上汽集团
SAIC MOTOR

MG4 ELECTRIC

Service Circuit Diagram

V2.1

SAIC

Foreword

Change History

No.	Action	Type	EWO	Chapter	Version/Date
1	First Version	/	/	/	V2.0 2022/05/31
2	Add X4 X6 X8	Engineering change	EAGDIG	S43-Rear Wiper System	V2.1 2023/03/13

Foreword

About This Document

General

This document is intended to assist in diagnosing electrical faults. The document is divided into the following sections:

INTRODUCTION - Includes the following contents: ABOUT THIS DOCUMENT, ELECTRICAL PRECAUTIONS, ABBREVIATIONS, WIRE COLOUR CODES, HARNESS ABBREVIATIONS, WIRE OPTION CODES, POWER SUPPLY MODES, CONNECTOR DETAILS, FAULT DIAGNOSIS, HOW TO USE THIS CIRCUIT.

FUSE BOX DETAILS - The information and fuction of fuses and relays in the engine conpartment fuse box and passenger compartment fuse box.

POWER DISTRIBUTION - Provides engine bay compartment and passenger compartment power distribution, it is intended to understand the condition of power distribution.

EARTH LEAD CIRCUIT DIAGRAM - Provide all the ground circuit and put them togeter, in order to look for earth information quickly for reader.

SUB-SYSTEM CIRCUIT DIAGRAM - Provide each system service circuit diagram.

LOCATION OF CONNECTORES AND EARTH LEADS - Shows the location of connectors and earth leads on the vehicle. For convenience, there will be several connectors or earth leads in one picture.

CONNECTOR TETAILS - Provide the connector faceview, name, description, colour and cavity information.

Battery Voltage

Open Circuit Voltage Test

Before commencing diagnosis of electrical problems, verify the condition of the battery is acceptable by using the open circuit voltage test.

1.Switch off all electrical loads on the vehicle.

2.Adjust digital multimeter to read DC volts on the appropriate scale.

3.Connect test probes across battery terminals ensuring that polarity is correct and record the voltage displayed.

A reading of 12.3V or more is acceptable, any battery which reads less than this will need charging.

Caution: If the vehicle has been used in the last eight hours before testing, the static on the surface of the battery must be removed by turning on the headlight for about 30 seconds. Wait for 60 seconds before checking the open circuit voltage.

Battery voltage is used as a known reference for ascertaining whether or not circuits are receiving sufficiently high voltage for components to function correctly. This reference is only a guide since most electronic circuits are designed to function over a wide range of voltages. In addition, consideration must be given to readings affected by voltage drop across certain components and fluctuations due to cable lengths.

Electrical Protection

General

The following guidelines are intended to ensure the safety of the operator whilst preventing damage to the electrical and electronic components fitted to the vehicle.

Equipment

Prior to commencing any test procedure on the vehicle, ensure that the relevant test equipment is working correctly and any harness or connections are in good condition. This particularly applies to mains lead or connections.

Caution: Before starting any work on power system, make sure the high voltage terminal, adapters and diagnostic equipment for testing have been insulated or shielded absolutely to prevent accidental personal accident and to minimize the risk of shock. The medicinal pacemaker carrier should be away from the power system circuit and the diagnostic equipment.

Polarity

Never reverse connect the vehicle battery and always observe the correct polarity when connecting test equipment.

High-Voltage Circuit

Whenever disconnecting live ht circuits, always use insulated pliers and never allow the open end of the ht lead to come into contact with other components, particularly ECU's. Since high voltage spikes can occur on the terminals of the high voltage components while the vehicle is running, exercise caution when measuring the voltage at these points.

Connector and Wire Harness

The front compartment of a vehicle is a particularly hostile environment for electrical components and connectors. Always ensure these items are dry and oil free before disconnecting and connecting test equipment. Never force connectors apart either by using tools or by pulling on the wiring harness.Always ensure locking tabs are disengaged before removal and note orientation to enable correct reconnection. Ensure that any protective covers and substances are replaced if disturbed.

Before removing a faulty component, refer to the Workshop Manual repair procedures. Ensure the START/STOP Switch is turned to the 'OFF' position, the battery is disconnected (see Battery Disconnecting) and any disconnected harnesses are supported to avoid any undue strain at the terminals. When replacing the component keep oily hands away from electrical connection areas and push connectors home until any locking tabs fully engage.

Battery Disconnecting

Before disconnecting the battery, switch off all electrical equipments.

Caution: To prevent damage to electrical components, ALWAYS disconnect the battery when working on the vehicle electrical systems. The earth lead must be disconnected first and reconnected last. Always ensure that battery leads are routed correctly and are not close to any potential chafing points.

High Voltage Precaution Requirements

Precautions related to high voltage systems and electric vehicles:

Unqualified personnel MUST NOT come into contact with EV or PHEV vehicles during repair - the correct barriers should be installed to prevent vehicle access.
DO NOT touch or contact any component identified as 'high voltage'
ONLY fully trained personnel should work with high voltage systems.
ALWAYS ensure that the correct insulated personal protective equipment (PPE) is used.
Prior to opening any high voltage circuits the systems MUST be checked using a suitable multi meter to ensure they carry no high voltage current.
Where there is need to work with the high voltage system is is essential that the correct 'make safe' procedure is followed - see Manual Service Disconnect procedure in the Service Repair manual.
After disconnecting the Master Safety Device (MSD), always wait 5 minutes prior to commencing any checks for residual voltage etc.
When any work is being carried out on the high voltage system the 12V battery MUST remain disconnected.
After disconnection of any HV connector it is essential that the connector and terminals are examined for condition, integrity and security prior to re-connection.
ALL high voltage components MUST have a good ground.

Warning: Only personnel that have full EV qualifications recommended by SAIC/MG Motor should undertake work on high voltage components and systems.

Warning: Non qualified staff are NOT permitted to dismantle high voltage systems or components (including, ESS. EDS, HV harnesses, EACP, Charging sockets etc).

Warning: Any qualified personnel working on high voltage systems or components MUST wear the correct insulated personal protective equipment (PPE). All PPE must be regularly checked and tested for condition and integrity.

Caution: When removing or servicing any parts of the high voltage system it is essential that no liquids enter, contaminate or are spilled on components, harnesses or connectors.

Abbreviation-1

A	Ampere
A/C	Air Conditioning
ABS	Anti-Lock Braking System
ANT	Antenna
ATC	Automatic Temperature Controller
BCM	Body Control Module
BUS	BUS System
CAN	Controller Area Network
CDL	Center Door Lock
CHSML	Center High Stop Mounted Lamp
CFB	Passenger Compartment Fusebox
DI	Direction Indicator Lamp
DRL	Daytime Running Lamp
EACP	Electric Air Conditioning Compressor
EBS	Electrical Battery Sensor
ECU	Electronic Control Unit
EDU	Electrical Drive Unit
EF	Front Compartment Fusebox Fuse
EPB	Electrical Parking Brake
EPS	Electric Power Steering
ESCL	Electronic Steering Column Lock
ESS	Energy Storage System
EVAP	Evaporator
EVP	Electronic Vacuum Pump
F	Fuse
FL	Front Left
FICM	Front Infotainment Control Module
FR	Front Right
GND	Ground
HRW	Rear Windscreen Heating
HS	High Speed
HVIL	High Voltage Interlock Loop

Abbreviation-2

IGN	Ignition
ILLU	Illumination
IMMO	Immobilization
IFP	Information Faceplate
IPK	Instrument Pack
LH	Left Hand
MIC	Microphone
MLS	Master Light Switch
NAV	Navigation
PACM	Pedestrian Alert Control Module
PDC	Parking Distance Control Module
PDU	Power Distrbution Unit
PEB	Power Electronic Box
PEPS	Passive Entry Passive Start
PTC	PTC
PWM	Pulse Width Modulated
PWR	Power
RH	Right Hand
RL	Rear Left
RLS	Rain Light Sensor
RR	Rear Right
RVC	Rear Vision Camera
SCRN	Shield
SCS	Stability Control System
SCU	Shift Control Unit
SIG	Signal
SPK	Speaker
SW	Switch
T-BOX	TBOX
TEMP	Temperature
TM	Traction Motor
VCU	Vehicle Control Unit

Wire Colour Code

Code	Description
R	Red
B	Black
O	Orange
S	Slate
K	Pink
N	Brown
Y	Yellow
U	Blue
P	Purple
W	White
G	Green
T	Tan
DG	Dark Green
DU	Dark Blue
LG	Light Green
LU	Light Blue

Caution: Some wires have double colours,such as "YW" means the main colour is yellow and the second colour is white.

Harness Abbreviation

Abbreviation	Description
AT	Antenna
BT/CB	Battery Cable
BY	Body Harness
CCU	CCU Cable
DD	Driver Door Harness
DS	Driver Seat Harness
EB	Front Compartment Harness
FA	Facia Harness
HV	High Volgate Harness
PD	Passenger Door Harness
RLD	Rear Left Door Harness
RRD	Rear Right Door Harness
TG	Tailgate Harness

Option Code-1

Code	Description
2022	Model Year 2022
3G02	National Code: EU
C21K	Lithium iron phosphate battery 51kWh
C21C	Ternary Polymer Lithium Battery 64kWh
C23A	High Voltage Battery Pack Heater
C23X	NO High Voltage Battery Pack Heater
E05A	Four-Wheel Drive
E05B	Rear-Engine Rear-Drive
F00E	Electric Power Steering
F12H	Steering Wheel Heating
F15E	Electronic Steering Column Lock
H10K	Stability Control System
H10W	ESP SPORT
H11A	AUTO HOLD
H15B	Electronic auxiliary braking
H20A	Adaptive Cruise Control
H30E	Electric parking brake
J17A	Tyre Pressure Monitoring System-Direct
J17P	Tyre Pressure Monitoring System-Indirect
K14B	External air intake grille active closing system
K20B	Power Adjust & Fold Mirror with Heating
K203	Electric Adjust & Manual Fold Mirror with Heating
K61B	Boneless wiper
M10D	Manual Anti-glare Interior Mirror
M35E	Center console power socket
M54A	Luggage compartment lighting
N002	Manual Adjust Driver Seat
N00A	Electric Adjust Driver Seat
N02B	6-way adjustment
N06A	4-way adjustment
N101	Manual Adjust Front Passenger Seat

Option Code-2

Code	Description
N201	Independent rear first row seats
N451	Front seat heating, type 1 (3rd gear)
N45W	Front Seat Heating
N45X	No seat heating
Q00S	Dual Airbag & Side Curtain
Q01B	Front Seat Airbag
Q09A	Passenger Airbag Disable Switch
Q15C	Child safety door lock
Q17B	Front seat belt height fixing
Q19R	Driver Seatbelt with Reminder
Q20S	Front & Rear Seatbelt with Reminder
Q26C	Upper and lower fixing points
Q31A	Passenger side airbag, single stage
Q40A	Driver's seat belt pretensioner, type 1
Q41A	Front passenger side safety belt pretensioner, type 1
R40G	Driver information display, color 7 inches
S00A	Headlight, led type A
S00B	Headlight, led type B
S02F	Front fog lamp
S03F	Rear fog lamp
S04A	Light with glove box
S0D1	Intelligent headlamp control system
S10A	Automatic lighting control system
S11D	Daytime running lights
S12L	LED high mounted brake lamp
S14L	Led brake light
S16D	Driver's side glass anti pinch only
S16E	Front door glass anti pinch
S16F	Front and rear door glass anti pinch
S1AB	Through type rear position lamp
S20H	Windshield heating

Option Code-3

Code	Description
S27A	With side impact function
S30S	Dual keyless entry
S31F	Senseless start
S32M	Engine anti-theft
S34B	Burglar alarm
S36A	Double snail horn
S37B	Bluetooth Handsfree phone
S40F	Front and rear reversing radar
S40P	Rear drive
S41B	Emergency lane keeping assist system
S41K	Lane keeping assist system
S43A	With automatic unlocking function
S44A	Remote central locking
S53B	Remote real-time monitoring with GPS
S54A	Integrated hood ajar alarm switch
S57A	Pedestrian warning control system
S61A	Remote start - engine
S62B	Reversing lamp 2
S65A	Headlamp delay off
S67A	Anti theft deadlock
S68A	Rear 4 sensor
S68C	4 sensors at the front and 4 sensors at the rear
S70E	Blind spot monitoring system, type E
S72A	Automatic falling lock with speed
S73A	AEB system
S74A	Intelligent speed assist system
S75A	Emergency call
S78A	360 panoramic image, color, analog
S82F	Front impact sensor
S83C	Inductive wireless charging equipment
S891	Driving mode 1

Option Code-4

Code	Description
S892	Driving mode 2
S94A	Traffic congestion assistance
S97A	Driver status monitoring
S97B	Indirect driver fatigue reminder
S98B	High and low voltage charging integrated module
S99B	Irreversible function
T00H	High voltage PTC
T05H	heat pump
T05X	No heat pump device
T11G	Automatic thermostatic air conditioning - Single Zone
T12F	Pollen / particulate filter
T12G	Pollen / PM2.5 filter
U00A	Radio
U013	Three USB ports
U04D	Radio range, Europe
U054	4 speakers
U05D	6 speakers, enhanced efficiency
U061	1 microphone
U10A	Entertainment system (non internet)
U10E	Internet system-typA
U11N	Navigation
U11X	No navigation
U35R	Steering wheel with volume adjustment
U40D	Color display type 3
U41A	Digital radio

Definition of Power Supply

According different power status, battery power is numbered as KL30, KLR, KL15, KL15 SW, KL50, KL58, KL31.

"KL30" means 12V battery power.

"KL15/KL15 SW" means battery power with START/STOP Switch in position ON/READY.

"KLR" means battery power with START/STOP Switch in position ACC.

"KL50" means battery power with START/STOP Switch in position START.

"KL58" means battery power with master light switch in position I and II.

"KL31" means earth ground.

Power Supply Symbol

The symbols of power supply in the circuit diagram are expressed as follows:

Connector Details

General

Connector means harness terminal connector.

Connector information includes name, description, colour, location view, face view and cavity information.

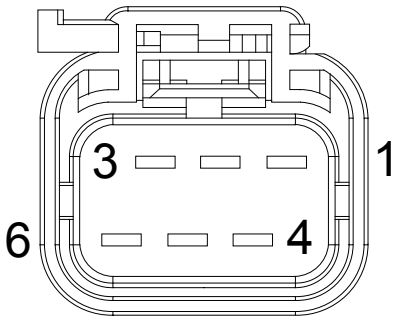
● Connector Name: The number is composed of the prefix of harness abbreviation and 3 serial number. For example, BY001 indicates the 001 connector of body harness.

● Connector Description: Describe the function of the connector, which is usually named after the components connected to the connector. For example, "Body Control Module-1" refers to the connector connected to interface 1 of the body control module. The name of inline connector depends on the harness name at both ends. For example, 'Inline-Driver Door Harness to Body Harness' refers to the connector on the body harness that connect with the facia harness.

● Connector Colour: Coluor of connector plastic parts. If the coluor of connector shell and inner core is inconsistent, the coluor of connector inner core shall prevail.

● Connector Location View: Indicates the approximate position of the connector on the vehicle.

● Connector Face View: Show the shape, outline and end face structure of the connector, and mark the pin number, as shown in the figure below.



Face View Example Photograph

● Connector Cavity Information: The wire information (cross-sectional area, colour and option code) of each connector cavity terminal is listed in the form of table. If there is no wire terminal in the cavity, the cavity information will not be displayed in the table.

Fault Diagnosis

General

When diagnosing an electrical fault, follow the steps below:

1. Study the circuit diagram appropriate to the reported fault to ensure a good understanding of circuit operation.

2. Study the power distribution, fuse details diagrams and identify other circuits which share fuses and/or earth points. Check whether these circuits operate correctly.

3. Using the photographs contained in the connector section, locate a point on the circuit (approximately half way between supply and earth) which is easily accessible.

4. Check that the PIN out details of the connector are correct and that the correct signals exist at the correct terminals.

5. Continue to the next point on the circuit which is easiest to access and repeat the above.

6. Continue with this approach until a fault is found, rectify the fault and then verify that the circuit operates correctly.

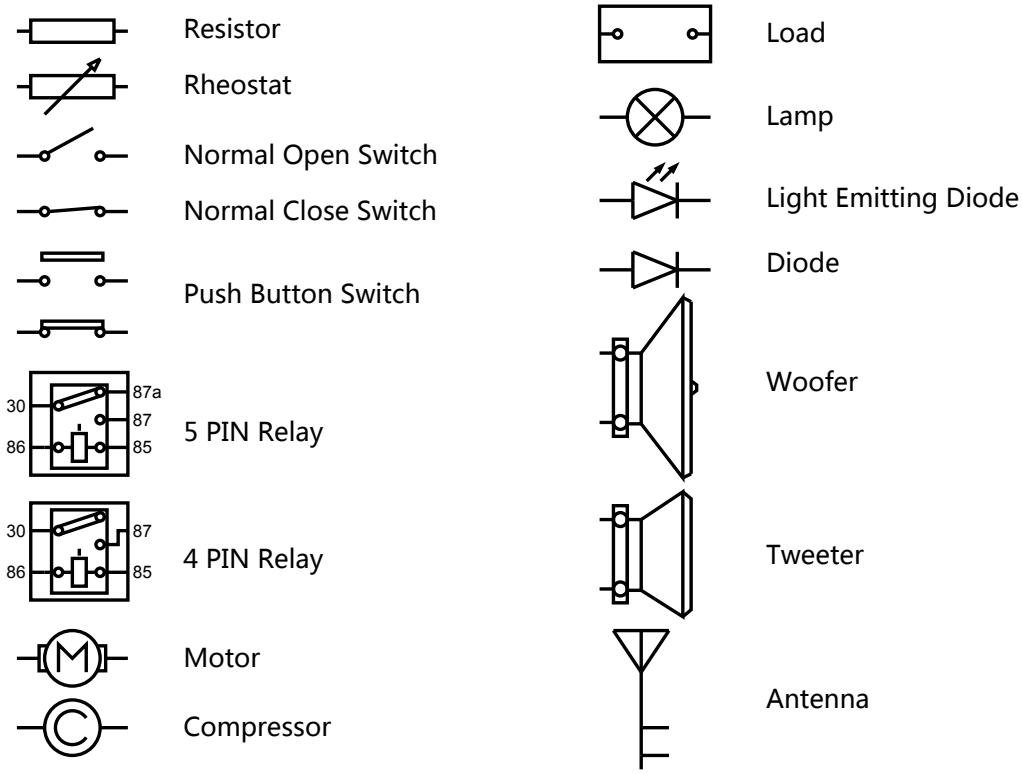
WARNING: Never probe directly into the front face of a connector. This can damage the terminal and cause a failure. Always probe the back of a terminal, taking care not to damage the terminal or any seals.

WARNING: Never probe the wire insulation. On small diameter cables this can cut the conductors. It may also allow moisture into the cable, causing corrosion.

How to Use This Circuit

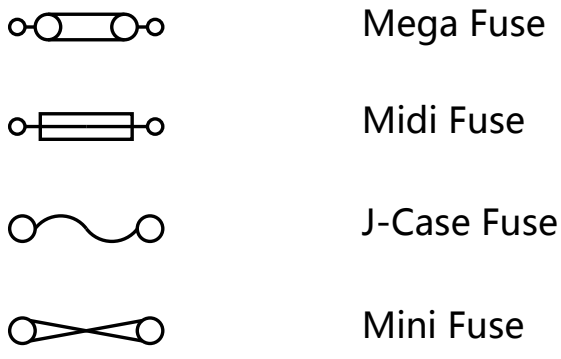
Component Symbol

In the below picture, there are normal electrical components refered in this Document.



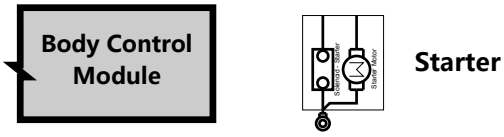
Fuse Symbol

There are many types of fuses.
In the below picture, there are normal kinds of fuses and their instructions refered in this Document.



How to Use This Circuit

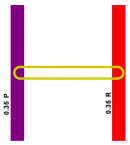
Controller/Device



Symbols of controller and device is as shown in the figure above.

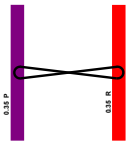
If all pins connected is shown in this page, the border of controller/device will be full line, or there will be a lightning symbol in the border.

Shielded Wire



A shielded wire is shown as illustration.

Twisted Pair Wires



Twisted pair wires are shown as illustration.

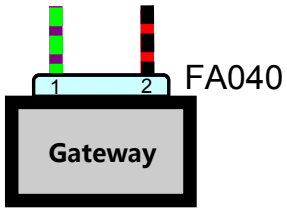
Foreword

How to Use This Circuit

Wire Attribute

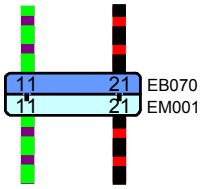
0.35 means wire sectional area, the unit is square milimeter.
GP means wire color, the main color is green and second color is purple.
The coloured circuit diagrams show the actual wiring colours.
S40P is the option of this wire. You can refer option codes in option code list.
Wire option code can be combined by [AND], [OR], [NOT], the symbols are as follows.
[AND]: &, &&
[OR]: /, ||
[NOT]: !

Harness Connector on Device



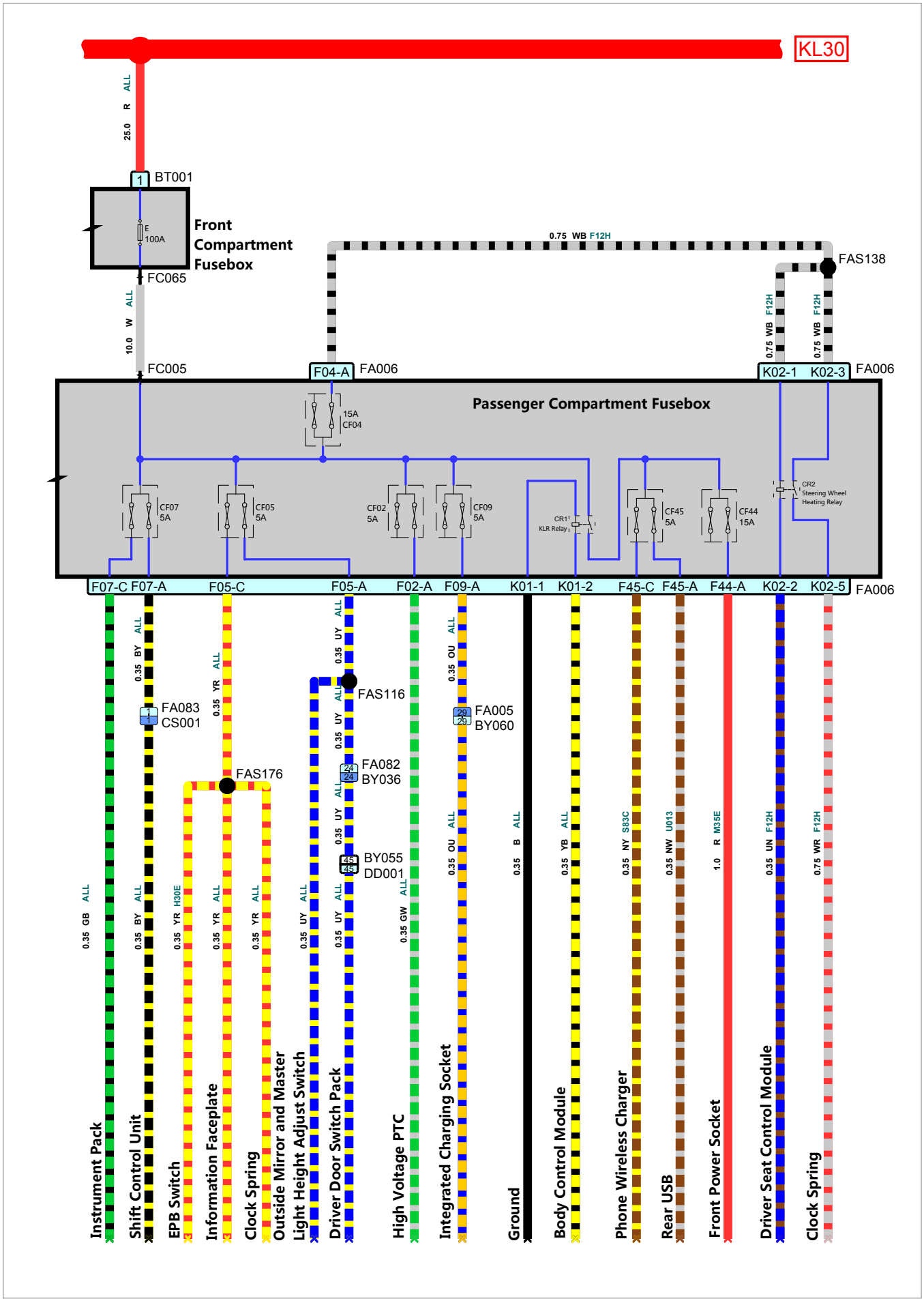
The component connector is shown as an illustration. The information provided lists the connector number, wiring pin number and connector type.
This figuare means the PIN1 & PIN2 of the female connector FA040 is connected with gateway.

Inline Connector

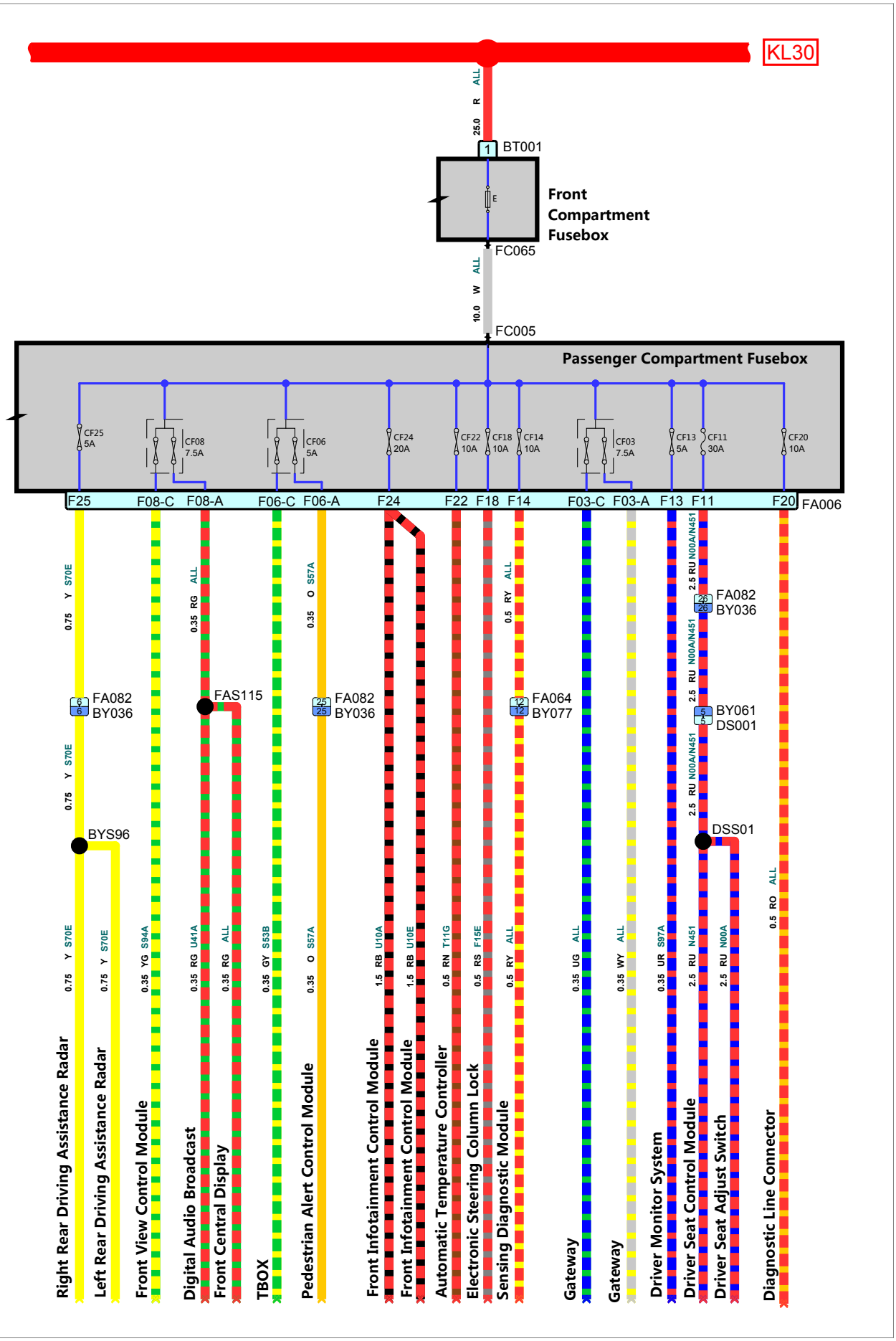


The in-line connector is shown as illustration.
EB070 & EM001 means the numbers of the in-line connectors.
The symbol of dark blue with pin is male connector, and the other is famale.
The illustration means PIN11 and PIN 21 are connected with each other of EB070 and EM001.

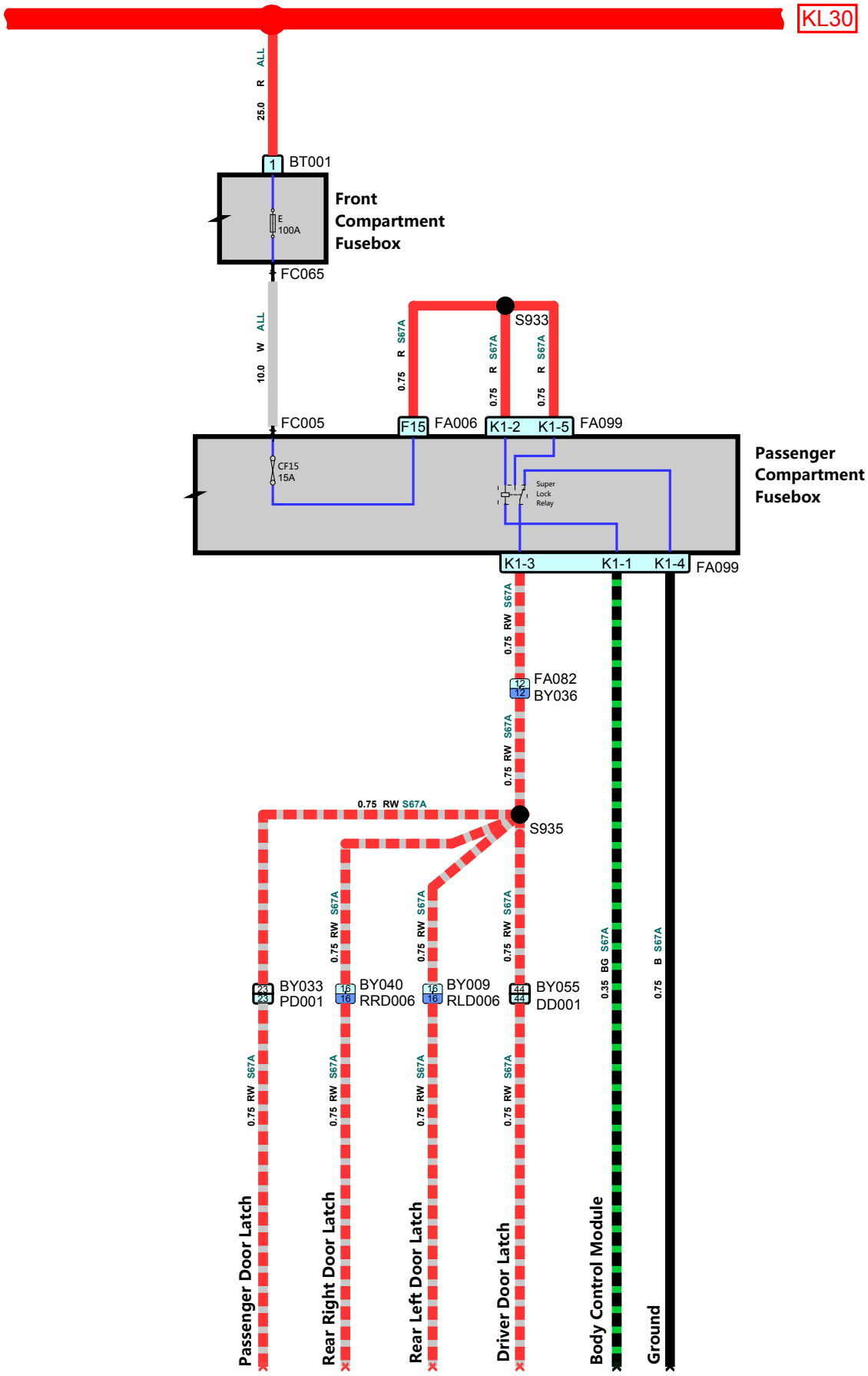
CF01-Passenger Compartment Power Distribution(1)



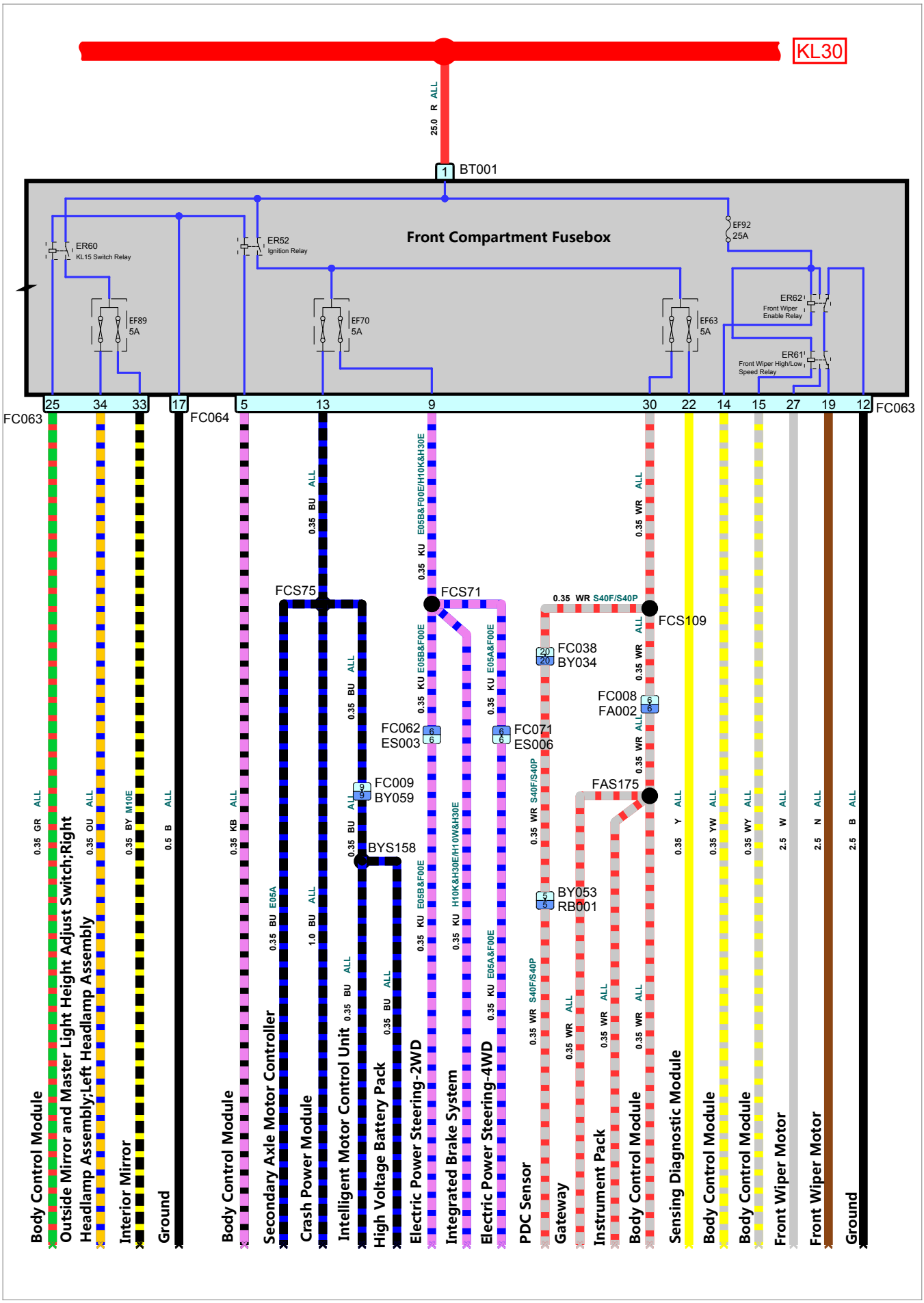
CF02-Passenger Compartment Power Distribution(2)



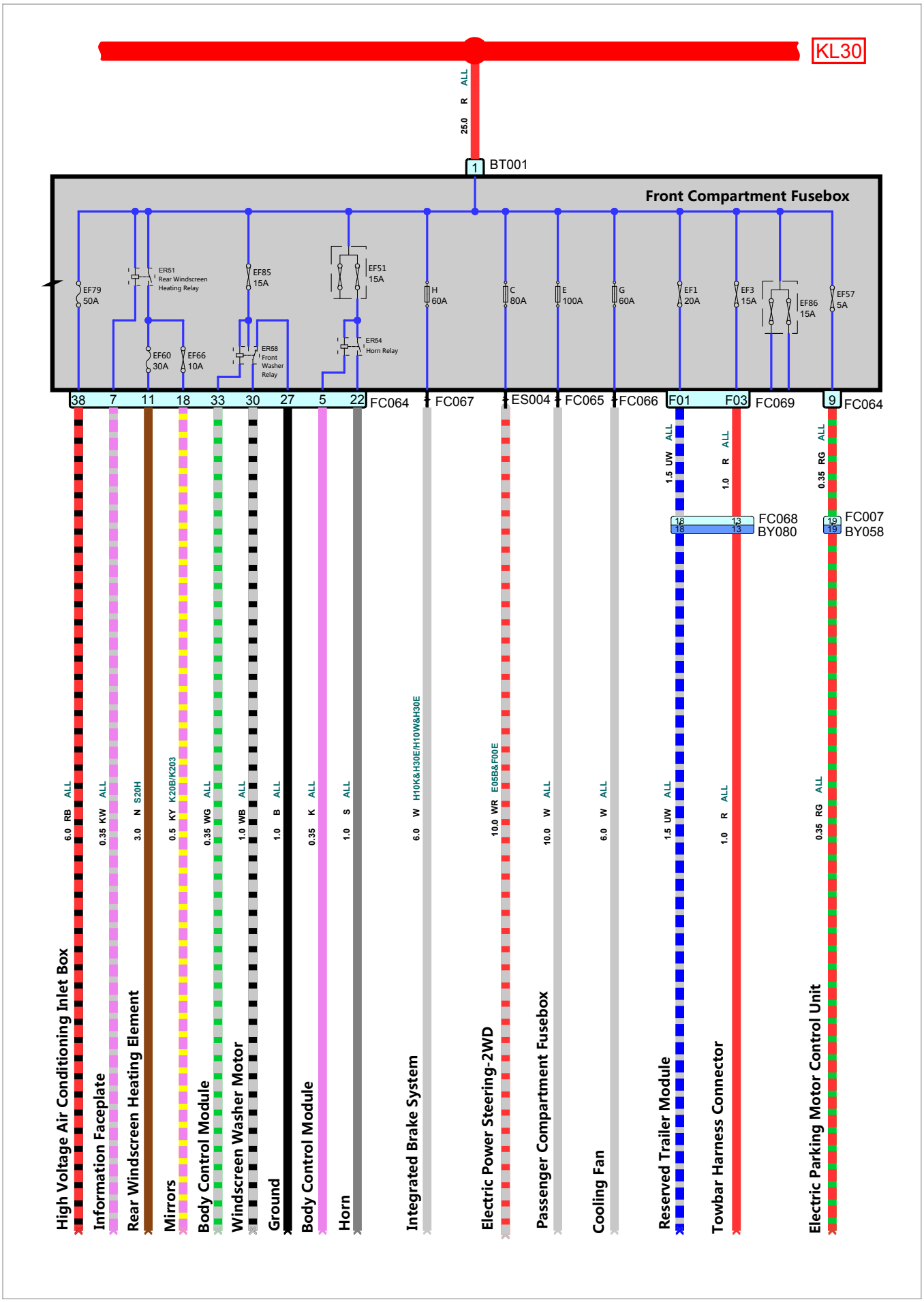
CF03-Passenger Compartment Power Distribution(3)



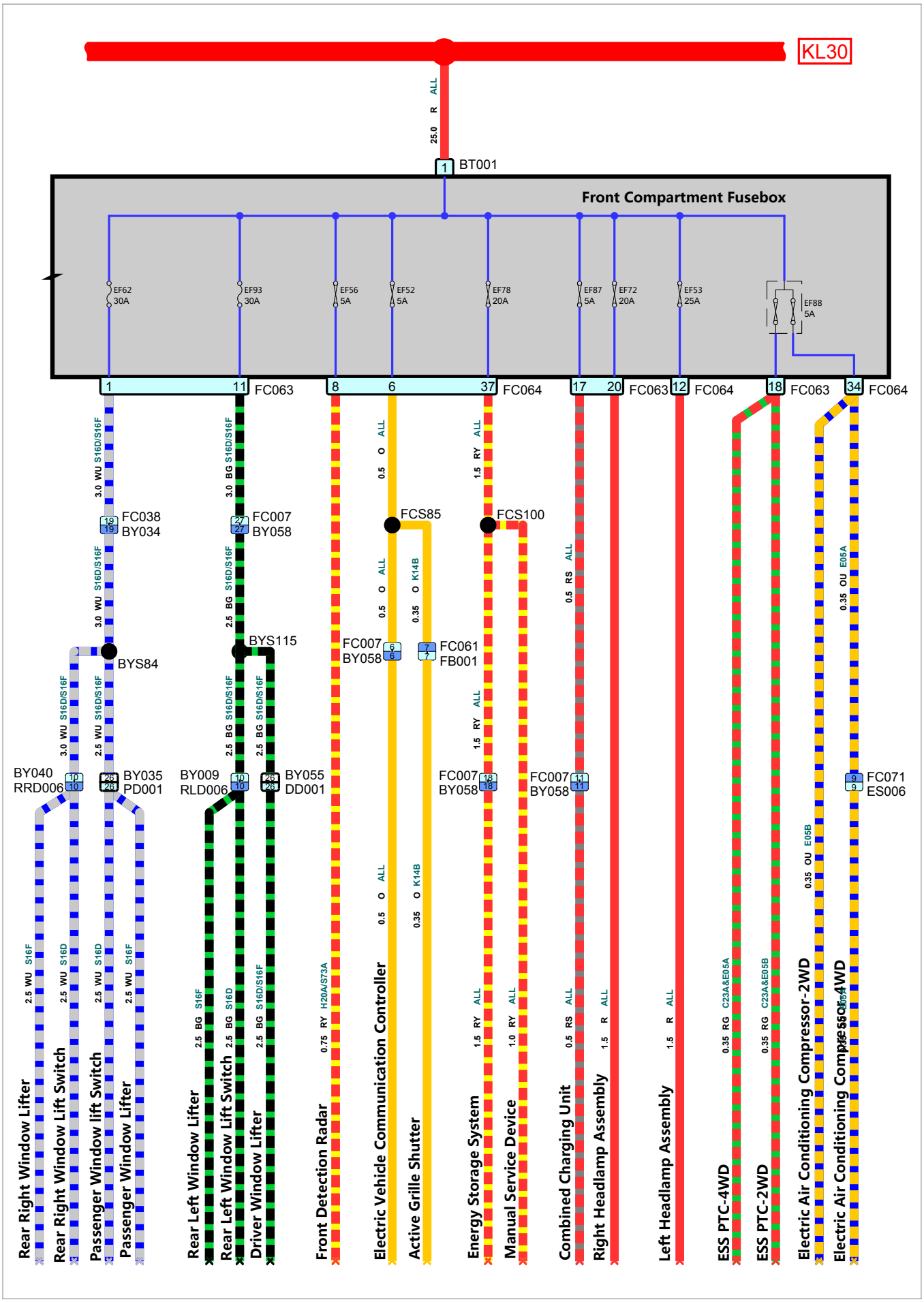
EF01-Front Compartment Power Distribution(1)



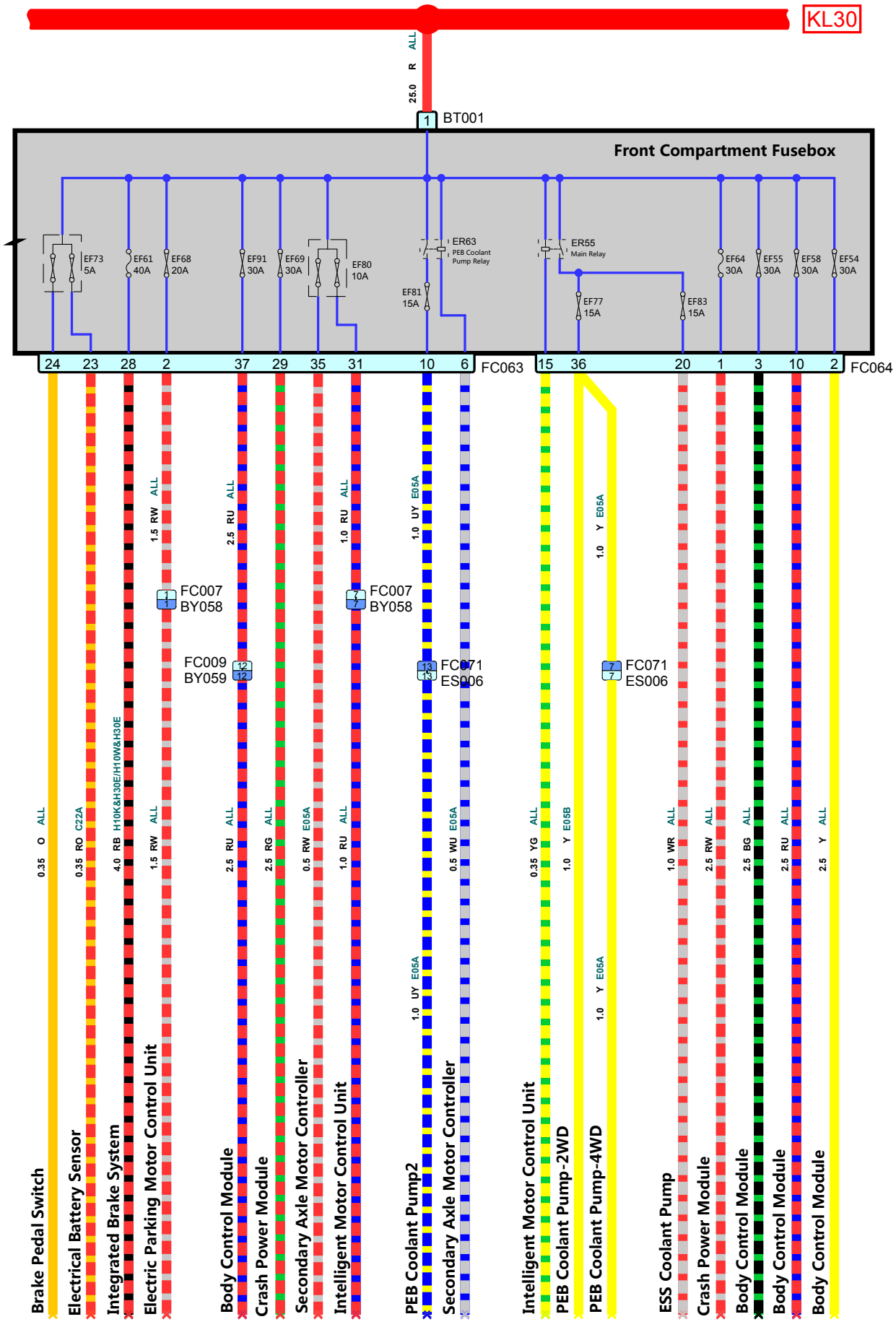
EF02-Front Compartment Power Distribution(2)



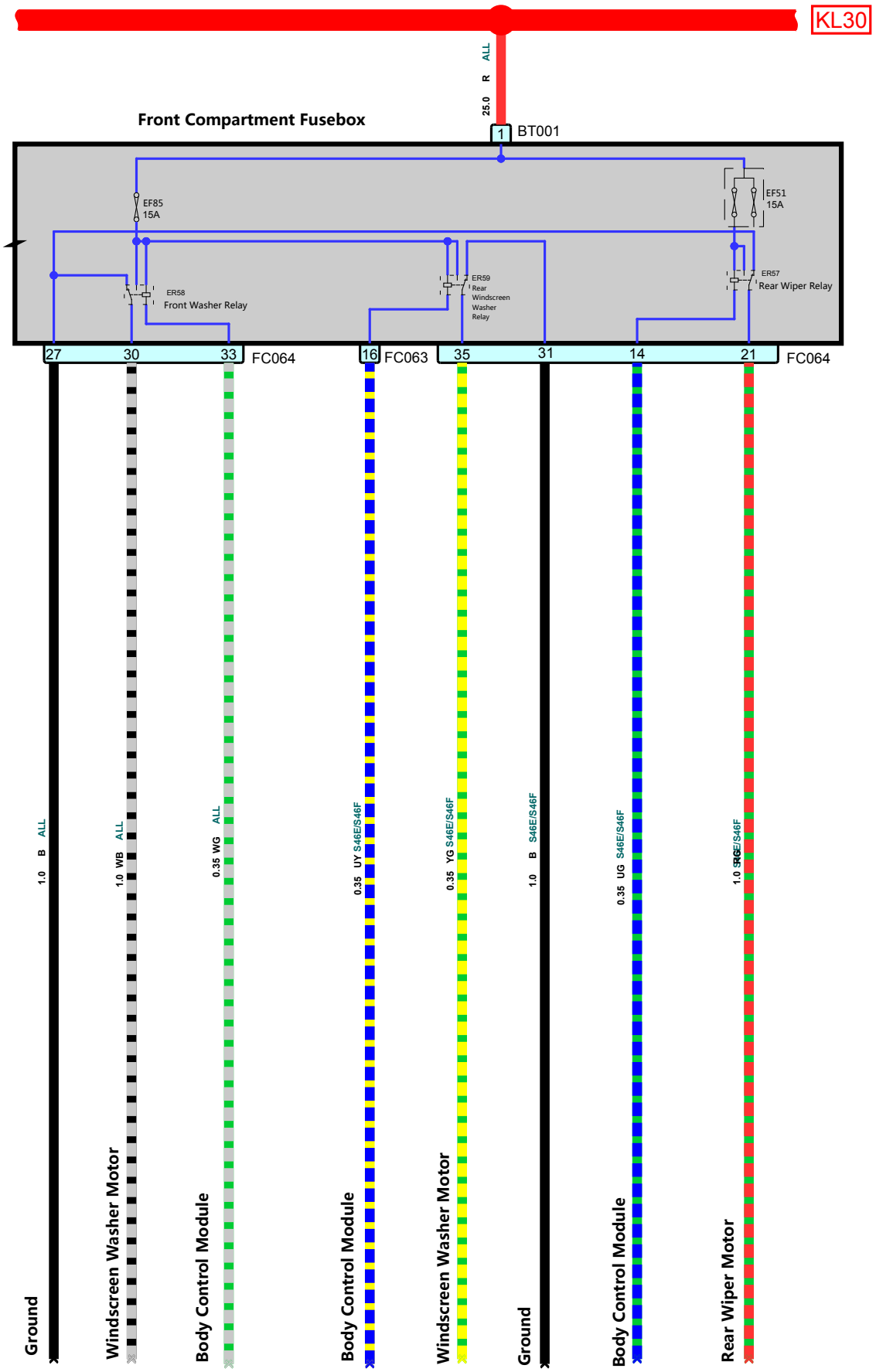
EF03-Front Compartment Power Distribution(3)



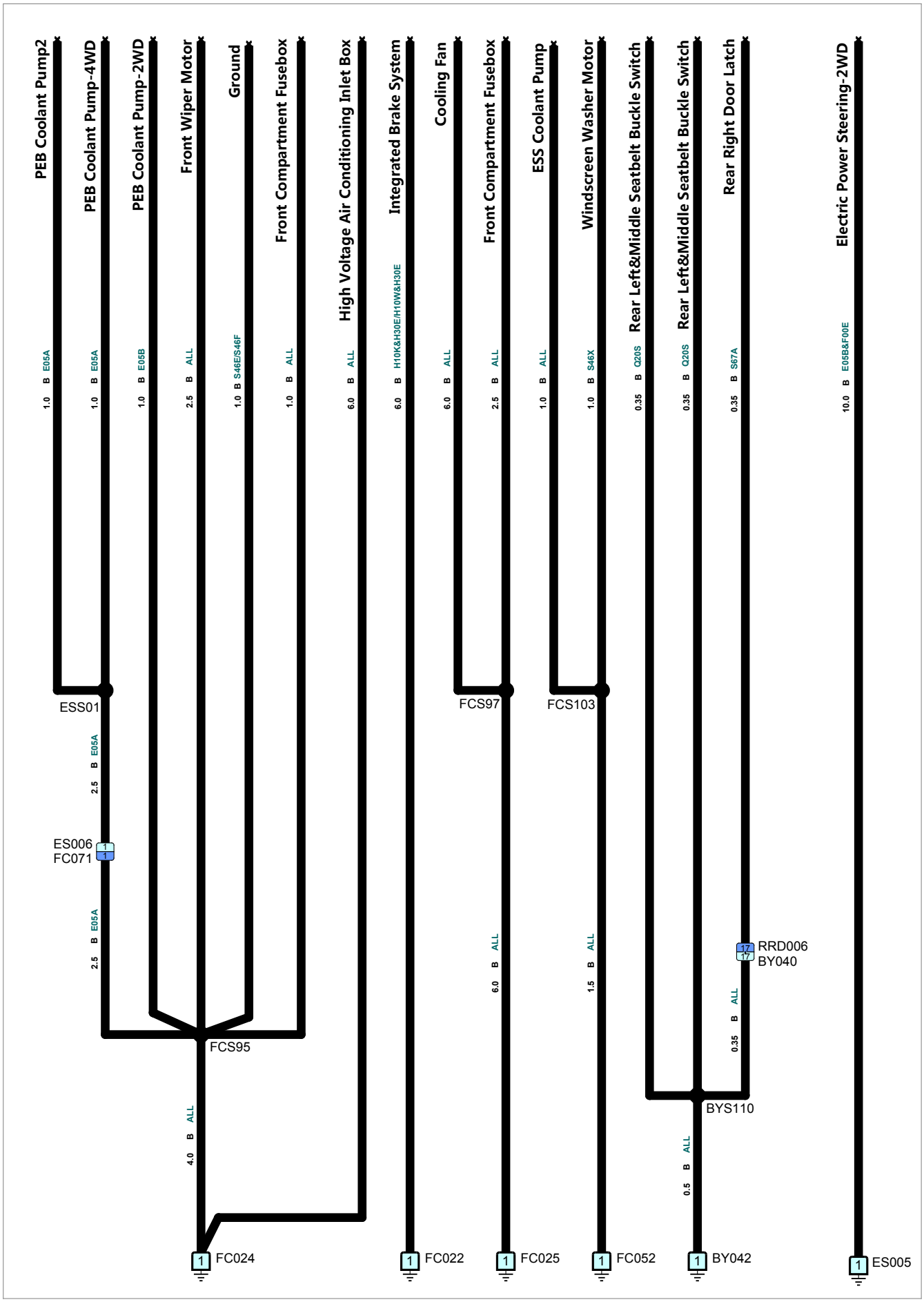
EF04-Front Compartment Power Distribution(4)



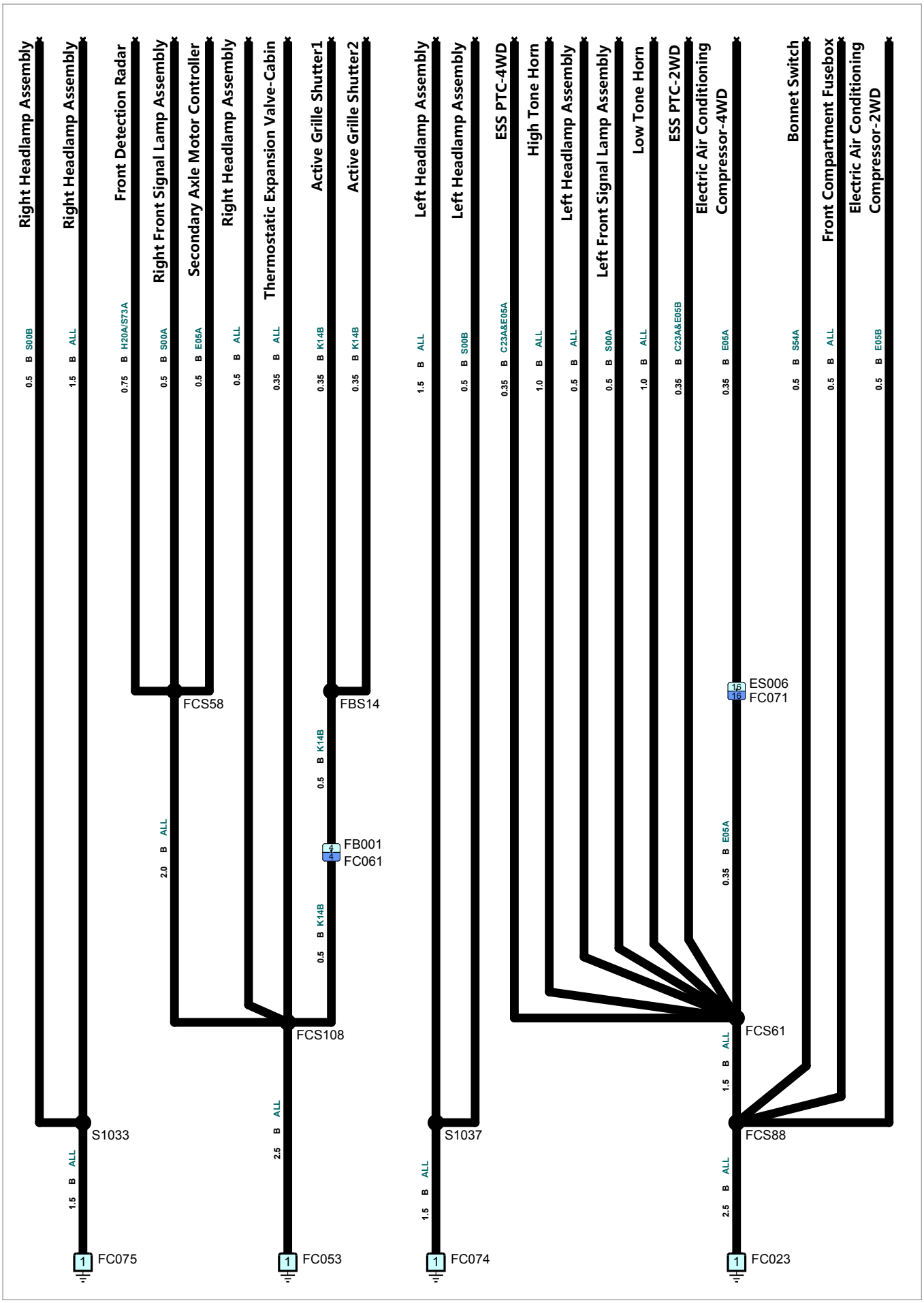
EF05-Front Compartment Power Distribution(5)



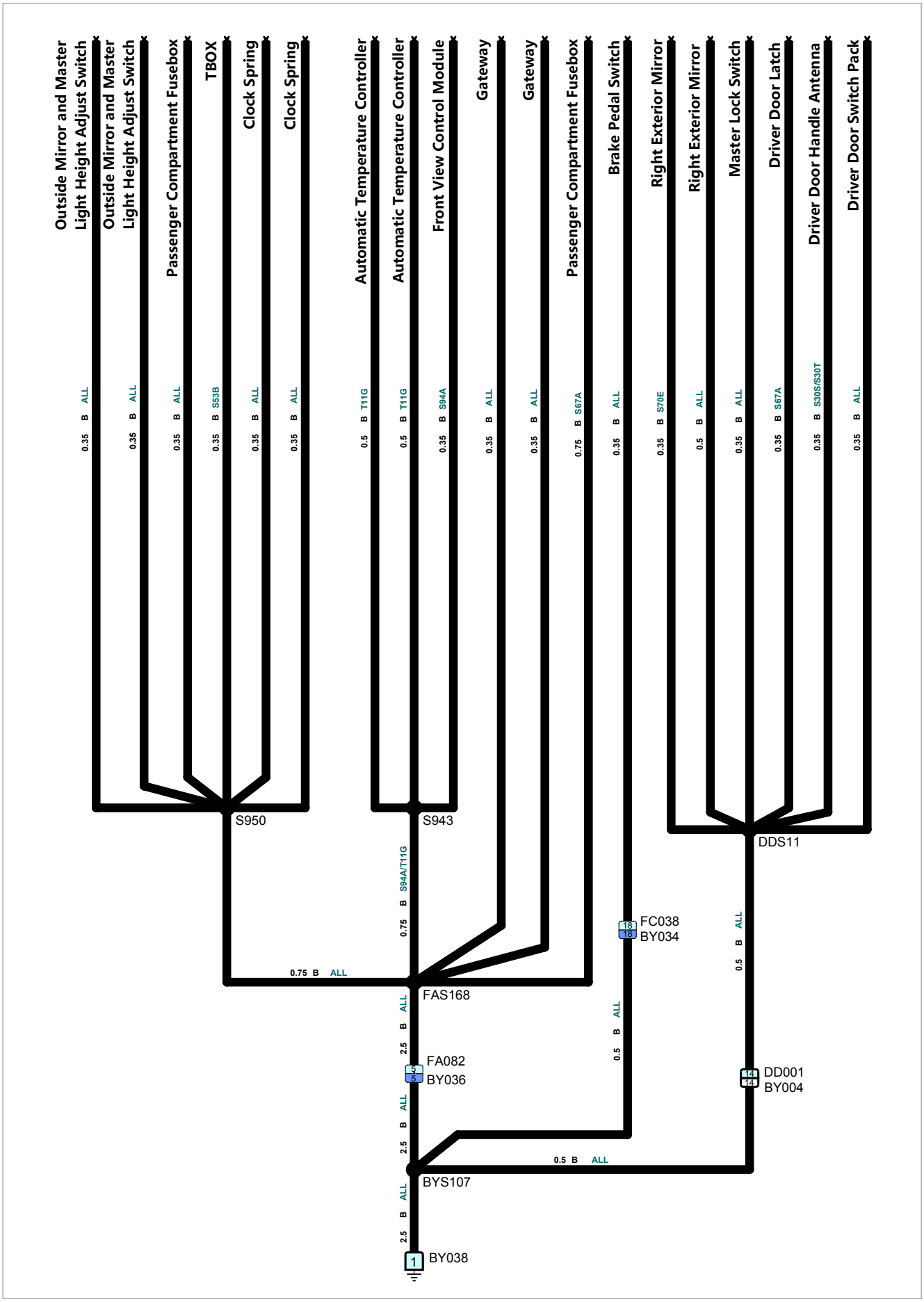
G01-Ground Circuit(1)



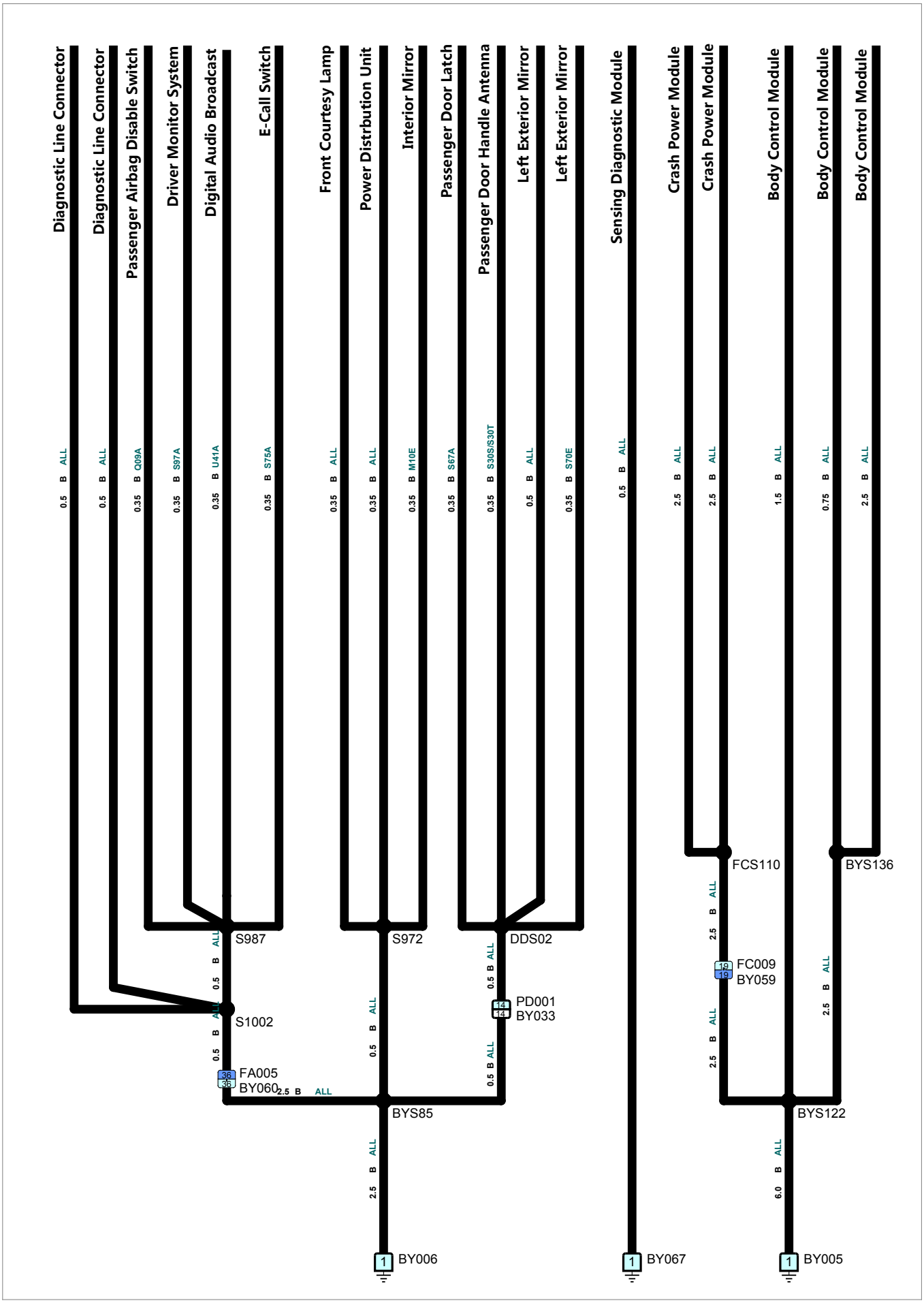
G02-Ground Circuit(2)



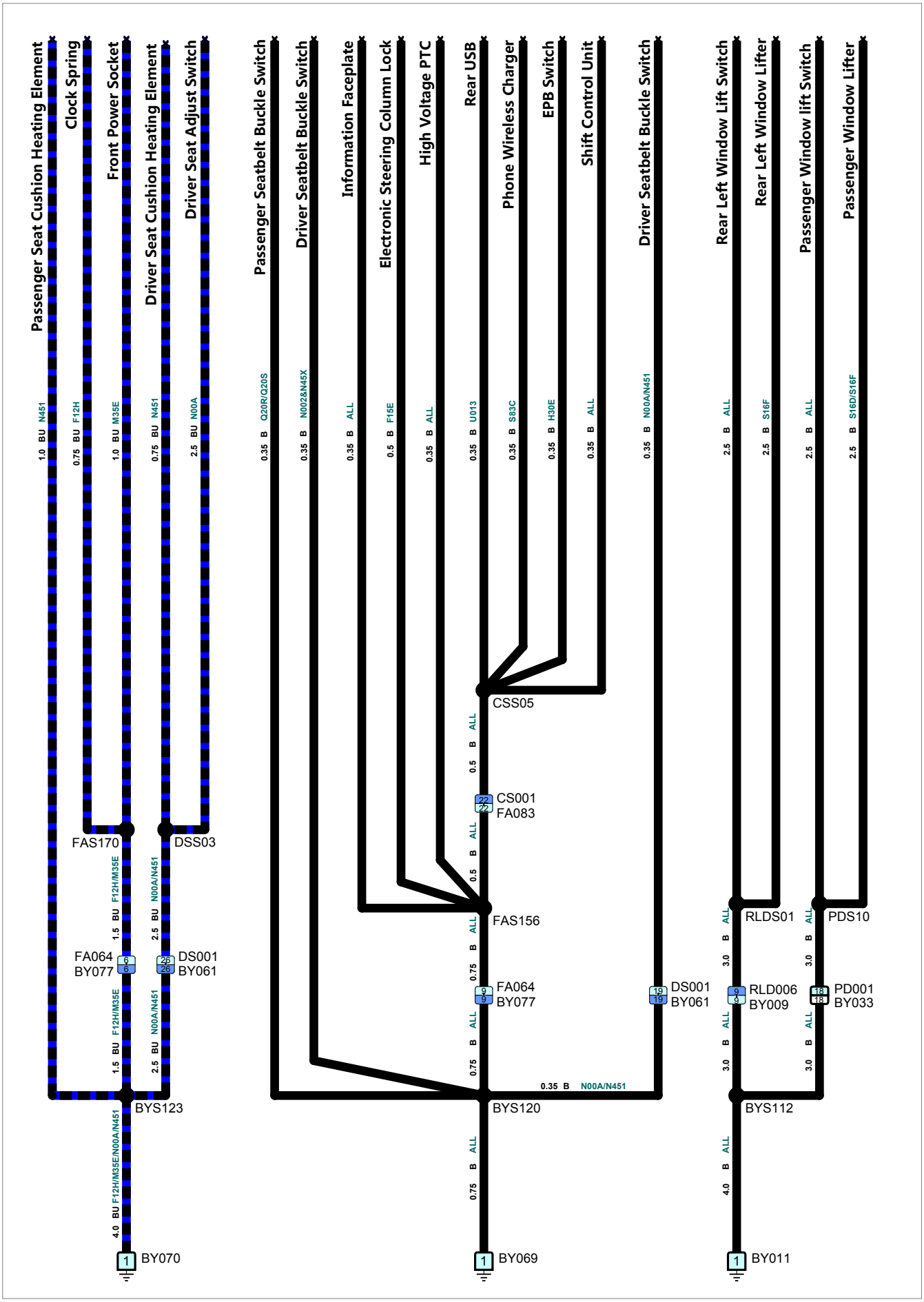
G03-Ground Circuit(3)



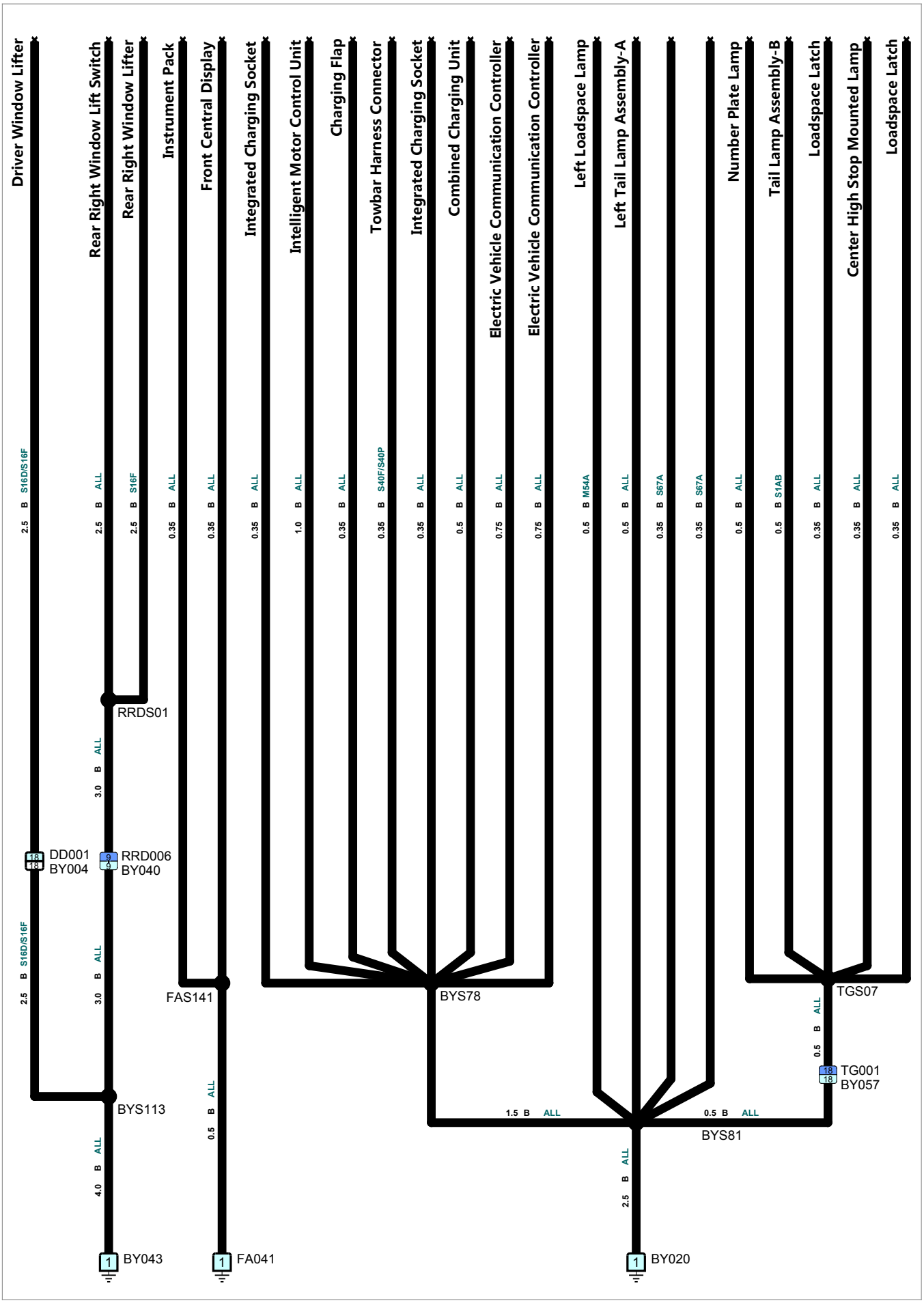
G04-Ground Circuit(4)



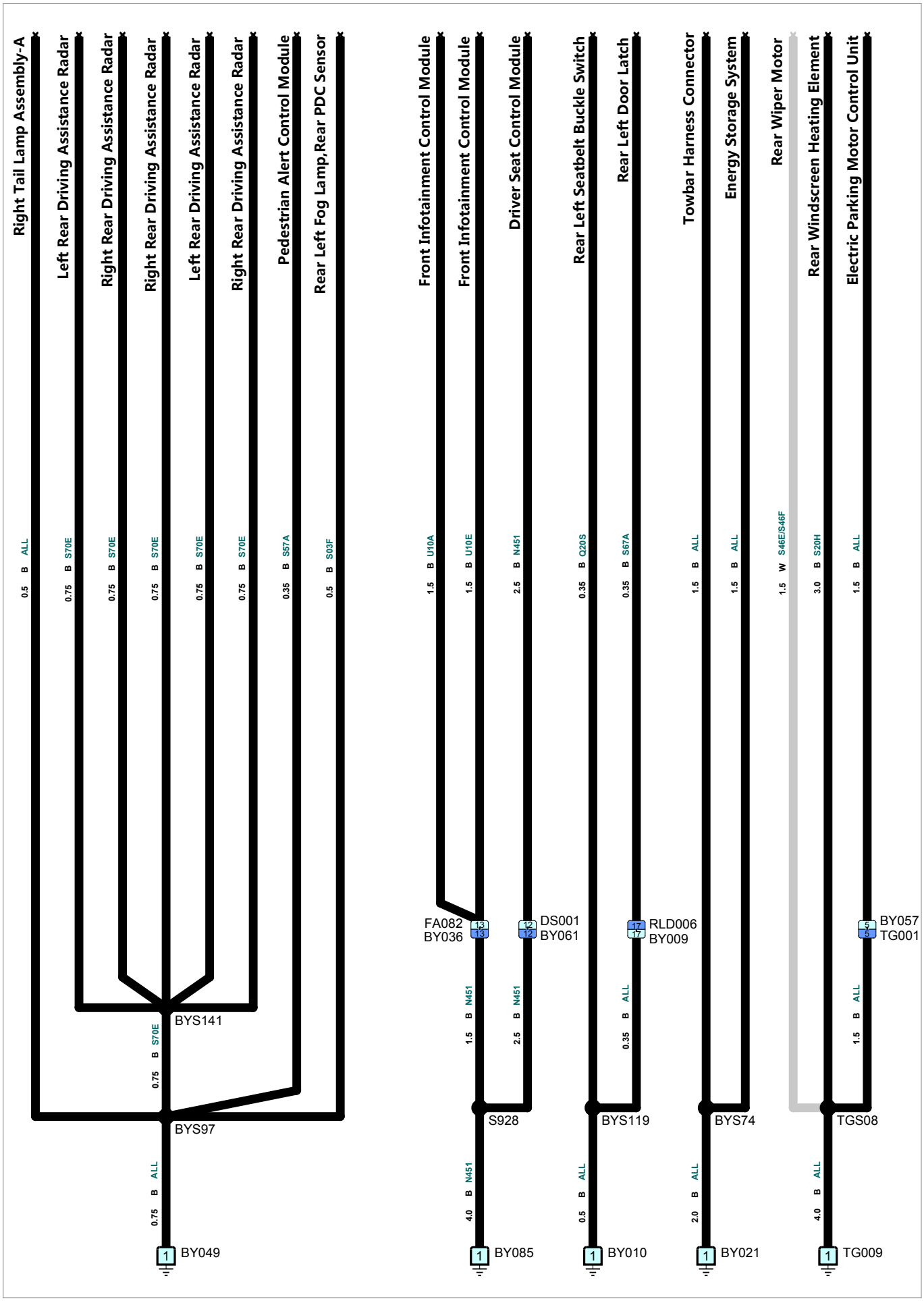
G05-Ground Circuit(5)



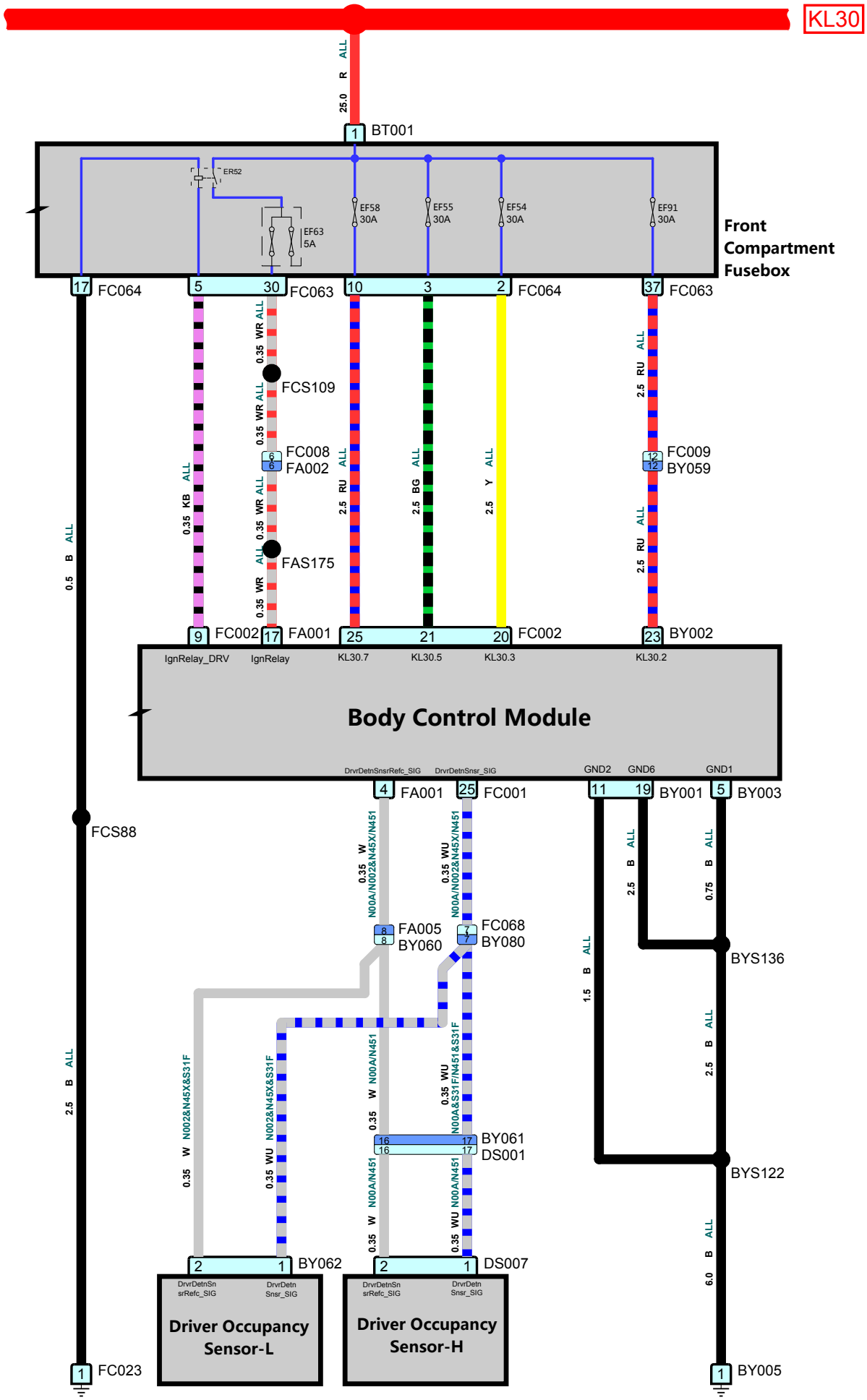
G06-Ground Circuit(6)



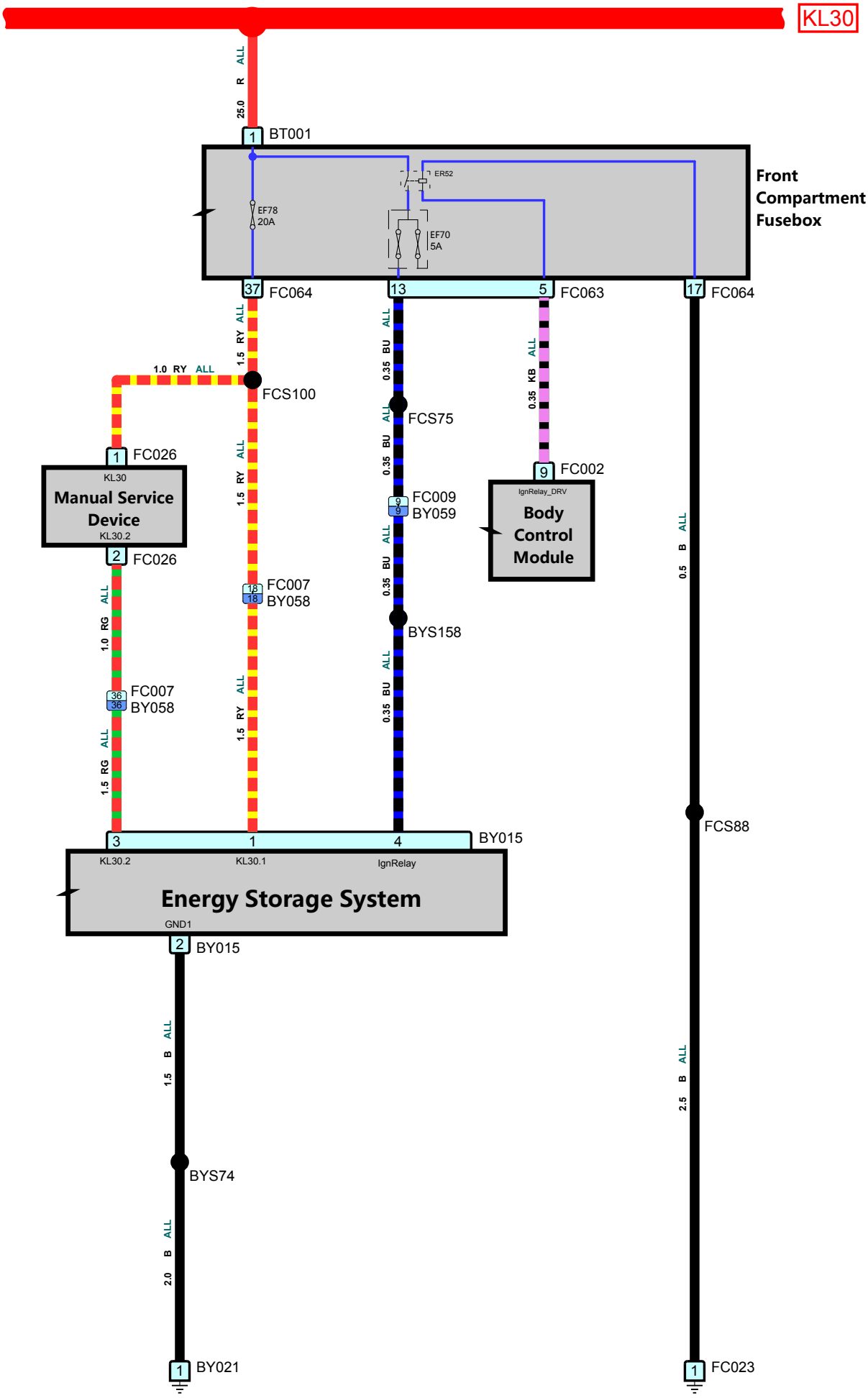
G07-Ground Circuit(7)



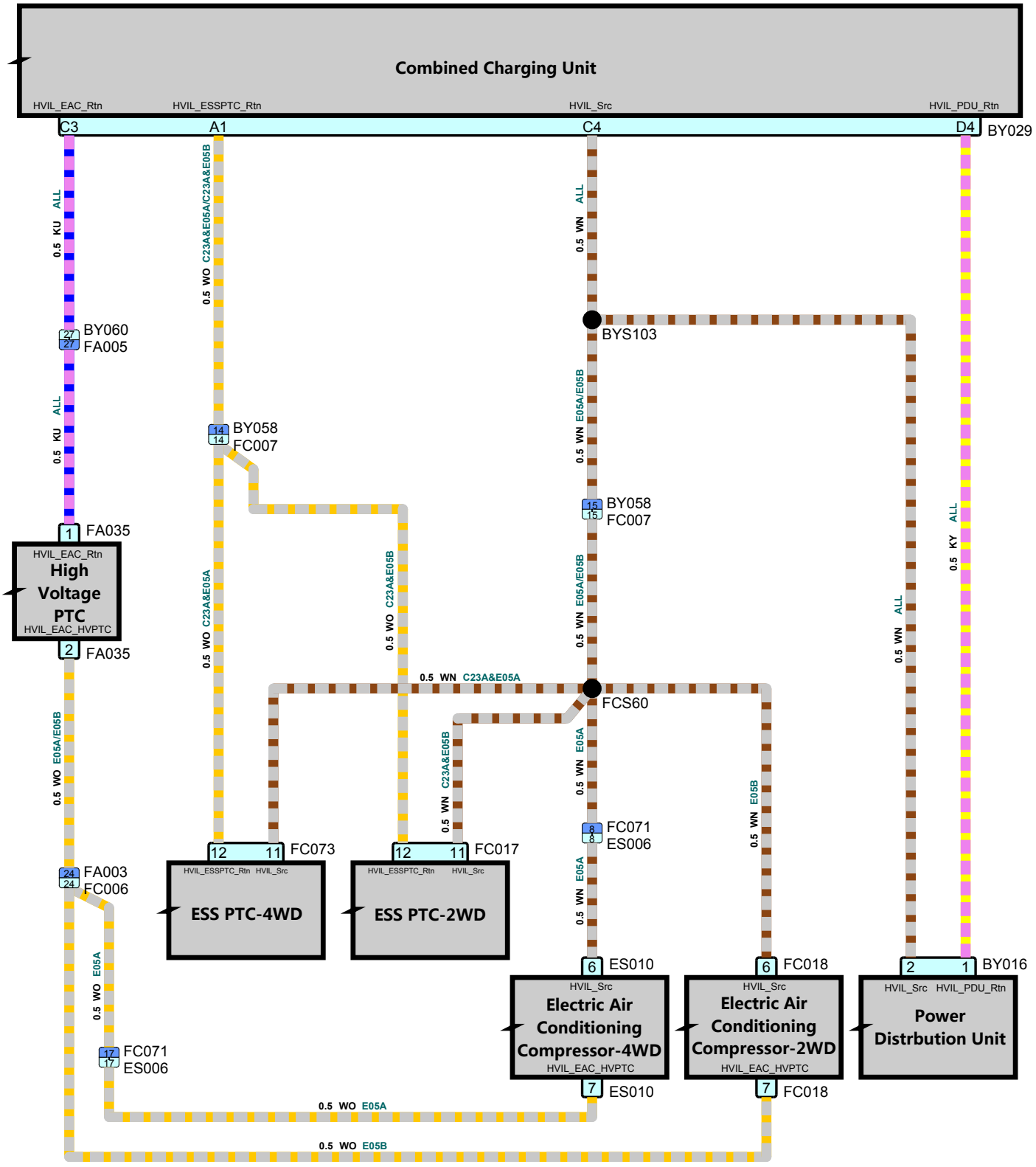
S01-Body Control Module



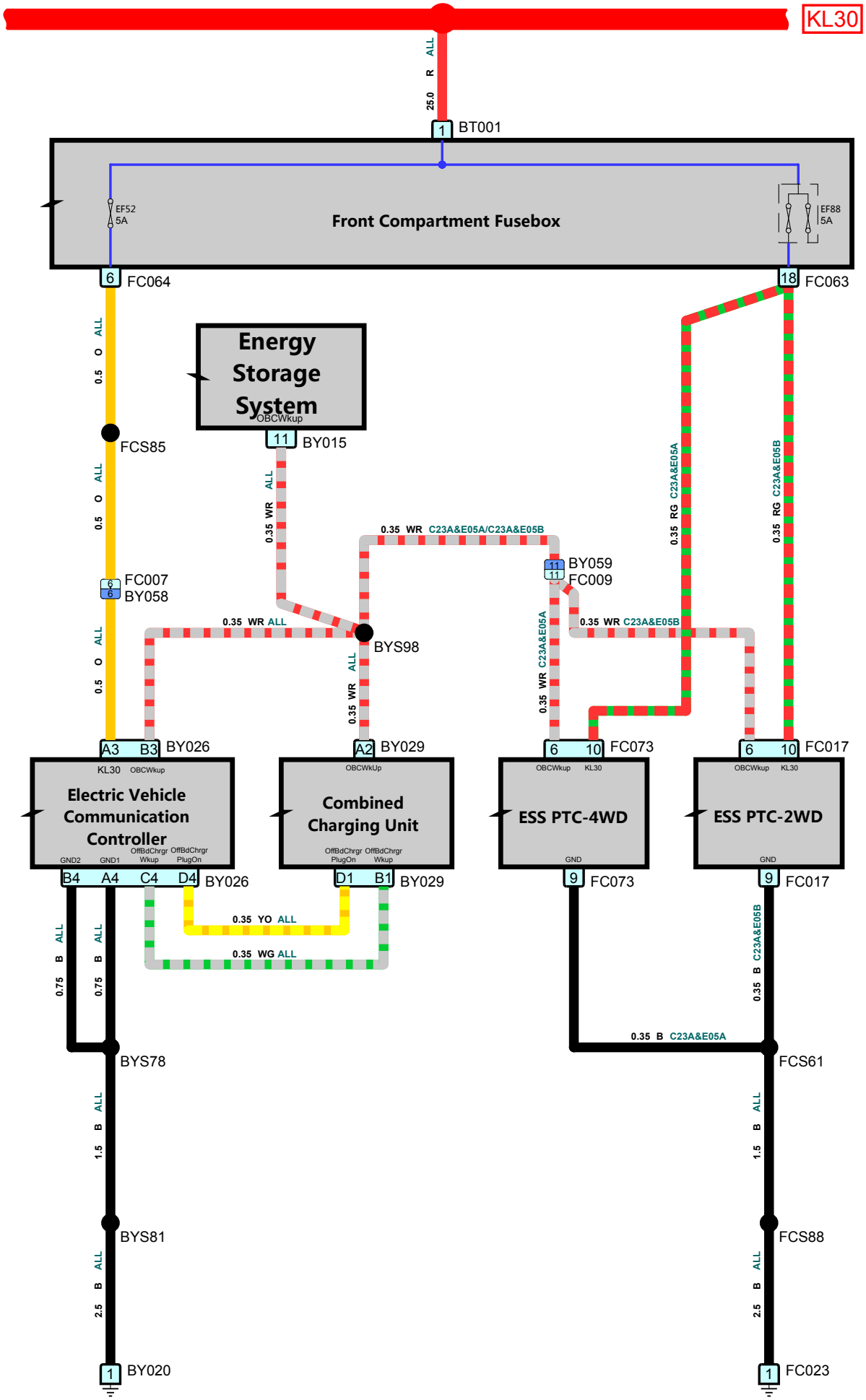
S02-Energy Storage System



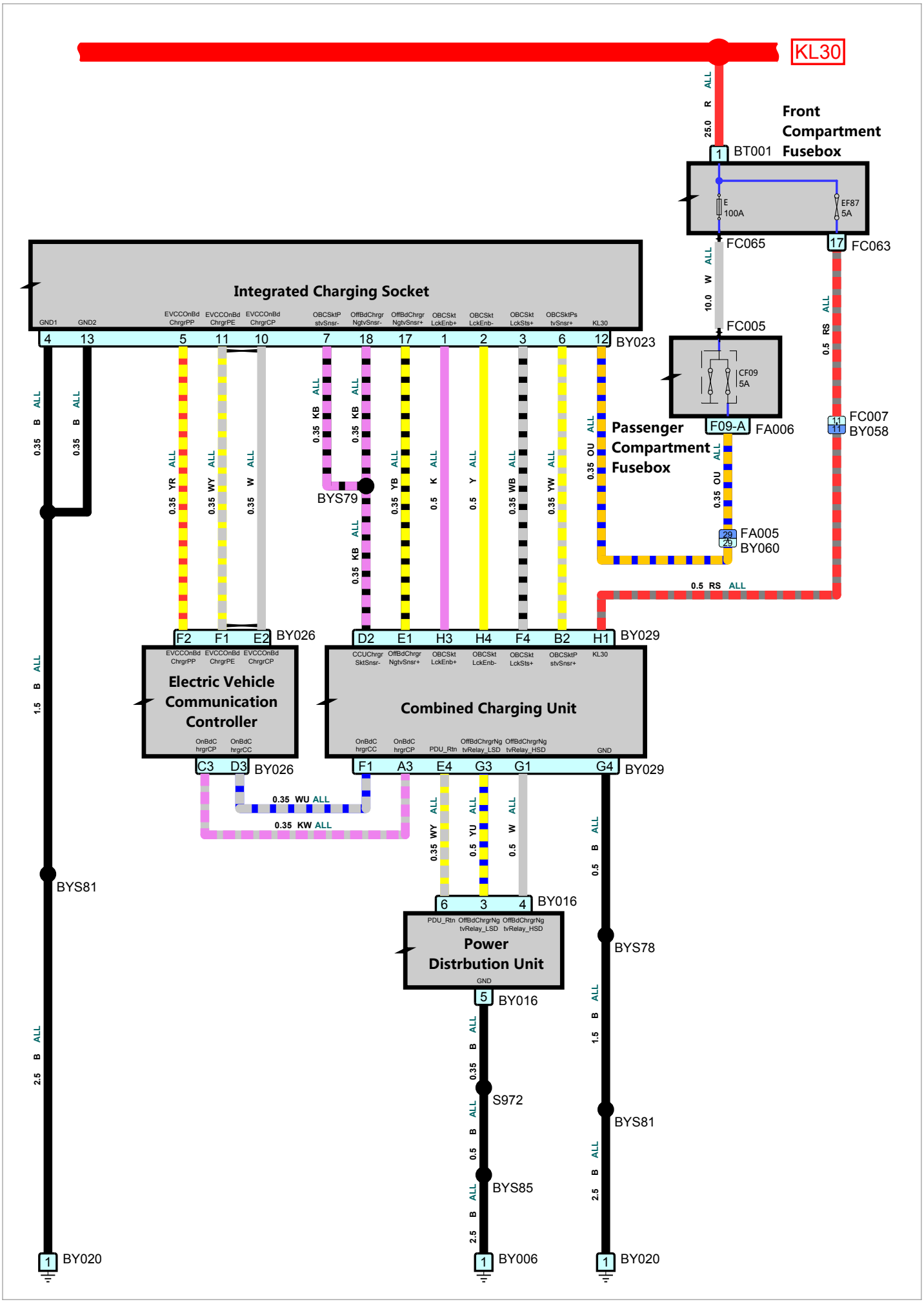
S03-Combined Charging Unit



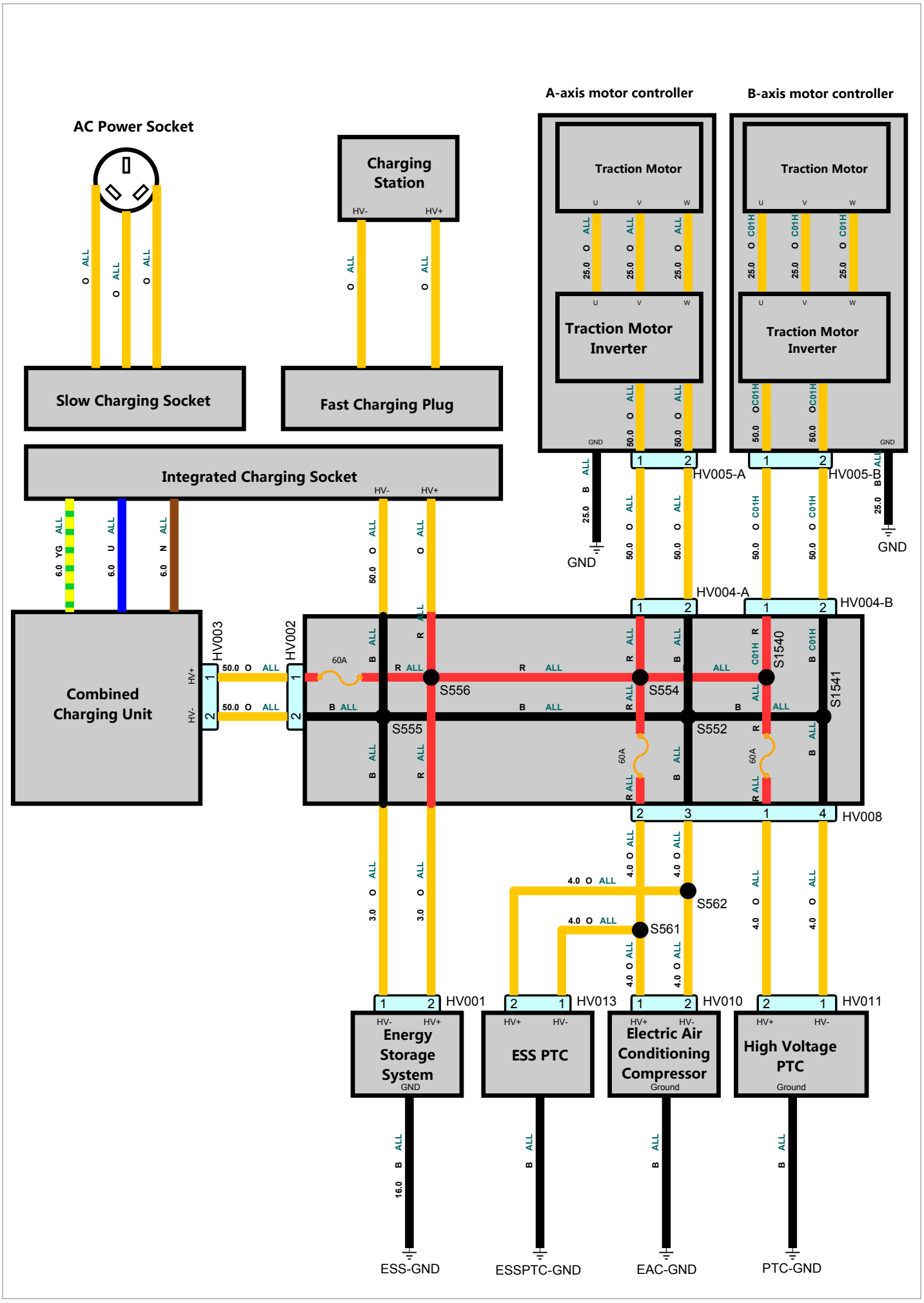
S04-Electric Vehicle Communication Controller



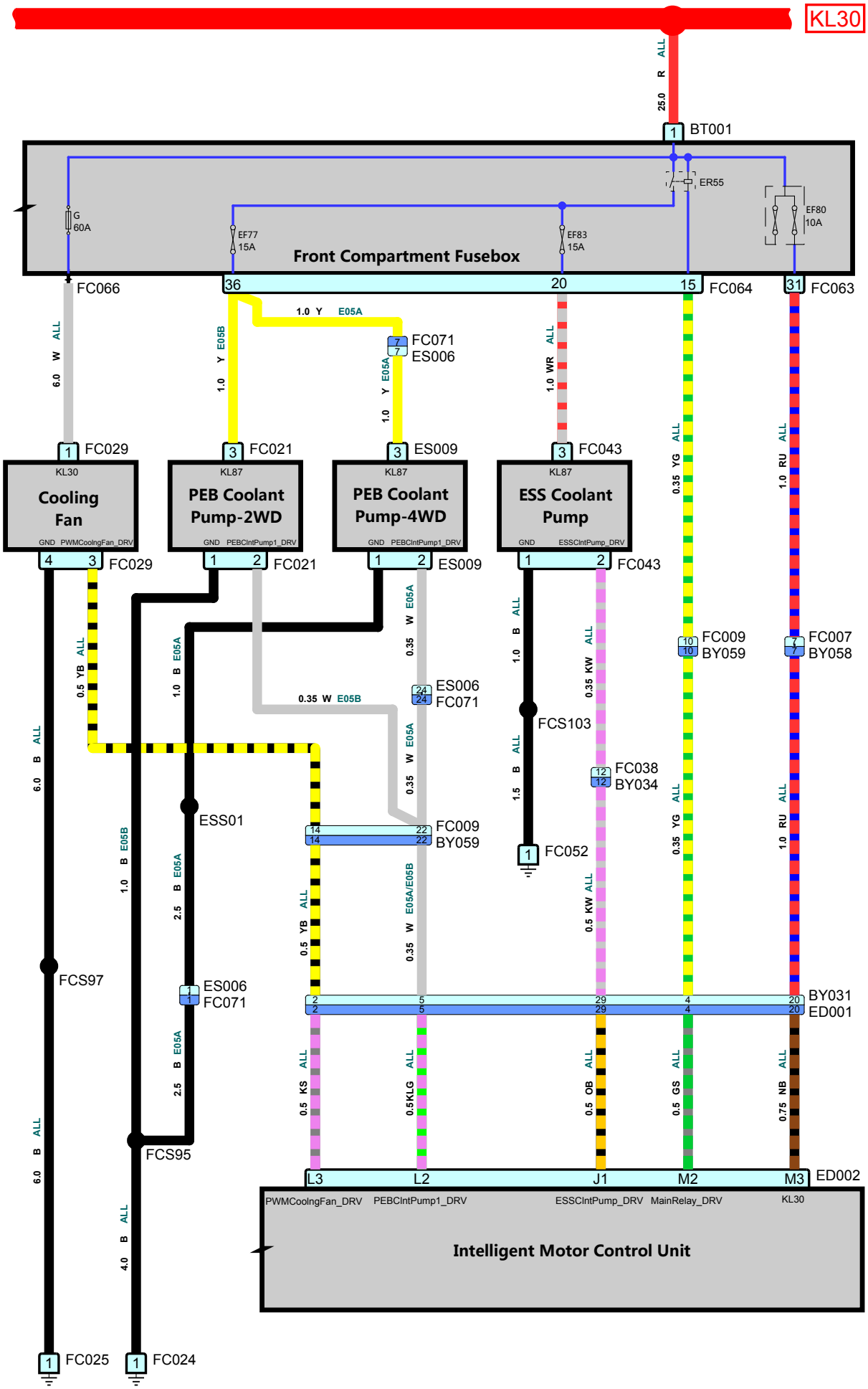
S05-Charging Control System



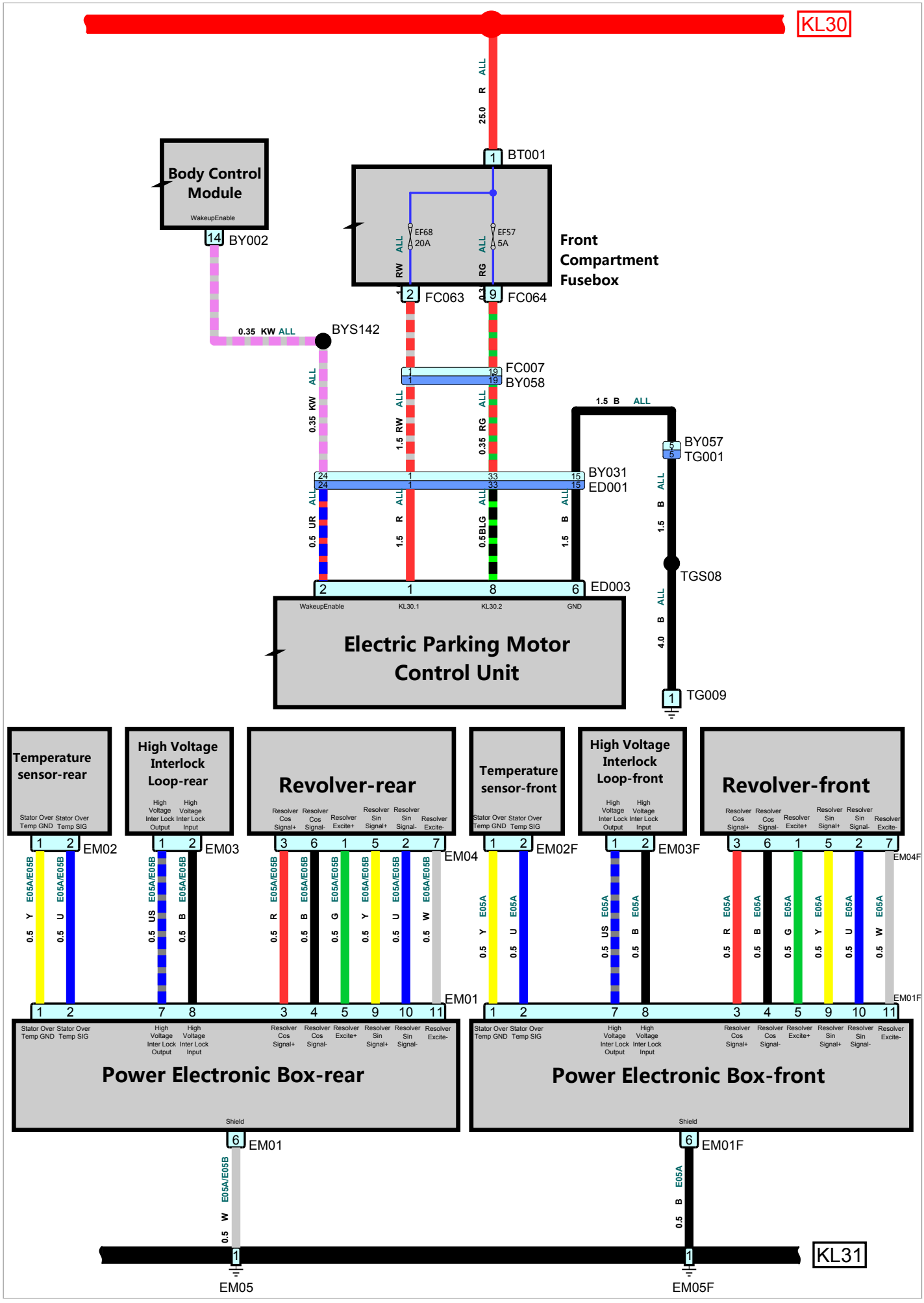
S06-High Voltage Distribution System



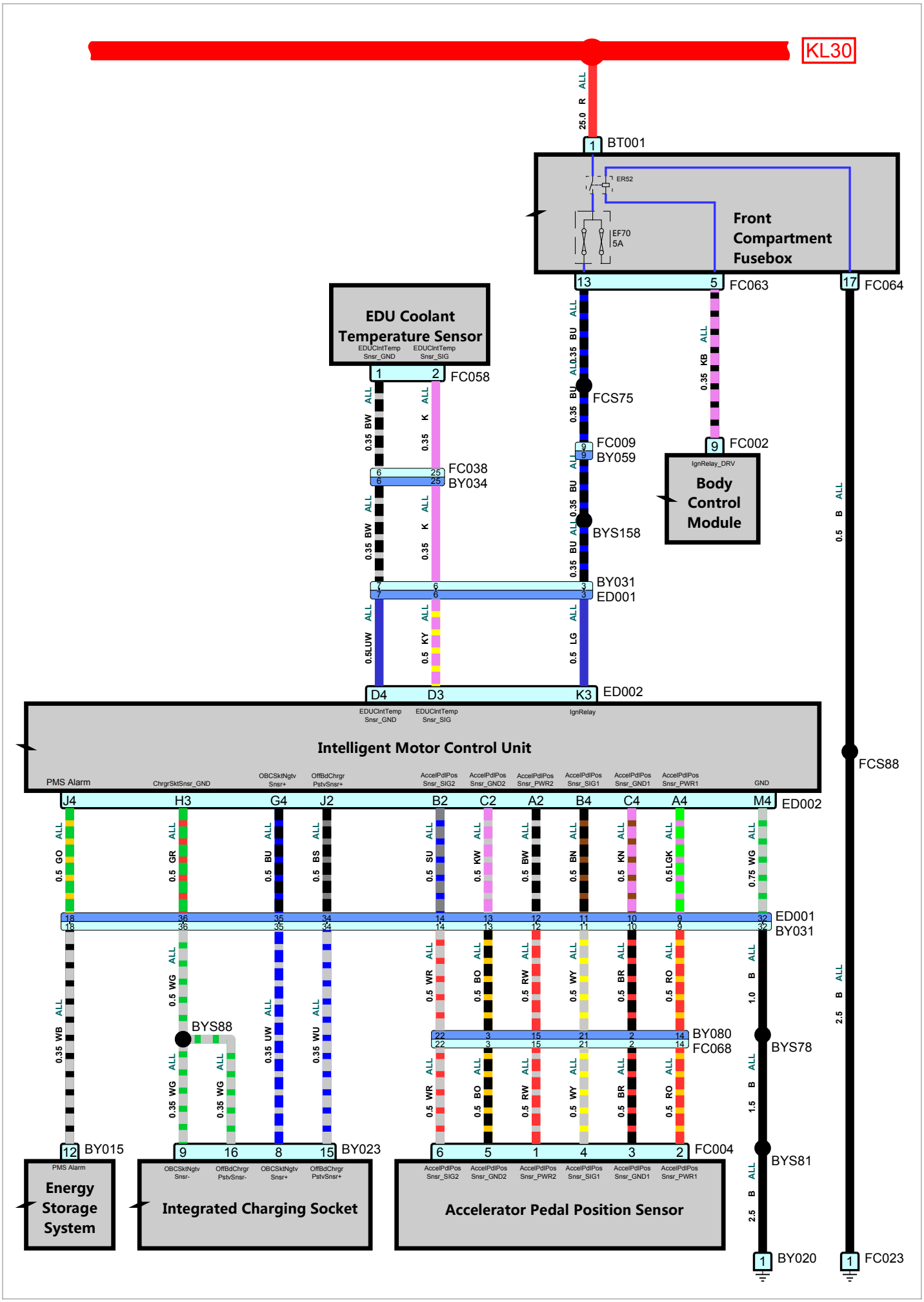
S07-Intelligent Electronic Control System(1)



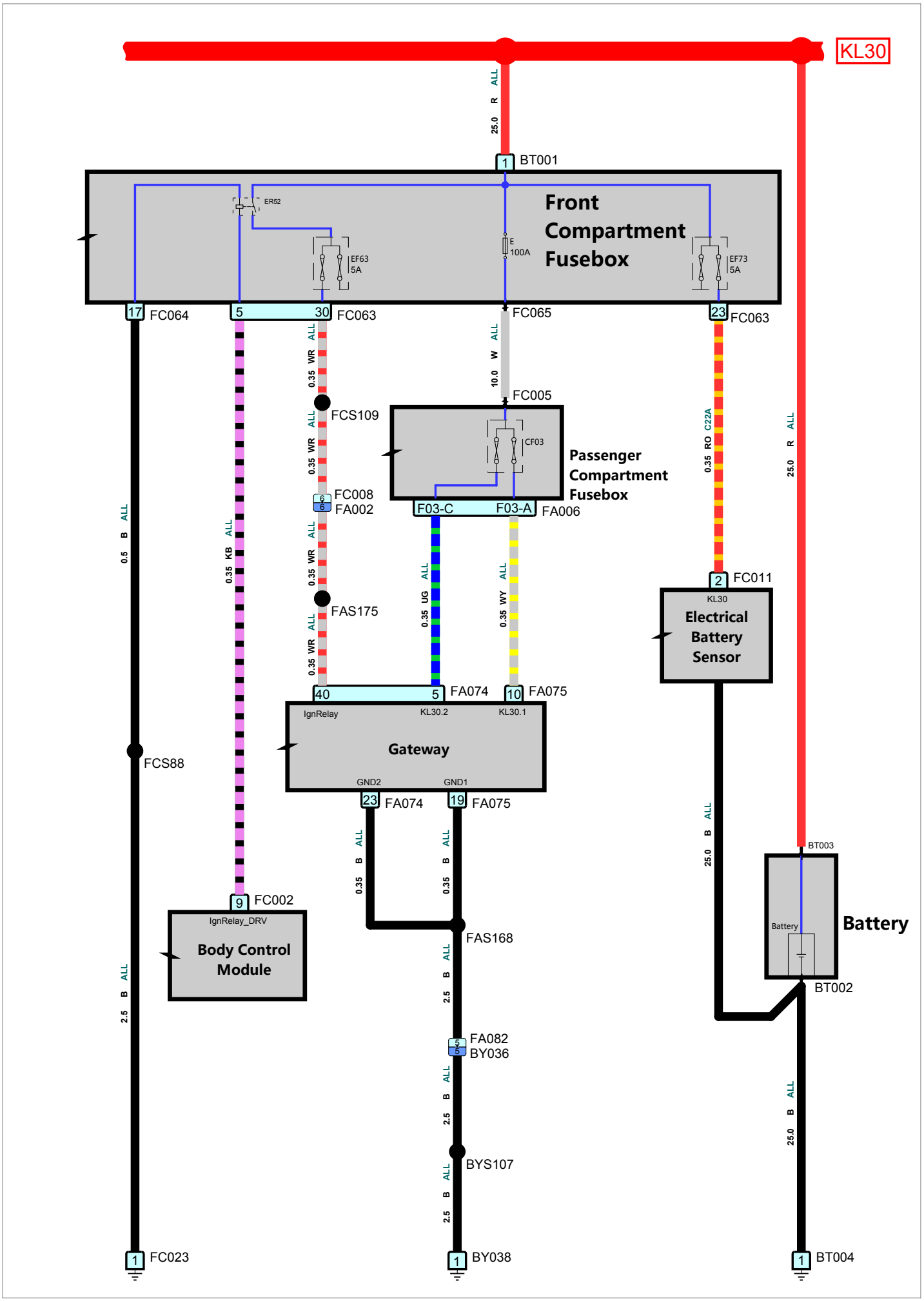
S08-Intelligent Electronic Control System(2)



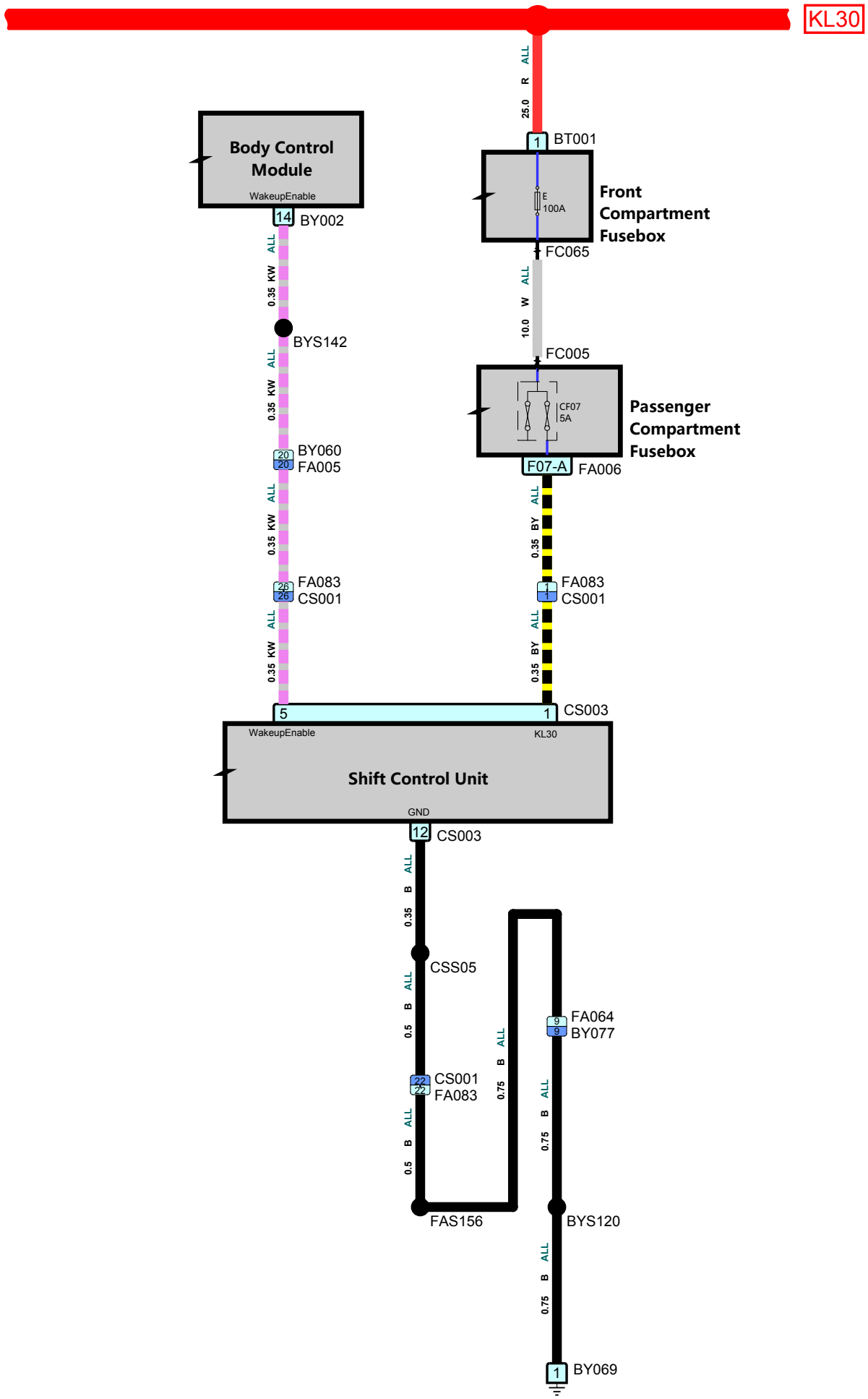
S09-Intelligent Electronic Control System(3)



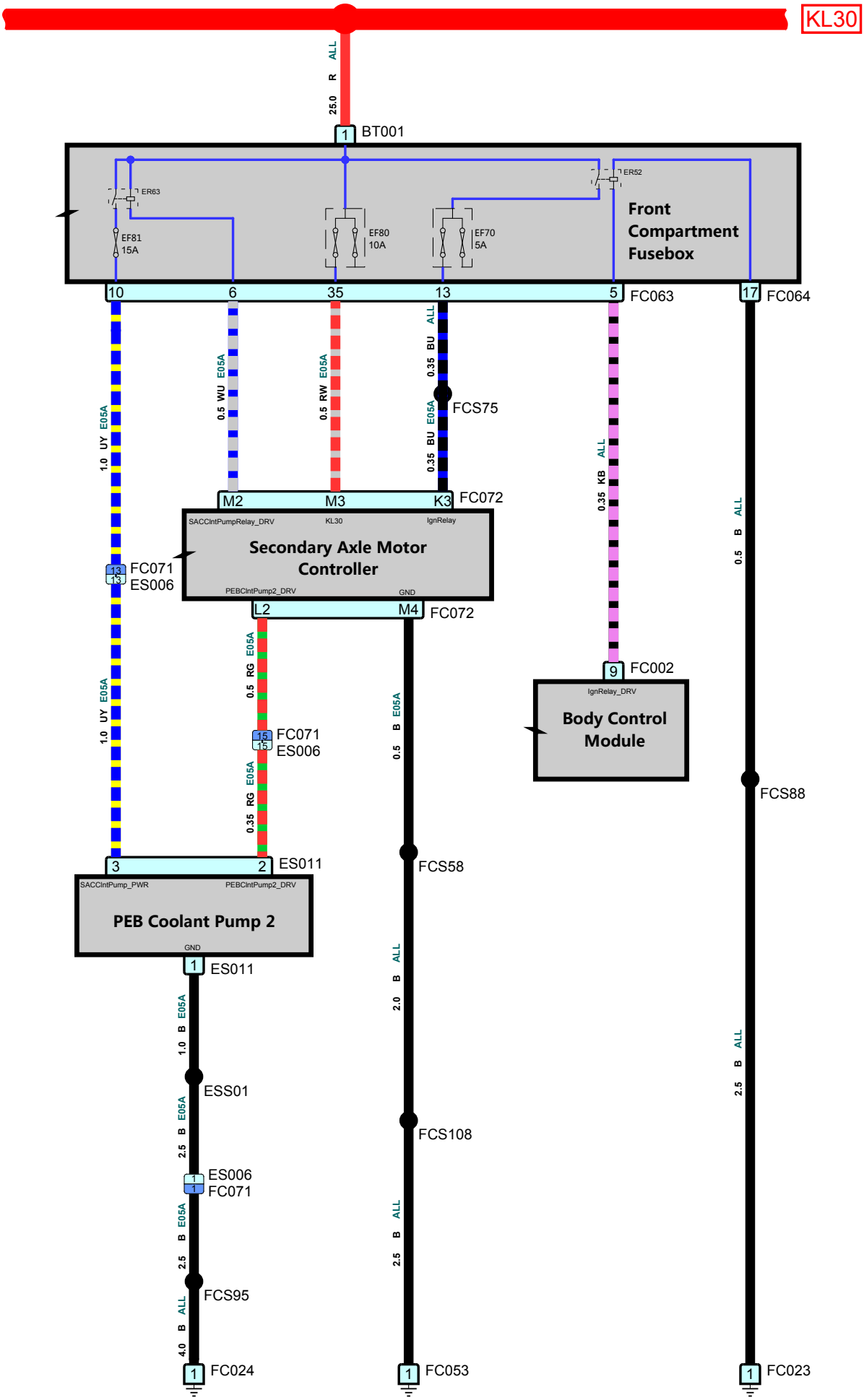
S10-Gateway & Electrical Battery Sensor



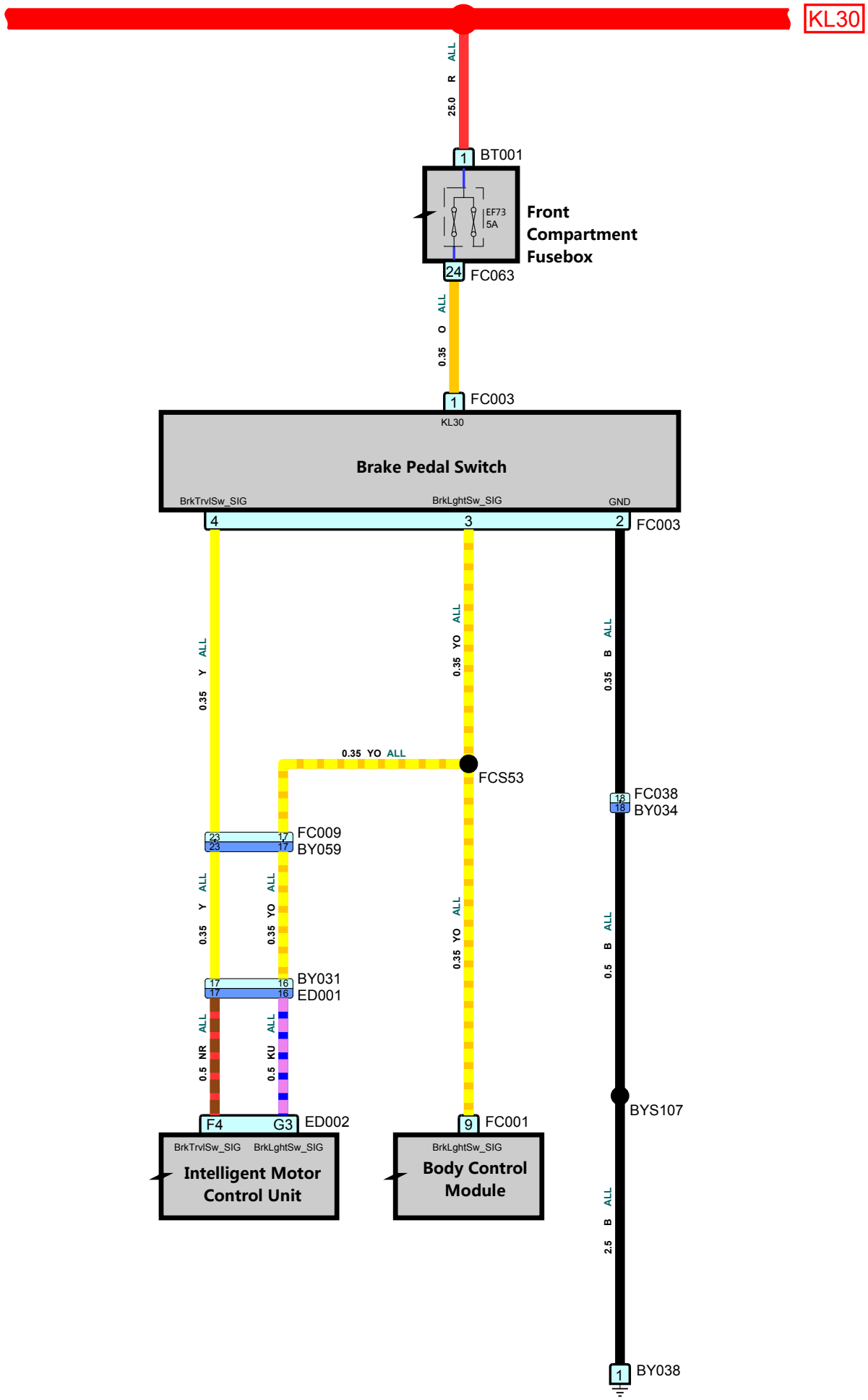
S11-Shift Control Unit



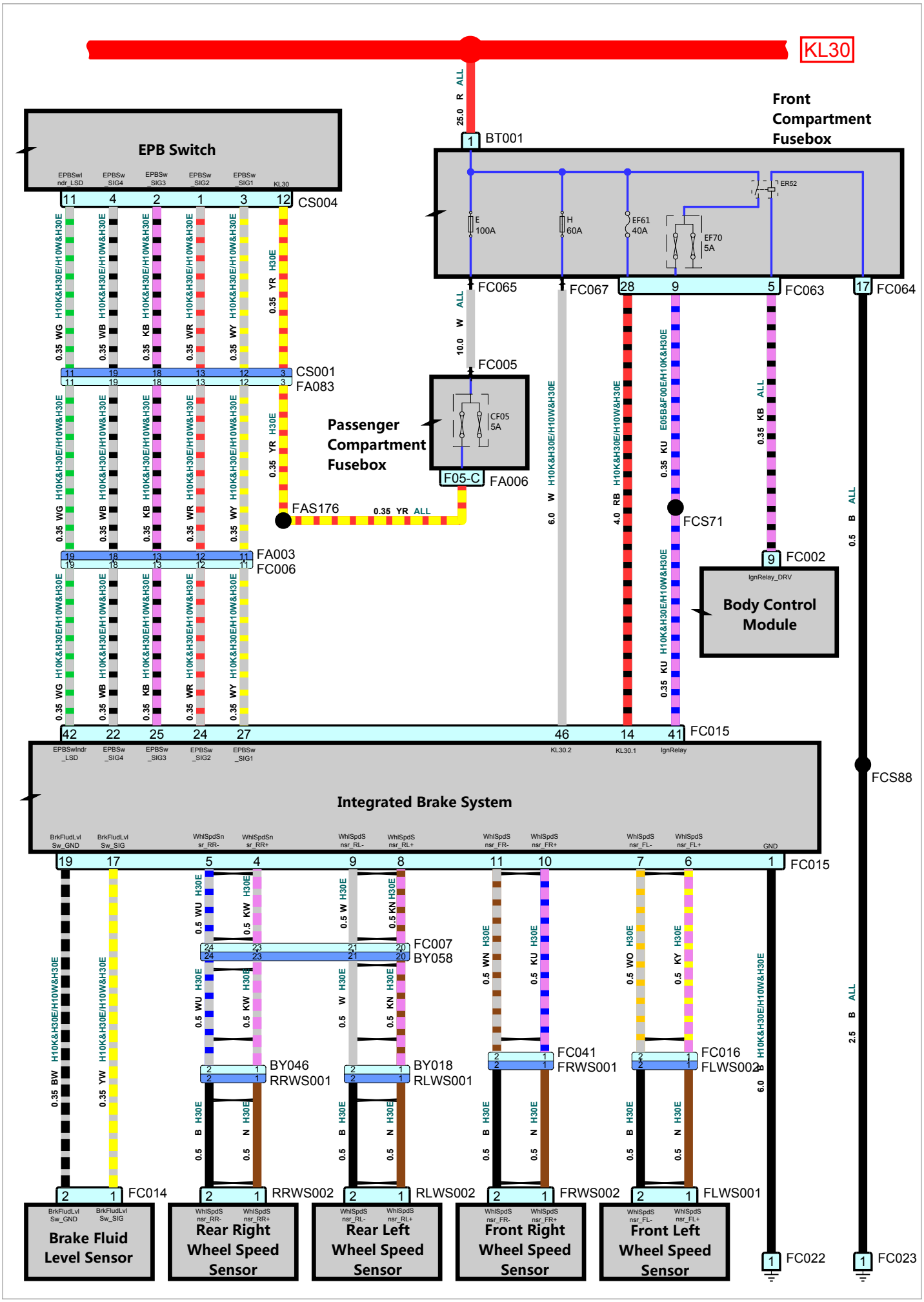
S12-Secondary Axle Motor Controller



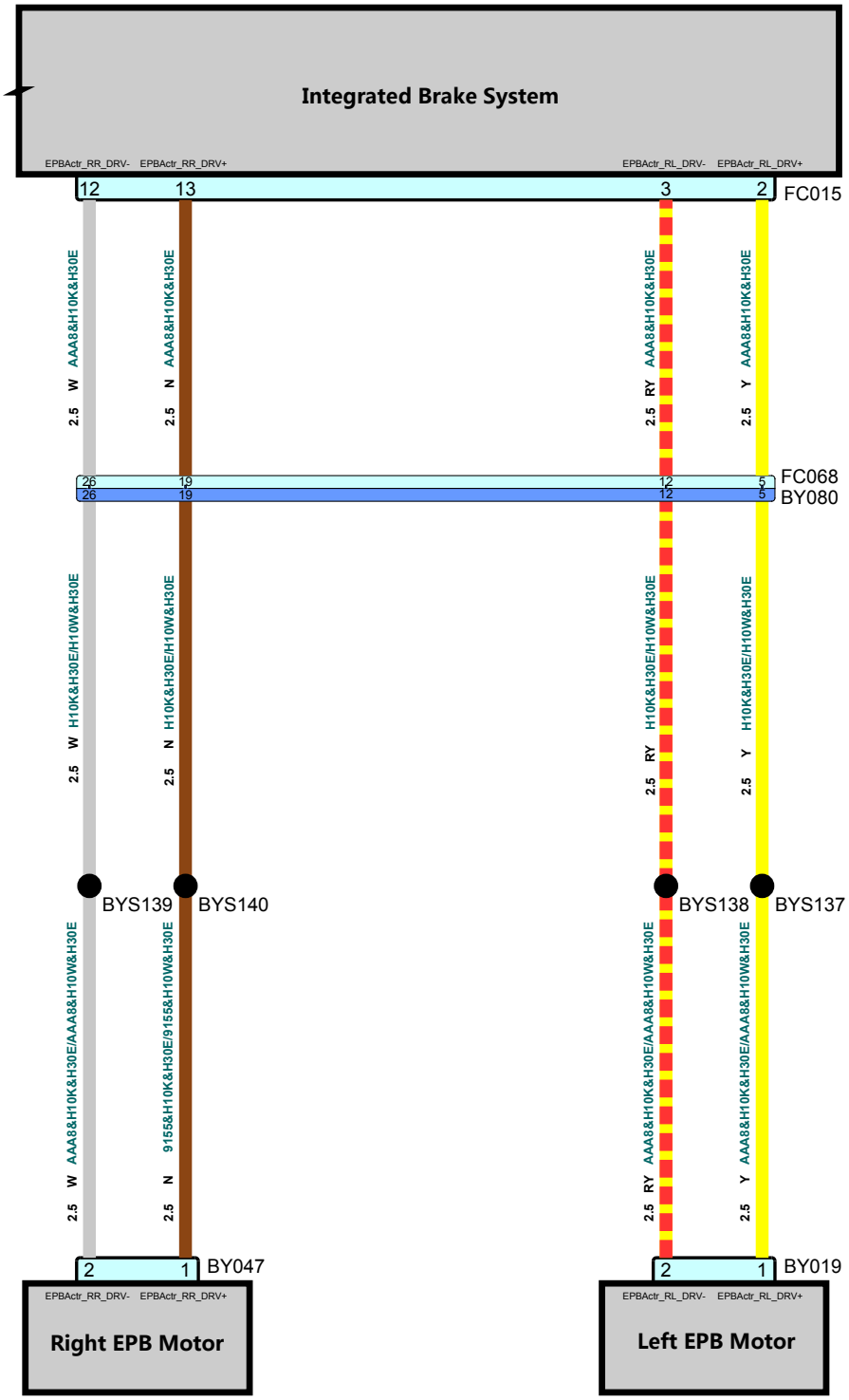
S13-Brake System(1)



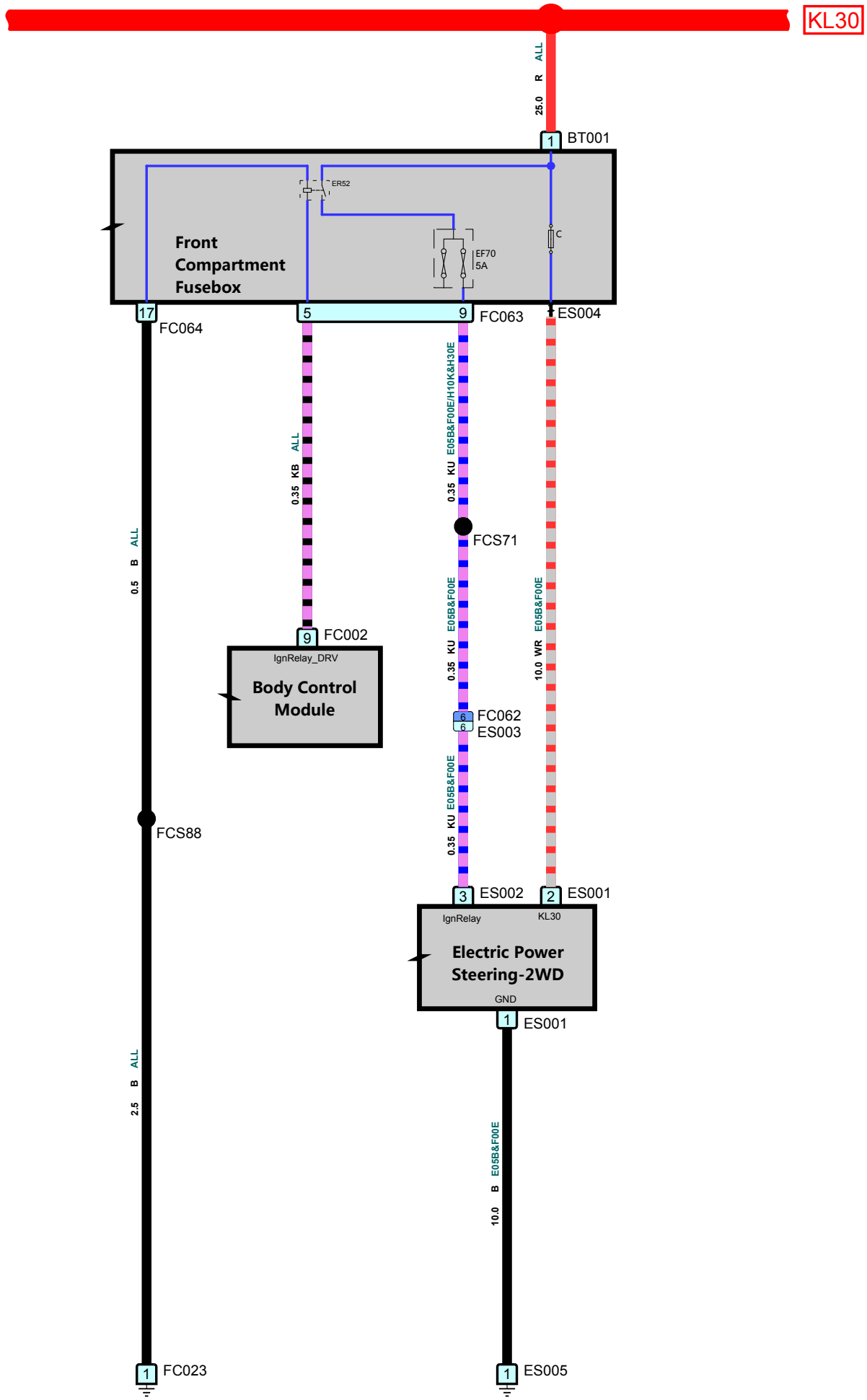
S14-Brake System(2)



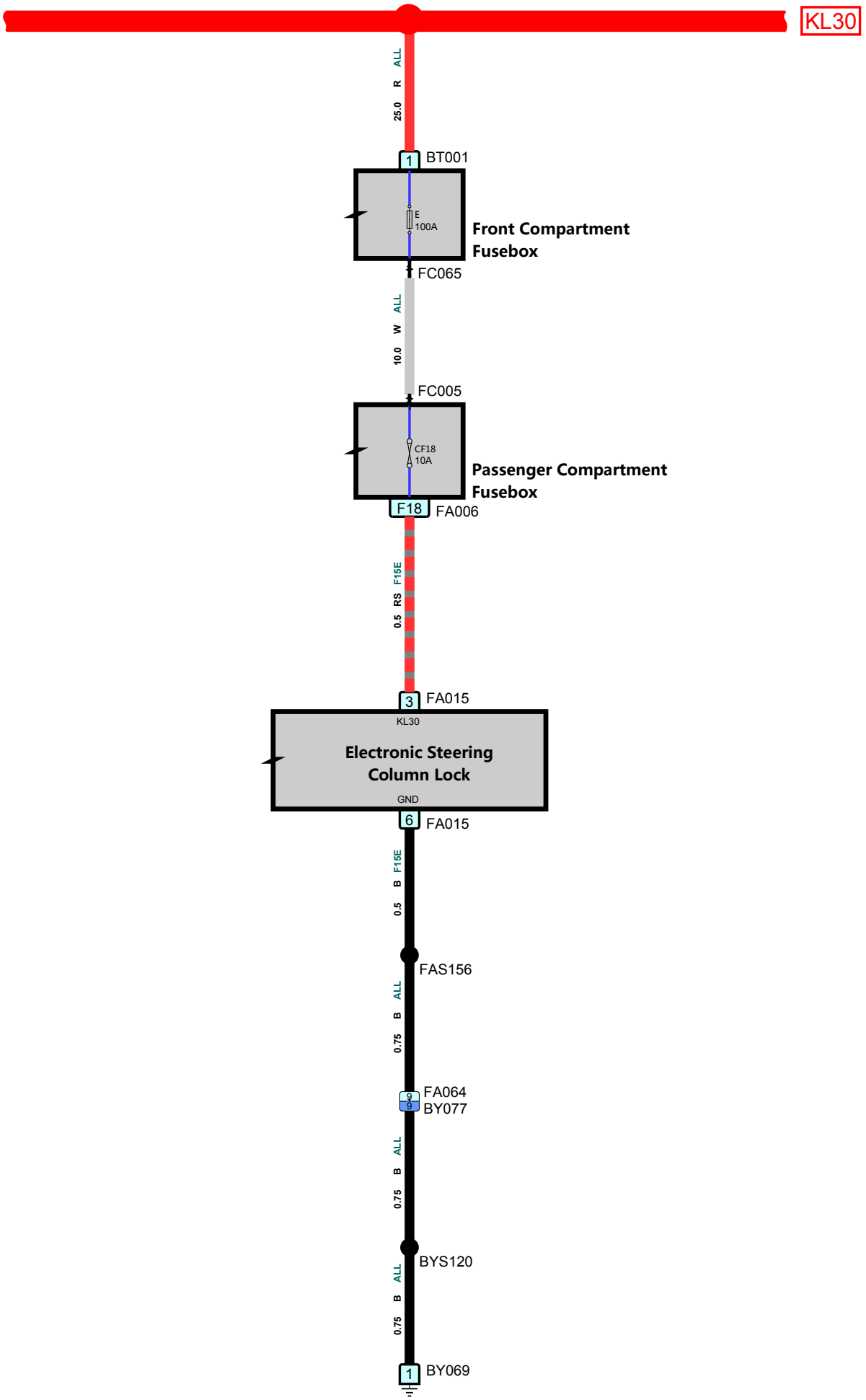
S15-Brake System(3)



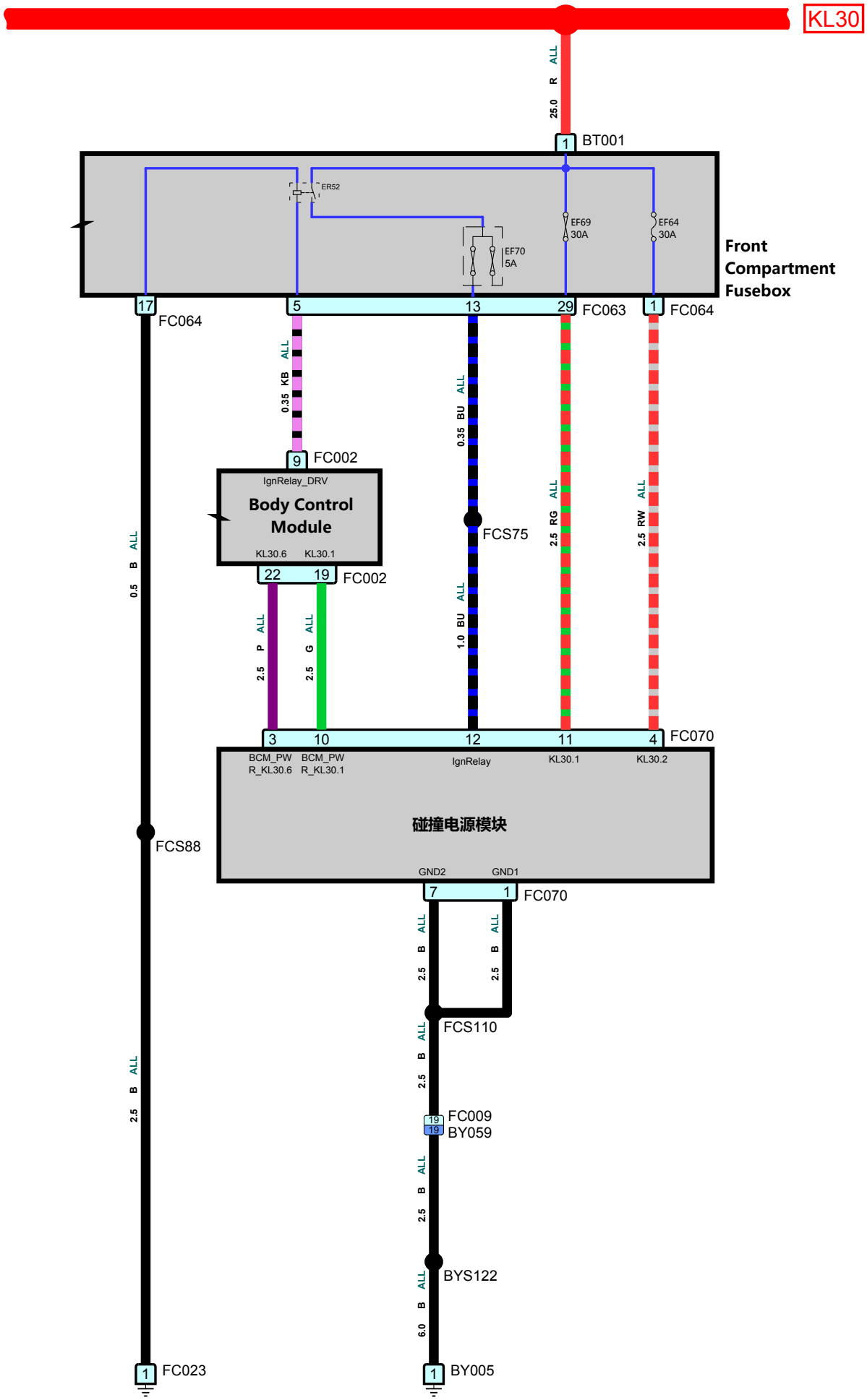
S16-Electric Power Steering



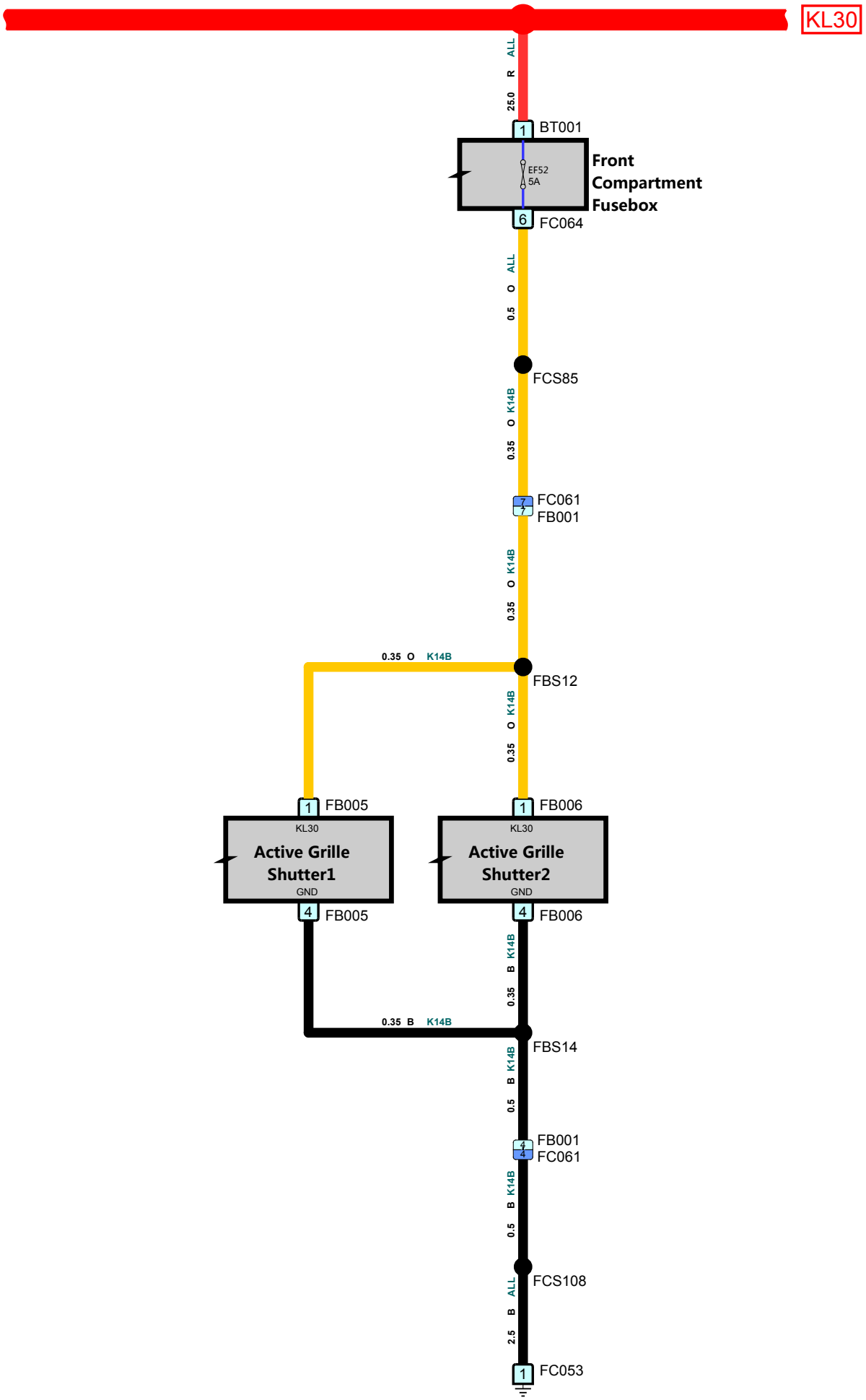
S17-Electronic Steering Column Lock



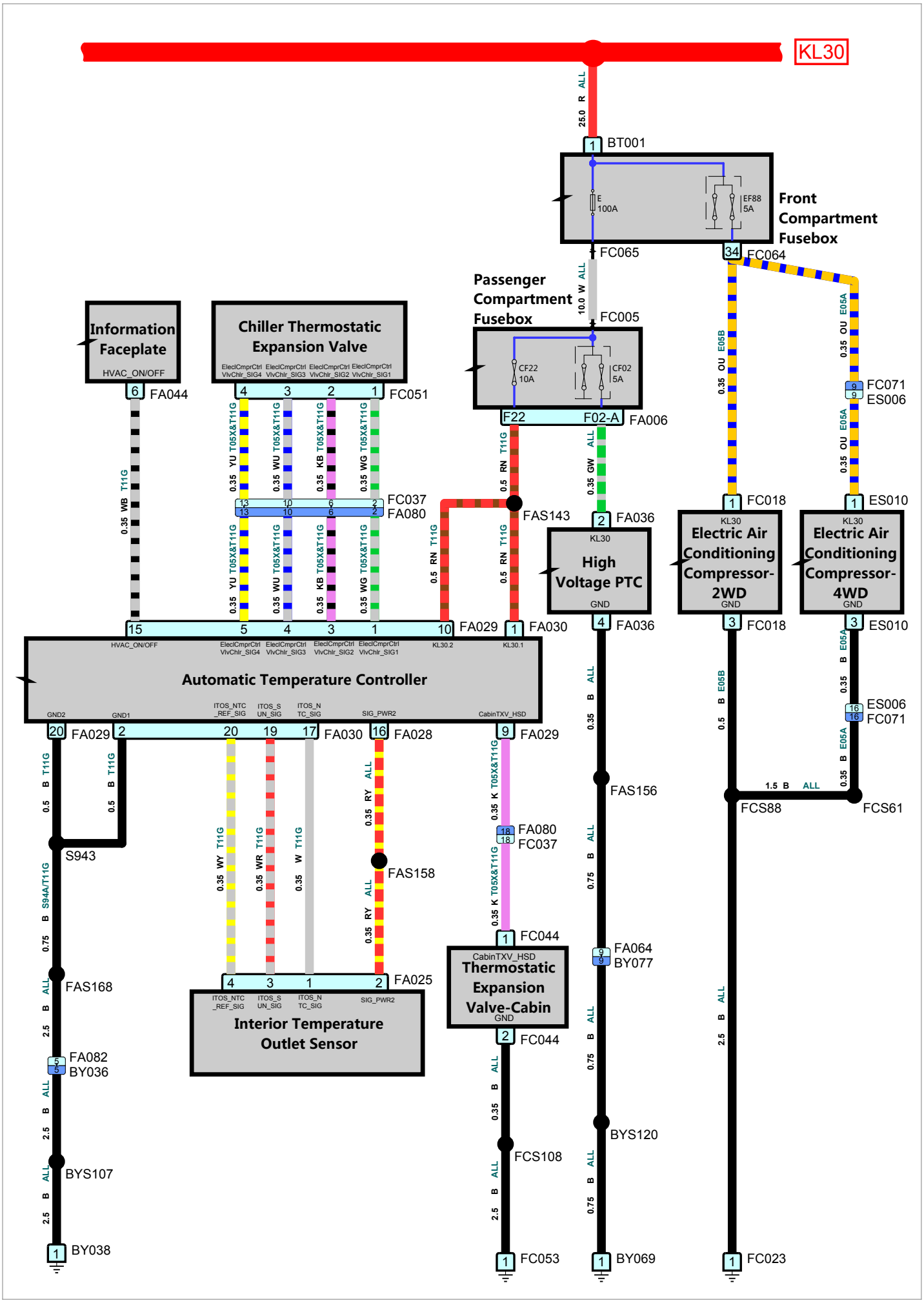
S18-Crash Power Module



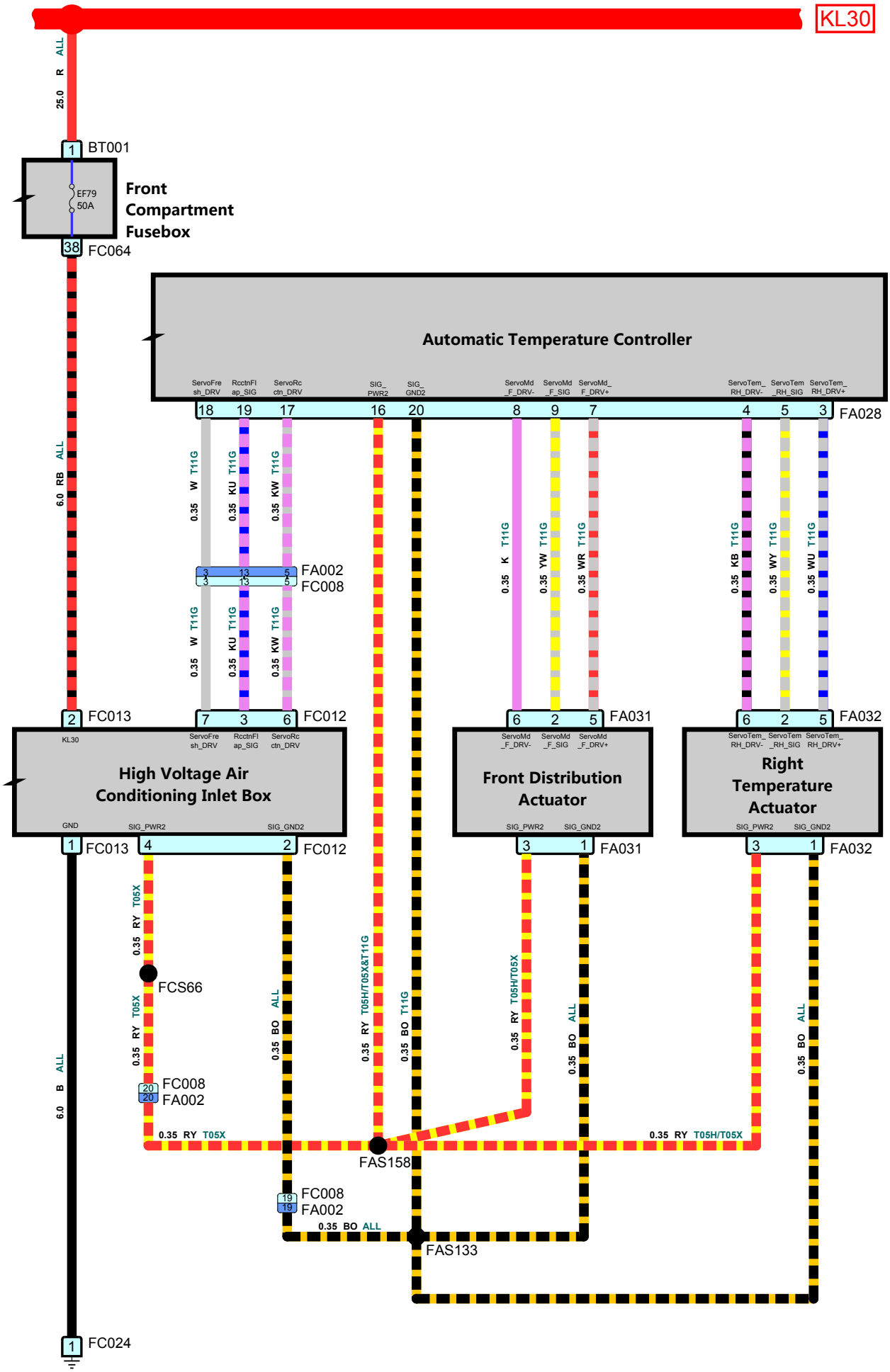
S19-Active Grille Shutter



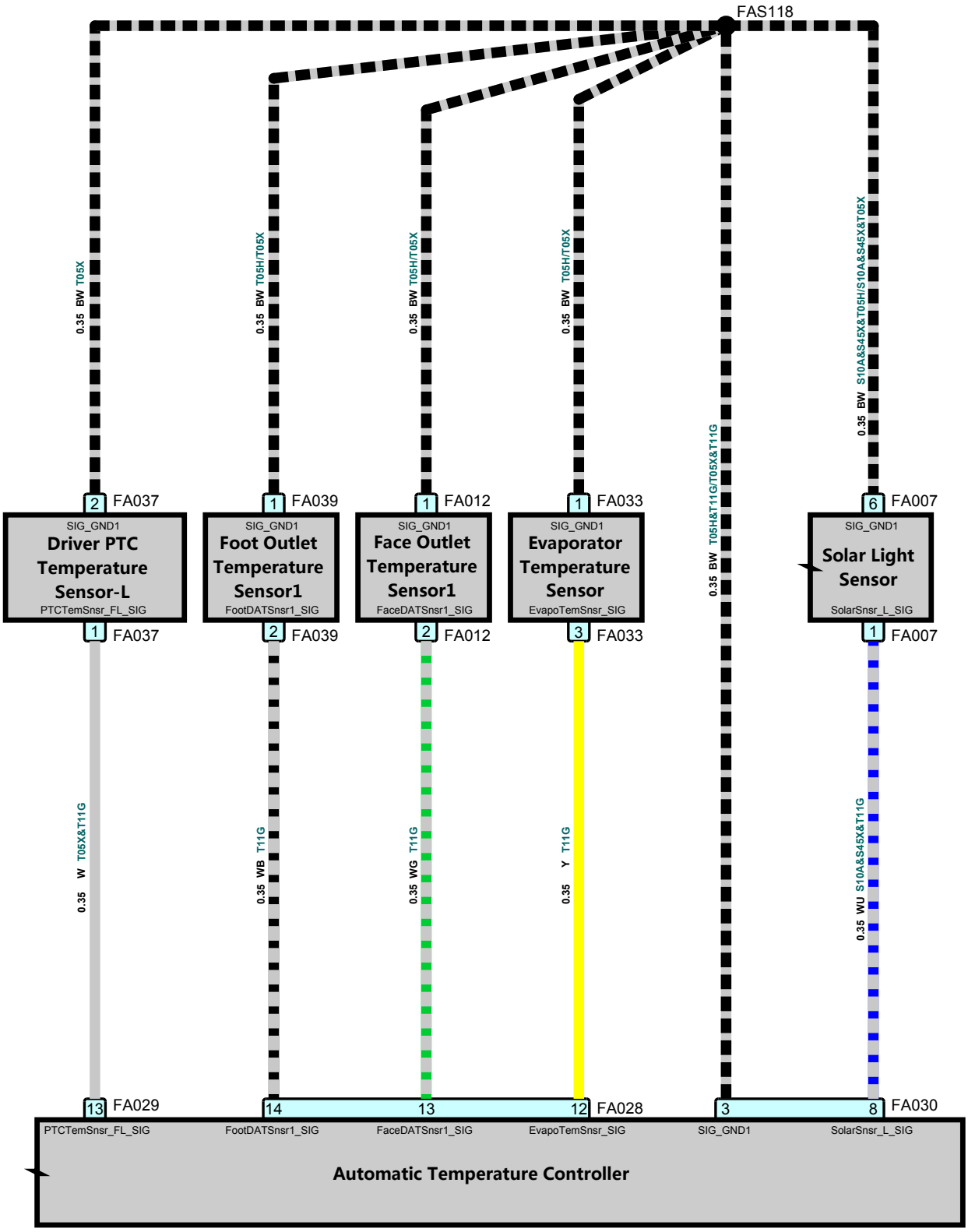
S20-Air Conditioning System(1)



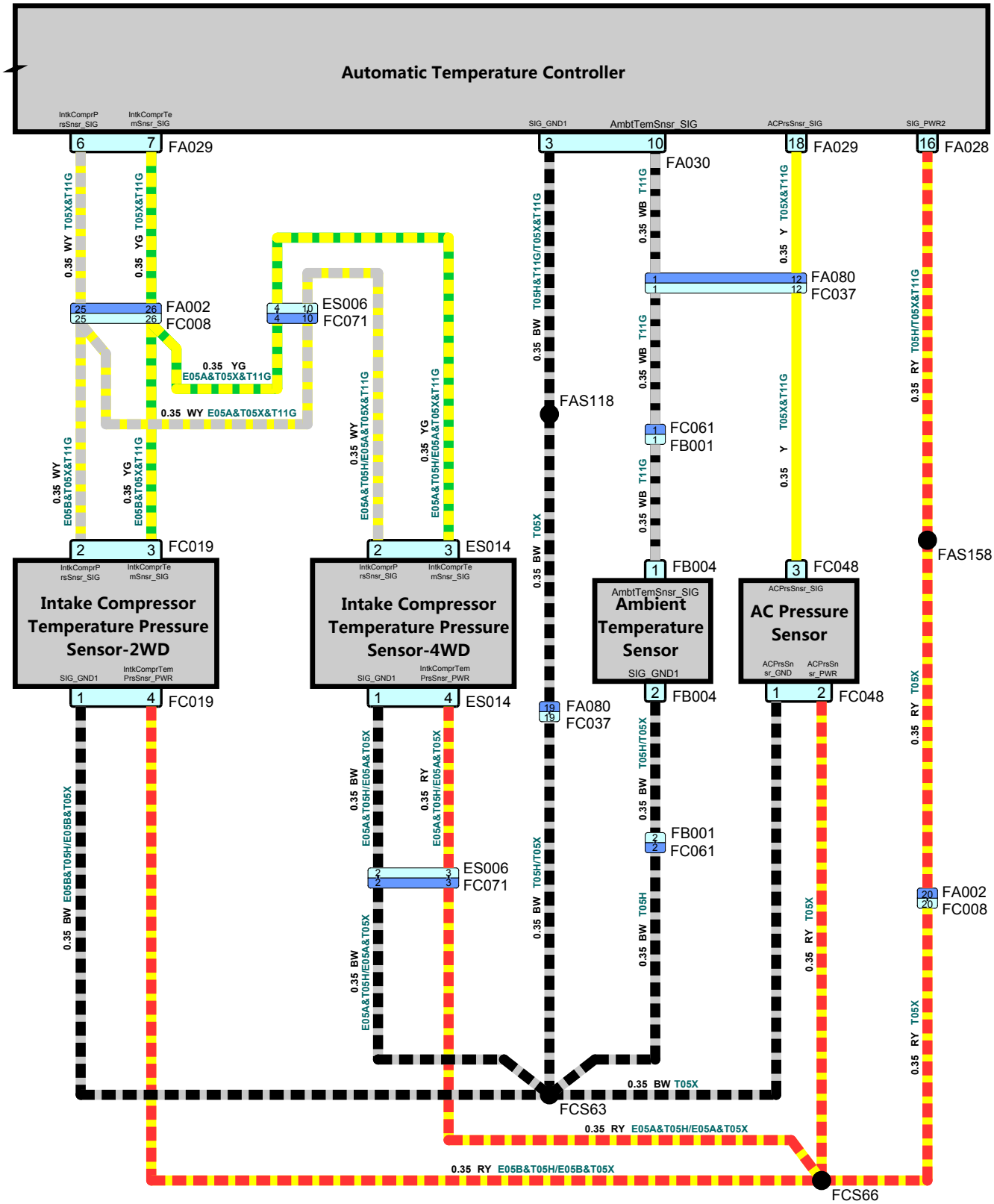
S21-Air Conditioning System(2)



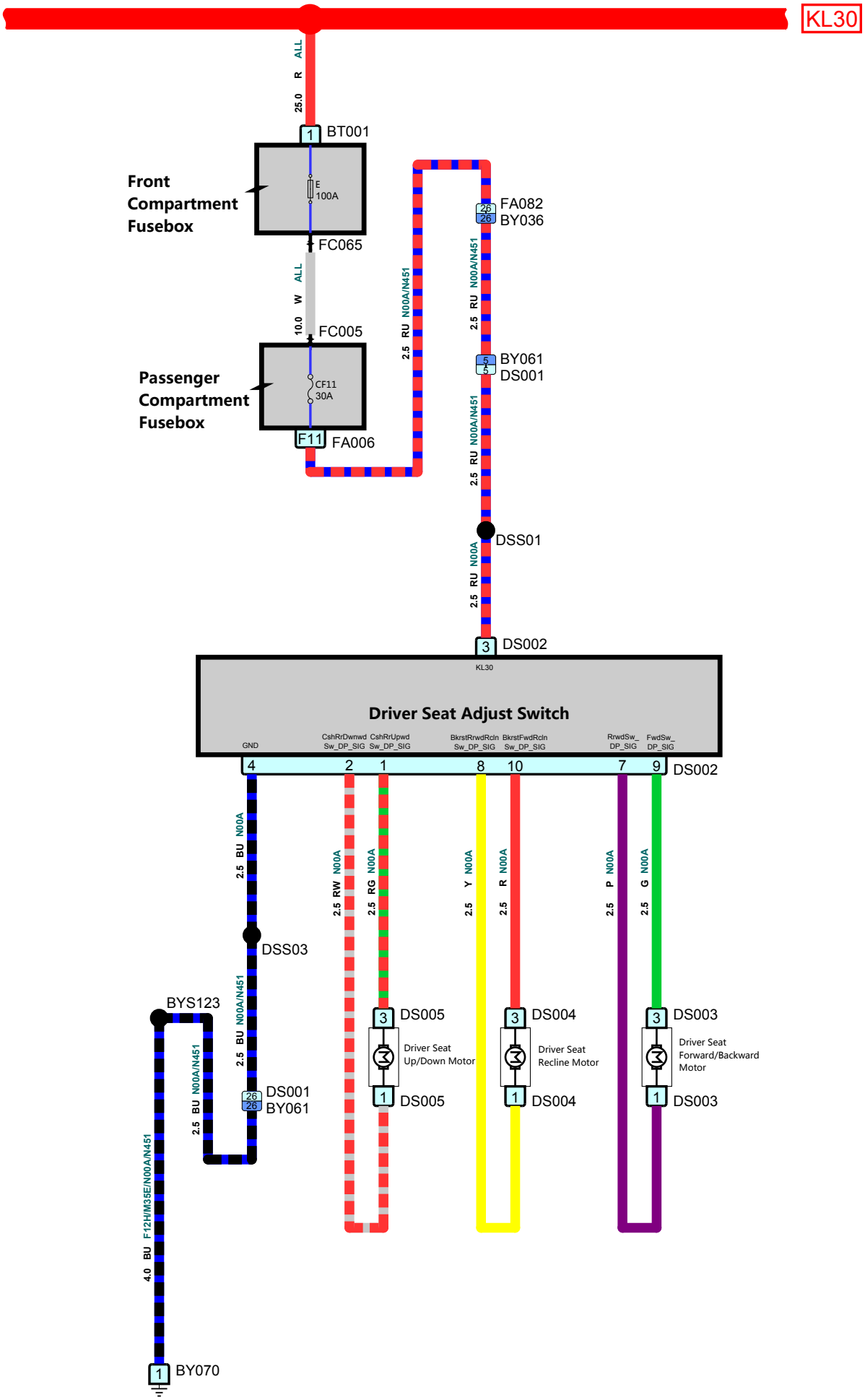
S22-Air Conditioning System(3)



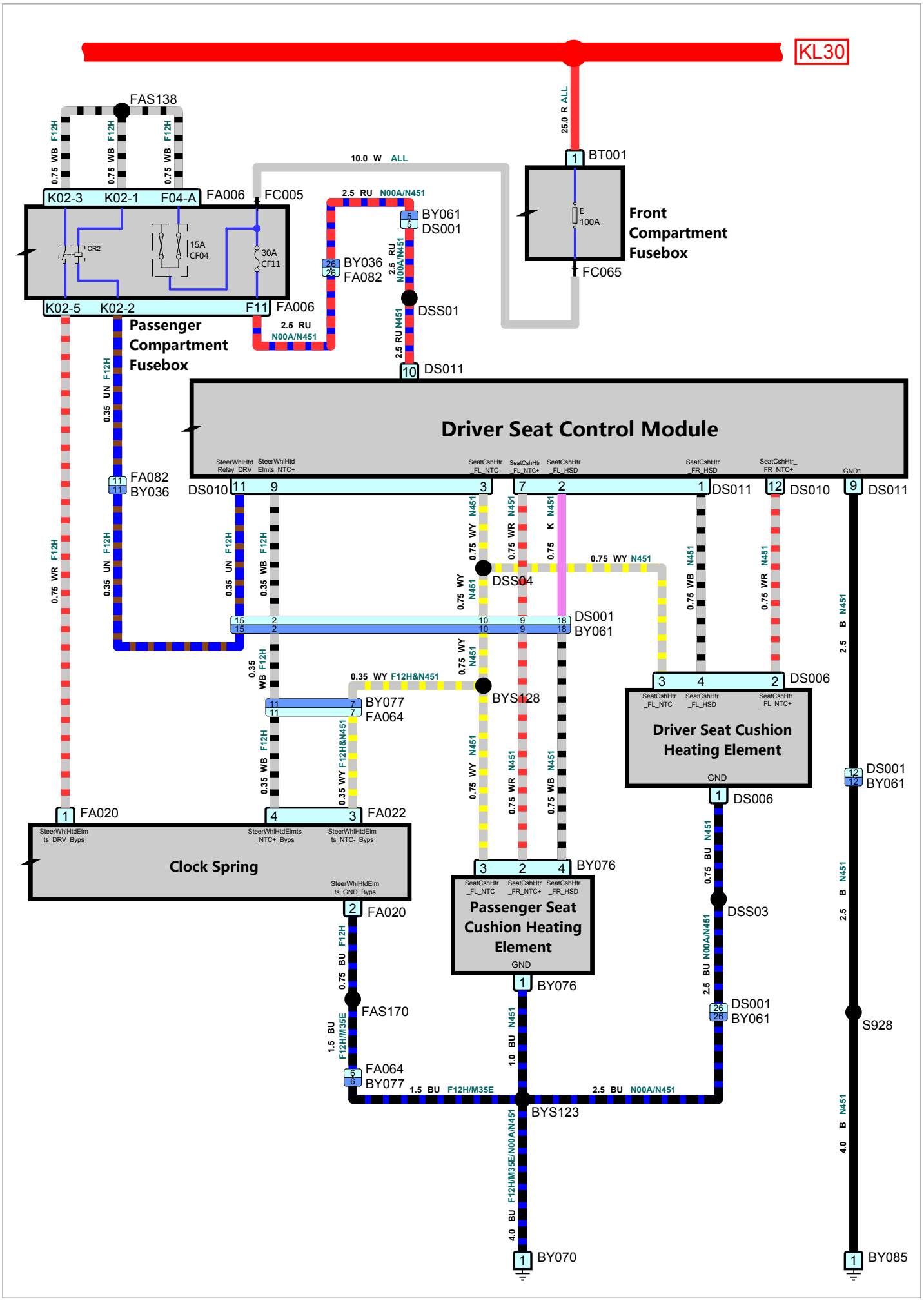
S23-Air Conditioning System(4)



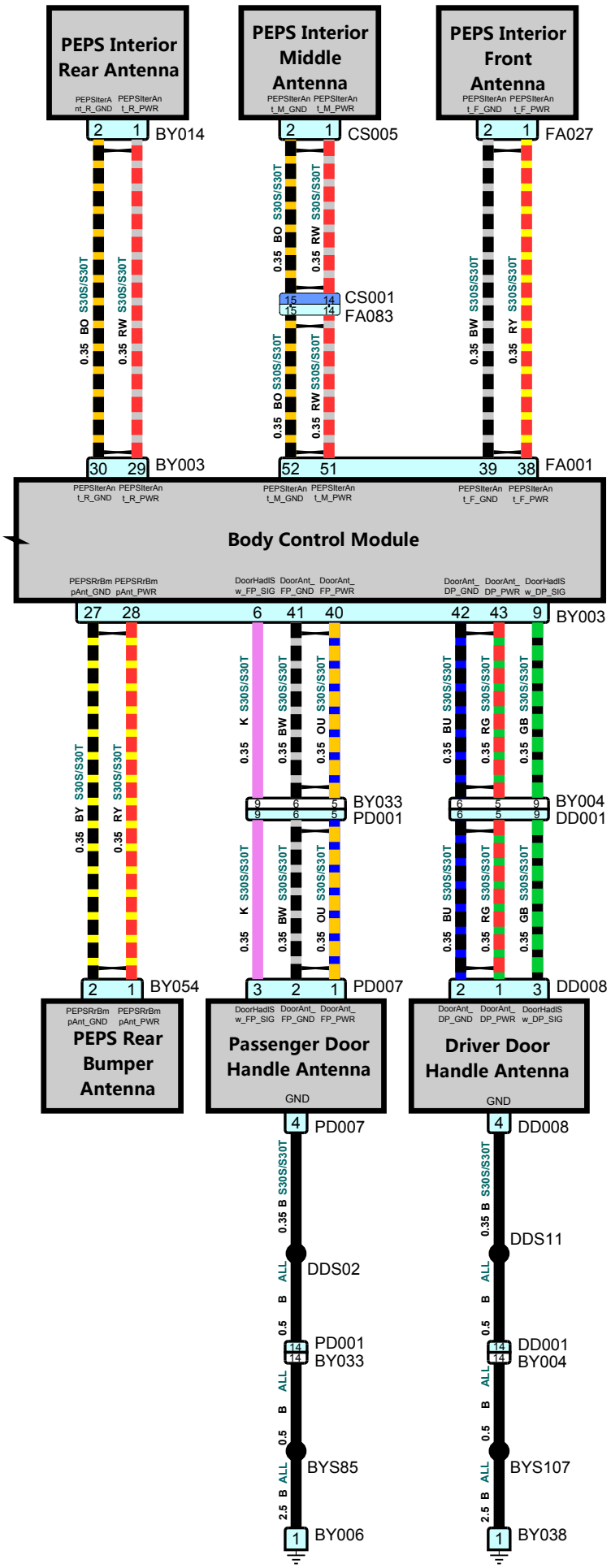
S26-Driver Seat Adjust Switch



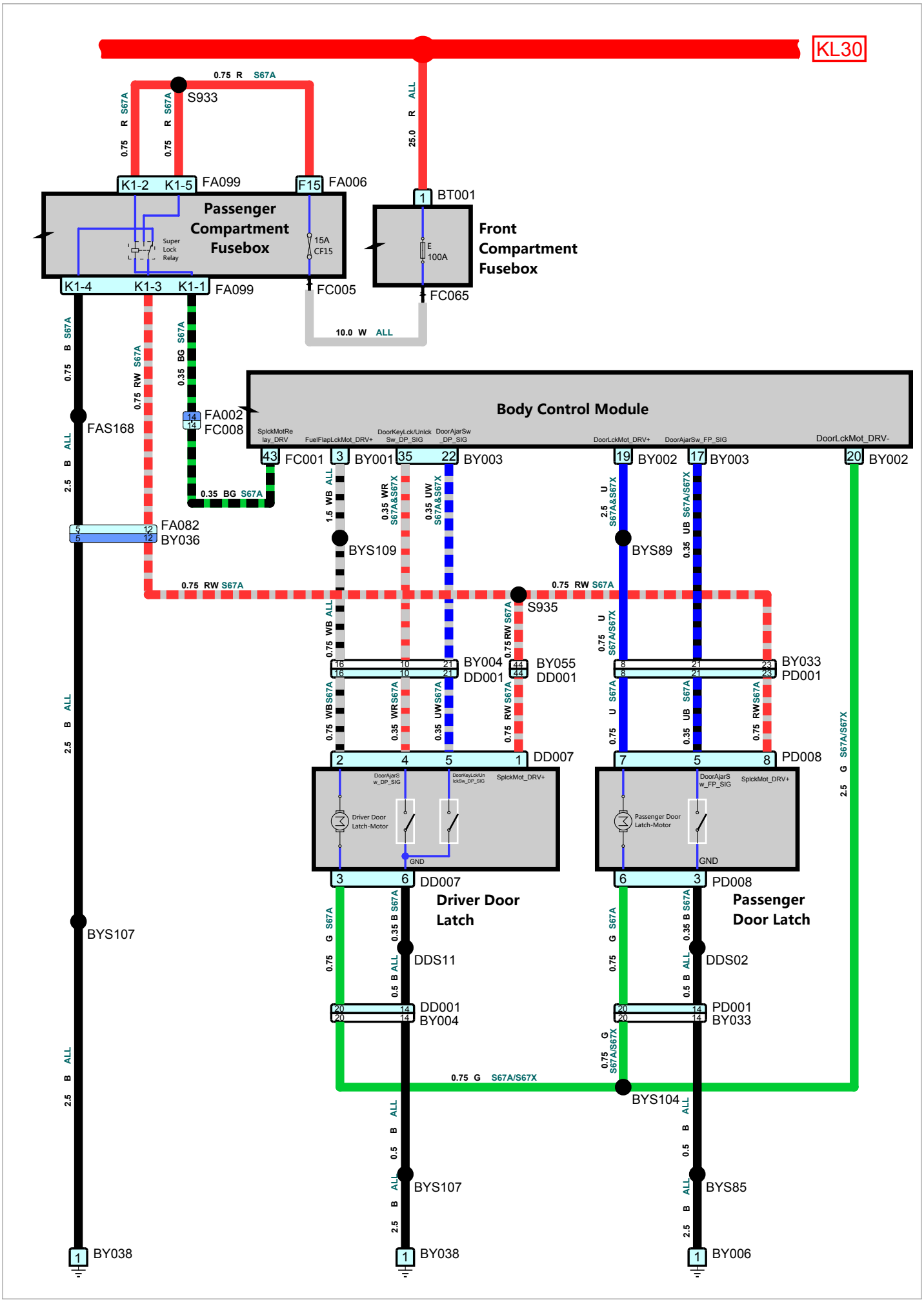
S27-Front Left Seat Heating & Steering Wheel Heating



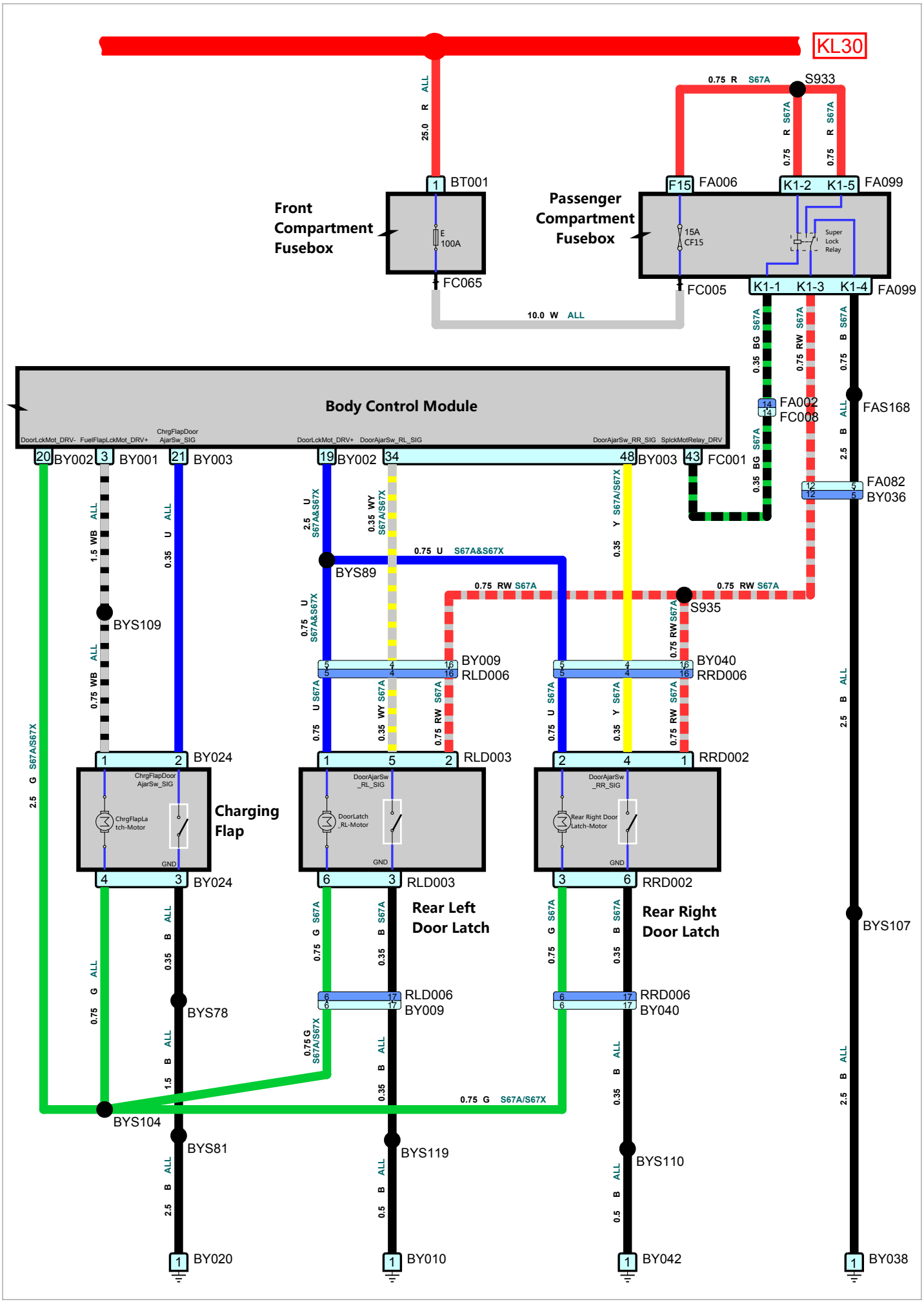
S28-Passive Entry Passive Start



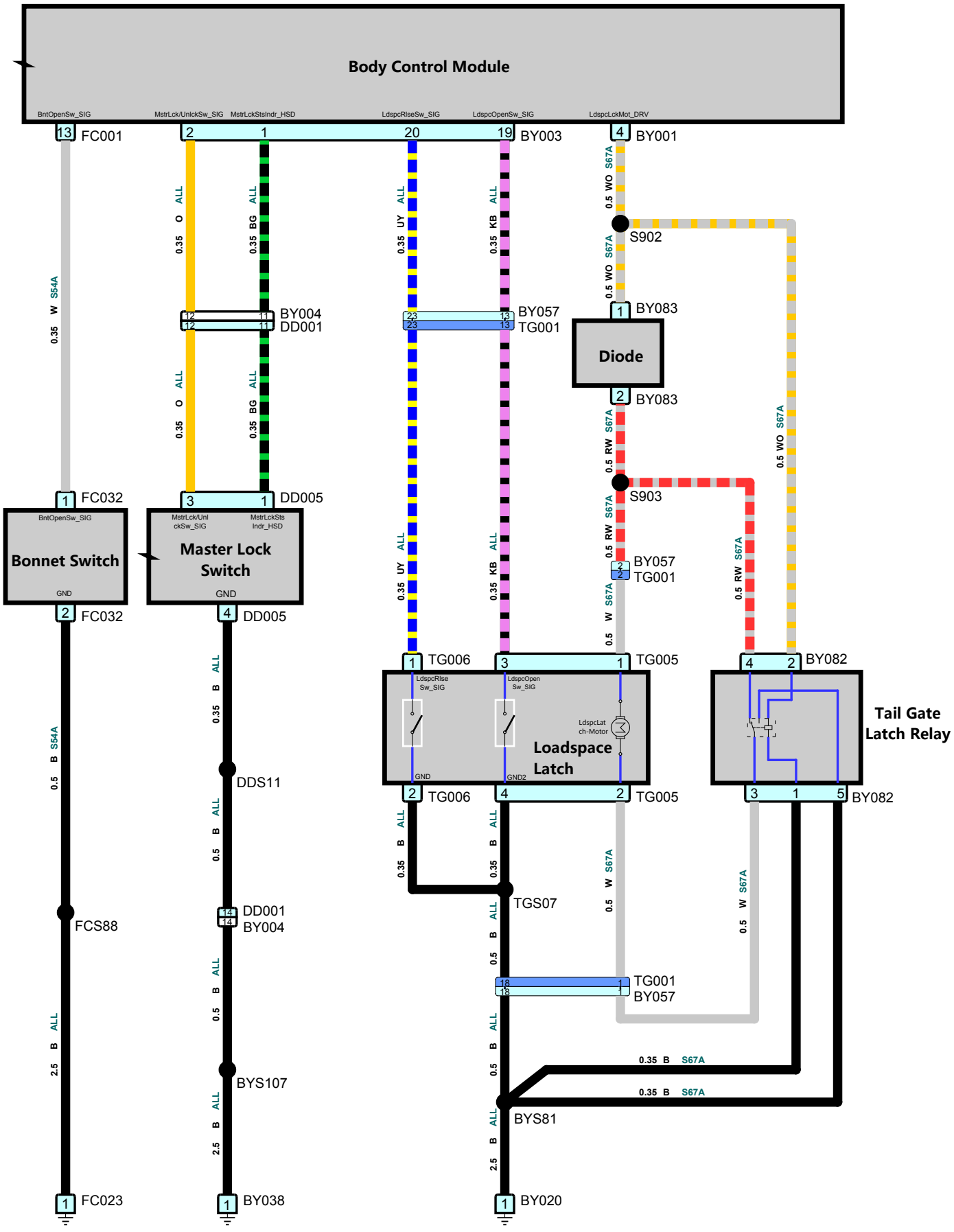
S29-Door Locking System(1)



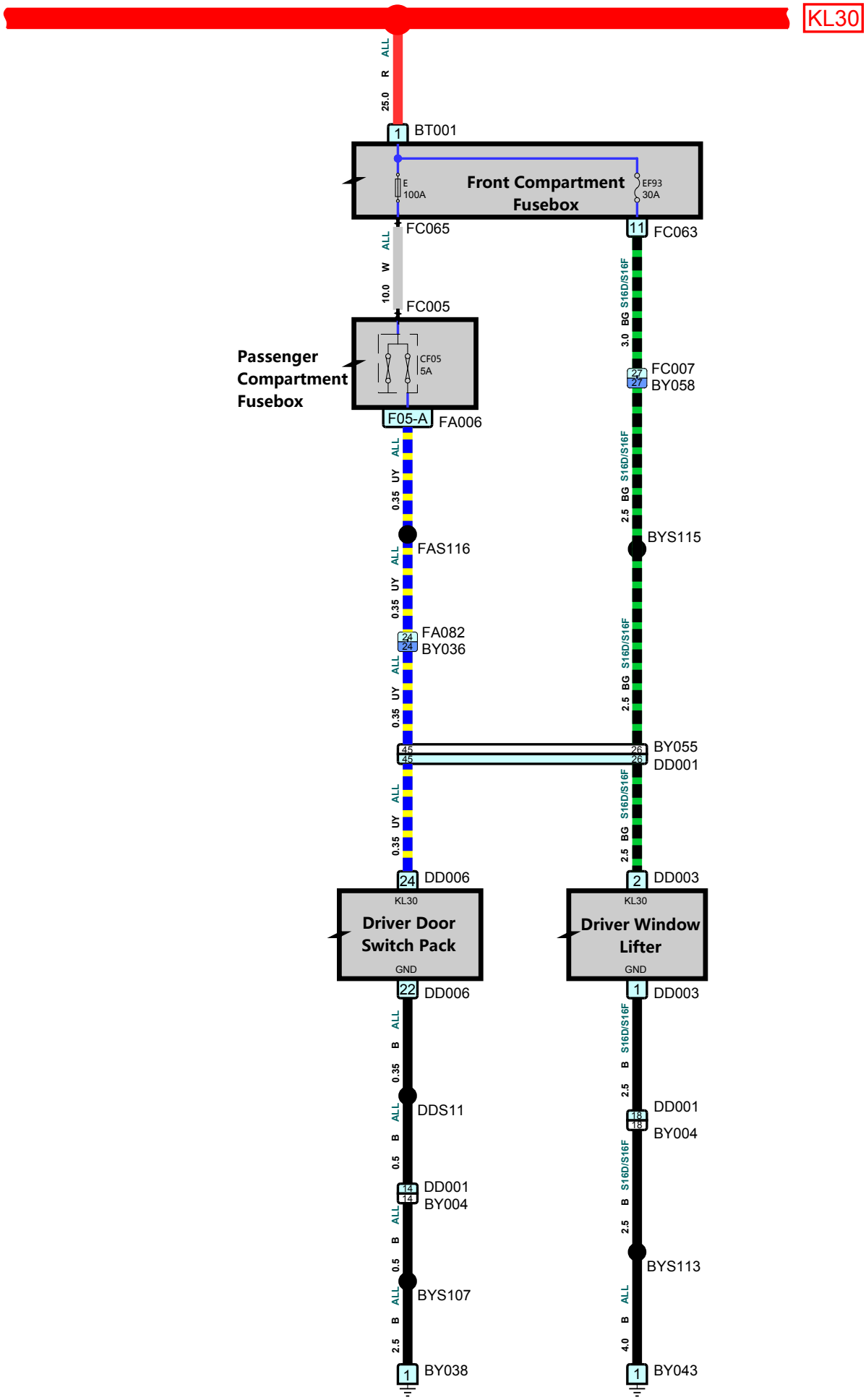
S30-Door Locking System(2)



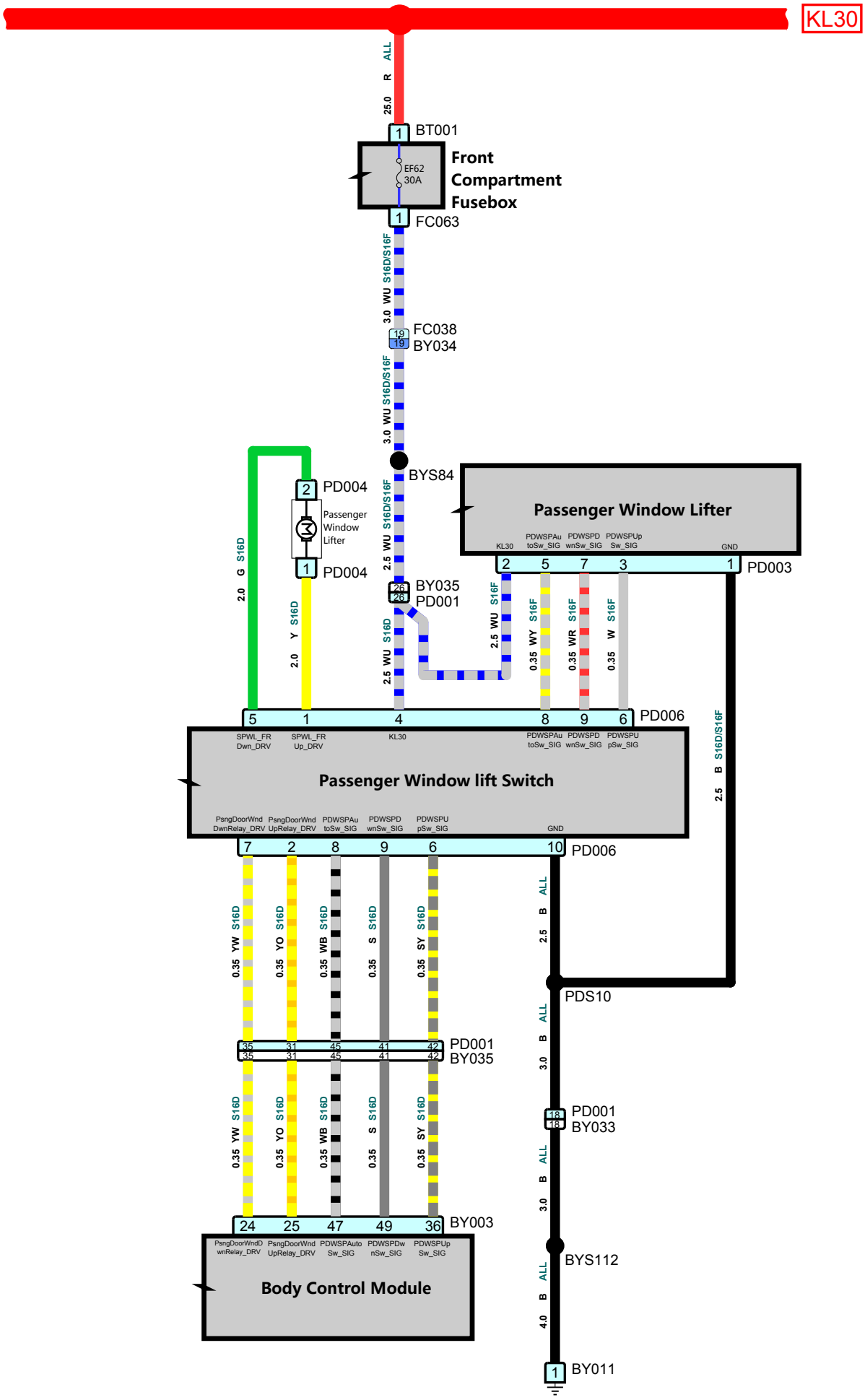
S31-Door Locking System(3)



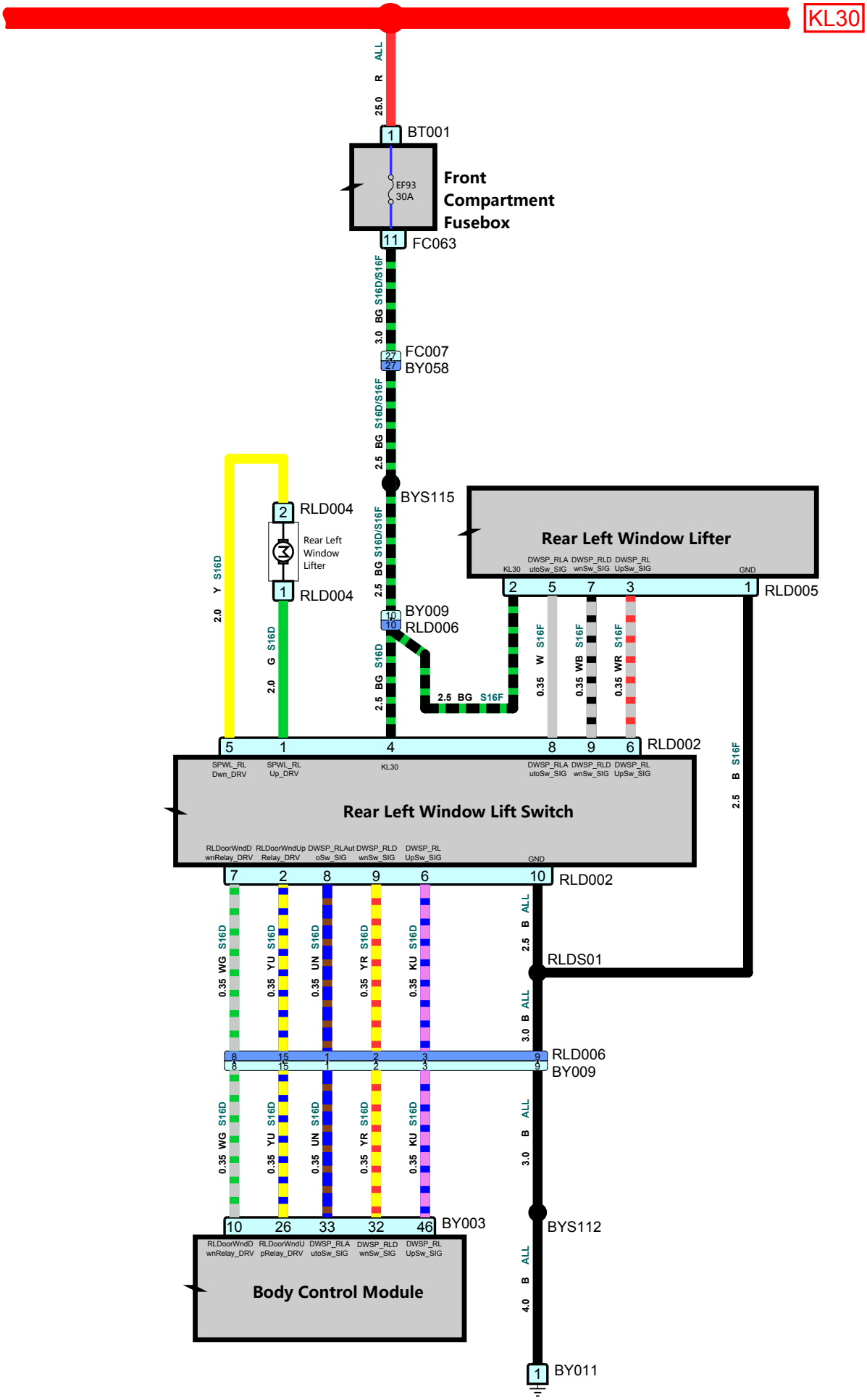
S32-Driver Window Lift



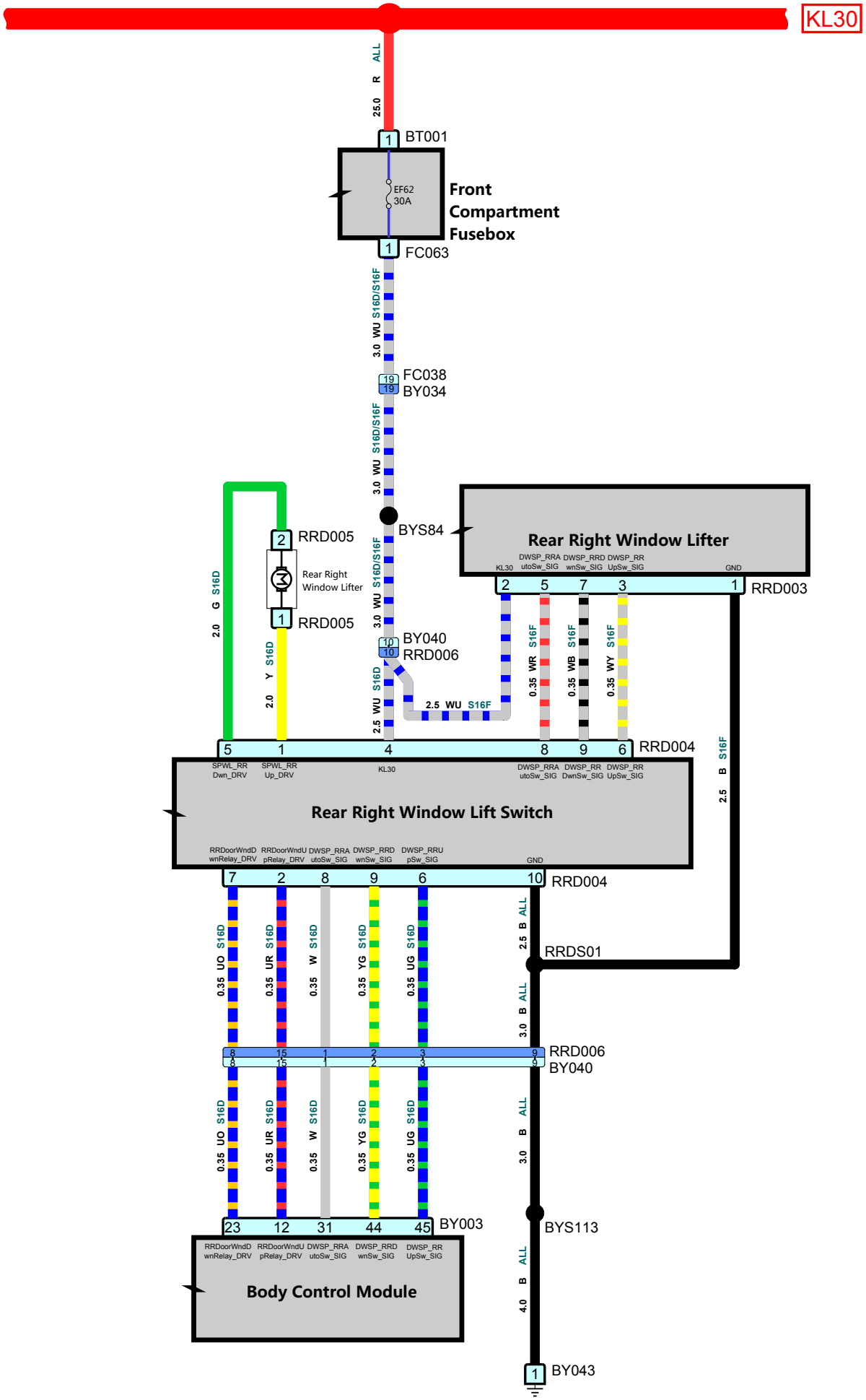
S33-Passenger Window lift



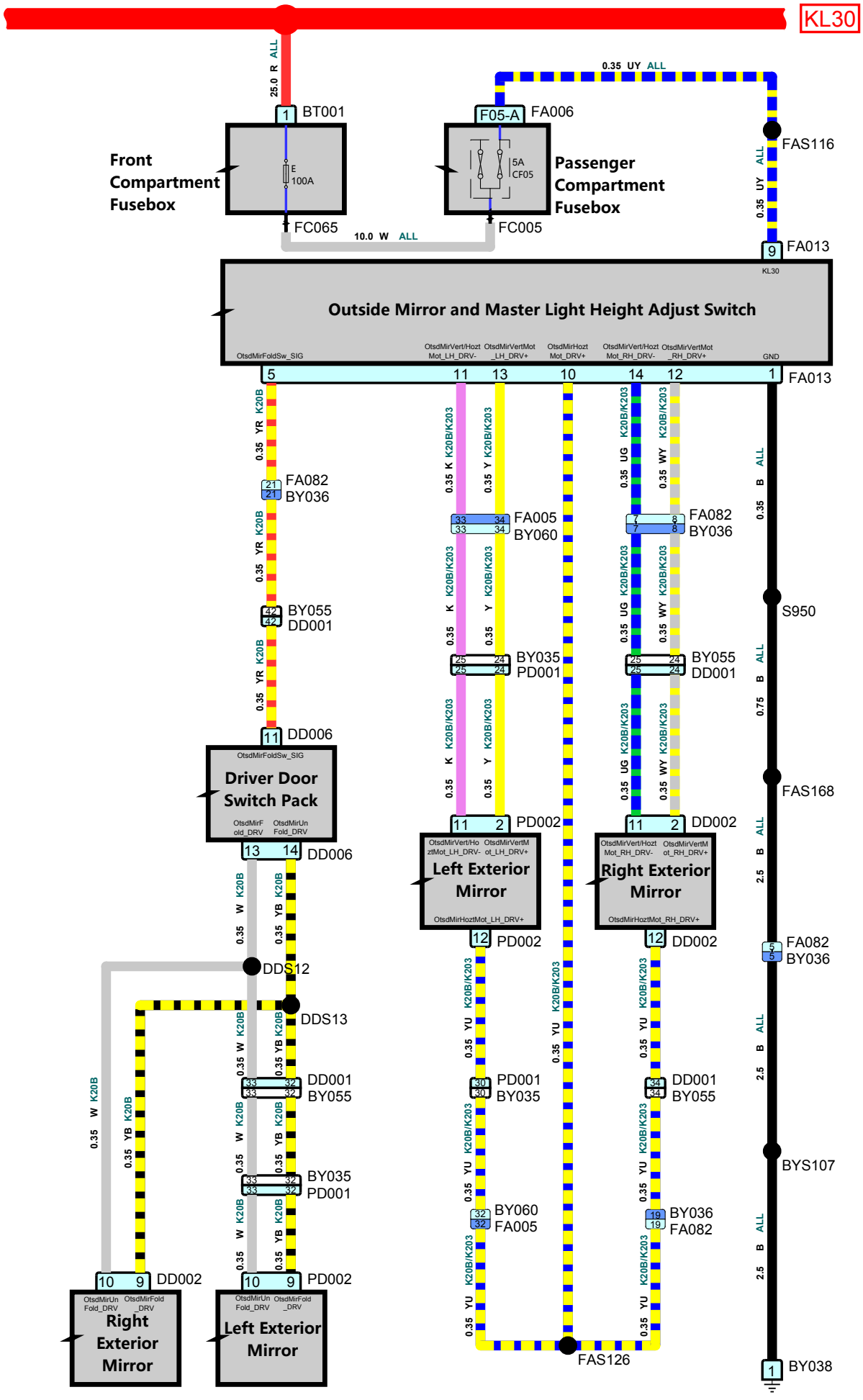
S34-Rear Left Window Lift



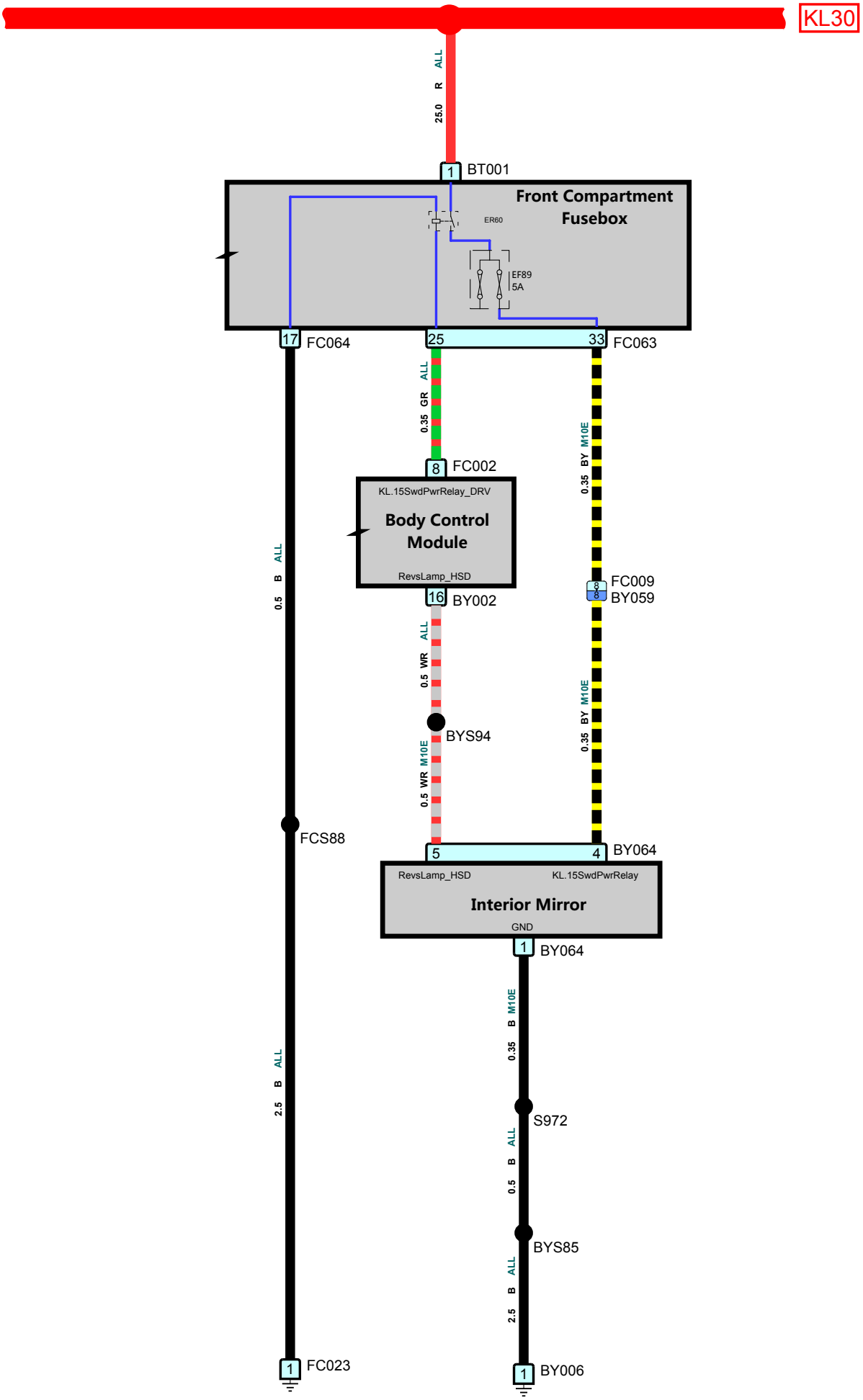
S35-Rear Right Window Lift



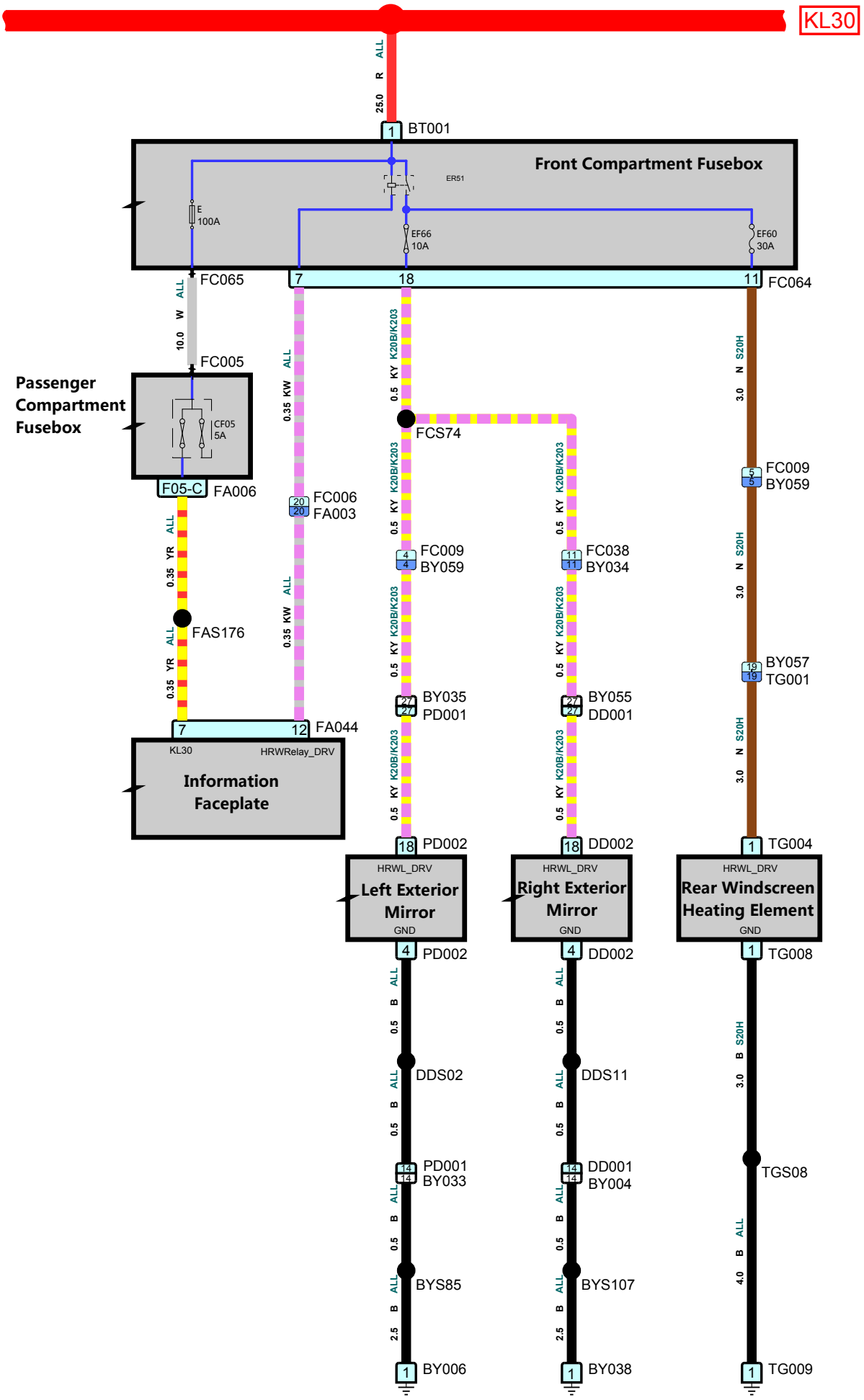
S36-Exterior Mirrors



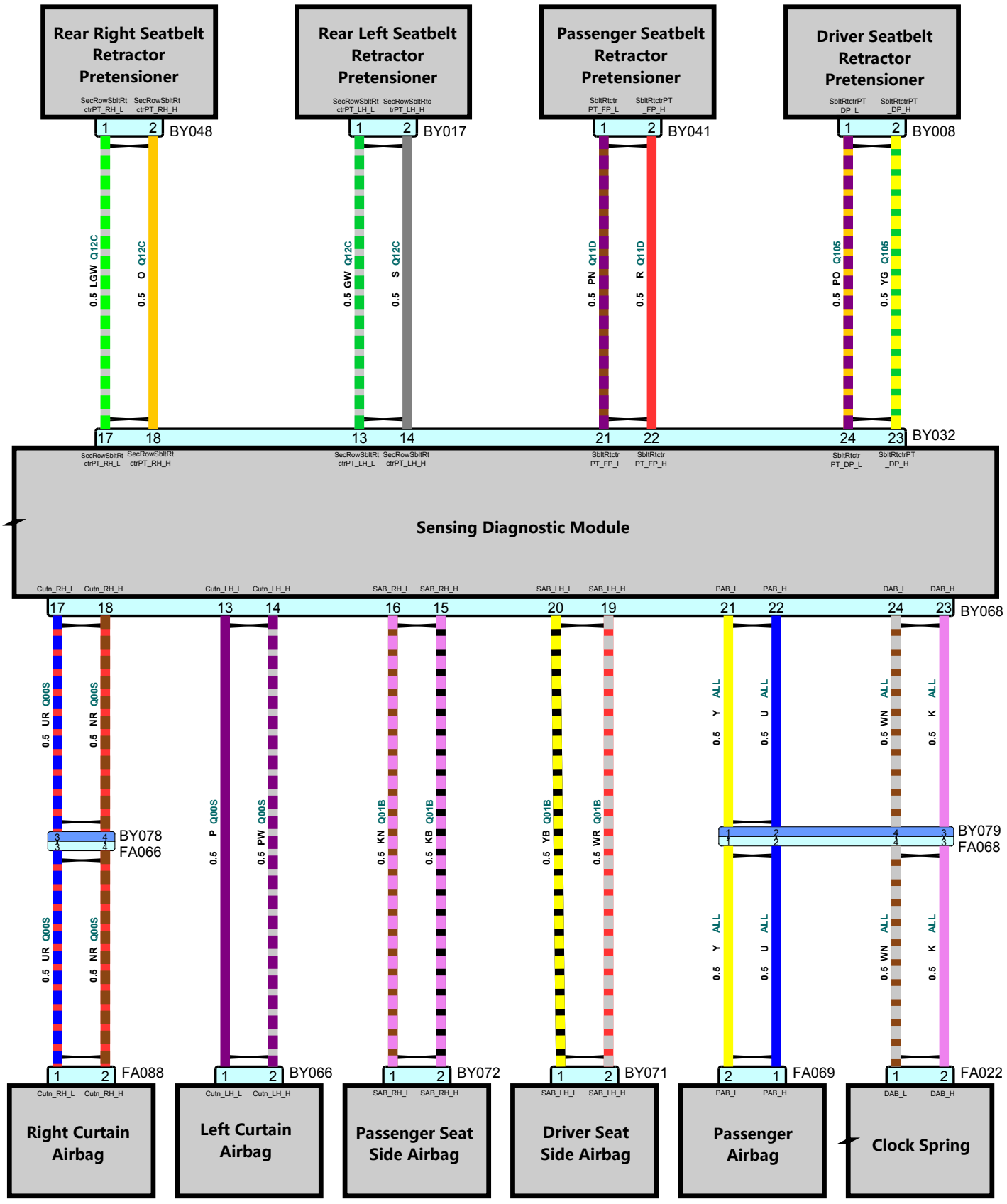
S37-Interior Mirror



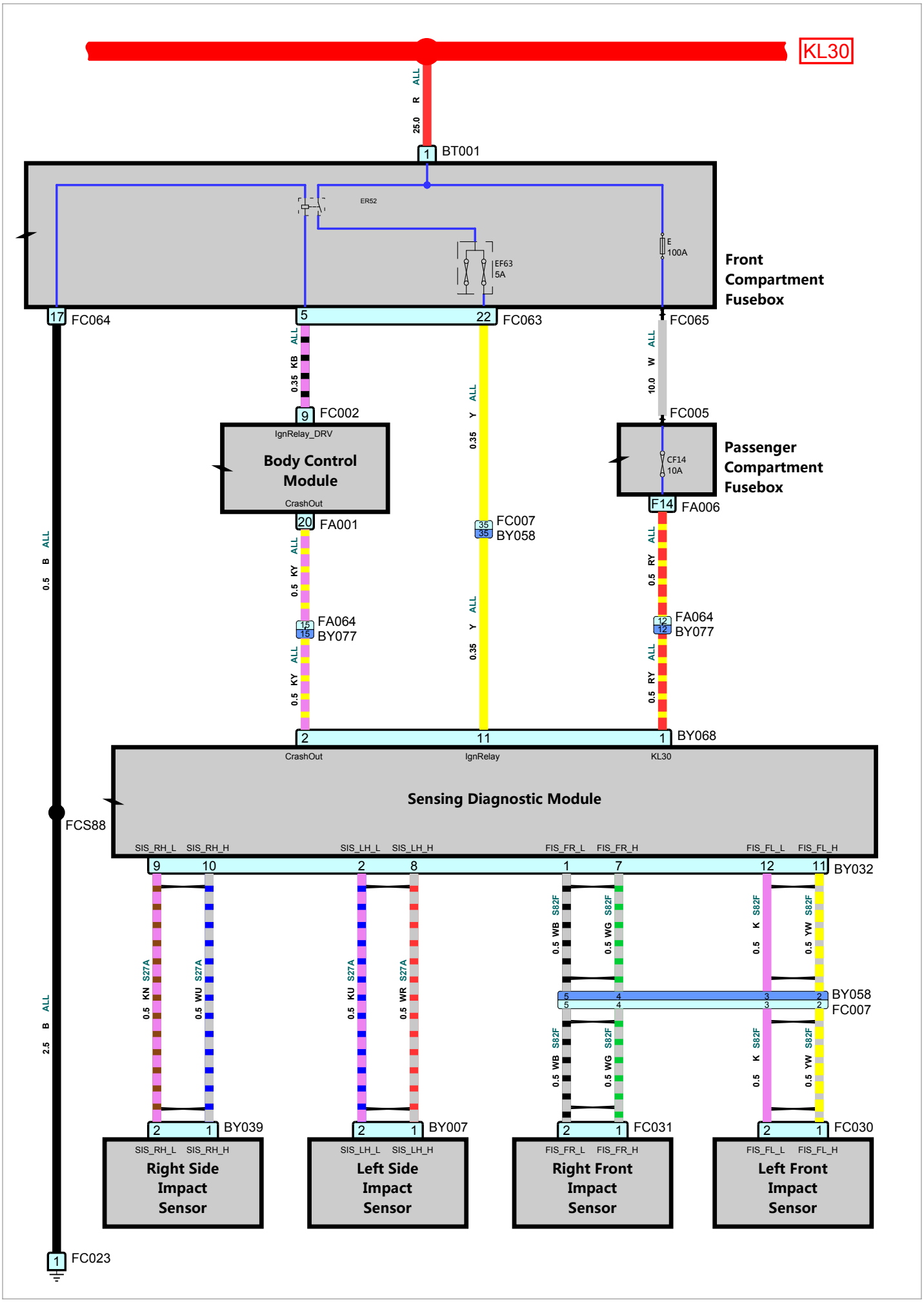
S38-Exterior Mirror Heating & Rear Windscreen Heating



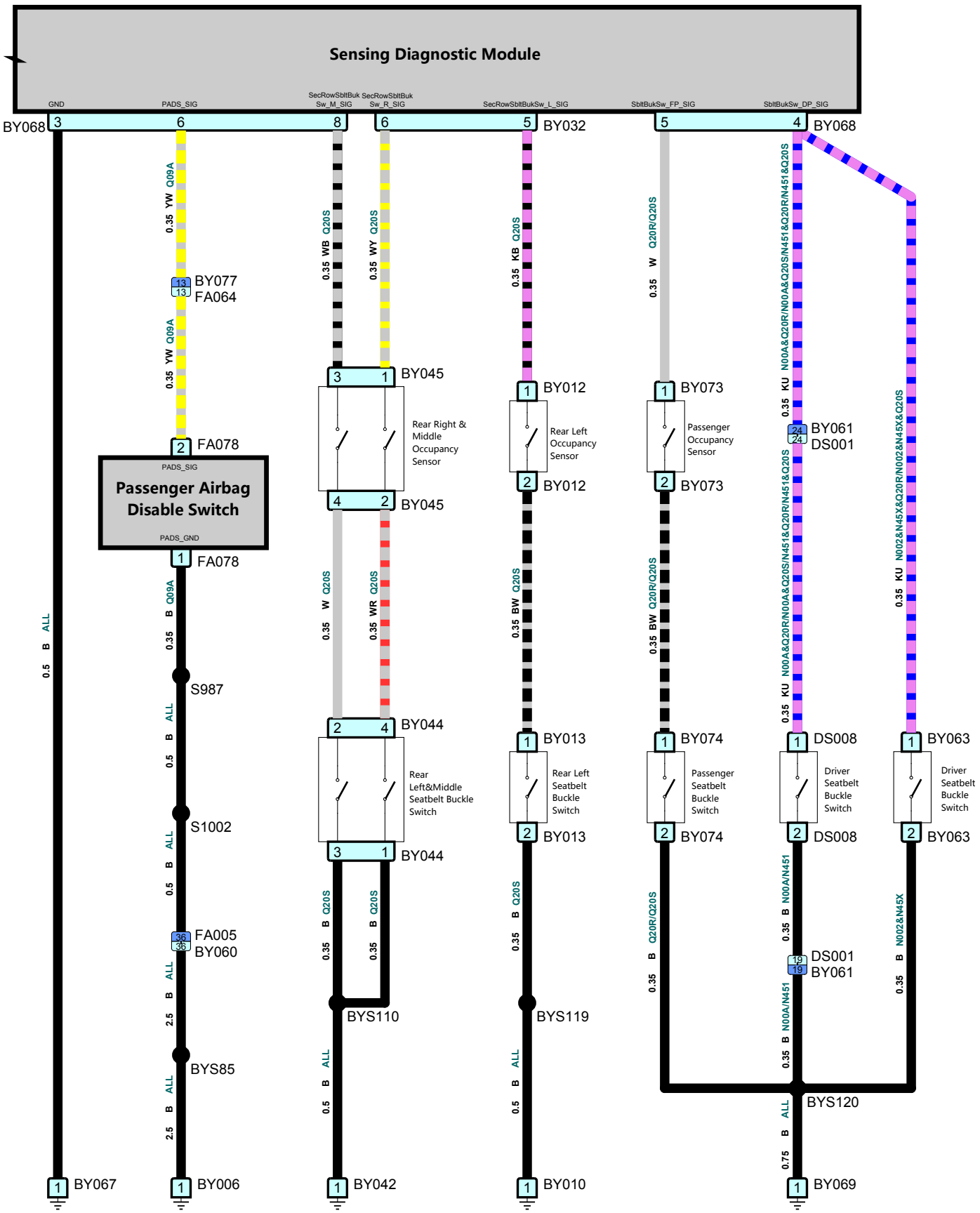
S39-Supplemental Restraint System(1)



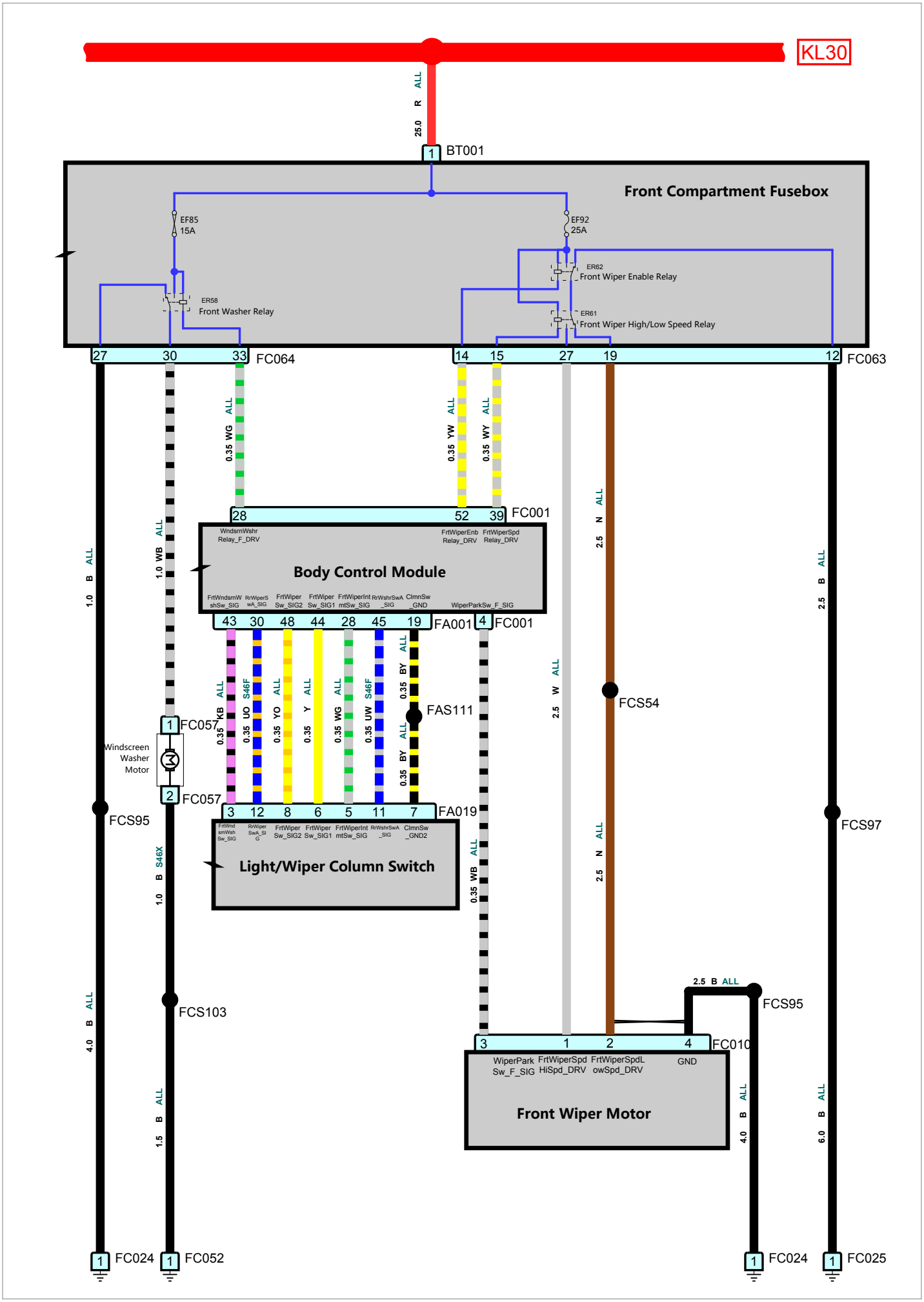
S40-Supplemental Restraint System(2)



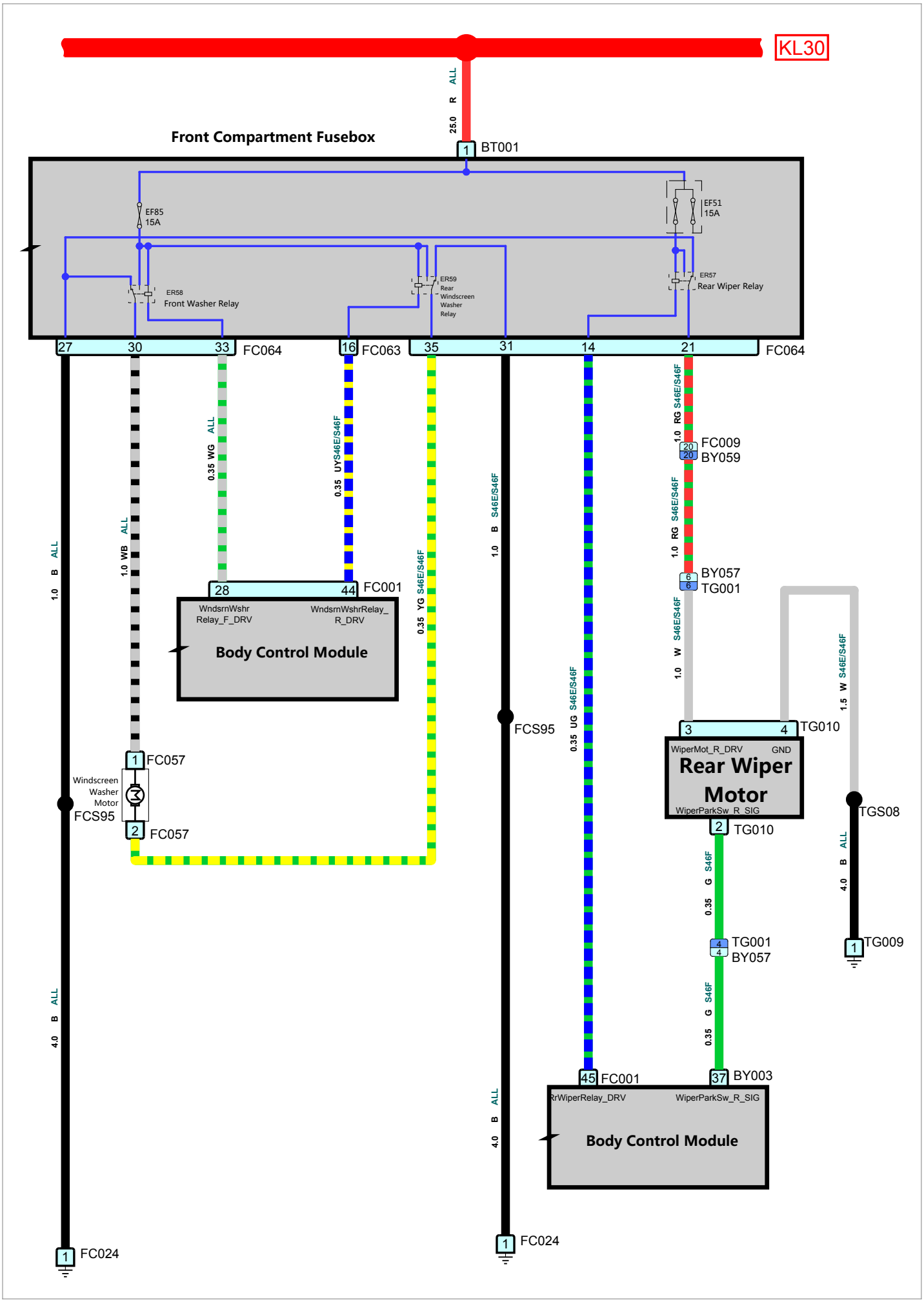
S41-Supplemental Restraint System(3)



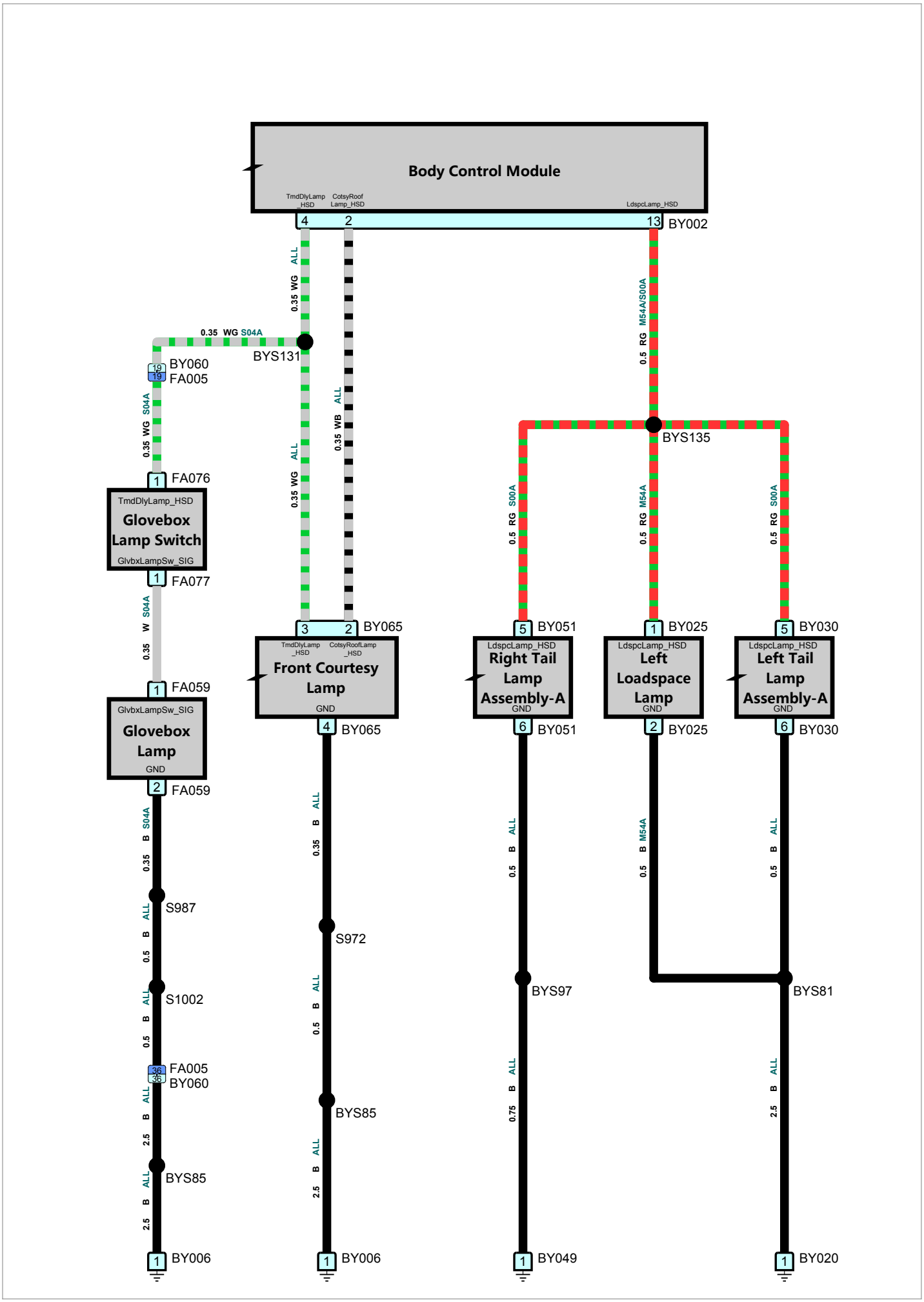
S42-Front Wiper System



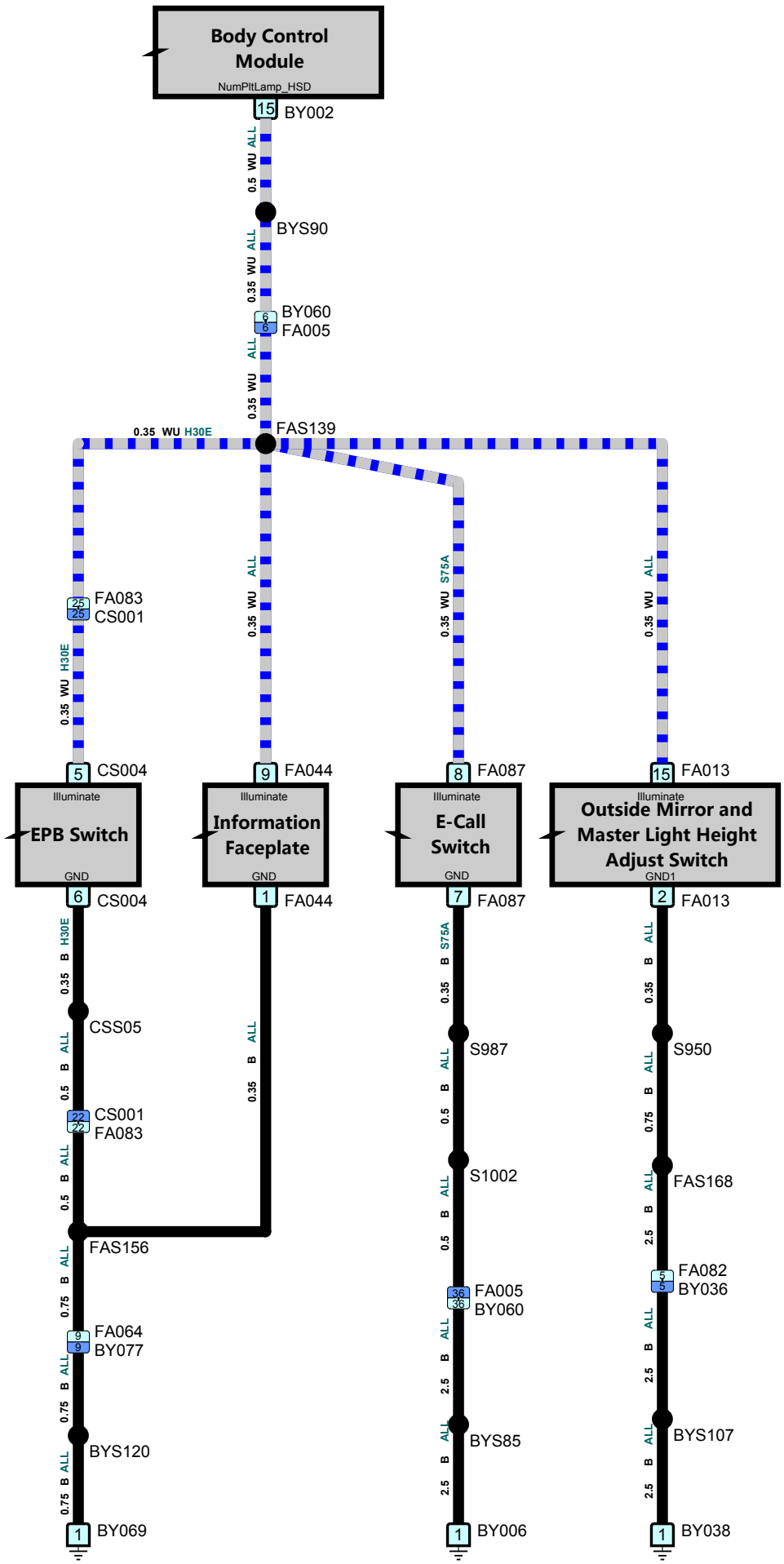
S43-Rear Wiper System



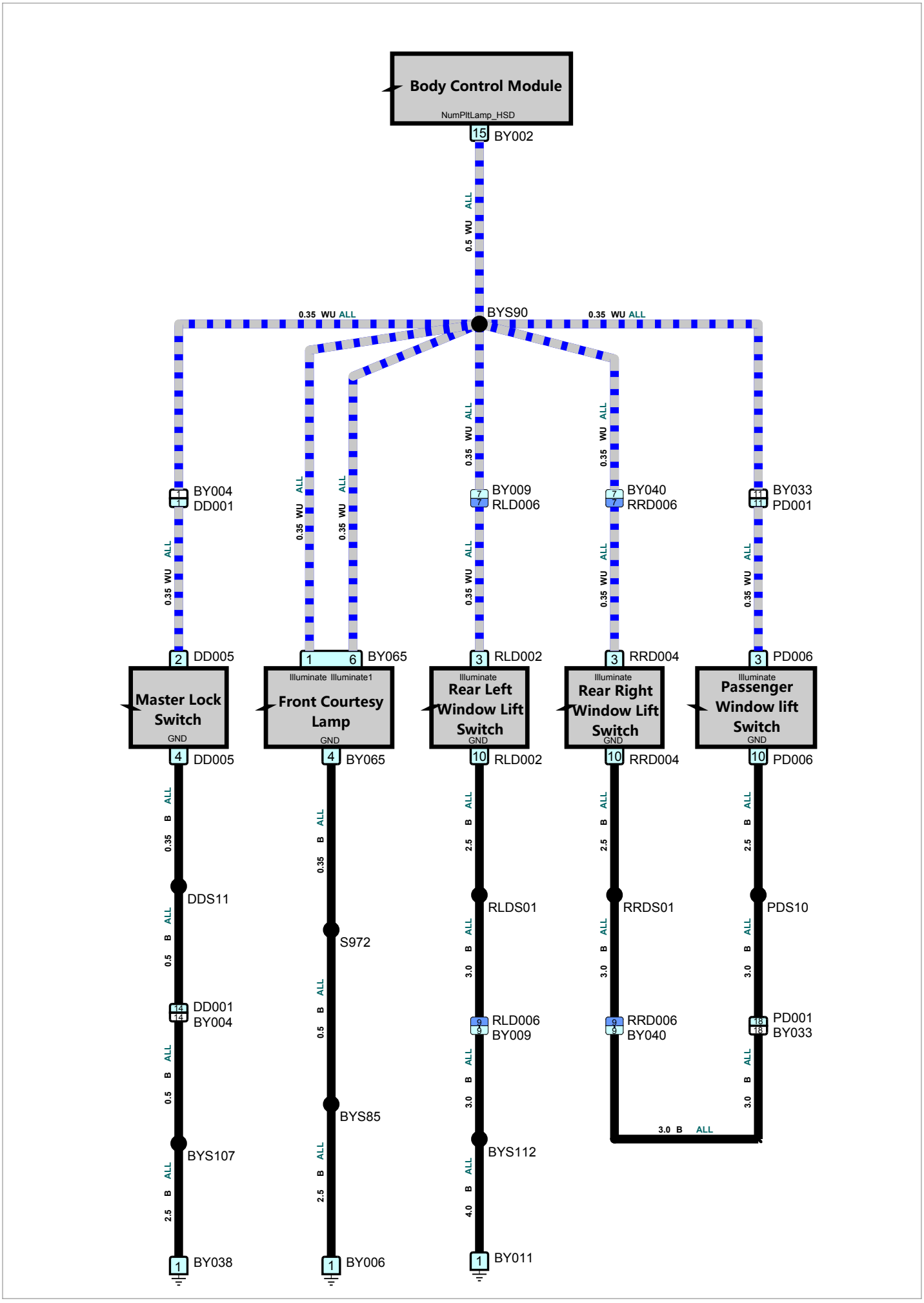
S44-Interior Lighting



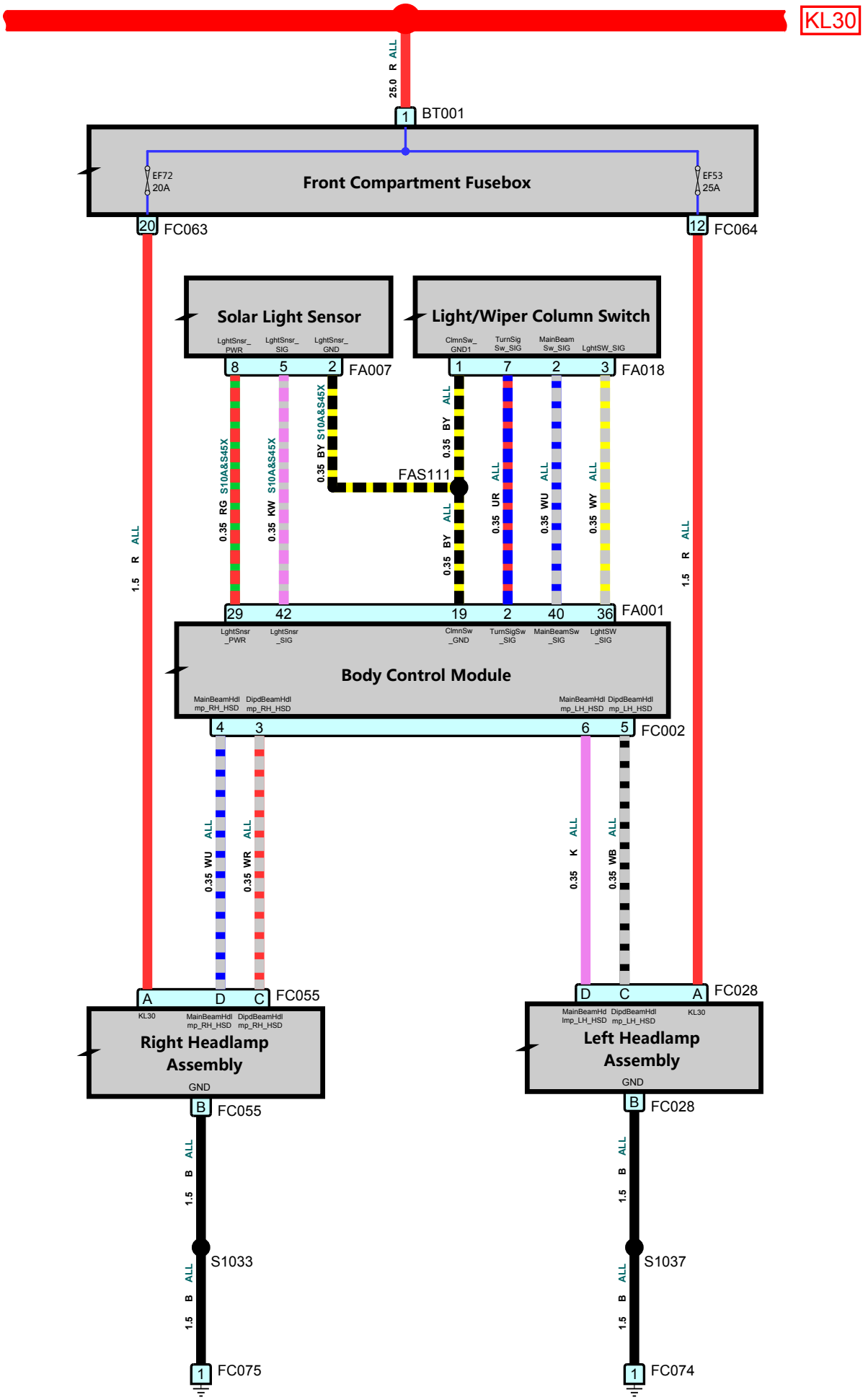
S45-Illumination(1)



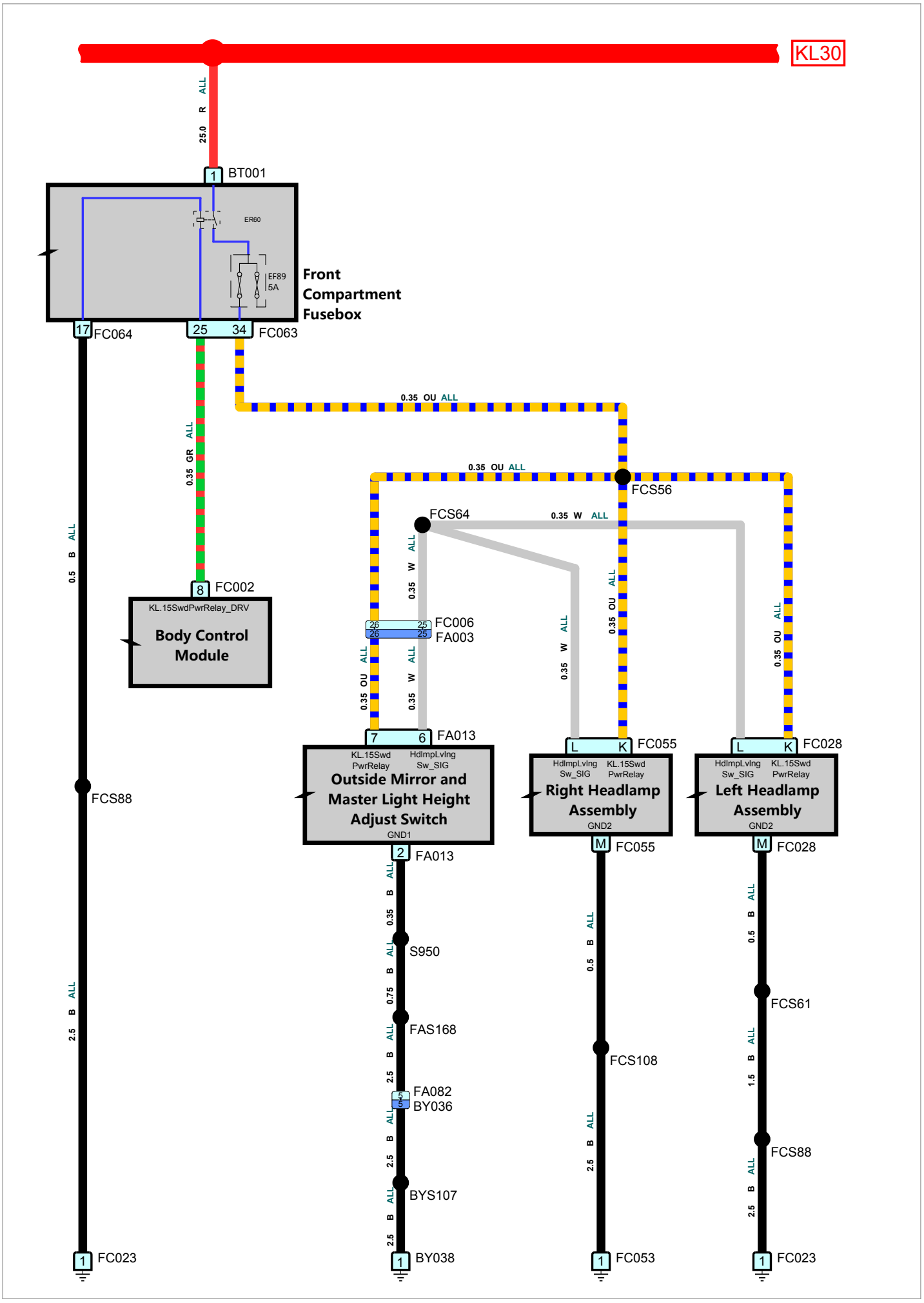
S46-Illumination(2)



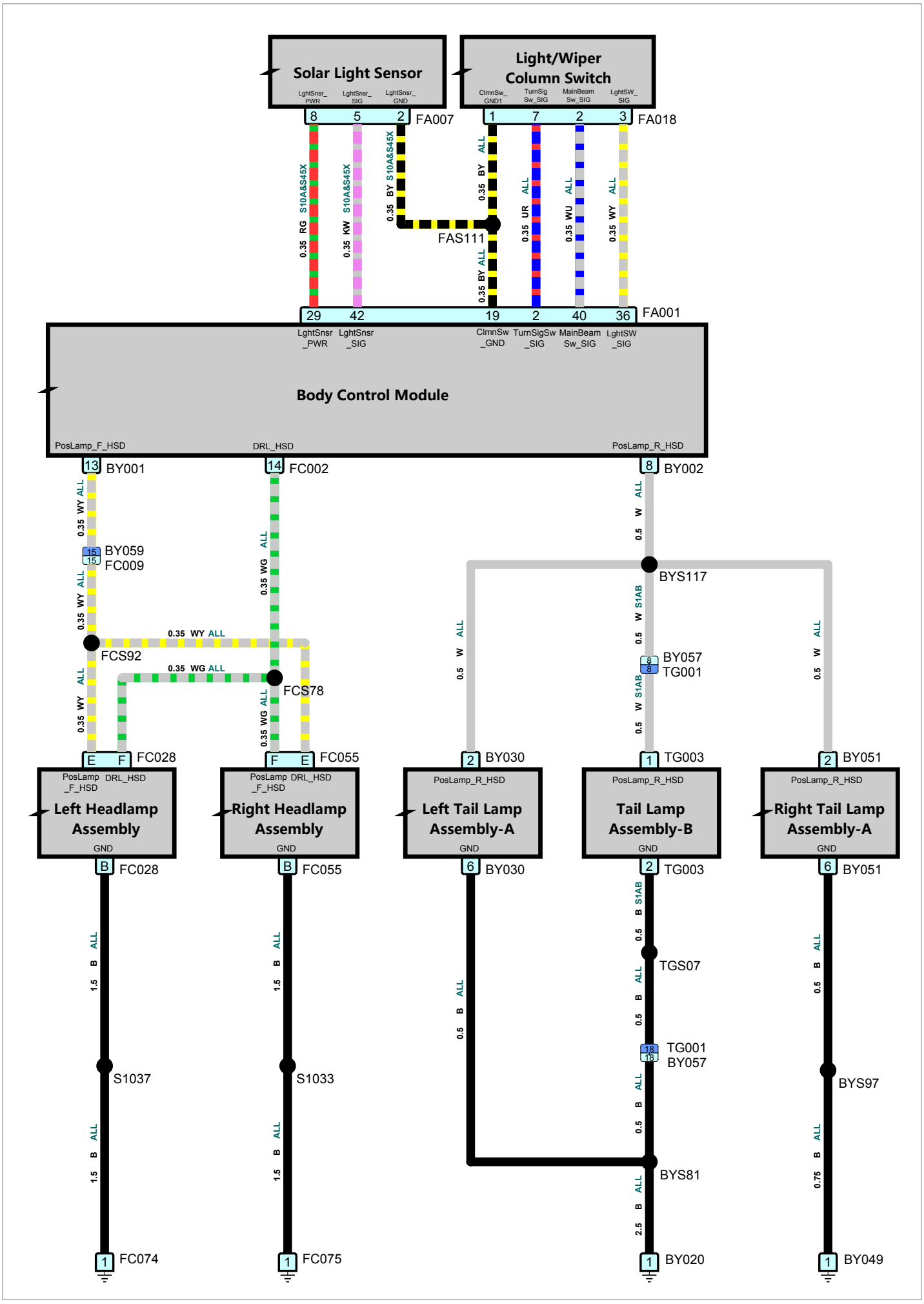
S47-Main/Dipped Beam Headlamp



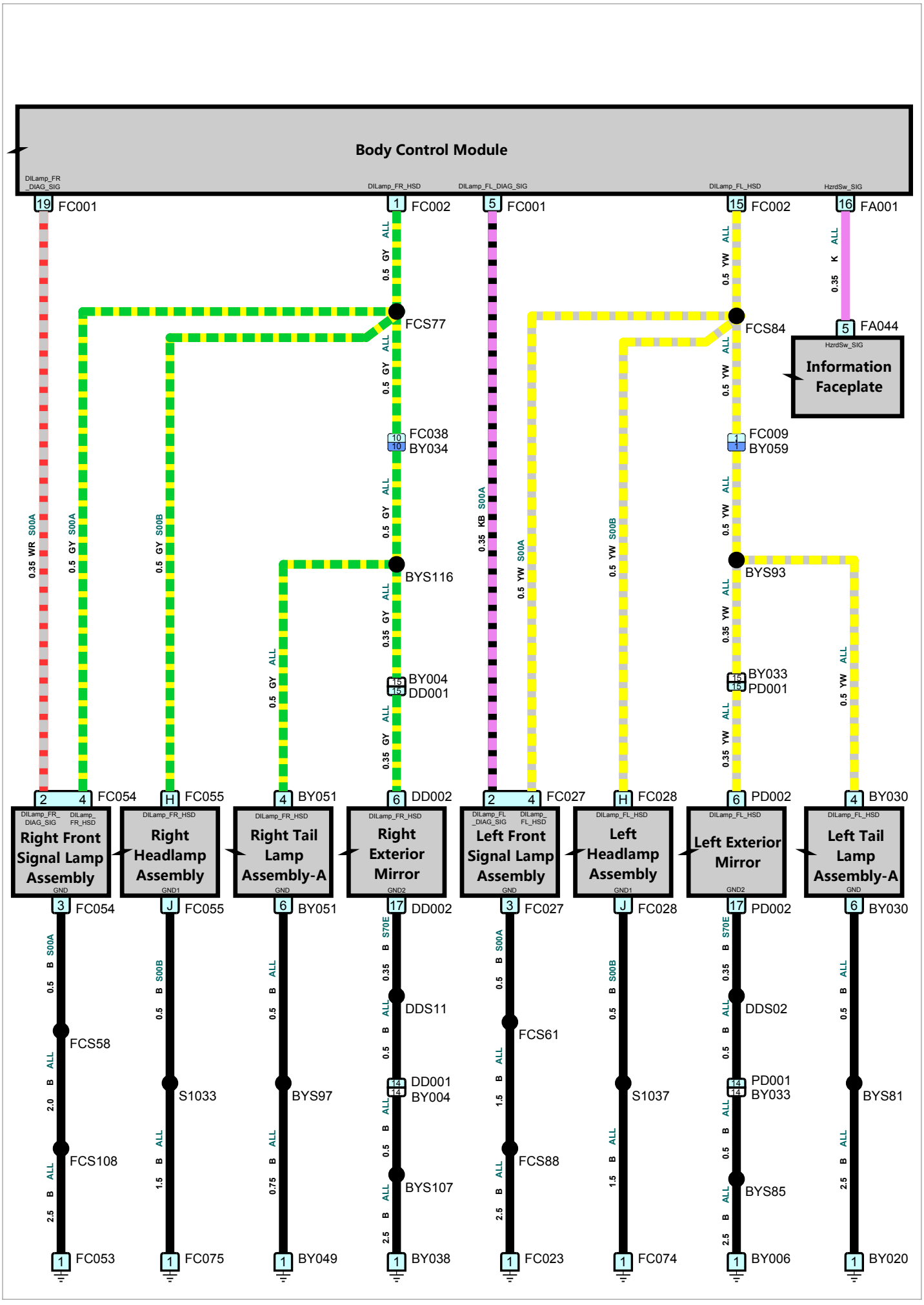
S48-Headlemp Levelling Switch



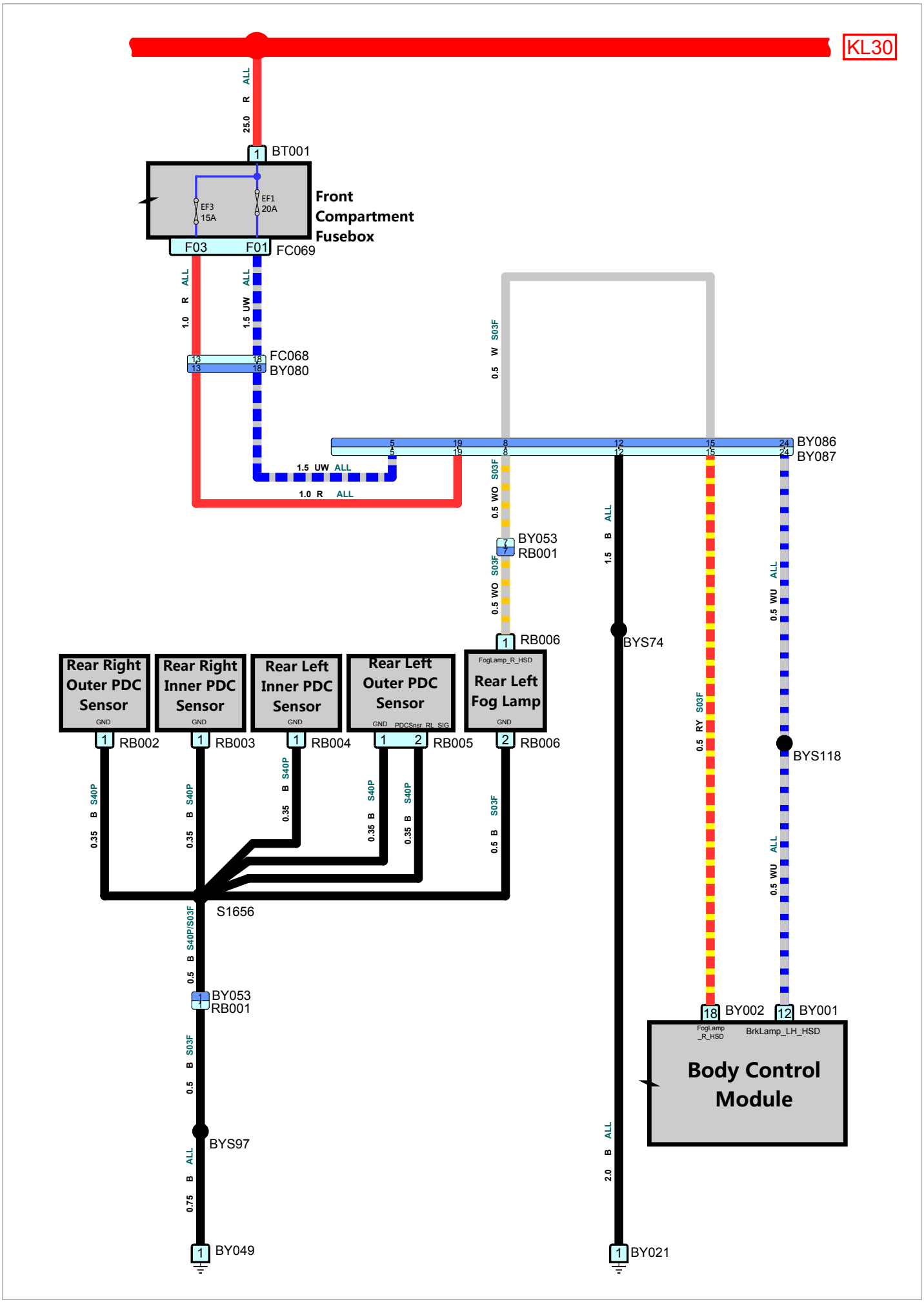
S49-Side Lamp & Daytime Running Lamp



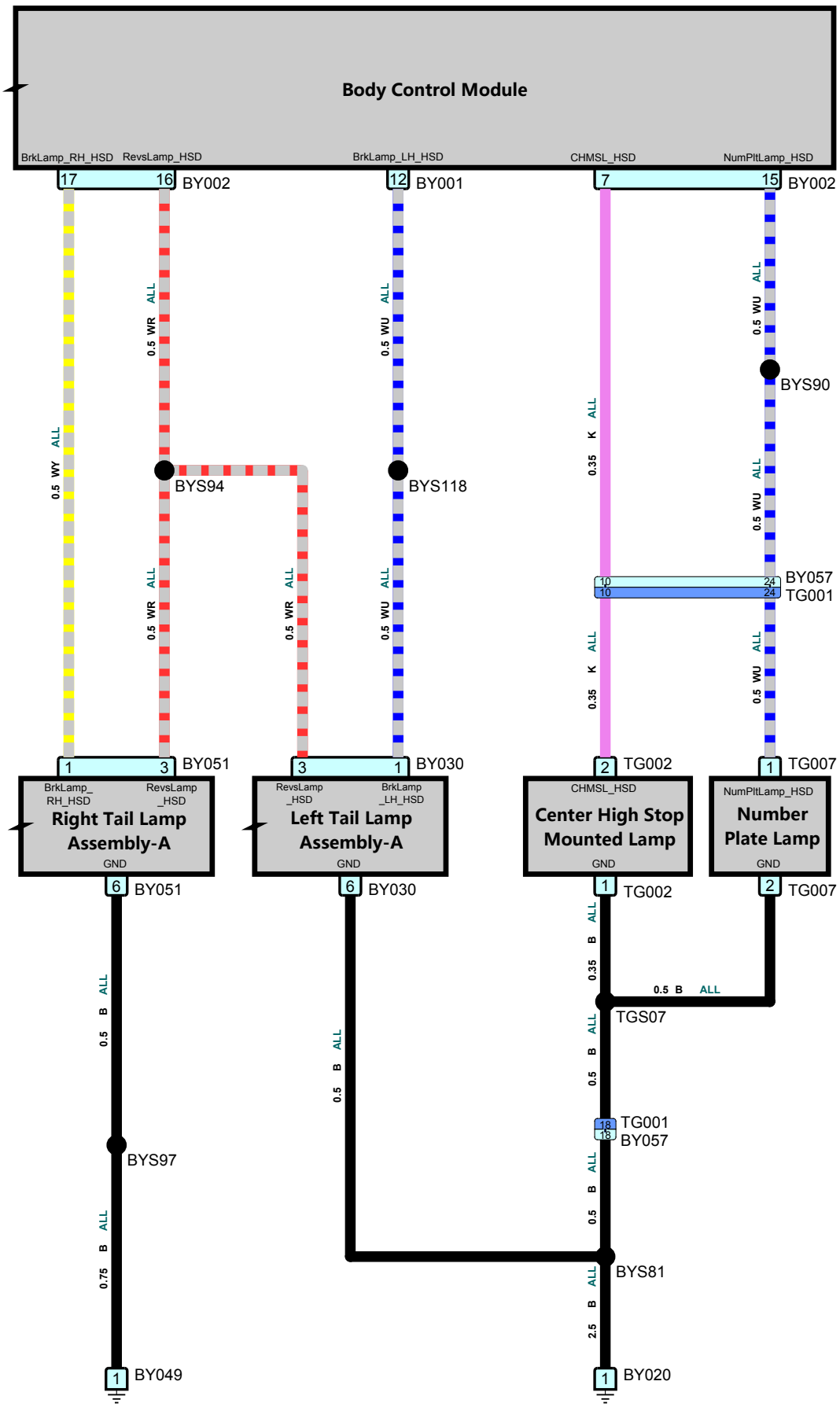
S50-Direction Indicator Lamp



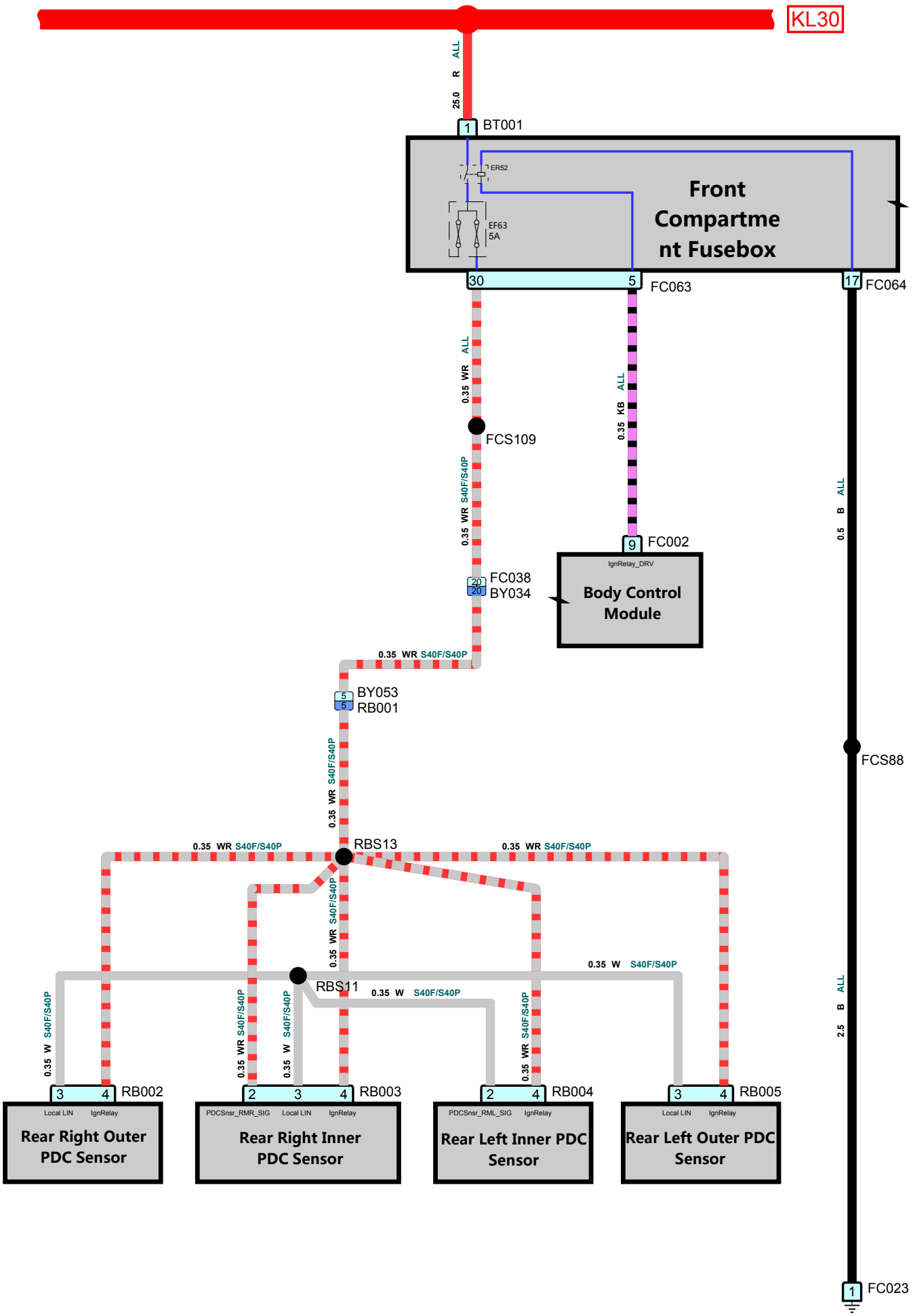
S51-Towbar Harness Connection



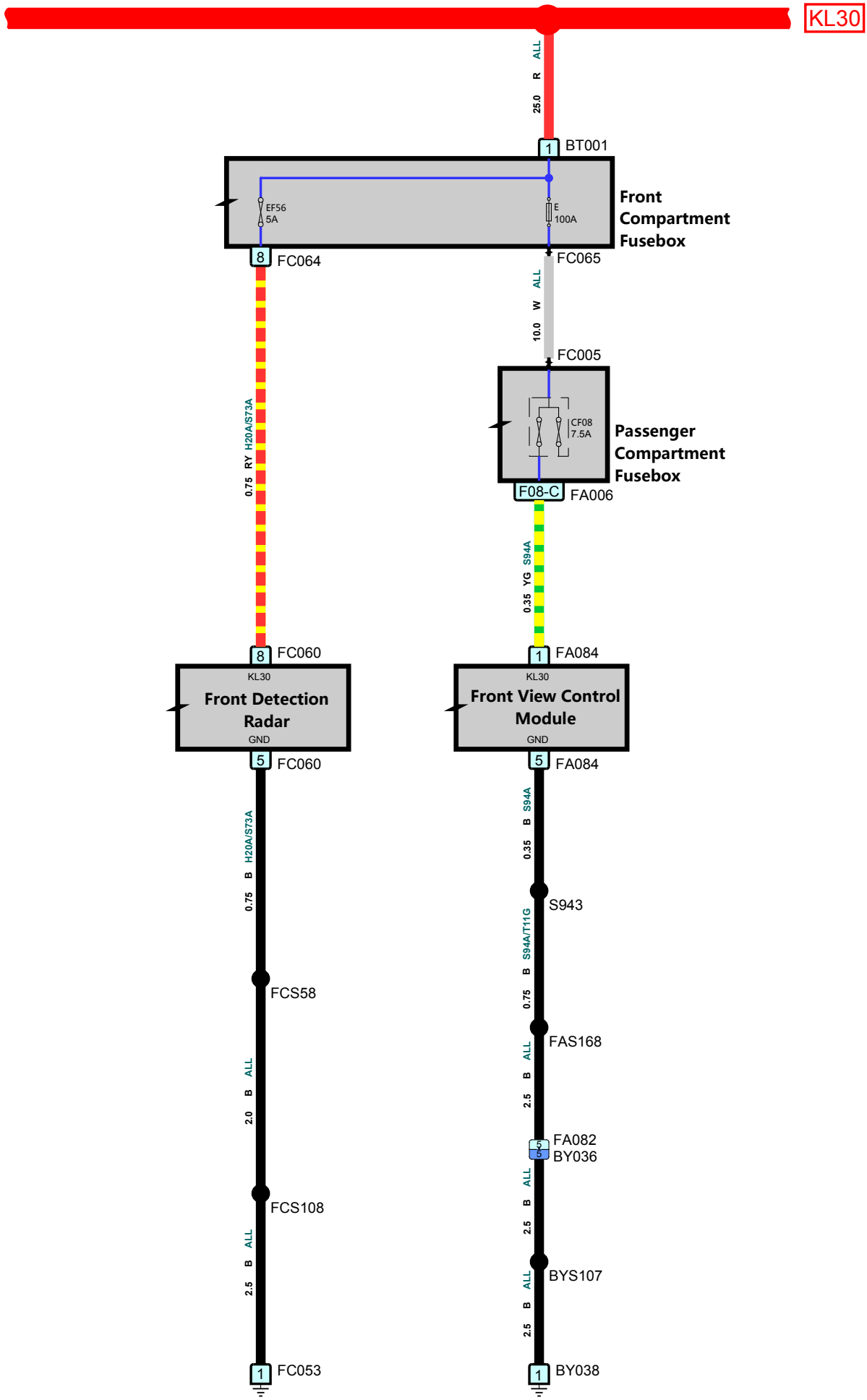
S52-Brake Lamp & Reverse Lamp & Number Plate Lamp



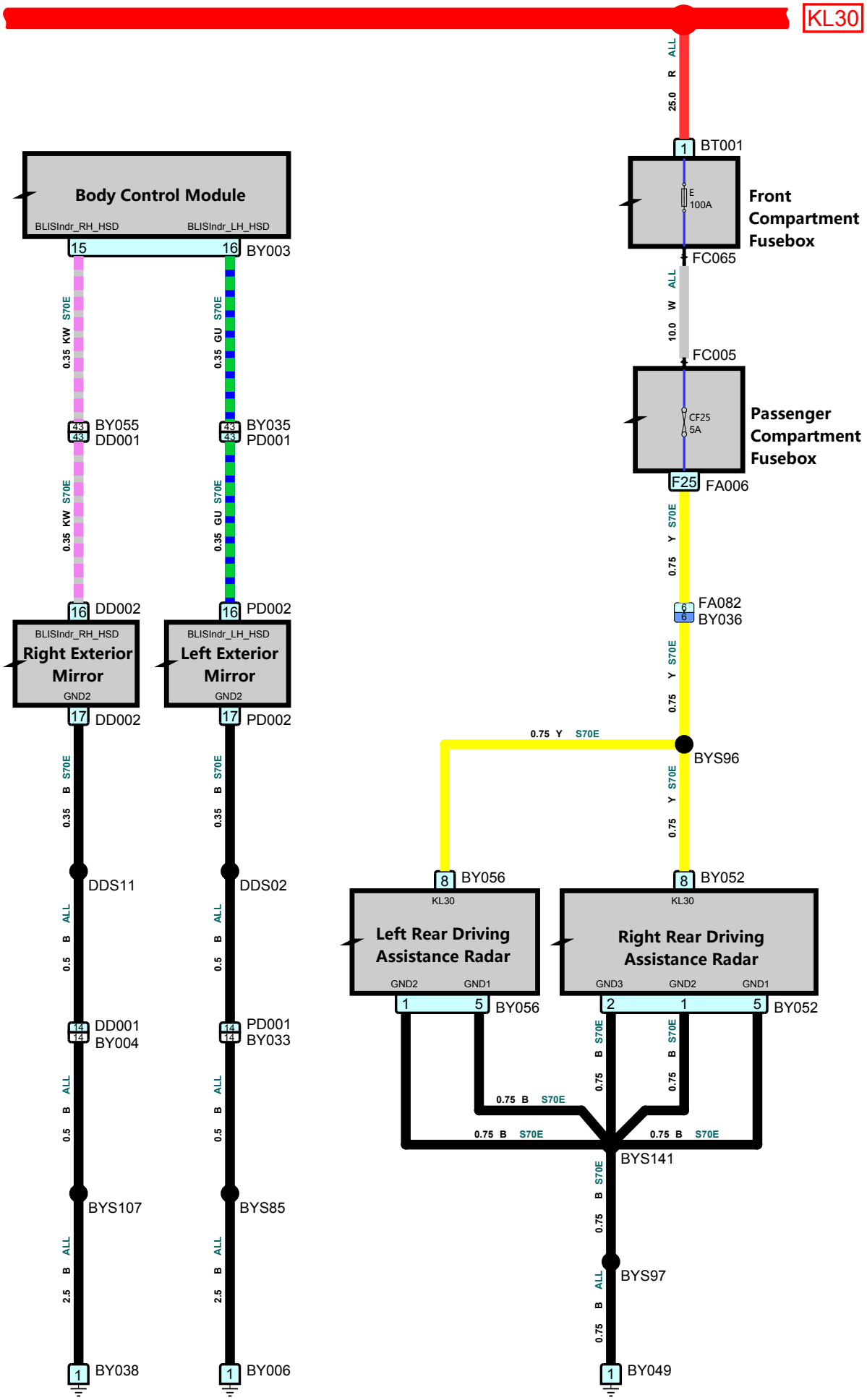
S53-Parking Distance Control System



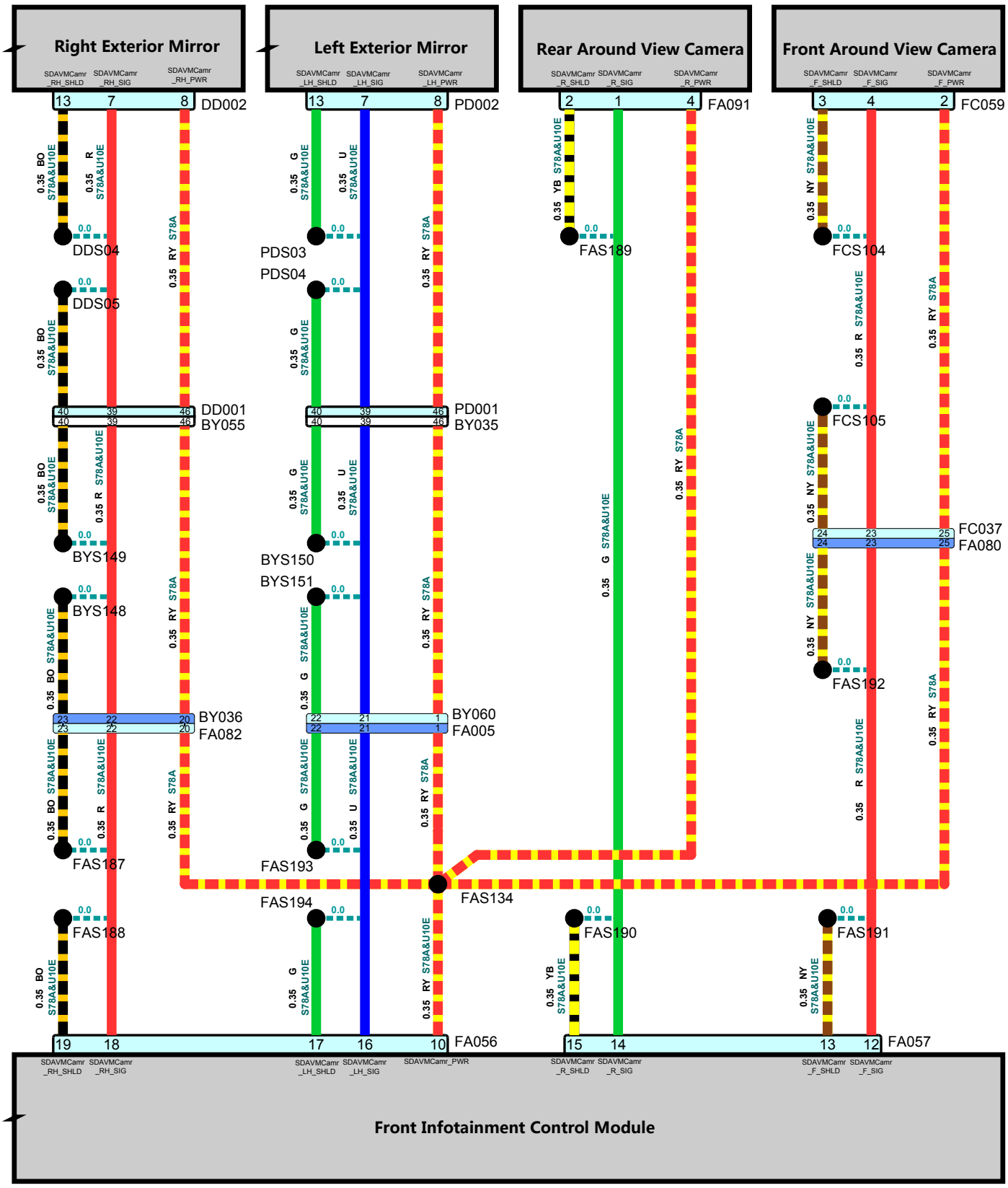
S54-Driving Assistance System



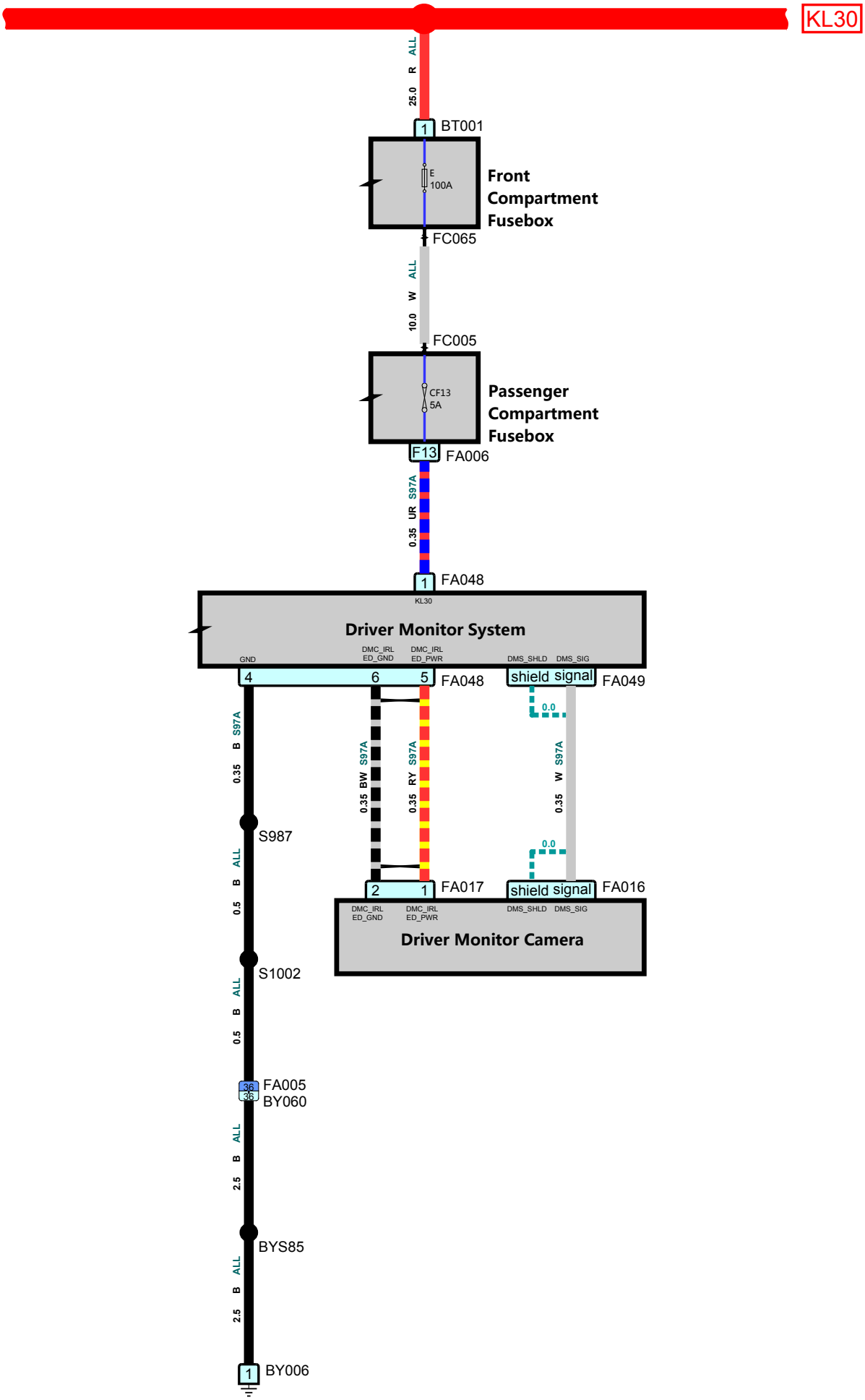
S55-Rear Driving Assistance System



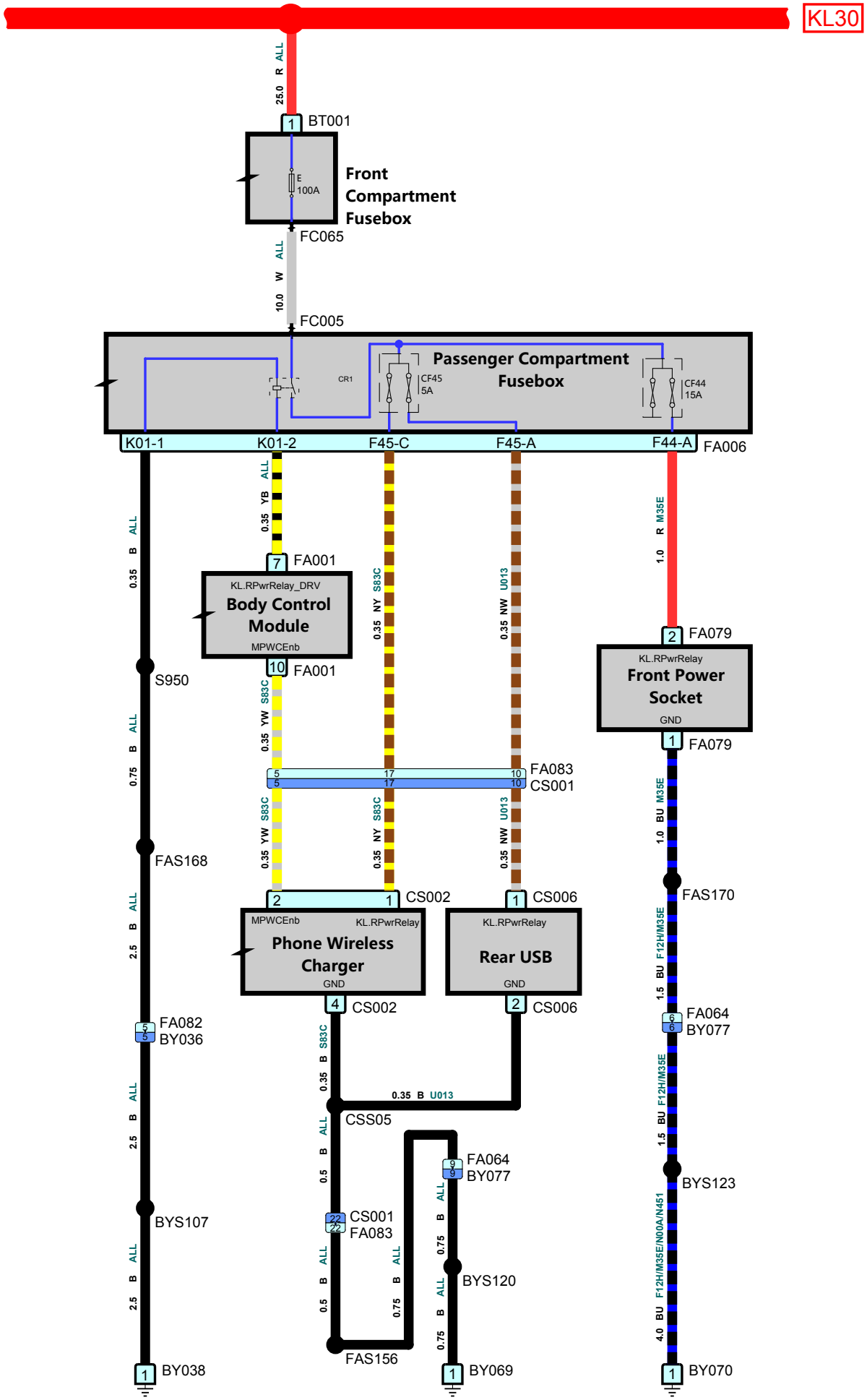
S56-Around View System



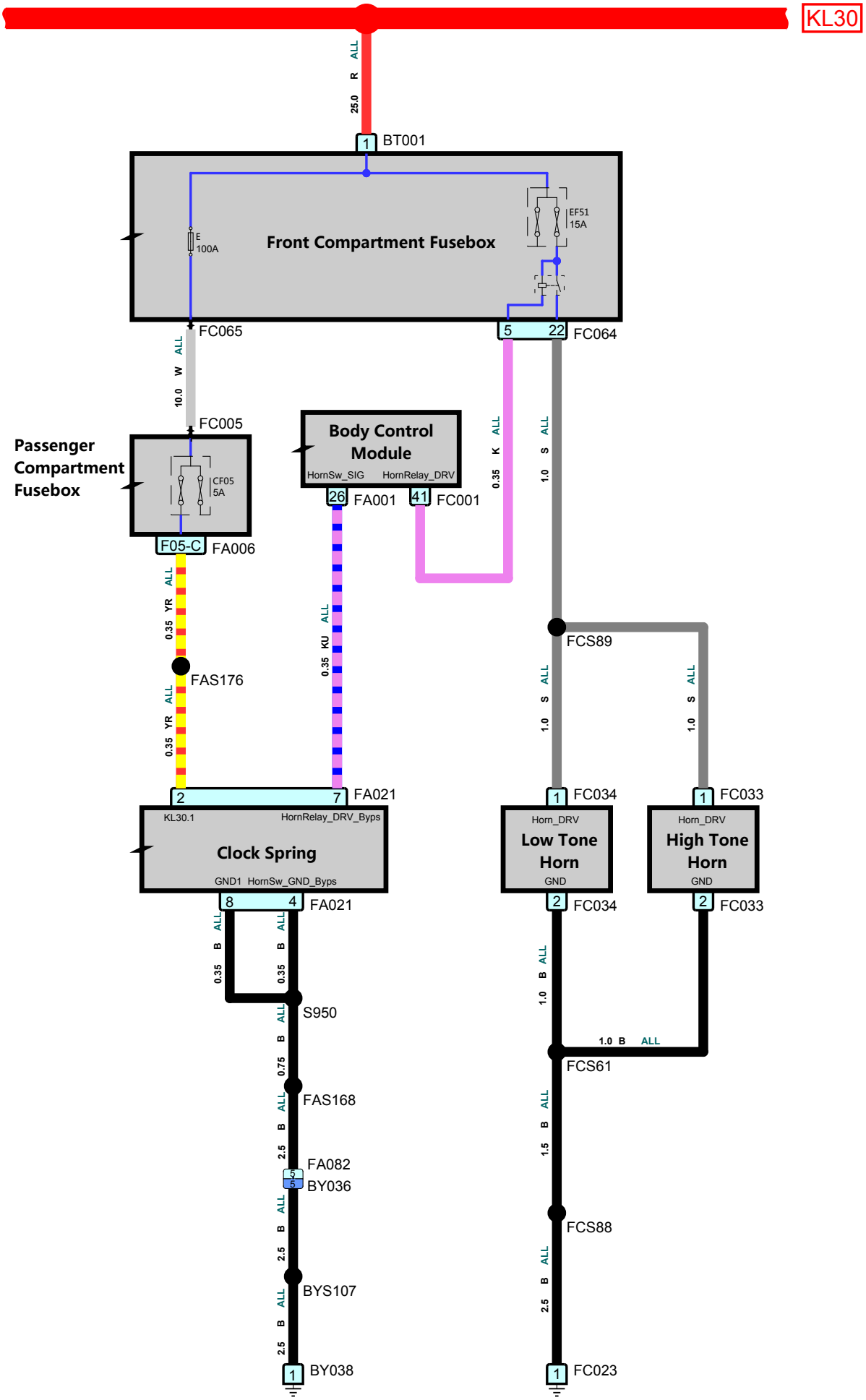
S57-Driver Monitor System



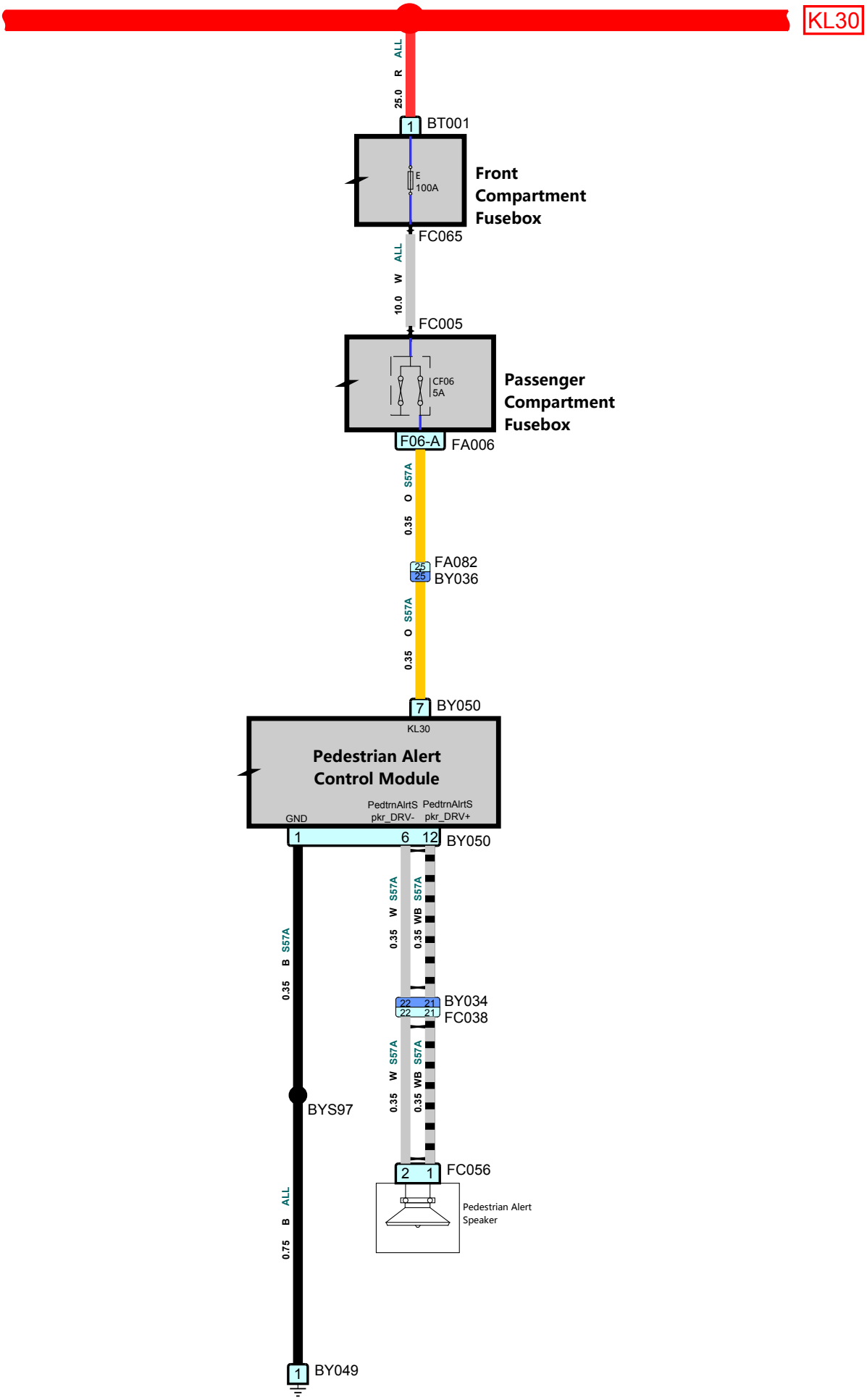
S58-Power Socket & Phone Wireless Charger



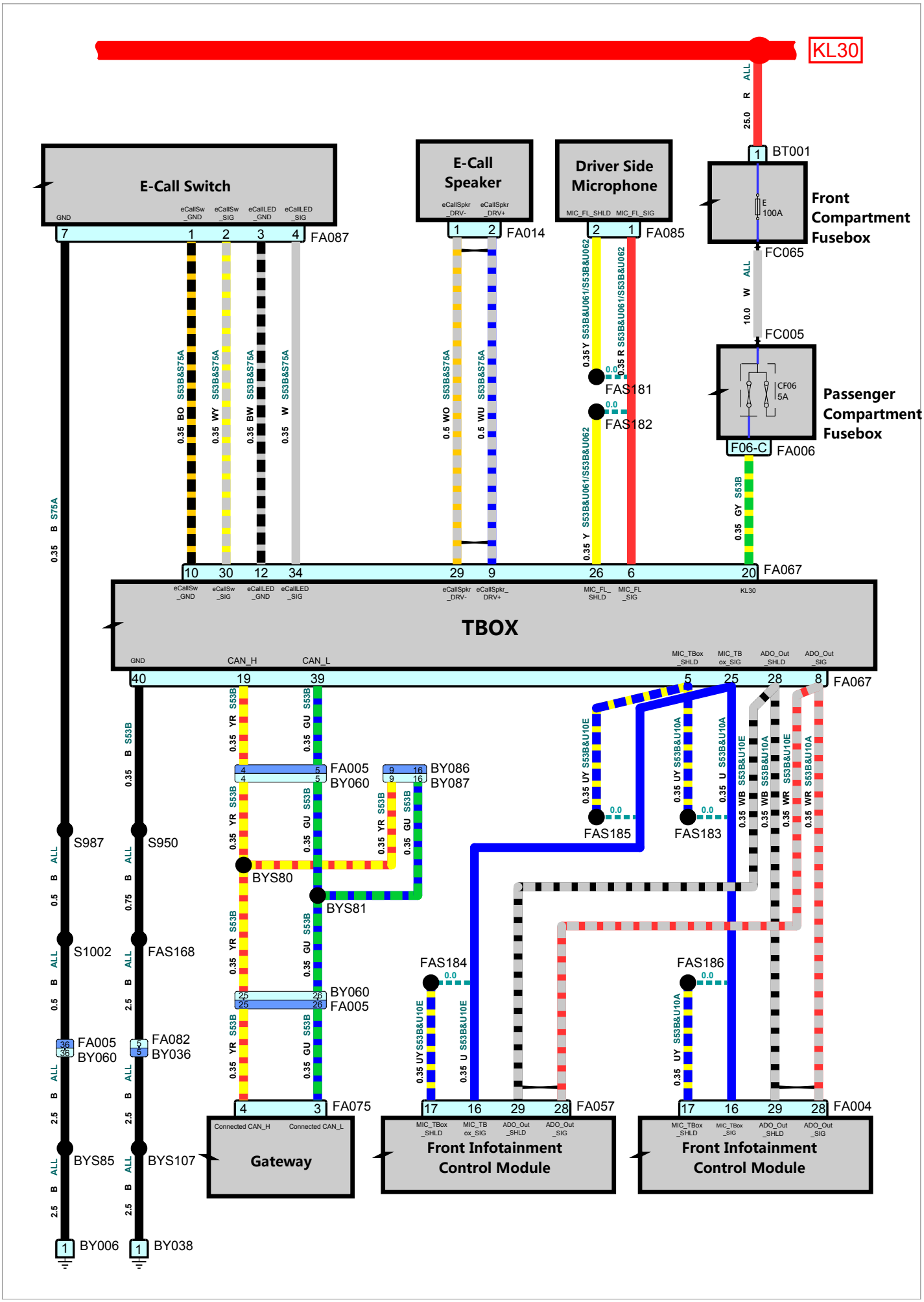
S59-Horn


KL30
25.0 R ALL
1 BT001
Front Compartment Fusebox
E 100A
EF51 15A
FC065
5 22 FC064
10.0 W ALL
FC005
Passenger Compartment Fusebox
CF05 5A
F05-C FA006
Body Control Module
HornSw_SIG HornRelay_DRV
26 FA001 41 FC001
0.35 K ALL
1.0 S ALL
FCS89
0.35 YR ALL
FAS176
0.35 KU ALL
2 7 FA021
KL30.1 HornRelay_DRV_Byps
Clock Spring
GND1 HornSw_GND_Byps
8 4 FA021
0.35 B ALL
S950
0.75 B ALL
FAS168
2.5 B ALL
FA082
BY036
BYS107
BY038
1 FC034
Horn_DRV
Low Tone Horn
GND
2 FC034
1 FC033
Horn_DRV
High Tone Horn
GND
2 FC033
1.0 B ALL
FCS61
1.5 B ALL
FCS88
FC023

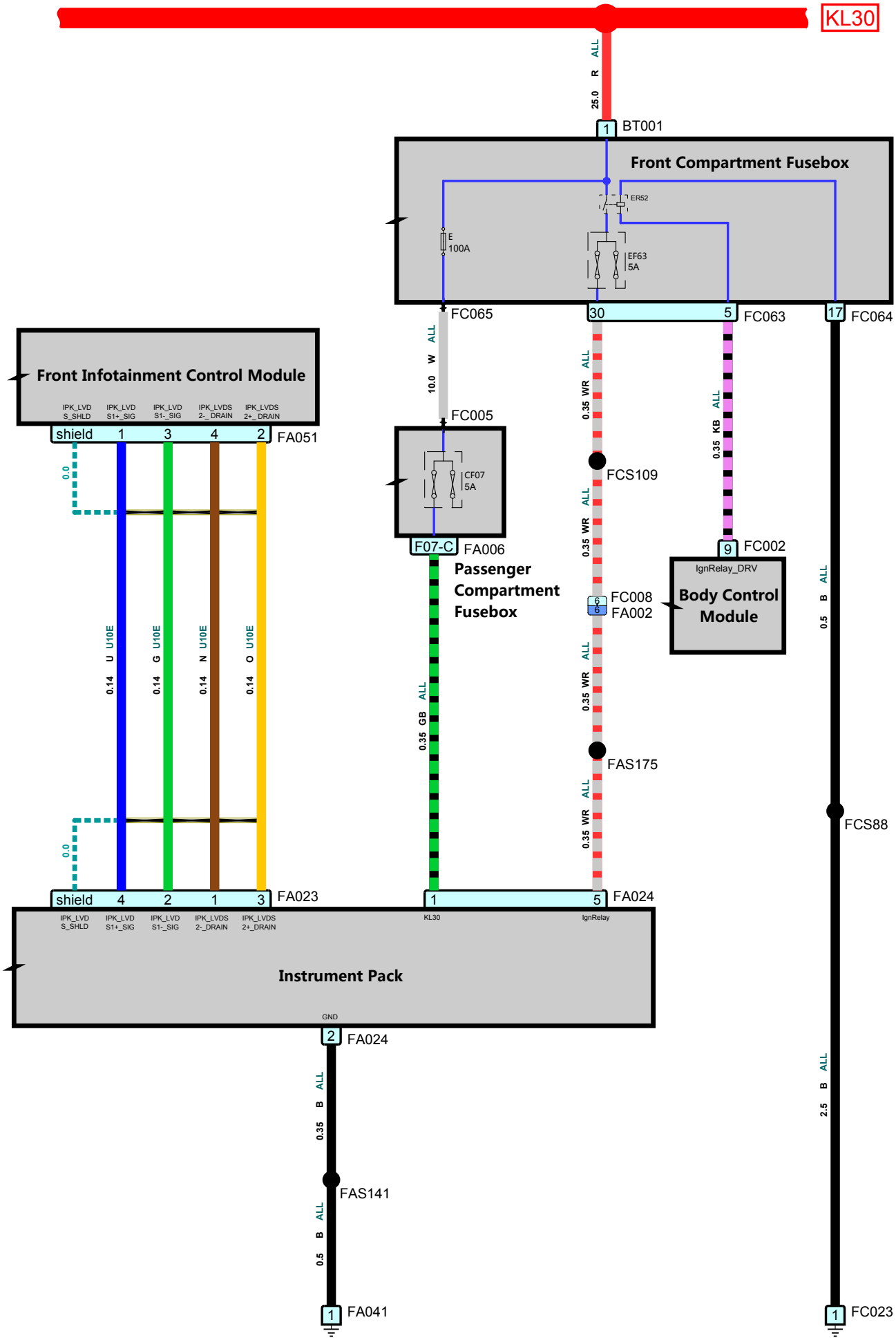
S60-Pedestrian Alert System



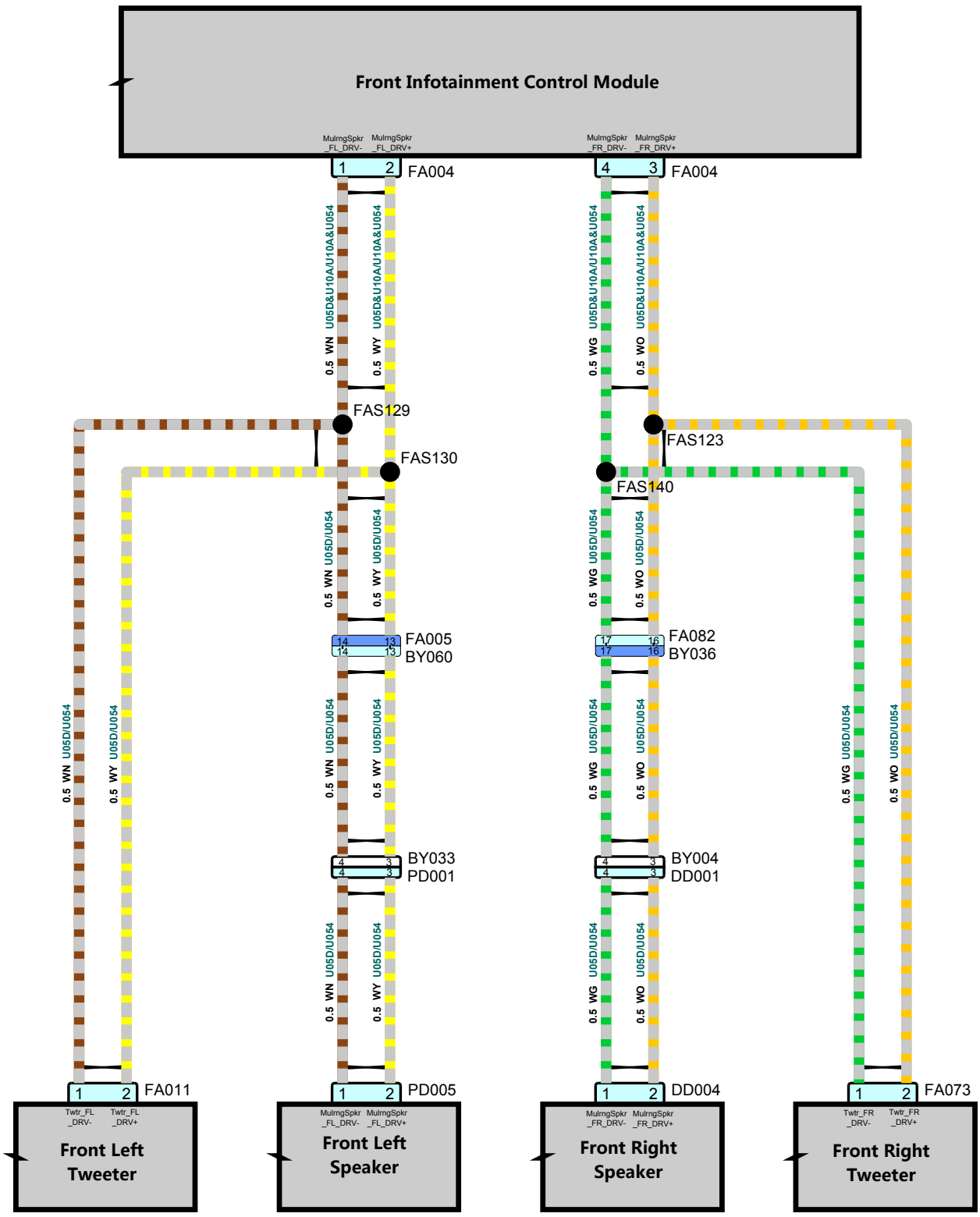
S61-TBOX


KL30
BT001
Front Compartment Fusebox
FC065
FC005
Passenger Compartment Fusebox
F06-C
FA006
E-Call Switch
FA087
E-Call Speaker
FA014
Driver Side Microphone
FA085
FAS181
FAS182
FA067
TBOX
FA005
BY060
BY086
BY087
BYS80
BYS81
FAS185
FAS183
FAS184
FAS186
FA075
Gateway
FA057
Front Infotainment Control Module
FA004
Front Infotainment Control Module
S987
S950
S1002
FAS168
FA005
BY060
FA082
BY036
BYS85
BYS107
BY006
BY038

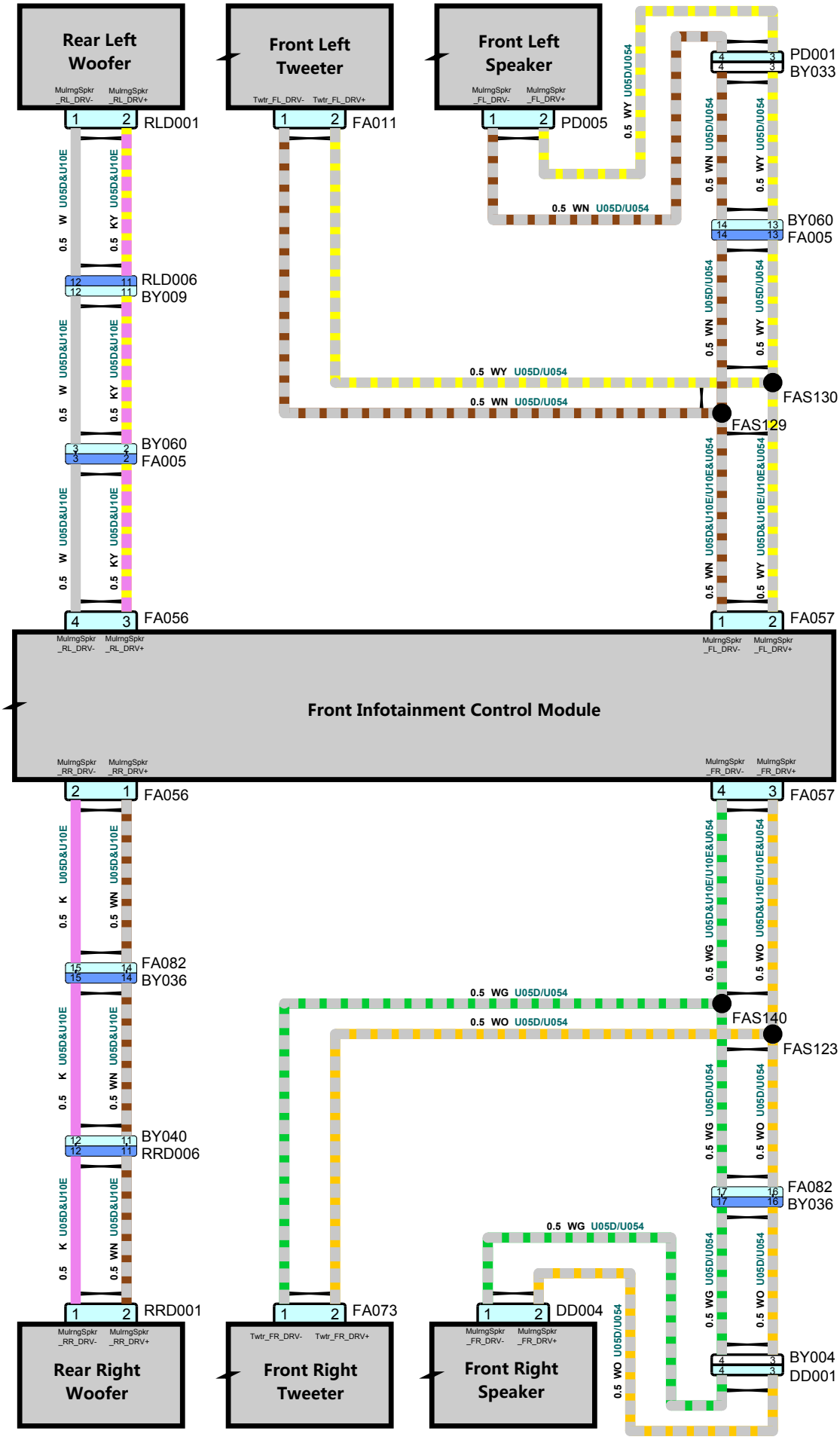
S62-Instrument Pack



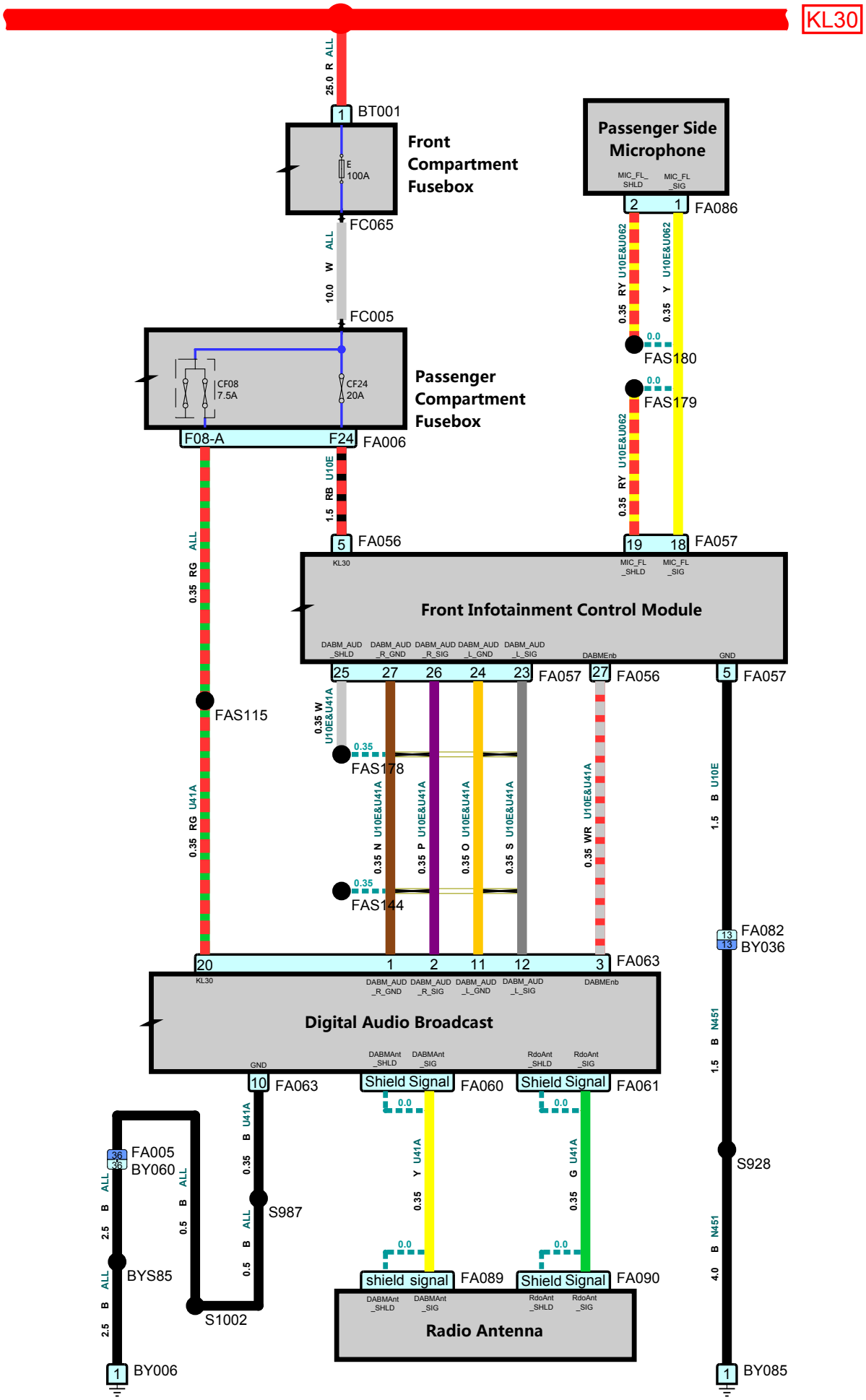
S63-Entertainment System-Speaker(1)



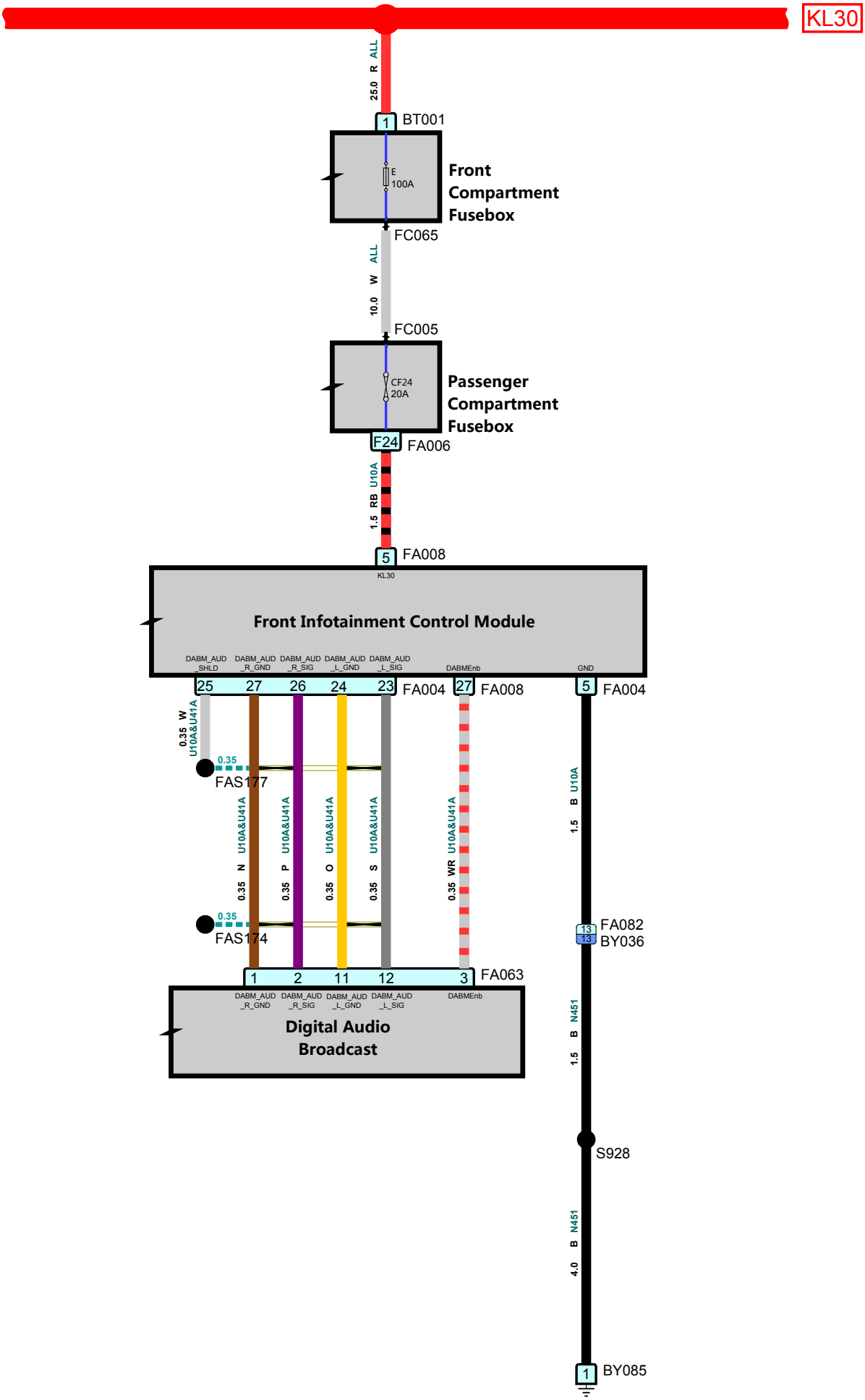
S64-Entertainment System-Speaker(2)



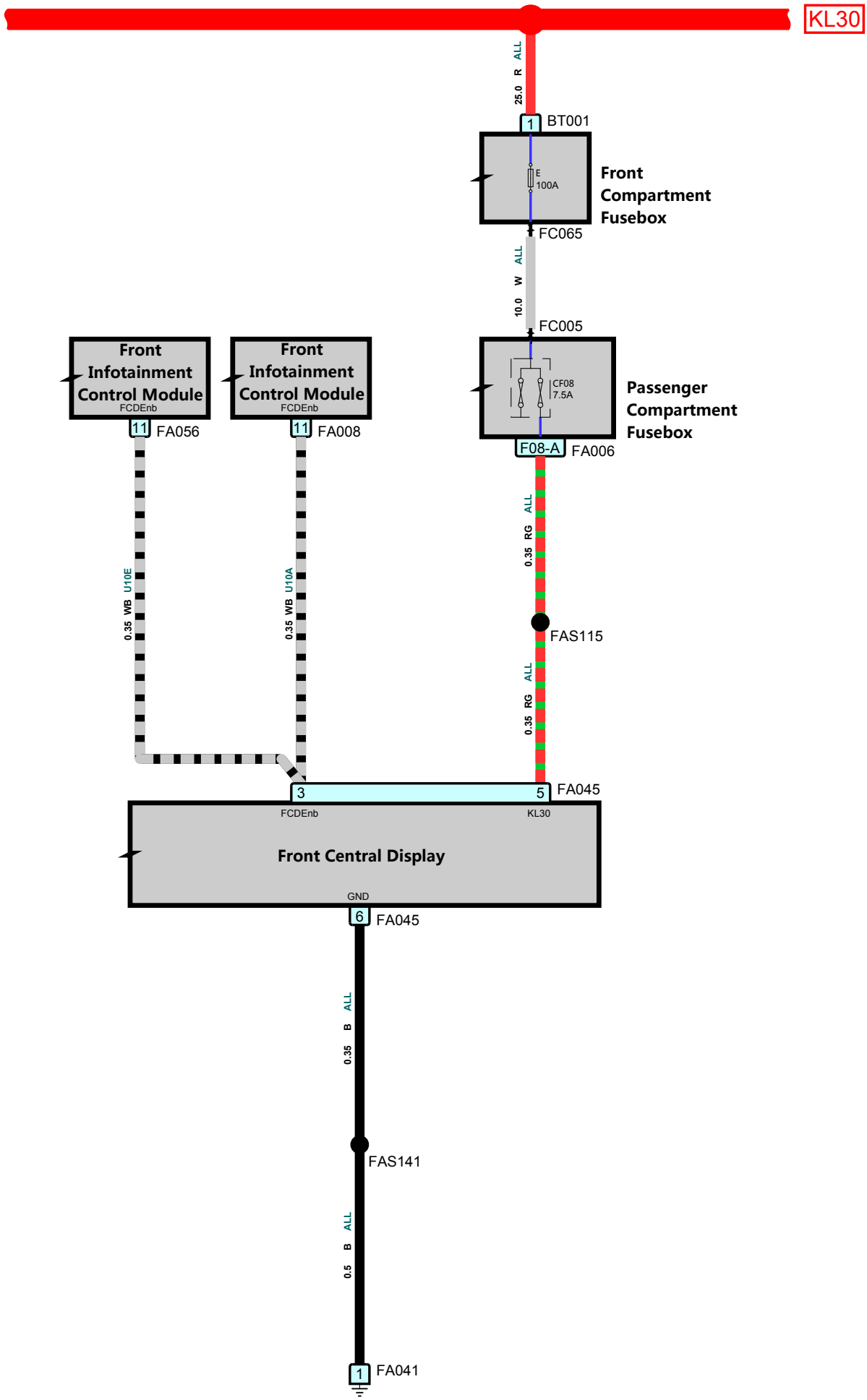
S65-Entertainment System(1)



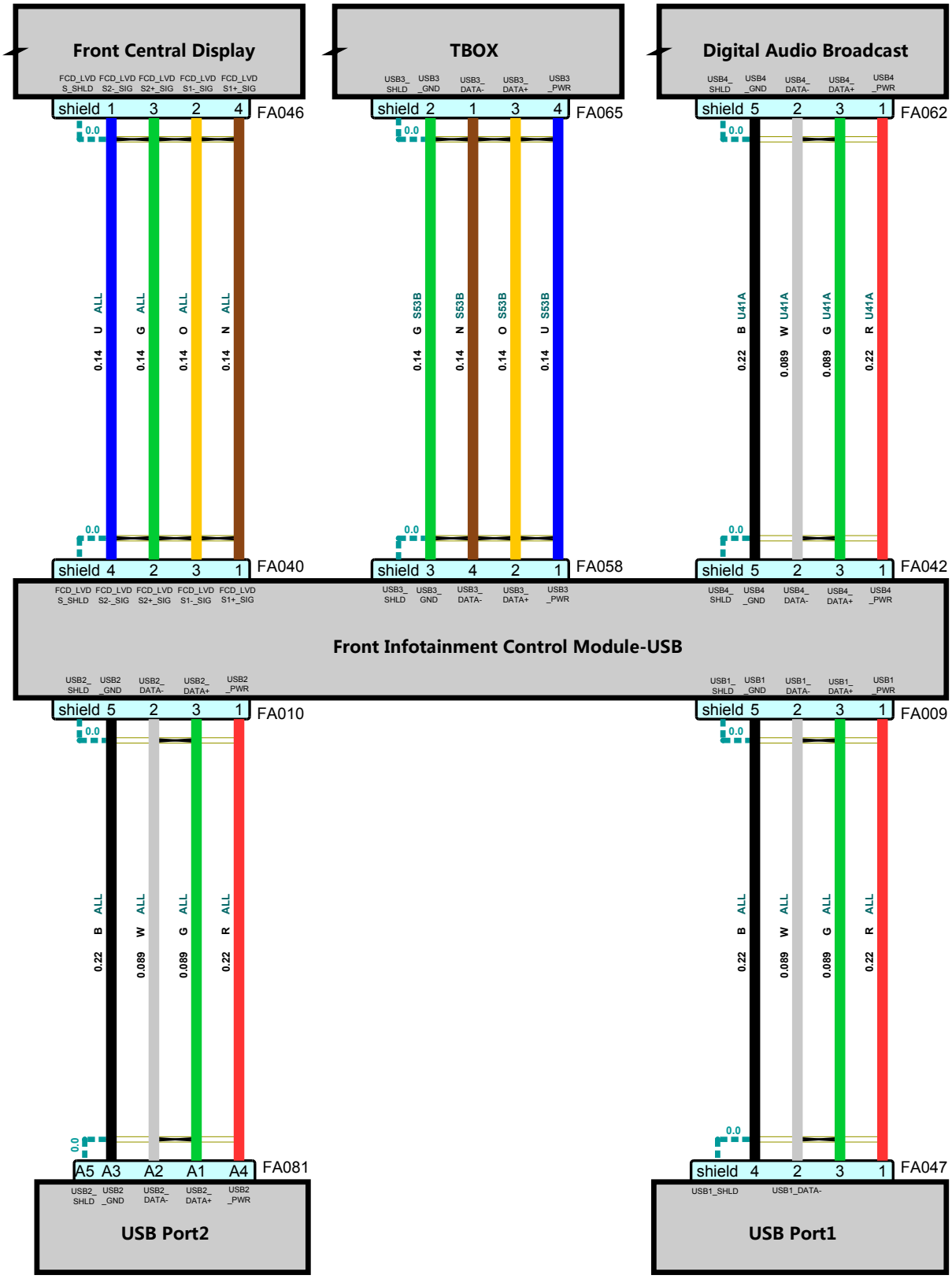
S66-Entertainment System(2)



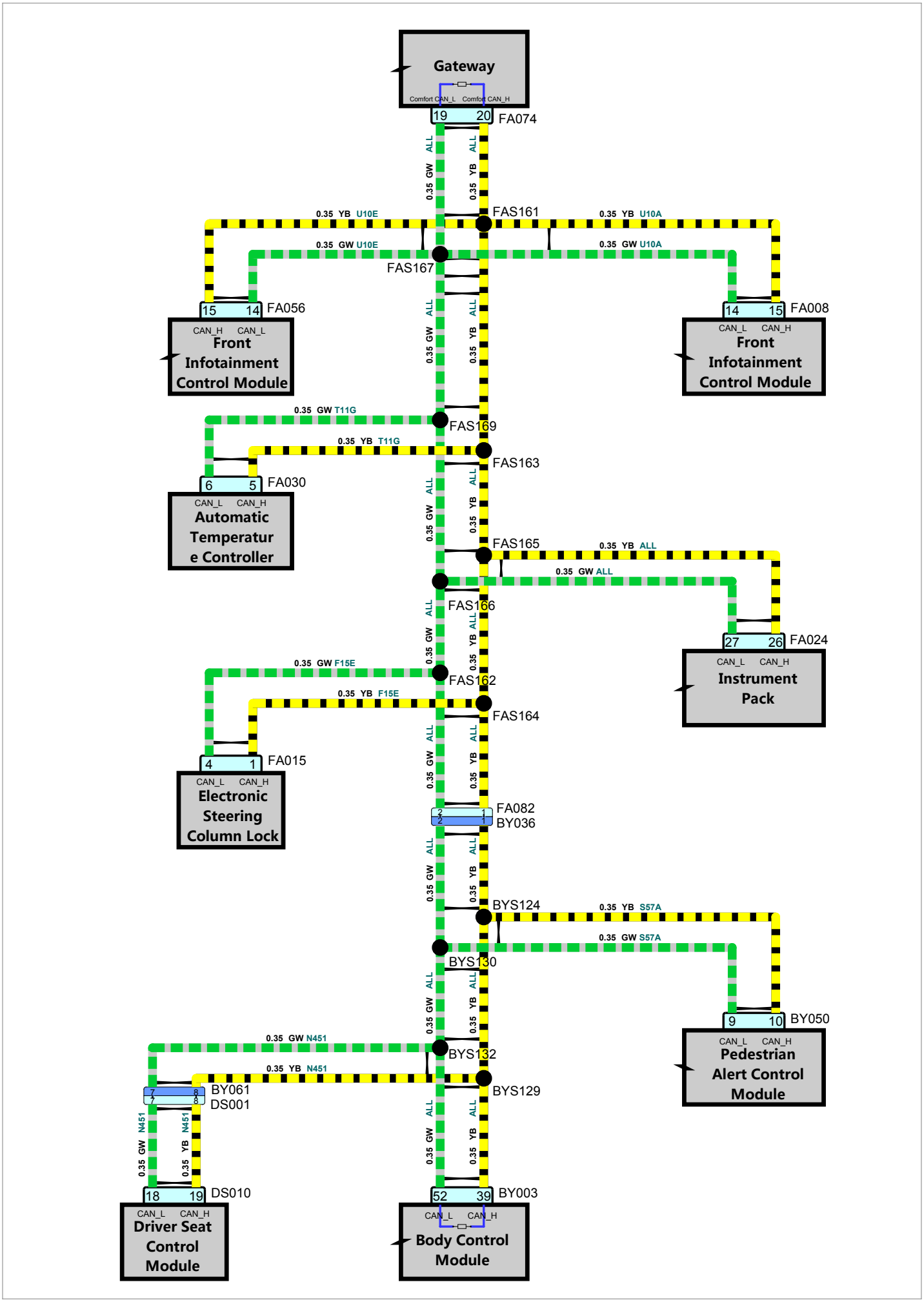
S67-Entertainment System(3)



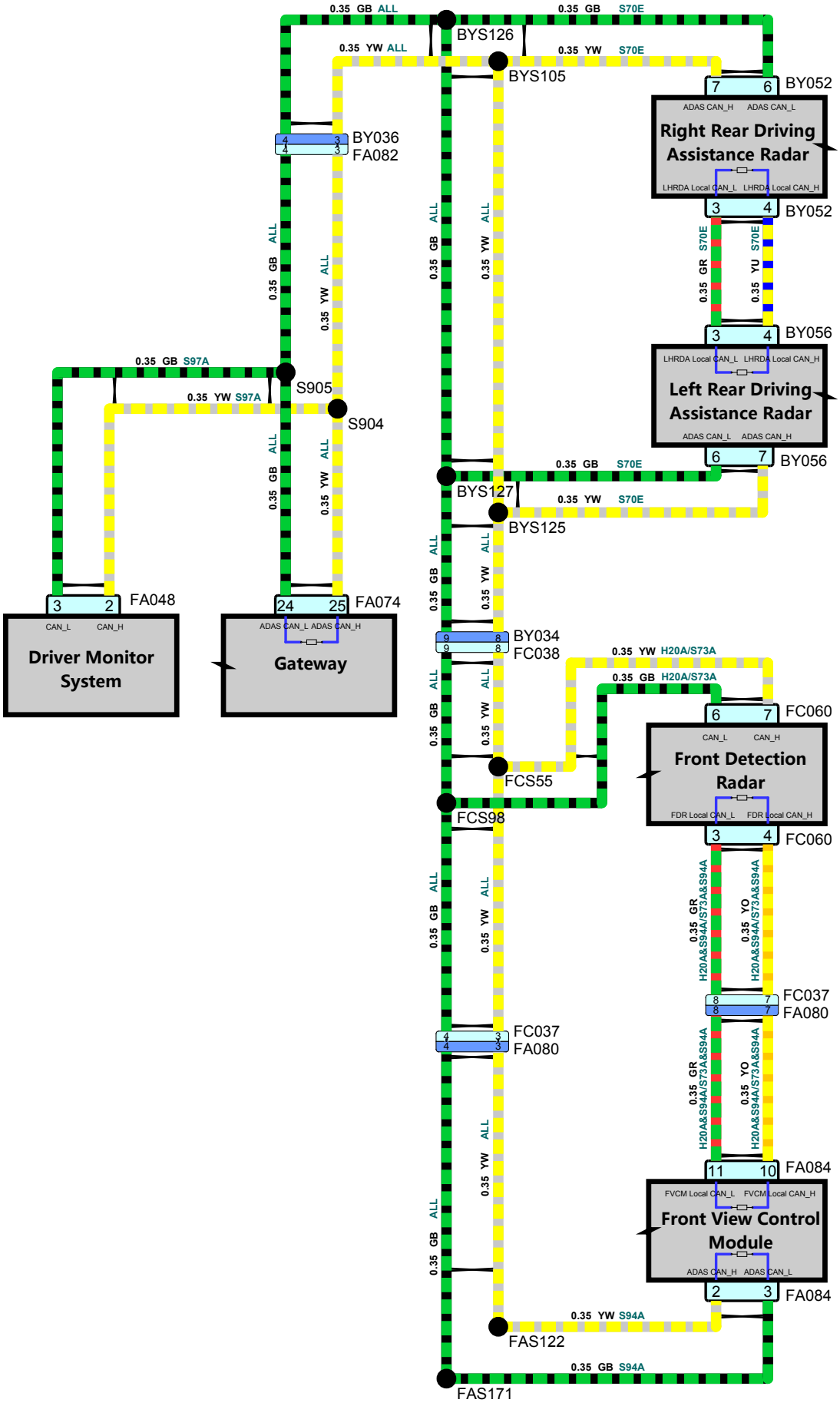
S68-Entertainment System(4)



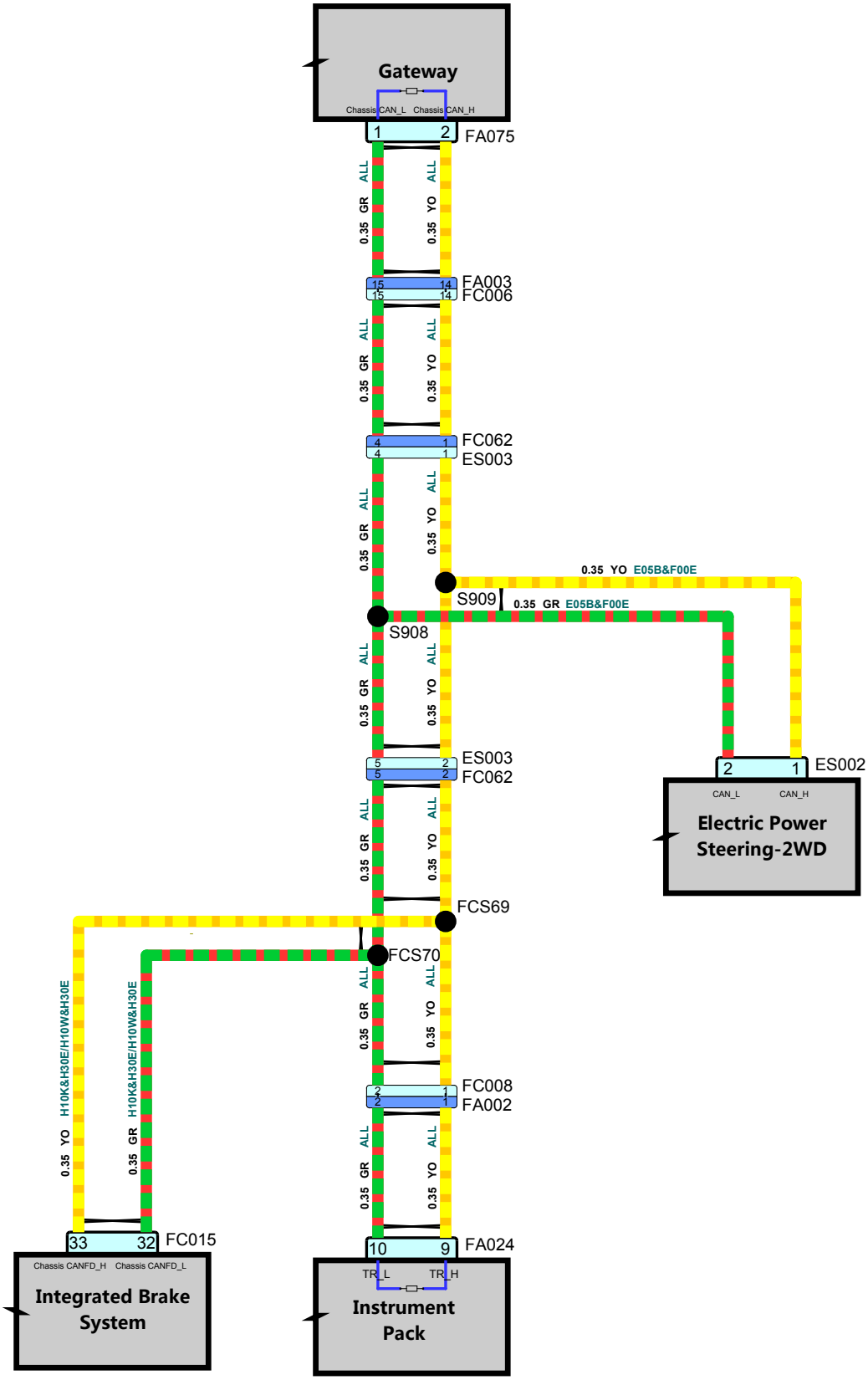
S69-BUS System-Body High Speed Controller Area Network



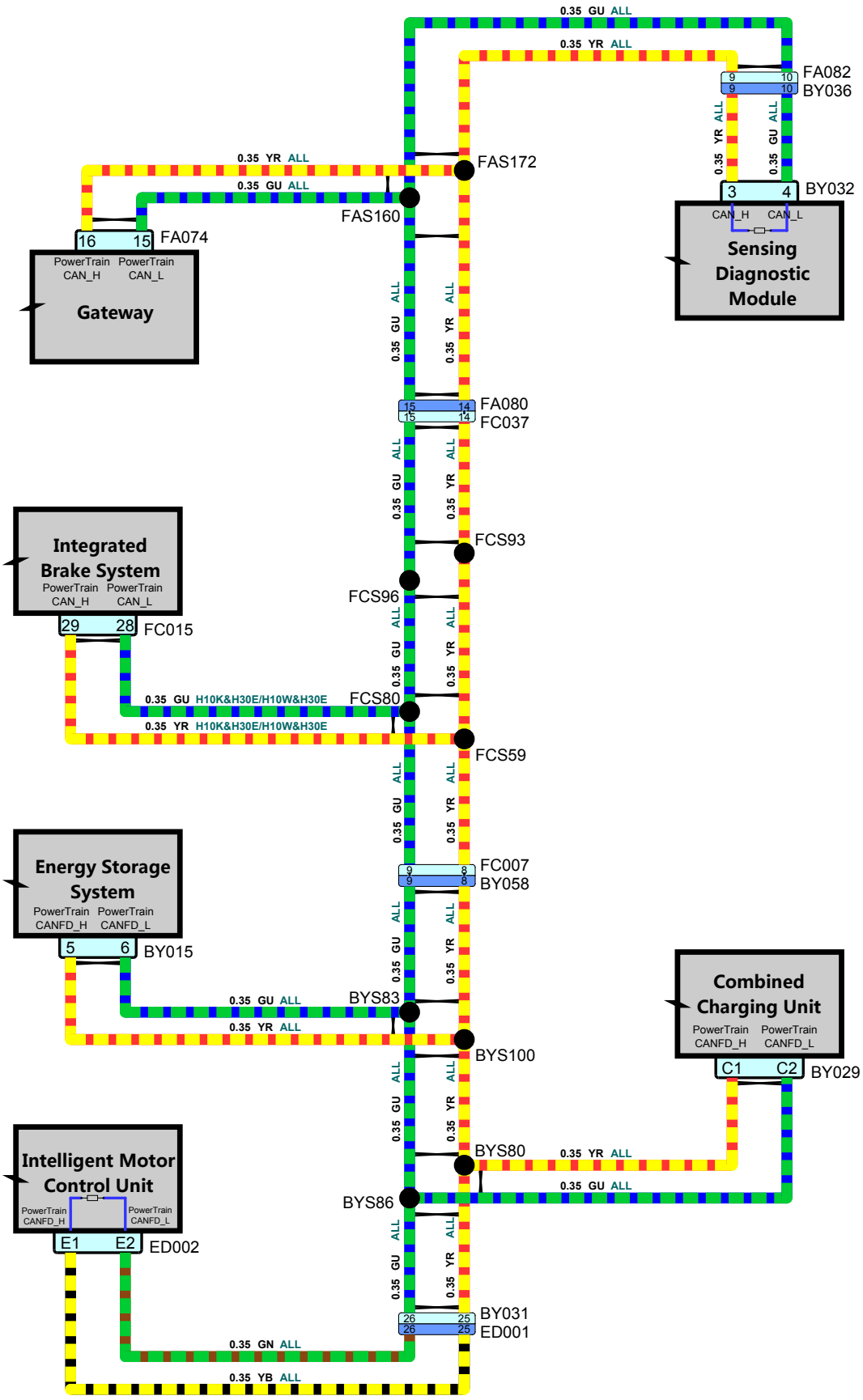
S70-BUS System-Driver Assistance High Speed Controller Area Network



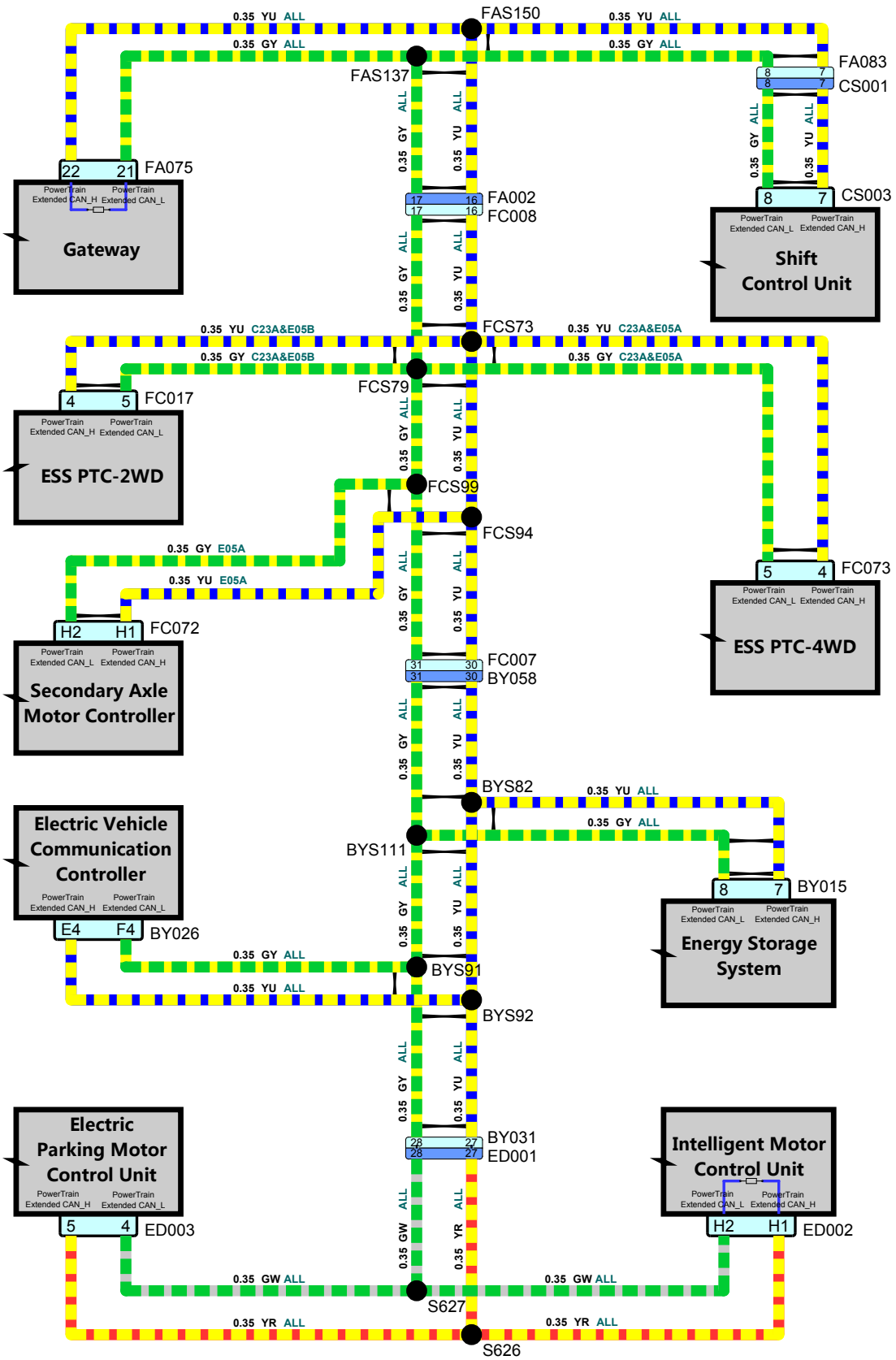
S71-BUS System-Chassis High Speed Controller Area Network



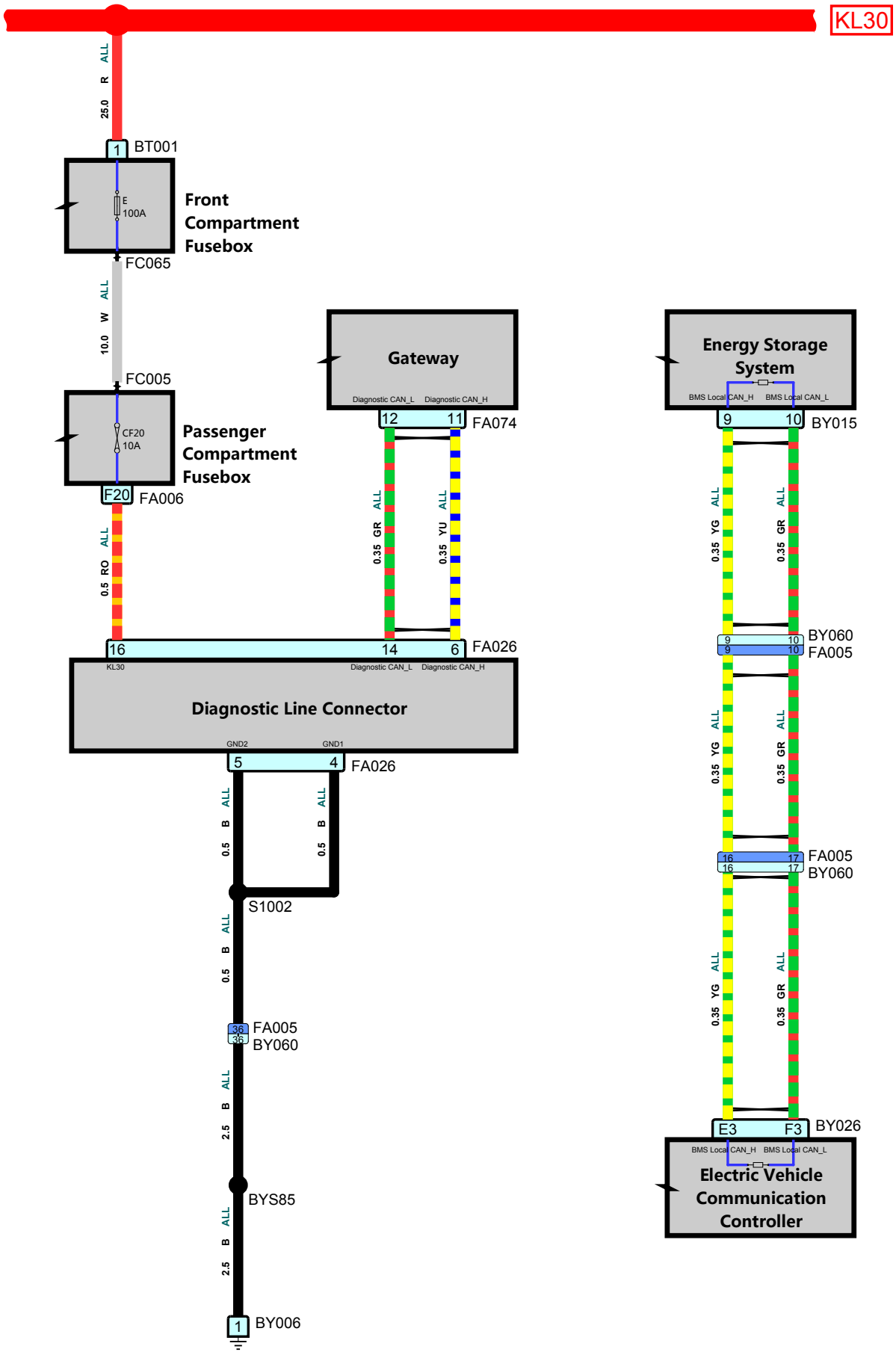
S72-BUS System-Powertrain High Speed Controller Area Network



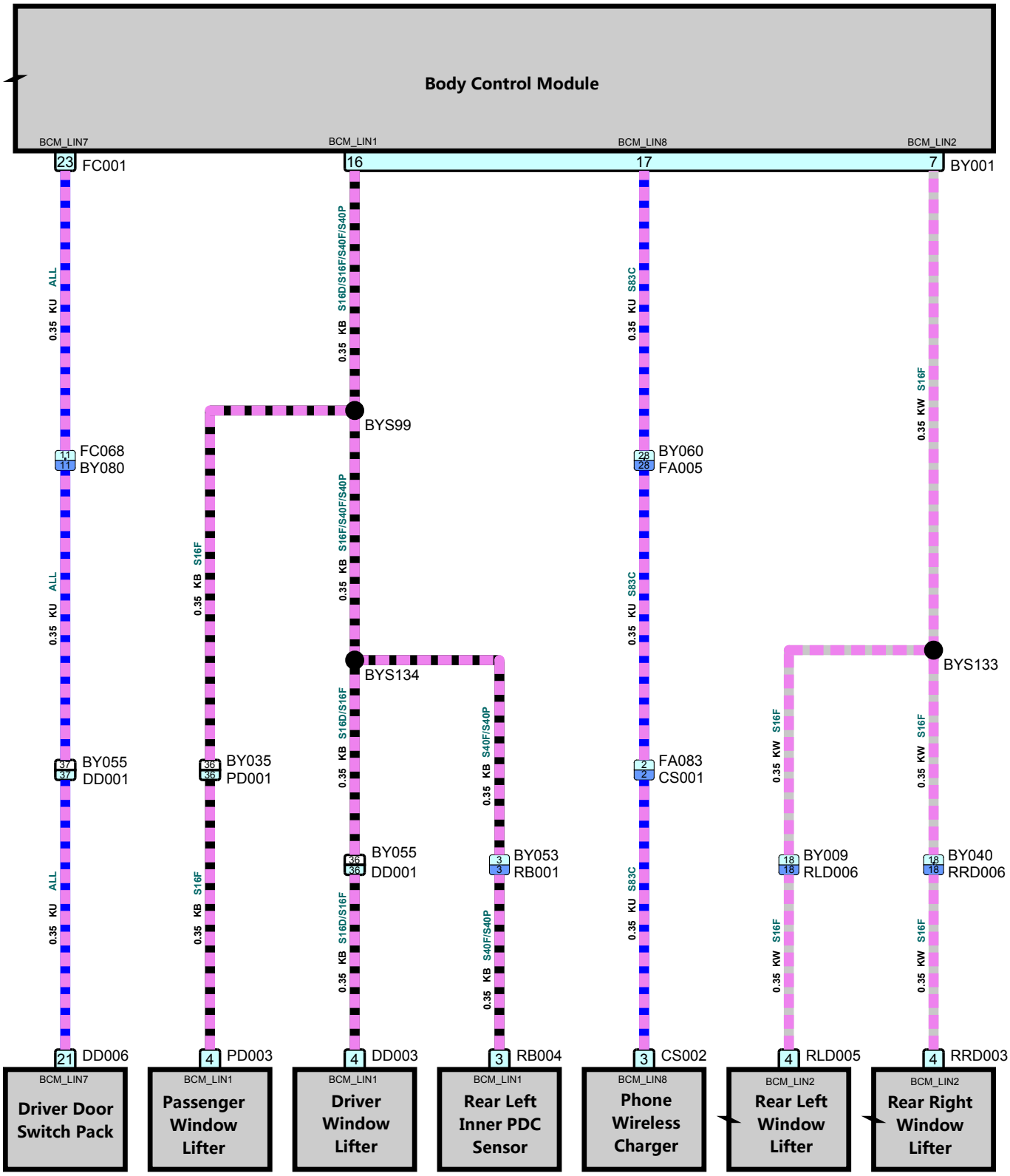
S73-BUS System-Powertrain High Speed (Extension) Controller Area Network



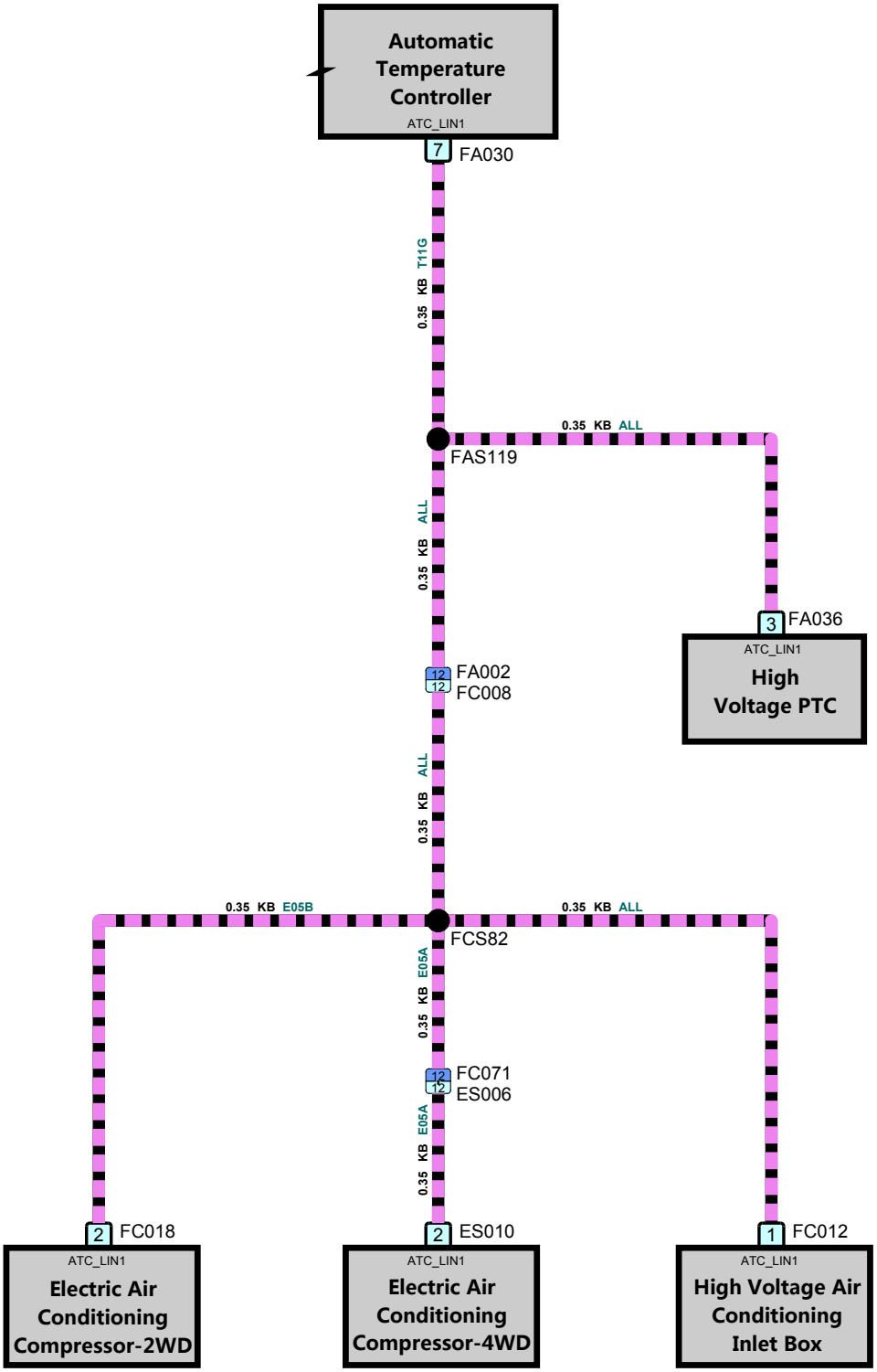
S74-BUS System-Diagnostic Line Connector



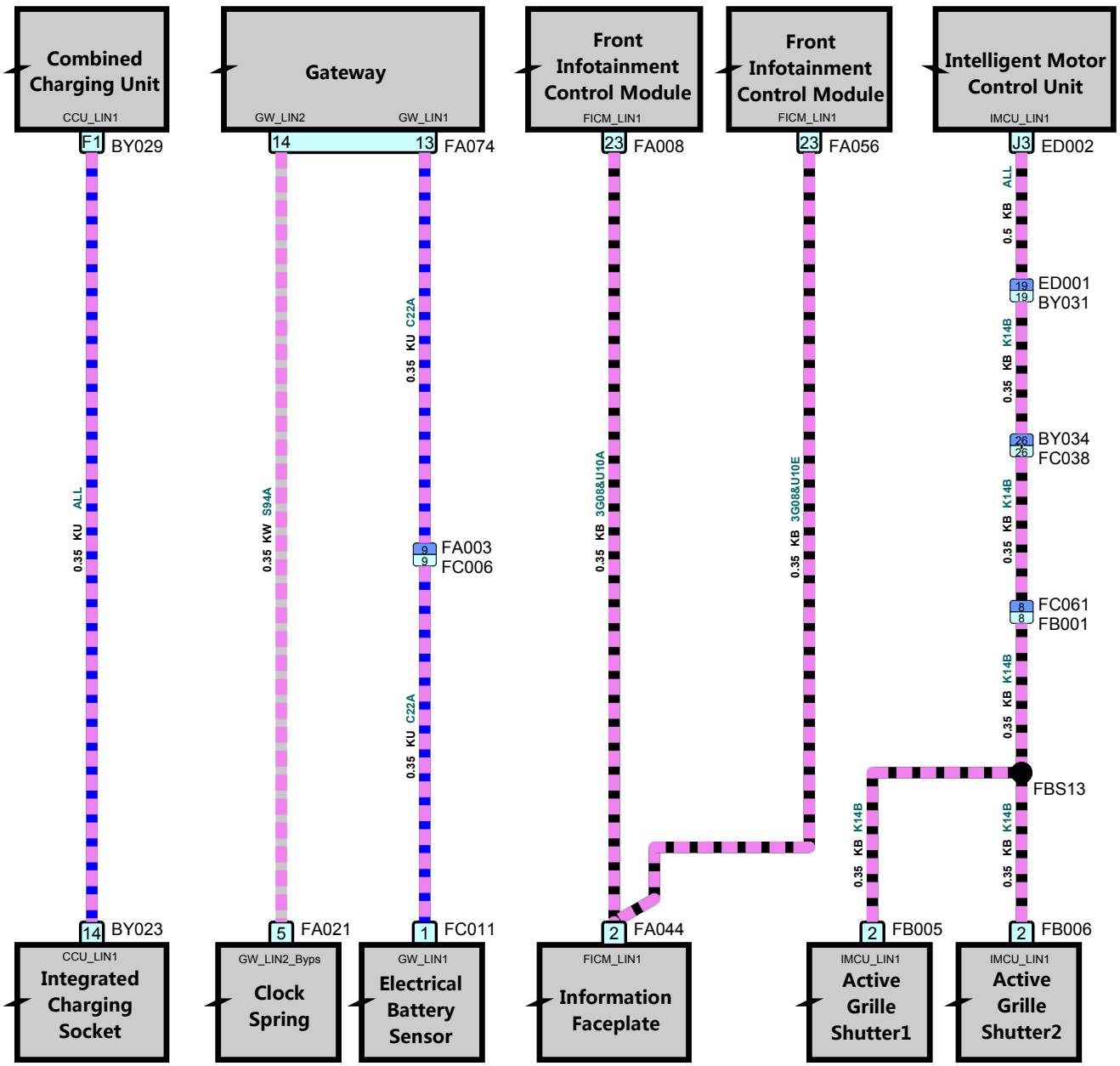
S75-BUS System-LIN(1)



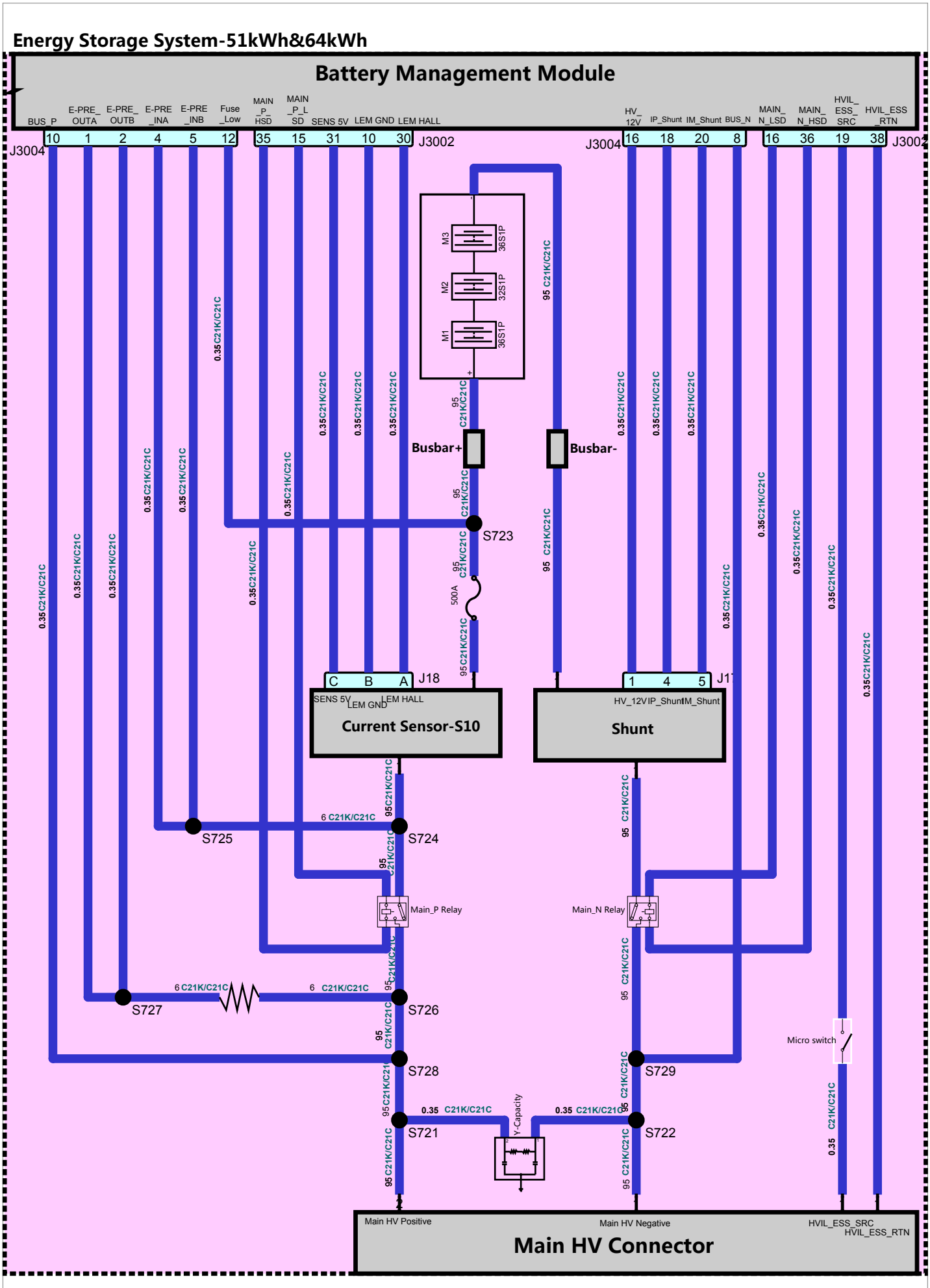
S76-BUS System-LIN(2)



S77-BUS System-LIN(3)

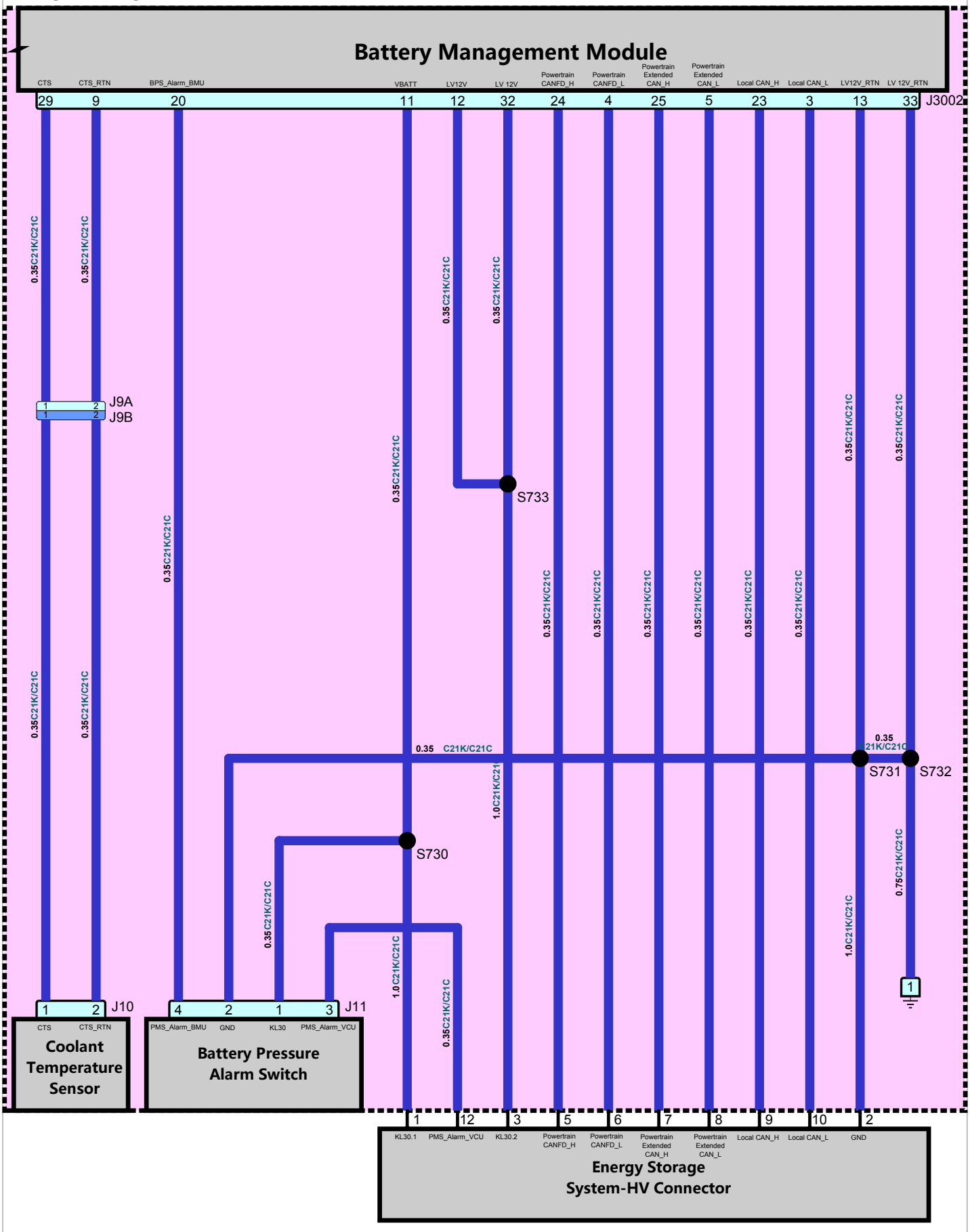


S78-ESS Internal Circuit-51kWh&64kWh(1)



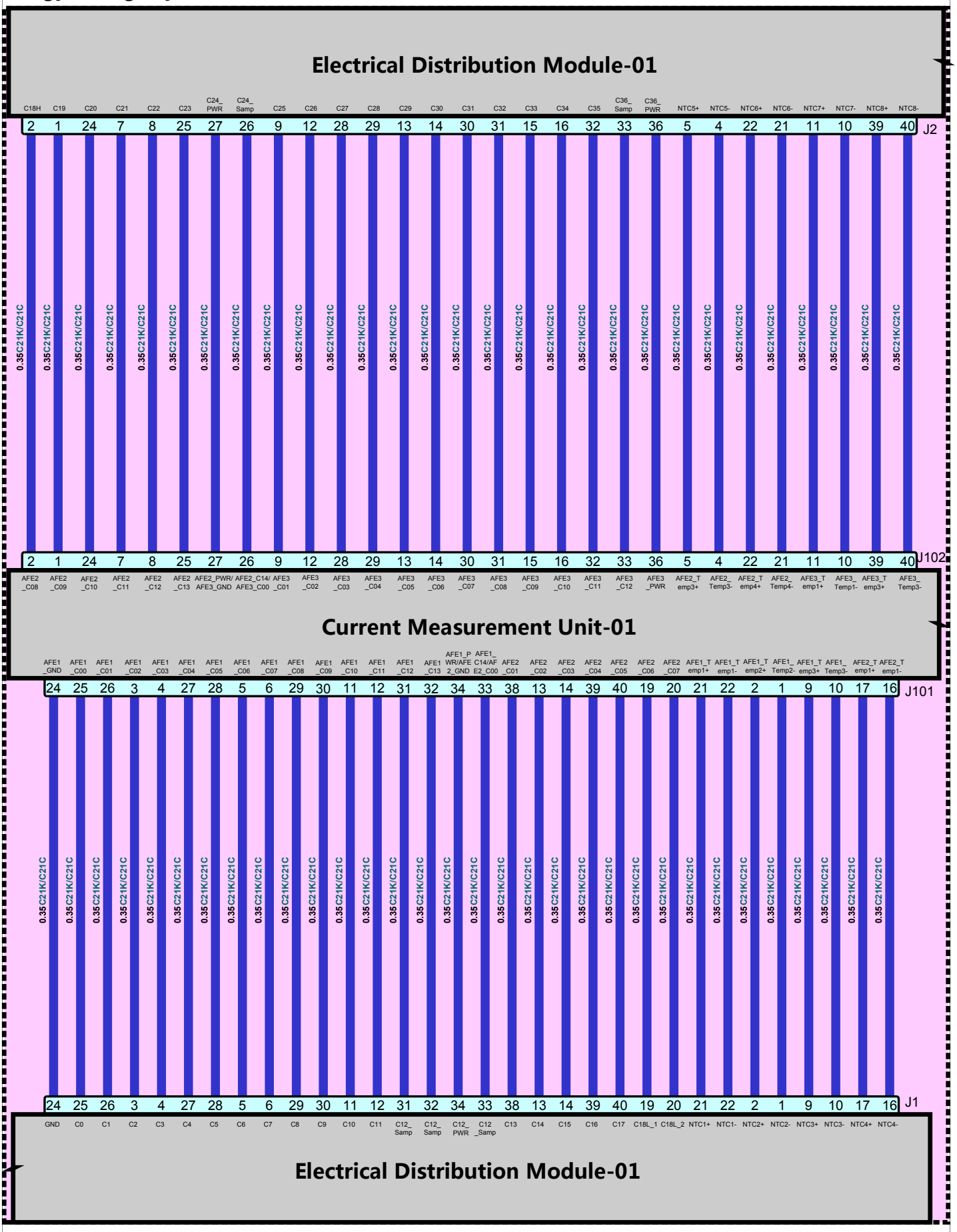
S79-ESS Internal Circuit-51kWh&64kWh(2)

Energy Storage System-51kWh&64kWh

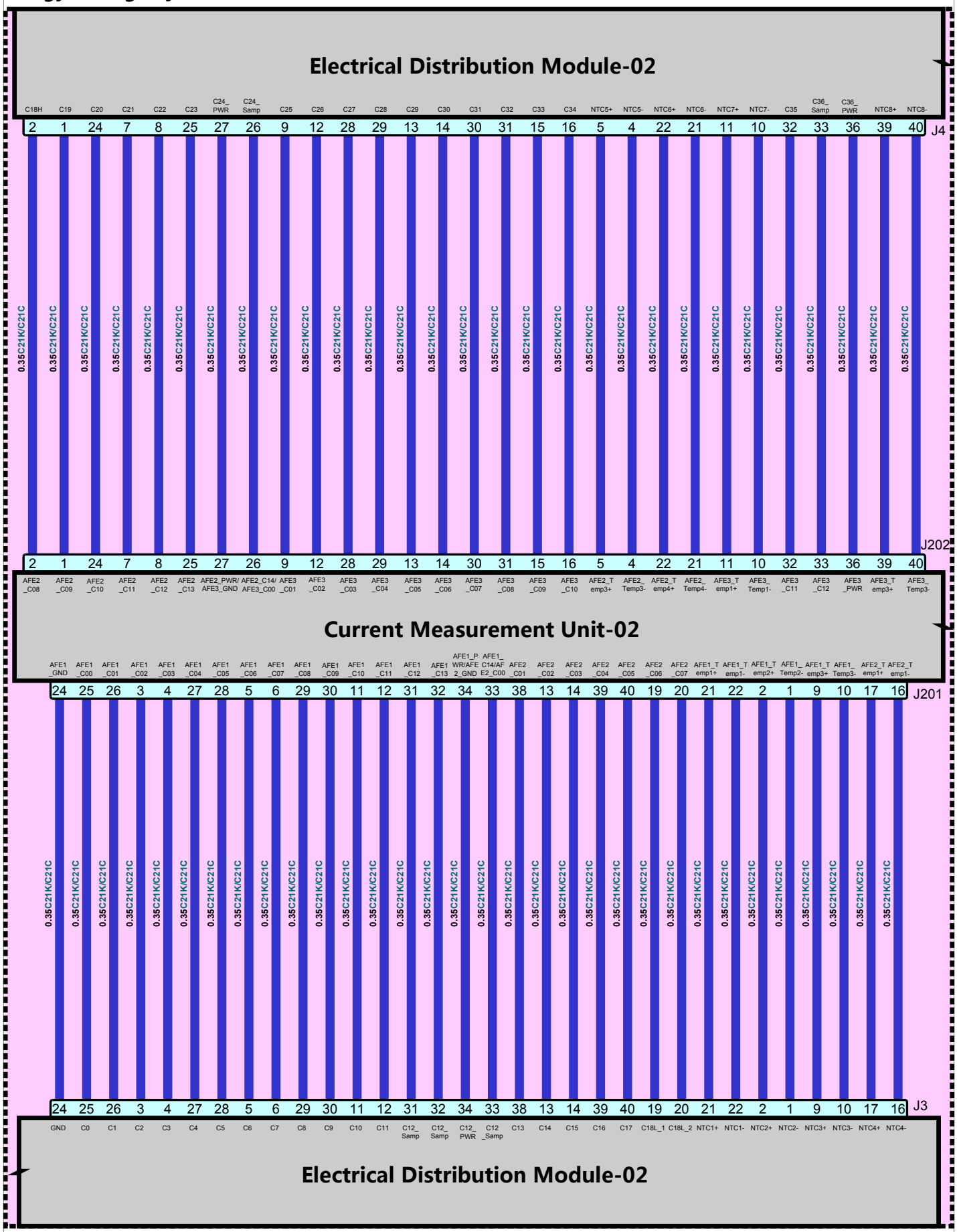


S80-ESS Internal Circuit-51kWh&64kWh(3)

Energy Storage System-51kWh&64kWh

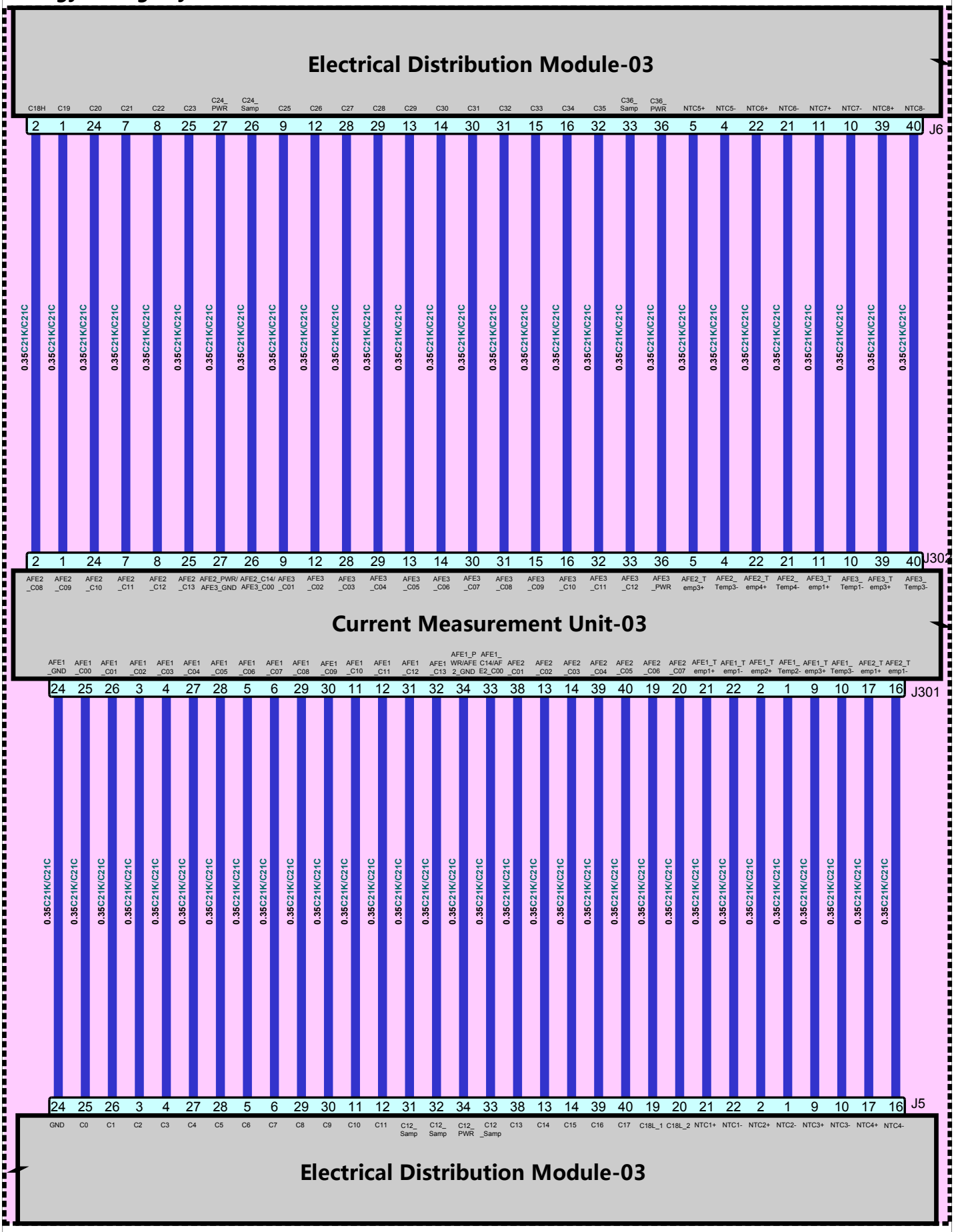


Energy Storage System-51kWh&64kWh

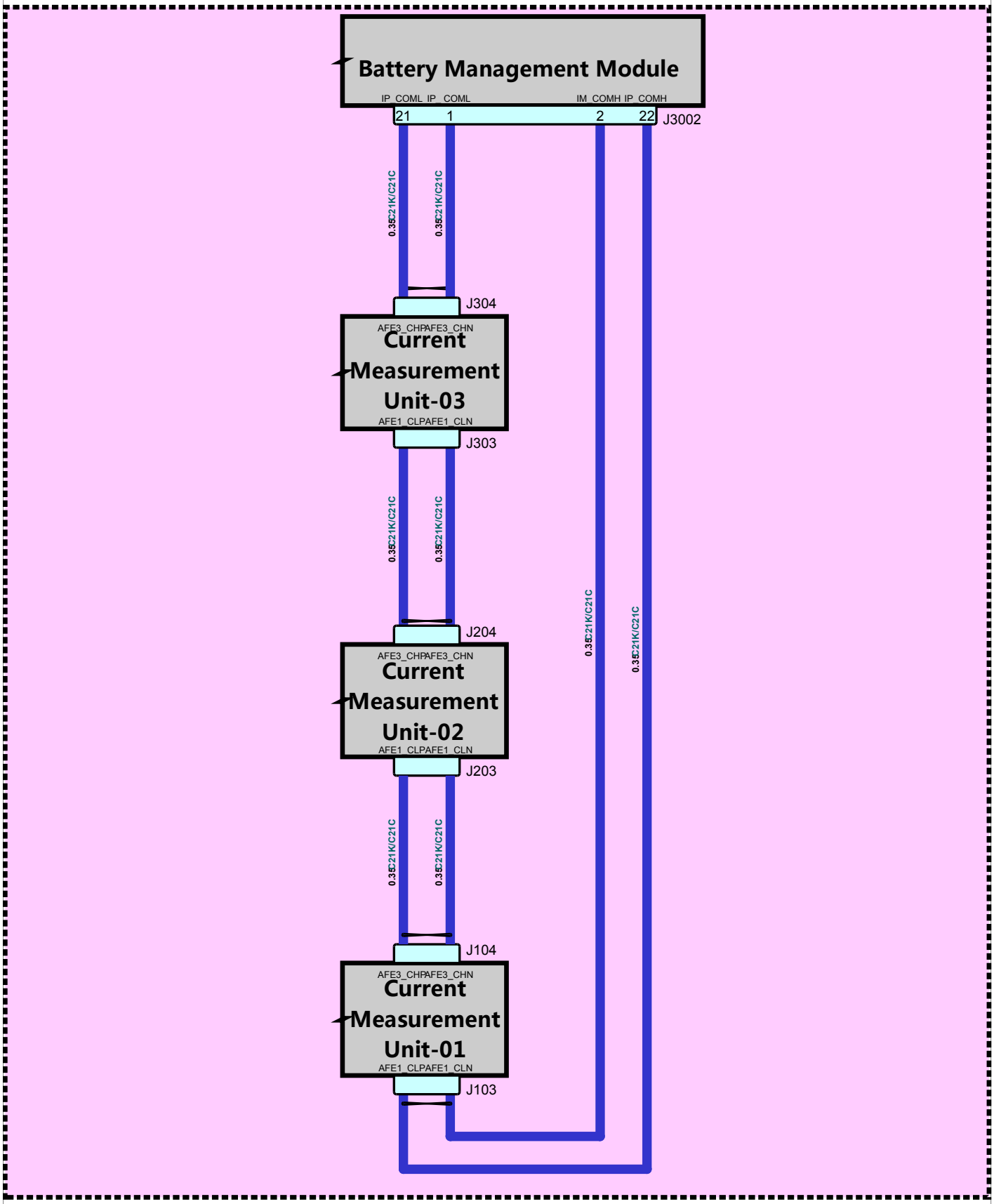


S82-ESS Internal Circuit-51kWh&64kWh(5)

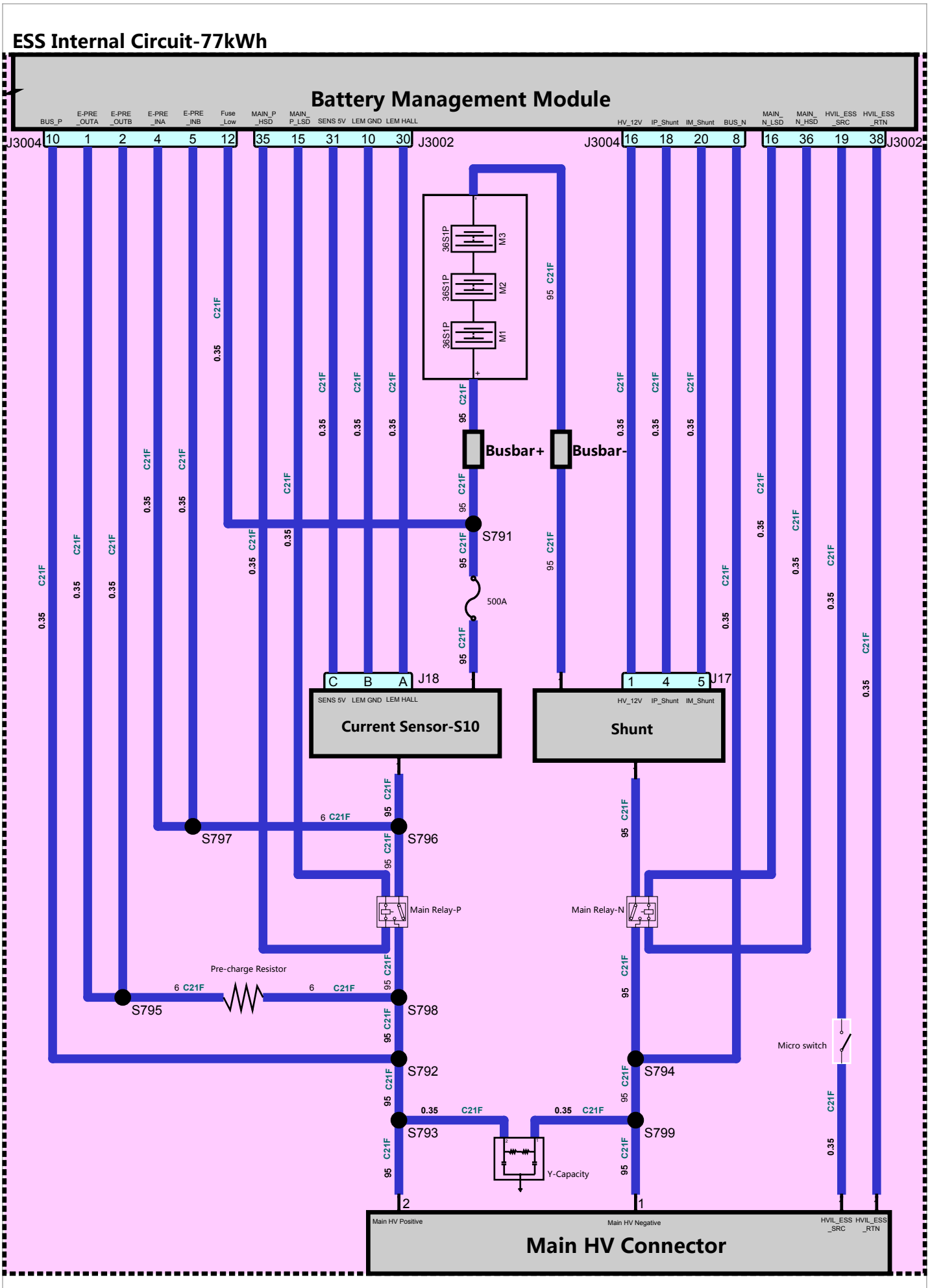
Energy Storage System-51kWh&64kWh



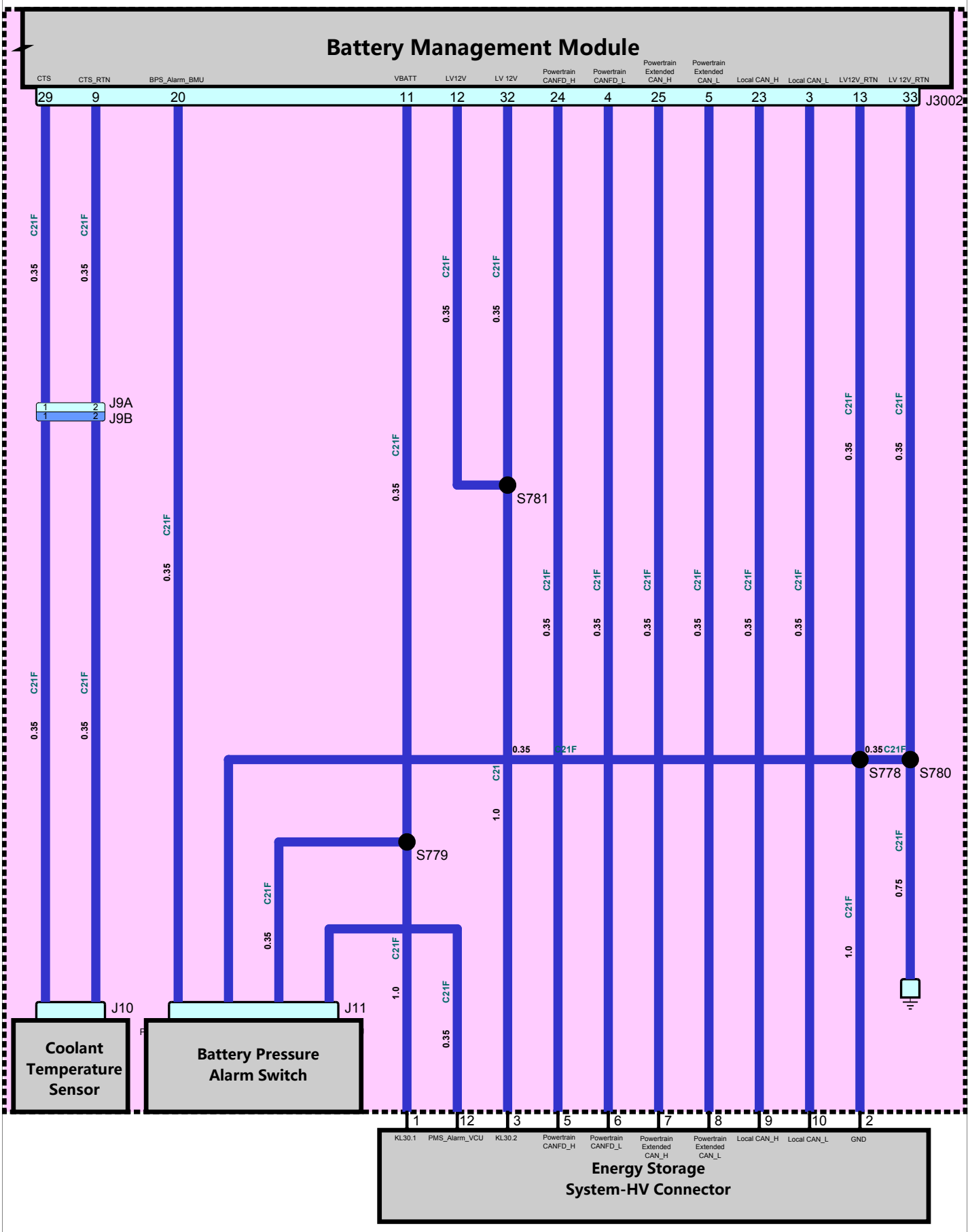
Energy Storage System-51kWh&64kWh



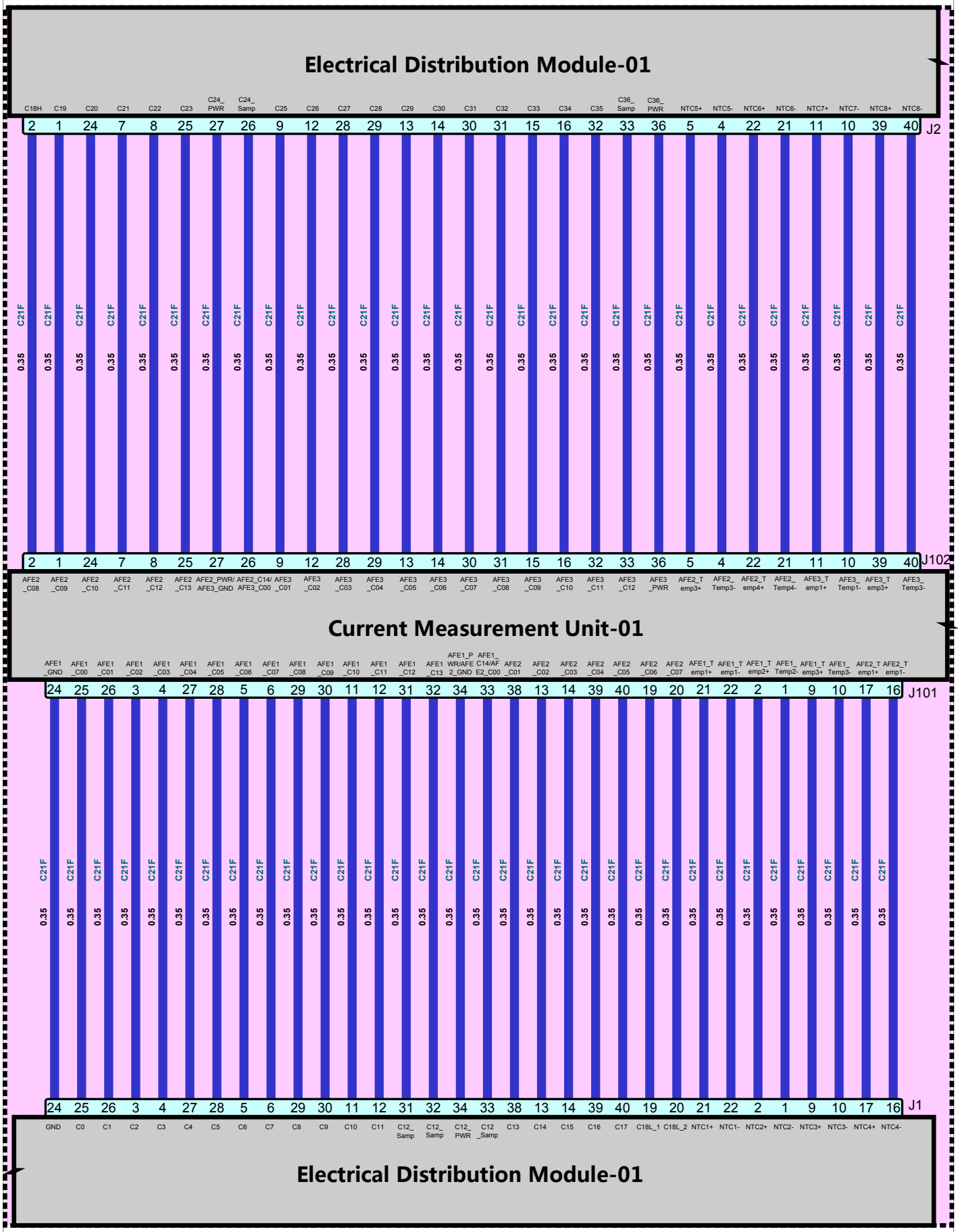
S84-ESS Internal Circuit-77kWh(1)



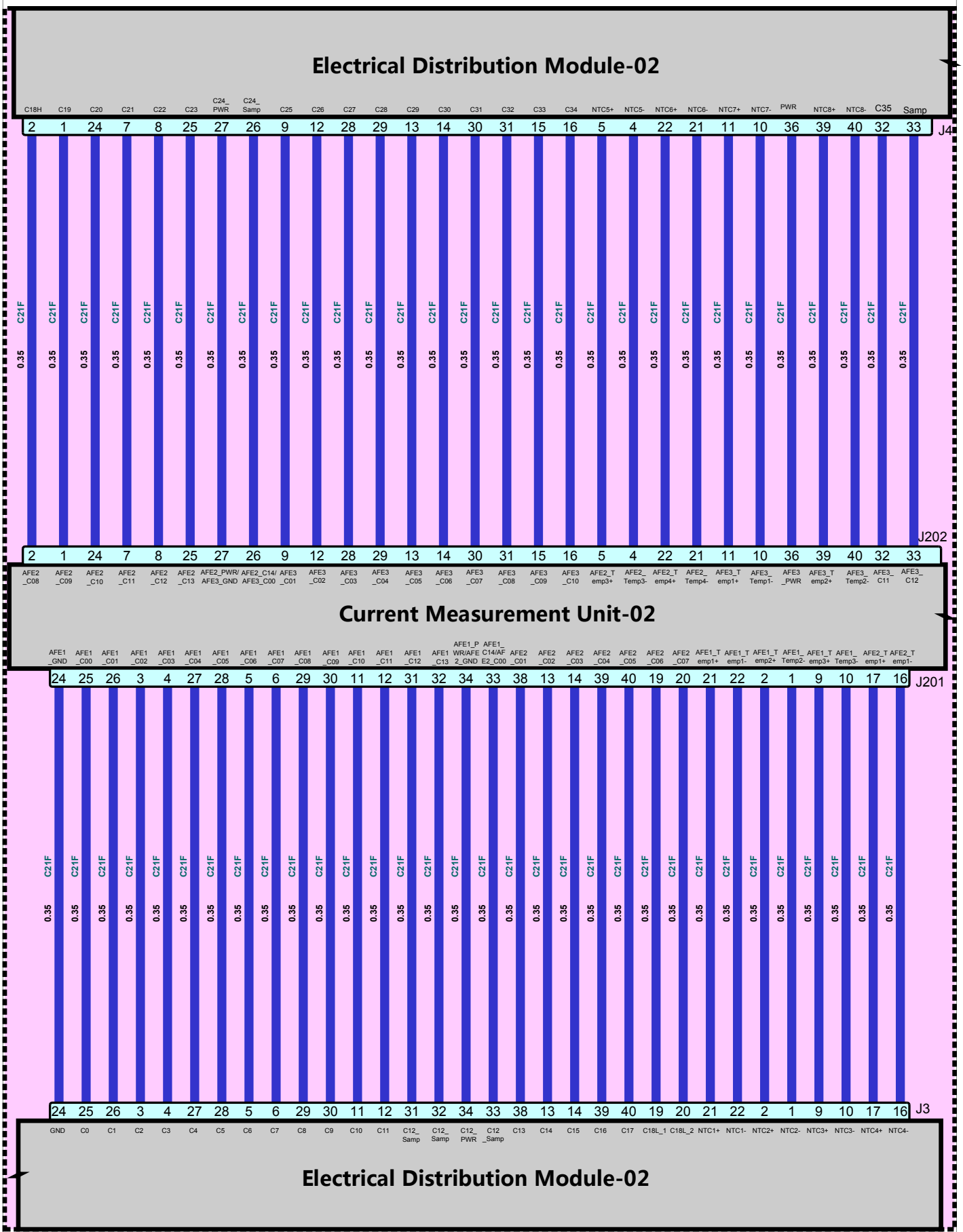
ESS Internal Circuit-77kWh



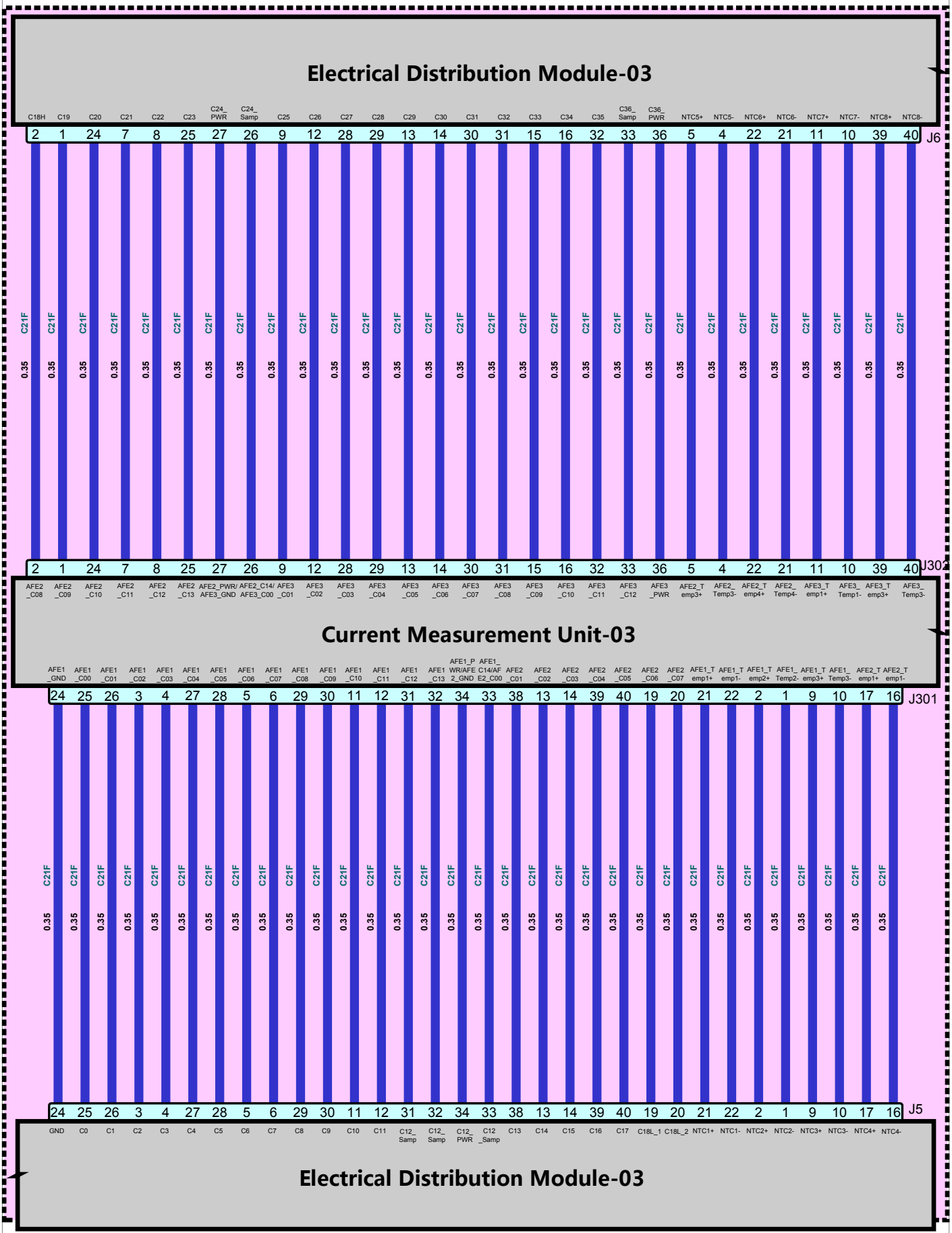
ESS Internal Circuit-77kWh



ESS Internal Circuit-77kWh



ESS Internal Circuit-77kWh



ESS Internal Circuit-77kWh