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DTC Troubleshooting Process Description

Troubleshooting Process Description

Troubleshooting Process Description

The following is a brief description of DTC troubleshooting process.

DTC Description

It describes the DTC diagnosed in this procedure. DTC No. and failure description with symptom description will be provided in writing when appropriate.

Subsystem Principle

Circuit/system description determines how the circuit/system works properly.

Conditions for Running DTCs

Conditions for running DTCs, it confirms which conditions must appear to allow the running of failure diagnosis.

Unordered list in this procedure shows that the conditions for running DTCs are in "and" relation with each other.

Conditions for Setting DTCs

Conditions for setting DTCs, it confirms which conditions must appear when diagnosis fails and when this DTC is set.

Unordered list in this procedure shows that the conditions for setting DTCs are in "and" relation with each other.

Operations of ECU after Failure

Action taken when the DTC is set, it confirms the default operation when the control module has a DTC set.

Unordered list in this procedure shows that actions taken when the DTC is set are in "and" relation with each other.

Conditions for Clearing DTCs

Conditions for clearing DTCs, it confirms the conditions that must be met to clear DTCs.

Unordered list in this procedure shows that conditions for clearing DTCs/MILs are in "or" relation with each other.

Possible Failure Causes and Maintenance Scheme

Failure Causes have all factors that may cause this DTC listed, so that the technician can narrow down the servicing range, and repair vehicle failures quickly and effectively.

Unordered list in this procedure shows that failure causes are in "or" relation with each other.

Diagnostic Test Steps

As a gradual process, circuit/system test is carried out in test sequence of positive number, technicians are allowed to carry out every test step in sequence, until a failure is found. If the result of the test step in this number has been reached, proceed with the test step in next number according to normal flow. If the result of the test step in this number does not be reached, inspection and servicing suggestion after this test will confirm which operation will be taken.

Carry out interference diagnosis to confirm system failure. Disconnect system harness connector from the module or component to test single circuit function. Module or component helps to confirm the circuit function. When the inspection fails, suggestion after servicing step will indicate the circuit failure need to be tested. For example, short to voltage, short to ground or open circuit/high resistance.

When inspecting single circuit failure, technicians shall also carry out terminal inspection, such as connecting surface and terminal tension on harness and component/module.

When those test steps are carried out, the control module and component will also be diagnosed. Before the replacement, always re-test the control module or component. For example, re-connect all components and module, re-test system, and confirm that the failure still exists before the module or component replacement.

Diagnostic Test Methods

Diagnostic test methods can provide static and/or dynamic component tests. Those tests are used to confirm whether the component works normally so as to avoid unnecessary replacement.

Test module in this category is not available. Mostly, module is used to confirm harness circuit in circuit/system test category, and always re-test module before replacement.

FTB List

FTB List

Category	FTB Summary	FTB	English Description	Chinese Description
00-0F	General Failure	00	No Sub Type Information	无子类型描述
		01	General Electrical Failure	一般电子故障
		02	General Signal Failure	一般信号故障
		03	FM (Frequency Modulated)/PWM (Pulse Width Modulated) Failure	调频/调制脉宽信号故障
		04	System Internal Failure	系统内部故障
		05	System Programming Failure	系统程序故障
		06	Algorithm Based Failures	基础算法故障
		07	Mechanical Failure	机械故障
		08	Bus Signal/Message Failure	总线信号/信息故障
		09	Component Failure	元件故障
10-1F	一般电子故障	11	Circuit Short to Ground	对地短路
		12	Circuit Short to Battery	对蓄电池短路
		13	Circuit Open	电路开路
		14	Circuit Short to Ground or Open	对地短路或开路
		15	Circuit Short to Battery or Open	对电源短路或开路
		16	Circuit Voltage Below Threshold	电路电压低于阈值
		17	Circuit Voltage Above Threshold	电路电压高于阀值
		18	Circuit Current Below Threshold	电路电流低于阈值
		19	Circuit Current Above Threshold	电路电流高出阈值
		1A	Circuit Resistance Below Threshold	电路电阻低于阈值
		1B	Circuit Resistance Above Threshold	电路电阻高于阀值
		1C	circuit voltage out of range	电压超出范围
		1D	Circuit Current Out of Range	电流超出范围
		1E	Circuit Resistance Out of Range	电阻超出范围
		1F	Circuit Intermittent	电路间歇故障
20-2F	一般信号故障	21	Signal Amplitude < Minimum	信号幅值小于最小值
		22	Signal Amplitude > Maximum	信号幅值大于最大值
		23	Signal Stuck Low	信号低于阈值卡滞
		24	Signal Stuck High	信号高于阈值卡滞
		25	Signal Shape/Waveform Failure	信号波形错误
		26	Signal Rate of Change Below Threshold	信号变频低于阈值
		27	Signal Rate of Change Above Threshold	信号变频高于阈值
		28	Signal Bias Level Out of Range / Zero Adjustment Failure	信号偏置超出范围/零点校准失败
		29	Signal Invalid	信号无效
		2A	Signal Stuck In Range	信号在阈值内卡滞
		2B	Signal Cross Coupled	信号交叉

Category	FTB Summary	FTB	English Description	Chinese Description
		2F	Signal Erratic	信号不稳定
30-3F	调频/调制脉宽信号故障	31	No Signal	无信号
		32	Signal Low Time < Minimum	信号低时间小于最小值
		33	Signal Low Time > Maximum	信号低时间大于最大值
		34	Signal High Time < Minimum	信号高时间小于最小值
		35	Signal High Time > Maximum	信号高时间大于最大值
		36	Signal Frequency Too Low	信号频率过低
		37	Signal Frequency Too High	信号频率过高
		38	Signal Frequency Incorrect	信号频率错误
		39	Signal Has Too Few Pulses	信号脉冲过少
		3A	Signal Has Too Many Pulses	信号脉冲过多
40-4F	系统内部故障	41	General Checksum Failure	一般校验和故障
		42	General Memory Failure	一般存储故障
		43	Special Memory Failure	特殊存储故障
		44	Data Memory Failure	数据存储故障
		45	Program Memory Failure	程序存储故障
		46	Calibration/Parameter Memory Failure	标定/参数存储故障
		47	Watchdog/Safety mC Failure	看门狗/安全监测故障
		48	Supervision Software Failure	软件监控故障
		49	Internal Electronic Failure	内部电子故障
		4A	Incorrect Component Installed	元件安装错误
		4B	Over Temperature	温度过高
50-5F	系统程序故障	51	Not Programmed	未编程
		52	Not Activated	未激活
		53	Deactivated	休眠
		54	Missing Calibration	无标定
		55	Not Configured	未配置
		56	Invalid/Incompatible Configuration	配置无效/不匹配
		57	Invalid/Incompatible Software Component	软件无效/不匹配
60-6F	基础算法故障	61	Signal Calculation Failure	信号计算故障
		62	Signal Compare Failure	信号对比故障
		63	Circuit/Component Protection Time-Out	电路/元件保护超时
		64	Signal Plausibility Failure	信号合理性故障
		65	Signal Has Too Few Transitions/Events	信号转变次数过少
		66	Signal Has Too Many Transitions/Events	信号转变次数过多
		67	Signal Incorrect After Event	偶发后信号错误
		68	Event Information	偶发事件

Category	FTB Summary	FTB	English Description	Chinese Description
70-7F	机械故障	71	Actuator Stuck	执行器卡滞
		72	Actuator Stuck Open	执行器卡滞在打开状态
		73	Actuator Stuck Closed	执行器卡滞关关闭状态
		74	Actuator Slipping	执行器打滑
		75	Emergency Position Not Reachable	未达到紧急位置
		76	Wrong Mounting Position	错误的安装位置
		77	Commanded Position Not Reachable	未达到目标位置
		78	Alignment or Adjustment Incorrect	校正错误
		79	Mechanical Linkage Failure	机械连接故障
		7A	Fluid Leak or Seal Failure	液体泄漏或密封故障
		7B	Low Fluid Level	低液位
80-8F	总线信号故障	81	Invalid Serial Data Received	接收系列无效数据
		82	Alive/Sequence Counter Incorrect/Not Updated	计数错误
		83	Value of Signal Protection Calculation Incorrect	校验值错误
		84	Signal Below Allowable Range	信号值低于允许范围
		85	Signal Above Allowable Range	信号值高于允许范围
		86	Signal Invalid	无效信号
		87	Missing Message	通信信息丢失
		88	Bus off	总线断开
		8F	Erratic	不稳定
90-9F	元件故障	91	Parametric	参数/变量
		92	Performance or Incorrect Operation	性能或操作错误
		93	No Operation	无作用
		94	Unexpected Operation	意外运行
		95	Incorrect Assembly	装配错误
		96	Component Internal Failure	元件内部故障
		97	Component or System Operation Obstructed or Blocked	元件或系统运行受阻
		98	Component or System Over Temperature	部件或系统温度过高
		9A	Component or System Operating Conditions	元件或系统运行受限

Integrity Inspection of Network

Integrity Inspection of Comfort HS CAN Network

Please confirm the followings:

- Control modules and LAN devices equipped on the vehicle
- Position of Control Module on HS CAN (Comfort System) Serial Data Circuit
- Control module B+, KL15, grounding, communication enabling and serial data circuit terminals

1. Confirm that there is no DTC for communication between other modules before the diagnosis.

   If any, diagnose it first.

2. Place the start switch in "OFF" position, and disconnect the negative battery cable.
3. Test the resistance between terminals CAN H (20) and CAN L (19) of the GW harness connector FA074 according to the following conditions:

   Condition A: With all connectors connected, check if the resistance is 60±5Ω.

   Condition B: With connectors of the GW or the BCM disconnected, test if the resistance is 120±5Ω

   Condition C: With connectors of the GW or the BCM disconnected, test if the resistance is infinite.

4. If the above resistances fail to meet the standard value, disconnect the harness connector from the control module which is unable to communicate.
5. Test if the resistance between the ground circuit terminal of each control module and the ground is less than 10Ω.

   If it is greater than the specified range, test the ground circuit for open circuit/high resistance.

6. Connect the negative battery cable, place the start switch in "ON" position, and confirm if the test lamp between the B+ circuit terminal of each control module and the ground illuminates.

   If the test lamp fails to illuminate, test the B+ circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

7. Confirm if the test lamp between each start circuit terminal and the ground illuminates.

   If the test lamp fails to illuminate, test the start circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

Integrity Inspection of Power HS CAN Network

Please confirm the followings:

- Control modules and LAN devices equipped on the vehicle
- Position of Control Module on HS CAN (Power System) Serial Data Circuit
- Control module B+, KL15, grounding, communication enabling and serial data circuit terminals

1. Confirm that there is no DTC for communication between other modules before the diagnosis.

   If any, diagnose it first.

2. Place the start switch in "OFF" position, and disconnect the negative battery cable.
3. Test the resistance between terminals CAN H (16) and CAN L (15) of the GW harness connector FA074 according to the following conditions:

   Condition A: With all connectors connected, test if the resistance is 62±5Ω.

   Condition B: With connectors of the SDM or the IMCU disconnected, test if the resistance is 124±5Ω.

   Condition C: With connectors of the SDM or the IMCU disconnected, test if the resistance is infinite.

4. If the above resistances fail to meet the standard value, disconnect the harness connector from the control module which is unable to communicate.
5. Test if the resistance between the ground circuit terminal of each control module and the ground is less than 10Ω.

   If it is greater than the specified range, test the ground circuit for open circuit/high resistance.

6. Connect the negative battery cable, place the start switch in "ON" position, and confirm if the test lamp between the B+ circuit terminal of each control module and the ground illuminates.

   If the test lamp fails to illuminate, test the B+ circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

7. Confirm if the test lamp between each start circuit terminal and the ground illuminates.

   If the test lamp fails to illuminate, test the start circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

Integrity Inspection of Chassis HS CAN Network

Please confirm the followings:

- Control modules and LAN devices equipped on the vehicle
- Position of Control Module on HS CAN (Chassis) Serial Data Circuit
- Control module B+, KL15, grounding, communication enabling and serial data circuit terminals

1. Confirm that there is no DTC for communication between other modules before the diagnosis.

   If any, diagnose it first.

2. Place the start switch in "OFF" position, and disconnect the negative battery cable.
3. Test the resistance between terminals CAN H (2) and CAN L (1) of the GW harness connector FA075 according to the following conditions:

   Condition A: With all connectors connected, test if the resistance is 62±5Ω.

   Condition B: With connectors of the GW or the IPK disconnected, test if the resistance is 124±5Ω.

   Condition C: With connectors of the GW or the IPK disconnected, test if the resistance is infinite.

4. If the above resistances fail to meet the standard value, disconnect the harness connector from the control module which is unable to communicate.
5. Test if the resistance between the ground circuit terminal of each control module and the ground is less than 10Ω.

   If it is greater than the specified range, test the ground circuit for open circuit/high resistance.

6. Connect the negative battery cable, place the start switch in "ON" position, and confirm if the test lamp between the B+ circuit terminal of each control module and the ground illuminates.

   If the test lamp fails to illuminate, test the B+ circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

7. Confirm if the test lamp between each start circuit terminal and the ground illuminates.

   If the test lamp fails to illuminate, test the start circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

Integrity Inspection of Driver Assistance HS CAN Network

Please confirm the followings:

- Control modules and LAN devices equipped on the vehicle
- Position of Control Module on HS CAN (Driver Assistance) Serial Data Circuit
- Control module B+, KL15, grounding, communication enabling and serial data circuit terminals

1. Confirm that there is no DTC for communication between other modules before the diagnosis.

   If any, diagnose it first.

2. Place the start switch in "OFF" position, and disconnect the negative battery cable.
3. Test the resistance between terminals CAN H (25) and CAN L (24) of the GW harness connector FA074 according to the following conditions:

   Condition A: With all connectors connected, test if the resistance is 62±5Ω.

   Condition B: With connectors of the GW or the FVCM disconnected, test if the resistance is 124±5Ω.

   Condition C: With connectors of the GW or the FVCM disconnected, test if the resistance is infinite.

4. If the above resistances fail to meet the standard value, disconnect the harness connector from the control module which is unable to communicate.
5. Test if the resistance between the ground circuit terminal of each control module and the ground is less than 10Ω.

   If it is greater than the specified range, test the ground circuit for open circuit/high resistance.

6. Connect the negative battery cable, place the start switch in "ON" position, and confirm if the test lamp between the B+ circuit terminal of each control module and the ground illuminates.

   If the test lamp fails to illuminate, test the B+ circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

7. Confirm if the test lamp between each start circuit terminal and the ground illuminates.

   If the test lamp fails to illuminate, test the start circuit for short to ground or open circuit/high resistance.

   If the circuit fuse is blown, test the control circuit of the control module for short to ground.

   If the circuit test is normal, replace the control module.

Shifter Control Unit (SCU)

DTC Index

List

DTC	FTB	VDS Description	Warning Lamp	Failure Level
U0073	88	PT CAN Bus Off	ON	IIA
U0128	87	Lost Communication with EPMCU	OFF	III
U0146	87	Lost Communication with Gateway (GW)	OFF	III
U0293	87	Lost Communication with IMCU	OFF	III
C16B4	29	Vehicle Speed Signal Invalid	OFF	III
P17BA	8B	Brake Pedal Signal Invalid	OFF	III
U16DB	82	CAN Message Roll Count Fail - EPMCU	OFF	III
U16DB	83	CAN Message CRC Check Fail - EPMCU	OFF	III
U17A9	82	CAN Message Roll Count Fail - Vehicle Speed	OFF	III
U17A9	83	CAN Message CRC Check Fail - Vehicle Speed	OFF	III
U1562	17	ECU Power Supply Circuit Voltage High	OFF	III
U1563	16	ECU Power Supply Circuit Voltage Low	OFF	III
P17A2	61	Lever Hall Sensor 1 Singal Error	OFF	III
P17A3	61	Lever Hall Sensor 2 Singal Error	OFF	III
P17A4	61	Lever Hall Sensor Singal Stuck	OFF	III
P17BB	07	Park (P) Button One Switch Malfunction	OFF	III
P17BC	07	Park (P) Button Two Switch Malfunction	OFF	III

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

C16B4, P17BA, U16DB and U17A9

DTC Description

DTC	FTB	DTC Description
C16B4	29	Vehicle Speed Signal Invalid
P17BA	8B	Brake Pedal Signal Invalid
U16 DB	82	CAN Message Roll Count Fail - EPMCU
U16 DB	83	CAN Message CRC Check Fail - EPMCU
U17A9	82	CAN Message Roll Count Fail - Vehicle Speed
U17A9	83	CAN Message CRC Check Fail - Vehicle Speed

Subsystem Principle

The input signal of ECU not only comes from the hard wire circuit, but also relies on the signal frame sent by each node on the CAN network. The ECU will judge if the signal is normal through CAN protocol rules or information of signal itself. When abnormal signal is monitored from CAN network, it will set this DTC.

Conditions for Running DTCs

- ECU supply voltage is normal.
- ECU is in wakeup state (KL15=ON).
- "Bus Off" DTC is not set.

Conditions for Setting DTCs

C16B4 29: It is detected that the speed signal of CAN bus is invalid data, which comes from the dynamic stability control system (SCS).

P17BA 8B: It is detected that the brake pedal signal of CAN bus is invalid data, which comes from ICC (transferred from IMCU).

U16DB 82/83: It is detected that the electric parking motor control unit (EPMCU) signal count/check is incorrect.

U17A9 82/83: It is detected that the speed signal count/check from the dynamic stability control system (SCS) is incorrect.

Operations of ECU after Failure

- Record the failure message.
- Disable the shifting operation.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

Signal Error Node ECU:

- Internal software failure.
- Internal Hardware Failure
- Failure exists in the system where the node is.

Reference Information

Service Circuit Diagram

- Shift Control System

Diagnostic Test Steps

1. System detection:Confirm the following symptoms.
   - They are current DTCs.

     ® Yes, confirm the next item;

     ® No, clear the DTCs with the scan tool.
   - Signal error node ECU software version is not the latest.

     ® Yes, perform the ECU update;

     ® No, confirm the next item.
   - Whether signal error node ECU has related DTC to this signal.

     ® Yes, perform the diagnostic procedure of this DTC.

     ® No, replace the signal error node ECU.

P17A2, P17A3 and P17A4

DTC Description

DTC	FTB	DTC Description
P17A2	61	Lever Hall Sensor 1 Singal Error
P17A3	61	Lever Hall Sensor 2 Singal Error
P17A4	61	Lever Hall Sensor Singal Stuck

Subsystem Principle

Two [Shift Lever Position Sensors] are integrated in [Column Lever Stalk Switch Assembly], and each sensor sends 2 cross-check signals, which are used to monitor the position of the column lever stalk switch. When abnormal sensor signal is detected, the DTC is set.

Conditions for Running DTCs

- ECU supply voltage is normal.
- ECU is in wakeup state (KL15=ON).

Conditions for Setting DTCs

P17A2 61: Invalid signal of shift lever position sensor 1 is detected.

P17A3 61: Invalid signal of shift lever position sensor 2 is detected.

P17A4 61: It is detected that the signal of shift lever position sensor is stuck in the unstable position for more than 60s.

Operations of ECU after Failure

- Record the failure message.
- Work with the position sensor single signal.

Conditions for Clearing DTCs

It is detected that the shift lever position signal returns to normal.

Possible Failure Causes

[Shifter Control Unit (SCU)]:

- Internal Hardware Failure
- Internal software failure.

Reference Information

Service Circuit Diagram

- Shift Control System

Diagnostic Test Steps

1. System detection:Confirm the following symptoms.

- While operating the shift lever, read the scan tool "[Shift Lever Gear Position]" parameter value to see whether it meets the gear position.

  ® Yes, confirm the next item;

  ® No, replace the [Shifter Control Unit (SCU)] assembly.

- ECU software version is not the latest.

  ® Yes, perform the ECU update;

  ® No, clear the DTCs with the scan tool.

P17BB and P17BC

DTC Description

DTC	FTB	DTC Description
P17BB	07	Park (P) Button One Switch Malfunction
P17BC	07	Park (P) Button Two Switch Malfunction

Subsystem Principle

[Park (P) Button] is integrated in [Knob Gearshift Switch Assembly], and the button sends the cross-check signal. ECU senses the user's operation by monitoring the button signal. When abnormal signal is detected, the DTC is set.

Conditions for Running DTCs

- ECU supply voltage is normal.
- ECU is in wakeup state (KL15=ON).

Conditions for Setting DTCs

P17BB 07: Parse failure exists in one of button signals 1&2.

P17BC 07: Parse failure exists in both of button signals 1&2.

Operations of ECU after Failure

P17BB 07: Work with button single signal.

P17BB 07: Disable the shifting operation.

Conditions for Clearing DTCs

It is detected that the button signal returns to normal.

Possible Failure Causes

[Shifter Control Unit (SCU)]:

- Internal Hardware Failure
- Internal software failure.

Reference Information

Service Circuit Diagram

- Shift Control System

Diagnostic Test Steps

1. System detection:Confirm the following symptoms.

   • Operate the shift lever [Park (P) Button], and read the scan tool "[Park (P) Button Signal 1/2]" parameter value to check that they are "Normal".

   ® Yes, confirm the next item;

   ® No, replace the [Shifter Control Unit (SCU)].

   • ECU software version is not the latest.

   ® Yes, perform the ECU update.

   ® No, clear the DTCs with the scan tool.

U0073

DTC Description

DTC	FTB	DTC Description
U0073	88	PT CAN Bus Off

Subsystem Principle

The data communication among ECUs is realized via the CAN bus. The DTC is set when it is detected that the CAN bus communication cannot be established.

Circuit related to this DTC:

[Shifter Control Unit (SCU)] connector:

- Terminal - 07: Powertrain HS CAN High
- Terminal - 08: Powertrain HS CAN Low

Conditions for Running DTCs

ECU is in wakeup state (KL15=ON).

Conditions for Setting DTCs

It is detected that the bus failed to receive/transmit the message.

Operations of ECU after Failure

ECU records the failure message.

Conditions for Clearing DTCs

The ECU successfully establishes the CAN bus communication.

Possible Failure Causes

[Shifter Control Unit (SCU)]:

- Internal Hardware Failure

CAN bus transmission:

- Harness or Connector Circuit Failure

ECUs in other nodes of CAN bus:

- ECU hardware failure.
- ECU power supply failure.

Reference Information

Service Circuit Diagram:

- Shift Control System

Diagnostic Test Steps

1. System detection:Confirm the following symptoms.

   - They are current DTCs.

     ® Yes, confirm the next item;

     ® No, clear the DTCs with the scan tool.

   - [Shifter Control Unit (SCU)] harness connector has terminal damage, retreat, looseness, water immersion and other failures.

     Yes, repair the connector failures;

     ® No, confirm the next item.

   - Short connect [KL15 Relay] socket power supply terminal 30 and output terminal 87, to test the following [Shifter Control Unit (SCU)] harness terminal:

Conditions	Measure the terminals	Normal Value
Power-off	CAN_H Terminal and CAN_L Terminal	Resistance: 60 or 120 Ω
Power-on	CAN_H Terminal and Ground	Voltage: 2.5 - 4.3 Volts
	CAN_L Terminal and Ground	Voltage: 0.7 - 2.5 Volts

     ® Yes, replace the [Shifter Control Unit (SCU)];

     ® No, perform "Detect Network Node" for ECUs on other nodes of network in turn.

2. Detect network node: Confirm the following symptoms.

   - Node ECU harness connector has terminal damage, retreat, looseness, water immersion and other failures.

     Yes, repair the connector failures;

     ® No, confirm the next item.

   - Short connect [KL15 Relay] socket power supply terminal 30 and output terminal 87, to test the following node ECU harness terminal:

Conditions	Measure the terminals	Normal Value
Power-off	CAN_H Terminal and CAN_L Terminal	Resistance: 60 or 120 Ω
	KL31 Terminal and Ground	Resistance: Less than 10Ω

Power-on	CAN_H Terminal and Ground	Voltage: 2.5 - 4.3 Volts
	CAN_L Terminal and Ground	Voltage: 0.7 - 2.5 Volts
	KL30 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to Illuminate it
	KL15 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to Illuminate it

® Yes, replace the node ECU;

® No, perform one node detection.

If the ECU detection for all CAN nodes has been completed, and node ECU failure has been corrected. Detect the CAN network related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.

U0128, U0146 and U0293

DTC Description

DTC	FTB	DTC Description
U0128	87	Lost Communication with EPMCU
U0146	87	Lost Communication with ICC
U0293	87	Lost Communication with IMCU

Subsystem Principle

The data communication among ECUs is realized via the CAN bus, and the communication of ECUs at each node on the CAN bus is monitored. It is mainly ECU power supply, KL15 switch signal and CAN network circuit that affect the CAN communication function of ECU. The DTC will be set when it is detected that the communication message of an ECU is lost.

Conditions for Running DTCs

- ECU supply voltage is normal.
- ECU is in wakeup state (KL15=ON).

Conditions for Setting DTCs

A message frame of a specific ECU is not received within the given time.

Operations of ECU after Failure

The system enters the protection operation mode, and relevant parameters use the default value to work.

Conditions for Clearing DTCs

A message frame of a specific ECU is received within the given time.

Possible Failure Causes

Node loss ECU:

- Internal software failure.
- Internal Hardware Failure
- ECU power supply circuit failure.

Reference Information

Service Circuit Diagram

- Shift Control System

Diagnostic Test Steps

1. System detection:Confirm the following symptoms.
   - They are current DTCs.

     ® Yes, confirm the next item;

     ® No, clear the DTCs with the scan tool.
   - Node loss ECU software version is not the latest.

     ® Yes, perform the ECU update.

     ® No, perform the "Detect Network Loss Node".
2. Detect network loss node: Confirm the following symptoms.
   - Node ECU harness connector has terminal damage, retreat, looseness, water immersion and other failures.

     Yes, repair the connector failures;

     ® No, confirm the next item.
   - Short connect [KL15 Relay] socket power supply terminal 30 and output terminal 87, to test the following node ECU harness terminal:

Conditions	Measure the terminals	Normal Value
Power-off	CAN_H and CAN_L	Resistance: 60 or 120 Ω
	KL31 Terminal and Ground	Resistance: Less than 10Ω
Power-on	CAN_H Terminal and Ground	Voltage: 2.5 - 4.3 Volts
	CAN_L Terminal and Ground	Voltage: 0.7 - 2.5 Volts
	KL30 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to Illuminate it
	KL15 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to Illuminate it

   ® Yes, replace the node ECU;

   ® No, detect the CAN network related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	ECU Power Supply Circuit Voltage High
U1563	16	ECU Power Supply Circuit Voltage Low

Subsystem Principle

[Low Voltage Battery] provides 12V standard power supply for the on-board low-voltage electrical device through the hard wire circuit. Start the vehicle to charge the [Low Voltage Battery], to maintain the battery power and voltage. When abnormal supply voltage is detected, the DTC is set.

Circuit related to this DTC:

[Shifter Control Unit (SCU)] connector:

- Terminal 01 KL30 (Power Supply).
- Terminal 12 KL31 (Ground).

Conditions for Running DTCs

ECU is in wakeup state (KL15=ON).

Conditions for Setting DTCs

U1562 17: The battery voltage greater than 16V is detected.

U1563 16: The battery voltage less than 9V is detected.

Operations of ECU after Failure

Disable the gear shift actuator action.

Conditions for Clearing DTCs

ECU supply voltage returns to normal.

Possible Failure Causes

[Shifter Control Unit (SCU)]:

- Internal software failure.
- Internal Hardware Failure

ECU power supply circuit:

- KL30 fuse contact is poor.
- Harness, ground and connector failure.

[Low-voltage Battery]:

- Battery feeding.
- Aging.

On-board Charging Circuit:

- On-board generator or electric energy conversion device.
- Harness, ground and connector failure.

On-board electrical device:

- Non-standard add-on refitted electrical devices.
- On-board electrical device sleep current is too high.

Reference Information

Service Circuit Diagram

- Shift Control System

Diagnostic Test Steps

1. System detection: After [Low-voltage Battery] is fully charged, confirm the following symptoms.

- The battery voltage measurement value is inconsistent with the scan tool "[Battery Positive (KL30) Circuit Voltage]" parameter value, and the difference is more than 0.5V.

  ® Yes, perform the "Detect ECU power supply circuit failure";

  ® No, confirm the next item.

- Gently shake the ECU power supply circuit related harness and connector, and the scan tool "[Battery Positive (KL30) Circuit Voltage]" parameter value jumps.

  ® Yes, perform the "Detect ECU power supply circuit failure".

  ® No, confirm the next item.

- Disconnect the charging device, and the battery voltage is less than 12V or fails to start.

  ® Yes, perform the "Detect the battery aging failure".

  ® No, confirm the next item.

- After the vehicle is started, under charging state, the battery voltage exceeds the range of 13 - 16V.

  ® Yes, perform the "Detect the on-board charging circuit failure".

  ® No, confirm the next item.

- With the vehicle not started or under sleep state, the battery voltage drops too quickly, and fails to maintain at more than 10V for a long time.

  ® Yes, perform the "Detect the on-board electrical device failure".

  ® No, confirm the next item.

- ECU software version is not the latest

  ® Yes, perform the ECU update.

  ® No, clear the DTCs with the scan tool.

2. Detect the ECU power supply circuit failure: confirm the following symptoms:

- [KL30 Fuse] Connector or terminal has corrosion or poor contact.

  ® Yes, tighten or replace the fuse;

  ® No, confirm the next item.

- [Shifter Control Unit (SCU)] harness connector has terminal damage, retreat, looseness, water immersion and other failures.

  Yes, repair the connector failures;

® No, confirm the next item.

• Test the following terminals at the [Shifter Control Unit (SCU)] connector harness side:

Conditions	Measure the terminals	Normal Value
Power-off	KL31 Terminal and Ground	Resistance: Less than 10Ω
Power-on	KL30 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to Illuminate it

® Yes, replace the [Shifter Control Unit (SCU)];

® No, detect the power supply system related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.

3. Detect Battery Aging Failure: confirm the following symptoms:

• The health status of battery is lower than the expected value.

® Yes, replace the [Low-voltage Battery].

4. Detect the on-board charging circuit failure: confirm the following symptoms:

• After the vehicle is started, the charging system voltage exceeds the range of 13 - 16V.

® Yes, repair or replace the on-board charging device;

® No, detect the charging system related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.

5. Detect the on-board electrical device failure: confirm the following symptoms:

Under the vehicle sleep state, the battery current is higher than the expected value.

® Yes, remove the on-board electrical devices one by one, confirm the device that consumes much electricity and make repairs/replacement;

® No, perform the "Detect the battery aging failure".

Electric Parking Motor Control Unit (EPMCU)

DTC Index

List

DTC	FTB	Description	Failure Level*
C1901	17	power supplier voltage too high	I
C1901	16	power supplier voltage too low	I
C1930	71	Rotor is Stuck	I
C1933	29	EPMCU rotor position sensor faults	IIB
C1934	1D	Motor Over Current	IIB
C196D	04	Power chip hardware failure	IIB
C196E	04	Driver chip hardware failure	IIB
C196F	63	Park Brake Application in Progress Overtime	IIB
C196F	99	Park Brake Application Exceed Expected Range	IIB
U0073	88	Control Module Communication Bus Off on "PT Extended CAN"	I
U0103	87	Lost Communication with Gear Shift Control Module (SCU)	IIB
U0122	87	Lost Communication with Integrated Brake System(IBS) / Stability Control System (SCS)	IIB
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)/Intelligent Computer Controller (ICC)	IIB
U0293	87	Lost Communication with Intelligent Motor Control Unit (IMCU)	IIB
U1562	17	Battery Voltage High	IIB
U1563	16	Battery Voltage Low	IIB
U1600	81	Invalid date received from SCU ModeReq	IIB
U1601	83	Frame SCU_EXTDCAN_FrP00 checksum error	IIB
U2021	47	External Watchdog error	IIB

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
- IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time
- III: Inspection during maintenance
- IV: Inspection based on actual demand

Diagnosis Information and Procedure

C1901, U1562 and U1563

DTC Description

DTC	FTB	Failure Description
C1901	16	power supplier voltage too low
C1901	17	power supplier voltage too high
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The module monitors the system voltage to check whether the module supply voltage is within the normal operating range; if the monitored voltage exceeds the specified range, trigger and record the DTC.

Conditions for Running DTCs

- The vehicle is powered on.
- Message frame EPTstCmdOn signal is "False".

Conditions for Setting DTCs

C1901 16: The input voltage of EPMCU is <6V.

C1901 17: The input voltage of EPMCU is >18V.

U1562 17: The input voltage of EPMCU is ≥16V for 1s.

U1563 16: The input voltage of EPMCU is ≤9V for 1s.

Operations of ECU after Failure

Report the DTC only.

Conditions for Clearing DTCs

C1901 16: The input voltage of EPMCU is ≥6.5V.

C1901 17: The input voltage of EPMCU is ≤17.5V.

U1562 17: The input voltage of EPMCU is <15.5V for 1s.

U1563 16: The input voltage of EPMCU is >9.5V for 1s.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
3. Battery cable fault:
   - Replace/repair battery cables.
4. Internal fault of electric parking motor control unit:
   - Replace/refresh the control module.

Reference Circuit Diagram

Electronic Oil Pump Controller & Electric Parking.

Diagnostic Test Steps

1. Check the battery:

   ® Abnormal aging, damage, deformation, or leakage of the battery: Replace the battery.

   ® Normal, go to 2.

2. Check the wiring harness and connectors of the electric parking motor control unit:

   ® Loose connectors, pin pins deformed/broken, power supply harness continuity fault, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check battery cables:

   ® Loose, broken, damaged and other abnormalities: repair/replace battery cables.

   ® Normal, go to 4.

4. Check the electric parking motor control unit:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

C1930, C1933 and C1934

DTC Description

DTC	FTB	Failure Description
C1930	71	Rotor is Stuck
C1933	29	EPMCU rotor position sensor faults
C1934	1D	Motor Over Current

Subsystem Principle

The EPMCU judges the operating status by detecting the operating current of motor; when the operating current of rotor is too large, it is generally diagnosed as the rotor rotating restriction problem.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

C1930 71:

- The parking brake application is out of range (M-18 and M+18, where M is the offline remote self-learning value).
- The motor speed is lower than 20rpm for 100ms.

C1933 29: 0.55<(sina*sina+cosa*cosa)<1.45, where a is the angle of Hall sensor.

C1934 1D: EPMCU current is ≥27A for 100ms.

Operations of ECU after Failure

Report the DTC only.

Conditions for Clearing DTCs

C1930 71: The parking brake application is within the range (M-18 and M+18, where M is the offline remote self-learning value), or the motor speed is lower than 20rpm for less than 100ms.

C1933 29: (sina*sina+cosa*cosa)<0.55 or (sina*sina+cosa*cosa)>1.45.

C1934 1D: EPMCU current is <27A for 100ms.

Possible Failure Causes and Maintenance Scheme

1. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
2. Internal fault of electric parking motor control unit:
   - Refresh/replace the control module.
3. EDU parking actuator malfunction:
   - Replace/repair the EDU parking actuator.

Reference Circuit Diagram

Electronic Oil Pump Controller & Electric Parking.

Diagnostic Test Steps

1. Check the wiring harness and connectors of the electric parking motor control unit:

   ® Loose connectors, pin pins deformed/broken, power supply harness continuity fault, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the EDU parking actuator:

   ® Confirm whether the parking actuator function is normal, hardware damage and other abnormalities: repair/replace the EDU parking actuator.

   ® Normal, go to 3.

3. Check the electric parking motor control unit:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

C196D, C196E and C196F

DTC Description

DTC	FTB	Failure Description
C196D	04	Power chip hardware failure
C196E	04	Driver chip hardware failure
C196F	63	Park Brake Application in Progress Overtime
C196F	99	Park Brake Application Exceed Expected Range

Subsystem Principle

Failure occurs inside the electric parking motor control unit (EPMCU), not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Wakeup Enabled.

Conditions for Setting DTCs

C196D 04:

- Power supply voltage VS over-voltage is greater than or equal to 19.5V.
- Power supply voltage VS under-voltage is less than or equal to 5.5V.
- SBC output VCC1 over-voltage is greater than or equal to 5.2V.
- SBC output VCC1 under-voltage is less than or equal to 4.5V.
- SBC output VCC1 is short to ground.

C196E 04:

- It warns if the chip temperature exceeds 125°C.
- It shuts down if the chip temperature exceeds 150°C.
- The power supply voltage VS undervoltage is <6V.
- VG<4.5V.
- It is detected that the FET is short to ground for 50 consecutive times (50ms).
- Over current shutoff.

C196F 63: The parking brake application lasts for more than 1s.

C196F 99: The parking brake application range exceeds (M-8, M+5), and M is the self-learning distance after being offline.

Operations of ECU after Failure

C196D 04 and C196E 04: Fail-safe mode.

C196F 63 and C196F 99: Unknown parking state.

Conditions for Clearing DTCs

C196D 04:

- VS<19V.
- VS is within the range of 6V - 16V.
- 4.8<SBC output VCC1<5.2V.
- 4.8<SBC output VCC1<5.2V.
- SBC output VCC1 is not short to ground.

C196E 04:

- The chip temperature is lower than 100°C.
- Power supply voltage VS rises to 6.6V.
- VG>4.5V.
- It is detected that the FET is short to ground for less than 50 times (50ms).
- The motor current drops.

C196F 63: The parking brake application lasts for less than 1s.

C196F 99: The parking brake application range is within (M-8, M+5), and M is the remote self-learning after being offline.

Possible Failure Causes and Maintenance Scheme

1. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
2. Internal fault of electric parking motor control unit:
   - Refresh/replace the control module.

Diagnostic Test Steps

1. Check the wiring harness and connectors of the electric parking motor control unit:

   ® Loose connectors, pin pins deformed/broken, power supply harness continuity fault, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the electric parking motor control unit:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

U0073

DTC Description

DTC	FTB	Failure Description
U0073	88	Control Module Communication Bus Off on "PT Extended CAN"

Subsystem Principle

The data communication among ECUs is realized via the CAN bus, and the communication of ECUs at each node on the CAN bus is monitored. The DTC is set when it is detected that the CAN bus communication cannot be established.

Conditions for Running DTCs

- The vehicle is powered on.
- Message frame EPTstCmdOn signal is "False".

Conditions for Setting DTCs

When the controller has the transmission error for certain times, "Bus Off" state will appear. The DTC will be set if "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

Initialize the CAN network.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 wakeup/standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
2. Internal fault of electric parking motor control unit:
   - Refresh/replace the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed (Extension) Controller Area Network

Diagnostic Test Steps

1. High speed CAN network integrity check.
2. Check the CAN communication harness and connectors of the electric parking motor control unit - intelligent domain controller:

   ® Connector loose, Pin pin deformed/broken, CAN communication harness continuity fault, CAN communication harness short circuit to ground/power, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the electric parking motor control unit:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

U0103, U0122, U0146, U0293, U1600 and U1601

DTC Description

DTC	FTB	Failure Description
U0103	87	Lost Communication with Gear Shift Control Module (SCU)
U0122	87	Lost Communication with Integrated Brake System(IBS) / Stability Control System (SCS)
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)/Intelligent Computer Controller (ICC)
U0293	87	Lost Communication with Intelligent Motor Control Unit (IMCU)
U1600	81	Invalid date received from SCU ModeReq
U1601	83	Frame SCU_EXTDCAN_FrP00 checksum error

Subsystem Principle

The data communication among ECUs is realized via the CAN bus, and the communication of ECUs at each node on the CAN bus is monitored. The corresponding DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

- The vehicle is powered on.
- No communication off failure.
- Message frame EPTstCmdOn signal is "False".

Conditions for Setting DTCs

U0103 87: Any message is not received from SCU (CAN ID:0x9D) for 2s.

U0122 87: Any message is not received from IBS (CAN ID:0x1A9) for 2s.

U0146 87: Any message is not received from ICC (CAN ID:0x1F1) for 2s.

U0293 87: Any message is not received from IMCU (CAN ID:0x9B) for 2s.

U1600 81: ModeReq exceeds the range defined in DBC.

U1601 83: The DTC will be set when SCU SCU EXTDCAN FrP00 message check is different from the calculation result of EPMCU.

Operations of ECU after Failure

Only Report DTC.

Conditions for Clearing DTCs

U0103 87:

- During vehicle operation cycle, any message can be received from SCU.
- History DTCs will be cleared after 40 wakeup/standby cycles.

U0122 87:

- During vehicle operation cycle, any message can be received from IBS.
- History DTCs will be cleared after 40 wakeup/standby cycles.

U0146 87:

- During vehicle operation cycle, any message can be received from ICC.
- History DTCs will be cleared after 40 wakeup/standby cycles.

U0293 87:

- During vehicle operation cycle, any message can be received from IMCU.
- History DTCs will be cleared after 40 wakeup/standby cycles.

U1600 81:

- ModeReq is within the range defined in DBC.
- History DTCs will be cleared after 40 wakeup/standby cycles.

U1601 83:

- SCU SCU_EXTDCAN_FrP00 message checksum is correct.
- History DTCs will be cleared after 40 wakeup/standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
2. Internal fault of electric parking motor control unit:
   - Refresh/replace the control module.
3. Internal failure of integrated braking system (for U0122 87):
   - Refresh/replace the control module.
4. Internal fault of shift control unit (for U0103 87, U1600 81, U1601 83):
   - Refresh/replace the control module.
5. Internal fault of ICC (for U0146 87):
   - Refresh/replace the control module.
6. Internal fault of IMCU (for U0293 87):
   - Refresh/replace the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed (Extension) Controller Area Network, BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. High speed CAN network integrity check.
2. Check the CAN communication harness and connectors of the electric parking motor control unit - shift control unit/ICC/integrated braking system/IMCU:

   ® Connector loose, Pin pin deformed/broken, CAN communication harness continuity fault, CAN communication harness short circuit to ground/power, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the control module:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

U2021

DTC Description

DTC	FTB	Failure Description
U2021	47	External Watchdog error

Subsystem Principle

Failure occurs inside the control module, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

The watchdog timer overflows consecutively for 200ms.

Operations of ECU after Failure

Report the DTC only.

Conditions for Clearing DTCs

- The watchdog timer will not be triggered and interrupted for a cycle of 10ms.
- History DTCs will be cleared after 40 wakeup/standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Wiring harness or connector failure:
   - Replace/repair the wiring harness or connector.
2. Internal fault of electric parking motor control unit:
   - Refresh/replace the control module.

Diagnostic Test Steps

1. Check the wiring harness and connectors of the electric parking motor control unit:

   ® Loose connectors, pin pins deformed/broken, power supply harness continuity fault, control module grounding fault, and other abnormalities: repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the electric parking motor control unit:

   ® Software mismatch, hardware damage, and other abnormalities: refresh/replace the control module.

   ® Normal, Go to TAC Human Assistance.

Intelligent Motor Control Unit (IMCU)

DTC Index

List

DTC	FTB	Description	MIL*	Level*
P0A1B	00	Current Control not Rationally	SVS	I
P0A5E	00	Offset of U-phase Current out of Range	SVS	IIA
P0A61	00	Offset of V-phase Current out of Range	SVS	IIA
P0A64	00	Offset of W-phase Current out of Range	SVS	IIA
P0A8E	00	Hardware Phase Current Above Max Limit	SVS	I
P1611	51	Immobilizer: No response received	N/A	IIB
P1612	06	Immobilizer: invalid response received	N/A	IIB
P1614	06	Immobilizer: ECU is not programmed	N/A	IIB
P1620	00	Both Postive and Negative insulation fault without charger	VCU Fault Lamp	II
P1621	01	EOP Fault Levl2	VCU Fault Lamp	II
P1622	00	BMS Wrng IMCU Thermal Runaway Warning	VCU Fault Lamp	II
P1623	96	TM fault	VCU Fault Lamp	II
P1624	96	SAM fault	VCU Fault Lamp	II
P1625	96	TM fail and not be draged	VCU Fault Lamp	II
P1626	96	SAM fail and not be draged	VCU Fault Lamp	II
P1627	1A	HV insulation fault Level 1	N	I
P1628	1A	HV insulation fault Level2	VCU Fault Lamp	II
P1A00	00	emergency switch fault	VCU Fault Lamp	I
P1A3B	00	Brake Pedal Learn Incomplete Fault	N	I
P1A5B	00	Brake Pedal short to battery	N	IV
P1A5C	00	Brake Pedal short to ground	N	IV
P1ABF	00	EDU Oil Temperature Sensor Short to Ground	Y	IV
P1AC0	00	EDU Oil Temperature Sensor Short to Battery or Open	Y	IV
P1B02	00	Acceleration Pedal Position Sensor Both Invalid	VCU Fault Lamp	II
P1B03	00	Accelerator Pedal Position Sensor Cross Check Fault	VCU Fault Lamp	II
P1B04	12	Accelerator Pedal Position Sensors 1 Short to Battery	VCU Fault Lamp	II

DTC	FTB	Description	MIL*	Level*
P1B04	14	Accelerator Pedal Position Sensors 1 Short to Ground or Open	VCU Fault Lamp	II
P1B05	12	Accelerator Pedal Position Sensors 2 Short to Battery	VCU Fault Lamp	II
P1B05	14	Accelerator Pedal Position Sensors 2 Short to Ground or Open	VCU Fault Lamp	II
P1B06	00	Shutdown Due to Airbag Deployment	VCU Fault Lamp	II
P1B07	00	HVBatteryFault	VCU Fault Lamp	II
P1B08	00	Brake Switch Cross Check Fault	VCU Fault Lamp	II
P1B13	09	Cooling Fan Startup Failure or Low Speed Error	SVS	IIA
P1B15	4B	Cooling Fan over Temperature	SVS	IIA
P1B17	11	Cooling Fan Short Circuit to GND	SVS	IIA
P1B17	12	Cooling Fan Short Circuit to Battery	SVS	IIA
P1B17	13	Cooling Fan Hardware Error	SVS	IIA
P1B19	00	Mon Inhibt Assist Function Fault	VCU Fault Lamp	II
P1B1B	86	Data unavailable for ETC(from ICC)	VCU Fault Lamp	II
P1B1C	86	Data unavailable for IBS(from ICC)	VCU Fault Lamp	II
P1B1D	86	Data unavailable for BCM(from ICC)	VCU Fault Lamp	II
P1B1E	86	Data unavailable for FVCM (from ICC)	VCU Fault Lamp	II
P1B1F	00	CCU/HVDCDC Fault	N	III
P1B25	00	ECU Reset Recognition	N	III
P1B30	00	Traction Motor(TM) Derating	VCU Fault Lamp	II
P1B31	00	Traction Motor Serious Fault	VCU Fault Lamp	I
P1B32	00	Traction Motor Warning Fault	VCU Fault Lamp	II
P1B40	00	Hv Battery Discharge Power Limitation	VCU Fault Lamp	II
P1B41	00	HV Battery Isolation Fault	VCU Fault Lamp	I
P1B42	00	HV System Insulation Fault (With Offboard Charger)	VCU Fault Lamp	I

DTC	FTB	Description	MIL*	Level*
P1B43	00	HVIL Open	VCU Fault Lamp	I
P1B69	00	ESS Cooling Pump not Lifebeat	SVS	IIA
P1B6A	00	ESS Cooling Pump Dry Run	SVS	IIA
P1B6B	00	ESS Cooling Pump Stall or Over Current	SVS	IIA
P1B6C	4B	ESS Cooling Pump Over Temperature Shutdown	SVS	IIA
P1B6D	00	ESS Cooling Pump Speed too Low	SVS	IIA
P1B6F	11	ESS Cooling Pump Short Circuit to GND	SVS	IIA
P1B6F	12	ESS Cooling Pump Short Circuit to Battery	SVS	IIA
P1B70	00	Shifter Position Fault	N	III
P1B72	00	Mon Shut Down Fault	VCU Fault Lamp	II
P1B74	29	Inhibit Regen & Creep Due To Signal Invalid For Brake Pedal Position	VCU Fault Lamp	II
P1B75	29	Inhibit Cruise Due to Signal Invalid For Cruise Control Switch Status	VCU Fault Lamp	III
P1B76	29	Signal invalid for EPB switch status	VCU Fault Lamp	II
P1B78	86	Data unavailable for Radar (from ICC)	VCU Fault Lamp	II
P1B79	29	Data unavailable for ICM(from ICC)	VCU Fault Lamp	II
P1B79	86	Data unavailable for ICM(from ICC)	Y	II
P1B82	1C	Cooling Fan Over Current	SVS	IIA
P1B8E	07	AGS1 mechanical break error	N	III
P1B8F	07	AGS2 mechanical break error	N	III
P1B90	88	Lin bus off	N	III
P1BA0	98	AGS1 motor over heat	N	III
P1BA1	17	AGS1 motor over voltage	N	III
P1BA2	16	AGS1 motor under voltage	N	III
P1BA3	01	AGS1 motor electronic fault	N	III
P1BA4	08	AGS1 Lin communication error	N	III
P1BA5	07	AGS1 mechanical block temporary	N	III
P1BA6	98	AGS2 motor over heat	N	III
P1BA7	17	AGS2 motor over voltage	N	III
P1BA8	16	AGS2 motor under voltage	N	III
P1BA9	01	AGS2 motor electronic fault	N	III
P1BAA	08	AGS2 Lin communication error	N	III
P1BAB	07	AGS2 mechanical block temporary	N	III
P1BAC	87	Lost communication with AGS1	N	III

DTC	FTB	Description	MIL*	Level*
P1BAD	87	Lost communication with AGS2	N	III
P1BB0	87	Lost communication with EOPC	VCU Fault Lamp	II
P1BB9	00	EOP Fault Levl1	N	II
P1BBA	08	Invalid data received from EOPC	N	II
P1BC0	00	SAM derating	VCU Fault Lamp	II
P1BC1	00	SAM serious fault	VCU Fault Lamp	I
P1BC2	00	SAM warning fault	VCU Fault Lamp	II
P1BE0	87	ICC(GW) Key Message Missing	VCU Fault Lamp	II
P1BE1	87	Gear Shift Control Module key message missing	N	III
P1BE4	87	Secondary Axle Motor Control Module Key Message Missing	VCU Fault Lamp	II
P1BE6	87	BMS Module key message missing	VCU Fault Lamp	II
P1BE7	87	IBS SCS Related Key Message Missing	Y	II
P1BED	00	One-way-Clutch overspeed fault	VCU Fault Lamp	II
P1BEE	00	One-Way clutch stuck	VCU Fault Lamp	II
P1BF9	00	Data unavailable for IPK(from ICC)	N	II
P1BFA	86	Data unavailable for EPS (from ICC)	VCU Fault Lamp	II
P1C23	00	Tracking Error Exceed LOT Threshold	SVS	I
P1C2C	00	VDD30 Power Supply Over Voltage	N/A	IIB
P1C2D	00	VDD30 Power Supply Under Voltage	N/A	IIB
P1C3E	00	Angle Self Calibration Angle Rationality Detection	SVS	I
P1C3F	00	Offset Angel Status Error	SVS	IIA
P1C40	00	Angle Self Calibration Acceleration Timeout	SVS	I
P1C44	00	Angle Self Calibration Calculation Timeout	SVS	I
P1C50	00	Resolver Errors	N/A	III
P1C52	00	Application Layer Level1 Failed to Track Torque Estimate Value and Torque Command Value	SVS	IIA
P1C53	00	Absolute Value of Motor Speed Above Max Limit	N/A	III
P1C59	00	IGBT Open Road Unsuccessful	SVS	I
P1C60	04	PEB ASW Status not Match with BSW Status	SVS	IIA
P1C63	00	U-phase Current Value is Too Large	SVS	I
P1C64	00	U-phase Current Value is Too Small	SVS	I

DTC	FTB	Description	MIL*	Level*
P1C66	00	V-phase Current Value is Too Large	SVS	I
P1C67	00	V-phase Current Value is Too Small	SVS	I
P1C69	00	W-phase Current Value is Too Large	SVS	I
P1C6A	00	W-phase Current Value is Too Small	SVS	I
P1C73	00	Blocked Electric Drive	N/A	IIB
P1C75	00	Stator temperature too high	SVS	IIA
P1C76	00	Stator Temperature below Low Range	SVS	IIA
P1C77	00	Inlet Coolant Temperature High Range	SVS	IIA
P1C78	00	Inlet Coolant Temperature Low Range	SVS	IIA
P1C7F	00	Crash Error via CAN Signal	N/A	I
P1C80	00	U-phase IGBT Over Temperature Error	SVS	IIA
P1C81	00	U-phase IGBT Temperature Below Min Limit	SVS	IIA
P1C82	00	V-phase IGBT Over Temperature Error	SVS	IIA
P1C83	00	V-phase IGBT Temperature Below Min Limit	SVS	IIA
P1C84	00	W-phase IGBT Over Temperature Error	SVS	IIA
P1C85	00	W-phase IGBT Temperature Below Min Limit	SVS	IIA
P1C8C	00	Software Detects Bus Voltage Overvoltage	SVS	I
P1C8D	00	UDC Above Limit	SVS	I
P1C8F	00	Inverter Lower Bridge Arm Short Circuit Failure	SVS	I
P1C98	00	Passive Discharge Timeout	N/A	III
P1C9A	00	D-Q Shaft Current Angle Rationality Detection Current Angle Status Error	N/A	IIB
P1CC1	00	Feedback Signal from the Coolant Pump not Received	SVS	IIA
P1CC2	00	Coolant Pump PWM Pin Short Circuit to GND	SVS	IIA
P1CC3	00	Coolant Pump PWM Pin Short Circuit to Battery	SVS	IIA
P1CC4	00	Mainrelay Hardware Error	SVS	IIA
P1CC5	00	Coolant Pump Dry Run	SVS	IIA
P1CC6	00	Coolant Pump is Blocked or Over Current	SVS	IIA
P1CC7	00	Coolant Pump Over Temp	SVS	IIA
P1CC8	00	Coolant Pump Low Speed	SVS	IIA
P1D11	00	Temperature Difference Between U-phase and Other Two Phases is Too Large	SVS	IIA
P1D12	00	Temperature Difference Between V-phase and Other Two Phases is Too Large	SVS	IIA
P1D13	00	Temperature Difference Between W-phase and Other Two Phases is Too Large	SVS	IIA
P1D19	00	U-phase Current not Rational	SVS	IIA
P1D1B	00	Sum of U/V/W Phase Current Invalid	SVS	IIA
P1D1C	00	V-phase Current not Rational	SVS	IIA
P1D1D	00	W-phase Current not Rational	SVS	IIA
P1D25	00	Output Power Limited in SBC During TC Power On	N/A	III
P1D2C	00	Received State from CAN Out of Range	N/A	IIB

DTC	FTB	Description	MIL*	Level*
P1D3E	00	Current Sensor LEMGND_A Amplitude not Rational	SVS	IIA
P1D41	00	Automatic Angle Calibration Acceleration Reverse	SVS	I
P1D42	00	Automatic Angle Calibration Acceleration Overspeed Fault	SVS	I
P1D5C	00	Current Sensor LEM5V_A Amplitude not Rational	SVS	IIA
P1D78	00	Stator Over Temp Error	N/A	IIB
P1D79	00	Junction Temperature Estimated by Observer is Greater than Threshold Value	N/A	IIB
P1D7A	00	Coolant OverTemp Error(Estimated)	N/A	IIB
P1D92	00	Over Speed While Offset Angle Invalid	N/A	IIB
P1DC0	00	Rotor Angle not Plausible	SVS	I
P1DC1	00	Motor Speed not Plausible	SVS	I
P1DC2	00	Phase Current out of Range	SVS	IIA
P1DC3	00	Motor Operation Mode not Plausible	SVS	I
P1DC4	00	IMCU Rolling Counter and Checksum Error	SVS	IIA
P1DC5	00	Actual Torque not Plausible	SVS	I
P1DCB	00	Monitoring of Torque Comparison Check out of Range	SVS	I
P1DCC	00	Stationary Damping Control out of Rang	SVS	I
P1DCD	00	DCDC Voltage not Plausible	SVS	I
P1DCE	00	Level2 Monitor Shutdown	SVS	I
P1DE1	00	Stator Over Temperature Derating Warning	N/A	III
P1DE3	00	Coolant Over Temperature Derating Warning	N/A	III
P1DE4	00	IGBT/Diode Over Temperature Derating Warning	N/A	III
P1DE5	00	Motor Over Speed Derating Warning	N/A	III
P1DE6	00	DClnk Over Voltage Derating Warning	N/A	III
P1DE7	00	DClnk Under Voltage Derating warning	N/A	III
P1DE9	00	Coolant over Temp Derating Error	N/A	III
P1DEA	00	Stator Over Temperature Derating Error	N/A	III
P1DEC	00	IGBT/Diode Over Temperature Derating Error	N/A	III
P1DED	00	DClnk Over Voltage Derating Error	N/A	III
P1DEE	00	DClnk Under Voltage Derating Error	N/A	III
P1DEF	00	Motor Over Speed Derating Error	N/A	III
P1DF0	00	High Voltage Inter Lock Fault	SVS	IIA
P1FB4	4B	Fast Charge Positive Side Temperature Low Range	N/A	III
P1FB5	4B	Fast Charge Positive Side Temperature High Range	N/A	III
P1FB6	4B	Slow Charge Negtive Side Temperature Low Range	N/A	III
P1FB7	4B	Slow Charge Negtive Side Temperature High Range	N/A	III
P3040	00	ESS Heater IGBT Shorting	N	III
P3041	00	ESS Heater hardware damaged	VCU Fault Lamp	II

DTC	FTB	Description	MIL*	Level*
P3042	87	Lost communication with ESS Heater	N	III
P3043	00	Invalid data received from ESS Heater	N	III
P3055	00	EPK System Fault	VCU Fault Lamp	II
P3056	87	Lost communication with EPMCU	VCU Fault Lamp	II
P3057	81	Invalid data received from EPMCU	VCU Fault Lamp	II
P30BC	81	Invalid data received from ICC	N	II
P30BD	81	Invalid data received from ICC	N	II
P3103	00	Current Sensor Errors	N/A	III
P3104	00	Detection of at Least 2 Open Phase Wires	N/A	III
P3105	00	Process Failure during Execution of Open Phase Wire Test Pulses	N/A	III
P3106	00	Detection of Open Phase Wire U	N/A	III
P3107	00	Detection of Open Phase Wire V	N/A	III
P3108	00	Detection of Open Phase Wire W	N/A	III
P310C	00	CAN Key Frame Lost	SVS	IIA
P3126	00	DriveBorad HighSide Die1 Fault	SVS	I
P3127	00	Drive Borad Low Side Die1 Fault	SVS	I
P3132	00	Rotor Flux abnormal	N/A	III
P3133	00	Monitor EEPROM Check Error	SVS	I
P313A	19	Software Phase Current Over High Range	SVS	I
P3146	00	Resolver Excite Signal Low Range	SVS	I
P314A	00	Resolver Excite Signal High Range	SVS	I
P3169	00	High Voltage Without Precharge Error	N/A	III
P316A	00	Monitor Resolver Lost Track Error	SVS	I
P316D	00	Preact Power Limit Error	N/A	IIB
P3172	00	Monitor Test Shutoff Fail	SVS	I
P3182	04	Gate Driver Initiation Error	N/A	III
P3183	00	Bus Voltage SPI Data Failure	SVS	IIA
P3184	00	SPI Data Failure of Driver Chip	SVS	IIA
P3185	00	Power Chip Failure Warning	N/A	III
P3186	00	Power Chip Failure	N/A	III
P3187	00	SBC Self Check Fault	N/A	III
P3188	00	Shutdown Path Test Fail	SVS	I
P3189	17	VDD5V High Range Warning	N/A	III
P3189	16	VDD5V Low Range Warning	N/A	III
P318A	00	Resolver Sin Signal High Range	SVS	I
P318B	00	Resolver Cos Signal High Range	SVS	I

DTC	FTB	Description	MIL*	Level*
P318C	00	Resolver SinCos Square Sum Out of Range	SVS	I
P318D	00	Resolver SinCos Square Sum Fluctuation Error	SVS	IIA
P318E	00	Decoding Enable Signal Timeout	SVS	I
P318F	4B	Harmonic suppression function abnormal	N/A	III
P3190	4B	Capacitance over temperature warning	N/A	III
P3191	00	Prefailure Warning	N/A	IIB
P3193	17	Monitor VDD5V High Range Fault	SVS	III
P3193	16	Monitor VDD5V Low Range Fault	SVS	III
P3194	16	ASW Triger reset Acitvely	N/A	III
P3197	00	Monitor Phase W Current High Range	SVS	I
P3198	00	Monitor PWM Check Error	SVS	I
P3199	1C	Monitor Resolver Sin+ Signal High Range	SVS	I
P319A	1C	Monitor Resolver Sin- Signal High Range	SVS	I
P319D	00	Monitor Resolver SinCos Square Sum Rationality Check Error	SVS	IIA
P319E	00	Monitor Phase Current Update Error	SVS	I
P31A0	00	Monitor Udc High Range	SVS	I
P31A1	00	Monitor Resolver Update Error	SVS	I
P31A3	00	Phase Current Update Error	SVS	IIA
P31A5	00	Level2 Soft Decoding Enable Timeout Fault	SVS	I
P31A6	00	Resover Deviation Self-learning Timeout Fault	N/A	I
P31A7	11	AC Side Short Circuit Fault	N/A	III
P31A8	00	CPU Load Rate Too High Fault	N/A	III
P31AD	00	Sensorless tracking Error	SVS	III
P31AE	00	Sensorless SMO Out of Control	SVS	III
P31B1	00	Drive Borad High Side Die2 Status1 Fault	N/A	III
P31B2	00	Drive Borad High Side Die2 Status2 Fault	N/A	III
P31B3	00	Drive Borad Low Side Die2 Status1 Fault	N/A	III
P31B4	00	Drive Borad Low Side Die2 Status2 Fault	N/A	III
P31B5	00	Power Supply Chip Internal Voltage Failure	N/A	III
P31B6	00	Power Chip Output Voltage Failure	N/A	III
P31B7	00	Power Chip Configuration Failure	N/A	III
P31B8	00	CPU Tasks Exectued in Wrong Sequence	N/A	III
U0074	88	Safety CAN Bus Off	VCU Fault Lamp	II
U0075	88	CAN3 (PTEXNDCAN) bus off	VCU Fault Lamp	I
U0103	87	Lost Communication with Gear Shift Control Module (SCU)	Y	II
U0122	87	Lost communication with IBS(SCS)	VCU Fault Lamp	II

DTC	FTB	Description	MIL*	Level*
U0146	F7	Lost communication with ICC(CCP/GW) In SFTYCAN	N	II
U0146	FF	Lost communication with ICC(CCP/GW) In PTEXTCAN	Y	III
U0146	87	Lost communication with ICC(CCP/GW)	Y	I
U0146	81	Invalid data received from IBS(SCS)	VCU Fault Lamp	I
U0147	81	Invalid data received from EPB(From IBS)	VCU Fault Lamp	II
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)	N	III
U020C	87	Lost communication with WLC	Y	III
U0404	81	Invalid Data Received from Gear Shift Control Module (SCU)	VCU Fault Lamp	II
U0405	81	Invalid data received from ICC	N	II
U0428	81	Invalid data received from SAS	VCU Fault Lamp	II
U0447	81	Invalid data received from ICC	N	II
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	Y	II
U045A	81	Invalid data received for APA (From IPD/MPD)	Y	II
U0546	81	Invalid Data Received From Front Infotainment Control Module (FICM)	Y	II
U0595	81	Invalid data received from SAM	VCU Fault Lamp	II
U0595	F1	Invalid data received from SAC In PTEXTCAN	Y	II
U0599	81	Invalid Data Received From CCU/HVDCDC	N	III
U0599	F1	Invalid data received from CCU(PTCAN)	N	II
U1111	87	Lost Communication With Battery Management System(BMS)	VCU Fault Lamp	I
U1111	F7	Lost communication with BMS In PTEXTCAN	N	III
U1113	87	Lost communication with SAC	VCU Fault Lamp	II
U1113	F7	Lost communication with SAC In PTEXTCAN	Y	III
U1115	87	Lost communication with CCU	N	III
U1115	F7	Lost communication with CCU In PTEXTCAN	Y	II
U1269	87	Lost communication with IPD	VCU Fault Lamp	II
U1296	87	Lost communication with IPD(IECUA)	VCU Fault Lamp	II
U130A	81	Invalid Data Received from Front View Camera Module (FVCM)	Y	II
U1411	81	Invalid Data Received From BMS	VCU Fault Lamp	II
U1411	F1	Invalid data received from BMS(PTCAN)	Y	II
U1415	81	Invalid data received for IPD/MPD	N	II

DTC	FTB	Description	MIL*	Level*
U1416	81	Data unavailable for IAM (from ICC)	N	II
U1417	81	Data unavailable for IPD (from ICC)	Y	II
U1418	81	Data unavailable for RWSGW (from ICC)	Y	II
U141B	81	Invalid data received from HADS	Y	II
U1562	17	Battery Voltage High	N/A	III
U1563	16	Battery Voltage Low	N/A	III
U1671	81	Invalid data received from RWSGW(From ICC)	N	III
U16B8	81	Invalid data received from IBS_10ms_PDU12	N	II
U16D3	87	SAC Key Message Missing In PTEXTCAN	N	II
U1756	87	IBS EPB Related Key Message Missing	VCU Fault Lamp	II
U175F	87	IPD APA Key Message Missing	Y	II
U1782	87	IPD(IECUA) Key Message Missing	VCU Fault Lamp	II
U1782	81	Invalid data received for AI Pilot (From IPD/MPD)	Y	II
U1908	81	Invalid data received from BMS Wrng Message(PTCAN)	N	II
U1908	87	BMS Wrng Message Missing	N	III
U1912	87	BMS Backup Key Message1 Missng	N	III
U195B	87	IPD SAS Key Message Missing	Y	II
U195B	81	Invalid data received for SAS (From IPD/MPD)	N	II
U197E	81	Invalid data received from BMS WrngBackup Message(EXTDCAN)	N	II
U197E	87	BMS Wrng Backup Message Missing	N	III
U19D6	81	Invalid data received from IPD_100ms_PDU03	Y	II
U19D6	87	IPD Key Message Missing	N	II
U1A12	87	the frame of Tester_100ms_PDU01 timeout	N	IIB
U1A4E	81	Invalid data received from ICC_200ms_PDU02 (From ICC In SFTYCAN)	Y	II
U2001	42	ECU Error - EEPROM Error	N/A	III
U2002	42	Sensorless tracking Error	N/A	III
U2004	04	Software in inactivate bank is invalid	SVS	III
U2018	00	Power Chip SPI Communication Failure	N/A	III
U2020	47	Power Chip Monitoring Failure	N/A	III
U2021	47	Sensorless SMO Out of Control	N/A	III

*Remarks:

- MIL description: MIL ON indicates that this DTC detected by control module is current or in the confirmation state during the running.
- Failure level description:
  - I: Stop the vehicle immediately for repair
  - IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
  - IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time

DTC	FTB	Description	MIL*	Level*
– III: Inspection during maintenance – IV: Inspection based on actual demand				

Diagnosis Information and Procedure

P0A1B, P1C23, P1C2C, P1C2D, P1C3E, P1C40, P1C44, P1C50, P1C52, P1C59, P1C60, P1C73, P1C77, P1C78, P3189, P3193, P31AD and P31AE

DTC Description

DTC	FTB	Failure Description
P0A1B	00	Current Control not Rationally
P1C23	00	Tracking Error Exceed LOT Threshold
P1C2C	00	VDD30 Power Supply Over Voltage
P1C2D	00	VDD30 Power Supply Under Voltage
P1C3E	00	Angle Self Calibration Angle Rationality Detection
P1C40	00	Angle Self Calibration Acceleration Timeout
P1C44	00	Angle Self Calibration Calculation Timeout
P1C50	00	Resolver Errors
P1C52	00	Application Layer Level1 Failed to Track Torque Estimate Value and Torque Command Value
P1C59	00	IGBT Open Road Unsuccessful
P1C60	04	PEB ASW Status not Match with BSW Status
P1C73	00	Blocked Electric Drive
P1C77	00	Inlet Coolant Temperature High Range
P1C78	00	Inlet Coolant Temperature Low Range
P3189	16	VDD5V Low Range Warning
P3189	17	VDD5V High Range Warning
P3193	16	Monitor VDD5V Low Range Fault
P3193	17	Monitor VDD5V High Range Fault
P31AD	00	Sensorless tracking Error
P31AE	00	Sensorless SMO Out of Control

Subsystem Principle

The intelligent motor control unit (IMCU) determines the environmental conditions for operation of current motor by detecting the voltage, current ,drive plate, steering angle, IGBT, motor itself, resolver value, PEB software state and component feedback information related to cooling water pump.

Conditions for Running DTCs

- Initialisation is completed.
- The vehicle is powered on.

Conditions for Setting DTCs

P0A1B 00: The voltage vector amplitude deviation is greater than 10V or the current vector amplitude deviation is greater than 35A.

P1C23 00: Resolver tracking error is too large.

P1C2C 00: Vdd30 power supply voltage is greater than the threshold.

P1C2D 00: Vdd30 power supply voltage is lower than the threshold.

P1C3E 00: The absolute value of the difference between the self-calibrated angle and preset angle is greater than the threshold.

P1C40 00: The acceleration time of the angle self-calibration exceeds the threshold.

P1C44 00: The time of the angle self-calibration exceeds the threshold.

P1C50 00: A resolver is faulty.

P1C52 00: Compared with the actual torque command, the torque error estimated by the torque formula method is excessive

P1C59 00: The total stator current is more than 100A when the IGBT has continuous current.

P1C60 00: The potential value of machine is not the same.

P1C73 00: The torque is greater than 148Nm; the speed is less than 40rpm.

P1C77 00: PEB inlet coolant temperature is higher than the threshold.

P1C78 00: PEB inlet coolant temperature is lower than the threshold.

P3189 16: Vdd5qt2 undervoltage failure.

P3189 17: Vdd5qt2 overvoltage failure.

P3193 16: Vdd5v voltage is below the threshold.

P3193 17: Vdd5v voltage is above the threshold.

P31AD 00: Rotor polarity identification failure.

P31AE 00: Current on the ab axis is greater than the threshold.

Operations of ECU after Failure

P0A1B, P1C23, P1C2C, P1C2D, P1C3E, P1C40, P1C44, P1C50, P1C52, P1C59, P1C60, P1C73, P1C77, P1C78, P3189 and P3193:

- The DTC is set.
- Limp Home is Level 3, and the pump is off.

P31AD and P31AE: Only set the DTC.

Conditions for Clearing DTCs

- The failure state is cleared.

- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Resolver failure:
   - Check/replace the resolver components.
   - Check the connection reliability of resolver harness and connector.
2. Electric motor failure:
   - Repair/replace the electric motor assembly.
   - Check/repair the electric motor harness and connector.
3. Current sensor failure:
   - Repair/check the connection reliability of current sensor harness and connector.
   - Repair/replace the current sensor component.
4. Cooling pump failure:
   - Check/repair the coolant pump components.
   - Replace the cooling pump.
   - Check/replace the coolant pump harness and connector.

Reference Circuit Diagram

High-voltage Power Distribution System.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the inverter component harness and connector:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the inverter harness connector.

   ® Normal, go to 3.
3. Check the inverter component:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IMCU.

   ® Normal, go to 10.
4. Check the electric motor component harness and connector:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the electric motor harness connector.

   ® Normal, go to 5.
5. Check the electric motor component:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IMCU.

   ® Normal, go to 10.
6. Check the current sensor component harness connector:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the current sensor harness connector.

   ® Normal, go to 7.
7. Check the current sensor component:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the current sensor.

   ® Normal, go to.
8. Check the coolant pump component harness connector:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the coolant pump harness connector.

   ® Normal, go to 9.
9. Check the coolant pump components:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the coolant pump.

   ® Normal, go to 10.
10. Check the intelligent electronic control unit:

    ® For software mismatch: Flash the control module.

    ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Current sensor diagnostic test methods:

   Disconnect the current sensor harness connector.

   Use a multimeter to measure the resistance value of current sensor Pin; when the resistance value is too large or infinite, it is judged that sensor internal circuit is open; when the sensor resistance value is too small or 0 ohm, it is judged that sensor internal circuit is short.
2. Coolant pump diagnostic test methods:

   Use a multimeter to measure the resistance value of coolant pump.

   Determine whether the resistance value is too large or small, or internal circuit is open or short.

   Use the scan tool to drive the operation of coolant pump.

   Use a multimeter to measure if the power cord voltage of coolant pump is normal; check if the ground wire of coolant pump is reliable.

P0A5E, P0A61, P0A64, P0A8E, P1C3F, P1C63, P1C64, P1C66, P1C67, P1C69 and P1C6A

DTC Description

DTC	FTB	60pxFailure Description
P0A5E	00	Offset of U-phase Current out of Range
P0A61	00	Offset of V-phase Current out of Range
P0A64	00	Offset of W-phase Current out of Range
P0A8E	00	Hardware Phase Current Above Max Limit
P1C3F	00	Offset Angel Status Error
P1C63	00	U-phase Current Value is Too Large
P1C64	00	U-phase Current Value is Too Small
P1C66	00	V-phase Current Value is Too Large
P1C67	00	V-phase Current Value is Too Small
P1C69	00	W-phase Current Value is Too Large
P1C6A	00	W-phase Current Value is Too Small

Subsystem Principle

The drive control unit monitors the working current of each coil in the drive motor stator winding with a current sensor; when the working current of stator winding coil fluctuates abnormally or is irrational, it will affect the normal operation of drive motor.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P0A5E 00: Check that the U-phase current is greater than the threshold during the current sensor calibration.

P0A61 00: Check that the V-phase current is greater than the threshold during the current sensor calibration.

P0A64 00: Check that the W-phase current is greater than the threshold during the current sensor calibration.

P0A8E 00: The circuit detects that the hardware phase current is greater or less than the threshold.

P1C3F 00: The angular offset value stored in EEPROM is 0.

P1C63 00: The U-phase current AD sampling value is greater than the threshold.

P1C64 00: The U-phase current AD sampling value is less than the threshold.

P1C66 00: The V-phase current AD sampling value is greater than the threshold.

P1C67 00: The V-phase current AD sampling value is less than the threshold.

P1C69 00: The W-phase current AD sampling value is greater than the threshold.

P1C6A 00: The W-phase current AD sampling value is less than the threshold.

Operations of ECU after Failure

- Actively short-circuited or turned off.
- Actively short-circuited.
- The DTC is set.
- Limp Home is Level 3.

Conditions for Clearing DTCs

The fault is eliminated.

Possible Failure Causes and Maintenance Scheme

1. Current sensor harness failure:
   - Replace/repair the current sensor harness.
2. Current sensor component failure:
   - Repair/replace the current sensor component.
3. Intelligent control module failure:
   - Replace/check the IMCU module.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Place the Start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the current sensor harness connector and connection status:

   ® For current sensor connector connection looseness and other unreliable conditions: Replace/repair the current sensor harness.

   ® Normal, go to 3.
3. Check the current sensor component:

   ® For current sensor damage: Replace/repair the current sensor component.

   ® Normal, go to 4.
4. Check the IMCU:

   ® For software mismatch: Flash the control module.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Current sensor check methods:

   Power off the vehicle, wait for 5 minutes, and disconnect the harness connector of current sensor component.

   Use a multimeter to check whether the resistance value of the current sensor is within a rational range.

2. Current sensor harness check methods:

   Power on the vehicle, use a probe to insert through the back of connector, and use a multimeter to test if the voltage is within a rational range.

P1620, P1627, P1628, P1B41 and P1B42

DTC Description

DTC	FTB	Failure Description
P1620	00	Both Postive and Negative insulation fault without charger
P1627	1A	HV insulation fault Level 1
P1628	1A	HV insulation fault Level2
P1B41	00	HV Battery Isolation Fault
P1B42	00	HV System Insulation Fault (With Offboard Charger)

Subsystem Principle

The intelligent electronic control unit obtains the insulation status of the whole vehicle monitored by the BMS through the CAN bus. If there is an insulation problem, it will limp and power down the whole vehicle according to the actual situation.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1620 00: No positive and negative insulation fault of charger.

P1627 1A: Within the calibration time, the positive insulation resistance or negative insulation resistance is less than 270 kohm.

P1628 1A: The insulation resistance of the negative electrode is less than 60 kohm within the calibration time.

P1B41 00: Insulation resistance is less than the calibration value

P1B42 00: When the fast charger plug is open, the insulation resistance is less than the calibration value

Operations of ECU after Failure

- The DTC is set.
- The vehicle is powered off.
- Vehicle Limp Home or Dragging.

Conditions for Clearing DTCs

P1620 00 : Without charger, there is no fault in both positive and negative insulation.

P1627 1A : The positive insulation resistance or negative insulation resistance is greater than 270kohm.

P1628 1A : The negative insulation resistance shall not be less than 60kohm.

P1B41 00 : The insulation resistance is greater than the calibration value.

P1B42 00 : When the fast charger plug is open, the insulation resistance is greater than the calibration value.

History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. HV harness failure:
   - Check/replace the high-voltage harness.
2. High voltage battery management module failure:
   - Replace/refresh the control module.
3. High and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger fault:
   - Replace/repair high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger.

Reference Circuit Diagram

High-voltage Power Distribution System.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the insulation status of HV harness:

   ® Insulation value less than or more than the standard value: Replace/repair the HV harness.

   ® Normal, go to 3.
3. Check the insulation status of high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger:

   ® The insulation value is less than the standard value: replace/repair the high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger.

   ® Normal, go to 4.
4. BMS failure:

   ® For software mismatch: Flash the control module.

   ® Normal, it's required to open the cover for repair, go to TAC Human Assistance.

Diagnostic Test Methods

1. Insulation test method for high-voltage components of the whole vehicle:

   • Disconnect the high voltage harness connector of the high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger.

   • Select the 1000V range of the insulation meter, and use the insulation meter to measure the insulation resistance between the positive and negative terminals of the high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger and the body ground.

   •

2. Insulation test method for high-voltage harness of the whole vehicle:

   • Disconnect the high voltage harness connector of the high voltage battery pack/high and low voltage charging integrated unit/electric air conditioning compressor/intelligent motor control unit/front axle drive motor controller/high voltage power distribution unit/high voltage electric heater/high voltage battery pack electric heater/wireless charger.

   • Select the 1000V range of the insulation meter, and use the insulation meter to measure the insulation resistance between the two terminals of all high-voltage harness connectors and the body ground.

P1621, P1ABF, P1AC0, P1BB0, P1BB9 and P1BBA

DTC Description

DTC	FTB	60pxFailure Description
P1621	01	EOP Fault Levl2
P1ABF	00	EDU Oil Temperature Sensor Short to Ground
P1AC0	00	EDU Oil Temperature Sensor Short to Battery or Open
P1BB0	87	Lost communication with EOPC
P1BB9	00	EOP Fault Levl1
P1BBA	08	Invalid data received from EOPC

Subsystem Principle

The intelligent motor control unit detects that the oil temperature sensor harness is short to ground or battery; the electric oil pump controller detects the working state of electric oil pump. The intelligent motor control unit (IMCU) makes data exchange with the electric oil pump control unit and electric drive unit control unit via the CAN bus; if the CAN bus circuit is open or short, communication cannot be made; when the IMCU takes too long time to receive a message, the data is considered invalid.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1621 00: The electric oil pump failure level is 1.

P1ABF 00: The sensor output voltage is >4.5v.

P1AC0 00:

- Oil temperature sensor is valid.
- The signal line voltage of oil temperature sensor is less than 0.5V for more than 100ms.

P1BB0 87:

- Oil temperature sensor is valid.
- The signal line voltage of oil temperature sensor is greater than 4.5V for more than 100ms.

P1BB9 00: The IMCU has not received the data information from the electric oil pump within 2s.

P1BBA 00: The IMCU has not received the data information from the electric oil pump within 200ms.

Operations of ECU after Failure

- The DTC is set.
- Speed is limited.

Conditions for Clearing DTCs

- The conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric oil pump controller failure:
   - Check/repair the electric oil pump harness and connector for crack and looseness.
   - Replace/repair the electric oil pump controller components.
   - Upgrade/replace the electric oil pump controller control unit.
2. Oil temperature sensor failure:
   - Check/repair the oil temperature sensor harness connector.
   - Check/replace the oil temperature sensor components.
   - Upgrade/replace the IMCU.
3. CAN bus failure:
   - Check/repair the CAN Bus connector and pin for looseness, corrosion and bending.
   - Replace/repair the CAN bus.
   - Replace/upgrade the IMCU or the electric oil pump control unit.

Reference Circuit Diagram

Electric Oil Pump Controller & Electronic Parking Brake

Diagnostic Test Steps

1. Place the Start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the electric oil pump controller component harness connector:

   ® Electric oil pump harness connector failure: Replace/repair the harness.

   ® Normal, go to 3.
3. Check/repair the electric oil pump controller components:

   ® Gently shake the electric oil pump, listen whether there is any abnormal sound inside; measure if the resistance value of electric oil pump is within the rational range: Replace the electric oil pump components.

   ® Normal, go to 4.
4. Check/repair the electric oil pump controller control unit:

   ® Check if the electric oil pump control unit needs upgrading, and check the connector for pin bending, looseness, etc.: Upgrade/repair the electric oil pump control unit.

   ® Normal, go to 6.

5. Check the oil temperature sensor harness, pin and connector:

   ® Check the oil temperature sensor harness, connector and pin for connection looseness, harness breakage, pin bending or corrosion and other conditions: Replace/repair the oil temperature sensor harness.

   ® Normal, go to 6.

6. Check the oil temperature sensor components:

   ® Check the oil temperature sensor for damage, corrosion and other conditions: Replace/repair the oil temperature sensor.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Oil temperature sensor test methods:

   • At room temperature (1 standard atmospheric pressure, about 20°C), use a multimeter to measure whether the resistance value of the oil temperature sensor is 25 kilohm.

2. Oil temperature sensor harness test methods:

   • Connect the oil temperature sensor harness properly, power on the vehicle, use a probe to insert through the back of oil temperature sensor connector, and measure if the ground wire of oil temperature sensor is reliably grounded.

   • With the same method, test if the signal line voltage of the oil temperature sensor is greater than 4.5V, or less than 0.5V.

   • When the voltage is greater than 4.5V, it is possibly short to battery; when the voltage is less than 0.5V, it is possibly short to ground.

   • When the signal line voltage is 4.9 - 5.01V, it indicates that the circuit in the oil temperature sensor is open or the ground wire is not grounded properly.

3. Electric oil pump controller test methods:

   • Gently shake the electric oil pump components with hands, and listen whether there is any abnormal sound inside the electric oil pump. In normal conditions, the electric oil pump controller has no abnormal sound.

   • Remove the electric oil pump, provide power supply and ground for electric oil pump from outside, and observe whether the electric oil pump operates normally.

   • When using an external power supply to drive the operation of electric oil pump, use the current gear of a multimeter to test if the working current of electric oil pump is too large.

4. CAN bus test methods:

   • The vehicle is powered on.

   • Find out the CAN data bus that connects the IMCU to the EDU, use a probe to insert through the back of connector, and use a multimeter to measure if the voltage at CAN-H side is abnormal.

   • Use the same method and a multimeter to measure if the voltage at CAN-L side is abnormal.

P1622, P1B07, P1BE0, P1BE1, P1BE6, P1BED, P1BEE, P1BF9, P1BFA, U0428, U0447, U0452, U045A, U1111, U1113, U1115, U130A, U1411, U1908, U1912, U195B and U197E

DTC Description

DTC	FTB	Failure Description
P1622	00	BMS Wrng IMCU Thermal Runaway Warning
P1B07	00	HVBatteryFault
P1BE0	87	ICC(GW) Key Message Missing
P1BE1	87	Gear Shift Control Module key message missing
P1BE6	87	BMS Module key message missing
P1BED	00	One-way-Clutch overspeed fault
P1BEE	00	One-Way clutch stuck
P1BF9	00	Data unavailable for IPK(from ICC)
P1BFA	86	Data unavailable for EPS (from ICC)
U0428	81	Invalid data received from SAS
U0447	81	Invalid data received from ICC
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U045A	81	Invalid data received for APA (From IPD/MPD)
U0546	81	Invalid Data Received From Front Infotainment Control Module (FICM)
U1111	87	Lost Communication With Battery Management System(BMS)
U1111	F7	Lost communication with BMS In PTEXTCAN
U1113	87	Lost communication with SAC
U1113	F7	Lost communication with SAC In PTEXTCAN
U130A	81	Invalid Data Received from Front View Camera Module (FVCM)
U1411	81	Invalid Data Received From BMS
U1411	F1	Invalid data received from BMS(PTCAN)
U1908	81	Invalid data received from BMS Wrng Message(PTCAN)
U1908	87	BMS Wrng Message Missing
U1912	87	BMS Backup Key Message1 Missng
U195B	81	Invalid data received for SAS (From IPD/MPD)
U195B	87	IPD SAS Key Message Missing
U197E	81	Invalid data received from BMS WrngBackup Message(EXTDCAN)
U197E	87	BMS Wrng Backup Message Missing

Subsystem Principle

Intelligent motor control unit. It communicates with the BMS and SDM via the CAN bus.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1622 00: When the BMS warns the IMCU via the CAN, it is in thermal runaway state.

P1B07 00: The BMS is faulty.

P1BE0 87: If the node cannot detect data from the transmitter consecutively in the node transmission time (1s).

P1BE1 87: If the node cannot detect specific data from the transmitter consecutively in the node transmission time (500ms).

P1BED 00: The auxiliary shaft motor speed minus the one-way clutch input shaft speed is greater than the threshold (3000rpm, can be calibrated) for a period of time (5s, can be calibrated).

P1BE6 87: The IMCU fails to receive the specific data sent from BMS within 500ms.

P1BEE 00: The auxiliary shaft motor speed minus the one-way clutch input shaft speed is less than the threshold (100rpm, can be calibrated) for a period of time (5s, can be calibrated).

P1BF9 00: Invalid IPK data is received from ICC.

P1BFA 00: Invalid EPS data is received from ICC.

U0428 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U1111 87: The IMCU fails to receive the specific data sent from BMS within 2s.

U1111 F7: In the PTEXCAN network, the IMCU fails to receive the specific data sent from BMS within 3s.

U1113 87: If the node cannot detect the frame (0xCA) from the transmitter consecutively in the node transmission time (2s).

U1113 F7: If the node cannot detect the frame (SAC) from the transmitter consecutively in the node transmission time (2s).

U130A 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U0452 81: No valid data can be received by IMCU from SDM within 200ms (due to checksum errors or scroll counter errors, etc.)

U1411 81: In the PTCAN bus network, no valid data can be received by IMCU from BMS within 200ms (due to checksum errors or scroll counter errors, etc.)

U1411 F7: In the PTCAN bus network, no valid data can be received by IMCU within 200ms (due to checksum errors or scroll counter errors, etc.)

U1908 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U1908 87: The IMCU fails to receive the specific data sent from BMS within 1s.

U1912 87: The IMCU fails to receive the specific data sent from BMS within 500ms (Backup key information).

U197E 81: In the EXTDCAN bus network, no valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U197E 87: The IMCU fails to receive the specific data sent from BMS within 1000ms.

Operations of ECU after Failure

- The vehicle is powered off.
- Limit the power.
- Disable four-wheel drive.
- The DTC is set.

Conditions for Clearing DTCs

- The conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS unit failure:
   - Check/replace the BMS unit.
2. PTCAN network bus failure:
   - Check if the PTCAN network bus connector is firmly connected, and if the pin has corrosion, bending and other conditions.
   - Replace/upgrade the control unit program.
3. PTEXTCAN network bus failure:
   - Check if the PTEXTCAN network bus connector is firmly connected, and if the pin has corrosion, bending and other conditions.
   - Replace/upgrade the control unit program.
4. EXTDCAN network bus failure:
   - Check if the EXTDCAN network bus connector is firmly connected, and if the pin has corrosion, bending and other conditions.
   - Replace/upgrade the control unit program.

Reference Circuit Diagram

- High-voltage Battery Pack
- Data Communication - Power HS CAN
- Data Communication - Power HS (Extension) CAN

Diagnostic Test Steps

1. Place the Start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the BMS unit and unit temperature sensor harness:

   ® For connector looseness, pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Replace/upgrade the BMS unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the BMS unit.

   ® Normal, go to 9.
4. Check the PTCAN network bus harness:

   ® For connector looseness, pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 5.
5. Replace/upgrade the BMS unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the BMS unit.

   ® Normal, go to 9.
6. Check the PTEXTCAN network bus harness:

   ® For connector looseness, pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 7.
7. Replace/upgrade the BMS unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the BMS unit.

   ® Normal, go to 9.
8. Check the EXTDCAN network bus harness:

   ® For connector looseness, pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 9.
9. Check the high-voltage battery management module:

   ® For software mismatch: Flash the control module.

   ® Normal, it's required to open the cover for repair, go to TAC Human Assistance.

Diagnostic Test Methods

1. BMS unit harness failure test methods:

- Check if the temperature sensor resistance of BMS unit is within the normal range (250kΩ@20°C) with a multimeter in resistance position.
- Penetrate from the back of the connector with a probe, and use a multimeter to measure the voltage of ground wire to check if it is normal (about 0.05V).
- Penetrate from the back of the connector with a probe, and use a multimeter to measure the voltage of single line to check if it is normal (3.6V @ room temperature).

2. PTCAN, PTEXTCAN and EXTDCAN bus network test methods:

- Disconnect IMCU from other modules, penetrate from the back of the connector with a probe, and use a multimeter to measure the voltage at H terminal to check if it is normal (about 2.6V).
- Disconnect IMCU from other modules, penetrate from the back of the connector with a probe, and use a multimeter to measure the voltage at L terminal to check if it is normal (about 2.4V).
- Disconnect the IMCU and other modules, during measurement, gently shake the harness, and observe whether the measured data abruptly changes when shaking the harness.

P1623, P1624, P1626, P1BC0, P1BC1, P1BC2, P1BE4, P1C53, U0595 and U16D3

DTC Description

DTC	FTB	Failure Description
P1623	96	TM fault
P1624	96	SAM fault
P1626	96	SAM fail and not be draged
P1BC0	00	SAM derating
P1BC1	00	SAM serious fault
P1BC2	00	SAM warning fault
P1BE4	87	Secondary Axle Motor Control Module Key Message Missing
P1C53	00	Absolute Value of Motor Speed Above Max Limit
U0595	81	Invalid data received from SAM
U0595	F1	Invalid data received from SAC In PTEXTCAN
U16D3	87	SAC Key Message Missing In PTEXTCAN

Subsystem Principle

The IMCU makes information exchange with SAM via the CAN network.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1623 96: Drive motor failure.

P1624 96: All of the following conditions are met:

- SAM failure level reported by MCU is failure 1 or failure 2.
- MCU detects that SAM cannot be driven due to three-phase short circuit.
- 1 and 2 are subject to the last calibration time.

P1625 96: Drive motor has failure and cannot be driven.

P1626 96: SAM reports that the TM failure level is failure 1 or failure 2 within the calibration time.

P1BC0 00: The rated power of auxiliary shaft motor power capacity is reduced in calibration time.

P1BC1 00: The secondary shaft motor request for suppression of high voltage has failure.

P1BC2 00: Auxiliary shaft motor is in fault state.

P1BE4 87: The SAM cannot be detect the specific information (0xCA) in node time (500ms).

P1C53 00: The absolute value of motor speed is over 15000 rpm.

U0595 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U0595 F1: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U16D3 87: In (PTEXTCAN) bus network, if the node cannot detect specific frame from the transmitter consecutively within 1s.

Operations of ECU after Failure

- The vehicle is powered off.
- SAM is invalid.
- Disable Crp and SAM is invalid.
- Disable the four-wheel drive.
- The DTC is set.

Conditions for Clearing DTCs

- The conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. SAM harness and connector failure:
   - Test/repair the SAM harness and connector.
2. SAM Module internal failure:
   - Check the power supply and ground of SAM.
   - Replace/upgrade the SAM.
3. Front drive shaft harness and connector failure:
   - Check/repair/replace the front drive shaft low-voltage system harness and connector, pin, etc.
4. Front drive shaft control unit failure:
   - Check/repair the power supply and ground wire of front drive shaft control unit.
   - Replace/repair the front drive shaft control unit.
5. Front drive shaft motor failure:
   - Replace/repair the front drive shaft motor.
6. PTEXTCAN network bus harness and connector failure:
   - Test/replace the PTEXTCAN network bus harness and connector.

Reference Circuit Diagram

- High-voltage Power Distribution System
- Data Communication - Power HS CAN
- Data Communication - Power HS (Extension) CAN

Diagnostic Test Scheme

1. Place the Start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service

disconnect to cut off the high-voltage battery power supply.

2. SAM harness and connector scheme:

   ® For connector looseness, pin deformation/breakage: Repair/replace the SAM unit harness connector.

   ® Normal, go to 3.

3. SAM internal failure scheme:

   ® For SAM power supply and ground wire: Test/repair the SAM power supply and ground wire;

   ® Normal, go to 4.

4. SAM internal failure scheme:

   ® Replace/upgrade the SAM.

   ® Normal, go to TAC Human Assistance.

5. Front drive shaft low-voltage circuit failure maintenance scheme:

   ® For connector looseness, pin deformation/breakage: Repair/replace the front drive shaft unit harness connector.

   ® Normal, go to 6.

6. Replace/repair the front drive shaft unit:

   ® Measure the power supply and ground of front drive shaft: Repair the power supply and ground of front drive shaft. Or replace/upgrade the front drive shaft unit.

   ® Normal, go to TAC Human Assistance.

7. PTEXTCAN network bus:

   ® For PTEXTCAN connector looseness, pin deformation/breakage: Repair/replace the PTEXTCAN harness connector.

   ® Normal, go to TAC Human Assistance.

Diagnostic Measurement Methods

1. SAM harness connector diagnostic measurement methods:

   • Visually check if the SAM unit harness connector is intact, and if the pin is bent, etc.

   • Use a multimeter to test if the power supply line and ground wire of SAM unit is intact.

2. PTEXTCAN network bus:

   • Check the integrity of harness and connector of PT EXTCAN network bus.

   • Use a multimeter to check if the H and L terminal voltages of the PT EXTCAN network bus are normal.

P1B40 and P1B43

DTC Description

DTC	FTB	Failure Description
P1B40	00	Hv Battery Discharge Power Limitation
P1B43	00	HVIL Open

Subsystem Principle

The IMCU obtains information from BMS via the CAN network. The DTC is related to the failure of high-voltage system detected by BMS unit.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B40 00: The high-voltage battery discharge power is less than the calibration value within the calibration time.

P1B43 00: HVIL is in open state.

Operations of ECU after Failure

- The vehicle is powered off.
- The DTC is set.

Conditions for Clearing DTCs

- HVIL is not in open state.
- The high-voltage battery discharge power is more than the calibration value within the calibration time.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-voltage battery pack power output is restricted:
   - Whether the high-voltage battery pack control module has other DTCs. Repair according to instructions of other DTCs.
   - For high-voltage battery pack internal failure, replace/upgrade the high-voltage battery pack assembly.
2. High-voltage interlock failure:
   - High-voltage system low-voltage harness or connector failure.
   - The high-voltage interlock system has damaged or invalid control unit.
   - Replace/upgrade the control unit.

Reference Circuit Diagram

- High-voltage Power Distribution System
- High-voltage Interlock System Circuit (None)

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. High-voltage battery pack power output is restricted:

   ® Check if the high-voltage control unit has other DTCs.

   ® If yes, repair the failure according to failure instructions.

   ® Normal, go to TAC Human Assistance.
3. High-voltage interlock failure harness connector:

   Check the high-voltage interlock harness connector pin and connector.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. High-voltage interlock failure test methods:
   - The vehicle is powered off. Disconnect the negative battery cable.

     Use a multimeter to measure if the high-voltage interlock harness has open circuit and short circuit failures.

P1A00, P1B02, P1B03, P1B1B, P1B1C, P1B1D, P1B1E, P1B70, P1B79, P1B90, P1C7F, P30BC, P30BD, U0405, U1269, U1671 and U19D6

DTC Description

DTC	FTB	Failure Description
P1A00	00	emergency switch fault
P1B02	00	Acceleration Pedal Position Sensor Both Invalid
P1B03	00	Accelerator Pedal Position Sensor Cross Check Fault
P1B1B	86	Data unavailable for ETC(from ICC)
P1B1C	86	Data unavailable for IBS(from ICC)
P1B1D	86	Data unavailable for BCM(from ICC)
P1B1E	86	Data unavailable for FVCM (from ICC)
P1B70	00	Shifter Position Fault
P1B79	29	Data unavailable for ICM(from ICC)
P1B79	86	Data unavailable for ICM(from ICC)
P1B90	88	Lin bus off
P1C7F	00	Crash Error via CAN Signal
P30BC	81	Invalid data received from ICC
P30BD	81	Invalid data received from ICC
U0405	81	Invalid data received from ICC
U1269	87	Lost communication with IPD
U1671	81	Invalid data received from RWSGW(From ICC)
U19D6	87	IPD Key Message Missing

Subsystem Principle

The IMCU continuously tests the signal of accelerator pedal position sensor after vehicle power-on. Two groups of signal messages exist on the accelerator pedal; by comparing two groups of signal messages, it can test the rationality of accelerator pedal sensor signal.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1A00 00: The control unit detects that the emergency switch is pressed.

P1B02 00: 2 accelerator pedal position signals are invalid within the calibration time.

P1B03 00: The voltage correlation of two accelerator pedal position sensors is out of the standard range within a period of standard time.

P1B1B 86: AC ECUAvlbly sent by GW is false within the calibration time.

P1B1C 86: BCM ECUAvlbly sent by GW is false within the calibration time.

P1B1D 86: SCS ECUAvlbly sent by GW is false within the calibration time.

P1B1E 86: EPB switch status signal is invalid within the calibration time.

P1B70 00: The shift lever position status is false.

P1B79 29: FICM ECUAvlbly sent from GW is false within the calibration time.

P1B79 86: L1 target speed control is beyond the reasonable range within 100ms.

P1B90 88: The voltage on the Lin bus is out of the standard range.

P1C7F 00: The impact signal set by CAN is detected.

P30BC 81: Invalid data is received from DrvMd (ICC) within the calibration time.

P30BD 81: Invalid data is received from OnePdl (ICC) within the calibration time.

U0405 81: Invalid data is received from CC (ICC) within the calibration time.

U1269 81: The frame (IPD) from transmitter cannot be detected continuously within the node transmission time (3s).

U1671 81: The specific frame (2AA) from transmitter cannot be detected continuously within the node transmission time (1000ms).

U19D6 87: IPD key information is lost.

Operations of ECU after Failure

P1A00, P1B02, P1B03, P1B1B, P1B1C, P1B1D, P1B1E, P1B70, P1B79 and P1B90:

- The vehicle is powered off.
- The DTC is set.
- Vehicle Limp Home.

P1C7F: The vehicle is powered off.

P30BC, P30BD, U0405, U1671 and U19D6: Only the DTC is set.

U1269: Disable ASL and ACC.

Conditions for Clearing DTCs

- The conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Emergency switch harness and connector failure:

- Repair/replace the emergency switch harness and connector.

2. Check the emergency switch sensor:
   - Repair/replace the emergency switch sensor component.
3. Check the shift lever position sensor harness:
   - Repair/replace the shift lever position sensor harness and connector.
4. Check the shift lever position sensor:
   - Repair/replace the shift lever position sensor component.
5. Check the accelerator pedal position sensor:
   - Repair/replace the accelerator pedal position sensor component.
6. Check the Lin harness:
   - Repair/replace the Lin harness and connector.
7. Check the Lin controller:
   - Repair/replace the Lin controller component.

Reference Circuit Diagram

- High-voltage Power Distribution System
- Intelligent Motor Control Unit (IMCU) (2)
- Lin Network System (N/A)

Diagnostic Test Steps

1. Read the state of SDM controller with a scan tool, and confirm if the relevant failures exist.

   ® Yes, troubleshoot the relevant failures first.

   ® No, go to the next step.

2. Place the Start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
3. Check the emergency switch harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

4. Check the emergency switch sensor:

   ® Repair/replace the emergency switch component. The failure is eliminated, and the repair is completed.

   ® This failure is not eliminated, go to TAC Human Assistance.

5. Check the shift lever position sensor harness:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 5.

6. Check the shift lever position sensor:

   ® Repair/replace the emergency switch component. The failure is eliminated, and the repair is completed.

   ® This failure is not eliminated, go to TAC Human Assistance.

7. Check the accelerator pedal position sensor:

   Repair/replace the accelerator pedal position sensor, the failure is eliminated, and the repair is completed.

   ® This failure is not eliminated, go to TAC Human Assistance.

8. Check the Lin harness:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 8.

9. Check/upgrade the IMCU:

   ® For software mismatch: Flash the control module.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Emergency switch diagnostic test methods:
   - Use a multimeter to measure if the emergency switch is invalid and damaged.
2. Gear switch diagnostic test methods:
   - Use a multimeter to measure if the gear switch performance is invalid and damaged.
3. Accelerator pedal diagnostic test methods:
   - Use the scan tool to read if the data of accelerator pedal is abnormal.
   - Use a multimeter to test if the voltage on the accelerator pedal signal line is abnormal.
4. Lin wire check:
   - Use a multimeter to test if the Lin voltage is short to ground or battery. Whether open circuit failure exists.

P1B04 and P1B05

DTC Description

DTC	FTB	Failure Description
P1B04	12	Accelerator Pedal Position Sensors 1 Short to Battery
P1B04	14	Accelerator Pedal Position Sensors 1 Short to Ground or Open
P1B05	12	Accelerator Pedal Position Sensors 2 Short to Battery
P1B05	14	Accelerator Pedal Position Sensors 2 Short to Ground or Open

Subsystem Principle

The IMCU directly controls the accelerator pedal position sensor. Two sensors exist on the accelerator pedal, and they form mutual redundancy test function.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

The measured voltage is out of the calibration range within the calibration time.

Operations of ECU after Failure

Disable cruise function.

Conditions for Clearing DTCs

- The measured voltage is within the calibration range within the calibration time.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Check the harness connected to the accelerator pedal position sensor:
   - Check the harness, connector and pins of the accelerator pedal sensor.
   - Replace/repair the accelerator pedal sensor harness.
2. Check the accelerator pedal position sensor:
   - Repair/replace the accelerator pedal position sensor.

Reference Circuit Diagram

Intelligent Motor Control Unit (IMCU) System (2).

Diagnostic Test Scheme

1. Accelerator pedal position sensor connection harness:

   ® Check the accelerator pedal position sensor connector, harness and pins for loose connection, seriously damaged harness, bent pin, etc.

   ® Normal, go to 2.

2. Accelerator pedal position sensor:

   ® Check/replace the accelerator pedal position sensor.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Maintenance Methods

1. Accelerator pedal position sensor harness failure diagnostic maintenance methods:
   - Use a multimeter to check/test if the accelerator pedal position sensor harness circuit is open or short to ground or battery.
   - Use a probe to insert through the accelerator pedal position sensor connector, and measure if the reference voltage of accelerator pedal position sensor power supply and the voltage of signal line are rational.
2. Accelerator pedal position sensor diagnostic maintenance methods:
   - Use a multimeter to measure the resistance of accelerator pedal position sensor. Judge whether the accelerator pedal position sensor is invalid.
   - Measure if the resistance of power supply pin and ground pin of accelerator pedal position sensor has short circuit failure.
   - Slowly slide the accelerator pedal, and measure if there is open circuit or short circuit failure between the signal terminal and the ground of accelerator pedal position sensor.

P1B06, U0151, U020C and U0404

DTC Description

DTC	FTB	Failure Description
P1B06	00	Shutdown Due to Airbag Deployment
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)
U020C	87	Lost communication with WLC
U0404	81	Invalid Data Received from Gear Shift Control Module (SCU)

Subsystem Principle

The intelligent motor control unit (IMCU) obtains the airbag deployment information via the body control module (BCM). The supplemental restraint system sensing and diagnostic module (SDM) transmits the information to BCM via the hard wire.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B06 00: Airbag is deployed.

U0151 87: If the node cannot detect data (163) from the transmitter consecutively in the node transmission time (2s).

U020C 87: If the node cannot detect specific data (WLC) from the transmitter consecutively in the node transmission time (1s).

U0404 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

Operations of ECU after Failure

- The vehicle is powered off.
- The DTC is set.

Conditions for Clearing DTCs

Airbag deployment information repair.

Possible Failure Causes and Maintenance Scheme

1. Airbag deployment failure:
   - Replace the deployed airbag component.
   - Replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System (1)

Diagnostic Test Scheme

1. System detection: Confirm the following symptoms.
   - They are current DTCs.

     ® Yes, confirm the next item;

     ® No, clear the DTCs with the scan tool.
   - Node loss ECU software version is not the latest.

     ® Yes, perform the ECU update.

     ® No, perform the "Detect Network Loss Node".
2. Detect network loss node: Confirm the following symptoms.
   - Node ECU harness connector has terminal damage, retreat, looseness, water immersion and other failures.

     ® Yes, repair the connector failures;

     ® No, confirm the next item.
   - Short connect [KL15 Relay] socket power supply terminal 30 and output terminal 87, to test the following node ECU harness terminal:

Con-ditio-ns	Measured terminals	Normal Value
Pow-er-off	CAN_H and CAN_L	Resistance: 60 or 120 Ω
	KL31 Terminal and Ground	Resistance: Less than 10Ω
Pow-er-on	CAN_H Terminal and Ground	Voltage: 2.5 - 4.3 Volts
	CAN_L Terminal and Ground	Voltage: 0.7 - 2.5 Volts
	KL30 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to illuminate it
	KL15 Terminal and Ground	Voltage: 10 to 16 Volts, Connect the test lamp to illuminate it

     ® Yes, replace the node ECU;

     ® No, detect the CAN network related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.
3. Check the SDM for the related failures.

   ® Yes, replace the corresponding components.

   ® No, replace the SDM.

P1B08, P1A3B, P1A5B and P1A5C

DTC Description

DTC	FTB	Failure Description
P1B08	00	Brake Switch Cross Check Fault
P1A3B	00	Brake Pedal Learn Incomplete Fault
P1A5B	00	Brake Pedal short to battery
P1A5C	00	Brake Pedal short to ground

Subsystem Principle

The brake pedal position sensor has 4 wires in total, respectively power cord, ground wire and two signal lines. The signal line provides the information to the IMCU, and provides the information of one wire to the BCM.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B08 00: The value related error between two brake switches is more than the calibration time.

P1A3B 00: The brake pedal learning is incomplete.

P1A5B 00: The sensor signal pin voltage is greater than 4.75V for 200ms.

P1A5C 00: The sensor voltage signal pin is less than 0.15V for 200ms.

Operations of ECU after Failure

- Disable Regen.
- The DTC is set.

Conditions for Clearing DTCs

P1B08 00:

- The value correlation between two brake switches is more than the calibration time.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1A5B 00:

- The voltage of sensor signal line is less than or equal to 4.75V for 200 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1A5C 00:

- The voltage of sensor signal line is less than or equal to 0.15V for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1A3B 00:

- Brake pedal position learning is complete.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Check the harness connected to the brake pedal position sensor:
   - Check if the brake pedal position sensor connector is loose or the fixed position is not firm, etc., and repair the failures.
   - Check if the brake pedal position sensor harness is damaged, etc., and repair the failures.
   - Check if the brake pedal position sensor connector pin is corroded, bent, etc., and repair the failures.
2. Brake pedal position learning is incomplete:
   - Re-learn the brake pedal position sensor position.
   - Replace/re-learn the brake pedal position sensor information.
3. Check the brake pedal position sensor:
   - Replace/repair the brake pedal position sensor.
4. Check the brake pedal switch state:
   - Replace/repair the brake pedal position sensor.

Reference Circuit Diagram

Exterior Lighting - Brake Lamp

Diagnostic Test Steps

1. Brake pedal position sensor harness:

   ® Check/repair the brake pedal position sensor connector, harness and pin.

   ® Normal, go to 2.

2. Replace the brake pedal position sensor:

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Brake pedal position sensor harness failure:
   - Use a multimeter to test if the harness has short circuit and open circuit failures.
2. Brake pedal position sensor:
   - Use a multimeter to test the resistance of brake pedal position sensor, and judge whether the brake pedal position sensor is invalid.

P1B13, P1B15, P1B17 and P1B82

DTC Description

DTC	FTB	Failure Description
P1B13	09	Cooling Fan Startup Failure or Low Speed Error
P1B15	4B	Cooling Fan over Temperature
P1B17	11	Cooling Fan Short Circuit to GND
P1B17	12	Cooling Fan Short Circuit to Battery
P1B17	13	Cooling Fan Hardware Error
P1B82	1C	Cooling Fan Over Current

Subsystem Principle

The cooling fan is controlled by the IMCU, which controls the fan speed through duty ratio.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B13 09: Cooling fan low PWM (duty ratio) signal duration is equal to 2s.

P1B15 4B: Cooling fan low PWM (duty ratio) signal duration is equal to 1s.

P1B17 11: The voltage collected by cooling fan PWM control ADC is below the threshold.

P1B17 12: The voltage collected by cooling fan PWM control ADC is above the threshold.

P1B17 13: Cooling fan low PWM signal duration is equal to 4s.

P1B82 1C: Cooling fan low PWM signal duration is equal to 3s.

Operations of ECU after Failure

P1B13 09:

- The DTC is set.
- Cooling fan is turned off.

P1B15 4B:

- The DTC is set.
- Cooling fan is turned off.

P1B17 11:

- The DTC is set.
- Cooling fan is turned off.

P1B17 12:

- The DTC is set.
- Cooling fan is turned on.

P1B17 13:

- The DTC is set.
- Cooling fan is turned off.

P1B82 1C:

- The DTC is set.
- Cooling fan is turned off.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Check the cooling fan:
   - Repair/replace the cooling fan.
2. Check the cooling fan control pins:
   - Check the connector and pins of cooling fan harness.
   - Check/replace the cooling fan harness.

Reference Circuit Diagram

Intelligent Motor Control Unit (IMCU) System (1).

Diagnostic Test Steps

1. Cooling fan harness:

   ® Test/replace the cooling fan harness.

   ® The harness is normal. Go to 2.

2. Cooling fan:

   ® Check/replace the cooling fan.

   ® Cooling fan is normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Test methods of cooling fan harness failure:
   - Visually check the cooling fan harness for damage, bent pins and corrosion, etc.
   - Use a multimeter to detect if there is a line breakage and open circuit in the cooling fan harness.
2. Cooling fan diagnostic test methods:
   - Rotate the blades of cooling fan to feel if the cooling fan is stuck or intermittently blocked when rotating.
   - Use a multimeter to measure if the resistance of cooling fan exceeds the reasonable range.

P1B19, P1B25, P1B31, P1B32 and P1B72

DTC Description

DTC	FTB	60pxFailure Description
P1B19	00	Mon Inhibt Assist Function Fault
P1B25	00	ECU Reset Recognition
P1B31	00	Traction Motor Serious Fault
P1B32	00	Traction Motor Warning Fault
P1B72	00	Mon Shut Down Fault

Subsystem Principle

Intelligent Motor Control Unit (IMCU) exchanges information with other control units via the CAN bus.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B19 00: The auxiliary functions are out of the calibration range for a period of calibration time.

P1B25 00: In Bosch function, identify and reset.

P1B31 00: Traction motor requests to suppress the high voltage.

P1B32 00: Traction motor is in fault state.

P1B72 00: IMCU detects that the torque is out of the calibration range for a period of calibration time.

Operations of ECU after Failure

- The vehicle is powered off.
- The DTC is set.
- Disable ASL, SAS and cruise.

Conditions for Clearing DTCs

P1B19 00:

- The monitor reports to IMCU that the auxiliary functions are within the calibration range.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1B25 00:

- No reset is identified.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1B31 00:

- Traction motor does not request to suppress the high voltage.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1B32 00:

- Traction motor is not in fault state.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1B72 00:

- The monitor reports to IMCU that the torque is within the calibration range.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Check for IMCU and auxiliary function failure:
   - Check if the IMCU needs a software upgrade.
   - Check the IMCU harness and connector for looseness, loose connection, bent pins, etc.
   - Check the auxiliary motor connector for looseness, incomplete connection of the connector, bent pins, etc.
2. Check the IMCU controller:
   - Check the IMCU controller harness and connector for looseness, damaged harness, bent pins, etc.
   - Check if the IMCU controller needs a upgrade.

Reference Circuit Diagram

None

Diagnostic Test Steps

1. Check for IMCU and auxiliary function failure:

   ® Check the IMCU harness, connector and auxiliary motor for damage, looseness and bent pins.

   ® Normal, go to 2.

2. Check if the IMCU software needs a upgrade or flash:

   ® No upgrade or flash is required, go to TAC Human Assistance.

Diagnostic Test Methods

1. Check for IMCU and auxiliary function failure:
   - Visually check the IMCU harness for damage, severely loose connector, corroded and bent pins and other symptoms.
   - Visually check the auxiliary drive motor for obvious defects.

P1611, P1612, P1614, P1B1F, P1B74, P1B75, P1B76, P1B78, P3055, P3056, P3057, U0146, U0147, U0546, U0599, U1115, U1416, U1417, U1418 and U141B

DTC Description

DTC	FTB	Failure Description
P1611	51	Immobilizer: No response received
P1612	06	Immobilizer: invalid response received
P1614	06	Immobilizer: ECU is not programmed
P1B1F	00	CCU/HVDCDC Fault
P1B74	29	Inhibit Regen & Creep Due To Signal Invalid For Brake Pedal Position
P1B75	29	Inhibit Cruise Due to Signal Invalid For Cruise Control Switch Status
P1B76	29	Signal invalid for EPB switch status
P1B78	86	Data unavailable for Radar (from ICC)
P3055	00	EPK System Fault
P3056	87	Lost communication with EPMCU
P3057	81	Invalid data received from EPMCU
U0146	87	Lost communication with ICC(CCP/GW)
U0146	F7	Lost communication with ICC(CCP/GW) In SFTYCAN
U0146	FF	Lost communication with ICC(CCP/GW) In PTEXTCAN
U0147	81	Invalid data received from EPB(From IBS)
U0599	81	Invalid Data Received From CCU/HVDCDC
U0599	F1	Invalid data received from CCU(PTCAN)
U1115	87	Lost communication with CCU
U1115	F7	Lost communication with CCU In PTEXTCAN
U1416	81	Data unavailable for IAM (from ICC)
U1417	81	Data unavailable for IPD (from ICC)
U1418	81	Data unavailable for RWSGW (from ICC)
U141B	81	Invalid data received from HADS

Subsystem Principle

IMCU communicates with other modules via the CAN bus.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1611 51: Anti-theft lock: No response data is received

P1612 06: Anti-theft lock: Invalid response data is received

P1614 06: Anti-theft lock: ECU is not programmed

P1B1F 00: DCDC is in fault state.

P1B76 29: EPB switch status signal Invalid in the calibration time.

P3055 00: EPK monitor fails.

P3056 87: If the node cannot detect the message from the transmitter consecutively in the node transmission time (2s)

P3057 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U0146 87: VCU cannot detect any AGS2 data (ICC) within the calibration time (300ms)

U0146 F7: If the node cannot detect data from the transmitter (ICC) consecutively in the node transmission time (4s)

U0146 FF: If the node cannot detect data from the transmitter (ICC) consecutively in the node transmission time (2s)

U0147 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U0599 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U0599 F1: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U1115 87: If the node cannot detect the message from the transmitter consecutively in the node transmission time (2s)

U1115 F7: If the node cannot detect data from the CCU module transmitter consecutively in the node transmission time (1s).

U141B 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

Operations of ECU after Failure

- Disable charging, DCDC fails.
- InhbCrp, disable cruise, disable ACC.
- The DTC is set.

Conditions for Clearing DTCs

P1B1F 00: DCDC is not in fault state.

P1B76 29: EPB switch status signal is valid in the calibration time

P3055 00: EPK monitor is normal.

P3056 87: When the timeout can be recovered within 20 cycles (200ms) of the frame, bit 0 of DTC status (testFailed) will be cleared.

P3057 81, U0147 81, U0599 81, U0599 F1 and U141B 81: Upon receiving any valid data, clear bit 0 immediately.

U1115 87 and U1115 F7: When the timeout can be recovered within 20 cycles (200ms) of the frame, bit 0 of DTC status (testFailed) will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Check CCU and its DTC:
   - Check if the CCU stores other DTCs.
   - Check/replace the CCU.
2. Check the EPB CAN message:
   - Check the can network message of EPB.
   - Check/replace the network state from EPB to IMCU.
3. Check EPK and its DTC:
   - Check if the EPK unit stores other DTCs.
   - Check/replace the EPK unit.
4. Check the harness of EPMCU:
   - Check the EPMCU harness, connector and pins for damage, looseness and bent pins.
   - Replace/repair the EPMCU harness.
5. Check the EPMCU CAN message:
   - Check/replace the EPMCU unit.
6. Check the FICM CAN message:
   - Check/replace the FICM unit.
7. Check the CCU CAN message:
   - Upgrade/flash the CCU.
   - Check/replace the CCU.
8. Check the harness connected to CCU:
   - Check the CCU harness, connector and pins for damage, looseness, bent and corrosion.
   - Replace/repair the CCU harness.
9. Check the HADS CAN message:
   - Upgrade/flash the HADS unit.
   - Replace/repair the HADS unit.

Reference Circuit Diagram

Data Communication - Power HS CAN

Diagnostic Test Steps

1. Check the data bus:

   Check the data bus for damage, loose connector, corroded and bent pins.

   ® Normal. Go to 2.
2. Check the faulty module, such as: CCU, EPB, EPK, EPMCU, FICM and HADS. Whether an upgrade is required:

   ® Upgrade/replace the corresponding module.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. CAN data bus diagnostic test methods:
   - The vehicle is powered off, disconnect the negative battery cable, and wait for 5min.
   - With a multimeter, measure the resistance of the H and L terminals of the CAN network bus from the IMCU harness location.
   - Remove the faulty module, measure the resistance between the CAN network bus H terminal and L terminal ground.
2. Diagnostic test methods for checking CCU, EPK and their DTCs:
   - Access the corresponding module with the scan tool, to see if there are other DTCs stored in the module.
   - According to the DTCs stored in the module memory, proceed with the vehicle repair.

P1625 and P1B30

DTC Description

DTC	FTB	60pxFailure Description
P1B30	00	Traction Motor(TM) Derating
P1625	96	TM fail and not be draged

Subsystem Principle

The drive motor is managed and driven by the TM control unit, and the TM communicates with the IMCU via the CAN network.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B30 00: Restrict the traction motor power in the calibration time

P1625 96: MCU reports that TM failure level is failure 1 or failure 2 within the calibration time.

Operations of ECU after Failure

- Speed is limited.
- The DTC is set.

Conditions for Clearing DTCs

P1B30 00: The traction motor power is not restricted in the calibration time.

P1625 96: MCU reports that the TM failure level is neither failure 1 nor failure 2 in the calibration time.

Possible Failure Causes and Maintenance Scheme

1. TM Drive PCB failure:
   - Check the appearance of the drive motor for any damage or improper installation, and make a repair.
   - Check if the cooling of the drive ECU is reasonable.
   - Replace/repair the drive ECU.

Reference Circuit Diagram

High-voltage Power Distribution System.

Diagnostic Test Steps

1. TM Drive PCB failure:

   ® Check the appearance of the drive motor for any improper installation or damage, and make a repair.

   ® Check/replace the TM drive unit.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. TM drive PCB failure diagnostic test methods:
   - Check the appearance of the drive motor for any damage.
   - Gently shake the connecting wire of the drive motor by hand to see if it is loosely connected or interferes with other parts.

P1B69, P1B6A, P1B6B, P1B6C, P1B6D and P1B6F

DTC Description

DTC	FTB	Failure Description
P1B69	00	ESS Cooling Pump not Lifebeat
P1B6A	00	ESS Cooling Pump Dry Run
P1B6B	00	ESS Cooling Pump Stall or Over Current
P1B6C	4B	ESS Cooling Pump Over Temperature Shutdown
P1B6D	00	ESS Cooling Pump Speed too Low
P1B6F	11	ESS Cooling Pump Short Circuit to GND
P1B6F	12	ESS Cooling Pump Short Circuit to Battery

Subsystem Principle

The intelligent control module provides the current coolant temperature status through the coolant temperature sensor near the high-voltage battery pack. When the coolant temperature rises, the vehicle control module will enable the electronic cooling pump in order to maintain a relatively constant temperature of the high-voltage system.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1B69 00: ESS cooling pump duty ratio signal error.

P1B6A 00: ESS pump low duty ratio signal lasts for 1s.

P1B6B 00: ESS pump low duty ratio signal lasts for 1.5s.

P1B6C 4B: ESS pump low duty ratio signal lasts for 2s.

P1B6D 00: ESS pump low duty ratio signal lasts for 2.5s.

P1B6F 11: The voltage collected by ESS cooling pump PWM control ADC is below the threshold

P1B6F 12: The voltage collected by ESS cooling pump PWM control ADC is above the threshold.

Operations of ECU after Failure

The DTC is set. Cooling pump is turned off.

Conditions for Clearing DTCs

The failure state is cleared.

Possible Failure Causes and Maintenance Scheme

1. Cooling water pump harness failure:
   - Check/repair the cooling water pump harness for breakage, damage, loose connector, bent and corroded pins of connector.
2. Cooling water pump failure:
   - Check/replace the deteriorated coolant.
   - Check/repair the cooling system pipeline blockage.
   - Check/replace the stuck or blocked cooling water pump.

Reference Circuit Diagram

Intelligent Motor Control Unit (IMCU) System (1).

Diagnostic Test Steps

1. Cooling water pump harness failure:

   ® Check/repair the cooling water pump harness for breakage, damage, loose connector, bent and corroded pins of connector.

   ® Replace the cooling pump harness.

   ® Normal, go to 2. Go to TAC Human Assistance.

2. Cooling water pump failure:

   ® Check/replace the stuck cooling pump, deteriorated coolant, blocked pipeline.

   ® Repair/replace the cooling pump.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Cooling water pump harness failure diagnostic test methods:
   - Use a multimeter to check whether there is an open circuit between the cooling pump power cord and the fuse box or a short circuit to other harnesses.
   - Use a multimeter to check whether the ground wire and control wire are open or shorted to other harnesses.
2. Cooling water pump failure diagnostic test methods:
   - Rotate the cooling water pump by hand, and feel whether the cooling pump is stuck or unable to rotate when rotating.
   - Use a multimeter to check whether the resistance between the power terminal and the ground terminal is within a reasonable range.

P1B8E, P1B8F, P1BA0, P1BA1, P1BA2, P1BA3, P1BA4, P1BA5, P1BA6, P1BA7, P1BA8, P1BA9, P1BAA, P1BAB, P1BAC and P1BAD

DTC Description

DTC	FTB	Failure Description
P1BA0	98	AGS1 motor over heat
P1B8F	07	AGS2 mechanical break error
P1B8E	07	AGS1 mechanical break error
P1BA1	17	AGS1 motor over voltage
P1BA2	16	AGS1 motor under voltage
P1BA3	01	AGS1 motor electronic fault
P1BA4	08	AGS1 Lin communication error
P1BA5	07	AGS1 mechanical block temporary
P1BA6	98	AGS2 motor over heat
P1BA7	17	AGS2 motor over voltage
P1BA8	16	AGS2 motor under voltage
P1BA9	01	AGS2 motor electronic fault
P1BAA	08	AGS2 Lin communication error
P1BAB	07	AGS2 mechanical block temporary
P1BAC	87	Lost communication with AGS1
P1BAD	87	Lost communication with AGS2

Subsystem Principle

IMCU communicates with Active Air Inlet Grille System (AGS) via LIN bus, and controls the AGS operation.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1BA0 98, P1B8E 07, P1BA1 17, P1BA2 16, P1BA3 01, P1BA4 08 and P1BA5 07:

- The corresponding bit from AGS1 is determined.

P1BA6 98, P1BA7 17 and P1BA8 16:

- The corresponding bit from AGS2 is determined.

Operations of ECU after Failure

The DTC is set.

Conditions for Clearing DTCs

- The corresponding bit from AGS1 is not determined.
- The corresponding bit from AGS2 is determined.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. AGS harness failure:
   - Check/repair the harness of AGS connection.
   - Replace/repair the AGS harness.
2. AGS motor failure:
   - Check/repair the AGS motor failure.
   - Replace/repair the AGS motor.
3. Intelligent motor control unit:
   - Software failure.
   - Hardware failure.

Reference Circuit Diagram

Active Air Inlet Grille

Diagnostic Test Steps

1. Check whether the software version of intelligent motor control unit is up-to-date:

   ® No, flash the software.

   ® Yes, go to the next step.

2. Check whether AGS harness for any damage, breakage, loose connector, bent and corroded pins, short to ground/power supply/open circuit, etc.:

   ® Yes, repair/replace the AGS harness.

   ® No, go to the next step.

3. Check whether the AGS motor is damaged, stuck or misplaced;

   ® Yes, adjust/replace the AGS motor.

   ® No, go to the next step.

4. Replace the intelligent motor control unit:

   Replace the intelligent motor control unit.

P1BE7, U0122, U0146, U16B8 and U1756

DTC Description

DTC	FTB	Failure Description
P1BE7	87	IBS SCS Related Key Message Missing
U0122	87	Lost communication with IBS(SCS)
U0146	81	Invalid data received from IBS(SCS)
U16B8	81	Invalid data received from IBS_10ms_PDU12
U1756	87	IBS EPB Related Key Message Missing

Subsystem Principle

IMCU communicates with IBS (SCS) via the CAN bus.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1BE7 87: If the node cannot detect specific data from the transmitter (0x169 or 0x1F1) consecutively in the node transmission time (1s).

U0122 87: If the node cannot detect data from the transmitter (B7, 13F, 153, 1A7) consecutively in the node transmission time (2s).

U0146 87: The frames (0x169 and 0x1F1) cannot be continuously detected from the transmitter within the node transmission time (2s).

U16B8 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

U1756 87: If the node cannot detect specific data from the transmitter (18A) consecutively in the node transmission time (500ms).

Operations of ECU after Failure

P1BE7 87, U0146 87 and U0122 87: Speed limit, Crp disabled, Regen disabled.

U16B8 81: The DTC is set.

U1756 87: Crp , cruise and ACC are disabled.

Conditions for Clearing DTCs

- The conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Node loss ECU:
   - Internal software failure.
   - Internal hardware failure.
   - ECU power supply circuit failure.

Reference Circuit Diagram

- Data Communication - Power HS CAN
- Data Communication - Chassis HS CAN

Diagnostic Test Steps

1. System detection: Confirm the following symptoms.
   - They are current DTCs.

     ® Yes, confirm the next item;

     ® No, clear the DTCs with the scan tool.
   - Node loss ECU software version is not the latest.

     ® Yes, perform the ECU update.

     ® No, perform the "Detect Network Loss Node".
2. Detect network loss node: Confirm the following symptoms.
   - Node ECU harness connector has terminal damage, retreat, looseness, water immersion and other failures.

     Yes, repair the connector failures;

     ® No, confirm the next item.
   - Short connect [KL15 Relay] socket power supply terminal 30 and output terminal 87, to test the following node ECU harness terminal:

Con-ditio-ns	Measure the terminals	Normal Value
Pow-er-off	CAN_H and CAN_L	Resistance: 60 or 120 Ω
	KL31 Terminal and Ground	Resistance: Less than 10Ω
Pow-er-on	CAN_H Terminal and Ground	Voltage: 2.5~4.3 V
	CAN_L Terminal and Ground	Voltage: 0.7~2.5 V
	KL30 Terminal and Ground	Voltage: 10 to 16 V, Connect the test lamp to Illuminate it
	KL15 Terminal and Ground	Voltage: 10 to 16 V, Connect the test lamp to Illuminate it

   ® Yes, replace the node ECU;

   ® No, detect the CAN network related harness short circuit, open circuit or ground poorness failure, and replace the harness after confirmation.

1. IBS (SCS) unit harness failure:

   ® Check/repair the unit harness for breakage, damage, loose connector, bent and corroded pins.

   ® Replace the harness.

   ® Normal, go to 2.

2. IBS (SCS) unit failure:

   ® Replace the IBS unit.

   Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. IBS (SCS) unit harness failure diagnostic test methods:

   • Check the harness for intuitive defects.

   • Use a multimeter to measure if the CAN bus in the harness is short to other harness or short to each other.

2. IBS unit failure diagnostic test methods:

   • The vehicle is powered on, use a multimeter to measure if the voltage at CAN_H terminal is within the rational range.

   • The vehicle is powered on, use a multimeter to measure if the voltage at CAN_L terminal is within the rational range.

   • Replace the associated control unit.

P1C75, P1C76, P1C80, P1C81, P1C82, P1C83, P1C84, P1C85, P1C9A and P1CC4

DTC Description

DTC	FTB	Failure Description
P1C75	00	Stator temperature too high
P1C76	00	Stator Temperature below Low Range
P1C80	00	U-phase IGBT Over Temperature Error
P1C81	00	U-phase IGBT Temperature Below Min Limit
P1C82	00	V-phase IGBT Over Temperature Error
P1C83	00	V-phase IGBT Temperature Below Min Limit
P1C84	00	W-phase IGBT Over Temperature Error
P1C85	00	W-phase IGBT Temperature Below Min Limit
P1C9A	00	D-Q Shaft Current Angle Rationality Detection Current Angle Status Error
P1CC4	00	Mainrelay Hardware Error

Subsystem Principle

Power Electronic Box (PEB) internal failure is found in the self-check, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on.
- Initialisation is completed.

Conditions for Setting DTCs

P1C75 00: The stator temperature AD sampling value is lower than the threshold.

P1C76 00: The stator temperature AD sampling value exceeds the threshold.

P1C80 00: The IGBT U-phase DBC temperature exceeds the threshold.

P1C81 00: IGBT U-phase DBC temperature is lower than the threshold.

P1C82 00: The IGBT V-phase DBC temperature exceeds the threshold.

P1C83 00: IGBT V-phase DBC temperature is lower than the threshold.

P1C84 00: The IGBT W-phase DBC temperature exceeds the threshold.

P1C85 00: IGBT W-phase DBC temperature is lower than the threshold.

P1C9A 00: The absolute difference between the current angle and 90 degrees is more than 15 degrees.

P1CC4 00: The voltage collected by the main relay control ADC exceeds a specific range.

Operations of ECU after Failure

- Limp Home level 2, the pump is enabled.
- The DTC is set.

Conditions for Clearing DTCs

- The DTC is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Drive motor failure:
   - Check/repair the drive motor for installation defects.
   - Check/replace the drive motor.
2. Drive motor hardware temperature sensor failure:
   - Check/replace the drive motor.
3. Offset angle and resolver failure:
   - Repair/check the offset angle and resolver for installation defects.
   - Replace/repair the offset angle and resolver.
4. Main relay harness failure:
   - Check/repair the main relay harness for breakage, damage, loose connector, bent and corroded pins, etc.
   - Repair/replace the main relay harness.
5. Main relay failure:
   - The vehicle is powered on, and check if the main relay is engaged.
   - Replace/repair the main relay.

Reference Circuit Diagram

- High-voltage Power Distribution System
- Intelligent Motor Control Unit (IMCU) System (2).

Diagnostic Test Steps

1. Drive motor diagnostic test steps:

   ® The vehicle is powered off, and check if there are strong electromagnetic waves near the drive motor causing component interference.

   ® Repair/replace the drive motor.

   ® Normal, go to TAC Human Assistance.
2. Main relay and harness failure diagnostic steps:

   ® The vehicle is powered on, and check the harness, connector and pins.

   ® Replace/repair the main relay.

   ® Normal. Go to TAC Human Assistance.
3. Offset angle and resolver failure diagnostic test steps:

   ® Replace/repair the offset angle and resolver.

® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Main relay and harness failure:

   • The vehicle is powered off, and check if the resistance of the main relay solenoid coil is rational.

   • The vehicle is powered off, and check if the coil supply voltage of the main relay is present.

   • The vehicle is powered on, and check if the coil grounding wire of the main relay is reliably grounded.

   • With the coil engaged, check the conductivity of the switch pins.

P1C8C, P1C8D, P1C8F, P1C98, P1D19, P1D1B, P1D1C, P1D1D, P1D25, P1D2C, P1D41 and P1D42

DTC Description

DTC	FTB	Failure Description
P1C8C	00	Software Detects Bus Voltage Overvoltage
P1C8D	00	UDC Above Limit
P1C8F	00	Inverter Lower Bridge Arm Short Circuit Failure
P1C98	00	Passive Discharge Timeout
P1D19	00	U-phase Current not Rational
P1D1B	00	Sum of U/V/W Phase Current Invalid
P1D1C	00	V-phase Current not Rational
P1D1D	00	W-phase Current not Rational
P1D25	00	Output Power Limited in SBC During TC Power On
P1D2C	00	Received State from CAN Out of Range
P1D41	00	Automatic Angle Calibration Acceleration Reverse
P1D42	00	Automatic Angle Calibration Acceleration Overspeed Fault

Subsystem Principle

Power Electronic Box (PEB) internal failure is found in the self-check, not involving external circuits; The resolver is a precise angle, position and speed detection device, which is connected to the TM motor to obtain the angle, position, speed and other signals of the motor.

Conditions for Running DTCs

- The vehicle is powered on.
- Rotation speed of motor at 500-4000rpm.
- Angular velocity calibration phase value.

Conditions for Setting DTCs

P1C8C 00: It is detected that the bus voltage is above threshold.

P1C8D 00: The hardware comparison circuit detects that the bus voltage exceeds the threshold.

P1C8F 00: In case of active short circuit, ISC_ is less than 50A or ISC_ is greater than 480V.

P1C98 00: When the vehicle is powered off and the main relay is turned off, the PEB high-voltage exceeds the threshold.

P1D19 00: The current amplitude difference between the U-phase and the other 2 phases exceeds the threshold.

P1D1B 00: The sum of the three-phase current exceeds the threshold.

P1D1C 00: The current amplitude difference between the V-phase and the other 2 phases exceeds the threshold.

P1D1D 00: The current amplitude difference between W phase and the other 2 phases exceeds the threshold.

P1D25 00:TC389 power-on self-test failure or SMU monitoring failure.

P1D2C 00: The target working state received by CAN is out of the defined range.

P1D41 00: The angular velocity calibration value is lower than the threshold.

P1D42 00: The angular velocity calibration value is greater than threshold.

Operations of ECU after Failure

- Standby.
- The DTC is set.
- Actively shorted, Limp Home level 3.
- Actively shorted or turned off.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Drive motor control unit crashes:
   - Turn off the ignition switch and wait for 5 minutes and then power on the vehicle.
2. Drive motor control unit failure:
   - Replace/upgrade the drive motor control unit.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Drive motor control unit crash failure:

   ® Power off the vehicle, wait for 5 minutes and then power on the vehicle.

   ® Normal, go to 2.

2. Replace/upgrade the drive motor control unit:

   ® Upgrade/replace the drive motor control unit.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Drive motor control module crash failure diagnostic test methods:
   - Check whether there is strong electromagnetic interference near the drive motor.

P1CC1, P1CC2, P1CC3, P1CC5, P1CC6, P1CC7 and P1CC8

DTC Description

DTC	FTB	Failure Description
P1CC1	00	Feedback Signal from the Coolant Pump not Received
P1CC2	00	Coolant Pump PWM Pin Short Circuit to GND
P1CC3	00	Coolant Pump PWM Pin Short Circuit to Battery
P1CC5	00	Coolant Pump Dry Run
P1CC6	00	Coolant Pump is Blocked or Over Current
P1CC7	00	Coolant Pump Over Temp
P1CC8	00	Coolant Pump Low Speed

Subsystem Principle

There are three pins on the cooling water pump, No.3 pin is the power supply pin, and power is supplied by the engine compartment fuse box. Pin 1 is the ground pin and pin 2 is the control pin. The operation and speed of the cooling water pump are controlled by the IMCU in the form of duty ratio.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1CC1 00: The duty ratio signal of the cooling pump is incorrect.

P1CC2 00: The voltage collected by the PWM control ADC of cooling pump is lower than the threshold.

P1CC3 00: The voltage collected by the PWM control ADC of cooling pump exceeds the threshold.

P1CC5 00: The duration of the pump PWM signal Low is equal to 1 s.

P1CC6 00: The duration of the pump PWM signal Low is equal to 1.5 s.

P1CC7 00: The duration of the pump PWM signal Low is equal to 2 s.

P1CC8 00: The duration of the pump PWM signal Low is equal to 2.5 s.

Operations of ECU after Failure

P1CC1 00, P1CC2 00, P1CC5 00, P1CC6 00, P1CC7 00 and P1CC8 00: Limp Home level 2, the pump is off.

P1CC3 00: Limp Home level 2, the pump is on.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Cooling water pump harness failure:
   - The cooling water pump harness has breakage, crack, loose connector, bent and corroded pins of connector.
   - Replace the cooling water pump harness.
2. Cooling water pump failure.
   - The cooling water pump motor is damaged.
   - The cooling water pump is stuck and runs poorly.
   - The cooling water pump fails due to internal corrosion.
   - Replace the cooling water pump.

Reference Circuit Diagram

Intelligent Motor Control Unit (IMCU) System (1).

Diagnostic Test Steps

1. Cooling water pump harness failure:

   ® Check/repair the cooling water pump harness for damage, breakage, loose connector, bent and corroded pins of connector.

   ® Replace/repair the cooling water pump harness.

   ® Normal, go to 2.

2. Cooling water pump failure:

   ® Check/repair the cooling water pump which is stuck or does not run smoothly.

   ® Replace the cooling water pump.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Cooling water pump harness failure diagnostic test methods:
   - Check the cooling water pump harness for obvious breakage, damage, loose connector, bent and corroded pins of connector.
   - Use a multimeter to measure whether there is short circuit between connector pin 2 and other harness.
   - Use a multimeter to check if the no.3 pin of the cooling water pump is conductive to other harness.
   - Use a multimeter Check if the no.1 pin of the cooling water pump is conductive to other harness.
2. Cooling water pump failure diagnostic test methods:
   - The vehicle is powered on, and use a multimeter to measure if the no.3 pin of the cooling water pump has a 12V power supply.

- Power on the vehicle, use a multimeter to test the voltage between pin 1 and the ground. The correct value is between 0.5-0V.
- Gently move the cooling water pump with your hand to feel if there is a stuck or other rotational obstruction.
- Unplug the cooling water pump connector and measure the resistance between pin 1 and pin 3 of the cooling water pump. The correct value is above 5mΩ.

P1D11, P1D12, P1D13, P1D3E, P1D5C, P1D78, P1D79, P1D7A and P1D92

DTC Description

DTC	FTB	Failure Description
P1D11	00	Temperature Difference Between U-phase and Other Two Phases is Too Large
P1D12	00	Temperature Difference Between V-phase and Other Two Phases is Too Large
P1D13	00	Temperature Difference Between W-phase and Other Two Phases is Too Large
P1D3E	00	Current Sensor LEMGND_A Amplitude not Rational
P1D5C	00	Current Sensor LEM5V_A Amplitude not Rational
P1D78	00	Stator Over Temp Error
P1D79	00	Junction Temperature Estimated by Observer is Greater than Threshold Value
P1D7A	00	Coolant OverTemp Error(Estimated)
P1D92	00	Over Speed While Offset Angle Invalid

Subsystem Principle

Power Electronic Box (PEB) internal failure is found in the self-check, not involving external circuits. PEB communicates with other modules via the CAN bus.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1D11 00: The absolute value of the difference between the average value of U-phase temperature and three-phase temperature exceeds the threshold.

P1D12 00: The absolute value of the difference between the average value of V-phase temperature and three-phase temperature exceeds the threshold.

P1D13 00: The absolute value of the difference between the average value of phase temperature and three-phase temperature exceeds the threshold.

P1D3E 00: The supply voltage (GND side) of the current sensor is out of range.

P1D5C 00: The supply voltage of the current sensor is out of range.

P1D78 00: The analysis value of stator temperature exceeds the threshold.

P1D79 00: The estimated monitored temperature exceeds the threshold.

P1D7A 00: The water temperature exceeds the threshold.

P1D92 00: Overspeed error when the rotor angle is invalid.

Operations of ECU after Failure

- Limp Home level 2, the pump is enabled.
- The DTC is set.
- Standby.

Conditions for Clearing DTCs

- The DTC is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Failure of temperature sensor in drive motor:
   - Check the drive motor for damage or incorrect installation. If yes, have it fixed.
   - Check/replace the drive motor.
2. Current sensor failure:
   - Check the drive motor for damage or installation error.
   - Replace the current sensor.
3. Coolant circulation system failure:
   - Check/repair the radiator, coolant circulation pipes, cooling elements and other components for any blockage, so that the coolant circulation is smooth.
   - Whether the coolant circulating pump is stuck or not.

Reference Circuit Diagram

- Intelligent Motor Control Unit (IMCU) System (1).
- High-voltage Power Distribution System

Diagnostic Test Steps

1. Coolant circulation system failure:

   ® Replace/repair the radiator, pipes and cooling parts of the coolant circulation system for any blockage.

   ® Normal, go to 2.

2. Current sensor failure:

   ® Replace/repair the current sensor.

   ® Normal, go to 3.

3. Drive motor and temperature sensor failure:

   ® Test/replace the drive motor and temperature sensor.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Coolant circulation failure diagnostic test methods:
   - The vehicle runs for 5-10 minutes.

- Check whether the temperature difference between the upper water pipe and the lower water pipe of radiator is reasonable by hand or infrared thermometer.
- Check whether the temperature difference of each section of the water pipe is within a reasonable range by hand or infrared thermometer.
- Check whether the coolant circulating pump is operating normally.

2. Circuit sensor failure diagnostic test methods:

- Use a multimeter to check whether the resistance value of the current sensor is within a reasonable range.
- Use a multimeter to check whether the lead of current sensor has short circuit and circuit break.

P1DC0, P1DC1, P1DC2, P1DC3, P1DC4, P1DC5, P1DCB, P1DCC and P1DCD

DTC Description

DTC	FTB	Failure Description
P1DC0	00	Rotor Angle not Plausible
P1DC1	00	Motor Speed not Plausible
P1DC2	00	Phase Current out of Range
P1DC3	00	Motor Operation Mode not Plausible
P1DC4	00	IMCU Rolling Counter and Checksum Error
P1DC5	00	Actual Torque not Plausible
P1DCB	00	Monitoring of Torque Comparison Check out of Range
P1DCC	00	Stationary Damping Control out of Rang
P1DCD	00	DCDC Voltage not Plausible

Subsystem Principle

Power Electronic Box (PEB) internal failure is found in the self-check, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1DC0 00: The difference between the primary and secondary electrical angles of the rotor exceeds the threshold or the sum of square of sine and cosine calculated by the secondary angle is less than error 1 and above the threshold.

P1DC1 00: Under the condition of resolver failure, the speed error of primary motor and secondary motor multiplied by the number of poles of the primary and secondary motors exceeds the phase current and the absolute value exceeds 2000rpm.

P1DC2 00: The absolute value of phase current exceeds 70A.

P1DC3 00: When the VCU communication is normal, if the HCU is not in the expected mode or the torque exceeds the torque limit.

P1DC4 00: When the motor is in torque mode or speed mode, the rolling counter or the check time exceeds the 4th frame of hcu05.

P1DC5 00: The direction of torque value is opposite, and the amplitude exceeds the threshold. If the torque error is greater than the torque error threshold, it is considered as a failure. Otherwise, when the torque error exceeds the threshold., it is regarded as a torque comparison failure.

P1DCB 00: The absolute value of torque command is greater than the torque error threshold 5N; otherwise, the torque error threshold is 50N; When the error between the estimated torque value and the command value exceeds the above error threshold and pwmmode is not under ASC state, it is considered as a failure.

P1DCC 00: The amplitude of damping intervention torque reaches 80N.

P1DCD 00: The current difference exceeds the threshold of 40V.

Operations of ECU after Failure

P1DC0 00, P1DC1 00, P1DC5 00 and P1DCB 00: Actively shorted or turned off.

P1DC2 00: Limp Home is Level 3.

P1DC3 00: DTC set.

P1DC4 00: Limp home level 1.

P1DCC 00: Limp home level 1.

P1DCD 00: Limp home level 2, L1 udc enabled.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Internal failure of PEB:

- Replace the PEB.

Reference Circuit Diagram

High-voltage Power Distribution System.

Diagnostic Test Steps

1. PEB failure:

   ® Power off the vehicle, wait for about 1 minute, and then power it on again.

   ® The fault is eliminated, the repair is completed.

   ® The failure has not been removed. Go to 2.

2. Replace the PEB:

   ® Replace/repair the PEB.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Replace the PEB:

- Observe whether there are additional components near the power PEB.
- Whether there is enhanced electronic magnetic interference.

P1DCE, P1DE1, P1DE3, P1DE4, P1DE5, P1DE6, P1DE7, P1DE9, P1DEA, P1DEC, P1DED, P1DEE, P1DEF and P1DF0

DTC Description

DTC	FTB	Failure Description
P1DCE	00	Level2 Monitor Shutdown
P1DE1	00	Stator Over Temperature Derating Warning
P1DE3	00	Coolant Over Temperature Derating Warning
P1DE4	00	IGBT/Diode Over Temperature Derating Warning
P1DE5	00	Motor Over Speed Derating Warning
P1DE6	00	DClnk Over Voltage Derating Warning
P1DE7	00	DClnk Under Voltage Derating warning
P1DE9	00	Coolant over Temp Derating Error
P1DEA	00	Stator Over Temperature Derating Error
P1DEC	00	IGBT/Diode Over Temperature Derating Error
P1DED	00	DClnk Over Voltage Derating Error
P1DEE	00	DClnk Under Voltage Derating Error
P1DEF	00	Motor Over Speed Derating Error
P1DF0	00	High Voltage Inter Lock Fault

Subsystem Principle

Power Electronic Box (PEB) internal failure is found in the self-check, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1DCE 00: error pin state error monitoring tc297.

P1DE1 00: The torque after the stator temperature limit is lower than the threshold * external characteristic torque.

P1DE3 00: The torque after cooling water temperature limit is lower than threshold * external characteristic torque.

P1DE4 00: The torque after IGBT/diode temperature limit is lower than the threshold * external characteristic torque.

P1DE5 00: The torque after overspeed limit is lower than the threshold * external characteristic torque.

P1DE6 00: The torque after dclnk over-voltage limit is lower than the threshold * external characteristic torque.

P1DE7 00: The torque after dclnk under-voltage limit is lower than the threshold * external characteristic torque.

P1DE9 00: The torque after temperature limit of cooling water is lower than the threshold * external characteristic torque.

P1DEA 00: The torque after dclnk over-voltage limit is lower than the threshold * external characteristic torque.

P1DEC 00: The torque after IGBT/diode temperature limit is lower than the threshold * external characteristic torque.

P1DED 00: The torque after dclnk over-voltage limit is lower than the threshold * external characteristic torque.

P1DEE 00: The torque after dclnk under-voltage limit is lower than the threshold * external characteristic torque.

P1DEF 00: The torque after overspeed limit is lower than the threshold * external characteristic torque.

P1DF0 00: The voltage collected by HVIL ADC is out of range.

Operations of ECU after Failure

The DTC is set.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. PEB cooling pump harness failure:
   - Check the harness of PEB cooling pump for damage and breakage, loose connector, bent and corroded pins. If yes, have it fixed.
   - Replace/repair the PEB cooling pump harness.
2. PEB cooling pump failure:
   - Check whether the coolant in the maintenance system is missing, and whether the coolant pump is corroded, stuck or damaged.
   - Check/replace the cooling pump.

Reference Circuit Diagram

High-voltage Power Distribution System.

Diagnostic Test Steps

1. PEB cooling pump harness failure:

   ® Check/repair the cooling pump for damaged or broken harness, loose connectors, or bending or corroded pins.

   ® Replace/repair the cooling pump harness.

   ® Normal, go to 2.

2. PEB cooling pump failure:

   ® Check/repair the PEB system coolant.

   ® Check whether the cooling pump is stuck or has high rotation resistance. If yes, have it fixed.

   ® Replace the cooling pump.

   ® The fault is eliminated, the repair is completed.

® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. PEB coolant pump harness failure diagnostic test methods:
   - Carefully check the coolant pump harness appearance.
   - Use a multimeter to check whether the cooling pump harness has an circuit break or is short to any other harness.
2. PEB coolant pump failure diagnostic test methods:
   - Check whether the coolant level is within a reasonable range.
   - Disassemble the cooling pump, and check whether the rotating blades are stuck and the rotation is smooth or not.
   - Use a multimeter to check whether the motor resistance of cooling pump is within a reasonable range.
   - Power on the cooling pump motor (12V) to see if it can rotate normally.

P1FB4, P1FB5, P1FB6 and P1FB7

DTC Description

DTC	FTB	Failure Description
P1FB4	4B	Fast Charge Positive Side Temperature Low Range
P1FB5	4B	Fast Charge Positive Side Temperature High Range
P1FB6	4B	Slow Charge Negtive Side Temperature Low Range
P1FB7	4B	Slow Charge Negtive Side Temperature High Range

Subsystem Principle

IMCU monitors the temperature change of positive and negative electrodes through temperature sensor during charging.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P1FB4: The temperature of the positive electrode of the fast charger is lower than the threshold.

P1FB5: The temperature of the positive electrode of the fast charger is higher than the threshold.

P1FB6: The temperature of the positive electrode of the slow charger is lower than the threshold.

P1FB7: The temperature of the positive electrode of the slow charger is higher than the threshold.

Operations of ECU after Failure

The DTC is set.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. On-board charger (OBD) harness failure:
   - Check the on-board charger (OBD) harness for breakage, damage, loose connector, bent or corroded pins, etc. If yes, have it fixed.
   - Replace/repair the on-board charger (OBD) harness.
2. Failure of temperature sensor in OBD:
   - Check/replace the on-board charger temperature sensor.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. On-board charger (OBD) harness failure:

   ® Check/repair the on-board charger (OBD) harness, connector and pins.

   ® Normal, go to 2.

2. Replace/repair the charger harness:

   ® Replace the charger harness.

   ® Normal, go to 3.

3. Replace/repair the charger temperature sensor:

   ® Replace the charger temperature sensor.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. On-board charger harness diagnostic test methods:
   - Power off the vehicle, disconnect the negative cable of the storage battery. Wait for 5 minutes.
   - Check the charger harness for breakage, damage, loose connector, bent or corroded pins, etc.
   - Measure the resistance of temperature sensor harness for short to ground or other harness.
2. Charger temperature sensor diagnostic test methods:
   - The vehicle is powered on.
   - Use a multimeter to test the voltage of signal line of temperature sensor, which is between 2-3V at normal temperature.
   - Use a multimeter to test the voltage between the grounding wire of the temperature sensor and the reliable ground, and the correct value is between 0.05-0V.
   - Power off the vehicle and disconnect the temperature sensor connector.
   - Use a multimeter to test the resistance of temperature sensor, which is between 250-300 kΩ at normal temperature.

P3040, P3041, P3042 and P3043

DTC Description

DTC	FTB	Failure Description
P3040	00	ESS Heater IGBT Shorting
P3041	00	ESS Heater hardware damaged
P3042	87	Lost communication with ESS Heater
P3043	00	Invalid data received from ESS Heater

Subsystem Principle

In order to maintain a relatively constant temperature, the high-voltage battery pack is equipped with a heating device. The heating device directly heats the coolant, and the coolant pump drives the coolant to circulate and heat the high-voltage battery pack.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P3040 00: Perform 20 consecutive tests, and the heating current is greater than 2A within 500ms.

P3041 00:

- When the ESS unit drives the heater to work, the effective current (1A) is not detected for 2s.
- The outlet temperature sensor is open-circuited or short-circuited.
- The IGBT temperature sensor is open-circuited or short-circuited.

P3042 87: The node cannot continuously detect the data from the transmitter within the node transmission time (2s) (37A 37B_scp).

P3043 00: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

Operations of ECU after Failure

The DTC is set.

Conditions for Clearing DTCs

P3040:

- It has not been detected for 20 consecutive times, and the current is greater than 2A within 500 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3041:

- When the ESS unit drives the heater to work, the effective current (1A) is detected within 2s.
- The outlet temperature sensor has no circuit break or short circuit.
- The IGBT temperature sensor has no circuit break or short circuit.

P3043:

- Receive any valid data and immediately clear bit 0.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-voltage battery pack heating module failure:
   - Replace/flash the ESS module.
2. High-voltage battery pack heater failure:
   - Check/repair the harness, connectors and pins of the high-voltage battery pack heater.
   - Replace/repair the harness of the high-voltage battery pack heater.
3. Coolant outlet temperature sensor failure:
   - Check/repair the harness, connector and pins of coolant temperature sensor.
   - Replace/repair the coolant temperature sensor.
4. ESS unit bus network communication failure:
   - Check/repair the harness, connector and pins of ESS unit bus network.
   - Replace/repair the ESS bus network harness.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Diagnostic test steps of high-voltage battery pack heating module failure:

   ® Repair/replace the heating module of high-voltage battery pack; Or upgrade the high-voltage battery pack heating module.

   ® Normal, go to 2.

2. Diagnostic test steps of high-voltage battery pack heating module harness failure:

   ® Check/replace the module connecting harness for damage, breakage, loose connector, bent and corroded pins,

   ® Normal, go to TAC Human Assistance.

3. Diagnostic test steps of coolant outlet temperature sensor failure:

   ® Check/replace the coolant outlet sensor for any damage.

   ® Normal, go to TAC Human Assistance.

4. Diagnostic test steps of ESS unit bus network communication failure:

   ® Check/repair the ESS unit bus network harness for open or short to other harnesses, loose connector, bent and corroded pins.

® Replace/repair the ESS unit bus harness.

® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Test steps of high-voltage battery pack heater (PTC):

- Power off the vehicle, disconnect the negative cable of the storage battery. Remove the safety switch.
- Disconnect the high-voltage battery pack heater (PTC) harness.
- Test the resistance of high-voltage battery pack heater (PTC) with a multimeter.

P3103, P310C, P3126, P3127, P3132, P3133, P313A, P3169, P316A, P316D and P3172

DTC Description

DTC	FTB	Failure Description
P3103	00	Current Sensor Errors
P310C	00	CAN Key Frame Lost
P3126	00	DriveBorad HighSide Die1 Fault
P3127	00	Drive Borad Low Side Die1 Fault
P3132	00	Rotor Flux abnormal
P3133	00	Monitor EEPROM Check Error
P313A	19	Software Phase Current Over High Range
P3169	00	High Voltage Without Precharge Error
P316A	00	Monitor Resolver Lost Track Error
P316D	00	Preact Power Limit Error
P3172	00	Monitor Test Shutoff Fail

Subsystem Principle

A failure occurs inside the SAC control unit, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on.
- The motor is in standby or trqctr or SPDCRL state.
- Excessive software decoding.

Conditions for Setting DTCs

P3103 00: The current related variable exceeds the threshold.

P310C 00: Key data ID:scp_169 and IMCU_PTCANFD_10ms_FrP09 of IMCU are missing.

P3126 00: All Higesid3 chip Die1 failure detected:

- The VSUP exceeds 5.5V for 200ms.
- The DT is less than 2us for 100 ms.
- The VDD is below 4.5V for 200ms.
- SPIERR 10 times.
- WDOGFLT of pending time.
- Comer of pending time.

P3127 00: All Higesid3 chip Die2 state 1 failure detected:

- The VCC exceeds 5.5V for 200ms.
- The VCCREG is below 4.5V for 200ms.
- OTSD_IC of pending time.
- DESAT for TBD times.

P3133 00: The rotor magnetic flux exceeds the threshold.

P3133 00: The verification at the EEPROM application layer is inconsistent with that at the monitoring layer.

P313A 19: In the current amplitude, the vector value of the current exceeds the threshold.

P3169 00: The change of high voltage exceeds the threshold (10V increase per ms).

P316A 00: Excessive tracking error of resolver program.

P316D 00: Control performance failure, limit power in advance.

P3172 00: Mon failed to close the path test.

Operations of ECU after Failure

P313A 19: Active short circuit or shutdown.

P316A 00: Active short circuit.

P310C 00: Limp home level 1.

P316D 00: Limp home level 3.

P3103 00, P3133 00, P3169 00 and P3172 00: The DTC is set.

Conditions for Clearing DTCs

- The failure state is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. SAC control unit failure:
   - Replace/repair the SAC control unit.
2. Internal damage failure of drive motor:
   - Replace the drive motor assembly.

Reference Circuit Diagram

- High-voltage Power Distribution System
- Data Communication - Power HS CAN

Diagnostic Test Steps

1. SAC control unit failure:

   ® Replace/flash the unit program.

   ® Normal, go to 2.

2. Replace/repair the drive motor assembly:

   ® Remove and replace the drive motor.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Replace the SAC unit:
   - Dismantle the SAC unit module, and observe whether the surface of the unit module is damaged.
2. Replace the drive motor.
   - Remove the drive motor assembly. Replace the drive motor with a new one.

P3104, P3105, P3106, P3107, P3108, P3146, P314A, P318A, P318B, P318C, P318D, P3197, P3199, P319A and P319D

DTC Description

DTC	FTB	Failure Description
P3104	00	Detection of at Least 2 Open Phase Wires
P3105	00	Process Failure during Execution of Open Phase Wire Test Pulses
P3106	00	Detection of Open Phase Wire U
P3107	00	Detection of Open Phase Wire V
P3108	00	Detection of Open Phase Wire W
P3146	00	Resolver Excite Signal Low Range
P314A	00	Resolver Excite Signal High Range
P318A	00	Resolver Sin Signal High Range
P318B	00	Resolver Cos Signal High Range
P318C	00	Resolver SinCos Square Sum Out of Range
P318D	00	Resolver SinCos Square Sum Fluctuation Error
P3197	00	Monitor Phase W Current High Range
P3199	1C	Monitor Resolver Sin+ Signal High Range
P319A	1C	Monitor Resolver Sin- Signal High Range
P319D	00	Monitor Resolver SinCos Square Sum Rationality Check Error

Subsystem Principle

It is the internal failure of drive motor, not involving external circuit.

Conditions for Running DTCs

The vehicle is powered on, and the initialisation is completed.

Conditions for Setting DTCs

P3104 00: During the open circuit test of stator winding, the current response obtained by applying two test pulses is a timeout DTC.

P3105 00:

- The motor is in the post-test-pulse mode.
- When free rotation timeout waiting zero current is in a certain state.
- The bus voltage drops below the minimum threshold, which is sufficient to generate pulses.
- When the deviation between the stored rotor angle and the actual angle exceeds the maximum threshold, the rotor cannot move, and a DTC is set.

P3106 00: When the second test pulse is applied during the stator winding 010 open circuit detection, it is detected that a certain amount of current in phase V flows through the phase winding, but when the current in phase U is less than a certain value, phase U is considered to be out of phase and the DTC is set.

P3107 00: The first test pulse is applied during the stator winding 100 open circuit detection, it is detected that a certain amount of current in phase U flows through the phase winding, but when the current in phase V is less than a certain value, phase V is considered to be out of phase and the DTC is set.

P3108 00:

- During the stator winding 100 open circuit detection, the first test pulse is applied, it is detected that a certain amount of current in phase U flows through the phase winding, but when the current in phase W is less than a certain value, phase W is considered to be out of phase and the DTC is set.
- The second test pulse 010 is applied in the second stator winding, it is detected that a certain amount of current in phase V flows through the phase winding, but when the current in phase W is less than a certain value, phase W is considered to be out of phase and the DTC is set.

P3146 00: The external signal amplitude is above the threshold.

P314A 00: The external signal amplitude is above the threshold.

P318A 00: Sinusoidal input differential signal exceeds the threshold (10 times, motor speed greater than 300rpm).

P318B 00: Differential signal of cosine input exceeds the threshold (10 times, motor speed greater than 300rpm).

P318C 00: The sum of sine squares exceeds the threshold. Or the sum of sine squares is lower than the threshold (10 times, motor speed greater than 300rpm).

P318D 00: The fluctuation of sine square sum exceeds the threshold. (10 times, motor speed greater than 300 rpm).

P3197 00: The sampling value of W-phase current AD is greater than/less than the threshold.

P3199 1C: Sinusoidal (HI) high signal is higher/lower than the threshold.

P319A 1C: Sinusoidal (LO) low signal is higher/lower than the threshold.

P319D 00: The sum of squares of sine/cosine differential signals is greater than/lower than the threshold.

Operations of ECU after Failure

P318A, P318B, P314A, P3146, P318C, P3199 and P319A:

- Active short circuit or shutdown.

- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P318D:

- Active short circuit, limp home level 3.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P319D:

- Limp home level 3.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3104, P3105, P3106, P3107 and P3108:

- The DTC is set.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Conditions for Clearing DTCs

P3104, P3105, P3106 and P3107: Check the connection of the converter and the electric motor. If there is no primary DTC, the ignition switch is turned on and off for one cycle.

P318A, P318B, P314A, P3146, P318C and P318D: Check the resolver. If there is no primary DTC, the ignition switch is turned on and off for one cycle.

P3197: Check the current sensor. If there is no primary DTC, the ignition switch is turned on and off for one cycle.

P3199: Check the resolver. If there is no primary DTC, the ignition switch is turned on and off for one cycle.

P319A and P319D: Check the parser. If there is no primary DTC, the ignition switch is turned on and off for one cycle.

Possible Failure Causes and Maintenance Scheme

1. Drive motor failure:
   - Check the exterior of the motor for damage, corrosion, etc.
   - Replace the drive motor assembly.

Reference Circuit Diagram

Data Communication - Power HS CAN.

. High-voltage Power Distribution System.

Diagnostic Test Steps

1. Power off the vehicle, remove the negative cable of the storage battery, release the safety switch, and wait for 5 minutes.
2. Replace the drive motor:

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Insulation detection of drive motor stator coil;
   - Disassemble the drive motor, and remove the harness (high-voltage wire) on the stator winding of the drive motor.
   - Use an insulation detector to measure the insulation of U phase, V phase and W relative to motor shell at 1000V respectively.
   - Use an insulation detector to measure the mutual insulation of three-phase coils (U-phase, V-phase and W-phase) at 1000V.

P3182, P3183, P3184, P3185, P3186, P3187, P3188, P318E, P318F, P3190, P3191, P3194 and P3198

DTC Description

DTC	FTB	Failure Description
P3182	04	Gate Driver Initiation Error
P3183	00	Bus Voltage SPI Data Failure
P3184	00	SPI Data Failure of Driver Chip
P3185	00	Power Chip Failure Warning
P3186	00	Power Chip Failure
P3187	00	SBC Self Check Fault
P3188	00	Shutdown Path Test Fail
P318E	00	Decoding Enable Signal Timeout
P318F	4B	Harmonic suppression function abnormal
P3190	4B	Capacitance over temperature warning
P3191	00	Prefailure Warning
P3194	16	ASW Triger reset Acitvely
P3198	00	Monitor PWM Check Error

Subsystem Principle

A failure occurs inside the drive control unit, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P3182 04: Drive chip initialization fails.

P3183 00: Register address and CRC verification fails.

P3184 00: SPI interruption and frequency failure.

P3185 00:

- Sbc chip is reset for 3 times.
- LDO uC is short to ground for 3 times.
- PreReg is short to ground for 3 times.
- The LDO uC voltage exceeds TBDV for 200ms.
- PreReg is short to ground for 3 times.
- Reference voltage exceeds TBDV for 200ms.
- The Vs1/2 voltage exceeds TBDV for 200ms.
- The bias current on TBDA is 200ms.

P3186 00:

- TBD (value) temperature monitoring for 200ms.
- LDO COM temperature exceeds TBD value for 200ms.
- LDO uC temperature exceeds the TBD value for 200ms.
- Pre-regulate the over-temperature of 200ms TBD value.

P3188 00: Failed to close the path test.

P318E 00: DDER enable signal timeout for more than 1s.

P318F 4B: The amplitude of the 5th/7th/11th/13th harmonic exceeds the threshold.

P3190 4B: Torque after capacitor temperature limit < threshold * external characteristic torque.

P3191 00: Power supply chip self-test error.

P3194 16: ASW actively triggers the reset function.

P3198 00: The sum of the duty ratios of the upper and lower bridge arms in each phase of the calculated PWM signal exceeds the duty ratio; The value of deviation between readback period and instruction period exceeds that of the readback period.

Operations of ECU after Failure

P3182, P3183, P318E and P3198: Standby.

P3185, P3186, P3187, P3188, P318F, P3190, P3191 and P3194: The DTC is set.

Conditions for Clearing DTCs

- The DTC is cleared.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Control unit failure:

- Software failure
- Hardware failure

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Check whether the module software version is the latest:

® Yes, update the system software.

® No, replace the control module.

P319E, P31A0, P31A1, P31A3, P31A5, P31A6, P31A7 and P31A8

DTC Description

DTC	FTB	Failure Description
P319E	00	Monitor Phase Current Update Error
P31A0	00	Monitor Udc High Range
P31A1	00	Monitor Resolver Update Error
P31A3	00	Phase Current Update Error
P31A5	00	Level2 Soft Decoding Enable Timeout Fault
P31A6	00	Resover Deviation Self-learning Timeout Fault
P31A7	11	AC Side Short Circuit Fault
P31A8	00	CPU Load Rate Too High Fault

Subsystem Principle

The AC drive motor has a stator and a rotor, and the stator has three groups of coils, namely U, V and W. These three groups of coils are called phases. In order to accurately control the work of the driving motor, SAC control unit accurately collects the parameters such as the rotation of the drive motor and the voltage and current on each phase coil.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P319E 00: UVW three-phase current data is not updated.

P31A0 00: The detected bus voltage may exceed the threshold.

P31A1 00: The resolver rotation signal value is not updated.

P31A3 00: The detected UVW three-phase current level 1 is not updated.

P31A5 00: The inverter program tracking error exceeds the threshold.

P31A6 00: The self-learning calculation time of fast rotation deviation exceeds the threshold.

P31A7 11: AC side short circuit failure warning.

P31A8 00: The load rate exceeds the threshold.

Operations of ECU after Failure

P31A3 00, P31A7 11 and P31A8 00:

- The DTC is set.
- Limp home level 3.

P31A1 00, P31A5 00 and P31A6 00: Active short circuit.

P31A0 00: Limp home level 3, L1 udc enabled.

P319E 00: Actively shorted or turned off.

Conditions for Clearing DTCs

- History DTCs will be cleared after 40 failure-free power-on/off cycles.
- The failure state is cleared.

Possible Failure Causes and Maintenance Scheme

1. Harness failure:
   - Check/repair the harness connectors and pins.
2. SAC unit failure:
   - Upgrade/replace the control unit.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Harness failure:

   ® Check/repair the SAC unit connecting harness for damage, loose connector, corroded or bent pins, etc.

   ® Normal, go to 2.

2. Replace/upgrade the SAC control unit:

   ® Replace/upgrade the control unit.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Harness connector failure diagnosis test methods:
   - Visually check whether the whole harness of SAC unit has any damage, corrosion, etc.
   - Measure the data bus and sensor signal lines in the harness. Whether there is circuit break and short circuit to other harness.
2. Control unit failure diagnostic test methods:
   - Check the appearance of SAC unit for damage, cracks, water marks, etc.
   - Check whether the connection of SAC unit connectoris is loose or not.
   - When upgrading or replacing the control unit, ensure that the storage battery voltage is above 12.6V.

P31B1, P31B2, P31B3, P31B4, P31B5, P31B6, P31B7 and P31B8

DTC Description

DTC	FTB	Failure Description
P31B1	00	Drive Borad High Side Die2 Status1 Fault
P31B2	00	Drive Borad High Side Die2 Status2 Fault
P31B3	00	Drive Borad Low Side Die2 Status1 Fault
P31B4	00	Drive Borad Low Side Die2 Status2 Fault
P31B5	00	Power Supply Chip Internal Voltage Failure
P31B6	00	Power Chip Output Voltage Failure
P31B7	00	Power Chip Configuration Failure
P31B8	00	CPU Tasks Exectued in Wrong Sequence

Subsystem Principle

A failure occurs inside the IMCU unit, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

P31B1 00:

- The VCC exceeds 5.5V for 200ms.
- CCREG is lower than 4.5V for 200 ms.
- OTSD_IC for 1500 times.
- Desaturation 1500 times.

P31B2 00:

- VGE_FLT 3 times.
- The VREF is lower than 4.5V for 200ms.
- VEE 200ms.

P31B3 00:

- The VCC exceeds 5.5V for 200ms.
- VCCREG is lower than 4.5V for 200 ms.
- OTSD_IC for 1500 times.
- Desaturation 1500 times.

P31B4 00:

- VGE_FLT 3 times.
- The VREF is lower than 4.5V for 200ms.
- VEE 200ms.

P31B5 00:

- The band gap voltage 1/2 exceeds 1500V for 200 ms.
- The pre-regulated voltage is lower than 1500V for 200 ms.

P31B6 00: The power supply device is short to ground, including:

- Footprint 1 is short to ground for 3 times.
- Footprint 2 is short to ground for 3 times.
- LDO COM is short to ground for 3 times.
- The reference voltage is short to ground for 3 times.

P31B7 00: Double-bit error occurred 1500 times in the protected configuration register. The state register should be read to determine which configuration has changed.

P31B8 00: Violation of predefined task sequence lasts for 1500ms.

Operations of ECU after Failure

The DTC is set.

Conditions for Clearing DTCs

- The failure condition is removed.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Internal failure of control unit.

- Upgrade/flash the faulty unit module.
- Replace the faulty unit module.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Control unit failure:

® Replace/flash the control unit.

® The fault is eliminated, the repair is completed.

® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Replace/flash the control unit:

- Check the storage battery voltage and make sure it is above 12.6V.
- Connect the connector of the control unit.
- Remove or turn off the electrical equipment installed on the vehicle.

U0073, U0074, U0075 and U0103

DTC Description

DTC	FTB	Failure Description
U0073	88	Control Module Communication Bus Off on Powertrain High Speed CAN
U0074	88	Safety CAN Bus Off
U0075	88	CAN3 (PTEXNDCAN) bus off
U0103	87	Lost Communication with Gear Shift Control Module (SCU)

Subsystem Principle

IMCU unit communicates with other units via Power, SFTYCAN and PTEXNDCAN networks.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

U0073 88: Powertrain HS CAN bus off.

U0074 88: Safe CAN HS CAN bus off.

U0075 88: Power Extend CAN HS CAN bus off.

U0103 87: The node cannot continuously detect the data from the transmitter within the node transmission time (2s).

Operations of ECU after Failure

Speed is limited, 4WD is disabled, Crp is disabled, SAM is invalid, ASL is disabled.

Conditions for Clearing DTCs

U0073 88:

- The powertrain HS CAN bus returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0074 88:

- The SFTYCAN HS CAN bus returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0075 88:

- The PTEXNDCAN HS CAN bus returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0103 87: When the timeout can be recovered within 20 frame cycles (200ms), DTC state bit 0 (testFailed) will be cleared

Possible Failure Causes and Maintenance Scheme

1. Powertrain HS CAN, SFTYCAN HS CAN, PTEXNDCAN HS CAN harness failure.

   - The harness is damaged, the connector is loose, and the pins in the connector are corroded or bent.
   - Replace/repair the damaged harness, connector and pins.

2. There are damaged control units on the Powertrain HS CAN, SFTYCAN HS CAN, PTEXNDCAN HS CAN bus harnesses.

   - Remove the control units on the powertrain HS CAN one by one. Troubleshoot damaged parts.
   - Remove the control units on SFTYCAN HS CAN one by one. Troubleshoot damaged parts.
   - Remove the control units on the PTEXNDCAN HS CAN one by one. Troubleshoot damaged parts.

Reference Circuit Diagram

- Data Communication - Power HS CAN
- Data Communication - Power HS (Extension) CAN

Diagnostic Test Steps

1. Bus network harness failure:

   ® Check/repair the Powertrain HS CAN, SFTYCAN HS CAN, PTEXNDCAN HS CAN Harnesses. Damaged harness, loose connector, and bent pins.

   ® Normal, go to 2.

2. CAN bus network failure:

   ® Repair/replace the CAN network data bus.

   ® The fault is eliminated, the repair is completed.

   ® The fault is not eliminated, Go to 3.

3. Control unit failure:

   ® Replace/repair the faulty control unit.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. CAN network harness failure:

   - Use a multimeter to detect if there is an open circuit or short circuit in the harness containing network wire.

U1296, U1415, U175F, U1782, U19D6, U1A12 and U1A4E

DTC Description

DTC	FTB	Failure Description
U1296	87	Lost communication with IPD(IECUA)
U1415	81	Invalid data received for IPD/MPD
U175F	87	IPD APA Key Message Missing
U1782	81	Invalid data received for AI Pilot (From IPD/MPD)
U1782	87	IPD(IECUA) Key Message Missing
U19D6	81	Invalid data received from IPD_100ms_PDU03
U1A12	87	the frame of Tester_100ms_PDU01 timeout
U1A4E	81	Invalid data received from ICC_200ms_PDU02 (From ICC In SFTYCAN)

Subsystem Principle

IPD communicates with other units via the CAN bus network.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

U1296 87: The data frame sent from the IPD cannot be received within the given time.

U1415 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U175F 87: If the node cannot detect specific data from the transmitter consecutively in 1s.

U1782 81: If the node cannot detect specific data consecutively in the node transmission time (500ms).

U1782 87: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U19D6 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.)

U1A12 87: If the node cannot detect specific data from the transmitter consecutively in the node transmission time (1000ms).

U1A4E 81: No valid data can be received within 200ms (due to checksum errors or scroll counter errors, etc.).

Operations of ECU after Failure

- SAS is disabled, Cruise is disabled, ACC is disabled, APA is disabled, and NRCD is disabled.
- The DTC is set.

Conditions for Clearing DTCs

U1296 87: The corresponding data frame is received.

U1415 81, U175F 87 and U19D6 81:

- Bit 0 will be cleared immediately when any valid data is received.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U1782 87 and U1782 81: DTC status bit 0 (testFailed) will be cleared when timeout is recovered in 20 cycles (400ms) of the frame.

U1A12 87: When the timeout can be recovered within 20 cycles (2000ms) of the frame, DTC status bit 0 (testFailed) will be cleared

U1A4E 81: Bit 0 will be cleared immediately when any valid data is received.

Possible Failure Causes and Maintenance Scheme

1. CAN network failure:
   - Check/repair the harness and connector of data bus.
   - Replace/repair the faulty data bus harness.

Reference Circuit Diagram

- Data Communication - Body HS CAN
- Data Communication - Body HS (Expansion) CAN
- Data Communication - Power HS CAN
- Data Communication - Power HS (Extension) CAN

Diagnostic Test Steps

1. Data bus failure:

   ® Check/repair the harness, connector and pins of data bus.

   ® Normal, go to 2.

2. Failure related unit:

   ® Upgrade/flash/replace the failure related unit.

   ® The fault is eliminated, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.

Diagnostic Test Methods

1. Visually check the data bus harness for corrosion, damage, etc.
2. Use a multimeter to check if the voltage and resistance of data bus is within the rational range.

U1562, U1563, U2001, U2004, U2018 and U2020

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low
U2001	42	ECU Error - EEPROM Error
U2004	04	Software in inactivate bank is invalid
U2018	00	Power Chip SPI Communication Failure
U2020	47	Power Chip Monitoring Failure

Subsystem Principle

Failure occurs inside the control unit, not involving external circuits.

Conditions for Running DTCs

The vehicle is powered on.

Conditions for Setting DTCs

U1562 17: The power supply voltage is above 16V for 1s.

U1563 16: The power supply voltage is below 9V for 1s.

U2001 42: EEPROM erase, write, and read failure.

U2004 04: SVF in the disabled cylinder set is not 0x01 for more than 2s.

U2018 00:

- Lock/unlock sequence is wrong.
- The chip selection signal is too long.
- The address is incorrect.
- The frame length is wrong.
- The parity check is wrong.

U2020 47: SBC detects a non-recoverable suspended state while the Cpu is running.

Operations of ECU after Failure

- Standby.
- The DTC is set.

Conditions for Clearing DTCs

U1562 17:

- Power supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U1563 16:

- Power supply voltage is 9V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U2001 42, U2004 04, U2018 00 and U2020 47: Failure status is eliminated.

Possible Failure Causes and Maintenance Scheme

1. Possible cause of control unit internal failure (including U2001 42, U2018 00 and U2020 47):
   - The system is subject to interference from an unknown source.
   - There is a large electromagnetic interference in the harness arrangement location.
   - The vehicle is powered on and off for 1 cycle to clear the DTC.
2. Battery voltage is too high:
   - Check the battery voltage.
   - The vehicle is powered on and off for 1 or 2 cycles.
3. Battery voltage is too low:
   - Check the battery voltage.
   - The vehicle is powered on and off for 1 or 2 cycles.

Reference Circuit Diagram

- Data Communication - Power HS CAN
- Data Communication - Power HS (Extension) CAN
- Battery Sensor

Diagnostic Test Steps

1. Control unit internal failure (including U2001, U2018 and U2020):

   ® Check the control unit harness arrangement position for electromagnetic interference.

   ® Normal, go to 2.
2. Cyclic program is executed in the control unit (including U2001, U2018 and U2020):

   ® The vehicle is powered off. Wait for 5 minutes. The vehicle is powered on again.

   ® The fault is eliminated, clear the history DTC, the repair is completed.

   ® This fault is not eliminated, go to TAC Human Assistance.
3. Battery voltage is too high:

   ® Measure the battery voltage.

   ® Normal, go to TAC Human Assistance.
4. Battery voltage is too low:

   ® Measure the battery voltage.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Control unit internal failure (including U2001, U2018 and U2020):
   - The vehicle is powered off. Wait for 5 minutes. The vehicle is powered on again. Read the DTC of the corresponding unit with a scan tool. Clear the DTC.

2. Battery voltage is too high:
   - Use a multimeter to measure if the battery voltage is above 16V.
   - The vehicle is powered off, disconnect the negative battery cable, and measure the battery voltage again.
3. Battery voltage is too low:
   - The vehicle is powered on. Use a multimeter to measure if the battery voltage is above 9V.
   - Measure if the battery charging wire voltage is above 9V.
   - Check the battery charging wire.

Secondary Axle Motor Controller (SAC)

DTC Index

List

DTC	FTB	Description	MIL*	Failure Level*
P0A1B	00	Current Control not Rationally	ON	I
P0A5E	00	Offset of U-phase Current out of Range	ON	IIA
P0A61	00	Offset of V-phase Current out of Range	ON	IIA
P0A64	00	Offset of W-phase Current out of Range	ON	IIA
P0A8E	00	Phase Current Above Limit	ON	I
P1611	51	Immobilizer: No response received	OFF	IIB
P1612	06	Invalid Response Received for Immobilizer	OFF	IIB
P1614	06	Immobilizer: ECU is not programmed	OFF	IIB
P1A11	00	Data Unavailable For SDM	OFF	II
P1B1C	86	Data Unavailable For IBS	OFF	II
P1B1D	86	Data Unavailable For BCM	OFF	II
P1BE0	87	ICC Key Message Missing	OFF	II
P1BE6	87	BMS Module key message missing	OFF	II
P1BFA	00	Data Unavailable For SAS/EPS	OFF	II
P1C23	00	Tracking Error Exceed LOT Threshold	ON	I
P1C2C	00	VDD30 Power Supply Over Voltage	OFF	IIB
P1C2D	00	VDD30 Power Supply Under Voltage	OFF	IIB
P1C3E	00	Angle Self Calibration Angle Rationality Detection	ON	I
P1C3F	00	Offset Angel Status Error	ON	IIA
P1C40	00	Angle Self Calibration Acceleration Timeout	ON	I
P1C44	00	Angle Self Calibration Calculation Timeout	ON	I
P1C50	00	Resolver Error	OFF	III
P1C52	00	Application Layer Level1 Failed to Track Torque Estimate Value and Torque Command Value	ON	IIA
P1C53	00	Absolute Value of Motor Speed Above Max Limit	OFF	III
P1C59	00	IGBT Open Road Unsuccessful	OFF	III
P1C60	04	Power Failure at Bottom Layer not Match Application Layer	ON	IIA
P1C63	00	U-phase Current Value Above Max Limit	ON	I
P1C64	00	U-phase Current Value Below Min Limit	ON	I
P1C66	00	V-phase Current Value Above Max Limit	ON	I
P1C67	00	V-phase Current Value Below Min Limit	ON	I
P1C69	00	W-phase Current Value Above Max Limit	ON	I
P1C6A	00	W-phase Current Value Below Min Limit	ON	I
P1C73	00	Blocked Electric Drive	OFF	IIB
P1C75	00	Stator temperature above high range error	ON	IIA

DTC	FTB	Description	MIL*	Failure Level*
P1C76	00	Stator Temperature below Low Range	ON	IIA
P1C77	00	Inlet Coolant Temperature High Range	OFF	IIB
P1C78	00	Inlet Coolant Temperature Low Range	OFF	IIB
P1C80	00	U-phase IGBT Over Temperature Error	ON	IIA
P1C81	00	U-phase IGBT Temperature Below Min Limit	ON	IIA
P1C82	00	V-phase IGBT Over Temperature Error	ON	IIA
P1C83	00	V-phase IGBT Temperature Below Min Limit	ON	IIA
P1C84	00	W-phase IGBT Over Temperature Error	ON	IIA
P1C85	00	W-phase IGBT Temperature Below Min Limit	ON	IIA
P1C8C	00	Signal Range Check of UDC	ON	I
P1C8D	00	UDC Above Limit	ON	I
P1C8F	00	Active Short Circuit error	OFF	III
P1C98	00	Passive Discharge Timeout	OFF	III
P1C9A	00	d-q Current not Rationally	OFF	IIB
P1CC1	00	Feedback Signal from the Coolant Pump not Received	ON	IIA
P1CC2	00	Coolant Pump PWM Pin Short Circuit to GND	ON	IIA
P1CC3	00	Coolant Pump PWM Pin Short Circuit to Battery	ON	IIA
P1CC4	00	Coolant Pump Power Supply Control Pin Short to GND	OFF	IIB
P1CC5	00	Coolant Pump Dry Run	ON	IIA
P1CC6	00	Coolant Pump is Blocked or Over Current	ON	IIA
P1CC7	00	Coolant Pump Over Temp	ON	IIA
P1CC8	00	Coolant Pump Low Speed	ON	IIA
P1D11	00	U-phase DBC Temp Offset Invalid	ON	IIA
P1D12	00	V-phase DBC Temp Offset Invalid	ON	IIA
P1D13	00	W-phase DBC Temp Offset Invalid	ON	IIA
P1D19	00	U-phase Current not Rational	ON	IIA
P1D1B	00	Three Phase Current Sum is Not Zero	ON	IIA
P1D1C	00	V-phase Current not Rational	ON	IIA
P1D1D	00	W-phase Current not Rational	ON	IIA
P1D25	00	TC389 Self Check Fail After Power On	OFF	III
P1D2C	00	Received State from CAN Out of Range	OFF	IIB
P1D3E	00	Offset Calibration of Offset Angle not Rational	OFF	IIB
P1D41	00	Offset Calibration Negative Acceleration	ON	I
P1D42	00	Automatic Angle Calibration Acceleration Overspeed Fault	ON	I
P1D5C	00	Current Sensor LEM5V_A Amplitude not Rational	OFF	IIB
P1D78	00	Stator Over Temp Error	OFF	IIB

DTC	FTB	Description	MIL*	Failure Level*
P1D79	00	The Junction Temperature Estimated By The Observer Is Greater Than The Threshold Value	OFF	IIB
P1D7A	00	Coolant OverTemp Error(Estimated)	OFF	IIB
P1D92	00	Over Speed While Offset Angle Invalid	OFF	IIB
P1DC0	00	Rotor Angle not Plausible	ON	I
P1DC1	00	Motor Speed not Plausible	ON	I
P1DC2	00	Phase Current out of Range	ON	IIA
P1DC3	00	Motor Operation Mode not Plausible	OFF	III
P1DC4	00	Rolling Counter and Checksum Error	ON	IIA
P1DC5	00	Actual Torque not Plausible	ON	I
P1DCB	00	Monitoring of Torque Comparison Check out of Range	ON	IIA
P1DCC	00	Stationary Damping Control out of Rang	ON	IIA
P1DCD	00	DCDC Voltage not Plausible	ON	IIA
P1DCE	00	Level2 Monitor Shutdown	OFF	III
P1DE1	00	Stator Over Temperature Derating Warning	OFF	III
P1DE3	00	Coolant Over Temperature Derating Warning	OFF	III
P1DE4	00	IGBT/Diode Over Temperature Derating Warning	OFF	III
P1DE5	00	Motor Over Speed Derating Warning	OFF	III
P1DE6	00	DClnk Over Voltage Derating Warning	OFF	III
P1DE7	00	DClnk Under Voltage Derating warning	OFF	III
P1DE9	00	Coolant over Temp Derating Error	OFF	III
P1DEA	00	Stator Over Temperature Derating Error	OFF	III
P1DEC	00	IGBT/Diode Over Temperature Derating Error	OFF	III
P1DED	00	DClnk Over Voltage Derating Error	OFF	III
P1DEE	00	DClnk Under Voltage Derating Error	OFF	III
P1DEF	00	Motor Over Speed Derating Error	OFF	III
P1DF0	00	High Voltage Inter Lock Fault	OFF	IIB
P3103	00	Current Sensor Error	OFF	III
P3104	00	Detection of at Least 2 Open Phase Wires	OFF	III
P3105	00	Process Failure during Execution of Open Phase Wire Test Pulses	OFF	III
P3106	00	Detection of Open Phase Wire U	OFF	III
P3107	00	Detection of Open Phase Wire V	OFF	III
P3108	00	Detection of Open Phase Wire W	OFF	III
P310C	00	CAN Key Frame Lost	ON	IIA
P3126	00	DriveBorad HighSide Die1 Fault	ON	I
P3127	00	DriveBorad HighSide Die2 Status1 Fault	ON	I
P3132	00	Rotor Flux Abnormal	OFF	III

DTC	FTB	Description	MIL*	Failure Level*
P3133	00	Monitor EEPROM Check Error	OFF	III
P313A	19	Software Phase Current Over High Range	ON	I
P3146	00	Resolver Excite Signal Low Range	ON	I
P314A	00	Resolver Excite Signal High Range	ON	I
P3169	00	High Voltage Without Precharge Error	OFF	III
P316A	00	Monitor Resolver Lost Track Error	ON	I
P316D	00	Preact Power Limit Error	OFF	IIB
P3172	00	Monitor Test Shutoff Fail	OFF	III
P3182	04	Gate Driver Initiation Error	OFF	III
P3183	00	Bus Voltage SPI Data Failure	ON	IIA
P3184	00	SPI Data Failure of Driver Chip	ON	IIA
P3185	00	Power Chip Failure Warning	OFF	III
P3186	00	Power Chip Failure	OFF	III
P3187	00	SBC Self Check Fault	OFF	III
P3188	00	Shutdown Path Test Fail	OFF	III
P3189	16	VDD5V Low Range Warning	OFF	III
P3189	17	VDD5V High Range Warning	OFF	III
P318A	00	Resolver Sin Signal High Range	ON	I
P318B	00	Resolver Cos Signal High Range	ON	I
P318C	00	Resolver SinCos Square Sum Out of Range	ON	I
P318D	00	Resolver SinCos Square Sum Fluctuation Error	ON	IIA
P318E	00	Decoding Enable Signal Timeout	ON	I
P318F	4B	Harmonic suppression function abnormal	OFF	III
P3190	4B	Capacitance over temperature warning	OFF	III
P3191	00	Prefailure Warning	OFF	IIB
P3193	16	Monitor VDD5V Low Range Fault	OFF	III
P3193	17	Monitor VDD5V High Range Fault	OFF	III
P3194	16	ASW Triger Reset Acitvely	OFF	III
P3197	00	Monitor Phase W Current High Range	ON	I
P3198	00	Monitor PWM Check Error	ON	I
P3199	1C	Monitor Resolver Sin+ Signal High Range	ON	I
P319A	1C	Monitor Resolver Sin- Signal High Range	ON	I
P319D	00	Monitor Resolver SinCos Square Sum Rationality Check Error	ON	IIA
P319E	00	Monitor Phase Current Update Error	ON	I
P31A0	00	Monitor Udc High Range	ON	IIA
P31A1	00	Monitor Resolver Update Error	ON	I
P31A3	00	Phase Current Update Error	OFF	IIB

DTC	FTB	Description	MIL*	Failure Level*
P31A5	00	Level2 Soft Decoding Enable Timeout Fault	ON	I
P31A6	00	Resover Deviation Self-learning Timeout Fault	ON	I
P31A7	11	AC Side Short Circuit Fault	OFF	III
P31A8	00	CPU Load Rate Too High Fault	OFF	III
P31AD	00	Sensorless Tracking Error	OFF	III
P31AE	00	Sensorless SMO Out of Control	OFF	III
P31B1	00	DriveBorad HighSide Die1 Fault	OFF	III
P31B2	00	DriveBorad HighSide Die2 Status1 Fault	OFF	III
P31B3	00	DriveBorad LowSide Die2 Status1 Fault	OFF	III
P31B4	00	DriveBorad LowSide Die2 Status2 Fault	OFF	III
P31B5	00	Power Supply Chip Internal Voltage Failure	OFF	III
P31B6	00	Power Chip Output Voltage Failure	OFF	III
P31B7	00	Power Chip Configuration Failure	OFF	III
P31B8	00	CPU Tasks Exectued in Wrong Sequence	OFF	III
U0073	88	Control Module Communication Bus Off on Powertrain High Speed CAN	ON	I
U0075	88	PText CAN Bus Off	ON	I
U0110	87	Lost Communication With IMCU	ON	I
U0146	87	Lost Communication with ICC/CCP/GW	OFF	I
U0411	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	ON	II
U0428	81	Steering Angle Signal Invalid	OFF	II
U0595	F1	Invalid data received from IMCU In PTEXTCAN	ON	II
U1111	87	Lost Communication With Battery Management System(BMS)	OFF	I
U1115	87	Lost Communication with Combined Charging Unit(CCU)	OFF	III
U1411	81	Invalid Data Received From BMS	OFF	II
U1562	17	Battery Voltage High	OFF	III
U1563	16	Battery Voltage Low	OFF	III
U16B2	87	IMCU Key Message Missing	ON	II
U16D3	87	IMCU Key Message Missing In PTEXTCAN	ON	II
U1912	87	BMS Key Message Missing In PTEXTCAN	OFF	II
U2001	42	ECU Error - EEPROM Error	OFF	III
U2004	04	Backup Software Failure	OFF	III
U2018	00	SPI Communication Error	OFF	III

DTC	FTB	Description	MIL*	Failure Level*
U2020	47	Power Chip Monitoring Failure	OFF	III

*Remarks:

1. The power system malfunction indicator lamp indicates that the control module detects this DTC is current or in the confirmation state during running.
2. Failure level description:
   - I: Stop the vehicle immediately for repair
   - IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
   - IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time
   - III: Inspection during maintenance
   - IV: Inspection based on actual demand

Diagnosis Information and Procedure

P0A1B

DTC Description

DTC	FTB	Failure Description
P0A1B	00	Current Control not Rationally

Subsystem Principle

Detection of three phase currents and voltages are carried out inside the 2nd shaft drive motor controller (SAC), and an error is calculated after comparing the results to the expected value.

Conditions for Running DTCs

Torque control mode.

Conditions for Setting DTCs

The voltage vector magnitude deviation is greater than 10V or the current vector magnitude deviation is greater than 35A.

Operations of ECU after Failure

- Actively short-circuited or turned off (depending on speed), FIDLog.
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0A5E, P0A61, P0A64, P1C63, P1C64, P1C66, P1C67, P1C69, P1C6A, P1D19, P1D1C, P1D1D, P1D3E, P1D5C and P3197

DTC Description

DTC	FTB	Failure Description
P0A5E	00	Offset of U-phase Current out of Range
P0A61	00	Offset of V-phase Current out of Range
P0A64	00	Offset of W-phase Current out of Range
P1C63	00	U-phase Current Value Above Max Limit
P1C64	00	U-phase Current Value Below Min Limit
P1C66	00	V-phase Current Value Above Max Limit
P1C67	00	V-phase Current Value Below Min Limit
P1C69	00	W-phase Current Value Above Max Limit
P1C6A	00	W-phase Current Value Below Min Limit
P1D19	00	U-phase Current not Rational
P1D1C	00	V-phase Current not Rational
P1D1D	00	W-phase Current not Rational
P1D3E	00	Offset Calibration of Offset Angle not Rational
P1D5C	00	Current Sensor LEM5V_A Amplitude not Rational
P3197	00	Monitor Phase W Current High Range

Subsystem Principle

The 2nd shaft drive motor controller (SAC) is equipped with a U/V/W-phase current self-check feature in it. The motor failure may also interfere with U, V, W phase currents.

Conditions for Running DTCs

P0A5E, P0A61 and P0A64: Initialisation phase.

P1C63, P1C64, P1C66, P1C67, P1C69, P1C6A, P1D3E, P1D5C and P3197: The Start switch is placed in ON position, and continues to enable.

P1D19, P1D1C and P1D1D: The motor speed is between 500 and 4000rpm.

Conditions for Setting DTCs

P0A5E 00: The U-phase current is greater than the threshold during the current sensor calibration.

P0A61 00: The V-phase current calibration value is greater than the threshold during the zero bias calibration of the energized current sensor.

P0A64 00: The W-phase current calibration value is greater than the threshold during the zero bias calibration of the energized current sensor.

P1C63 00: The U-phase current AD sampling value is greater than the threshold.

P1C64 00: The U-phase current AD sampling value is less than the threshold.

P1C66 00: The V-phase current AD sampling value is greater than the threshold.

P1C67 00: The V-phase current AD sampling value is less than the threshold.

P1C69 00: The W-phase current AD sampling value is greater than the threshold.

P1C6A 00: The W-phase current AD sampling value is less than the threshold.

P1D19 00: The difference between the U-phase current magnitude and the other two phase current magnitudes is above the threshold.

P1D1C 00: The difference between the V-phase current magnitude and the other two phase current magnitudes is greater than the threshold.

P1D1D 00: The difference between the W-phase current magnitude and the other two phase current magnitudes is above the threshold.

P1D3E 00: The supply voltage (ground side) of the current sensor is out of range.

P1D5C 00: The supply voltage of the current sensor is out of range.

P3197 00: W-phase current AD sampling value is greater than/less than the threshold.

Operations of ECU after Failure

P0A5E, P0A61, P0A64, P1D19, P1D1C and P1D1D:

- Limp Home Level 3, FIDLog.
- SVS MIL illuminates.

P1C63, P1C64, P1C66, P1C67, P1C69, P1C6A and P3197:

- Actively short-circuited or turned off (depending on speed), FIDLog.
- SVS MIL illuminates.

P1D3E and P1D5C: Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 3.

3. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0A8E, P1C2C, P1C2D, P3126, P3127, P3189, P3193, P31B1, P31B2, P31B3 and P31B4

DTC Description

DTC	FTB	Failure Description
P0A8E	00	Phase Current Above Limit
P1C2C	00	VDD30 Power Supply Over Voltage
P1C2D	00	VDD30 Power Supply Under Voltage
P3126	00	DriveBorad HighSide Die1 Fault
P3127	00	DriveBorad HighSide Die2 Status1 Fault
P3189	16	VDD5V Low Range Warning
P3189	17	VDD5V High Range Warning
P3193	16	Monitor VDD5V Low Range Fault
P3193	17	Monitor VDD5V High Range Fault
P31B1	00	DriveBorad HighSide Die1 Fault
P31B2	00	DriveBorad HighSide Die2 Status1 Fault
P31B3	00	DriveBorad LowSide Die2 Status1 Fault
P31B4	00	DriveBorad LowSide Die2 Status2 Fault

Subsystem Principle

Perform internal failure detection in the 2nd shaft drive motor controller (SAC), and no external circuit is involved.

Conditions for Running DTCs

P0A8E, P1C2C, P1C2D, P3126, P3127, P31B1, P31B2, P31B3 and P31B4: Initialisation is completed.

P3189 and P3193: The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P0A8E 00: The hardware comparison circuit detects that the phase current is greater than or less than the threshold.

P1C2C 00: VDD30 supply voltage is greater than the threshold.

P1C2D 00: VDD30 supply voltage is less than the threshold.

P3126 00: HSD primary side failure.

P3127 00: LSD primary side failure.

P3189 16: Vdd5qt2 undervoltage failure.

P3189 17: Vdd5qt2 overvoltage failure.

P3193 16: VDD5V voltage is less than the threshold.

P3193 17: VDD5V voltage is greater than the threshold.

P31B1 00: HSD secondary side failure Status1.

P31B2 00: HSD secondary side failure Status2.

P31B3 00: LSD secondary side failure Status1.

P31B4 00: LSD secondary side failure Status2.

Operations of ECU after Failure

P0A8E 00:

- Actively short-circuited, FIDLog.
- SVS MIL illuminates.

P1C2C, P1C2D, P3189, P3193, P31B1, P31B2, P31B3 and P31B4: Only DFC is reported.

P3126 and P3127:

- Actively short-circuited.
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1611, P1612 and P1614

DTC Description

DTC	FTB	Failure Description
P1611	51	Immobilizer: No response received
P1612	06	Invalid Response Received for Immobilizer
P1614	06	Immobilizer: ECU is not programmed

Subsystem Principle

Perform internal failure detection in the 2nd shaft drive motor controller (SAC), and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1611 51: Anti-theft response frame is not received.

P1612 06: Incorrect anti-theft response frame is received.

P1614 06: Key is not configured.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1A11, P1B1C, P1B1D, P1BE0, P1BE6, P1BFA, P1D2C, P310C, U0073, U0075, U0110, U0146, U0411, U0428, U0595, U1111, U1115, U1411, U16B2, U16D3 and U1912

DTC Description

DTC	FTB	Failure Description
P1A11	00	Data Unavailable For SDM
P1B1C	86	Data Unavailable For IBS
P1B1D	86	Data Unavailable For BCM
P1BE0	87	ICC Key Message Missing
P1BE6	87	BMS Module key message missing
P1BFA	00	Data Unavailable For SAS/EPS
P1D2C	00	Received State from CAN Out of Range
P310C	00	CAN Key Frame Lost
U0073	88	Control Module Communication Bus Off on Powertrain High Speed CAN
U0075	88	PText CAN Bus Off
U0110	87	Lost Communication With IMCU
U0146	87	Lost Communication with ICC/CCP/GW
U0411	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U0428	81	Steering Angle Signal Invalid
U0595	F1	Invalid data received from IMCU In PTEXTCAN
U1111	87	Lost Communication With Battery Management System(BMS)
U1115	87	Lost Communication with Combined Charging Unit(CCU)
U1411	81	Invalid Data Received From BMS
U16B2	87	IMCU Key Message Missing
U16D3	87	IMCU Key Message Missing In PTEXTCAN
U1912	87	BMS Key Message Missing In PTEXTCAN

Subsystem Principle

The 2nd shaft drive motor controller (SAC) communicates with other control modules via the HS CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1A11 00: The signal sent to SDM via GW is invalid for 200ms.

P1B1C 86: The signal sent to IBS via GW is invalid for 200ms.

P1B1D 86: The signal sent to BCM via GW is invalid for 200ms.

P1BE0 87: The DTC will be set if the specified data frame from the ICC is not received within 500ms.

P1BE6 87 and U1912 87: The DTC will be set if the specified data frame from the BMS is not received within 500ms.

P1BFA 00: The signal sent to SAS via GW is invalid for 200ms.

P1D2C 00: The target working state received by CAN is out of defined range.

P310C 00: IMCU key information frame is lost.

U0073 88 and U0075 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0110 87: The DTC will be set if the specified data frame from the IMCU is not received within 2s.

U0146 87: The DTC will be set if the specified data frame from the ICC is not received within 2s.

U0411 81 and U0595 F1: The specified valid data from the IMCU is not received within 200ms.

U0428 81: The valid data from the SAS is not received within 200ms.

U1111 87: The DTC will be set if the specified data frame from the BMS is not received within 2s.

U1115 87: The DTC will be set if the specified data frame from the CCU is not received within 2s.

U1411 81: The valid data from the BMS is not received within 200ms.

U16B2 87 and U16D3 87: The DTC will be set if the specified data frame from the IMCU is not received within 500ms.

Operations of ECU after Failure

P1A11, P1B1C, P1B1D, P1BE0, P1BE6, P1BFA, U0146, U0428, U1111, U1115, U1411 and U1912: Only DFC is reported.

P1D2C 00: Enter Standby mode.

P310C 00:

- Limp Home Level 1.
- SVS MIL illuminates.

U0075 88 and U16B2 87:

- Only DFC is reported.
- SVS MIL illuminates.

U0073, U0110, U0411, U0595 and U16D3:

- Limp Home.
- SVS MIL illuminates.

Conditions for Clearing DTCs

P1A11 00:

- The signal sent to SDM via GW is valid for 200ms.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

P1B1C 86:

- The signal sent to IBS via GW is valid for 200ms.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

P1B1D 86:

- The signal sent to BCM via GW is valid for 200ms.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

P1BE0, P1BE6, U0110, U0146, U1111, U1115 and U16B2:

- The DTC will be cleared if the corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

P1BFA 00:

- The signal sent to SAS via GW is valid for 200ms.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

P1D2C 00 and P310C 00:

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U0073 88 and U0075 88:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U0411, U0428, U0595, U1411, U16D3 and U1912:

- The DTC will be cleared if any valid data is received within 200ms.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.
3. SDM internal failure (for P1A11 00):
   - Replace/flash the control module.
4. Integrated brake system internal failure (for P1B1C 86):
   - Replace/flash the control module.
5. Body control module internal failure (for P1B1D 86):
   - Replace/flash the control module.
6. Intelligent computing controller (ICC) internal failure (for P1BE0 87 and U0146 87):
   - Replace/flash the control module.
7. High-voltage battery management module internal failure (for P1BE6 87, U1111 87, U1411 87 and U1912 87):
   - Replace/flash the control module.
8. SAS internal failure (for P1BFA 00 and U0428 81):
   - Replace/flash the control module.
9. Intelligent motor control unit (IMCU) internal failure (for U0110 87, U0411 81, U0595 F1, U16B2 87 and U16D3 87):
   - Replace/flash the control module.
10. Combined charging unit internal failure (for U1115 87):
    - Replace/flash the control module.

Reference Circuit Diagram

Power HS CAN Bus and Power HS (Extension) CAN Bus

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the harness and connector of the 2nd shaft drive motor controller - airbag control module/integrated brake system/body control module/intelligent computing controller/high-voltage battery management module/steering angle sensor/intelligent motor control unit/combined charging unit:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C23, P1C50, P3146, P314A, P316A, P318A, P318B, P318C, P318D, P3199, P319A, P319D, P31A1 and P31A6

DTC Description

DTC	FTB	Failure Description
P1C23	00	Tracking Error Exceed LOT Threshold
P1C50	00	Resolver Error
P3146	00	Resolver Excite Signal Low Range
P314A	00	Resolver Excite Signal High Range
P316A	00	Monitor Resolver Lost Track Error
P318A	00	Resolver Sin Signal High Range
P318B	00	Resolver Cos Signal High Range
P318C	00	Resolver SinCos Square Sum Out of Range
P318D	00	Resolver SinCos Square Sum Fluctuation Error
P3199	1C	Monitor Resolver Sin+ Signal High Range
P319A	1C	Monitor Resolver Sin- Signal High Range
P319D	00	Monitor Resolver SinCos Square Sum Rationality Check Error
P31A1	00	Monitor Resolver Update Error
P31A6	00	Resover Deviation Self-learning Timeout Fault

Subsystem Principle

The resolver is a precise angle, position and speed detection device that is connected to the TM motor to obtain signals such as the angle, position, and speed of the motor.

Conditions for Running DTCs

P1C23, P1C50, P3199, P319A, P319D, P31A1 and P31A6: The Start switch is placed in ON position, and continues to enable.

P3146, P314A, P318A, P318B, P318C and P318D: Initialisation is completed.

P316A 00: Soft decode convergence.

Conditions for Setting DTCs

P1C23 00 and P316A 00: Resolver tracking error exceeds the threshold.

P1C50 00: Resolver error occurs.

P3146 00: The resolver excitation signal amplitude is less than the threshold.

P314A 00: The resolver excitation signal amplitude is greater than the threshold.

P318A 00: Resolver Sin differential signal exceeds the threshold (10 times, the motor speed is greater than 300rpm).

P318B 00: Resolver Cos differential signal exceeds the threshold (10 times, the motor speed is greater than 300rpm).

P318C 00: Resolver SinCos quadratic sum is greater than/less than the threshold (10 times, the motor speed is greater than 300 rpm).

P318D 00: Resolver SinCos quadratic sum fluctuation exceeds the threshold (10 times, the motor speed is greater than 300rpm).

P3199 1C: Resolver Sin+ signal is greater than/less than the threshold.

P319A 1C: Resolver Sin- signal is greater than/less than the threshold.

P319D 00: Resolver SinCos quadratic sum differential signal is greater than/less than the threshold.

P31A1 00: Resolver signal value is not updated.

P31A6 00: The calculation time of the resolver deviation self-learning exceeds the threshold.

Operations of ECU after Failure

P1C23 00:

- Actively short-circuited, FID resolver failure.
- SVS MIL illuminates.

P1C50 00: Only DFC is reported.

P3146, P314A, P318A, P318B and P318C:

- Actively short-circuited or turned off (depending on speed), FID resolver failure.
- SVS MIL illuminates.

P316A 00, P31A1 00 and P31A6 00:

- Actively short-circuited.
- SVS MIL illuminates.

P318D 00:

- Limp Home Level 3, FID resolver failure.
- SVS MIL illuminates.

P3199 1C and P319A 1C:

- Actively short-circuited or turned off (depending on speed).
- SVS MIL illuminates.

P319D 00:

- Limp Home Level 3.
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C3E, P1C40, P1C44, P1D41, P1D42 and P1DC0

DTC Description

DTC	FTB	Failure Description
P1C3E	00	Angle Self Calibration Angle Rationality Detection
P1C40	00	Angle Self Calibration Acceleration Timeout
P1C44	00	Angle Self Calibration Calculation Timeout
P1D41	00	Offset Calibration Negative Acceleration
P1D42	00	Automatic Angle Calibration Acceleration Overspeed Fault
P1DC0	00	Rotor Angle not Plausible

Subsystem Principle

The resolver is a precise angle, position and speed detection device that is connected to the TM motor to obtain signals such as the angle, position, and speed of the motor.

Conditions for Running DTCs

P1C3E, P1C40, P1C44, P1D41 and P1D42: Angle calibration phase.

P1DC0 00: The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1C3E 00: The absolute value of the difference between the steering angle self-calibration angle and the preset angle is greater than the threshold.

P1C40 00: The acceleration time of the steering angle self-calibration exceeds the threshold.

P1C44 00: The calculation time of the steering angle self-calibration exceeds the threshold.

P1D41 00: The angle calibration speed is less than the threshold.

P1D42 00: The angle calibration speed exceeds the threshold.

P1DC0 00: The difference between the electrical angles of the rotor stages 1 and 2 exceeds the threshold.

Operations of ECU after Failure

P1C3E 00:

- Actively short-circuited.
- SVS MIL illuminates.

P1C40, P1C44, P1D41, P1D42 and P1DC0:

- Actively short-circuited or turned off (depending on speed).
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C3F, P1C9A and P1D92

DTC Description

DTC	FTB	Failure Description
P1C3F	00	Offset Angel Status Error
P1C9A	00	d-q Current not Rationally
P1D92	00	Over Speed While Offset Angle Invalid

Subsystem Principle

The resolver is a precise angle, position and speed detection device that is connected to the TM motor to obtain signals such as the angle, position, and speed of the motor.

Conditions for Running DTCs

P1C3F 00: Angle calibration phase.

P1C9A 00 and P1D92 00: The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1C3F 00: The internal angular offset value of EEPROM is 0.

P1C9A 00: The absolute value between the current angle and 90 degrees exceeds 15 degrees.

P1D92 00: Rotor speed overspeed failure when rotor angle is invalid.

Operations of ECU after Failure

P1C3F 00:

- Only DFC is reported.
- SVS MIL illuminates.

P1C9A 00 and P1D92 00: Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

P1C52, P1C59, P1C60, P1C8F, P1C98, P1D25, P1DC1, P1DC4, P1DC5, P1DCB, P1DCC, P1DCE, P1DE5, P1DEF, P3103, P3132, P3133, P3169, P316D, P3172, P31A3, P31A5

DTC Description

DTC	FTB	Failure Description
P1C52	00	Application Layer Level1 Failed to Track Torque Estimate Value and Torque Command Value
P1C59	00	IGBT Open Road Unsuccessful
P1C60	04	Power Failure at Bottom Layer not Match Application Layer
P1C8F	00	Active Short Circuit error
P1C98	00	Passive Discharge Timeout
P1D25	00	TC389 Self Check Fail After Power On
P1DC1	00	Motor Speed not Plausible
P1DC4	00	Rolling Counter and Checksum Error
P1DC5	00	Actual Torque not Plausible
P1DCB	00	Monitoring of Torque Comparison Check out of Range
P1DCC	00	Stationary Damping Control out of Rang
P1DCE	00	Level2 Monitor Shutdown
P1DE5	00	Motor Over Speed Derating Warning
P1DEF	00	Motor Over Speed Derating Error
P3103	00	Current Sensor Error
P3132	00	Rotor Flux Abnormal
P3133	00	Monitor EEPROM Check Error
P3169	00	High Voltage Without Precharge Error
P316D	00	Preact Power Limit Error
P3172	00	Monitor Test Shutoff Fail
P31A3	00	Phase Current Update Error
P31A5	00	Level2 Soft Decoding Enable Timeout Fault

Subsystem Principle

Perform internal failure detection in the 2nd shaft drive motor controller (SAC), and no external circuit is involved.

Conditions for Running DTCs

P1C52, P1C59, P1C60, P1C8F, P1C98, P1D25, P1DC4, P1DC5, P1DCB, P1DCC, P1DCE, P1DE5, P1DEF, P3103, P3132, P3169, P316D, P3172, P31A3 and P31A5: The Start switch is placed in ON position, and continues to enable.

P1DC1 00: Soft decode convergence.

P3133 00: The motor controller is in Standby or trqctr or spdctrl status.

Conditions for Setting DTCs

P1C52 00: Compared with the actual torque command, the torque error estimated by the torque formula method is excessive.

P1C59 00: The total stator current is more than 100A when the IGBT is turned off.

P1C60 04: Bottom layer power-on failed, and status of bottom layer is mismatched with that of application layer

P1C8F 00: When actively shorted, ISC_ is less than 50A or ISC_UdcLink is greater than 480V.

P1C98 00: When both the power mode and the main relay are off, the PEB high voltage power is above the threshold.

P1D25 00: TC389 fails in the self-check or SMU monitoring fails after power-on.

P1DC1 00: When the resolver has no failure, the error between speeds of Level1 and Level2 motors multiplied by the number of poles exceeds the phase current and the absolute value is greater than 2000rpm.

P1DC4 00: Counter checksum error.

P1DC5 00: The torque value is in opposite direction and the amplitude is greater than the threshold.

P1DCB 00: The torque monitoring comparison is out of range.

P1DCC 00: Anti-shudder torque reaches 80N.

P1DCE 00: Level 2 monitoring shutoff.

P1DE5 00: Overspeed torque limit warning.

P1DEF 00: Overspeed torque limit failure.

P3103 00: Current relevant variables are greater than the threshold.

P3132 00: Rotor magnetic flux is greater than the threshold.

P3133 00: The verification of EEPROM application layer and monitoring layer are inconsistent.

P3169 00: The change before and after the high voltage power-on is above the threshold (voltage rise by 10V in 1ms).

P316D 00: Advance power limit failure.

P3172 00: Level2 line turn-off test fails.

P31A3 00: It is detected that the UVW-phase current Level1 is not updated.

P31A5 00: Resolver tracking error exceeds the threshold.

Operations of ECU after Failure

P1C52 00:

- Limp Home Level 3, FIDLog.
- SVS MIL illuminates.

P1C59, P1C8F, P1C98, P1D25, P1DCE, P1DE5, P1DEF, P3103, P3132, P3133, P3169 and P3172: Only DFC is reported.

P1C60 04:

- Enter Standby mode.
- SVS MIL illuminates.

P1DC1 00, P1DC5 00 and P1DCB 00:

- Actively short-circuited or turned off (depending on speed).
- SVS MIL illuminates.

P1DC4 00 and P1DCC 00:

- Limp Home Level 1.
- SVS MIL illuminates.

P316D 00 and P31A3 00: Limp Home Level 3.

P31A5 00:

- Actively short-circuited.
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C53, P1C73 and P1DC3

DTC Description

DTC	FTB	Failure Description
P1C53	00	Absolute Value of Motor Speed Above Max Limit
P1C73	00	Blocked Electric Drive
P1DC3	00	Motor Operation Mode not Plausible

Subsystem Principle

The resolver is a precise angle, position and speed detection device that is connected to the TM motor to obtain signals such as the angle, position, and speed of the motor.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1C53 00: The absolute value of motor speed exceeds 15000rpm.

P1C73 00: The torque is greater than 148Nm; the speed is less than 40rpm.

P1DC3 00: Motor operation mode is irrational.

Operations of ECU after Failure

P1C53 00 and P1DC3 00: Only DFC is reported.

P1C73 00: Limp Home Level 4.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 3.

3. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C75, P1C76, P1C80, P1C81, P1C82, P1C83, P1C84, P1C85, P1D11, P1D12, P1D13 and P1D78

DTC Description

DTC	FTB	Failure Description
P1C75	00	Stator temperature above high range error
P1C76	00	Stator Temperature below Low Range
P1C80	00	U-phase IGBT Over Temperature Error
P1C81	00	U-phase IGBT Temperature Below Min Limit
P1C82	00	V-phase IGBT Over Temperature Error
P1C83	00	V-phase IGBT Temperature Below Min Limit
P1C84	00	W-phase IGBT Over Temperature Error
P1C85	00	W-phase IGBT Temperature Below Min Limit
P1D11	00	U-phase DBC Temp Offset Invalid
P1D12	00	V-phase DBC Temp Offset Invalid
P1D13	00	W-phase DBC Temp Offset Invalid
P1D78	00	Stator Over Temp Error

Subsystem Principle

A temperature sensor is provided inside the motor. According to the detected temperature values, the determination of whether to start the cooling system is made.

Conditions for Running DTCs

P1C75 00, P1C76 00 and P1D78 00: The Start switch is placed in ON position, and continues to enable.

P1C80, P1C81, P1C82, P1C83, P1C84, P1C85, P1D11, P1D12 and P1D13: Initialisation is completed.

Conditions for Setting DTCs

P1C75 00: Stator temperature AD sampling value is higher than the threshold.

P1C76 00: Stator temperature AD sampling value is lower than the threshold.

P1C80 00: IGBT U-phase DBC temperature is above the threshold.

P1C81 00: IGBT U-phase DBC temperature is below the threshold.

P1C82 00: IGBT V-phase DBC temperature is above the threshold.

P1C83 00: IGBT V-phase DBC temperature is below the threshold.

P1C84 00: IGBT W-phase DBC temperature is above the threshold.

P1C85 00: IGBT W-phase DBC temperature is below the threshold.

P1D11 00: The absolute value of the difference between the U-phase temperature and the average value of the three-phase temperature is greater than the threshold.

P1D12 00: The absolute value of the difference between the V-phase temperature and the average value of the three-phase temperature is above the threshold.

P1D13 00: The absolute value of the difference between the W-phase temperature and the average value of the three-phase temperature is above the threshold.

P1D78 00: The stator temperature is greater than the threshold.

Operations of ECU after Failure

P1C75, P1C76, P1C80, P1C81, P1C82, P1C83, P1C84, P1C85, P1D11, P1D12 and P1D13:

- Limp Home Level 2, and the FID water pump is turned on.
- SVS MIL illuminates.

P1D78 00: Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Cooling water pipe failure:
   - Replace the cooling water pipe.
3. Drive motor failure:
   - Replace the drive motor.
4. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller and the drive motor connecting pipe:

   ® For cooling water pipe aging, looseness, damage or leakage and other abnormal conditions: Replace the cooling water pipe.

   ® Normal, go to 2.

2. Read the DTC with the scan tool again and confirm whether the cooling system related DTC exists.

® Yes, perform the troubleshooting procedures of other DTCs first.

® No, go to 3.

3. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 5.

5. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1C77, P1C78, P1D79, P1D7A, P1DE3 and P1DE9

DTC Description

DTC	FTB	Failure Description
P1C77	00	Inlet Coolant Temperature High Range
P1C78	00	Inlet Coolant Temperature Low Range
P1D79	00	The Junction Temperature Estimated By The Observer Is Greater Than The Threshold Value
P1D7A	00	Coolant OverTemp Error(Estimated)
P1DE3	00	Coolant Over Temperature Derating Warning
P1DE9	00	Coolant over Temp Derating Error

Subsystem Principle

The 2nd shaft drive motor controller (SAC) monitors the coolant temperature, and it reports the failure when the temperature is too high.

Conditions for Running DTCs

P1C77 00, P1C78 00, P1DE3 00 and P1DE9 00: The Start switch is placed in ON position, and continues to enable.

P1D79 00 and P1D7A 00: Initialisation is completed.

Conditions for Setting DTCs

P1C77 00: Coolant Inlet temperature is higher than the threshold.

P1C78 00: Coolant Inlet temperature is lower than the threshold.

P1D79 00: Observer estimated temperature is higher than the threshold.

P1D7A 00: Coolant temperature is higher than the threshold.

P1DE3 00: Cooling water temperature over temperature torque limit warning.

P1DE9 00: Cooling water temperature over temperature torque limit failure.

Operations of ECU after Failure

P1C77 00 and P1C78 00: Only DFC is reported, and FID water pump is turned on.

P1D79 00 and P1D7A 00: Enter Standby mode.

P1DE3 00 and P1DE9 00: Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Cooling water pipe failure:
   - Replace the cooling water pipe.
3. Front shaft drive motor cooling pump failure:
   - Replace/repair the front shaft drive motor cooling pump.
4. Cooling water pump relay failure:
   - Replace/repair the cooling water pump relay.
5. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

2nd Shaft Motor Controller

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller and the drive motor connecting pipe:

   ® For cooling water pipe aging, looseness, damage or leakage and other abnormal conditions: Replace the cooling water pipe.

   ® Normal, go to 2.

2. Check the harness and connector of the 2nd shaft drive motor controller - front shaft drive motor cooling pump:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the harness and connector of the 2nd shaft drive motor controller - cooling water pump relay:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the front shaft drive motor cooling pump:

   ® For hardware damage and other abnormal conditions: Repair/replace the front shaft drive motor cooling pump.

   ® Normal, go to 5.

5. Check the cooling water pump relay:

   ® For hardware damage and other abnormal conditions: Repair/replace the cooling water pump relay.

   ® Normal, go to 6.

6. Check the 2nd shaft drive motor controller:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

P1C8C, P1C8D, P1DCD and P31A0

DTC Description

DTC	FTB	Failure Description
P1C8C	00	Signal Range Check of UDC
P1C8D	00	UDC Above Limit
P1DCD	00	DCDC Voltage not Plausible
P31A0	00	Monitor Udc High Range

Subsystem Principle

The high-voltage battery pack outputs high-voltage DC power to the drive motor, and the 2nd shaft drive motor controller (SAC) monitors the voltage and current.

Conditions for Running DTCs

P1C8C 00, P1DCD 00 and P31A0 00: The Start switch is placed in ON position, and continues to enable.

P1C8D 00: Initialisation is completed.

Conditions for Setting DTCs

P1C8C 00: It is detected that the bus voltage is above threshold.

P1C8D 00: The hardware comparison circuit detects that the bus voltage is above threshold.

P1DCD 00: The calculation value of high-voltage bus voltage exceeds the threshold of 40V.

P31A0 00: It is detected that the bus voltage is above the threshold.

Operations of ECU after Failure

P1C8C 00 and P1C8D 00:

- Actively short-circuited, FIDLog.
- SVS MIL illuminates.

P1DCD 00 and P31A0 00:

- Limp Home.
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.
4. High-voltage battery pack internal failure:
   - Replace/repair the high-voltage battery pack.

Reference Circuit Diagram

High-voltage Power Distribution System

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the high-voltage harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the high-voltage harness connector.

   ® Normal, go to 3.
3. Check the high-voltage harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.
4. Check the high-voltage harness insulation status of the 2nd shaft drive motor controller - high-voltage battery pack:

   ® Insulation value less than the standard value: replace/repair the HV harness.

   ® Normal, go to 5.
5. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 6.
6. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 7.
7. Check the high-voltage battery pack:

   ® For software mismatch, hardware damage and other abnormal conditions: Replace the high-voltage battery pack.

   ® Normal, go to TAC Human Assistance.

P1CC1, P1CC2, P1CC3, P1CC4, P1CC5, P1CC6, P1CC7 and P1CC8

DTC Description

DTC	FTB	Failure Description
P1CC1	00	Feedback Signal from the Coolant Pump not Received
P1CC2	00	Coolant Pump PWM Pin Short Circuit to GND
P1CC3	00	Coolant Pump PWM Pin Short Circuit to Battery
P1CC4	00	Coolant Pump Power Supply Control Pin Short to GND
P1CC5	00	Coolant Pump Dry Run
P1CC6	00	Coolant Pump is Blocked or Over Current
P1CC7	00	Coolant Pump Over Temp
P1CC8	00	Coolant Pump Low Speed

Subsystem Principle

The 2nd shaft drive motor controller (SAC) controls the operation of cooling water pump according to the coolant temperature.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1CC1 00: Cooling water pump heartbeat signal error.

P1CC2 00: Cooling water pump PWM control pin is short to ground.

P1CC3 00: Cooling water pump PWM control pin is short to battery.

P1CC4 00: Cooling water pump power supply pin is short to ground.

P1CC5 00: The duration of the low cooling water pump PWM signal is equal to 1s.

P1CC6 00: The duration of the low cooling water pump PWM signal is equal to 1.5s.

P1CC7 00: The duration of the low cooling water pump PWM signal is equal to 2s.

P1CC8 00: The duration of the low cooling water pump PWM signal is equal to 2.5s.

Operations of ECU after Failure

P1CC1, P1CC2, P1CC5, P1CC6, P1CC7 and P1CC8:

- Limp Home Level 2, and the FID_ water pump is turned off.
- SVS MIL illuminates.

P1CC3 00:

- Limp Home Level 2, and the FID_ water pump fails to be turned on.
- SVS MIL illuminates.

P1CC4 00: Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Front shaft drive motor cooling pump failure:
   - Replace/repair the front shaft drive motor cooling pump.
3. Cooling water pump relay failure:
   - Replace/repair the cooling water pump relay.
4. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

2nd Shaft Motor Controller

Diagnostic Test Steps

1. Check the harness and connector of the 2nd shaft drive motor controller - front shaft drive motor cooling pump:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the harness and connector of the 2nd shaft drive motor controller - cooling water pump relay:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the front shaft drive motor cooling pump:

   ® For hardware damage and other abnormal conditions: Repair/replace the front shaft drive motor cooling pump.

   ® Normal, go to 4.

4. Check the cooling water pump relay:

   ® For hardware damage and other abnormal conditions: Repair/replace the cooling water pump relay.

   ® Normal, go to 5.

5. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D1B, P1DC2, P313A and P319E

DTC Description

DTC	FTB	Failure Description
P1D1B	00	Three Phase Current Sum is Not Zero
P1DC2	00	Phase Current out of Range
P313A	19	Software Phase Current Over High Range
P319E	00	Monitor Phase Current Update Error

Subsystem Principle

The 2nd shaft drive motor controller (SAC) is equipped with a U/V/W-phase current self-check feature in it. The motor failure may also interfere with U, V, W phase currents.

Conditions for Running DTCs

P1D1B 00, P313A 19 and P319E 00: The Start switch is placed in ON position, and continues to enable.

P1DC2 00: Soft decode convergence.

Conditions for Setting DTCs

P1D1B 00: The sum of the three phase currents is above the threshold.

P1DC2 00: The absolute value of phase current exceeds 70A.

P313A 19: The phase current is above the threshold.

P319E 00: UVW three-phase current data is not updated.

Operations of ECU after Failure

P1D1B 00:

- Limp Home Level 3, FIDLog.
- SVS MIL illuminates.

P1DC2 00:

- Limp Home Level 3.
- SVS MIL illuminates.

P313A 19:

- Actively short-circuited or turned off (depending on speed), FIDLog.
- SVS MIL illuminates.

P319E 00:

- Actively short-circuited or turned off (depending on speed).
- SVS MIL illuminates.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 3.

3. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1DE1, P1DEA, P318F and P3190

DTC Description

DTC	FTB	Failure Description
P1DE1	00	Stator Over Temperature Derating Warning
P1DEA	00	Stator Over Temperature Derating Error
P318F	4B	Harmonic suppression function abnormal
P3190	4B	Capacitance over temperature warning

Subsystem Principle

The motor stator or rotor temperature is too high, and the 2nd shaft drive motor controller (SAC) will limit the motor torque.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1DE1 00: Motor stator temperature over temperature torque limit warning.

P1DEA 00: Motor stator temperature over temperature torque limit failure.

P318F 4B: The amplitude of 5/7/11/13 harmonics is greater than the threshold.

P3190 4B: Torque after the capacitor temperature limit is < Threshold* External Characteristic Torque.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 3.

3. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1DE4 and P1DEC

DTC Description

DTC	FTB	Failure Description
P1DE4	00	IGBT/Diode Over Temperature Derating Warning
P1DEC	00	IGBT/Diode Over Temperature Derating Error

Subsystem Principle

Internal IGBT/Diode temperature of the 2nd shaft drive motor controller (SAC) is too high, and the 2nd shaft drive motor controller will limit the motor torque.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P1DE4 00: IGBT/Diode temperature over temperature torque limit warning.

P1DEC 00: IGBT/Diode over temperature torque limit failure.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1DE6, P1DE7, P1DED and P1DEE

DTC Description

DTC	FTB	Failure Description
P1DE6	00	DClnk Over Voltage Derating Warning
P1DE7	00	DClnk Under Voltage Derating warning
P1DED	00	DClnk Over Voltage Derating Error
P1DEE	00	DClnk Under Voltage Derating Error

Subsystem Principle

The intermediate voltage converted by the DCDC in the 2nd shaft drive motor controller (SAC) is DClink voltage.

Conditions for Running DTCs

The motor controller is in Standby or trqctr or spdctrl status.

Conditions for Setting DTCs

P1DE6 00: DClnk overvoltage torque limit warning.

P1DE7 00: DClnk undervoltage torque limit warning.

P1DED 00: DClnk overvoltage torque limit failure.

P1DEE 00: DClnk undervoltage torque limit failure.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1DF0

DTC Description

DTC	FTB	Failure Description
P1DF0	00	High Voltage Inter Lock Fault

Subsystem Principle

The combined charging unit monitors the HIVIL state, and sends it to the 2nd shaft drive motor controller via CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

The HVIL voltage is out of range.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P3104, P3105, P3106, P3107 and P3108

DTC Description

DTC	FTB	Failure Description
P3104	00	Detection of at Least 2 Open Phase Wires
P3105	00	Process Failure during Execution of Open Phase Wire Test Pulses
P3106	00	Detection of Open Phase Wire U
P3107	00	Detection of Open Phase Wire V
P3108	00	Detection of Open Phase Wire W

Subsystem Principle

The 2nd shaft drive motor controller (SAC) is equipped with a U/V/W-phase current self-check feature in it.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

P3104 00: During stator winding open circuit detection, the current response obtained by applying two test pulses shall be timeout DFC.

P3105 00: The motor is in pulse test mode when in idle timeout waiting zero current state; or the bus voltage drops to below the minimum threshold and is large enough to generate pulse; or when the deviation between the stored rotor angle and the actual angle exceeds the maximum threshold, the rotor cannot move, and the DFC should be reported.

P3106 00: It is detected that the U-phase harness circuit is open.

P3107 00: It is detected that the V-phase harness circuit is open.

P3108 00: It is detected that the W-phase harness circuit is open.

Operations of ECU after Failure

Only DFC is reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Drive motor failure:
   - Replace the drive motor.
3. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harnesses or connectors of the drive motor and the 2nd shaft drive motor controller:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the drive motor:

   ® For hardware damage and other abnormal conditions: Replace the drive motor.

   ® Normal, go to 3.

3. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P3182, P3183, P3184, P3185, P3186, P3187, P3188, P318E, P3191, P3194, P3198, P31A7, P31A8, P31AD, P31AE, P31B5, P31B6, P31B7, P31B8, U2001, U2004, U2018 and U2020

DTC Description

DTC	FTB	Failure Description
P3182	04	Gate Driver Initiation Error
P3183	00	Bus Voltage SPI Data Failure
P3184	00	SPI Data Failure of Driver Chip
P3185	00	Power Chip Failure Warning
P3186	00	Power Chip Failure
P3187	00	SBC Self Check Fault
P3188	00	Shutdown Path Test Fail
P318E	00	Decoding Enable Signal Timeout
P3191	00	Prefailure Warning
P3194	16	ASW Triger Reset Acitvely
P3198	00	Monitor PWM Check Error
P31A7	11	AC Side Short Circuit Fault
P31A8	00	CPU Load Rate Too High Fault
P31AD	00	Sensorless Tracking Error
P31AE	00	Sensorless SMO Out of Control
P31B5	00	Power Supply Chip Internal Voltage Failure
P31B6	00	Power Chip Output Voltage Failure
P31B7	00	Power Chip Configuration Failure
P31B8	00	CPU Tasks Exectued in Wrong Sequence
U2001	42	ECU Error - EEPROM Error
U2004	04	Backup Software Failure
U2018	00	SPI Communication Error
U2020	47	Power Chip Monitoring Failure

Subsystem Principle

Perform internal failure detection in the 2nd shaft drive motor controller (SAC), and no external circuit is involved.

Conditions for Running DTCs

P3182 04, P3183 00, P3184 00 and P3187 00: Initialisation is completed.

P3185, P3186, P3188, P3191, P3194, P3198, P31A7, P31A8, P31AD, P31AE, P31B5, P31B6, P31B7, P31B8, U2001, U2004, U2018 and U2020: The Start switch is placed in ON position, and continues to enable.

P318E 00: Soft decode convergence.

Conditions for Setting DTCs

P3182 04: Drive chip initialisation failure.

P3183 00: Register address and CRC verification failure.

P3184 00: SPI interruption and frequency failure.

P3185 00: Power supply chip hardware failure.

P3186 00: Power supply chip over temperature/overload failure.

P3187 00: Power supply chip self-check error.

P3188 00: Line turn-off test failed.

P318E 00: Soft decode enable signal times out for 1s.

P3191 00: The software is in the Prefailure state.

P3194 16: ASW actively triggers the reset function.

P3198 00: Duty ratio monitoring failure.

P31A7 11: AC side short circuit failure.

P31A8 00: Load rate exceeds the threshold.

P31AD 00: Rotor polarity identification failure.

P31AE 00: Current on ab axis is greater than the threshold.

P31B5 00: Power supply chip internal voltage failure.

P31B6 00: Power supply chip output voltage failure.

P31B7 00: Power supply chip configuration failure.

P31B8 00: Program flow monitoring failure.

U2001 42: EEPROM erase, write, and read failure.

U2004 04: Back-up software failure.

U2018 00: SPI communication failure.

U2020 47: SBC detects a non-recoverable suspended state while the Cpu is running.

Operations of ECU after Failure

P3182, P3185, P3186, P3187, P3188, P3194, P31A7, P31A8, P31AD, P31AE, P31B5, P31B6, P31B7, P31B8, U2001, U2004, U2018 and U2020: Only DFC is reported.

P3183 00 and P3184 00:

- Enter Standby mode.
- SVS MIL illuminates.

P3198 00:

- Actively short-circuited.
- SVS MIL illuminates.

P318E 00:

- Actively short-circuited, FID resolver failure.
- SVS MIL illuminates.

P3191 00: Only DFC and FIDLog are reported.

Conditions for Clearing DTCs

- The DTC will be cleared when the conditions for setting DTCs are not present.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the 2nd shaft drive motor controller harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The 2nd shaft drive motor controller (SAC) monitors the system supply voltage, to check whether the module supply voltage is in the normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position, and continues to enable.

Conditions for Setting DTCs

U1562 17: The supply voltage is greater than 16V for 1s.

U1563 16: The supply voltage is less than 9V for 1s.

Operations of ECU after Failure

U1562 17: Only DFC is reported.

U1563 16: Enter Standby mode.

Conditions for Clearing DTCs

U1562 17:

- The power supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U1563 16:

- The power supply voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Harness or connector failures:
   - Replace/repair the harness or connector.
3. Battery cable failure:
   - Replace/repair the battery cable.
4. 2nd shaft drive motor controller internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

2nd Shaft Motor Controller

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the 2nd shaft drive motor controller harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the 2nd shaft drive motor controller:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Front Detection Radar (FDR)

DTC Index

List

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B19AC	00	Drive Assit System Perception and Decision Model Calculation Fault	III
B19C7	04	Front Detection Radar (FDR) Internal Faults	III
B19C8	97	Front Detection Radar (FDR) Blind	III
B19C9	78	Front Detection Radar (FDR) Misaligned	III
B19CA	54	Front Detection Radar (FDR) Alignment Never Done Or Not Done	III
U0073	88	CAN Bus Off	III
U0074	88	Control Module Communication Bus Off on SubCAN	III
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)	III
U0300	51	Internal Control Module Software Incompatibility	III
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)	III
U0417	81	Invalid Data Received from Electric Parking Brake (EPB) Module/Integrated Brake System (IBS)	III
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)	III
U0422	81	Invalid Data Received from Body Control Module (BCM)	III
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)	III
U0428	81	Invalid Steering Wheel Angle Data Received	III
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)	III
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	III
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)	III
U0594	81	Invalid Data Received from Vehicle Control Unit (HCU/VCU)	III
U1021	87	Lost Communication with Right Hand Rear Drive Assist Module (RHRDA)	III
U1264	87	Lost Communication with Front View Camera Module (FVCM)	III
U130A	81	Invalid Data Received from Front View Camera Module (FVCM)	III
U1321	81	Invalid Data Received from Right Hand Rear Drive Assist Module (RHRDA)	III
U1415	81	Invalid Data Received from Driver Monitor System (DMS)	III
U1416	81	Invalid Data Received from Hands Off Detection (HOD)	III
U1417	81	Invalid Data Received from Steering Wheel Switch (SWS)	III
U1562	17	Battery Voltage High	III
U1563	16	Battery Voltage Low	III
U2000	04	ECU Hardware Error	III
U2003	04	ECU Error-Software Error	III

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B19AB

DTC Description

DTC	FTB	DTC Description
B19AB	00	Production Mode Is Not Switched off

Subsystem Principle

Under normal circumstances, the system will report error if entering the production line mode, and meanwhile limit the related functions.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

Production Line Mode Activated

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- The production line mode is off.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Radar internal failure.
   - Flash/replace the radar module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the radar harness and connector:

   ® For connector looseness, Pin deformation/breakage, radar power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the radar:

   ® Confirm whether the production line mode can be off, whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B19AC

DTC Description

DTC	FTB	DTC Description
B19AC	00	Drive Assit System Perception and Decision Model Calculation Fault

Subsystem Principle

The forward detection radar (FDR) communicates with other modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

It is detected that the detection information of sensor is inconsistent with the preset vehicle information.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- All the data returns to confidence range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Improper radar installation.
   - The radar is fitted correctly.
3. Radar internal failure.
   - Replace/flash the radar.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps:

1. Check if the mounting position of radar is correct, and check the harness and connector for wear or corrosion, etc.

   ® For abnormal radar mounting position, harness and connector: Repair/replace the harness or connector, and adjust the radar position.

   ® Normal, go to 2.

2. Clear the DTC, check the vehicle again, and confirm the vehicle status:

   ® Abnormal, go to 3.

   ® Normal, diagnosis is completed.

3. Check the radar harness and connector:

   ® For connector looseness, Pin deformation/breakage, slave control radar harness conductivity failure, radar power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the radar:

   ® Confirm whether the radar function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Learn and programme the radar, confirm whether the failure is eliminated; if the DTC is reset, replace the radar.

   ® Normal, go to TAC Human Assistance.

B19C7

DTC Description

DTC	FTB	DTC Description
B19C7	04	Front Detection Radar (FDR) Internal Faults

Subsystem Principle

Failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

- Internal Hardware Failure
- Flash Failure
- RAM Failure
- Internal Communication Failure
- The temperature of the internal component is abnormal.

Operations of ECU after Failure

Initialise the CAN bus transceiver.

Conditions for Clearing DTCs

During next power-on/power-off cycle, the failure disappears.

Possible Failure Causes and Maintenance Scheme

1. Forward detection radar failure.

   • Flash the software/replace the control module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the FDR software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the FDR module:

   ® Abnormal, replace the FDR module;

   ® Normal, go to TAC Human Assistance.

B19C8

DTC Description

DTC	FTB	DTC Description
B19C8	97	Front Detection Radar (FDR) Blind

Subsystem Principle

The forward detection radar (FDR) is used to detect the traffic condition on the road ahead, which can identify distant vehicles, obstacles,pedestrians, etc.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

External shielding affects the radar sensor, such as: snow coverage, obstacle blockage.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- Remove the obstacles, and you can detect the target.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The FDR is not clean or its mounting position is inaccurate.
   - Clean/adjust the mounting position.
2. Forward detection radar failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check and confirm whether the following conditions exist:
   - The FDR is not clean or its mounting position is inaccurate.

     ® Yes, clean the FDR/adjust the mounting position;

     ® No, perform the next step.
2. Check the FDR software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.
3. Check the FDR module:

   ® Abnormal, replace the FDR module;

   ® Normal, go to TAC Human Assistance.

B19C9 and B19CA

DTC Description

DTC	FTB	DTC Description
B19C9	78	Front Detection Radar (FDR) Misaligned
B19CA	54	Front Detection Radar (FDR) Alignment Never Done Or Not Done

Subsystem Principle

The forward detection radar (FDR) realizes the driver assistance system functions and needs to be calibrated and learned after the replacement of the controller or after the controller's location has been affected.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B19C9: The module detects a calibration error, which exceeds the specified range (beyond ±3°).

B19CA: The FDR is not calibrated or calibration is not completed or fails.

Operations of ECU after Failure

Disable all functions.

Conditions for Clearing DTCs

B19C9:

- The module detects that the calibration is completed successfully (±3).
- History DTCs will be cleared after 40 power-on and power-off cycles.

B19CA:

- During the same ignition cycle, it is detected that the FDR calibration is completed successfully.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Improper radar installation.
   - Re-install it properly.
2. Forward detection radar (FDR) not calibrated or calibration not completed or calibration error.
   - Recalibrate it.
3. Forward detection radar failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the radar for proper installation.

   ® Abnormal, refit it properly.

   ® Normal, go to 2.

2. Check the FDR software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FDR module:

   ® Abnormal, replace the FDR module;

   ® Normal, go to TAC Human Assistance.

U0073, U0146 and U0447

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)

Subsystem Principle

The forward detection radar (FDR) communicates with other control modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

U0073 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U0146 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0073 88.

U0447 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U0146 87.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame sent from the GW module cannot be received within 2s.

U0447 81: The DTC will be set if invalid data is received from the GW module for 3 consecutive working cycles.

Operations of ECU after Failure

U0073 88:

- Initialise the CAN transceiver.
- Relevant system functions are invalid.

U0146 87 and U0447 81: Relevant system functions are invalid.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0146 87:

- The specified data frame sent from the module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0447 81:

- All related signal values are within the range, and are valid within 1 cycle.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the FDR and GW software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the FDR and GW module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U0074, U1264 and U130A

DTC Description

DTC	FTB	DTC Description
U0074	88	Control Module Communication Bus Off on SubCAN
U1264	87	Lost Communication with Front View Camera Module (FVCM)
U130A	81	Invalid Data Received from Front View Camera Module (FVCM)

Subsystem Principle

The forward detection radar (FDR) communicates with the front view camera module (FVCM) via a group of private CAN buses.

Conditions for Running DTCs

U0074 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U1264 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0074 88.

U130A 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0074 88 and U1264 87.

Conditions for Setting DTCs

U0074 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U1264 87: The DTC will be set if the specified data frame sent from the FVCM cannot be received within 2s.

U130A 81: The DTC will be set if invalid data is received from the FVCM for 3 consecutive cycles.

Operations of ECU after Failure

U0074 88:

- Initialise the CAN transceiver.
- All related functions are invalid.

U1264 87 and U130A 81: Relevant system functions are invalid.

Conditions for Clearing DTCs

U0074 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1264 87:

- The specified data frame sent from the corresponding module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U130A 81:

- All related signal values are within the range, and are valid within 1 cycle.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the FVCM and FDR software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FVCM and FDR module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U0416, U0417, U0420, U0422, U0423, U0428, U0452, U0546, U0594, U1415, U1416 and U1417

DTC Description

DTC	FTB	DTC Description
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
U0417	81	Invalid Data Received from Electric Parking Brake(EPB) Module / Integrated Brake System (IBS)
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)
U0422	81	Invalid Data Received from Body Control Module (BCM)
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)
U0428	81	Invalid Steering Wheel Angle Data Received
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)
U0594	81	Invalid Data Received from Vehicle Control Unit (HCU/VCU)
U1415	81	Invalid Data Received from Driver Monitor System (DMS)
U1416	81	Invalid Data Received from Hands Off Detection (HOD)
U1417	81	Invalid Data Received from Steering Wheel Switch (SWS)

Subsystem Principle

The forward detection radar (FDR) communicates with other modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U0146 87.

Conditions for Setting DTCs

The DTC will be set if invalid data of corresponding module is received for 3 consecutive cycles.

Operations of ECU after Failure

U0416, U0417, U0420, U0422, U0428, U0452, U0594, U1415, U1416 and U1417: Related system functions are invalid.

U0423 and U0546: No function influence, only DTC is stored.

Conditions for Clearing DTCs

- All related signal values are within the range, and are valid within 1 cycle.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The related module power supply fuse is faulty.
   - Replace the corresponding fuse.
2. Related circuits failure.
   - Replace/repair the related harness.
3. Connector failure or poor fit.
   - Replace/repair the harness connector.
4. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the module software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the related module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1021 and U1321

DTC Description

DTC	FTB	DTC Description
U1021	87	Lost Communication with Right Hand Rear Drive Assist Module (RHRDA)
U1321	81	Invalid Data Received from Right Hand Rear Drive Assist Module (RHRDA)

Subsystem Principle

The forward detection radar (FDR) communicates with the right rear distant object detection module (RHRDA) via the CAN bus.

Conditions for Running DTCs

U1021 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0073 88.

U1321 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U1021 87.

Conditions for Setting DTCs

U1021 87: The DTC will be set if the specified data frame sent from the RHRDA cannot be received within 2s.

U1321 81: The DTC will be set if invalid data frame sent from the RHRDA is received for 3 consecutive cycles.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

U1021 87:

- The specified data frame sent from the RHRDA can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1321 81:

- All related signal values are within the range, and are valid within 1 cycle.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The related module power supply fuse is faulty.
   - Replace the corresponding fuse.
2. Related circuits failure.
   - Replace/repair the related harness.
3. Connector failure or poor fit.
   - Replace/repair the harness connector.
4. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the FDR and RHRDA software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the FDR and RHRDA module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The forward detection radar (FDR) monitors the 12V supply voltage; if the monitored voltage exceeds the specified range, trigger and record the DTC.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: It is detected that the battery voltage is greater than 16V for 1s.

U1563 16: It is detected that the battery voltage is less than 9V for 1s.

Operations of ECU after Failure

Disable the fault diagnosis function.

Conditions for Clearing DTCs

U1562 17:

- It is detected that the battery voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1563 16:

- It is detected that the battery voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Battery aging/damage.
   - Replace the battery.
4. High/low voltage conversion system failure.
   - Check/repair the related components.
5. Forward detection radar failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the battery:

   ® Confirm whether the battery function is normal, and whether there are battery aging, damage, deformation, liquid leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® Confirm whether the battery cable function is normal, and whether there are looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2000, U2003 and U0300

DTC Description

DTC	FTB	DTC Description
U2000	04	ECU Hardware Error
U2003	04	ECU Error-Software Error
U0300	51	Internal Control Module Software Incompatibility

Subsystem Principle

Failure occurs inside the radar, and no external circuit is involved.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

U2000 04: ECU hardware failure, such as: RAM failure, ROM failure, EEPROM failure, internal self-test failure, etc.

U2003 04: ECU software failure, such as: EEPROM error, vehicle configuration not programmed, not learned or calibrated, etc.

U0300 51: It is detected that the calibration, data group, CUDA software documents are empty or mismatched.

Operations of ECU after Failure

All system functions are invalid.

Conditions for Clearing DTCs

U2000 04 and U2003 04:

- During next ignition cycle, the detection system has no related failure.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0300 51:

- Calibration, data group, CUDA software document status is normal.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Radar internal failure.

   ® Replace/repair the radar.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps:

1. Check the radar harness and connector:

   ® For connector looseness, Pin deformation/breakage, radar power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the radar:

   ® Confirm whether the radar function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the radar.

   ® Normal, go to TAC Human Assistance.

Front View Camera Module (FVCM)

DTC Index

List

DTC	FTB	Description	Failure Level*
B1962	97	Front View Camera Module (FVCM) Camera View Blocked	III
B1963	46	Front View Camera Module (FVCM) Calibration Failure	III
B1977	57	Front View Camera Module (FVCM) Software Mismatch	III
B197A	09	Front View Camera Module (FVCM) Temperature out of Range	III
B197B	96	Front View Camera Module (FVCM) Internal Temporary Fault	III
B197C	96	Front View Camera Module (FVCM) Internal Permanent Fault	III
U0073	88	CAN Bus Off	III
U0074	88	Control Module Communication Bus Off on SubCAN	III
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)	III
U0416	81	Invalid Data Received from Stability Control System (SCS)/Integrated Brake System(IBS)	III
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)	III
U0422	81	Invalid Data Received from Body Control Module (BCM)	III
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)	III
U0428	81	Invalid Steering Wheel Angle Data Received	III
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)	III
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	III
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)	III
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)	III
U1021	87	Lost Communication with Right Hand Rear Drive Assist Module (RHRDA)	III
U1265	87	Lost Communication with Front Detection Radar (FDR)	III
U130B	81	Invalid Data Received from Front Detection Radar (FDR)	III
U1321	81	Invalid Data Received from Right Hand Rear Drive Assist Module (RHRDA)	III
U1562	17	Battery Voltage High	III
U1563	16	Battery Voltage Low	III
U2200	01	Ethernet BR Cable Fault	III
U2230	00	Ethernet PHY Unnormal Link-down Fault	III
U2262	00	Lost Ethernet Communication with Gateway (GW) / Connected Computation Platform (CCP) /Intelligent Computation Center (ICC)	III

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B1962

DTC Description

DTC	FTB	DTC Description
B1962	97	Front View Camera Module (FVCM) Camera View Blocked

Subsystem Principle

The front view camera is turned on when the switch is enabled, the image sensor completes the photovoltaic conversion of the optical signal collected by the lens to the electrical signal and the image processing and information acquisition in the image processing chip. When certain conditions are met, the sensor will send request signals to other ECUs via the CAN network to execute relevant operations such as alarm reminder or vehicle control.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

Foreign objects (tree leaves, ice, snow, etc.) in front of windscreen ; the DTC will be set 1800s after it is detected that the image signal is lost.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

The DTC will be cleared 45s after image signal is detected.

History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Dirty windscreen.
   - Clean the windscreen.
2. Foreign objects in front of front view camera.
   - Remove the foreign objects.
3. Front view camera module failure.
   - Flash/replace the FVCM:

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check if the windscreen is dirty:

   ® Yes, clean the windscreen;

   ® No, go to 2.

2. Check for foreign objects in front of front view camera:

   ® Yes, remove the foreign objects;

   ® No, go to 3.

3. Check the FVCM software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the FVCM:

   ® Abnormal, replace the FVCM;

   ® Normal, go to TAC Human Assistance.

B1963

DTC Description

DTC	FTB	DTC Description
B1963	46	Front View Camera Module (FVCM) Calibration Failure

Subsystem Principle

After the front view camera module (FVCM) is replaced, it can be normally used after being calibrated.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

- The camera calibration position is out of range/not calibrated.
- During initialisation calibration, the target calibration failed or it fails to complete the automatic calibration of reference point within the specified time (10min).
- Calibration data is missed when ECU detects startup.

Operations of ECU after Failure

- Relevant system functions are off.

Conditions for Clearing DTCs

- The calibration is successful, and the camera calibration position is within rational range.
- When the system detects a new calibration attempt.
- During next ignition cycle and startup, calibration data can be detected.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The front view camera module is not calibrated.

   • The front view camera module is calibrated.

2. Front view camera module failure.

   • Flash/replace the FVCM:

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check and confirm if the mounting position of FVCM is incorrect:

   ® Yes, adjust the mounting position;

   ® No, go to 2.

2. Check the FVCM software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FVCM:

   ® Abnormal, replace the FVCM;

   ® Normal, go to TAC Human Assistance.

B1977

DTC Description

DTC	FTB	DTC Description
B1977	57	Front View Camera Module (FVCM) Software Mismatch

Subsystem Principle

Failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The module detects related incorrect data at startup.

Operations of ECU after Failure

- Relevant system functions are off.

Conditions for Clearing DTCs

- During next ignition cycle, related incorrect data is not detected.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The FVCM is not calibrated/software is not flashed.

   • The FVCM is calibrated/software version is flashed.

2. Front view camera module failure.

   • Flash/replace the FVCM:

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the FVCM software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the FVCM:

   ® Abnormal, replace the FVCM;

   ® Normal, go to TAC Human Assistance.

B197A, B197B and B197C

DTC Description

DTC	FTB	DTC Description
B197A	09	Front View Camera Module (FVCM) Temperature out of Range
B197B	96	Front View Camera Module (FVCM) Internal Temporary Fault
B197C	96	Front View Camera Module (FVCM) Internal Permanent Fault

Subsystem Principle

The front view camera generally consists of the camera lens, PCB assembly, housing, rear cover, label, bracket and so on. The image sensor completes the photovoltaic conversion of the optical signal collected by the lens to the electrical signal and the image processing and information acquisition in the image processing chip. When certain conditions are met, the sensor will send request signals to other ECUs via the CAN network to execute relevant operations such as alarm reminder or vehicle control.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B197A 09:

- The system temperature is too high (over 100℃) for 2s.
- The imager temperature is out of range (-49 ~ 108℃) for 150ms.

B197B 96: It is detected that the failure exists inside the FVCM or related device (monitoring during cycle/monitoring at startup).

B197C 96: It is detected that permanent failure exists inside the FVCM.

Operations of ECU after Failure

- Relevant system functions are invalid.

Conditions for Clearing DTCs

B197A 09: It is detected that the module internal temperature returns to normal range (lower than 86℃ for 2s), and for imager (lasts for 30ms).

B197B 96: Temporary failure is not detected inside the module or related device.

B197C 96: Permanent failure is not detected inside the FVCM during next ignition cycle.

Possible Failure Causes and Maintenance Scheme

1. The temperature of the FVCM is too high.
   - Wait for the FVCM to cool down.
2. Front view camera module failure.
   - Flash/replace the FVCM:

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the FVCM temperature:

   ® Abnormal, wait until the module cools down to normal range;

   ® Normal, go to 2;

2. Check the FVCM software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FVCM:

   ® Abnormal, replace the FVCM;

   ® Normal, go to TAC Human Assistance.

U0073, U0146 and U0447

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)

Subsystem Principle

The front view camera module (FVCM) communicates with the gateway module (GW) via the CAN bus.

Conditions for Running DTCs

U0073 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U0146 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0073 88.

U0447 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U0146 87.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame sent from the GW module cannot be received within 2s.

U0447 81: The DTC will be set if invalid data is received from the GW module for 3 consecutive working cycles.

Operations of ECU after Failure

U0073 88:

- Initialise the CAN transceiver.
- Relevant system functions are invalid.

U0146 87 and U0447 81: System related functions are invalid.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0146 87:

- The specified data frame sent from the module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0447 81:

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the FVCM and GW software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the FVCM and GW module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U0074, U1265 and U130B

DTC Description

DTC	FTB	DTC Description
U0074	88	Control Module Communication Bus Off on SubCAN
U1265	87	Lost Communication with Front Detection Radar (FDR)
U130B	81	Invalid Data Received from Front Detection Radar (FDR)

Subsystem Principle

The front view camera module (FVCM) communicates with the forward detection radar (FDR) via a group of private CAN buses.

Conditions for Running DTCs

U0074 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U1265 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0074 88.

U130B 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0074 88 and U1265 87.

Conditions for Setting DTCs

U0074 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U1265 87: The DTC will be set if the specified data frame sent from the FDR module cannot be received within 2s.

U130B 81: The DTC will be set if invalid data is received from the FDR module for 3 consecutive cycles.

Operations of ECU after Failure

U0074 88:

- Initialise the CAN transceiver.
- All related functions are invalid.

U1265 87 and U130B 81: All related functions are invalid.

Conditions for Clearing DTCs

U0074 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1265 87:

- The specified data frame sent from the corresponding module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U130B 81:

- All related signal values are within the range, and are valid within 1 cycle.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the FVCM and FDR software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FVCM and FDR module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U0416, U0420, U0422, U0423, U0428, U0452, U0546 and U0594

DTC Description

DTC	FTB	DTC Description
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)
U0422	81	Invalid Data Received from Body Control Module (BCM)
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)
U0428	81	Invalid Steering Wheel Angle Data Received
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)

Subsystem Principle

The front view camera module (FVCM) communicates with the other modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0146 87.

Conditions for Setting DTCs

The DTC will be set if invalid data of corresponding module is received for 3 consecutive cycles.

Operations of ECU after Failure

U0416, U0420, U0422, U0428, U0452 and U0594: Related system functions are invalid.

U0423 and U0546: No function influence, only DTC is stored.

Conditions for Clearing DTCs

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The related module power supply fuse is faulty.
   - Replace the corresponding fuse.
2. Related circuits failure.
   - Replace/repair the related harness.
3. Connector failure or poor fit.
   - Replace/repair the harness connector.
4. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the module software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the related module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1021 and U1321

DTC Description

DTC	FTB	DTC Description
U1021	87	Lost Communication with Right Hand Rear Drive Assist Module (RHRDA)
U1321	81	Invalid Data Received from Right Hand Rear Drive Assist Module (RHRDA)

Subsystem Principle

The front view camera module (FVCM) communicates with the Right Hand Rear Drive Assist Module (RHRDA) via the CAN bus.

Conditions for Running DTCs

U1021 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0073 88.

U1321 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U1021 87.

Conditions for Setting DTCs

U1021 87: The DTC will be set if the specified data frame sent from the Right Hand Rear Drive Assist Module cannot be received within 2s.

U1321 81: The DTC will be set if invalid data sent from the Right Hand Rear Drive Assist Module is received for 3 consecutive cycles.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

U102 87:

- The specified data frame sent from the Right Hand Rear Drive Assist Module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1321 81:

- The valid data frame sent from the Right Hand Rear Drive Assist Module is received.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the FVCM and RHRDA software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the FVCM and RHRDA module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The front view camera module (FVCM) monitors the 12V supply voltage; if the monitored voltage exceeds the specified range, trigger and record the DTC.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: It is detected that the battery voltage is greater than 16V for 1s.

U1563 16: It is detected that the battery voltage is less than 9V for 1s.

Operations of ECU after Failure

Disable the fault diagnosis function.

Conditions for Clearing DTCs

U1562 17:

- It is detected that the battery voltage returns to less than 15.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1563 16:

- It is detected that the battery voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Battery aging/damage.
   - Replace the battery.
4. High/low voltage conversion system failure.
   - Check/repair the related components.
5. Front view camera module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

Driving Assistance System

Diagnostic Test Steps

1. Check the battery:

   ® Confirm whether the battery function is normal, and whether there are battery aging, damage, deformation, liquid leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® Confirm whether the battery cable function is normal, and whether there are looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2200, U2230 and U2262

DTC Description

DTC	FTB	DTC Description
U2200	01	Ethernet BR Cable Fault
U2230	00	Ethernet PHY Unnormal Link-down Fault
U2262	00	Lost Ethernet Communication with Gateway (GW) / Connected Computation Platform (CCP) /Intelligent Computation Center (ICC)

Subsystem Principle

The front view camera module (FVCM) communicates with the Gateway (GW) / Connected Computation Platform (CCP) /Intelligent Computation Center (ICC) via the Ethernet.

Conditions for Running DTCs

U2200 01 and U2230 00:

- The Start switch is placed in ON position.
- The system voltage is normal.
- 1s after communication is enabled.

U2262 00:

- The system voltage is normal.
- The start switch is in "ON" position.
- CAN network management status is in network mode/normal state.
- Cable diagnosis function is not enabled.

Conditions for Setting DTCs

U2200 01: The DTC will be set if the cables are open, short to each other, short to battery or ground for 2s.

U2230 00 and U2262 00: After ECU enters the activated state, the DTC will be set if the Ethernet PHY is in link-off state for more than 500ms.

Operations of ECU after Failure

U2262 00: Relevant system functions are invalid.

U2200 01 and U2230 00: Remote detection function is invalid.

Conditions for Clearing DTCs

U2200 01:

- Cable returns to normal, which lasts for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U2230 00 and U2262 00:

- The Ethernet PHY is in link state, which returns to normal for 500ms.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Ethernet

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the FVCM and GW /CCP /ICC software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the FVCM and GW /CCP /ICC module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

Left Hand Rear Drive Assist Module (LHRDA)

DTC Index

List

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B19B0	87	Lost Communication With Slave ECU	III
B19B1	00	Calibration Number Not Match	III
U0073	88	CAN Bus Off	III
U0074	88	Control Module Communication Bus Off on Private CAN	III
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)	III
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)	III
U0417	81	Invalid Data Received from Electric Parking Brake (EPB) Module / Integrated Brake System (IBS)	III
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)	III
U0422	81	Invalid Data Received from Body Control Module (BCM)	III
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)	III
U0428	81	Invalid Steering Wheel Angle Data Received	III
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)	III
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	III
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)	III
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)	III
U1562	17	Battery Voltage High	III
U1563	16	Battery Voltage Low	III
U2000	04	ECU Hardware Error	III
U2003	04	ECU Error-Software Error	III

*Remarks:
Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B19A2, B19A3, B19AC and B19B1

DTC Description

DTC	FTB	DTC Description
B19A2	05	Sensor Misaligned
B19A3	54	Radar Alignment Never Done Or Not Done
B19AC	00	Vehicle Information Mismatch
B19B1	00	Calibration Number Not Match

Subsystem Principle

The main function of Rearward Driver Assistance System (RDA) is to clear the blind spot in the rearview mirror. It detects the area on both sides of the vehicle through the left rear distant object detection module (LHRDA) and the right rear distant object detection module (RHRDA) installed on the vehicle, and alerts the driver when a danger is detected, thus avoiding accidents due to the blind spot in the rearview mirror during lane changing.

Conditions for Running DTCs

B19A2 05, B19A3 54 and B19AC 00:

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

B19B1 00: After the function is enabled.

Conditions for Setting DTCs

B19A2 05: It is detected that the sensor is not calibrated.

B19A3 54: It is detected that the sensor is not calibrated or calibration is not completed.

B19AC 00: The vehicle information calculated by DACore is inconsistent with the sensor detection information.

B19B1 00: Fail to complete the calibration or calibration pauses due to error, CUDA is empty or mismatched.

Operations of ECU after Failure

Related functions are invalid.

Conditions for Clearing DTCs

B19A2 05 and B19A3 54:

- The calibration is completed successfully.
- History DTCs will be cleared after 40 power-on and power-off cycles.

B19AC 00:

- All the data processed by DAcore returns to confidence range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

B19B1 00:

- The calibration is completed successfully.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. The module installation is improper.
   - The module is fitted correctly.
3. Module internal failure.
   - Replace/flash the module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps:

1. Check if the mounting position of module is correct, and check the harness and connector for wear or corrosion, etc.

   ® For abnormal module mounting position, harness and connector: Repair/replace the harness or connector, and adjust the module position.

   ® Normal, go to 2.

2. Clear the DTC, check the vehicle again, and confirm the vehicle status:

   ® Abnormal, go to 3.

   ® Normal, diagnosis is completed.

3. Check the control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the control module.

   ® Normal, go to TAC Human Assistance.

B19A4

DTC Description

DTC	FTB	DTC Description
B19A4	97	Radar Blind

Subsystem Principle

The main function of Rearward Driver Assistance System (RDA) is to clear the blind spot in the rearview mirror. It detects the area on both sides of the vehicle through the left rear distant object detection module (LHRDA) and the right rear distant object detection module (RHRDA) installed on the vehicle, and alerts the driver when a danger is detected, thus avoiding accidents due to the blind spot in the rearview mirror during lane changing.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

External covering affects the module sensor or no sufficient external reference can be detected

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- The module can detect sufficient external reference.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Sensor is blocked.
   - Remove the covering.
2. Sensor internal failure.
   - Flash/replace the sensor.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the sensor:

   ® Confirm that there is no covering around the module and other abnormal conditions: Remove the covering.

   ® Normal, go to 2.

2. Check the harness and connector of the sensor:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the sensor:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B19AB

DTC Description

DTC	FTB	DTC Description
B19AB	00	Production Mode Is Not Switched off

Subsystem Principle

Under normal circumstances, the system will report error if entering the production line mode, and meanwhile limit the related functions.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

Production Line Mode Activated

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- The production line mode is off.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Sensor internal failure.
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the module:

   ® Confirm whether the production line mode can be off, whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B19B0

DTC Description

DTC	FTB	DTC Description
B19B0	87	Lost Communication With Slave ECU

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with the right rear distant object detection module (RHRDA) via private CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.
- The following DTC is not set: U0074 88.

Conditions for Setting DTCs

Data is not synchronised to the slave control module for more than 5s.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- Valid data is synchronised within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Module internal failure.
   - Replace/flash the module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps:

1. Check the module harness and connector for wear or corrosion:

   ® For abnormal harness and connector: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the master control module - slave control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, slave control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the slave control module, learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the master control module.

   ® Normal, go to TAC Human Assistance.

U0073, U0146 and U0447

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with the Gateway (GW) / Connected Computation Platform (CCP) via the CAN bus.

Conditions for Running DTCs

U0073 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U0146 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0073 88.

U0447 81:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTCs are not set: U0073 88 and U0146 87.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame sent from the module cannot be received within 2s.

U0447 81: The DTC will be set if invalid data is received from the module for 3 consecutive working cycles.

Operations of ECU after Failure

U0073 88:

- CAN communication function is invalid.
- Relevant system functions are invalid.

U0146 87 and U0447 81: Relevant system functions are invalid.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on cycles.

U0146 87:

- The specified data frame sent from the module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0447 81:

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the control module and GW /CCP software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the rear distant object detection module and GW /CCP module:

   ® Abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

U0074

DTC Description

DTC	FTB	DTC Description
U0074	88	Control Module Communication Bus Off on Private CAN

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with the right rear distant object detection module (RHRDA) via private CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

When it has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

- CAN bus communication function fails, and CAN transceiver is initialised.
- Relevant system functions are unavailable.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Module internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check the module harness and connector for wear or corrosion:

   ® For abnormal harness and connector: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the master control module - slave control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, slave control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module.

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the master control module, learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the slave control module.

   ® Normal, go to TAC Human Assistance.

U0416, U0417, U0420, U0422, U0423, U0428, U0452, U0546 and U0594

DTC Description

DTC	FTB	DTC Description
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
U0417	81	Invalid Data Received from Electric Parking Brake(EPB) Module / Integrated Brake System (IBS)
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)
U0422	81	Invalid Data Received from Body Control Module (BCM)
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)
U0428	81	Invalid Steering Wheel Angle Data Received
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with other modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- The following DTC is not set: U0146 87.

Conditions for Setting DTCs

U0416 81: The DTC will be set if invalid data of SCS / IBS is received for 3 consecutive cycles.

U0417 81: The DTC will be set if invalid data of EPB / IBS is received for 3 consecutive cycles.

U0420 81: The DTC will be set if invalid data of EPS is received for 3 consecutive cycles.

U0422 81: The DTC will be set if invalid data of BCM is received for 3 consecutive cycles.

U0423 81: The DTC will be set if invalid data of FICM is received for 3 consecutive cycles.

U0428 81: The DTC will be set if invalid data of Steering Wheel Angle is received for 3 consecutive cycles.

U0452 81: The DTC will be set if invalid data of SDM is received for 3 consecutive cycles.

U0546 81: The DTC will be set if invalid data of IPK is received for 3 consecutive cycles.

U0594 81: The DTC will be set if invalid data of ECM or HCU/VCU is received for 3 consecutive cycles.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The related module power supply fuse is faulty.
   - Replace the corresponding fuse.
2. Related circuits failure.
   - Replace/repair the related harness.
3. Connector failure or poor fit.
   - Replace/repair the harness connector.
4. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the module software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the related module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

Module monitors the system voltage to confirm whether the module supply voltage is within the normal operating range.

Conditions for Running DTCs

The start switch is in "ON" position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

Disable the fault diagnosis function.

Conditions for Clearing DTCs

U1562 17:

- The system voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1563 16:

- The system voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage.
   - Replace the battery.
2. Harness or connector failures.
   - Replace/repair the harness or connector.
3. Battery cable failure.
   - Replace/repair the battery cable.
4. High/low voltage conversion system failure.
   - Check/repair the related components.
5. Control module internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the battery:

   ® Confirm whether the battery function is normal, and whether there are battery aging, damage, deformation, liquid leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® Confirm whether the battery cable function is normal, and whether there are looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2000 and U2003

DTC Description

DTC	FTB	DTC Description
U2000	04	ECU Hardware Error
U2003	04	ECU Error-Software Error

Subsystem Principle

Failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

The function is enabled.

Conditions for Setting DTCs

U2000 04: ECU hardware failure, such as: RAM failure, ROM failure, EEPROM failure, internal self-test failure, etc.

U2003 04: ECU software failure, such as: EEPROM error, vehicle configuration not programmed, not learned or calibrated, etc.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- During next ignition cycle, the detection system has no related failure.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Module internal failure.

   ® Replace/repair the module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps:

1. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Right Hand Rear Drive Assist Module (RHRDA)

DTC Index

List

DTC	FTB	Description	Failure Level*
B19A2	05	Sensor Misaligned	III
B19A3	54	Radar Alignment Never Done Or Not Done	III
B19A4	97	Radar Blind	III
B19AB	00	Production Mode Is Not Switched off	III
B19AC	00	Vehicle Information Mismatch	III
B19B0	87	Lost Communication With Slave ECU	III
B19B1	00	Calibration Number Not Match	III
U0073	88	CAN Bus Off	III
U0074	88	Control Module Communication Bus Off on Private CAN	III
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)	III
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)	III
U0417	81	Invalid Data Received from Electric Parking Brake(EPB) Module / Integrated Brake System (IBS)	III
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)	III
U0422	81	Invalid Data Received from Body Control Module (BCM)	III
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)	III
U0428	81	Invalid Steering Wheel Angle Data Received	III
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)	III
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	III
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)	III
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)	III
U1562	17	Battery Voltage High	III
U1563	16	Battery Voltage Low	III
U2000	04	ECU Hardware Error	III
U2003	04	ECU Error-Software Error	III

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B19A2, B19A3, B19AC and B19B1

DTC Description

DTC	FTB	DTC Description
B19A2	05	Sensor Misaligned
B19A3	54	Radar Alignment Never Done Or Not Done
B19AC	00	Vehicle Information Mismatch
B19B1	00	Calibration Number Not Match

Subsystem Principle

The main function of Rearward Driver Assistance System (RDA) is to clear the blind spot in the rearview mirror. It detects the area on both sides of the vehicle through the left rear distant object detection module (LHRDA) and the right rear distant object detection module (RHRDA) installed on the vehicle, and alerts the driver when a danger is detected, thus avoiding accidents due to the blind spot in the rearview mirror during lane changing.

Conditions for Running DTCs

B19A2 05, B19A3 54 and B19AC 00:

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.
- Not in Mute mode.

B19B1 00: After the function is enabled.

Conditions for Setting DTCs

B19A2 05: It is detected that the sensor is not calibrated.

B19A3 54: It is detected that the sensor is not calibrated or calibration is not completed.

B19AC 00: The vehicle information calculated by DACore is inconsistent with the sensor detection information.

B19B1 00: Fail to complete the calibration or calibration pauses due to error, CUDA is empty or mismatched.

Operations of ECU after Failure

Related functions are invalid.

Conditions for Clearing DTCs

B19A2 05 and B19A3 54:

- The calibration is completed successfully.
- History DTCs will be cleared after 40 power-on and power-off cycles.

B19AC 00:

- All the data processed by DAcore returns to confidence range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

B19B1 00:

- The calibration is completed successfully.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. The module installation is improper.
   - The module is fitted correctly.
3. Module internal failure.
   - Replace/flash the module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps:

1. Check if the mounting position of module is correct, and check the harness and connector for wear or corrosion, etc.

   ® For abnormal module mounting position, harness and connector: Repair/replace the harness or connector, and adjust the module position.

   ® Normal, go to 2.

2. Clear the DTC, check the vehicle again, and confirm the vehicle status:

   ® Abnormal, go to 3.

   ® Normal, diagnosis is completed.

3. Check the control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the control module.

   ® Normal, go to TAC Human Assistance.

B19A4

DTC Description

DTC	FTB	DTC Description
B19A4	97	Radar Blind

Subsystem Principle

The main function of Rearward Driver Assistance System (RDA) is to clear the blind spot in the rearview mirror. It detects the area on both sides of the vehicle through the left rear distant object detection module (LHRDA) and the right rear distant object detection module (RHRDA) installed on the vehicle, and alerts the driver when a danger is detected, thus avoiding accidents due to the blind spot in the rearview mirror during lane changing.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.
- Not in Mute mode.

Conditions for Setting DTCs

External covering affects the module sensor or no sufficient external reference can be detected

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- The module can detect sufficient external reference.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Sensor is blocked.
   - Remove the covering.
2. Sensor internal failure.
   - Flash/replace the sensor.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the sensor:

   ® Confirm that there is no covering around the sensor and other abnormal conditions: Remove the covering.

   ® Normal, go to 2.

2. Check the harness and connector of the sensor:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the sensor:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B19AB

DTC Description

DTC	FTB	DTC Description
B19AB	00	Production Mode Is Not Switched off

Subsystem Principle

Under normal circumstances, the system will report error if entering the production line mode, and meanwhile limit the related functions.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

Production Line Mode Activated

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- The production line mode is off.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Sensor internal failure.
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the module:

   ® Confirm whether the production line mode can be off, whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the rear distant object detection module.

   ® Normal, go to TAC Human Assistance.

B19B0

DTC Description

DTC	FTB	DTC Description
B19B0	87	Lost Communication With Slave ECU

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with the right rear distant object detection module (RHRDA) via private CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The Start switch is placed in ON position.
- The following DTC is not set: U0074 88.

Conditions for Setting DTCs

Data is not synchronised to the slave control module for more than 5s.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- Valid data is synchronised within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Module internal failure.
   - Replace/flash the module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps:

1. Check the module harness and connector for wear or corrosion:

   ® For abnormal harness and connector: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the master control module - slave control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, slave control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the slave control module, learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the master control module.

   ® Normal, go to TAC Human Assistance.

U0073, U0146 and U0447

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)
U0447	81	Invalid Data Received from Gateway (GW) or Connected Computation Platform (CCP)

Subsystem Principle

The right rear distant object detection module (RHRDA) communicates with the Gateway (GW) / Connected Computation Platform (CCP) module via the CAN bus.

Conditions for Running DTCs

U0073 88:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U0146 87:

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- 1s after network node wakeup.
- AutoSAR node is in network mode.
- The following DTC is not set: U0073 88.

U0447 81:

- 1s after communication is enabled.
- The system is normal, and remains stable.
- The start switch is in "ON" position.
- 1s after network node wakeup.
- AutoSAR node is in network mode.
- The following DTCs are not set: U0073 88 and U0146 87.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame sent from the module cannot be received within 2s.

U0447 81: The DTC will be set if invalid data is received from the module for 3 consecutive working cycles.

Operations of ECU after Failure

U0073 88:

- CAN communication function is invalid.
- Relevant system functions are invalid.

U0146 87 and U0447 81: Relevant system functions are invalid.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0146 87:

- The specified data frame sent from the module can be received within 20 cycles.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U0447 81:

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair the related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the control module and GW /CCP software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the rear distant object detection module and GW /CCP module:

® Abnormal, replace the faulty modules;

® Normal, go to TAC Human Assistance.

U0074

DTC Description

DTC	FTB	DTC Description
U0074	88	Control Module Communication Bus Off on Private CAN

Subsystem Principle

The left rear distant object detection module (LHRDA) communicates with the right rear distant object detection module (RHRDA) via private CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

When it has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

- CAN bus communication function fails, and CAN transceiver is initialised.
- Relevant system functions are unavailable.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Module internal failure.
   - Replace/flash the module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check the module harness and connector for wear or corrosion:

   ® For abnormal harness and connector: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the master control module - slave control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, slave control module harness conductivity failure, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module.

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the master control module, learn and programme the module, confirm whether the failure is eliminated; if the DTC is reset, replace the slave control module.

   ® Normal, go to TAC Human Assistance.

U0416, U0417, U0420, U0422, U0423, U0428, U0452, U0546 and U0594

DTC Description

DTC	FTB	DTC Description
U0416	81	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
U0417	81	Invalid Data Received from Electric Parking Brake(EPB) Module / Integrated Brake System (IBS)
U0420	81	Invalid Data Received from Power Steering Control Module (EPS)
U0422	81	Invalid Data Received from Body Control Module (BCM)
U0423	81	Invalid Data Received From Front Infotainment Control Module (FICM)
U0428	81	Invalid Steering Wheel Angle Data Received
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U0546	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)
U0594	81	Invalid Data Received from Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)

Subsystem Principle

The right rear distant object detection module (RHRDA) communicates with other modules via the gateway (GW) and CAN bus.

Conditions for Running DTCs

- 1s after communication is enabled.
- The system voltage is normal, and remains stable.
- The start switch is in "ON" position.
- The following DTC is not set: U0146 87.

Conditions for Setting DTCs

U0416 81: The DTC will be set if invalid data of SCS / IBS is received for 3 consecutive cycles.

U0417 81: The DTC will be set if invalid data of EPB / IBS is received for 3 consecutive cycles.

U0420 81: The DTC will be set if invalid data of EPS is received for 3 consecutive cycles.

U0422 81: The DTC will be set if invalid data of BCM is received for 3 consecutive cycles.

U0423 81: The DTC will be set if invalid data of FICM is received for 3 consecutive cycles.

U0428 81: The DTC will be set if invalid data of Steering Wheel Angle is received for 3 consecutive cycles.

U0452 81: The DTC will be set if invalid data of SDM is received for 3 consecutive cycles.

U0546 81: The DTC will be set if invalid data of IPK is received for 3 consecutive cycles.

U0594 81: The DTC will be set if invalid data of ECM or HCU/VCU is received for 3 consecutive cycles.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- Valid data is received within 1 cycle, and all related signal values are within the range.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. The related module power supply fuse is faulty.
   - Replace the corresponding fuse.
2. Related circuits failure.
   - Replace/repair the related harness.
3. Connector failure or poor fit.
   - Replace/repair the harness connector.
4. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Perform the integrity inspection of Driver Assistance HS CAN network:

   ® Confirm that other module tests are normal;

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the module software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the related module:

   ® Abnormal, replace the faulty module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

Module monitors the system voltage to confirm whether the module supply voltage is within the normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

Disable the fault diagnosis function.

Conditions for Clearing DTCs

U1562 17:

- The system voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

U1563 16:

- The system voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage.
   - Replace the battery.
2. Harness or connector failures.
   - Replace/repair the harness or connector.
3. Battery cable failure.
   - Replace/repair the battery cable.
4. High/low voltage conversion system failure.
   - Check/repair the related components.
5. Control module internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps

1. Check the battery:

   ® Confirm whether the battery function is normal, and whether there are battery aging, damage, deformation, liquid leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® Confirm whether the battery cable function is normal, and whether there are looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2000 and U2003

DTC Description

DTC	FTB	DTC Description
U2000	04	ECU Hardware Error
U2003	04	ECU Error-Software Error

Subsystem Principle

Failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

The function is enabled.

Conditions for Setting DTCs

U2000 04: ECU hardware failure, such as: RAM failure, ROM failure, EEPROM failure, internal self-test failure, etc.

U2003 04: ECU software failure, such as: EEPROM error, vehicle configuration not programmed, not learned or calibrated, etc.

Operations of ECU after Failure

Relevant system functions are invalid.

Conditions for Clearing DTCs

- During next ignition cycle, the detection system has no related failure.
- History DTCs will be cleared after 40 power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Module internal failure.

   ® Replace/repair the module.

Reference Circuit Diagram

Rear Driving Assistance System

Diagnostic Test Steps:

1. Check the module harness and connector:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the rear distant object detection module.

   ® Normal, go to TAC Human Assistance.

Gateway Module (GW)

DTC Index

List

DTC	FTB	Description	Warning Lamp	Failure Level*
B1AD3	00	Pedestrian Alert Control Module (PACM) thermal protection or short-circuit protection or DC detected fault	ON	II
B1AD4	00	Pedestrian Alert Speaker (PAS) open circuit failure	ON	II
B1B06	16	12V Battery Charge Voltage Low	ON	IIB
B1B80	07	Alternator Mechanical Failure	ON	IIB
B1B81	01	Alternator Electrical Failure	ON	IIB
C0042	14	Brake Pedal Position Sensor "Circuit A"Short to Ground or Open	OFF	IIB
C0042	15	Brake Pedal Position Sensor "Circuit A"Short to Battery	OFF	IIB
C0042	1C	Brake Pedal Position Sensor "Circuit A"Circuit Voltage Out of Range	OFF	IIB
C0042	54	Brake Pedal Position Sensor "Circuit A"Missing Calibration	OFF	IIB
C1F80	00	Brake Pedal Zero Position Exceed Expected Range	OFF	IIB
P0564	11	Cruise Control Multi-Function Input "A" Circuit Short to Ground	OFF	IIB
P0564	12	Cruise Control Multi-Function Input "A" Circuit Short to Battery	OFF	IIB
P0564	1C	Cruise Control Multi-Function Input "A" Circuit Circuit Voltage Out of Range	OFF	IIB
P0564	96	Cruise Control Multi-Function Input "A" Circuit Component Internal Failure	OFF	IIB
P0589	11	Cruise Control Multi-Function Input "B" Circuit Short to Ground	OFF	IIB
P0589	12	Cruise Control Multi-Function Input "B" Circuit Short to Battery	OFF	IIB
P0589	1C	Cruise Control Multi-Function Input "B" Circuit Circuit Voltage Out of Range	OFF	IIB
P0589	96	Cruise Control Multi-Function Input “B” Circuit Component Internal Failure	OFF	IIB
P0955	1C	Auto Shift Manual Mode Circuit Voltage Out of Range	OFF	IIB
P0955	96	Auto Shift Manual Mode Circuit Component Internal Failure	OFF	IIB
P15AB	1C	Drive Mode Switch Circuit Voltage Out of Range	OFF	IIB
P15AB	96	Drive Mode Switch Circuit Component Internal Failure	OFF	IIB
P1900	41	Remote PRND Display Module (RPD) LIN Communication Checksum Error with Master Node	OFF	III
P1901	87	Remote PRND Display Module (RPD) LIN Communication Time Out with Master Node	OFF	III
P1910	1C	Remote PRND Display Module (RPD) Power Supply Abnormal	OFF	III
P1911	28	Transmission Shift Lever Position Signal Out Of the Range of Regular Function	OFF	III
P1911	29	The Transmission Shift Lever Position Signal Invalid	OFF	III
P1A25	00	Cruise Control Switch Fault	OFF	IIB
U0073	88	PowerTrain HS CAN Bus Off	OFF	IIB
U0074	88	Chassis HS CAN Bus Off	OFF	IIB
U0075	88	Body HS CAN Bus Off	OFF	IIB
U0076	88	Infotainment HS CAN Bus Off	OFF	IIB
U0077	88	Diagnostic HS CAN Bus Off	OFF	IIB

DTC	FTB	Description	Warning Lamp	Failure Level*
U0078	88	WIFI HS CAN Bus Off	OFF	IIB
U0079	88	Safety Driving HS CAN Bus Off	OFF	IIB
U007A	88	ADAS HS CAN Bus Off	OFF	IIB
U0103	87	Lost Communication With Shift Control Unit (SCU)	OFF	III
U0110	87	Lost Communication With Traction Controller (TC)	OFF	III
U0120	87	Lost Communication With Alternator	OFF	III
U0121	87	Lost Communication With Anti-lock Brake System (ABS)	OFF	III
U0122	87	Lost Communication With Stability Control System (SCS)	OFF	III
U0126	87	Lost Communication With Steering Angle Sensor (SAS)	OFF	III
U0127	87	Lost Communication With Tire Pressure Monitor System (TPMS)	OFF	III
U0128	87	Lost Communication With Electric Park Brake Module (EPB)	OFF	III
U0131	87	Lost Communication With Electric Power Steering (EPS)	OFF	III
U0140	87	Lost Communication With Body Control Module (BCM)	OFF	III
U0147	87	Lost Communication With FOTA Management Unit (FMU)	OFF	III
U0151	87	Lost Communication With Supplemental Restraint System Diagnostic Module (SDM)	OFF	III
U0155	87	Lost Communication With Instrument Pack (IPK)	OFF	III
U0159	87	Lost Communication With Parking Distance Control Module (PDC)	OFF	III
U0164	87	Lost Communication With Heating, Ventilation and Air Conditioning (HVAC)	OFF	III
U0170	87	Lost Communication With Ambient Lighting Control Module (ALCM)	OFF	III
U0180	87	Lost Communication With Adaptive Frontlighting System (AFS)	OFF	III
U0186	87	Lost Communication with Amplifier (AMP)	OFF	III
U0197	87	Lost Communication With Ecall TBox	OFF	III
U0198	87	Lost Communication With Telematics Box (TBOX)	OFF	III
U0208	87	Lost Communication With Front Left Seat Control Module (FLSM)	OFF	III
U0236	87	Lost Communication With Electric Steering Column Lock (ESCL)	OFF	III
U0245	87	Lost Communication With Front Infotainment Control Module (FICM)	OFF	III
U0292	87	Lost Communication With Integrated Starter Controller (ISC)	OFF	III
U0293	87	Lost Communication With Hybrid Powertrain Control Module (HCU)	OFF	III
U0298	87	Lost Communication With DC to DC converter (DCDC)	OFF	III
U1001	87	Lost Communication With Passive Entry Passive Start (PEPS)	OFF	III
U1003	87	Lost Communication With Memory Seat Moudle (MSM)	OFF	III
U1008	87	Lost Communication With Remote PRND Display Module (RPD)	OFF	III
U1009	87	Lost Communication With All Terrain System Switch (ATSSW)	OFF	III
U100E	87	Lost Communication With_Energy Storage System Positive Temperature Coefficient (ESSPTC)	OFF	III
U1021	87	Lost Communication With Rear Drive Assist (RDA)	OFF	III
U1022	87	Lost Communication With RHRDA	OFF	III
U1023	87	Lost Communication With Around View Module (AVM)	OFF	III
U1041	87	Lost Communication With Bluetooth Passive Entry Passive Start(BPEPS)	OFF	III
U1101	87	Lost Communication With Clutch Cooling Electric Oil Pump (CCEOP)	OFF	III

DTC	FTB	Description	Warning Lamp	Failure Level*
U1102	87	Lost Communication With Chassis Management Module (CMM)	OFF	III
U1103	87	Lost Communication With Actuator Control Unit (ACU)	OFF	III
U1111	87	Lost Communication With Battery Management System (BMS)	OFF	III
U1113	87	Lost Communication With Secondary Axle Motor Control Module(SAC)	OFF	III
U1115	87	Lost Communication With Combined Charging Unit (CCU)	OFF	III
U1116	87	Lost Communication With Electronic Battery Sensor (EBS)	ON	III
U1122	87	Lost Communication With Electronic Hydraulic Brake System (EHBS)	OFF	III
U1146	87	Lost Communication With Architecture Extension Module (AEM)	OFF	III
U115A	87	Lost Communication With Point To Point Park Assist Module (P2P)	OFF	III
U115B	87	Lost Communication With Near Distance Assitant System (NDAS)	OFF	III
U1263	87	Lost Communication With FVCM/FDR	OFF	III
U1264	87	Lost Communication With Front View Camera Module (FVCM)	OFF	III
U1265	87	Lost Communication With Front Detection Radar (FDR)	OFF	III
U1266	87	Lost Communication With Pedestrian Alert Control Module (PACM)	OFF	III
U1267	87	Lost Communication With Full Display Mirror (FDM)	OFF	III
U1268	87	Lost Communication With Driver Monitor System (DMS)	OFF	III
U1269	87	Lost Communication With High Definition Map (HDM)	OFF	III
U126A	87	Lost Communication With LFSDA/RFSDA	OFF	III
U126C	87	Lost Communication With Power net Guardian Module(PGM)	OFF	III
U126D	87	Lost Communication With Steering Wheel Switch(SWS)	OFF	III
U1414	81	Lost Communication With Electronic Park Motor Control Unit (EPMCU)	OFF	III
U1500	00	VIN Mismatch with FOTA Management Unit (FMU)	OFF	III
U1562	17	Battery Power Supply Circuit Voltage High	OFF	III
U1563	16	Battery Power Supply Circuit Voltage Low	OFF	III
U179C	82	Vehicle Control Unit (VCU) Data Frame Check Error	OFF	IIB
U2001	41	ECU EEPROM Check Error	OFF	IIB
U2001	42	ECU EEPROM Access Error	OFF	IIB
U2218	87	Response Timeout for HTTP Request-ICM	OFF	III
U2219	87	Response Timeout for SOME/IP Request-ICM(Intelligent Cockpit Module)	OFF	III
U2226	87	Response Timeout for SOME/IP Request-FVCM	OFF	III
U2227	87	Response Timeout for HTTP Request-FVCM	OFF	III
U2228	87	Response Timeout for SOME/IP Request-TBOX	OFF	III
U2229	87	Response Timeout for HTTP Request-TBOX	OFF	III
U222E	87	Response Timeout for SOME/IP Request-LADS(Low Speed Automated Driving System)	OFF	III
U222F	87	Response Timeout for HTTP Request-LADS(Low Speed Automated Driving System)	OFF	III
U2263	00	Lost Ethernet Connection with TBOX	OFF	III
U2265	00	Lost Ethernet Connection with ICM	OFF	III
U2270	00	Lost Ethernet Connection with IPK/ICM	OFF	III

DTC	FTB	Description	Warning Lamp	Failure Level*
U2278	00	Lost Ethernet Connection with FVCM	OFF	III
U227C	00	Lost Ethernet Connection with LADS(Low Speed Automated Driving System)	OFF	III

*Remarks:

Failure level description:

- I: The failure requires an immediate check of the vehicle
- IIA: The failure requires a check of the vehicle by driving slowly to the nearby maintenance station directly under a safe condition
- IIB: The failure requires a check of the vehicle by driving to the nearby maintenance station as soon as possible when convenient
- III: The failure requests maintanance only
- IV: Maintanance as actual required

Diagnosis Information and Procedure

B1AD3, B1AD4 and U1266

DTC Description

DTC	FTB	DTC Description
B1AD3	00	Pedestrian Alert Control Module (PACM) thermal protection or short-circuit protection or DC detected fault
B1AD4	00	Pedestrian Alert Speaker (PAS) open circuit failure
U1266	87	Lost Communication With Pedestrian Alert Control Module (PACM)

Subsystem Principle

The pedestrian alert control module (PACM) is fitted in the passenger side lower closure panel; the pedestrian alert speaker is fitted at the front compartment grille; the PACM communicates with the GW via the CAN bus, and sends the self-diagnosed DTC to the GW for the record. The scan tool obtains the failure message of PACM via the GW.

PACM circuit related to this DTC:

- PACM-12 buzzer drives the positive cable.
- PACM-10 CAN high.
- PACM-09 CAN low.
- PACM-07 module 12V power supply.
- PACM-06 buzzer drives the negative cable.
- PACM-01 module is grounded.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

B1AD3 00: The chip temperature is too high, working current is too large, and the DC conversion is abnormal.

B1AD4 00: The pedestrian alert buzzer circuit is open.

U1266 87: PACM data frame is not received.

Operations of ECU after Failure

- The pedestrian alert function is disabled.
- The instrument has warning prompt.

Conditions for Clearing DTCs

- B1AD3 and B1AD4: PACM has not detected related failure.
- U1266: PACM message frame is received within the specified time.

Possible Failure Causes

- Pedestrian alert control module (PACM) failure.
- PACM power supply and communication failure.
- Circuit failure between PACM and speaker.
- Pedestrian alert speaker failure.

Diagnostic Test Steps

1. Try to replace the following components for B1AD3 00:

   • Pedestrian alert control module (PACM).

2. Disconnect the negative battery cable, disconnect the connector between the PACM and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the following harness terminals.

Conditions	Measure the terminals	Normal Value
Power-off	PACM-01 and Ground	Conducting
	PACM-06&12	3 - 8 Ω
	PACM-09&10	60 Ω
Power-on	PACM-07 and Ground	More than 10V
	PACM-09 and Ground	2.5 - 4.3 V
	PACM-10 and Ground	0.7 - 2.5 V

   ® Out of range, perform the next step;

   ® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

3. Disconnect the negative battery cable, disconnect the connector between the pedestrian alert speaker and the harness, and confirm whether the following failures exist:

   • Confirm whether the connector terminal between the component and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the following harness circuit status.

Measure the terminals	Normal Value
PACM-01 and Speaker-01	Conducting
PACM-07 and Speaker-02	Conducting

   ® Out of range, check the middle connector or replace the faulty harness;

   ® Within the range, replace the pedestrian alert speaker.

B1B06

DTC Description

DTC	FTB	DTC Description
B1B06	16	12V Battery Charge Voltage Low

Subsystem Principle

The battery voltage during charging process will be slightly higher than the voltage value with the battery not charged. Therefore, the DTC will be set when it is detected that the battery voltage during charging process is lower than the expected value.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U1008.

Conditions for Setting DTCs

When the high/low voltage conversion system charges the battery, the module power supply circuit voltage is lower than the rational value.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

Failure setting conditions are not met any longer.

Possible Failure Causes

- Battery feeding.
- Battery failure.
- Charging system failure.

Diagnostic Test Steps

1. After the battery is normally charged, check the following abnormal conditions:

   • The battery voltage is lower than 12 V at vehicle startup.

   ® Yes, service the battery charging system (high/low voltage conversion system);

   ® No, perform the next step.

   • When the vehicle is in normal operation, the vehicle still has the feeding phenomenon.

   ® Yes, replace the battery;

   ® No, end the repair.

B1B80, B1B81 and U0120

DTC Description

DTC	FTB	DTC Description
B1B80	07	Alternator Mechanical Failure
B1B81	01	Alternator Electrical Failure
U0120	87	Lost Communication With Alternator

Subsystem Principle

The GW establishes the communication through LIN bus and intelligent AC motor, which is used for the control and monitoring of intelligent AC motor. The intelligent AC motor will make self-diagnosis and send the failure message to the GW via the LIN bus, and the GW records and keeps the message. The DTC will be set when it is detected that the intelligent AC motor communication is abnormal or has failure message.

Gateway (GW) circuit related to this DTC:

- GW(40Pin)-13: LIN bus.

Conditions for Running DTCs

B1B80 and B1B81:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTCs do not exist: U1562 and U1563.

U0120:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0073.

Conditions for Setting DTCs

B1B80 07: LIN bus AC motor mechanical failure message is received.

B1B81 01: LIN bus AC motor mechanical failure message is received.

U0120 87: LIN bus AC motor node message is not received.

Operations of ECU after Failure

AC motor function is disabled.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

- GW module software is not the latest.
- Intelligent AC motor internal failure.
- Intelligent AC motor power supply/ground failure.
- Intelligent AC motor communication failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information:
   - Software version is not the latest.

     ® Yes, flash the software;

     ® No, perform the next step.
2. Try to replace the following components for B1B80 07 and B1B81 00:
   - Intelligent AC motor.
3. Disconnect the negative battery cable, disconnect the connector between the GW and the harness, and confirm whether the following failures exist.
   - Confirm whether the connector terminal between the module and the harness is damaged.

     ® Yes, repair the damaged terminal;

     ® No, perform the next step.
   - Test the following harness terminals.

Conditions	Measure the terminals	Normal Value
Power-off	GW(40Pin)-13 and Ground	Non-conducting
Power-on	GW(40Pin)-13 and Ground	Higher than 10V

     ® Out of range, service the circuit failure or replace the harness;

     ® Within the range, perform the next step.
4. Disconnect the negative battery cable, disconnect the connector between the intelligent AC motor and the harness, and confirm whether the following failures exist:
   - Confirm whether the connector terminal between the component and the harness is damaged.

     ® Yes, repair the damaged terminal;

     ® No, perform the next step.
   - Confirm whether the power supply and the ground of intelligent AC motor are normal.

     ® Yes, perform the next step.

     ® No, service the related circuit failure.
   - Test the following circuit status between the harness module and the AC motor.

Measure the terminals	Normal Value
GW(40Pin)-13 and ALT-01	Conducting

     ® Out of range, check the middle connector or replace the faulty harness;

® Within the range, replace the intelligent AC motor.

C0042 and C1F80

DTC Description

DTC	FTB	DTC Description
C0042	14	Brake Pedal Position Sensor "Circuit A"Short to Ground or Open
C0042	15	Brake Pedal Position Sensor "Circuit A"Short to Battery
C0042	1C	Brake Pedal Position Sensor "Circuit A"Circuit Voltage Out of Range
C0042	54	Brake Pedal Position Sensor "Circuit A"Missing Calibration
C1F80	00	Brake Pedal Zero Position Exceed Expected Range

Subsystem Principle

The brake pedal position sensor is fitted on the brake pedal bracket assembly, which is used to monitor the opening of the brake pedal depressed. The sensor is connected to the BCM through the hard wire circuit. After the sensor is fitted in place, perform the sensor zero position learning first, so as to achieve the initial reading of voltage value when the pedal opening is 0%, which is recorded as the zero position voltage. When it is detected that the position signal and zero position voltage are abnormal, the DTC is set.

Signal parse rules: The signal voltage changes between the zero position voltage and 4.5V, which has positive correlation with the pedal opening (0-100%); the larger the opening, the higher the voltage.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

C0042 14: The sensor voltage value is less than 0.5V.

C0042 15: The sensor voltage value is higher than 4.5V.

C0042 1C: The sensor voltage value exceeds the voltage value corresponding to 0-100%.

C0042 54: Zero position learning of sensor is not completed.

C1F80 00: The sensor zero position learning value is out of rational range.

Operations of ECU after Failure

The pedal position signal setting is the default value of 100%.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

- The sensor is not fitted or adjusted in place.
- The sensor zero position learning is not completed.
- Brake pedal position sensor signal circuit failure.
- Brake pedal position sensor failure.
- Body module failure.
- Gateway module failure.

Diagnostic Test Steps

1. Confirm whether the following failures exist for C0042 54 and C1F80 00:

- The brake pedal position sensor is not fitted or adjusted in place.

® Yes, adjust the mounting position;

® No, perform the next step.

- The position sensor zero position learning is not performed.

® Yes, complete the zero position learning.

® No, perform the next step.

2. Use a scan tool to read the node loss module information.

- Software version is not the latest.

® Yes, flash the software;

® No, perform the next step.

3. Disconnect the negative battery cable, disconnect the connector between the GW module and the harness, and confirm whether the following failures exist.

- Confirm whether the connector terminal between the module and the harness is damaged.

® Yes, repair the damaged terminal;

® No, perform the next step.

- Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the GW module.

P0564, P0589 and P1A25

DTC Description

DTC	FTB	DTC Description
P0564	11	Cruise Control Multi-Function Input "A" Circuit Short to Ground
P0564	12	Cruise Control Multi-Function Input "A" Circuit Short to Battery
P0564	1C	Cruise Control Multi-Function Input "A" Circuit Circuit Voltage Out of Range
P0564	96	Cruise Control Multi-Function Input "A" Circuit Component Internal Failure
P0589	11	Cruise Control Multi-Function Input "B" Circuit Short to Ground
P0589	12	Cruise Control Multi-Function Input "B" Circuit Short to Battery
P0589	1C	Cruise Control Multi-Function Input "B" Circuit Circuit Voltage Out of Range
P0589	96	Cruise Control Multi-Function Input "B" Circuit Component Internal Failure
P1A25	00	Cruise Control Switch 3 Signal Logical Error

Subsystem Principle

The cruise control switch is integrated on the steering wheel multi-function switch, which is used to control the vehicle cruise state. The switch is connected to the GW through the hard wire circuit. When it is detected that the switch signal is abnormal, the DTC is set.

Gateway (GW) circuit related to this DTC:

- GW(40Pin)-14: LIN bus.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

P0564 11: The switch 1 voltage is less than 0.2 V.

P0564 12: The switch 1 voltage is higher than 4.5 V.

P0564 1C: The switch 1 voltage is not within the parse range.

P0564 96: The switch 1 voltage is stuck at a certain value.

P0589 11: The switch 2 voltage is less than 0.2 V.

P0589 12: The switch 2 voltage is higher than 4.5 V.

P0589 1C: The switch 2 voltage is not within the parse range.

P0589 96: The switch 2 voltage is stuck at a certain value.

P1A25 00: Logic crash exists between multi-channel signals.

Operations of ECU after Failure

Vehicle cruise function is disabled.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

- GW module software is not the latest.
- Gateway module failure.
- Multifunction switch internal failure.
- Multifunction switch communication failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information:

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the GW and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the following harness terminals.

Conditions	Measure the terminals	Normal Value
Power-off	GW(40Pin)-14 and Ground	Non-conducting
Power-on	GW(40Pin)-14 and Ground	Higher than 10V

   ® Out of range, service the circuit failure or replace the harness;

   ® Within the range, perform the next step.

3. Disconnect the negative battery cable, disconnect the connector between the multi-function switch and the harness, and confirm whether the following failures exist:

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Confirm whether the power supply and the ground of multi-function switch are normal.

   ® Yes, perform the next step.

   ® No, service the related circuit failure.

• Test the following circuit status between the harness module and the multi-function switch.

Measure the terminals	Normal Value
GW(40Pin)-13 and SWS-05	Conducting

® Out of range, check the middle connector or replace the faulty harness;

® Within the range, replace the multi-function switch.

P0955

DTC Description

DTC	FTB	DTC Description
P0955	1C	Auto Shift Manual Mode Circuit Voltage Out of Range
P0955	96	Auto Shift Manual Mode Circuit Component Internal Failure

Subsystem Principle

The shift lever upshift and downshift switch is integrated in the shifter control unit. When it is detected that this signal is abnormal, the DTC is set.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

P0955 1C: The switch signal is not within the OFF/ON/UP/DOWN range.

P0955 96: The switch signal is stuck in the UP/DOWN state.

Operations of ECU after Failure

The switch function is disabled.

Conditions for Clearing DTCs

P0955 1C: The switch signal is within the OFF/ON/UP/DOWN range.

P0955 96: The switch signal changes.

Possible Failure Causes

- Shifter control unit failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

P15AB

DTC Description

DTC	FTB	DTC Description
P15AB	1C	Drive Mode Switch Circuit Voltage Out of Range
P15AB	96	Drive Mode Switch Circuit Component Internal Failure

Subsystem Principle

The driving mode switch is located on the central entertainment display. When the button is pressed to trigger, the system will switch between NORMAL, ECO, SPORT and other modes in cycles. When it is detected that this signal is abnormal, the DTC is set.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

P15AB 1C: The switch signal voltage is not within the parse range of being pressed or released.

P15AB 96: The switch signal is in pressed state for more than 10s.

Operations of ECU after Failure

Set the switch state to released.

Conditions for Clearing DTCs

P15AB 1C: The switch signal voltage is within the parse range of being pressed or released.

P15AB 96: The switch signal changes from pressed to released.

Possible Failure Causes

- Driving mode switch failure.
- Driving mode switch signal circuit failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.
   - Software version is not the latest.

     ® Yes, flash the software;

     ® No, perform the next step.
2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.
   - Confirm whether the connector terminal between the module and the harness is damaged.

     ® Yes, repair the damaged terminal;

     ® No, perform the next step.
   - Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

P1900, P1901, P1910, P1911 and U1008

DTC Description

DTC	FTB	DTC Description
P1900	41	Remote PRND Display Module (RPD) LIN Communication Checksum Error with Master Node
P1901	87	Remote PRND Display Module (RPD) LIN Communication Time Out with Master Node
P1910	1C	Remote PRND Display Module (RPD) Power Supply Abnormal
P1911	28	Transmission Shift Lever Position Signal Out Of the Range of Regular Function
P1911	29	The Transmission Shift Lever Position Signal Invalid
U1008	87	Lost Communication With Remote PRND Display Module (RPD)

Subsystem Principle

The remote PRND display module (RPD) is integrated in the shifter control unit (SCU), the RPD receives the shift lever position signal transmitted by the gateway (GW), and displays the current gear position through a indicator lamp. As a sub-node of LIN bus, the module communicates with the master node, and prevents the data bit error through the Checksum mechanism. The module will make self-diagnosis, and send the failure message to the GW. The DTC will be set when it is detected that the RPD communication is abnormal or has failure message.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U1008.

Conditions for Setting DTCs

P1900 41: Data frame checksum error.

P1901 87: RPD module data processing timeout.

P1910 1C: RPD module working voltage out of normal working range.

P1911 28: Shift lever signal value received by RPD module out of parse range.

P1911 29: Shift lever signal value received by RPD module invalid.

U1008 87: RPD module data frame not received.

Operations of ECU after Failure

P1900 41, P1901 87 and U1008 87: Maintain the original gear display.

P1910 1C, P1911 28 and P1911 29: No gear display.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

- GW module software is not the latest.
- SCU failure.

Diagnostic Test Steps

1. Use a scan tool to read the SCU/GW module information:
   - Software version is not the latest:
     ® Yes, flash the software;
     ® No, perform the next step.
2. Check the shift lever related functions:
   - The gear panel indicator lamp display is abnormal:
     ® Yes, perform the next step.
     ® No, ignore this failure.
3. Replace the SCU module.

U0073, U0074, U0075, U0076, U0077, U0078, U0079 and U007A

DTC Description

DTC	FTB	DTC Description
U0073	88	PowerTrain HS CAN Bus Off
U0074	88	Chassis HS CAN Bus Off
U0075	88	Body HS CAN Bus Off
U0076	88	Infotainment HS CAN Bus Off
U0077	88	Diagnostic HS CAN Bus Off
U0078	88	WIFI HS CAN Bus Off
U0079	88	Safety Driving HS CAN Bus Off
U007A	88	ADAS HS CAN Bus Off

Subsystem Principle

The data communication among ECUs is realized via the CAN bus. The gateway (GW) module connects several CAN bus circuits on the vehicle, and achieves the data communication across CAN bus between the ECUs, i.e. the ECU on a CAN bus achieves the communication with the ECU on another CAN bus through GW data forwarding. The GW monitors the communication state of each bus at the same time, and the DTC is set when it is detected that the CAN bus communication cannot be established.

Gateway (GW) circuit related to this DTC:

- GW(40Pin)-12: Diagnosis HS CAN Low.
- GW(40Pin)-11: Diagnosis HS CAN High.
- GW(40Pin)-15: Power HS CAN Low.
- GW(40Pin)-16: Power HS CAN High.
- GW(40Pin)-19: Body HS CAN Low.
- GW(40Pin)-20: Body HS CAN High.
- GW(40Pin)-24: ADAS HS CAN Low.
- GW(40Pin)-25: ADAS HS CAN High.
- GW(24Pin)-21: Power HS CAN (Extension) Low.
- GW(24Pin)-22: Power HS CAN (Extension) High.
- GW(24Pin)-01: Chassis HS CAN Low.
- GW(24Pin)-02: Chassis HS CAN High.
- GW(24Pin)-03: Connection HS CAN Low.
- GW(24Pin)-04: Connection HS CAN High.

Conditions for Running DTCs

U0073, U0074, U0075, U0076, U0077, U0078 and U0079:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.

U007A:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

The ECU fails to establish the CAN bus communication.

Operations of ECU after Failure

Initialise the CAN bus transceiver.

Conditions for Clearing DTCs

The ECU successfully establishes the CAN bus communication.

Possible Failure Causes

- CAN bus harness or connector circuit failure.
- The module circuit of each node on the CAN bus is faulty.

Diagnostic Test Steps

1. Disconnect the negative battery cable, disconnect the faulty module of each node on the CAN bus in turn for detection, and confirm whether the following failures exist; relevant modules can refer to "Circuit Diagram CAN Bus" chapter.

- Confirm whether the connector terminal between the module and the harness is damaged.

  ® Yes, repair the damaged terminal;

  ® No, perform the next step.

- Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
Power-on	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that failure exists at the harness side, and continue to test the module of next node;

® Within the range, which indicates that the failure exists at the module side, replace the module of current node.

® Complete the inspection on the modules of all nodes, if the CAN terminal voltage at the harness side is still abnormal, replace the CAN bus related harness.

U0103, U0110, U0164, U0236, U0292, U0293,U0298, U1003, U1009, U100E,U1103, U1111, U1115 and U1146

DTC Description

DTC	FTB	DTC Description
U0103	87	Lost Communication With Shift Control Unit (SCU)
U0110	87	Lost Communication With Traction Controller (TC)
U0164	87	Lost Communication With Heating, Ventilation and Air Conditioning (HVAC)
U0236	87	Lost Communication With Electric Steering Column Lock (ESCL)
U0292	87	Lost Communication With Integrated Starter Controller (ISC)
U0293	87	Lost Communication With Hybrid Powertrain Control Module (HCU)
U0298	87	Lost Communication With DC to DC converter (DCDC)
U1003	87	Lost Communication With Memory Seat Moudle (MSM)
U1009	87	Lost Communication With All Terrain System Switch (ATSSW)
U100E	87	Lost Communication With_Energy Storage System Positive Temperature Coefficient (ESSPTC)
U1103	87	Lost Communication With Actuator Control Unit (ACU)
U1111	87	Lost Communication With Battery Management System (BMS)
U1115	87	Lost Communication With Combined Charging Unit (CCU)
U1146	87	Lost Communication With Architecture Extension Module (AEM)

Subsystem Principle

The gateway (GW) module connects several CAN bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the CAN bus. The DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

U0103, U0110, U0292, U0293, U1009, U100E, U1103, U1111, U1115 and U1146:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

U0164 and U0236:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0075.

U0298:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0073.

U1003:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0074.

Conditions for Setting DTCs

A message frame of a specific ECU is not received within the given time.

Operations of ECU after Failure

The storage node loses the last message before communication.

Conditions for Clearing DTCs

A message frame of a specific ECU is received within the given time.

Possible Failure Causes

- Node loss module software failure.
- Node loss module power supply circuit failure.
- Node loss module CAN terminal failure.
- Node loss module hardware failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.

- Software version is not the latest.

  ® Yes, flash the software;

  ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.

- Confirm whether the connector terminal between the module and the harness is damaged.

  ® Yes, repair the damaged terminal;

® No, perform the next step.

• Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

U0121, U0122, U0126, U0127, U0128, U0131, U1101, U1122 and U1414

DTC Description

DTC	FTB	DTC Description
U0121	87	Lost Communication With Anti-lock Brake System (ABS)
U0122	87	Lost Communication With Stability Control System (SCS)
U0126	87	Lost Communication With Steering Angle Sensor (SAS)
U0127	87	Lost Communication With Tire Pressure Monitor System (TPMS)
U0128	87	Lost Communication With Electric Park Brake Module (EPB)
U0131	87	Lost Communication With Electric Power Steering (EPS)
U1101	87	Lost Communication With Clutch Cooling Electric Oil Pump (CCEOP)
U1122	87	Lost Communication With Electronic Hydraulic Brake System (EHBS)
U1414	81	Lost Communication With Electronic Park Motor Control Unit (EPMCU)

Subsystem Principle

The gateway (GW) module connects several CAN bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the CAN bus. The DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

U0121, U0126, U0128 and U0131:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0074.

U0122 and U1101:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0073.

U0127:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0076.

U1122:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0074.

U1414:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

A message frame of a specific ECU is not received within the given time.

Operations of ECU after Failure

The storage node loses the last message before communication.

Conditions for Clearing DTCs

A message frame of a specific ECU is received within the given time.

Possible Failure Causes

- Node loss module software failure.
- Node loss module power supply circuit failure.
- Node loss module CAN terminal failure.
- Node loss module hardware failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.
   - Software version is not the latest.

     ® Yes, flash the software;

     ® No, perform the next step.
2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.
   - Confirm whether the connector terminal between the module and the harness is damaged.

     ® Yes, repair the damaged terminal;

     ® No, perform the next step.
   - Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10 V
	Ignition (KL15) and Ground	More than 10 V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

U0140, U0147, U0151, U0159, U1001 and U1041

DTC Description

DTC	FTB	DTC Description
U0140	87	Lost Communication With Body Control Module (BCM)
U0147	87	Lost Communication With FOTA Management Unit (FMU)
U0151	87	Lost Communication With Supplemental Restraint System Diagnostic Module (SDM)
U0159	87	Lost Communication With Parking Distance Control Module (PDC)
U1001	87	Lost Communication With Passive Entry Passive Start (PEPS)
U1041	87	Lost Communication With Bluetooth Passive Entry Passive Start(BPEPS)

Subsystem Principle

The gateway (GW) module connects several CAN bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the CAN bus. The DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

U0140 and U1001:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0075.

U0147 and U1041:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0076.

U0151:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0073.

U0159:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ACC" or "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0074.

Conditions for Setting DTCs

A message frame of a specific ECU is not received within the given time.

Operations of ECU after Failure

The storage node loses the last message before communication.

Conditions for Clearing DTCs

A message frame of a specific ECU is received within the given time.

Possible Failure Causes

- Node loss module software failure.
- Node loss module power supply circuit failure.
- Node loss module CAN terminal failure.
- Node loss module hardware failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.

- Software version is not the latest.

  ® Yes, flash the software;

  ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.

- Confirm whether the connector terminal between the module and the harness is damaged.

  ® Yes, repair the damaged terminal;

  ® No, perform the next step.

- Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10 V
	Ignition (KL15) and Ground	More than 10 V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

U0155, U0186, U0197, U0198, U0208, U0245, U100E, U1023, U1102, U1113, U1263, U1267, U1269, U126A and U179C

DTC Description

DTC	FTB	DTC Description
U0155	87	Lost Communication With Instrument Pack (IPK)
U0186	87	Lost Communication with Amplifier (AMP)
U0197	87	Lost Communication With Ecall TBox
U0198	87	Lost Communication With Telematics Box (TBOX)
U0208	87	Lost Communication With Front Left Seat Control Module (FLSM)
U0245	87	Lost Communication With Front Infotainment Control Module (FICM)
U100E	87	Lost Communication With BMS-ESSPTC
U1023	87	Lost Communication With Around View Module (AVM)
U1102	87	Lost Communication With Chassis Management Module (CMM)
U1113	87	Lost Communication With Secondary Axle Motor Control Module(SAC)
U1263	87	Lost Communication With FVCM/FDR
U1267	87	Lost Communication With Full Display Mirror (FDM)
U1269	87	Lost Communication With High Definition Map (HDM)
U126A	87	Lost Communication With LFSDA/RFSDA
U179C	82	Vehicle Control Unit (VCU) Data Frame Check Error

Subsystem Principle

The gateway (GW) module connects several CAN bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the CAN bus. The DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

U0155, U0245 and U1267:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0076.

U0197 and U179C:

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

U0198:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0077.

U0186, U0208, U100E, U1023, U1102, U1113, U1263, U1269 and U126A:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0075.

Conditions for Setting DTCs

U0155, U0186, U0197, U0198, U0208, U0245, U100E, U1023, U1102, U1113, U1263, U1267, U1269 and U126A: A message frame of a specific ECU is not received within the given time.

U179C:Vehicle Control Unit (VCU) Data Frame Check Error.

Operations of ECU after Failure

U0155, U0186, U0197, U0198, U0208, U0245, U100E, U1023, U1102, U1113, U1263, U1267, U1269 and U126A: The storage node loses the last message before communication.

U179C:Record the corresponding DTC.

Conditions for Clearing DTCs

U0155, U0186, U0197, U0198, U0208, U0245, U100E, U1023, U1102, U1113, U1263, U1267, U1269 and U126A: A message frame of a specific ECU is received within the given time.

U179C:Vehicle Control Unit (VCU) Data Frame Check no Error.

Possible Failure Causes

- Node loss module software failure.
- Node loss module power supply circuit failure.
- Node loss module CAN terminal failure.
- Node loss module hardware failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.

• Confirm whether the connector terminal between the module and the harness is damaged.

® Yes, repair the damaged terminal;

® No, perform the next step.

• Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

U0420, U082A, U169D, U17A8, U17C7 and U182A

DTC Description

DTC	FTB	DTC Description
U0420	81	Electric Power Steering (EPS) Data Frame Check Error
U082A	82	Electric Park Brake Module (EPB) Data Frame Check Error
U169D	82	Shift Control Unit (SCU) Data Frame Check Error
U17A8	82	Auto Parking Assist System (APA) Data Frame Check Error
U17C7	82	Stability Control System (SCS) Data Frame Check Error
U182A	82	Electric Park Brake Module (EPB) Data Frame Check Error

Subsystem Principle

The communication mechanism of CAN bus prevents frame missing and data bit error in data transmission through Rolling Counter and Checksum. The DTC will be set when it is detected that the above two check mechanism errors occur during communication process.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.
- "Bus Off" DTC is not read.

Conditions for Setting DTCs

FTB 82: Data frame rolling counter check error.

FTB 81: Data frame checksum error.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

FTB 82: Data frame rolling counter check passed.

FTB 81: Data frame checksum passed.

Possible Failure Causes

- Signal failure node module software failure.
- Signal failure node module circuit failure.
- Signal failure node module hardware failure.
- Gateway (GW) module failure.

Diagnostic Test Steps

1. Use a scan tool to read the signal failure node module information.
   - Software version is not the latest.
     ® Yes, flash the software;
     ® No, perform the next step.
   - DTC exists.
     ® Yes, refer to DTC related chapter for service;
     ® No, perform the next step.
2. Try to replace the following components:
   - Signal failure node module.
   - Gateway (GW) module.

U1021, U1022, U115A, U115B, U1264, U1265, U1268, U126C and U126D

DTC Description

DTC	FTB	DTC Description
U1021	87	Lost Communication With Rear Drive Assist (RDA)
U1022	87	Lost Communication With RHRDA
U115A	87	Lost Communication With Point To Point Park Assist Module (P2P)
U115B	87	Lost Communication With Near Distance Assitant System (NDAS)
U1264	87	Lost Communication With Front View Camera Module (FVCM)
U1265	87	Lost Communication With Front Detection Radar (FDR)
U1268	87	Lost Communication With Driver Monitor System (DMS)
U126C	87	Lost Communication With Power net Guardian Module(PGM)
U126D	87	Lost Communication With Steering Wheel Switch(SWS)

Subsystem Principle

The gateway (GW) module connects several CAN bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the CAN bus. The DTC will be set when it is detected that the communication of an ECU is lost.

Conditions for Running DTCs

U0145, U1021, U1022, U126C and U126D:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0076.

U115A and U115B:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

U1264, U1265 and U1268:

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTC does not exist: U0074.

Conditions for Setting DTCs

A message frame of a specific ECU is not received within the given time.

Operations of ECU after Failure

The storage node loses the last message before communication.

Conditions for Clearing DTCs

A message frame of a specific ECU is received within the given time.

Possible Failure Causes

- Node loss module software failure.
- Node loss module power supply circuit failure.
- Node loss module CAN terminal failure.
- Node loss module hardware failure.

Diagnostic Test Steps

1. Use a scan tool to read the node loss module information.

- Software version is not the latest.

® Yes, flash the software;

® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the node loss module and the harness, and confirm whether the following failures exist.

- Confirm whether the connector terminal between the module and the harness is damaged.

® Yes, repair the damaged terminal;

® No, perform the next step.

- Test the terminal at the following harness side:

Conditions	Measure the terminals	Normal Value
Power-off	CAN High and CAN Low	60 or 120 Ω
	GND(KL31) and Ground	Conducting
Power-on	Power Supply (KL30) and Ground	More than 10V
	Ignition (KL15) and Ground	More than 10V
	CAN High and Ground	2.5 - 4.3 V
	CAN Low and Ground	0.7 - 2.5 V

® Out of range, which indicates that the failure exists at the harness side, service the harness circuit failure;

® Within the range, which indicates that the failure exists at the module side, replace the node loss module.

U1116

DTC Description

DTC	FTB	DTC Description
U1116	87	Lost Communication With Electronic Battery Sensor (EBS)

Subsystem Principle

The electronic battery sensor (EBS) is fitted on the negative battery cable, and calculates the residual capacity of battery through battery working current. The GW establishes the communication with EBS via LIN bus, and obtains the battery power and other related information. The DTC will be set when it is detected that the EBS information is not received.

Gateway (GW) circuit related to this DTC:

- GW(40Pin)-13: LIN bus.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

LIN bus EBS node information is not received.

Operations of ECU after Failure

The storage node loses the last message before communication.

Conditions for Clearing DTCs

All failure setting conditions are not met any longer.

Possible Failure Causes

- GW module software is not the latest.
- EBS Internal failure.
- EBS power supply/ground failure.
- EBS communication failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information:

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, perform the next step.

2. Disconnect the negative battery cable, disconnect the connector between the GW and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the following harness terminals.

Conditions	Measure the terminals	Normal Value
Power-off	GW(40Pin)-13 and Ground	Non-conducting
Power-on	GW(40Pin)-13 and Ground	Higher than 10V

   ® Out of range, service the circuit failure or replace the harness;

   ® Within the range, perform the next step.

3. Disconnect the negative battery cable, disconnect the connector between the EBS and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Confirm whether the power supply and the ground of EBS are normal.

   ® Yes, perform the next step.

   ® No, service the related circuit failure.

   • Test the following circuit status between the harness module and the EBS.

Measure the terminals	Normal Value
GW(40Pin)-13 and EBS-01	Conducting

   ® Out of range, check the middle connector or replace the faulty harness;

   ® Within the range, replace the EBS.

U1500

DTC Description

DTC	FTB	DTC Description
U1500	00	VIN Mismatch with FOTA Management Unit (FMU)

Subsystem Principle

The flash management unit (FMU) sends the vehicle wakeup request instruction to the gateway (GW) via the CAN bus, and the GW executes the operation of waking up the vehicle network. The GW shall check if the VINs of FMU and GW are matched, when mismatch is detected, the DTC will be set.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.
- The following DTCs do not exist: U0077 88 and U0147 87.

Conditions for Setting DTCs

The VIN information stored in the GW is mismatched with the VIN information received from the FMU.

Operations of ECU after Failure

It is prohibited to execute the network wakeup request instruction from the FMU.

Conditions for Clearing DTCs

The VIN information stored in the GW is successfully matched with the VIN information received from the FMU.

Possible Failure Causes

- The VIN of GW module is mismatched with current vehicle.
- The VIN of FMU module is mismatched with current vehicle.

Diagnostic Test Steps

1. Use a scan tool to read the GW and FMU module information:

- The VIN of GW module is mismatched with current vehicle.

  ® Yes, flash the configuration of GW or replace the GW module with a new one;

  ® No, perform the next step.

- The VIN of FMU module is mismatched with current vehicle:

  ® Yes, flash the configuration of FMU or replace the FMU module with a new one;

  ® No, perform the next step.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Power Supply Circuit Voltage High
U1563	16	Battery Power Supply Circuit Voltage Low

Subsystem Principle

The battery provides 12V standard power supply to each ECU through the KL30 circuit. At vehicle startup, the high/low voltage conversion system charges the battery to maintain the battery power and voltage. When abnormal KL30 voltage is detected, the DTC is set.

Gateway (GW) circuit related to this DTC:

- GW(24Pin)-10: Power supply 1.
- GW(40Pin)-05: Power supply 2.
- GW(24Pin)-19: Ground 1.
- GW(40Pin)-23: Ground 2.

Conditions for Running DTCs

- ECU is in wakeup state.

Conditions for Setting DTCs

U1562 17: The battery KL30 voltage is greater than 16V for 1s.

U1563 16: The battery KL30 voltage is less than 9V for 1s.

Operations of ECU after Failure

Disable the diagnostic functions of all ECUs.

Conditions for Clearing DTCs

U1562 17: The battery KL30 voltage is less than 15.5V for 1s.

U1563 16: The battery KL30 voltage is greater than 9.5V for 1s.

Possible Failure Causes

- Battery feeding.
- Battery failure.
- Contact between the power supply and the ground circuit is poor.
- Fuse contact is poor.
- High/low voltage conversion system failure.
- Gateway module failure.

Diagnostic Test Steps

1. Measure the battery voltage:

   • The voltage is less than 10 volts.

   ® Yes, troubleshoot the battery and charging system failure, go to Step 2;

   ® No, troubleshoot the circuit problem, go to Step 3.

2. After the battery is normally charged, check the following abnormal conditions:

   • The battery voltage is lower than 12 volts at vehicle startup.

   ® Yes, service the battery charging system;

   ® No, perform the next step.

   • When the vehicle is in normal operation, the vehicle still has the feeding phenomenon.

   ® Yes, replace the battery;

   ® No, end the repair.

3. Open the fuse box, and check if the KL30 power supply related fuses have the following abnormal conditions:

   • Fuse connector or terminal has corrosion or poor contact.

   ® Yes, replace the abnormal fuse or connector wire;

   ® No, perform the next step.

4. Disconnect the negative battery cable, disconnect the connector between the GW and the harness, and confirm whether the following failures exist.

   • Confirm whether the connector terminal between the module and the harness is damaged.

   ® Yes, repair the damaged terminal;

   ® No, perform the next step.

   • Test the terminal at the following harness side.

Conditions	Measure the terminals	Normal Value
Power-off	GW(24Pin)-19 and Ground	Conducting
	GW(40Pin)-23 and Ground	Conducting
Power-on	GW(24Pin)-10 and Ground	More than 10V
	GW(40Pin)-05 and Ground	More than 10V

® Out of range, which indicates that the failure exists at the harness side, service the related harness circuit conductivity failure;

® Within the range, which indicates that the failure exists at the module side, replace the GW module.

U2001

DTC Description

DTC	FTB	DTC Description
U2001	41	ECU EEPROM Check Error
U2001	42	ECU EEPROM Access Error

Subsystem Principle

ECU internal memories EEPROM and RAM are used for data storage and reading/writing. The characteristics of EEPROM are readable, power-off data not lost but low speed. The characteristics of EEPROM are readable, power-off data lost but high speed. The DTC will be set when it is detected that the data reading/writing failed and the data storage correctness check failed.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- ECU is in wakeup state.

Conditions for Setting DTCs

U2001 41: It is detected that the EEPROM correctness check failed.

U2001 42: It is detected that the EEPROM reading/writing failed.

Operations of ECU after Failure

- Maintain the system basic function.
- Record the failure message.

Conditions for Clearing DTCs

U2001 41: It is detected that the EEPROM correctness check passed.

U2001 42: It is detected that the EEPROM reading/writing is successful.

Possible Failure Causes

- GW software version is not the latest.
- Gateway module (GW) failure.

Diagnostic Test Steps

1. Try to replace the following components.
   - Controller software version is not the latest.

     ® Yes, flash the software;

     ® No, perform the next step.
2. Try to replace the following components.
   - Gateway module.

U2218, U2219, U2265 and U2270

DTC Description

DTC	FTB	DTC Description
U2218	87	Response Timeout for HTTP Request-ICM
U2219	87	Response Timeout for SOME/IP Request-ICM(Intelligent Cockpit Module)
U2265	00	Lost Ethernet Connection with ICM
U2270	00	Lost Ethernet Connection with IPK/ICM

Subsystem Principle

The gateway (GW) module connects several Ethernet bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the Ethernet bus. The DTC will be set when it is detected that the transmission command request of an ECU is not responded for a very long time.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

U2218 and U2219: A message frame of a specific ECU is not received within the given time.

U2265,U2270: After the DTC enabling conditions are met, the Ethernet PHY is in link-off state for 500ms.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

U2218 and U2219: A message frame of a specific ECU is received within the given time.

U2265,U2270: The Ethernet PHY is continuously in the connected state for 500ms.

Possible Failure Causes

- Connector or harness failure.
- Intelligent compartment controller module failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information.
   - Software version is not the latest.

     ® Yes, flash the software;

     ® No, go to 2.
2. Check the intelligent compartment controller module - GW module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 3.
3. Check the GW module failure:

   ® Abnormal, GW module failure, the diagnosis is completed;

   ® Normal, go to TAC Human Assistance.

U2226, U2227 and U2278

DTC Description

DTC	FTB	DTC Description
U2226	87	Response Timeout for SOME/IP Request-FVCM
U2227	87	Response Timeout for HTTP Request-FVCM
U2278	00	Lost Ethernet Connection with FVCM

Subsystem Principle

The gateway (GW) module connects several Ethernet bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the Ethernet bus. The DTC will be set when it is detected that the transmission command request of an ECU is not responded for a very long time.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

U2226 and U2227: A message frame of a specific ECU is not received within the given time.

U2278: After the DTC enabling conditions are met, the Ethernet PHY is in link-off state for 500ms.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

U2226 and U2227: A message frame of a specific ECU is received within the given time.

U2278: The Ethernet PHY is continuously in the connected state for 500ms.

Possible Failure Causes

- Connector or harness failure.
- Front view camera module failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information.

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, go to 2.

2. Check the front view camera module - GW module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 3.

3. Check the GW module failure:

   ® Abnormal, GW module failure, the diagnosis is completed;

   ® Normal, go to TAC Human Assistance.

U2228, U2229 and U2263

DTC Description

DTC	FTB	DTC Description
U2228	87	Response Timeout for SOME/IP Request-TBOX
U2229	87	Response Timeout for HTTP Request-TBOX
U2263	00	Lost Ethernet Connection with TBOX

Subsystem Principle

The gateway (GW) module connects several Ethernet bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the Ethernet bus. The DTC will be set when it is detected that the transmission command request of an ECU is not responded for a very long time.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

U2228 and U2229: A message frame of a specific ECU is not received within the given time.

U2263: After the DTC enabling conditions are met, the Ethernet PHY is in link-off state for 500ms.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

U2228 and U2229: A message frame of a specific ECU is received within the given time.

U2263: The Ethernet PHY is continuously in the connected state for 500ms.

Possible Failure Causes

- Connector or harness failure.
- TBOX failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information.
   - Software version is not the latest.

   ® Yes, flash the software;

   ® No, go to 2.
2. Check the TBOX - GW module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 3.
3. Check the GW module failure:

   ® Abnormal, GW module failure, the diagnosis is completed;

   ® Normal, go to TAC Human Assistance.

U222E, U222F and U227C

DTC Description

DTC	FTB	DTC Description
U222E	87	Response Timeout for SOME/IP Request-LADS(Low Speed Automated Driving System)
U222F	87	Response Timeout for HTTP Request-LADS(Low Speed Automated Driving System)
U227C	00	Lost Ethernet Connection with LADS(Low Speed Automated Driving System)

Subsystem Principle

The gateway (GW) module connects several Ethernet bus circuits on the vehicle, and conducts the communication monitoring for the ECU of each node on the Ethernet bus. The DTC will be set when it is detected that the transmission command request of an ECU is not responded for a very long time.

Conditions for Running DTCs

- The battery voltage is within the normal range, and remains stable.
- The start switch is in "ON" state.
- ECU is in wakeup state.

Conditions for Setting DTCs

U222E and U222F: A message frame of a specific ECU is not received within the given time.

U227C: After the DTC enabling conditions are met, the Ethernet PHY is in link-off state for 500ms.

Operations of ECU after Failure

Record the failure message.

Conditions for Clearing DTCs

U222E and U222F: A message frame of a specific ECU is received within the given time.

U227C: The Ethernet PHY is continuously in the connected state for 500ms.

Possible Failure Causes

- Connector or harness failure.
- Low-speed driver assistance control module failure.
- Gateway module failure.

Diagnostic Test Steps

1. Use a scan tool to read the GW module information.

   • Software version is not the latest.

   ® Yes, flash the software;

   ® No, go to 2.

2. Check the low-speed driver assistance control module - GW module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 3.

3. Check the GW module failure:

   ® Abnormal, GW module failure, the diagnosis is completed;

   ® Normal, go to TAC Human Assistance.

Driver Monitor System (DMS)

DTC Index

List

DTC	FTB	Description	Failure Level*
B2340	4B	ECU Over Temperature Failure	IIB
B2341	4B	Camera Over Temperature Failure	IIB
B2342	11	Camera Power Fault - Circuit Short to Ground	III
B2342	12	Camera Power Fault - Circuit Short to Battery	III
B2342	13	Camera Power Fault - Circuit Open	III
B2342	4B	ECU Inner Power-Supply Related Circuit Module Failure	III
B2343	04	ECU Hardware Error	III
B2344	09	Camera Hardware Error	III
B2345	45	Control Module Memory Error	III
B2345	47	ECU Error - Internal Watchdog Error	III
B2345	61	ECU Calculation Failure	III
B2348	82	Invalid Data Received from Power Steering Control Module (EPS)	III
B2348	83	Invalid Data Received from Power Steering Control Module (EPS)	III
B2349	82	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)	III
B2349	83	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)	III
B234A	00	Ethernet PHY Invalid ID	III
B234B	95	Camera Integrity Failure	IIB
B234D	00	Driver Monitor System (DMS) Safety Companion Core Error	III
U0073	88	CAN Bus Off	III
U0100	87	Lost Communication with Engine Control Module (ECM) or Vehicle Control Unit Control Unit (HCU/VCU)	III
U0126	87	Lost Steering Wheel Angle Signal	III
U0146	87	Lost Communication with Gateway (GW) / Connected Computation Platform (CCP)	III
U0155	87	Lost Communication with Instrument Pack (IPK)	III
U1264	87	Lost Communication with Front View Camera Module (FVCM)	III
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U1562	17	Battery Voltage High	III
U1563	16	Battery Voltage Low	III
U2000	04	ECU Hardware Error	III
U2002	42	ECU Error - RAM Error	III
U2004	42	ECU Error - ROM Error	III
U2007	09	I/O Hardware Error	III
U2010	00	Camera I2C Failure	IIB
U2210	87	SOME/IP Data Response Time out - GW / CCP / ICC	III
U2211	87	HTTP Data Response Time out - GW / CCP / ICC	III
U2262	00	Lost Ethernet Communication with Gateway(GW) / Connected Computation Platform (CCP) / Intelligent Computation Center (ICC)	III
U2262	01	Ethernet - Electrical Failure	III
U2262	2F	Ethernet - Signal Degradation	III

DTC	FTB	Description	Failure Level*
U2262	68	Ethernet - Link Lost	III

*Remarks:
Failure level description:

- I: The failure requires an immediate check of the vehicle
- IIA: The failure requires a check of the vehicle by driving slowly to the nearby maintenance station directly under a safe condition
- IIB: The failure requires a check of the vehicle by driving to the nearby maintenance station as soon as possible when convenient
- III: The failure requests maintanance only
- IV: Maintanance as actual required

Diagnosis Information and Procedure

B2340 and B2341

DTC Description

DTC	FTB	DTC Description
B2340	4B	ECU Over Temperature Failure
B2341	4B	Camera Over Temperature Failure

Subsystem Principle

Failure detected inside the module, not involving external circuits.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B2340 4B: DMS ECU temperature is higher than 90℃ for 1 s.

B2341 4B: The sensed temperature of the camera temperature sensor is higher than 90 ℃ for 1 s.

Operations of ECU after Failure

- The related system function fails.
- DMS system shutdown.
- Restart after the temperature returns to normal for 5s.

Conditions for Clearing DTCs

B2340 4B: The DMS ECU temperature returns to normal for 5s.

B2341 4B: The sensed temperature of the camera temperature sensor returns to normal for 5s.

Possible Failure Causes and Maintenance Scheme

1. Excessive temperature of module and camera.
   - Wait for the module and camera to cool down.
2. Module or camera failure.
   - Flash/replace the faulty parts.

Reference Circuit Diagram

Driver Monitor System

Diagnostic Test Steps

1. Check the temperature of DMS module and camera:

   ® If abnormal, wait for the module to cool down to the normal range;

   ® Normal, go to 2;

2. Check the module software version:

   ® If the software is not the latest, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the DMS module and camera:

® If abnormal, replace the faulty parts;

® Normal, go to TAC Human Assistance.

B2342 and B2343

DTC Description

DTC	FTB	DTC Description
B2342	11	Camera Power Fault - Circuit Short to Ground
	12	Camera Power Fault - Circuit Short to Battery
	13	Camera Power Fault - Circuit Open
	4B	ECU Inner Power-Supply Related Circuit Module Failure
B2343	04	ECU Hardware Error

Subsystem Principle

The module will check the system voltage and internal power supply to confirm whether there is any failure in the module internal power supply and camera power supply line.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B2342 11: The camera power supply circuit is short to ground.

B2342 12: The camera power supply circuit is short to the power supply.

B2342 13: The camera power supply circuit is open.

B2342 4B: The ECU has an internal power failure.

B2343 04: The ECU hardware failure.

Operations of ECU after Failure

Reset and reinitialize the failed module.

Conditions for Clearing DTCs

- No related failures are detected.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Failure of DMS module and camera.
   - Flash the software/replace the control module or camera.

Reference Circuit Diagram

Driver Monitor System

Diagnostic Test Steps

1. Connect the scan tool to confirm the failure:
   a. Connect the scan tool, and place the start switch in "ON" position.
   b. Verify that no other DTCs have been read.
2. Check related connectors and wiring:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.
3. Check the DMS module software version:

   ® If the software is not the latest, upgrade the software version;

   ® If the software is the latest version, or the problem cannot be solved by upgrading the software version, go to Step 4.
4. Check the DMS module and camera:

   ® If abnormal, replace the faulty parts;

   ® Normal, go to TAC Human Assistance.

B2344, U234B and U2010

DTC Description

DTC	FTB	DTC Description
B2344	09	Camera Hardware Error
B234B	95	Camera Integrity Failure
U2010	00	Camera I2C Failure

Subsystem Principle

A failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B2344 09: Camera hardware failure.

B234B 95: Invalid device serial number.

U2010 00: Lost ACK, I2C communication timeout or camera I2C failure.

Operations of ECU after Failure

U2344 09: DMS output signals N/A, the related system function fails.

U234B 95: DMS output signals N/A, the related system function fails.

U2010 00: DMS output signals N/A, the related system function fails.

Conditions for Clearing DTCs

- No related system failure is detected.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Camera internal failure.

   ® Replace/repair the module.

Reference Circuit Diagram

Driver Monitor System

Diagnostic test steps:

1. Check the module harness and connectors:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the camera:

   ® Confirm whether there are abnormal module functions, software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module, and replace the camera if the failure still exists.

   ® Normal, go to TAC Human Assistance.

B2345 and B234D

DTC Description

DTC	FTB	DTC Description
B2345	45	Control Module Memory Error
	47	ECU Error - Internal Watchdog Error
	61	ECU Calculation Failure
B234D	00	Driver Monitor System (DMS) Safety Companion Core Error

Subsystem Principle

A self-test failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B2345 45: Controller storage failure.

B2345 47: The watchdog detects any abnormal errors or timeouts in the operating system or security mechanism.

B2345 61: If data from the Smart-Eye freezed(timestamp freezed) for 1sec or the Brighness of the Image not in readable range.

B234D 00: Heartbeat Interrupted or SC software is not the release version.

Operations of ECU after Failure

B2345 45, B2345 47 and B2345 61: DMS output signals N/A, the related system function fails.

B234D 00: None.

Conditions for Clearing DTCs

B2345 45, B2345 47 and B2345 61:

- The detection system does not detect any related failure.
- After 40 power cycles, the history DTC will be cleared.

B234D 00:

- Heartbeat is normal and SC software is the release version.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Module internal failure.

   ® Replace/repair the module.

Reference Circuit Diagram

Driver Monitor System

Diagnostic test steps:

1. Check the module harness and connectors:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the DMS software version:

   ® If the software is not the latest, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the DMS module:

   ® If abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

B2348, B2349, U0100, U0126 and U0155

DTC Description

DTC	FTB	DTC Description
B2348	82	Invalid Data Received from Power Steering Control Module (EPS)
	83	Invalid Data Received from Power Steering Control Module (EPS)
B2349	82	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
	83	Invalid Data Received from Stability Control System (SCS) / Integrated Brake System (IBS)
U0100	87	Lost Communication with Engine Control Module (ECM) or Vehicle Control Unit (HCU/VCU)
U0126	87	Lost Steering Wheel Angle Signal
U0155	87	Lost Communication with Instrument Pack (IPK)

Subsystem Principle

The Driver Fatigue Monitoring System (DMS) communicates with other modules via CAN bus and gateway module (GW).

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- DTC not set: U0073 88.

Conditions for Setting DTCs

B2348 82, B2348 83, B2349 82, B2349 83: Error or invalid data received from the corresponding module, or communication timeout.

U0100 87: The DTC will be set if the specified data frame sent from the module cannot be received within 5s.

U0126 87, U0155 87: The DTC will be set if the specified data frame sent from the module cannot be received within 2s.

Operations of ECU after Failure

B2348 82, B2348 83, B2349 82, B2349 83: DMS output signals N/A, the related system function fails.

U0100 87, U0126 87, U0155 87: DMS will enter the safe mode and DMS will be downgraded.

Conditions for Clearing DTCs

- The specified data frames sent by the module can be received for 100 consecutive cycles, and the values are within the confidence range.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check the integrity of Driver Assistance HS CAN network:

   ® Confirm that other modules are tested normally.

2. Check related lines:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software versions of DMS, gateway and corresponding modules:

   ® If the software is not the latest, upgrade the software version;

   ® If the software is the latest version, or the problem cannot be solved by upgrading the software version, go to Step 4.

4. Check the DMS, gateway module and related modules:

   ® If abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

B234A, U2210, U2211 and U2262

DTC Description

DTC	FTB	DTC Description
B234A	00	Ethernet PHY Invalid ID
U2210	87	SOME/IP Data Response Time out - GW / CCP / ICC
U2211	87	HTTP Data Response Time out - GW / CCP / ICC
U2262	00	Lost Ethernet Communication with Gateway(GW) / Connected Computation Platform (CCP) / Intelligent Computation Center (ICC)
	01	Ethernet - Electrical Failure
	2F	Ethernet - Signal Degradation
	68	Ethernet - Link Lost

Subsystem Principle

The Driver Fatigue Monitoring System (DMS) communicates with other modules via Ethernet.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

B234A 00: The read and detected ID is invalid or does not meet the standard.

U2210 87: The GW/CCP/ICC doesn't respond to application requests for 2s.

U2211 87: The GW/CCP/ICC doesn't respond to application requests for 2s.

U2262 00: The Ethernet PHY is in link-down status for 500 milliseconds after the DTC enable condition is satisfied.

U2262 01: There is an electrical failure in Ethernet.

U2262 2F: The Ethernet has signal degradation.

U2262 68: The Ethernet link is lost.

Operations of ECU after Failure

Record the DTC.

Conditions for Clearing DTCs

- No related failures are detected, and the Ethernet communication returns to normal.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Ethernet

Diagnostic Test Steps

1. Connect the scan tool to confirm the failure:
   a. Connect the scan tool, and place the start switch in "ON" position.
   b. Verify that no other DTCs have been read.
2. Check related lines:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.
3. Check the software version of DMS and related modules:

   ® If the software is not the latest, upgrade the software version;

   ® If the software is the latest version, or the problem cannot be solved by upgrading the software version, go to Step 4.
4. Check the DMS and related modules:

   ® If abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

U0073 and U0146

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW)/Connected Computation Platform (CCP)

Subsystem Principle

The Driver Fatigue Monitoring System (DMS) communicates with the Gateway (GW)/Connected Computation Platform (CCP) via CAN bus.

Conditions for Running DTCs

U0073 88:

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

U0146 87:

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- DTC not set: U0073 88.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame sent from the Gateway cannot be received within 2s.

Operations of ECU after Failure

U0073 88:

- Initialise the CAN transceiver.
- Set signal defaults according to specific functions.
- The related system function fails.
- Set DMS related valid signals to invalid.
- The bus is reconnected every second.
- If the display bus is off, reset the system.

U0146 87: Related system functions fail and default values are set, and the system is reset in more severe cases.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- After 40 power cycles, the history DTC will be cleared.

U0146 87:

- The specified data frame sent from the module can be received within 100 cycles.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check the integrity of Driver Assistance HS CAN network:

   ® Confirm that other modules are tested normally.

2. Check related lines:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the DMS and GW/CCP software version:

   ® If the software is not the latest, upgrade the software version;

   ® If the software is the latest version, or the problem cannot be solved by upgrading the software version, go to Step 4.

4. Check the DMS and GW /CCP module:

   ® If abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

U1264 and U1265

DTC Description

DTC	FTB	DTC Description
U1264	87	Lost Communication with Front View Camera Module (FVCM)
U1265	87	Lost Communication with Front Detection Radar (FDR)

Subsystem Principle

Driver Fatigue Monitoring System (DMS) communicates with front view camera module (FVCM) and forward detection radar (FDR) via a set of CAN buses.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.
- DTC not set: U0073 88.

Conditions for Setting DTCs

If the specified data frame sent by the corresponding module cannot be received for 2s, the DTC will be set.

Operations of ECU after Failure

Related system functions fail and default values are set, and the system is reset in more severe cases.

Conditions for Clearing DTCs

- The specified data frame sent by the corresponding module can be received.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Replace/repair related harness.
2. Connector failure or poor fit.
   - Replace/repair the harness connector.
3. Related module failure.
   - Flash the software/replace the control module.

Reference Circuit Diagram

BUS System - Driver Assistance High Speed Controller Area Network

Diagnostic Test Steps

1. Check the integrity of Driver Assistance HS CAN network:

   ® Confirm that other modules are tested normally;

2. Check related lines:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of DMS and corresponding modules:

   ® If the software is not the latest, upgrade the software version;

   ® If the software is the latest version, or the problem cannot be solved by upgrading the software version, go to Step 4.

4. Check the DMS and corresponding modules:

   ® If abnormal, replace the faulty modules;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The module will monitor the system voltage to check whether the supply voltage of the module is within the normal operating range.

Conditions for Running DTCs

The start switch is in "ON" position.

Conditions for Setting DTCs

U1562 17: The supply voltage is higher than 16V for 1s.

U1563 16: The supply voltage is lower than 9V for 1s.

Operations of ECU after Failure

Disable the failure diagnosis function.

Conditions for Clearing DTCs

U1562 17:

- The system voltage is lower than 15.5V for 1s.
- After 40 power cycles, the history DTC will be cleared.

U1563 16:

- The system voltage is higher than 9.5V for 1s.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Storage battery aging/damaged.
   - Replace the storage battery.
2. Harness or connector failure.
   - Replace/repair the harness or connector.
3. Storage battery cable failure.
   - Replace/repair the storage battery cable.
4. Failure of HV/LV conversion system.
   - Check/repair related components.
5. Internal failure of control module.
   - Replace/flash the control module.

Reference Circuit Diagram

Driver Monitor System

Diagnostic Test Steps

1. Check the storage battery:

   ® Confirm whether the battery function is normal, and whether there are battery aging, damage, deformation, liquid leakage and other abnormal conditions: Replace the battery.

   ® If normal, go to Step 2.

2. Check the module harness and connectors:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the storage battery cable:

   ® Confirm whether the battery cable function is normal, and whether there are looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the module:

   ® Confirm whether the module function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2000, U2002, U2004 and U2007

DTC Description

DTC	FTB	DTC Description
U2000	04	ECU Hardware Error
U2002	42	ECU Error - RAM Error
U2004	42	ECU Error - ROM Error
U2007	09	I/O Hardware Error

Subsystem Principle

A failure occurs inside the module, not involving external circuits.

Conditions for Running DTCs

- 1 second after the communication is enabled.
- The system voltage is normal.
- The start switch is in "ON" position.

Conditions for Setting DTCs

U2000 04: ECU hardware failure, such as: RAM failure, ROM failure, EEPROM failure, internal self-test failure, etc.

U2002 42:

- DBSC4 RAM controller and LPDDR4 RAM failure.
- AXI bus transmission failure.
- Operation failure of Arm real-time kernel, MFIS or EFUSE.

U2004 42: Operation failure of CR7 and AXI buses.

U2007 09:

- Internal bus interface failure.
- Peripheral configuration register failure.
- The CPG frequency is incorrect.
- Rcar-3 peripheral reset state failure.

Operations of ECU after Failure

- DMS output signals N/A, the related system function fails.
- Try to initialize, and the system enters the safe mode, CAN not available.

Conditions for Clearing DTCs

- The module returns to normal operation.
- After 40 power cycles, the history DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Module internal failure.

   ® Repair/replace the module.

Reference Circuit Diagram

Driver Monitor System

Diagnostic test steps:

1. Check the module harness and connectors:

   ® For connector looseness, Pin deformation/breakage, module power supply/grounding harness failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the DMS module:

   ® Confirm whether there are abnormal module functions, software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module and the camera.

   ® Normal, go to TAC Human Assistance.

Front Left Seat Control Module (FLSM)

DTC Index

List

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B1026	11	Steering Wheel Heat Temperature Sensor Signal Circuit Short to Ground	III
B1026	25	Steering Wheel Heat Temperature Sensor Signal Waveform Failure	III
U0073	88	CAN Bus Off	I
U010F	87	Lost Communication with Air Conditioning Control Module (AC)	II
U0140	87	Lost Communication with Body Control Module (BCM)	II
U0146	87	Lost Communication with Gateway (GW)	II
U1562	17	Battery Voltage High	I
U1563	16	Battery Voltage Low	I

*Remarks:
Failure level description:

- I: The failure requires an immediate check of the vehicle
- IIA: The failure requires a check of the vehicle by driving slowly to the nearby maintenance station directly under a safe condition
- IIB: The failure requires a check of the vehicle by driving to the nearby maintenance station as soon as possible when convenient
- III: The failure requests maintanance only
- IV: Maintanance as actual required

Diagnosis Information and Procedure

B1015 and B1016

DTC Description

DTC	FTB	Failure Description
B1015	11	Left Seat Heat Sensor signal circuit short to ground
B1015	15	Left Seat Heat Sensor signal circuit short to Battery or or open
B1015	25	Left Seat Heat sensor signal waveform failure
B1016	11	Right Seat Heat Sensor signal circuit short to ground
B1016	15	Right Seat Heat Sensor signal circuit short to Battery or open
B1016	25	Right Seat heat sensor signal waveform failure

Subsystem Principle

The front seat temperature sends the message to the front left seat control module, which is used to control the operation of front seat heating element.

Conditions for Running DTCs

- The controller is waken up.
- The engine is not started within the latest 1000ms.

Conditions for Setting DTCs

B1015 11 and B1016 11: It is detected that the signal voltage of the temperature sensor is less than 0.5V for 4s.

B1015 15 and B1016 15: It is detected that the signal voltage of the temperature sensor is higher than 4.9V for 4s.

B1015 25 and B1016 25: It is detected that the sensor voltage does not change 75% of the heat load within 8 minutes.

Operations of ECU after Failure

B1015 11, B1016 11, B1015 15 and B1016 15: The seat heating function is invalid.

B1015 25 and B1016 25: Record the DTC.

Conditions for Clearing DTCs

B1015 11 and B1016 11:

- It is detected that the signal voltage of the temperature sensor is higher than 0.5V for 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1015 15 and B1016 15:

- It is detected that the signal voltage of the temperature sensor is less than 4.9V for 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1015 25 and B1016 25:

- During heating, the NTC sensor voltage changes for 8 minutes based on the calibration parameters.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes

- Harness or connector failures.
- Seat temperature sensor failure.
- FLSM control module failure.

Diagnostic Test Steps

1. Check the seat temperature sensor - front left seat control module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 2.

2. Check the seat temperature sensor:

   ® Abnormal, repair/replace the seat temperature sensor;

   ® Normal, go to 3.

3. Check the FLSM control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the FLSM control module;

   ® Normal, go to TAC Human Assistance.

B1019 and B1020

DTC Description

DTC	FTB	Failure Description
B1019	11	Front Left Seat Heater Circuit high side Short to Ground
B1019	12	Front Left Seat Heater Circuit high side Short to Battery
B1020	11	Front Right Seat Heater Circuit high side Short to Ground
B1020	12	Front Right Seat Heater Circuit high side Short to Battery

Subsystem Principle

The front seat temperature sends the message to the front left seat control module, which is used to control the operation of front seat heating element.

Conditions for Running DTCs

- The controller is waken up.
- The engine is not started within the latest 1000ms.
- Seat heating function is turned on.

Conditions for Setting DTCs

B1019 11 and B1020 11: The heat load on the left side is 100%, and the multi-sensor voltage in HSD is 4.9V for 0.2s.

B1019 12 and B1020 12: The heat load on the left side is 100%, and the multi-sensor voltage in HSD is less than 0.4V for 5s.

Operations of ECU after Failure

If the seat heating function is invalid, record the DTC.

Conditions for Clearing DTCs

The heat load is 100%, and the multi-sensor voltage in HSD is between 2 and 4V.

Possible Failure Causes

- Harness or connector failures.
- Seat heating element failure.
- FLSM control module failure.

Diagnostic Test Steps

1. Check the seat heating element - front left seat control module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 2.

2. Check the seat heating element:

   ® Abnormal, repair/replace the seat heating element;

   ® Normal, go to 3.

3. Check the FLSM control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the FLSM control module;

   ® Normal, go to TAC Human Assistance.

B1025 and B1026

DTC Description

DTC	FTB	Failure Description
B1025	12	Steering Wheel Heat Circuit Low Side Driver Short to Battery
B1026	12	Steering Wheel Heat Temperature Sensor Signal Circuit Short to Battery
B1026	11	Steering Wheel Heat Temperature Sensor Signal Circuit Short to Ground
B1026	25	Steering Wheel Heat Temperature Sensor Signal Waveform Failure

Subsystem Principle

The steering wheel heating temperature sensor and the heating element are integrated in the steering wheel, and the operation of steering wheel heating element is controlled through the button on the centre console.

Conditions for Running DTCs

- The controller is waken up.
- The engine is not started within the latest 1000ms.
- Steering wheel heater is on.

Conditions for Setting DTCs

B1025 12: The front seat ventilation/heating function is turned off, and it is detected that L_S_FAND_ in the Pin changes from high to low within 10ms.

B1026 12: It is detected that the signal voltage of the temperature sensor is higher than 4.9V for 4s.

B1026 11: It is detected that the signal voltage of the temperature sensor is less than 0.5V for 4s.

B1026 25: It is detected that the signal voltage update range of the temperature sensor is less than 3℃, and continue to heat for 8 minutes.

Operations of ECU after Failure

B1025 12: Record the DTC, and the steering wheel heating function is invalid.

B1026: The steering wheel heating function is invalid.

Conditions for Clearing DTCs

B1025 12:

- The FLSM changes from sleep to wakeup, and it is detected that the Pin level of L_S_FAND_ remains high within 10ms.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1026 12:

- It is detected that the signal voltage of the temperature sensor is less than 4.9V for 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1026 11:

- It is detected that the signal voltage of the temperature sensor is higher than 0.5V for 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1026 25:

- It is detected that the signal voltage update range of the temperature sensor is higher than 3℃, and heat for 5 minutes.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes

- Harness or connector failures.
- Steering wheel heating element failure.
- FLSM control module failure.

Diagnostic Test Steps

1. Check the steering wheel heating element - front left seat control module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness";

   ® Normal, go to 2.

2. Check the steering wheel heating element:

   ® Abnormal, repair/replace the steering wheel heating element;

   ® Normal, go to 3.

3. Check the FLSM control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the FLSM control module;

   ® Normal, go to TAC Human Assistance.

U0073, U010F, U0140 and U0146

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off
U010F	87	Lost Communication with Air Conditioning Control Module (AC)
U0140	87	Lost Communication with Body Control Module (BCM)
U0146	87	Lost Communication with ICC/GW

Subsystem Principle

The front left seat control module communicates with other modules via the CAN bus.

Conditions for Running DTCs

U0073 88:

- 1s after the network is woken up.
- In the normal network mode.
- 1s after the voltage high/low failure (if any) recovers.
- Not engine startup stage, or 1s after the startup is completed.
- The vehicle power mode is in operation or system power mode is off and the system request activation is recovered.

U010F 87, U0140 87 and U0146 87:

- 1s after the network is woken up.
- In the normal network mode.
- 1s after the voltage high/low failure (if any) recovers.
- Not engine startup stage, or 1s after the startup is completed.
- The vehicle power mode is in operation or system power mode is off and the system request activation is recovered.
- DTC U0073 88 is not present.

Conditions for Setting DTCs

U0073 88: Bus is off for 500ms.

U010F 87: AC network frame (AC_HSC3_FrP06) cannot be received for 2s.

U0140 87: BCM network frame (BCM_HSC3_FrP09) cannot be received for 2s.

U0146 87: GW network frame (GW_HSC3_FrP01) cannot be received for 2s.

Operations of ECU after Failure

U0073 88: Record the DTC, and initialise the CAN transceiver.

U010F 87: Record the DTC, and the signal received from AC will retain the last received rational signal value.

U0140 87: Record the DTC, and the signal received from BCM will retain the last received rational signal value.

U0146 87: Record the DTC, and the signal received from GW will retain the last received rational signal value.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U010F 87:

- 100 AC network frames (AC_HSC3) are received.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0140 87:

- 100 BCM network frames (BCM_HSC3) are received.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0146 87:

- 100 GW network frames (GW_HSC3) are received.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes

- Harness or connector failures.
- FLSM control module internal failure.
- A/C control module (AC) internal failure (for U010F 87).
- Body control module (BCM) internal failure (for U0140 87).
- Gateway module (GW) internal failure (for U0146 87).

Diagnostic Test Steps

1. Integrity Inspection of Body HS CAN Network:
2. Communication Test - CAN Communication Harness Test:

   ® Abnormal: Repair/replace the harness or replace the controller;

   ® Normal, go to 3.

3. Communication Test - Controller CAN Communication Terminal Resistance Test;

   ® Abnormal, replace the controller or repair the connector Pin;

   ® Normal, go to 4.

4. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The front left seat control module monitors the 12V supply voltage; if the monitored voltage is too high or low, trigger and record the DTC.

Conditions for Running DTCs

Not engine startup stage, or 1s after the startup is completed.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

Record a DTC.

Conditions for Clearing DTCs

U1562 17:

- The power supply voltage returns to normal range, and the voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U1563 16:

- The power supply voltage returns to normal range, and the voltage is higher than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes

- Harness or connector failures.
- Battery failure.
- FLSM failure.

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or liquid leakage and other abnormal conditions: Replace the battery;

   ® Normal, go to 2.

2. Power supply ground test - power supply test and ground test (controller):

   ® Abnormal, repair/replace the harness;

   ® Normal, go to 3.

3. Harness and connector test - connector male terminal test (controller power supply and ground Pin):

   ® Abnormal, repair Pin/replace the controller;

   ® Normal, go to 4.

4. Check the battery cable:

   ® Abnormal, repair/replace the battery cable;

   ® Normal, go to 5.

5. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Test Methods

I. Harness and Connector Test

- Harness Conductivity Test
  1. Disconnect the negative battery cable
  2. Disconnect the harness connectors on both ends
  3. Measurement

Measurement	Normal Range	Abnormal result
Resistance between corresponding Pins on both ends	< 5Ω	>5Ω: Harness open-circuit

- Harness Short to Ground Test
  1. Disconnect the negative battery cable
  2. Disconnect the harness connectors on both ends
  3. Measurement

Measurement	Normal Range	Abnormal result
Resistance between harness related Pin and body ground	>10KΩ	<10KΩ: Harness Short to Ground

- Harness Short to Battery Test

1. Disconnect the negative battery cable
2. Disconnect the harness connectors on both ends
3. Measurement

Measurement	Normal Range	Abnormal result
Resistance between harness related Pin and positive battery cable	>10KΩ	<10KΩ: Harness Short to Battery

- Connector Female Terminal Check

1. Disconnect the negative battery cable
2. Disconnect the harness connector
3. Measurement

Measurement	Normal Range	Abnormal result
Observe the harness connector female terminal	Connector Pin and Jack Intact	Jack Plugged/Pin Retreating

- Connector Male Terminal Check

1. Disconnect the negative battery cable
2. Disconnect the harness connector

Measurement	Normal Range	Abnormal Result
Observe the component connector male terminal	Connector Pin Intact	Pin Deformation and Breakage

II. Communication Test

- CAN Communication Harness Test

1. Disconnect the negative battery cable
2. Disconnect the controller CAN bus connector
3. Conduct the following measurement on the harness connector CAN Pin:

Measurement	Normal Range	Result
Resistance between CANH and CANL (disconnect connector controller, without CAN terminal resistance)	54 ~ 69Ω	<54Ω: Short circuit between CANH and CANL >70Ω: Terminal resistance failure
Resistance between CANH and CANL (disconnect connector controller, with CAN terminal resistance)	108 ~ 132Ω	<108Ω: Short circuit between CANH and CANL >132Ω: Terminal resistance failure on other end
CANH - Resistance between Body and Ground	>200Ω	<200Ω: CANH Short to Ground
CANL - Resistance between Body and Ground	>200Ω	<200Ω: CANL Short to Ground
CANH - Resistance between Positive Battery Cables	>6kΩ	<6kΩ: CANH Short to Battery

CANL - Resistance between Positive Battery Cables	>6kΩ	<6kΩ: CANL Short to Battery
Observe the harness connector male terminal CANH/CANL Pin	Connector Pin and Jack Intact	Jack Plugged/Pin Retreating

- Controller CAN Communication Terminal Resistance Test
  1. Disconnect the negative battery cable
  2. Disconnect the controller CAN bus connector
  3. Conduct the following measurement on the ECU connector Pin:

Measurement	Normal Range	Result
Resistance between CANH and CANL (disconnect connector controller, with CAN terminal resistance)	54 ~ 69Ω	<54Ω or >70Ω: Terminal resistance failure
Resistance between CANH and CANL (disconnect connector controller, without CAN terminal resistance)	>10KΩ	<10KΩ: Controller Failure
Observe the controller connector male terminal CANH/CANL Pin	Connector Pin Intact	Pin Deformation and Breakage

III. Power Supply/Ground Test

- Power Supply Test

1. Disconnect the negative battery cable
2. Disconnect the controller/actuator power supply harness connector
3. Connect the negative battery cable
4. Measurement:

Measurement	Normal Range	Abnormal result
Harness End Power Supply Pin Voltage	11V - 14V (Battery Voltage)	< Battery voltage: power supply open circuit

- Ground Test

1. Disconnect the negative battery cable
2. Disconnect the controller/actuator ground harness connector
3. Measurement:

Measurement	Normal Range	Abnormal result
Resistance between harness end ground Pin and body ground	< 5Ω	>5Ω: Ground open circuit

A/C Control Module (HVAC)

DTC Index

List

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B13B4	87	Lost communication with LIN Node-Blower	III
B13C0	1C	PTC Low Voltage Out of Range	III
B13C3	96	Positive Temperature Cofficient(PTC) PCB Temperature Sensor Failure	III
B13C4	4B	Positive Temperature Cofficient(PTC) PCB Over Temperature	III
B13C6	17	Positive Temperature Cofficient(PTC) HV Over Voltage	III
B13C7	01	HVPTC Fault	III
B13C8	19	PTC Left HV Over Current	III
B13C9	19	PTC Right HV Over Current	III
B13CA	4B	PTC Left Sidebar Over Temperature	III
B13CB	4B	PTC Right Sidebar Over Temperature	III
B13CC	96	PTC Left HV Current Sensor Failure	III
B13CD	96	PTC Right HV Current Sensor Failure	III
B13CE	96	PTC Left Sidebar Temp Sensor Failure	III
B13CF	96	PTC Right Sidebar Temp Sensor Failure	III
B1400	11	Indoor Condensor Inlet Temperature Sensor Circuit Short	III
B1400	13	Indoor Condensor Inlet Temperature Sensor Circuit Open	III
B1401	11	Indoor Condensor Outlet Temperature Sensor Circuit Short	III
B1401	13	Indoor Condensor Outlet Temperature Sensor Circuit Open	III
B1402	11	Intake Compressor Temperature Sensor Short to Ground	III
B1402	13	Compressor Inlet Temperature Sensor Circuit Open	III
B1402	15	Intake Compressor Temperature Sensor Short to Battery/Open Circuit	III
B1403	11	Outdoor Condensor Outlet Temperature Sensor Circuit Short	III
B1403	13	Outdoor Condensor Outlet Temperature Sensor Circuit Open	III
B1404	11	Positive Temperature Coefficient(PTC) Assistant Temperature Sensor Circuit Short	III
B1404	13	Positive Temperature Coefficient(PTC) Assistant Temperature Sensor Circuit Open	III
B1411	11	Ambient Sensor Short to Ground	III
B1411	15	Ambient Sensor Short to Battery/Open Circuit	III
B1411	1C	Ambient Temperature Sensor Reading Out of Range	III
B1412	11	Incar Temperature Sensor(Temperature) Short to Ground	III
B1412	12	Incar Temperature Sensor(Temperature) Short to Battery	III
B1412	14	Incar Temperature Sensor(Temperature) Short to Ground/Open Circuit	III
B1412	15	Incar Temperature Sensor(Temperature) Short to Battery/Open Circuit	III
B1414	11	Front Left Face Outlet Temperature Sensor Short to Ground	III
B1414	15	Front Left Face Outlet Temperature Sensor Short to Battery/Open Circuit	III
B1416	11	Front Left Foot Outlet Temperature Sensor Short to Ground	III
B1416	15	Front Left Foot Outlet Temperature Sensor Short to Battery/Open Circuit	III
B1419	11	Evaporator Temperature Sensor Short to Ground	III
B1419	15	Evaporator Temperature Sensor Short to Battery/Open Circuit	III

DTC	FTB	Description	Failure Level
B141A	11	Positive Temperature Coefficient (PTC) Short to Ground	III
B141A	15	Positive Temperature Coefficient (PTC) Short to Battery/Open Circuit	III
B1423	11	Incar Temperature Sensor(Reference) Short to Ground	III
B1423	12	Incar Temperature Sensor(Reference) Short to Battery	III
B1423	14	Incar Temperature Sensor(Reference) Short to Ground/Open Circuit	III
B1423	15	Incar Temperature Sensor(Reference) Short to Battery/Open Circuit	III
B1424	11	Incar Temperature Sensor(Sun) Short to Ground	III
B1424	12	Incar Temperature Sensor(Sun) Short to Battery	III
B1424	14	Incar Temperature Sensor(Sun) Short to Ground/Open Circuit	III
B1424	15	Incar Temperature Sensor(Sun) Short to Battery/Open Circuit	III
B1431	11	Fresh/Recirculation Actuator Control Circuit Short to Ground	III
B1431	12	Fresh/Recirculation Actuator Control Circuit Short to Battery	III
B1432	11	Fresh/Recirculation Actuator Feedback Circuit Short to Ground	III
B1432	12	Fresh/Recirculation Actuator Feedback Circuit Short Battery	III
B1432	14	Fresh/Recirculation Actuator Feedback Circuit Short to Ground/Open circuit	III
B1432	15	Fresh/Recirculation Actuator Feedback Circuit Short Battery/Open circuit	III
B1433	11	Distribution Actuator Control Circuit Short to Ground	III
B1433	12	Distribution Actuator Control Circuit Short to Battery	III
B1434	11	Distribution Actuator Feedback Circuit Short to Ground	III
B1434	12	Distribution Actuator Feedback Circuit Short to Ground/Open Circuit	III
B1434	14	Distribution Actuator Feedback Circuit Short to Battery/Open Circuit	III
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B1437	12	Right Temperature Actuator Control Circuit Short to Battery	III
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B1438	14	Right Temperature Actuator Feedback Circuit Short to Ground/Open Circuit	III
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B143C	01	Right Temperature Actuator Blockage Error	III
B1441	05	Distribution Actuator Calibration Error	III
B1442	01	Distribution Actuator Blockage Error	III
B144B	54	Actuator Calibration Not Learned	III
B144C	05	Fresh/Recirculation Actuator Calibration Error	III
B144D	01	Fresh/Recirculation Actuator Blockage Error	III
B1450	00	Cabin TXV Failure-Heat Pump LIN	III
B1450	11	Cabin Thermostatic Expansion Valve (TXV) Short to Ground	III
B1450	15	Cabin Thermostatic Expansion Valve (TXV) Short to Battery/Open Circuit	III
B1451	00	Chiller ECCV Failure-Heat Pump LIN	III
B1461	00	Bypass Valve Failure	III
B1464	00	Heat Pump Controller Failure	III
B1465	00	Electrical Expansion Valve Failure	III
B1467	00	Heating Valve Failure	III
B1476	11	Blower_F(LIN) Short circuit	III

DTC	FTB	Description	Failure Level
B1477	96	Blower_F(LIN) Temperature Sensor Failure	III
B1478	4B	Blower_F(LIN) Bridge Driver Over Temperature	III
B1478	96	Blower_F(LIN) Bridge Driver Failure	III
B1479	96	Blower_F(LIN) Internal Error	III
B147A	19	Blower_F(LIN) Motor Over Current	III
B147A	71	Blower_F(LIN) Motor Blocked	III
B147B	4B	Blower_F(LIN) PCB Over Temperature	III
B147C	19	Blower_F(LIN) Battery Over Current	III
B147D	1D	Blower_F(LIN) Current Offset Failure	III
B147E	16	Blower_F(LIN) Under Voltage Failure	III
B147E	17	Blower_F(LIN) Over Voltage Failure	III
B147F	86	Blower_F(LIN) Response Error	III
B1482	87	LIN Slave Node Missing - Electric Air Conditioning Compressor	III
B1483	87	Lin Slave Node Missing - Positive Temperature Coefficient (PTC)	III
B1491	12	Refrigerant Pressure Sensor Short to Battery	III
B1491	14	Refrigerant Pressure Sensor Short to Ground/Open load	III
B1492	11	Intake Compressor Pressure Sensor Short to Ground	III
B1492	12	Intake Compressor Pressure Sensor Short to Battery	III
B1492	14	Intake Compressor Pressure Sensor Short to Ground or Open Circuit	III
B1492	15	Intake Compressor Pressure Sensor Short to Battery or Open Circuit	III
B1493	11	Indoor Condensor Outlet Pressure Sensor Circuit Short	III
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B14A1	4B	Electrical Air Condition Compressor (EAC) Over Heat	III
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B14A5	01	Electrical Air Condition Compressor (EAC) Low Voltage Side Voltage Error	III
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B14A7	86	Electrical Air Condition Compressor (EAC) LIN Error	III
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B14C7	86	Positive Temperature Coefficient (PTC) Response Error	III
B14CC	96	Positive Temperature Cofficient(PTC) HV Sensor Failure	III
B14CD	16	Positive Temperature Cofficient(PTC) HV UnderVoltage	III
B14CE	13	Positive Temperature Cofficient(PTC) IGBT Open Circuit	III
B14CF	11	Positive Temperature Cofficient(PTC) IGBT Short To Ground	III
B14E7	11	External 5V Supply Circuit Short to Ground	III

DTC	FTB	Description	Failure Level
B14E7	12	External 5V Supply Circuit Short to Battery	III
B14F2	00	Initialization Error	III
U0073	88	CAN Bus Off	IIA
U0140	87	Lost Communication with Body Control Module (BCM)	IIB
U0146	87	Lost Communication with Gateway (GW)	IIB
U1562	17	Battery Voltage High	I
U1563	16	Battery Voltage Low	I
U2001	41	ECU Error-EEPROM Checksum Error	IIB
U2002	42	ECU Error - RAM Error	IIB

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
- IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time
- III: Inspection during maintenance
- IV: Inspection based on actual demand

Diagnosis Information and Procedure

B13B0

DTC Description

DTC	FTB	Failure Description
B13B0	87	LIN Slave Node Missing - Heat Pump

Subsystem Principle

The air conditioning system contains two controllers, respectively, the A/C controller and the heat pump controller. The A/C controller is connected to the CAN network, and connected to the heat pump controller via LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

HP_LIN7_FrP00 signal is not received for 2s.

Operations of ECU after Failure

Normal communication of LIN node is unavailable; record a DTC.

Conditions for Clearing DTCs

- Valid HP_LIN7_FrP00 signal is received.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair or replace the harness or connector.
2. Heat pump controller failure.
   - Repair or replace the heat pump controller module.
3. Automatic temperature control failure.
   - Repair or replace the automatic temperature control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the automatic temperature control - heat pump controller harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the heat pump controller:

   ® For abnormal conditions, heat pump controller contamination or damage, repair/replace the heat pump controller.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B13B4

DTC Description

DTC	FTB	Failure Description
B13B4	87	Lost Communication with LIN Node - Blower

Subsystem Principle

The Heating, Ventilation and Air Conditioning Control Module (HVAC) controls the blower to communicate via the LIN bus.

Conditions for Running DTCs

- The communication is normal.
- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

Blower LIN Communication Failure.

Operations of ECU after Failure

- Front blower (LIN) stops working.
- Record DTC.

Conditions for Clearing DTCs

- Available communication data for the blower is 2s.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Blower failure.
   - Repair/replace the blower.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the harness and connector of HVAC - front blower:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the front blower:

   ® Abnormal, the front blower is damaged or, replace/repair the blower.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B13C0

DTC Description

DTC	FTB	Failure Description
B13C0	1C	PTC Low Voltage Out of RANG

Subsystem Principle

The high-voltage electric heater monitors the system voltage to detect if the working voltage of this module is within normal range.

Conditions for Running DTCs

- The communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

The signal of electric heater fault low voltage out of range is 1 for 100ms.

Operations of ECU after Failure

Electric heater cannot work normally; record a DTC.

Conditions for Clearing DTCs

- The signal of electric heater fault low voltage out of range is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup and standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the high-voltage electric heater harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination or damage, repair/replace the electric heater.

   ® Normal, go to TAC Human Assistance.

B13C3, B13C4 and B141A

DTC Description

DTC	FTB	Failure Type Description
B13C3	96	Positive Temperature Cofficient(PTC) PCB Temperature Sensor Failure
B13C4	4B	Positive Temperature Cofficient (PTC) PCB Over Temperature
B141A	11	Positive Temperature Coefficient(PTC)Short to Ground
B141A	15	Positive Temperature Coefficient(PTC)Short to Battery/Open Oircuit

Subsystem Principle

The electric heater (PTC) temperature sensor is used to monitor the interior temperature of the electric heater.

Conditions for Running DTCs

B13C3 and B13C4:

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B1483 87 is not set.

B141A:

- Recover from overvoltage or low voltage for 1s.
- Not at the electric powertrain start command On and 1s after the command On.

Conditions for Setting DTCs

B13C3: PTC temperature sensor failure is detected.

B13C4: High temperature of PTC temperature sensor is detected.

B141A 11: The PTC temperature sensor voltage is less than 0.1V for 100ms.

B141A 15: The PTC temperature sensor voltage is higher than 4.9V for 100ms.

Operations of ECU after Failure

B13C3 and B13C4: The PTC cannot work normally; record a DTC.

B141A: None.

Conditions for Clearing DTCs

B13C3:

- PTC temperature sensor returns to normal.
- The history DTC will be cleared after the sensor returns to the specified range for 8s.

B13C4:

- PTC temperature sensor returns to normal.
- The history DTC will be cleared after the sensor returns to the specified range for 8s.

B141A 11: The PTC temperature sensor voltage is higher than 0.1V for 100ms.

B141A 15: The PTC temperature sensor voltage is less than 4.9V for 100ms.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Temperature sensor failure.

   Repair/replace the temperature sensor.
3. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.

Reference Circuit Diagram

LIN line

Maintenance Test Steps

1. Check the high-voltage electric heater harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.
2. Check the temperature sensor:

   ® For abnormal conditions, temperature sensor damage, replace the temperature sensor.

   ® Normal, go to 3.
3. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater damage or contamination, replace the high-voltage electric heater.

   ® Normal, go to TAC Human Assistance.

B13C6 and B14CD

DTC Description

DTC	FTB	Failure Type Description
B13C6	17	Positive Temperature Coffcient(PTC)HV Over VOltage
B14CD	16	Positive Temperature Cofficient(PTC) HV UnderVoltage

Subsystem Principle

The high-voltage electric heater is powered by the high-voltage battery pack and an internal high voltage sensor is used to monitor the high-voltage supply voltage.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

B13C6: It is detected that the voltage of high-voltage electric heater is too high.

B14CD: It is detected that the electric heater HV sensor is faulty.

Operations of ECU after Failure

- The high-voltage electric heater sensor returns to normal.
- It is detected that the high-voltage electric heater sensor is normal for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
3. Heating, ventilation and air conditioning module.
   - Flash/replace the HVAC control module.

Circuit Diagram

High Voltage Distribution System

Diagnostic Test Steps

1. Check the high-voltage electric heater - high-voltage battery pack harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage electric heater:

   ® For abnormal conditions, electric heater stuck or damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the HVAC.

   ® Normal, go to TAC Human Assistance.

B13C7

DTC Description

DTC	FTB	Failure Type Description
B13C7	01	HVPTC Fault

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

The signal of electric heater _Fault_Flag_1_AC_LIN2 is 1 for 100ms.

Operations of ECU after Failure

The electric heater cannot work normally; record a DTC.

Conditions for Clearing DTCs

- The signal of electric heater _Fault_Flag_1_AC_LIN2 is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the HVAC - high-voltage electric heater harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination or damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other failure, repair/replace the HVAC.

   ® Normal, go to TAC Human Assistance.

B13C8 and B13C9

DTC Description

DTC	FTB	Failure Description
B13C8	19	PTC Left HV Over Current
B13C9	19	PTC Ringht HV Over current

Subsystem Principle

The high-voltage electric heater is powered by the high-voltage battery pack and an internal high voltage sensor is used to monitor the high-voltage supply voltage.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

B13C8: The signal of electric heater fault left high voltage out of range is 1 for 100ms.

B13C9: The signal of electric heater fault right high voltage out of range is 1 for 100ms.

Operations of ECU after Failure

The PTC cannot work normally; record a DTC.

Conditions for Clearing DTCs

B13C8: The signal of high-voltage electric heater - left side temperature exceeding 1 is 0 for 100ms.

B13C9: The signal of high-voltage electric heater - right side temperature electric heater is 0 for 100ms.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

High Voltage Distribution System

Maintenance Test Steps

1. Check the high-voltage battery pack - high-voltage electric heater harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination/damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other diagnostic failures, repair/replace the control module.

   ® Normal, go to TAC Human Assistance.

B13CA and B13CB

DTC Description

DTC	FTB	Failure Type Description
B13CA	4B	PTC Left Sidebar Over Temperature
B13CB	4B	PTC Right Sidebar Over Temperature

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

B13CA: The signal of high-voltage electric heater - left side temperature exceeding I is 1 for 100ms.

B13CB: The signal of high-voltage electric heater - right side temperature exceeding I is 1 for 100ms.

Operations of ECU after Failure

The PTC cannot work normally; record a DTC.

Conditions for Clearing DTCs

B13CA:

- The signal of high-voltage electric heater - left side temperature exceeding I is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B13CB:

- The signal of high-voltage electric heater - right side temperature exceeding I is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
3. Heating, ventilation and air conditioning module.
   - Flash/replace the control module.

Reference Circuit Diagram

LIN line

Maintenance Test Steps

1. Check the high-voltage electric heater harness or connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination or damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other failures, repair/replace the HVAC.

   ® Normal, go to TAC Human Assistance.

B13CC and B13CD

DTC Description

DTC	FTB	Failure Type Description
B13CC	96	PTC Left HV Current Sensor Failure
B13CD	96	PTC Right HV Current Sensor Failure

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

B13CC: The signal of PTC fault left high-voltage current sensor is 1 for 100ms.

B13CD: The signal of PTC fault right high-voltage current sensor is 1 for 100ms.

Operations of ECU after Failure

The PTC cannot work normally. Record the DTC.

Conditions for Clearing DTCs

B13CC:

- The signal of PTC fault left high-voltage current sensor is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B13CD:

- The signal of PTC fault right high-voltage current sensor is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. High-voltage electric heater left/right high-voltage current sensor failure.
   - Repair/replace the high-voltage electric heater high-voltage current sensor.
3. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
4. Heating, ventilation and air conditioning module.
   - Flash/replace the control module.

Reference Circuit Diagram

LIN line

Maintenance Test Steps

1. Check the high-voltage electric heater harness or connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the high-voltage current sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the high-voltage current sensor.

   ® Normal, go to 3.

3. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination or damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other failures, repair/replace the HVAC.

   ® Normal, go to TAC Human Assistance.

B13CF and B13CE

DTC Description

DTC	FTB	Failure Type Description
B13CF	96	PTC Left Sidebar Temp Sensor Failure
B13CE	96	PTC Right Sidebar Temp Sensor Failure

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

B13CF: The value of PTC fault left side temperature sensor is 1 for 100ms.

B13CE: The value of PTC fault right side temperature sensor is 1 for 100ms.

Operations of ECU after Failure

The PTC cannot work normally; record a DTC.

Conditions for Clearing DTCs

B13CF:

- The value of PTC fault left side temperature sensor is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B13CE:

- The value of PTC fault right side temperature sensor is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. High-voltage electric heater - left/right side temperature sensor failure.
   - Repair/replace the high-voltage electric heater temperature sensor.
3. High-voltage electric heater failure.
   - Repair/replace the high-voltage electric heater.
4. Heating, ventilation and air conditioning module.
   - Flash/replace the control module.

Reference Circuit Diagram

LIN line

Maintenance Test Steps

1. Check the high-voltage electric heater harness or connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the temperature sensor.

   ® Normal, go to 3.

3. Check the high-voltage electric heater:

   ® For abnormal conditions, high-voltage electric heater contamination or damage, repair/replace the high-voltage electric heater.

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other failures, repair/replace the HVAC.

   ® Normal, go to TAC Human Assistance.

B1400 and B1401

DTC Description

DTC	FTB	Failure Description
B1400	11	Indoor Condensor Inlet Temperature Sensor Circuit Short
	13	Indoor Condensor Inlet Temperature Sensor Circuit Open
B1401	11	Indoor Condensor Outlet Temperature Sensor Circuit Short
	13	Indoor Condensor Outlet Temperature Sensor Circuit Open

Subsystem Principle

The interior condenser inlet temperature sensor is fitted on the inlet pipe of the interior condenser, which is used to monitor the temperature of the refrigerant at the inlet of the interior condenser. The interior condenser outlet temperature sensor is fitted on the outlet pipe of the interior condenser, which is used to monitor the temperature of the refrigerant at the outlet of the interior condenser.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B148F 88 is not set.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

B1400 11: Condenser inlet temperature sensor short circuit is detected.

B1400 13: Condenser inlet temperature sensor open circuit is detected.

B1401 11: Condenser outlet temperature sensor short circuit is detected.

B1401 13: Condenser outlet temperature sensor open circuit is detected.

Operations of ECU after Failure

Shut down the heat pump; record a DTC.

Conditions for Clearing DTCs

- It is detected that the condenser inlet temperature sensor returns to normal.
- The history DTC will be cleared after the sensor returns to the specified range for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. Heat pump control module.
   - Flash/replace the control module.
3. Interior condenser inlet/outlet temperature sensor failure.
   - Repair/replace the interior condenser inlet/outlet temperature sensor.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Maintenance Test Steps

1. Check the condenser inlet/outlet temperature sensor - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Connector".

   ® Normal, go to 2.

2. Check the interior condenser inlet/outlet temperature sensor:

   ® For abnormal conditions, interior condenser inlet/outlet sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/Repair the control module.

   ® Normal, go to TAC Human Assistance.

B1402

DTC Description

DTC	FTB	Failure Description
B1402	11	Intake Compressor Temperature Sensor Short to Ground
	13	Compressor Inlet Temperature Sensor Circuit Open
	15	Intake Compressor Temperature Sensor Short to Battery/Open Circuit

Subsystem Principle

The compressor inlet temperature sensor is fitted on the inlet pipe of the compressor, which is used to monitor the temperature of the refrigerant at the inlet of the compressor.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

B1402 11: Compressor inlet temperature sensor short circuit is detected.

B1402 13: Compressor inlet temperature sensor open circuit is detected.

B1402 15: Compressor inlet temperature sensor short to battery or open circuit is detected.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- It is detected that the compressor inlet temperature sensor returns to normal.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. Heat pump control module failure.
   - Flash/replace the control module.
3. Compressor inlet temperature sensor failure.
   - Repair/replace the sensor.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Maintenance Test Steps

1. Check the compressor inlet temperature sensor harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the compressor inlet temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the sensor.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1403

DTC Description

DTC	FTB	Failure Description
B1403	11	Outdoor Condensor Outlet Temperature Sensor Circuit Short
	13	Outdoor Condensor Outlet Temperature Sensor Circuit Open

Subsystem Principle

The exterior condenser temperature sensor is fitted on the connecting pipeline of the external heat exchanger, to monitor the refrigerant temperature at the exterior condenser.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

The signal of exterior condenser temperature sensor HP_LIN7_FrP01 is 1 for 100ms.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- The signal of exterior condenser temperature sensor HP_LIN7_FrP01 is 0.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. Heat pump control module failure.
   - Flash/replace the control module.
3. Exterior condenser outlet temperature sensor failure.
   - Repair/replace the sensor.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Maintenance Test Steps

1. Check the exterior condenser outlet temperature sensor harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the exterior condenser outlet temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the sensor.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1404

DTC Description

DTC	FTB	Failure Description
B1404	13	Positive Temperature Coefficient(PTC) Assistant Temperature Sensor Circuit Short
	11	Positive Temperature Coefficient(PTC) Assistant Temperature Sensor Circuit Open

Subsystem Principle

The electric heater (PTC) auxiliary temperature sensor is used to assist in monitoring the temperature of the electric heater.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

The signal of electric heater (PTC) auxiliary temperature sensor HP_LIN7_FrP01 is 1 for 100ms.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- The signal of electric heater (PTC) auxiliary temperature sensor HP_LIN7_FrP01 is 0.
- The history DTC will be cleared after the sensor returns to the specified range for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. Heat pump control module failure.
   - Flash/replace the control module.
3. Passenger side/Driver side electric heater temperature sensor failure.
   - Repair/replace the sensor.

Reference Circuit Diagram

Hot Pump System

Maintenance Test Steps

1. Check the passenger side/Driver side electric heater temperature sensor harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the passenger side/Driver side electric heater temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the sensor.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1411

DTC Description

DTC	FTB	Failure Description
B1411	11	Ambient Sensor Short to Ground
B1411	15	Ambient Sensor Short to Battery/Open Circuit
B1411	1C	Ambient Temperature Sensor Reading Out of Range

Subsystem Principle

The ambient temperature sensor is fixed on the front bumper grille, and the heating, ventilation and air conditioning control module (HVAC) uses the signal of the sensor to modify the climate control algorithm, so as to compensate the surrounding air temperature.

Conditions for Running DTCs:

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1411 11: Ambient temperature sensor voltage is less than 0.1V for 100ms.

B1411 15: Ambient temperature sensor voltage is higher than 4.9V for 100ms.

B1411 1C: Ambient temperature sensor voltage is between 0.1V and 0.57V or between 4.66V and 4.9V for 500ms.

Operations of ECU after Failure

B1411 11 and 15: System uses the default value of 25℃.

B1411 1C: Record the corresponding DTC.

Conditions for Clearing DTCs

B1411 11:

- Ambient temperature sensor voltage is higher than 0.1V for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B1411 15:

- Ambient temperature sensor voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B1411 1C

- Ambient temperature sensor voltage is between 0.58-4.65V , which lasts for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Ambient temperature sensor failure.
   - Repair/replace the ambient temperature sensor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the ambient temperature sensor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the ambient temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, repair/replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1412, B1423, B1424

DTC Description

DTC	FTB	Failure Description
B1412	11	Incar Temperature Sensor (Temperature) Short to Ground
B1412	12	Incar Temperature Sensor (Temperature) Short to Battery
B1412	14	Incar Temperature Sensor (Temperature) Short to Ground/Open Circuit
B1412	15	Incar Temperature Sensor (Temperature) Short to Battery/Open Circuit
B1423	11	Incar Temperature Sensor (Reference) Short to Ground
B1423	12	Incar Temperature Sensor (Reference) Short to Battery
B1423	14	Incar Temperature Sensor (Reference) Short to Ground/Open Circuit
B1423	15	Incar Temperature Sensor (Reference) Short to Battery/Open Circuit
B1424	11	Incar Temperature Sensor(Sun) Short to Ground
B1424	12	Incar Temperature Sensor(Sun) Short to Battery
B1424	14	Incar Temperature Sensor(Sun) Short to Ground/Open Circuit
B1424	15	Incar Temperature Sensor(Sun)Short to Battery/Open Circuit

Subsystem Principle

The interior temperature sensor is an integrated photothermal NTC type sensor, which provides the input of passenger compartment air temperature for the HVAC control module. This sensor is fitted in the ATC panel.

Conditions for Running DTCs:

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1412 11 and 14: The interior temperature sensor (temperature) NTC voltage is less than 0.1V for 100ms.

B1412 12 and 15: The interior temperature sensor (temperature) NTC voltage is higher than 4.9V for 100ms.

B1423 11 and 14: The interior temperature sensor (reference) REF voltage is less than 0.1V for 100ms.

B1423 12 and 15: The interior temperature sensor (reference) REF voltage is higher than 4.9V for 100ms.

B1424 11 and 14: The interior temperature sensor (solar) SUN voltage is less than 0.1V for 100ms.

B1424 12 and 15: The interior temperature sensor (solar) SUN voltage is higher than 4.9V for 100ms.

Operations of ECU after Failure

System uses the default value 27°C.

Conditions for Clearing DTCs

B1412 11.14:

- The interior temperature (temperature) sensor voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1412 12 and 15:

- The interior temperature (temperature) sensor voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1423 11 14:

- The interior temperature sensor (reference) voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1423 12 and 15:

- The interior temperature sensor (reference) voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1424 11 and 14:

- The interior temperature sensor (solar) voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1424 12 and 15:

- The interior temperature sensor (solar) voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Interior temperature sensor failure.
   - Repair/replace the interior temperature sensor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the interior temperature sensor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the interior temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1414

DTC Description

DTC	FTB	Failure Description
B1414	11	Front Left Face Air Outlet Temperature Sensor Short to Ground
B1414	15	Front Left Face Air Outlet Temperature Sensor Short to Battery/Open Circuit

Subsystem Principle

Front left face air outlet temperature sensor is an NTC type sensor, which provides signal relating to front left face air outlet temperature for the heating, ventilation and air conditioning control module (HVAC).

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1414 11: Front left face air outlet temperature sensor voltage is less than 0.1V for 100ms.

B1414 15: Front left face air outlet temperature sensor voltage is higher than 4.9V for 100ms.

Operations of ECU after Failure

Record a DTC; the system default value is 10℃.

Conditions for Clearing DTCs

B1414 11:

- Left face air outlet temperature sensor voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1414 15:

- Left face air outlet temperature sensor voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Front left face air outlet temperature sensor failure.
   - Repair/replace the front left face air outlet temperature sensor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the front left face air outlet temperature sensor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the front left face air outlet temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1416

DTC Description

DTC	FTB	Failure Description
B1416	11	Front Left Foot Outlet Temperature Sensor Short to Ground
B1416	15	Front Left Foot Outlet Temperature Sensor Short to Battery/Open Circuit

Subsystem Principle

Temperature sensor for foot blowing air outlet is an NTC type sensor, which provides signal input relating to footwell temperature for the heating, ventilation and air conditioning control module (HVAC).

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1416 11: Temperature sensor for foot blowing air outlet voltage is less than 0.1V for 100ms.

B1416 15: Temperature sensor for foot blowing air outlet voltage is higher than 4.9V for 100ms.

Operations of ECU after Failure

System default value: 10℃; record a DTC.

Conditions for Clearing DTCs

B1416 11:

- Temperature sensor for foot blowing air outlet voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1416 15:

- Temperature sensor for foot blowing air outlet voltage is less than 4.9V for 500ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Temperature sensor for foot blowing air outlet failure.
   - Repair/replace the front left footwell air outlet temperature sensor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the temperature sensor for foot blowing air outlet - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the temperature sensor for foot blowing air outlet:

   ® For abnormal conditions, sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1419

DTC Description

DTC	FTB	Failure Description
B1419	11	Evaporator Temperature Sensor Short to Ground
B1419	15	Evaporator Temperature Sensor Short to Battery or Open Circuit

Subsystem Principle

The evaporator temperature sensor is an NTC type sensor, providing input of the evaporator exhaust outlet temperature for the heating, ventilation and air conditioning control module (HVAC). The evaporator temperature sensor is located at the outlet of the evaporator core in the heater assembly.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1419 11: Evaporator temperature sensor voltage is less than 0.1V for 100ms.

B1419 15: Evaporator temperature sensor voltage is greater than 4.9V for 100ms.

Operations of ECU after Failure

The air conditioning cannot refrigerate.

Conditions for Clearing DTCs

B1419 11:

- Evaporator temperature sensor voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1419 15:

- Evaporator temperature sensor voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Evaporator temperature sensor failure.
   - Repair/replace the evaporator temperature sensor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the evaporator temperature sensor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the evaporator temperature sensor:

   ® For abnormal conditions, sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1431, B1432, B144C, B144D

DTC Description

DTC	FTB	Failure Description
B1431	11	Fresh/Recirculation Actuator Control Circuit Short to Ground
B1431	12	Fresh/Recirculation Actuator Control Circuit Short to Battery
B1432	11	Fresh/Recirculation Actuator Feedback Circuit Short to Ground
B1432	12	Fresh/Recirculation Actuator Feedback Circuit Short Battery
B1432	14	Fresh/Recirculation Actuator Feedback Circuit Short to Ground/Open circuit
B1432	15	Fresh/Recirculation Actuator Feedback Circuit Short Battery/Open circuit
B144C	05	Fresh/Recirculation Actuator Calibration Error
B144D	01	Fresh/Recirculation Actuator Blockage Error

Subsystem Principle

The internal/external recirculated air damper actuator controls the internal/external recirculated air damper by opening and closing the inlet of fresh/recirculated air.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1431 11: The voltage of the fresh/recirculated damper actuator is less than 0.1V for 100ms.

B1431 12: The voltage of the fresh/recirculated damper actuator is higher than 6V for 100ms.

B1432 11 and 14: The feedback voltage of the fresh/recirculated damper actuator is less than 0.1V for 500ms.

B1432 12 and 15: The feedback voltage of the fresh/recirculated damper actuator is higher than 4.9V for 500ms.

B144C: After the self-learning of the fresh/recirculated damper actuator, the voltage at the initial position is beyond the range of 0.99-1.79V, and the voltage at the end position is beyond the range of 3.21-4.01V.

B144D: The feedback voltage is constant when trying to drive the motor.

Operations of ECU after Failure

- Internal/external recirculated mode damper actuator stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

B1431 11:

- The voltage of the fresh/recirculated damper actuator is higher than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1431 12:

- The voltage of the fresh/recirculated damper actuator is less than 6V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1432 11:

- The feedback voltage of the fresh/recirculated damper actuator is higher than 0.1V for 500ms.

B1432 15:

- The feedback voltage of the fresh/recirculated damper actuator is less than 4.9V for 500ms.

B144C:

- After the re-calibration, the start and stop/end voltage values are in the normal range.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B144D:

- During the calibration of fresh/recirculated air damper actuator, the feedback voltage is valid.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Damper actuator self-learning failure:
   - Perform "A/C Damper Actuator Self-learning".
3. Fresh/recirculated damper motor failure.
   - Repair/replace the fresh/recirculated damper motor.
4. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the fresh/recirculated damper motor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Perform "A/C Damper Actuator Self-learning":

   ® For abnormal conditions, actuator stuck or damage, replace the fresh/recirculated damper actuator.

   ® Normal, go to 3.

3. Check the fresh/recirculated damper motor:

   ® For abnormal conditions, motor contamination or damage, replace the fresh/recirculated damper motor.

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1433, B1434

DTC Description

DTC	FTB	Failure Description
B1433	12	Distribution Actuator Control Circuit Short to Battery
B1433	11	Distribution Actuator Control Circuit Short to Ground
B1434	14	Distribution Actuator Feedback Circuit Short to Battery/Open Circuit
B1434	15	Distribution Actuator Feedback Circuit Short to Battery
B1434	12	Distribution Actuator Feedback Circuit Short to Ground/Open Circuit
B1434	11	Distribution Actuator Feedback Circuit Short to Ground

Subsystem Principle

Mode damper: the damper actuator drives the mode damper to vary the air passing through the A/C box and air ducts so as to meet different user needs, such as, face, footwell, windscreen.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1433 11: Mode damper actuator voltage is less than 0.1V for 100ms.

B1433 12: Mode damper actuator voltage is greater than 6V for 100ms.

B1434 11 and 14: Mode damper actuator feedback voltage is less than 0.1V for 100ms.

B1434 12 and 15: Mode damper actuator feedback voltage is greater than 4.9V for 100ms.

Operations of ECU after Failure

- Mode damper actuator stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

B1433 11:

- Mode damper actuator voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1433 12 and 15:

- Mode damper actuator voltage is less than 6V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1434 11 and 14:

- Mode damper actuator feedback voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1434 12 and 15:

- Mode damper actuator feedback voltage is less than 4.9V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Mode damper motor failure.
   - Repair/replace the mode damper motor.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the mode damper motor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the mode damper motor:

   ® For abnormal conditions, motor contamination or damage, replace the motor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1437, B1438, B143B and B143C

DTC Description

DTC	FTB	Failure Description
B1437	11	Right Temperature Actuator Control Circuit Short to Ground
	12	Right Temperature Actuator Control Circuit Short to Battery
B1438	11	Right Temperature Damper Actuator Feedback Circuit Short to Ground
	12	Right Temperature Actuator Feedback Circuit Short to Battery
	14	Right Temperature Actuator Feedback Circuit Short to Ground/Open Circuit
	15	Right Temperature Damper Actuator Feedback Circuit Short to Ground/Open Circuit
B143B	05	Right Temperature Actuator Calibration Error
B143C	01	Right Temperature Actuator Blockage Error

Subsystem Principle

Right temperature damper actuator drives the temperature damper to change the mixing ratio of the cold/warm air so as to control the temperature of the A/C outlet air.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- Recover from overvoltage or low voltage for 1s.
- B14E7 11 does not exist.

Conditions for Setting DTCs

B1437 11: The temperature damper actuator voltage is less than 0.1V for 100ms.

B1437 12: The temperature damper actuator voltage is greater than 6V for 100ms.

B1438 11: The temperature 1 actuator feedback circuit voltage is less than 0.1V for 500ms.

B1438 12: The temperature damper actuator feedback voltage is less than 0.1V for 500ms.

B1438 14 15: The temperature damper actuator feedback voltage is greater than 4.9V for 500ms.

B143B: After the self-learning of temperature damper actuator, the voltage at the start position exceeds 0.99-1.79V, and that at end position exceeds 3.21-4.01V.

B143C: The feedback voltage keeps unchanged when trying to drive the motor.

Operations of ECU after Failure

B1437, B1438 12, 14, 15, B143B and B143C:

- Internal/external recirculated mode damper actuator stops working.
- The control module records the DTC.

B1438 11:

- The front temperature 1 damper motor stops working.
- Record the DTC.

Conditions for Clearing DTCs

B1437 11:

- The temperature damper actuator voltage is greater than 0.1V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1437 12:

- The temperature damper actuator voltage is less than 6V for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1438 11: The temperature 1 actuator feedback circuit voltage is greater than 0.1V consecutively for 500ms.

B1438 12:

- The temperature damper actuator feedback voltage is greater than 0.1V consecutively for 500ms.

B1438 14 and 15:

- The temperature damper actuator feedback voltage is less than 4.9V consecutively for 500ms.

B143B:

- After the re-calibration, the start and stop/end voltage values are in the normal range.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B143C:

- During the calibration of temperature damper actuator, the feedback voltage is valid.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Right temperature damper actuator self-learning failure:
   - Perform "A/C Damper Actuator Self-learning".
3. Right temperature damper actuator.

- Repair/replace the right temperature damper actuator.

4. Heating, ventilation and air conditioning module failure.

- Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of Right temperature damper actuator - HVAC control module:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Perform "A/C Damper Actuator Self-learning":

   ® Abnormal, the actuator is stuck or damaged, replace the temperature damper actuator.

   ® Normal, go to 3.

3. Check the right temperature damper actuator:

   ® Abnormal, the motor is contaminated or damaged, replace the right temperature damper actuator.

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1441 and B1442

DTC Description

DTC	FTB	Failure Description
B1441	05	Distribution Actuator Calibration Error
B1442	01	Distribution Actuator Blockage Error

Subsystem Principle

The front mode damper actuator is controlled by the heating, ventilation, and air conditioning control module (HVAC), which achieves different air outlet modes (face air outlet, footwell air out, defog, etc.) by adjusting different opening angle to change the air flowing through the A/C box and air duct.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B14E7 is not read.

Conditions for Setting DTCs

B1441 05: After the self-learning of the damper actuator, the voltage at the initial position is beyond the range of 0.11-0.82V, and the voltage at the end position is beyond the range of 4.18-4.89V.

B1442 01: During the self-learning of the damper actuator, when driving the motor, the feedback voltage is fixed.

Operations of ECU after Failure

- Front mode damper actuator stops working.
- Record DTC.

Conditions for Clearing DTCs

B1441 05:

- After the self-learning of the damper actuator, the starting position voltage and the end position voltage are within the normal range.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B1442 01:

- During the self-learning of the damper actuator, when driving the motor, the feedback voltage changes normally.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness.
2. Damper actuator self-learning failure.
   - Perform "A/C Damper Actuator Self-learning".
3. Mode damper actuator failure.
   - Repair/replace the front mode damper actuator.
4. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Perform "A/C Damper Actuator Self-learning":

   ® For abnormal conditions, actuator stuck or damage, replace the actuator.

   ® Normal, go to 2.

2. Check the mode damper actuator:

   ® For abnormal conditions, actuator stuck or damage, replace the actuator.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B144B

DTC Description

DTC	FTB	Failure Description
B144B	54	Actuator Calibration Not Learned

Subsystem Principle

The automatic A/C controller controls the operation of the temperature damper motor and mode damper motor on the A/C box assembly.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

Relevant EEPROM zone bits are not set.

Operations of ECU after Failure

- The DC motor stops working.
- Record DTC.

Conditions for Clearing DTCs

- DC motor learning is successful, and relevant EEPROM marks are fitted.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Damper actuator self-learning is not performed.
   - Perform "A/C Damper Actuator Self-learning".
2. Damper actuator failure.
   - Check/replace the damper actuator.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Perform "A/C Damper Actuator Self-learning":

   ® For abnormal conditions, actuator stuck or damage, replace the actuator.

   ® Normal, go to 2.

2. Check the damper actuators, including mode damper actuator, left temperature damper actuator, right temperature damper actuator, driver temperature damper actuator, defog mode damper actuator and fresh/recirculated damper actuator:

   ® For abnormal conditions, actuator stuck or damage, replace the damper actuator.

   ® Normal, go to 3.

3. Check the HVAC control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B1450

DTC Description

DTC	FTB	Failure Description
B1450	00	Cabin TXV Failure-Heat Pump LIN
B1450	11	Cabin Thermostatic Expansion Valve (TXV) Short to Ground
B1450	15	Cabin Thermostatic Expansion Valve (TXV) Short to Battery/Open Circuit

Subsystem Principle

The cabin expansion valve regulates the flow of the refrigerant and matches the refrigerant flow with the heat load of the air passing through the evaporator core.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B13B0 87 is not set.

Conditions for Setting DTCs

B1450 00: The LIN signal of passenger compartment expansion valve is 1 for 100ms.

B1450 11: When the cabin thermal expansion valve drive Pin is enabled, the load current is more than 2A for 60ms.

B1450 15: When the cabin thermal expansion valve drive Pin is enabled, the load current is not present for 60ms.

Operations of ECU after Failure

B1450 00: The heat pump cannot work normally; record a DTC.

B1450 11 15: Cabin valve is off.

Conditions for Clearing DTCs

B1450 00:

- The LIN signal of cabin thermal expansion valve is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B1450 11: When the cabin thermal expansion valve drive Pin is enabled, the load current is less than 2A for 10s.

B1450 15: When the cabin thermal expansion valve drive Pin is enabled, the load current is less than 2A for 100ms.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.

   Repair/replace the harness and connector.

2. Cabin expansion valve failure.

   Check the cabin expansion valve.

3. Heat pump control module failure.

   Flash/replace the heat pump control module.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Diagnostic Test Steps

1. Check the cabin expansion valve - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the cabin expansion valve:

   ® For abnormal conditions, expansion valve stuck or damage, replace the expansion valve.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1451

DTC Description

DTC	FTB	Failure Description
B1451	00	Chiller ECCV Failure-Heat Pump LIN

Subsystem Principle

The expansion valve is the demarcation point between high pressure side and low pressure side of air conditioning system. When the coolant passes through thermal expansion valve, the coolant pressure will decrease. Thermal expansion valve also measures the amount of liquid coolant which may flow into evaporator.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B13B0 87 is not set.

Conditions for Setting DTCs

The LIN2 signal of battery cooler compartment expansion valve is 1 for 100ms.

Operations of ECU after Failure

The heat pump cannot work normally; record a DTC.

Conditions for Clearing DTCs

- The LIN2 signal of battery cooler compartment expansion valve is 0 for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.
   - Repair/replace the harness and connector.
2. Battery cooler compartment expansion valve failure.
   - Check/replace the battery cooler compartment expansion valve.
3. Heat pump control module failure.
   - Flash/replace the heat pump control module.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Diagnostic Test Steps

1. Check the battery cooler compartment expansion valve - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the battery cooler compartment expansion valve:

   ® For abnormal conditions, expansion valve stuck or damage, replace the expansion valve.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1461

DTC Description

DTC	FTB	Failure Description
B1461	00	Bypass Valve Failure

Subsystem Principle

The bypass valve keeps a constant differential pressure by controlling the opening of bypass valve.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

A bypass valve failure is detected.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- The bypass valve is detected to return to normal.
- The DTC will be reset after bypass valve's recovery for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector.
   - Repair/replace the harness and connector.
2. Bypass valve failure.
   - Check/replace the bypass valve.
3. Heat pump control module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Hot Pump System

Diagnostic Test Steps

1. Check the bypass valve - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failures, replace the bypass valve.

   ® Normal, go to 2.

2. Check the bypass valve:

   ® For abnormal conditions, expansion valve stuck or damage, replace the bypass valve.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1464

DTC Description

DTC	FTB	Failure Description
B1464	00	Heat Pump Controller Failure

Subsystem Principle

The A/C system consists of a compressor, an external heat exchanger, an interior condenser, an evaporator, an expansion valve, a solenoid valve, relevant sensors and control system (A/C controller and heat pump controller), etc.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

A heat pump controller failure is detected.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- It is detected that the heat pump controller returns to normal.
- It is detected that the DTC will be reset after the heat pump controller returns to normal for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector.
   - Repair/replace the harness and connector.
2. Bypass valve failure.
   - Check/replace the bypass valve.
3. Heat pump control module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Hot Pump System

Diagnostic Test Steps

1. Check the heat pump controller harness and connector:

   ® For abnormal conditions, harness and connector failures, replace the heat pump controller.

   ® Normal, go to 2.

2. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1465

DTC Description

DTC	FTB	Failure Description
B1465	00	Electronic Expansion Valve Failure

Subsystem Principle

The electronic expansion valve is fitted in the engine compartment to control the refrigerant flow.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

Electronic expansion valve failure is detected.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- The electronic expansion valve is detected to return to normal.
- The DTC will be reset after electronic expansion valve's recovery for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector.
   - Repair/replace the harness and connector.
2. Electronic expansion valve failure.
   - Check/replace the bypass valve.
3. Heat pump control module failure.
   - Flash/replace the heat pump control module.

Reference Circuit Diagram

Hot Pump System

Diagnostic Test Steps

1. Check the electronic expansion valve - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failures, replace the electronic expansion valve.

   ® Normal, go to 2.

2. Check the electronic expansion valve:

   ® For abnormal conditions, expansion valve stuck or damage, replace the electronic expansion valve.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1467

DTC Description

DTC	FTB	Failure Description
B1467	00	Heating Valve Failure

Subsystem Principle

The heating valve changes the ON/OFF of the valve by energizing or de-energizing the coil, so as to change the refrigeration system flow direction control and ON/OFF control, etc.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

Heating valve failure is detected.

Operations of ECU after Failure

The heat pump stops working; record a DTC.

Conditions for Clearing DTCs

- The heating valve is detected to return to normal.
- The DTC will be reset after heating valve's recovery for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector.
   - Repair/replace the harness and connector.
2. Heating valve failure.
   - Check/replace the heating valve.
3. Heat pump control module failure.
   - Flash/replace the heat pump control module.

Reference Circuit Diagram

Hot Pump System

Diagnostic Test Steps

1. Check the electronic expansion valve - heat pump control module harness and connector:

   ® For abnormal conditions, harness and connector failures, replace the electronic expansion valve.

   ® Normal, go to 2.

2. Check the electronic expansion valve:

   ® For abnormal conditions, expansion valve stuck or damage, replace the electronic expansion valve.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1476

DTC Description

DTC	FTB	Failure Description
B1476	11	Blower_F(LIN) Short circuit

Subsystem Principle

The blower communicates with the electric A/C compressor and A/C control panel via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

Front blower (LIN) diagnosis signal is 1 for 100ms.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) diagnosis signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness.
2. A/C air inlet box failure.
   - Repair/replace the A/C air inlet box.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of A/C air inlet box:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 3.

3. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1477 and B147B

DTC Description

DTC	FTB	Failure Description
B147B	4B	Blower_F(LIN) PCB Over Temperature
B1477	96	Blower_F(LIN) Temperature Sensor Failure

Subsystem Principle

The Blower communicates with the HVAC control module via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

Front blower (LIN) signal is 4 for 100ms, the DTC is set.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) diagnosis signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness.
2. A/C air inlet box failure.
   - Repair/replace the A/C air inlet box.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of A/C air inlet box:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1478

DTC Description

DTC	FTB	Failure Description
B1478	96	Blower_F(LIN) Bridge Driver Failure
B1478	4B	Blower_F(LIN) Bridge Driver Over Temperature

Subsystem Principle

A/C air inlet box communicates with the HVAC control module via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

Front blower (LIN) signal is 4 for 100ms, the DTC is set.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) diagnosis signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. A/C air inlet box failure.

   Repair/replace the A/C air inlet box.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of A/C air inlet box:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1479 and B147F

DTC Description

DTC	FTB	Failure Description
B1479	96	Blower_F(LIN) Internal Error
B147F	86	Blower_F(LIN) Response Error

Subsystem Principle

Failure occurs inside the blower, not involving external circuits.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

Front blower (LIN) signal is 1 for 100ms, the DTC is set.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) diagnosis signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. A/C air inlet box failure.

   Repair/replace the A/C air inlet box.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B147A

DTC Description

DTC	FTB	Failure Description
B147A	71	Blower_F(LIN) Motor Blocked
B147A	19	Blower_F(LIN) Motor Over Current

Subsystem Principle

A/C air inlet box communicates with the HVAC control module via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

B147A 71: Front blower (LIN2) signal is 2 for 100ms, the DTC is set.

B147A 19: Front blower LIN3 signal is 8 for 100ms.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) diagnosis signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. A/C air inlet box failure.

   Repair/replace the A/C air inlet box.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System/LIN line

Diagnostic Test Steps

1. Check the harness and connector of A/C air inlet box:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 3.

3. Check the HVAC control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B147C and B147D

DTC Description

DTC	FTB	Failure Description
B147C	19	Blower_F(LIN) Battery Over Current
B147D	1D	Blower_F(LIN) Current Offset Failure

Subsystem Principle

The Blower communicates with the HVAC control module via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

B147C 19: Front blower (LIN) signal is 32 for 100ms, the DTC is set.

B147D 1D: Front blower LIN3 power source signal is 1 for 100ms.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. A/C air inlet box failure.

   Repair/replace the A/C air inlet box.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of A/C air inlet box:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C air inlet box is normal:

   ® Abnormal, the A/C air inlet box is faulty, replace the A/C air inlet box.

   ® Normal, go to 3.

3. Check the HVAC control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B147E

DTC Description

DTC	FTB	Failure Description
B147E	17	Blower_F(LIN) Over Voltage Failure
B147E	16	Blower_F(LIN) Under Voltage Failure

Subsystem Principle

Blower communicates with other modules via the LIN bus.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B13B4 87 is not set.

Conditions for Setting DTCs

B147E 17: Front blower (LIN) signal is 64 for 100ms, the DTC is set.

B147E 16: Front blower LIN3 power source signal is 128 for 100ms.

Operations of ECU after Failure

Front blower (LIN) stops working, and the DTC is recorded.

Conditions for Clearing DTCs

- Front blower (LIN) power source signal is 0 for 100ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. A/C air inlet box failure.

   Repair/replace the A/C air inlet box.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System/LIN line

Diagnostic Test Steps

1. Check the harness and connector of A/C system:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check if the function of A/C system is normal:

   ® Abnormal, the A/C system is faulty, replace the A/C system.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1482

DTC Description

DTC	FTB	Failure Description
B1482	87	LIN Slave Node Missing - Electric Air Conditioning Compressor

Subsystem Principle

The heating, ventilation and air conditioning control module (HVAC) communicates with the electric A/C compressor via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B1481 88 is not set.

Conditions for Setting DTCs

Data frame is not received from the electric A/C compressor for 2s.

Operations of ECU after Failure

Electric A/C compressor cannot work normally; record a DTC.

Conditions for Clearing DTCs

Data frame is received from the electric A/C compressor.

Possible Failure Causes and Maintenance Scheme

1. LIN bus or connector failure.

   Repair/replace the harness.

2. Electric A/C compressor failure.

   Repair/replace the electric A/C compressor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the electric A/C compressor - HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electric A/C compressor:

   ® For abnormal conditions, electric A/C compressor failure, repair/replace the electric A/C compressor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1483

DTC Description

DTC	FTB	Failure Description
B1483	87	Lin Slave Node Missing - Positive Temperature Coefficient (PTC)

Subsystem Principle

The A/C controller controls the operation of the heat pump controller and the electric heater via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B1481 88 is not set.

Conditions for Setting DTCs

Data frame is not received from the electric heater for 2s.

Operations of ECU after Failure

Electric heater cannot work normally; record a DTC.

Conditions for Clearing DTCs

Data frame is received from the electric heater.

Possible Failure Causes and Maintenance Scheme

1. LIN bus or connector failure.

   Repair/replace the harness.

2. Electric heater failure.

   Repair/replace the electric heater.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the electric heater - HVAC control module harness and connector

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electric heater:

   ® For abnormal conditions, electric heater failure, repair/replace the electric heater.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1491

DTC Description

DTC	FTB	Failure Description
B1491	12	Refrigerant Pressure Sensor Short to Battery
B1491	14	Refrigerant Pressure Sensor Short to Ground/Open load

Subsystem Principle

The refrigerant pressure sensor is to prevent the refrigeration system from operating at the ultimate refrigerant pipeline pressure.

Conditions for Running DTCs

- Recover from overvoltage or low voltage for 1s.
- Not at the electric powertrain start command On and 1s after the command On.

Conditions for Setting DTCs

B1491 12: The refrigerant pressure sensor circuit voltage is greater than 4.9 V consecutively for 100ms.

B1491 14: The refrigerant pressure sensor circuit voltage is less than 0.1V consecutively for 100ms.

Operations of ECU after Failure

Compressor stops working.

Conditions for Clearing DTCs

B1491 12: The pressure sensor circuit voltage is less than 4.9V consecutively for 100ms.

B1491 14: The pressure sensor circuit voltage is greater than 0.1V consecutively for 100ms.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Refrigerant pressure sensor failure.

   Repair/replace the refrigerant pressure sensor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector of the refrigerant pressure sensor:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the refrigerant pressure sensor:

   ® Abnormal, the refrigerant pressure sensor is contaminated or damaged, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1492

DTC Description

DTC	FTB	Failure Description
B1492	11	Intake Compressor Pressure Sensor Short to Ground
B1492	12	Intake Compressor Pressure Sensor Short to Battery
B1492	14	Intake Compressor Pressure Sensor Short to Ground or Open Circuit
B1492	15	Intake Compressor Pressure Sensor Short to Battery or Open Circuit

Subsystem Principle

The compressor inlet temperature sensor is fitted on the inlet pipe of the compressor, which is used to monitor the pressure of the refrigerant at the inlet of the compressor.

Conditions for Running DTCs

- 1s after the communication is activated.
- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B1492 12 and 15: Compressor inlet pressure sensor short to battery.

B1492 11 and 14: Compressor inlet pressure sensor short to ground or open circuit

Operations of ECU after Failure

The heat pump cannot work normally; record a DTC.

Conditions for Clearing DTCs

- Compressor inlet pressure sensor has no failure.
- It is detected that the compressor inlet pressure sensor returns to normal range for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Compressor inlet pressure sensor failure.

   Repair/replace the inlet pressure sensor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Diagnostic Test Steps

1. Check the compressor inlet pressure sensor harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the compressor inlet pressure sensor:

   ® For abnormal conditions, inlet pressure sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1493

DTC Description

DTC	FTB	Failure Description
B1493	11	Indoor Condensor Outlet Pressure Sensor Circuit Short
B1493	13	Indoor Condensor Outlet Pressure Sensor Circuit Open

Subsystem Principle

While flowing through the interior condenser, the compressed high-temperature and high-pressure refrigerant warms the air brought by the blower to the inside vehicle up, thereby warming the passengers up.

Conditions for Running DTCs

- 1s after the communication is activated.
- After the system power supply recovers.
- The Start switch is placed in ON position.
- DTC B13B0 87 is not set.

Conditions for Setting DTCs

B1493 11: The interior condenser outlet pressure sensor is short-circuited.

B1493 13: The interior condenser outlet pressure sensor is open-circuited.

Operations of ECU after Failure

The heat pump cannot work normally; record a DTC.

Conditions for Clearing DTCs

- Interior condenser outlet pressure sensor has no failure.
- It is detected that the interior condenser outlet pressure sensor returns to normal for 8s.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Interior condenser outlet pressure sensor failure.

   Repair/replace the Interior condenser outlet pressure sensor.

3. Heat pump control module failure.

   Flash/replace the heat pump control module.

Reference Circuit Diagram

Hot Pump System

Diagnostic Test Steps

1. Check the interior condenser outlet pipe pressure sensor harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the Interior condenser outlet pressure sensor:

   ® For abnormal conditions, outlet pressure sensor contamination or damage, replace the sensor.

   ® Normal, go to 3.

3. Check the Heat pump control module failure:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14A0 and B14A2

DTC Description

DTC	FTB	Failure Description
B14A0	16	Electrical Air Condition Compressor (EAC) High Voltage Side Under Voltage
B14A2	17	Electrical Air Condition Compressor (EAC) High Voltage Side Over Voltage

Subsystem Principle

The electric A/C compressor is driven by a high-voltage motor, and the high voltage is supplied by the high-voltage battery pack.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 is not set.
- The electric drive is on standby.

Conditions for Setting DTCs

B14A0: The high voltage of the electric A/C compressor is too low.

B14A2: Electric A/C compressor temperature is too high.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The high voltage of the electric A/C compressor returns to normal.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.

   Repair/replace the harness connector.

2. Electric A/C compressor failure.

   Repair/replace the electric A/C compressor.

Reference Circuit Diagram

High Voltage Distribution System

Maintenance Test Steps

1. Check the electric A/C compressor harness connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Connector".

   ® Normal, go to 2.

2. Check the electric A/C compressor:

   ® For abnormal conditions, electric A/C compressor stuck or damage, repair/replace the electric A/C compressor.

   ® Normal, go to TAC Human Assistance.

B14A1

DTC Description

DTC	FTB	Failure Description
B14A1	4B	Electrical Air Condition Compressor (EAC) Over Heat

Subsystem Principle

The A/C controller controls the enabling and disabling of the electric A/C compressor to ensure normal compressor pressure range. It also play a role in over-temperature protection for the compressor.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

The electric A/C compressor temperature is too high.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The electric A/C compressor temperature returns to normal.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness and connector failure.

   Repair/replace the harness and connector.

2. Electric A/C compressor failure.

   Check/replace the electric A/C compressor.

3.

4. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the A/C compressor harness and connector:

   ® For abnormal conditions, harness and connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the electric A/C compressor:

   ® For abnormal conditions, compressor abnormal sound or damage, replace the A/C compressor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14A5

DTC Description

DTC	FTB	Failure Description
B14A5	01	Electrical Air Condition Compressor (EAC) Low Voltage Side Voltage Error

Subsystem Principle

The battery supplies voltage to the electric A/C compressor and the A/C controller controls the enabling and disabling of the electric A/C compressor.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

An electric A/C compressor low voltage failure occurs.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The low voltage of the electric A/C compressor returns to normal.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Compressor failure.

   Flash/replace the compressor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the electric A/C compressor harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the compressor:

   ® For abnormal conditions, compressor stuck or damage, replace the compressor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14A6, B14A7

DTC Description

DTC	FTB	Failure Description
B14A6	86	Electrical Air Condition Compressor (EAC) Communication Error
B14A7	86	Electrical Air Condition Compressor (EAC) LIN Error

Subsystem Principle

The A/C controller controls the operation of the heat pump controller and the electric A/C compressor via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.
- DTC B1481 88 is not set.

Conditions for Setting DTCs

B14A6: Data frame is not received from the electric A/C compressor for 2s.

B14A7: Electric A/C compressor LIN bus failure.

Operations of ECU after Failure

Electric A/C compressor cannot work normally; record a DTC.

Conditions for Clearing DTCs

B14A6 and B14A7:

- Data frame is received from the electric A/C compressor.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Electric A/C compressor failure.

   Repair/replace the rear A/C control panel.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the rear electric A/C compressor harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electric A/C compressor:

   ® For abnormal conditions, electric A/C compressor failure, repair/replace the rear A/C control panel.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14A8

DTC Description

DTC	FTB	Failure Description
B14A8	01	Electrical Air Condition Compressor (EAC) Temperature Sensor Error

Subsystem Principle

The A/C controller controls the enabling and disabling of the electric A/C compressor to ensure normal compressor pressure range. It also play a role in over-temperature protection for the compressor.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.

Conditions for Setting DTCs

The electric A/C compressor temperature sensor is faulty.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The electric A/C compressor temperature sensor returns to normal.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Compressor inlet temperature sensor failure.

   Repair/replace the heat pump controller compressor inlet temperature sensor.

3. Heat pump controller failure.

   Flash/replace the control module.

Reference Circuit Diagram

Air conditioning system/Hot Pump System

Diagnostic Test Steps

1. Check the A/C compressor - heat pump control module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electric A/C compressor inlet temperature sensor:

   ® For abnormal conditions, compressor inlet temperature sensor failure, replace the inlet temperature sensor.

   ® Normal, go to 3.

3. Check the heat pump control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14A9 and B14AA

DTC Description

DTC	FTB	Failure Description
B14A9	01	Electrical Air Condition Compressor (EAC) Current Sensor Error
B14AA	00	Electrical Air Condition Compressor (EAC) Current Sensor Shortcircuit Error

Subsystem Principle

Failure occurs inside the electric A/C compressor, and no external circuit is involved.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

B14A9 01: Electric A/C compressor current sensor failure.

B144A 00: Electric A/C compressor current sensor short circuit failure.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The electric A/C compressor current sensor returns to normal.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness.

2. Electric A/C compressor failure.

   Check and repair/replace the electric A/C compressor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Basic Detection Methods for Circuits

Diagnostic Test Steps

1. Check the electric A/C Harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electric A/C:

   ® For abnormal conditions, electric A/C failure, replace the electric A/C.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14AB

DTC Description

DTC	FTB	Failure Description
B14AB	01	Electrical Air Condition Compressor (EAC) Inpower Supply Error

Subsystem Principle

Failure occurs inside the electric A/C compressor, and no external circuit is involved.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

The error signal of A/C input power supply is 1 for 100ms.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- ACP enters correct power supply signal.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric compressor failure.

   Repair/replace the compressor.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Basic Detection Methods for Circuits

Diagnostic Test Steps

1. Check the electric compressor:

   ® For abnormal conditions, electric compressor failure, perform "Repair/Replacement of Compressor".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14AC and B14AE

DTC Description

DTC	FTB	Failure Description
B14AC	92	Electrical Air Condition Compressor (EAC) Torque Stall Error
B14AE	00	Electrical Air Condition Compressor (EAC) Over Torque

Subsystem Principle

Failure occurs inside the electric A/C compressor, and no external circuit is involved.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

B14AC 92: The ACP stall signal is 1 for 100ms.

B14AE 00: The ACP overload signal is 1 for 100ms.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

B14AC:

- The stall signal of air conditioner is 0.
- History DTCs will be cleared after 40 failure-free working cycles.

B14AE:

- The overload signal of ACP is 0.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric compressor failure.

   Repair/replace the compressor.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Basic Detection Methods for Circuits

Diagnostic Test Steps

1. Check the electric compressor:

   ® For abnormal conditions, electric compressor failure, perform "Repair/Replacement of Compressor".

   ® Normal, go to 2.

2. Check the HVAC control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B14AD

DTC Description

DTC	FTB	Failure Description
B14AD	1C	Electrical Air Condition Compressor (EAC) Voltage Sensor Error

Subsystem Principle

Failure occurs inside the electric A/C compressor, and no external circuit is involved.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1482 87 and B1481 88 are not set.
- The electric drive is on standby.

Conditions for Setting DTCs

The electric A/C compressor voltage sensor is faulty.

Operations of ECU after Failure

- The electric A/C compressor stops working.
- The control module records the DTC.

Conditions for Clearing DTCs

- The electric A/C compressor voltage sensor returns to normal.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric compressor failure.

   Repair/replace the compressor.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Diagnostic Test Steps

1. Check the electric compressor:

   ® For abnormal conditions, electric compressor failure, perform "Repair/Replacement of Compressor".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14C0

DTC Description

DTC	FTB	Failure Description
B14C0	96	PTC IGBT Driver Failure

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- Power system is ready.
- DTC B13B5 87 is not set.

Conditions for Setting DTCs

High-voltage electric heater signal of 1 is not received for 100ms.

Operations of ECU after Failure

The PTC cannot work normally. Record the DTC.

Conditions for Clearing DTCs

- High-voltage electric heater signal of 0 is received for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric heater failure.

   Repair/replace the electric heater.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the electric heater:

   ® For abnormal conditions, electric heater failure, perform "Repair/Replacement of Electric Heater".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14C7

DTC Description

DTC	FTB	Failure Description
B14C7	86	Positive Temperature Coefficient (PTC) Response Error

Subsystem Principle

The high-voltage electric heater carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- Power system is ready.
- DTCs B1483 87 and B148F 88 are not set.

Conditions for Setting DTCs

Electric heater (PTC) response failure.

Operations of ECU after Failure

Without heating function, record a DTC.

Conditions for Clearing DTCs

- No response failure occurs in the electric heater (PTC).
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Electric heater failure.

   Repair/replace the electric heater.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Basic Detection Methods for Circuits

Diagnostic Test Steps

1. Check the electric heater:

   ® For abnormal conditions, electric heater failure, perform "Repair/Replacement of Electric Heater".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14CC

DTC Description

DTC	FTB	Failure Description
B14CC	96	Positive Temperature Cofficient(PTC) HV Sensor Failure

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- B1483 87 is not set.

Conditions for Setting DTCs

Electric heater high voltage sensor failure is detected.

Operations of ECU after Failure

Disable PTC heating function.

Conditions for Clearing DTCs

- The electric heater high voltage sensor returns to normal.
- A normal electric heater high voltage sensor is detected for 8s.

Possible Failure Causes and Maintenance Scheme

1. High-voltage electric heater failure.

   Repair/replace the electric heater.

2. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the heater:

   ® For abnormal conditions, high-voltage electric heater failure, perform "Repair/Replacement of Electric Heater".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14CE and B14CF

DTC Description

DTC	FTB	Failure Description
B14CE	13	Positive Temperature Cofficient(PTC) IGBT Open Circuit
B14CF	11	Positive Temperature Cofficient(PTC) IGBT Short To Ground

Subsystem Principle

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C panel and different working conditions, and its working state will not be displayed on the A/C display.

Conditions for Running DTCs

- 1s after the communication is activated.
- The system voltage is normal.
- The Start switch is placed in ON position.
- DTC B1483 87 is not set.

Conditions for Setting DTCs

B14CE: Electric heater IGBT open circuit failure is detected.

B14CF: Electric heater IGBT short-to-ground failure is detected.

Operations of ECU after Failure

The PTC cannot work normally. Record the DTC.

Conditions for Clearing DTCs

B14CE:

- The electric heater high voltage sensor returns to normal.
- A normal electric heater high voltage sensor is detected for 8s.

B14CF:

- The high voltage of the electric heater returns to normal.
- It is detected that the high voltage of the electric heater returns to normal for 8s.

Possible Failure Causes and Maintenance Scheme

1. High-voltage electric heater failure.

   Repair/replace the high-voltage electric heater.

2. Automatic A/C control module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

LIN line

Diagnostic Test Steps

1. Check the A/C electric heater:

   ® For abnormal conditions, A/C electric heater failure, perform "Repair/Replacement of A/C Electric Heater".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14E7

DTC Description

DTC	FTB	Failure Description
B14E7	11	External 5V Supply Circuit Short to Ground
B14E7	12	External 5V Supply Circuit Short to Battery

Subsystem Principle

The heating, ventilation and air conditioning control module (HVAC) controls the air temperature and air distribution inside the vehicle by controlling the operation of the cooling system and the control damper in the heater assembly. The external 5V power supply circuit provides the working voltage to the regulator in each damper actuator.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The system voltage is normal.

Conditions for Setting DTCs

B14E7 11: External 5V power supply voltage is less than 4.4V for 100ms.

B14E7 12: External 5V power supply voltage is higher than 5.5V for 100ms.

Operations of ECU after Failure

A/C function failure.

Conditions for Clearing DTCs

B14E7 11:

- External 5V supply voltage is greater than 4.4V, which lasts for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

B14E7 12:

- External 5V supply voltage is less than 5.5V, which lasts for 100ms.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.

   Repair/replace the harness or connector.

2. Left/right temperature damper motor failure.

   Repair/replace the left/right temperature damper motor.

3. Heating, ventilation and air conditioning module failure.

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the left/right temperature damper motor:

   ® For abnormal conditions, left/right temperature damper motor stuck or damage, replace the left/right temperature damper motor.

   ® Normal, go to 3.

3. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B14F2, U2001 and U2002

DTC Description

DTC	FTB	Failure Description
B14F2	00	Initialization Error
U2001	41	ECU Error-EEPROM Checksum Error
U2002	42	ECU Error - RAM Error

Subsystem Principle

Every time the start switch is turned on, the automatic A/C controller will perform the diagnosis and check, and the DTCs corresponding to the detected failures will be saved in the automatic A/C controller, and the default value or strategy will be applied to correspond to the detected failure.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B14F2: System initialisation goes wrong.

U2001 and U2002: The ECU detects a checksum error.

Operations of ECU after Failure

A/C function failure.

Conditions for Clearing DTCs

B14F2:

- System initialisation is normal.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

U2001 and U2002:

- The ECU detects a correct checksum.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Automatic control module failure:

   Flash/replace the HVAC control module.

2. HVAC control module software failure:

   Flash/replace the HVAC control module.

Diagnostic Test Steps

1. Check the HVAC control module software version:

   ® For abnormal conditions, HVAC control module software version mismatch, perform "Upgrading of HVAC Control Module Software".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0073

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off

Subsystem Principle

The HVAC control module communicates with other control modules via the HS CAN bus.

Conditions for Running DTCs

- 1s after the communication returns to normal.
- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

When the controller has the transmission error for certain times, "Bus Off" state will appear. The DTC will be set if "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

Use the default value.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure.
   - Repair/replace the harness or connector.
2. Gateway failure.
   - Flash/replace the GW.
3. Heating, ventilation and air conditioning module failure.
   - Flash/replace the HVAC control module.

Possible Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the GW control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0140

DTC Description

DTC	FTB	Failure Description
U0140	87	Lost Communication with Body Control Module (BCM)

Subsystem Principle

The heating, ventilation and air conditioning control module (HVAC) communicates with the BCM via the CAN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The battery voltage is normal, and remains stable.
- DTC U0073 88 is not read.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the BCM cannot be received within the given time.

Operations of ECU after Failure

Use the default value.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. CAN harness or connector failure:
   - Repair/replace the harness or connector.
2. Heating, ventilation and air conditioning module failure:
   - Flash/replace the HVAC control module.
3. Body control module failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the body control module failure:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0146

DTC Description

DTC	FTB	Failure Description
U0146	87	Lost Communication with Gateway (GW)

Subsystem Principle

The heating, ventilation and air conditioning control module (HVAC) communicates with the gateway (GW) via the HS CAN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The battery voltage is normal, and remains stable.
- DTC U0073 88 is not read.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the GW cannot be received within the given time.

Operations of ECU after Failure

Use the default value.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. CAN harness or connector failure:

   Repair/replace the harness or connector.

2. Heating, ventilation and air conditioning module failure:

   • Flash/replace the HVAC control module.

3. Gateway control module failure:

   • Flash/replace the GW control module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the GW control module failure:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The heating, ventilation and air conditioning control module (HVAC) monitors the system voltage to detect if the working voltage of this module is within the normal range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: It is detected that the power supply voltage is greater than 16V for 200ms.

U1563 16: It is detected that the power supply voltage is less than 9V for 200ms.

Operations of ECU after Failure

A/C is not available.

Conditions for Clearing DTCs

U1562:

- The battery voltage is in the normal range. The power supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free working cycles.

U1563:

- The battery voltage is in the normal range. The power supply voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:

   Repair/replace the harness.

2. Battery failure:

   Replace the battery.

3. Relay/fuse failure:

   Repair/replace the relay/fuse.

4. Heating, ventilation and air conditioning module failure:

   Flash/replace the HVAC control module.

Reference Circuit Diagram

Air Conditioning System

Diagnostic Test Steps

1. Check the HVAC control module harness and connector:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the battery:

   ® Abnormal, battery failure, perform "Replace the battery".

   ® Normal, go to 3.

3. Check the relay/fuse:

   ® Abnormal, relay/fuse failure, perform "Replace the relay/fuse".

   ® Normal, go to 4.

4. Check the HVAC control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Electric Power Steering Control Module (EPS)

DTC Index

List

DTC	FTB	Description	MIL	Failure Level
C1624	17	ECU Temperature is Out of Range or Unplausible	Yellow	II
C1630	23	Steering Torque Sensor Channel 1 Error	Red flash	II
C1630	24	Steering Torque Sensor Channel 2 Error	Red flash	II
C1631	2F	Steering Angle Signal Implausible	Yellow	II
C1632	71	Steering Gear is Blocked	Red flash	II
C1632	86	Index Sensor Error	Yellow	II
C1633	54	Steering Angle Calibration Error	Yellow	II
C1634	00	Steering Angle Initialization Error	Yellow	II
C1636	00	The Configured Max Amount of Allowed Healings is Reached	Yellow	III
C1640	72	Motor Failure or Motor Related Driver Circuit Failure	Red flash	II
C164A	72	MOSFETs Short Circuit	Red flash	II
C1650	00	Motor Position Sensor Failure	Red flash	II
C1660	00	ECU Inner Power-Supply Related Circuit Module Failure	Red flash	II
C1660	61	ECU Calculation Failure	Red flash	II
C1661	00	Steering Gear Friction Too High or Wormwheel About to Break	Yellow	III
C1662	00	Lost Assist Due to Battery Voltage High	Yellow	III
C1665	00	Reduction of Assistance Due To Battery Voltage Low	Yellow	III
C1670	00	Motor Torque Limiter(MTL) Reached Limitation	Yellow	III
C1671	62	Software or Hardware Check Fail	Yellow	II
C1672	64	Motor Torque Limiter(MTL) Plausibilization Error	Red flash	II
C1680	00	Reduction of Assistance Due to ECU Temperature	Yellow	III
C16A1	47	Hardware Executes An Unexpected Reset	OFF	III
C16B1	29	EPS Assistance Depend on Partly Enable Conditions Due to Engine Speed / PT-Ready Unavailable	OFF	III
C16B3	29	The Global Date & Time of EPS Snapshot Is Not True Due to Instrument Pack (IPK) Signals Unavailable	OFF	III
C16B4	29	Default Assistance Provided Due to Invalid Vehicle Speed Average Driven	Yellow	II
C16B5	29	Drivering Monitoring System(DMC) Unavailable	OFF	III
C16B6	29	High Speed Intelligent Driving Unavailable	OFF	III
C16B8	29	EPS Local Advanced Function Unavailabe	OFF	III
C16B9	29	Low Speed Intelligent Driving Unavailable	OFF	III
C16BA	29	EPS Advanced or Basic Function Error	Yellow	II
U0073	88	CAN Bus Off	Yellow	II
U0122	87	Lost Communication with Stability Control System (SCS)	Yellow	II
U0146	87	Lost Communication with Gateway (GW)	OFF	III
U0158	87	Lost Communication with APA	OFF	III
U0300	51	ECU is in Production Mode or Special Software	Yellow	II
U1562	17	Battery Voltage High	OFF	III

DTC	FTB	Description	MIL	Failure Level
U1563	16	Battery Voltage Low	OFF	III
U2000	04	ECU Hardware Error	Red flash	II
U2001	41	ECU Error-EEPROM Checksum Error	Red flash	II
U2002	42	ECU Error - RAM Error	Red flash	II
U2003	04	ECU Error-Software Error	Red flash	II
U2004	42	ECU Error - ROM Error	Red flash	II
U2005	41	ECU Error-Flash Checksum Error	Yellow	III

*Remarks:

1.

   • When the lamp illuminates Yellow, it indicates that the electric power steering system has a general failure irrelevant to steering angle and the performance is reduced, please stop the car as soon as safety permits. And if the lamp always lights on after restarting the vehicle and driving for a short while, please contact an MG Authorised Repairer for repair as soon as possible.

   • When this lamp illuminates red and flashes, it indicates the electric power steering system has a serious failure. Please contact an MG Authorised Repairer for repair as soon as possible.

2. Failure level description:

   • I: Stop the vehicle immediately for repair

   • II: Carefully drive to Authorised Repairer for repair

   • III: Repair as soon as possible

   • IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

C1624, C1636, C1640, C164A, C1650, C1660, C1661, C1662, C1665, C1670, C1671, C1672, C1680, C16A1, U2000, U2001, U2002, U2003, U2004, U2005 and U0300

DTC Description

DTC	FTB	Failure Description
C1624	17	ECU Temperature Out of Range or Irrational
C1636	00	The Configured Max Amount of Allowed Healings is Reached
C1640	72	Motor Failure or Motor Related Driver Circuit Failure
C164A	72	MOSFETs Short Circuit
C1650	00	Motor Position Sensor Failure
C1660	00	ECU Inner Power-Supply Related Circuit Module Failure
C1660	61	ECU Calculation Failure
C1661	00	Steering Gear Friction Too High or Wormwheel About to Break
C1662	00	Lost Assist Due to Battery Voltage High
C1665	00	Reduction of Assistance Due To Battery Voltage Low
C1670	00	Motor Torque Limiter(MTL) Reached Limitation
C1671	62	Software or Hardware Check Fail
C1672	64	Motor Torque Limiter(MTL) Plausibilization Error
C1680	00	Reduction of Assistance Due to ECU Temperature
C16A1	47	Hardware Executes An Unexpected Reset
U2000	04	ECU Hardware Error
U2001	41	ECU Error-EEPROM Checksum Error
U2002	42	ECU Error - RAM Error
U2003	04	ECU Error-Software Error
U2004	42	ECU Error-ROM Error
U2005	41	ECU Error-Flash Checksum Error
U0300	51	ECU is in Production Mode or Special Software

Subsystem Principle

Electric Power Steering Control Module internal failure is found in the self-check, not involving external circuits.

Conditions for Running DTCs

C1640, C1660, C1661, C1662, C1665, C1670, C1680, C16A1, U2000, U2001, U2002 and U2003: Place the start switch in ON position.

C1650, U2005, C1624, C1636, C1671, C1672, U2004, U0300 and C164A:

- DTC setting is activated.
- After wakeup.
- Full monitoring mode.

Conditions for Setting DTCs

C1624:

- Temperature difference between the controller and pcb is too high.
- Controller temperature is out of range.
- Pcb temperature is out of range.
- Dbc temperature is out of range.

C1636: The status is switched from Normal to Failure too many times in a period of time.

C1640:

- Output/FET drive circuit fails.
- Motor circuit is interrupted.
- Motor phase current is out of normal range.

C164A: Short circuit is detected in any/multiple MOSFETs.

C1650:

- Motor position sensor signal is incorrect or not in the normal range.
- The calculated motor position signal is not credible.

C1660 00: Internal monitoring voltage error.

C1660 61: Internal calculation failure.

C1661: Power vibrations, high power density, and high friction between mechanical parts.

C1662: The battery voltage is above the shutdown threshold (18V) for 20ms.

C1665: The battery voltage is below the shutdown threshold (9V) for 15s.

C1670 : PWM signal error.

C1671:

- Fail to cancel steering check.
- Speed check fails.
- Motor torque offset check fails.
- RPSFade out function check fails
- Software rationality check fails.
- Data storage is damaged.
- Vibration rationality check fails.

- The system ASIC self-check of revolution counter fails.

C1672: Motor torque limiter rationality check fails.

C1680: Temperature sensor signal value is out of expected range.

C16A1:

- External signal resets.
- Watchdog timer overruns.
- Clock monitor resets.
- Low voltage indicator resets.
- Software resets.
- Safety protection resets.

U2000: ECU hardware error.

U2001: EEPROM failure.

U2002: RAM detection fails.

U2003: Control unit is not normally turned off.

U2004:

- Read operation fails.
- Data memory CRC checksum failure.
- ECU production data startup check fails.

U2005: Flash error.

U0300:

- Electronic control unit is in Production mode.
- Special software, such as fault injection software, is being used.

Operations of ECU after Failure

C1624: The system runs in fault operation mode, but may provide up to 100% help.

C1636: Assistance is reduced to 50%.

C1640, C1650, C1660, C1662, C1670, C16A1, U2000, U2001, U2002 and U2005:

- No boost power is available.
- EPS red MIL blinks.

C164A: The system runs in fault operation mode.

C1661 and C1665:

- Boost power is reduced.
- EPS yellow MIL illuminates.

C1671:

- Safety status request is normal.
- Although the boost is normal or may be 100%, there is a risk that the system will violate safety objectives, including unexpected steering boost.

C1672: None.

C1680:

- No boost power is available.
- EPS yellow MIL illuminates.

U2003: EPS function not affected.

U2004: Output level will be closed. No operation is made.

U0300:

- Safety status request is normal.
- ECU is not in Customer mode.
- SW in ECU is used for testing, not for customers.

Conditions for Clearing DTCs

C1624:

- Temperature difference between the controller and pcb is within the range.
- Controller temperature is within specified range.
- Pcb temperature is within specified range.
- Dbc temperature is within specified range.

C1636: The number of switching from normal to fault operation does not exceed the threshold.

C1640:

- Output/FET drive circuit Normal.
- Motor phase current is within normal range.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C164A: No short circuit is detected in any MOSFET.

C1650:

- Motor position sensor signal is normal or in the normal range.
- The calculated motor position signal is credible.
- History DTCs will be cleared and the MIL will go out after 40 wakeup-standby cycles.

C1660 00:

- Internal voltage is normal.
- EPS MIL goes out.

C1660 61:

- Internal calculation is credible.
- EPS MIL goes out.

C1661:

- No excessive vibration and high power density is available.
- MIL goes out.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

C1662:

- The supply voltage is below 17.7V for 20ms.
- MIL goes out.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

C1665:

- The supply voltage is above 10V for 15s.
- MIL goes out.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

C1670:

- PWM check is passed.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C1671:

- Cancel the steering check permit.
- Speed check permit.
- Motor torque offset check is passed.
- Software rationality check fails.
- Data storage is damaged.
- Vibration rationality check fails.
- The system ASIC self-check of revolution counter fails.

C1672: Motor torque limiter rationality check is normal.

C1680:

- Temperature sensor signal value is in expected range.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C16A1:

- The module operates normally, without unexpected reset.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

U2000:

- ECU hardware detection is good.
- EPS MIL goes out.

U2001:

- EEPROM is correct.
- EPS MIL goes out.

U2002:

- No error is found in RAM detection.
- EPS MIL goes out.

U2003: All software detections are correct.

U2004:

- Read operation succeeds.
- Data memory CRC checksum succeeds.
- ECU production data startup check succeeds.

U2005:

- Communication is normal.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

U0300:

- ECU is in Customer mode.
- Correctly delivered software is in use.

Possible Failure Causes and Maintenance Scheme

1. Related circuit/connector failure.

   Repair/replace the harness.

2. Steering column assembly failure.

   Check/replace the steering column assembly.

3. Electric power steering control module failure.

   Flash/replace the EPS control module.

Reference Circuit Diagram

Electric Power Steering

Diagnostic Test Steps

1. Check related circuit/connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the EPS control module software.

   ® Normal, go to TAC Human Assistance.

C1630, C1631 and C1632

DTC Description

DTC	FTB	Failure Description
C1630	23	Steering Torque Sensor Channel 1 Error
C1630	24	Steering Torque Sensor Channel 2 Error
C1631	2F	Steering Angle Signal Implausible
C1632	71	Steering Gear is Blocked
C1632	86	Index Sensor Error

Subsystem Principle

The torque angle sensor is integrated in the steering column, its function is to measure the magnitude and direction of the torque acted by the driver on the steering wheel, as well as the magnitude and direction of the steering wheel angle, which is a EPS control signal.

Conditions for Running DTCs

C1630 23 24 and C1632 86:

- DTC setting is activated.
- After wakeup.
- Full monitoring mode.

C1631 and C1632 72: Place the start switch in "ON" position.

Conditions for Setting DTCs

C1630 23 24:

- Signal error.
- The signal radius is out of normal range.
- ASIC detection error.
- The signal value is out of range.

C1631: Angle signal is implausible.

C1632 71:

- Steering gear is blocked.
- The steering column has a heavy impact load.
- The critical value has been reached.

C1632 86:

- Appears along with DTC C1630 49.
- The median sensor is undervoltage, overvoltage, short circuited, open circuited.

Operations of ECU after Failure

C1630 23 24: The system runs in fault operation mode, but may provide up to 100% help.

C1631:

- End protection and active return fuctions are lost.
- EPS yellow MIL illuminates.

C1632 71: None.

C1632 86:

- No active return fuction is available.
- EPS yellow MIL illuminates.

Conditions for Clearing DTCs

C1630 23 24:

- Communication is normal.
- The signal radius is in normal range.
- No error is found in ASIC detection.
- The signal value is in the range.

C1631:

- Angle signal is plausible.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C1632 71:

- Steering gear is not blocked.
- No significant impact on the steering column.
- The threshold is not reached.

C1632 86:

- The median sensor signal is within the correct range.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

Possible Failure Causes and Maintenance Scheme

1. Related circuit/connector failure.

   Repair/replace the harness.

2. Steering column assembly failure.

   Check/replace the steering column assembly.

3. Electric power steering control module failure.

   Flash/replace the EPS control module.

Reference Circuit Diagram

Electric Power Steering

Diagnostic Test Steps

1. Check related circuit/connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Use a scan tool to read if the "Drive Torque" is within a rational value range.

   ® Abnormal, the torque angle sensor is faulty, repair/replace the sensor or upper level assembly.

   ® Normal, go to 3.

3. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the EPS control module.

® Normal, go to TAC Human Assistance.

C1633 and C1634

DTC Description

DTC	FTB	Failure Description
C1633	54	Steering Angle Calibration Error
C1634	00	Steering Angle Initialization Error

Subsystem Principle

The torque angle sensor is integrated in the steering column, its function is to measure the magnitude and direction of the torque acted by the driver on the steering wheel, as well as the magnitude and direction of the steering wheel angle, which is a EPS control signal.

Conditions for Running DTCs

Place the start switch in "ON" position.

Conditions for Setting DTCs

C1633: Not calibrated or incorrectly calibrated.

C1634: Initialisation value lost or error.

Operations of ECU after Failure

- Active return and end protection functions are turned off.
- EPS yellow MIL illuminates.

Conditions for Clearing DTCs

C1633:

- The calibration value is correctly stored in EEPROM and valid.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C1634:

- The initialisation value is correctly stored in EEPROM and valid.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

Possible Failure Causes and Maintenance Scheme

1. Steering column assembly failure.

   Check/replace the steering column assembly.

2. The EPS control module software version does not match.

   Flash/replace the EPS control module.

Diagnostic Test Steps

1. Read if the "Steering Gear Right End Protection Learning State" an "Steering Gear Left End Protection Learning State" are within the rational value range (refer to the Appendix for rational value range). :

   ® Abnormal, the torque angle sensor is faulty, repair/replace the sensor or upper level assembly.

   ® Normal, go to 2.

2. Perform the steering wheel calibration operation:

   Turn the steering wheel to straight forward position.

   Turn the steering wheel all the way to the left.

   Turn the steering wheel to straight forward position.

   Turn the steering wheel all the way to the right.

   Turn the steering wheel to straight forward position.

   Connect the scan tool, read and clear the DTC, and check if the fault still exists.

   No ® Diagnosis is completed.

   Yes ® Go to Step 3;

3. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the EPS control module.

   ® Normal, go to TAC Human Assistance.

C16B1, C16B3 and C16B4

DTC Description

DTC	FTB	Failure Description
C16B1	29	EPS Assistance Depend on Partly Enable Conditions Due to Engine Speed / PT-Ready Unavailable
C16B3	29	The Global Date & Time of EPS Snapshot Is Not True Due to Instrument Pack (IPK) Signals Unavailable
C16B4	29	Default Assistance Provided Due to Invalid Vehicle Speed Average Driven

Subsystem Principle

The function of the electronic control unit (ECU) is to conduct logical analysis, make calculations and give commands to control the motor operation according to the signals from the torque sensor and speed sensor. Furthermore, ECU is also configured with safety protection and self-diagnosis functions. ECU determines if the system is in normal state by collecting signals such as the motor current, alternator voltage and engine working condition, etc. If the system fails, the boost power will be canceled automatically and ECU will carry out fault diagnosis and analysis.

Conditions for Running DTCs

- 1s after wakeup.
- 1s after the voltage returns to normal.
- The power mode is ON or ACC.
- DTC setting is activated.
- DTC U0073 and U0146 are not set.

Conditions for Setting DTCs

C16B1:

- The Engine Not Started signal lasts for 500ms.
- Signal 0xC9 is not received in 500ms.
- Signal 0x196 is not received in 500ms.

C16B3:

- The Instrument Pack Unavailable signal lasts for 2s.
- Signal 0x541 is not received in 2s.

C16B4: The validity of Dynamic Stability Control System signal is invalid for 1s.

Operations of ECU after Failure

C16B1 and C16B3:

- Functions based on power management mode are lost.
- The default value is adopted for global date/time display.

C16B4:

- Functions based on power management mode are lost.
- The default value is adopted for global date/time display.
- EPS yellow MIL illuminates.

Conditions for Clearing DTCs

C16B1:

- The Engine Started signal lasts for 2s.
- Signal 0xC9 is received for 2s.
- Signal 0x196 is received for 2s.

C16B3:

- The Instrument Pack Available signal lasts for 20s.
- Signal 0x541 is received for 20s.

C16B4: If the validity of Dynamic Stability Control System signal is valid for 100 consecutive times, the MIL will go out.

Possible Failure Causes and Maintenance Scheme

1. Check the harness and connector of EPS control module or gateway:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. EPS control module failure:

   Flash/replace the EPS control module.

3. Corresponding module failure:

   Flash/replace the corresponding module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. Check the harness and connector of EPS control module - corresponding module:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the EPS control module.

   ® Normal, go to 3.

3. Check the corresponding module:

   ® Abnormal, the corresponding module failure or software version does not match, flash/replace the corresponding module.

   ® Normal, go to TAC Human Assistance.

C16B5, C16B6, C16B8, C16B9, C16BA, U0073, U0122, U0146 and U0158

DTC Description

DTC	FTB	Failure Description
C16B5	29	Drivering Monitoring System(DMC) Unavailable
C16B6	29	High Speed Intelligent Driving Unavailable
C16B8	29	EPS Local Advanced Function Unavailabe
C16B9	29	Low Speed Intelligent Driving Unavailable
C16BA	29	EPS Advanced or Basic Function Error
U0073	88	CAN Bus Off
U0122	87	Lost Communication with Stability Control System (SCS)
U0146	87	Lost Communication with Gateway (GW)
U0158	87	Lost Communication with APA

Subsystem Principle

The electric power steering control module (EPS) communicates with other modules via the CAN bus.

Conditions for Running DTCs

C16B5:

- Place the start switch in "ON" position.
- DTC setting is activated.
- DTC U0073 and U0146 are not set.

C16B6, U0073, U0122, U0146 and C16BA:

- 1s after wakeup.
- 1s after the voltage returns to normal.
- DTC setting is activated.
- Full monitoring mode.
- The power mode is ON or power mode signal is lost and wakeup is enabled.
- DTC U0073 and U0146 are not set.

C16B8, C16B9 and U0158:

- 1000ms after the communication starts.
- The supply voltage is within normal range, after it is recovered from the abnormal voltage for 1000ms.
- Engine cranks for 1000ms.
- The power mode is running.
- No DTC is reported.

Conditions for Setting DTCs

C16B5: The DTC will be set if the specified data frame from the FICM cannot be received within 1s.

C16B6: FVCM Signal is not received for more than 500ms.

C16B8: The DTC will be set if the specified data frame from the IBS is not received within 500ms.

C16B9:

- The checksum check of LADS_020ms_PDU04 is abnormal in 500ms.
- The scroll counter check of LADS_020ms_PDU04 is abnormal in 500ms.

C16BA:

- The motor torque of active return exceeds the safety limit.
- The torque exceeds the allowable range or the function arbitration is invalid.
- The APC torque is not zero and the vehicle speed is greater than 10km/h.
- The end torque is activated, which violates the basic activation condition.
- The write operation of EEPROM about end stop fails.
- EndStop HSD function is activated incorrectly.
- The oscillation torque is out of the allowable range or the function arbitration of oscillation channel is invalid.
- The DTSC torque is out of the allowable range, or function arbitration is invalid for DTSC channel.

U0073: When the controller has the transmission error for certain times, "Bus Off" state will appear. The DTC will be set if "Bus Off" state appears for 5 consecutive times.

U0122: The DTC will be set if specified data frames sent from the IBS cannot be received within 2s.

U0146: The DTC will be set if the specified data frame sent from the GW cannot be received within 2s.

U0158: The DTC will be set if the specified data frame sent from the auto parking assist control module (APA) cannot be received within 2s.

Operations of ECU after Failure

C16B5: EPS maintains the last operation execution mode.

C16B6: LKA function fails.

C16B8: Whether the exit can be achieved or not is to be confirmed.

C16B9 and U0158: APA function is disabled.

C16BA:

- Safety status request is normal.
- Active return function will be turned off.
- AUTPARKCTRL will exit.
- EndStop function will be unavailable.
- TSC, LDW and HSD functions will be unavailable.

U0073 and U0122:

- Default boost power will be provided.
- EPS yellow MIL illuminates.

U0146:

- Provide boost power according to the vehicle speed.
- The default value is adopted for global date/time display.

Conditions for Clearing DTCs

C16B5:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

C16B6:

- FVCM Signal is received for more than 2s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C16B8: The specified data frame sent from IBS is received within 200ms.

C16B9:

- The checksum check of LADS_020ms_PDU04 is normal in 500ms.
- The scroll counter check of LADS_020ms_PDU04 is normal in 500ms.

C16BA:

- The steering torque deviation with CardanJointComp is below the safety limit or the arbitration is valid.
- The motor torque of active return is below the safety limit.
- LANEASSIST torque is within the allowable range and the function arbitration is valid.
- The vehicle speed is lower than 10km/h.
- The oscillation torque is within the allowable range, and the function arbitration of oscillation channel is valid.
- The DTSC torque is within the allowable range, or function arbitration is valid for DTSC channel.

U0073:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on and powered-off cycles, the MIL goes out.

U0122 and U0146:

- The corresponding data frame is received for 100 consecutive times, the MIL goes out.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

U0158: The specified data frame sent from LADS is received within 400ms.

Possible Failure Causes and Maintenance Scheme

1. Check the harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. EPS control module failure:

   Flash/replace the EPS control module.

3. Corresponding module failure:

   Flash/replace the corresponding module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. Check the harness and connector of EPS control module - corresponding module:

   ® For abnormal conditions, harness/connector failure, perform "Repair/Replacement of Harness and Connector".

   ® Normal, go to 2.

2. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the EPS control module.

   ® Normal, go to 3.

3. Check the corresponding module:

   ® Abnormal, the corresponding module failure or software version does not match, flash/replace the corresponding module.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The electric power steering control module (EPS) monitors the supply voltage.

Conditions for Running DTCs

- DTC setting is activated.
- After wakeup.

Conditions for Setting DTCs

U1562: The power supply voltage is higher than or equal to 16V for 1s.

U1563: The power supply voltage is lower than or equal to 9V for 1s.

Operations of ECU after Failure

Stop the network diagnosis.

Conditions for Clearing DTCs

U1562:

- The power supply voltage is lower than or equal to 15.5V for 1s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

U1563:

- The power supply voltage is higher than or equal to 9.5V for 1s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:

   Repair/replace the harness.

2. Battery failure:

   Replace the battery.

3. Relay/fuse failure:

   Replace the relay/fuse.

4. EPS control module failure:

   Flash/replace the EPS control module.

Reference Circuit Diagram

Electric Power Steering

Diagnostic Test Steps

1. Check the harness and connector of EPS control module:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the battery:

   ® Abnormal, battery failure, perform "Replace the battery".

   ® Normal, go to 3.

3. Check the relay/fuse:

   ® Abnormal, relay/fuse failure, perform "Replace the relay/fuse".

   ® Normal, go to 4.

4. Check the EPS control module:

   ® Abnormal, the EPS control module software version does not match, flash/replace the module.

   ® Normal, go to TAC Human Assistance.

Electronic Steering Column Lock (ESCL)

DTC Index

List

DTC	FTB	Description	EPS Warning Lamp*	Failure Level*
B170C	00	The Authentication Is Failure Between Electronic Steering Column Lock ECU (ESCL) and Body Control Module (BCM)	Yellow Lamp Flashes	I
B1832	01	Position Sensor Error	Yellow Lamp Flashes	I
B1833	01	Motor High Side Short Error	Yellow Lamp Flashes	I
B1834	01	Motor Low Side Short Error	Yellow Lamp Flashes	I
B1835	13	ECU Internal Error - Motorbridge Open Circuit	Yellow Lamp Flashes	I
B1836	42	ECU Error - RAM Error (Slave Controller)	Yellow Lamp Flashes	I
B1837	42	ECU Error - ROM Error (Slave Controller)	Yellow Lamp Flashes	I
B1838	04	A/D Converter Error	Yellow Lamp Flashes	I
B1839	04	ECU Slave Controller Incorrect Enable	Yellow Lamp Flashes	I
B183A	04	ECU Slave Controller Is Not Enable	Yellow Lamp Flashes	I
B183B	04	ECU Slave Controller Reset Error	Yellow Lamp Flashes	I
B183C	04	ECU System-Basis-Chip Reset Error	Yellow Lamp Flashes	I
B183D	04	ECU Main Controller Error	Yellow Lamp Flashes	I
B183E	04	ECU Main Controller Program Sequence Error	Yellow Lamp Flashes	I
B183F	04	ECU Slave Controller Error	Yellow Lamp Flashes	I
B1840	04	ECU Slave Controller Program Sequence Error	Yellow Lamp Flashes	I
U0073	88	CAN Bus Off	None	IIA
U0140	87	Lost Communication with Body Control Module (BCM)	None	IIA
U0146	87	Lost Communication with Gateway (GW)	None	IIA
U0155	87	Lost Communication with Instrument Pack (IPK)	None	IIB
U1562	17	Battery Voltage High	None	IIA
U1563	16	Battery Voltage Low	None	IIA
U17A9	82	Frame 0x1A9 Counter Error	None	IIA
U17A9	83	Frame 0x1A9 Checksum Error	None	IIA
U2001	42	ECU Error - EEPROM Error	Yellow Lamp Flashes	I
U2002	42	ECU Error - RAM Error	Yellow Lamp Flashes	I
U2004	42	ECU Error - ROM Error	Yellow Lamp Flashes	I
U2010	00	ECU Error - I2C Communication Error	Yellow Lamp Flashes	I

*Remarks:

1. When this lamp illuminates yellow and flashes, it indicates that the electronic steering column lock has failed. Please stop the vehicle as soon as safety permits, shut down the engine and contact a local MG Authorised Repairer for service immediately. If this lamp extinguishes after flashing for a while, it indicates that the steering wheel is locked. Please attempt to rotate the steering wheel.
2. Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised Repairer for repair
- IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation

DTC	FTB	Description	EPS Warning Lamp*	Failure Level*
• IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time • III: Inspection during maintenance • IV: Inspection based on actual demand				

Diagnosis Information and Procedure

B170C

DTC Description

DTC	FTB	Failure Description
B170C	00	The Authentication Is Failure Between Electronic Steering Column Lock ECU (ESCL) and Body Control Module (BCM)

Subsystem Principle

Electronic steering column lock system (ESCL): to lock the steering column when the vehicle is stopped. While unlocking the vehicle, the ESCL and the BCM will verify relevant vehicle and key information.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.
- DTC U0073 88 is not set.
- DTC U0140 87 is not set.
- Not in the bus initialisation process.
- The battery voltage is between 9V and 16V.

Conditions for Setting DTCs

ESCL and BCM authentication fails.

Operations of ECU after Failure

- Unlocking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

- ESCL and BCM authentication is passed.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column lock control module is mismatched with BCM.

   Programme or match the control module.

2. Electronic steering column lock control module failure.

   Flash/replace the ESCL control module:

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:

   Connect the scan tool, and place the start switch in "ON" position.

   Read the "Anti-theft Learning Result" to check whether it is within rational value range (see Appendix for rational value range).

   ® Abnormal, Yes ® Test/replace the electronic steering column lock control module;

   ® Normal, go to 2.

2. Programme or match the control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

B1832

DTC Description

DTC	FTB	Failure Description
B1832	01	Position Sensor Error

Subsystem Principle

The electronic steering column lock system (ESCL) is used to lock the steering wheel column when the vehicle stops, and the position sensor is used to detect whether the electronic steering column lock system is in the locking position.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

- Both of the sensors work.
- The locking time of locking tab is less than 50ms.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

- Only 1 position sensor is enabled.
- If the unlocking process works, the moving time of locking dog will be more than 50ms.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Check the electronic steering column lock control module:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Electronic steering column lock control module failure:

   Flash/replace the ESCL control module:

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Read the "ESCL Locking Switch State" and "ESCL Unlocking Switch State" to check whether they are within rational value range (see Appendix for rational value range). :

   Yes ® Test/replace the electronic steering column assembly;

   ® No, go to 2.

2. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

B1833 and B1834

DTC Description

DTC	FTB	Failure Description
B1833	01	Motor High Side Short Error
B1834	01	Motor Low Side Short Error

Subsystem Principle

The electronic steering column lock system (ESCL) is used to lock the steering wheel column when the vehicle stops, and the position sensor is used to detect whether the electronic steering column lock system is in the locking position.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1833 01: The diagnosed voltage of motor bridge is higher than 75% of the battery voltage when no driver is activated.

B1834 01: The diagnosed voltage of motor bridge is higher than 12.5% of the battery voltage when no driver is activated.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

B1833 01:

- The diagnosed voltage of motor bridge is lower than 75% of the battery voltage when a single driver is activated.
- MIL turns off after the DTC is cleared.

B1834 01:

- The diagnosed voltage of motor bridge is higher than 12.5% of the battery voltage when a single driver is activated.
- MIL turns off after the DTC is cleared.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Test/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Read the "ESCL Locking Switch State" and "ESCL Unlocking Switch State" to check whether they are within rational value range (see Appendix for rational value range).

   ® Abnormal, Test/replace the electronic steering column lock control module;

   ® Normal, go to 2.

2. Check the electronic steering column lock control module:

® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

® Normal, go to TAC Human Assistance.

B1835

DTC Description

DTC	FTB	Failure Description
B1835	13	ECU Internal Error - Motorbridge Open Circuit

Subsystem Principle

The electronic steering column lock module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

- The diagnosed voltage of motor bridge is lower than 75% of the battery voltage when the high-side driver is activated.
- The diagnosed voltage of motor bridge is higher than 12.5% of the battery voltage when the low-side driver is activated.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

- The diagnosed voltage of motor bridge is higher than 75% of the battery voltage when the high-side driver is activated.
- The diagnosed voltage of motor bridge is lower than 12.5% of the battery voltage when the low-side driver is activated.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Repair/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the ESCL control module software version:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

B1836 and B1837

DTC Description

DTC	FTB	Failure Description
B1836	42	ECU Error - RAM Error (Slave Controller)
B1837	42	ECU Error - ROM Error (Slave Controller)

Subsystem Principle

The electronic steering column lock control module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1836: Security data access error confirmed.

B1837: Incorrect check value of application program code.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

B1836:

- Security data access is correct.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B1837:

- Correct check value of application program code.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Flash/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

   ® Abnormal, electronic steering column control module software version mismatch, flash/replace the electronic steering column control module.

   ® Normal, go to TAC Human Assistance.

B1838

DTC Description

DTC	FTB	Failure Description
B1838	04	A/D Converter Error

Subsystem Principle

The electronic steering column lock module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

- The voltage at the ground terminal is higher than (8/1023)Vcc for 50ms.
- Vcc is lower than (1016/1023) for 50ms.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

- The voltage at the ground end is lower than or equal to (8/1023)Vcc.
- Vcc is higher than or equal to (1016/1023)Vcc.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Test/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

B1839, B183A and B183B

DTC Description

DTC	FTB	Failure Description
B1839	04	ECU Slave Controller Incorrect Enable
B183A	04	ECU Slave Controller Is Not Enable
B183B	04	ECU Slave Controller Reset Error

Subsystem Principle

The electronic steering column lock control module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1839: Slave controller sets the enable line to more than 100ms, but the main controller has no response.

B183A: Slave controller is unable to reset after the reset line is activated.

B183B: Auxiliary controller is unable to reset after powered.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

B1839:

- Slave controller sets the enable line, and the main controller has responses.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B183A:

- Slave controller resetting is activated after the reset line.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B183B:

- Auxiliary controller is reset after powered.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Flash/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

® Abnormal, electronic steering column control module software version mismatch, flash/replace the electronic steering column control module.

® Normal, go to TAC Human Assistance.

B183C

DTC Description

DTC	FTB	Failure Description
B183C	04	ECU System-Basis-Chip Reset Error

Subsystem Principle

The electronic steering column lock module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

System basic chip reset line is deactivated within 20ms after the watchdog trigger is disabled.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

- System basic chip reset line is activated within 20ms after the watchdog trigger is disabled.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Test/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

B183D, B183E, B183F and B1840

DTC Description

DTC	FTB	Failure Description
B183D	04	ECU Main Controller Error
B183E	04	ECU Main Controller Program Sequence Error
B183F	04	ECU Slave Controller Error
B1840	04	ECU Slave Controller Program Sequence Error

Subsystem Principle

The electronic steering column lock control module (ESCL) carries out a self-check for internal failures, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B183D and B183F: CPU validation library reports an error.

B183E: Path flag check failed in the master controller.

B1840: Path flag check failed in the slave controller.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

B183D, B183F:

- CPU validation library has not detected any error.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B183E:

- Path flag check succeeded in the master controller.
- History DTCs will be cleared after 40 wakeup-standby cycles.

B1840:

- Path flag check succeeded in the slave controller.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Electronic steering column assembly failure.

   Flash/replace the electronic steering column assembly.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

® Abnormal, electronic steering column control module software version mismatch, flash/replace the electronic steering column control module.

® Normal, go to TAC Human Assistance.

U0073, U0146 and U17A9

DTC Description

DTC	FTB	DTC Description
U0073	88	CAN Bus Off
U0146	87	Lost Communication with Gateway (GW)
U17A9	82	Frame 0x1A9 Counter Error
U17A9	83	Frame 0x1A9 Checksum Error

Subsystem Principle

The electronic steering column lock control module (ESCL) communicates with other control modules via the CAN bus or gateway (GW).

Conditions for Running DTCs

U0146 and U17A9:

- 1s after network wakeup.
- In the normal network mode.
- 1s after voltage recovers from ultra high/low voltage.
- Battery voltage range is 9 - 16V.

U0073:

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.
- In the normal network mode.
- Not in the bus initialisation process.

Conditions for Setting DTCs

U0146: The DTC will be set if the specified data frame sent from the GW cannot be received within 2s.

U17A9: The DTCs will be set if the specified data frame sent from IBS cannot be received within 820ms.

U0073: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

U0146: 20 messages of GW are received within 0.44s.

U17A9: The specified data frame sent from IBS is received within 820ms.

U0073:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. CAN harness or connector failure:

   Repair/replace the harness.

2. Electronic steering column lock failure:

   Flash/replace the ESCL module.

3. Gateway failure:

   Flash/replace the GW.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to 3.

3. Check the GW module:

   ® Abnormal, GW module failure or software version mismatch, flash/replace the GW module.

   ® Normal, go to TAC Human Assistance.

U0140

DTC Description

DTC	FTB	DTC Description
U0140	87	Lost Communication with Body Control Module (BCM)

Subsystem Principle

The electronic steering column lock control module (ESCL) communicates with the body control module (BCM) via the CAN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.
- In the normal network mode.
- Not in the bus initialisation process.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the SCS cannot be received within 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. CAN harness or connector failure:

   Repair/replace the harness.

2. Electronic steering column lock failure:

   Flash/replace the ESCL control module:

3. Body control module failure:

   Flash/replace the dynamic stability control module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to 3.

3. Check the BCM:

® Abnormal, BCM failure or software version mismatch, flash/replace the BCM.

® Normal, go to TAC Human Assistance.

U0155

DTC Description

DTC	FTB	DTC Description
U0155	87	Lost Communication with Instrument Pack (IPK)

Subsystem Principle

The electronic steering column lock control module (ESCL) communicates with the instrument pack (IPK) via the CAN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not set.
- In the normal network mode.
- Not in the bus initialisation process.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the SCS cannot be received within 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. CAN harness or connector failure:

   Repair/replace the harness.

2. Electronic steering column lock failure:

   Flash/replace the ESCL control module:

3. Instrument pack failure:

   Flash/replace IPK.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the CAN harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to 3.

3. Check the IPK:

   ® Abnormal, IPK failure or software version mismatch, flash/replace the IPK.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	DTC Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The electronic steering column lock control module (ESCL) monitors the system voltage in real time.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562: The power supply voltage is higher than or equal to 16V for 1s.

U1563: The power supply voltage is lower than or equal to 9V for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

U1562:

- The power supply voltage is lower than or equal to 15.5V for 1s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

U1563:

- The power supply voltage is higher than or equal to 9.5V for 1s.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:

   Repair/replace the harness.

2. Battery failure:

   Replace the battery.

3. Relay/fuse failure:

   Repair/replace the relay/fuse.

4. Electronic steering column lock failure:

   Flash/replace the ESCL control module.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the ESCL control module harness and connector:

   ® Abnormal, the harness/connector is faulty, perform "Repair/Replacement of Harness".

   ® Normal, go to 2.

2. Check the battery:

   ® Abnormal, battery failure, perform "Replace the battery".

   ® Normal, go to 3.

3. Check the relay/fuse:

   ® Abnormal, relay/fuse failure, perform "Replace the relay/fuse".

   ® Normal, go to 4.

4. Check the electronic steering column lock control module:

   ® Abnormal, ESCL control module software version mismatch, flash/replace the ESCL control module.

   ® Normal, go to TAC Human Assistance.

U2001, U2002, U2004 and U2010

DTC Description

DTC	FTB	Failure Description
U2001	42	ECU Error - EEPROM Error
U2002	42	ECU Error - RAM Error
U2004	42	ECU Error - ROM Error
U2010	00	CU Error - I2C Communication Error

Subsystem Principle

The electronic steering column lock control module (ESCL) carries out a self-check for internal failures, not involving external circuits.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U2001: Failed decision-making for 3 times or an error reported by the data memory.

U2002: Incorrect RAM test characteristic curve read from RAM.

U2004: Incorrect check value of application program code.

U2010: Wrong function code, CRC error or timeout.

Operations of ECU after Failure

- Locking is prohibited.
- EPS warning lamp (yellow) flashes.

Conditions for Clearing DTCs

U2001:

- Normal decision-making for 3 times or no error reported by the data memory.
- History DTCs will be cleared after 40 wakeup-standby cycles.

U2002:

- Correct RAM test characteristic curve read from RAM.
- History DTCs will be cleared after 40 wakeup-standby cycles.

U2004:

- Correct check value of application program code.
- History DTCs will be cleared after 40 wakeup-standby cycles.

U2010:

- No wrong function code, correct CRC and no timeout.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Steering column assembly failure.

   Flash/replace the ESCL control module software.

Reference Circuit Diagram

Electronic Steering Column Lock

Diagnostic Test Steps

1. Check the electronic steering column lock control module:

   ® Abnormal, electronic steering column control module software version mismatch, flash/replace the electronic steering column control module.

   ® Normal, go to TAC Human Assistance.

Integrated Brake System (IBS)

DTC Index

List

DTC	FTB	Description - Chinese	MIL	Failure Level
C0020	16	B6T Temperature Sensor Electrical Signal Low	OFF	II
C0020	17	B6T Temperature Sensor Electrical Signal High	OFF	II
C0020	1A	Reverse Battery Protection Not Work	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0030	09	Left Front Tone Wheel Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0030	14	Left Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0031	07	Left Front Wheel Speed Sensor Mechanical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	13	LHF Wheel Speed Sensor Circuit Open	ABS MIL illuminates	II
C0031	15	Left Front Wheel Speed Sensor Circuit Short to Battery or Open	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	29	Left Front Wheel Speed Sensor Signal Invalid	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	2F	Left Front Wheel Speed Sensor Signal Erratic	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	49	Left Front Wheel Speed Sensor Hardware Failures	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	4A	Left Front Wheel Speed Sensor Wrong Type	ABS MIL illuminates, and ESC MIL illuminates	II
C0031	64	Left Front Wheel Speed Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0032	14	Left Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0033	09	Right Front Tone Wheel Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0033	14	Right Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0034	07	Right Front Wheel Speed Sensor Mechanical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	13	RHF Wheel Speed Sensor Circuit Open	ABS MIL illuminates	II
C0034	15	Right Front Wheel Speed Sensor Circuit Short to Battery or Open	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	29	Right Front Wheel Speed Sensor Signal Invalid	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	2F	Right Front Wheel Speed Sensor Signal Erratic	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	49	Right Front Wheel Speed Sensor Hardware Failures	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	4A	Right Front Wheel Speed Sensor Wrong Type	ABS MIL illuminates, and ESC MIL illuminates	II
C0034	64	Right Front Wheel Speed Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0035	14	Right Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0036	09	Left Rear Tone Wheel Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0036	14	Left Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0037	07	Left Rear Wheel Speed Sensor Mechanical Error	ABS MIL illuminates, and ESC MIL illuminates	II

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C0037	13	LHR Wheel Speed Sensor Circuit Open	ABS MIL illuminates	II
C0037	15	Left Rear Wheel Speed Sensor Circuit Short to Battery or Open	ABS MIL illuminates, and ESC MIL illuminates	II
C0037	29	Left Rear Wheel Speed Sensor Signal Invalid	ABS MIL illuminates, and ESC MIL illuminates	II
C0037	2F	Left Rear Wheel Speed Sensor Signal Erratic	ABS MIL illuminates, and ESC MIL illuminates	II
C0037	49	Left Rear Wheel Speed Sensor Hardware Failures	ABS MIL illuminates, and ESC MIL illuminates	II
C0037	4A	Left Rear Wheel Speed Sensor Wrong Type	ABS MIL illuminates, and ESC MIL illuminates	II
C0037	64	Left Rear Wheel Speed Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0038	14	Left Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0039	09	Right Rear Tone Wheel Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0039	14	Right Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C003A	07	Right Rear Wheel Speed Sensor Mechanical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	13	RHR Wheel Speed Sensor Circuit Open	ABS MIL illuminates	II
C003A	15	Right Rear Wheel Speed Sensor Circuit Short to Battery or Open	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	29	Right Rear Wheel Speed Sensor Signal Invalid	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	2F	Right Rear Wheel Speed Sensor Signal Erratic	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	49	Right Rear Wheel Speed Sensor Hardware Failures	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	4A	Right Rear Wheel Speed Sensor Wrong Type	ABS MIL illuminates, and ESC MIL illuminates	II
C003A	64	Right Rear Wheel Speed Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C003B	14	Right Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground	ABS MIL illuminates	II
C0044	01	Main Cylinder Pressure Sensor Electrical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0044	26	Pressure Sensor P1/P2 Signal Exceeds The Lower Limit Value	ABS MIL illuminates, and ESC MIL illuminates	II
C0044	27	Pressure Sensor P1/P2 Signal Exceeds The Upper Limit Value	ABS MIL illuminates, and ESC MIL illuminates	II
C0044	28	Main Cylinder Pressure Offset Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0044	44	Main Cylinder Pressure Sensor Configuration Data Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0044	64	Main Cylinder Pressure Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0045	01	System Pressure Sensor Communication / Electrical / Function Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0045	26	System Pressure Sensor P1 / P2 Out of Range Low	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0045	27	System Pressure Sensor P1 / P2 Out of Range High	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II

DTC	FTB	Description - Chinese	MIL	Failure Level
C0045	28	System Pressure Sensor P1 and P2 Signal Offset Out of Range	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0045	44	System Pressure Sensor Configuration Error	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0045	64	System Pressure Sensor P1 and P2 / T1 and T2 Signal Error	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0046	26	Pressure Sensor T1/T2 Signal Exceeds The Lower Limit Value	ABS MIL illuminates, and ESC MIL illuminates	II
C0046	27	Pressure Sensor T1/T2 Signal Exceeds The Upper Limit Value	ABS MIL illuminates, and ESC MIL illuminates	II
C0048	29	TTS Gradient Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	44	TTS Eeprom Checksum Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	49	TTS Electrical Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	54	Travel Sensor Initial Offset Adjustment Execution Check Error - Missing Calibration	OFF	II
C0048	64	TTS S1 and S2 Difference between Offset-Corrected Signals Out of Range	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	81	TTS Communication Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	96	TTS SENT Frame Status Fault	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0048	99	TTS Offset in Pedal Release Position Out of Range	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0049	01	Brake Fluid Level Switch Electrical Failure	Brake system MIL illuminates	II
C0049	04	Brake Fluid Level Sensor Internal Fault	OFF	II
C0049	11	Brake Fluid Level Sensor Short to Ground	OFF	II
C0049	12	Brake Fluid Level Sensor Short to Battery	OFF	II
C0049	13	Brake Fluid Level Sensor Open Circuit	OFF	II
C0049	14	Brake Fluid Level Sensor Short Circuit	OFF	II
C0049	74	Brake Fluid Level Empty	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0049	7A	Fluid Leak or Seal Failure	ABS MIL illuminates, and ESC MIL illuminates	II
C0049	7B	Brake Fluid Level Low	ABS MIL illuminates, and ESC MIL illuminates	II
C004B	26	System Pressure Sensor T1 / T2 Out of Range Low	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II

DTC	FTB	Description - Chinese	MIL	Failure Level
C004B	27	System Pressure Sensor T1 / T2 Out of Range High	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0051	27	Steering Wheel Position Sensor Step Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	28	Steering Wheel Angle Offset Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	54	Steering Wheel Angle Not Calibrated	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	62	Steering Wheel Angle Signal Comparison Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	64	Steering Wheel Angle Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	84	Steering Wheel Angle Signal Below Range	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	85	Steering Wheel Angle Signal Above Range	ABS MIL illuminates, and ESC MIL illuminates	II
C0051	96	Steering Wheel Angle Failed	ABS MIL illuminates, and ESC MIL illuminates	II
C0061	01	Lateral Acceleration Sensor Electrical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0061	28	Lateral Acceleration Sensor Offset Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0061	54	Lateral Acceleration Sensor Not Calibrated	ABS MIL illuminates, and ESC MIL illuminates	II
C0061	64	Lateral Acceleration Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0062	01	Longitudinal Acceleration Sensor Electrical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0062	28	Longitudinal Acceleration Sensor Offset Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0062	54	Longitudinal Acceleration Sensor Not Calibrated	ABS MIL illuminates, and ESC MIL illuminates	II
C0062	64	Longitudinal Acceleration Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C0062	76	Longitudinal Acceleration Sensor Wrong Mounting Position	ABS MIL illuminates, and ESC MIL illuminates	II
C0063	01	Yaw Rate Sensor Electrical Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0063	28	Yaw Rate Sensor Offset Error	ABS MIL illuminates, and ESC MIL illuminates	II
C0063	64	Yaw Rate Sensor Signal Implausible	ABS MIL illuminates, and ESC MIL illuminates	II
C006B	00	Stability Control System Active Too Long	ABS MIL illuminates, and ESC MIL illuminates	II
C0089	64	Traction Control System (TCS) Disable Switch Error	OFF	II
C0500	15	Left Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0502	11	LHF Wheel Speed Sensor Circuit Short to Ground	ABS MIL illuminates	II
C0503	12	LHF Wheel Speed Sensor Circuit Short to Ubatt	ABS MIL illuminates	II
C0504	12	Left Front Wheel Speed Sensor Return Line Short to Battery	ABS MIL illuminates	II
C0505	15	Left Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0506	15	Right Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0508	11	RHF Wheel Speed Sensor Circuit Short to Ground	ABS MIL illuminates	II
C0509	12	RHF Wheel Speed Sensor Circuit Short to Ubatt	ABS MIL illuminates	II

DTC	FTB	Description - Chinese	MIL	Failure Level
C050A	12	Right Front Wheel Speed Sensor Return Line Short to Battery	ABS MIL illuminates	II
C050B	15	Right Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C050C	15	Left Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C050E	11	LHR Wheel Speed Sensor Circuit Short to Ground	ABS MIL illuminates	II
C050F	12	LHR Wheel Speed Sensor Circuit Short to Ubatt	ABS MIL illuminates	II
C0510	12	Left Rear Wheel Speed Sensor Return Line Short to Battery	ABS MIL illuminates	II
C0511	15	Left Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0512	15	Right Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0514	11	RHR Wheel Speed Sensor Circuit Short to Ground	ABS MIL illuminates	II
C0515	12	RHR Wheel Speed Sensor Circuit Short to Ubatt	ABS MIL illuminates	II
C0516	12	Right Rear Wheel Speed Sensor Return Line Short to Battery	ABS MIL illuminates	II
C0517	15	Right Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply	ABS MIL illuminates	II
C0518	1D	Left Front Wheel Speed Sensor Supply Circuit Current Out of Range	ABS MIL illuminates	II
C0519	1D	Right Front Wheel Speed Sensor Supply Circuit Current Out of Range	ABS MIL illuminates	II
C051A	1D	Left Rear Wheel Speed Sensor Supply Circuit Current Out of Range	ABS MIL illuminates	II
C051B	1D	Rear Rear Wheel Speed Sensor Supply Circuit Current Out of Range	ABS MIL illuminates	II
C052C	1B	Internal UnderVoltage at KL30_M	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C052C	96	Internal OverVoltage at KL30_M	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C052C	A2	Supply is Too Low KL30_2	ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C052E	A2	Nbrake Function Failure-UnderVoltage	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C053B	A2	Supply is Too Low KL30_1	OFF	II
C0555	87	Left Front Wheel Speed Sensor Missing Protocol Data	ABS MIL illuminates	II
C0556	87	Right Front Wheel Speed Sensor Missing Protocol Data	ABS MIL illuminates	II
C0557	87	Left Rear Wheel Speed Sensor Missing Protocol Data	ABS MIL illuminates	II

DTC	FTB	Description - Chinese	MIL	Failure Level
C0558	87	Right Rear Wheel Speed Sensor Missing Protocol Data	ABS MIL illuminates	II
C055E	7A	Air Volume in Linear Actuator Circuit Too High	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C057E	64	Bridge Temperature Sensor Not Plausible	OFF	II
C058A	78	Motor Position Alignment Wrong or Not Aligned	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0594	02	B6 Bridge Driver Failure	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0594	29	PWM Feedback Out of Range	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0594	92	Motor Torque Not Balance - Load Observer Not Matched with Actual Load	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0594	94	Motor Moves Without Command	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0596	29	Motor Current Abnormal	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C0597	92	ACC Failure-Vehicle Acceleration / Deceleration Out of Range	OFF	II
C0598	02	Feedline & Flush Test - System Execution Failure	OFF	II
C0598	07	Feedline & Flush Test - Mechatronical Failure	OFF	II
C0598	73	Front Outlet Control - Actuator Stuck Closed	Brake system MIL illuminates	II
C0598	97	Feedline & Flush Test - Result Expired	OFF	II
C05B8	02	Motor Position Sensor Signal Error	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C05C2	98	B6 Bridge / DCLink Capacitor / Motor Rotor Magnet / Motor Over Temperature	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C060D	12	Left Actuator - Motor Line Circuit Short to Battery	ABS MIL illuminates, and ESC MIL illuminates	I
C0612	12	Right Actuator - Motor Line Circuit Short to Battery	ABS MIL illuminates, and ESC MIL illuminates	I
C0614	49	Right Actuator - Control Circuit Internal Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C0616	49	Left Actuator - Control Circuit Internal Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C1003	72	Unwanted Open Feed Valve or Cut Valve in Primary Circuit or Secondary Circuit	Brake system MIL illuminates, and ABS MIL illuminates	II
C1003	73	Unwanted Closed Feed Valve or Cut Valve in Primary Circuit or Secondary Circuit	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C100A	85	Brake Disc Over Temperature	ABS MIL illuminates, and ESC MIL illuminates	II
C100B	86	Engine Torque Request Not Adjustable	ABS MIL illuminates, and ESC MIL illuminates	II

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C1013	09	Volume Deviation Monitoring - Leakage Localization Cannot Confirm	Brake system MIL illuminates	II
C1013	7A	System Has Leakage	Brake system MIL illuminates	II
C1013	92	Large Amount of Air - Loss of Brake Pressure	Brake system MIL illuminates	II
C1019	74	Mechanical End Stop Protection Fault - Motor Revolution During Zero Point Detection	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C1019	78	Mechanical End Stop Protection Fault - Zero Point Detection Failed	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
C1020	52	PSM State Fault	OFF	II
C104B	7A	TMC Has Leakage	ABS MIL illuminates, and ESC MIL illuminates	II
C104D	7A	Air Volume in TMC Circuit Too High	ABS MIL illuminates, and ESC MIL illuminates	II
C10B0	44	EEPROM Reading Data Error	ABS MIL illuminates, and ESC MIL illuminates	II
C10C0	9A	Brake System Lifetime Reached Limit	ABS MIL illuminates, and ESC MIL illuminates	II
C10C0	FB	Abc Deceleration Deviation - Lower than Request	ABS MIL illuminates, and ESC MIL illuminates	II
C10C0	FC	Abc Deceleration Deviation - Higher than Request	ABS MIL illuminates, and ESC MIL illuminates	II
C1109	08	Clutch Switch Signal Implausible	OFF	II
C1112	00	No Coding Detected	ABS MIL illuminates, and ESC MIL illuminates	II
C1113	00	Parameter Error or EEPROM Incoherent	ABS MIL illuminates, and ESC MIL illuminates	II
C1114	4A	HCU/ECU Mismatch	ABS MIL illuminates, and ESC MIL illuminates	II
C1115	46	Analog Valve Calibration Memory Failure	ABS MIL illuminates, and ESC MIL illuminates	II
C1116	11	Vacuum Sensor Circuit Short to Ground	ABS MIL illuminates, and ESC MIL illuminates	II
C1116	12	Vacuum Sensor Circuit Short to Battery	ABS MIL illuminates, and ESC MIL illuminates	II
C1117	1C	TMC Sensor Voltage Out Of Range	ABS MIL illuminates, and ESC MIL illuminates	II
C1121	24	Hill Descent Control (HDC) Switch Error	OFF	II
C1122	24	Auto Hold (AVH) Switch Error	OFF	II
C1801	06	Right Actuator - Host Available But Did Not React	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1801	13	Right Actuator - Open Line Detected During Release Action	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1801	1B	Right Actuator - High Resistance During HSP Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	III
C1801	1D	Right Actuator - High Free Run Current During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1801	71	Right Actuator - Standstill During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1801	77	Right Actuator - Irregular Current During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1801	92	Right Actuator - Maximum Allowed Power Dissipation During Releasing Or Applying Exceeded	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1801	94	Right Actuator - Maximum Time For Action Exceeded	Yellow P lamp illuminates	I

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C1802	06	Left Actuator - Host Available But Did Not React	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1802	13	Left Actuator - Open Line Detected During Release Action	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1802	1B	Left Actuator - High Resistance During HSP Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	III
C1802	1D	Left Actuator - High Free Run Current During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1802	71	Left Actuator - Standstill During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1802	77	Left Actuator - Irregular Current During Action Detected	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1802	92	Left Actuator - Maximum Allowed Power Dissipation During Releasing Or Applying Exceeded	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1802	94	Left Actuator - Maximum Time For Action Exceeded	Yellow P lamp illuminates	I
C1803	07	Rolling Detected Dispite Maximum Pressure is Requested	ABS MIL illuminates, and ESC MIL illuminates	II
C1803	63	Maximum Holding Time Exceeded	ABS MIL illuminates, and ESC MIL illuminates	II
C1803	77	Electronic Park Brake (EPB) Actuator - Commanded Position Not Reachable	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1804	47	Electronic Park Brake (EPB) Software Safety Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C1805	01	Electronic Park Brake (EPB) Switch General Electrical Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C1805	02	Electronic Park Brake (EPB) Switch General Signal Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C1805	2A	Electronic Park Brake (EPB) Switch Blocked Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
C1806	04	PBC Requested Power Latch Time out	ABS MIL illuminates, and ESC MIL illuminates	I
C1806	49	Electronic Park Brake (EPB) ECU Internal Electronic Failure	ABS MIL illuminates, and ESC MIL illuminates	I
C1806	53	Maintenance Mode	Yellow P lamp illuminates	I
C1806	54	Assembly Test Was Not Executed	Yellow P lamp illuminates	I
C1807	4B	Motor Overheat	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1808	06	Abortion of Actuator Dynamic Brake Function (ADBF)	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
C1810	13	Left Motor Failure_Passive Test - Circuit Resistance Above Threshold or Voltage out of Range	ABS MIL illuminates, and ESC MIL illuminates	I
C1811	13	Right Motor Failure_Passive Test - Circuit Resistance Above Threshold or Voltage out of Range	ABS MIL illuminates, and ESC MIL illuminates	I
C1812	98	Motor Supply Component or System Over Temperature	ABS MIL illuminates, and ESC MIL illuminates	I
C1813	1F	Electronic Park Brake (EPB) Circuit Current Above Threshold Too Long	ABS MIL illuminates, and ESC MIL illuminates	I

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C1815	12	Electronic Park Brake (EPB) Switch Lamp Circuit Short to Supply	ABS MIL illuminates, and ESC MIL illuminates	I
C1815	13	Electronic Park Brake (EPB) Switch Lamp Circuit Open	ABS MIL illuminates, and ESC MIL illuminates	I
C1816	00	Electronic Park Brake (EPB) Switch Wake Up ECU Failed	ABS MIL illuminates, and ESC MIL illuminates	I
C1830	53	Electronic Park Brake (EPB) Function Deactivated (Roller Bench Test Mode)	Yellow P lamp illuminates, and red P lamp flashes or illuminates	I
C1A95	49	Wheel Speed Multiplexer Selftest Execution Failure or Result Expired Failure	ABS MIL illuminates, and ESC MIL illuminates	II
C1A97	49	Wheel Speed Multiplexer Selftest Failure	ABS MIL illuminates, and ESC MIL illuminates	I
U0073	88	CAN Bus Off	ABS MIL illuminates, and ESC MIL illuminates	I
U0074	88	Control Module Communication Bus Off on Safety CAN	ABS MIL illuminates, and ESC MIL illuminates	I
U0103	87	Lost Communication with Gear Shift Control Module (SCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U010F	87	Lost Communication With Air Conditioning Control Module (AC)	OFF	I
U0122	87	Lost Communication with RBM	ABS MIL illuminates, and ESC MIL illuminates	I
U0126	87	Lost Communication with Steering Angle Sensor Module (SAS)	ABS MIL illuminates, and ESC MIL illuminates	I
U0128	87	Lost Communication with Electronic Park Motor Control Unit (EPMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U0140	87	Lost Communication with Body Control Module (BCM)	ABS MIL illuminates, and ESC MIL illuminates	I
U0145	87	Lost Communication with Intelligent Pilot Device(IPD)	ABS MIL illuminates, and ESC MIL illuminates	I
U0146	87	Lost Communication with Intelligent Computation Center	OFF	I
U0148	87	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)	ABS MIL illuminates, and ESC MIL illuminates	I
U0155	87	Lost Communication with Instrument Pack (IPK)	OFF	I
U0164	87	Lost Communication With Air Conditioning Control Module (AC)	ABS MIL illuminates, and ESC MIL illuminates	I
U0229	87	Lost Communication with Rear Wheel Steering(RWS)	ABS MIL illuminates, and ESC MIL illuminates	I
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)	ABS MIL illuminates, and ESC MIL illuminates	I
U0293	87	Lost Communication With IMCU	ABS MIL illuminates, and ESC MIL illuminates	I
U0300	51	Internal Control Module Software Incompatibility	OFF	II
U0300	57	HAD Software Compatibility Check - Invalid / Incompatible Software Component	ABS MIL illuminates, and ESC MIL illuminates	II
U0404	81	Invalid Data Received from Gear Shift Control Module (SCU)	OFF	I

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U0422	81	Invalid Data Received from Body Control Module (BCM)	OFF	I
U0423	81	Invalid Data Received from Instrument Panel Cluster Control Module (IPK)	OFF	I
U0428	81	Invalid Steering Wheel Angle Data Received	OFF	I
U0447	81	Invalid Data Received from Gateway (GW)	OFF	I
U0452	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	OFF	I
U0546	81	Invalid Data Received From Front Infotainment Control Module (FICM)	OFF	I
U1000	49	Boost Converter Failure	OFF	II
U1000	71	Linear Actuator Piston / TMC Floating Piston Stuck	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
U1022	87	Lost Communication with Right Hand Rear Drive Assist Module(RHRDA)	ABS MIL illuminates, and ESC MIL illuminates	I
U1265	87	Lost Communication with Front View Camera Module (FVCM)/ Front Detection Radar (FDR)	OFF	I
U130B	81	Invalid Data Received from Front Detection Radar (FDR)	OFF	I
U1322	81	Invalid Data Received from Rear Drive Assist Module (BLIS/RDA)	OFF	I
U1560	68	Power Supply Unexpected Shut Down	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
U1562	17	Battery Voltage High	ABS MIL illuminates, and ESC MIL illuminates	I
U1563	16	Battery Voltage Low	ABS MIL illuminates, and ESC MIL illuminates	I
U1594	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	OFF	I
U163C	87	Frame 0x03C Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1647	87	Frame 0x047 Timeout	OFF	I
U1655	87	Frame 0x55 Timeout	OFF	I
U1657	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U1657	87	Frame 0x057 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1671	81	Invalid Data Received from Rear Wheel Steering(RWS)	ABS MIL illuminates, and ESC MIL illuminates	I
U168A	87	Frame 0x08A Timeout	OFF	I
U1690	81	Invalid Data Received from Redundant Brake Module(RBM)	ABS MIL illuminates, and ESC MIL illuminates	I
U1690	87	Frame 0x090 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1692	81	Invalid Data Received from Redundant Brake Module(RBM)	ABS MIL illuminates, and ESC MIL illuminates	I
U1692	87	Frame 0x092 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1695	87	Frame 0x095 Timeout	OFF	I
U169B	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U169B	87	Frame 0x09B Timeout	ABS MIL illuminates, and ESC MIL illuminates	I

DTC	FTB	Description - Chinese	MIL	Failure Level
U169D	81	Invalid Data Received from Gear Shift Control Module (SCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U169D	87	Frame 0x09D Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U16AD	81	Invalid Data Received from Steering Angle Sensor (SAS) Module	ABS MIL illuminates, and ESC MIL illuminates	I
U16B4	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	OFF	I
U16B4	87	Frame 0x0B4 Timeout	OFF	I
U16BD	81	Invalid Data Received from Redundant Brake Module(RBM)	ABS MIL illuminates, and ESC MIL illuminates	I
U16BF	81	Invalid Data Received from Second Brake System	ABS MIL illuminates, and ESC MIL illuminates	I
U16BF	87	Frame 0x0BF Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U16DB	81	Invalid Data Received from Electronic Park Motor Control Unit (EPMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U16DB	87	Frame 0x0DB Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U16E7	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U16E9	87	Frame 0x0E9 Timeout	OFF	I
U16EF	87	Frame 0x0EF Timeout	OFF	I
U1739	87	Frame 0x139 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U174D	87	Frame 0x14D Timeout	OFF	I
U1757	81	Invalid Data Received from Front Detection Radar (FDR)	ABS MIL illuminates, and ESC MIL illuminates	I
U1757	87	Frame 0x157 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1763	81	Invalid Data Received From Sensing Diagnostic Module(SDM)	ABS MIL illuminates, and ESC MIL illuminates	I
U1769	81	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U1769	87	Frame 0x169 Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U176E	81	Invalid Data Received from RHRDA	ABS MIL illuminates, and ESC MIL illuminates	I
U176E	87	Frame 0x16E Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U177E	81	Invalid Data Received from Front Detection Radar (FDR)	ABS MIL illuminates, and ESC MIL illuminates	I
U1794	81	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U1794	87	Frame 0x194 Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U17F1	87	Frame 0x1F1 Time out	OFF	I
U17F5	87	Frame 0x1F5 Timeout	OFF	I
U182B	87	Frame 0x22B Timeout	OFF	I
U1889	87	Frame0x289 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U188D	81	Invalid Data Received from Body Control Module (BCM)	ABS MIL illuminates, and ESC MIL illuminates	I
U188D	87	Frame0x28D Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U18D5	81	Invalid Data Received from RHRDA	ABS MIL illuminates, and ESC MIL illuminates	I
U18D5	87	Frame 0x2D5 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I

DTC	FTB	Description - Chinese	MIL	Failure Level
U1916	87	Frame 0x316 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U191B	87	Frame 0x31B Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U192C	87	Frame 0x32C Timeout	OFF	I
U192E	87	Frame 0x32E Timeout	OFF	I
U193D	81	Invalid Data Received from Air Conditioning Control Module (AC)	ABS MIL illuminates, and ESC MIL illuminates	I
U193D	87	Frame 0x33D Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1952	87	Frame 0x352 Timeout	OFF	I
U197D	81	Invalid Data Received From Intelligent Pilot Device(IPD)	ABS MIL illuminates, and ESC MIL illuminates	I
U197D	87	Frame 0x37D Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U198F	87	Frame 0x38F Timeout	OFF	I
U1994	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)	ABS MIL illuminates, and ESC MIL illuminates	I
U1994	87	Frame 0x394 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U199C	81	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U199C	87	Frame 0x39C Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U19F0	81	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U19F0	87	Frame 0x3F0 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U19FB	87	Frame 0x3FB Timeout	OFF	I
U19FF	87	Frame 0x3FF Timeout	OFF	I
U1A76	87	Frame 0x476 Timeout	OFF	I
U1B31	81	Invalid Data Received from Body Control Module (BCM)	ABS MIL illuminates, and ESC MIL illuminates	I
U1B31	87	Frame 0x531 Timeout	ABS MIL illuminates, and ESC MIL illuminates	I
U1B40	81	Invalid Data Received from Intelligent Computation Center(ICC)	ABS MIL illuminates, and ESC MIL illuminates	I
U1B40	87	Frame GW_HSC1_FrP07 (0x540) Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U1B41	87	Frame 0x541 Time out	ABS MIL illuminates, and ESC MIL illuminates	I
U1B48	87	Frame 0x548 Timeout	OFF	I
U2001	42	ECU Error - EEPROM Error	Yellow P lamp illuminates, and red P lamp flashes or illuminates	II
U3000	27	Mechanical End Stop Protection - Unsteady Actuator Position Signal	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
U3000	49	ECU Error-ECU Internal electronic failure	ABS MIL illuminates, and ESC MIL illuminates	I
U3000	56	Implausible or Corrupted Configuration Data	Yellow P lamp illuminates, and red P lamp flashes or illuminates	III
U3000	84	Mechanical End Stop Protection - Actuator Position Exceeds Mechanical Lower Limit	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II
U3000	85	Mechanical End Stop Protection - Actuator Position Exceeds Mechanical Upper Limit	Brake system MIL illuminates, ABS MIL illuminates, and IPB malfunction warning lamp illuminates	II

DTC	FTB	Description - Chinese	MIL	Failure Level
U3000	94	System Pressure Deviation Out of Range	Brake system MIL illuminates	II

*Remarks:

1. If the IBS/TC warning lamp does not extinguish or illuminates during driving, it indicates the system has a failure
2. If the brake system malfunction indicator lamp does not extinguish or illuminates during driving, it indicates a failure with the braking system such as brake fluid loss or electronic brake force distribution (EBD) failure.
3. The ABS malfunction indicator lamp indicates that the control module detects this DTC is current or in the confirmation state during the running.
4. If the EPB MIL remains ON or illuminates during driving, it indicates that the EPB fails or enters the diagnostic state.
5. Failure level description:
   - I: Stop the vehicle immediately for repair
   - II: Carefully drive to Authorised Repairer for repair
   - III: Repair as soon as possible
   - IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

C0020

DTC Description

DTC	FTB	Failure Description
C0020	16	B6T Temperature Sensor Electrical Signal Low
C0020	17	B6T Temperature Sensor Electrical Signal High
C0020	1A	Reverse Battery Protection Not Work

Subsystem Principle

The pump motor is a component of brake module assembly. When ABS, traction control or stability control system are required to run, integrated brake system (IBS) activates pump motor relay and turns on pump motor.

Conditions for Running DTCs

C0020 16 17: After the system initialisation is completed, each cycle corresponds to each 10ms.

C0020 1A: When the engine is started, undervoltage drops quickly.

Conditions for Setting DTCs

C0020 16: In this monitoring function, check the output voltage level of B6 electric bridge temperature sensor. The DTC will be set if the time of sensor output signal <450 mV exceeds the specified monitoring time.

C0020 17: In this monitoring function, check the output voltage level of B6 electric bridge temperature sensor. The DTC will be set if the time of sensor output signal >3300 mV exceeds the specified monitoring time.

C0020 1A: The reverse battery protection does not work, therefore energy may flow from KL30_2/KL30_1 to KL30_1/KL30_2, or the recycled energy may flow to KL30_1/KL30_2. The monitoring system detects the engine crank pulse, and check if the voltage drop of reverse gear protection device at KL30_1/KL30_2 becomes negative value. The DTC will be set if it is negative value.

Operations of ECU after Failure

C0020 16 17: None.

C0020 1A: Disable functions: Brake EBD ABS.

Conditions for Clearing DTCs

C0020 16: No DTC is locked in the ignition cycle.

C0020 17: No DTC is locked in the ignition cycle.

C0020 1A: Cycle the ignition and start the engine.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Replace the integrated brake system (IBS).

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:

1. Check and visually observe the brake system for leakage, damage, etc.

   If any of the above situations occurs, repair/replace related faulty parts of brake system.

   ® Normal, go to 2.

2. Check if the brake fluid is too dirty or if the fluid contains bubbles or moisture.

   If any of the above situations occurs, replace the brake system fluid and bleed air in the system.

   Normal, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS):

   ® Abnormal, replace the integrated brake system (IBS);

   ® Normal, go to TAC Human Assistance.

C0030, C0033, C0036, C0039

DTC Description

DTC	FTB	Failure Description
C0030	09	Left Front Tone Wheel Error
C0033	09	Right Front Tone Wheel Error
C0036	09	Left Rear Tone Wheel Error
C0039	09	Right Rear Tone Wheel Error

Subsystem Principle

The wheel speed is detected by the active wheel speed sensor and the encoder ring. The encoder ring is composed of permanent magnets. Each wheel speed sensor receives a reference voltage from the electronic brake control module, and transmits the AC square-wave signal to the electronic brake control module. When the wheels are rotating, the electronic brake control module calculates the wheel speed based on the frequency of the square-wave signal.

Conditions for Running DTCs

- The vehicle speed is no less than 14km/h.
- The system voltage is normal.

Conditions for Setting DTCs

The number of expected speed sensor signal pulse of each loop is based on the filtered wheel speed signal. The DTC will be set if the number of detected wheel speed signal and the number of expected pulses display at least one lost pulse.

Operations of ECU after Failure

- Except for EBD and OHB, all other system functions are invalid.
- ABS and ESC malfunction indicator lamps are on.

Conditions for Clearing DTCs

- The acceleration of all wheels is <0.4 g.
- The speed of all wheels exceeds 9 km/h.
- Failure Conditions Related to Wheels without Tone Wheel Error
- Failure Conditions Related to Wheels without Wheel Speed Continuity Error
- Failure Conditions Related to Wheels without Noise Error

Possible Failure Causes and Maintenance Scheme

1. Wheel speed sensor gear ring failure.
   - Replace the bearing.
2. Wheel speed sensor failure.
   - Replace the wheel speed sensor.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Diagnostic Test Steps

1. Check the mounting position of the wheel speed sensor, and check the harness and connector for looseness, poor contact, distortion, corrosion, contamination, deformation, etc.

   Clean, repair or replace the faulty parts found in visual check.

   ® Normal, go to 2.

2. Check the signal wheel or signal gear for wear or deformation, etc. Clean, repair or replace the faulty parts found in visual check.

   Normal, go to 3.

3. Read relevant parameters or perform the forced output with a scan tool, then determine the failure state:

   Connect the scan tool, drive straight at a speed above 20km/h, and read the "Front Left Wheel Speed / Front Right Wheel Speed / Rear Right Wheel Speed / Rear Left Wheel Speed" to check whether it is within the rational value range (refer to the Appendix for rational value range).

   - No® Test/replace the faulty gear ring or the wheel speed sensor.
   - Yes ® Go to Step 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C0030, C0031, C0032, C0033, C0034, C0035, C0036, C0037, C0038, C0039, C003A, C003B, C0500, C0502, C0503, C0504, C0505, C0506, C0508, C0509, C050A and C050B

DTC Description

DTC	FTB	Failure Description
C0030	14	Left Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground
C0031	07	Left Front Wheel Speed Sensor Mechanical Error
C0031	13	LHF Wheel Speed Sensor Circuit Open
C0031	29	Left Front Wheel Speed Sensor Signal Invalid
C0031	2F	Left Front Wheel Speed Sensor Signal Erratic
C0031	49	Left Front Wheel Speed Sensor Hardware Failures
C0031	4A	Left Front Wheel Speed Sensor Wrong Type
C0031	64	Left Front Wheel Speed Sensor Signal Implausible
C0032	14	Left Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground
C0033	14	Right Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground
C0034	07	Right Front Wheel Speed Sensor Mechanical Error
C0034	13	RHF Wheel Speed Sensor Circuit Open
C0034	29	Right Front Wheel Speed Sensor Signal Invalid
C0034	2F	Right Front Wheel Speed Sensor Signal Erratic
C0034	49	Right Front Wheel Speed Sensor Hardware Failures
C0034	4A	Right Front Wheel Speed Sensor Wrong Type
C0034	64	Right Front Wheel Speed Sensor Signal Implausible
C0035	14	Right Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground
C0036	14	Left Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground
C0037	07	Left Rear Wheel Speed Sensor Mechanical Error
C0037	13	LHR Wheel Speed Sensor Circuit Open
C0037	29	Left Rear Wheel Speed Sensor Signal Invalid
C0037	2F	Left Rear Wheel Speed Sensor Signal Erratic
C0037	49	Left Rear Wheel Speed Sensor Hardware Failures
C0037	4A	Left Rear Wheel Speed Sensor Wrong Type
C0037	64	Left Rear Wheel Speed Sensor Signal Implausible
C0038	14	Left Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground
C0039	14	Right Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Ground
C003A	07	Right Rear Wheel Speed Sensor Mechanical Error
C003A	13	RHR Wheel Speed Sensor Circuit Open
C003A	29	Right Rear Wheel Speed Sensor Signal Invalid
C003A	2F	Right Rear Wheel Speed Sensor Signal Erratic
C003A	49	Right Rear Wheel Speed Sensor Hardware Failures
C003A	4A	Right Rear Wheel Speed Sensor Wrong Type
C003A	64	Right Rear Wheel Speed Sensor Signal Implausible
C003B	14	Right Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Ground
C0500	15	Left Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply
C0502	11	LHF Wheel Speed Sensor Circuit Short to Ground
C0503	12	LHF Wheel Speed Sensor Circuit Short to Ubatt
C0504	12	Left Front Wheel Speed Sensor Return Line Short to Battery
C0505	15	Left Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply

C0506	15	Right Front Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply
C0508	11	RHF Wheel Speed Sensor Circuit Short to Ground
C0509	12	RHF Wheel Speed Sensor Circuit Short to Ubatt
C050A	12	Right Front Wheel Speed Sensor Return Line Short to Battery
C050B	15	Right Front Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply
C0031	15	Left Front Wheel Speed Sensor Circuit Short to Battery or Open
C0034	15	Right Front Wheel Speed Sensor Circuit Short to Battery or Open
C0037	15	Left Rear Wheel Speed Sensor Circuit Short to Battery or Open
C003A	15	Right Rear Wheel Speed Sensor Circuit Short to Battery or Open

Subsystem Principle

The wheel speed is detected by the active wheel speed sensor and the encoder ring. The encoder ring is composed of permanent magnets. Each wheel speed sensor receives a 12V reference voltage from the electronic brake control module, and transmits the AC square-wave signal to the electronic brake control module. When the wheels are rotating, the electronic brake control module calculates the wheel speed based on the frequency of the square-wave signal.

Conditions for Running DTCs

- 1.8s after the power-on is reset.
- The system voltage is normal.
- In the diagnosis mode.
- The wheel sensor power supply voltage is lower than the second undervoltage threshold.

Conditions for Setting DTCs

C0030 14, C0033 14, C0036 14 and C0039 14: After 140ms, confirm that the self-test result sensor circuit has parasitic resistance to the ground.

C0031, C0034, C0037 and C003A 15: The measured sensor signal current exceeds the normal range continuously.

C0031 07, C0034 07, C0037 07 and C003A 07: After 140ms, confirm that the sensor is short to battery.

C0031 13, C0034 13, C0037 13 and C003A 13:

- Confirm that the unfiltered wheel acceleration is >20g.
- The harmonic oscillation is not detected in the wheel speed signal.
- In the last cycle, the symbol for the wheel acceleration changes.
- The reciprocal value for the unfiltered wheel acceleration is larger than 40g/cycle.

C0031 15: The measured sensor signal current exceeds the normal range continuously.

C0031 29, C0034 29, C0037 29 and C003A 29:

- If the fastest wheel speed is higher than 10km/h, and the slowest wheel speed is lower than 2km/h, then, after 180s, the failures of all the wheel speed sensors with a speed less than 2km/h will be detected.
- If the speed of any non-driving wheel reaches 14km/h (not applicable to AWD) or the fastest wheel speed without over-spinning reaches 14km/h, all of the wheel speed sensors with a speed less than 2km/h will be detected as failure.
- If 3 fastest wheel speeds with a tolerance of 5% are identical, and exceed the slowest wheel speed by more than 2000% for 5s, or 3 fastest wheel speeds with a tolerance of 10% are identical, and exceed the slowest wheel speed by more than 2000% for 5s, the slowest wheel failure is detected.
- When the vehicle speed is higher than 14km/h, the difference between the fastest wheel speed and the slowest wheel speed exceeds the threshold.

C0031 2F, C0034 2F, C0037 2F and C003A 2F:

- The wheel speed is disordered continuously.
- The extreme value exceeds the wheel speed.
- The outward wheel speed signal is detected.

C0031 49, C0034 49, C0037 49 and C003A 49:

- KL30B is an unavailable low level.
- The internal comparator is unavailable.

C0031 4A, C0034 4A, C0037 4A and C003A 4A:

- The mismatch failure will be set for the sensor type if 8 or more digital protocols are received within 2s after the ignition switch is turned on.
- The mismatch failure will be set if the sensor type does not receive the protocols correctly during 1000ms period and stationary period.

C0031 64, C0034 64, C0037 64 and C003A 64:

- If the fastest wheel speed is higher than 10km/h, and the slowest wheel speed is lower than 2km/h, then, after 180s, the failures of all the wheel speed sensors with a speed less than 2km/h will be detected.

- If the speed of any non-driving wheel reaches 14km/h (not applicable to AWD) or the fastest wheel speed without over-spinning reaches 14km/h, all of the wheel speed sensors with a speed less than 2km/h will be detected as failure.
- If 3 fastest wheel speeds with a tolerance of 5% are identical, and exceed the slowest wheel speed by more than 2000% for 5s, or 3 fastest wheel speeds with a tolerance of 10% are identical, and exceed the slowest wheel speed by more than 2000% for 5s, the slowest wheel failure is detected.
- When the vehicle speed is higher than 14km/h, the difference between the fastest wheel speed and the slowest wheel speed exceeds the threshold.

C0032 14, C0035 14, C0038 14 and C003B 14: After 140ms, confirm that the sensor ground wire has parasitic resistance to the ground.

C0500 15 and C0506 15: After 140ms, confirm that the sensor signal line has parasitic resistance to the battery.

C0502 11 and C0508 11: After 140ms, confirm that the sensor power cord is short to ground.

C0503 12 and C0509 12: After 140ms, confirm that the sensor power cord is short to battery.

C0504 12 and C050A 12: After 140ms, confirm that the sensor circuit is short to battery.

C0505 15 and C050B 15: After 140ms, confirm that the sensor circuit has parasitic resistance to the battery.

Operations of ECU after Failure

Disable function: ABS.

Conditions for Clearing DTCs

C0030 14, C0033 14, C0036 14 and C0039 14: The wheel speed sensor signal is within the specified range within 30s, the corresponding PCU is not set, relevant functions are enabled again, and the MIL goes out.

C0031, C0034, C0037 and C003A 15:

- Relevant functions are activated again, the wheel speed sensor has no electrical interference for 1s (count immediately when the signal is recovered), and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0031 07, C0034 07, C0037 07 and C003A 07:

- Relevant functions are activated again, the acceleration of all wheels is less than 0.4g and the vehicle speed is greater than 9km/h, the ratio of maximum wheel speed to minimum wheel speed is less than 125%, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0031 13, C0034 13, C0037 13 and C003A 13: The wheel speed sensor signal is within the specified range within 30s, the corresponding PCU is not set, relevant functions are enabled again, and the MIL goes out.

C0031 29, C0034 29, C0037 29 and C003A 29:

- Relevant functions are activated again, the acceleration of all wheels is less than 0.4g and the vehicle speed is greater than 9km/h, the ratio of maximum wheel speed to minimum wheel speed is less than 125%, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0031 2F, C0034 2F, C0037 2F and C003A 2F:

- Relevant functions are activated again, the acceleration of all wheels is less than 0.4g and the vehicle speed is greater than 9km/h, the ratio of maximum wheel speed to minimum wheel speed is less than 125%, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0031 49, C0034 49, C0037 49 and C003A 49: If no failure is detected for the PCU wheel speed module during monitoring, relevant functions will be enabled again and the driver warning will be turned off.

C0031 4A, C0034 4A, C0037 4A and C003A 4A: The DTC will be cleared during the next ignition cycle.

C0031 64, C0034 64, C0037 64 and C003A 64:

- Relevant functions are activated again, the acceleration of all wheels is less than 0.4g and the vehicle speed is greater than 9km/h, the ratio of maximum wheel speed to minimum wheel speed is less than 125%, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0032 14, C0035 14, C0038 14 and C003B 14: If the diagnostic command occurs, the history DTCs will be cleared, and the MIL will go out.

C0500 15 and C0506 15: If the diagnostic command occurs, the history DTCs will be cleared, and the MIL will go out.

C0502 11 and C0508 11: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0503 12 and C0509 12: Relevant functions are activated again, and the driving warning is off. The wheel speed

sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0504 12 and C050A 12: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0505 15 and C050B 15: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0031 15: Relevant functions are activated again, the wheel speed sensor has no electrical interference for 1s (count immediately when the signal is recovered), and the MIL goes out.

Possible Failure Causes and Maintenance Scheme

1. Relevant harness failure.
   - Repair/replace the harness.
2. Corresponding wheel speed sensor failure.
   - Replace the corresponding wheel speed sensor.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the wheel speed sensor:

   ® Wheel speed sensor failure, replace the wheel speed sensor;

   ® No wheel speed sensor failure, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C050C, C050E, C050F, C0510, C0511, C0512, C0514, C0515, C0516, C0517, C0518, C0519, C051A, C051B, C0555, C0556, C0557, C0558, C1A95 and C1A97

DTC Description

DTC	FTB	Failure Description
C050C	15	Left Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply
C050E	11	LHR Wheel Speed Sensor Circuit Short to Ground
C050F	12	LHR Wheel Speed Sensor Circuit Short to Ubatt
C0510	12	Left Rear Wheel Speed Sensor Return Line Short to Battery
C0511	15	Left Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply
C0512	15	Right Rear Wheel Speed Sensor Signal Line Has Parasitic Resistance to Supply
C0514	11	RHR Wheel Speed Sensor Circuit Short to Ground
C0515	12	RHR Wheel Speed Sensor Circuit Short to Ubatt
C0516	12	Right Rear Wheel Speed Sensor Return Line Short to Battery
C0517	15	Right Rear Wheel Speed Sensor Return Line Has Parasitic Resistance to Supply
C0518	1D	Left Front Wheel Speed Sensor Supply Circuit Current Out of Range
C0519	1D	Right Front Wheel Speed Sensor Supply Circuit Current Out of Range
C051A	1D	Left Rear Wheel Speed Sensor Supply Circuit Current Out of Range
C051B	1D	Rear Rear Wheel Speed Sensor Supply Circuit Current Out of Range
C0555	87	Left Front Wheel Speed Sensor Missing Protocol Data
C0556	87	Right Front Wheel Speed Sensor Missing Protocol Data
C0557	87	Left Rear Wheel Speed Sensor Missing Protocol Data
C0558	87	Right Rear Wheel Speed Sensor Missing Protocol Data
C1A95	49	Wheel Speed Multiplexer Selftest Execution Failure or Result Expired Failure
C1A97	49	Wheel Speed Multiplexer Selftest Failure

Subsystem Principle

The wheel speed is detected by the active wheel speed sensor and the encoder ring. The encoder ring is composed of permanent magnets. Each wheel speed sensor receives a 12V reference voltage from the electronic brake control module, and transmits the AC square-wave signal to the electronic brake control module. When the wheels are rotating, the electronic brake control module calculates the wheel speed based on the frequency of the square-wave signal.

Conditions for Running DTCs

- 1.8s after the power-on is reset.
- In the diagnosis mode.
- The wheel sensor power supply voltage is lower than the second undervoltage threshold.

Conditions for Setting DTCs

C050C 15 and C0512 15: After 140ms, confirm that the sensor signal line has parasitic resistance to the battery.

C050E 11 and C0514 11: After 140ms, confirm that the sensor power cord is short to ground.

C050F 12 and C0515 12: After 140ms, confirm that the sensor power cord is short to battery.

C0510 12 and C0516 12: After 140ms, confirm that the sensor circuit is short to battery.

C0511 15 and C0517 15: After 140ms, confirm that the sensor circuit has parasitic resistance to the battery.

C0518, C0519, C051A and C051B: The DTC will be set if the measured result sensor signal currect exceeds the following specified range continuously within 140ms.

- 7mA - 10%>Minimum Value >7mA + 10%
- 14mA - 10%>Maximum Value >14mA + 10%
- 28mA - 10%>Speed Signal>28mA + 10%

C0555, C0556, C0557 and C0558:

- The DTC will be set if the protocol data frame is not received beyond 450ms within the wheel speed range of 0 km/h - 0.7 km/h.
- The DTC will be set if the protocol data frame or 12 wheel increment pulses (no matter how much time is required) beyond 140ms within the wheel speed range of 0.7 km - 320 km/h.

C1A95: WSMT is not perform for 4 times during the cycle when the vehicle runs at a speed of at least 30km/h for at least 10s.

C1A97: During the self-test period when the wheel speed multiplexer is switched, the DTC will be set if the wheel speed sensor signal does not change from valid to invalid or from invalid to valid.

Operations of ECU after Failure

Disable function: ABS.

Conditions for Clearing DTCs

C050C 15 and C0512 15: If the diagnostic command occurs, the history DTCs will be cleared, and the MIL will go out.

C050E 11 and C0514 11: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C050F 12 and C0515 12: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0510 12 and C0516 12: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0511 15 and C0517 15: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C0518, C0519, C051A and C051B: The wheel speed sensor signal is within the specified range within 30s, the corresponding PCU is not set, relevant functions are enabled again, and the MIL goes out.

C0555, C0556, C0557 and C0558: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C1A95: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

C1A97: Relevant functions are activated again, and the driving warning is off. The wheel speed sensor signal is within the specified range within 32s, the corresponding PCU12 is not set, and the MIL goes out.

Possible Failure Causes and Maintenance Scheme

1. Relevant harness failure.
   - Repair/replace the harness.
2. Corresponding wheel speed sensor failure.
   - Replace the corresponding wheel speed sensor.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the wheel speed sensor:

   ® Wheel speed sensor failure, replace the wheel speed sensor;

   ® No wheel speed sensor failure, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C0044, C0045, C0046, C004B, C0048 and C1117

DTC Description

DTC	FTB	Failure Description
C0044	01	Main Cylinder Pressure Sensor Electrical Error
C0044	26	Pressure Sensor P1/P2 Signal Exceeds The Lower Limit Value
C0044	27	Pressure Sensor P1/P2 Signal Exceeds The Upper Limit Value
C0044	28	Main Cylinder Pressure Offset Error
C0044	44	Main Cylinder Pressure Sensor Configuration Data Error
C0044	64	Main Cylinder Pressure Sensor Signal Implausible
C0045	01	System Pressure Sensor Communication / Electrical / Function Fault
C0045	26	System Pressure Sensor P1 / P2 Out of Range Low
C0045	27	System Pressure Sensor P1 / P2 Out of Range High
C0045	28	System Pressure Sensor P1 and P2 Signal Offset Out of Range
C0045	44	System Pressure Sensor Configuration Error
C0045	64	System Pressure Sensor P1 and P2 / T1 and T2 Signal Error
C0046	26	Pressure Sensor T1/T2 Signal Exceeds The Lower Limit Value
C0046	27	Pressure Sensor T1/T2 Signal Exceeds The Upper Limit Value
C004B	26	System Pressure Sensor - T1/T2 Out of Range Low
C004B	27	System Pressure Sensor - T1/T2 Out of Range High
C1117	1C	TMC Sensor Voltage Out Of Range
C0048	29	TTS Electrical Fault
C0048	44	Stroke Sensor EEPROM Memory Checksum Error
C0048	49	Stroke Sensor Electrical Failure
C0048	54	Travel Sensor Initial Offset Adjustment Execution Check Error - Missing Calibration
C0048	64	TTS S1 and S2 Difference between Offset-Corrected Signals Out of Range
C0048	81	TTS Communication Fault
C0048	96	TTS SENT Frame Status Fault
C0048	99	TTS Offset in Pedal Release Position Out of Range

Subsystem Principle

The pressure sensor and the stoke sensor are inside IBS to monitor the brake pressure and the brake stroke of the regulator respectively.

Conditions for Running DTCs

C0044 01, 26, 27, 44 and 64: The sensor voltage is normal.

C0044 28: The sensor voltage is normal, and the pressure sensor signal is normal.

C0045 01, 26, 27, 44 and 64: The sensor voltage is normal.

C0045 28: The sensor voltage is normal, and the pressure sensor signal is normal.

C0046 26 and 27: The sensor voltage is normal.

C004B 26 and 27: The sensor voltage is normal.

C1117 1C: The Start switch is placed in ON position.

C0048 29, 44, 49, 54, 64, 81 and 96: The sensor voltage is normal.

C0048 44 and 99: During startup.

Conditions for Setting DTCs

C0044 01:

- At least one corrupted sensor data transfer or command failure is detected in a cycle, and the duration exceeds the specified threshold.
- The duration of abnormal sensor supply voltage or function integrity exceeds the threshold.

C0044 26: The pressure sensor P1/P2 signal is lower than the minimum limit -57.7 bar.

C0044 27: The pressure sensor P1/P2 signal is higher than the maximum limit 327 bar.

C0044 28: The absolute value of calculated pressure sensor signal offset is higher than the offset threshold value.

C0044 44:

- During the initialisation, at least one broken pressure sensor data is detected by the EEPROM segment of relevant sensor and memorizer.
- At least one failure condition duration exceeds that of the threshold valve is monitored within one cycle.

C0044 64:

- No valid T1/T2 signal is available in the previous cycle.

- One invalid T1/T2 signal information has been set by the sensor in the previous cycle.
- At least one signal sensor substitution sample exceeds the specified T1/T2 range.
- The converted sensor signal T1/T2 exceeds the upper limit value or lower limit value of the invalid wave band.
- The deviations of T1/T2 signal in the previous cycle are not within the limit of the threshold value.
- The common modes of T1/T2 signal in the previous cycle are not within the limit of the threshold value.
- The gradient distinctions of T1/T2 signal in the previous cycle are not within the limit of the threshold value.

C0045 01:

- At least one corrupted sensor data transfer or command failure is detected in a cycle, and the duration exceeds the specified threshold.
- It is detected that at least one failure message exists in the circuit for more than the specified minimum failure duration.
- Timeout condition or at least one failure condition is detected with the duration of failure detected in the cycle exceeding the specified minimum failure duration.

C0045 26: The pressure sensor P1/P2 signal is lower than the minimum limit -57.7 bar.

C0045 27: The pressure sensor P1/P2 signal is higher than the maximum limit 327 bar.

C0045 28: The pressure sensor signal offset is higher than the offset threshold.

C0045 44: The DTC will be set if at least one damaged pressure sensor date is detected.

C0045 64:

- In the last cycle, no valid P1/P2 signal is available.
- The sensor sets invalid P1/P2 signal message in the last circuit.
- In the last cycle, P1/P2 signal offset is not wihin the threshold limit.

C0046 26: The pressure sensor T1/T2 signal is lower than the minimum limit -64C.

C0046 27: The pressure sensor T1/T2 signal is higher than the maximum limit 191C.

C004B 26: The pressure sensor T1/T2 signal is lower than the minimum limit -64C.

C004B 27: The pressure sensor T1/T2 signal is higher than the maximum limit 191C.

C1117 1C: The voltage of pressure sensor exceeds the threshold value.

C0048 29: The monitor detects the position gradient not belonging to the driver brake request.

C0048 44: The DTC will be set if is detected that EEPROM message is damaged.

C0048 49: The DTC will be set if the monitor detects the failure state (internal signal check) discovered by TMC stroke sensor itself, transmission error from sensor to EMU, signal gradient failure or occurrence of upper and lower limits of sensor.

C0048 54: The stroke sensor misses initial offset adjustment and calibration.

C0048 64: If the absolute difference between two offset calibration signals of TMC stoke sensor path exceeds one of two threshold values, and exceeds their respective tolerance time, the monitor sets the DTC.

C0048 81: It is detected that the communication error exists in both sent communication channels.

C0048 96: Failure is found in the internal check.

C0048 99: The pedal release position offset (the sum of initial value and long-term value) of one or two path of TMC stroke sensor exceeds the allowable range, the monitor sets the DTC.

Operations of ECU after Failure

C0048 29, 44, 49, 64, 81, 96 and 99: Disable functions: EBD and ABS.

C0045 01, 26, 27, 28, 44, 64, 26 and 27: Disable functions: EBD and ABS.

C0046: Disable functions: All functions other than EBD, ABS and EDC.

C0048 54: Disable functions: None.

C0044 01, 26, 27, 28, 44, 64, 26 and 27: Except for EBD, ABS, EDC and ETC, other system functions are invalid.

C1117 1C: Except for EBD, ABS, EDC and ETC, all other system functions are invalid.

Conditions for Clearing DTCs

C0044 01:

- If within the former 140ms after system startup, the failure detection conditions are not met within 70ms, relevant functions will be enabled again, and the driver warning will be off.
- If within the former 400ms after system startup, the failure detection conditions are not met within the predefined time, relevant functions will be enabled again, and the driver warning will be off.

C0044 26, C0044 27, C0046 26 and C0046 27: If within the former 200ms after system startup, the failure detection conditions are not met within 100ms, relevant functions will be enabled again, and the driver warning will be off.

C0044 28: If the pressure sensor offset is read from non-volatile memory (NVM), relevant functions will be enabled again, and the driving warning off will be evaluated as failure-free.

C0044 44: If within the former 140ms after system startup, the failure detection conditions are not met within 70ms, relevant functions will be enabled again, and the driver warning will be off.

C0044 64:

- If within the former 2.160s after system startup, the failure detection conditions are not met within the predefined time, relevant functions will be enabled again, and the driver warning will be off.
- If within the former 200ms after system startup, the failure detection conditions are not met within 100ms, relevant functions will be enabled again, and the driver warning will be off.

C0045 01, 26, 27, 28, 44 and 64: The monitoring function only supports recovering the failure after external trigger.

C0048 29, 44, 49, 54, 64, 81, 96 and 99: Only after the system is restarted.

C004B 26 and 27: The monitoring function only supports recovering the failure after external trigger.

C1117 1C: If the detection conditions are met within 10s, relevant functions will be enabled again, and the driver warning will be off.

Possible Failure Causes and Maintenance Scheme

1. Related harness connector failure.

   Repair/replace the harness.

2. Master cylinder pressure sensor and stroke sensor failure.

   Repair/replace the master cylinder pressure sensor and stroke sensor.

3. Brake master cylinder failure.

   Repair/replace the brake master cylinder.

4. Integrated brake system (IBS) failure.

   Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C0049

DTC Description

DTC	FTB	Failure Description
C0049	01	Brake Fluid Level Switch Electrical Failure
C0049	74	Brake Fluid Level Empty
C0049	7A	Fluid Leak or Seal Failure
C0049	7B	Brake Fluid Level Low
C0049	04	Brake Fluid Level Sensor Internal Fault
C0049	11	Brake Fluid Level Sensor Short to Ground
C0049	12	Brake Fluid Level Sensor Short to Battery
C0049	13	Brake Fluid Level Sensor Open Circuit
C0049	14	Brake Fluid Level Sensor Short Circuit

Subsystem Principle

The integrated brake system (IBS) monitors the brake fluid level according to the input signal of brake fluid level sensor.

Conditions for Running DTCs

C0049 01: Once per cycle.

C0049 04, 11, 12, 13 and 14: Once per cycle, and once every 500ms.

C0049 74: Once per cycle, and once every 10ms.

C0049 7A: If filling timeout failure or filling low-efficiency failure is not set, one cycle is performed every 2ms.

C0049 7B: Once for each circuit, but not within the detected undervoltage period.

Conditions for Setting DTCs

C0049 01: The switch electrical monitoring will recognise the electrical failure switch, and set internal or electrical failure.

C0049 04: The monitor detects that the H bridge is not within the working range during operation or startup.

C0049 11: The monitor detects that the sensor circuit is short to ground during operation or startup.

C0049 12: The monitor detects that the sensor circuit is short to battery during operation or startup.

C0049 13: The monitor detects whether the sensor circuit is open during operation or startup through the electrical measurement on the H bridge.

C0049 14: The monitor detects that the sensor circuit is short during operation or startup.

C0049 74: Under the conditions of low brake fluid level recognised, if the brake fluid volume extracted from the filling room is relatively high at 40cm3, the DTC will be set.

C0049 7A:

- If the filling efficiency is too low, the residual capacity in the wheels and LAC may not cause the legally required vehicle slowdown.
- Duration for Filling Too Long

C0049 7B: The brake fluid level sensor signal indicates that the brake fluid level is lower than the specified minimum value.

Operations of ECU after Failure

C0049 01: None.

C0049 74: Disable functions: NBRAKE, BTRS, EBD, ABS, EDC_FA, EDC_RA, BTC, MTC, AYC, HBA, RAINBS, HDC, ACC, HSA, AVH, AEB and EPA.

C0049 7A: If filling timeout failure or filling low-efficiency failure is not set, one cycle is performed every 2ms.

C0049 7B: Disable functions: BTR, , ABS, EDC_FA, EDC_RA, BTC, MTC, AYC, HBA, HDC, ACC, HSA, AVH, DMM_AEB and DMM_EPA.

C0049 04, 11, 12, 13 and 14: None

Conditions for Clearing DTCs

C0049 04 11, 12, 13 and 14: If the DTC is set, it will be locked in the ignition cycle.

C0049 74: The monitoring function only supports recovering the failure after external trigger.

C0049 7A and 7B: If the setting conditions do not exist, then the DTC will be cleared in the next ignition cycle.

Possible Failure Causes and Maintenance Scheme

1. Shortage of brake fluid.
   - Refill/replace the brake fluid.
2. Brake system leakage.
   - Replace the leaking component.
3. Brake fluid level switch circuit failure.
   - Repair/replace the harness.
4. Brake fluid level switch failure.
   - Replace the brake fluid reservoir assembly.
5. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the brake fluid level:

   ® Refill/replace the brake fluid if the fluid level is lower than the lowest scale mark;

   ® Brake fluid level is normal, go to 2.

2. Check the brake system leakage:

® Brake circuit (brake pipe, brake caliper, brake mastery cylinder, etc.) has leakage, replace the leaking parts;

® No leakage in brake circuit, go to 3.

3. Check related circuits:

® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

® Related circuits have no fault, go to 4.

4. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the brake fluid level switch:

® Brake fluid level switch failure, replace the brake fluid reservoir assembly;

® No brake fluid level switch failure, go to 6.

6. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system(IBS) module;

® Normal, go to TAC Human Assistance.

C0051

DTC Description

DTC	FTB	Failure Description
C0051	27	Steering Wheel Position Sensor Step Error
C0051	28	Steering Wheel Angle Offset Error
C0051	54	Steering Wheel Angle Not Calibrated
C0051	62	Steering Wheel Angle Signal Comparison Failure
C0051	64	Steering Wheel Angle Signal Implausible
C0051	84	Steering Wheel Angle Signal Below Range
C0051	85	Steering Wheel Angle Signal Above Range
C0051	96	Steering Wheel Angle Failed

Subsystem Principle

The steering angle sensor is integrated in the steering column, which measures the size and direction of the torque acted by the driver on the steering wheel, as well as the size and direction of the steering wheel angle.

Conditions for Running DTCs

C0051 27: Place the start switch in "ON" position; vehicle speed is greater than 10.8km/h, and there is no steering angle signal failure.

C0051 54: Reset and power on.

C0051 62: The Start switch is placed in ON position; the vehicle speed is greater than 10.8km/h; the absolute value of steering angle reference value is less than 30; the voltage is within the specific range.

C0051 64: The Start switch is placed in ON position; the vehicle turns from straight driving at the speed of greater than 10.8km/h; the sensor voltage is within the operating range; no sideslip; IBS function is on.

C0051 28, 84 and 85: Place the start switch in "ON" position, there is no CAN bus communication timeout.

C0051 96: The Start switch is placed in ON position.

Conditions for Setting DTCs

C0051 27: The deviation between the average values of the steering wheel angle signals calculated twice consecutively is greater than the given threshold.

C0051 28: If the calculated offset absolute value of steering angle sensor is greater than 15.

C0051 54: The steering angle position sensor has not been calibrated.

C0051 62:

- The steering wheel angle is not initialised after the vehicle is started.
- The deviation between the calculated steering angle signal and the reference signal exceeds the threshold.

C0051 64:

- One signal value of the yaw rate, lateral acceleration and steering wheel angle is less than the other two signal values, which exceeds the tolerance.
- The deviation between the reference steering wheel angle calculated from vehicle speed, lateral acceleration and yaw rate and the steering wheel angle signal exceeds the threshold.

C0051 84 and 85: If the measured absolute value of steering angle sensor is greater than 720.

C0051 96: The transmitting state of steering angle sensor has defects.

Operations of ECU after Failure

- EBD and ABS functions are normal, and other functions are invalid.
- ESC malfunction indicator lamp is on.

Conditions for Clearing DTCs

C0051 27 and 64: Relevant functions are activated again, the lateral acceleration sensor, steering angle sensor, and yaw rate sensor have no electric interference, the malfunction indicator lamp goes out.

C0051 28: Relevant functions are activated again, the absolute value of calculated steering wheel angle sensor offset is less than or equal to 15, and the MIL goes out.

C0051 54: Relevant functions are activated again, the configured sensors are successfully calibrated, and the MIL goes out.

C0051 62, 84, 85 and 96: Relevant functions are activated again, during the subsequent steering process, the signals of yaw rate sensor, lateral acceleration sensor and steering wheel angle sensor have no error, and the MIL goes out.

Possible Failure Causes and Maintenance Scheme

C0051 27:

1. Steering angle sensor failure.
   - Repair/replace the steering angle sensor.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0051 28, C0051 84 and C0051 85:

1. Steering angle sensor is not calibrated.
   - Perform the steering angle sensor calibration.
2. Steering angle sensor failure.
   - Repair/replace the steering angle sensor.

3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.
4. Steering system failure (such as excessive worn).
   - Repair/replace the faulty parts.

C0051 64:

1. Steering angle sensor failure.
   - Confirm the failure and fix it with the scan tool.
2. Related circuits failure.
   - Repair/replace the harness.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0051 54:

1. Steering angle sensor failure.
   - Perform the steering angle sensor calibration.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0051 62 and C0051 96:

1. Steering angle sensor failure.
   - Perform the steering angle sensor calibration.
2. Related circuits failure.
   - Repair/replace the harness.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. Check if the steering angle sensor module calibration is completed:

   ® If the steering angle sensor calibration is not completed, perform the steering angle sensor calibration;

   ® Steering angle sensor calibration has been completed, go to 2.

2. Check the steering angle sensor:

   ® Steering angle sensor failure, repair/replace the steering angle sensor;

   ® No steering angle sensor failure, go to 3.

3. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the steering system:

   ® Steering system failure, such as excessive worn, repair/replace the faulty part;

   ® Steering system has no fault, go to 6.

6. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C0061, C0062, C0063 and C0597

DTC Description

DTC	FTB	Failure Description
C0061	01	Lateral Acceleration Sensor Electrical Error
C0061	28	Lateral Acceleration Sensor Offset Error
C0061	54	Lateral Acceleration Sensor Not Calibrated
C0061	64	Lateral Acceleration Sensor Signal Implausible
C0062	01	Longitudinal Acceleration Sensor Electrical Error
C0062	28	Longitudinal Acceleration Sensor Offset Error
C0062	54	Longitudinal Acceleration Sensor Not Calibrated
C0062	64	Longitudinal Acceleration Sensor Signal Implausible
C0062	76	Longitudinal Acceleration Sensor Wrong Mounting Position
C0063	01	Yaw Rate Sensor Electrical Error
C0063	28	Yaw Rate Sensor Offset Error
C0063	64	Yaw Rate Sensor Signal Implausible
C0597	92	ACC Failure-Vehicle Acceleration / Deceleration Out of Range

Subsystem Principle

The lateral acceleration sensor, longitudinal acceleration sensor and yaw sensor are integrated in IBS. It measures the vehicle's rotary motion around its vertical axis and the vehicle's slippage and transmits the corresponding data to the IBS. ECU compares the signals received from the lateral acceleration sensor, the longitudinal acceleration sensor, the yaw sensor and the steering angle sensor, and determines the forthcoming situation and then takes corresponding control.

Conditions for Running DTCs

C0061, C0062 and C0063 01: The Start switch is placed in ON position.

C0061 and C0063 28: Sensor signal is valid.

C0061 and C0062 54: After reset and power on.

C0061 and C0063 64: The vehicle speed is greater than 10.8km/h, and the sensor signal is valid.

C0062 28: Detect the failure and store the detection results, or perform the initialisation.

C0062 64: After reset and power on, not during the controller initialisation.

C0062 76: The vehicle speed exceeds 14km/h continuously, not during the initialisation.

C0597 92: Once per cycle.

Conditions for Setting DTCs

C0061, C0062 and C0063 01:

- The analog or digital supply voltage state is abnormal.
- The internal control circuit state is abnormal.

C0061 28:

- The lateral acceleration is greater than 7.0m/s, and the duration is over the threshold value.
- The absolute value of calculated lateral acceleration is over 2.5m/s.

C0061 54: Lateral acceleration sensor is not calibrated.

C0061 64:

- After the setting time is passed, a signal value is much less than the other two signal values (changes of the yaw rate, lateral acceleration and steering angle signal), and signal failure is detected.
- The signal value of lateral acceleration sensor is within the range of -59m/s² - 59m/s². If the lateral acceleration sensor signal reaches or exceeds the allowable range, the DTC will be set.

C0062 28: If the absolute value of calculated longitudinal acceleration signal offset is over 2.5m/s, the DTC will be set.

C0062 54: Longitudinal acceleration sensor is not calibrated.

C0062 64:

- The signal value of longitudinal acceleration sensor is within the range of -59m/s² - 59m/s². If the longitudinal acceleration sensor signal reaches or exceeds the allowable range, the DTC will be set.
- If the absolute value of measured longitudinal acceleration sensor signal is greater than 0.8g, the DTC will be set.

C0062 76:

- Within the specific minimum failure duration, if the calculated wheel rotation acceleration is greater than 0.35g or less than -0.35g while the measured acceleration is about 0.0g.
- Within the specific minimum failure duration, the measured and calculated acceleration values show reverse symbol, and both of the two values are higher than 0.2g.

C0063 28:

-

– If the absolute value of yaw sensor signal is greater than 31.0 for 0.5s, the DTC will be set.

– Within 2s before the vehicle is off, if the absolute value of yaw sensor signal is greater than 8.25, the DTC will be set.

– When the vehicle is off and stopped, if the difference between the measured yaw sensor signal value and stored signal value is greater than 15.0, the DTC will be set.

– If the absolute value of calculated yaw sensor offset is greater than 6.5, the DTC will be set.

C0063 64:

- After the setting time is passed, a signal value is much less than the other two signal values (changes of the yaw rate, lateral acceleration and steering angle signal), and signal failure is detected.

  The signal value of yaw sensor is within the range of -300 - 300. If the yaw sensor signal reaches or exceeds the allowable range, the DTC will be set.

C0597 92: During the ACC brake startup period, if the vehicle deceleration exceeds the threshold, the DTC will be set.

Operations of ECU after Failure

C0061 and C0063:

- ETC, ESC, ARP, ACC, AEB, HSA and AVH functions are invalid.
- ESC malfunction indicator lamp is on.

C0062 01, 28, 64 and 76:

- ETC, HDC, HSA and AVH functions are invalid.
- ESC malfunction indicator lamp is on.

C0062 54: HDC, HSA and AVH functions are invalid.

C0597 92: ACC and AVH functions are invalid.

Conditions for Clearing DTCs

C0061, C0062 and C0063 01:

- Relevant functions are activated again, the lateral acceleration sensor, steering angle sensor, and yaw rate sensor have no electric interference, the malfunction indicator lamp goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0061 and C0062 28:

- Relevant functions are activated again, the vehicle is stationary and the absolute value of lateral acceleration and longitudinal acceleration is less than or equal to 2.5m/s² for 200ms, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.
-

C0061 and C0062 54:

- Relevant functions are activated again, the configured sensors are successfully calibrated, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0061 and C0063 64:

- Relevant functions are activated again, the lateral acceleration sensor, steering angle sensor, and yaw rate sensor have no electric interference, the malfunction indicator lamp goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0062 64 and 76:

- Relevant functions are activated again, the longitudinal acceleration sensor has no error, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0063 28:

- Relevant functions are activated again, the absolute value of yaw rate sensor is less than or equal to 6.5/s, and the MIL goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

C0597 92: Until the next cycle, history DTCs will be cleared.

Possible Failure Causes and Maintenance Scheme

C0061 01, C0062 01 and C0063 01:

1. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.
2. High frequency interference.
   - Remove the interference source.

C0061 28, C0062 28 and C0063 28:

1. Integrated brake system (IBS) module installation error.
   - Adjust the integrated brake system (IBS) bracket or refit the integrated brake system (IBS) module.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0061 54 and C0062 54:

1. Sensor not calibrated.
   - Perform the sensor calibration.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0061 64, C0062 64 and C0063 64:

1. The dynamic stability control module is not fitted in place, or the failure related to bracket causes the module vibration.
   - Adjust the integrated brake system (IBS) bracket or refit the integrated brake system (IBS) module.
2. Sensor related harness failure.
   - Repair/replace the harness.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C0062 76:

1. Integrated brake system (IBS) module installation error or not tightened.
   - Adjust the integrated brake system (IBS) bracket or refit the integrated brake system (IBS) module.
2. Sensor not calibrated.
   - Perform the sensor calibration.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check if the sensor has been calibrated:

   ® If the sensor is not calibrated, perform the sensor calibration;

   ® If the sensor is calibrated, go to 2.
2. Check if the integrated brake system (IBS) module or bracket is fitted in place or loose:

   ® If the integrated brake system (IBS) module or bracket is not fitted in place or loose. adjust the integrated brake system (IBS) bracket or refit the integrated brake system (IBS) module;

   ® If the dynamic stability control module or bracket is fitted in place, go to 3.
3. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 4.
4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.
5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C0089

DTC Description

DTC	FTB	Failure Description
C0089	64	Traction Control System (TCS) Disable Switch Error

Subsystem Principle

Traction Control System (TCS) disable switch controls the on/off of the function.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The signal shows "Switch Pressed" for more than 10s.

Operations of ECU after Failure

Auto hold function fails.

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. The switch has been pressed for a long time.
   - Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on.
2. The switch supply voltage is interrupted.
   - Repair/replace the harness.
3. Switch failure.
   - Repair/replace the switch.
4. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS).
5. Gateway module failure.
   - Flash/replace the GW module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the switch is mistakenly operated:

   ® Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on, if the switch is normal, it has no fault;

   ® If it is confirmed that the switch is not mistakenly operated, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the switch:

   ® Switch failure, repair/replace the switch;

   ® Switch has no fault, go to 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, replace the integrated brake system (IBS).

5. Check the steering system:

   ® Steering system failure, such as excessive worn, repair/replace the faulty part;

   ® Steering system has no fault, go to 5.

6. Check the integrated brake system (IBS):

   ® Abnormal, replace the integrated brake system (IBS);

   ® Normal, go to 7.

7. Check the software version of gateway (GW) module:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, replace the gateway module.

8. Check the GW module:

   ® Abnormal, replace the gateway module;

   ® Normal, go to TAC Human Assistance.

C052C, C052E and C053B

DTC Description

DTC	FTB	Failure Description
C052C	1B	Internal UnderVoltage at KL30_M
C052C	96	Internal OverVoltage at KL30_M
C052C	A2	Supply is Too Low KL30_2
C052E	A2	Nbrake Function Failure-UnderVoltage
C053B	A2	Supply is Too Low KL30_1

Subsystem Principle

The integrated brake system (IBS) monitors the system voltage to check if the power supply voltage of the module is within the normal operating range.

Conditions for Running DTCs

C052C 1B and 96: MKC motor is operating.

C052C, C052E and C052B A2: Once per cycle.

Conditions for Setting DTCs

C052C 1B: When undervoltage is detected at the internal KL30_M, check if the KL30_2 is within the normal range, if yes, this failure is detected.

C052C 96: When the MKC motor recovers energy, the absorber diode shall limit the overvoltage, if the voltage is too high, this failure is detected.

C052C A2: The voltage at KL30_2 is much lower than that at KL30_1, and the undervoltage at the internal KL30_M is detected.

C052E A2:

- The voltage at KL30_1 and KL30_2 is lower than 4.5V for more than 1ms.
- The voltage at KL30_1 and KL30_2 drops below 6.5V for more than 150ms (stationary period is 250ms).

C052B A2: The voltage at KL30_1 is much lower than that at KL30_2.

Operations of ECU after Failure

C052C: Disable functions: EBD and ABS.

C052E: Disable functions: EBD and ABS.

C053B: None.

Conditions for Clearing DTCs

C052C 1B and 96: The start switch is in "ON" position next time.

C052C A2: If the failure setting conditions are not met and the voltage at KL30_2 is higher than 10V for more than 50ms, the temporary DTC will be cleared.

C052E A2: If the voltage at KL30_1 is higher than 7.234V or the voltage at KL30_2 is higher than 7.339V for more than 150ms (stationary period is 250ms).

C052B A2: If the failure setting conditions are not met and the voltage at KL30_1 is higher than 10V for more than 1800ms, the temporary DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage.
   - Replace the battery.
2. Harness or connector failures.
   - Replace/repair the harness or connector.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the battery:

   ® Battery feeding, charge the battery;

   ® Battery aging or damage, replace the battery;

   ® Battery is normal, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C055E, C057E, C058A, C0594, C0596, C05B8, C05C2, C060D, C0612, C0614 and C0616

DTC Description

DTC	FTB	Failure Description
C055E	7A	Air Volume in Linear Actuator Circuit Too High
C057E	64	Bridge Temperature Sensor Not Plausible
C058A	78	Motor Position Alignment Wrong or Not Aligned
C0594	02	B6 Bridge Driver Failure
C0594	29	PWM Feedback Out of Range
C0594	92	Motor Torque Not Balance - Load Observer Not Matched with Actual Load
C0594	94	Motor Moves Without Command
C0596	29	Motor Current Abnormal
C05B8	02	Feedline & Flush Test - System Execution Failure
C05C2	98	B6 Bridge / DCLink Capacitor / Motor Rotor Magnet / Motor Over Temperature
C060D	12	Left Actuator - Motor Line Circuit Short to Battery
C0612	12	Right Actuator - Motor Line Circuit Short to Battery
C0614	49	Right Actuator - Control Circuit Internal Failure
C0616	49	Left Actuator - Control Circuit Internal Failure

Subsystem Principle

The module realizes the functions including the anti-lock brake, the brake force distribution and the acceleration slip regulation by controlling opening and closing of the valves.

Conditions for Running DTCs

C057E 7A 64: The start switch is in "ON" position.

C058A 78, 02, 92, 94, 29, 02 and 98: After the system initialisation is completed.

C0594 29: The PWM module is enabled, and the GDU is in normal operating state.

C060D 12: When the EPB is pulled up or released.

C0612 12 and C0614 49: When the EPB is pulled up or released.

C0616 49: When the EPB is pulled up or released.

Conditions for Setting DTCs

C055E 7A: Large amount of leakage or air in LAC.

C057E 64: The temperature measured by the bridge sensor is irrational.

C058A 78:

- The difference between motor electrical angles calculates the alignment angle deviation. If the difference is larger than 20 degrees, it will trigger the failure.
- If the data is unavailable/damaged, or the calibration procedure is not performed/faulty, the DTC will be set.

C0594 02: The pin state is not consistent with the data read on SPI.

C0594 29: The feedback signal shall not be higher than 102% of PWM period, and shall be equal to the PWM signal applied on the electric bridge (+/-6% tolerance); if this condition is not met for more than 2.5ms, the DTC will be set.

C0594 92: It is detected that other motor control monitors the undetected failures.

C0594 94: It is detected that the motor control and direction switch of LAC driver is incorrect.

C0596 29: Abnormal motor current is detected.

C05B8 02: It is detected that the motor position sensor signal is incorrect.

C05C2 98: Electric bridge/DC side capacitor/motor rotor/motor over temperature.

C060D 12: If failure is detected during the regular passive test period, it indicates that the motor power cord is short to GND or KL30, and the DTC shall be immediately set.

C0612: If failure is detected during the regular passive test period, it indicates that the motors short to battery, and the DTC will be set.

C0614: If the following parameters are detected during the activation process, the motor control is mismatched, and the DTC will be set.

- Redundant current measurement during activation.
- Voltage measurement during activation.
- If failure is detected during the regular passive test period, it indicates that the internal ECU components are faulty, and the DTC will be set.

C0616 49: The motor mismatch is detected during activation process.

Operations of ECU after Failure

C055E: Disable functions: NBRAKE, BTRS, EBD, ABS, EDC_FA, EDC_RA, BTC, MTC, AYC, HBA, RAINBS, HDC, ACC, HSA, AVH, AEB and EPA.

C057E: None.

C058A, C0594, C0596, C05B8 and C05C2: Disable functions: EBD and ABS.

C060D, C0612, C0614 and C0616: Disable functions: SR and SA.

Conditions for Clearing DTCs

C055E 7A: No failure recovers.

C057E 64: The failure recovers only when the monitoring successfully passed in two continuous driving cycles.

C058A 78: Failure is not detected again within 10ms during system initialisation stage.

C0594 02: Start the cycle again.

C0594 29: Start the cycle again.

C0594 92: It is not detected that other motor control monitors the undetected failures.

C0594 94: It is detected that the motor control and direction switch of LAC driver is correct.

C0596 29: Abnormal motor current is not detected.

C05B8 02: If the recovery test completed by ART-M passes, relevant functions will be enabled again, and the driver warning will be off.

C05C2 98:

- The temperature of B6 electric bridge drops 20°C for at least 1s at the maximum safe working value.
- The temperature of DClink capacitor drops 20°C for at least 10s at the maximum safe working value.
- Failure is not detected again within 10s during system initialisation stage.

C060D 12: The external trigger clears the command for the ignition switch or diagnosis.

C0612 12, C0614 and 49:

- Actuator works normally.
- The DTCs will be cleared and the MIL will be off after 40 failure-free working cycles.

C0616 49: The external trigger clears the command for the ignition switch or diagnosis.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Actuator - motor failure.
   - Replace the actuator - motor.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the motor:

   ® Motor stuck or failure, replace the motor;

   ® No motor failure, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C006B

DTC Description

DTC	FTB	Failure Description
C006B	00	Stability Control System Active Too Long

Subsystem Principle

The integrated brake system (IBS) can assist the driver to well control the driving and stability under all driving conditions and ensure maximum vehicle safety.

Conditions for Running DTCs

The yaw rate sensor signal is valid during this period.

Conditions for Setting DTCs

The integrated brake system (IBS) brake interference activation time is over the least failure lasting time, and the calculated extra yaw torque is greater than 0.

Operations of ECU after Failure

- Except for EBD and ABS, all other system functions are invalid.
- ESC malfunction indicator lamp is on.

Conditions for Clearing DTCs

- Relevant functions are activated again, the lateral acceleration sensor, steering angle sensor, and yaw rate sensor have no electric interference, the malfunction indicator lamp goes out.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. The tyre pressure is incorrect.
   - Refill the tyre pressure to the standard pressure.
2. The size of wheels or tyres does not meet the specification.
   - Replace the tyre of recommended size.
3. Steering angle sensor failure.
   - Repair/replace the steering angle sensor.
4. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.
5. Steering system failure (such as excessive worn).
   - Repair/replace the faulty parts.
6. Chassis damage.
   - Repair/replace the faulty parts, and complete the four-wheel alignment.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the tyre pressure:

   ® If tyre pressure is insufficient, refill the tyre pressure to the standard pressure;

   ® Tyre pressure is normal, go to 2.

2. Check the tyre size:

   ® Steering angle sensor failure, repair/replace the steering angle sensor;

   ® No steering angle sensor failure, go to 3.

3. Check the steering angle sensor:

   ® Steering angle sensor failure, repair/replace the steering angle sensor;

   ® No steering angle sensor failure, go to 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the steering system:

   ® Steering system failure, such as excessive worn, repair/replace the faulty part;

   ® Steering system has no fault, go to 6.

6. Check the chassis system:

   ® Chassis system failure, repair/replace the failure, and complete the four-wheel alignment.

   ® Chassis system has no failure, go to 7.

7. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C100A

DTC Description

DTC	FTB	Failure Description
C100A	85	Brake Disc Over Temperature

Subsystem Principle

Integrated brake system (IBS) calculates the brake disc temperature by monitoring the parameters such as brake fluid pressure and braking time, to guarantee the performance of brake system.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC is set when the system detects high brake disc temperature.

Operations of ECU after Failure

ACC function fails.

Conditions for Clearing DTCs

- The DTC is cleared when the brake disc temperature is low enough, and the function returns to normal.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Brake discs overheated (e.g., caused by frequent braking).
   - Hold the vehicle stationary for a period of time, to cool the brake discs.
2. Ambient temperature signal failure.
   - Check the source of ambient temperature signal (HVAC), and fix it.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Confirm if the brake discs are overheated:

   ® Hold the vehicle stationary for a period of time, to cool the brake discs.

   ® If the brake disc temperature are normal, go to 2.

2. Check the source of ambient temperature signal (HVAC):

   ® If the source of ambient temperature signal (HVAC) is faulty, fix the faulty point;

   ® If the source of ambient temperature signal is normal, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C100B

DTC Description

DTC	FTB	Failure Description
C100B	86	Engine Torque Request Not Adjustable

Subsystem Principle

The integrated brake system (IBS) ensures the dynamic stability of the vehicle by controlling the brake pressure of a specific wheel while accurately controlling the output torque of the engine.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The engine torque request is not adjustable for 300ms.

Operations of ECU after Failure

- EDC, ETC and AVH functions are invalid.
- ESC malfunction indicator lamp is on.

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.
- History DTCs will be cleared and the MIL will go out after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Related harness connector failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the IBS software version:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1013, C104B and C104D

DTC Description

DTC	FTB	Failure Description
C1013	09	Air Capacity Deviation Monitoring - Leakage Point Failure to Confirm
C1013	7A	System Has Leakage
C1013	92	Large Amount of Air - Loss of Brake Pressure
C104B	7A	TMC Has Leakage
C104D	7A	Air Volume in TMC Circuit Too High

Subsystem Principle

The integrated brake system (IBS) can assist the driver to well control the driving and stability under all driving conditions and ensure maximum vehicle safety.

Conditions for Running DTCs

C1013 7A: When the system pressure is higher than the minimum pressure value (2/3 of secondary brake pressure) and lower than the maximum pressure value (60bar).

C1013 92 09: Each cycle after system initialisation is completed is during each braking process.

C104D 7A: The Start switch is placed in ON position.

C1014B 7A: If TMC pressure signal and TMC position signal are available, loop once every 10ms, DCV and SIMV valves are not disabled, and TMC leakage failure is not set.

Conditions for Setting DTCs

C1013 7A:

- The DTC will be set when the system pressure is higher than the minimum pressure value (2/3 of secondary brake pressure) and lower than the maximum pressure value (60bar).
- VDM leak locating is active in each circuit.

C1013 92: During normal auto process, after the system is initialised, VDM air detection is activated in each loop.

C1013 09: During normal braking process, after the system is initialised, VDM leak locating is active in each circuit.

C104D 7A: A large amount of air exists in TMC circuit.

C104B 7A: If (after the temperature, production and sensor tolerances and air information from hydraulic self-test are considered) the stroke signal "Too High" is equivalent to pressure signal.

Operations of ECU after Failure

None

Conditions for Clearing DTCs

C1013 7A:

- After the system is restarted (replacement of ignition switch), and brake is applied for 10 times at a constant pressure of more than 25bar and less than 60bar, the duration is at least 4.5s. If the braking for all 10 times is i.o, the DTC will be cleared.
- When the speed is lower than 50kph and Vdm_vol_too_high_main failure is set, the DTC will be cleared.

C10103 92: After the system is restarted (replacement of ignition switch) and typical brake is applied for 5 consecutive times, the time interval between each brake application is at least 1s. If the engagement for all 5 brakes is i.o, the DTC will be cleared.

C1013 09: After the system is restarted (replacement of ignition switch) and typical brake is applied for 5 consecutive times, the time interval between each brake application is at least 1s.

C104D 7A: When the system is restarted, if failure is no longer present, the DTC will be cleared.

C104B 7A: If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.

Possible Failure Causes and Maintenance Scheme

1. Related harness connector failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check and visually observe the brake system for leakage, damage, etc.

   ® Abnormal, repair/replace related faulty parts of brake system.

   ® Normal, go to 2.

2. Check if the brake fluid is too dirty or if the fluid contains bubbles or moisture.

   ® If any of the above situations occurs, replace the brake system fluid and bleed air in the system.

   ® Normal, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

4. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system (IBS) module;

® Normal, go to TAC Human Assistance.

C1019, C1020, C10C0, C0598, C1003, U0300, U1000, U2001, U3000

DTC Description

DTC	FTB	Failure Description
C1019	74	Mechanical End Protection Error - Operation During Motor Zero Bit Protection
C1019	78	Mechanical End Protection Error - Zero Bit Detection Failed
C1020	52	PSM Status Error
C10C0	9A	Brake System Life Cycle Limit Reached
C10C0	FB	Auto Braking Deceleration Lower Than Required Deceleration
C10C0	FC	Auto Braking Deceleration Higher Than Required Deceleration
C0598	02	Feeder and Flush Test - System Execution Failure
C0598	07	Feeder and Flush Test - Mechanical Failure
C0598	73	Front Outlet Control Actuator Stuck Closed
C0598	97	Feeder and Flush Test - Pressure Reduction Test Not Completed
C1003	72	Pedal Simulator Solenoid Valve or Cut-off Valve Unexpectedly Open
C1003	73	Pedal Simulator Solenoid Valve or Cut-off Valve Unexpectedly Closed
U1000	49	Boost Regulator Failure
U1000	71	Linear Actuator Piston or Master Cylinder Floating Piston Stuck
U2001	42	ECU Internal Failure - EEPROM Error
U3000	27	Mechanical End Protection - Actuator Position Signal Unstable
U3000	49	ECU Internal Failure - Internal Electrical Failure
U3000	56	Implausible or Corrupted Configuration Data
U0300	51	Internal Control Module Software Mismatch
U0300	57	HAD Software Compatibility Check - Invalid or Incompatible
U3000	84	Mechanical End Protection - Actuator Position Exceed Lower Limit
U3000	85	Mechanical End Protection - Actuator Position Exceed Upper Limit
U3000	94	System Pressure Deviation Out of Range

Subsystem Principle

Internal failure detection is performed in the integrated brake system (IBS), and no external circuit is involved.

Conditions for Running DTCs

C0598 02 and C0598 07: When FLFT service operates.

C0598 73: When pressure buildup test (PBT) operates and tests the isolation valve.

C0598 97, C1013 92, C1020 52 and U200142: After the system initialisation is completed.

C1003 72, C1003 73, U0300 57, U1000 49, U1000 71, U3000 49 and U300094: The Start switch is placed in ON position.

C1019 78, U300027, U3000 84 and U3000 85: MESP sleep state and ZPD execution state.

C10C0 9A, C10C0 FB and C10C0 FC: The brake system has deceleration control system, the auto driving is activated, and VD requires actual deceleration.

U3000 56: When ECU is woken up.

U0300 51: After power-on module is reset.

Conditions for Setting DTCs

C1020 52: PSM state is set as a value that causes system component degradation.

C10C0 9A: The life of brake system is up to the limit of had system.

C10C0 FB: During auto driving process, if the vehicle deceleration is much lower than the required vehicle deceleration (with predefined acceleration and timing threshold).

C10C0 FC: During auto driving process, if the vehicle deceleration is much higher than the required vehicle deceleration (with predefined acceleration and timing threshold).

C0598 02: When the feeder is under the flash test. If the system procedure of PBT fails or times out, the DTC will be set.

C0598 07: When the feeder is under the flash test. If one relief valve of auxiliary brake system is stuck or the supply line is impermeable, the DTC will be set.

C0598 73: The monitor is activated when the pressure recovery test runs. The DTC will be set if it is found that isolation valve FL/FR is stuck during the test process.

C0598 97: When the feeder is under the flash test. The DTC will be set if PBT is not completed in some ignition cycles.

C1003 72 and C1003 73:

- The main pressure supply valve is on.
- The main driver cut-off valve is on.
- The secondary pressure supply valve is on.
- The auxiliary driver cut-off valve is on.

U0300 51: The internal software version of controller is mismatched with that of hardware.

U0300 57: Failure will be detected when PBSsw and SBSsw have different sw version indexes.

U1000 49: Oscillator fo DC/DC converter is not switchable.

U1000 71:

- Check that the portion between LAC and piston is stuck.
- It is detected that the TMC floating piston is stuck.

U2001 42: The DTC will be set if the written EEPROM data is mismatched with original data for more than 3 times.

U3000 27, C1019 74 and C1019 78: The DTC will be set if LAC piston position exceeds LAC working range or the signal gradient exceeds possible physical value.

U3000 49, U3000 84 and U3000 85: MCU internal failure is detected, such as MCU ram check, CRC check, odd-even check, PCU watchdog, operating system, valve driver failure.

U3000 56: The DTC will be set if implausible or corrupted configuration data is detected.

U3000 94:

- The counter exceeds the negative threshold (-50).
- The linear actuator control (LAC) is not permanently in pressure control mode.
- The actual value is lower than the lower limit threshold.
- PDM monitor is in the failure-tolerant mode, and both 0xF4 and 0xF0 do not meet requirements.

Operations of ECU after Failure

C0598 02, C0598 07, C0598 73, C0598 97, C1013 92, C1013 92, C1020 52, C10C0 9A, C10C0 FB, C10C0 FC, U0300 57, U1000 49, U2001 42 and U3000 94: Disable functions: None.

C1003 72, C1003 73, C1019 74, C1019 78, U1000 71, U3000 27, U3000 84 and U3000 85: Disable functions: EBD and ABS.

U3000 49: Disable all functions.

U0300 51 and U3000 56: Disable functions: AVH, EXTR and EXTA.

Conditions for Clearing DTCs

C1019 74 and C1019 78: ZPD report has been completed.

C1020 52: When PSM state is set as "PSM/State/Function/Full", the failure will be recovered.

C10C0 9A, C0598 73 and U1000 49: None.

C10C0 FB and C10C0 FC: Recover in current KL15 cycle.

C0598 02, C0598 07 and C0598 97: The failure recovers if the system execution failure is not detected in the next later-stage operation during repeated service.

C1003 72, C1003 73 and U1000 71: If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.

U0300 51: Controller software is matched with hardware.

U0300 57: The software compatible with PBS and SBS software version has been updated.

U2001 42: Two actuators reach the same clamped or released state.

U3000 27: ZPD report is completed, and the LAC piston position signal is within the working range.

U3000 49 and U3000 94: If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.

U3000 56: The DTC will be cleared based on relevant index of VDA305-100 interface.

U3000 84: ZPD report is completed, and the LAC piston position signal is within the working range.

U3000 85: ZPD report is completed, the LAC piston position signal is within the working range, and HST report is completed.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage.
   - Replace the battery.
2. Related circuits failure.
   - Repair/replace the harness.
3. Alternator failure.
   - Replace/repair the motor.
4. Data configuration is not completed or configured data is damaged.
   - Reconfigure the data.
5. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Diagnostic Test Steps

1. Check the controller data configuration:

   ® If data configuration is not completed, perform the configuration;

   ® Data configuration is completed, go to 2.

2. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the battery:

® Battery feeding, charge the battery;

® Battery aging or damage, replace the battery;

® Related circuits have no fault, go to 4.

4. Check related circuits:

® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

® Related circuits have no fault, go to 5.

5. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system (IBS) module;

® Normal, go to TAC Human Assistance.

C1109

DTC Description

DTC	FTB	Failure Description
C1109	08	Clutch Switch Signal Implausible

Subsystem Principle

Integrated brake system (IBS) obtains the clutch switch signal from other modules via CAN.

Conditions for Running DTCs

- The system voltage is normal.

Conditions for Setting DTCs

- A fault is detected when the reverse gear switch is active in the start position. If the yaw rate signal and lateral acceleration signal are available, and stationary forward curve travel is recognized, the DTC will be set.
- A fault will be detected if the reverse gear switch is pressed with the clutch not being pressed and the vehicle speed is higher than 10.8 km/h.

Operations of ECU after Failure

- Disabled function: HSA, AVH.

Conditions for Clearing DTCs

None.

Possible Failure Causes and Maintenance Scheme

1. Transmission control module failure.
   - Confirm the module failure and fix it with the scan tool.
2. Related circuits failure.
   - Repair/replace the harness.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS).

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the signal transmitter module is faulty with the scan tool:

   ® If the signal transmitter module is faulty, fix its fault;

   ® If the signal transmitter module has no fault, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS):

   ® Abnormal, replace the integrated brake system (IBS);

   ® Normal, go to TAC Human Assistance.

C1112, C1113 and C10B0

DTC Description

DTC	FTB	Failure Description
C1112	00	No Coding Detected
C1113	00	Parameter Error or EEPROM Memory Failure
C10B0	44	EEPROM Memory Reading Data Failure

Subsystem Principle

When the start switch is placed in "ON" position, after commanding to be energized, the microprocessor will run a diagnostic programme to detect internal failure. If any internal failure is detected, the control module will set a DTC.

Conditions for Running DTCs

The system is powered on.

Conditions for Setting DTCs

C10B0: The monitor cannot read data from actual block or redundant block.

C1112 and C1113: The parameter code and calculated checksum read and stored by the programme are not found.

Operations of ECU after Failure

C10B0: None.

C1112 and C1113: Disable functions: OHB, EDC, BTC, HBA, ACC, HSA and AVH.

Conditions for Clearing DTCs

C10B0: If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.

C1112 and C1113: Relevant functions are activated again, the failure is not detected again, and the MIL goes out.

Possible Failure Causes and Maintenance Scheme

1. Controller configuration is not completed.
   - Perform the controller configuration.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Diagnostic Test Steps

1. Check if the integrated brake system (IBS) is configured:

   ® If the integrated brake system (IBS) configuration is completed, perform the controller configuration;

   ® If the integrated brake system (IBS) configuration is completed, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1114

DTC Description

DTC	FTB	Failure Description
C1114	4A	HCU/ECU Mismatch

Subsystem Principle

The integrated brake system (IBS) runs a diagnostic program to detect internal failure, and no external circuit is involved.

Conditions for Running DTCs

The loop is zero and the effective configuration is completed.

Conditions for Setting DTCs

HCU/ECU mismatch.

Operations of ECU after Failure

- All system functions are invalid.
- EBD, ABS and ESC MILs turn on.

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle and the MIL will be off.

Possible Failure Causes and Maintenance Scheme

1. Integrated brake system (IBS) failure.

- Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C1115

DTC Description

DTC	FTB	Failure Description
C1115	46	Analog Valve Calibration Memory Failure

Subsystem Principle

The module realizes the functions including the anti-lock brake, the brake force distribution and the acceleration slip regulation by controlling opening and closing of the valves.

Conditions for Running DTCs

The loop is zero and the effective configuration is completed.

Conditions for Setting DTCs

The external sensor power supply voltage is out of the specified range for more than specified minimum failure duration.

Operations of ECU after Failure

All system functions are invalid.

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle and the MIL will be off.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuit/connector failure.
   - Replace the related circuit/connector.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C1116

DTC Description

DTC	FTB	Failure Description
C1116	11	Vacuum Sensor Short to Ground
C1116	12	Vacuum Sensor Short to Battery

Subsystem Principle

The vacuum sensor detects the pressure (negative pressure) inside the vacuum booster to determine the operating state of vacuum booster. The vacuum sensor communicates with the engine control module (ECM) via the hard wire.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

If the supply voltage of vacuum sensor exceeds the specified range, and the duration of which exceeds the threshold, a failure is detected.

Operations of ECU after Failure

Disable function: AVH.

Conditions for Clearing DTCs

The sensor supply voltage is within the specified range for 10s, the relevant function will be activated again.

Possible Failure Causes and Maintenance Scheme

1. Related circuit/connector failure.
   - Replace the related circuit/connector.
2. Integrated brake system failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 2.

2. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1121

DTC Description

DTC	FTB	Failure Description
C1121	24	Hill Descent Control (HDC) Switch Error

Subsystem Principle

The hill descent control (HDC) switch controls the on/off of the function.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

If the switch is continuously pressed for more than 10s or the switch input is invalid for more than 150ms, the HDC switch will enter the failure mode.

Operations of ECU after Failure

None

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. The switch has been pressed for a long time.
   - Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on.
2. Related harness connector failure.
   - Repair/replace the harness.
3. Switch failure.
   - Repair/replace the switch.
4. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS).

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Confirm if the switch is mistakenly operated:

   ® Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on, if the switch is normal, it has no fault;

   ® If it is confirmed that the switch is not mistakenly operated, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the switch:

   ® Switch failure, repair/replace the switch;

   ® Switch has no fault, go to 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C1122

DTC Description

DTC	FTB	Failure Description
C1122	24	Auto Hold (AVH) Switch Error

Subsystem Principle

The auto hold (AVH) switch controls the on/off of the function.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

If the switch is continuously pressed for more than 10s or the switch input is invalid for more than 150ms, the AVH switch will enter the failure mode.

Operations of ECU after Failure

Auto hold function fails.

Conditions for Clearing DTCs

- If the setting conditions are not present, the DTC will be cleared in the next ignition cycle.
- History DTCs will be cleared after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. The switch has been pressed for a long time.
   - Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on.
2. The switch supply voltage is interrupted.
   - Repair/replace the harness.
3. Switch failure.
   - Repair/replace the switch.
4. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Confirm if the switch is mistakenly operated:

   ® Wait a short time and then re-operate, or operate the switch after the vehicle is powered off and then powered on, if the switch is normal, it has no fault;

   ® If it is confirmed that the switch is not mistakenly operated, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the switch:

   ® Switch failure, repair/replace the switch;

   ® Switch has no fault, go to 4.

4. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system(IBS) module;

   ® Normal, go to TAC Human Assistance.

C1801

DTC Description

DTC	FTB	Failure Description
C1801	06	Right Actuator - Host Available But Did Not React
C1801	13	Right Actuator - Open Line Detected During Release Action
C1801	1B	Right Actuator - High Resistance During HSP Detected
C1801	1D	Right Actuator - High Free Run Current During Action Detected
C1801	71	Right Actuator - Standstill During Action Detected
C1801	77	Right Actuator - Irregular Current During Action Detected
C1801	92	Right Actuator - Maximum Allowed Power Dissipation During Releasing Or ApplyingExceeded
C1801	94	Right Actuator - Maximum Time For Action Exceeded

Subsystem Principle

When the driver operates the EPB switch, the motors execute the corresponding command to apply the braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

When the EPB is pulled up or released.

Conditions for Setting DTCs

C1801 06 13 1B 77: If the request to the host is not confirmed within 10 cycles.

C1801 71: During the process of being clamped or released, the actuator motor speed is lower than 500rpm for more than 500ms.

C1801 92: The power loss during the process of being clamped exceeds 125W, or the power loss during the process of being released exceeds 25W.

C1801 1D: During actuator's operation, the running current is higher than 7.5A.

C1801 94: More than 4s is needed to reduce the clamping force, or 1.6s is needed to set the clearance.

Operations of ECU after Failure

C1801 06: Disable functions: None.

C1801 13 1B 1D 71 77 92 94: Disable functions: AVH, EXTR and EXTA.

Conditions for Clearing DTCs

C1801 06 13 1B 71 77 92: The DTC will be cleared if actuator operation is normal.

C1801 1D 94:

- The voltage at the right motor low-voltage side drops to below 1.4V within 1ms.
- The motor current is less than 24A during startup.

C1801 94:

- Less than 4.0s is needed to reduce the clamping for (no clearance is set) or less than 1.6s is needed to set the clearance.
- Before setting the clearance, the idle current is less than 7.5 A (Gen4 actuator with toothed belt).

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Rear brake pad failure.
   - Replace the rear brake pad.
3. Rear brake disc failure.
   - Replace the rear brake disc.
4. Rear guide pin assembly failure.
   - Replace the rear guide pin assembly.
5. Motor stuck or failure.
   - Replace the motor assembly.
6. Rear caliper housing assembly failure.
   - Replace the rear caliper housing assembly.
7. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the rear brake pad:

   ® For rear brake pad crack, excessive wear, uneven wear and other failures, replace the rear brake pad;

   ® No rear brake pad failure, go to 3.

3. Check the rear brake disc:

   ® For rear brake disc crack, excessive wear, uneven wear and other failures, replace the rear brake disc;

® No rear brake disc failure, go to 4.

4. Check the rear guide pin assembly:

® Rear guide pin assembly failure, replace the rear guide pin assembly;

® No rear guide pin assembly failure, go to 5.

5. Check the motor:

® Motor stuck or failure, replace the motor;

® No motor failure, go to 6.

6. Check the rear guide pin assembly:

® Rear caliper housing assembly failure, replace the rear caliper housing assembly;

® No rear caliper housing assembly failure, go to 7.

7. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 8.

8. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system (IBS) module;

® Normal, go to TAC Human Assistance.

C1802

DTC Description

DTC	FTB	Failure Description
C1802	06	Left Actuator - Host Available But Did Not React
C1802	13	Left Actuator - Open Line Detected During Release Action
C1802	1B	Left Actuator - High Resistance During HSP Detected
C1802	1D	Left Actuator - High Free Run Current During Action Detected
C1802	71	Left Actuator - Standstill During Action Detected
C1802	77	Left Actuator - Irregular Current During Action Detected
C1802	92	Left Actuator - Maximum Allowed Power Dissipation During Releasing Or Applying Exceeded
C1802	94	Left Actuator - Maximum Time For Action Exceeded

Subsystem Principle

The module realizes the functions including the anti-lock brake, the brake force distribution and the acceleration slip regulation by controlling opening and closing of the valves.

Conditions for Running DTCs

When the EPB is pulled up or released.

Conditions for Setting DTCs

C1802 06 13 1B 77: If the request to the host is not confirmed within 10 cycles.

C1802 71: During the process of being clamped or released, the actuator motor speed is lower than 500rpm for more than 500ms.

C1802 92: The power loss during the process of being clamped exceeds 125W, or the power loss during the process of being released exceeds 25W.

C1802 1D: During actuator's operation, the running current is higher than 7.5A.

C1802 94: More than 4s is needed to reduce the clamping force, or 1.6s is needed to set the clearance.

Operations of ECU after Failure

C1802 06: Disable functions: None.

C1802 13 1B 1D 71 77 92 94: Disable functions: AVH, EXTR and EXTA.

Conditions for Clearing DTCs

C1802 06 13 1B 71 77 92: The DTC will be cleared if actuator operation is normal.

C1802 1D 94:

- The voltage at the right motor low-voltage side drops to below 1.4V within 1ms.
- The motor current is less than 24A during startup.

C1802 94:

- Less than 4.0s is needed to reduce the clamping for (no clearance is set) or less than 1.6s is needed to set the clearance.
- Before setting the clearance, the idle current is less than 7.5 A (Gen4 actuator with toothed belt).

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Rear brake pad failure.
   - Replace the rear brake pad.
3. Rear brake disc failure.
   - Replace the rear brake disc.
4. Rear guide pin assembly failure.
   - Replace the rear guide pin assembly.
5. Motor stuck or failure.
   - Replace the motor assembly.
6. Rear caliper housing assembly failure.
   - Replace the rear caliper housing assembly.
7. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the rear brake pad:

   ® For rear brake pad crack, excessive wear, uneven wear and other failures, replace the rear brake pad;

   ® No rear brake pad failure, go to 3.

3. Check the rear brake disc:

   ® For rear brake disc crack, excessive wear, uneven wear and other failures, replace the rear brake disc;

® No rear brake disc failure, go to 4.

4. Check the rear guide pin assembly:

® Rear guide pin assembly failure, replace the rear guide pin assembly;

® No rear guide pin assembly failure, go to 5.

5. Check the motor:

® Motor stuck or failure, replace the motor;

® No motor failure, go to 6.

6. Check the rear guide pin assembly:

® Rear caliper housing assembly failure, replace the rear caliper housing assembly;

® No rear caliper housing assembly failure, go to 7.

7. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 8.

8. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system (IBS) module;

® Normal, go to TAC Human Assistance.

C1803, C1804 and C1808

DTC Description

DTC	FTB	Failure Description
C1803	77	Electronic Park Brake (EPB) Actuator - Commanded Position Not Reachable
C1804	47	Electronic Park Brake (EPB) Software Safety Failure
C1808	06	Abortion of Actuator Dynamic Brake Function (ADBF)

Subsystem Principle

ECU of EPB function is integrated inside the brake control module, and the actuators are integrated caliper assemblies of motors on both sides. When EPB switch is operated, the controller sends instruction, actuator motor operation enable the caliper to be clamped, so as to achieve the parking brake function.

Conditions for Running DTCs

C1803: The parking status is unclear, and the voltage is beyond the range.

C1804 and C1808: The start switch is placed in ON position.

Conditions for Setting DTCs

C1803: An actuator failure, incoherent braking or unexplained braking will cause a DTC to be set.

C1804: IPB safety task controls the permission of IPB on Applied/Released need, dynamic braking or hardware test. The DTC will be set if the need of IPB is not accepted by safety boundary.

C1808: If ADBF request is aborted or ADBF is requested or ADBF cannot be changed, the DTC shall be set.

Operations of ECU after Failure

C1803 and C1808: Disable functions: AVH, EXTR and EXTA.

C1804: EXTA, RBT, BPA, SA, ADBF and AVH functions are disabled.

Conditions for Clearing DTCs

C1803:

- Repair the actuator or actuator motor failure.
- Use "Start by Switch" to place the brake in a specified state.

C1804: If the failure is no longer present, the DTC will be cleared in the next cycle.

C1808: If two actuators are in the same state, the DTC will be cleared.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Rear brake pad failure.
   - Replace the rear brake pad.
3. Rear brake disc failure.
   - Replace the rear brake disc.
4. Rear guide pin assembly failure.
   - Replace the rear guide pin assembly.
5. Motor stuck or failure.
   - Replace the motor assembly.
6. Rear caliper housing assembly failure.
   - Replace the rear caliper housing assembly.
7. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the rear brake pad:

   ® For rear brake pad crack, excessive wear, uneven wear and other failures, replace the rear brake pad;

   ® No rear brake pad failure, go to 3.

3. Check the rear brake disc:

   ® For rear brake disc crack, excessive wear, uneven wear and other failures, replace the rear brake disc;

   ® No rear brake disc failure, go to 4.

4. Check the rear guide pin assembly:

   ® Rear guide pin assembly failure, replace the rear guide pin assembly;

   ® No rear guide pin assembly failure, go to 5.

5. Check the motor:

   ® Motor stuck or failure, replace the motor;

   ® No motor failure, go to 6.

6. Check the rear guide pin assembly:

   ® Rear caliper housing assembly failure, replace the rear caliper housing assembly;

   ® No rear caliper housing assembly failure, go to 7.

7. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 8.

8. Check the integrated brake system (IBS) module:

® Abnormal, replace the integrated brake system (IBS) module;

® Normal, go to TAC Human Assistance.

C1805 and C1815

DTC Description

DTC	FTB	Failure Description
C1805	01	Electronic Park Brake (EPB) Switch General Electrical Failure
C1805	02	Electronic Park Brake (EPB) Switch General Signal Failure
C1805	2A	Electronic Park Brake (EPB) Switch Blocked Timeout
C1815	12	Electronic Park Brake (EPB) Switch Lamp Circuit Short to Supply
C1815	13	Electronic Park Brake (EPB) Switch Lamp Circuit Open

Subsystem Principle

The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order to apply braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

C1805 2A: When the vehicle speed is lower than 3.5km/h, if the switch is in the engaged or released position for more than 90 seconds, this DTC will be stored.

C1805 02: The DTC will be set if the switch cannot reach a new stable state within 150ms.

C1815 12: The DTC will be set if the LED indicator lamp is short to battery.

C1805 01: An internal short circuit is detected between the collector of any pull-down transistor and KL30. After monitoring for 50ms, the switch and the low-level switch driver will be disabled during the current ignition cycle.

C1815 13: The DTC will be set if the LED indicator lamp is short or open to the ground.

Operations of ECU after Failure

C1805: Disable functions: SR, SA, ADBF and RBT.

C1815: None.

Conditions for Clearing DTCs

C1805: If the free state, pulling-up state and release state of the switch are correct, the DTC will be reset when the system is woken up next time.

C1815: If there is no failure recovery and no failure occurs in the next ignition cycle, restore the failure.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Switch failure.
   - Repair/replace the switch.
3. Integrated brake system failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the switch:

   ® Switch failure, repair/replace the switch;

   ® Switch has no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1806

DTC Description

DTC	FTB	Failure Description
C1806	04	PBC Requested Power Latch Time out
C1806	49	Electronic Park Brake (EPB) ECU Internal Electronic Failure
C1806	53	Maintenance Mode
C1806	54	Assembly Test Was Not Executed

Subsystem Principle

No external circuit is involved in the integrated brake system (IBS) internal failure.

Conditions for Running DTCs

C1806 04 and 49: The Start switch is placed in ON position.

C1806 53: ECU Wakeup

C1806 54:

- ECU is woken up.
- This is always the case when the system is awake or when the system is awaken and parameter settings are available.

Conditions for Setting DTCs

C1806 49: Electronic parking brake (EPB) ECU internal electronic failure.

C1806 53: After entering the maintenance mode, set the EEPROM mark to indicate the on-going maintenance mode.

C1806 04: If the PBC library requests power latch for more than 60 minutes, the DTC will be set.

C1806 54:

- Assembly inspection is not performed. A DTC will be set if the EEPROM flag for the completion of assembly inspection is not set.
- There are no available parameter settings or the revision of the parameter set is inconsistent with the expected revision or at least one parameter is out of range.

Operations of ECU after Failure

C1806 49:

- AVH, SR, SA, ADBF, DAR, EXTR, EXTA, RBT and BPA functions are disabled.

C1806 53: Disable functions: AVH, EXTR and EXTA.

C1806 04: In the next ignition cycle, if the power latch is not requested for 20 minutes since system inital state is requested, the DTC will be cleared.

Conditions for Clearing DTCs

C1806 53: After exiting the maintenance mode, the mark resets in the maintenance mode of EEPROM. If this mark is reset, the DTC will be reset.

C1806 49: When the next ignition cycle is completed, the MIL will go out.

C1806 04: When the next ignition cycle is completed, the MIL will go out.

C1806 54:

- If the assembly inspection has been performed via diagnosis, the EEPROM flag for the completion of assembly inspection will be set. If this flag is set, the DCT will be cleared.

Possible Failure Causes and Maintenance Scheme

C1806 04 and C1806 49:

1. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C1806 53:

1. The system enters the service mode.
   - Use the scan tool to exit the service mode.
2. Actuator failure (such as motor failure, guide pin assembly failure, caliper housing assembly failure).
   - Repair/replace the faulty parts.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

C1806 54:

1. Actuator assembly initialisation is not completed.
   - Assembly initialisation is completed through the scan tool.
2. Actuator failure (such as motor failure, guide pin assembly failure, caliper housing assembly failure).
   - Repair/replace the faulty parts.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Confirm the failure with the scan tool:

   ® If the system is in the service mode, exit the service mode through the scan tool, and complete the assembly initialisation;

   ® If the system initialisation is not completed, complete the assembly initialisation through the scan tool.

   ® If the problems are still not solved after completing the service mode and initialisation, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the rear brake disc:

   ® For rear brake disc crack, excessive wear, uneven wear and other failures, replace the rear brake disc;

   ® No rear brake disc failure, go to 4.

4. Check the rear guide pin assembly:

   ® Rear guide pin assembly failure, replace the rear guide pin assembly;

   ® No rear guide pin assembly failure, go to 5.

5. Check the motor:

   ® Motor stuck or failure, replace the motor;

   ® No motor failure, go to 6.

6. Check the rear caliper housing assembly:

   ® Rear caliper housing assembly failure, replace the rear caliper housing assembly;

   ® No rear caliper housing assembly failure, go to 7.

7. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1807

DTC Description

DTC	FTB	Failure Description
C1807	4B	Motor Overheat

Subsystem Principle

Electronic parking system consists of an EPB switch, an EPB module integrated in the integrated brake system (IBS) and 2 EPB motors fitted on two rear wheels respectively. The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order to apply braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

ECU is woken up.

Conditions for Setting DTCs

If the calculated temperature of actuator is higher than 110°C and incoming request PBCINAppyreleaseRequest ParkApply or HoldApply degrades, the DTC shall be set.

Operations of ECU after Failure

Disable functions: AVH, EXTR and EXTA.

Conditions for Clearing DTCs

The DTC will be cleared if the calculated temperature is lower than 108°C.

Possible Failure Causes and Maintenance Scheme

1. Related circuit/connector failure.
   - Repair/replace the harness.
2. Parking brake motor failure.
   - Repair/replace the parking brake motor.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to 4.

4. Check the parking brake motor:

   ® Abnormal, repair/replace the parking brake motor;

   ® Normal, go to TAC Human Assistance.

C1810, C1811 and C1813

DTC Description

DTC	FTB	Failure Description
C1810	13	Left Motor Failure_Passive Test - Circuit Resistance Above Threshold or Voltage Out of Range
C1811	13	Right Motor Failure_Passive Test - Circuit Resistance Above Threshold or Voltage Out of Range
C1813	1F	Electronic Park Brake (EPB) Circuit Current Above Threshold Too Long

Subsystem Principle

The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

C1810 and C1811: The DTCs will be set if the power supply circuits of motor is detected to be short to ground or short to battery periodically.

C1813: Electronic park brake (EPB) circuit current exceeds the threshold for too long time.

Operations of ECU after Failure

C1810 and C1811: ADBF, RBT and BPA functions are disabled.

C1813:

- AVH, SR, SA, ADBF, DAR, EXTR, EXTA, RBT and BPA functions are disabled.
- The yellow P MIL turns on.

Conditions for Clearing DTCs

C1810:

- If there is no failure recovery, the relevant functions in the current cycle are disabled and the warning still exists; if the failure does not occur, the warning will not exist in the next cycle and IBS malfunction indicator lamp is off.
- The DTCs will be cleared after 40 failure-free working cycles.

C1811:

- Conditions locked. If the failure cause is not detected, restore the failure.
- The DTCs will be cleared after 40 failure-free working cycles.

C1813:

- Electronic park brake (EPB) circuit current exceeds the threshold for a normal time.
- The DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1812

DTC Description

DTC	FTB	Failure Description
C1812	98	Motor Supply Component or System Over Temperature

Subsystem Principle

Electronic parking system consists of an EPB switch, an EPB module integrated in the integrated brake system (IBS) and 2 EPB motors fitted on two rear wheels respectively. The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order to apply braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

Motor supply component or system over temperature.

Operations of ECU after Failure

- AVH, SR, SA, ADBF, DAR, EXTR, EXTA, RBT and BPA functions are disabled.
- The yellow P MIL turns on.

Conditions for Clearing DTCs

- The DTC will be cleared during the next ignition cycle.
- The DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Rear guide pin assembly failure.
   - Replace the rear guide pin assembly.
3. Motor stuck or failure.
   - Replace the motor assembly.
4. Rear caliper housing assembly failure.
   - Replace the rear caliper housing assembly.
5. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the rear guide pin assembly:

   ® Rear guide pin assembly failure, replace the rear guide pin assembly;

   ® No rear guide pin assembly failure, go to 3.

3. Check the motor:

   ® Motor stuck or failure, replace the motor;

   ® No motor failure, go to 4.

4. Check the rear guide pin assembly:

   ® Rear caliper housing assembly failure, replace the rear caliper housing assembly;

   ® No rear caliper housing assembly failure, go to 5.

5. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 6.

6. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1816

DTC Description

DTC	FTB	Failure Description
C1816	00	Electronic Park Brake (EPB) Switch Wake Up ECU Failed

Subsystem Principle

The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order to apply braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if wakeup signal is not read back after the start switch is turned off and within 250ms after the test begins.

Operations of ECU after Failure

Disable function: None.

Conditions for Clearing DTCs

- There is no failure in a new ignition cycle.
- The DTCs will be cleared after 40 failure-free working cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

C1830

DTC Description

DTC	FTB	Failure Description
C1830	53	Electronic Park Brake (EPB) Function Deactivated (Roller Bench Test Mode)

Subsystem Principle

The EPB switch, electronic parking brake module and two parking brake motors are connected via wires. When the driver operates the EPB switch, the motors execute the appropriate order to apply braking force to the rear wheels or to remove the force from the rear wheels.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The electronic parking brake (EPB) function is disabled (hub rotating test mode).

Operations of ECU after Failure

- All functions are invalid.
- The corresponding MILs are all on.

Conditions for Clearing DTCs

- There is no failure in a new ignition cycle.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.

   • Repair/replace the harness.

2. Integrated brake system (IBS) failure.

   • Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 2.

2. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 3.

3. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

U0073 and U0074

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off
U0074	88	Control Module Communication Bus Off on Safety CAN

Subsystem Principle

Integrated Brake System (IBS) communicates with other modules via the High Speed CAN bus.

Conditions for Running DTCs

- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

U0073: EDC, ETC, ESC, HDC, ARP, ACC, AEB and AVH functions are disabled.

U0074: EDC, HDC, ARP, ACC, AEB, HSA and AVH functions are disabled.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared and the MIL will go out after 40 wakeup-standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Corresponding communication module failure.
   - Confirm the module failure and fix it with the scan tool.
2. Related circuits failure.
   - Repair/replace the harness.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network / BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the signal transmitter module is faulty with the scan tool:

   ® If the signal transmitter module is faulty, fix its fault;

   ® If the signal transmitter module has no fault, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the software version of gateway (GW) module:

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to 6.

6. Check the GW module:

   ® Abnormal, replace the gateway module;

   ® Normal, go to TAC Human Assistance.

U0103, U010F, U0122, U0126, U0128, U0140, U0145, U0148, U0151, U0164, U0229, U0245, U0293, U1022, U163C, U1657, U1671, U1690, U1692, U169B, U169D, U16AD, U16B4, U16BD, U16BF, U16DB

DTC Description

DTC	FTB	Failure Description
U0103	87	Lost Communication with Gear Shift Control Module (SCU)
U010F	87	Lost Communication With Air Conditioning Control Module (AC)
U0122	87	Lost Communication with RBM
U0126	87	Lost Communication with Steering Angle Sensor Module (SAS)
U0128	87	Lost Communication with Electronic Park Motor Control Unit (EPMCU)
U0140	87	Lost Communication with Body Control Module (BCM)
U0145	87	Lost Communication with Intelligent Pilot Device(IPD)
U0148	87	Invalid Data Received from Intelligent Computation Center(ICC)
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)
U0164	87	Lost Communication With Air Conditioning Control Module (AC)
U0229	87	Lost Communication with Rear Wheel Steering(RWS)
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)
U0293	87	Lost Communication With IMCU
U1022	87	Lost Communication with Right Hand Rear Drive Assist Module(RHRDA)
U163C	87	Frame 0x03C Timeout
U1657	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U1657	87	Frame 0x057 Timeout
U1671	81	Invalid Data Received from Rear Wheel Steering(RWS)
U1690	81	Invalid Data Received from Redundant Brake Module(RBM)
U1690	87	Frame 0x090 Timeout
U1692	81	Invalid Data Received from Redundant Brake Module(RBM)
U1692	87	Frame 0x092 Timeout
U169B	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U169B	87	Frame 0x095 Timeout
U169D	81	Invalid Data Received from Gear Shift Control Module (SCU)
U169D	87	Frame 0x09D Time out
U16AD	81	Invalid Data Received from Steering Angle Sensor (SAS) Module
U16B4	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U16B4	87	Frame 0x0B4 Timeout
U16BD	81	Invalid Data Received from Redundant Brake Module(RBM)
U16BF	81	Invalid Data Received from Second Brake System
U16BF	87	Frame 0x0BF Timeout
U16DB	81	Invalid Data Received from Electronic Park Motor Control Unit (EPMCU)
U16DB	87	Frame 0x0DB Timeout

Subsystem Principle

The integrated brake system (IBS) communicates with other modules via the CAN bus, and receives relevant signals from other modules via the CAN to realize relevant functions.

Conditions for Running DTCs

- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The specified signal frame from the corresponding controller could not be received within the time limit or invalid data was received from the corresponding controller.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

The corresponding data frame is received for 10 consecutive cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

3. Corresponding communication module failure.

• Confirm the module failure and fix it with the scan tool.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network / BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the signal transmitter module is faulty with the scan tool:

   ® If the signal transmitter module is faulty, fix its fault;

   ® If the signal transmitter module has no fault, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the software version of intelligent computing controller (ICC):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the IBS module;

   ® Normal, go to 6.

6. Check the GW module:

   ® Abnormal, replace the gateway module;

   ® Normal, go to TAC Human Assistance.

U0146, U0155, U0404, U0422, U0423

DTC Description

DTC	FTB	Failure Description
U0146	87	Lost Communication with Intelligent Computing Controller (ICC)
U0155	87	Lost Communication with Instrument Pack (IPK)
U0404	81	Invalid Data Received from Shifter Control Unit (SCU)
U0422	81	Invalid Data Received from Body Control Module (BCM)
U0423	81	Invalid Data Received from Instrument Pack (IPK)
U0428	81	Invalid Steering Wheel Angle Data Received
U0447	81	Invalid Data Received from Gateway (GW)
U0452	81	Invalid Data Received from Sensing Diagnostic Module (SDM)
U0546	81	Invalid Data Received from Front Infotainment Control Module (FICM)
U1265	87	Lost Communication with Front View Camera Module (FVCM)/Forward Detection Radar (FDR)
U130B	81	Invalid Data Received from Forward Detection Radar (FDR)
U1322	81	Invalid Data Received from Rearward Driver Assistance Module (BLIS/RDA)
U1594	81	Invalid Data Received from Intelligent Motor Control Unit (IMCU)
U1647	87	Network Frame Timeout -0x047
U1655	87	Network Frame Timeout -0x55
U168A	87	Network Frame Timeout -0x08A
U1695	87	Network Frame Timeout -0x095
U16E9	87	Network Frame Timeout -0x0E9
U16EF	87	Network Frame Timeout -0x0EF
U174D	87	Network Frame Timeout -0x14D
U17F1	87	Network Frame Timeout -0x1F1
U17F5	87	Network Frame Timeout -0x1F5
U182B	87	Network Frame Timeout -0x22B
U192C	87	Network Frame Timeout -0x32C
U192E	87	Network Frame Timeout -0x32E
U1952	87	Network Frame Timeout -0x352
U198F	87	Network Frame Timeout -0x38F
U19FB	87	Network Frame Timeout -0x3F8
U1A76	87	Network Frame Timeout -0x476
U1B48	87	Network Frame Timeout -0x548

Subsystem Principle

Integrated Brake System (IBS) communicates with other modules via the High Speed CAN bus.

Conditions for Running DTCs

- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The specified signal frame from the corresponding controller could not be received within the time limit or invalid data was received from the corresponding controller.。

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

The corresponding data frame is received for 10 consecutive cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.
3. Corresponding communication module failure.
   - Confirm the module failure and fix it with the scan tool.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network, BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the signal transmitter module is faulty with the scan tool:

   ® If the signal transmitter module is faulty, fix its fault;

   ® If the signal transmitter module has no fault, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of corresponding faulty communication module:

® Software is not the latest version, upgrade the corresponding communication module software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the corresponding communication module:

® Abnormal, replace the corresponding communication module;

® Normal, go to 5.

5. Check the software version of integrated brake system (IBS):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 6.

6. Check the software version of intelligent computing controller (ICC):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 7.

7. Check the software version of gateway (GW):

® Software is not the latest version, upgrade the software version;

® Software is the latest version, or upgrading the software version does not solve the problem, go to 8.

8. Check the integrated brake system (IBS) module:

® Abnormal, replace the SCS module;

® Normal, go to 9.

9. Check the intelligent computing controller (ICC):

® Abnormal, replace the intelligent computing controller (ICC);

® Normal, go to TAC Human Assistance.

U16E7, U1739, U1757, U1763, U1769, U176E, U177E, U1794, U1889, U188D, U18D5, U1916, U191B, U193D, U197D, U1994, U199C, U19F0, U19FF, U1B31, U1B40 and U1B41

DTC Description

DTC	FTB	Failure Description
U16E7	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U1739	87	Frame 0x139 Timeout
U1757	81	Invalid Data Received from Front Detection Radar (FDR)
U1757	87	Frame 0x157 Timeout
U1763	81	Invalid Data Received From Sensing Diagnostic Module(SDM)
U1769	81	Invalid Data Received from Intelligent Computation Center(ICC)
U1769	87	Frame 0x169 Time out
U176E	81	Invalid Data Received from RHRDA
U176E	87	Frame 0x16E Timeout
U177E	81	Invalid Data Received from Front Detection Radar (FDR)
U1794	81	Invalid Data Received from Intelligent Computation Center(ICC)
U1794	87	Frame 0x194 Time out
U1889	87	Frame0x289 Timeout
U188D	81	Invalid Data Received from Body Control Module (BCM)
U188D	87	Frame0x28D Timeout
U18D5	81	Invalid Data Received from RHRDA
U18D5	87	Frame 0x2D5 Timeout
U1916	87	Frame 0x316 Timeout
U191B	87	Frame 0x31B Time out
U193D	81	Invalid Data Received from Air Conditioning Control Module (AC)
U193D	87	Frame 0x33D Timeout
U197D	81	Invalid Data Received From Intelligent Pilot Device(IPD)
U197D	87	Frame 0x37D Timeout
U1994	81	Invalid Data Received from Integrated Motor Control Unit(IMCU)
U1994	87	Frame 0x394 Timeout
U199C	81	Invalid Data Received from Intelligent Computation Center(ICC)
U199C	87	Frame 0x39C Timeout
U19F0	81	Invalid Data Received from Intelligent Computing Controller (ICC)
U19F0	87	Frame 0x3F0 Timeout
U19FF	87	Frame 0x3FF Timeout
U1B31	81	Invalid Data Received from Body Control Module (BCM)
U1B31	87	Frame 0x531 Timeout
U1B40	81	Invalid Data Received from Intelligent Computation Center(ICC)
U1B40	87	Frame GW_HSC1_FrP07 (0x540) Time out
U1B41	87	Frame 0x541 Time out

Subsystem Principle

The integrated brake system (IBS) communicates with other modules via the CAN bus, and receives relevant signals from other modules via the CAN to realize relevant functions.

Conditions for Running DTCs

- The system voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The specified signal frame from the corresponding controller could not be received within the time limit or invalid data was received from the corresponding controller.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

The corresponding data frame is received for 10 consecutive cycles.

Possible Failure Causes and Maintenance Scheme

1. Related circuits failure.
   - Repair/replace the harness.
2. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.
3. Corresponding communication module failure.
   - Confirm the module failure and fix it with the scan tool.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network / BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Confirm if the signal transmitter module is faulty with the scan tool:

   ® If the signal transmitter module is faulty, fix its fault;

   ® If the signal transmitter module has no fault, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the software version of intelligent computing controller (ICC):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 5.

5. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the IBS module;

   ® Normal, go to 6.

6. Check the intelligent computing controller (ICC):

   ® Abnormal, replace the intelligent computing controller (ICC);

   ® Normal, go to TAC Human Assistance.

U1560, U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1560	68	Power Supply Unexpected Shut Down
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The integrated brake system (IBS) monitors the system voltage to check if the power supply voltage of the module is within the normal operating range.

Conditions for Running DTCs

U1560: When ECU is woken up.

U1562 and U1563: The Start switch is placed in ON position.

Conditions for Setting DTCs

U1560: Unexpected power-off or reset.

U1562: The power supply voltage is greater than 16V for 1s.

U1563: Power supply voltage is 9V for 1s.

Operations of ECU after Failure

U1560: Disable functions: AVH, EXTR and EXTA.

U1562 and U1563: All functions are invalid.

Conditions for Clearing DTCs

U1560:

- After one valid brake.

  History DTCs will be cleared and the MIL will be off after 40 failure-free ignition cycles.

U1562: The power supply voltage is less than 15.5V for 1s.

U1563: The power supply voltage is above 9.5V for 1s.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage.
   - Replace the battery.
2. Harness or connector failures.
   - Replace/repair the harness or connector.
3. Integrated brake system (IBS) failure.
   - Flash/replace the integrated brake system (IBS) module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the battery:

   ® Battery feeding, charge the battery;

   ® Battery aging or damage, replace the battery;

   ® Battery is normal, go to 2.

2. Check related circuits:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair the connector/replace the harness;

   ® Related circuits have no fault, go to 3.

3. Check the software version of integrated brake system (IBS):

   ® Software is not the latest version, upgrade the software version;

   ® Software is the latest version, or upgrading the software version does not solve the problem, go to 4.

4. Check the integrated brake system (IBS) module:

   ® Abnormal, replace the integrated brake system (IBS) module;

   ® Normal, go to TAC Human Assistance.

Body Control Module (BCM)

DTC Index

List

DTC	FTB	Chinese Description	Failure Level*
B1041	11	Left Brake Lamps Control Circuit Short to Ground	III
B1041	12	Left Brake Lamps Control Circuit Short to Battery	III
B1041	13	Left Brake Lamps Control Circuit Open Circuit	III
B1042	11	Right Brake Lamps Control Circuit Short to Ground	III
B1042	12	Right Brake Lamps Control Circuit Short to Battery	III
B1042	13	Right Brake Lamps Control Circuit Open Circuit	III
B1043	11	Centre High Mounted Stop Lamp (CHMSL) Circuit Short to Ground	III
B1043	12	Centre High Mounted Stop Lamp (CHMSL) Circuit Short to Battery	III
B1043	13	Centre High Mounted Stop Lamp (CHMSL) Circuit Open Circuit	III
B1045	11	Reverse Lamps Control Circuit Short to Ground	III
B1045	12	Reverse Lamps Control Circuit Short to Battery	III
B1045	13	Reverse Lamps Control Circuit Open Circuit	III
B1047	11	Left Daytime Running Lamp Control Circuit Short to Ground	III
B1047	12	Left Daytime Running Lamp Control Circuit Short to Battery	III
B1047	13	Left Daytime Running Lamp Control Circuit Open Circuit	III
B1048	11	Right Daytime Running Light Control Circuit Short to Ground	III
B1048	12	Right Daytime Running Light Control Circuit Short to Battery	III
B1048	13	Right Daytime Running Light Control Circuit Open Circuit	III
B1049	11	Daytime Running Light Control Circuit Short to Ground	III
B1049	12	Daytime Running Light Control Circuit Short to Battery	III
B1049	13	Daytime Running Light Control Circuit Open Circuit	III
B104A	11	Left Direction Indicators Control Circuit Short to Ground	II
B104A	12	Left Direction Indicators Control Circuit Short to Battery	II
B104A	13	Left Direction Indicators Control Circuit Open Circuit	II
B104B	11	Right Direction Indicators Control Circuit Short to Ground	II
B104B	12	Right Direction Indicators Control Circuit Short to Battery	II
B104B	13	Right Direction Indicators Control Circuit Open Circuit	II
B104C	71	Hazard-Warning Switch Stuck	III
B104E	11	Hazard Lamps on Indicator Driver Short to Ground	III
B104E	12	Hazard Lamps on Indicator Driver Short to Battery	III
B104E	13	Hazard Lamps on Indicator Driver Open Circuit	III
B1053	11	Rear Fog Lamps Control Circuit Short to Ground	III
B1053	12	Rear Fog Lamps Control Circuit Short to Battery	III
B1053	13	Rear Fog Lamps Control Circuit Open Circuit	III
B1055	71	Rear Fog Lamps Switch Stuck	III
B1059	12	Dipped Beam Head Lamp Relay Control Circuit Short to Battery	III
B1059	14	Dipped Beam Head Lamp Relay Control Circuit Short to Ground or Open Circuit	III
B105A	11	Left Dipped Beam Head Lamp Control Circuit Short to Ground	III

DTC	FTB	Chinese Description	Failure Level*
B105A	12	Left Dipped Beam Head Lamp Control Circuit Short to Battery	III
B105A	13	Left Dipped Beam Head Lamp Control Circuit Open Circuit	III
B105B	11	Right Dipped Beam Head Lamp Control Circuit Short to Ground	III
B105B	12	Right Dipped Beam Head Lamp Control Circuit Short to Battery	III
B105B	13	Right Dipped Beam Head Lamp Control Circuit Open Circuit	III
B105C	12	Main Beam Headlamp Relay Control Circuit Short to Battery	III
B105C	14	Main Beam Head Lamp Relay Control Circuit Short to Ground or Open Circuit	III
B105D	11	Light Function Column Switch: Main Beam Headlamp Switch Short to Ground	III
B105D	1E	Light Function Column Switch: Main Beam Headlamp Switch Resistance out of Range	III
B1060	11	Number Plate Lamps Control Circuit Short to Ground	III
B1060	12	Number Plate Lamps Control Circuit Short to Battery	III
B1060	13	Number Plate Lamps Control Circuit Open Circuit	III
B1061	11	Left Position Lamp Control Circuit Short to Ground	III
B1061	12	Left Position Lamp Control Circuit Short to Battery	III
B1061	13	Left Position Lamp Control Circuit Open Circuit	III
B1062	11	Right Position Lamp Control Circuit Short to Ground	III
B1062	12	Right Position Lamp Control Circuit Short to Battery	III
B1062	13	Right Position Lamp Control Circuit Open Circuit	III
B1066	73	Brake Pedal Switch Stuck	III
B1070	11	DI Successive Light Disable Circuit Short to Ground	III
B1070	12	DI Successive Light Disable Circuit Short to Battery	III
B1070	13	DI Successive Light Disable Open Circuit	III
B1071	11	Light Function Column Switch: Direction Indicator Switch Short to Ground	III
B1071	1E	Light Function Column Switch: Direction Indicator Switch Resistance out of Range	III
B1077	11	Main Light Switch Short to Ground	III
B1077	15	Main Light Switch Circuit Short to Battery or Open	III
B1077	1C	Main Light Switch Resistance Out of Range	III
B1078	11	Fog Light Switch Circuit Short to Ground	III
B1078	15	Fog Light Switch Circuit Short to Battery or Open	III
B1078	1C	Fog Light Switch Circuit Resistance Out of Range	III
B107B	11	Auto Light Sensor Power Circuit Short to Ground	III
B107B	12	Auto Light Sensor Power Circuit Short to Battery	III
B107B	13	Auto Light Sensor Power Open Circuit	III
B1081	11	Courtesy Lamps Control Circuit Short to Ground	III
B1081	13	Courtesy Lamps Control Circuit Open Circuit	III
B1082	11	Timed Delay / Inadvertent Power Control Circuit Short to Ground	III
B1082	12	Timed Delay / Inadvertent Power Control Circuit Short to Battery	III
B1089	11	Trunk Lamp Control Circuit Short to Ground	III
B1089	12	Trunk Lamp Control Circuit Short to Battery	III
B1089	13	Trunk Lamp Control Circuit Open Circuit	III
B108A	11	Illumination Dimming Control Circuit Short to Ground	III

DTC	FTB	Chinese Description	Failure Level*
B108A	12	Illumination Dimming Control Circuit Short to Battery	III
B108A	13	Illumination Dimming Control Circuit Open Circuit	III
B10A3	12	Door Superlock Relay Control Circuit Short to Battery	III
B10A3	14	Door Superlock Relay Control Circuit Short to Ground or Open Circuit	III
B10A3	71	All Door SuperLock Relay Stuck	III
B10A6	11	Door Lock Status LED Circuit Short to Ground	III
B10A6	12	Door Lock Status LED Circuit Short to Battery	III
B10A6	13	Door Lock Status LED Circuit Open Circuit	III
B10AC	71	Master Lock Switch Stuck	III
B10AD	71	Master Unlock Switch Stuck	III
B10B1	71	Trunk/Boot Release Switch Stuck	III
B10B2	11	Loadspace Unlock Circuit Short to Ground	III
B10B2	12	Trunk Unlock Circuit Short to Battery	III
B10B2	13	Loadspace Unlock Open Circuit	III
B10B2	71	Trunk/Boot Release Relay Stuck	III
B1101	12	Front Wiper Enable Relay Driver Short to Battery	III
B1101	14	Front Wiper Enable Relay Driver Short to Ground or Open Circuit	III
B1102	12	Rear Wiper Enable Relay Driver Short to Battery	III
B1102	14	Rear Wiper Enable Relay Driver Short to Ground or Open Circuit	III
B1103	12	Front Wiper Speed Relay Driver Short to Battery	III
B1103	14	Front Wiper Speed Relay Driver Short to Ground or Open Circuit	III
B1105	71	Front Wiper Park Switch Actuator Stuck	III
B1107	71	Rear Wiper Park Switch Actuator Stuck	III
B1109	1E	Column Switch Potentiometer for Wiper Delay Resistance out of Range	III
B110B	12	Rear Washer Relay Control Circuit Short to Battery	III
B110B	14	Rear Washer Relay Control Circuit Short to Ground or Open Circuit	III
B110C	12	Front Washer Relay Control Circuit Short to Battery	III
B110C	14	Front Washer Relay Control Circuit Short to Ground or Open Circuit	III
B1111	12	Drivers Window Up Relay Control Circuit Short to Battery	III
B1111	14	Drivers Window Up Relay Control Circuit Short to Ground or Open Circuit	III
B1112	12	Front Passenger Window Up Relay Control Circuit Short to Battery	III
B1112	14	Front Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit	III
B1113	12	Rear Left Passenger Window Up Relay Control Circuit Short to Battery	III
B1113	14	Rear Left Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit	III
B1114	12	Rear Right Passenger Window Up Relay Control Circuit Short to Battery	III
B1114	14	Rear Right Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit	III
B1115	71	Local Passenger Door Window Switch Stuck	III
B1116	71	Local Rear LH Door Window Switch Stuck	III
B1117	71	Local Rear RH Door Window Switch Stuck	III
B1121	12	Drivers Window Down Relay Control Circuit Short to Battery	III
B1121	14	Drivers Window Down Relay Control Circuit Short to Ground or Open Circuit	III

DTC	FTB	Chinese Description	Failure Level*
B1122	12	Front Passenger Window Down Relay Control Circuit Short to Battery	III
B1122	14	Front Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit	III
B1123	12	Rear Left Passenger Window Down Relay Control Circuit Short to Battery	III
B1123	14	Rear Left Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit	III
B1124	12	Rear Right Passenger Window Down Relay Control Circuit Short to Battery	III
B1124	14	Rear Right Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit	III
B112A	04	Driver Window Switch Internal Fault	III
B112A	71	Driver Window Switch Stuck	III
B112B	04	Passenger Window Switch Internal Fault	III
B112B	71	Passenger Window Switch Stuck	III
B112C	04	Left Rear Window Switch Internal Fault	III
B112C	71	Local Rear LH Door Window Switch Stuck	III
B112D	04	Right Rear Window Switch Internal Fault	III
B112D	71	Local Rear RH Door Window Switch Stuck	III
B1130	04	Driver Window Motor Internal Fault	III
B1130	51	Driver Window Motor has no Calibration Data	III
B1131	71	Driver Window Motor Relay Fault	III
B1132	96	Driver Window Sensing System Fault	III
B1134	04	Passenger Window Motor Internal Fault	III
B1134	51	Passenger Window Motor has no Calibration Data	III
B1135	71	Passenger Window Motor Relay Fault	III
B1136	96	Passenger Window Sensing System Fault	III
B1138	04	Left Rear Window Motor Internal Fault	III
B1138	51	Left Rear Window Motor has no Calibration Data	III
B1139	71	Left Rear Window Motor Relay Fault	III
B113A	96	Left Rear Window Sensing System Fault	III
B113C	04	Right Rear Window Motor Internal Fault	III
B113C	51	Right Rear Window Motor has no Calibration Data	III
B113D	71	Right Rear Window Motor Relay Fault	III
B113E	96	Right Rear Window Sensing System Fault	III
B1155	12	Horn Relay Driver Short to Battery	III
B1155	14	Horn Relay Drive Circuit Short to Ground or Open Circuit	III
B1156	12	HRW Relay Control Circuit Short to Battery	III
B1156	14	HRW Relay Control Circuit Short to Ground or Open Circuit	III
B1157	12	HRW Telltale Circuit Short to Battery	III
B1157	14	HRW Telltale Circuit Short to Ground or Open Circuit	III
B1165	11	RUN Power Relay Control Circuit Short to Ground	II
B1165	13	RUN Power Relay Control Circuit Open Circuit	II
B1166	00	Run Crank Control Circuit Error (IGN1)	II
B1166	11	Run Crank Power Relay Control Circuit Short to Ground (IGN1)	II
B1166	13	Run Crank Power Relay Control Circuit Open Circuit (IGN1)	II

DTC	FTB	Chinese Description	Failure Level*
B1167	11	Accessory Power Relay Control Circuit Short to Ground	II
B1167	12	Accessory Power Relay Control Circuit Short to Battery	II
B1167	13	Accessory Power Relay Control Circuit Open Circuit	II
B1168	11	RAP (Retained Accessary Power) Relay Control Circuit Short to Ground	II
B1168	12	RAP (Retained Accessary Power) Relay Control Circuit Short to Battery	II
B1168	13	RAP (Retained Accessary Power) Relay Control Circuit Open Circuit	II
B1169	00	ACC Wakeup HSD Control Circuit Error	III
B1169	11	Accessary High Side Drive Output Circuit Short to Ground	III
B1169	13	ACC HSD Output Circuit Open Circuit	III
B116B	00	BCM Internal Power Mode State Mismatch with GW	III
B11A0	11	Hood Ajar (Bonnet Open Switch) Circuit Short to Ground	III
B11A0	13	Hood Ajar (Bonnet Open Switch) Circuit Open Circuit	III
B1307	11	Main Beam LH Circuit Short to Ground	III
B1307	12	Main Beam LH Short to Battery	III
B1307	13	Main Beam LH Open Circuit	III
B1308	11	Main Beam RH Circuit Short to Ground	III
B1308	12	Main Beam RH Short to Battery	III
B1308	13	Main Beam RH Open Circuit	III
B1310	87	Lost Communication With RHA	II
B1311	87	Lost Communication With LHA	II
B1312	87	Lost Communication With TailLampAsmblA_LH	II
B1313	87	Lost Communication With TailLampAsmblA_RH	II
B1314	87	Lost Communication With TailLampAsmblB_LH	II
B1316	87	Lost Communication With CrsPosLamp_R	II
B1321	11	Blind Spot Warning Telltale LH Circuit Short to Ground	III
B1321	12	Blind Spot Warning Telltale LH Circuit Short to Battery	III
B1321	13	Blind Spot Warning Telltale LH Open Circuit	III
B1322	11	Blind Spot Warning Telltale RH Circuit Short to Ground	III
B1322	12	Blind Spot Warning Telltale RH Circuit Short to Battery	III
B1322	13	Blind Spot Warning Telltale RH Open Circuit	III
B1323	11	Door Open Warning Telltale RH Circuit Short to Ground	III
B1323	12	Door Open Warning Telltale RH Circuit Short to Battery	III
B1323	13	Door Open Warning Telltale RH Open Circuit	III
B1324	11	Door Open Warning Telltale LH Circuit Short to Ground	III
B1324	12	Door Open Warning Telltale LH Circuit Short to Battery	III
B1324	13	Door Open Warning Telltale LH Open Circuit	III
B1414	87	Lost Communication With TailLampAsmblB_RH	II
B1701	95	Transponder Antenna Fault	II
B1702	96	Invalid Key Present	II
B1703	96	Additional Nodes Authentication Failure	II
B1705	96	Loss Communication with Base Station	II

DTC	FTB	Chinese Description	Failure Level*
B1708	87	CAN Communication Failure During Anti-theft Authentication	II
B1709	95	No PEB (TC) Challenge Received	II
B170A	96	BCM not receiving TBOX's response	II
B170B	96	Telematic Box Authentication Failure	II
B170D	96	Body Control Module does not Receive Electrical Steering Column Lock's Challenge	II
B1710	95	Attack State is Triggered During PEB (TC) Authentication	II
B1713	96	BCM not receiving SDM's response	II
B1715	96	BCM not receiving ATC's response	II
B1716	96	BCM not receiving IPK's response	II
B1719	95	No PEB (ISC) Challenge Received	II
B1754	01	Driver Door HSU Antenna Inter/Intra Short	II
B1754	11	Driver Door HSU Antenna Short to Ground	II
B1754	12	Driver Door HSU Antenna Short to Battery	II
B1754	13	Driver Door HSU Antenna Open Circuit	II
B1754	19	Driver Door HSU Antenna Over Current	II
B1755	01	Passenger Door HSU Antenna Inter/Intra Short	II
B1755	11	Passenger Door HSU Antenna Short to Ground	II
B1755	12	Passenger Door HSU Antenna Short to Battery	II
B1755	13	Passenger Door Handle Switch Unit Antenna Open Circuit	II
B1755	19	Passenger Door Handle Switch Unit Antenna Over Current	II
B1756	01	Bumper Antenna Inter/Intra Short	II
B1756	11	Bumper Antenna Short to Ground	II
B1756	12	Bumper Antenna Short to Battery	II
B1756	13	Bumper Antenna Open Circuit	II
B1756	19	Bumper Antenna Over Current	II
B1757	01	Front Interior Antenna Inter/Intra short	II
B1757	11	Front Interior Antenna Short to Ground	II
B1757	12	Front Interior Antenna Short to Battery	II
B1757	13	Front Interior Antenna Open Circuit	II
B1757	19	Front Interior Antenna Over Current	II
B1758	01	Middle Interior Antenna Inter/Intra short	II
B1758	11	Middle Interior Antenna Short to Ground	II
B1758	12	Middle Interior Antenna Short to Battery	II
B1758	13	Middle Interior Antenna Open Circuit	II
B1758	19	Middle Interior Antenna Over Current	II
B1759	01	Rear Interior Antenna Inter/Intra short	II
B1759	11	Rear Interior Antenna Short to Ground	II
B1759	12	Rear Interior Antenna Short to Battery	II
B1759	13	Rear Interior Antenna Open Circuit	II
B1759	19	Rear Interior Antenna Over Current	II
B1957	31	Park Distance Control Rear Left Sensor Fault	II

DTC	FTB	Chinese Description	Failure Level*
B1958	31	Park Distance Control Rear Middle Left Sensor Fault	II
B1959	31	Park Distance Control Rear Middle Right Sensor Fault	II
B195A	31	Park Distance Control Rear Right Sensor Fault	II
B195B	31	Park Distance Control Front Left Sensor Fault	II
B195C	31	Park Distance Control Front Middle Left Sensor Fault	II
B195D	31	Park Distance Control Front Middle Right Sensor Fault	II
B195E	31	Park Distance Control Front Right Sensor Fault	II
B2A02	1C	MPWC Mobile Phone Wireless Charging voltage is out of range	IV
B2A03	87	Communication between BCM and the MPWC Controller is lost	IV
C1A00	55	Standard Tyre Pressure Not Configured	III
C1A01	55	Sensor ID Not Configured	III
C1A02	16	Front Left Tyre Sensor Battery Voltage Low	III
C1A02	31	No RF Signal Received from Left Front Tyre Sensor	III
C1A03	16	Front Right Tyre Sensor Battery Voltage Low	III
C1A03	31	No RF Signal Received from Right Front Tyre Sensor	III
C1A04	16	Rear Right Tyre Sensor Battery Voltage Low	III
C1A04	31	No RF Signal Received From Right Rear Tyre Sensor	III
C1A05	16	Rear Left Tyre Sensor Battery Voltage Low	III
C1A05	31	No RF Signal Received from Left Rear Tyre Sensor	III
P15AB	11	Driving Mode Request Switch Circuit Short to Ground	III
P15AB	13	Driving Mode Request Switch Circuit Open Circuit	III
U0073	88	Control Module Communication Bus Off on HSCAN1	I
U0075	88	CAN Bus Off	II
U0100	87	Lost Communication with Engine Control Module (ECM)	I
U0101	87	Lost Communication with Transmission Control Module (TCM)	I
U010F	87	Lost Communication with Air Conditioning Control Module (AC)	II
U0110	87	Lost Communication With TC	II
U0120	87	Lost Communication with Alternator	II
U0121	87	Lost Communication with Anti-Lock Brake System Module (ABS)	I
U0122	87	Lost Communication with Stability Control System (SCS)	I
U0146	87	Lost Communication with Gateway (GW)	II
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)	II
U0155	87	Lost Communication with Instrument Pack (IPK)	II
U0169	87	Lost Communication with Sunroof Control Module	II
U0180	87	Lost Communication with Automatic Lighting Control Module(AFS/DHL)	II
U0198	87	Lost Communication with Telematic Control Module (TBOX)	II
U0208	87	Lost Communication with Seat Control Module A (DSM)	II
U0215	87	Lost Communication with Drive Door Switch Pack(DDSP)	III
U0222	87	Lost Communication with Door Window Motor (Driver)	II
U0223	87	Lost Communication with Door Window Motor (Front Passenger)	II
U0224	87	Lost Communication with Door Window Motor (RL)	II

DTC	FTB	Chinese Description	Failure Level*
U0225	87	Lost Communication with Door Window Motor (RR)	II
U0231	87	Lost Communication with Rain Light Sensor(RLS)	II
U0236	87	Lost Communication with Column Lock Module (ESCL)	II
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)	II
U0268	87	Lost Communication with Airbag Display Module (ADM)	II
U0282	87	Lost Communication with Master Light Switch	III
U0292	87	Lost Communication With ISC	II
U0293	87	Lost Communication With Vehicle Control Unit (HCU/VCU)	II
U1003	87	Lost Communication with Gear Shift Control Module (SCU)	II
U1005	87	Lost Communication with Ultrasonic Alarm Sensor Module	II
U1008	87	Lost Communication with Remote PRND Display Module (RPD)	II
U1024	87	Lost Communication with Battery Back Up Sounder Module (BBUS)	II
U1116	87	Lost Communication with Electronic Battery Sensor (EBS)	II
U1140	87	Lost Communication with Power Liftgate Control Module (PLCM)	II
U1150	87	Lost Communication with Upper Console PDC Switch	III
U1158	87	Lost Communication with Front Park Distance Control Module(PDC)	II
U1159	87	Lost Communication with Rear Park Distance Control Module(PDC)	II
U1169	87	Lost Communication with Sunroof Sunshade Control Module	II
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)	II
U1501	00	BCM(or IPK) Redundant Data Resync Failure	II
U1562	17	Battery Voltage High	II
U1563	16	Battery Voltage Low	II
U2001	41	ECU Error-EEPROM Checksum Error	II
U2002	42	ECU Error - RAM Error	II
U2004	42	ECU Error - ROM Error	II
U2020	47	ECU Error - Internal Watchdog Error	II
U2021	47	ECU Error - External Watchdog Error	II

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to 4S store for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B1041, B1042 and B1043

DTC Description

DTC	FTB	Failure Description
B1041	11	Left Brake Lamps Control Circuit Short to Ground
B1041	12	Left Brake Lamps Control Circuit Short to Battery
B1041	13	Left Brake Lamps Control Circuit Open Circuit
B1042	11	Right Brake Lamps Control Circuit Short to Ground
B1042	12	Right Brake Lamps Control Circuit Short to Battery
B1042	13	Right Brake Lamps Control Circuit Open Circuit
B1043	11	Centre High Mounted Stop Lamp (CHMSL) Circuit Short to Ground
B1043	12	Centre High Mounted Stop Lamp (CHMSL) Circuit Short to Battery
B1043	13	Centre High Mounted Stop Lamp (CHMSL) Circuit Open Circuit

Subsystem Principle

The brake lamp switch is a Hall effect sensor, activated by the brake panel. When the brake panel is depressed, the brake signal is sent, the BCM will receive the brake signal and illuminate the brake lamp to remind the vehicle behind about the following distance.

Conditions for Running DTCs

B1041 11 and 13:

- The left brake lamp drive circuit is on.
- The control duty ratio of PWM signal is greater than 70%.
- The start switch is in "ACC"/"ON" position.

B1041 12:

- Drive circuit of left brake lamp is off.
- The start switch is in "ACC"/"ON" position.

B1042 11 and 13:

- The right brake lamp drive circuit is on.
- The control duty ratio of PWM signal is greater than 70%.
- The start switch is in "ACC"/"ON" position.

B1042 12:

- Right brake lamp drive circuit is off.
- The start switch is in "ACC"/"ON" position.

B1043 11 and 13:

- The high mounted stop lamp drive circuit is on.
- The start switch is in "ACC"/"ON" position.

B1043 12:

- CHMSL drive circuit is off.
- The start switch is in "ACC"/"ON" position.

Conditions for Setting DTCs

B1041 11: HSD circuit short to ground is detected for 20 consecutive times.

B1041 12: HSD circuit short to battery is detected for 20 consecutive times.

B1041 13: HSD circuit open circuit is detected for 20 consecutive times.

B1042 11: HSD circuit short to ground is detected for 20 consecutive times.

B1042 12: HSD circuit short to battery is detected for 20 consecutive times.

B1042 13: HSD circuit open circuit is detected for 20 consecutive times.

B1043 11: HSD circuit short to ground is detected for 20 consecutive times.

B1043 12: HSD circuit short to battery is detected for 20 consecutive times.

B1043 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1041 11: Drive output is off in the current start cycle.

B1041 12 and 13: None.

B1042 11: Drive output is closed in the current ignition cycle.

B1042 12 and 13: None.

B1043 11: Drive output is off in the current ignition cycle.

B1043 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Brake lamp failure:
   - Repair/replace the brake lamp or tail lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Brake Lamp & Reverse Lamp & Number Plate Lamp

Diagnostic Test Steps

1. Check the left brake lamp - BCM and the right brake lamp - BCM connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the left/right brake lamp:

   ® Brake lamp damage and other abnormal conditions: Repair/replace the brake lamp or tail lamp/rear combination lamp assembly.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1045

DTC Description

DTC	FTB	Failure Description
B1045	11	Reverse Lamps Control Circuit Short to Ground
B1045	12	Reverse Lamps Control Circuit Short to Battery
B1045	13	Reverse Lamps Control Circuit Open Circuit

Subsystem Principle

The BCM controls the reverse lamps to turn on and off via the drive circuit.

Conditions for Running DTCs

B1045 11 and 13:

- Reverse lamps are on.
- The Start switch is placed in ON position.

B1045 12:

- Reverse lamp is off.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1045 11: HSD circuit short to ground is detected for 20 consecutive times.

B1045 12: HSD circuit short to battery is detected for 20 consecutive times.

B1045 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1045 11: Reverse lamps do not work in the current ignition cycle.

B1045 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Reverse lamp failure:
   - Repair/replace the reverse lamp or tail lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Brake Lamp & Reverse Lamp & Number Plate Lamp

Diagnostic Test Steps

1. Check the reverse lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the reverse lamp:

   ® For reverse lamp damage and other abnormal conditions: Repair/replace the reverse lamp or rear combination lamp assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1047, B1048 and B1049

DTC Description

DTC	FTB	Failure Description
B1047	11	Left Daytime Running Lamp Control Circuit Short to Ground
B1047	12	Left Daytime Running Lamp Control Circuit Short to Battery
B1047	13	Left Daytime Running Lamp Control Circuit Open Circuit
B1048	11	Right Daytime Running Light Control Circuit Short to Ground
B1048	12	Right Daytime Running Light Control Circuit Short to Battery
B1048	13	Right Daytime Running Light Control Circuit Open Circuit
B1049	11	Daytime Running Light Control Circuit Short to Ground
B1049	12	Daytime Running Light Control Circuit Short to Battery
B1049	13	Daytime Running Light Control Circuit Open Circuit

Subsystem Principle

The BCM controls the daytime running lamp via the HSD circuit; when the start switch is in "ON/RUNNING" position, and the light sensor determines that it is daytime, the daytime running lamp illuminates.

Conditions for Running DTCs

B1047 11 and B1047 13: Drive circuit of left daytime running lamp is on, the Start switch is placed in ON position, and the left daytime running lamp is enabled.

B1047 12: Drive circuit of left daytime running lamp is off, the Start switch is placed in ON position, and the left daytime running lamp is enabled.

B1048 11 and B1048 13: Drive circuit of right daytime running lamp is on, the Start switch is placed in ON position, and the right daytime running lamp is enabled.

B1048 12: Drive circuit of right daytime running lamp is off, the Start switch is placed in ON position, and the right daytime running lamp is enabled.

B1049 11 and B1049 13: Drive circuit of daytime running lamp is on, the Start switch is placed in ON position, and the daytime running lamp is enabled.

B1049 12: Drive circuit of daytime running lamp is off, the Start switch is placed in ON position, and the daytime running lamp is enabled.

Conditions for Setting DTCs

B1047 11, B1048 11 and B1049 11: HSD circuit short to ground is detected for 20 consecutive times.

B1047 12, B1048 12 and B1049 12: HSD circuit short to battery is detected for 20 consecutive times.

B1047 13, B1048 13 and B1049 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1047 11: The left daytime running lamp does not work in the current ignition cycle.

B1047 12, B1047 13, B1048 12, B1048 13, B1049 12 and B1049 13: None.

B1048 11: The right daytime running lamp does not work in the current ignition cycle.

B1049 11: The daytime running lamp does not work in the current ignition cycle.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Daytime running lamp failure:
   - Repair/replace the daytime running lamp or headlamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Side Lamp & Daytime Running Lamp

Diagnostic Test Steps

1. Check the daytime running lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the daytime running lamp:

   ® For daytime running lamp damage and other abnormal conditions: Repair/replace the daytime running lamp or headlamp assembly;

   ® Normal, go to 3.

3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

® Normal, go to TAC Human Assistance.

B104A and B104B

DTC Description

DTC	FTB	Failure Description
B104A	11	Left Direction Indicators Control Circuit Short to Ground
B104A	12	Left Direction Indicators Control Circuit Short to Battery
B104A	13	Left Direction Indicators Control Circuit Open Circuit
B104B	11	Right Direction Indicators Control Circuit Short to Ground
B104B	12	Right Direction Indicators Control Circuit Short to Battery
B104B	13	Right Direction Indicators Control Circuit Open Circuit

Subsystem Principle

When the start switch is in "ON/RUNNING" position and the light stalk switch is in left/right turn position, the BCM flashes the corresponding direction indicator lamp by identifying the status of the direction indicator lamp switch, and meanwhile the direction indicator lamp on the instrument pack flashes and provides the current status of the direction indicator lamp for the driver by acoustic warning.

Conditions for Running DTCs

B104A 11 and B104A 13: The system is powered on and in operation mode; the drive circuit of left direction indicator lamp is on.

B104A 12: The system is powered on and in operation mode, and the drive circuit of left direction indicator lamp is off.

B104B 11 and B104B 13: The system is powered on and in operation mode; the drive circuit of right direction indicator lamp is on.

B104B 12: The system is powered on and in operation mode, and the drive circuit of right direction indicator lamp is off.

Conditions for Setting DTCs

B104A 11, B104B 11: HSD circuit short to ground is detected for 20 consecutive times.

B104A 12, B104B 12: HSD circuit short to battery is detected for 20 consecutive times.

B104A 13, B104B 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B104A 11 and B104B 11: Drive output is closed in the current ignition cycle.

B104A 12 and B104B 12: None.

B104A 13: Flash frequency of left direction indicator lamp doubles.

B104B 13: Flash frequency of right direction indicator lamp doubles.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Direction indicator lamp failure:
   - Repair/replace the direction indicator lamp or the corresponding assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Direction Indicator Lamp

Diagnostic Test Steps

1. Check the direction indicator lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the direction indicator lamp:

   ® For direction indicator lamp damage and other abnormal conditions: Repair/replace the direction indicator lamp or the corresponding assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B104C and B104E

DTC Description

DTC	FTB	Failure Description
B104C	71	Hazard-Warning Switch Stuck
B104E	11	Hazard Lamps on Indicator Driver Short to Ground
B104E	12	Hazard Lamps on Indicator Driver Short to Battery
B104E	13	Hazard Lamps on Indicator Driver Open Circuit

Subsystem Principle

The hazard warning lamps are comprised of front, rear and side direction indicator lamps. The hazard warning lamp switch is marked with a triangle, which is a touch switch. When the hazard warning lamp is activated, the triangle mark on the switch will flash. When the width lamps or headlamps are turned on, the triangle mark dims but still flashes. The hazard warning lamp can be activated manually regardless of current position of the start switch.

Conditions for Running DTCs

B104C 71: The system is powered on and in operation.

B104E 11:

- The Start switch is placed in ON position.
- The hazard warning indicator lamp is on.
- The control duty ratio of PWM signal is greater than 100%.

B104E 12:

- The Start switch is placed in ON position.
- The hazard warning indicator lamp is off.
- The control duty ratio of PWM signal is greater than 100%.

B104E 13:

- The Start switch is placed in ON position.
- The hazard warning indicator lamp is off.

Conditions for Setting DTCs

B104C 71: It is detected that the hazard warning lamp switch remains active for more than 20s.

B104E 11: HSD circuit short to ground is detected for 20 consecutive times.

B104E 12: HSD circuit short to battery is detected for 20 consecutive times.

B104E 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B104C 71: The current hazard warning lamp switch input signal is invalid.

B104E 11: Drive output is closed in the current ignition cycle.

B104E 12 and 13: None.

Conditions for Clearing DTCs

B104C 71:

- It is detected that the hazard warning lamp switch is released.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B104E 11, 12 and 13:

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Hazard warning lamp switch failure:
   - Repair/replace the hazard warning lamp switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Direction Indicator Lamp

Diagnostic Test Steps

1. Check the Information Faceplate - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the Information Faceplate:

   ® For damage and other abnormal conditions: Repair/replace the Information Faceplate;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1053

DTC Description

DTC	FTB	Failure Description
B1053	11	Rear Fog Lamps Control Circuit Short to Ground
B1053	12	Rear Fog Lamps Control Circuit Short to Battery
B1053	13	Rear Fog Lamps Control Circuit Open Circuit

Subsystem Principle

With the start switch in "ACC" or "ON/START" position, the rear fog lamp switch is turned on, and the rear fog lamps will light up.

Conditions for Running DTCs

B1053 11 and 13: The system is powered on and in operation mode, and the drive circuit of rear fog lamp is on.

B1053 12: The system is powered on and in operation mode, and the drive circuit of rear fog lamp is off.

Conditions for Setting DTCs

B1053 11: HSD circuit short to ground is detected for 20 consecutive times.

B1053 12: HSD circuit short to battery is detected for 20 consecutive times.

B1053 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1053 11: HSD output is closed in the current ignition cycle.

B1053 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Fog lamp failure:
   - Repair/replace the fog lamp or fog lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Towbar Harness Connection

Diagnostic Test Steps

1. Check the rear fog lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear fog lamp:

   ® For rear fog lamp damage and other abnormal conditions: Repair/replace the rear fog lamp or rear fog lamp assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1055 and B1078

DTC Description

DTC	FTB	Failure Description
B1055	71	Rear Fog Lamp Switch Stuck
B1078	11	Fog Light Switch Circuit Short to Ground
B1078	15	Fog Light Switch Circuit Short to Battery or Open
B1078	1C	Fog Light Switch Circuit Resistance Out of Range

Subsystem Principle

With the start switch in "ACC" or "ON/START" position, the front/rear fog lamp switch is turned on, and the front/rear fog lamp will light up.

Conditions for Running DTCs

B1055 71: The Start switch is placed in ON position.

B1078:

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not read.

Conditions for Setting DTCs

B1055 71: If the rear fog lamp switch is kept pressed for over 30s, the condition of stuck switch will be set and the rear fog lamp does not work until the switch is released.

B1078 11: The AD converter detects a short circuit to ground for 2s.

B1078 15 and 1C: The AD converter detects an out-of-range for 2s.

Operations of ECU after Failure

B1055 71: Ignore the rear fog lamp switch signal until it returns to normal.

B1078 11, 15 and 1C: Ignore the fog lamp switch signal until it returns to normal.

Conditions for Clearing DTCs

B1055 71:

- It is detected that the front/rear fog lamp switch is released once.

  History DTCs will be cleared after 40 failure-free ignition cycles.

B1078:

- The switch AD converter is detected to be in the normal range.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Information Faceplate failure:
   - Repair/replace the Information Faceplate.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Towbar Harness Connection

Diagnostic Test Steps

1. Check BCM - Information Faceplate harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the Information Faceplate:

   ® For Information Faceplate stuck, damage and other abnormal conditions: Repair/replace the Information Faceplate;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B105A and B105B

DTC Description

DTC	FTB	Failure Description
B105A	11	Left Dipped Beam Head Lamp Control Circuit Short to Ground
B105A	12	Left Dipped Beam Head Lamp Control Circuit Short to Battery
B105A	13	Left Dipped Beam Head Lamp Control Circuit Open Circuit
B105B	11	Right Dipped Beam Head Lamp Control Circuit Short to Ground
B105B	12	Right Dipped Beam Head Lamp Control Circuit Short to Battery
B105B	13	Right Dipped Beam Head Lamp Control Circuit Open Circuit

Subsystem Principle

The BCM receives the signal from the light stalk switch and the rain/light sensor, and controls the ON/OFF of the left and right high/low beams via the LIN bus or hard wire.

Conditions for Running DTCs

B105A 11: Left low beam drive circuit is on for more than 30s, which is more than 70% PWM control.

B105A 12: Left low beam drive circuit is off.

B105A 13: Left low beam drive circuit is on for more than 30s.

B105B 11: Right low beam drive circuit is on for more than 30s, which is more than 70% PWM control.

B105B 12: Right low beam drive circuit is off.

B105B 13: Right low beam drive circuit is on for more than 30s.

Conditions for Setting DTCs

B105A 11 and B105B 11: HSD circuit short to ground is detected for 10 consecutive times.

B105A 12 and B105B 12: HSD circuit short to battery is detected for 10 consecutive times.

B105A 13 and B105B 13: HSD circuit open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B105A 11 and B105B 11: HSD output is closed in the current ignition cycle.

B105A 12, B105A 13, B105B 12 and B105B 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Light stalk combination switch failure:
   - Repair/replace the light stalk combination switch.
3. Headlamp failure:
   - Repair/replace the high/low beam or headlamp assembly.
4. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the light stalk combination switch - BCM and headlamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the light stalk combination switch:

   ® For light stalk combination switch stuck, damage and other abnormal conditions: Repair/replace the light stalk combination switch;

   ® Normal, go to 3.

3. Check the high/low beam:

   ® For high/low beam damage and other abnormal conditions: Repair/replace the high/low beam or headlamp assembly;

   ® Normal, go to 4.

4. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1059 and B105C

DTC Description

DTC	FTB	Failure Description
B1059	12	Dipped Beam Head Lamp Relay Control Circuit Short to Battery
B1059	14	Dipped Beam Head Lamp Relay Control Circuit Short to Ground or Open Circuit
B105C	12	Main Beam Headlamp Relay Control Circuit Short to Battery
B105C	14	Main Beam Head Lamp Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

The master light switch transmits the signal to the body control module (BCM), which controls the high/low beam to turn off or on.

Conditions for Running DTCs

B1059 12 and B105C 12:

- Low beam relay control circuit is on.
- The Power gear is located in the ON position.

B1059 14 and B105C 14:

- Low beam relay control circuit is off.

  The Power gear is located in the ON position.

Conditions for Setting DTCs

B1059 12 and B105C 12: It is detected that the low voltage driver is short to battery for 10 times.

B1059 14 and B105C 14: It is detected that the low voltage driver is short to ground or open for 10 times.

Operations of ECU after Failure

B1059 12 and B105C 12: Close the circuit output immediately.

B1059 14 and B105C 14: None.

Conditions for Clearing DTCs

- It is detected that the low side driver is normal (detected normal for 20 times).
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Light stalk combination switch failure:
   - Repair/replace the light stalk combination switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the light stalk combination switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the light stalk combination switch:

   ® For light stalk combination switch stuck, damage and other abnormal conditions: Repair/replace the light stalk combination switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B105D and B1077

DTC Description

DTC	FTB	Failure Description
B105D	11	Light Function Column Switch: Main Beam Headlamp Switch Short to Ground
B105D	1E	Light Function Column Switch: Main Beam Headlamp Switch Resistance out of Range
B1077	11	Main Light Switch Short to Ground
B1077	15	Main Light Switch Circuit Short to Battery or Open
B1077	1C	Main Light Switch Resistance Out of Range

Subsystem Principle

The BCM receives the signal from the light stalk switch and the rain/light sensor, and controls the ON/OFF of the left and right high/low beams via the LIN bus or hard wire.

Conditions for Running DTCs

B105D 11 and 1E: The Start switch is placed in ON position.

B1077 11, 15 and 1C:

- DTCs U1562 and U1563 are not read.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B105D 11: The AD converter in the BCM detects the occurrence of a short to ground failure for 2s.

B105D 1E: The AD converter in the BCM detects the switch resistance out of the rational range for 2s.

B1077 11: The AD converter detects a short to ground failure for 2s.

B1077 15 and 1C: The AD converter detects an out-of-range for 2s.

Operations of ECU after Failure

B105D 11 and 1E: The combination switch output signal is invalid in the current ignition cycle.

B1077 11, 15 and 1C: Switch on side lamps and low beams while the start switch is in "KL.15" position.

Conditions for Clearing DTCs

B105D 11 and 1E: The AD converter in the BCM detects that the switch works normally.

B1077 11, 15 and 1C:

- The switch AD converter is detected to be in the normal range.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Light stalk combination switch failure:
   - Repair/replace the light stalk combination switch.
3. Headlamp failure:
   - Repair/replace the high/low beam or headlamp assembly.
4. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the light stalk combination switch - BCM and headlamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the light stalk combination switch:

   ® For light stalk combination switch stuck, damage and other abnormal conditions: Repair/replace the light stalk combination switch;

   ® Normal, go to 3.

3. Check the high/low beam:

   ® For high/low beam damage and other abnormal conditions: Repair/replace the high/low beam or headlamp assembly;

   ® Normal, go to 4.

4. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1060

DTC Description

DTC	FTB	Failure Description
B1060	11	Number Plate Lamps Control Circuit Short to Ground
B1060	12	Number Plate Lamps Control Circuit Short to Battery
B1060	13	Number Plate Lamps Control Circuit Open Circuit

Subsystem Principle

BCM controls the license plate lamps via one-way drive.

Conditions for Running DTCs

B1060 11 and B1060 13: The system is powered on and in operation, and the license plate lamp HSD is on.

B1060 12: The system is powered on and in operation mode, and HSD of license plate lamp is off.

Conditions for Setting DTCs

B1060 11: HSD circuit short to ground is detected for 20 consecutive times.

B1060 12: HSD circuit short to battery is detected for 20 consecutive times.

B1060 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1060 11: HSD output is closed in the current vehicle power-on and power-off cycles.

B1060 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. License plate lamp failure:
   - Repair/replace the corresponding license plate lamp.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Brake Lamp & Reverse Lamp & Number Plate Lamp

Diagnostic Test Steps

1. Check the license plate lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the license plate lamp:

   ® For license plate lamp damage and other abnormal conditions: Repair/replace the license plate lamp;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1061 and B1062

DTC Description

DTC	FTB	Failure Description
B1061	11	Left Position Lamp Control Circuit Short to Ground
B1061	12	Left Position Lamp Control Circuit Short to Battery
B1061	13	Left Position Lamp Control Circuit Open Circuit
B1062	11	Right Position Lamp Control Circuit Short to Ground
B1062	12	Right Position Lamp Control Circuit Short to Battery
B1062	13	Right Position Lamp Control Circuit Open Circuit

Subsystem Principle

The BCM controls the operation of left position lamp via HSD.

Conditions for Running DTCs

B1061 11, B1061 13, B1062 11 and B1062 13: The system is powered on and in operation mode, and the left/right position lamp HSD is on.

B1061 12 and B1062 12: The system is powered on and in operation mode, and the left position lamp HSD is off.

Conditions for Setting DTCs

B1061 11 and B1062 11: HSD circuit short to ground is detected for 20 consecutive times.

B1061 12 and B1062 12: HSD circuit short to battery is detected for 20 consecutive times.

B1061 13 and B1062 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1061 11 and B1062 11: HSD output is closed in the current ignition cycle.

B1061 12, B1061 13, B1062 12 and B1062 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Left position lamp failure:
   - Repair/replace the corresponding position lamp or assembly.
3. Right position lamp failure:
   - Repair/replace the corresponding position lamp or assembly.
4. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Side Lamp & Daytime Running Lamp

Diagnostic Test Steps

1. Check the left position lamp - BCM and the right position lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the left/right position lamp:

   ® For left/right position lamp damage and other abnormal conditions: Repair/replace the left or right position lamp or assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1066

DTC Description

DTC	FTB	Failure Description
B1066	73	Brake Pedal Switch Stuck

Subsystem Principle

The brake lamp switch is a Hall effect sensor, activated by the brake panel. When the brake panel is depressed, the brake signal is sent, the BCM will receive the brake signal and illuminate the brake lamp to remind the vehicle behind about the following distance.

Conditions for Running DTCs

- The brake switch is activated.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The brake switch remains active for more than 180s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- It is detected that the brake pedal switch can work normally.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Brake lamp switch failure:
   - Repair/replace the brake lamp switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Brake System

Diagnostic Test Steps

1. Check the brake lamp switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the brake lamp switch:

   ® For brake lamp switch damage and other abnormal conditions: Repair/replace the brake lamp switch;

   ® Normal, go to 3.

3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

® Normal, go to TAC Human Assistance.

B1070

DTC Description

DTC	FTB	Failure Description
B1070	11	DI Successive Light Disable Circuit Short to Ground
B1070	12	DI Successive Light Disable Circuit Short to Battery
B1070	13	DI Successive Light Disable Open Circuit

Subsystem Principle

The waterfall direction indicator lamp replaces the traditional flashing direction indicator lamp, and will flow like water as it is turned on. The master light switch sends a command to the body control module (BCM), which is then directly executed by the BCM to turn on or off.

Conditions for Running DTCs

- The system power mode is in RUN position.
- The waterfall direction indicator lamp is disabled.

Conditions for Setting DTCs

B1070 11: HSD circuit short to ground is detected for 20 consecutive times.

B1070 12: HSD circuit short to battery is detected for 20 consecutive times.

B1070 13: HSD circuit open is detected for 20 consecutive times.

Operations of ECU after Failure

B107011: Close the HSD circuit output immediately.

B1070 12 and B1070 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Direction indicator lamp failure:
   - Repair/replace the direction indicator lamp.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Direction Indicator Lamp

Diagnostic Test Steps

1. Check the direction indicator lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the direction indicator lamp:

   ® For direction indicator lamp damage and other abnormal conditions: Repair/replace the direction indicator lamp;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1071

DTC Description

DTC	FTB	Failure Description
B1071	11	Light Function Column Switch: Direction Indicator Switch Short to Ground
B1071	1E	Light Function Column Switch: Direction Indicator Switch Resistance out of Range

Subsystem Principle

Light stalk switch is on the left side of the steering column, and one of them is used to control the direction indicator lamps. After receiving the request signal from direction indicator lamp combination switch, BCM controls the left and right direction indicator lamps respectively via two-way drive output.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1071 11: The AD converter in the BCM detects the occurrence of a short to ground failure for 2s.

B1071 1E: The AD converter in the BCM detects the switch resistance out of the rational range for 2s.

Operations of ECU after Failure

The combination switch output signal is invalid in the current ignition cycle.

Conditions for Clearing DTCs

- The AD converter in the BCM detects that the switch works normally.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Light stalk combination switch failure:
   - Repair/replace the light stalk combination switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Direction Indicator Lamp

Diagnostic Test Steps

1. Check the light stalk combination switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the light stalk combination switch:

   ® For light stalk combination switch stuck, damage and other abnormal conditions: Repair/replace the light stalk combination switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B107B

DTC Description

DTC	FTB	Failure Description
B107B	11	Auto Light Sensor Power Circuit Short to Ground
B107B	12	Auto Light Sensor Power Circuit Short to Battery
B107B	13	Auto Light Sensor Power Open Circuit

Subsystem Principle

The automatic light sensor monitors the intensity of the vehicle's external ambient light to send an electronic signal to the body control module (BCM), and the BCM turns on or off the lights suitable for the prevailing environment in accordance with the signal to enable the automatic light to be turned on.

Conditions for Running DTCs

B107B 11 and B107B 13: The system is powered on and in operation mode, and the drive circuit is on.

B107B 12: The system is powered on and in operation mode, and the drive circuit is off.

Conditions for Setting DTCs

B107B 11: HSD circuit short to ground is detected for 20 consecutive times.

B107B 12: HSD circuit short to battery is detected for 20 consecutive times.

B107B 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B107B 11: HSD output is closed in the current ignition cycle.

B107B 12 and B107B 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Automatic light sensor failure:
   - Repair/replace the automatic light sensor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the automatic light sensor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the automatic light sensor:

   ® For automatic light sensor damage and other abnormal conditions: Repair/replace the automatic light sensor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1081

DTC Description

DTC	FTB	Failure Description
B1081	11	Courtesy Lamps Control Circuit Short to Ground
B1081	13	Courtesy Lamps Control Circuit Open Circuit

Subsystem Principle

After receiving signals from the reading lamp switch, the door switch or the trunk lid release switch, the BCM will control the corresponding interior lamp to light up.

Conditions for Running DTCs

B1081 11: The system is powered on and in operation, and the interior lamp HSD is on, which is equal to or more than 70% PWM control.

B1081 13: The system is powered on and in operation, and the interior lamp HSD is on.

Conditions for Setting DTCs

B1081 11: HSD circuit short to ground is detected for 50 consecutive times.

B1081 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1081 13: None.

B1081 11: HSD output is closed in the current ignition cycle.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Interior lamp failure:
   - Repair/replace the interior lamp or the interior lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Interior Lighting

Diagnostic Test Steps

1. Check the interior lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the interior lamp:

   ® For interior lamp damage and other abnormal conditions: Repair/replace the interior lamp or the interior lamp assembly.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1082

DTC Description

DTC	FTB	Failure Description
B1082	11	Timed Delay / Inadvertent Power Control Circuit Short to Ground
B1082	12	Timed Delay / Inadvertent Power Control Circuit Short to Battery

Subsystem Principle

The BCM controls the opening and closing of the delay relay.

Conditions for Running DTCs

B1082 11:

- The system is powered on and in operation.
- The delay relay opens.

B1082 12:

- The system is powered on and in operation.
- The delay relay closes.

Conditions for Setting DTCs

B1082 11: HSD circuit short to ground is detected for 20 consecutive times.

B1082 12: HSD circuit short to battery is detected for 20 consecutive times.

Operations of ECU after Failure

B1082 11: Delay relay does not work in the current ignition cycle.

B1082 12: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front/rear reading lamp failure:
   - Repair/replace the front/rear reading lamp or the front/rear reading lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Interior Lighting

Diagnostic Test Steps

1. Check the front reading lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front reading lamp:

   ® For damage and other abnormal conditions: Repair/replace the front reading lamp or the front reading lamp assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1089

DTC Description

DTC	FTB	Failure Description
B1089	11	Trunk Lamp Control Circuit Short to Ground
B1089	12	Trunk Lamp Control Circuit Short to Battery
B1089	13	Trunk Lamp Control Circuit Open Circuit

Subsystem Principle

The trunk lamp is fitted on the trunk side trim panel. The outside is a plastic case, and the inside contains lens and lamp clamp. When the trunk is opened, the trunk lamp will work automatically.

Conditions for Running DTCs

B1089 11 and 13: The system is powered on and in operation mode, and HSD of the trunk lamp is on, which is more than 70% PWM control.

B1089 12: The system is powered on and in operation mode, and HSD of the trunk lamp is off.

Conditions for Setting DTCs

B1089 11: HSD circuit short to ground is detected for 20 consecutive times.

B1089 12: HSD circuit short to battery is detected for 20 consecutive times.

B1089 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1089 11: The trunk lamp does not work in the current ignition cycle.

B1089 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Trunk lamp failure:
   - Repair/replace the trunk lamp or the trunk lamp assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Interior Lighting

Diagnostic Test Steps

1. Check the trunk lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the trunk lamp:

   ® For trunk lamp damage and other abnormal conditions: Repair/replace the trunk lamp or the trunk lamp assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B108A

DTC Description

DTC	FTB	Failure Description
B108A	11	Illumination Dimming Control Circuit Short to Ground
B108A	12	Illumination Dimming Control Circuit Short to Battery
B108A	13	Illumination Dimming Control Circuit Open Circuit

Subsystem Principle

When the width lamp is turned on or the BCM determines that the signal of the light sensor is for night driving, the interior backlight illuminates.

Conditions for Running DTCs

B108A 11 and 13:

- The dimming drive circuit is on.
- The control duty ratio of PWM signal is greater than 70%.
- The Start switch is placed in ON position.

B108A 12:

- The dimming drive circuit is off.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B108A 11: HSD circuit short to ground is detected for 20 consecutive times.

B108A 12: HSD circuit short to battery is detected for 20 consecutive times.

B108A 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B108A 11: Backlight dimming control circuit does not work in the current ignition cycle.

B108A 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Backlight LED failure:
   - Repair/replace the damaged backlight LED or the corresponding assembly.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Illumination

Diagnostic Test Steps

1. Check the backlight related components - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the backlight LED:

   ® For backlight LED damage and other abnormal conditions: Repair/replace the damaged backlight LED or the corresponding assembly;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B10A3

DTC Description

DTC	FTB	Failure Description
B10A3	12	Door Superlock Relay Control Circuit Short to Battery
B10A3	14	Door Superlock Relay Control Circuit Short to Ground or Open Circuit
B10A3	71	All Door SuperLock Relay Stuck

Subsystem Principle

Failure occurs inside the BCM run program, and no external circuit is involved.

Conditions for Running DTCs

B10A3 12:

- Door super lock relay control circuit is on.
- The Power mode is placed in ACC position.

B10A3 14:

- Door super lock relay control circuit is off.
- The Power mode is placed in ACC position.

B10A3 71: The system is powered on and in operation mode.

Conditions for Setting DTCs

B10A3 12: LSD circuit short to battery is detected for 10 consecutive times.

B10A3 14: LSD circuit open or short to ground failure is detected for 10 consecutive times.

B10A3 71: LSD circuit on and output off, or LSD circuit off and output on are detected for 20 consecutive times.

Operations of ECU after Failure

B10A3 14 and B10A3 71: None.

B10A3 12: The drive output is closed in the current vehicle power-on and power-off cycles.

Conditions for Clearing DTCs

B10A3 12 and B10A3 14:

- LSD circuit normal is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B10A3 71:

- LSD circuit OFF and output OFF, or LSD circuit ON and output ON are detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Control module internal failure:

   • Flash/replace the control module.

Diagnostic Test Steps

1. Check the control module power supply and ground:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the control module software:

   ® For software mismatch: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B10A6

DTC Description

DTC	FTB	Failure Description
B10A6	11	Door Lock Status LED Circuit Short to Ground
B10A6	12	Door Lock Status LED Circuit Short to Battery
B10A6	13	Door Lock Status LED Circuit Open Circuit

Subsystem Principle

The BCM monitors the state of central control locking/unlocking switch in real time. The door locking status indicator lamp is used to indicate if the door is locked.

Conditions for Running DTCs

B10A6 11 and 12: HSD of door locking status indicator lamp is on.

B10A6 13: HSD of door locking status indicator lamp is off.

Conditions for Setting DTCs

B10A6 11: HSD circuit short to ground failure is detected for 20 consecutive times.

B10A6 12: HSD circuit short to battery failure is detected for 20 consecutive times.

B10A6 13: HSD circuit open circuit failure is detected for 20 consecutive times.

Operations of ECU after Failure

B10A6 11: HSD output is closed in the current ignition cycle.

B10A6 12 and 13: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Central control door lock switch failure:
   - Repair/replace the central control door lock switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Door Locking System

Diagnostic Test Steps

1. Check the central control door lock switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the central control door lock switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the central control door lock switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B10AC and B10AD

DTC Description

DTC	FTB	Failure Description
B10AC	71	Master Lock Switch Stuck
B10AD	71	Master Unlock Switch Stuck

Subsystem Principle

The BCM monitors the state of central control locking/unlocking switch in real time. The door locking status indicator lamp is used to indicate if the door is locked.

Conditions for Running DTCs

The system is powered on and in operation mode.

Conditions for Setting DTCs

B10AC: It is detected that the central control locking switch is in the state of being pressed for more than 20s.

B10AD: It is detected that the central control unlocking switch is in the state of being pressed for more than 20s.

Operations of ECU after Failure

B10AC: Central control locking switch signal is ignored.

B10AD: Central control unlocking switch signal is ignored.

Conditions for Clearing DTCs

- It is detected that the switch is released once.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Central control door lock switch failure:
   - Repair/replace the central control door lock switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Door Locking System

Diagnostic Test Steps

1. Check the central control door lock switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the central control door lock switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the central control door lock switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B01B1 and B10B2

DTC Description

DTC	FTB	Failure Description
B10B1	71	Trunk/Boot Release Switch Stuck
B10B2	71	Trunk/Boot Release Relay Stuck

Subsystem Principle

The BCM monitors the state of the trunk release switch in real time, and opens the trunk lock based on the switch release command. The power liftgate control module monitors the operating state of internal tailgate release relay in real time.

Conditions for Running DTCs

The system is powered on and in operation mode.

Conditions for Setting DTCs

B10B1 71: It is detected that the tailgate/trunk release switch is in the state of being pressed for more than 20s.

B10B2 71: The tailgate relay LSD circuit is off, the output is on or LSD circuit is on, and the output is off.

Operations of ECU after Failure

B10B1 71: Ignore the tailgate/trunk release switch signal.

B10B2 71: None.

Conditions for Clearing DTCs

B10B1 71:

- It is detected that the switch is released once.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B10B2 71:

- LSD circuit of the tailgate relay is off and the output is off; or the LSD circuit is on and the output is on.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Tailgate release switch failure:
   - Repair/replace the tailgate release switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Door Locking System

Diagnostic Test Steps

1. Check the tailgate release switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the tailgate release switch:

   ® For tailgate release switch stuck, damage and other abnormal conditions: Repair/replace the tailgate release switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1101

DTC Description

DTC	FTB	Failure Description
B1101	12	Front Wiper Enable Relay Driver Short to Battery
B1101	14	Front Wiper Enable Relay Driver Short to Ground or Open Circuit

Subsystem Principle

There are 2 front wiper relays in the front compartment fuse box: front wiper enable relay (relay 1) and front wiper speed relay (relay 2). After receiving the request signal from the wiper/washer stalk switch, the BCM controls the corresponding wiper relay to work.

Conditions for Running DTCs

B1101 12: The start switch is in "ACC" or "ON" position, and the front wiper enable relay closes.

B1101 14: The start switch is in "ACC" or "ON" position, and the front wiper enable relay opens.

Conditions for Setting DTCs

B1101 12: LSD circuit short to battery is detected for 10 consecutive times.

B1101 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1101 12: LSD output is closed in the current ignition cycle.

B1101 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Front Wiper System

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front wiper enable relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the relay.
3. Externally connect a 12V power supply to relay terminals 85 and 86 and test if the resistance between terminals 30 and 87 of switch is conductive.

   If not conductive, replace the relay.

B1102

DTC Description

DTC	FTB	Failure Description
B1102	12	Rear Wiper Enable Relay Driver Short to Battery
B1102	14	Rear Wiper Enable Relay Driver Short to Ground or Open Circuit

Subsystem Principle

There are 2 wiper relays in the front compartment fuse box: wiper enable relay (relay 1) and wiper speed relay (relay 2). After receiving the request signal from the wiper/washer stalk switch, the BCM controls the corresponding wiper relay to work.

Conditions for Running DTCs

B1102 12: The start switch is in "ACC" or "ON" position, and the rear wiper enable relay closes.

B1102 14: The start switch is in "ACC" or "ON" position, and the rear wiper enable relay opens.

Conditions for Setting DTCs

B1102 12: LSD circuit short to battery is detected for 10 consecutive times.

B1102 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1102 12: LSD output is closed in the current ignition cycle.

B1102 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Wiper System

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the wiper enable relay:

   ® For stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1103

DTC Description

DTC	FTB	Failure Description
B1103	12	Front Wiper Speed Relay Driver Short to Battery
B1103	14	Front Wiper Speed Relay Driver Short to Ground or Open Circuit

Subsystem Principle

There are 2 front wiper relays in the front compartment fuse box: front wiper enable relay (relay 1) and front wiper speed relay (relay 2). After receiving the request signal from the wiper/washer stalk switch, the BCM controls the corresponding wiper relay to work.

Conditions for Running DTCs

B1103 12: The start switch is placed in "ACC" or "ON" position, and the front wiper speed relay closes.

B1103 14: The start switch is placed in "ACC" or "ON" position, and the front wiper speed relay opens.

Conditions for Setting DTCs

B1103 12: LSD circuit short to battery is detected for 10 consecutive times.

B1103 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1103 12: LSD output is closed in the current ignition cycle.

B1103 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Front Wiper System

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the wiper speed relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the relay.
3. Externally connect a 12V power supply to relay terminals 85 and 86 and test if the resistance between terminals 30 and 87 of relay switch is conductive.

   If not conductive, replace the relay.

B1105

DTC Description

DTC	FTB	Failure Description
B1105	71	Front Wiper Park Switch Actuator Stuck

Subsystem Principle

When the start switch is turned off, if the wiper still operates, the wiper relay will maintain the current closing state; when the wiper operates to the reset position at a low speed, the relay disconnects automatically and the wiper stops working.

Conditions for Running DTCs

The system is powered on and in operation mode; the front wiper is not in wiping mode.

Conditions for Setting DTCs

The front wiper does not reach the reset position after working for 18s.

Operations of ECU after Failure

The wiper stops after working for 18s in the current working cycle.

Conditions for Clearing DTCs

- Switch state change is detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front wiper motor failure:
   - Repair/replace the front wiper motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Front Wiper System

Diagnostic Test Steps

1. Check the front wiper motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front wiper motor:

   ® For wiper motor stuck, damage and other abnormal conditions: Repair/replace the front wiper motor;

   ® Normal, go to 3.

3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

® Normal, go to TAC Human Assistance.

B1107

DTC Description

DTC	FTB	Failure Description
B1107	71	Rear Wiper Park Switch Actuator Stuck

Subsystem Principle

When the start switch is turned off, if the wiper still operates, the wiper relay will maintain the current closing state; when the wiper operates to the reset position at a low speed, the relay disconnects automatically and the wiper stops working.

Conditions for Running DTCs

The system is powered on and in operation mode; the rear wiper is not in wiping mode.

Conditions for Setting DTCs

The rear wiper does not reach the reset position after working for 18s.

Operations of ECU after Failure

The wiper stops after working for 18s in the current working cycle.

Conditions for Clearing DTCs

- Switch state change is detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. rear wiper motor failure:
   - Repair/replace the rear wiper motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Wiper System

Diagnostic Test Steps

1. Check the rear wiper motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear wiper motor:

   ® For stuck, damage and other abnormal conditions: Repair/replace the rear wiper motor;

   ® Normal, go to 3.

3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

® Normal, go to TAC Human Assistance.

B1109

DTC Description

DTC	FTB	Failure Description
B1109	1E	Column Switch Potentiometer for Wiper Delay Resistance out of Range

Subsystem Principle

The wiper stalk switch consists of a 5-position toggle switch and a rotary switch. The intermittent wipe (INT), low-speed wipe (LO) and high-speed wipe (HI) switch positions and the "OFF" position are locked, however the stroke wipe (MIST) and program control wipe/wash switches are unlocked. The rotary switch is used to select the intermittent delay time or to adjust the sensitivity of the rain sensor (if equipped).

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The AD converter in the BCM detects that the resistance is out of range for 2s.

Operations of ECU after Failure

Use the default value.

Conditions for Clearing DTCs

- Analog-digital converter in BCM detects that the resistance returns to the normal range.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Wiper/washer stalk switch failure:
   - Repair/replace the wiper/washer stalk switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Front Wiper System

Diagnostic Test Steps

1. Check the wiper/washer stalk switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the wiper/washer stalk switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the wiper/washer stalk switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B110B

DTC Description

DTC	FTB	Failure Description
B110B	12	Rear Washer Relay Control Circuit Short to Battery
B110B	14	Rear Washer Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request signal from the wiper/washer stalk switch, the BCM controls the corresponding washer relay to work.

Conditions for Running DTCs

B110B 12: The start switch is in "ACC" or "ON" position, and the rear washer relay closes.

B110B 14: The start switch is in "ACC" or "ON" position, and the rear washer relay opens.

Conditions for Setting DTCs

B110B 12: LSD circuit short to battery is detected for 10 consecutive times.

B110B 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B110B 12: LSD output is closed in the current ignition cycle.

B110B 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Wiper System

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear washer relay:

   ® For stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the relay.
3. Externally connect a 12V power supply to relay terminals 85 and 86 and test if the resistance between terminals 30 and 87 of relay switch is conductive.

   If not conductive, replace the relay.

B110C

DTC Description

DTC	FTB	Failure Description
B110C	12	Front Washer Relay Control Circuit Short to Battery
B110C	14	Front Washer Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request signal from the wiper/washer stalk switch, the BCM controls the corresponding washer relay to work.

Conditions for Running DTCs

B110C 12: The start switch is in "ACC" or "ON" position, and the front washer relay closes.

B110C 14: The start switch is in "ACC" or "ON" position, and the front washer relay opens.

Conditions for Setting DTCs

B110C 12: LSD circuit short to battery is detected for 10 consecutive times.

B110C 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B110C 12: LSD output is closed in the current ignition cycle.

B110C 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Front Wiper System

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front washer relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the relay.
3. Externally connect a 12V power supply to relay terminals 85 and 86 and test if the resistance between terminals 30 and 87 of relay switch is conductive.

   If not conductive, replace the relay.

B1111 and B1121

DTC Description

DTC	FTB	Failure Description
B1111	12	Drivers Window Up Relay Control Circuit Short to Battery
	14	Drivers Window Up Relay Control Circuit Short to Ground or Open Circuit
B1121	12	Drivers Window Down Relay Control Circuit Short to Battery
	14	Drivers Window Down Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request from the driver door combination switch or the driver window regulator motor, the BCM drives the corresponding window regulator motor to work by controlling the opening or closing of the driver window Up/Down relay.

Conditions for Running DTCs

B1111 12: The start switch is in "ACC" or "ON" position, and the driver window Up relay closes.

B1111 14: The start switch is in "ACC" or "ON" position, and the driver window Up relay opens.

B1121 12: The start switch is in "ACC" or "ON" position, and the driver window Down relay closes.

B1121 14: The start switch is in "ACC" or "ON" position, and the driver window Down relay opens.

Conditions for Setting DTCs

B1111 12 and B1121 12: LSD circuit short to battery failure is detected for 10 consecutive times.

B1111 14 and B1121 14: LSD circuit short to ground or open circuit failure is detected for 10 consecutive times.

Operations of ECU after Failure

B1111 12 and B1121 12: LSD output is closed in the current ignition cycle.

B1111 14 and B1121 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Driver window regulator motor failure:
   - Repair/replace the driver window regulator motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Driver Window Lift

Diagnostic Test Steps

1. Check the driver window regulator motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the driver window regulator motor:

   ® For the driver window regulator motor stuck, damage and other abnormal conditions: Repair/replace the driver window regulator motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1112 and B1122

DTC Description

DTC	FTB	Failure Description
B1112	12	Front Passenger Window Up Relay Control Circuit Short to Battery
	14	Front Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit
B1122	12	Front Passenger Window Down Relay Control Circuit Short to Battery
	14	Front Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request from the driver door combination switch or the front passenger window regulator switch, the BCM drives the corresponding window regulator motor to work by controlling the opening or closing of the front passenger window Up/Down relay.

Conditions for Running DTCs

B1112 12: The start switch is in "ACC" or "ON" position, and the front passenger window Up relay closes.

B1112 14: The start switch is in "ACC" or "ON" position, and the front passenger window Up relay opens.

B1122 12: The start switch is in "ACC" or "ON" position, and the front passenger window Down relay closes.

B1122 14: The start switch is in "ACC" or "ON" position, and the front passenger window Down relay opens.

Conditions for Setting DTCs

B1112 12 and B1122 12: LSD circuit short to battery failure is detected for 10 consecutive times.

B1112 14 and B1122 14: LSD circuit open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1112 12 and B1122 12: LSD output is closed in the current ignition cycle.

B1112 14 and B1122 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front passenger window regulator switch failure:
   - Repair/replace the front passenger window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Passenger Window lift

Diagnostic Test Steps

1. Check the front passenger window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front passenger window regulator switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the front passenger window regulator motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1113 and B1123

DTC Description

DTC	FTB	Failure Description
B1113	12	Rear Left Passenger Window Up Relay Control Circuit Short to Battery
	14	Rear Left Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit
B1123	12	Rear Left Passenger Window Down Relay Control Circuit Short to Battery
	14	Rear Left Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request from the driver door combination switch or the rear left passenger window regulator switch, the BCM drives the corresponding window regulator motor to work by controlling the opening or closing of the rear left passenger window Up/Down relay.

Conditions for Running DTCs

B1113 12: The start switch is in "ACC" or "ON" position, and the rear left passenger window Up relay closes.

B1113 14: The start switch is in "ACC" or "ON" position, and the rear left passenger window Up relay opens.

B1123 12: The start switch is in "ACC" or "ON" position, and the rear left passenger window Down relay closes.

B1123 14: The start switch is in "ACC" or "ON" position, and the rear left passenger window Down relay opens.

Conditions for Setting DTCs

B1113 12 and B1123 12: LSD circuit short to battery failure is detected for 10 consecutive times.

B1113 14 and B1123 14: LSD circuit open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1113 12 and B1123 12: LSD output is closed in the current ignition cycle.

B1113 14 and B1123 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear left window regulator switch failure:
   - Repair/replace the rear left window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Left Window Lift

Diagnostic Test Steps

1. Check the rear left window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear left window regulator switch:

   ® For stuck damage and other abnormal conditions: Repair/replace the rear left window regulator switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1114 and B1124

DTC Description

DTC	FTB	Failure Description
B1114	12	Rear Right Passenger Window Up Relay Control Circuit Short to Battery
	14	Rear Right Passenger Window Up Relay Control Circuit Short to Ground or Open Circuit
B1124	12	Rear Right Passenger Window Down Relay Control Circuit Short to Battery
	14	Rear Right Passenger Window Down Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

After receiving the request from the driver door combination switch or the rear right passenger window regulator switch, the BCM drives the corresponding window regulator motor to work by controlling the opening or closing of the rear right passenger window Up/Down relay.

Conditions for Running DTCs

B1114 12: The start switch is in "ACC" or "ON" position, and the rear right passenger window Up relay closes.

B1114 14: The start switch is in "ACC" or "ON" position, and the rear right passenger window Up relay opens.

B1124 12: The start switch is in "ACC" or "ON" position, and the rear right passenger window Down relay closes.

B1124 14: The start switch is in "ACC" or "ON" position, and the rear right passenger window Down relay opens.

Conditions for Setting DTCs

B1114 12 and B1124 12: LSD circuit short to battery failure is detected for 10 consecutive times.

B1114 14 and B1124 14: LSD circuit open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1114 12 and B1124 12: LSD output is closed in the current ignition cycle.

B1114 14 and B1124 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear right window regulator switch failure:
   - Repair/replace the rear right window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Right Window Lift

Diagnostic Test Steps

1. Check the rear right window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear right window regulator switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the rear right window regulator switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1115 and B112B

DTC Description

DTC	FTB	Failure Description
B1115	71	Local Passenger Door Window Switch Stuck
B112B	04	Passenger Window Switch Internal Fault
	71	Passenger Window Switch Stuck

Subsystem Principle

Power window switches of front passenger door and rear doors are on the door interior trim panel. Each power window switch is provided with a printed circuit board (PCB), and electronic components and connectors are fitted on the PCB. The upper surface of PCB is covered with a layer of rubber membrane with a projecting pin on each of the switches, providing each switch with the force to return to the centre position. There is a carbon contact on the lower surface of each projecting pin, which will form a complete circuit on the PCB when the corresponding switch is pressed.

Conditions for Running DTCs

B1115 71: The start switch is in "ACC" or "ON" position.

B112B 04 and 71:

- LIN communication is normal.
- The start switch is in "ACC" or "ON" position.

Conditions for Setting DTCs

B1115 71 and B112B 71: Valid switch request signal is detected for over 20s.

B112B 04: Set the valid switch signal to 1.

Operations of ECU after Failure

B1115 71: Request signal from the switch is ignored.

B112B 04 and 71: None.

Conditions for Clearing DTCs

B1115 71:

- The switch is detected released successfully once.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B112B 04 and 71:

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front passenger window regulator switch failure:
   - Repair/replace the front passenger window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Passenger Window lift

Diagnostic Test Steps

1. Check the front passenger window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front passenger window regulator switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the front passenger window regulator motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1116 and B112C

DTC Description

DTC	FTB	Failure Description
B1116	71	Local Rear LH Door Window Switch Stuck
B112C	04	Left Rear Window Switch Internal Fault
	71	Local Rear LH Door Window Switch Stuck

Subsystem Principle

Power window switches of front passenger door and rear doors are on the door interior trim panel. Each power window switch is provided with a printed circuit board (PCB), and electronic components and connectors are fitted on the PCB. The upper surface of PCB is covered with a layer of rubber membrane with a projecting pin on each of the switches, providing each switch with the force to return to the centre position. There is a carbon contact on the lower surface of each projecting pin, which will form a complete circuit on the PCB when the corresponding switch is pressed.

Conditions for Running DTCs

B1116 71: The start switch is in "ACC" or "ON" position.

B112C 04 and 71:

- LIN communication is normal.
- The start switch is in "ACC" or "ON" position.

Conditions for Setting DTCs

B1116 71 and B112C 71: Valid switch request signal is detected for over 20s.

B112C 04: Set the valid switch signal to 1.

Operations of ECU after Failure

B1116 71: Request signal from the switch is ignored.

B112C 04 and 71: None.

Conditions for Clearing DTCs

B1116 71:

- The switch is detected released successfully once.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B112C 04 and 71:

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear left window regulator switch failure:
   - Repair/replace the rear left window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Left Window Lift

Diagnostic Test Steps

1. Check the rear left window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear left window regulator switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the rear left window regulator switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1117 and B112D

DTC Description

DTC	FTB	Failure Description
B1117	71	Local Rear RH Door Window Switch Stuck
B112D	04	Right Rear Window Switch Internal Fault
	71	Local Rear RH Door Window Switch Stuck

Subsystem Principle

Power window switches of front passenger door and rear doors are on the door interior trim panel. Each power window switch is provided with a printed circuit board (PCB), and electronic components and connectors are fitted on the PCB. The upper surface of PCB is covered with a layer of rubber membrane with a projecting pin on each of the switches, providing each switch with the force to return to the centre position. There is a carbon contact on the lower surface of each projecting pin, which will form a complete circuit on the PCB when the corresponding switch is pressed.

Conditions for Running DTCs

B1117 71: The start switch is in "ACC" or "ON" position.

B112D 04 and 71:

- LIN communication is normal.
- The start switch is in "ACC" or "ON" position.

Conditions for Setting DTCs

B1117 71 and B112D 71: Valid switch request signal is detected for over 20s.

B112D 04: Set the valid switch signal to 1.

Operations of ECU after Failure

B1117 71: Request signal from the switch is ignored.

B112D 04 and 71: None.

Conditions for Clearing DTCs

B1117 71:

- The switch is detected released successfully once.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B112D 04 and 71:

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear right window regulator switch failure:
   - Repair/replace the rear right window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Rear Right Window Lift

Diagnostic Test Steps

1. Check the rear right window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear right window regulator switch:

   ® For stuck, damage and other abnormal conditions: Repair/replace the rear right window regulator switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B112A

DTC Description

DTC	FTB	Failure Description
B112A	04	Driver Window Switch Internal Fault
	71	Driver Window Switch Stuck

Subsystem Principle

After receiving the request from the driver door combination switch or the driver window combination switch, the BCM drives the corresponding window regulator motor to work by controlling the opening or closing of the driver window Up/Down relay.

Conditions for Running DTCs

- LIN communication is normal.
- The start switch is in "ACC" or "ON" position.

Conditions for Setting DTCs

B112A 71: It is detected that the valid request signal of switch lasts for more than 20s.

B112A 04: Set the valid switch signal to 1.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Driver window regulator switch failure:
   - Repair/replace the driver window regulator switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Driver Window Lift

Diagnostic Test Steps

1. Check the driver window regulator switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the driver window regulator switch failure:

   ® For the driver window regulator switch stuck, damage and other abnormal conditions: Repair/replace the driver window regulator switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1130, B1131 and B1132

DTC Description

DTC	FTB	Failure Description
B1130	01	Driver Window Motor Internal Fault
	51	Driver Window Motor has no Calibration Data
B1131	71	Driver Window Motor Relay Fault
B1132	96	Driver Window Sensing System Fault

Subsystem Principle

The motor supports the window with one-touch Up/Down function. After the activation of LIN bus, the motor operation becomes effective. This type of motor communicates with each other via LIN bus. The intelligent motor also monitors the speed, Up and Down input signal of the passenger switches to determine if the manual or auto operation request is required.

Conditions for Running DTCs

LIN1 communication is normal; the system is powered on and in operation mode.

Conditions for Setting DTCs

B1130 04: The valid signal is set to 1.

B1130 51: Data calibration of driver window motor fails.

B1131 71: Driver window motor relay fails.

B1131 96: Driver window sensing system fails.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

B1130 04 and 51:

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1131 71 and B1132 96:

- Signal is 0.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Driver window regulator motor failure:
   - Repair/replace the driver window regulator motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the driver window regulator motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the driver window regulator motor:

   ® For the driver window regulator motor stuck, damage and other abnormal conditions: Repair/replace the driver window regulator motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1134, B1135 and B1136

DTC Description

DTC	FTB	Failure Description
B1134	04	Passenger Window Motor Internal Fault
	51	Passenger Window Motor has no Calibration Data
B1135	71	Passenger Window Motor Relay Fault
B1136	96	Passenger Window Sensing System Fault

Subsystem Principle

The motor supports the window with one-touch Up/Down function. After the activation of LIN bus, the motor operation becomes effective. This type of motor communicates with each other via LIN bus. The intelligent motor also monitors the speed, Up and Down input signal of the passenger switches to determine if the manual or auto operation request is required.

Conditions for Running DTCs

- LIN1 communication is normal.
- The system is powered on and in operation mode.

Conditions for Setting DTCs

B1134 04: The valid signal is set to 1.

B1134 51: The data is not calibrated.

B1135 71: The signal state of passenger window motor relay is 1.

B1136 96: The signal state of passenger window sensing system is 1.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front passenger window motor failure:
   - Repair/replace the front passenger window motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the front passenger window motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front passenger window motor

   ® For the front passenger window motor stuck, damage and other abnormal conditions: Repair/replace the front passenger window motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1138, B1139 and B113A

DTC Description

DTC	FTB	Failure Description
B1138	04	Left Rear Window Motor Internal Fault
	51	Left Rear Window Motor has no Calibration Data
B1139	71	Left Rear Window Motor Relay Fault
B113A	96	Left Rear Window Sensing System Fault

Subsystem Principle

The motor supports the window with one-touch Up/Down function. After the activation of LIN bus, the motor operation becomes effective. This type of motor communicates with each other via LIN bus. The intelligent motor also monitors the speed, Up and Down input signal of the rear left switches to determine if the manual or auto operation request is required.

Conditions for Running DTCs

- LIN2 communication is normal.
- The system is powered on and in operation mode.

Conditions for Setting DTCs

B1138 04: The valid signal is set to 1.

B1138 51: The data is not calibrated.

B1139 71: The signal state of rear left window motor relay is 1.

B113A 96: The signal state of rear left window sensing system is 1.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear left window motor failure:
   - Repair/replace the rear left window switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the rear left window motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear left window motor:

   ® For the rear left window motor stuck, damage and other abnormal conditions: Repair/replace the rear left window motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B113C, B113D and B113E

DTC Description

DTC	FTB	Failure Description
B113C	04	Rear Right Window Motor Internal Fault
	51	Right Rear Window Motor has no Calibration Data
B113D	71	Right Rear Window Motor Relay Fault
B113E	96	Right Rear Window Sensing System Fault

Subsystem Principle

The motor supports the window with one-touch Up/Down function. After the activation of LIN bus, the motor operation becomes effective. This type of motor communicates with each other via LIN bus. The intelligent motor also monitors the speed, Up and Down input signal of the rear right switches to determine if the manual or auto operation request is required.

Conditions for Running DTCs

- LIN2 communication is normal.
- The system is powered on and in operation mode.

Conditions for Setting DTCs

B113C 04: The valid signal is set to 1.

B113C 51: The data is not calibrated.

B113D 71: The signal state of rear right window regulator motor relay is 1.

B113E 96: The signal state of rear right window sensing system is 1.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Signal is reset.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear right window regulator motor failure:
   - Repair/replace the rear right window regulator motor.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the rear right window motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear right window regulator motor:

   ® For the rear right window regulator motor stuck, damage and other abnormal conditions: Repair/replace the rear right window regulator motor;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1155

DTC Description

DTC	FTB	Failure Description
B1155	12	Horn Relay Driver Short to Battery
B1155	14	Horn Relay Drive Circuit Short to Ground or Open Circuit

Subsystem Principle

The BCM drives the horns to work by controlling the relay.

Conditions for Running DTCs

B1155 12: The system is powered on and in operation mode, and the horn relay closes.

B1155 14: The system is powered on and in operation mode, and the horn relay opens.

Conditions for Setting DTCs

B1155 12: LSD circuit short to battery is detected for 10 consecutive times.

B1155 14: LSD circuit short to ground or open circuit is detected for 10 consecutive times.

Operations of ECU after Failure

B1155 12: LSD output is closed in the current ignition cycle.

B1155 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 20 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. Horn switch failure:
   - Repair/replace the horn switch or the steering wheel harness.
4. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Horn

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the horn relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the relay.
3. Externally connect a 12V power supply to horn relay terminals 85 and 86. Test if the resistance between terminals 30 and 87 is less than 5Ω.

   If it is not within the specified range, replace the horn relay.

B1156

DTC Description

DTC	FTB	Failure Description
B1156	12	HRW Relay Control Circuit Short to Battery
B1156	14	HRW Relay Control Circuit Short to Ground or Open Circuit

Subsystem Principle

Rear window heating control switch is integrated on the infotainment faceplate (IFP), which directly controls the rear window heating to turn on or off.

Conditions for Running DTCs

B1156 12:

- The rear window heater relay is on.
- The Start switch is placed in ON position.

B1156 14:

- The rear window heater relay is off.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1156 12: LSD circuit short to battery is detected for 20 consecutive times.

B1156 14: LSD circuit open or short to ground failure is detected for 20 consecutive times.

Operations of ECU after Failure

B1156 12: LSD output is off in the current ignition cycle.

B1156 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear window heater relay failure:
   - Repair/replace the rear window heater relay.
3. Infotainment faceplate failure:
   - Repair/replace the infotainment faceplate.

Reference Circuit Diagram

Exterior Mirror Heating & Rear Windscreen Heating

Diagnostic Test Steps

1. Check the front compartment fuse box - IFP harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear window heater relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the rear window heater relay;

   ® Normal, go to 3.

3. Check the infotainment faceplate:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the infotainment faceplate;

   ® Normal, go to TAC Human Assistance.

B1157

DTC Description

DTC	FTB	Failure Description
B1157	12	HRW Telltale Circuit Short to Battery
B1157	14	HRW Telltale Circuit Short to Ground or Open Circuit

Subsystem Principle

Press the Heated Rear Window button to enable the rear window heating function, and the indicator on the button will be on. The heated rear window function will automatically turn off after operating for 15 minutes. It will operate for a second time within 5 minutes, and then automatically turn off after heating for 8 minutes. When the heated rear window works, press the button again to turn off the heating function, then the indicator on the button goes out.

Conditions for Running DTCs

B1157 12:

- The heated rear window indicator is on.
- The Start switch is placed in ON position.

B1157 14:

- The rear window heater relay is off.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1157 12: LSD circuit short to battery is detected for 20 consecutive times.

B1157 14: LSD circuit open circuit or short to ground is detected for 20 consecutive times.

Operations of ECU after Failure

B1157 12: LSD output is closed in the current ignition cycle.

B1157 14: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear window heater relay failure:
   - Repair/replace the rear window heater relay.
3. Infotainment faceplate failure:
   - Repair/replace the infotainment faceplate.

Reference Circuit Diagram

Exterior Mirror Heating & Rear Windscreen Heating

Diagnostic Test Steps

1. Check the front compartment fuse box - IFP harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear window heater relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the rear window heater relay;

   ® Normal, go to 3.

3. Check the infotainment faceplate:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the infotainment faceplate;

   ® Normal, go to TAC Human Assistance.

B1165 and B1166

DTC Description

DTC	FTB	Failure Description
B1165	13	RUN Power Relay Control Circuit Open Circuit
B1165	11	RUN Power Relay Control Circuit Short to Ground
B1166	00	Run Crank Control Circuit Error (IGN1)
B1166	11	Run Crank Power Relay Control Circuit Short to Ground (IGN1)
B1166	13	Run Crank Power Relay Control Circuit Open Circuit (IGN1)

Subsystem Principle

Wakeup enabling_high-side drive, ON starting power relay, ACC power relay and ACC/wakeup_high-side drive are the high-side drive outputs controlled by the body control module (BCM), which are used for waking up the network. When the output end is open circuit, the relevant control unit cannot be wakened up by the BCM signal. During the normal working process, the gateway needs to detect the output end for open circuit.

Conditions for Running DTCs

B1165 11, B1166 11 and B1166 00:

- The system is powered on and in operation mode.
- Drive circuit of Run power relay opens.

B1165 13 and B1166 13:

- The system is powered on and in operation mode.
- Drive circuit of Run power relay closes.

Conditions for Setting DTCs

B1165 13 and B1166 13: HSD circuit open circuit is detected for 20 consecutive times.

B1165 11 and B1166 11: HSD circuit short to ground is detected for 20 consecutive times.

B1166 00: HSD ON is detected for 50 consecutive times, and the feedback indication is not ON.

Operations of ECU after Failure

B1165 13, B1166 13 and B1166 00: None.

B1165 11 and B1166 11: Drive output is closed in the current ignition cycle.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Body Control Module

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the KL15 relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the KL15 relay.
3. Externally connect a 12V power supply to KL15 relay terminals 85 and 86. Test if the resistance between terminals 30 and 87 is less than 5Ω.

   If it is not within the specified range, replace the KL15 relay.

B1167 and B1168

DTC Description

DTC	FTB	Failure Description
B1167	11	Accessory Power Relay Control Circuit Short to Ground
B1167	12	Accessory Power Relay Control Circuit Short to Battery
B1167	13	Accessory Power Relay Control Circuit Open Circuit
B1168	11	RAP (Retained Accessary Power) Relay Control Circuit Short to Ground
B1168	12	RAP (Retained Accessary Power) Relay Control Circuit Short to Battery
B1168	13	RAP (Retained Accessary Power) Relay Control Circuit Open Circuit

Subsystem Principle

Wakeup enabling_high-side drive, ON starting power relay, ACC power relay and ACC/wakeup_high-side drive are the high-side drive outputs controlled by the body control module (BCM), which are used for waking up the network. When the output end is open circuit, the relevant control unit cannot be wakened up by the BCM signal. During the normal working process, the BCM needs to detect the output end for open circuit.

Conditions for Running DTCs

- The system is powered on and in operation mode.
- Drive circuit of ACC power relay is kept opened.

Conditions for Setting DTCs

B1167 11 and B1168 11: HSD circuit short to ground is detected for 20 consecutive times.

B1167 12 and B1168 12: HSD circuit short to battery is detected for 20 consecutive times.

B1167 13 and B1168 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1167 11 and B1168 13: Drive output is closed in the current ignition cycle.

B1167 12, B1167 13, B1168 11 and B1168 12: None.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Body Control Module

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the KL.R relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the KL.R relay.
3. Externally connect a 12V power supply to KL.R relay terminals 85 and 86. Test if the resistance between terminals 30 and 87 is less than 5Ω.

   If it is not within the specified range, replace the KL.R relay.

B1169

DTC Description

DTC	FTB	Failure Description
B1169	00	ACC Wakeup HSD Control Circuit Error
B1169	11	Accessary High Side Drive Output Circuit Short to Ground
B1169	13	ACC HSD Output Circuit Open Circuit

Subsystem Principle

Wakeup enabling_high-side drive, ON starting power relay, ACC power relay and ACC/wakeup_high-side drive are the high-side drive outputs controlled by the BCM, which are used for waking up the network. When the output end is open circuit, the relevant control unit cannot be wakened up by the BCM hardwire. During the normal working process, the BCM needs to detect the output end for open circuit.

Conditions for Running DTCs

B1169 11 and B1169 00: The power mode is not in CRANK position, and the HSD is on.

B1169 13: The power mode is not in CRANK position, and the HSD is off.

Conditions for Setting DTCs

B1169 13: HSD circuit open circuit is detected for 20 consecutive times.

B1169 11: HSD circuit short to ground is detected for 20 consecutive times.

B1169 00: HSD ON is detected for 50 consecutive times, and the feedback indication is not ON.

Operations of ECU after Failure

B1169 13: None.

B1169 11 and B1169 00: HSD output is closed in the current ignition cycle.

Conditions for Clearing DTCs

- HSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Relay failure:
   - Repair/replace the relay;
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Body Control Module

Diagnostic Test Steps

1. Check the front compartment fuse box - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the relay:

   ® For relay stuck, damage and other abnormal conditions: Repair/replace the relay;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

Test the KL.R relay:

1. Place the start switch in "OFF" position, and disconnect the negative battery cable.
2. Remove the KL.R relay.
3. Externally connect a 12V power supply to KL.R relay terminals 85 and 86. Test if the resistance between terminals 30 and 87 is less than 5Ω.

   If it is not within the specified range, replace the KL.R relay.

B116B

DTC Description

DTC	FTB	Failure Description
B116B	00	BCM Internal Power Mode State Mismatch with GW

Subsystem Principle

The control module connected to CAN serial data link monitors the serial data communication condition on CAN line in real time during network communication period. If the control unit does not receive any message from a controller on the CAN bus within a certain period of time, it needs to detect the failure and record the DTC that communication with the sending node of the message is lost.

Conditions for Running DTCs

The system is powered on and in operation mode.

Conditions for Setting DTCs

The BCM internal start switch state is different from the system start switch state (The failure is detected for 50 times and then is confirmed).

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The state of BCM internal start switch and system start switch is the same (normal is detected for 36 times).
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. BCM internal failure:
   - Flash/replace the BCM.
3. GW module internal failure:
   - Flash/replace the GW module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For GW hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B11A0

DTC Description

DTC	FTB	Failure Description
B11A0	11	Hood Ajar (Bonnet Open Switch) Circuit Short to Ground
B11A0	13	Hood Ajar (Bonnet Open Switch) Circuit Open Circuit

Subsystem Principle

The BCM monitors the Open/Closed state of the bonnet through the bonnet touch switch.

Conditions for Running DTCs

The bonnet switch state signal is 0.

Conditions for Setting DTCs

- B11A0 11: Circuit short to ground is detected for 2s.
- B11A0 13: Circuit open circuit is detected for 2s.

Operations of ECU after Failure

Turn on the fail-safe function.

Conditions for Clearing DTCs

It is detected that the circuit is normal.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Bonnet switch failure:
   - Repair/replace the bonnet switch.
3. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Door Locking System

Diagnostic Test Steps

1. Check the bonnet switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the bonnet switch:

   ® For bonnet switch stuck, damage and other abnormal conditions: Repair/replace the bonnet switch;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1307 and B1308

DTC Description

DTC	FTB	Failure Description
B1307	11	Main Beam LH Circuit Short to Ground
B1307	12	Main Beam LH Short to Battery
B1307	13	Main Beam LH Open Circuit
B1308	11	Main Beam RH Circuit Short to Ground
B1308	12	Main Beam RH Short to Battery
B1308	13	Main Beam RH Open Circuit

Subsystem Principle

The master light switch sends a "Left & Right High Beams On/Off" request to the BCM via a hard wire, and then the BCM controls the operation of the left and right high beams via the hard wire.

Conditions for Running DTCs

B1307 11: Left high beam drive circuit is on for more than 30s, which is more than 70% PWM control.

B1307 12: Left high beam drive circuit is off.

B1307 13: Left high beam drive circuit is on for more than 30s.

B1308 11: Right high beam drive circuit is on for more than 30s, which is more than 70% PWM control.

B1308 12: Right high beam drive circuit is off.

B1308 13: Right high beam drive circuit is on for more than 30s.

Conditions for Setting DTCs

B1307 11 and B1308 11: HSD circuit short to ground is detected for 20 consecutive times.

B1307 12 and B1308 12: HSD circuit short to battery is detected for 20 consecutive times.

B1307 13 and B1308 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1307 11 and B1308 11: HSD output is closed in the current vehicle power-on and power-off cycles.

B1307 12, 13, B1308 12 and 13: None.

Conditions for Clearing DTCs

- LSD circuit working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Left/right headlamp assembly failure:
   - Repair/replace the left/right headlamp assembly failure.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the left/right headlamp assembly - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the left/right headlamp:

   ® For left/right headlamp damage and other abnormal conditions: Repair/replace the left/right headlamp;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1310 and B1311

DTC Description

DTC	FTB	Failure Description
B1310	87	Lost Communication With RHA
B1311	87	Lost Communication With LHA

Subsystem Principle

The headlamp is hardwired to communicate with the BCM, and the headlamp switch gives a control signal to the BCM, which performs the headlamp off or on.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN communication is normal.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the headlamp cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Left/right headlamp failure:
   - Repair/replace the left/right headlamp.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the left/right headlamp assembly - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the left/right headlamp:

   ® For left/right headlamp damage and other abnormal conditions: Repair/replace the left/right headlamp assembly;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1312, B1313, B1314, B1316 and B1414

DTC Description

DTC	FTB	Failure Description
B1312	87	Lost Communication With TailLampAsmblA_LH
B1313	87	Lost Communication With TailLampAsmblA_RH
B1314	87	Lost Communication With TailLampAsmblB_LH
B1316	87	Lost Communication With CrsPosLamp_R
B1414	87	Lost Communication With TailLampAsmblB_RH

Subsystem Principle

The body tail lamps contain rear position lamps, rear direction indicator lamps, brake lamp rear fog lamps, and reverse lamps, which are controlled and communicated separately by the BCM via a hard wire.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN communication is normal.

Conditions for Setting DTCs

B1312 87 and B1313 87: The DTC will be set if the specified data frame sent from the body tail lamp assembly cannot be received within 2s.

B1314 87: The DTC will be set if the specified data frame sent from the left trunk lid rear combination switch cannot be received within 2s.

B1414 87: The DTC will be set if the specified data frame sent from the right trunk lid rear combination switch cannot be received within 2s.

B1316 87: The DTC will be set if the specified data frame sent from the through-type rear position lamp cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body tail lamp failure:
   - Flash/replace the corresponding body tail lamp.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Brake Lamp & Reverse Lamp & Number Plate Lamp, Side Lamp & Daytime Running Lamp, Direction Indicator Lamp

Diagnostic Test Steps

1. Check the body tail lamp - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the corresponding body tail lamp:

   ® For corresponding body tail lamp damage and other abnormal conditions: Repair/replace the corresponding body tail lamp assembly;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1321, B1322, B1323 and B1324

DTC Description

DTC	FTB	Failure Description
B1321	11	Blind Spot Warning Telltale LH Circuit Short to Ground
B1321	12	Blind Spot Warning Telltale LH Circuit Short to Battery
B1321	13	Blind Spot Warning Telltale LH Open Circuit
B1322	11	Blind Spot Warning Telltale RH Circuit Short to Ground
B1322	12	Blind Spot Warning Telltale RH Circuit Short to Battery
B1322	13	Blind Spot Warning Telltale RH Open Circuit
B1323	11	Door Open Warning Telltale RH Circuit Short to Ground
B1323	12	Door Open Warning Telltale RH Circuit Short to Battery
B1323	13	Door Open Warning Telltale RH Open Circuit
B1324	11	Door Open Warning Telltale LH Circuit Short to Ground
B1324	12	Door Open Warning Telltale LH Circuit Short to Battery
B1324	13	Door Open Warning Telltale LH Open Circuit

Subsystem Principle

When the passengers in the vehicle are about to open the door or intend to change lanes while driving, the vehicle's radar sensor detects an approaching vehicle or a vehicle in the blind spot, and the monitoring system reports to the body control module (BCM), which turns on the rearview mirror indicator to warn the passengers in the vehicle through the body control module (BCM).

Conditions for Running DTCs

B1321 11, B1321 13, B1322 11, B1322 13, B132311, B1323 13, B1324 11 and B1324 13:

- The Start switch is placed in ON position.
- Switch backlight is on.

B1321 12, B1322 12, B1323 12 and B1324 12:

- The Start switch is placed in ON position.
- Switch backlight is off.

Conditions for Setting DTCs

B1321 11, B1322 11, B1323 11 and B1324 11: HSD circuit short to ground is detected for 20 consecutive times.

B1321 12, B1322 12, B1323 12 and B1324 12: HSD circuit short to battery is detected for 20 consecutive times.

B1321 13, B1322 13, B1323 13 and B1324 13: HSD circuit open circuit is detected for 20 consecutive times.

Operations of ECU after Failure

B1321 11, B1322 11, B1323 11 and B1324 11: Close the current output immediately until the next vehicle power-on and power-off cycle.

B1321 12, B1321 13, B1322 12, B1322 13, B1323 12, B1323 13, B1324 12 and B1324 13: None.

Conditions for Clearing DTCs

- HSD working normally is detected for 36 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the BCM.
3. Left/right rearview mirror failure:
   - Flash/replace the left/right rearview mirror.

Reference Circuit Diagram

Rearward Driver Assistance System

Diagnostic Test Steps

1. Check the left/right rearview mirror - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the left/right rearview mirror:

   ® For left/right rearview mirror damage and other abnormal conditions: Repair/replace the left/right rearview mirror;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1701, B1702, B1703 and B1705

DTC Description

DTC	FTB	Failure Description
B1701	95	Transponder Antenna Fault
B1702	96	Invalid Key Present
B1703	96	Additional Nodes Authentication Failure
B1705	96	Loss Communication with Base Station

Subsystem Principle

When starting the vehicle, the radio frequency transceiver in the key will send a signal containing characteristic value, the base station inside the spare coil transmits the signal to the BCM, and the BCM will compare the characteristic value signal.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1701 95: Immobiliser module detects immobiliser transmitter antenna failure.

B1702 96: Immobiliser module detects invalid key signal or absence of the key.

B1703 96: Additional node authentication fails.

B1705 96: Communication between immobiliser module and base station is lost.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

B1701:

- The immobiliser module detects that the immobiliser transmitter antenna is normal.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1702:

- The immobiliser module detects a valid key signal.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1703:

- Additional node authentication passed.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1705:

- The communication between immobiliser module and base station is normal.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Remote key failure:
   - Repair/replace the remote key.
3. Spare coil failure:
   - Repair/replace the spare coil.
4. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Electrical inspection

Diagnostic Test Steps

1. Check the spare coil - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the remote key:

   ® For remote key damage and other abnormal conditions: Repair/replace the remote key;

   ® Normal, go to 3.

3. Check the spare coil:

   ® For spare coil damage and other abnormal conditions: Repair/replace the spare coil;

   ® Normal, go to 4.

4. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1708

DTC Description

DTC	FTB	Failure Description
B1708	87	CAN Communication Failure During Anti-theft Authentication

Subsystem Principle

The BCM sends a pre-cancellation password to the ECM via the serial data circuit, and the ECM sends a check password to the BCM; the ECM and the BCM calculate the check password, and the ECM allows the engine to run when the calculation result of the ECM matches that of the BCM.

Conditions for Running DTCs

The system is in operation mode.

Conditions for Setting DTCs

- The Power gear is in the ON position.
- CAN communication initialisation error occurs within 2s.
- The EMS is not in the safety mobilisation state.

Operations of ECU after Failure

Use the system default signal value.

Conditions for Clearing DTCs

- CAN communication is normal.
- Initialisation is normal.
- The EMS is in the safety mobilisation state.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Gateway module failure:
   - Flash/replace the GW module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1709, B1710 and B1719

DTC Description

DTC	FTB	Failure Description
B1709	95	Loss Communication with Base Station
B1710	95	Attack State is Triggered During PEB (TC) Authentication
B1719	95	No PEB (ISC) Challenge Received

Subsystem Principle

The BCM communicates with the power electronic box (PEB) via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1709: PEB reply cannot be received within 2s.

B1710: The immobiliser system state is triggered during PEB authentication, and the message received by the BCM is invalid.

B1719: Within 2s of PEB security verification, if CAN communication or initialisation fails, the BCM will record a DTC.

Operations of ECU after Failure

The vehicle cannot start.

Conditions for Clearing DTCs

B1709:

- PEB reply can be received within 2s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

B1710:

- The ECU determines that the PEB authentication is valid.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

B1719:

- CAN communication and initialisation are normal during PEB immobiliser authentication.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Gateway Module Failure
   - Flash/replace the corresponding GW module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For GW hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1713 and U0151

DTC Description

DTC	FTB	Failure Description
B1713	96	BCM not receiving SDM's response
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)

Subsystem Principle

The BCM communicates with the SDM via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1713: SDM reply is not received in 250ms.

U0151: The DTC will be set if the specified data frame sent from the SDM cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

B1713:

- SDM reply is received in 250ms.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0151:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. Body control module failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For GW hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1715 and U010F

DTC Description

DTC	FTB	Failure Description
B1715	96	BCM not receiving ATC's response
U010F	87	Lost Communication with Air Conditioning Control Module (AC)

Subsystem Principle

The body control module (BCM) communicates with the air conditioning control module (AC) via the CAN bus.

Conditions for Running DTCs

B1715: The Start switch is placed in ON position.

U010F:

- CAN3 communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1715: The automatic AC control module reply is not received in 250ms.

U010F: The DTC will be set if the specified data frame sent from the AC control module cannot be received within 2s.

Operations of ECU after Failure

B1715: None.

U010F: Use the system default value signal.

Conditions for Clearing DTCs

B1715:

- Automatic AC control module reply is received in 250ms.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U010F:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Automatic A/C control module failure.
   - Flash/replace the automatic A/C control module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the automatic A/C control module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the automatic A/C control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the automatic A/C control module;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1716 and U0155

DTC Description

DTC	FTB	Failure Description
B1716	96	BCM not receiving IPK's response
U0155	87	Lost Communication with Instrument Pack (IPK)

Subsystem Principle

The body control module (BCM) communicates with the instrument pack (IPK) via the CAN bus.

Conditions for Running DTCs

B1716: The Start switch is placed in ON position.

U0155:

- CAN3 communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1716: IPK reply is not received in 250ms.

U0155: The DTC will be set if the specified data frame sent from the IPK cannot be received within 2s.

Operations of ECU after Failure

B1716: None.

U0155: Use the system default value signal.

Conditions for Clearing DTCs

B1716:

- IPK reply is received in 250ms.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0155:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Instrument pack failure.
   - Flash/replace IPK.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the IPK - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IPK;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1754

DTC Description

DTC	FTB	Failure Description
B1754	01	Driver Door HSU Antenna Inter/Intra Short
B1754	11	Driver Door HSU Antenna Short to Ground
B1754	12	Driver Door HSU Antenna Short to Battery
B1754	13	Driver Door HSU Antenna Open Circuit
B1754	19	Driver Door HSU Antenna Over Current

Subsystem Principle

The low-frequency antenna is used to generate a low-frequency electromagnetic induction area near the door, so as to induce the key and authenticate the validity of the key.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1754 01: Door handle antenna internal short circuit failure is detected.

B1754 11: Door handle antenna internal short to ground failure is detected.

B1754 12: Door handle antenna internal short to battery failure is detected.

B1754 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1754 19: The load current of the antenna is greater than 700mA when the antenna is sending information.

Operations of ECU after Failure

- Set the DTC.
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1754 01:

- Door handle antenna internal short circuit failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1754 11:

- Door handle antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1754 12:

- Door handle antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1754 13 and B1754 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Driver Door Handle Assembly Failure
   - Flash/replace the driver door handle assembly.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the driver door handle assembly - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the driver door handle assembly:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the driver door handle assembly;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1755

DTC Description

DTC	FTB	Failure Description
B1755	01	Passenger Door HSU Antenna Inter/Intra Short
B1755	11	Passenger Door HSU Antenna Short to Ground
B1755	12	Passenger Door HSU Antenna Short to Battery
B1755	13	Passenger Door Handle Switch Unit Antenna Open Circuit
B1755	19	Passenger Door Handle Switch Unit Antenna Over Current

Subsystem Principle

The low-frequency antenna is used to generate a low-frequency electromagnetic induction area near the door, so as to induce the key and authenticate the validity of the key.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1755 01: Door handle antenna internal short circuit failure is detected.

B1755 11: Door handle antenna internal short to ground failure is detected.

B1755 12: Door handle antenna internal short to battery failure is detected.

B1755 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1755 19: The load current of the antenna is greater than 700mA when the antenna is sending information.

Operations of ECU after Failure

- Set the DTC.
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1755 01:

- Door handle antenna internal short circuit failure is not detected.

  History DTCs will be cleared after 40 failure-free ignition cycles.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1755 11:

- Door handle antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1755 12:

- Door handle antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1755 13 and B1755 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Front Passenger Door Handle Assembly Failure
   - Flash/replace the front passenger door handle assembly.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the front passenger door handle assembly - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.
2. Check the front passenger door handle assembly:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the front passenger door handle assembly;

   ® Normal, go to 3.
3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1756

DTC Description

DTC	FTB	Failure Description
B1756	01	Bumper Antenna Inter/Intra Short
B1756	11	Bumper Antenna Short to Ground
B1756	12	Bumper Antenna Short to Battery
B1756	13	Bumper Antenna Open Circuit
B1756	19	Bumper Antenna Over Current

Subsystem Principle

In the passive keyless entry and anti-theft system, the rear bumper fascia antenna is used to sense the key beside the trunk lid so as to unlock the trunk lid after the legality of the key is verified.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1756 01: Bumper antenna internal short circuit failure is detected.

B1756 11: Bumper antenna internal short to ground failure is detected.

B1756 12: Bumper antenna internal short to battery failure is detected.

B1756 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1756 19: The load current of the antenna is greater than 700mA when the antenna is sending information.

Operations of ECU after Failure

- Set the DTC.
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1756 01:

- Bumper antenna internal short circuit failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1756 11:

- Bumper antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1756 12:

- Bumper antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1756 13 and B1756 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Flash/replace the BCM.
3. Rear Bumper Antenna Failure
   - Flash/replace the rear bumper antenna.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the rear bumper antenna - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear bumper antenna:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the rear bumper antenna;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1757

DTC Description

DTC	FTB	Failure Description
B1757	01	Front Interior Antenna Inter/Intra short
B1757	11	Front Interior Antenna Short to Ground
B1757	12	Front Interior Antenna Short to Battery
B1757	13	Front Interior Antenna Open Circuit
B1757	19	Front Interior Antenna Over Current

Subsystem Principle

The interior low-frequency antenna, which is necessary for the PEPS system, sends low-frequency signal to the smart key which sends authentication information to the BCM via RF signal. After the legal authentication is passed, the engine will be allowed to start.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1757 01: Front interior antenna internal short circuit failure is detected.

B1757 11: Front interior antenna internal short to ground failure is detected.

B1757 12: Front interior antenna internal short to battery failure is detected.

B1757 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1757 19: The load current of the antenna is greater than 700mA when the antenna is sending information.

Operations of ECU after Failure

- The instrument displays "Passive entry function failure, please repair it".
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1757 01:

- Front interior antenna internal short circuit failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1757 11:

- Front interior antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1757 12:

- Front interior antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1757 13 and B1757 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the corresponding BCM.
3. Front interior antenna failure:
   - Repair/replace the front interior antenna.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the front interior antenna - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the front interior antenna:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the front interior antenna;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1758

DTC Description

DTC	FTB	Failure Description
B1758	01	Middle Interior Antenna Inter/Intra short
B1758	11	Middle Interior Antenna Short to Ground
B1758	12	Middle Interior Antenna Short to Battery
B1758	13	Middle Interior Antenna Open Circuit
B1758	19	Middle Interior Antenna Over Current

Subsystem Principle

The interior low-frequency antenna, which is necessary for the PEPS system, sends low-frequency signal to the smart key which sends authentication information to the BCM via RF signal. After the legal authentication is passed, the engine will be allowed to start.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1758 01: Middle interior antenna internal short circuit failure is detected.

B1758 11: Middle interior antenna internal short to ground failure is detected.

B1758 12: Middle interior antenna internal short to battery failure is detected.

B1758 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1758 19: The load current of the antenna is greater than 700mA when the antenna is sending information.

Operations of ECU after Failure

- The instrument displays "Passive entry function failure, please repair it".
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1758 01:

- Middle interior antenna internal short circuit failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1758 11:

- Middle interior antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1758 12:

- Middle interior antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1758 13 and B1758 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Middle interior antenna failure:
   - Repair/replace the middle interior antenna.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the middle interior antenna - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the middle interior antenna:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the middle interior antenna;

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B1759

DTC Description

DTC	FTB	Failure Description
B1759	01	Rear Interior Antenna Inter/Intra short
B1759	11	Rear Interior Antenna Short to Ground
B1759	12	Rear Interior Antenna Short to Battery
B1759	13	Rear Interior Antenna Open Circuit
B1759	19	Rear Interior Antenna Over Current

Subsystem Principle

The interior low-frequency antenna, which is necessary for the PEPS system, sends low-frequency signal to the smart key which sends authentication information to the BCM via RF signal. After the legal authentication is passed, the engine will be allowed to start.

Conditions for Running DTCs

- The controller is in working mode.
- The battery voltage is between 9-16V.
- The antenna is sending data.
- DTCs U1562 and U1563 are not set.

Conditions for Setting DTCs

B1759 01: Rear interior antenna internal short circuit failure is detected.

B1759 11: Rear interior antenna internal short to ground failure is detected.

B1759 12: Rear interior antenna internal short to battery failure is detected.

B1759 13: The load current of the antenna is less than 30mA when the antenna is sending information.

B1759 19: The load current of the antenna is greater than 400mA when the antenna is sending information.

Operations of ECU after Failure

- The instrument displays "Passive entry function failure, please repair it".
- Abandon current transmission; a new transmission may begin.

Conditions for Clearing DTCs

B1759 01:

- Rear interior antenna internal short circuit failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1759 11:

- Rear interior antenna internal short to ground failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1759 12:

- Rear interior antenna internal short to battery failure is not detected.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B1759 13 and B1759 19:

- The load current of the antenna returns to normal when the antenna is sending information.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rear interior antenna failure:
   - Repair/replace the rear interior antenna.
3. Body control module failure:
   - Repair/replace the BCM.

Reference Circuit Diagram

Passive Entry and Passive Start

Diagnostic Test Steps

1. Check the rear interior antenna - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rear interior antenna:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the rear interior antenna;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B170A, B170B and U0198

DTC Description

DTC	FTB	Failure Description
B170A	96	BCM not receiving TBOX's response
B170B	96	Telematic Box Authentication Failure
U0198	87	Lost Communication with Telematic Control Module (TBOX)

Subsystem Principle

The BCM communicates with the TBOX via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B170A 96: TBOX reply cannot be received within 2s.

B170B 96: Verification fails.

U0198: The DTC will be set if the specified data frame sent from the BCM cannot be received within 2s.

Operations of ECU after Failure

B170A and B170B: None.

U0198: Use the system default value signal.

Conditions for Clearing DTCs

B170A 96:

- The TBOX reply can be received within 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

B170B 96:

- Authentication passed.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0198 87:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. BCM internal failure:
   - Flash/replace the BCM.
3. GW internal failure:
   - Flash/replace the GW module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Comfort HS CAN Network.
2. Communication Test - CAN Communication Harness Test:

   ® Abnormal: Repair/replace the harness or replace the controller;

   ® Normal, go to 3.

3. Communication Test - Controller CAN Communication Terminal Resistance Test;

   ® Abnormal: replace the controller or repair the connector Pin;

   ® Normal, go to 4.

4. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

B170D and U0236

DTC Description

DTC	FTB	Failure Description
B170D	96	Body Control Module does not Receive Electrical Steering Column Lock's Challenge
U0236	87	Lost Communication with Column Lock Module (ESCL)

Subsystem Principle

BCM communicates with the electronic steering column lock control module (ESCL) via CAN bus.

Conditions for Running DTCs

B170D: The Start switch is placed in ON position.

U0236:

- CAN or LIN communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B170D: Electronic steering column lock (ESCL) reply cannot be received within 2s.

U0236: The DTC will be set if the specified data frame sent from the BCM cannot be received within 2s.

Operations of ECU after Failure

B170D: None.

U0236: Use the system default value signal.

Conditions for Clearing DTCs

B170D:

- Electronic steering column lock (ESCL) reply can be received within 2s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U0236:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Electronic steering column lock failure:
   - Repair/replace the ESCL.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Body HS CAN Network.
2. Check the ESCL - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the ESCL:

   ® For ESCL stuck, damage and other abnormal conditions: Repair/replace the ESCL;

   ® Normal, go to 4.
4. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

B1957, B1958, B1959, B195A, B195B, B195C, B195D and B195E

DTC Description

DTC	FTB	Failure Description
B1957	31	Park Distance Control Rear Left Sensor Fault
B1958	31	Park Distance Control Rear Middle Left Sensor Fault
B1959	31	Park Distance Control Rear Middle Right Sensor Fault
B195A	31	Park Distance Control Rear Right Sensor Fault
B195B	31	Park Distance Control Front Left Sensor Fault
B195C	31	Park Distance Control Front Middle Left Sensor Fault
B195D	31	Park Distance Control Front Middle Right Sensor Fault
B195E	31	Park Distance Control Front Right Sensor Fault

Subsystem Principle

The PDC sensor judges the distance between obstacles and the vehicle by monitoring obstacles and transferring the signal to the BCM.

Conditions for Running DTCs

Parking distance control system is activated.

Conditions for Setting DTCs

B1957 31: Left rear PDC sensor signal failure = 1.

B1958 31: Left rear middle PDC sensor signal failure = 1.

B1959 31: Right rear middle PDC sensor signal failure = 1.

B195A 31: Right rear PDC sensor signal failure = 1.

B195B 31: Left front PDC sensor signal failure = 1.

B195C 31: Left front middle PDC sensor signal failure = 1.

B195D 31: Right front middle PDC sensor signal failure = 1.

B195E 31: Right front PDC sensor signal failure = 1.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

B1957 31: Left rear PDC sensor signal = 0.

B1958 31: Left rear middle PDC sensor signal = 0.

B1959 31: Right rear middle PDC sensor signal = 0.

B195A 31: Right rear PDC sensor signal = 0.

B195B 31: Left front PDC sensor signal = 0.

B195C 31: Left front middle PDC sensor signal = 0.

B195D 31: Right front middle PDC sensor signal = 0.

B195E 31: Right front PDC sensor signal = 0.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the BCM.
3. Corresponding PDC sensor failure:
   - Flash/replace the corresponding PDC sensor.

Reference Circuit Diagram

PDC Module

Diagnostic Test Steps

1. Check the PDC sensor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the corresponding PDC sensor:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the corresponding PDC sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the BCM;

   ® Normal, go to TAC Human Assistance.

P15AB

DTC Description

DTC	FTB	Failure Description
P15AB	11	Driving Mode Request Switch Circuit Short to Ground
P15AB	13	Driving Mode Request Switch Circuit Open Circuit

Subsystem Principle

The driving mode switch refers to the Sport Mode switch, and the gateway (GW) collects the state information of the driving mode switch and sends the signal to the control unit.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

P15AB 11: Driving mode request switch circuit short to ground is detected within 2s, so the BCM records the DTC.

P15AB 13: The AD converter detects an out-of-range for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- It is detected that the driving mode switch returns to normal once.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Lower centre console switch failure:
   - Flash/replace the lower centre console switch.
3. Body control module failure:
   - Flash/replace the BCM.
4. Gateway Module Failure
   - Flash/replace the corresponding GW control module.

Reference Circuit Diagram

Electrical Testing

Diagnostic Test Steps

1. Check the driving mode switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.

3. Check the driving mode switch:

   ® For driving mode switch and other abnormal conditions: Repair/replace the driving mode switch;

   ® Normal, go to 4.

4. Check the GW:

   ® For software mismatch, hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 5.

5. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

C1A00 and C1A01

DTC Description

DTC	FTB	Failure Description
C1A00	55	Standard Tyre Pressure Not Configured
C1A01	55	Sensor ID Not Configured

Subsystem Principle

For vehicles with tyre pressure monitoring system (TPMS), standard tyre pressure needs to be initialised.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

C1A00 55: Tyre pressure standard value is not configured as 0xFF

C1A01 55: Left front, right front, left rear and right rear pressure sensor ID channels are 0xFF FF FF FF or the same.

Operations of ECU after Failure

When the DTC is current, the TPMS will not work.

Conditions for Clearing DTCs

C1A00 55:

- DID C001 standard tyre pressure value continues to be valid.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

C1A01 55:

- ID learning is completed successfully or ID channel is written successfully.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the BCM.
2. Tyre pressure sensor failure:
   - Flash/replace the tyre pressure sensor.

Diagnostic Test Steps

1. Connect the scan tool, and place the start switch in "ON" position:

   Software setup test - perform "SIPS Complete Configuration";

   ® Confirm that the application and calibration software versions of ECU are correct;

   ® Normal, go to 2.

2. Scan tool test - confirm that no DTC is stored:

   Confirm that no DTCs other than DTC C1A00 and C1A01 are set;

   ® Abnormal: Repair the causes for other DTC generation;

   ® None, go to 3.

3. Check the tyre pressure sensor:

   ® For hardware damage and other abnormal conditions: Flash/replace the tyre pressure sensor;

   ® Normal, go to 4.

4. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

C1A02

DTC Description

DTC	FTB	Failure Description
C1A02	16	Front Left Tyre Sensor Battery Voltage Low
C1A02	31	No RF Signal Received from Left Front Tyre Sensor

Subsystem Principle

Vehicles with tyre pressure monitoring system have 4 tyre pressure monitoring sensors which monitor the tyre pressures and feed them back to the tyre pressure monitoring system module (TPMS) to alert the driver.

Conditions for Running DTCs

C1A02 16: The start switch is in "ACC" or "ON" position.

C1A02 31:

- The Start switch is placed in ON position.
- The vehicle speed is in the operating range.
- The TPMS is in normal mode.
- The following DTC is not read: C1A01.

Conditions for Setting DTCs

C1A02 16: The sensor data packet shows a low battery voltage.

C1A02 31: No effective transmission from the front left tyre pressure sensor is received within the given time.

Operations of ECU after Failure

C1A02 16: None.

C1A02 31:

- TPMS failure is set.
- Front left tyre pressure value is invalid.
- Continuously monitor the faulty sensor.

Conditions for Clearing DTCs

C1A02 16:

- The sensor data packet shows a normal battery voltage.
- History DTCs will be cleared after 40 power-on cycles.

C1A02 31:

- An effective transmission from the front left tyre pressure sensor is received.
- History DTCs will be cleared and the MIL will go out after 40 power-on cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the BCM.
2. Tyre Pressure Sensor Failure
   - Flash/replace the tyre pressure sensor.

Reference Circuit Diagram

Electrical Testing

Diagnostic Test Steps

1. Scan tool test - confirm that no DTC is stored:

   Confirm that no DTC other than DTC C1A02 is set.

   ® Abnormal: Repair the causes for other DTC generation;

   ® None, go to 2.

2. Check the tyre pressure sensor:

   ® For hardware damage and other abnormal conditions: Flash/replace the tyre pressure sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

C1A03

DTC Description

DTC	FTB	Failure Description
C1A03	16	Front Right Tyre Sensor Battery Voltage Low
C1A03	31	No RF Signal Received from Right Front Tyre Sensor

Subsystem Principle

Vehicles with tyre pressure monitoring system have 4 tyre pressure monitoring sensors which monitor the tyre pressures and feed them back to the tyre pressure monitoring system module (TPMS) to alert the driver.

Conditions for Running DTCs

C1A03 16: The start switch is in "ACC" or "ON" position.

C1A03 31:

- The Start switch is placed in ON position.
- The vehicle speed is in the operating range.
- The TPMS is in normal mode.
- The following DTC is not read: C1A01.

Conditions for Setting DTCs

C1A03 16: The sensor data packet shows a low battery voltage.

C1A03 31: No effective transmission from the front right tyre pressure sensor is received within the given time.

Operations of ECU after Failure

C1A03 16: None.

C1A03 31:

- TPMS failure is set.
- Front right tyre pressure value is invalid.
- Continuously monitor the faulty sensor.

Conditions for Clearing DTCs

C1A03 16:

- The sensor data packet shows a normal battery voltage.
- History DTCs will be cleared after 40 power-on cycles.

C1A03 31:

- An effective transmission from the front right tyre pressure sensor is received.
- History DTCs will be cleared after 40 power-on cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the BCM.
2. Tyre Pressure Sensor Failure
   - Flash/replace the tyre pressure sensor.

Reference Circuit Diagram

Electrical Testing

Diagnostic Test Steps

1. Scan tool test - confirm that no DTC is stored:

   Confirm that no DTC other than DTC C1A03 is set;

   ® Abnormal: Repair the causes for other DTC generation;

   ® None, go to 2.

2. Check the tyre pressure sensor:

   ® For hardware damage and other abnormal conditions: Flash/replace the tyre pressure sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

C1A04

DTC Description

DTC	FTB	Failure Description
C1A04	16	Rear Right Tyre Sensor Battery Voltage Low
C1A04	31	No RF Signal Received From Right Rear Tyre Sensor

Subsystem Principle

Vehicles with tyre pressure monitoring system have 4 tyre pressure monitoring sensors which monitor the tyre pressures and feed them back to the tyre pressure monitoring system module (TPMS) to alert the driver.

Conditions for Running DTCs

C1A04 16: The start switch is in "ACC" or "ON" position.

C1A04 31:

- The Start switch is placed in ON position.
- The vehicle speed is in the operating range.
- The TPMS is in normal mode.
- The following DTC is not read: C1A01.

Conditions for Setting DTCs

C1A04 16: The sensor data packet shows a low battery voltage.

C1A04 31: No effective transmission from the rear right tyre pressure sensor is received within the given time.

Operations of ECU after Failure

C1A04 16: None.

C1A04 31: The TPMS is unavailable under the following conditions, the yellow warning lamp flashes for 90s, then stays on:

- TPMS failure is set.
- Rear right tyre pressure value is invalid.
- Continuously monitor the faulty sensor.

Conditions for Clearing DTCs

C1A04 16:

- The sensor data packet shows a normal battery voltage.
- History DTCs will be cleared after 40 power-on cycles.

C1A04 31:

- An effective transmission from the rear right tyre pressure sensor is received.
- History DTCs will be cleared after 40 power-on cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the BCM.
2. Tyre Pressure Sensor Failure
   - Flash/replace the tyre pressure sensor.

Reference Circuit Diagram

Electrical Testing

Diagnostic Test Steps

1. Scan tool test - confirm that no DTC is stored:

   Confirm that no DTC other than DTC C1A04 is set;

   ® Abnormal: Repair the causes for other DTC generation;

   ® None, go to 2.

2. Check the tyre pressure sensor:

   ® For hardware damage and other abnormal conditions: Flash/replace the tyre pressure sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

C1A05

DTC Description

DTC	FTB	Failure Description
C1A05	16	Rear Left Tyre Sensor Battery Voltage Low
C1A05	31	No RF Signal Received from Left Rear Tyre Sensor

Subsystem Principle

Vehicles with tyre pressure monitoring system have 4 tyre pressure monitoring sensors which monitor the tyre pressures and feed them back to the tyre pressure monitoring system module (TPMS) to alert the driver.

Conditions for Running DTCs

C1A05 16: The start switch is in "ACC" or "ON" position.

C1A05 31:

- The Start switch is placed in ON position.
- The vehicle speed is in the operating range.
- The TPMS is in normal mode.
- The following DTC is not read: C1A01.

Conditions for Setting DTCs

C1A05 16: The sensor data packet shows a low battery voltage.

C1A05 31: No effective transmission from the rear left tyre pressure sensor is received within the given time.

Operations of ECU after Failure

C1A05 16: None.

C1A05 31: The TPMS is unavailable under the following conditions, the yellow warning lamp flashes for 90s, then stays on:

- TPMS failure is set.
- Rear left tyre pressure value is invalid.
- Continuously monitor the faulty sensor.

Conditions for Clearing DTCs

- CAN communication and initialisation are normal during PEB immobiliser authentication.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the BCM.
2. Tyre Pressure Sensor Failure
   - Flash/replace the tyre pressure sensor.

Reference Circuit Diagram

Electrical Testing

Diagnostic Test Steps

1. Scan tool test - confirm that no DTC is stored:

   Confirm that no DTC other than DTC C1A05 is set;

   ® Abnormal: Repair the causes for other DTC generation;

   ® None, go to 2.

2. Check the tyre pressure sensor:

   ® For hardware damage and other abnormal conditions: Flash/replace the tyre pressure sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0073 and U0075

DTC Description

DTC	FTB	Failure Description
U0073	88	Control Module Communication Bus Off on HSCAN1
U0075	88	CAN Bus Off

Subsystem Principle

The BCM communicates with the GW module via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

When the controller has the transmission error for certain times, "Bus Off" state will appear. The DTC will be set if "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Body HS CAN Network.
2. Check the GW module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the BCM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

® Normal, go to TAC Human Assistance.

U0100 and U0101

DTC Description

DTC	FTB	Failure Description
U0100	87	Lost Communication with Engine Control Module (ECM)
U0101	87	Lost Communication with Transmission Control Module (TCM)

Subsystem Principle

The BCM communicates with other modules via GW.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the control module cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Body HS CAN Network.
2. Check the GW module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the BCM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

® Normal, go to TAC Human Assistance.

U0110

DTC Description

DTC	FTB	Failure Description
U0110	87	Lost Communication With TC

Subsystem Principle

The BCM communicates with the drive motor control unit (TC) via the CAN bus.

Conditions for Running DTCs

- CAN communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

ECU RAM and ROM checksum is incorrect.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- ECU RAM and ROM checksum is correct after the ignition switch is turned on.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. Drive motor control unit internal failure:
   - Flash/replace the drive motor control unit.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Body HS CAN Network.
2. Check the GW module - drive motor control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the drive motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the drive motor control unit;

   ® Normal, go to TAC Human Assistance.

U0120

DTC Description

DTC	FTB	Failure Description
U0120	87	Lost Communication with Alternator

Subsystem Principle

The gateway (GW) communicates with the alternator via the LIN bus, and the body control module (BCM) communicates with the GW via the CAN bus.

Conditions for Running DTCs

The Power gear is in the ON position.

Conditions for Setting DTCs

Message from the alternator is lost.

Operations of ECU after Failure

- Battery MIL turns on.
- The alternator is in the wrong operation mode.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the BCM.
3. Gateway failure:
   - Flash/replace the GW.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the BCM - GW harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For hardware damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0180 and U0208

DTC Description

DTC	FTB	Failure Description
U0180	87	Lost Communication with Automatic Lighting Control Module(AFS/DHL)
U0208	87	Lost Communication with Seat Control Module A (DSM)

Subsystem Principle

The BCM communicates with other modules via GW.

Conditions for Running DTCs

- CAN communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the specified module cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Driver Seat Control Module failure:
   - Flash/replace the Driver Seat Control Module .
3. Gateway module failure:
   - Flash/replace the GW module.
4. Body control module failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the Driver Seat Control Module - BCM harness and connector:

   Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the Driver Seat Control Module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the Driver Seat Control Module;

   ® Normal, go to 3.

3. Check the GW:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW;

   ® Normal, go to 4.

4. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0121, U0122 and U0146

DTC Description

DTC	FTB	Failure Description
U0121	87	Lost Communication with Anti-Lock Brake System Module (ABS)
U0122	87	Lost Communication with Stability Control System (SCS)
U0146	87	Lost Communication with Gateway (GW)

Subsystem Principle

The BCM communicates with other modules via GW.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if specified data frames sent from the dynamic stability control module cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. Body control module failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 3.

3. Check the BCM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

® Normal, go to TAC Human Assistance.

U0169 and U1169

DTC Description

DTC	FTB	Failure Description
U0169	87	Lost Communication with Sunroof Control Module
U1169	87	Lost Communication with Sunroof Sunshade Control Module

Subsystem Principle

The GW communicates with the sunroof control unit via the LIN bus, and drives the sunroof or sunroof sunshade to open or close.

Conditions for Running DTCs

- CAN communication is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

ECU cannot perform the program initialisation of all RAMs from Step 1 to Step 4.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- ECU can perform the program initialisation of all RAMs from Step 1 to Step 4.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the BCM.
3. GW internal failure:
   - Flash/replace the GW.

Reference Circuit Diagram

Sunroof

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For GW damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0215

DTC Description

DTC	FTB	Failure Description
U0215	87	Lost Communication with Drive Door Switch Pack(DDSP)

Subsystem Principle

The BCM communicates with the driver door combination switch via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN1 communication is normal.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the driver door combination switch cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Driver door combination switch failure:
   - Repair/replace the driver door combination switch.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the driver door combination switch - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the driver door combination switch:

   ® For driver door combination switch damage and other abnormal conditions: Repair/replace the driver door combination switch;

   ® Normal, go to 3.

3. Check the BCM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

® Normal, go to TAC Human Assistance.

U0222, U0223, U0224 and U0225

DTC Description

DTC	FTB	Failure Description
U0222	87	Lost Communication with Door Window Motor (Driver)
U0223	87	Lost Communication with Door Window Motor (Front Passenger)
U0224	87	Lost Communication with Door Window Motor (RL)
U0225	87	Lost Communication with Door Window Motor (RR)

Subsystem Principle

The BCM communicates with the driver and front passenger window motors via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN1 communication is normal.

Conditions for Setting DTCs

U0222 87: The DTC will be set if the specified data frame sent from the driver window motor cannot be received within the given time.

U0223 87: The DTC will be set if the specified data frame sent from the front passenger window motor cannot be received within the given time.

U0224 87: The DTC will be set if the specified data frame sent from the left rear window motor cannot be received within the given time.

U0225 87: The DTC will be set if the specified data frame sent from the right rear window motor cannot be received within the given time.

Operations of ECU after Failure

- Disable the window regulator functions.
- Use the default signal value.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Corresponding window regulator motor failure:
   - Repair/replace the corresponding window regulator motor.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the corresponding window regulator motor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the corresponding window regulator motor:

   ® For the window motor damage and other abnormal conditions: Repair/replace the corresponding window regulator motor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0231

DTC Description

DTC	FTB	Failure Description
U0231	87	Lost Communication with Rain Light Sensor(RLS)

Subsystem Principle

Rain/light sensor is the core sensor of automatic wiper system and automatic light function, actively emits light to the front windscreen through the light-emitting diode, and then uses the light sensor to sense whether the accumulation of raindrops on the glass to diminish the amount of reflected light (enhance the refraction of light) to sense the amount of light/rain; automatic headlamp is done by the ambient light sensor to detect the vehicle into the tunnel or night and other darker scenes, then the rain/light sensor sends a signal directly to the BCM and communicate.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN2 communication is normal.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the rain/light sensor cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Rain/light sensor failure:
   - Repair/replace the rain/light sensor.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the rain/light sensor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the rain/light sensor:

   ® For rain/light sensor damage and other abnormal conditions: Repair/replace the rain/light sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0245

DTC Description

DTC	FTB	Failure Description
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)

Subsystem Principle

The BCM communicates with the front infotainment control module (FICM) via the CAN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- CAN communication is activated.

Conditions for Setting DTCs

The DTC will be set if specified data frames sent from the FICM cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front infotainment control module failure:
   - Flash/replace the FICM.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Comfort HS CAN Network.
2. Check the FICM - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the FICM;

   ® Normal, go to 4.

4. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0268

DTC Description

DTC	FTB	Failure Description
U0268	87	Lost Communication with Instrument Panel Seat Belt Warning Lamp

Subsystem Principle

The BCM communicates with the Instrument Panel Seat Belt Warning Lamp via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if specified data frames sent from the FICM cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. IPK failure:
   - Flash/replace the IPK.
3. BCMI failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the BCM -IPK harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IPK;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the body system control module;

   ® Normal, go to TAC Human Assistance.

U0282

DTC Description

DTC	FTB	Failure Description
U0282	87	Lost Communication with Master Light Switch

Subsystem Principle

The master light switch communicates with the BCM via a hard wire to control the exterior lighting.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the master light switch cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Master light switch failure:
   - Flash/replace the master light switch.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

Main/Dipped Beam Headlamp

Diagnostic Test Steps

1. Check the BCM - master light switch harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the master light switch:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the master light switch;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0292 and U0293

DTC Description

DTC	FTB	Failure Description
U0292	87	Lost Communication With ISC
U0293	87	Lost Communication With Vehicle Control Unit (HCU/VCU)

Subsystem Principle

The BCM communicates with other modules via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the VCU cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. BCM failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1003

DTC Description

DTC	FTB	Failure Description
U1003	87	Lost Communication with Gear Shift Control Module (SCU)

Subsystem Principle

The gateway (GW) communicates with the shifter control unit (SCU) via the HS CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the SCU cannot be received within 2s.

Operations of ECU after Failure

Use the default signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Shifter control unit failure:
   - Repair/replace the corresponding shifter control unit.
3. GW module internal failure:
   - Flash/replace the GW module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network, BUS System-Powertrain High Speed (Extension) Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the SCU - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.

3. Check the SCU:

   ® For SCU damage and other abnormal conditions: Repair/replace the SCU;

   ® Normal, go to 4.

4. Check the GW:

   ® For GW damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 5.

5. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1005

DTC Description

DTC	FTB	Failure Description
U1005	87	Lost Communication with Ultrasonic Alarm Sensor Module

Subsystem Principle

The BCM communicates with the ultrasonic sensor via the LIN bus.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- LIN3 communication is normal.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the ultrasonic sensor cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Ultrasonic sensor failure:
   - Repair/replace the ultrasonic sensor.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the ultrasonic sensor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the ultrasonic sensor:

   ® For ultrasonic sensor damage and other abnormal conditions: Repair/replace the ultrasonic sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1008 and U1024

DTC Description

DTC	FTB	Failure Description
U1008	87	Lost Communication with Remote PRND Display Module (RPD)
U1024	87	Lost Communication with Battery Back Up Sounder Module (BBUS)

Subsystem Principle

The BCM communicates with other modules via GW.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the module cannot be received within the given time.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway failure:
   - Flash/replace the GW.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW;

   ® Normal, go to 3.

3. Test the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1116

DTC Description

DTC	FTB	Failure Description
U1116	87	Lost Communication with Electronic Battery Sensor (EBS)

Subsystem Principle

The BCM communicates with the electronic battery sensor module via the LIN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the electronic battery sensor cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Electronic Battery Sensor failure:
   - Flash/replace the Electronic Battery Sensor .
3. GW failure:
   - Flash/replace the GW.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the Electronic Battery Sensor - GW harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the GW:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW;

   ® Normal, go to 3.

3. Check the Electronic Battery Sensor:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the Electronic Battery Sensor;

   ® Normal, go to TAC Human Assistance.

U1140

DTC Description

DTC	FTB	Failure Description
U1140	87	Lost Communication with Power Liftgate Control Module (PLCM)

Subsystem Principle

The BCM communicates with the power liftgate control module (PLCM) via the CAN bus.

Conditions for Running DTCs

- 1s after wakeup.
- The system voltage is normal.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the PLCM cannot be received within 2s.

Operations of ECU after Failure

The BCM retains the last valid value signal received from the PLCM.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 wakeup - standby cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Power liftgate control module failure:
   - Flash/replace the power liftgate control module.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Check the power liftgate control module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the power liftgate control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the power liftgate control module;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1150

DTC Description

DTC	FTB	Failure Description
U1150	87	Lost Communication with Upper Console PDC Switch

Subsystem Principle

The BCM communicates with other modules via the CAN bus.

Conditions for Running DTCs

The PDC system is activated.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from centre console PDC switch cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Gateway module failure:
   - Flash/replace the GW module.
3. BCM internal failure:
   - Flash/replace the BCM.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Comfort HS CAN Network.
2. Check the GW module - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1158 and U1159

DTC Description

DTC	FTB	Failure Description
U1158	87	Lost Communication with Front Park Distance Control Module(PDC)
U1159	87	Lost Communication with Rear Park Distance Control Module(PDC)

Subsystem Principle

The PDC system is a safe-assistant device when the vehicle is parked or reversing. The radar detects an obstacle and transmits the signal to the control module, which communicates with other modules separately and then warns the passengers in the vehicle through sound and light.

Conditions for Running DTCs

The PDC system is activated.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from rear PDC switch cannot be received within 2s.

Operations of ECU after Failure

Use the system default value signal.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Body control module failure:
   - Repair/replace the BCM.
3. Rear Left Inner PDC Sensor failure:
   - Flash/replace the Rear Left Inner PDC Sensor.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the Rear Left Inner PDC Sensor - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 2.

2. Check the Rear Left Inner PDC Sensor:

   ® For hardware damage and other abnormal conditions: Repair/replace the Rear Left Inner PDC Sensor;

   ® Normal, go to 3.

3. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U1500 and U1501

DTC Description

DTC	FTB	Failure Description
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)
U1501	00	BCM(or IPK) Redundant Data Resync Failure

Subsystem Principle

When the start switch is switched on, the BCM will perform a switch-on test. IPK signal has not been received. The BCM communicates with the IPK via the CAN to check the matching of VINs as well as the data sync.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1500: When the VIN code of BCM does not match that of IPK, a valid error report will be sent.

U1501: BCM and IPK redundant data synchronisation fails.

Operations of ECU after Failure

Apply for another match every 10 kilometers.

Conditions for Clearing DTCs

U1500:

- When the VIN code of BCM matches that of IPK, a valid correctness report will be sent.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U1501:

- BCM and IPK redundant data synchronisation succeeds.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the control module.
2. Instrument pack failure:
   - Flash/replace IPK.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Use the scan tool to read and check whether the IPK or BCM VIN code matches the actual car, and whether the "backup mileage in BCM" of BCM and IPK matches;

   ® Abnormal: Programme/encode or configure the IPK or the BCM;

   ® Normal, go to 2.

2. Check the control module power supply and ground:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.

3. Check the control module:

   ® For hardware damage and other abnormal conditions: Repair/replace the control module;

   ® Normal, go to 4.

4. Check the control module software:

   ® For software mismatch: Flash/replace the control module;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The BCM monitors the system voltage to check if the power supply voltage of the module is in the normal operating range.

Conditions for Running DTCs

The start switch is in "OFF" or "ACC" or "ON" position.

Conditions for Setting DTCs

U1562 17: The supply voltage greater than 16V is detected for 1s.

U1563 16: The supply voltage less than 9V is detected for 1s.

Operations of ECU after Failure

If Interior lighting is not available, disable/stop the fault monitor.

Conditions for Clearing DTCs

U1562 17:

- The system voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U1563 16:

- The system voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Harness or connector failures:
   - Replace/repair the harness or connector.
3. Battery cable failure:
   - Repair/replace the battery cable.
4. Control module internal failure:
   - Flash/replace the control module.

Reference Circuit Diagram

Body Control Module

Diagnostic Test Steps

1. Check the battery:
   - ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery;
   - ® Normal, go to 2.
2. Power supply ground test - power supply test and ground test (controller):
   - ® Abnormal: repair/replace the harness;
   - ® Normal, go to 3.
3. Harness and connector test - connector male terminal test (controller power supply and groun Pin):
   - ® Abnormal: Repair Pin/replace the controller;
   - ® Normal, go to 4.
4. Check the battery cable:
   - ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable;
   - ® Normal, go to 5.
5. Check the control module:
   - ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;
   - ® Normal, go to TAC Human Assistance.

U2001, U2002, U2004, U2020 and U2021

DTC Description

DTC	FTB	Failure Description
U2001	41	ECU Error-EEPROM Checksum Error
U2002	42	ECU Error - RAM Error
U2004	42	ECU Error - ROM Error
U2020	47	ECU Error - Internal Watchdog Error
U2021	47	ECU Error - External Watchdog Error

Subsystem Principle

Failure occurs inside the BCM, and no external circuit is involved.

Conditions for Running DTCs

The system is powered on and in operation mode.

Conditions for Setting DTCs

U2001 41: ECU RAM and ROM checksum is incorrect.

U2002 42: ECU cannot perform the program initialisation of all RAMs from Step 1 to Step 4.

U2004 42: Data read from the ROM is not consistent with the initial value.

U2020 47: The internal watchdog is reset.

U2021 47: The external watchdog is reset.

Operations of ECU after Failure

- Some functions of BCM are invalid.
- The system is reset.

Conditions for Clearing DTCs

U2001 41:

- ECU RAM and ROM checksum is error-free.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U2002 42:

- ECU can perform program initialisation of all RAMs from Step 1 to Step 4.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U2004 42:

- Data read from the ROM is consistent with the initial value.
- History DTCs will be cleared after 40 failure-free ignition cycles.

U2020 47 and U2021 47:

- The system returns to normal.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Body control module failure:
   - Flash/replace the control module.

Diagnostic Test Steps

1. Harness and connector test - connector female terminal check (controller):
   - ® Abnormal: Repair/replace the harness or connector;
   - ® Normal, go to 2.
2. Harness and connector test - connector male terminal check (controller):
   - ® Abnormal: repair the connector or replace the controller;
   - ® Normal, go to 3.
3. Power supply/ground test - power supply test (controller):
   - ® Abnormal: repair/replace the harness;
   - ® Normal, go to 4.
4. Power supply/ground test - ground test (controller):
   - ® Abnormal: repair/replace the harness;
   - ® Normal, go to 5.
5. Check the control module:
   - ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module;
   - ® Normal, go to TAC Human Assistance.

Sensing and Diagnostic Module (SDM)

DTC Index

List

DTC	FTB	Description	Airbag Warning Lamp*	Failure Level*
B0001	11	Driver Airbag Short to Ground	ON	I
B0001	12	Driver Airbag Short to Battery	ON	I
B0001	1A	Driver Airbag Resistance Too Low	ON	I
B0001	1B	Driver Airbag Resistance Too High	ON	I
B0001	56	Driver Airbag Incompatible Configuration	ON	I
B0010	11	Passenger Airbag Short to Ground	ON	I
B0010	12	Passenger Airbag Short to Battery	ON	I
B0010	1A	Passenger Airbag Resistance Too Low	ON	I
B0010	1B	Passenger Airbag Resistance Too High	ON	I
B0010	56	Passenger Front Airbag Incompatible Configuration	ON	I
B0020	11	Left Side Airbag Short to Ground	ON	I
B0020	12	Left Side Airbag Short to Battery	ON	I
B0020	1A	Left Side Airbag Resistance too Low	ON	I
B0020	1B	Left Side Airbag Resistance too High	ON	I
B0020	56	Left Side Airbag Incompatible Configuration	ON	I
B0021	11	Left Curtain Airbag Short to Ground	ON	I
B0021	12	Left Curtain Airbag Short to Battery	ON	I
B0021	1A	Left Curtain Airbag Resistance Too Low	ON	I
B0021	1B	Left Curtain Airbag Resistance Too High	ON	I
B0021	56	Left Curtain Airbag Incompatible Configuration	ON	I
B0028	11	Right Side Airbag Short to Ground	ON	I
B0028	12	Right Side Airbag Short to Battery	ON	I
B0028	1A	Right Side Airbag Resistance too Low	ON	I
B0028	1B	Right Side Airbag Resistance too High	ON	I
B0028	56	Right Side Airbag Incompatible Configuration	ON	I
B0029	11	Right Curtain Airbag Short to Ground	ON	I
B0029	12	Right Curtain Airbag Short to Battery	ON	I
B0029	1A	Right Curtain Airbag Resistance Too Low	ON	I
B0029	1B	Right Curtain Airbag Resistance Too High	ON	I
B0029	56	Right Curtain Airbag Incompatible Configuration	ON	I
B0050	12	Driver Buckle Switch Short to Battery	ON	I
B0050	13	Driver Buckle Switch Open	ON	I
B0052	12	Passenger Buckle Switch + ODS Short to Battery	ON	I
B0053	12	Second Row Left Seat Belt Buckle Switch Short to Battery	ON	I
B0054	12	Second Row Middle Seat Belt Buckle Switch Short to Battery	ON	I
B0055	12	Second Row Right Seat Belt Buckle Switch Short to Battery	ON	I
B0073	11	Second Row Left Seat Belt Pretensioner Retractor Short to Ground	ON	I
B0073	12	Second Row Left Seat Belt Pretensioner Retractor Short to Battery	ON	I

DTC	FTB	Description	Airbag Warning Lamp*	Failure Level*
B0073	1A	Second Row Left Seat Belt Pretensioner Retractor Resistance too Low	ON	I
B0073	1B	Second Row Left Seat Belt Pretensioner Retractor Resistance too High	ON	I
B0073	56	Second Row Left Seat Belt Pretensioner Retractor Incompatible Configuration	ON	I
B0075	11	Second Row Right Seat Belt Pretensioner Retractor Short to Ground	ON	I
B0075	12	Second Row Right Seat Belt Pretensioner Retractor Short to Battery	ON	I
B0075	1A	Second Row Right Seat Belt Pretensioner Retractor Resistance too Low	ON	I
B0075	1B	Second Row Right Seat Belt Pretensioner Retractor Resistance too High	ON	I
B0075	56	Second Row Right Seat Belt Pretensioner Retractor Incompatible Configuration	ON	I
B0079	11	Driver Seat Belt Pretensioner Retractor Short to Ground	ON	I
B0079	12	Driver Seat Belt Pretensioner Retractor Short to Battery	ON	I
B0079	1A	Driver Seat Belt Pretensioner Retractor Resistance too Low	ON	I
B0079	1B	Driver Seat Belt Pretensioner Retractor Resistance too High	ON	I
B0079	56	Driver Seat Belt Pretensioner Retractor Incompatible Configuration	ON	I
B007A	11	Passenger Seat Belt Pretensioner Retractor Short to Ground	ON	I
B007A	12	Passenger Seat Belt Pretensioner Retractor Short to Battery	ON	I
B007A	1A	Passenger Seat Belt Pretensioner Retractor Resistance too Low	ON	I
B007A	1B	Passenger Seat Belt Pretensioner Retractor Resistance too High	ON	I
B007A	56	Passenger Seat Belt Pretensioner Retractor Incompatible Configuration	ON	I
B0090	49	Left Front Side Impact Sensor Internal Fault	ON	I
B0090	56	Left Front Side Impact Sensor Type Mismatch	ON	I
B0090	86	Left Front Side Impact Sensor Transmitted Data Invalid	ON	I
B0090	87	Left Front Side Impact Sensor Lost Communication	ON	I
B0091	49	Left B-Pillar Side Impact Sensor Internal Fault	ON	I
B0091	56	Left B-Pillar Side Impact Sensor Incompatible Configuration	ON	I
B0091	86	Left B-Pillar Side Impact Sensor Transmitted Data Invalid	ON	I
B0091	87	Left B-Pillar Side Impact Sensor Lost Communication	ON	I
B0095	49	Right Front Side Impact Sensor Internal Fault	ON	I
B0095	56	Right Front Side Impact Sensor Type Mismatch	ON	I
B0095	86	Right Front Side Impact Sensor Transmitted Data Invalid	ON	I
B0095	87	Right Front Side Impact Sensor Lost Communication	ON	I
B0096	49	Right B-Pillar Side Impact Sensor Internal Fault	ON	I
B0096	56	Right B-Pillar Side Impact Sensor Incompatible Configuration	ON	I
B0096	86	Right B-Pillar Side Impact Sensor Transmitted Data Invalid	ON	I
B0096	87	Right B-Pillar Side Impact Sensor Lost Communication	ON	I
B00DF	11	Passenger Airbag Disable Switch Short to Ground	ON	I
B00DF	12	Passenger Airbag Disable Switch Short to Battery	ON	I

DTC	FTB	Description	Airbag Warning Lamp*	Failure Level*
B00DF	13	Passenger Airbag Disable Switch Open	ON	I
B00DF	56	Passenger Airbag Disable Switch Configuration Mismatch	ON	I
B1920	00	Deployed Loops Exits by SVD Function	ON	I
B1924	00	Front impact sensor configuration mismatch with CAL parameter	ON	I
B1932	00	Front Deployment Data Record Exist	ON	I
B1933	00	Side Deployment Data Record Exist	ON	I
B1934	00	Rear Deployment Data Record Exist	ON	I
B1938	12	Passenger Airbag ON Lamp Short to Battery	ON	I
B1938	14	Passenger Airbag ON Lamp Short to Ground or Open	ON	I
B1939	12	Passenger Airbag OFF Lamp Short to Battery	ON	I
B1939	14	Passenger Airbag OFF Lamp Short to Ground or Open	ON	I
B193A	12	Crash Out Short to Battery	ON	I
B193A	14	Crash Out Short to Ground or Open	ON	I
B193C	56	System Configuration Mismatch	ON	I
B193E	00	Deployment Data Record Full: No Over-Write-Able Records Exist	ON	I
B193F	00	SDM Internal Faults-Control Function Block	ON	I
B193F	09	SDM Internal Faults-Acceleration Sensors	ON	I
B193F	49	SDM Internal Faults-Power	ON	I
B193F	96	SDM Internal Faults-Firing Circuit	ON	I
U0073	88	CAN Bus Off	OFF	IIA
U0122	87	Lost Communication with Stability Control System (SCS)	OFF	IIA
U0127	87	Lost Communication with Tire Pressure Monitoring System (TPMS)	OFF	IIA
U0128	87	Lost Communication with Electronic Parking Brake (EPB) Module	OFF	IIA
U0131	87	Lost Communication with Steering Angle Sensor Module / Power Steering Control Module(SAS/EPS)	OFF	IIA
U0140	87	Lost Communication with Body Control Module (BCM)	OFF	IIA
U0146	87	Lost Communication with Gateway (GW)	OFF	IIA
U0155	87	Lost Communication with Instrument Pack (IPK)	OFF	IIA
U0293	87	Lost Communication With Vehicle Control Unit (HCU/VCU)	OFF	IIA
U1264	87	Lost Communication with Front View Camera Module (FVCM)	OFF	IIA
U1265	87	Lost Communication with Front Detection Radar (FDR)	OFF	IIA
U1562	17	Battery Voltage High	ON	I
U1563	16	Battery Voltage Low	ON	I

*Remarks:

1. If the airbag warning lamp does not extinguish after the self-check or illuminates during driving, it indicates that the SRS system has failure
2. Failure level description:
   - I: Stop the vehicle immediately for repair
   - IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
   - III: Repair as soon as possible
   - IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B0001

DTC Description

DTC	FTB	DTC Description
B0001	11	Driver Airbag Short to Ground
B0001	12	Driver Airbag Short to Battery
B0001	1A	Driver Airbag Resistance Too Low
B0001	1B	Driver Airbag Resistance Too High
B0001	56	Driver Airbag Incompatible Configuration

Subsystem Principle

The driver airbag is mounted in the steering wheel, and is connected to the SDM through a clock spring. The clock spring is a rotary coupler to avoid the movement interference of the wire harness when the steering wheel rotates. The supplemental restraint system sensing and diagnostic module (SDM) monitors the signal from the impact sensor and vehicle speed sensor. When a serious collision signal is detected, it sends a deployment signal to the airbag, triggering the gas generator to release a large amount of gas, and deploying the folded airbag in the device quickly, so as to protect the safety of the driver together with the seat belt.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0001 11: Driver airbag circuit is short to ground.

B0001 12: Driver airbag circuit is short to battery.

B0001 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of driver airbag is within any of the following ranges: (gray area) 1.2Ω<R<2.0Ω; (guarantee area) R<1.2Ω.

B0001 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of driver airbag is within any of the following ranges: (gray area) 3.1Ω<R<6.5Ω; (guarantee area) R>6.5Ω.

B0001 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0001 11:

- The resistance of driver airbag circuit to ground returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0001 12:

- The resistance of driver airbag circuit to battery returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0001 1A and 1B:

- The deployment circuit resistance returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0001 56:

- The configuration is correct.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Driver airbag failure.

   ® Replace/repair the driver airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - driver airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the driver airbag:

® For hardware damage and other abnormal conditions: Repair/replace the driver airbag.

® Normal, go to 3.

3. Check the SDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

® Normal, go to TAC Human Assistance.

B0010

DTC Description

DTC	FTB	DTC Description
B0010	11	Passenger Airbag Short to Ground
B0010	12	Passenger Airbag Short to Battery
B0010	1A	Passenger Airbag Resistance Too Low
B0010	1B	Passenger Airbag Resistance Too High
B0010	56	Passenger Front Airbag Incompatible Configuration

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) monitors the signal from the impact sensor and vehicle speed sensor. When a serious collision signal is detected, it sends a deployment signal to the airbag, triggering the gas generator to release a large amount of gas, and deploying the folded airbag in the device quickly, so as to protect the safety of passengers together with the seat belt in the event of a collision.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0010 11: Passenger airbag circuit is short to ground.

B0010 12: Passenger airbag circuit is short to battery.

B0010 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of passenger airbag is within any of the following ranges: (gray area) 0.9Ω<R<1.8Ω; (guarantee area) R<0.9Ω.

B0010 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of passenger airbag is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω; (guarantee area) R>5.8Ω.

B0010 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0010 11:

- The resistance of passenger airbag circuit to ground returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0010 12:

- The resistance of passenger airbag circuit to battery returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0010 1A and 1B:

- The deployment circuit resistance returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0010 56:

- The configuration is correct.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Passenger airbag failure.

   ® Replace/repair the passenger airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - passenger airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, passenger airbag harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the passenger airbag:

   ® Confirm whether the passenger airbag function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger airbag.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0020

DTC Description

DTC	FTB	DTC Description
B0020	11	Left Side Airbag Short to Ground
B0020	12	Left Side Airbag Short to Battery
B0020	1A	Left Side Airbag Resistance too Low
B0020	1B	Left Side Airbag Resistance too High
B0020	56	Left Side Airbag Incompatible Configuration

Subsystem Principle

The side airbag is outside the seat bracket below the seat upholstery. It can protect the rib, pelvis and upper visceral organs in case of side impact. In case of a side collision, if the severity is enough to deploy the seat side airbag, the SDM will send a control signal to trigger the seat side airbag.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

B0020 11: Left side airbag circuit is short to ground.

B0020 12: Left side airbag circuit is short to battery.

B0020 1A: The detected resistance of left side airbag is within any of the following ranges: (gray area) 0.9Ω<R<1.8Ω, (guarantee area) R<0.9Ω.

B0020 1B: The detected resistance of left side airbag is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0020 56:

- The deployment circuit is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- The external connection is not detected within 6s after power-on. Mismatched airbag deployment circuit configuration will be recorded within 6s after power-on.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0020 11:

- Short to ground failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0020 12:

- Short to battery failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0020 1A and B0020 1B:

- Deployment device circuit resistance returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0020 56: None.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Left seat side airbag failure.

   ® Replace/repair the Left seat side airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - left seat side airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, left seat side airbag harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the left seat side airbag:

   ® Confirm whether the left seat side airbag function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the left seat side airbag.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0021

DTC Description

DTC	FTB	DTC Description
B0021	11	Left Curtain Airbag Short to Ground
B0021	12	Left Curtain Airbag Short to Battery
B0021	1A	Left Curtain Airbag Resistance Too Low
B0021	1B	Left Curtain Airbag Resistance Too High
B0021	56	Left Curtain Airbag Incompatible Configuration

Subsystem Principle

The head curtain airbag module is in the interior trim panel above the front and rear doors. The head curtain airbag module is connected with the SDM through the body harness. The head curtain airbag is provided to ensure all occupants heads will not touch the vehicle body and intruded external objects will not hurt the occupants' bodies in case of collision.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

B0021 11: Left side curtain airbag circuit is short to ground.

B0021 12: Left side curtain airbag circuit is short to battery.

B0021 1A: The detected resistance of left side curtain airbag is within any of the following ranges: (gray area) 0.9Ω<R<1.8Ω, (guarantee area) R<0.9Ω.

B0021 1B: The detected resistance of left side curtain airbag is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0021 56:

- The deployment circuit is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- The external connection is not detected within 6s after power-on. Mismatched airbag deployment circuit configuration will be recorded within 6s after power-on.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0021 11:

- Short to ground failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0021 12:

- Short to battery failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0021 1A and B0021 1B:

- Deployment device circuit resistance returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0021 56: None.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Left side curtain airbag failure.

   ® Replace/repair the left side curtain airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - left side curtain airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, left side curtain airbag harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the left side curtain airbag:

   ® Confirm whether the left side curtain airbag function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the left side curtain airbag.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0028

DTC Description

DTC	FTB	DTC Description
B0028	11	Right Side Airbag Short to Ground
B0028	12	Right Side Airbag Short to Battery
B0028	1A	Right Side Airbag Resistance too Low
B0028	1B	Right Side Airbag Resistance too High
B0028	56	Right Side Airbag Incompatible Configuration

Subsystem Principle

The side airbag is outside the seat bracket below the seat upholstery. It can protect the rib, pelvis and upper visceral organs in case of side impact. In case of a side collision, if the severity is enough to deploy the seat side airbag, the SDM will send a control signal to trigger the seat side airbag.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

B0028 11: Right side airbag circuit is short to ground.

B0028 12: Right side airbag circuit is short to battery.

B0028 1A: The detected resistance of right side airbag is within any of the following ranges: (gray area) 0.9Ω<R<1.8Ω, (guarantee area) R<0.9Ω.

B0028 1B: The detected resistance of right side airbag is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0028 56:

- The deployment circuit is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- The external connection is not detected within 6s after power-on. Mismatched airbag deployment circuit configuration will be recorded within 6s after power-on.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0028 11:

- Short to ground failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0028 12:

- Short to battery failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0028 1A and B0028 1B:

- Deployment device circuit resistance returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0028 56: None.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Right seat side airbag failure.

   ® Replace/repair the Right seat side airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - right seat side airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, right seat side airbag harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the right seat side airbag:

   ® Confirm whether the right seat side airbag function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the right seat side airbag.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0029

DTC Description

DTC	FTB	DTC Description
B0029	11	Right Curtain Airbag Short to Ground
B0029	12	Right Curtain Airbag Short to Battery
B0029	1A	Right Curtain Airbag Resistance Too Low
B0029	1B	Right Curtain Airbag Resistance Too High
B0029	56	Right Curtain Airbag Incompatible Configuration

Subsystem Principle

The head curtain airbag module is in the interior trim panel above the front and rear doors. The head curtain airbag module is connected with the SDM through the body harness. The head curtain airbag is provided to ensure all occupants heads will not touch the vehicle body and intruded external objects will not hurt the occupants' bodies in case of collision.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0029 11: Right side curtain airbag circuit is short to ground.

B0029 12: Right side curtain airbag circuit is short to battery.

B0029 1A: The detected resistance of right side curtain airbag is within any of the following ranges: (gray area) 0.9Ω<R<1.8Ω, (guarantee area) R<0.9Ω.

B0029 1B: The detected resistance of right side curtain airbag is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0029 56:

- The deployment circuit is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- The external connection is not detected within 6s after power-on. Mismatched airbag deployment circuit configuration will be recorded within 6s after power-on.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0029 11:

- Short to ground failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0029 12:

- Short to battery failure returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0029 1A and B0029 1B:

- Deployment device circuit resistance returns to normal.
- History DTCs will be cleared after 40 wakeup - standby cycles.

B0029 56: None.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Right side curtain airbag failure.

   ® Replace/repair the right side curtain airbag.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - right side curtain airbag harness and connector:

   ® For connector looseness, Pin deformation/breakage, right side curtain airbag harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the right side curtain airbag:

   ® Confirm whether the right side curtain airbag function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the right side curtain airbag.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0050

DTC Description

DTC	FTB	DTC Description
B0050	12	Driver Buckle Switch Short to Battery
B0050	13	Driver Buckle Switch Open

Subsystem Principle

When the vehicle starts, the driver and passengers will be notified to fasten their seat belts through beeps and indicator light. When a collision occurs, the supplemental restraint system sensing and diagnostic module (SDM) sends a control signal to the airbags and the seat belt pre-tensioners. After receiving the control signal, the airbags deploy, and the seat belt pre-tensioners tighten to ensure that the driver and passengers are securely kept in their seats and to protect the safety of the drivers and passengers.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0050 12: The driver seat belt buckle is short to battery.

B0050 13: The driver seat belt buckle circuit is open.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- Communication/line is normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Driver seat belt buckle switch failure.

   ® Replace/repair the driver seat belt buckle switch.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Driver Seat Belt Buckle State" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 4.

2. Check the SDM - driver seat belt buckle switch harness and connector:

   ® For connector looseness, Pin deformation/breakage, driver seat belt buckle switch harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the driver seat belt buckle switch:

   ® Confirm whether the driver seat belt buckle switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the driver seat belt buckle switch.

   ® Normal, go to 4.

4. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0052 and B0058

DTC Description

DTC	FTB	DTC Description
B0052	12	Passenger Buckle Switch + ODS Short to Battery
B0058	12	Occupant Detection Sensor Short to Battery

Subsystem Principle

When the vehicle starts, the driver and passengers will be notified to fasten their seat belts through beeps and indicator light. When a collision occurs, the supplemental restraint system sensing and diagnostic module (SDM) sends a control signal to the airbags and the seat belt pre-tensioners. After receiving the control signal, the airbags deploy, and the seat belt pre-tensioners tighten to ensure that the driver and passengers are securely kept in their seats and to protect the safety of the drivers and passengers.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0052 12: Passenger seat belt buckle and occupant detection sensor are short to battery.

B0058 12: The third row right passenger seat belt buckle switch + ODS have electric leakage resistance to the battery.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Passenger seat occupancy sensor failure.

   ® Replace/repair the passenger seat occupancy sensor.

3. Passenger seat belt buckle switch failure.

   ® Replace/repair the passenger seat belt buckle switch.

4. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Passenger Seat Belt Buckle State" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 5.

2. Check the SDM - passenger seat occupancy sensor, the passenger seat belt buckle switch - passenger seat occupancy sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, passenger seat occupancy sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the passenger seat occupancy sensor:

   ® Confirm whether the passenger seat occupancy sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger seat occupancy sensor.

   ® Normal, go to 4.

4. Check the passenger seat belt buckle switch:

   ® Confirm whether the passenger seat belt buckle switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger seat belt buckle switch.

   ® Normal, go to 5.

5. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0053

DTC Description

DTC	FTB	DTC Description
B0053	12	Second Row Left Seat Belt Buckle Switch Short to Battery

Subsystem Principle

When the vehicle starts, the driver and passengers will be notified to fasten their seat belts through beeps and indicator light. When a collision occurs, the supplemental restraint system sensing and diagnostic module (SDM) sends a control signal to the airbags and the seat belt pre-tensioners. After receiving the control signal, the airbags deploy, and the seat belt pre-tensioners tighten to ensure that the driver and passengers are securely kept in their seats and to protect the safety of the drivers and passengers.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The 2nd row left seat belt buckle is short to battery.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. 2nd row left seat occupancy sensor failure.

   ® Replace/repair the 2nd row left seat occupancy sensor.

3. 2nd row left seat belt buckle switch failure.

   ® Replace/repair the 2nd row left seat belt buckle switch.

4. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "2nd Row Left Seat Belt Buckle State" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 5.

2. Check the 2nd row left seat occupancy sensor - 2nd row left seat belt buckle switch, SDM - 2nd row left seat occupancy sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, 2nd row left seat occupancy sensor harness conductivity failure, 2nd row left seat belt buckle switch harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the 2nd row left seat occupancy sensor:

   ® Confirm whether the 2nd row left seat occupancy sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row left seat occupancy sensor.

   ® Normal, go to 4.

4. Check the 2nd row left seat belt buckle switch:

   ® Confirm whether the 2nd row left seat belt buckle switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row left seat belt buckle switch.

   ® Normal, go to 5.

5. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0054

DTC Description

DTC	FTB	DTC Description
B0054	12	Second Row Middle Seat Belt Buckle Switch Short to Battery

Subsystem Principle

When the vehicle starts, the driver and passengers will be notified to fasten their seat belts through beeps and indicator light. When a collision occurs, the supplemental restraint system sensing and diagnostic module (SDM) sends a control signal to the airbags and the seat belt pre-tensioners. After receiving the control signal, the airbags deploy, and the seat belt pre-tensioners tighten to ensure that the driver and passengers are securely kept in their seats and to protect the safety of the drivers and passengers.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The 2nd row left seat belt buckle + ODS are short to battery.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. 2nd row middle seat occupancy sensor failure.

   ® Replace/repair the 2nd row middle seat occupancy sensor.

3. 2nd row middle seat belt buckle switch failure.

   ® Replace/repair the 2nd row middle seat belt buckle switch.

4. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "2nd Row Middle Seat Belt Buckle State" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 5.

2. Check the 2nd row middle seat occupancy sensor - 2nd row middle seat belt buckle switch, SDM - 2nd row middle seat occupancy sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, 2nd row middle seat occupancy sensor harness conductivity failure, 2nd row middle seat belt buckle switch harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the 2nd row middle seat occupancy sensor:

   ® Confirm whether the 2nd row middle seat occupancy sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row middle seat occupancy sensor.

   ® Normal, go to 4.

4. Check the 2nd row middle seat belt buckle switch:

   ® Confirm whether the 2nd row middle seat belt buckle switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row middle seat belt buckle switch.

   ® Normal, go to 5.

5. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0055

DTC Description

DTC	FTB	DTC Description
B0055	12	Second Row Right Seat Belt Buckle Switch Short to Battery

Subsystem Principle

When the vehicle starts, the driver and passengers will be notified to fasten their seat belts through beeps and indicator light. When a collision occurs, the supplemental restraint system sensing and diagnostic module (SDM) sends a control signal to the airbags and the seat belt pre-tensioners. After receiving the control signal, the airbags deploy, and the seat belt pre-tensioners tighten to ensure that the driver and passengers are securely kept in their seats and to protect the safety of the drivers and passengers.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The 2nd row right seat belt buckle is short to battery.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. 2nd row right seat occupancy sensor failure.

   ® Replace/repair the 2nd row right seat occupancy sensor.

3. 2nd row right seat belt buckle switch failure.

   ® Replace/repair the 2nd row right seat belt buckle switch.

4. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "2nd Row Right Seat Belt Buckle State" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 5.

2. Check the 2nd row right seat occupancy sensor - 2nd row right seat belt buckle switch, SDM - 2nd row right seat occupancy sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, 2nd row right seat occupancy sensor harness conductivity failure, 2nd row right seat belt buckle switch harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the 2nd row right seat occupancy sensor:

   ® Confirm whether the 2nd row right seat occupancy sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row right seat occupancy sensor.

   ® Normal, go to 4.

4. Check the 2nd row right seat belt buckle switch:

   ® Confirm whether the 2nd row right seat belt buckle switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row right seat belt buckle switch.

   ® Normal, go to 5.

5. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0073

DTC Description

DTC	FTB	DTC Description
B0073	11	Second Row Left Seat Belt Pretensioner Retractor Short to Ground
B0073	12	Second Row Left Seat Belt Pretensioner Retractor Short to Battery
B0073	1A	Second Row Left Seat Belt Pretensioner Retractor Resistance too Low
B0073	1B	Second Row Left Seat Belt Pretensioner Retractor Resistance too High
B0073	56	Second Row Left Seat Belt Pretensioner Retractor Incompatible Configuration

Subsystem Principle

In case of collision, the seat belt pre-tensioner is controlled by the signal transmitted from the SDM to ensure that the occupants are securely kept in their own positions.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0073 11: The 2nd row left seat belt pre-tensioner retractor is short to ground.

B0073 12: The 2nd row left seat belt pre-tensioner retractor is short to battery.

B0073 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of the 2nd row left seat belt pre-tensioner is within any of the following ranges: (gray area) 1.0Ω<R<1.9Ω; (guarantee area) R<1.0Ω.

B0073 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of 2nd row left seat belt pre-tensioner is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0073 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0073 11:

- The resistance of the 2nd row left seat pre-tensioner retractor to ground returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0073 12:

- The resistance of the 2nd row left seat pre-tensioner retractor to battery returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0073 1A and 1B:

- The deployment circuit resistance returns to the normal value.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0073 56:

- The configuration is correct.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. 2nd row left seat belt retractor failure.

   ® Replace/repair the 2nd row left seat belt retractor.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Ignition Circuit Resistance Value of 2nd Row Left Seat Belt Pre-tensioner" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 4.

2. Check the SDM - 2nd row left seat belt pre-tensioner harness and connector:

   ® For connector looseness, Pin deformation/breakage, 2nd row left seat belt retractor harness conductivity failure, control module power supply/grounding harness

conductivity failure and other abnormal conditions: Repair/replace the harness connector.

® Normal, go to 3.

3. Check the 2nd row left seat belt retractor:

® Confirm whether the 2nd row left seat belt retractor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row left seat belt retractor.

® Normal, go to 4.

4. Check the SDM:

® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

® Normal, go to TAC Human Assistance.

B0075

DTC Description

DTC	FTB	DTC Description
B0075	11	Second Row Right Seat Belt Pretensioner Retractor Short to Ground
B0075	12	Second Row Right Seat Belt Pretensioner Retractor Short to Battery
B0075	1A	Second Row Right Seat Belt Pretensioner Retractor Resistance too Low
B0075	1B	Second Row Right Seat Belt Pretensioner Retractor Resistance too High
B0075	56	Second Row Right Seat Belt Pretensioner Retractor Incompatible Configuration

Subsystem Principle

In case of collision, the seat belt pre-tensioner is controlled by the signal transmitted from the SDM to ensure that the occupants are securely kept in their own positions.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0075 11: The 2nd row right seat belt pre-tensioner retractor is short to ground.

B0075 12: The 2nd row right seat belt pre-tensioner retractor is short to battery.

B0075 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of the 2nd row right seat belt pre-tensioner is within any of the following ranges: (gray area) 1.0Ω<R<1.9Ω; (guarantee area) R<1.0Ω.

B0075 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of the 2nd row right seat belt pre-tensioner is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B0075 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0075 11:

- The resistance of the 2nd row right seat pre-tensioner retractor to ground returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0075 12:

- The resistance of the 2nd row right seat pre-tensioner retractor to battery returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0075 1A and 1B:

- The deployment circuit resistance returns to the normal value.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0075 56:

- The configuration is correct.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. 2nd row right seat belt retractor failure.

   ® Replace/repair the 2nd row right seat belt retractor.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Ignition Circuit Resistance Value of 2nd Row Right Seat Belt Pre-tensioner" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 4.

2. Check the SDM - 2nd row right seat belt retractor harness and connector:

   ® For connector looseness, Pin deformation/breakage, 2nd row right seat belt retractor harness conductivity failure, control module power supply/grounding harness

conductivity failure and other abnormal conditions: Repair/replace the harness connector.

® Normal, go to 3.

3. Check the 2nd row right seat belt retractor:

   ® Confirm whether the 2nd row right seat belt retractor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the 2nd row right seat belt retractor.

   ® Normal, go to 4.

4. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0079

DTC Description

DTC	FTB	DTC Description
B0079	11	Driver Seat Belt Pretensioner Retractor Short to Ground
B0079	12	Driver Seat Belt Pretensioner Retractor Short to Battery
B0079	1A	Driver Seat Belt Pretensioner Retractor Resistance too Low
B0079	1B	Driver Seat Belt Pretensioner Retractor Resistance too High
B0079	56	Driver Seat Belt Pretensioner Retractor Incompatible Configuration

Subsystem Principle

In case of collision, the seat belt pre-tensioner is controlled by the signal transmitted from the SDM to ensure that the occupants are securely kept in their own positions.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0079 11: Driver seat belt pre-tensioner retractor circuit is short to ground.

B0079 12: Driver seat belt pre-tensioner retractor circuit is short to battery.

B0079 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of driver seat belt pre-tensioner is within any of the following ranges: (gray area) 1.0Ω<R<1.9Ω, (guarantee area) R<1.0Ω.

B0079 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of driver seat belt pre-tensioner is within any of the following ranges: (gray area) 2.4Ω < R < 5.8Ω, (guarantee area) R > 5.8Ω.

B0079 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B0079 11:

- The resistance of driver seat belt pre-tensioner retractor circuit to ground returns to normal.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free ignition cycles.

B0079 12:

- The resistance of driver seat belt pre-tensioner retractor circuit to battery returns to normal.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free ignition cycles.

B0079 1A and 1B:

- The deployment circuit resistance returns to normal.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free ignition cycles.

B0079 56:

- The configuration is correct.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Driver seat belt pre-tensioner retractor failure.

   ® Replace/repair the driver seat belt pre-tensioner retractor.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Ignition Circuit Resistance Value of Driver Seat Belt Pre-tensioner" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 4.

2. Check the SDM - driver seat belt pre-tensioner retractor harness and connector:

   ® For connector looseness, Pin deformation/breakage, driver seat belt pre-tensioner retractor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the driver seat belt pre-tensioner retractor:

   ® Confirm whether the driver seat belt pre-tensioner retractor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the driver seat belt pre-tensioner retractor.

   ® Normal, go to 4.

4. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B007A

DTC Description

DTC	FTB	DTC Description
B007A	11	Passenger Seat Belt Pretensioner Retractor Short to Ground
B007A	12	Passenger Seat Belt Pretensioner Retractor Short to Battery
B007A	1A	Passenger Seat Belt Pretensioner Retractor Resistance too Low
B007A	1B	Passenger Seat Belt Pretensioner Retractor Resistance too High
B007A	56	Passenger Seat Belt Pretensioner Retractor Incompatible Configuration

Subsystem Principle

In case of a collision, the seat belt pre-tensioner is controlled by the signal transmitted from the SDM. The front seat belt pre-tensioner tightens, this ensures the occupant is securely kept in his/her seat.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B007A 11: Passenger seat belt pre-tensioner retractor circuit is short to ground.

B007A 12: Passenger seat belt pre-tensioner retractor circuit is short to battery.

B007A 1A: Deployment circuit resistance is lower than the threshold. The detected resistance of the passenger seat belt pre-tensioner retractor is within any of the following ranges: (gray area) 1.0Ω<R<1.9Ω, (guarantee area) R<1.0Ω.

B007A 1B: Deployment circuit resistance is higher than the threshold. The detected resistance of passenger seat belt pre-tensioner retractor is within any of the following ranges: (gray area) 2.4Ω<R<5.8Ω, (guarantee area) R>5.8Ω.

B007A 56:

- The deployment circuit is not configured and is detected to be normal within 6s after power-on, or the deployment circuit is short to battery/short to ground or the output is short-circuited.
- If the deployment circuit is configured, and the external connection is not detected within 6s after power-on. (For the DTC of high circuit resistance, the DTC of airbag deployment circuit configuration mismatch will be recorded within 6s after power-on).

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B007A 11:

- The resistance of passenger seat belt pre-tensioner retractor circuit to ground returns to normal.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free power-on and power-off cycles.

B007A 12:

- The resistance of passenger seat belt pre-tensioner retractor circuit to battery returns to normal.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free power-on and power-off cycles.

B007A 1A and 1B:

- The deployment circuit resistance returns to the normal value.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free power-on and power-off cycles.

B007A 56:

- The configuration is correct.
- History DTCs will be cleared and the SDM warning lamp will be off after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Passenger seat belt pre-tensioner retractor circuit failure.

   ® Replace/repair the passenger seat belt pre-tensioner retractor.

3. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Read the SDM real-time display parameter "Ignition Circuit Resistance Value of Passenger Seat Belt Pre-tensioner" to check whether it is within the normal range:

   ® Abnormal, go to 2.

   ® Normal, go to 4.

2. Check the SDM - passenger seat belt pre-tensioner retractor harness and connector:

   ® For connector looseness, Pin deformation/breakage, passenger seat belt pre-tensioner retractor

harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

® Normal, go to 3.

3. Check the passenger seat belt pre-tensioner retractor.

® Confirm whether the passenger seat belt pre-tensioner retractor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger seat belt pre-tensioner retractor.

® Normal, go to 4.

4. Check the SDM:

® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

® Normal, go to TAC Human Assistance.

B0090

DTC Description

DTC	FTB	DTC Description
B0090	49	Left Front Side Impact Sensor Internal Fault
B0090	56	Left Front Side Impact Sensor Type Mismatch
B0090	86	Left Front Side Impact Sensor Transmitted Data Invalid
B0090	87	Left Front Side Impact Sensor Lost Communication

Subsystem Principle

The front impact sensor is located on the front bumper bracket and fixed to the body with bolts. The sensor is designed with a mounting position for correct installation. Each sensor includes an electronic circuit and a sensing unit. The front impact sensor sends an acceleration signal to the SDM, which determines whether to trigger through calculation.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0090 49: Sensor interior electronic failure.

B0090 56: If the RAS (Remote Acceleration Sensor) is not configured, but the sensor is normal; or if the RAS (Remote Acceleration Sensor) is not configured but the sensor itself is separated.

B0090 87:

- Sensor short to battery or ground once or for several times is detected within 200ms.
- Sensor communication failure once or for several times is detected within 200ms.

B0090 86:

- Sensor deviation failure is detected.
- Acceleration data is too high or too low.

Operations of ECU after Failure

B0090 49, 87 and 86:

- Driver side airbag trigger is forbidden.
- The airbag warning lamp illuminates.

B0090 56:

- Left front SIS (side impact sensor) configuration is incorrect, the detonation function is not affected, but the detonation timing may be offset.
- The airbag warning lamp illuminates.

Conditions for Clearing DTCs

B0090 49, 56 and 86: After 40 failure-free vehicle power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0090 87:

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front left impact sensor failure:
   - Flash/replace the front left impact sensor.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - front left impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, front left impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the front left impact sensor:

   ® Confirm whether the front left impact sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the front left impact sensor.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0091

DTC Description

DTC	FTB	DTC Description
B0091	49	Left B-Pillar Side Impact Sensor Internal Fault
B0091	56	Left B-Pillar Side Impact Sensor Incompatible Configuration
B0091	86	Left B-Pillar Side Impact Sensor Transmitted Data Invalid
B0091	87	Left B-Pillar Side Impact Sensor Lost Communication

Subsystem Principle

The side impact sensor is located beside the body sill frame and fixed to the body with bolts. The sensor is designed with a mounting position for correct installation. Each sensor includes an electronic circuit and a sensing unit. The side impact sensor sends an acceleration signal to the SDM which calculates this signal to determine whether to trigger the airbag or not.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0091 49: Sensor interior electronic failure.

B0091 56: If the RAS (Remote Acceleration Sensor) is not configured, but the sensor is normal; or if the RAS (Remote Acceleration Sensor) is not configured but the sensor itself is separated.

B0091 87:

- Sensor short to battery or ground once or for several times is detected within 200ms.
- Sensor communication failure once or for several times is detected within 200ms.

B0091 86:

- Sensor deviation failure is detected.
- Acceleration data is too high or too low.

Operations of ECU after Failure

B0091 49, 87 and 86:

- Driver side airbag trigger is forbidden.
- The airbag warning lamp illuminates.

B0091 56:

- Left SIS (side impact sensor) configuration is incorrect, and only the left trigger is restricted.
- The airbag warning lamp illuminates.

Conditions for Clearing DTCs

B0091 49, 56 and 86: After 40 failure-free vehicle power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0091 87:

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Left side impact sensor failure:
   - Flash/replace the left side impact sensor.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - left side impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, left side impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the left side impact sensor:

   ® Confirm that there are left side impact sensor hardware damage and other abnormal conditions: Repair/replace the left side impact sensor.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm that there are SDM hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0095

DTC Description

DTC	FTB	DTC Description
B0095	49	Right Front Side Impact Sensor Internal Fault
B0095	56	Right Front Side Impact Sensor Type Mismatch
B0095	86	Right Front Side Impact Sensor Transmitted Data Invalid
B0095	87	Right Front Side Impact Sensor Lost Communication

Subsystem Principle

The front impact sensor is located on the front bumper bracket and fixed to the body with bolts. The sensor is designed with a mounting position for correct installation. Each sensor includes an electronic circuit and a sensing unit. The front impact sensor sends an acceleration signal to the SDM, which determines whether to trigger through calculation.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B0095 49: Sensor interior electronic failure.

B0095 56: If the RAS (Remote Acceleration Sensor) is not configured, but the sensor is normal; or if the RAS (Remote Acceleration Sensor) is not configured but the sensor itself is separated.

B0095 87:

- Sensor short to battery or ground once or for several times is detected within 200ms.
- Sensor communication failure once or for several times is detected within 200ms.

B0095 86:

- Sensor deviation failure is detected.
- Acceleration data is too high or too low.

Operations of ECU after Failure

B0095 49, 87 and 86:

- Driver side airbag trigger is forbidden.
- The airbag warning lamp illuminates.

B0095 56:

- Right front SIS (side impact sensor) configuration is incorrect, the detonation function is not affected, but the detonation timing may be offset.
- The airbag warning lamp illuminates.

Conditions for Clearing DTCs

B0095 49, 56 and 86: After 40 failure-free vehicle power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0095 87:

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Front right impact sensor failure:
   - Flash/replace the front right impact sensor.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - front right impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, front right impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the front right impact sensor:

   ® Confirm that there are front right impact sensor hardware damage and other abnormal conditions: Repair/replace the front right impact sensor.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm that there are SDM hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B0096

DTC Description

DTC	FTB	DTC Description
B0096	49	Right B-Pillar Side Impact Sensor Internal Fault
B0096	56	Right B-Pillar Side Impact Sensor Incompatible Configuration
B0096	86	Right B-Pillar Side Impact Sensor Transmitted Data Invalid
B0096	87	Right B-Pillar Side Impact Sensor Lost Communication

Subsystem Principle

The side impact sensor is located beside the body sill frame and fixed to the body with bolts. The sensor is designed with a mounting position for correct installation. Each sensor includes an electronic circuit and a sensing unit. The side impact sensor sends an acceleration signal to the SDM which calculates this signal to determine whether to trigger the airbag or not.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- The SDM functions normally.

Conditions for Setting DTCs

B0096 49: Sensor interior electronic failure.

B0096 56: If the RAS (Remote Acceleration Sensor) is not configured, but the sensor is normal; or if the RAS (Remote Acceleration Sensor) is not configured but the sensor itself is separated.

B0096 87:

- Sensor short to battery or ground once or for several times is detected within 200ms.
- Sensor communication failure once or for several times is detected within 200ms.

B0096 86:

- Sensor deviation failure is detected.
- Acceleration data is too high or too low.

Operations of ECU after Failure

B0096 49, 87 and 86:

- Driver side airbag trigger is forbidden.
- The airbag warning lamp illuminates.

B0096 56:

- Right SIS (side impact sensor) configuration is incorrect, the detonation function is not affected, but the detonation timing may be offset.
- The airbag warning lamp illuminates.

Conditions for Clearing DTCs

B0096 49, 56 and 86: After 40 failure-free vehicle power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B0096 87:

- The signal returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Right side impact sensor failure:
   - Flash/replace the right side impact sensor.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - right side impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, right side impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the right side impact sensor:

   ® Confirm that there are right side impact sensor hardware damage and other abnormal conditions: Repair/replace the right side impact sensor.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm that there are SDM hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B00DF

DTC Description

DTC	FTB	DTC Description
B00DF	11	Passenger Airbag Disable Switch Short to Ground
B00DF	12	Passenger Airbag Disable Switch Short to Battery
B00DF	13	Passenger Airbag Disable Switch Open
B00DF	56	Passenger Airbag Disable Switch Configuration Mismatch

Subsystem Principle

The airbag disable switch is located at the right of the instrument panel. When the passenger airbag disable switch is in "OFF" position, the warning lamp on the instrument pack will indicate the state. If the child safety seat is fitted on the passenger seat, the passenger airbag disable switch must be set to "OFF" position, to prevent the airbag exploded from injuring children. When no child safety seat is placed on the front passenger seat or there is no child or passenger on the front passenger seat, the switch shall be turned to "ON" position.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B00DF 11: Front passenger airbag disable switch is short to ground.

B00DF 12: Front passenger airbag disable switch is short to battery.

B00DF 13: Front passenger airbag disable switch is open.

B00DF 56: Front passenger airbag disable switch is configured as hardware enabled and software disabled in EEPROM, but hardware load exists physically.

Operations of ECU after Failure

B00DF 11, B00DF 12 and B00DF 13: Only the passenger airbag is prohibited from being detonated, the SDM warning lamp turns on.

B00DF 56: The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B00DF 11, B00DF 12 and B00DF 13:

- Communication returns to normal.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B00DF 56: After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Passenger airbag disable switch failure:
   - Flash/replace the passenger airbag disable switch.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - passenger airbag disable switch harness and connector:

   ® For connector looseness, Pin deformation/breakage, passenger airbag disable switch harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the passenger airbag disable switch:

   ® Confirm whether the passenger airbag disable switch function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger airbag disable switch.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B1920, B1924, B1932, B1933 and B1934

DTC Description

DTC	FTB	DTC Description
B1920	00	Deployed Loops Exits by SVD Function
B1924	00	Front impact sensor configuration mismatch with CAL parameter
B1932	00	Front Deployment Data Record Exist
B1933	00	Side Deployment Data Record Exist
B1934	00	Rear Deployment Data Record Exist

Subsystem Principle

While energized, the SDM monitors the preparation of the restraint system module. After start-up, it shall perform the continuous monitoring. The SDM can detect the short circuit in the system, as well as the short circuit/leakage and open circuit of the battery. If the system or component failure is detected, the supplemental restraint system (SRS) warning lamp will illuminate to warn the driver. The SDM tests the current of the airbag and the pre-tensioner trigger device, and check the continuity of related circuits.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1920 00: Temporary airbag deployment data is written in EEPROM.

B1924 00: The configuration of front impact sensor does not match the calibration parameters.

B1932 00: Front airbag deployment data is written in EEPROM.

B1933 00: Side airbag deployment data is written in EEPROM.

B1934 00: Rear trigger data is written in EEPROM.

Operations of ECU after Failure

B1932 00, B1933 00 and B1934 00: The module still has the function of deploying airbags; the SDM warning lamp turns on.

B1920 00, B1924 00: The module still has not the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

B1920 00, B1932 00, B1933 00 and B1934 00: After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

B1924 00:

- The configuration of front impact sensor match the calibration parameters.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, front left, front right, left side B pillar, right side pillar impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B1938 and B1939

DTC Description

DTC	FTB	DTC Description
B1938	12	Passenger Airbag ON Lamp Short to Battery
B1938	14	Passenger Airbag ON Lamp Short to Ground or Open
B1939	12	Passenger Airbag OFF Lamp Short to Battery
B1939	14	Passenger Airbag OFF Lamp Short to Ground or Open

Subsystem Principle

The airbag disable switch is located at the right of the instrument panel. When the passenger airbag disable switch is in "OFF" position, the warning lamp on the instrument pack will indicate the state. If the child safety seat is fitted on the passenger seat, the passenger airbag disable switch must be set to "OFF" position, to prevent the airbag exploded from injuring children. When no child safety seat is placed on the front passenger seat or there is no child or passenger on the front passenger seat, the switch shall be turned to "ON" position.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1938 12: PAB disable ON lamp is short to battery.

B1938 14: PAB disable ON lamp is short to ground or open.

B1939 12: PAB disable OFF lamp is short to battery.

B1939 14: PAB disable OFF lamp is short to ground or open.

Operations of ECU after Failure

The airbag warning lamp illuminates.

Conditions for Clearing DTCs

B1938 12: The resistance of PAB disable ON lamp to battery returns to normal.

B1938 14: The resistance of PAB disable ON lamp to ground returns to normal.

B1939 12: The resistance of PAB disable OFF lamp to battery returns to normal.

B1939 14: The resistance of PAB disable OFF lamp to ground returns to normal.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Passenger airbag disable ON/OFF warning lamp failure:
   - Flash/replace the passenger airbag disable ON/OFF warning lamp.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - passenger airbag disable ON/OFF warning lamp harness and connector:

   ® For connector looseness, Pin deformation/breakage, passenger airbag disable ON/OFF warning lamp harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the passenger airbag disable ON/OFF warning lamp:

   ® Confirm whether the passenger airbag disable ON/OFF warning lamp function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the passenger airbag disable ON/OFF warning lamp.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B193A

DTC Description

DTC	FTB	DTC Description
B193A	12	Crash Out Short to Battery
B193A	14	Crash Out Short to Ground or Open

Subsystem Principle

The driver airbag is mounted in the steering wheel, and is connected to the SDM through a clock spring. The clock spring is a rotary coupler to avoid the movement interference of the wire harness when the steering wheel rotates. The supplemental restraint system sensing and diagnostic module (SDM) monitors the signal from the impact sensor and vehicle speed sensor. When a serious collision signal is detected, it sends a deployment signal to the airbag, triggering the gas generator to release a large amount of gas, and deploying the folded airbag in the device quickly, so as to protect the safety of the driver together with the seat belt in the event of a collision.

Conditions for Running DTCs

B193A 14: Communication/line failure - short to ground or open circuit.

B193A 12: Communication/line failure - short to battery.

Conditions for Setting DTCs

B193A 14: 3 consecutive ACN messages show the ACN bus is short to ground or open.

B193A 12: 3 consecutive ACN messages show the ACN bus is short to battery.

Operations of ECU after Failure

The airbag warning lamp illuminates.

Conditions for Clearing DTCs

- The communication line returns to normal again.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Impact sensor failure:
   - Flash/replace the impact sensor.
3. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps:

1. Check the SDM - impact sensor harness and connector:

   ® For connector looseness, Pin deformation/breakage, impact sensor harness conductivity failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the impact sensor:

   ® Confirm whether the impact sensor function is normal, whether the hardware is damaged and whether there are other abnormal conditions: Repair/replace the impact sensor.

   ® Normal, go to 3.

3. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B193C and B193E

DTC Description

DTC	FTB	DTC Description
B193C	56	System Configuration Mismatch
B193E	00	Deployment Data Record Full: No Over-Write-Able Records Exist

Subsystem Principle

When the start switch is turned on, the diagnostic function of the SDM is monitoring SRS. If any failure is detected, the SDM will store a related DTC in the NVRAM and output a signal to illuminate the SRS warning lamp. The failure information in the memory can be read with the scan tool.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B193E 00: There is no writable record after the airbag deployment data has been completely written into EEPROM for 100ms.

B193C 56: This device is fitted, which is not matched with the system.

Operations of ECU after Failure

The airbag warning lamp illuminates.

Conditions for Clearing DTCs

After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Flash/replace the SDM.

Diagnostic Test Steps:

1. Connect the scan tool to the vehicle, and operate based on the prompt: "SIPS" - "Programme and Encode" - "SDM" - "Flash".
2. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

B193F

DTC Description

DTC	FTB	DTC Description
B193F	00	SDM Internal Faults-Control Function Block
B193F	09	SDM Internal Faults-Acceleration Sensors
B193F	49	SDM Internal Faults-Power
B193F	96	SDM Internal Faults-Firing Circuit

Subsystem Principle

When the start switch is turned on, the diagnostic function of the SDM is monitoring the SRS; if any failure is detected, the SDM will store a related DTC in the NVRAM and output a signal to illuminate the SRS warning lamp. The failure information in the memory can be read with the scan tool.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B193F 00: Internal control function module of SDM fails.

B193F 09: Internal acceleration sensor of SDM fails.

B193F 49: Power-related failure occurs inside the SDM.

B193F 96: Internal ignition circuit of SDM fails.

Operations of ECU after Failure

The airbag warning lamp illuminates.

Conditions for Clearing DTCs

After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.

   ® Replace/repair the harness or connector.

2. Supplemental restraint system sensing and diagnostic module internal failure.

   ® Replace/flash the supplemental restraint system sensing and diagnostic module.

Diagnostic Test Steps:

1. Connect the scan tool to the vehicle, and operate based on the prompt: "SIPS" - "Programme and Encode" - "SDM" - "Flash".
2. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM.

   ® Normal, go to TAC Human Assistance.

U0073

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with other modules via the CAN bus.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0122

DTC Description

DTC	FTB	Failure Description
U0122	87	Lost Communication with Integrated Brake System (IBS)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with the integrated brake system (IBS) via the gateway (GW).

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the IBS cannot be received within 2s.

Operations of ECU after Failure

The module still has the function of deploying airbags; the SDM warning lamp turns on.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Sensing Diagnostic Module internal failure.
   - Replace/flash the Sensing Diagnostic Module.
3. IBS failure.
   - Replace/flash the IBS.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the IBS - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the IBS:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IBS;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0127

DTC Description

DTC	FTB	Failure Description
U0127	87	Lost Communication with Tire Pressure Monitoring System (TPMS)

Subsystem Principle

The tyre pressure monitoring system is integrated in the body control module (BCM), and the SDM communicates with the body control module (BCM) via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the BCM cannot be received within given time.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental Restraint System Sensing and Diagnostic Module Failure
   - Replace/flash the SDM.
3. GW internal failure.
   - Replace/flash the GW.
4. Body control module failure.
   - Replace/flash the BCM.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network, BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW - BCM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the SDM - GW harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 4.
4. Check the SDM:

   ® For SDM damage and other abnormal conditions: Repair/replace the SDM;

   ® Normal, go to 5.
5. Check the GW:

   ® For GW damage and other abnormal conditions: Repair/replace the GW;

   ® Normal, go to 6.
6. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM;

   ® Normal, go to TAC Human Assistance.

U0128

DTC Description

DTC	FTB	Failure Description
U0128	87	Lost Communication with Electronic Parking Brake (EPB) Module

Subsystem Principle

The electronic parking function is integrated in the integrated braking system (IBS), and the airbag control module communicates with the integrated braking system through the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the EPB module cannot be received within 2s.

Operations of ECU after Failure

The module still has the function of deploying airbags.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free ignition cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Repair/replace the harness or connector.
2. Integrated Brake System failure:
   - Flash/replace the Integrated Brake System.
3. SDM internal failure:
   - Flash/replace the SDM.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the SDM - Integrated Brake System harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the IBS:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IBS;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0131

DTC Description

DTC	FTB	Failure Description
U0131	87	Lost Communication with Steering Angle Sensor Module / Power Steering Control Module(SAS/EPS)

Subsystem Principle

The SDM communicates with the steering angle sensor/electric power steering module (SAS/EPS) via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the steering angle sensor/electric power steering module (SAS/EPS) cannot be received within 2s.

Operations of ECU after Failure

The module still has the deployment function.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0140

DTC Description

DTC	FTB	Failure Description
U0140	87	Lost Communication with Body Control Module (BCM)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with the body control module (BCM) via the gateway (GW)/connected computing platform.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the BCM cannot be received within 2s.

Operations of ECU after Failure

The SDM retains the last valid value signal received from the BCM.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0146

DTC Description

DTC	FTB	Failure Description
U0146	87	Lost Communication with Gateway (GW)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with the gateway (GW) via the CAN bus.

Conditions for Running DTCs

- The system voltage is normal.
- The SDM functions normally.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the GW module cannot be received within 2s.

Operations of ECU after Failure

The module still has the function of trigger, and the airbag failure warning lamp illuminates.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0155

DTC Description

DTC	FTB	Failure Description
U0155	87	Lost Communication with Instrument Pack (IPK)

Subsystem Principle

The SDM communicates with the IPK via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the IPK cannot be received within 2s.

Operations of ECU after Failure

The module still has the deployment function.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U0293

DTC Description

DTC	FTB	Failure Description
U0293	87	Lost Communication With Vehicle Control Unit (HCU/VCU)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with other modules via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the HCU/VCU module cannot be received within the given time.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. IMCU failure.
   - Replace/flash the IMCU.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the IMCU - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the IMCU:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IMCU;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U1264

DTC Description

DTC	FTB	Failure Description
U1264	87	Lost Communication with Front View Camera Module (FVCM)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with the front view camera module (FVCM) via the CAN bus.

Conditions for Running DTCs

- The SDM wakes up.
- The system voltage is normal.
- DTC U0073 is not set.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the FVCM cannot be received within 2s.

Operations of ECU after Failure

The SDM retains the last valid signal value received from the FVCM.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U1265

DTC Description

DTC	FTB	Failure Description
U1265	87	Lost Communication with Front Detection Radar (FDR)

Subsystem Principle

The supplemental restraint system sensing and diagnostic module (SDM) communicates with other modules via the CAN bus.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the front detection radar (FDR) is not received within 2s.

Operations of ECU after Failure

The SDM retains the last valid value received from the FDR.

Conditions for Clearing DTCs

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the control module.
3. GW internal failure.
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the GW module - SDM harness and connector:

   ® For connector looseness, Pin deformation/breakage, harness conductivity failure, harness short to ground/battery and other abnormal conditions: Repair/replace the harness or connector;

   ® Normal, go to 3.
3. Check the GW module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the GW module;

   ® Normal, go to 4.
4. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the SDM;

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The SDM monitors the system voltage to check if the supply voltage of the battery or the alternator is within the normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

The module still has the deployment function, and the airbag warning lamp illuminates.

Conditions for Clearing DTCs

U1562 17:

- The power supply voltage is less than 15.5V for 1s.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

U1563 16:

- The power supply voltage is greater than 9.5V for 1s.
- After 40 failure-free power-on and power-off cycles, the history DTCs will be cleared and the airbag warning lamp will be Off.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures.
   - Replace/repair the harness or connector.
2. Supplemental restraint system sensing and diagnostic module internal failure.
   - Replace/flash the SDM.
3. Battery aging/damage.
   - Replace the battery.

Reference Circuit Diagram

Supplemental Restraint System

Diagnostic Test Steps

1. Check the control module harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the SDM:

   ® Confirm whether the SDM function is normal, and whether there are software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

High-voltage Battery Pack (BMS)

DTC Index

List

DTC	FTB	Description	MIL*	Failure Level*
P0A0C	00	Main HVIL Duty Low	—	IIB
P0A0D	00	Main HVIL Duty High	—	IIB
P0A7D	00	Hybrid Battery Pack State of Charge Low	—	III
P0A95	00	Pack Main Fuse is Broken	—	IIB
P0AA7	00	Battery High Voltage Isolation Sensor Circuit Failed	Yellow Lamp	IIA
P0AFA	00	Hybrid Battery System Voltage Low	—	IIB
P0AFB	00	Hybrid Battery System Voltage High	—	IIB
P0B19	00	Pack Voltage is Error Value	—	III
P0C44	00	Coolant Temperature Drive out of Range High	—	IIA
P0C45	00	Coolant Temperature Drive out of Range Low	—	IIA
P0C78	00	Precharge Time Out	—	IIB
P1E00	01	Shunt EEPROM Data Missing	Yellow Lamp	IIA
P1E00	04	Shunt Report SM Check Fail or Over Temperature	—	IIB
P1E00	87	Shunt Current Data Missing	—	IIB
P1E04	00	Leakage Diagnostic Outside	—	IIB
P1E05	00	Leakage Diagnostic Inside	—	IIB
P1E06	00	Pack Insulation Calculation Error	—	IIB
P1E07	00	SBC Report Fault	—	IIB
P1E0D	00	Precharge Resistor Over Heat	—	IIB
P1E0E	00	Cell Dynamic Voltage Difference	—	III
P1E0F	00	Temperature Difference Severe	—	IIB
P1E11	00	Real Time Clock Error	Yellow Lamp	IIA
P1E1B	00	High Voltage Management Unit (HVM) Calibration Out of Range	—	IIB
P1E1C	00	Discharge Over Current Severe	—	IIB
P1E1D	00	Charge Over Current Severe	—	IIB
P1E1E	00	Discharge Over Current	—	IIB
P1E1F	00	Charge Over Current	—	IIB
P1E22	00	BMS Open Relay with Current	—	III
P1E23	00	IMCU Sends Close Main Relay Request before BMS is Ready	—	III
P1E24	00	Pack Critical High Voltage Signals is Error Value While Closing Relay	Red Lamp	I
P1E26	00	Crash Happened	—	IIB
P1E2B	00	High Voltage Interlock (HVIL) Source Duty High	Yellow Lamp	IIA
P1E2C	00	High Voltage Interlock (HVIL) Source Duty Low	Yellow Lamp	IIA
P1E30	00	12V Switch Supply Circuit Failed High	Yellow Lamp	IIA

DTC	FTB	Description	MIL*	Failure Level*
P1E31	00	12V Switch Supply Circuit Failed Low	Yellow Lamp	IIA
P1E32	00	BMU Report Fault	—	III
P1E33	01	OffCharge Relay Report Fail	—	IIB
P1E33	02	OffCharge Relay Report Unknow	—	IIB
P1E34	00	5V Sensor Supply Circuit Failed High	Yellow Lamp	IIA
P1E35	00	5V Sensor Supply Circuit Failed Low	Yellow Lamp	IIA
P1E37	01	High Voltage Sampling Chip 795X Report Fail	—	IIB
P1E37	87	High Voltage Sampling Chip 795X Report Missing	—	IIB
P1E38	00	Module SOC Diffience High	—	III
P1E39	00	On-board Charge Over Current	—	IIB
P1E3A	01	MCU Data Error	—	III
P1E3A	02	MCU Run Invalid	—	III
P1E3B	00	AFE Communication Direction Is Abnormal	—	III
P1E3C	00	Pressure Sensor Report Fail	—	IIB
P1E3D	00	Cell Power Up When Voltage is Low	—	IIB
P1E3F	00	PTC High Voltage Interlock Status	—	III
P1E40	00	Off-board Charge Over Curent	—	IIB
P1E41	00	On-board Charge Under Current	—	IIB
P1E48	00	12V Supply Circuit Failed Low	—	III
P1E49	00	12V Supply Circuit Failed High	—	III
P1E4C	00	Main Positive Relay Failed Weld Check at Sequence Up	Red Lamp	I
P1E4D	00	Main Negative Relay Failed Weld Check at Sequence Up	—	III
P1E51	00	Off-board Charge Relay Failed Weld Check at Sequence Up	—	I
P1E52	00	Main Positive Relay Failed Weld Check at Sequence Down	Red Lamp	I
P1E53	00	Main Negative Relay Failed Weld Check at Sequence Down	—	IIB
P1E57	00	Off-board Charge Relay Failed Weld Check at Sequence Down	—	III
P1E58	00	Main Positive Relay Closure Failure	Red Lamp	I
P1E59	00	Main Negative Relay Closure Failure	Red Lamp	I
P1E5A	00	Precharge Relay Closure Failure	Red Lamp	I
P1E5E	00	Off-board Charge Relay Closure Failure	Red Lamp	I
P1E5F	00	Main Positive Relay Unexpected Open	—	IIB
P1E60	00	Main Negative Relay Unexpected Open	—	IIB
P1E64	00	Off-board Charge Relay Unexpected Open	—	IIB
P1E6D	00	Sum of Cell Voltage is Different with Module Voltage	—	IIB
P1E70	00	Cell Over Voltage	—	IIB
P1E71	00	Cell Over Voltage Severe	—	IIB
P1E72	00	Cell Under Voltage	—	IIB
P1E73	00	Cell Under Voltage Severe	—	IIB
P1E75	00	Cell Over Temperature	—	IIB
P1E76	00	Cell Over Temperature Severe	—	IIB

DTC	FTB	Description	MIL*	Failure Level*
P1E77	00	Cell Under Temperature	—	IIB
P1E82	00	On-board Charger Report EPO	—	IIB
P1E83	00	Off-board Charger Report Emergency Power Off(EPO)	—	IIB
P1E87	00	Read DATA from EEPROM Fail	—	III
P1E94	00	Sum of Cell Voltage is Different with Pack Voltage	—	IIB
P1E9C	00	Air Compressor Fuse Broken	—	IIB
P1E9D	00	Closed Main Relay Instruction Error	—	III
P1EAA	00	Pack LV5V Failed High	Yellow Lamp	IIA
P1EAB	00	Pack LV5V Failed Low	Yellow Lamp	IIA
P1EAE	00	On-board Charge Current Mismatch	—	IIB
P1EAF	00	On-board Charge Voltage Mismatch	—	IIB
P1EB1	00	On-board Charger Status Abnormal	—	IIB
P1EB2	00	Isolation Value Is Too Low During Charging	—	IIB
P1EB4	88	Internal CAN Bus Off	—	III
P1EC1	00	Aux Battery is Too Low before Closing Relays	—	III
P1EC2	00	On-board Charge Charger Fuse Fault	—	IIB
P1EFF	87	BMS Reports Lost Communication With AFE Summary	—	IIA
P1F10	87	Lost Communication with off-board Charger Module	—	IIB
P1F16	98	Off-board Charger Socket Over Temperature	—	IIB
P1F17	07	Ess Cooling System Abnormal	—	III
P1F2C	01	Cell Voltage Changed Abnormal	—	IIB
P1F2D	09	Temperature Signal Drift	—	IIB
P1F31	87	CMU Reports Lost Communication with Analog Front End Circuit 01	—	IIA
P1F32	87	CMU Reports Lost Communication with Analog Front End Circuit 02	—	IIA
P1F33	87	CMU Reports Lost Communication with Analog Front End Circuit 03	—	IIA
P1F34	87	CMU Reports Lost Communication with Analog Front End Circuit 04	—	IIA
P1F35	87	CMU Reports Lost Communication with Analog Front End Circuit 05	—	IIA
P1F36	87	CMU Reports Lost Communication with Analog Front End Circuit 06	—	IIA
P1F37	87	CMU Reports Lost Communication with Analog Front End Circuit 07	—	IIA
P1F38	87	CMU Reports Lost Communication with Analog Front End Circuit 08	—	IIA
P1F39	87	CMU Reports Lost Communication with Analog Front End Circuit 09	—	IIA
P1F63	00	Manual Service Disconnect (MSD) is not Plugged	—	IIB
P1F64	00	On-board Charge Socket Over Temperature	—	IIB
P1F65	00	On-board Charge Socket Failure Hardware	—	IIB
P1F66	00	Off-board Charge Socket Failure Hardware	—	IIB
P1F6B	00	Cell Temperature Sensor Line is Open Wire	—	IIB
P1F6C	00	Cell Voltage Sensor Line is Open Wire	Yellow Lamp	IIA
P1F70	00	Analog Front End Circuit Fault Summary	—	III
P1F71	00	Analog Front End Circuit Fault Which Need to Forbid Charging	—	III
P1F72	00	Analog Front End Circuit Fault Which Need to Forbid Balancing	—	III

DTC	FTB	Description	MIL*	Failure Level*
P1F73	00	Analog Front End Circuit Sampling Voltage Redundancy Check Failed	—	III
P1F74	00	Analog Front End Circuit Sampling Temperature Redundancy Check Failed	—	III
P1F75	00	Analog Front End CircuitFault Which Need Light On	Yellow Lamp	IIA
P1F7C	00	Analog Front End Circuit Cell Voltage is InValid	—	IIB
P1F7D	00	Analog Front End Circuit Cell Temperature is InValid	—	IIB
P1F7E	00	Invalid Data Received From CCU	—	IIB
P1F7F	00	High Voltage between OffChg Negative Relay Over Limit Before Closing	—	III
P1F80	00	Cell Voltage Diffrence While in Still State	—	IIB
P1F81	00	ISC Report HV Inhibit	—	III
P1F82	00	Invalid Data Received From Sensing Diagnostic Module(SDM)	—	IIB
P1F83	00	Invalid Data Received From ISC	—	IIB
P1F84	87	Lost Communication With IMCU From Extend CAN Or Cal CAN	—	IIB
P1F85	00	ISC HVIL Fault	—	III
P1F86	00	ACP HVIL Fault	—	III
P1F87	00	DCDC HVIL Fault	—	III
P1F8A	00	Pack Thermal Runaway Happened	—	IIB
P1F8B	98	Off-board Charger Socket Over Temperature	—	IIB
P1F8C	98	On-board Charge Socket Over Temperature	—	IIB
P1F8D	12	BMS Battery Pressure Swtich Signal is High as same as VCU Signal	Yellow Lamp	IIA
P1F8D	15	BMS Battery Pressure Swtich Signal is Different as VCU Signal	—	IIB
P1F8D	16	Battery Pressure Swtich Signal is Oscilation	—	IIB
P1F8D	17	VCU Pressure Swtich Signal is Oscilation	—	IIB
P1F96	00	IMCU 0x8A Message Data Invalid	—	IIB
U0073	88	Control Module Communication Bus Off on Powertrain High Speed CAN	—	IIB
U0074	88	Control Module Communication Bus Off on PT EXT CAN	—	IIB
U0146	87	Lost Communication with ICC/CCP/GW	—	IIB
U0198	87	Lost Communication with TBOX/IAM	—	III
U0292	87	Lost Communication with Secondary Axle Motor Controller (SAC)	—	IIB
U0293	87	Lost Communication With IMCU	—	IIB
U0414	87	Lost Communication with Integrated Brake System(IBS)	—	IIB
U1112	87	Lost Communication With OBC/CCU	—	III
U1113	87	Lost Communication with Secondary Axle Motor Controller (SAC)	—	IIB
U1562	17	Battery Voltage High	—	III
U1563	16	Battery Voltage Low	—	III

DTC	FTB	Description	MIL*	Failure Level*
U2004	04	Inactive Software is Invalid	—	III

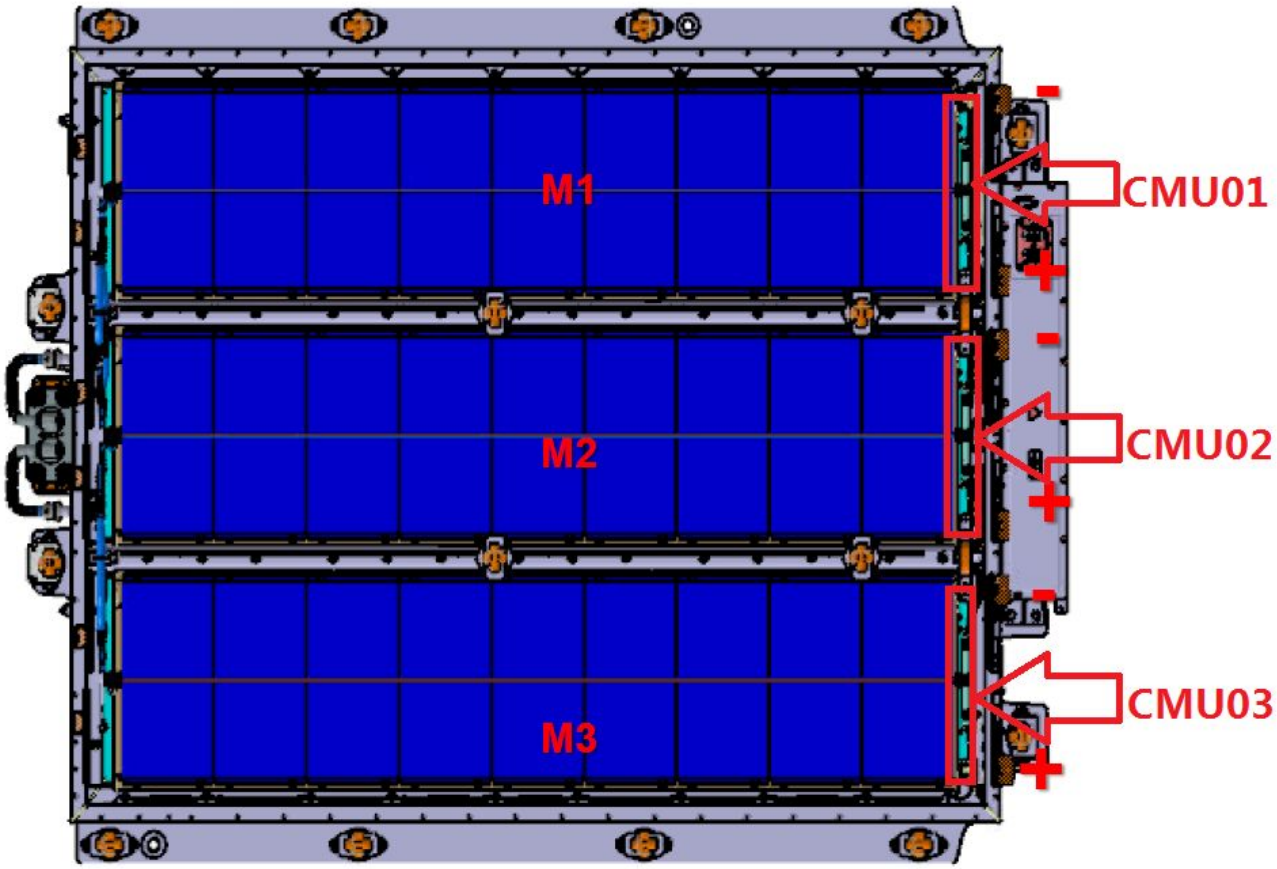
*Remarks:

1. High voltage battery failure warning lamp indicates that the control module detects this DTC is current or in the confirmation state during the running.
2. Failure level description:
   - I: Stop the vehicle immediately for repair
   - IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
   - IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time
   - III: Inspection during maintenance
   - IV: Inspection based on actual demand

Diagnosis Information and Procedure

CMU Physical Comparison

Each cell monitoring unit (CMU) will monitor the state of the single cell it is responsible for, and send the collected data to the high-voltage battery management system (BMS) in a serial way. CMU01-CMU03 physical comparison is shown in the figure below.



P1F31	87	CMU Reports Lost Communication with Analog Front End Circuit 01	CMU01
P1F32	87	CMU Reports Lost Communication with Analog Front End Circuit 02	CMU01
P1F33	87	CMU Reports Lost Communication with Analog Front End Circuit 03	CMU01
P1F34	87	CMU Reports Lost Communication with Analog Front End Circuit 04	CMU02
P1F35	87	CMU Reports Lost Communication with Analog Front End Circuit 05	CMU02
P1F36	87	CMU Reports Lost Communication with Analog Front End Circuit 06	CMU02
P1F37	87	CMU Reports Lost Communication with Analog Front End Circuit 07	CMU03
P1F38	87	CMU Reports Lost Communication with Analog Front End Circuit 08	CMU03
P1F39	87	CMU Reports Lost Communication with Analog Front End Circuit 09	CMU03

P0A0C and P0A0D

DTC Description

DTC	FTB	Failure Description
P0A0C	00	Main HVIL Duty Low
P0A0D	00	Main HVIL Duty High

Subsystem Principle

The high-voltage battery management system (BMS) uses the interlock loop to monitor the connection state and failure of high-voltage connectors.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P0A0C 00: The duty ratio of the main high-voltage interlock loop PWM signal is lower than 40% or the cycle is lower than 0.03s, for 5s.

P0A0D 00: The duty ratio of the main high-voltage interlock loop PWM signal is higher than 60% or the cycle is higher than 0.05s, for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P0A0C 00:

- The duty ratio of the main high-voltage interlock loop PWM signal is higher than 40% or the cycle is higher than 0.03s, for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P0A0D 00:

- The duty ratio of the main high-voltage interlock loop PWM signal is lower than 60% or the cycle is lower than 0.05s, for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the high-voltage harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the high-voltage harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0A7D

DTC Description

DTC	FTB	Failure Description
P0A7D	00	Hybrid Battery Pack State of Charge Low

Subsystem Principle

Insufficient SOC value may potentially damage the battery. The high-voltage battery management system (BMS) monitors the SOC value of the battery pack in real time and triggers the alarm level DTC according to the set threshold.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The SOC value is less than 0.05%, which accumulates for more than 10s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The SOC value is higher than 0.05%, which accumulates for more than 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Battery module failure:
   - Replace the battery module.

Diagnostic Test Steps

1. Check the harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

   ® If abnormal, replace the battery module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0A95

DTC Description

DTC	FTB	Failure Description
P0A95	00	Pack Main Fuse is Broken

Subsystem Principle

The high-voltage fuse is located in the electric power distribution module (EDM) and connected with the battery high voltage loop switch. The high-voltage battery management system (BMS) detects the high voltage point in the fuse through the high voltage sampling line connected to the fuse.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

It is detected that the voltage difference between the two ends of the fuse is higher than 10V for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- It is detected that the voltage difference between the two ends of the fuse is less than 10V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0AA7 and P1E06

DTC Description

DTC	FTB	Failure Description
P0AA7	00	Battery High Voltage Isolation Sensor Circuit Failed
P1E06	00	Pack Insulation Calculation Error

Subsystem Principle

The high-voltage battery management system (BMS) detects the HV voltage/current signal and also has the function of detecting the insulation of battery pack.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P0AA7 00: The internal self-diagnosis failure of BMS insulation circuit lasts for 2s.

P1E06 00: The failure BMS insulation detection lasts for 2s.

Operations of ECU after Failure

P0AA7 00: The yellow high-voltage battery MIL turns on.

P1E06 00: None.

Conditions for Clearing DTCs

- The failure disappears for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-voltage harness failure of high-voltage battery pack:
   - Replace/repair the high-voltage harness.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the insulation state of high-voltage harness of high-voltage battery pack:

   ® Insulation value less than the standard value: Replace/repair the high-voltage harness.

   ® Normal, go to 3.
3. Check the insulation state of high-voltage battery pack:

   ® Insulation value less than the standard value: Replace/repair the BMS/EDM.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Insulation testing method for high-voltage battery pack:
   - Disconnect the high-voltage battery pack high-voltage wire harness connector.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the positive/negative terminals of the high-voltage battery pack and the vehicle body ground.
2. Insulation testing method for high-voltage battery packs and high-voltage wiring harnesses:
   - Disconnect the high-voltage wiring harness connector of the high-voltage battery pack and the high-voltage distribution unit.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the two terminals of the high-voltage wire harness connector and the vehicle body ground.

P0AFA and P0AFB

DTC Description

DTC	FTB	Failure Description
P0AFA	00	Hybrid Battery System Voltage Low
P0AFB	00	Hybrid Battery System Voltage High

Subsystem Principle

The high-voltage battery management system (BMS) monitors the voltage of the battery pack through the high voltage acquisition loop, to guarantee the battery pack operating in a safe voltage range, thus avoiding the overcharge and overdischarge of the battery pack.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P0AFA 00: The total voltage of battery pack is valid and lower than the diagnostic threshold of battery cell parameters.

P0AFB 00: The total voltage of the battery pack is valid and higher than the diagnostic threshold of cell parameters.

Operations of ECU after Failure

P0AFA 00: Equalization disabled and the discharge power is limited to 0kW.

P0AFB 00: Charging disabled and the charging power is limited to 0kW.

Conditions for Clearing DTCs

P0AFA 00:

- The total voltage of the battery pack is valid and higher than the diagnostic threshold of cell parameters.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P0AFB 00:

- The total voltage of the battery pack is valid and lower than the diagnostic threshold of cell parameters.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Overdischarge failure of high-voltage battery pack:
   - Apply slow charging to the vehicle.
3. Overcharge failure of high-voltage battery pack:
   - Discharge the battery pack.
4. BMS/EDM failure:
   - Replace/flash the control module.
5. Battery module failure:
   - Replace the battery module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Measure the total voltage of high-voltage battery pack:

   ® Excessive/insufficient voltage value: vehicle slow charging/battery pack discharging.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.
5. Check the battery module:

   ® For Hardware damage and other abnormal conditions: Replace the battery module.

   ® Normal, go to TAC Human Assistance.

P0B19

DTC Description

DTC	FTB	Failure Description
P0B19	00	Pack Voltage is Error Value

Subsystem Principle

The high-voltage battery management system (BMS) monitors the voltage at different points on positive and negative terminals of the bus through the high voltage sampling harness.

Conditions for Running DTCs

- The main relay is closed without diagnosis and the battery voltage is normal.
- After 1s in high voltage mode.

Conditions for Setting DTCs

The high-voltage battery pack voltage is incorrect.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The high-voltage battery pack voltage is valid.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0C44 and P0C45

DTC Description

DTC	FTB	Failure Description
P0C44	00	Coolant Temperature Drive out of Range High
P0C45	00	Coolant Temperature Drive out of Range Low

Subsystem Principle

Mounted inside the battery pack, the high-voltage battery pack coolant temperature sensor is used for BMS monitoring of coolant temperature and controlling of battery pack's operating in the normal temperature range.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P0C44 00: The temperature of coolant in high-voltage battery pack is higher than or equal to 85℃ for 10s.

P0C45 00: The temperature of coolant in high-voltage battery pack is lower than or equal to -39℃ for 10s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P0C44 00:

- The coolant temperature of high-pressure battery pack is lower than 85℃ for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P0C45 00:

- The coolant temperature of high-pressure battery pack is higher than -39℃ for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Coolant temperature sensor failure:
   - Replace the water inlet pipe.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness and connector of BMS/EDM - coolant temperature sensor:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the coolant temperature sensor:

   ® For hardware damage and other abnormal conditions: Replace the water inlet pipe.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P0C78

DTC Description

DTC	FTB	Failure Description
P0C78	00	Precharge Time Out

Subsystem Principle

The electrical distribution module (EDM) of the battery pack contains a high-voltage relay and a precharge resistor. The high-voltage battery management system (BMS) controls the on-off state of the internal relays of EDM, thus controlling the connection and disconnection of high voltage power supply in the vehicle. When the relay closes, the BMS monitors the voltage of each relay so as to confirm the normal connection of high voltage power supply. Meanwhile, the BMS monitors the capacitor voltage between high voltage positive and negative terminals during relay closing via the precharge relay and the precharge resistor.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The precharge time exceeds 500ms.

Operations of ECU after Failure

The charging power is limited to 0kW, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

- The precharge time is less than 500ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Failure of electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater/motor controller:
   - Replace/repair the electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater/motor controller.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the electric A/C compressor:
   - Measure the impedance between the positive and negative of the high-voltage terminal of the electric A/C compressor. If the value is lower than the standard value, then short-connect the high voltage interlock terminals of the high voltage connector of the electric A/C compressor, re-fit the MSD, connect the negative battery cable, and confirm if the vehicle can be normally powered-on.

   ® Abnormal, go to 3.

   ® If normal: Replace the electric A/C compressor.
3. Check the high-voltage electric heater/high-voltage battery pack electric heater/motor controller in turn:
   - Measure the impedance between the positive and negative of the high-voltage terminal of the high-voltage electric heater/high-voltage storage battery pack electric heater/motor controller in turn. If the value is lower than the standard value, then short-connect the high voltage interlock terminals of the high voltage connector of the high-voltage electric heater/high-voltage battery pack electric heater/motor controller, re-fit the MSD, connect the negative battery cable, and confirm if the vehicle can be normally powered-on.

   ® If abnormal, go to Step 4.

   ® If normal: Replace the high-voltage electric heater/high-voltage battery pack electric heater/motor controller.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1E00

DTC Description

DTC	FTB	Failure Description
P1E00	01	Shunt EEPROM Data Missing
P1E00	04	Shunt Report SM Check Fail or Over Temperature
P1E00	87	Shunt Current Data Missing

Subsystem Principle

The battery pack negative uses the Shunt current sensor to collect current, and the Shunt sensor chip will check its own series of safety mechanisms and report them to BMS. Meanwhile, the BMS also performs zero drift and rationality checks on the current collected by Shunt.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E00 01: The APP fails to receive Shunt EEPROM data from BSW for 30s.

P1E00 04: Shunt self test failure or over temperature for 5s.

P1E00 87: The BMS could not receive Shunt current data for 5s.

Operations of ECU after Failure

P1E00 01: The yellow high-voltage battery MIL turns on.

P1E00 04: The charging power is limited to 10kW.

P1E00 87:None.

Conditions for Clearing DTCs

P1E00 01:

- The APP receives Shunt EEPROM data from BSW for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E00 04:

- Shunt self inspection is successful or the temperature is normal for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E00 87:

- The BMS receives Shunt current data for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Shunt current sensor failure:
   - Replace the EDM.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1E04

DTC Description

DTC	FTB	Failure Description
P1E04	00	Leakage Diagnostic Outside

Subsystem Principle

The high-voltage battery management system (BMS) detects the HV voltage/current signal and also has the function of detecting the insulation of battery pack.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The BMS detects the insulation failure of the external high-voltage circuit to the chassis for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The failure disappears for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Vehicle high-voltage harness failure:
   - Replace/repair the high-voltage harness.
2. BMS failure:
   - Replace/flash the control module.
3. Failure of HV/LV combined charging unit/intelligent motor control unit/high-voltage distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater:
   - Replace/repair the HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the insulation state of vehicle high-voltage harness:

   ® Insulation value less than the standard value: Replace/repair the high-voltage harness.

   ® Normal, go to 3.
3. Check the insulation state of HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater:

   ® Insulation value lower than the standard value: Replace/repair the HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater.

   ® Normal, go to 4.
4. Check the high-voltage battery management module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Insulation testing method for high-voltage components of the entire vehicle:
   - Disconnect the high-voltage wiring harness connectors of the HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the positive/negative terminals of the HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater and the vehicle body ground.
2. Insulation testing method for high-voltage wiring harnesses of the entire vehicle:
   - Disconnect the high-voltage wiring harness connectors of the high-voltage battery pack/the HV/LV combined charging unit/intelligent motor control unit/high-voltage power distribution unit/electric A/C compressor/high-voltage electric heater/high-voltage battery pack electric heater.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the two terminals of all high-voltage wire harness connectors and the vehicle body ground.

P1E05

DTC Description

DTC	FTB	Failure Description
P1E05	00	Leakage Diagnostic Inside

Subsystem Principle

The high-voltage battery management system (BMS) detects the HV voltage/current signal and also has the function of detecting the insulation of battery pack.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The BMS detects the insulation failure of the internal high-voltage circuit to the chassis for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The failure disappears for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the insulation state of high-voltage battery pack:

   ® Insulation value less than the standard value: Replace/repair the BMS/EDM.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Diagnostic Test Methods

1. Insulation testing method for high-voltage battery pack:
   - Disconnect the high-voltage battery pack high-voltage wire harness connector.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the positive/negative terminals of the high-voltage battery pack and the vehicle body ground.

P1E07

DTC Description

DTC	FTB	Failure Description
P1E07	00	SBC Report Fault

Subsystem Principle

The SBC power chip supplies power to high-voltage battery management system (BMS), which meets the power supply requirements of BMS.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

SBC failure lasts for 3s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- SBC fault-free lasts for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1E0D

DTC Description

DTC	FTB	Failure Description
P1E0D	00	Precharge Resistor Over Heat

Subsystem Principle

There is a pre-charge resistor in the battery pack to limit and prevent excessive energy from being applied to the relay during the power-on process, so as to protect and prolong the service life of the relay. The high-voltage battery management system (BMS) monitors the shunt current value during the relay closing process to determine whether there is excessive energy during the relay closing process. If the monitored energy exceeds the limit of the precharge resistor, this will cause damage to the precharge resistor.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

When precharging, the accumulated energy of precharging exceeds the capacity energy of precharge relay.

Operations of ECU after Failure

The charging power is limited to 0kW, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

- The precharge energy is below the limit.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1E0E, P1F2C and P1F80

DTC Description

DTC	FTB	Failure Description
P1E0E	00	Cell Dynamic Voltage Difference
P1F2C	01	Cell Voltage Changed Abnormal
P1F80	00	Cell Voltage Diffrence While in Still State

Subsystem Principle

Each module of the battery pack is equipped with a cell monitoring unit, which can collect the voltage of individual cells in the module and report it to the high-voltage battery management system (BMS). BMS compares the voltages of all cells. If the voltage difference of cells inside the battery pack is excessive, it means that the battery consistency is poor, which will affect the charging and discharging performance of the battery pack.

Conditions for Running DTCs

P1E0E 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1F2C 01: BMS wakeup is activated.

P1F80 00:

- The main relay is closed without diagnosis and the battery voltage is normal.
- The battery pack current is lower than 1A.
- The battery pack power is higher than 60%.

Conditions for Setting DTCs

P1E0E 00: The difference between the maximum and minimum voltages of the cell exceeds 1V, which lasts for more than 30s.

P1F2C 01: The battery cell voltage remains unchanged. The absolute value of the battery pack current is greater than 10A for more than 30s.

P1F80 00: When the abs current is lower than 1A and the battery pack power is higher than 60%, the cell voltage difference is greater than 500mV for more than 3s

Operations of ECU after Failure

P1E0E 00 and P1F80 00: None.

P1F2C 01: Disable charging, the charging power is limited to 0kW, the discharge power is limited to 25kW.

Conditions for Clearing DTCs

P1E0E 00:

- The difference between the maximum voltage and the minimum voltage of single cell is less than 1V for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F2C 01:

- The absolute value of battery pack current is greater than 10A for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F80 00:

- When abs current is lower than 1A and battery power is higher than 60%, the cell voltage difference is less than 500mV for more than 3s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

     ® Normal, flash/replace the BMS/EDM.

     ® Abnormal, go to 2.
2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

® Normal, go to 4.

4. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

   ® Normal, go to 5.

5. Check the battery module:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery module.

   ® Normal, go to TAC Human Assistance.

P1E0F and P1F2D

DTC Description

DTC	FTB	Failure Description
P1E0F	00	Temperature Difference Severe
P1F2D	09	Temperature Signal Drift

Subsystem Principle

Each module of the battery pack is equipped with a cell monitoring unit, which can collect the temperature in the module and report it to the high-voltage battery management system (BMS). If the temperature difference inside the battery pack is excessive, that is, the temperature distribution is uneven, it will affect the overall life of the battery pack.

Conditions for Running DTCs

P1E0F 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1F2D 09: BMS wakeup is activated.

Conditions for Setting DTCs

P1E0F 00: The difference between the maximum and minimum temperatures of the battery cell exceeds 20℃, which lasts for more than 30s.

P1F2D 09: The temperature collected by NTC changes over 30℃ within 20s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E0F 00:

- The difference between the maximum and minimum temperatures of the battery cell is less than 20℃, which lasts for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F2D 09:

- The temperature collected by NTC changes less than 10℃ in 1 s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:
   - Use the scan tool to read whether the temperature signal of each AFE monitoring battery is within the reasonable range (see appendix for the reasonable range).

   ® Normal, flash/replace the BMS/EDM.

   ® Abnormal, go to 2.
2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.
4. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

   ® Normal, go to 5.
5. Check the battery module:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery module.

   ® Normal, go to TAC Assistance.

P1E11

DTC Description

DTC	FTB	Failure Description
P1E11	00	Real Time Clock Error

Subsystem Principle

The clock module (RTC) is integrated in the high-voltage battery management system (BMS). When the battery pack is in wake mode, the RTC will generate a real-time clock (RTC) signal in real time, and the BMS will obtain the clock time or report the fault according to the state of the driver chip.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

Real-time clock RTC signal error.

Operations of ECU after Failure

The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

- The real-time clock RTC signal is correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

- Replace/flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1E1B

DTC Description

DTC	FTB	Failure Description
P1E1B	00	High Voltage Management Unit (HVM) Calibration Out of Range

Subsystem Principle

In the high-voltage battery management system (BMS), its calibration parameters will be checked when it is powered on, and the calibration parameters will be written when the PCB version goes offline.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

High-voltage calibration parameters are abnormal or missing.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- HVM calibration parameters are normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

- Replace/flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1E1C and P1E1E

DTC Description

DTC	FTB	Failure Description
P1E1C	00	Discharge Over Current Severe
P1E1E	00	Discharge Over Current

Subsystem Principle

The battery pack is equipped with a current sensor to monitor the current status of the battery pack. The high-voltage battery management system (BMS) receives the current value from the sensor and sets the discharge current limit according to the current state of the battery.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E1C 00: The discharge current exceeds the maximum allowable limit of the battery system, and the accumulated energy exceeds the battery cell calibration current threshold.

P1E1E 00: The discharge current exceeds the discharge warning current limit of the battery system, and the accumulated energy exceeds the battery cell calibration current threshold.

Operations of ECU after Failure

P1E1C 00: the discharge power is limited to 0kW.

P1E1E 00: the discharge power is limited to 25kW.

Conditions for Clearing DTCs

P1E1C 00:

- The discharge current is lower than the maximum allowable current limit.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E1E 00:

- The discharge current is lower than the discharge warning current limit.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E1D and P1E1F

DTC Description

DTC	FTB	Failure Description
P1E1D	00	Charge Over Current Severe
P1E1F	00	Charge Over Current

Subsystem Principle

The battery pack is equipped with a current sensor to monitor the current status of the battery pack. The high-voltage battery management system (BMS) receives the current value from the sensor and sets the charging current limit according to the current state of the battery.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E1D 00: The charging current exceeds the maximum charging current limit of the battery system, and the accumulated energy exceeds the battery cell calibration current threshold.

P1E1F 00: The charging current exceeds the charging warning current limit of the battery system, and the accumulated energy exceeds the battery cell calibration current threshold.

Operations of ECU after Failure

The charging power is limited to 0kW.

Conditions for Clearing DTCs

P1E1D 00:

- The charging current is lower than the maximum allowable current limit.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E1F 00:

- The charging current is lower than the charging warning current limit.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Intelligent motor control unit failure:
   - Replace/flash the control module.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Judge the generation of DTC:

   If the DTC is generated under the charging state of the charger, go to 2.

   ® If DTC is generated while the vehicle is running, it may be caused by incorrect control of the intelligent motor control unit, then try to flash/replace the intelligent electronic control unit.

2. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E22

DTC Description

DTC	FTB	Failure Description
P1E22	00	BMS Open Relay with Current

Subsystem Principle

The high-voltage battery management system (BMS) controls the power-on and power-off of the relay. During the vehicle running, the relay remains closed to maintain the normal operation of the high-voltage loop of the vehicle. When there is a failure, the BMS will control the emergency power-off of the relay and set the corresponding DTC.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

During power-down, the bus current is higher than the limit current 10A for more than 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- During power-down, the bus current is normal for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Intelligent motor control unit failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E23

DTC Description

DTC	FTB	Failure Description
P1E23	00	IMCU Sends Close Main Relay Request before BMS is Ready

Subsystem Principle

The high-voltage battery management system (BMS) controls the on-off of each relay according to a certain sequence, and monitors the state of the relay to detect errors. The BMS monitors the state of all relays to ensure that the on-off of each relay is carried out in the required sequence. If the relays are not executed in the required sequence, the BMS will detect the error and disconnect all relays to disconnect the high-voltage connection between the battery pack and the vehicle.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The first frame information of the intelligent motor control unit sends out the request to close the relay.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The first frame message sent by the intelligent motor control unit does not require the relay to be closed.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Storage battery failure:
   - Replace/repair the storage battery.
3. Intelligent motor control unit failure:
   - Replace/flash the control module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the storage battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the harness connector between intelligent motor control unit and high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E24

DTC Description

DTC	FTB	Failure Description
P1E24	00	Pack Critical High Voltage Signals is Error Value While Closing Relay

Subsystem Principle

The electric distribution module (EDM) of the battery pack contains a high-voltage relay to control the on-off of the high-voltage circuit of the vehicle battery pack. The control coil of each relay is connected to and controlled by the high-voltage battery management system (BMS). The relay is normally open, and only closed when the BMS supplies power to the control coil of the relay. Meanwhile, HVM will collect the voltage at the rear end of the relay and report it to BMS, and BMS will judge whether the relay is normally engaged or whether the circuit is faulty according to this voltage.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The critical high voltage signal value is incorrect.

Operations of ECU after Failure

- The charging power is limited to 0kW, the discharge power is limited to 0kW.
- The red high-voltage battery MIL turns on.

Conditions for Clearing DTCs

- The critical high voltage signal value is correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E26

DTC Description

DTC	FTB	Failure Description
P1E26	00	Crash Happened

Subsystem Principle

The high-voltage battery management system (BMS) is connected to the 12V power supply in the pack via Crash signal. Crash signal is connected from low-voltage connector to the maintenance switch (MSD) and then to BMS to control the on-off of relay coil. If the 12V power supply of the crash circuit is not supplied to BMS, the coil power supply of the relay will be interrupted, thus disconnecting the relay and disconnecting the battery pack from the vehicle.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The collision signal is true for 1 cycle.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The collision signal is false for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Sensing Diagnostic Module failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the CAN communication harness and connector of the high-voltage battery pack - Sensing Diagnostic Module:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the Sensing Diagnostic Module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E2B and P1E2C

DTC Description

DTC	FTB	Failure Description
P1E2B	00	High Voltage Interlock (HVIL) Source Duty High
P1E2C	00	High Voltage Interlock (HVIL) Source Duty Low

Subsystem Principle

The high-voltage battery management system (BMS) uses the interlock loop to monitor the connection state and failure of high-voltage connectors.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E2B 00: The duty ratio of PWM signal at the input of high-voltage interlock loop is higher than 60% or the cycle is higher than 0.05s, for 5s.

P1E2C 00: The duty ratio of PWM signal at the input of high-voltage interlock loop is lower than 40% or the cycle is lower than 0.03s, for 5s.

Operations of ECU after Failure

The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1E2B 00:

- The duty ratio of PWM signal at the input of high-voltage interlock loop is lower than 60% or the cycle is lower than 0.03s, for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E2C 00:

- The duty ratio of PWM signal at the input of high-voltage interlock loop is higher than 40% or the cycle is higher than 0.03s, for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the high-voltage harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the high-voltage harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E30 and P1E31

DTC Description

DTC	FTB	Failure Description
P1E30	00	12V Switch Supply Circuit Failed High
P1E31	00	12V Switch Supply Circuit Failed Low

Subsystem Principle

The high-voltage battery management system (BMS) outputs 12V power to the shunt current sensor. Meanwhile, the BMS monitors whether the power supply circuit is normal.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E30 00: The 12V switch supply voltage is higher than 16V for more than 2s.

P1E31 00: The 12V switch supply voltage is lower than 9V for more than 2s.

Operations of ECU after Failure

The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1E30 00:

- The 12V switch supply voltage is lower than 16V for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E31 00:

- The 12V switch supply voltage is higher than 9V for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Storage battery failure:
   - Replace the storage battery.
3. BMS/EDM failure:
   - Replace/flash the control module.
4. Shunt current sensor failure:
   - Replace the EDM.

Diagnostic Test Steps

1. Check the storage battery:

   ® If the battery voltage is not within normal range, and the battery is aging, damaged, deformed or leaking, etc.: Replace the battery.

   ® Normal, go to 2.

2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E32

DTC Description

DTC	FTB	Failure Description
P1E32	00	BMU Report Fault

Subsystem Principle

The high-voltage battery management system (BMS) receives the battery cell sampling information, sensor information and vehicle information from CMU for comprehensive calculation and processing.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

BMS hardware diagnosed failure for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- BMU hardware diagnosis results pass for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E33

DTC Description

DTC	FTB	Failure Description
P1E33	01	OffCharge Relay Report Fail
P1E33	02	OffCharge Relay Report Unknow

Subsystem Principle

The fast charge-negative relay and the main negative relay are connected in series, and the fast charge-negative relay is outside the battery pack. The BMS is responsible for sending and controlling the fast charge-negative relay, and the CCU is responsible for the action, detection and diagnosis of the fast charge-negative relay.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E33 01: The diagnosis result of fast charge relay is failure for 1s.

P1E33 02: The state of fast charge relay is unknown for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E33 01:

- The diagnosis result of fast charge-negative relay is fault-free for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E33 02:

- The fast charge relay is in normal state for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Fast charge relay failure:
   - Replace/repair the high-voltage power distribution unit.
3. High-voltage distribution unit failure:
   - Replace/repair the high-voltage power distribution unit.
4. HV/LV CCU failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the harness and connectors of HV distribution unit - HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the high-voltage power distribution unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the high-voltage power distribution unit.

   ® Normal, go to 4.

4. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.

5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E34 and P1E35

DTC Description

DTC	FTB	Failure Description
P1E34	00	5V Sensor Supply Circuit Failed High
P1E35	00	5V Sensor Supply Circuit Failed Low

Subsystem Principle

The high-voltage battery management system (BMS) outputs 5V power to LEM current sensor, and the BMU monitors whether the power supply circuit is normal or not.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E34 00: The supply voltage of 5V sensor is higher than 5.2V for 1s.

P1E35 00: The supply voltage of 5V sensor is lower than 4.8V for 1s.

Operations of ECU after Failure

The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1E34 00:

- The supply voltage of 5V sensor is lower than 5.2V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E35 00:

- The supply voltage of 5V sensor is higher than 4.8V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. LEM current sensor failure:
   - Replace the EDM.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E37

DTC Description

DTC	FTB	Failure Description
P1E37	01	High Voltage Sampling Chip 795X Report Fail
P1E37	87	High Voltage Sampling Chip 795X Report Missing

Subsystem Principle

Internal failure of high-voltage battery management system (BMS).

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E37 01: The high-voltage sampling chip 795X reports error for 20s.

P1E37 87: High-voltage sampling chip 795X data is lost for 20s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E37 01:

- The high-voltage sampling chip 795X reports correctly for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E37 87:

- High-voltage sampling chip 795X has no data loss for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

- Replace/flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E38

DTC Description

DTC	FTB	Failure Description
P1E38	00	Module SOC Diffience High

Subsystem Principle

BMS judges the maximum SOC difference of the cells in the module according to the calculated maximum and minimum SOC values of each cell, which is used to represent the consistency among the cells in the module.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The difference between maximum and minimum SOC of batteries is greater than 10% for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The difference between the maximum and minimum SOC of batteries is less than 10% for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Battery module failure:
   - Replace the battery module.

Diagnostic Test Steps

1. Check the harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

   ® If abnormal, replace the battery module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1E39, P1E41, P1EAE and P1EAF

DTC Description

DTC	FTB	Failure Description
P1E39	00	On-board Charge Over Current
P1E41	00	On-board Charge Under Current
P1EAE	00	On-board Charge Current Mismatch
P1EAF	00	On-board Charge Voltage Mismatch

Subsystem Principle

When the HV/LV combined charging unit starts charging, the high-voltage battery management system (BMS) requires the HV/LV combined charging unit to output corresponding current to charge the battery pack via CAN communication, and the BMS monitors the charging current.

Conditions for Running DTCs

The BMS is under slow charging.

Conditions for Setting DTCs

P1E39 00: The slow charging current is higher than the current required by BMS for more than 5A, which lasts for more than 400ms.

P1E41 00: The BMS current demand is higher than 4A, while the actual current is lower than 0.5A, which lasts for more than 5s.

P1EAE 00: The difference between the slow charging current and the current required by BMS is higher than 4A for more than 5s.

P1EAF 00: The difference between the slow charging voltage and the voltage required by BMS is higher than 10V for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E39 00:

- The slow charging current is lower than the current required by BMS for less than 5A, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E41 00:

- The BMS current demand is higher than 4A, and the actual current is higher than 0.5A, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1EAE 00:

- The difference between the slow charging current and the BMS current demand is less than 4A, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1EAF 00:

- The difference between the slow charging voltage and the BMS voltage demand is less than 10V, which lasts for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Slow charging failure:
   - Replace the slow charge plug.
3. HV/LV CCU failure:
   - Replace/flash the control module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Try to replace another slow charging plug and check whether the failure is read:

   ® If normal, replace the slow charging plug.

   ® Abnormal, go to 2.

2. Check the harness connector between the high-voltage battery pack and the HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E3B

DTC Description

DTC	FTB	Failure Description
P1E3B	00	AFE Communication Direction Is Abnormal

Subsystem Principle

The AFE is connected in series. During normal communication, the stack at the end of the communication chain transmits one by one upwards. The upper AFE needs to transmit the sampling data of itself and all the lower stacks. Therefore, the closer to the AFE of MCU, the more data to be transmitted, the greater the power consumption, resulting in inconsistent cell voltage, which is ladder-shaped. Therefore, it needs to ensure that AFE switches the communication direction after running for a period of time, and try to ensure that the time is equal for forward and reverse communication.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

AFE reverse communication.

Operations of ECU after Failure

Disable the equilibrium.

Conditions for Clearing DTCs

- The AFE communication is normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace the cell monitoring unit.
3. BMS/EDM failure:
   - Replace/flash the control module.
4. Battery module failure:
   - Replace the battery module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector between cell monitoring unit and BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Replace the battery cell monitoring unit.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.
5. Check the battery module:

   ® For Hardware damage and other abnormal conditions: Replace the battery module.

   ® Normal, go to TAC Assistance.

P1E3C and P1F8D

DTC Description

DTC	FTB	Failure Description
P1E3C	00	Pressure Sensor Report Fail
P1F8D	12	BMS Battery Pressure Swtich Signal is High as same as VCU Signal
P1F8D	15	BMS Battery Pressure Swtich Signal is Different as VCU Signal
P1F8D	16	Battery Pressure Swtich Signal is Oscilation
P1F8D	17	VCU Pressure Swtich Signal is Oscilation

Subsystem Principle

A pressure switch sensor is built in the battery pack to detect the pressure state of the internal gas, so as to judge whether there is thermal runaway inside the battery pack. When the air pressure in the battery pack exceeds the threshold set by the sensor, the pressure switch is turned on, and the sensor sends an alarm flag signal of the pressure switch to IMCU and BMS via a hard line, so that the controller could judge thermal runaway and give an external alarm.

Conditions for Running DTCs

P1E3C 00, P1F8D 15, P1F8D 16, P1F8D 17:

- The start switch is in "ON" position.
- The storage battery voltage is normal.
- IMCU CAN communication is normal.
- BMS activation lasts for 12min.

P1F8D 12: The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E3C 00: Pressure sensor failure lasts for 30s.

P1F8D 12: BMS and IMCU pressure switch signals are abnormally pulled high for more than 30 minutes.

P1F8D 15: BMS and IMCU pressure switch signals are inconsistent for more than 12 minutes.

P1F8D 16: The BMS pressure switch signal fluctuates for more than 12min.

P1F8D 17: The IMCU pressure switch signal fluctuates for more than 12min.

Operations of ECU after Failure

P1E3C 00, P1F8D 15, P1F8D 16, P1F8D 17: None.

P1F8D 12: The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1E3C 00:

- The pressure sensor is normal for 30s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8D 12:

- BMS and IMCU pressure switch signals are abnormal for more than 30 minutes.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8D 15:

- BMS and IMCU pressure switch signals are inconsistent for more than 12 minutes.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8D 16:

- The BMS pressure switch signal is abnormal for more than 12 minutes.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8D 17:

- The IMCU pressure switch signal is abnormal for more than 12 minutes.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Intelligent motor control unit failure:
   - Replace/flash the control module.
3. Pressure switch failure:
   - Replace the pressure switch.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Intelligent Electronic Control System, ESS Internal Circuit-51kWh&64kWh, ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Check the harness and connectors of high-voltage battery pack - intelligent motor control unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to 3.

3. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
4. Check the harness and connector of BMS/EDM - pressure switch:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 5.

5. Check the pressure switch:

   ® For hardware damage and other abnormal conditions: Replace the pressure switch.

   ® Normal, go to 6.

6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E3D

DTC Description

DTC	FTB	Failure Description
P1E3D	00	Cell Power Up When Voltage is Low

Subsystem Principle

If the static voltage of the battery cell is insufficient after the battery pack is powered on, it should not be charged normally to protect the battery cell.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

After 5s of power-on, the minimum static voltage of the battery cell is lower than the input value.

Operations of ECU after Failure

Charging disabled and the charging power is limited to 0kW.

Conditions for Clearing DTCs

- After 5s of power-on, the minimum static voltage of the battery cell is higher than the input value.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Battery module failure:
   - Replace the battery module.

Diagnostic Test Steps

1. Check the harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

   ® If abnormal, replace the battery module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E3F, P1F85, P1F86 and P1F87

DTC Description

DTC	FTB	Failure Description
P1E3F	00	PTC High Voltage Interlock Status
P1F85	00	ISC HVIL Fault
P1F86	00	ACP HVIL Fault
P1F87	00	DCDC HVIL Fault

Subsystem Principle

The vehicle has multiple high-voltage interlock loops, and each component monitors its own high-voltage interlock status and reports it to BMS via CAN.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E3F 00: The PTC reports the high-voltage interlock failure for 5s.

P1F85 00: The ISC reports the high-voltage interlock failure for 5s.

P1E86 00: The A/C compressor reports the high-voltage interlock failure for 5s.

P1F87 00: The DCDC reports the high-voltage interlock failure for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E3F 00:

- The PTC does not report the high-voltage interlock failure for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E85 00:

- The ISC does not report the high-voltage interlock failure for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E86 00:

- The A/C does not report the high-pressure interlock failure for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E87 00:

- The DCDC does not report the high-voltage interlock failure for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. HV/LV CCU failure:
   - Replace/flash the control module.
3. Intelligent motor control unit failure:
   - Replace/flash the control module.
4. High-voltage electric heater failure:
   - Replace the high-voltage electric heater.
5. Electric A/C compressor failure:
   - Replace the electric A/C compressor.
6. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System, BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Check the harness connectors of high-voltage electric heater/intelligent motor control unit/electric A/C compressor/HV/LV combined charging unit:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Integrity Inspection of HS CAN Network.
3. Check the CAN communication harness and connectors of high-voltage battery pack - intelligent motor control unit/HV/LV combined charging unit:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the high-voltage electric heater/intelligent motor control unit/electric A/C compressor/HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the high-voltage electric heater/intelligent motor control unit/electric A/C compressor/HV/LV combined charging unit.

   ® If normal, try to open and repair the high-voltage battery pack, and go to Step 5.

5. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for

more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.

6. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 7.

7. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E40

DTC Description

DTC	FTB	Failure Description
P1E40	00	Off-board Charge Over Curent

Subsystem Principle

When the fast charging starts, the high-voltage battery management system (BMS) requires the fast charging pile to output corresponding current to charge the battery pack via CAN communication, and the BMS monitors the charging current. This DTC is triggered when the actual current value is higher than the requested value.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The actual output current of fast charging pile is more than 5A higher than that required by the system, which lasts for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The difference between the current required by the system and the actual output current of the charger is less than 5A for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Quick charge plug failure:
   - Replace the fast charging plug.
3. Charging port failure:
   - Replace the charging port.
4. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Try to replace another fast charging plug and check whether the failure is read:

   ® If normal, replace the fast charging plug.

   ® Abnormal, go to 2.

2. Check the harness connectors of high-voltage battery pack and integrated charging port:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the charging port:

   ® For hardware damage and other abnormal conditions: Replace the charging port.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1E48 and P1E49

DTC Description

DTC	FTB	Failure Description
P1E48	00	12V Supply Circuit Failed Low
P1E49	00	12V Supply Circuit Failed High

Subsystem Principle

Electrical distribution module (EDM) includes main positive relay, main negative relay and pre-charge relay. These relays are normally open, and the high-voltage battery management system (BMS) is connected with the relay coil via the high-side drive circuit and the low-side drive circuit to control the opening and closing of the relays. Meanwhile, the BMS will monitor the relay coil voltage.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E48 00: The 12V supply voltage is lower than 9V for more than 2s.

P1E49 00: The 12V supply voltage is higher than 16V for more than 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E48 00:

- The 12V supply voltage is higher than 9V for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E49 00:

- The 12V supply voltage is lower than 16V for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Storage battery failure:
   - Replace the storage battery.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the storage battery:

   ® If the battery voltage is not within normal range, and the battery is aging, damaged, deformed or leaking, etc.: Replace the battery.

   ® Normal, go to 2.

2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E4C, P1E52, P1E58 and P1E5F

DTC Description

DTC	FTB	Failure Description
P1E4C	00	Main Positive Relay Failed Weld Check at Sequence Up
P1E52	00	Main Positive Relay Failed Weld Check at Sequence Down
P1E58	00	Main Positive Relay Closure Failure
P1E5F	00	Main Positive Relay Unexpected Open

Subsystem Principle

The electrical distribution module (EDM) contains the main positive relay. The main positive relay is connected with the high-voltage positive electrode of the battery pack. The high-voltage battery management system (BMS) is connected with the relay coil via the high-side drive circuit and the low-side drive circuit to control the opening and closing of the relays.

Conditions for Running DTCs

P1E4C 00, P1E52 00 and P1E58 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1E5F 00: The main positive relay is closed.

Conditions for Setting DTCs

P1E4C 00 and P1E52 00: It is detected that the voltage difference between the two ends of the main positive relay is less than or equal to 5V for more than 500 ms.

P1E58 00: It is detected that the voltage difference between the two ends of the main positive relay is greater than or equal to 5V for more than 500 ms.

P1E5F 00: It is detected that the voltage difference between the two ends of the main positive relay is greater than or equal to 5V for more than 10s.

Operations of ECU after Failure

P1E4C 00, P1E52 00 and P1E58 00:

- The charging power is limited to 0kW, the discharge power is limited to 0kW.
- The red high-voltage battery MIL turns on.

P1E5F 00: The charging power is limited to 10kW, the discharge power is limited to 25kW.

Conditions for Clearing DTCs

P1E4C 00 and P1E52 00:

- It is detected that the voltage difference between the two ends of the main positive relay is greater than 5V for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E58 00:

- It is detected that the voltage difference between the two ends of the main positive relay is less than 5V for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E5F 00:

- It is detected that the voltage difference between the two ends of the main positive relay is less than 5V for more than 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Main positive relay/precharge relay failure:
   - Replace the EDM.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E4D, P1E53, P1E59 and P1E60

DTC Description

DTC	FTB	Failure Description
P1E4D	00	Main Negative Relay Failed Weld Check at Sequence Up
P1E53	00	Main Negative Relay Failed Weld Check at Sequence Down
P1E59	00	Main Negative Relay Closure Failure
P1E60	00	Main Negative Relay Unexpected Open

Subsystem Principle

The electrical distribution module (EDM) contains the main negative relay. The main negative relay is connected with the high-voltage negative electrode of the battery pack. The high-voltage battery management system (BMS) is connected with the relay coil via the high-side drive circuit and the low-side drive circuit to control the opening and closing of the relays.

Conditions for Running DTCs

P1E4D 00, P1E53 00 and P1E59 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1E60 00: The main negative relay is closed.

Conditions for Setting DTCs

P1E4D 00: It is detected that the voltage value at the rear end of the main negative relay is greater than or equal to 5V for more than 500 ms.

P1E53 00: It is detected that the voltage value at the rear end of the main negative relay is less than or equal to 5V for more than 300 ms.

P1E59 00: It is detected that the voltage value at the rear end of the main negative relay is greater than or equal to 5V for more than 500 ms.

P1E60 00: It is detected that the voltage value at the rear end of the main negative relay is greater than or equal to 5V for more than 10s.

Operations of ECU after Failure

P1E4D 00 and P1E53 00: None.

P1E60 00: The charging power is limited to 0kW, the discharge power is limited to 0kW.

P1E59 00:

- The charging power is limited to 10kW, the discharge power is limited to 25kW.
- The red high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1E4D 00:

- It is detected that the voltage value at the rear end of the main negative relay is greater than 5V for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E53 00:

- It is detected that the voltage value at the rear end of the main negative relay is greater than 5V for more than 40 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E59 00:

- It is detected that the voltage value at the rear end of the main negative relay is less than 5V for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E60 00:

- It is detected that the voltage value at the rear end of the main negative relay is less than 5V for more than 10 s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Main negative relay failure:
   - Replace the EDM.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E51, P1E57, P1E5E and P1E64

DTC Description

DTC	FTB	Failure Description
P1E51	00	Off-board Charge Relay Failed Weld Check at Sequence Up
P1E57	00	Off-board Charge Relay Failed Weld Check at Sequence Down
P1E5E	00	Off-board Charge Relay Closure Failure
P1E64	00	Off-board Charge Relay Unexpected Open

Subsystem Principle

The fast charge-negative relay and the main negative relay are connected in series, and the fast charge-negative relay is outside the battery pack. The BMS is responsible for sending and controlling the fast charge-negative relay, and the CCU is responsible for the action, detection and diagnosis of the fast charge-negative relay.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E51 00, P1E57 00: It is detected that the voltage value of fast charge relay is less than or equal to 5V, which lasts for more than 500 ms.

P1E5E 00: The fast charge relay cannot be closed for more than 500ms.

P1E64 00: The voltage difference between the two ends of the fast charge relay is greater than 10V, which lasts for more than 10s.

Operations of ECU after Failure

P1E51 00: The charging power is limited to 0kW, the discharge power is limited to 0kW.

P1E57 00: None.

P1E5E 00:

- The charging power is limited to 0kW, the discharge power is limited to 0kW.
- The red high-voltage battery MIL turns on.

P1E64 00: Disable charging.

Conditions for Clearing DTCs

P1E51 00 and P1E57 00:

- It is detected that the voltage value of fast charge relay is greater than 5V, which lasts for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E5E 00:

- The fast charge relay can be closed for more than 500 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E64 00:

- The voltage difference between the two ends of the fast charge relay is less than 10V, which lasts for more than 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Fast charge relay failure:
   - Replace/repair the high-voltage power distribution unit.
3. High-voltage distribution unit failure:
   - Replace/repair the high-voltage power distribution unit.
4. HV/LV CCU failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the harness and connectors of HV distribution unit - HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the high-voltage power distribution unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the high-voltage power distribution unit.

   ® Normal, go to 4.
4. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.
5. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1E5A

DTC Description

DTC	FTB	Failure Description
P1E5A	00	Precharge Relay Closure Failure

Subsystem Principle

The electrical distribution module (EDM) contains a pre-charge relay. The pre-charge relay is connected with the high-voltage positive electrode of the battery pack. Before the main positive relay is closed, the high-voltage battery management system (BMS) will control and close the pre-charge relay to charge the capacitive load in the external circuit, and the main positive relay can not be closed until the pre-charge is completed.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

It is detected that the voltage difference between two ends of the pre-charge relay is greater than or equal to 5V, which lasts for more than 500 ms.

Operations of ECU after Failure

- The charging power is limited to 0kW, the discharge power is limited to 0kW.
- The red high-voltage battery MIL turns on.

Conditions for Clearing DTCs

- It is detected that the voltage difference between the two ends of the pre-charge relay is less than 5V, which lasts for more than 60 ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Pre-charge relay failure:
   - Replace the EDM.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E6D and P1E94

DTC Description

DTC	FTB	Failure Description
P1E6D	00	Sum of Cell Voltage is Different with Module Voltage
P1E94	00	Sum of Cell Voltage is Different with Pack Voltage

Subsystem Principle

Battery modules of the battery pack are equipped with battery cell monitoring units, and each CMU collects the cell voltage and total voltage of the respective battery modules.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E6D 00: At least 1 CMU reports the mismatch of voltage values.

P1E94 00: The difference between the total voltage of the battery pack and the sum of the voltages of battery cells in the battery module is greater than or equal to 10V, which lasts for 10s.

Operations of ECU after Failure

P1E6D 00: None.

P1E94 00: The charging power is limited to 10kW, the discharge power is limited to 25kW.

Conditions for Clearing DTCs

P1E6D 00:

- The voltage value reported by CMU is normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E94 00:

- The difference between the total voltage value collected of the battery pack and the total voltage value of the single cells in the battery module is less than 10V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

   ® Normal, flash/replace the BMS/EDM.

   ® Abnormal, go to 2.
2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.
4. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

   ® Normal, go to 5.
5. Check the battery module:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery module.

   ® Normal, go to TAC Assistance.

P1E70, P1E71, P1E72 and P1E73

DTC Description

DTC	FTB	Failure Description
P1E70	00	Cell Over Voltage
P1E71	00	Cell Over Voltage Severe
P1E72	00	Cell Under Voltage
P1E73	00	Cell Under Voltage Severe

Subsystem Principle

The modules in the battery pack are equipped with cell monitoring unit, which monitors the independent battery module in the respective battery module.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E70 00: The maximum voltage of the battery cell is greater than or equal to its calibrated current threshold.

P1E71 00: The maximum voltage of the battery cell is greater than or equal to its calibrated current threshold.

P1E72 00: The minimum voltage of the battery cell is less than or equal to its calibrated current threshold.

P1E73 00: The minimum voltage of the battery cell is less than or equal to its calibrated current threshold.

Operations of ECU after Failure

P1E70 00: None.

P1E71 00: Charging disabled and the charging power is limited to 0kW.

P1E72 00: Equalization disabled and the discharge power is limited to 7kW.

P1E73 00: Disable charging and equilibrium, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

P1E70 00:

- The maximum voltage of the battery cell is less than its calibrated current threshold.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E71 00:

- The maximum voltage of the battery cell is less than its calibrated current threshold.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E72 00:

- The minimum voltage of the battery cell is greater than its calibrated current threshold.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E73 00:

- The minimum voltage of the battery cell is greater than its calibrated current threshold.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:
   - Use the scan tool to check whether the maximum voltage and minimum voltage of each AFE monitoring battery cell are within the reasonable range (see appendix for the reasonable range).

     ® Normal, flash/replace the BMS/EDM.

     ® Abnormal, go to 2.
2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.
4. Check the cell monitoring unit:

® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

® Normal, go to 5.

5. Check the battery module:

® For hardware damage and other abnormal conditions: Repair/replace the battery module.

® Normal, go to TAC Assistance.

P1E75, P1E76 and P1E77

DTC Description

DTC	FTB	Failure Description
P1E75	00	Cell Over Temperature
P1E76	00	Cell Over Temperature Severe
P1E77	00	Cell Under Temperature

Subsystem Principle

The cell monitoring unit of each battery module can monitor the battery temperature sensing inputs. Each battery temperature sensor is placed in sequence, and a thermistor is used to monitor the temperature, so as to monitor the temperature at different positions of the battery module.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1E75 00: The maximum temperature of battery cells is valid and higher than 55℃, which lasts for more than 4s.

P1E76 00: The maximum temperature of battery cells is valid and higher than 60℃, which lasts for more than 4s.

P1E77 00: The minimum temperature of battery cells is valid and lower than -31℃, which lasts for more than 4s.

Operations of ECU after Failure

P1E75 00: Disable equilibrium, the charging power is limited to 2kW, the discharge power is limited to 7kW.

P1E76 00: Disable charging and equilibrium, the charging power is limited to 0kW, the discharge power is limited to 0kW.

P1E77 00: The charging power is limited to 0kW, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

P1E75 00:

- The maximum temperature of battery cells is invalid or lower than 53℃, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E76 00:

- The maximum temperature of battery cells is invalid or lower than 55℃, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E77 00:

- The minimum temperature of battery cells is invalid or higher than -29℃, which lasts for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Place the start switch in "ON" position, connect the scan tool, read the DTC and confirm if there is any other DTCs related to the cooling system.

   ® Yes, troubleshoot other DTCs first.

   ® No, go to 2.

2. Read relevant parameters to verify the failure state:
   - Use the scan tool to read whether the temperature signal of each AFE monitoring battery is within the reasonable range (see appendix for the reasonable range).

   ® Normal, flash/replace the BMS/EDM.

   ® Abnormal, go to 3.

3. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
4. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 5.

5. Check the cell monitoring unit:

® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

® Normal, go to 6.

6. Check the battery module:

® For hardware damage and other abnormal conditions: Repair/replace the battery module.

® Normal, go to TAC Assistance.

P1E82

DTC Description

DTC	FTB	Failure Description
P1E82	00	On-board Charger Report EPO

Subsystem Principle

The HV/LV combined charging unit (CCU) sends EPO instructions to the high-voltage battery management system (BMS) via CAN communication.

Conditions for Running DTCs

Slow charging wakeup is activated.

Conditions for Setting DTCs

The charging state signal value is incorrect.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The charging state signal value is correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. HV/LV CCU failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness connector between the high-voltage battery pack and the HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E83

DTC Description

DTC	FTB	Failure Description
P1E83	00	Off-board Charger Report Emergency Power Off(EPO)

Subsystem Principle

The high-voltage battery management system (BMS) communicates with the fast charging pile via CAN network, and the fast charging pile will inform BMS of its current running state via CAN network.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

Fast charging pile reports EPO for more than 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Fast charging pile does not report EPO for more than 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. HV/LV combined charging unit failure:
   - Replace/flash the control module.
4. BMS/EDM failure:
   - Replace/flash the control module.
5. Fast charging pile failure:
   - Replace the fast charging pile.

Diagnostic Test Steps

1. Check the harness connectors of high-voltage battery pack and integrated charging port:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 3.

3. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E87

DTC Description

DTC	FTB	Failure Description
P1E87	00	Read DATA from EEPROM Fail

Subsystem Principle

BMS will store data in the EEPROM of BMU hardware circuit for saving and continuing the data information of related functions.

Conditions for Running DTCs

- The main relay is closed without diagnosis and the battery voltage is normal.
- Keep BMS awake within 10s ~ 20s.

Conditions for Setting DTCs

Failed to read data from EEPROM.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Successfully read data from EEPROM.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

• Replace/flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1E9C and P1EC2

DTC Description

DTC	FTB	Failure Description
P1E9C	00	Air Compressor Fuse Broken
P1EC2	00	On-board Charge Charger Fuse Fault

Subsystem Principle

A fuse is connected in series on the high-voltage line between the high-voltage positive relay and the high-voltage connector of the electric A/C compressor/high-low-voltage CCU to protect and limit the current output on this line.

Conditions for Running DTCs

P1E9C 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1EC2 00: HV/LV CCU wake-up activated.

Conditions for Setting DTCs

P1E9C 00: It is detected that the voltage difference between the two ends of the fuse of the electric A/C compressor is greater than 20V.

P1EC2 00: The fuse voltage difference of slow charging circuit is greater than or equal to 20V for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1E9C 00:

- It is detected that the voltage difference between the two ends of the fuse of the electric A/C compressor is lower than 20V.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1EC2 00:

- The fuse differential pressure of slow charging circuit is lower than 20V for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-voltage harness or connector failure:
   - Replace/repair the harness or connector.
2. Fuse failure of electric A/C compressor/HV/LV CCU:
   - Replace the fuse.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the high-voltage harness connectors of high-voltage power distribution unit, high-voltage battery pack, electric A/C compressor/HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the high-voltage harness connector.

   ® Normal, go to 3.
3. Check the fuse of electric A/C compressor/HV/LV CCU:

   ® For hardware damage and other abnormal conditions: Replace the electric A/C compressor/HV/LV CCU.

   ® Normal, go to 4.
4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1E9D

DTC Description

DTC	FTB	Failure Description
P1E9D	00	Closed Main Relay Instruction Error

Subsystem Principle

The intelligent motorcontrol unit (IMCU) sends this DTC to the high-voltage battery management system (BMS) via CAN line.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The BMS detects that the high voltage state PowerMode signal is Off, but the ClsMainRelay is still closed for more than 30s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The BMS detects that the high voltage state PowerMode signal is Off, but the ClsMainRelay is on.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Intelligent motor control unit failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network, BUS System-Powertrain High Speed (Extension) Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the CAN communication harness and connector of high-voltage battery pack - intelligent motor control unit:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the intelligent motor control unit.

   ® Normal, go to 4.
4. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
5. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 6.
6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1EAA and P1EAB

DTC Description

DTC	FTB	Failure Description
P1EAA	00	Pack LV5V Failed High
P1EAB	00	Pack LV5V Failed Low

Subsystem Principle

The high-voltage battery management system (BMS) provides 5V power to the insulation detection loop.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1EAA 00: The 5V supply voltage is higher than 5.2V for 1s.

P1EAB 00: The 5V supply voltage is lower than 4.8V for 1s.

Operations of ECU after Failure

The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1EAA 00:

- The 5V supply voltage is lower than 5.2V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1EAB 00:

- The 5V supply voltage is higher than 4.8V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

• Replace/flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1EB1

DTC Description

DTC	FTB	Failure Description
P1EB1	00	On-board Charger Status Abnormal

Subsystem Principle

When the HV/LV combined charging unit starts charging, it reports its own state to the high-voltage battery management system (BMS) via CAN communication.

Conditions for Running DTCs

HV/LV CCU wake-up activated.

Conditions for Setting DTCs

The state of HV/LV CCU is abnormal.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The state of HV/LV CCU is normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. HV/LV CCU failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness connector between the high-voltage battery pack and the HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1EB2

DTC Description

DTC	FTB	Failure Description
P1EB2	00	Isolation Value Is Too Low During Charging

Subsystem Principle

When the HV/LV CCU starts charging, the high-voltage battery management system (BMS) monitors the insulation state.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The insulation value is lower than 270k Ω for 3S.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The insulation value is higher than 270k Ω for 3S.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. HV harness failure:
   - Replace/repair the high-voltage harness.
2. HV/LV CCU failure:
   - Replace/repair the HV/LV CCU.
3. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the insulation state of high-voltage harness between HV/LV CCU and high-voltage battery pack:

   ® Insulation value less than the standard value: Replace/repair the high-voltage harness.

   ® Normal, go to 3.
3. Check the insulation state of HV/LV CCU:

   ® Insulation value less than standard value: Replace/repair the HV/LV CCU.

   ® Normal, go to 4.
4. Check the insulation state of high-voltage battery pack:

   ® Insulation value less than the standard value: Replace/repair the BMS/EDM.

   ® Normal, go to 5.
5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

Diagnostic Test Methods

1. Insulation testing method for HV/LV CCU:
   - Disconnect the high voltage harness connector of the HV/LV CCU.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the positive/negative terminals of the HV/LV CCU and the vehicle body ground.
2. Insulation testing method for high-voltage battery pack:
   - Disconnect the high-voltage battery pack high-voltage wire harness connector.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the positive/negative terminals of the high-voltage battery pack and the vehicle body ground.
3. Insulation testing method for high-voltage battery packs and high-voltage wiring harnesses:
   - Disconnect the high-voltage wiring harness connector of the high-voltage battery pack and the high-voltage distribution unit.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the two terminals of the high-voltage wire harness connector and the vehicle body ground.
4. Insulation testing method for high-voltage wiring harness of the HV/LV CCU:
   - Disconnect the high-voltage wiring harness connector between the HV/LV CCU and the high-voltage distribution unit.
   - Select an insulation meter within the 1000V range and use it to measure the insulation resistance between the two terminals of the high-voltage wire harness connector and the vehicle body ground.

P1EB4

DTC Description

DTC	FTB	Failure Description
P1EB4	88	Internal CAN Bus Off

Subsystem Principle

The high-voltage battery management system (BMS) communicates with the high-voltage acquisition module (HVM) via the internal CAN.

Conditions for Running DTCs

- The start switch is in "ON" position.
- The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 3.
3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1EC1, U1562 and U1563

DTC Description

DTC	FTB	Failure Description
P1EC1	00	Aux Battery is Too Low before Closing Relays
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The high-voltage battery management system (BMS) needs the low-voltage system of the vehicle to input a voltage of about 12V to meet its own working needs. BMS will monitor the input voltage value to ensure that the system works properly.

Conditions for Running DTCs

P1EC1 00: During the closing of the relay.

U1563 16: The start switch is in "ON" position.

U1562 17: The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1EC1 00: Before the relay is closed, the storage battery voltage is lower than 9V.

U1562 17: The supply voltage is higher than 16V for 1s.

U1563 16: The supply voltage is lower than 9V for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1EC1 00:

- Before the relay is closed, the storage battery voltage is higher than 9V.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U1562 17:

- The supply voltage is lower than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U1563 16:

- The supply voltage is higher than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Storage battery aging/damaged:
   - Replace the storage battery.
2. Harness or connector failure:
   - Replace/repair the harness or connector.
3. Storage battery cable failure:
   - Replace/repair the storage battery cable.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Energy Storage System

Diagnostic Test Steps

1. Check the storage battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the harness and connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the storage battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1EFF

DTC Description

DTC	FTB	Failure Description
P1EFF	87	BMS Reports Lost Communication With AFE Summary

Subsystem Principle

The high-voltage battery management module (BMS) monitors the status of individual battery cells through the battery cell monitoring unit.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

BMS reported that it lost communication with any AFE for more than 30s.

Operations of ECU after Failure

Disable the equilibrium, and the charging capacity is limited to 70%.

Conditions for Clearing DTCs

- The CMU communicates with all AFEs normally for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace the cell monitoring unit.
3. BMS/EDM failure:
   - Replace/flash the control module.
4. Battery module failure:
   - Replace the battery module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:
   - Use the scan tool to read "AFE Lost Communication Data" to confirm which AFE lost communication with.

AFE1-3	CMU1
AFE4-6	CMU2
AFE7-9	CMU3

   ® Normal, flash/replace the BMS/EDM.

   ® Abnormal, go to 2.

2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
3. Check the communication harness and connectors between each cell monitoring unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.

4. Check the harness and connectors of the high-voltage battery management module - cell monitoring unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 5.

5. Check the corresponding faulty cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Replace the battery cell monitoring unit.

   ® Normal, go to 6.

6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F10

DTC Description

DTC	FTB	Failure Description
P1F10	87	Lost Communication with off-board Charger Module

Subsystem Principle

The high-voltage battery management system (BMS) communicates with the fast charging control module via the CAN line.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

Lost communication with fast charging module for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Normal communication with fast charging module lasts for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. HV/LV CCU failure:
   - Replace the HV/LV CCU.
3. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the CAN communication harness and connectors of the high-voltage battery pack - HV/LV CCU:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the HV/LV combined charging unit:

   ® For hardware damage and other abnormal conditions: Replace the HV/LV CCU.

   ® Normal, go to 4.
4. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
5. Check the harness connector of high-voltage battery management module:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 6.
6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F16, P1F66 and P1F8B

DTC Description

DTC	FTB	Failure Description
P1F16	98	Off-board Charger Socket Over Temperature
P1F66	00	Off-board Charge Socket Failure Hardware
P1F8B	98	Off-board Charger Socket Over Temperature

Subsystem Principle

During fast charging, the high-voltage battery management system (BMS) should monitor the temperature of the fast charging port to prevent accidents such as fire caused by over-temperature .

Conditions for Running DTCs

P1F16 98: The BMS is under fast charge mode.

P1F66 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1F8B 98: The main relay is closed without diagnosis and the battery voltage is normal and BMS in fast charge mode.

Conditions for Setting DTCs

P1F16 98: The fast charging port temperature is higher than 120℃ for 9s.

P1F66 00: In driving mode, the temperature change of the fast charging port is abnormal for 9s.

P1F8B 98: The positive and negative temperature of fast charging port is higher than 110℃ for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1F16 98:

- The temperature of fast charging port is lower than 105℃ for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F66 00:

- The temperature change of the fast charging port is normal for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8B 98:

- The positive and negative temperature of fast charging port is lower than 110℃ for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. HV/LV CCU failure:
   - Replace/flash the control module.
4. Intelligent motor control unit failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System, Intelligent Electronic Control System

Diagnostic Test Steps

1. Check the harness and connectors of the HV/LV CCU - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the harness and connectors of the intelligent motor control unit - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 4.

4. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.

5. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 6.

6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1F17

DTC Description

DTC	FTB	Failure Description
P1F17	07	Ess Cooling System Abnormal

Subsystem Principle

The high-voltage battery management system (BMS) controls the opening and closing of the cooling water pump to cool the battery pack.

Conditions for Running DTCs

Battery cooling system works.

Conditions for Setting DTCs

The battery cooling system works, the maximum temperature of the battery cell is higher than 45℃ and the BMS coolant temperature is higher than 50℃ for 30s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The battery cooling system not works, the maximum temperature of the battery cell is lower than 45℃ and the BMS coolant temperature is lower than 50℃ for 30s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-pressure battery pack cooling water pipe failure:
   - Replace the cooling water pipe.
2. Harness or connector failure:
   - Replace/repair the harness or connector.
3. High-pressure battery pack coolant pump failure:
   - Replace the high-voltage battery pack coolant pump.
4. Intelligent motor control unit failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Intelligent Electronic Control System

Diagnostic Test Steps

1. Check the cooling water pipe of high-voltage battery pack:

   ® For coolant pipe aging, looseness, damage or leakage and other abnormal conditions: Replace the coolant pipe.

   ® Normal, go to 2.

2. Check the harness and connectors of the high-voltage battery pack coolant pump - intelligent motor control unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the high-voltage battery pack coolant pump:

   ® For hardware damage and other abnormal conditions: Replace the high-voltage battery pack coolant pump.

   ® Normal, go to 4.

4. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.

5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F31, P1F32, P1F33, P1F34, P1F35, P1F36, P1F37, P1F38 and P1F39

DTC Description

DTC	FTB	Failure Description
P1F31	87	CMU Reports Lost Communication with Analog Front End Circuit 01
P1F32	87	CMU Reports Lost Communication with Analog Front End Circuit 02
P1F33	87	CMU Reports Lost Communication with Analog Front End Circuit 03
P1F34	87	CMU Reports Lost Communication with Analog Front End Circuit 04
P1F35	87	CMU Reports Lost Communication with Analog Front End Circuit 05
P1F36	87	CMU Reports Lost Communication with Analog Front End Circuit 06
P1F37	87	CMU Reports Lost Communication with Analog Front End Circuit 07
P1F38	87	CMU Reports Lost Communication with Analog Front End Circuit 08
P1F39	87	CMU Reports Lost Communication with Analog Front End Circuit 09

Subsystem Principle

Each main battery module is equipped with a cell monitoring unit (CMU), which monitors the state of the single cell it is responsible for, and sends the collected data to the high-voltage battery management system (BMS) in a serial manner.

Conditions for Running DTCs

BMS wake-up activated.

Conditions for Setting DTCs

P1F31 87: CMU lost communication with AFE01 for more than 30s.

P1F32 87: CMU lost communication with AFE02 for more than 30s.

P1F33 87: CMU lost communication with AFE03 for more than 30s.

P1F34 87: CMU lost communication with AFE04 for more than 30s.

P1F35 87: CMU lost communication with AFE05 for more than 30s.

P1F36 87: CMU lost communication with AFE06 for more than 30s.

P1F37 87: CMU lost communication with AFE07 for more than 30s.

P1F38 87: CMU lost communication with AFE08 for more than 30s.

P1F39 87: CMU lost communication with AFE09 for more than 30s.

Operations of ECU after Failure

Disable charging and equilibrium, the charging power is limited to 0kW, the discharge power is limited to 25kW.

Conditions for Clearing DTCs

P1F31 87:

- The communication between CMU and AFE01 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F32 87:

- The communication between CMU and AFE02 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F33 87:

- The communication between CMU and AFE03 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F34 87:

- The communication between CMU and AFE04 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F35 87:

- The communication between CMU and AFE05 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F36 87:

- The communication between CMU and AFE06 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F37 87:

- The communication between CMU and AFE07 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F38 87:

- The communication between CMU and AFE08 is normal, lasting for more than 1s.

- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F39 87:

- The communication between CMU and AFE09 is normal, lasting for more than 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace the cell monitoring unit.
3. BMS/EDM failure:
   - Replace/flash the control module.
4. Battery module failure:
   - Replace the battery module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the communication harness and connectors between each cell monitoring unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the harness and connectors of the high-voltage battery management module - cell monitoring unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 4.
4. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Replace the battery cell monitoring unit.

   ® Normal, go to 5.
5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F63

DTC Description

DTC	FTB	Failure Description
P1F63	00	Manual Service Disconnect (MSD) is not Plugged

Subsystem Principle

The low voltage MSD is set on the power supply circuit of the relay. When the low voltage MSD is unplugged during maintenance, the BMS cannot close the relay, in this way to prevent electric shock.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

The MSD is open for 8s.

Operations of ECU after Failure

The charging power is limited to 0kW, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

- The MSD is closed for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Manual service disconnect failure:
   - Replace the MSD.
3. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Energy Storage System

Diagnostic Test Steps

1. Check the harness and connectors of high-voltage battery pack - manual service disconnect, front compartment fuse box - manual service disconnect:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the MSD:

   ® For MSD looseness, internal connectivity failure, hardware damage and other abnormal conditions: replace the MSD.

   ® Normal, go to 3.

3. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
4. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 5.

5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F64, P1F65 and P1F8C

DTC Description

DTC	FTB	Failure Description
P1F64	00	On-board Charge Socket Over Temperature
P1F65	00	On-board Charge Socket Failure Hardware
P1F8C	98	On-board Charge Socket Over Temperature

Subsystem Principle

After the slow charging process starts, the high-voltage battery management system (BMS) periodically detects the slow charging temperature to prevent excessive temperature.

Conditions for Running DTCs

P1F64 00 and P1F65 00: The main relay is closed without diagnosis and the battery voltage is normal.

P1F8C 98: The main relay is closed without diagnosis and the battery voltage is normal, and in slow charge mode.

Conditions for Setting DTCs

P1F64 00: The slow charging port temperature is higher than 120℃ for 9s.

P1F65 00: The temperature change of slow charging port is abnormal for 9s.

P1F8C 98: The positive and negative temperature of slow charging port is higher than 110℃ for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1F64 00:

- The slow charging port temperature is lower than 120℃ for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F65 00:

- The temperature change of slow charging port is normal for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F8C 98:

- The positive and negative temperature of slow charging port is lower than 110℃ for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. CCU failure:
   - Replace/flash the control module.
4. Intelligent motor control unit failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System, Intelligent Electronic Control System

Diagnostic Test Steps

1. Check the harness and connectors of the HV/LV CCU - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the harness and connectors of the intelligent motor control unit - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 4.

4. Check the HV/LV combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.

5. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 6.

6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F6B and P1F6C

DTC Description

DTC	FTB	Failure Description
P1F6B	00	Cell Temperature Sensor Line is Open Wire
P1F6C	00	Cell Voltage Sensor Line is Open Wire

Subsystem Principle

The high-voltage battery management system (BMS) monitors the temperature and voltage of the battery cell via the battery cell monitoring unit (CMU), which is connected with the temperature sensor/battery cell pole via the sampling line.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

P1F6B 00: The signal line of cell temperature sensor is open circuit for 30s.

P1F6C 00: The cell voltage sensor signal line is open circuit for 30s.

Operations of ECU after Failure

P1F6B 00: None.

P1F6C 00:

- SOC value is limited to 70%.
- The yellow high-voltage Battety MIL turns on.

Conditions for Clearing DTCs

P1F6B 00:

- The cell temperature sensor signal line is normal for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F6C 00:

- The cell voltage sensor signal line is normal for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Cell monitoring unit failure:
   - Replace/repair the battery cell monitoring unit.
3. Battery module failure:
   - Replace/repair the battery module.
4. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
2. Check the harness and connector of battery cell monitoring unit - battery module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the cell monitoring unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

   ® Normal, go to 4.
4. Check the battery module:

   ® For hardware damage and other abnormal conditions: Repair/replace the battery module.

   ® Normal, go to TAC Assistance.

P1F70, P1F71, P1F72, P1F73, P1F74, P1F75, P1F7C and P1F7D

DTC Description

DTC	FTB	Failure Description
P1F70	00	Analog Front End Circuit Fault Summary
P1F71	00	Analog Front End Circuit Fault Which Need to Forbid Charging
P1F72	00	Analog Front End Circuit Fault Which Need to Forbid Balancing
P1F73	00	Analog Front End Circuit Sampling Voltage Redundancy Check Failed
P1F74	00	Analog Front End Circuit Sampling Temperature Redundancy Check Failed
P1F75	00	Analog Front End CircuitFault Which Need Light On
P1F7C	00	Analog Front End Circuit Cell Voltage is InValid
P1F7D	00	Analog Front End Circuit Cell Temperature is InValid

Subsystem Principle

Each main battery module is equipped with a cell monitoring unit (CMU), which monitors the state of the single cell it is responsible for, and sends the collected data to the high-voltage battery management system (BMS) in a serial manner.

Conditions for Running DTCs

The BMS is powered on.

Conditions for Setting DTCs

P1F70 00: The analog front-end circuit fails for 30s.

P1F71 00: The analog front-end circuit failure disables charging for 30s.

P1F72 00: The analog front-end circuit failure disables equalization for 30s.

P1F73 00: Sampling voltage check failure of analog front-end circuit lasts for 30s.

P1F74 00: Sampling temperature check failure of analog front-end circuit lasts for 30s.

P1F75 00: The analog front-end circuit self-test MIL turns on for 30s.

P1F7C 00: The voltage signal of analog front-end circuit unit is invalid for 30s.

P1F7D 00: The analog front-end circuit single temperature signal is invalid for 30s.

Operations of ECU after Failure

P1F70 00, P1F73 00, P1F74 00 and P1F7D 00: None.

P1F71 00: Disable the charging.

P1F72 00, P1F7C 00: Disable the equilibrium.

P1F75 00: The yellow high-voltage battery MIL turns on.

Conditions for Clearing DTCs

P1F70 00:

- The analog front-end circuit does not fail for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F71 00:

- The analog front-end circuit has no failure of charging disabled for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F72 00:

- The analog front-end circuit has no failure of equalization disabled for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F73 00:

- The sampling voltage check of analog front-end circuit is normal for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F74 00:

- The sampling temperature check of analog front-end circuit is normal for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F75 00:

- The analog front-end circuit self-test MIL does not turn on for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F7C 00:

- The voltage signal of analog front-end circuit unit is valid for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F7D 00:

- The temperature signal of analog front-end circuit unit is valid for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:

- Replace/repair the harness or connector.

2. Cell monitoring unit failure:

- Replace/repair the battery cell monitoring unit.

3. Battery module failure:

- Replace/repair the battery module.

4. BMS/EDM failure:

- Replace/flash the control module.

Reference Circuit Diagram

ESS Internal Circuit-51kWh&64kWh / ESS Internal Circuit-77kWh

Diagnostic Test Steps

1. Read relevant parameters to verify the failure state:

- Use the scan tool to read the maximum and minimum voltage of each AFE monitoring battery cell, and check whether the temperature signal of AFE monitoring battery is within the reasonable range (see appendix for the reasonable range).

® Normal, flash/replace the high-voltage battery management module.

® Abnormal, go to 2.

2. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.

3. Check the harness and connector of battery cell monitoring unit - battery module:

® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

® Normal, go to 4.

4. Check the cell monitoring unit:

® For hardware damage and other abnormal conditions: Repair/replace the battery cell monitoring unit.

® Normal, go to 5.

5. Check the battery module:

® For hardware damage and other abnormal conditions: Repair/replace the battery module.

® Normal, go to TAC Assistance.

P1F7E, P1F82, P1F83, P1F84, U0073, U0074, U0146, U0198, U0292, U0293, U0414, U1112 and U1113

DTC Description

DTC	FTB	Failure Description
P1F7E	00	Invalid Data Received From CCU
P1F82	00	Invalid Data Received From Sensing Diagnostic Module(SDM)
P1F83	00	Invalid Data Received From ISC
P1F84	87	Lost Communication With IMCU From Extend CAN Or Cal CAN
U0073	88	Control Module Communication Bus Off on Powertrain High Speed CAN
U0074	88	Control Module Communication Bus Off on PT EXT CAN
U0146	87	Lost Communication with ICC/CCP/GW
U0198	87	Lost Communication with TBOX/IAM
U0292	87	Lost Communication with Secondary Axle Motor Controller (SAC)
U0293	87	Lost Communication With IMCU
U0414	87	Lost Communication with Integrated Brake System(IBS)
U1112	87	Lost Communication With OBC/CCU
U1113	87	Lost Communication with Secondary Axle Motor Controller (SAC)

Subsystem Principle

The high-voltage battery management system (BMS) communicates with other modules via CAN bus.

Conditions for Running DTCs

P1F7E, P1F82 and P1F83: The main relay is closed without diagnosis and the battery voltage is normal.

P1F84:

- The main relay is closed without diagnosis and the battery voltage is normal.
- The Extend CAN or Cal CAN bus is not turned off.

U0073 and U0074:

- The start switch is in "ON" position.
- The main relay is closed without diagnosis and the battery voltage is normal.

U0146 87 and U0414 87:

- The start switch is in "ON" position.
- The battery voltage is normal.
- DTC U0073 88 is not read.

U0198 87:

- Slow charge wake-up activated and vehicle wake-up not activated.
- BMS sends 0x443.

U0292 87 and U1113 87:

- The start switch is in "ON" position.
- The battery voltage is normal.
- DTC U0073 88 and U0074 88 is not read.

U0293:

- The start switch is in "ON" position.
- The battery voltage is normal.
- DTC U0074 88 is not read.

U1112:

- The start switch is in "ON" position.
- The battery voltage is normal.
- Slow charge is waken up.
- The CCU network is not closed.

Conditions for Setting DTCs

P1F7E 00: Invalid data is received from combined charging unit.

P1F82 00: Invalid data is received from Sensing Diagnostic Module.

P1F83 00: Invalid data is received from ISG motor control unit

P1F84 87: Lost communication with IMCU for 2s.

U0073 88 and U0074 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The specified data frame sent by ICC/CCP/GW cannot be received within 2s.

U0198 87: The specified data frame sent by TBOX/IAM cannot be received within 2s.

U0292 87 and U1113 87: The specified data frame sent by SAC cannot be received within 2s.

U0293 87: The specified data frame sent by IMCU cannot be received within 2s.

U0414 87: The specified data frame sent by IBS cannot be received within 2s.

U1112 87: The specified data frame sent by CCU cannot be received within 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1F7E 00:

- The CCU message is received and verified successfully.

- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F82 00:

- The SDM message is received and verified successfully.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F83 00:

- The ISC message is received and verified successfully.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1F84 87:

- The information sent by IMCU is received for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0073 88 and U0074 88:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0146 87:

- The received data frame sent by ICC/CCP/GW lasts for 400ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0198 87:

- The received data frame sent by TBOX/IAM lasts for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0292 87 and U1113 87:

- The received data frame sent by SAC lasts for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0293 87:

- The received data frame sent by IMCU lasts for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0414 87:

- The received data frame sent by IBS lasts for 200ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U1112 87:

- The received data frame sent by CCU lasts for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Failure of CCU (for P1F7E 00 and U1112 87):
   - Replace/flash the control module.
3. Sensing Diagnostic Module failure (for P1F82 00):
   - Replace/flash the control module.
4. ISG motor control unit failure (for P1F83 00):
   - Replace/flash the control module.
5. Intelligent motor control unit failure (for P1F84 87 and U0293 87):
   - Replace/flash the control module.
6. Intelligent computing controller failure (for U0146 87):
   - Replace/flash the control module.
7. Intelligent computing domain controller failure (for U0198 87):
   - Replace/flash the control module.
8. Failure of front shaft drive motor control module (for U0292 87 and U1113 87):
   - Replace/flash the control module.
9. Integrated Brake System failure (for U0414 87):
   - Replace/flash the control module.
10. BMS/EDM failure:
    - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network, BUS System-Powertrain High Speed (Extension) Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the control module CAN communication harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.

4. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for

more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.

5. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 6.

6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F7F

DTC Description

DTC	FTB	Failure Description
P1F7F	00	High Voltage between OffChg Negative Relay Over Limit Before Closing

Subsystem Principle

Before charging with the European standard pile, test the voltage at both ends of the fast charge relay, which shall meet the requirements of the European standard.

Conditions for Running DTCs

- The main relay is closed without diagnosis and the battery voltage is normal.
- The fast charging is ready.

Conditions for Setting DTCs

The voltage of fast charge-negative relay exceeds the limit before it is electrically closed.

Operations of ECU after Failure

The charging power is limited to 0kW, the discharge power is limited to 0kW.

Conditions for Clearing DTCs

- The voltage of the fast charge-negative relay is normal before it is electrically closed.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Fast charge relay failure:
   - Replace/repair the high-voltage power distribution unit.
3. High-voltage distribution unit failure:
   - Replace/repair the high-voltage power distribution unit.
4. CCU failure:
   - Replace/flash the control module.
5. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control system

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the harness and connectors of HV distribution unit - CCU:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the high-voltage power distribution unit:

   ® For hardware damage and other abnormal conditions: Repair/replace the high-voltage power distribution unit.

   ® Normal, go to 4.
4. Check the combined charging unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 5.
5. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F81

DTC Description

DTC	FTB	Failure Description
P1F81	00	ISC Report HV Inhibit

Subsystem Principle

ISC monitors the high-voltage disable failure, and once it occurs, it needs to stop the high-voltage.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

ISC reports high-voltage power-on limit failure for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- ISC does not report high-voltage power-on limit for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. BMS/EDM failure:
   - Replace/flash the control module.
3. Intelligent motor control unit failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the intelligent motor control unit and harness connector of high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 3.

3. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1F8A

DTC Description

DTC	FTB	Failure Description
P1F8A	00	Pack Thermal Runaway Happened

Subsystem Principle

The modules in the battery pack are equipped with cell monitoring units (CMU), which monitors the independent battery module in the respective battery module.

Conditions for Running DTCs

The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

Battery pack thermal runaway fault lasts for 5s.

Operations of ECU after Failure

Disable charging and equilibrium, the charging power is limited to 0kW, the discharge power is limited to 7kW.

Conditions for Clearing DTCs

- Battery pack has no thermal runaway fault lasts for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. High-voltage battery pack failure:

- Replace the high-voltage battery pack.

Diagnostic Test Steps

1. Check the high-voltage battery pack:

   ® For hardware damage and other abnormal conditions: Replace the high-voltage battery pack.

   ® Normal, go to TAC Assistance.

P1F96

DTC Description

DTC	FTB	Failure Description
P1F96	00	IMCU 0x8A Message Data Invalid

Subsystem Principle

The high-voltage battery management system (BMS) communicates with the intelligent motor control unit (IMCU) via CAN.

Conditions for Running DTCs

- The main relay is closed without diagnosis and the battery voltage is normal.
- IMCU is powered on.

Conditions for Setting DTCs

The check of information sent by IMCU failed for 2s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The check of information sent by IMCU is correct for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failure:
   - Replace/repair the harness or connector.
2. Intelligent motor control unit failure:
   - Replace/flash the control module.
3. BMS/EDM failure:
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network, BUS System-Powertrain High Speed (Extension) Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the CAN communication harness and connector of high-voltage battery pack - intelligent motor control unit:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the intelligent motor control unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the intelligent motor control unit.

   ® Normal, go to 4.
4. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, operate the manual service disconnect to cut off the high-voltage battery power supply, use the special tool to remove the high-voltage battery pack, and open the cover for repair. Disassembly and assembly of high-voltage battery pack must be strictly in accordance with the specification requirements of disassembly and assembly part of the maintenance manual.
5. Check the harness connector of BMS/EDM:

   ® For connector looseness, Pin deformation/breakage: Repair/replace the harness connector.

   ® Normal, go to 6.
6. Check the BMS/EDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

U2004 and P1E3A

DTC Description

DTC	FTB	Failure Description
U2004	04	Inactive Software is Invalid
P1E3A	01	MCU Data Error
P1E3A	02	MCU Run Invalid

Subsystem Principle

Internal failure of high-voltage battery management system (BMS), without external circuits involved.

Conditions for Running DTCs

U2004: 1s after wake-up.

P1E3A: The main relay is closed without diagnosis and the battery voltage is normal.

Conditions for Setting DTCs

U2004 04: Inactive area software is invalid for more than 2s.

P1E3A 01: MCU data check error exceeds 30s.

P1E3A 02: MCU reports invalid operation for more than 30s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

U2004 04:

- Inactive area software is valid for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E3A 01:

- MCU data check is correct for more than 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1E3A 02:

- MCU reports that the operation is valid for more than 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BMS/EDM failure:

- Flash the control module.

Diagnostic Test Steps

1. Check the BMS/EDM:

® For software mismatch: Flash the control module.

® Normal, go to TAC Human Assistance.

Combined Charging Unit (CCU)

DTC Index

List

DTC	FTB	Description	MIL*	Failure Level*
P1D61	01	LV Output Current Zero Drift Fault	OFF	IV
P1D62	19	DC/DC Output Current Above Threshold	ON	IIA
P1D63	4B	DC/DC Coolling Liquid Over Temperature	ON	IIA
P1D65	01	B+/B- Connection Error	OFF	IIA
P1D66	16	DC/DC Output Voltage Under Minimum Value	ON	IIA
P1D66	17	DC/DC Output Voltage Above Threshold	ON	IIA
P1D67	01	DCDC Active Discharge Timeout	OFF	IV
P1D68	16	DC/DC Input Voltage Below Threshold	ON	IIA
P1D68	17	DC/DC Input Voltage Above Threshold	ON	IIA
P1D6A	01	DCDC Mode Change Timeout Error	OFF	IV
P1D6B	12	DC/DC Output Current Sensor Circuit Short to Battery	ON	IIA
P1D6C	11	DC/DC PCB Temperature Sensor Circuit Short to Ground	ON	IIA
P1D6C	12	DC/DC PCB Temperature Sensor Circuit Short to Battery	ON	IIA
P1D6D	12	DC/DC Output Voltage Sensor Circuit Short to Battery	ON	IIA
P1D82	00	DC/DC Request Mode Error	ON	IIA
P1D83	1C	DC/DC Request Voltage Out of Range	OFF	IV
P1D84	02	DC/DC Crash Signal Enable	ON	IIA
P1FA0	16	AC Voltage is too Low	OFF	IIB
P1FA1	17	AC Voltage is too High	OFF	IIB
P1FA3	17	Bus voltage of Power Factor Correction (PFC) Output is too High	OFF	IIB
P1FA4	00	Bus voltage of Power Factor Correction (PFC) Output is too Low	OFF	IIB
P1FA5	01	High Voltage Output to BMS Short between Positive and Negtive	OFF	IIB
P1FA6	17	High Voltage Output to BMS is too High	OFF	IIB
P1FA7	16	High Voltage Output to BMS is too Low	OFF	IIB
P1FA9	08	Communication Between Primary MCU and Secondary MCU is Failure	OFF	IIB
P1FAA	08	Communication Between CAN MCU and Secondary MCU is Failure	OFF	IIB
P1FAB	02	Wakeup Signal Error	OFF	IIB
P1FAD	00	High Voltage Interlock(HVIL) to BMS is Unlocked	OFF	IIB
P1FB4	4B	Temperature of Primary PFC1 Inductance is too high	OFF	IIB
P1FB6	4B	Temperature of Primary LLC1 Transformer is too high	OFF	IIB
P1FB7	4B	Temperature of Primary LLC2 Transformer is too high	OFF	IIB
P1FB8	09	OBC doesn't Work Due to Ambient Temperature is too Low	OFF	III
P1FB9	98	OBC doesn't Work Due to Ambient Temperature is too High	OFF	III
P1FBB	98	OBC will Stop Due to the Temperature of Positive Temperature sensor in Slow Charging Socket is too High	OFF	IIB
P1FBC	01	OBC will Stop Due to the Temperature of Negative Temperature sensor in Slow Charging Socket is too High	OFF	IIB
P1FBE	1C	OBC will Not Start Due to the Alternating Current (AC) Input is Overtime	OFF	IIB
P1FBF	1C	OBC will Stop Due to the Alternating Current (AC) Input is Abnormal Shut Off	OFF	IIB

DTC	FTB	Description	MIL*	Failure Level*
P1FC0	03	OBC will Stop Due to the Control Pilot (CP) PWM is Overtime	OFF	IIB
P1FC1	03	OBC will Stop Due to the Duty Cycle of Control Pilot (CP) PWM is Abnormal	OFF	IIB
P1FC2	01	The Power Output to Battery is too High	OFF	IIB
P1FC3	00	OBC will Stop Due to the PFC MCU Shut Down the Power Loop through I/O Signal Output to the Main MCU	OFF	IIB
P1FC5	96	The temperature sensor in onboard charging socket is failure	OFF	IIB
P1FEC	16	INV HV Voltage is too Low	OFF	III
P1FEC	19	INV HV Current is too High	OFF	III
P1FEC	00	Isolation Fault	OFF	III
P1FEC	17	INV HV Voltage is too High	OFF	III
P1FED	16	INV PFC Bus Voltage is too Low	OFF	III
P1FED	17	INV PFC Bus Voltage is too High	OFF	III
P1FED	72	Offboard Charging Negative Relay Open Unexpectedly	OFF	IIB
P1FED	73	Offboard Charging Negative Relay Adhesion	OFF	IIB
P1FED	92	Offboard Charging Negative Relay Status Unknown	OFF	IIB
P1FEE	16	INV AC Voltage is too Low	OFF	III
P1FEE	17	INV AC Voltage is too High	OFF	III
P1FEE	19	INV AC Current is too High	OFF	III
P1FEE	00	OffBoard Charging Socket Is Too High	OFF	IIB
P1FEF	00	Water Channel Error	OFF	IIB
P1FEF	87	LIN Communication Timeout	OFF	III
P3210	00	CP Out Fault	OFF	III
P3211	00	Onboard Charging Socket Electric Lock Fault	OFF	IIB
P3212	00	Offboard Charging Socket Electric Lock Fault	OFF	IIB
P3213	00	AC Voltage to Onboard Charging Socket Interlock(HVIL) is Unlocked	OFF	IIB
P3214	00	ACP to BMS Interlock(HVIL) is Unlocked	OFF	IIB
P3215	00	PDU to BMS Interlock(HVIL) is Unlocked	OFF	IIB
P3216	00	ESSPTC to BMS Interlock(HVIL) is Unlocked	OFF	IIB
P3217	00	WLC to BMS Interlock(HVIL) is Unlocked	OFF	IIB
U0073	88	Control Module Communication Bus Off on Hybrid High Speed CAN	OFF	IIB
U0074	88	Control Module Communication Bus Off on PT EXT CAN	OFF	I
U0075	88	Control Module Communication Bus Off on BMS Cal CAN	OFF	IIB
U0146	87	Lost Communication with ICC/CCP/GW	OFF	IV
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)	OFF	IV
U0198	87	Lost Communication with TBOX/IAM	OFF	IV
U0293	87	Lost Communication With IMCU	OFF	IIB
U1111	87	Lost Communication With Battery Management System(BMS)	OFF	IIB
U1562	17	Battery Voltage High	ON	IIA
U1563	16	Battery Voltage Low	ON	IIA
U1763	87	Frame SDM_HSC1_FrP00 Timeout	OFF	IV
U1897	87	Frame BMS_HSC1_FrP02 Timeout	OFF	IV
U2001	42	ECU Error - EEPROM Error	OFF	III

DTC	FTB	Description	MIL*	Failure Level*
U2002	42	ECU Error - RAM Error	ON	IIA
U2004	04	Inactive Software is Invalid	OFF	III
U2005	41	ECU Flash Checksum Error	ON	IIA

*Remarks:

1. The yellow flashing of the charging and discharging status indicator light indicates that there is a fault with the charging and discharging
2. Failure level description:
   - I: Stop the vehicle immediately for repair
   - IIA: Slowly drive the vehicle to the nearest service station for inspection in a safe situation
   - IIB: Drive the vehicle as soon as possible to the nearest service station for inspection at a convenient time
   - III: Inspection during maintenance
   - IV: Inspection based on actual demand

Diagnosis Information and Procedure

P1D61 and P1D6A

DTC Description

DTC	FTB	Failure Description
P1D61	01	LV Output Current Zero Drift Fault
P1D6A	01	DCDC Mode Change Timeout Error

Subsystem Principle

It is the combined charging unit (CCU) internal failure, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1D61 01: The DC/DC output current is greater than 10A.

P1D6A 01: The DC/DC output current is less than 10A for 10s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1D61 01:

- The DC/DC output current is less than or equal to 10A.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D6A 01:

- The DCDC output current is higher than 10A for 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D62, P1D65, P1D66 and P1D67

DTC Description

DTC	FTB	Failure Description
P1D62	19	DC/DC Output Current Above Threshold
P1D65	01	B+/B- Connection Error
P1D66	16	DC/DC Output Voltage Under Minimum Value
P1D66	17	DC/DC Output Voltage Above Threshold
P1D67	01	DCDC Active Discharge Timeout

Subsystem Principle

DCDC is integrated in the combined charging unit (CCU), DCDC converts the high voltage power from the high-voltage battery pack into low voltage power, so as to charge the 12V battery and supply power for low-voltage electric appliances.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1D62 19: The DC/DC output current is greater than 230A for 20ms.

P1D65 01: The DC/DC output voltage is less than 3V±5%.

P1D66 16: The DC/DC output voltage is less than 8.5V for 200ms.

P1D66 17: The DC/DC output voltage is greater than 16.5V for 200ms.

P1D67 01:

- The discharging activation time is greater than 60s.
- The input voltage is greater than 60V.

Operations of ECU after Failure

P1D62 19 and P1D66 16 17:

- DC/DC converter is powered off.
- The charging and discharging status indicator light flashes yellow.

P1D65 01: DC/DC converter is powered off.

P1D67 01: None.

Conditions for Clearing DTCs

P1D62 19:

- The current returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D65 01:

- The DC/DC output voltage is greater than 3V±5%.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D66 16:

- The DC/DC output voltage is greater than 9V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D66 17:

- The DC/DC output voltage is less than 16V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D67 01:

- 1s after DC/DC exits the discharging state.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Battery failure:
   - Replace the battery.
3. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness or connector of Combined Charging Unit (CCU)- Battery :

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D63

DTC Description

DTC	FTB	Failure Description
P1D63	4B	DC/DC Coolling Liquid Over Temperature

Subsystem Principle

The temperature sensor is mainly used to collect the PEB coolant temperature, and the intelligent motor control unit (IMCU) uses the coolant temperature signal from the temperature sensor to adjust the parameters in real time to control the operation of the cooling system, so as to achieve the best cooling effect.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

DC/ DC coolant temperature is greater than or equal to 86℃ for 3s.

Operations of ECU after Failure

- DC/DC converter is powered off.
- The charging and discharging status indicator light flashes yellow.

Conditions for Clearing DTCs

- DC/ DC coolant temperature is less than or equal to 65℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU connection coolant pipe failure:
   - Replace/repair the coolant pipe.
3. Coolant temperature sensor failure:
   - Replace/repair the coolant temperature sensor.
4. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Intelligent Electronic Control System

Diagnostic Test Steps

1. Check the CCU connection coolant pipe:

   ® For coolant pipe aging, looseness, damage or leakage and other abnormal conditions: Repair/replace the coolant pipe.

   ® Normal, go to 2.

2. Check the harness and connector of the coolant temperature sensor - IMCU:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the coolant temperature sensor:

   ® For hardware damage and other abnormal conditions: Repair/replace the coolant temperature sensor.

   ® Normal, go to 4.

4. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D68

DTC Description

DTC	FTB	Failure Description
P1D68	16	DC/DC Input Voltage Below Threshold
P1D68	17	DC/DC Input Voltage Above Threshold

Subsystem Principle

The combined charging unit (CCU) is connected to the high-voltage battery pack, which supplies high-voltage electricity to the CCU.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1D68/16: The DC/DC input voltage is less than 210V for 1s.

P1D68 17: The DC/DC input voltage is greater than 500V for 200ms.

Operations of ECU after Failure

- DC/DC converter is powered off.
- The charging and discharging status indicator light flashes yellow.

Conditions for Clearing DTCs

P1D68 16:

- The DC/DC input voltage is greater than 220V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D68 17:

- The DC/DC input voltage is less than 490V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. HV harness or connector failures:
   - Replace/repair the HV harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.
3. High-voltage battery pack internal failure:
   - Replace the high-voltage battery pack.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D6B, P1D6C, P1D6D, P1D82 and P1D83

DTC Description

DTC	FTB	Failure Description
P1D6B	12	DC/DC Output Current Sensor Circuit Short to Battery
P1D6C	11	DC/DC PCB Temperature Sensor Circuit Short to Ground
P1D6C	12	DC/DC PCB Temperature Sensor Circuit Short to Battery
P1D6D	12	DC/DC Output Voltage Sensor Circuit Short to Battery
P1D82	00	DC/DC Request Mode Error
P1D83	1C	DC/DC Request Voltage Out of Range

Subsystem Principle

It is the combined charging unit (CCU) internal failure, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1D6B 12: DC/DC output current sensor feedback value is equal to 4096.

P1D6C 11: DC/ DC PCB temperature sensor feedback value is equal to 0.

P1D6C 12: DC/ DC PCB temperature sensor feedback value is equal to 4096.

P1D6D 12: DC/DC output voltage sensor feedback value is equal to 4096.

P1D82 00: DC/DC request mode error.

P1D83 1C:

- The DC/DC requested voltage is greater than 16V.
- The DC/DC requested voltage is less than 9V.

Operations of ECU after Failure

P1D6B, P1D6C, P1D6D and P1D82:

- DC/DC converter is powered off.
- The charging and discharging status indicator light flashes yellow.

P1D83 1C: The default output is 14.25V.

Conditions for Clearing DTCs

P1D6B 12:

- DC/DC output current sensor feedback value is less than 4096.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D6C 11:

- DC/ DC PCB temperature sensor feedback value is greater than 0.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D6C 12:

- DC/ DC PCB temperature sensor feedback value is less than 4096.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D6D 12:

- DC/DC output voltage sensor feedback value is less than 4096.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D82 00:

- DC/DC Request Mode Correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1D83 1C:

- The DC/DC requested voltage is greater than 9V and less than 16V.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1D84

DTC Description

DTC	FTB	Failure Description
P1D84	02	DC/DC Crash Signal Enable

Subsystem Principle

The impact sensor communicates with the supplemental restraint system sensing and diagnostic module (SDM) via the hardwire, and the SDM communicates with the combined charging unit (CCU) via the CAN bus.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

DC/DC receives the impact signal.

Operations of ECU after Failure

- DC/DC enters standby and discharging mode.
- The charging and discharging status indicator light flashes yellow.

Conditions for Clearing DTCs

- DC/DC does not receive the impact signal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. SDM internal failure:
   - Replace/flash the control module.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the harness and connector of CCU - SDM:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the SDM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.
4. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FA0 and P1FA1

DTC Description

DTC	FTB	Failure Description
P1FA0	16	AC Voltage is too Low
P1FA1	17	AC Voltage is too High

Subsystem Principle

The vehicle converts the external AC power into DC power via the CCU which is charged into the high-voltage battery pack (BMS), thereby providing sufficient power for vehicle driving.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FA0 16:

- Single-phase charging: The AC voltage is less than 75V for 100ms.
- Three-phase charging: The AC voltage is less than 288V for 100ms.

P1FA1 17:

- Single-phase charging: The AC voltage is greater than 275V for 100ms.
- Three-phase charging: The AC voltage is greater than 476V for 100ms.

Operations of ECU after Failure

The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

Conditions for Clearing DTCs

P1FA0 16:

- Single-phase charging: The AC voltage is greater than 85V for 1s.
- Three-phase charging: The AC voltage is greater than 296V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FA1 17:

- Single-phase charging: The AC voltage is less than 265V for 1s.
- Three-phase charging: The AC voltage is less than 460V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FA3, P1FA4 and P1FC2

DTC Description

DTC	FTB	Failure Description
P1FA3	17	Bus voltage of Power Factor Correction (PFC) Output is too High
P1FA4	00	Bus voltage of Power Factor Correction (PFC) Output is too Low
P1FC2	01	The Power Output to Battery is too High

Subsystem Principle

It is the combined charging unit (CCU) internal failure, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FA3 17 (6.6KW): The power factor correction (PFC) circuit output bus voltage is greater than 450V for100ms.

P1FA3 17 (11KW): The power factor correction (PFC) circuit output bus voltage is greater than 880V for100ms.

P1FA4 00 (6.6KW): The power factor correction (PFC) circuit output bus voltage is lower than 300V for 120ms.

P1FA4 00 (11KW):

- Single-phase charging: The power factor correction (PFC) circuit output bus voltage is lower than 400V for 100ms.
- Three-phase charging: The power factor correction (PFC) circuit output bus voltage is lower than 500V for 100ms.

P1FC2 01: The output power is 20% higher than the Max. power for 1s.

Operations of ECU after Failure

P1FA3 17 and P1FC2 01: The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

P1FA4 00: Powered off.

Conditions for Clearing DTCs

P1FA3 17 (6.6KW):

- The power factor correction (PFC) circuit output bus voltage is lower than 380V for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FA3 17 (11KW):

- The power factor correction (PFC) circuit output bus voltage is lower than 790V for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FA4 00:

- The voltage returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FC2 01:

- The actual output power is less than the allowed output power, and it is reset once every 10s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Try to charge:

   ® Charging failed: replace the CCU.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FA5, P1FA6 and P1FA7

DTC Description

DTC	FTB	Failure Description
P1FA5	01	High Voltage Output to BMS Short between Positive and Negtive
P1FA6	17	High Voltage Output to BMS is too High
P1FA7	16	High Voltage Output to BMS is too Low

Subsystem Principle

The vehicle converts the external AC power into DC power via the CCU which is charged into the high-voltage battery pack (BMS), thereby providing sufficient power for vehicle driving.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FA5 01 (6.6KW): The output current to high-voltage battery pack is higher than 40A for 140ms.

P1FA5 01 (11KW): The output current to high-voltage battery pack is higher than 60A for 260ms.

P1FA6 17: The output voltage to high-voltage battery pack is higher than 500V for 100ms.

P1FA7 16: The output voltage to high-voltage battery pack is lower than 210V for 500ms.

Operations of ECU after Failure

P1FA5 01 and P1FA6 17: Powered off.

P1FA7 16: The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

Conditions for Clearing DTCs

P1FA5 01:

- The current returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FA6 17:

- The output voltage to high-voltage battery pack is lower than 490V for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FA7 16:

- The output voltage to high-voltage battery pack is higher than 220V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.
3. High-voltage battery pack internal failure:
   - Replace the high-voltage battery pack.

Reference Circuit Diagram

High Voltage Distribution System

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - high-voltage battery pack:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FA9, P1FAA, P1FB4, P1FB6, P1FB7, P1FB8, P1FB9, P1FC3, P1FEF, U2001, U2002 , U2004 and U2005

DTC Description

DTC	FTB	Failure Description
P1FA9	08	Communication Between Primary MCU and Secondary MCU is Failure
P1FAA	08	Communication Between CAN MCU and Secondary MCU is Failure
P1FB4	4B	Temperature of Primary PFC1 Inductance is too high
P1FB6	4B	Temperature of Primary LLC1 Transformer is too high
P1FB7	4B	Temperature of Primary LLC2 Transformer is too high
P1FB8	09	OBC doesn't Work Due to Ambient Temperature is too Low
P1FB9	98	OBC doesn't Work Due to Ambient Temperature is too High
P1FC3	00	OBC will Stop Due to the PFC MCU Shut Down the Power Loop through I/O Signal Output to the Main MCU
P1FEF	00	Water Channel Error
U2001	42	ECU Error - EEPROM Error
U2002	42	ECU Error - RAM Error
U2004	04	Inactive Software is Invalid
U2005	41	ECU Flash Checksum Error

Subsystem Principle

It is the combined charging unit (CCU) internal failure, not involving external circuits.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FA9 08: Communication between the master and slave controllers fails for 10s.

P1FAA 08: Communication between the low-voltage controller and slave controller fails for 10s.

P1FB4 4B (6.6KW): Master PFC1 inducer temperature is higher than 133℃ for 3s.

P1FB4 4B (11KW): Master PFC1 inducer temperature is higher than 113℃ for 3s.

P1FB6 4B (6.6KW): Master LLC1 transformer temperature is higher than 125℃ for 3s.

P1FB6 4B (11KW): Master LLC1 transformer temperature is higher than 103℃ for 3s.

P1FB7 4B (6.6KW): Master LLC2 transformer temperature is higher than 125℃ for 3s.

P1FB7 4B (11KW): Master LLC2 transformer temperature is higher than 113℃ for 3s.

P1FB8 09: Ambient temperature is lower than -40℃ for 3s.

P1FB9 98 (6.6KW): Ambient temperature is higher than 133℃ for 3s.

P1FB9 98 (11KW): Ambient temperature is higher than 113℃ for 3s.

P1FC3 00: Due to slave controller failure, the signal from the master controller is turned off.

P1FEF 00: Absolute value of difference between water temperature 2 and water temperature 1 is ≥6℃, and the maximum values of water temperature 2 and water temperature 1 are higher than 75℃ for 1s.

U2001 42: CCU controller detects an EEPROM read/write error.

U2002 42: CCU controller detects a RAM read/write error.

U2004 04: Inactive Zone Software invalid for more than 2s.

U2005 41: CCU controller detects a calculation checksum error that was previously written in the flash memory.

Operations of ECU after Failure

P1FA9, P1FAA, P1FB4, P1FB6, P1FB7, P1FB8, P1FB9 and P1FC3: The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

P1FEF: The system will be reset for 3 times, if the fault is not eliminated, the system will be powered off.

U2001: Charging accuracy will get worse.

U2004 : None

U2002 and U2005:

- Power off.
- The charging and discharging status indicator light flashes yellow.

Conditions for Clearing DTCs

P1FA9 08:

- Communication between the master and slave controllers resumes.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FAA 08:

- Communication between the low-voltage controller and slave controller resumes.

- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB4 4B (6.6KW):

- Master PFC1 inducer temperature is lower than 120℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB4 4B (11KW):

- Master PFC1 inducer temperature is lower than 90℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB6 4B (6.6KW):

- Master LLC1 transformer temperature is lower than 105℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB6 4B (11KW):

- Master LLC1 transformer temperature is lower than 90℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB7 4B (6.6KW):

- Master LLC2 transformer temperature is lower than 105℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB7 4B (11KW):

- Master LLC2 transformer temperature is lower than 90℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB8 09:

- Ambient temperature is higher than -35℃ for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB9 98 (6.6KW):

- Ambient temperature is lower than 120℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FB9 98 (11KW):

- Ambient temperature is lower than 90℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FC3 00:

- The slave controller recovers from the failure.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEF 00:

- Absolute value of difference between water temperature 2 and water temperature 1 is ≤ 5℃, and the maximum values of water temperature 2 and water temperature 1 are lower than 65℃ for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U2001 42:

- No failure is detected after a wakeup cycle.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U2002 42:

- ECU can perform the initialisation of RAM from Step 1 to Step 4.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U2004 04:

- Inactive area software valid for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U2005 41:

- No failure is detected after a wakeup cycle.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Try to charge:

   ® Charging failed: replace the CCU.

® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

P1FAB

DTC Description

DTC	FTB	Failure Description
P1FAB	02	Wakeup Signal Error

Subsystem Principle

The combined charging unit (CCU) sends the wakeup signal, to confirm the start of charging.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

The hardware wakeup signal was not sent successfully for 500ms.

Operations of ECU after Failure

The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

Conditions for Clearing DTCs

- The hardware wakeup signal was sent successfully for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FAD

DTC Description

DTC	FTB	Failure Description
P1FAD	00	High Voltage Interlock(HVIL) to BMS is Unlocked

Subsystem Principle

The CCU uses HVIL circuit to monitor the connection status of high-voltage connector.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

The high-voltage interlock signal to high-voltage battery pack is at low level for 3s.

Operations of ECU after Failure

Powered off.

Conditions for Clearing DTCs

- The high-voltage interlock signal to high-voltage battery pack is at high level for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness and connector at the high-voltage DC side of the combined charging unit:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FBB, P1FBC, P1FBE, P1FBF, P1FC0, P1FC1, P1FC5, P1FEE, P3211 and P3212

DTC Description

DTC	FTB	Failure Description
P1FBB	98	OBC will Stop Due to the Temperature of Positive Temperature sensor in Slow Charging Socket is too High
P1FBC	01	OBC will Stop Due to the Temperature of Negative Temperature sensor in Slow Charging Socket is too High
P1FBE	1C	OBC will Not Start Due to the Alternating Current (AC) Input is Overtime
P1FBF	1C	OBC will Stop Due to the Alternating Current (AC) Input is Abnormal Shut Off
P1FC0	03	OBC will Stop Due to the Control Pilot (CP) PWM is Overtime
P1FC1	03	OBC will Stop Due to the Duty Cycle of Control Pilot (CP) PWM is Abnormal
P1FC5	96	The temperature sensor in onboard charging socket is failure
P1FEE	00	OffBoard Charging Socket Is Too High
P3211	00	Onboard Charging Socket Electric Lock Fault
P3212	00	Offboard Charging Socket Electric Lock Fault

Subsystem Principle

The slow charging circuit inside the combined charging unit (CCU) converts the AC power into high-voltage DC power, and charge the high-voltage battery pack.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FBB 98: Slow charging port positive pole temperature is higher than 111℃ for 1s.

P1FBC 01: Slow charging port negative pole temperature is higher than 111℃ for 1s.

P1FBE 1C: After the switch 2 is turned off, the AC input voltage is lower than 60V for 5s.

P1FBF 1C: AC input is abnormal.

P1FC0 03: Charging cable connection control signal is at 9V high potential for 5min.

P1FC1 03: Charging cable connection control signal PWM duty ratio is less than 8% or greater than 97% for 500ms.

P1FC5 96: Temperature sensor voltage is greater than 3.3V or less than 0.03V for 5s.

P1FEE 00: Charging port negative pole temperature sensor temperature is higher than 111℃ for 1s.

P3211 00 and P3212 00:

- The electronic lock negative socket is at low potential for 500ms.
- Send a lock or unlock command, and drive 3 times, the electronic lock feedback keeps at low potential for 50ms or at high potential for 150ms.
- The electronic lock pin 4 keeps at low potential for 500ms.

Operations of ECU after Failure

P1FBB, P1FBC, P1FBE, P1FBF, P1FC0, P1FC1 and P1FEE: The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

P1FC5 96: reset for 5 times, if the DTC still exists, restrict the output power and input current to be lower than 16A.

P3211 00: None.

P3212 00: Powered off.

Conditions for Clearing DTCs

P1FBB 98:

- Slow charging port positive pole temperature is lower than 91℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FBC 01:

- Slow charging port negative pole temperature is lower than 91℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FBE 1C:

- After the switch 2 is turned off, the AC input voltage is higher than 65V for 200ms, or the switch 2 is turned on.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FBF 1C:

- AC input is normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FC0 03:

- The charging cable connection control signal is at 9V for 200ms or the switch 2 is turned on.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FC1 03:

- Charging cable connection control signal PWM duty ratio is between 8%- 97% for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FC5 96:

- The temperature sensor voltage is between 0.03V - 3.3V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEE 00:

- Charging port negative pole temperature sensor temperature is lower than 91℃ for 60s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3211 00 and P3212 00:

- Send a lock command, the electronic lock positive socket and negative socket is at high potential for 500ms, or send a unlock command, the electronic lock positive socket is at low potential, and negative socket is at high potential for 500ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

P1FEC, P1FED and P1FEE

DTC Description

DTC	FTB	Failure Description
P1FEC	16	INV HV Voltage is too Low
P1FEC	17	INV HV Voltage is too High
P1FEC	19	INV HV Current is too High
P1FED	16	INV PFC Bus Voltage is too Low
P1FED	17	INV PFC Bus Voltage is too High
P1FEE	16	INV AC Voltage is too Low
P1FEE	17	INV AC Voltage is too High
P1FEE	19	INV AC Current is too High

Subsystem Principle

The vehicle converts the external AC power into DC power via the CCU which is charged into the high-voltage battery pack (BMS), thereby providing sufficient power for vehicle driving, and the CCU can also convert the high-voltage DC power into AC output.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FEC 16: The inverter input high voltage is less than 210V for 1s.

P1FEC 17: The inverter input high voltage is greater than 500V for 200ms.

P1FEC 19 (6.6KW): The inverter input current is greater than 28A for 100ms.

P1FEC 19 (11KW): The inverter input current is greater than 30A for 100ms.

P1FED 16 (6.6KW): The inverter PFC circuit voltage is less than 280V for 120ms.

P1FED 16 (11KW): The inverter PFC circuit voltage is less than 350V for 100ms.

P1FED 17 (6.6KW): The inverter PFC circuit voltage is greater than 470V for 100ms.

P1FED 17 (11KW): The inverter PFC circuit voltage is greater than 860V for 100ms.

P1FEE 16: The inverter output AC voltage is less than 170V for 100ms.

P1FEE 17: The inverter output AC voltage is greater than 264V for 100ms.

P1FEE 19: The inverter output AC current is greater than the limit for 150ms.

Operations of ECU after Failure

The system will be reset for 3 times, if the fault is not eliminated, the system will be powered off.

Conditions for Clearing DTCs

P1FEC 16:

- The inverter input high voltage is greater than 220V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEC 17:

- The inverter input high voltage is less than 490V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEC 19:

- The current returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 16 (6.6KW):

- The inverter PFC circuit voltage is greater than 290V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 16 (11KW):

- The inverter PFC circuit voltage is greater than 370V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 17 (6.6KW):

- The inverter PFC circuit voltage is less than 380V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 17 (11KW):

- The inverter PFC circuit voltage is less than 790V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEE 16:

- The voltage returns to normal.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEE 17:

- The inverter output AC voltage is less than 245V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FEE 19:

- The inverter output AC current is less than the limit for 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps

1. Check the combined charging unit (CCU) harness or connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FEC

DTC Description

DTC	FTB	Failure Description
P1FEC	00	Isolation Fault

Subsystem Principle

The combined charging unit (CCU) has the function of insulation detection.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

In the INV mode, the insulation resistance is less than 200kΩ for 150ms.

Operations of ECU after Failure

Power off.

Conditions for Clearing DTCs

- In the INV mode, the insulation resistance is greater than 370kΩ for 4s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. CCU HV harness failure:
   - Replace/repair the HV harness.
2. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

High voltage Distribution System

Diagnostic Test Steps

1. Place the start switch in "OFF" position, disconnect the negative battery cable, keep the vehicle in standstill for more than 5min, and operate the manual service disconnect to cut off the high-voltage battery power supply.
2. Check the insulation status of CCU HV harness:

   ® Insulation value less than the standard value: replace/repair the HV harness.

   ® Normal, go to 3.
3. Check the insulation resistance of the combined charging unit:

   ® Insulation value less than the standard value: replace the control module.

   ® Normal, go to 4.
4. Check the Combined Charging Unit:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FED

DTC Description

DTC	FTB	Failure Description
P1FED	72	Offboard Charging Negative Relay Open Unexpectedly
P1FED	73	Offboard Charging Negative Relay Adhesion
P1FED	92	Offboard Charging Negative Relay Status Unknown

Subsystem Principle

The combined charging unit (CCU) actuates, detects and diagnoses the fast charging negative relay.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P1FED 72: After sending the command to drive the relay close for 280ms, the relay status is open for 120ms.

P1FED 73: After sending the command to drive the relay open for 280ms, the relay status is close for 120ms.

P1FED 92: After sending the command to drive the relay close or open for 280ms, the relay status is unknown for 120ms.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

P1FED 72:

- After sending the command to drive the relay off for 280ms, the relay status is close for 120ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 73:

- After sending the command to drive the relay on for 280ms, the relay status is open for 120ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P1FED 92:

- After sending the command to drive the relay off or on for 280ms, the relay status is close or open for 120ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Fast charging relay failure:
   - Replace the high-voltage power distribution unit.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - high-voltage power distribution unit (PDU):

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the high-voltage power distribution unit:

   ® For hardware damage and other abnormal conditions: Replace the high-voltage power distribution unit.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Assistance.

P1FEF

DTC Description

DTC	FTB	Failure Description
P1FEF	87	LIN Communication Timeout

Subsystem Principle

The combined charging unit (CCU) communicates with the charging port door via LIN bus.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

Master MCU has not received the message from MCU for 10s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Master MCU has received the message from MCU.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Charging port door failure:
   - Replace the charging port door
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-LIN

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - charging port door:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the charging port door:

   ® For hardware damage and other abnormal conditions: Replace the charging port door.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P3210

DTC Description

DTC	FTB	Failure Description
P3210	00	CP Out Fault

Subsystem Principle

The combined charging unit (CCU) confirms that the charging is ready through CP signal.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

CP output voltage exceeds the 12V±1V or 9V±1V range, or the deviation between the duty ratio output and detection is greater than 2% for 500ms.

Operations of ECU after Failure

Power off.

Conditions for Clearing DTCs

- CP output voltage is within the 12V±1V or 9V±1V range, or the deviation between the duty ratio output and detection is less than 2% for 500ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Integrated charging port failure:
   - Replace the integrated charging port.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the harness and connector of combined charging unit (CCU) - integrated charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the integrated charging port:

   ® For hardware damage and other abnormal conditions: Replace the integrated charging port.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P3213, P3214, P3215, P3216 and P3217

DTC Description

DTC	FTB	Failure Description
P3213	00	AC Voltage to Onboard Charging Socket Interlock(HVIL) is Unlocked
P3214	00	ACP to BMS Interlock(HVIL) is Unlocked
P3215	00	PDU to BMS Interlock(HVIL) is Unlocked
P3216	00	ESSPTC to BMS Interlock(HVIL) is Unlocked
P3217	00	WLC to BMS Interlock(HVIL) is Unlocked

Subsystem Principle

The combined charging unit (CCU) uses the interlock loops to monitor the connection status and failure of HV connectors.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

P3213 00: The AC interlock signal is at low potential for 3s.

P3214 00: The ACP interlock signal is at low potential for 3s.

P3215 00: The PDU interlock signal is at low potential for 3s.

P3216 00: The ESSPTC interlock signal is at low potential for 3s.

P3217 00: The WLC interlock signal is at low potential for 3s.

Operations of ECU after Failure

P3213 00: Powered off.

P3214, P3215, P3216 and P3217: None.

Conditions for Clearing DTCs

P3213 00:

- The AC interlock signal is at high potential for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3214 00:

- The ACP interlock signal is at high potential for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3215 00:

- The PDU interlock signal is at high potential for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3216 00:

- The ESSPTC interlock signal is at high potential for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

P3217 00:

- The WLC interlock signal is at high potential for 100ms.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Electric A/C compressor/HV power distribution unit/HV battery pack electric heater/High voltage electric heater failure:
   - Replace the electric A/C compressor/HV power distribution unit/HV battery pack electric heater/High voltage electric heater.
3. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Combined Charging Unit

Diagnostic Test Steps

1. Check the harness and connector of combinedcharging unit (CCU) - the electric A/C compressor/HV power distribution unit/HV battery pack electric heater/High voltage electric heater:

   Check the harness and connector of the electric A/C compressor - High voltage electric heater:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the electric A/C compressor/HV power distribution unit/HV battery pack electric heater/High voltage electric heater:

   ® For hardware damage and other abnormal conditions: Replace the electric A/C compressor/HV power distribution unit/HV battery pack electric heater/High voltage electric heater.

   ® Normal, go to 3.

3. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0073, U0074, U0075, U0146, U0151, U0198, U0293, U1111, U1763 and U1897

DTC Description

DTC	FTB	Failure Description
U0073	88	Control Module Communication Bus Off on Hybrid High Speed CAN
U0074	88	Control Module Communication Bus Off on PT EXT CAN
U0075	88	Control Module Communication Bus Off on BMS Cal CAN
U0146	87	Lost Communication with ICC/CCP/GW
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)
U0198	87	Lost Communication with TBOX/IAM
U0293	87	Lost Communication With IMCU
U1111	87	Lost Communication With Battery Management System(BMS)
U1763	87	Frame SDM_HSC1_FrP00 Timeout
U1897	87	Frame BMS_HSC1_FrP02 Timeout

Subsystem Principle

The combined charging unit (CCU) communicates with other control modules via the HS CAN bus.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

U0073 88, U0074 88 and U0075 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 87: The DTC will be set if the specified data frame from the GW is not received within 2s.

U0151 87: The DTC will be set if the specified data frame from the SDM is not received within 2s.

U0198 87: The DTC will be set if the specified data frame from the TBOX is not received within 2s.

U0293 87: The DTC will be set if the specified data frame from the IMCU is not received within 2s.

U1111 87: The DTC will be set if the specified data frame from the BMS is not received within 2s.

U1763 87: The DTC will be set if the specified data frame from the SDM is not received within 500ms.

U1897 87: The DTC will be set if the specified data frame from the BMS is not received within 500ms.

Operations of ECU after Failure

U0073, U0074 and U0075: The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.

U0146, U0151, U0198, U1763 and U1897: None.

U0293 and U1111: Powered off.

Conditions for Clearing DTCs

U0073, U0074 and U0075:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0146, U0151, U0198, U0293, U1111, U1763 and U1897:

- The corresponding data frame is received in the specified time (20 times the cycle).
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. CCU internal failure:
   - Replace/flash the control module.
3. GW internal failure (for U0146 87):
   - Replace/flash the control module.
4. SDM internal failure (for U0151 87, U1763 87):
   - Replace/flash the control module.
5. TBOX internal failure (for U0198 87):
   - Replace/flash the control module.
6. Intelligent Motor Control Unit (IMCU) internal failure (for U0293 87):
   - Replace/flash the control module.
7. High-voltage battery pack system internal failure (for U1111 87, U1897 87):
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Powertrain High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the harness and connector of combined charging unit (CCU) - gateway module (GW) /sensing and diagnostic module (SDM)/TBOX/intelligent motor control unit (IMCU)/HV battery pack system:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery,

control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

® Normal, go to 3.

3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The combined charging unit (CCU) monitors the system supply voltage to check if the supply voltage of the module is in the normal operating range.

Conditions for Running DTCs

- The vehicle is powered on for 1s.
- DTC enabling is activated.

Conditions for Setting DTCs

U1562 17: The supply voltage is greater than 16V for 1s.

U1563 16 The supply voltage is less than 9V for 1s.

Operations of ECU after Failure

- The system will be reset for 5 times, if the fault is not eliminated, the system will be powered off.
- The charging and discharging status indicator light flashes yellow.

Conditions for Clearing DTCs

U1562 17:

- The supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U1563 16:

- The supply voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Harness or connector failures:
   - Replace/repair the harness or connector.
3. Battery cable failure:
   - Replace/repair the battery cable.
4. CCU internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the harness and connector of combined charging unit (CCU):

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the Combined Charging Unit (CCU):

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Front Infotainment Control Module (FICM)

DTC Index

List

DTC	FTB	Description	Failure Level
B1A01	71	Steering Wheel Controls "Call/Reject" Switch Stuck	III
B1A02	71	Steering Wheel Controls "Mute" Switch Stuck	III
B1A05	71	Steering Wheel Controls "Volume Up" Switch Stuck	III
B1A06	71	Steering Wheel Controls "Volume Down" Switch Stuck	III
B1A07	71	Steering Wheel Controls "Source" Switch Stuck	III
B1A08	71	Steering Wheel Controls "Voice" Switch Stuck	III
B1A10	11	Tuner's Antenna Short to Ground	III
B1A10	12	Tuner's Antenna Short to Battery	III
B1A10	13	Tuner's Antenna Open	III
B1A10	19	Tuner's Antenna Over Current	III
B1A11	11	GPS Signal Short to Ground	III
B1A11	13	GPS Signal Open Circuit	III
B1A13	11	FICM GSM Main Antenna Short to Ground	III
B1A13	13	FICM GSM Main Antenna Open Fault	III
B1A14	11	FICM GSM AUX Antenna Short to Ground	III
B1A14	13	FICM GSM AUX Antenna Open Fault	III
B1A15	11	GPS Signal Short to Ground	III
B1A15	13	GPS Signal Open Circuit	III
B1A1D	87	Lost Display Communication with LCD Panel via LVDS	II
B1A1E	87	Lost Display Communication with Instrument Pack (IPK) via LVDS	II
B1A20	11	FR Speaker Short to Ground	III
B1A20	12	FR Speaker Short to Battery	III
B1A20	1A	FR Speaker Short Circuit	III
B1A20	1B	FR Speaker Open	III
B1A21	11	FL Speaker Short to Ground	III
B1A21	12	FL Speaker Short to Battery	III
B1A21	1A	FL Speaker Short Circuit	III
B1A21	1B	FL Speaker Open	III
B1A22	11	RR Speaker Short to Ground	III
B1A22	12	RR Speaker Short to Battery	III
B1A22	1A	RR Speaker Short Circuit	III
B1A22	1B	RR Speaker Open	III
B1A23	11	RL Speaker Short to Ground	III
B1A23	12	RL Speaker Short to Battery	III
B1A23	1A	RL Speaker Short Circuit	III
B1A23	1B	RL Speaker Open	III
B1A24	01	Power of USB1 Port Error	III
B1A25	11	Microphone1 Short to Ground	III

DTC	FTB	Description	Failure Level
B1A25	12	Microphone1 Short to Battery	III
B1A25	13	Microphone1 Open	III
B1A26	01	Power of USB2 Port Error	III
B1A28	11	Microphone2 Short to Ground	III
B1A28	12	Microphone2 Short to Battery	III
B1A28	13	Microphone2 Open	III
B1A3E	71	Steering Wheel Controls "Seek Up" Switch Stuck	III
B1A3F	71	Steering Wheel Controls "Seek Down" Switch Stuck	III
B1A43	11	Left Side Steering Wheel Controls Short to Ground	III
B1A43	15	Left Side Steering Wheel Controls Short to Battery or Open	III
B1A44	11	Right Side Steering Wheel Controls Short to Ground	III
B1A44	15	Right Side Steering Wheel Controls Short to Battery or Open	III
B1A4B	71	Steering Wheel Controls "Custom" Switch Stuck	III
B1A60	96	Radio Broadcast Receiving Module (RBRM) internal fault	III
B1A61	11	Radio Broadcast Receiving Module (RBRM) FM/AM antenna circuit short to ground	III
B1A61	13	Radio Broadcast Receiving Module (RBRM) FM/AM antenna circuit open	III
B1A62	11	Radio Broadcast Receiving Module (RBRM) DAB antenna circuit short to ground	III
B1A62	13	Radio Broadcast Receiving Module (RBRM) DAB antenna circuit open	III
B1A63	11	Radio Broadcast Receiving Module (RBRM) Audio Line-out circuit short to ground	III
B1A63	12	Radio Broadcast Receiving Module (RBRM) Audio Line-out circuit short to battery	III
B1A63	13	Radio Broadcast Receiving Module (RBRM) Audio Line-out Circuit Open	III
B1AA0	11	Infotainment Faceplate Enable Circuit Short to Ground	III
B1AA0	12	Infotainment Faceplate Enable Circuit Short to Battery	III
B1AE0	12	Left 360° Camera Video Signal Short to Battery	III
B1AE0	14	Left 360° Camera Video Signal Short to Ground or Open	III
B1AE1	12	Right 360° Camera Video Signal Short to Battery	III
B1AE1	14	Right 360° Camera Video Signal Short to Ground or Open	III
B1AE2	12	Front 360° Camera Video Signal Short to Battery	III
B1AE2	14	Front 360° Camera Video Signal Short to Ground or Open	III
B1AE3	12	Rear 360° Camera Video Signal Short to Battery	III
B1AE3	14	Rear 360° Camera Video Signal Short to Ground or Open	III
B1AE4	12	Rear Camera Video Signal Circuit Short to Battery	III
B1AE4	13	Rear Camera Video Signal Circuit Short to Ground or Open	III
B1AE9	11	Camera Power Short to Ground	III
B1AE9	12	Camera Power Short to Battery	III
B1AF3	00	HD 360°Signal Input Fault	III
U0073	88	CAN Bus Off	II
U010F	87	Lost Communication with Air Conditioning Control Module (AC)	II
U0122	87	Lost Communication with Stability Control System (SCS)	II
U0127	87	Lost Communication with Tire Pressure Monitoring System (TPMS)	II
U0131	87	Lost Communication With Power Steering Control Module (EPS)	II

DTC	FTB	Description	Failure Level
U0140	87	Lost Communication with Body Control Module (BCM)	II
U0146	87	Lost Communication with Gateway (GW)	II
U0155	87	Lost Communication with Instrument Pack (IPK)	II
U0170	87	Lost Communication With Ambient Lighting Control Module (ALCM)	II
U0208	87	Lost Communication With Front Left Seat Control Module (FLSM)	II
U1021	87	Lost Communication with Rear Drive Assist Module (BLIS/RDA)	II
U1023	87	Lost Communication with Around View Module (AVM)	II
U1031	87	Lost Communication With Infotainment Faceplate Module(IFP)	II
U110F	87	Lost Communication with Slim Air Vent Module (SAVM)	II
U1264	87	Lost Communication with Front View Camera Module (FVCM)	II
U1266	87	Lost Communication with Pedestrian Alert Control Module (PACM)	II
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)	III
U1562	17	Battery Voltage High	II
U1563	16	Battery Voltage Low	II
U2210	87	Response Timeout_SOME/IP_GW/CCP/ICC	II
U2211	87	Response Timeout_HTTP_GW/CCP/ICC	II
U2262	00	Lost Ethernet Connection with GW/CCP/ICC	II
U2228	87	Response Timeout_SOME/IP_Telematic Control Module	II
U2229	87	Response Timeout_HTTP_Telematic Control Module	II
U2263	00	Lost Ethernet Connection with TBOX	II

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised store for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B1A01, B1A02, B1A05, B1A06, B1A07, B1A08, B1A3E, B1A3F and B1A4B

DTC Description

DTC	FTB	Failure Description
B1A01	71	Steering Wheel Controls "Call/Reject" Switch Stuck
B1A02	71	Steering Wheel Controls "Mute" Switch Stuck
B1A05	71	Steering Wheel Controls "Volume Up" Switch Stuck
B1A06	71	Steering Wheel Controls "Volume Down" Switch Stuck
B1A07	71	Steering Wheel Controls "Source" Switch Stuck
B1A08	71	Steering Wheel Controls "Voice" Switch Stuck
B1A3E	71	Steering Wheel Controls "Seek Up" Switch Stuck
B1A3F	71	Steering Wheel Controls "Seek Down" Switch Stuck
B1A4B	71	Steering Wheel Controls "Custom" Switch Stuck

Subsystem Principle

The audio device can be controlled by the remote buttons mounted on the steering wheel. These commonly-used function buttons can allow some functions of the vehicle to be used in a much more convenient manner and improve driving safety.

Conditions for Running DTCs

The FICM is in wakeup state.

Conditions for Setting DTCs

B1A01 71: Call/Reject button is in the state of being pressed for 60s.

B1A02 71: Mute button is in the state of being pressed for 60s.

B1A05 71: Volume Up button is in the state of being pressed for 60s.

B1A06 71: Volume Down button is in the state of being pressed for 60s.

B1A07 71: Source button is in the state of being pressed for 60s.

B1A08 71: Voice button is in the state of being pressed for 60s.

B1A3E 71: Seek Up button is in the state of being pressed for 60s.

B1A3F 71: Seek Down button is in the state of being pressed for 60s.

B1A4B 71: Custom button is in the state of being pressed for 60s.

Operations of ECU after Failure

Reject the switch input.

Conditions for Clearing DTCs

- The steering wheel button is in the state of being released for 2s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Steering wheel multifunction switch failure:
2. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the steering wheel multifunction switch:

   ® For steering wheel multifunction switch stuck, damage and other abnormal conditions: Repair/replace the steering wheel multifunction switch.

   ® Normal, go to 2.

2. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A10

DTC Description

DTC	FTB	Failure Description
B1A10	11	Tuner's Antenna Short to Ground
B1A10	12	Tuner's Antenna Short to Battery
B1A10	13	Tuner's Antenna Open
B1A10	19	Tuner's Antenna Over Current

Subsystem Principle

The radio antenna is mainly used for receiving radio wave signal in the air, so as to carry out the wireless transmission of satellite data.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1A10 11: The feedback voltage of the antenna module is detected to be less than 0.14V for 1s.

B1A10 12: The feedback voltage of the antenna module is detected to be greater than 1.14V for 1s.

B1A10 13: The feedback voltage of the antenna module is detected to be less than 0.07V for 1s.

B1A10 19: The feedback voltage of the antenna module is detected to be greater than 1.19V for 1s.

Operations of ECU after Failure

No radio signal or the signal is unstable.

Conditions for Clearing DTCs

B1A10 13 and B1A10 19:

- The feedback voltage of the antenna module is detected to be between 0.07V and 1.19V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A10 12 and B1A10 11:

- The feedback voltage of the antenna module is detected to be between 0.14V and 1.14V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Radio antenna failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - radio antenna harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the radio antenna:

   ® For hardware damage and other abnormal conditions: Repair/replace the radio antenna.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A11 and B1A15

DTC Description

DTC	FTB	Failure Description
B1A11	11	GPS Signal Short to Ground
B1A11	13	GPS Signal Open Circuit
B1A15	11	GPS Signal Short to Ground
B1A15	13	GPS Signal Open Circuit

Subsystem Principle

The navigation antenna is used to receive the signal from GPS satellite for vehicle positioning, so as to be used for driving navigation.

Conditions for Running DTCs

The FICM is in wakeup state.

Conditions for Setting DTCs

B1A11 11: It is detected that the feedback voltage of the GPS antenna is less than 0.07V for 1s.

B1A11 13: It is detected that the feedback voltage of the GPS antenna is less than 0.15V for 1s.

B1A15 11: It is detected that the feedback voltage of the GPS antenna is less than 0.05V for 1s.

B1A15 13: It is detected that the feedback voltage of the GPS antenna is less than 0.4V for 1s.

Operations of ECU after Failure

No GPS signal.

Conditions for Clearing DTCs

B1A11 11:

- It is detected that the feedback voltage of the GPS antenna is between 0.07V and 1.14V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A11 13:

- It is detected that the feedback voltage of the GPS antenna is between 0.15V and 1.1V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A15 11:

- It is detected that the feedback voltage of the GPS antenna is between 0.05V and 0.74V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A15 13:

- It is detected that the feedback voltage of the GPS antenna is between 2V and 3.6V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. GPS antenna failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - GPS antenna harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the GPS antenna:

   ® For hardware damage and other abnormal conditions: Repair/replace the GPS antenna.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A13 and B1A14

DTC Description

DTC	FTB	Failure Description
B1A13	11	FICM GSM Main Antenna Short to Ground
B1A13	13	FICM GSM Main Antenna Open Fault
B1A14	11	FICM GSM AUX Antenna Short to Ground
B1A14	13	FICM GSM AUX Antenna Open Fault

Subsystem Principle

The navigation antenna is used to receive the signal from GSM (Global System for Mobile Communication) satellite, so as to carry out mobile network communication.

Conditions for Running DTCs

The FICM is in wakeup state.

Conditions for Setting DTCs

B1A13 11: It is detected that the feedback voltage of the main GSM antenna is between 0.24V and 0.34V for 1s.

B1A13 13: It is detected that the feedback voltage of the main GSM antenna is between 1V and 1.2V for 1s.

B1A14 11: It is detected that the feedback voltage of the secondary GSM antenna is between 0.24V and 0.34V for 1s.

B1A14 13: It is detected that the feedback voltage of the secondary GSM antenna is between 1V and 1.2V for 1s.

Operations of ECU after Failure

No 4G function.

Conditions for Clearing DTCs

- It is detected that the feedback voltage of the GSM antenna is between 0.34V and 1V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. GSM antenna failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - GSM antenna harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the GSM antenna:

   ® For hardware damage and other abnormal conditions: Repair/replace the GSM antenna.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A1D and B1A1E

DTC Description

DTC	FTB	Failure Description
B1A1D	87	Lost Display Communication with LCD Panel via LVDS
B1A1E	87	Lost Display Communication with Instrument Pack (IPK) via LVDS

Subsystem Principle

The front infotainment control module (FICM) communicates with the LCD panel module and the instrument pack (IPK) via the LVDS hard wire.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1A1D 87: The DTC will be set if the specified data frame from the LCD panel module is not received within 2000ms.

B1A1E 87: The DTC will be set if the specified data frame from the IPK is not received within 2000ms.

Operations of ECU after Failure

B1A1D 87:

- Turn off the LCD display.
- Turn off the touch control function.
- Turn off the brightness control function.

B1A1E 87: Turn off IPK related display.

Conditions for Clearing DTCs

- The DTC will be cleared if the corresponding data frame is received for 2000ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. LCD panel failure:
3. Instrument pack internal failure:
4. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - LCD panel/IPK harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the LCD panel:

   ® For hardware damage and other abnormal conditions: Repair/replace the LCD panel.

   ® Normal, go to 3.

3. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to 4.

4. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A20, B1A21, B1A22 and B1A23

DTC Description

DTC	FTB	Failure Description
B1A20	11	FR Speaker Short to Ground
B1A20	12	FR Speaker Short to Battery
B1A20	1A	FR Speaker Short Circuit
B1A20	1B	FR Speaker Open
B1A21	11	FL Speaker Short to Ground
B1A21	12	FL Speaker Short to Battery
B1A21	1A	FL Speaker Short Circuit
B1A21	1B	FL Speaker Open
B1A22	11	RR Speaker Short to Ground
B1A22	12	RR Speaker Short to Battery
B1A22	1A	RR Speaker Short Circuit
B1A22	1B	RR Speaker Open
B1A23	11	RL Speaker Short to Ground
B1A23	12	RL Speaker Short to Battery
B1A23	1A	RL Speaker Short Circuit
B1A23	1B	RL Speaker Open

Subsystem Principle

The audio frequency played is made by a variable AC voltage, and this voltage is based on the DC voltage of the same circuit. The AC voltage moves the speaker cone and generates sound.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1A20 11, B1A21 11, B1A22 11 and B1A23 11: It is detected that the speaker is short to ground for 100ms.

B1A20 12, B1A21 12, B1A22 12 and B1A23 12: It is detected that the speaker is short to battery for 100ms.

B1A20 1A, B1A21 1A, B1A22 1A and B1A23 1A: It is detected that the speaker is short circuited for 100ms.

B1A20 1B, B1A21 1B, B1A22 1B and B1A23 1B: It is detected that the speaker is open circuited for 100ms.

Operations of ECU after Failure

Turn off the speaker.

Conditions for Clearing DTCs

- It is detected that the speaker circuit is normal for 100ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Speaker failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment System - Speaker

Diagnostic Test Steps

1. Check the FICM - front left/front right/rear left/rear right speaker harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the front left/front right/rear left/rear right speaker:

   ® For hardware damage and other abnormal conditions: Repair/replace the front left/front right/rear left/rear right speaker.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A24 and B1A26

DTC Description

DTC	FTB	Failure Description
B1A24	01	Power of USB1 Port Error
B1A26	01	Power of USB2 Port Error

Subsystem Principle

The on-board USB port is located in the centre console, through which the entertainment mainframe can read the external data or the digital equipment can be charged.

Conditions for Running DTCs

FICM wakeup is activated and the input power supply of USB port operates normally.

Conditions for Setting DTCs

B1A24 01: USB1 port input power supply voltage is too low.

B1A26 01: USB2 port input power supply voltage is too low.

Operations of ECU after Failure

B1A24 01: Switch off USB1 related functions.

B1A26 01: Switch off USB2 related functions.

Conditions for Clearing DTCs

B1A24 01:

- USB1 port input power voltage is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A26 01:

- USB2 port input power supply voltage is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. USB failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - USB port harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the USB:

   ® For hardware damage and other abnormal conditions: Repair/replace the USB.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A25 and B1A28

DTC Description

DTC	FTB	Failure Description
B1A25	11	Microphone1 Short to Ground
B1A25	12	Microphone1 Short to Battery
B1A25	13	Microphone1 Open
B1A28	11	Microphone2 Short to Ground
B1A28	12	Microphone2 Short to Battery
B1A28	13	Microphone2 Open

Subsystem Principle

The microphone located in the reading lamp assembly is an important part of the FICM, which can receive the voice command from the user.

Conditions for Running DTCs

The FICM is in wakeup state.

Conditions for Setting DTCs

B1A25 11 and B1A28 11: It is detected that the feedback voltage of MIC is less than 0.18V for 100ms.

B1A25 12 and B1A28 12: It is detected that the feedback voltage of MIC is higher than 2.91V for 100ms.

B1A25 13 and B1A28 13: It is detected that the feedback voltage of MIC is between 1.64V and 1.84V for 100ms.

Operations of ECU after Failure

Turn off the MIC functions.

Conditions for Clearing DTCs

- It is detected that the feedback voltage of MIC is between 0.88V and 1.58V for 100ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Microphone failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - MIC harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the microphone:

   ® For hardware damage and other abnormal conditions: Repair/replace the microphone.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A43 and B1A44

DTC Description

DTC	FTB	Failure Description
B1A43	11	Left Side Steering Wheel Controls Short to Ground
B1A43	15	Left Side Steering Wheel Controls Short to Battery or Open
B1A44	11	Right Side Steering Wheel Controls Short to Ground
B1A44	15	Right Side Steering Wheel Controls Short to Battery or Open

Subsystem Principle

The audio device can be controlled by the remote buttons mounted on the steering wheel. These commonly-used function buttons can allow some functions of the vehicle to be used in a much more convenient manner and improve driving safety.

Conditions for Running DTCs

The FICM is in wakeup state.

Conditions for Setting DTCs

B1A43 11: The input voltage of left steering wheel control button is lower than 0.122V for 2s.

B1A43 15: The input voltage of left steering wheel control button is higher than 3.212V for 2s.

B1A44 11: The input voltage of right steering wheel control button is lower than 0.122V for 2s.

B1A44 15: The input voltage of right steering wheel control button is higher than 3.212V for 2s.

Operations of ECU after Failure

Reject all switch inputs.

Conditions for Clearing DTCs

- The input voltage of steering wheel control buttons is between 0.12V and 3.212V for 2s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Clock spring failure:
3. Steering wheel multifunction switch failure:
4. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - clock spring - steering wheel multifunction switch harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the clock spring:

   ® For hardware damage and other abnormal conditions: Repair/replace the clock spring.

   ® Normal, go to 3.

3. Check the steering wheel multifunction switch:

   ® For steering wheel multifunction switch stuck, damage and other abnormal conditions: Repair/replace the steering wheel multifunction switch.

   ® Normal, go to 4.

4. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A60

DTC Description

DTC	FTB	Failure Description
B1A60	96	Radio Broadcast Receiving Module (RBRM) internal fault

Subsystem Principle

Internal failure for monitoring the running programme occurs, not involving external circuits.

Conditions for Running DTCs

The start switch is in ON or ACC position.

The battery voltage is normal.

Conditions for Setting DTCs

- RBRM AUX is short to battery.
- RBRM auxiliary ground is shorted.
- RBRM Switch is short to battery.
- RBRM Switch is short to ground.
- RBRM internal chip communication error.
- RBRM microcontroller watchdog resets.

Operations of ECU after Failure

DAB function has no audio, DAB function does not display

Conditions for Clearing DTCs

- RBRM has no internal failure.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

FICM internal failure:

Diagnostic Test Steps

1. Check the harness and connector of FICM:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A61

DTC Description

DTC	FTB	Failure Description
B1A61	11	Radio Broadcast Receiving Module (RBRM) FM/AM antenna circuit short to ground
B1A61	13	Radio Broadcast Receiving Module (RBRM) FM/AM antenna circuit open

Subsystem Principle

The radio antenna is mainly used to receive radio broadcasting signals.

Conditions for Running DTCs

- The start switch is in ON or ACC position.
- The system voltage is normal.

Conditions for Setting DTCs

B1A61 11: It is detected that the feedback voltage of antenna module is less than 0.5V for 1s.

B1A61 13: It is detected that the feedback current of antenna module is less than 40mA for 1s.

Operations of ECU after Failure

The channel cannot be changed.

Conditions for Clearing DTCs

B1A61 11:

- It is detected that the feedback voltage of antenna module is between 0.5V and 13V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A61 13:

- It is detected that the feedback current of antenna module is between 40mA and 199mA for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Antenna failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the harness and connector of FICM- Antenna:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A62

DTC Description

DTC	FTB	Failure Description
B1A62	11	Radio Broadcast Receiving Module (RBRM) DAB antenna circuit short to ground
B1A62	13	Radio Broadcast Receiving Module (RBRM) DAB antenna circuit open

Subsystem Principle

The DAB digital antenna is mainly used to receive radio broadcasting signals.

Conditions for Running DTCs

- The start switch is in ON or ACC position.
- The system voltage is normal.

Conditions for Setting DTCs

B1A62 11: It is detected that the feedback voltage of antenna module is less than 0.5V for 1s.

B1A62 13: It is detected that the feedback current of antenna module is less than 40mA for 1s.

Operations of ECU after Failure

The channel cannot be changed.

Conditions for Clearing DTCs

B1A62 11:

- It is detected that the feedback voltage of antenna module is between 0.5V and 13V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A62 13:

- It is detected that the feedback current of antenna module is between 40mA and 199mA for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Antenna failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the harness and connector of FICM- Antenna:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1A63

DTC Description

DTC	FTB	Failure Description
B1A63	11	Radio Broadcast Receiving Module (RBRM) Audio Line-out circuit short to ground
B1A63	12	Radio Broadcast Receiving Module (RBRM) Audio Line-out circuit short to battery
B1A63	13	Radio Broadcast Receiving Module (RBRM) Audio Line-out Circuit Open

Subsystem Principle

The digital audio broadcasting (DAB) module converts the digital audio signals into sound through the receiving antenna, and plays it out through the speakers.

Conditions for Running DTCs

- The start switch is in ON or ACC position.
- The system voltage is normal.

Conditions for Setting DTCs

B1A63 11: It is detected that the feedback voltage of antenna module is less than 0.8V for 1s.

B1A63 12: It is detected that the feedback voltage of antenna module is higher than 1.7V for 1s.

B1A63 13: It is detected that the feedback voltage of antenna module is between 1.4V and 1.7V for 1s.

Operations of ECU after Failure

RBRM has no audio signal input to FICM.

Conditions for Clearing DTCs

B1A63 11:

- It is detected that the feedback voltage of antenna module is between 0.8V and 3.3V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A63 12:

- It is detected that the feedback voltage of antenna module is between 0.1V and 1.7V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1A63 13:

- It is detected that the feedback voltage of antenna module is between 1.4V and 1.7V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Digital audio broadcasting (DAB) module failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the harness and connector of FICM - DAB module:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the digital audio broadcasting (DAB) module:

   ® For hardware damage and other abnormal conditions: Repair/replace the DAB module.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1AA0

DTC Description

DTC	FTB	Failure Description
B1AA0	11	Infotainment Faceplate Enable Circuit Short to Ground
B1AA0	12	Infotainment Faceplate Enable Circuit Short to Battery

Subsystem Principle

Infotainment faceplate (IFP) buttons are used to locate the displayed menu items and other options; press the control button to select the option.

Conditions for Running DTCs

B1AA0 11: The FICM is in wakeup state and the enable input is high.

B1AA0 12: The FICM is in wakeup state and the enable input is low.

Conditions for Setting DTCs

B1AA0 11: It is detected that the IFP enable circuit voltage is less than 0.09V for 100ms.

B1AA0 12: It is detected that the IFP enable circuit voltage is higher than 1.54V for 100ms.

Operations of ECU after Failure

Reject all switch inputs.

Conditions for Clearing DTCs

- It is detected that the IFP enable circuit voltage is between 0.09V and 1.54V for 100ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Infotainment faceplate failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the FICM - IFP harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the infotainment faceplate:

   ® For hardware damage and other abnormal conditions: Repair/replace the IFP.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1AE0, B1AE1, B1AE2, B1AE3 and B1AE9

DTC Description

DTC	FTB	Failure Description
B1AE0	12	Left 360° Camera Video Signal Short to Battery
B1AE0	14	Left 360° Camera Video Signal Short to Ground or Open
B1AE1	12	Right 360° Camera Video Signal Short to Battery
B1AE1	14	Right 360° Camera Video Signal Short to Ground or Open
B1AE2	12	Front 360° Camera Video Signal Short to Battery
B1AE2	14	Front 360° Camera Video Signal Short to Ground or Open
B1AE3	12	Rear 360° Camera Video Signal Short to Battery
B1AE3	14	Rear 360° Camera Video Signal Short to Ground or Open
B1AE9	11	Camera Power Short to Ground
B1AE9	12	Camera Power Short to Battery

Subsystem Principle

For vehicles with the panoramic imaging system, when any camera or entertainment mainframe is replaced, the system shall be re-calibrated to realize the image stitching function. Failure to calibrate may lead to error in the panoramic stitching due to camera internal parameter error and installation angle error, resulting in image deformation or misalignment.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1AE0 12, B1AE1 12, B1AE2 12 and B1AE3 12: It is detected that the 360° camera video signal circuit is short to battery.

B1AE0 14, B1AE1 14, B1AE2 14 and B1AE3 14: It is detected that the 360° camera video signal circuit is short to ground or open.

B1AE9 11: Camera power supply voltage is lower than 0.08V for 100ms.

B1AE9 12: Camera power supply voltage is higher than 1.19V for 100ms.

Operations of ECU after Failure

No 360° camera image.

Conditions for Clearing DTCs

B1AE0, B1AE1, B1AE2 and B1AE3:

- It is detected that the 360° camera video signal circuit is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

B1AE9 11, 12:

- The camera power supply voltage is between 0.08V and 1.19V for 100ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. 360° AVM camera failure:
3. FICM internal failure:

Reference Circuit Diagram

AVM System

Diagnostic Test Steps

1. Check the FICM - 360° AVM camera harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check 360° AVM camera:

   ® For not calibrated, hardware damage and other abnormal conditions: Calibrate/replace 360° AVM camera.

   ® Normal, go to 3.

3. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1AE4

DTC Description

DTC	FTB	Failure Description
B1AE4	12	Rear Camera Video Signal Circuit Short to Battery
B1AE4	13	Rear Camera Video Signal Circuit Short to Ground or Open

Subsystem Principle

The rear camera communicates with the front infotainment control module (FICM), transmits the image of the rear vehicle to the FICM, and displays the image on the screen for the driver's reversing reference.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

B1AE4 12: It is detected that the rear camera video signal circuit is short to battery.

B1AE4 13: It is detected that the rear camera video signal circuit is short to ground or open.

Operations of ECU after Failure

Turn off the rear camera display.

Conditions for Clearing DTCs

- It is detected that the rear camera video signal circuit is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Rear camera failure:
3. FICM internal failure:

Reference Circuit Diagram

Rearview Camera

Diagnostic Test Steps

1. Check the FICM - rear camera harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the rear camera:

   ® For not calibrated, hardware damage and other abnormal conditions: Calibrate/replace rear camera.

   ® Normal, go to 3.

3. Check the FICM:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B1AF3

DTC Description

DTC	FTB	Failure Description
B1AF3	00	HD 360°Signal Input Fault

Subsystem Principle

Error occurs when the LVDS transmits the video signal, it is sent to the front infotainment control module (FICM) via CAN signal and the DTC is recorded.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

It is set when no message from P2P AVM, HDAVM or MPD is received via the LVDS bus in 2000ms.

Operations of ECU after Failure

No digital 360 camera or AVM display.

Conditions for Clearing DTCs

- It is cleared when message from P2P AVM, HDAVM or MPD is received via the LVDS bus in 2000ms.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. HD 360 failure:
3. FICM internal failure:

Reference Circuit Diagram

Entertainment system - PRO mainframe

Diagnostic Test Steps

1. Check the harness and connector of FICM - HD 360:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0073, U010F, U0122, U0127, U0131, U0140, U0146, U0155, U0170, U2210, U2211, U2262, U2228, U2229 and U2263

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off
U010F	87	Lost Communication with Air Conditioning Control Module (AC)
U0122	87	Lost Communication with Stability Control System (SCS)
U0127	87	Lost Communication with Tire Pressure Monitoring System (TPMS)
U0131	87	Lost Communication With Power Steering Control Module (EPS)
U0140	87	Lost Communication with Body Control Module (BCM)
U0146	87	Lost Communication with Gateway (GW)
U0155	87	Lost Communication with Instrument Pack (IPK)
U0170	87	Lost Communication With Ambient Lighting Control Module (ALCM)
U2210	87	Response Timeout_SOME/IP_GW/CCP/ICC
U2211	87	Response Timeout_HTTP_GW/CCP/ICC
U2262	00	Lost Ethernet Connection with GW/CCP/ICC
U2228	87	Response Timeout_SOME/IP_Telematic Control Module
U2229	87	Response Timeout_HTTP_Telematic Control Module
U2263	00	Lost Ethernet Connection with TBOX

Subsystem Principle

The FICM communicates with other modules via the CAN bus.

Conditions for Running DTCs

U0073 88:

- DTCs U1562 and U1563 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

U010F, U0122, U0127, U0131, U0140, U0146, U0155, U0170, U2210, U2211, U2262, U2228, U2229 and U2263:

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U010F, U0122, U0127, U0131, U0140, U0146, U0155, U0170, U2210, U2211, U2262, U2228, U2229 and U2263: The DTC will be set if the specified data frame sent from the corresponding module cannot be received by the FICM within 2s.

Operations of ECU after Failure

U0073 88 and U0146 87: CAN bus off.

U0155 87:

- Turn off the voice reminder.
- Turn off the time synchronisation.
- Turn off IPK related display and control.

U010F, U0122, U0127, U0131, U0140, U0146, U0170, U2210, U2211, U2262, U2228, U2229 and U2263: Part of functions are lost and unavailable.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

U010F, U0122, U0127, U0131, U0140, U0146, U0155, U0170, U2210, U2211, U2262, U2228, U2229 and U2263:

- The FICM receives the specified data frame sent from the corresponding module for 2s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. FICM/GW/HVAC/SCS/TPMS/EPS/BCM/IPK/ALCM internal failure:

Reference Circuit Diagram

Data Communication - Information HS CAN

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the FICM - corresponding module harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the FICM/GW/HVAC/SCS/TPMS/EPS/BCM/IPK/ALCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0208, U1021, U1023, U110F, U1264 and U1266

DTC Description

DTC	FTB	Failure Description
U0208	87	Lost Communication With Front Left Seat Control Module (FLSM)
U1021	87	Lost Communication with Rear Drive Assist Module (BLIS/RDA)
U1023	87	Lost Communication with Around View Module (AVM)
U110F	87	Lost Communication with Slim Air Vent Module (SAVM)
U1264	87	Lost Communication with Front View Camera Module (FVCM)
U1266	87	Lost Communication with Pedestrian Alert Control Module (PACM)

Subsystem Principle

The FICM communicates with other modules via the CAN bus.

Conditions for Running DTCs

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the corresponding module cannot be received by the FICM within 2s.

Operations of ECU after Failure

Part of functions are lost and unavailable.

Conditions for Clearing DTCs

- The FICM receives the specified data frame sent from the corresponding module for 2s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. FICM/RDA/AVM/FVCM/PACM/FLSM internal failure:

Reference Circuit Diagram

Data Communication - Information HS CAN

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the FICM - corresponding module harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the FICM/RDA/AVM/SAVM/FVCM/PACM/FLSM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1031

DTC Description

DTC	FTB	Failure Description
U1031	87	Lost Communication With Infotainment Faceplate Module(IFP)

Subsystem Principle

The front infotainment control module (FICM) communicates with the infotainment faceplate (IFP) via the LIN bus.

Conditions for Running DTCs

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC will be set if the specified data frame sent from the IFP cannot be received by the FICM within 2s.

Operations of ECU after Failure

Part of functions are lost and unavailable.

Conditions for Clearing DTCs

- The FICM receives the specified data frame sent from the IFP for 2s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. FICM/IFP internal failure:

Reference Circuit Diagram

Data Communication - LIN

Diagnostic Test Steps

1. Check the FICM - IFP communication harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the FICM/IFP:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1500

DTC Description

DTC	FTB	Failure Description
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)

Subsystem Principle

The FICM receives the signal from the BCM through the CAN bus, compares the 17-byte VINs stored in both modules and determines if there are any failures.

Conditions for Running DTCs

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The local VIN value and the CAN information value are different for 10 consecutive times.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The local VIN value and the CAN information value are the same for 10 consecutive times.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

FICM, BCM and IPK internal failure:

Diagnostic Test Steps

1. Check the BCM/IPK/FICM harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the FICM, BCM and IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The FICM monitors the system voltage to check whether the power supply voltage of the battery or the alternator is within the normal operating range.

Conditions for Running DTCs

- The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

- Turn off the display.
- Turn off the audio.
- Turn off the radio.
- The CAN bus is in open state.

Conditions for Clearing DTCs

U1562 17:

- The power supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

U1563 16:

- The power supply voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
2. Harness or connector failures:
3. Battery cable failure:
4. High/low voltage conversion system failure.
5. FICM internal failure:

Reference Circuit Diagram

Entertainment system - Entertainment Mainframe

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the FICM harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Communication Module (TBOX)

DTC Index

List

DTC	FTB	Description	Failure Level
B1511	71	E-Call Switch Stuck	III
B1521	11	Telematic Control Module (TBOX) GPS Antenna Short to GND Fault	III
B1521	12	Telematic Control Module (TBOX) GPS Antenna Short to Battery	III
B1521	13	Telematic Control Module (TBOX) GPS Antenna Open Fault	III
B1522	31	GPS Module Localization Fault	III
B1525	11	Telematic Control Module (TBOX) GSM Antenna Short to Ground.	III
B1525	12	Telematic Control Module (TBOX) GSM Antenna Short to Battery.	III
B1525	13	Telematic Control Module (TBOX) GSM Antenna Open Fault	III
B1526	31	Telematic Control Module (TBOX) GSM Module Fault	III
B152A	11	Telematic Control Module (TBOX) Second GSM Antenna Short to Ground	III
B152A	12	Telematic Control Module (TBOX) Second GSM Antenna Short to Battery	III
B152A	13	Telematic Control Module (TBOX) Second GSM Antenna Open Fault	III
B1529	31	Infotainment Control Module (FICM) Communication Fault	III
B1533	11	Microphone Input Short to Ground	III
B1533	12	Microphone Input short to battery	III
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B1535	12	Speaker Short to battery	III
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B1550	16	TBox battery Voltage too low or not connected	III
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B1551	00	TBox battery fails to charge	III
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B1562	00	Body Control Module (BCM) Authentication Telematic Control Module (TBOX) Failure	III
B1570	31	Telematic Control Module (TBOX) Internal Bluetooth Module Fault	III
U0073	88	Control Module Communication Bus Off on Diagnostic High Speed CAN	I
U0074	88	Control Module Communication Bus Off on Hybrid High Speed CAN	I
U0078	88	Control Module Communication Bus Off on WIFI High Speed CAN	I
U0110	87	Lost Communication With TC	III
U0146	87	Lost Communication with Gateway (GW)	III
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)	III
U0292	87	Lost Communication With ISC	III
U0293	87	Lost Communication With (HCU/VCU)	III

DTC	FTB	Description	Failure Level
U1111	87	Lost Communication With Battery Management System(BMS)	III
U1112	87	Lost Communication With Onboard Charger(OBC)	III
U1500	62	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)	II
U1562	17	Battery Voltage High	I
U1563	16	Battery Voltage Low	I
U2001	42	ECU Error-EEPROM Checksum Error	II
U2218	87	Failed to respond to the Ethernet communication with Intelligent Cockpit Module (ICM)	II
U2262	00	Lost Ethernet Connection with Gateway/Connected Computation Platform/Intelligent Computer Controller (GW/CCP/ICC)	II

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to Authorised store for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B1511

DTC Description

DTC	FTB	Failure Description
B1511	71	E-Call Switch Stuck

Subsystem Principle

The E-Call button is used to call for help by pressing it in an emergency.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

The button is invalid in the state of being pressed for 20s.

Operations of ECU after Failure

E-Call is failure.

Conditions for Clearing DTCs

- The button is in the state where no pressing is needed.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Control button failure or malfunction:
2. TBOX internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the emergency call switch:

   ® For switch stuck, damage and other abnormal conditions: Repair/replace the emergency call switch.

   ® Normal, go to 2.

2. Check the TBOX:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1521 and B1522

DTC Description

DTC	FTB	Failure Description
B1521	11	Telematic Control Module (TBOX) GPS Antenna Short to GND Fault
B1521	12	Telematic Control Module (TBOX) GPS Antenna Short to Battery
B1521	13	Telematic Control Module (TBOX) GPS Antenna Open Fault
B1522	31	GPS Module Localization Fault

Subsystem Principle

The GPS antenna is connected to the GPS receiver via a single coaxial cable, which transmits the received GPS signal to the receiver for processing.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1521 11: It is detected that the GPS antenna is short to ground for 4s.

B1521 13: It is detected that the GPS antenna is short to battery for 4s.

B1521 13: It is detected that the GPS antenna is open circuit for 4s.

B1522 31: It is detected that the MCU cannot receive the GPS signal from the internal GPS module for 12s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

B1521 11, 12 and 13:

- GPS antenna is detected to be normal for 4s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1522 31:

- MCU normally receives the GPS signal from the internal GPS module for 12s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. GPS antenna failure:
3. Communication module internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the communication module - GPS antenna harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the GPS antenna:

   ® For hardware damage and other abnormal conditions: Repair/replace the GPS antenna.

   ® Normal, go to 3.

3. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1525,B1526 and B152A

DTC Description

DTC	FTB	Failure Description
B1525	11	Telematic Control Module (TBOX) GSM Antenna Short to Ground
B1525	12	Telematic Control Module (TBOX) GSM Antenna Short to Battery
B1525	13	Telematic Control Module (TBOX) GSM Antenna Open Fault
B152A	11	Telematic Control Module (TBOX) Second GSM Antenna Short to Ground
B152A	12	Telematic Control Module (TBOX) Second GSM Antenna Short to Battery
B152A	13	Telematic Control Module (TBOX) Second GSM Antenna Open Fault
B1526	31	Telematic Control Module (TBOX) GSM Module Fault

Subsystem Principle

The TBOX can provide wireless Internet access, remote monitoring and other functions for the vehicle.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1525 11 and B152A 11: It is detected that the GSM antenna is short to ground for 4s.

B1525 12 and B152A 12: It is detected that the GSM antenna is short to battery for 4s.

B1525 13 and B152A 13: When the GSM antenna is detected open circuit for 4s.

B1526 31: The MCU cannot receive the response to the running command of the internal WAN module for 12s.

Operations of ECU after Failure

B1525 and B152A: TBOX is switched to interior antenna.

B1526 31: The TBOX cannot provide Internet access.

Conditions for Clearing DTCs

B1525 and B152A:

- It is detected that the GSM antenna is normal for 4s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1526 31:

- MCU receives the response to the running command from the internal WAN module for 12s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. GSM antenna failure:
3. Communication module internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the communication module - GSM antenna harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the GSM antenna:

   ® For hardware damage and other abnormal conditions: Repair/replace the GSM antenna.

   ® Normal, go to 3.

3. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1529

DTC Description

DTC	FTB	Failure Description
B1529	31	Infotainment Control Module (FICM) Communication Fault

Subsystem Principle

The communication module (TBOX) communicates with other control modules via the HS CAN bus.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

When the FICM signal voltage is detected to be less than 2V for 4s, set the DTC.

Operations of ECU after Failure

Communication failure with front infotainment control module (FICM).

Conditions for Clearing DTCs

- When the FICM signal voltage is detected to be greater than 4V for 4s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Communication module, GW and FICM internal failure:

Reference Circuit Diagram

Data Communication - Information HS CAN

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the communication module - GW - FICM harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the communication module, GW and FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1533 and B1534

DTC Description

DTC	FTB	Failure Description
B1533	11	Microphone Input Short to Ground
B1533	12	Microphone Input short to battery
B1533	13	Microphone Input Open
B1534	11	Microphone Output Short to Ground
B1534	12	Microphone Output short to battery
B1534	13	Microphone Output Open

Subsystem Principle

The microphone located in the front reading lamp assembly is an important part of the FICM, which can receive the voice command from the user.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1533 11: It is detected that the microphone input circuit is short to ground.

B1533 12: It is detected that the microphone input circuit is short to battery.

B1533 13: It is detected that the microphone input circuit is open circuit.

B1534 11: It is detected that the microphone output circuit is short to ground.

B1534 12: It is detected that the microphone output circuit is short to battery.

B1534 13: It is detected that the microphone output circuit is open circuit.

Operations of ECU after Failure

TBOX cannot provide voice service.

Conditions for Clearing DTCs

B1533:

- It is detected that the microphone input circuit is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

B1534:

- It is detected that the microphone output circuit is normal.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Microphone failure:
3. Communication module and FICM internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the microphone - communication module - FICM harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the microphone:

   ® For hardware damage and other abnormal conditions: Repair/replace the microphone.

   ® Normal, go to 3.

3. Check the communication module and FICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1535

DTC Description

DTC	FTB	Failure Description
B1535	11	Speaker Short to Ground
B1535	12	Speaker Short to battery
B1535	13	Speaker Open

Subsystem Principle

In an emergency, the user presses the E-Call button to call for help, and the sound is amplified by the system and output through the emergency speaker.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1535 11: It is detected that the speaker output is short to ground for 4s.

B1535 12: It is detected that the speaker output is short to battery for 4s.

B1535 13: It is detected that the speaker output circuit is open for 4s.

Operations of ECU after Failure

The speaker cannot function normally.

Conditions for Clearing DTCs

- It is detected that the speaker output is normal for 4s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Speaker failure:
3. Communication module internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the communication module - speaker harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the speaker:

   ® For hardware damage and other abnormal conditions: Repair/replace the speaker.

   ® Normal, go to 3.

3. Check the communication module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

B1541, B1542 and B1570

DTC Description

DTC	FTB	Failure Description
B1541	00	Telematic Control Module (TBOX) Internal SIM Card Status - Not Present
B1542	00	Telematic Control Module (TBOX) Internal SIM Card - Invalid
B1570	31	Telematic Control Module (TBOX) Internal Bluetooth Module Fault

Subsystem Principle

The communication module has built-in SIM card and Bluetooth module, which provides the vehicle with functions such as communication, Internet access, on-board telephone.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1541 00: Running command indicates UIM is lost or fails for 10s.

B1542 00: Running command indicates UIM is invalid for 60s.

B1570 31: There is no AT feedback signal (from Bluetooth module to MCU) or there is any error of feedback signal from the Bluetooth module for 10s.

Operations of ECU after Failure

B1541 00 and B1542 00: The TBOX cannot provide Internet access.

B1570 31: The TBOX cannot provide the Bluetooth function.

Conditions for Clearing DTCs

B1541 00:

- SIM card initialisation is successful for 10s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1542 00:

- SIM card initialisation is successful for 60s.
- History DTCs will be cleared after 40 failure-free start cycles.

B1570 31:

- AT feedback signal (from Bluetooth module to MCU) is normal for 10s.
- History DTCs will be cleared after 40 failure-free start cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Communication module internal failure:

Diagnostic Test Steps

1. Check the communication module harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1550, B1551 and B1552

DTC Description

DTC	FTB	Failure Description
B1550	16	TBox battery Voltage too low or not connected
B1550	17	TBox battery Voltage too high
B1551	00	TBox battery fails to charge
B1552	01	TBox battery health has fallen below level required to fulfill the legal requirement

Subsystem Principle

The TBOX monitors the system voltage to check whether the power supply voltage of the TBOX is in the normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

B1550 16: The DTC will be set if it detects that the TBOX battery is not connected or the voltage after startup is too low.

B1550 17: The DTC will be set if it detects that the voltage of the TBOX battery is greater than the acceptable voltage range after the start switch is turned on.

B1551 00: The DTC will be set if it detects that the TBOX battery is not being charged after the start switch is turned on.

B1552 01: The DTC will be set if it detects that the health status of the TBOX battery is worse than required level after startup.

Operations of ECU after Failure

When the external power supply is cut off, the TBOX cannot trigger the E-Call.

Conditions for Clearing DTCs

B1550 16:

- It is detected that the TBOX battery is not connected or the TBOX battery level is too low after the start switch is turned on.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

B1550 17:

- It is detected that the voltage of the TBOX battery is greater than the acceptable voltage after the start switch is turned on.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

B1551 00:

- It is detected that the TBOX battery cannot be charged after the start switch is turned on.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

B1552 01:

- It is detected that the TBOX battery state is normal after the start switch is turned on.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Communication module internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the communication module harness and connector:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

B1562

DTC Description

DTC	FTB	Failure Description
B1562	00	Body Control Module (BCM) Authentication Telematic Control Module (TBOX) Failure

Subsystem Principle

The TBOX communicates with the BCM via the CAN bus and verifies information. After verification, the BCM allows the communication module to remotely control the vehicle, if the BCM cannot obtain the verification information from the communication module, the communication module will not be able to remotely control the vehicle.

Conditions for Running DTCs

- The battery voltage is normal.
- The Start switch is placed in ON position.
- DTC U0073 is not read.

Conditions for Setting DTCs

The communication module and BCM authentication is incorrect.

Operations of ECU after Failure

The communication module cannot control the vehicle remotely.

Conditions for Clearing DTCs

- The communication module and BCM authentication is consistent.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. BCM internal failure:
2. Communication module internal failure:

Diagnostic Test Steps

1. Check the BCM/communication module harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the communication module and the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module and the BCM.

   ® Normal, go to TAC Human Assistance.

U0073, U0146, U0151,U2218 and U2262

DTC Description

DTC	FTB	Failure Description
U0073	88	Control Module Communication Bus Off on Diagnostic High Speed CAN
U0146	87	Lost Communication with Gateway (GW)
U0151	87	Lost Communication with Sensing Diagnostic Module (SDM)
U2218	87	Failed to respond to the Ethernet communication with Intelligent Cockpit Module (ICM)
U2262	00	Lost Ethernet Connection with Gateway/Connected Computation Platform/ Intelligent Computer Controller (GW/CCP/ICC)

Subsystem Principle

The communication box communicates with other modules via the CAN bus or Ethernet.

Conditions for Running DTCs

U0073 88:

- DTCs U1562 and U1563 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

U0146, U0151, U2218 and U2263:

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0146 and U0151: The DTC will be set if the specified data frame sent from the corresponding module cannot be received by the communication module within 200ms.

U2218 87 : If the specified data frame sent by ICM cannot be received within the specified time, this DTC is set.

U2262 00 : If the specified data frame sent by GW/CCP/ICC cannot be received within the specified time, this DTC is set.

Operations of ECU after Failure

U0073 88 and U0146 87: CAN bus off.

U0151,U2218 and U2262: Part of functions are lost and unavailable.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

U0146,U0151,U2218 and U2262:

- The communication module receives the specified data frame sent from the corresponding module for 2000ms.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Communication module, GW module, SDM internal and ICM failure:

Reference Circuit Diagram

Data Communication - Information HS CAN

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the information communication module - corresponding module harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the communication module, GW module ,SDM and ICM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0074, U0078, U0110, U0292, U0293, U1111 and U1112

DTC Description

DTC	FTB	Failure Description
U0074	88	Control Module Communication Bus Off on Hybrid High Speed CAN
U0078	88	Control Module Communication Bus Off on WIFI High Speed CAN
U0110	87	Lost Communication With TC
U0292	87	Lost Communication With ISC
U0293	87	Lost Communication With (HCU/VCU)
U1111	87	Lost Communication With Battery Management System(BMS)
U1112	87	Lost Communication With Onboard Charger(OBC)

Subsystem Principle

The communication box communicates with other modules via the CAN bus.

Conditions for Running DTCs

U0074 88 and U0078 88:

- DTCs U1562 and U1563 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

U0110, U0292, U0293, U1111 and U1112:

- DTCs U1562, U1563 and U0073 are not read.
- The battery voltage is normal.
- The Start switch is placed in ON position.

Conditions for Setting DTCs

U0074 88 and U0078 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0110, U0292, U0293, U1111 and U1112: The DTC will be set if the specified data frame sent from the corresponding module cannot be received by the communication module within 2s.

Operations of ECU after Failure

U0074 88 and U0078 88: CAN bus off.

U0110, U0292, U0293, U1111 and U1112: Part of functions are lost and unavailable.

Conditions for Clearing DTCs

U0074 88 and U0078 88:

- "Bus Off" state does not appear within 5s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

U0110, U0292, U0293, U1111 and U1112:

- The communication module receives the specified data frame sent from the corresponding module for 2s.
- History DTCs will be cleared after 40 failure-free vehicle power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
2. Communication module, GW, drive motor control unit, ISG motor control unit, hybrid/vehicle control unit, high-voltage battery management system, on-board charger internal failure:

Reference Circuit Diagram

Data Communication - Information HS CAN

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the information communication module - corresponding module harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to ground/short to battery, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the communication module, GW, drive motor control unit, ISG motor control unit, hybrid/vehicle control unit, high-voltage battery management system and on-board charger:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1500

DTC Description

DTC	FTB	Failure Description
U1500	62	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)

Subsystem Principle

The communication module receives the signal from the BCM through the CAN bus, compares the 17-byte VINs stored in both modules and determines if there are any failures.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The numerical values of EEPROM VIN and CAN VIN do not match, which lasts for 4s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- The numerical values of EEPROM VIN and CAN VIN are the same, which lasts for 4s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. BCM internal failure:
2. Instrument pack internal failure:
3. Communication module internal failure:

Diagnostic Test Steps

1. Check the BCM/IPK/communication module harness connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the BCM/IPK/communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The TBOX monitors the system voltage to check whether the power supply voltage of the TBOX is in the normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

U1562 17:

- The power supply voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

U1563 16:

- The power supply voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
2. Harness or connector failures:
3. Battery cable failure:
4. High/low voltage conversion system failure:
5. Communication module internal failure:

Reference Circuit Diagram

Communication Module

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the communication module harness and connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2001

DTC Description

DTC	FTB	Failure Description
U2001	42	ECU Error-EEPROM Checksum Error

Subsystem Principle

Perform internal failure detection in the TBOX, and no external circuit is involved.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

The DTC is set when the following data are different.

- Data is written to the EEPROM.
- Data writing and read-back are inconsistent for 5s.

Operations of ECU after Failure

None.

Conditions for Clearing DTCs

- Data is consistent for 5s.
- History DTCs will be cleared after 40 failure-free power-on and power-off cycles.

Possible Failure Causes and Maintenance Scheme

1. Communication module internal failure:

Diagnostic Test Steps

1. Check the communication module harness connector:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the communication module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

Instrument Pack (IPK)

DTC Index

List

DTC	FTB	Description	Failure Level*
B1221	86	Distance Count Signal Invalid	II
U0073	88	CAN Bus Off	I
U0140	87	Lost Communication with Body Control Module (BCM)	II
U0146	87	Lost Communication with Gateway (GW)	II
U0236	87	Lost Communication with Column Lock Module (ESCL)	II
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)	II
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)	II
U1562	17	Battery Voltage High	I
U1563	16	Battery Voltage Low	I
U2001	42	ECU Error-EEPROM Checksum Error	II
U2005	41	ECU Error-Flash Checksum Error	II

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to the authorized dealer for repair
- III: Repair as soon as possible
- IV: No need to repair or repair during maintenance

Diagnosis Information and Procedure

B1221

DTC Description

DTC	FTB	DTC Description
B1221	86	Distance Count Signal Invalid

Subsystem Principle

The mileages are calculated after the IPK receives the relevant signals, and displayed on the IPK; after the mileages are saved, the reading on the odometer cannot be modified.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562, U1563 and U0073 are not read.
- The communication is enabled for more than 1s.

Conditions for Setting DTCs

The mileage count signal is invalid for more than 5s or the signal times out.

Operations of ECU after Failure

The odometer stops increasing.

Conditions for Clearing DTCs

- The mileage count signal is valid for more than 2s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Instrument pack internal failure:
   - Replace/repair the instrument pack.
3. Dynamic stability control module internal failure:
   - Replace/flash the dynamic stability control module.

Reference Circuit Diagram

BUS System-Chassis High Speed Controller Area Network

Diagnostic Test Steps:

1. Integrity Inspection of HS CAN Network.
2. Check the instrument pack - GW CAN communication harness and connector, dynamic stability control system - GW CAN communication harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication line conductivity failure, CAN communication line short to battery/ground failure, instrument pack power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U0073, U0140, U0146, U0236 and U0245

DTC Description

DTC	FTB	Failure Description
U0073	88	CAN Bus Off
U0140	87	Lost Communication with Body Control Module (BCM)
U0146	87	Lost Communication with Gateway (GW)
U0236	87	Lost Communication with Column Lock Module (ESCL)
U0245	87	Lost Communication with Front Infotainment Control Module (FICM)

Subsystem Principle

The instrument pack (IPK) communicates with other modules via the CAN bus.

Conditions for Running DTCs

U0073 88:

- The Start switch is placed in ON position.
- DTCs U1562 and U1563 are not read.
- The communication is enabled for more than 1s.

U0140 87, U0146 87, U0236 87 and U0245 87:

- The Start switch is placed in ON position.
- DTCs U1562, U1563 and U0073 are not read.
- The communication is enabled for more than 1s.

Conditions for Setting DTCs

U0073 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U0140 87: The DTC will be set if the specified data frame sent from the BCM cannot be received within 2s.

U0146 87: The DTC will be set if the specified data frame sent from the GW module cannot be received within 2s.

U0236 87: The DTC will be set if the specified data frame sent from the ESCL control module cannot be received within 2s.

U0245 87: The DTC will be set if the specified data frame sent from the FICM cannot be received within 2s.

Operations of ECU after Failure

U0073 88: The speed, rotation speed and temperature will be displayed as 0.

U0140 87, U0146 87, U0236 87 and U0245 87: None.

Conditions for Clearing DTCs

U0073 88:

- "Bus Off" failure does not appear within 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U0140 87, U0146 87, U0236 87 and U0245 87:

- The corresponding data frame is received for 100 consecutive times.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Instrument pack internal failure:
   - Replace/flash the control module.
3. Body control module internal failure (for U0140 87):
   - Replace/flash the control module.
4. Gateway internal failure (for U0146 87):
   - Replace/flash the control module.
5. Electronic steering column lock control module internal failure (for U0236 87):
   - Replace/flash the control module.
6. FICM internal failure (for U0245 87):
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Body High Speed Controller Area Network

Diagnostic Test Steps

1. Integrity Inspection of Information HS CAN Network.
2. Check the IPK - control module CAN communication harness and connector:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to battery/ground failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U1500

DTC Description

DTC	FTB	DTC Description
U1500	00	VIN Mismatch with Body Control Module (BCM) or Instrument Pack (IPK)

Subsystem Principle

When the start switch is switched on, the BCM will perform a switch-on test. IPK signal has not been received. The BCM communicates with the IPK via the CAN to check the matching of VINs as well as the data sync.

Conditions for Running DTCs

- The Start switch is placed in ON position.
- DTCs U1562, U1563, U0140 and U0073 are not read.
- The communication is enabled for more than 1s.

Conditions for Setting DTCs

The BCM informaiton is lost for 5s or the VIN code in BCM is mismatched with that in IPK or both are default values.

Operations of ECU after Failure

Trip display error.

Conditions for Clearing DTCs

- The VIN code in BCM is matched with that in IPK for 5s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. BCM internal failure:
   - Replace/flash the control module.
2. Instrument pack internal failure:
   - Replace/flash the control module.

Diagnostic Test Steps:

1. Use a scan tool to check if the VIN code is normal:

   ® Normal, diagnosis is completed.

   ® Abnormal, go to 2.

2. Check the BCM:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the BCM.

   ® Normal, go to 3.

3. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IPK.

   ® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The instrument pack monitors the system voltage to check if the power supply voltage of the module is within a normal operating range.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The battery voltage is greater than 16V for 1s.

U1563 16: The battery voltage is less than 9V for 1s.

Operations of ECU after Failure

LCD off, lighting off, instrument reset and indicator lamp off.

Conditions for Clearing DTCs

U1562 17:

- The battery voltage is less than 15.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U1563 16:

- The battery voltage is greater than 9.5V for 1s.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Harness or connector failures:
   - Replace/repair the harness or connector.
3. Battery cable failure:
   - Replace/repair the battery cable.
4. Instrument pack internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Instrument Pack

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the IPK harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IPK.

   ® Normal, go to TAC Human Assistance.

U2001 and U2005

DTC Description

DTC	FTB	DTC Description
U2001	42	ECU Error-EEPROM Checksum Error
U2005	41	ECU Error-Flash Checksum Error

Subsystem Principle

Perform internal failure detection on the IPK, and no external circuit is involved. Each time when it is energised, the control module will run a programme to detect internal failures.

Conditions for Running DTCs

- In wakeup state.
- The scan tool DTCs U1562 and U1563 are not read.

Conditions for Setting DTCs

U2001 42: ECU EEPROM check error.

U2005 41: ECU flash error.

Operations of ECU after Failure

U2001 42: The instrument display is not correct and the ODO is not displayed.

U2005 41: The instrument and LCD display functions are invalid.

Conditions for Clearing DTCs

U2001 42:

- ECU EEPROM check is correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

U2005 41:

- ECU flash is correct.
- History DTCs will be cleared after 40 failure-free power-on/off cycles.

Possible Failure Causes and Maintenance Scheme

1. Instrument pack internal failure:

   ® Replace/repair the instrument pack.

Diagnostic Test Steps:

1. Check the IPK harness and connector:

   ® For connector looseness, Pin deformation/breakage, control module power supply/grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the IPK:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the IPK.

   ® Normal, go to TAC Human Assistance.

Electric Vehicle Communication Controller (EVCC)

DTC Index

List

DTC	FTB	Description	Failure Level*
P1FF0	1C	CP(Control Pilot-In) Voltage is Abnormal	I
P1FF7	00	Lost Communication with Fast Charging Station by EVCC	I
P1FFA	00	EVSE Charging Process Timeout	I
P1FFB	88	OFFBD CAN BUS OFF	I
U1111	87	Lost Communication With Battery Management System(BMS)	I
U1562	17	Battery Voltage High	I
U1563	16	Battery Voltage Low	I
U2000	04	ECU Hardware Error	I
U2001	42	EVCC EEPROM Error	I
U2002	42	EVCC RAM Error	I
U2004	42	EVCC ROM Error	I
U2020	47	EVCC Internal Watchdog error	I
U2021	47	EVCC External Watchdog error	I

*Remarks:

Failure level description:

- I: Stop the vehicle immediately for repair
- II: Carefully drive to the authorized dealer for repair
- IV: Repair as soon as possible or repair during maintenance
- IV: No need to repair

Diagnosis Information and Procedure

P1FF0

DTC Description

DTC	FTB	Failure Description
P1FF0	1C	CP(Control Pilot-In) Voltage is Abnormal

Subsystem Principle

The charger communication control module (EVCC) communicates with the charging pile, converting the communication protocol to facilitate the vehicle charging.

Conditions for Running DTCs

- The battery voltage is normal.
- It is in the charging mode status.

Conditions for Setting DTCs

When the CP signal duty ratio is 3% to 8%, the CP signal voltage is not in the range of 8 to 10V when S2 is turned on or the CP signal voltage is not in the range of 5 to 7V when S2 is turned off for 1s.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

When the CP signal duty ratio is 3% to 8%, the CP signal voltage is in the range of 8 to 10V when S2 is turned on or the CP signal voltage is in the range of 5 to 7V when S2 is turned off for 1s.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Charging port failure:
   - Replace/repair the charging port.
3. Charger communication control module internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Charging Control System

Diagnostic Test Steps

1. Check the harness and connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, control module grounding failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 2.

2. Check the harness and connector of charger communication control module - charging port:

   ® For connector looseness, Pin deformation/breakage, relevant harness conductivity failure, short to ground failure, short to battery failure, and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the charging port:

   ® For hardware damage and other abnormal conditions: Repair/replace the charging port.

   ® Normal, go to 4.

4. Check the charger communication control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FF7

DTC Description

DTC	FTB	Failure Description
P1FF7	00	Lost Communication with Fast Charging Station by EVCC

Subsystem Principle

The charger communication control module (EVCC) communicates with the charging pile, converting the communication protocol to facilitate the vehicle charging.

Conditions for Running DTCs

The battery voltage is normal.

Conditions for Setting DTCs

After the request, EVCC does not receive a response message from EVSE (Electric Vehicle Supply Equipment) for 3s.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

After the request, EVCC receives a response message from EVSE.

Possible Failure Causes and Maintenance Scheme

1. Charger communication control module internal failure:
   - Replace/flash the control module.
2. Charging port failure:
   - Replace/repair the charging port.
3. Charging gun connection failure:
   - Replace/repair the charging gun.
4. Charging pile failure:
   - Replace the charging pile.

Diagnostic Test Steps

1. Check the charging gun:

   ® For charging gun connection looseness and other abnormal conditions: Repair/replace the charging gun.

   ® Normal, go to 2.

2. Check the harness connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 3.

3. Check the charger communication control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FFA

DTC Description

DTC	FTB	Failure Description
P1FFA	00	EVSE Charging Process Timeout

Subsystem Principle

The charger communication control module (EVCC) communicates with the charging pile, converting the communication protocol to facilitate the vehicle charging.

Conditions for Running DTCs

- The battery voltage is normal.
- It is in the charging mode status.

Conditions for Setting DTCs

SLAC attenuation exceeds 40dB or failure to get the mac address or the connection detection exceeds 5s.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

SLAC attenuation is below 40dB and the mac address is successfully obtained and the connection detection is less than 5s.

Possible Failure Causes and Maintenance Scheme

1. Charger communication control module internal failure:
   - Replace/flash the control module.
2. Charging pile failure:
   - Replace the charging pile.

Diagnostic Test Steps

1. Check the harness connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the charger communication control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

P1FFB and U1111

DTC Description

DTC	FTB	Failure Description
P1FFB	88	OFFBD CAN BUS OFF
U1111	87	Lost Communication With Battery Management System(BMS)

Subsystem Principle

The charger communication control module (EVCC) communicates with other modules via the CAN bus.

Conditions for Running DTCs

The battery voltage is normal.

Conditions for Setting DTCs

P1FFB 88: When the controller has the transmission error for certain times, the "Bus Off" state will appear. The DTC will be set if the "Bus Off" state appears for 5 consecutive times.

U1111 87: The DTC will be set if the specified data frame from the BMS is not received within 500ms.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

P1FFB 88: "Bus Off" failure does not appear within 5s.

U1111 87: The corresponding data frame is received for 100 consecutive times.

Possible Failure Causes and Maintenance Scheme

1. Harness or connector failures:
   - Replace/repair the harness or connector.
2. Charger communication control module internal failure:
   - Replace/flash the control module.
3. High-voltage battery management module internal failure (for U1111 87):
   - Replace/flash the control module.

Reference Circuit Diagram

BUS System-Diagnostic Line Connector

Diagnostic Test Steps

1. Integrity Inspection of HS CAN Network.
2. Check the CAN communication harness and connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, CAN communication harness conductivity failure, CAN communication harness short to battery/ground failure, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.
3. Check the control module:

® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

® Normal, go to TAC Human Assistance.

U1562 and U1563

DTC Description

DTC	FTB	Failure Description
U1562	17	Battery Voltage High
U1563	16	Battery Voltage Low

Subsystem Principle

The charger communication control module (EVCC) monitors the supply voltage.

Conditions for Running DTCs

The Start switch is placed in ON position.

Conditions for Setting DTCs

U1562 17: The power supply voltage is greater than 16V for 1s.

U1563 16: The power supply voltage is less than 9V for 1s.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

U1562 17: The supply voltage is less than 15.5V for 1s.

U1563 16: The power supply voltage is greater than 9.5V for 1s.

Possible Failure Causes and Maintenance Scheme

1. Battery aging/damage:
   - Replace the battery.
2. Harness or connector failures:
   - Replace/repair the harness or connector.
3. Battery cable failure:
   - Replace/repair the battery cable.
4. Charger communication control module internal failure:
   - Replace/flash the control module.

Reference Circuit Diagram

Electric Vehicle Communication Controller

Diagnostic Test Steps

1. Check the battery:

   ® For battery aging, damage, deformation or leakage and other abnormal conditions: Replace the battery.

   ® Normal, go to 2.

2. Check the harness and connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, control module power supply/grounding harness conductivity failure and other abnormal conditions: Repair/replace the harness or connector.

   ® Normal, go to 3.

3. Check the battery cable:

   ® For looseness, breakage, damage and other abnormal conditions: Repair/replace the battery cable.

   ® Normal, go to 4.

4. Check the charger communication control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.

U2000, U2001, U2002, U2004, U2020 and U2021

DTC Description

DTC	FTB	Failure Description
U2000	04	ECU Hardware Error
U2001	42	EVCC EEPROM Error
U2002	42	EVCC RAM Error
U2004	42	EVCC ROM Error
U2020	47	EVCC Internal Watchdog error
U2021	47	EVCC External Watchdog error

Subsystem Principle

Charger Communication Control Module (EVCC) internal failure is found in the self-check, not involving external circuits.

Conditions for Running DTCs

The battery voltage is normal.

Conditions for Setting DTCs

U2000 04:

- PLC AFE cannot read FLASH information & CRC error.
- EVCC MCU has not received the message from PLC AFE for 500ms.
- DCDC (5V) supply voltage is beyond the range of 4.75 - 5.25V.
- DCDC (12V) supply voltage is beyond the range of 11.4 - 12.6V.
- LDO (3.3V) supply voltage is beyond the range of 3.1 - 3.5V.

U2001 42: EVCC Controller EEPROM Failure

U2002 42: EVCC Controller RAM Failure

U2004 42: EVCC Controller ROM Failure

U2020 47: EVCC Internal Watchdog Failure.

U2021 47: EVCC External Watchdog Failure.

Operations of ECU after Failure

Record DTC.

Conditions for Clearing DTCs

U2000 04: PLC AFE reads FLASH information successfully, EVCC AFE reads FLASH information successfully, DCDC (5V) supply voltage is in the range of 4.75 - 5.25V, DCDC (12V) supply voltage is in the range of 11.4 - 12.6V, and LDO (3.3V) supply voltage is in the range of 3.1 - 3.5V.

U2001 42: No failure is detected after turning the start switch off and on again.

U2002 42: ECU executes all RAM in the initialisation procedure.

U2004 42: The first checksum calculation performed after initialisation is correct.

U2020 47: There is no internal watchdog failure in the next working cycle.

U2021 47: There is no external watchdog failure in the next working cycle.

Possible Failure Causes and Maintenance Scheme

1. Charger communication control module internal failure:

   • Replace/flash the control module.

Diagnostic Test Steps

1. Check the harness connector of charger communication control module:

   ® For connector looseness, Pin deformation/breakage, power supply harness conductivity failure, grounding failure and other abnormal conditions: Repair/replace the harness connector.

   ® Normal, go to 2.

2. Check the charger communication control module:

   ® For software mismatch, hardware damage and other abnormal conditions: Flash/replace the control module.

   ® Normal, go to TAC Human Assistance.