



MG4 EV

Service Repair Manual

July 2023

How to Use this Manual

Overview

To help you with the use of this Manual, we divided the Manual into several chapters and sections. The title of each chapter is outside each page header, and the title of the corresponding section is inside the page header.

The contents of the chapter and section are at the beginning of the Manual, which are divided by chapters and sections. Page numbers start with the first page of the text, which are outside the footer of the page.

All the repair operation steps must be arranged in the order they normally appear in. The serial number in the illustration refers to the corresponding text.

The instructions for adjustment and repair operations include the service tool number to be applied, and the corresponding illustration also reflects the use status of the tool. The instructions for adjustment and repair operations also involve wear limits, torque values, guide information and useful assembly details. Each adjustment or repair operation has an unique repair operation number.

The meanings of "Warning", "Note" and "Prompt" are as follows:

"Warning" requires you to take necessary measures or not to take prohibited measures. If a "Warning" is neglected, the following consequences may occur:

- Serious injury to a technician
- Serious injury to other technical staff in the work area
- In case of improper vehicle repair, serious injury to the driver and/or passengers in the vehicle will be caused.

"Note" requires to pay special attention to necessary measures or prohibited measures. If a "Note" is neglected, the following consequences may occur:

- Damage to the vehicle
- Unnecessary vehicle repairs
- Unnecessary parts replacement
- Improper operation or performance of the system or component under repair
- Damage to any system or component which is dependent upon the proper operation or performance of the system or component under repair
- Improper operation or performance of any system or component which is dependent upon the proper operation or performance of the system or component under repair
- Damage to fasteners, basic tools, or special tools
- Leakage of coolant, lubricating oil or other main fluid

"Description" emphasizes the necessary features of certain diagnostic or service procedure. It is for the following purposes:

- Clarify a procedure
- Provide additional information for the execution of procedure
- Provide internal reasons why to operate according to recommended procedures
- Provide information which can help to execute the procedures more effectively
- Present information that gives the technician the benefit of past experience in accomplishing a procedure with greater ease

"Prompt" provides some help information.

Reference

LH or RH in this manual is viewed from the rear of vehicle.

Operations involved in this manual do not include tests after service. This is especially important after the component related to safety is serviced or replaced.

Dimensions

Dimensions referenced here are based on design engineering specifications. This manual includes all the available service limits.

The company will continuously improve the vehicle specification, design and manufacturing. So there will be some changes in vehicle frequently. Although we try our best to make the manual be correctly written, we cannot guarantee there is no little error between the specification and description in this manual as for the vehicle in any particular situation.

Service and Replacement Instructions

Components

In case of replacement, use components recommended by the Company only.

Pay particular attention to the following points related to the service or replacement and accessories:

- Use of other components instead of those recommended by the SMC may impair vehicle safety and anti-corrosion measures.
- Apply the torque value given by this Manual.
- Fit the clamp device on the specified location. If the clamping effect of the clamp device is impaired by the remove operations, then replace it.
- Use of other components instead of those recommended by the SMC will make the warranty invalid.

All components recommended by the SMC enjoy the right for warranty.

Dealers of the SMC shall only supply components recommended by the SMC.

Special Tools

Use of the special tools helps to prevent possible component damage.

Part of the operations in the Manual cannot be fulfilled without related special tools.

All the special tools described in the Manual are available from:

Shanghai Runyue Industry Development Co., Ltd.

Address: Annex Building, Lotus Building, No. 159, Tianzhou Road, Shanghai

Postal code: 200233

Tel: 021-64853663

Fax: 021-64853639

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General

General Precautions

Dangerous Substances

Modern vehicles contain many materials or liquids which if not handled with care can be hazardous to both personal health and the environment.

Warning : *Many liquids and other substances used in vehicles are poisonous and should under no circumstances be consumed and should, as far as possible, be kept from contact with the skin. These liquids and substances include acid, antifreeze, brake fluid, fuel, windscreen washer additives, lubricants, refrigerants and various adhesives.*

Warning : *Always read carefully the instructions printed on labels or stamped on components and obey them implicitly. Such instructions are included for reasons of your health and personal safety. Never disregard them.*

Many O rings, seals, hoses, flexible pipes and other similar items which appear to be natural rubber, are in fact, made of synthetic materials called Fluoroelastomers. Under normal operating conditions this material is safe and does not present a health hazard. However, if the material is damaged by fire or excessive heating, it can break down and produce highly corrosive Hydrofluoric acid.

Contact with Hydrofluoric acid can cause serious burns on contact with skin. If skin contact does occur:

- Remove any contaminated clothing immediately.
- Irrigate affected area of skin with a copious amount of cold water or limewater for 15 to 60 minutes.
- Obtain medical assistance immediately.

Should any material be in a burnt or overheated condition, handle with extreme caution and wear protective clothing (seamless industrial gloves, protective apron etc.).

Decontaminate and dispose of gloves immediately after use.

Lubricating Fluids

Avoid excessive skin contact with used lubricating oils and always adhere to the health protection precautions.

Warning : *Avoid excessive skin contact with used engine oil. Used engine oil contains potentially harmful contaminants which may cause skin cancer or other serious skin disorders.*

Warning : *Avoid excessive skin contact with mineral oil. Mineral oils remove the natural fats from the skin, leading to dryness, irritation and dermatitis.*

Precautions

The following precautions should be observed at all times:

- Wear protective clothing, including impervious gloves when practicable.
- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Do not put oily rags in pockets.
- Avoid contaminating clothes (particularly those next to the skin) with oil.
- Overalls must be cleaned regularly. Discard heavily soiled clothing and oil impregnated footwear.
- First aid treatment should be obtained immediately for open cuts and wounds.
- Apply barrier creams before each work period to help prevent lubricating oil from contaminating the skin.
- Wash with soap and water to ensure all oil is removed (proprietary skin cleansers and nail brushes will help).
- Use moisturisers after cleaning; preparations containing lanolin help replace the skin's natural oils which have been removed.
- Do not use petrol/gasoline, kerosene, diesel fuel, oil, thinners or solvents for cleaning skin.
- Where practicable, degrease components prior to handling.
- If skin disorders develop, obtain medical advice without delay.
- Wear eye protection (e.g. goggles or face shield) if there is a risk of eye contamination. Eye wash facilities should be provided in close vicinity to the work area.

Safety Instructions**Jacking**

Caution : *It is best to use the lift when working under the vehicle. Be sure to hold the wheels with chocks and apply parking brake.*

Always use the recommended jacking points.

Always ensure that any lifting apparatus has sufficient load capacity for the weight to be lifted.

Ensure the vehicle is standing on level ground prior to lifting or jacking.

Apply the parking brake and chock the wheels.

Warning : *Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.*

Do not leave tools, lifting equipment, spilt oil, etc. around or on the work bench area. Always keep a clean and tidy work area.

Brake Shoes and Pads

Always use the correct gear and brake pads. When renewing brake pads and brake shoes, always replace as complete axle sets.

Brake Hydraulic System

Observe the following recommendations when working on the brake system:

- Apply two spanners to loosen or tighten brake pipes or pipe fittings.
- Ensure that hoses run in a natural curve and are not twisted or deformed.
- Fix brake pipes securely with retaining clips and ensure that the pipe cannot contact a potential chafing point.
- Containers used for brake fluid must be kept absolutely clean.
- Do not store brake fluid in an unsealed container, it will absorb water and in this condition would be dangerous to use due to a lowering of its boiling point.
- Do not allow brake fluid to be contaminated with mineral oil, or put new brake fluid in a container which has previously contained mineral oil.
- Do not re-use the brake fluid removed from the system.
- Always use clean brake fluid or a recommended alternative to clean hydraulic components.
- After disconnection of brake pipes and hoses, immediately fit suitable blanking caps or plugs to prevent the ingress of dirt.
- Only use the correct brake fittings with compatible threads.

- Observe absolute cleanliness when working with hydraulic components.

Cooling System Caps and Plugs

Remove expansion tank caps and coolant drain pipe or bleed screws with great care when the cooling system is hot, especially if it is overheated. To avoid the possibility of scalding, allow the cooling system to cool before attempting removal.

Precautions for High Voltage

Basic Requirements

Basic requirements for related precautions for high voltage in vehicle are as follows:

- Non-related personnel are forbidden to come into contact with the vehicle during vehicle repair.
- Do not touch the components with the high-voltage warning sign at will.
- If it is necessary to dismantle the relevant high voltage components, the dismantling personnel need to undergo high voltage safety training.
- When operating high voltage components, the operator must wear protective equipment as well as insulating gloves.
- When operating exposed high voltage system components, the operator must use a multimeter to measure if there is high voltage, and don't do anything before making sure that there is no high voltage.
- When the driving is over, turn off the start switch. If there is a need to disassemble the high voltage system, wait for 5 minutes before proceeding.
- When disassembling or assembling electrical components, the 12V power supply and the MSD on the high-voltage battery pack must be disconnected.
- After removing the high voltage components, it is necessary to check the assembling and connection of all high voltage components and ensure their reliability before reconnecting the high voltage power supply.
- All high voltage components should be grounded well.

Warning : *Make sure the maintenance personnel of the high-voltage system have the special operation permit of electrician produced by the safety supervision bureau.*

Warning : *It is forbidden for maintenance personnel who have not participated in the knowledge training of high voltage system of this model to dismantle the high voltage system (including high-voltage battery pack, drive motor, PEB, high voltage harness, electric A/C compressor, on-board charger, charging port and AC charging cable).*

Warning : *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 essential that the correct 'make safe' procedure is followed - see Manual Service Disconnect procedure in the Service Repair manual. After disconnecting the Manual Service Disconnect (MSD), always wait 5 minutes prior to commencing any checks for residual voltage etc.*

Caution : *In the process of installation and dismantling, brake fluid, washer fluid, coolant and other liquids shall be prevented from entering or splashing onto high voltage components.*

Environmental Precautions**Overview**

This section provides general information which can help to reduce the environmental impacts from the activities carried out in workshops.

Emissions to Air

Many of the activities that are carried out in workshops emit gases and fumes which contribute to global warming, depletion of the ozone layer and/or the formation of photochemical smog at ground level. By considering how the workshop activities are carried out, these gases and fumes can be minimised, thus reducing the impact on the environment.

Exhaust Fumes

Running car engines is an essential part of workshop activities and shall be carried out in a well ventilated environment. However, the amount of time engines are running and the position of the vehicle should be carefully considered at all times, to reduce the release of poisonous gases and minimise the inconvenience to people living nearby.

Solvents

Some of the cleaning agents used are solvent based and will evaporate to atmosphere if used improperly, or if containers are left unsealed. All solvent containers should be firmly closed when not needed and solvent should be used sparingly. Suitable alternative materials may be available to replace some of the commonly used solvents. Similarly, many paints are solvent based and the spray should be minimised to reduce solvent emissions.

Refrigerant

Discharge and replacement of refrigerant from air conditioning units should only be carried out by using the correct equipment.

Engine

Always adhere to the following:

- Don't leave engines running unnecessarily;
- Minimise testing times and check where the exhaust fumes being blown.

Diluent:

- Keep lids on containers of solvents;
- Only use the minimum quantity;
- Consider alternative materials;
- Minimise over-spray when painting.

Gases:

- Use the correct equipment for collecting refrigerants;
- Don't burn rubbish on site.

Discharges to Water

Oil, petrol, solvent, acids, hydraulic oil, antifreeze and other such substances should never be poured down the drain and

every precaution must be taken to prevent spillage reaching the drains.

Handling of such materials must take place well away from the drains and preferably in an area with a kerb or wall around it, to prevent discharge into the drain. If a spillage occurs, it should be soaked up immediately. Having a spill kit available will make this easier.

Checklist

Always adhere to the following disposal and spillage prevention instructions.

- Never pour anything down a drain without first checking that it is environmentally safe to do so, and that it does not contravene any local regulations.
- Store liquids in a walled area.
- Make sure that taps on liquid containers are secure and cannot be accidentally turned on.
- Protect bulk storage tanks from vandalism by locking the valves.
- Transfer liquids from one container to another in an area away from open drains.
- Ensure lids are replaced securely on containers.
- Have spill kits available near to points of storage and handling of liquids.

Spill Kits

Special materials are available to absorb a number of different substances. They can be in granular form, ready to use and bought in convenient containers for storage. Disposal of used spill-absorbing material is dealt with in 'Waste Management' section.

Land Contamination

Oils, fuels, solvents, etc. can contaminate any soil that they are allowed to contact. Such materials should never be disposed of by pouring onto soil and every precaution must be taken to prevent spillage reaching soil. Waste materials stored on open ground could also leak, or have polluting substances washed off them that would contaminate the land. Always store these materials in suitable robust containers.

Checklist

Always adhere to the following:

- Don't pour or spill anything onto the soil or bare ground.
- Don't store waste materials on bare ground.

Local Issues

A number of environmental issues will be of particular concern to residents and other neighbors close to the site. The sensitivity of these issues will depend on the proximity of the site and the layout and amount of activity carried on at the site.

Car alarm testing, panel beating, hammering and other such noisy activities should, whenever possible, be carried out

indoors with doors and windows shut or as far away from residential area as possible.

Be sensitive to the time of day when these activities are carried out and minimise the time of the noisy operation, particularly in the early morning and late evening.

Another local concern will be the smell from the various materials used. Using less solvent, paint and petrol could help prevent this annoyance.

Local residents and other business users will also be concerned about traffic congestion, noise and exhaust fumes, be sensitive to these concerns and try to minimise inconvenience from deliveries, customers and servicing operations.

Checklist

Always adhere to the following:

- Identify where the neighbors who are likely to be affected are situated;
- Minimise noise, smells and traffic nuisance.
- Prevent waste pollution by disposing of waste in the correct container.
- Have waste containers emptied regularly.

Waste Management

One of the major ways that pollution can be reduced is by the careful handling, storage and disposal of all waste materials that occur on sites. This means that it is necessary to not only know what the waste materials are, but also to have the necessary documentation and to know local regulations that apply.

Handling and Storage of Waste

They should be stored in such a way as to prevent the escape of the material to land, water or air.

They must also be segregated into different types of waste e.g. oil, metals, batteries, used vehicle components. This will prevent any reaction between different materials and assist in disposal.

Disposal of Waste

Disposal of waste materials must only be to waste carriers who are authorized to carry those particular waste materials and have all the necessary documentation. The waste carrier is responsible for ensuring that the waste is taken to the correct disposal sites.

Dispose of waste in accordance with the following guidelines:

- Fuel, hydraulic fluid, anti-freeze and oil: keep separate and dispose of to specialist contractor.
- Refrigerant: collect in specialist equipment and reuse.
- Detergents: safe to pour down the foul drain if diluted.
- Paint, thinners: keep separate and dispose of to specialist contractor.

- Components: send back to supplier for refurbishment, or disassemble and reuse any suitable parts. Dispose of the remainder in ordinary waste.
- Small parts: reuse any suitable parts, dispose of the remainder in ordinary waste.
- Metals: can be sold if kept separate from general waste.
- Tyres: keep separate and dispose of to specialist contractor.
- Packaging: compact as much as possible and dispose of in ordinary waste.
- Asbestos material: keep separate and dispose of to specialist contractor.
- Oily and fuel wastes (e.g. rags, used spill kit material): keep separate and dispose of to specialist contractor.
- Air filters: keep separate and dispose of to specialist contractor.
- Rubber/plastics: dispose of in ordinary waste.
- Water pipes: dispose of in ordinary waste.
- Batteries: keep separate and dispose of to specialist contractor.
- Airbags - explosives: keep separate and dispose of to specialist contractor.
- Electrical components: send back to supplier for refurbishment, or disassemble and reuse any suitable parts. Dispose of the remainder in ordinary waste.
- Catalysts: can be sold if kept separate from general waste.
- Used spill-absorbing material: keep separate and dispose of to specialist contractor.

General Fitting Instructions**Component Remove**

Whenever possible, clean components and surrounding area before removing.

- Blank off openings exposed by component removal.
- Immediately seal fuel, oil or hydraulic lines when apertures are exposed; use plastic caps or plugs to prevent loss of fluid and ingress of dirt.
- Close the open ends of oilways exposed by component removal with tapered hardwood plugs or conspicuous plastic plugs.
- Immediately a component is removed, place it in a suitable container; use a separate container for each component and its associated parts.
- Clean bench and provide marking materials, labels and containers before removing a component.

Remove

Observe scrupulous cleanliness when removing components, particularly when brake, fuel or hydraulic system parts are being worked on. A particle of dirt or a cloth fragment could cause a serious malfunction if trapped in these systems.

- Blow out all tapped holes, crevices, oilways and fluid passages with compressed air. Ensure that any O-rings used for sealing are correctly replaced or renewed, if disturbed during the process.
- Use marking ink to identify mating parts and ensure correct reassembly. Do not use a centre punch or scriber to mark parts, they could initiate cracks or distortion in marked components.
- Wire together mating parts where necessary to prevent accidental interchange (e.g. roller bearing components).
- Attach labels to all parts which are to be renewed, and to parts requiring further inspection before being passed for reassembly; place these parts in separate containers from those containing parts for rebuild.
- Do not discard a part due for renewal until after comparing it with a new part, to ensure that its correct replacement has been obtained.

Cleaning Components

Always use the recommended cleaning agent or equivalent. Ensure that adequate ventilation is provided when volatile degreasing agents are being used. Do not use degreasing equipment for components containing items which could be damaged by the use of this process.

General Inspection

All components should be inspected for wear or damage before being refitted.

- Never inspect a component for wear or dimensional check unless it is absolutely clean; a slight smear of grease can conceal an incipient failure.
- When a component is to be checked dimensionally against recommended values, use the appropriate measuring equipment (surface plates, micrometers, dial gauges etc.). Ensure the measuring equipment is calibrated and in good serviceable condition.
- Reject a component if its dimensions are outside the specified tolerances, or if it appears to be damaged.
- A part may be refitted if its critical dimension is exactly to its tolerance limit and it appears to be in satisfactory condition. Use 'Plastigauge' for checking bearing surface clearances.

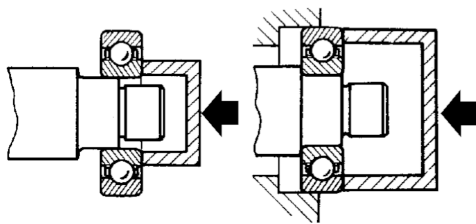
Ball and Roller Bearings

Overview

When removing and refitting bearings, ensure that the following practices are observed to ensure component serviceability.

- Remove all traces of lubricant from bearing under inspection by cleaning with a suitable degreasant; maintain absolute cleanliness throughout operations.
- Hold inner ring of bearing between finger and thumb of one hand and spin outer ring to check that it revolves absolutely smoothly. Repeat, holding outer ring and spinning inner ring.
- Rotate outer ring gently with a reciprocating motion, while holding inner ring; feel for any check or obstruction to rotation. Reject bearing if action is not perfectly smooth.
- Lubricate bearing with generous amounts of lubricant appropriate to refitting.
- Inspect shaft and bearing housing for discoloration or other markings which indicate movement between bearing and housing.
- Ensure that shaft and housing are clean and free from burrs before fitting bearing.
- If one bearing of a pair shows an imperfection, it is advisable to replace both with new bearings; an exception could be if the faulty bearing had covered a low mileage, and it can be established that damage is confined to only one bearing.
- Never refit a ball or roller bearing without first ensuring that it is in a fully serviceable condition.
- When hub bearings are removed or displaced, new bearings must be fitted; do not attempt to refit the old hub bearings.
- When fitting a bearing to a shaft, only apply force to the inner ring of the bearing. When fitting a bearing into a housing, only apply force to the outer ring of the bearing.

- In the case of grease lubricated bearings (e.g. hub bearings) fill the space between bearing and outer seal with the recommended grade of grease before fitting seal.
- Always mark components of separable bearings (e.g. taper roller bearings) when removing, to ensure correct reassembly. Never fit new rollers in a used outer ring; always fit a complete new bearing assembly.

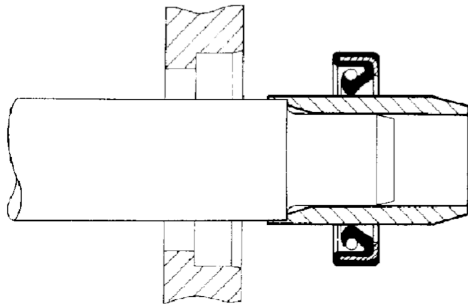


Oil Seals

Overview

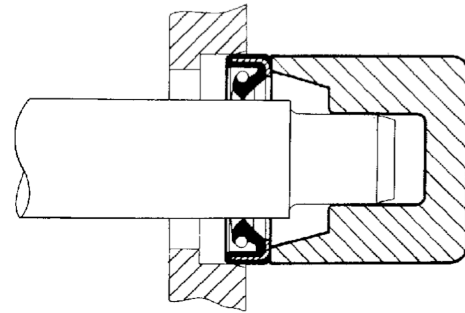
Always renew oil seals which have been removed from their working location (whether as an individual component or as part of an assembly). NEVER use a seal which has been improperly stored or handled, such as hung on a hook or nail.

- Carefully examine seal before fitting to ensure that it is clean and undamaged.
- Ensure the surface on which the new seal is to run is free of burrs or scratches. Renew the component if the original sealing surface cannot be completely restored.
- Protect the seal from any surface which it has to pass when being fitted. Use a protective sleeve or tape to cover the relevant surface.
- Lubricate the sealing lips with a recommended lubricant before use to prevent damage during initial use. On dual lipped seals, smear the area between the lips with lubricant.
- If a seal spring is provided, ensure that it is fitted correctly. Place lip of seal towards fluid to be sealed and slide into position on shaft. Use fitting sleeve where possible to protect sealing lip from damage by sharp corners, threads or splines. If a fitting sleeve is not available, use plastic tube or tape to prevent damage to the sealing lip.



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- Grease outside diameter of seal, place square to housing recess and press into position using great care, and if possible a 'bell piece' to ensure that seal is not tilted. In some cases it may be preferable to fit seal to housing before fitting to shaft. Never let weight of unsupported shaft rest in seal.



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- Use the recommended service tool to fit an oil seal. If the correct service tool is not available, use a suitable tube approximately 0.4 mm (0.015 in.) smaller than the outside diameter of the seal. Use a hammer VERY GENTLY on drift if a suitable press is not available.
- Press the oil seal to the bottom of housing with sealing lip facing the lubricant. Lubricate the shaft shoulder of the sealing surface to ensure that seal is not tilted in the housing.

Joints and Joint Faces**Overview**

Keep joints dry unless specified otherwise.

- Always use the correct gaskets as specified.
- When adhesive is used, apply in a thin uniform film to metal surfaces; take care to prevent adhesive from entering oilways, pipes or gaps.
- If washers and/or adhesive are recommended for use, remove all traces of old adhesive prior to refitting. Do not use a tool which will damage the joint faces and smooth out any scratches or burrs using an oil stone.
- Prior to refitting, blow through any oilways, pipes or gaps with compressed air.

Locking Devices**Overview**

Always replace locking devices with one of the same design.

Tab Washers

Always release locking tabs and fit new tab washers. Do not re-use locking tabs.

Locking Nut

Always use a torque wrench when refitting or removing locking nuts, brake and other pipe connectors.

Locating Pins

Always fit new locating pins for the hole.

Circlips

Always fit new circlips of the correct size for the groove.

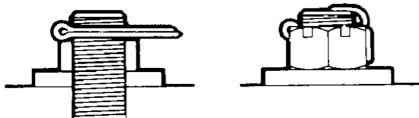
Keys and Keyways

Remove burrs from edges of keyways with a fine file and clean thoroughly before attempting to refit key.

Clean and inspect key closely; keys are suitable for refitting only if indistinguishable from new, as any indentation may indicate the onset of wear.

Split Pins

Always fit new split-pins of the correct size for the hole in the bolt or stud.



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Screw Threads

Overview

Metric threads to ISO standards are used.

Damaged nuts, bolts and screws must always be discarded. Cleaning damaged threads with a die or tap impairs the strength and fit of the threads and is not recommended.

Always ensure that replacement bolts are at least equal in strength to those replaced.

Castellated nuts must not be loosened to accept a split-pin, except in recommended cases when this forms part of an adjustment.

Do not allow oil or grease to enter blind threaded holes. The hydraulic action on screwing in the bolt or stud could split the housing.

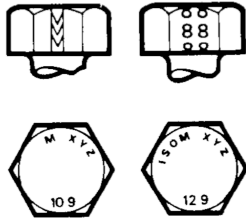
Always tighten a nut or bolt to the recommended torque value. Damaged or corroded threads can affect the torque value.

To check or re-tighten a bolt or screw to a specified torque value, first loosen a quarter of a turn, then re-tighten to the correct torque value.

Oil thread lightly before tightening to ensure a free running thread, except in the case of threads treated with sealant/lubricant, and self-locking nuts.

Fasteners Identification

Bolt Identification

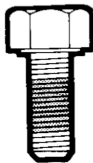


S003044

An ISO metric bolt or screw made of steel and larger than 6 mm in diameter can be identified by either of the symbols ISO M or M embossed or indented on top of the bolt head.

In addition to marks identifying the manufacturer, the top of the bolt head is also marked with symbols indicating the strength grade, e.g. 8.8; 10.9; 12.9; 14.9. As an alternative, some bolts and screws have the M and strength grade symbol stamped on the flats of the hexagon.

Encapsulated Bolts and Screws



S003045

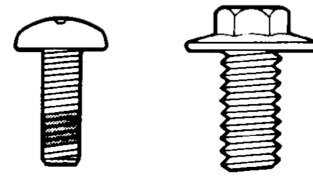
Encapsulated bolts and screws have a locking agent pre-applied to the thread. They are identified by a coloured section which extends 360° around the thread. The locking agent is released and activated by the assembly process and is then chemically cured to provide the locking action.

Unless a specific repair procedure states otherwise, encapsulated bolts may be reused providing the threads are undamaged and the following procedure is adopted:

- Remove loose adhesive from the bolt and housing threads.
- Ensure threads are clean and free of oil and grease.
- Apply an approved locking agent.

An encapsulated bolt may be replaced with a bolt of equivalent specification provided it is treated with an approved locking agent.

Self-locking Bolts and Screws



S003046

Self-locking bolts and screws, i.e. nylon patched or trilobular thread can be reused providing resistance can be felt when the locking portion enters the female thread.

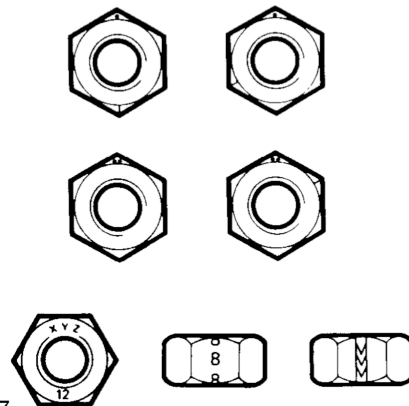
Nylon patched bolts and screws have a locking agent pre-applied to the threads. They are identified by the presence of a coloured section of thread which extends for up to 180° around the thread.

Trilobular bolts (i.e. Powerlok) have a special thread form which creates a slight interference with the thread of the hole or nut into which it is screwed.

DO NOT reuse self-locking bolts or screws in critical locations. Always use the correct replacement self-locking nut, bolt or screw.

DO NOT fit non self-locking fasteners in applications where a self-locking nut, bolt or screw is specified.

Nut Identification



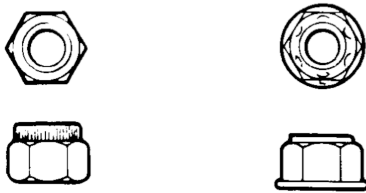
S003047

A nut with an ISO metric thread is marked on one face or on one of the flats of the hexagon with the strength grade symbol 8, 12, or 14. Some nuts with a strength grade 4, 5 or 6 are also marked and some have the metric symbol M on the flat opposite the strength grade marking.

When tightening a slotted or castellated nut, never loosen it to insert a split pin except where recommended as part of an adjustment. If difficulty is experienced, alternative washers or nuts should be selected, or the washer thickness reduced.

Where bearing preload is involved, nuts should be tightened in accordance with special instructions.

Self-locking Nuts



S003048

Self-locking nuts can be reused providing resistance can be felt when the locking portion of the nut passes over the thread of the bolt or stud.

Where self-locking nuts have been removed, it is advisable to replace them with new ones of the same type.

Don't use non self-lock nuts in the area where self-lock nuts must be used.

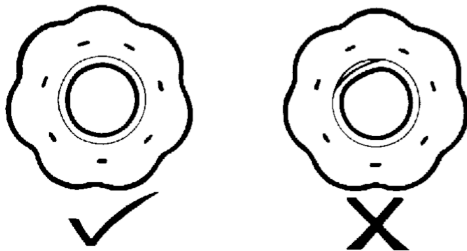
Flexible Pipes and Hoses

Overview

When removing and refitting flexible hydraulic pipes and hoses, ensure that the following practices are observed to ensure component serviceability.

- Clean end fittings and the area surrounding them as thoroughly as possible.
- Obtain appropriate plugs or caps before detaching hose end fittings, so that the ports can be immediately covered to prevent the ingress of dirt.
- Clean hose externally and blow through with compressed air. Examine carefully for cracks, separation of plies, security of end fittings and external damage. Reject any faulty hoses.
- When refitting a hose, ensure that no unnecessary bends are introduced, and that hose is not twisted before or during tightening of union nuts.
- Fit a cap to seal a hydraulic union and a plug to its socket after removal to prevent ingress of dirt.
- Absolute cleanliness must be observed with hydraulic components at all times.
- After any work on hydraulic systems, carefully inspect for leaks underneath the vehicle.

Flexible Pipes



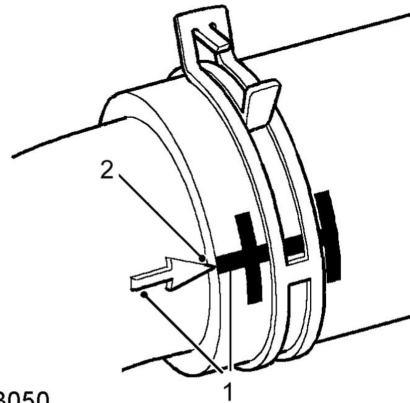
S003049

All flexible pipes are made up of two laminations, an armoured rubber outer sleeve and an inner viton core. If any of the flexible pipes has been disconnected, it is imperative that the internal bore is inspected to ensure that the viton lining has not become separated from the armoured outer sleeve. A new flexible pipe must be fitted if separation is evident.

Cooling System Hoses

The following precautions MUST be followed to ensure that integrity of cooling system hoses and their connections to system components are maintained.

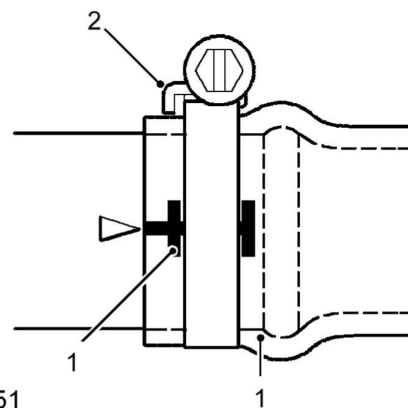
Hose Orientation and Connection



S003050

Correct orientation of cooling hoses is important in ensuring that the hose does not become scratched or damaged through contact with adjacent components. Where 'timing' marks (1) are provided on the hose and corresponding connection, these must be used to ensure correct orientation. Hoses must be pushed fully onto their connection points. Usually, a marking (2) on the pipe end provides a positive indicator.

Hose Clip



S003051

Markings (1) are usually provided on the hose to indicate the correct clip position. If no markings are provided, position the clip directly at the location as shown in above figure. Worm drive clips should be oriented with the crimped side of the clip bracket (2) facing towards the end of the pipe, or the hose may become pinched between the clip and the pipe. Worm drive clips should be tightened to 3 Nm unless otherwise stated. Ensure that hose clips do not foul adjacent components.

Heat Protection

Always ensure that heatshields and protective sheathing are in good condition. Replace if damage is evident. Particular care must be taken when routing pipelines close to hot components. Hoses will relax and deflect slightly when hot; ensure this movement is taken into account when routing and securing hoses.

Electrical Precautions

Overview

The following guidelines are intended to ensure the safety of the operator while preventing damage to the electrical and electronic components fitted to the vehicle. Where necessary, specific precautions are detailed in the individual procedures of this manual.

Equipment

Prior to commencing any test procedure on the vehicle ensure that the relevant test equipment is working correctly and any harness or connectors are in good condition. It is particularly important to check the condition of the lead and plugs of mains operated equipment.

Polarity

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

High Voltage Circuits

Whenever disconnecting live HT circuits always use insulated pliers and never allow the open end of the HT lead to contact any components.

Connectors and Harnesses

The engine compartment of a vehicle is a particularly hostile environment for electrical components and connectors:

- Always ensure electrically related items are dry and oil free before disconnecting and connecting test equipment.
- Ensure disconnected multiplugs and sensors are protected from being contaminated with oil, coolant or other solutions. Contamination could impair performance or result in catastrophic failure.
- Never force connectors apart using tools to prise apart or by pulling on the wiring harness.
- Always ensure locking mechanism is disengaged before disconnection, and match orientation to enable correct reconnection.
- Ensure that any protection (covers, insulation etc.) is in good condition and replaced if damaged.

Having confirmed a component to be faulty:

- Switch off the ignition and disconnect the battery negative.
- Remove the component and support the disconnected harness.
- When replacing the component, keep oily hands away from electrical connection areas and push connectors home until any locking tabs fully engage.

Battery Disconnection

Before disconnecting the battery, disable the alarm system and switch off all electrical equipment.

Caution : *To prevent damage to electrical components, always disconnect the battery when working on the vehicle electrical system. The ground lead must be disconnected first and reconnected last.*

Caution : *Always ensure that battery leads are routed correctly without any potential hazards.*

Battery Charging

Always ensure any battery charging area is well ventilated and that every precaution is taken to avoid naked flames and sparks.

Disciplines

Turn off the ignition system prior to making any connection or disconnection in the system to prevent electrical surges caused by disconnecting 'live' connections damaging electronic components.

Ensure hands and work surfaces are clean and free of grease, swarf, etc. Grease collects dirt which can cause electric leakage (short circuits) or open circuit.

Connectors should never be subjected to forced removal or refit, especially internal connectors. Damaged circuits can cause short-circuit and open-circuit fault conditions.

Prior to commencing test, and periodically during a test, touch a good vehicle body to discharge static electricity. Some electronic components are vulnerable to the static electricity that may be generated by the operator.

When handling printed circuit boards, treat with care and hold by the edges only; note that some electronic components are susceptible to body static.

Electrical Connectors Lubrication

In order to prevent corrosion, some connectors under bonnet and vehicle body are coated with special lubricant in factory. If these are destroyed in maintaining, repair and replacing process, special lubricant should be newly wiped.

Supplementary Restraint System Precautions

General Precautions

The SRS system contains components which could be potentially hazardous to the service engineer if not serviced and handled correctly. The following guidelines are intended to alert the service engineer to potential sources of danger and emphasise the importance of ensuring the integrity of SRS components fitted to the vehicle.

Warning : *It is imperative that before any work is undertaken on the SRS system the appropriate information is read thoroughly.*

Warning : *It is imperative that the appropriate information is read thoroughly before any work is undertaken on the SRS system.*

Warning : *The airbag module contains sodium azide which is poisonous and extremely flammable. Contact with water, acid or heavy metals may produce harmful or explosive compounds. Do not dismantle, incinerate or bring into contact with electricity, before the airbag is deployed.*

Warning : *When a seat belt has withstood the strain of a severe vehicle impact or shows signs of wear, immediately replace it with a new one.*

Warning : *Always disconnect the vehicle battery before carrying out any electric welding on a vehicle fitted with an SRS system.*

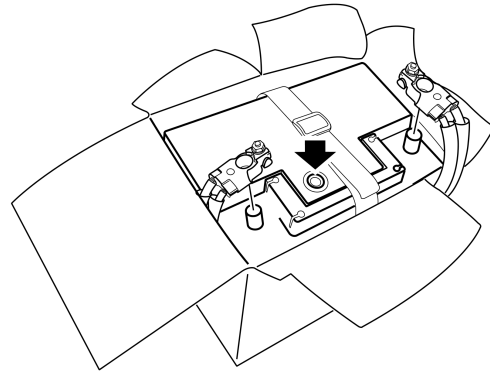
Caution : *Do not expose an airbag module or seat belt pre-tensioner to heat exceeding 85 °C.*

It should be noted that these precautions are not restricted to operations performed when maintaining the SRS, the same care must be exercised when working on ancillary systems and components located in the vicinity of the SRS components. These include, but are not limited to:

- Steering system - driver front airbag module, rotary coupler.
- Instrument panel - passenger front airbag module.
- Interior trim - ICShead curtain airbags ('A' pillar trim, 'B' pillar trim, grab handles, headlining above front doors); SRSdiagnosis control unit (beneath centre console); side impact crash sensors (inside the body sill frame)
- Seats - side airbags; front seat belt pre-tensioners
- Electrical system - SRSharnesses, connecting wires and connectors

Making the System Safe

Before working on or in the vicinity of the SRS components, ensure the system is rendered safe by performing the following procedures:



S003092

- Remove the key from the ignition switch.
- Disconnect the negative battery terminal first, and the positive.
- Wait 10 minutes for SDMback-up power circuit to discharge.

The SRS uses energy reserve capacitors to keep the system active in the event of electrical supply failure under crash conditions. It is necessary to allow the capacitor sufficient time to discharge (at least 10 minutes) in order to avoid the risk of accidental deployment.

Caution : *Disconnect the battery before starting the SRS operation. Disconnect the negative battery cable first. DO NOT disconnect the battery in the reverse order.*

Refit

In order to ensure system integrity, it is essential that the SRS is regularly checked and maintained so that it is ready for effective operation in the event of a collision. Carefully inspect SRS components before installation. Do not fit a part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.

Warning : *The integrity of the SRS system is critical for safety reasons.*

Ensure the following precautions are always adhered to:

- Never fit used SRS components from another vehicle or attempt to repair an SRS component.
- Never use the SRS components without a clear identification label.
- Never use an airbag or SRSECU that has been dropped.
- When repairing the SRS, only use genuine new parts.
- Never apply electrical power to an SRS component unless instructed to do so as part of an approved test procedure.
- Ensure the screws are tightened to the correct torque. Always use new fasteners when replacing SRS components.
- Ensure that the SRSECU is fitted correctly. There must not be any gap between the SRSECU and the bracket

to which it is mounted. An incorrectly mounted SRSECU could cause the system to malfunction.

- Do not supply power to the SRSECU before all SRS components are connected.

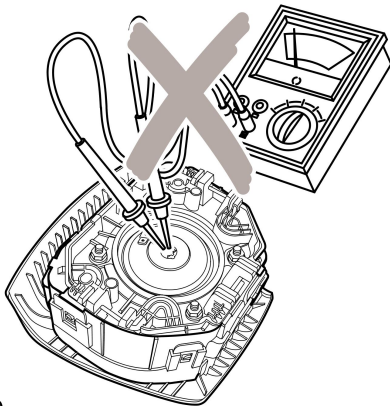
Caution : Ensure SRS components are not contaminated by oil, grease, detergent or water.

Caution : Torque wrenches should be regularly checked for accuracy to ensure that all fasteners are tightened to the correct torque.

Caution : After seat belt pre-tensioner works, the seat belts can still be used as conventional seat belts, but will need to be replaced as soon as possible to re-establish full SRS protection.

Caution : If the SRS component is to be replaced, the bar code of the new component must be recorded.

SRS Component Test Precautions



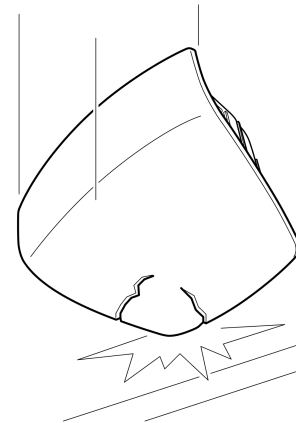
S003080

SRS components are triggered using relatively low operating currents, always adhere to the following precautions:

Warning : Do not use a multi-meter or other general purpose test equipment on SRS system components, or accidental deployment may occur. Only use the recommended diagnostic equipment to diagnose system faults.

Warning : Do not use electrical test equipment on the SRS harness while it is connected to any of the SRS system components. It may cause accidental deployment and personal injury.

Handling and Storage



S003081

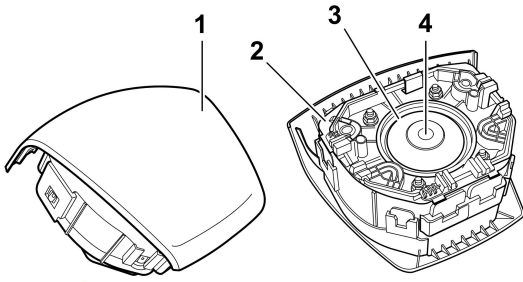
Always comply with the following handling precautions:

Warning : The SRS components are sensitive and potentially hazardous if not handled correctly; always comply with the following handling precautions:

- SRS ECU and airbag module must be stored in a dry environment at normal temperature not exceeding 85 °C. Ensure heat source, fire source, water and other corrosive chemical substances are kept away from the stored SRS components.
- For safety, inflammable objects shall not be placed around the airbag module.
- New airbag module shall be kept in original packaging state until fitted.
- The storage area must comply with all legal requirements. Enough fire extinguishers or other extinguishing devices must be provided.
- It is forbidden to use the dropped airbag module and SRS ECU at will. An airbag module and SRS ECU dropped on the ground must be scrapped.
- Do not hold the airbag module wire or connector with hands when handling undeployed airbag module.
- It is forbidden to disassemble the undeployed airbag module or damage the sealed airbag module metal case.
- Never carry airbag module or seat belt pre-tensioner in the compartment.

Warning : Never attach anything to an airbag cover or any object to an airbag module. Do not allow anything to rest on top of an airbag module.

Caution : Do not apply grease or cleaning solvents to seat belt pre-tensioner units, otherwise it may cause component failure.



S003082

Warning : Store the airbag module with the deployment side facing up. If it is stored with the deployment side facing down, accidental deployment of airbag will cause personal injury.

Warning : Airbag modules and seat belt pre-tensioners are classified as explosive devices. For overnight and longer term storage, they must be stored in a secure steel cabinet which has been approved as suitable for the purpose and has been registered by the local authority.

Warning : When recycling or handling the seat belt pre-tensioner, DO NOT aim the piston pipe at yourself or others. Keep the pistons facing the ground. Hold the case instead of the seat belt.

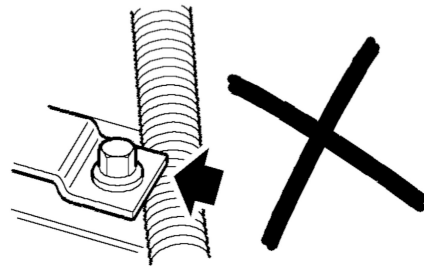
Warning : Store the airbag module or seat belt pre-tensioners in a designated storage area.

Caution : Improper handling or storage can internally damage the airbag module, making it inoperative. If you suspect the airbag module has been damaged, fit a new module and refer to the Deployment/Disposal Procedures for disposal of the damaged module.

SRS Harnesses and Connectors

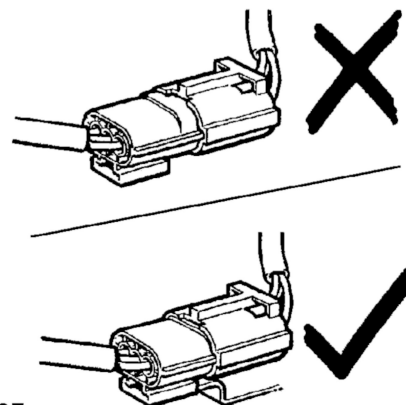
- Never fit extra electronic equipment (such as a mobile telephone, two-way radio or in-car entertainment system) in such a way that it could generate electromagnetic interference in the airbag circuit. Seek specialist advice when fitting such equipment.

Note : SRS harness can be identified by a special yellow sleeve which plays the role of protecting the harness (black with yellow stripe protective sleeve is sometimes used).



S003006

Warning : Always ensure SRS harness is routed correctly. Be careful to avoid trapping or pinching the SRS harness. Do not leave the connectors hanging loose or allow SRS components to hang from their harnesses. Check for possible points of chafing.



S003007

Precautions for Vehicle Owners

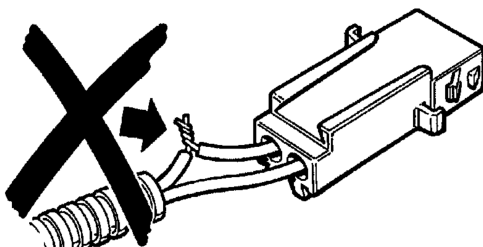
For the airbag to work effectively and protect vehicle owners, follow the precautions listed below.

Driver and passengers must use seat belts correctly. Correctly using the seat belts can protect the body and reduce injuries in the event of an accident.

Never fit any accessory that obstructs or impairs the operation of the seat belt pre-tensioners or airbags.

Do not place any object on the steering wheel or instrument panel that could penetrate an inflating airbag or be a thrown item likely to cause injury.

Never fit cover on seat which fitting side airbag.



S003005

Always observe the following precautions with regards to SRSharnesses:

- Never attempt to modify, splice or repair SRSharnesses.

Children under 12 years old should not sit in the front seat.

Only genuine accessory parts are allowed to be fitted.

Only authorised people can remove airbag modules, SRSECU, SRSharnesses and connectors.

If the airbag and seat belt pre-tensioner are deployed during an accident, SRSmust be replaced and discarded.

Every SRSon every car has been paired and identified, illegally adding or modifying the SRSand harnesses could cause injuries.

Modifying the vehicle structure or SRSis strictly prohibited and may cause wrong airbag deployment or failure to deploy when required.

Rotary Coupler Precautions

Caution : *Always follow the procedure for fitting and checking the rotary coupler as instructed in the SRS repairs section. Comply with all safety and installation procedures to ensure the system functions correctly.*

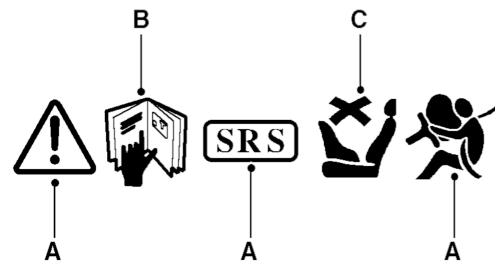
Observe the following precautions:

- Do not unlock and rotate the rotary coupler when it is removed from the vehicle.
- Do not turn the wheels when the rotary coupler is removed from the vehicle.
- Always ensure the rotary coupler is removed and refitted in its centred position and with the front wheels in the straight ahead position - refer to the SRSrepair section for the correct removal and refit procedure.
- If a new rotary coupler is being fitted, ensure the locking tab holding the coupler's rotational position is not broken; units with a broken locking tab should not be used.

Warning Labels

Warning labels are displayed at various positions in the vehicle. SRScomponents have additional warning labels displayed on them to indicate that particular care is needed when handling them. These include airbag modules, SRSECU, seat belt pre-tensioners and the rotary coupler.

The following warning symbols may be displayed at various locations on the vehicle:



S003008

A. Be careful when working in close proximity to SRScomponents.

B. Refer to the publication where the procedures, instructions and advice can be found (usually Workshop Manual or Owner's Manual) for working on the SRS.

C. Do not use rear facing child seats in the front passenger seat of vehicles fitted with passenger airbags.

Warning : *It is imperative that the appropriate information is read thoroughly before any work is undertaken on the SRS system.*

The following figure indicates possible locations and content for warning labels. Exact positions and content may vary dependent on model year, legislation and market trends.

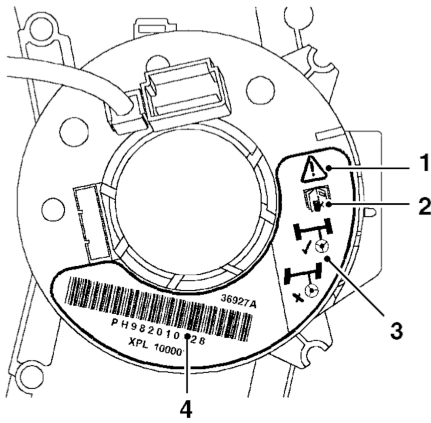


S003009

Do not use rear facing child seats in the front passenger seat of vehicles fitted with passenger airbags.

Rotary Coupler

1. Be careful when working in close proximity to SRScomponents.
2. Refer to Workshop Manual for detailed instructions.
3. Ensure the wheels are in the straight ahead position before removal and refitting.
4. Bar code. The code number must be recorded if the rotary coupler is to be replaced.



S003011

Bar Codes

Bar codes are fitted to SRS components and components which are critically related to SRS operation. The code number(s) must be recorded if the component is to be replaced.

Components featuring bar codes include the following:

- Driver front airbag module – label attached to rear of airbag module housing
- Passenger front airbag module – label attached at side of airbag module housing
- SRSECU– including label on top of SRSECU.
- Rotary coupler - several labels on front face.

Roadside Assistance

Traction - SRS component not deployed

Normal towing procedures are unlikely to cause an airbag to deploy. However, as a precaution, turn off the ignition switch and disconnect both battery leads. Disconnect the negative '-' lead first.

Traction - SRS component not deployed

Once the driver airbag has been deployed, the vehicle must have a suspended tow. However, as a precaution, turn off the ignition switch and disconnect both battery leads. Disconnect the negative '-' lead first.

SRS components deployed

If a vehicle is to be scrapped and contains an undeployed airbag module, the module must be manually deployed.

Always observe the following precautions:

Warning : Only personnel who have undergone the appropriate training should undertake deployment of airbag and seat belt pre-tensioner modules.

Warning : A deployed airbag or seat belt pre-tensioner is very hot, which should be cooled down for at least 30 minutes.

Warning : Only use approved deployment equipment, and only deploy SRS components in a well-ventilated area. Ensure SRS components are not damaged or ruptured before deployment.

Warning : Contact with chemicals from deployed and damaged SRS components could present a health hazard; wear protective clothing when handling them. DO NOT eat, drink or smoke when handling SRS components.

Warning : Deployment of airbag modules and seat belt pre-tensioners can cause injury to personnel in the close vicinity of the deploying unit. In case of injury, seek urgent medical advice. Possible sources of injury include:

- Impact - due to component deployment caused by operation on airbag module or seat belt pre-tensioner.
- Hearing damage - due to noise produced by deploying airbag module or seat belt pre-tensioner.
- Burns - due to hot component parts and gases.
- Irritation to eyes and lungs - due to gases or combustion residue during deployment.

Warning : The following precautions MUST be followed:

- Only use approved deployment tool to carry out this operation.
- Before commencing any deployment procedure, ensure the deployment tool functions properly.
- Deployment of any airbag/pre-tensioner modules should be performed in a well ventilated area which has been designated for the purpose.
- Ensure the airbag/pre-tensioner modules are not damaged or ruptured before deployment.
- Notify the relevant authorities of intention to deploy airbag and pre-tensioner units.
- When deploying any airbag and seat belt pre-tensioner units, ensure that all personnel are at least 15 metres away from the deployment zone.
- When deploying seat belt pre-tensioners in the vehicle, ensure the pre-tensioner unit is fully secured to its fixing point.
- When removing deployed airbag and seat belt pre-tensioner modules, wear protective clothing. Use gloves and seal deployed units in a plastic bag.
- After any component of the SRS system is deployed, all SRS components must be replaced. DO NOT re-use or repair any parts of the SRS system.
- Do not lean over airbag modules or seat belt pre-tensioner units when connecting deployment equipment.

SRS Component Replacement Policy

Impacts Which Do Not Deploy the Airbags or Pre-tensioners

Check for structural damage in the area of the impact, paying particular attention to bumpers, longitudinal beams, anti-collision beams and bracketry.

Impacts Which Deploy the Airbags or Pre-tensioners

The replacement and inspection policy is dependent on the type and severity of the crash condition. The following guidelines are the basic precautions for deployment of SRS components:

Front Seat Side Airbag Deployment (driver and passenger)

If the front seat side airbags are deployed, the following parts must be replaced:

- Driver Seat Side Airbag Module
- Passenger Seat Side Airbag Module
- Cables connecting front seat airbag modules to SRSharness
- Seat Belt Pre-tensioners
- Driver Seat Belt Retractor
- Rotary Coupler
- SDM

In addition, the following should be inspected for damage and replaced as necessary:

- Front passenger's seat belt retractor (webbing, tongue latching, 'D' loop, body anchorage point)
- Rear seat belt buckles (webbing, buckle covers, body anchorage and tongue latching function)
- Instrument panel adjacent to passenger airbag module
- Steering wheel (if damage is evident)
- Front seat frames and head restraints (if there is evidence of damage to the seat frame or cushion pan)
- Steering column (if adjustment is lost or there are signs of collapse)
- Seat belt height adjusters on 'B' pillar
- Rear seat belt escutcheons in parcel shelf trim

Side (Thorax) Airbags

If the side (thorax) airbags are deployed, the following parts must be replaced, on the side of the vehicle on which the deployment occurred:

- Seat (Thorax) Airbag Module
- Seat Cushion Foam
- Seat Cushion Cover
- Front Seat Belt Buckle Pre-tensioners
- SDM

- Side Impact Crash Sensors (both sides of vehicle)

In addition, the following should be inspected for damage and replaced as necessary:

- Front seat belts (retractors, webbing, tongue latching, 'D' loop and body anchorage points)
- Rear seat belt buckles (webbing, buckle covers, tongue latching and body anchorage points)
- Front seat frame (if there is evidence of external or airbag deployment damage to seat frame)
- 'B' Pillar Interior Trims and Fasteners
- Door Casings
- Seat belt height adjusters on 'B' pillar
- Rear seat belt escutcheons in parcel shelf trim

Inflatable Curtain Structure (ICS) Airbag Modules

If the ICS airbag modules are deployed, the following parts on the side of the vehicle for which deployment occurs must be replaced:

- ICS Airbag Modules
- Connecting wire between the airbag gas generator and the SRSharness
- Airbag retaining clips above window aperture
- 'A' Pillar Interior Trims
- Front Seat Belt Buckle Pre-tensioners
- SDM
- Side Impact Crash Sensors (both sides of vehicle)

In addition, the following should be inspected for damage and replaced as necessary:

- Headlining
- ICS Mounting Bracket
- Alarm Sensor
- Front seat belts (retractors, webbing, tongue latching, 'D' loop and body anchorage points)
- Rear seat belt buckles (webbing, buckle covers, tongue latching and body anchorage points)
- 'B' Pillar Upper Trims and Fasteners
- Door Casings
- Seat belt height adjusters on 'B' pillar
- Rear seat belt escutcheons in parcel shelf trim

Rear Impacts

Rear impacts may cause the seat belt pre-tensioners to deploy. If this occurs, all pre-tensioner units must be replaced. In addition, the following components should be inspected for damage and replaced as necessary:

- Front Seat Frames
- Seat belt height adjusters on 'B' pillar

- Front seat belts (retractors, webbing, tongue latching, 'D' loop and body anchorage points)
- Rear seat belt buckles (webbing, buckle covers, tongue latching and body anchorage points)
- Rear seat belt escutcheons in parcel shelf trim
- SDM

Periodic Replacement of SRS Components

The performance of the propellants within airbags and pre-tensioners will deteriorate over a period of time. As a result, it is essential that the airbags and pre-tensioners are periodically replaced to maintain occupant safety. The airbag, seat belt pre-tensioner and rotary coupler shall be replaced every 10 years.

Air Conditioning System Precautions

Overview

The air conditioning system contains fluids and components which could be potentially hazardous to the service engineer or the environment if not serviced and handled correctly. The following guidelines are intended to alert the service engineer to potential sources of danger and emphasise the importance of ensuring the integrity of the air conditioning operating conditions and components fitted to the vehicle.

Where necessary, additional specific precautions are detailed in the relevant sections of this Manual which should be referred to prior to commencing repair operations.

Warning : *Servicing must only be carried out by personnel familiar with both the vehicle system, the charging and testing equipment. All operations must be carried out in a well ventilated area away from open flame and heat sources.*

Warning : *Air conditioning refrigerant is a hazardous liquid, and when handled incorrectly, it can cause serious injury. Suitable protective clothing, consisting of face protection, heat proof gloves, rubber boots and rubber apron or waterproof overalls, must be worn when carrying out operations on the air conditioning system.*

Remedial Actions

If an accident involving the refrigerant should occur, conduct the following remedial actions:

- If the A/C refrigerant liquid enters the eye, do not rub it. Gently run large quantities of eye wash over affected eye to raise the temperature. If an eye wash is not available, cool clean water may be used to flush the eye. After rinsing, cover the eye with a clean pad and seek immediate medical attention.
- If the A/C refrigerant liquid is splashed onto the skin, run large quantities of water over the affected area to raise the temperature. Implement the same action if the skin comes in contact with discharging cylinders. Wrap the contaminated body parts in blankets (or similar materials) and seek immediate medical attention.
- If the debilitating effects of inhalation of the A/C refrigerant vapour is suspected, seek fresh air. If the affected person is unconscious, move them away from the contaminated area to fresh air and apply artificial respiration and/or oxygen and seek immediate medical attention.

Warning : *Due to its low evaporating temperature, air conditioning refrigerant must be handled with care. Air conditioning refrigerant splashed on any part of the body will cause immediate freezing of that area. Also, refrigerant tanks and replenishment trolleys when discharging will freeze skin if skin contacts with discharged fluid.*

Service Precautions

Observe the following precautions when handling components used in the air conditioning system:

- Air conditioning units must not be lifted by their hoses, pipes or capillary lines.
- Hoses and lines must not be subjected to any twist or stress; the efficiency of the system will be impaired by kinks or restrictions. Ensure that hoses are correctly positioned before tightening couplings, and ensure that all clips and supports are utilised.
- Flexible hoses should not be positioned close to the hot components (no less than 100 mm) unless protected by heat shielding.
- Completed assemblies must be checked for refrigeration lines touching metal panels. Any direct contact of components and panels may transmit noise and so must be eliminated.
- The appropriate torque wrench must be used when tightening refrigerant connections to the stipulated value. An additional spanner must be used to hold the union to prevent twisting of the pipe when tightening connections.
- Before connecting any hose or pipe, ensure that refrigerant oil is applied to the seat of the new O-rings, BUT NOT to the threads of the connection.
- All air conditioning system components must be stored under seal until immediately prior to connection.
- Ensure components are at room temperature before uncapping, to prevent condensation of moisture from the air that enters it.
- Components must not remain uncapped for longer than 15 minutes. In the event of a delay, the sealing component must be fitted.
- When disconnecting, immediately cap all air conditioning pipes to prevent ingress of dirt and moisture into the system.
- The receiver/drier contains desiccant which absorbs moisture. It must be positively sealed at all times. A receiver/drier that has been left uncapped must not be used, and fit a new unit.
- The receiver/drier should be the last component connected to the system to ensure optimum dehydration and maximum moisture protection of the system.

- Whenever the refrigerant system is opened, the desiccant must be renewed immediately before refilling the refrigerant.
- Use alcohol and a clean lint-free cloth to clean dirty connections.
- Ensure that all new parts fitted are marked for use with A/C refrigerant.

Warning : *The system refrigerant must be evacuated immediately before recharging commences. Delay between evacuation and recharging is not permitted.*

Refrigerant Oil

Refrigerant oil easily absorbs water and must not be stored for long periods. Do not pour unused refrigerant oil back into the container. Always use an approved refrigerant oil.

When replacing components in the A/C system, drain the refrigerant oil from the component being replaced into a graduated container. On assembly, add the quantity of lubricating oil drained to the new component.

Compressor

A new compressor is sealed and pressurized with Nitrogen gas. When fitting a new compressor, slowly release the sealing cap; gas pressure should be heard to vent as the seal is broken.

Warning : *Do not open the seal cover prior to connecting the air conditioning pipes to the compressor.*

Rapid Refrigerant Discharge

If the air conditioning system is involved in accident damage and the system is punctured, the refrigerant will discharge rapidly. The rapid discharge of refrigerant will also result in the loss of most of the oil from the system. While removing the compressor, drain the remaining oil, and service as instructed in the air conditioning section of this manual.

Precautions for Refrigerant Recovery, Recycling and Recharging

When the air conditioning system is recharged, any existing refrigerant is first recovered from the system and recycled. The system is then charged with the required weight of refrigerant and volume of A/C lubricating oil.

Warning : *Refrigerant must always be recycled before re-use to ensure that the purity of the refrigerant is high enough for safe use in the air conditioning system.*

Warning : *Recycling should always be carried out with equipment whose design is certified for compliance with SAE J1991. Other equipment may not recycle refrigerant to the required level of purity.*

Warning : *Air conditioning refrigerant Recovery Recycling Recharging Station shall not use any other type of refrigerant.*

Warning : *Air conditioning refrigerant from domestic and commercial sources shall not be used in motor vehicle air conditioning systems.*

Air Conditioning Compressor Replacement

Replacement Instructions

A new compressor is filled with A/C lubricating oil. The new compressor must be drained and an equivalent quantity of oil added before fitting. To calculate the quantity of oil to be added, carry out the following procedure:

1. Remove the filler/drain plug from the old compressor.
2. Invert the compressor and drain the oil into a calibrated measuring cylinder. Ensure that the compressor is completely drained.
3. Record the quantity of oil drained, and discard the oil.
4. Remove the filler/drain plug from the new compressor.
5. Invert the compressor and drain the oil into a calibrated measuring cylinder. Ensure that the compressor is completely drained.
6. Add the same amount of oil drained from the old compressor to the new compressor.
7. Discard the remaining oil drained from the new compressor.
8. Fit and tighten the compressor filler/drain plug.

Controller maintenance precautions

Warning : Please strictly follow the service manual and diagnostic tool's tips. In order to ensure the normal function of the vehicle, it must be ensured that the controller module is successfully refreshed before delivery.

Lifting and Towing

Lifting & Towing Lifting Vehicle

Description

Before lifting the vehicle, note the following:

- The vehicle must be parked on a level and firm ground.
- Ensure the EPB is OFF.
- Ensure P or N is selected.

To avoid damage to the underbody parts, please follow the procedures below:

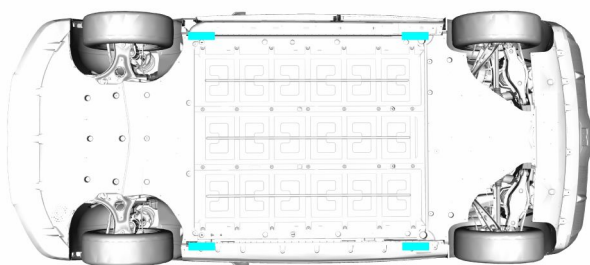
DO NOT place a jack or axle stand where it may contact any of the following parts:

- Vehicle Body Structural Part
- Bumper
- Brake Line
- Front Suspension Arm
- Steering Connection Mechanism
- Rear Suspension Arm
- High-voltage Battery Module
- High-voltage Drive Motor
- Transmission Housing
- Rear Towing Eye

Note : *Jacking and supporting the front of the vehicle should only be done under the customer front jacking points and/or the jacking bracket on the front section of the front subframe.*

Front/Rear Supporting Point of the Vehicle

The jack supplied with the vehicle should only be used to replace wheels in emergency.



S0000160

Warning : *Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.*

Warning : *Do not commence work on the underside of the vehicle until suitable safety supports have been positioned under the sill reinforced brackets.*

Lifting and Supporting the Vehicle

Place the head of the jack on the approved lifting point at the front and rear of the vehicle - see image

Caution : *Do not jack or support the vehicle on any points other than those indicated, otherwise it may cause damage to the body or chassis components.*

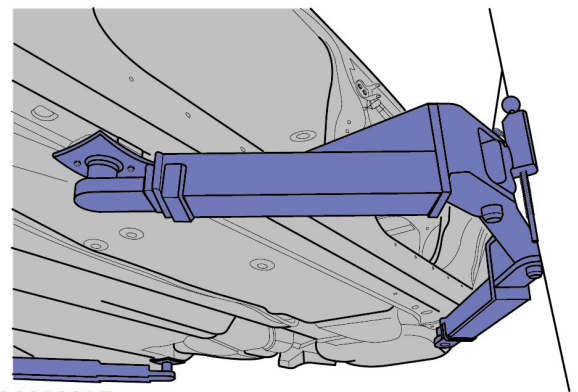
Warning : *Do not commence work on the underside of the vehicle until suitable safety supports have been positioned under the sill reinforced brackets.*

Warning : *Always chock the wheels when jacking.*

Hydraulic Jack

Any hydraulic jack to be considered must have a bearing capacity of at least 1,500kg (3,300lbs).

Wheel Free Ramp



S0000005

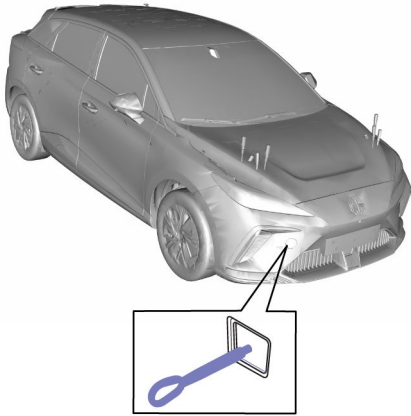
Put the mat of the lifting arm of the ramp under the jacking point on the sill.

Roadside Assistance

Towing Vehicle

Towing eye

Warning : *DO not use a tow rope that is twisted - or the towing hook may be unscrewed.*



S0000163

The car is equipped with two towing holes each at the front and the rear, which are used for fitting the towing eyes stored in the tool kit in the spare wheel beneath the loadspace carpet.

To fit the front towing eye, remove the small cover on the bumper, and screw the towing eye into the threaded hole in the bumper beam through the small square hole. Ensure the towing eye is fully tightened!

If the car needs to be towed, most qualified recovery specialists will use wheel lift equipment to suspend the driving wheels, so as to protect the drive motor from damage. The parking brake must be released, the hazard warning lamps should be switched on, and all the passengers should leave the vehicle being towed.

Towing for Recovery

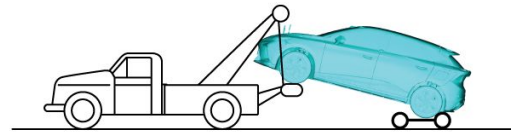
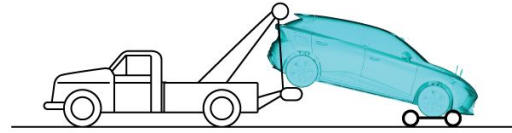
Warning : *If, due to an electrical fault, potential safety hazards may exist, it is not allowed to put the start switch in 'ON' position.*

Warning : *DO not suddenly start the towing car with great acceleration or accelerate to avoid damaging the car.*

Warning : *The towing speed of the vehicle shall not exceed 30km/h, the towing distance shall not exceed 50km.*

Suspended Towing

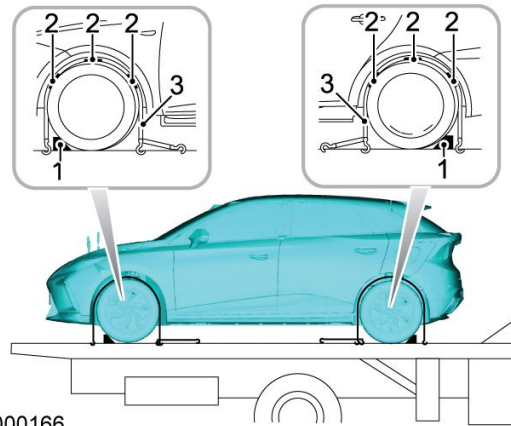
If the car needs to be towed, most qualified recovery specialists will use wheel lift equipment to suspend the driving wheels, so as to protect the drive motor from damage. The parking brake must be released, the hazard warning lamps should be switched on, and all the passengers should leave the vehicle being towed.



S0000165

Transporter or Trailer with Rope

If your car is to be transported on the back of a trailer or transporter, it must be secured as illustrated:



S0000166

- Apply parking brake, and place the electric drive system gear in 'P' position.
- Place the wheel chocks (1) as shown in the figure, and place the anti-slip rubber pads (2) around the wheels.
- Fit the lashing strap (3) around the wheel and secure it to the towing vehicle. Tighten the strap to secure the vehicle.

Identification Code

Vehicle Identification Number

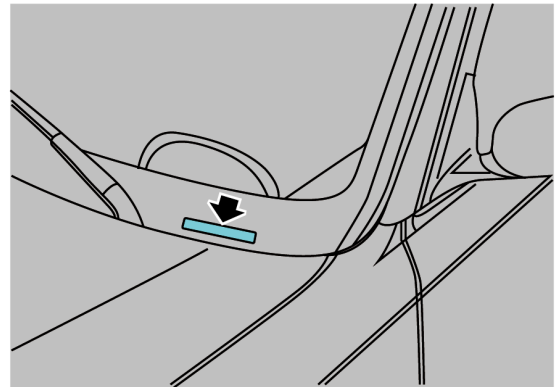
VIN(VIN)

Example:LSJWH4098NN998125

Digit	Code	Description
1-3	LSJ	Geographic area, country, vehicle manufacturer
4-5	WH	Vehicle Model/ Series
6	4	Vehicle Body Structural Characteristics, 4 = Hatchback, 5 Doors
7	0	Drive Motor 0 = Peak Power > 60 KW
8	9	9 = Seat Belt, Front Airbags for Driver and Front Passenger, Seat Side Airbags, and Front/Rear Side Curtain Airbags
9	8	Check Bit (represented by any figure from 0 to 9 or letter X)
10	N	Model Year N= 2022
11	N	Assembly Plant, GN = Ningde (Fujian)
12-17	XXXXXX	6 figures = Serial number

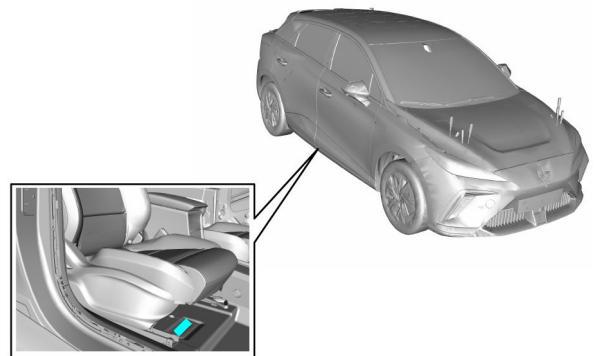
VINis also stamped in the following location:

On a plate behind the LH lower corner of the windshield.



S0000006

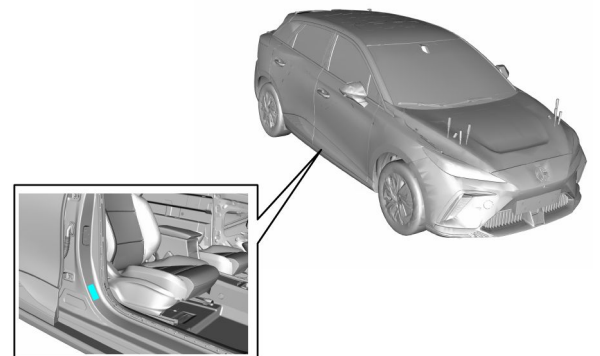
Printed on the seat beam under the right seat.



S0000161

Location of Vehicle Identification Label

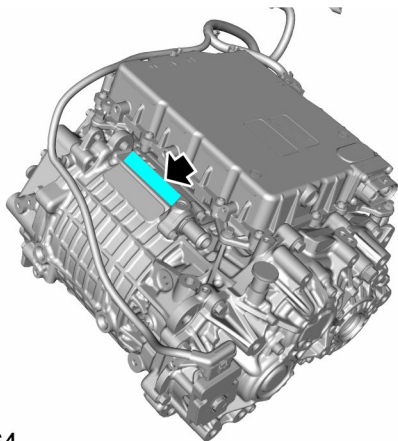
The identification plate is located at the lower side of the right B pillar. For details, please refer to the specific vehicle identification plate.



S0000162

Position of Important ID Numbers Drive Motor Number**Electric Drive System**

On the upper left side of the electric drive system housing, as shown in the figure



S0000164

Maintenance and Lubrication

Capacity

Fluid capacity

The following capacity values are merely approximate value for the corresponding system.

Component/ System	Capacity	
	2WD	4WD
Front Electric Drive Transmission Oil:	—	1.1L
Rear Electric Drive Transmission Oil (125kW&150kW) :	0.85L	—
Rear Electric Drive Transmission Oil (170kW&180kW) :	0.9L	
Electric Drive Transmission coolant:	5.6L	6.4L
High-voltage battery pack coolant:	4.0L	
Brake System Brake Fluid:	0.8L	
Windshield Washer Reservoir:	2.5L	

Fluid**Coolant**

Only use the coolant recommended and approved by MG Motor. Glycol (OAT) coolant is recommended.

In an emergency, a small amount of clean water may be added to the coolant reservoir. However, it should be noted that this will weaken the anti-freeze and corrosion protection function and reduce the service life of the coolant. DO NOT refill the cooling system with anti-freeze of different formulations.

The addition of corrosion inhibitors or other additives to the cooling system of this car may severely disrupt the efficiency of the system and cause electric drive system(EDS) and high voltage battery pack(ESS) damage. It is recommended to use additives approved by MG Motor.

Brake Fluid

Use brake fluid DOT-4 only.

Lubricating Fluids**Transmission Fluid**

Failure to use the specified transmission fluid may result in serious damage to the transmission.

Refill or fill up with Shell E-Fluids E6 iX (SL2808) oil.

General lubricating grease

Use produced FN745/94 lubricating grease.

Lock, Lock Body and Hinge

Do not apply any lubricating grease on the fixed end of the door hinge torsion bar spring, however, Isoflex Topas L32CN lubricating grease is recommended for its rotating end.

Washer Fluid

Use ZY-VIII washer fluid.

Cooling System

Specification

Torque

Description	Value
Bolt-Evaporator pipe to Condenser	7-10Nm
Bolt-Pipe-Compressor to condenser to Condenser	7-10Nm
Bolt-Pipe-evaporator to compressor to Tank beam	7-10Nm
Bolt-Condenser to Cooling fan	4.5-5.5Nm
Nut-Air duct to Front bumper beam	5-6Nm
Bolt-Radiator upper bracket to Front anti-collision beam assembly	7-10Nm
Bolt-Drive motor control module tank to Body	4-6Nm
Bolt-Battery cooler to Body	7-10Nm
Nut-Battery cooler tank to Body	4-6Nm

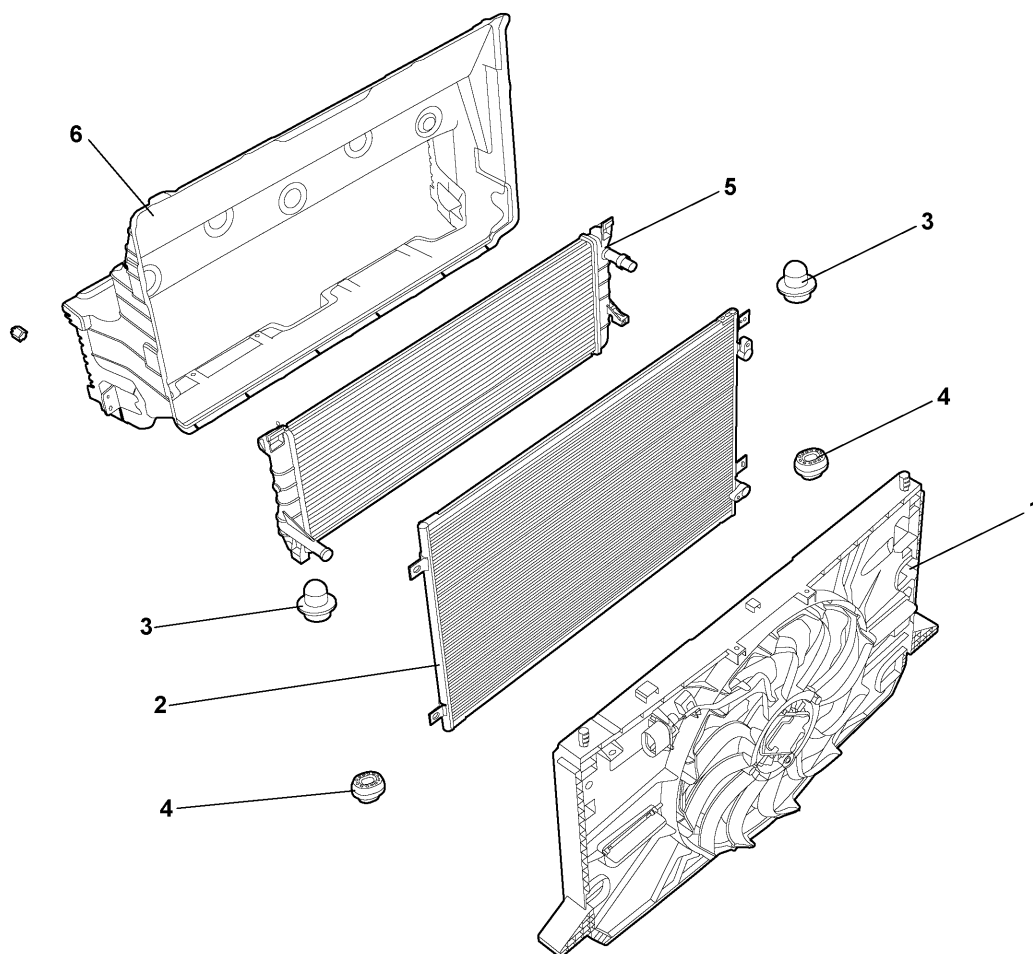
Parameters

Coolant: Type Drive Motor Control Module Coolant - 2WD Drive Motor Control Module Coolant - 4WD Power Battery Coolant	OAT organic acid coolant consisting of water and ethylene glycol 5.6 L 6.4L 4.0L
Cooling fan: Cooling fan control - high-voltage power supplied ON: EDS cooling pump is on, EDS coolant temperature Compressor ON, A/C refrigerant pressure OFF:	Temperature-controlled electric axial flow type If one of the conditions is met, the cooling fan is turned on $\geq 55^{\circ}\text{C}$ $\geq 0.22\text{ MPa}$ The above conditions for turning on cooling fan are not met
Cooling fan control - high-voltage power not supplied ON: EDS coolant temperature Duration: Ambient temperature $\geq 5^{\circ}\text{C}$ Ambient temperature $< 5^{\circ}\text{C}$	$\geq 63^{\circ}\text{C}$ 120s 60s
Radiator	Crossflow Type
Cooling Water Pump Power Drive voltage Rate of flow	80W 9-16V Approx. 1900l/h, 30Kpa
Relief valve of radiator pressure cover High pressure ON Low pressure ON	140-160 kPa -2-10 kPa

Description and Operation

System Layout

Front-end Cooling Module

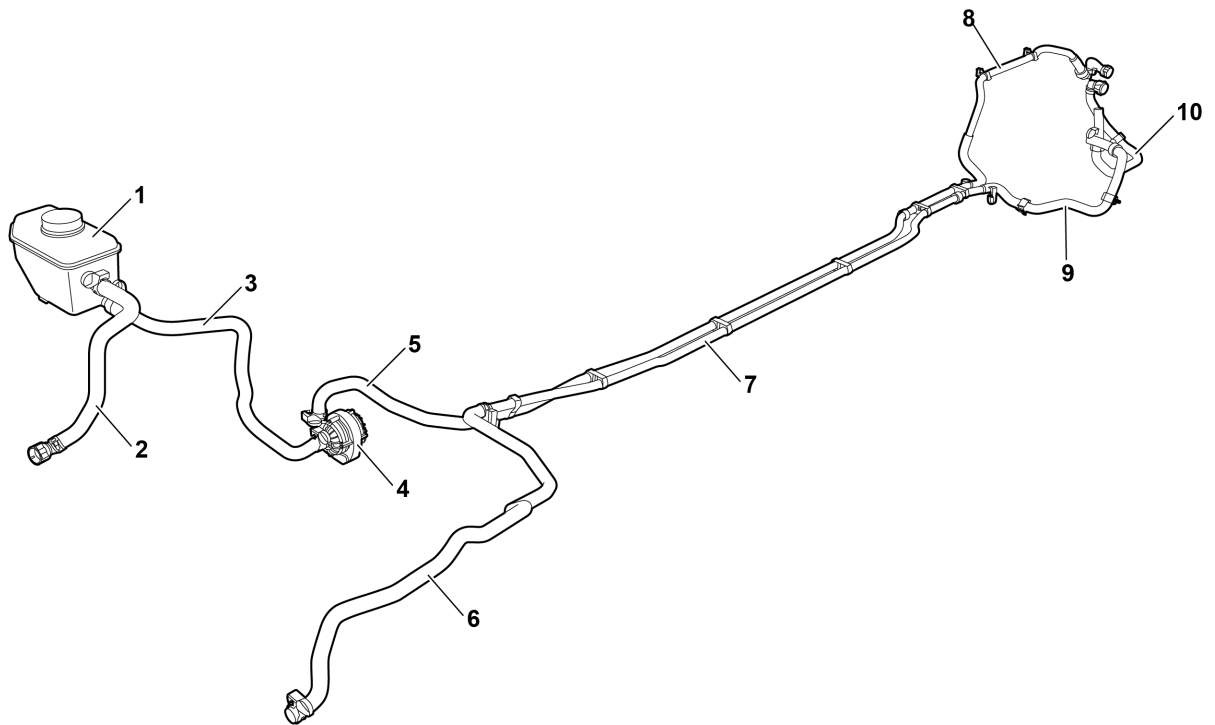


S3120240

- 1. Cooling Fan
- 2. Condenser
- 3. Upper Shock Pad
- 4. Lower Shock Pad
- 5. Condenser
- 6. Wind Scooper Assembly

Cooling Pipeline

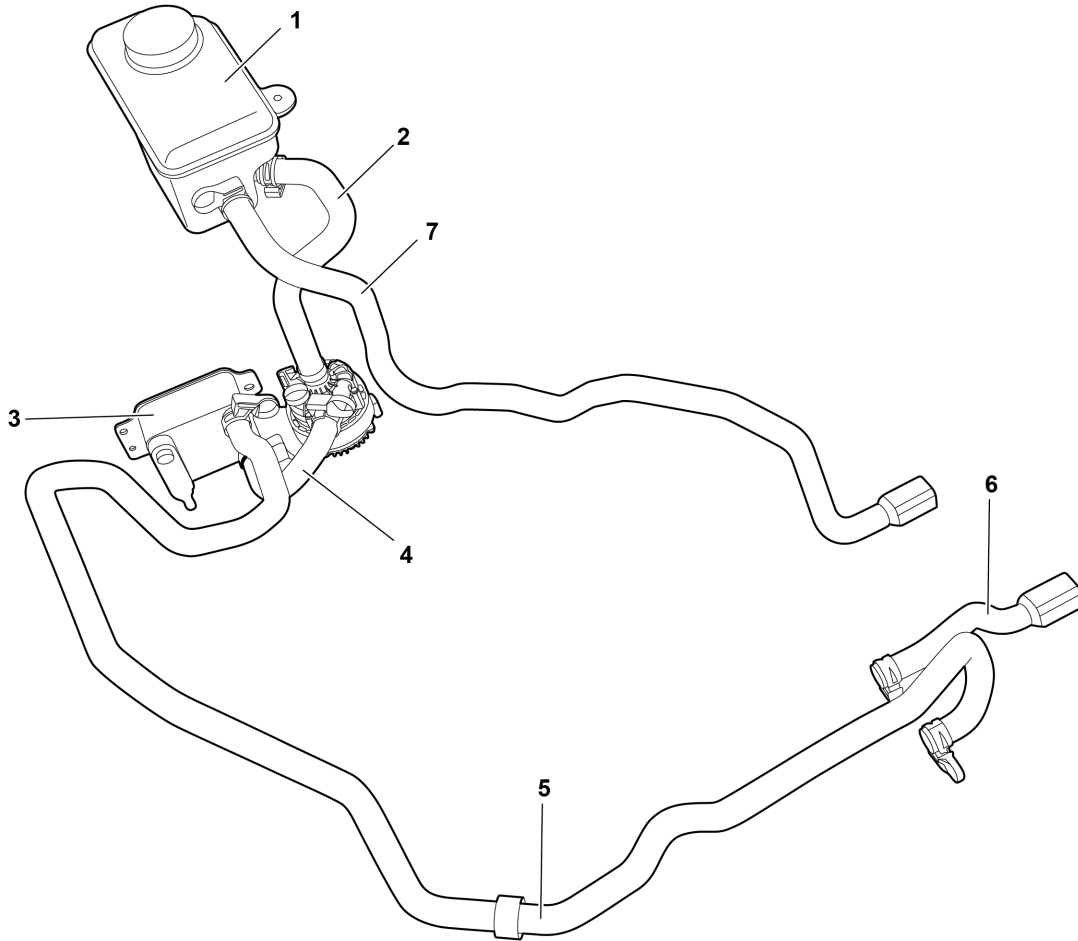
Cooling Pipeline EDS



S3120238

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Drive Motor Control Module Expansion Tank 2. Pipeline Assembly - Low Temperature Radiator to Expansion Tank 3. Pipeline Assembly - Drive Motor Control Module Expansion Tank to Water Pump 4. Drive Motor Control Module Water Pump 5. Pipeline Assembly - Electronic Water Pump to Combined Charging Unit - Electronic Water Pump to CCU | <ol style="list-style-type: none"> 6. Pipeline Assembly - Motor to Radiator 7. Pipeline Assembly - Cooling System 8. Pipeline Assembly - Electronic Water Pump to Combined Charging Unit 9. Drive Motor Water Outlet Pipe Assembly 10. Pipeline Assembly - Combined Charging Unit to Drive Motor Control Module |
|--|--|

Cooling Pipeline ESS

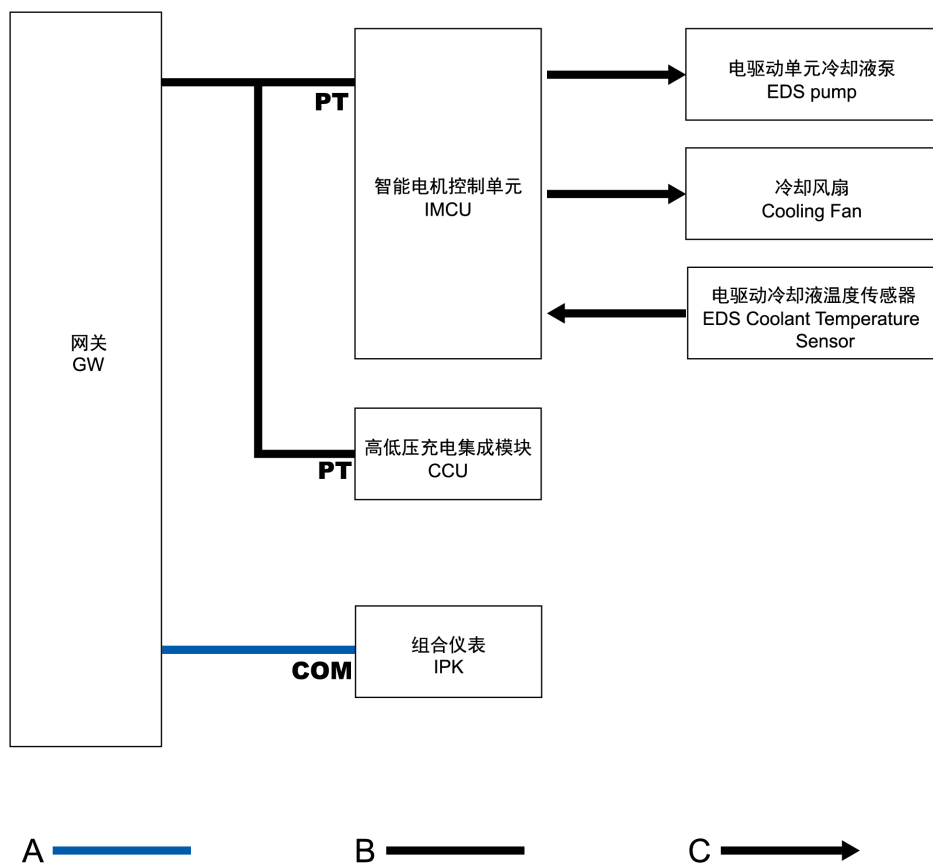


S3120239

- | | |
|--|--|
| 1. Battery Cooler Expansion Tank | 5. Pipeline Assembly - Battery Cooler to Power Battery Heater |
| 2. Pipeline Assembly - Battery Cooler Expansion Tank to Water Pump | 6. Pipeline Assembly - Power Battery Heater to Power Battery |
| 3. Power Battery Cooler Assembly | 7. Pipeline Assembly - Power Battery to Battery Expansion Tank |
| 4. Pipeline Assembly - Water Pump to Battery Cooler | |

System Control Diagram

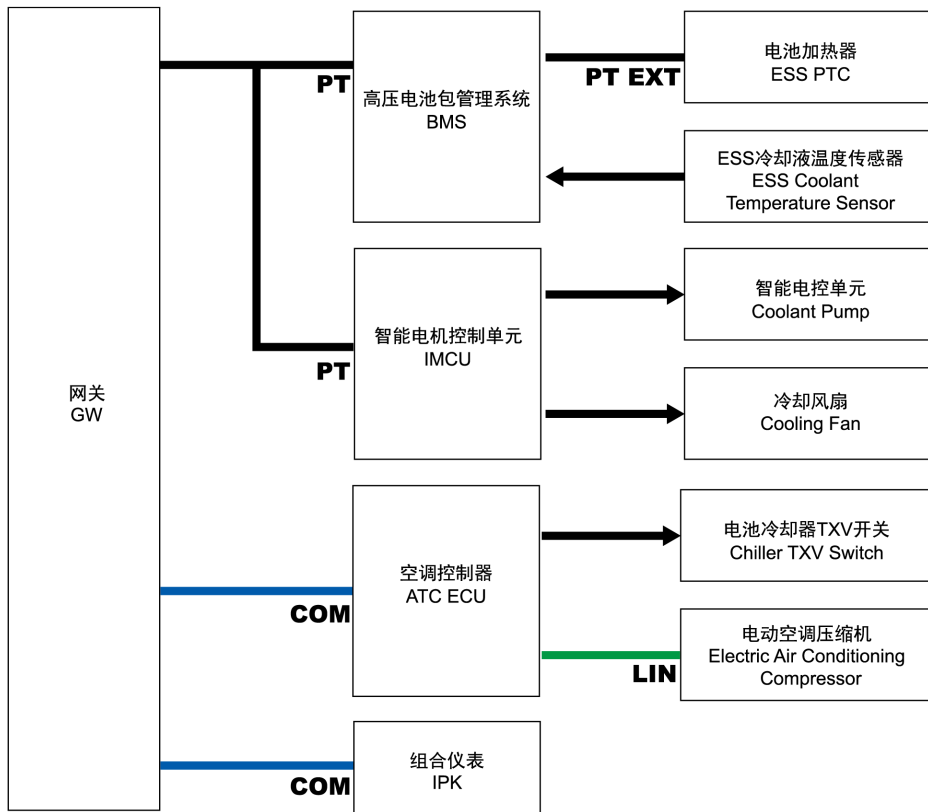
Electric Drive Unit Cooling



S3121028

A = Comfort CAN; B = Power HS CAN; C = Hard Wire

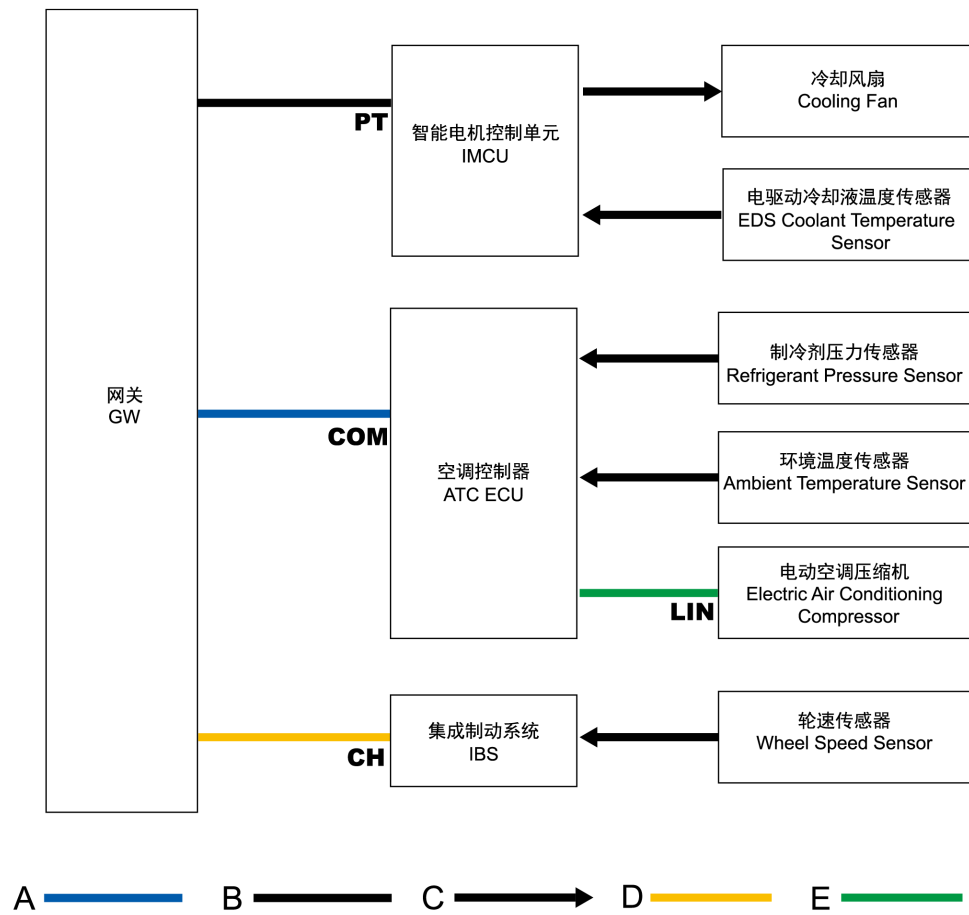
HV Battery Pack Cooling



S3121029

A = Comfort CAN; B = Power CAN; C = Hard Wire; D = LIN Bus

Cooling Fan Control



S3121030

A = Comfort CAN; B = Power HS CAN; C = Hard Wire; D = Chassis CAN; E = LIN Bus

Description

Overview

The cooling system is divided into 2 separate systems, namely the electric drive unit cooling system and HV battery pack cooling system.

The cooling system utilizes the principle of heat conduction, and the coolant is circulated in the individual cooling systems to keep the combined charging unit (CCU), electric drive system (EDS) and battery at an optimum operating temperature.

Cooling System Components

Coolant

The coolant is composed of water, antifreeze (glycol type) and a little additive. The water quality will directly affect the property of the coolant. Coolant made of water with high hardness and much corrosive ion (for example, chloride ion, sulfate ion) can cause rust and scaling on the heat transfer surface and severe corrosion on the metal.

The coolant provides the anti-freeze, anti-boiling, anti-corrosion, anti-rust and anti-foam functions.

To keep its optimum efficiency, the coolant shall be replaced regularly.

Coolant Pump

The coolant pump drives the coolant to flow.

The electric drive unit cooling pump circulates the electric drive unit coolant by its operation.

The battery cooling pump circulates the battery cooling system coolant by its operation.

Coolant Hose

The rubber coolant hose delivers coolant among all components. The coolant hose is fixed to each component by spring clamps.

Expansion Tank

The expansion tank is used to store and supplement coolant in the system.

The level mark on the expansion tank is used to easily check the coolant level. When the coolant is below the MIN mark, refill and maintain the level between MIN and MAX to ensure normal operation of the cooling system.

Front-end Cooling Module

The cooling module consists of the radiator, condenser and cooling fan.

The radiator is used to cool the coolant, the condenser is used to cool the refrigerant, and the cooling fan is used to control the heat exchange speed between the radiator and the condenser.

The bottom of the radiator is located in the rubber bushing supported by the bracket fixed on the front longitudinal beam,

and the top is in the rubber bushing supported by the bracket of the upper radiator beam.

The condenser is in front of the radiator, and the cooling fan is behind the radiator.

Battery Chiller

The battery chiller is a key component of the battery cooling system, and is responsible for regulating the temperature of the battery coolant.

The battery chiller consists of the following components: battery chiller core, battery chiller expansion valve, battery chiller bracket, refrigerant intake and exhaust pipe, coolant inlet and outlet hard pipe, chiller bracket shock pad, O-ring and mounting bolts.

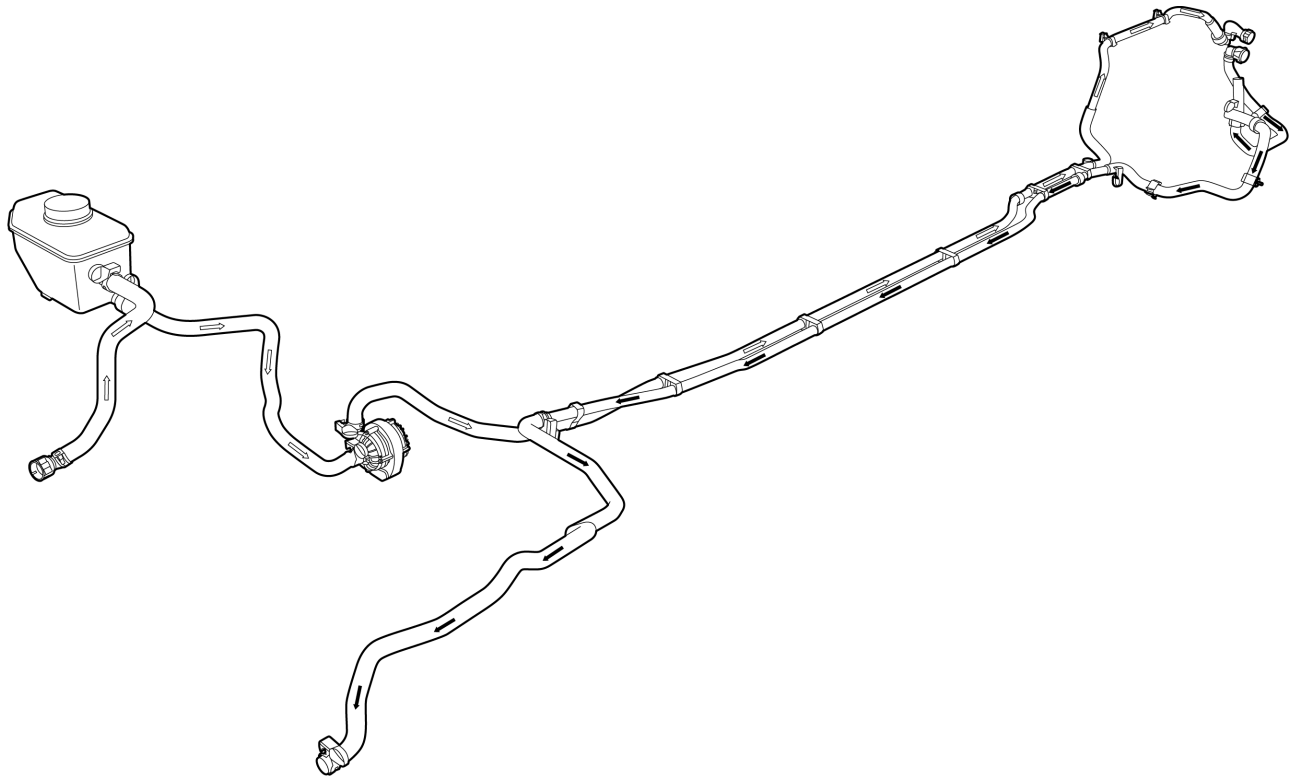
Coolant Temperature Sensor

The coolant temperature sensor is on the cooling pipe, which is used to detect the temperature of the coolant.

The coolant temperature sensor is an NTC (Negative Temperature Coefficient) thermistor which contacts with the coolant and is part of the bleeder circuit.

Operation

Electric Drive System (EDS) Cooling



冷水 →

热水 →

S3120257

Coolant Circulation

The coolant of electric drive cooling system is circulated by the EDS coolant pump. The heat from the EDS, CCU, etc. is transferred to the radiator through coolant, and to the atmosphere through the airflow blown by the cooling fan.

The coolant circulates from the port of the EDS water pump back to the water pump inlet via the CCU, EDS, and radiator. The expansion tank of the cooling system is used to store and supplement coolant required by the system.

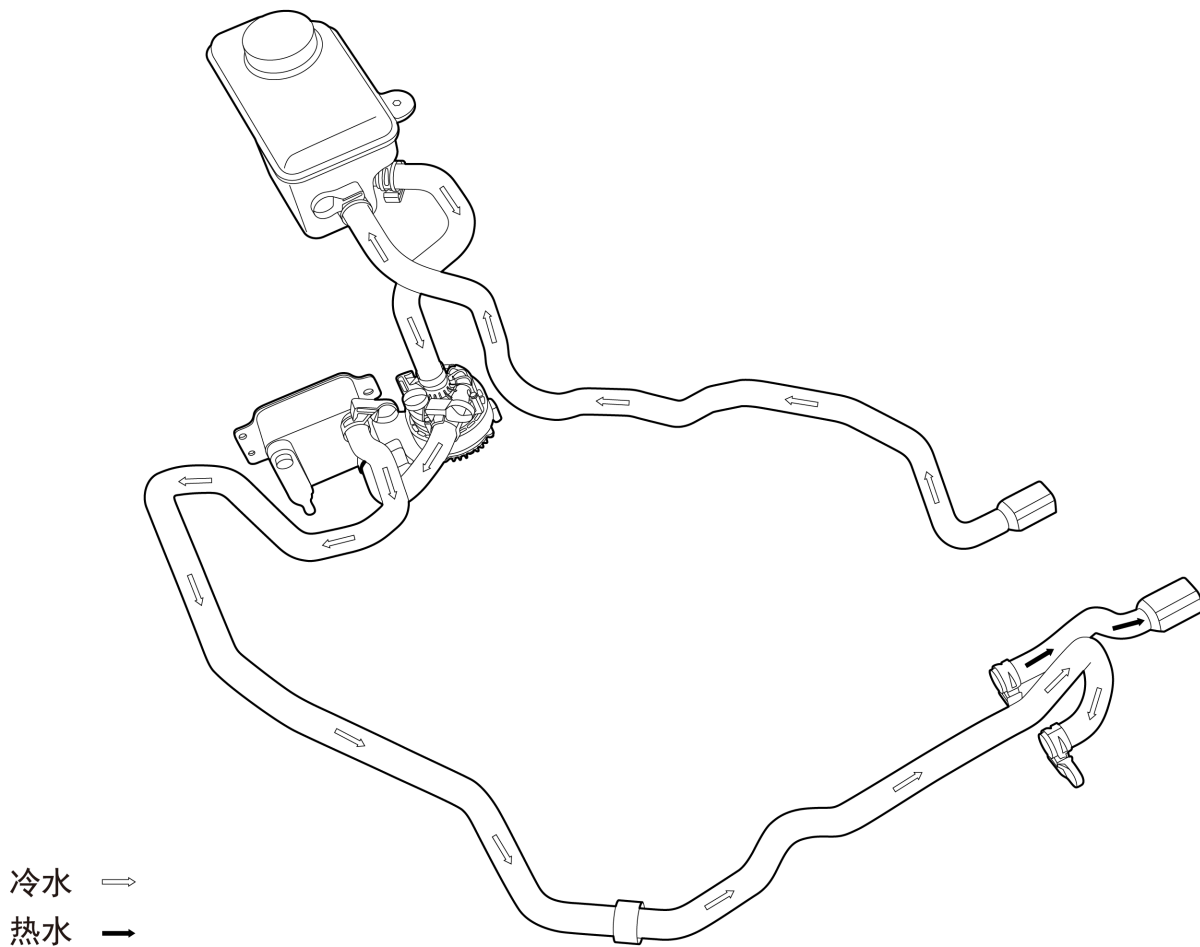
Coolant Temperature Control

When the vehicle is supplied with high voltage, the EDS cooling pump starts operation at low speed. As the temperature in the coolant circulation components increases, the coolant pump speeds up. Meanwhile, the EDS coolant temperature sensor detects the coolant temperature of the entire system. As the coolant temperature rises continuously, the cooling fan rotates at an appropriate speed to provide the required air volume for the radiator to dissipate heat.

Cooling System Alarm

When the EDS coolant temperature sensor detects excessive coolant temperature, an alarm message will be displayed on IPK. The EDS system may also illuminate the motor overheat MIL.

High-voltage Battery Pack (ESS) Thermal Management



S3120258

To ensure the operation effect of high-voltage battery pack, it is necessary to effectively and fully manage the temperature of the high-voltage battery pack through external cooling or heating.

Coolant Circulation

The coolant of high-voltage battery pack is circulated by the battery coolant pump. The coolant of high-voltage battery pack circulates from the port of the battery water pump back to the water pump inlet via the battery heater (if any), battery chiller, high-voltage battery pack and battery coolant expansion tank.

High-voltage Battery Pack (ESS) Cooling

The ESS battery cooling cycle can be started during fast charging and vehicle driving.

The heat generated by the battery pack is transferred to the battery chiller via the coolant. The battery chiller is cooled by the refrigerant.

Water pump control: The high-voltage battery pack contains multiple battery temperature sensors that send signals to BMS, which communicates with IMCU through the gateway to turn on or off the battery water pump. When the maximum battery temperature is greater than or equal to a certain value, the

IMCU turns on the battery water pump; when the maximum battery temperature is less than a certain value, the IMCU turns off the battery water pump.

Battery chiller control: When the battery water pump is turned on and the battery coolant temperature is greater than the threshold, the A/C controller opens the expansion solenoid valve on the battery chiller, so that the refrigerant flows through the battery chiller to cool down the coolant. When the battery water pump is turned off, or the battery coolant temperature is less than or equal to a certain value, the A/C controller will close the expansion solenoid valve on the battery chiller. When there is no compressor ON request in the passenger compartment, the compressor is turned on after the expansion solenoid valve of battery chiller is opened; after the compressor is turned off, the expansion solenoid valve of battery chiller is closed. If the cooling requirements of the passenger compartment and battery cannot be met at the same time, the system will prioritize the battery cooling over the passenger compartment cooling.

High-voltage Battery Pack (ESS) Heating (If Any)

The ESS battery heating cycle can be started during fast charging under low temperature.

The high-voltage battery heater (PTC) heats the battery coolant, which transfers the heat to the battery through rotation of the water pump for the purpose of heating the battery.

Water pump control: When the minimum battery temperature is less than a certain value, the IMCU turns on the battery water pump; when the minimum battery temperature is greater than or equal to a certain value, the IMCU turns off the battery water pump.

High-voltage battery heater (PTC) control: When the battery water pump is turned on, the high-voltage battery heater (PTC) receives the PT EXT signal from BMS to turn on the heating function, and adjusts the output power in real time to warm up the high-voltage battery pack in an optimal manner; when the battery temperature rises to a certain value, the BMS controls the battery heater (PTC) to stop heating before turning off the water pump.

Battery Thermal Management System Alarm

When the BMS detects excessive battery temperature, it will transfer the information to IPK, which will display the relevant alarm prompt or illuminate the alarm lamp.

Cooling Fan Control

Cooling Fan Control

The PWM cooling fan is controlled by the IMCU. When the cooling fan operates, the IMCU controls the PWM module, so that the cooling fan operates at 8 speeds within the duty ratio range of 92% to meet different cooling load requirements.

Cooling fan ON and OFF after high voltage is applied:

Cooling fan ON - If any of the following conditions is met, the cooling fan is turned on:

The EDS cooling pump is turned on, and the EDS coolant temperature is 55°C or above;

The compressor is turned on, and the A/C pressure is 0.22 Mpa or above.

Cooling fan OFF: The above conditions for turning on the cooling fan are not met.

Cooling fan ON and OFF after high voltage is off:

Cooling fan ON:

The EDS coolant temperature is 63°C or above;

The ambient temperature is 5°C or above for 120 seconds.

The ambient temperature is < 5°C for 60 seconds.

Speed change of cooling fan after turned on when high voltage is applied:

The speed of cooling fan is determined by the EDS coolant temperature, ambient temperature, A/C refrigerant pressure and vehicle speed.

Service Guide - Universal Guide

Drain and Refill - EDS

Drain

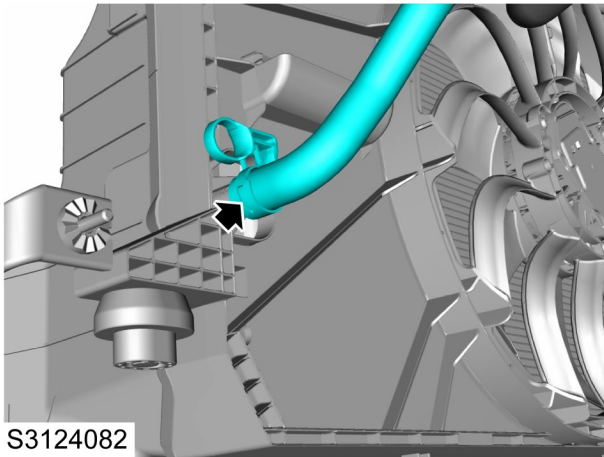
1. Unscrew the coolant expansion tank cap.
2. Prepare a proper container to collect the spilled coolant.
3. Remove the front bottom deflector.

Bottom Deflector Remove

4. Remove the manual service disconnect.

Manual Service Disconnect Remove

5. Disconnect the pipeline from the radiator.



6. Drain the cooling system.

Refill

1. Connect the pipeline to the radiator.
2. Fit the manual service disconnect.

Manual Service Disconnect Refit

3. Fit the front bottom deflector.

Bottom Deflector Refit

4. Prepare the coolant of specified concentration.

Fluid Fluid

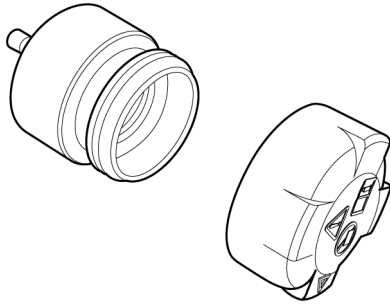
5. Refill the cooling system, until the coolant level reaches between MIN and MAX marks on the expansion tank and keeps still.
6. Connect the scan tool and enter the SIPS to perform the electric drive unit coolant refill/bleeding. The specific path is SIPS—Fast Channel—Electric Drive Unit Coolant Refill/Bleeding.
7. Observe the flow of coolant in the tank (coolant flow indicates that the pump is not idling).
8. Keep the coolant flowing for 20 to 30 minutes. The coolant can be added when the coolant level in the expansion tank is low during this process.
9. When the coolant level in the expansion tank does not change, disconnect the scan tool.
10. Check whether the coolant level is between MIN and

MAX. If not, fill the coolant between MIN and MAX as required.

11. Fit and tighten the coolant expansion tank cap.
12. Check the cooling system for leak.

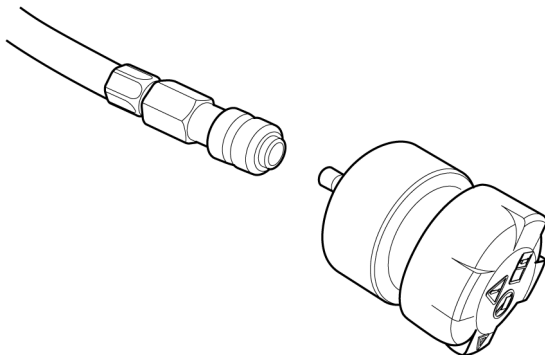
Pressure Cap Testing - EDS Check

1. Visually check the expansion tank cap for signs of leakage.
2. Check the hose for signs of rupture or twisting and for the reliability of pipeline connection.
3. Unscrew the coolant expansion tank cap.
4. Fit TEN00010 to the expansion tank cap.



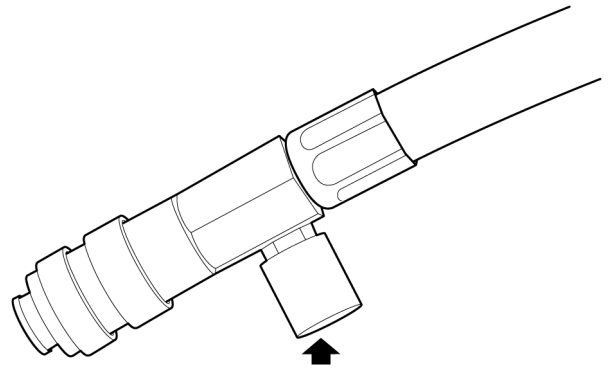
S3123414

5. Connect the pressure hose of the pressurizer TI4001 to TEN00010.



S3123415

6. Pressurize the expansion tank cap slowly to the specified pressure, then check the pressure; if the pressure range is maintained within 140 - 160KPa, the expansion tank cap is normal.
7. Release pressure through the relief valve on the pressurizer TI4001.

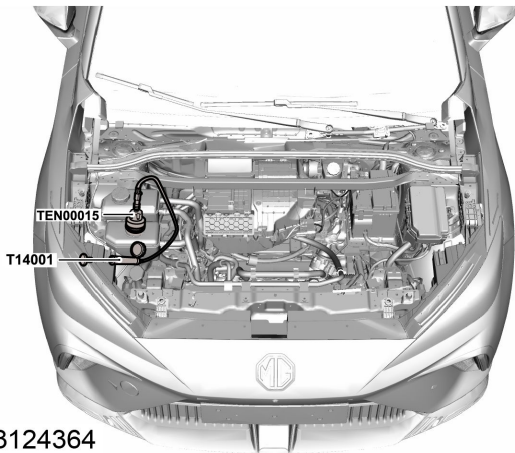


S143048

8. Remove TI4001 pressure hose from TEN00010.
9. Remove the expansion tank cap from TEN00010 and fit it to the expansion tank.

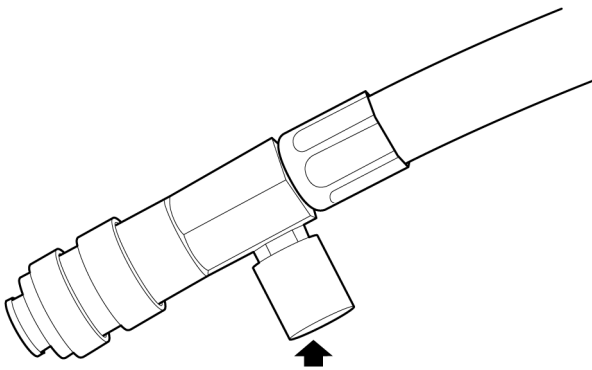
System Pressure Testing - EDS Check

1. Remove the trim cover blocking the coolant expansion tank.
2. Check the hose for signs of rupture or twisting and for the reliability of pipeline connection.
3. Unscrew the coolant expansion tank cap.
4. Fit TENG0015 to the expansion tank.
5. Connect T14001 pressure hose to TENG0015.
6. Pressurize the system to the pressure of 140 - 160KPa slowly and check it for leakage.




S3124364

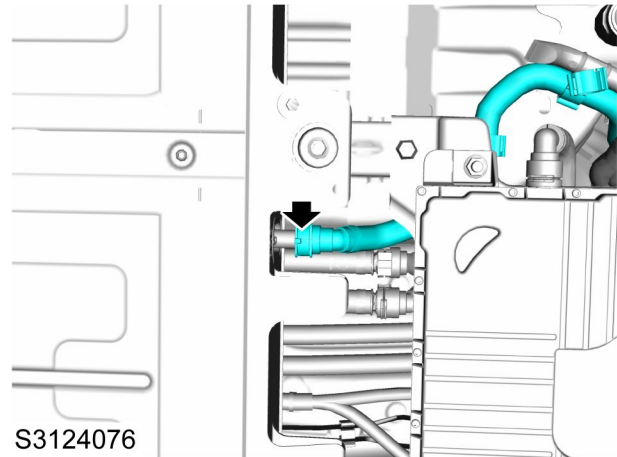
7. Visually check the electric drive unit and the cooling system for signs of coolant leakage.
8. Release pressure through the relief valve on T14001.



S143048


Drain and Refill - ESS Drain

1. Disconnect the negative battery cable.
 2. Remove the manual service disconnect.
-  **Manual Service Disconnect Remove**
3. Cover the expansion tank cap with a wet cloth, and unscrew the cap.
 4. Place a proper container to collect the coolant.
 5. Disconnect the pipeline from the power battery.



6. Drain the coolant in the high-voltage battery pack.

Refill

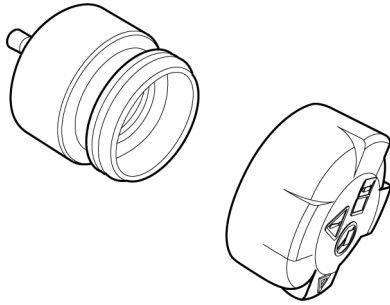
1. Connect the pipeline to the power battery.
 2. Fit the manual service disconnect.
-  **Manual Service Disconnect Refit**
3. Connect the negative battery cable.
 4. Prepare the coolant of specified concentration.

Fluid Fluid

5. Refill the cooling system, until the coolant level reaches between MIN and MAX marks on the expansion tank and keeps still.
6. Connect the scan tool and enter the SIPS to perform the electric drive unit coolant refill/bleeding. The specific path is SIPS—Fast Channel—High-voltage Battery Pack Coolant Refill/Bleeding.
7. Observe the flow of coolant in the tank (coolant flow indicates that the pump is not idling).
8. Keep the coolant flowing for 20 to 30 minutes. The coolant can be added when the coolant level in the expansion tank is low during this process.
9. When the coolant level in the expansion tank does not change, disconnect the scan tool.
10. Check whether the coolant level is between MIN and MAX. If not, fill the coolant between MIN and MAX as required.
11. Fit and tighten the coolant expansion tank cap.
12. Check the cooling system for leak.

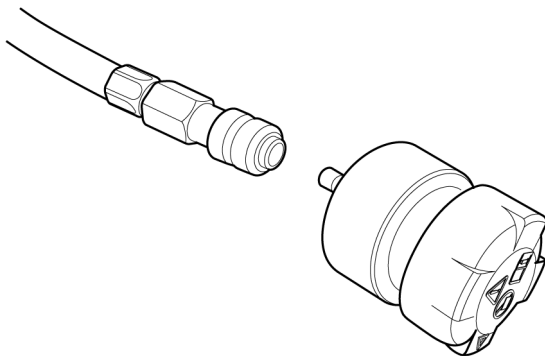
**Pressure Cap Testing - ESS
Check**

1. Visually check the expansion tank cap for signs of leakage.
2. Check the hose for signs of rupture or twisting and for the reliability of pipeline connection.
3. Open the coolant expansion tank cap.
4. Fit TENO0010 to the expansion tank cap.



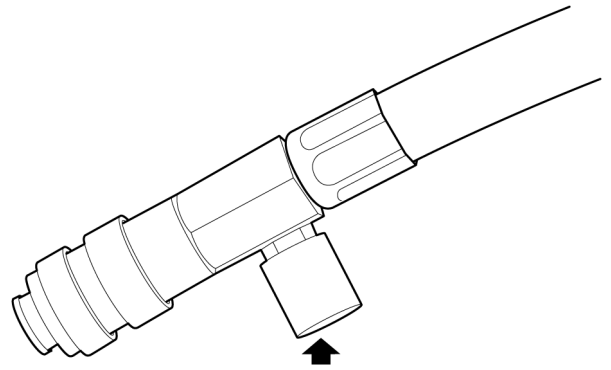
S3123414

5. Connect T14001 pressure hose to TENO0010.



S3123415

6. Pressurize the expansion tank cap slowly to the specified pressure, then check the pressure; if the pressure is maintained at 140KPa, the expansion tank cap is normal.
7. Release pressure through the relief valve on the pressurizer.

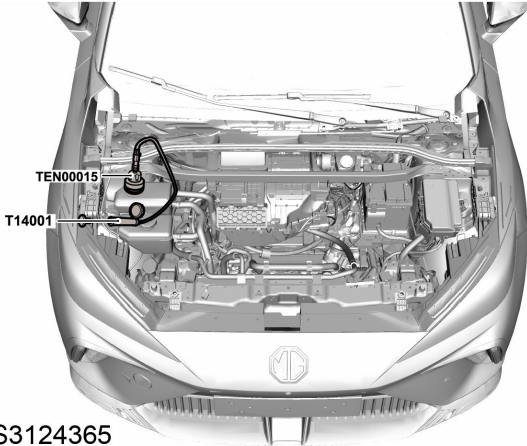


S143048

8. Remove T14001 pressure hose from TENO0010.
9. Remove the expansion tank cap from TENO0010 and fit it to the expansion tank.
10. Fit the high-voltage battery pack expansion tank trim panel.

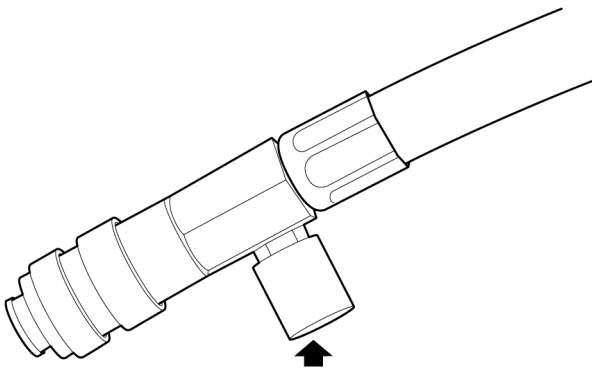
System Pressure Testing - ESS Check

1. Check the hose for signs of rupture or twisting and for the reliability of pipeline connection.
2. Open the coolant expansion tank cap.
3. Fit TENO0015 to the expansion tank.
4. Connect TI4001 pressure hose to TENO0015.



S3124365

5. Pressurize the system to the pressure of 140KPa slowly and check for leakage.
6. Visually check the high-voltage battery pack and cooling system for signs of coolant leakage.
7. Release pressure through the relief valve on TI4001.




S143048

8. Disconnect TI4001 hose from TENO0015.
9. Remove TENO0015 from the expansion tank and fit the expansion tank cap.

Service Guide - Front-end Cooling Module

Cooling System Radiator Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

 **Coolant Drain Refill**

3. Remove the beauty cover.

 **Beauty Cover Remove**

4. Recover the A/C system refrigerant.

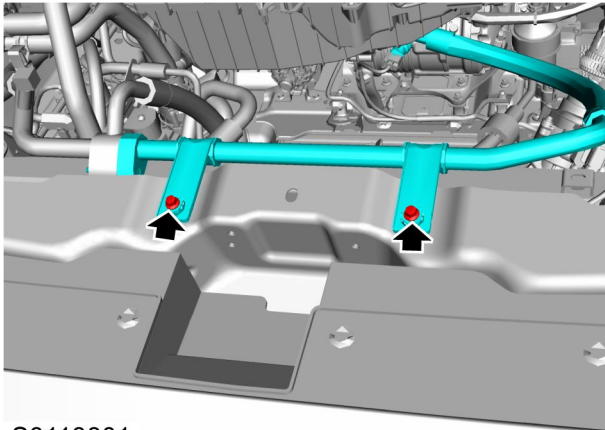
 **Refrigerant Refrigerant Recovery Air**

Conditioning System Drain A/C System Lubricating Oil Refill Refill

5. Remove the upper shock pad.

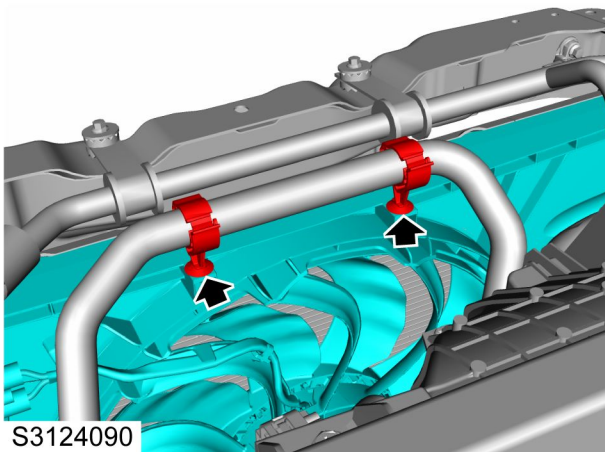
 **Upper Shock Pad Remove**

6. Remove 2 bolts fixing the pipeline assembly - A/C evaporator to compressor to the upper radiator beam.



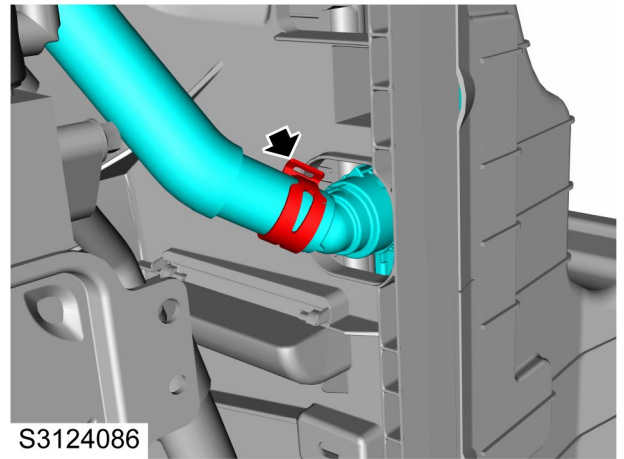
S3113801

7. Release the clip from to the cooling fan.



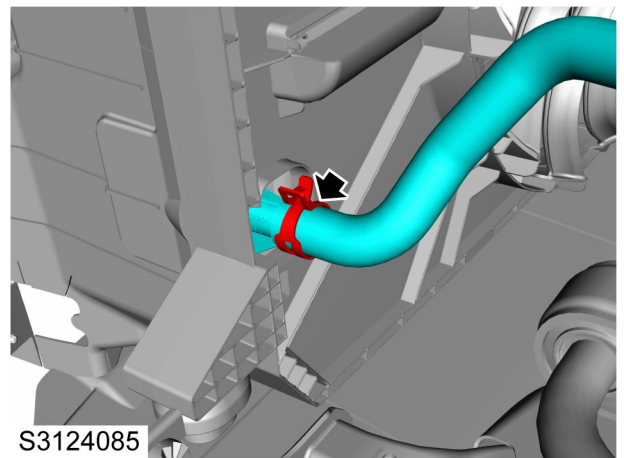
S3124090

8. Loosen the clamp, and disconnect the pipeline assembly - radiator to expansion tank from the radiator.



S3124086

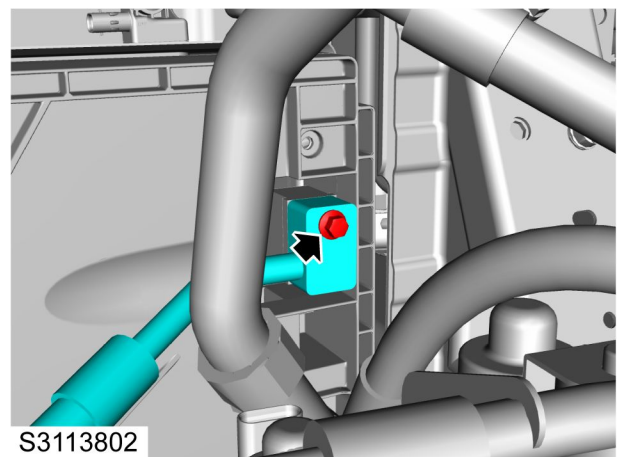
9. Loosen the clamp, and disconnect the pipeline assembly - motor to radiator from the radiator.



S3124085

10. Remove 1 bolt fixing the pipeline assembly - A/C compressor to condenser to the condenser, disconnect the pipeline, and discard the seal ring.

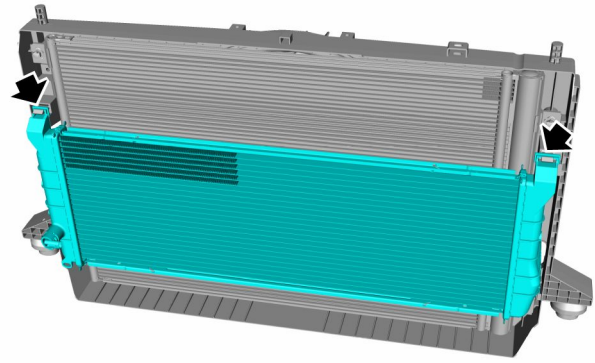
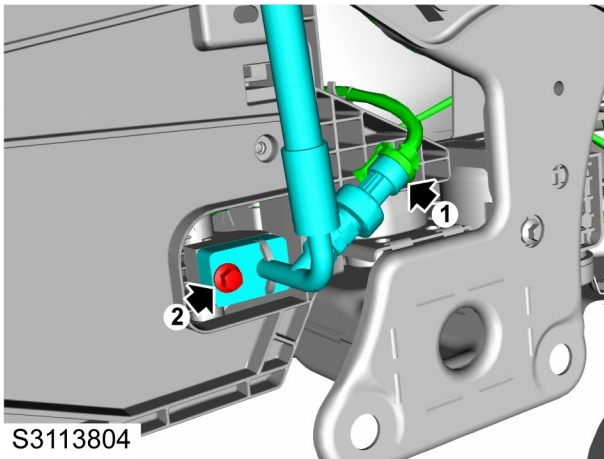
Caution : *Protect the pollutants from entering the open joints.*



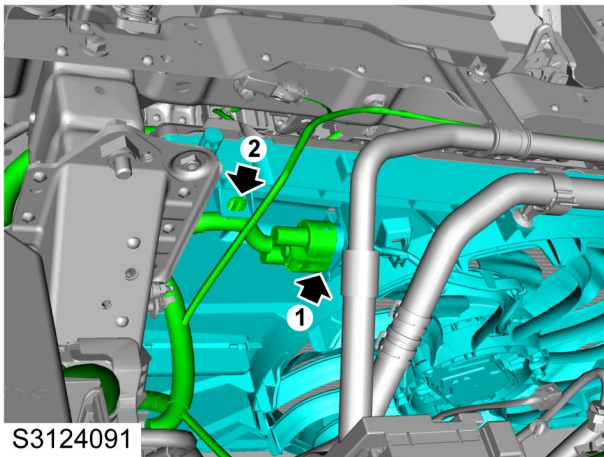
S3113802

11. Remove 1 bolt (2) fixing the evaporator pipe assembly to the condenser, disconnect the pipeline, and discard the seal ring.

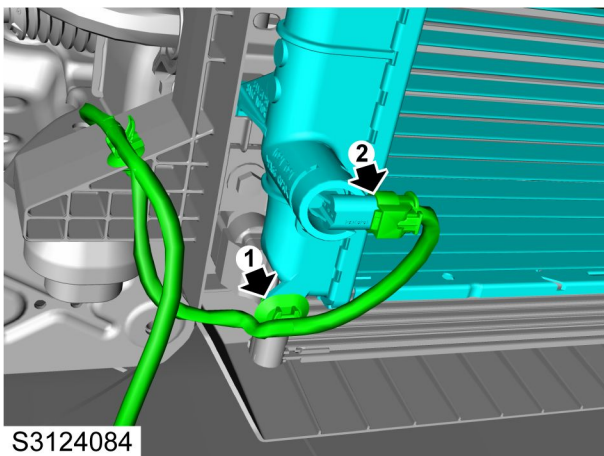
Caution : *Protect the pollutants from entering the open joints.*



12. Disconnect the harness connector (1) from the engine cooling fan, and loosen the harness clip (2).



13. Pull out the front-end cooling module.
14. Loosen the clip (1) fixing the front compartment harness assembly to the radiator.
15. Disconnect the harness connector (2) from the radiator.



16. Loosen the clip, and remove the radiator from the front-end cooling module.


S3124087

Refit

1. Fix the radiator to the front-end cooling module, and secure it with clips.
2. Connect the harness connector of the radiator.
3. Fix the front compartment harness assembly to the radiator, and secure it with clips.
4. Fit the front-end cooling module.
5. Connect the harness connector of the engine cooling fan, and secure the harness with clips.
6. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.
7. Fix the evaporator pipe assembly to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
8. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.
9. Fix the pipeline assembly - A/C compressor to condenser to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
10. Connect the pipeline assembly - motor to radiator to the radiator, and secure it with clamps.
11. Connect the pipeline assembly - radiator to expansion tank to the radiator, and secure it with clamps.
12. Fix the cooling pipeline to the cooling fan, and secure it with clips.
13. Fix the pipeline assembly - A/C evaporator to compressor to the upper radiator beam, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.

 **Upper Shock Pad Refit**

15. Refill the A/C system refrigerant.

 **Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

16. Fit the beauty cover.

 **Beauty Cover Refit**

17. Refill the coolant.

Coolant Drain Refill

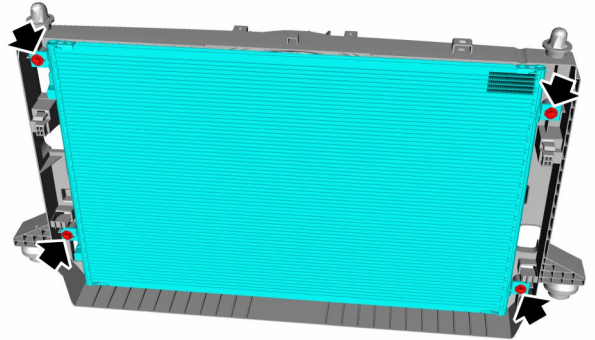
18. Connect the negative battery cable.

Condenser Assembly Remove

1. Remove the cooling system radiator.

Cooling System Radiator Remove

2. Remove 4 bolts fixing the condenser to the cooling fan.



S3124088

Refit

1. Fix the condenser to the cooling fan, fit 4 bolts, tighten them to **4.5-5.5Nm**, and check the torque.
2. Fit the cooling system radiator.

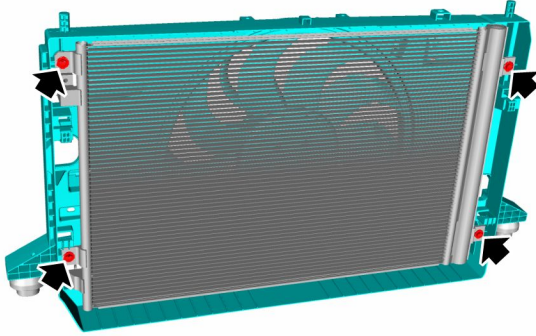
Cooling System Radiator Refit

Engine Cooling Fan Remove

1. Remove the cooling system radiator.

Cooling System Radiator Remove

2. Remove 4 bolts fixing the condenser to the cooling fan, and remove the engine cooling fan.



S3124242

Refit

1. Fit the engine cooling fan.
2. Fix the condenser to the cooling fan, fit 4 bolts, tighten them to **4.5-5.5Nm**, and check the torque.
3. Fit the cooling system radiator.

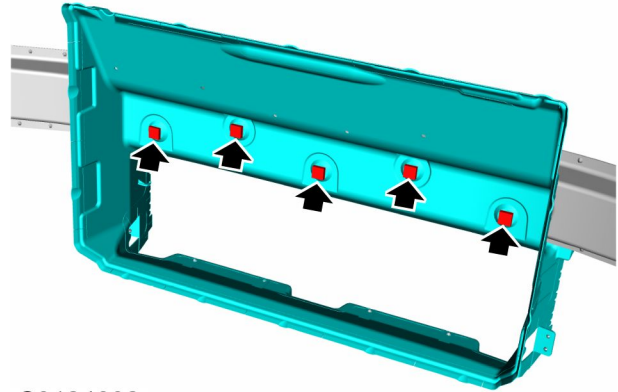
Cooling System Radiator Refit

Cooling System Wind Scooper Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper beam.

Front Bumper Beam Remove

3. Remove 5 nuts fixing the wind scooper to the front bumper beam.



S3124092

Refit

1. Fix the wind scooper to the front bumper beam, fit 5 nuts, tighten them to **5-6Nm**, and check the torque.
2. Refit the front bumper beam.

Front Bumper Beam Refit

3. Connect the negative battery cable.

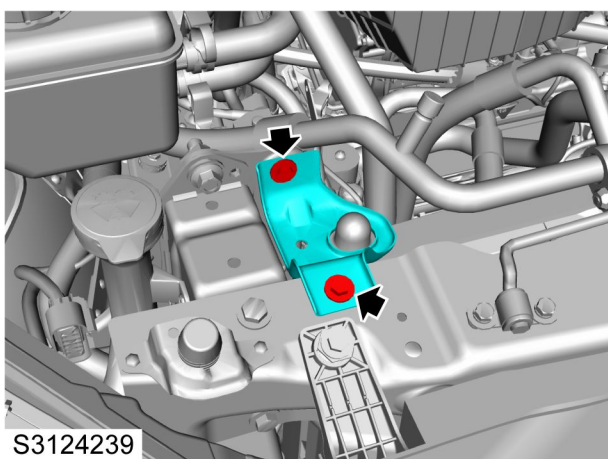
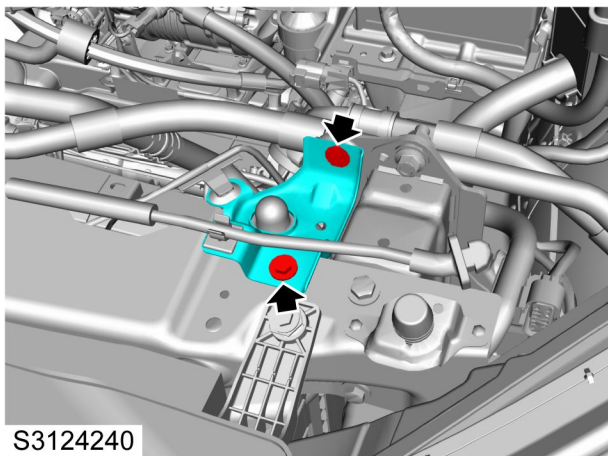
Radiator Upper Shock Pad Remove

 Beauty Cover Refit

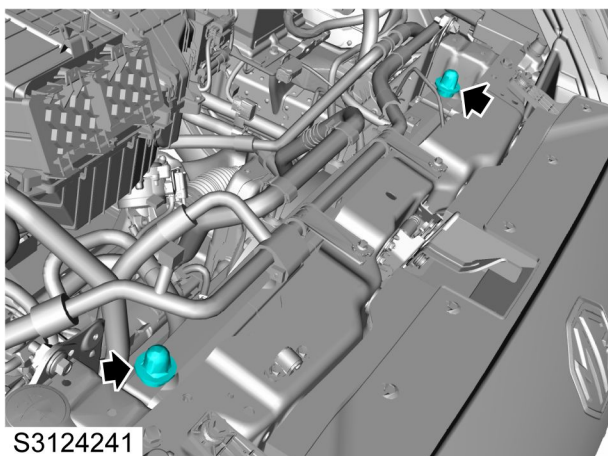
1. Remove the beauty cover.

Beauty Cover Remove

2. Remove 2 bolts fixing the upper radiator bracket to the front anti-collision beam assembly.



3. Remove the upper radiator shock pad from the radiator.



Refit

1. Fit the radiator upper shock pad.
2. Fix the upper radiator bracket to the front anti-collision beam assembly, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
3. Fit the beauty cover.

Radiator Lower Shock Pad Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant Drain Refill

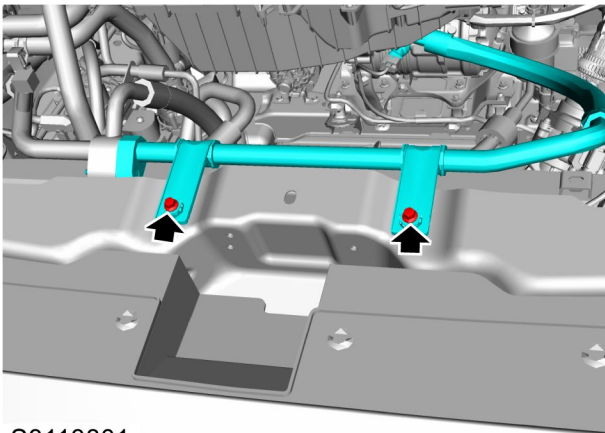
3. Recover the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Remove the upper shock pad.

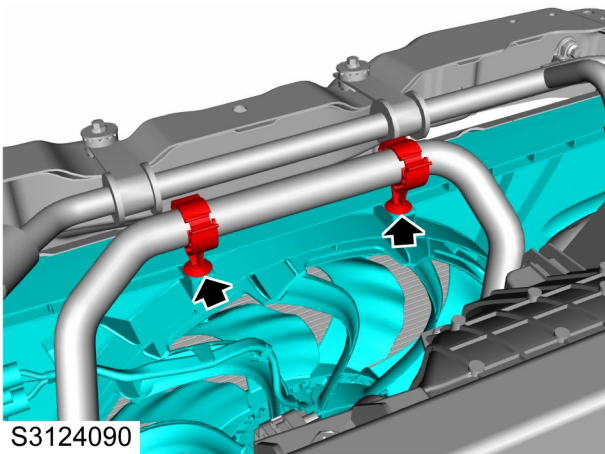
Upper Shock Pad Remove

5. Remove 2 bolts fixing the pipeline assembly - A/C evaporator to compressor to the upper radiator beam.



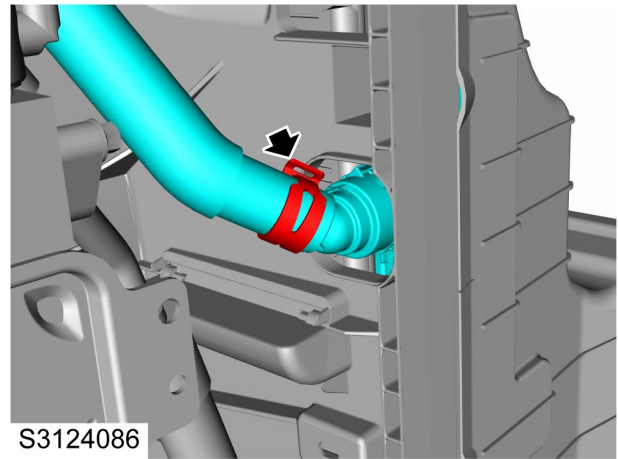
S3113801

6. Release the clip from to the cooling fan.



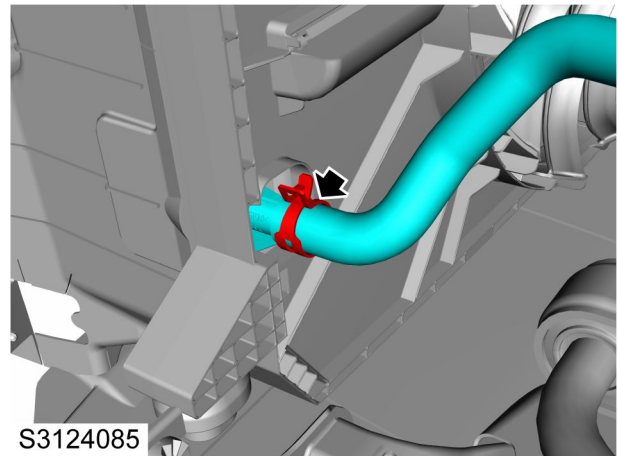
S3124090

7. Loosen the clamp, and disconnect the pipeline assembly - radiator to expansion tank from the radiator.



S3124086

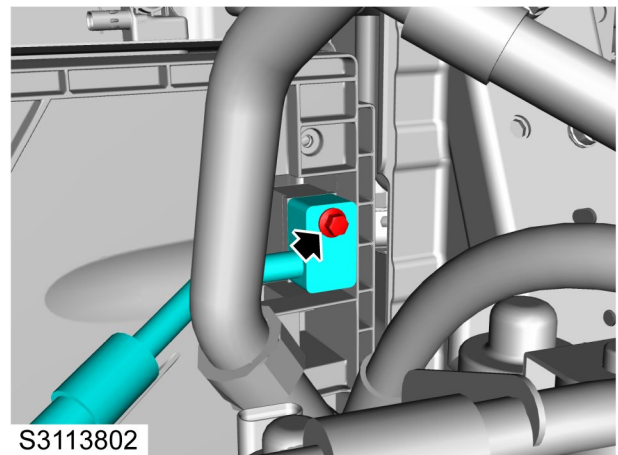
8. Loosen the clamp, and disconnect the pipeline assembly - motor to radiator from the radiator.



S3124085

9. Remove 1 bolt fixing the pipeline assembly - A/C compressor to condenser to the condenser, disconnect the pipeline, and discard the seal ring.

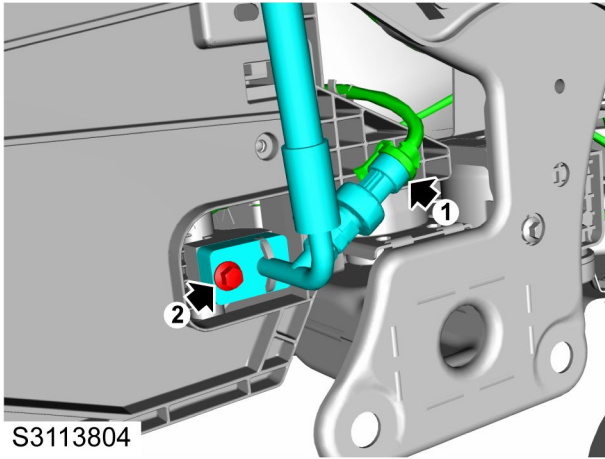
Caution : *Protect the pollutants from entering the open joints.*



S3113802

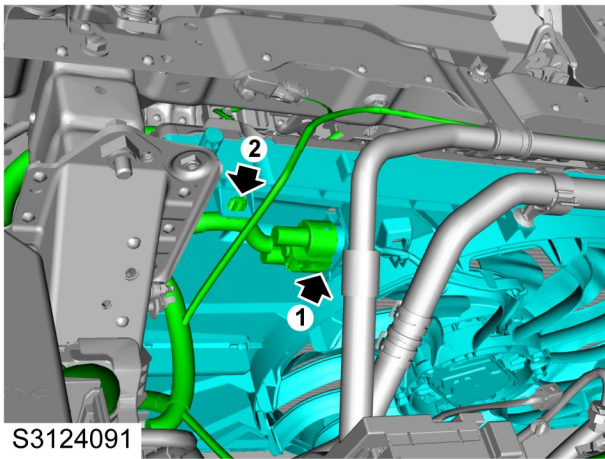
10. Remove 1 bolt (2) fixing the evaporator pipe assembly to the condenser, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



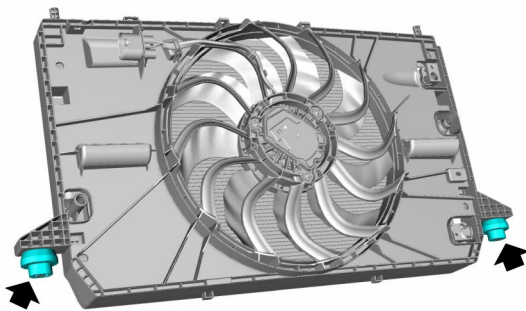
S3113804

11. Disconnect the harness connector (1) from the engine cooling fan, and loosen the harness clip (2).



S3124091

12. Pull out the front-end cooling module.
13. Remove the lower radiator shock pad from the front-end module.



S3124093

Refit


1. Fix the radiator lower shock pad to the front-end cooling module.
2. Fit the front-end cooling module.
3. Connect the harness connector of the engine cooling fan, and secure the harness with clips.
4. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.

5. Fix the evaporator pipe assembly to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.
7. Fix the pipeline assembly - A/C compressor to condenser to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
8. Connect the pipeline assembly - motor to radiator to the radiator, and secure it with clamps.
9. Connect the pipeline assembly - radiator to expansion tank to the radiator, and secure it with clamps.
10. Fix the cooling pipeline to the cooling fan, and secure it with clips.
11. Fix the pipeline assembly - A/C evaporator to compressor to the upper radiator beam, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.

12. Fit the upper shock pad.

 **Upper Shock Pad Refit**

13. Refill the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

14. Refill the coolant.

 **Coolant Drain Refill**

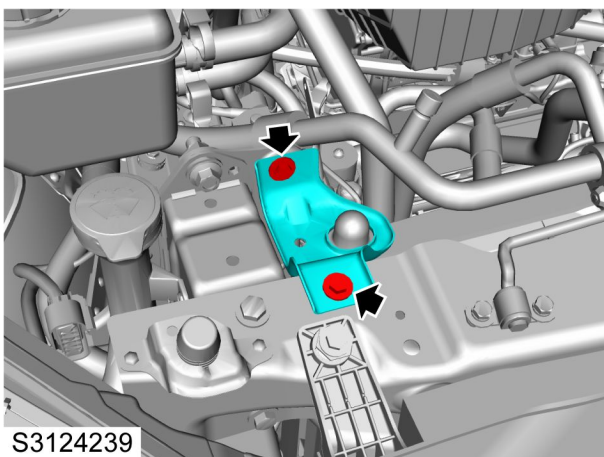
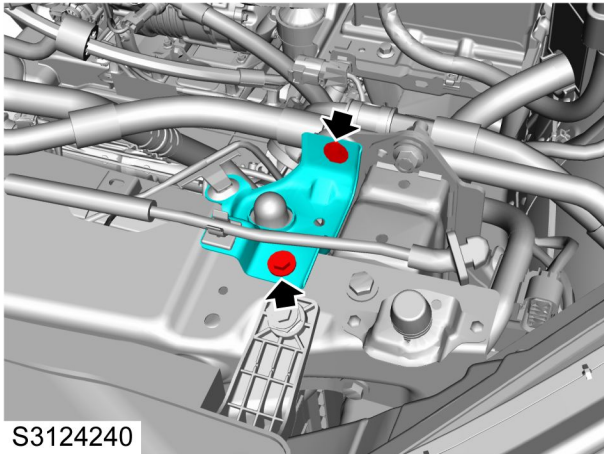
15. Connect the negative battery cable.

Upper Radiator Support Remove

1. Remove the beauty cover.

 beauty cover Remove

2. Remove 4 bolts fixing the upper radiator bracket to the front anti-collision beam assembly.



Refit


1. Fix the upper radiator bracket to the front anti-collision beam assembly, fit 4 bolts, tighten them to **7-10Nm**, and check the torque.
2. Refit the beauty cover.

 beauty cover Refit

Service Guide - EDS Pipeline

Pipeline Assembly - Drive Motor Control Module Expansion Tank to Water Pump Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

 **Coolant Drain Refill**

3. Remove the beauty cover.

 **Beauty Cover Remove**

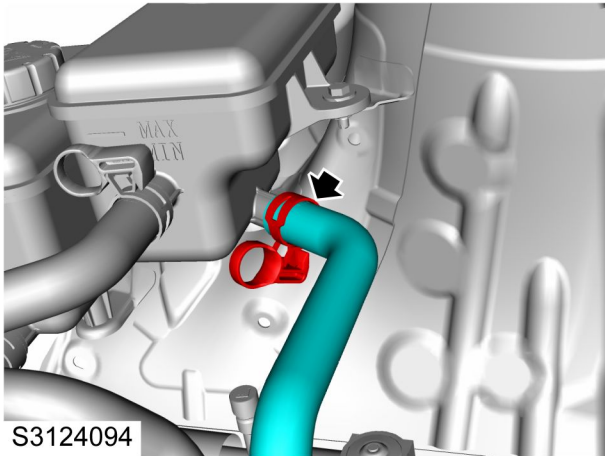
4. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

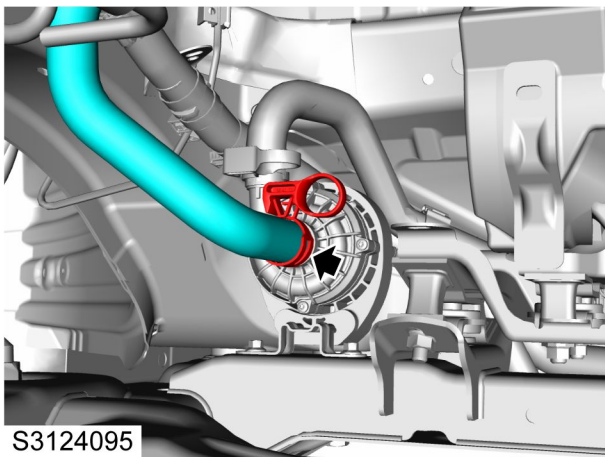
5. Remove the bottom deflector.

 **Bottom Deflector Remove**

6. Loosen the clamp, and disconnect the hose of pipeline assembly - drive motor control module expansion tank to water pump from the expansion tank.



7. Loosen the clamp, and disconnect the hose of pipeline assembly - drive motor control module expansion tank to water pump from the water pump.



Refit

1. Connect the hose of pipeline assembly - drive motor control module expansion tank to water pump to the water pump and secure it with clamps.
2. Connect the hose of pipeline assembly - drive motor

control module expansion tank to water pump to the expansion tank and secure it with clamps.

3. Fit the bottom deflector.

 **Bottom Deflector Refit**

4. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

5. Fit the beauty cover.

 **Beauty Cover Refit**

6. Refill the coolant.

 **Coolant Drain Refill**

7. Connect the negative battery cable.

Drive Motor Control Module Water Pump Remove

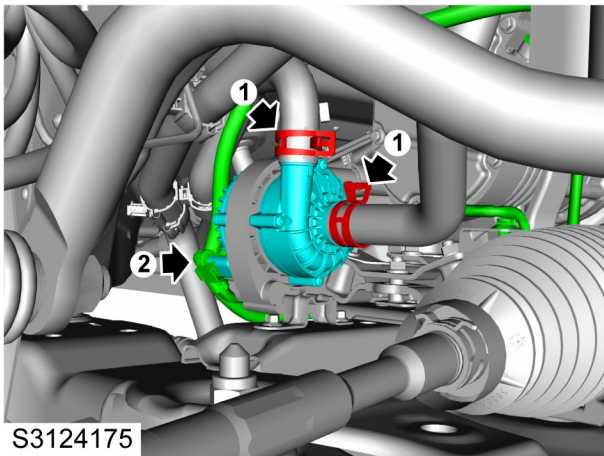
1. Disconnect the negative battery cable.
2. Remove the bottom deflector.

Bottom Deflector Remove

3. Drain the coolant.

Coolant Drain Refill

4. Loosen the clamp, and disconnect the pipeline (1) from the water pump.
5. Disconnect the harness (2) from the water pump.



Refit

1. Connect the harness to the water pump.
2. Connect the harness to the water pump, and secure it with clamps.
3. Fit the bottom deflector.

Bottom Deflector Refit

4. Refill the coolant.

Coolant Drain Refill

5. Connect the negative battery cable.

Pipeline Assembly - Electric Water Pump to Combined Charging Unit (CCU) Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant Drain Refill

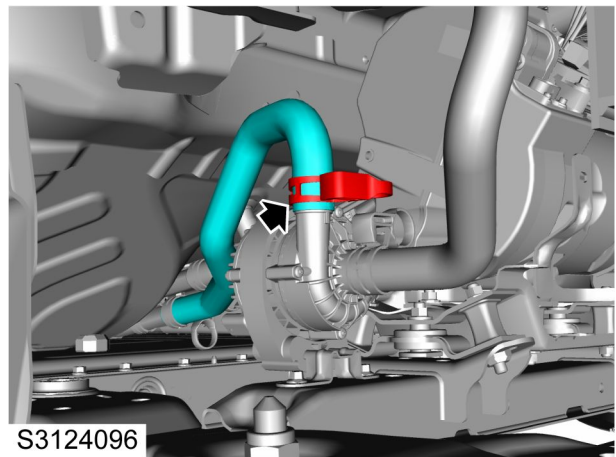
3. Remove the manual service disconnect.

Manual Service Disconnect Remove

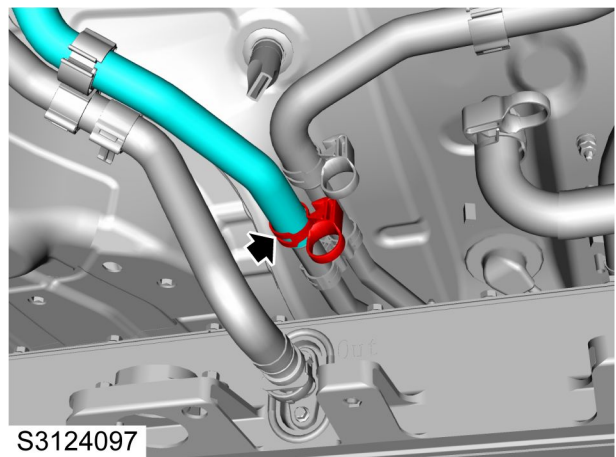
4. Remove the bottom deflector assembly.

Bottom Deflector Remove

5. Loosen the clamp, and remove the hose of pipeline assembly - electronic water pump to combined charging unit from the electronic water pump.



6. Loosen the clamp, and remove the hose of pipeline assembly - electronic water pump to combined charging unit from the cooling pipeline.



Refit

1. Fix the pipeline assembly - electronic water pump to combined charging unit to the cooling pipeline, and secure it with clamps.
2. Fix the pipeline assembly - electronic water pump to combined charging unit to the electronic water pump, and secure it with clamps.
3. Fit the bottom deflector.

Bottom Deflector Refit

4. Fit the manual service disconnect.

Manual Service Disconnect Refit

5. Refill the coolant.

Coolant Drain Refill

6. Connect the negative battery cable.

Pipeline Assembly - Cooling System Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant Drain Refill

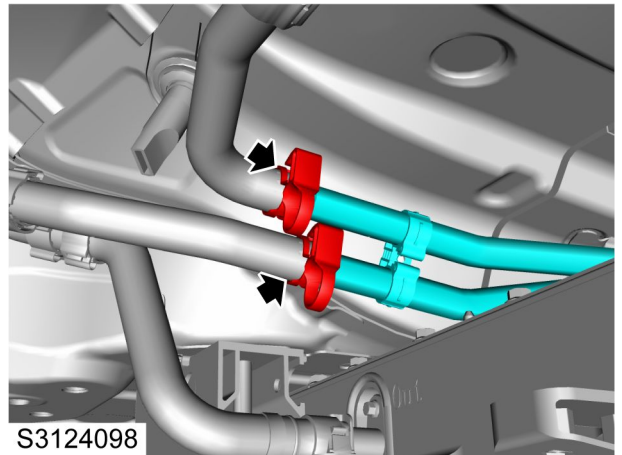
3. Remove the manual service disconnect.

Manual Service Disconnect Remove

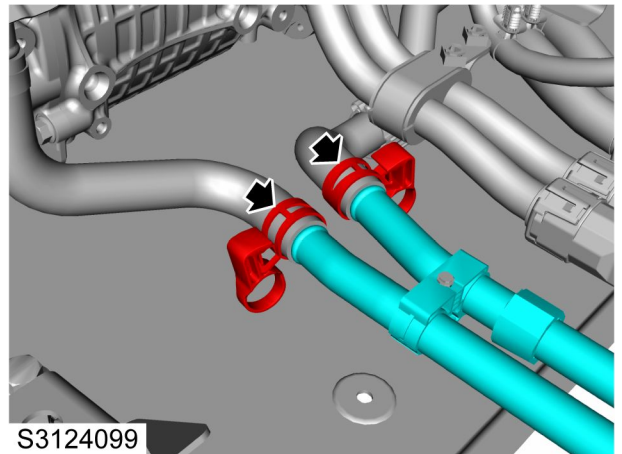
4. Remove the bottom deflector.

Bottom Deflector Remove

5. Loosen the clamp, and remove the hose of pipeline assembly - cooling system from the cooling pipeline.



6. Loosen the clamp, and remove the hose of pipeline assembly - cooling system from the cooling pipeline.



Refit

1. Fix the hose of pipeline assembly - cooling system to the cooling pipeline, and secure it with clamps.

2. Fit the bottom deflector.

Bottom Deflector Refit

3. Fit the manual service disconnect.

Manual Service Disconnect Refit

4. Refill the coolant.

Coolant Drain Refill

5. Connect the negative battery cable.

Pipeline Assembly - Electric Water Pump to Combined Charging Unit (CCU) Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant Drain Refill

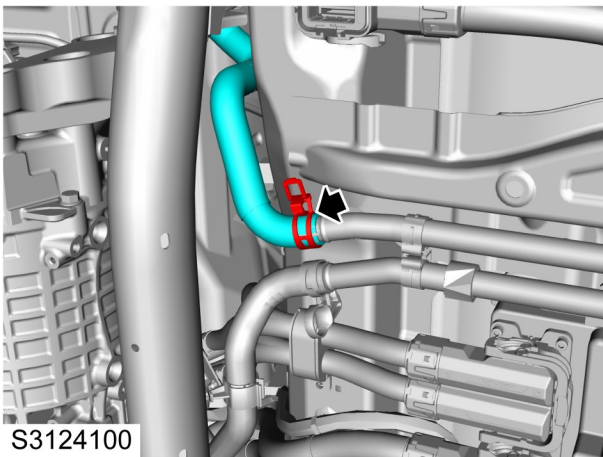
3. Remove the manual service disconnect.

Manual Service Disconnect Remove

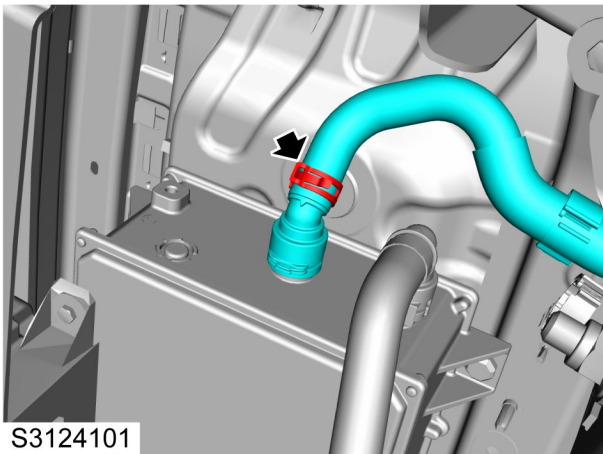
4. Remove the bottom deflector assembly.

Bottom Deflector Remove

5. Loosen the clamp, and remove the hose of pipeline assembly - electronic water pump to combined charging unit from the cooling pipeline.



6. Loosen the clamp, and remove the hose of pipeline assembly - electronic water pump to combined charging unit from the combined charging unit.



Refit

1. Fix the hose of pipeline assembly - electronic water pump to combined charging unit to the cooling pipeline, and secure it with clamps.
2. Fix the pipeline assembly - electronic water pump to combined charging unit to the combined charging unit, and secure it with clamps.
3. Fit the bottom deflector.

Bottom Deflector Refit

4. Fit the manual service disconnect.

Manual Service Disconnect Refit


5. Refill the coolant.

Coolant Drain Refill

6. Connect the negative battery cable.

Pipeline Assembly - Combined Charging Unit (CCU) to Drive Motor Control Module Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

 **Coolant Drain Refill**

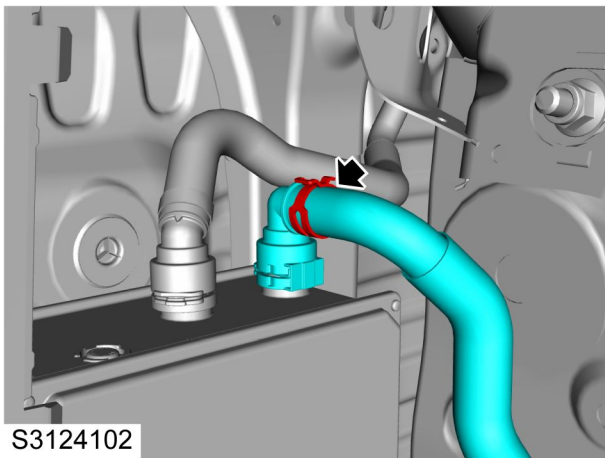
3. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

4. Remove the bottom deflector assembly.

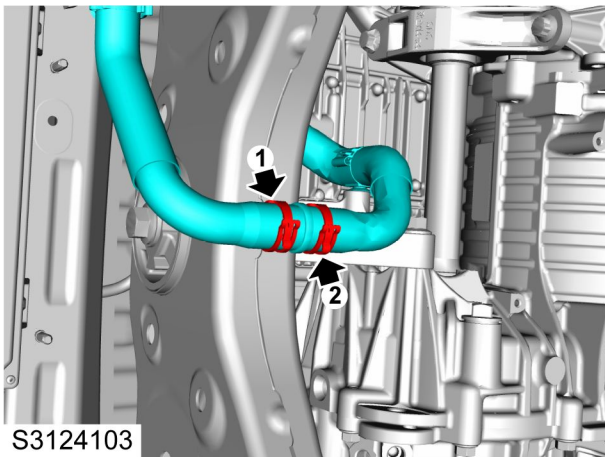
 **Bottom Deflector Remove**

5. Loosen the clamp, and remove the hose of pipeline assembly - combined charging unit to drive motor control module from the combined charging unit.



S3124102

6. Loosen the clamp (1), and remove the hose of pipeline assembly - combined charging unit to drive motor control module.



S3124103

Refit

1. Fit the hose of pipeline assembly - combined charging unit to drive motor control module, and secure it with clamps.
2. Connect the hose of pipeline assembly - combined charging unit to drive motor control module to the combined charging unit, and secure it with clamps.
3. Fit the bottom deflector assembly.

 **Bottom Deflector Refit**

4. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

5. Refill the coolant.

 **Coolant Drain Refill**

6. Connect the negative battery cable.

Pipeline Assembly - Combined Charging Unit (CCU) to Drive Motor Control Module Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant Drain Refill

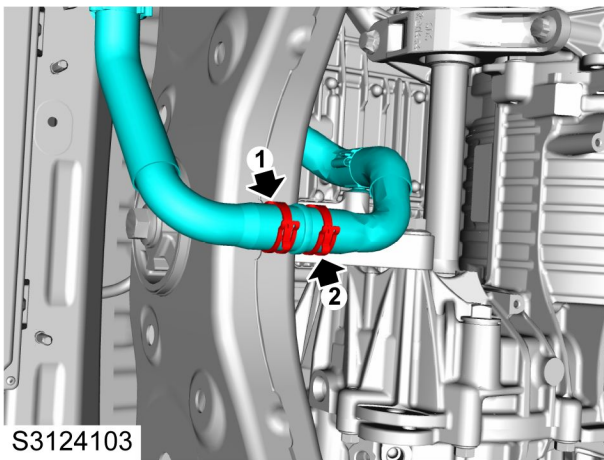
3. Remove the manual service disconnect.

Manual Service Disconnect Remove

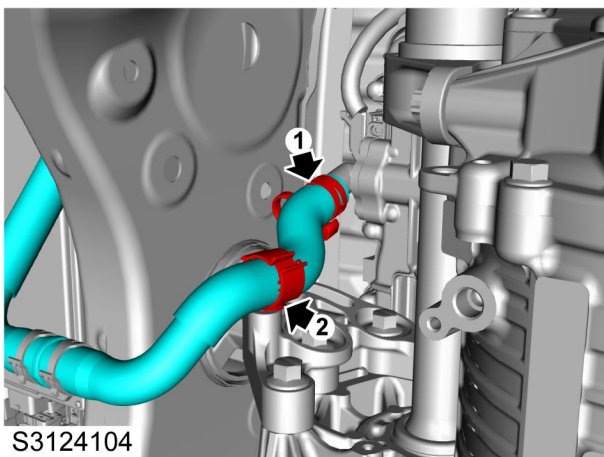
4. Remove the bottom deflector assembly.

Bottom Deflector Remove

5. Loosen the clamp (2), and remove the hose of pipeline assembly - combined charging unit to drive motor control module.



6. Loosen the clamp (1), and remove the hose of pipeline assembly - combined charging unit to drive motor control module from the electric drive unit.
7. Loosen the clip (2), and remove the pipeline assembly - combined charging unit to drive motor control module.



Refit

1. Fit the pipeline assembly - combined charging unit to drive motor control module, and secure it with clamps.
2. Connect the hose of pipeline assembly - combined charging unit to drive motor control module to the electric drive unit, and secure it with clamps.

3. Fit the hose of pipeline assembly - combined charging unit to drive motor control module, and secure it with clamps.

4. Fit the bottom deflector assembly.

Bottom Deflector Refit

5. Fit the manual service disconnect.

Manual Service Disconnect Refit


6. Refill the coolant.

Coolant Drain Refill

7. Connect the negative battery cable.

Drive Motor Water Outlet Pipe Assembly Remove

1. Disconnect the negative battery cable.
2. Drain the coolant.

 **Coolant Drain Refill**

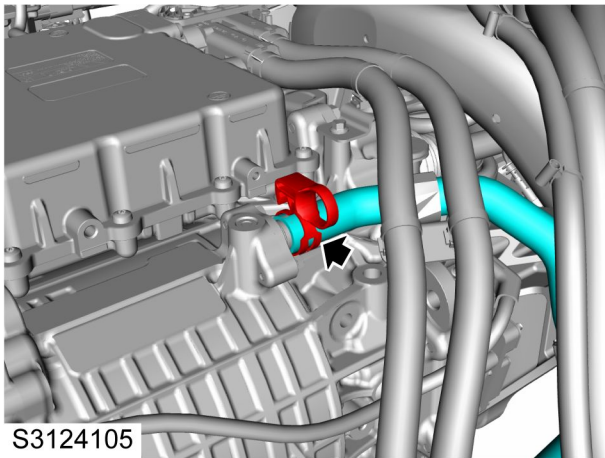
3. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

4. Remove the bottom deflector.

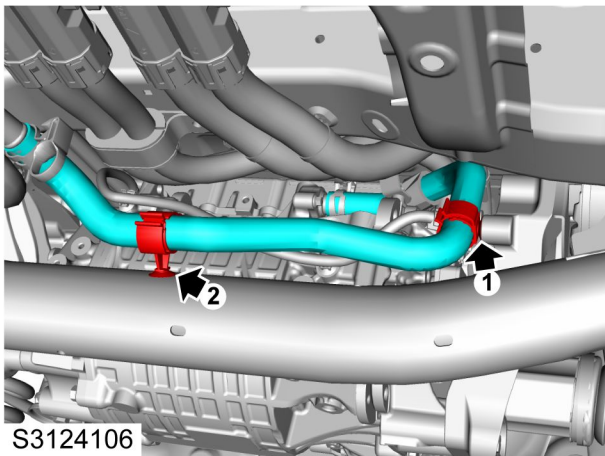
 **Bottom Deflector Remove**

5. Loosen the clamp, and disconnect the hose of drive motor water outlet pipe from the drive motor.



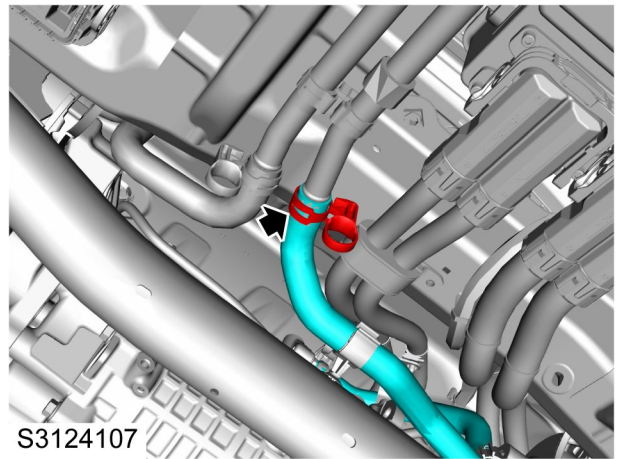
S3124105

6. Loosen the clip (1), and remove the drive motor water outlet pipe from the drive motor bracket.
7. Loosen the clip (2), and remove the drive motor water outlet pipe from the rear suspension subframe assembly.



S3124106

8. Loosen the clamp, and remove the drive motor water outlet pipe.



S3124107

Refit

1. Fit the drive motor water outlet pipe and secure it with clamps.
2. Fix the drive motor water outlet pipe to the rear suspension subframe assembly, and secure it with clips.
3. Fix the drive motor water outlet pipe to the drive motor bracket, and secure it with clips.
4. Fix the drive motor water outlet pipe to the drive motor, and secure it with clamps.
5. Fit the bottom deflector.

 **Bottom Deflector Refit**

6. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

7. Refill the coolant.

 **Coolant Drain Refill**

8. Connect the negative battery cable.

Pipeline Assembly - Motor to Radiator Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

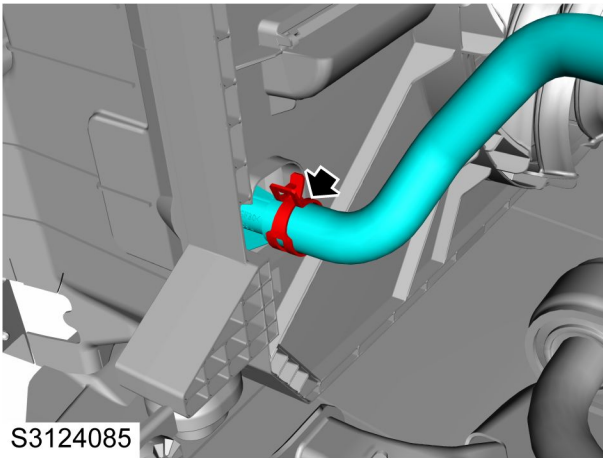
3. Drain the coolant.

Coolant Drain Refill

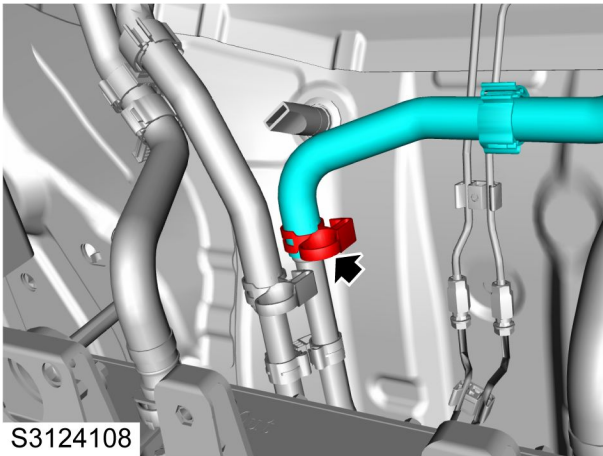
4. Remove the bottom deflector.

Bottom Deflector Remove

5. Loosen the clamp, and disconnect the hose of pipeline assembly - motor to radiator from the radiator.



6. Loosen the clamp, and disconnect the hose of pipeline assembly - motor to radiator from the cooling pipeline.



Refit

1. Fix the hose of pipeline assembly - motor to radiator to the cooling pipeline, and secure it with clamps.
2. Connect the hose of pipeline assembly - motor to radiator to the radiator, and secure it with clamps.
3. Fit the bottom deflector.

Bottom Deflector Refit

4. Refill the coolant.

Coolant Drain Refill

5. Fit the manual service disconnect.

Manual Service Disconnect Refit

6. Connect the negative battery cable.

**Pipeline Assembly - Low Temperature Radiator to Expansion Tank
Remove**

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

 **Beauty Cover Remove**

3. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

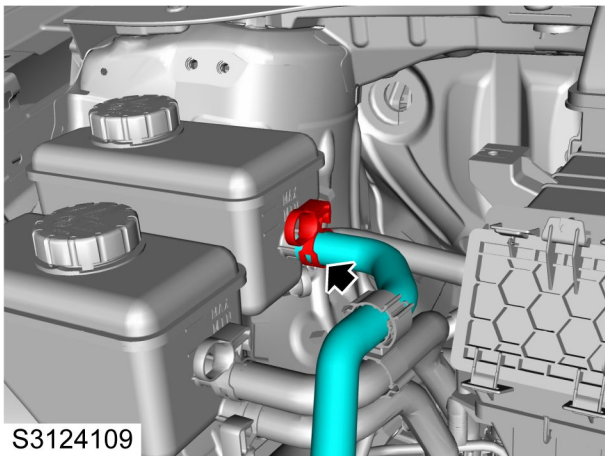
4. Drain the coolant.

 **Coolant Drain Refill**

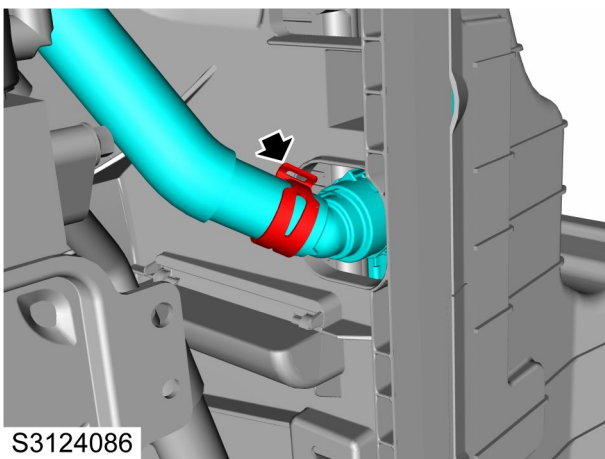
5. Remove the bottom deflector.

 **Bottom Deflector Remove**

6. Loosen the clamp, and disconnect the hose of pipeline assembly - low temperature radiator to expansion tank from the expansion tank.



7. Loosen the clamp, and disconnect the hose of pipeline assembly - low temperature radiator to expansion tank from the radiator.



Refit

1. Connect the hose of pipeline assembly - low temperature radiator to expansion tank to the radiator, and fix it with clamps.
2. Connect the hose of pipeline assembly - low temperature radiator to expansion tank to the expansion tank, and secure it with clamps.

3. Fit the bottom deflector.

 **Bottom Deflector Refit**

4. Refill the coolant.

 **Coolant Drain Refill**

5. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

6. Fit the beauty cover.

 **Beauty Cover Refit**

7. Connect the negative battery cable.

Drive Motor Control Module Expansion Tank Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

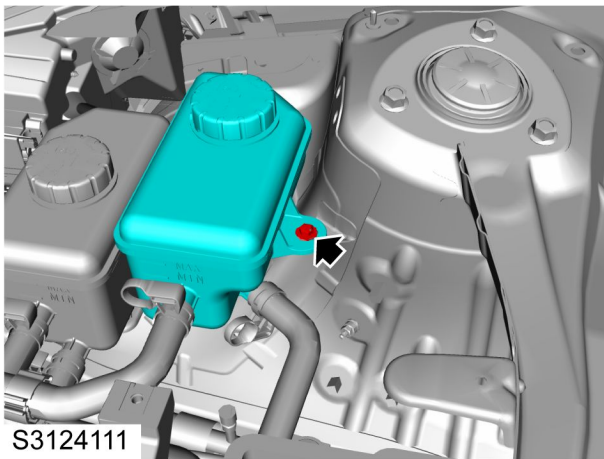
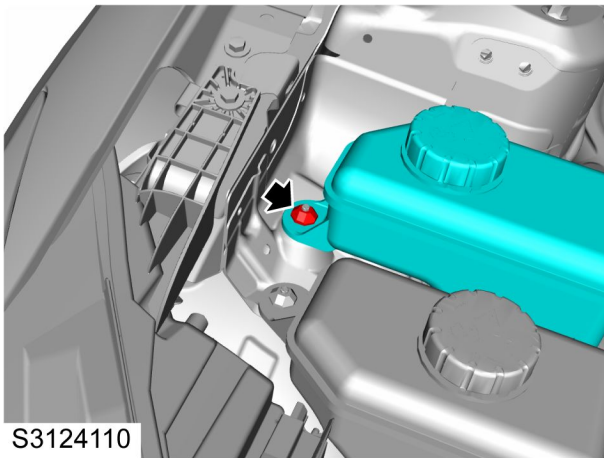
3. Remove the manual service disconnect.

Manual Service Disconnect Remove

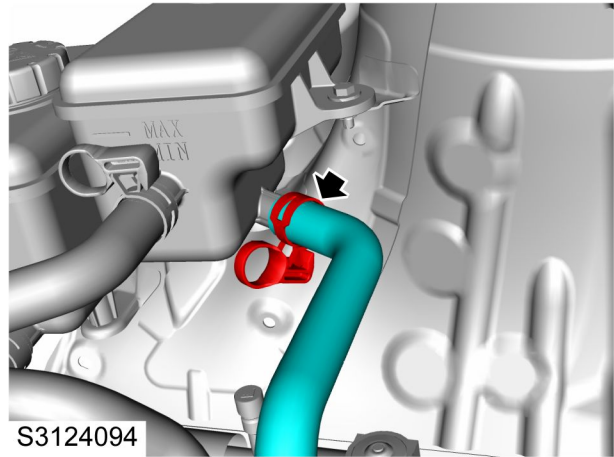
4. Drain the coolant.

Coolant Drain Refill

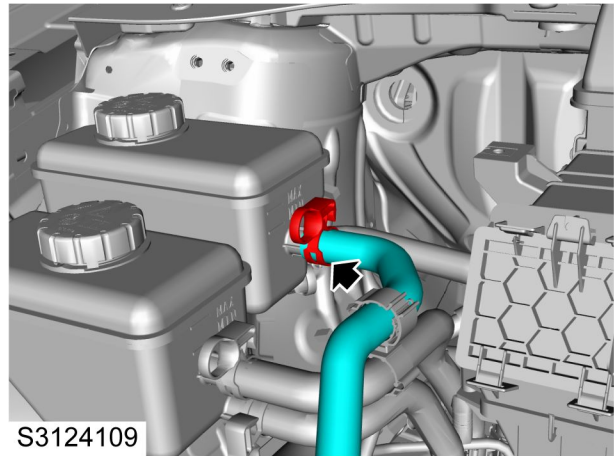
5. Remove 2 bolts fixing the drive motor control module expansion tank to the body.



6. Loosen the clamp, and disconnect the hose of pipeline assembly - drive motor control module expansion tank to water pump from the expansion tank.



7. Loosen the clamp, and disconnect the hose of pipeline assembly - low temperature radiator to expansion tank from the expansion tank.



Refit

1. Connect the hose of pipeline assembly - low temperature radiator to expansion tank to the expansion tank, and secure it with clamps.
2. Connect the hose of pipeline assembly - drive motor control module expansion tank to water pump to the expansion tank and secure it with clamps.
3. Fix the drive motor control module expansion tank to the body, fit 2 bolts, tighten them to **4-6Nm**, and check the torque.
4. Refill the coolant.

Coolant Drain Refill

5. Fit the manual service disconnect.

Manual Service Disconnect Refit

6. Fit the beauty cover.

Beauty Cover Refit


7. Connect the negative battery cable.

**Service Guide - ESS Pipeline
Pipeline Assembly - Battery Chiller Expansion
Tank to Water Pump
Remove**

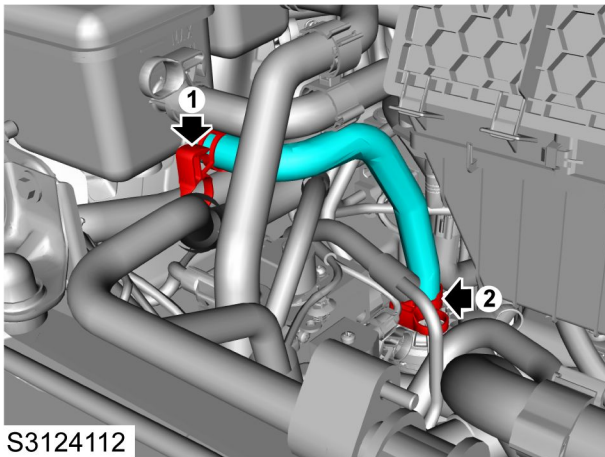
1. Remove the beauty cover.

 **Beauty Cover Remove**

2. Drain the coolant.

 **Coolant Drain Refill**

3. Disconnect the pipeline (1) from the battery cooler expansion tank.
4. Disconnect the pipeline (2) from the water pump.



Refit

1. Connect the pipeline to the water pump.
2. Connect the pipeline to the battery cooler expansion tank.
3. Refill the coolant.

 **Coolant Drain Refill**

4. Fit the beauty cover.


 **Beauty Cover Refit**

**Power Battery Coolant Pump Assembly
Remove**

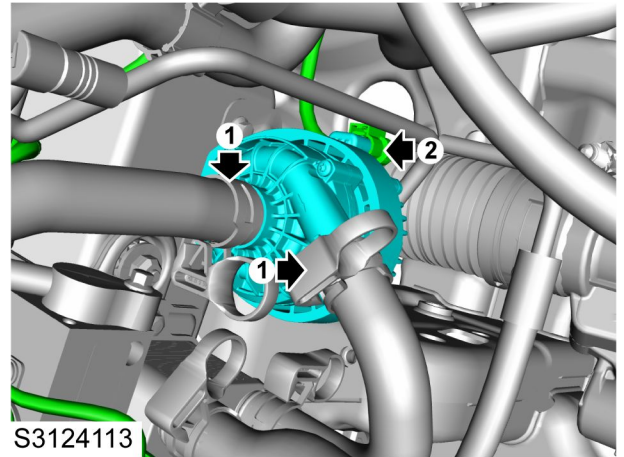
1. Remove the beauty cover.

 **Beauty Cover Remove**

2. Drain the coolant.

 **Coolant Drain Refill**

3. Disconnect the negative battery cable.
4. Disconnect the pipeline (1) from the water pump.
5. Disconnect the harness (2) from the water pump.



Refit

1. Connect the harness to the water pump.
2. Connect the pipeline to the water pump.
3. Connect the negative battery cable.
4. Refill the coolant.

 **Coolant Drain Refill**

5. Fit the beauty cover.

 **Beauty Cover Refit**

Pipeline Assembly - Water Pump to Battery Chiller Remove

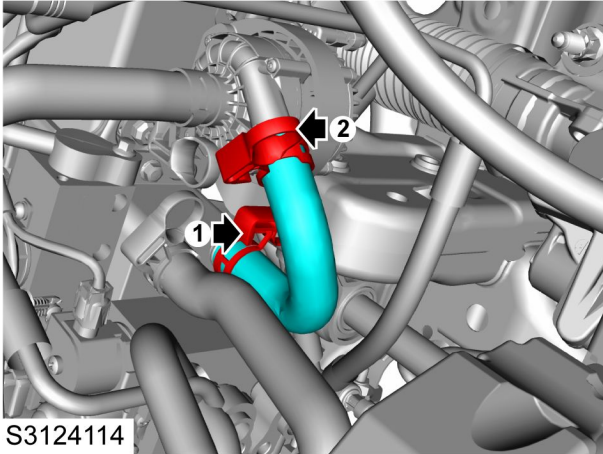
1. Remove the beauty cover.

Beauty Cover Remove

2. Drain the coolant.

Coolant Drain Refill

3. Disconnect the pipeline (1) from the battery cooler.
4. Disconnect the pipeline (2) from the water pump.



Refit

1. Connect the pipeline to the water pump.
2. Connect the pipeline to the battery cooler.
3. Refill the coolant.

Coolant Drain Refill

4. Fit the beauty cover.

Beauty Cover Refit

Power Battery Chiller Assembly Remove

1. Remove the beauty cover.

Beauty Cover Remove

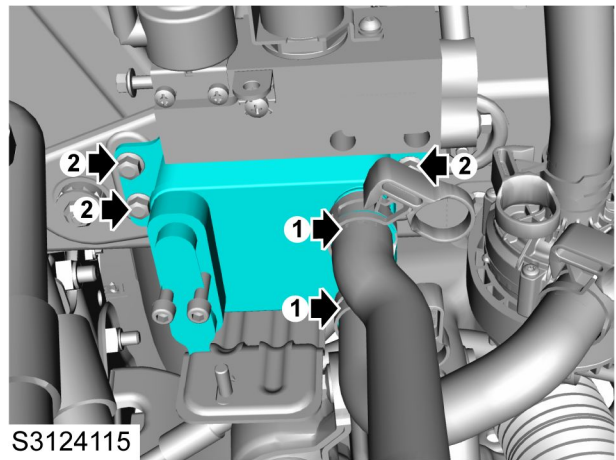
2. Drain the coolant.

Coolant Drain Refill

3. Remove the electronic expansion heating valve.

Electronic Expansion Heating Valve Assembly Remove

4. Disconnect the pipeline (1) from the power battery cooler.
5. Remove 3 bolts (2) fixing the power battery cooler to the body.



Refit

1. Fit 3 bolts fixing the power battery cooler to the body, tighten them to **7-10Nm**, and check the torque.
2. Connect the pipeline to the power battery cooler.
3. Fit the electronic expansion heating valve.

Electronic Expansion Heating Valve Assembly Refit

4. Refill the coolant.

Coolant Drain Refill

5. Fit the beauty cover.

Beauty Cover Refit

Pipeline Assembly - Battery Chiller to Power Battery Heater Remove

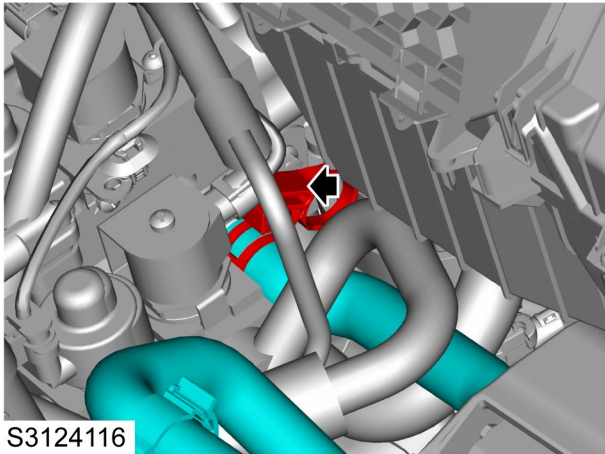
1. Remove the beauty cover.

Beauty Cover Remove

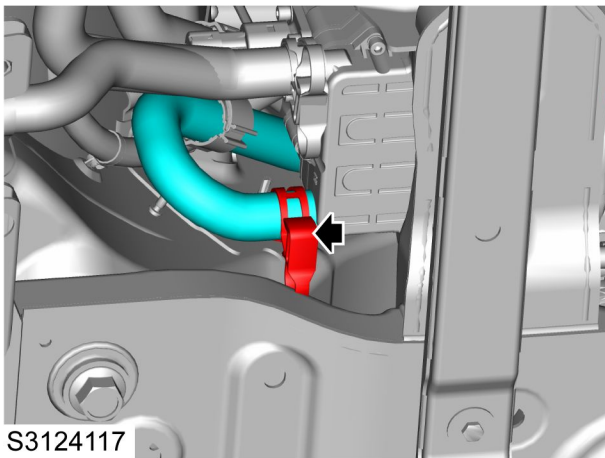
2. Drain the coolant.

Coolant Drain Refill

3. Disconnect the pipeline from the battery cooler.



4. Disconnect the pipeline from the battery heater.



Refit

1. Connect the pipeline to the battery heater.
2. Connect the pipeline to the battery cooler.
3. Refill the coolant.

Coolant Drain Refill

4. Fit the beauty cover.

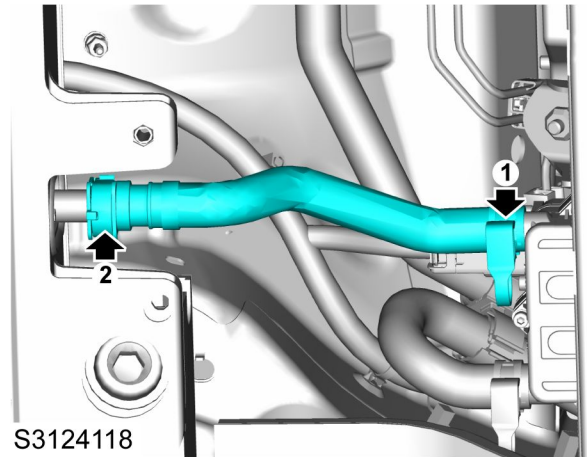
Beauty Cover Refit

Pipeline Assembly - Power Battery Power Battery Heater to Power Battery Remove

1. Drain the coolant.

Coolant Drain Refill

2. Disconnect the pipeline (1) from the battery heater.
3. Disconnect the pipeline (2) from the power battery.



Refit

1. Connect the pipeline to the power battery.
2. Connect the pipeline to the battery heater.
3. Refill the coolant.

Coolant Drain Refill

Pipeline Assembly - Power Battery to Battery Expansion Tank Remove

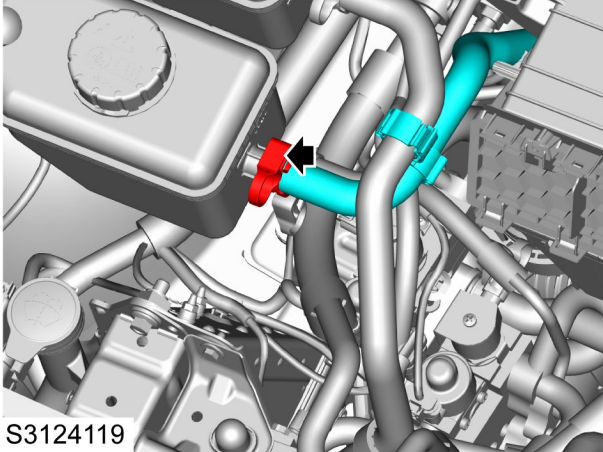
1. Remove the beauty cover.

Beauty Cover Remove

2. Drain the coolant.

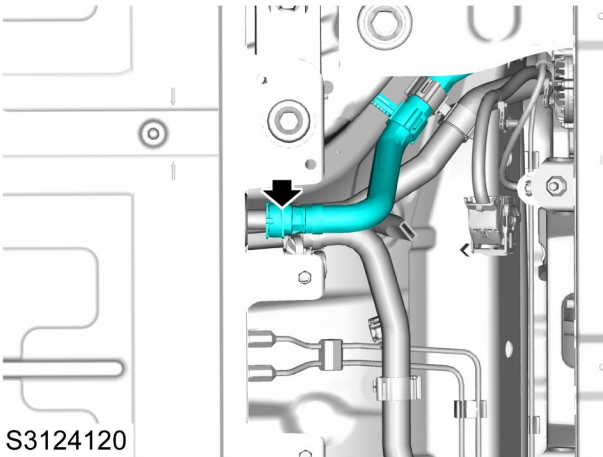
Coolant Drain Refill

3. Disconnect the pipeline from the battery expansion tank.



S3124119

4. Disconnect the pipeline from the power battery.



S3124120

Refit

1. Connect the pipeline to the power battery.
2. Connect the pipeline to the battery expansion tank.
3. Refill the coolant.

Coolant Drain Refill

4. Fit the beauty cover.

Beauty Cover Refit

Battery Chiller Expansion Tank Remove

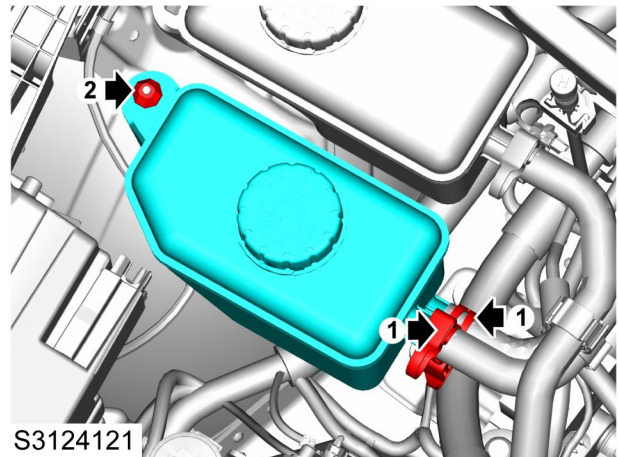
1. Remove the beauty cover.

Beauty Cover Remove

2. Drain the coolant.

Coolant Drain Refill

3. Disconnect the pipeline (1) from the battery cooler expansion tank.
4. Remove 1 nut (2) fixing the battery coolant expansion tank to the body.



S3124121

Refit

1. Fit 1 nut fixing the battery coolant expansion tank to the body, tighten it to **4-6Nm**, and check the torque.
2. Connect the pipeline to the battery cooler expansion tank.
3. Refill the coolant.

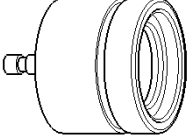
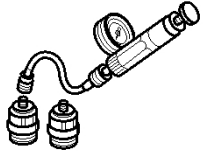
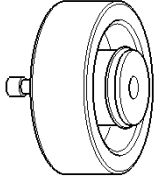
Coolant Drain Refill

4. Fit the beauty cover.

Beauty Cover Refit

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TEN00010	Pressure test connector, cap	 <p>TEN00010</p>
T14001	Cooling system pressure kit	 <p>T14001</p>
TEN00015	Pressure test connector, cooling system	 <p>TEN00015</p>

Gear Shift Control Mechanism Assembly

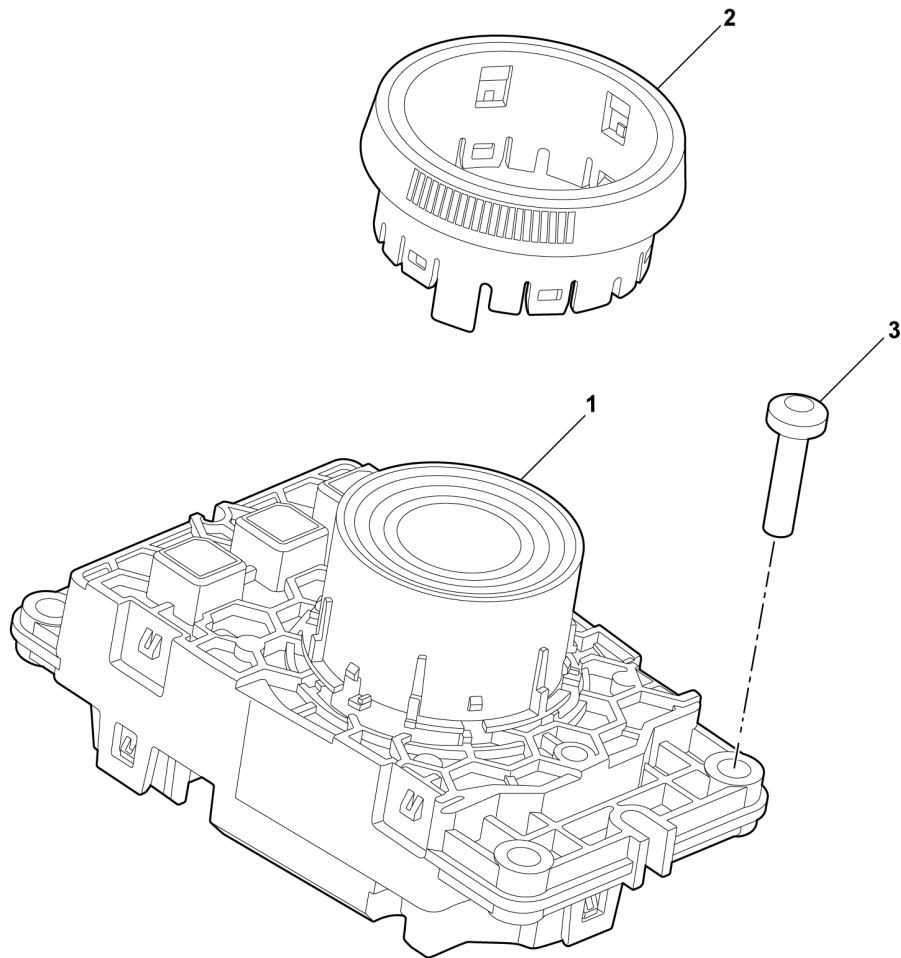
Specification

New sTOTopic

Description	Value
Screw-Shift Control Mechanism to Central Console	3-7Nm

Description and Operation

System Layout

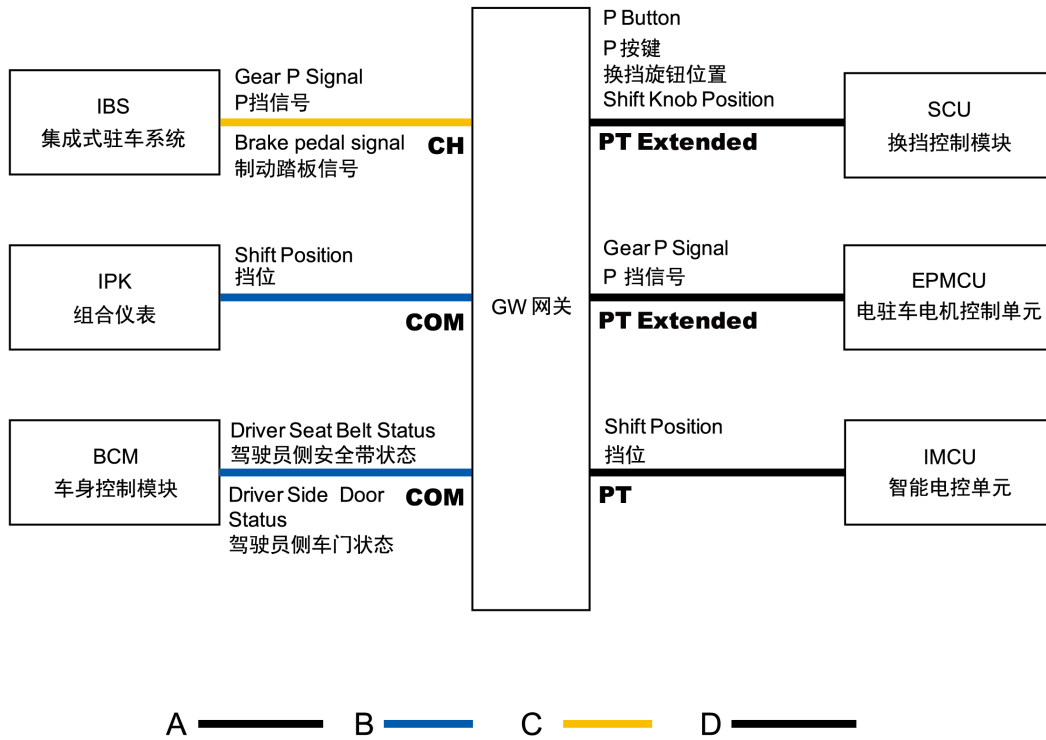


S9220728

- 1. Gear Shift Control Mechanism
- 2. Shift Knob Trim Ring

- 3. Screw - Gear Shift Control Mechanism

System Control Diagram



S1211106

A=Power Train CAN; B=Comfort CAN; C=Chasis CAN; D=Power Train Extended CAN

Description

Overview

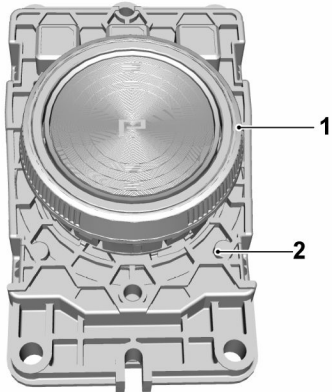
Function of gear shift control mechanism:

1. Collect current gear information
2. Output shift position signal

The gear shift control mechanism exchanges information with other external ECUs via the Powertrain ExpansionCANbus, mainly the intelligent motor control unit (IMCU) and the electronic park motor control unit (EPMCU) integrated in the electric drive unit. The R, N and D gear information is obtained by reading the signal from the gear position sensor in the gear shift control mechanism, while the P gear position signal can be triggered by pressing the P gear button on the gear shift control mechanism.

The collected R, N and D position information is sent to the IMCU through the Powertrain ExpansionCANbus; the P gear position information is sent to the EPMCU through the Powertrain ExpansionCANbus.

Gear Shift Control Mechanism



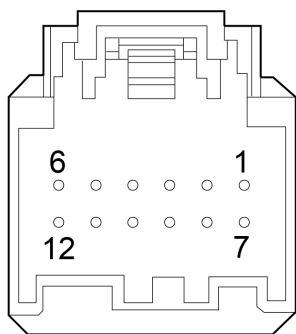
S9223392

The gear shift control mechanism integrates the SCU and P gear button, which is fixed on the centre console by bolts.

1. Shift Knob Trim Ring
2. Gear Shift Control Mechanism

Operation**Gear Signal Collection**

A Hall rotation angle position sensor is encapsulated in the chip for sensing the gear information on the circuit board of SCU. When the knob is rotated, the sensor in the chip senses the angle position of the shift lever to determine the R, N and D positions.

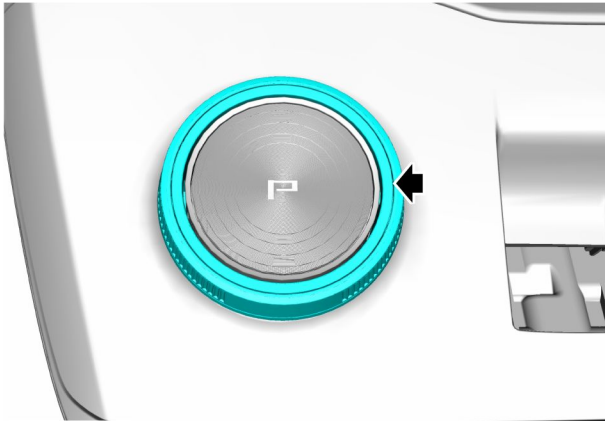
Detailed Information List of Component Pins

Mark No.	Name
1	KL30
2 - 4	NA
5	Wake-up Signal
6	NA
7	CAN High
8	CAN Low
9-11	NA
12	Ground

Service Guide

Gear Shift Control Mechanism Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the shifter knob bezel.

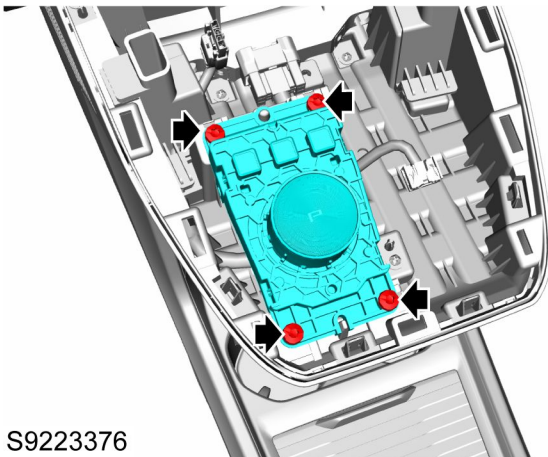


S9223394

3. Remove the centre console upper trim panel.

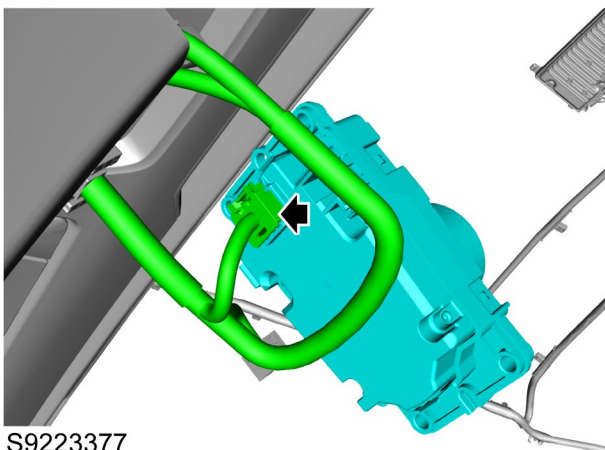
Centre Console Upper Trim Panel Remove

4. Remove 4 screws fixing the gear shift control mechanism to the centre console.



S9223376

5. Disconnect the harness from the gear shift control mechanism.



S9223377

Refit

1. Connect the harness to the gear shift control

mechanism.

2. Fit 4 screws fixing the gear shift control mechanism to the centre console, tighten them to **3-7Nm**, and check the torque.
3. Fit the centre console upper trim panel.

Centre Console Upper Trim Panel Refit

4. Fit the shifter knob bezel.
5. Connect the negative battery cable.
6. Connect the scan tool and access the SIPS.
7. Select SIPS-Programming and Coding-SCU-Replacement, and follow the on-screen instructions.

Electric Drive Unit - A Shaft Rear

Electric Drive Unit - A Shaft Rear

Specification

New sTOTopic

Description	Value
Drain Plug	25-35Nm
Refueling Plug (A Axle)	15-20Nm
Bolt-Mount Bracket to Electric Transmission	(65-75) Nm+ (85-95) °
Bolt-Electric Transmission to Subframe	(135-165) Nm+ (85-95) °
Bolt-Parking Actuator to Shell	19-25Nm
Bolt-Oil-blocking Labyrinth to Shell	8.5-11.5Nm
Bolt-Bearing Plate	19-25Nm
Bolt-Transmission Shell to Driving Motor Shell (A Axle)	26-34Nm
Screw-Front And Rear Bearing Of Intermediate Shaft	105-115Nm
Bolt-Water Pipe Joint to Shell	7-10Nm
Bolt-Drive Motor Control Module Observation Cover Plate to Shell (A Axle)	19-25Nm
Bolt-Insulating Block to Shell	5-7Nm
Bolt-Hatchback Line to Shell	19-25Nm
Bolt-A Axle IMCU to Electric Transmission Mount	26-34Nm
Bolt-A Axle IMCU to Electric Transmission	19-25Nm

Parameters

Model	Shaft A
Motor Type	Permanent magnet synchronous motor
Rated Power/Peak Power	68/150Kw (64KWh battery)
Peak Torque	250Nm (64KWh battery)
Rated Speed/Maximum Speed	8000/17000 (64KWh battery)
Rated Power/Peak Power	54/125Kw (51KWh battery)
Peak Torque	250Nm (51KWh battery)
Rated Speed/Maximum Speed	8000/17000 (51KWh battery)
Protection Grade	IP67
Total Gear Ratio	10.53
Gear Ratio of Input Shaft to Intermediate Shaft	2.885
Final Drive Ratio	3.65
Centre Distance between Input Shaft and Intermediate Shaft	78mm
Centre Distance between Intermediate Shaft and Differential Shaft	115mm
Mass (without oil)	59kg
Lubricating Oil	Shell E-Fluids E6 iX (SL2808)
Oil Filling Volume During Overhaul	0.8±0.05L
Fluid Filling Quantity During Replacement	0.7±0.05L
Maximum Overall Dimensions of Electric Drive Unit (Length x Width x Height)	393*437*297mm

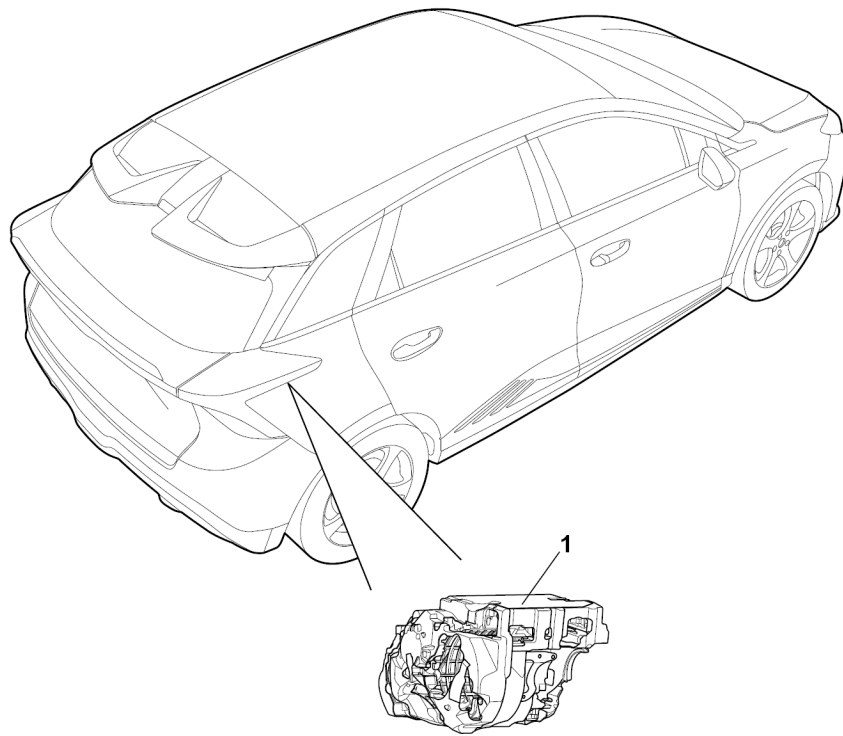
List of Disposable Assembly Parts	Gasket - Filling Plug
	Gasket - Drain Plug
	Input Shaft Bearing
	Intermediate Shaft Bearing
	Differential Bearing
	Axle Shaft Oil Seal
	Circlip - Input Shaft Rear Bearing
	Circlip - Intermediate Shaft Rear Bearing Outer Ring
	Gasket - Differential Bearing
	Bolt - Intermediate Shaft Locking
Sealant	Loctite 5900
Lubrication grease	HP300

Electric Drive Unit - A Shaft Rear

Description and Operation

System Layout

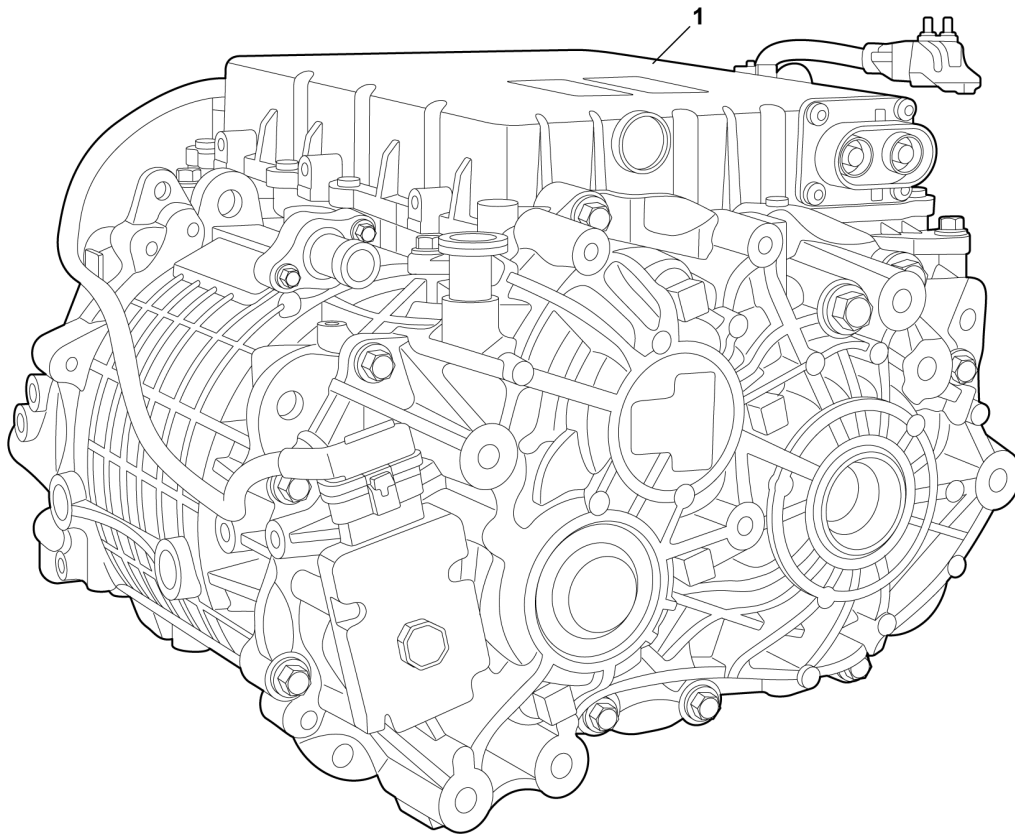
ECU



S1121211

I. ECU

Electric Drive Unit Assembly

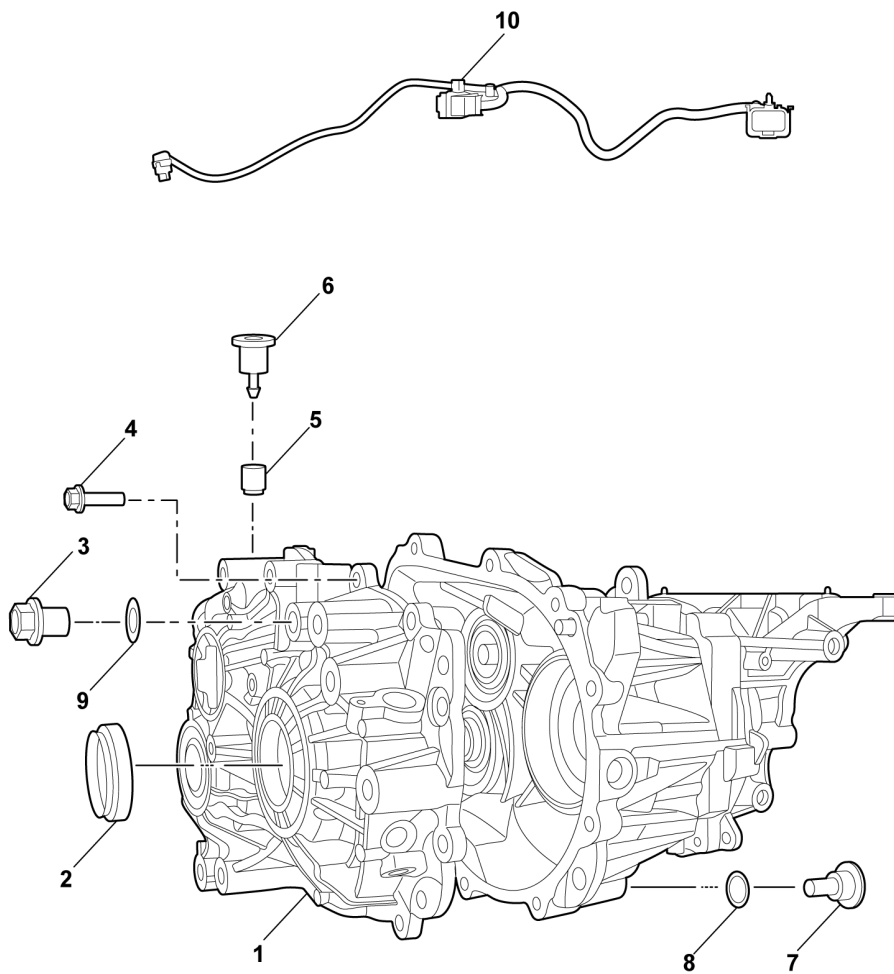


S1210191

I. Electric Drive Unit Assembly

Electric Drive Unit - A Shaft Rear

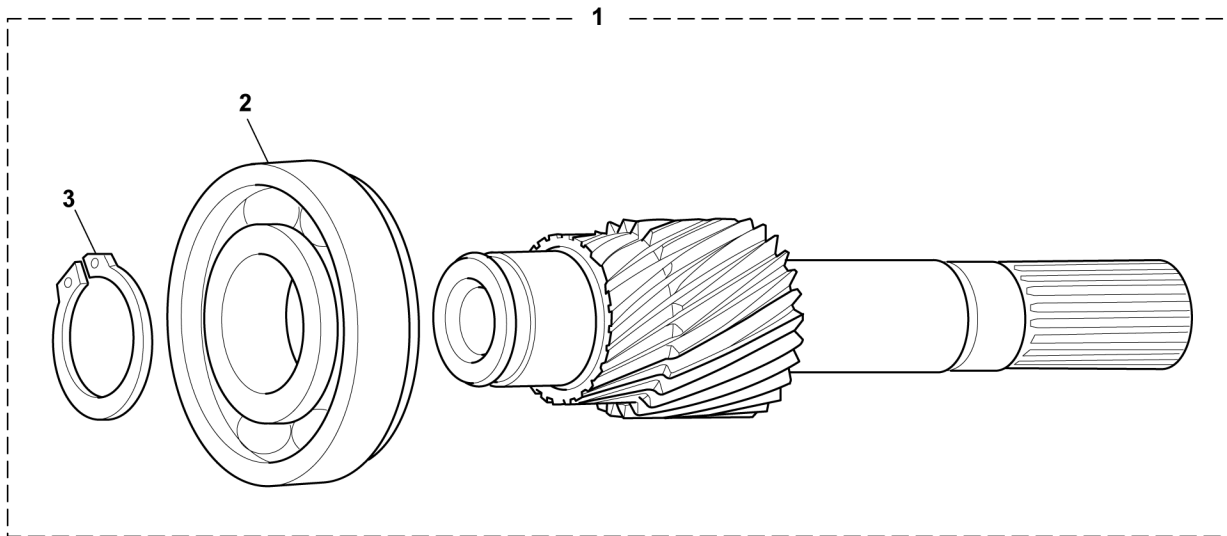
Electric Drive Unit Housing and Accessories



S1210192

- | | |
|--|-----------------------------|
| 1. Transmission Housing | 6. Vent Plug Assembly |
| 2. Differential Oil Seal | 7. Oil Drain Plug |
| 3. Oil Filler Bolt | 8. Gasket - Oil Drain Plug |
| 4. Bolt - Transmission Housing to Integrated Housing | 9. Gasket - Oil Filler Plug |
| 5. Sealing tube - Vent Plug Assembly | 10. Low Voltage Harness |

Input Shaft



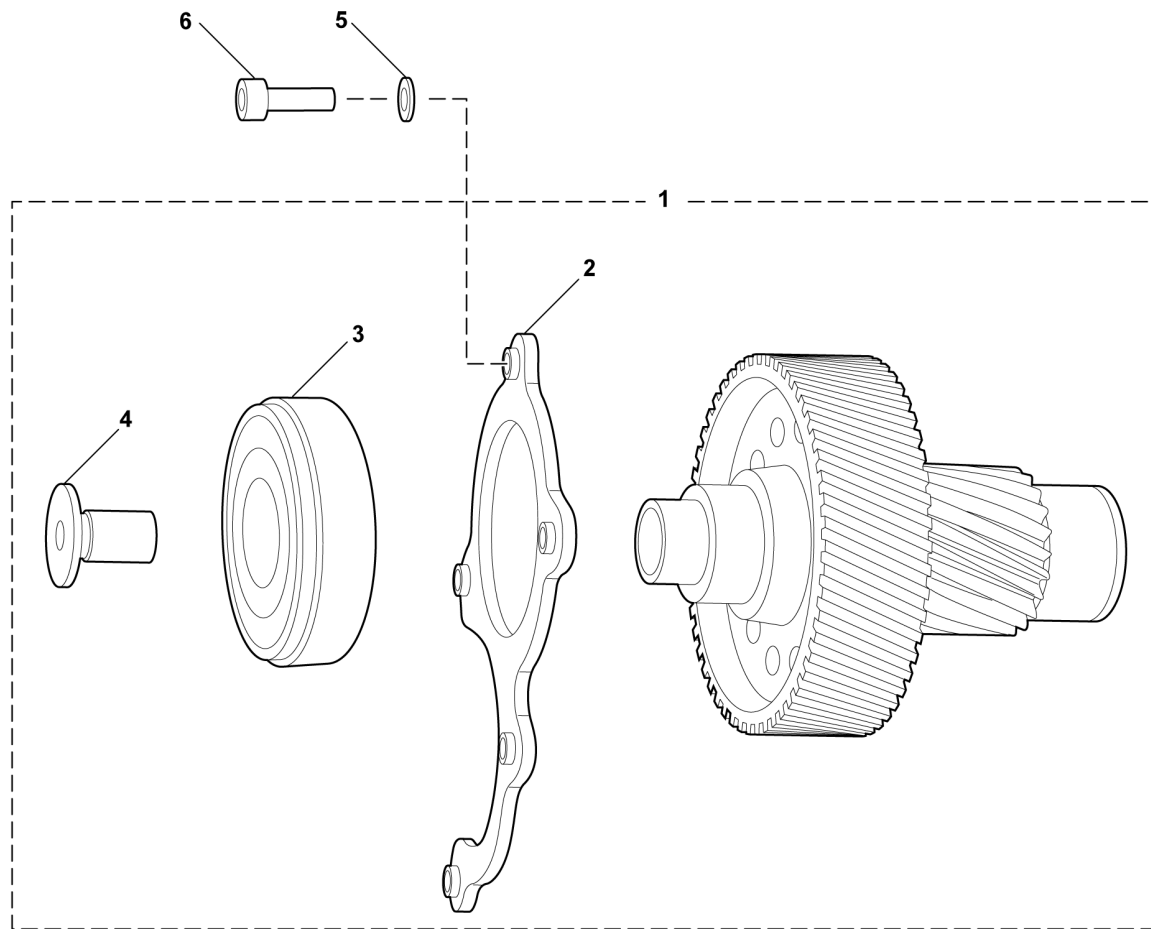
S1210193

- 1. Input Shaft Assembly
- 2. Input Shaft Bearing

- 3. Circlip - Input Shaft Bearing

Electric Drive Unit - A Shaft Rear

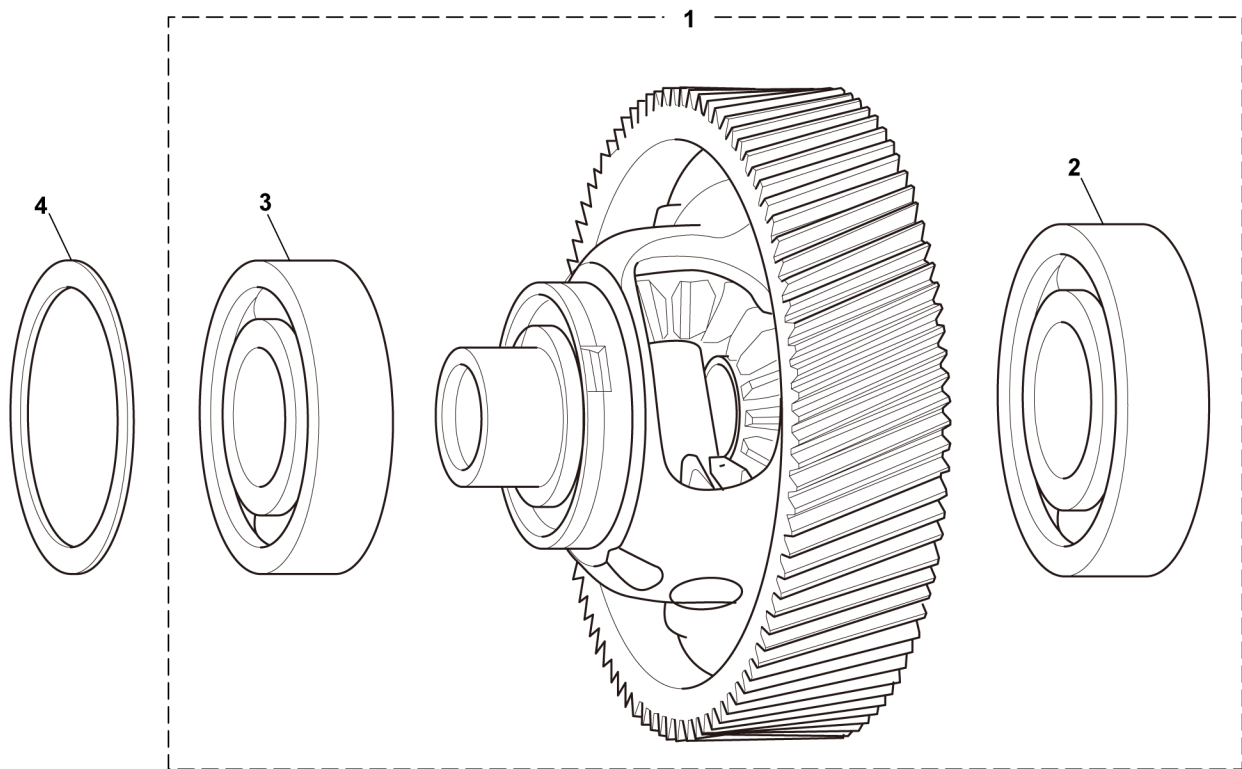
Intermediate Shaft



S1210194

- | | |
|------------------------------------|--|
| 1. Intermediate Shaft Assembly | 4. Locking Screw |
| 2. Integrated Bearing Press Plate | 5. Gasket - Bolt of Integrated Bearing Press Plate |
| 3. Intermediate Shaft Rear Bearing | 6. Bolt - Integrated Bearing Press Plate |

Differential

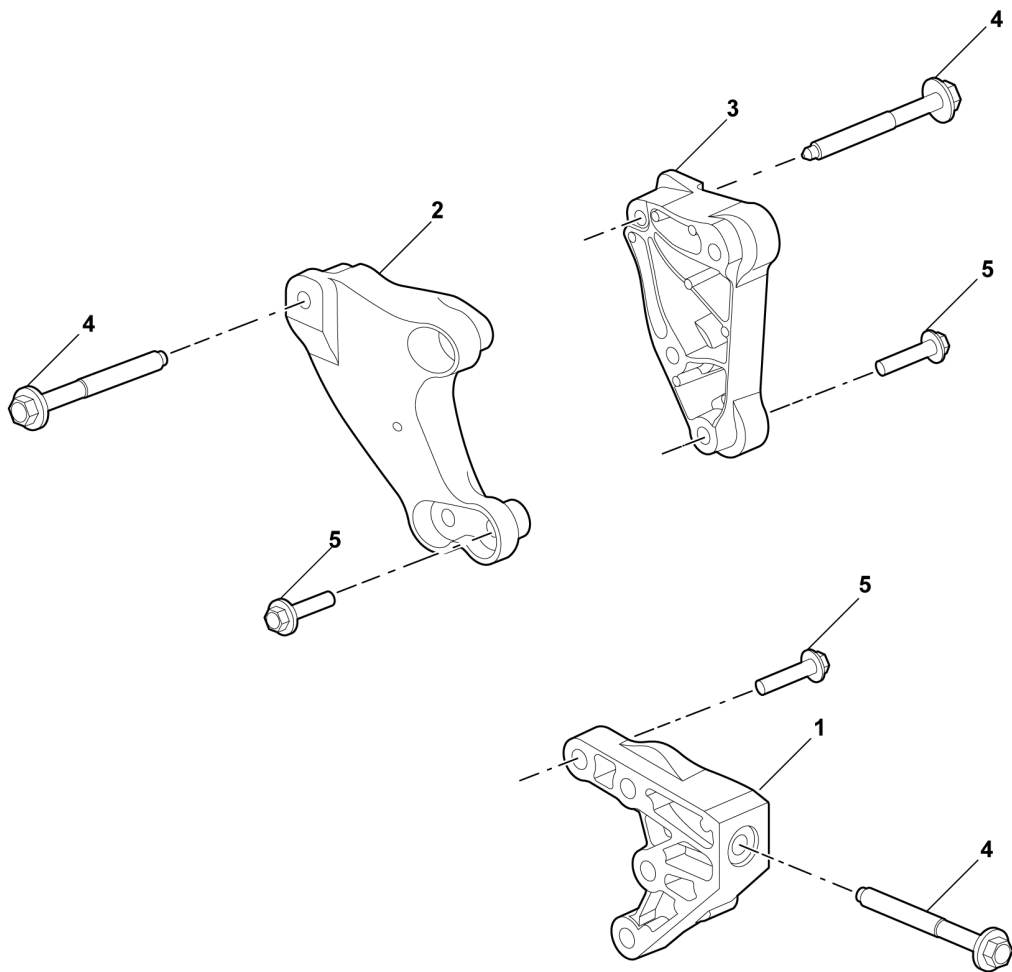


S1210195

- 1. Differential Assembly
- 2. Differential Bearing
- 3. Differential Bearing
- 4. Differential Bearing Gasket

Electric Drive Unit - A Shaft Rear

Electric Drive Unit Assembly Mount Bracket

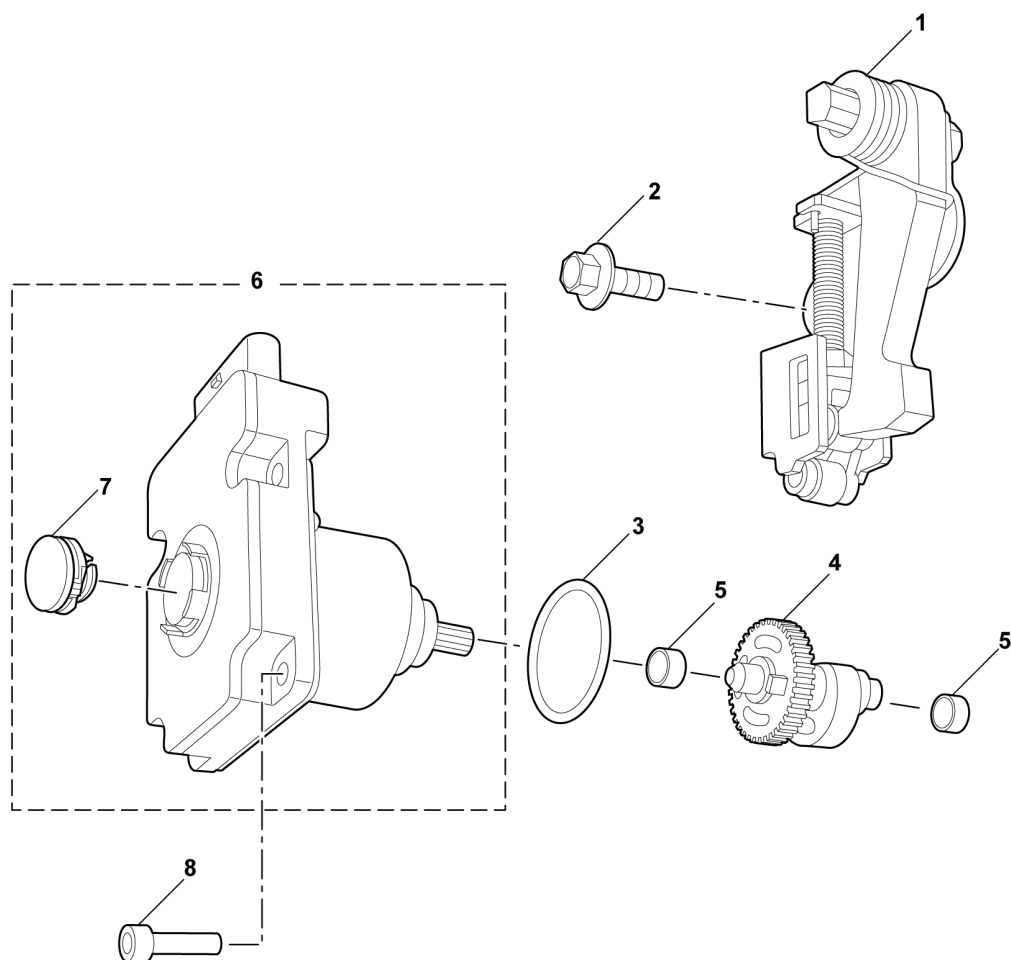


S1210196

- 1. Rear Mount Bracket
- 2. Left Mount Bracket
- 3. Right Mount Bracket

- 4. Bolt - Mount Bracket to Subframe
- 5. Bolt - Mount Bracket to Transmission

Parking Mechanism

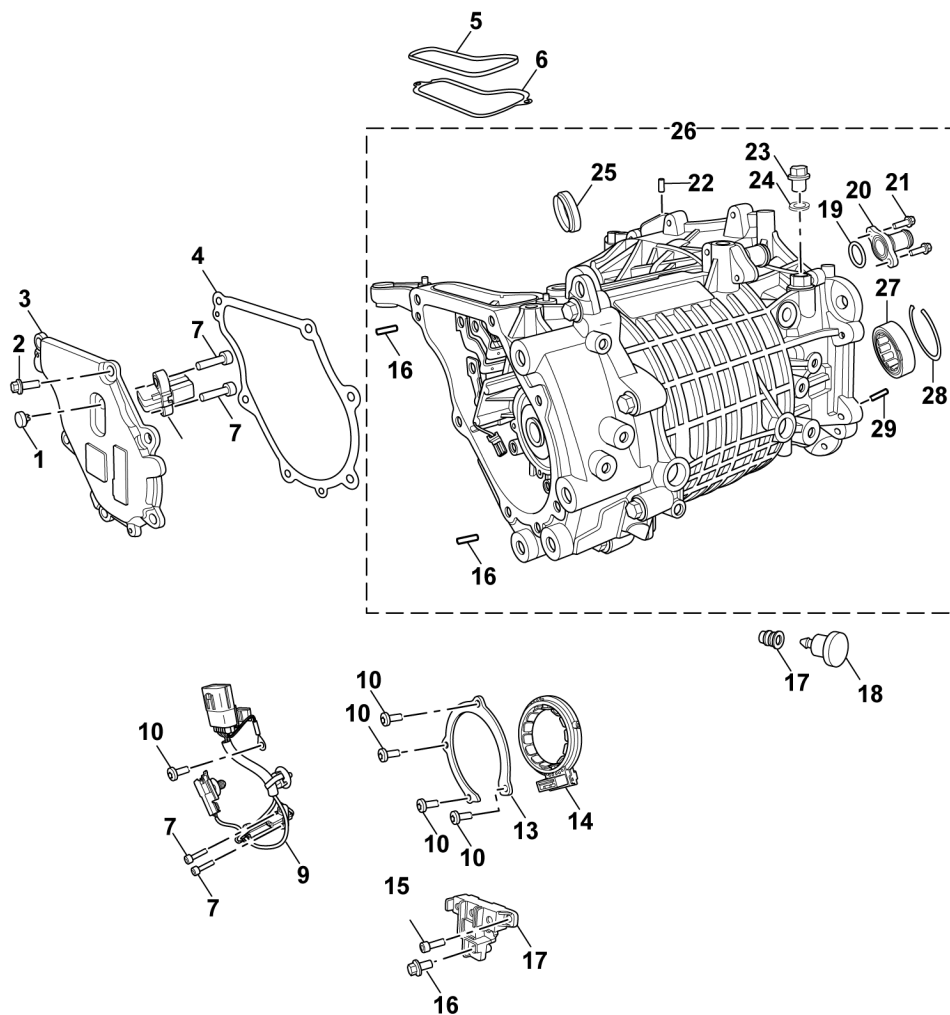


S1210197

- | | |
|--------------------------------------|--|
| 1. Parking Mechanism Assembly | 5. Shaft Sleeve |
| 2. Bolt - Parking Mechanism Assembly | 6. EPMCU (Electric Parking Mechanism Control Unit) |
| 3. O ring - EPMCU | 7. Vent plug - EPMCU |
| 4. Parking Shaft Assembly | 8. Bolt - EPMCU |

Electric Drive Unit - A Shaft Rear

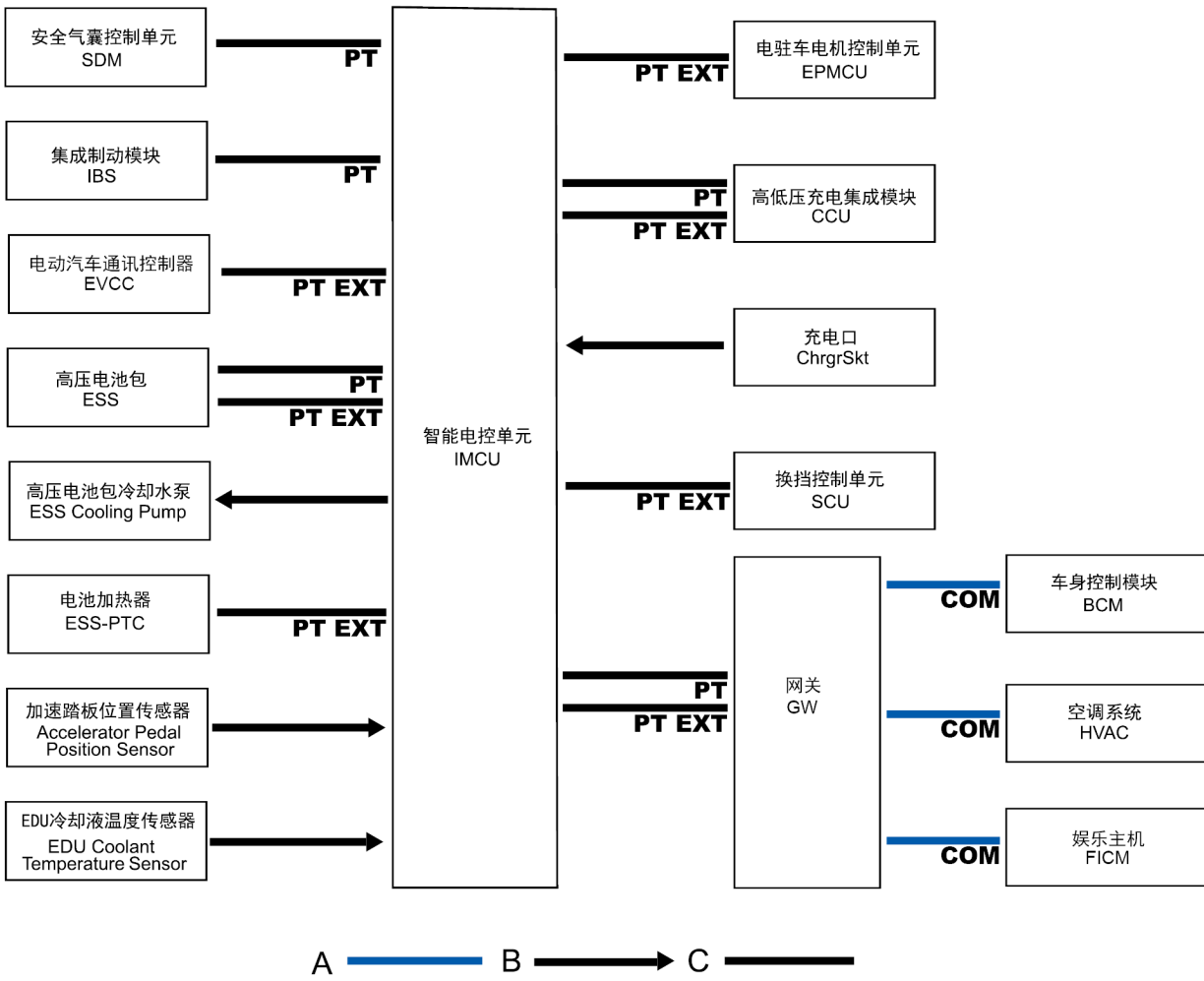
Motor Layout



S1210190

- | | |
|--|--|
| 1. Electric Drive Unit Breather Plug | 16. Electric Drive Unit Housing Locating Pin |
| 2. Bolt - Electric Drive Unit Housing | 17. Electric Drive Unit Breather Plug Seal Pipe |
| 3. Electric Drive Unit Housing | 18. Electric Drive Unit Breather Plug |
| 4. Gasket - Electric Drive Unit Housing | 19. O-ring - Transmission Cooling Water Pipe Fitting |
| 5. O-ring - Electric Drive Unit Housing | 20. Transmission Cooling Water Pipe Fitting |
| 6. Gasket - Electric Drive Unit Drive Motor | 21. Bolt - Electric Drive Unit Housing |
| 7. Bolt - Electric Drive Unit Low-voltage Connector | 22. Electric Drive Unit Housing Locating Pin |
| 8. Electric Drive Unit Low-voltage Connector | 23. Electric Drive Unit Oil Filling Plug |
| 9. Electric Drive Unit Low-voltage Harness | 24. Gasket - Electric Drive Unit Oil Filling Plug |
| 10. Bolt - Electric Drive Unit Drive Motor Rotary Transformer Stator Retaining Plate | 25. Electric Drive Unit Differential Oil Seal |
| 11. Electric Drive Unit Drive Motor Rotary Transformer Stator Retaining Plate | 26. Electric Drive Unit Drive Motor Assembly |
| 12. Electric Drive Unit Drive Motor Rotary Transformer Stator | 27. Electric Drive Unit Intermediate Shaft Front Bearing |
| 13. Bolt - Electric Drive Unit Drive Motor Insulator Block | 28. Snap Ring - Electric Drive Unit Drive Motor Shaft Cylindrical Bearing Outer Ring |
| 14. Bolt - Electric Drive Unit Drive Motor Insulator Block | 29. Electric Drive Unit Housing Locating Pin |
| 15. Electric Drive Unit Drive Motor Insulator Block | |

System Control Diagram



S1121217

A = Comfort CAN Bus; B = Hard Wire; C = Power HS CAN Bus

Electric Drive Unit - A Shaft Rear

Description

Overview

The model is equipped with the electric drive unit shaft A. The shaft A is equipped with a two-stage reducer.

Reducer Housing

The reducer housing is cast from die-cast aluminum. The motor housing and the right housing of the reducer share the same housing structure. The reducer housing is equipped with an oil filler plug and drain plug, and both of them are sealed with an aluminum washer.

The reducer is filled with lubricating oil so as to lubricate the internal components using a splash method.

Input Shaft

The input shaft motor meshes with the spline and transmits the motor power to the differential through the input shaft and intermediate shaft. The input shaft is supported in the housing by bearings.

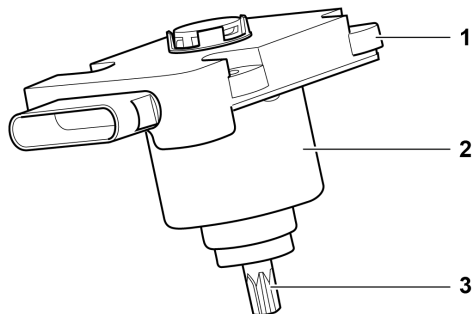
Intermediate Shaft

The intermediate shaft is supported in the housing by bearings, which is used to transfer torque and increase the gear ratio.

Differential

The differential housing supports the planetary shaft, planetary gear and sun gear. The differential assembly is supported by bearings in the transmission housing.

Electronic Park Motor Control Unit



S1214849

1. Electronic Park Motor Control Unit (EPMCU)
2. Parking Motor
3. Parking Motor Spline

The electronic park motor control unit (EPMCU) integrates the control module, park motor, sensors and other components, which is fixed to the outside of the left housing of the reducer by four bolts. The spline at the front end of the park motor is used with the park shaft gear on the park mechanism assembly fixed in the reducer. When EPMCU receives the P gear signal, the park motor operates, drives the park pawl on the park mechanism assembly, and lock the park gear on the input shaft to realize the park function.

Drive Motor

The drive motor is a three-phase AC motor, which is controlled by the intelligent motor control unit (IMCU).

Intelligent Motor Control Unit (IMCU)

The ECU is an electrical control component that controls the drive motor, which communicates with the IPK, BCM and other controllers via the high-speed CAN.

Operation

Reducer Assembly

The drive system drives the input shaft to change the rotation speed and direction by the motor speed regulation and the motor reversing principle, thereby changing the speed of the drive gear and reverse gear.

When the gear shift control mechanism is in D gear, the torque is directly transmitted from the drive motor to the reducer input shaft, and to the intermediate shaft gear and the final drive driven gear through the input shaft gear, and finally to the drive shaft. The vehicle speed is changed by changing the motor speed after starting or during driving.

Differential

The differential allows the wheels to rotate at different speeds when the intermediate shaft torques are the same. The pinion integrated with the intermediate shaft is engaged with the final drive driven gear of the differential assembly. When the wheels move forward in straight line, the torque will be applied to the whole assembly and the planetary gear does not rotate. The torque is transmitted to the wheels through the drive shafts. When the vehicle takes a turn, the inner wheels will pass a shorter distance at a lower speed. Thus it drives the planetary gear to rotate, and the outer sun gear offers a higher speed to the outer wheels.

Precautions for Operation of Drive Motor

Since the drive motor works in a high voltage and high current environment, attention must be paid to the following during operation:

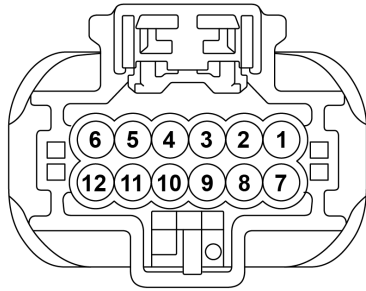
1. Collision, drop and squeezing against human body shall be avoided during product transportation and fitting.
2. The storage environment shall be dry. The environmental requirements for unpacking the motor are: temperature within $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, and humidity within $10\% \sim 70\%$ RH.
3. The insulation inspection must be performed for the motor before fitting and use (For specific operations, refer to PEB the removal/refit content)
4. Before the motor is fitted and used, the motor output shaft shall be able to rotate freely. Check the appearance of the motor to make sure that the housing is free of damage or abnormal deformation.
5. Before the motor is fitted and used, check that the conductive part of the three-phase harness and the heavy-current interface of the motor are clean and free of foreign matters or grease.
6. The low-voltage connector is plastic, which shall be protected from direct collision with or stress by hard objects during fitting.

7. The motor rotor is strongly magnetic, so that other components than high and low voltage cover plates shall not be removed and refitted.

Electric Drive Unit - A Shaft Rear

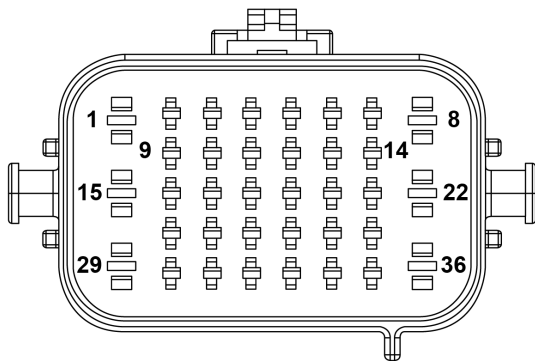
Detailed Information List of Component Pins

Definition of Motor Low Voltage Harness Pins



Pin No.	Description
1	NTC GND
2	NTC+
3	Rotary Transformer COS+
4	Rotary Transformer COS-
5	Rotary Transformer Excitation +
6	Shield Ground
7	HV Interlock Signal Output
8	HV Interlock Signal Input
9	Rotary Transformer SIN+
10	Rotary Transformer SIN-
11	Rotary Transformer Excitation -
12	

End View and Pin Definition of ECU Harness Connector BY031



Pin No.	Description
1	KL30.1
2	Cooling Fan Relay
3	KL.15

4	Main Relay
5	PEB Cooling Water Pump I_Power Supply
6	EDU Coolant Temperature Sensor Signal
7	EDU Coolant Temperature Sensor Ground
8	-
9	Accelerator Pedal Position Sensor Power Supply 1
10	Accelerator Pedal Position Sensor Ground 1
11	Accelerator Pedal Position Sensor Signal 1
12	Accelerator Pedal Position Sensor Power Supply 2
13	Accelerator Pedal Position Sensor Ground 2
14	Accelerator Pedal Position Sensor Signal 2
15	Ground
16	BrkLghtSw_SIG
17	BrkTrvlSw_SIG
18	BPSWakeUp
19	IMCU_LIN I
20	KL30
21	-
22	-
23	-
24	Enable Wake-up
25	Powertrain CANFD_H
26	Powertrain CANFD_L
27	Powertrain Expansion CAN_H
28	Powertrain Expansion CAN_L
29	Battery Pack Cooling Water Pump_DRV
30	IMCU Cal CAN_H
31	IMCU Cal CAN_L
32	GND
33	KL30.2
34	OffBdChrgPrPstvSnsr+
35	OBCSkNgtvSnsr+
36	ChrgSkvSnsr-

Electric Drive Transmission/ Transaxle

Electric Drive Unit - A Shaft Rear

Service Guide - Electric Drive Unit - A Shaft Electric Drive Unit Fluid - Drain and Refill Drain

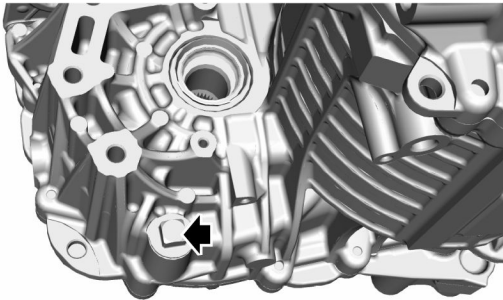
1. Remove the manual service disconnect.

Manual Service Disconnect

2. Remove the rear bottom deflector.

Bottom Deflector

3. Place an appropriate container under the electric drive transmission.
4. Clean the area around the oil drain plug, remove the oil drain plug and discard the sealing gasket.



S1214809

5. Drain the electric drive transmission oil.
6. Place the new sealing gasket on the oil drain plug, fit and tighten the oil drain plug to **25-35Nm**, and check the torque.

Refill

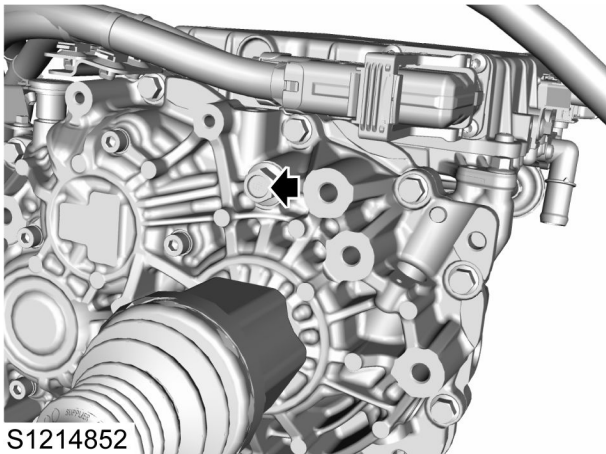
1. Remove the manual service disconnect.

Manual Service Disconnect

2. Remove the rear bottom deflector.

Bottom Deflector

3. Clean the area around the oil filler plug, remove the oil filler plug and discard the sealing gasket.



S1214852

4. Fill the electric drive transmission oil through the filler port, and the filling amount is:

Drain and Refill	0.7 L
Refill from Dry State	0.8 L

5. Place the new sealing gasket on the oil filler plug, fit and tighten the oil filler plug to **15-20Nm**, and check the torque.

6. Fit the manual service disconnect.

Manual Service Disconnect

Electric Drive Unit - A Shaft Rear

Electric Drive Unit and Mount Remove

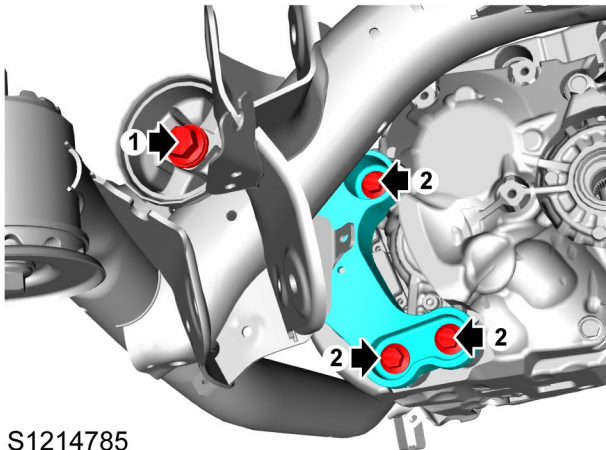
1. Drain the electric drive transmission oil.

Electric Drive Transmission Oil Drain Refill Drain Refill

2. Remove the rear subframe assembly.

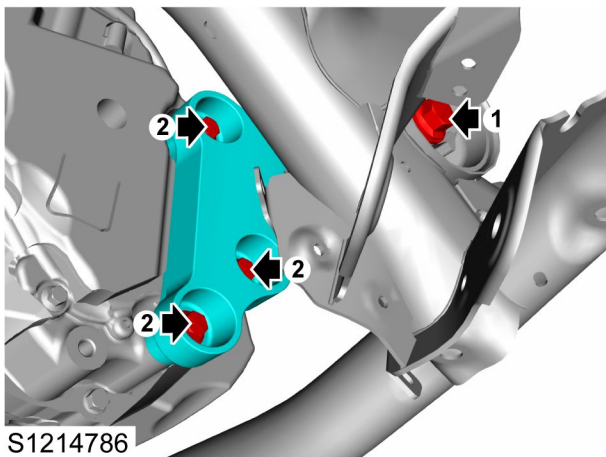
Rear Subframe Assembly Remove

3. Remove and discard 1 bolt fixing the left mount bracket to the rear subframe (1).
4. Remove and discard 3 bolts fixing the left mount bracket to the electrically driven transmission (2).



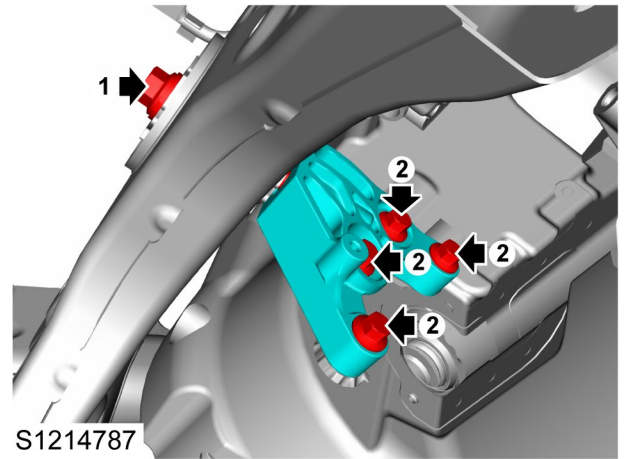
S1214785

5. Remove and discard 1 bolt fixing the right mount bracket to the rear subframe (1).
6. Remove and discard 3 bolts fixing the right mount bracket to the electrically driven transmission (2).



S1214786

7. Remove and discard 1 bolt fixing the rear mount bracket to the rear subframe (1).
8. Remove and discard 4 bolts fixing the rear mount bracket to the electrically driven transmission (2).



S1214787

Refit

1. Fit 4 new bolts fixing the rear mount bracket to the electric drive transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.
2. Fit 1 new bolt fixing the rear mount bracket to the rear subframe, tighten it to **(135-165) Nm+ (85-95) °**, and check the torque.
3. Fit 3 new bolts fixing the right mount bracket to the electric drive transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.
4. Fit 1 new bolt fixing the right mount bracket to the electric drive transmission, tighten it to **(135-165) Nm+ (85-95) °**, and check the torque.
5. Fit 3 new bolts fixing the left mount bracket to the electric drive transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.
6. Fit 1 new bolt fixing the left mount bracket to the rear subframe, tighten it to **(135-165) Nm+ (85-95) °**, and check the torque.
7. Fit the rear subframe assembly.

Rear subframe assembly Refit


8. Fill the electric drive transmission oil.

Electric Drive Transmission Oil Drain Refill Drain Refill

Electric Drive Transmission/ Transaxle

Differential Oil Seal - Left Remove- Left

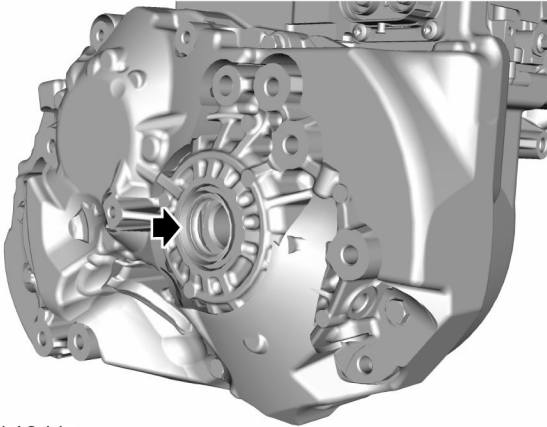
1. Drain the electric drive transmission oil.

 [Electric Drive Transmission Oil Drain Refill](#)
[Drain Refill](#)

2. Remove the left rear axle shaft assembly.

 [Left Rear Axle Shaft Assembly Remove - Right](#)
[Rear Remove - Left Rear](#)

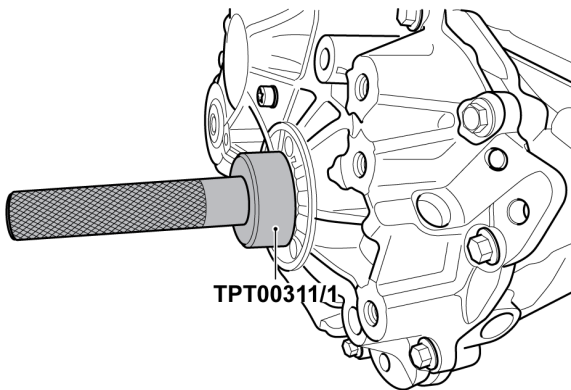
3. Remove the left differential oil seal.



S1214811

Refit- Left

1. Clean the oil seal groove.
2. Fit the left differential oil seal with the special tool TPT00311/1.



S1214961

3. Fit the left rear axle shaft assembly.

 [Left Rear Axle Shaft Assembly Refit - Right](#)
[Rear Refit - Left Rear](#)

4. Fill the electric drive transmission oil.

 [Electric Drive Transmission Oil Drain Refill](#)
[Drain Refill](#)

Electric Drive Unit - A Shaft Rear

Differential Oil Seal - Right Remove - Right

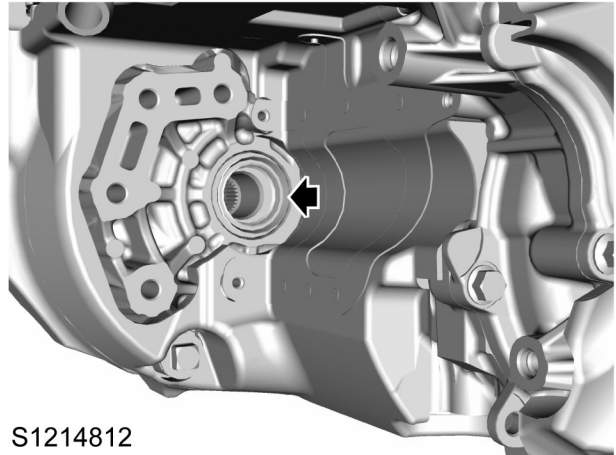
1. Drain the electric drive transmission oil.

 [Electric Drive Transmission Oil Drain Refill](#)
[Drain Refill](#)

2. Remove the rear axle shaft intermediate connecting shaft assembly.

 [Rear Axle Shaft Intermediate Connecting Shaft](#)
[Assembly Remove](#)

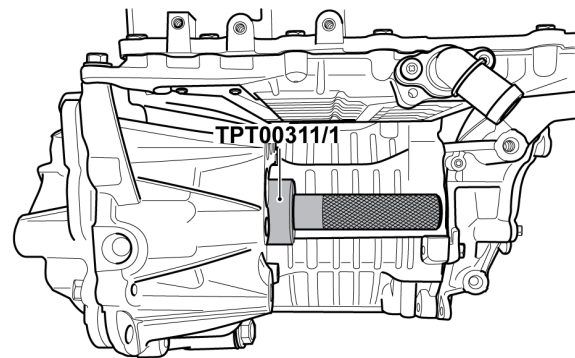
3. Remove and discard the right differential oil seal.



S1214812

Refit - Right

1. Clean the oil seal groove.
2. Fit the new right differential oil seal with the special tool TPT00311/1.



S1214962

3. Fit the rear axle shaft intermediate connecting shaft assembly.

 [Rear axle shaft intermediate connecting shaft](#)
[assembly Refit](#)


4. Fill the electric drive transmission oil.

 [Electric Drive Transmission Oil Drain Refill](#)
[Drain Refill](#)

Electric Drive Unit - A Shaft Rear

Electric Drive Unit Disassemble Remove


1. Remove the electric drive unit and mount.

 **Electric Drive Unit and Mount Remove Remove**

2. Remove the IMCU.

 **IMCU Remove Remove Remove - B Rear**

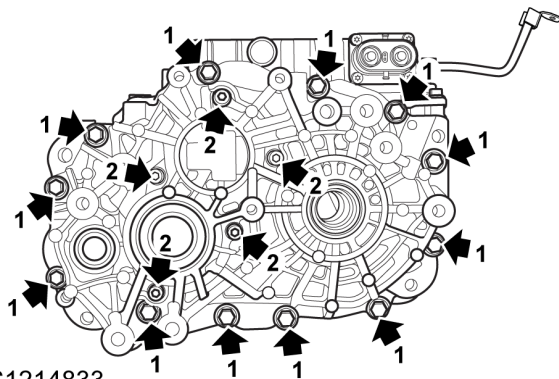
3. Remove the differential oil seal.

 **Differential Oil Seal Remove- Left Remove - Right Remove Remove Remove - B Rear - Left Remove - B Rear - Right**

4. Remove the electronic park mechanism.

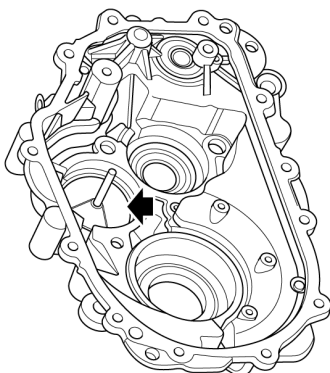
 **Electronic Park Mechanism Remove P Gear Unlocking Remove Remove - B Shaft Disassembling**

5. Remove 12 bolts (1) fixing the electric drive unit housing to the drive motor housing.
6. Remove 5 bolts (2) fixing the bearing plate.



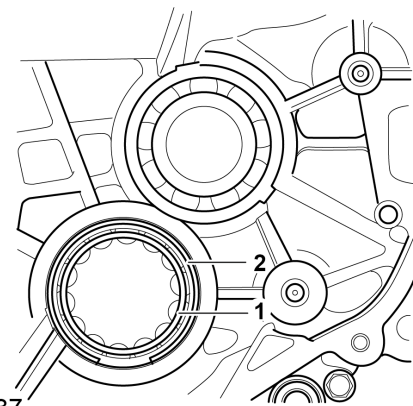
S1214833

7. Remove the input shaft, intermediate shaft and differential.
8. Remove the oil nozzle.



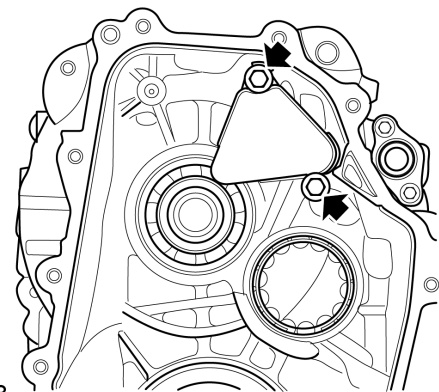
S1214836

9. Remove the circlip (1) fixing the intermediate shaft cylindrical bearing.
10. Remove the intermediate cylindrical bearing (2).



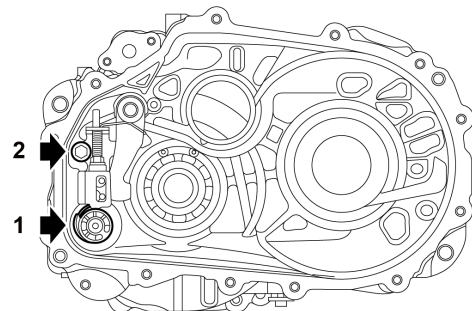
S1214837

11. Remove 2 bolts fixing the oil retaining labyrinth to the housing and discard the O-ring.



S1214838

12. Remove the camshaft assembly (1).
13. Remove 1 bolt (2) fixing the parking actuator to the housing.

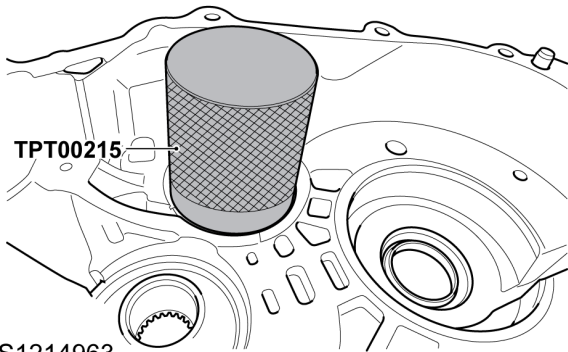


S1214960

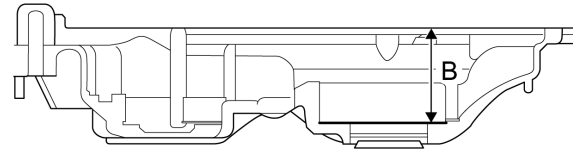
Refit

1. Fit 1 bolt fixing the parking actuator to the housing, tighten it to **19-25Nm**, and check the torque.
2. Fit the camshaft assembly.
3. Fit 2 bolts and new O-ring fixing the oil retaining labyrinth to the housing, tighten them to **8.5-11.5Nm**, and check the torque.
4. Apply lubricating oil on the outer ring of the intermediate shaft cylindrical bearing, and use the special tool TPT00215 to press-fit the intermediate

shaft cylindrical bearing until it is flush with the housing bearing hole base, with the notch side of the cylindrical bearing upward.



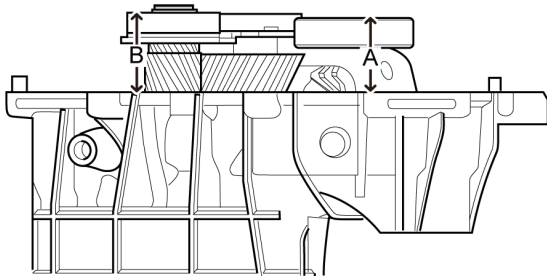
S1214963



S1214840

5. Fit the circlip in the housing circlip slot.
6. Fit the oil nozzle into the transmission housing, and fit the bayonet into the housing mounting hole.
7. Fit the input shaft, intermediate shaft and differential.
8. Use the gauge block 1, gauge block 2 and depth gauge to measure the distance A from the upper end face of the differential bearing to the motor housing closing end face and the distance B from the end face of the transmission housing differential bearing seat to the housing closing end face.
9. Measure A and B at three points (evenly distributed), and record the average value.
10. Calculate $C=B-A$ and select the appropriate shim.
11. Use a vernier caliper to measure the shim thickness again, which shall not exceed ± 0.02 .
12. Grease the adjustment shim and place it in the transmission housing.

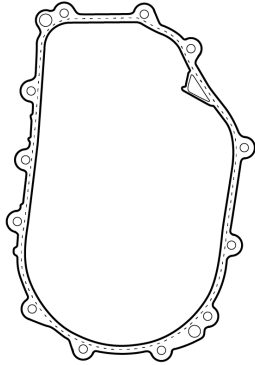
Adjustment Shim	
Clearance C	Selected Shim Specification
$C < 1.47$	NOK
$1.47 \leq C < 1.50$	1.45
$1.50 \leq C < 1.50$	1.50
$1.55 \leq C < 1.50$	1.55
$1.60 \leq C < 1.50$	1.60
$1.65 \leq C < 1.50$	1.65
$1.70 \leq C < 1.50$	1.70
$1.75 \leq C < 1.50$	1.75
$1.80 \leq C < 1.50$	1.80
$1.85 \leq C < 1.50$	1.85
$1.90 \leq C < 1.50$	1.90
$1.95 \leq C < 1.50$	1.95
$2.00 \leq C < 2.05$	2.00
$2.05 \leq C < 2.05$	2.05
$2.10 \leq C < 2.05$	2.10
$2.15 \leq C < 2.05$	2.15
$2.20 \leq C < 2.05$	2.20
$2.25 \leq C < 2.05$	2.25
$2.30 \leq C < 2.05$	2.30
$2.32 \leq C$	NOK



S1214822

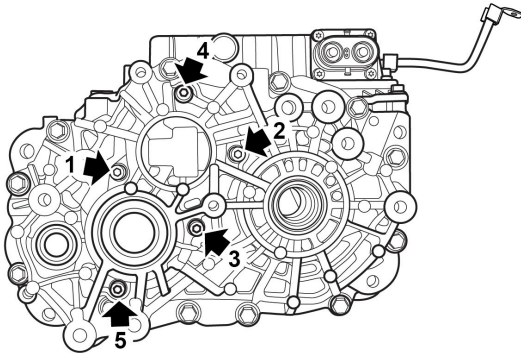
13. Apply the closing sealant on the motor housing closing surface without breakage, which is 2-3mm wide.

Electric Drive Unit - A Shaft Rear



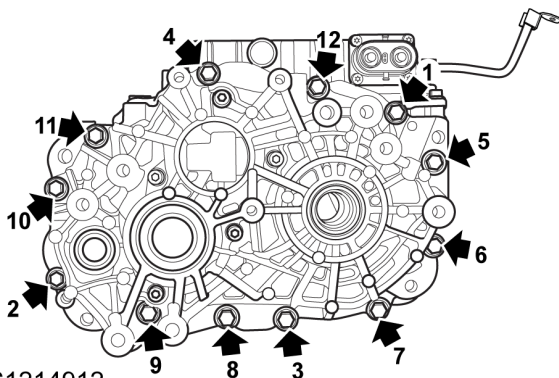
S1214841

- Fit 5 bolts fixing the bearing plate in the sequence as shown in the figure, tighten them to **19-25Nm**, and check the torque.



S1214834

- Fit 12 bolts fixing the electric drive unit housing to the drive motor housing in the sequence as shown in the figure, tighten them to **26-34Nm**, and check the torque.



S1214912

- Fit the electronic park mechanism.

Electronic Park Mechanism Refit Refit Refit - B Shaft Disassembling

- Fit the differential oil seal.

Differential Oil Seal Refit- Left Refit - Right Refit Refit Refit - B Rear - Left Refit - B Rear - Right

- Fit the IMCU.

IMCU Refit Refit Refit - B Rear

- Fit the electric drive unit assembly and mount.

Electric Drive Unit and Mount Refit Refit

- Perform the dry cavity and water pipeline tightness test.

Dry Cavity Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

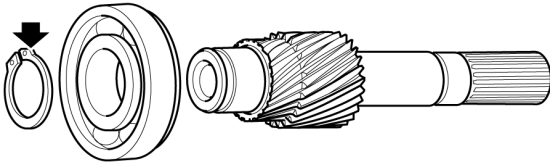
Water Pipeline Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

Input Shaft Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling Remove Remove

2. Remove and discard the circlip fixing the input shaft bearing.

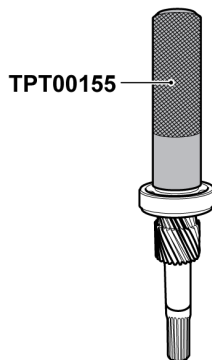


S1214914

3. Remove and discard the input shaft bearing.

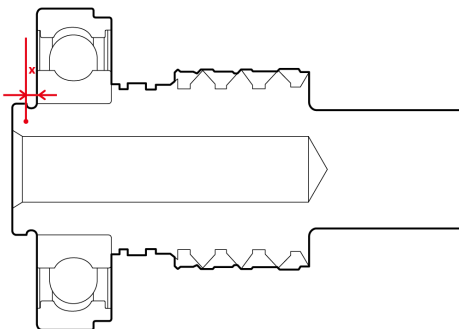
Refit

1. Use the special tool TPT00155 to fit the new input shaft rear bearing.



S1214964

2. Use a feeler gauge to measure the depth of the circlip slot and select the corresponding circlip to fit into the circlip slot.



S1215086

Measure the clearance X (mm) (input shaft bearing inner ring plane to input shaft circlip mating surface)	Circlip Thickness (mm)
$X < 1.90$	NOK
$1.90 \leq X < 1.95$	1.88
$1.95 \leq X < 2.00$	1.93
$2.00 \leq X < 2.05$	1.98
$2.05 \leq X < 2.06$	2.03
$2.06 < X$	NOK

3. Assemble the electric drive unit assembly.

Electric Drive Unit Disassembling Refit Refit

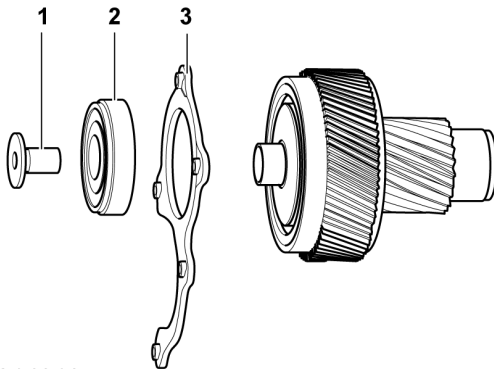
Electric Drive Unit - A Shaft Rear

Intermediate Shaft Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling Remove Remove

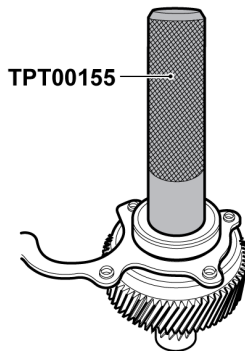
2. Remove 1 screw (1) fixing the bearings at both ends of the intermediate shaft.
3. Remove the intermediate shaft rear bearing (2).
4. Remove the intermediate shaft ball bearing press plate (3).



S1214913

Refit

1. Fit the intermediate shaft ball bearing press plate.
2. Use the special tool TPT00155 to fit the intermediate shaft rear bearing.



S1214965

3. Fit 1 screw fixing the bearings at both ends of the intermediate shaft, tighten it to **105-115Nm**, and check the torque.
4. Assemble the electric drive unit.

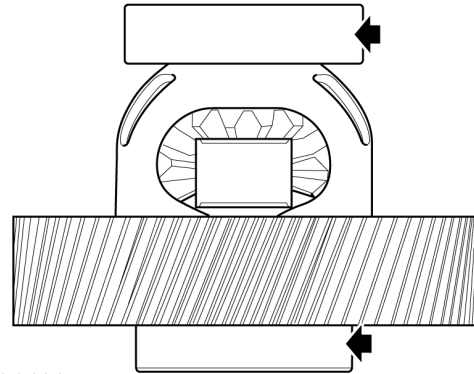
Electric Drive Unit Disassembling Refit Refit

Differential Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling Remove Remove

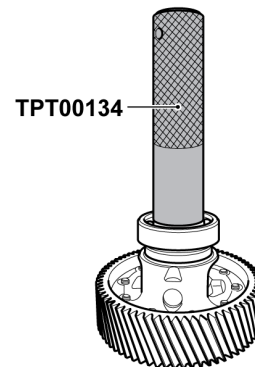
2. Remove the bearings on both ends of the differential.



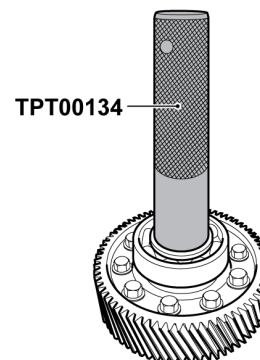
S1214827

Refit

1. Use the special tools TPT00134 to fit the bearings at both ends of the differential.



S1214966



S1214967

2. Assemble the electric drive unit.

Electric Drive Unit Disassembling Refit Refit

Electronic Parking Mechanism Remove

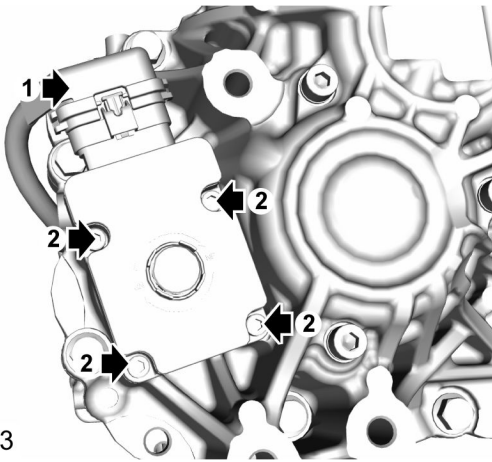
1. Remove the manual service disconnect.

Manual Service Disconnect Remove

2. Remove the electric drive transmission assembly and mount.

Electric Drive Transmission Assembly and Mount Remove Remove

3. Disconnect the harness (1) from the electric parking motor control unit (EPMCU).
4. Remove 4 bolts (2) fixing the EPMCU to the transmission.



S1214963

Refit

1. Fit and tighten 4 bolts fixing the electric parking mechanism to the transmission.
2. Connect the harness to the electric parking motor control unit (EPMCU).
3. Remove the electric drive transmission assembly and mount.

Electric Drive Transmission Assembly and Mount Refit Refit

4. Fit the manual service disconnect.

Manual Service Disconnect Refit



5. Connect the scan tool and access the SIPS.
6. Select "Programming and Coding- EPMCU- Replacement", and follow the on-screen instructions.

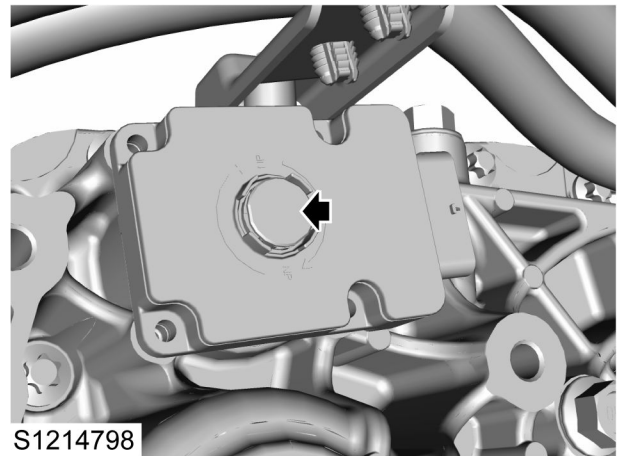
P Gear Unlocking P Gear Unlocking

When the P gear mechanism cannot be shifted out of P gear due to EPMCU failure, low voltage & flat battery, high voltage failure, SCU failure, etc., P gear unlocking can be completed by the following steps.

Caution : The following steps require the support of a jack to complete the operation, please stay safe.

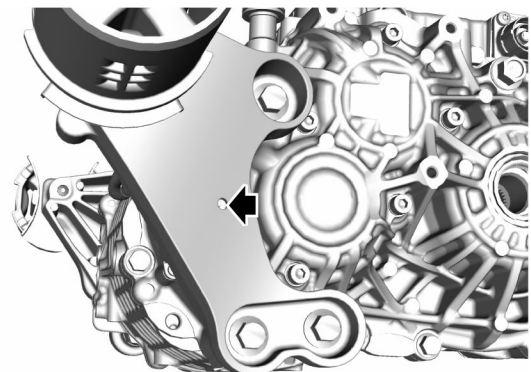
Caution : After performing the following steps, if the vehicle is re-supplied with low voltage power, the system will shift into P gear.

1. Remove the manual service disconnect.  Manual Service Disconnect
2. Remove the bottom deflector.  Bottom Deflector
3. Pry off the vent plug with a flat-blade screwdriver and discard it.



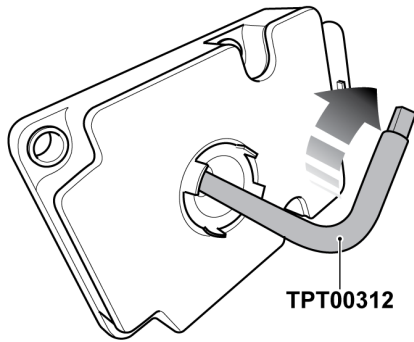
S1214798

4. Pass the special tool TPT00312/I through the hole on the mount bracket.



S1214972

5. Rotate the internal mechanism clockwise with the special tool TPT00312/I to shift out of P gear.



S1214968

6. Fit a new vent plug.
7. Fit the bottom deflector. **Bottom Deflector**
8. Fit the manual service disconnect. **Manual Service Disconnect**

When the P gear mechanism cannot be shifted out of P gear due to SCU communication failure, P gear unlocking can be completed by the following steps.

1. Ensure that the battery power supply is normal.
2. Connect the scan tool, perform the stroke position self-learning for the electric parking module, please refer to Self-learning and Programming - Electric Parking Motor Control Unit (EPMCU) for details.
3. After the stroke self-learning is successfully completed, the parking pawl will be in a non-P gear position.

Drive Motor Small Assembly Remove

1. Disassemble the electric drive transmission.

Electric Drive Unit Disassembling Remove Remove

2. Remove the LV harness of the electric drive unit.

LV Harness of Electric Drive Unit Remove Remove Remove - B Rear Remove - B Rear Remove

3. Remove the resolver stator.

Resolver Stator Remove Remove Remove - B Rear

4. Remove the drive motor insulation block of the electric drive unit.

Drive Motor Insulation Block of Electric Drive Unit Remove Remove Remove - B Rear

5. Remove the drive motor assembly.

Refit

1. Fit the drive motor insulation block of the electric drive unit.

Drive Motor Insulation Block of Electric Drive Unit Refit Refit Refit - B Rear

2. Fit the resolver stator.

Resolver Stator Refit Refit Refit - B Rear

3. Fit the LV harness of the electric drive unit.

LV Harness of Electric Drive Unit Refit Refit Refit - B Rear Refit - B Rear Refit

4. Fit the vent plug to the drive motor.

5. Assemble the electric drive transmission.

Electric Drive Unit Disassembling Refit Refit

6. Perform the dry cavity and coolant pipeline air tightness test.

Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

Electric Drive Transmission/ Transaxle

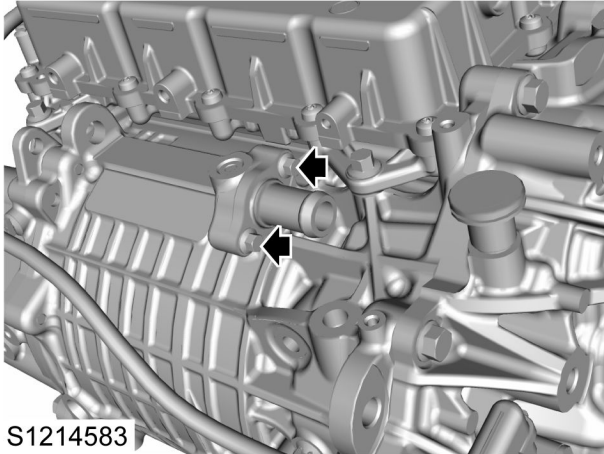
Electric Drive Unit - A Shaft Rear

Motor Cooling Water Pipe Fitting Remove

1. Remove the electric drive transmission and mount.

Electric Drive Transmission and Mount Remove Remove

2. Remove 2 bolts fixing the coolant pipe fittings to the transmission and discard the O-rings.



Refit

1. Fit 2 bolts fixing the coolant pipe fittings to the housing, tighten them to **7-10Nm**, and check the torque.
2. Fit the electric drive transmission and mount.

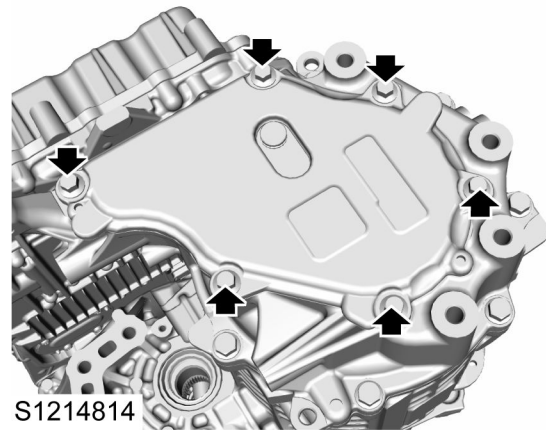
Electric Drive Transmission and Mount Refit Refit

Drive Motor Control Module Observation Cover Plate Remove

1. Remove the electric drive transmission assembly.

Electric Drive Transmission and Mount

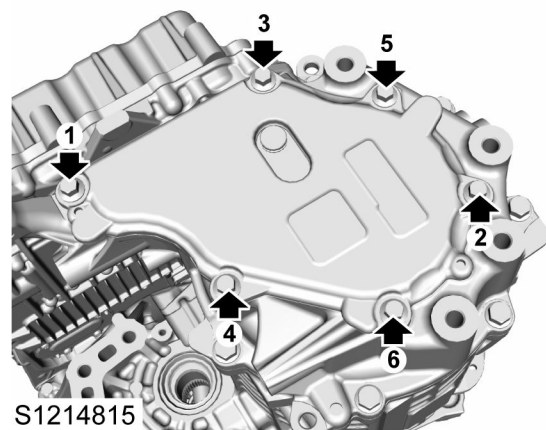
2. Remove 6 bolts fixing the observation cover plate of the drive motor control module to the housing and discard the gaskets.



3. Remove 2 bolts fixing the interlocking connector to the cover plate. (Figure missing)

Refit

1. Fit and tighten 2 bolts fixing the interlocking connector to the cover plate.
2. Fit 6 bolts and new gaskets fixing the observation cover plate of the drive motor control module to the housing in the sequence as shown in the figure, tighten them to **19-25Nm**, and check the torque.



3. Fit the electric drive transmission assembly.

Electric Drive Transmission and Mount

4. Perform the dry cavity air tightness test.

Dry Cavity Air Tightness Test

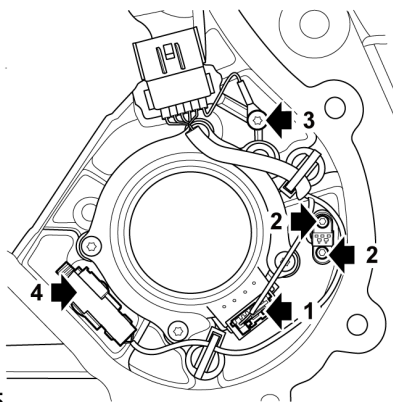
Electric Drive Unit - A Shaft Rear

Electric Drive Unit Low-voltage Harness Remove

1. Remove the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module Remove Remove Remove - B Shaft Disassembling

2. Disconnect the connector (1) from the resolver stator.
3. Remove 2 bolts (2) fixing the harness interlocking connector to the housing.
4. Remove 1 bolt (3) fixing the harness grounding wire to the housing.
5. Disconnect the connector (4) from the transfer line of the LV harness.



S1214845

Refit

1. Connect the transfer line of the LV harness.
2. Fit and tighten 1 bolt fixing the harness grounding wire to the housing.
3. Fit and tighten 2 bolts fixing the harness interlocking connector to the housing.
4. Connect the connector to the resolver stator.
5. Fit the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module Refit Refit Refit - B Shaft Disassembling

6. Perform the self-learning for the intelligent electronic control unit.

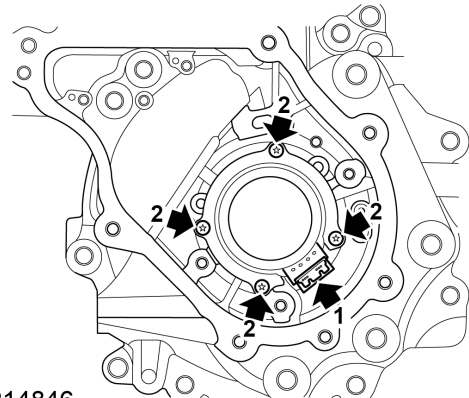
Intelligent Motor Control Unit (IMCU) Intelligent Motion Control Unit (IMCU) - Shaft B - Rear Electronic Control Unit (SAC)

Resolver Stator Remove

1. Remove the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module Remove Remove Remove - B Shaft Disassembling

2. Disconnect the connector (1) from the resolver stator.
3. Remove 4 bolts (2) fixing the resolver stator pressing plate to the housing.



S1214846

Refit

1. Measure the resistance of two points as shown in the figure with a micro-resistance tester, which requires a resistance value $\leq 0.1m\Omega$, measure twice and exchange the probe.
2. Fit the resolver stator (with the connector facing upward) into the motor end cover.
3. Fit and tighten 4 bolts fixing the resolver stator pressing plate to the housing.
4. Connect the connector to the resolver stator.
5. Fit the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module

6. Perform the self-learning for the drive motor.

Electric Drive Transmission/ Transaxle

Electric Drive Unit - A Shaft Rear

Electric Drive Unit Drive Motor Insulation Block Remove

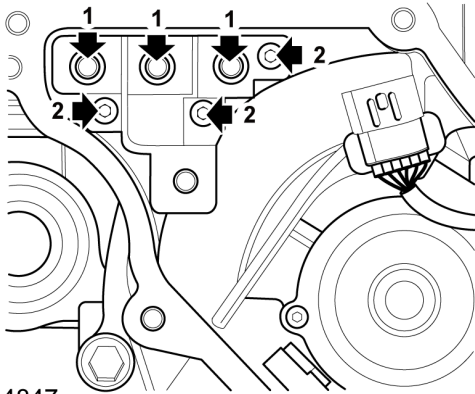
1. Remove the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module Remove Remove Remove - B Shaft Disassembling

2. Remove the Intelligent electronic control unit.

Intelligent Electronic Control Unit Remove Remove Remove - B Rear

3. Remove the bolt fixing the rotor 3-phase wire to the insulation block.
4. Remove 3 bolts fixing the insulation block to the housing (2).



S1214847

Refit

1. Fit 3 bolts fixing the insulation block to the housing, tighten them to **5-7Nm**, and check the torque.
2. Fit the Intelligent electronic control unit.

Intelligent Electronic Control Unit Refit Refit Refit - B Rear

3. Fit the remaining bolts fixing the rotor 3-phase wire to the insulation block, tighten them to **19-25Nm**, and check the torque.
4. Fit the observation cover plate of the drive motor control module.

Observation Cover Plate of Drive Motor Control Module Refit Refit Refit - B Shaft Disassembling

5. Perform the self-learning for the drive motor.

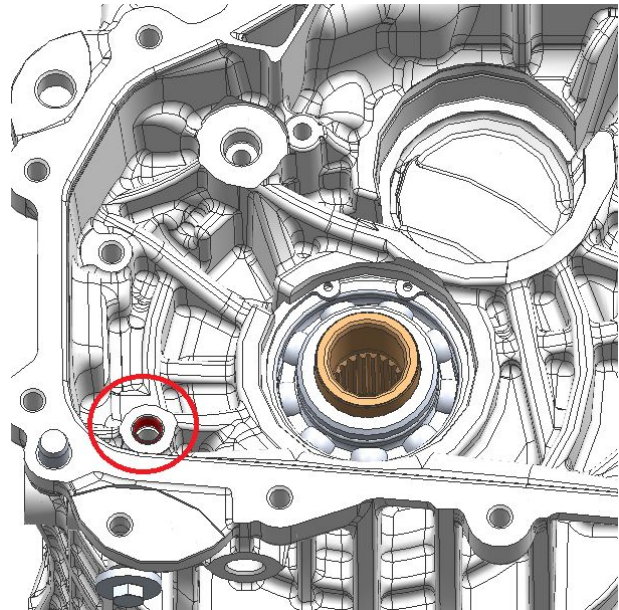
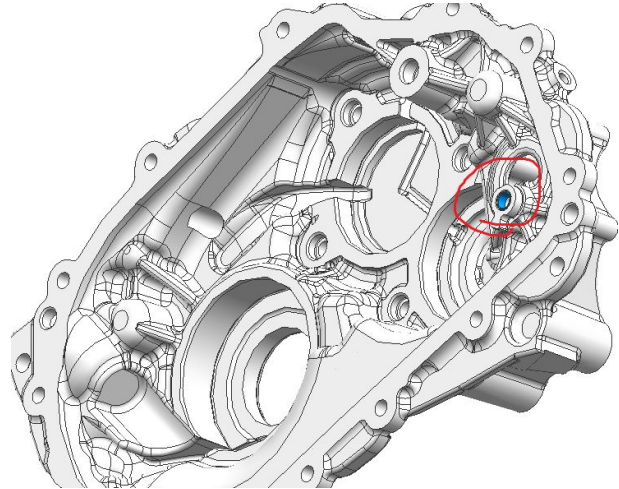
Intelligent Motor Control Unit (IMCU) Intelligent Motion Control Unit (IMCU) - Shaft B - Rear Electronic Control Unit (SAC)

Electric Drive Unit Parking Mechanism Shaft Sleeve Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling Remove Remove

2. Remove the parking mechanism bushings of electric drive unit fixed to the housings at both ends.



Refit

1. Use a rubber hammer to tap the plain bearing, so that it is flush with the end face of the housing mounting holes.
2. Assemble the electric drive unit.

Electric Drive Unit Disassembling Refit Refit

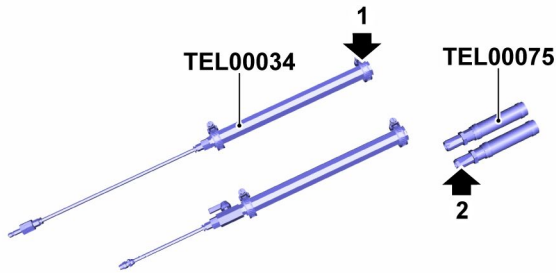
Electric Drive Unit - A Shaft Rear

Water Tightness Test Coolant Pipeline Air Tightness Test

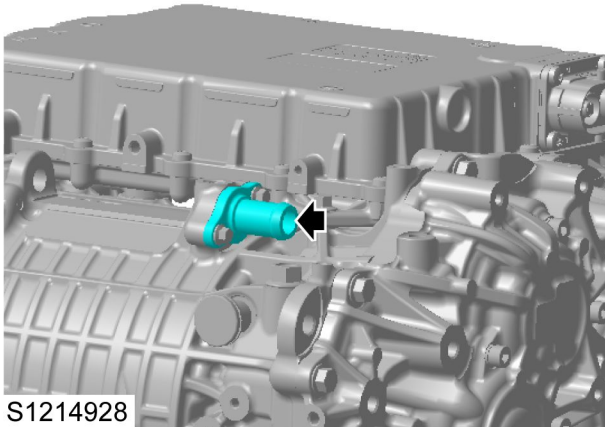
1. Remove the electric drive transmission assembly.

Electric Drive Transmission Assembly and Mount Remove Remove

2. Fix the special tool TEL00075 to one pipe without the valve of TEL00034, and fix the other end of TEL00075 to the coolant outlet of the drive motor, and tighten the clamp.

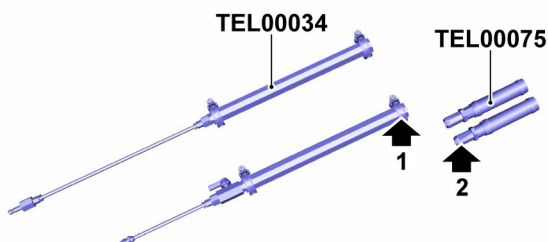


S1214969

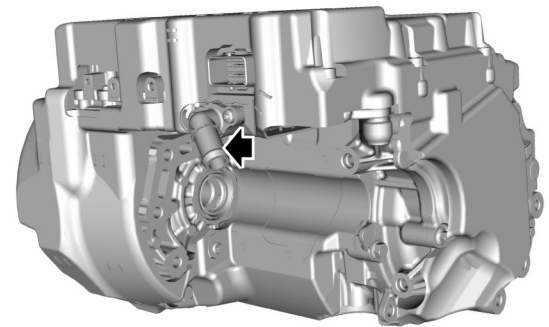


S1214928

3. Connect the other pipe with the valve of TEL00034 to TEL00075, and fix the other end of TEL00075 to the coolant inlet of the intelligent control unit, then tighten the clamp.



S1214970



S1214932

4. Connect the pipe without the valve to the air tightness test equipment.
5. Close the valve on the pipe.
6. Inflate the system with the air tightness equipment to a pressure of 2.5bar (absolute pressure), maintain the pressure for 10 seconds, and test for 10 seconds; if the system pressure drop is 150pa or less, the air tightness test is considered as passed, otherwise it is required to find out the leaking points; after they are fixed, re-conduct the air tightness test until the test is passed.
7. Fit the electric drive transmission assembly.

Electric Drive Transmission Assembly and Mount Refit Refit

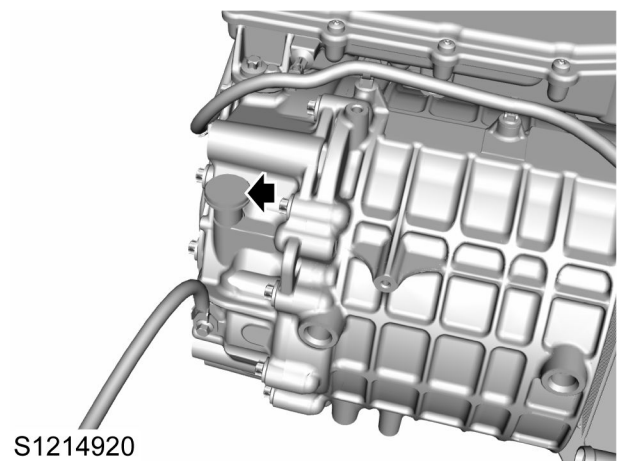
Dry Cavity Air Tightness Test

1. Remove the electric drive transmission assembly.

Do not remove the axle shaft connecting shaft from the motor.

Electric Drive Transmission Assembly and Mount Remove Remove Remove - B Rear

2. Remove the vent plug, and fit the sealing tube at the lower part of the vent plug back into the housing.



S1214920

3. Remove the observation window cover plate of the motor, discard the gasket, and remove the vent plug on the observation window of the cover plate from

Electric Drive Transmission/ Transaxle

the inside. (Link to Observation Window Cover Plate Remove)

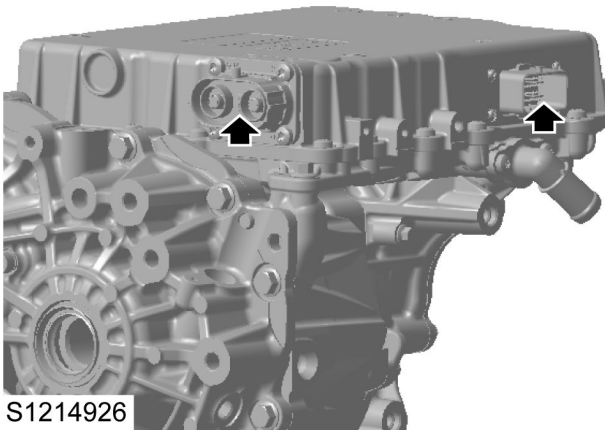
Observation Window Cover Remove Remove Remove - B Shaft Disassembling

The vent plug cannot be forcibly removed from the front.

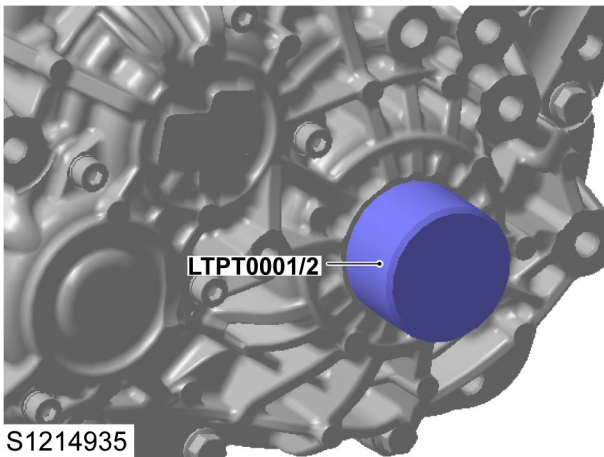
4. Fit the observation window cover plate back onto the motor.

Observation Window Cover Refit Refit Refit - B Shaft Disassembling

5. With TEL00095 and TEL00096, seal the harness connector socket on the .

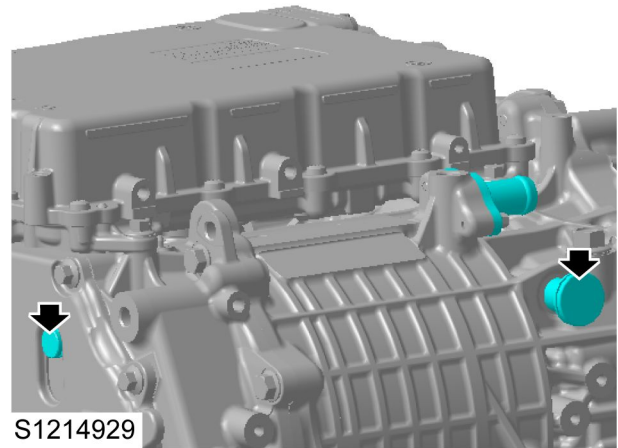


6. Plug the differential oil seal in place with the special tool TPT00311.



7. With two rubber plugs from the special tool TPT00301, block the vent plug and observation window vent plug respectively; with the other end connected to the air tightness equipment, perform the dry cavity air tightness test: at the temperature of 25°C, inflate to the pressure of 1.25bar (absolute pressure), maintain for 10s, and test if the pressure drop is 80pa or less within 30s. If the air tightness test fails, check and fix the leaking points, and re-conduct the air tightness test until the test is passed.

Electric Drive Unit - A Shaft Rear



8. Fit the vent plug into the motor housing. Visually check and confirm that the vent plug is fitted in place after fitting.
9. Fit the electric drive transmission assembly.

Electric Drive Transmission Assembly and Mount Refit Refit Refit - B Rear

Electric Drive Unit - A Shaft Rear

Intelligent Motor Control Unit (IMCU)

Remove

Warning : Maintenance personnel who were not trained in high voltage system knowledge of the vehicle are prohibited from dismantling the high voltage components (including high-voltage battery pack, electric drive system, CCU, high-voltage PDU, high-voltage harness, electric A/C compressor, battery heater, electric A/C heater, charging port, etc.).

Warning : Prior to disassembling or assembling HV components, the systems **MUST** be checked using a suitable multimeter to ensure they carry no high voltage current. Where there is need to work with the high voltage system, it is essential that the correct 'make safe' procedure is followed - see *Manual Service Disconnect procedure in the Service Repair manual. After disconnecting the Manual Service Disconnect (MSD), always wait 5 minutes prior to commencing any checks for residual voltage etc.*


Warning : Before starting the maintenance work, maintenance personnel must put on the protection equipment, including insulating gloves and high voltage insulated boots. Before wearing the insulated gloves, they must be checked whether there is damage and ensure they have no insulation failure.

Caution : In the process of installation and dismantling, brake fluid, washer fluid, coolant and other liquids shall be prevented from entering or splashing onto high voltage components.


1. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

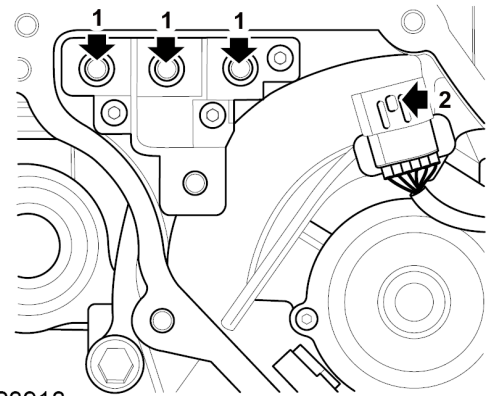
2. Remove the electric drive unit and mount.

 **Electric Drive Unit and Mount Remove Remove - B Rear**

3. Remove the drive motor control module sight cover.

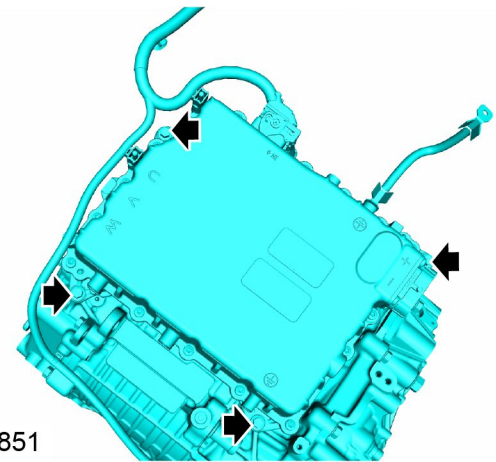
 **Drive Motor Control Module Sight Cover Remove Remove - B Shaft Disassembling**

4. Disconnect the harness connector (2).
5. Remove 3 bolts (1) fixing the ECU in the electric drive unit.



S1123913

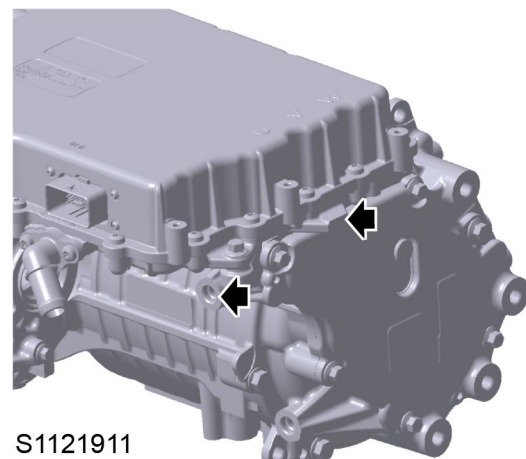
6. Remove 4 bolts fixing the ECU to the electric drive unit and mount, and remove the ECU.



S1123851

Refit

1. Fit a new seal ring on the ECU cooling pipe joint, and apply a small amount of HP300 grease on the seal ring.
2. Fix the ECU to the electric drive unit and mount, fit 4 bolts, tighten them to **26-34Nm** diagonally, and check the torque.
3. Use a micro resistance tester to measure the resistance at the two points as shown twice, with the resistance value $\leq 0.1 \text{ m}\Omega$, and exchange the probes.



S1121911


4. Connect the internal and external harness connectors.
5. Fix the ECU high voltage copper busbar in the drive motor, fit 3 bolts, tighten them to **19-25Nm**, and check

the torque.

6. Fit the drive motor control module sight cover.

 **Drive Motor Control Module Sight Cover** Refit
Refit Refit - B Shaft Disassembling

7. Fit the electric drive unit and mount.

 **Electric Drive Unit and Mount** Refit Refit Refit
- B Rear

8. Fit the manual service disconnect.


 **Manual Service Disconnect** Refit

Intelligent Motor Control Unit Cooling Water Pipe Fitting Remove

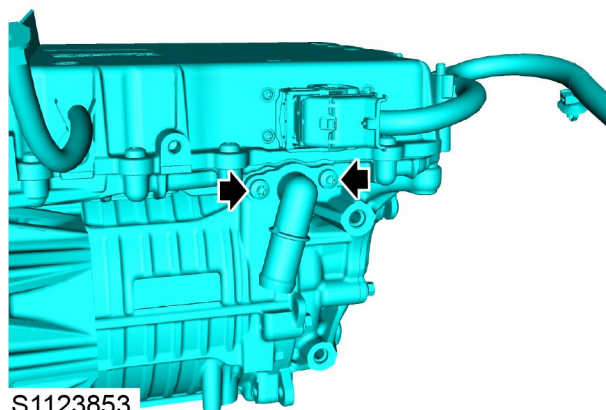
1. Remove the manual service disconnect.

 **Manual Service Disconnect** Remove

2. Remove the electric drive unit and mount.


 **Electric Drive Unit and Mount** Remove Remove
Remove - B Rear

3. Remove 2 bolts fixing the IMCU cooling water pipe fitting to the IMCU, and remove the IMCU water pipe fitting.



Refit

1. Fix the IMCU cooling water pipe fitting to the IMCU, fit 2 bolts, tighten them to TBD and check the torque.
2. Fit the electric drive unit and mount.

 **Electric Drive Unit and Mount** Refit Refit Refit
- B Rear


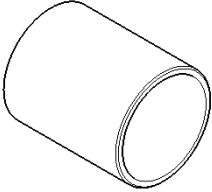
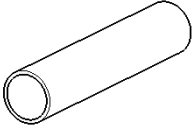
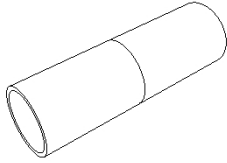
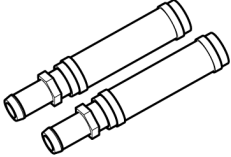
3. Fit the manual service disconnect.

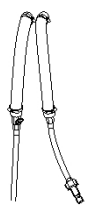
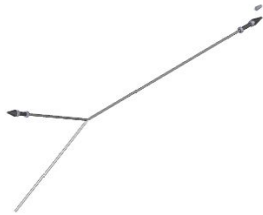
 **Manual Service Disconnect** Refit

Electric Drive Unit - A Shaft Rear

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TPT00311	Differential Oil Seal Assembly Tool	 <p align="center">TPT00311</p>
TPT00215	Replacer, input shaft bearing , outside	 <p align="center">TPT00215</p>
TPT00155	Output Shaft Rear Bearing Press Tool	 <p align="center">TPT00155</p>
TPT00134	Output Shaft Rear Bearing Press Tool	 <p align="center">TPT00134</p>
TEL00075	Pipe connector	 <p align="center">TEL00075</p>

Tool Number	Description	Picture
TEL00034	Cooling system leaktest tool	 <p>TEL00034</p>
TPT00301	Kit-pressure test connector	 <p>TPT00301</p>

Electric Drive Unit - A Shaft - Front

**Electric Drive Unit - A Shaft - Front
Specification**

中第 239 行的引用 (topicref) 错误: 无法打开文档
"C:\dita-data\PETasks\3b7f7390-fee6-4522-81d7-00309d965c25\SM016573.ditamap"

Torque

[A60110] 文档

Parameters

"C:\dita-data\PETasks\3b7f7390-fee6-4522-81d7-00309d965c25\SM016573.ditamap"

Model	A Shaft
Motor type	Permanent Magnet Synchronous Motor
Rated power/peak power	68/150Kw (64KWh battery)
Peak torque	250Nm (64KWh battery)
Rated speed/Maximum speed	8000/17000 (64KWh battery)
Rated power/peak power	54/125Kw (51KWh battery)
Peak torque	250Nm (51KWh battery)
Rated speed/Maximum speed	8000/17000 (51KWh battery)
IP rating	IP67
Total speed ratio	10.53
Speed ratio of input shaft to intermediate shaft	2.885
Final drive ratio	3.65
Centre distance between input shaft and intermediate shaft	78mm
Centre distance between intermediate shaft and differential shaft	115mm
Mass (without oil)	59kg
Lubricating Oil	Shell E-Fluids E6 iX (SL2808)
Dry motor fluid filling volume (overhaul)	1.1L
Wet motor fluid filling volume (replacement)	0.95L
Maximum overall dimension of electric drive unit (length*width*height)	393*437*297mm
List of disposable assembly parts	Gasket - Oil Filler Plug
	Gasket - Drain Plug
	Input Shaft Bearing
	Intermediate Shaft Bearing
	Differential Bearing
	Axle Shaft Oil Seal
	Circlip - Input Shaft Rear Bearing
	Circlip - Intermediate Shaft Rear Bearing Outer Ring
	Gasket- Differential Bearing
	Bolt - Intermediate Shaft Locking
Sealant	Loctite 5900
Lubricating grease	HP300

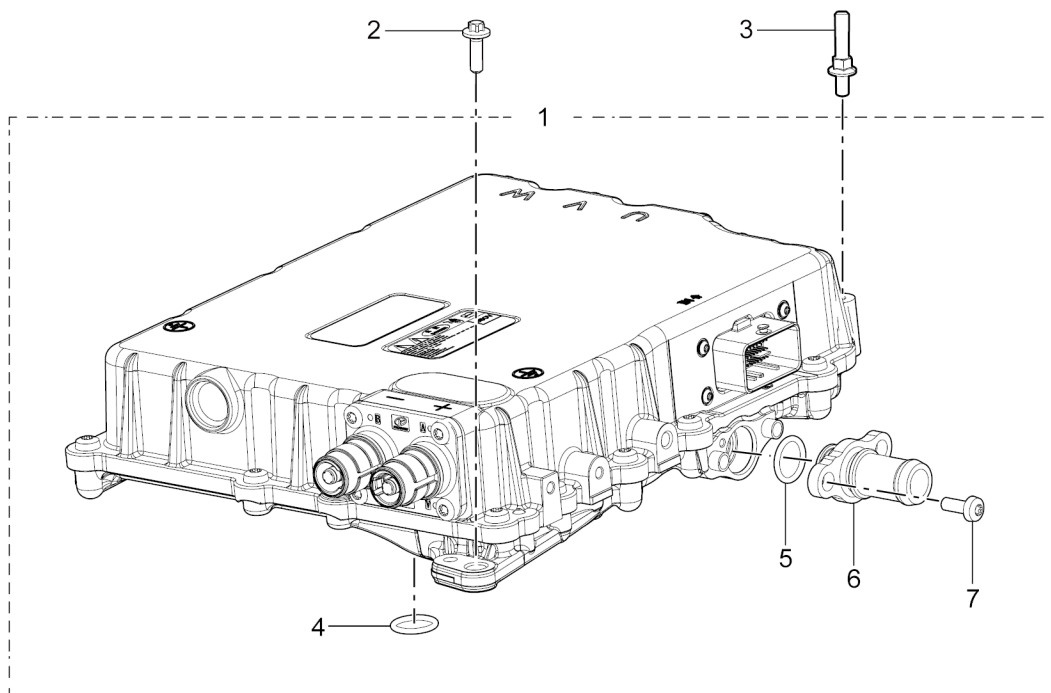
Note 1: "Dry motor fluid filling volume (overhaul)" refers to the filling volume required for the normal fluid filling when no fluid in the transmission. After the retarder is opened for repairing the transmission, the fluid is required to be removed from the transmission, then refill with the dry motor fluid filling volume.

Note 2: "Wet motor fluid filling volume (replacement)" refers to the filling volume required for the normal fluid filling by the drain plug via gravity drain to no dripping when the transmission is in normal state. Use wet motor fluid filling volume in case of after-sales replacement of fluid or new electric drive unit assembly.

Description and Operation

System Layout

Electronic Control Unit

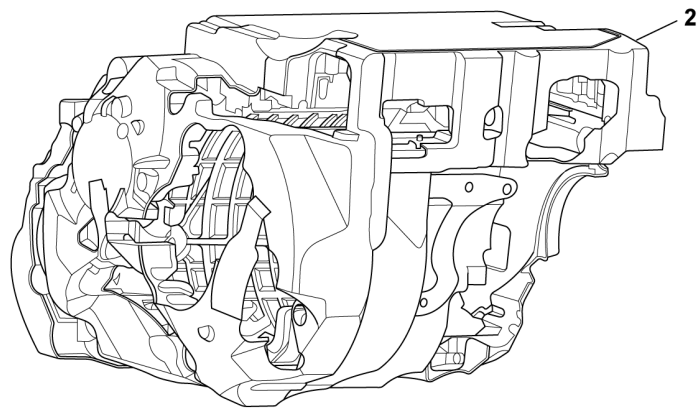
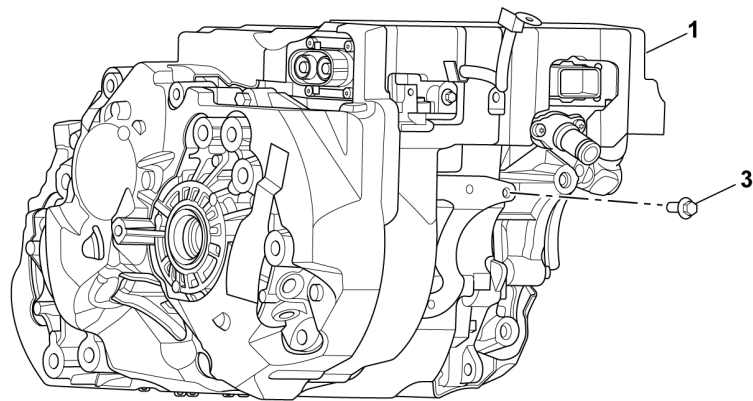


S1121253

- | | |
|---|--|
| 1. Drive Motor Control Module | 5. Seal Ring - Drive Motor Control Module Water Pipe Fitting |
| 2. Bolt - Drive Motor Control Module | 6. Drive Motor Control Module Water Pipe Fitting |
| 3. Stud - Electric Drive Unit Low-voltage Harness | 7. Bolt - Drive Motor Control Module Water Pipe Fitting |
| 4. Seal Ring - Drive Motor Control Module | |

Electric Drive Unit - A Shaft - Front

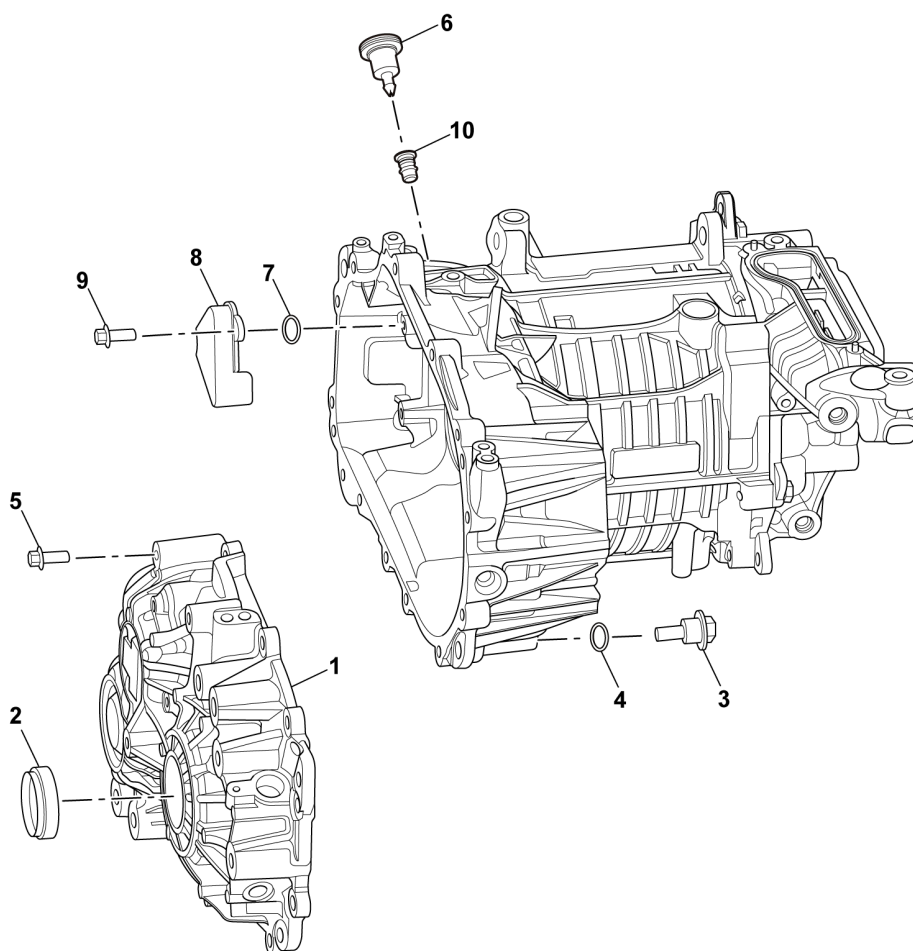
Electric Drive Unit Assembly



S1210231

- 1. Electric Drive Unit Assembly
- 2. Electric Drive Transmission Acoustic Package
- 3. Bolt - Acoustic Package

Electric Drive Unit Housing & Accessories

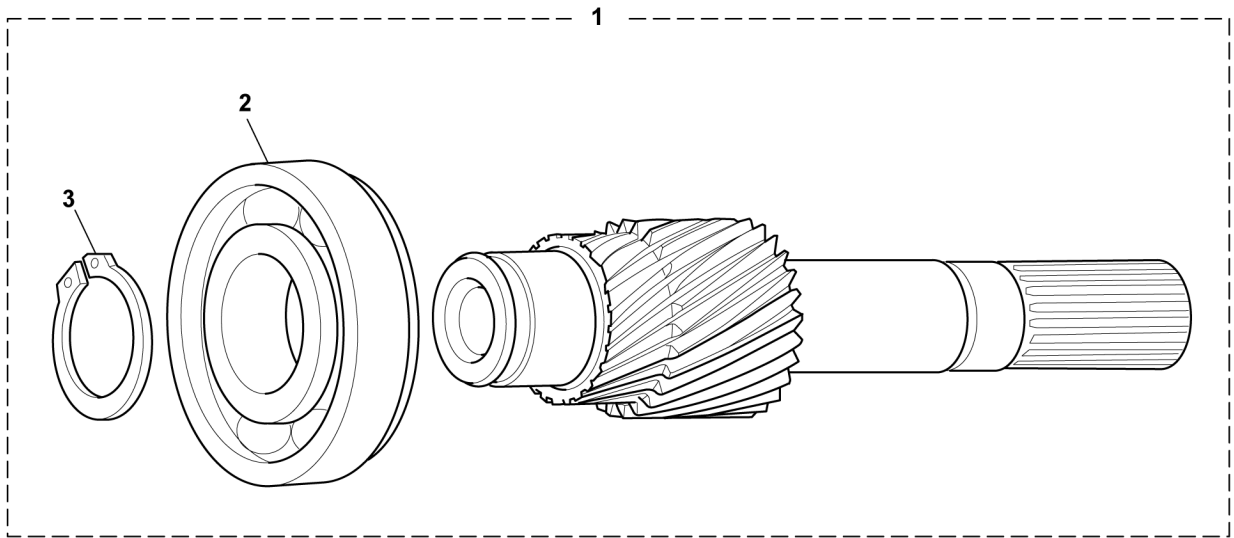


S1210232

- | | |
|--|---|
| 1. Electric Drive Unit Housing | 6. Electric Drive Unit Vent Plug |
| 2. Electric Drive Unit Differential Oil Seal | 7. O-ring - Electric Drive Unit Housing |
| 3. Electric Drive Unit Oil Drain Plug | 8. Electric Drive Unit Housing Spoiler |
| 4. Gasket - Electric Drive Unit Oil Drain Plug | 9. Bolt - Electric Drive Unit Housing Spoiler |
| 5. Bolt - Transmission Refit | 10. Electric Drive Unit Vent Plug Seal Pipe |

Electric Drive Unit - A Shaft - Front

Input Shaft

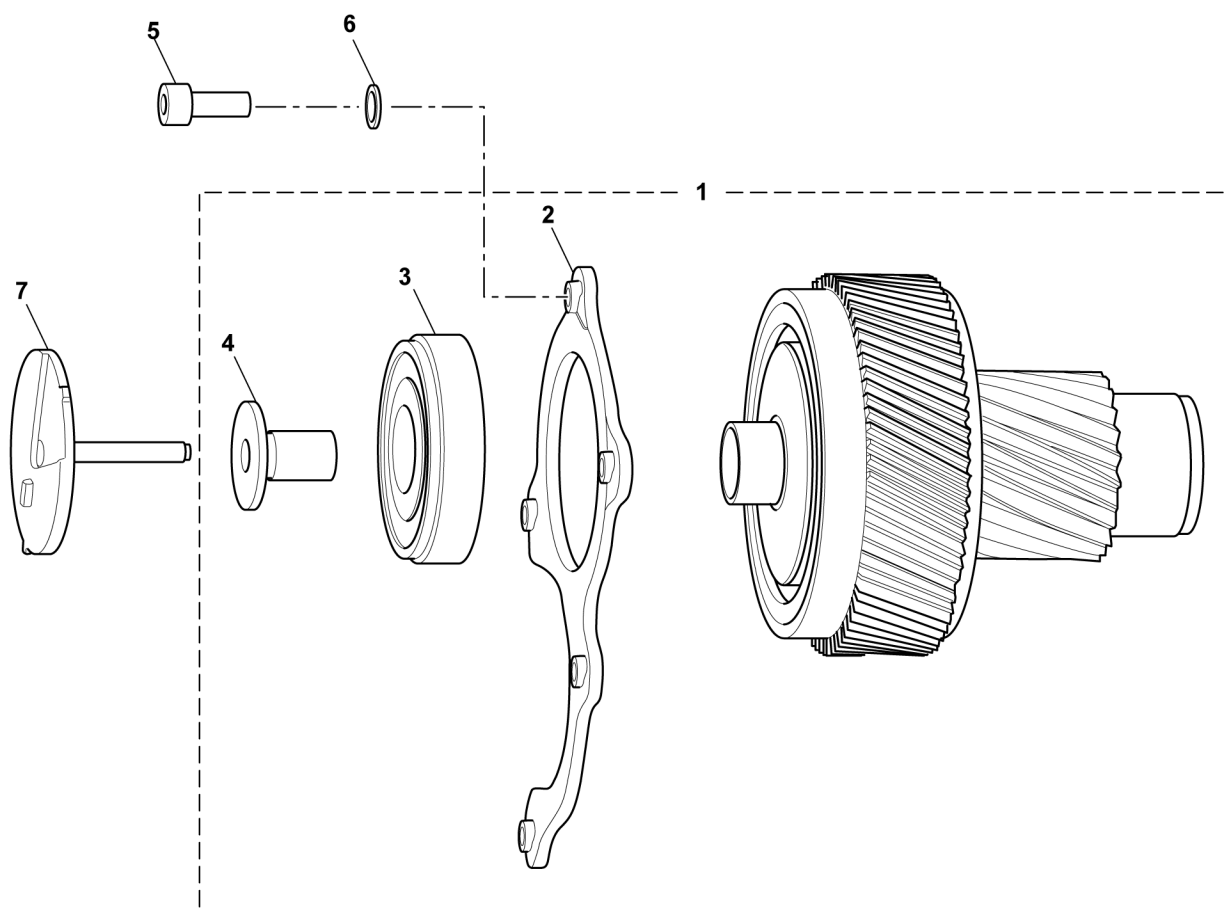


S1210193

- 1. Input Shaft Assembly
- 2. Input Shaft Bearing

- 3. Circlip - Input Shaft Bearing

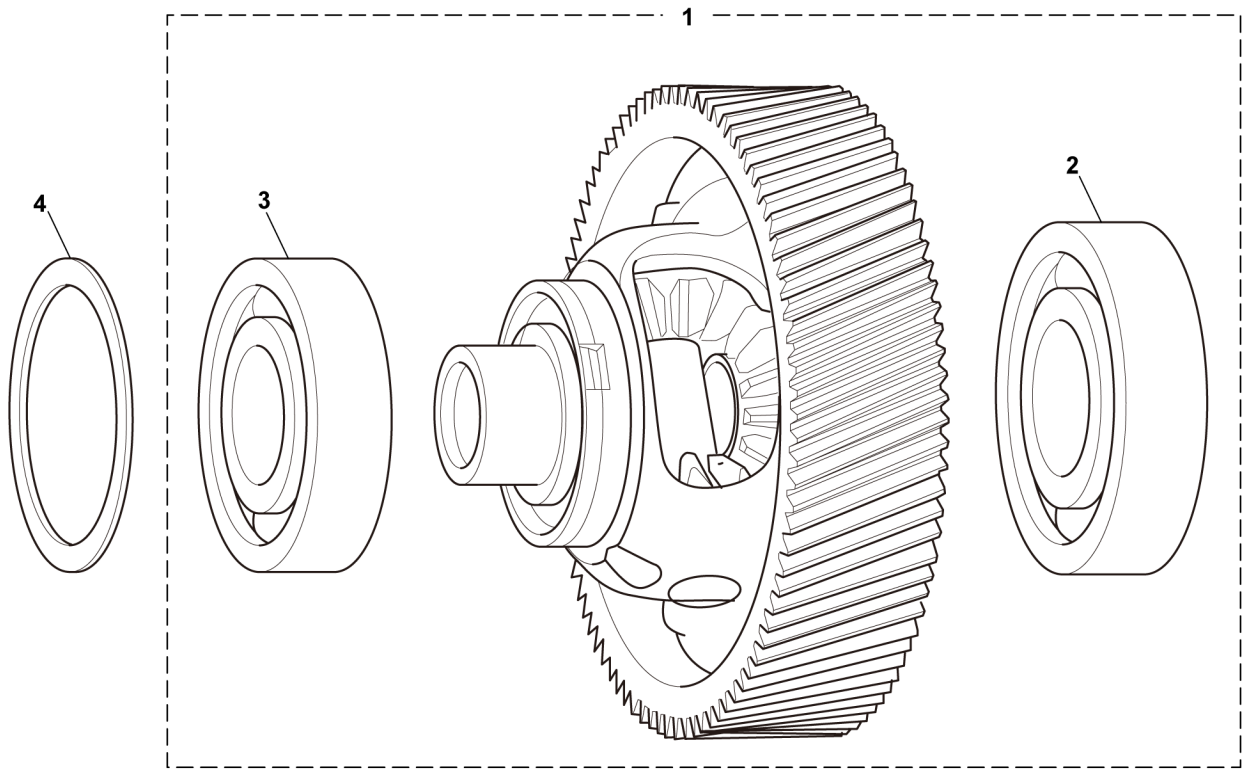
Intermediate Shaft



S1210194

- | | |
|--|---|
| 1. Intermediate Shaft Assembly | 5. Bolt - Transmission Housing to Intermediate Shaft Ball Bearing Press Plate |
| 2. Input Shaft Intermediate Shaft Integrated Bearing Press Plate | 6. Bolt Gasket |
| 3. Intermediate Shaft Rear Bearing | 7. Oil Nozzle |
| 4. Locking Screw | |

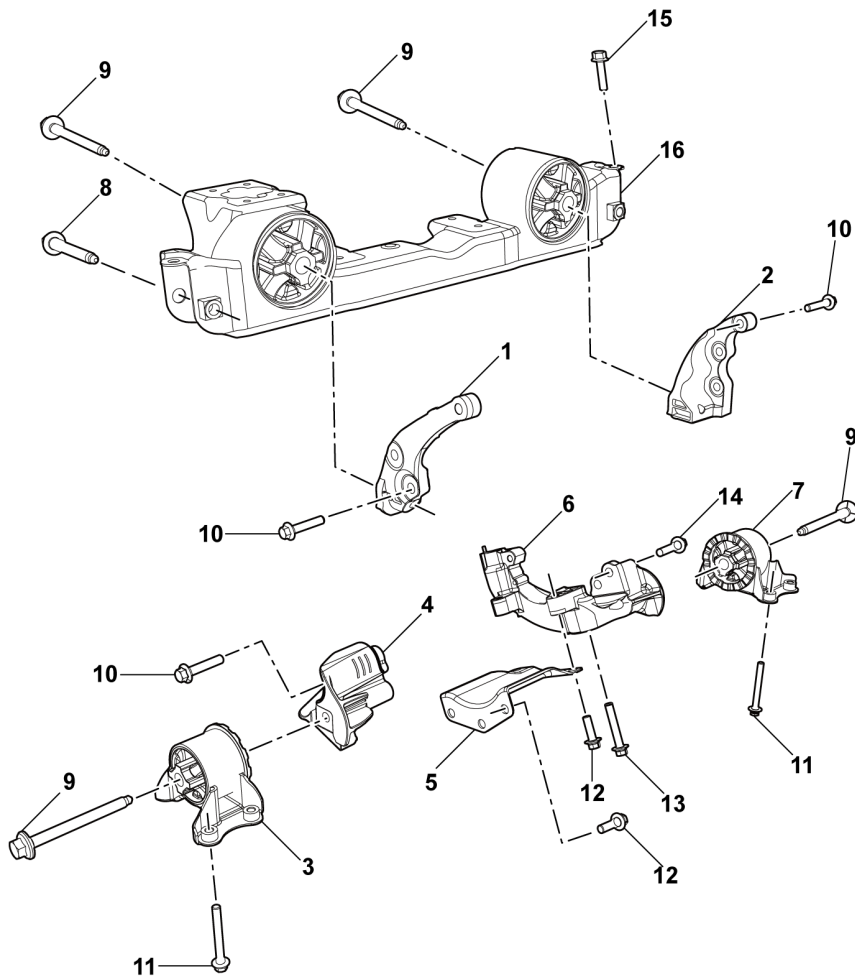
Differential



S1210195

- 1. Differential Assembly
- 2. Differential Bearing
- 3. Differential Bearing
- 4. Differential Bearing Gasket

Electric Drive Unit Assembly Mount Bracket

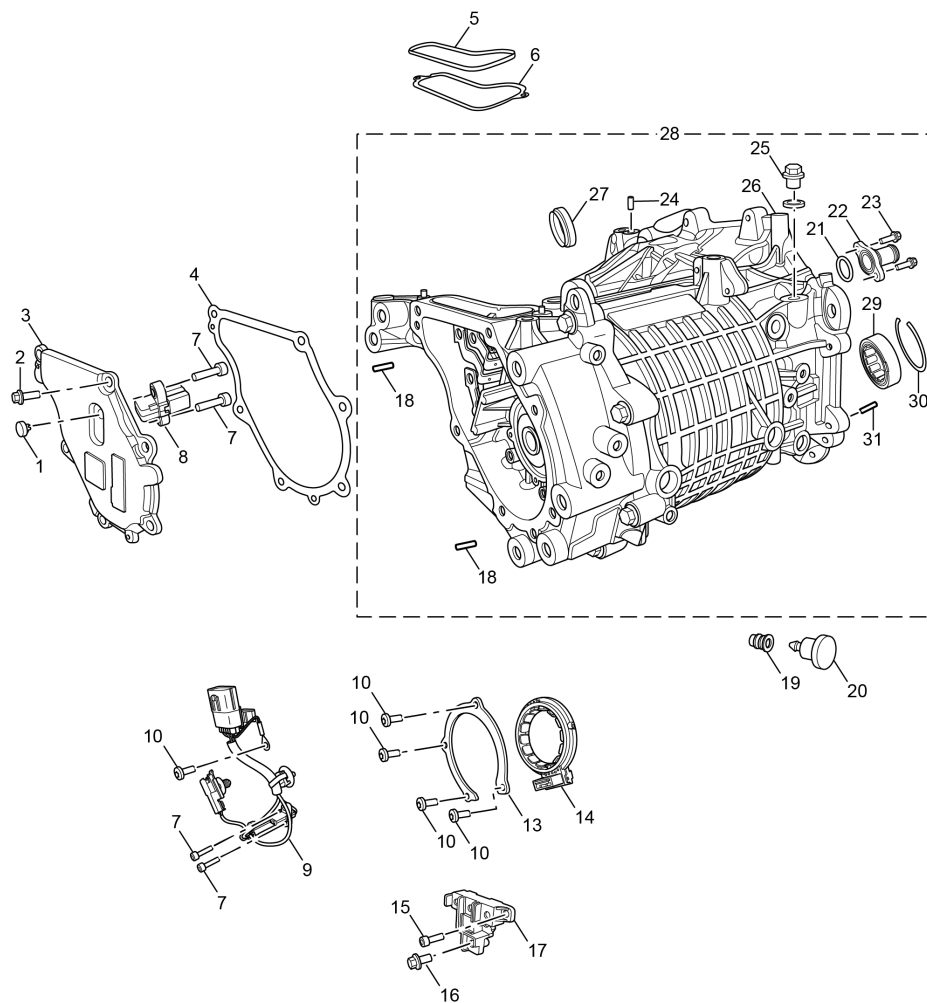


S2610002

- | | |
|--------------------------------------|--|
| 1. Front Mount Bracket | 9. Bolt - Rear Mount (Subframe Side) |
| 2. Front Mount Bracket | 10. Bolt - Driver Motor Mount (Motor Side) |
| 3. Rear Mount Assembly | 11. Bolt - Rear Mount (Subframe Side) |
| 4. Rear Mount Bracket | 12. Bolt - Driver Motor Mount (Motor Side) |
| 5. Rear Mount Bracket | 13. Bolt - Driver Motor Mount (Motor Side) |
| 6. Rear Mount Bracket | 14. Bolt - Driver Motor Mount (Motor Side) |
| 7. Rear Mount Assembly | 15. Bolt - Rear Mount (Subframe Side) |
| 8. Bolt - Rear Mount (Subframe Side) | 16. Engine Refit - Front Upper Beam |

Electric Drive Unit - A Shaft - Front

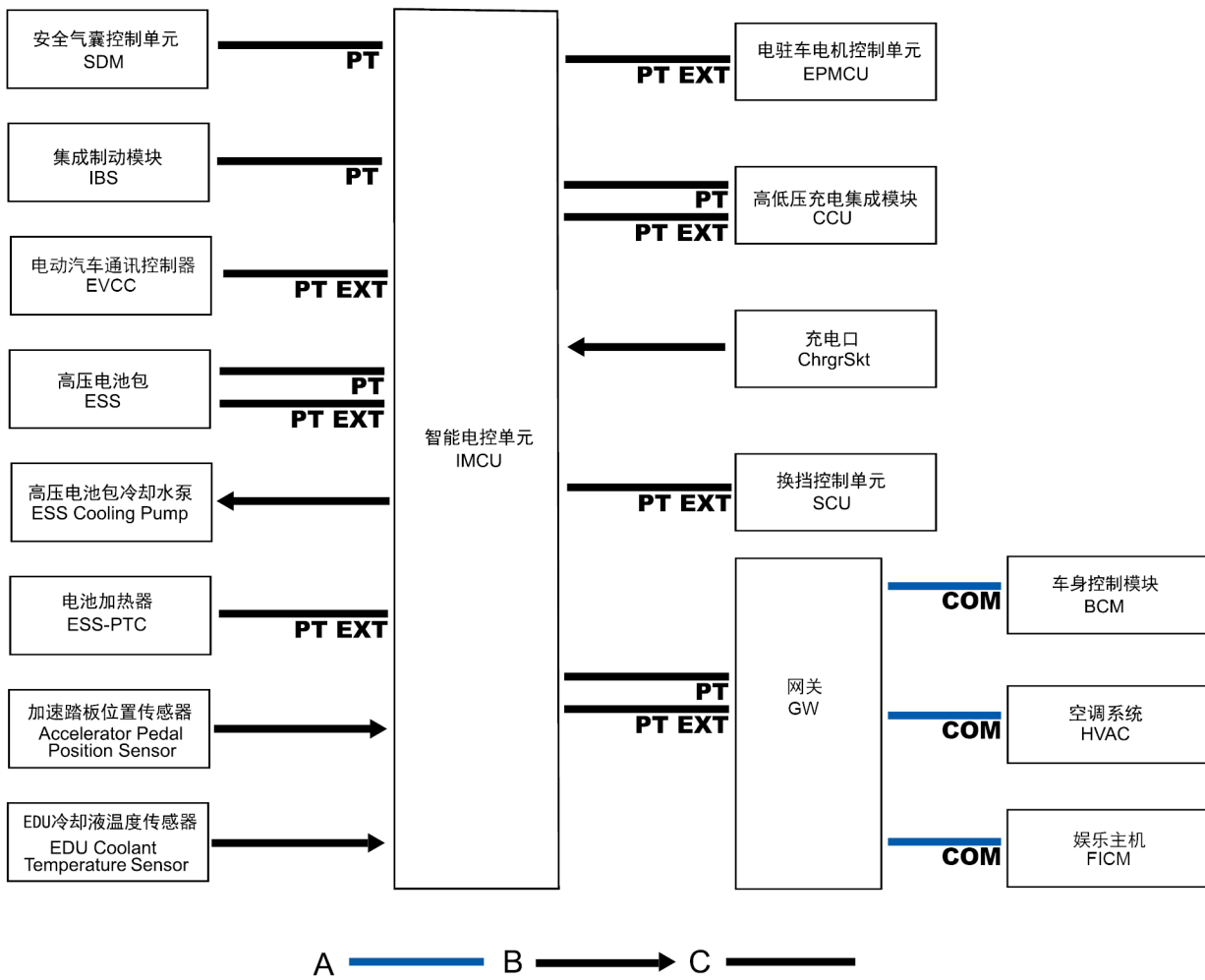
Motor Layout



S1210229

- | | |
|--|--|
| 1. Electric Drive Unit Vent Plug | 16. Electric Drive Unit Housing Locating Pin |
| 2. Bolt - Electric Drive Unit Housing | 17. Electric Drive Unit Vent Plug Seal Pipe |
| 3. Electric Drive Unit Housing | 18. Electric Drive Unit Vent Plug |
| 4. Sealing Pad - Electric Drive Unit Housing | 19. O-ring - Transmission Cooling Water Pipe Fitting |
| 5. O-ring - Electric Drive Unit Housing | 20. Transmission Cooling Water Pipe Fitting |
| 6. Gasket - Electric Drive Unit Drive Motor | 21. Bolt - Electric Drive Unit Housing |
| 7. Bolt - Electric Drive Unit Low-voltage Connector | 22. Electric Drive Unit Housing Locating Pin |
| 8. Electric Drive Unit Low-voltage Connector | 23. Electric Drive Unit Oil Filler Plug |
| 9. Electric Drive Unit Low-voltage Harness | 24. Gasket - Electric Drive Unit Oil Filler Plug |
| 10. Bolt - Electric Drive Unit Drive Motor Resolver Stator Retaining Plate | 25. Electric Drive Unit Differential Oil Seal |
| 11. Electric Drive Unit Drive Motor Resolver Stator Retaining Plate | 26. Electric Drive Unit Drive Motor Assembly |
| 12. Electric Drive Unit Drive Motor Resolver Stator | 27. Electric Drive Unit Intermediate Shaft Front Bearing |
| 13. Bolt - Electric Drive Unit Drive Motor Insulation Block | 28. Snap Ring - Electric Drive Unit Drive Motor Shaft Cylindrical Bearing Outer Ring |
| 14. Bolt - Electric Drive Unit Drive Motor Insulation Block | 29. Electric Drive Unit Housing Locating Pin |
| 15. Electric Drive Unit Drive Motor Insulation Block | |

System Control Diagram



S1121217

A = Comfort CAN Bus; B = Hard Wire; C = Power HS CAN Bus

Electric Drive Unit - A Shaft - Front

Description

Overview

The model is equipped with electric drive unit A shaft. A shaft is equipped with a two-stage retarder.

Retarder Housing

The retarder housing is cast from die-cast aluminum. The motor housing and the right housing of the retarder share the same housing structure. There is an oil filler plug and an oil drain plug on the retarder housing, which are sealed with an aluminum gasket respectively.

The retarder is filled with lubricating oil so as to lubricate the internal components using a splash method.

Input Shaft

The input shaft motor is engaged through splines, and the motor power is transmitted to the differential through the input shaft and intermediate shaft. The input shaft is supported in the housing by bearings.

Intermediate Shaft

The intermediate shaft is supported in the housing by bearings, which plays a role of transmitting torque and increasing speed ratio.

Differential

The differential housing supports the planetary shaft, planetary gear and sun gear inside. The differential assembly is supported by the bearings in the retarder housing.

Drive Motor

The drive motor is a three-phase AC motor, which is controlled by the intelligent motor control unit (IMCU).

Intelligent Motor Control Unit (IMCU)

IMCU is the electrically controlled component that controls the drive motor and it communicates with IPK, BCM and other controllers via HS CAN.

Operation

Retarder Assembly

The drive system drives the input shaft to change the rotation speed and direction by the motor speed regulation and the motor reversing principle, thereby changing the speed of the drive gear and the reverse gear.

When the gear shift control mechanism is in D gear, the torque is directly transmitted from the drive motor to the input shaft of the retarder, and then to intermediate shaft gear and the final drive driven gear through the input shaft gear, and finally to the axle shaft. The vehicle speed is changed by changing the motor speed after starting and during driving.

Differential

The differential allows the wheels to rotate at different speeds when the intermediate shaft torques are the same. The pinion integrated with the intermediate shaft is engaged with the final drive driven gear of the differential assembly. When the wheels move forward in straight line, the torque will be applied to the whole assembly and the planetary gear does not rotate. The torque is transmitted to the wheels through the axle shafts. When the vehicle takes a turn, the inner wheels will pass a shorter distance at a lower speed. Thus it drives the planetary gear to rotate, and the outer sun gear offers a higher speed to the outer wheels.

Operational Considerations for Drive Motor

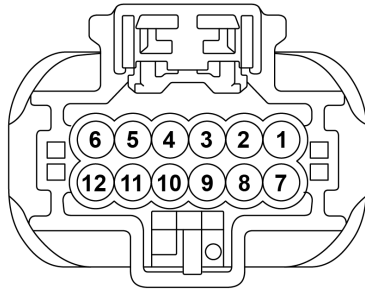
Since the drive motor works in a high voltage and heavy current environment, the following points must be paid attention to during operation:

1. Collision, drop and squeezing against human body shall be avoided during product transportation and fitting.
2. The storage environment shall be dry. The environmental requirements for unpacking the motor package are: temperature in the range of $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, and humidity in the range of $10\% \sim 70\% \text{ RH}$.
3. Before the motor is fitted and used, the insulation check must be performed (Refer to PEB Remove/Refit for specific operation)
4. Before the motor is fitted and used, the motor output shaft shall be able to rotate flexibly. Check the appearance of the motor and make sure that the housing is free of damage or abnormal deformation.
5. Before the motor is fitted and used, check to make sure that the conductive part of the three-phase harness and the heavy-current interface of the motor are clean and free of foreign matters or grease.
6. The low-voltage connector is a plastic component that shall be protected from direct collision with or stress by hard objects during fitting.
7. The motor rotor is ferromagnetic, therefore, the motor is not allowed to be disassembled except for the high- and low-voltage cover plates.

Electric Drive Unit - A Shaft - Front

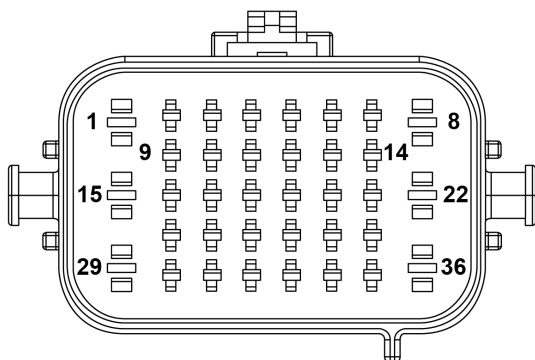
Detailed Information List of Component Pins

Definition of Motor LV Harness Pins



Pin No.	Description
1	NTC GND
2	NTC+
3	Rotary Transformer COS +
4	Rotary Transformer COS -
5	Rotary Transformer Excitation +
6	Shield GND
7	High Voltage Interlock Signal Output
8	High Voltage Interlock Signal Input
9	Rotary Transformer SIN +
10	Rotary Transformer SIN -
11	Rotary Transformer Excitation -
12	

End View and Pin Definition of Electronic Control Unit Harness Connector BY031



Pin No.	Description
1	KL30.1
2	Cooling Fan Relay

3	KL.15
4	Main Relay
5	PEB Cooling Water Pump I_Power Supply
6	EDU Coolant Temperature Sensor Signal
7	EDU Coolant Temperature Sensor Ground
8	-
9	Accelerator Pedal Position Sensor Power Supply 1
10	Accelerator Pedal Position Sensor Ground 1
11	Accelerator Pedal Position Sensor Signal 1
12	Accelerator Pedal Position Sensor Power Supply 2
13	Accelerator Pedal Position Sensor Ground 2
14	Accelerator Pedal Position Sensor Signal 2
15	Ground
16	BrkLghtSw_SIG
17	BrkTrvlSw_SIG
18	BPSWakeUp
19	IMCU_LIN1
20	KL30
21	-
22	-
23	-
24	Enable Wake-up
25	Power CANFD_H
26	Power CANFD_L
27	Power Extension CAN_H
28	Power Extension CAN_L
29	Battery Pack Cooling Water Pump_DRV
30	IMCU Cal CAN_H
31	IMCU Cal CAN_L
32	GND
33	KL30.2
34	OffBdChrgrPstvSnsr+
35	OBCSktNgtvSnsr+
36	ChrgrSktSnsr-

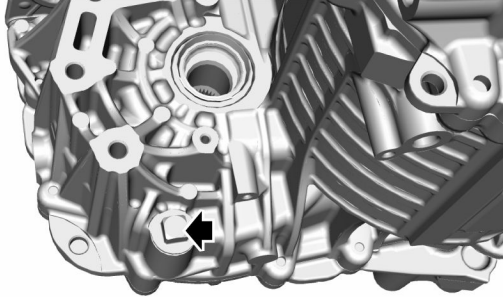
Service Guide

Electric Drive Unit Fluid - Drain and Refill Drain

1. Remove the bottom deflector.

Bottom Deflector

2. Place a suitable container under the electric drive unit.
3. Clean the area around the drain plug, remove the drain plug and discard the seal gasket.



S1214809

4. Drain the electric drive unit fluid.
5. Place a new seal gasket on the drain plug, fit the drain plug, tighten it to **25-35Nm**, and check the torque.
6. Fit the bottom deflector.

Bottom Deflector

Refill

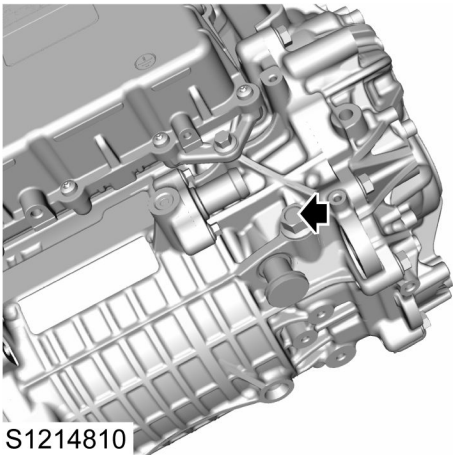
1. Remove the manual service disconnect.

Manual Service Disconnect (MSD)

2. Remove the front compartment trim cover.

Front Compartment Trim Cover

3. Clean the area around the filler plug, remove the filler plug and discard the seal gasket.



S1214810

4. Refill electric drive unit fluid through the filler port, and the capacity is:

Drain and Refill	1.05L
Refill from Dry State	1.1L

5. Place a new seal gasket on the filler plug, fit the filler plug, tighten it to **15-20Nm**, and check the torque.
6. Fit the front compartment trim cover.

Front Compartment Trim Cover

7. Fit the manual service disconnect.

Manual Service Disconnect (MSD)

Electric Drive Unit - A Shaft - Front

Electric Drive Unit and Mount Remove

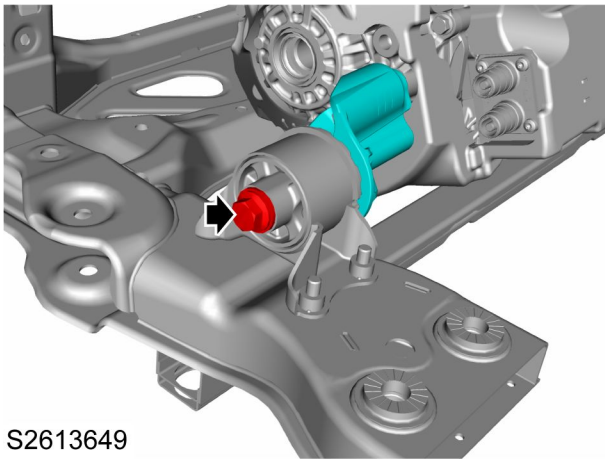
1. Drain the electric drive unit fluid.

Electric Drive Unit Fluid

2. Remove the front subframe assembly.

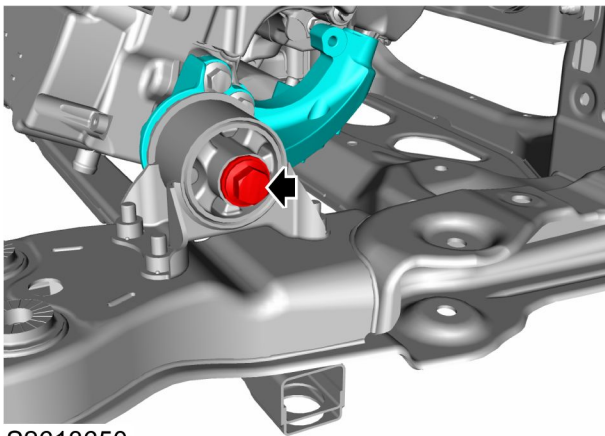
Front Subframe Assembly

3. Remove and discard 1 bolt fixing the left mount bracket to the mount.



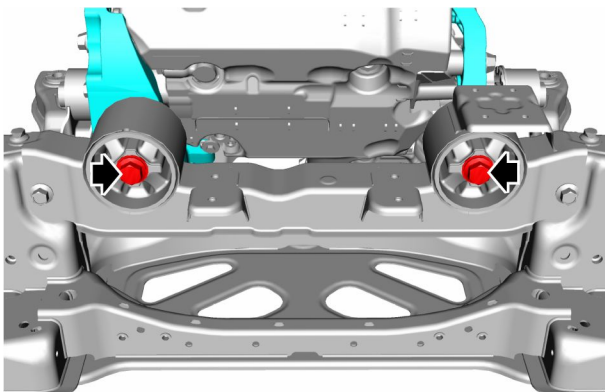
S2613649

4. Remove and discard 1 bolt fixing the right mount bracket to the mount.



S2613650

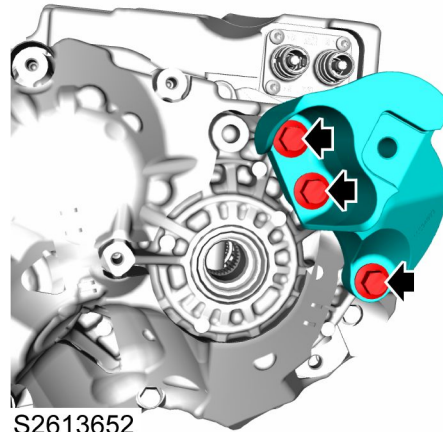
5. Remove and discard 2 bolts fixing the front mount bracket to the front mount.



S2613651

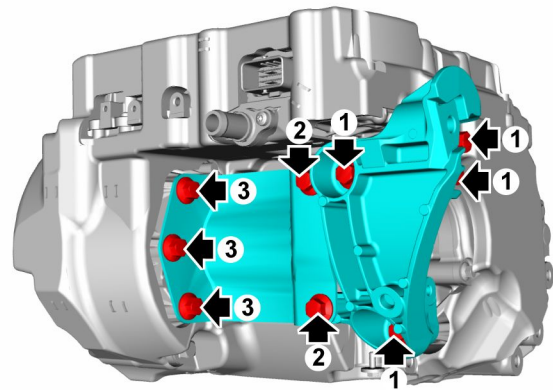
6. Remove and discard 3 bolts fixing the left mount

bracket to the electric drive unit.



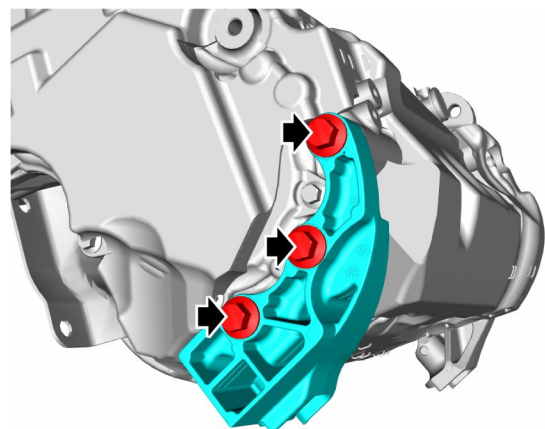
S2613652

7. Remove and discard 4 bolts (1) fixing the right mount bracket to the electric drive unit.
8. Remove and discard 2 bolts (2) fixing the guard plate to the right mount bracket.
9. Remove and discard 3 bolts (3) fixing the guard plate to the transmission.

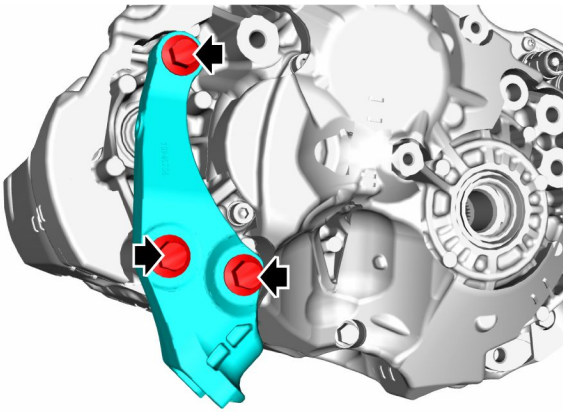


S2613653

10. Remove and discard 6 bolts fixing the front mount bracket to the electric drive unit.

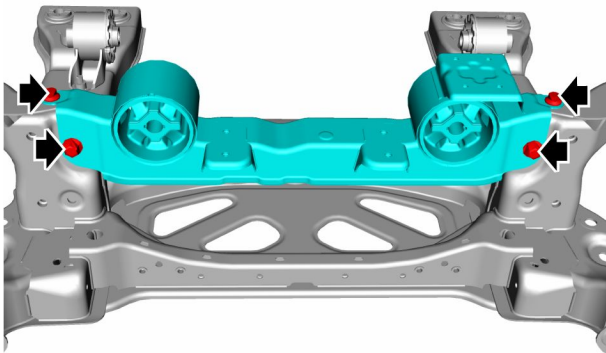


S2613654



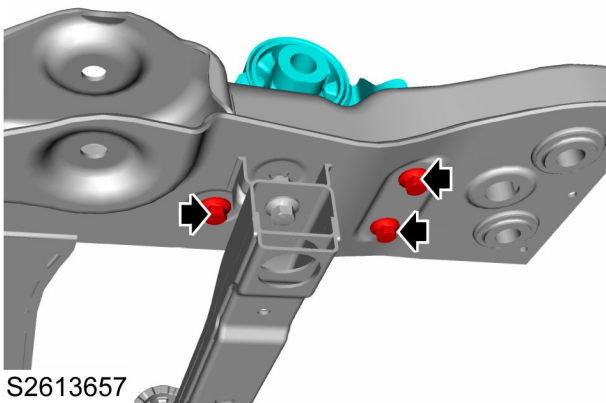
S2613655

11. Remove and discard 4 bolts fixing the front subframe mount to the front subframe.



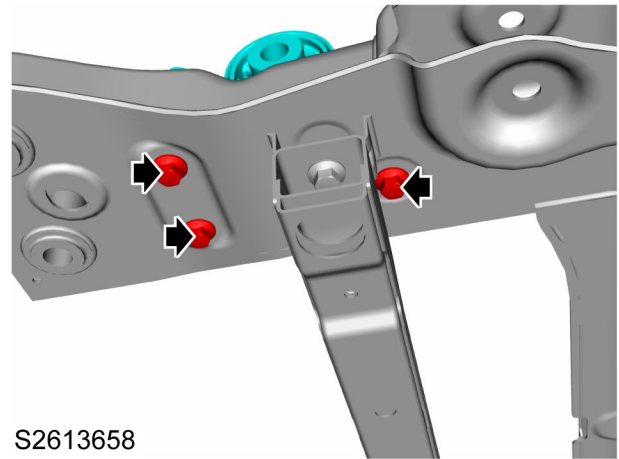
S2613656

12. Remove and discard 3 bolts fixing the left mount to the front subframe.



S2613657

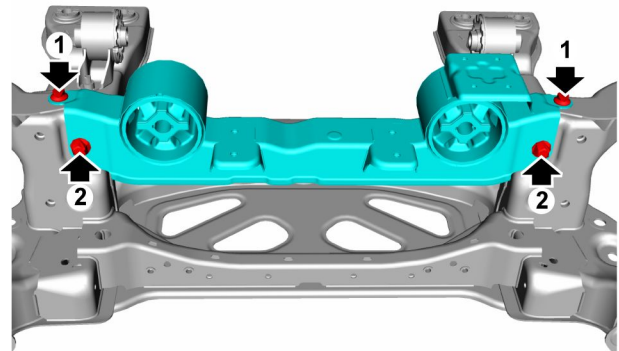
13. Remove and discard 3 bolts fixing the right mount to the front subframe.



S2613658

Refit

1. Fit 3 new bolts fixing the right mount to the front subframe, tighten them to **(45-55) Nm+ (85-95) °**, and check the torque.
2. Fit 3 new bolts fixing the left mount to the front subframe, tighten them to **(45-55) Nm+ (85-95) °**, and check the torque.
3. Fit 4 new bolts fixing the front subframe mount to the front subframe. The torque in the figure (1) is **(45-55) Nm+ (85-95) °**, and the torque in the figure (2) is **(63-77) Nm+ (85-95) °**. Check the torque.



S2613668

4. Fit 6 new bolts fixing the front mount bracket to the electric drive unit, tighten them to **(63-77) Nm+ (85-95) °**, and check the torque.
5. Fit 2 new bolts fixing the guard plate to the right mount bracket, tighten them to **40-50Nm**, and check the torque.
6. Fit 3 bolts fixing the guard plate to the transmission, tighten them to **40-50Nm**, and check the torque.
7. Fit 4 new bolts fixing the right mount bracket to the electric drive unit, tighten them to **(63-77) Nm+ (85-95) °**, and check the torque.
8. Fit 3 new bolts fixing the left mount bracket to the electric drive unit, tighten them to **(63-77) Nm+ (85-95) °**, and check the torque.

Electric Drive Unit - A Shaft - Front

- Fit 2 new bolts fixing the front mount bracket to the front mount, tighten them to (135-165) Nm+ (85-95) °, and check the torque.
- Fit 1 new bolt fixing the right mount bracket to the mount, tighten it to (135-165) Nm+ (85-95) °, and check the torque.
- Fit 1 new bolt fixing the left mount bracket to the mount, tighten it to (135-165) Nm+ (85-95) °, and check the torque.
- Fit the front subframe assembly.

Front Subframe Assembly

- Refill the electric drive unit fluid.

Electric Drive Unit Fluid

Differential Oil Seal - Left Remove

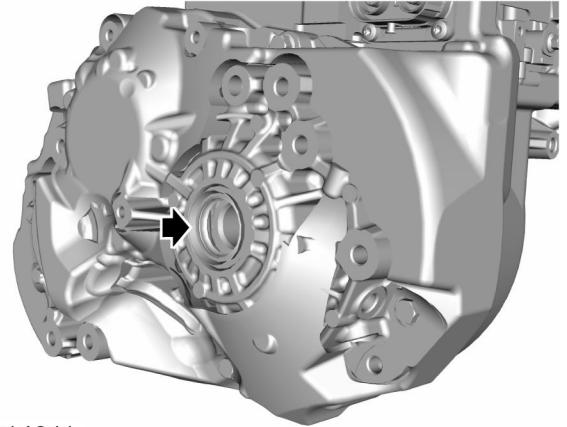
- Drain the electric drive unit fluid.

Electric Drive Unit Fluid

- Remove the front left axle shaft assembly.

Front Left Axle Shaft Assembly

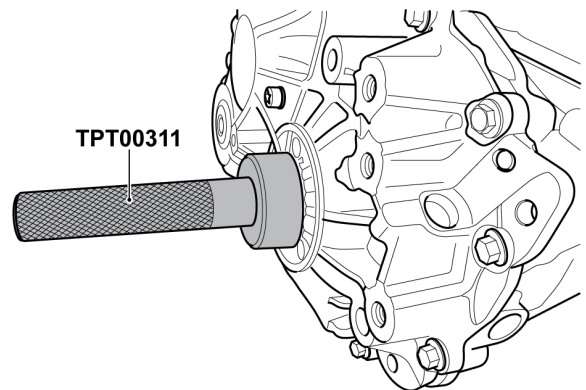
- Remove the left differential oil seal.



S1214811

Refit

- Clean the oil seal groove.
- Use special tool TPT00311 to fit the left differential oil seal.



S1215172

- Fit the front left axle shaft assembly.

Front Left Axle Shaft Assembly

- Refill the electric drive unit fluid.

Electric Drive Unit Fluid

Electric Drive Transmission/ Transaxle

Electric Drive Unit - A Shaft - Front

Differential Oil Seal - Right Remove

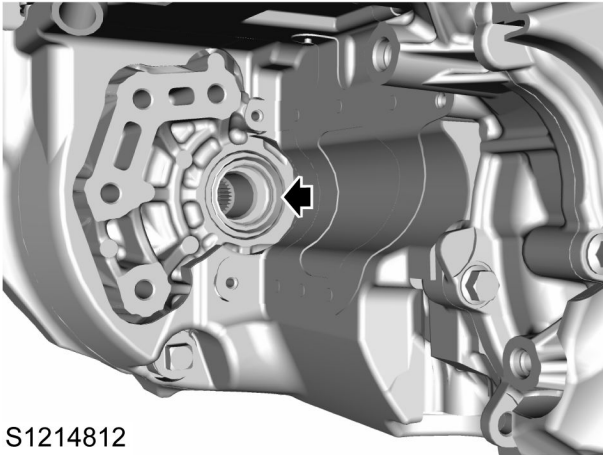
1. Drain the electric drive unit fluid.

Electric Drive Unit Fluid

2. Remove the front axle shaft intermediate connecting shaft assembly.

Front Axle Shaft Intermediate Connecting Shaft Assembly

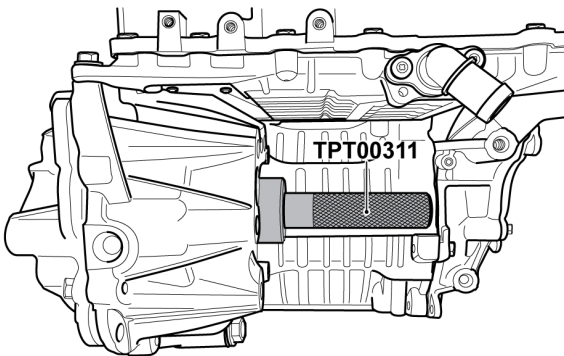
3. Remove the right differential oil seal and discard it.



S1214812

Refit

1. Clean the oil seal groove.
2. Use special tool TPT00311 to fit the right differential oil seal.



S1215173

3. Fit the front axle shaft intermediate connecting shaft assembly.

Front Axle Shaft Intermediate Connecting Shaft Assembly

4. Refill the electric drive unit fluid.

Electric Drive Unit Fluid

Electric Drive Unit Disassemble Remove

1. Remove the electric drive unit and mount.

Electric Drive Unit and Mount

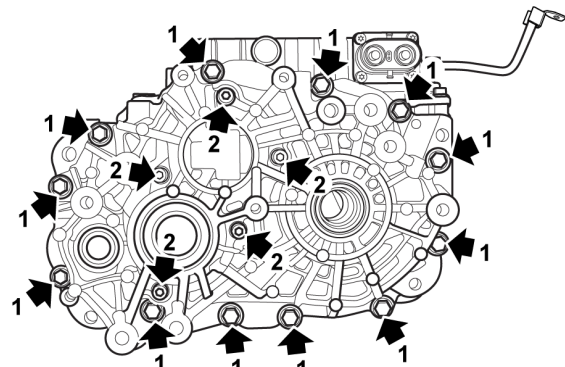
2. Remove the intelligent motor control unit (IMCU).

Intelligent Motor Control Unit (IMCU)

3. Remove the differential oil seal.

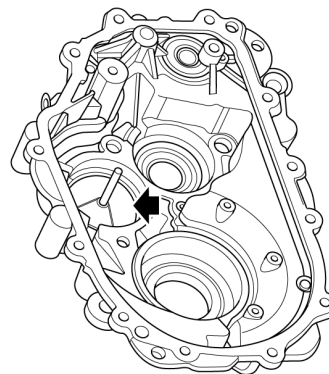
Differential Oil Seal

4. Remove 12 bolts (1) fixing the electric drive unit housing to the drive motor housing.
5. Remove 5 bolts (2) fixing the bearing plate.



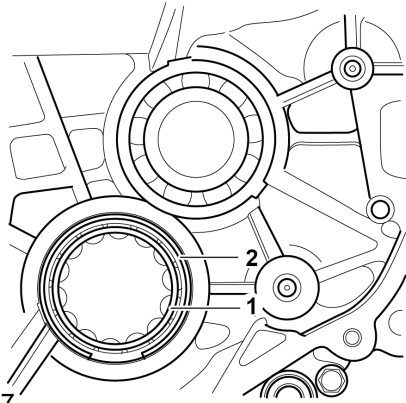
S1214833

6. Remove the input shaft, intermediate shaft and differential.
7. Remove the oil nozzle.



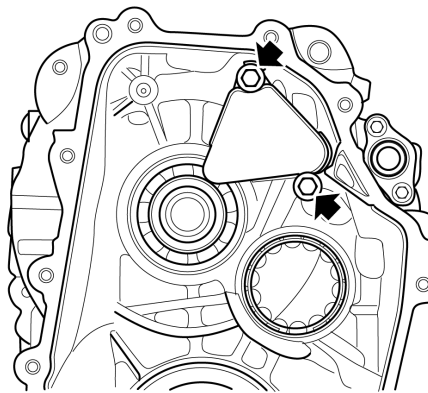
S1214836

8. Remove the circlip (1) fixing the intermediate shaft cylindrical bearing.
9. Remove the intermediate cylindrical bearing (2).



S1214837

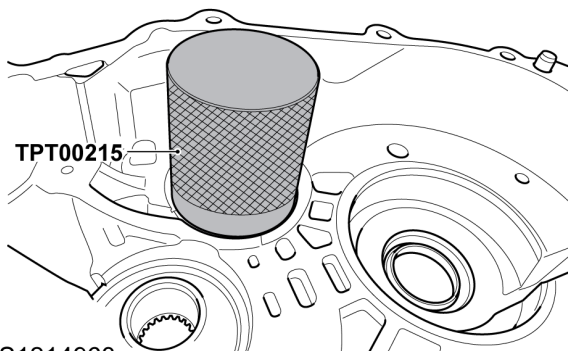
- Remove 2 bolts fixing oil baffle maze to the housing and discard the O-rings.



S1214838

Refit

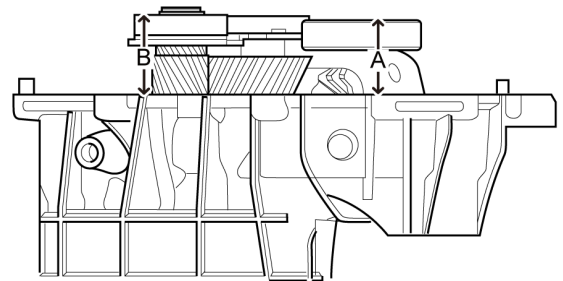
- Fit 2 bolts and new O-rings fixing the oil baffle maze to the housing, tighten them to **8.5-11.5Nm**, and check the torque.
- Apply lubricating oil to the intermediate shaft cylindrical bearing outer ring, and press the intermediate shaft cylindrical bearing to align with the base of the housing bearing bore with the special tool TPT00215, with the notch of cylindrical bearing facing up.



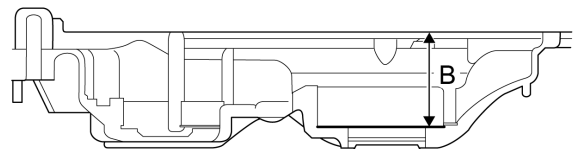
S1214963

- Fit the circlip into the circlip groove on the housing.
- Fit the oil nozzle into the transmission housing, with the bayonet fitting into the mounting hole of the housing.
- Fit the input shaft, intermediate shaft and differential.

- Measure the distance A from the differential bearing upper end face to the motor housing assembling end face, and the distance B from the transmission housing differential bearing seat end face to the housing assembling end face with gauge blocks 1 and 2 and depth gauge.
- Both A and B measure three points (uniform distribution) and record the average value.
- Calculate according to $C=B-A$, and select an appropriate gasket.
- Measure the gasket thickness again with the vernier gasket, and its thickness shall not be greater than ± 0.02 .
- Apply grease to the adjusting gasket and put it into the transmission housing.



S1214822

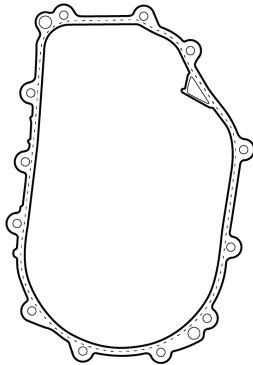


S1214840

Adjusting Gasket	
Clearance C	Selection of Gasket Specification
$C < 1.47$	NOK
$1.47 \leq C < 1.50$	1.45
$1.50 \leq C < 1.50$	1.50
$1.55 \leq C < 1.50$	1.55
$1.60 \leq C < 1.50$	1.60
$1.65 \leq C < 1.50$	1.65
$1.70 \leq C < 1.50$	1.70

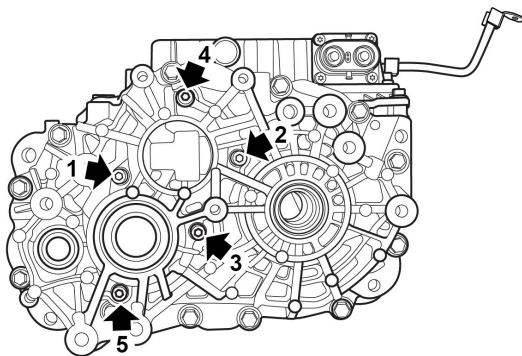
$1.75 \leq C < 1.50$	1.75
$1.80 \leq C < 1.50$	1.80
$1.85 \leq C < 1.50$	1.85
$1.90 \leq C < 1.50$	1.90
$1.95 \leq C < 1.50$	1.95
$2.00 \leq C < 2.05$	2.00
$2.05 \leq C < 2.05$	2.05
$2.10 \leq C < 2.05$	2.10
$2.15 \leq C < 2.05$	2.15
$2.20 \leq C < 2.05$	2.20
$2.25 \leq C < 2.05$	2.25
$2.30 \leq C < 2.05$	2.30
$2.32 \leq C$	NOK

11. Apply the assembling sealant to the motor housing assembling face, with a width of 2-3mm, and breakage is not allowed.



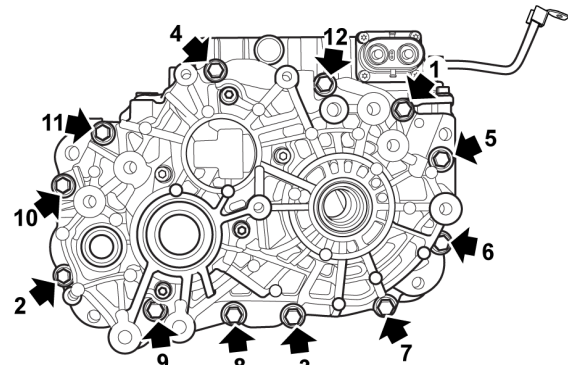
S1214841

12. Fit 5 bolts fixing the bearing plate in the sequence shown, tighten them to **19-25Nm**, and check the torque.



S1214834

13. Fit 12 bolts fixing the electric drive unit housing to the drive motor housing in the sequence shown, tighten them to **26-34Nm**, and check the torque.



S1214912

14. Fit the differential oil seal.

Differential Oil Seal

15. Fit the intelligent motor control unit.

Intelligent Motor Control Unit (IMCU)

16. Fit the electric drive unit assembly and mount.

Electric Drive Unit and Mount

17. Carry out a dry chamber and water tightness test.

Dry Chamber Tightness Test

Water Tightness Test

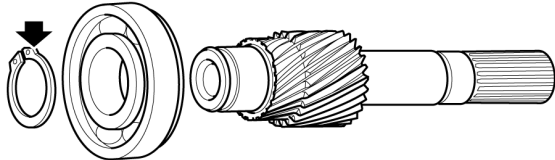
Electric Drive Unit - A Shaft - Front

**Input Shaft Assembly
Remove**

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling

2. Remove and discard the circlips fixing the input shaft bearing.

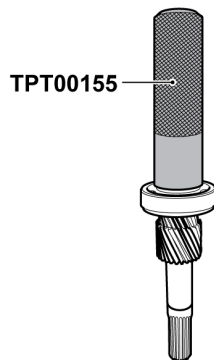


S1214914

3. Remove and discard the input shaft bearing.

Refit

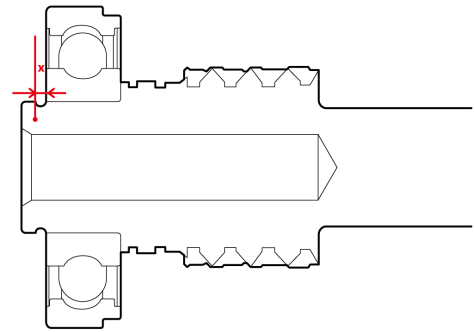
1. Use special tool TPT00155 to fit the new input shaft rear bearing.



S1214964

2. Use a feeler gauge to measure the depth of the circlip slot, select the proper circlip, and fit it into the circlip slot.

Measured Clearance X (mm) (From inner ring plane of the input shaft bearing to the input shaft circlip mating surface)	Circlip Thickness (mm)
$X < 1.90$	NOK
$1.90 \leq X < 1.95$	1.88
$1.95 \leq X < 2.00$	1.93
$2.00 \leq X < 2.05$	1.98
$2.05 \leq X < 2.06$	2.03
$2.06 < X$	NOK



S1215086

3. Fit the electric drive unit assembly.

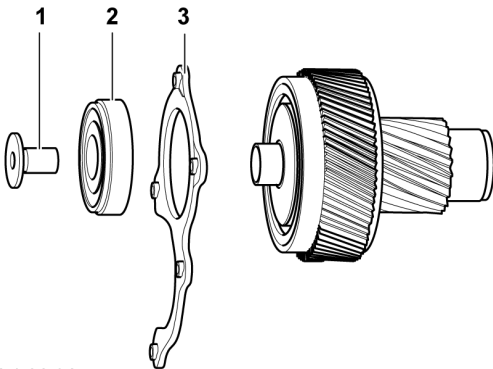
Electric Drive Unit Disassembling

Intermediate Shaft Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling

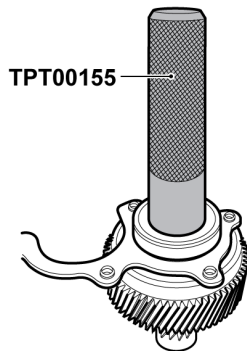
2. Remove 1 screw (1) fixing the bearings on both sides of the intermediate shaft.
3. Remove the intermediate shaft rear bearing (2).
4. Remove the intermediate shaft ball bearing press plate (3).



S1214913

Refit

1. Fit the intermediate shaft ball bearing press plate.
2. Use special tool TPT00155 to fit the intermediate shaft rear bearing.



S1214965

3. Fit 1 screw fixing the bearings on both sides of the intermediate shaft, tighten it to **105-115Nm**, and check the torque.
4. Assemble the electric drive unit.

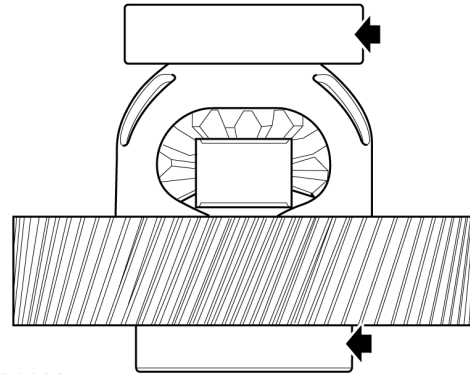
Electric Drive Unit Disassembling

Differential Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling

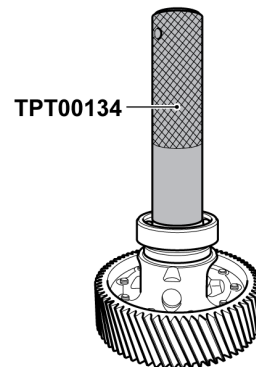
2. Remove the bearings on both ends of the differential.



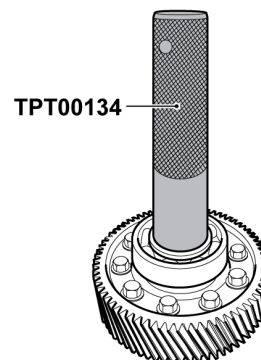
S1214827

Refit

1. Use special tool TPT00134 to fit the bearings on both sides of the differential.



S1214966



S1214967

2. Assemble the electric drive unit.

Electric Drive Unit Disassembling

Electric Drive Unit - A Shaft - Front

Drive Motor Small Assembly Remove

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling

2. Remove the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness

3. Remove the resolver stator.

Resolver Stator

4. Remove the electric drive unit drive motor insulation block.

Electric Drive Unit Drive Motor Insulation Block

5. Remove the drive motor assembly.

Refit

1. Fit the electric drive unit drive motor insulation block.

Electric Drive Unit Drive Motor Insulation Block

2. Fit the resolver stator.

Resolver Stator

3. Fit the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness

4. Fit the vent plug to the drive motor.
5. Assemble the electric drive unit.

Electric Drive Unit Disassembling

6. Carry out a dry chamber and water tightness test.

Dry Chamber Tightness Test

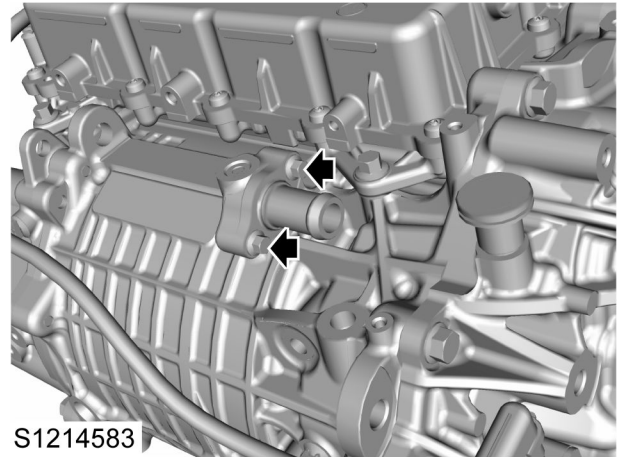
Water Tightness Test

Motor Cooling Water Pipe Fitting Remove

1. Remove the electric drive unit and mount.

Electric Drive Unit and Mount

2. Remove 2 bolts fixing the water pipe fitting to transmission and discard the O-rings.



Refit

1. Fit 2 bolts and new O-rings fixing the water pipe fitting to the housing, tighten them to **7-10Nm**, and check the torque.
2. Fit the electric drive unit and mount.

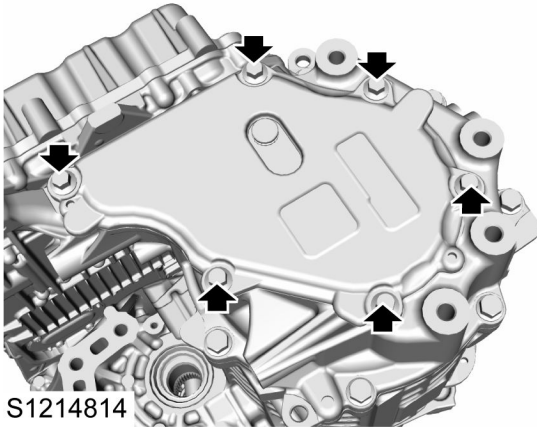
Electric Drive Unit and Mount

Drive Motor Control Module Observation Cover Plate Remove

1. Remove the electric drive unit assembly.

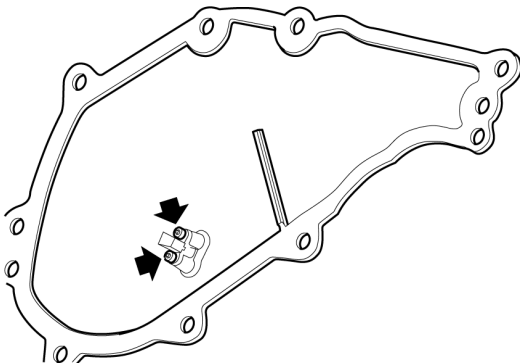
Electric Drive Unit and Mount

2. Remove 6 bolts fixing the drive motor control module observation cover plate to the housing and discard the gaskets.



S1214814

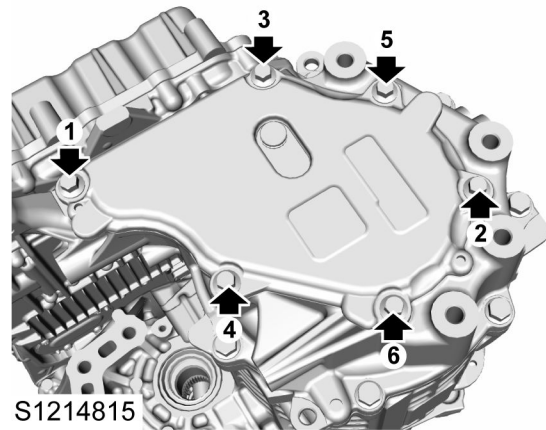
3. Remove 2 bolts fixing the interlock connector to the cover plate.



S1214922

Refit

1. Fit 2 bolts fixing the interlock connector to the cover plate and tighten them.
2. Fit 6 bolts and new gaskets fixing the drive motor control module observation cover plate to the housing in the sequence shown, tighten them to **19-25Nm**, and check the torque.



S1214815

3. Carry out a water tightness test.

Water Tightness Test

4. Carry out a dry chamber tightness test.

Dry Chamber Tightness Test

5. Fit the electric drive unit assembly.

Electric Drive Unit and Mount

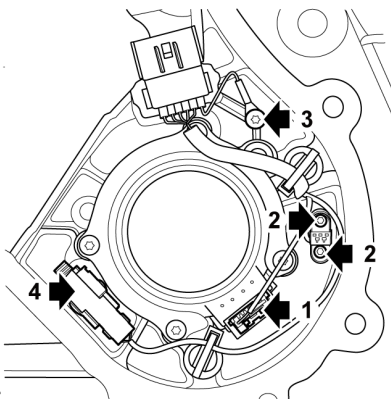
Electric Drive Unit - A Shaft - Front

Electric Drive Unit Low-voltage Harness Remove

1. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

2. Disconnect the connector (1) from the resolver stator.
3. Remove 2 bolts (2) fixing the harness interlock connector to the housing.
4. Remove 1 bolt (3) fixing the harness grounding wire to the housing.
5. Disconnect the connector (4) from the low-voltage harness patch cable.



S1214845

Refit

1. Connect the low-voltage harness patch cable.
2. Fit 1 bolt fixing the harness grounding wire to the housing and tighten it.
3. Fit 2 bolts fixing the harness interlock connector to the housing and tighten them.
4. Connect the resolver stator.
5. Fit the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

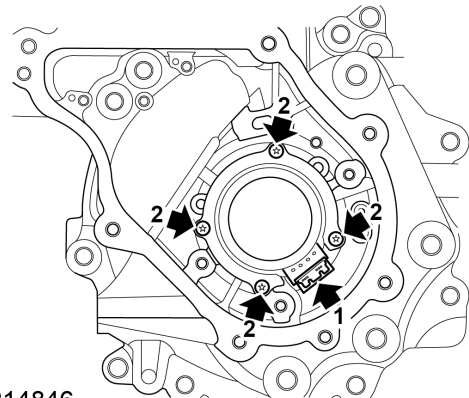
6. Perform a self-learning for the intelligent motor control unit (IMCU).

Resolver Stator Remove

1. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

2. Disconnect the connector (1) from the resolver stator.
3. Remove 4 bolts (2) fixing the resolver stator press plate to the housing.



S1214846

Refit

1. Fit the resolver stator (with the connector facing up) into the motor end cover.
2. Fit 4 bolts fixing the resolver stator press plate to the housing and tighten them up.
3. Connect the resolver stator.
4. Fit the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

5. Perform a self-learning for the drive motor.

Electric Drive Transmission/ Transaxle

Electric Drive Unit - A Shaft - Front

Electric Drive Unit Drive Motor Insulation Block Remove

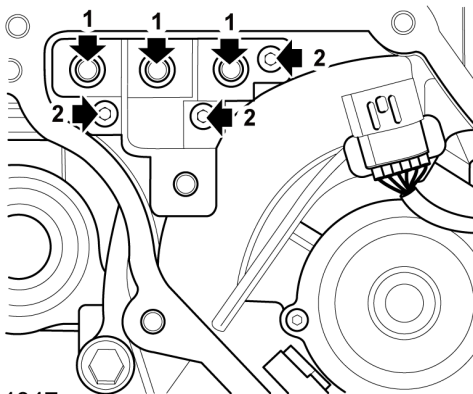
1. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

2. Remove the intelligent motor control unit (IMCU).

Intelligent Motor Control Unit (IMCU)

3. Remove the bolts fixing the 3 phase rotor cable to the insulation block.
4. Remove 3 bolts (2) fixing the insulation block to the housing.



S1214847

Refit

1. Fit 3 bolts fixing the insulation block to the housing, tighten them to **5-7Nm**, and check the torque.
2. Fit the intelligent motor control unit.

Intelligent Motor Control Unit (IMCU)

3. Fit the bolts fixing the remaining 3-phase rotor cable to the insulation block, tighten them to **19-25Nm** and check the torque.
4. Fit the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

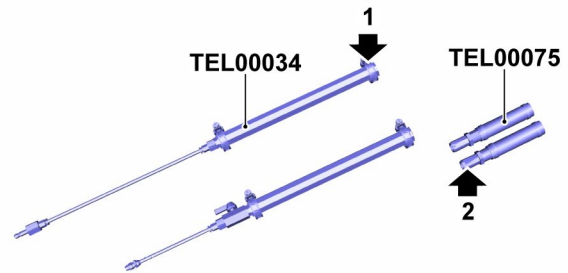
5. Perform a self-learning for the drive motor.

Water Tightness Test Water Tightness Test

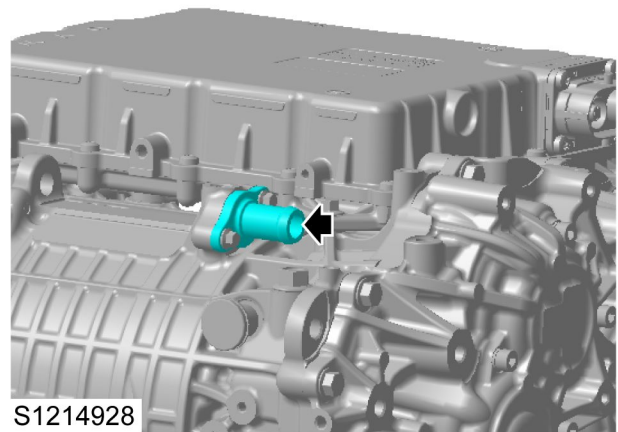
1. Remove the electric drive unit assembly.

Electric Drive Unit Assembly and Mount

2. Fix the special tool TEL00075 to a pipeline without a valve of TEL00034, and fix the other end of the TEL00075 to the water outlet of the drive motor, then tighten the clamp.

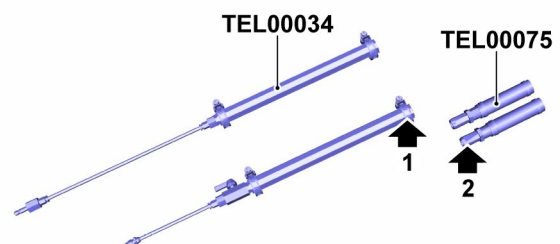


S1214969



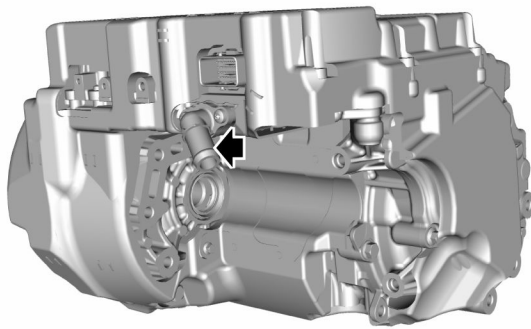
S1214928

3. Connect another TEL00034 with a valve with TEL00075, and fix the other end of TEL00075 to the water inlet of IMCU, then tighten the clamp.



S1214970

Electric Drive Unit - A Shaft - Front



S1214932

4. Connect the pipeline without a valve with the air tightness testing equipment.
5. Close the valve on the pipeline.
6. Inflate the system to a pressure of 2.5bar (absolute pressure) with the air tightness testing equipment, maintain for 10s and test for 10s; If the system's pressure drop is $\leq 150\text{pa}$, the tightness test will be considered as pass. Otherwise please find the leaking point and repair it. Then repeat the tightness test until it passes.
7. Fit the electric drive unit assembly.

Electric Drive Unit Assembly and Mount

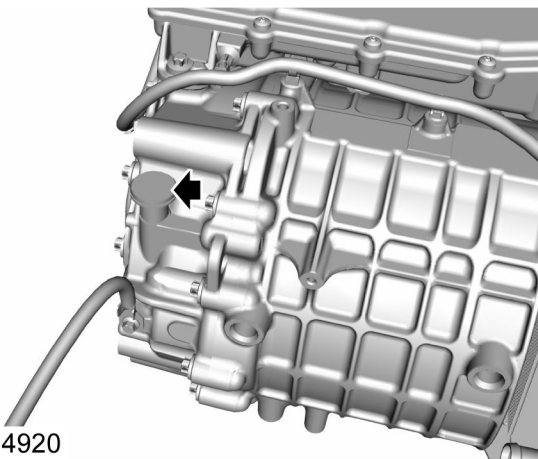
Dry Chamber Tightness Test

1. Remove the electric drive unit assembly.

Caution : Do not remove half connect shaft on motor.

Electric Drive Unit Assembly and Mount

2. Remove the vent plug and refit the seal pipe at the lower part of the vent plug back to the housing.



S1214920

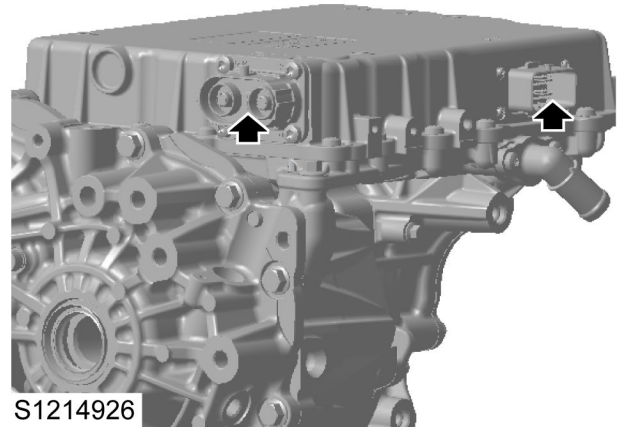
3. Remove the cover plate of the motor observation window, discard the gasket, and then remove the vent plug on the observation window from the cover plate inner side. (Link to Observation Window Cover Plate Remove)

The vent plug cannot be forcibly removed from the front.

4. Refit the observation window cover plate to the motor.

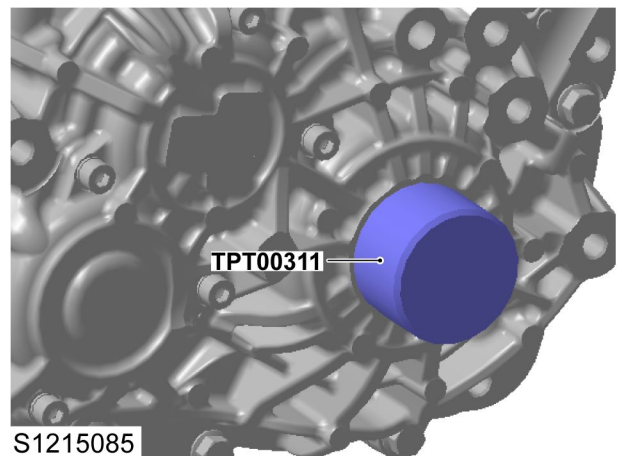
 **Observation Cover Plate**

5. Use TEL00095 and TEL00096 to seal the harness connector on the.



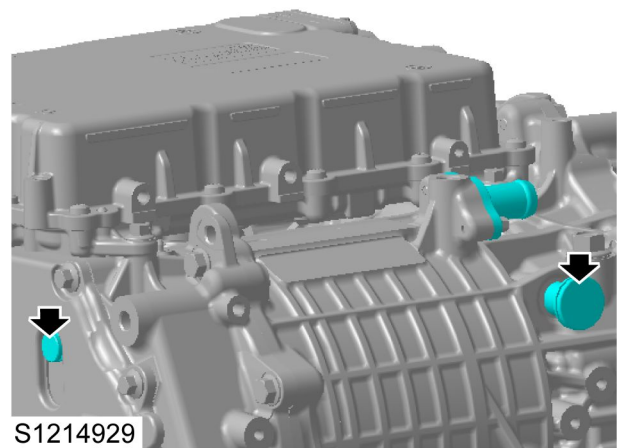
S1214926

6. Use special tool TPT00311 to seal the differential oil seal in place.



S1215085

7. Use two rubber plugs of special tool TPT00301 to block the vent plug and observation window vent plug separately, and connect the other end to air tightness testing equipment to conduct a dry chamber tightness test: under 25°C, the pressure inflates to 1.25bar (absolute pressure), maintain for 10s, and test if the pressure drop is $\leq 80\text{pa}$ within 30s. If the air tightness fails, check the leakage point and repair it, then repeat the air tightness test until it passes.



S1214929

8. Fit the vent plug to the motor housing. After refit,

visually check to confirm the vent plug is fitted in place.

9. Fit the electric drive unit assembly.

Electric Drive Unit Assembly and Mount

Intelligent Motor Control Unit (IMCU) Remove

Warning : *Maintenance personnel who were not trained in high voltage system knowledge of the vehicle are prohibited from dismantling the high voltage components (including high-voltage battery pack, electric drive system, CCU, high-voltage PDU, high-voltage harness, electric A/C compressor, battery heater, electric A/C heater, charging port, etc.).*

Warning : *Prior to disassembling or assembling HV components, the systems MUST be checked using a suitable multimeter to ensure they carry no high voltage current. Where there is need to work with the high voltage system, it is essential that the correct 'make safe' procedure is followed - see Manual Service Disconnect procedure in the Service Repair manual. After disconnecting the Manual Service Disconnect (MSD), always wait 5 minutes prior to commencing any checks for residual voltage etc.*

Warning : *Before starting the maintenance work, maintenance personnel must put on the protection equipment, including insulating gloves and high voltage insulated boots. Before wearing the insulated gloves, they must be checked whether there is damage and ensure they have no insulation failure.*

Caution : *In the process of installation and dismantling, brake fluid, washer fluid, coolant and other liquids shall be prevented from entering or splashing onto high voltage components.*

1. Remove the manual service disconnect.

Manual Service Disconnect (MSD)

2. Remove the electric drive unit and mount.

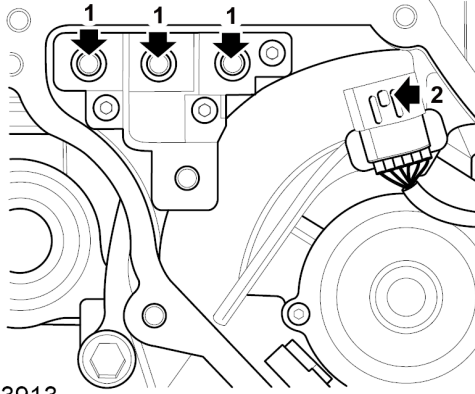
Electric Drive Unit and Mount

3. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

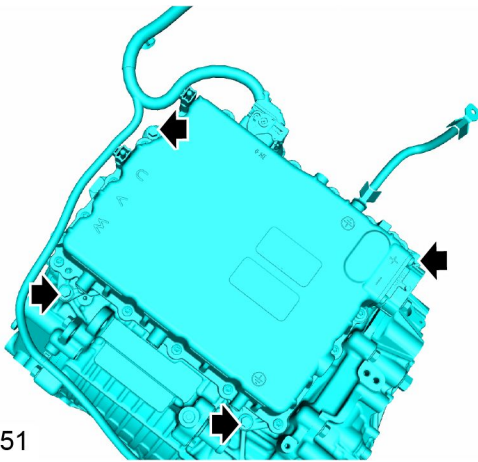
4. Disconnect the harness connector (2).
5. Remove 3 bolts (1) fixing the electronic control unit into the electric drive unit.

Electric Drive Unit - A Shaft - Front



S1123913

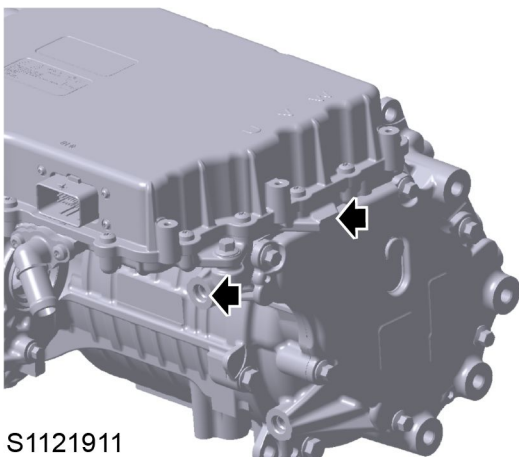
- Remove 4 bolts fixing the electronic control unit to the electric drive unit and mount, and then remove the electronic control unit.



S1123851

Refit

- Fit a new sealing ring on the cooling pipeline interface of the electronic control unit, and apply a small amount of HP300 grease on the sealing ring.
- Fix the electronic control unit to the electric drive unit and mount, fit 4 bolts, tighten them to **26-34Nmin** in a diagonal sequence, and check the torque.
- Use a micro resistance gauge to measure the resistance of two points as shown in the figure. The resistance value is required to be $\leq 0.1m\Omega$. Measure twice and exchange the probes.



S1121911

- Connect the internal and external harness connectors.
- Fix the electronic control unit high-voltage copper bar in the drive motor, fit 3 bolts, tighten them to **19-25Nm**, and check the torque.
- Fit the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate

- Fit the electric drive unit and mount.

Electric Drive Unit and Mount

- Fit the manual service disconnect.

Manual Service Disconnect (MSD)

Intelligent Motor Control Unit Coolant Pipe Fittings Remove

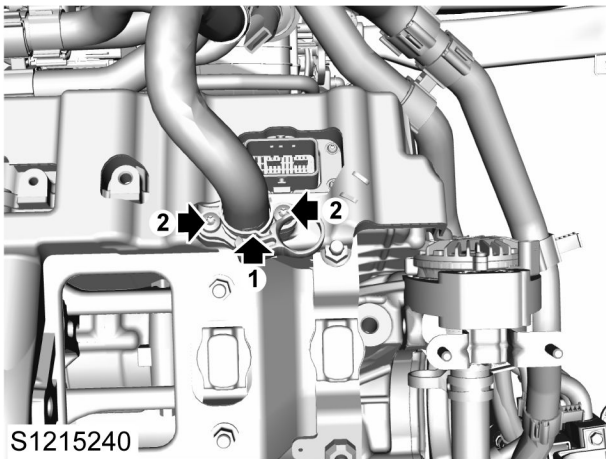
1. Remove the manual service disconnect.

Manual Service Disconnect (MSD) Remove

2. Drain the coolant.

Coolant Drain Refill

3. Disconnect the pipeline (1) from the IMCU cooling water pipe fitting.
4. Remove 2 bolts (2) fixing the IMCU cooling water pipe fitting to the IMCU.



Refit

1. Fit 2 bolts fixing the IMCU cooling water pipe fitting to the IMCU, tighten them to 7-10Nm, and check the torque.
2. Connect the pipeline to the IMCU cooling water pipe fitting.
3. Refill the coolant.

Coolant Drain Refill


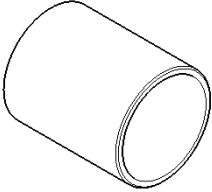
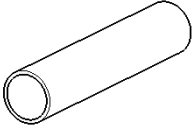
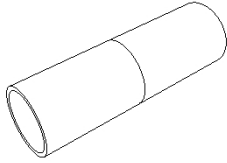
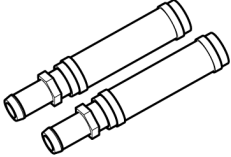
4. Fit the manual service disconnect.

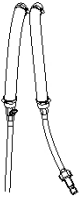
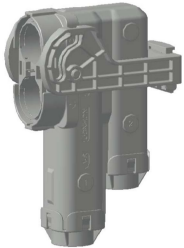
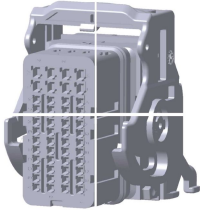
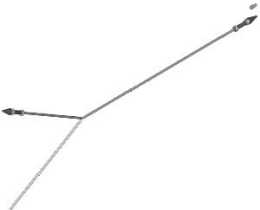
Manual Service Disconnect (MSD) Refit

Electric Drive Unit - A Shaft - Front

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TPT00311	Differential Oil Seal Assembly Tool	 <p style="text-align: center;">TPT00311</p>
TPT00215	Replacer, input shaft bearing , outside	 <p style="text-align: center;">TPT00215</p>
TPT00155	Output Shaft Rear Bearing Press Tool	 <p style="text-align: center;">TPT00155</p>
TPT00134	Output Shaft Rear Bearing Press Tool	 <p style="text-align: center;">TPT00134</p>
TEL00075	Pipe connector	 <p style="text-align: center;">TEL00075</p>

Tool Number	Description	Picture
TEL00034	Cooling system leaktest tool	 <p>TEL00034</p>
TEL00095	Main high voltage connector 4-2 pin plug	 <p>TEL00095</p>
TEL00096	Low voltage connector plug 4	 <p>TEL00096</p>
TPT00301	Kit-pressure test connector	 <p>TPT00301</p>

Electric Drive Unit - B Shaft - Rear

Electric Drive Unit - B Shaft - Rear

Specification

Torque

Description	Value
Drain Plug	25-35Nm
Refueling Plug	23-27Nm
Bolt-Mount Bracket to Transmission (B Axis)	(65-75) Nm+ (85-95) °
Bolt-Mount Bracket to Rear Auxiliary Frame (B Axis)	(135-165) Nm+ (85-95) °
Bolt-Electronic Parking Mechanism to Transmission (B Axis)	5-7Nm
Bolt-Spoiler to Shell	5-7Nm
Bolt-Parking Mechanism to Transmission	19-25Nm
Shell Magnet	7-10Nm
Bolt-Bearing Plate	19-25Nm
Bolt-Shell	26-34Nm
Bolt-Intermediate Shaft	155-165Nm
Bolt-Motor Water Pipe Joint to Shell (B Axis)	7-10Nm
Bolt-Observation Cover Plate to Shell (B Axis)	7-10Nm
Bolt-Insulating Block to Shell	5-7Nm
Bolt-IMCU Three-phase Line to Insulating Block (B Axis)	14-16Nm
Bolt-IMCU to Transmission (B Axis)	26-34Nm

Parameters

Model	Shaft B (2WD)	Shaft B (4WD)
Motor Type	Permanent Magnet Synchronization	
Rated Power/Peak Power	90/180kw	84/170kw
Peak Torque	350Nm	
Rated Speed/Max. Speed	9000/17000 rpm	8000/17000 rpm
IP Rating	IP67	
Overall Speed Ratio	10.56	
Speed Ratio of Input Shaft and Intermediate Shaft	2.892	2.893
Final Drive Ratio	3.65	
Centre Distance between Input Shaft and Output Shaft	86mm	
Centre Distance between Intermediate Shaft and Differential Shaft	128mm	
Mass (without Oil)	79.3kg	
Lubricating Oil	Shell E - Fluids E6 iX (SL2808)	
Fuel Volume of Dry Motor	0.9±0.05L	
Filling Volume after Sales (Wet Motor)	0.75±0.05L	
Maximum Overall Dimension of Electric Drive Unit (Length*Width*Height)	463*472*310	

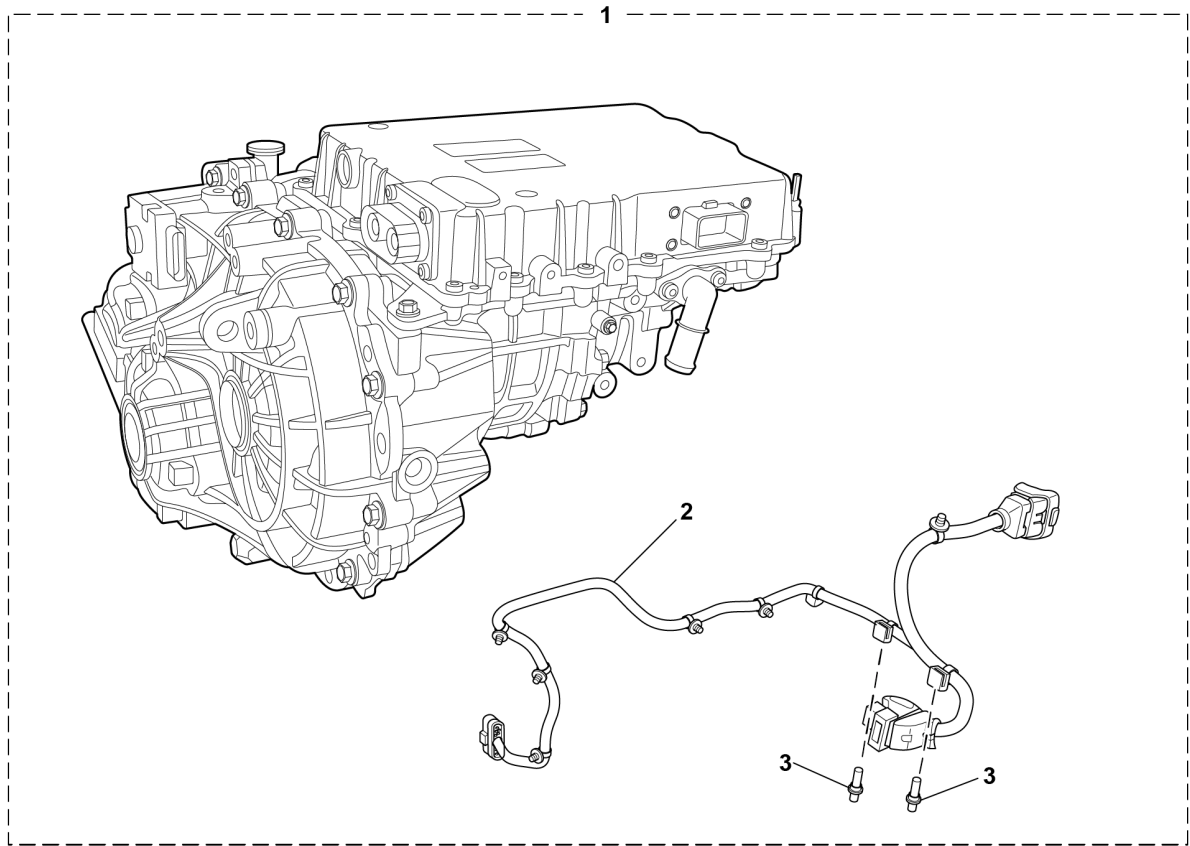
Disposable Parts	Bolt - Intermediate Shaft Locking
	Bolt - Housing
	Gasket - Oil Filler Plug
	Drain Plug
	Gasket - Drain Plug
	Gasket - Intermediate Shaft Rear Bearing Press Plate
	Differential Bearing
	Input Shaft Bearing
	Intermediate Shaft Bearing
	Axle Shaft Oil Seal
	O-ring - Electronic Parking Module
	Differential Adjusting Gasket
	Input Shaft Adjusting Gasket
	O-ring - Intelligent Motion Control Unit to Housing
	Gasket - Intelligent Motion Control Unit to Housing
	Shaft Sleeve - Parking Mechanism
	Snap Ring - Intermediate Shaft Front Bearing
	Circlip - Input Shaft Rear Bearing
	O-ring - Transmission Cooling Water Pipe Fitting
Sealing Ring - Drive Motor Control Module	
Sealing Gasket - High Voltage Observation Window Cover Plate	
Sealant	Loctite 5900
Lubrication Grease	HP300

Electric Drive Unit - B Shaft - Rear

Description and Operation

System Layout

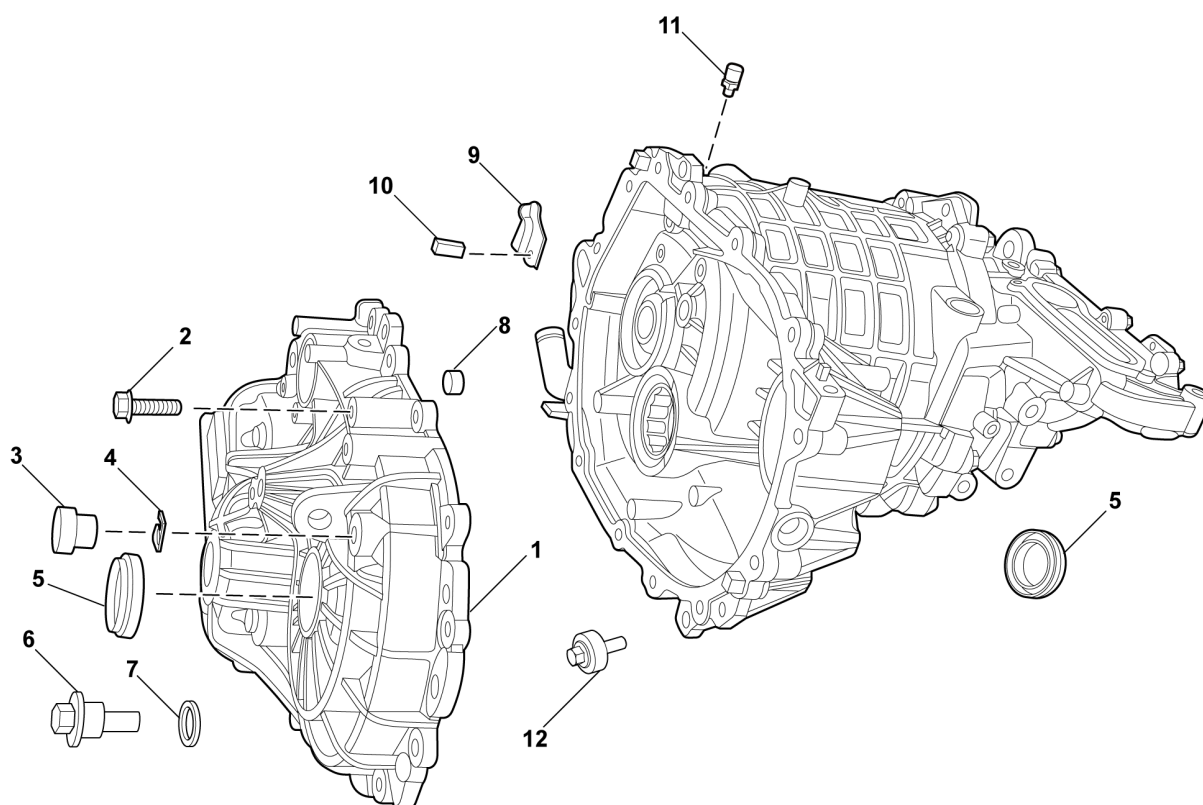
Electric Drive Unit



S1210241

- 1. Electric Drive Unit
- 2. Electric Drive Unit Low-voltage Harness
- 3. Bolt - Electric Drive Unit Cover Plate Sound Insulation Pad

Electric Drive Unit Housing

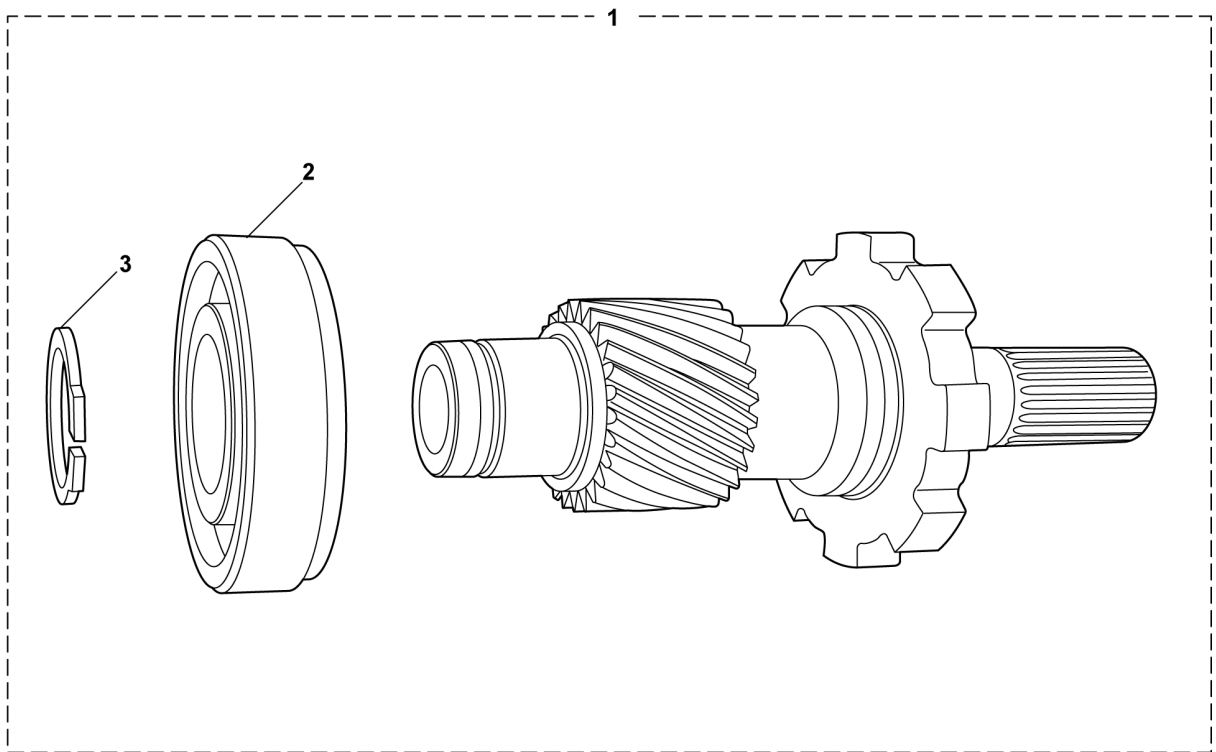


S163035

- | | |
|---|---|
| 1. Electric Drive Unit Housing Subassembly | 7. Gasket - Electric Drive Unit Oil Drain Plug |
| 2. Bolt - Electric Drive Unit Housing | 8. Electric Drive Unit Parking Mechanism Shaft Sleeve |
| 3. Electric Drive Unit Oil Filler Plug | 9. Electric Drive Unit Housing Spoiler |
| 4. Gasket - Electric Drive Unit Oil Filler Plug | 10. Bolt - Electric Drive Unit Clutch Housing Spoiler |
| 5. Electric Drive Unit Differential Oil Seal | 11. Electric Drive Unit Vent Plug |
| 6. Electric Drive Unit Oil Drain Plug | 12. Electric Drive Unit Vent Plug Seal Pipe |

Electric Drive Unit - B Shaft - Rear

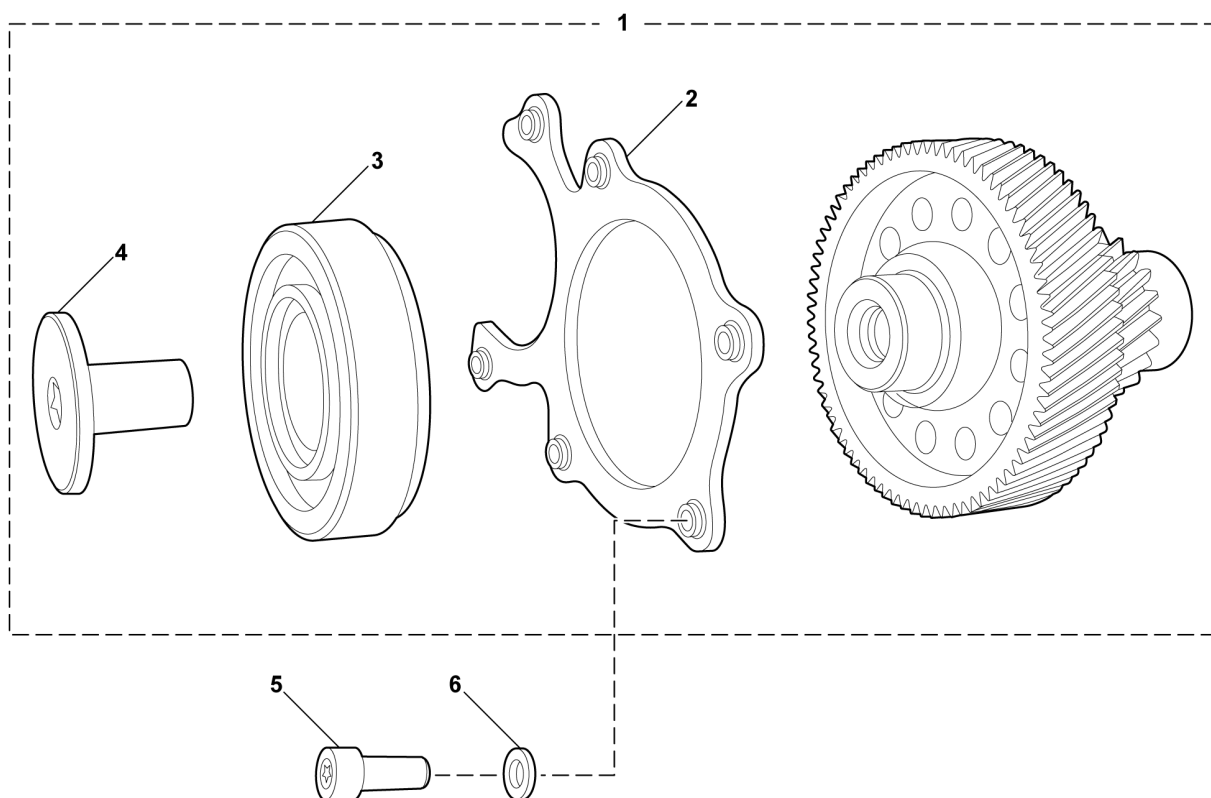
Input Shaft



S1210206

- 1. Electric Drive Unit Input Shaft Assembly
- 2. Electric Drive Unit Main Shaft Rear Bearing
- 3. Circlip - Electric Drive Unit Input Shaft Rear Bearing

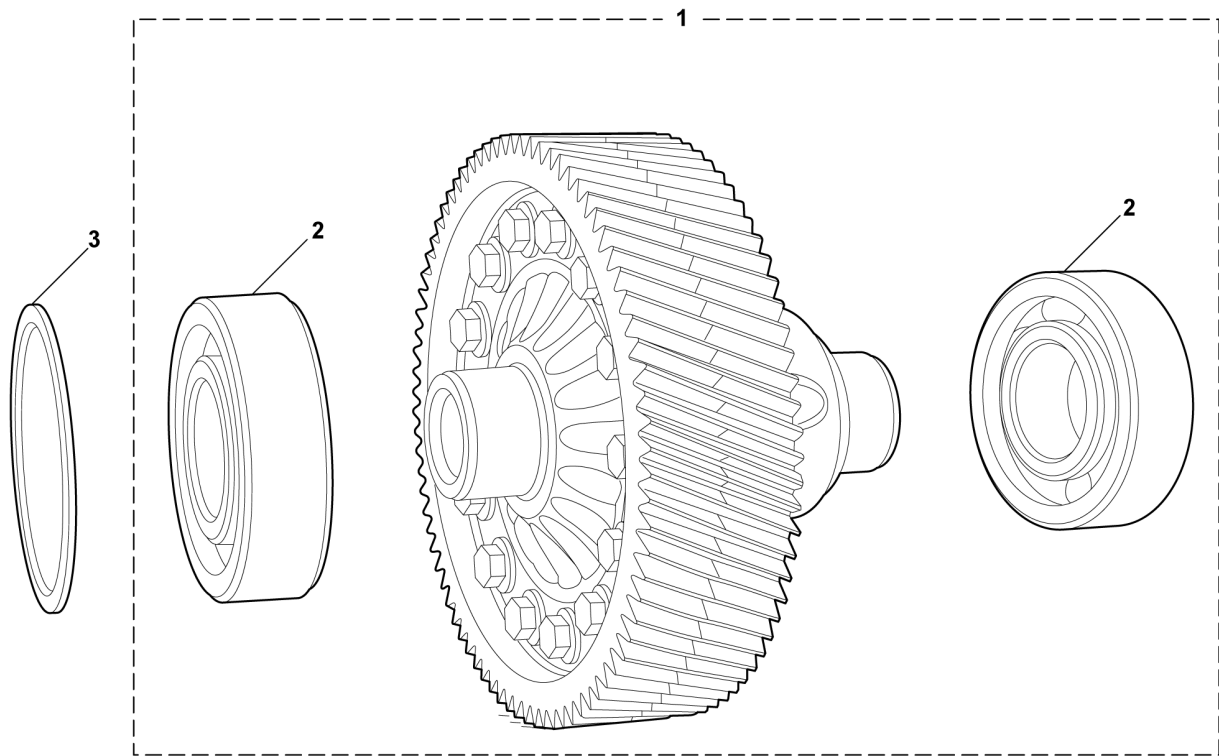
Intermediate Shaft



S1210207

- | | |
|--|---|
| 1. Electric Drive Unit Intermediate Shaft Assembly | 4. Bolt - Electric Drive Unit Intermediate Shaft Locking |
| 2. Electric Drive Unit Main Shaft Rear Bearing Press Plate | 5. Bolt - Electric Drive Unit Main Shaft Rear Bearing Press Plate |
| 3. Electric Drive Unit Intermediate Shaft Rear Bearing | 6. Gasket - Electric Drive Unit Main Shaft Rear Bearing Press Plate |

Differential

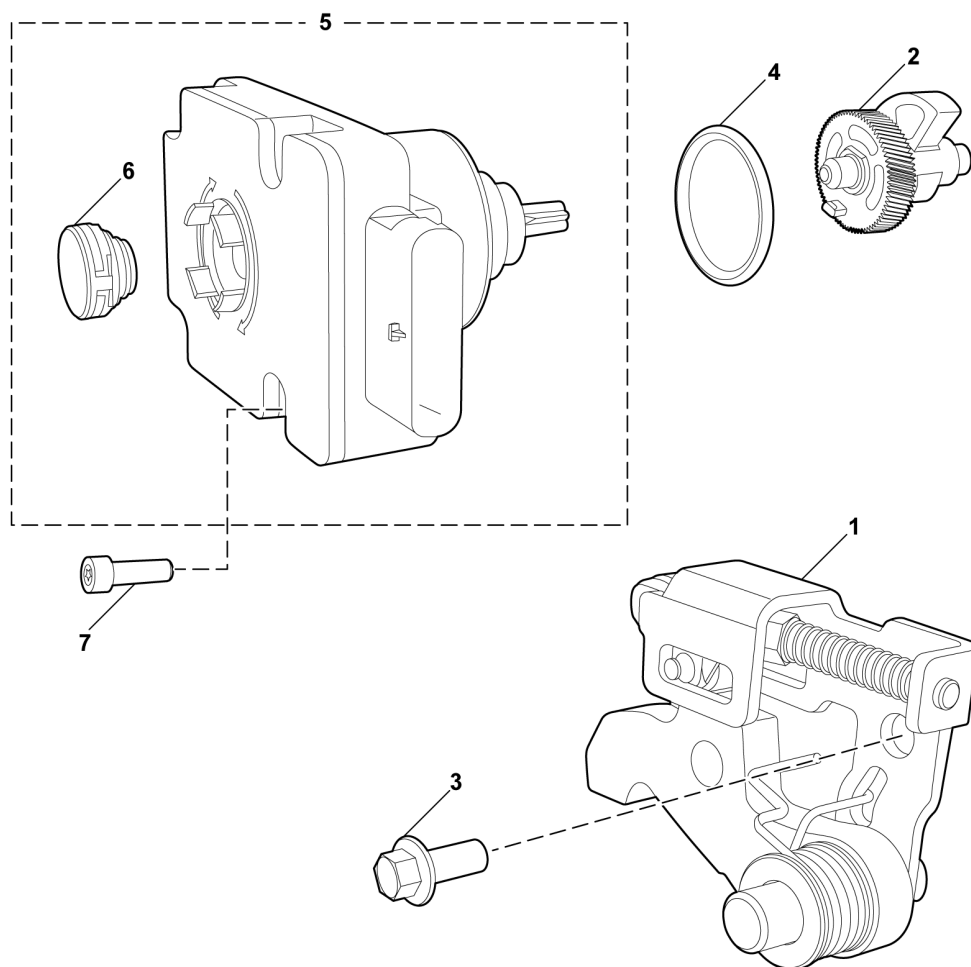


S1210208

- 1. Electric Drive Unit Transaxle Assembly
- 2. Electric Drive Unit Differential Bearing

- 3. Gasket - Electric Drive Unit Differential

Parking Mechanism

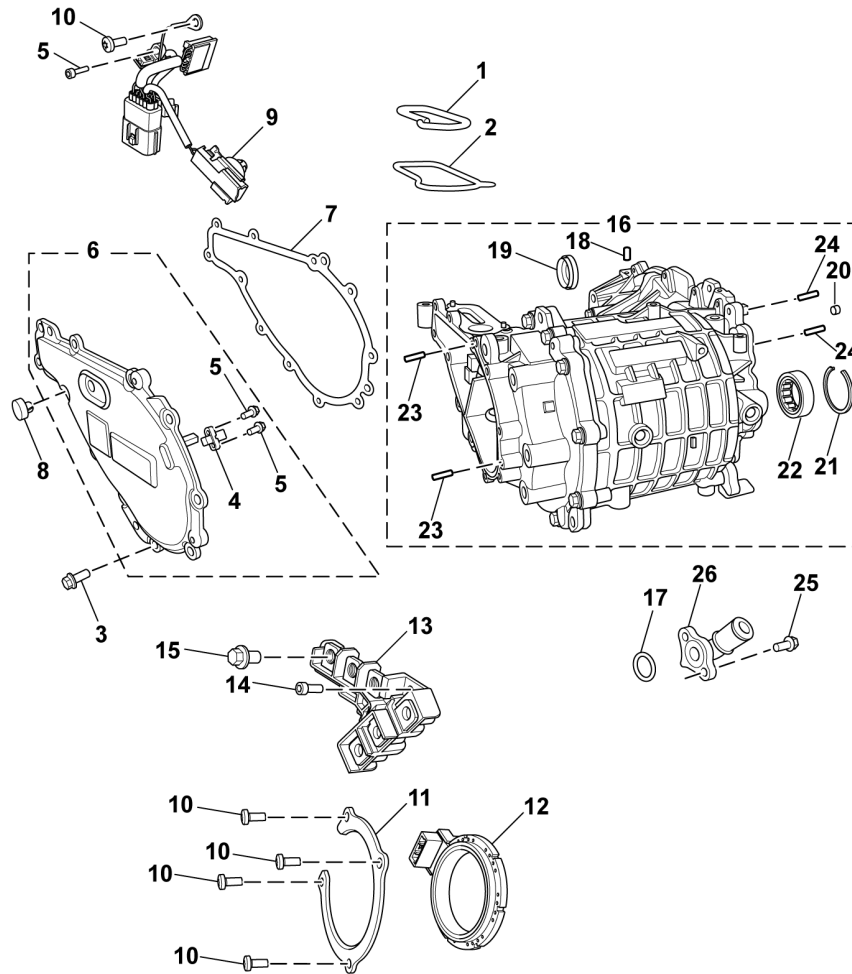


S1210209

- | | |
|---|---|
| 1. Parking Mechanism Assembly | 5. Electric Drive Unit Electric Shift Module |
| 2. Electric Drive Unit Parking Mechanism Parking Shaft Assembly | 6. Electric Drive Unit Vent Plug |
| 3. Bolt - Electric Drive Unit Parking Mechanism | 7. Bolt - Electric Parking Motor Control Unit |
| 4. Electric Drive Unit Electric Shift Module O-ring | |

Electric Drive Unit - B Shaft - Rear

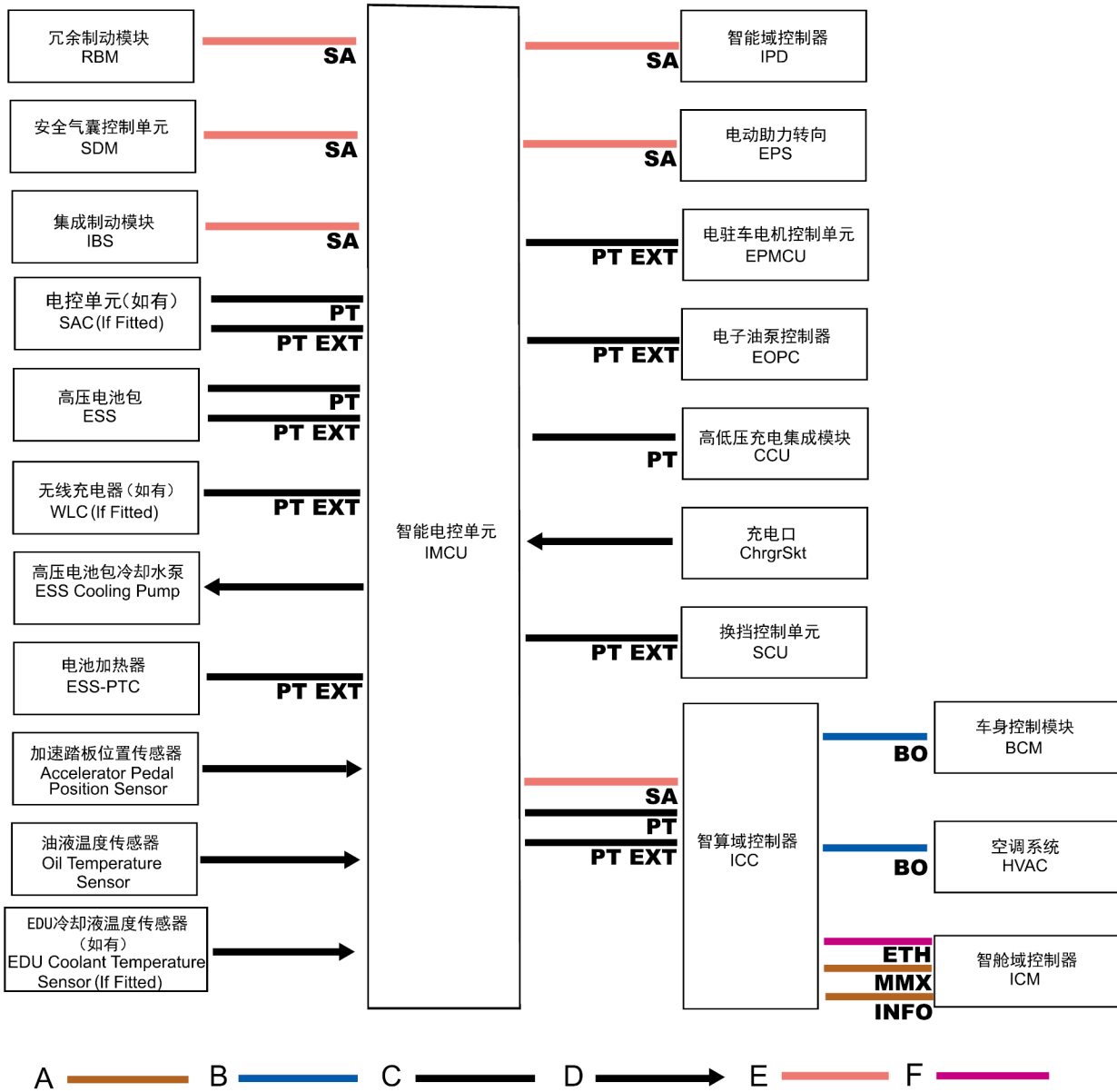
Transmission Accessories



S1210204

- | | |
|---|--|
| 1. O-ring - Electric Drive Unit Housing | 18. Electric Drive Unit Housing Locating Pin |
| 2. Gasket - Electric Drive Unit Drive Motor | 19. Electric Drive Unit Differential Oil Seal |
| 3. Bolt - Electric Drive Unit Housing | 20. Electric Drive Unit Parking Mechanism Shaft Sleeve |
| 4. Electric Drive Unit Low-voltage Connector | 21. Snap Ring - Electric Drive Unit Drive Motor Shaft Cylindrical Bearing Outer Ring |
| 5. Bolt - Electric Drive Unit Low-voltage Connector | 22. Electric Drive Unit Intermediate Shaft Front Bearing |
| 6. Electric Drive Unit High-voltage Observation Window Cover Plate Assembly | 23. Electric Drive Unit Housing Locating Pin |
| 7. Sealing Pad - Electric Drive Unit Housing | 24. Electric Drive Unit Housing Locating Pin |
| 8. Electric Drive Unit Vent Plug | 25. Bolt - Electric Drive Unit Housing |
| 9. Electric Drive Unit Low-voltage Harness | 26. Transmission Cooling Water Pipe Fitting |
| 10. Bolt - Electric Drive Unit Drive Motor Resolver Stator Retaining Plate | |
| 11. Electric Drive Unit Drive Motor Resolver Stator Retaining Plate | |
| 12. Electric Drive Unit Drive Motor Resolver Stator | |
| 13. Electric Drive Unit Drive Motor Insulation Block | |
| 14. Bolt - Electric Drive Unit Drive Motor Insulation Block | |
| 15. Bolt - Electric Drive Unit Drive Motor Insulation Block | |
| 16. Electric Drive Unit Drive Motor Assembly | |
| 17. O-ring - Transmission Cooling Water Pipe Fitting | |

System Control Diagram



S1121204

A = Multi-media/Infotainment HS CAN Bus; B = Body HS CAN Bus; C = Powertrain HS CAN Bus; D = Hard Wire; E = Security HS CAN Bus; F = Ethernet CAN Bus

Electric Drive Unit - B Shaft - Rear

Description

Overview

Such model is equipped with B shaft of electric drive unit. B shaft is equipped with two-stage retarder.

Retarder Housing

The retarder housing is cast from die-cast aluminum. The motor housing and the right housing of the retarder share the same housing structure. There is an oil filler plug and an oil drain plug on the retarder housing, which are sealed with an aluminum gasket respectively.

The retarder is filled with lubricating oil so as to lubricate the internal components using a splash method.

Input Shaft

The input shaft motor is engaged through splines, and the motor power is transmitted to the differential through the input shaft and intermediate shaft. The input shaft is supported in the housing by bearings.

The input shaft is equipped with parking gear, providing parking function.

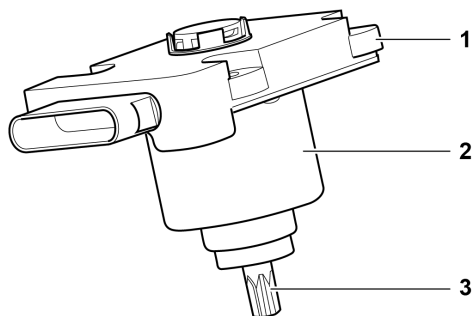
Intermediate Shaft

The intermediate shaft is supported inside the housing by the bearing.

Differential

The differential housing supports the planetary shaft, planetary gear and sun gear inside. The differential assembly is supported by the bearings in the retarder housing.

Electric Parking Module



S1214849

1. Electric Parking Motor Control Unit (EPMCU)
2. Parking Motor
3. Parking Motor Spline

The electronic parking module, integrated with electric parking motor control unit (EPMCU), parking motor, sensor and other components, is fixed by four bolts to the outside of left housing of retarder, and the spline at the front of the parking motor is matched with the parking shaft gear of parking mechanism assembly fixed inside the retarder. When EPMCU receives the P gear signal, the parking motor works and drives the parking

pawl on the parking mechanism assembly to lock the parking gear on the input shaft, thereby realizing the parking function.

Drive Motor

The drive motor is a three-phase AC motor, which accepts the control of auxiliary shaft intelligent motion control unit (IMCU).

Intelligent Motion Control Unit (IMCU)

IMCU, an electronic control component that controls the drive motor, communicates with controllers like ICM and BCM on HS CAN.

Operation

Retarder Assembly

The drive system drives the input shaft to change the rotation speed and direction by the motor speed regulation and the motor reversing principle, thereby changing the speed of the drive gear and the reverse gear.

When the gear shift control mechanism is in D gear, the torque is directly transmitted from the drive motor to the input shaft of the retarder, and then to intermediate shaft gear and the final drive driven gear through the input shaft gear, and finally to the axle shaft. The vehicle speed is changed by changing the motor speed after starting and during driving.

Differential

The differential allows the wheels to rotate at different speeds when the intermediate shaft torques are the same. The pinion integrated with the intermediate shaft is engaged with the final drive driven gear of the differential assembly. When the wheels move forward in straight line, the torque will be applied to the whole assembly and the planetary gear does not rotate. The torque is transmitted to the wheels through the axle shafts. When the vehicle takes a turn, the inner wheels will pass a shorter distance at a lower speed. Thus it drives the planetary gear to rotate, and the outer sun gear offers a higher speed to the outer wheels.

Operational Considerations for Drive Motor

Since the drive motor works in a high voltage and heavy current environment, the following points must be paid attention to during operation:

1. Collision, drop and squeezing against human body should be avoided during product transportation and fitting.
2. The storage environment shall be dry. The environmental requirements for unpacking the motor package are: temperature in the range of $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, and humidity in the range of $10\% \sim 70\% \text{ RH}$.
3. Before the motor is fitted and used, the insulation inspection must be performed. (See Refit and Remove of PEB for details)
4. Before the motor is fitted and used, the motor output shaft should be able to rotate flexibly. Check the appearance of the motor and make sure that the housing is free of damage or abnormal deformation.
5. Before the motor is fitted and used, check to make sure that the conductive part of the three-phase harness and the heavy-current interface of the motor are clean and free of foreign matters or grease.
6. The low-voltage connector is a plastic component that should be protected from direct collision with or stress by hard objects during fitting.

7. The motor rotor is ferromagnetic, therefore, the motor is not allowed to be disassembled except for the specified parts.

Intelligent Motion Control Unit (IMCU) System Function

The intelligent motion control unit regulates the torque and speed of the drive motor with high precision and efficiency.

The intelligent motion control unit sends cooling demand to the cooling water pump and adjusts the opening of water pump according to the temperature.

The intelligent motion control unit provides protection for the battery according to the parameter signals transmitted by the BMS, and these parameters include maximum charging current, maximum discharging current, etc.

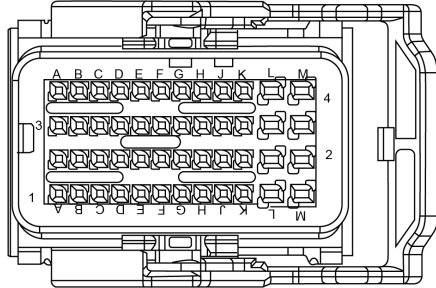
When the BMS disconnects the high voltage system, the intelligent motion control unit will release the power in the capacitor.

Electric Drive Unit - B Shaft - Rear

Detailed Information List of Component Pins

Intelligent Motion Control Unit (IMCU)

End view and pin information of intelligent motion control unit (IMCU) harness connector are as follows:



Mark No.	English Abbreviation	English Name
A1	-	-
A2	AccelPdIPosSnsr_PWR2	Accelerator Pedal Position Sensor Power Supply 2
A3	-	-
A4	AccelPdIPosSnsr_PWR1	Accelerator Pedal Position Sensor Power Supply 1
B1	-	-
B2	AccelPdIPosSnsr_SIG2	Accelerator Pedal Position Sensor Signal 2
B3	-	-
B4	AccelPdIPosSnsr_SIG1	Accelerator Pedal Position Sensor Signal 1
C1	-	-
C2	AccelPdIPosSnsr_GND2	Accelerator Pedal Position Sensor Ground 2
C3	-	-
C4	AccelPdIPosSnsr_GND1	Accelerator Pedal Position Sensor Ground 1
D1	-	-
D2	-	-
D3	EDUCIntTempSnsr_SIG	PEB Coolant Temperature Sensor Signal

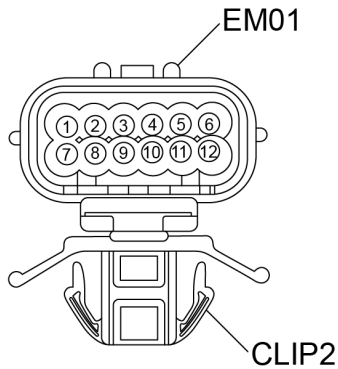
D4	EDUCIntTempSnsr_GND	PEB Coolant Temperature Sensor Ground
E1	PowerTrain CAN_H	Powertrain HS CAN High
E2	PowerTrain CAN_L	Powertrain HS CAN Low
E3	-	-
E4	-	-
F1	-	-
F2	-	-
F3	-	-
F4	BrkTrvlSw_SIG	Brake Stroke Switch
G1	IMCU Cal CAN_H	IMCU Calibration CAN High
G2	IMCU Cal CAN_L	IMCU Calibration CAN Low
G3	BrkLghtSw_SIG	Brake Light Switch
G4	OBCSktNgvtvSnsr+	Slow Charging Socket Negative Sensor
H1	PowerTrain Extended CAN_H	Powertrain Extended HS CAN High
H2	PowerTrain Extended CAN_L	Powertrain Extended HS CAN Low
H3	ChrgrSktSnsr_GND	Charging Socket Sensor Ground
H4	EmgcSw_SIG	Emergency Switch Signal
J1	ESSCIntPump_DRV	Energy Storage System Cooling Water Pump
J2	OffBdChrgrPstvSnsr+	Fast Charge Positive Sensor
J3	-	-
J4	BPSWakeUp	High-voltage Battery Pack Pressure Warning Switch - PMS
K1	-	-
K2	-	-
K3	IgnRelay	Ignition Wake-up Signal
K4	-	-
L1	-	-

Electric Drive Transmission/ Transaxle

L2	PEBCIntPumpI_DRV	Electric Drive Unit Cooling Water Pump I
L3	PWMCoolngFan_DRV	Pulse Width Modulation Cooling Fan
L4	-	-
M1	-	-
M2	MainRelay_DRV	Main Relay
M3	KL30	KL30
M4	GND	Ground

Electric Drive Unit Low-voltage Harness - Housing

End view and pin information of electric drive unit low-voltage harness connector are as follows:

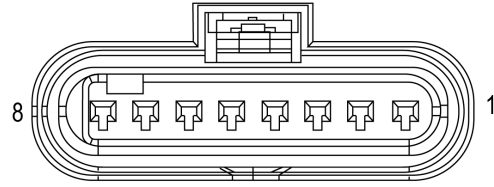


Mark No.	English Abbreviation	English Name
1	Temperature sensor input	Temperature Sensor Input
2	Temperature sensor GND	Temperature Sensor Ground
3	SIN+	Rotary Transformer SIN +
4	SIN-	Rotary Transformer SIN -
5	EXC-	Rotary Transformer Excitation -
6	-	-
7	HVIL	High Voltage Interlock
8	HVIL	High Voltage Interlock
9	COS+	Rotary Transformer COS +
10	COS-	Rotary Transformer COS -
11	EXC+	Rotary Transformer Excitation +
12	-	-

Electric Drive Unit - B Shaft - Rear

Electronic Parking Brake Control Module (EPMCU)

End view and pin information of electronic parking brake control module (EPMCU) harness connector are as follows:



Mark No.	English Abbreviation	English Name
1	KL30.1	KL30.1
2	WakeupEnable	Wake-up Enable Signal
3	-	-
4	PowerTrain Extended CAN_L	Powertrain Extended HS CAN Low
5	PowerTrain Extended CAN_H	Powertrain Extended HS CAN High
6	GND	Ground
7	-	-
8	KL30.2	KL30.2

Electric Drive Unit - B Shaft - Rear

Service Guide

Electric Drive Unit Fluid - Drain and Refill Drain and Refill - B Rear

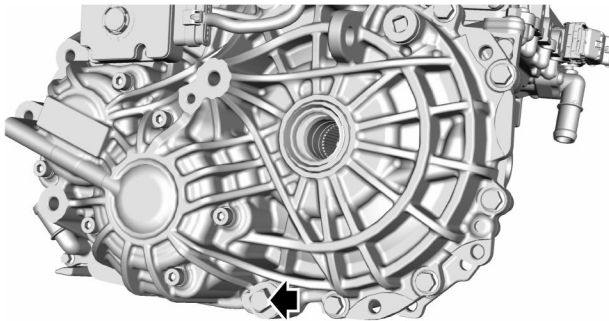
Caution :

Replace the electric drive unit fluid when the vehicle is soaked in water

1. Remove the bottom deflector.

 **Bottom Deflector Remove**

2. Place a suitable container under the electric drive unit.
3. Clean the area around the drain plug, remove and discard the drain plug and the seal gasket.

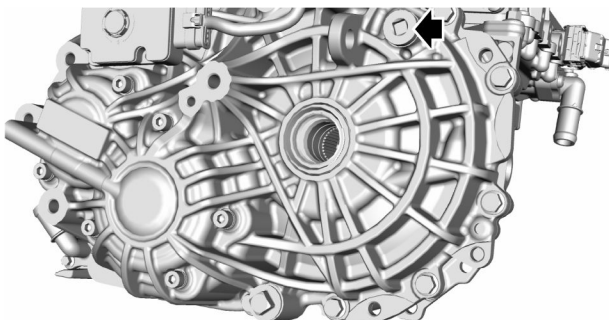


S1215049

4. Drain the electric drive unit fluid.
5. Place a new seal gasket on the drain plug, fit the new drain plug, tighten it to **25-35Nm**, and check the torque.
6. Remove the manual service disconnect.

 **Manual Service Disconnect (MSD) Remove**

7. Clean the area around the filler plug, remove the filler plug and discard the seal gasket.



S1215050

8. Refill electric drive unit fluid through the filler port, and the capacity is:

Drain and Refill	0.75L
Refill from Dry State	0.9L

9. Place a new seal gasket on the filler plug, fit the filler

plug, tighten it to **23-27Nm**, and check the torque.

10. Fit the manual service disconnect.

 **Manual Service Disconnect (MSD) Refit**

11. Fit the bottom deflector.

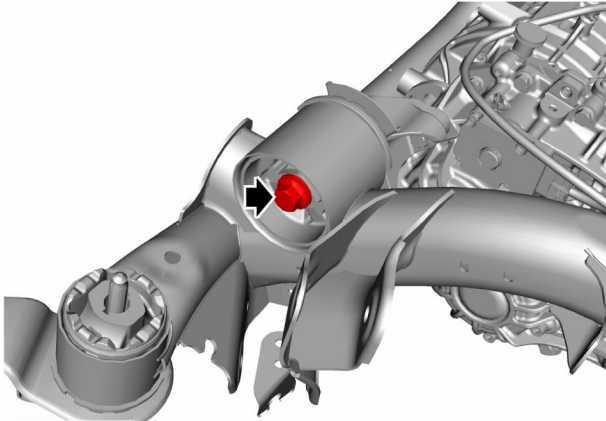
 **Bottom Deflector Refit**

Electric Drive Unit and Mount Remove - B Rear

1. Remove the rear subframe assembly.

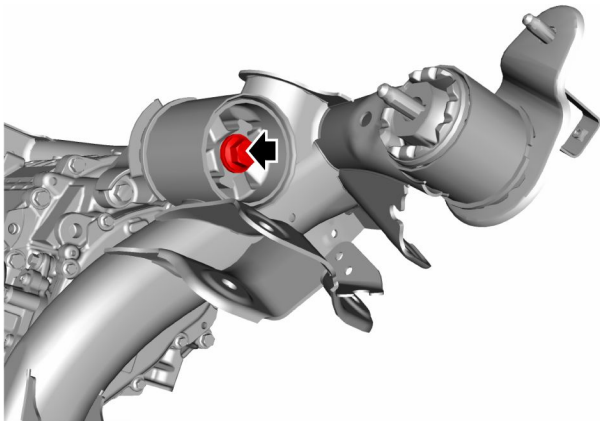
Rear subframe Remove

2. Remove and discard 1 bolt fixing the left mount bracket to the rear subframe.



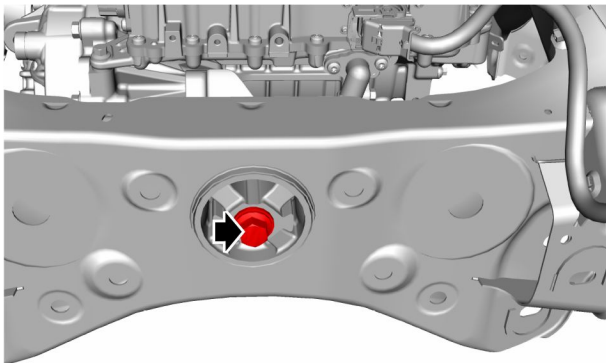
S2613668

3. Remove and discard 1 bolt fixing the right mount bracket to the rear subframe.



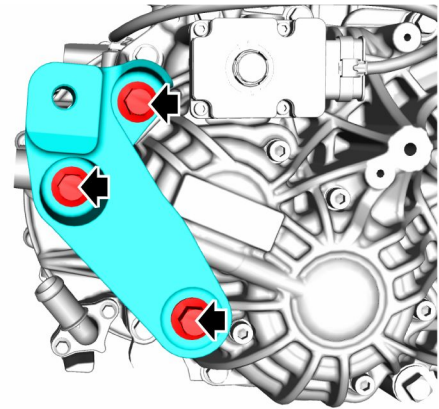
S2613669

4. Remove and discard 1 bolt fixing the rear mount bracket to the rear subframe.



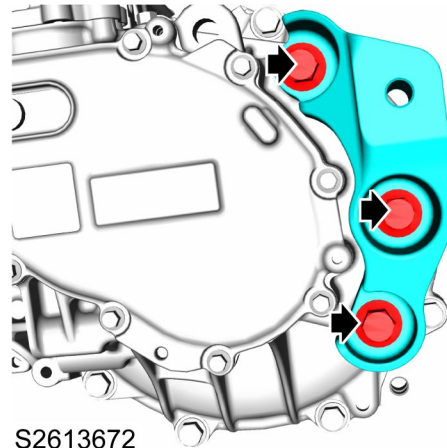
S2613670

5. Remove and discard 3 bolts fixing the left mount bracket to the transmission.



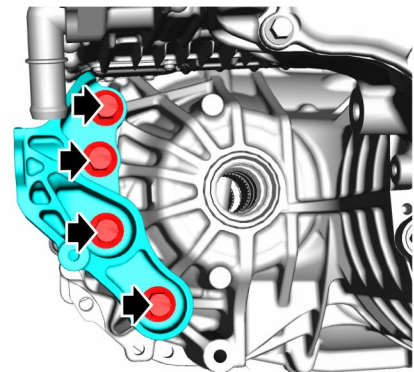
S2613671

6. Remove and discard 3 bolts fixing the right mount bracket to the transmission.



S2613672

7. Remove and discard 4 bolts fixing the rear mount bracket to the transmission.



S2613673

Refit - B Rear

1. Fit 4 new bolts fixing the rear mount bracket to the transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.
2. Fit 3 new bolts fixing the right mount bracket to the transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.
3. Fit 3 new bolts fixing the left mount bracket to the transmission, tighten them to **(65-75) Nm+ (85-95) °**, and check the torque.

Electric Drive Unit - B Shaft - Rear

4. Fit 1 new bolt fixing the rear mount bracket to the rear subframe, tighten it to (135-165) Nm+ (85-95) °, and check the torque.
5. Fit 1 new bolt fixing the right mount bracket to the rear subframe, tighten it to (135-165) Nm+ (85-95) °, and check the torque.
6. Fit 1 new bolt fixing the left mount bracket to the rear subframe, tighten it to (135-165) Nm+ (85-95) °, and check the torque.
7. Fit the rear subframe assembly.

 **Rear subframe Refit**

**Differential Oil Seal - Left
Remove - B Rear - Left**

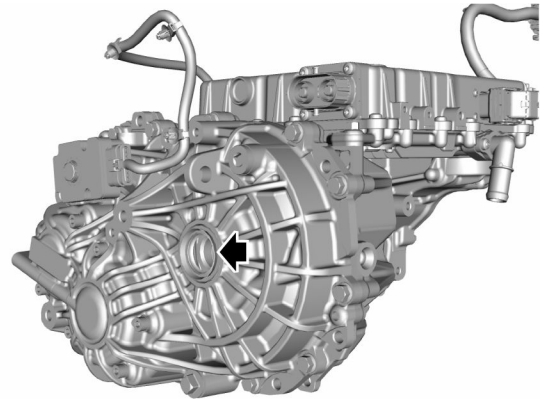
1. Drain the electric drive unit fluid.

 **Electric Drive Unit Fluid Drain and Refill - B Rear**

2. Remove the rear left axle shaft assembly.

 **Left Rear Axle Shaft Assembly Remove - Right Rear Remove - Left Rear**

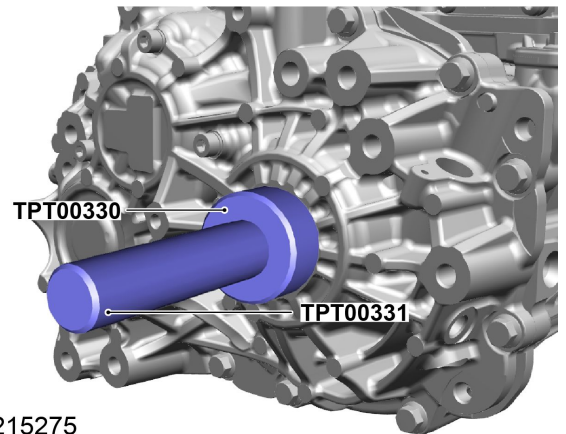
3. Remove the left differential oil seal.



S1215054

Refit - B Rear - Left

1. Clean the oil seal groove.
2. Use the special tools TPT00330 and TPT00331 to fit the left differential oil seal.



S1215275

3. Fit the rear left axle shaft assembly.

 **Left Rear Axle Shaft Assembly Refit - Right Rear Refit - Left Rear**

4. Fill the electric drive unit fluid.

 **Electric Drive Unit Fluid Drain and Refill - B Rear**

Differential Oil Seal - Right Remove - B Rear - Right

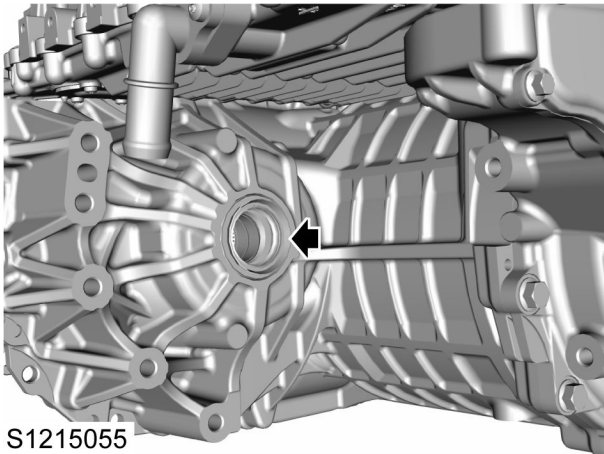
1. Drain the electric drive unit fluid.

Electric Drive Unit Fluid Drain and Refill - B Rear

2. Remove the rear axle shaft intermediate connecting shaft assembly.

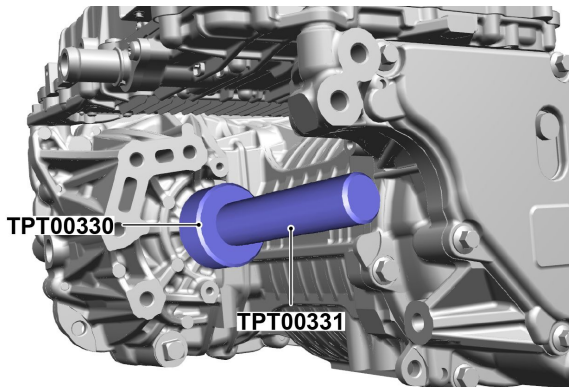
Rear Axle Shaft Intermediate Connecting Shaft Assembly Remove

3. Remove the right differential oil seal and discard it.



Refit - B Rear - Right

1. Clean the oil seal groove.
2. Use the special tools TPT00330 and TPT00331 to fit the new right differential oil seal.



S1215276

3. Fit the rear axle shaft intermediate connecting shaft assembly.

Rear Axle Shaft Intermediate Connecting Shaft Assembly Refit

4. Fill the electric drive unit fluid.

Electric Drive Unit Fluid Drain and Refill - B Rear

Electric Shift Module Remove

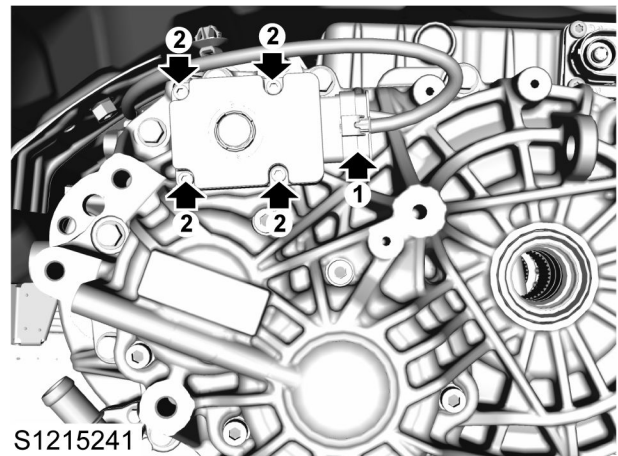
1. Remove the manual service disconnect.

Manual Service Disconnect (MSD) Remove

2. Remove the rear end bottom deflector.

Rear End Bottom Deflector Remove

3. Disconnect the harness (1) from the electric parking motor control unit (EPMCU).
4. Remove 4 bolts fixing the electric parking motor control unit (EPMCU) to transmission and discard the O-rings (2).



Refit

1. Fit 4 bolts and new O-rings fixing the electric parking mechanism to the transmission, tighten them to 5-7Nm, and check the torque.
2. Connect the harness to the electric parking motor control unit (EPMCU).
3. Fit the rear end bottom deflector.

Rear End Bottom Deflector Refit

4. Fit the manual service disconnect.

Manual Service Disconnect Refit

5. Connect the scan tool and access the SIPS.
6. Select "Programming and Coding - EPMCU - Replacement", and follow the on-screen instructions.

P Gear Unlocking


When the P gear mechanism cannot be shifted out of P gear due to EPMCU failure, low-voltage feed, high-voltage failure, SCU failure and other conditions, P gear unlocking can be completed through the following steps.

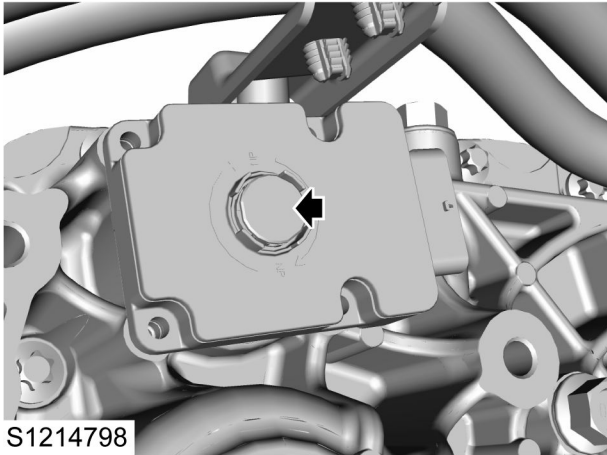
Caution : The following steps require the support of a jack to complete the operation, please stay safe.

Caution : After performing the following steps, if the vehicle is re-supplied with low voltage power, the system will shift into P gear.

1. Remove the manual service disconnect.  Manual Service Disconnect Remove

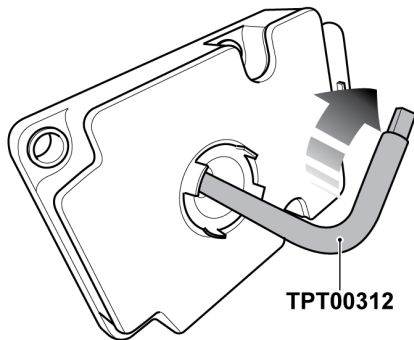
Electric Drive Unit - B Shaft - Rear

- Remove the rear end bottom deflector.  **Bottom Deflector Remove**
- Use a flat-bladed screwdriver to pry off and discard the vent plug.





- Use the special tool TPT00312 to turn clockwise the internal mechanism to the bottom and get out of P gear.

Caution : *There should be no obvious resistance when operating out of P gear. If there is obvious resistance when starting or during operation, please stop immediately, otherwise the internal mechanism of parking will be damaged.*



S1214968

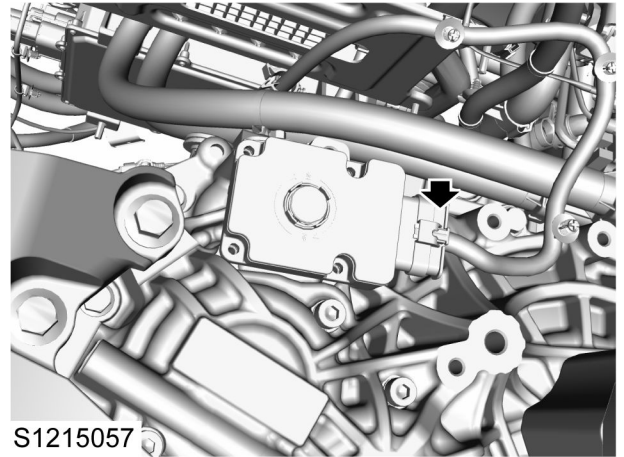
- Fit a new vent plug.
- Fit the rear end bottom deflector.  **Bottom Deflector Refit**
- Fit the manual service disconnect.  **Manual Service Disconnect Refit**

Electric Drive Unit Low Voltage Harness Remove - B Rear

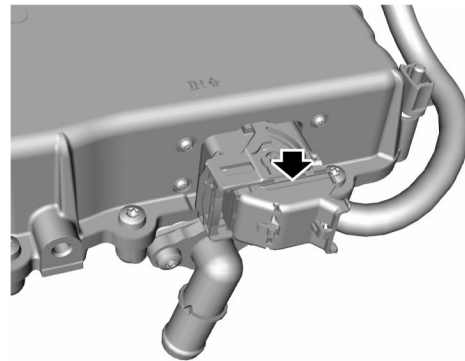
- Remove electric drive unit and mount.

Electric Drive Unit and Mount Remove Remove Remove - B Rear

- Disconnect the connector of the electric shift module.



- Disconnect the connector of the intelligent motion control unit.



S1215058

Refit - B Rear

- Connect the intelligent motion control unit.
- Connect the electric shift module.
- Fit the electric drive unit and mount.


Electric Drive Unit and Mount Refit Refit Refit - B Rear

Electric Drive Transmission/ Transaxle

Electric Drive Unit - B Shaft - Rear

Electric Drive Unit Disassemble Remove - B Shaft Disassembling

1. Remove the electric drive unit and mount.

 **Electric Drive Unit and Mount Remove Remove
Remove - B Rear**


2. Remove the electric drive unit low voltage harness.

 **Electric Drive Unit Low Voltage Harness Remove
Remove Remove - B Rear Remove - B Rear Remove**

3. Remove the intelligent motor control unit (IMCU).

 **Intelligent Motor Control Unit (IMCU) Remove
Remove Remove - B Rear**

4. Remove the differential oil seal.

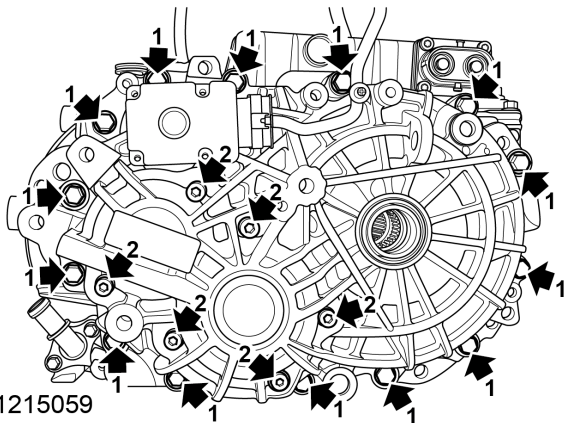
 **Differential Oil Seal Remove- Left Remove -
Right Remove Remove Remove - B Rear - Left Remove -
B Rear - Right**

5. Remove the electric shift module.

 **Electric Shift Module Remove Remove**

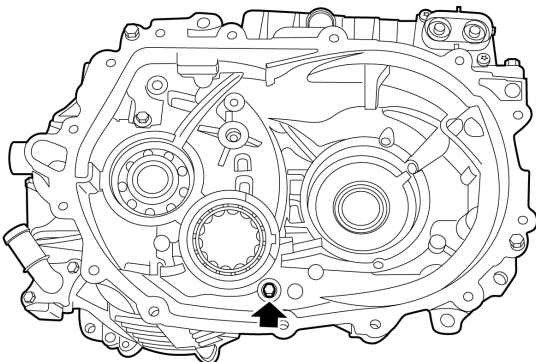
6. Remove 14 bolts (1) fixing the electric drive unit housing to the drive motor housing.

7. Remove 6 bolts (2) and gaskets fixing the bearing plate, and discard the gaskets.



S1215059

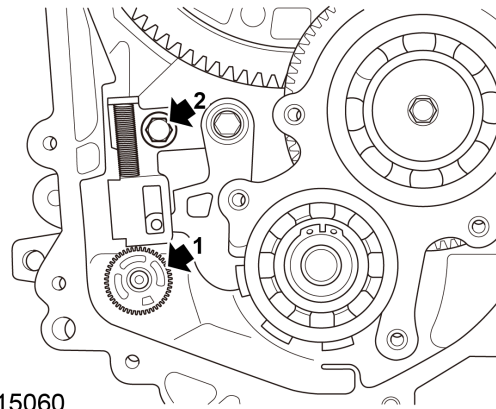
8. Remove the housing magnet assembly from the housing.



S1215266

9. Remove the parking rotating shaft (1).

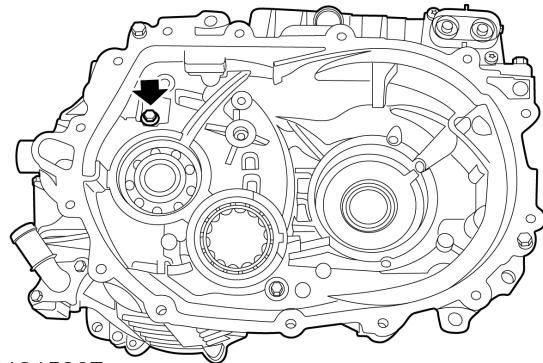
10. Remove 1 bolt (2) fixing the parking mechanism to the housing.



S1215060

11. Remove the input shaft, intermediate shaft and differential.

12. Remove 1 bolt fixing the spoiler to the housing.

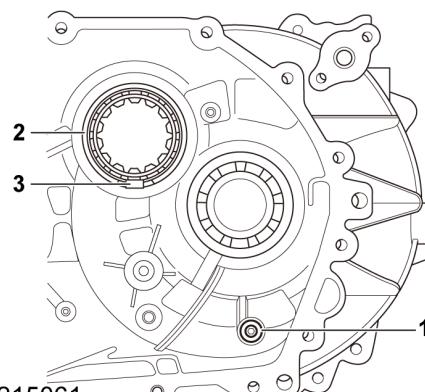


S1215267

13. Remove and discard the parking mechanism shaft sleeve (1).

14. Remove and discard the circlip (2) fixing the intermediate shaft bearing.

15. Remove the intermediate shaft bearing (3).



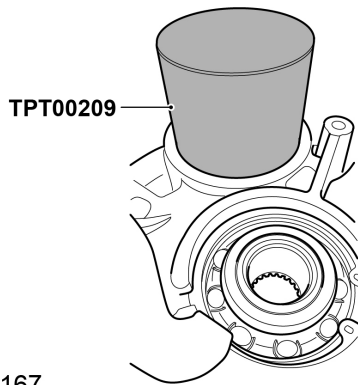
S1215061

Refit - B Shaft Disassembling

1. Use a feeler gauge to measure the clearance between the oil seal and the housing, which shall be less than 0.1mm.
2. Use special tool TPT00209 to fit the intermediate shaft bearing.

Electric Drive Unit - B Shaft - Rear

Caution : The notched side of the bearing should face up.

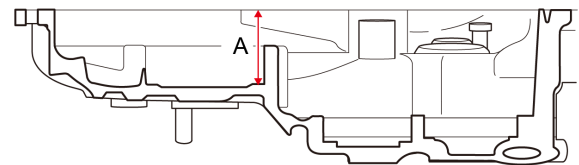


S1215167

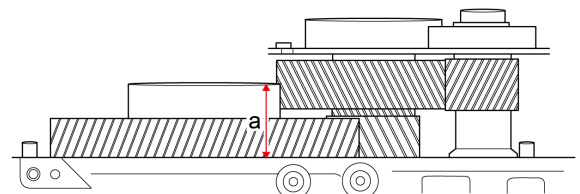
3. Fit the new circlip fixing the intermediate shaft bearing.
4. Fit a new parking mechanism shaft sleeve flush with the end face of the housing mounting hole.
5. Fit the input shaft, intermediate shaft and differential.
6. Use a depth gauge to measure the distance a from the top end face of the differential bearing to the motor housing assembling face; and the distance A from the differential bearing hole seat of the transmission housing to the housing assembling face.
7. Calculate A-a and select the adjusting gasket of corresponding specification according to the gasket selection table.
8. Measure the gasket thickness again with the vernier caliper, and the thickness shall not be greater than ± 0.02 .
9. Put the gasket into the bearing hole seat of the transmission housing in place (grease can be applied to the adjusting gasket).

Required clearance for gasket selection of differential side ball bearing 0-0.05	
Measured Clearance X (mm) (From the housing bearing base plane to the bearing outer ring)	Gasket Thickness (mm)
$1.45 \leq X < 1.50$	1.45
$1.50 \leq X < 1.55$	1.50
$1.55 \leq X < 1.60$	1.55
$1.60 \leq X < 1.65$	1.60
$1.65 \leq X < 1.70$	1.65
$1.70 \leq X < 1.75$	1.70
$1.75 \leq X < 1.80$	1.75
$1.80 \leq X < 1.85$	1.80
$1.85 \leq X < 1.90$	1.85
$1.90 \leq X < 1.95$	1.90

$1.95 \leq X < 2.00$	1.95
$2.00 \leq X < 2.05$	2.00
$2.05 \leq X < 2.10$	2.05
$2.10 \leq X < 2.15$	2.10
$2.15 \leq X < 2.20$	2.15
$2.20 \leq X < 2.25$	2.20
$2.25 \leq X < 2.28$	2.25
$2.28 < X$	NOK

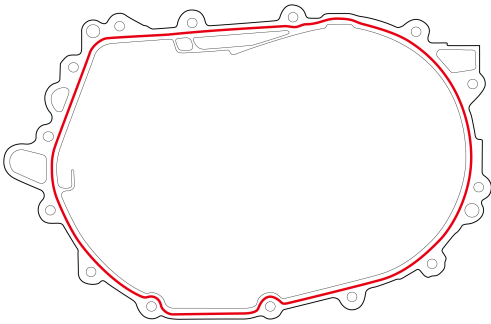


S1215062



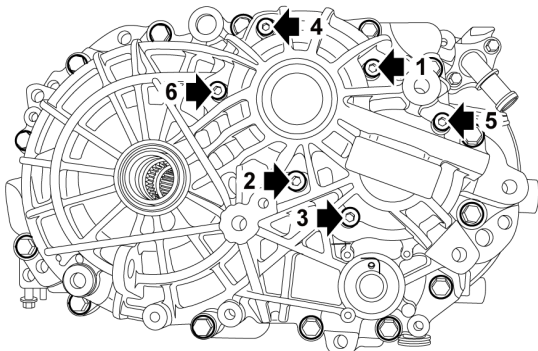
S1215063

10. Fit 1 bolt fixing spoiler to the housing, tighten it to **5-7Nm**, and check the torque.
11. Fit the parking mechanism into the motor housing, ensure that the parking mechanism is close to the mounting surface of the motor housing, and then tighten the fixing bolts.
12. Fit 1 bolt fixing the parking mechanism to the housing, tighten it to **19-25Nm**, and check the torque.
13. Fit the parking rotating shaft.
14. Fit the housing magnet assembly fixed to the housing, tighten it to **7-10Nm**, and check the torque.
15. Apply sealant on the motor housing assembling face, with a width of 2-3mm, and without breakage.



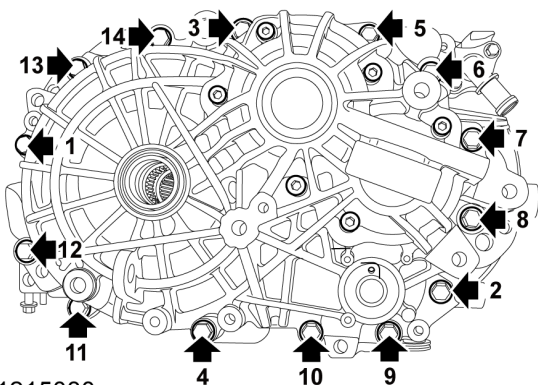
S1215065

16. Fit 6 bolts fixing the bearing plate in the sequence as shown in the figure, tighten them to **19-25Nm**, and check the torque.



S1215067

17. Fit 14 bolts fixing the electric drive unit housing to the drive motor housing in the sequence as shown in the figure, tighten them to **26-34Nm**, and check the torque.



S1215080

18. Fit the electric shift module.

Electric Shift Module Refit Refit

19. Fit the differential oil seal.

Differential Oil Seal Refit- Left Refit - Right Refit Refit Refit - B Rear - Left Refit - B Rear - Right

20. Fit the intelligent motor control unit.

Intelligent Motor Control Unit (IMCU) Refit Refit Refit - B Rear

21. Fit the electric drive unit low voltage harness.

Electric Drive Unit Low Voltage Harness Refit Refit Refit - B Rear Refit - B Rear Refit

22. Fit the electric drive unit and mount.

Electric Drive Unit and Mount Refit Refit Refit - B Rear

23. Carry out a water tightness test.

Water Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear


24. Carry out a dry chamber tightness test.

Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

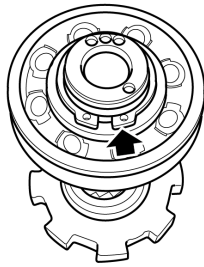
Electric Drive Unit - B Shaft - Rear

**Input Shaft Assembly
Remove - B Rear**

1. Disassemble the electric drive unit.

 **Electric Drive Unit Disassembling Remove Remove
Remove - B Shaft Disassembling**

2. Remove the circlip fixing the bearing, remove the bearing, and discard the circlip.

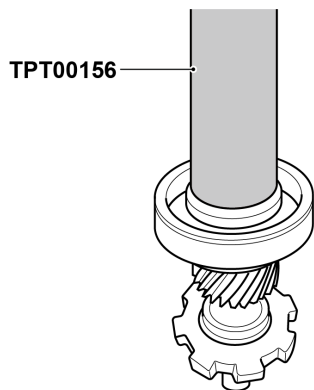


S1215081

Refit - B Rear

1. Use special tool TPT00156 to fit the bearing.

Caution : *The bearing boss side should face the gear shaft.*



S1215082

2. Use a bevel feeler gauge to measure and select a new input shaft circlip.
3. Measure the circlip thickness again with the vernier caliper, which shall not be greater than $\pm 0.02\text{mm}$.

Measured Clearance X (mm) (From inner ring plane of the input shaft bearing to the input shaft circlip mating surface)	Circlip Thickness (mm)
$X < 1.90$	NOK
$1.90 \leq X < 1.95$	1.88
$1.95 \leq X < 2.00$	1.93
$2.00 \leq X < 2.05$	1.98


$2.05 \leq X < 2.06$	2.03
$2.06 < X$	NOK

4. Assemble the electric drive unit.

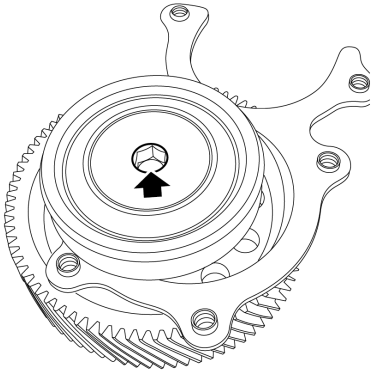
 **Electric Drive Unit Disassembling Refit Refit
Refit - B Shaft Disassembling**

Output Shaft Assembly Remove - B Rear

1. Disassemble the electric drive unit.

 **Electric Drive Unit Disassembling** Remove Remove
Remove - B Shaft Disassembling

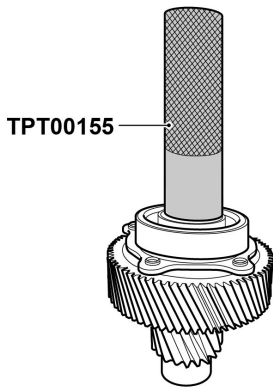
2. Remove and discard 1 bolt fixing the bearing.



S1215083

Refit - B Rear

1. Use special tool TPT00155 to fit the bearing.




S1215084

2. Fit 1 new bolt fixing the bearing, tighten it to **155-165Nm**, and check the torque.
3. Assemble the electric drive unit.

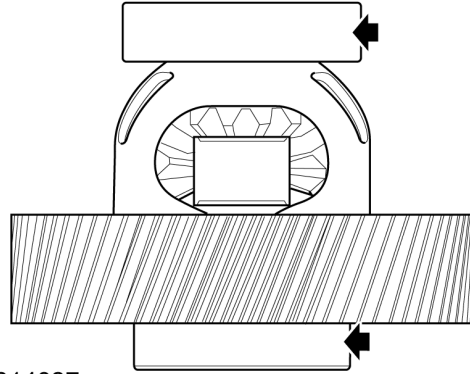
 **Electric Drive Unit Disassembling** Refit Refit
Refit - B Shaft Disassembling

Differential Assembly Remove - B Rear

1. Disassemble the electric drive unit.

 **Electric Drive Unit Disassembling** Remove Remove
Remove - B Shaft Disassembling

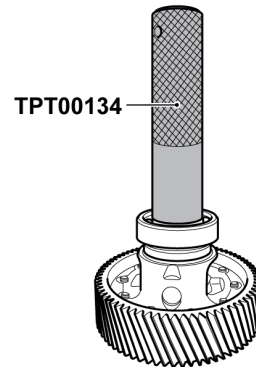
2. Remove the bearings on both ends of the differential.



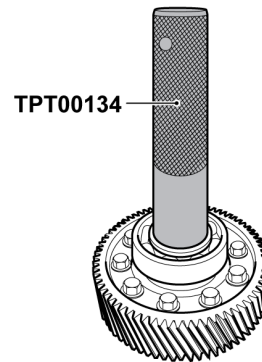
S1214827

Refit - B Rear

1. Use special tool TPT00134 to fit the bearings on both sides of the differential.



S1214966



S1214967

2. Assemble the electric drive unit.

 **Electric Drive Unit Disassembling** Refit Refit
Refit - B Shaft Disassembling

Electric Drive Unit - B Shaft - Rear

**Electric Drive Unit Drive Motor Small Assembly
Remove - B Rear**

1. Disassemble the electric drive unit.

Electric Drive Unit Disassembling Remove Remove Remove - B Shaft Disassembling

2. Remove the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness Remove Remove Remove - B Rear Remove - B Rear Remove

3. Remove the resolver stator.

Resolver Stator Remove Remove Remove - B Rear

4. Remove the electric drive unit drive motor insulation block.

Electric Drive Unit Drive Motor Insulation Block Remove Remove Remove - B Rear

5. Remove the motor cooling water pipe fitting.

Motor Cooling Water Pipe Fitting Remove Remove Remove - B Rear

6. Remove the drive motor assembly.

Refit - B Rear

1. Fit the motor cooling water pipe fitting.

Motor Cooling Water Pipe Fitting Refit Refit Refit - B Rear

2. Fit the electric drive unit drive motor insulation block.

Electric Drive Unit Drive Motor Insulation Block Refit Refit Refit - B Rear

3. Fit the resolver stator.

Resolver Stator Refit Refit Refit - B Rear

4. Fit the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness Refit Refit Refit - B Rear Refit - B Rear Refit

5. Fit the vent plug to the drive motor.

6. Assemble the electric drive unit.

Electric Drive Unit Disassembling Refit Refit Refit - B Shaft Disassembling

7. Perform the dry cavity and coolant pipeline air tightness test.

Dry Cavity Air Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

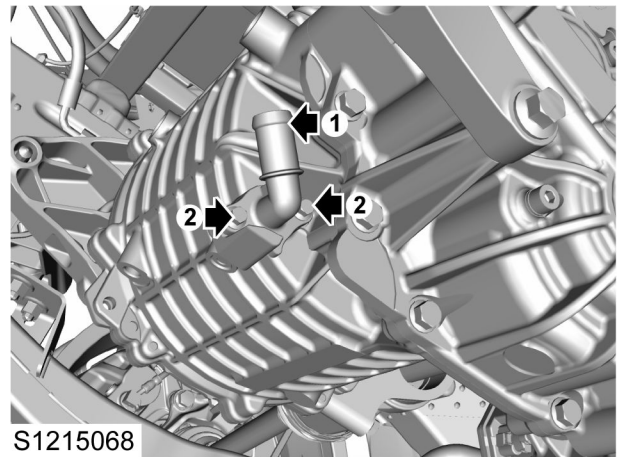
Coolant Pipeline Air Tightness Test Coolant Pipeline Air Tightness Test Dry Cavity Air Tightness Test Water Tightness Test Dry Chamber Tightness Test Coolant Pipeline Air Tightness Test - B Rear Dry Cavity Air Tightness Test - B Rear

**Motor Cooling Water Pipe Fitting
Remove - B Rear**

1. Drain the coolant.

Coolant Drain Refill

2. Disconnect the pipeline (1) from the motor water pipe fitting.
3. Remove 2 bolts fixing the water pipe fitting to the housing and discard the O-ring (2).



Refit - B Rear

1. Fit 2 bolts and new O-rings fixing the motor pipe fitting to the housing, tighten them to **7-10Nm**, and check the torque.
2. Connect the pipeline to the motor pipe fitting.
3. Refill the coolant.

Coolant Drain Refill

Electric Drive Transmission/ Transaxle

Electric Drive Unit - B Shaft - Rear

Drive Motor Control Module Observation Cover Plate

Remove - B Rear

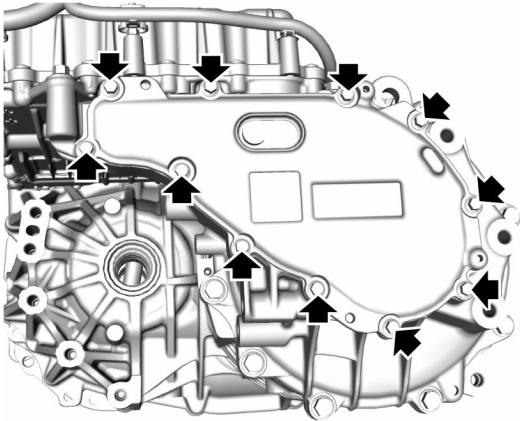
1. Remove the manual service disconnect.

Manual Service Disconnect (MSD) Remove

2. Remove the right rear axle shaft assembly.

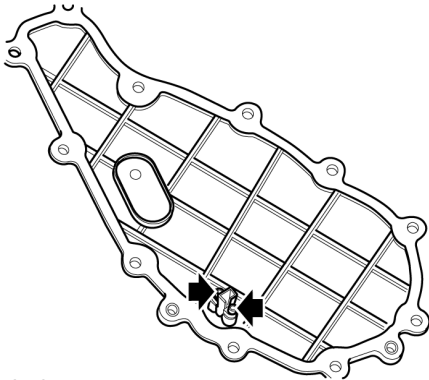
Rear Right Axle Shaft Assembly Remove - Right Rear Remove - Left Rear

3. Remove 11 bolts fixing the drive motor control module observation cover plate to the housing and discard the gaskets.



S1215069

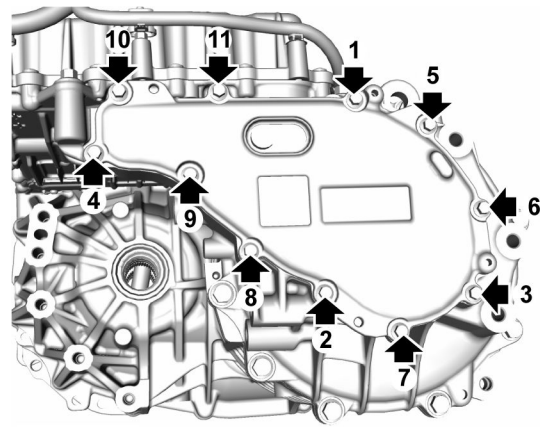
4. Remove 2 bolts fixing the interlock connector to the observation cover plate.



S1215070

Refit - B Rear

1. Fit and tighten 2 bolts fixing the interlocking connector to the observation cover plate.
2. Fit 11 bolts and new gaskets fixing the observation cover plate of the drive motor control module to the housing in the sequence as shown in the figure, tighten them to **7-10Nm**, and check the torque.



S1215071

3. Fit the right rear axle shaft assembly.

Rear Right Axle Shaft Assembly Refit - Right Rear Refit - Left Rear

4. Fit the manual service disconnect.

Manual Service Disconnect Refit

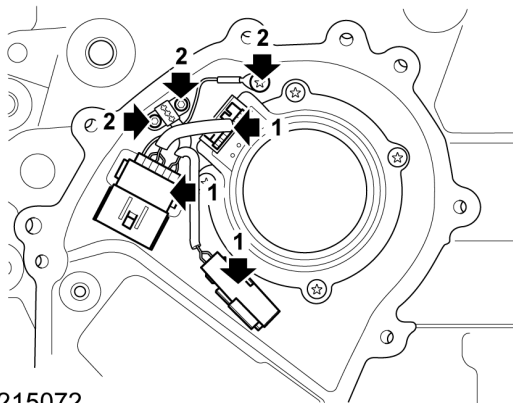
Electric Drive Unit - B Shaft - Rear

Electric Drive Unit Low-voltage Harness Remove - B Rear

1. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate Remove - B Rear

2. Disconnect low-voltage harness connector (1) of the electric drive unit.
3. Remove 3 bolts (2) fixing the low-voltage harness of the electric drive unit to the housing.



S1215072

Refit - B Rear

1. Fit and tighten 3 bolts fixing the low-voltage harness of electric drive unit to the housing.
2. Connect the low-voltage harness of electric drive unit.
3. Fit the drive motor control module observation cover plate.

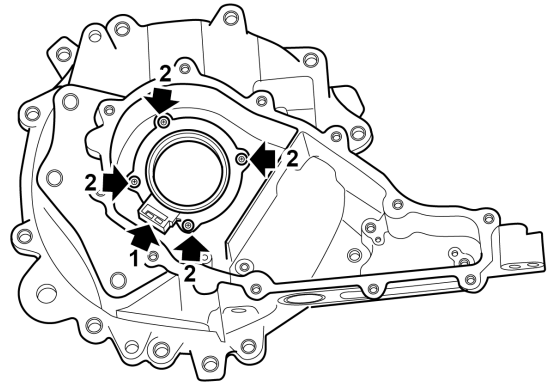
Drive Motor Control Module Observation Cover Plate Refit - B Rear

Resolver Stator Remove - B Rear

1. Remove the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness Remove Remove - B Rear Remove - B Rear Remove

2. Disconnect the harness (1) connected to the resolver stator.
3. Remove 4 bolts (2) fixing the resolver stator to the housing.



S1215073

Refit - B Rear

1. Fit and tighten 4 bolts fixing the resolver stator to the housing.
2. Connect the harness to the resolver stator.
3. Fit the electric drive unit low-voltage harness.

Electric Drive Unit Low-voltage Harness Refit Refit Refit - B Rear Refit - B Rear Refit

4. Perform the self-learning for the drive motor.

Electric Drive Unit Drive Motor Insulation Block

Remove - B Rear

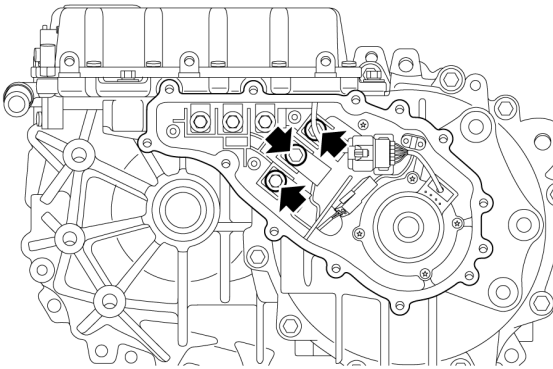
1. Remove the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate Remove - B Rear

2. Remove the intelligent motion control unit (IMCU).

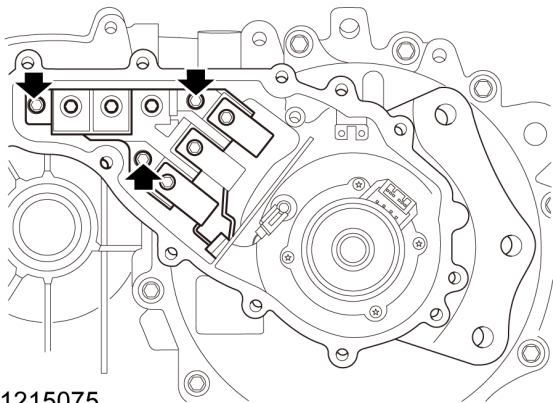
Intelligent Motion Control Unit Remove Remove Remove - B Rear

3. Remove 3 bolts fixing the three-phase line.



S1215074

4. Remove 3 bolts fixing the insulation block to the housing.



S1215075

Refit - B Rear

1. Fit 3 bolts fixing the insulation block to the housing, tighten them to **5-7Nm**, and check the torque.
2. Fit the intelligent motion control unit.

Intelligent Motion Control Unit Refit Refit Refit - B Rear

3. Fit the bolt(s) fixing the remaining 3-phase rotor cable to the insulation block, tighten them to **14-16Nm** and check the torque.
4. Fit the drive motor control module observation cover plate.

Drive Motor Control Module Observation Cover Plate Refit - B Rear

5. Perform the self-learning for the drive motor.

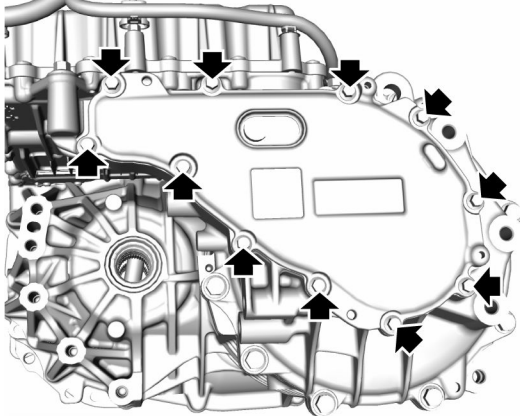
Electric Drive Unit - B Shaft - Rear

Intelligent Motor Control Unit (IMCU) Remove - B Rear

1. Remove the electric drive unit and mount.

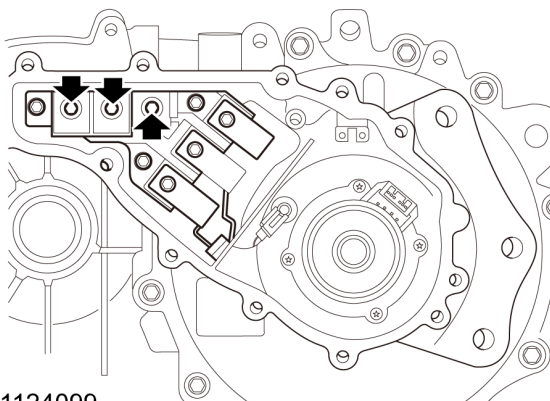
Electric Drive Unit and Mount Remove Remove **Remove - B Rear**

2. Remove 11 bolts fixing the drive motor control module observation cover plate to the housing and discard the gaskets.



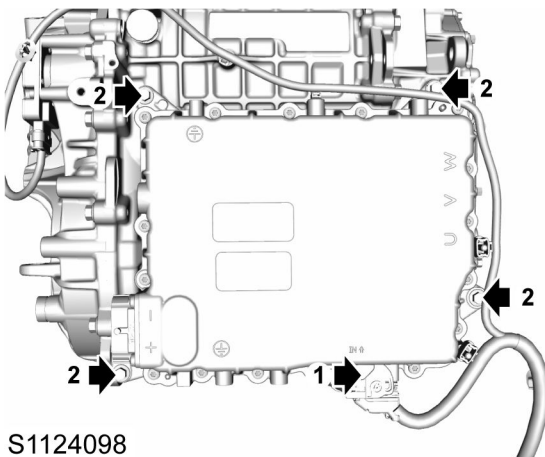
S1215069

3. Remove 3 bolts fixing the three phase cable of the intelligent motor control unit to the insulation block.



S1124099

4. Disconnect the harness (1) from the intelligent motor control unit.
5. Remove 4 bolts (2) fixing the intelligent motor control unit to the transmission.

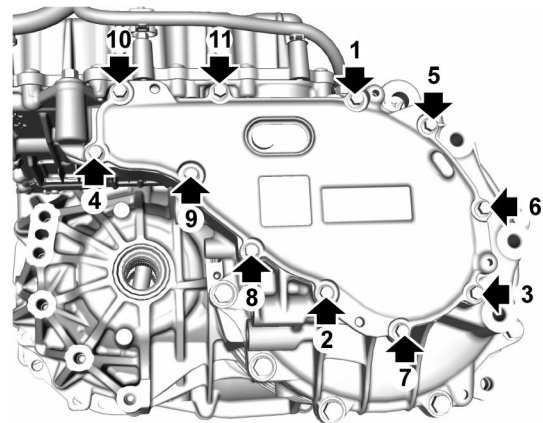


S1124098

6. Remove and discard the O-ring and gasket.

Refit - B Rear

1. Fit a new O-ring and gasket.
2. Fit 4 bolts fixing the intelligent motor control unit to the transmission, tighten them to **26-34Nm**, and check the torque.
3. Connect the harness to the intelligent motor control unit.
4. Fit 3 bolts fixing the three-phase cable of the intelligent motor control unit to the insulation block, tighten them to **14-16Nm** and check the torque.
5. Fit 11 bolts and new gaskets fixing the drive motor control module observation cover plate to the housing in the sequence as shown in the figure, tighten them to **7-10Nm**, and check the torque.



S1215071

6. Fit the electric drive unit and mount.

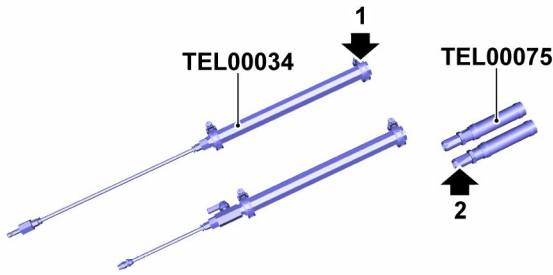
Electric Drive Unit and Mount Refit Refit Refit **- B Rear**

Coolant Pipeline Air Tightness Test - B Rear

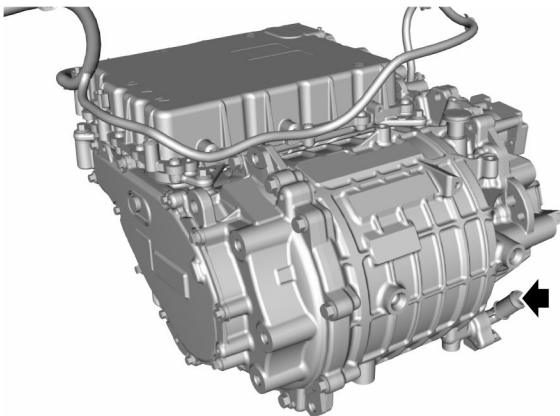
1. Remove the electric drive unit assembly.

Electric Drive Unit Assembly and Mount Remove Remove Remove **Remove Remove - B Rear**

2. Fix the special tool TEL00075 to one pipe without the valve of TEL00034, and fix the other end of TEL00075 to the coolant outlet of the drive motor, and tighten the clamp.

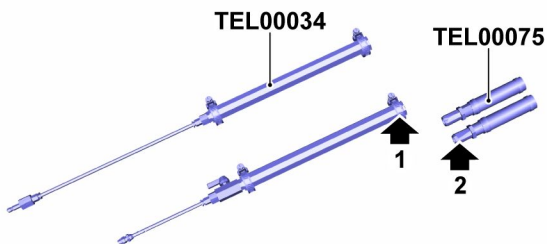


S1214969

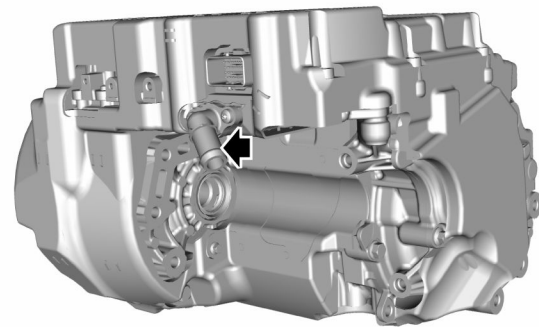


S1215076

3. Connect the other pipe with the valve of TEL00034 to TEL00075, and fix the other end of TEL00075 to the coolant inlet of the intelligent control unit, and then tighten the clamp.



S1214970



S1214932

4. Connect the pipeline without a valve with the air tightness test equipment.
5. Close the valve on the pipeline.
6. Inflate the system to a pressure of 2.5bar (absolute pressure) with the air tightness test equipment, maintain for 10s and test for 10s; If the system's pressure drop is $\leq 150\text{pa}$, the tightness test will be considered as pass. Otherwise please find the leaking point and repair it. Then repeat the tightness test until it passes.
7. Fit the electric drive unit assembly.

Electric Drive Unit Assembly and Mount Refit Refit Refit - B Rear

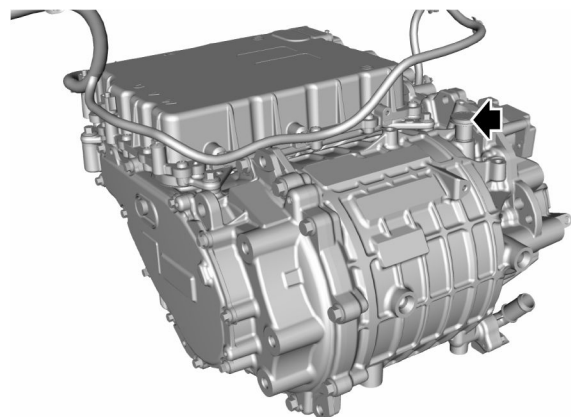
Dry Cavity Air Tightness Test - B Rear

1. Remove the electric drive unit assembly.

Do not remove the axle shaft connecting shaft from the motor.

Electric Drive Unit Assembly and Mount Remove Remove Remove - B Rear

2. Remove the vent plug.



S1215077

3. Remove the observation window cover plate of the motor, discard the gasket, and then remove the vent plug on the observation window of the cover plate from the inside.

The vent plug cannot be forcibly removed from the front.

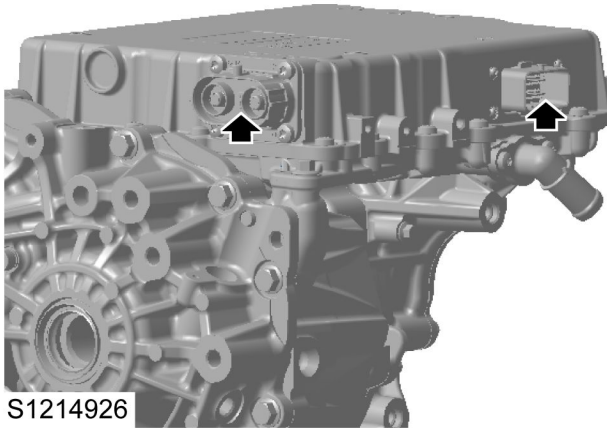
Electric Drive Unit - B Shaft - Rear

Drive Motor Control Module Observation Cover Plate Remove - B Rear

4. Fit the observation window cover plate back onto the motor.

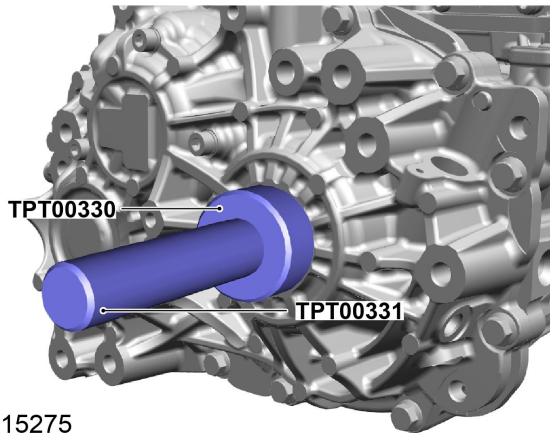
Drive Motor Control Module Observation Cover Plate Refit - B Rear

5. Use TEL00095 and TEL00096 to seal the harness connector port on the.



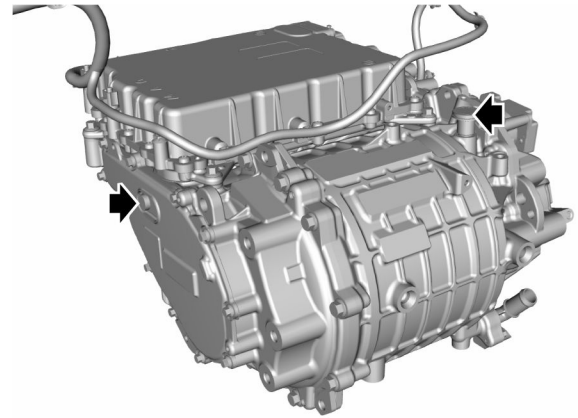
S1214926

6. Use the special tools TPT00330 and TPT00331 to block the differential oil seal in place.



S1215275

7. With two rubber plugs from the special tool TPT00301, block the vent plug and observation window vent plug respectively, with the other end connected to the air tightness equipment, then perform the dry cavity air tightness test; at the temperature of 25°C, inflate to the pressure of 1.25bar (absolute pressure), maintain for 10s, and test if the pressure drop is $\leq 80\text{pa}$ within 30s. If the air tightness fails, check the leakage point and repair it, then repeat the air tightness test until it passes.



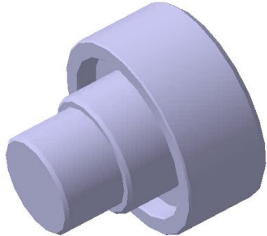
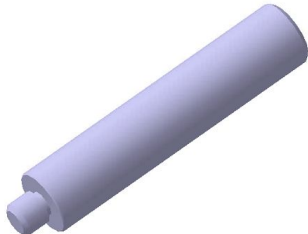

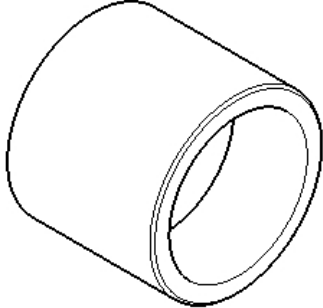
S1215078

8. Fit the vent plug to the motor housing. After refit, visually check to confirm the vent plug is fitted in place.
9. Fit the electric drive unit assembly.

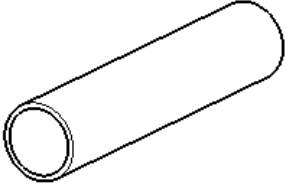
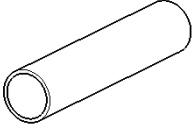
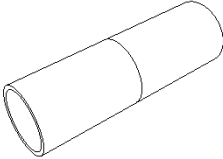
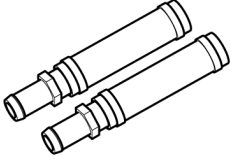
Electric Drive Unit Assembly and Mount Refit Refit - B Rear

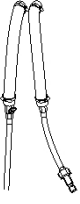
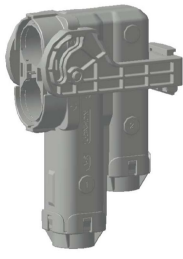
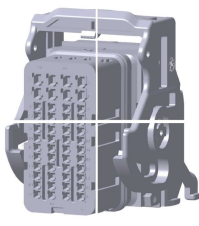
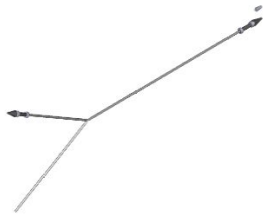
Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TPT00330	差速器油封安装工具	 <p>TPT00330</p>
TPT00331	通用手柄	 <p>TPT00331</p>
TPT00312	P Gear Unlocking Tool	 <p>TPT00312</p>
TPT00209	Rear Output Bearing Mounting Press Tool	 <p>TPT00209</p>

Electric Drive Unit - B Shaft - Rear

Tool Number	Description	Picture
TPT00156	Input Shaft Bearing Press Tool	 <p align="center">TPT00156</p>
TPT00155	Output Shaft Rear Bearing Press Tool	 <p align="center">TPT00155</p>
TPT00134	Output Shaft Rear Bearing Press Tool	 <p align="center">TPT00134</p>
TEL00075	Pipe connector	 <p align="center">TEL00075</p>

Tool Number	Description	Picture
TEL00034	Cooling system leaktest tool	 <p>TEL00034</p>
TEL00095	Main high voltage connector 4-2 pin plug	 <p>TEL00095</p>
TEL00096	Low voltage connector plug 4	 <p>TEL00096</p>
TPT00301	Kit-pressure test connector	 <p>TPT00301</p>

High-voltage Battery Pack and Its Charging System

Specification

Torque

Description	Value
Nut-ESS ground to Body	7-10Nm
Bolt-ESS to Body	90-110Nm
Bolt-CCU to Body	19-25Nm
Bolt-CCU ground	7-10Nm
Nut-Charging harness ground Nut	7-10Nm
Bolt-PTC to Body	7-10Nm
Nut-PTC ground Nut	7-10Nm

Parameters

High-voltage Battery Pack Parameters

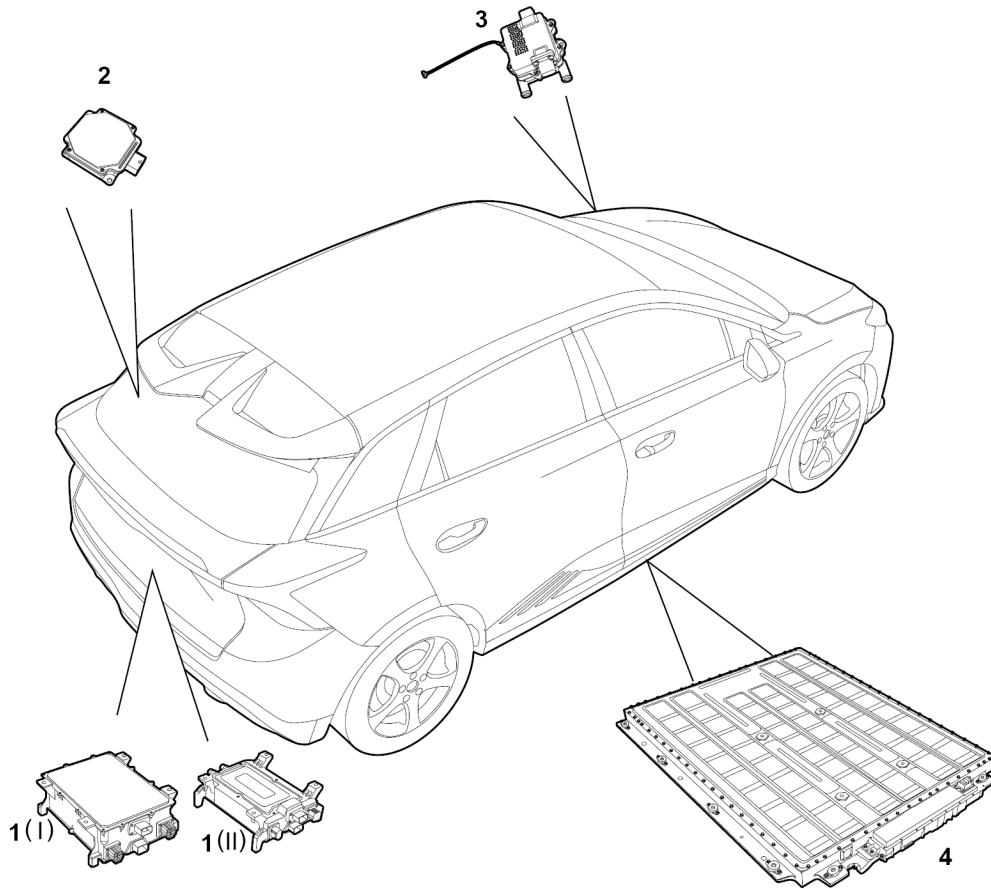
Items	Parameter Values		
Rated energy, kWh	51	64	77
Nominal capacity, Ah	156	169.5	195
Rated voltage, V	327	380	380
Voltage range, V	260-379.6	291.2-452.4	302.4-469.8
Weight, kg	398.7	408.6	447
Battery cell arrangement	1P104S	1P104S	1P108S
IP rating	IP67	IP67	IP67

Combined Charging Unit (CCU) Parameters

	Items	7kW	11kW
High Voltage End	Input voltage, V	85-265	85-265
	Maximum input current, A	32A	32A
	Maximum output current, A	24	33
	Output voltage range, Vdc	220-290	220-490
	Maximum input power, KW	NA	NA
	Maximum output power, KW	6.6	10

Low Voltage End	Output voltage range, V	9-16	9-16
	Peak output power, KW	3	3
	Rated power output, KW	3	2.5
	IP rating	IP67	IP67

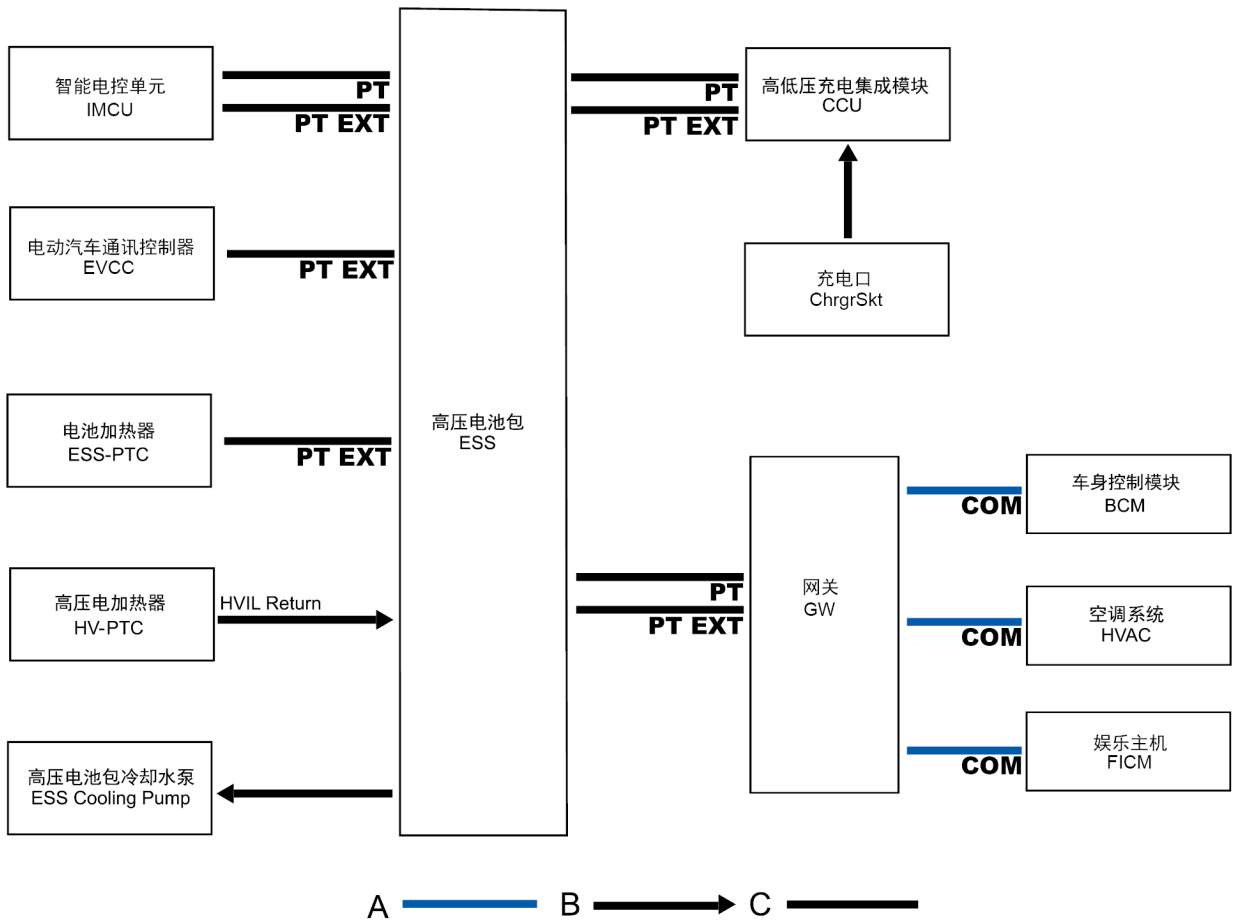
Description and Operation System Layout



S1121210

- 1. (I) Combined Charging Unit Module - 11KW (if any); (II) Combined Charging Unit - 7KW (if any)
- 2. Electric Vehicle Communication Module
- 3. Power Battery Heater
- 4. HV Battery Pack

System Control Diagram

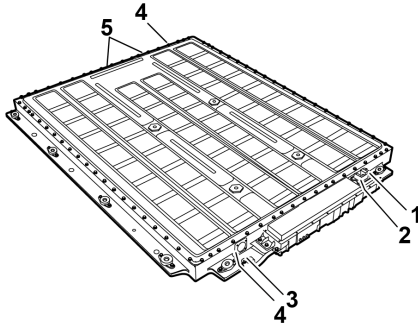


S1121218

A = Comfort CAN Bus; B = Hard Wire; C = Power/Power Extension HS CAN Bus

Description

HV Battery Pack



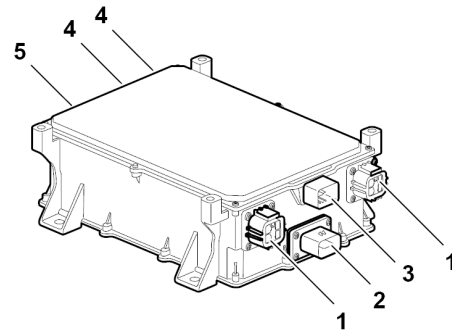
S1121200

1. Vehicle Low-voltage Connector
2. Vehicle High-voltage Connector
3. Battery Pack Ground Wire
4. Pressure Alarm Switch*/ Explosion-proof Valve
5. Cooling Water Pipe Inlet/Outlet

HV Battery Pack Composition

1. Battery module: This pack contains 104 battery cells, but without individual module.
2. Battery Management System (BMS): The BMS is integrated in the EDM module. It evaluates the status of the battery pack based on the collected information such as voltage, temperature and bus current of each module battery cell in the battery pack, estimates the remaining battery level, the remaining mileage of pure electric driving and the life status of the battery pack in real time, manages the on-board charging and the off-board charging, and provides battery pack information for the vehicle to respond to the vehicle high-voltage loop on-off command so as to provide energy for the vehicle.
3. Electrical distribution module (EDM): It controls the output of all high-voltage circuits in the battery pack through the main positive, main negative and precharging relays.
4. HV/LV harness and connector.
5. Cooling system: water-cooling.
6. Housing.

Combined Charging Unit



S1121198

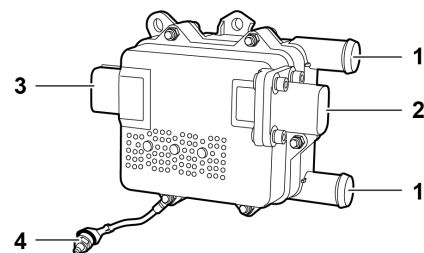
1. Vehicle High-voltage Connector
2. Positive Cable Connector
3. Vehicle Low-voltage Connector
4. Cooling Water Pipe Inlet/Outlet
5. Ground Wire

The combined charging unit (CCU) is connected with the HV battery pack. The 220V/380V AC power supply charges the high-voltage battery pack through the slow charging port and combined charging unit. At the same time, the CCU converts the HV DC power of the HV battery pack into LV DC power to power the vehicle or charge the 12V battery.

Charging Port

The charging port is fitted at the left rear of the vehicle. The charging port contains two types of interfaces: AC and DC, and is the interface for the energy supply of the HV battery pack.

Battery Heater



S1121199

1. Cooling Water Pipe Inlet/Outlet
2. Vehicle High-voltage Connector
3. Vehicle Low-voltage Connector
4. Battery Heater Ground Wire

The battery heater is used to heat the power battery at low temperatures. During low-temperature fast charging, the

heater can shorten the time for the power battery to charge quickly.

Operation

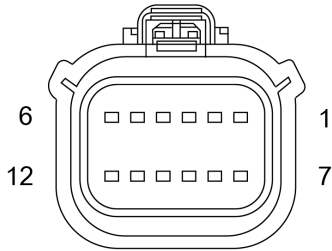
HV Battery Pack Function Operation

1. Communicate with the vehicle and the combined charging unit (CCU) respectively via the independent CAN network.
2. Provide the HV battery pack status for the ECU, control the on/off status of different high-voltage relays to realize the on/off of various high-voltage circuits and finally realize the management of charging and discharging and the indication of HV battery pack battery status.
3. On-board charging management: charge the HV battery pack through CCU with the AC charging port.
4. Thermal management function: Thermal management of HV battery pack is realized by water cooling.
5. High voltage safety management: realize insulation resistance detection, high voltage interlock detection and collision detection functions, and possess fault detection management and handling mechanism.
6. Realize connection line detection between on-board and non-CCU modules, and control the indication of vehicle charging state and charging connection indicator lamp.

CCU Function Operation

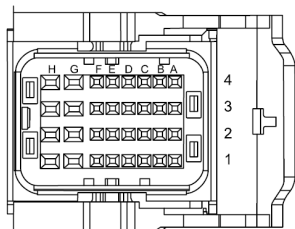
1. The basic working principle under charging condition: AC power is converted into HV DC and LV DC after being filtered, rectified, corrected, boosted or stepped down inside CCU, and then charges for power batteries and batteries respectively.
2. Under driving conditions: the HV DC power inside the power battery is converted into 12V LV power after being filtered, rectified, and stepped down, which supplies power to the vehicle and charges the 12V battery.

Detailed Information List of Component Pins End View and Pin Information of HV Battery Pack Harness Connector BY015



Pin No.	Description
1	KL30.1
2	Ground I
3	KL30.2
4	-
5	Power CANFD_H
6	Power CANFD_L
7	Power Extension CANFD_H
8	Power Extension CANFD_L
9	BMS Cal CAN_H
10	BMS Cal CAN_L
11	
12	BPSWakeUp

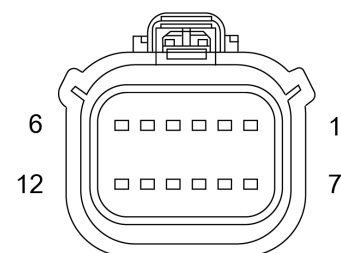
End View and Pin Definition of CCU Harness Connector BY029



Mark No.	English Name
A1	HVIL_Battery Heater_Rtn
B1	OffBdChrgrWkup

C1	Power CANFD_H
D1	OffBdChrgrPlugOn
E1	OffBdChrgrNgvtvSnsr+
F1	CCU_LINI
G1	OffBdChrgrNgvtvRelay_HSD
H1	KL30
A2	Charger Wake-up
B2	OBCSktPstvSnsr+
C2	Power CANFD_L
D2	ChrgrSktSnsr-
E2	-
F2	-
G2	-
H2	-
A3	OnBd Chrgr(CP)
B3	OnBd Chrgr(CC)
C3	HVIL_Electric A/C Compressor_Rtn
D3	-
E3	-
F3	-
G3	OffBdChrgrNgvtvRelay_LSD
H3	OBCSktLckEnb+
A4	-
B4	-
C4	HVIL_Src
D4	HVIL_HV PDU_Rtn
E4	PDU_RtnQ
F4	OBCSktLckSts+Q
G4	Ground Q
H4	OBCSktLckEnb-Q

End View and Pin Information of Battery Heater Harness Connector FC017



Power and Control System

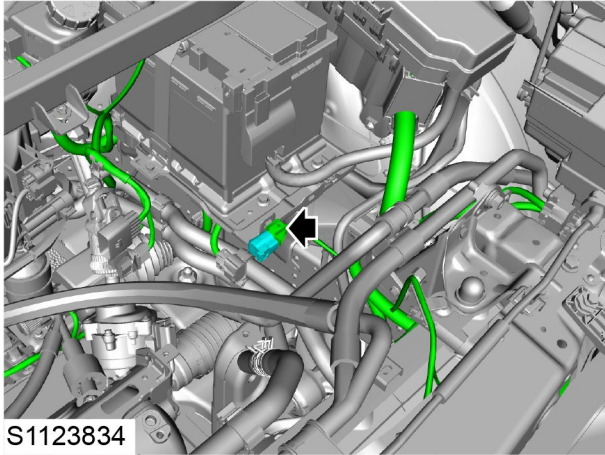
Pin No.	Description
1	-
2	-
3	-
4	Power Extension CAN_H
5	Power Extension CAN_L
6	Charger Wake-up
7	-
8	-
9	Ground
10	KL.30
11	HVIL_Src
12	HVIL_ESSPTC_Rtn

Service Guide

MSD

Remove

1. Disconnect the negative battery cable.
2. Disconnect the harness connector.
3. Loosen the clip and remove the manual service disconnect.



4. Fit the special tool TEL00052 to the base of the manual service disconnect.

Refit

1. Remove the special tool TEL00052 from the base of the manual service disconnect.
2. Connect the harness connector.
3. Fit the manual service disconnect and tighten it.
4. Connect the negative battery cable.

High-voltage Battery Pack Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

3. Remove the bottom deflector.

Bottom Deflector Remove

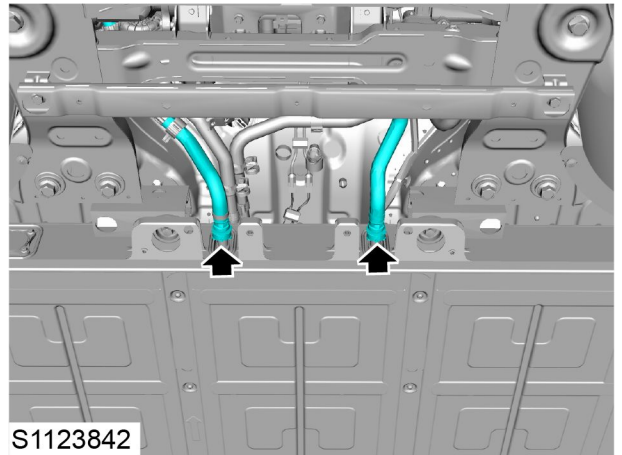
4. Drain ESS coolant.

Drain and Refill - ESS Remove

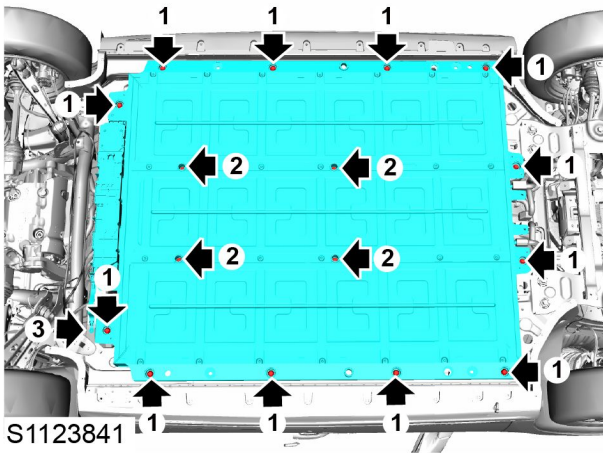
5. Raise the vehicle on the lift with the HV battery pack lift special tool TEL000.

Do not work on or under a vehicle supported only by a jack. The vehicle must be supported on a safe device.

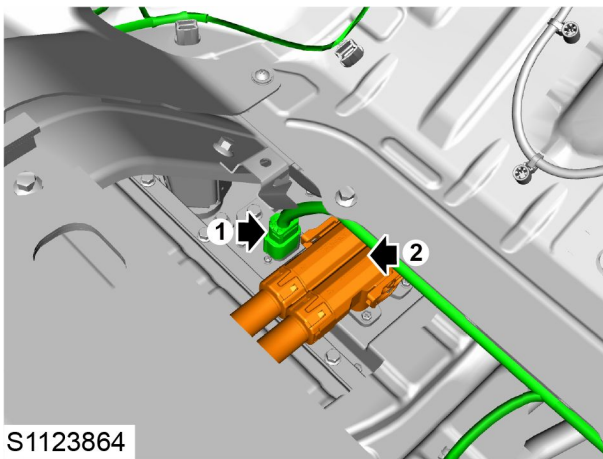
6. Release the clamp, and disconnect the cooling water pipe from the HV battery pack.



7. Use a multimeter (DCV, the range is greater than 400V) to measure if there is high voltage between terminals of HV battery pack HV connectors, between the terminals and the ground and between terminals in HV connectors at the HV harness end. If the voltage is zero, continue removing.
8. Remove 4 bolts (2) fixing the HV battery pack to the body.
9. Place special tool TEL00050 of HV battery pack carrier under the HV battery pack on the lifting station, and adjust the carrier to the proper position.
10. Remove 12 bolts (1) fixing the HV battery pack to the body.
11. Remove 1 nut (3) fixing the HV battery pack grounding wire to the body.



12. Slowly lower the HV battery pack to the proper position with the HV battery pack carrier.
13. Disconnect the LV harness connector (1) from the HV battery pack.
14. Disconnect the HV harness connector (2) from the HV battery pack.



15. Continue lowering the HV battery pack with the HV battery pack carrier slowly and remove it from the lifting station.

Warning : *DO NOT move the special tool of high-voltage battery pack carrier once lifted.*

Refit

1. Raise the vehicle on a lift.

Do not work on or under a vehicle supported only by a jack. The vehicle must be supported on a safe device.

2. Slowly raise the HV battery pack by using the HV battery pack carrier special tool LTEL0004, adjust the carrier to the proper position for fitting the HV battery pack, and connect the harness connector of HV battery pack.

Warning : *DO NOT attempt to move the HV battery pack carrier when it is in a lifting state.*

3. Slowly raise the HV battery pack by using the HV battery pack carrier special tool LTEL0004, and adjust

the carrier to the proper position for fitting the HV battery pack.

Warning : *DO NOT attempt to move the HV battery pack carrier when it is in a lifting state.*

4. Fit 1 nut fixing the HV battery pack grounding wire to the body, tighten to **7-10Nm(TBD)**, and check the torque.
5. Fit 12 bolts fixing the HV battery pack to the body, tighten them to **90-110Nm**, and check the torque.
6. Lower the high-voltage battery pack carrier and remove it from the lifting station.
7. Fit 4 bolts fixing the HV battery pack to the body, tighten to **90-110Nm**, and check the torque.
8. Connect the cooling water pipe on the HV battery pack.
9. Refill the ESS coolant.

Coolant Drain Refill

10. Fit the bottom deflector.

Bottom Deflector Refit

11. Fit the manual service disconnect.

Manual Service Disconnect Refit

12. Programme and encode the battery management system (BMS) , After success, continue to install the battery pack to the vehicle.

Battery Management System (BMS)

Combined Charging Unit (CCU)

Remove

1. Remove the manual service disconnect.

Manual Service Disconnect Remove

2. Remove the bottom deflector.

Bottom Deflector Remove

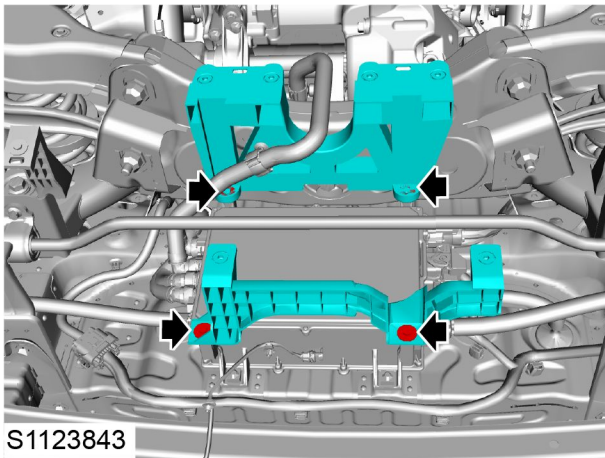
3. Remove the rear bumper.

Rear Bumper Remove

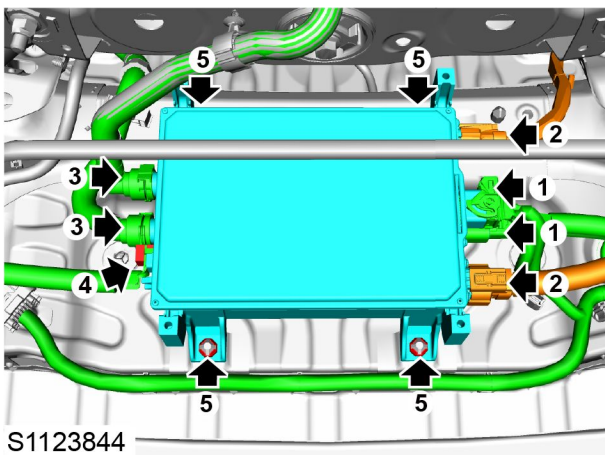
4. Drain the EDS coolant.

Coolant Drain Refill

5. Remove 4 bolts fixing the bracket to the combined charging unit, loosen the water pipe clip and remove the bracket.



6. Disconnect the low voltage harness connector (1) of the combined charging unit.
7. Disconnect the high voltage harness connector (2) of the combined charging unit.
8. Loosen the clamp, and disconnect the combined charging unit cooling water pipe (3).
9. Remove the combined charging unit ground bolt (4).
10. Remove 4 nuts (5) fixing the combined charging unit to the body, and remove the combined charging unit.



11. Remove the combined charging unit ground nut, and remove the combined charging unit ground wire.

Refit

1. Fix the combined charging unit to the body, fit 4 nuts, tighten them to **19-25Nm**, and check the torque.
2. Fit the combined charging unit ground nut and bolt, tighten them to **7-10Nm**, and check the torque.
3. Connect the cooling water pipe to the combined charging unit, and secure with clamps.
4. Connect the high and low voltage harness connectors of the combined charging unit.
5. Fix the bracket to the combined charging unit, fit and tighten 4 bolts.
6. Fix the water pipe to the bracket, and secure with clips.
7. Refill the EDS coolant.

Coolant Drain Refill

8. Fit the rear bumper assembly.

Rear Bumper Refit

9. Fit the bottom deflector.

Bottom Deflector Refit

10. Fit the manual service disconnect.

Manual Service Disconnect Refit

11. Programme and encode the combined charging unit (CCU).

Combined Charging Unit (CCU)

Charging Port Remove

1. Remove the manual service disconnect.

Manual Service Disconnect Remove

2. Remove the charging port door housing assembly.

Charging Port Door Housing Assembly Remove

3. Remove the rear left wheelhouse liner.

Rear Wheelhouse Liner Remove

4. Remove the left-side trim panel of trunk.

Trunk Side Trim Panel Remove

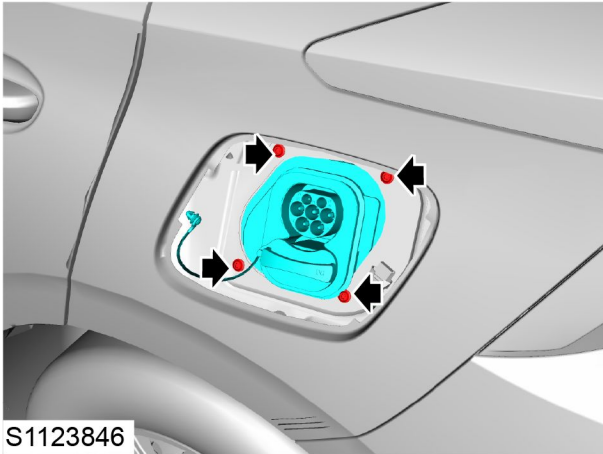
5. Remove the rear bumper.

Rear Bumper Remove

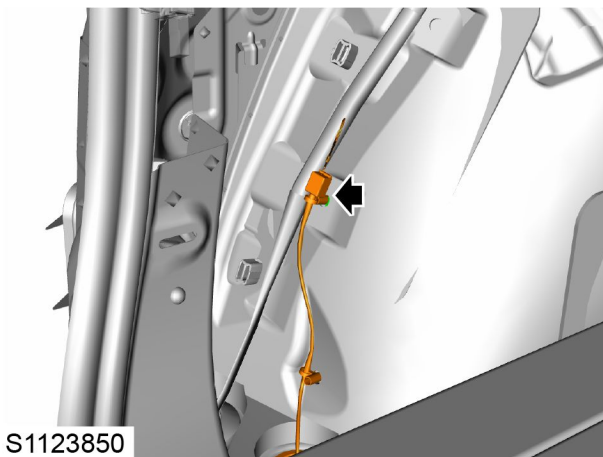
6. Remove the high-voltage battery pack assembly.

High-voltage Battery Pack Assembly Remove

7. Remove 4 bolts fixing the charging port to the body.

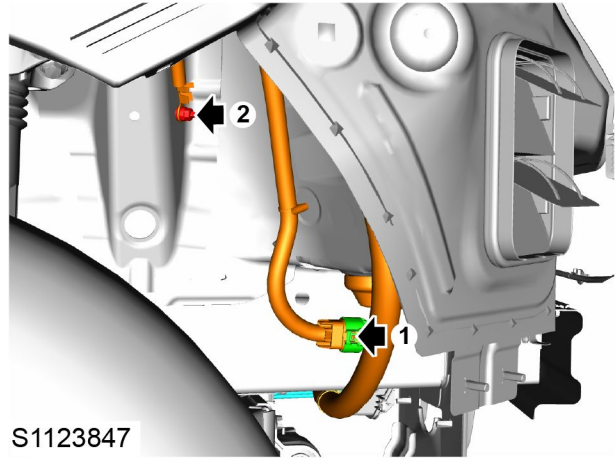


8. Loosen the cable clip and pull out the cable.

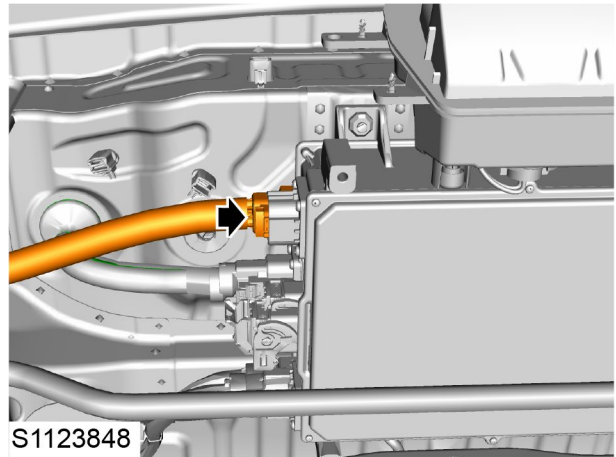


9. Disconnect the connection (1) from the body harness.

10. Remove the charging port harness ground nut (2).

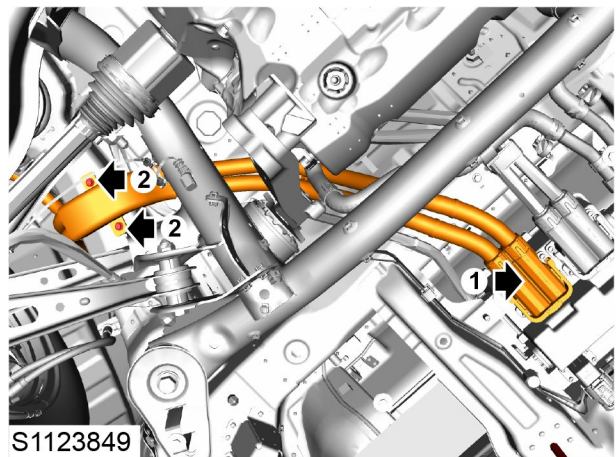


11. Disconnect the harness connector from the combined charging unit.



12. Disconnect the harness connector (1) from the high-voltage power distribution unit.

13. Remove 2 bolts (2) fixing the charging port harness to the underbody.



14. Loosen the harness clips and remove the charging port assembly.

Refit

1. Arrange the charging port and harness to the body and secure with clips.
2. Fix the charging port harness to the underbody, fit 2 bolts and tighten them.

3. Connect the harness connector to the high-voltage power distribution unit.
4. Connect the harness connector to the combined charging unit.
5. Fit the charging port harness ground nut, tighten it to **7-10Nm**, and check the torque.
6. Connect to the body harness.
7. Fix the cable to the body, and secure with clips.
8. Fix the charging port to the body, fit 4 bolts and tighten them.
9. Fit the high-voltage battery pack.

High-voltage battery pack Refit

10. Fit the rear bumper assembly.

Rear Bumper Refit

11. Fit the left-side trim panel of trunk.

Trunk Side Trim Panel Refit

12. Fit the rear left wheelhouse liner

Rear Wheelhouse Liner Refit

13. Fit the charging port door housing

Charging Port Door Housing Refit

14. Fit the manual service disconnect.

Manual Service Disconnect Refit

Electric Vehicle Communication Controller Remove

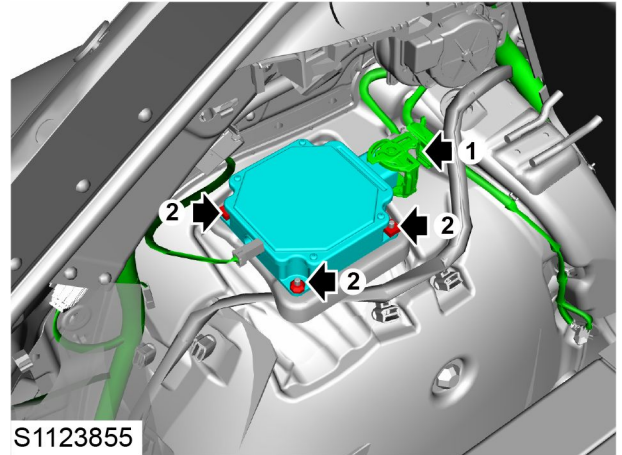
1. Remove the manual service disconnect.

Manual Service Disconnect Remove

2. Remove the left-side trim panel of trunk.

Trunk Side Trim Panel Remove

3. Disconnect the harness connector (1).
4. Remove 3 nuts (2) fixing the communication controller to the body, and remove the communication controller.



Refit

1. Fix the communication controller to the body, fit 3 nuts, tighten them to 5-7Nm, check the torque.
2. Connect the harness connector.
3. Fit the left-side trim panel of trunk.

Trunk Side Trim Panel Refit

4. Fit the manual service disconnect.

Manual Service Disconnect Refit

5. Programme and encode the electric vehicle communication controller.

Electric Vehicle Communication Controller (EVCC)

Battery Heater Remove

1. Turn off the starter switch and let the vehicle stand for more than 5 minutes before removing it from the operation.
2. Remove the manual switch.

Manual Switch Remove

3. Remove the front cabin beauty cover.

Front Cabin Beauty Cover Remove

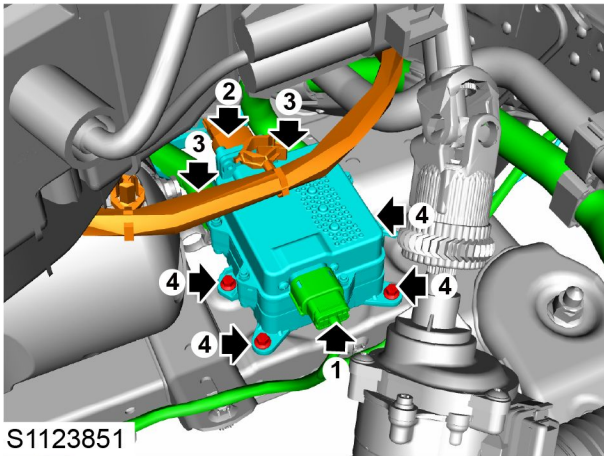
4. Drain the ESS coolant.

ESS Coolant Drain Refill

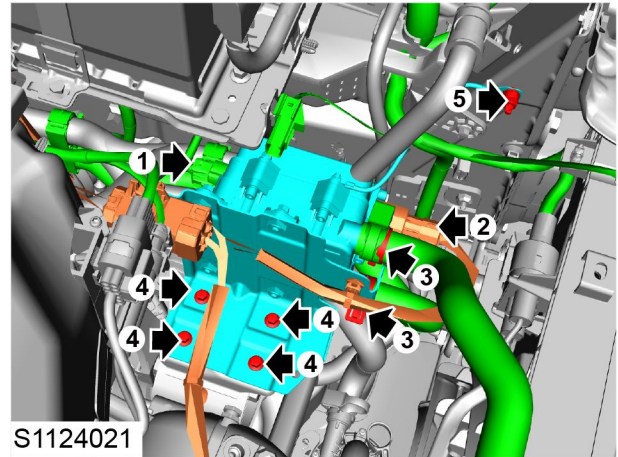
5. Remove the battery heater - 2WD.
 - a. Remove the front bottom deflector.

Bottom Deflector Remove

- b. Disconnect the low-voltage wire harness connector (1).
- c. Disconnect the high voltage harness connector (2).
- d. Loosen the clamp (3) and disconnect the battery heater inlet and outlet pipes.
- e. Remove the four bolts (4) that secure the battery heater to the body of the vehicle.



- f. Remove the battery heater ground nut and remove the battery heater.
6. Remove the battery heater - 4WD.
 - a. Disconnect the low-voltage wire harness connector (1).
 - b. Disconnect the high voltage harness connector (2).
 - c. Loosen the clamp (3) and disconnect the battery heater inlet and outlet pipes.
 - d. Remove the four bolts (4) that secure the battery heater to the body of the vehicle.
 - e. Remove the battery heater ground nut (5) and remove the battery heater.



Refit

1. Fix the battery heater to the body, fit 4 bolts, tighten them to **7-10Nm**, and check the torque.
2. Fit the battery heater ground harness to body, fit 1 nut, tighten it to **7-10Nm**, and check the torque.
3. Lift the vehicle.
4. Connect the harness connectors.
5. Connect the water inlet/outlet hoses and secure with clamps.
6. Refill the ESS coolant.

Coolant Drain Refill

7. Fit the bottom deflector.


Bottom Deflector Refit

8. Fit the manual service disconnect.

Manual Service Disconnect Refit

Summary Table of Special Tools

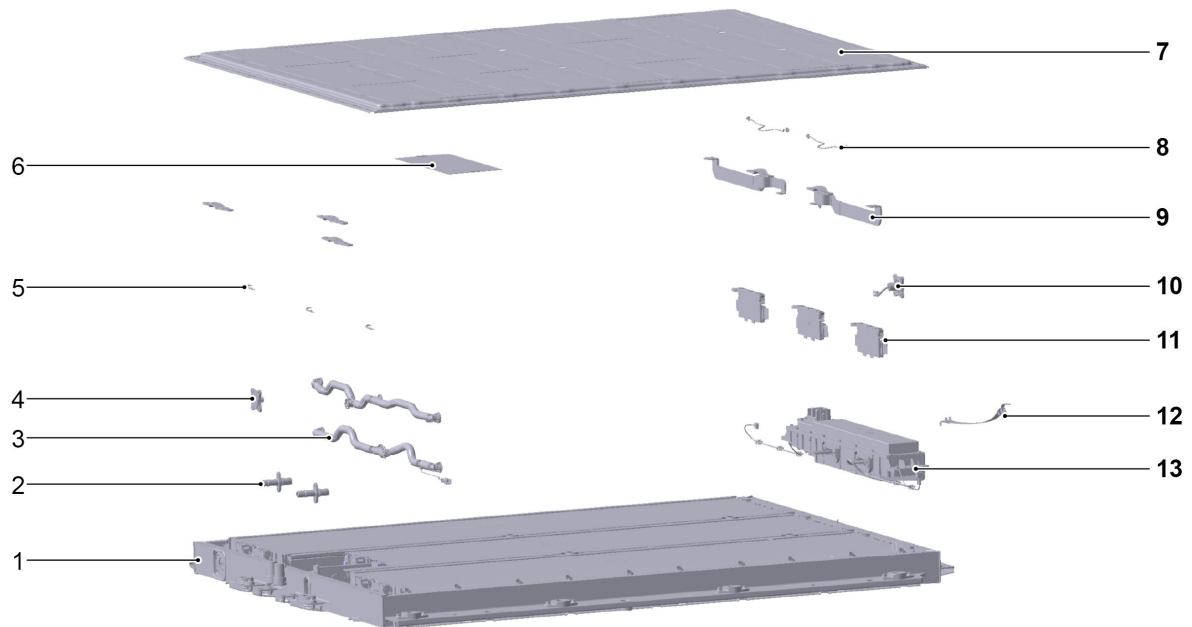
Special Tools

Tool Number	Description	Picture
LTEL0004	动力电池托架工具	 <p>LTEL0004</p>

High Voltage Battery Pack Subsystem**Specification****Torque**

Description	Value
Bolt - battery pack upper cover	7.5-9.5Nm
Nut - battery pack hanging point	55-65Nm
Bolt - high voltage copper bar	7.5-9.5Nm
Bolt - EDM module	19-25Nm
Bolt - CMU module	5-7Nm
Bolt - water cooling panel low voltage harness	5-7Nm
Bolt - water pipe connector	5-7Nm
Bolt - explosion proof valve	5-7Nm
Bolt - pressure alarm valve	5-7Nm
Bolt - high pressure protective support	7.5-9.5Nm
Bolt - battery pack ground wire	7.5-9.5Nm
Nut - battery pack ground wire	7-10Nm
Bolt - battery pack guard	9-12Nm

**Description and Operation
System Layout**

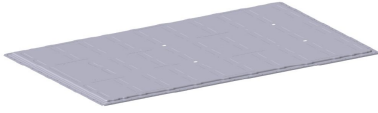


S1121246

- | | |
|------------------------------|------------------------------|
| 1. Tray and Cell Assembly | 8. Low Voltage Harness |
| 2. Water Pipe Connector | 9. High Voltage Copper Bar |
| 3. Cooling Water Pipe | 10. Pressure Alarm Valve |
| 4. Explosion Proof Valve | 11. CMU Modular |
| 5. Cooling Plate Ground Wire | 12. Battery Pack Ground Wire |
| 6. Mica Plate | 13. EDM Modular |
| 7. Upper Cover | |

Description

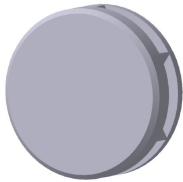
Upper Cover



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The upper cover is used to protect the cells, electronic components and other parts inside the battery pack.

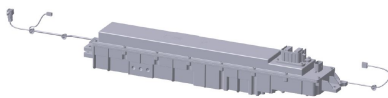
Balance Valve



S1124039

The balance valve is located on the EDM module of the battery pack to balance the pressure difference inside and outside the battery pack.

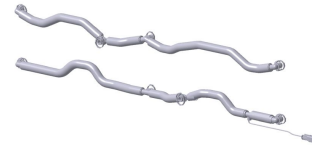
Electrical Distribution Module (EDM)



S1124040

The EDM module is located at the rear of the high voltage battery pack. There is a BMS module in the EDM module, which communicates with other controllers through CAN bus. After receiving the information (cell voltage, temperature, etc.), BMS comprehensively calculates the SOC of the high-voltage battery pack, controls the cooling system and all high-voltage and low-voltage circuits output by the high-voltage battery pack. And EDM module is the actuator of high-voltage battery pack. It includes main positive, main negative and precharge relays to control the high-voltage output of all high-voltage battery packs.

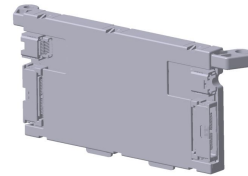
Cooling System



S1124041

The cooling system is divided into the cooling pipeline inside the battery pack, the cooling plate in the middle of the cell and the water temperature sensor. The coolant flows into the water inlet pipe from the water inlet at the front end of the battery pack, and then flows out of the battery pack through the cooling plate to the water outlet pipe of the cooling pipeline.

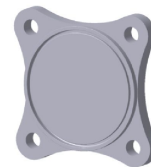
Cell Management Unit (CMU)



S1124042

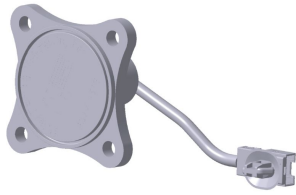
Cell management unit (CMU) collect the voltage and temperature signals of the cells in the battery module and transmit the signals to the BMS module.

Explosion Proof Valve



S1124043

The explosion-proof valve is located at the front of the battery pack. When the internal pressure of the battery pack reaches the opening pressure value of the explosion-proof valve, the explosion-proof valve opens to reduce the internal pressure of the battery pack. When the internal pressure of the battery pack is lower than the opening pressure, the explosion-proof valve is closed.

Pressure Alarm Valve

S1124044

The pressure alarm valve is located at the rear of the battery pack. The pressure alarm valve is used to monitor the pressure inside the battery pack and transmit it to the BMS module. At the same time, the pressure alarm valve has the function of explosion-proof valve. When the internal pressure of the battery pack reaches the opening pressure value of the valve, the valve opens to reduce the internal pressure of the battery pack. When the internal pressure of the battery pack is lower than the opening pressure, the valve closes.

Service Guide

Disassembly Instructions

Basic Requirements

The basic requirements for safety precautions related to vehicle high voltage are as following:

- When repairing the high-voltage parts of the vehicle, non relevant personnel are not allowed to touch the high-voltage parts at will.
- Do not touch the parts with high voltage warning signs at will.
- If relevant high-voltage components need to be disassembled, the disassembly personnel need to receive high-voltage safety training.
- When operating high-voltage components, operator need to wear labor protection articles and insulating gloves.
- Before maintenance, power off the whole vehicle first, and then wait for 5 minutes before maintenance.
- When disassembling or assembling electrical components, the 12V power supply and manual maintenance switch must be disconnected.
- When operating exposed high-voltage system components, a multimeter must be used to measure whether there is high-voltage power first, and then operate when there is no high-voltage power.
- After the disassembly and assembly of high-voltage components and before connecting the high-voltage power again, it is necessary to check the assembly and connection of all high-voltage components to ensure their reliability.
- All high voltage components shall be well grounded.

Warning : *Only persons that hold the correct high voltage training certificates and qualifications are allowed to work on high voltage systems and components.*

Warning : *Non qualified staff are NOT permitted to dismantle high voltage systems or components (including, ESS, Electric Drive Transmission, PEB, PDU, EACP, PTC units, HV harnesses, CCU, DCDC, Charging sockets etc).*

Warning : *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 essential that the correct 'make safe' procedure is followed - see Manual Service Disconnect procedure in the Service Repair manual. After disconnecting the Manual Service Disconnect (MSD), always wait 5 minutes prior to commencing any checks for residual voltage etc.*

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.*

General Description**General Information**

This maintenance manual is for professionals and qualified technicians. Without training or proper tools, injury may be caused during maintenance. It may cause damage to the battery pack or improper operation of the battery pack at the same time.

The high-voltage battery pack provides power for the automobile electric power transmission system and auxiliary system. The high voltage battery pack management system is used to detect and adjust the cell voltage, current and temperature to ensure the safe operation of the battery and the maximum battery life.

Security Information

Before servicing the battery pack, you must read the safety information section. In order to reduce the risk of injury, pay attention to the danger reminder, warning reminder and caution reminder in the manual before maintenance. Safety information also includes requirements for personal protective equipment and work area.

This manual contains various "danger", "warning" and "caution" reminders. You must pay attention to the personal injury caused by reducing the risk of death or repairing the battery pack.

This manual is used for by professionally trained personnel. Without proper training and appropriate equipment and tools, it may cause personal injury to others.

"Danger", "warning" and "caution" reminders are not exhaustive, and potential risks caused by errors that cannot be implemented in accordance with this manual may not be warned.

Battery pack high voltage hazard : The maximum voltage of the battery pack is about 470v. In order to avoid serious personal injury, a buffer must be set before maintenance.

Personal protective equipment hazards : The high voltage battery pack includes a variety of high voltage components. Personal protective equipment must be worn when carrying out any maintenance, otherwise serious personal injury or even death may be caused.

Battery pack reconnection hazard : Reconnecting the battery pack may cause the battery pack voltage to be at full potential. There must be a warning when reconnecting, otherwise serious personal injury or even death may be caused.

Battery pack voltage hazard : Before carrying out any moving and installation procedures for the battery pack high voltage system, the battery high voltage must be disassembled, otherwise serious personal injury or even death may be caused.

Potential danger of battery pack voltage : Before the battery pack high voltage disassembly, the battery pack may be at full voltage. There must be a warning when connecting, otherwise serious personal injury or even death may be caused.

Manual service switch hazard : Personal protective equipment must be worn before removing the manual maintenance switch, which can prevent potential hazards, otherwise serious personal injury or even death may be caused.

Maintenance area for service : Before repairing the battery pack, a maintenance area must be set up, otherwise serious personal injury or even death may be caused.

Manual service switch warning : In order to avoid the risk of unconscious installation and electric shock, the manual maintenance switch must be stored in a safe position, otherwise it may cause serious personal injury or even death.

Fastener reminder : If improper fasteners are used, the battery pack may be damaged. Replace all used high-voltage fasteners and module fasteners. Please pay attention to using the correct part number. If you do not follow the instructions, the battery pack may be damaged.

Battery pack lifting reminder : The weight of the battery pack must be evenly distributed throughout the length of the battery pack. The upper cover of the battery pack must be installed before lifting the battery pack. Failure to follow the instructions may cause damage to the battery pack.

Electrostatic discharge reminder : Electrostatic discharge can damage parts and components, so great care should be taken when handling all electronic part. Personal electrostatic discharge must be carried out before repairing all electronic devices. Failure to follow the instructions may cause damage to the battery pack

Personal Protective Equipment

Personal protective equipment is used to protect the safety and health of operators.

Personal protective equipment includes insulated gloves (grade higher than 1000 V), insulated shoes (grade higher than 1000 V), masks or safety goggles, etc.

Before starting work, check that all personal protective equipment are worn correctly. Do not use damaged personal protective equipment. The following checks are required before and after use :

- Check personal protective equipment for aging and damage.
- Insulated rubber gloves must be checked for scratches, holes and tears.
- Insulated safety shoes must be checked for holes, damage, nails, metal parts, wear or other problems.

Safe Working Area

When disassembling and repairing battery packs, it is very important to provide a safe and effective controlled work area.

- The work area must be located indoors and protected from rain, snow, sand and other substances.
- Separate work areas from metal, powder, or other contaminants, such as oil. If necessary, the working area can be covered with plastic curtain or other materials.
- The working area should be at least close to the size of one vehicle to ensure the effective development of the work.
- The floor of the work area must be kept dry and ventilated. Rain or snow is not allowed to enter the work area.
- Warning signs shall be set up in the working area, and those without permission shall not enter the working area.

High Voltage Insulation Test

Test Process

- High voltage insulation test is required before and after maintenance.
- Move the high voltage battery pack to the work area.
- Remove the upper cover.
- Remove the fire shield (if installed).
- Remove the protective cover on the positive and negative poles of EDM module.
- Place the insulation meter at 500V, connect the positive pole to the high voltage pole on the upper side of the EDM module, and connect the negative pole to the tray. The test result shall be $\geq 550M \Omega$.
- The positive pole is connected to the high-voltage pole on the other side of the EDM, and the negative pole is connected to the tray. The test result shall be $\geq 550M \Omega$.

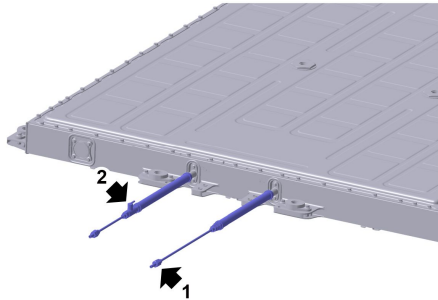
Battery Pack Air Tightness Test

Dry Chamber Tightness Test

1. The air tightness test of the battery pack shall be carried out after the disassembly or maintenance of the sub parts of the high-voltage battery pack is completed.
2. Move the high voltage battery pack to working area.
3. Install the special tool TEL00102 onto the high-voltage connector socket.
4. Install the special tool TEL00103 onto the low-voltage connector socket.
5. Align the sealing surface of special tool TEL00104 to the balance valve side of EDM module and lock the tool.
6. Place 4 weights evenly and symmetrically on the upper cover of the battery pack (the contact surface between the article and the battery pack shall be smooth, and each weight shall not exceed 10kg to prevent the upper cover from bulging after the sealing test).
7. Connect the air tight equipment with special tool TEL00102.
8. Start the air tightness test, slowly inject the air into the battery pack through the special tool TEL00102 until it reaches 4.6kpa. After the pressure value is stable, close the valve on the barometer and maintain the pressure for 5 minutes. The pressure drop shall be less than or equal to 0.25kpa.
9. If the air tightness test fails, it is necessary to find out the leakage point and re execute the air tightness process after maintenance until it passes.

Waterway Tightness Test


1. After the disassembly or maintenance of high-voltage battery pack waterway parts, Waterway tightness test is required after completion.
2. Move the high voltage battery pack to working area.
3. Connect the special tool TEL00034 to the inlet and water outlet pipe respectively, and tighten the clamp.



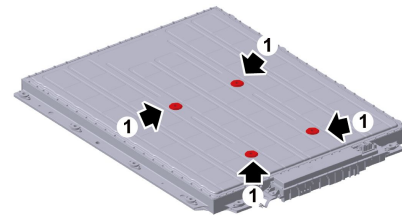
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4. Connect the tyre pump in special tool T14001 to special tool TEL00034 (1) and close the valve on the other side of TEL00034 (2).
5. Start the tightness test, slowly inject air into the cooling pipeline to 200KPa, close the valve on the tool, maintain the pressure for 4 minutes, and the pressure drop shall be less than or equal to 0.3kpa.

Upper Cover Remove

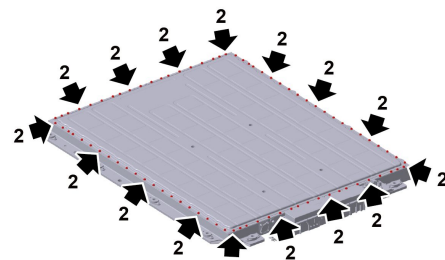
1. Remove the high voltage battery pack.
-  **High Voltage Battery Pack Remove**

2. Move the high voltage battery pack to working area.
3. Clean the dust, oil and other obvious stains on the surface of the high-voltage battery pack with a dry soft cloth.
4. Remove the four suspension point nuts that secure the upper cover of the battery pack to the tray (1) .



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5. Remove the 80 bolts that secure the upper cover of the battery pack to the tray (2) .



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6. Remove the upper cover of the battery pack and discard the 4 sealing rings at the hanging point.
7. Conduct high voltage insulation test. If the test result meets the standard, proceed to the next step; Otherwise, refer to DTC manual for troubleshooting before proceeding to the next step.

Refit

1. Clean the joint surface between the high-voltage battery pack tray and the upper cover.
 2. Check whether the sealing ring on the joint surface of the upper cover and the tray is damaged. In case of damage, 3M sz1000 sealant shall be used to repair the damaged part. The recommended ambient temperature for repair is 10 – 25 ° C.
- a. Materials and tools : 3M SZ1000 two-component foaming sealant, pneumatic glue gun (recommended model: DP400-85-01), static mixing tube (more than 18 sections recommended), PET release film.

- b. According to the size of the part to be repaired, select the step cutting of the head of the rubber mixing pipe with appropriate diameter.
- c. Install two-component rubber hose and mixing hose, and connect the rubber gun to compressed air.
- d. Before formal repair, please use the glue gun to hit the mixed two-component sealant and visually confirm whether it is mixed evenly.
- e. Use a pneumatic glue gun to spot the sealant into the area to be repaired.
- f. Cover the pet release film over the repair area and ensure that the peelable surface is facing the sealant. Due to the high viscosity of the adhesive, in order to ensure the seamless fit between the repaired sealant and the original adhesive strip, a certain pressure can be applied to the repaired sealant through the release film.
- g. Wait for the sealant to dry (at 23-25 °C, the drying time is about 10-15 minutes), and peel the PET release film from the sealant.
- h. Wait until the sealant at the repaired part is completely cured and the repair is completed.

Note : *Due to the foaming and expansion of the sealant, the height of the sealant strip at the repaired part may be greater than that of the surrounding unpainted strips, which will not affect the overall sealing performance. If it is necessary to obtain a repair surface with a gentle transition from the non repaired part, it is recommended to fill and repair a small amount of layers.*

3. Install 4 new sealing rings at the hanging point.
4. Install the upper cover of the high-voltage battery pack and 80 bolts , and tighten to **7.5-9.5Nm** , check the torque.
5. Install 4 suspension point nuts , and tighten to **55-65Nm** , check the torque.
6. Test the tightness of battery dry chamber.
7. Install the high voltage battery pack to vehicle.

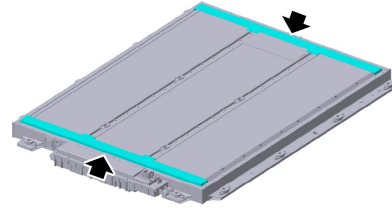
High Voltage Battery Pack Refit

Flash Hider Remove

1. Remove the high voltage battery pack.
2. Move the high voltage battery pack to the work area.
3. Remove the upper cover of the battery pack.

upper cover Remove

4. Remove fire shields on both sides.



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Refit

1. Install the fire shield into the battery pack and make sure it is installed in place.
2. Install the battery pack cover.

Upper Cover Refit

3. Install the high voltage battery pack to vehicle.

High Voltage Battery Pack Refit

Mica Plate Remove

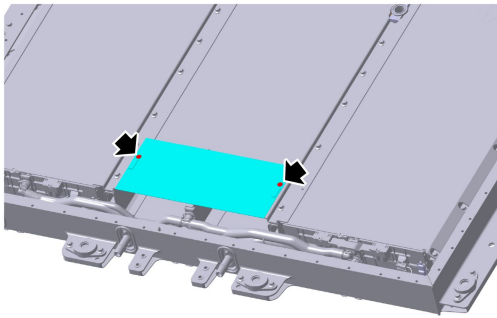
1. Remove the high voltage battery pack.

High Voltage Battery Pack Remove

2. Move the high voltage battery pack to the work area.
3. Remove the upper cover of the battery pack.

Upper Cover Remove

4. Remove the 2 clips fixing the mica plate.



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5. Remove the mica plate.

Refit

1. Install the mica plate into the battery pack.
2. Install 2 clips and ensure they are installed in place.
3. Install the battery pack cover.

Upper Cover Refit

4. Install the high voltage battery pack to vehicle.

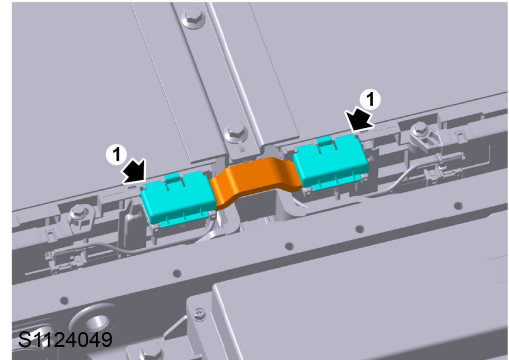
High Voltage Battery Pack Refit

High Voltage Copper Bar Remove

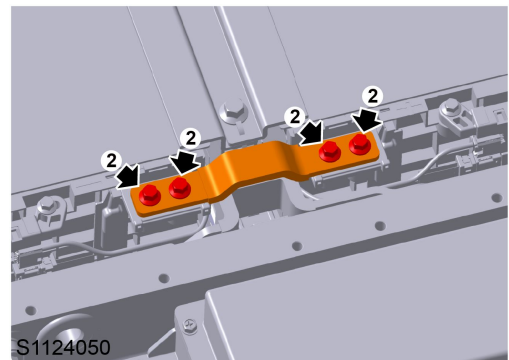
1. Remove the upper cover of the battery pack.

Upper Cover Remove

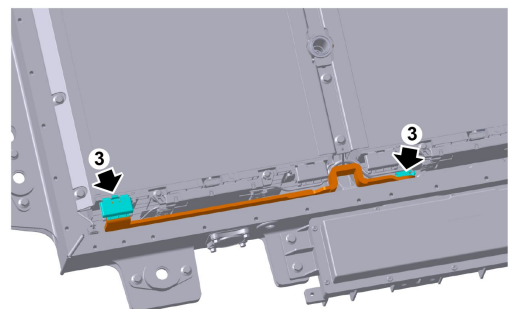
2. Remove the fire shield (if have).
3. Remove the jumper copper bar between modules.
 - a. Remove the protective cover (1).



- b. Remove the 4 bolts fixing the copper bar (2).

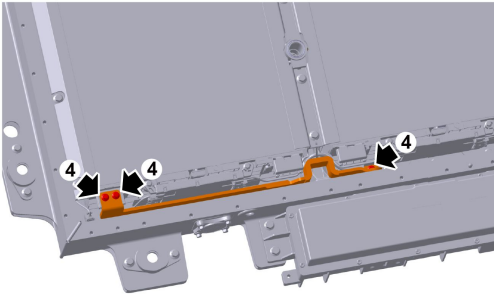


- c. Remove the jumper copper bar and replace the protective cover.
4. Module to EDM copper bar removal.
 - a. Remove the jumper copper bar between module groups.
 - b. Remove the protective cover (3).



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- c. Remove the 3 bolts fixing the copper bar (4).

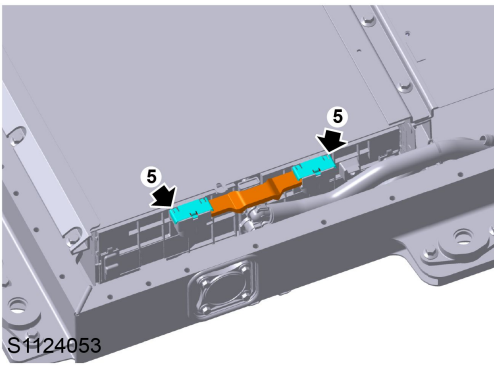


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- d. Remove the copper bar and refit the protective cover.

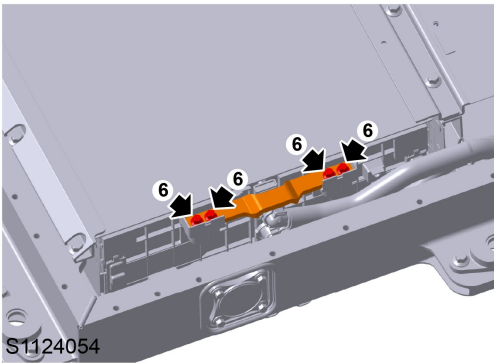
Note : *When removing the fixing bolts of EDM side copper bar, pay attention to the tools to avoid contacting the FPC soft board on the cell side to avoid damage.*

5. Disassembly of jumper copper bar in module.
 - a. Remove the jumper copper bar between modules.
 - b. Remove the protective cover (5) .



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- c. Remove the 4 bolts fixing the copper bar (6) .



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- d. Remove the copper bar and replace the protective cover.

Refit

- I. Installation of jumper copper bar in module.
 - a. Remove the protective cover.
 - b. Install the copper bar and 4 bolts , and tighten to **7.5-9.5Nm** , check the torque.
 - c. Refit the protective cover.
 - d. Install the jumper copper bar between modules.

2. Module to EDM copper bar installation.
 - a. Remove the protective cover.
 - b. Install the copper bar and 3 bolts , tighten to **7.5-9.5Nm** , check the torque.
 - c. Refit the protective cover.
 - d. Install the jumper copper bar between modules.

Note : *When removing the fixing bolts of EDM side copper bar, pay attention to the tools to avoid contacting the FPC soft board on the cell side to avoid damage.*

3. Installation of jumper copper bar between modules.
 - a. Remove the protective cover.
 - b. Install the copper bar and 4 bolts , tighten to **7.5-9.5Nm** , check the torque.
 - c. Replace the protective cover.
4. Install fire protection cover (if have).
5. Install the battery pack cover.

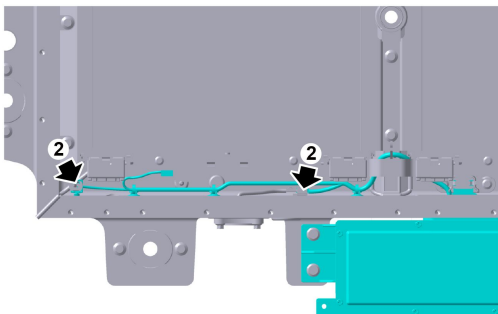
 **Upper Cover Refit**

**EDM Module
Remove**

1. Before removing the EDM, connect the diagnostic tool to back up the parameters in the BMS.
2. Remove the high-voltage copper bar on EDM side.

High-voltage Copper Bar Remove

3. Disconnect the low-voltage harness connector and the harness clip (2) .

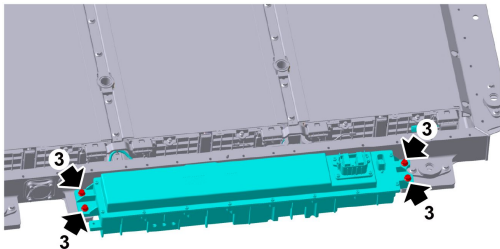


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4. Remove the CMU module.

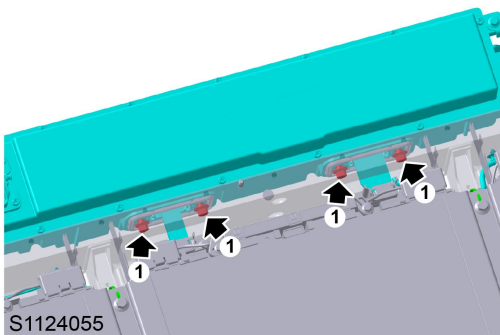
Note : When removing the CMU module, be careful not to scratch the FPC soft board. After the CMU module is removed, use adhesive tape to paste the FPC soft board on the side of the cell.

5. Remove the 4 EDM fixing bolts (3) .



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6. Remove the 4 EDM fixing bolts (1) .



S1124055

Note : When removing the bolts, pay attention to the tools to avoid contacting the FPC soft board on the cell side, so as to avoid damage.

7. Remove the EDM module and discard the two sealing

rings.

8. Remove ground wire.

Refit

1. Clean the mounting surface of EDM sealing ring and the joint surface of sealing ring on the tray.
2. Install 2 new sealing rings onto the EDM module.
3. Install the EDM module onto the battery pack and install the 4 bolts from the inside of the tray , tighten to **19-25Nm** , check the torque.

Note : When installing the bolts, it should be noted that the tools should avoid contacting the FPC soft board on the side of the cell to avoid damage.

4. Install the 4 bolts that secure the EDM module , tighten to **19-25Nm** , check the torque.
5. Install the CMU module.

Note : When installing the connector on the CMU module, be careful not to scratch or damage the FPC soft board.

6. Connect the harness connector on the EDM module and fix the harness clip.
7. Install the high-voltage copper bar on EDM side.

High-voltage Copper Bar Refit

8. After the battery is packaged and before equipped to vehicle, use the special tool TEL00105 to connect the diagnostic tool for fault diagnosis and BMS programming coding of the battery pack.
9. Pack the high-voltage battery into the whole vehicle.

High-voltage Battery Pack Refit

CMU Module Remove

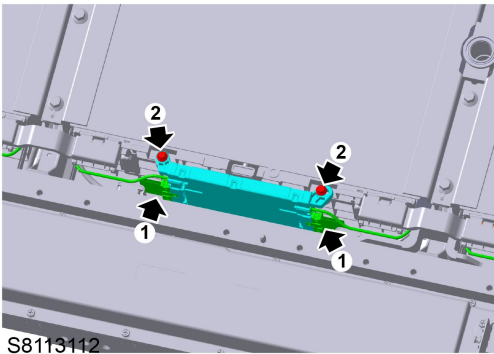
1. Remove the upper cover of the battery pack.

Upper Cover Remove

2. Remove the fire shield (if have).
3. Remove the high-voltage copper bar next to the CMU (if have).

High-voltage Copper Bar Remove

4. Remove the harness connector connecting CMU module (1) .



5. Remove the 2 bolts fixing the CMU module (2) .
6. Remove the CMU module.

Note : After the CMU module is removed, it shall be placed in an anti-static bag to prevent electrostatic breakdown.

Refit

1. Install the CMU module into the battery pack.
2. Install the 2 bolts , tighten to **5-7Nm** , check the torque.
3. Install the harness connector 1 and connector 2 connecting the CMU module.
4. Install the high-voltage copper bar next to the CMU module (if have).

High-voltage Copper Bar Refit

5. Install fire protection cover (if have).
6. Install the upper cover of the high-voltage battery pack.

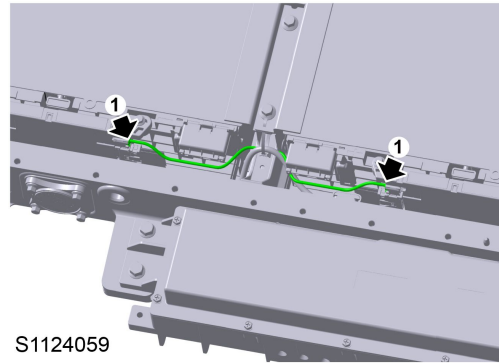
Upper Cover Refit

Low Voltage Harness Remove

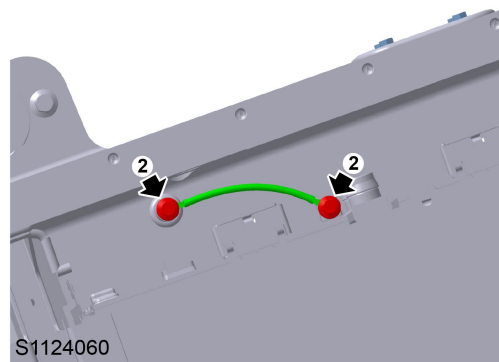
1. Remove the upper cover of the battery pack.

Upper Cover Remove

2. Remove the fire shield (if have).
3. CMU communication harness removal.
 - a. Disconnect the connectors at both ends of the harness (1) .



- b. Disconnect the fixing clip of the harness.
 - c. Remove the CMU communication harness.
4. c. Removal of water cooling plate grounding harness.
 - a. Remove the cooling water pipe.
 - b. Remove 2 bolts fixing the grounding harness of the water-cooled panel (2) .



- c. Remove the water cooling plate grounding harness.

Refit

1. CMU communication harness installation.
 - a. Install the harness on the two CMU modules and connect the connectors on the corresponding side.
 - b. Fix the harness clip.
2. Installation of water cooling plate grounding harness.
 - a. Install the water-cooled plate ground wire into the tray.
 - b. Install the 2 bolts , tighten to **5-7Nm** , check the torque.
 - c. Install the cooling water pipe.
3. Install fire protection cover (if have).

4. Install the battery pack cover.

 **Upper Cover Refit**

Cooling Water Pipe Remove

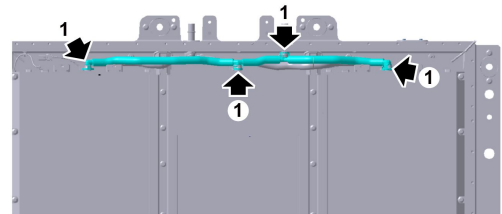
1. Drain the coolant inside the battery pack.
2. Remove the upper cover of the battery pack.

 **Upper Cover Remove**

3. Remove the fire shield (if have).
4. Remove the high-pressure copper bar (if any) above the cooling water pipe interface.

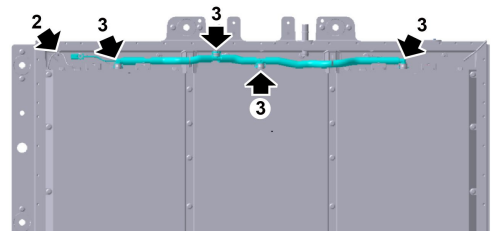
 **High-pressure Copper Bar Remove**

5. Disconnect the tie on the water pipe.
6. Disassembly of water outlet pipe
 - a. Disconnect the connection between the outlet water pipe and the water pipe connector on the module and tray.



S1124061

- b. Remove the water outlet pipe.
7. Disassembly of water inlet pipe
 - a. Remove the water outlet pipe.
 - b. Disconnect the water temperature sensor connector from the low-voltage harness (2) .



S1124062

- c. Disconnect the connection between the water inlet pipe and the water pipe connector on the module and tray (3) .
 - d. Remove the water inlet pipe.
8. After the water pipe is removed, the interface of the water pipe shall be properly protected to prevent the residual coolant in the pipe from flowing out.

Refit

1. Installation of water inlet pipe.

- a. Install the water inlet pipe into the battery pack, connect the water pipe with the water pipe connector on the tray and module, and ensure that it is fastened.
 - b. Connect the water temperature sensor connector and the low-voltage harness.
 - c. Install the water outlet pipe.
2. Outlet pipe installation
 - a. Install the water outlet pipe into the battery pack, connect the water pipe with the water pipe connector on the tray and module, and ensure that it is fastened.
 3. Fix the water inlet and outlet pipes with ties.
 4. Test the water seal integrity of battery pack.
 5. Install the high-pressure copper bar above the cooling water pipe interface.

High-pressure Copper Bar Refit

6. Install fire protection cover (if have).
7. Install the battery pack cover.

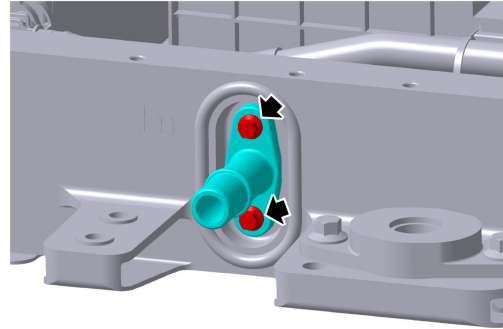
Upper Cover Refit

Water Pipe Connector Remove

1. Drain the coolant inside the battery pack.
2. Remove the upper cover of the battery pack.

Upper Cover Remove

3. Remove the fire shield (if have).
4. Disconnect the water pipe connector from the water pipe.
5. Remove 2 bolts fixing the water pipe joint.



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6. Remove the water connection.
7. After the water pipe joint is removed, the interface of the water pipe shall be properly protected to prevent the residual coolant in the pipeline from flowing out.

Refit

1. Clean the joint surface of the water pipe joint , and check the seal of the water pipe connector. If it is damaged, replace the water pipe joint.
2. Install the water pipe connector on the tray and install the 2 bolts , tighten to **5-7Nm** , check the torque.
3. Connect the water pipe connector to the water pipe and make sure it is tight.
4. Test the water seal integrity of battery pack.
5. Install fire protection cover (if have).
6. Install the battery pack cover.

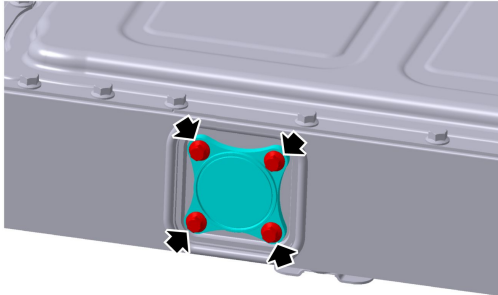
Upper Cover Refit

**Explosion Proof Valve
Remove**

1. Remove the high voltage battery pack.

 **High Voltage Battery Pack Remove**

2. Move the high voltage battery pack to the work area.
3. Clean the explosion-proof valve and surrounding area.
4. Remove the 4 bolts fixing the explosion-proof valve.



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5. Remove the explosion-proof valve.

Refit

1. Clean the joint surface between the tray and the sealing on the explosion-proof valve.
2. Install the explosion-proof valve on the tray and install 4 bolts , tighten to **5-7Nm** , check the torque.
3. Execute seal integrity test of dry chamber.
4. Install the high voltage battery pack.

 **High Voltage Battery Pack Refit**

**Pressure Alarm Valve
Remove**

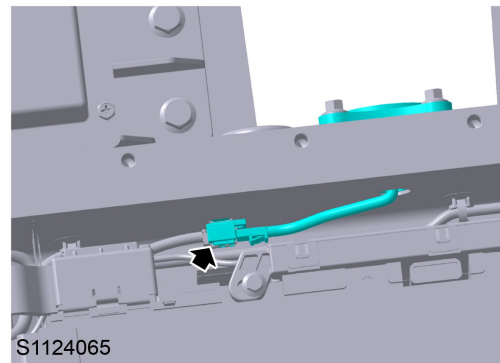
1. Clean the pressure alarm valve and surrounding area.
2. Remove the upper cover of the battery pack.

 **Upper Cover Remove**

3. Remove fire shield (if have).
4. Remove the high-pressure copper bar above the pressure alarm valve harness connector.

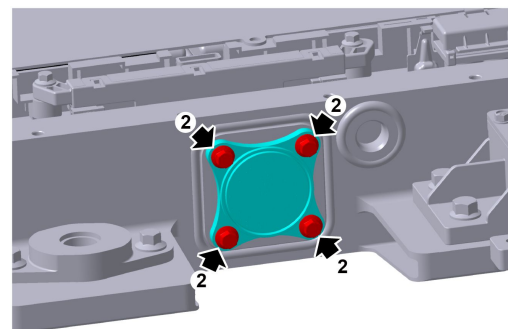
 **High-pressure Copper Bar Remove**

5. Disconnect the harness connector and clip connecting the pressure alarm switch.



S1124065

6. Remove the 4 bolts fixing the pressure alarm valve (2) .



S1124066

7. Remove the pressure alarm valve.

Remove

1. Clean the joint surface between the tray and the seal on the pressure alarm valve. If it is damaged, replace the pressure alarm valve.
2. Install the pressure alarm valve on the tray and install 4 bolts , tighten to **5-7Nm** , check the torque.
3. Connect the connector between the pressure alarm valve and the low-voltage harness, and fix the harness clip.
4. Install the high-voltage copper bar.

 **High-voltage Copper Bar Refit**

5. Install the fire cover (if have).
6. Install the battery pack cover.

 **Upper Cover Refit**

Balance Valve Remove

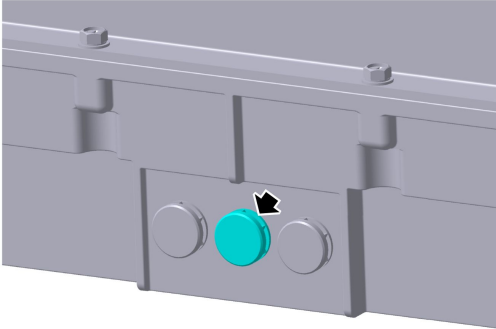
1. Execute high-voltage power down operation.
2. Remove the manual service switch.

Manual service switch Remove

3. Remove the middle bottom deflector of the vehicle.

Bottom Deflector Remove

4. Clean the balance valve and its surrounding area.
5. Use tools to remove the balance valve and discard it.



S1124067

Refit

1. Clean the joint surface of the sealing on the EDM module.
2. Install the new balance valve and make sure it is installed in place.
3. Install the middle bottom deflector of the vehicle.

Bottom Deflector Refit

4. Install the manual maintenance switch.

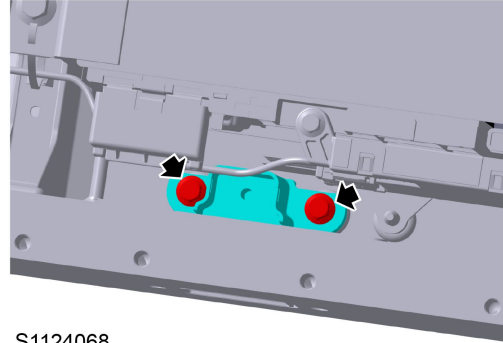
Manual Service Switch Refit

High Voltage Protective Support Remove

1. Remove the EDM module.

EDM Module Remove

2. Remove the 2 bolts that fix the high-pressure protective support to the tray.



S1124068

3. Remove the high-pressure protective support.

Refit

1. Install the high-pressure protective bracket on the tray.
2. Install the 2 bolts, tighten to **7.5-9.5Nm**, check the torque.
3. Install the EDM module.

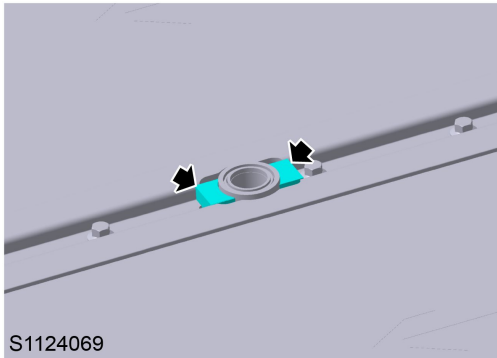
EDM Module Refit

**Cushion Block
Remove**

1. Remove the upper cover of the battery pack.

 **Upper Cover Remove**

2. Remove the cushion block at the hanging point.



Remove

1. Install the cushion block to the hanging point in the battery pack and ensure that it is installed in place.
2. Install the battery pack cover.

 **Upper Cover Refit**

**Ground Wire
Remove**

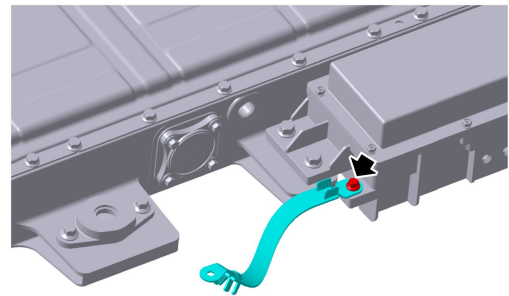
1. Execute high-voltage power down operation.
2. Remove the manual service switch.

 **Manual service switch Remove**

3. Remove the middle bottom deflector of the incoming vehicle.

 **Bottom Deflector Remove**

4. Remove one nut fixing the battery pack ground wire to the body.
5. Remove one bolt that secures the battery pack ground wire to the EDM module.



6. Remove ground wire.

Refit

1. Clean the ground wire terminal and the mounting surface on the body and EDM module.
2. Fix one end of the grounding wire to the EDM module and install one bolt , tighten to **7.5-9.5Nm** , check the torque.
3. Fix the other end of the grounding wire to the body and install a nut , tighten to **7-10Nm** , check the torque.
4. Install the middle bottom deflector.

 **Bottom Deflector Refit**

5. Install the manual maintenance switch.

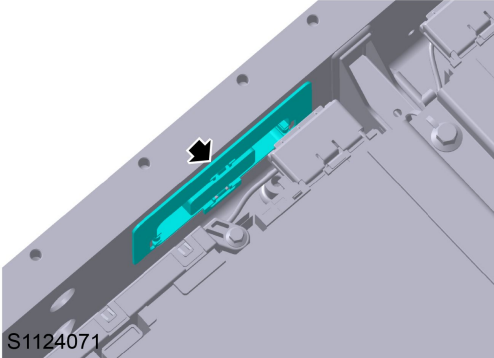
 **Manual Service Switch Refit**

High Voltage Protective Sleeve Remove

1. Remove the high-pressure protective support.

High Voltage Protective Support Remove

2. Use a tool to push the high-voltage protective sleeve out to the cell side of the battery pack.



3. Remove the high-voltage protective sleeve.

Refit

1. Clean the mounting surface of the high-pressure protective sleeve on the tray.
2. Install the high-voltage protective sleeve on the tray and make sure it is installed in place.
3. Install the high-voltage protective support.

High Voltage Protective Support Refit

Guard Plate Remove

1. Remove the manual service switch.

Manual service switch Remove

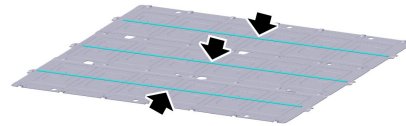
2. Using the special tool TEL00097 for the auxiliary kit for the lift , and lift the vehicle .

Warning : *Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.*

3. Remove the fixing bolts of the guard plate.
4. Remove the guard plate.

Refit

1. Clean the joint surface between the guard plate and the battery pack, and apply damping glue on the guard plate as shown in the figure.



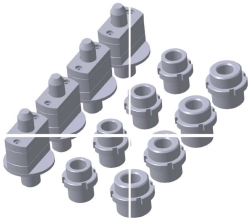
S1124073

2. Install the bolts , tighten to **9-12Nm** , check the torque.
3. Lower the vehicle.
4. Install the manual maintenance switch.

Manual Service Switch Refit

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TEL00097	Lift auxiliary kit	 <p>TEL00097</p>

A/C System

Specification

Torque

Description	Value
Bolt-Compressor to Compressor bracket	19-25Nm
Bolt-Pipe-Compressor to condenser to Compressor	7-10Nm
Bolt-Pipe-Gas-liquid separator to condenser to Compressor	7-10Nm
Nut-Compressor bracket to Front subframe	12-18Nm
Bolt-Pipe-Compressor to condenser to Compressor bracket	7-10Nm
Bolt-Pipe-Compressor to condenser to Condenser	7-10Nm
Bolt-Evaporator pipe to Air conditioner case assembly	7-10Nm
Bolt-Evaporator pipe to Body	7-10Nm
Bolt-Evaporator pipe to Expansion valve	7-10Nm
Bolt-Evaporator pipe to Condenser	7-10Nm
Bolt-Heat pump valve integration module to Body	7-10Nm
Bolt-Air conditioner pipe to Bypass valve	7-10Nm
Bolt-Pipe-Inside condenser to outside condenser to Air conditioner	7-10Nm
Bolt-Pipe-Condenser to evaporator to Bypass valve	7-10Nm
Bolt-Pipe-Condenser to evaporator to Condenser	7-10Nm
Nut-Evaporator pipe to Pipe-evaporator to gas-liquid separator	7-10Nm
Bolt-Evaporator pipe to Heating valve	7-10Nm
Nut-Pipe-evaporator to gas-liquid separator to Evaporator pipe	7-10Nm
Bolt-Pipe-evaporator to gas-liquid separator to Tank beam	7-10Nm
Bolt-Pipe-evaporator to gas-liquid separator to Gas-liquid separator	7-10Nm
Bolt-Pipe-heat pump valve integration module to condenser to Condenser	7-10Nm
Bolt-Pipe-gas-liquid separator to condenser to Gas-liquid separator	7-10Nm
Bolt-Pipe-gas-liquid separator to condenser to Body	7-10Nm
Bolt-Gas-liquid separator to Front bumper beam	7-10Nm
Bolt-Air conditioner pipe to Gas-liquid separator	7-10Nm
Bolt-Bypass valve to Bracket	7-10Nm
Bolt-Heating valve to Heat pump valve integration module	7-10Nm
Bolt-Heating valve to Bracket	7-10Nm
Bolt-Pipe-heat pump valve integration module to gas-liquid separator to Heating valve	7-10Nm
Bolt-Pipe-Inside condenser to outside condenser to Heating valve	7-10Nm
Nut-Air conditioner to Body	7-10Nm
Bolt-Air conditioner Bracket to Body	7-10Nm
Bolt-Air conditioner Bracket to Air conditioner	7-10Nm

Description	Value
Bolt-Electric heater to Air conditioner	2.5Nm
Nut-Ground lead for electric heater	7-10Nm

Parameters

Refrigerant: Type Amount	R-1234yf 580±20 g
Compressor: Displacement Speed: Minimum Speed Maximum Speed Lubricating Oil: Refill Amount (new) HV Side Operating Voltage: Minimum Voltage Maximum Voltage LV Side Operating Voltage: Relief Valve: ON Pressure OFF Pressure	33 cc/rev 800 r/min 8500 r/min POE 150±10 g 160 V 490 V 12 V 3.8 ± 0.3 Mpa 3.01 Mpa(min)
System protection: 1.1 Evaporator Temperature Compressor ON Compressor OFF 1.2 Refrigerant Pressure Compressor ON Compressor OFF	≥3 °C < 0 °C < 1.5 Mpa > 2.6 Mpa

Amount of lubricating oil for replacement of A/C components (parameters including oil recovered):

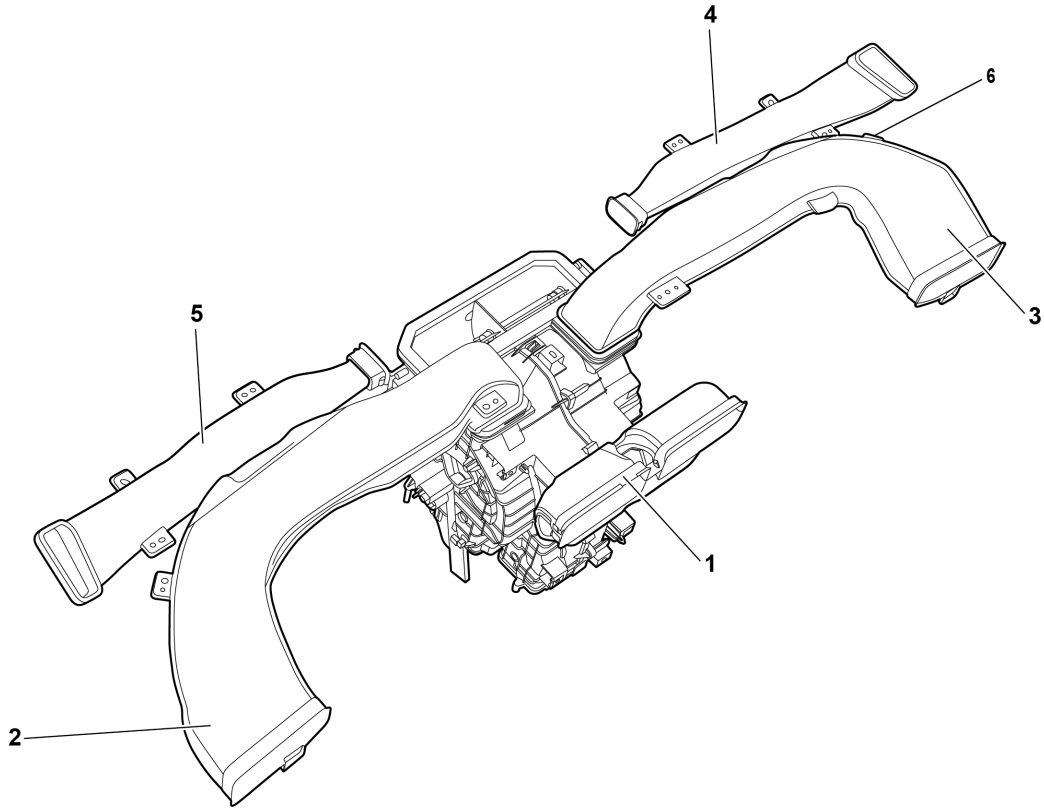
Lubricating Oil Type	HSI
Total amount of lubricating oil	150±10 g
Compressor replacement	Remaining lubricating oil in the original compressor
Gas-liquid separator replacement	Remaining lubricating oil in the original gas-liquid separator
Evaporator replacement	30 g
Condenser replacement	30 g
Refrigerant pipeline replacement	30g for replacement of 1 pipe, 45g for replacement of 2 pipes, 60g for replacement of 3 or more pipes
Battery chiller replacement	30 g

Note: 1. Large leak, cracked hose, impact or open relief valve can cause sudden loss of the refrigerant. Refrigerant leak or slow leak will not cause this degree of fluid loss. When replacing components which cause a huge loss of refrigerant, add an appropriate amount of fluid to specific components. 2. If the lost fluid of the components exceeds the specified value, add as per the fluid loss.

Description and Operation

System Layout

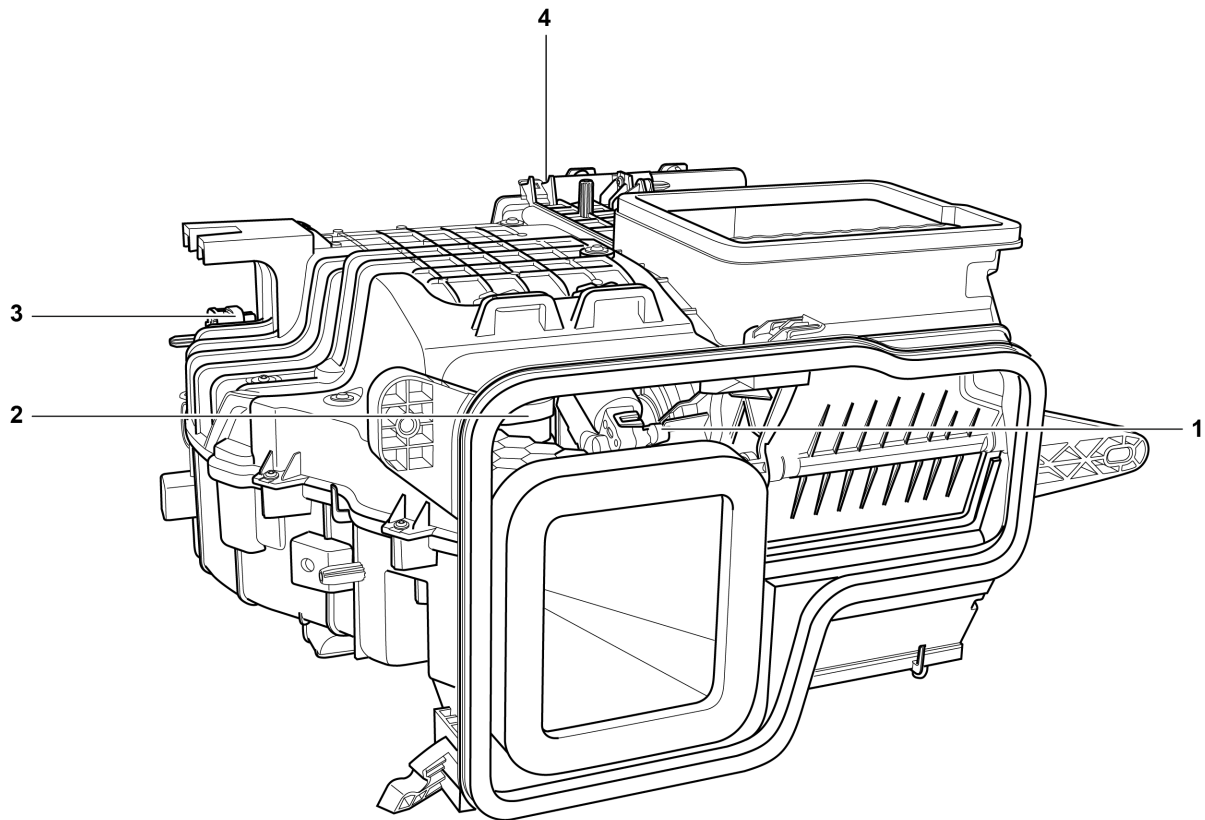
Air Duct



S3210131

- | | |
|---------------------------------------|---|
| 1. Instrument Panel Air Duct - Middle | 4. Side Defrost Air Duct - Right |
| 2. Instrument Panel Air Duct - Left | 5. Side Defrost Air Duct - Left |
| 3. Instrument Panel Air Duct - Right | 6. A/C Box Face Air Outlet Temperature Sensor |

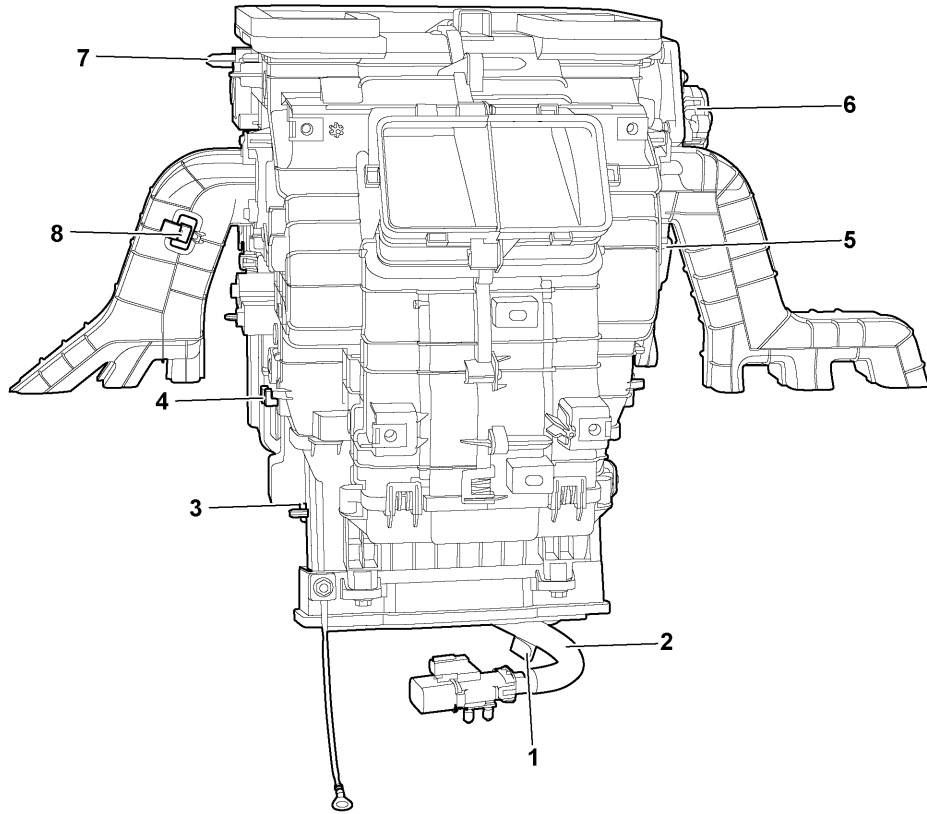
A/C Air Inlet Box



S3210113

- 1. Internal/External Circulation Damper Actuator
- 2. Blower Assembly
- 3. A/C Air Inlet Box Harness
- 4. A/C Filter Element Cover

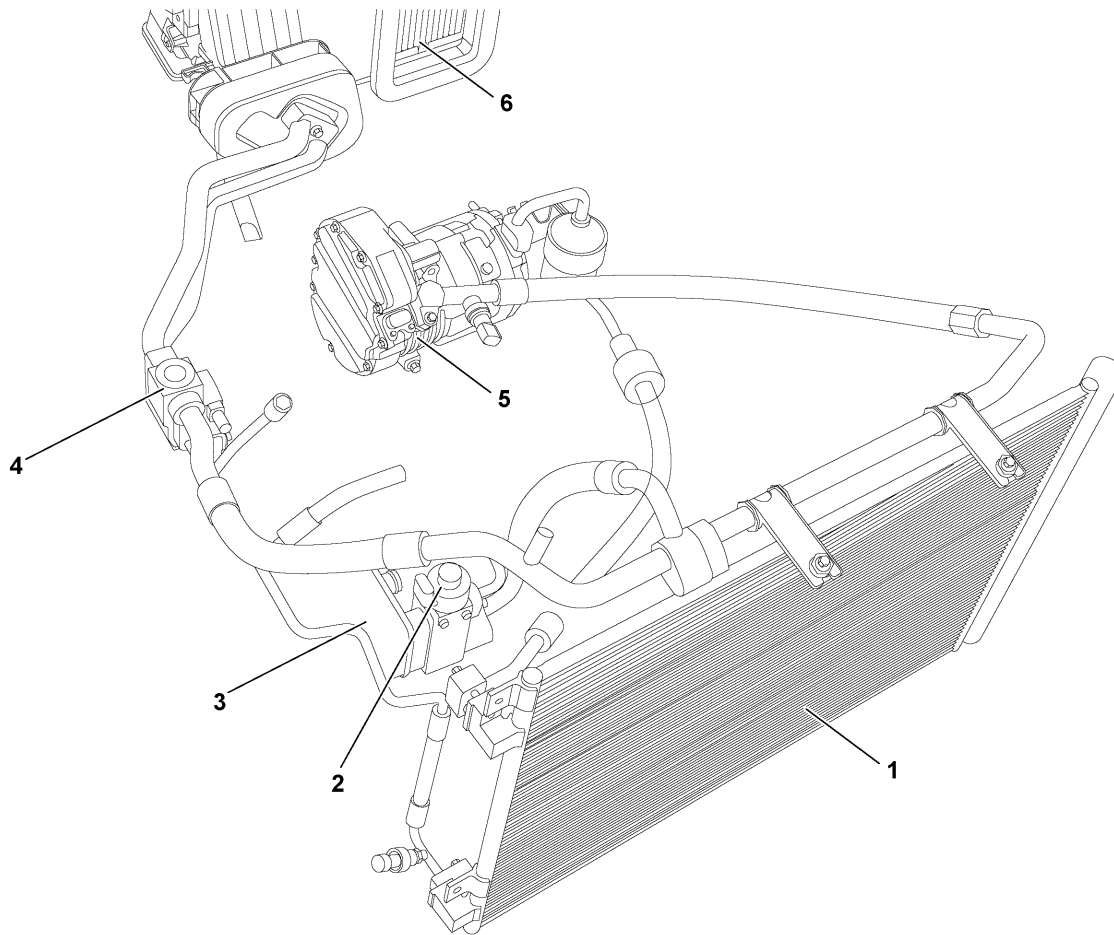
A/C Distribution Box



S3210112

- | | |
|---------------------------|---|
| 1. Drain Pipe | 5. Temperature Damper Actuator |
| 2. Electric Heater | 6. Mode Damper Actuator |
| 3. Evaporator Assembly | 7. Mode Damper Actuator |
| 4. PTC Temperature Sensor | 8. Footwell Air Outlet Temperature Sensor |

Cooling System Components



S3210114

- | | |
|--|----------------------------|
| 1. Condenser | 4. A/C Expansion Valve |
| 2. Electronic Expansion Heating Valve Assembly | 5. A/C Compressor Assembly |
| 3. Power Battery Cooler Assembly | 6. Evaporator Assembly |

Description

Overview

HVAC: HVAC is used to control the interior air temperature, humidity, cleanliness and airflow in an optimum state, provide a comfortable ride for the occupant and relieve travel fatigue; meanwhile, it creates a good working condition for the driver and plays an important role in ensuring safe driving.

According to the setting on the control panel, the blower provides power source, fresh air or interior air filtered by A/C filter flows through the A/C box before being heated or cooled, and supplies to the windscreen or passengers via the air duct.

The HVAC system consists of the ventilation, refrigeration, heating and control components. The system contains the A/C filter assembly, A/C box assembly (heater core or electric heater, evaporator, interior condenser, etc.), air duct, A/C controller, control panel, etc.

Ventilation Components

The ventilation components consist of A/C filter, A/C air duct, A/C box (divided into air inlet box and distribution box, including housing, damper, damper actuator, blower, etc.) and relief valve, etc.

A/C Filter

The A/C filter is used to filter fine particles such as dust and pollen to improve the quality of air flowing into the cabin.

The A/C filter is fitted on the A/C box assembly, it shall be checked on a regular basis, and replaced when necessary.

A/C Air Duct

The instrument panel central air duct and the defrost air duct are fitted on the instrument panel.

4 air outlet assemblies in the instrument panel allow occupants to control the flow and direction of air distribution to face. Each vent assembly incorporates movable vanes to control direction.

The front footwell air outlet is fitted in the port beside the A/C box assembly.

A/C Box Assembly

The A/C box assembly consists of the air inlet box and the distribution box.

===The air inlet box contains the blower, internal and external/fresh air circulation actuators, etc.; and the distribution box contains the A/C filter, heater core or electric heater, interior condenser, electric heater, evaporator core and control damper, etc.

The passage in the A/C box assembly introduces air into the A/C box and divides it into three parts which are supplied to the air outlets of "face", "footwell" and "defrost" respectively. An internal/external/fresh air circulation damper is mounted in the air inlet box assembly, which adjusts the interior or exterior

air as the circulating air. The drain outlet at the bottom of the box body directs condensed water from the box body to the lower side of the vehicle.

Damper Actuator

The damper is in the A/C box assembly, which controls the inlet air, outlet air temperature and position of the outlet air.

Recirculated air damper: the damper actuator drives the recirculated air damper to open and close the fresh and circulated air inlets so as to control the source of inlet air.

Temperature damper: the 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.

Mode damper: the damper actuator drives the mode damper to change the air passing through the A/C box and air ducts so as to meet different users' needs, such as, face, footwell, windscreen, etc.

Blower

The blower is the power source of the whole ventilation system. Use the blower to drive interior air circulation or introduce fresh air into the vehicle.

The blower is fitted in the air inlet box assembly. Control of the blower air volume can be realized by using the button on the control interface to control the PWM duty ratio.

Relief Valve

The relief valve facilitates the smooth flow of the air through the passenger compartment. When the blower introduces fresh air or the doors are closed, the relief valve will open to maintain the air pressure inside the vehicle, which can protect the eardrums of the occupants to a certain extent.

The relief valve is located at both sides of the trunk, which allows air in the passenger compartment to be discharged to the covered area between the body and rear bumper. The relief valve is an effective check valve and each relief valve port is composed of a grille covered by a soft rubber damper. The relief valve opening degree can be automatically adjusted according to the pressure difference between the passenger compartment and the external environment.

Heater Components

It provides heat for the A/C heating. This model is equipped with an electric heater (standard).

High-voltage Electric Heater (HV PTC)

The A/C controller controls the on/off of the electric heater and the heating level according to the settings on the A/C interface and different working conditions, and its working state will not be displayed on the A/C display.

The HV PTC is controlled by low voltage and supplied by high voltage power. The A/C controller controls the heating level

of the HV PTC according to the heating demand via the LIN bus.

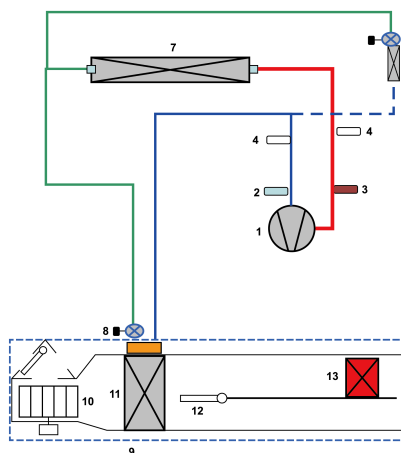
Refrigeration System

Refrigeration Principle

The refrigeration principle is compression-type evaporative heat absorption. By the action of the compressor, a low-temperature and low-pressure refrigerant is compressed into a high-temperature and high-pressure refrigerant, so that the volume of the vapor is reduced, the pressure is increased,

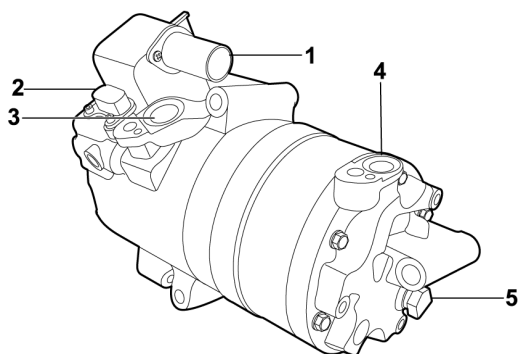
and it is cooled into a liquid refrigerant after passing through the condenser, and then it passes through the expansion valve, and rapidly evaporates and expands to absorb the temperature of the air inside the vehicle to achieve the cooling effect. The system comprises a compressor, a condenser, TXV, A/C pipeline and an evaporator. The system is a closed loop which applies the refrigerant as the heat transfer medium. Add A/C lubricant to the refrigerant to lubricate the internal components of the compressor.

A/C System Schematic



1. Compressor
2. Compressor Intake Air Temperature Pressure Sensor
3. Refrigerant Pressure Sensor
4. Filler
5. Battery Chiller
6. Electronic Expansion Valve
7. Condenser
8. Thermostatic Expansion Valve
9. A/C Box Assembly
10. Blower
11. Evaporator
12. Damper
13. HV PTC

Compressor



S3110071

1. High Pressure Compressor Harness Interface
2. Low Pressure Connector
3. Air Intake Port
4. Exhaust port
5. Relief Valve

The compressor is the power source of refrigerant circulation.

The compressor compresses the low pressure/low temperature vapour from the evaporator and converts it into the high pressure/high temperature gas refrigerant of the condenser.

With fixed displacement, the compressor, under the mounting bracket of the transmission, provides the A/C system with required amount of refrigerant by the change of high-voltage motor speed.

TXV and Evaporator

The evaporator is in the air inlet of the heater assembly and absorbs heat from the exterior or recirculated inlet air. Low pressure and low temperature refrigerant changes from liquid to vapour in the evaporator, absorbing large quantities of heat during this process.

The TXV regulates the flow of the refrigerant and matches the refrigerant flow with the heat load of the air passing through the evaporator core. The TXV is fitted on the inlet and outlet ports of the evaporator. The valve consists of an aluminum housing containing inlet and outlet passages. A metering valve is fitted in the inlet passage and the metering valve is controlled

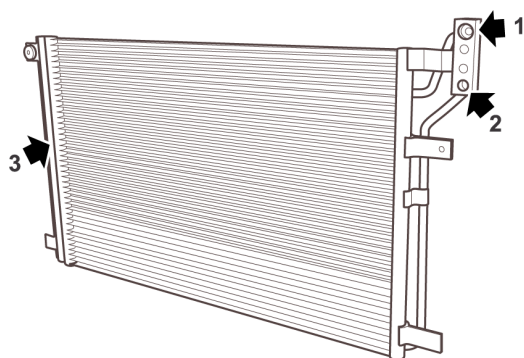
by a temperature sensitive tube connected to a diaphragm. The top of the diaphragm is filled with refrigerant and senses evaporator outlet pressure and the temperature sensitive tube senses evaporator outlet temperature. By regulating the opening of the thermostatic expansion valve, the force can be balanced, which keeps a proper degree of superheat for the evaporator outlet and balances the refrigerant flow and the thermal load of the air.

Thermostatic Expansion Valve

The liquid coolant flows from the metering valve to the evaporator. The metering valve reduces the pressure and temperature of the refrigerant, changes the solid stream of refrigerant into a fine spray and improves the evaporation effect. As the refrigerant passes through the evaporator, it absorbs heat from the ambient air flowing through the evaporator core. The increase of the temperature causes the refrigerant to vaporize and increases its pressure.

The temperature and pressure of the refrigerant from the evaporator drive the diaphragm and temperature sensitive tube to move and regulate the metering valve opening, thereby controlling the volume of the refrigerant flowing through the evaporator. The warmer the air flowing through the evaporator core, the more heat available to evaporate refrigerant, which allows more refrigerant to pass through the metering valve.

Condenser



S3410254

1. Air intake port
2. Liquid outlet port
3. Condenser

The condenser transfers the refrigerant heat into the ambient air and changes the refrigerant vapour from the compressor into liquid. The condenser also removes moisture and solid impurities from the refrigerant with its drying module and functions as a reservoir for liquid refrigerant so as to accommodate changes of heat load in the evaporator.

With the impact effect and/or cooling fan, the air passing through the heat exchanger absorbs heat from the refrigerant and changes the refrigerant from a vapour to liquid. The

condenser cools and liquifies the refrigerant before it enters the modulator. In the modulator, most of the remaining gas in the refrigerant is separated. The refrigerant uses the desiccant and filter to remove moisture and particles before entering into the secondary cooler. The refrigerant is further cooled as it flows through the secondary cooler, which results in the refrigerant from the condenser outlet to the evaporator is almost 100% converted into liquid.

A/C Pipeline

Aluminum A/C pipelines connect the system components together with O-rings between the connections to ensure a secure seal. To maintain a similar flow velocity in the system, the diameter of the refrigerant lines may vary so as to suit the two pressure/temperature modes. The pipelines with larger diameters are fitted in the low pressure/temperature mode and those with smaller diameters are fitted in the high pressure/temperature mode. The refrigerant refill port is integrated into the A/C pipelines so as to facilitate the system service.

Electronic Expansion Valve

The electronic expansion valve is a throttling control element for which the programme can be preset by using the electronic adjusting mode. It uses the electrical signal generated by the adjusted parameters to control the voltage or current applied to the expansion valve, thereby achieving the adjustment of the liquid supply. EXV is also a key element of multi-couple unit. Compared with the traditional thermal expansion valve, the electronic expansion valve has a larger adjusting range, quick and sensitive action and precise adjustment. So it is more stable and reliable.

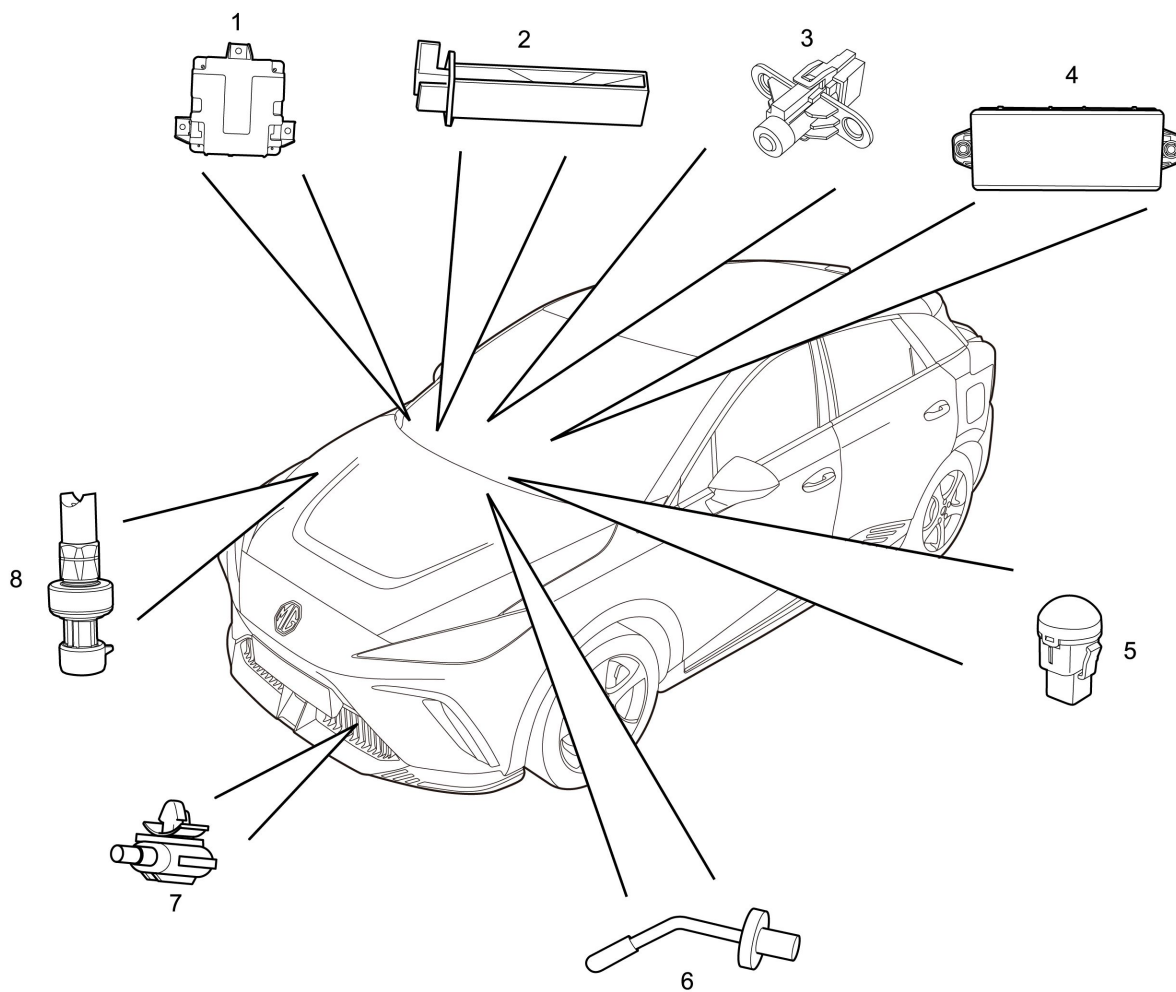
Solenoid Valve

The solenoid valves are fitted on the A/C pipeline, by controlling the opening and closing of the relevant actuators, they achieve the purpose of controlling the flow direction of the refrigerant.

The relevant solenoid valves include heating solenoid valve, refrigeration solenoid valve, bypass solenoid valve, dehumidification solenoid valve, and the like.

Description and Operation - ATC

System Layout

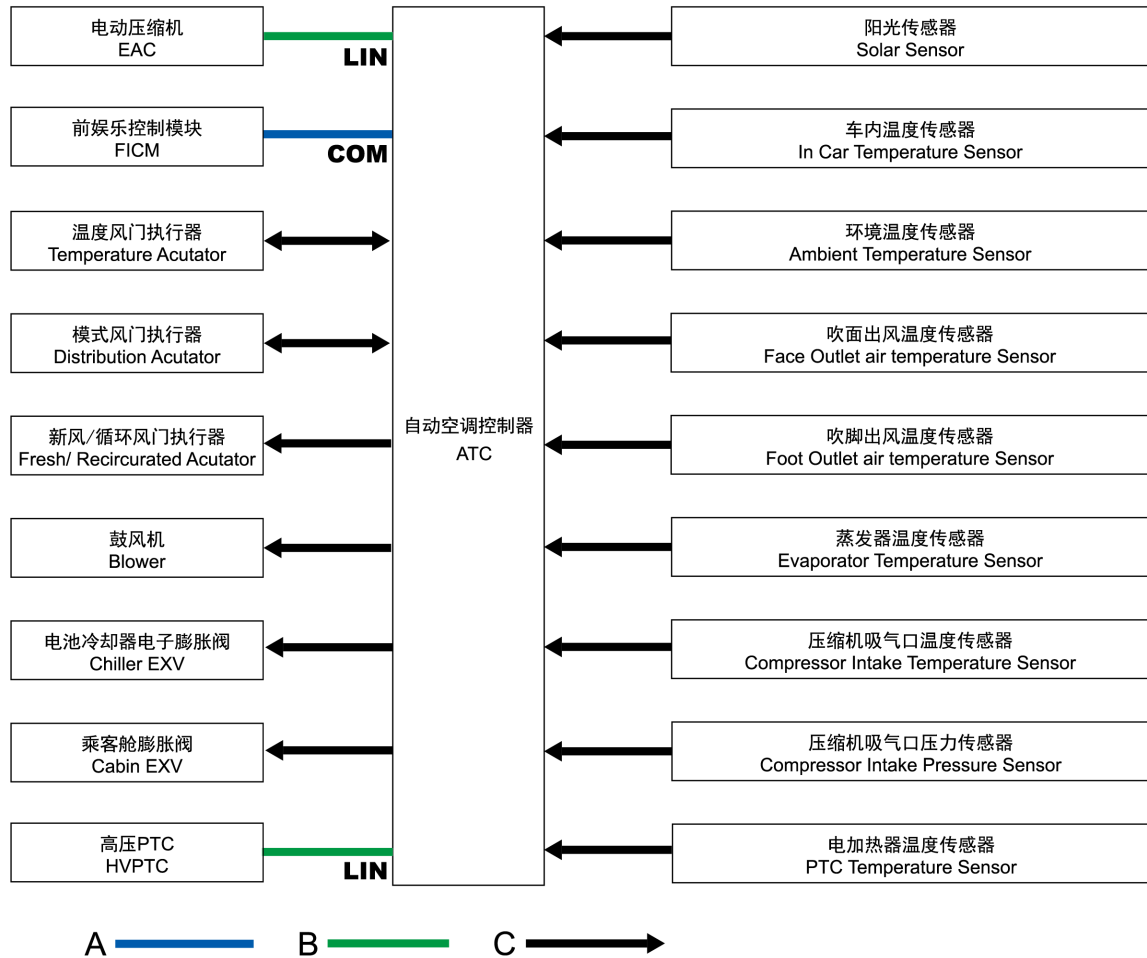


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- | | |
|---------------------------------------|--|
| 1. A/C Thermal Pump Controller* | 5. Solar Sensor |
| 2. Face Air Outlet Temperature Sensor | 6. Evaporator Temperature Sensor |
| 3. Interior Temperature Sensor | 7. Ambient Temperature Sensor |
| 4. A/C Controller | 8. A/C Refrigerant Temperature/Pressure Sensor |

System Control Diagram

System Control Diagram



S3211039

A = Comfort CAN; B = LIN Bus; C = Hard Wire

Description

Overview

The automatic temperature control (ATC) can manually control the air volume, air temperature, air circulation and air distribution.

In the Auto mode, the ATC system monitors the interior temperature, exterior temperature, outlet temperature, and sunlight intensity, etc., and automatically outputs the corresponding outlet temperature, air distribution volume, air distribution mode etc., meanwhile maintaining the A/C system in an optimal work state.

Control Panel

You can find buttons for A/C switch, defrost/defog, and rear window heating, while other A/C operation buttons are integrated in the centre console display.

Sensor

The sensors related to air conditioning control are mainly used to monitor the temperature and pressure of the refrigerant and the temperature of the air, so that the air conditioning controller can effectively protect the entire system and work in coordination with each other.

The temperature sensors are all negative thermistor sensors, and as the temperature of the refrigerant increases or the temperature of the air rises, the resistance value of the sensor becomes smaller.

The pressure sensor is a varistor sensor that changes as the pressure of the refrigerant changes.

Solar Sensor

The solar sensor is fitted on the trim panel in the middle of the instrument panel to monitor the luminous intensity of solar lights, and automatically control the operation of A/C.

Exterior Temperature Sensor

The exterior temperature sensor is fitted on the front bumper lower grille to monitor the exterior air temperature.

Interior Temperature Sensor

The interior temperature sensor is fitted on the trim panel at the right side of the driver to monitor the interior air temperature.

Face Air Outlet Temperature Sensor

The face air outlet temperature sensor is fitted on the face air outlet on the right side of the A/C box to monitor the air temperature distributed by the A/C box to the face.

Footwell Air Outlet Temperature Sensor

The footwell air outlet temperature sensor is fitted on the footwell air outlet on the left side of the A/C box to monitor the air temperature distributed by the A/C box to the footwell.

Evaporator Temperature Sensor

The evaporator temperature sensor is located at the evaporator for monitoring the surface temperature of

evaporator. When the temperature monitored is lower than a certain value, the compressor will be requested to turn off to prevent evaporator freezing.

Interior Condenser Inlet Temperature Sensor

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.

Interior Condenser Outlet Temperature Sensor

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.

Electric Heater Temperature Sensor

The electric heater temperature sensor is fitted near the electric heater on the left side of the A/C box, which is used to monitor the temperature around the electric heater.

External Heat Exchanger Temperature Sensor

The external heat exchanger temperature sensor is fitted on the connecting pipe of the external heat exchanger, which is used to monitor the temperature of the refrigerant at the external heat exchanger.

Compressor Inlet Temperature Sensor

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.

A/C Refrigerant Pressure Sensor

The A/C refrigerant pressure sensor is fitted on the high pressure pipe of the cooling pipeline, which is used to monitor the pressure of the refrigerant, when the pressure is too small or too large, the compressor is requested off to protect the entire refrigerant circulation system.

Operation

Overview

The automatic temperature control (ATC) system contains 2 controllers, namely, an automatic A/C controller and a heat pump controller. The automatic A/C controller is connected to the CAN network, and connected to the heat pump controller via LIN bus.

The heat pump controller is used to control the refrigerant circulation. The relevant solenoid valve is turned on or off by monitoring the state of the refrigerant with the relevant sensor, and selecting different refrigeration circulations can allow the A/C system to have functions such as cooling, heating, or defrosting.

The A/C controller is used to control the state of the air, by manually regulating the air volume, air outlet mode, air intake mode, air outlet temperature and other information to drive the relevant actuator to operate, meanwhile it can also be set to the AUTO mode, at this time, the system can automatically adjust the corresponding air volume output, air outlet mode and air intake mode.

Refrigerant Circulation Control

Refrigerant Pressure Control

Pressure protection: The refrigerant circulation system requires pressure protection, excessive high pressure and low pressure of the refrigerant may cause damage to the relevant components of the refrigerant circulation system, for example, compressor.

- When the compressor is operating, the pressure relief valve of the compressor will be opened to release a certain pressure, for example, when the pressure is extremely high.
- When the pressure sensor detects that the refrigerant pressure is above or below the correlative threshold, it will request the A/C controller to turn off the electric A/C compressor.

Normal pressure regulation:

- The expansion valve regulates the opening automatically to control and stabilize the pressure of the refrigerant.
- To meet the demand for heat load, the A/C controller automatically adjusts the speed of the compressor through the input from relevant temperature sensor.
- The cooling fan operates to regulate the heat exchange volume of the heat exchanger, to some extent, to regulate the pressure of the refrigerant.

Refrigerant Flow Direction Control

Based on to the input on the A/C panel, the temperature and pressure state of the refrigerant monitored by the heat pump controller, and the actual air outlet temperature monitored by the A/C controller, the A/C controller requests the heat pump

controller to perform the operation of the relevant solenoid valve, to achieve the goal of controlling the flow direction of the refrigerant.

Air State Control

Air Volume Control

In the Auto mode, based on the temperature set on the panel, and inputs of the corresponding sensor, the A/C controller controls the speed of the blower motor by increasing or decreasing the voltage at the blower motor ground end, to meet the customer's demands.

Intake Control

When the request of intake air source change is shown on the A/C control panel, the A/C controller enables the internal/external circulation actuator to change the damper angle.

Temperature Control

In the Auto mode, based on the temperature set on the panel, and inputs of the corresponding sensor, the A/C controller automatically rotates the temperature damper actuator to change the mixing ratio of cool and warm air, to meet the customer's demands.

Mode Control

In the Auto mode, based on the temperature set on the panel, and inputs of the corresponding sensor, the A/C controller automatically rotates the mode damper actuator to change the air outlet mode of the A/C, to meet the customer's demands.

Compressor Control

The vehicle is equipped with an electric A/C compressor. The compressor can be divided into LV side and HV side.

The LV side is provided with a LV power supply, which is powered by the vehicle battery and used for the communication of control signal and feedback signal of the compressor.

The HV side is provided with a HV power supply, which is powered by a HV battery pack and used to drive the electric compressor motor.

Compressor Control

Compressor ON: When the vehicle is in "Ready" state, if there is a cooling demand, or the EDS/battery has a cooling demand, the A/C controller requests the electric compressor to rotate. At the same time, the speed of the compressor can be changed according to different cooling demands to control the cooling capacity.

Compressor OFF: When the vehicle is not powered by the HV battery pack, the compressor stops/doesn't work. When one of the following conditions is met, the compressor speed may be 0:

- The refrigerant pressure is higher or lower than a certain value;

- The evaporator temperature is lower than a certain value, etc.

Service Guide - Universal Guide**A/C System****A/C System Odor Remove**

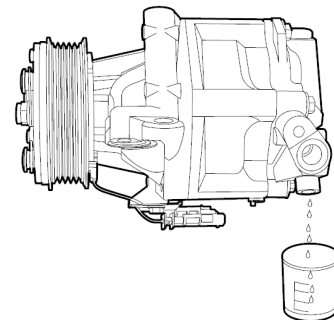
1. When the A/C is started under hot and humid conditions, the smell may be blown out from the air outlets. The components that may produce the smell include:
 - Foreign objects or breeding micro-organism in the A/C filter;
 - Breeding micro-organism on the A/C box housing;
 - Breeding micro-organism on the evaporator;
 - Breeding micro-organism on the air duct;
2. In case of any smell, please observe the following steps for odour removal:
 - Replace the A/C filter;
 - Clean the A/C box housing;
 - Clean the evaporator;
 - Clean the A/C air ducts.
3. The relevant cleaning fluid may be used during cleaning:
 - The solution containing 40% vinegar and 60% water;
 - Proper cleanser, etc.



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A/C Compressor Oil Balance

1. The compressor lubricating oil must be balanced during compressor replacement. The lubricating oil must go through balance treatment according to the following conditions:
2. Firstly, measure the oil volume in the replaced compressor, pour it out from the compressor intake/exhaust ports or the oil drain plug, measure with a measuring cup and record the value.



S3213100

3. Pour out the lubricating oil from the new compressor.
4. Add the same volume of oil as that of the replaced compressor in the new compressor.

Refrigerant Recovery and Refill**Refrigerant Recovery**

1. Connect the high-pressure side hose with a quick disconnection interface to the high-pressure service side connector of the A/C system.
2. Open the interface valve.
3. Connect the low-pressure side hose with a quick disconnection interface to the low-pressure service side connector of the A/C system.
4. Open the interface valve.
5. Check the high-pressure side and low-pressure side gauges on the refilling station control panel, and ensure there is pressure in the A/C. If there is no pressure, there is recoverable refrigerant in the system.
6. Open the high-pressure side and low-pressure side valves.
7. Open the gas and liquid valves on the refrigerant reservoir.
8. Drain refrigerant in the oil separator.
9. Close the drain valve.
10. Connect the refilling station to the appropriate power socket.
11. Connect the main power switch.
12. Start the recycle process. For information about the refilling station, refer to the manufacturer's instructions for use.
13. Wait for 5min before checking the low-pressure side gauge on the control panel. If the A/C system is capable of keeping vacuum, the recovery is completed.
14. If the pressure at the low-pressure side starts to rise from 0, there remains refrigerant in the system. Recover the residual refrigerant. Repeat this step until the system can keep vacuum for 2 minutes.

Air Conditioning System Drain

1. Check if the high-pressure side and low-pressure side hoses are connected to the A/C system. Open the high/low-pressure side valves on the refilling station control panel.
2. Open the gas and liquid valves on the refrigerant reservoir.
3. Start the vacuum pump and start the drain process. In the process of recirculation, non-condensable gases (mostly air) will be automatically exhausted from the reservoir. A sound of pressure release may be heard.
4. Check the system for leak. For information about the refilling station, refer to the manufacturer's instructions for use.

A/C System Lubricating Oil Refill

At this time, the lubricating oil discharged from the A/C system during recovery must be supplemented.

Note:

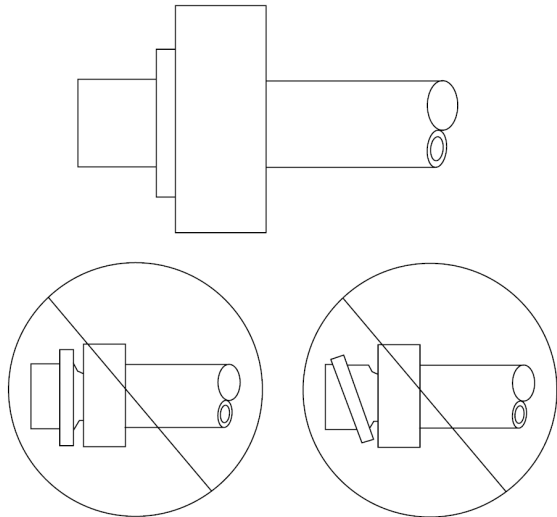
- Always keep the lubricating oil bottle cap tight to prevent moisture or contaminants from entering the lubricating oil.
 - This operation requires a vacuum A/C system. It is forbidden to open the lubricating oil filling valve when the A/C system is at positive pressure. This will result in backflow of lubricating oil through the bottle air vent.
 - An oil level lower than the suction pipe is prohibited when refilling or supplementing lubricating oil; otherwise, air will enter the A/C system.
1. Use the special lubricating oil (contained in graduated bottle) for the system.
 2. For information about the refilling station, refer to the manufacturer's instructions for use. Add an appropriate amount of lubricating oil to the A/C system.
 3. When the oil refilled reaches the required point, close the valve.

Refill

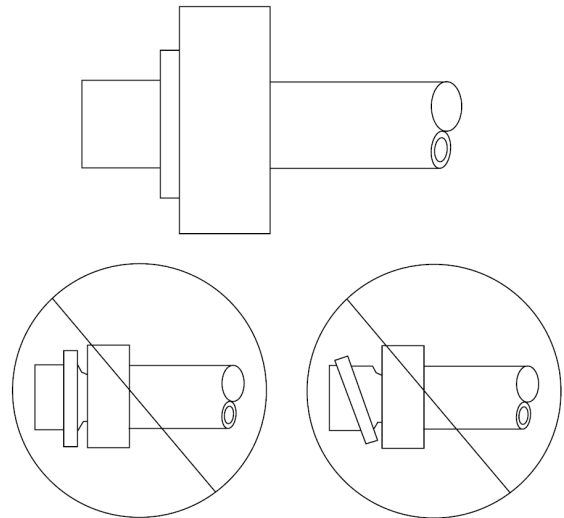
1. Close the low-pressure side valve on the control panel.
2. Open the high-pressure side valve on the control panel.
3. For information about the refilling station, refer to the manufacturer's instructions for use.
4. Fill refrigerant of the required amount into the A/C, and ensure the unit of measurement is correct, for example, kg or lb.
5. Start refill.

A/C System Seal Replacement**Remove**

1. Remove the seal washer from the A/C refrigeration component.
2. Check the seal washer for any sign of damage to determine the root cause of the failure.
3. Check the A/C refrigeration components for damage or burrs. Repair if necessary.
4. Discard the seal washer.



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Refit

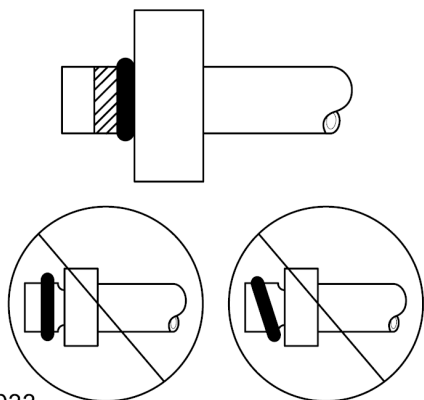
1. Check the new seal washer for any signs of cracks, cuts or damage.
Do not use a damaged seal washer.
2. Remove the cap or tape from the A/C refrigeration components.
3. Use a lint-free clean, dry cloth, to clean the sealing surfaces of the A/C refrigeration components.
4. Carefully fit the new seal washer onto the A/C refrigeration component. The washer bottom must be completely against the surface of the fitting.
5. Assemble the remaining A/C refrigeration components. Refer to the appropriate service procedure(s).

A/C System O-ring Replacement

appropriate service procedure(s).

Remove

1. Disassemble the A/C refrigeration components. Refer to the appropriate repair procedure.
2. Remove the O-ring from the A/C refrigeration component.
3. Check the O-ring for any sign of damage to help determine the root cause of the failure.
4. Check the A/C refrigeration components for damage or burrs. Repair if necessary.
5. Cap or tape the A/C refrigeration components.

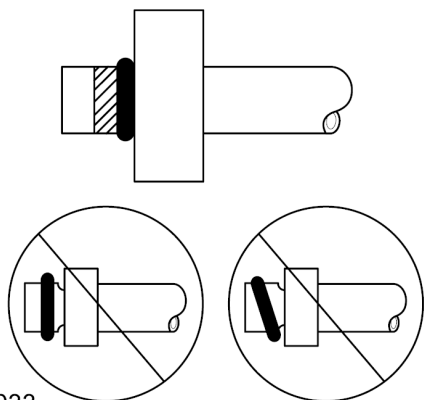


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6. Discard the O-ring.

Refit

1. Check the new O-ring for any sign of cracks, cuts, or damage. Replace as needed.
2. Remove the cap or tape from the A/C refrigeration components.
3. Use a lint-free, clean and dry cloth to carefully clean the sealing surfaces of the A/C refrigeration components.
4. Apply a small amount of mineral-based 525 viscosity refrigerant oil to the new O-ring.
5. Carefully place the new O-ring into the A/C refrigeration component.
6. The O-ring seal must be fully seated.



S3113033


7. Assemble the A/C components. Refer to the

Service Guide - Compressor/Condenser**A/C Compressor Assembly (2WD)****Remove**

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

 **Beauty Cover Remove**

3. Drain the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

4. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

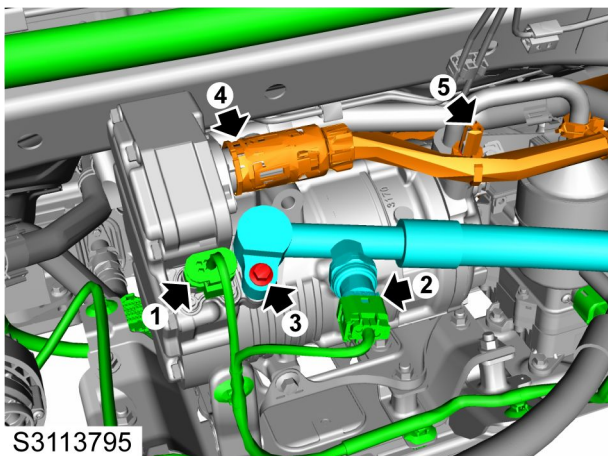
5. Remove the bottom deflector.

 **Bottom Deflector Remove**

6. Disconnect the harness connector (1) from the compressor.
7. Remove 1 bolt (3) fixing the pipeline assembly - A/C gas-liquid separator to compressor to the compressor, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.

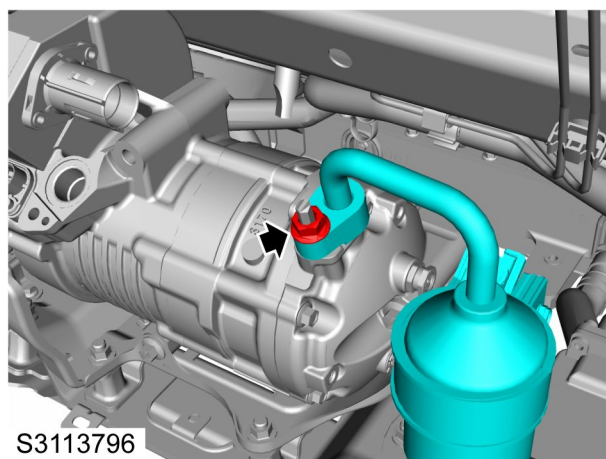
8. Disconnect the power battery high voltage harness connector (4) from the compressor, and loosen the clip (5).



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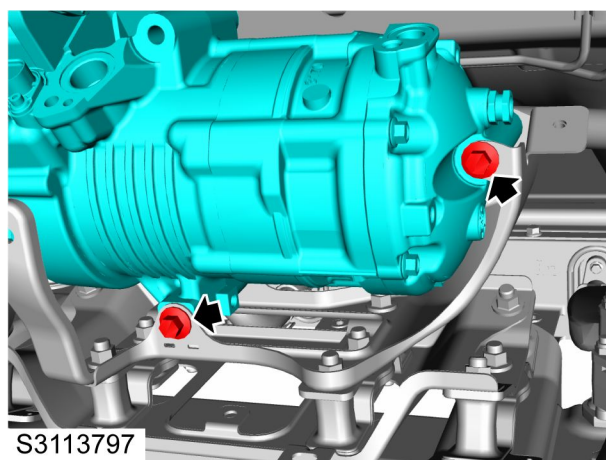
9. Remove 1 bolt fixing the pipeline assembly - A/C compressor to condenser to the compressor, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



S3113796

10. Remove 2 bolts fixing the compressor to the compressor bracket.



S3113797

Refit

1. Fix the compressor to the compressor bracket, fit 2 bolts, tighten them to **19-25Nm**, and check the torque.
2. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.
3. Fix the pipeline assembly - A/C compressor to condenser to the compressor, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Connect the power battery high voltage harness connector of the compressor, and fit the clip.
5. Fit a new seal ring on the A/C pipeline and apply clean compressor oil.
6. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the compressor, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
7. Connect the harness connector of the compressor.
8. Fit the bottom deflector.

 **Bottom Deflector Refit**

9. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

10. Refill the A/C system refrigerant.

[Refrigerant Recovery](#) [Air Conditioning System Drain](#) [A/C System Lubricating Oil Refill](#) [Refill](#)

11. Fit the beauty cover.

[Beauty Cover Refit](#)

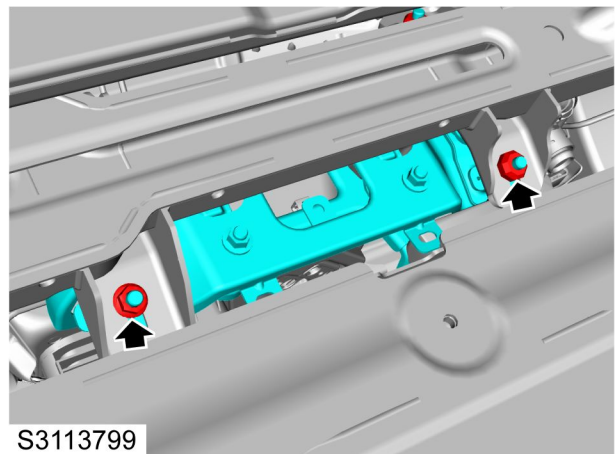
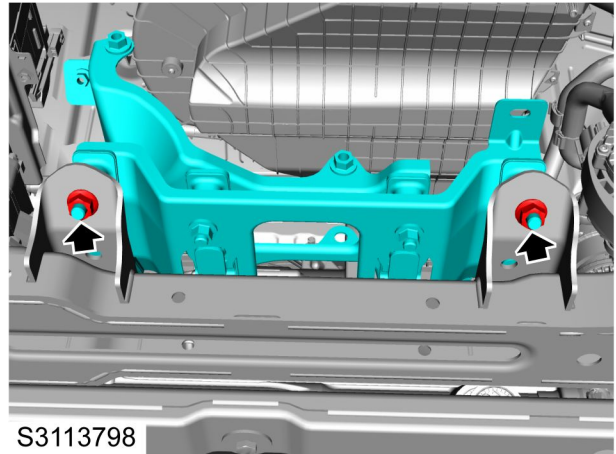
12. Connect the negative battery cable.

A/C Compressor Mount Bracket Assembly (2WD) Remove

1. Remove the A/C compressor assembly.

[A/C Compressor Assembly Remove](#)

- Loosen the clip fixing the front compartment harness assembly to the A/C compressor mount bracket.
- Remove 4 nuts fixing the A/C compressor mount bracket to the front subframe.



4. Remove the A/C compressor mount bracket assembly.

Refit

- Fix the A/C compressor mount bracket to the front subframe, fit 4 nuts, tighten them to **12-18Nm**, and check the torque.
- Connect the front compartment harness assembly to the clip of A/C compressor mount bracket.
- Fit the A/C compressor assembly.

[A/C Compressor Assembly Refit](#)

Service Guide - A/C Pipeline (Non-thermal Pump)

Pipeline Assembly - A/C Compressor to Condenser Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

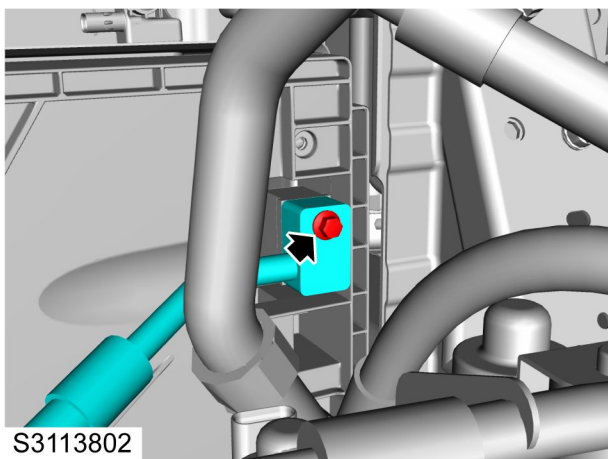
Beauty Cover Remove

3. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

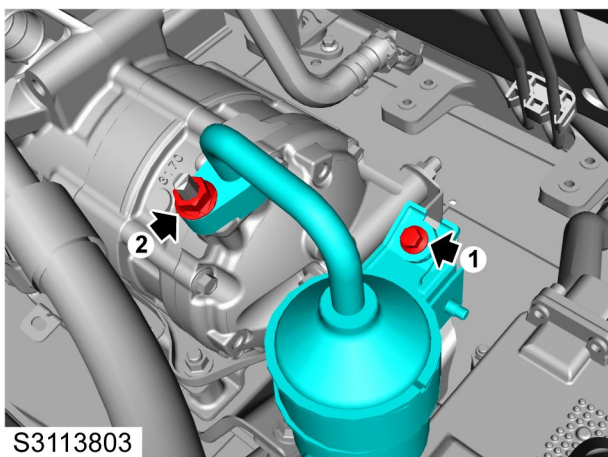
4. Remove 1 bolt fixing the pipeline assembly - A/C compressor to condenser to the condenser, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



5. Remove 1 bolt (1) fixing the pipeline assembly - A/C compressor to condenser to the compressor.
6. Loosen the harness clip, remove 1 nut (2) fixing the pipeline assembly - A/C compressor to condenser to the compressor, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



Refit

1. Remove the plug, fit a new seal ring on the A/C pipeline, and apply clean compressor oil.
2. Fix the pipeline assembly - A/C compressor to condenser to the compressor, fit 1 nut, tighten it to **7-10Nm**, and check the torque.
3. Fix the pipeline assembly - A/C compressor to condenser to the compressor bracket, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring on the A/C pipeline, and apply clean compressor oil.
5. Fix the pipeline assembly - A/C compressor to condenser to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

7. Fit the beauty cover.

Beauty Cover Refit

8. Connect the negative battery cable.

Evaporator Pipe Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

3. Drain the A/C system refrigerant.

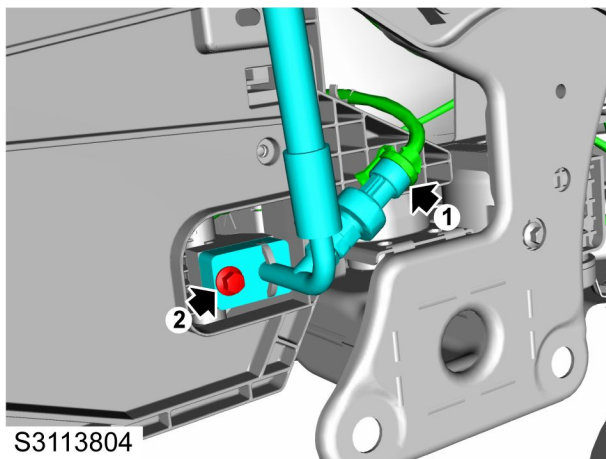
Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Remove the bottom deflector.

Bottom Deflector Remove

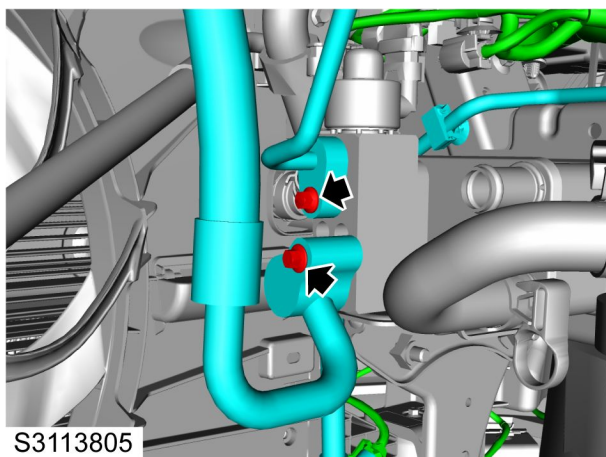
5. Disconnect the harness connector (1) from the evaporator pipeline assembly.
6. Remove 1 bolt (2) fixing the evaporator pipe assembly to the condenser, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



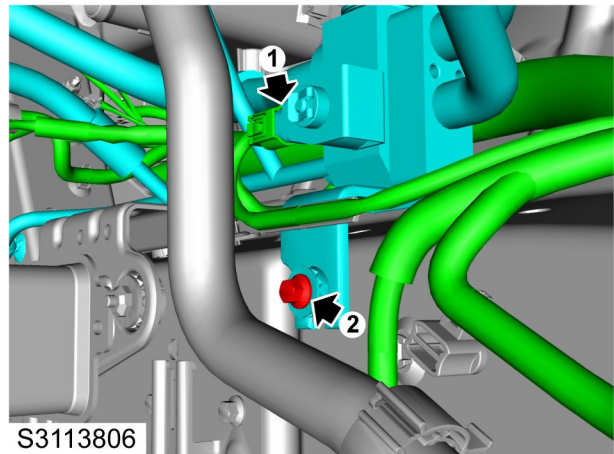
7. Remove 2 bolts fixing the evaporator pipeline assembly to the A/C electronic expansion valve, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



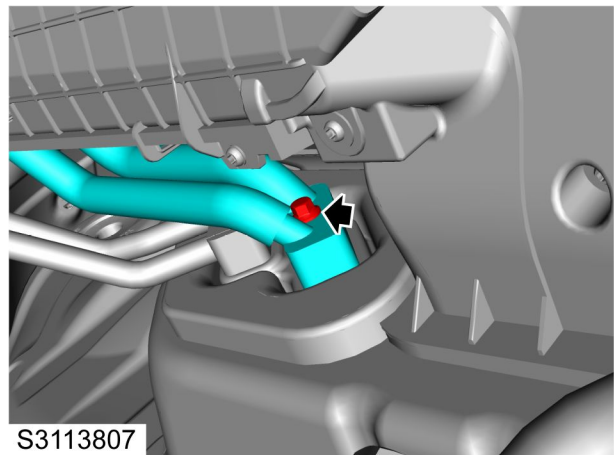
8. Disconnect the harness connector (1) from the evaporator pipeline assembly.

9. Remove 1 bolt (2) fixing the evaporator pipe assembly to the body.

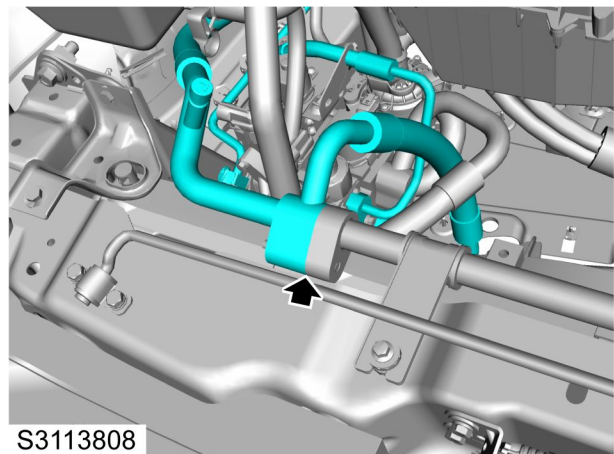


10. Remove 1 bolt fixing the evaporator pipeline assembly to the A/C box, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



11. Disconnect the evaporator pipeline assembly from the pipeline assembly - A/C evaporator to compressor.



Refit

1. Connect the evaporator pipeline assembly to the pipeline assembly - A/C evaporator to compressor.
2. Remove the plug, fit a new seal ring on the A/C pipeline,

and apply clean compressor oil.

3. Fix the evaporator pipeline assembly to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Fix the evaporator pipeline assembly to the body, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Connect the harness connector of the evaporator pipeline assembly.
6. Remove the plug, fit a new seal ring on the A/C pipeline, and apply clean compressor oil.
7. Fix the evaporator pipeline assembly to the A/C electronic expansion valve, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
8. Remove the plug, fit a new seal ring on the A/C pipeline, and apply clean compressor oil.
9. Fix the evaporator pipe assembly to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
10. Connect the harness connector of the evaporator pipeline assembly.
11. Fit the bottom deflector.

Bottom Deflector Refit

12. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

13. Fit the beauty cover.

Beauty Cover Refit

14. Connect the negative battery cable.

A/C Electronic Expansion Valve Remove

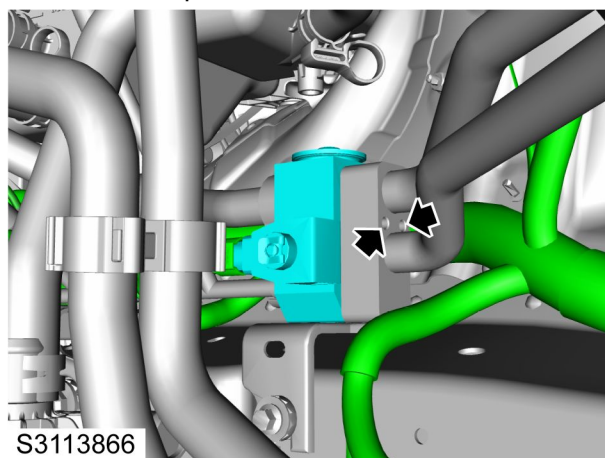
1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

3. Drain the A/C system refrigerant.

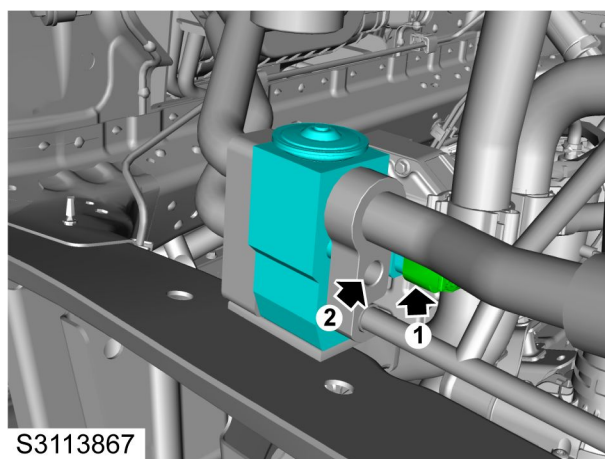
Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Remove 2 screws fixing the A/C pipeline to the A/C electronic expansion valve.



5. Disconnect the connector (1) of the A/C electronic expansion valve.
6. Remove 1 screw (2) fixing the A/C pipeline to the A/C electronic expansion valve, disconnect the pipeline, and discard the seal ring.


Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the A/C pipeline to the A/C electronic expansion valve, fit and tighten 1 screw.
3. Connect the connector of the A/C electronic expansion valve.

4. Fix the A/C pipeline to the A/C electronic expansion valve, fit and tighten 2 screws.
5. Refill the A/C system refrigerant.

 **Refrigerant Recovery Air**
Conditioning System Drain A/C System Lubricating
Oil Refill Refill

6. Fit the beauty cover.

 **Beauty Cover Refit**


7. Connect the negative battery cable.

A/C Refrigerant Temperature/Pressure Sensor Remove

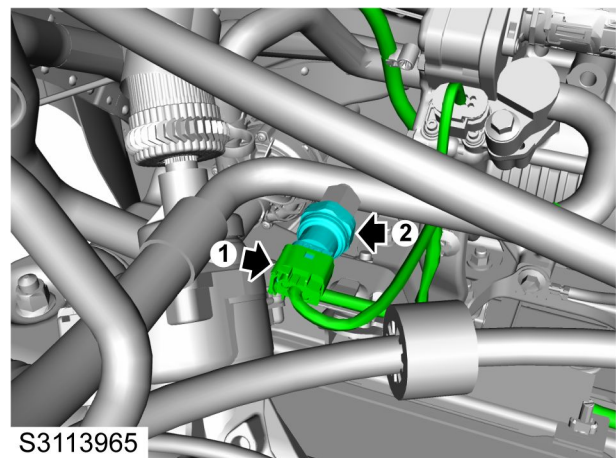
1. Disconnect the negative battery cable.
2. Remove the beauty cover.

 **beauty cover Remove**

3. Drain the A/C system refrigerant.


 **refrigerant Recovery Air**
Conditioning System Drain A/C System Lubricating
Oil Refill Refill

4. Disconnect the harness connector of A/C refrigerant temperature and pressure sensor (1).
5. Remove the A/C refrigerant temperature and pressure sensor (2).



Refit

1. Fit the A/C refrigerant temperature and pressure sensor.
2. Connect the harness connector of the A/C refrigerant temperature and pressure sensor.
3. Refill the A/C system refrigerant.

 **refrigerant Recovery Air**
Conditioning System Drain A/C System Lubricating
Oil Refill Refill

4. Refit the beauty cover.

 **beauty cover Refit**

5. Connect the negative battery cable.

A/C Heat Pump System Valve Unit Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

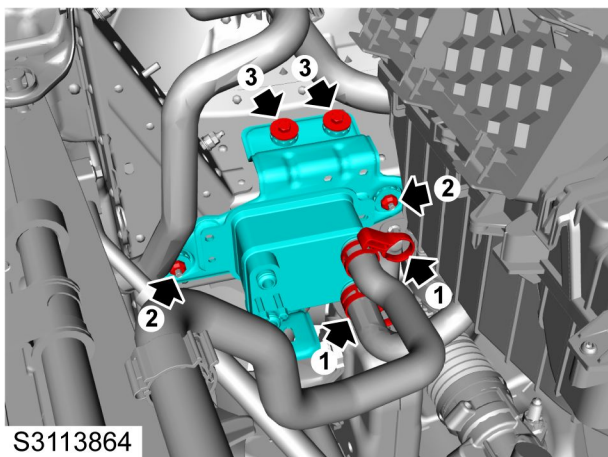
3. Drain the coolant.

Coolant Drain Refill

4. Remove the A/C electronic expansion valve.

A/C Electronic Expansion Valve Remove 拆卸 Remove

5. Loosen the clamp (1), and disconnect the hose of the A/C pipeline from the A/C heat pump system valve unit.
6. Remove 2 nuts (2) fixing the A/C heat pump system valve unit to the body.
7. Remove 2 bolts (3) fixing the A/C heat pump system valve unit to the body.



Refit

1. Fix the A/C heat pump system valve unit to the body, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
2. Fix the A/C heat pump system valve unit to the body, fit 2 nuts, tighten them to TBD, and check the torque.
3. Connect the hose of the A/C pipeline to the A/C heat pump system valve unit, and secure with clamps.
4. Fit the A/C electronic expansion valve.

A/C Electronic Expansion Valve Refit Refit

5. Refill the coolant.

Coolant Drain Refill

6. Fit the beauty cover.

Beauty Cover Refit

7. Connect the negative battery cable.

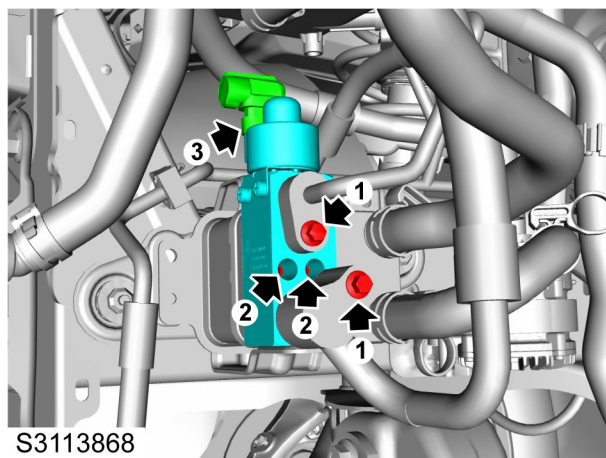
A/C Electronic Expansion Valve 拆卸

1. 断开蓄电池负极。
2. 排空空调系统制冷剂。

制冷剂

3. 拆下将空调管路固定到空调电子膨胀阀上的2个螺钉 (1) , 断开管路连接, 并废弃密封圈。
4. 拆下将空调电子膨胀阀固定到空调热泵系统阀集成模块上的2个螺钉 (2) 。
5. 断开空调电子膨胀阀的连接器 (3) 。

Caution : Protect the pollutants from entering the open joints.



- 6.

Refit

1. Connect the connector of the A/C electronic expansion valve.
2. Fix the A/C electronic expansion valve to the A/C heat pump system valve unit, fit and tighten 2 screws.
3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the A/C pipeline to the A/C electronic expansion valve, fit and tighten 2 screws.
5. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

6. Fit the beauty cover.

Beauty Cover Refit

7. Connect the negative battery cable.

Service Guide - A/C Pipeline (Heat Pump)

Pipeline Assembly - A/C Compressor to Internal Condenser (2WD)

Remove

1. Disconnect the negative battery cable.
2. Remove the A/C air inlet box.

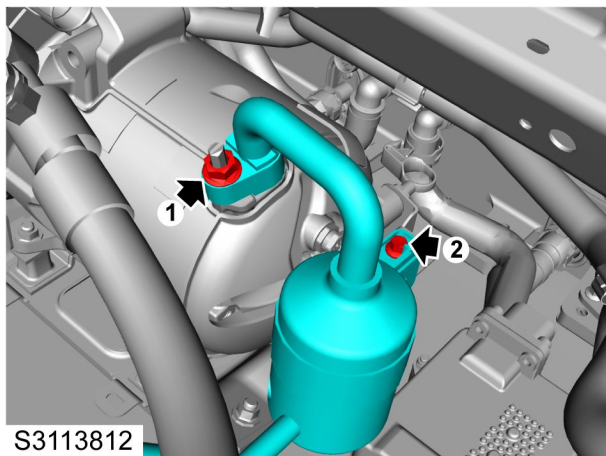
A/C Air Inlet Box Remove

3. Drain the A/C system refrigerant.

Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

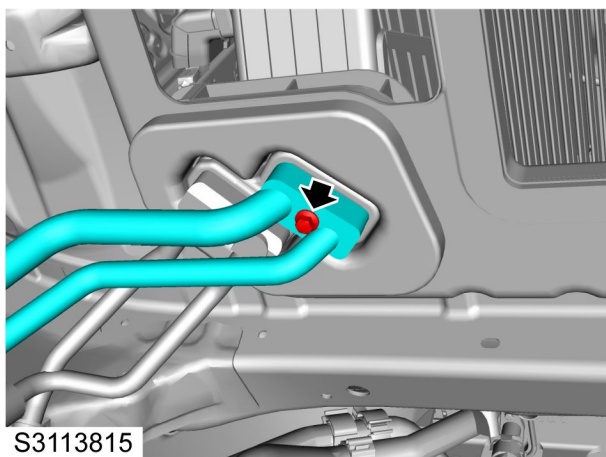
4. Remove 1 bolt (1) fixing the pipeline assembly - A/C compressor to interior condenser to the compressor, disconnect the pipeline, and discard the seal ring.
5. Remove 1 bolt (2) fixing the pipeline assembly - A/C compressor to condenser to the compressor bracket.

Caution : *Protect the pollutants from entering the open joints.*



6. Remove 1 bolt fixing the pipeline assembly - interior condenser to exterior condenser to the A/C box, disconnect the pipeline, and discard the seal ring.

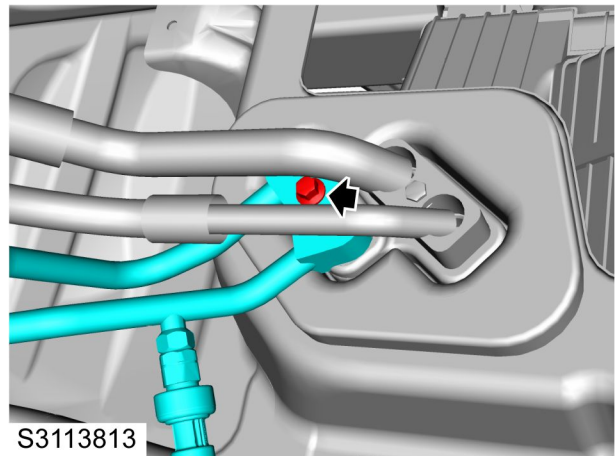
Caution : *Protect the pollutants from entering the open joints.*



7. Remove 1 bolt fixing the pipeline assembly - A/C compressor to interior condenser to the A/C box,

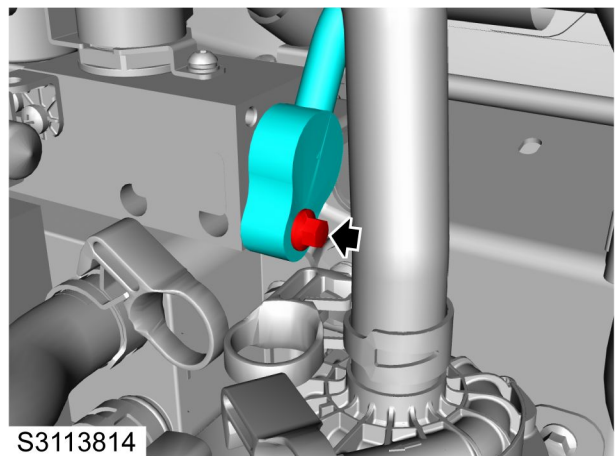
disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



8. Remove 1 bolt fixing the pipeline assembly - A/C compressor to interior condenser to the bypass valve, disconnect the pipeline, and discard the seal ring.


Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - A/C compressor to interior condenser to the bypass valve, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the pipeline assembly - A/C compressor to interior condenser to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Fix the pipeline assembly - interior condenser to exterior condenser to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Fix the pipeline assembly - A/C compressor to condenser to the compressor bracket, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.

7. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
8. Fix the pipeline assembly - A/C compressor to interior condenser to the compressor, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
9. Refill the A/C system refrigerant.

 **Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**


10. Fit the A/C air inlet box.

 **A/C Air Inlet Box Refit**

11. Connect the negative battery cable.

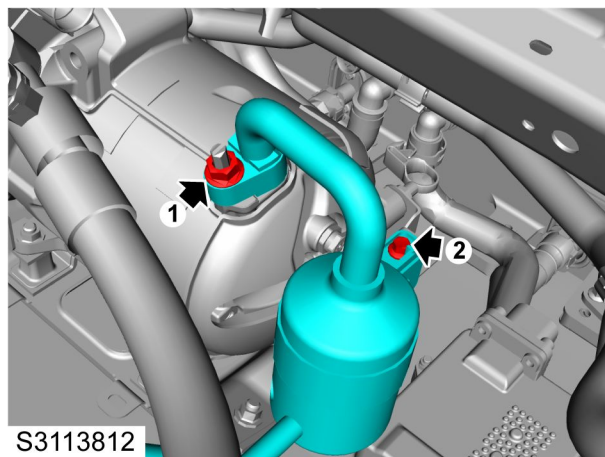
**Pipeline Assembly - A/C Compressor to Internal Condenser (4WD)
Remove**

1. Disconnect the negative battery cable.
2. Drain the A/C system refrigerant.

 **Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

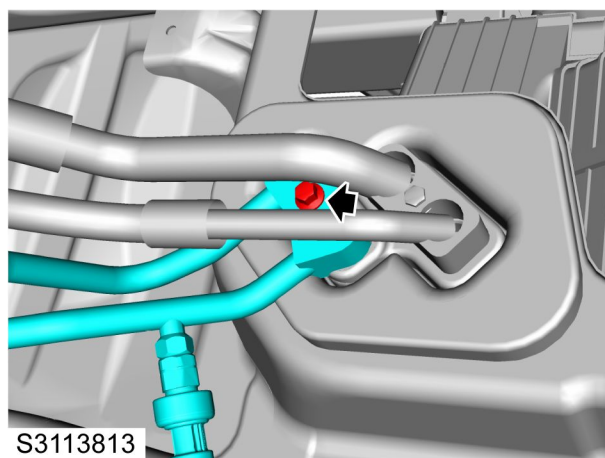
3. Remove 1 bolt (1) fixing the pipeline assembly - A/C compressor to interior condenser to the compressor, disconnect the pipeline, and discard the seal ring.
4. Remove 1 bolt (2) fixing the pipeline assembly - A/C compressor to condenser to the compressor bracket.

Caution : *Protect the pollutants from entering the open joints.*



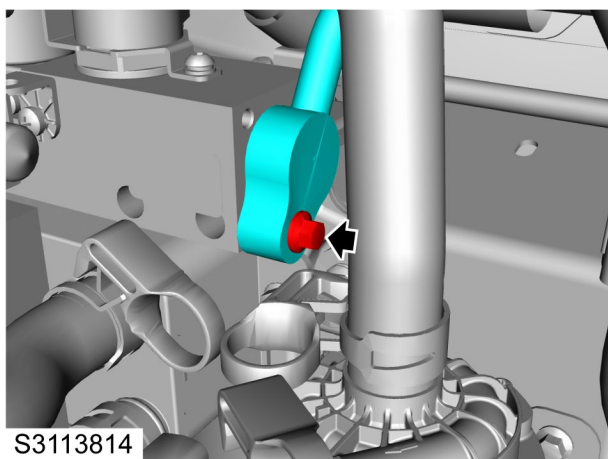
5. Remove 1 bolt fixing the pipeline assembly - A/C compressor to interior condenser to A/C Box, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



6. Remove 1 bolt fixing the pipeline assembly - A/C compressor to interior condenser to the bypass valve, disconnect the pipeline, and discard the seal ring.


Caution : *Protect the pollutants from entering the open joints.*



S3113814

Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - A/C compressor to internal condenser to the bypass valve, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the pipeline assembly - A/C compressor to internal condenser to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Fix the pipeline assembly - A/C compressor to condenser to the compressor bracket, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
7. Fix the pipeline assembly - A/C compressor to internal condenser to the compressor, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
8. Refill the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**


9. Connect the negative battery cable.

Pipeline Assembly - Internal Condenser to External Condenser (Integrated Valve) Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

 **Beauty Cover Remove**

3. Drain the A/C system refrigerant.

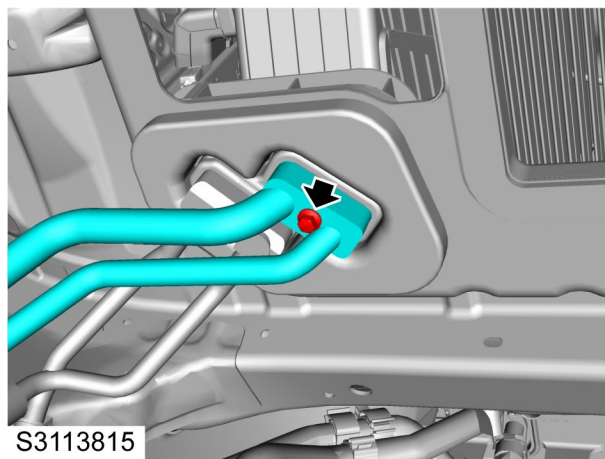
 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

4. Remove the A/C air inlet box assembly.

 **A/C Air Inlet Box Remove**

5. Remove 1 bolt fixing the pipeline assembly - interior condenser to exterior condenser to the A/C box, disconnect the pipeline, and discard the seal ring.

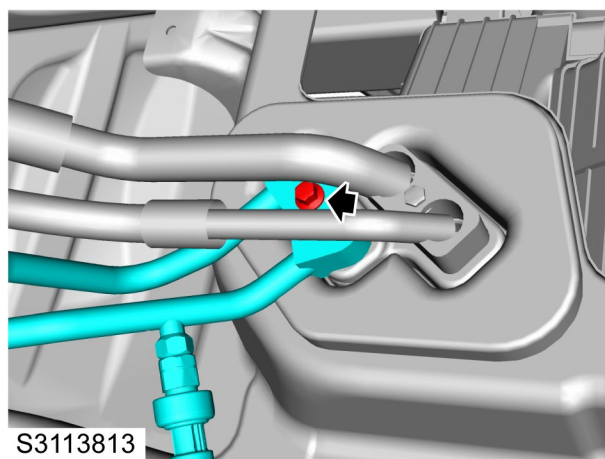
Caution : Protect the pollutants from entering the open joints.



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6. Remove 1 bolt fixing the pipeline assembly - A/C compressor to interior condenser to the A/C box, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.

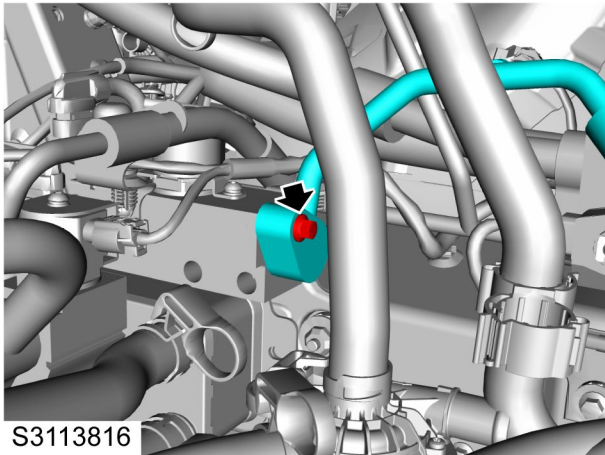


S3113813

7. Remove 1 bolt fixing the pipeline assembly - interior condenser to exterior condenser to the electronic expansion bypass valve assembly, disconnect the

pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*




Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - interior condenser to exterior condenser to the electronic expansion bypass valve assembly, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the pipeline assembly - A/C compressor to interior condenser to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Fix the pipeline assembly - interior condenser to exterior condenser to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Fit the A/C air inlet box.

 **A/C Air Inlet Box Refit**

7. Refill the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

8. Fit the beauty cover.

 **Beauty Cover Refit**


9. Connect the negative battery cable.

Pipeline Assembly - A/C Condenser to Evaporator Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

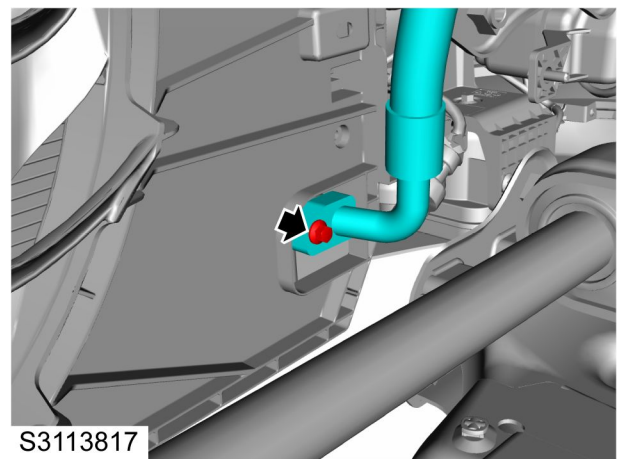
 **Beauty Cover Remove**

3. Drain the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

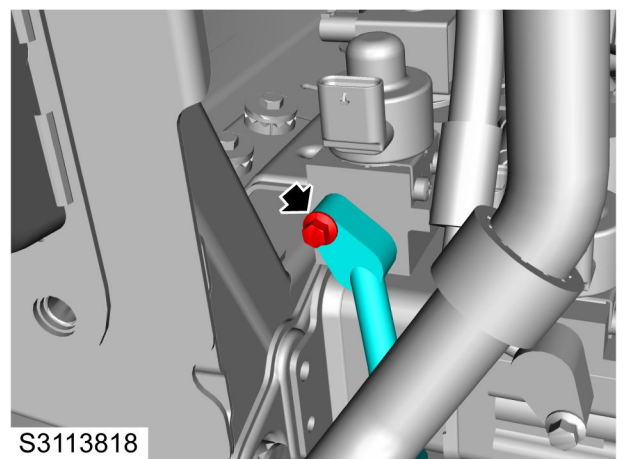
4. Remove 1 bolt fixing the pipeline assembly - A/C condenser to evaporator to the condenser, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



5. Remove 1 bolt fixing the pipeline assembly - A/C condenser to evaporator to the electronic expansion bypass valve, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*




Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - A/C condenser to evaporator

to the electronic expansion bypass valve, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.

3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the pipeline assembly - A/C condenser to evaporator to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Refill the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

6. Fit the beauty cover.

 **Beauty Cover Refit**


7. Connect the negative battery cable.

Evaporator Pipe Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

 **Beauty Cover Remove**

3. Drain the A/C system refrigerant.

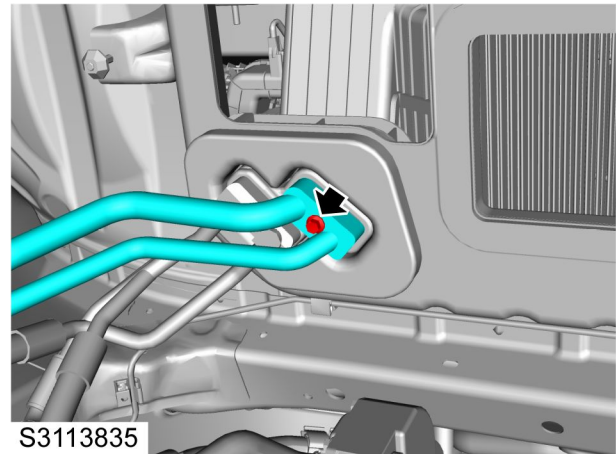
 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

4. Remove the A/C box air inlet box assembly.

 **A/C Air Inlet Box Assembly Remove**

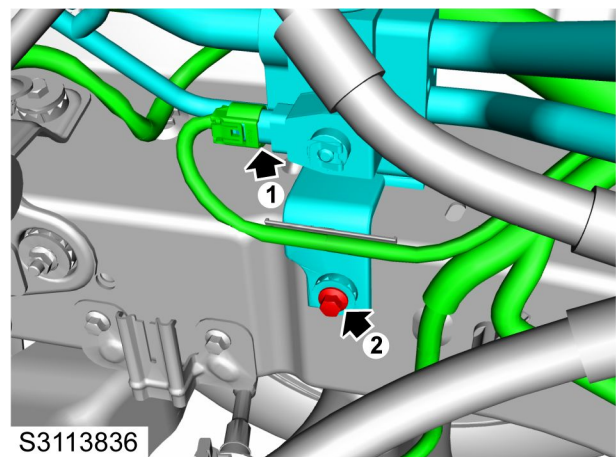
5. Remove 1 bolt fixing the evaporator pipe assembly to the A/C box, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



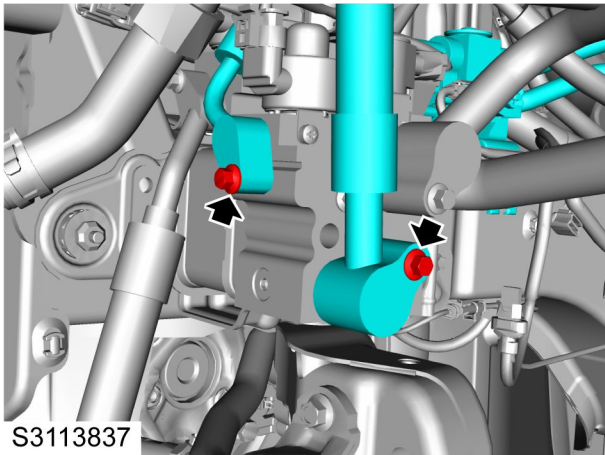
6. Disconnect the harness connector (1) of the evaporator pipe assembly.
7. Remove 1 bolt (2) fixing the evaporator pipe assembly to the body.

Caution : *Protect the pollutants from entering the open joints.*



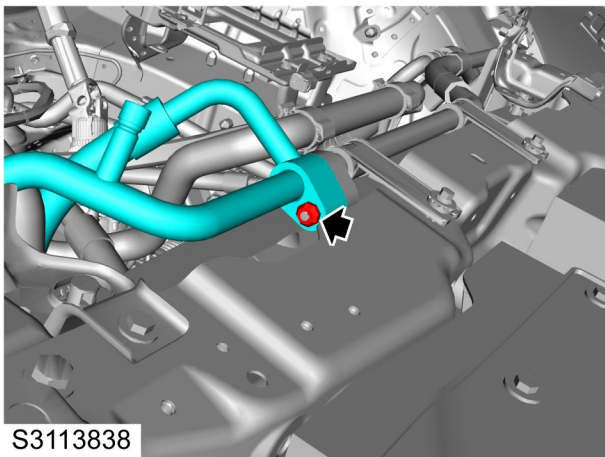
8. Remove 2 bolts fixing the evaporator pipe assembly to the electronic expansion heating valve, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



9. Remove 1 nut fixing the evaporator pipe assembly to the pipeline assembly - evaporator to A/C gas-liquid separator, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the evaporator pipe assembly to the pipeline assembly - evaporator to A/C gas-liquid separator, fit 1 nut, tighten it to **7-10Nm**, and check the torque.
3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the evaporator pipe assembly to the electronic expansion heating valve, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
5. Fix the evaporator pipe assembly to the body, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Connect the harness connector to the evaporator pipe assembly.
7. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.

8. Fix the evaporator pipe assembly to the A/C box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
9. Fit the A/C box air inlet box assembly.

A/C Air Inlet Box Refit

10. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

11. Fit the beauty cover.

Beauty Cover Refit

12. Connect the negative battery cable.

Pipeline Assembly - Evaporator to A/C Gas-liquid Separator Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

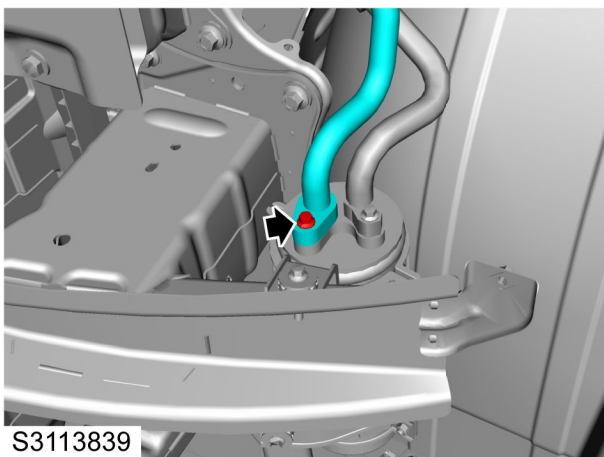
Beauty Cover Remove

3. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

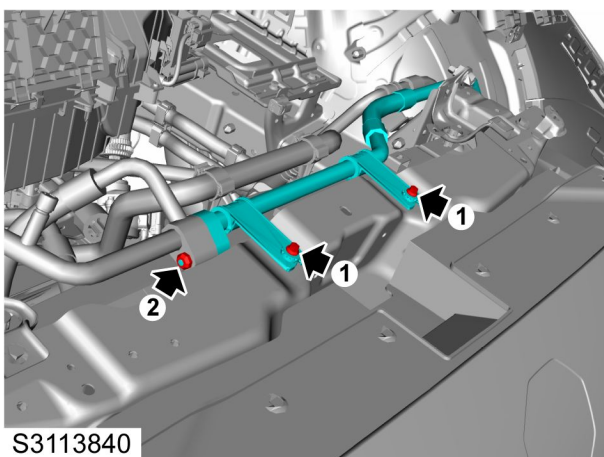
4. Remove 1 bolt fixing the pipeline assembly - evaporator to A/C gas-liquid separator to the gas-liquid separator, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



5. Remove 2 bolts (1) fixing the pipeline assembly - evaporator to A/C gas-liquid separator to the upper radiator beam assembly.
6. Remove 1 nut (2) fixing the pipeline assembly - evaporator to A/C gas-liquid separator to the evaporator pipe assembly, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - evaporator to A/C gas-liquid separator to the evaporator pipe assembly, fit 1 nut, tighten it to **7-10Nm**, and check the torque.
3. Fix the pipeline assembly - evaporator to A/C gas-liquid separator to the upper radiator beam assembly, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
5. Fix the pipeline assembly - evaporator to A/C gas-liquid separator to the gas-liquid separator, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

7. Fit the beauty cover.

Beauty Cover Refit

8. Connect the negative battery cable.

Pipeline - A/C Heat Pump System Valve Integrated Module to Condenser Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

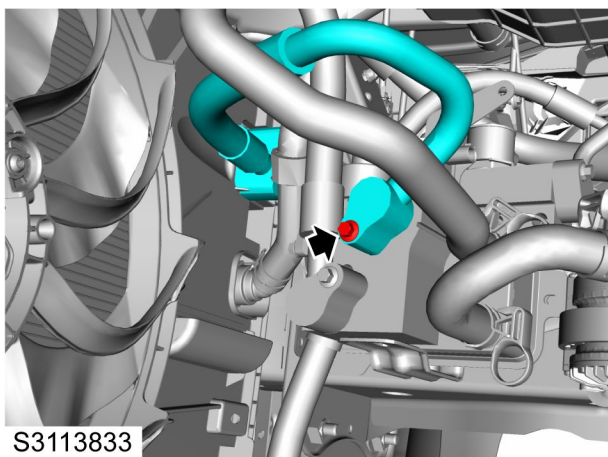
Beauty Cover Remove

3. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

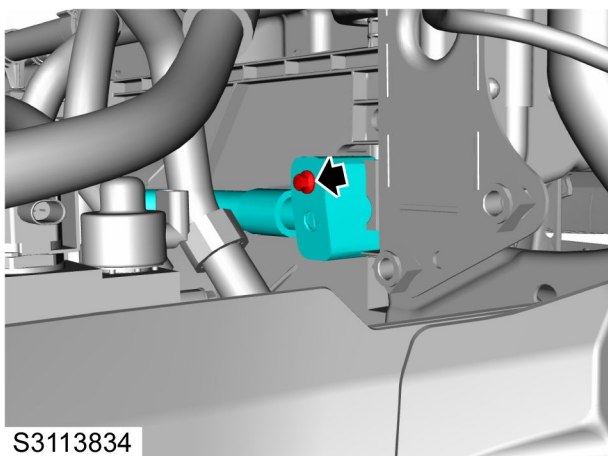
4. Remove 1 bolt fixing the pipeline - A/C heat pump system valve unit to condenser to the electronic expansion heating valve assembly, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



5. Remove 1 bolt fixing the pipeline - A/C heat pump system valve unit to condenser to the condenser, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline - A/C heat pump system valve unit to

condenser to the condenser, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.

3. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
4. Fix the pipeline - A/C heat pump system valve unit to condenser to the electronic expansion heating valve, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
5. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

6. Fit the beauty cover.

Beauty Cover Refit

7. Connect the negative battery cable.

Pipeline Assembly - A/C Gas-liquid Separator to Compressor (2WD)

Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

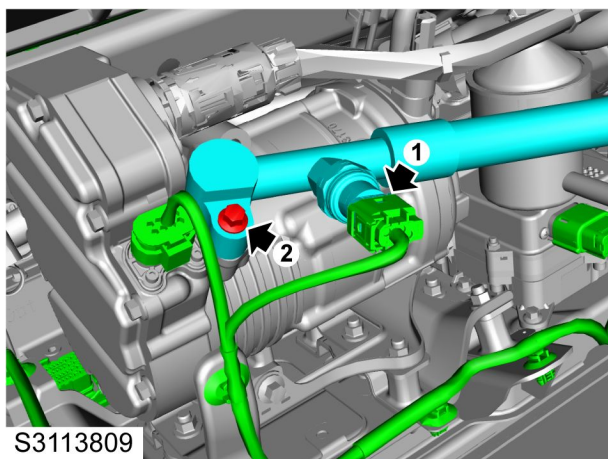
Beauty Cover Remove

3. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

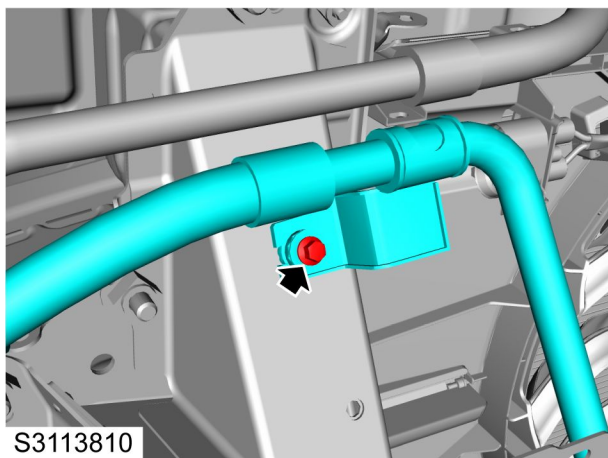
4. Disconnect the harness connector (1) of the pipeline assembly - A/C gas-liquid separator to compressor.
5. Remove 1 bolt (2) fixing the pipeline assembly - A/C gas-liquid separator to compressor to the compressor, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



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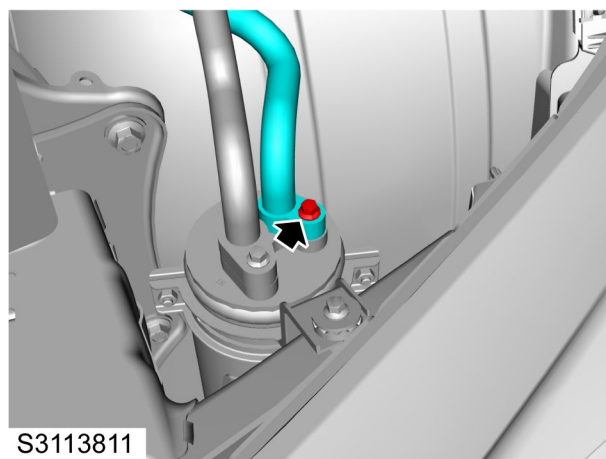
6. Remove 1 bolt fixing the pipeline assembly - A/C gas-liquid separator to compressor to the body.



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7. Remove 1 bolt fixing the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



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Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the body, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
5. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the compressor, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Connect the harness connector of the pipeline assembly - A/C gas-liquid separator to compressor.
7. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

8. Fit the beauty cover.

Beauty Cover Refit

9. Connect the negative battery cable.

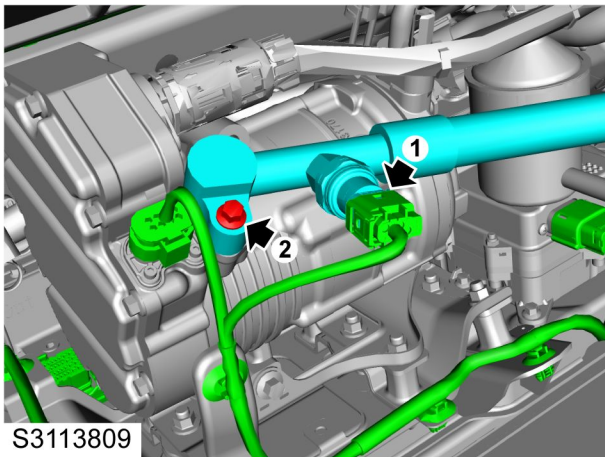
Pipeline Assembly - A/C Gas-liquid Separator to Compressor (4WD) Remove - 4WD

1. Disconnect the negative battery cable.
2. Drain the A/C system refrigerant.

Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

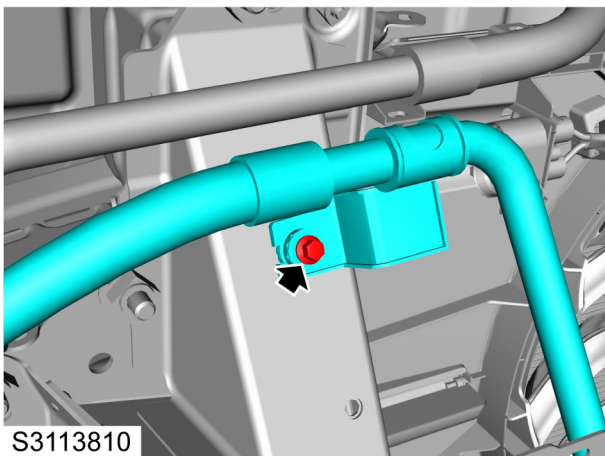
3. Disconnect the harness connector (1) from pipeline assembly - A/C gas-liquid separator to compressor.
4. Remove 1 bolt (2) fixing the pipeline assembly - A/C gas-liquid separator to compressor to the compressor; disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



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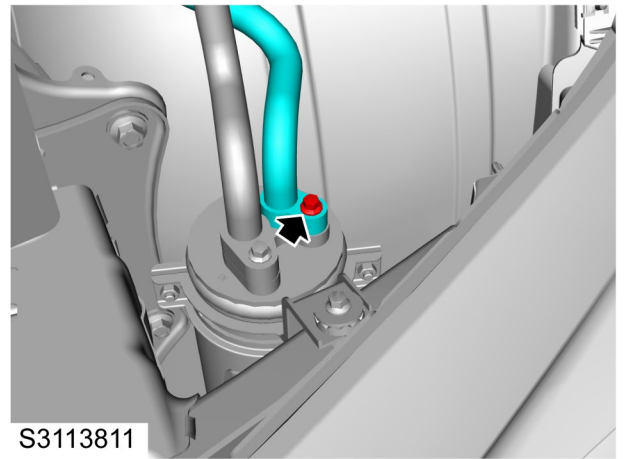
5. Remove 1 bolt fixing the pipeline assembly - A/C gas-liquid separator to compressor to the body.



S3113810

6. Remove 1 bolt fixing the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator; disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



S3113811

Refit - 4WD

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator; fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the body; fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
5. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the compressor; fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Connect the pipeline assembly - A/C gas-liquid separator to the harness connector of compressor.
7. Refill the A/C system refrigerant.

Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

8. Connect the negative battery cable.

A/C Electronic Expansion Valve Remove

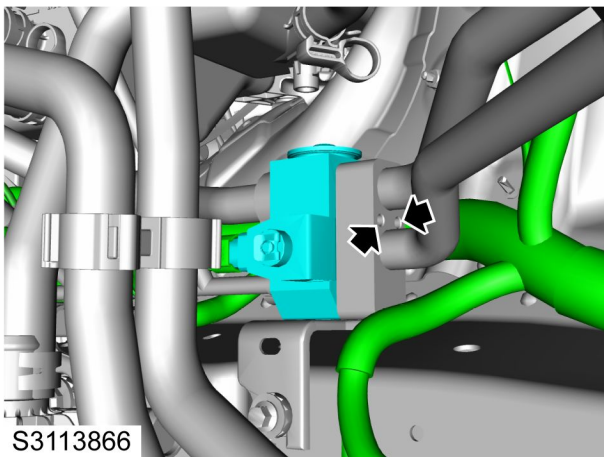
1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

3. Drain the A/C system refrigerant.

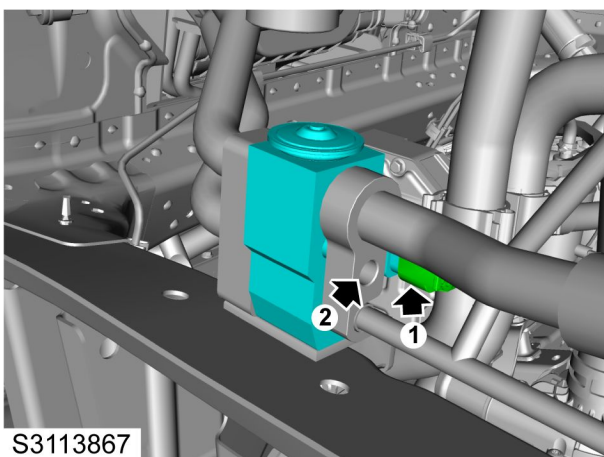
Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Remove 2 screws fixing the A/C pipeline to the A/C electronic expansion valve.



5. Disconnect the connector (1) of the A/C electronic expansion valve.
6. Remove 1 screw (2) fixing the A/C pipeline to the A/C electronic expansion valve, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
2. Fix the A/C pipeline to the A/C electronic expansion valve, fit and tighten 1 screw.
3. Connect the connector of the A/C electronic expansion

valve.

4. Fix the A/C pipeline to the A/C electronic expansion valve, fit and tighten 2 screws.
5. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

6. Fit the beauty cover.

Beauty Cover Refit

7. Connect the negative battery cable.

A/C Gas-liquid Separator Remove

1. Disconnect the negative battery cable.
2. Drain the A/C system refrigerant.

Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

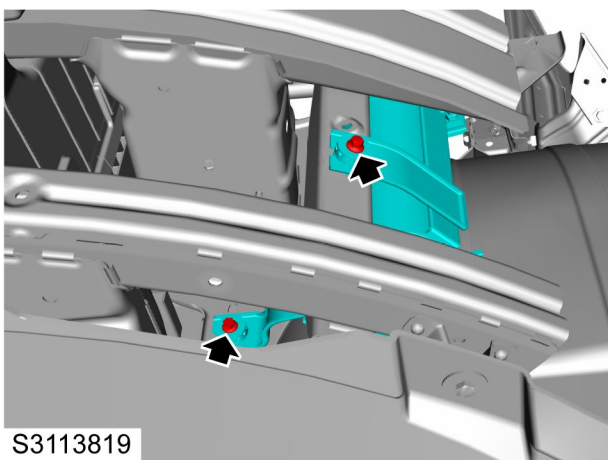
3. Remove the front bumper.

Front Bumper Remove

4. Remove the headlamp assembly.

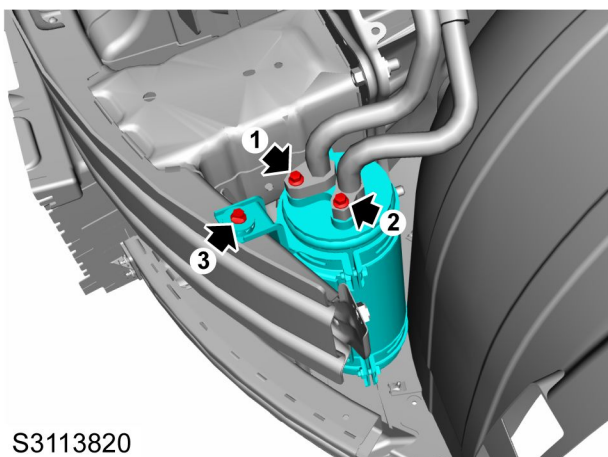
Headlamp Assembly Remove

5. Remove 2 bolts fixing the A/C gas-liquid separator to the front bumper beam.



6. Remove 1 bolt (1) fixing the A/C pipeline to the A/C gas-liquid separator, disconnect the pipeline, and discard the seal ring.
7. Remove 1 bolt (2) fixing the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator, disconnect the pipeline, and discard the seal ring.
8. Remove 1 bolt (3) fixing the A/C gas-liquid separator to the front bumper beam.

Caution : *Protect the pollutants from entering the open joints.*



Refit

1. Fix the A/C gas-liquid separator to the front bumper beam, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
2. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
3. Fix the pipeline assembly - A/C gas-liquid separator to compressor to the A/C gas-liquid separator, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
5. Fix the A/C pipeline to the A/C gas-liquid separator, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Fix the A/C gas-liquid separator to the front bumper beam, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
7. Fit the headlamp assembly.

Headlamp Assembly Refit

8. Fit the front bumper.

Front Bumper Refit

9. Refill the A/C system refrigerant.

Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

10. Connect the negative battery cable.

A/C Heat Pump System Valve Unit Remove

1. Remove the beauty cover.

Beauty Cover Remove

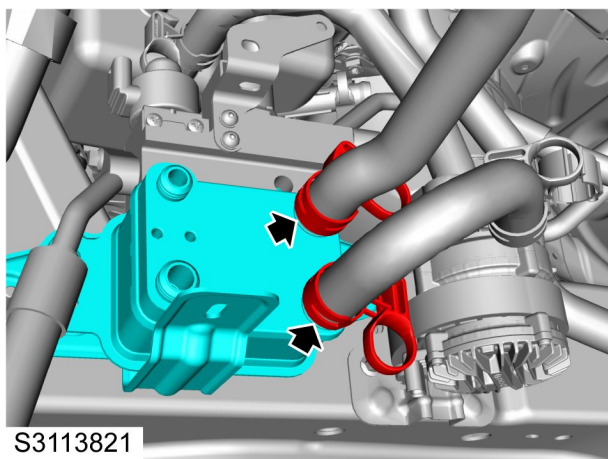
2. Drain the coolant.

Coolant Drain Refill

3. Remove the electronic expansion heating valve assembly.

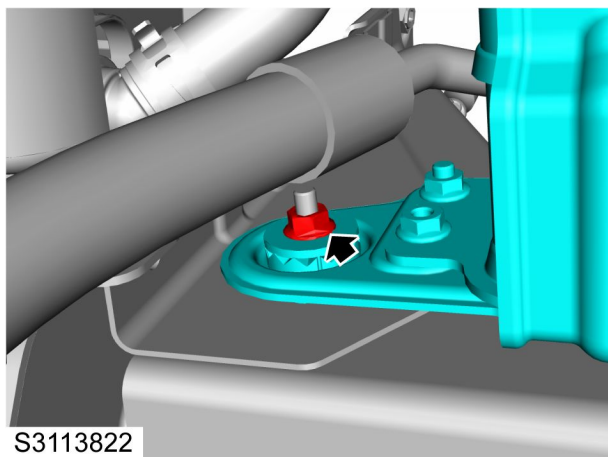
Electronic Expansion Heating Valve Remove

4. Loosen the clamp, and disconnect the A/C hose from the A/C heat pump system valve unit.

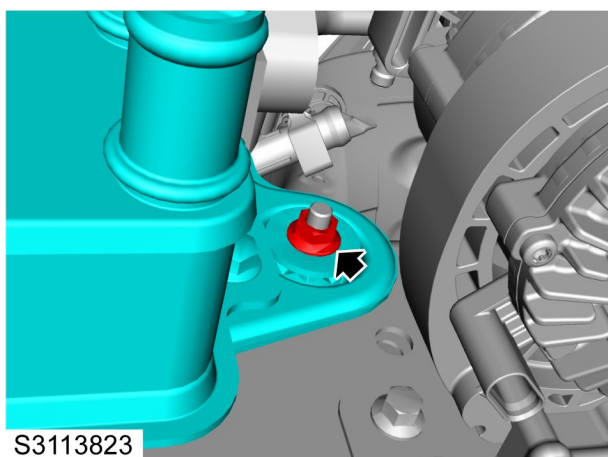


S3113821

5. Remove 2 nuts fixing the A/C heat pump system valve unit to the body.

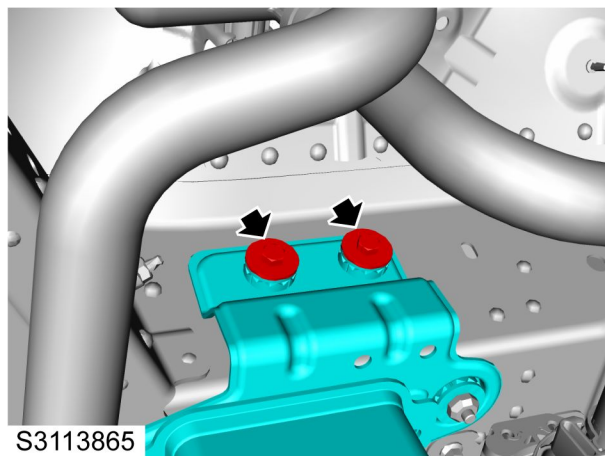


S3113822



S3113823

6. Remove 2 bolts fixing the A/C heat pump system valve unit to the body.



S3113865

安装

1. 将空调热泵系统阀集成模块固定到车身上，装上2个螺栓拧紧至 **7-10Nm**，并检查扭矩。
2. 将空调热泵系统阀集成模块固定到车身上，装上2个螺母拧紧至TBD，并检查扭矩。
3. 将空调管路的软管连接到空调热泵系统阀集成模块上，并用卡箍固定。
4. 装上电子膨胀制热阀。

电子膨胀制热阀

5. 加注冷却液。


冷却液

Electronic Expansion Bypass Valve Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

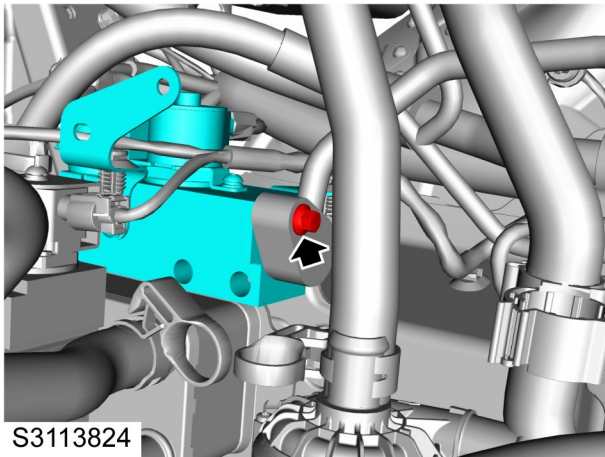
 **Beauty Cover Remove**

3. Drain the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

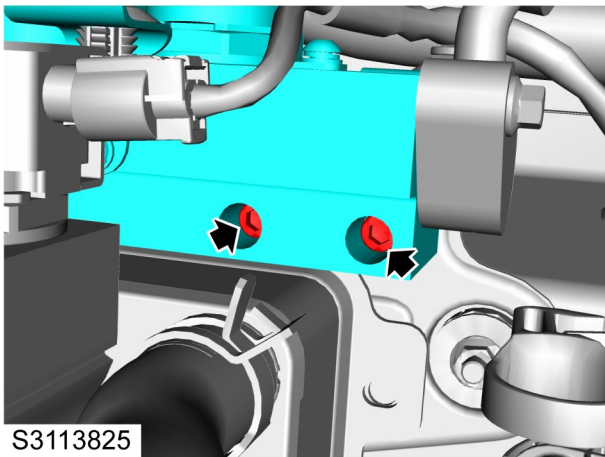
4. Remove 1 bolt fixing the A/C pipeline to the electronic expansion bypass valve assembly, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



S3113824

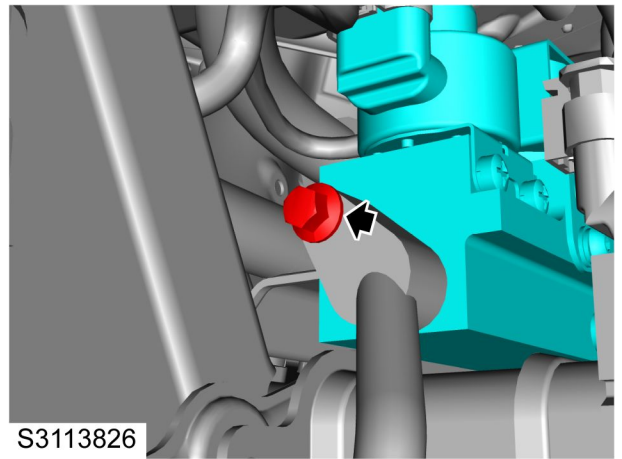
5. Remove 2 bolts fixing the electronic expansion bypass valve assembly to the bracket.



S3113825

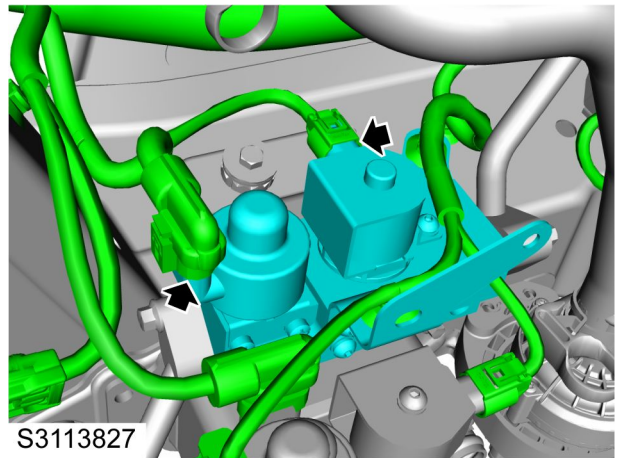
6. Remove 1 bolt fixing the A/C pipeline to the electronic expansion bypass valve assembly, disconnect the pipeline, and discard the seal ring.

Caution : *Protect the pollutants from entering the open joints.*



S3113826


7. Disconnect the harness connector of the electronic expansion bypass valve.




S3113827

Refit

1. Connect the harness connector of the electronic expansion bypass valve.
2. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
3. Fix the A/C pipeline to the electronic expansion bypass valve assembly, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Fix the electronic expansion bypass valve assembly to the bracket, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
5. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
6. Fix the A/C pipeline to the electronic expansion bypass valve assembly, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
7. Refill the A/C system refrigerant.

 **Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill**

8. Fit the beauty cover.
-  **Beauty Cover Refit**
9. Connect the negative battery cable.

Electronic Expansion Heating Valve Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

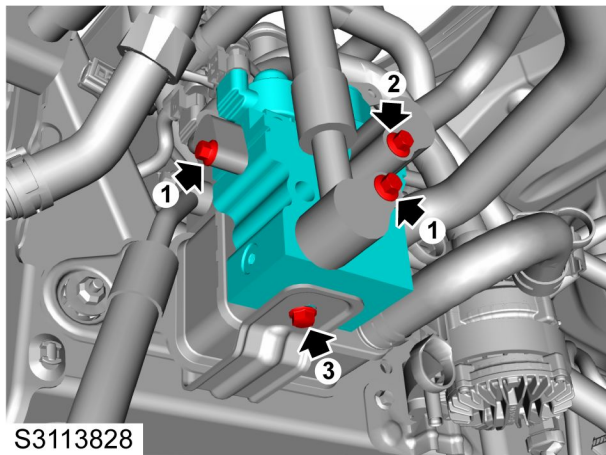
Beauty Cover Remove

3. Drain the A/C system refrigerant.

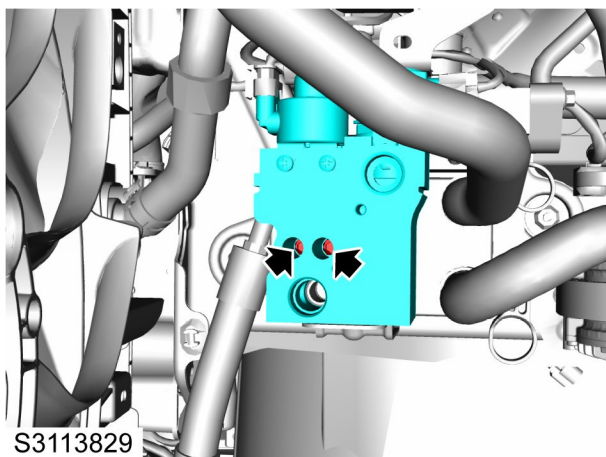
Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Remove 2 bolts (1) fixing the pipeline assembly - interior condenser to exterior condenser to the electronic expansion heating valve, disconnect the pipeline, and discard the seal ring.
5. Remove 1 bolt (2) fixing the pipeline assembly - A/C heat pump system valve unit to gas-liquid separator to the electronic expansion heating valve, disconnect the pipeline, and discard the seal ring.
6. Remove 1 bolt (3) fixing the electronic expansion heating valve to the bracket.

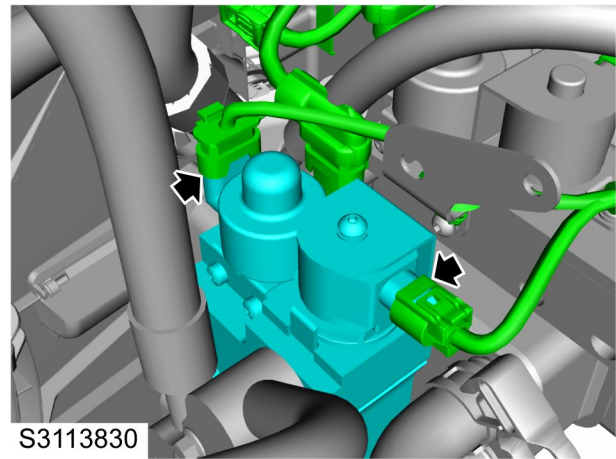
Caution : *Protect the pollutants from entering the open joints.*



7. Remove 2 bolts fixing the electronic expansion heating valve to the A/C heat pump system valve unit.



8. Disconnect the harness connector of the electronic expansion heating valve.



Refit

1. Connect the harness connector of the front electronic expansion heating valve.
2. Fix the electronic expansion heating valve to the A/C heat pump system valve unit, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
3. Fix the electronic expansion heating valve to the bracket, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
5. Fix the pipeline assembly - A/C heat pump system valve unit to gas-liquid separator to the electronic expansion heating valve, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Remove the plug, fit a new seal ring to the A/C pipeline, and apply clean compressor oil to it.
7. Fix the pipeline assembly - interior condenser to exterior condenser to the electronic expansion heating valve, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
8. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

9. Fit the beauty cover.

Beauty Cover Refit

10. Connect the negative battery cable.

A/C Refrigerant Temperature/Pressure Sensor Remove

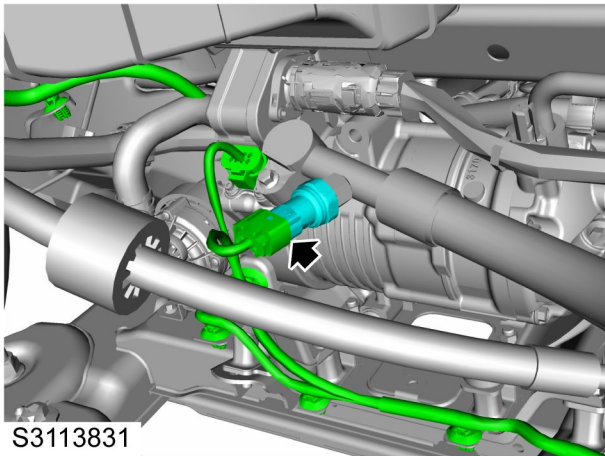
1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

3. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Disconnect the harness connector of the A/C refrigerant temperature and pressure sensor.



5. Remove the A/C refrigerant temperature and pressure sensor.

Refit

1. Fit the A/C refrigerant temperature and pressure sensor.
2. Connect the harness connectors of the A/C refrigerant temperature and pressure sensor.
3. Refill the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

4. Fit the beauty cover.

Beauty Cover Refit

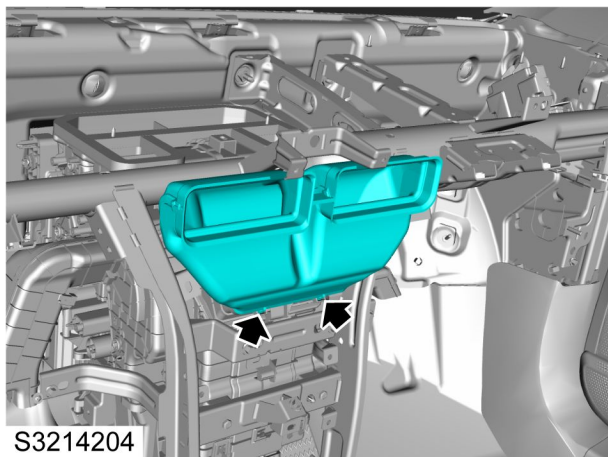
5. Connect the negative battery cable.

Service Guide - A/C Air Duct**Instrument Panel Air Duct - Middle
Remove - Middle**

1. Remove the instrument panel body assembly.

 **Instrument Panel Body Remove**

2. Loosen the clip, and remove the instrument panel air duct - centre.

**Refit - Middle**

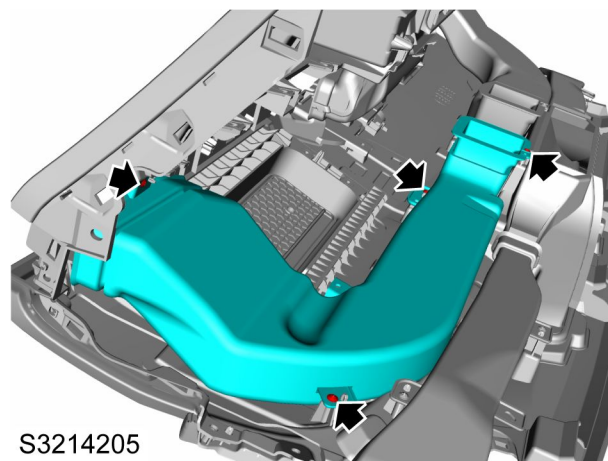
1. Fit the instrument panel air duct - middle and secure with clips.
2. Fit the instrument panel body assembly.

 **Instrument Panel Body Refit****Instrument Panel Air Duct - Left
Remove - Left**

1. Remove the instrument panel body assembly.

 **Instrument Panel Body Remove**

2. Remove 4 screws fixing the instrument panel air duct - left to the instrument panel body.

**Refit - Left**

1. Fix the instrument panel air duct - left to the instrument panel body, fit 4 screws and tighten them.
2. Fit the instrument panel body assembly.

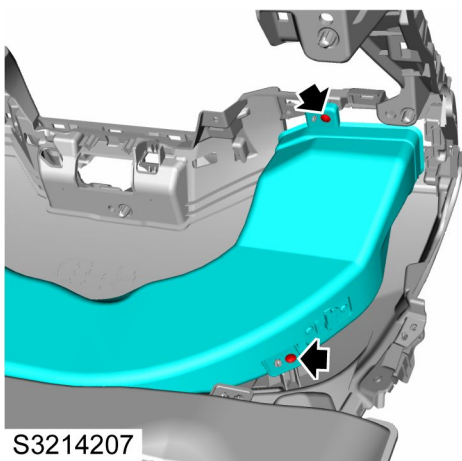
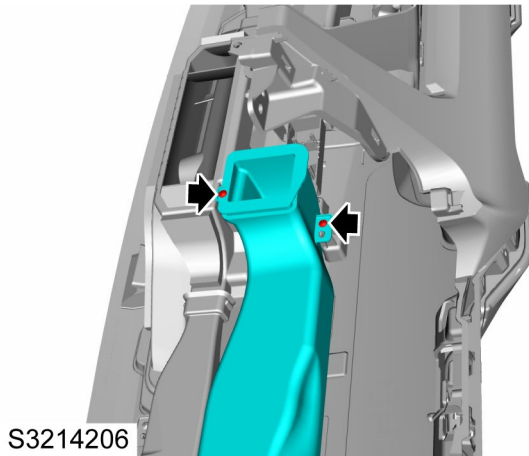
 **Instrument Panel Body Refit**

Instrument Panel Air Duct - Right Remove - Right

1. Remove the instrument panel body assembly.

Instrument Panel Body Remove

2. Remove 4 screws fixing the instrument panel air duct - right to the instrument panel body.



Refit - Right

1. Fix the instrument panel air duct - right to the instrument panel body, fit 4 screws and tighten them.
2. Fit the instrument panel body assembly.

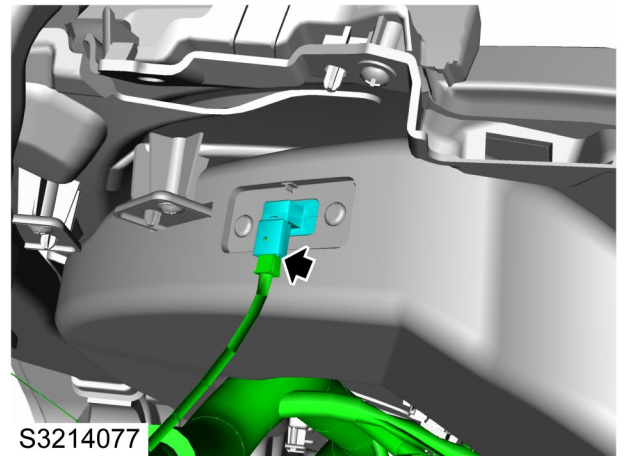
Instrument Panel Body Refit

A/C Box Air Outlet Temperature Sensor Remove

1. Remove the instrument panel body assembly.

Instrument Panel Body Remove

2. Disconnect the harness connector of the face air outlet temperature sensor.



3. Release the clip, and remove the face air out temperature sensor.

Refit

1. Fit the face air outlet temperature sensor and secure it with clips.
2. Connect the harness connector of the face air outlet temperature sensor.
3. Fit the instrument panel body assembly.

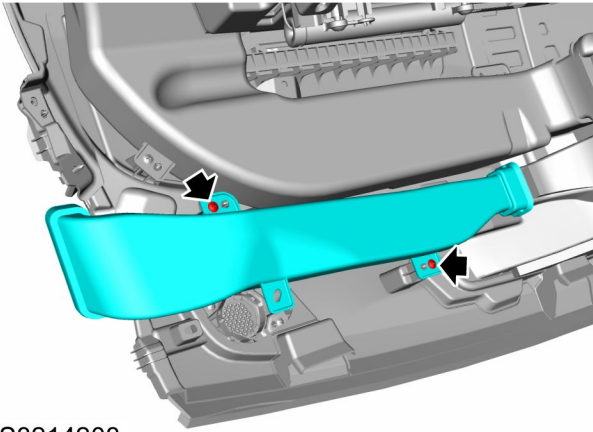
Instrument Panel Body Refit

Defrost Air Duct - Left Remove - Left

1. Remove the instrument panel body assembly.

Instrument Panel Body Remove

2. Remove 2 screws fixing the defrost air duct - left to the instrument panel body.



S3214208

Refit - Left

1. Fix the defrost air duct - left to the instrument panel body, fit 2 screws and tighten them.
2. Fit the instrument panel body assembly.

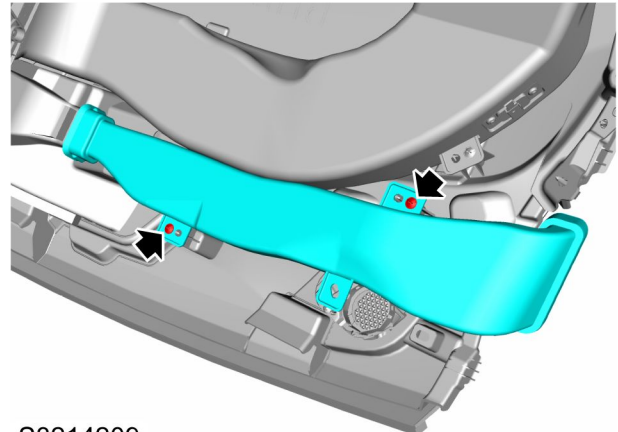
Instrument Panel Body Refit

Defrost Air Duct - Right Remove - Right

1. Remove the instrument panel body assembly.

Instrument Panel Body Remove

2. Remove 2 screws fixing the defrost air duct - right to the instrument panel body.



S3214209

Refit - Right

1. Fix the defrost air duct - right to the instrument panel body, fit 2 screws and tighten them.
2. Fit the instrument panel body assembly.

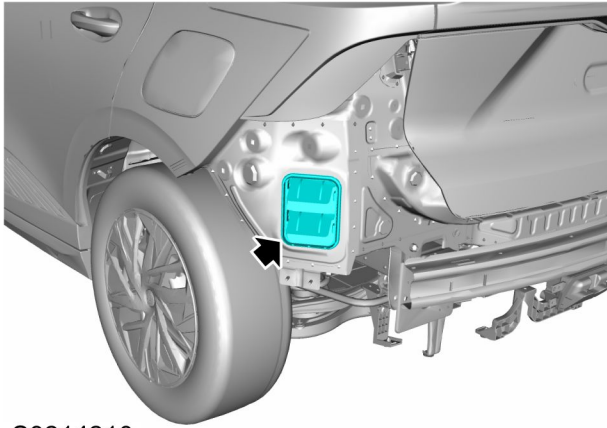
Instrument Panel Body Refit

Body Air Outlet Deflector Assembly Remove

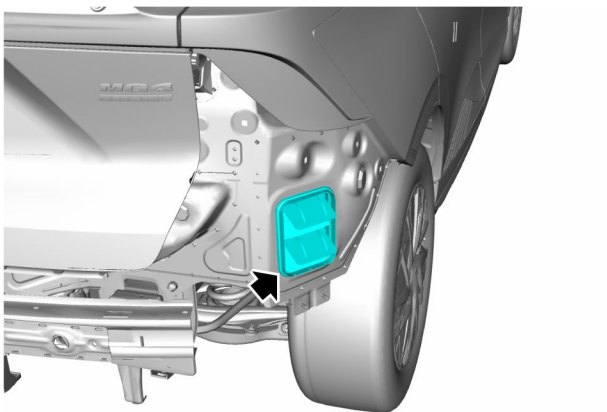
1. Remove the rear bumper assembly.

Rear Bumper Remove

2. Loosen the clip, and remove the body air outlet deflector.



S3214210



S3214211

Refit

1. Fit the body air outlet deflector, and secure with clips.
2. Fit the rear bumper assembly.

Rear Bumper Refit

Service Guide - A/C Air Inlet Box

A/C Box Air Inlet Box Remove

1. Disconnect the negative battery cable.
2. Remove the beauty cover.

Beauty Cover Remove

3. Drain the coolant.

Coolant Drain Refill

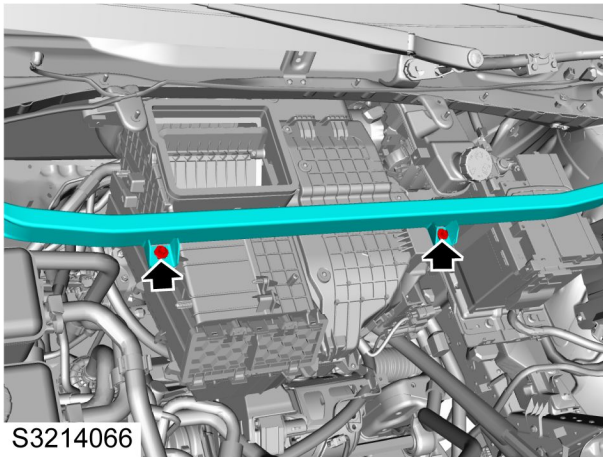
4. Drain the A/C system refrigerant.

Refrigerant Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

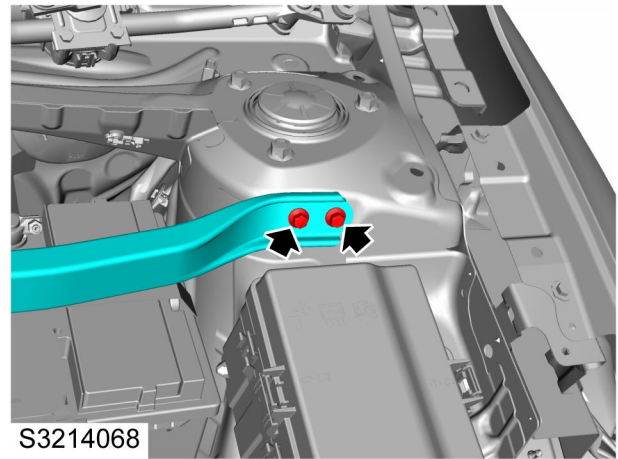
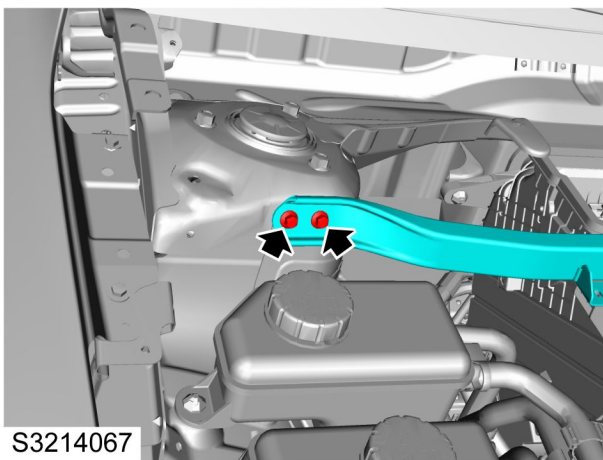
5. Remove the air inlet grille assembly.

Air Inlet Grille Remove

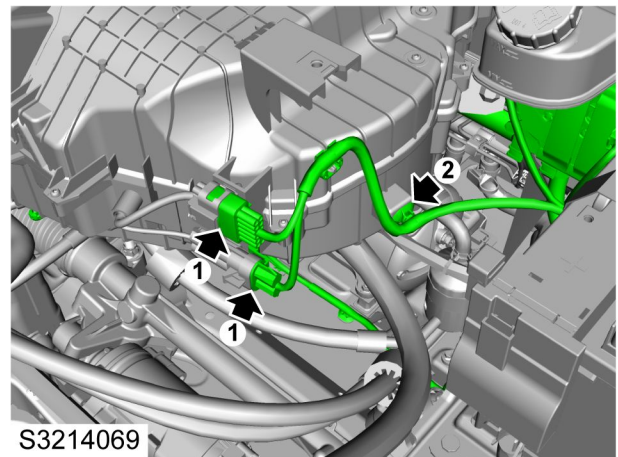
6. Remove 2 bolts fixing the A/C air inlet box upper bracket to the A/C air inlet box.



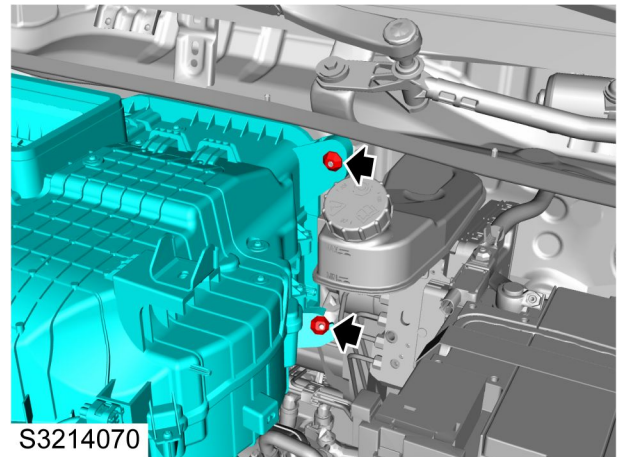
7. Remove 4 bolts fixing the A/C air inlet box upper bracket to the body.

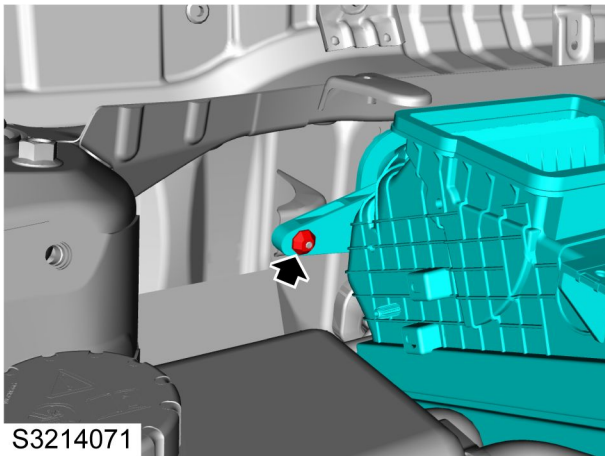


8. Disconnect the harness connector (1) from the blower, and remove the clip.



9. Remove 3 nuts fixing the A/C air inlet box to the body.





S3214071

Refit

1. Fix the A/C air inlet box to the body, fit 3 nuts, tighten them to **7-10Nm**, and check the torque.
2. Connect the harness connector of the blower, and secure it with clips.
3. Fix the A/C air inlet box upper bracket to the body, fit 4 bolts, tighten them to **7-10Nm**, and check the torque.
4. Fix the A/C air inlet box upper bracket to the A/C air inlet box, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
5. Fit the air inlet grille assembly.

👉 Air Inlet Grille Refit

6. Refill the A/C system refrigerant.

👉 Refrigerant Refill
Refrigerant Recovery Air Conditioning System Drain A/C System Lubricating Oil Refill Refill

7. Refill the coolant.

👉 Coolant Drain Refill

8. Connect the negative battery cable.
9. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

👉 Heating, Ventilation and Air Conditioning (HVAC)**A/C Box Air Inlet Box Harness Remove**

1. Remove the blower assembly.

👉 Blower Assembly Remove

2. Loosen the clips and remove the A/C air inlet box harness.

Refit

1. Fit the A/C air inlet box harness and secure it with clips.
2. Refit the blower assembly.

👉 Blower Assembly Refit

A/C Filter Element Remove

1. Remove the A/C filter element cover.

A/C filter element cover Remove

2. Take out the A/C filter element.

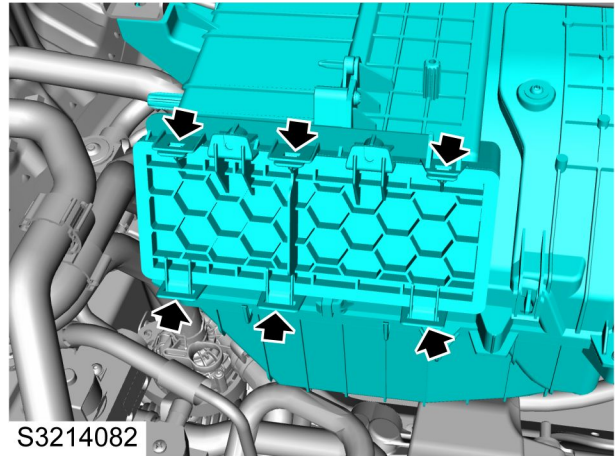
Refit

1. Fit the A/C filter element into the A/C air inlet box.
2. Fit the A/C filter element cover.

A/C Filter Element Cover Refit

A/C Filter Element Cover Remove

1. Disconnect the negative battery cable.
2. Loosen the clip, and remove the A/C filter element cover.



Refit

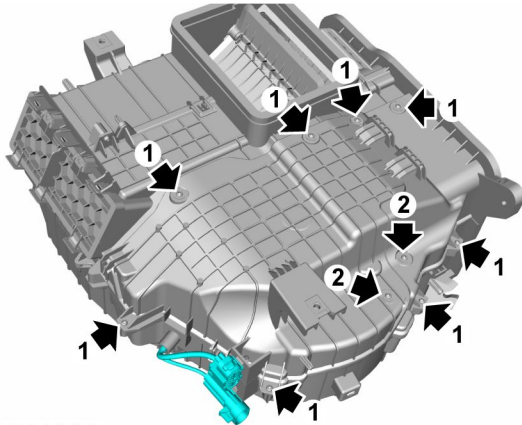
1. Fit the A/C filter element cover and secure it with clips.
2. Connect the negative battery cable.

**Blower
Remove**

1. Remove the A/C air inlet box.

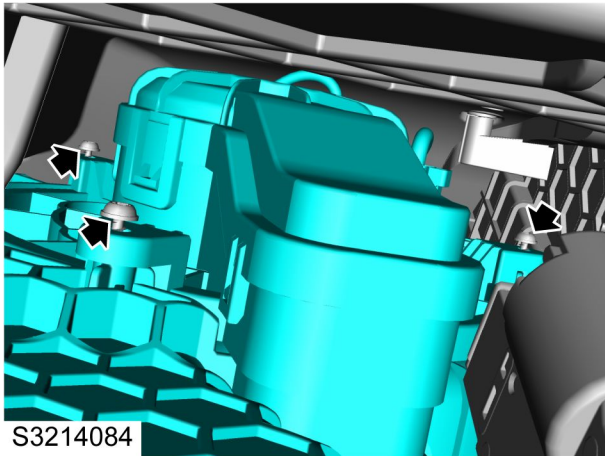
 **A/C Air Inlet Box Remove**

2. Remove 8 screws (1) fixing the upper part of A/C air inlet box to the lower part of A/C box.
3. Remove 2 screws (2) fixing the upper part of A/C air inlet box to the blower.



S3214083

4. Remove 3 screws fixing the blower to the A/C air inlet box.



S3214084

5. Loosen the clip and remove the blower.

Refit

1. Fix the blower to the A/C air inlet box and secure it with clips.
2. Fix the blower to the A/C air inlet box, fit and tighten 3 screws.
3. Fix the upper part of A/C air inlet box to the blower, fit and tighten 2 screws.
4. Fix the upper part of A/C air inlet box to the lower part of A/C box, fit and tighten 8 screws.
5. Fit the A/C air inlet box.

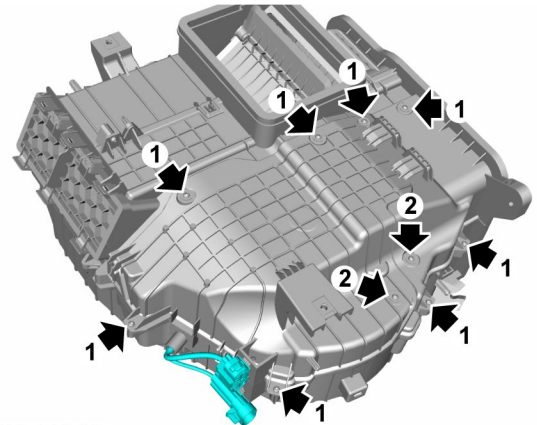
 **A/C Air Inlet Box Refit**

**Blower Speed Regulation Resistor
Remove**

1. Remove the air inlet box.

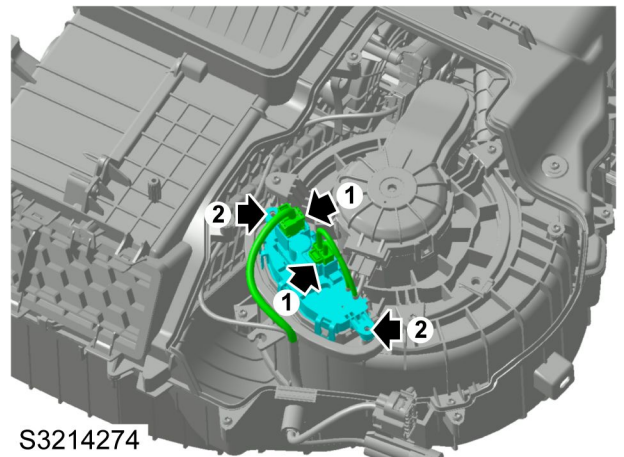
 **air inlet box Remove**

2. Remove the 8 screws (1) securing the upper part of the air inlet box to the lower part of the air conditioner box.
3. Remove the 2 screws (2) that secure the upper part of the air intake box to the blower.



S3214083

4. Disconnect the connector (1) on the blower speed control resistor.
5. Remove the 2 screws (2) that secure the blower speed control resistor to the air intake box of the air conditioner box.



S3214274

6. Loosen the buckle and remove the blower speed control resistor.

Refit

1. Install the blower speed regulating resistor and fix it with a clip.
2. Fix the blower speed regulating resistance to the air inlet box, fix 2 screws and tighten them.
3. Connect the connector on the blower speed control resistor.
4. Fix the upper part of the air inlet box to the blower, install 2 screws and tighten.

5. Fix the upper part of the air inlet box to the lower part of the air conditioner box, install 8 screws and tighten them.
6. Fix the air inlet box.

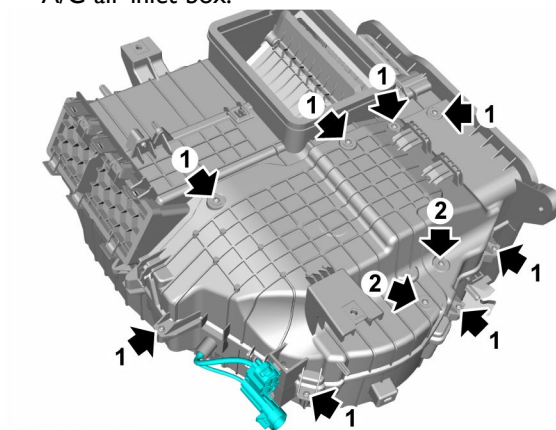
 **air inlet box Refit**

Internal/External Recirculated Damper Actuator Remove

1. Remove the A/C air inlet box.

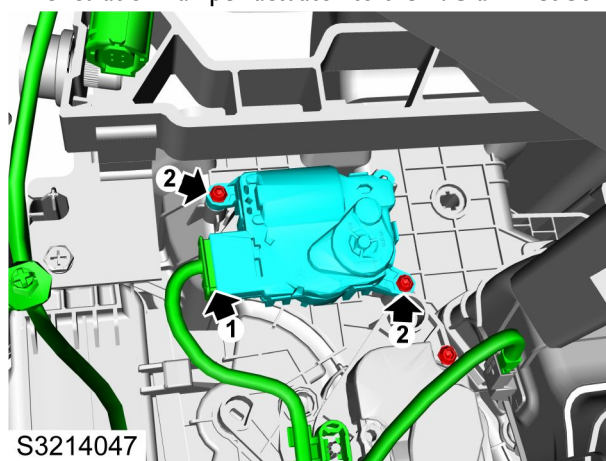
A/C Air Inlet Box

2. Remove 8 screws (1) fixing the upper part of A/C air inlet box to the lower part of A/C box.
3. Remove 2 screws (2) fixing the upper part of A/C air inlet box to the blower, and remove the upper part of A/C air inlet box.



S3214083

4. Disconnect the harness connector (1) from the internal/external circulation damper actuator.
5. Remove 2 screws (2) fixing the internal/external circulation damper actuator to the A/C air inlet box.



S3214047

6. Disconnect the internal/external circulation damper actuator from the internal/external circulation damper linkage mechanism and remove the internal/external circulation damper actuator.

Refit

1. Fit the internal/external circulation damper actuator, and connect the internal/external circulation damper actuator to the internal/external circulation damper linkage mechanism.
2. Fix the internal/external circulation damper actuator to the A/C air inlet box, fit and tighten 2 screws.
3. Connect the harness connector of the internal/external

circulation damper actuator.

4. Fix the upper part of A/C air inlet box to the blower, fit and tighten 2 screws.
5. Fix the upper part of A/C air inlet box to the lower part of A/C box, fit and tighten 8 screws.
6. Fit the A/C air inlet box.

A/C Air Inlet Box

7. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

Service Guide - A/C Distribution Box

A/C Distribution Box

Remove

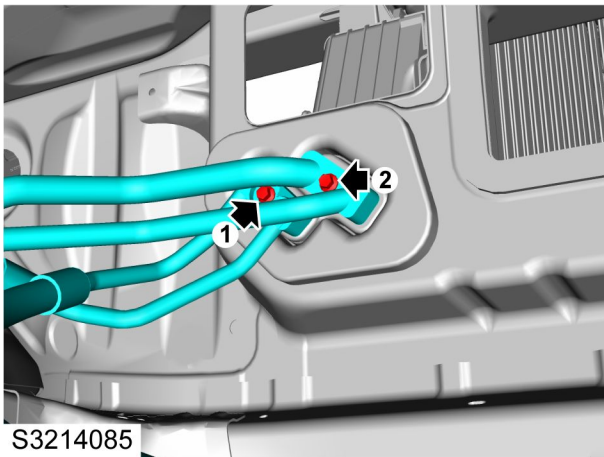
1. Remove the A/C air inlet box assembly.

A/C Air Inlet Box Remove

2. Remove the instrument panel beam assembly.

Instrument Panel Beam Remove

3. Disconnect the connector from the A/C distribution box.
4. Remove 1 bolt (1) fixing the pipeline assembly - internal condenser to external condenser to the front interior A/C, disconnect the pipeline, and discard the seal ring.
5. Remove 1 bolt (2) fixing the evaporator pipe assembly to the front interior A/C, disconnect the pipeline, and discard the seal ring.



6. Loosen the clip and remove the A/C distribution box from the vehicle.

Refit

1. Fix the A/C distribution box to the body and secure with clips.
2. Remove the plug, fit a new seal ring on the A/C pipe, and apply clean compressor oil.
3. Fix the evaporator pipe assembly to the front interior A/C, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
4. Remove the plug, fit a new seal ring on the A/C pipe, and apply clean compressor oil.
5. Fix the pipeline assembly - interior condenser to exterior condenser to the front interior A/C, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Connect the connector to the A/C distribution box.
7. Fit the instrument panel beam assembly.

Instrument Panel beam Refit

8. Fit the A/C air inlet box assembly.

A/C Air Inlet Box Refit

9. Perform a self-learning for the A/C damper actuator.

Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

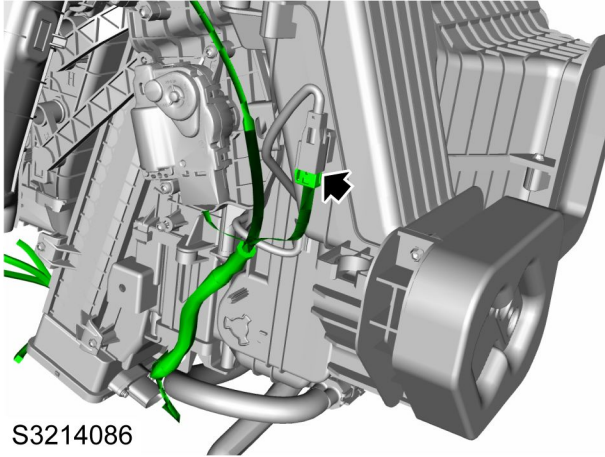
Heating, Ventilation and Air Conditioning (HVAC)

Evaporator Assembly Remove

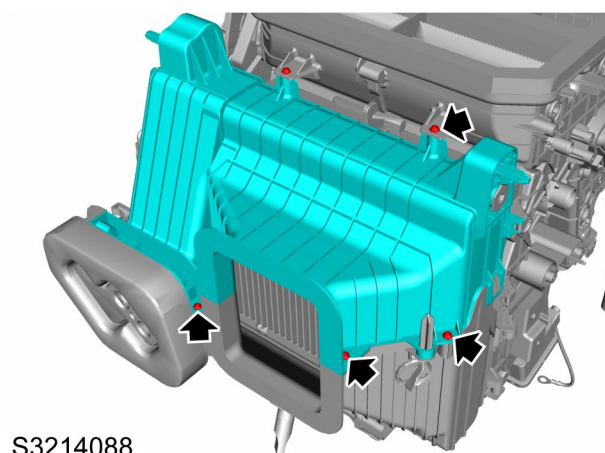
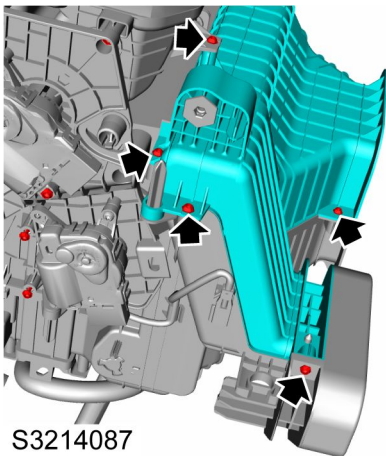
1. Remove the A/C distribution box.

A/C Distribution Box Remove

2. Disconnect the harness connector from the evaporator temperature sensor.



3. Remove 9 screws fixing the front part of A/C distribution box to the A/C distribution box.



4. Remove the front part of A/C distribution box, and pull out the evaporator assembly.

Refit

1. Fix the evaporator assembly to the A/C distribution box.

2. Fix the front part of A/C distribution box to the A/C distribution box, fit and tighten 9 screws.
3. Connect the harness connector to the evaporator temperature sensor.

4. Fit the A/C distribution box.

A/C Distribution Box Refit

5. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

Heating, Ventilation and Air Conditioning (HVAC)

Electric Heater Remove

1. Remove the centre console heater closure panel assembly.

Centre Console Heater Closure Panel Assembly Remove

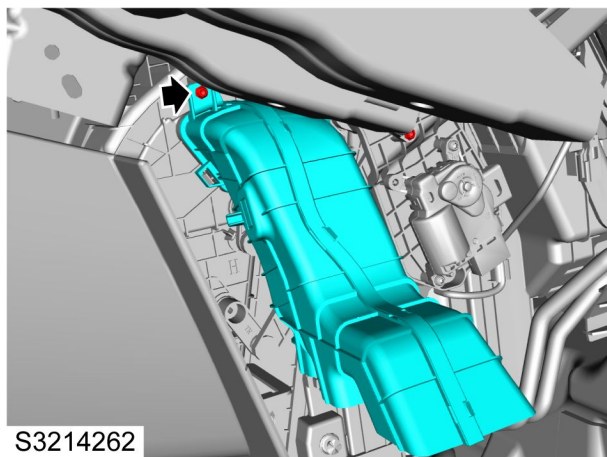
2. Remove the glove box assembly.

Glove Box Assembly Remove

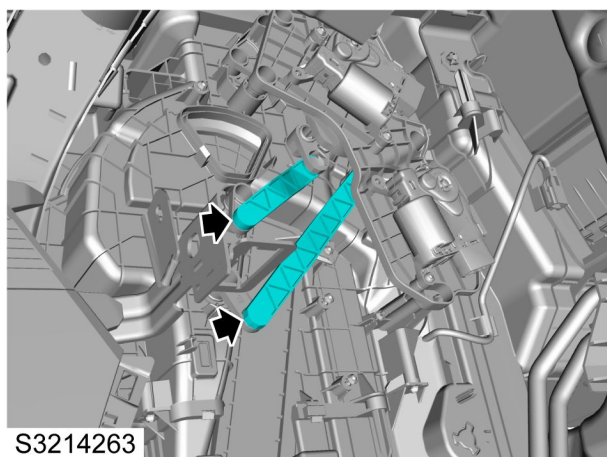
3. Remove the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Remove

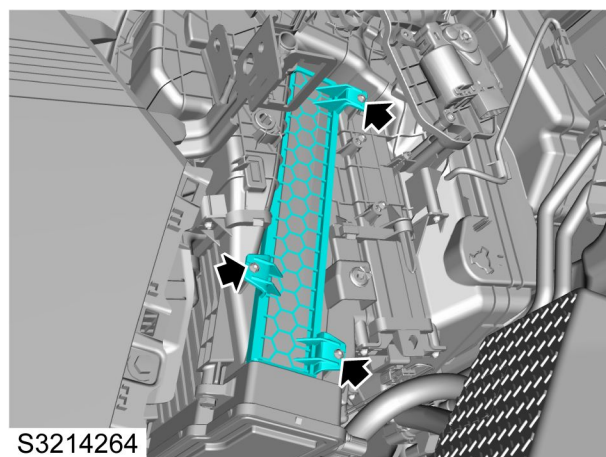
4. Remove 1 screw fixing the driver side footwell air duct to the A/C box.



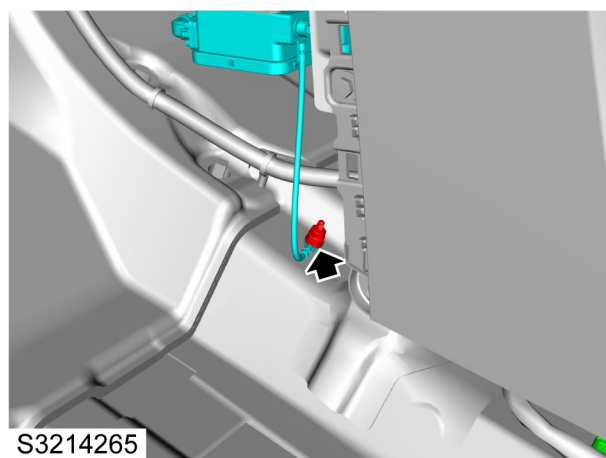
5. Disconnect the connector from the A/C box.



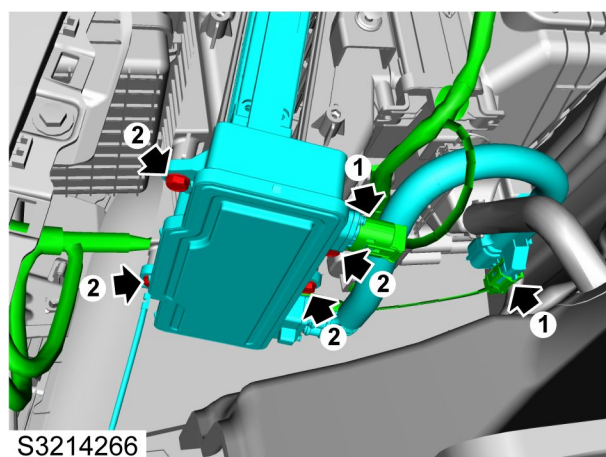
6. Remove 3 screws fixing the A/C box side bulkhead to the A/C box.



7. Lift the carpet, and remove the nut of the electric heater grounding wire.



8. Disconnect the harness connector (1) from the electric heater.
9. Remove 4 bolts (2) fixing the electric heater to the lower part of A/C distribution box.



Refit

1. Fix the electric heater to the lower part of A/C distribution box, fit 4 bolts, tighten them to **2.5Nm**, and check the torque.
2. Connect the harness connector to the electric heater.
3. Fit the nut of the electric heater grounding wire, tighten it to **7-10Nm**, check the torque, and restore the

carpet.

4. Fix the A/C box side bulkhead to the A/C box, fit and tighten 3 screws.
5. Connect the connector of the A/C box.
6. Fix the driver side footwell air duct to the A/C box, fit and tighten 1 screw.
7. Fit the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Refit

8. Fit the glove box assembly.

Glove Box Assembly Refit

9. Fit the centre console heater closure panel assembly.

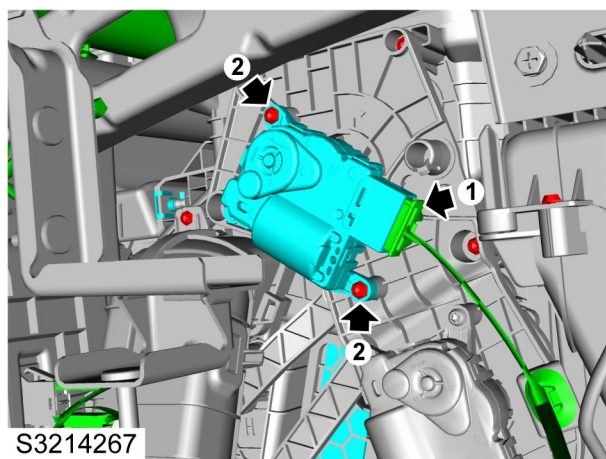
Centre Console Heater Closure Panel Assembly Refit

Mode Damper Actuator Remove

1. Disconnect the negative battery cable.
2. Remove the driver side instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Remove

3. Disconnect the harness connector (1) from the mode damper actuator.
4. Remove 2 screws (2) fixing the mode damper actuator to the A/C distribution box.



5. Disconnect the mode damper actuator from the mode damper linkage mechanism and remove the mode damper actuator.

Refit

1. Connect the mode damper actuator and the mode damper linkage mechanism.
2. Fix the mode damper actuator to the A/C distribution box, fit and tighten 2 screws.
3. Connect the harness connector to the internal/external circulation damper actuator.
4. Fit the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Refit

5. Connect the negative battery cable.
6. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

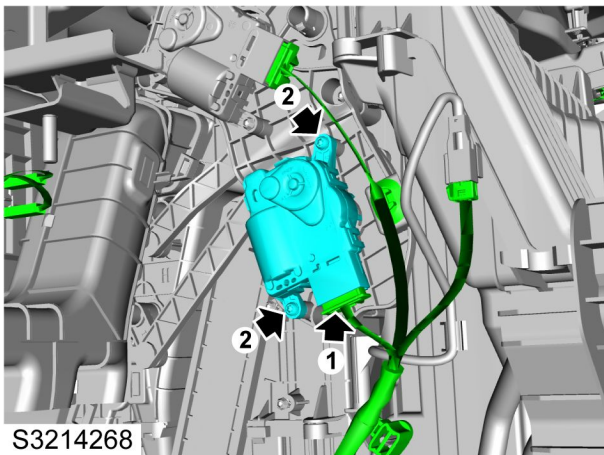
Heating, Ventilation and Air Conditioning (HVAC)

Temperature Damper Actuator Remove

1. Disconnect the negative battery cable.
2. Remove the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Remove

3. Disconnect the harness connector (1) from the temperature damper actuator.
4. Remove 2 screws (2) fixing the temperature damper actuator to the A/C distribution box.



5. Disconnect the temperature damper actuator from the temperature damper linkage mechanism and remove the temperature damper actuator.

Refit

1. Fit the temperature damper actuator.
2. Connect the actuator and linkage mechanism of the temperature damper.
3. Fix the temperature damper actuator to the A/C distribution box, fit and tighten 2 screws.
4. Connect the harness connector to the temperature damper actuator.
5. Fit the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Refit

6. Connect the negative battery cable.
7. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

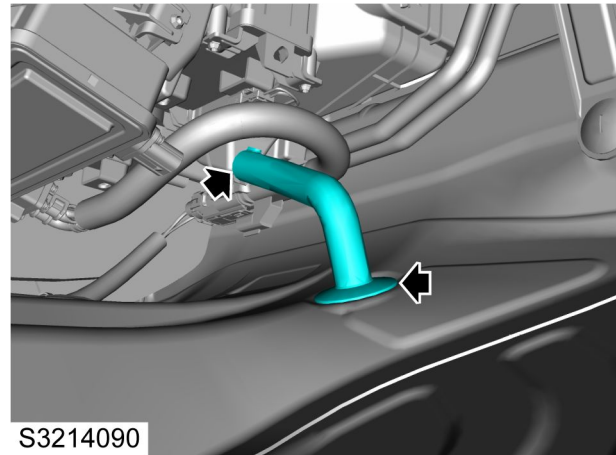
Heating, Ventilation and Air Conditioning (HVAC)

Drain Pipe Remove

1. Disconnect the negative battery cable.
2. Remove the passenger side heater closure panel assembly.

Centre Console Heater Closure Panel Assembly Remove

3. Lift the carpet.
4. Loosen the clips and remove the drain pipe.



Refit

1. Fit the drain pipe and secure with clips.
2. Restore the carpet.
3. Fit the passenger side heater closure panel assembly.

Centre Console Heater Closure Panel Assembly Refit

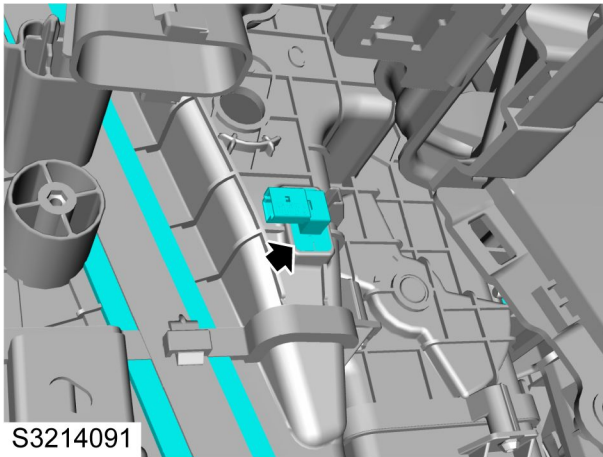
4. Connect the negative battery cable.

PTC Temperature Sensor Remove

1. Disconnect the negative battery cable.
2. Remove the driver side heater closure panel.

Centre Console Heater Closure Panel Assembly Remove

3. Disconnect the harness connector from the PTC temperature sensor.
4. Remove the PTC temperature sensor.



Refit

1. Fit the PTC temperature sensor.
2. Connect the harness connector of the PTC temperature sensor.
3. Fit the passenger side heater closure panel assembly.

Centre Console Heater Closure Panel Assembly Refit

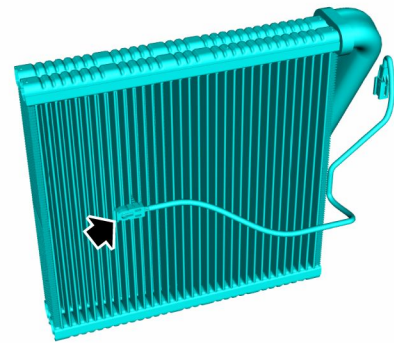
4. Connect the negative battery cable.

Evaporator Temperature Sensor Remove

1. Remove the evaporator assembly.

Evaporator Assembly Remove

2. Remove the evaporator temperature sensor.



S3214092

Refit

1. Fit the evaporator temperature sensor.
2. Fit the evaporator assembly.

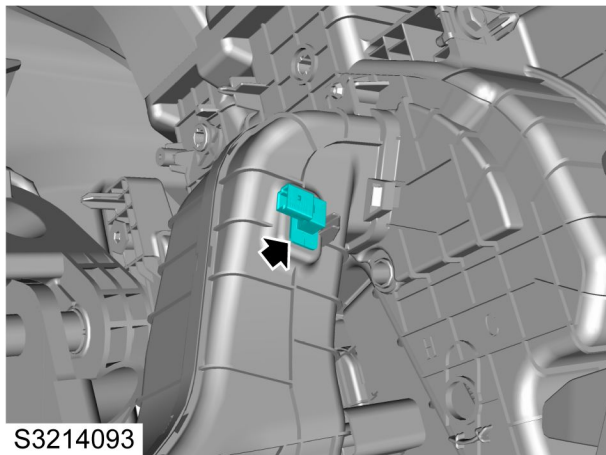
Evaporator Assembly Refit

Footwell Air Outlet Temperature Sensor Remove

1. Disconnect the negative battery cable.
2. Remove the driver side lower closure panel assembly.

 **Instrument Panel Lower Closure Panel Assembly Remove**

3. Disconnect the harness connector from the face air outlet temperature sensor.
4. Loosen the clip and remove the left footwell air outlet temperature sensor.



Refit

1. Fit the footwell air outlet temperature sensor and secure with clips.
2. Connect the harness connector of the footwell air outlet temperature sensor.
3. Fit the driver side lower closure panel assembly.

 **Instrument Panel Lower Closure Panel Assembly Refit**

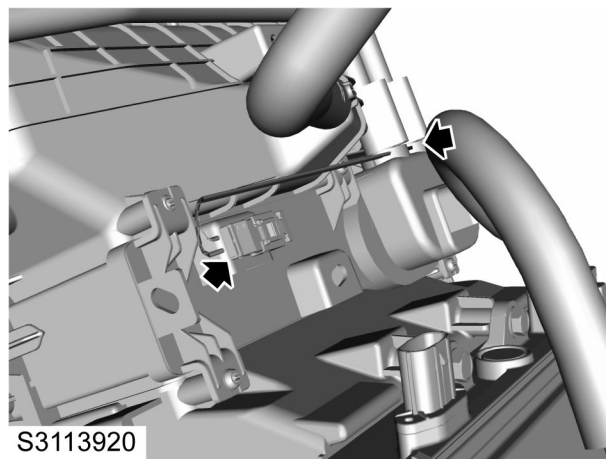
4. Connect the negative battery cable.

A/C Internal Condenser Sensor Repair Kit Remove

1. Remove the A/C distribution box.

 **A/C distribution box Remove**

2. Remove the air conditioner in-condenser sensor repair kit.



Refit

1. Install the air conditioner inner condenser sensor repair kit.
2. Install the A/C distribution box.

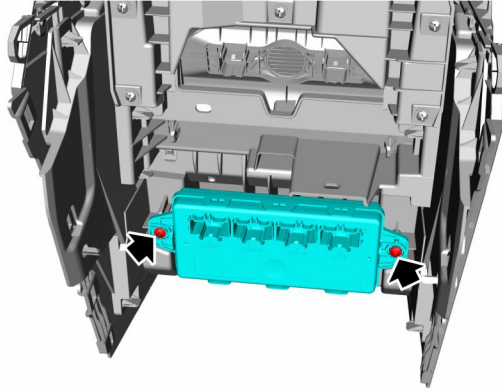
 **A/C distribution box Refit**

**Service Guide - Control Related
HVAC Control Module Assembly
Remove**

1. Remove the centre console assembly.

 **Centre Console Assembly Remove**

2. Remove 2 screws fixing the A/C controller to the centre console assembly.




S3214212

Refit

1. Fix the A/C controller to the centre console assembly, fit and tighten 2 screws.
2. Fit the centre console assembly.

 **Centre Console Assembly Refit**

3. Perform a self-learning for the A/C damper actuator. Refer to Module Self-learning and Programming Manual, "HVAC Control Module".

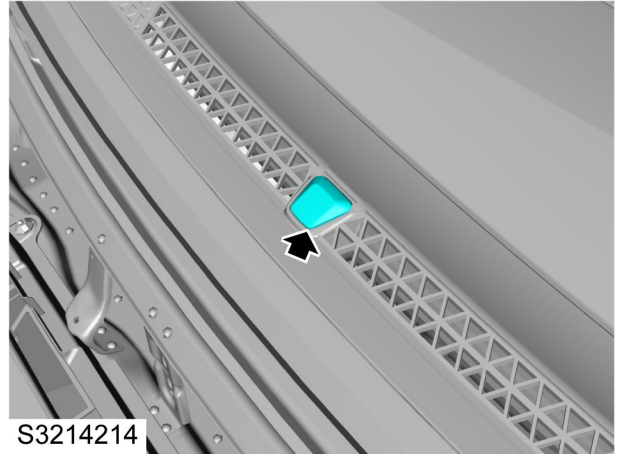
 **Heating, Ventilation and Air Conditioning (HVAC)**

**Solar and Headlamp Auto Lighting Sensor
Assembly
Remove**

1. Remove the instrument panel body assembly.

 **Instrument Panel Body Remove**

2. Loosen the clip and remove the solar & headlamp auto lighting sensor assembly.



S3214214

Refit

1. Fit the solar & headlamp auto lighting sensor assembly and secure with clips.
2. Fit the instrument panel body assembly.

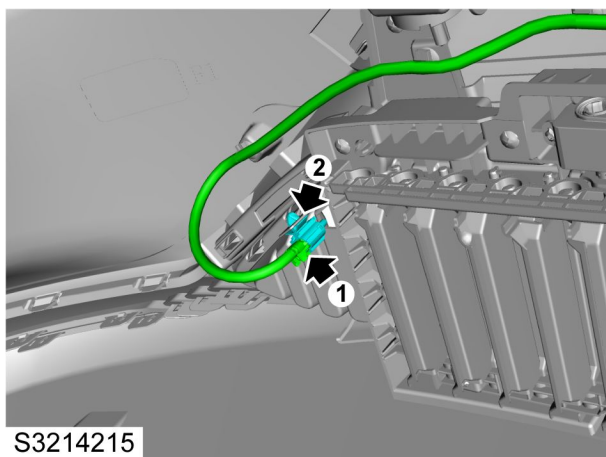
 **Instrument Panel Body Refit**

Ambient Temperature Sensor Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper assembly.

 **Front Bumper Remove**

3. Disconnect the connector of the ambient temperature sensor (1).
4. Loosen the clip (2) and remove the ambient temperature sensor.



Refit

1. Fit the ambient temperature sensor and secure with clips.
2. Connect the connector of the ambient temperature sensor.
3. Fit the front bumper assembly.

 **Front Bumper Refit**

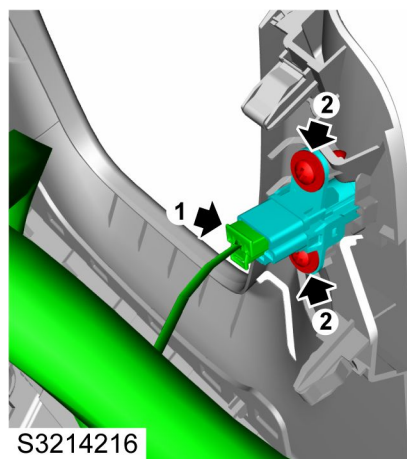
4. Connect the negative battery cable.

Interior Temperature Sensor Remove

1. Remove the driver side knee baffle assembly.

 **Driver Side Knee Baffle Assembly Remove**

2. Disconnect the harness connector (1) from the interior temperature sensor.
3. Remove 2 screws (2) fixing the interior temperature sensor to the steering column shield.



4. Loosen the clip and remove the interior temperature sensor.

Refit

1. Fit the interior temperature sensor and secure with clips.
2. Fit 2 screws fixing the interior temperature sensor to the steering column shield, and tighten them.
3. Connect the harness connector of the interior temperature sensor.
4. Fit the driver side knee baffle assembly.

 **Driver Side Knee Baffle Assembly Refit**

Steering System

Specification

Torque

Description	Value
Bolt&Nut-Steering gear to front subframe	63-77Nm+ (175°-185°)
Bolt-Front subframe to body	(135-165) Nm+ (85-95) °
Bolt-front buffer bar to front subframe	19-25Nm
Bolt&Nut-Front lower control arm outer tie rod to front lower control arm	81-99Nm+(85°-95°)
Bolt-Steering column intermediate shaft to steering gear	18-22Nm+ (115°-125°)
Nut-left steering rack locking nut	63-73Nm
Nut-Steering rack to steering knuckle	31.5-38.5Nm+ (30°-45°)
Steering inner tie rod-Steering inner tie rod to steering gear	100-110Nm
Bolt-Steering column to facia framework	19-25Nm
Bolt-Steering column intermediate shaft to upper steering column	26-34Nm
Bolt-Steering column intermediate shaft to bracket	4-6Nm
Nut-right steering rack locking nut	63-73Nm
Nut-Extenal lever adjustment	63-73Nm
Blot-steering wheel to steering column	60-70Nm
Bolt-Damper to steering wheel	6.3-7.3Nm
Screw-Clock spring to Steering column	5-6Nm

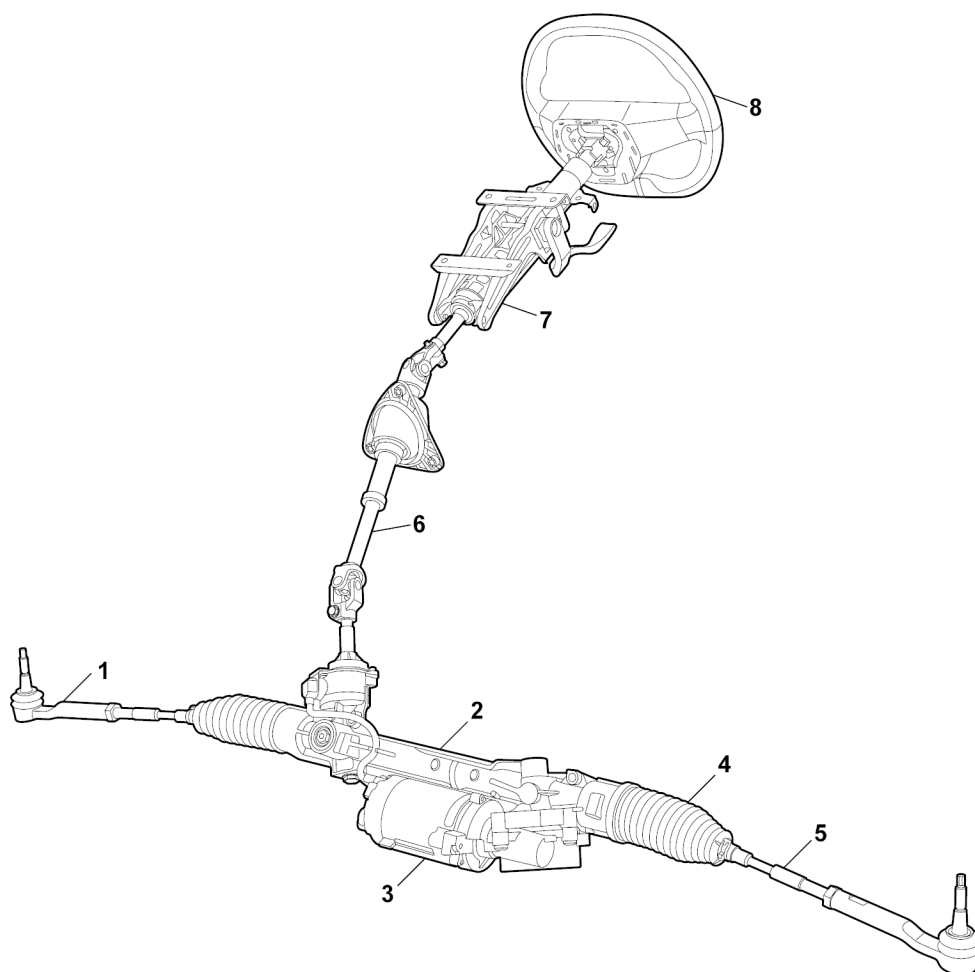
Parameters

Type	Rack Electric Power Steering System
Steering Column Model:	Four-way Adjustable Energy-Absorbing Steering Column
Diameter of steering wheel	372.2mm
Revolution of Steering Wheel	2WD-1.44
	4WD-1.28

Description and Operation

System Layout

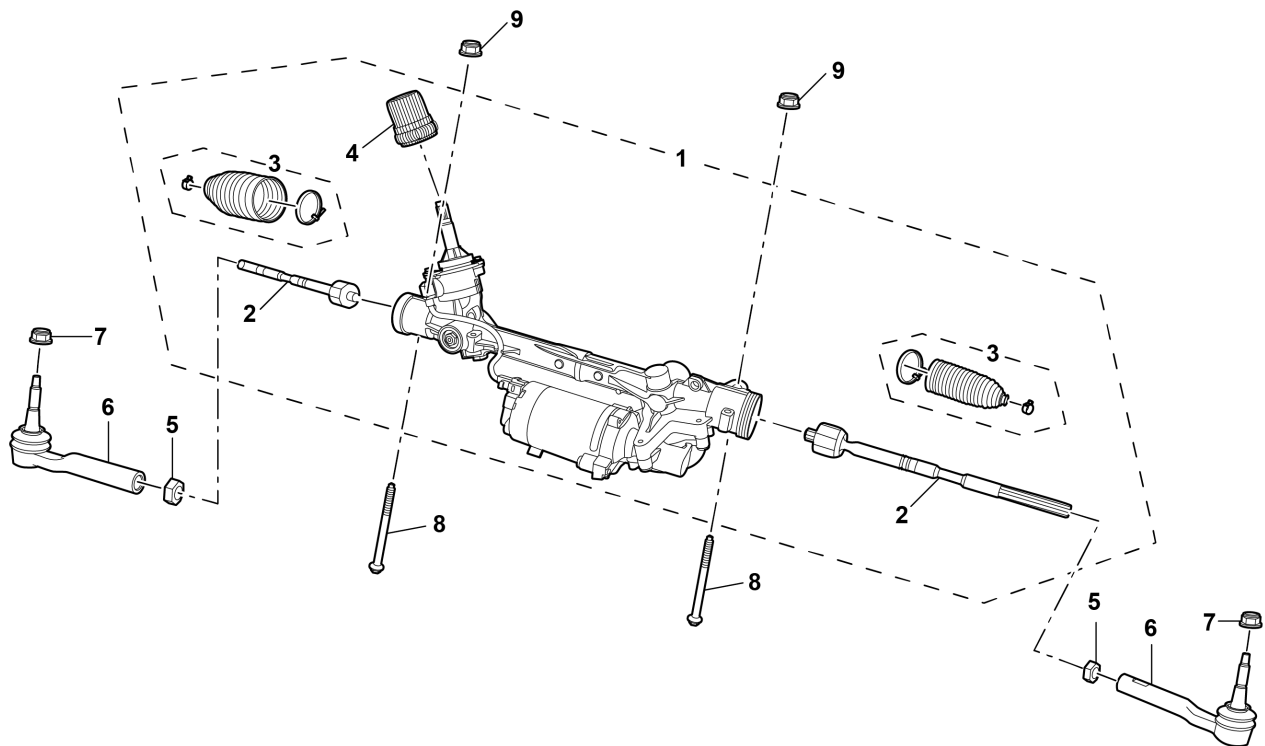
Steering System Component Layout



S2111278

- | | |
|--------------------------------|--------------------------------|
| 1. Steering Gear Outer Tie Rod | 5. Steering Gear Inner Tie Rod |
| 2. Steering Gear Subassembly | 6. Steering Intermediate Shaft |
| 3. Steering Motor | 7. Steering Column |
| 4. Steering Gear Boot | 8. Steering Wheel |

Steering Gear Assembly Component Layout

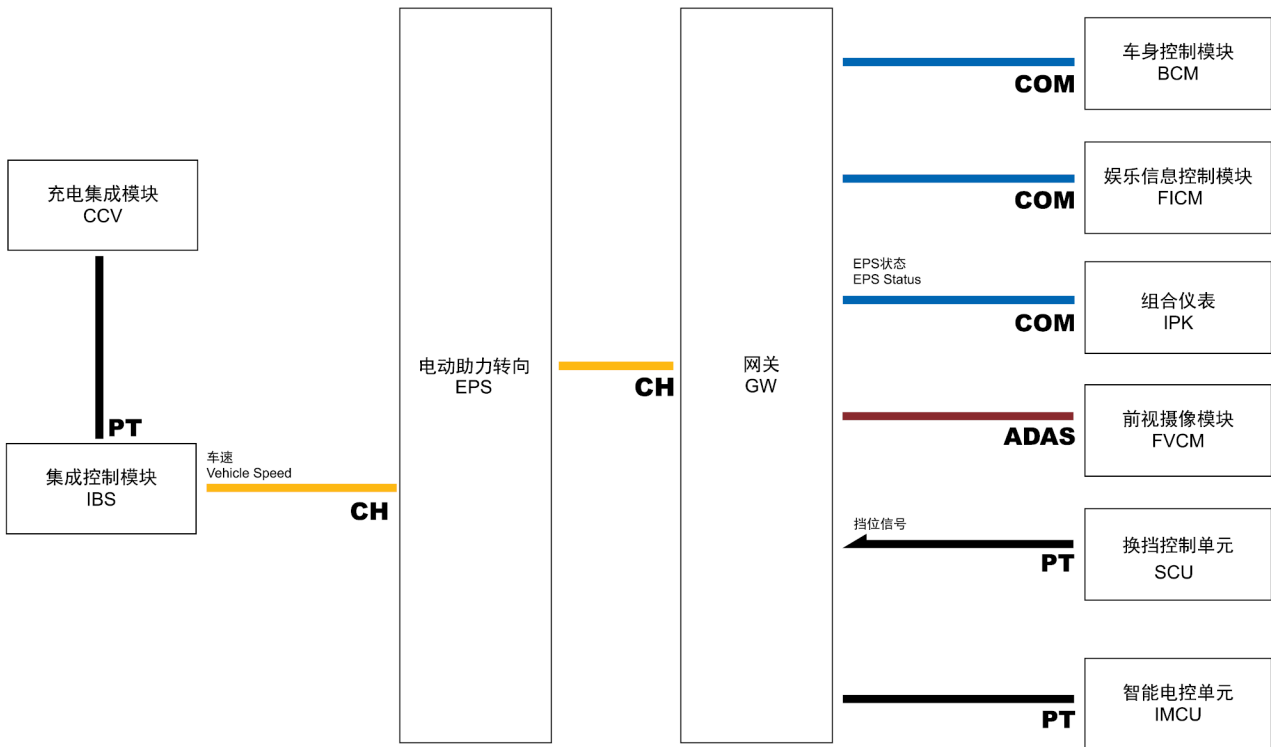


S2111279

- | | |
|--------------------------------|--|
| 1. Steering Gear Subassembly | 6. Steering Gear Outer Tie Rod |
| 2. Steering Gear Inner Tie Rod | 7. Nut - Outer Tie Rod Ball Head to Steering Knuckle |
| 3. Steering Gear Boot | 8. Steering Gear Retaining Bolt |
| 4. Universal Joint Sleeve | 9. Steering Gear Retaining Nut |
| 5. Locking Nut | |

System Control Diagram

EPS Control Diagram



A

B

C

D

S2111260

A = Power HS CAN Bus; B = Comfort HS CAN Bus; C = Chassis HS CAN Bus; D = ADAS CAN Bus

Description

Overview

EPS is a power steering system that directly relies on the motor to provide auxiliary torque. According to different locations of motor arrangement, EPS can be divided into four types: steering column-assist type, gear-assist type, rack-assist type, double pinion-assist type. The motor of steering column-assist type EPS is fixed on one side of steering column, and connected to the steering shaft through reducer mechanism, directly driving the steering shaft to assist the steering. The motor and the reducer mechanism of gear-assist type EPS directly drive the rack to provide assist. The double pinion-assist type EPS has two pinions, a driving pinion connected to the steering column and a power-assisted pinion connected to the motor, with the output torque of the motor acting on an additional power-assisted gear through a reducer mechanism and transmitted to the rack.

The basic principle for different types of EPS is the same: the torque sensor is connected with the steering shaft (pinion shaft). When the steering shaft rotates, the torque sensor starts to work and turns the relative rotational displacement of the input shaft and output shaft under the action of the torsion bar into electric signals and transmits them to the ECU, which decides the rotation direction of the motor and the size of the power-assisted current according to the signals from the speed sensor and the torque sensor, thus completing the real-time control of power steering. Therefore, it can easily realize the effect of providing different power assist to the motor at different speeds to ensure that the vehicle is light and flexible at low speeds and stable and reliable at high speeds. Therefore, the EPS has a high degree of freedom in setting the steering characteristics.

Electric Power Steering System

The electric power steering system consists of the following components:

1. Electric Power Steering Control Module
2. Steering Motor
3. Torque Sensor
4. Steering Reducer Mechanism

Electric Power Steering Control Module

The function of the ECUs is to perform logic analysis and calculation based on the torque sensor signals and vehicle speed sensor signals, then send commands to control the motor operation. Furthermore, the ECUs are also configured with safety protection and self-diagnosis functions, and the ECU determines if the system is in normal state by collecting the motor current, powertrain status and other signals. If the system fails, the power assist will be canceled automatically and the ECU will carry out fault diagnosis and analysis.

Steering Motor

The function of the motor is to output an appropriate auxiliary torque based on the ECU instruction, and it is the power source of EPS. Brushless permanent magnet motors are mostly used.

Torque Sensor

The torque sensor is integrated in the steering gear, and its function is to measure the size and direction of the torque acted by the driver on the steering wheel. It is the control signal of EPS.

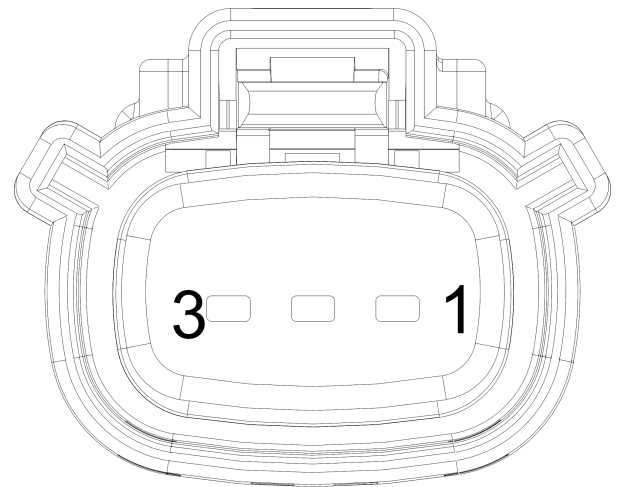
Reducer Mechanism

The reducer mechanism of EPS is connected to the motor, which plays the role of speed reduction and torque increase.

Steering Angle Sensor

The steering angle sensor is integrated on the rotary coupler in the steering column combination switch, it can monitor the steering angle data entered by the driver, transmit corresponding data to the related ECU, and give corresponding control of the vehicle.

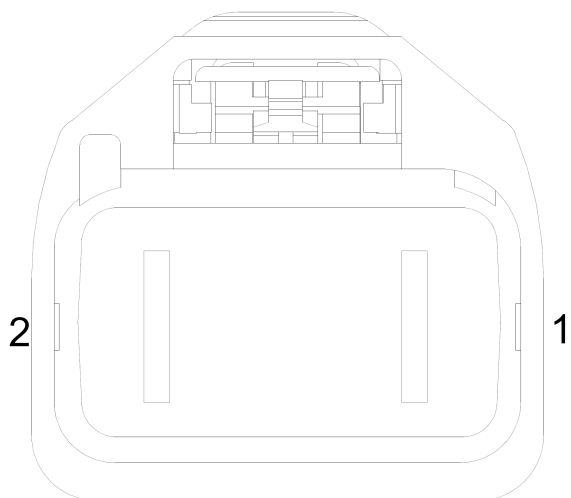
End View and Pin Information of EPS Control Module Harness Connector EPS001



Pin No.	Description
1	Wake-up
2	HS CAN High
3	HS CAN Low

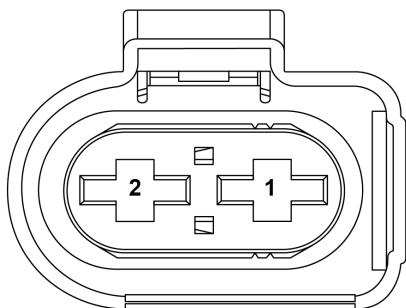
End View and Pin Information of EPS Control Module Harness Connector EPS002

End View and Pin Information of EPS-2WD Harness Connector ES011

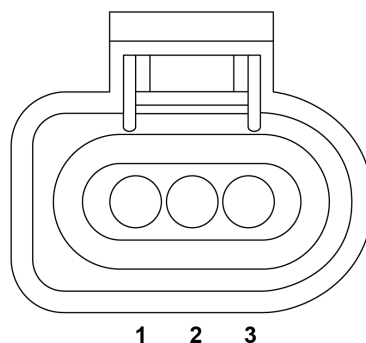


Pin No.	Description
1	Ground
2	KL.30

End View and Pin Information of EPS-2WD Harness Connector ES010



Pin No.	Description
1	Ground
2	KL.30



Pin No.	Description
1	Chassis CAN Low
2	Chassis CAN High
3	Relay

Operation

When the electric power steering control module is used to control the power steering motor so as to operate the steering gear, the electric power steering system can reduce the power required for the driver to steer the vehicle. The electric power steering control module also uses a combination of torque sensors, steering angle sensors, battery voltage circuits and serial data circuits to perform system functions. The EPS control module will monitor the vehicle speed and powertrain status information through the CAN Bus to determine the magnitude of power for vehicle steering. At a low speed, greater assistance is provided for steering during parking operations. At a high speed, less assistance is provided to improve road feel and directional stability.

The EPS module determines the magnitude of desired force by using the combination of torque sensor, steering angle sensor, speed and system temperature input calculated value. The EPS control module continually monitors the return signal from the torque sensor and the steering position signal. With the rotation of the steering column and steering shaft, monitor the steering input shaft and output shaft by torque signal circuit, then use the EPS control module to calculate the torque.

The EPS control module responds to the change of torque sensor signal and steering angle sensor signal by controlling the current of the steering motor. The EPS control module controls the PWM motor drive circuit to drive the 3-phase motor.

The EPS control module can calculate the internal system temperature and protect the EPS system from high temperature damage. In order to reduce the high system temperature, the EPS control module will decrease the directive current flowing to the steering motor, that is, reduce the steering power. The EPS control module can detect failures of the EPS system. When failure of the EPS is detected, the steering warning lamp on the instrument will illuminate.

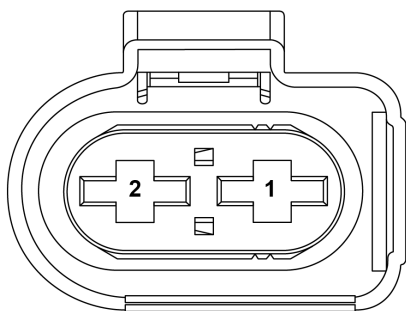
The EPS control module is provided with the "active self centring" function, when the driver's hands leave the steering wheel, control of the self centring speed can improve the driving feel and safety greatly.

The EPS control module is also configured with the "end stop protection" function which can decrease the auxiliary torque and avoid noise, overheat and damage to the mechanical parts before the maximum travel of the steering gear rack is achieved.

Detailed Information List of Component Pins

End View and Pin Information of Harness

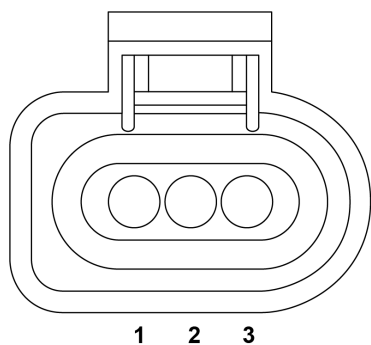
Connector ES010



Pin No.	Description
1	Ground
2	KL.30

End View and Pin Information of Harness

Connector ES011



Pin No.	Description
1	Chassis CAN Low
2	Chassis CAN High
3	Relay

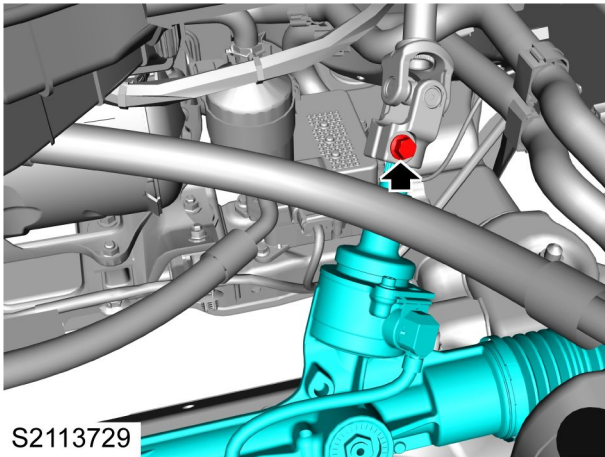
Service Guide

Power Steering Gear Subassembly Remove

1. Remove the manual service disconnect.

Manual Service Disconnect Remove

2. Remove the universal joint sleeve, remove and discard 1 bolt fixing the intermediate shaft universal joint to the steering gear input shaft.



3. Remove the bottom deflector.

Bottom Deflector Remove

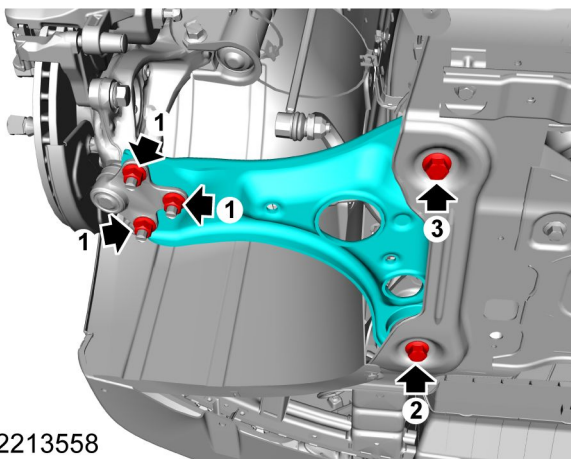
4. Remove the outer tie rod of the steering gear.

Steering Gear Outer Tie Rod Remove

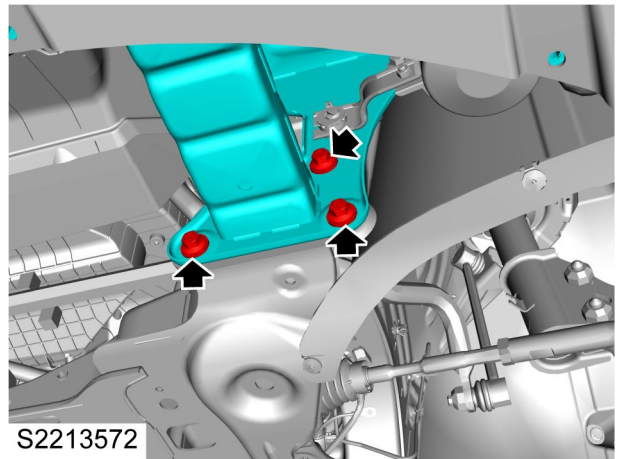
5. Remove the front stabilizer bar links (both sides).

Front Stabilizer Bar Link Remove

6. Remove 3 bolts (both sides) (1) fixing the outer ball joint of front lower control arm to the front lower control arm and discard them.

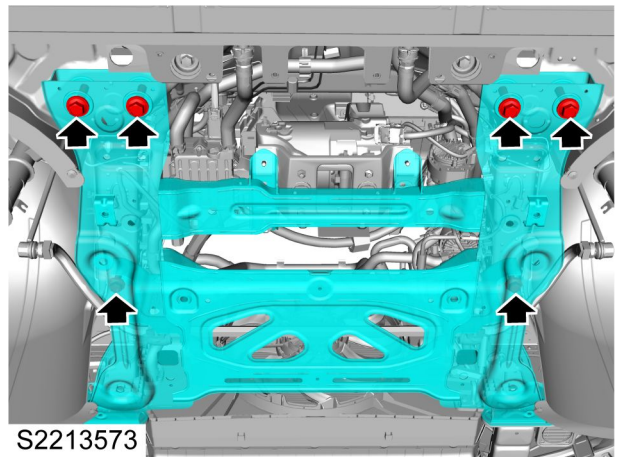


7. Remove and discard 3 bolts (both sides) fixing the front bumper beam to the front subframe.

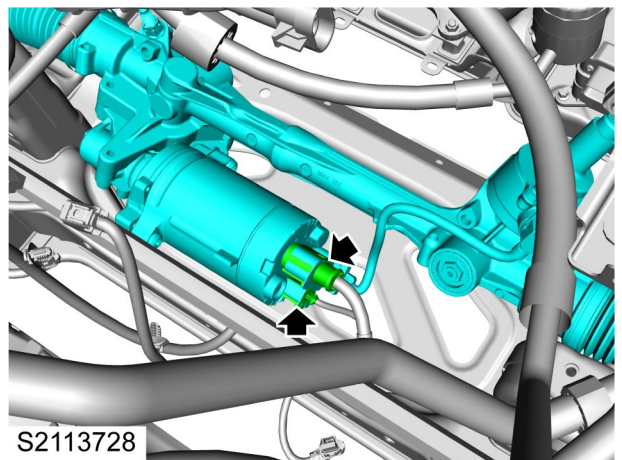


8. Remove the steering gear subassembly (2WD)

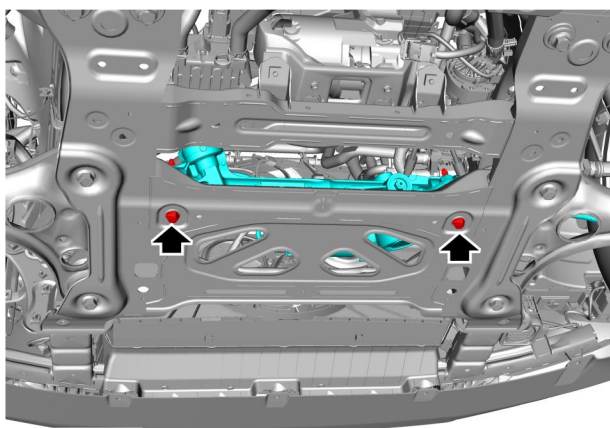
- a. Loosen the harness clips, use a hydraulic lifting device to lift the front subframe, remove and discard 6 bolts fixing the front subframe to the body.



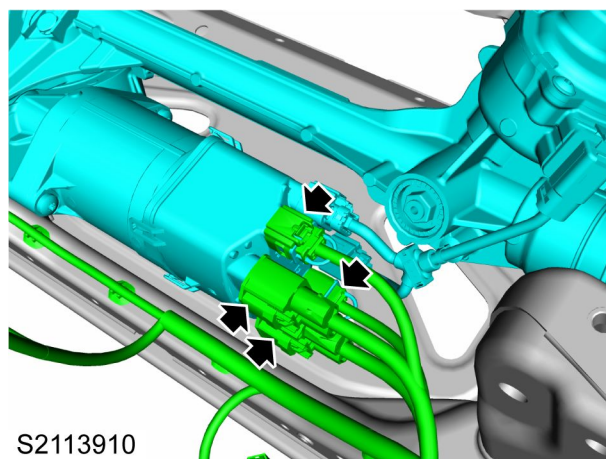
- b. Lower the front subframe to a proper height.
- c. Disconnect the harness connector of the steering motor.



- d. Remove and discard 2 bolts and nuts fixing the steering rack to the front subframe.

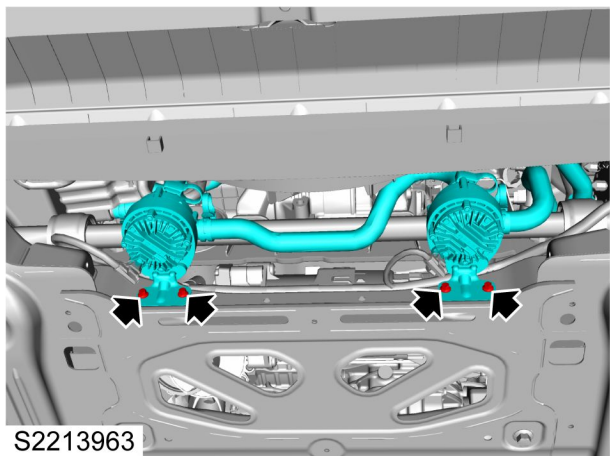


S2113730



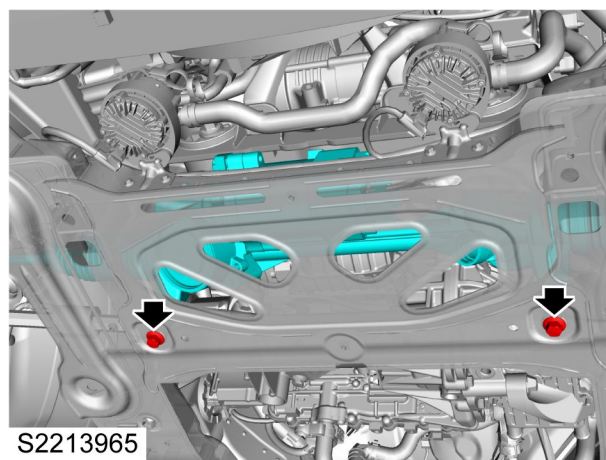
S2113910

9. Remove the steering gear subassembly (4WD)
 - a. Remove 4 bolts fixing the water pump bracket (4WD) to the front subframe, and remove the pump.



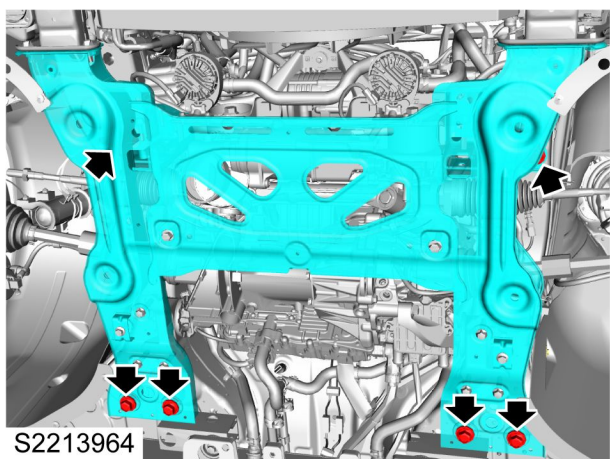
S2213963

- e. Remove and discard 2 bolts and nuts fixing the steering rack to the front subframe.



S2213965

- b. Loosen the harness clips, use a hydraulic lifting device to lift the front subframe, remove and discard 6 bolts fixing the front subframe to the body.



S2213964

10. Lower the hydraulic lifting device to a proper height, and carefully pull the steering gear subassembly out of the vehicle.

Refit

- c. Lower the front subframe to a proper height.
- d. Disconnect the harness connector of the steering gear subassembly.

1. Locate the steering gear assembly to the front subframe, fit 2 new nuts and bolts in sequence (start at the driver side), and tighten them to **63-77Nm+ (175°-185°)**.
2. Ensure that the front subframe mounting area is clean, use a hydraulic lifting device to lift the front subframe.
3. Connect the harness connector .
4. Refit the steering gear subassembly (4WD)
 - a. Locate the front subframe to the body, fit 6 bolts, and tighten them to **(135-165) Nm+ (85-95) °**.
 - b. Fix the pump blacket to the front subframe, fit 4 bolts and tighten them.
5. Refit the steering gear subassembly (2WD)
 - a. Locate the front subframe to the body, fit 6 bolts, and tighten them to **(135-165) Nm+ (85-95) °**.
6. Fix the front bumper beam to the front subframe, fit 3 new bolts (both side), and tighten them to **19-25Nm**.
7. Lower the hydraulic lifting device, and move it to the safety zone.

8. Locate the front lower control arm to the outer ball joint of front lower control arm (both sides), fit 3 bolts, and tighten them to **81-99Nm+(85°-95°)**.
9. Fit the front stabilizer bar link.

Front Stabilizer Bar Link Refit

10. Fit the steering gear outer tie rod.

Steering Gear Outer Tie Rod Refit

11. Fit the bottom deflector.

Bottom Deflector Refit

12. Locate the intermediate shaft universal joint to the steering gear input shaft, fit 1 new bolt, tighten it to **18-22Nm+ (115°-125°)**, and fit the universal joint sleeve.

13. Fit the manual service disconnect.

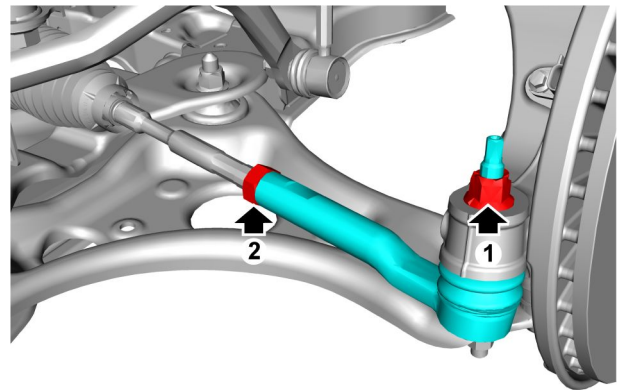
Manual Service Disconnect Refit

Steering Gear Outer Tie Rod Remove

1. Remove the front wheels.

Wheels Remove

2. Remove 1 nut (1) fixing the steering gear outer tie rod to the steering knuckle and discard it.
3. Disconnect the steering gear outer tie rod from the steering knuckle.
4. Mark the location of the regulating nut, and loosen the nut (2) fixing the steering gear outer tie rod to the steering gear inner tie rod.



S2113731

5. Unscrew the regulating nut of the steering gear outer tie rod from the steering gear inner tie rod.

Refit

1. Screw the regulating nut, and tighten the steering gear outer tie rod to the mark position of locking nut with the ball joint upward.
2. Tighten the locking nut to **63-73Nm**.
3. Locate the steering gear outer tie rod to the steering knuckle, fit 1 new nut and tighten it to **31.5-38.5Nm+ (30°-45°)**.
4. Fit the front wheels.

Wheels Refit

5. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

6. Perform a self-learning for the electric power steering module.

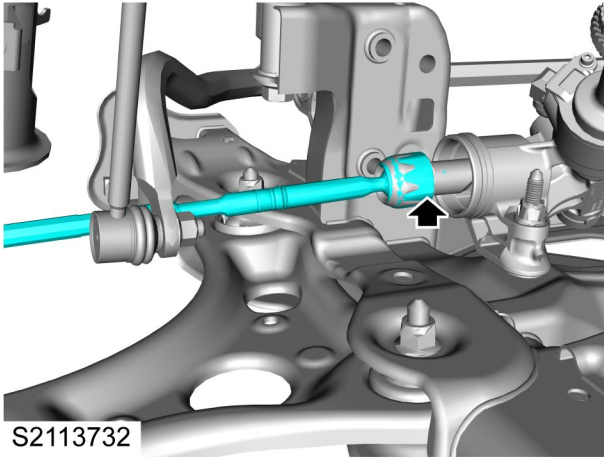
Steering Column Lock Control Module (ESCL)

Steering Gear Inner Tie Rod Remove

1. Remove the steering gear boot.

Steering Gear Boot Remove

2. Unscrew the steering gear inner tie rod from the steering gear, and disconnect the connection.



3. Remove the inner tie rod of the steering gear.

Refit

1. Locate the steering gear inner tie rod to the steering gear and use a tool to tighten the steering gear inner tie rod to **100–110Nm**.
2. Fit the steering gear boot.

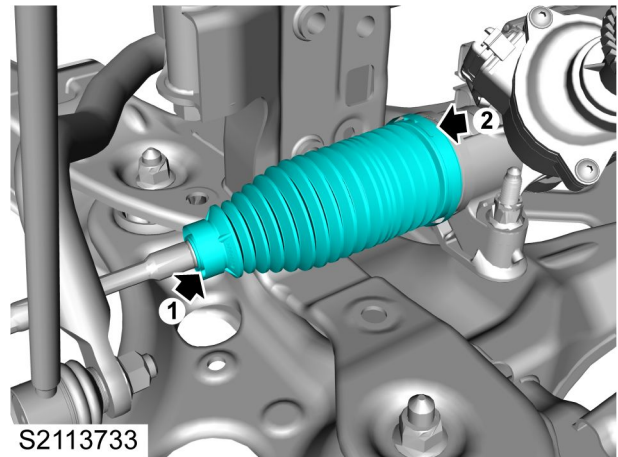
Steering Gear Boot Refit

Steering Gear Sleeve Remove

1. Remove the outer tie rod of the steering gear.

Steering Gear Outer Tie Rod Remove

2. Remove and discard the outer boot clamp (2) of the steering gear.
3. Remove and discard the inner boot clamp (1) of the steering gear.



4. Remove the steering gear boot from the steering gear.

Refit

1. Fix the steering gear boot to the steering gear. Ensure that the steering gear boot is located in the steering gear groove.
2. Fit and secure the new inner boot clamp of the steering gear to the steering gear boot.
3. Fit the new outer boot clamp of the steering gear to the steering gear boot, and secure it.
4. Fit the steering gear outer tie rod.

Steering Gear Outer Tie Rod Refit

Upper Steering Column Remove

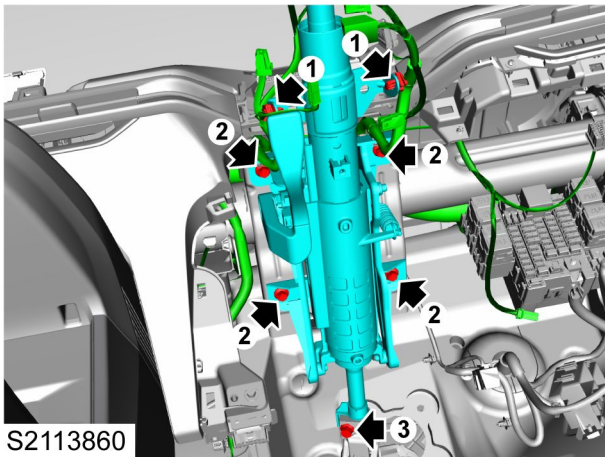
1. Remove the steering wheel combination switch.

Steering Wheel Combination Switch Remove

2. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Remove

3. Remove 1 bolt (3) fixing the intermediate shaft universal joint to the upper steering column, and discard it.
4. Pry off the harness clip (1) from the upper steering column.
5. Remove 4 bolts (2) fixing the upper steering column to the instrument panel beam assembly.



6. Remove the upper steering column assembly.

Refit

1. Locate the upper steering column to the instrument panel beam assembly, fit 4 bolts and tighten them to **19-25Nm**.
2. Fit the harness clip to the upper steering column
3. Locate the intermediate shaft universal joint to the upper steering column, fit 1 new bolt and tighten it to **26-34Nm**.
4. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Refit

5. Fit the steering wheel combination switch.

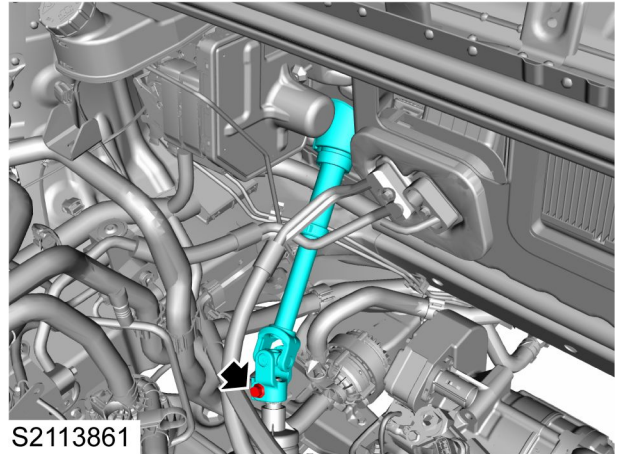
Steering Wheel Combination Switch Refit

Steering Intermediate Shaft Assembly Remove

1. Keep the wheels facing forward and lock the steering wheel.
2. Remove the A/C air inlet box.

A/C Air Inlet Box Remove

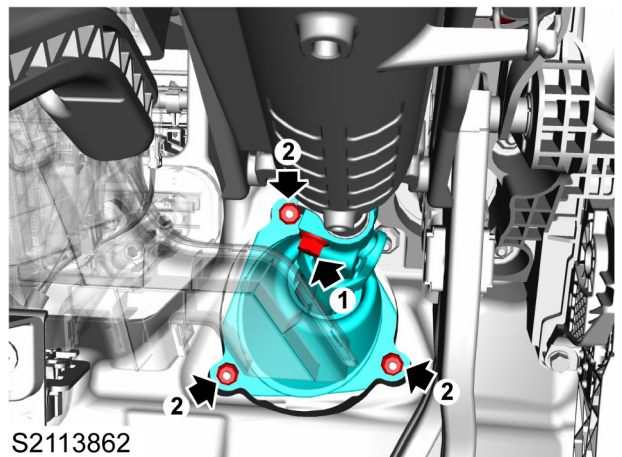
3. Remove and discard 1 bolt fixing the intermediate shaft universal joint to the steering gear input shaft.



4. Remove the driver side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Assembly Remove

5. Remove 1 bolt (1) fixing the steering intermediate shaft universal joint to the upper steering column, and discard it.
6. Remove 3 nuts (2) fixing the steering intermediate shaft assembly to the body.



7. Carefully pull out the steering intermediate shaft assembly.

Refit

1. Fix the steering intermediate shaft assembly to the body, fit 3 nuts and tighten them to **4-6Nm**.
2. Fix the steering intermediate shaft universal joint to the upper steering column, fit 1 new bolt and tighten it to **26-34Nm**.

3. Fit the driver side instrument panel lower closure panel.

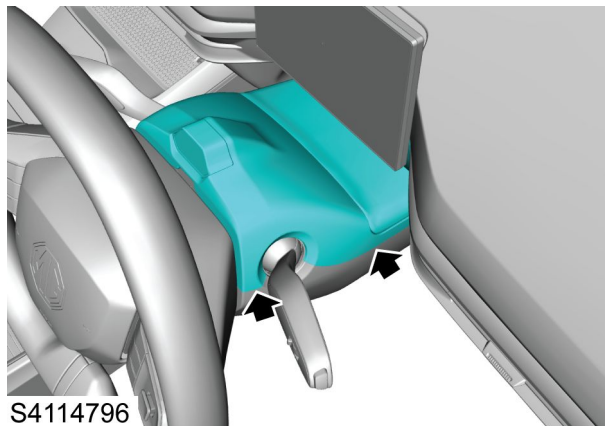
Instrument Panel Lower Closure Panel Assembly Refit

4. Fix the intermediate shaft universal joint to the steering gear input shaft, fit 1 new bolt and tighten it to **18-22Nm+ (115°-125°)**.
5. Fit the A/C air inlet box.

A/C Air Inlet Box Refit

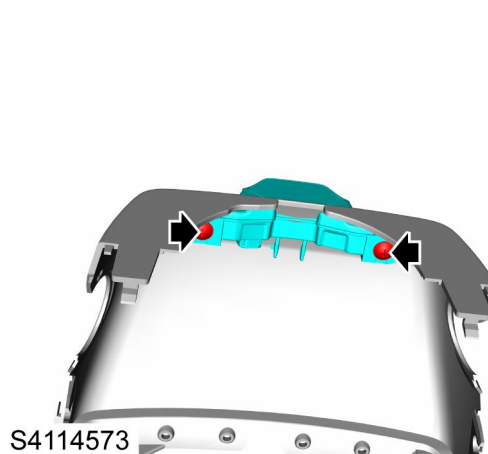
Steering Column Upper Trim Cover Remove

1. Adjust the steering wheel leftward or rightward, pry off the clip of steering column upper shield, and remove the steering column upper shield.



S4114796

2. If necessary, remove 2 screws fixing the fatigue monitoring module to the steering column upper shield and remove the fatigue monitoring module.



S4114573

Refit

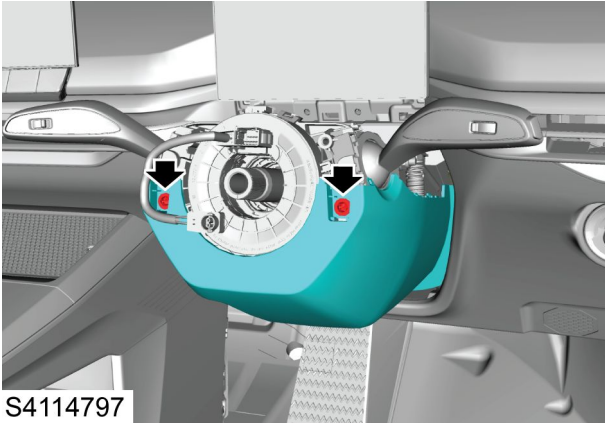
1. If removed, fit 2 screws fixing the fatigue monitoring module to the steering column upper shield and tighten them.
2. Locate the steering column upper shield to the steering column, and align with the hole in the steering column lower shield, then press the clip in place.

Steering Column Lower Trim Cover Remove

1. Remove the steering column upper shield.

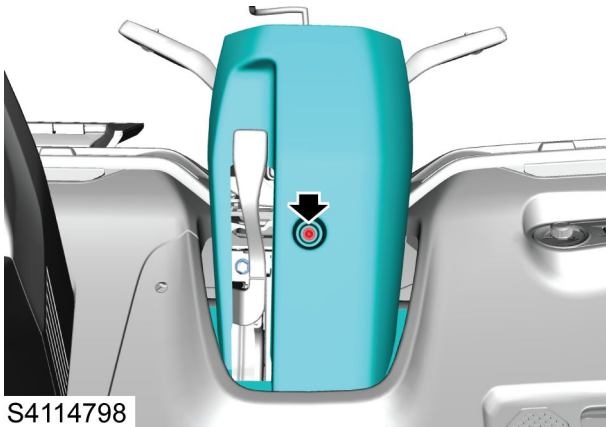
Steering Column Upper Shield

2. Adjust the steering wheel leftward or rightward to a proper position.
3. Remove 2 screws fixing the steering column lower shield to the combination switch.



S4114797

4. Remove 1 screw fixing the steering column lower shield to the steering column, and remove the steering column lower shield.



S4114798

Refit

1. Adjust the steering wheel leftward or rightward to a proper position.
2. Locate the steering column lower shield to the steering column, fit and tighten 3 screws.
3. Fit the steering column upper shield.

Steering Column Upper Shield

Steering Wheel Positioning Adjustment Adjustment

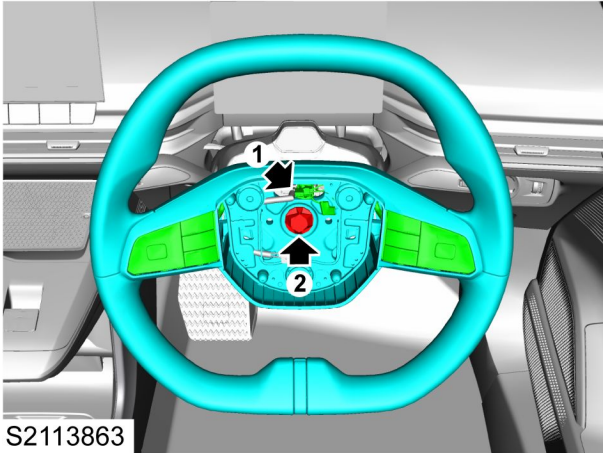
1. If the steering wheel exceeds the locator value clockwise:
 - a. Loosen the right locking nut.
 - b. Turn the right outer tie rod to the left by a hexagonal plane.
 - c. Tighten the right locking nut to **63-73Nm**.
 - d. Loosen the left locking nut.
 - e. Turn the left outer tie rod to the left by a hexagonal plane.
 - f. Tighten the left locking nut to **63-73Nm**.
2. If the steering wheel exceeds the locator value counter-clockwise:
 - a. Loosen the left locking nut.
 - b. Turn the left outer tie rod to the right by a hexagonal plane.
 - c. Tighten the left locking nut to **63-73Nm**.
 - d. Loosen the right locking nut.
 - e. Turn the right outer tie rod to the right by a hexagonal plane.
 - f. Tighten the right locking nut to **63-73Nm**.
3. Repeat 1 or 2 until the wheels face forward, and the steering wheel is in the centre position.

Steering Wheel Assembly Remove

1. Remove the steering wheel airbag.

Steering Wheel Airbag Remove

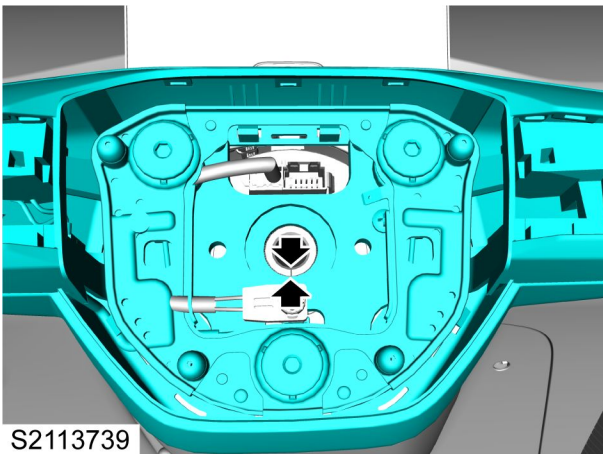
2. Put the steering wheel in the centre and allow the wheel to be in the front.
3. Disconnect the harness connector (1) of the steering wheel.
4. Unscrew 1 bolt (2) fixing the steering wheel to the steering column.



5. Ensure that the steering wheel is completely disengaged from the steering column spline grooves and then remove the bolt.
6. Remove the steering wheel assembly.
7. Stick tape along the edge of the steering column lever combination switch to keep it in the correct mounting position.

Refit

1. Remove the tape on the combination switch of the steering column lever.
2. Ensure that the wheel is in the front, and fit the steering wheel to the steering column according to the mark.



3. Locate the steering wheel on the steering column, fit 1 bolt, and tighten it to **60-70Nm**.
4. Connect the harness connector of the steering wheel.

5. Fit the steering wheel airbag.

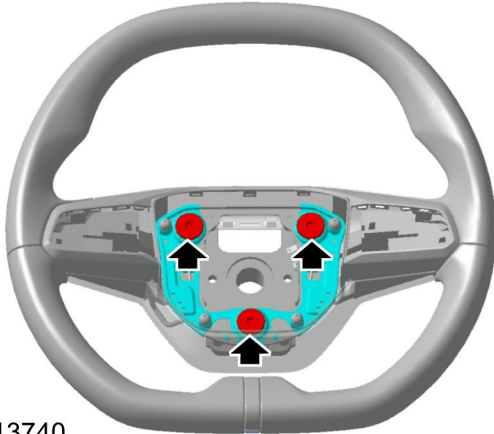
Steering Wheel Airbag Refit

Steering Wheel Molding Remove

1. Remove the steering wheel airbag.

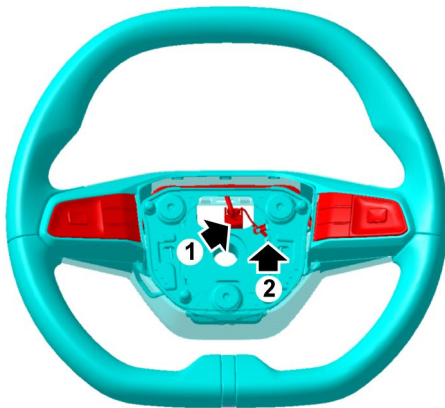
Steering Wheel Airbag Remove

2. Disconnect the horn contact.
3. Remove 3 bolts fixing the horn sound mechanism to the steering wheel, and remove the horn sound mechanism.



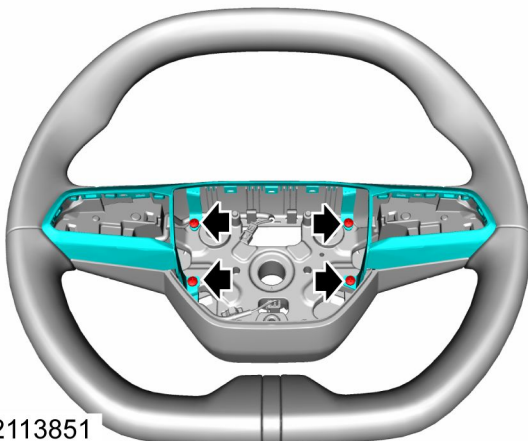
S2113740

4. Disconnect the steering wheel entertainment switch harness connector (1).
5. Remove 1 screw (2) fixing the ground terminal to the steering wheel.



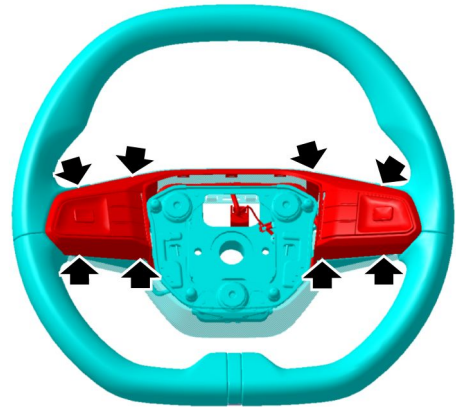
S2113741

6. Remove 4 screws fixing the steering wheel moulding assembly to the steering wheel.



S2113851

7. Carefully pry off the clip and remove the steering wheel entertainment switch and steering wheel moulding.

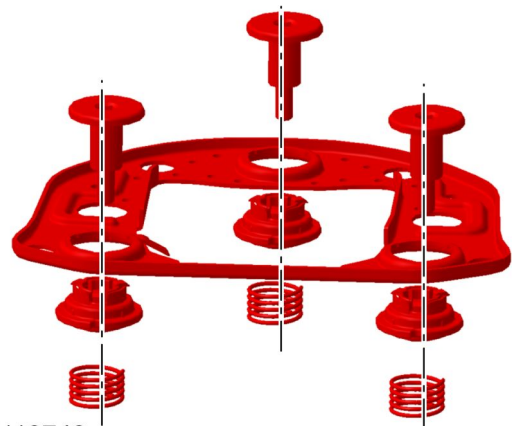


S2113744

8. Pry off the clip connecting the steering wheel moulding and entertainment switch, and remove the steering wheel moulding.

Refit

1. Locate the steering wheel moulding to the entertainment switch, and press the clip in place.
2. Locate the steering wheel entertainment switch and the steering wheel moulding assembly to the steering wheel, fit 4 screws and tighten them.
3. Fix the ground terminal to the steering wheel, fit 1 screw and tighten it.
4. Connect the harness connector of the steering wheel entertainment switch.
5. Locate the horn sound related parts to the steering wheel, fit 3 bolts and tighten them to **6.3-7.3Nm**.



S2113743

6. Connect the horn contact and press it tightly.
7. Fit the steering wheel airbag.

Steering Wheel Airbag Refit

8. After fitting, perform the horn sound test, and ensure function and sound feeling are not abnormal.

Steering Wheel Multifunction Switch Remove

1. Disconnect the negative battery cable.
2. Remove the steering wheel moulding.

Steering Wheel Moulding

3. Loosen the clips and remove the steering wheel entertainment switch.

Refit

1. Fix the steering wheel entertainment switch to the steering wheel moulding, and press the clip.
2. Fit the steering wheel moulding.

Steering Wheel Moulding

3. Connect the negative battery cable.

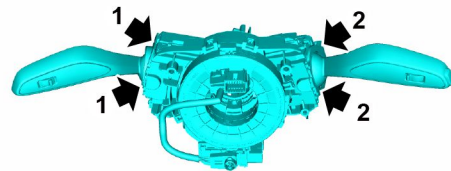
Steering Wheel Combination Switch Remove

1. Disconnect the negative battery cable.
2. Remove the steering column shield.

Steering Column Upper Shield Remove

Steering Column Lower Shield Remove

3. Pry off the retaining clip of the stalk switch trim panel and remove the trim panel.
4. Remove 2 screws (2) fixing the wiper stalk switch to the clock spring, remove the wiper stalk switch and disconnect the harness connector.
5. Remove 2 screws (1) fixing the light stalk switch to the clock spring, remove the light stalk switch and disconnect the harness connector.



S7213484

6. Remove the steering wheel assembly.

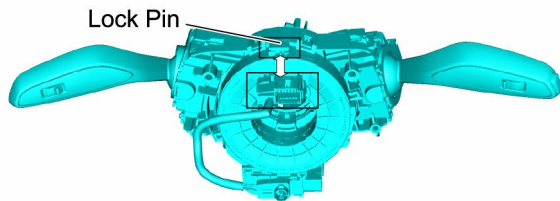
Steering Wheel Assembly Remove

7. Fix the clock spring and bracket with tapes, ensure it will not move left and right and is always in the centre.
8. Remove 1 screw fixing the clock spring to the steering column, disconnect the harness connector and remove the clock spring. Be careful not to damage the locating tape.

Refit

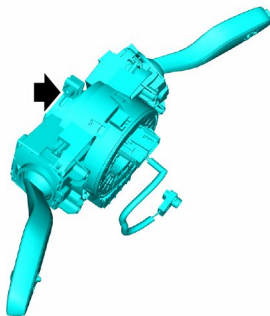
Caution : *If the fixing device on a new steering column lever combination switch has been damaged, or if the steering column lever combination switch has been accidentally dropped on the ground, discard the combination switch.*

1. Before fitting, ensure the red locating pin of the clock spring is not removed or damaged and the front wheels face the front.
2. Ensure the clock spring to be fitted is in the centre, if it is not, gently rotate the rotor counterclockwise to the end, then turn it clockwise for about 2.7 circles. Align the connector clip with the Lock Pin position (this location is the centre).



S7213486

3. Connect the harness connector of the clock spring.
4. Fix the clock spring to the steering column, fit 1 screw, tighten it to **5-6Nm**, check the torque, and ensure the combination switch assembly will not loose.



S7213483

5. Fit the steering wheel assembly.

Steering Wheel Assembly Refit

6. Connect the harness connector of the stalk switch.
7. Fix the stalk switch to the clock spring, fit and tighten 4 screws.
8. Fit the stalk switch trim panel and snap it into place.
9. Connect the negative battery cable.
10. Perform a self-learning for the EPS.

Electric Power Steering (EPS) Module

11. Check the system, rotate each lever of the combination switch and check if it can work.
12. Check if the buttons of the entertainment switch on the steering wheel can work.
13. Fit the steering column shield.

Steering Column Upper Shield Remove

Steering Column Lower Shield Refit

Wheel Alignment

Specification

Torque

Description	Value
Nut-left steering rack locking nut	63-73Nm
Bolt&Nut-Rear toe link to rear subframe	150-180Nm
Bolt&Nut-rear lower control arm to rear subframe	150-180Nm

Parameters

Item		Parameters
Front Wheel	Camber	-12 ϕ ±45 ϕ
	King Pin Caster Angle	6°50 ϕ ±45 ϕ
	Toe Angle (total toe)	6 ϕ ±12 ϕ
	King Pin Inclination Angle	12°45 ϕ ±45 ϕ
Rear Wheel	Camber	-1°±45 ϕ
	Toe Angle (total toe)	12 ϕ ±12 ϕ

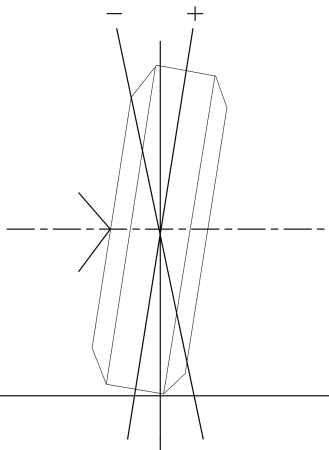
Description and Operation

Description

Camber Angle Description

The camber angle refers to the wheel deviation angle from the vertical direction when observed from the front of the vehicle. When the top of the wheel tilts outward, the camber angle is positive (+); when the top of the wheel tilts inward, the wheel camber is negative (-). The degree of tilt is measured as an angle away from the vertical direction. The set value of the vehicle camber angle can affect the direction control and tyre wear.

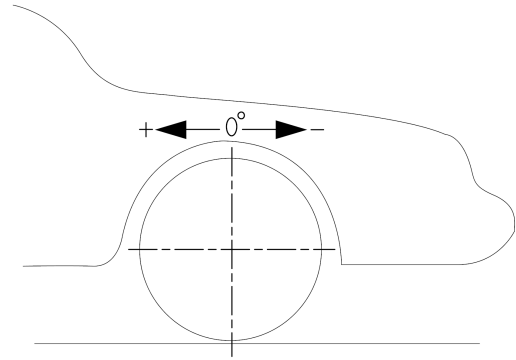
- Excessive positive camber angle will cause excessive wear of the outside of the tyre and the suspension parts.
- Excessive negative camber angle will cause excessive wear of the inside of the tyre and the suspension parts.
- If the difference between the camber angles on both sides is 1° or above, the vehicle will deviate to the side with a larger positive camber angle.



S2310001

Caster Angle Description

The caster angle refers to the angle of forward or backward inclination of the highest point of the steering axis when viewed from the side of the vehicle. The backward inclination is positive (+), and the forward inclination is negative (-). The kingpin caster affects the direction control during steering instead of the tyre wear. The kingpin caster is affected by the height of the vehicle, so it is of great importance to keep the body at the design height. Overload, fatigue or loose rear spring will affect the caster angle. When the rear part of the vehicle is lower than the designed body leveling height, the front suspension moves towards the direction where the positive kingpin caster increases. When the rear part of the vehicle is higher than the designed body leveling height, the front suspension moves towards the direction where the positive kingpin caster decreases.



S2310002

It is difficult to steer at high speed with a small positive kingpin caster, and the wheel return performance decreases after the steering is completed. If the positive kingpin caster of one wheel is larger than that of other wheels, the wheel will deflect toward the center of the vehicle. In this case, even if the positive kingpin caster is extremely small, it will cause the vehicle to deviate.

Off Tracking Description

Vehicle off tracking is a driving phenomenon occurred when the vehicle is traveling straight on a flat road, the vehicle is deviated toward one side, resulting in the connecting line between the centers of the front and rear axles inconsistent with the center line of the travel track.

Off tracking generally can be caused by the following factors:

- Slopes
- Changes of tyre structure
- Wheel alignment (left and right caster angle difference and camber difference of front wheels)
- Unbalanced steering gear
- The steering position of electronic power steering (EPS) and torque sensor are not properly calibrated

Memory Steering Description

Memory steering refers to the tendency of a vehicle to deviate to the last turning direction operated by the driver. In addition, after turning to the opposite direction, vehicle off tracking still can occur in this direction.

Scrub Radius Description

Theoretically, the scrub radius shall be kept as small as possible. Generally, the steering axis inclination (SAI) crosses with the centreline of the tyre and the wheel below the road, which forms a positive scrub radius. In the strut structure, the steering axis inclination (SAI) is much larger than the long arm/short arm suspension system. It makes the steering axis inclination (SAI) and the centre line of the tyre and the wheel intersect above the road surface, which forms a negative scrub radius. The smaller the scrub radius, the better the directional stability. Installation of aftermarket wheels will lead to extra deviation of the vehicle, which will greatly increase the scrub

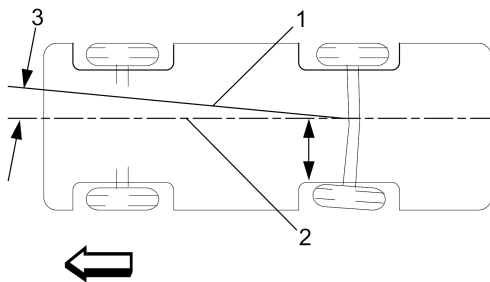
radius. The newly fitted wheel may cause further deviation of the tyre centre line from the spindle, which will increase the scrub radius.

A larger scrub radius can cause severe shimmy after hitting the uneven road surface. Four-wheel drive vehicles with large tyres use a steering damper to compensate for an increased scrub radius. The scrub radius can not be measured directly with conventional methods. The scrub radius is geometrically designed by the engineer during the design phase of the suspension system.

Thrust Angle Description

The front wheels are used for vehicle orientation or steering. The rear wheels control the track of the vehicle, which relates to the thrust angle (3). The thrust angle is the track that rear wheels travel. Theoretically, the thrust angle is geometrically consistent with the body centreline (2).

The positive toe in angle of the left rear wheel as shown in the figure will cause the thrust line (1) to deviate from the centre, and the resulting deviation from the centerline is regarded as the thrust angle.



S2310003

The incorrectly set thrust angle may make the driving route of vehicle look like a "dog track", which may cause the steering wheel to fail to return or the axle to be mistaken for bending. The thrust angle can be checked during wheel alignment.

A positive thrust angle indicates that the thrust line points to the right side of the vehicle (RHS).

A negative thrust angle indicates that the thrust line points to the left side of the vehicle (LHS).

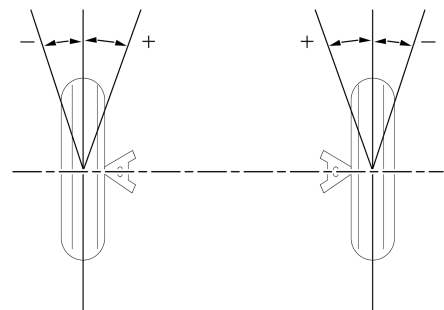
If the thrust angle exceeds the specified value, change of the relation between the axle and the body can change the reading of the thrust angle.

If the thrust angle is positive, move the right side of the vehicle forward and/or move the left side of the vehicle backward, the thrust angle will move to zero angle.

If the thrust angle is negative, move the right side of the vehicle backward and/or move the left side of the vehicle forward, the thrust angle will move to zero angle.

Toe-in Description

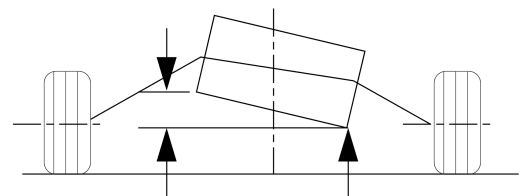
Wheel toe-in refers to the degree that the front and/or rear wheels deflect inward or outward from the front position. When the wheel points inward, the toe-in is positive (+); when the wheel points outward, the toe-in is negative (-). The actual value of the toe-in is normally a fraction of a degree. The function of the toe-in is to ensure that wheels on both sides roll in parallel. The toe-in also compensates for a small amount of deviation caused by the wheel support system when the wheels roll forward. In other words, if the wheels are set to a positive toe-in when the vehicle is stationary, the wheels on both sides will roll in parallel when the vehicle is moving. Improper adjustment of the toe-in will lead to premature tyre wear and unstable steering.



S2310005

Torque Steering Description

Torque steering means that in the event of sudden or hard accelerations, the vehicle will deviate from one direction. During deceleration, the vehicle will deviate from the other direction.



S2310004

On the specific vehicle, the following factors may cause the torque steering to be more obvious:

- Tyres with a small right front diameter can generate a right guide torque. Check the front tyres for differences in brand, structure or size. If the tyres look similar, exchange the front tyres on both sides and retest the vehicle. The tyre and wheel assembly can greatly affect the calibration of the torque steering.

- There are great differences between the pressure of front right and front left tyres.
- The difference between the left and right side of the axle angle in the front view may cause the vehicle to deviate significantly when steering. The deviation will appear on the side where the axle tilts downward most from the differential to the wheel. The inclination between the transaxle surface and the horizontal plane can be used as a sign of the tilt angle of the axle. The higher side of the transaxle surface (as shown on the left) has the maximum axle angle which tilts downward.

Side-sway Description

Side-sway refers to the unintentional drift or deviation of a vehicle from a straight direction to either side when applying force by hand on the steering wheel. Side-sway is a symptom resulting from over-sensitive response of the vehicle to external disturbances such as uneven road and crosswind, which may be aggravated by poor returnability of steering mechanism.

Service Guide

Four-wheel Alignment Check

Complaints about steering and vibration are not always caused by improper alignment; one possible cause is wheel and tyre imbalance, and another possibility is worn or improperly manufactured tyres. Worn or improperly manufactured tyres cause the vehicle off tracking, and the definition of off tracking is as follows: Vehicle off tracking is a driving phenomenon occurred when the vehicle is traveling straight on a flat road, the vehicle is deviated toward one side, resulting in the connecting line between the centers of the front and rear axles inconsistent with the center line of the travel track.

Before performing any adjustment affecting wheel alignment, perform the following inspections and adjustments in order to ensure correct alignment readings:

- Check tyres for proper air inflation or irregular wear.
- Check the radial runout of wheels and tyres.
- Check wheel bearings for excessive clearance or gap.
- Check ball joints and steering gear outer tie rod ball joints for looseness or wear.
- Check control arms and stabilizer bar for looseness or wear.
- Check the steering gear for looseness.
- Check struts/shock absorbers for wear, leakage or any noticeable noises.
- Check the vehicle trim height.
- Check the steering wheel for excessive drag or poor returnability due to stiffness or corrosion of linkage mechanism or suspension components.

Give consideration also to the condition of the equipment being used for the alignment; follow the equipment manufacturer's instructions.

Satisfactory vehicle operation may occur over a wide range of alignment setting value. However, if the setting value exceeds the service allowable specifications, correct the alignment to the service recommended specifications.

Perform the following steps when measuring front and rear wheel alignment angles:

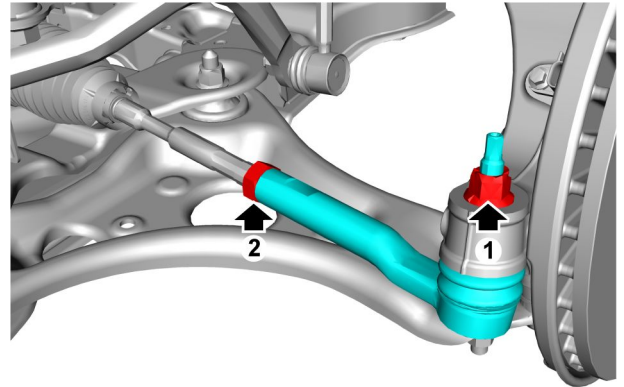
1. Fit the alignment equipment according to the manufacturer's instructions.
2. Conduct up and down vibration for the front and rear bumpers 3 times prior to checking the wheel alignment.
3. Measure the alignment angles and record the readings.
4. Adjust alignment angles to the specified value, if necessary.

Adjustment

1. Observe the readings indicated on the test equipment, and adjust the four-wheel alignment data according to

the requirements.

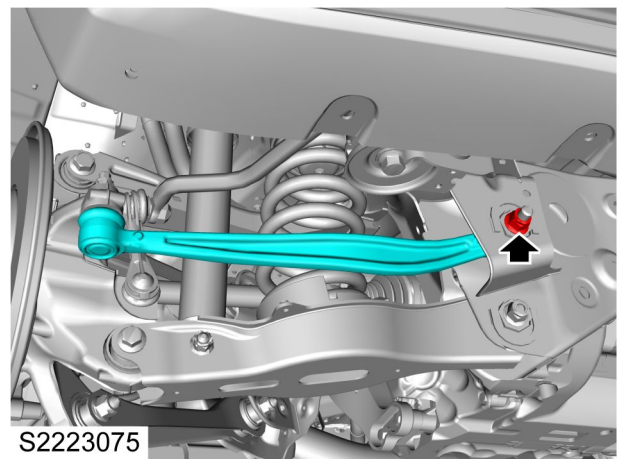
2. Front wheel toe-in adjustment:
 - a. Loosen the locking nut of the steering gear outer tie rod.
 - b. Adjust the steering gear inner tie rod (2) to set the front wheel alignment parameters to the specified value.



S2113731

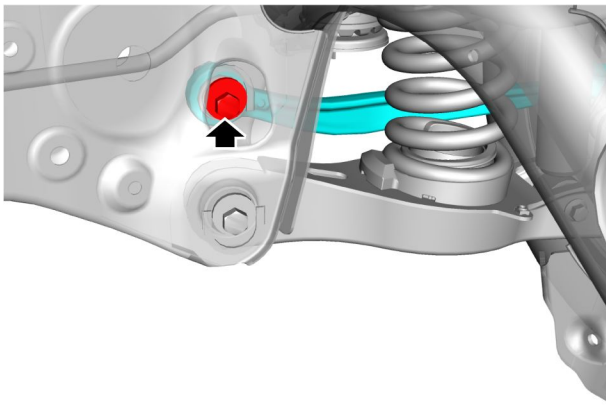
- c. Tighten the locking nut to **63-73Nm**.
 - d. Repeat the above steps on the other side.
3. Rear wheel toe-in adjustment:

- a. First loosen the nut fixing the rear lateral push rod to the rear subframe.



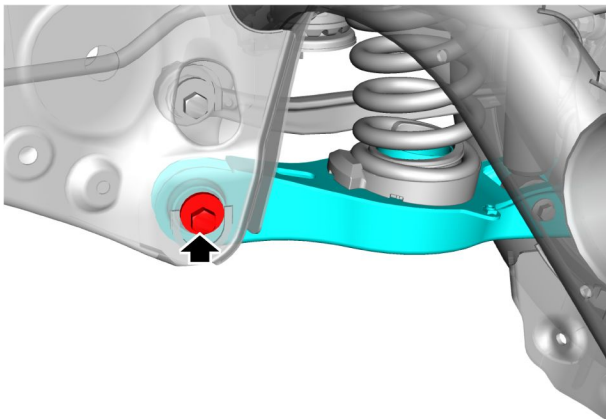
S2223075

- b. Use a tool to unscrew the eccentric bolt of rear lateral push rod.



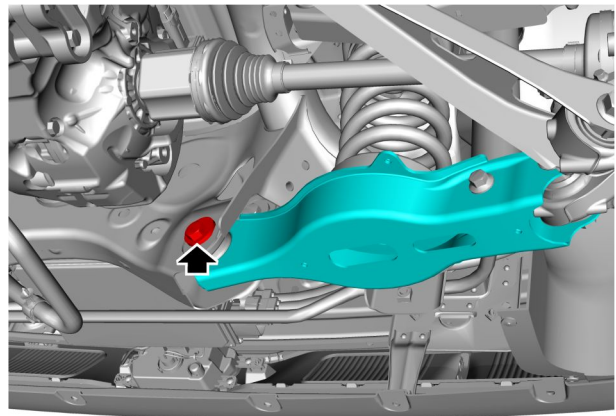
S2113764

- c. Loosen the nut fixing the rear lower control arm to the rear subframe.
- d. Rotate the eccentric bolt of rear lower swing arm with a tool until the rear wheel toe-in falls within the specified range.



S2113765

- e. Tighten the lateral push rod locking nut to **150-180Nm**, and tighten the rear lower control arm locking nut to **150-180Nm**.
 - f. Repeat the above steps on the other side.
4. Rear wheel camber adjustment:
- a. Loosen the nut fixing the rear lower control arm to the rear subframe.
 - b. Rotate the eccentric bolt with a tool until the rear wheel camber falls within the specified range.



S2223074

- c. Tighten the locking nut to **150-180Nm**.
- d. Repeat the above steps on the other side.

Front Suspension

Specification

Torque

Description	Value
Bolt&Nut-Front lower control arm to front subframe	135-165Nm+ (85°-95°)
Bolt&Nut-Front lower control arm outer tie rod to front lower control arm	81-99Nm+(85°-95°)
Nut-front damper top nut	65-75Nm
Bolt-front damper to body	55-65Nm
Nut-Front shock absorber assembly to front steering knuckle	135-165Nm+(85-95)°
Nut-Front anti-roll bar links to front shock absorber assembly	110-135Nm
Bolt-front brake hose bracket to front damper	10-15Nm
Bolt&Nut-Steering gear to front subframe	(63-77) Nm+ (175-185) °
Bolt-A Axle Right Mount to Front Subframe	(45-55) Nm+ (85-95) °
Bolt-A Axle Left Mount to Front Subframe	(45-55) Nm+ (85-95) °
Bolt-A Axle Front Subframe Mount to Front Subframe	(45-55) Nm+ (85-95) °
Bolt-Front subframe to body	(135-165) Nm+ (85-95) °
Bolt-front buffer bar to front subframe	19-25Nm
Bolt-Front anti-roll bar links to front subframe	55-65Nm
Bolt-battery bar to front subframe	45-55Nm
Nut-Steering rack to steering knuckle	(31.5-38.5) Nm+ (30-45) °
Bolt-Compressor bracket to Front subframe	12-18Nm
Bolt-PTC to Body	7-10Nm
Bolt-battery heater to front subframe	7-10Nm
Nut-Front anti-roll bar links to front anti-roll bar	75-90Nm
Bolt-Front wheel hub to steering knuckle	63-77Nm+(85°-95°)
Nut-Front lower control arm to steering knuckle	18-22Nm+ (85°-95°)
Bolt-front brake disc protector to steering knuckle	7-10Nm
Bolt-front damper to steering knuckle	135-165Nm+ (85°-95°)
Bolt-front wheel speed sensor to steering knuckle	7-10Nm

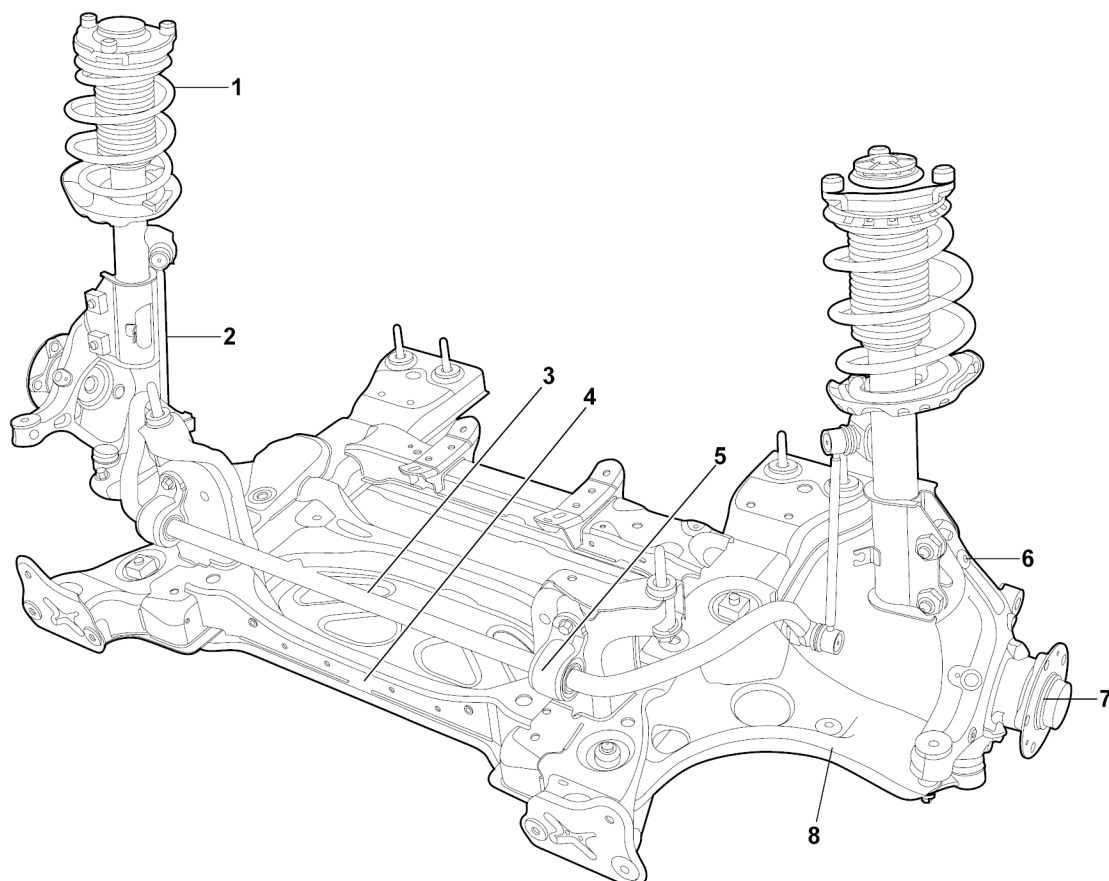
Parameters

Diameter of Front Anti-roll Bar	24mm
Front Coil Spring Parameters	
Total Number of Turns	5
Valid Number of Turns	4
Diameter of Spring Wire	13.8mm
Free Height	359mm

Description and Operation

System Layout

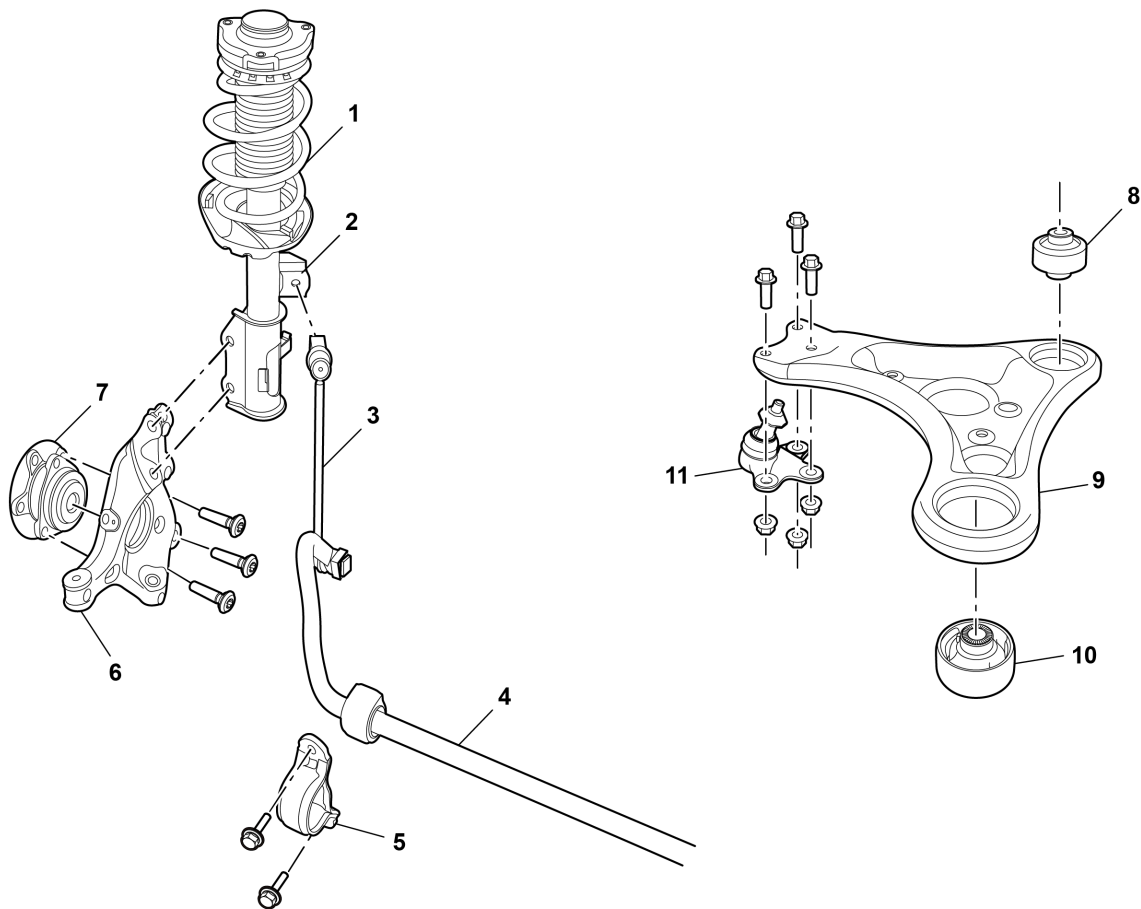
Front Suspension Layout



S2210100

- | | |
|--------------------------------------|---|
| 1. Front Shock Absorber Assembly (2) | 5. Front Anti-roll Bar Bushing |
| 2. Front Anti-roll Bar Link (2) | 6. Steering Knuckle Assembly (2) |
| 3. Front Anti-roll Bar | 7. Front Wheel Hub Bearing Assembly (2) |
| 4. Front Subframe Assembly | 8. Front Lower Control Arm Assembly (2) |

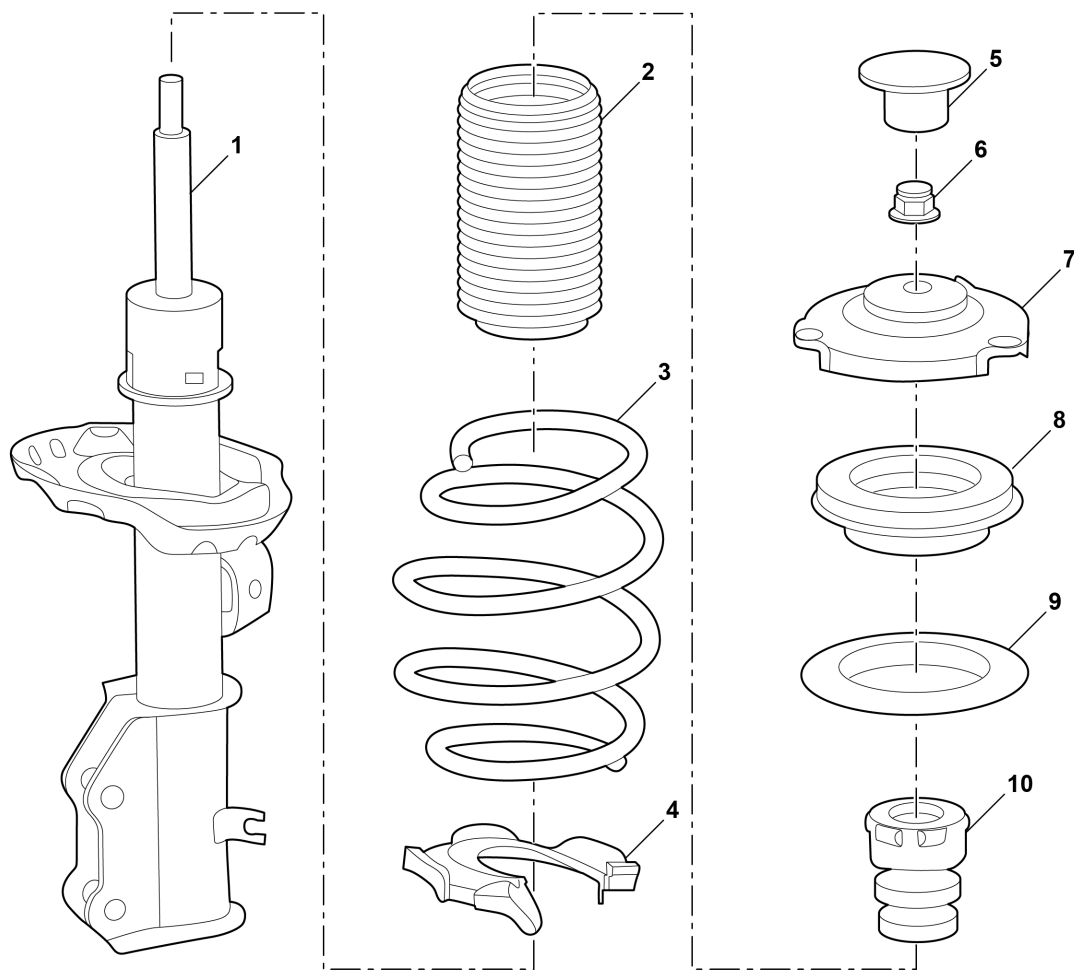
Exploded View of Front Suspension



S2210101

- | | |
|--------------------------------------|---|
| 1. Front Shock Absorber Coil Spring | 7. Front Wheel Hub Bearing Assembly |
| 2. Front Shock Absorber Strut | 8. Front Lower Swing Arm Rear Bushing |
| 3. Front Anti-roll Bar Link | 9. Front Lower Control Arm |
| 4. Front Anti-roll Bar | 10. Front Lower Swing Arm Front Bushing |
| 5. Front Anti-roll Bar Bushing Clamp | 11. Steering Knuckle Ball Head |
| 6. Steering Knuckle Assembly | |

Exploded View of Front Shock Absorber



S2211102

- | | |
|--|---|
| 1. Front Shock Absorber Strut | 6. Top Nut |
| 2. Dust Shield | 7. Front Shock Absorber Upper Mounting Support Assembly |
| 3. Coil Spring | 8. Top Bearing of Front Shock Absorber |
| 4. Front Shock Absorber Lower Spring Cushion | 9. Front Shock Absorber Upper Spring Cushion |
| 5. Dust Cap | 10. Bumper Block |

Description

Overview

Front suspension includes:

- Front Subframe Assembly
- 2 front lower control arm assemblies
- 2 steering knuckle assemblies
- 2 front shock absorber assemblies
- 2 front wheel hub bearing assemblies
- Front ant-roll bar and 2 anti-roll bar links

Front Subframe Assembly

The front subframe is stamped and welded with the high-strength steel, which features light weight and high structural strength. The geometric dimension of all key positions is accurately controlled during manufacture to ensure proper location of the front suspension and steering system components. The front subframe is assembled on the vehicle body through 4 supporting points. The front subframe provides locations for assembly of all front suspension components except the top support of the shock absorber and the support of the powertrain.

The rear supporting plate of the front subframe between the rear mounting point of the front subframe and the body can increase the rigidity of the front subframe. The arrangement of the supporting points can avoid the displacement of the front subframe under the lateral force, which will produce unnecessary steering effects.

The front end of the front subframe of some models is equipped with 2 longitudinal beam reinforcement bars, 1 cross beam and 1 lower buffer beam, which can better transmit and absorb the collision force and improve the protection of passenger compartment.

Front Shock Absorber Assembly

2 McPherson shock absorber assemblies control the damping effect of front suspension. Each shock absorber consists of a damping unit, a coil spring and a upper mounting support assembly. According to the damper transmission ratio (1:1), the design of the front suspension shall feature the anti-dive and anti-squat. The layout and design of shock absorber minimizes the wheel camber loss as a result of lateral force and improves the handling performance and steering response capability. The coil spring is between the damper spring seat and upper mounting support assembly, which remains in the compressed state. Vibration isolator at both ends of the spring reduces noises delivered to the vehicle body from the front suspension. Under the upper mounting support assembly is fitted a bearing, when the steering system work, the bearing allows coil spring rotation. The dust shield protects the shock absorber strut from getting dirty or damaged. Coil spring shaft and damper shaft are offset, in the turning process,

this arrangement can provide lateral load compensation, and enhance the damping effect.

Front Shock Absorber

The front shock absorber is a dual barrel type structure, which can be inflated and fuelled. This type of structure allows the movement of shock absorber piston inside the inner cylinder. There is an oil drain hole on the inner cylinder between the inner and outer cylinders. This structure minimizes the cavitation and eliminates the influence of the piston motion due to the damaged outer cylinder. The lower end of the front shock absorber is connected to the steering knuckle and fixed with bolts and nuts to ensure a correct orientation. The front shock absorber strut is integrated with the upper mounting support by nuts. There is a hexagonal slot at the top of front shock absorber strut, when fastening the nuts of the front shock absorber strut, the hexagonal slot can prevent rotation of the front shock absorber strut. The spring seat at a certain angle is combined with the shock absorber strut, and the mounting brackets for front anti-roll bar link are welded near the spring seat. There are 2 welding brackets near the bottom of the shock absorber strut, which are used for fitting the front brake hose and wheel speed sensor harness respectively.

Coil Spring

The coil spring is made of spring steel (containing carbon, silicon, manganese, phosphorus, chromium, and other alloy materials), which is assembled with the shock absorber strut. The top of the coil spring is fitted with an upper vibration insulator under the bearing seat, and the bearing is in the upper mounting support. The lower end of the coil spring is fitted on the spring seat through the lower vibration insulator, and the spring seat and the shock absorber strut are integrated. The front coil spring may vary depending on the powertrain used in the vehicle and vehicle configuration. Front coil springs with different configurations can be identified by the color code applied to the coil.

Upper Mounting Support Assembly

The upper mounting support assembly is composed of the inner and outer support frames, vulcanized rubber, and upper/lower supports. The rubber is vulcanized on the steel frame, with a support pressed in the upper/lower sides respectively. The top bearing is pressed into the base under the upper mounting support, and it can be replaced separately. The upper mounting support is integral, so that any part of it cannot be replaced separately. If necessary, a new upper mounting support assembly must be replaced.

Front Lower Control Arm Assembly

The front lower control arm is of fork type. The swing arm body is stamped and welded with alloy steel, which connects the front steering knuckle and the front subframe. The front lower swing arm has a ball head, which is tapered to fit the steering knuckle hole, and is fixed on the steering knuckle

with a locking nut. The front lower swing arm is connected with the subframe through the front and rear bushings. The front bushing is assembled to the front subframe with a bolt. The rear bushing is assembled to the subframe with a pair of bolts/nuts. The force from the vehicle wheel is transferred to the swing arm body by the ball head before the front/rear bushings transfer it to the subframe. In addition to transferring force, the flexibility of the bushings also allows the swing arm to sway up and down, they can absorb the vibration from the ground and their rigidity can provide a good stability. When the swing arm swings, the axis of the front bushing is the axis of rotation to swing, which plays a guiding role in the movement track of the wheel and makes the wheel move according to the predetermined track. The ball head of swing arm and the rear bushing can be replaced separately.

Front Anti-roll Bar and Link

The front anti-roll bar made of solid spring steel is connected to the rear of the front subframe by two bushings and bushing clamps. The bushings are assembled with the anti-roll bar as a whole through the secondary vulcanization process. The bushing clamps are fitted through special tooling, neither of which can be disassembled or replaced individually. The bushings are of low friction without additional lubrication, and allow the front anti-roll bar to rotate freely in static state. This allows the front anti-roll bar to respond quickly to roll inputs. The two ends of the front anti-roll bar are attached to one ball head of front anti-roll bar link, while the other ball head of the link is connected to the front shock absorber strut. This arrangement allows the front anti-roll bar to act in the ratio of 1:1 with wheel travel, providing the maximum lateral stability performance. The ends of each front anti-roll bar link are fitted with a ball joint which can increase the response speed and efficiency. The upper ball joint is mounted to the link at 90° to the axis, connected directly to the welded support on the front shock absorber strut, and secured with a locking nut. The lower ball joint is also mounted to the link at 90° to the axis, connected to the front anti-roll bar, and secured with a locking nut. The ball joints on the front anti-roll bar link are not serviceable and if replacement of any ball joint is necessary, a new link will be required.

Service Guide

Front Lower Control Arm Assembly Remove

1. Remove the wheels.

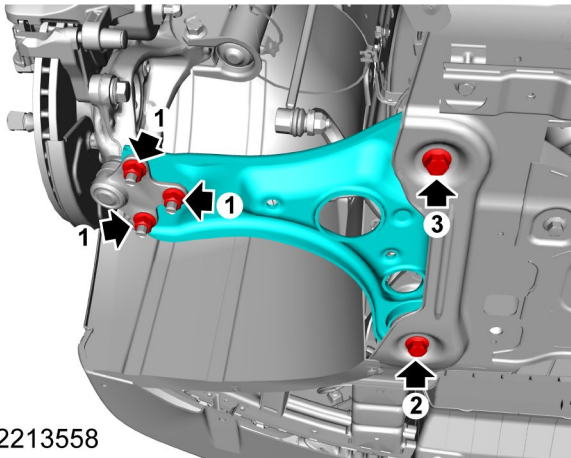
Wheels Remove

2. Remove the front bottom deflector.

Bottom Deflector Remove

3. Support the front lower control arm assembly and the steering knuckle assembly with the hydraulic lifting device.
4. Remove 3 bolts and nuts (1) fixing the outer ball joint of front lower control arm to the front lower control arm and discard them.
5. Remove and discard 1 bolt (2) fixing the front bushing of front lower control arm to the subframe.
6. Remove 1 bolt and nut (3) fixing the rear bushing of front lower control arm to the front subframe and discard them.

Warning : *Do not wobble the front lower swing arm up and down with excessive force or substantially, otherwise it will cause damage to the ball joint of front lower swing arm.*



S2213558

7. Remove the front lower control arm assembly.

Refit

1. Locate the front lower control arm to the subframe, fit 1 new retaining bolt and nut fixing the front and rear bushings, and do not tighten them temporarily.
2. Tighten 1 bolt and nut fixing the front and rear bushings of front lower control arm to the subframe to **135-165Nm+ (85°-95°)**.
3. Locate the outer ball joint of front lower control arm to the front lower control arm, fit 3 new bolts and nuts, and tighten them to **81-99Nm+(85°-95°)**.
4. Lower the hydraulic lifting device, and move it to the safety zone.
5. Fit the front bottom deflector.

Bottom Deflector Refit

6. Fit the wheels.

Wheels Refit

7. Check four-wheel alignment.

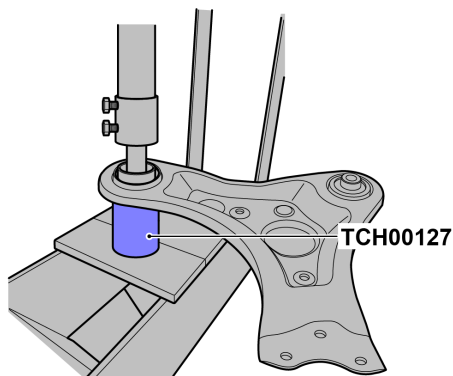
Four-wheel Alignment Check Adjustment

Front Lower Control Arm Bushing Remove

1. Remove the front lower control arm assembly.

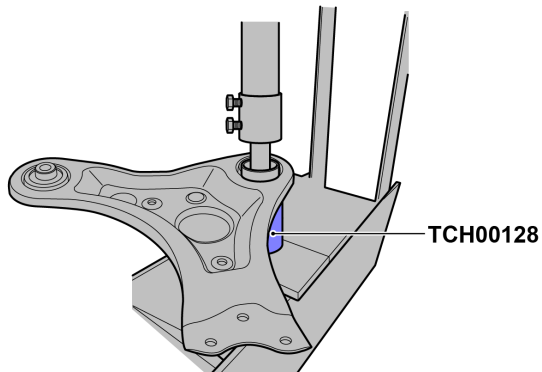
Front Lower Control Arm Assembly Remove

2. Press the front bushing of the front lower control arm out of the front lower control arm assembly with a press and the special tool TCH00127.



S2213560

3. Remove the front bushing of front lower control arm.
4. Press the rear bushing of the front lower control arm out of the front lower control arm assembly with a press and the special tool TCH00128.

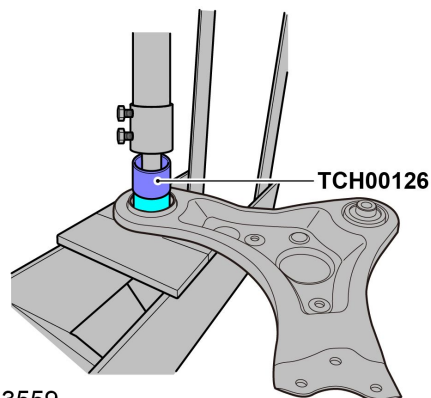


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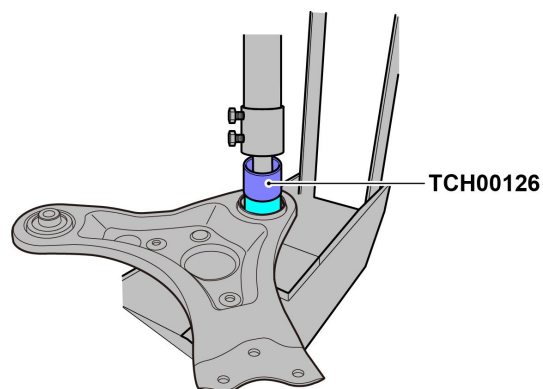
5. Remove the rear bushing of front lower control arm.

Refit

1. Clean the junction of the front lower control arm and the rear bushing of front lower control arm.
2. As shown in the illustration, use a press and the special tool TCH00126 to press new front and rear bushings of front lower control arm into the lower swing arm.



S2213559



S2213837

3. Remove the special tool.
4. Fit the front lower control arm assembly.

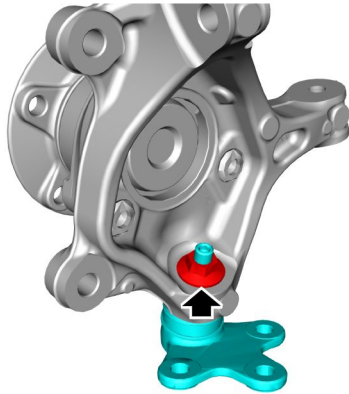
Front Lower Control Arm Assembly Refit

Front Lower Control Arm Ball Head Connector Assembly Remove

1. Remove the front lower control arm assembly.

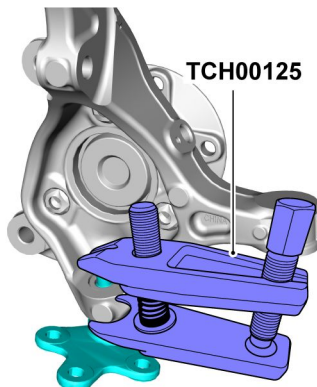
Front Lower Control Arm Assembly Remove

2. Remove 1 nut fixing the outer ball joint of front lower control arm to the steering knuckle and discard it.



S2213560

3. Use the special tool TCH00125 to remove the front lower control arm outer ball head connector assembly.



S2213561

Refit

1. Ensure that the front lower control arm ball head connector assembly and the front lower control arm assembly are clean.
2. Locate the front lower control arm outer ball head connector assembly to the steering knuckle, fit 1 new nut, and tighten it to **81-99Nm+(85°-95°)**.
3. Fit the front lower control arm assembly.

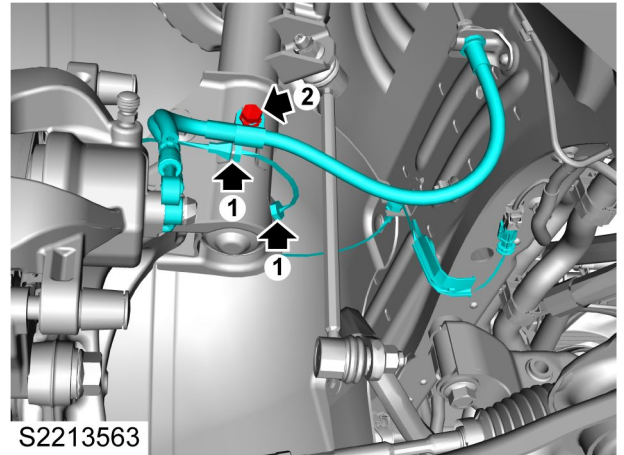
Front Lower Control Arm Assembly Refit

Front Shock Absorber Assembly Remove

1. Remove the front wheels.

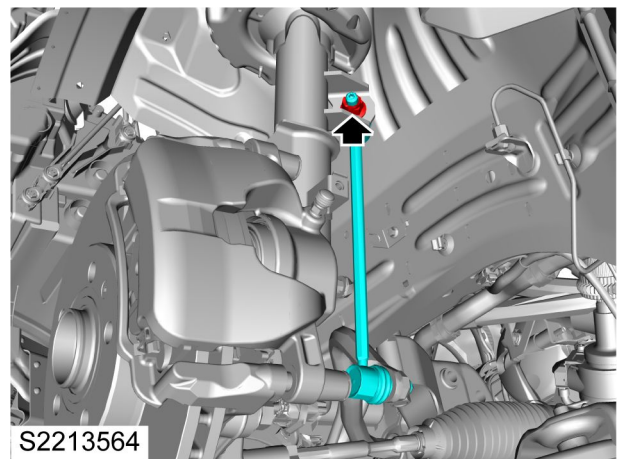
Wheels Remove

2. Disconnect the harness clip (1) of the wheel speed sensor from the front shock absorber.
3. Remove 1 bolt (2) fixing the front brake hose bracket to the front shock absorber, and disconnect the connection.



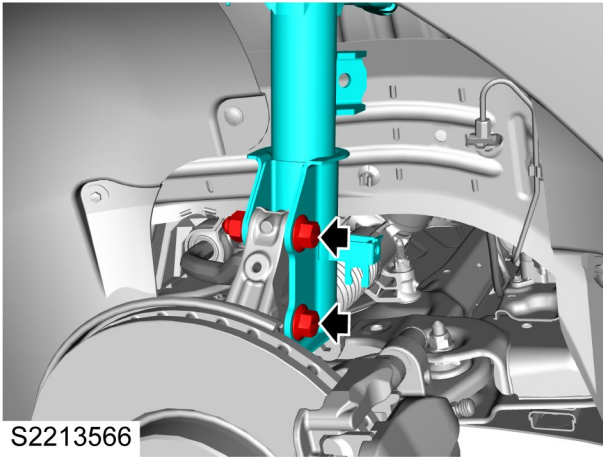
S2213563

4. Use a tool to lock the ball joint of the front anti-roll bar link, remove and discard 1 nut fixing the link to the front shock absorber, and disconnect the link from the shock absorber.



S2213564

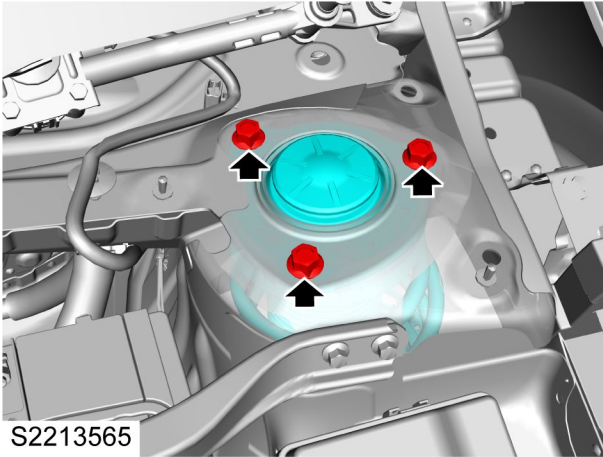
5. Remove 2 bolts and nuts fixing the front shock absorber assembly to the steering knuckle and discard them.



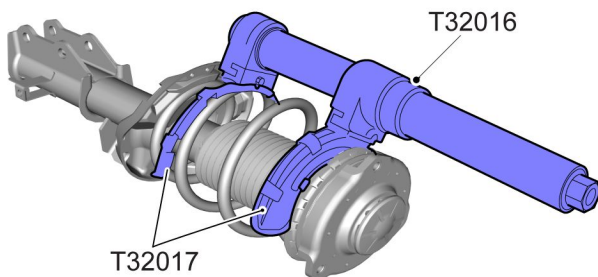
- Remove the A/C air inlet grille side corner and panel lower support plate.

 **A/C Air Inlet Grille Side Corner and Panel Lower Support Plate Remove**

- Remove and discard 3 bolts fixing the front shock absorber to the body.



- Remove the front shock absorber assembly.
- Remove the dust cover at the top of the front shock absorber.
- Fix the spring compressor T32016 and T32017 to the front shock absorber spring, ensure the adapter of the spring compressor is properly fitted, and compress the spring.



- Lock the top of the front shock absorber with an Allen wrench, remove and discard the top nut with special tool TCH00117.

- Remove the upper mounting support assembly of the front shock absorber.
- Remove the bearing and upper spring vibration isolator.
- Remove the coil spring of front shock absorber and lower spring vibration isolator.
- Remove the front shock absorber dust shield and bumper block.
- Release the pressure of coil spring, loosen the adapter from the spring compressor and remove the coil spring.

Refit

- Check the front shock absorber strut and bearing for any sign of crack or damage.
- Check the dust shield and bump stop for any sign of aging or damage.
- Clean the front shock absorber strut and bumper block, and locate the bumper block and dust shield to the front shock absorber strut.
- Locate the lower spring vibration isolator and spring to the front shock absorber, and use the tool T32016 and T32017 to compress the spring.
- Ensure the correct position for installation, and locate the upper spring vibration isolator, the bearing and the top mount assembly to the front shock absorber strut.
- Fit a new top nut of the front shock absorber, lock the front shock absorber strut with an Allen wrench, and tighten the nut to **65-75Nm** with the special tool.
- Release the spring, loosen the adapter of the spring compressor and take out the spring compressor.
- Fit the dust cover of the front shock absorber.
- Clean the junction of the front shock absorber and the body.
- Locate the front shock absorber to the body, fit 3 new bolts and tighten them to **55-65Nm**.
- Fit the A/C air inlet grille panel lower support plate.

 **A/C Air Inlet Grille Panel Lower Support Plate Refit**

- Locate the front shock absorber assembly to the steering knuckle, fit 2 new bolts and nuts, and tighten them to **135-165Nm+(85-95)°**.
- Locate the front anti-roll bar link to the front shock absorber. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut to **110-135Nm**.
- Locate the front brake hose bracket to the front shock absorber, fit 1 bolt and tighten it to **10-15Nm**.
- Fix the harness clip of the front wheel speed sensor to

the front shock absorber strut bracket, and clamp it.

16. Fit the front wheels.

Wheels Refit

17. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

Front Subframe Assembly Remove

Caution : Do not hang the compressor on the air conditioner pipe to avoid damage.

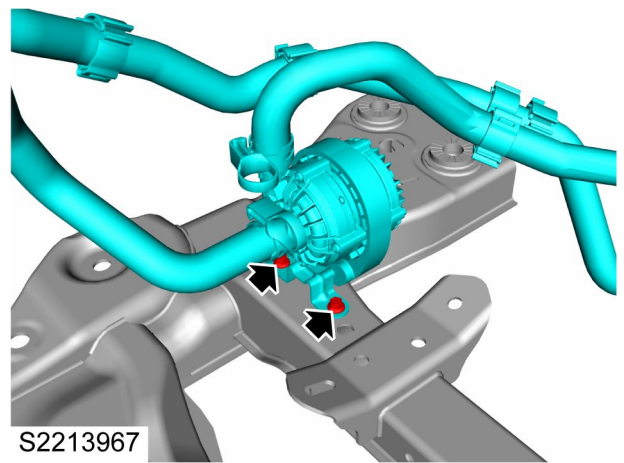
1. Remove the manual service disconnect.

Manual Service Disconnect Remove

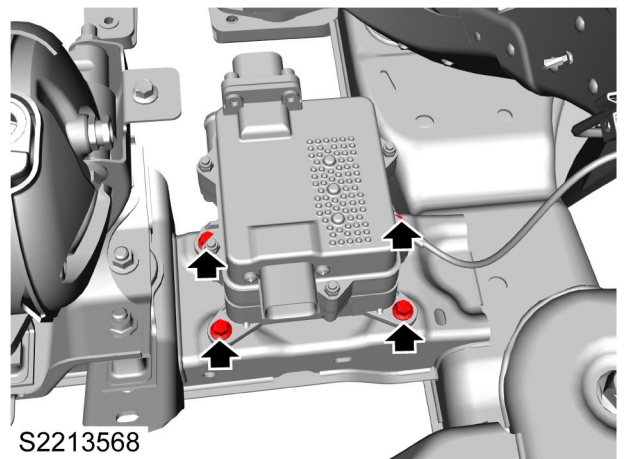
2. Remove the front lower control arm assemblies (both sides).

Front Lower Control Arm Assembly

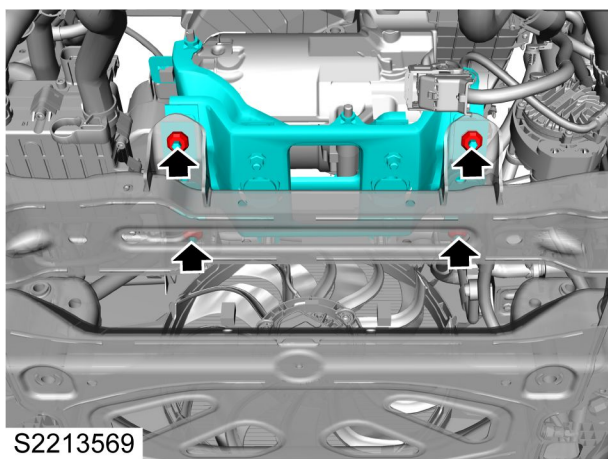
3. Remove the front subframe (2WD)
 - a. Remove 2 bolts fixing the water pump (2WD) to the front subframe.



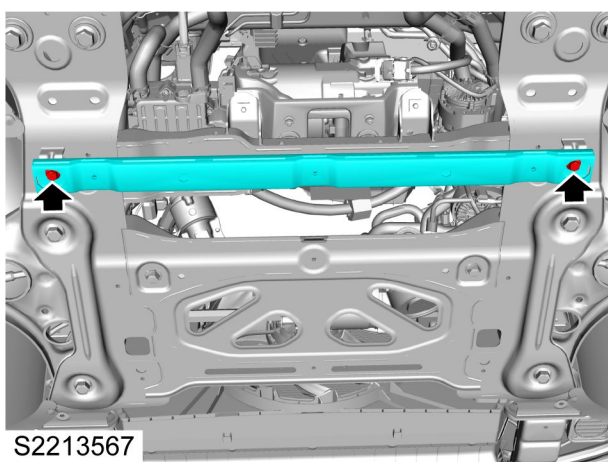
- b. Remove 4 bolts fixing the high-voltage battery pack electric heater to the front subframe, and move them away.



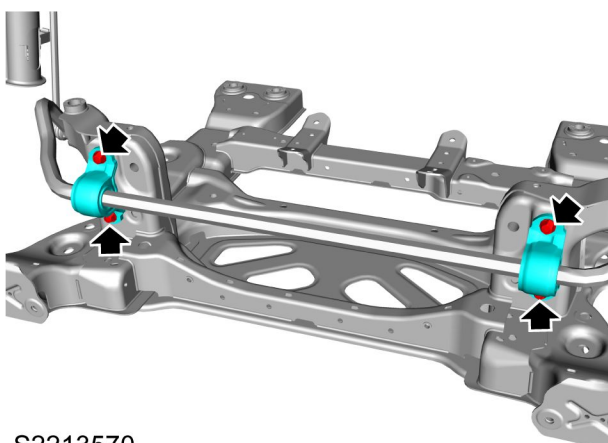
- c. Remove 4 nuts fixing the electric A/C compressor bracket (2WD) to the front subframe.



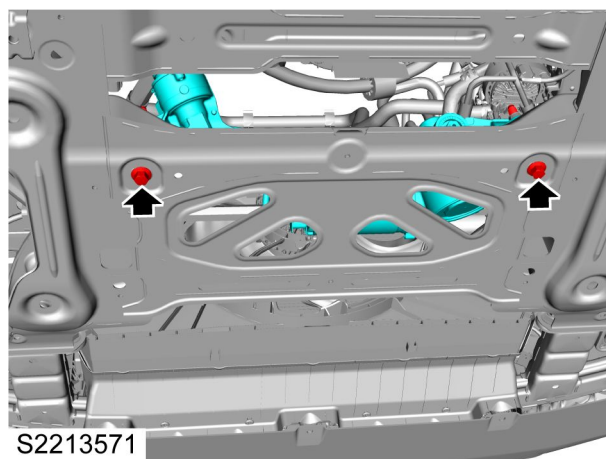
d. Remove 2 bolts fixing the battery protection beam to the front subframe.



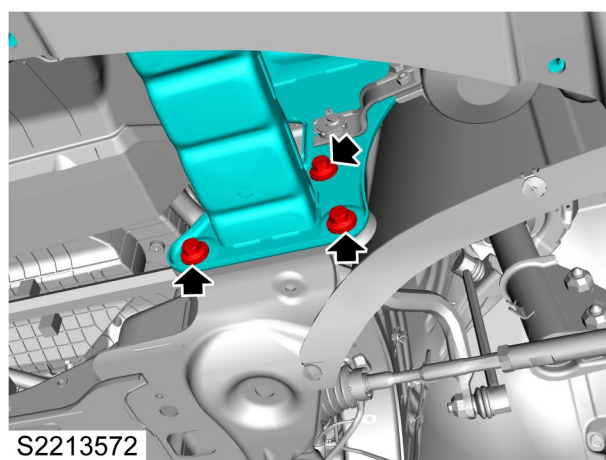
e. Remove and discard 4 bolts fixing the front anti-roll bar to the front subframe.



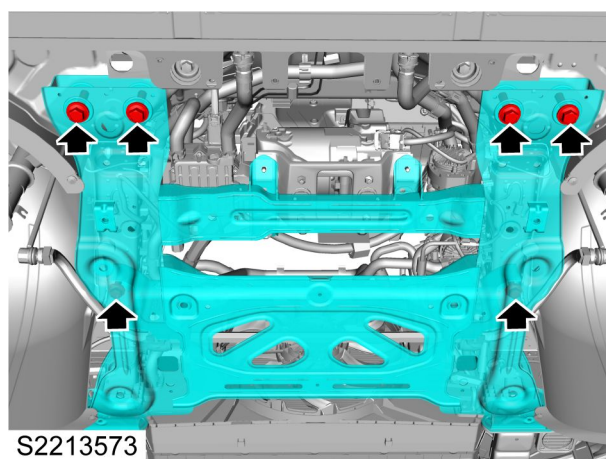
f. Remove and discard 2 bolts and nuts fixing the steering gear to the front subframe.



g. Remove and discard 3 bolts (both sides) fixing the front bumper beam to the front subframe.



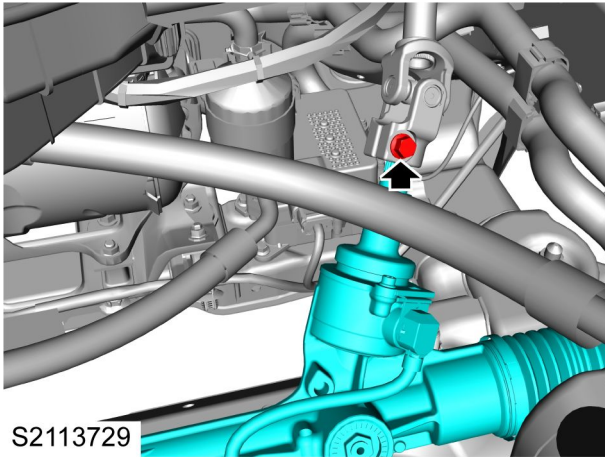
h. Loosen the harness clips, use a hydraulic lifting device to support the front subframe, remove and discard 6 bolts fixing the front subframe to the body.



i. Lower the hydraulic lifting device, and remove the front subframe assembly.

4. Remove the front subframe (4WD)

a. Remove and discard 1 bolt fixing the intermediate shaft universal joint to the steering gear input shaft.



S2113729

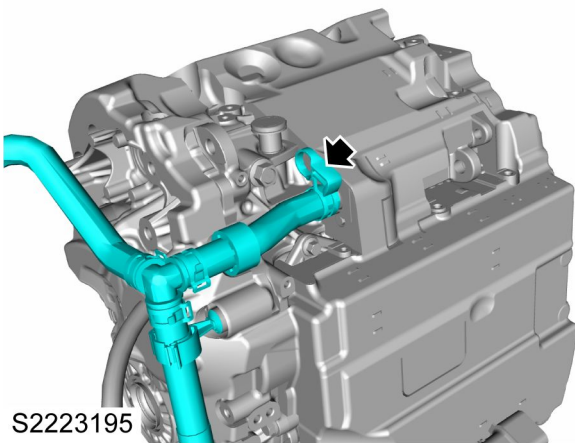
b. Remove the AC compressor mounting bracket (4WD).

AC compressor mounting bracket (4WD) Remove

c. Draining the cooling system - EDS.

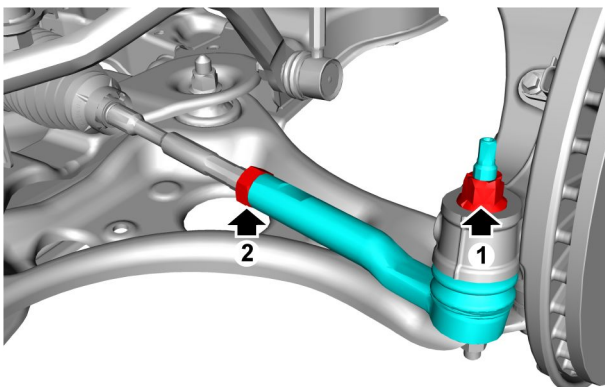
Draining-EDS Drain Refill

d. Loosen the clamp and disconnect the cooling pipe from the EDS. (4WD)



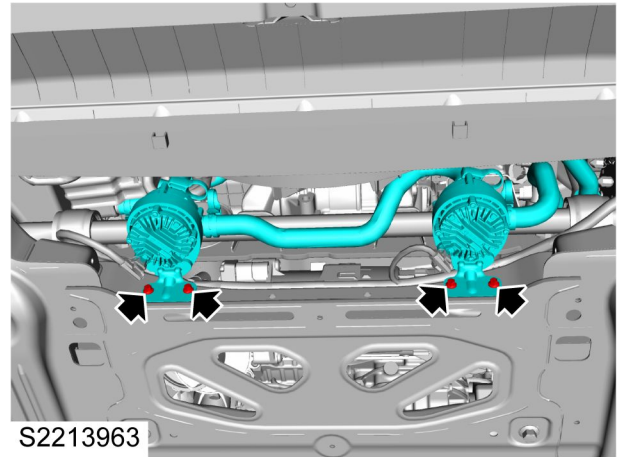
S2223195

e. Remove 1 nut (1) fixing the steering gear outer tie rod to the steering knuckle and discard it.



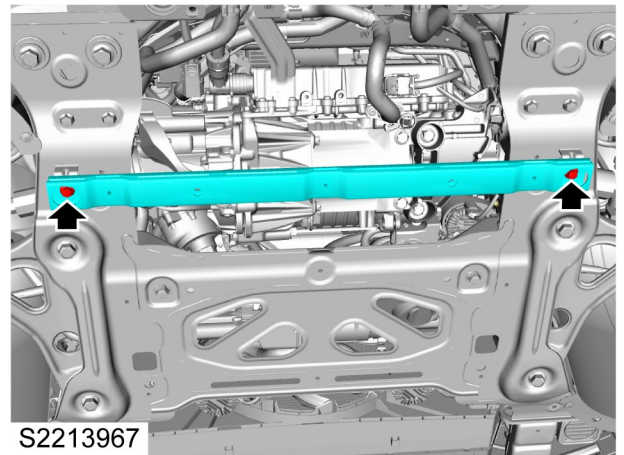
S2113731

f. Remove 4 bolts fixing the water pump (4WD) to the front subframe and move it.



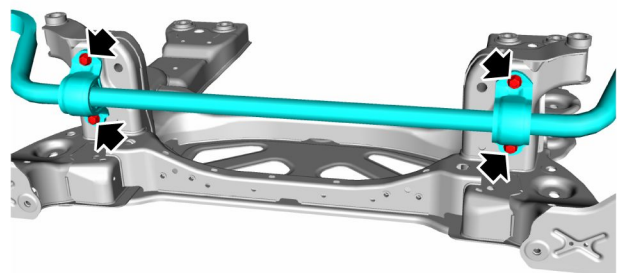
S2213963

g. Remove 2 bolts fixing the battery protection beam to the front subframe.



S2213967

h. Remove and discard 4 bolts fixing the front anti-roll bar to the front subframe.



S2213966

i. Remove the right front axle shaft assembly.

Front Right Axle Ahaft Assembly Remove - Right Front Remove - Left Front

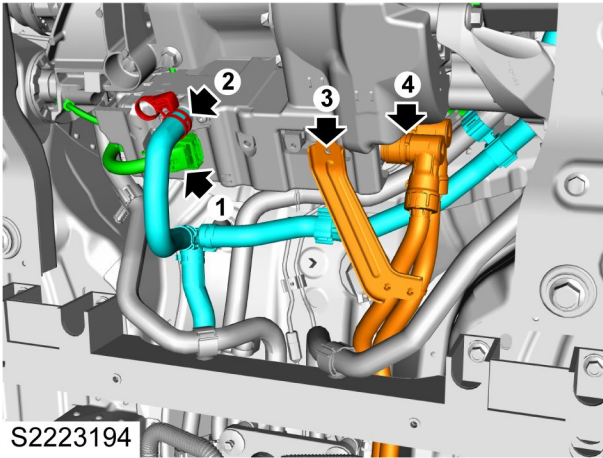
j. Remove the left front axle shaft assembly.

Front Left Axle Ahaft Assembly Remove - Right Front Remove - Left Front

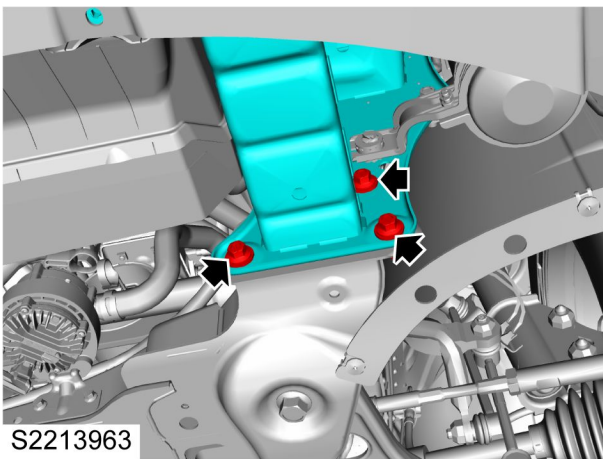
k. Disconnect the IMCU (1).

l. Loosen the clamp (2) and disconnect the cooling pipe from the EDS. (4WD)

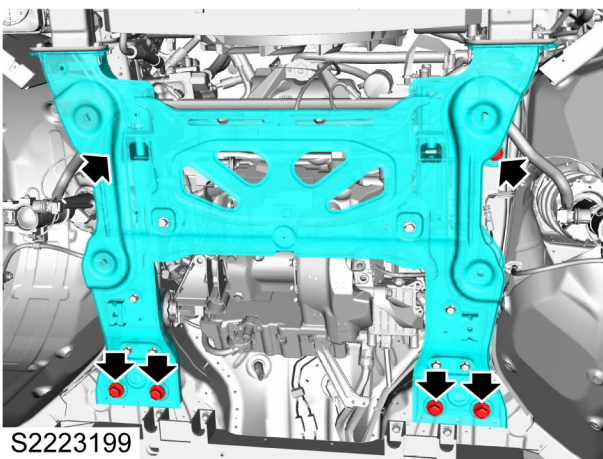
- m. Remove 1 bolt (3) fixing the high-voltage harness bracket to the EDS, Loosen the clamp to disconnect the IMCU (4).



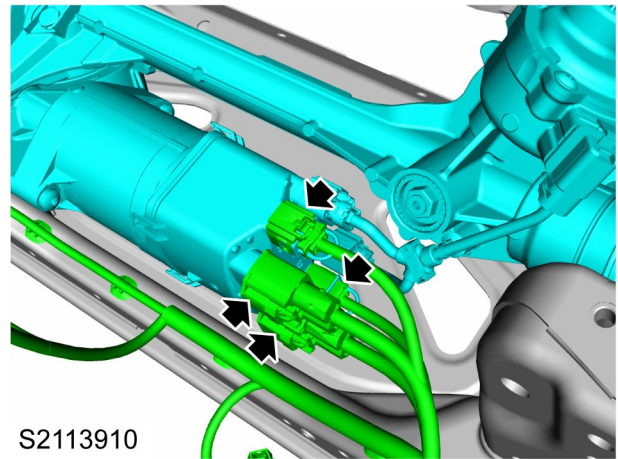
- n. Use a hydraulic lifting device to lift the front subframe and EDS and the steering gear subassembly.
- o. Remove and discard 3 bolts (both sides) fixing the front bumper beam to the front subframe.



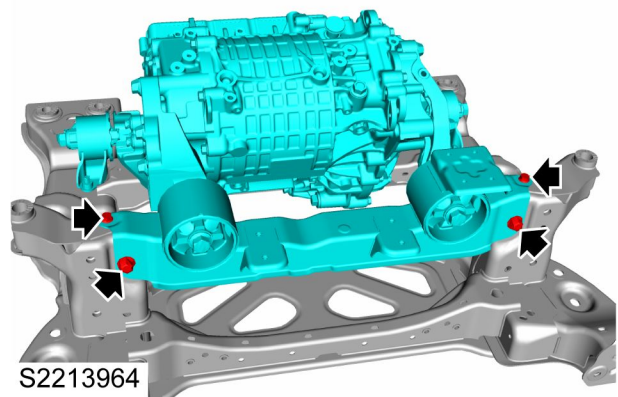
- p. Remove and discard 6 bolts fixing the front subframe to the body.



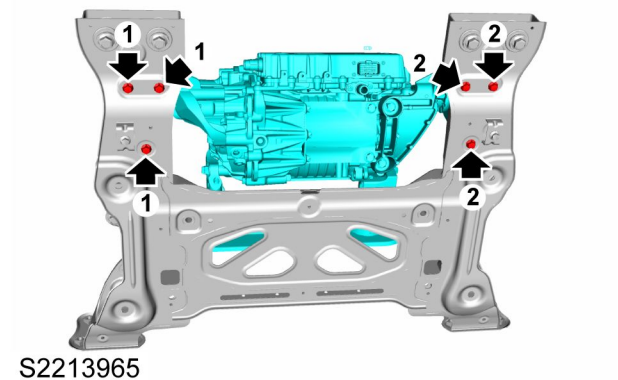
- q. Lower the front subframe to a proper height.
- r. Disconnect the harness connector of the steering gear subassembly.



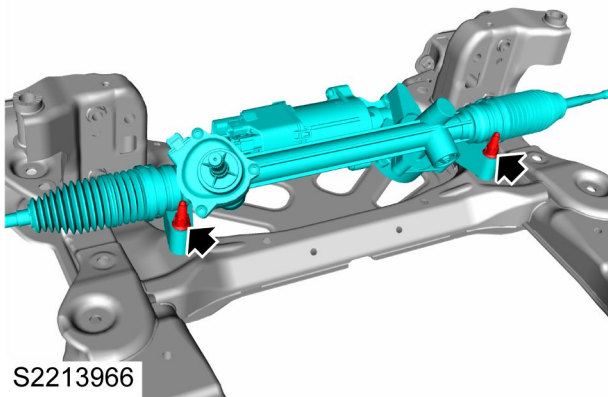
- s. Lower the hydraulic lifting device to remove the front subframe and EDS and the steering gear subassembly.
- t. Use cushion black to reliably support the EDS, remove and discard 4 bolts fixing the front subframe mounting to the front subframe.



- u. Remove and discard 3 bolts (1) fixing the left mounting to the front subframe.
- v. Remove and discard 3 bolts (2) fixing the right mounting to the front subframe, remove the EDS and the mountings.



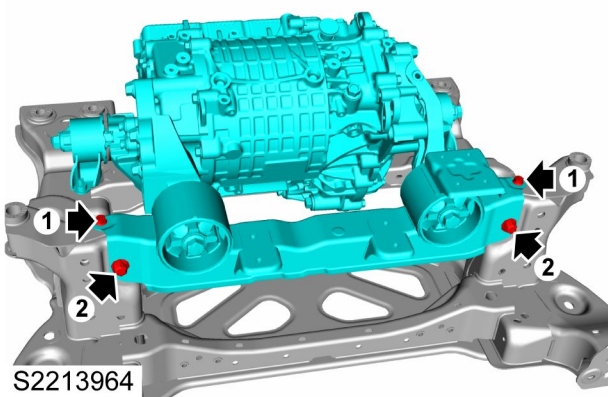
- w. Remove and discard 2 bolts fixing the steering gear subassembly to the front subframe.



- x. Lower the hydraulic lifting device, and remove the front subframe assembly.

Refit

1. Refit the front subframe (4WD)
 - a. Ensure that the junction surface of the front subframe assembly and the steering gear subassembly is clean.
 - b. Locate the steering gear assembly to the front subframe, fit 2 new nuts and bolts, and tighten them to **(63-77) Nm+ (175-185) °**.
 - c. Ensure that the junction surface of the front subframe assembly and the EDS mounting is clean, locate the mounting to the front subframe.
 - d. Fix the right mounting to the front subframe, fit 3 new bolts and tighten them to **(45-55) Nm+ (85-95) °**.
 - e. Fix the left mounting to the front subframe, fit 3 new bolts and tighten them to **(45-55) Nm+ (85-95) °**.
 - f. Fix the front subframe mounting to the front subframe, fit 4 new bolts and tighten them to **(45-55) Nm+ (85-95) °(1), (63-77) Nm+ (85-95) °(2)**.



- g. Connect the steering gear subassembly.

- h. Ensure that the junction surface of the front subframe assembly and the body is clean, and raise the front subframe assembly to each locating point of the body.
- i. Locate the front subframe to the body, fit 6 new bolts, tighten them to **(135-165) Nm+ (85-95) °**.
- j. Fix the front bumper beam to the front subframe, fit 3 new bolts (both sides), and tighten them to **19-25Nm**.
- k. Lower the hydraulic lifting device, and move it to the safety zone.
- l. Connect the IMCU, fix the high-voltage harness bracket to EDS, fit 1 bolt and and tighten it.
- m. Connect the cooling pipe to EDS.
- n. Connect the IMCU.
- o. Fit the left front axle shaft assembly.

Front Left Axle Shaft Assembly Refit - Right Front Refit - Left Front

- p. Fit the right front axle shaft assembly.

Front Right Axle Shaft Assembly Refit - Right Front Refit - Left Front

- q. Locate the anti-roll bar to the front subframe, fit 4 new bolts, and tighten them to **55-65Nm**.
- r. Fix the battery protection beam to the front subframe, fit 2 bolts, and tighten them to **45-55Nm**.
- s. Fix the water pump to the front subframe, fit 4 bolts, and tighten them.
- t. Fix the steering gear outer tie rod to the steering knuckle, fit 1 new bolt, and tighten it to **(31.5-38.5) Nm+ (30-45) °**.
- u. Connect the cooling pipe to EDS.
- v. Refill the cooling system - EDS.

Refill-EDS Drain Refill

- w. Fit the AC compressor (4WD).

AC compressor (4WD) Refit

- x. Locate the steering gear assembly to the front subframe, fit 2 new nuts and bolts in sequence (start at the driver side), and tighten them to **63-77Nm+ (175°-185°)**.
2. Refit the front subframe(2WD)
 - a. Ensure that the junction surface of the front subframe assembly and the body is clean, and raise the front subframe assembly to each locating point of the body.

- b. Locate the front subframe to the body, fit 6 new bolts, tighten them to (135-165) Nm+ (85-95) °.
- c. Fix the front bumper beam to the front subframe, fit 3 new bolts (both sides), and tighten them to **19-25Nm**.
- d. Locate the steering gear to the front subframe, fit 2 new bolts and nuts, and tighten them to (63-77) Nm+ (175-185) °.
- e. Locate the anti-roll bar to the front subframe, fit 4 new bolts, and tighten them to **55-65Nm**.
- f. Fix the battery protection beam to the front subframe, fit 2 bolts, and tighten them to **45-55Nm**.
- g. Fix the electric A/C compressor bracket to the front subframe, fit 4 nuts, and tighten them to **12-18Nm**.
- h. Fix the high-voltage battery pack electric heater to the front subframe, fit 4 bolts, and tighten them to **7-10Nm**.
- i. Locate the drive motor control module water pump bracket to the front subframe, fit 2 bolts and tighten them to **7-10Nm**.
- j. Lower the hydraulic lifting device, and move it to the safety zone.

3. Fit the front lower control arm assemblies (both sides).

 **Front Lower Control Arm Assembly Refit**

4. Fit the manual service disconnect.

 **Manual Service Disconnect Refit**

Front Stabilizer Shaft Remove

1. Remove the wheels.

 **Wheels Remove**

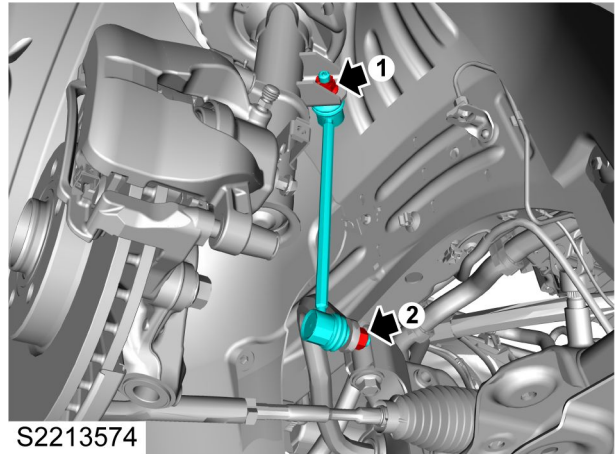
2. Remove the front wheelhouse liner (any side).

 **Front Wheelhouse Liner Assembly Remove**

3. Remove the front bottom deflector.

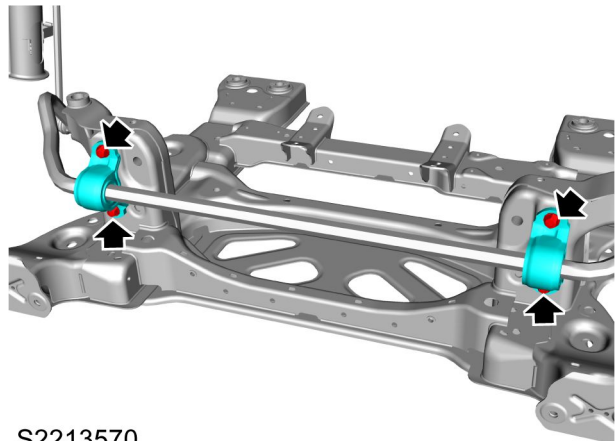
 **Bottom Deflector Remove**

4. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (2) (both sides) fixing the link to the stabilizer bar.



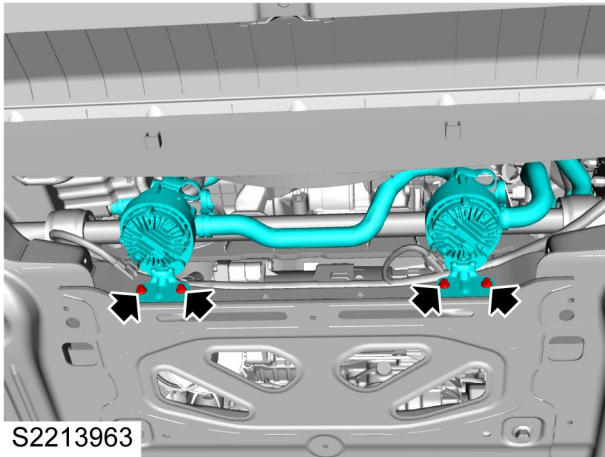
5. Remove the front stabilizer bar (2WD)

- a. Remove and discard 4 bolts fixing the front stabilizer bar to the front subframe.



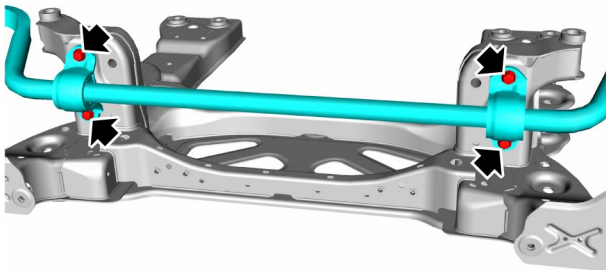
6. Remove the front stabilizer bar (4WD)

- a. Remove 4 bolts fixing the water pump to the front subframe, and remove the pump.



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- b. Remove and discard 4 bolts fixing the front stabilizer bar to the front subframe.



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- 7. Find the right space and carefully pull the front stabilizer bar out of the vehicle.

Refit

- 1. Refit the front stabilizer bar (4WD)
 - a. Locate the front stabilizer bar to the front subframe, adjust it to the appropriate place, fit 4 new bolts, and tighten them to **55-65Nm**.
 - b. Fix the pump to the front subframe, fit 4 bolts and tighten them.
- 2. Refit the front stabilizer bar (2WD)
 - a. Locate the front stabilizer bar to the front subframe, adjust it to the appropriate place, fit 4 new bolts, and tighten them to **55-65Nm**.
- 3. Locate the front stabilizer bar link to the anti-roll bar. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut to **75-90Nm**.
- 4. Fit the front bottom deflector.

 **Bottom Deflector Refit**

- 5. Fit the front wheelhouse liner assembly.

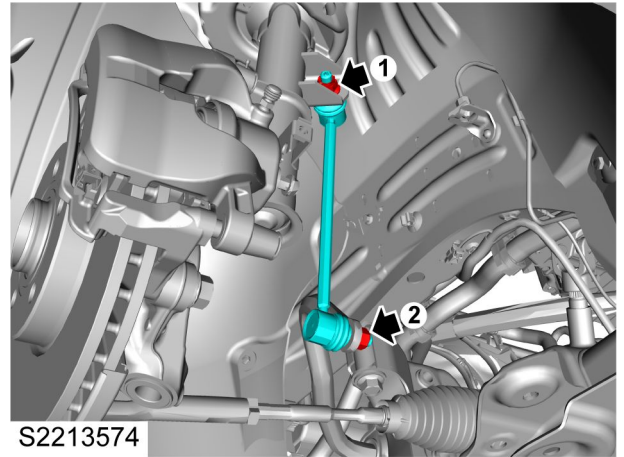
 **Front Wheelhouse Liner Assembly Refit**

- 6. Fit the front wheels.

 **Wheels Refit**

Front Stabilizer Bar Link Remove

- 1. Raise the vehicle to the appropriate height.
- 2. Rotate the wheel to a proper position.
- 3. Use a tool to lock the ball joint of the front anti-roll bar link to prevent its rotation, remove and discard 1 nut (1) fixing the link to the front shock absorber assembly.
- 4. Use a tool to lock the ball joint of the front anti-roll bar link to prevent its rotation, remove and discard 1 nut (2) fixing the link to the front anti-roll bar.



S2213574

- 5. Disconnect the connection and remove the front anti-roll bar link.

Refit

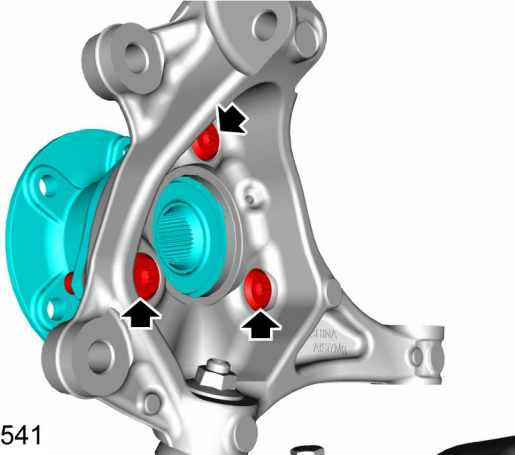
- 1. Locate the front anti-roll bar link to the front anti-roll bar. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut to **75-90Nm**.
- 2. Locate the front anti-roll bar link to the front shock absorber assembly. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut to **75-90Nm**.
- 3. Rotate the wheel to its original position, and lower the vehicle.

Front Wheel Hub Bearing Remove

1. Remove the front brake disc.

Front Brake Disc Remove

2. Remove 3 bolts fixing the front wheel hub bearing assembly to the steering knuckle and discard them.



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3. Remove the front wheel hub bearing assembly.

Refit

1. Clean the junction between the front wheel hub bearing assembly and the steering gear.
2. Locate the front wheel hub bearing assembly to the steering knuckle, fit 3 new bolts, first pre-tighten them and tighten them to **63-77Nm+(85°-95°)** in a diagonal sequence.
3. Fit the front brake disc.

Front Brake Disc Refit

4. Check four-wheel alignment.

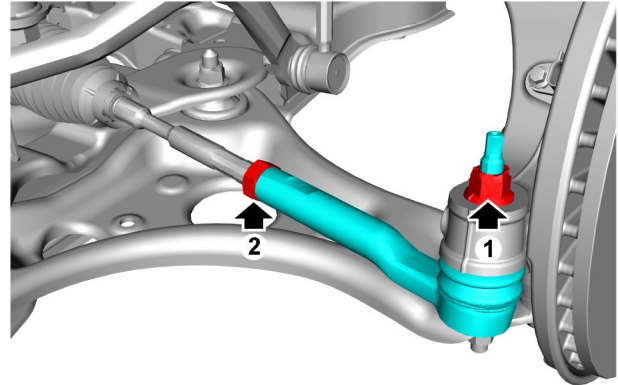
Four-wheel Alignment Check Adjustment

Steering Knuckle Assembly Remove

1. Remove the front brake disc.

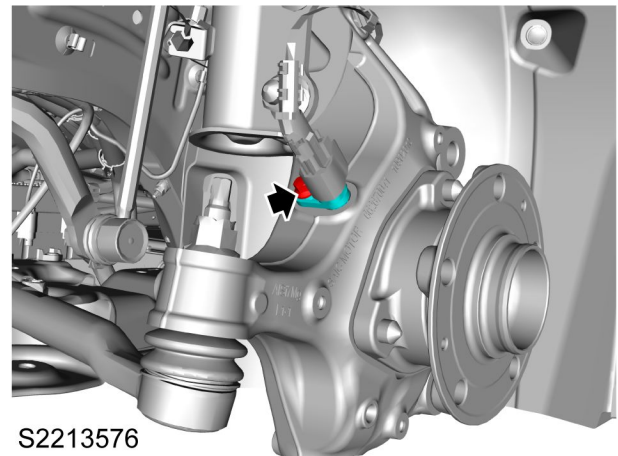
Front Brake Disc Remove

2. Remove 1 nut (1) fixing the steering gear outer tie rod to the steering knuckle, discard it and disconnect the connection.



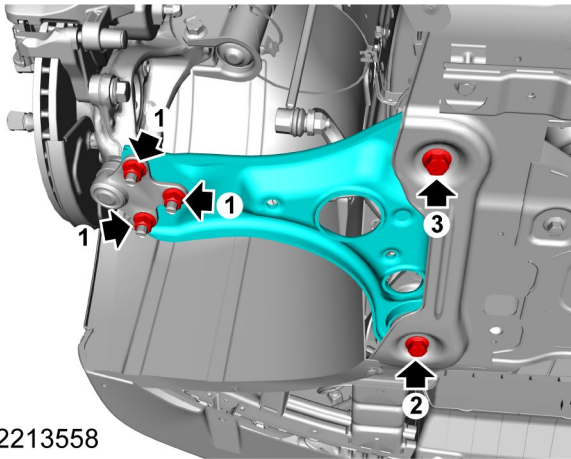
S2113731

3. Remove and discard 1 bolt fixing the wheel speed sensor to the steering knuckle, remove the wheel speed sensor, and disengage the harness clip from the steering knuckle.



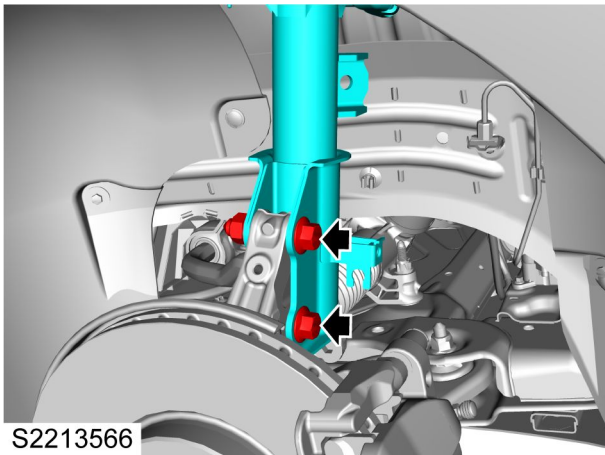
S2213576

4. Support the front lower swing arm assembly and the steering knuckle assembly with the hydraulic lifting device.
5. Remove 3 bolts and nuts (1) fixing the outer ball joint of front lower swing arm to the front lower control arm and discard them.



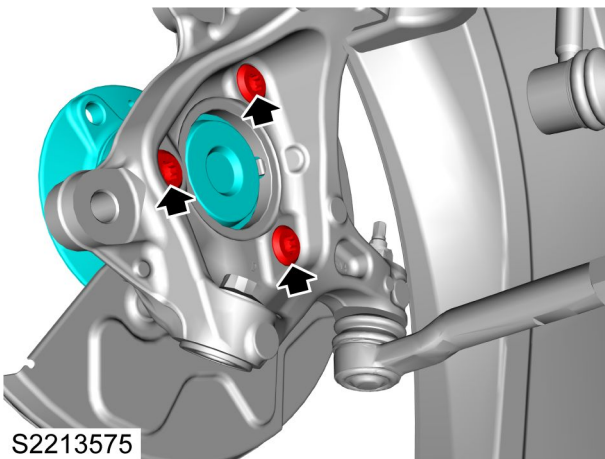
S2213558

6. Remove 2 bolts and nuts fixing the front shock absorber assembly to the steering knuckle and discard them.



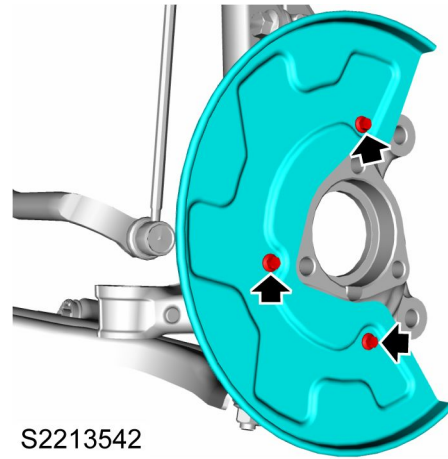
S2213566

7. Remove and discard 3 bolts fixing the front wheel hub bearing assembly to the steering knuckle, and remove the front wheel hub bearing assembly.



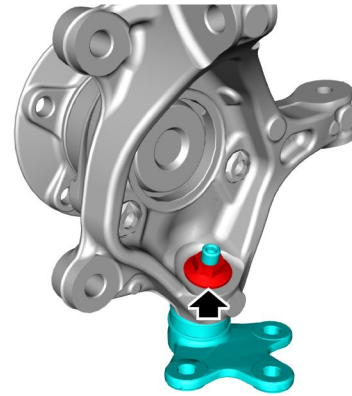
S2213575

8. Remove 3 bolts fixing the front brake disc guard plate to the steering knuckle.



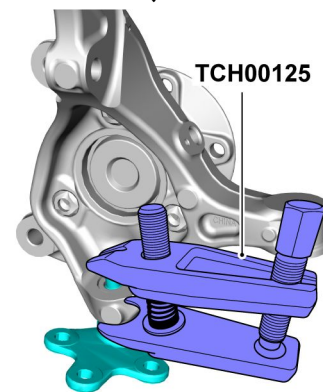
S2213542

9. Remove 1 nut fixing the front lower control arm ball joint connector assembly to the steering knuckle and discard it.



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10. Use the special tool TCH00125 to remove the front lower control arm ball joint connector assembly.



S2213561

11. Remove the steering knuckle assembly.

Refit

1. Locate the front lower control arm ball joint connector assembly to the steering knuckle, fit 1 new nut, and tighten it to **18-22Nm+ (85°-95°)**.
2. Locate the front brake disc guard plate to the steering knuckle, fit 3 bolts and tighten them to **7-10Nm**.
3. Clean the junction between the front wheel hub bearing assembly and the steering gear.

4. Locate the front wheel hub bearing assembly to the steering knuckle, fit 3 new bolts, first pre-tighten them and tighten them to **63-77Nm+(85°-95°)** in a diagonal sequence.
5. Locate the front shock absorber assembly to the steering knuckle, fit 2 new bolts and nuts, and tighten them to **135-165Nm+ (85°-95°)**.
6. Locate the outer ball joint of front lower control arm to the front lower control arm, fit 3 new bolts and nuts, and tighten them to **81-99Nm+(85°-95°)**.
7. Push the hydraulic lifting device to the safety zone.
8. Locate the wheel speed sensor to the steering knuckle, fit 1 bolt, tighten it to **7-10Nm**, and fix the wheel speed sensor harness to the steering knuckle.
9. Locate the steering gear outer tie rod to the steering knuckle, fit 1 new nut and tighten it to **31.5-38.5Nm+ (30°-45°)**.
10. Fit the front brake disc.

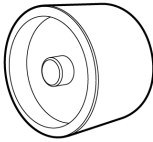
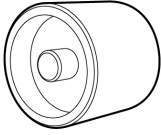

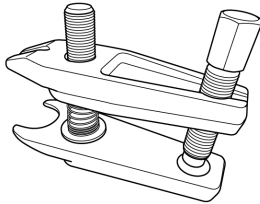
Front Brake Disc Refit

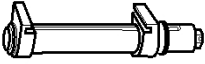
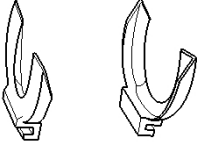
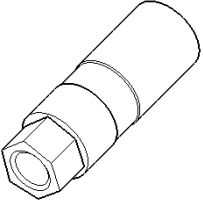
11. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TCH00127	Remover front lower control arm front bush	 <p>TCH00127</p>
TCH00128	Remover front lower control arm rear bush	 <p>TCH00128</p>
TCH00126	Rocker arm bushing press tool	 <p>TCH00126</p>
TCH00125	Front lower rocker arm outer ball joint remover	 <p>TCH00125</p>

Tool Number	Description	Picture
T32016	Coil spring compressor	 <p>T32016</p>
T32017	Adaptor coil spring compressor	 <p>T32017</p>
TCH00117	Remover & replacer front damp big bolt	 <p>TCH00117</p>

Rear Suspension

Specification

Torque

Description	Value
Bolt-Rear damper to body	55-65Nm+ (90°-110°)
Bolt&Nut-Rear damper to rear lower control arm	90-110Nm
Bolt&Nut-Front upper control arm to rear subframe	135-165Nm+ (85°-95°)
Bolt&Nut-Front upper control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-Front lower control arm to rear subframe	135-165Nm+ (85°-95°)
Bolt&Nut-Front lower control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-rear upper control arm to rear subframe	135-165Nm+ (85°-95°)
Bolt&Nut-rear upper control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-rear lower control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-rear lower control arm to rear subframe	150-180Nm
Bolt&Nut-Rear toe link to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-Rear toe link to rear subframe	150-180Nm
Bolt-Rear anti-roll bar to rear subframe	55-65Nm
Nut-rear anti-roll barb to rear anti-roll bar links	75-90Nm
Nut-rear anti-roll bar links to wheel carrier	75-90Nm
Bolt-rear subframe to EDS mount bracket	135-165Nm+ (85°-95°)
Bolt-rear subframe and EDS to body	135-165Nm+ (175°-185°)
Bolt-rear subframe bar to body	90-110Nm
Bolt-EPB motor bracket to rear brake caliper bracket	7-10Nm
Bolt-The Under flow duct bracket to subframe	4-6Nm
Bolt-Rear wheel hub bearing to rear wheel carrier	63-77Nm+(85°-95°)
Nut-right rear drive shaft locking device	345-375Nm
Bolt-rear brake disc protector to rear brake caliper bracket	7-10Nm

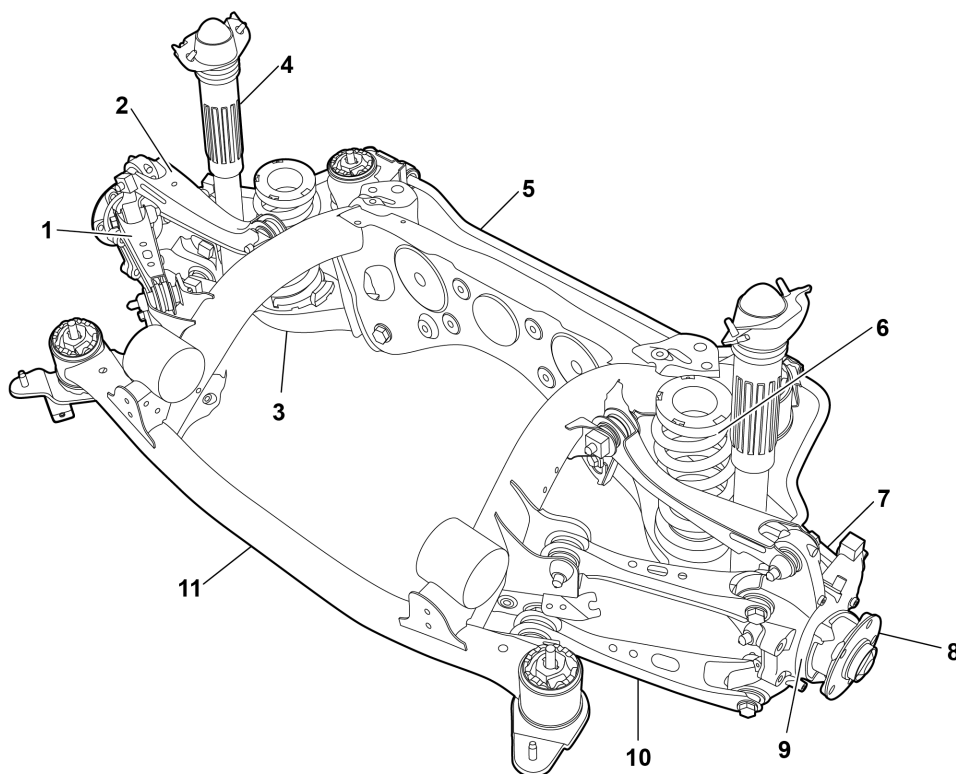
Parameters

Diameter of Rear Anti-Roll Bar	19mm
Rear Coil Spring Parameters	
Total Number of Turns	7.05
Valid Number of Turns	6.15
Diameter of Spring Wire	16.7mm
Free Height	331.4mm

Description and Operation

System Layout

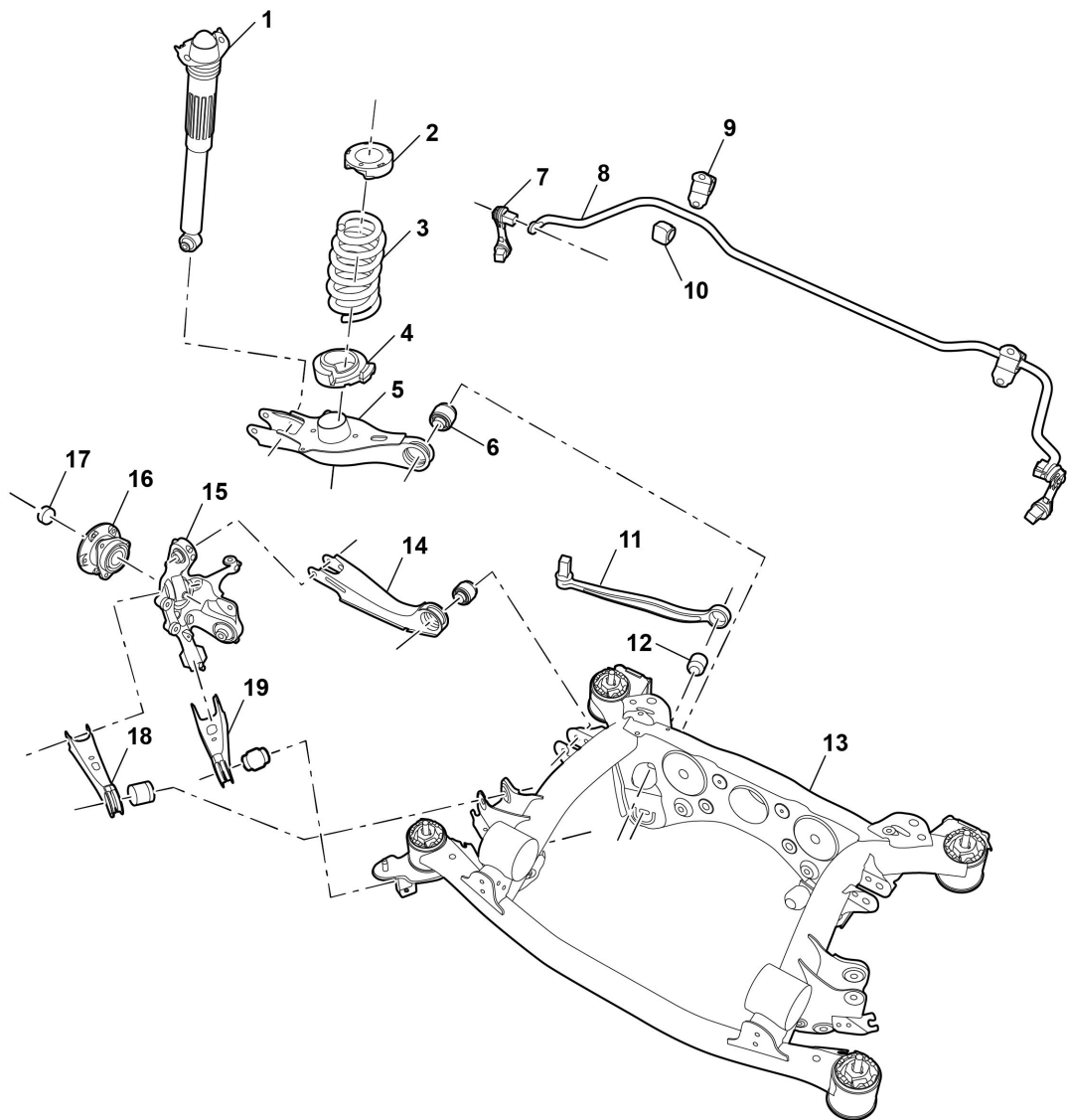
Rear Suspension Layout



S2220100

- | | |
|---|--|
| 1. Rear Suspension Front Upper Control Arm Assembly (2) | 7. Rear Wheel Bracket Assembly (2) |
| 2. Rear Upper Control Arm Assembly (2) | 8. Rear Wheel Hub Bearing Assembly (2) |
| 3. Rear Lower Control Arm Assembly (2) | 9. Rear Lateral Push Rod Assembly (2) |
| 4. Rear Shock Absorber Assembly (2) | 10. Rear Suspension Front Lower Control Arm Assembly (2) |
| 5. Rear Anti-roll Bar | 11. Rear Subframe Assembly |
| 6. Rear Suspension Coil Spring Assembly (2) | |

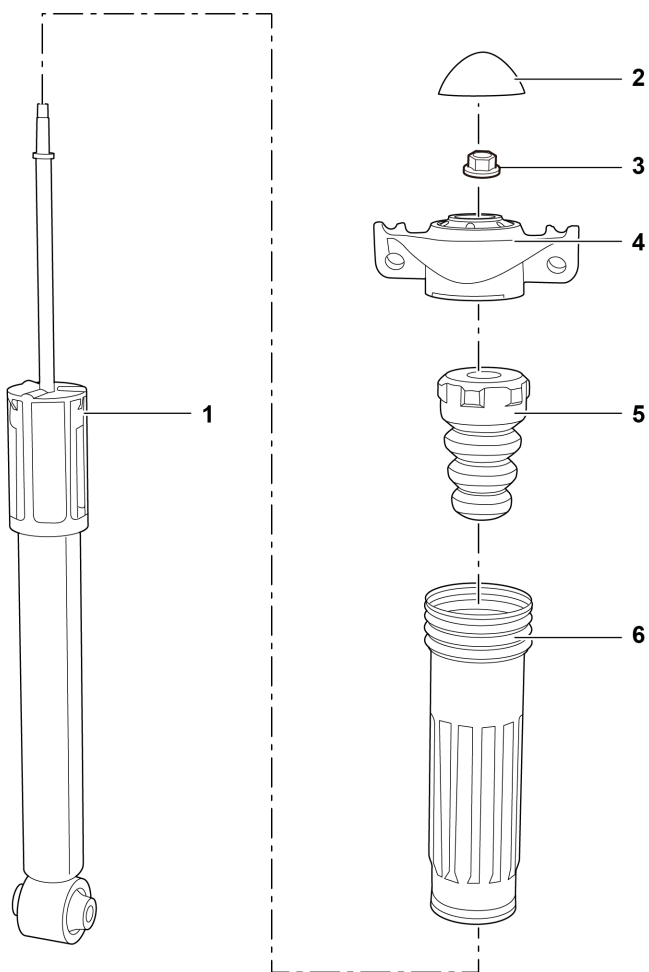
Exploded View of Rear Suspension



S2220101

- | | |
|--|---|
| 1. Rear Shock Absorber Assembly | 11. Horizontal Push Rod Assembly |
| 2. Rear Suspension Spring Upper Vibration Isolator | 12. Lateral Push Rod Assembly Bushing |
| 3. Rear Coil Spring | 13. Rear Subframe Assembly |
| 4. Rear Suspension Spring Lower Vibration Isolator | 14. Rear Upper Control Arm |
| 5. Rear Lower Control Arm | 15. Rear Wheel Bracket Assembly |
| 6. Rear Lower Swing Arm Bushing | 16. Rear Wheel Hub Bearing Assembly |
| 7. Rear Stabilizer Bar Link | 17. Nut - Rear Wheel Hub Bearing Assembly |
| 8. Rear Stabilizer Bar | 18. Front Upper Control Arm Assembly |
| 9. Rear Stabilizer Bar Bushing | 19. Front Lower Control Arm Assembly |
| 10. Rear Stabilizer Bar Clamp | |

Exploded View of Rear Shock Absorber Assembly



S9410103

- 1. Rear Shock Absorber Strut
- 2. Soundproof Cap
- 3. Upper Mounting Nut

- 4. Upper Support Base
- 5. Auxiliary Spring
- 6. Dust Shield

Description**Overview****Rear suspension includes:**

- Rear Subframe Assembly
- 2 trailing arm assemblies
- 2 lower control arm assemblies
- 2 upper control arm assemblies
- 2 lateral push rod assemblies
- 2 shock absorber assemblies
- 2 coil spring assemblies
- Rear anti-roll bar and 2 links
- 2 wheel hub bearing assemblies
- 2 wheel bracket assemblies

Rear Subframe Assembly

The rear subframe assembly is in a frame structure, which is connected rigidly to the body by 6 bolts. The rear subframe provides mounting positions for the rear upper control arm, rear lower control arm, rear lateral push rod and anti-roll bar, etc. The rear subframe assembly can transfer the load of the suspension components to the lower vehicle body and mitigate the impact from the collision with the body structure.

Rear Shock Absorber

The rear shock absorber is a dual barrel type structure, can be inflated and fuelled. This type of structure allows the movement of shock absorber piston inside the inner cylinder with an oil hole which is between the inner and outer cylinders. This structure minimizes the cavitation and eliminates the influence of the piston motion due to the damage of outer cylinder. The lower part of the shock absorber is equipped with a bushing, which is connected with the lower control arm through a pair of bolts/nuts. This mounting position allows the rear shock absorber to have a mechanical lever ratio of 1:1, thus enhancing vibration control. The upper part of the rear shock absorber is connected with the body by two bolts.

Coil Spring

The coil spring is made of spring steel (containing carbon, silicon, manganese, phosphorus, chromium, and other alloy materials), which is fitted between the body and the rear lower control arm. Each spring is fitted between the upper and lower spring vibration isolators which reduce noise transmitted to the body from the suspension. The lower vibration isolator is fitted in a flat hole in the rear lower control arm, when removing, pull it out of the flat hole. When fitting, align it with the corresponding hole of the rear lower control arm. The rear coil spring may vary depending on the powertrain used in the vehicle and vehicle configuration. Different rear coil springs can be identified by the color code applied to the coil.

Rear Upper Control Arm

The rear upper control arm is stamped and welded with hot-rolled steel plate, with a rubber bushing at both ends. The inner side of the rear upper control arm is connected with the rear subframe by a bolt and a nut, and the outer side of the rear upper control arm is connected with the rear wheel bracket by a bolt, a nut and a gasket.

Rear Lower Control Arm

The rear lower control arm is a box-shaped structural part which consists of the upper and lower pieces made of hot-rolled steel plate stamped and welded together. It carries the rear shock absorber and spring, and is connected with the anti-roll bar link. The inner side of the rear lower control arm is press-fitted with a rubber bushing, which is connected with the rear subframe by an eccentric bolt, an eccentric gasket and a nut. The eccentric bolt can be used to adjust the four-wheel alignment camber of the rear axle. The outer side of the rear lower control arm is connected with the rear wheel bracket by a bolt and a nut.

Rear Lateral Push Rod

The rear lateral push rod is press-fitted with a rubber bushing at both ends. The inner side of the rear lateral push rod is connected with the rear subframe by an eccentric bolt, an eccentric gasket and a nut, and the eccentric bolt can be used to adjust the four-wheel alignment toe-in of the rear axle. The outer side of the rear lateral push rod is connected with the rear wheel bracket by a bolt, a nut and two gaskets.

Trailing Arm Assembly

The trailing arm is stamped with high-strength steel, which is a single-piece structural part like a "blade" and is mainly used to transfer the force of the rear wheels to the body. The front end of the trailing arm is welded with a steel pipe for fitting the rubber bushing. The trailing arm is connected to the body through a mounting bracket which is equipped with a dust cover to protect the bushing from impurities. The rear of the trailing arm is connected to the rear wheel bracket by 3 bolts. In order to relieve the longitudinal impact of the rear axle, the longitudinal structure of the rubber bushing uses a hollow design, which can be replaced separately.

Anti-roll Bar and Links

The anti-roll bar made of solid spring steel is connected to the front of the subframe by two bushings and bushing clamps. The bushings are assembled with the anti-roll bar as a whole through the secondary vulcanization process. The clamps are fitted through special tooling, and the bushings and clamps cannot be disassembled or replaced individually. The bushings are of low friction without additional lubrication, and allow the anti-roll bar to rotate freely in static state. This allows the anti-roll bar to respond quickly to roll inputs. The two ends of rear anti-roll bar are connected with the rear anti-roll bar link, while the other end of the link is connected with the rear

lower control arm. Each rear anti-roll bar link is attached to the rear anti-roll bar through the ball joint connection, and a bushing is fitted at the lower end to connect with the lower control arm by a bolt and a nut. The ball joint connection can improve the response and efficiency of the vehicle to rollover.

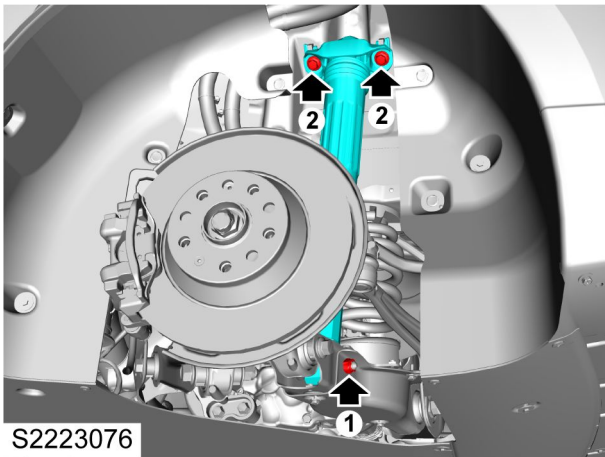
Service Guide

Rear Shock Absorber Assembly Remove

1. Remove the rear wheels.

Wheels Remove

2. Raise the vehicle to the appropriate height.
3. Support the rear lower control arm assembly with the hydraulic lifting device.
4. Remove and discard 1 bolt and nut (1) fixing the rear shock absorber assembly to the rear lower control arm.
5. Remove and discard 2 bolts (2) fixing the rear shock absorber assembly to the body.



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6. Remove the rear shock absorber assembly.

Refit

1. Clean the junction surface of the rear shock absorber assembly and the vehicle body.
2. Locate the rear shock absorber assembly to the body, fit 2 new bolts and tighten them to **55-65Nm+ (90°-110°)**.
3. Locate the rear shock absorber assembly to the rear lower control arm, fit 1 new bolt and nut and tighten them to **90-110Nm**.
4. Lower the hydraulic lifting device, and move it to the safety zone.
5. Lower the vehicle.
6. Fit the rear wheels.

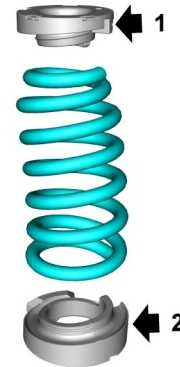
Wheels Refit

Rear Suspension Spring Assembly Remove

1. Remove the rear lower control arm assembly.

Rear Lower Control Arm Assembly Remove

2. Slowly lower the hydraulic lifting device and remove the rear suspension spring assembly.
3. Remove the upper vibration isolator (1) and the lower vibration isolator (2) of the rear suspension spring.



S2223077

Refit

1. Clean the junction surface of the rear lower control arm and the spring assembly.
2. Assemble the upper and lower vibration insulators on the spring.
3. Locate the rear suspension spring assembly on the rear lower control arm assembly, and ensure that the protrusion of the rear suspension spring lower vibration insulator is aligned with the rear lower control arm.
4. Lift the hydraulic lifting device to support the rear lower control arm and engages the rear suspension spring upper vibration insulator to the body.
5. Fit the rear lower control arm assembly.

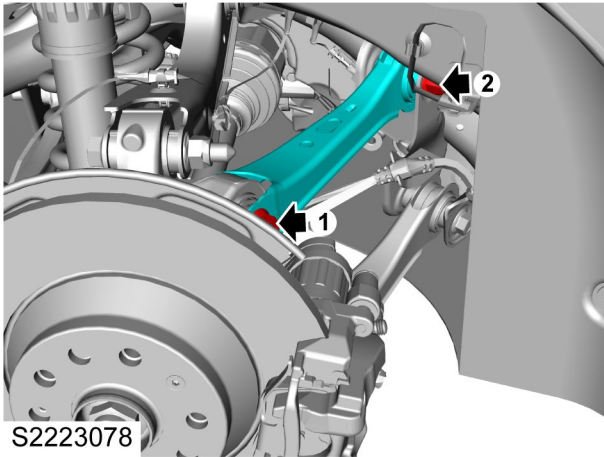
Rear Lower Control Arm Assembly Refit

Front Upper Control Arm Assembly Remove

1. Remove the rear wheels.

Wheels Remove

2. Remove 1 bolt and nut (1) fixing the front upper control arm to the rear wheel bracket, and discard them.
3. Remove 1 bolt and nut (2) fixing the front upper control arm to the rear subframe, and discard them.



4. Remove the front upper control arm assembly.

Refit

1. Locate the front upper control arm to the rear subframe, fit 1 new bolt and nut, and tighten them to **135-165Nm+ (85°-95°)**.
2. Locate the front upper control arm to the rear wheel bracket, fit 1 new bolt and nut, and tighten them to **135-165Nm+ (85°-95°)**.
3. Fit the rear wheels.

Wheels Refit

4. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

Front Lower Control Arm Assembly Remove

1. Remove the rear wheels.

Wheels Remove

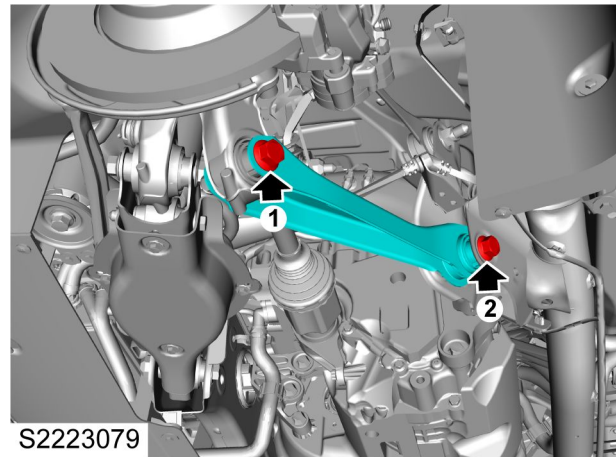
2. Remove the rear bottom deflector.

Bottom Deflector Remove

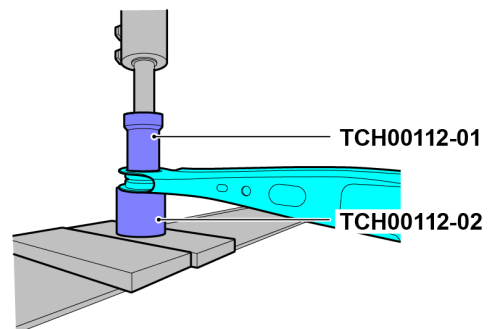
3. Support the rear wheel bracket with the hydraulic lifting device.

Caution : Do not jack the vehicle to support the vehicle on the upper and lower swing arms, which may damage the parts or cause misalignment.

4. Remove 1 bolt and nut (1) fixing the front lower control arm to the rear wheel bracket, and discard them.
5. Remove 1 bolt and nut (2) fixing the front lower control arm to the rear subframe, and discard them.



6. Remove the front lower control arm assembly.
7. Use a hydraulic press and the special tool TCH00112 to press down the bush.

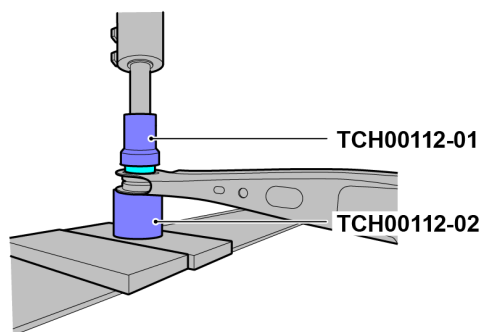


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8. Remove the rubber bush.

Refit

1. Clean the rubber bushing groove.
2. Use a hydraulic press and a special tool TCH00112 to press the rubber bushing into the control arm.



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3. Locate the front lower control arm to the rear subframe, fit 1 bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
4. Locate the front lower control arm to the rear wheel bracket, fit 1 bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
5. Lower the hydraulic lifting device, and move it to the safety zone.
6. Lower the vehicle to the appropriate height.
7. Fit the rear wheels.

Wheels

8. Fit the bottom deflector.

Bottom Deflector

Rear Upper Control Arm Assembly Remove

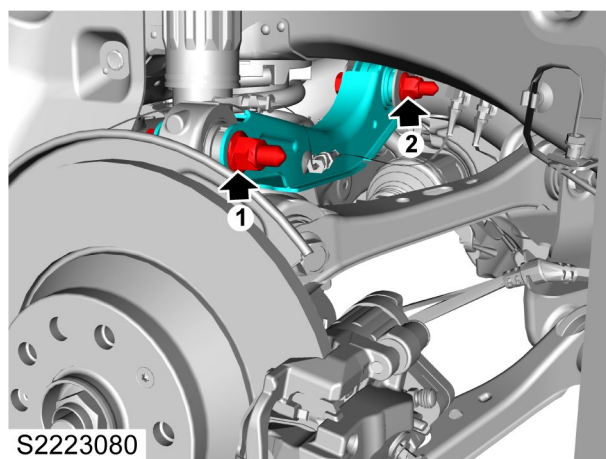
1. Remove the rear wheels.

Wheels Remove

2. Remove the rear bottom deflector.

Bottom Deflector Remove

3. Loosen the harness clips, remove 1 bolt and nut (1) fixing the rear upper control arm to the rear wheel bracket, and discard them.
4. Remove 1 bolt and nut (2) fixing the rear upper control arm to the rear subframe, and discard them.



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5. Remove the rear upper control arm assembly.

Refit

1. Locate the rear upper control arm to the rear subframe, fit 1 new bolt and nut, and tighten them to **135-165Nm+ (85°-95°)**.
2. Locate the rear upper control arm to the rear wheel bracket, fit 1 new bolt and nut, and tighten them to **135-165Nm+ (85°-95°)**; fit the harness clip and tighten it.
3. Fit the rear bottom deflector.

Bottom Deflector Refit

4. Fit the rear wheels.

Wheels Refit

5. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

Rear Lower Control Arm Assembly Remove

1. Remove the rear wheels.

Wheels Remove

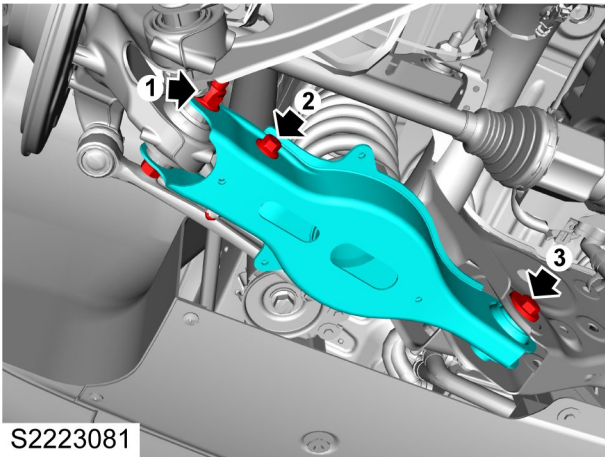
2. Remove the rear bottom deflector.

Bottom Deflector Remove

3. Support the rear wheel bracket with the hydraulic lifting device.

Caution : *Do not jack the vehicle to support the vehicle on the upper and lower swing arms, which may damage the parts or cause misalignment.*

4. Remove 1 bolt and nut (1) fixing the rear lower control arm to the rear wheel bracket, and discard them.
5. Remove and discard 1 bolt and nut (2) fixing the rear shock absorber assembly to the rear lower control arm.
6. Remove 1 bolt, nut and gasket (3) fixing the rear lower control arm to the rear subframe, and discard the nut.



7. Remove the rear lower control arm and the spring assembly.

Refit

1. Locate the spring assembly to the rear lower control arm assembly.
2. Locate the rear lower control arm assembly to the rear subframe, fit 1 bolt, gasket and 1 new nut, and pre-tighten the nut.
3. Align the spring assembly with the mounting position on the body, locate the rear lower control arm to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
4. Locate the rear shock absorber assembly to the rear lower control arm, fit 1 new bolt and nut and tighten them to **90-110Nm**.
5. Lower the hydraulic lifting device, and move it to the safety zone.
6. Lower the vehicle to the appropriate height.
7. Fit the rear wheels.

Wheels Refit

8. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

9. After completing the four-wheel alignment, tighten the nut fixing the rear lower control arm assembly to the rear subframe to **150-180Nm**.

10. Fit the rear bottom deflector.

Bottom Deflector Refit

Lateral Push Rod Assembly Remove

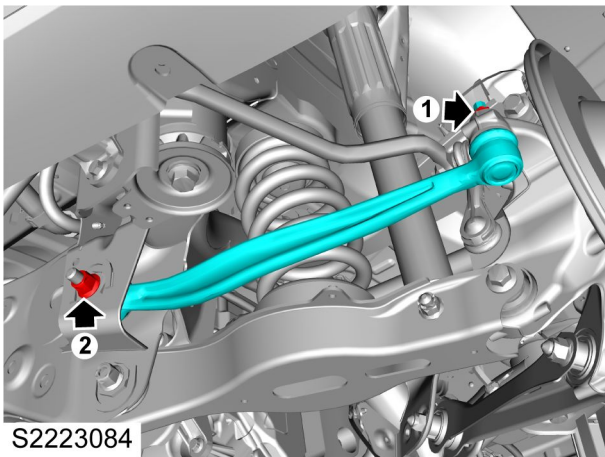
1. Remove the rear wheels.

Wheels Remove

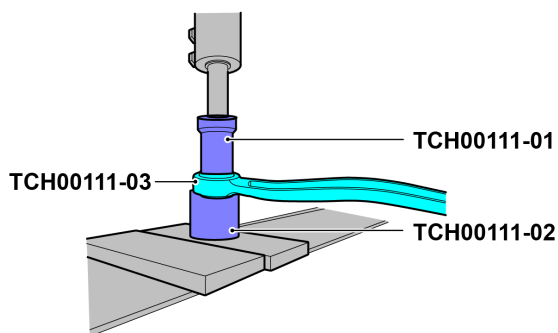
2. Remove the rear bottom deflector.

Bottom Deflector Remove

3. Support the rear wheel bracket with the hydraulic lifting device.
4. Remove 1 eccentric bolt, gasket and nut (2) fixing the rear lateral push rod to the rear subframe, and discard the nut.
5. Remove and discard 1 bolt and nut (1) fixing the rear lateral push rod to the wheel bracket.



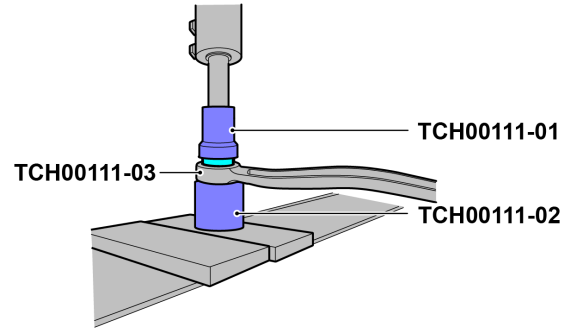
6. Remove the rear lateral push rod.
7. Use a hydraulic press and the special tool TCH00111 to press down the bushing.



8. Remove the bushing from the special tool.

Refit

1. Clean the groove of the rubber bushing.
2. Use a hydraulic press and the special tool TCH00111 to press the rubber bushing into the rear lower control arm assembly.



3. Locate the rear lateral push rod on the wheel bracket, fit 1 new bolt, nut and gasket and tighten them to **135-165Nm+ (85°-95°)**.
4. Locate the rear lateral push rod to the rear subframe, fit 1 bolt and new nut and pre-tighten the nut.
5. Lower the hydraulic lifting device, and move it to the safety zone.
6. Fit the rear wheels.

Wheels Refit

7. Check four-wheel alignment.

Four-wheel Alignment Check Adjustment

8. After completing the four-wheel alignment, tighten the nut fixing the rear lateral push rod to the rear subframe to **150-180Nm**.
9. Fit the rear bottom deflector.

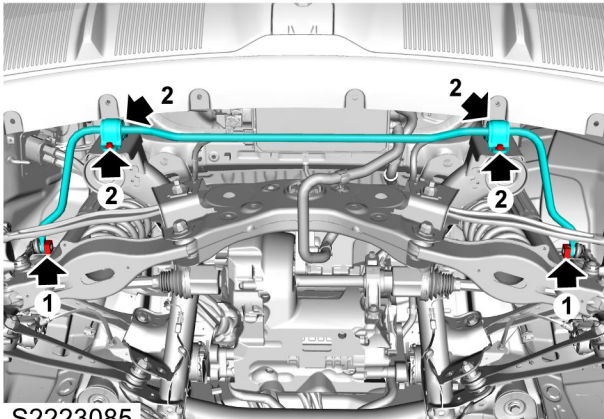
Bottom Deflector Refit

Rear Stabilizer Bar Remove

1. Remove the rear bottom deflector.

Bottom Deflector Remove

2. Use a tool to lock the ball joint of the rear anti-roll bar link to prevent its rotation, remove and discard 2 nuts (1) fixing the rear anti-roll bar to the link.
3. Remove 4 bolts (2) fixing the rear anti-roll bar to the rear subframe and discard them.



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4. Disconnect the rear anti-roll bar from the link, and gently pull out the rear anti-roll bar from the vehicle.

Refit

1. Locate the rear anti-roll bar to the link, fit 2 new nuts and pre-tighten them.
2. Locate the rear anti-roll bar to the rear subframe, fit 4 new bolts, and tighten them to **55-65Nm**.
3. Use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut locating the rear anti-roll bar to the link to **75-90Nm**.
4. Fit the rear bottom deflector.

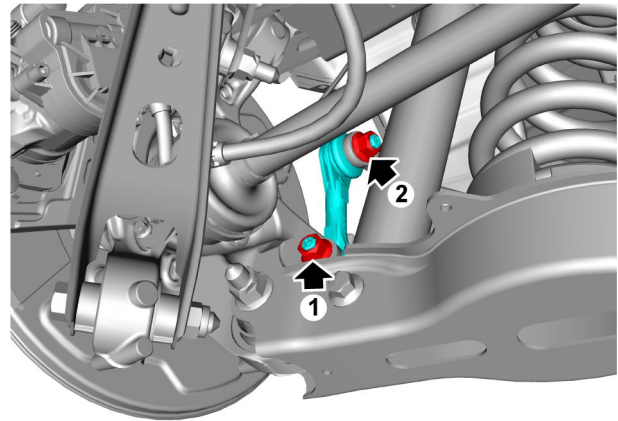
Bottom Deflector Refit

Rear Stabilizer Bar Link Remove

1. Raise the vehicle to the appropriate height.
2. Remove the rear bottom deflector.

Bottom Deflector Remove

3. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (1) fixing the rear anti-roll bar link to the rear wheel bracket.
4. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (2) fixing the rear anti-roll bar to the link.



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5. Remove the rear anti-roll bar link.

Refit

1. Locate the rear anti-roll bar to the link. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten the nut to **75-90Nm**.
2. Locate the rear anti-roll bar link to the rear wheel bracket. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten it to **75-90Nm**.
3. Fit the rear bottom deflector.

Bottom Deflector Refit

Rear Subframe Assembly Remove

1. Drain the cooling system.

Coolant Drain - EDS

2. Remove the rear wheels (both sides).

Wheels Remove

3. Remove the manual service disconnect.

Manual Service Disconnect

4. Remove the rear stabilizer bar.

Rear Stabilizer Bar Remove

5. Remove the rear lateral push rod assembly.

Rear Lateral Push Rod Assembly Remove

6. Remove the rear upper control arm assemblies (both sides).

Rear Upper Control Arm Assembly Remove

7. Remove the rear lower control arm assemblies (both sides).

Rear Lower Control Arm Assembly Remove

8. Remove the rear suspension front upper control arm assemblies (both sides).

Rear Suspension Front Upper Control Arm Assembly Remove

9. Remove the rear suspension front lower control arm assemblies (both sides).

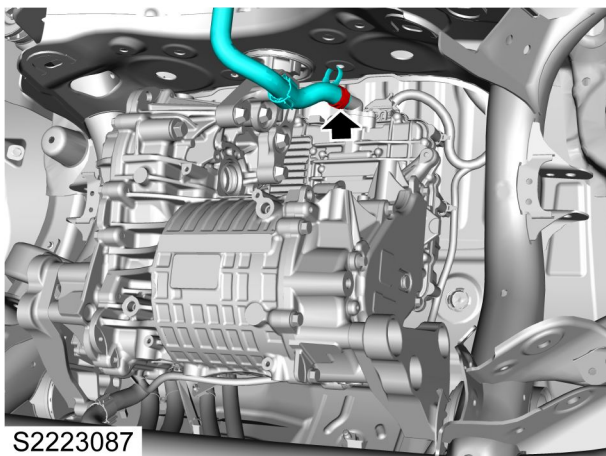
Rear Suspension Front Lower Control Arm Assembly Remove

10. Remove the rear left and right axle shaft assemblies.

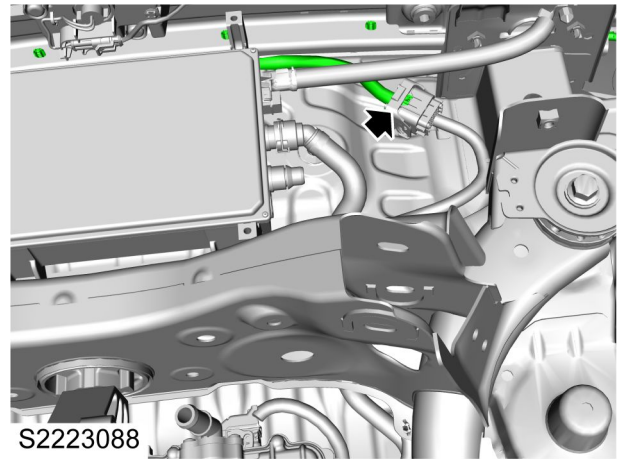
Rear Right Axle Shaft Assembly Remove

Rear Left Axle Shaft Assembly

11. Loosen the clamp, and disconnect the EDS water inlet pipe.

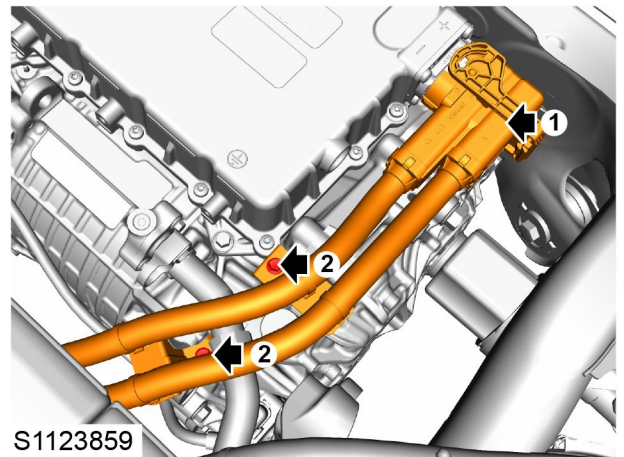


12. Disconnect the EDS harness from the body harness.



13. Loosen the low voltage harness clip, remove 1 screw fixing the EDS ground wire to the body, and remove the harness.

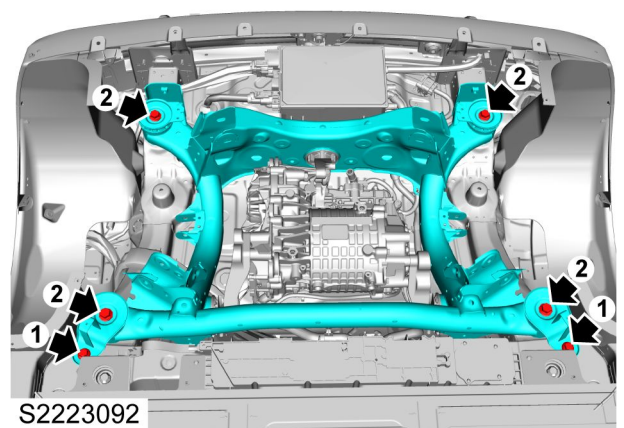
14. Remove 2 bolts (2) fixing the high-voltage harness to the EDS, and disconnect the harness connector (1).



15. Disengage the rear subframe related harness clip and water pipe clip.

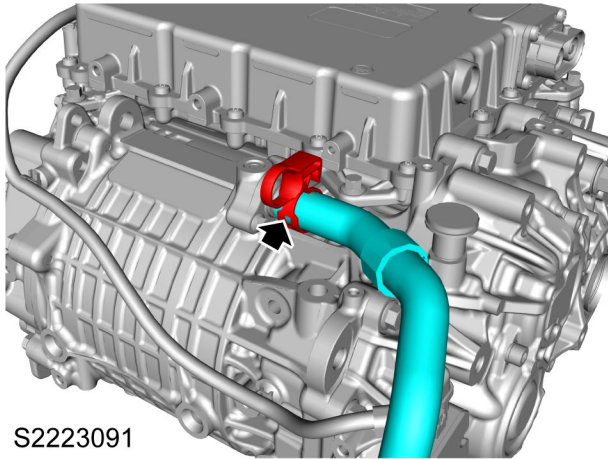
16. Support the rear subframe and EDS assembly with the hydraulic lifting device, remove 2 bolts (1) fixing the rear subframe support plate assembly to the rear subframe, and discard them.

17. Remove and discard 4 bolts (2) fixing the rear subframe assembly and EDS assembly to the body.



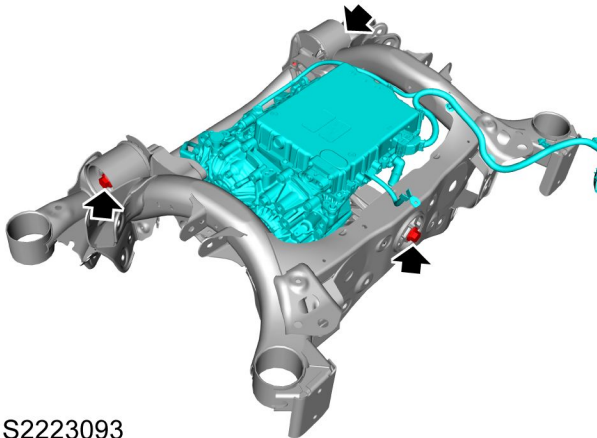
18. Slowly lower the hydraulic lifting device to a proper

height, loosen the clamp, and disconnect the EDS water outlet pipe.



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- Lower the hydraulic lifting device, remove and discard 3 bolts fixing the EDS mount to the front subframe, and take out the rear subframe assembly with assistance.



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Refit

- With assistance, locate the rear subframe to the EDS mount, fit 3 new bolts, tighten them to **135-165Nm+ (85°-95°)**, and check the torque.
- Lift the hydraulic lifting device to a proper height, connect the EDS water outlet pipe, and secure it with clamps.
- Locate the rear subframe and EDS assembly to the body, fit 4 new bolts and tighten them to **135-165Nm+ (175°-185°)**.
- Locate the rear subframe support plate to the body, fit 2 new bolts and tighten them to **90-110Nm**.
- Lower the hydraulic lifting device, and move it to the safety zone.
- Clamp the rear subframe related harness clip and water pipe clip in place.
- Locate the high voltage harness bracket to the EDS, fit 2 bolts and tighten them to **7-10Nm**.
- Connect the high-voltage harness connector, press the clip in place, and fit the high voltage harness clip.

- Fix the EDS ground wire to the body, fit and tighten 1 screw, and fit the low voltage harness clip.
- Connect the EDS harness to the body harness.
- Connect the EDS water inlet pipe and secure it with clamps.
- Locate the bottom deflector bracket to the rear subframe, fit 6 bolts and tighten them to **4-6Nm**.
- Fit the left and right rear axle shaft assemblies.

Rear Right Axle Shaft Assembly Remove

Rear Left Axle Shaft Assembly

- Fit the rear suspension front lower control arm assemblies (both sides).

Rear Suspension Front Lower Control Arm Assembly Remove

- Fit the rear suspension front upper control arm assemblies (both sides).

Rear Suspension Front Upper Control Arm Assembly Remove

- Fit the rear lower control arm assemblies (both sides), and first pre-tighten the nut fixing the rear lower control arm to the rear subframe.

Rear Lower Control Arm Assembly Remove

- Fit the rear upper control arm assemblies (both sides).

Rear Upper Control Arm Assembly Remove

- Fit the rear lateral push rod assembly, and first pre-tighten the nut fixing the rear lateral push rod to the rear subframe.

Rear Lateral Push Rod Assembly Remove

- Fit the rear stabilizer bar.

Rear Stabilizer Bar Remove

- Fit the manual service disconnect.

Manual Service Disconnect

- Fit the rear wheels (both sides).

Wheels Remove

- Fill the cooling system.

Coolant Drain - EDS

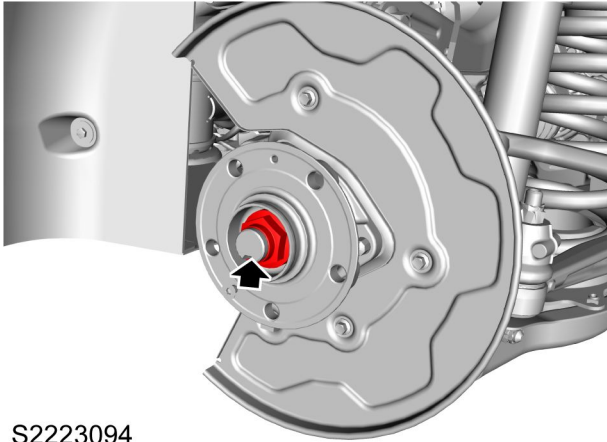
- Check four-wheel alignment.

Four-wheel Alignment

- After completing the four-wheel alignment, tighten the nuts fixing the rear lateral push rod to the rear subframe to **150-180Nm**(both sides); tighten the nuts fixing the rear lower control arm assembly to the rear subframe to **150-180Nm**(both sides).

Rear Wheel Hub Bearing Remove

1. Pry off the wheel centre trim cover, pry up the rear axle shaft nut locking device with a tool, and remove and discard the axle shaft nut.



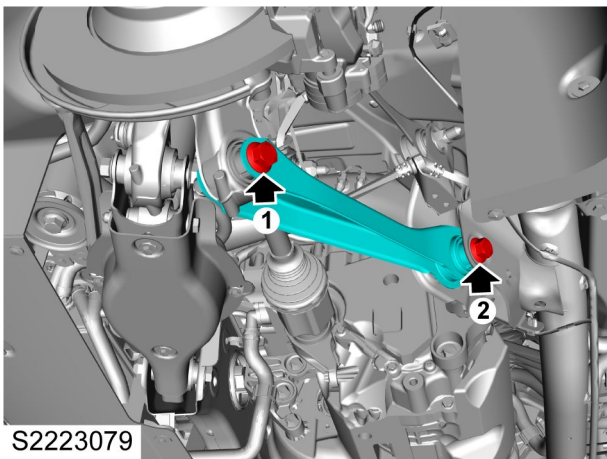
2. Remove the rear bottom deflector.

Bottom Deflector Remove

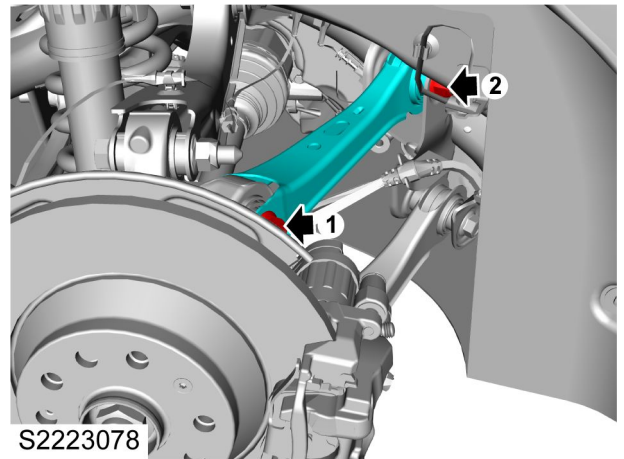
3. Remove the rear brake caliper and the rear brake disc.

Rear Brake Disc Remove

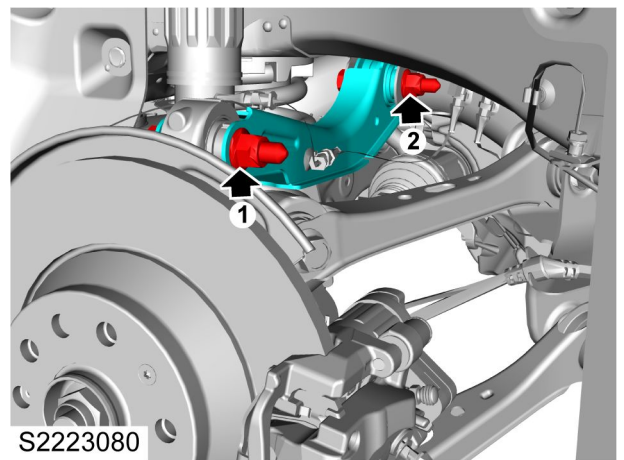
4. Support the rear lower control arm assembly and the rear wheel bracket assembly with the hydraulic lifting device.
5. Remove 1 bolt and nut (1) fixing the rear suspension front lower control arm to the rear wheel bracket, and discard them.



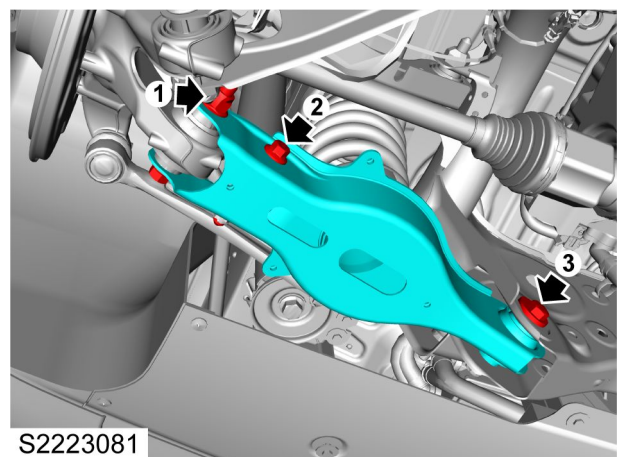
6. Remove 1 bolt and nut (1) fixing the rear suspension front upper control arm to the rear wheel bracket, and discard them.



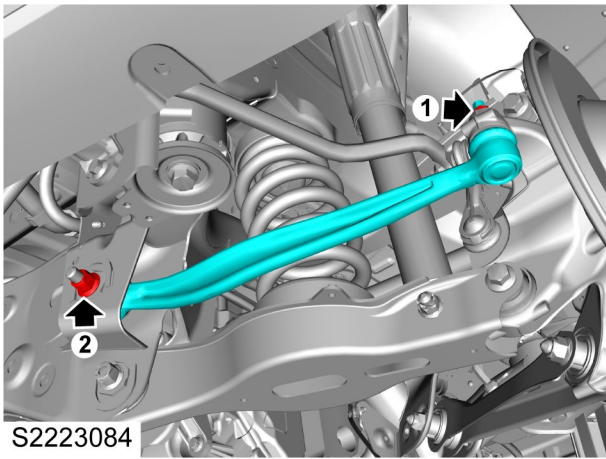
7. Remove 1 bolt and nut (1) fixing the rear upper control arm to the rear wheel bracket, and discard them.



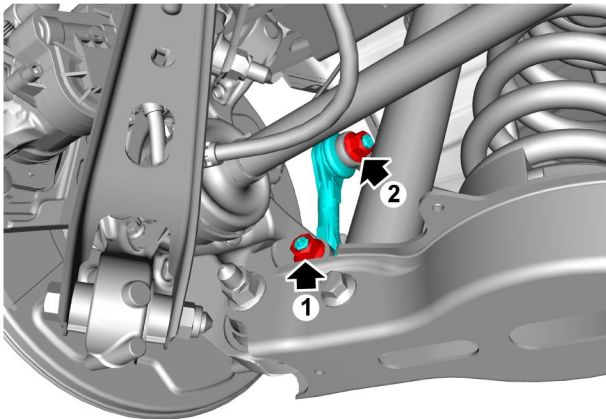
8. Remove 1 bolt and nut (1) fixing the rear lower control arm to the rear wheel bracket, and discard them.



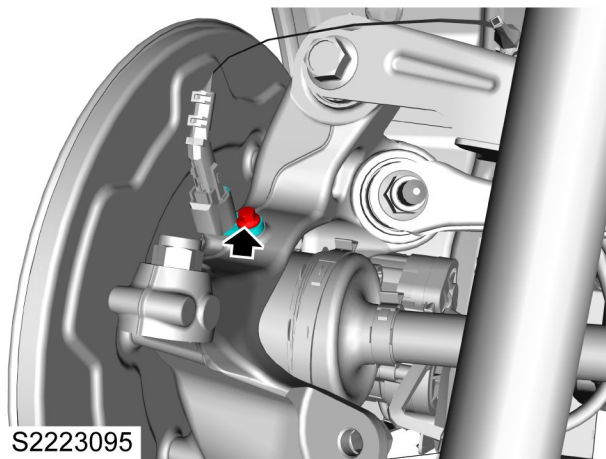
9. Remove and discard 1 bolt and nut (1) fixing the rear lateral push rod to the wheel bracket.



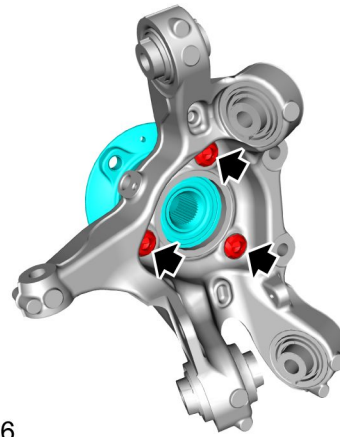
10. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (1) fixing the rear anti-roll bar link to the rear wheel bracket.



11. Remove 1 bolt fixing the wheel speed sensor to the rear wheel bracket, and remove the wheel speed sensor.



12. Pull the wheel hub bearing assembly outward, disconnect the axle shaft assembly from the wheel hub bearing assembly, and fix the axle shaft in a proper position.
13. Remove and discard 3 bolts fixing the rear wheel hub bearing assembly to the rear wheel bracket.



14. Remove the rear wheel hub bearing assembly.

Refit

1. Clean the junction of the rear wheel hub bearing assembly and the rear wheel bracket.
2. Locate the rear wheel hub bearing assembly to the rear wheel bracket, fit 3 new bolts, first pre-tighten them and tighten them to **63-77Nm+(85°-95°)** in a diagonal sequence.
3. Clean the junction surface of the axle shaft and the wheel hub bearing assembly, to allow the axle shaft to engage the wheel hub bearing splines.
4. Locate the wheel speed sensor to the rear wheel bracket, fit 1 bolt and tighten it to **63-77Nm+(85°-95°)**.
5. Locate the rear anti-roll bar link to the rear wheel bracket. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten it to **75-90Nm**.
6. Locate the rear lateral push rod on the rear wheel bracket, fit 1 new bolt, nut and gasket and tighten them to **135-165Nm+ (85°-95°)**.
7. Locate the rear lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
8. Locate the rear upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
9. Locate the rear suspension front upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
10. Locate the rear suspension front lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
11. Lower the hydraulic lifting device, and move it to the safety zone.

12. Fit the rear brake caliper and the rear brake disc.

Rear Brake Disc Refit

13. Fit the rear bottom deflector.

Bottom Deflector Refit

14. Fit 1 new axle shaft locking nut, first pre-tighten 200Nm, loosen it reversely by 100° and re-tighten it to **345-375Nm**, and press down the nut locking device.

15. Fit the wheel centre trim cover.

16. Check four-wheel alignment.

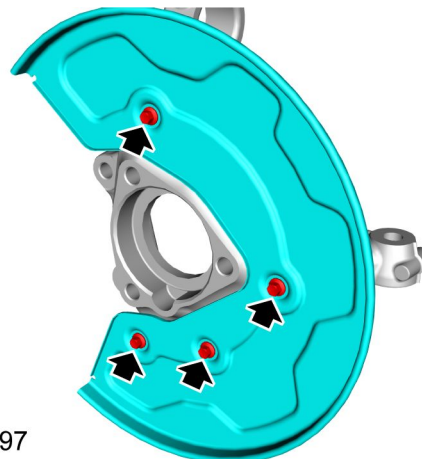
Four-wheel Alignment Check Adjustment

Wheel Bracket Assembly Remove

1. Remove the rear wheel hub bearing.

Rear Wheel Hub Bearing Remove

2. Remove 4 bolts fixing the rear brake disc guard plate to the rear wheel bracket, and remove the rear wheel bracket.



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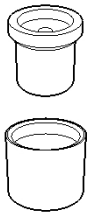

Refit

1. Fix the rear brake disc guard plate to the rear wheel bracket, fit 4 bolts and tighten them to **7-10Nm**.
2. Fit the rear wheel hub bearing.

Rear Wheel Hub Bearing Refit

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
TCH00112	Remover and replace trailing arm bush	 <p>TCH00112</p>
TCH00111	Remover & replacer lower arm bush	 <p>TCH00111</p>

Tyres and Wheels**Specification****Torque**

Description	Value
Bolt-wheel	120-130Nm

Service Guide

Wheel

Remove

1. Remove the wheel trim cover or the wheel bolt caps.
2. Loosen 5 wheel bolts counterclockwise for half a turn.
3. Raise the vehicle to the appropriate height.
4. Remove 5 wheel bolts and place them in the tool tray.
5. Remove the wheel, extract the wheel valve assembly, and discard it. Remove the tyre from the rim with a tyre changer.

Warning : Use a tyre changer to remove the tyre. Do not remove the tyre using a hand tool or tyre crowbar alone, otherwise wheel or tyre rim will be damaged.

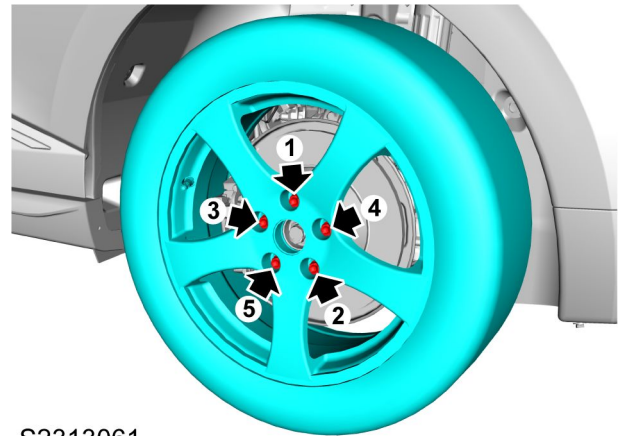
Caution : Do not place the wheel hub down on the ground to avoid scratching.

Refit

Caution : Use scraper or wire brush to remove the corrosive on the mounting surfaces of the wheel, brake drum and brake disc before fitting wheels. Improper junction between the metal mounting surface and the metal will cause the wheel bolts to be loose when fitting wheels. This may cause the wheel to fall off while the vehicle is moving, resulting in vehicle control loss and even personal injuries.

1. Fit the new wheel valve assembly.
2. Fit the tyre with a tyre changer and inflate the tyre until the rim is in place. Ensure the locating ring at the outer side of the tyre bead is around the wheel rim flange on both sides. This method can ensure the correct position of the tyre bead.
3. Conduct wheel dynamic balancing with a tyre dynamic balancer.
4. Fit the wheel and tighten the wheel bolts until the wheel is located completely onto the wheel hub.
5. Lower the vehicle.
6. Tighten 5 wheel bolts to **120-130Nm**. For tightening order, please refer to the picture below (1 to 5).

Warning : If the vertical surface between the wheels, brake disc or drum is contaminated with oil, it will cause the wheels to become loose, resulting in vehicle control loss and even personal injuries. Never loosen a seized wheel by heating. This will shorten the life of the wheels, wheel bolts, hub and bearing assembly. Wheel bolts must be tightened in correct sequence to the correct torque to avoid distortion of wheels, brake disc and drum.



S2313061

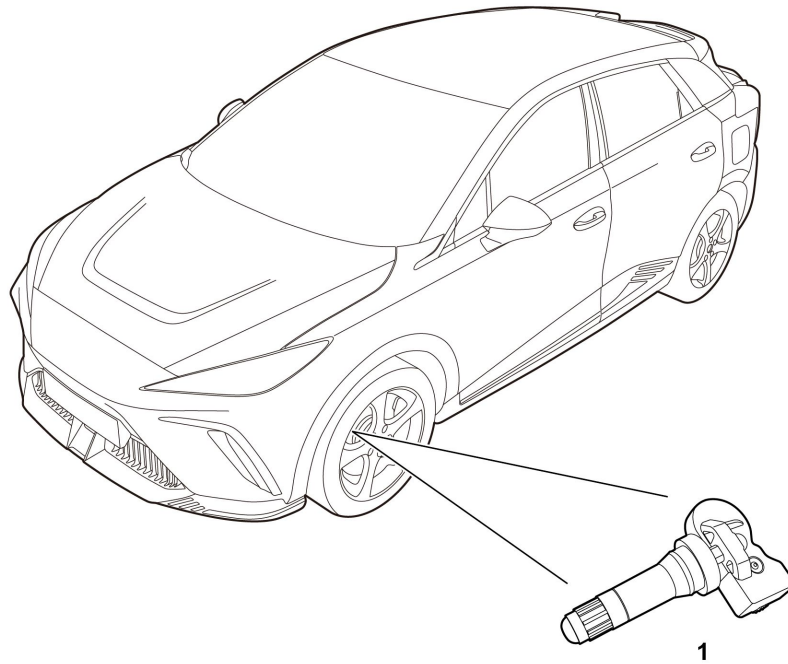
7. Fit the wheel trim cover or the wheel bolt caps.

Tyre Pressure Monitoring System

Description and Operation

System Layout

Tyre Pressure Monitoring System (TPMS)



S2320020

- I. Tyre Pressure Sensor × 4

Description

The tyre pressure monitoring system consists of a body control module and tyre pressure sensors fitted in the valve stems of the four wheels. Each tyre pressure sensor features an electromechanical device for pressure and temperature measurement and has a unique serial number for identifying the mounting position of the sensor. The driver can view the pressure and position of a tyre on the instruments pack kit. When the pressure of any of the four tyres rises or falls significantly, the instrument TPMS warning lamp will illuminate to remind the driver to check the tyre.

Operation

When the body control module is operating, it receives the wireless signal from the tyre pressure sensor and converts its data into tyre pressure, tyre temperature, tyre position and sensor mode. The body control module sends the obtained tyre pressure, tyre temperature and tyre position data to the instruments pack kit via the CAN bus. When the vehicle is stationary, the sensor does not detect changes in acceleration, and the sensor enters the stationary mode. At this time, the sensor performs pressure sampling at intervals, and no signal is sent if the tyre pressure does not change. As the vehicle speed increases, the sensor detects the changes in acceleration, and enters the rolling mode. At this time, the sensor sends a signal to the module at intervals.

The tyre pressure sensor continuously compares its last sampled pressure with the current sampled pressure. If it detects that the difference between them reaches a certain value in the stationary or rolling mode, it will recheck the pressure to confirm the situation. When the sensor confirms that the tyre leaks quickly, it will send the corresponding wireless signal to the body control module, which will transfer the corresponding information to the instruments pack kit that displays the corresponding alarm message. When the tyre pressure monitoring system detects that the tyre pressure (slowly) drops to the alarm limit, it will display the prompt messages such as Low Tyre Pressure or Check Tyre Pressure on the instruments pack kit.

The indicator lamp and other prompt messages can be turned off by adjusting the tyre pressure to the recommended value or above.

If the power of body control module is cut off or the vehicle battery is disconnected, each tyre pressure monitoring sensor identification code will be reserved, but all the tyre pressure information will be lost, and "—" will be displayed on the instruments pack kit. The vehicle is driven at 40 km/h (25 mph) or above, so that the sensor enters the rolling mode and sends a signal to make the instrument display the current tyre pressure. When the vehicle is stationary, you can also reduce the tyre pressure (by more than 30 kPa) to make the sensor in the stationary mode send a signal, and the instrument will also display the current tyre pressure. The body control module is capable of detecting the internal failure of tyre pressure monitoring system. Read DTCs with an after-sale scan tool, and judge the failure cause according to the definition of failure.

Service Guide

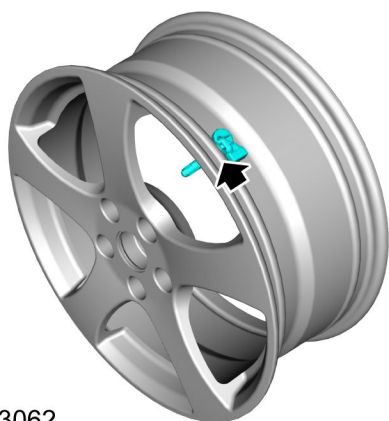
Tyre Pressure Sensor

Remove

1. Remove the wheels.

Wheels Remove

2. Deflate the tyre.
3. Press the tyre at the valve core on the tyre changer until the tyre pressure sensor is exposed.
4. Remove the tyre pressure sensor and valve core assembly, and discard them.



S2313062

Refit

1. Fit the new tyre pressure sensor and valve core seat assembly to the wheel rim, and ensure that it is fitted in place.

Warning : *Make sure that the tyre does not touch the tyre pressure sensor during removing and fitting.*

2. Inflate the tyre to a suitable tyre pressure value.
3. Re-conduct tyre dynamic balancing.
4. Fit the wheels.

Wheels Refit

5. Perform a self-learning for the tyre pressure monitoring system. Refer to “Self-learning and Adjustment, Programming and Encoding-Body Control Module (BCM)-Tyre Sensor Replacement”.

Body Control Module (BCM)

Brake System

Specification

Torque

Description	Value
Bolt-front brake disc protector to brake caliper bracket	25-30Nm
Bolt-Front brake caliper decorative cover to front brake caliper bracket	8-11Nm
Bolt-front brake disc protector to front brake hose	28-32Nm
Bolt-front brake caliper bracket to steering knuckle	190-210Nm
Bolt-Front wheel hub to steering knuckle	63-77Nm+(85°-95°)
Bolt-wheel	120-130Nm
Bolt-front brake disc to front wheel hub	7-10Nm
Bolt-front brake disc protector to steering knuckle	7-10Nm
Bolt-rear brake caliper housing to rear brake caliper bracket	25-30Nm
Bolt-EPB motor to rear brake caliper housing	7-9Nm
Bolt-rear brake hose to rear brake caliper housing	28-32Nm
Bolt-rear brake caliper bracket to rear brake caliper bracket	81-99Nm+(85°-95°)
Bolt-EPB motor bracket to rear brake caliper bracket	7-10Nm
Screw-rear brake disc to rear wheel carrier	7-10Nm
Bolt-rear brake disc protector to rear brake caliper bracket	7-10Nm
Bolt-fluid reservoir to master cylinder	3.6-4.2Nm
Nut-master cylinder to pedal bracket	19-25Nm
Nut-front brake pipe to master cylinder	19-25Nm
Bolt-Evaporator pipe to Air conditioner case assembly	7-10Nm
Bolt-front wheel speed sensor to steering knuckle	7-10Nm
Bolt-rear wheel speed sensor to rear wheel support	7-10Nm
Nut-brake pedal to front panel	19-25Nm
Bolt-acceleration pedal to pedal bracket	4-5Nm
Nut-left front brake pipe to front brake hose	15-19Nm
Nut-master cylinder to left front brake pipe	15-19Nm
Nut-right front brake pipe to front brake hose	15-19Nm
Nut-master cylinder to right front brake pipe	15-19Nm
Nut-master cylinder to rear brake pipe to left rear Brake pipe	13-15Nm
Nut-master cylinder to rear brake pipe to right rear Brake pipe	13-15Nm
Nut-left rear brake pipe to left rear brake hose	15-19Nm
Nut-right rear brake pipe to right rear brake hose	15-19Nm
Bolt-front brake hose bracket to front damper	10-15Nm

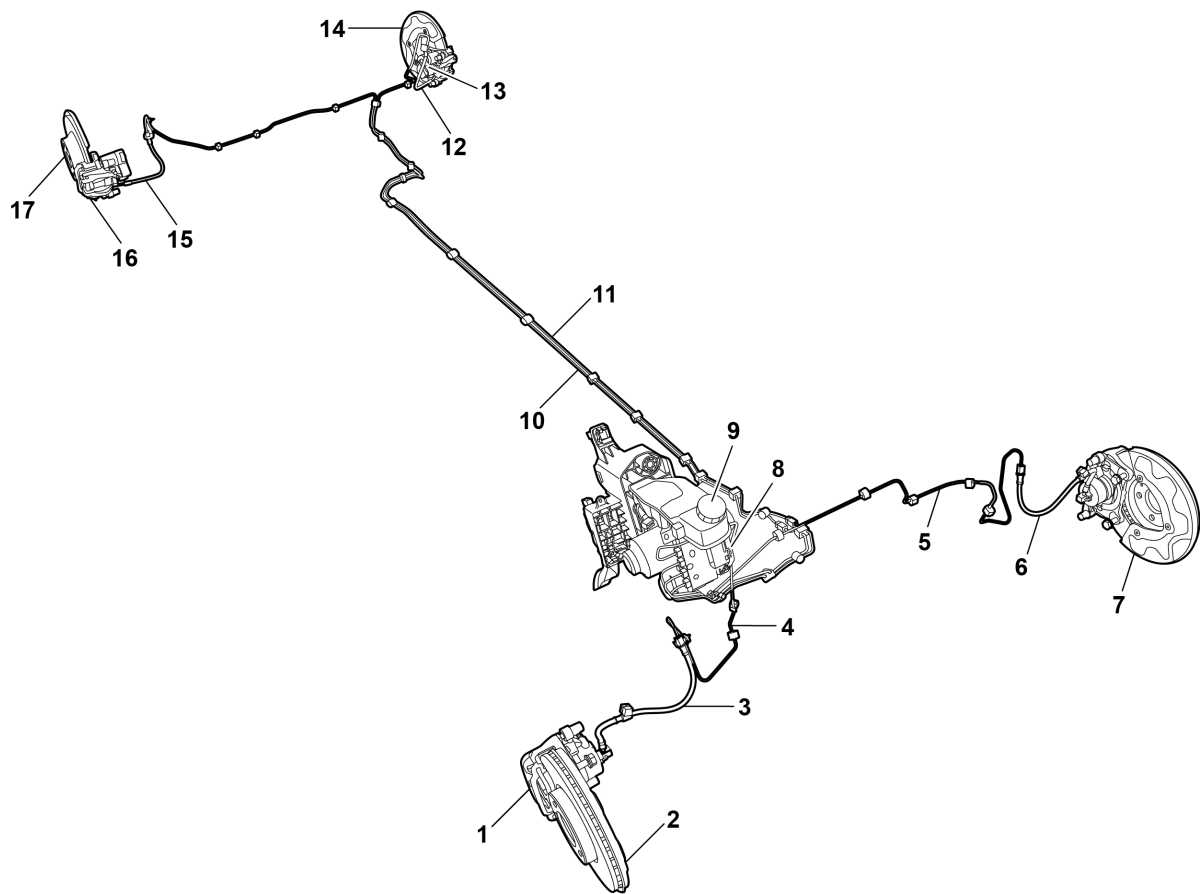
Brake System**Brake System**

Description	Value
Nut-rear brake disc protector emptying	16-18Nm
Nut-front brake disc protector emptying	16-18Nm

Parameters

Item		Parameters	
		2WD-51KWh&64KWh	4WD-64KWh&2WD-77KWh
Front Brake Disc	Diameter	300mm	345mm
	Thickness	25mm	30mm
	Minimum Allowable Thickness	23mm	28mm
	Runout	0.05mm	0.05mm
Front Brake Pad	Thickness	11mm	11mm
	Minimum Allowable Thickness	2mm	2mm
Rear Brake Disc	Diameter	300mm	340mm
	Thickness	12mm	22mm
	Minimum Allowable Thickness	10mm	20mm
	Runout	0.05mm	0.05mm
Rear brake pad	Thickness	10.5mm	10.5mm
	Minimum Allowable Thickness	2mm	2mm

**Description and Operation
System Layout**

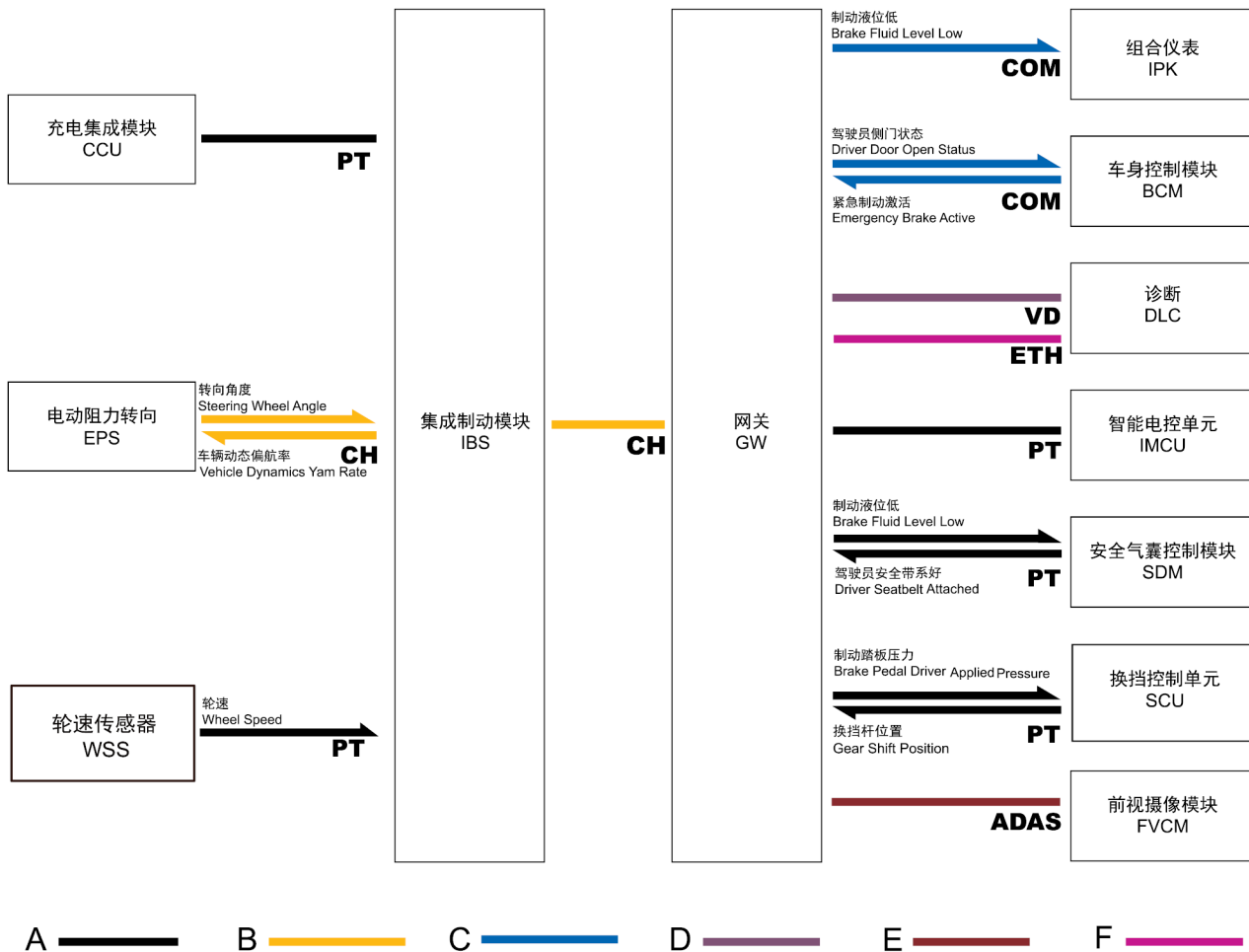


S2410146

- | | |
|----------------------------------|---------------------------------|
| 1. Front Brake Caliper Assembly | 10. Rear Right Brake Pipe |
| 2. Front Brake Disc | 11. Rear Left Brake Pipe |
| 3. Front Right Brake Hose | 12. Rear Right Brake Hose |
| 4. Front Right Brake Pipe | 13. Parking Motor |
| 5. Front Left Brake Pipe | 14. Rear Brake Disc Guard Plate |
| 6. Front Left Brake Hose | 15. Rear Right Brake Hose |
| 7. Front Brake Disc Guard Plate | 16. Rear Brake Caliper Assembly |
| 8. Brake Master Cylinder Booster | 17. Rear Brake Disc |
| 9. Brake Fluid Reservoir | |

System Control Diagram

Brake System Control Chart



S2410154

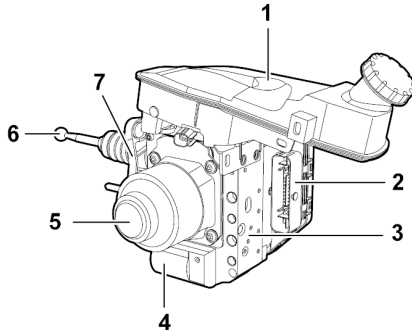
A = Power HS CAN Bus; B = Chassis HS CAN Bus; C = Comfort CAN Bus; D = Diagnosis CAN Bus; E = ADAS CAN; F = Ethernet

Description

This series of vehicles is equipped with IBS, which mainly consists of the following components: pedal assembly on the driver side in the passenger compartment, master cylinder booster assembly on the left of the front compartment (integrated with SCS function), wheel speed sensors, brake caliper assemblies at 4 wheel ends, brake discs and brake disc guard plates, corresponding brake hard pipes and hoses. IBS is a vacuum-free braking system. Compared with models with vacuum booster, brake master cylinder, electronic vacuum pump and brake regulator, the pressure buildup time of emergency brake is significantly shortened, and the weight and size of the braking system are reduced.

The pedal assembly is fixed on the dash panel and includes a brake pedal and an accelerator pedal. The brake pedal is connected with the push rod of the master cylinder booster assembly through a booster connector. A brake lamp switch is fitted on the pedal assembly to provide signals for vehicle starting and illumination of the brake lamp.

The master cylinder booster assembly is fixed on the dash panel and pedal assembly bracket through 4 welding studs on the fixing flange. The master cylinder booster assembly mainly consists of the following components:



S2410137

1. Brake Fluid Reservoir with Level Sensor
2. Electronic Control Unit
3. Valve Block with Solenoid Valve
4. Pedal Simulator
5. Brushless Motor
6. Brake Pedal Interface
7. Fixing Flange

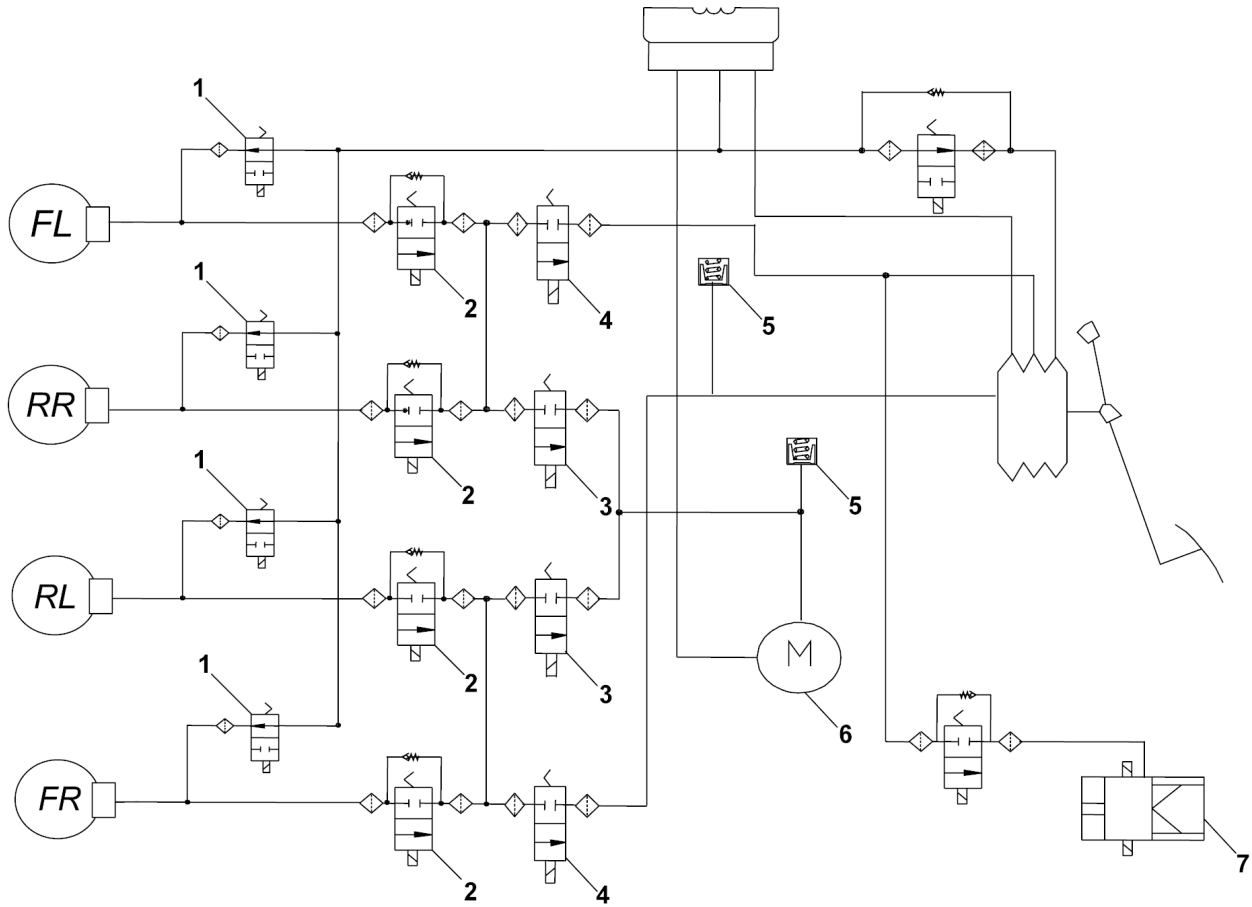
The wheel speed sensor generates a pulse signal by coordinating with the magnetic ring in the wheel hub bearing, and the front wheel speed sensor is fixed on the steering knuckle, while the rear wheel speed sensor is fixed on the wheel bracket.

The front brake caliper assembly is a 4-piston fixed caliper, which is mounted on the steering knuckle. The front brake disc

is a vent disc, and the inner guard plate protects the front brake disc. When the hydraulic pressure is transmitted to the brake caliper, both the inner and outer pistons push the brake pad against the brake disc, causing friction to decelerate the vehicle. The rear brake caliper assembly is a single-piston floating type, which is mounted on the wheel bracket. The rear brake disc is a vent disc, and the inner guard plate protects the rear brake disc. When the hydraulic pressure is transmitted to the brake caliper, the piston stretches outward, forcing the inner brake pad to press against the brake disc. Meanwhile, the brake caliper housing slides along the guide pin under the hydraulic reaction to drive the outer brake pad to come into contact with the brake disc, causing friction to decelerate the vehicle. A parking motor is also mounted on the rear brake caliper assembly. When the parking motor is working, the piston extends outwards, this forces the internal/external brake pads to clamp the brake disc for stable parking.

Operation

Schematic Diagram of IBS Brake System

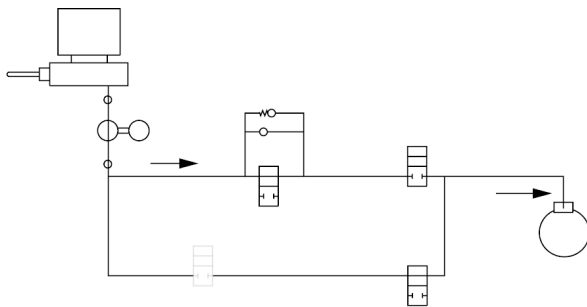


S2410119

- | | |
|------------------------------------|--------------------|
| 1. Oil Return Valve | 5. Pressure Sensor |
| 2. Oil Inlet Valve | 6. Brushless Motor |
| 3. Relief Valve | 7. Simulator |
| 4. Master Cylinder Isolation Valve | |

Normal Braking

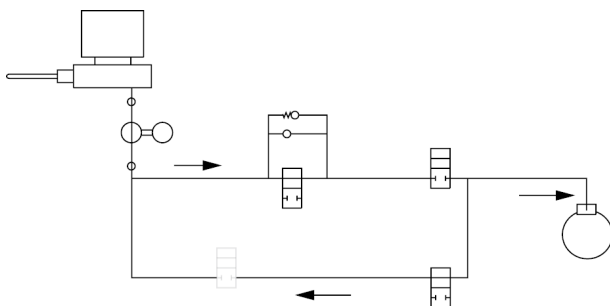
During normal braking, the shut-off valve is energized and closed, and the brake fluid cannot flow to the caliper; meanwhile, the pedal simulator solenoid valve is energized and opened, the brake fluid flows to the simulator, and the driver's static pedal feel is provided by the pedal simulator. The master cylinder displacement sensor and the master cylinder pressure sensor monitor the driver's braking request at the same time, perform calculation through the built-in software model, and send the required pressure buildup request to the brushless motor. The brushless motor works to build up pressure for the four caliper wheel cylinders. As shown below.



S2410115

Regenerative Braking

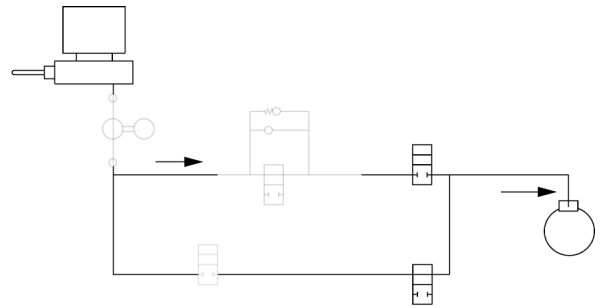
During regenerative braking, the shut-off valve is energized and closed, and the brake fluid cannot flow to the caliper; meanwhile, the pedal simulator solenoid valve is energized and opened, the brake fluid flows to the simulator, and the driver's static pedal feel is provided by the simulator. The master cylinder displacement sensor and the master cylinder pressure sensor monitor the driver's braking request at the same time, and perform calculation through the built-in software model. If the capacity of the motor meets the braking requirement, the brushless motor will not work. As shown below.



S2410116

Failure Braking Mode

When the electrical module fails completely, the shut-off valve is normally open in the power-off state. The driver depresses the pedal to generate the braking pressure through the TMC, which builds up pressure for the four caliper wheel cylinders. As shown below.



S2410117

The above-mentioned processes are continuously carried on during the IBSIBS operation until the vehicle is regulated to the optimum driving condition.

Application of Electronic Park Brake

When the vehicle is stationary, the electronic park brake can be applied at any time, regardless of the start switch position.

Pull the EPB switch upward until the indicator in the EPB switch illuminates. It sends a signal "Apply Brake" to the EPB module. The module receives the request and controls the rear brake actuator to apply the brake, and the indicator in the EPB switch and the indicator[Ⓟ] in the instruments pack kit illuminate.

If the red indicator in the EPB switch and the red indicator[Ⓟ] in the instruments pack kit illuminate, it means the parking brake has been applied.

If the red indicator[Ⓟ] in the instruments pack kit flashes, it means that the parking brake has failed.

If the green indicator[Ⓟ] in the instruments pack kit illuminates, it means that the Auto Hold function is active.

If the yellow EPB malfunction indicator lamp[Ⓟ] in the instruments pack kit remains ON, it means that the electronic park brake system is faulty.

Release of Electronic Park Brake

To manually release the electronic park brake, the module should receive the following signals:

- Start Switch State
- Brake Lamp Switch Signal
- Electronic Park Brake Switch Signal

With the vehicle in the "ON/RUNNING" state, if the module receives the "Brake Lamp Switch" signal indicating that the brake pedal has been depressed and the EPB switch release signal, it will control the parking actuator to release the parking brake.

When the indicator in the EPB switch and the indicator[Ⓟ] in the instruments pack kit turn off, it means that the parking brake has been released.

Start Assist Function

The EPB can automatically judge the driver's intention of leaving, and automatically release the parking brake.

When the vehicle starts off on a slope, the EPB will release the electronic park brake by judging the slope value and motor torque output to prevent slope slipping.

The following conditions must be met to activate the start assist function:

- The driver seat belt has been fastened
- The vehicle is running
- The shift lever is in D or P gear
- The accelerator pedal is depressed

When the accelerator pedal is depressed, the EPB module will control the park actuator to release the park brake by judging the torque value.

This function is different from the hill start assist function HHC.

Emergency Braking Function

In case of an emergency while driving, such as the vehicle cannot be stopped by depressing the brake pedal, the vehicle can be decelerated by pulling up and holding the EPB switch.

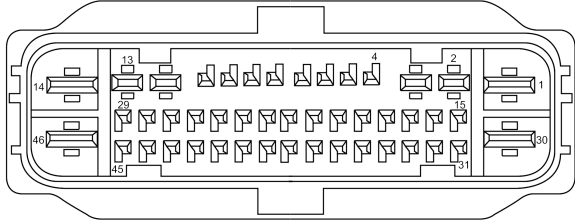
Holding the EPB switch in the on or off position will provide continuous signal (rather than momentary application/release signal) to the EPB module.

Pulling up and holding the EPB switch will provide continuous "Application" signal. The EPB module analyses this data and initiates an emergency braking process.

Releasing the EPB switch or depressing the accelerator pedal will cancel the emergency braking process.

During emergency braking, the EPB system will prevent the rear wheels from locking by controlling the application force of the parking brake actuator.

**Detailed Information List of Component Pins
End View and Pin Information of IBS Connector
FC046**



Pin No.	Pin Functions
1	GND (Ground)
2	Left Rear EPB Motor+
3	Left Rear EPB Motor-
4	Right Rear Wheel Speed Sensor+
5	Right Rear Wheel Speed Sensor-
6	Left Front Wheel Speed Sensor+
7	Left Front Wheel Speed Sensor-
8	Left Rear Wheel Speed Sensor+
9	Left Rear Wheel Speed Sensor-
10	Right Front Wheel Speed Sensor+
11	Right Front Wheel Speed Sensor-
12	Right Rear EPB Motor-
13	Right Rear EPB Motor+
14	KL30.1 (Power Supply)
15	-
16	-
17	Brake Fluid Level Sensor+
18	-
19	Brake Fluid Level Sensor-
20	-
21	-
22	EPB Switch Signal 4
23	-
24	EPB Switch Signal 2

25	EPB Switch Signal 3
26	-
27	EPB Switch Signal 1
28	Powertrain CAN Low
29	Powertrain CAN High
30	-
31	-
32	Chassis CAN Low
33	Chassis CAN High
34	-
35	-
36	-
37	-
38	-
39	-
40	-
41	Ign Relay
42	EPB Switch Indicator
43	-
44	-
45	-
46	KL30.2 (Power Supply)

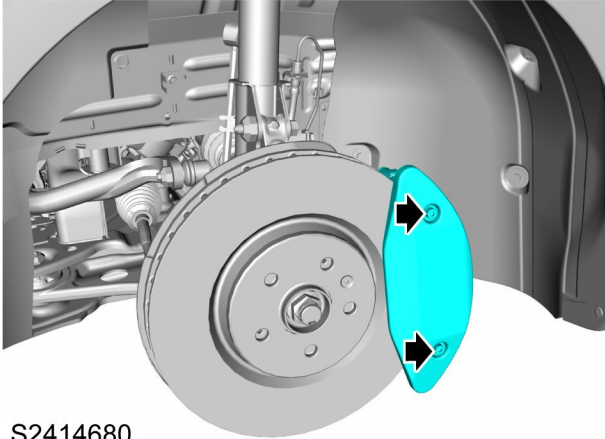
Service Guide

Front Brake Pad Remove

1. Remove the front wheels.

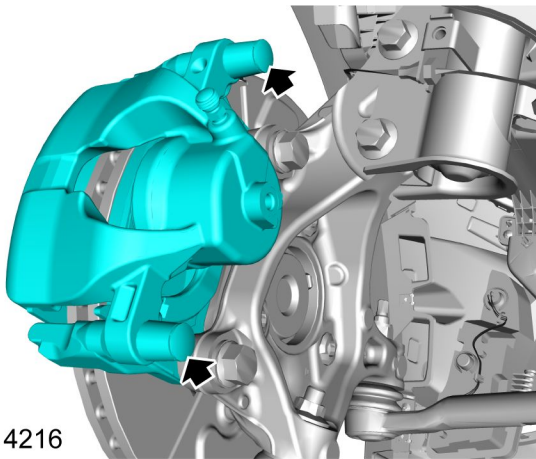
Wheels Remove

2. Remove 2 bolts fixing the front brake caliper cover (if equipped) to the front brake caliper bracket, remove the cover.



S2414680

3. Remove 2 guide pin trim covers of front brake caliper.
4. Remove and discard 2 guide pin bolts fixing the front brake caliper housing assembly to the front brake caliper bracket assembly.



S2414216

5. Remove the front brake caliper housing assembly and fix it in a proper position.

Caution : *Do not hang the brake caliper on the brake hose.*

6. Remove the front brake pad.

Refit

1. Clean the front brake disc, the front brake caliper housing assembly and the front brake caliper bracket assembly, and check the front brake caliper and seals for damage.
2. Fit the front brake pad to the front brake caliper bracket assembly.

3. Use a tool to press the piston in the front brake caliper housing assembly backward to a proper position.
4. Locate the front brake caliper housing assembly to the front brake caliper bracket assembly, fit 2 new guide pin bolts, and tighten them to **25-30Nm**.
5. Fit 2 front brake caliper guide pin trim covers.
6. Depress the brake pedal several times to position the front brake pads.

Tip : *Pedal travel may be longer than normal during first brake application.*

7. Fix the front brake caliper cover to the front brake caliper bracket, fit 2 bolts and tighten them to **8-11Nm**.
8. Fit the front wheels.

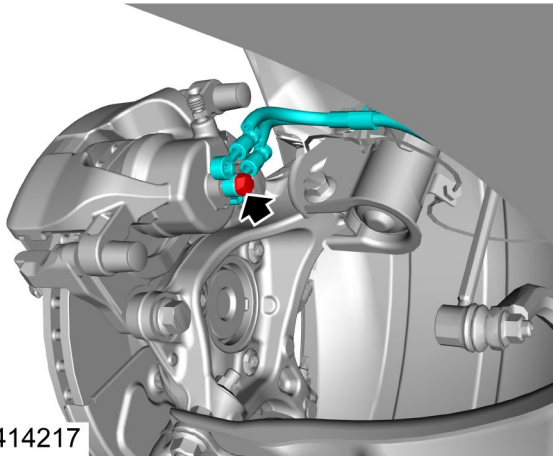
Wheels Refit

Front Brake Caliper Housing Assembly Remove

1. Remove the front wheels.

Wheels Remove

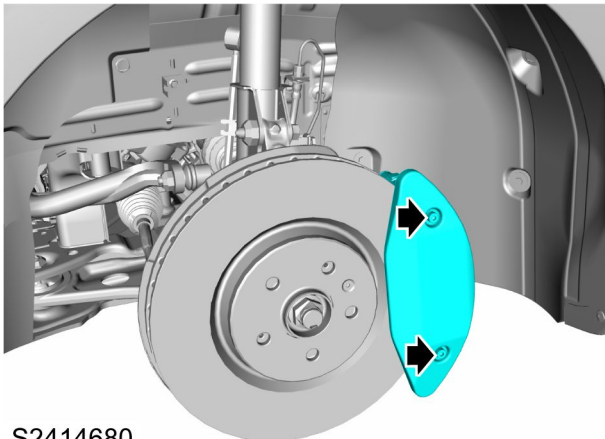
2. Place a proper container under the vehicle to collect the spilled liquid.
3. Remove 1 bolt and 2 gaskets fixing the front brake hose to the front brake caliper assembly, discard the gaskets and disconnect the pipeline.



S2414217

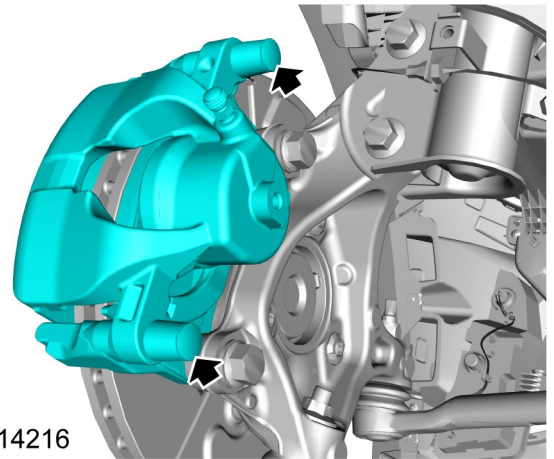
Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.

4. Remove 2 bolts fixing the front brake caliper cover (if equipped) to the front brake caliper bracket, remove the cover.



S2414680

5. Remove 2 guide pin trim covers of front brake caliper.
6. Remove and discard 2 guide pin bolts fixing the front brake caliper housing assembly to the front brake caliper bracket assembly.



S2414216

7. Using a suitable pry bar to remove the front brake caliper housing assembly from the front brake caliper bracket.

Refit

1. Clean the front brake disc, the front brake caliper housing assembly and the front brake caliper bracket assembly, and check the front brake caliper and seals for damage.
2. Locate the front brake caliper housing assembly to the front brake caliper bracket assembly, fit 2 new guide pin bolts, and tighten them to **25-30Nm**.
3. Fit 2 front brake caliper guide pin trim covers.
4. Fix the front brake caliper cover to the front brake caliper bracket, fit 2 bolts and tighten them to **8-11Nm**.
5. Locate the front brake hose to the front brake caliper assembly, fit 2 new gaskets and 1 bolt, and tighten them to **28-32Nm**.
6. Bleed the brake system.

Brake System Drain

7. Fit the front wheels.

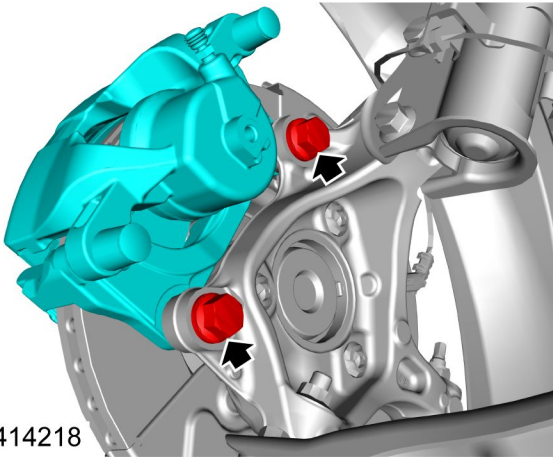
Wheels Refit

Front Brake Caliper Bracket Remove

1. Remove the front brake pad.

Front Brake Pad Remove

2. Remove and discard 2 bolts fixing the front brake caliper bracket assembly to the steering knuckle.



S2414218

3. Remove the front brake caliper bracket assembly.

Refit

1. Clean the front brake disc, the front brake caliper housing assembly and the front brake caliper bracket assembly, and check the front brake caliper and seals for damage.
2. Locate the front brake caliper bracket assembly to the steering knuckle, fit 2 new bolts and tighten them to **190-210Nm**.
3. Fit the front brake pad.

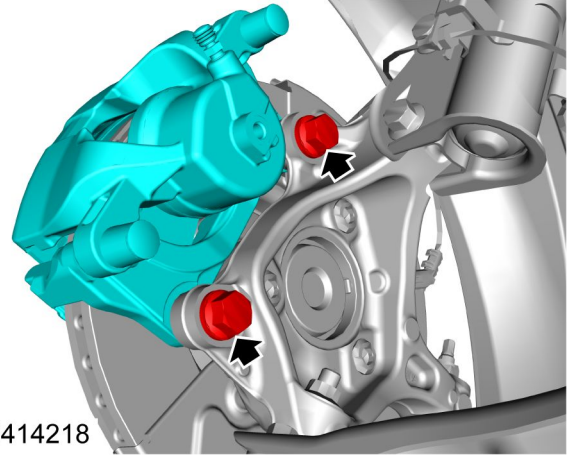
Front Brake Pad Refit

Front Brake Disc Remove

1. Remove the front wheels.

Wheels Remove

2. Remove and discard 2 bolts fixing the front brake caliper bracket assembly to the steering knuckle.

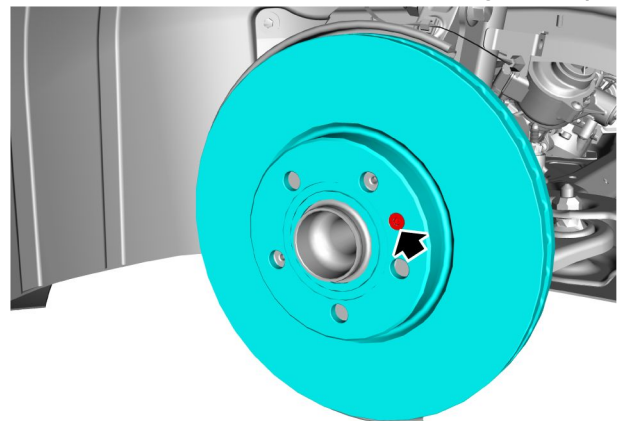


S2414218

3. Remove the front brake caliper bracket assembly and fix it in a proper position.

Caution : Do not hang the brake caliper on the brake hose.

4. Remove 1 countersunk head screw fixing the front brake disc to the front wheel hub bearing assembly.



S2414219

5. Remove the front brake disc.

Refit

1. Ensure the junction surface between the front brake disc and the front wheel hub bearing assembly is clean.
2. Locate the front brake disc to the front wheel hub bearing assembly, fit 1 countersunk head screw, and tighten it to **63-77Nm+(85°-95°)**.
3. Check the runout of the brake disc.

Brake Disc Thickness and Circular Runout Check

4. Remove the front brake caliper bracket assembly, and use a tool to press the piston in the front brake caliper housing assembly backward to a proper position.
5. Locate the front brake caliper bracket assembly to the

steering knuckle, fit 2 new bolts and tighten them to **190-210Nm**.

- Fit the front wheels.

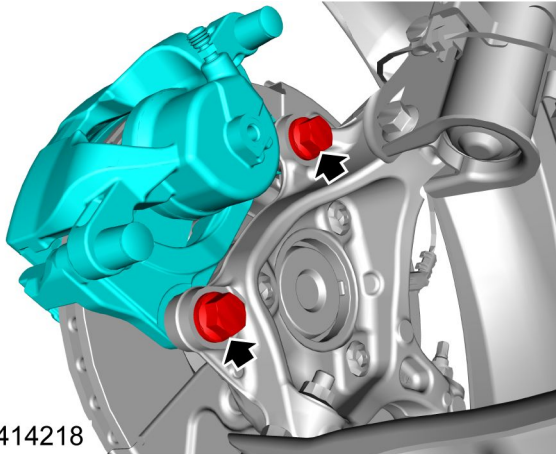
Wheels Refit

Thickness and Circular Runout Check

- Remove the front wheels.

Wheels Remove

- Remove and discard 2 bolts fixing the front brake caliper assembly to the steering knuckle.



S2414218

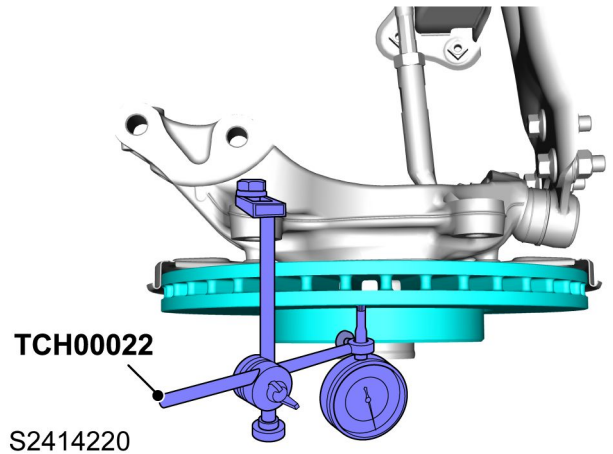
- Remove the front brake caliper assembly and fix it in a proper position.

Caution : *Do not hang the brake caliper on the brake hose.*

- Measure the thickness of the front brake disc at four equal division points on the surface of front brake disc with a differential gauge/micrometre, and ensure the measurement points are located 10mm inward from the edge of the front brake disc. If the thickness of the front brake disc is lower than the specified minimum value (see service brake parameters for details), replace the front brake disc.

Caution : *Brake discs must be replaced in pairs, unless the disc is just replaced with a new one with less than 1500 km.*

- Fit 5 wheel bolts, and tighten them to **120-130Nm**.
- Fit the dial indicator to TCH00022, use the front brake caliper assembly to assemble bolt holes, and fix the TCH00022 to the inner side of the front steering knuckle. Fix the probe of the dial indicator on the position 10mm inward from the edge of the front brake disc.



TCH00022

S2414220

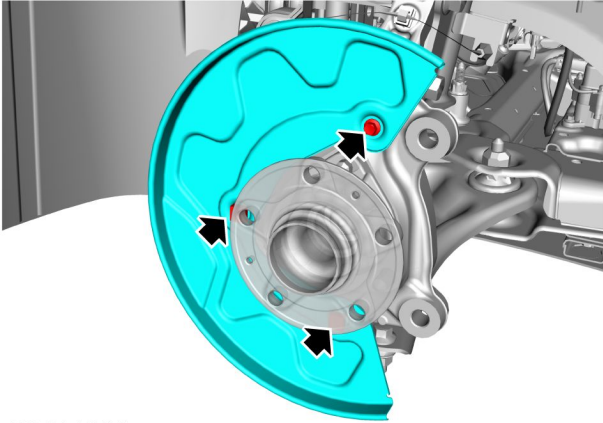
- Reset the dial indicator, turn the brake disc for a full circle and measure the front brake disc runout.
 - If the front brake disc runout exceeds the specified value (see service brake parameters for details):
 - Remove the wheel bolts.
 - Remove 1 countersunk head screw fixing the front brake disc to the front wheel hub bearing assembly, and remove the front brake disc.
 - Ensure the junction surface between the front brake disc and the front wheel hub bearing assembly is clean.
 - Locate the front brake disc to the front wheel hub bearing assembly, fit 1 countersunk head screw, and tighten it to **7-10Nm**.
 - Check the runout of the brake disc again.
 - If the runout still exceeds the specified value, replace the front brake disc or the front wheel hub bearing assembly.
 - Remove the dial indicator and TCH00022.
 - Remove the wheel bolts.
 - If the front brake disc has been replaced, use the tool to press the front brake caliper piston backward to a proper position.
 - Locate the front brake caliper assembly to the front steering knuckle, fit 2 new bolts and tighten them to **190-210Nm**.
 - Fit the front wheels.
- ### **Wheels Refit**
- Depress the brake pedal for several times to adjust the front brake pad.

Front Brake Disc Guard Plate Remove

1. Remove the front brake disc.

Front Brake Disc Remove

2. Remove 3 bolts fixing the front brake disc guard plate to the steering knuckle.



S2414221

3. Remove the front brake disc guard plate.

Refit

1. Locate the front brake disc guard plate to the steering knuckle, fit 3 bolts and tighten them to **7-10Nm**.
2. Fit the front brake disc.

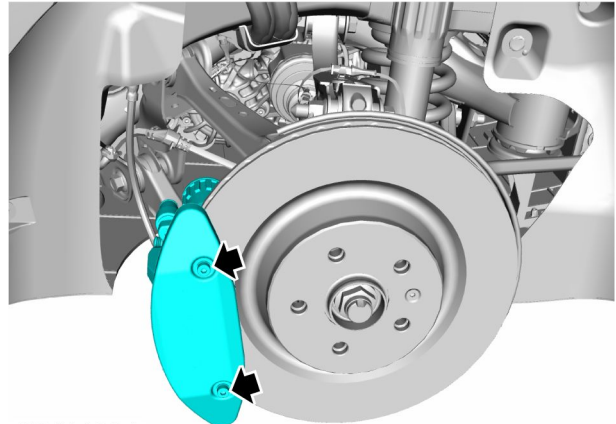
Front Brake Disc Refit

Rear Brake Pad Remove

1. Use a scan tool to perform an electric parking brake release.
2. Disconnect the negative battery cable.
3. Remove the rear wheels.

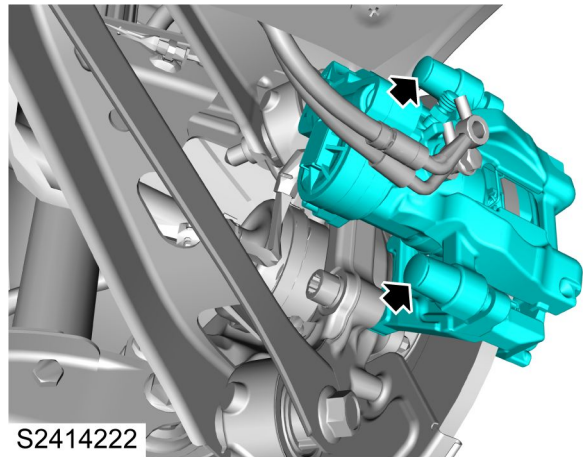
Wheel Is Remove

4. Remove 2 bolts fixing the rear brake caliper cover (if equipped) to the rear brake caliper bracket, remove the cover.



S2414681

5. Disconnect the harness connector of the parking motor, and remove 2 rear brake caliper guide pin trim covers.
6. Remove 2 bolts fixing the rear brake caliper housing assembly to the rear brake caliper bracket assembly.



S2414222

7. Remove the rear brake caliper housing assembly and fix it in a proper position.

Caution : *Do not hang the brake caliper on the brake hose.*

8. Remove the rear brake pad from the rear brake caliper bracket assembly.

Refit

1. Clean the rear brake disc, the rear brake caliper housing assembly and the rear brake caliper bracket assembly, and check the rear brake caliper and seals for damage.
2. Fit the rear brake pad to the rear brake caliper bracket

assembly.

3. Locate the rear brake caliper housing assembly to the rear brake caliper bracket assembly, fit 2 bolts and tighten them to **25-30Nm**.
4. Fit 2 rear brake caliper guide pin trim covers, and connect the harness connector of the parking motor.
5. Fix the rear brake caliper cover to the rear brake caliper bracket, fit 2 bolts and tighten them.
6. Connect the negative battery cable.
7. Use a scan tool to adjust the EPB system.
8. Depress the brake pedal several times to position the rear brake pads.

Tip : Pedal travel may be longer than normal during first brake application.

9. Fit the rear wheels.

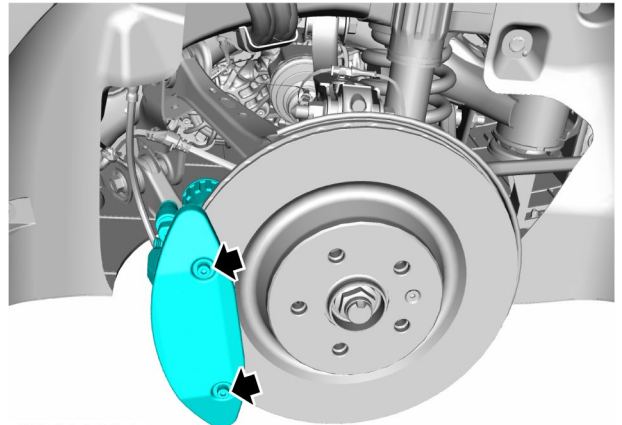
 **Wheels Refit**

Rear Brake Caliper Housing Assembly Remove

1. Use a scan tool to perform an electric parking brake release.
2. Disconnect the negative battery cable.
3. Remove the rear wheels.

 **Wheels Remove**

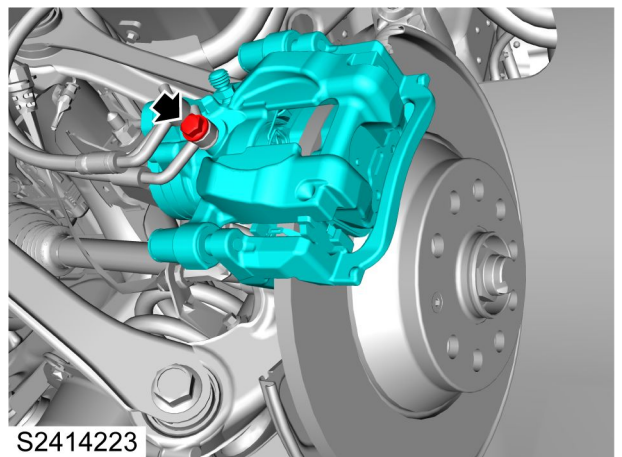
4. Remove 2 bolts fixing the rear brake caliper cover (if equipped) to the rear brake caliper bracket, remove the cover.



S2414681

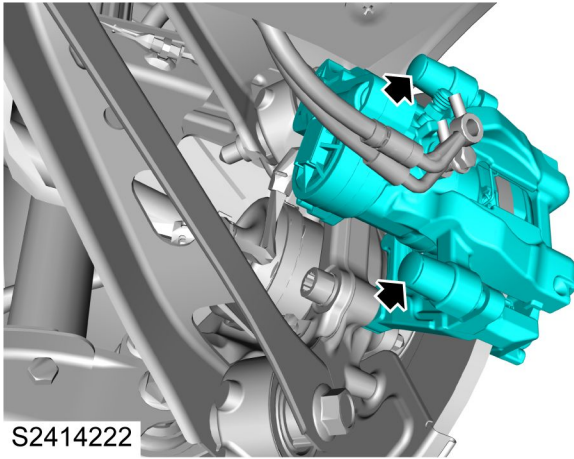
5. Disconnect the harness connector of the parking motor, and remove 2 rear brake caliper guide pin trim covers.
6. Put the cloth at the rear brake hose connector to absorb the spilled brake fluid.
7. Remove 1 bolt and 2 gaskets fixing the rear brake hose to the rear brake caliper housing assembly, and discard the gaskets.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



S2414223

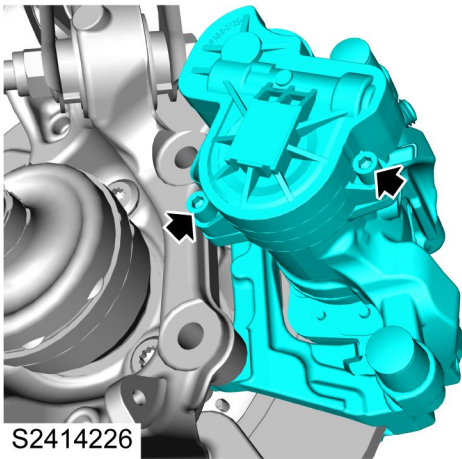
8. Remove 2 bolts fixing the rear brake caliper housing assembly to the rear brake caliper bracket assembly.



10. Fit the rear wheels.

Wheels Refit

9. Remove the rear brake caliper housing assembly.
10. Remove 2 bolts fixing the parking motor to the brake caliper.



11. Remove the parking brake motor.

Refit

1. Locate the parking motor to the rear brake caliper housing assembly, fit 2 bolts and tighten them to **7-9Nm**.
2. Locate the rear brake caliper housing assembly to the rear brake caliper bracket assembly, fit 2 bolts and tighten them to **25-30Nm**.
3. Locate the rear brake hose to the rear brake caliper housing assembly, fit 1 bolt and 2 new gaskets, and tighten them to **28-32Nm**.
4. Fit 2 rear brake caliper guide pin trim covers.
5. Fix the rear brake caliper cover to the rear brake caliper bracket, fit 2 bolts and tighten them.
6. Connect the harness connector of the parking motor.
7. Connect the negative battery cable.
8. Perform the assembly initialisation for the parking motor.

Electric Parking Motor Control Unit (EPMCU)

9. Bleed the brake system.

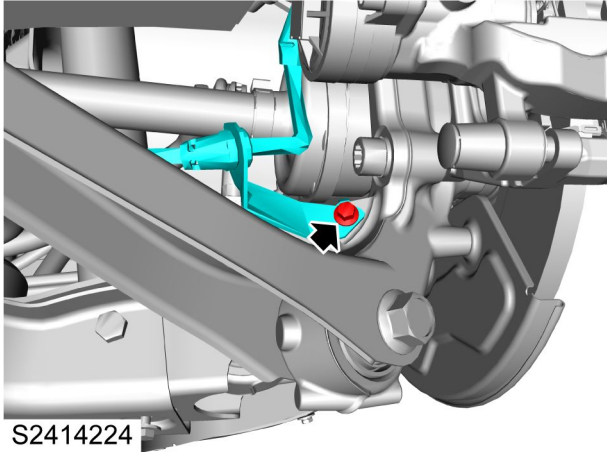
Brake System Drain

Rear Brake Caliper Bracket Remove

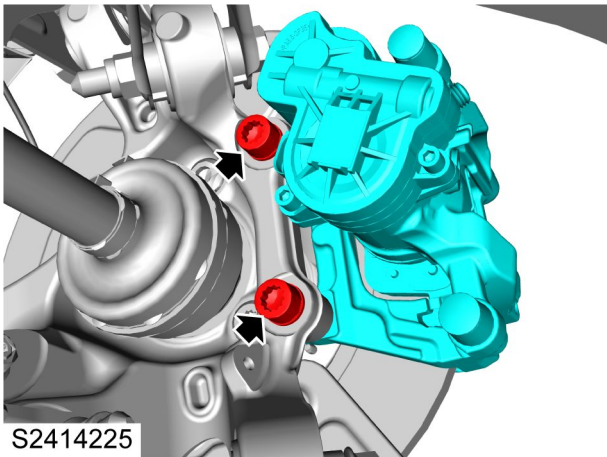
1. Remove the rear brake pad.

 **Rear brake pad Remove**

2. Disconnect the harness connector of the parking motor, remove 1 bolt fixing the parking motor harness bracket to the rear wheel bracket, and remove the harness.



3. Remove and discard 2 bolts fixing the rear brake caliper bracket assembly to the rear wheel bracket.



4. Remove the rear brake caliper bracket assembly.

Refit

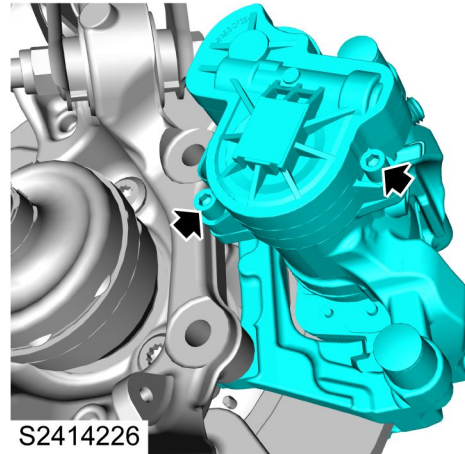
1. Clean the rear brake disc, the rear brake caliper housing assembly and the rear brake caliper bracket assembly.
2. Locate the rear brake caliper bracket assembly to the rear wheel bracket, fit 2 new bolts and tighten them to **81-99Nm+(85°-95°)**.
3. Connect the harness connector of the parking motor.
4. Fix the parking motor harness bracket to the rear wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
5. Connect the negative battery cable.
6. Fit the rear brake pads.

 **Rear brake pad Refit**

7. Use a scan tool to adjust the electronic park brake system.

Parking Motor Assembly Remove

1. Use a scan tool to perform an electric parking brake release.
2. Disconnect the negative battery cable.
3. Raise the vehicle to the appropriate height.
4. Disconnect the harness connector of the parking motor.
5. Remove 2 bolts fixing the parking motor to the rear brake caliper assembly.



6. Remove the parking motor.

Refit

1. Locate the parking motor to the rear brake caliper assembly, fit 2 bolts and tighten them to **7-9Nm**.
2. Connect the harness connector of the parking motor.
3. Lower the vehicle.
4. Connect the negative battery cable.
5. Perform the assembly initialisation for the parking motor.

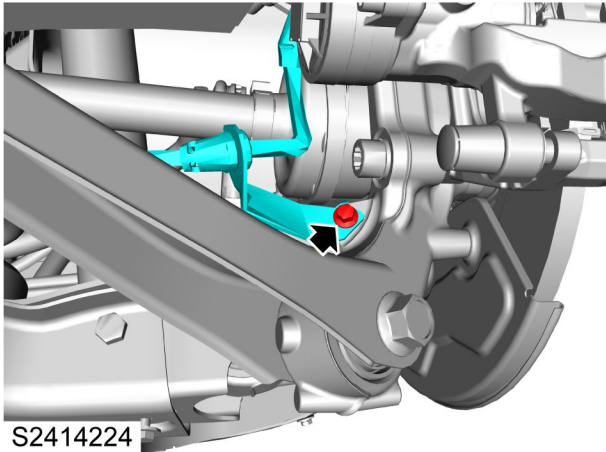
 **Electric Parking Motor Control Unit (EPMCU)**

Rear Brake Disc Remove

1. Use a scan tool to perform an electric parking brake release.
2. Disconnect the negative battery cable.
3. Remove the rear wheels.

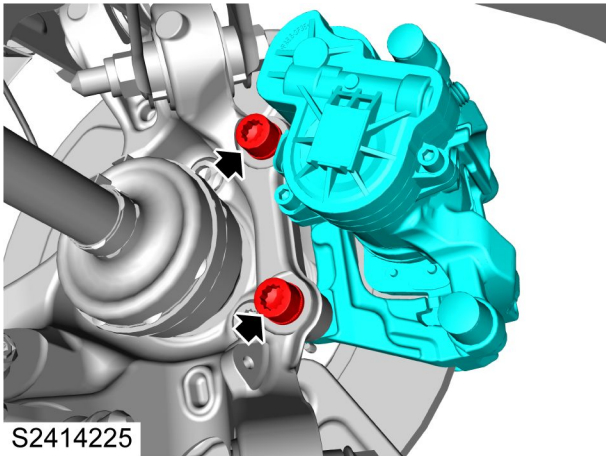
Wheels Remove

4. Disconnect the harness connector of the parking motor.
5. Remove 1 bolt fixing the parking motor harness bracket to the rear wheel bracket, and remove the harness.



S2414224

6. Remove and discard 2 bolts fixing the rear brake caliper bracket assembly to the rear wheel bracket.

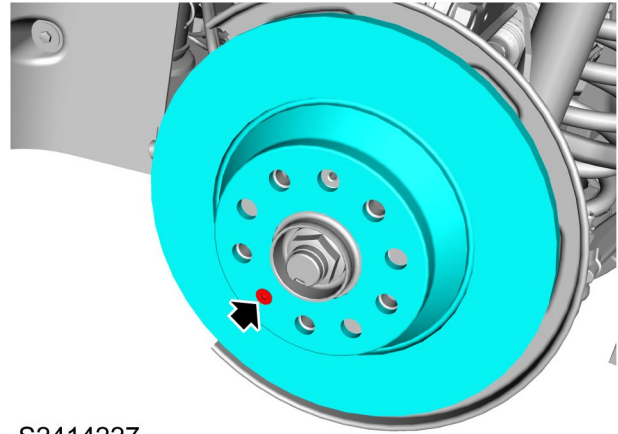


S2414225

7. Carefully pry off the rear brake caliper bracket assembly with a tool, and fix it in a proper position.

Caution : Do not hang the brake caliper on the brake hose.

8. Remove 1 countersunk head screw fixing the rear brake disc to the rear wheel hub bearing assembly.



S2414227

9. Remove the rear brake disc.

Refit

1. Ensure the junction surface between the rear brake disc and the rear wheel hub bearing assembly is clean.
2. Locate the rear brake disc to the rear wheel hub bearing assembly, fit 1 countersunk head screw, and tighten it to **7-10Nm**.
3. Check the runout of the rear brake disc.

Rear Brake Disc Thickness and Circular Runout Check

4. Check the mounting surface and hole of the wheel bracket and rear brake caliper bracket assembly, remove the foreign material or oil stain and ensure the mounting surface and hole are clean.
5. Locate the rear brake caliper bracket assembly to the rear wheel bracket, fit 2 new bolts and tighten them to **81-99Nm+(85°-95°)**.
6. Fix the parking motor harness bracket to the rear wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
7. Connect the harness connector of the parking motor.
8. Connect the negative battery cable.
9. Use a scan tool to adjust the electronic park brake system.
10. Fit the rear wheels.

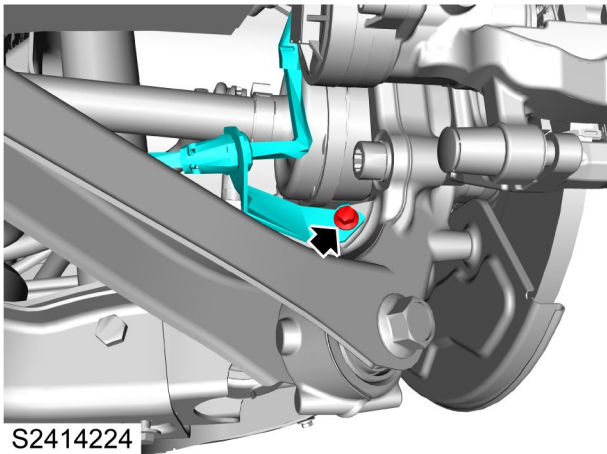
Wheels Refit

Thickness and Circular Runout Check

1. Use a scan tool to perform an electric parking brake release.
2. Disconnect the negative battery cable.
3. Remove the rear wheels.

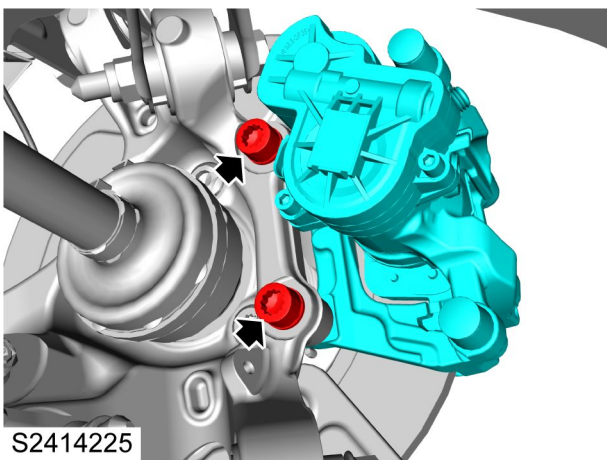
Wheels Remove

4. Disconnect the harness connector of the parking motor.
5. Remove 1 bolt fixing the parking motor harness bracket to the rear wheel bracket, and remove the harness.



S2414224

6. Remove and discard 2 bolts fixing the rear brake caliper assembly to the rear wheel bracket.



S2414225

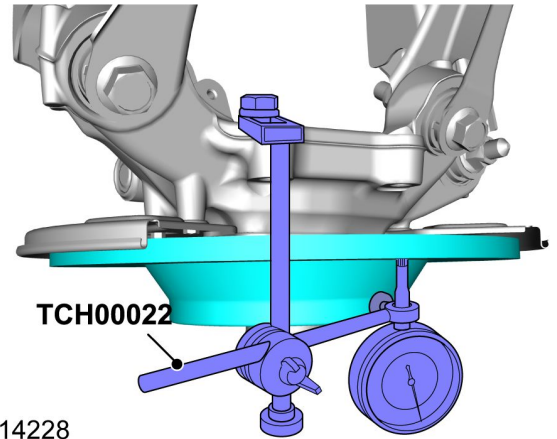
7. Carefully pry off the rear brake caliper assembly with a tool, and fix it in a proper position.

Caution : Do not hang the brake caliper on the brake hose.

8. Measure the thickness of the rear brake disc at four equal division points on the surface of rear brake disc with a differential gauge/micrometre, and ensure the measurement points are located 10mm inward from the edge of the rear brake disc. If the thickness of the rear brake disc is lower than the specified minimum value (see service brake parameters for details), replace the rear brake disc.

Caution : Brake discs must be replaced in pairs, unless the disc is just replaced with a new one with less than 1500 km.

9. Fit 5 wheel bolts, and tighten them to **120-130Nm**.
10. Fit the dial indicator to TCH00022, use the rear brake caliper assembly to assemble bolt holes, and fix the TCH00022 to the inner side of the wheel bracket. Fix the probe of the dial indicator on the position 10mm inward from the edge of the rear brake disc.



S2414228

11. Reset the dial indicator, turn the brake disc for a full circle and measure the rear brake disc runout.
12. If the rear brake disc runout exceeds the specified value (see service brake parameters for details):
 - a. Remove the wheel bolts.
 - b. Remove 1 countersunk head screw fixing the rear brake disc to the rear wheel hub bearing assembly, and remove the rear brake disc.
 - c. Ensure the junction surface between the rear brake disc and the rear wheel hub bearing assembly is clean.
 - d. Locate the rear brake disc to the rear wheel hub bearing assembly, fit 1 countersunk head screw, and tighten it to **7-10Nm**.
 - e. Check the runout of the rear brake disc again.
 - f. If the runout still exceeds the specified value, replace the rear brake disc or the rear wheel hub bearing assembly.
13. Remove the dial indicator and TCH00022 from the inner side of the wheel bracket.
14. Remove the wheel bolts.
15. Locate the rear brake caliper assembly to the rear wheel bracket, fit 2 new bolts and tighten them to **81-99Nm+(85°-95°)**.
16. Fix the parking motor harness bracket to the rear wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
17. Connect the harness connector of the parking motor.
18. Connect the negative battery cable.
19. Use a scan tool to adjust the electronic park brake system.
20. Depress the brake pedal several times to adjust the rear brake pad.
21. Fit the rear wheels.

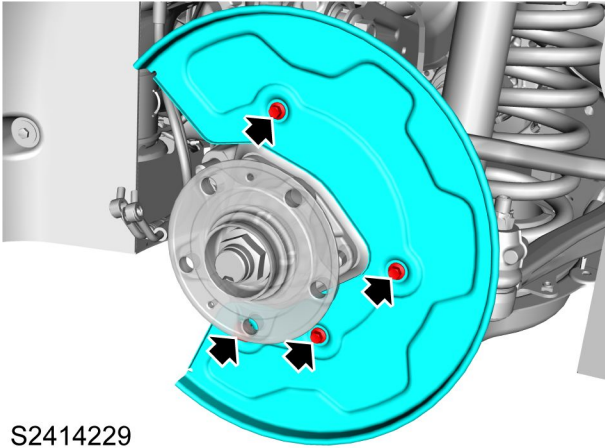
Wheels Refit

Rear Brake Disc Guard Plate Remove

1. Remove the rear brake disc.

Rear Brake Disc Remove

2. Remove 4 bolts fixing the rear brake disc guard plate to the rear wheel bracket.



S2414229

3. Remove the rear brake disc guard plate.

Refit

1. Ensure the junction surface of the rear brake disc guard plate and the rear wheel bracket is clean.
2. Locate the rear brake disc guard plate to the rear wheel bracket, fit 4 bolts and tighten them to **7-10Nm**.
3. Fit the rear brake disc.

Rear Brake Disc Refit

Brake Fluid Reservoir Assembly Remove

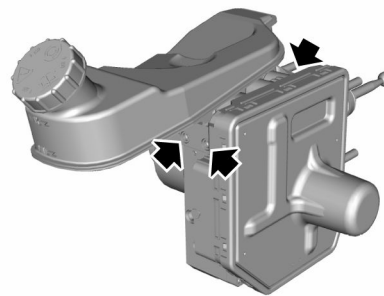
1. Disconnect the negative battery cable.
2. Remove the brake master cylinder booster assembly.

Brake Master Cylinder Booster Assembly Remove

3. Put the cloth under the brake master cylinder and reservoir assembly to absorb the spilled fluid.

Caution : Brake fluid will damage the paint. If fluid spills, immediately remove it and clean this area with water.

4. Remove and discard 3 bolts fixing the brake fluid reservoir to the brake master cylinder.



S2414331

5. Remove the brake fluid reservoir assembly.

Refit

1. Locate the brake fluid reservoir to the brake master cylinder, fit 3 bolts, and tighten them to **3.6-4.2Nm**.
2. Fit the brake master cylinder booster assembly.

Brake Master Cylinder Booster Assembly Refit

3. Connect the negative battery cable.
4. Drain the brake system.

Brake System Drain

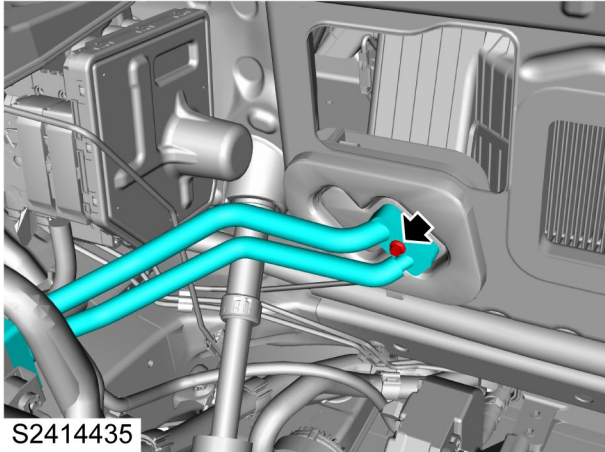
Brake Master Cylinder Booster Assembly Remove

1. Remove the A/C air inlet box.

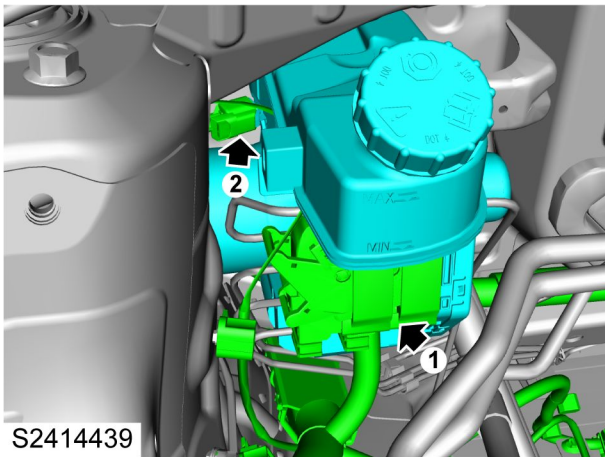
A/C Air Inlet Box Remove

2. Remove 1 bolt fixing the evaporator pipe assembly to the evaporator box, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.

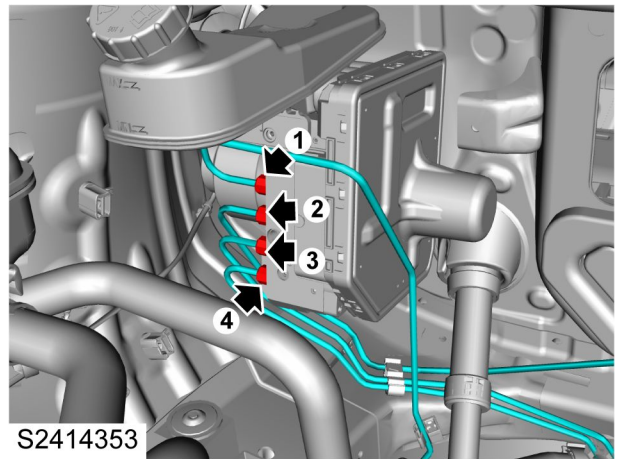


3. Disconnect the harness connector (1) from the brake master cylinder booster, and disconnect the harness connector (2) of the brake fluid level sensor.



4. Put a cloth under the brake master cylinder booster to absorb the spilled fluid.
5. Mark the positions of 4 front brake pipes on the brake master cylinder booster for assembly.
6. Disconnect the brake master cylinder booster from the front brake pipe in the sequence (1, 2, 3, 4).

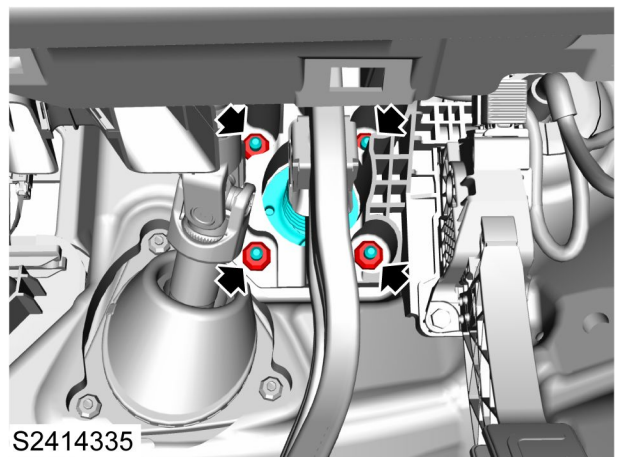
Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



7. Cover the brake pipe connector to prevent loss and contamination of brake fluid.
8. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Remove

9. Remove 4 nuts fixing the brake master cylinder booster to the dash panel.



10. Loosen and discard the push rod clip of brake pedal.
11. Remove the brake master cylinder booster assembly.

Refit

1. Locate the brake master cylinder booster assembly to the body.
2. Connect the brake pedal to the brake master cylinder booster push rod, and press the clip.
3. Locate the brake master cylinder booster to the dash panel, fit 4 nuts and tighten them to **19-25Nm**.
4. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Refit

5. Clean the brake pipe connector.
6. Connect the front brake pipe to the brake master cylinder booster according to the assembly marks, and ensure that the pipes are connected to the correct ports, and tighten the connector nut to **19-25Nm**.
7. Connect the harness connector of the brake fluid level sensor.

8. Connect the harness connector of the brake master cylinder booster.
9. Fix the evaporator pipe assembly to the evaporator box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
10. Fit the A/C air inlet box.

A/C Air Inlet Box Refit

11. Drain the brake system.

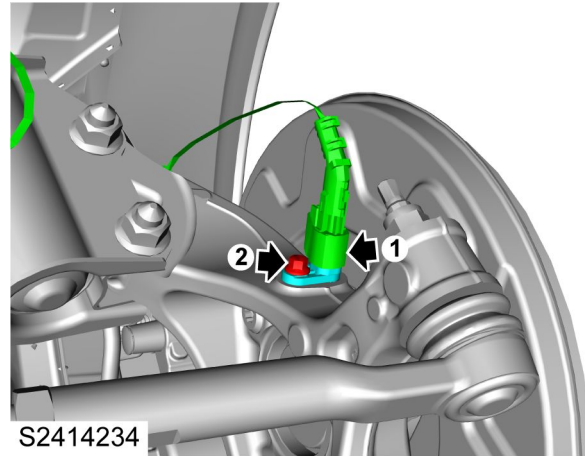
Brake System Drain

Front Wheel Speed Sensor Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front wheels.

Wheels Remove

3. Disconnect the harness connector (1) of the front wheel speed sensor assembly.
4. Remove 1 bolt (2) fixing the front wheel speed sensor assembly to the steering knuckle.



5. Remove the front wheel speed sensor assembly.

Refit

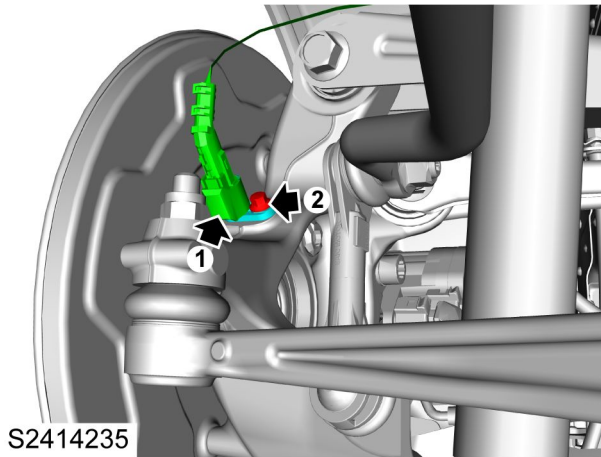
1. Clean the contact surface of the front wheel speed sensor assembly and the steering knuckle.
2. Locate the front wheel speed sensor assembly to the steering knuckle, fit 1 bolt and tighten it to **7-10Nm**.
3. Connect the harness connector of the front wheel speed sensor assembly.
4. Fit the front wheels.

Wheels Refit

5. Connect the negative battery cable.

**Rear Wheel Speed Sensor Assembly
Remove**

1. Disconnect the negative battery cable.
2. Disconnect the harness connector (1) of the rear wheel speed sensor assembly.
3. Remove 1 bolt (2) fixing the rear wheel speed sensor assembly to the wheel bracket.



4. Remove the rear wheel speed sensor assembly.

Refit

1. Clean the contact surface of the rear wheel speed sensor assembly and the wheel bracket.
2. Locate the rear wheel speed sensor assembly to the wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
3. Connect the harness connector of the rear wheel speed sensor assembly.
4. Connect the negative battery cable.

**Brake Pedal Assembly
Remove**

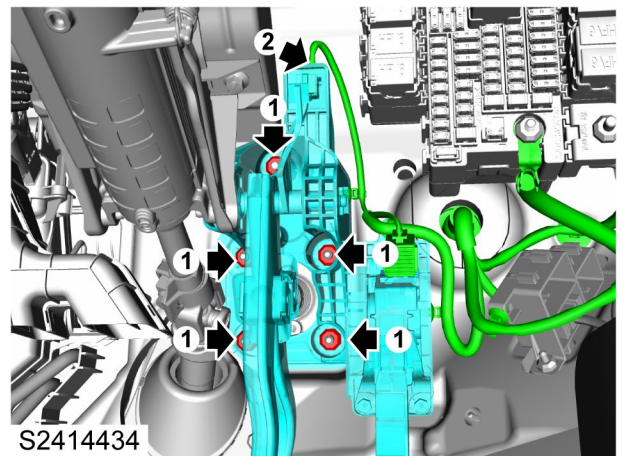
1. Remove the driver side knee baffle assembly.

 **Driver Side Knee Baffle Assembly Remove**

2. Remove the accelerator pedal assembly.

 **Accelerator Pedal Assembly Remove**

3. Remove 5 nuts (1) fixing the brake pedal to the dash panel.
4. Disengage the harness clip from the pedal bracket, and disconnect the harness connector (2) from the brake lamp switch.



5. Loosen the push rod clip of brake pedal, and remove the brake pedal assembly.

Refit

1. Connect the brake pedal to the brake master cylinder booster push rod, and press the clip.
2. Connect the harness connector of the brake lamp switch, and fix the harness clip to the pedal bracket.
3. Locate the brake pedal to the dash panel, fit 5 nuts and tighten them to **19-25Nm**.
4. Fit the accelerator pedal assembly.

 **Accelerator Pedal Assembly Refit**

5. Fit the driver side knee baffle assembly.

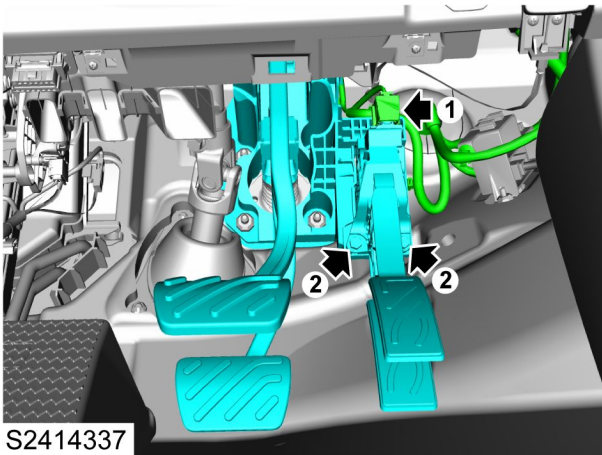
 **Driver Side Knee Baffle Assembly Refit**

Accelerator Pedal Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the driver side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Assembly Remove

3. Disconnect the accelerator pedal harness connector (1).
4. Remove 2 bolts (2) fixing the accelerator pedal assembly to the pedal bracket.



5. Remove the accelerator pedal assembly.

Refit

1. Locate the accelerator pedal assembly to the pedal bracket, fit 2 bolts and tighten them to **4-5Nm**.
2. Connect the harness connector of the accelerator pedal.
3. Fit the driver side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Assembly Refit

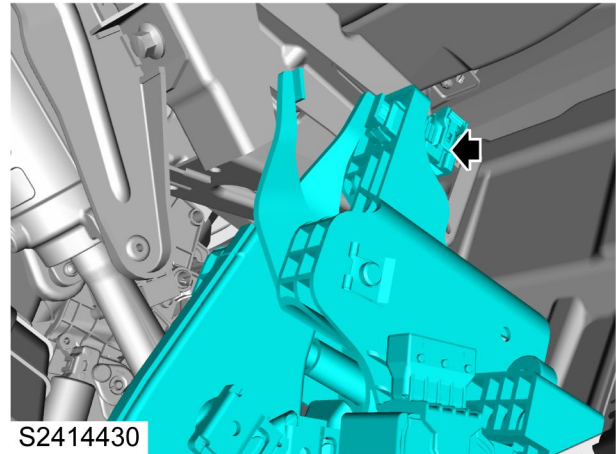
4. Connect the negative battery cable.

Brake Lamp Switch Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Remove

3. Disconnect the harness connector of the brake lamp switch.
4. Pry off the clip, and remove the brake lamp switch assembly.



Refit

1. Locate the brake lamp switch to the brake pedal, and tighten the clips.
2. Connect the harness connector of the brake lamp switch.
3. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Refit

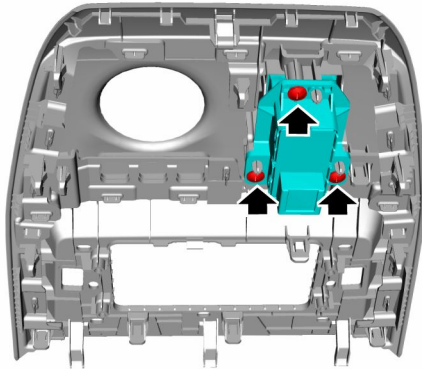
4. Connect the negative battery cable.

**EPB Switch
Remove**

1. Remove the centre console upper trim panel assembly.

 **Centre Console Upper Trim Panel Assembly**

2. Disconnect the harness connector of the electric parking switch.
3. Remove 3 screws fixing the electric parking switch to the centre console upper trim panel.



S2414256

4. Remove the electric parking switch.

Refit

1. Locate the electronic parking switch to the centre console upper trim panel assembly, fit 3 screws and tighten them.
2. Connect the harness connector of the electronic parking switch.
3. Fit the centre console upper trim panel assembly.

 **Centre Console Upper Trim Panel Assembly**

**Front Left Brake Pipe
Remove- Front Left**

1. Remove the front left wheel.

 **Wheel Remove**

2. Remove the manual service disconnect.

 **Manual Service Disconnect Remove**

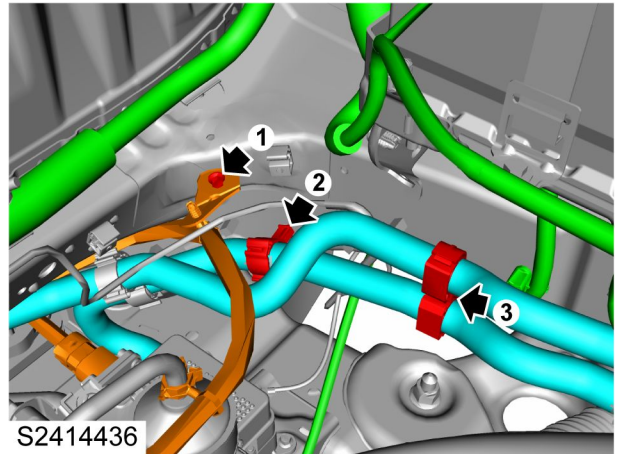
3. Remove the A/C air inlet box.

 **A/C Air Inlet Box Remove**

4. Remove the steering intermediate shaft assembly.

 **Steering Intermediate Shaft Assembly Remove**

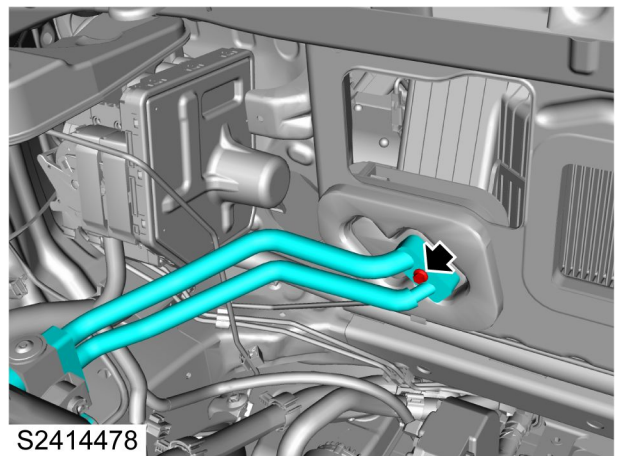
5. Remove 1 bolt (1) fixing the HV harness to the body, and put it aside.
6. Disconnect the clip (2) fixing the pipeline assembly - battery cooler to power battery heater to the body, and put it aside.
7. Disconnect the clip (3) fixing the pipeline assembly - motor to radiator to the body, and put it aside.



S2414436

8. Remove 1 bolt fixing the evaporator pipe assembly to the evaporator box, disconnect the pipeline, and discard the seal ring.

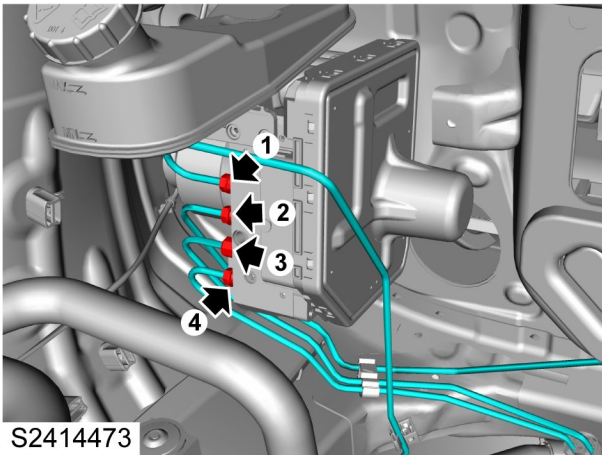
Caution : *Protect the pollutants from entering the open joints.*



S2414478

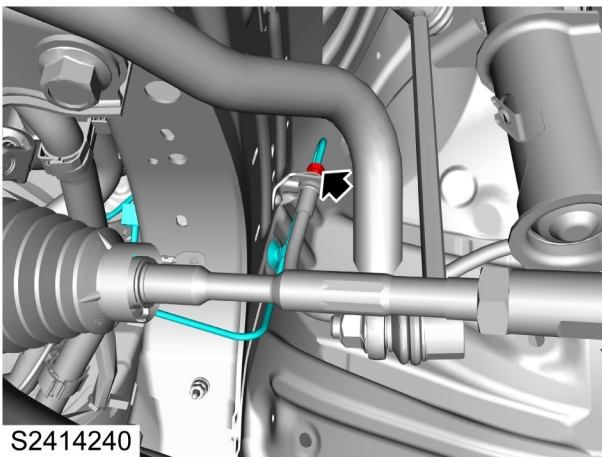
9. Put a cloth under the brake master cylinder booster to absorb the spilled fluid.
10. Remove 1 connector nut (2) fixing the front left

brake pipe to the brake master cylinder booster, and disconnect the pipeline.



11. Remove the connector nut fixing the front left brake pipe to the front brake hose, and disconnect the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



12. Find the right space and use a tool to disengage the pipe clamp from the front left brake pipe, and remove the front left brake pipe.

Refit - Front Left

1. Clean the brake pipe connector.
2. Locate the front left brake pipe to the body clamp.
3. Locate the front left brake pipe connector to the front brake hose, and tighten the connector nut to **15-19Nm**.
4. Connect the front left brake pipe to the brake master cylinder booster, and ensure that the pipes are connected to the correct ports, and tighten the connector nut to **15-19Nm**.
5. **7-10Nm** Fix the evaporator pipe assembly to the evaporator box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.

6. Fix the clip of the pipeline assembly - motor to radiator to the body, and clamp it.
7. Fix the clip of the pipeline assembly - battery cooler to power battery heater to the body, and clamp it.
8. Fix the HV harness to the body, fit 1 bolt and tighten it.
9. Fit the steering intermediate shaft assembly.

Steering Intermediate Shaft Assembly Refit

10. Fit the A/C air inlet box.

A/C Air Inlet Box Refit

11. Fit the manual service disconnect.

Manual Service Disconnect Refit

12. Fit the front left wheel.

Wheel Refit

13. Drain the brake system.

Brake System Drain

Front Right Brake Pipe Remove - Front Right

1. Remove the front right wheel.

Wheel Remove

2. Remove the A/C air inlet box.

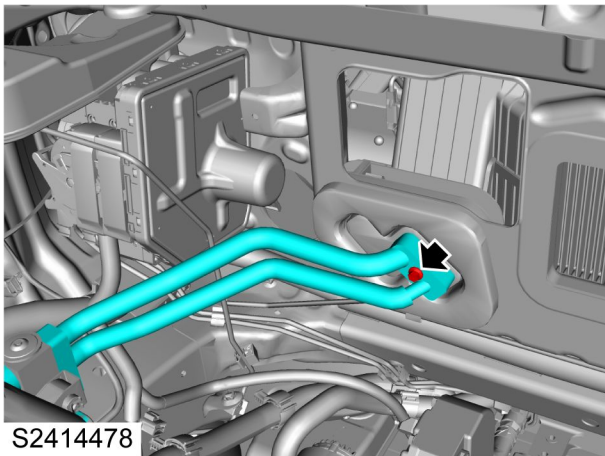
A/C Air Inlet Box Remove

3. Remove the steering intermediate shaft assembly.

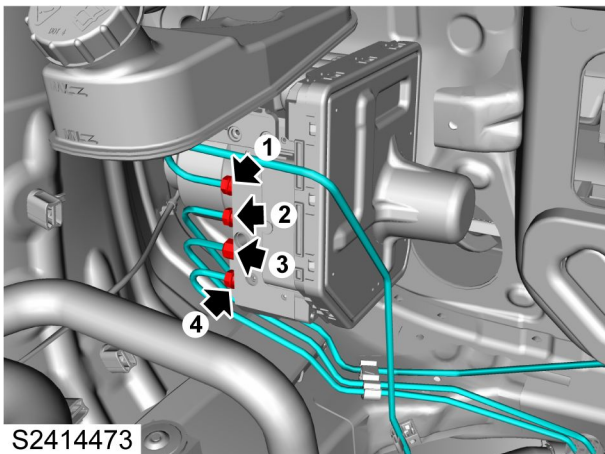
Steering Intermediate Shaft Assembly Remove

4. Remove 1 bolt fixing the evaporator pipe assembly to the evaporator box, disconnect the pipeline, and discard the seal ring.

Caution : Protect the pollutants from entering the open joints.

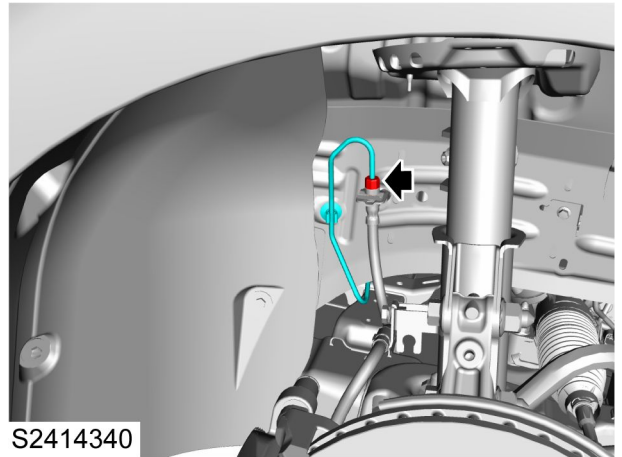


5. Put a cloth under the brake master cylinder booster to absorb the spilled fluid.
6. Remove 1 connector nut (1) fixing the front right brake pipe to the brake master cylinder booster, and disconnect the pipeline.



7. Remove the connector nut fixing the front right brake pipe to the front brake hose, and disconnect the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



8. Use a tool to disengage the front right brake pipe clamp, and remove the front right brake pipe.

Refit - Front Right

1. Clean the brake pipe connector.
2. Locate the front right brake pipe to the body clamp.
3. Locate the front right brake pipe connector to the front brake hose, and tighten the connector nut to **15-19Nm**.
4. Connect the front right brake pipe to the brake master cylinder booster, and ensure that the pipes are connected to the correct ports, and tighten the connector nut to **15-19Nm**.
5. Fix the evaporator pipe assembly to the evaporator box, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
6. Fit the steering intermediate shaft assembly.

Steering Intermediate Shaft Assembly Refit

7. Fit the A/C air inlet box.

A/C Air Inlet Box Refit

8. Fit the front right wheel.

Wheel Refit

9. Drain the brake system.

Brake System Drain

Front Brake Pipe - Master Cylinder Booster Assembly to Rear Brake Pipe Remove

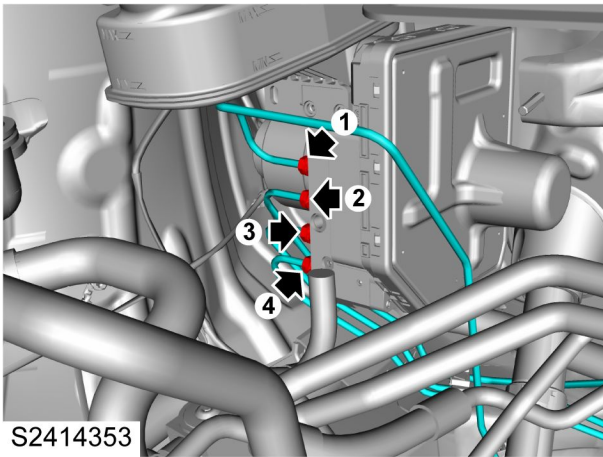
1. Remove the A/C air inlet box.

A/C Air Inlet Box Remove

2. Remove the steering intermediate shaft assembly.

Steering Intermediate Shaft Assembly Remove

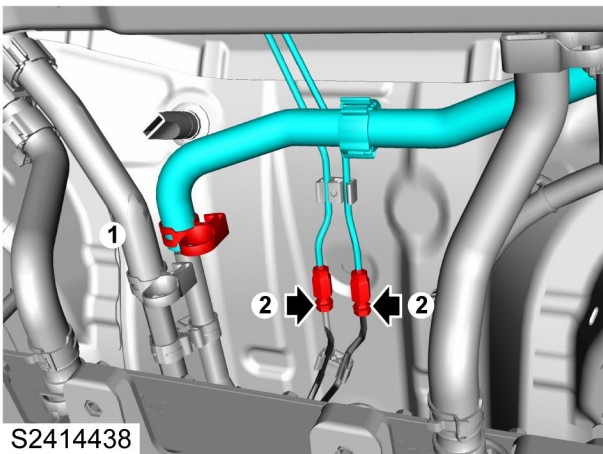
3. Put a cloth under the brake master cylinder booster to absorb the spilled fluid.
4. Mark the positions of 2 front brake pipes on the brake master cylinder booster for assembly.
5. Remove 2 connector nuts (3 and 4) fixing the connecting pipe of front brake pipe - master cylinder booster assembly to rear brake pipe to the brake master cylinder booster, and disconnect the pipeline.



6. Remove the front bottom deflector.

Bottom Deflector Remove

7. Loosen the clamp (1), disconnect the hose from the cooling pipeline, and remove it.
8. Remove the connector nut (2) fixing the connecting pipe of front brake pipe - master cylinder booster assembly to rear brake pipe to the rear brake pipe, and disconnect the pipeline.



9. Disconnect the pipe clamp fixing the connecting pipe of front brake pipe - master cylinder booster assembly to

rear brake pipe to the body.

10. Pull out the connecting pipe from the front brake pipe - master cylinder booster assembly to rear brake pipe.

Refit

1. Clean the brake pipe connector.
2. Locate the connecting pipe between master cylinder booster assembly and rear brake pipe to the body clamp and ensure that it is clamped in place.
3. Connect the connecting pipe between master cylinder booster assembly and rear brake pipe to the rear brake pipe, and tighten the connector nut to **13-15Nm**.
4. Connect the cooling hose and secure with clamps.
5. Fit the front bottom deflector.

Bottom Deflector Refit

6. Fix 2 connecting pipes between master cylinder booster assembly and rear brake pipe to the brake master cylinder booster according to the assembly marks, and ensure that the pipes are connected to the correct ports, and tighten the brake pipe connector nut to **13-15Nm**.
7. Fit the steering intermediate shaft assembly.

Steering Intermediate Shaft Assembly Refit

8. Fit the A/C air inlet box.

A/C Air Inlet Box Refit

9. Drain the brake system.

Brake System Drain

Rear Left Brake Pipe

Remove - Rear Left

1. Remove the rear bottom deflector.

Bottom Deflector Remove

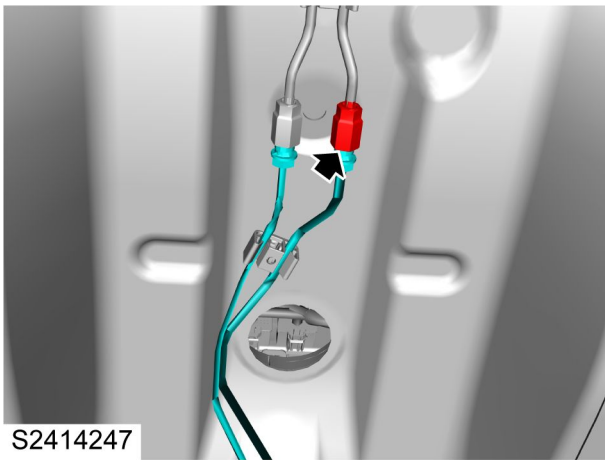
2. Remove the rear left wheel.

Wheels Remove

3. Remove the high-voltage battery pack and its bracket.

High-voltage Battery Pack Remove

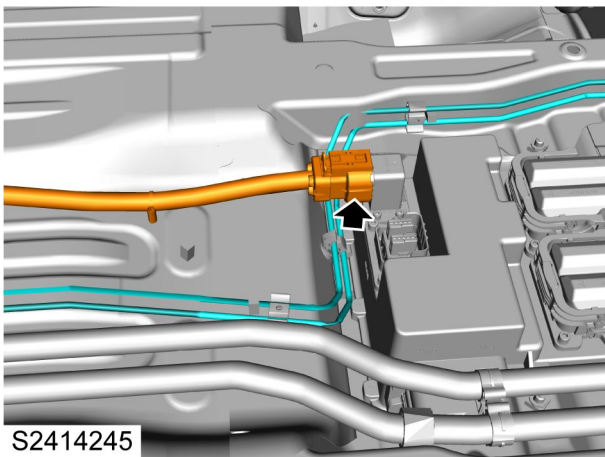
4. Place an appropriate container under the vehicle to collect the spilled brake fluid.
5. Remove the connecting pipe between the master cylinder booster assembly and the rear brake hard pipe from the rear left brake hard pipe connector nut.



6. Disconnect the brake hard pipe, plug the opening of the brake pipe connector for the avoidance of brake fluid loss or contamination.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.

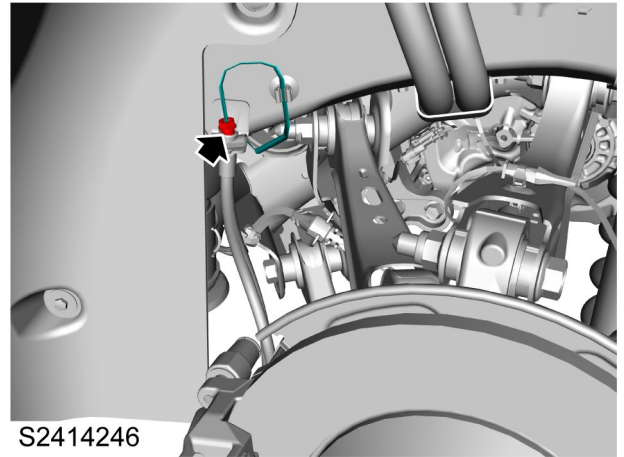
7. Disconnect the high-voltage harness connector from the PDU.



8. Remove the connector nut fixing the rear left brake hard pipe to the rear left brake hose, and disconnect

the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



9. Disconnect the rear left brake hard pipe from the pipe clamp on the body.
10. Pull out the rear left brake hard pipe.

Refit - Rear Left

1. Clean the brake pipe connector.
2. Locate the rear left brake hard pipe to the body clamp and ensure that it is clamped in place.
3. Remove the plug, locate the rear left brake hard pipe connector to the rear left brake hose, and tighten the connector nut to **15-19Nm**.
4. Connect the high-voltage harness connector to the PDU.
5. Remove the plug, locate the rear left brake hard pipe connector to the connecting pipe between the master cylinder booster assembly and the rear left brake hard pipe, and tighten the connector nut to **13-15Nm**.
6. Fit the high-voltage battery pack and bracket.

High-voltage Battery Pack Refit

7. Fit the rear wheels.

Wheels Refit

8. Fit the rear bottom deflector.

Bottom Deflector Refit

9. Bleed the brake system.

Brake System Drain

Rear Right Brake Pipe

Remove - Rear Right

1. Remove the rear bottom deflector.

Bottom Deflector Remove

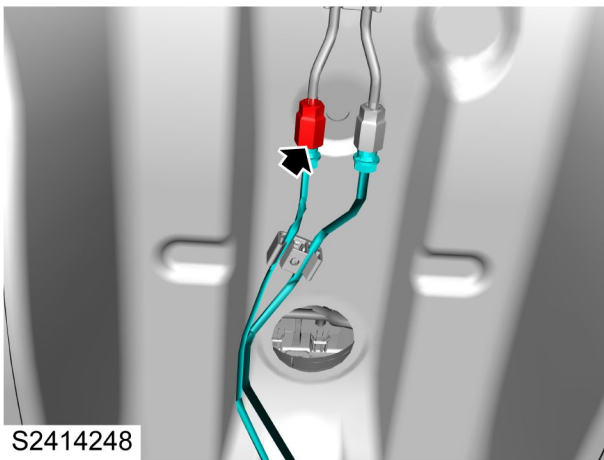
2. Remove the rear right wheel.

Wheels Remove

3. Remove the high-voltage battery pack and its bracket.

High-voltage Battery Pack Remove

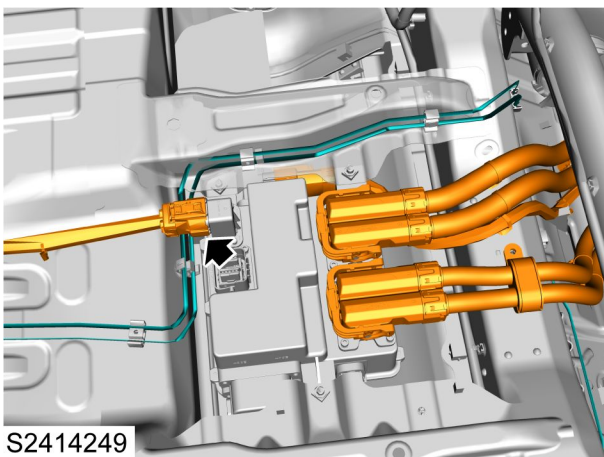
4. Place an appropriate container under the vehicle to collect the spilled brake fluid.
5. Remove the connecting pipe between the master cylinder booster assembly and the rear brake hard pipe from the rear right brake hard pipe connector nut.



6. Disconnect the brake hard pipe, plug the opening of the brake pipe connector for the avoidance of brake fluid loss or contamination.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.

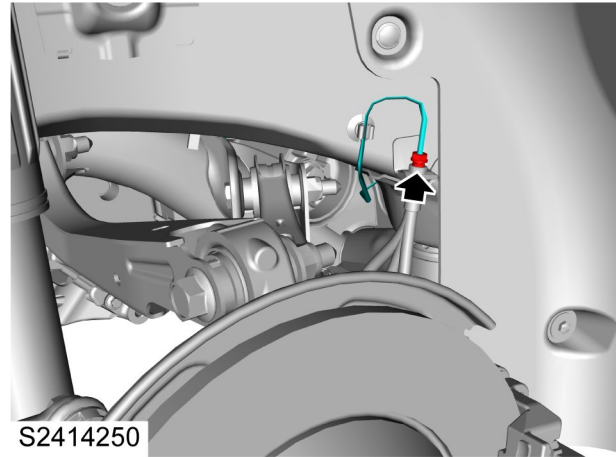
7. Disconnect the high-voltage harness connector from the PDU, and remove the harness.



8. Remove the connector nut fixing the rear right brake hard pipe to the rear right brake hose, and disconnect

the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



9. Disconnect the rear right brake hard pipe from the pipe clamp on the body.
10. Pull out the rear right brake hard pipe.

Refit - Rear Right

1. Clean the brake pipe connector.
2. Locate the rear right brake hard pipe to the body clamp and ensure that it is clamped in place.
3. Remove the plug, locate the rear right brake hard pipe connector to the rear right brake hose, and tighten the connector nut to **15-19Nm**.
4. Connect the high-voltage harness connector to the PDU.
5. Remove the plug, locate the rear right brake hard pipe connector to the connecting pipe between the master cylinder booster assembly and the rear right brake hard pipe, and tighten the connector nut to **13-15Nm**.
6. Fit the high-voltage battery pack and bracket.

High-voltage Battery Pack Refit

7. Fit the rear wheels.

Wheels Refit

8. Fit the rear bottom deflector.

Bottom Deflector Refit

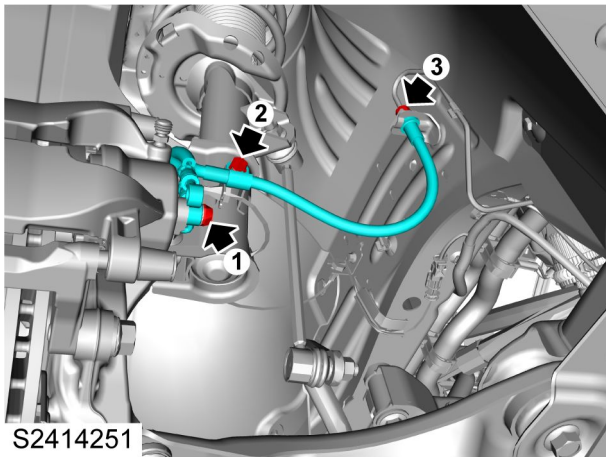
9. Bleed the brake system.

Brake System Drain

**Front Brake Hose Assembly
Remove**

1. Raise the vehicle to the appropriate height, and turn the steering wheel to a proper position.
2. Place a proper container under the vehicle to collect the spilled liquid.
3. Remove 1 bolt (1) and 2 washers fixing the front brake hose to the front brake caliper, and discard the washers.
4. Remove 1 bolt (2) fixing the front brake hose and bracket to the front shock absorber.
5. Remove the connector nut (3) fixing the front brake hard pipe to the front brake hose, and disconnect the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



6. Remove the pins fixing the front brake hard pipe and front brake hose to the body bracket, and remove the front brake hose.

Refit

1. Clean the brake pipe connector.
2. Locate the brake hard pipe and front brake hose to the body bracket, fit the pins and fasten them in place.
3. Locate the front brake hard pipe connector to the front brake hose, and tighten the connector nut to **15-19Nm**.
4. Locate the front brake hose and bracket to the front shock absorber, fit 1 bolt and tighten it to **10-15Nm**.
5. Locate the front brake hose to the front brake caliper, fit 1 bolt and 2 new washers, and tighten the bolt to **28-32Nm**.
6. Lower the vehicle, and restore the position of the steering wheel.
7. Bleed the brake system.

 **Brake System Drain**

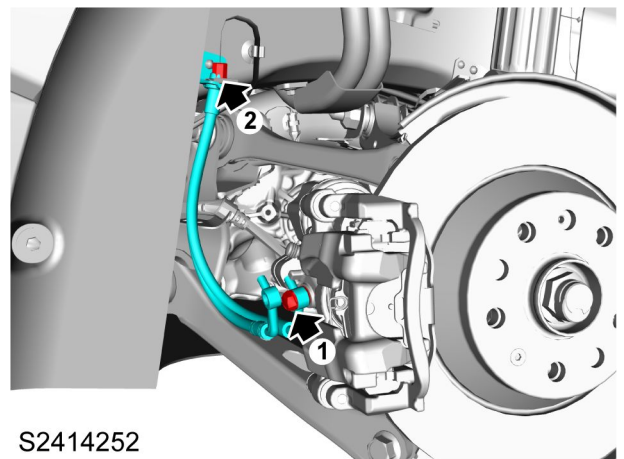
**Rear Brake Hose Assembly
Remove**

1. Remove the rear wheels.

 **Wheels Remove**

2. Place an appropriate container under the vehicle to collect the spilled liquid.
3. Remove 1 bolt and 2 washers (1) fixing the rear brake hose to the rear brake caliper, and discard the washers.
4. Remove the pins fixing the rear brake hard pipe and rear brake hose to the body bracket.
5. Remove the connector nuts (2) fixing the rear brake hard pipe to the rear brake hose, and disconnect the connection.

Caution : Before disconnecting or removing the brake lines, ensure the middle area around the lines and joints are clean. Plug the open joints to prevent the entry of pollutants.



6. Remove the rear brake hose.

Refit

1. Clean the brake pipe connector.
2. Locate the rear brake hard pipe connector to the rear brake hose, and tighten the connector nut to **15-19Nm**.
3. Locate the rear brake hard pipe and rear brake hose to the body bracket, fit the pins and fasten them in place.
4. Locate the rear brake hose to the rear brake caliper, fit 1 bolt and 2 new washers, and tighten the bolt to **28-32Nm**.
5. Fit the rear wheels.

 **Wheels Refit**

6. Bleed the brake system.

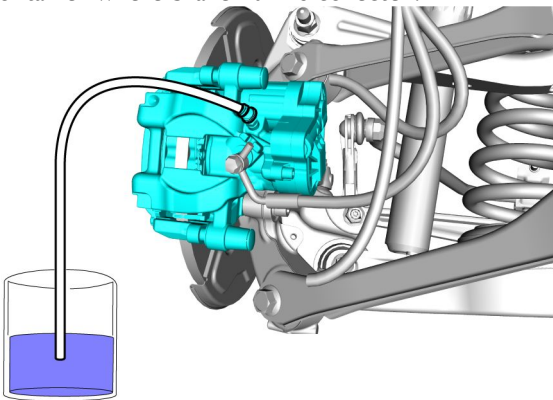
 **Brake System Drain**

Brake System Drain Drain

1. Fill the brake fluid to the MAX mark position.

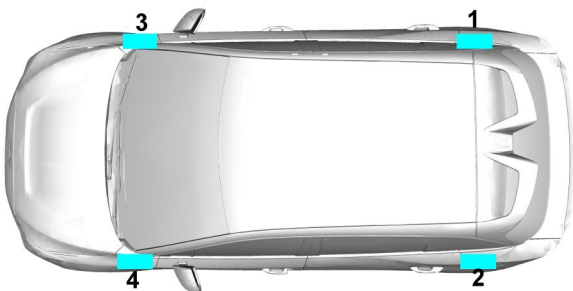
Caution : During the entire bleeding process, ensure the new brake fluid level in the brake reservoir is between the MIN and MAX positions.

2. Raise the vehicle to the appropriate height.
3. Remove the bleed screw dust cap from the rear right brake caliper assembly, fit the hose onto the bleed screw, and immerse the free end of the hose into the container where brake fluid is collected.



S2414254

4. Depress the brake pedal for several times and apply stable pressure.
5. Loosen the bleed screw to separate the brake fluid from the air.
6. Depress the brake pedal to the maximum travel steadily, and allow it to return without any external force. Repeat the operation for several times until the air-free brake fluid flows into the container, then fix the brake pedal to the maximum travel, and tighten the rear right bleed screw to **16-18Nm**.
7. Remove the hose and fit the bleed screw dust cap.
8. Repeat the bleeding procedure in sequence of rear left - front right - front left, and the tightening torque of front brake caliper bleed screw is **16-18Nm**.



S2414255

leakage.

12. Perform the road test, and check the minimum travel of the brake pedal when the brake is functioning.

9. Lower the vehicle.
10. Fill the brake fluid to the MAX mark position.
11. Apply pressure on the brake pedal and check for

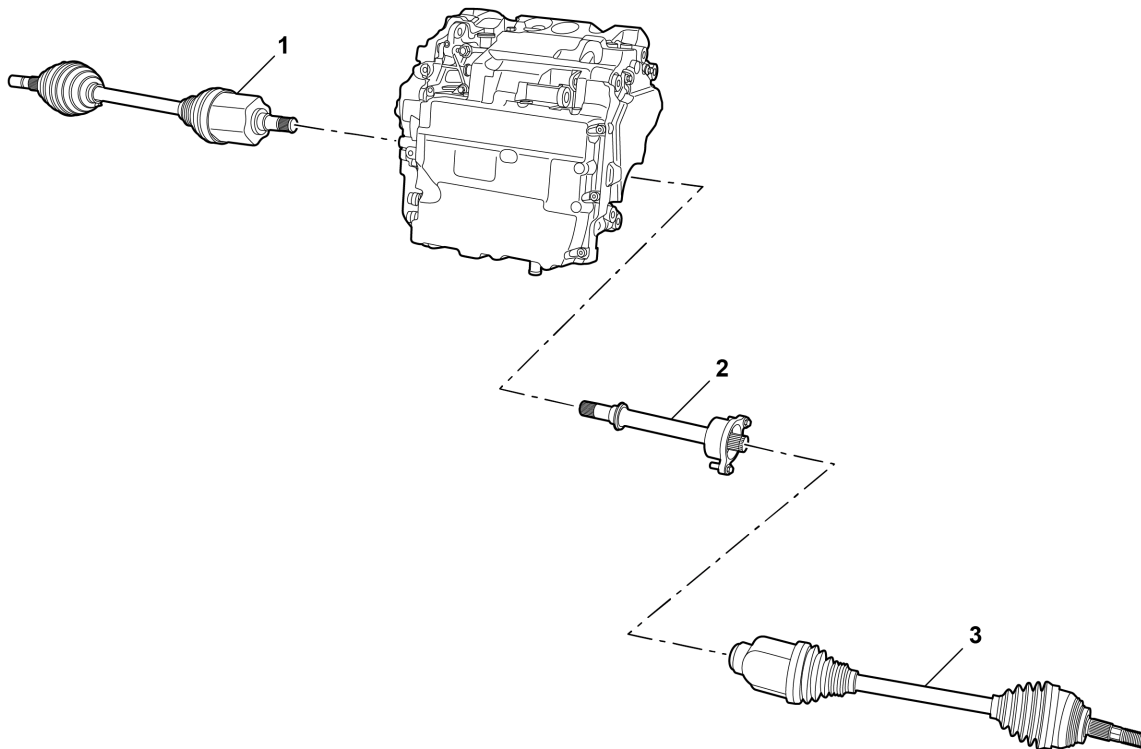
Wheel Drive Shaft**Specification****Torque**

Description	Value
Bolt-rear wheel speed sensor bracket to steering bracket	7-10Nm
Bolt&Nut-rear upper control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-Rear toe link to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-rear lower control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-Front upper control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Bolt&Nut-Front lower control arm to rear wheel carrier	135-165Nm+ (85°-95°)
Nut-right rear drive shaft locking device	345-375Nm
Nut-left rear drive shaft locking device	345-375Nm
Bolt-wheel drive inter to EDS	40-50Nm
Bolt&Nut-Front lower control arm outer tie rod to front lower control arm	81-99Nm+(85°-95°)
Nut-Front anti-roll bar links to front anti-roll bar	75-90Nm
Nut-Steering rack to steering knuckle	31.5-38.5Nm+ (30°-45°)
Bolt-Front Drive shaft intermediate coeecting shaft to bracket	40-50Nm

Description and Operation

System Layout

Front Drive Shaft Layout

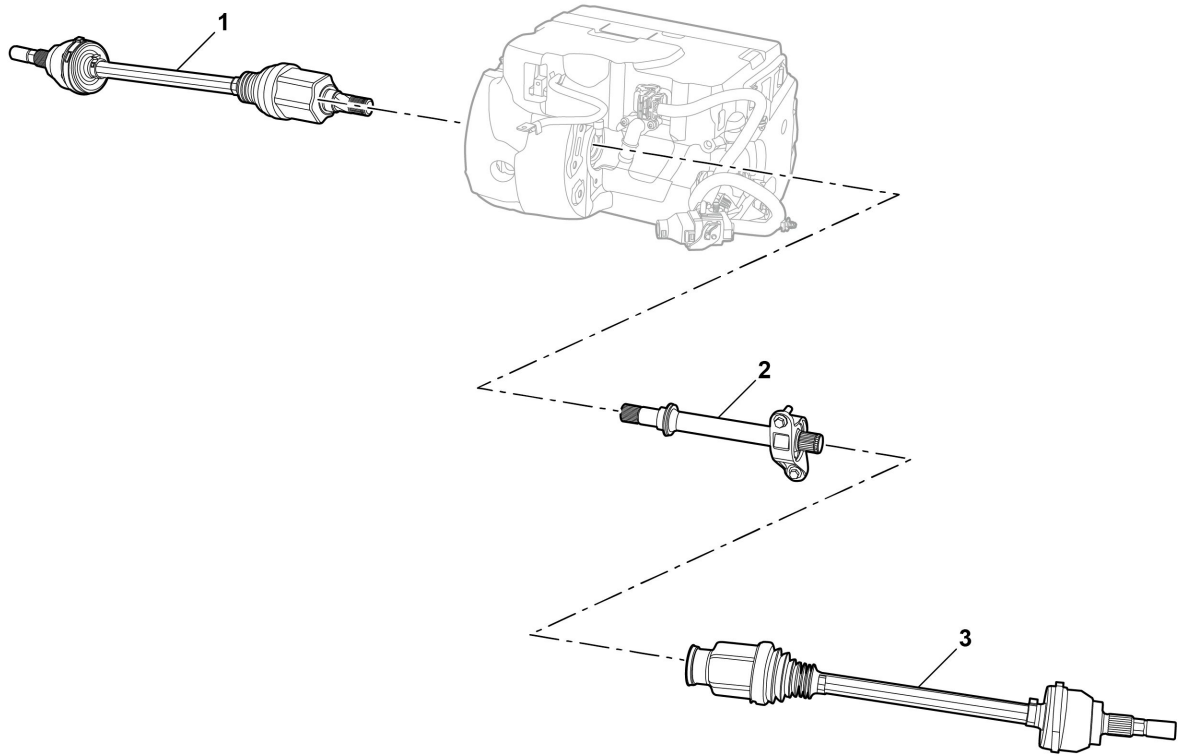


S9410135

- 1. Left Front Axle Shaft Assembly
- 2. Intermediate Shaft Assembly

- 3. Right Front Axle Shaft Assembly

Rear Drive Shaft Layout-2WD

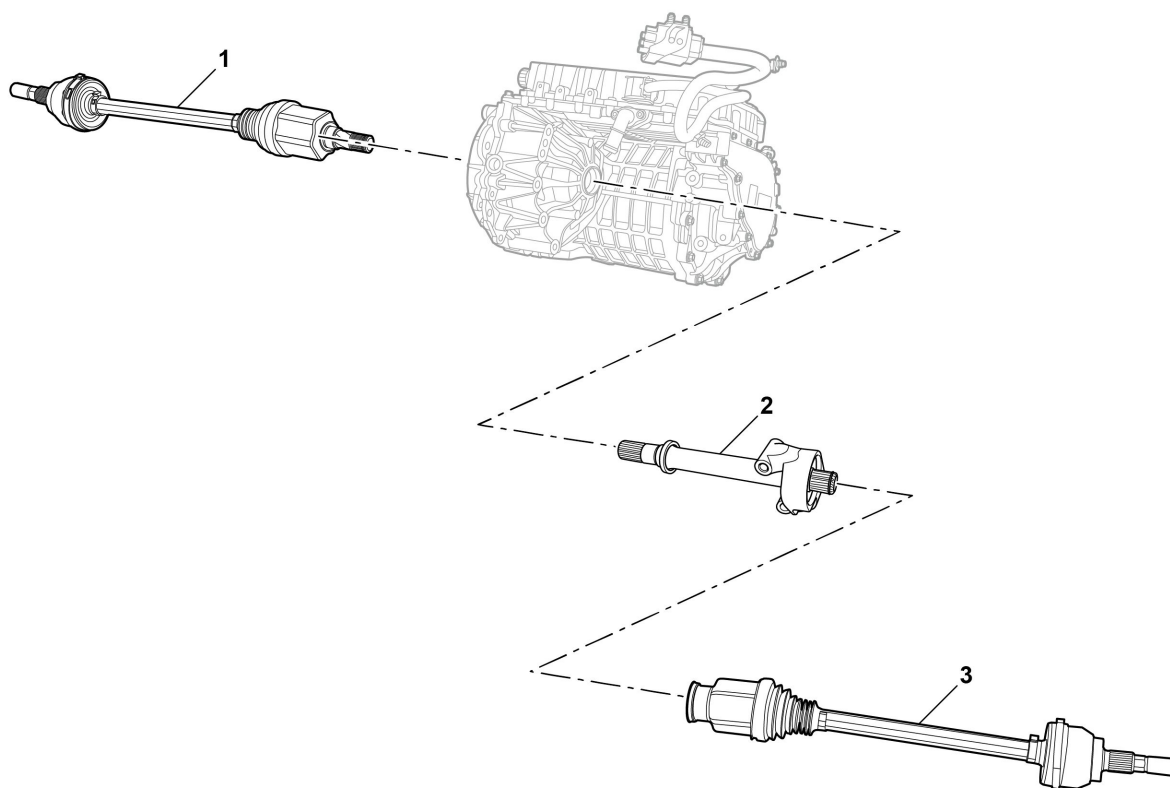


S9410110

- 1. Left Rear Axle Shaft Assembly
- 2. Rear Drive Shaft Intermediate Shaft Assembly

- 3. Right Rear Axle Shaft Assembly

Rear Drive Shaft Layout-4WD

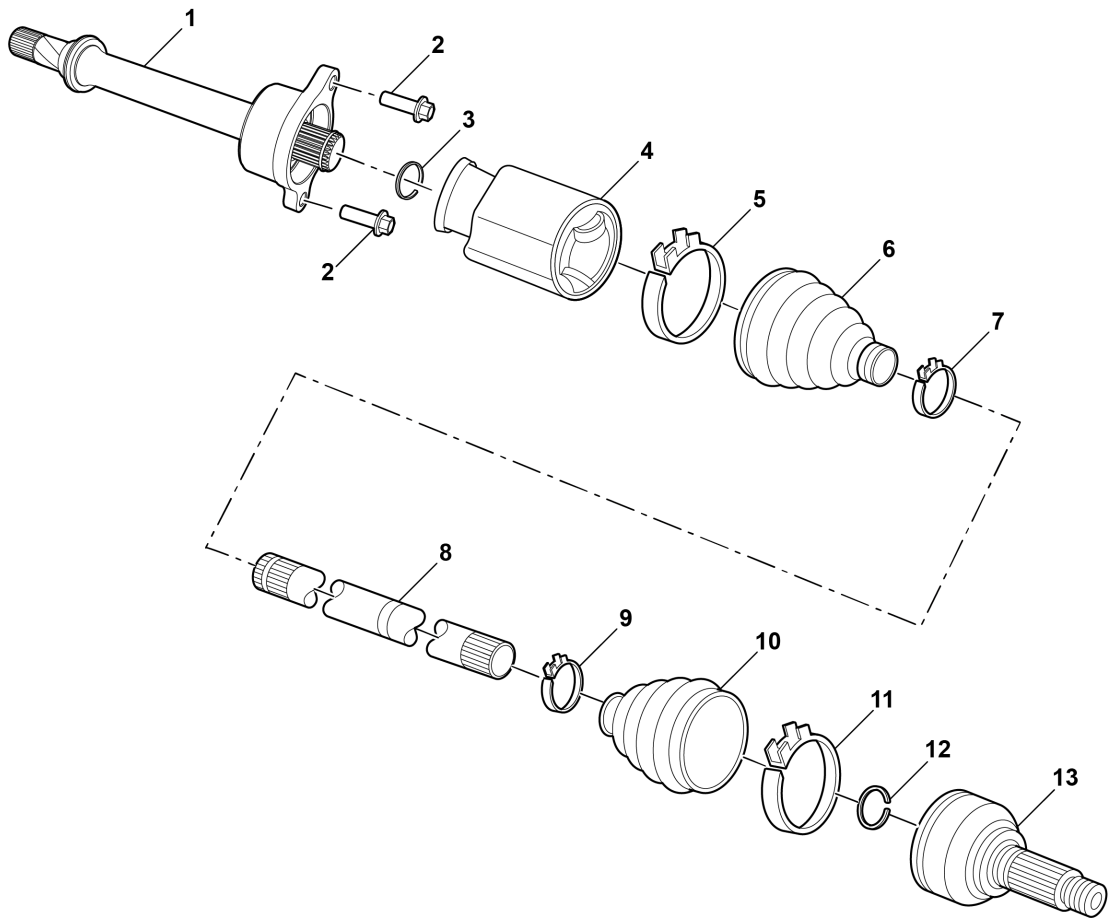


S9410139

- 1. Left Rear Axle Shaft Assembly
- 2. Rear Drive Shaft Intermediate Shaft Assembly

- 3. Right Rear Axle Shaft Assembly

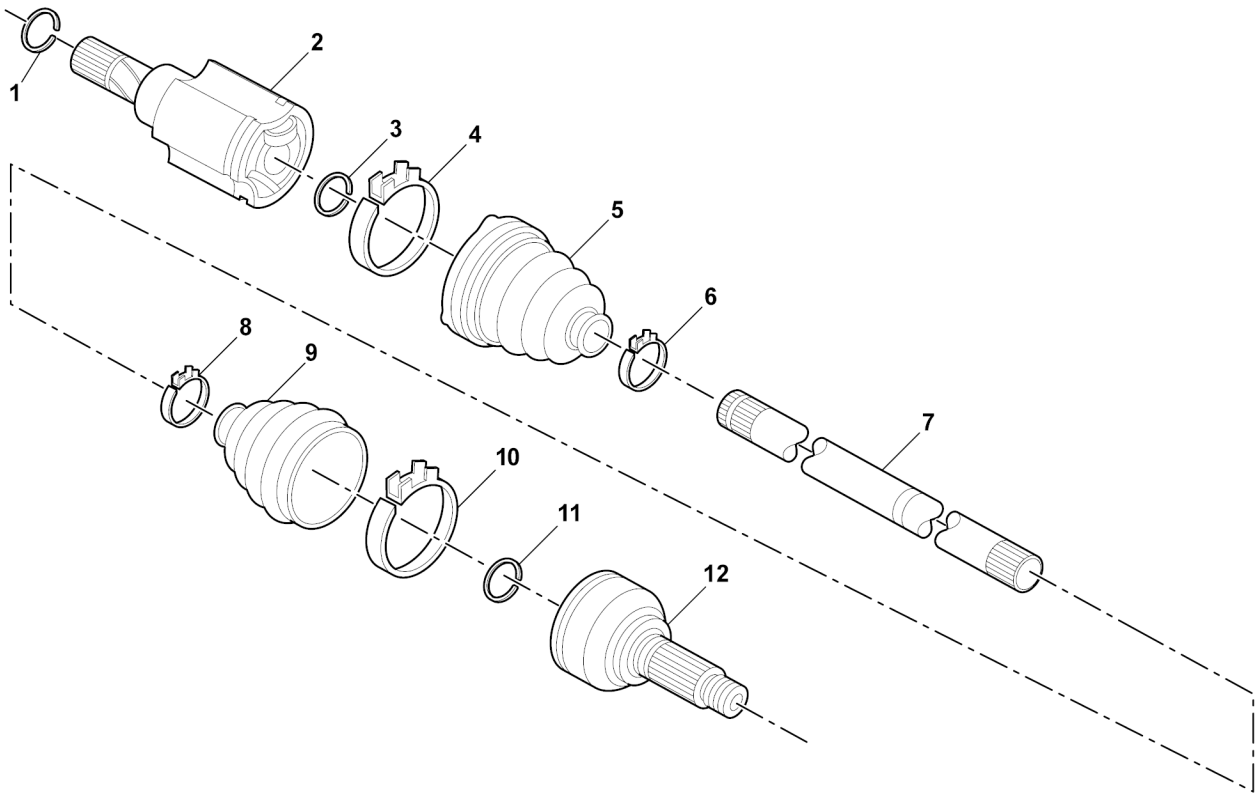
Exploded View of Right Front Axle Shaft Assembly (Only Service Tripod Shaft)



S9410136

- | | |
|--|------------------------------------|
| 1. Intermediate Shaft | 8. Shaft |
| 2. Bolt | 9. Clamp |
| 3. Connecting Ring (Spring Retaining Ring) | 10. Constant Velocity Joint Sleeve |
| 4. Tripod Joint | 11. Clamp |
| 5. Clamp | 12. Circlip |
| 6. Tripod Join Sleeve | 13. Constant Velocity Joint |
| 7. Clamp | |

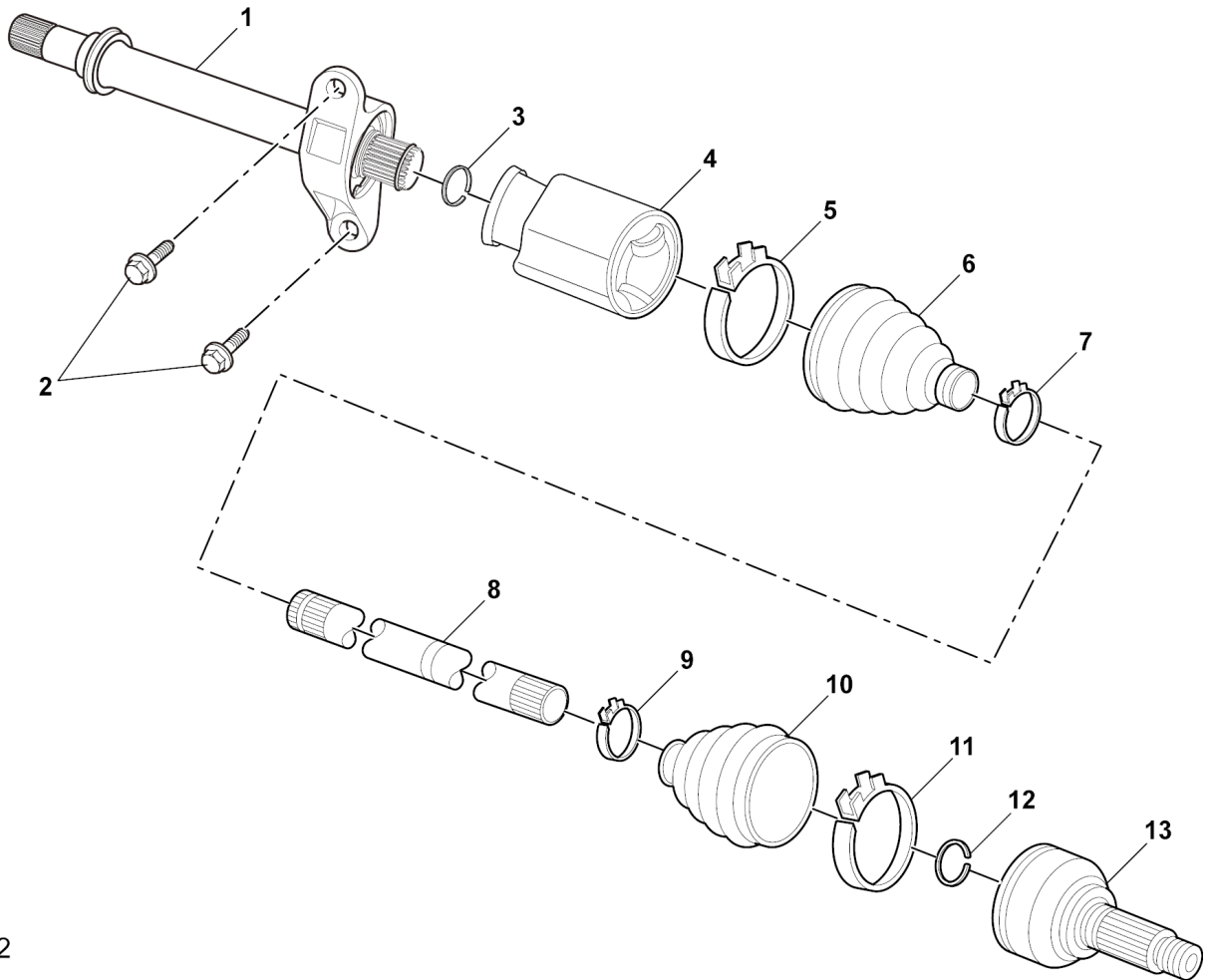
Exploded View of Left Front Axle Shaft Assembly (Only Service Tripod Shaft)



S9410104

- | | |
|--|-----------------------------------|
| 1. Connecting Ring (Spring Retaining Ring) | 7. Shaft |
| 2. Tripod Joint | 8. Clamp |
| 3. Circlip | 9. Constant Velocity Joint Sleeve |
| 4. Clamp | 10. Clamp |
| 5. Tripod Shaft Sleeve | 11. Circlip |
| 6. Tripod Shaft Assembly Small Clamp | 12. Constant Velocity Joint |

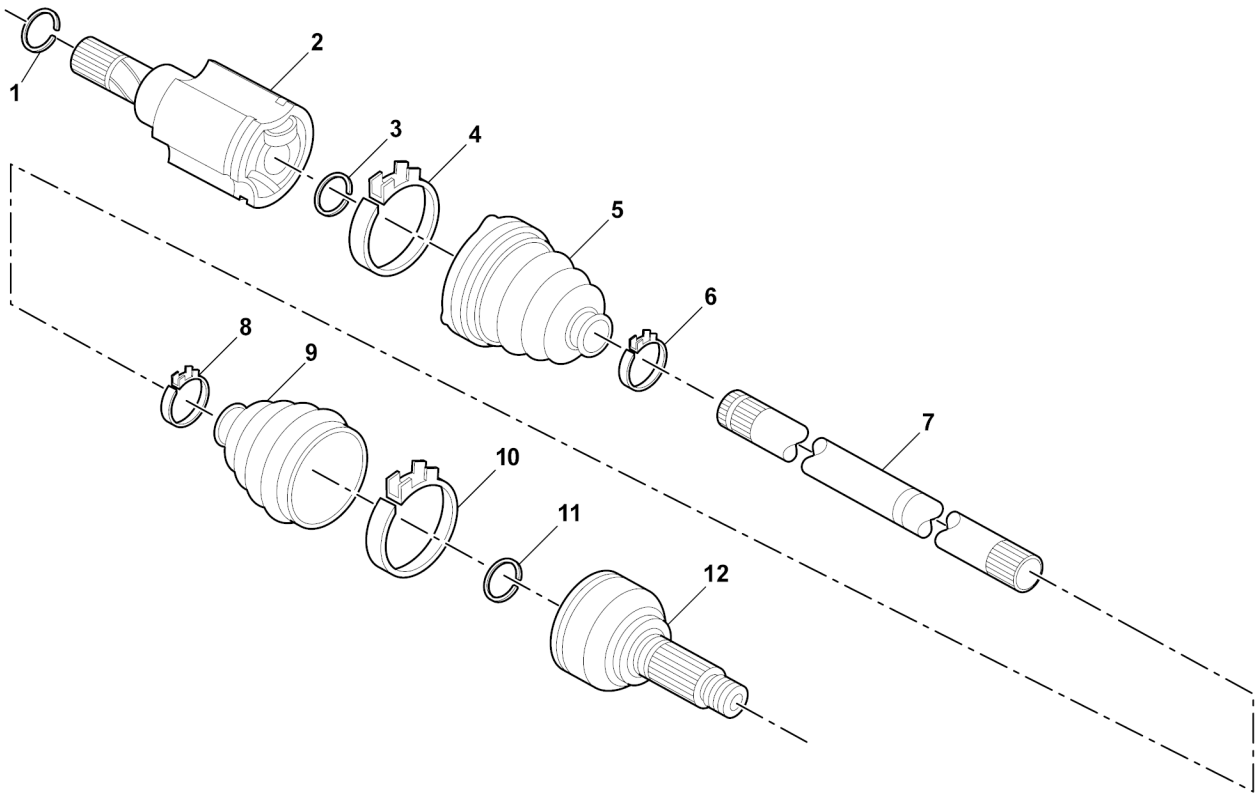
Exploded View of Right Rear Axle Shaft Assembly-2WD



S9410102

- | | |
|--|------------------------------------|
| 1. Intermediate Shaft | 8. Shaft |
| 2. Bolt | 9. Clamp |
| 3. Connecting Ring (Spring Retaining Ring) | 10. Constant Velocity Joint Sleeve |
| 4. Tripod Joint | 11. Clamp |
| 5. Clamp | 12. Circlip |
| 6. Tripod Join Sleeve | 13. Constant Velocity Joint |
| 7. Clamp | |

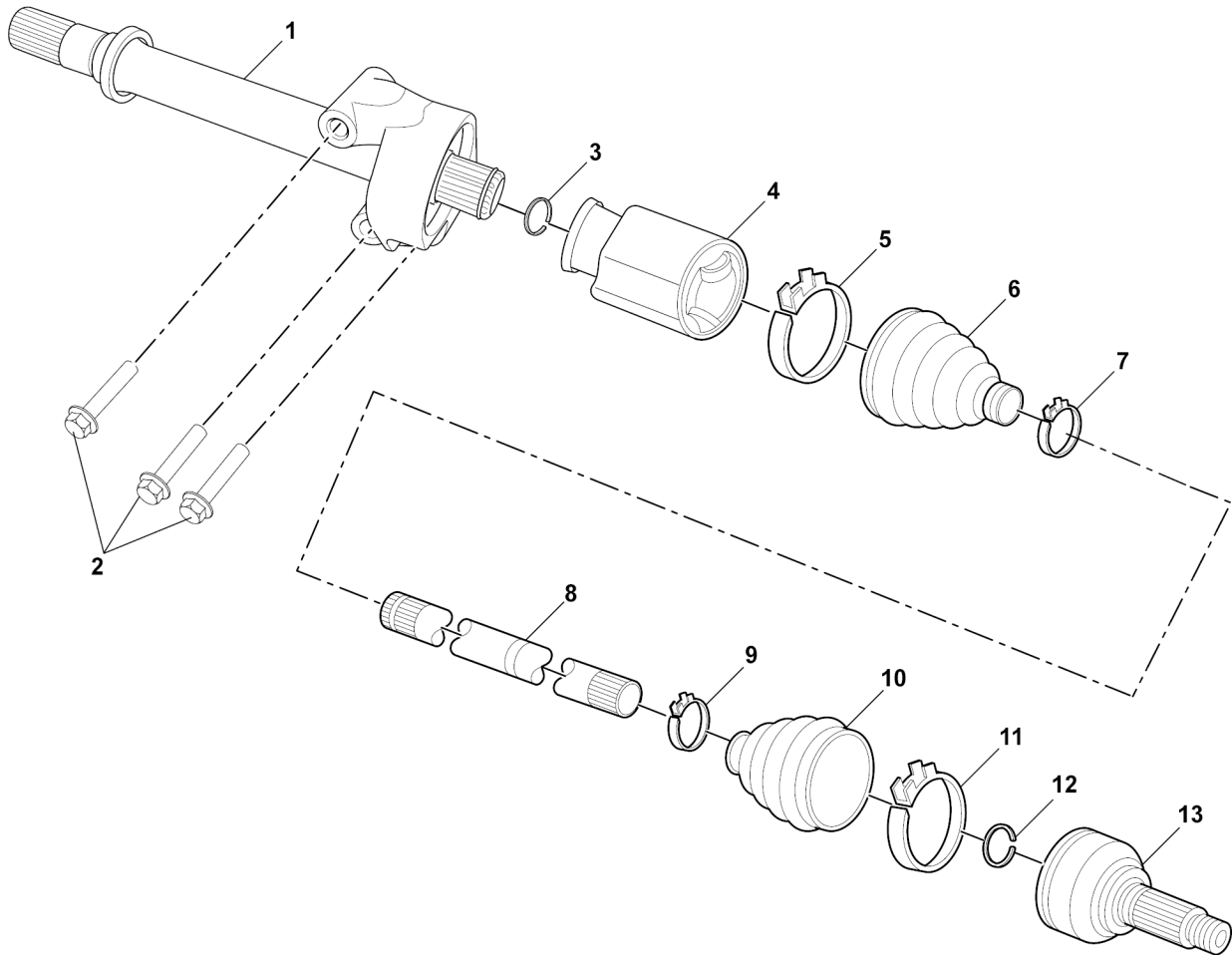
Exploded View of Left Rear Axle Shaft Assembly-2WD



S9410104

- | | |
|--|-----------------------------------|
| 1. Connecting Ring (Spring Retaining Ring) | 7. Shaft |
| 2. Tripod Joint | 8. Clamp |
| 3. Circlip | 9. Constant Velocity Joint Sleeve |
| 4. Clamp | 10. Clamp |
| 5. Tripod Shaft Sleeve | 11. Circlip |
| 6. Tripod Shaft Assembly Small Clamp | 12. Constant Velocity Joint |

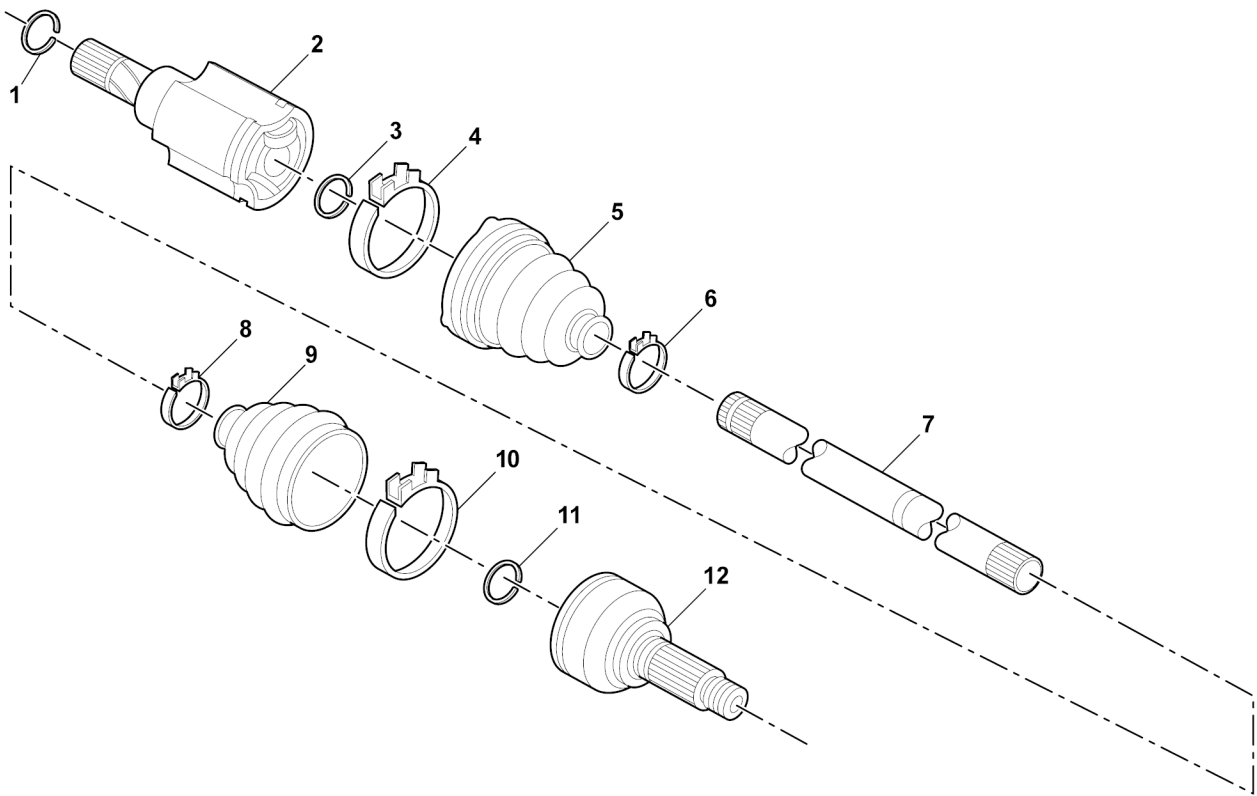
Exploded View of Right Rear Axle Shaft Assembly-4WD



S9410139

- | | |
|--|------------------------------------|
| 1. Intermediate Shaft | 8. Shaft |
| 2. Bolt | 9. Clamp |
| 3. Connecting Ring (Spring Retaining Ring) | 10. Constant Velocity Joint Sleeve |
| 4. Tripod Joint | 11. Clamp |
| 5. Clamp | 12. Circlip |
| 6. Tripod Join Sleeve | 13. Constant Velocity Joint |
| 7. Clamp | |

Exploded View of Left Rear Axle Shaft Assembly-4WD



S9410104

- | | |
|--|-----------------------------------|
| 1. Connecting Ring (Spring Retaining Ring) | 7. Shaft |
| 2. Tripod Joint | 8. Clamp |
| 3. Circlip | 9. Constant Velocity Joint Sleeve |
| 4. Clamp | 10. Clamp |
| 5. Tripod Shaft Sleeve | 11. Circlip |
| 6. Tripod Shaft Assembly Small Clamp | 12. Constant Velocity Joint |

Description

Drive shaft, also known as axle shaft, is a rigid shaft connecting the differential and drive wheel, and its inner and outer ends has a universal joint assembly; the universal joint assembly is filled with lubricating grease inside and provided with rubber sleeve outside.

The inner universal joint assembly is a tripod constant velocity universal joint assembly, which can slide axially. It consists of a tripod and its three pins, a sliding ball cage, a retainer and other parts; the three pins have spherical liners, which can reduce sliding resistance; the tripod universal joint assembly has an external spline shaft, which is used to connect the differential or the intermediate shaft.

The outer universal joint assembly is a ball-cage constant velocity universal joint assembly. It has an external spline shaft, which connects with the wheel by matching with the spline in the hub bearing and fixing the locking nut. The left drive axle shaft assembly is connected with the differential and the left wheel; the outer end of the right drive axle shaft assembly is connected with the right wheel; the inner end of the right drive axle shaft assembly is indirectly connected with the differential through the intermediate shaft, and the intermediate shaft is fixed at the rear end of the cylinder block through the bracket.

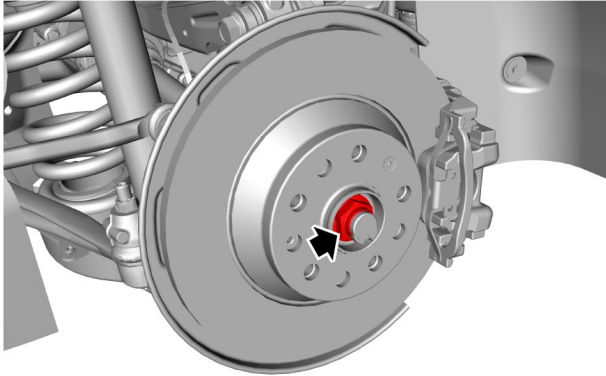
Service Guide

Rear Right Axle Shaft Assembly Remove - Right Rear

1. Remove the rear right wheel.

Wheels Remove

2. Pry up the rear right axle shaft nut locking device with a tool, remove and discard the axle shaft nut.

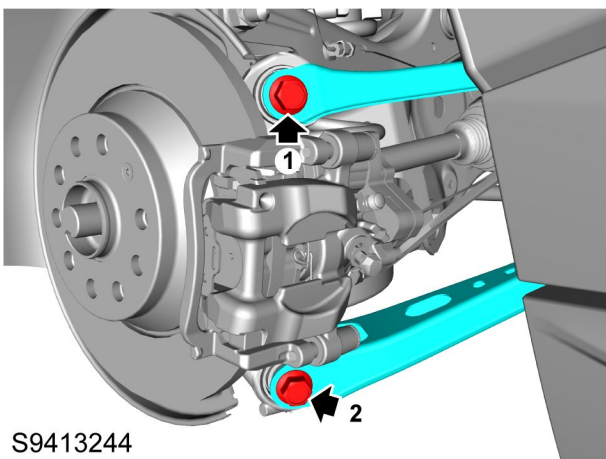


S9413243

3. Remove the rear bottom deflector.

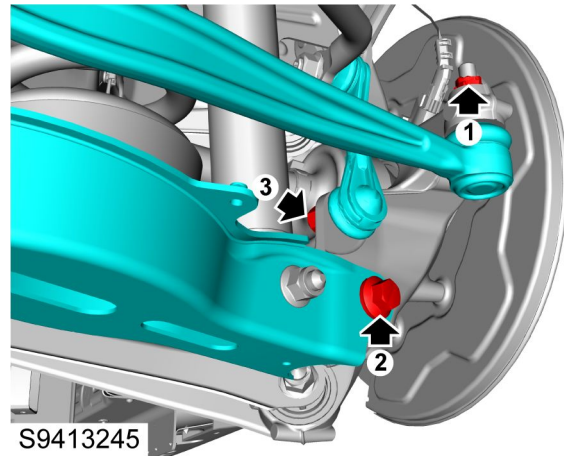
Bottom Deflector Remove

4. Support the rear lower control arm assembly and the rear wheel bracket assembly with the hydraulic lifting device.
5. Remove 1 bolt and nut (2) fixing the rear suspension front lower control arm to the rear wheel bracket, and discard them.
6. Remove 1 bolt and nut (1) fixing the rear suspension front upper control arm to the rear wheel bracket, and discard them.



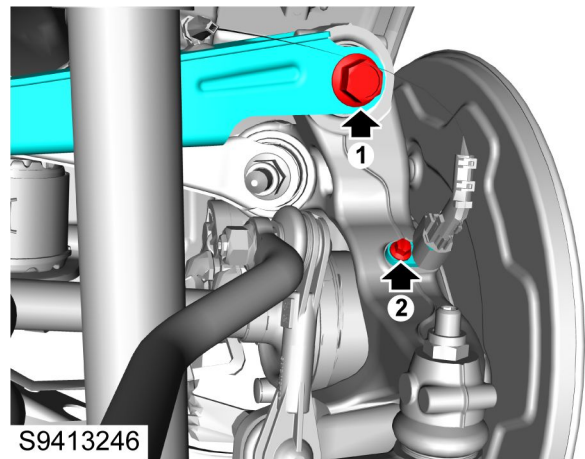
S9413244

7. Remove and discard 1 bolt and nut (1) fixing the rear lateral push rod to the wheel bracket.
8. Remove 1 bolt and nut (2) fixing the rear lower control arm to the rear wheel bracket, and discard them.
9. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (3) fixing the rear anti-roll bar link to the rear wheel bracket.



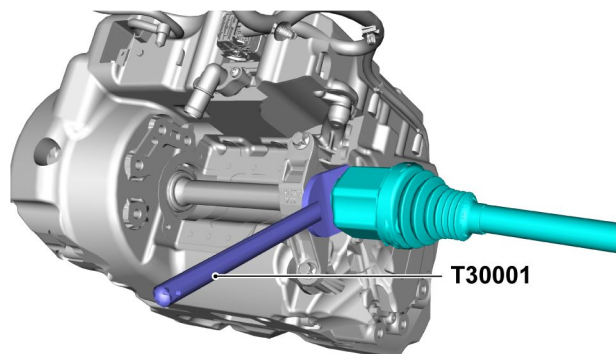
S9413245

10. Remove 1 bolt and nut (1) fixing the rear upper control arm to the rear wheel bracket, and discard them.
11. Remove 1 bolt fixing the wheel speed sensor to the rear wheel bracket, and remove the wheel speed sensor.



S9413246

12. Pull the wheel hub bearing assembly outward, disconnect the axle shaft assembly from the wheel hub bearing assembly, and fix the axle shaft in a proper position.
13. Separate the rear right axle shaft from the intermediate shaft with the special tool T30001.



S9413241

14. Remove the rear right drive shaft assembly, and discard the connecting ring of the intermediate shaft (spring snap ring).

Refit - Right Rear

1. Clean the junctions between rear right axle shaft ends and the intermediate shaft as well as wheel hub.
2. Fit the new connecting ring to the intermediate shaft.
3. Fit the rear right axle shaft to the intermediate shaft and ensure full engagement.
4. Pull the wheel hub outward, to allow the rear right axle shaft to engage the wheel hub spline.
5. Locate the rear wheel speed sensor to the rear wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
6. Locate the rear upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
7. Locate the rear anti-roll bar link to the rear wheel bracket. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten it to **135-165Nm+ (85°-95°)**.
8. Locate the rear lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
9. Locate the rear lateral push rod on the rear wheel bracket, fit 1 new bolt, nut and gasket and tighten them to **135-165Nm+ (85°-95°)**.
10. Locate the rear front upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
11. Locate the rear front lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
12. Lower the hydraulic lifting device, and move it to the safety zone.
13. Fit the rear bottom deflector.

 **Bottom Deflector Refit**

14. Fit the new rear right axle shaft locking device, firstly pre-tighten it to 200Nm, loosen it reversely by 100° and tighten it to **345-375Nm**, and press down the nut locking device.
15. Fit the rear right wheel.

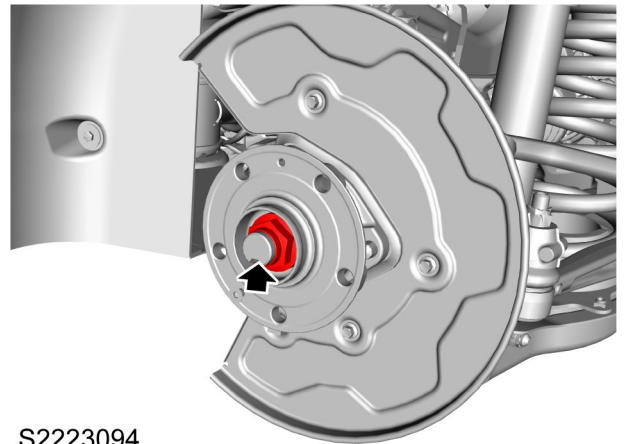
 **Wheels Refit**

Rear Left Axle Shaft Assembly Remove - Left Rear

1. Remove the rear left wheel.

 **Wheels Remove**

2. Pry up the rear left axle shaft nut locking device with a tool, remove and discard the axle shaft nut.

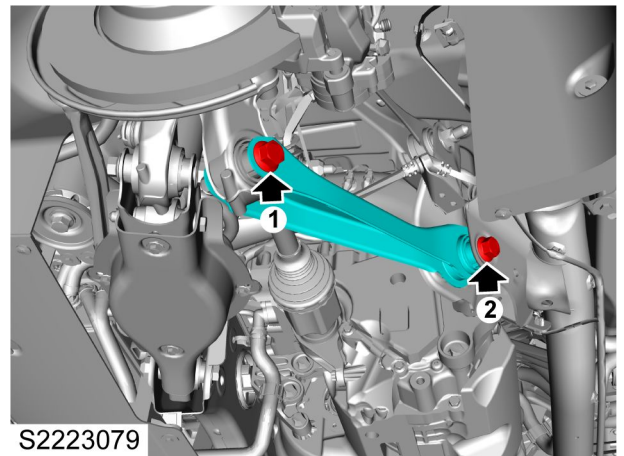


S2223094

3. Remove the rear bottom deflector.

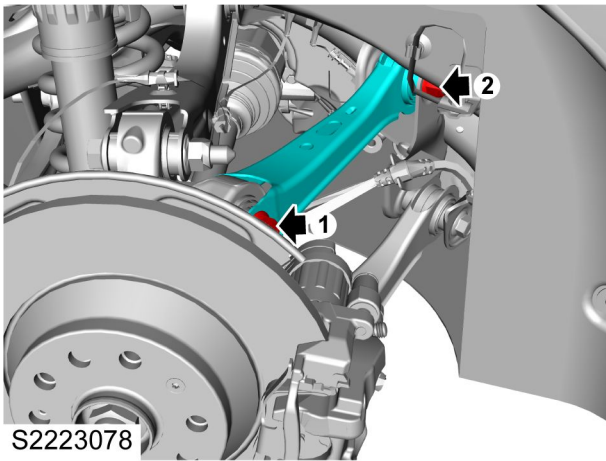
 **Bottom Deflector Remove**

4. Support the rear lower control arm assembly and the rear wheel bracket assembly with the hydraulic lifting device.
5. Remove 1 bolt and nut (1) fixing the rear suspension front lower control arm to the rear wheel bracket, and discard them.

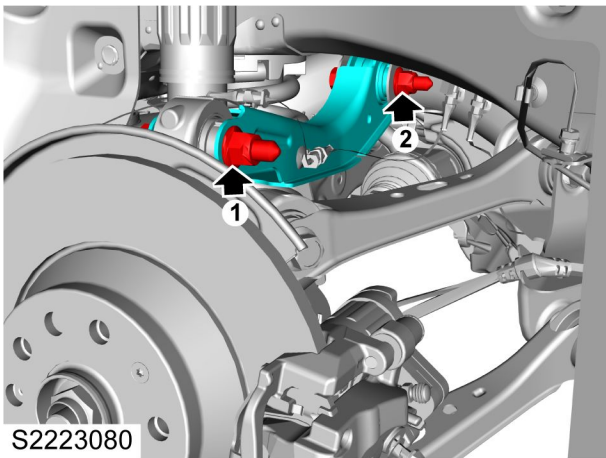


S2223079

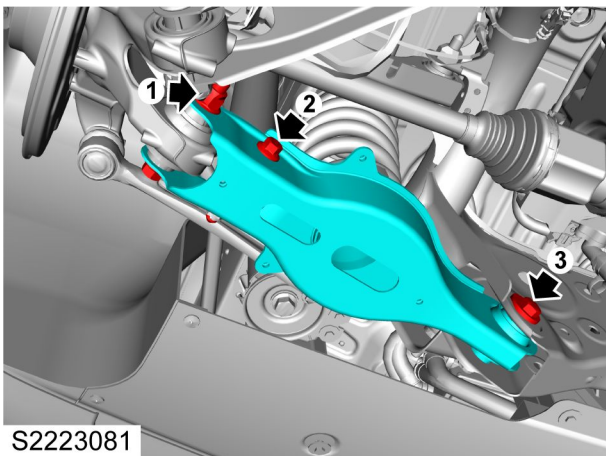
6. Remove 1 bolt and nut (1) fixing the rear suspension front upper control arm to the rear wheel bracket, and discard them.



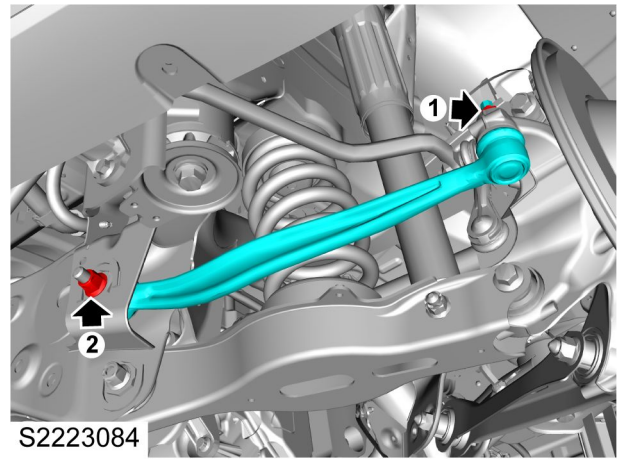
7. Remove 1 bolt and nut (1) fixing the rear upper control arm to the rear wheel bracket, and discard them.



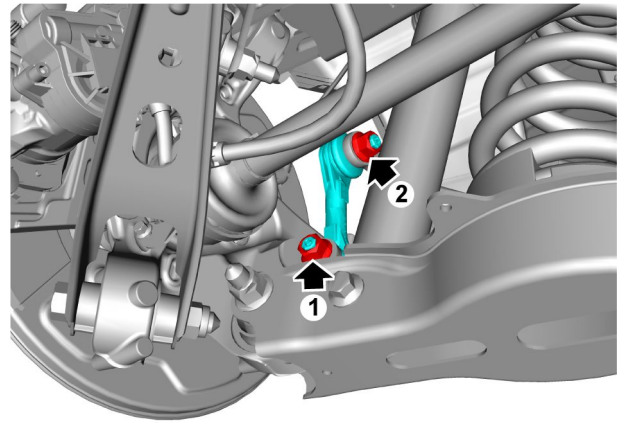
8. Remove 1 bolt and nut (1) fixing the rear lower control arm to the rear wheel bracket, and discard them.



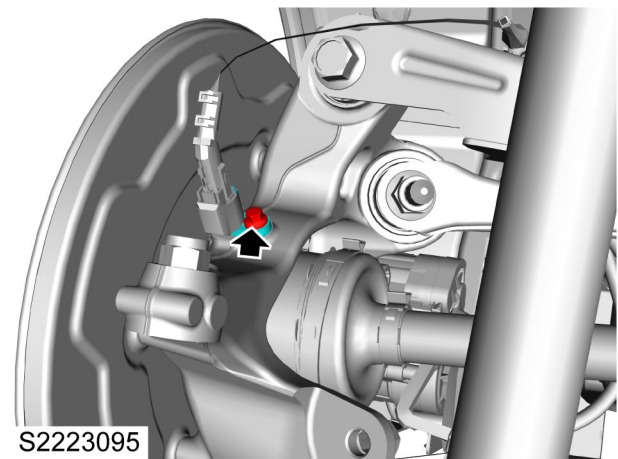
9. Remove and discard 1 bolt and nut (1) fixing the rear lateral push rod to the wheel bracket.



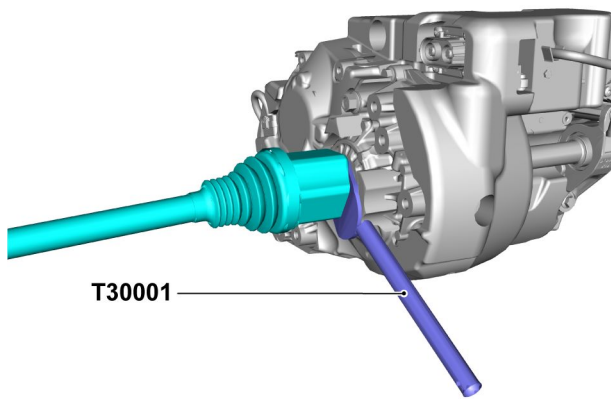
10. Use a tool to lock the ball joint of the link to prevent its rotation, remove and discard 1 nut (1) fixing the rear anti-roll bar link to the rear wheel bracket.



11. Remove 1 bolt fixing the wheel speed sensor to the rear wheel bracket, and remove the wheel speed sensor.



12. Pull the wheel hub bearing assembly outward, disconnect the axle shaft assembly from the wheel hub bearing assembly, and fix the axle shaft in a proper position.
13. Separate the rear left axle shaft from the transmission with the special tool T30001.



S9413242

14. Remove the rear left drive shaft assembly, remove and discard the connecting ring of the rear left axle shaft (spring snap ring).

Refit - Left Rear

1. Clean the junctions between rear left axle shaft ends and the intermediate shaft as well as wheel hub.
2. Fit the new connecting ring to the rear left axle shaft.
3. Locate the rear left axle shaft to the transmission and ensure full engagement.
4. Pull the wheel hub outward, to allow the rear left axle shaft to engage the wheel hub spline.
5. Locate the rear wheel speed sensor to the rear wheel bracket, fit 1 bolt and tighten it to **7-10Nm**.
6. Locate the rear anti-roll bar link to the rear wheel bracket. Fit 1 new nut, use a tool to lock the ball joint of the link to prevent its rotation, and tighten it.
7. Locate the rear lateral push rod on the rear wheel bracket, fit 1 new bolt, nut and gasket and tighten them to **135-165Nm+ (85°-95°)**.
8. Locate the rear lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
9. Locate the rear upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
10. Locate the front upper control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
11. Locate the front lower control arm assembly to the rear wheel bracket, fit 1 new bolt and 1 new nut, and tighten them to **135-165Nm+ (85°-95°)**.
12. Lower the hydraulic lifting device, and move it to the safety zone.
13. Fit the rear bottom deflector.

 **Bottom Deflector Refit**

14. Fit the new rear left axle shaft locking device, firstly

pre-tighten it to 200Nm, loosen it reversely by 100° and tighten it to **345-375Nm**, and press down the axle shaft locking device.

15. Fit the rear left wheel.

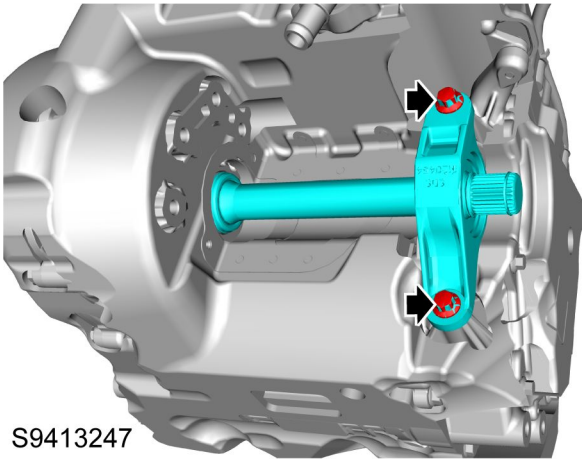
 **Wheels Refit**

Rear Drive Shaft Intermediate Connecting Shaft Assembly Remove

1. Remove the right rear axle shaft assembly.

Rear Right Axle Shaft Assembly Remove - Right Rear Remove - Left Rear

2. Prepare a proper container to collect the spilled oil.
3. Remove and discard 2 bolts fixing the intermediate shaft bracket to the electric drive unit housing.



S9413247

4. Separate the intermediate shaft assembly from the electric drive unit housing, and discard the connecting ring (spring snap ring).

Refit

1. Clean the junctions of the intermediate shaft end and the transmission.
2. Fit a new connecting ring to the intermediate shaft end.
3. Locate the intermediate shaft to the transmission and ensure full engagement.
4. Locate the intermediate shaft bracket to the transmission, fit 2 new bolts, and tighten them to **40-50Nm**.
5. Take away the container for collecting fluid, and dispose of it.
6. Fit the right rear axle shaft assembly.

Rear Right Axle Shaft Assembly Refit - Right Rear Refit - Left Rear

Front Right Axle Shaft Assembly Remove - Right Front

1. Remove the front right wheel.

Wheels Remove

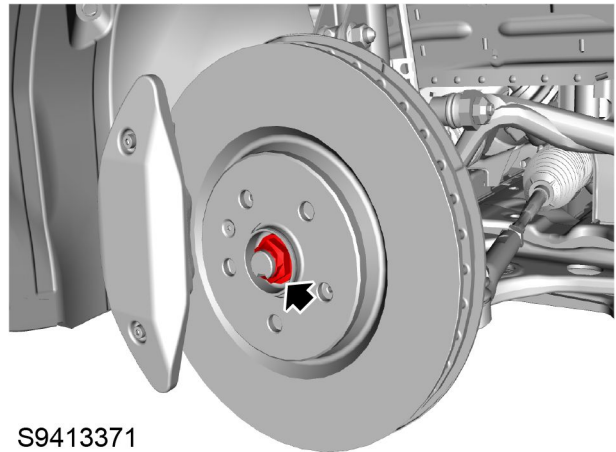
2. Remove the front bottom deflector.

Bottom Deflector Remove

3. Lower the front subframe to a proper height.

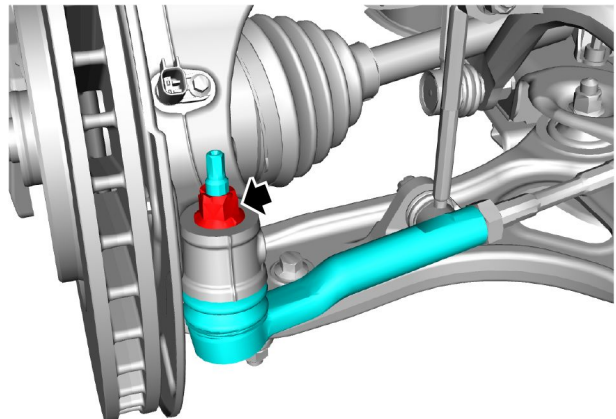
Front Subframe Remove

4. Pry up the front right axle shaft nut locking device with a tool, remove and discard the axle shaft nut.



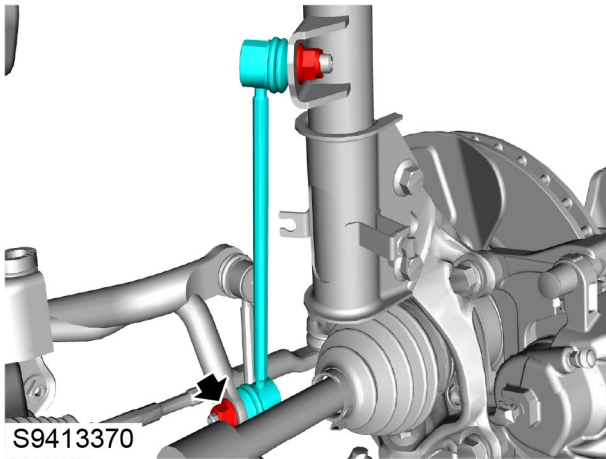
S9413371

5. Remove 1 nut fixing the steering rack outer tie rod to the front swivel hub assembly, disconnect the steering rack outer tie rod from the front swivel hub assembly, and discard the nut.

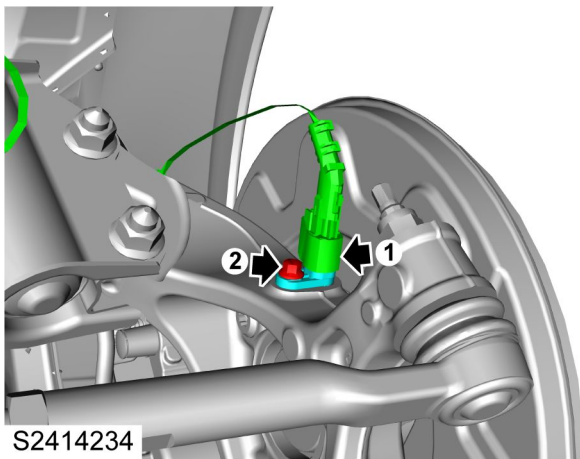


S9413369

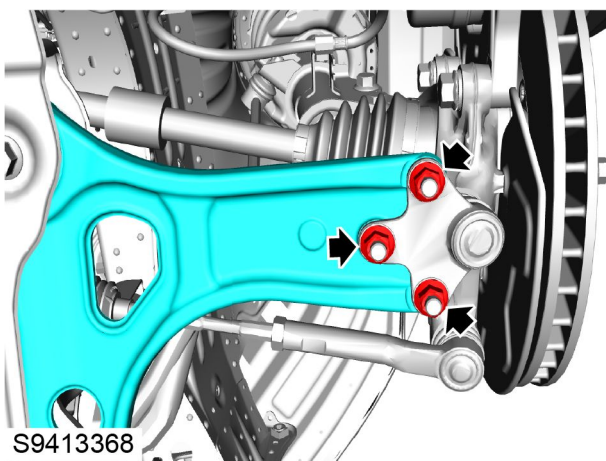
6. Remove and discard 1 nut fixing the connecting rod of the anti-roll bar to the anti-roll bar and disconnect the anti-roll bar connecting rod.



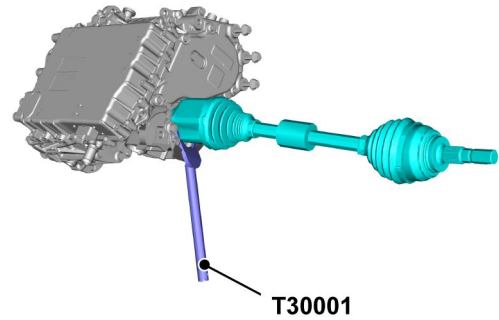
7. Remove 1 bolt fixing the front wheel speed sensor to the steering knuckle assembly and remove the wheel speed sensor.



8. Remove and discard the 3 bolts and nuts fixing the outer ball joint of the front lower control arm to the front lower control arm.



9. Pull the hub bearing assembly outward, disconnect the drive axle shaft assembly from the hub bearing assembly, and fix the drive axle shaft in a proper position.
10. Separate the front right axle shaft from the intermediate shaft with the special tool T30001.



S3413372

11. Remove the front right drive shaft assembly, and discard the connecting ring of the intermediate shaft (spring snap ring).

Refit - Right Front

1. Clean the junctions between front right axle shaft ends and the intermediate shaft as well as wheel hub.
2. Fit the new connecting ring to the intermediate shaft.
3. Fit the front right axle shaft to the intermediate shaft and ensure full engagement.
4. Pull the wheel hub outward, to allow the front right axle shaft to engage the wheel hub spline.
5. Locate the outer ball joint of the front lower control arm to the front lower control arm, fit 3 new bolts and nuts and tighten to **81-99Nm+(85°-95°)**.
6. Locate the front wheel speed sensor to the steering knuckle, fit 1 bolt and tighten it to **7-10Nm**.
7. Locate the connecting rod of the front stabilizer bar to the front stabilizer bar, fit 1 new nut, and use a tool to clamp the ball head of the connecting rod to prevent it from rotating, tighten it to **75-90Nm**.
8. Locate the steering gear outer tie rod to the steering knuckle, fit 1 new nut and tighten it to **31.5-38.5Nm+ (30°-45°)**.
9. Fit the new front right axle shaft locking device, firstly pre-tighten it to 200Nm, loosen it reversely by 100° and tighten it to **345-375Nm**, and press down the nut locking device.
10. Fit the front subframe.

 **Front Subframe Refit**

11. Fit the front bottom deflector.

 **Bottom Deflector Refit**

12. Fit the front right wheel.

 **Wheels Refit**

Front Left Axle Shaft Assembly Remove - Left Front

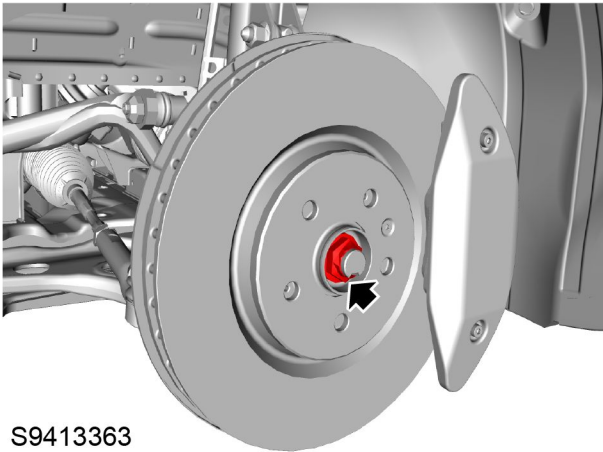
1. Remove the front left wheel.

Wheels Remove

2. Remove the front bottom deflector.

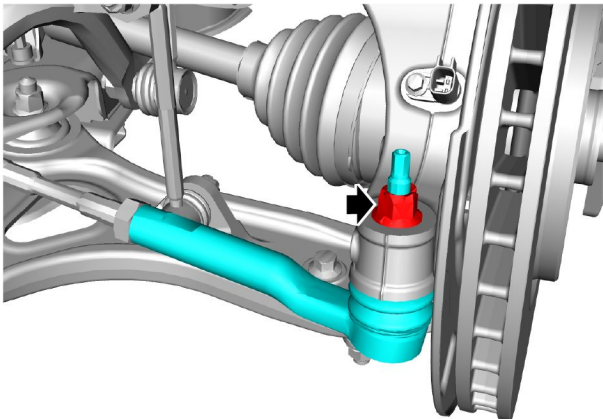
Bottom Deflector Remove

3. Pry up the front left axle shaft nut locking device with a tool, remove and discard the axle shaft nut.



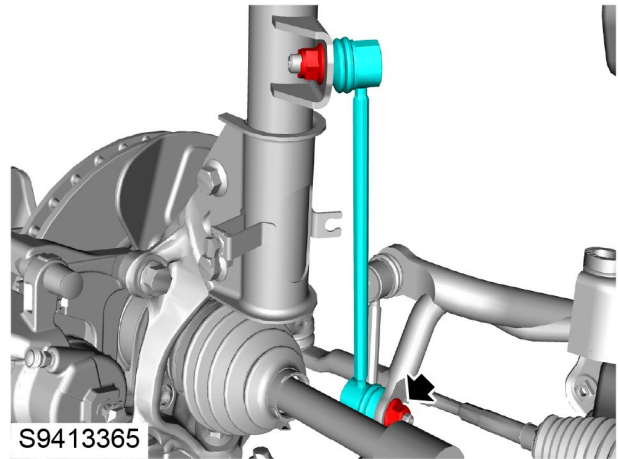
S9413363

4. Remove 1 nut fixing the steering rack outer tie rod to the front swivel hub assembly, disconnect the steering rack outer tie rod from the front swivel hub assembly, and discard the nut.



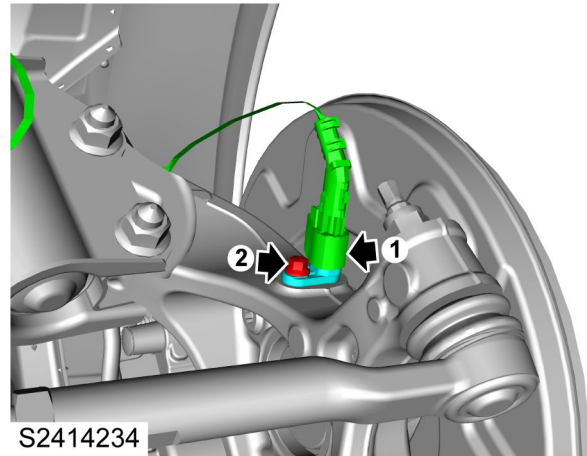
S9413364

5. Remove and discard 1 nut fixing the connecting rod of the anti-roll bar to the anti-roll bar and disconnect the anti-roll bar connecting rod.



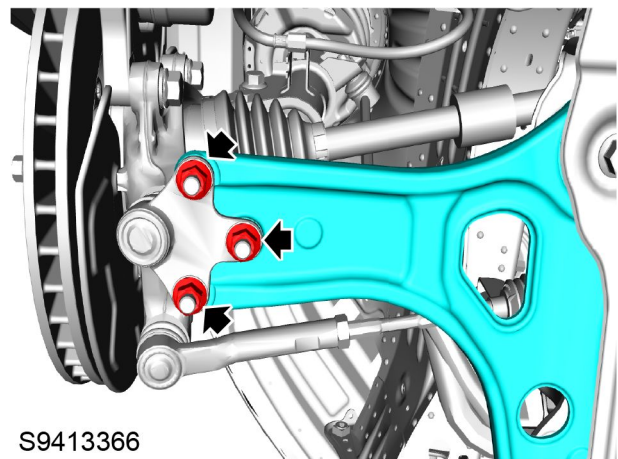
S9413365

6. Remove 1 bolt fixing the front wheel speed sensor to the steering knuckle assembly and remove the wheel speed sensor.



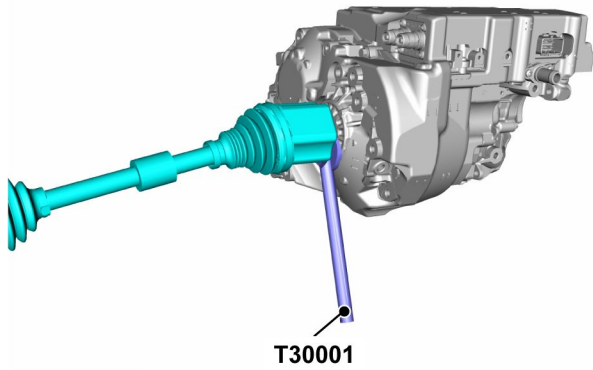
S2414234

7. Remove and discard the 3 bolts and nuts fixing the outer ball joint of the front lower control arm to the front lower control arm.



S9413366

8. Pull the hub bearing assembly outward, disconnect the drive axle shaft assembly from the hub bearing assembly, and fix the drive axle shaft in a proper position.
9. Separate the front left axle shaft from the transmission with the special tool T30001.



S3413367

10. Remove the front left drive shaft assembly, and discard the connecting ring (spring snap ring).

Refit - Left Front

1. Clean the junctions between front left axle shaft ends and the transmission as well as wheel hub.
2. Fit the new connecting ring to the front left axle shaft.
3. Fit the front left axle shaft to the transmission and ensure full engagement.
4. Pull the wheel hub outward, to allow the front left axle shaft to engage the wheel hub spline.
5. Locate the outer ball joint of the front lower control arm to the front lower control arm, fit 3 new bolts and nuts and tighten to **81-99Nm+(85°-95°)**.
6. Locate the front wheel speed sensor to the steering knuckle, fit 1 bolt and tighten it to **7-10Nm**.
7. Locate the connecting rod of the front stabilizer bar to the front stabilizerbar, fit 1 new nut, and use a tool to clamp the ball head of the connecting rod to prevent it from rotating, tighten it to **75-90Nm**.
8. Locate the steering gear outer tie rod to the steering knuckle, fit 1 new nut and tighten it to **31.5-38.5Nm+ (30°-45°)**.
9. Fit the new front left axle shaft locking device, firstly pre-tighten it to 200Nm, loosen it reversely by 100° and tighten it to **345-375Nm**, and press down the nut locking device.
10. Fit the front bottom deflector.

 **Bottom Deflector Refit**

11. Fit the front left wheel.

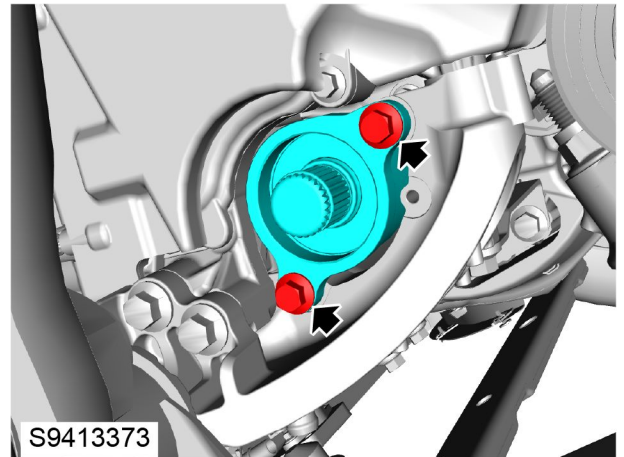
 **Wheels Refit**

Front Axle Shaft Intermediate Connecting Shaft Assembly Remove

1. Remove the right front axle shaft assembly.

 **Front Right Axle Shaft Assembly**

2. Prepare a proper container to collect the spilled oil.
3. Remove and discard 2 bolts fixing the intermediate shaft bracket to the electric drive unit housing.



4. Separate the intermediate shaft assembly from the electric drive unit housing, and discard the connecting ring (spring snap ring).

Refit

1. Clean the junctions of the intermediate shaft end and the transmission.
2. Fit a new connecting ring to the intermediate shaft end.
3. Locate the intermediate shaft to the transmission and ensure full engagement.
4. Locate the intermediate shaft bracket to the transmission, fit 2 new bolts, and tighten them to **40-50Nm**.
5. Take away the container for collecting fluid, and dispose of it.
6. Fit the right front axle shaft assembly.

 **Front Right Axle Shaft Assembly**

Tripod Joint Assembly Remove

1. Remove the front axle shaft assembly (If equipped).

 **Front Left Axle Shaft Assembly (If equipped)**

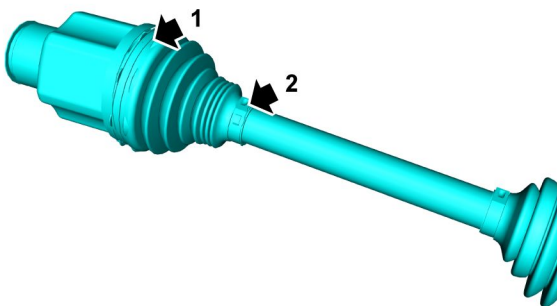
 **Front Right Axle Shaft Assembly (If equipped)**

2. Remove the rear axle shaft assembly.

 **Rear Left Axle Shaft Assembly Remove - Right Rear Remove - Left Rear**

 **Rear Right Axle Shaft Assembly Remove - Right Rear Remove - Left Rear**

3. Fix the drive shaft with a bench clamp.
4. Loosen the two clamps (1) and (2) and discard them.



S9413248

5. Remove the tripod joint assembly from the drive shaft.

Refit

1. Clean the drive shaft and tripod joint assembly sleeve.
2. Fit the tripod joint to the drive shaft.
3. Apply grease to the interior of the tripod joint assembly.
4. Locate the tripod joint assembly sleeve to the drive shaft.
5. Fit two new clamps onto the drive shaft.
6. Fit the rear axle shaft assembly.

 **Rear Left Axle Shaft Assembly Refit - Right Rear Refit - Left Rear**

 **Rear Right Axle Shaft Assembly Refit - Right Rear Refit - Left Rear**

7. Fit the front axle shaft assembly (If equipped).

 **Front Left Axle Shaft Assembly (If equipped)**

 **Front Right Axle Shaft Assembly (If equipped)**

Tripod Joint Assembly Sleeve Remove

1. Remove the tripod joint assembly.

 **Tripod Joint Assembly Remove**

2. Remove the tripod joint assembly sleeve from the drive shaft.

Refit

1. Clean the drive shaft and the tripod joint assembly.
2. Apply grease to the interior of the tripod joint assembly.
3. Fix the tripod joint assembly to the drive shaft.
4. Fit the tripod joint assembly.

 **Tripod Joint Assembly Refit**

Universal Joint Assembly

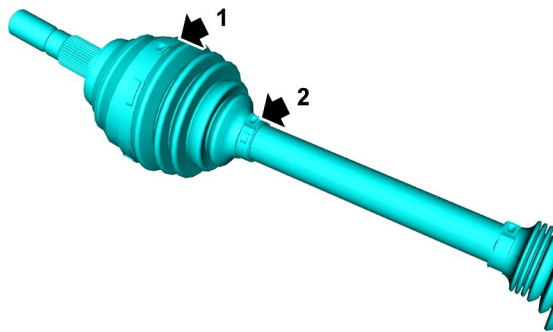
Remove

1. Remove the rear axle shaft assembly.

 **Left Right Axle Shaft Assembly Remove - Right Rear Remove - Left Rear**

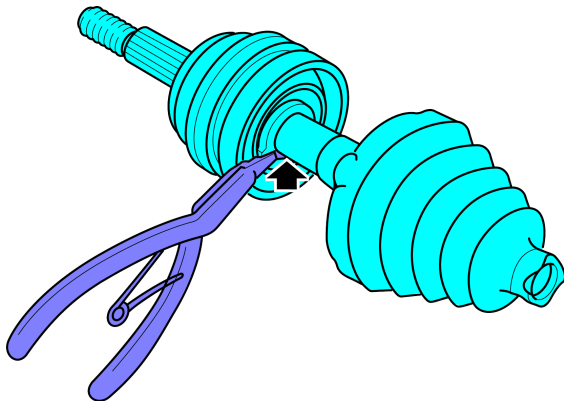
 **Rear Right Axle Shaft Assembly Remove - Right Rear Remove - Left Rear**

2. Fix the drive shaft with a bench clamp.
3. Loosen the two clamps (1) and (2) and discard them.



S9413249

4. Slide the constant velocity universal joint assembly sleeve along the drive shaft so as to see the inside of the constant velocity universal joint.
5. Clamp the round wire snap ring of the constant velocity joint with tools, take out the round wire snap ring and discard it.



S9413219


6. Remove the constant velocity joint assembly.

Refit

1. Clean the drive shaft and the sleeve.
2. Fit a new spring snap ring to the drive shaft.
3. Locate the constant velocity joint assembly to the drive shaft, press the spring snap ring in the groove with a proper tool, and fully push the constant velocity joint in the drive shaft.
4. Apply grease to the constant velocity joint assembly.
5. Locate the constant velocity joint assembly sleeve on

the constant velocity joint, and fit two new clamps for fastening.

6. Fit the rear axle shaft assembly.

 **Left Right Axle Shaft Assembly Refit - Right Rear Refit - Left Rear**

 **Rear Right Axle Shaft Assembly Refit - Right Rear Refit - Left Rear**

Universal Joint Assembly Sleeve

Remove

1. Remove the constant velocity joint assembly.

Constant Velocity Joint Assembly Remove

2. Remove the constant velocity joint assembly sleeve from the drive shaft.

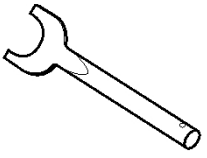
Refit

1. Fit the constant velocity joint assembly sleeve on the drive shaft.
2. Fit the constant velocity joint assembly.

Constant Velocity Joint Assembly Refit

Summary Table of Special Tools

Special Tools

Tool Number	Description	Picture
T30001	Remover Drive Shaft	 <p>T30001</p>

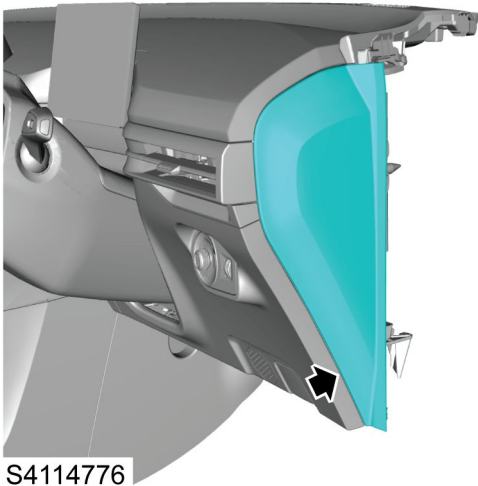
Instrument Panel and Centre Console**Specification****Torque**

Description	Value
Bolt-Front passenger airbag to instrument panel	6-8Nm
Bolt- Fascia body to fascia bridge	5-6.6Nm
Bolt-Fascia bridge to body	19-25Nm
Bolt-A/C module to I/P tie bar	7-10Nm
Bolt-Steering column to facia framework	19-25Nm
Bolt-Console to console bracket	3-4Nm
Bolt-Front seat to Body	40-50Nm

Service Guide

Instrument Panel End Cover Assembly Remove

1. Pry off the body weatherstrip at the instrument panel end cover.
2. Pry off the clip of the instrument panel along the edge of the instrument panel end cover, and remove the instrument panel end cover.



3. Repeat the above steps to remove the instrument panel end cover on the other side.

Refit

1. Align the adapter of the instrument panel end cover to the hole of the instrument panel body, push it hard to the end, and clamp it in place.
2. Restore the body weatherstrip at the instrument panel end cover.
3. Repeat the above steps to fit the instrument panel end cover on the other side.

Driver Side Knee Baffle Assembly Remove

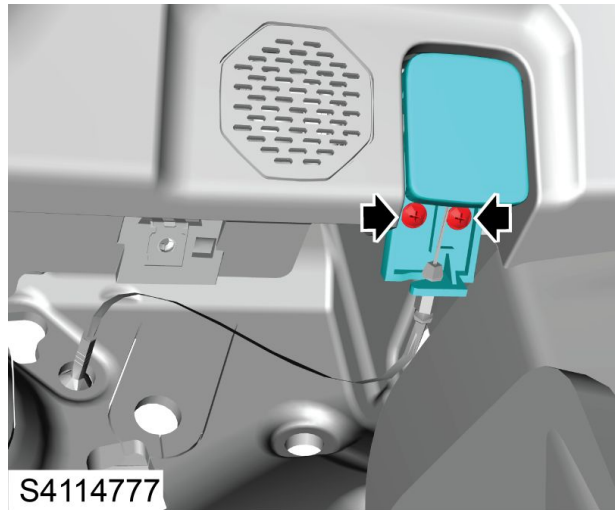
1. Disconnect the negative battery cable.
2. Remove the driver side instrument panel end cover assembly.

Instrument Panel End Cover Assembly Remove

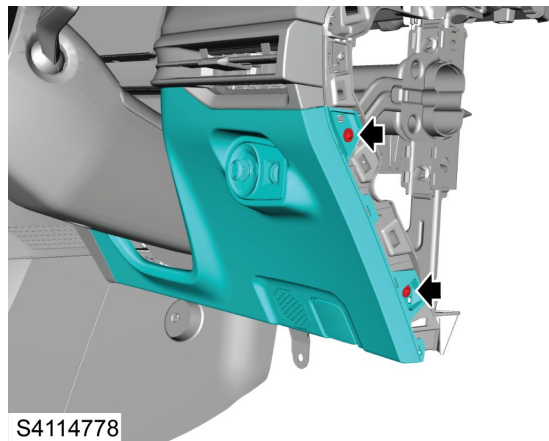
3. Remove the driver side instrument panel lower closure panel assembly.

Driver Side Instrument Panel Lower Closure Panel Assembly Remove

4. Remove 2 screws fixing the bonnet release handle to the driver side knee baffle.



5. Remove 2 screws fixing the driver side knee baffle to the instrument panel frame.



6. Pry off the retaining clip, disconnect the harness connector and remove the driver side knee baffle.
7. If necessary, loosen the clips of the light height adjustment switch, and remove the light height adjustment switch.

Refit

1. If removed, fix the light control switch to the driver side lower trim panel assembly, and secure with clips.
2. Connect the harness connector of the light control switch.

3. Align the clip of driver side lower trim panel assembly with the hole of instrument panel frame, push it hard to the end, and clamp it in place.
4. Fit 2 screws fixing the driver side lower trim panel assembly to the instrument panel frame, and tighten them.
5. Fit 2 screws fixing the bonnet release handle to the driver side lower trim panel assembly and switch, and tighten them.
6. Fit the driver side instrument panel lower closure panel assembly.

Driver Side Instrument Panel Lower Closure Panel Assembly Refit

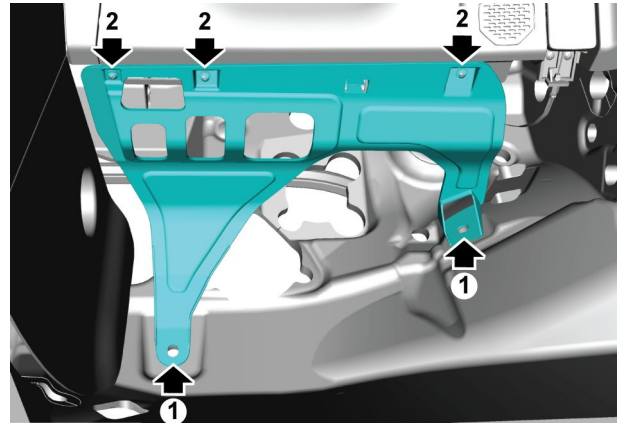
7. Fit the driver side instrument panel end cover assembly.

Instrument Panel End Cover Assembly Refit

8. Connect the negative battery cable.

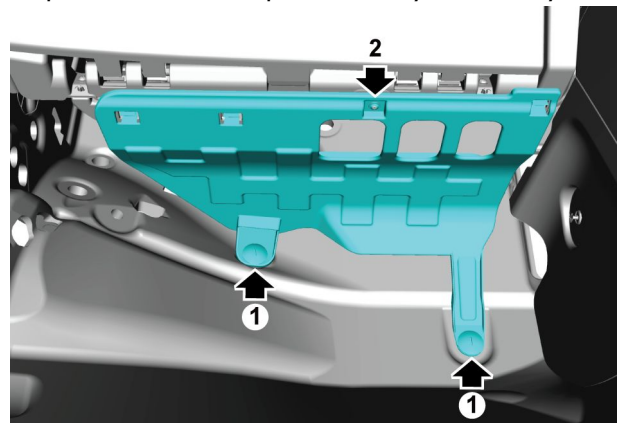
Instrument Panel Lower Closure Panel Assembly Remove

1. Remove 2 plastic nuts (1) fixing the driver side instrument panel lower closure panel assembly to the knee baffle.
2. Remove 3 screws (2) fixing the driver side instrument panel lower closure panel assembly to the body.



S4114779

3. Remove the driver side instrument panel lower closure panel assembly.
4. Remove 2 plastic nuts (1) fixing the passenger side instrument panel lower closure panel assembly to the glove box frame.
5. Remove 1 screw (2) fixing the passenger side instrument panel lower closure panel assembly to the body.



S4114780

6. Remove the passenger side instrument panel lower closure panel assembly.

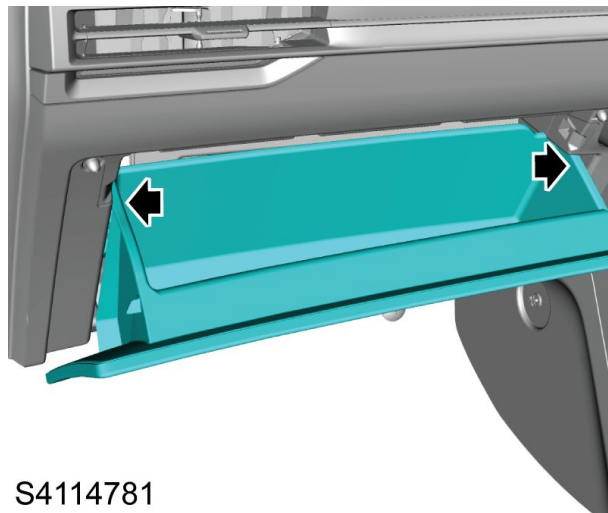
Refit

1. Align the clip of the passenger side lower closure panel assembly with the hole of the glove box frame, push it hard to the end, and clamp it in place.
2. Fit 2 plastic nuts fixing the passenger side instrument panel lower closure panel assembly to the body.
3. Fit 1 screw fixing the passenger side instrument panel lower closure panel assembly to the instrument panel body.

4. Align the clip of the driver side lower closure panel assembly with the hole of the driver side lower trim panel and switch, push it hard to the end, and clamp it in place.
5. Fit 3 screws fixing the driver side instrument panel lower closure panel assembly to the knee baffle.
6. Fit 2 plastic nuts fixing the driver side instrument panel lower closure panel assembly to the body.

Glove Box Assembly Remove

1. Open the glove box.
2. Press 2 stoppers of the glove box to disengage the glove box from the glove box frame.



S4114781

3. Loosen the glove box damper cable, and remove the glove box assembly.

Refit

1. Fit the glove box damper cable.
2. Locate the glove box to the glove box frame, and press the glove box stopper into the glove box frame.
3. Close the glove box.

Instrument Panel Side Air Outlet Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the instrument panel end cover assembly.

Instrument Panel End Cover Remove

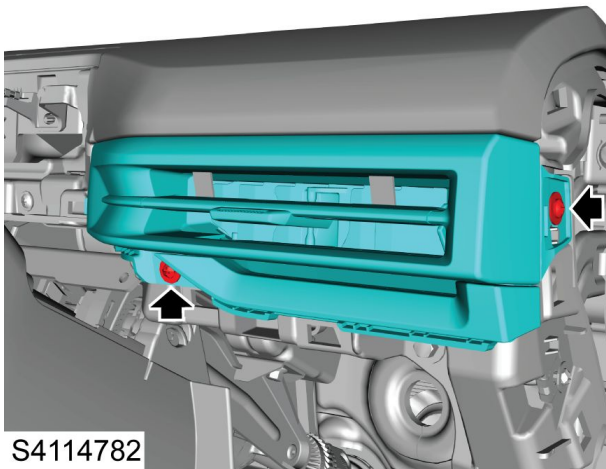
3. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Remove

4. Remove the instrument pack assembly.

Instrument Pack Assembly Remove

5. Remove 2 screws fixing the driver side instrument panel air outlet to the instrument panel frame.



6. Pry off the clips fixing the driver side instrument panel air outlet to the instrument panel frame, and remove the driver side instrument panel air outlet.

Refit

1. Align the clip of driver side instrument panel air outlet with the hole of instrument panel frame, push it hard to the end, and clamp it in place.
2. Fit 2 screws fixing the driver side instrument panel air outlet to the instrument panel frame, and tighten them.
3. Fit the instrument pack assembly.

Instrument Pack Assembly Refit

4. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Refit

5. Fit the driver side instrument panel end cover.

Instrument Panel End Cover Refit

6. Connect the negative battery cable.

Central Instrument Panel Air Outlet Assembly Remove

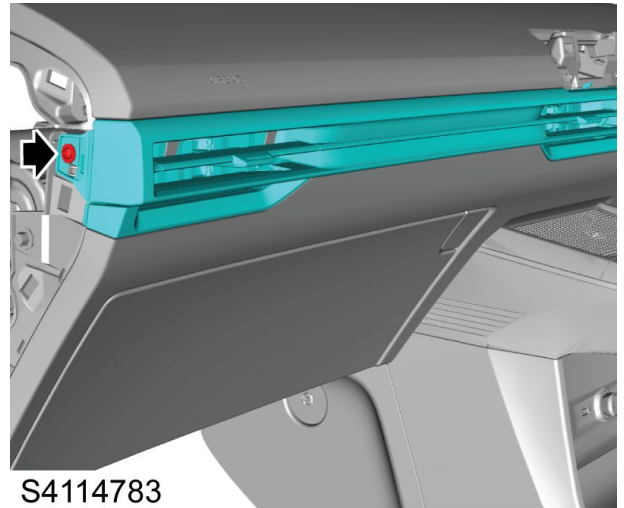
1. Disconnect the negative battery cable.
2. Remove the passenger side instrument panel end cover.

Instrument Panel End Cover Remove

3. Remove the player.

Player Remove

4. Remove 1 screw fixing the central instrument panel air outlet moulding to the instrument panel frame.



5. Pry off the clip fixing the central instrument panel air outlet to the instrument panel body from the edge of the central instrument panel air outlet.
6. Remove the central instrument panel air outlet assembly and the passenger side air outlet assembly.
7. Pry off the clip fixing the central air outlet to the air outlet moulding from the back, and remove the central air outlet.

Refit

1. Align the clip of the instrument panel central air outlet moulding to the hole of the central air outlet, push it hard to the end, and clamp it in place.
2. Align the clip of the central instrument panel air outlet moulding to the hole of the instrument panel body, push it hard to the end, and clamp it in place.
3. Fit 1 screw fixing the central instrument panel air outlet moulding to the instrument panel body, and tighten them.
4. Fit the player.

Player Refit

5. Fit the passenger side instrument panel end cover.

Instrument Panel End Cover Refit

6. Connect the negative battery cable.

Interior Fittings

Instrument Panel Body

Remove

1. Disconnect the negative battery cable.
2. Remove the instrument panel end cover assembly.

Instrument Panel End Cover Assembly Remove

3. Remove the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Remove

4. Remove the knee baffle.

Knee Baffle Remove

5. Remove the central instrument panel air outlet assembly.

Central Instrument Panel Air Outlet Assembly Remove

6. Remove the instrument panel side air outlet assembly.

Instrument Panel Side Air Outlet Assembly Remove

7. Remove the steering column upper trim cover.

Steering Column Upper Trim Cover Remove

8. Remove the steering column lower trim cover.

Steering Column Lower Trim Cover Remove

9. Remove the glove box assembly.

Glove Box Assembly Remove

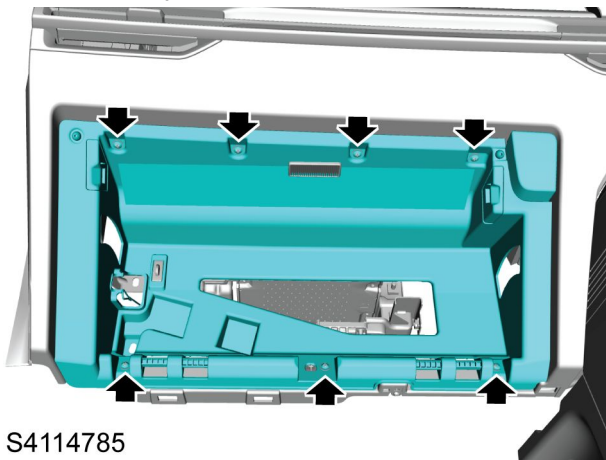
10. Remove the A pillar upper trim panel.

A Pillar Upper Trim Panel Remove

11. Remove the centre console assembly.

Centre Console Assembly Remove

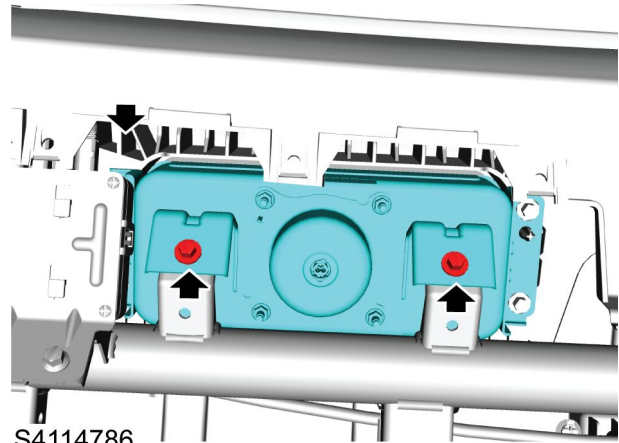
12. Remove 7 screws fixing the glove box frame to the instrument panel frame.



S4114785

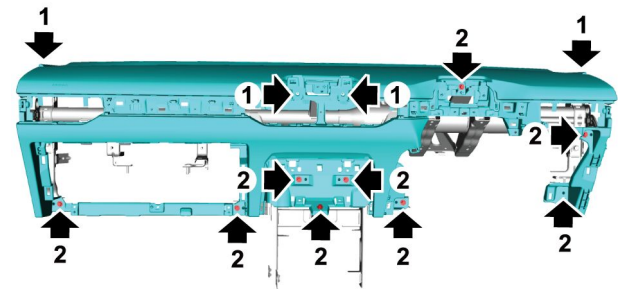
13. Pry off the clip fixing the glove box frame to the instrument panel frame, disconnect the harness connector, and remove the glove box frame.
14. Remove 2 bolts fixing the instrument panel airbag bracket to the instrument panel beam, and disconnect the harness connector.

Instrument Panel and Centre Console



S4114786

15. Remove 4 screws (1) fixing the instrument panel body to the instrument panel beam.
16. Remove 9 bolts (2) fixing the instrument panel body to the instrument panel beam.



S4114787

17. Pry off the harness clip fixing the instrument panel body, disconnect the harness connector, and lift the instrument panel body out of the vehicle with assistance.
18. If necessary, remove 4 bolts fixing the instrument panel airbag to the instrument panel body from the back of instrument panel body, and remove the instrument panel airbag.
19. If necessary, remove 2 screws fixing the instrument panel face air duct to the instrument panel body from the back of instrument panel body, and remove the instrument panel face air duct.
20. If necessary, pry off the clip fixing the solar sensor to the instrument panel body from the back of instrument panel body, and remove the solar sensor.

Refit

1. If the solar sensor has been removed, first fix the solar sensor to the instrument panel body, push in the solar sensor to ensure that it is clamped in place.
2. If the instrument panel face air duct has been removed, fit 2 screws fixing the instrument panel face air duct to the instrument panel body, and tighten them.

3. If the instrument panel airbag has been removed, fit 4 bolts fixing the instrument panel airbag to the instrument panel body, tighten them to **6-8Nm**, and check the torque.
4. With assistance, lift the instrument panel body into the vehicle, and connect the harness clip of the instrument panel body.
5. Fit 9 bolts fixing the instrument panel body to the instrument panel beam, tighten them to **5-6.6Nm**, and check the torque.
6. Fit 4 screws fixing the instrument panel body to the instrument panel beam, and tighten them.
7. Fit 2 bolts fixing the instrument panel airbag to the instrument panel beam, tighten them to **6-8Nm**, and check the torque.
8. Connect the harness connector of the glove box frame.
9. Align the clip of the glove box frame with the hole of instrument panel frame, push it hard to the end, and clamp it in place.
10. Fit 7 screws fixing the glove box frame to the instrument panel frame, and tighten them.
11. Fit the centre console assembly.

Centre Console Assembly Refit

12. Fit the A pillar upper trim panel.

A Pillar Upper Trim Panel Refit

13. Fit the glove box assembly.

Glove Box Assembly Refit

14. Fit the steering column lower trim cover.

Steering Column Lower Trim Cover Refit

15. Fit the steering column upper trim cover.

Steering Column Upper Trim Cover Refit

16. Fit the instrument panel side air outlet assembly.

Instrument Panel Side Air Outlet Assembly Refit

17. Fit the central instrument panel air outlet assembly.

Central Instrument Panel Air Outlet Assembly Refit

18. Fit the knee baffle.

Knee Baffle Refit

19. Fit the instrument panel lower closure panel assembly.

Instrument Panel Lower Closure Panel Assembly Refit

20. Fit the instrument panel end cover.

Instrument Panel End Cover Refit

21. Connect the negative battery cable.

Instrument Panel Beam Assembly Remove

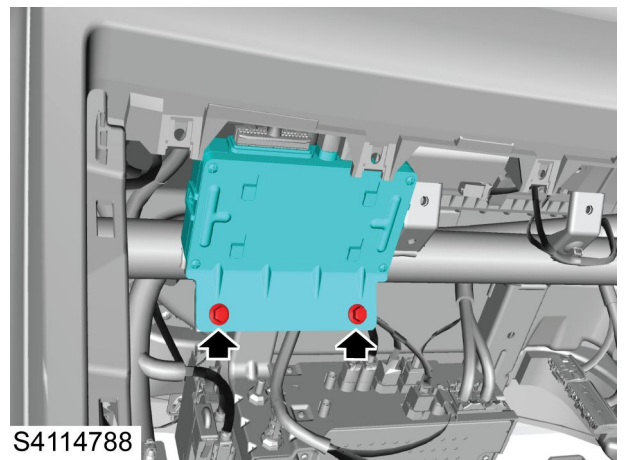
1. Disconnect the negative battery cable.
2. Remove the instrument panel body assembly.

Instrument Panel Body Assembly Remove

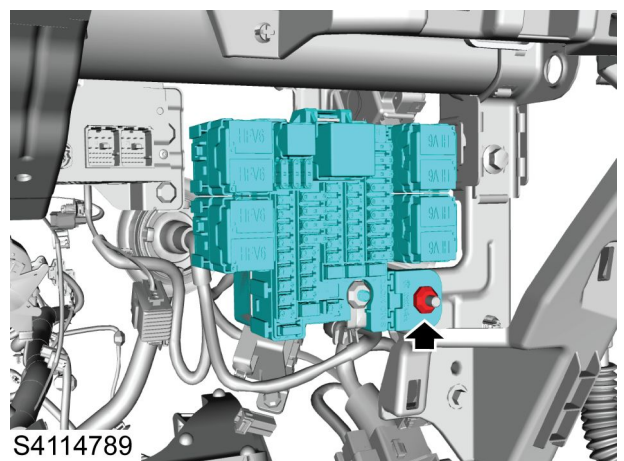
3. Remove the windscreen wiper module assembly and motor.

Windscreen Wiper Module Assembly and Motor Remove

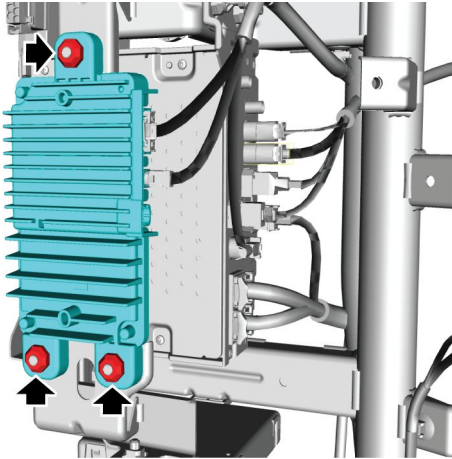
4. Remove 2 bolts fixing the T-BOX to the instrument panel beam, disconnect the harness, and remove the T-BOX.



5. Remove 1 nut fixing the driver compartment fuse box to the instrument panel beam and remove the driver compartment fuse box.

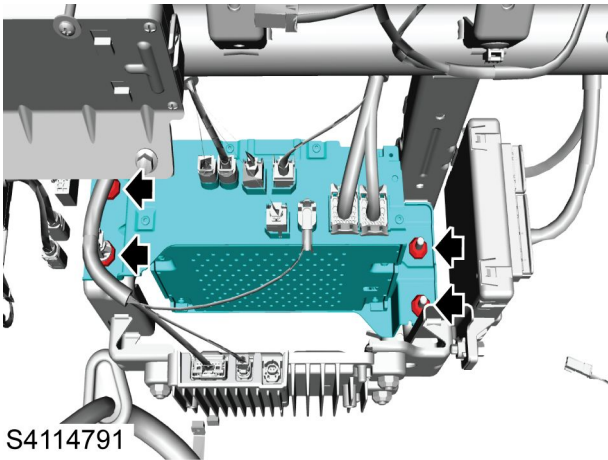


6. Remove 3 nuts fixing the fatigue monitoring module to the beam, disconnect the harness, and remove the fatigue monitoring module.



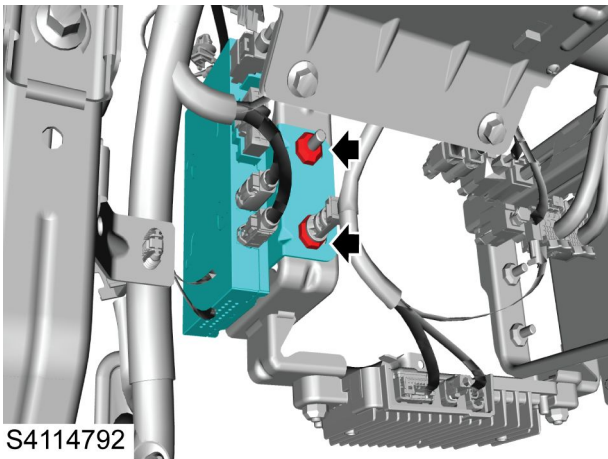
S4114790

7. Remove 4 nuts fixing the DAB module to the beam, disconnect the harness, and remove the DAB module.



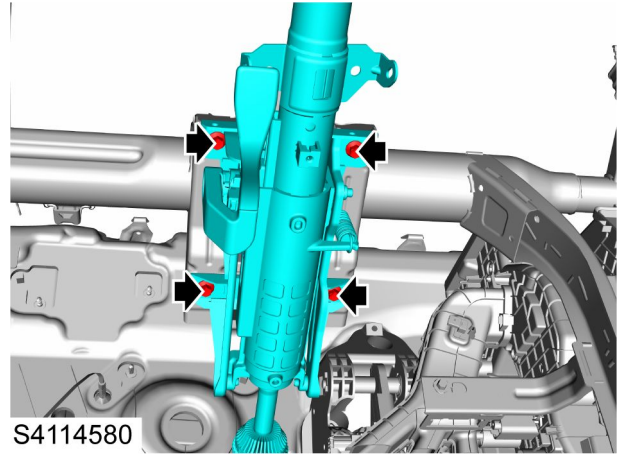
S4114791

8. Remove 2 nuts fixing the FICM to the beam, disconnect the harness, and remove the FICM.



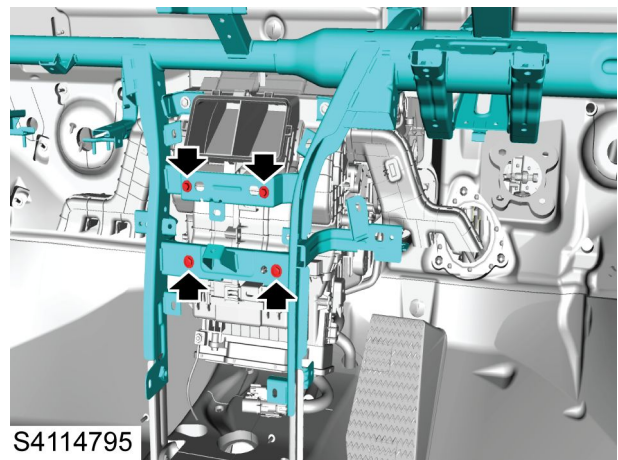
S4114792

9. Remove 4 bolts fixing the steering column assembly to the instrument panel beam, remove the steering column assembly and support it reliably.



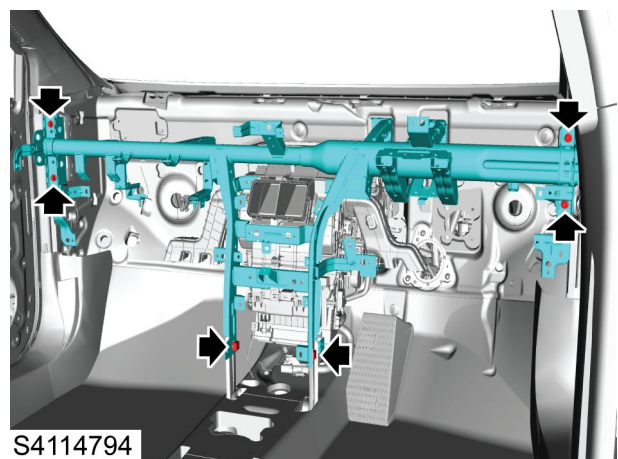
S4114580

10. Remove 4 bolts fixing the A/C box assembly to the instrument panel beam.

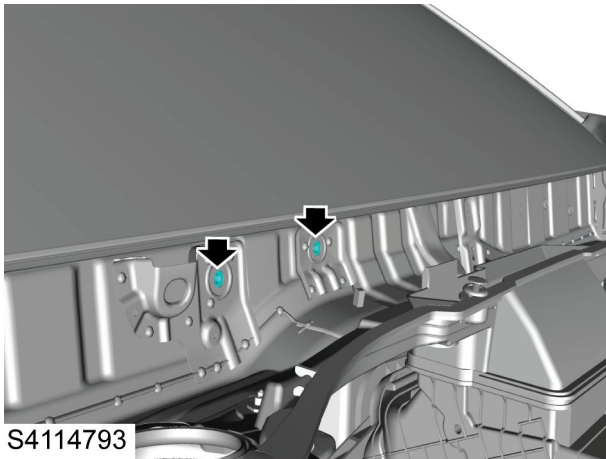


S4114795

11. Remove 8 bolts fixing the instrument panel beam to the body.



S4114794



12. Disengage the harness clip from the instrument panel beam, and lift the instrument panel beam out of the vehicle with assistance.

Refit

1. With assistance, locate the instrument panel beam to the correct position of the body, and fit the harness clip of the instrument panel beam.
2. Fit 8 bolts fixing the instrument panel beam assembly to the body, tighten them to **19-25Nm**, and check the torque.
3. Fit 5 bolts fixing the A/C box assembly to the instrument panel beam, tighten them to **7-10Nm**, and check the torque.
4. Fit 4 bolts fixing the steering column to the instrument panel beam assembly, tighten them to **19-25Nm**, and check the torque.
5. Connect the harness connector, fit 2 nuts fixing the FICM to the beam, and tighten them.
6. Connect the harness connector, fit 2 nuts fixing the DAB module to the beam, and tighten them.
7. Connect the harness connector, fit 3 nuts fixing the fatigue monitoring module to the beam, and tighten them.
8. Fit and tighten 1 nut fixing the driver compartment fuse box to the beam.
9. Connect the harness connector, fit 2 bolts fixing the T-BOX to the instrument panel beam, and tighten them.
10. Fit the windscreen wiper module assembly and motor.

Windscreen Wiper Module Assembly and Motor

Refit

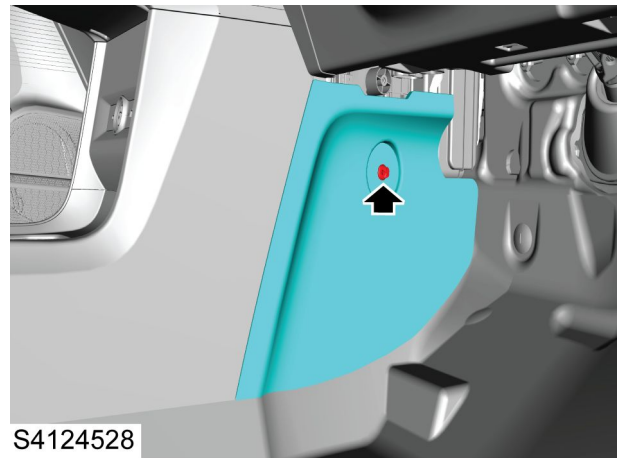
11. Fit the instrument panel body assembly.

Instrument Panel Body Assembly Refit Refit

12. Connect the negative battery cable.

Centre Console Heater Closure Panel Assembly Remove

1. Remove 1 clip fixing the centre console heater closure panel assembly to the A/C box.



2. Pry off the clip fixing the centre console heater closure panel to the centre console assembly from the edge of the centre console heater closure panel and remove the centre console heater closure panel.
3. Repeat the above step to remove the centre console heater closure panel on the other side.

Refit

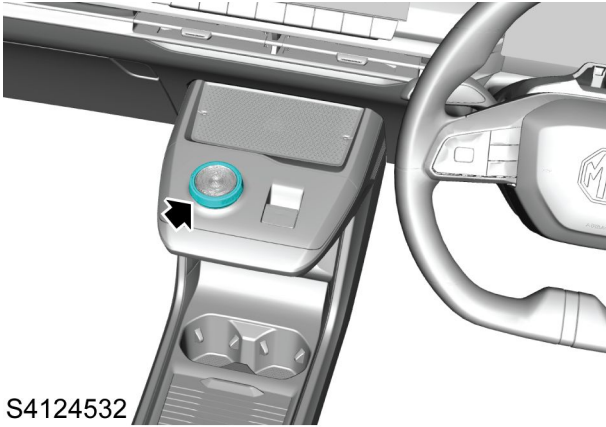
1. Align the clip of the centre console heater closure panel to the hole of the centre console assembly, push it hard to the end, and clamp it in place.
2. Fit 1 clip fixing the centre console heater closure panel to the A/C box.
3. Repeat the above step to fit the centre console heater closure panel on the other side.

Interior Fittings

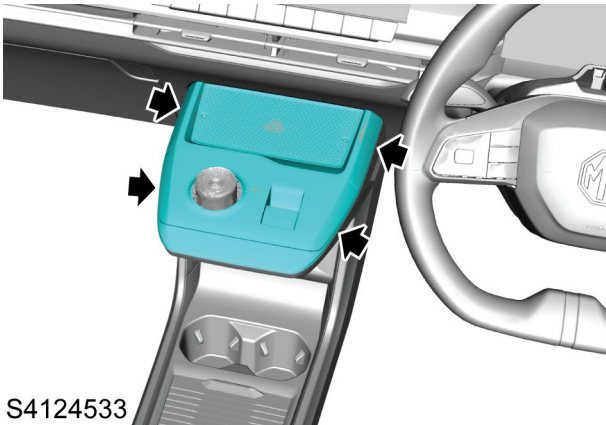
Instrument Panel and Centre Console

Centre Console Upper Trim Panel Assembly Remove

1. Disconnect the negative battery cable.
2. Pry open the moulding of the electronic shift lever knob.



3. Pry open the clip along the edge of the centre console upper trim panel assembly, disconnect the harness connector, and remove the centre console upper trim panel assembly.



Refit

1. Connect the harness connector, align the adapter of the centre console upper trim panel to the hole of the centre console, push it hard to the end and fasten it.
2. Locate the moulding of the electronic shift knob to the electronic shift knob, and press the clip in place.
3. Connect the negative battery cable.

Centre Console Cup Holder Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the centre console assembly.

Centre Console Assembly Remove

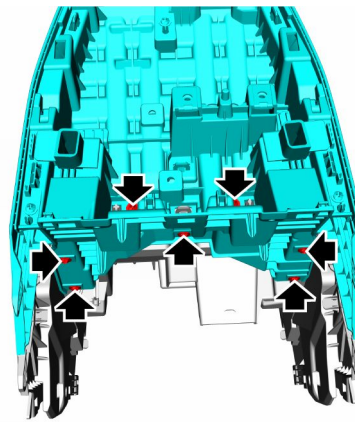
3. Remove the centre console rear panel assembly.

Centre Console Rear Panel Assembly Remove

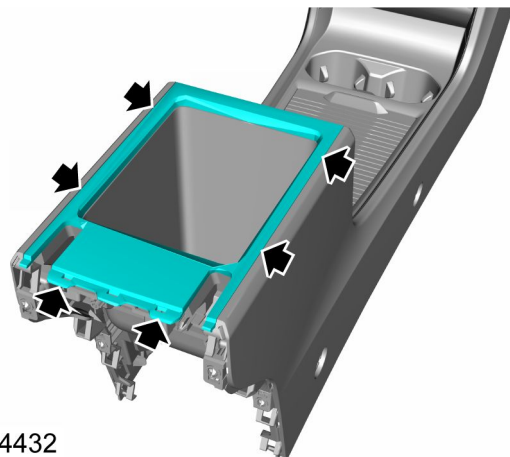
4. Remove the centre console armrest assembly.

Centre Console Armrest Assembly Remove

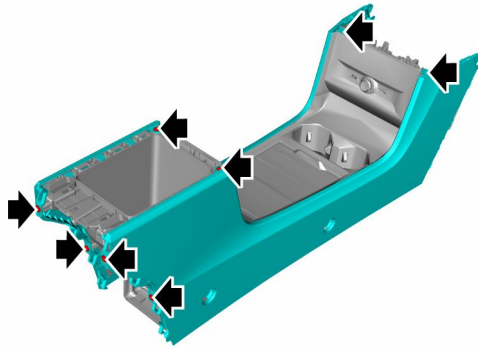
5. Remove 7 screws fixing the centre console upper trim panel frame to the centre console assembly, pry off the clip and remove the centre console upper trim panel frame.



6. Pry off the clip fixing the centre console armrest cover to the centre console assembly, and remove the centre console armrest cover.

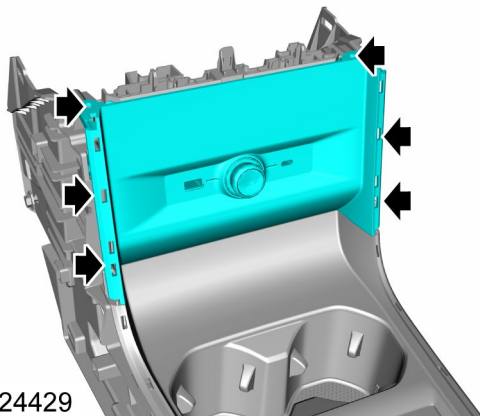


7. Remove 8 screws fixing the centre console side trim panel assembly to the centre console assembly, pry off the clip and remove the centre console side trim panel assembly.



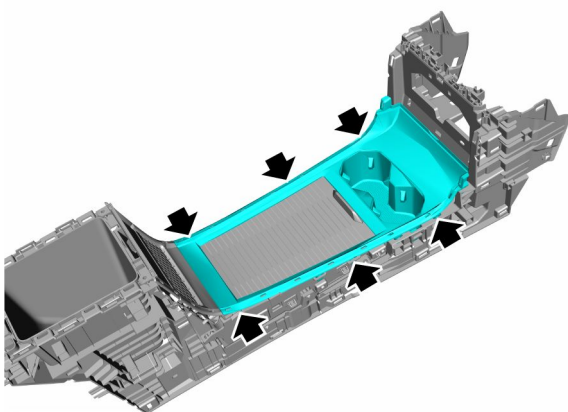
S4124430

8. Pry off the clip fixing the 12V power socket to the centre console assembly, disconnect the harness, and remove the 12V power socket.



S4124429

9. Pry off the clip fixing the centre console cup holder to the centre console assembly, and remove the centre console cup holder.



S4124428

Refit

1. Align the adapter of the centre console cup holder to the hole of the centre console assembly, push it hard to the end and fasten it.
2. Connect the harness connector, align the adapter of the 12V power socket to the hole of the centre console assembly, push it hard to the end and fasten it.
3. Fit 8 screws fixing the centre console side trim panel to

the centre console assembly and tighten them.

4. Align the adapter of the centre console armrest cover to the hole of the centre console assembly, push it hard to the end and fasten it.
5. Fit 7 screws fixing the centre console upper trim panel frame to the centre console assembly and tighten them.
6. Fit the centre console armrest assembly.

 **Centre Console Armrest Assembly Refit**

7. Fit the centre console rear panel assembly.

 **Centre Console Rear Panel Assembly Refit**

8. Fit the centre console assembly.

 **Centre Console Assembly Refit**

9. Connect the negative battery cable.

Centre Console Armrest Assembly Remove

1. Remove the centre console rear panel assembly.

Centre Console Rear Panel Assembly Remove

2. Remove 4 screws fixing the centre console armrest assembly to the centre console assembly.



3. Remove the centre console armrest assembly.

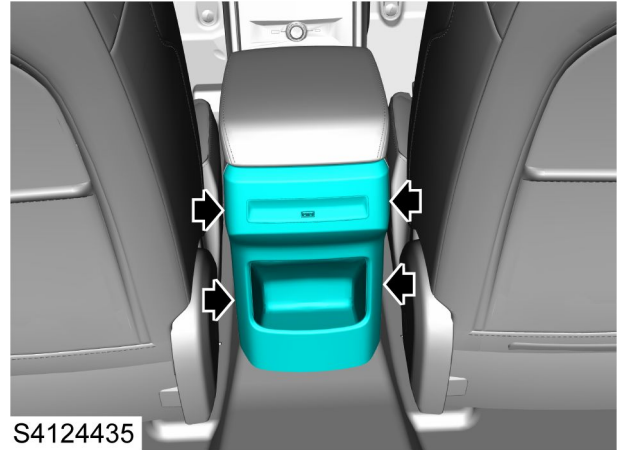
Refit

1. Locate the centre console armrest assembly on the centre console assembly.
2. Fit 4 screws fixing the centre console armrest assembly to the centre console assembly, and tighten them.
3. Fit the centre console rear panel assembly.

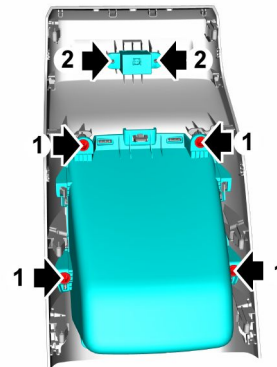
Centre Console Rear Panel Assembly Remove

Centre Console Rear Panel Assembly Remove

1. Disconnect the negative battery cable.
2. Pry off the clip fixing the centre console rear panel to the centre console assembly from the edge of the centre console rear panel, disconnect the harness connector, and remove the centre console rear panel.



3. If necessary, remove 4 screws (1) fixing the centre console rear storage box to the centre console assembly, pry off the clip and remove the centre console rear storage box.
4. If necessary, remove 2 screws (2) fixing the USB charging module to the centre console assembly, and remove the USB charging module.



Refit

1. If removed, fit 2 screws fixing the USB charging module to the centre console assembly, and tighten them.
2. If removed, align the clip of the centre console rear storage box to the hole of the centre console rear panel, push it hard to the end, clamp it in place, fit 4 screws and tighten them.
3. Connect the harness connector, align the clip of the centre console rear panel assembly with the hole of centre console body, push it hard to the end, and clamp it in place.
4. Connect the negative battery cable.

Centre Console Assembly

Remove

1. Disconnect the negative battery cable.
2. Remove the centre console heater closure panel assembly.

Centre Console Heater Closure Panel Assembly

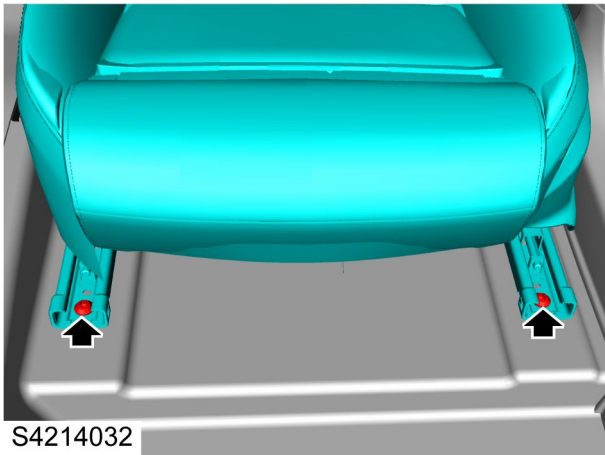
3. Remove the centre console upper trim panel assembly.

Centre Console Upper Trim Panel Assembly Remove

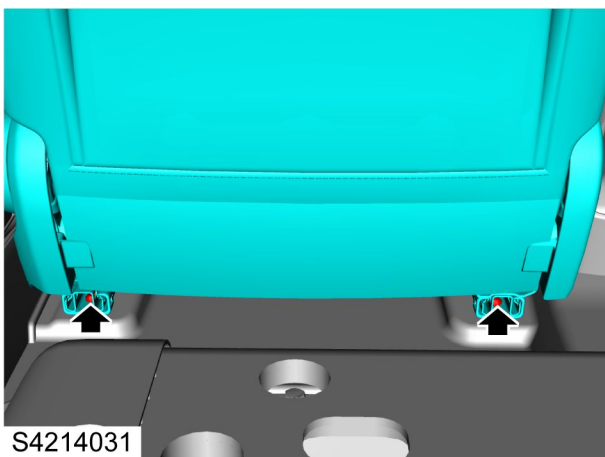
4. Remove the gear shift control mechanism assembly.

Gear Shift Control Mechanism Remove

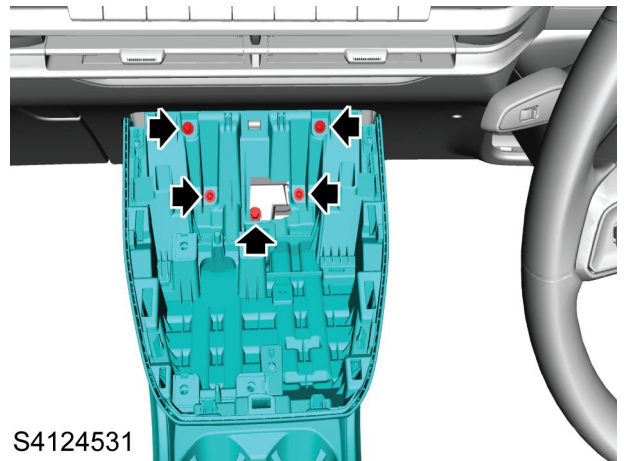
5. Adjust the passenger seat to the rearmost position.
6. Remove and discard 2 bolts fixing the front end of passenger seat rail to the body.



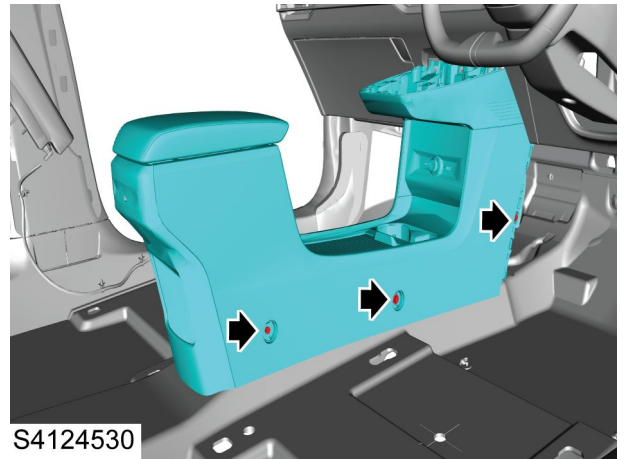
7. Adjust the passenger seat to the topmost position.
8. Remove and discard 2 bolts fixing the rear end of passenger seat rail to the body.



9. Disconnect the harness connector, and remove the passenger seat assembly from the vehicle.
10. Remove 5 screws fixing the centre console assembly to the instrument panel body.



11. Move the front seat to a proper position, pry off the bolt trim cover, and remove 3 bolts fixing the centre console to both sides of the bracket.



12. Disconnect the harness connector, loosen the clip and lift the centre console assembly out of the vehicle with assistance.

Refit

1. With assistance, lift the centre console body assembly into the vehicle.
2. Connect the harness connector, press the harness clip, lift the centre console body assembly into the vehicle, align the locating pin of the centre console body with the locating hole of the instrument panel body, move it forward to the end, and check the gap at the joint between the front part of the centre console body and the lower part of the instrument panel, to ensure the connection is in place.
3. Fit 6 bolts fixing the centre console to both sides of the bracket, tighten them to **3-4Nm** and check the torque, and fit the bolt trim cover.
4. Fit 5 screws fixing the centre console assembly to the instrument panel, and tighten them.
5. Ensure the seat tracks are properly aligned with the base, and locate the front seat to the body.
6. Connect the harness connector.
7. Fix the front seat to the body, fit 4 bolts (front and

Interior Fittings

rear), tighten them to **40-50Nm**, and check the torque.

8. Fit the gear shift control mechanism assembly.

Gear Shift Control Mechanism Assembly

9. Fit the centre console upper trim panel.

Centre Console Upper Trim Panel

10. Fit the centre console heater closure panel assembly.

Centre Console Heater Closure Panel Assembly

11. Connect the negative battery cable.

Instrument Panel and Centre Console

Front Insulation Pad Remove

1. Disconnect the negative battery cable.
2. Remove the A/C distribution box assembly.

A/C Distribution Box Assembly Remove

3. Remove the body harness at the front compartment, to pass it through the holes in the dash panel insulation pad.

Body Harness Remove

4. Remove the upper steering column assembly.

Upper Steering Column Assembly Remove

5. Remove the brake pedal assembly.

Brake Pedal Assembly Remove

6. Remove the accelerator pedal assembly.

Accelerator Pedal Assembly Remove

7. Remove the body control module.

Body Control Module Remove

8. Remove the heat pump controller.

Heat Pump Controller Remove Remove

9. Remove the crash power module.

Crash Power Module Remove

10. Remove the Apillar lower trim panel.



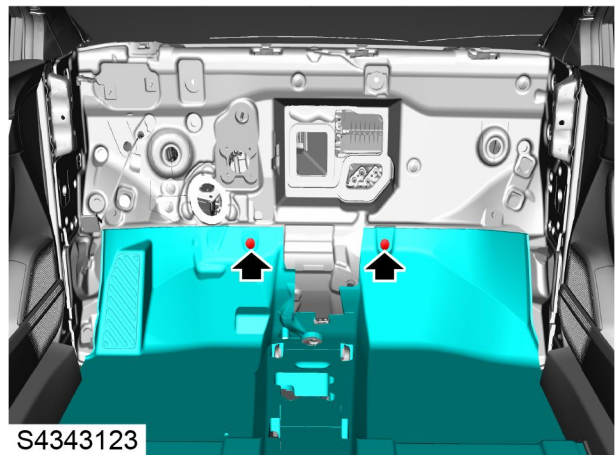
A

Pillar Lower Trim Panel Remove

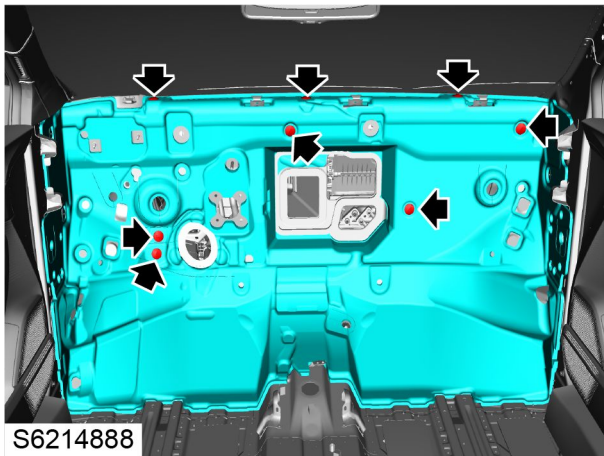
11. Remove the door sill trim panel.

Door Sill Trim Panel Remove

12. Remove 2 plastic nuts fixing the carpet to the body, and lift the carpet at the front part.



13. Pry off the harness clip, disconnect the harness connector, and pull the harnesses out of the holes in the dash panel.
14. Remove 8 plastic nuts fixing the dash panel insulation pad to the body, and remove the dash panel insulation pad.



Refit

1. Locate the dash panel insulation pad to the body, fit 8 plasticnuts, and tighten them.
2. Pass the harness through the holes in the dash panel, connectthe harness connector, and secure with clips.
3. Restore the carpet at the front part, fit 2 plastic nuts andtighten them.
4. Pass the bonnet release cable and sunroof drain pipe throughthe holes in the dash panel, and secure with clips.
5. Fit the door sill trim panel.

Door Sill Trim Panel Refit

6. Fit the crash power module.

Crash Power Module Refit

7. Fit the heat pump controller.

Heat Pump Controller Refit 安装

8. Fit the body control module.

Body Control Module Refit

9. Fit the accelerator pedal assembly.

Accelerator Pedal Assembly Refit

10. Fit the brake pedal assembly.

Brake Pedal Assembly Refit

11. Fit the upper steering column assembly.

Upper Steering Column Assembly Refit

12. Fit the body harness at the front compartment, to pass it throughthe holes in the dash panel insulation pad.

Body Harness Refit

13. Fit the A pillar lower trim panel.



A

Pillar Lower Trim Panel Refit

14. Fit the A/C distribution box assembly.

A/C Distribution Box Assembly Refit

15. Connect the negative battery cable.

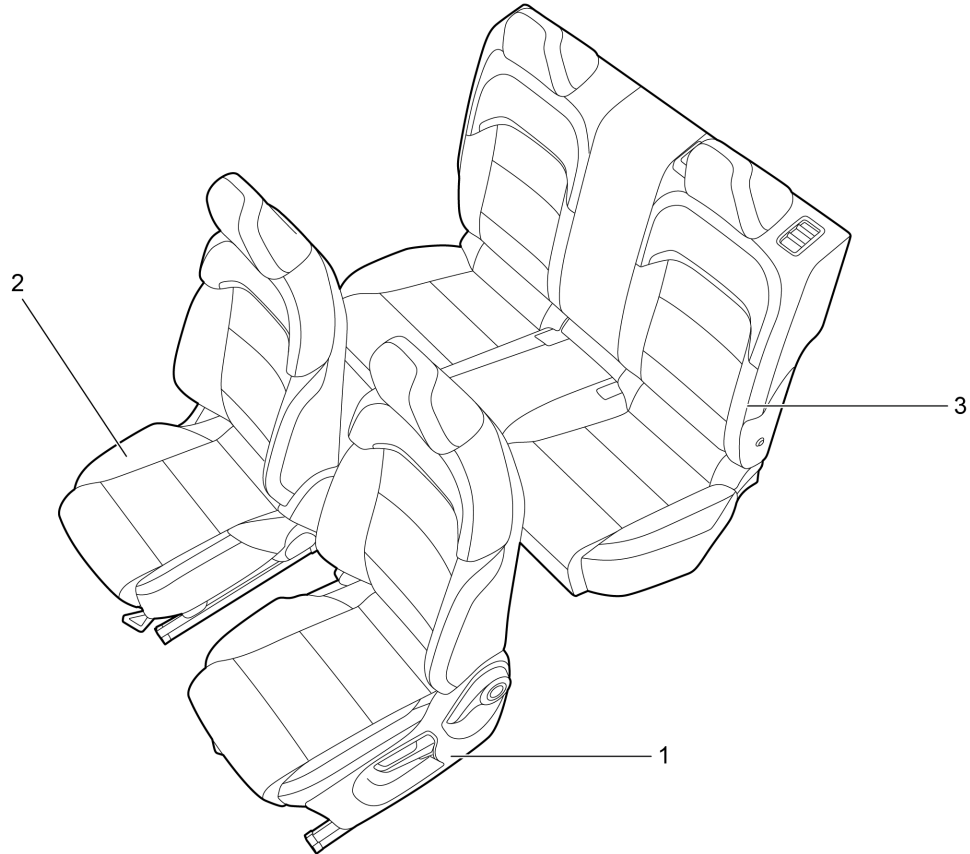
Seats**Specification****New sTOTopic**

Description	Value
Bolt-Front seat to Body	40-50Nm
Bolt-Back of front seat to framework bothsides	42-48Nm
Bolt-Rear middle seat belt to body	35-45Nm

Description and Operation

System Layout

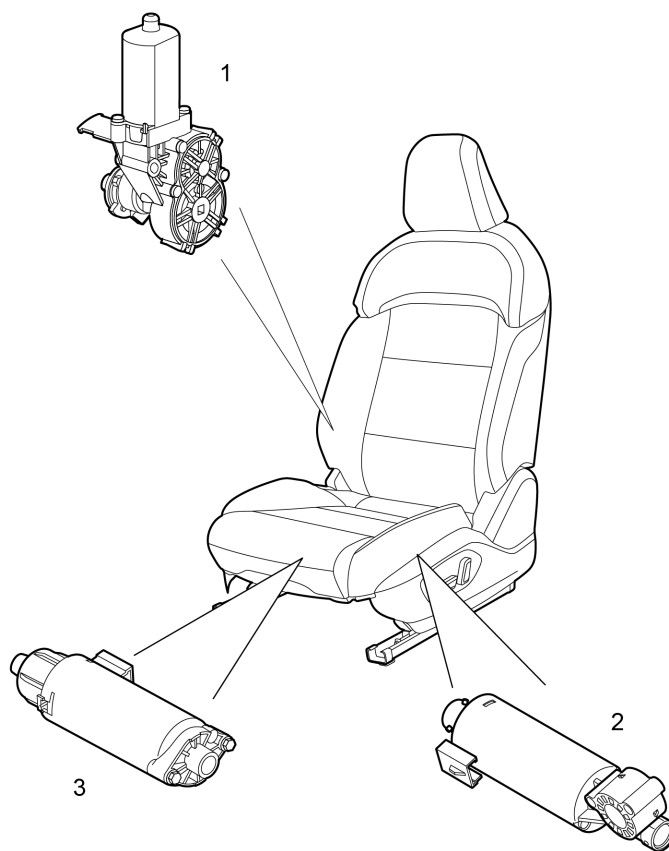
Seat Layout



S4210208

- 1. Driver Seat
- 2. Front Passenger Seat
- 3. Rear Seat

Front Power Seat Motor Layout

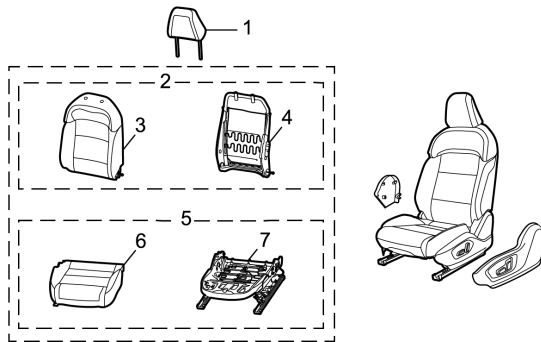


S4210209

1. Seat Back Regulator Motor
2. Seat Height Regulator Motor
3. Seat Forward/Backward Regulator Motor

Description

Front Seat Assembly



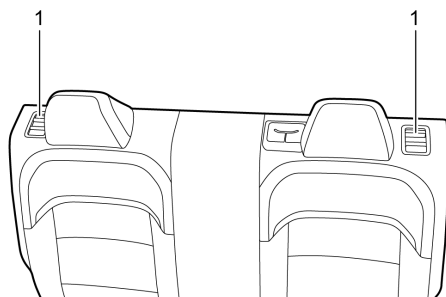
S4214052

1. Seat Headrest
2. Seat Back Assembly
3. Seat Back Cover
4. Seat Back Frame
5. Seat Cushion Assembly
6. Seat Cushion Cover
7. Seat Cushion Frame

The common seat assembly mainly consists of headrest, seat back, seat cushion and accessories. Among them, both seat back assembly and seat cushion assembly consist of cover, foam and frame. The seat assembly and the main components are repaired as fittings according to the vulnerability and maintainability of the components.

The front seat assembly may have different configurations according to vehicle configuration and seat exterior, for example, 4-way manual seat (forward/backward adjustment, seat back inclination); 6-way manual/power seat (forward/backward adjustment, seat back inclination, and seat height); fabric and PU; seat heating function.

Rear Seat Assembly



S4214053

The rear seat of this model is a 4/6 type seat with reclinable seat back. If you want to expand the space of the trunk, first fully lower (or remove) all the rear seat headrests, and pull up the control lock knobs respectively on both sides (1) to fold the

seat backs forward. When unfolding the rear seat back again, pull up the back control lock knob to release the locked state, push the back until it reaches an appropriate position, and the back is locked when you hear a click.

Operation

Front Manual Seat



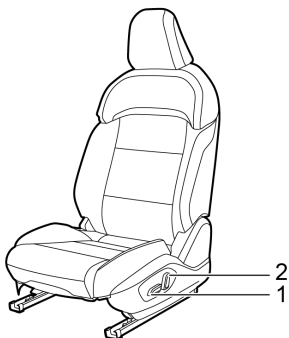
S4214055

1. Seat Longitudinal Position Adjusting Handle
2. Seat Height Adjusting Handle (If equipped)
3. Seat Back Adjusting Handle

The horizontal position and height of the seat cushion and the seat back inclination can be adjusted by the handle according to individual needs.

The horizontal position of the seat can be adjusted by the handle (1) in the front of the seat cushion. Lift the handle and pull it to the desired position. Release the handle until it clicks to lock the seat to the selected position. The seat height adjusting handle (2) is located on the trim panel outside the seat cushion. Lift upwards or press downwards the handle repeatedly to raise or lower the seat within a certain range. The seat back inclination adjusting handle (3) is located in the rear of the height adjusting handle. Press the handle forwards or backwards to adjust the seat back inclination. Release the seat back adjusting handle to lock the seat back to the selected position.

Front Power Seat



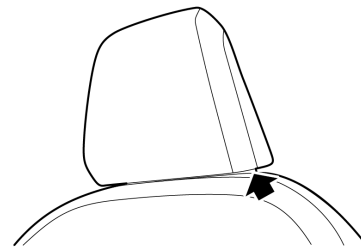
S4214056

1. Seat Horizontal Position/Height Adjusting Switch
2. Seat Back Adjusting Switch

The power seat can be adjusted by the driver seat switch assembly on the trim panel outside the seat cushion according to individual needs. The power seat switch assembly contains

a 2-channel switch which controls the forward/backward inclination of the seat back and a 4-channel switch which controls the height and horizontal position of the seat. Each motor can receive a 12V power supply from the switch box and connect the ground. When adjusting the seat, the corresponding motor is powered on and starts working. When the seat achieves its maximum position for any direction, the thermal protection cut-off switch will protect the motor by cutting off the power supply automatically.

Seat Headrest



S4214054

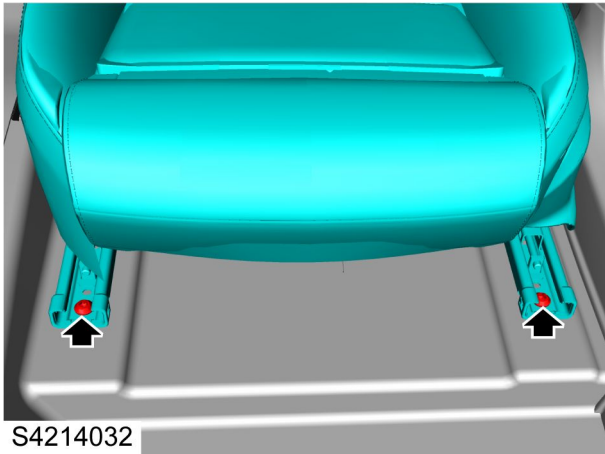
The front seat headrest has 4 adjustable heights and the rear seat headrest has 3 adjustable heights. When adjusting the headrest from a low position to a high one, pull the headrest directly upward, and gently press the headrest downward after it reaches the desired position to make sure that it is locked in position. To remove the headrest, hold the left guide sleeve button of the headrest, and pull the headrest upward to remove it. When adjusting the headrest from a high position to a low one, press the left guide button, and press the headrest downward, release the button after it reaches the desired position, and gently press the headrest downward to make sure that it is locked in position.

Service Guide

Front Seat Assembly

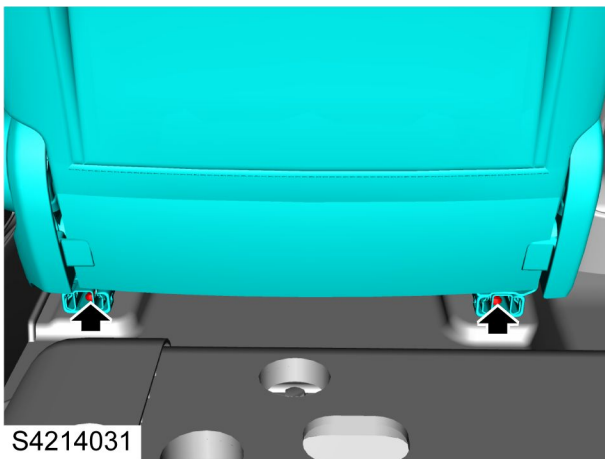
Remove

1. Turn off the Start switch and disconnect the positive and negative battery cables (disconnect the ground wire first). Wait for 10 minutes until the backup circuit is discharged.
2. Adjust the seat to the rearmost position.
3. Remove and discard 2 bolts fixing the front end of the seat rail to the body.



S4214032

4. Adjust the seat to the frontmost position.
5. Remove and discard 2 bolts fixing the rear end of the seat rail to the body.



S4214031

6. Disconnect the harness connector, and remove the front seat assembly from the vehicle.

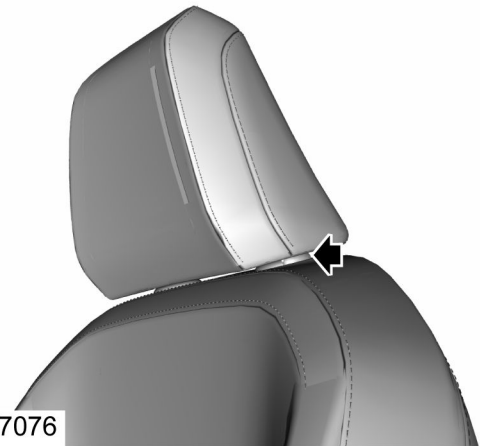
Refit

1. Ensure the seat tracks are properly aligned with the base, and locate the front seat to the body.
2. Connect the harness connector.
3. Fix the front seat to the body, fit 4 bolts (front and rear), tighten them to **40-50Nm**, and check the torque.
4. Adjust the seat to a proper position, and connect the negative battery cable.

General Head Restraint

Remove

1. Press and hold the left guide sleeve button of the headrest, and pull the headrest upward to remove it.



S4217076

2. Remove the headrest assembly.

Refit

1. Locate the headrest correctly on the headrest mounting guide sleeve, and insert it into the guide sleeve.
2. Gently press the headrest downward, and adjust the headrest to the appropriate position, to ensure that it is locked in place.

Front Seat Exterior Trim Panel and Seat Adjusting Switch Remove

1. Remove the front seat assembly.

Front Seat Assembly Remove

2. Remove the front seat exterior trim panel.

Manual Seat (if equipped):

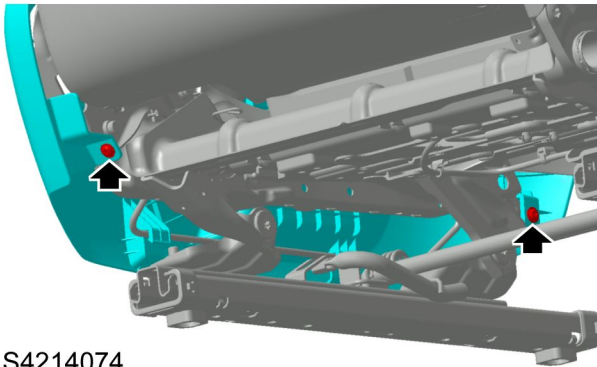
- a. Remove the front manual seat height adjusting handle.

Front Manual Seat Height Adjusting Handle Remove

- b. Remove the front manual seat back adjusting handle.

Front Manual Seat Back Adjusting Handle Remove

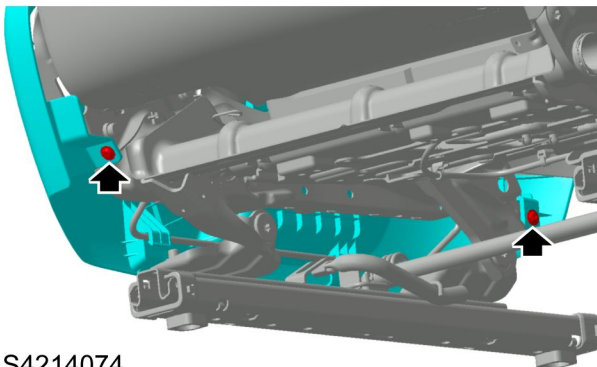
- c. Remove 2 screws fixing the seat exterior trim panel to the seat frame, pry off the retaining clips, and remove the front seat exterior trim panel.



S4214074

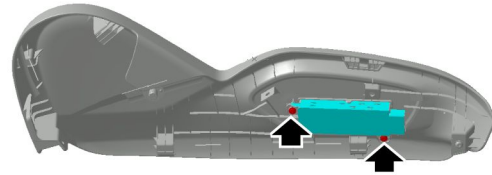
Power Seat (if equipped):

- a. Remove 2 screws fixing the seat exterior trim panel to the seat frame, pry off the retaining clips, disconnect the harness connector and remove the front seat exterior trim panel.



S4214074

- b. Remove 2 screws fixing the combination switch to the exterior trim panel, and remove the combination switch.



S4214031

Refit

1. Fit the front seat exterior trim panel.

Power Seat (if equipped):

- a. Fix the combination switch to the exterior trim panel, fit and tighten 2 screws, and connect the harness connector.
- b. Locate the front seat exterior trim panel to the seat frame, and press the clip in place.
- c. Fit and tighten 2 screws fixing the front seat exterior trim panel to the seat frame.

Manual Seat (if equipped):

- a. Locate the front seat exterior trim panel to the seat frame, and press the clip in place.
- b. Fit and tighten 2 screws fixing the front seat exterior trim panel to the seat frame.
- c. Fit the front manual seat back adjusting handle.

Front Manual Seat Back Adjusting Handle Refit

- d. Fit the front manual seat height adjusting handle.

Front Manual Seat Height Adjusting Handle Refit

2. Fit the front seat assembly.

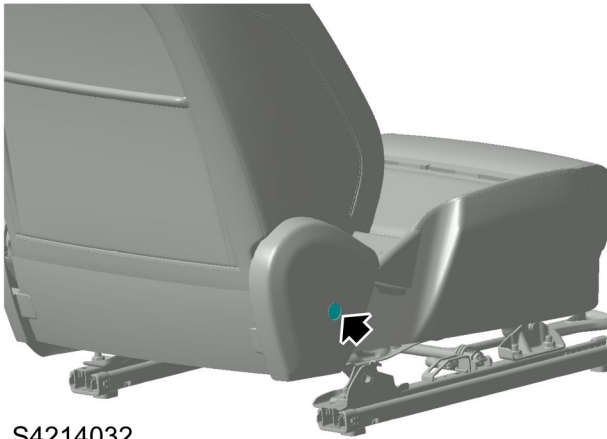
Front Seat Assembly Refit

Front Seat Interior Trim Panel Remove

1. Remove the front seat assembly.

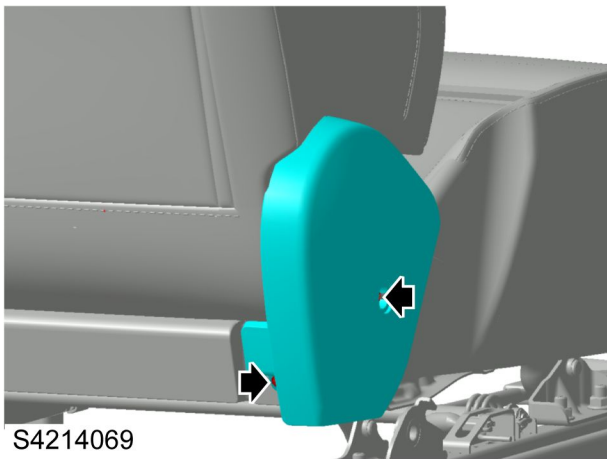
 **Front Seat Assembly Remove**

2. Pry off the front seat interior trim panel screw trim cover.



S4214032

3. Remove 2 screws fixing the front seat interior trim panel to the seat frame.



S4214069

4. Lift up the interior trim panel, pull it outwards, loosen the clip, and remove the front seat interior trim panel.

Refit

1. Locate the front seat interior trim panel to the seat frame, and press the clip in place.
2. Fit and tighten 2 screws fixing the interior trim panel to the seat frame.
3. Fit the front seat interior trim panel screw trim cover.
4. Fit the front seat assembly.

 **Front Seat Assembly Refit**

Front Seat Back Assembly Remove

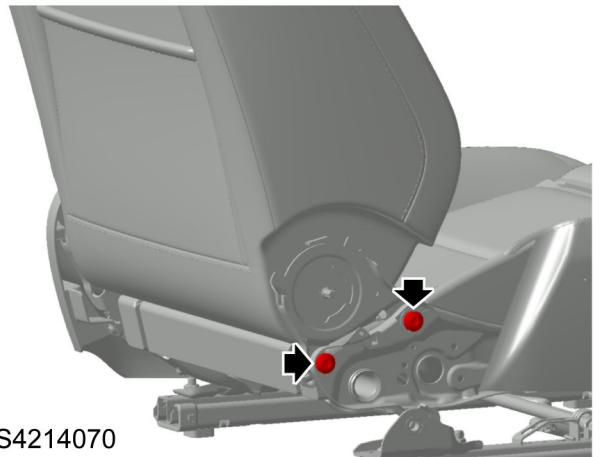
1. Remove the front seat exterior trim panel.

 **Front Seat Exterior Trim Panel Remove**

2. Remove the front seat interior trim panel.

 **Front Seat Interior Trim Panel Remove**

3. Loosen the hooks fixing the seat back cover to the bottom of the seat.
4. Remove the bolts (4 bolts on both sides in total) fixing the front seat back to the cushion frame.



S4214070

5. Disconnect the harness connector, and remove the front seat back.

Refit

1. Connect the harness connector, fix the front seat back to the seat cushion frame, fit 4 bolts on both sides, tighten them to **42-48Nm**, and check the torque.
2. Fix the seat back cover to the seat and secure it with hooks.
3. Fit the front seat interior trim panel.

 **Front Seat Interior Trim Panel Refit**

4. Fit the front seat exterior trim panel.

 **Front Seat Exterior Trim Panel Refit**

Front Seat Cushion Assembly Remove

1. Remove the front seat exterior trim panel.

Front Seat Exterior Trim Panel Remove

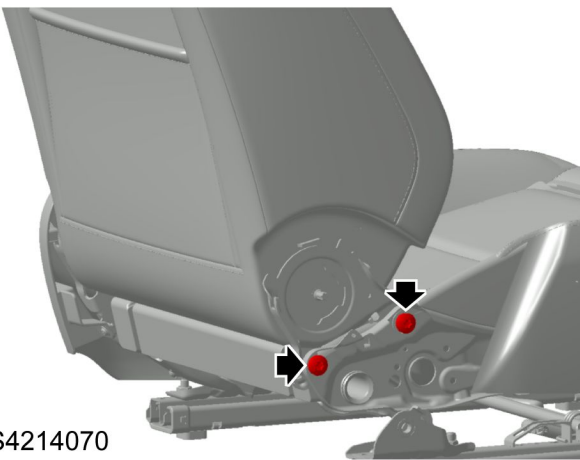
2. Remove the front seat interior trim panel.

Front Seat Interior Trim Panel Remove

3. Remove the front seat belt buckle.

Front Seat Belt Buckle Remove

4. Loosen the hooks fixing the seat back cover to the bottom of the seat.
5. Remove the bolts (two on each side, i.e. 4 in total) fixing the seat back to the seat cushion frame, and remove the seat back.



S4214070

6. Remove the front seat cushion assembly.

Refit

1. Fix the seat back to the seat cushion frame, fit 4 bolts on both sides, tighten them to **40-46Nm**, and check the torque.
2. Fix the seat back cover to the seat and secure it with hooks.
3. Fit the front seat belt buckle.

Front Seat Belt Buckle Refit

4. Fit the front seat interior trim panel.

Front Seat Interior Trim Panel Refit

5. Fit the front seat exterior trim panel.

Front Seat Exterior Trim Panel Refit

Front Seat Cushion Cover Remove

1. Remove the front seat assembly.

Front Seat Assembly Remove

2. Remove the front seat cushion assembly.

Front Seat Cushion Assembly Remove

3. Pry off the clip fixing the front seat cushion cover to the seat cushion frame.
4. Release the seat cushion foam from the seat cushion frame and remove the seat cushion foam and cover.
5. Release the elastic strap, remove the C-ring fixing the seat cushion cover to the seat cushion foam and mark its position.

Refit

1. Fit the seat cushion foam into the seat cushion cover, secure it with the elastic strap and C-ring, and check the fit between the cover and the cushion foam.
2. Fit the seat cushion foam with cover to the seat cushion frame, and secure the seat cushion cover with clips.
3. Fit the front seat cushion assembly.

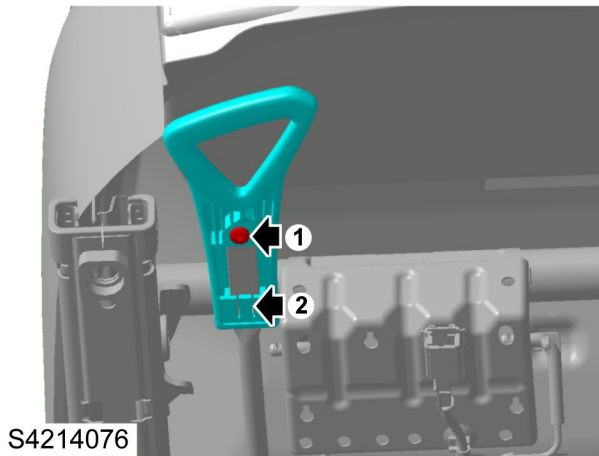
Front Seat Cushion Assembly Refit

4. Fit the front seat assembly.

Front Seat Assembly Refit

Front Manual Seat Front/Rear Adjusting Handle Remove

1. Remove 1 screw (1) fixing the front manual seat forward/backward adjusting handle to the seat cushion frame.
2. Pry open the clip (2) fixing the front manual seat forward/backward adjusting handle to the seat cushion frame, and remove the front manual seat forward/backward adjusting handle.

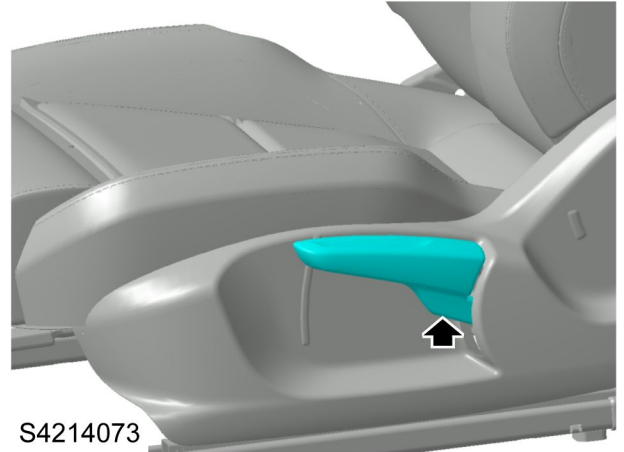


Refit

1. Locate the forward/backward adjusting handle of the front manual seat to the seat cushion frame, and press the clip in place.
2. Fit and tighten 1 screw.

Front Manual Seat Height Adjusting Handle Remove

1. Extend into the internal side of front seat height adjusting handle with a flat-bladed tool, pry open the clamp fixing the height adjusting handle onto the height adjusting handle bracket.



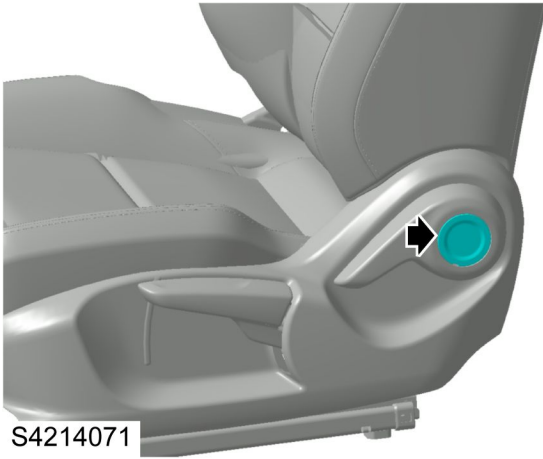
2. Remove the front seat height adjusting handle.

Refit

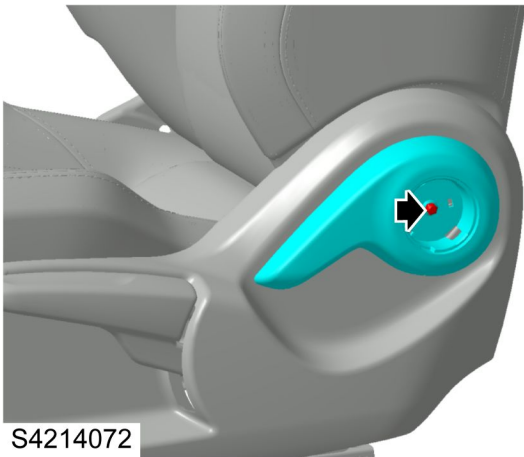
1. Fit the front seat height adjusting handle to the handle bracket, and ensure the retaining clip is fitted in place.

Front Manual Seat Back Adjusting Handle Remove

1. Pry open the front seat back adjusting handle trim cover along the gap with a flat-bladed tool.



2. Pry up the inner edge of the retaining circlip with a flat-bladed tool and remove the front seat back adjusting handle circlip.



3. Insert a flat-bladed tool from the edge into the inside of the front seat height adjusting handle, and carefully pry off the front seat back adjusting handle outwards.

Refit

1. Fit the front seat back adjusting handle on the seat back adjustment shaft to ensure that it is fitted in place.
2. Fit the retaining circlip to the front seat back adjusting shaft, and ensure it is fitted in place.
3. Fit the front seat back adjusting handle trim cover.

Seat Headrest Guide Remove

1. Front Seat Headrest Guide:

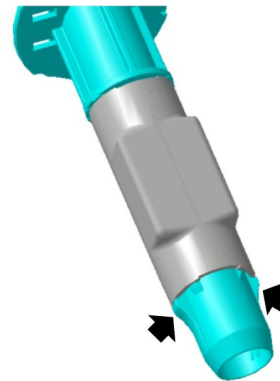
- a. Remove the front seat assembly.

 **Front Seat Assembly Remove**

- b. Remove the front seat back assembly.

 **Front Seat Back Assembly Remove**

- c. Loosen the elastic straps on the seat back cover.
- d. Pry off the clip fixing the front and back covers of the seat back, and separate the front and back covers.
- e. Press and hold the guide sleeve button of the headrest, and pull the headrest upward to remove it.
- f. Mark the location of the C-ring fixing the seat back cover to the foam, remove it and open the cover.
- g. Stretch out the hand inside the seat back foam, press the clip at the lower end of the headrest guide sleeve and push out the headrest guide sleeve upwards.



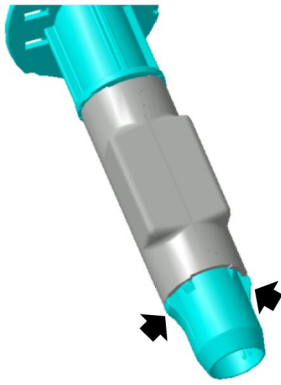
S4213977

2. Rear Seat Headrest Guide:

- a. Remove the rear seat back assembly.

 **Rear Seat Back Assembly Remove**

- b. Pry off the clip fixing the front and rear covers of the rear seat back, and separate the front and rear covers.
- c. Press and hold the headrest guide sleeve button from the back plate hole of the rear seat, and pull the headrest upward to remove the headrest.
- d. Stretch out the hand inside the seat back foam, press the clip at the lower end of the headrest guide sleeve and push out the headrest guide sleeve upwards.



S4213977

Refit

- I. Front Seat Headrest Guide:
 - a. Fit 2 seat headrest adjusting guides to the seat back frame.
 - b. Fit the seat back cover onto the back foam, secure with the elastic strap and C-ring, and check the fit between the cover and the back foam.
 - c. Locate the headrest correctly on the headrest mounting guide sleeve, and insert it into the guide sleeve. Press and hold the button, push the headrest down to the appropriate position.
 - d. Fix the front and back covers of the seat back in place with clips.
 - e. Fix the elastic straps of the seat back covers.
 - f. Fit the front seat back assembly.

 **Front Seat Back Assembly Refit**

- g. Fit the front seat assembly.

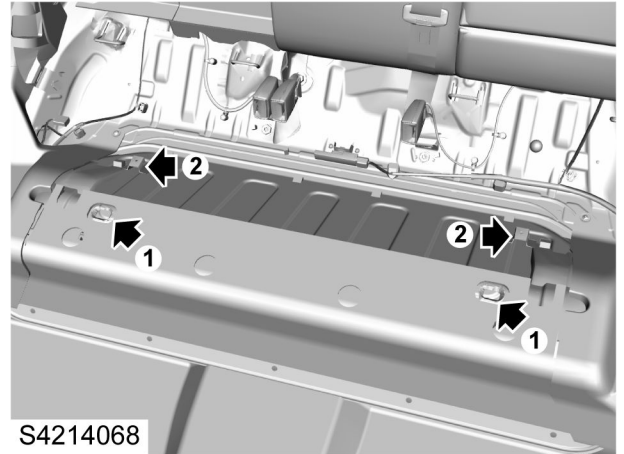
 **Front Seat Assembly Refit**

2. Rear Seat Headrest Guide:
 - a. Fit 2 seat headrest adjusting guides on the seat back frame, and zip up the cover.
 - b. Locate the headrest correctly on the headrest mounting guide sleeve, and insert it into the guide sleeve. Press and hold the button, push the headrest down to the appropriate position.
 - c. Fix the front and back covers of the seat back in place with clips.
 - d. Fit the rear seat back.

 **Rear Seat Back Assembly Refit**

Rear Seat Cushion Assembly Remove

1. Lift up the rear seat cushion assembly, and remove 2 clips (1) fixing the front end of the cushion.
2. Push the rear seat cushion towards the rear of the vehicle forcibly to release the retaining clip (2) at the rear end.



3. Remove the rear seat cushion.

Refit

1. Lift the front end of the rear seat cushion, and fix the rear end with hooks.
2. Fix the front end of the rear seat cushion with clips.

Rear Seat Cushion Cover Remove

1. Remove the rear seat cushion assembly.

Rear Seat Cushion Assembly Remove

2. Loosen the straps and J-clamps fixing the seat cushion cover to the seat frame.
3. Mark the locations of the C-rings fixing the seat cushion cover and foam, then remove the C-rings.
4. Remove the cover from the cushion foam.

Refit

1. Fit the cushion cover and fix it on the cushion foam with C-ring.
2. Fix the seat cushion cover and foam onto the seat frame with straps and J-clamps.
3. Fit the rear seat cushion assembly.

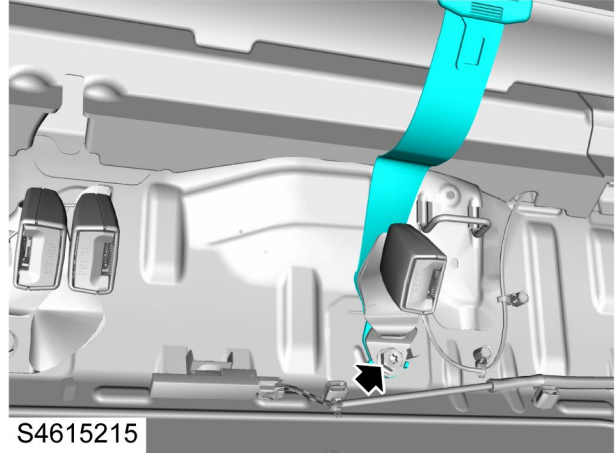
Rear Seat Cushion Assembly Refit

Rear Seat Back Assembly Remove

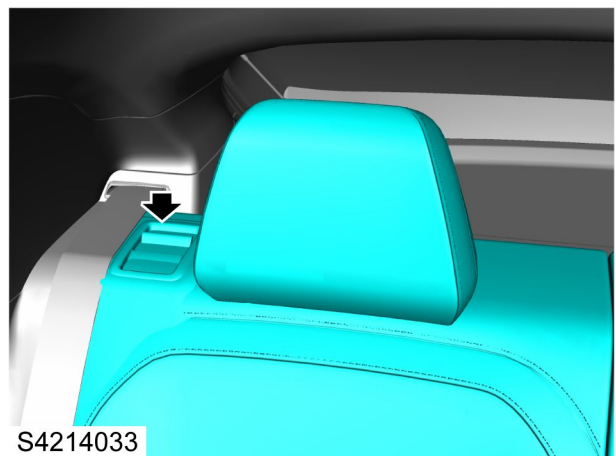
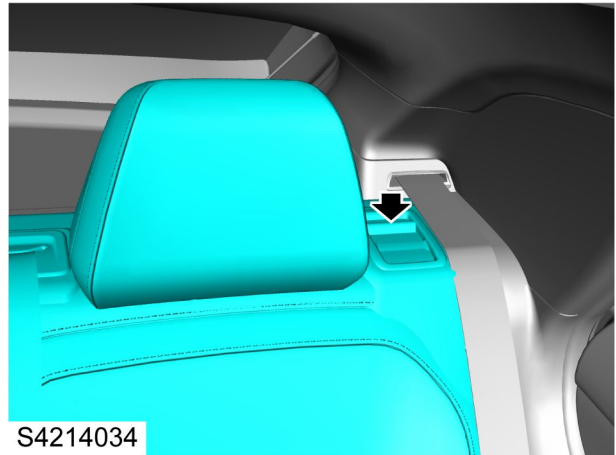
1. Remove the rear seat cushion assembly.

Rear Seat Cushion Assembly Remove

2. Remove 1 bolt fixing the rear centre seat belt to the body.



3. Unlock the control lock knobs on the top of both sides of the seat back to fold the rear seat back down.



4. Lift the rear seat back upward to respectively remove both sides of the rear seat back from the bracket, and remove the rear seat back from the vehicle.

Refit

1. Locate both sides of the rear seat back on the bracket and fit it in place.

2. Pull up the control lock knob on the top of the seat back, and unfold the rear seat back upward to the rearmost position.
3. Fix the rear centre seat belt to the body, fit 1 bolt, tighten it to **35-45Nm**, and check the torque.
4. Fit the rear seat cushion assembly.

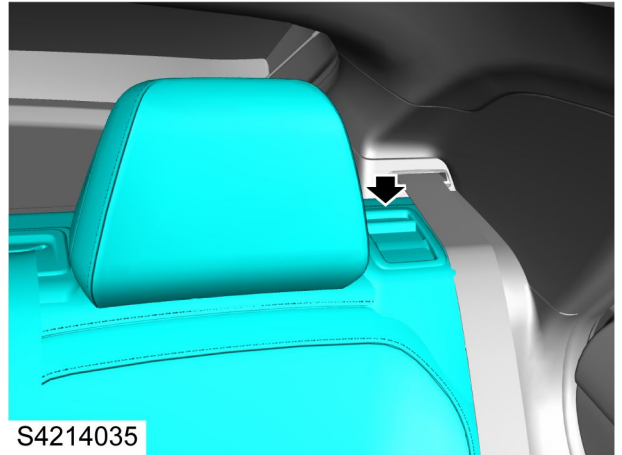
 **Rear Seat Cushion Assembly Refit**

Rear Seat Back Cover Remove

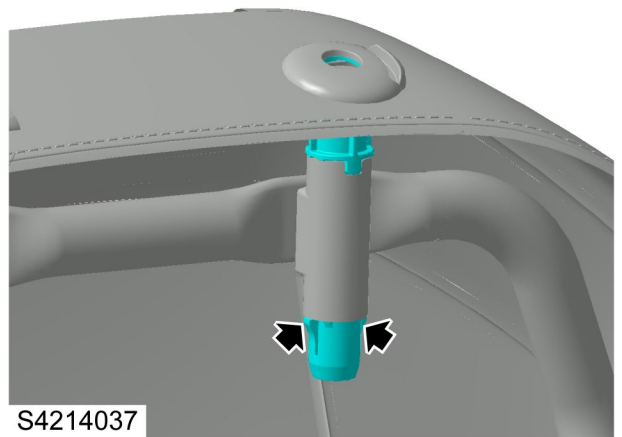
1. Remove the rear seat back assembly.

 **Rear Seat Back Assembly Remove**

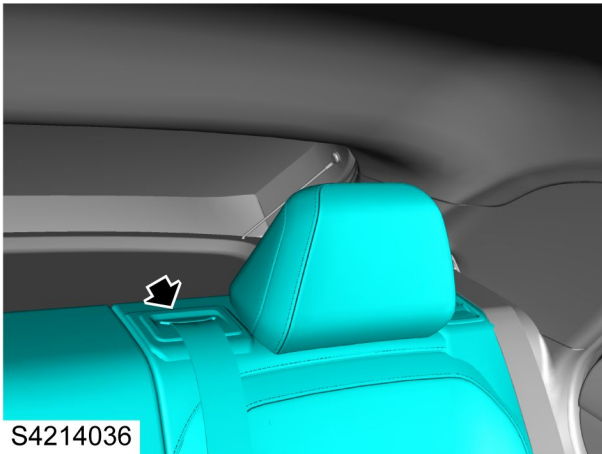
2. Press and hold the left guide sleeve button of the headrest, and pull the headrest upward to remove it.
3. Pry off the clip fixing the seat back control lock frame, and remove the seat back control lock frame.



4. Pry off the clip fixing the front and rear covers of the rear seat back, and separate the front and rear covers.
5. Unzip the zipper upward, press the clip from the hole of the seat back frame, and push out the headrest guide sleeve upward.



6. Pry off the clip fixing the rear centre seat belt frame to the rear seat back, and pass the rear centre seat belt through the fascia hole.



7. Mark the locations of the C-rings fixing the seat back cover and foam, remove them, then remove the cover and foam.

Refit

1. Align the cover with the front of the seat back foam and secure with C-rings.
2. Fix the seat back cover and foam on the seat back frame.
3. Pass the rear centre seat belt through the seat belt hole, fix the rear centre seat belt frame to the seat back, and press the clip in place.
4. Fit 2 seat headrest adjusting guide sleeves on the seat back frame, and zip up the cover.
5. Fix the front and back covers of the seat back in place with clips.
6. Fix the seat back control lock frame to the seat back, and press the clip in place.
7. Locate the headrest correctly on the headrest mounting guide sleeve, and insert it into the guide sleeve. Press and hold the button, push the headrest down to the appropriate position.
8. Fit the rear seat back assembly.

Rear Seat Back Assembly Refit

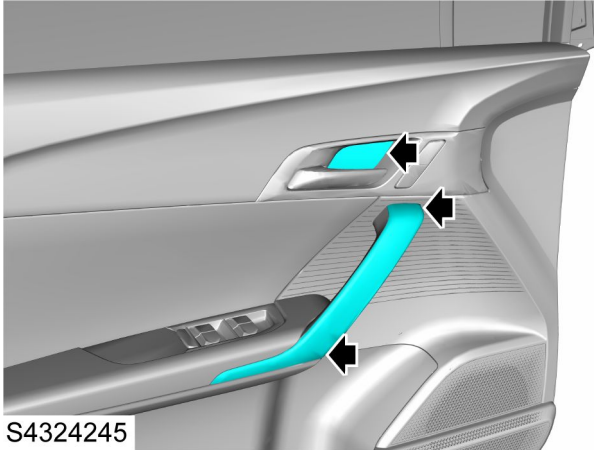
Door Interior Trim

Service Guide

Front Door Interior Trim Panel

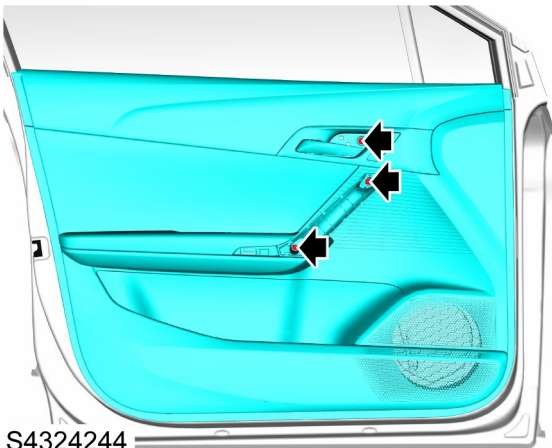
Remove

1. Disconnect the negative battery cable.
2. Pry off the inner handle screw trim cover and the front door armrest screw trim cover.



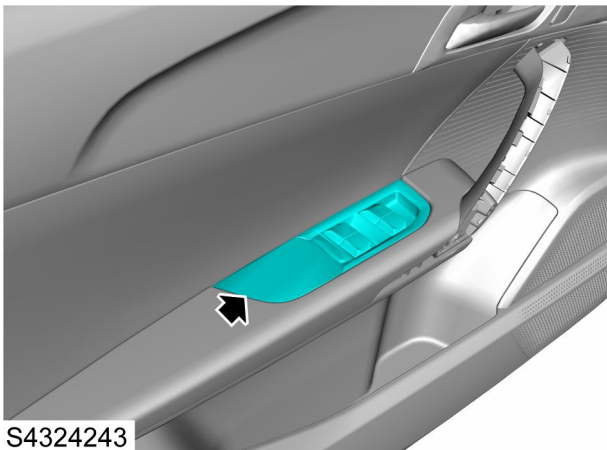
S4324245

3. Remove 3 screws fixing the front door interior trim panel to the door.



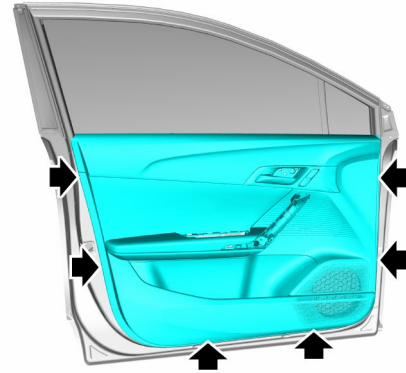
S4324244

4. Pry off the front door window regulator switch, and disconnect the harness connector from the back.



S4324243

5. Pry off the clip fixing the front door interior trim panel to the door, remove and discard the clip.



S4324242

6. Disconnect the stay wire of the interior handle cable assembly, disconnect the harness connector, and remove the front door interior trim panel.

Refit

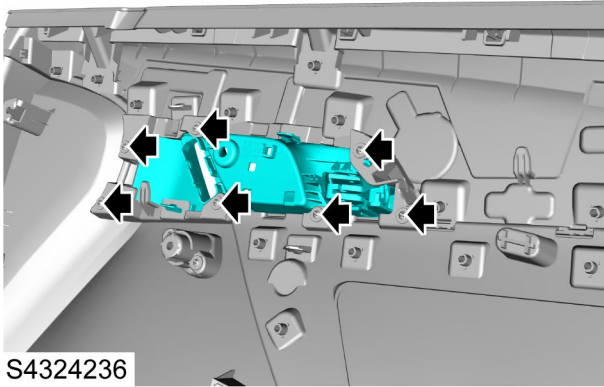
1. Connect the harness connector, fit the stay wire of the interior handle cable assembly, align the new clip with the corresponding panel mounting hole, and fix the front door interior trim panel to the door.
2. Connect the harness connector, fit the front door window regulator switch, and press the clip in place.
3. Fit and tighten 3 screws fixing the front door trim panel to the door, and fit the screw trim cover.
4. Connect the negative battery cable.

Front Door Inner Handle Remove

1. Remove the front door trim panel.

Front Door Trim Panel Remove

2. Remove 7 screws fixing the front door inner handle to the interior trim panel.



3. Remove the front door inner handle from the door interior trim panel.

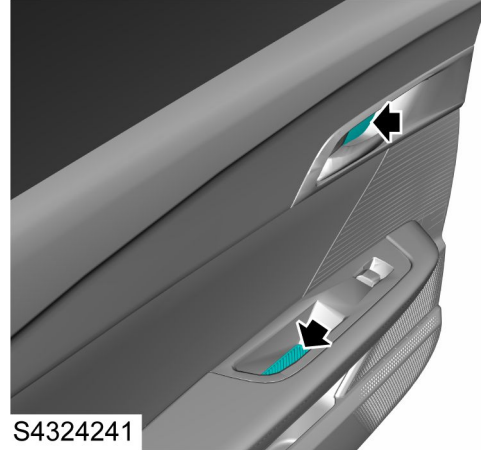
Refit

1. Fix the front door inner handle to the interior trim panel, fit and tighten 7 screws.
2. Fit the front door trim panel.

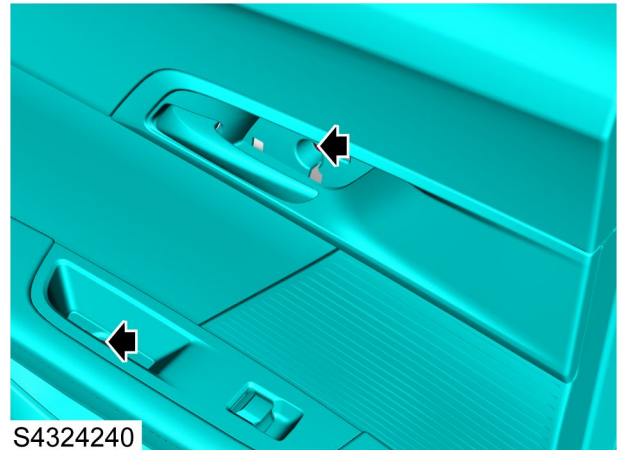
Front Door Trim Panel Refit

Rear Door Interior Trim Panel Remove

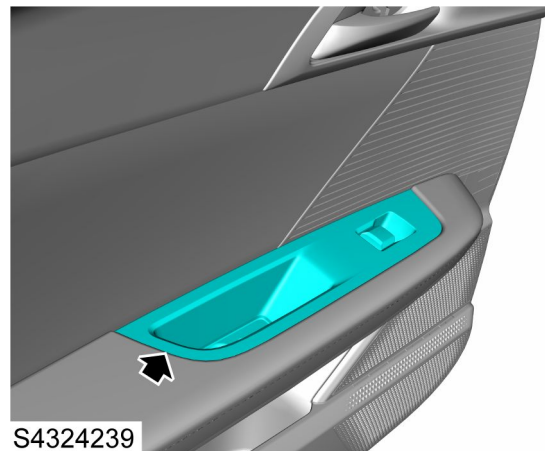
1. Disconnect the negative battery cable.
2. Pry off the inner handle screw trim cover and the rear door pull cup screw trim cover.



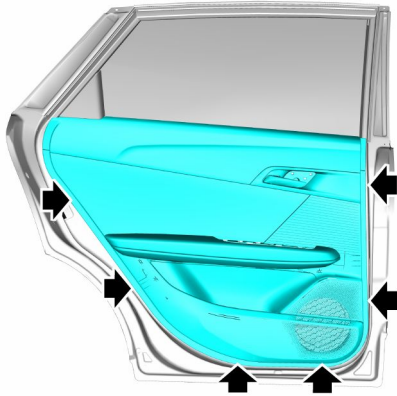
3. Remove 2 screws fixing the rear door trim panel to the door.



4. Pry off the rear door window regulator switch, and disconnect the harness connector from the back.



5. Remove the rear door window interior trim panel assembly, pry off the clips fixing the rear door interior trim panel to the door, remove and discard the clips.



S4324238

6. Disconnect the stay wire of the interior handle cable assembly, disconnect the harness connector, and remove the rear door interior trim panel.

Refit

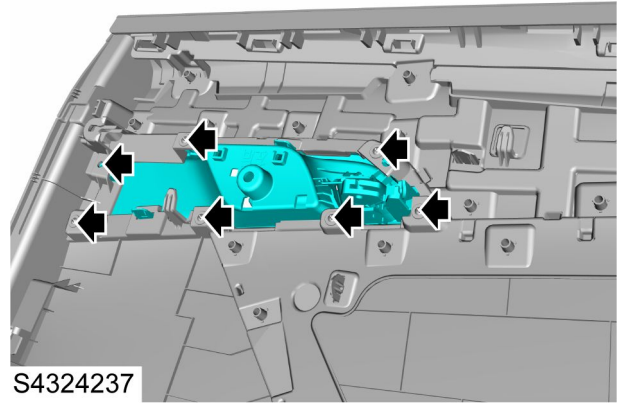
1. Connect the harness connector, fit the stay wire of the interior handle cable assembly, align the new clip with the corresponding panel mounting hole, and fix the rear door interior trim panel to the door.
2. Fit the rear door window interior trim panel assembly, connect the harness connector, fit the rear door window regulator switch, and press the clip in place.
3. Fit and tighten 2 screws fixing the rear door trim panel to the door, and fit the screw trim cover.
4. Connect the negative battery cable.

Rear Door Inner Handle Remove

1. Remove the rear door trim panel.

 **Rear Door Trim Panel Remove**

2. Remove 7 screws fixing the rear door inner handle to the rear door interior trim panel.



S4324237

3. Remove the rear door inner handle from the door interior trim panel.

Refit

1. Fix the rear door inner handle to the interior trim panel, fit and tighten 7 screws.
2. Fit the rear door trim panel.

 **Rear Door Trim Panel Refit**

Interior Trim Panel**Specification****Torque**

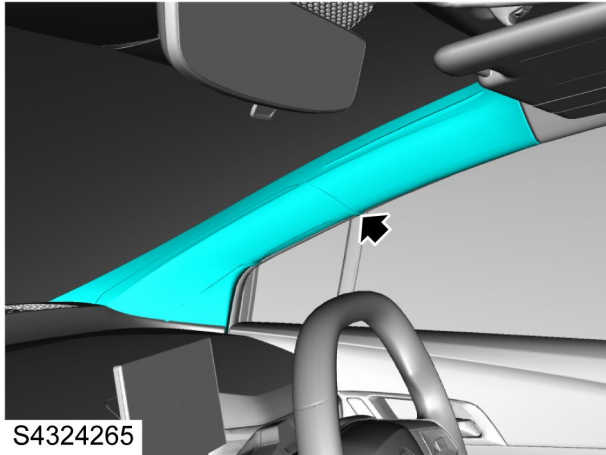
Description	Value
Bolt-Front seat belt to body	35-45Nm
Bolt-Rear seat belt to body	35-45Nm

Service Guide

A Pillar Upper Trim Panel

Remove

1. Pry open the front door body side weatherstrips.
2. Pry open the clips of A pillar upper trim panel assembly.



3. Remove the A pillar upper trim panel assembly.

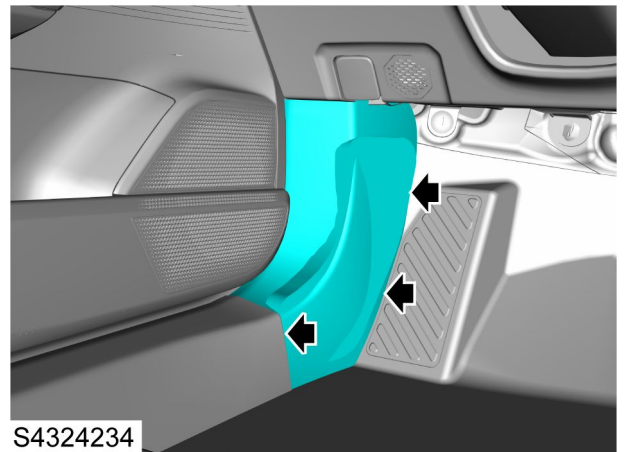
Refit

1. Locate the A pillar upper trim panel to the body, and press the clip in place.
2. Fit the front door weatherstrips at the A pillar upper trim panel assembly.

A Pillar Lower Trim Panel

Remove

1. Pull open the front door body side weatherstrip outside the A pillar lower trim panel assembly.
2. Pry open the front end clip of the door sill trim panel and separate the door sill trim panel from the lower end of the A pillar lower trim panel assembly.



3. Pry open the clips of A pillar lower trim panel assembly and remove the A pillar lower trim panel.

Refit

1. Fit the A pillar lower trim panel assembly, and ensure that the clip is fitted in place.
2. Insert the front end clip of the door sill trim panel into the hole of the A pillar lower trim panel and ensure that it is fitted in place.
3. Fit the front door weatherstrip.

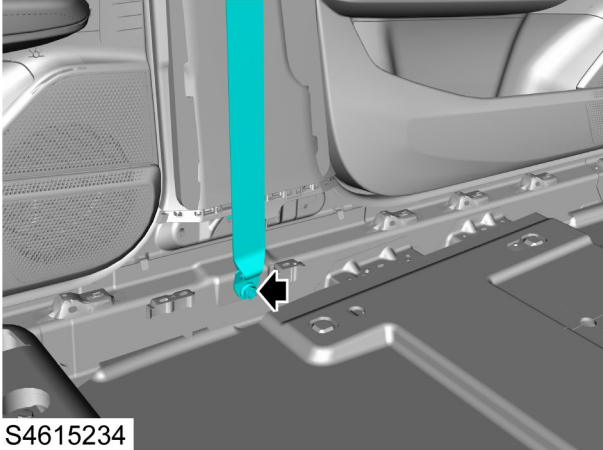
B Pillar Upper Trim Panel

Remove

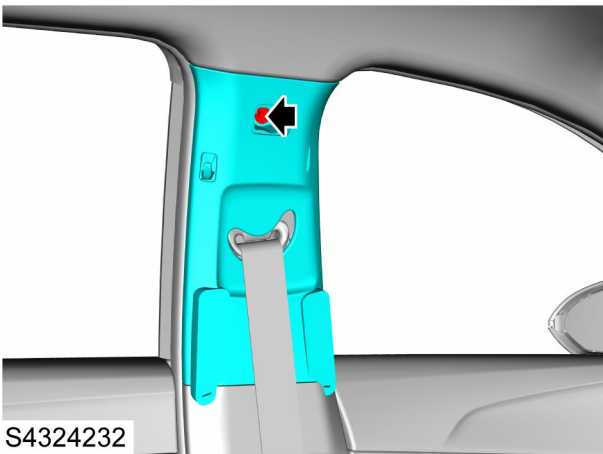
1. Pull open the door weatherstrips on both sides of the B pillar upper trim panel assembly.
2. Remove the door sill trim panel assembly.

Door Sill Trim Panel Assembly Remove

3. Remove 1 bolt fixing the front seat belt to the body.



4. Pry open the upper clip of the B pillar lower trim panel to separate the B pillar upper trim panel from the upper part of B pillar lower trim panel assembly.
5. Pry open the screw trim cover of the B pillar upper trim panel, and remove 1 bolt fixing the B pillar upper trim panel to the body.



6. Pry open the retaining clip, remove the B pillar upper trim panel assembly and pull out the seat belt.

Refit

1. Pass the seat belt through the hole of the B pillar upper trim panel assembly.
2. Locate the B pillar upper trim panel assembly to the B pillar and press the clip in place.
3. Fit and tighten 1 bolt fixing the B pillar upper trim panel to the body, and fit the screw trim cover.
4. Locate the B pillar lower trim panel to the lower end of the B pillar upper trim panel, and press the clip in place.
5. Fix the seat belt to the body, fit 1 bolt, tighten it to

35-45Nm, and check the torque.

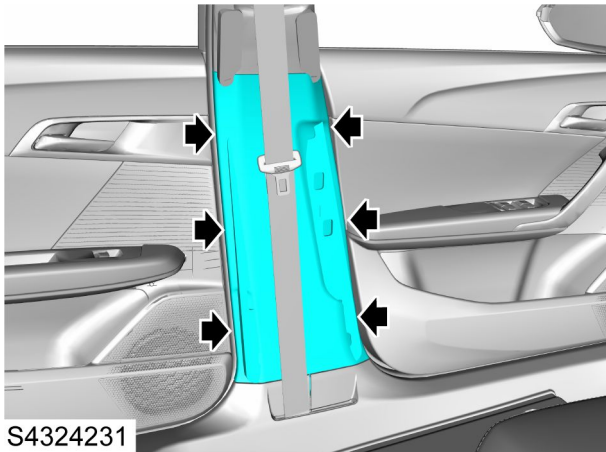
6. Fit the door sill trim panel assembly.

Door Sill Trim Panel Assembly Refit

7. Fit the door weatherstrips on both sides of the B pillar upper trim panel assembly.

B Pillar Lower Trim Panel Remove

1. Pull open the door weatherstrips on both sides of the B pillar lower trim panel assembly.
2. Pry open the clip at the joint of door sill trim panel and B pillar lower end.
3. Pry open the retaining clip of the B pillar lower trim panel, and remove the B pillar lower trim panel assembly.



Refit

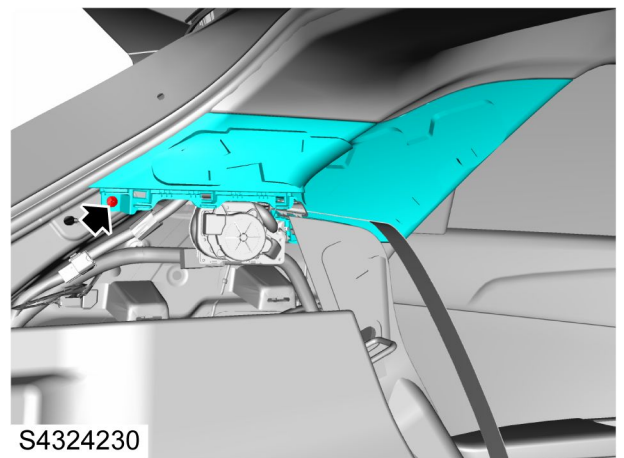
1. Locate the B pillar lower trim panel assembly on the B pillar, and fit the clip in place.
2. Fit the retaining clip at the joint between the door sill trim panel and the lower end of B pillar in place.
3. Fit the door weatherstrips on both sides of the B pillar lower trim panel assembly.

C Pillar Upper Trim Panel Remove

1. Fold the rear seat back downwards.
2. Pull open the rear door frame weatherstrips.
3. Pry open the upper clip of the C pillar lower trim panel to separate the C pillar upper trim panel from the upper part of C pillar lower trim panel assembly.
4. Remove the rear parcel shelf support plate assembly.

Rear Parcel Shelf Support Plate Assembly Remove

5. Remove 1 screw fixing the C pillar upper trim panel to the body, carefully pry open the retaining clip along the edge of C pillar upper trim panel and remove the C pillar upper trim panel.



Refit

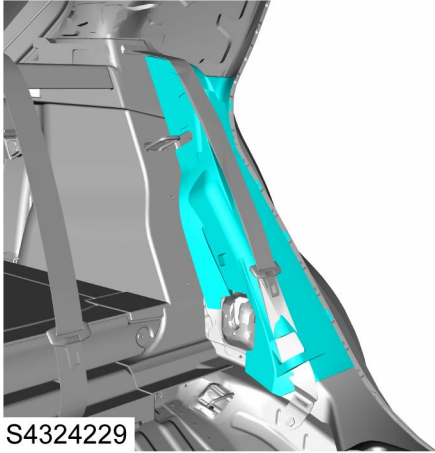
1. Fit the C pillar upper trim panel to the body, fit 1 screw, tighten it, and ensure that the clip is fitted in place.
2. Fit the rear parcel shelf support plate.

Rear Parcel Shelf Support Plate Refit

3. Insert the upper end of the C pillar lower trim panel into the hole of the C pillar upper trim panel, and ensure that the clip is fitted in place.
4. Fit the weatherstrips of the rear door frame in place.
5. Lift the rear seat back and lock the buckle.

C Pillar Lower Trim Panel Remove

1. Pull up the rear door body side weatherstrip.
2. Fold the rear seat back downwards.
3. Carefully pry open the retaining clip on the C pillar lower trim panel and remove the C pillar lower trim panel.



Refit

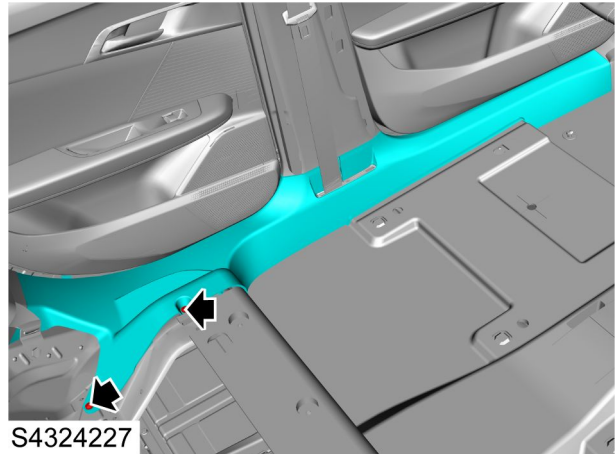
1. Fit the D pillar lower trim panel to the body, and ensure that the clip is fitted in place.
2. Lift the rear seat back and lock the buckle.
3. Fit the weatherstrips of the rear door frame in place.

Door Sill Trim Panel Assembly Remove

1. Pull open the front and rear door weatherstrips at the door sill trim panel.
2. Remove the rear seat cushion assembly.

Rear Seat Cushion Assembly Remove

3. Remove 2 screws fixing the door sill trim panel assembly to the body.



4. Pry open the clip at the joint of door sill trim panel and lower end of C pillar lower trim panel.
5. Loosen the clip, and remove the door sill trim panel assembly.

Refit

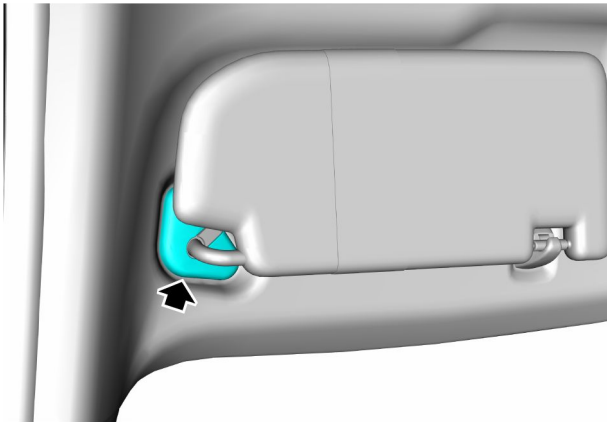
1. Locate the door sill trim panel to the body, and press the clip in place.
2. Fit the clip at the junction between the door sill trim panel and the lower end of D pillar lower trim panel in place.
3. Fit and tighten 2 screws fixing the door sill trim panel to the body.
4. Fit the rear seat cushion assembly.

Rear Seat Cushion Assembly Refit

5. Fit the front and rear door weatherstrips.

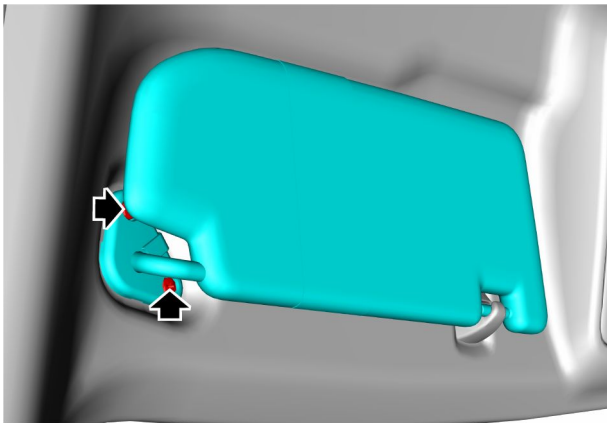
Sun Visor Assembly Remove

1. Flip down the sun visor, and remove the trim cover of the sun visor screw.



S4333987

2. Remove 2 screws fixing the sun visor to the roof trim panel and remove the sun visor from the sun visor bracket.



S4333986

3. Pry open the trim cover of the sun visor bracket screw and the clip fixing the sun visor bracket to the headliner, and remove the sun visor bracket.



S4333985

Refit

1. Align the adapter of the sun visor bracket to the adapter of the roof interior trim panel, push it hard to the end and fasten it, and fit the screw trim cover.

2. Fix one end of the sun visor to the sun visor bracket and the other end to the roof interior trim panel, fit and tighten 2 screws.
3. Fit the sun visor screw trim cover, and reset the sun visor.

Roof Interior Trim Remove

1. Disconnect the negative battery cable and fold down the seat back.
2. Remove the A pillar upper trim panel assembly.

A Pillar Upper Trim Panel Assembly Remove

3. Remove the sun visor assembly.

Sun Visor Assembly Remove

4. Remove the B pillar upper trim panel assembly.

B Pillar Upper Trim Panel Assembly Remove

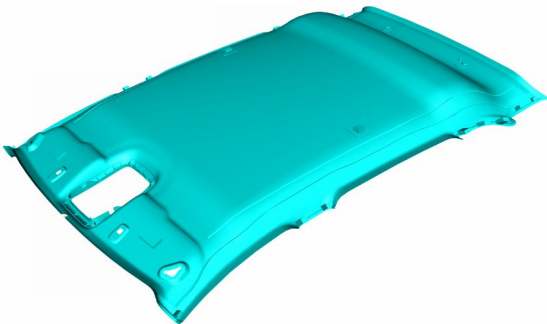
5. Remove the C pillar upper trim panel assembly.

C Pillar Upper Trim Panel Assembly Remove

6. Remove the overhead console and front reading lamp assembly.

Overhead Console and Front Reading Lamp Assembly Remove

7. Release the retaining clip, and carefully remove the roof interior trim panel from the tail gate.



S4333984

Refit

1. Locate the roof interior trim panel to the body, and press the clip in place.
2. Fit the roof console.

Roof Console Refit

3. Fit the C pillar upper trim panel assembly.

C Pillar Upper Trim Panel Assembly Refit

4. Fit the B pillar upper trim panel assembly.

B Pillar Upper Trim Panel Assembly Refit

5. Fit the sun visor assembly.

Sun Visor Assembly Refit

6. Fit the A pillar upper trim panel assembly.

A Pillar Upper Trim Panel Assembly Refit

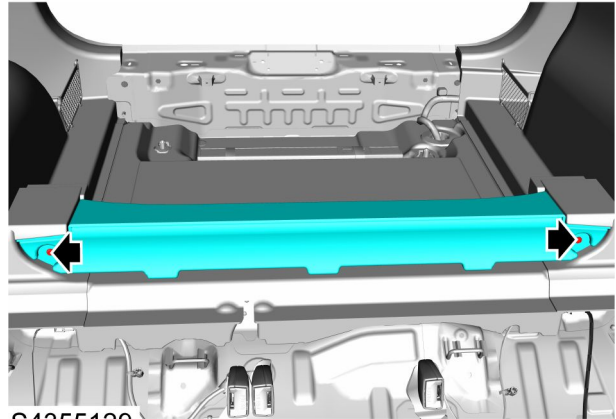
7. Restore the seat adjustment and connect the negative battery cable.

Trunk Side Trim Panel Remove

1. Open the tail gate, and remove the trunk carpet.
2. Remove the trunk sill trim panel.

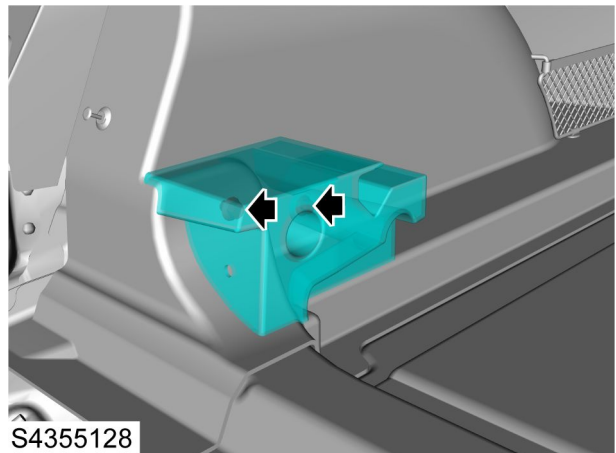
Trunk Sill Trim Panel Remove

3. Remove 2 screws fixing the trunk carpet support plate to the body, and remove the trunk sill carpet support plate and fold down the seat back.



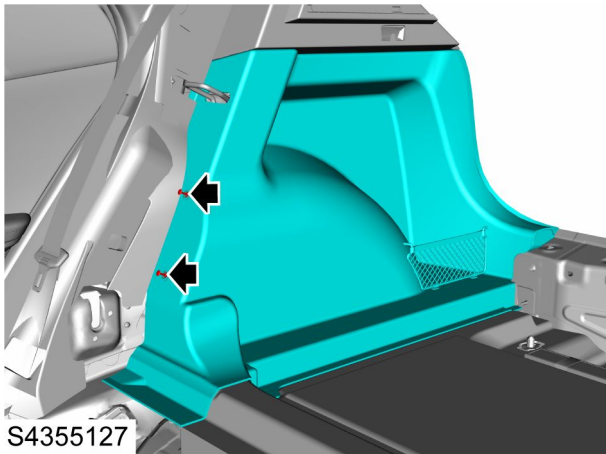
S4355129

4. Remove 2 bolts fixing the trunk carpet right (left) bracket to the body, and remove the trunk carpet right (left) bracket.

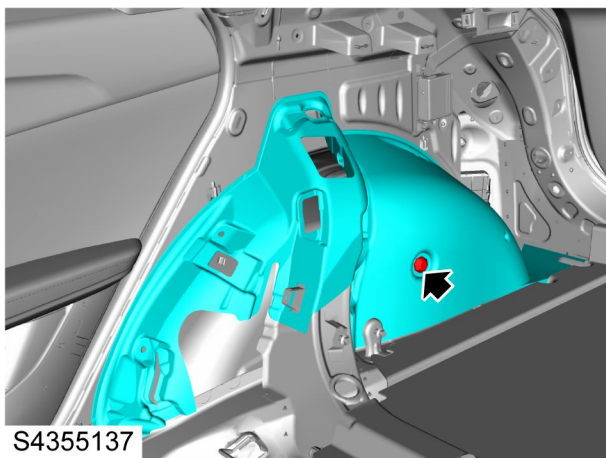


S4355128

5. Pry open the clip at the edge of the rear parcel shelf, and lift up part of rear parcel shelf.
6. Pry open the clip at the edge of the D pillar lower trim panel, and remove some trunk weatherstrips.
7. Remove the clip fixing the trunk right (left) trim panel to the body and remove the trunk right (left) trim panel assembly.



8. If necessary, remove the liner sound insulation pad from the rear wheelhouse assembly.



Refit

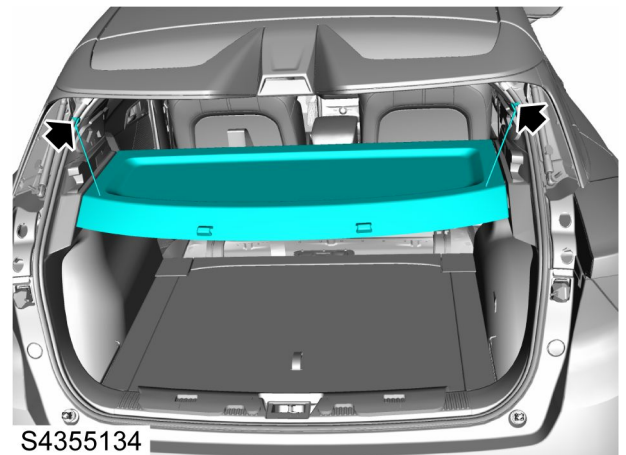
1. If necessary, locate the rear wheelhouse sound insulation pad to the rear wheelhouse liner.
2. Locate the left trunk side trim panel to the trunk, and snap it into place.
3. Fit the clip of the C pillar lower trim panel and press it in place.
4. Restore part of the rear parcel shelf and fix it with clips.
5. Fit 2 bolts fixing the trunk carpet right (left) side bracket to the body and tighten them.
6. Fit 2 screws fixing the trunk carpet support plate to the body and tighten them.
7. Fit the trunk sill trim panel.

Trunk Sill Trim Panel Refit

8. Fit the trunk carpet, and close the tail gate.

Rear Parcel Shelf Remove

1. Open the tailgate.
2. Remove 2 slings of the rear parcel shelf on the tail gate.



3. Lift the rear parcel shelf to separate it from the retaining slot, pull out and remove the rear parcel shelf.

Refit

1. Insert the tail end of the rear parcel shelf into the slot of the luggage cover support plate assembly of the trunk and push it in place.
2. Hang 2 slings on the tail gate.
3. Close the tail gate.

Rear Parcel Shelf Support Plate Remove

1. Fold down the rear seat back.
2. Remove the rear parcel shelf assembly

Rear Parcel Shelf Assembly Remove

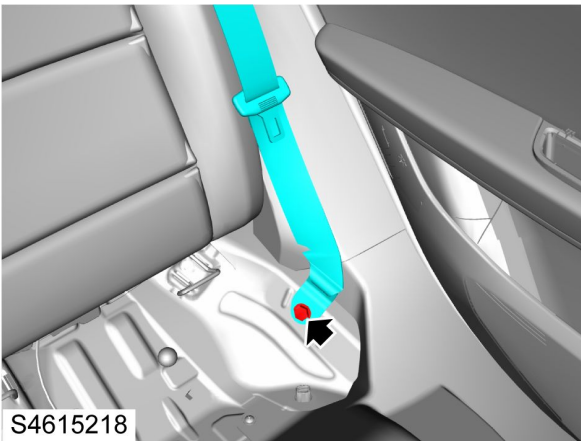
3. Remove the C pillar lower trim panel.

C Pillar Lower Trim Panel Remove

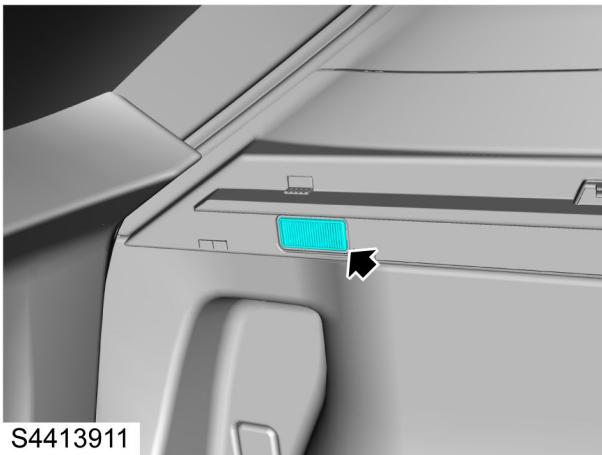
4. Remove the rear seat cushion.

Rear Seat Cushion Remove

5. Remove 1 bolt fixing the left(right) rear seat belt to the body.



6. Pry open the clip fixing the trunk lamp to the rear parcel shelf side trim panel, disconnect the harness connector and remove the trunk lamp assembly.



7. Pry open some clips on the upper part of the trunk side trim panel, to separate it from the rear parcel shelf support plate.
8. Pry open the clips, to pass the rear seat belt assembly through the rear parcel shelf support plate, and remove the rear parcel shelf support plate.

Refit

1. Align the clip of the rear parcel shelf side trim panel to the hole of the body, press it hard and fasten it.
2. Reset the upper part of the trunk side trim panel to the

parcel shelf support plate.

3. Connect the harness connector, fix the trunk lamp to the rear parcel shelf side trim panel, press the clip in place, and fit the trunk lamp assembly.
4. Fit 2 bolts fixing the rear seat belt to the body, tighten them to **35-45Nm**, and check the torque.
5. Fit the rear seat cushion assembly.

Rear Seat Cushion Assembly Refit

6. Fit the C pillar lower trim panel.

C Pillar lower Trim Panel Refit

7. Fit the rear parcel shelf.

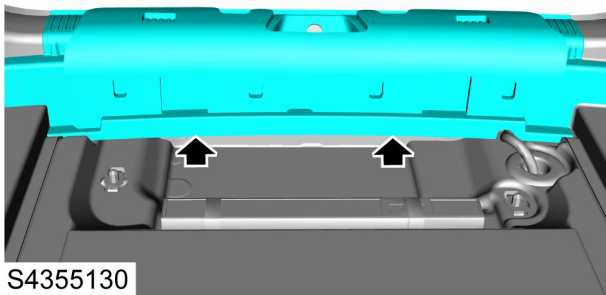
Rear Parcel Shelf Assembly Refit

8. Restore the rear seat back.

Trunk Sill Trim Panel

Remove

1. Open the tail gate, and remove the trunk carpet.
2. Pry up some trunk weatherstrips, release the clip and remove the trunk sill trim panel.



S4355130

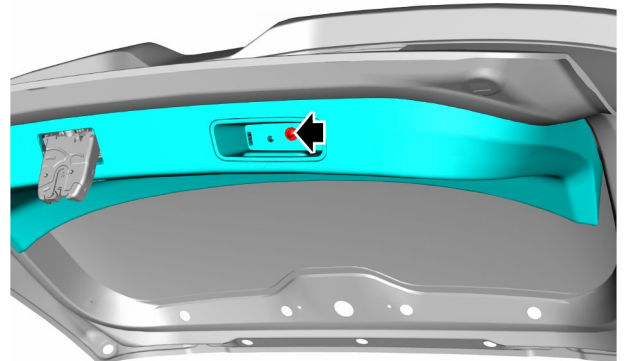
Refit

1. Locate the trunk sill trim panel to the body, snap it into place, and restore part of the trunk weatherstrips.
2. Fit the trunk carpet, and close the tail gate.

Tail Gate Trim Panel

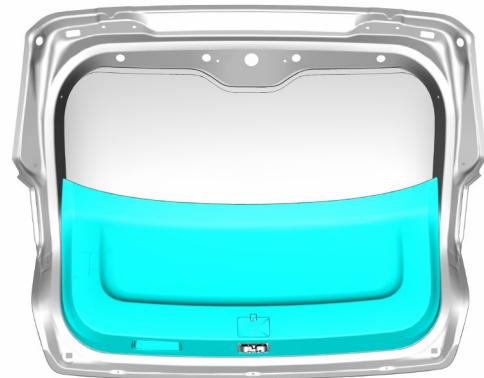
Remove

1. Open the tail gate, and remove the lock sleeve.
2. Pry open the trim cover of the tail gate lower trim panel screw, and remove 1 screw fixing the tail gate trim panel to the tail gate.



S4324226

3. Pry open the retaining clip, and remove the tail gate trim panel.



S4324225

Refit

1. Locate the tail gate trim panel to the tail gate, and press the clip in place.
2. Fit and tighten 1 screw fixing the tail gate trim panel to the tail gate.
3. Fit the tail gate trim panel screw trim cover, and press the clip in place.
4. Fit the lock sleeve, and close the tail gate.

Carpet Remove

1. Disconnect the negative battery cable.
2. Remove the front seat assembly.

Front Seat Assembly Remove

3. Remove the centre console assembly.

Centre Console Assembly Remove

4. Remove the door sill trim panel assembly.

Door Sill Trim Panel Assembly Remove

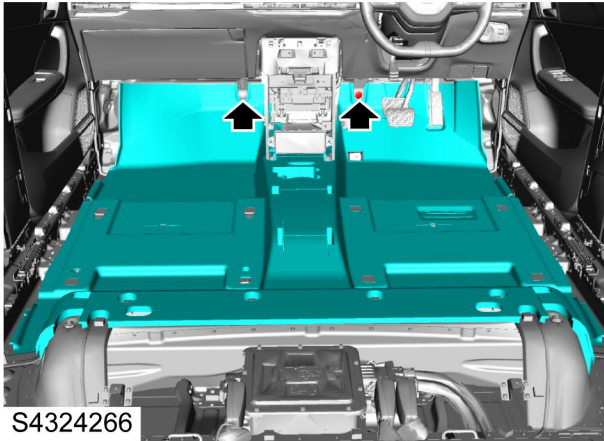
5. Remove the A pillar lower trim panel.

A Pillar Lower Trim Panel Remove

6. Remove the rear seat cushion assembly.

Rear Seat Cushion Assembly Remove

7. Loosen the carpet retaining clip, disconnect the harness connector, and remove the carpet.



Refit

1. Arrange the carpet in the vehicle, connect the harness connector and secure with clips.
2. Fit the rear seat cushion assembly.

Rear Seat Cushion Assembly Refit

3. Fit the A pillar lower trim panel.

A Pillar Lower Trim Panel Refit

4. Fit the door sill trim panel assembly.

Door Sill Trim Panel Assembly Refit

5. Fit the centre console assembly.

Centre Console Assembly Refit

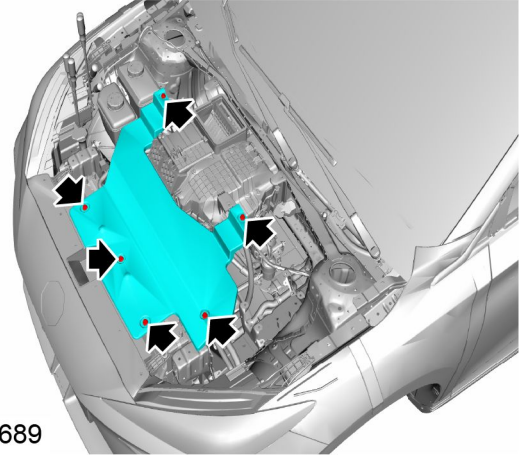
6. Fit the front seat assembly.

Front Seat Assembly Refit

7. Connect the negative battery cable.

Beauty Cover Remove

1. Open the bonnet.
2. Remove 6 clips fixing the beauty cover to the body and remove the beauty cover.



Refit

1. Position the beauty cover to the body and fix 6 clips, and ensure the clips are secured in place.
2. Close the bonnet.

Stationary Windows

Service Guide

Windscreen Remove

1. Remove the A/C air inlet grille assembly.

A/C Air Inlet Grille Side Corner, Panel and Accessories Remove

2. Remove the interior rearview mirror.

Manual Anti-dazzle Interior Rearview Mirror Assembly Remove - Manual Remove - Automatic

Automatic Anti-dazzle Interior Rearview Mirror Assembly Remove - Automatic

3. Remove the A pillar upper trim panel assembly.

A Pillar Upper Trim Panel Assembly Remove

4. Put suitable coverings inside and outside the vehicle to prevent scratches.
5. Put 2 suction cups symmetrically on both sides of the windscreen (outside).
6. Pierce a through-hole in the adhesive, pass a cutting wire through or use a cutter directly to cut the adhesive on the glass and surroundings.
7. Remove the windscreen with suckers on both sides aided by an assistant.
8. To refit, clean the adhesive on the original windscreen and the vehicle body.

Refit

1. Thoroughly clean the mounting position of the windscreen on the body and the windscreen with cleaner.
2. Apply glass primer to the body assembly area of the windscreen.
3. Apply adhesive to the windscreen assembly, and press the windscreen into the windscreen frame with suction cups.
4. Fix the windscreen to the windscreen frame with tapes, and let the adhesive dry for 24 hours, and remove the tapes.
5. Pour the water on the windscreen assembly, and check for leak. If any leak is found, dry the windscreen assembly and block the leaking location with adhesive. If it still leaks, remove the windscreen assembly and repeat all service procedures.
6. Fit the A pillar upper trim panel assembly.

A Pillar Upper Trim Panel Assembly Refit

7. Fit the interior rearview mirror.

Manual Anti-dazzle Interior Rearview Mirror Assembly Refit - Manual Refit - Automatic

Automatic Anti-dazzle Interior Rearview Mirror Assembly Refit - Automatic

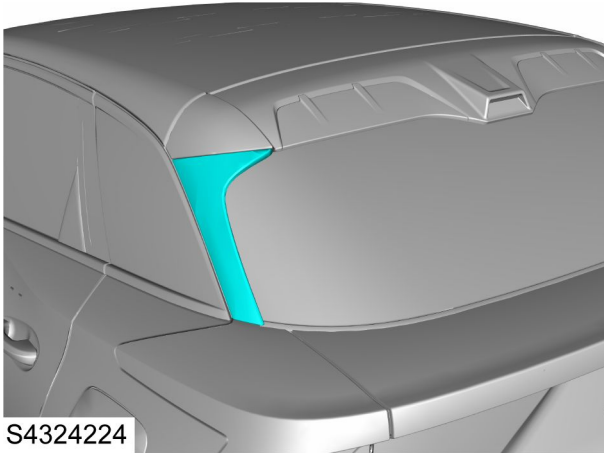
8. Fit the A/C air inlet grille assembly.

A/C Air Inlet Grille Side Corner, Panel and Accessories Refit

Rear Window Remove

tail gate, and press the clip in place.

1. Pry open the retaining clips on left/right sides of the D pillar exterior trim panel and remove the D pillar exterior trim panel.



S4324224

2. Remove the spoiler assembly.

Spoiler Assembly Remove

3. Put suitable coverings inside and outside the vehicle to prevent scratches.
4. Put 2 suction cups symmetrically on both sides of the rear window (outer side).
5. Pierce a through-hole in the adhesive, pass a cutting wire through or use a cutter directly to cut the adhesive on the glass and surroundings.
6. Remove the rear window with suction cups on both sides aided by an assistant.
7. To refit, clean the adhesive on the original rear window and the vehicle body.

Refit

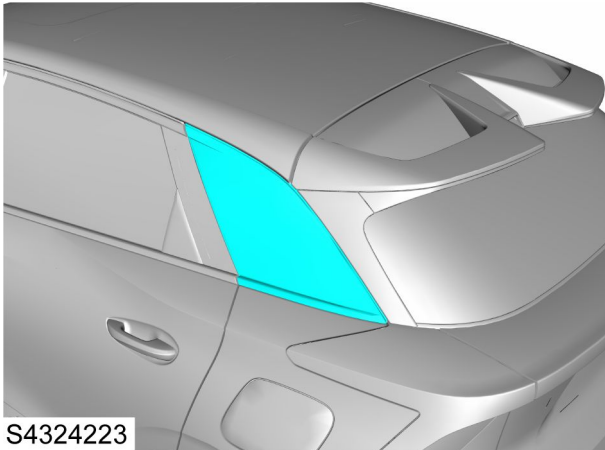
1. Thoroughly clean the mounting position of the rear window on the body and the rear window with cleaner.
2. Apply glass primer to the body assembly area of the rear window.
3. Apply adhesive to the rear window assembly, and press the rear window into the rear window frame with suction cups.
4. Fix the rear window to the rear window frame with tapes, and let the adhesive dry for 24 hours, and remove the tapes.
5. Pour the water on the rear window assembly, and check for leak. If any leak is found, dry the rear window assembly and block the leaking location with adhesive. If it still leaks, remove the rear window assembly and repeat the entire repair procedure.
6. Fit the spoiler assembly.

Spoiler Assembly Refit

7. Locate the left/right D pillar exterior trim panel to the

Rear Quarter Window**Remove**

1. Release the clip and remove the rear quarter window glass trim cover assembly from the vehicle.
2. Carefully cut the adhesive between the rear quarter window glass and the rear quarter window trim cover with a scraper and avoid scratching the surface paint.
3. Remove the rear quarter window glass from the rear quarter window.



S4324223

4. Remove the adhesive on the rear quarter window glass and rear quarter window trim cover with a knife.

Refit

1. Thoroughly clean the mounting position of the rear quarter window and area around the quarter window on the body with cleaner.
2. Apply adhesive on the rear quarter window, and locate the rear quarter window to the trim cover.
3. Fix the rear quarter window trim cover to the body, fit the clip and press it in place.
4. Pour water on the rear quarter window, and check for leak. If any leak is found, dry the rear quarter window and block the leaking location with adhesive. If it still leaks, remove the rear quarter window and repeat all service procedures.

Bumper, Fascia and Grille**Specification****Torque**

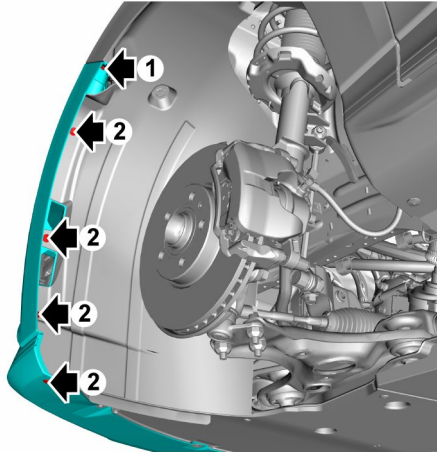
Description	Value
Bolt-The front bumper bracket to the wing side	3-4Nm
Bolt-Upper bracket to front end module	3-4Nm
Bolt-Middle bracket to front end module	3-4Nm
Bolt-Front bumper to upper bracket	3-4Nm
Bolt-Front bumper to headlamp	3-4Nm
Bolt-Front bumper to front bumper beam	4-6Nm
Bolt-Rear bumper to body	3-4Nm
Bolt-Rear bumper to Under flow duct	4-6Nm

Service Guide

Front Bumper

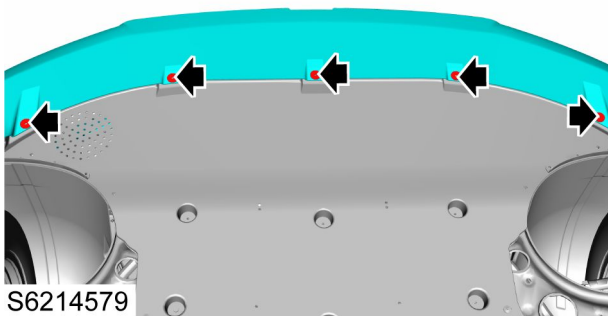
Remove

1. Disconnect the negative battery cable.
2. Remove 1 screw (1) fixing the front bumper to the left/right fender.
3. Remove 4 screws (2) fixing the front bumper to the left and right wheelhouse liners.



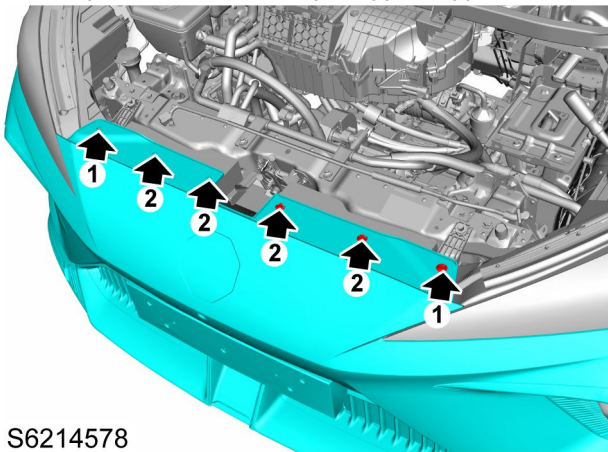
S6214580

4. Remove 5 bolts fixing the front bumper bottom to the front bumper beam.



S6214579

5. Remove 2 bolts (1) fixing the front bumper to the headlamp assembly and 4 bolts (2) fixing the front bumper to the front bumper upper support.

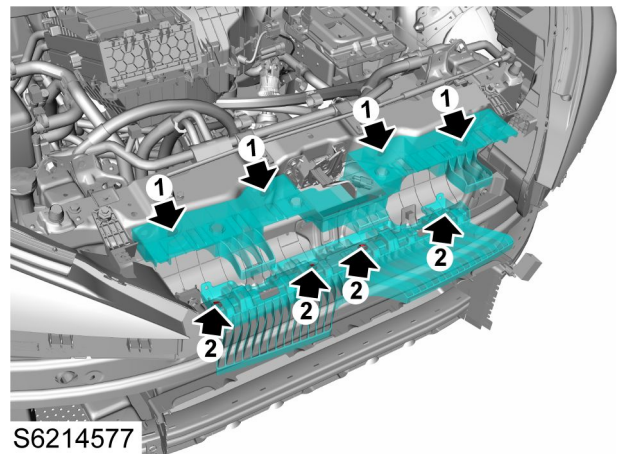


S6214578

6. With assistance, lift both sides of the front bumper

carefully and pull it outward, release the retaining clips, and separate the front bumper from the brackets on both sides of the body.

7. Disconnect the harness connector, and remove the front bumper.
8. Remove 4 bolts (1) fixing the front bumper upper support to the front-end module, and remove the front bumper upper support.
9. Remove 4 bolts (2) fixing the front bumper middle support to the front-end module, and remove the middle support.

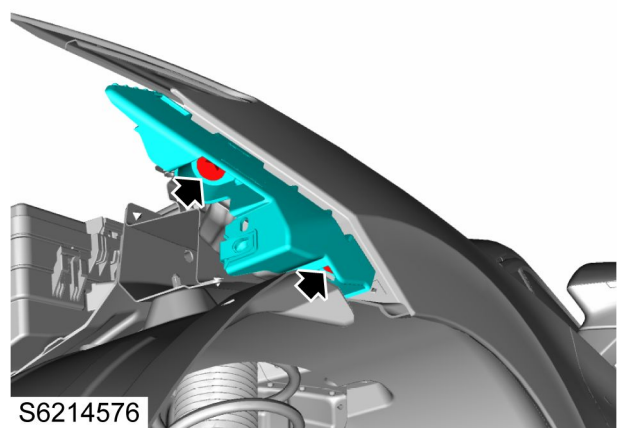


S6214577

10. Remove the front bumper side bracket.
 - a. Remove the headlamp assembly.

Headlamp Assembly Remove

- b. Remove 2 bolts fixing the front bumper left (right) side bracket to the fender, and remove the front bumper left (right) side bracket.



S6214576

Refit

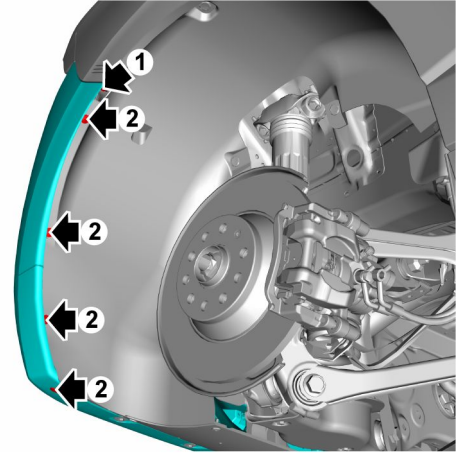
1. Fit the front bumper side bracket.
 - a. Fix the left (right) side bracket of the front bumper to the fender, fit 2 bolts, tighten them to **3-4Nm**, and check the torque.
 - b. Fit the headlamp assembly.

Headlamp Assembly Refit

2. Fit the harness clip, and fit 4 bolts fixing the front bumper upper bracket to the front-end module, tighten them to **3-4Nm**, and check the torque.
3. Fit 4 bolts fixing the middle support to the front-end module, tighten them to **3-4Nm**, and check the torque.
4. With assistance, locate the front bumper to the body, connect the harness connector, and press the clip in place.
5. Fit 4 bolts fixing the front bumper to the upper bracket, tighten them to **3-4Nm**, and check the torque.
6. Fit 2 bolts fixing the front bumper to the headlamp, tighten them to **3-4Nm**, and check the torque.
7. Fit 5 bolts fixing the bottom of front bumper to the front bumper beam, tighten them to **4-6Nm**, and check the torque.
8. Fit and tighten 4 screws fixing the front bumper to the left (right) front wheelhouse liner.
9. Fit and tighten 1 screw fixing the front bumper to the right (left) fender.
10. Connect the negative battery cable.

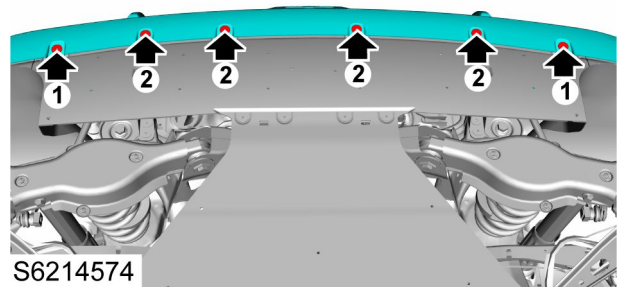
Rear Bumper Remove

1. Disconnect the negative battery cable, and open the tail gate.
2. Remove 1 screw (1) fixing the rear bumper to the body.
3. Remove 4 screws (2) fixing the rear bumper to the right/left wheelhouse liners.



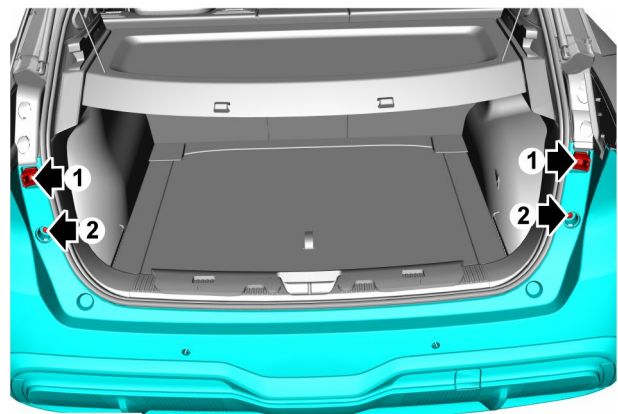
S6214575

4. Remove 2 bolts (1) fixing the rear bumper to the rear bottom deflector.
5. Remove 4 bolts (2) fixing the rear bumper to the rear bumper bracket.



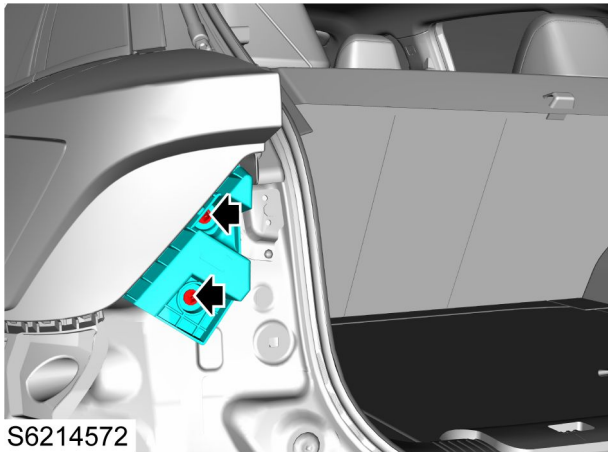
S6214574

6. Pry open the trim cover, remove 2 bolts (1) and 2 screws (2) fixing the rear bumper to the body.



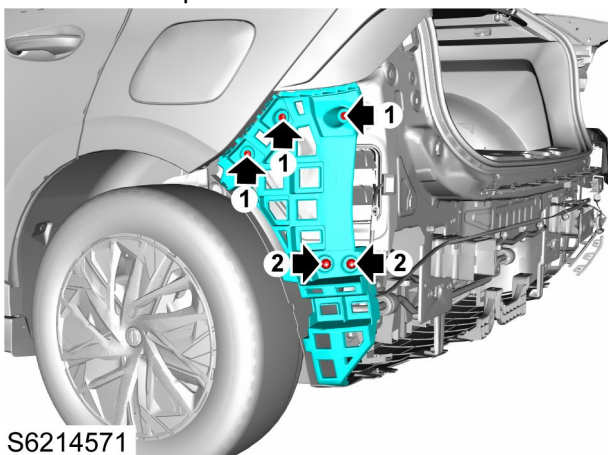
S6214573

7. With assistance, release the retaining clips, remove the rear bumper assembly, and disconnect the harness connector.
8. Remove 2 screws fixing the rear bumper left (right) side bracket to the body, and remove the rear bumper bracket.



S6214572

9. Remove 3 screws (1) and 2 nuts (2) fixing the rear bumper left (right) side bracket to the body, and remove the rear bumper side brackets.



S6214571

Refit

1. Fix the rear bumper left (right) side bracket to the body, fit and tighten 3 screws and 2 nuts.
2. Fix the rear bumper left (right) bracket to the body, fit and tighten 2 screws.
3. With assistance, locate the rear bumper to the body, connect the harness connector, and press the clip in place.
4. Fit 2 bolts and 2 screws fixing the rear bumper to the body, tighten them to **3-4Nm**, and fit the screw trim cover.
5. Fit and tighten 4 bolts fixing the rear bumper to the rear bumper bracket.
6. Remove 2 bolts fixing the rear bumper to the bottom deflector, tighten them to **4-6Nm**, and check the torque.
7. Fit and tighten 1 screw fixing the rear bumper to the

body.

8. Fit 4 screws fixing the rear bumper to the left (right) wheelhouse liner, and tighten them.
9. Connect the negative battery cable, and close the tail gate.

Body Exterior Trim**Specification****Torque**

Description	Value
Nut-Under the air intake grille support plate to body	4-6Nm
Bolt-Rear bottom diversion plate to the subframe	4-6Nm
Bolt-The Under flow duct bracket to CCU	4-6Nm
Bolt-Swing arm guard to low suspension arm	4-6Nm
Bolt-Rear bumper to Under flow duct	4-6Nm
Bolt-Rear bottom diversion plate to the bracket	4-6Nm
Bolt-Rear bottom diversion plate to the battery protection board	4-6Nm
Bolt-Front bottom diversion plate to the battery protection board	4-6Nm
Bolt-Front bottom diversion plate to the subframe	4-6Nm
Bolt-Front bottom diversion plate to the bracket of subframe	4-6Nm
Bolt-Under flow duct to front bumper	4-6Nm
Bolt-Spoiler to tail gate	5-7Nm

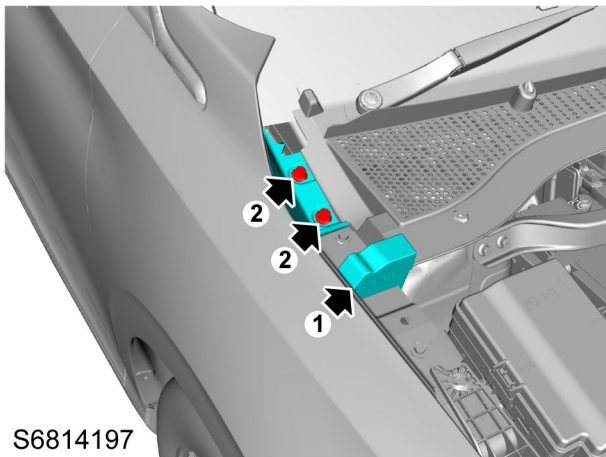
Service Guide

A/C Air Inlet Grille Panel and Accessories Remove

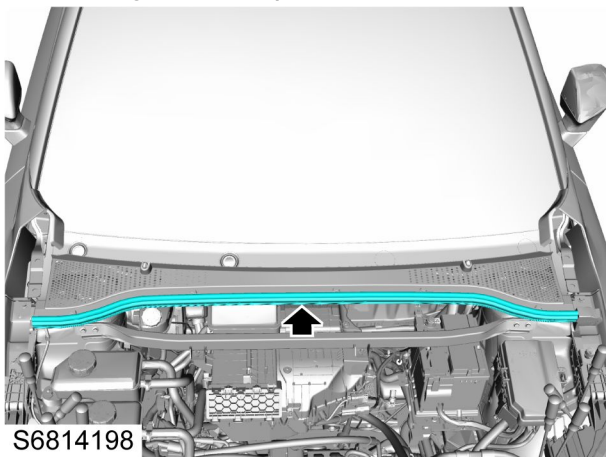
1. Open the bonnet.
2. Release the clips at the side corners of the A/C air inlet grille, and remove the side corners.



3. Remove the A/C air inlet grille assembly side water retaining block (1), and remove 2 split pins (2) fixing the A/C air inlet grille panel seals to the A/C air inlet grille assembly.



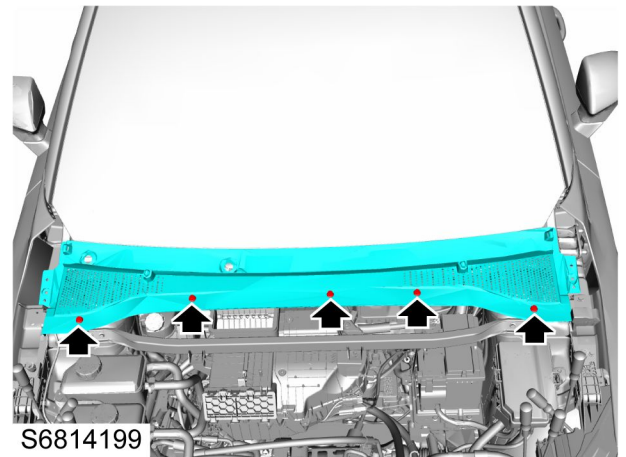
4. Remove the rear bonnet weatherstrips from the A/C air inlet grille assembly.



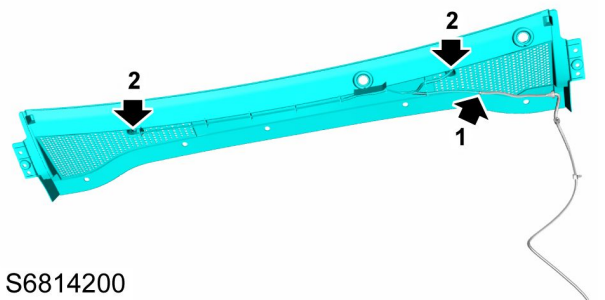
5. Remove the windscreen wiper arm assembly.

Windscreen Wiper Arm Assembly Remove

6. Remove 5 clips fixing the A/C air inlet grille to the body, and remove the A/C air inlet grille assembly.



7. Disconnect the windscreen washer nozzle hose from the windscreen washer pump hose (1), disconnect the washer nozzle hose from the nozzle (2), and remove the nozzle and washer nozzle hose.



Refit

1. Fit the nozzle to the A/C air inlet grille assembly and connect the windscreen washer nozzle hose and nozzle.
2. Connect the windscreen washer pump hose and the windscreen washer nozzle hose.
3. Locate the A/C air inlet grille to the body, fit 5 clips fixing the A/C air inlet grille to the body, and fix them in place.
4. Fit the windscreen wiper arm assembly.

Windscreen Wiper Arm Assembly Refit

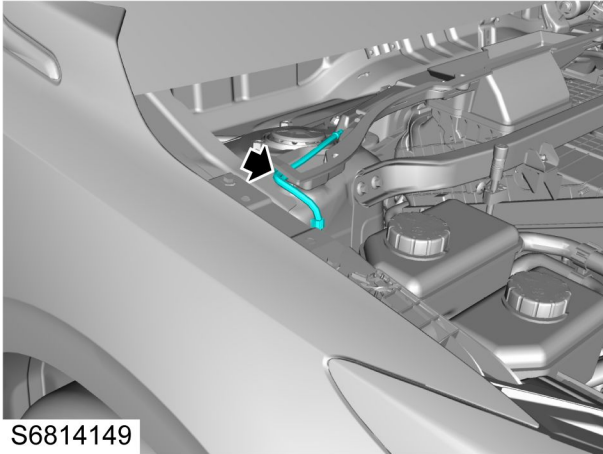
5. Fit the rear bonnet weatherstrip, and ensure that it is fixed in place.
6. Fit the water retaining block of the A/C air inlet grille, and ensure that it is fixed in place.
7. Fit 2 split pins fixing the seal to the A/C air inlet grille assembly, and ensure that they are fixed in place.
8. Fit the A/C air inlet grille side corner and ensure that the clip is fitted in place.
9. Close the bonnet.

A/C Air Inlet Grille Panel Lower Support Plate Remove

1. Remove the A/C air inlet grille panel and accessories.

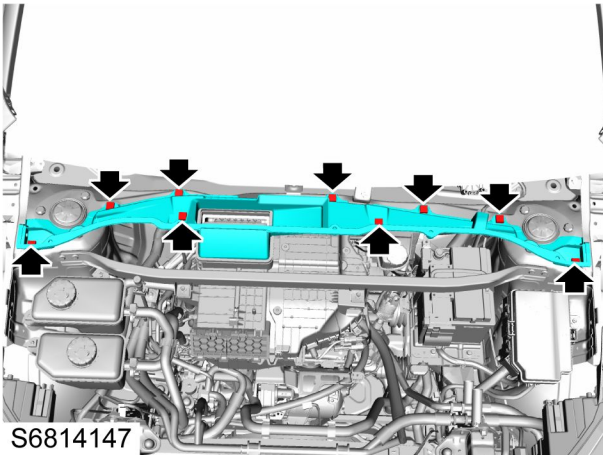
A/C Air Inlet Grille Panel and Accessories Remove

2. Pass the washer pump hose through the lower support plate of the A/C air inlet grille.



S6814149

3. Remove 9 nuts fixing the lower support plate of the A/C air inlet grille to the body.



S6814147

4. Remove the lower support plate assembly of the A/C air inlet grille.

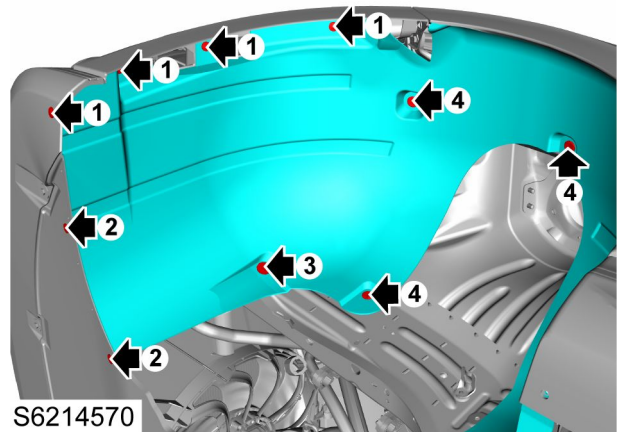
Refit

1. Fix the lower support plate assembly of the A/C air inlet grille to the body, fit 9 nuts, tighten them to **4-6Nm**, and check the torque.
2. Pass the washer pump hose through the lower support plate of the A/C air inlet grille, and ensure it is fitted in place.
3. Fit the A/C air inlet grille panel and accessories.

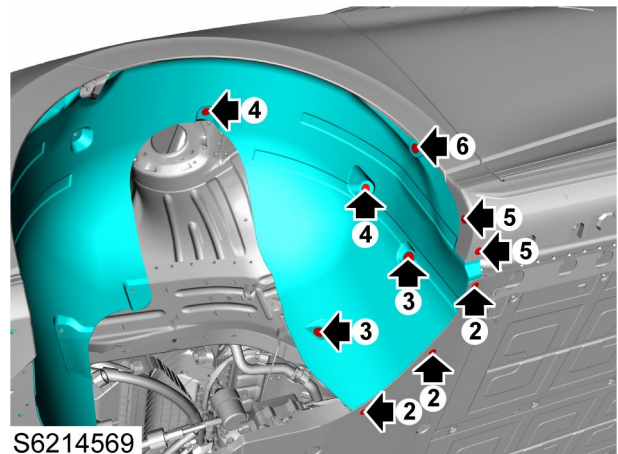
A/C Air Inlet Grille Panel and Accessories Refit

Front Wheelhouse Liner Assembly Remove

1. If necessary, raise the vehicle, and remove the tyre or adjust its position.
2. Remove 4 screws (1) fixing the front left wheelhouse liner to the front bumper.
3. Remove 5 screws (2) fixing the front left wheelhouse liner to the bottom deflector.
4. Remove 3 bolts (3) fixing the front left wheelhouse liner to the body.
5. Remove 4 clips (4) fixing the front left wheelhouse liner to the body.
6. Remove 2 screws (5) fixing the front left wheelhouse liner to the door sill moulding.
7. Remove 1 clip (6) fixing the front left wheelhouse liner to the front fender.



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8. Remove the front right wheelhouse liner as described above.

Refit

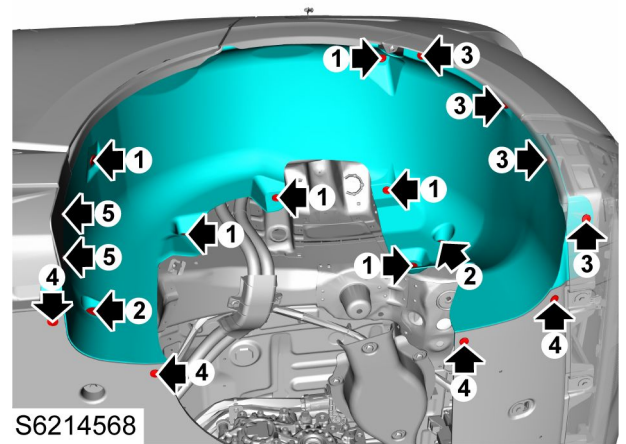
1. Fix the front left wheelhouse liner to the body and align it with the mounting hole.
2. Fit and tighten 2 clips fixing the left front wheelhouse liner to the front fender.
3. Fit and tighten 2 screws fixing the front left wheelhouse liner to the door sill moulding.

4. Fit 5 clips fixing the front left wheelhouse liner to the body.
5. Fit and tighten 3 bolts fixing the front left wheelhouse liner to the body.
6. Fit and tighten 5 screws fixing the left front wheelhouse liner to the bottom deflector.
7. Fit and tighten 4 screws fixing the left front wheelhouse liner to the front bumper.
8. Fit the front right wheelhouse liner as described above.

Rear Wheelhouse Liner Assembly

Remove

1. If necessary, raise the vehicle, and remove the tyre.
2. Remove 6 clips (1) fixing the rear left wheelhouse liner to the body.
3. Remove 2 nuts (2) fixing the rear left wheelhouse liner to the body.
4. Remove 4 screws (3) fixing the rear left wheelhouse liner to the rear bumper.
5. Remove 4 screws (4) fixing the rear left wheelhouse liner to the bottom deflector..
6. Remove 2 screws (5) fixing the rear left wheelhouse liner to the door sill moulding.



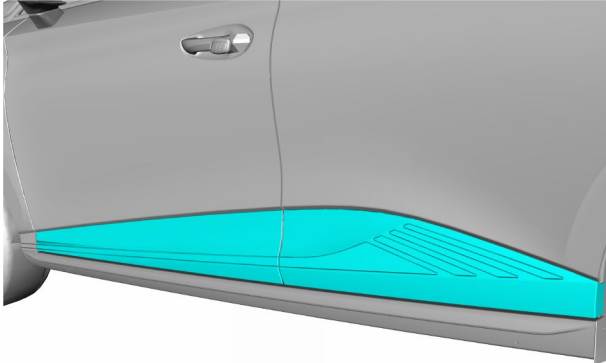
7. Remove the rear right wheelhouse liner as described above.

Refit

1. Fix the rear left wheelhouse liner to the body and align it with the mounting hole.
2. Fit and tighten 2 screws fixing the rear left wheelhouse liner to the door sill moulding.
3. Fit and tighten 4 screws fixing the rear left wheelhouse liner to the bottom deflector.
4. Fit and tighten 4 screws fixing the rear left wheelhouse liner to the rear bumper.
5. Fit and tighten 2 nuts fixing the rear left wheelhouse liner to the body.
6. Fit and tighten 6 clips fixing the left rear wheelhouse liner to the body.
7. Fit the rear right wheelhouse liner as described above.

**Chafing Strip
Remove**

1. Pry open the clip fixing the door moulding to front/rear left doors from the outside of the door, and remove the front/rear left door moulding.



S4324222

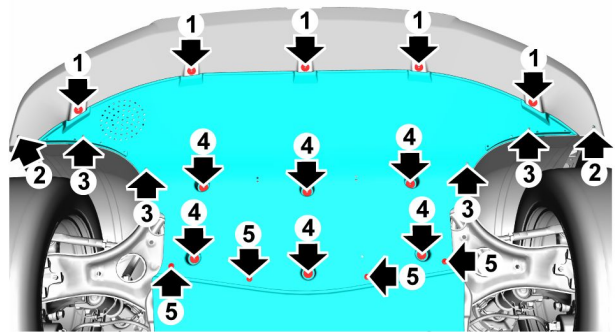
2. Remove the front/rear right door moulding as described above.

Refit

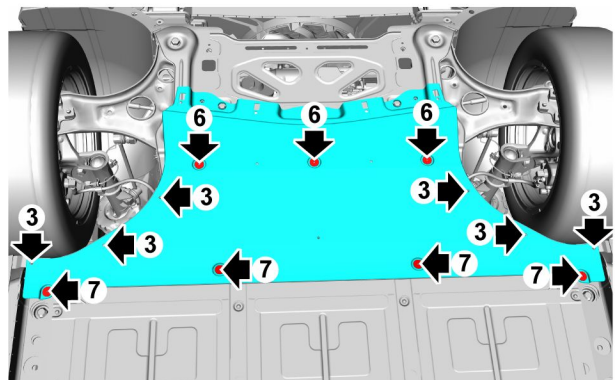
1. Locate the left front/rear door moulding to the front door, and press the clip in place.
2. Fit the right front/rear door moulding as described above.

**Bottom Deflector
Remove**

1. Lift the vehicle.
2. Remove the front bottom deflector.
 - a. Remove 5 bolts (1) fixing the front bottom deflector to the front bumper.
 - b. Remove 2 screws (2) fixing the front bottom deflector to the front bumper.
 - c. Remove 10 screws (3) fixing the front bottom deflector to the left/right wheelhouse liner.
 - d. Remove 6 bolts (4) fixing the front bottom deflector to the front subframe.
 - e. Remove 4 screws (5) fixing the front bottom deflector to the front subframe.
 - f. Remove 3 bolts (6) fixing the front bottom deflector to the front subframe bracket.
 - g. Remove 4 bolts (7) fixing the front bottom deflector to the battery protection plate.



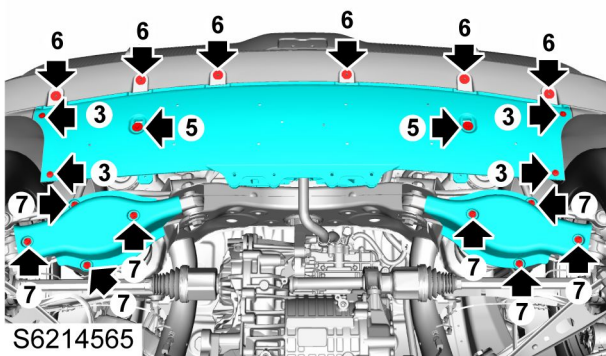
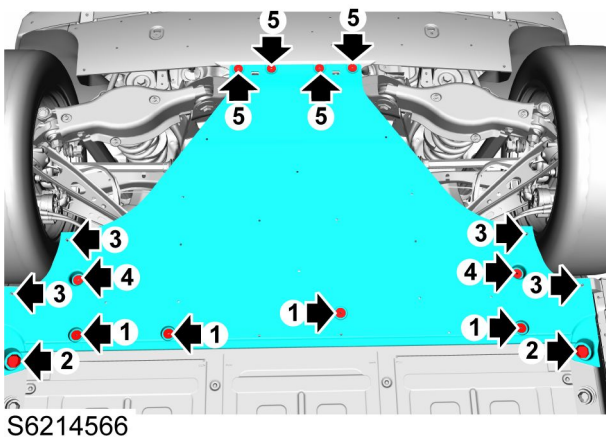
S6214567



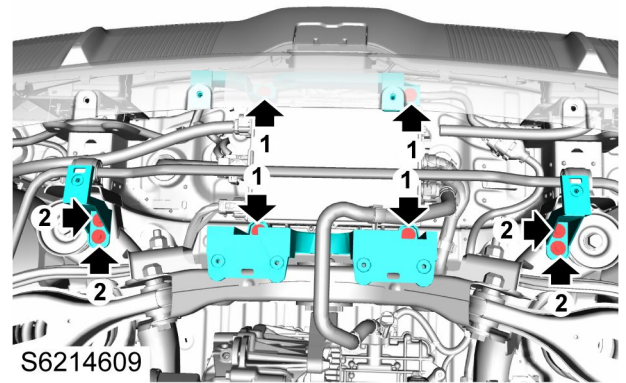
S6214568

- h. Remove the front bottom deflector in sequence.
3. Remove the rear bottom deflector.
 - a. Remove 4 bolts (1) fixing the rear bottom deflector to the battery protection plate.
 - b. Remove 2 plastic nuts (2) fixing the rear bottom deflector to the battery protection plate.

- c. Remove 8 screws (3) fixing the rear bottom deflector to the left/right wheelhouse liner.
- d. Remove 2 bolts (4) fixing the rear bottom deflector to the rear subframe.
- e. Remove 6 bolts (5) fixing the rear bottom deflector to the bottom deflector bracket.
- f. Remove 6 bolts (6) fixing the rear bottom deflector to the rear bumper.
- g. Remove 8 bolts (7) fixing the swing arm guard plate to the rear swing arm.



- h. Remove the rear bottom deflector in sequence.
 - i. If necessary, remove 4 bolts (1) fixing the rear bottom deflector bracket to the CCU.
 - j. If necessary, remove 4 bolts (2) fixing the rear bottom deflector bracket to the rear subframe.



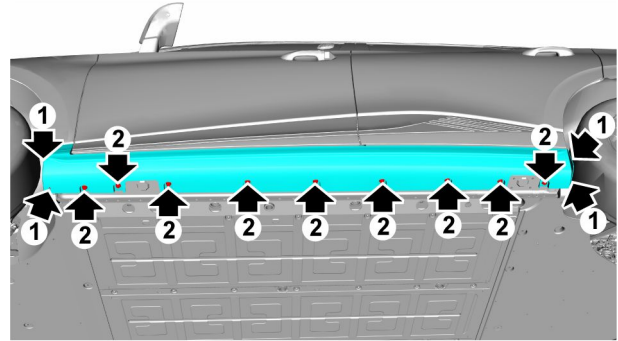
Refit

1. Locate the rear bottom deflector to the body.
 - a. If removed, fit 4 bolts fixing the rear bottom deflector bracket to the rear subframe, tighten them to **4-6Nm**, and check the torque.
 - b. If removed, fit 4 bolts fixing the rear bottom deflector bracket to the CCU, tighten them to **4-6Nm**, and check the torque.
 - c. Fit 8 bolts fixing the swing arm guard plate to the rear swing arm, tighten them to **4-6Nm**, and check the torque.
 - d. Fit 6 bolts fixing the rear bottom deflector to the rear bumper, tighten them to **4-6Nm**, and check the torque.
 - e. Fit 6 bolts fixing the rear bottom deflector to the bottom deflector bracket, tighten them to **4-6Nm**, and check the torque.
 - f. Fit 2 bolts fixing the rear bottom deflector to the rear subframe, tighten them to **4-6Nm**, and check the torque.
 - g. Fit 8 screws fixing the rear bottom deflector to the left/right wheelhouse liner, and tighten them.
 - h. Fit 2 plastic nuts fixing the rear bottom deflector to the battery protection plate, and tighten them.
 - i. Fit 4 bolts fixing the rear bottom deflector to the battery protection plate, tighten them to **4-6Nm**, and check the torque.
2. Locate the front bottom deflector to the body.
 - a. Fit 4 bolts fixing the front bottom deflector to the battery protection plate, tighten them to **4-6Nm**, and check the torque.
 - b. Fit 3 bolts fixing the front bottom deflector to the front subframe bracket, tighten them to **4-6Nm**, and check the torque.
 - c. Fit 4 screws fixing the front bottom deflector to the front subframe, and tighten them.

- d. Fit 6 bolts fixing the front bottom deflector to the front subframe, tighten them to **4-6Nm**, and check the torque.
 - e. Fit 10 screws fixing the front bottom deflector to the left/right wheelhouse liner, and tighten them.
 - f. Fit and tighten 2 screws fixing the front bottom deflector to the front bumper.
 - g. Fit 5 bolts fixing the front bottom deflector to the front bumper, tighten them to **4-6Nm**, and check the torque.
3. Lower the vehicle.

Doorsill Molding Remove

1. Remove 4 retaining screws (1) fixing the door sill moulding to the front and rear wheelhouses.
2. Remove 9 split pins (2) of the door sill moulding.



S5533030

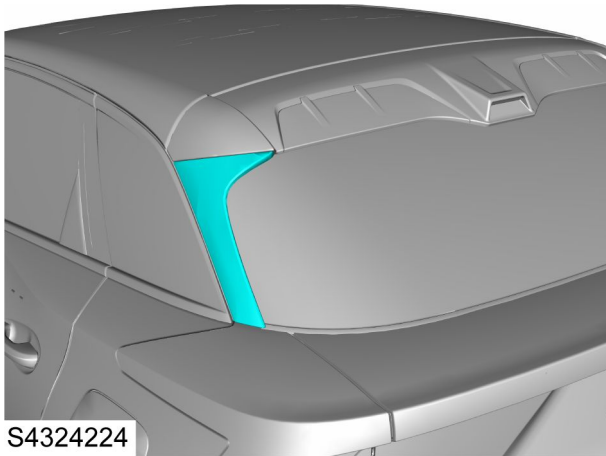
3. Remove the door sill moulding.

Refit

1. Position the door sill moulding.
2. Fit 9 split pins of the door sill moulding.
3. Fit 4 retaining screws on the side of front/rear wheelhouse.

D Pillar Exterior Trim Panel Remove

1. Carefully pry open the retaining clip from the body along the edge of left D pillar exterior trim panel, and remove the left D pillar exterior trim panel.



S4324224

2. Remove the right D pillar exterior trim panel as described above.

Refit

1. Fix the left D pillar exterior trim panel to the body, and press the clip in place.
2. Fit the right D pillar exterior trim panel as described above.

Spoiler Remove

1. Remove the D pillar exterior trim panel.

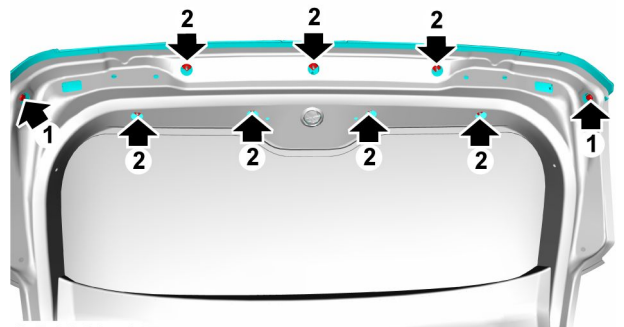
 **D Pillar Exterior Trim Panel Remove**

2. Disconnect the negative battery cable, and open the tail gate.
3. Pry open the trim cover of the spoiler bolt.



SC114377

4. Remove 2 bolts (1) and 7 nuts (2) fixing the spoiler to the body, and disconnect the harness connector of the high-mounted stop lamp.



SC114376

5. Pry open the retaining clip of the spoiler, and remove the spoiler assembly.

Refit

1. Connect the harness connector, locate the spoiler assembly to the tail gate, and press the clip in place.
2. Fit 7 nuts and 2 bolts fixing the spoiler assembly to the body, tighten them to **5-7Nm**, and check the torque.
3. Fit the bolt trim cover, connect the negative battery cable, and close the tail gate.
4. Fit the D pillar exterior trim panel.

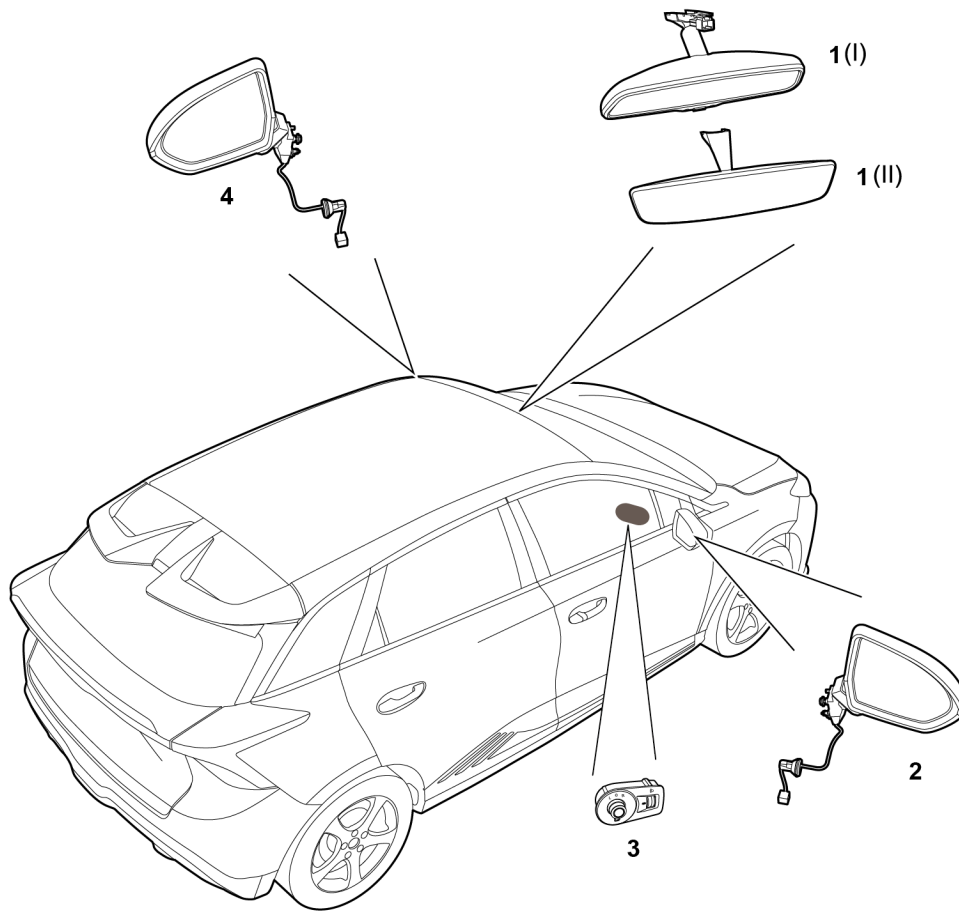
 **D Pillar Exterior Trim Panel Refit**

Rearview Mirrors**Specification****Torque**

Description	Value
Bolt-Outside rear view mirror to door	7-10Nm
Bolt-Inside rear view mirror to bracket	1.6-2Nm

Description and Operation

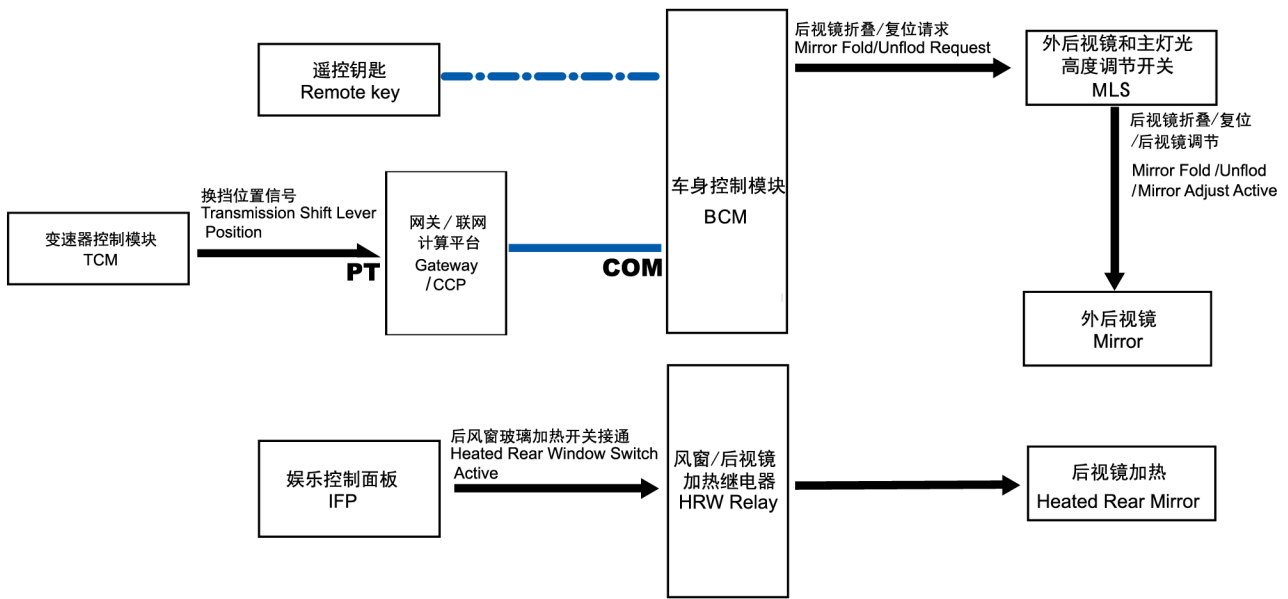
System Layout



SC410206

- 1. (I) Automatic Anti-dazzle Interior Rearview Mirror (II) Manual Anti-dazzle Interior Rearview Mirror
- 2. Exterior Rearview Mirror (Right)
- 3. Exterior Rearview Mirror Control Switch
- 4. Exterior Rearview Mirror (Left)

System Control Diagram



SC411010



A = Hard Wire; B = RF Signal; C = Power HS CAN Bus; D = Comfort CAN Bus

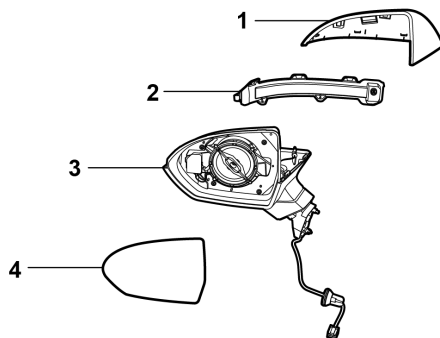
Description

Exterior Rearview Mirror Assembly

The exterior rearview mirror has the power adjustment and heating functions, and some rearview mirrors with certain configurations also have power folding function. Each exterior rearview mirror assembly is controlled by the circular control switch of the exterior rearview mirror and master lighting leveling switch.

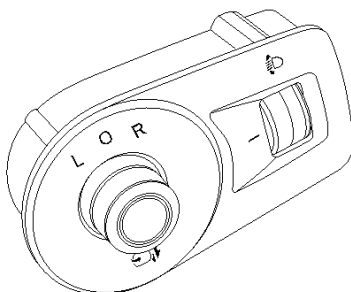
The left and right exterior rearview mirror assemblies shall be distinguished, but the basic structures are the same. The housing of the exterior rearview mirror assembly is a plastic mould which includes the exterior rearview mirror glass (4) and side direction indicator lamp (2), and the exterior rearview mirrors also have cameras fitted in the lower part. The exterior rearview mirror assembly is fixed on the front door by 2 bolts.

The exterior rearview mirror body (3) is unrepairable and shall be replaced as an assembly. The exterior rearview mirror cover (1), exterior rearview mirror glass (4), side direction indicator lamp (2) and camera (if equipped) are repairable.



SC413218

Exterior Rearview Mirror Adjusting Switch



S4101001

The exterior rearview mirror adjusting switch is on the lower trim panel at driver side.

The exterior rearview mirror adjusting switch can operate the folding motor of the exterior rearview mirror assembly, and vertical and horizontal motors of the mirror glass.

Interior Rearview Mirror Assembly

The interior rearview mirror assembly has manual and auto anti-dazzle configurations. The interior rearview mirror is repaired and replaced as an assembly.

Operation**Exterior Rearview Mirror**

The steering gear of the exterior rearview mirror includes 2 bidirectional motors (vertical motor and horizontal motor) which provide horizontal and vertical motions for the rearview mirror. The vertical motor is responsible for the up-and-down motion while the horizontal motor is for the left-and-right motion.

According to the configuration, some exterior rearview mirrors are provided with a folding motor with power folding or expansion function.

The exterior rearview mirror can provide the following functions:

- Exterior Rearview Mirror Glass Heating
- Exterior Rearview Mirror Glass Adjustment
- Exterior Rearview Mirror Assembly Folding
- Direction Indicator Lamp

Exterior Rearview Mirror Glass Heating

The exterior rearview mirror glass heating function is designed to avoid appearance of mist or fog on the mirror. The heating element is located at the rear of the mirror, which works when the rear window is heated. When operating the A/C control panel, the rear window heater relay operates to heat the exterior rearview mirror glass.

Exterior Rearview Mirror Glass Power Adjustment

The exterior rearview mirror adjusting switch in the driver door combination switch is connected with the vertical motor and horizontal motor through hard wire, which can realize the selection of left/right exterior rearview mirror glass and 4-direction adjustment of glass.

Press the L (left side) or R (right side) button on the adjusting switch to select the exterior rearview mirror glass in the corresponding side and make adjustment.

After the exterior rearview mirror glass is selected, press four arrows on the round switch to adjust the selected mirror glass up, down, left or right.

Exterior Rearview Mirror Assembly Folding (Power)

The BCM receives the lock or unlock request, and sends operation instructions to the driver door combination switch via the LIN bus to activate the exterior rearview mirror assembly folding motor for electric folding or unfolding of the exterior rearview mirror. The folding and unfolding request of the exterior rearview mirror adjusting switch can also be sent to the exterior rearview mirror assembly folding motor directly through the driver door combination switch via hard wire to achieve the corresponding operation.

The exterior rearview mirror will be folded electrically by pressing the folding button on the exterior rearview mirror

adjusting switch. The mirror housing will return to its original position by pressing the button again.

The power folding function of the exterior rearview mirror assembly is operated through the exterior rearview mirror adjusting switch, and the exterior rearview mirror assembly shall not be folded manually, otherwise, relevant equipment failure may be resulted therefrom.

Interior Rearview Mirror**Manual Anti-dazzle Function (If equipped)**

During driving, the strong light from the interior rearview mirror may affect the driver. To avoid such visual shock, pull the lever at the base of the interior rearview mirror and change the view to 'dip' the mirror. Push back the lever to return the interior rearview mirror to the normal position.

Auto Anti-dazzle Function (If equipped)

During driving, the strong light from the interior rearview mirror may affect the driver. The auto anti-dazzle function can solve this problem and avoid unnecessary consequences from this visual impact. The auto anti-dazzle interior rearview mirror will automatically dim when the headlamp of rear vehicle emits dazzling light, and when the light intensity of the rear vehicle goes back to normal, the auto anti-dazzle interior rearview mirror will become bright again.

The auto anti-dazzle function is disabled during reversing, i.e. when the shift lever is shifted into R gear and the engine is working, the BCM provides reverse signal to the interior rearview mirror. When the rearview mirror detects this input, it disables the auto anti-dazzle function, which helps the driver to observe the object behind the vehicle by the maximum reflectivity obtained by the rearview mirror during reversing.

Service Guide

Exterior Rearview Mirror Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front door interior trim panel.

Front Door Interior Trim Panel Remove

3. Disconnect the harness connector of the exterior rearview mirror.
4. Remove 2 bolts fixing the exterior rearview mirror assembly to the door, and remove the exterior rearview mirror assembly.



Refit

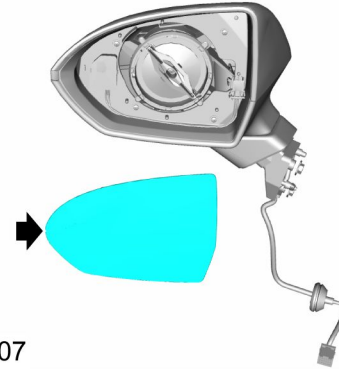
1. Fix the exterior rearview mirror assembly to the door, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
2. Connect the harness connector of the exterior rearview mirror.
3. Fit the front door interior trim panel.

Front Door Interior Trim Panel Refit

4. Connect the negative battery cable.

Exterior Rearview Mirror Glasses Remove

1. Disconnect the negative battery cable.
2. Carefully push the glass near the body side into the exterior rearview mirror.
3. Hold the rearview mirror glass away from the body side and carefully separate the glass from the rearview mirror motor.



4. Disconnect the harness connector on the back of the rearview mirror glass to remove the exterior rearview mirror glass.

Refit

1. Fit the harness connector on the back of the rearview mirror glass.
2. Locate the rearview mirror glass to the rearview mirror motor and fit it in place.
3. Connect the negative battery cable.

Exterior Rearview Mirror Cover Remove

1. Disconnect the negative battery cable.
2. Remove the exterior rearview mirror glass.

Exterior Rearview Mirror Glass Remove

3. Pry off the clip on the exterior rearview mirror cover to separate the cover from the rearview mirror.



SC413206

4. Remove the exterior rearview mirror cover.

Refit

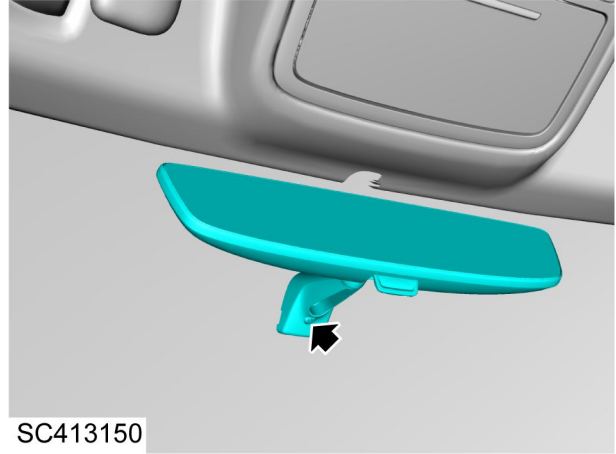
1. Locate the exterior rearview mirror cover to the exterior rearview mirror, and align the clips.
2. Press the rearview mirror cover hard and fasten the clips.
3. Fit the exterior rearview mirror glass.

Exterior Rearview Mirror Glass Refit

4. Connect the negative battery cable.

Manual Anti-dazzle Interior Rearview Mirror Remove - Manual

1. Disconnect the negative battery cable.
2. Remove 1 screw fixing the interior rearview mirror assembly to the base, and remove the manual anti-dazzle interior rearview mirror assembly.



SC413150

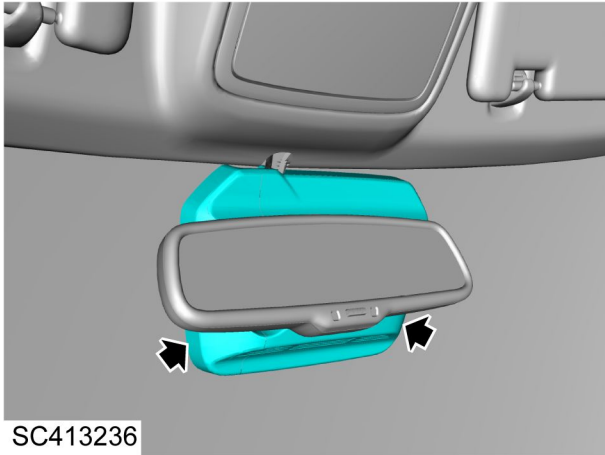
Refit - Manual

1. Locate the interior rearview mirror to the windscreen base.
2. Fit 1 screw fixing the manual anti-dazzle interior rearview mirror assembly to the base, tighten it to **1.6-2Nm**, and check the torque.

Automatic Anti-dazzle Interior Rearview Mirror

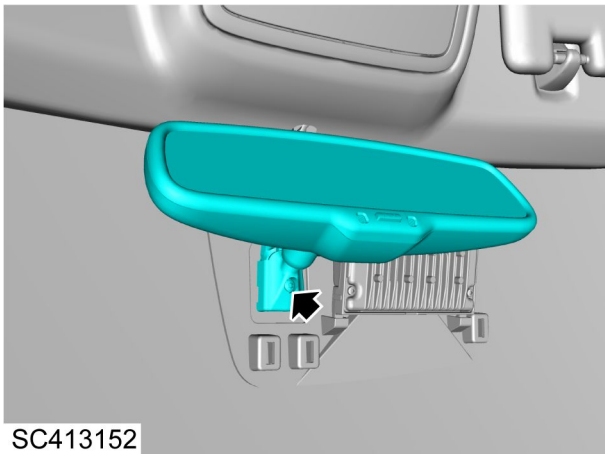
Remove - Automatic

1. Disconnect the negative battery cable.
2. Pry off the clip, and remove the multi-function sensor cover.



SC413236

3. Disconnect the harness connector, remove 1 screw fixing the interior rearview mirror assembly to the base, and remove the interior rearview mirror assembly.



SC413152

Refit - Automatic

1. Fit 1 screw fixing the rearview mirror assembly to the base, tighten it to **1.6-2Nm**, and check the torque. Connect the harness connector.
2. Fix the multi-function sensor cover to the base, and press the clip in place.
3. Connect the negative battery cable.

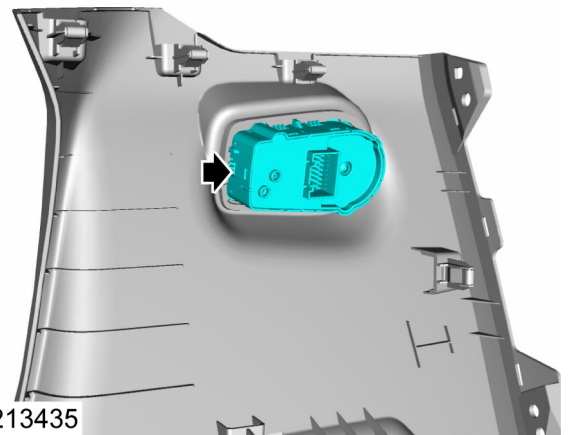
Exterior Rearview Mirrors and Headlamp Leveling Switch

Remove

1. Disconnect the negative battery cable.
2. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Remove

3. Disconnect the harness connectors of the exterior rearview mirrors and the headlamp leveling switch.
4. Loosen the clips, and remove the exterior rearview mirrors and headlamp leveling switch



S7213435

Refit

1. Fix the exterior rearview mirrors and headlamp levelling switch to the driver side lower trim panel, and ensure the clips are fully engaged.
2. Connect the harness connectors of the exterior rearview mirrors and the headlamp leveling switch.
3. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Refit

4. Connect the negative battery cable.

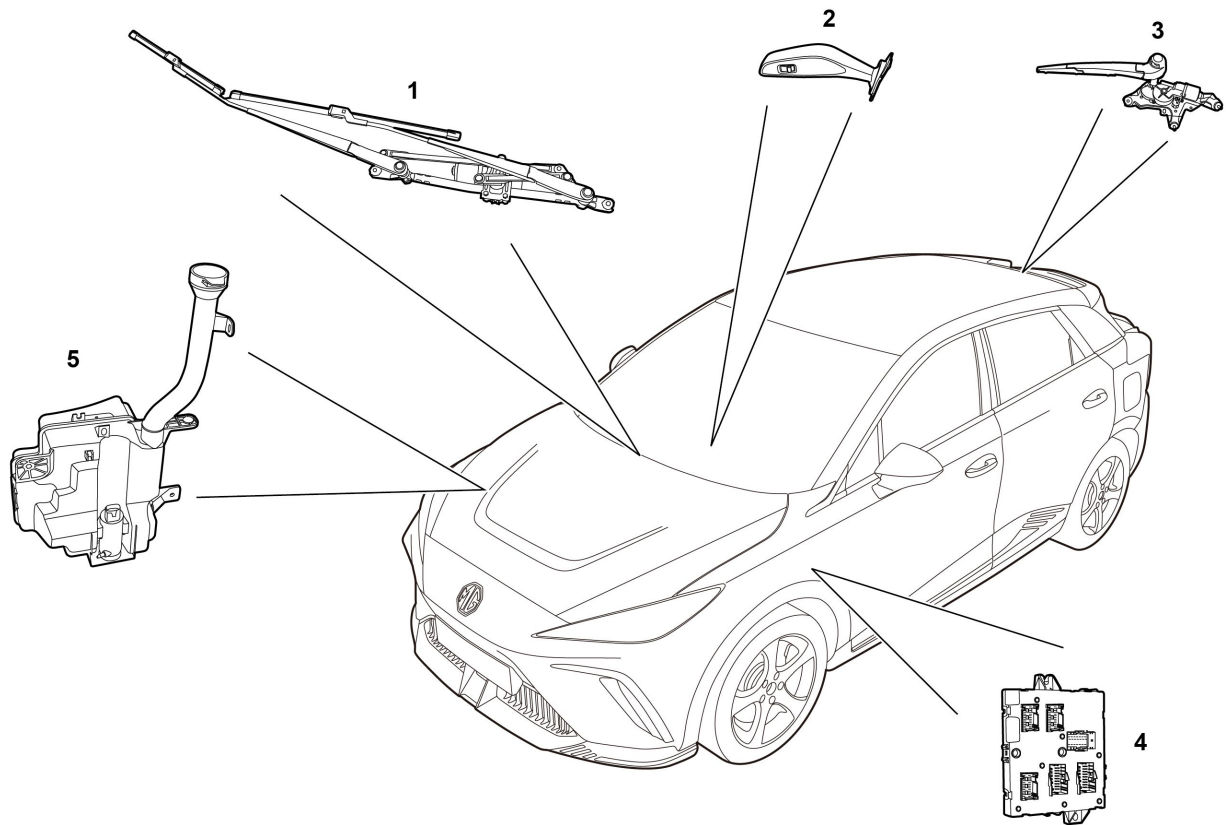
Wiper and Washer System**Specification****Torque**

Description	Value
Nut-Wiper arm to linkage	28-32Nm
Bolt-Wiper electronic to wiper module	7-10Nm
Nut-Wiper electronic to wiper module	28-32Nm
Bolt-Wiper module to body	7-10Nm
Bolt-Washer to front bumper	4-6Nm
Nut-wiper to motor	8-10Nm
Bolt/Nut-Rear wiper motor to tail gate	7-10Nm

Description and Operation

System Layout

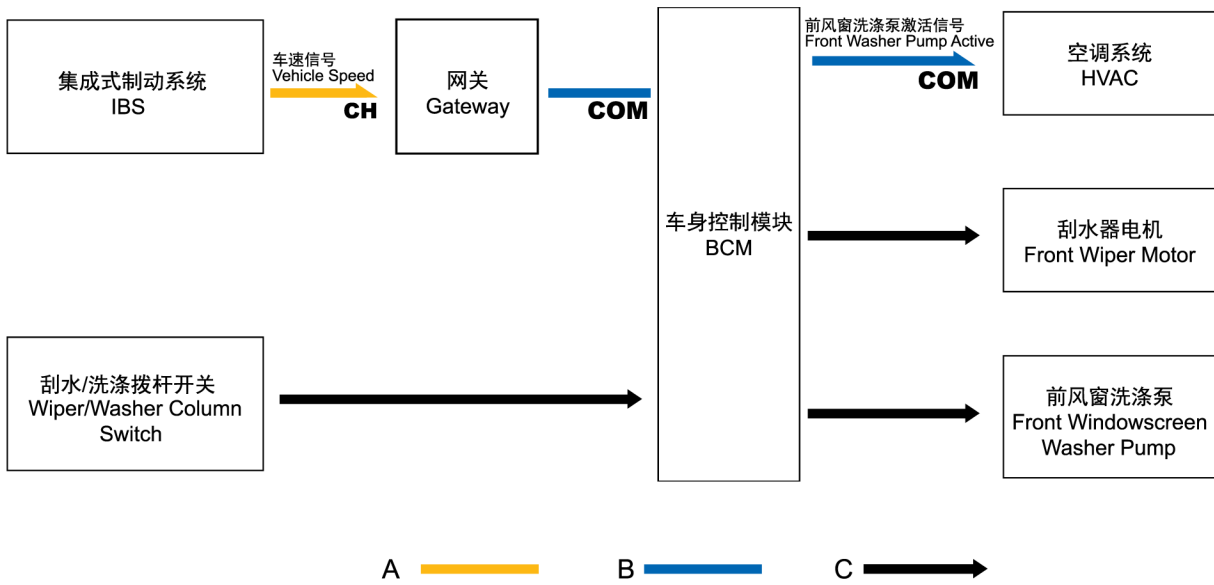
Wiper Washer System Layout



S6810902

- 1. Windscreen Wiper Assembly
- 2. Windscreen Wiper/Washer Switch
- 3. Rear Window Wiper Assembly
- 4. Body Control Module
- 5. Washer Reservoir

System Control Diagram



S4410158

A = Chassis CAN Bus; B = Comfort CAN Bus; C = Hard Wire

Description

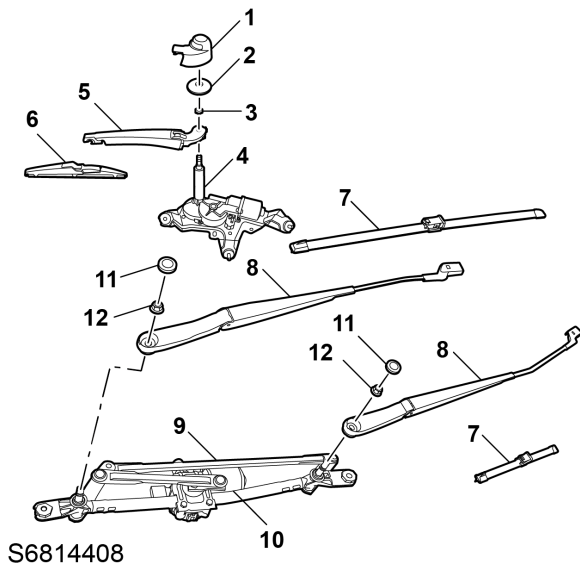
Overview

The wiper and washer system is controlled by the body control module (BCM), which will operate after receiving commands from the wiper/washer lever switch on the right side of the steering wheel.

The diagnostic information for the wiper and washer system can be read with the scan tool.

Wiper

The rear wiper (if equipped) includes the wiper shaft cap (1), motor shaft seal ring (2), fixing nut (3), motor (4), rear washer arm (5) and wiper blade (6). The front wiper includes the wiper blade (7), wiper arm (8), wiper linkage mechanism (9), wiper motor (10), wiper shaft cap (11) and fixing nut (12).

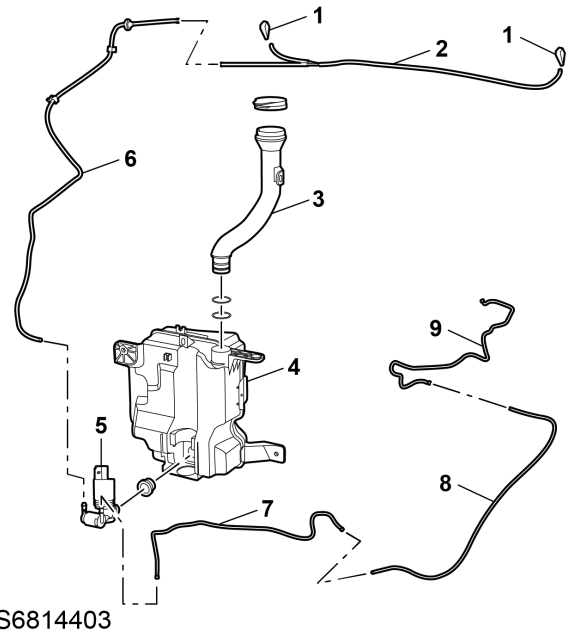


The windscreen wiper motor is located below the air inlet grille at the bottom of the windscreen, which is fitted on a linkage mechanism on the support between the inner and outer compartment walls. The motor is a DC motor, which drives the worm gear through the worm attached to the motor spindle. The outside of the worm gear is connected to the linkage mechanism which can drive the wiper arm attached to the worm gear box at the end of the linkage mechanism. The wiper arm is fitted to the output shaft of the linkage mechanism, which is composed of arm support, arm plate and arm extension. A spring is below the arm plate, one end is connected to the arm extension, and the other end is connected with the arm support through hook, which can apply appropriate pressure to the wiper blade on the windscreen. The blade of the boneless wiper is fixed to the wiper arm by the clips on both sides, which can rotate to a certain extent to ensure that the wiper can clean the windshield in any mode and decrease noise and wind resistance.

Washer

The windscreen washer consists of the windscreen washer nozzle (1), windscreen washer nozzle hose (2), washer reservoir filler pipe assembly (3), windscreen washer reservoir (4), window washer pump (5) and windscreen washer pump hose (6).

The rear window washer (if equipped) consists of the rear window washer pump hose (7), rear window washer middle connecting hose (8) and rear window washer hose (9).



The washer reservoir is located in front of right wheel house, with a capacity of about 3 liters. The front compartment is provided with a filler pipe assembly with a filler neck which can be used to refill the washer reservoir.

The washer pump is under the washer reservoir. When the washer pump is enabled, it will pump the fluid in the washer reservoir into the front washer nozzle on the A/C air inlet grille and rear washer nozzle on the rear wiper under the action of pressure. The check valve and quick connector in the pipeline can prevent liquid from flowing back to the washer reservoir from the nozzle and hose, and thus ensures the washer is instant available.

Operation

Overview

The front wiper/washer system is controlled by the BCM. When the BCM receives an ON signal from the washer/wiper lever switch connected by the hard wire, it drives the washer pump and wiper motor to work. The bidirectional washer pump provides washer fluid for the windshield and rear window.

Front Wiper/Washer System

The front wiper system includes the BCM, front washer/wiper lever switch and two relays. One of the relay 1 is used to turn on/off the front wiper, and the other relay 2 is used to control the front wiper speed. When the BCM receives signals from the front washer/wiper lever switch, it drives the front wiper to work by closing the two wiper relays in the front compartment fuse box.

The switches for single wipe, intermittent wipe and low/high speed wipe form a closed circuit with the BCM through relay 1 or 2.

Single Wipe

When the BCM receives a valid single wipe request from the wiper, it will control the wiper to work. If the single wipe request is valid, the front wiper will keep working.

Low Speed Wipe

When the front wiper/washer lever switch is turned to the low speed wipe mode, the BCM receives the position signal of the lever switch and controls the front wiper enable relay 1 to work and wiper speed relay 2 not to work. Power supply is connected to the motor through relay 1 by a resistor. Due to the action of the resistor, the power supply is reduced, and at this time, the front wiper works at low speed.

High Speed Wipe

When the front wiper/washer lever switch is turned to the high speed wipe mode, the BCM receives the position signal of the lever switch and controls the front wiper enable relay 1 to work and wiper speed relay 2 to work. The power supply bypasses the resistor for deceleration and connects with the motor directly, at this stage, the front wiper works at high speed.

Rear Wiper/Washer System

The BCM receives a valid request from the rear wiper switch, and controls a single relay to perform corresponding operations.

Rear Window Wash/Wipe

When the rear wiper/washer lever switch is turned to the wiper/washer gear, the BCM controls the operation of the rear washer pump. As long as the switch is not released, the BCM will activate the rear wiper relay and the rear wiper will keep working.

Intermittent Wipe Mode - Variable Intermittent Wipe (without rain sensor)

The function of variable intermittent wipe: The vehicle is provided with a wiper delay potentiometer, but without an optional rain sensor.

When receiving a valid wiper interval request, the BCM will control the front wiper to operate. The time interval of intermittent wipe varies with the vehicle speed level and the setting of wiper delay potentiometer

When the front wiper/washer lever switch is turned to the intermittent wipe position, the dynamic stability control system monitors the wheel speed signal and transmits it to the BCM via the CAN bus.

The BCM adjusts the selected delay time by comparing vehicle speed with the resistance corresponding to the intermittent delay rotary switch.

Programmed Wash/Wipe


When the start switch is in ACC or ON/RUNNING and the front wiper/washer lever switch is pulled to the intelligent wipe position in the direction of the steering wheel, the BCM will control the front wiper to work at low speed, control the front washer pump operation and trigger the internal counter. When the counter value reaches the set value, the BCM closes the relay, and the front wiper starts to work.

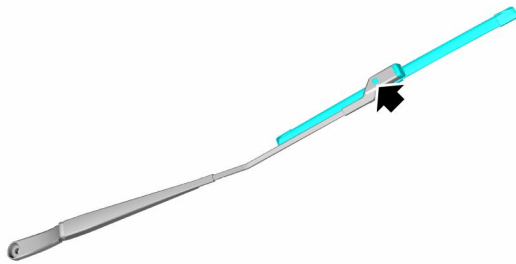
Note: The wiper continues operating for three times after the lever switch is released. After several seconds, the wiper will wipe once more to eliminate the washer fluid on the windscreen.

Service Guide

**Windscreen Wiper Blade Assembly
Remove**

Caution :

1. With the bonnet in closed state, click the icon  on the large screen, select "Safety - Power Off" in sequence for up to 20 seconds, press down the wiper lever switch to the single wipe position and release, the wiper will automatically move to the service position, and stop on the windscreen.
2. Lift the wiper arm from the glass to the position away from the windscreen.
3. Press the button of the windshield wiper arm, and pull the upper end of the wiper blade outward to disengage it from the wiper arm.



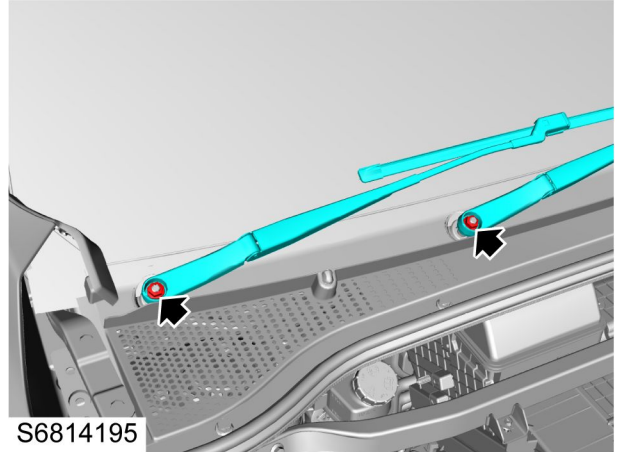
S6814192

Refit

1. Fit the wiper blade into the wiper arm slot and push the wiper blade towards the wiper arm until it is fully embedded.
2. Put the wiper assembly back onto the windscreen, and check if the wiper blade is fixed correctly to the wiper arm.
3. Press down the wiper lever switch again to single wipe position and release, or power on, then the wiper will exit the service mode and automatically return to its initial position.

**Windscreen Wiper Arm Assembly
Remove**

1. Open the bonnet.
2. Pry off the wiper shaft cover and remove 2 nuts fixing the wiper arm to the linkage mechanism.



S6814195

3. Remove the windscreen wiper arm assembly.

Refit

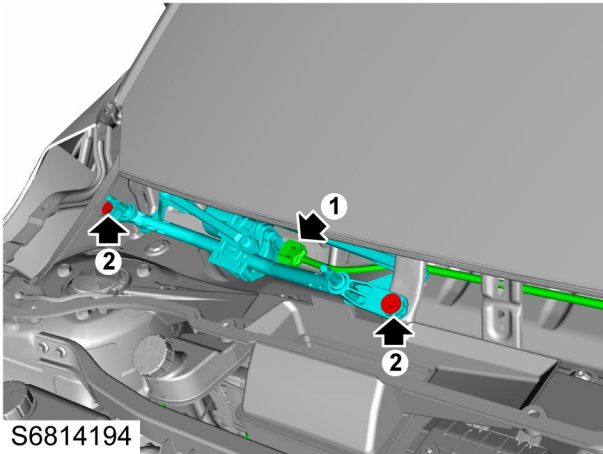
1. Fix the windscreen wiper arm assembly to the linkage mechanism, and ensure that the wiper blade is in the correct initial position and aligned with the locating dot of the wiper on the glass.
2. Locate the wiper arm to the linkage mechanism. Fit 2 nuts, tighten them to **28-32Nm**, and check the torque.
3. Fit the wiper arm shaft cover, and close the front compartment cover.

Windscreen Wiper Linkage Mechanism and Motor Remove

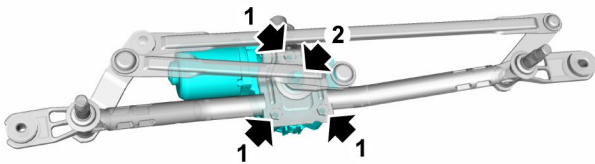
1. Disconnect the negative battery cable.
2. Remove the A/C air inlet grille panel and accessories.

A/C Air Inlet Grille Panel and Accessories Remove

3. Disconnect the harness connector (1) and remove 2 bolts (2) fixing the windscreen wiper module assembly to the body.



4. Lift and remove the windscreen wiper module assembly from the front compartment.
5. Remove 3 bolts (1) and 1 nut (2) fixing the windscreen wiper motor to the wiper module, and remove the motor.



Refit

1. Fit 3 bolts fixing the wiper motor to the wiper module, tighten them to **7-10Nm**, and check the torque.
2. Fit 1 nut fixing the wiper motor to the wiper module, tighten it to **28-32Nm**, and check the torque.
3. Fit 3 nuts fixing the windscreen wiper module assembly to the body, tighten them to **7-10Nm**, and check the torque.
4. Connect the harness connector.
5. Fit the A/C air inlet grille panel and accessories.

A/C Air Inlet Grille Panel and Accessories Refit


6. Connect the negative battery cable.

Windscreen Washer Reservoir Assembly Remove

1. Remove the headlamp assembly.

 **Headlamp Assembly Remove**

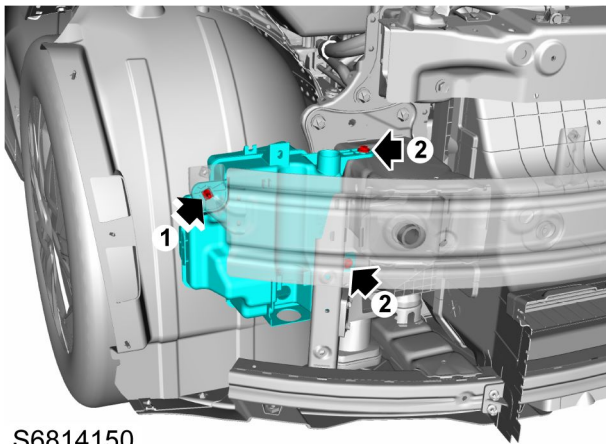
2. Remove the windscreen washer reservoir filler pipe assembly.

 **Windscreen Washer Reservoir Filler Pipe Assembly Remove**

3. Remove the windscreen washer pump assembly.

 **Windscreen Washer Pump Assembly Remove**

4. Remove 1 nut (1) and 2 bolts (2) fixing the windscreen washer reservoir to the front bumper beam.



S6814150

5. Remove the windscreen washer reservoir.

Refit

1. Locate the windscreen washer reservoir to the front bumper beam, fit 2 bolts and 1 nut, tighten them to **4-6Nm**, and check the torque.
2. Fit the windscreen washer pump assembly.

 **Windscreen Washer Pump Assembly Refit**

3. Fit the windscreen washer reservoir filler pipe assembly.

 **Windscreen Washer Reservoir Filler Pipe Assembly Refit**

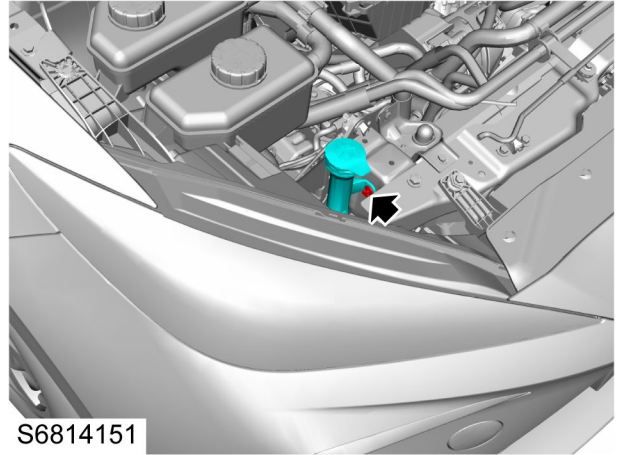
4. Fit the headlamp assembly.

 **Headlamp Assembly Refit**

5. Refill the windscreen washer fluid.

Windscreen Washer Reservoir Filler Pipe Assembly Remove

1. Open the bonnet and support it firmly.
2. Pry off the clip fixing the windscreen washer reservoir filler pipe assembly to the body.



S6814151

3. Remove the windscreen washer reservoir filler pipe assembly.
4. Check the seal ring at the neck of the windscreen washer reservoir assembly for damage or deformation, so as to renew it timely.

Refit

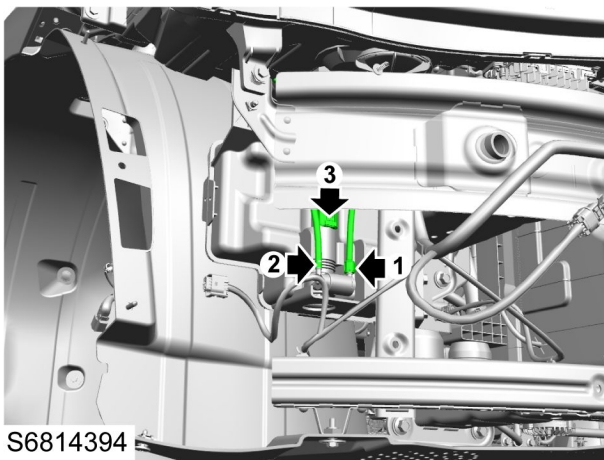
1. Fit the windscreen washer reservoir filler pipe assembly to the windscreen washer reservoir assembly.
2. Press the clip fixing the windscreen washer reservoir filler pipe assembly to the body in place.
3. Close the front compartment cover.

Windscreen Washer Pump Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

Front Bumper Remove

3. Place a suitable container for cleaning under the windscreen washer pump to collect the spilled windscreen washer fluid.
4. Disconnect the connection (1) from the rear window washer pump hose to the windscreen washer pump, and disconnect the connection (2) and harness connector (3) from the windscreen washer pump hose to the windscreen washer pump.



5. Pull out the windscreen washer pump, and remove the windscreen washer pump assembly.

Refit

1. Fit the washer pump to the windscreen washer reservoir.
2. Connect the windscreen and rear window washer pump hoses to the washer pump, connect the harness connector.
3. Take the container for collecting the windscreen washer fluid away, and clean it.
4. Fit the front bumper.

Front Bumper Refit

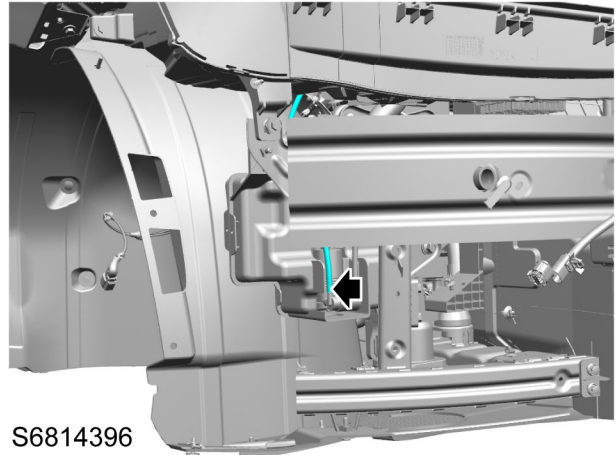
5. Refill the windscreen washer fluid.
6. Connect the negative battery cable.

Windscreen Washer Pump Hose Remove

1. Remove the front bumper.

Front Bumper Remove

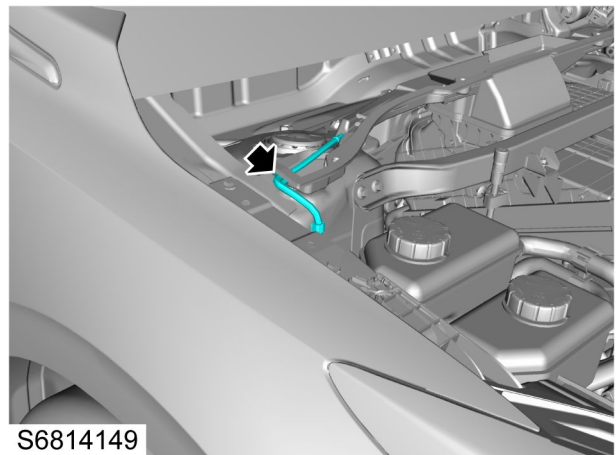
2. Place a suitable container for cleaning under the windscreen washer pump to collect the spilled windscreen washer fluid.
3. Disconnect the windscreen washer pump hose from the washer pump.



4. Remove the A/C air inlet grille panel and accessories.

A/C Air Inlet Grille Panel and Accessories Remove

5. Pass out the end of the windscreen washer pump hose through the opening on the side of the A/C air inlet grille bracket, and remove the windscreen washer pump hose.



Refit

1. Pass the end of the windscreen washer pump hose through the opening on the A/C air inlet grille bracket side and ensure it is fitted in place.
2. Fit the A/C air inlet grille and accessories.

A/C Air Inlet Grille Panel and Accessories Refit

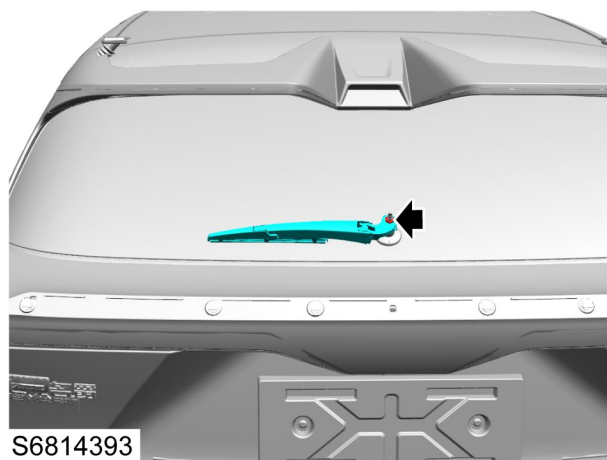
3. Arrange the new hose according to direction of the used one, and connect it to the washer pump.

4. Refill the windscreen washer fluid, take the container for collecting the windscreen washer fluid away, and clean it.
5. Fit the front bumper.

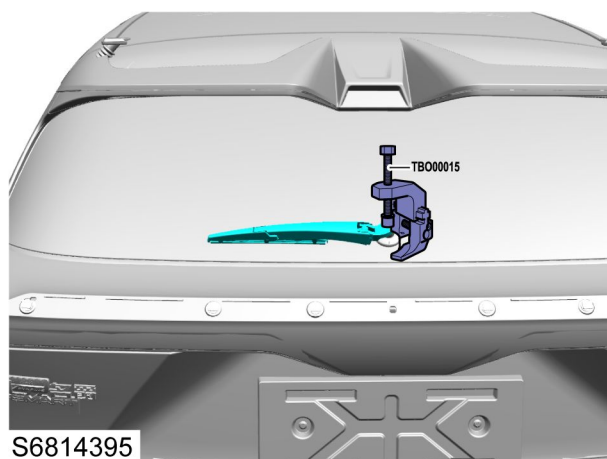
Front Bumper Refit

Rear Wiper Arm Assembly Remove

1. Pry off the wiper shaft cover, and remove 1 nut fixing the rear window wiper arm assembly to the rear wiper motor shaft.



2. Use special tool TBO00015 to remove the rear window wiper arm assembly.

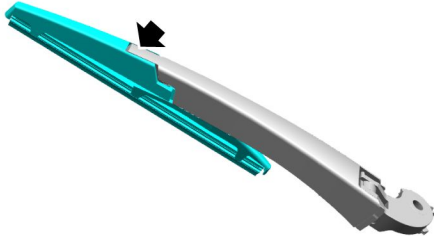


Refit

1. Fix the wiper arm to the wiper motor shaft, and ensure that the adhesive tape of the wiper blade is fitted in its initial position properly and aligned with the locating dot of the wiper on the glass.
2. Fit 1 nut fixing the wiper arm, tighten it to **8-10Nm**, and check the torque.
3. Fit the wiper arm shaft cover.

Rear Wiper Blade Assembly Remove

1. Lift the rear window wiper arm from the rear window.
2. Pull the joint of the wiper blade and the wiper arm to remove the wiper blade from the wiper arm.



S6814392

Refit

1. Vertically clamp the rear window wiper blade into the wiper arm clip, and ensure it is clamped in place.
2. Put the wiper assembly back onto the rear window, and check if the wiper blade is fixed correctly to the wiper arm.

Rear Wiper Motor Remove

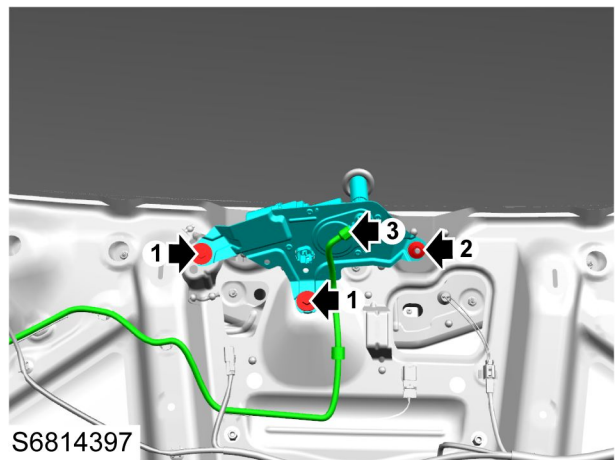
1. Disconnect the negative battery cable.
2. Remove the rear window wiper arm assembly.

Rear Window Wiper Arm Assembly Remove

3. Remove the seal ring of rear wiper motor from the wiper motor output shaft.
4. Remove the tailgate interior trim panel.

Tailgate Interior Trim Panel Remove

5. Remove 2 bolts (1) and 1 nut (2) fixing the rear wiper motor to the tailgate.
6. Disconnect the rear wiper washer hose (3).



S6814397

7. Disconnect the harness connector, and remove the rear window wiper motor assembly.

Refit

1. Connect the harness connector, and locate the rear window wiper motor to the mounting position.
2. Fit 2 bolts and 1 nut fixing the rear window wiper motor to the tailgate, tighten them to **7-10Nm**, and check the torque.
3. Connect the rear window wiper washer hose.
4. Fit the tailgate interior trim panel.

Tailgate Interior Trim Panel Refit

5. Fit the rear wiper motor seal ring.
6. Fit the rear window wiper arm assembly.

Rear Window Wiper Arm Refit

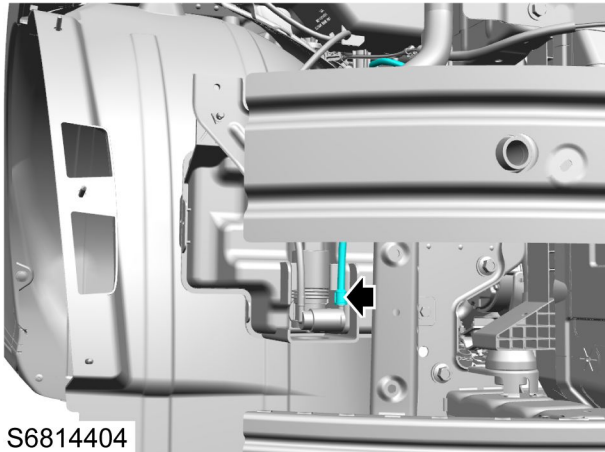
7. Connect the negative battery cable.

Rear Window Washer Pump Hose Remove

1. Remove the front bumper assembly.

 **Front Bumper Assembly Remove**

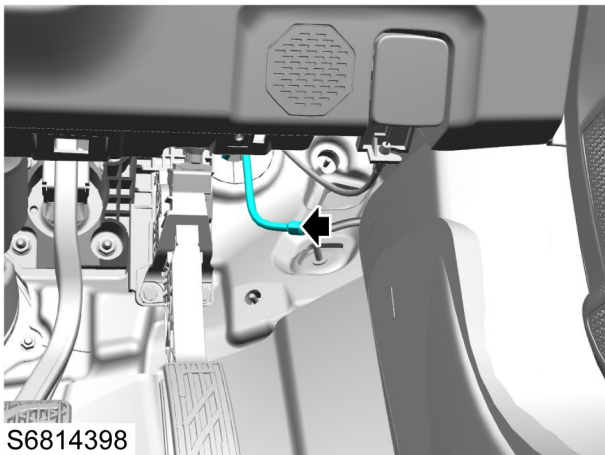
2. Place a suitable container for cleaning under the windscreen washer pump to collect the spilled windscreen washer fluid.
3. Disconnect the rear window washer pump hose from the windscreen washer pump.



4. Remove the instrument panel lower closure panel.

 **Instrument Panel Lower Closure Panel Remove**

5. Disconnect the rear window washer pump hose from the rear window washer middle connecting hose.



6. Remove the rear window washer pump hose.

Refit

1. Arrange the new hose according to direction of the used one, and connect it to the washer pump.
2. Connect the rear window washer middle connecting hose to the rear window washer pump hose.
3. Fit the instrument panel lower closure panel.

 **Instrument Panel Lower Closure Panel Refit**

4. Refill the windscreen washer fluid.
5. Take the container for collecting the windscreen washer fluid away, and clean it.

6. Fit the front bumper assembly.

 **Front Bumper Assembly Refit**

Rear Window Washer Intermediate Connecting Hose Remove

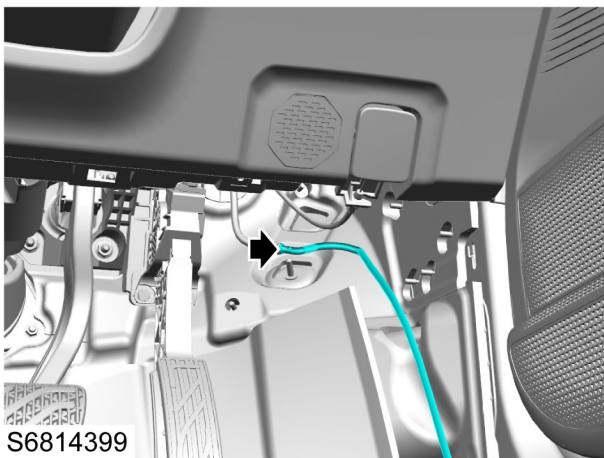
1. Remove the driver side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Remove

2. Remove the A pillar lower trim panel.

A Pillar Lower Trim Panel Remove

3. Place a container at the joint of the rear window washer pump hose and the rear window washer middle connecting hose.
4. Disconnect the rear window washer middle connecting hose from the rear window washer pump hose.



5. Remove the right door sill trim panel.

Door Sill Trim Panel Remove

6. Remove the C pillar lower trim panel.

C Pillar Lower Trim Panel Remove

7. Remove the trunk side trim panel.

Trunk Side Trim Panel Remove

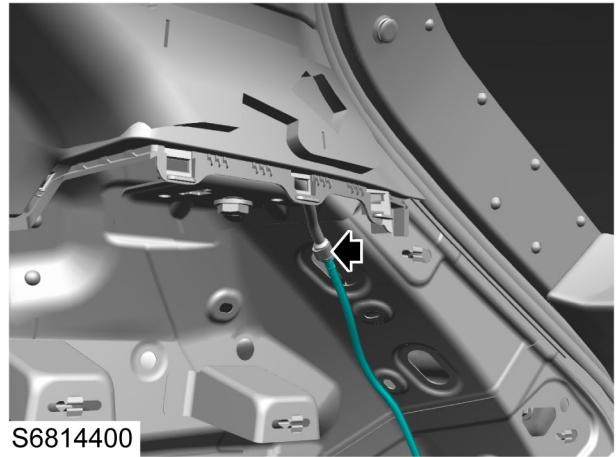
8. Remove the luggage cover support plate.

Luggage Cover Support Plate Remove

9. Remove the C pillar upper trim panel.

C Pillar Upper Trim Panel Remove

10. Disconnect the rear window washer middle connecting hose from the rear window washer nozzle hose, and remove the rear window washer middle connecting hose.



Refit

1. Arrange the new hose according to direction of the used one.
2. Connect the rear window washer middle connecting hose to the rear window washer nozzle hose.
3. Fit the C pillar upper trim panel.

C Pillar Upper Trim Panel Refit

4. Fit the luggage cover support plate.

Luggage Cover Support Plate Refit

5. Fit the trunk side trim panel.

Trunk Side Trim Panel Refit

6. Fit the C pillar lower trim panel.

C Pillar Lower Trim Panel Refit

7. Fit the right door sill trim panel.

Right Door Sill Trim Panel Refit

8. Connect the rear window washer middle connecting hose to the rear window washer pump.

9. Take the container for collecting the windscreen washer fluid away, and clean it.

10. Fit the A pillar lower trim panel.

A Pillar Lower Trim Panel Refit

11. Fit the driver side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Refit

12. Refill the windscreen washer fluid.

Rear Window Washer Nozzle and Hose Remove

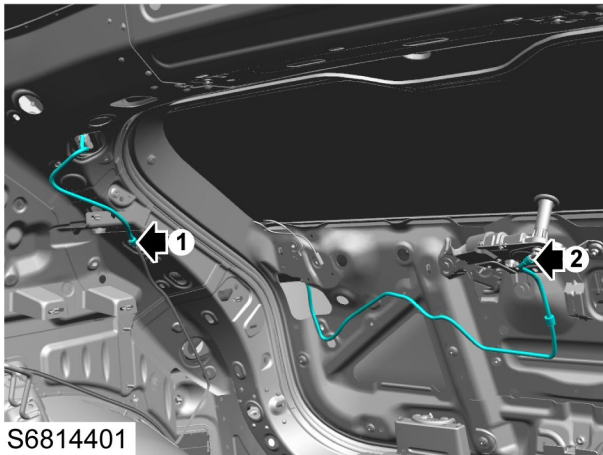
1. Remove the roof trim panel assembly.

 **Roof Trim Panel Assembly Remove**

2. Remove the tailgate interior trim panel.

 **Tailgate Interior Trim Panel Remove**

3. Disconnect the rear window washer middle connecting hose (1) and the rear window washer nozzle hose (2).



4. Remove the rear window washer nozzle hose.

Refit

1. Arrange the new hose according to direction of the used one.
2. Connect the rear window washer middle connecting hose (rear) to the rear window washer nozzle hose.
3. Fit the roof trim panel assembly.


 **Roof Interior Trim Refit**

4. Fit the tailgate interior trim panel.

 **Tailgate Interior Trim Panel Refit**

Summary Table of Special Tools

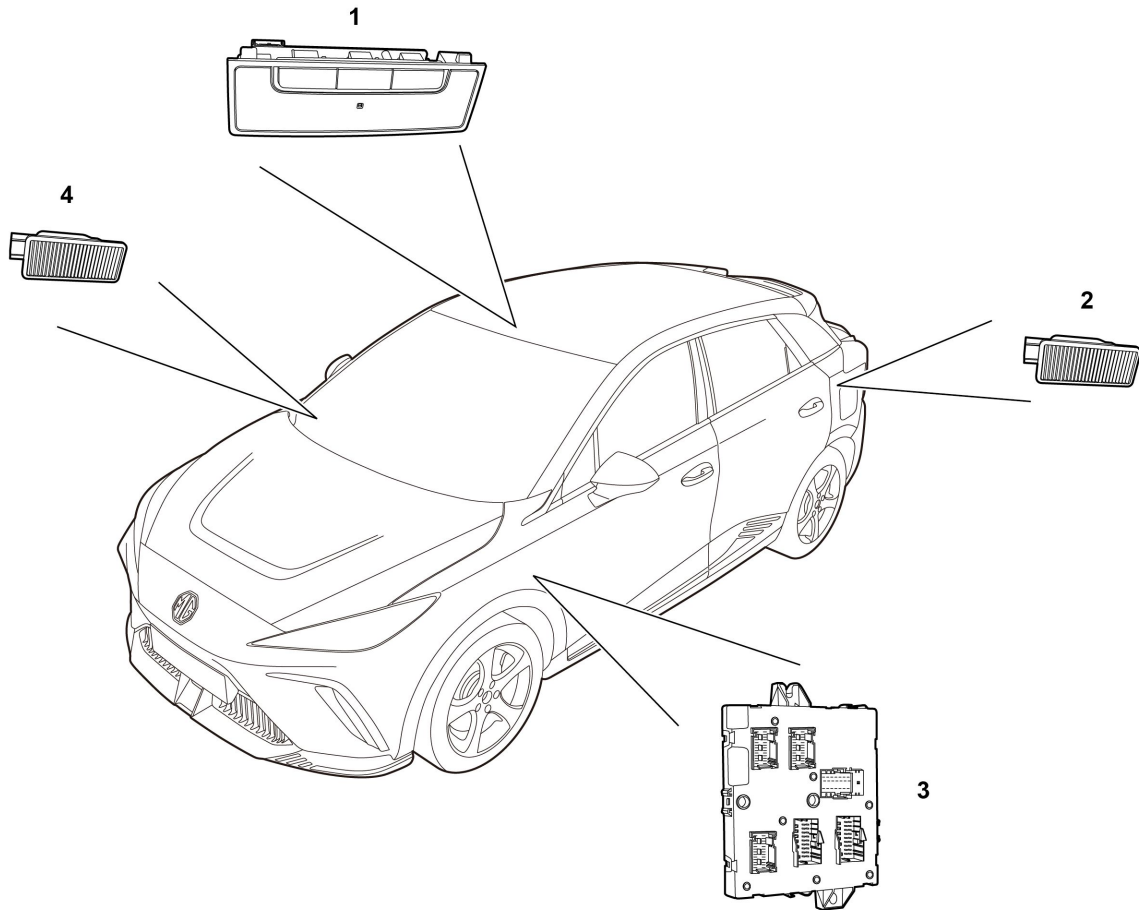
Special Tools

Tool Number	Description	Picture
TBO00015	Rear Wiper Arm Remove	 <p>TB000015</p>

Interior Light

Description and Operation

System Layout

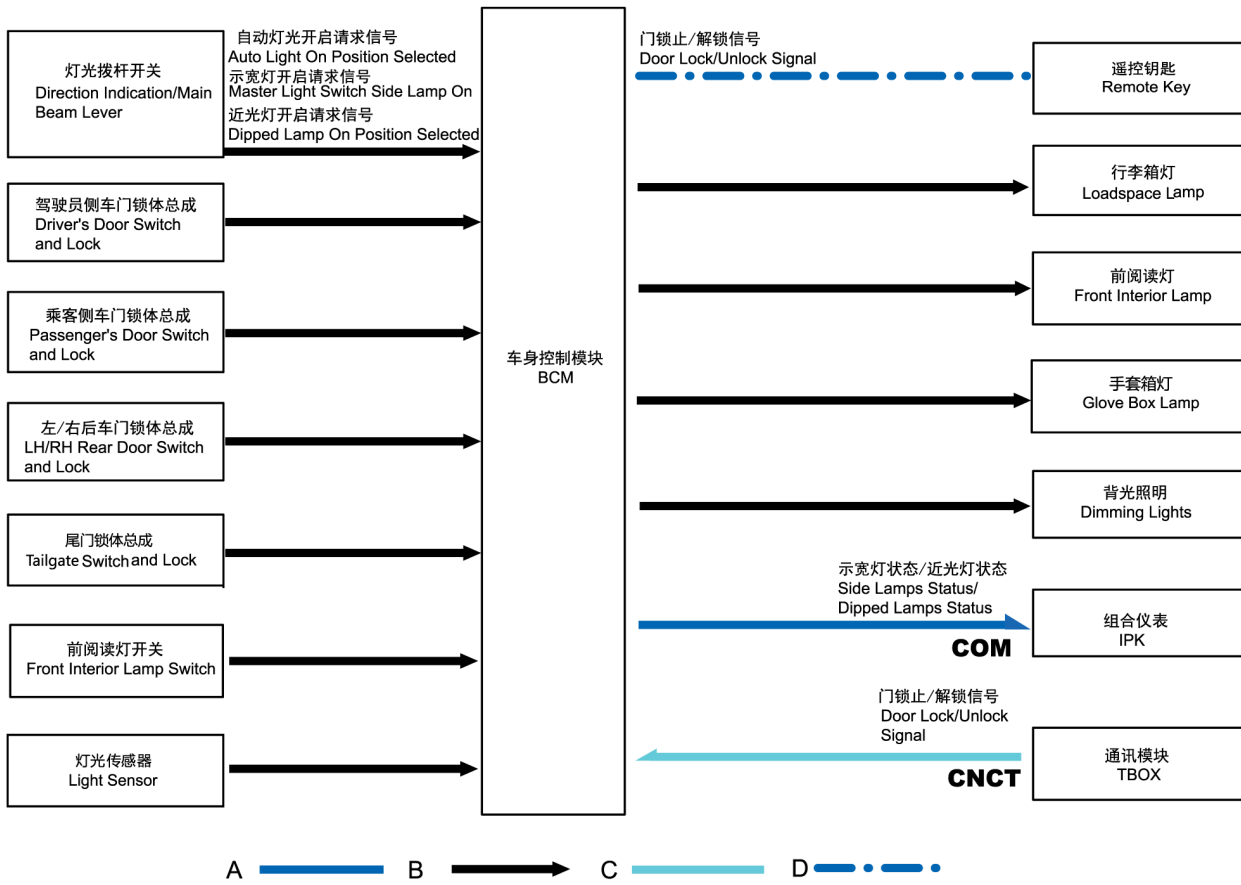


S4410959

- 1. Front Reading Lamp
- 2. Trunk Lamp

- 3. Body Control Module
- 4. Glove Box Lamp

System Control Diagram



S4410156

A = Comfort CAN Bus; B = Hard Wire; C = Connection CAN Bus; D = RF Signal

Description**Overview**

BCM The reading lamps and other interior lighting systems are controlled by the BCM at the left front dash panel of the A pillar.

Front Reading Lamp

The front reading lamp is an LED lamp.

The front reading lamp is fixed in the overhead console above the windshield with spring clips and can be replaced individually. It can be illuminated and canceled by 3 button-type switches on the reading lamp assembly.

Glove Box Lamp

The glove box lamp is located above the right glove box in the vehicle. Carefully pry off the glove box lamp assembly to replace it.

The glove box lamp is an LED lamp. When the glove box is open, the glove box lamp will illuminate automatically.

Trunk Lamp

The trunk lamp is located on the rear parcel shelf support plate on the left of the vehicle. Carefully pry off the trunk lamp assembly to replace it.

The trunk lamp is an LED lamp. When the trunk is open, the trunk lamp will illuminate automatically.

Operation

Overview

Interior Lighting

Interior lighting includes:

- Front Reading Lamp
- Trunk Lamp
- Glove Box Lamp
- Interior Backlight

The BCM receives signals related to the interior lighting system. When the BCM receives the reading lamp switch signal, door switch signal or tailgate switch signal, it will illuminate the corresponding lamp inside the vehicle. When the BCM detects that the headlamp is on or the ambient light is insufficient through the light sensor, the BCM illuminates the backlight of some interior switches.

PWM Interior Lighting Controlled (by PWM)

The interior lamps under control include the front reading lamp and trunk lamp. It can be controlled with auto mode or manual mode.

Auto Mode PWM Control

No need to manually press the specific switch, the BCM will control the working status of the interior lamp according to the signal received.

The interior lamp will illuminate automatically under the following conditions:

- When you press the UNLOCK button on the remote key, or unlock with the body control module, the front reading lamp will illuminate gradually. If no door is opened within 30s, the front reading lamp will dim gradually.
- When the start switch is off and the width lamp is on, or the light sensor determines that it is night, the reading lamp will illuminate gradually. If no door is opened within 30s, the reading lamp will dim gradually.
- When the start switch is turned off within 30s after the width lamp goes out, the reading lamp will illuminate gradually.
- If any door is opened, the reading lamp will illuminate gradually.
- If the interior lamps illuminate, all doors are in closed state, when the start switch is changed to "OFF" position from "ACC" or "ON" position, the interior lamps will dim gradually in 30s.
- When you press the LOCK button on the remote key or lock the doors with the body control module, the interior lamps will dim gradually.
- When all doors are in the closed state and the start switch is in "ACC" or "ON" position, the interior lamps will dim gradually.

- If any door is opened, the interior lamps will illuminate and gradually dim in 15min when the energy-saving function of the battery is on.

Note : *In auto mode PWM control, once the impact sensor is triggered, the interior lamps will illuminate immediately.*

Manual Mode PWM Control

Press the roof lamp switch to illuminate the corresponding lamp. When the interior lamps are turned on/off manually, the auto delay function will be disabled.

Manual Shift between Control Modes

Press the master switch on the front reading lamp assembly to activate the auto mode. Press the master switch again to turn off the auto mode.

The interior lighting delay power control includes:

- Front Reading Lamp

The BCM controls the interior lighting system by driving the relay.

Under the following situations, the BCM controls the delay of the interior lamps by disconnecting the delay relay.

- When the start switch is in "ACC" or "ON/RUNNING" position
- Press the UNLOCK button on the remote key, and unlock the doors with the body control module

The delay function may fail under the following conditions:

- 15min after the start switch is OFF
- Press the LOCK button on the remote key, and lock the doors with the body control module
- When the vehicle is in anti-theft state
- When the vehicle is locked externally

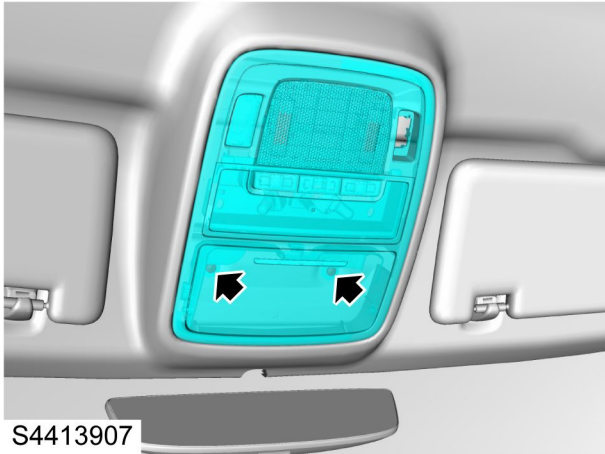
LED Interior Backlight Control

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.

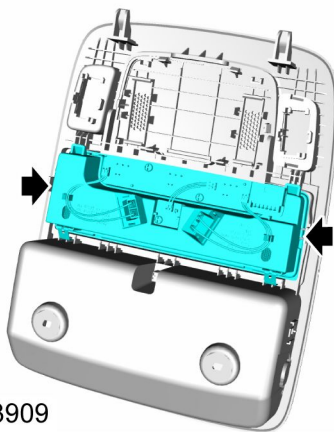
Service Guide

Roof Console and Front Reading Lamp Assembly Remove

1. Disconnect the negative battery cable.
2. Open the glasses box, and remove 2 screws fixing the overhead console and switches to the roof.



3. Loosen the clip, disconnect the harness connector on the back and remove the overhead console and switches.
4. Loosen the clip fixing the front reading lamp to the overhead console, and remove the front reading lamp assembly.

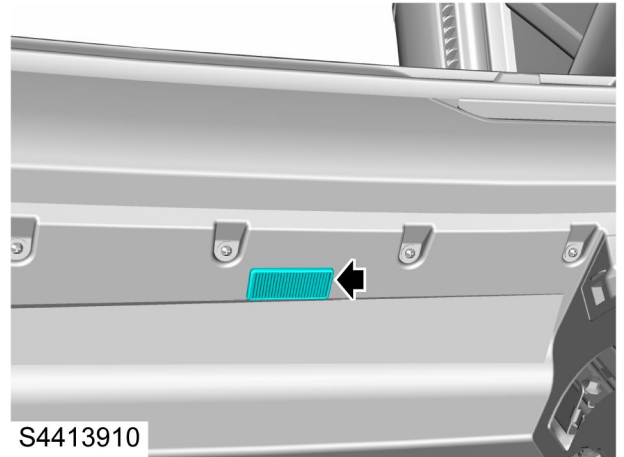


Refit

1. Fix the front reading lamp assembly to the overhead console, and press the clip in place.
2. Connect the harness connector on the back, fix the overhead console to the roof, and press the clip in place.
3. Fit and tighten 2 screws fixing the overhead console to the roof.
4. Close the glasses box.
5. Connect the negative battery cable.

Glove Box Lamp Assembly Remove

1. Disconnect the negative battery cable.
2. Open the glove box, pry off the clip fixing the glove box lamp to the lower instrument panel.



3. Disconnect the harness connector and remove the glove box lamp assembly.

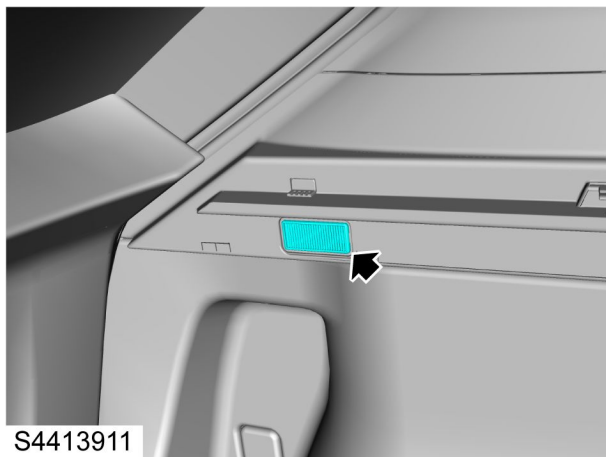
Refit

1. Connect the harness connector.
2. Fix the glove box lamp to the lower instrument panel, press the clip in place, and fit the glove box lamp assembly.
3. Close the glove box.
4. Connect the negative battery cable.

Trunk Lamp Assembly

Remove

1. Disconnect the negative battery cable.
2. Pry off the clip fixing the trunk lamp to the rear parcel shelf side trim panel.



3. Disconnect the harness connector and remove the trunk lamp assembly.

Refit

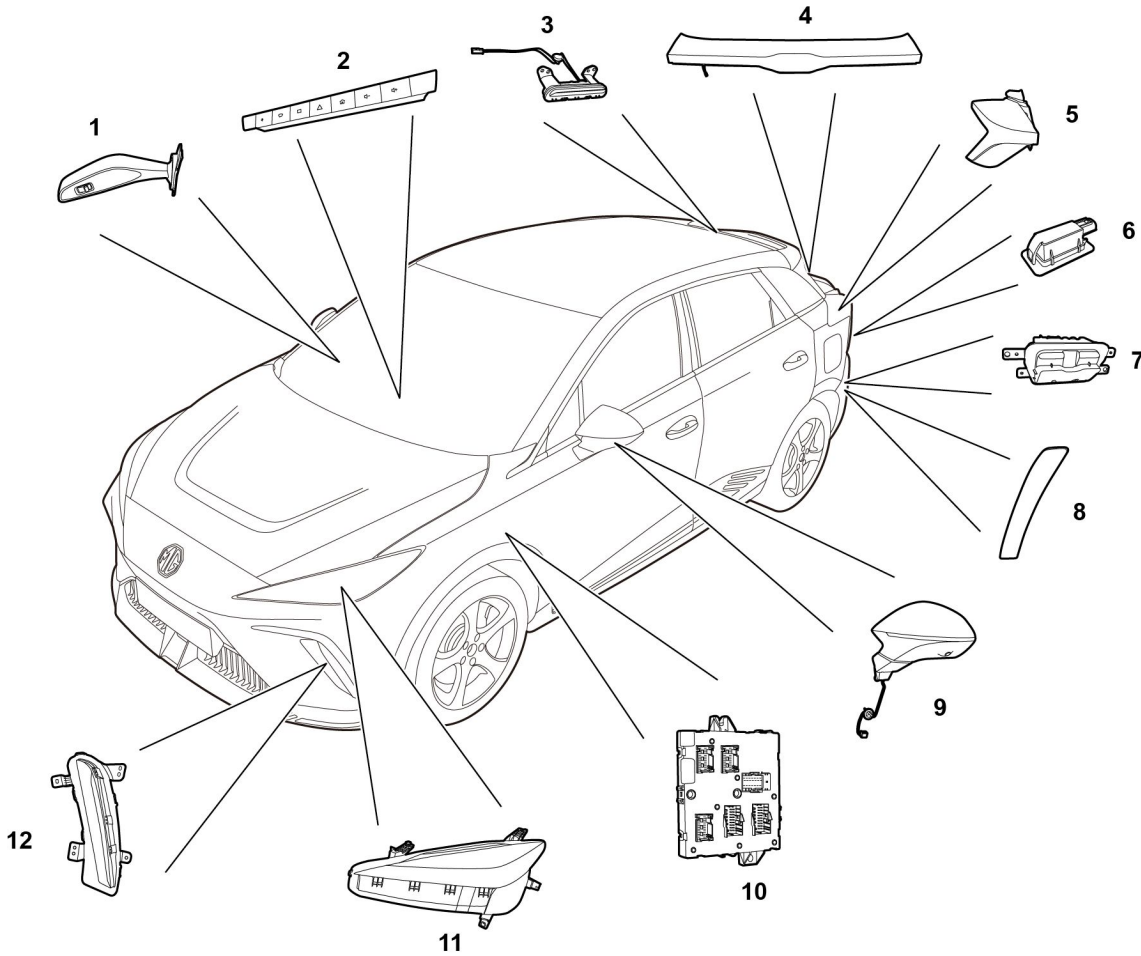
1. Connect the harness connector.
2. Fix the trunk lamp to the rear parcel shelf side trim panel, press the clip in place, and fit the trunk lamp assembly.
3. Connect the negative battery cable.

Exterior Lighting**Specification****Torque**

Description	Value
Bolt-Headlamp to body	3-5Nm
Bolt-Headlamp alignment	0.1-0.5Nm
Bolt-Tail lamp to body	3-5Nm
Nut-Rear width lamp to Tail gate	2.7-3.3Nm

Description and Operation

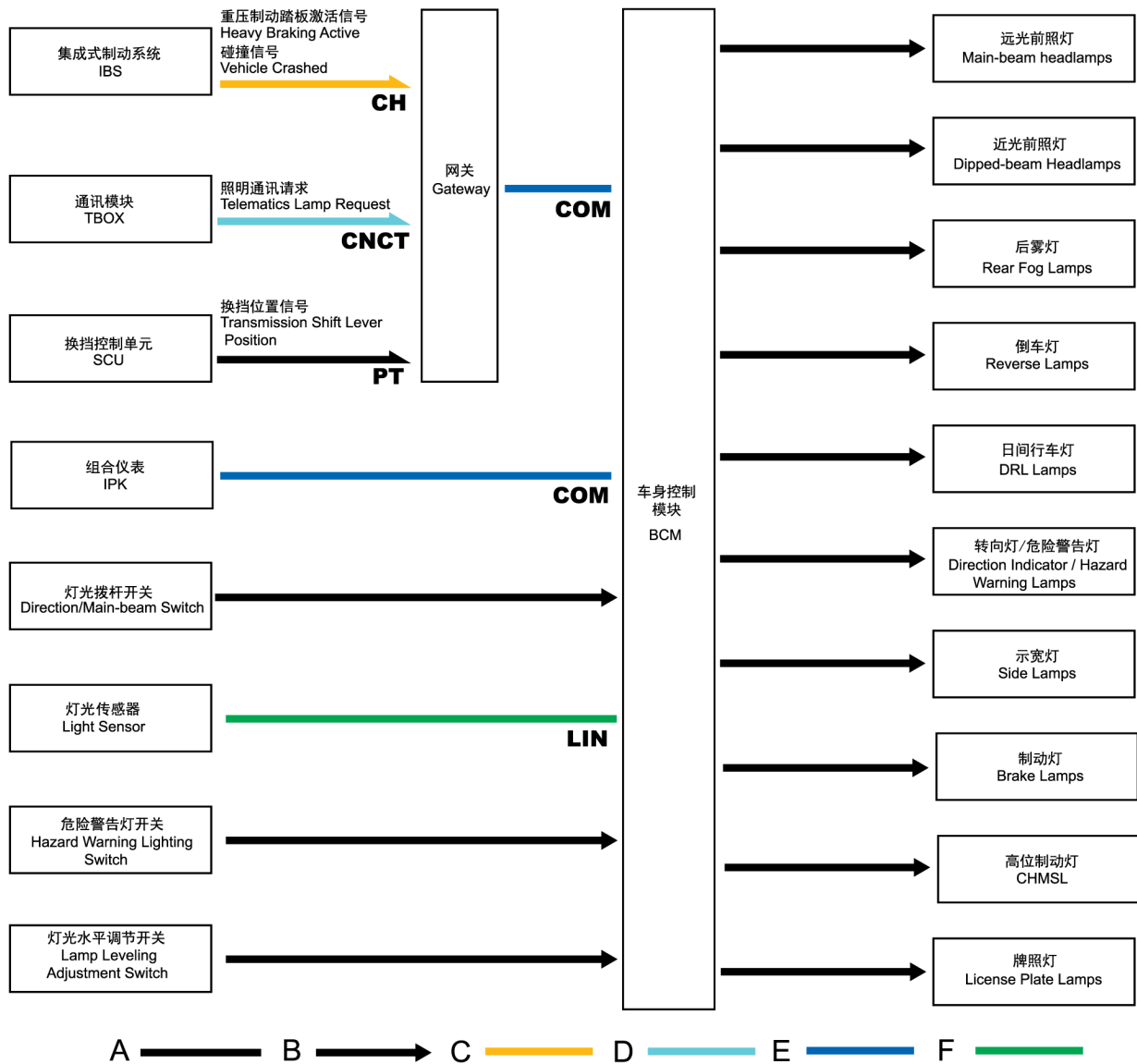
System Layout



S6510995

- | | |
|-----------------------------------|------------------------------------|
| 1. Light Stalk Combination Switch | 7. Rear Fog Lamp |
| 2. Hazard Warning Lamp Switch | 8. Reflex Reflector |
| 3. High-mounted Stop Lamp | 9. Side Direction Indicator Lamp |
| 4. Through-type Rear Width Lamp | 10. Body Control Module |
| 5. Tail Lamp | 11. Headlamp |
| 6. Rear License Plate Lamp | 12. Front Direction Indicator Lamp |

System Control Diagram



S4410157

A = Power CAN Bus; B = Hard Wire; C = Chassis CAN Bus; D = Connection CAN Bus; E= Comfort CAN Bus; F = LIN Bus

Description

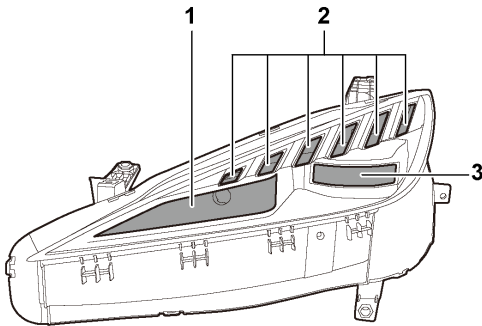
Overview

The exterior lighting system includes all external lamps, which are controlled by the master light switch and auto lamp control sensor. Exterior lighting system includes:

- Headlamp
- Front Direction Indicator Lamp
- Tail Lamp
- Through-type Rear Width Lamp
- Rear License Plate Lamp
- High-mounted Stop Lamp
- Rear Fog Lamp
- Side direction indicator lamp

Headlamp

Headlamp (Low Configuration)



S6514225

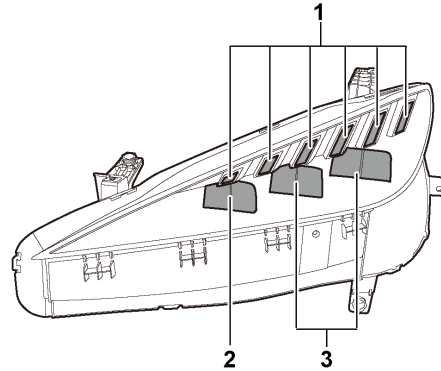
1. Direction Indicator Lamp (LED)
2. Daytime Running Lamp / Width Lamp (LED)
3. High/Low Beam (LED)

The headlamp has 5 retaining bolts, 1 of which is fitted on the front-end module, 1 is fitted on the front bumper side bracket, 1 is fitted on the fender, and 2 are fitted on the front bumper beam.

The headlamp assembly includes the high/low beam, daytime running lamp, width lamp and direction indicator lamp, which are all LED lamps.

Headlamp

Headlamp (high configuration)



S6514226

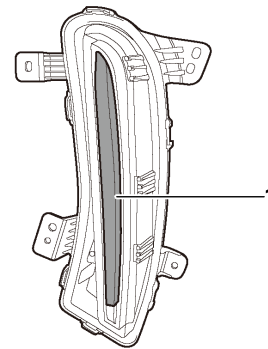
1. Daytime Running Lamp / Width Lamp (LED)
2. High Beam (LED)
3. Low Beam (LED)

The headlamp has 5 retaining bolts, 1 of which is fitted on the front-end module, 1 is fitted on the front bumper side bracket, 1 is fitted on the fender, and 2 are fitted on the front bumper beam.

The headlamp assembly includes the high/low beam, daytime running lamp and width lamp, which are all LED lamps.

Front Direction Indicator Lamp

Front Direction Indicator Lamp



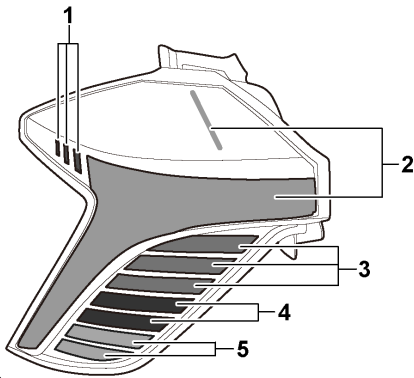
S6514227

1. Direction Indicator Lamp (LED)

The front direction indicator lamp is fixed to the front bumper assembly with 4 screws.

The front direction indicator lamp assembly includes the direction indicator lamps (LED).

Tail Lamp



S6514228

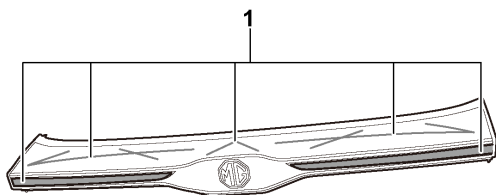
- 1. Side Marker Lamp (LED)
- 2. Rear Width Lamp (LED)
- 3. Rear Direction Indicator Lamp (LED)
- 4. Reverse Lamp (LED)
- 5. Brake Lamp (LED)

The tail lamp is fixed on the bodyside panel with 2 bolts.

The tail lamp assembly includes side marker lamp, rear width lamp, reverse lamp, brake lamp and rear direction indicator lamp. The rear width lamp is located above the tail lamp assembly, the side marker lamp is at the upper left of the tail lamp, the brake lamp is at the bottom of the tail lamp assembly, the rear direction indicator lamp is in the middle part of tail lamp assembly, and the reverse lamp is located at the lower part of tail lamp assembly (TBD).

Through-type Rear Position Lamp (If equipped)

Through-type Rear Position Lamp



S6514224

- 1. Rear Width Lamp (LED)

The through-type rear width lamp is fixed on the tail gate with 9 nuts.

The through-type rear position lamp assembly includes the width lamp (LED).

Rear License Plate Lamp

Both rear license plate lamps are fitted on the through-type rear width lamp, which are located at both sides of the tailgate switch, with bulbs inside (TBD).

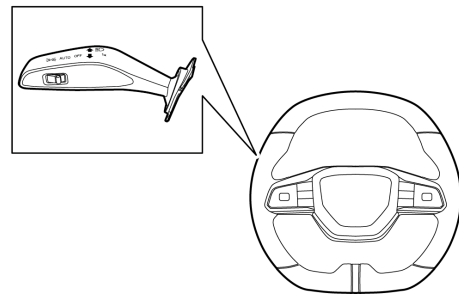
Side Direction Indicator Lamp

The side direction indicator lamp (LED) is fixed on the exterior rearview mirror.

High-mounted Stop Lamp

The high-mounted stop lamp (LED) is in the upper part of the rear window, and it is fixed to the spoiler with 2 nuts, which can be seen when removing the spoiler.

Master Light Switch



S6514193

The master lighting switch is located at the left side of the steering wheel, which is used for controlling the external lighting.

Operation

Overview

Exterior Lighting Control and Detection

The BCM controls the following exterior lamps:

- High Beam Headlamp
- Low Beam Headlamp
- Rear Fog Lamp
- Reverse Lamp
- License Plate Lamp
- Width Lamp/Daytime Running Lamp
- Direction Indicator Lamp/Hazard Warning Lamp
- Brake Lamp/High-mounted Stop Lamp

Automatic Light Control

When the "AUTO" gear is selected on the touch switch of the instrument panel, the light sensor will turn on/off the headlamps automatically by sensing the intensity of the outside light (visible light).

The followings are the illumination in different gears with "AUTO" gear is selected at night:

- When the start switch is OFF, the low beam headlamp and the width lamp do not illuminate.
- When the start switch is in ACC position, the width lamp illuminates.
- When the start switch is in ON/RUNNING position, the low beam headlamp and the width lamp illuminate.

Intelligent High Beam (If Any)

Under automatic control, when the low beams are turned on, the front view camera module (FVCM) will detect light signals ahead and transmit them to the BCM. The BCM will turn on/off the high beams, and the corresponding intelligent high beam indicator on the instrument pack will illuminate.

The intelligent high beam function will be activated when the following conditions are met at the same time:

1. The touch panel switch of the instrument panel is selected to "AUTO" gear and the low beam is automatically turned on.
2. The vehicle is travelling at a speed of over 40km/h.
3. Rear fog lamps are not on.

Under automatic control, and the low beams are on, if the road ahead is dark, the system will turn on the high beams. The high beam will be automatically switched to the low beam if any of the following conditions occur:

- Headlamp beams of the approaching vehicle from the opposite direction is detected by the FVCM.
- Tail lamp beams of the vehicle ahead in the same direction is detected by the FVCM.

- The surroundings are bright enough (such as street lamps) and no high beam is required.
- The vehicle speed drops below 40km/h.

Under automatic control, the working state of manual switching of high/low beam is:

- With the intelligent high beam function activated, continuously move the high beam and low beam lever in 2 seconds, the system will not exit the intelligent high beam function.
- With the intelligent high beam function activated, move the high beam and low beam lever for 2 consecutive times with an interval of more than 2s, the intelligent high beam function will be disabled. Continuously move the high beam and low beam lever in 2s next time or restart the vehicle and select "AUTO" gear again, and the intelligent high beam function can be re-activated.

Note : The intelligent high beam function can be activated up to three times in a starting cycle.

The intelligent high beam function cannot be switched automatically in the following conditions, and manual switching of high/low beam is required:

- Sensor vision is affected by severe weather such as dense fog, heavy rain, and heavy snow.
- Travelling in the moonlight or in the circumstances with weak road lighting ahead, or in the areas with poor lighting but lots of buildings.
- Travelling on the high-reflection road, for example, after the rain, snow or other high-reflection conditions.
- When there are high-reflection objects near the road such as traffic signs.
- Distinct light source, such as external devices, exists in the vicinity of the windscreen sensor, resulting in sensor dazzling.
- The windscreen is dirty, broken or vision-blocked due to objects in front of the sensor.
- The lamplight of other vehicles cannot be detected due to the missing, broken, blocked or partly blocked lamp, or other causes.
- The headlamp beams and tail lamp beams of other vehicles cannot be detected due to high/low sensor vision during vehicle's travelling uphill/downhill an abrupt slope, with loads or in a pit.
- Travelling on a curving road or on a mountain road.

Brake Lamp

The brake lamp switch has two pedal status outputs, one signal is sent to the BCM, and the other is sent to the ECM.

Emergency Brake Lamp

The brake lamp or hazard warning lamp will flash under the following conditions:

1. The brake lamp switch inputs the activation signal.
2. The ABS or the SCS sends the relevant activation signal.

When the emergency brake is activated, if the hazard warning lamp is working, the emergency brake lamp will not flash.

If the activated hazard warning lamp causes failure of the emergency brake lamp, the emergency brake lamp will not flash again after the hazard warning lamp is cancelled unless the above conditions are met.

The emergency brake lamp can be activated only when the vehicle speed exceeds 50km/h. After the emergency brake lamp is activated, when the ABS activation signal/hard brake activation signal disappears and the vehicle speed is greater than 2km/h, the emergency brake lamp will go out after 2s. With the emergency brake lamp activated, when the ABS activation signal/hard brake activation signal disappears and the vehicle speed is less than 2km/h, the emergency brake lamp will go out after illumination for 5s.

With the vehicle speed less than 10km/h for more than 1s, if the emergency brake lamp goes out, the hazard warning lamp will be activated automatically; before the vehicle speed drops below 10km/h, if the emergency brake lamp stops flashing, the hazard warning lamp will not be activated automatically even if the vehicle speed is already below 10km/h. If the hazard warning lamp is activated, press the hazard warning lamp switch or keep the vehicle speed above 20km/h for more than 5s or restart the vehicle, and the hazard warning lamp will go out.

When the SCS cannot receive the hard brake activation signal, the BCM can illuminate the emergency brake lamp as per the acceleration signal of the SCS.

Brake Lamp Activation Request from Other Systems

When the BCM receives the brake lamp activation request signal from the SCS, EPB and FVCM, the BCM will illuminate the brake lamp according to the valid signal.

Direction Indicator Lamp

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 switch status of the direction indicator lamp. Then 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.

Rear Fog Lamp

When the start switch is in ON/RUNNING position, the low beam headlamp is enabled, then the activation of the rear fog lamp switch can illuminate the rear fog lamp. When the rear fog lamp switch and the low beam headlamp are disabled, the

rear fog lamp goes out. If the rear fog lamps are on at the time of engine start, they will remain ON.

Hazard Warning Lamp

The hazard warning lamps include: 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 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.

Operation Priority of Direction Indicator Lamp and Hazard Warning Lamp

If the direction indicator lamp switch is enabled when the hazard warning lamp is working, the direction indicator lamp will cancel the hazard warning lamp. Then, the hazard warning lamp will still flash after the direction indicator lamp switch or the start switch is turned off.

If the hazard warning lamp switch is enabled when the direction indicator lamp is working, the hazard warning lamp will replace the direction indicator lamp. The direction indicator lamp will resume after the hazard warning lamp is disabled.

The hazard warning lamp can be activated automatically under the following situations:

In case of an impact: when the BCM detects an impact signal, it will flash the hazard warning lamp automatically for warning. Accidental activation of the hazard warning lamp during an impact can be cancelled by pressing the hazard warning lamp switch for more than 5s.

Low Beam Headlamp

When the start switch is in ON/RUNNING position, and the touch panel switch of the instrument panel is selected to the low beam gear, the BCM closes the low beam relay and illuminates the low beam headlamp.

High Beam Headlamp

When the start switch is in ON/RUNNING position, the BCM closes the high beam relay and illuminates the high beam headlamp by identifying the status of the light stalk switch.

Width Lamp

When turning the touch panel switch of the instrument panel to the Auto mode, width lamp gear or low beam gear, the width lamp illuminates. When only the width lamp is turned on, the daytime running lamp will be turned on for the headlamp to supplement the light source.

The touch panel switch of the instrument panel is selected to "AUTO" gear, when the BCM receives the "Outside Light Intensity Low" signal from the light sensor, it will illuminate the width lamps automatically.

Reverse Lamp

When the start switch is in ON/RUNNING position, and the TCM detects that the shift lever is in "R" position, it will send the reverse signal to the BCM through the CAN bus. Once the BCM determines that the signal is valid, it will illuminate the reverse lamps immediately. When the BCM detects that the signal is invalid (the start switch is not in ON/RUNNING position or the shift lever is not in the "R" gear), the reverse lamp will go out.

Note : For vehicles with automatic transmission, to avoid shifting to "R" gear and illuminating the reverse lamp accidentally during the gear shift, after the BCM detects that the shift lever is held in "R" gear for more than 1s, it will illuminate the reverse lamp.

Additional Functions

Vehicle Locating Function

This function helps the driver to quickly locate his vehicle with the body lamp at night. Set the response mode of vehicle locating indication: (Lights only or Lights + Horn) . After the vehicle is locked for a few minutes, the vehicle locating function is enabled and the audible and visual warning is triggered by pressing the LOCK button on the remote key. When the LOCK button is pressed again, the vehicle locating function can be disabled. Press the UNLOCK button to cancel the vehicle locating function.

Follow Me Home Function

When the driver turns off the start switch and is about to leave the vehicle, the Follow Me Home function can control the timed illumination of the low beam headlamp and width lamp to illuminate the area around the vehicle. The duration of the illumination (0-90s) can be set according to individual needs (increase at an increment of 30s). If the door is opened after the Follow Me Home function timer is working, the timer will repeat the operation.

The BCM can identify the status of the Follow Me Home function according to the activation signal of this function.

The Follow Me Home function can be set by manual mode as follows:

After the start switch is off, turn the light stalk switch to the steering wheel, then the system enters the Follow Me Home mode.

With the Follow Me Home function activated, pull the light stalk switch or change the position of the start switch to disable the Follow Me Home function.

When the enabled start switch, alternator failure or battery overdischarge is detected, the Follow Me Home function cannot work properly.

License Plate Lamp

The license plate lamp is controlled by the BCM. When the touch panel switch of the instrument panel is selected to the width lamp gear or headlamp gear, license plate lamp illuminates.

Daytime Running Lamp

The BCM controls the daytime running lamp via 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. When the low beam is turned on, the daytime running lamp goes out automatically.

Lamp of Security System

When a valid request signal of external locking is received, the vehicle security system is enabled and the vehicle is locked or enters the complete anti-theft state, the BCM will control the direction indicator lamps to give 3 flashes.

If the anti-theft function of the security system is cancelled, the direction indicator lamps give 1 flash.

If the vehicle is not fully locked (bonnet, tailgate and doors are open), the direction indicator lamp will not flash.

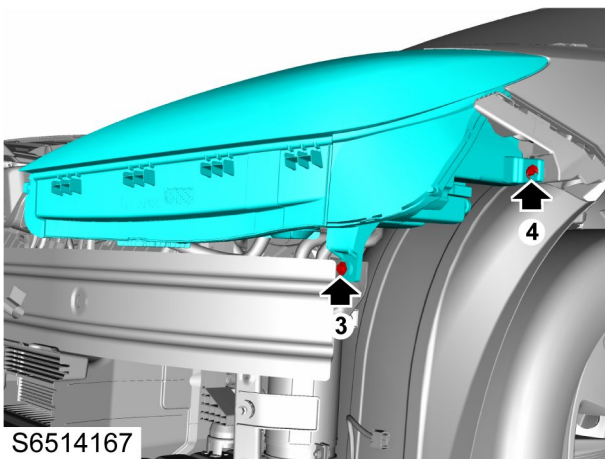
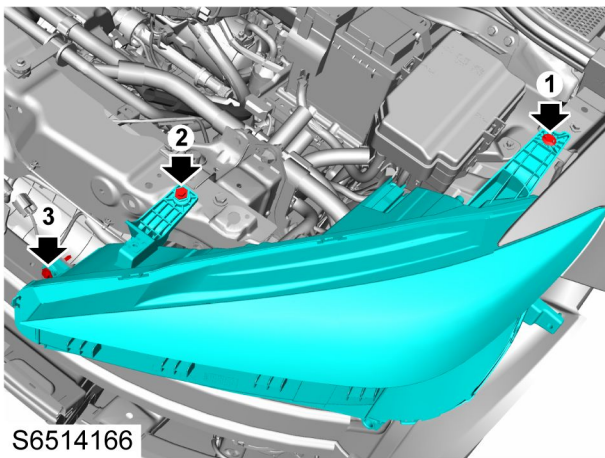
Service Guide

Headlamp Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

 **Front Bumper Remove**

3. Remove 1 bolt (1) fixing the headlamp assembly to the fender, and 1 bolt (2) fixing the headlamp assembly to the front-end module.
4. Remove 2 bolts (3) fixing the headlamp assembly to the front bumper beam, and remove 1 bolt (3) fixing the headlamp assembly to the front bumper side bracket.



5. Disconnect the harness connector and remove the headlamp assembly.

Refit

1. Connect the harness connector of the headlamp.
2. Align the headlamp assembly to the mounting point, respectively fit 5 bolts, tighten them to **3-5Nm**, and check the torque.
3. Fit the front bumper.

 **Front Bumper Refit**

4. Connect the negative battery cable.
5. Check if the headlamp is aligned.

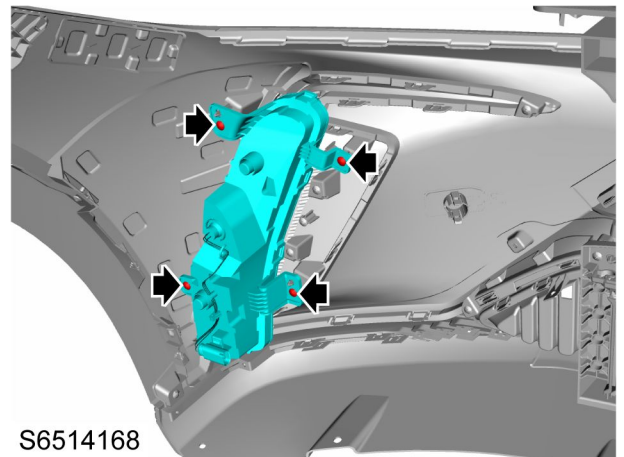
 **Front End Information**

Front Direction Indicator Lamp Assembly Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

 **Front Bumper Remove**

3. Remove 4 screws fixing the front direction indicator lamp assembly to the front bumper.



4. Remove the front direction indicator lamp assembly.

Refit

1. Locate the front direction indicator lamp to the front bumper assembly.
2. Fit 4 screws fixing the front direction indicator lamp assembly to the front bumper and tighten them.
3. Fit the front bumper.

 **Front Bumper Refit**

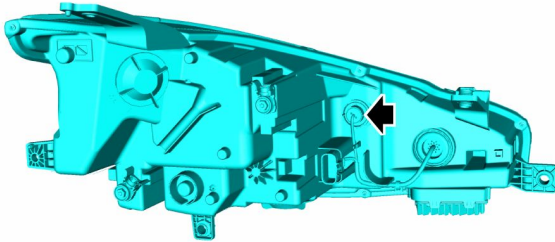
4. Connect the negative battery cable.

Front Direction Indicator Lamp Bulb Remove

1. Remove the headlamp assembly.

Headlamp Assembly

2. Turn the front direction indicator lamp holder counterclockwise and remove the holder.



S6514240

3. Remove the bulb from the lamp holder and discard it.

Refit

1. Fit the bulb to the lamp holder.
2. Fit the bulb holder to the headlamp assembly.
3. Fit the headlamp assembly.

Headlamp Assembly

4. Connect the negative battery cable.

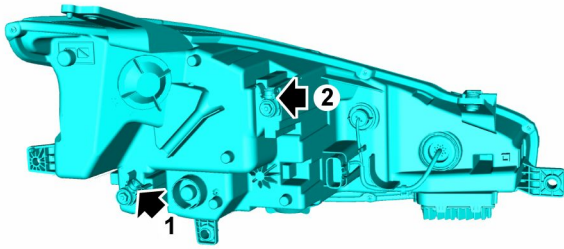
Headlamp Lighting Calibration Check

1. Unload the cargo in the vehicle to empty it.
2. Light Inspection (Low-configuration)
 - a. Turn on the low beam and allow the beam to fall on the screen 10m away.
 - b. Adjust the headlamp to ensure that the height of the cut-off line or central height of the low beam shall be between 50mm below H and 300mm below H (H=739.5mm).
 - c. The headlamp high/low beam is a bulb which needs to adjust the low beam only.
3. Light Inspection (High-configuration)
 - a. Turn on the low beam and allow the beam to fall on the screen 10m away.
 - b. Adjust the headlamp to ensure that the height of the cut-off line or central height of the low beam shall be between 50mm below H and 300mm below H (H=850mm).
 - c. Turn on the high beam and allow the beam to fall on the screen 10m away.
 - d. Adjust the headlamp to ensure that the height of the cut-off line or central height of the low beam shall be between 50mm below H and 300mm below H (H=836.2mm).
4. For requirements on beam illumination location, please refer to GB 7258-2019 Safety Specifications for Motor Vehicles Operating on Roads.

Adjustment

Warning : *The light deflection caused by the mounting bracket deformation or abnormal lamp mounting position can't be corrected by normal adjustment and the excessive adjustment will break the lamp.*

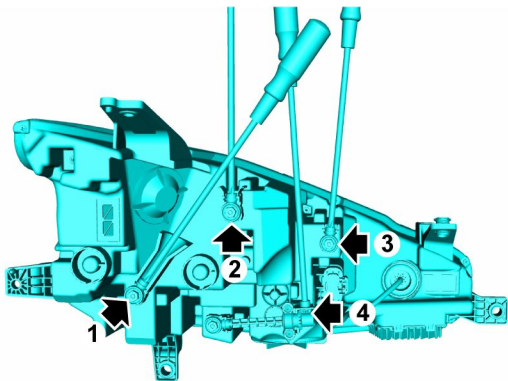
1. Light Adjustment (Low-configuration)
 - a. Turn the adjusting screw (1) to adjust the high/low beam in vertical direction, with the adjusting torque of **0.1-0.5Nm**.
 - b. Turn the adjusting screw (2) to adjust the high/low beam in horizontal direction, with the adjusting torque of **0.1-0.5Nm**.



S6514173

2. Light Adjustment (High-configuration)

- a. Turn the adjusting screw (1) to adjust the low beam in vertical direction, with the adjusting torque of **0.1-0.5Nm**.
- b. Turn the adjusting screw (2) to adjust the low beam in horizontal direction, with the adjusting torque of **0.1-0.5Nm**.
- c. Turn the adjusting screw (3) to adjust the high beam in horizontal direction, with the adjusting torque of **0.1-0.5Nm**.
- d. Turn the adjusting screw (4) to adjust the high beam in vertical direction, with the adjusting torque of **0.1-0.5Nm**.



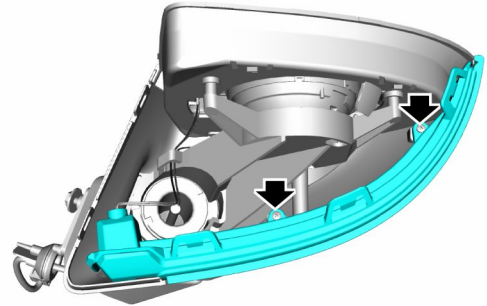
S6514169

Side Direction Indicator Lamp Remove

- 1. Disconnect the negative battery cable.
- 2. Remove the exterior rearview mirror cover.

Exterior Rearview Mirror Cover

- 3. Remove 2 screws fixing the side direction indicator lamp to the exterior rearview mirror assembly.



SC413207

- 4. Disconnect the harness connector and remove the side direction indicator lamp assembly.

Refit

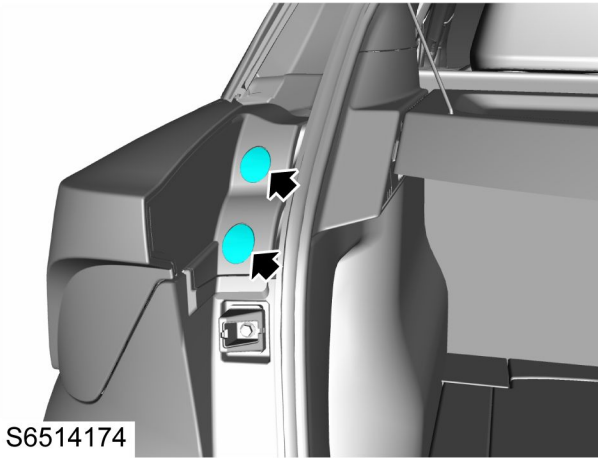
- 1. Connect the harness connector.
- 2. Fix the side direction indicator lamp to the exterior rearview mirror assembly, fit 2 screws and tighten them.
- 3. Fit the exterior rearview mirror cover.

Exterior Rearview Mirror Cover Refit

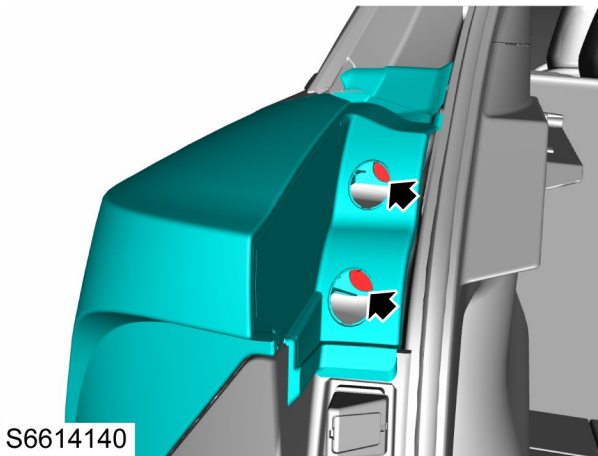
- 4. Connect the negative battery cable.

Tail Lamp Assembly Remove

1. Open the tail gate, and disconnect the negative battery cable.
2. Pry open the trim cover of the tail lamp assembly bolt.



3. Remove 2 bolts fixing the tail lamp assembly to the body.



4. Disconnect the harness connector and remove the tail lamp assembly.

Refit

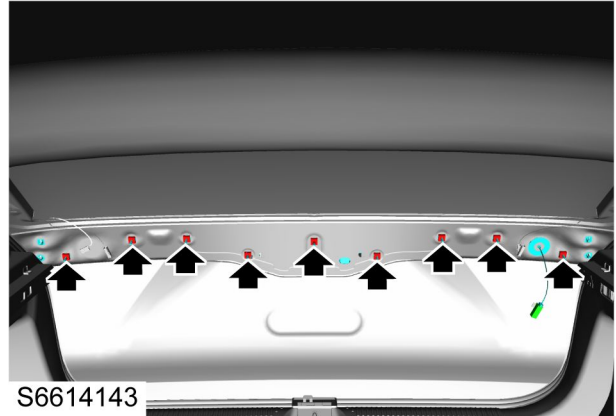
1. Connect the harness connector.
2. Fix the tail lamp to the body, fit 2 bolts, tighten them to **3-5Nm**, and check the torque.
3. Fit the tail lamp bolt trim panel.
4. Connect the negative battery cable, and close the tail gate.

Through-type Rear Width Lamp Assembly Remove

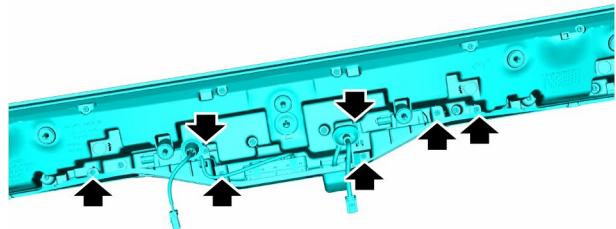
1. Disconnect the negative battery cable.
2. Remove the tail gate interior trim panel.

Tail Gate Interior Trim Panel

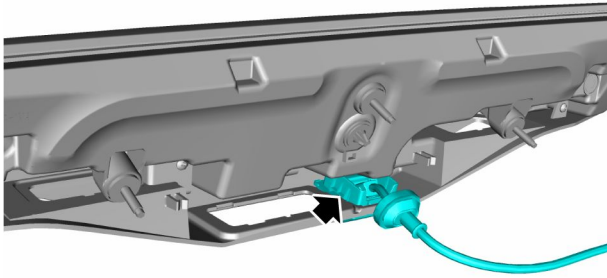
3. Remove 9 nuts fixing the through-type rear position lamp assembly to the tail gate.



4. Disconnect the harness connector and remove the through-type rear position lamp assembly.
5. If necessary, remove 7 screws fixing the rear license plate lamp trim panel to the through-type rear position lamp assembly, and remove the rear license plate lamp trim panel.

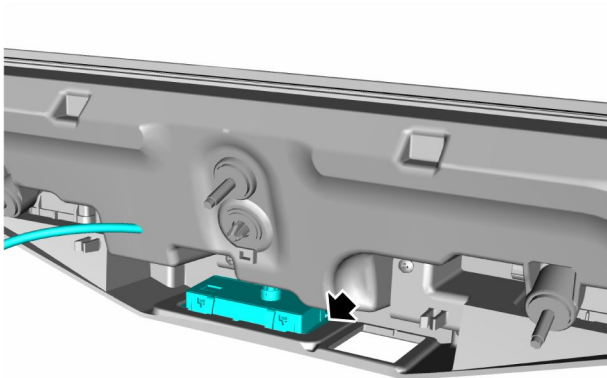


6. if necessary, pry open the clip fixing the rear camera to the through-type rear position lamp and remove the rear camera assembly.



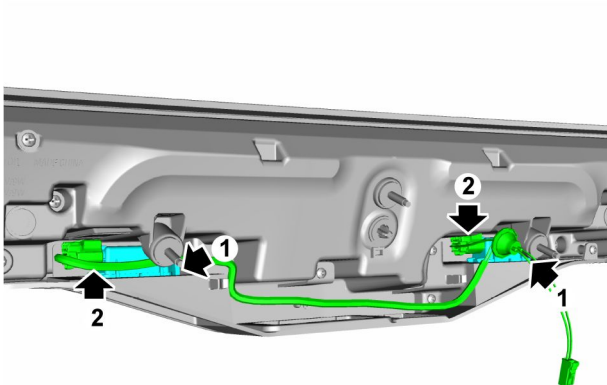
S6514212

7. if necessary, pry open the clip fixing the tail gate switch to the through-type rear position lamp and remove the tail gate switch assembly.



S6514213

8. if necessary, pry open the clip fixing the rear license plate lamp to the through-type rear position lamp (1), disconnect the harness connector (2) and remove the rear license plate lamp assembly.



S6514211

Refit

1. If removed, fix the rear license plate lamp assembly to the through-type rear position lamp, and press the clip in place.
2. If removed, fix the tail gate switch to the through-type rear position lamp, and press the clip in place.
3. If removed, fix the rear camera assembly to the

through-type rear position lamp, and press the clip in place.

4. If removed, fit 7 screws fixing the rear license plate lamp trim panel to the through-type rear position lamp assembly, and tighten them.
5. Connect the harness connector.
6. Fit 9 nuts fixing the through-type rear position lamp/spoiler assembly (if equipped) to the tail gate, tighten them to **2.7-3.3Nm**, and check the torque.
7. Fit the interior trim panel of the tail gate.

Tail Gate Interior Trim Panel Refit

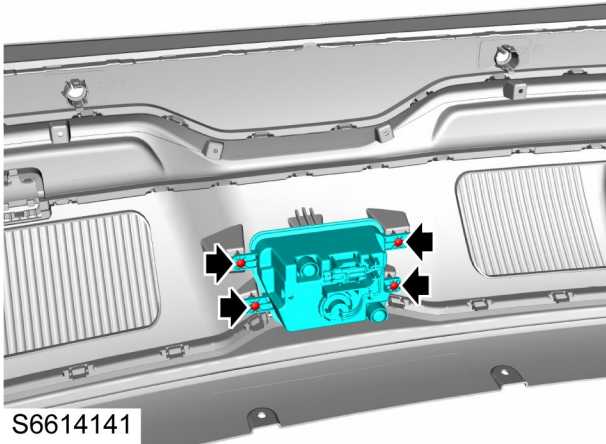
8. Connect the negative battery cable.

Rear Fog Lamp Assembly Remove

1. Remove the rear bumper.

Rear Bumper Remove

2. Remove 4 screws fixing the rear fog lamp assembly to the rear bumper.



3. Remove the rear fog lamp assembly.

Refit

1. Fix the rear fog lamp assembly to the rear bumper, fit and tighten 4 screws.
2. Fit the rear bumper.

Rear Bumper Refit

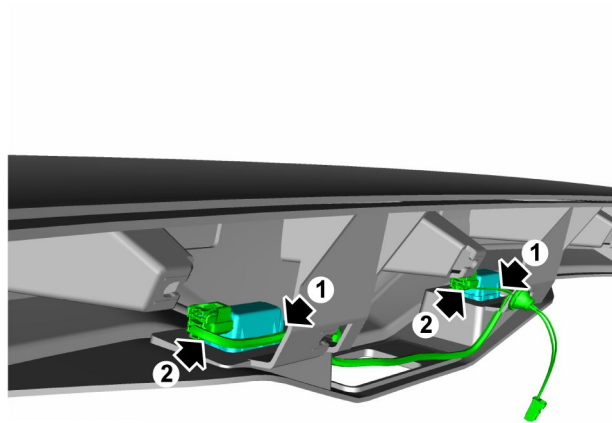
3. Connect the negative battery cable.

Rear License Plate Lamp Remove

1. Disconnect the negative battery cable.
2. Remove the rear license plate lamp (fixed to the spoiler).
 - a. Remove the spoiler assembly.

Spoiler Assembly

- b. Release the retaining clip fixing the rear license plate lamp to the spoiler assembly (1), and disconnect the harness connector (2).

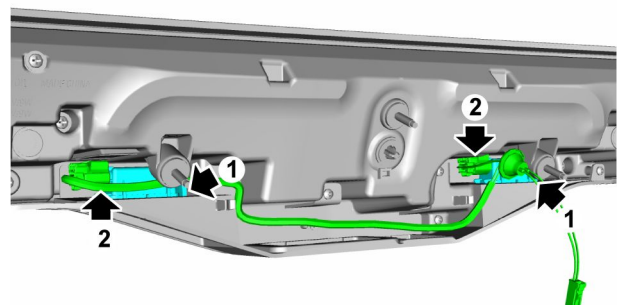


S6514176

3. Remove the rear license plate lamp (fixed to the through-type rear position lamp).
 - a. Remove the through-type rear position lamp assembly.

Through-type Rear Position Lamp

- b. Release the retaining clip fixing the rear license plate lamp to the through-type rear position lamp assembly (1), and disconnect the harness connector (2).



S6514211

4. Remove the rear license plate lamp assembly.

Refit

1. Fit the rear license plate lamp assembly (fixed to the through-type rear position lamp).

- a. Fix the rear license plate lamp assembly to the through-type rear position lamp, and press the clip in place.
- b. Connect the harness connector.
- c. Fit the through-type rear position lamp assembly.

Through-type Rear Position Lamp Assembly

2. Fit the rear license plate lamp assembly (fixed to the spoiler assembly).
 - a. Fix the rear license plate lamp assembly to the spoiler assembly, and press the clip in place.
 - b. Connect the harness connector.
 - c. Fit the spoiler assembly.

Spoiler Assembly

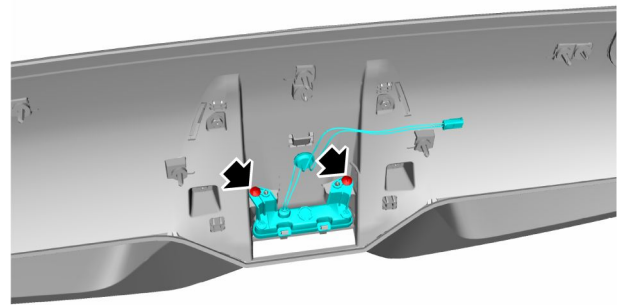
3. Connect the negative battery cable.

High-mounted Stop Lamp Assembly Remove

1. Remove the spoiler assembly.

Spoiler Assembly Remove

2. Remove 2 screws fixing the high-mounted stop lamp to the spoiler assembly.



S6514177

3. Disconnect the harness connector and remove the high-mounted stop lamp assembly.

Refit

1. Fit and tighten 2 screws fixing the high-mounted stop lamp to the spoiler.
2. Connect the harness connector.
3. Fit the spoiler assembly.

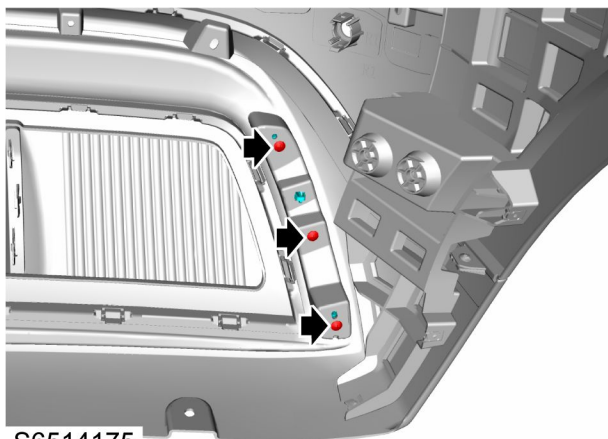
Spoiler Assembly Refit

Rear Bumper Reflector Assembly Remove

1. Remove the rear bumper.

Rear Bumper Remove

2. Remove 3 screws fixing the rear bumper reflector assembly to the rear bumper.



S6514175

3. Remove the rear bumper reflector assembly.

Refit

1. Fit 3 screws fixing the rear bumper reflector to the rear bumper, and tighten them.
2. Fit the rear bumper.

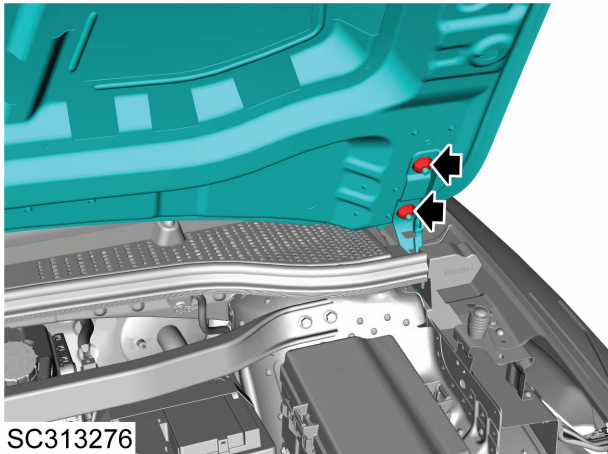
Rear Bumper Refit

Front Compartment Coverings and Weatherstrips

Service Guide

Bonnet Adjustment

1. Mark the profiles of the bonnet with a non-permanent marker.
2. Loosen 4 nuts fixing the tail gate hinge flaps on both sides to the bonnet.



3. Adjust the bonnet to uniformise the clearances between the bonnet and the front bumper fascia, the headlamp and the front fender (for clearance information, please refer to "Body Dimension" in the "Body Panel and Painting" section), and to make it fit with the front bumper fascia, the headlamp and the front fender in size.

Front End Information

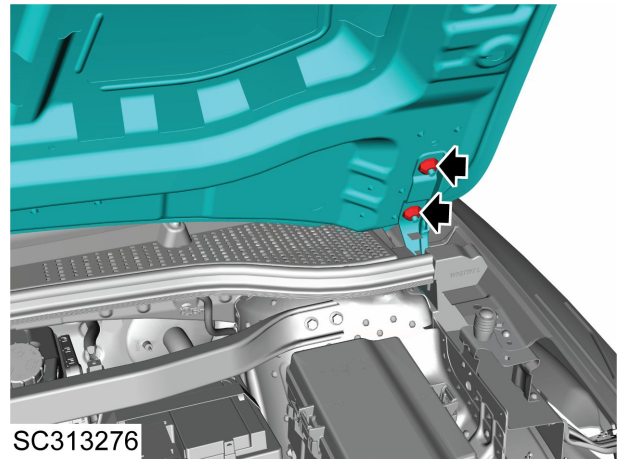
4. For clearance information, please refer to "Body Dimension" in the "Body Panel and Painting" section.
5. Tighten the nuts of the tail gate hinge flap to **19-25Nm**, and check the torque.

Bonnet Assembly

Remove

Warning : *Special attention should be paid to avoid vehicle damage and personal injury.*

1. Open and support the bonnet properly.
2. Remove 4 nuts fixing the hinges on both sides to the bonnet.



3. With assistance, remove the bonnet assembly.

Refit

Warning : *Bonnet will drop off due to its own weight during removing and fitting, therefore, ensure that bonnet is safely supported during removing and fitting.*

1. With assistance, locate the bonnet onto the vehicle.

Caution : *DO NOT damage the thread on the bolt when inserting the bolt into the mounting hole.*

2. Fit 4 nuts fixing the hinges on both sides to the bonnet, but do not tighten them to the specified torque.
3. Check if the bonnet is properly positioned, and adjust the gap and flush between the front compartment lid and the front fender carefully to meet DTS (dimension technical specification) requirements.

Front End Information

4. After adjustment, tighten 4 nuts to **19-25Nm**, check the torque and close the bonnet.

Door & Lid System

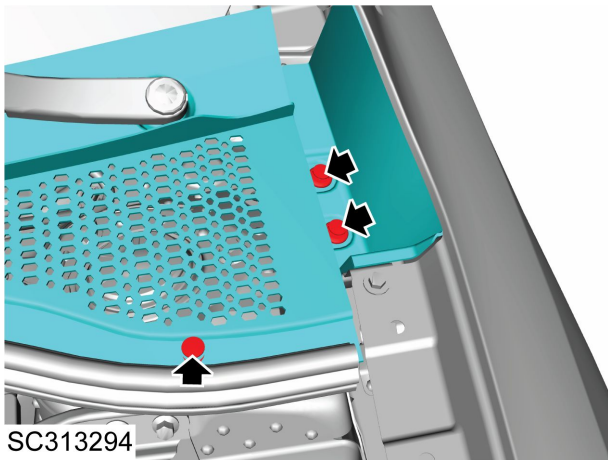
Bonnet Hinge Assembly Remove

Warning : *Special attention should be paid to avoid vehicle damage and personal injury.*

1. Mark the position of the hinges relative to the bonnet for positioning during refitting.
2. Remove the bonnet assembly.

Bonnet Assembly Remove

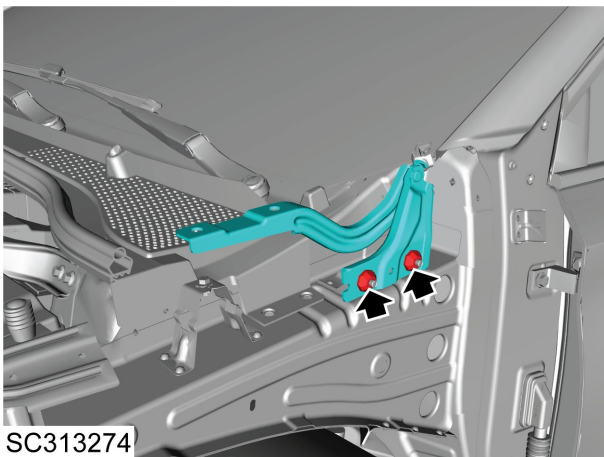
3. Remove the A/C air inlet grille panel side seals.
4. Pry off 2 clips fixing the A/C air inlet grille side baffle to the fender, remove 1 clip fixing the A/C air inlet grille assembly to the body, and remove the A/C air inlet grille side baffle.



5. Remove the fender.

Fender Remove

6. Remove 4 nuts fixing the hinges on both sides to the front end of the body, and remove the hinges on both sides.



7. Remove the hinges on both sides.

Refit

1. Properly locate the hinges on both sides to the front-end of the body and align the positions marked at the time of removal.
2. Fit 4 bolts fixing the hinges on both sides to the front end of the body, tighten them to **19-25Nm**, and check

the torque.

3. Fit the fender.

Fender Refit

4. Fit 2 clips fixing the A/C air inlet grille side baffle to the fender, fit 1 clip fixing the A/C air inlet grille to the body, and press the clip in place.
5. Fit the A/C air inlet grille panel side seal.
6. Fit the bonnet assembly.

Bonnet Assembly Refit

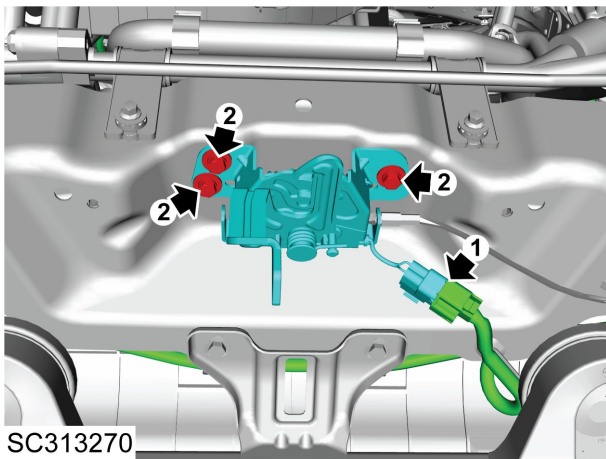
Warning : *Bonnet will drop off due to its own weight during removing and fitting, therefore, ensure that bonnet is safely supported during removing and fitting.*

Bonnet Lock Assembly Remove

1. Open and support the bonnet properly.
2. Remove the front bumper and bracket.

Front Bumper and Bracket Remove

3. Mark the lock position on the front-end module bracket so that proper location can be found for refit.
4. Disconnect the harness connector (1) of the bonnet lock.
5. Remove 3 bolts (2) fixing the bonnet lock to the bonnet lock mounting panel.



6. Separate the bonnet cable assembly from the lock to remove the bonnet lock assembly.

Refit

1. Connect the bonnet lock release cable assembly and the lock assembly firmly, i.e. fit the spherical end of the cable core wire into the hook slot of the bonnet lock, put the core wire into the long slot of the bonnet lock case, and align the circular groove of the main cable pipe connector with the mounting slot of the lock case, then press it hard until it clicks.
2. Fit the bonnet lock assembly on the plate and align it with the position marked during removal.
3. Fit 3 bolts fixing the lock assembly to the mounting panel, and do not tighten the bolts to the specified torque at this step.
4. Close the bonnet, observe the relative position of the lock and lock catch, adjust the lock and allow the lock catch to enter into the lock tongue.
5. After adjustment, tighten 3 bolts to **7-10Nm**, and check the torque.
6. Connect the harness connector.
7. Fit the front bumper and bracket.

Front Bumper and Bracket Refit

8. Close the bonnet.

Bonnet Release Cable Remove

1. Open the bonnet and support it with a rod firmly.
2. Remove the bonnet lock assembly.

Bonnet Lock Body Remove

3. Remove the instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Remove

4. Release the bonnet release cable assembly from the bonnet lock.
5. Loosen the retaining clips of the bonnet release cable in turn.
6. Release the bonnet release cable from the engine compartment.
7. Release the bonnet release cable assembly from the release handle.
8. Drag the bonnet release cable assembly from the engine compartment.

Refit

1. Locate the bonnet release cable assembly to the engine compartment, fit the flat blade end to the driver compartment through the bulkhead hole of the front engine compartment, and secure it in the bulkhead hole with the rubber seal ring of the cable assembly.
2. Place the ball end of the bonnet release cable assembly into the slot.
3. Fit the retaining clip of bonnet release cable.
4. Fit the instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Refit

5. Fit the bonnet lock assembly.

Bonnet Lock Body Refit

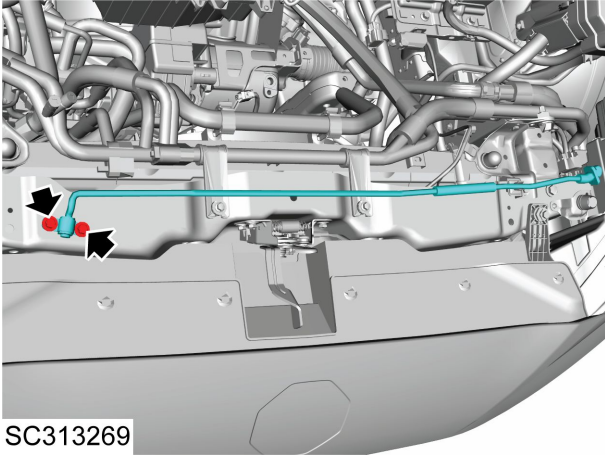
6. Pull the release handle of the bonnet in the driver compartment, and check if the bonnet works properly when it is opened.

Door & Lid System

Bonnet Strut Rod Remove

Warning : *Special attention should be paid to avoid vehicle damage and personal injury.*

1. Open and support the bonnet properly.
2. Remove 2 bolts fixing the bonnet support rod to the body.



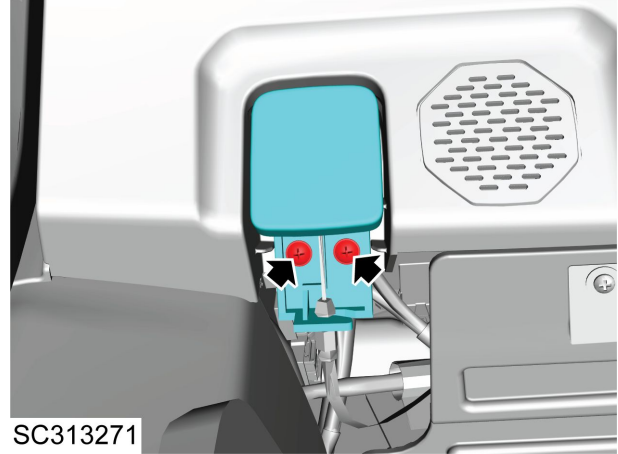
Refit

Warning : *Bonnet will drop off due to its own weight during removing and fitting, therefore, ensure that bonnet is safely supported during removing and fitting.*

1. Fix the bonnet support rod to the body, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
2. Close the bonnet.

Bonnet Release Handle Remove

1. Pull up the bonnet release handle.
2. Remove 2 self-tapping screws fixing the bonnet release handle assembly to the instrument panel lower closure panel.



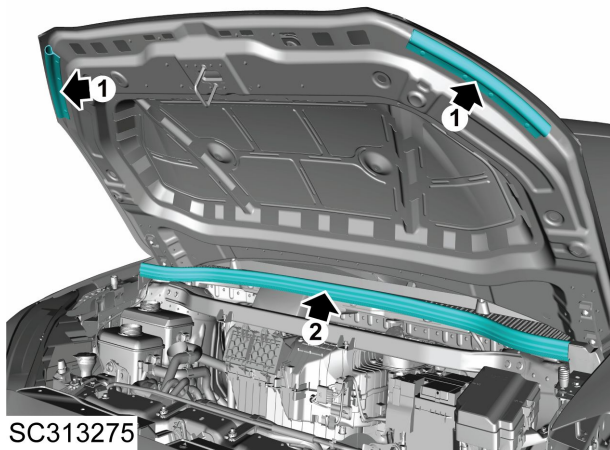
3. Release the bonnet release cable assembly from the release handle to remove the bonnet release handle assembly.

Refit

1. Place the ball end of the bonnet release cable into the handle slot.
2. Align the handle with the mounting hole.
3. Fit 2 self-tapping screws fixing the release handle to the lower trim panel, tighten them to **1.3-1.9Nm**, and check the torque.
4. Pull the release handle of the bonnet in the driver compartment, and check if the bonnet works properly when it is opened.

Bonnet Weatherstrips (Front, Rear) Remove

1. Open and support the bonnet firmly.
2. Remove the clip fixing the front bonnet weatherstrip to the bonnet, and remove the front bonnet weatherstrip (1).
3. Remove the rear bonnet weatherstrips from the A/C air inlet grille (2).

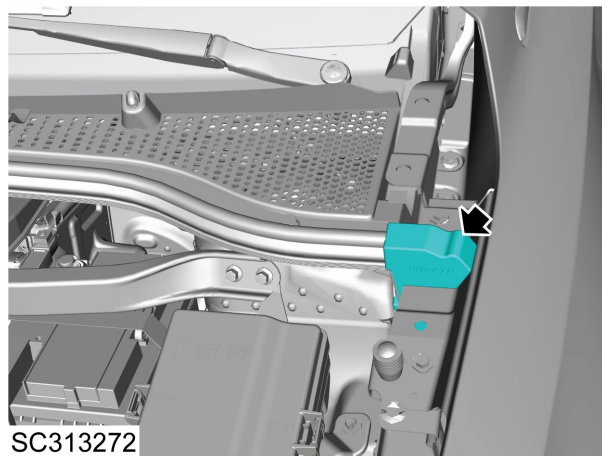


Refit

1. Fit the rear bonnet weatherstrip along the A/C air inlet grille, and clamp it.
2. Fix the front bonnet weatherstrip to the bonnet, and press the clip in place.
3. Close the bonnet.

A/C Air Inlet Grille Panel Side Seals Remove

1. Remove the A/C air inlet grille panel side seals.



Refit

1. Fit the A/C air inlet grille panel side seal.

Door and Weatherstrip

Specification

Torque

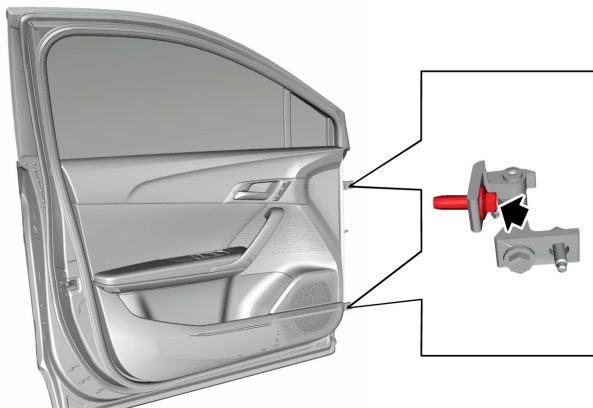
Description	Value
Bolt-door hinge to door	40-50Nm
Bolt-door lock catch to body	19-25Nm
Screw-stop screw	20-26Nm
Bolt-door checker to body	19-25Nm
Bolt-door hinge to body	30-36Nm
Screw-glove box window trim frame to instrument panel frame	1.4-1.8Nm
Screw-outer handle liner assembly to lock cylinder	2-2.5Nm
Bolt-door lock to door	7-10Nm
Screw-door outer handle panel to door	2-2.5 N.m
Bolt-rear door hinge to door	40-50Nm
Bolt-rear door checker to body	19-25Nm
Bolt-rear door hinge to body	30-36Nm
Bolt-rear door lock to door	7-10Nm
Screw-rear door outer handle panel to door	2-2.5Nm

Service Guide

Front Door Adjustment

Front Door Hinge Adjustment

1. Open the front door.
2. Put the wood block on the jack, and put the jack below the door to support the front door.
3. Unscrew 2 bolts fixing the upper and lower front door hinges to the front door.



SC114531

4. Use the jack to support and adjust the front door.
5. Pre-tighten the hinge bolts.
6. Remove the jack, and close the door to check the adjustment.
7. When the desired adjustment is achieved, tighten the bolt fixing the hinge on the door side to the specified torque of **40-50Nm**, and check the torque.

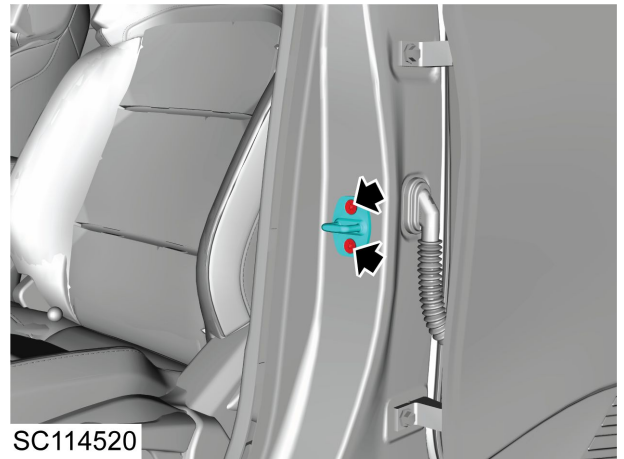
Front Door Striker Adjustment

The front door striker is a latch with two screws. In most cases, it is necessary to adjust the striker upward/downward or inward/outward:

- Frame damage resulting from a collision.
- Fit a new door weatherstrip.
- The customer complains that the wind noise is too loud.

Adjust the striker upward/downward or inward/outward according to the following procedures:

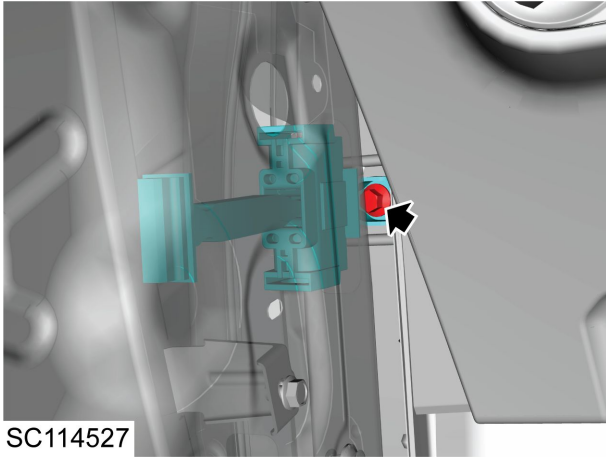
1. The door must be positioned correctly.
2. Open the front door.
3. Loosen 2 striker bolts. Adjust the striker to align the door pin, then pre-tighten the bolts.



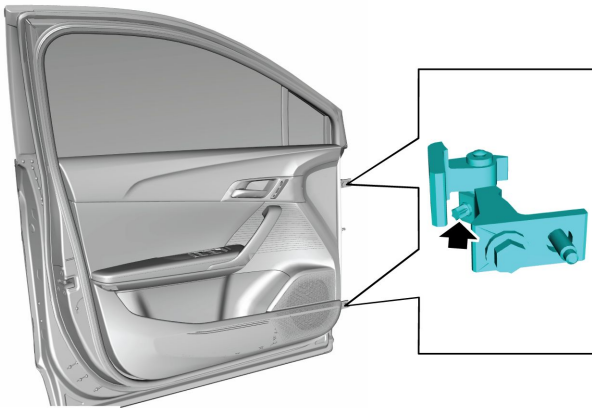
4. Close the door, and check if the rear of the door is flush with the sheet metal of the body side panel and if the door can open and close normally.
5. After the adjustment, open the door, tighten the bolts fixing the strikers to the body to **19-25Nm**, and check the torque.
6. Close the door.

**Front Door Assembly
Remove**

1. Disconnect the negative battery cable.
2. Open the front door.
3. Remove and discard 1 bolt fixing the door check to the body side.

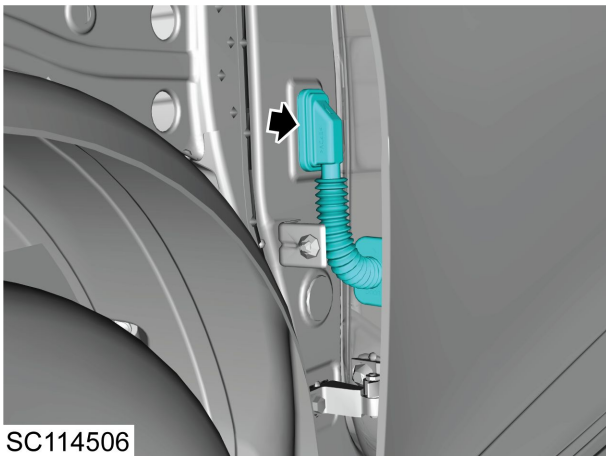


4. Remove the anti-rotation bolts fixing the two hinge flaps in the middle of the upper and lower hinges.



Caution : *Protect the paint from scratch when removing or fitting the door assembly.*

5. Pry off the rubber seal ring on the body side, pull out the connector, and disconnect the harness connector.



6. Lift the front door up, separate the flaps of the upper

and the lower hinges, and remove the front door assembly.

Refit

1. Fix the upper and lower hinge flaps to the door, fit 2 bolts, and leave them untightened for now.
2. With assistance, fit the door to the body through the assembly of hinge flaps and body hinge flap, fit 2 anti-rotation bolts, tighten them to **20-26Nm**, and check the torque.
3. Connect the harness connector, and insert the rubber seal ring into the mounting hole in the body.
4. Fit 1 new bolt fixing the door check to the body side, tighten it to **19-25Nm**, and check the torque.
5. Adjust the opening and closing performance of the door.



Front Door Hinge Adjustment

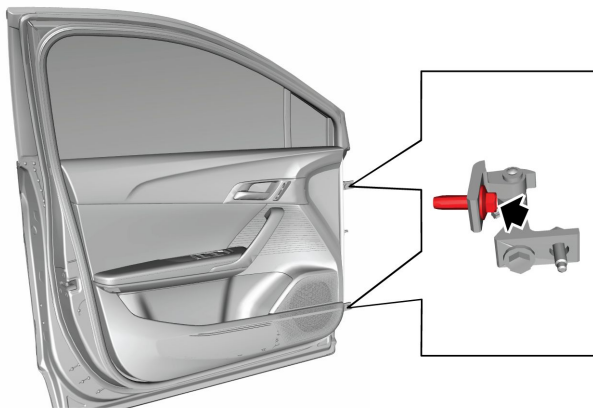
6. Connect the negative battery cable.

Front Door Hinge Assembly Remove

1. Open the front door.
2. Remove the front door assembly.

Front Door Assembly Remove

3. Remove and discard 2 bolts fixing the upper hinge to the door side from the outside of the door, and remove the front door upper hinge.



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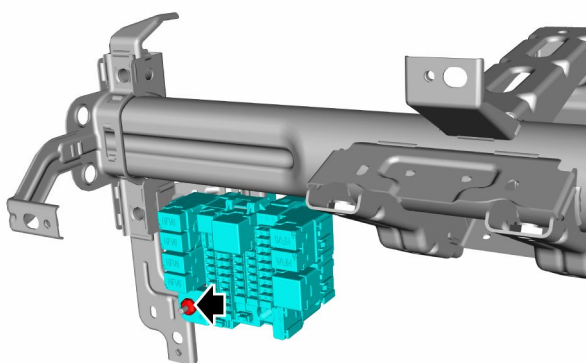
4. Remove the front door hinge assembly - driver side.
 - a. Remove the driver side lower trim panel assembly.

Driver Side Lower Trim Panel Assembly Remove

- b. Remove the A pillar lower trim panel.

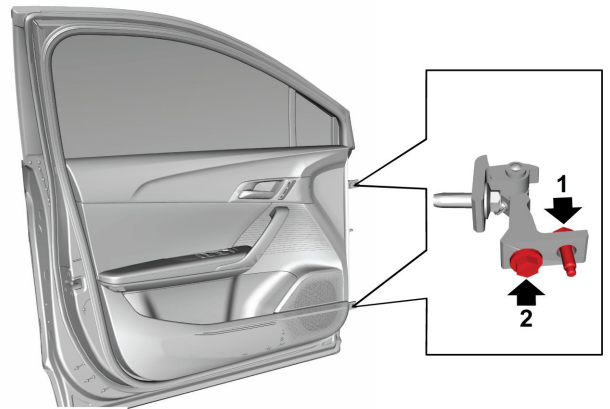
A Pillar Lower Trim Panel Remove

- c. Remove 1 nut fixing the driver compartment fuse box to the instrument panel beam and remove the driver compartment fuse box.



S4114579

- d. Tear off the screw hole gasket to expose the tool hole.
- e. Remove 2 bolts (1) fixing the lower hinge to the body side from the outside of the body and discard them.
- f. Remove and discard 2 bolts (2) fixing the lower hinge to the body side from the inside of the body, and remove the driver door lower hinge.

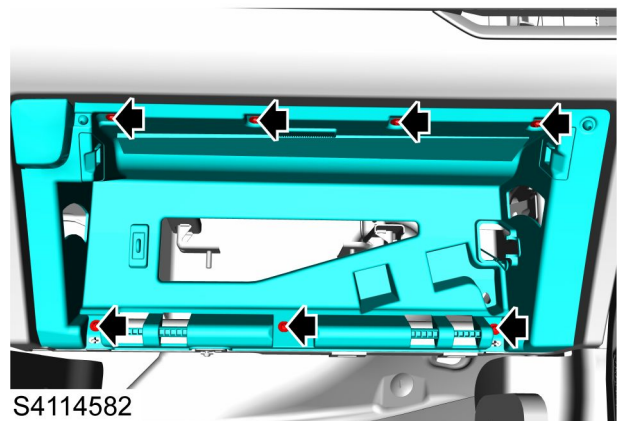


SC114532

5. Remove the front door hinge assembly - passenger side.
 - a. Remove the glove box assembly.

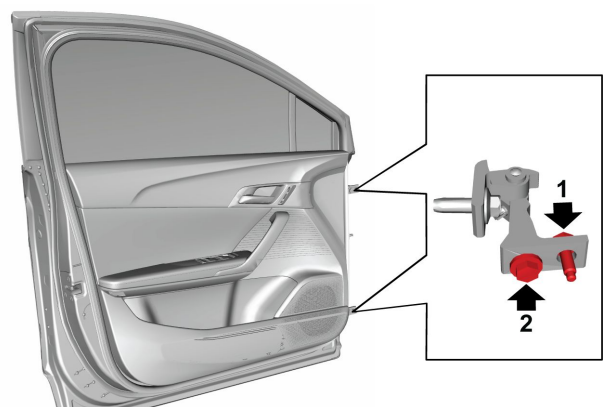
Glove Box Assembly Remove

- b. Remove 7 screws fixing the glove box frame to the instrument panel frame, loosen the clips and remove the glove box frame.



S4114582

- c. Tear off the screw hole gasket to expose the tool hole.
- d. Remove 2 bolts (1) fixing the lower hinge to the body side from the outside of the body and discard them.
- e. Remove and discard 2 bolts (2) fixing the lower hinge to the body side from the inside of the body, and remove the driver door lower hinge.



SC114532

Refit

1. Fit the front door hinge assembly - driver side.
 - a. Fit 2 bolts fixing the lower hinge of the front door to the body from the inside of the body, tighten them to **30-36Nm**, and check the torque.
 - b. Fit 2 bolts fixing the lower hinge of the front door to the body from the outside of the body, tighten them to **30-36Nm**, and check the torque.
 - c. Restore the screw hole gasket.
 - d. Fit 2 bolts fixing the upper hinge to the door side from the outside of the body, tighten them to **40-50Nm**, and check the torque.
- e. Fit the front door assembly.

 **Front Door Assembly Refit**

- f. Remove the jack, and check if the door can work properly.
- g. Fit the driver side lower trim panel assembly.

 **Driver Side Lower Trim Panel Assembly Refit**

- h. Fit the A pillar lower trim panel.

 **A Pillar Lower Trim Panel Refit**

- i. Fit and tighten 1 nut fixing the driver compartment fuse box to the beam.
2. Fit the front door hinge assembly - passenger side.
 - a. Fit 2 bolts fixing the lower hinge of the front door to the body from the inside of the body, tighten them to **30-36Nm**, and check the torque.
 - b. Fit 2 bolts fixing the lower hinge of the front door to the body from the outside of the body, tighten them to **30-36Nm**, and check the torque.
 - c. Restore the screw hole gasket.
 - d. Fit 2 bolts fixing the upper hinge to the door side from the outside of the body, tighten them to **40-50Nm**, and check the torque.
 - e. Fit the front door assembly.

 **Front Door Assembly Refit**

- f. Remove the jack, and check if the door can work properly.
- g. Press the clip, fit 7 bolts fixing the glove box frame to the instrument panel body, tighten them to **1.4-1.8Nm**, and check the torque.
- h. Fit the glove box assembly.

 **Glove Box Assembly Refit**

3. Close the front door.

Front Door Outer Handle and Lock Cylinder Assembly - Keyless Entry Remove

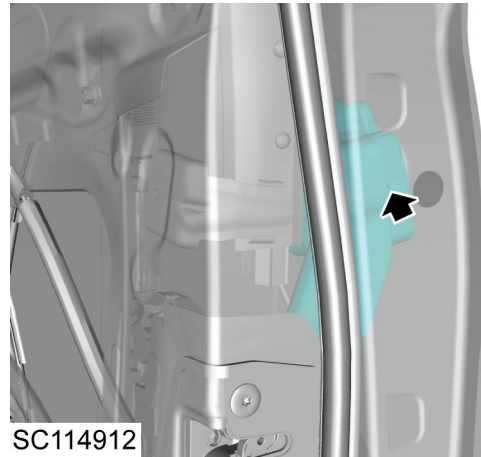
1. Open the driver door and raise the window to the highest position.
2. Remove the front door interior trim panel.

 **Front Door Interior Trim Panel Remove**

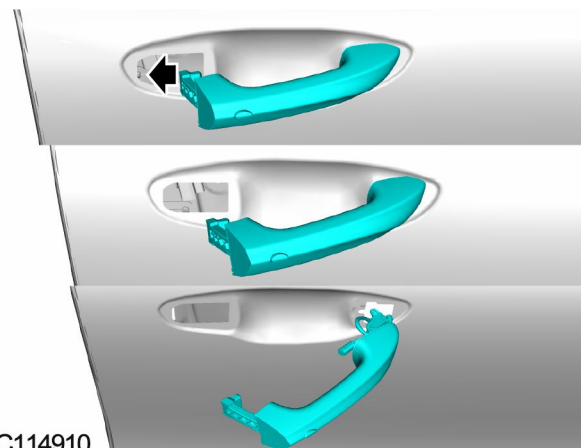
3. Remove the front door waterproof membrane.

 **Front Door Waterproof Membrane Remove**

4. Remove the lock cylinder retaining screw plug at the end of the front door, to access the screws that secure the door lock cylinder to the outer door handle panel.
5. Loosen the screw, but do not remove the screw, because it is clamped inside.



6. Pull the rear end of the front door outer handle, pry off the lock cylinder trim cover and remove the front door lock cylinder.
7. Disconnect the harness connector of the PEPS antenna from the door cavity.
8. Move the outer handle towards the rear body, pull the rear of the outer handle outwards to separate it from the outer handle bracket, remove the outer handle assembly.



Refit

1. Insert the antenna through the hole on the front handle

of the door from the outside of the door, and connect the harness connector.

2. Clip the front end of the driver side door outer handle into the front hole of the door, and move the outer handle towards the rear of the vehicle.
3. Clamp the rear end of the outer handle into the slot of the outer handle bracket.
4. Fit the rear shim of the door outer handle.
5. Fully pull up the rear end of the door handle, fix the front door lock cylinder assembly to the outer door handle liner, and tighten to **2-2.5Nm**, and check the torque.
6. Press the plug into the round hole on the side of the door to ensure that the snap on the plug is fully engaged to ensure sealing.
7. Pull up the rear end of the handle and install the lock core trim cover.
8. Fit the front door waterproof membrane.

 **Front Door Waterproof Membrane Refit**


9. Fit the front door interior trim panel.

 **Front Door Interior Trim Panel Refit**

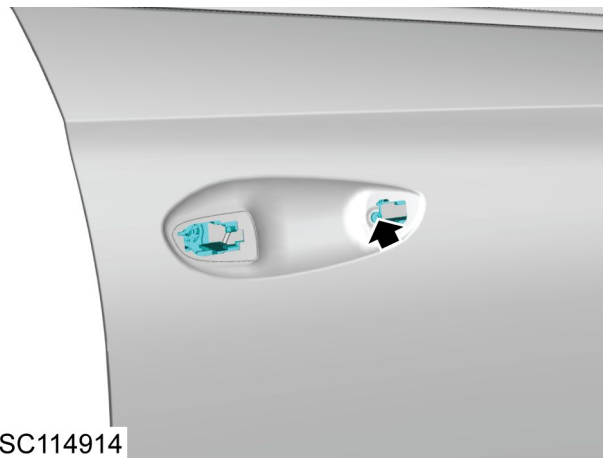
10. Close the door and check if the outer door handle can work properly.

Driver Side Door Outer Handle Liner and Lock Assembly Remove

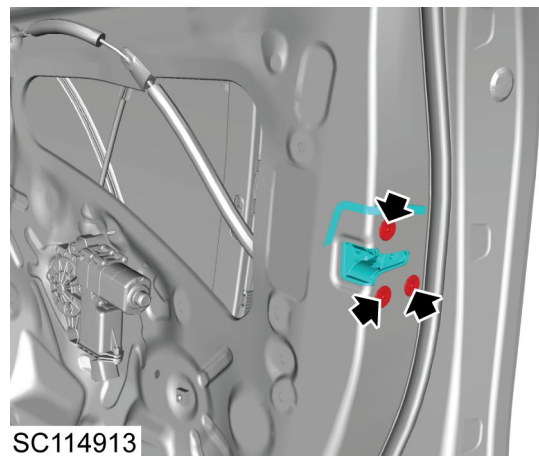
1. Open the front door, and ensure that the front door window glass is fully lifted.
2. Remove the front door outer handle and lock cylinder trim cover.

 **Front Door Outer Handle and Lock Cylinder Trim Cover Remove**

3. Remove 1 screw fixing the exterior front door handle bracket to the door panel.



4. Disconnect the harness connector on the front door lock, and remove 3 bolts fixing the front door lock to the door.



5. Remove the exterior front door handle bracket and lock assembly, and pry off the clamp fixing the harness clip to the exterior front door handle bracket.
6. Separate the front door inner handle cable from the lock body assembly.
7. Disconnect the front door outer handle link from the front door lock, and disconnect it from the outer handle bracket.
8. Disconnect the front door lock cylinder link from the front door lock, and disconnect it from the outer handle bracket.

Refit

1. Connect the front door outer handle link to the front door lock and the front door outer handle bracket respectively.
2. Fix the front door lock cylinder link to the front door lock and the front door outer handle bracket respectively.
3. Connect the front door inner handle cable to the front door lock body.
4. Fix the front door outer handle bracket and lock assembly to the door panel from the inside of the door.
5. Fit 3 bolts fixing the front door lock to the front door panel, tighten them to **7-10Nm**, and check the torque.
6. Fit 1 screw fixing the front door outer handle bracket to the front door panel, tighten it to **2-2.5 N.m** , and check the torque.
7. Fix the harness clip to the front door outer handle bracket, and connect the front door lock connector.
8. Fit the front door outer handle and lock cylinder trim cover.

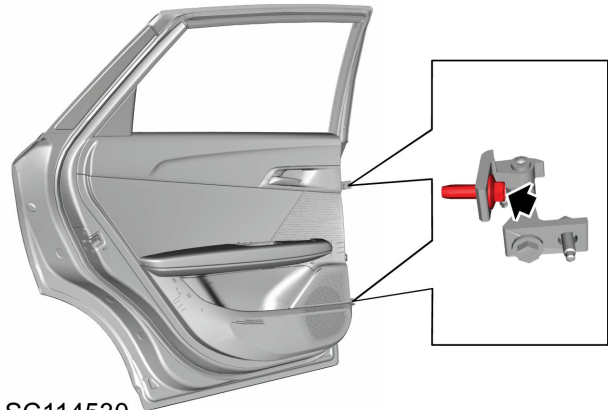
 **Front Door Outer Handle and Lock Cylinder Trim Cover Refit**

9. Try to open the door through the outer handle, and ensure all parts are correctly fitted.
10. Close the front door.

Rear Door Adjustment

Rear Door Hinge Adjustment

1. Open the rear door.
2. Put the wood block on the jack, and put the jack under the door to support the rear door.
3. Unscrew 2 bolts fixing the upper and lower rear door hinges to the rear door side.



SC114530

4. Use the jack to support and adjust the rear door.
5. Pre-tighten the bolts fixing the hinge to the door side.
6. Remove the jack, and close the door to check the adjustment.
7. When the desired adjustment is achieved, tighten the bolt fixing the hinge on the door to **40-50Nm**, and check the torque.

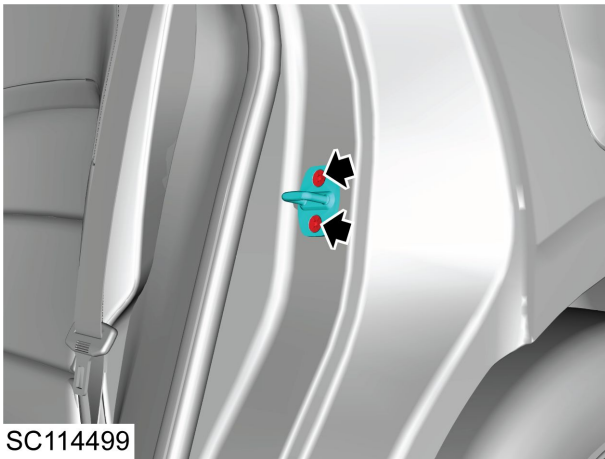
Rear Door Striker Adjustment

The rear door striker is a latch with two screws. In most cases, it is necessary to adjust the striker upward/downward or inward/outward:

- Frame damage resulting from a collision.
- Fit a new door weatherstrip.
- The customer complains that the wind noise is too loud.
- It is difficult to open or close the door.

Adjust the striker upward/downward or inward/outward according to the following procedures:

1. The door must be positioned correctly.
2. Open the rear door.
3. Loosen 2 striker bolts. Adjust the striker to align the door pin, then pre-tighten the bolts.



SC114499

4. Close the door, and check if the front and rear of the door are flush with the sheet metal of the body side panel and if the door can open and close normally.
5. After the adjustment, open the door, tighten the bolts fixing the strikers to the body to **19-25Nm**, and check the torque.
6. Close the door.

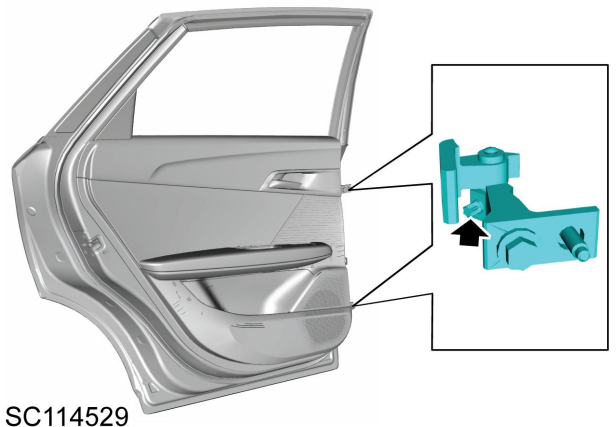
Rear Door Assembly Remove

1. Disconnect the negative battery cable.
2. Open the rear door.
3. Put the wood block on the jack, and put the jack under the door to support the rear door.
4. Remove 1 bolt fixing the door check to the body side.



SC114505

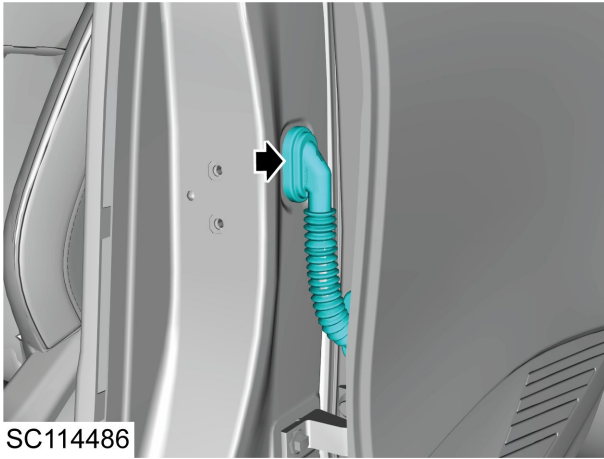
5. Pry off the anti-rotation bolt trim cover, and remove the anti-rotation bolt fixing the two hinge flaps between the upper hinge and the lower hinge.



SC114529

Caution : *Protect the paint from scratch when removing or fitting the door assembly.*

6. With the help of an assistant, pry off the rubber seal ring on the body side, and pull out the connector to disconnect the harness connector.



SC114486

7. Lift the rear door up, separate the flaps of the upper and the lower hinges, and remove the rear door assembly.

Refit

1. With the help of an assistant, locate the door to the body.
2. Connect the harness connector, and insert the rubber seal ring into the mounting hole in the body.
3. Fit the anti-rotation bolts fixing the upper and lower hinges of the rear door to the door side, tighten them to **20-26Nm**, check the torque, and fit the anti-rotation bolt trim covers.
4. Fit 1 new bolt fixing the door check to the body side, tighten it to **19-25Nm**, and check the torque.
5. Adjust the opening and closing performance of the door.

Rear Door Hinge Adjustment

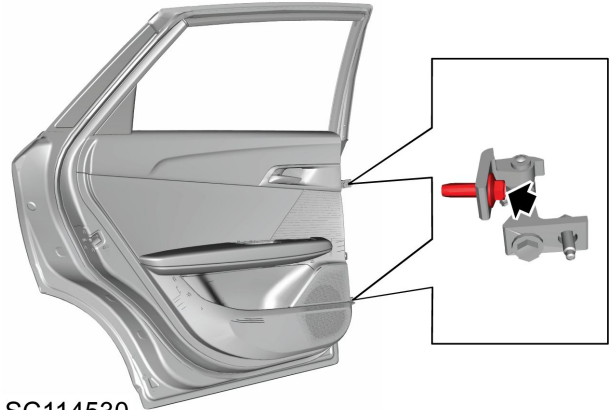
6. Connect the negative battery cable.

Rear Door Hinge Assembly Remove

1. Open the rear door.
2. Remove the rear door assembly.

Rear Door Assembly Remove

3. Remove and discard 2 bolts fixing the rear door upper hinge to the rear door.

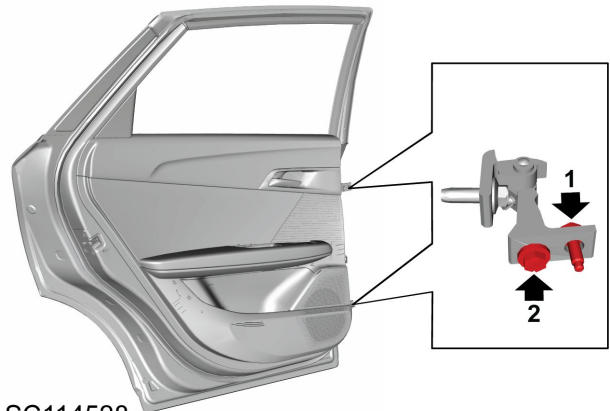


SC114530

4. Remove the B pillar lower trim panel.

B Pillar Lower Trim Panel Remove

5. Remove and discard 2 bolts (1) fixing the rear door lower hinge to the body side from the outside of the B pillar.
6. Remove and discard 2 bolts (2) fixing the rear door lower hinge to the body side from the inside of the B pillar.



SC114528

7. Remove the upper and lower hinges of the rear door.

Refit

1. Locate the lower hinge of the rear door to the B pillar.
2. Fit 2 new bolts locating the lower hinge to the body side from the inner side of the B pillar, tighten them to **30-36Nm**, and check the torque.
3. Fit 2 new bolts locating the lower hinge to the body side from the outer side of the B pillar, tighten them to **30-36Nm**, and check the torque.
4. Fit the B pillar lower trim panel.

 **B Pillar Lower Trim Panel Refit**

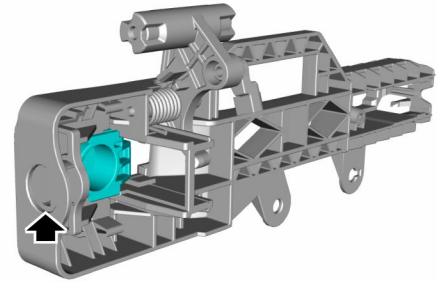
5. With the help of an assistant, fit 2 new bolts locating the upper hinge of the rear door to the door side, tighten them to **40-50Nm**, and check the torque.
6. Fit the rear door assembly.

 **Rear Door Assembly Refit**

7. Close the rear door.

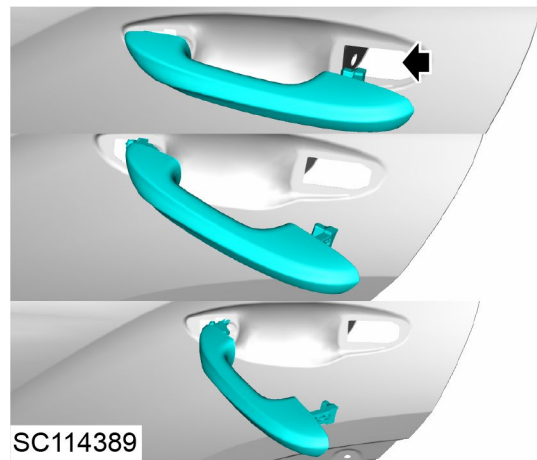
Rear Door Outer Handle Remove

1. Remove the slide valve plug on the side of the rear door to gain access to the slide valve fixing the lock cylinder trim cover to the door outer handle bracket.
2. Use the right tool to open the slide valve.



SC114342

3. Pull up the rear end of the outer handle, and remove the outer handle lock cylinder trim cover.
4. Move the outer handle towards the rear body, pull the rear of the outer handle outwards to disconnect it from the outer handle bracket, then remove it.



SC114389

Refit

1. Clip the front end of the rear door outer handle into the front mounting hole of the door, and move the outer handle towards the front of the vehicle.
2. Fit the rear shim of the outer handle.
3. Fit the rear door lock cylinder trim cover.
4. Pull up the rear end of the rear door outer handle completely, fix the rear door lock cylinder trim cover to the door outer handle bracket, and push in the slide valve to ensure that it is clamped in place.
5. Press the slide valve plug into the round hole on the door side and secure the plug clip firmly so that seal can be achieved.
6. Check if the door outer handle can work properly.

**Rear Door Lock Assembly
Remove**

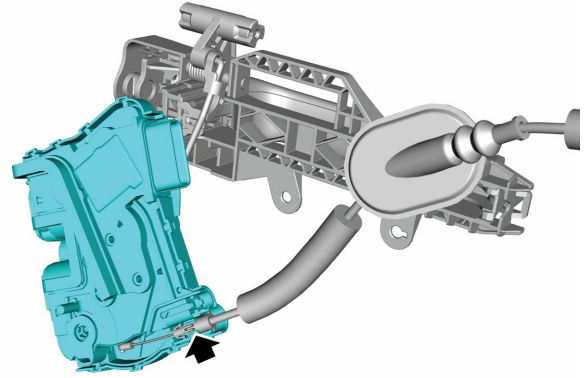
1. Open the rear door and ensure that rear door windows rise to the highest position.
2. Remove the rear door interior trim panel.

 **Rear Door Interior Trim Panel Remove**

3. Remove the rear door waterproof membrane.

 **Rear Door Waterproof Membrane Remove**

4. Remove the clip between the rear door outer handle link and the lock.



SC114501

Refit

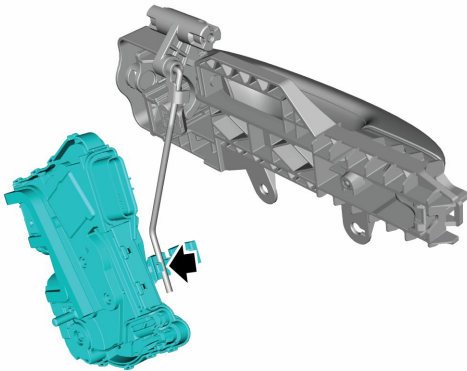
1. Fit the inner handle cable of the rear door to the lock.
2. Locate the lock to the mounting position from the door cavity, fit 3 bolts, tighten them to **7-10Nm**, and check the torque.
3. Connect the harness connector of the lock.
4. Connect the rear door outer handle release link to the lock, and secure with clips.
5. Fit the rear door waterproof membrane.

 **Rear Door Waterproof Membrane Refit**

6. Fit the rear door interior trim panel.

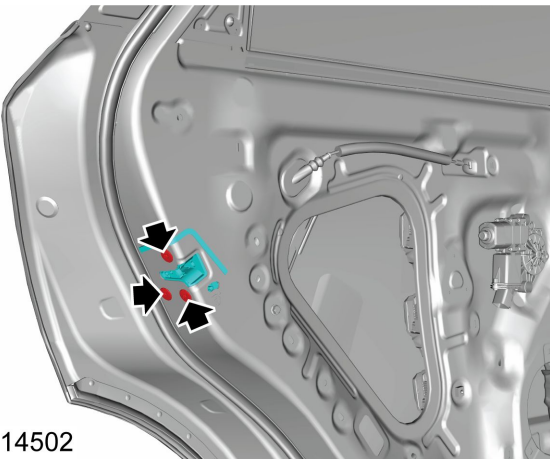
 **Rear Door Interior Trim Panel Refit**

7. Check if the outer and inner handles of the rear door can work properly.



SC114500

5. Disconnect the harness connector on the rear door lock, and remove 3 bolts fixing the rear door lock to the door.




SC114502

6. Carefully separate the interior handle cable of the rear door from the lock, and completely remove the rear door lock.

Rear Door Outer Handle Liner Assembly Remove

1. Open the rear door, and ensure that the rear door window glass is fully lifted.
2. Remove the rear door outer handle and lock cylinder trim cover.

 **Rear Door Outer Handle and Lock Cylinder Trim Cover Remove**

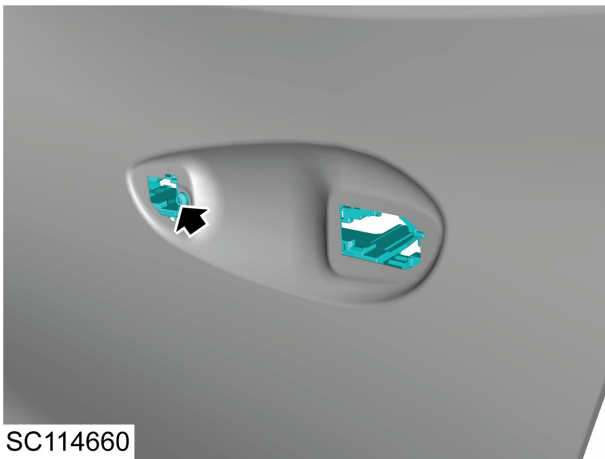
3. Remove the rear door interior trim panel.

 **Rear Door Interior Trim Panel Remove**

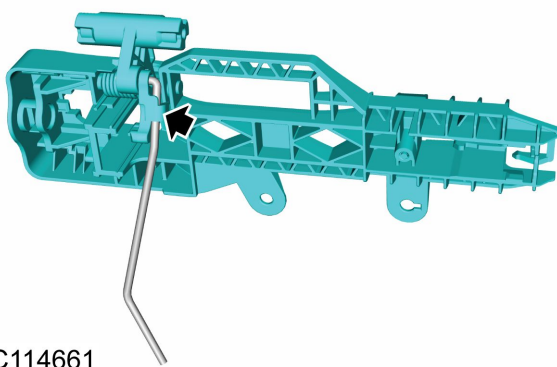
4. Remove the rear door waterproof membrane.

 **Rear Door Waterproof Membrane Remove**

5. Remove 1 screw fixing the rear door outer handle bracket to the door.



6. Separate the outer handle link from the rear door outer handle bracket, and remove the rear door outer handle bracket assembly from the door cavity.



Refit

1. Fit the rear door outer handle bracket assembly from the rear door cavity, and locate it to the corresponding mounting position on the door outer panel.
2. Fit the rear door outer handle link to the rear door outer handle bracket.
3. Fit 1 screw fixing the outer handle bracket to the door

from the outside of the door, tighten it to 2-2.5Nm , and check the torque.


4. Fit the rear door waterproof membrane.

 **Rear Door Waterproof Membrane Refit**

5. Fit the rear door interior trim panel.

 **Rear Door Interior Trim Panel Refit**

6. Fit the rear door outer handle and lock cylinder trim cover.

 **Rear Door Outer Handle and Lock Cylinder Trim Cover Refit**

7. Try to open the door through the outer handle, and ensure all parts are correctly fitted.

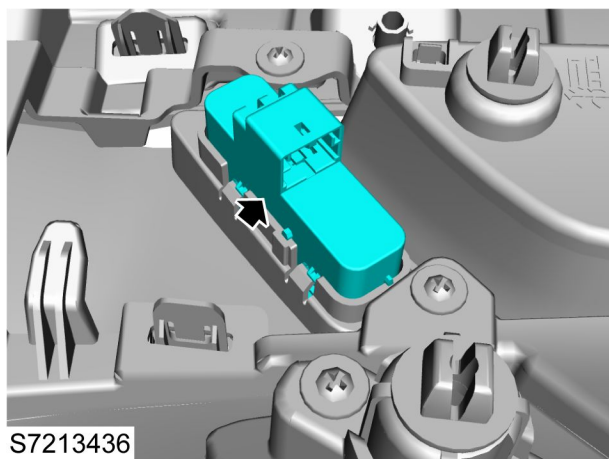
Door Lock Switch

Remove

1. Disconnect the negative battery cable.
2. Remove the driver side door interior trim panel.

Door Interior Trim Panel Remove

3. Disconnect the harness connector of the door lock switch.
4. Loosen the clip and remove the door lock switch.



Refit

1. Fix the door lock switch to the door interior trim panel and ensure the clips are fully engaged.
2. Connect the harness connector of the door lock switch.
3. Fit the driver side door interior trim panel.

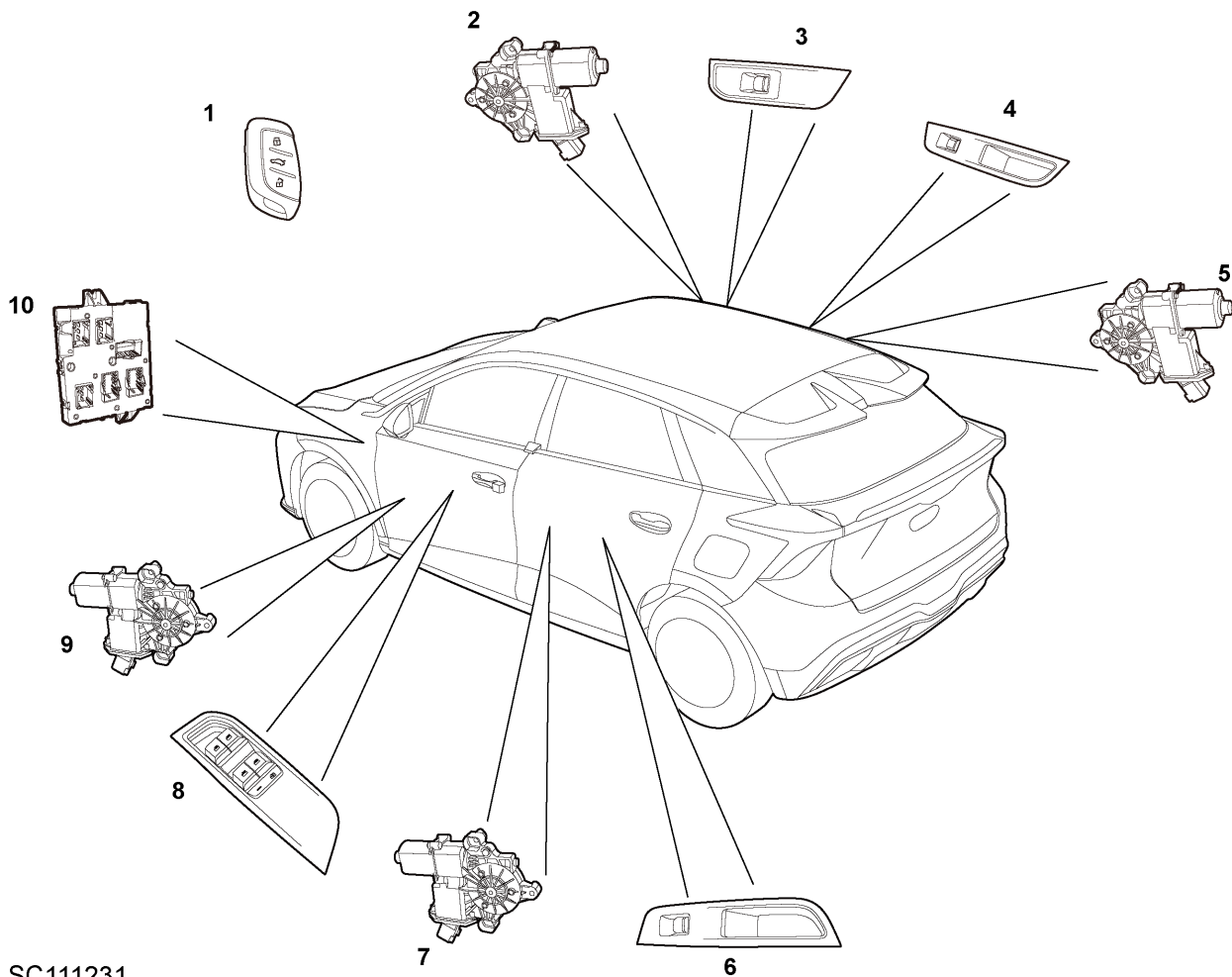
Door Interior Trim Panel Refit

4. Connect the negative battery cable.

Window Glass and Weatherstrip**Specification****Torque**

Description	Value
Nut-winder regulator guide rail to door	7-10Nm
Bolt-winder regulator motor to door	3-4Nm
Screw-front door sill outer sealing strip to door	1-2Nm
Bolt-door checker to body	19-25Nm
Bolt-front door partition pillar to door	7-10Nm
Screw-front door partition pillar to door	1-1.5Nm
Nut-rear winder regulator guide rail to door	7-10Nm
Bolt-rear winder regulator motor to door	3-4Nm
Bolt-rear door checker to body	19-25Nm
Bolt-rear door sill outer sealing strip to door	7-10Nm
Screw-rear door winder frame trim to door	0.8-1.8Nm

Description and Operation System Layout

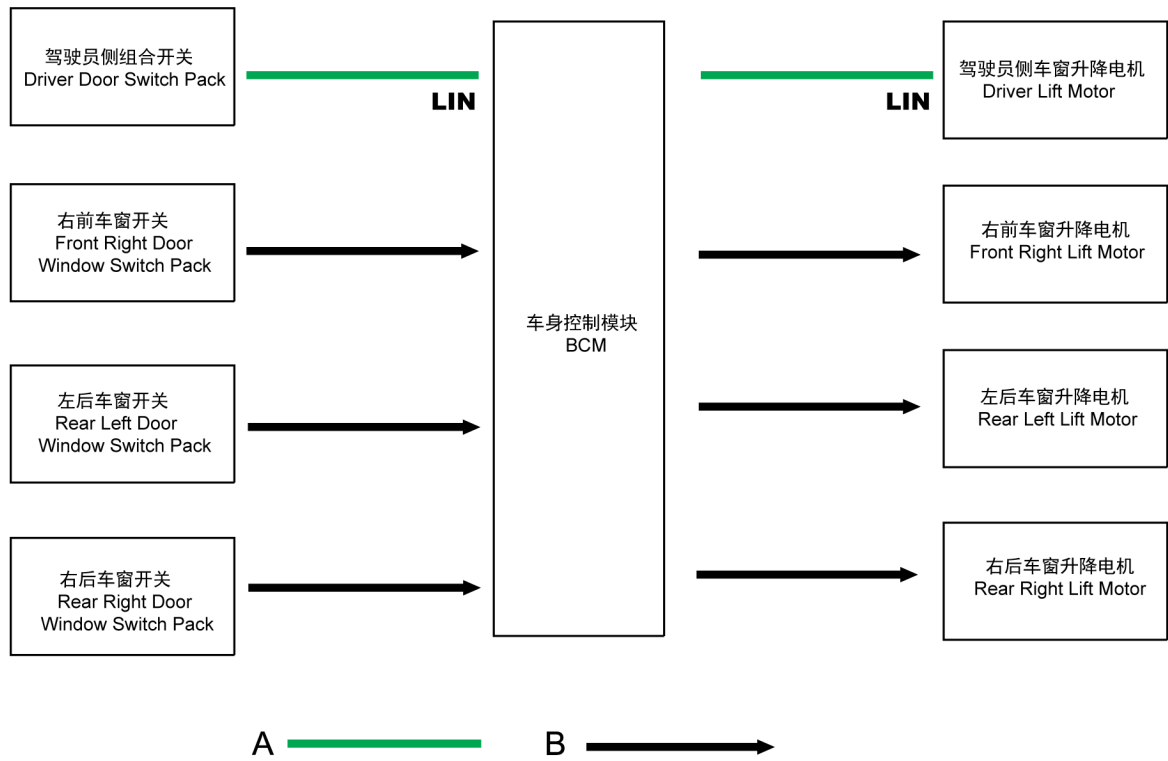


SC111231

1. Smart Key
2. Front Passenger Window Regulator Motor
3. Front Passenger Window Switch
4. Rear Right Window Switch
5. Rear Right Window Regulator Motor
6. Rear Left Window Switch
7. Rear Left Window Regulator Motor
8. Driver Window Switch
9. Driver Window Regulator Motor
10. Body Control Module (BCM)

System Control Diagram

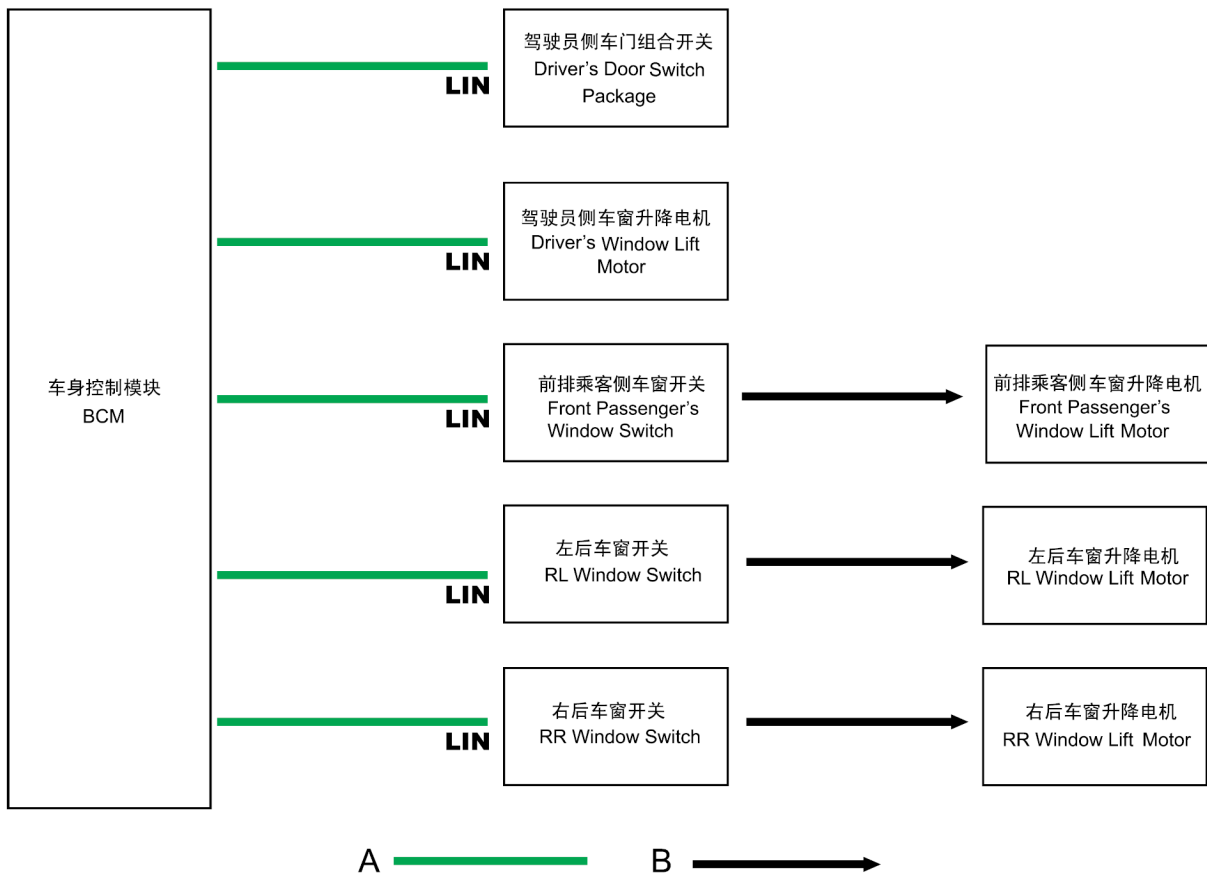
Glass Regulator System Control Diagram - Only Driver Door with Anti-pinch



S7211102

A = LIN Bus; B = Hard Wire

Glass Regulator System Control Diagram - Four
Doors with Anti-pinch



S7211107

A = LIN Bus; B = Hard Wire

Description

Overview

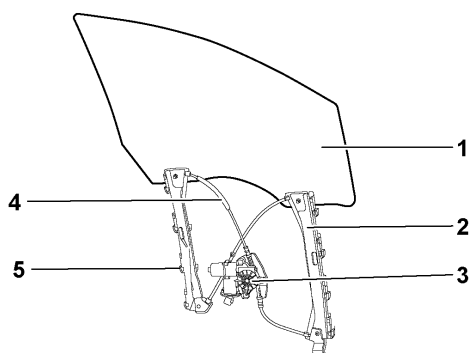
All vehicle models are equipped with the front and rear power window systems. The power window system includes:

- Front and rear window glass on left and right sides
- Driver door switch package (DDSP)
- Individual switches on the front and rear passenger doors
- Window regulator motor and regulator mechanism
- Body Control Module (BCM)

Each door interior trim panel is equipped with a lift/press type switches which control the power window of the corresponding door. DDSP is equipped with 4 power window switches and 1 rear window disable switch for the driver to control the operation of all windows. When the vehicle is powered on, or within 30s after the vehicle is powered off and no door is opened, it is allowed to operate the power window.

The power window system with one-touch down function is fitted on the doors of all models as standard configuration. The anti-pinch and one-touch up functions can only be realized on the front and rear doors of some models.

Front Power Window



SC114654

1. Front Door Window Glass
2. Rail
3. Motor Assembly
4. Cable
5. Slide Block

The front power window can be operated by the separate switch on the door or DDSP. The common front window motor is controlled by the BCM located on the side of driver side lower trim panel, and the driver window motor with anti-pinch and one-touch up function is jointly controlled by the BCM and the anti-pinch module at the motor. The BCM controls the upward or downward movement of the window glass by reversing the supply polarity of the window motor.

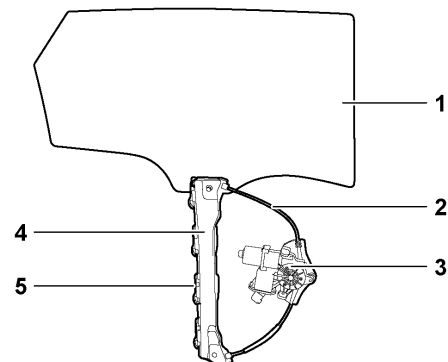
The front window regulator and motor assembly consists of 2 guide rails, 3 cables, 1 motor, 1 speed change mechanism

(winding drum) and 2 slide blocks. The guide rail is fixed on the door interior panel with 4 nuts and the window motor is fixed on the door interior panel with 3 bolts. The window glass is connected to the slide block on the guide rail through clips. The slide block is clamped on the flanging of the rail to move up and down along the rail for clearance fit.

The ascending/descending of the window glass is controlled by 3 cables. One end of the upper cable is connected to the slide block. The cable moves upward along the rail to wind around the pulley on the top of the rail and downward along the diagonal to arrive at the winding drum connected with the motor. One end of the lower cable is connected to the slide block bottom. The cable moves downward along the rail to wind around the pulley at the bottom of the rail and moves along the diagonal to arrive at the winding drum connected with the motor.

When the motor is operating, the slide block slides on the rail along the direction as required under the lead of the cable to drive the window glass to move up and down.

Rear Power Window



SC114653

1. Rear Door Window Glass
2. Cable
3. Motor Assembly
4. Rail
5. Slide Block

The rear power window can be controlled by the individual switch on each rear door or DDSP. The common front window motor is controlled by the BCM located on the side of driver side lower trim panel, and the driver window motor with anti-pinch and one-touch up function is jointly controlled by the BCM and the anti-pinch module at the motor. The BCM controls the upward or downward movement of the window glass by reversing the supply polarity of the window motor.

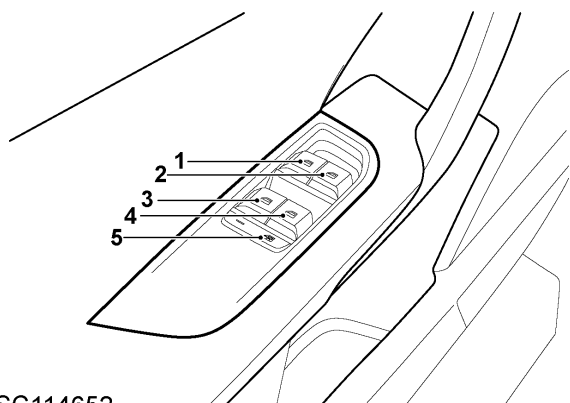
The rear window regulator and motor assembly consists of 1 rail, 2 cables, 1 motor, 1 speed change mechanism (winding drum) and 1 slide block. The guide rail is fixed on the door interior panel with 4 nuts and the window motor is fixed on the door interior panel with 3 bolts. The window glass is

connected to the slide block on the guide rail by bolts. The slide block is clamped on the flanging of the rail to move up and down along the rail for clearance fit.

The ascending/descending of the window glass is controlled by 2 cables. One end of the upper cable is connected to the slide block. The cable moves upward along the rail to wind around the pulley on the top of the rail and downward along the diagonal to arrive at the winding drum connected with the motor. One end of the lower cable is connected to the slide block bottom. The cable moves downward along the rail to wind around the pulley at the bottom of the rail and moves along the diagonal to arrive at the winding drum connected with the motor.

When the motor is operating, the slide block slides on the rail along the direction as required under the lead of the cable to drive the window glass to move up and down.

Driver Door Switch Package



SC114652

1. Driver Door Power Window Switch
2. Front Passenger Door Power Window Switch
3. Left Rear Door Power Window Switch
4. Right Rear Door Power Window Switch
5. Rear Window Disable Switch

Operation

Power Window

Control of the window regulator can be achieved by the following operations:

- Operate the switch on the DDSP to move up/down each power window and disable the rear power window.
- Operate the front/rear passenger side switch to move up/down the corresponding power window.
- Lazy Lock feature: long press the Lock/Unlock button on the remote key for several seconds until the windows start to move, to close/open all windows (if equipped).

Window Regulator Switch

The DDSP sends the control commands to the window motor through the BCM, including such request signals as open, close, one-touch open/close, etc. The DDSP is fitted with the rear window disable switch, when the disable switch is activated, the rear passenger window switch will be disabled.

Independent Passenger Window Switch

The independent passenger window switch controls the up/down of the corresponding passenger window glass. When the rear window disable function is active, the rear window switch cannot perform the up/down operation of this window glass.

Window Regulator Control Mode

Manual Mode

Lift/press the window switch to execute manual mode. The window will continue ascending/descending until the switch is released.

One-button Control

Only the driver window switch or the four door window switches are provided with one-touch up/down function.

- One-button Open (One-touch Down): press the window control switch to the 2nd position, and the window will automatically open. Operate the window control switch again during the descending, and the window will stop descending.
- One-Button Close (One-touch Up): lift the window control switch to the 2nd position, and the window will automatically close. Operate the window control switch again during the ascending, and the window will stop ascending.

Anti-pinch Function

For the switch with one-touch up function, when the function is applied, if there is any object in the ascending path of window glass, the window glass will stop at the obstacle and descend automatically so that the obstacle can be removed.

Heat Protection and Self-learning

Heat Protection

Window regulator motors without "one-button up" and "anti-pinch" functions realize heat protection through the opening and closing of the temperature-sensitive patch. When consecutive and repeated operation of the window regulator switch within a short time causes a hot motor, the temperature-sensitive patch will disconnect, cutting off the power of the regulator motor and realizing heat protection for the regulator motor. Then, the power window switch will become disabled temporarily, please wait for a short time, after the motor is slightly cooled, it will resume the function of the window regulator.

The window regulator motors with "one-touch up" and "anti-pinch" functions has a motor control module which realizes the ascending/descending, anti-pinch and thermal protection functions of the window. Consecutive and repeated operation of the power window with the "one-touch up" and "anti-pinch" functions within a short time can cause the BCM to determine that the window regulator motor is too hot and that the thermal protection is required. In this case, the power window switch will be disabled, and the regulator motor will stop, please wait for a short time, after the motor is slightly cooled, it will resume the function of the window regulator.

Self-learning

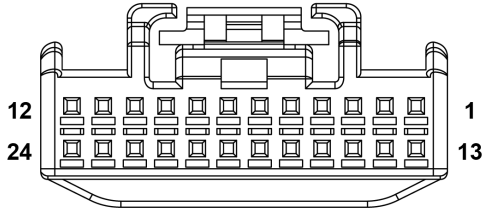
For window regulators with "one-touch up" and "anti-pinch" functions, if the power is off during the operation of regulators, these functions will be disabled; when the power is on, these functions can be resumed by the initialization of regulators.

The window will resume the "one-touch up" and "anti-pinch" functions by fully opening the window, continually lifting the switch to fully close the window, and lifting and holding the switch for about 5s.

After the completion of above procedures, the self-learning of the window is finished.

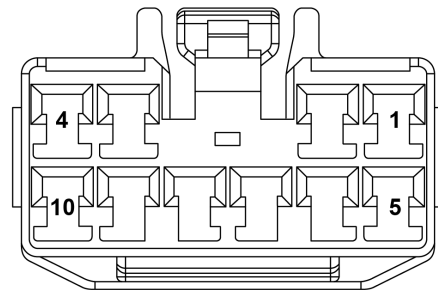
Detailed Information List of Component Pins

End View and Pin Information of Driver Window One-touch Up/Down Switch Harness Connector DD006 (With Anti-pinch)



Pin No.	Description
1	Ground
2	Power Supply
3	Window Up Switch Signal
4	LINI
5	Window Automatic Switch Signal
6	-
7	Window Down Switch Signal

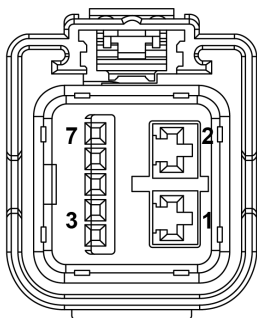
End View and Pin Information of Front Passenger Window Switch Harness Connector PD006



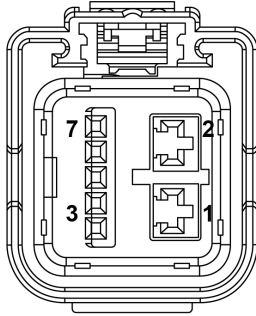
Pin No.	Description
1 - 10	-
11	Exterior Rearview Mirror Folding Switch
12	-
13	Exterior Rearview Mirror Unfolding Motor
14	Exterior Rearview Mirror Folding Motor
15-20	-
21	LIN7
22	Ground
23	-
24	Power Supply

Pin No.	Description
1	Front Passenger Window Up Motor
2	Front Passenger Window Up Relay
3	Backlight Brightness
4	Power Supply
5	Front Passenger Window Down Motor
6	Front Passenger Window Switch Up Signal
7	Front Passenger Window Down Relay
8	Front Passenger Window Automatic Switch Signal
9	Front Passenger Window Switch Down Signal
10	Ground

End View and Pin Information of Front Passenger Window One-touch Up/Down Switch Harness Connector PD003 (Anti-pinch)



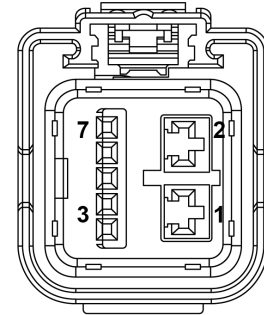
End View and Pin Information of Left Rear Window Switch Harness Connector RLD004



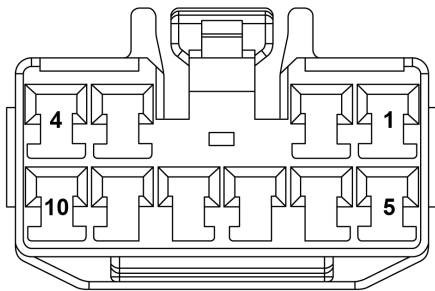
Pin No.	Description
5	Left Rear Window Down Motor
6	Left Rear Window Switch Up Signal
7	Left Rear Window Switch Down Relay
8	Left Rear Window Automatic Switch Signal
9	Left Rear Window Switch Down Signal
10	Ground

Pin No.	Description
1	Ground
2	Power Supply
3	Window Up Switch Signal
4	LIN2
5	Window Automatic Switch Signal
6	-
7	Window Down Switch Signal

End View and Pin Information of Right Rear Window Switch Harness Connector RRD003



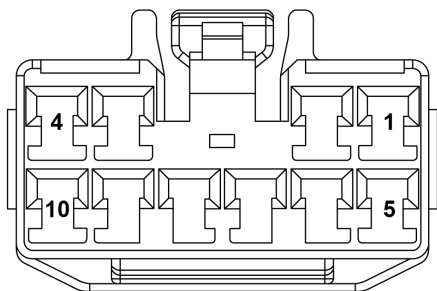
End View and Pin Information of Left Rear Window Switch Harness Connector RLD005



Pin No.	Description
1	Ground
2	Power Supply
3	Window Up Switch Signal
4	LIN2
5	Window Automatic Switch Signal
6	-
7	Window Down Switch Signal

Pin No.	Description
1	Left Rear Window Up Motor
2	Left Rear Window Switch Up Relay
3	Backlight Brightness
4	Power Supply

End View and Pin Information of Right Rear Window Switch Harness Connector RRD004



Pin No.	Description
1	Right Rear Window Up Motor
2	Right Rear Window Switch Up Relay
3	Backlight Brightness
4	Power Supply
5	Right Rear Window Down Motor
6	Right Rear Window Switch Up Signal
7	Left Rear Window Switch Down Relay
8	Right Rear Window Automatic Switch Signal
9	Right Rear Window Switch Down Signal
10	Ground

Service Guide

Front Door Window Remove

1. Remove the front door interior trim panel.

 **Front Door Interior Trim Panel Remove**

2. Remove the front door waterproof membrane.

 **Front Door Waterproof Membrane Remove**

3. Raise the glass to a certain height, to align two clip barbs of the glass with the mounting holes in the door.

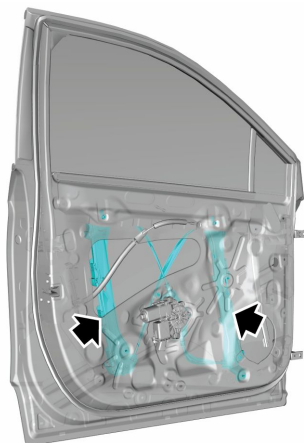
4. Remove the front door window outer weatherstrip.

 **Front Door Window Outer Weatherstrip Remove**

5. Remove the front door window inner weatherstrip.

 **Front Door Window Inner Weatherstrip Remove**

6. Push 2 clip barbs fixing the glass to the window regulator outwards from the hole in the glass regulator bracket, and lift the glass to remove it from the window frame.



SC114507

Refit

1. Carefully fit the glass between the inner and outer panels from the window frame, and fit glass run channel weatherstrips on both sides.
2. Lower the glass slowly until it reaches the slider of the glass regulator, align the glass with the clip, put the glass into the slider clip and fit it in place.
3. Fit the inner weatherstrip of front door windowsill.

 **Front Door Window Inner Weatherstrip Refit**

4. Fit the front door window outer weatherstrip.

 **Front Door Window Outer Weatherstrip Refit**

5. Fit the front door waterproof membrane.

 **Front Door Waterproof Membrane Refit**

6. Fit the front door interior trim panel.

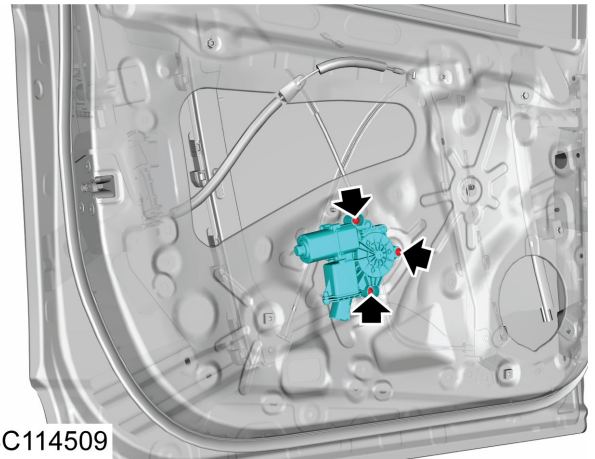
 **Front Door Interior Trim Panel Refit**

Front Door Window Regulator Remove

1. Disconnect the negative battery cable.
2. Remove the front door window glass.

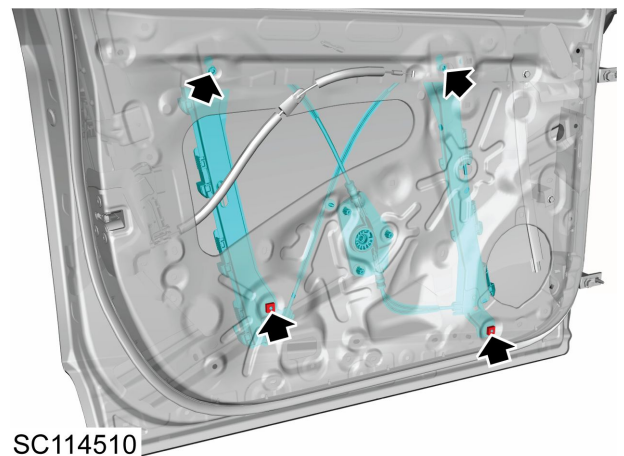
 **Front Door Window Glass Remove**

3. Remove 3 bolts fixing the window regulator motor to the door panel, and disconnect the motor harness connector.



SC114509

4. Loosen the gear engagement, and remove the window regulator motor.
5. Remove 4 nuts fixing the window regulator to the door panel, loosen the clips, and take the window regulator out of the door cavity.



SC114510

Refit

1. Fit the window regulator into the front door cavity, and press the clip in place.
2. Fit 4 nuts fixing the window regulator on the door panel, tighten them to **7-10N·m** in sequence from top to bottom and from left to right, and check the torque.
3. Locate the window regulator motor to the window regulator, engage the gear, and connect the harness connector of the motor.
4. Fit 3 bolts fixing the window regulator motor on the door panel, tighten them to **3-4Nm**, and check the torque.

5. Fit the front door window glass.

Front Door Window Glass Refit

6. Connect the negative battery cable.
7. Check if the window regulator can work properly, and check if the window with "one-touch up" function can operate normally.

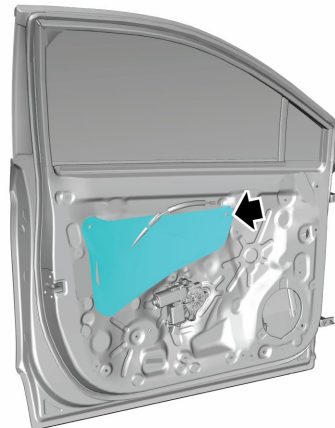
Note : *In case of power failure, the "one-touch up" function may fail; at this time, press the switch to ascend the window to the top, press and hold it for 5s to complete the self learning for window regulator, then the "one-touch up" function will be recovered.*

Front Door Waterproof Membrane Remove

1. Remove the front door interior trim panel.

Front Door Interior Trim Panel Remove

2. Tear off the waterproof membrane.



SC114514

Refit

1. Fit the waterproof membrane.
2. Fit the front door interior trim panel.

Front Door Interior Trim Panel Refit

Front Door Window Inner Weatherstrip Remove

1. Remove the front door interior trim panel.

 **Front Door Interior Trim Panel Remove**

2. Pull up to remove the front door window inner weatherstrip.



SC114517

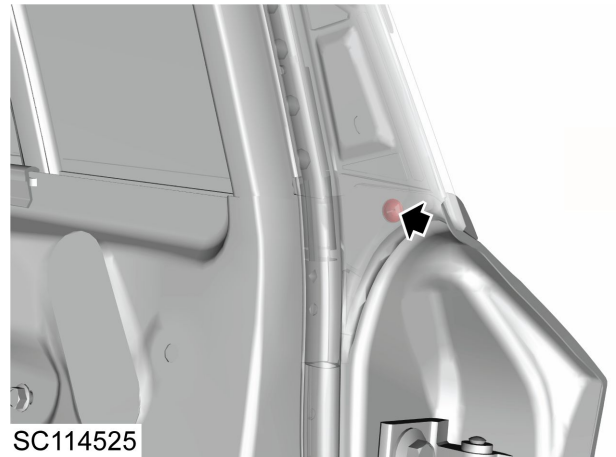
Refit

1. Align the weatherstrip opening with the door inner panel seam allowance, and fit the front door windowsill inner weatherstrip.
2. Fit the front door interior trim panel.

 **Front Door Interior Trim Panel Refit**

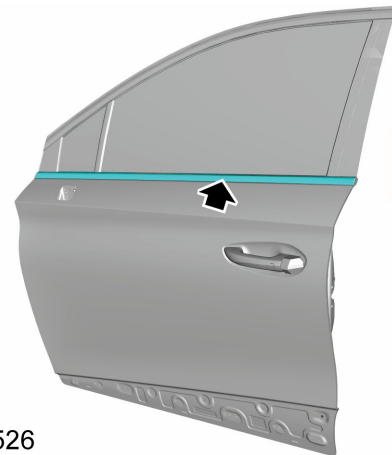
Front Door Window Outer Weatherstrip Remove

1. Open the front door.
2. Pull open part of the front door side weatherstrips at the front door window frame when removing, to expose the location of screws fixing the front door window outer weatherstrip.
3. Remove 1 screw fixing the front door window outer weatherstrip to the front door window frame.



SC114525

4. Remove the front door window outer weatherstrip.



SC114526

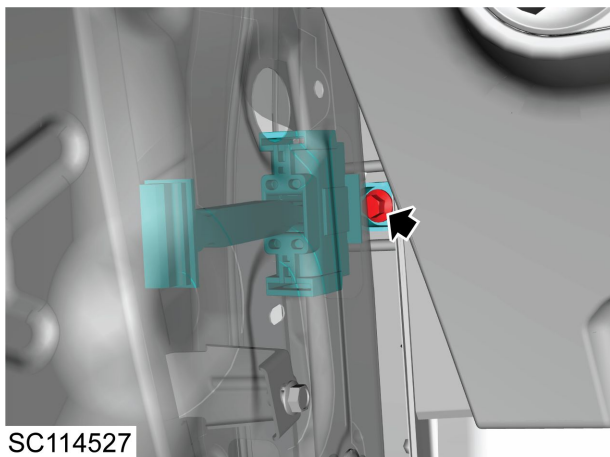
Refit

1. Fit 1 screw fixing the front door window outer weatherstrip to the front door window frame, tighten it to **1-2Nm**, and check the torque.
2. Close the front door.

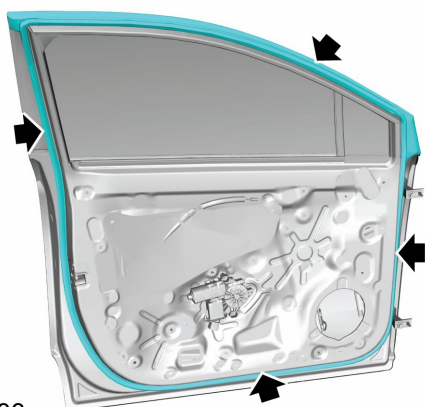
Front Door Weatherstrip Assembly (Door Side)

Remove

1. Remove and discard 1 bolt fixing the door check to the body side.



2. Remove the front door weatherstrip along the front door.



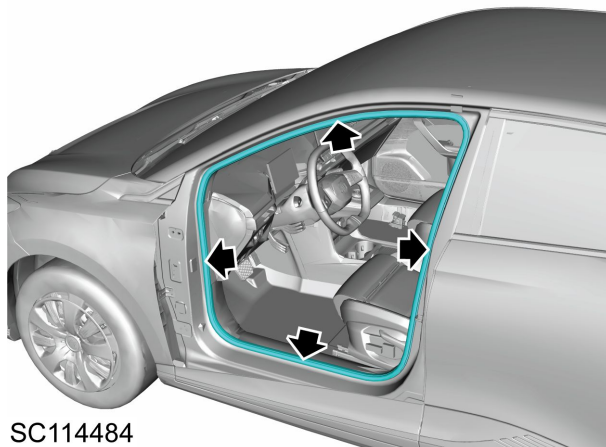
Refit

1. Fit the front door weatherstrip to the front door along the front door inner panel seam allowance.
2. Fit 1 bolt fixing the door check to the body side, tighten it to **19-25Nm**, and check the torque.

Front Door Weatherstrip Assembly (Body Side)

Remove

1. Open the front door, and remove the front door weatherstrip at bodyside.



Refit

1. Fit the front door weatherstrip at bodyside to the body along the front door bodyside panel seam allowance, and fit the front door weatherstrip at bodyside.

Front Door Window Glass Run Channel Weatherstrip Remove

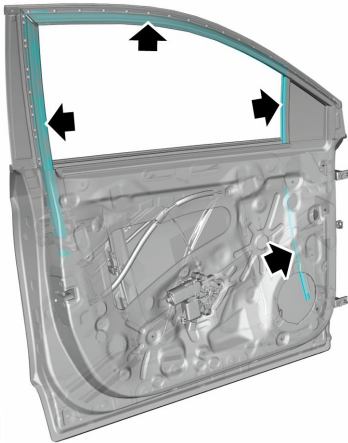
1. Remove the front door window glass.

 **Front Door Window Glass Remove**

2. Remove the front door window frame trim.

 **Front Door Window Frame Trim Remove**

3. Remove the front door window glass run channel weatherstrip.



SC114508

Refit

1. Insert the rear part of the window glass run channel weatherstrip into the front door window frame rear trim panel.
2. Align the weatherstrip opening with the door inner panel seam allowance, and fit the front door window glass run channel weatherstrip.
3. Fit the front door window frame trim.

 **Front Door Window Frame Trim Refit**

4. Fit the front door window glass.

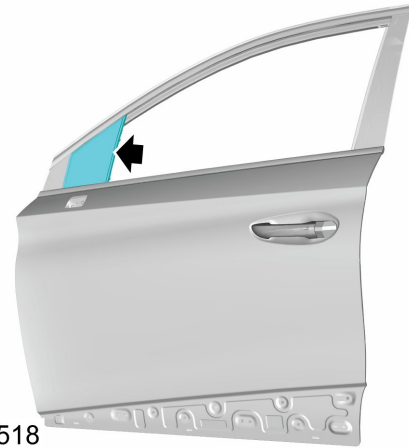
 **Front Door Window Glass Refit**

Front Door Quarter Window Glass Assembly Remove

1. Remove the front door separating pillar.

 **Front Door Separating Pillar Remove**

2. Loosen the clips, and remove the front door quarter window assembly.



SC114518

Refit

1. Fit the front door quarter window glass assembly, and fasten the clips.
2. Fit the front door separating pillar.

 **Front Door Separating Pillar Refit**

Front Door Window Frame Molding Remove

1. Open the front door, and lower the window to a proper height.
2. Loosen the clips, and remove the front door window frame trim.



Refit

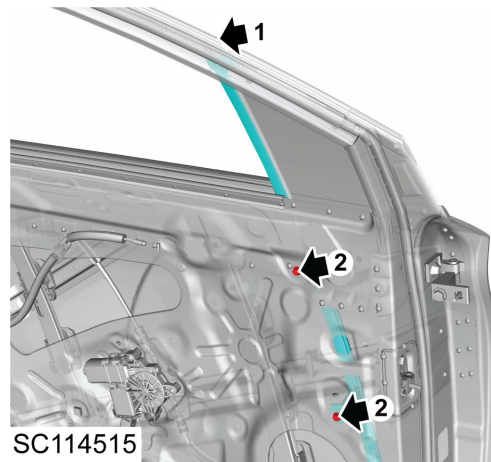
1. Fit the front door window frame trim, and fasten the clips.
2. Raise the window glass to the top position, and close the front door.

Front Door Separation Pillar Remove

1. Remove the front door window run channel weatherstrip.

Front Door Window Glass Run Channel Weatherstrip Remove

2. Pull open part of the front door side weatherstrips at the front door window frame when removing, to expose the location of screws fixing the front door separating pillar.
3. Remove 1 screw (1) fixing the front door separating pillar to the front door window frame.
4. Remove 2 bolts (2) fixing the front door separating pillar to the door panel.



5. Take out the front door separating pillar at an appropriate position.

Refit

1. Fit 2 bolts fixing the front door separating pillar to the door panel, tighten them to **7-10Nm**, and check the torque.
2. Fit 1 screw fixing the front door separating pillar to the door panel, tighten them to **1-1.5Nm**, and check the torque.
3. Fit the front door window glass run channel weatherstrip.

Front Door Window Glass Run Channel Weatherstrip Refit

Front Door Window Upper Molding Assembly Remove

1. Carefully pry off the clip of the front door window upper moulding, and gently remove the front door window upper moulding.



SC114519

Refit

1. Locate the front door window glass upper moulding to the body, and press the clip in place.

Front Door Frame A Pillar Decorative Film Remove

1. Carefully remove the front door window upper moulding assembly.



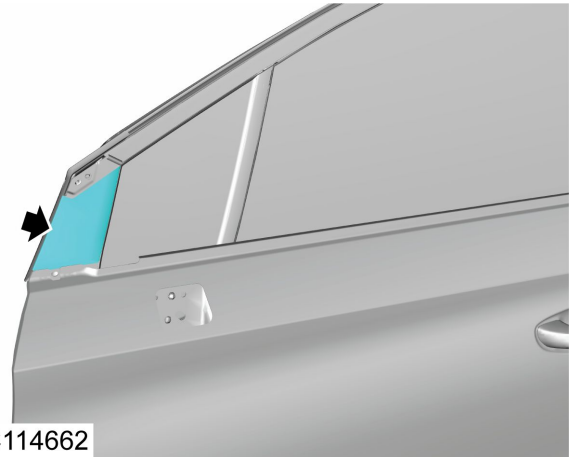
Front Door Window Upper Moulding Assembly Remove

2. Remove the front door window outer weatherstrip.



Front Door Window Outer Weatherstrip Remove

3. Tear off the front door frame A-pillar decorative film and discard it.



SC114662

Refit

1. Check the surface paint of the door frame, and ensure that the surface is spotless and flat (If there are spots and unevenness, first use non-woven fabric dipped in 50:50 alcohol to scrub the location of the film to ensure the cleanliness of the pasted parts).
2. Peel off the isolation paper on the back of the black film, remove the excess, perforated black film from the upper part along the split line, ensure that the left and right 2 points are aligned with the left and right edges of the panel and apply the film from top to bottom while using a squeegee to discharge the air, and try to avoid repeatedly lifting and pasting the black film during the process.
3. After the black film has been completely laminated to the panel, use the squeegee to scrape the film back and forth 2-3 times to ensure that the air is fully discharged. Then use the handle to quickly remove the transparent protective film from the surface at once, so as to avoid stopping in the middle.
4. The excess black film on both sides of the window frame is wrapped by hand, and the rounded corners are trimmed until they are smooth and free from warping.
5. Check that the black film and the window frame fit tightly and the surface is flat without bubbles, creases, dewy white and other defects. If there is a defect, you need to repeat the above operation.

A squeegee must be used continuously during the lamination process to expel air bubbles. If you need to rework, it is recommended to do it within 24 hours of lamination, and the risk of adhesive residue will increase beyond 24 hours. If it is removed after 24 hours, it is recommended to use alcohol to wipe it.

6. Fit the front door window outer weatherstrip.

Front Door Window Outer Weatherstrip

7. Fit the front door window upper moulding assembly.

Front Door Window Upper Moulding Assembly

Front Door Frame B Pillar Decorative Film Remove

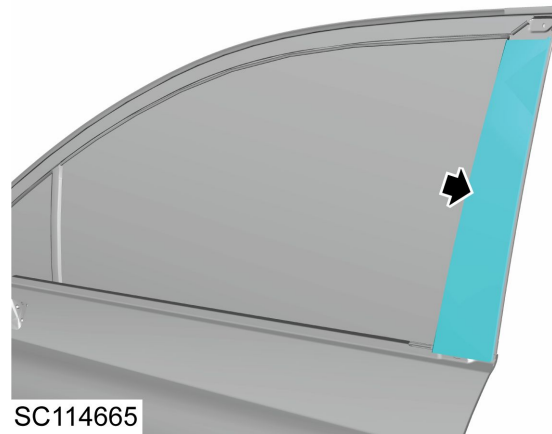
1. Remove the front door window upper moulding assembly.

Front Door Window Upper Moulding Assembly Remove

2. Remove the front door window outer weatherstrip.

Front Door Window Outer Weatherstrip Remove

3. Tear off the front door frame B-pillar decorative film and discard it.



Refit

1. Check the surface paint of the door frame, and ensure that the surface is spotless and flat (If there are spots and unevenness, first use non-woven fabric dipped in 50:50 alcohol to scrub the location of the film to ensure the cleanliness of the pasted parts).
2. Peel off the isolation paper on the back of the black film, remove the excess, perforated black film from the upper part along the split line, ensure that the left and right 2 points are aligned with the left and right edges of the panel and apply the film from top to bottom while using a squeegee to discharge the air, and try to avoid repeatedly lifting and pasting the black film during the process.
3. After the black film has been completely laminated to the panel, use the squeegee to scrape the film back and forth 2-3 times to ensure that the air is fully discharged. Then use the handle to quickly remove the transparent protective film from the surface at once, so as to avoid stopping in the middle.
4. The excess black film on both sides of the window frame is wrapped by hand, and the rounded corners are trimmed until they are smooth and free from warping.
5. Check that the black film and the window frame fit tightly and the surface is flat without bubbles, creases, dewy white and other defects. If there is a defect, you need to repeat the above operation.

A squeegee must be used continuously during the lamination process to expel air bubbles. If you need to rework, it is recommended to do it within 24 hours of lamination, and the risk of adhesive residue will increase beyond 24 hours. If it is removed after 24 hours, it is recommended to use alcohol to wipe it.

6. Fit the front door window outer weatherstrip.

Front Door Window Outer Weatherstrip

7. Remove the front door window upper moulding assembly.

Front Door Window Upper Moulding Assembly

Rear Door Window Remove

1. Remove the rear door interior trim panel.

Rear Door Interior Trim Panel Remove

2. Remove the rear door waterproof membrane.

Rear Door Waterproof Membrane Remove

3. Raise the glass to a certain height, to align two clip barbs of the glass with the mounting holes in the door.

4. Remove the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Remove

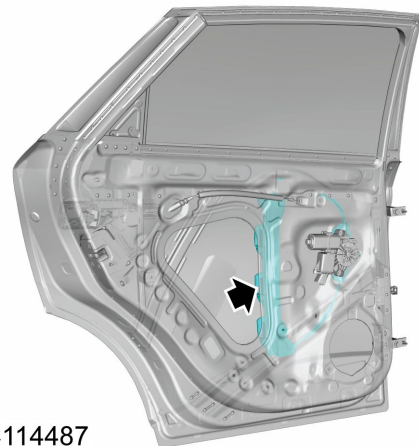
5. Remove the rear door window inner weatherstrip.

Rear Door Window Inner Weatherstrip Remove

6. Remove the rear door separating pillar.

Rear Door Separating Pillar Remove

7. Push 2 clip barbs fixing the glass to the window regulator outwards from the hole in the glass regulator bracket, and lift the glass to remove it from the window frame.



SC114487

Refit

1. Carefully fit the glass between the inner and outer panels from the window frame, and fit glass run channel weatherstrips on both sides.

2. Lower the glass slowly until it reaches the slider of the glass regulator, align the glass with the clip, put the glass into the slider clip and fit it in place.

3. Fit the rear door separating pillar.

Rear Door Separating Pillar Refit

4. Fit the rear door window inner weatherstrip.

Rear Door Window Inner Weatherstrip Refit

5. Fit the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Refit

6. Fit the rear door waterproof membrane.

Rear Door Waterproof Membrane Refit

7. Fit the rear door interior trim panel.

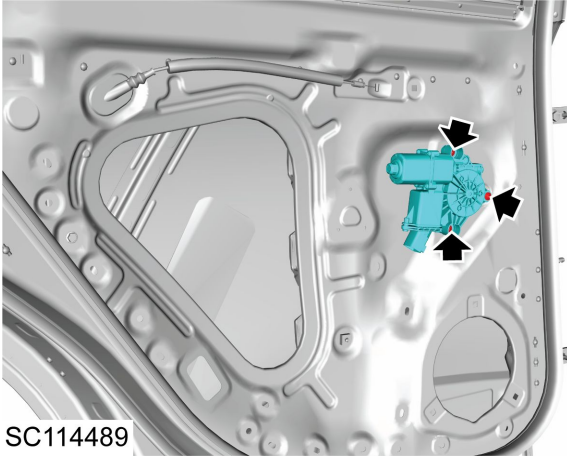
Rear Door Interior Trim Panel Refit

Rear Door Window Regulator Remove

1. Disconnect the negative battery cable.
2. Remove the rear door window.

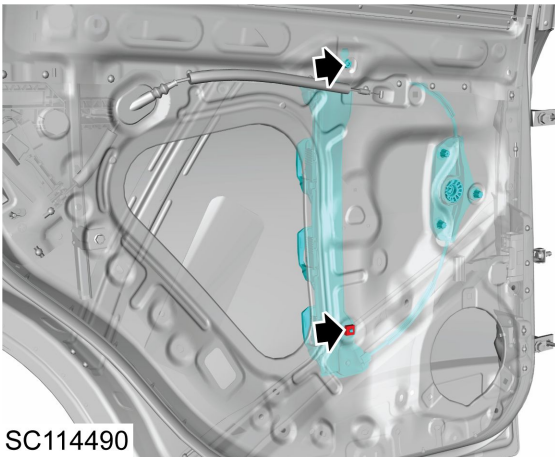
Rear Door Window Glass Remove

3. Remove 3 bolts fixing the window regulator motor to the door panel, and disconnect the motor harness connector.



SC114489

4. Loosen the gear engagement, and remove the window regulator motor.
5. Remove 2 nuts fixing the window regulator to the door panel, loosen the clips, and take the window regulator out of the door cavity.



SC114490

Refit

1. Fit the window regulator into the rear door cavity, and press the clip in place.
2. Fit 4 nuts fixing the window regulator on the door panel, tighten them to **7-10N·m** in sequence from top to bottom and from left to right, and check the torque.
3. Locate the window regulator motor to the window regulator, engage the gear, and connect the harness connector of the motor.
4. Fit 3 bolts fixing the window regulator motor on the door panel, tighten them to **3-4N·m**, and check the torque.

5. Fit the rear door window.

Rear Door Window Glass Refit

6. Connect the negative battery cable.
7. Check if the window regulator can work properly, and check if the window with "one-touch up" function can operate normally.

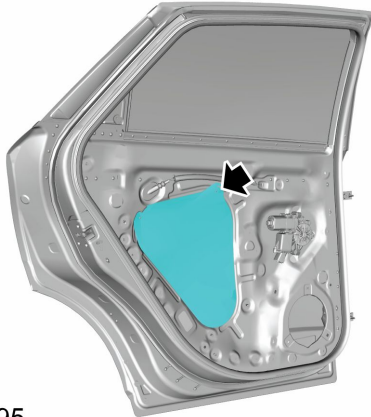
Note : *In case of power failure, the "one-touch up" function may fail; at this time, press the switch to ascend the window to the top, press and hold it for 5s to complete the self learning for window regulator, then the "one-touch up" function will be recovered.*

Rear Door Waterproof Membrane Remove

1. Remove the rear door interior trim panel.

 **Rear Door Interior Trim Panel Remove**

2. Tear off the waterproof membrane.



SC114495

Refit

1. Fit the waterproof membrane.
2. Fit the rear door interior trim panel.

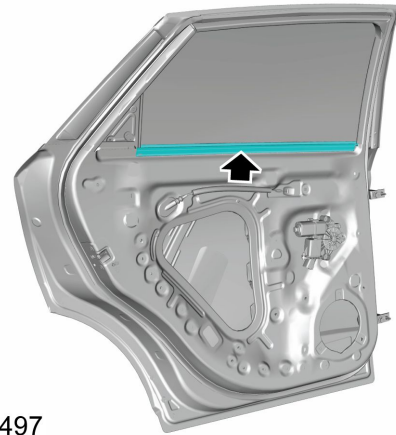
 **Rear Door Interior Trim Panel Refit**

Rear Door Window Inner Weatherstrip Remove

1. Remove the rear door interior trim panel.

 **Rear Door Interior Trim Panel Remove**

2. Pull up to remove the rear door window inner weatherstrip.



SC114497

Refit

1. Aligning the weatherstrip opening with the door inner panel seam allowance, fit the rear door window inner weatherstrip.
2. Fit the rear door interior trim panel.

 **Rear Door Interior Trim Panel Refit**

Rear Door Window Outer Weatherstrip Remove

1. Open the rear door.
2. Pull the outer weatherstrip up from the front to the rear end of the door in order and remove it.



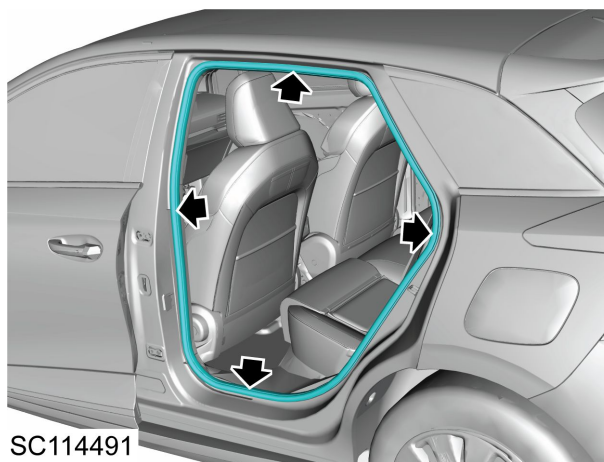
SC114503

Refit

1. Align the rear door window outer weatherstrip with the door panel, and fit it onto the flanging of the door panel.
2. Close the rear door.

Rear Door Weatherstrip Assembly (Body Side) Remove

1. Open the rear door, and remove the rear door weatherstrip at bodyside.



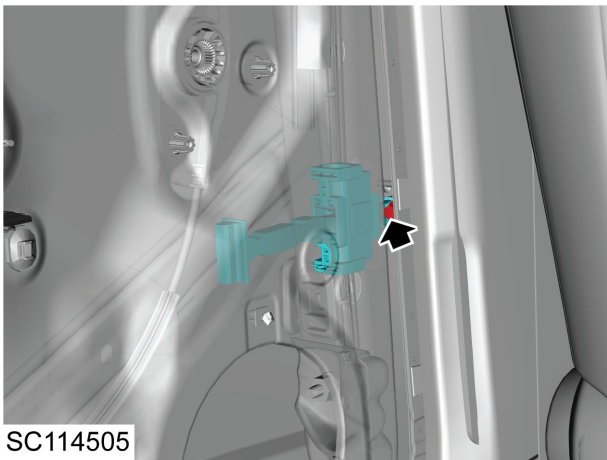
SC114491

Refit

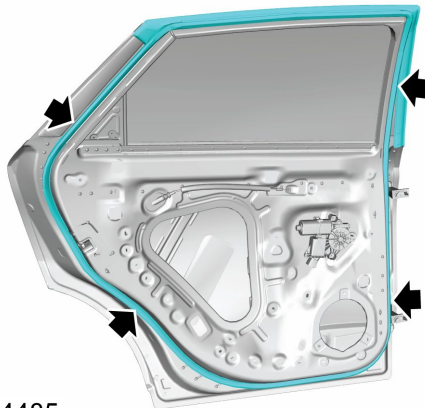
1. Fit the rear door weatherstrip at bodyside to the body along the rear door bodyside panel seam allowance, and fit the rear door weatherstrip at bodyside.

**Rear Door Weatherstrip Assembly (Door Side)
Remove**

1. Remove and discard I bolt fixing the door check to the body side.



2. Remove the rear door weatherstrip along the rear door.



Refit

1. Fit the rear door weatherstrip to the rear door along the rear door inner panel seam allowance.
2. Fix the door check to the body side, fit I bolt, tighten it to **19-25Nm**, and check the torque.

**Rear Door Lower Rear Auxiliary Weatherstrip
Assembly
Remove**

1. Pry off the clip fixing the rear door lower rear auxiliary weatherstrip to the rear door, and remove the rear door lower rear auxiliary weatherstrip assembly.



Refit

1. Fix the rear door lower rear auxiliary weatherstrip assembly to the rear door, and press the clip in place.

Rear Door Window Glass Run Channel Weatherstrip Remove

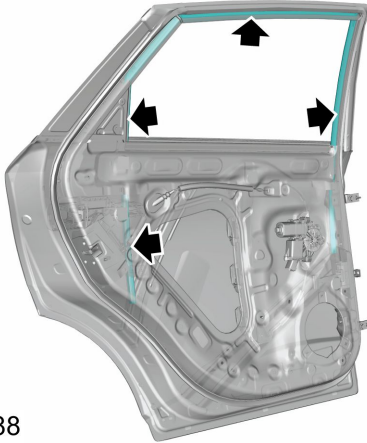
1. Remove the rear door window.

Rear Door Window Glass Remove

2. Remove the rear door window frame trim.

Rear Door Window Frame Trim Remove

3. Remove the rear door window glass run channel weatherstrip.



SC114488

Refit

1. Insert the rear part of the window glass run channel weatherstrip into the rear door window frame rear trim panel.
2. Align the weatherstrip opening with the door inner panel seam allowance, and fit the rear door window glass run channel weatherstrip.
3. Fit the rear door window frame trim.

Rear Door Window Frame Trim Refit

4. Fit the rear door window.

Rear Door Window Glass Refit

Rear Door Separator Remove

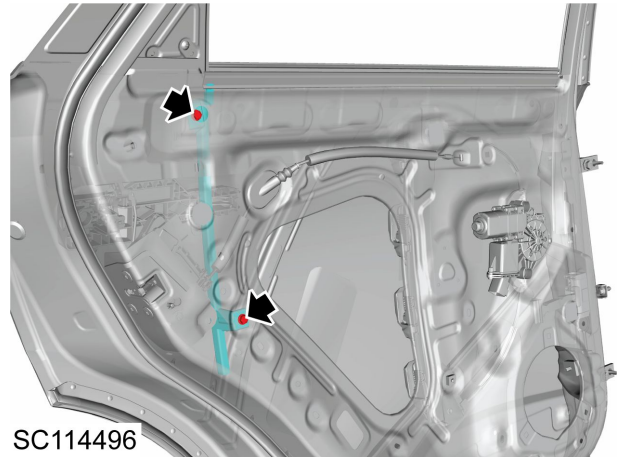
1. Remove the rear door interior trim panel.

Rear Door Interior Trim Panel Remove

2. Remove the rear door waterproof membrane.

Rear Door Waterproof Membrane Remove

3. Remove 2 bolts fixing the rear door separating pillar to the door panel.



SC114496

4. Take out the rear door separating pillar at an appropriate position.

Refit

1. Fit 2 bolts fixing the rear door separating pillar to the door panel, tighten them to **7-10Nm**, and check the torque.
2. Fit the rear door waterproof membrane.

Rear Door Waterproof Membrane Refit

3. Fit the rear door interior trim panel.

Rear Door Interior Trim Panel Refit

**Rear Door Window Upper Molding Assembly
Remove**

1. Carefully pry off the clip of the rear door window upper moulding, and gently remove the rear door window upper moulding.



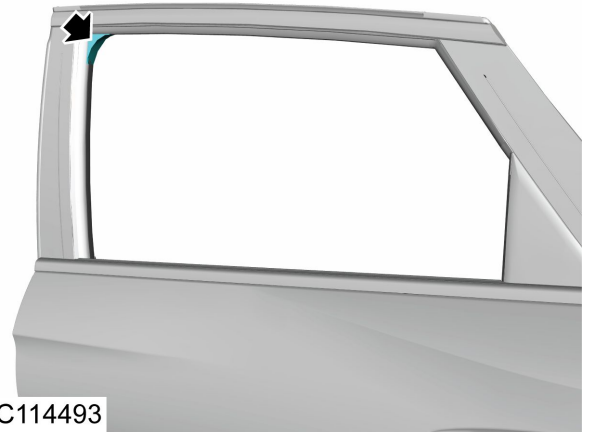
SC114498

Refit

1. Locate the rear door window glass upper moulding to the body, and press the clip in place.

**Rear Door Window Frame Molding
Remove**

1. Open the rear door, and lower the window to a proper height.
2. Loosen the clips, and remove the rear door window frame trim.



SC114493

Refit

1. Fit the rear door window frame trim, and fasten the clips.
2. Raise the window glass to the top position, and close the rear door.

Rear Door Frame D-pillar Decorative Film Remove

1. Carefully remove the rear door window upper moulding assembly.

Rear Door Window Upper Moulding Assembly Remove

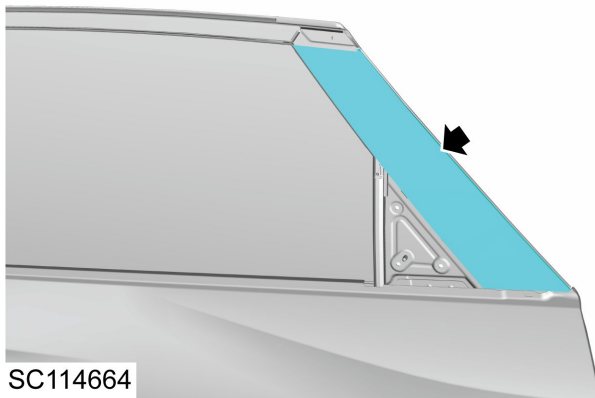
2. Remove the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Remove

3. Remove the rear door window outer trim panel assembly.

Rear Door Window Outer Trim Panel Assembly Remove

4. Tear off and discard the rear door frame D-pillar decorative film.



Refit

1. Check the surface paint of the door frame, and ensure that the surface is spotless and flat (If there are spots and unevenness, first use non-woven fabric dipped in 50:50 alcohol to scrub the location of the film to ensure the cleanliness of the pasted parts).
2. Peel off the isolation paper on the back of the black film, remove the excess, perforated black film from the upper part along the split line, ensure that the left and right 2 points are aligned with the left and right edges of the panel and apply the film from top to bottom while using a squeegee to discharge the air, and try to avoid repeatedly lifting and pasting the black film during the process.
3. After the black film has been completely laminated to the panel, use the squeegee to scrape the film back and forth 2-3 times to ensure that the air is fully discharged. Then use the handle to quickly remove the transparent protective film from the surface at once, so as to avoid stopping in the middle.
4. The excess black film on both sides of the window frame is wrapped by hand, and the rounded corners are trimmed until they are smooth and free from warping.
5. Check that the black film and the window frame fit tightly and the surface is flat without bubbles, creases,

dewy white and other defects. If there is a defect, you need to repeat the above operation.

A squeegee must be used continuously during the lamination process to expel air bubbles. If you need to rework, it is recommended to do it within 24 hours of lamination, and the risk of adhesive residue will increase beyond 24 hours. If it is removed after 24 hours, it is recommended to use alcohol to wipe it.

6. Fit the rear door window outer trim panel assembly.

Rear Door Window Outer Trim Panel Assembly

7. Fit the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip

8. Fit the rear door window upper moulding assembly.

Rear Door Window Upper Moulding Assembly

Rear Door Frame B-pillar Decorative Film Remove

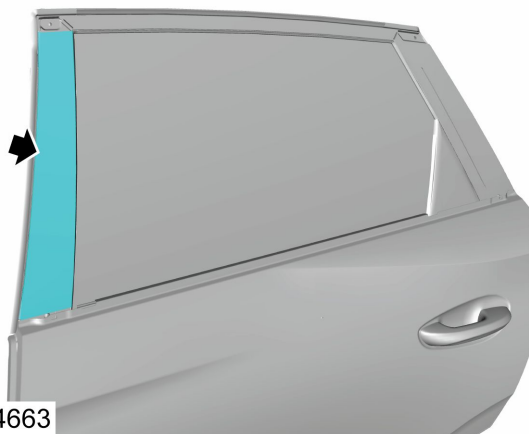
1. Carefully remove the rear door window upper moulding assembly.

Rear Door Window Upper Moulding Assembly Remove

2. Remove the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Remove

3. Tear off and discard the rear door frame B-pillar decorative film.



SC114663

Refit

1. Check the surface paint of the door frame, and ensure that the surface is spotless and flat (If there are spots and unevenness, first use non-woven fabric dipped in 50:50 alcohol to scrub the location of the film to ensure the cleanliness of the pasted parts).
2. Peel off the isolation paper on the back of the black film, remove the excess, perforated black film from the upper part along the split line, ensure that the left and right 2 points are aligned with the left and right edges of the panel and apply the film from top to bottom while using a squeegee to discharge the air, and try to avoid repeatedly lifting and pasting the black film during the process.
3. After the black film has been completely laminated to the panel, use the squeegee to scrape the film back and forth 2-3 times to ensure that the air is fully discharged. Then use the handle to quickly remove the transparent protective film from the surface at once, so as to avoid stopping in the middle, and ensure that the black film is tightly fitted and the surface is smooth and flat.
4. The excess black film on both sides of the window frame is wrapped by hand, and the rounded corners are trimmed until they are smooth and free from warping.
5. Check that the black film and the window frame fit tightly and the surface is flat without bubbles, creases, dewy white and other defects. If there is a defect, you need to repeat the above operation.

A squeegee must be used continuously during the lamination process to expel air bubbles. If you need to rework, it is recommended to do it within 24 hours of lamination, and the risk of adhesive residue will increase beyond 24 hours. If it is removed after 24 hours, it is recommended to use alcohol to wipe it.

6. Fit the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip

7. Fit the rear door window upper moulding assembly.

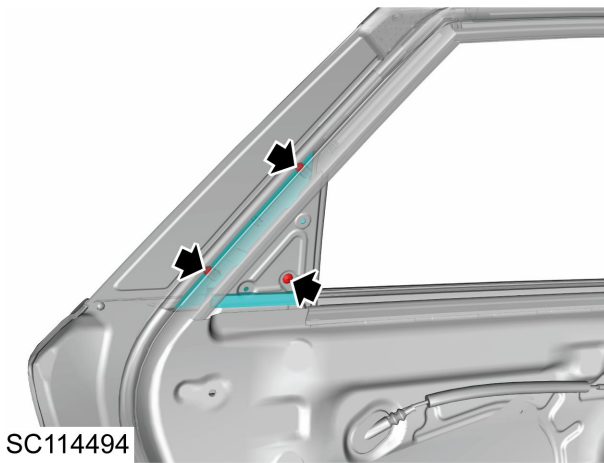
Rear Door Window Upper Moulding Assembly

Rear Door Window Exterior Trim Panel Assembly Remove

1. Open the rear door.
2. Loosen the clip, and remove the rear door window interior trim panel assembly.
3. Remove the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Remove

4. Pull open part of the rear door side weatherstrips at the rear door window frame when removing, to expose the location of screws fixing the rear door window exterior trim panel.
5. Remove 3 screws fixing the rear door window exterior trim panel to the door panel.



6. Remove the rear door window outer trim panel assembly.

Refit

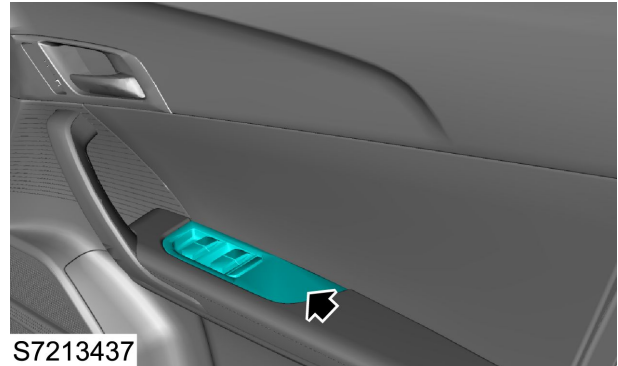
1. Fit 3 screws fixing the rear door window outer trim panel assembly to the door panel, tighten them to **0.8-1.8Nm**, and check the torque.
2. Fit the rear door window outer weatherstrip.

Rear Door Window Outer Weatherstrip Refit

3. Fit the rear door window inner trim panel assembly, and press the clip.
4. Close the rear door.

Power Window Switch - Driver Side Remove

1. Disconnect the negative battery cable.
2. Pry off the clip fixing the power window switch to the front door interior trim panel.



3. Disconnect the harness connector and remove the driver side power window switch.

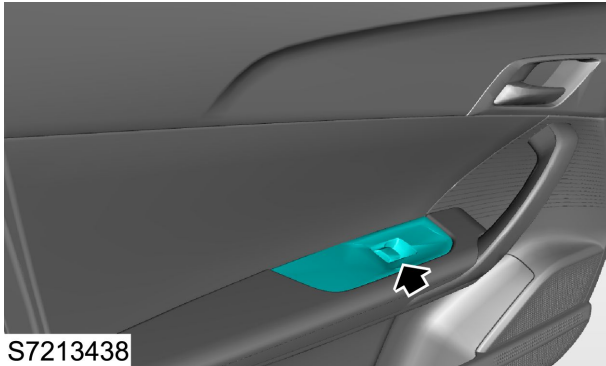
Refit

1. Connect the harness connector of the driver power window switch.
2. Fix the power window switch to the front door interior trim panel, and press the clip in place.
3. Connect the negative battery cable.
4. Check if the window glass regulator can work. During removing/refitting, the "one-button up/down" and "anti-pinch" functions may fail, in this case, perform self-learning for the driver side power window switch.

Self-learning for Driver Power Window Switch

Power Window Switch - Front Passenger Remove

1. Disconnect the negative battery cable.
2. Pry off the clip fixing the power window switch to the door interior trim panel.



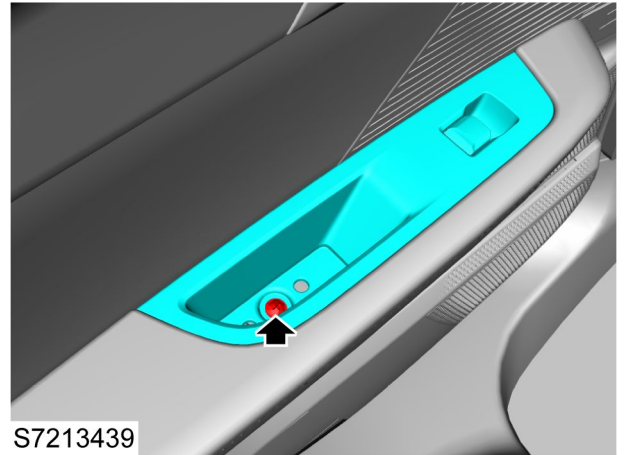
3. Disconnect the harness connector and remove the power window switch.

Refit

1. Connect the harness connector of the power window.
2. Fix the power window switch to the door interior trim panel, and press the clip in place.
3. Connect the negative battery cable.

Power Window Switch - Others Remove

1. Disconnect the negative battery cable.
2. Remove the rear door power window switch screw trim cover.
3. Remove 1 screw fixing the rear door power window switch to the door, and pry off the retaining clip.



4. Disconnect the harness connector and remove the power window switch - others.

Refit

1. Connect the harness connector of the power window.
2. Press the rear door power window switch on the door interior trim panel and ensure the clips are fully engaged.
3. Fit and tighten 1 screw fixing the rear door power window switch to the door interior trim panel.
4. Fit the rear door power window switch screw trim cover.
5. Connect the negative battery cable.

Door & Lid System

**Body Rear End Coverings and
Weatherstrips**

Specification

Torque

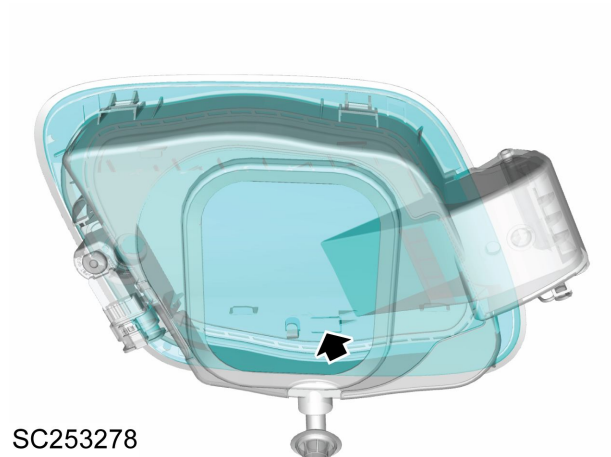
Description	Value
Bolt-tailgate hinge to tail door	26-34Nm
Nut-tailgate hinge to body	26-34Nm
Bolt-tailgate lock body assenbly to tail door	19-25Nm
Bolt-tailgate latch to body	19-25Nm
Bolt-body end gas spring mounting ball head bracket to body	19-25Nm
Bolt-tailgate end gas spring mounting ball head bracket to tail	19-25Nm
Bolt-tailgate bumper to body	7-10Nm
Bolt-tailgate bumper to tailgate	7-10Nm

Service Guide

Charging Port Door Assembly

Remove

1. Open the charging port door assembly.
2. Pry off the clip fixing the charging port door and push the charging port door assembly outwards at the same time.



SC253278

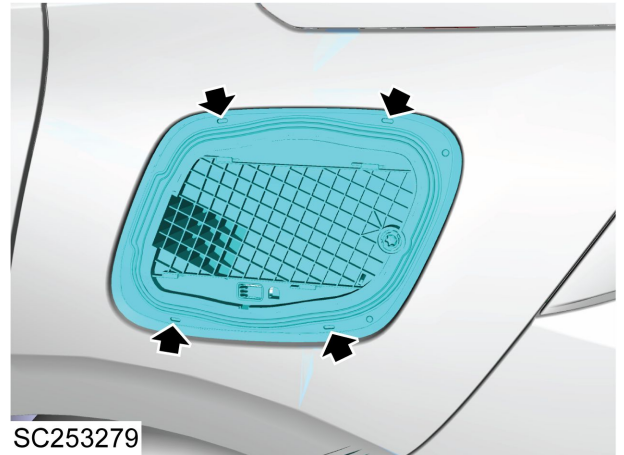
Refit

1. Push the charging port door assembly along the chute, and make sure the clip is fitted in place.
2. Close the charging port door assembly.

Charging Port Door Housing Assembly

Remove

1. Open the charging port door assembly.
2. Pry off the clip fixing the charging port door and pull the charging port door assembly outwards at the same time.



SC253279

Refit

1. Push the charging port door assembly along the chute, and make sure the clip is fitted in place.
2. Close the charging port door assembly.

Door & Lid System

Tail Gate Assembly Remove

1. Open the tail gate, and make sure that it is reliably supported to keep it open during removal.

Warning : Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.

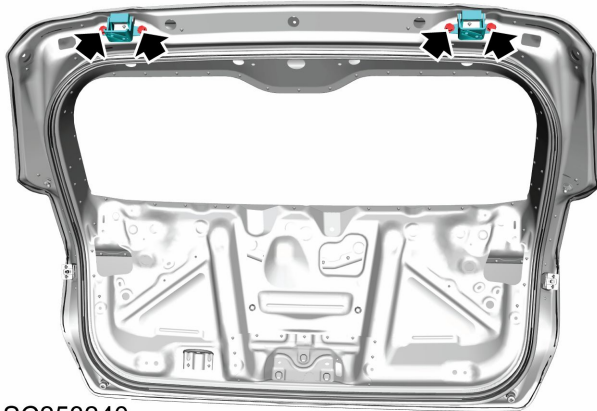
2. Disconnect the negative battery cable.
3. Remove the tail gate harness.

Tail Gate Harness

4. Remove the tail gate air spring.

Tail Gate Air Spring Remove

5. With assistance, remove 4 bolts fixing the hinges on both sides to the tail gate. If it is required to refit the tail gate, a reference position shall be marked on the hinge.



SC253240

6. Remove the tail gate assembly.

Refit

1. With assistance, fit the tail gate to the correct position.

Warning : Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.

2. Check the fit clearance and flushness between the tail gate and the bodyside panel and rear end panel. For clearance information, please refer to "Body Dimension" in the "Body Panel and Painting" section.

Rear End Information

3. After adjustment, tighten 4 bolts to **26-34Nm**, and check the torque.
4. Remove the tail gate air spring.

Tail Gate Air Spring Refit

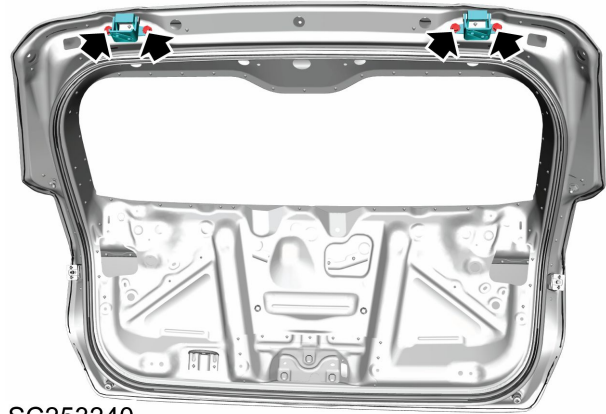
5. Remove the tail gate harness.

Tail Gate Harness Remove

Adjustment

1. Mark the profiles of the trunk lid with a non-permanent marker.

2. Loosen 4 bolts fixing the tail gate hinge flap to the tail gate.



SC253240

3. Adjust the tail gate to make the gap between the tail gate and the tail lamp and that between the tail gate and the rear bumper fascia uniform and make the tail gate flush with the tail lamp and the rear bumper fascia.
4. For clearance information, please refer to "Body Dimension" in the "Body Panel and Painting" section.

Rear End Information

5. Tighten 4 bolts fixing the hinges to the tail gate to **26-34Nm**, and check the torque.

Tail Gate Hinge Remove

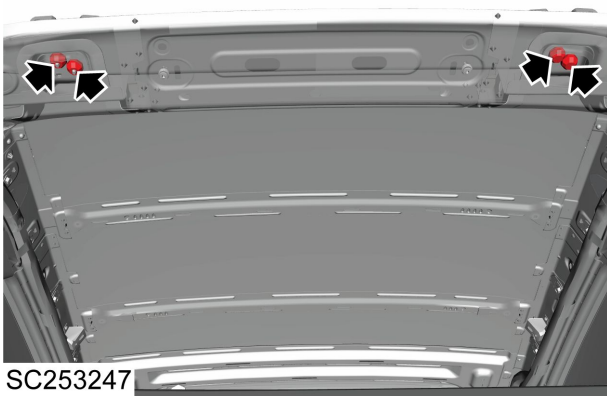
1. Open the tail gate, and make sure that it is reliably supported to keep it open during removal.

Warning : *Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.*

2. Remove the tail gate assembly.

Tail Gate Assembly

3. Mark the position of the tail gate hinge on the vehicle body with a non-permanent marker.
4. Loosen the clip, pry open the tail gate end of roof interior trim panel to access the retaining nuts of the tail gate hinges.
5. Remove 4 nuts fixing the left and right tail gate hinges to the body, so as to remove the tail gate hinge assembly.



Refit

1. Locate the tail gate hinge assembly to the marked mounting location on the body.
2. Fit 4 nuts fixing the left/right tail gate hinges to the body, tighten them to **26-34Nm**, and check the torque.
3. Fit the tail gate end of roof interior trim panel.
4. Fit the tail gate assembly.

Tail Gate Assembly

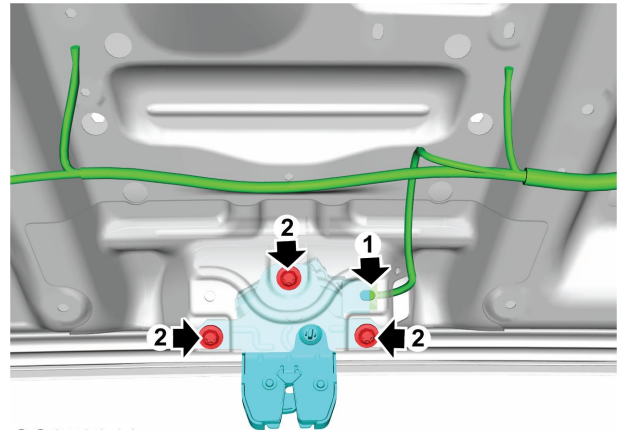
Warning : *Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.*

Tail Gate Lock Assembly Remove

1. Remove the tail gate interior trim panel.

Tail Gate Interior Trim Panel Remove

2. Remove 3 bolts (2) fixing the tail gate lock to the tail gate, disconnect the lock harness connector (1), and remove the tail gate lock.



Refit

1. Locate the tail gate lock to the tail gate panel, and connect the harness connector.
2. Fit 3 bolts fixing the tail gate lock to the tail gate, but do not tighten them.
3. Check and adjust the fit clearance and flushness between the tail gate lock and the surrounding panels, tighten them to **19-25Nm** after adjustment, and check the torque.
4. Fit the interior trim panel of the tail gate.

Tail Gate Interior Trim Panel Refit

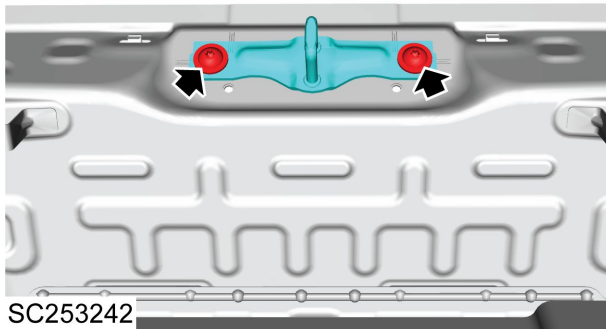
Door & Lid System

Tail Gate Striker Assembly Remove

1. Remove the trunk sill trim panel.

Trunk Sill Trim Panel Remove

2. Mark the location of tail gate striker relative to the vehicle body.
3. Remove 2 bolts fixing the tail gate striker to the body, and remove the tail gate striker.



SC253242

Refit

1. Pre-fasten the tail gate striker according to the mark of its location relative to the vehicle body.
2. Open and close the tail gate several times, check and adjust the fit clearance and flushness between the tail gate and the surrounding panels by moving the bottom panel of the striker.
3. Make sure that the tail gate lock is fully locked.
4. Fit 2 bolts fixing the striker to the body, tighten them to **19-25Nm**, and check the torque.
5. Fit the trunk sill trim panel.

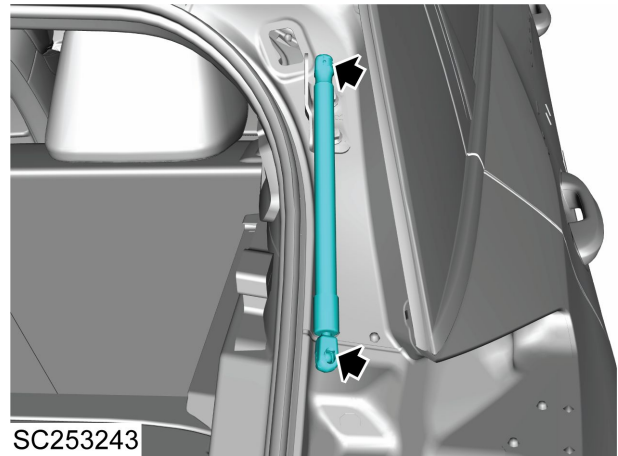
Trunk Sill Trim Panel Refit

Tail Gate Gas Spring Assembly Remove

1. Open the tail gate, and make sure that it is reliably supported to keep it open during removal.

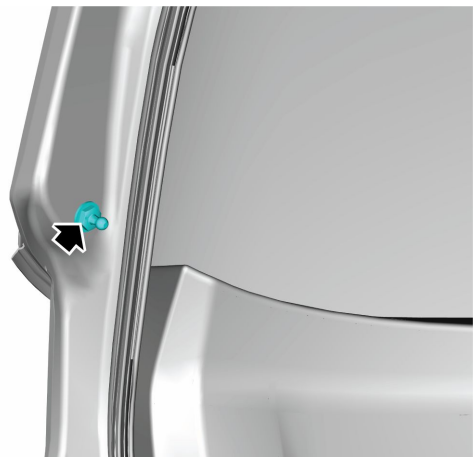
Warning : *Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.*

2. Pry off the steel spring retaining clips at both ends of right (left) air springs, unplug the ball head sockets at both ends from the ball heads of the tail gate, and remove the tail gate air spring.



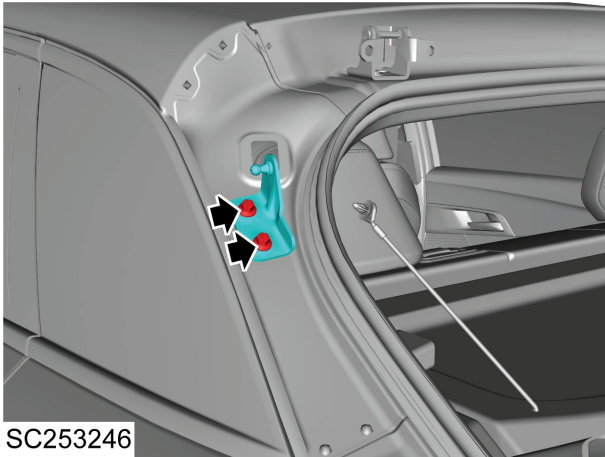
SC253243

3. Remove 1 bolt fixing the ball head mounting brackets of the air spring at right (left) tail gate end to the tail gate, and remove the ball head mounting brackets of the air spring at tail gate end.



SC253245

4. Remove 2 bolts fixing the ball head mounting brackets of the air spring at right (left) tail gate end to the body, and remove the ball head mounting brackets of the air spring at body end.



Refit

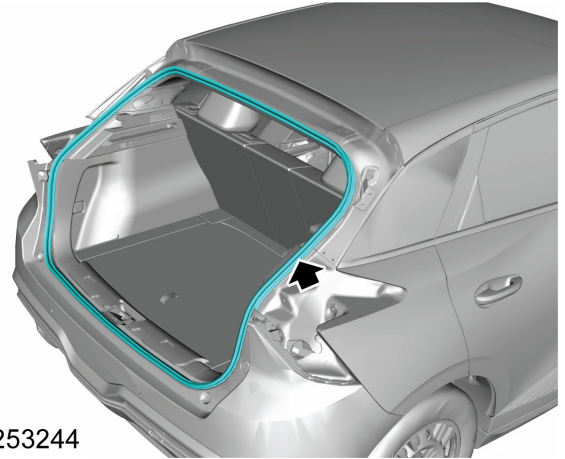
1. Fit 2 bolts fixing the ball head mounting bracket of air spring at right (left) body end to the body, tighten them to **19-25Nm**, and check the torque.
2. Fit 1 bolt fixing the ball head mounting bracket of air spring at right (left) tail gate end to the tail gate, tighten it to **19-25Nm**, and check the torque.
3. Align the ball head socket at sleeve end of air spring with the ball head on the mounting bracket at right (left) body end, and make sure the air spring piston is downward.
4. Hold the sleeve end and press the ball head socket hard to the ball head; a "crack" sound indicates the completion of the fitting.

Caution : To avoid damaging the airtightness of the air spring, never hold the centre of the air spring and laterally apply force to it by hand.

5. Align the ball head socket at piston end of right (left) air spring with the ball head on the tail gate, hold the end of the piston, push the ball head socket onto the ball head with thumb forcibly. If the two parts are fitted well, a "crack" sound will be heard.
6. Fit steel spring pieces to the ball head sockets at both ends of right (left) air spring, and ensure that they are properly located in the spring piece slots.

Tail Gate Weatherstrip Remove

1. Open the tail gate, and make sure it is securely supported during removal.
2. Carefully pull out and remove the tail gate weatherstrip.



Refit

1. Open the tail gate and ensure it is firmly supported during fitting.
2. Align the tail gate weatherstrip joint with the seam allowance close to the panel centre in the left tail lamp mounting area and insert the weatherstrip into the seam allowance.
3. Insert the weatherstrip from the joint position into the seam allowance from top to bottom in both the clockwise and counterclockwise directions respectively.
4. Tap the weatherstrip in place with the rubber hammer.

Door & Lid System

Tailgate Bumper

Remove

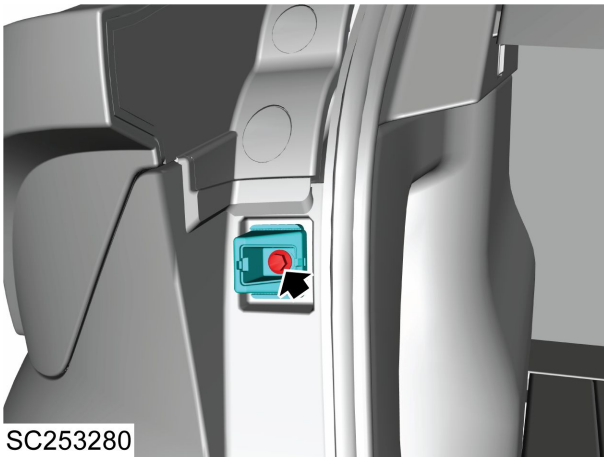
1. Open the tail gate, and make sure that it is reliably supported to keep it open during removal.

Warning : *Due to heavy tailgate, safety stands shall be set before operation, and pay special attention to avoid vehicle damage and personal injury.*

2. Remove 1 bolt fixing the tail gate buffer block to the tail gate.



3. Pry open the cover plate of the tail gate buffer block, and remove 1 bolt fixing the tail gate buffer block to the body.



Refit

1. Fit 1 bolt fixing the tail gate bumper block to the body, tighten it to **7-10Nm**, and check the torque.
2. Fit the tail gate bumper block cover plate.
3. Fit 1 bolt fixing the tail gate bumper block to the tail gate, tighten it to **7-10Nm**
4. Close the tail gate.

Fender**Specification****New sTOTopic**

Description	Value
Bolt-fender to body	7-10Nm
Nut-fender to body	7-10Nm

Service Guide

Fender
Remove

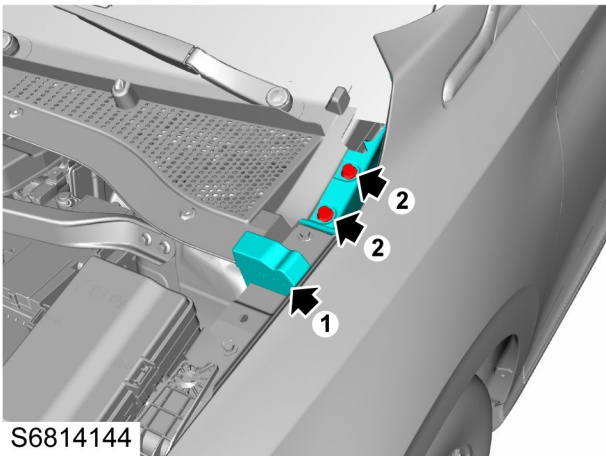
1. Remove the headlamp assembly.

 **Headlamp Assembly Remove**

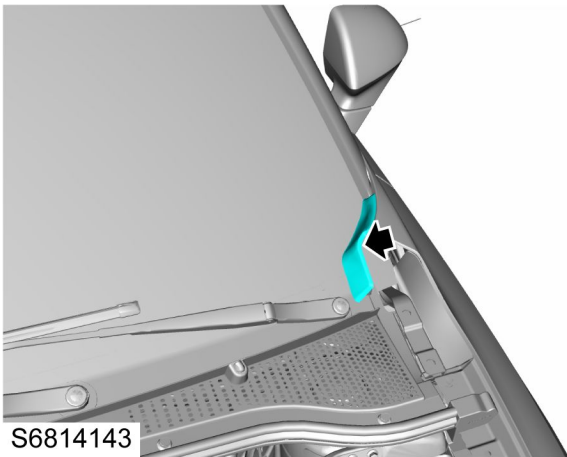
2. Remove the front wheelhouse liner.

 **Front Wheelhouse Liner Remove**

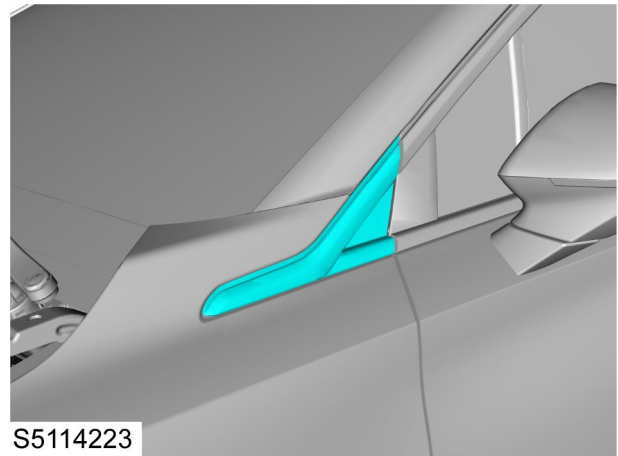
3. Remove the A/C air inlet grille assembly side water retaining block (1), and remove 2 split pins (2) fixing the A/C air inlet grille panel seals to the A/C air inlet grille assembly.



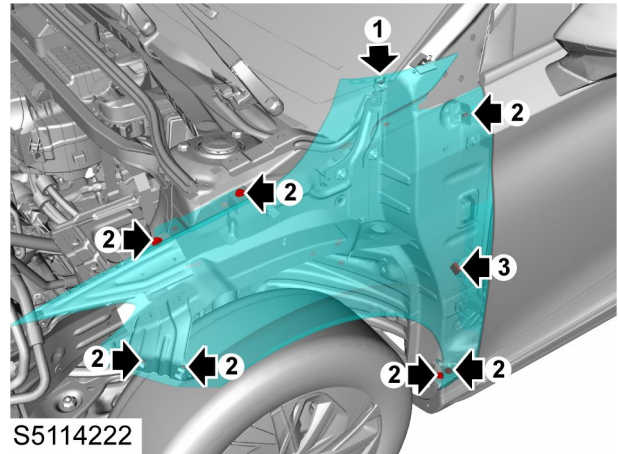
4. Release the clips at the side corners of the A/C air inlet grille, and remove the side corners.



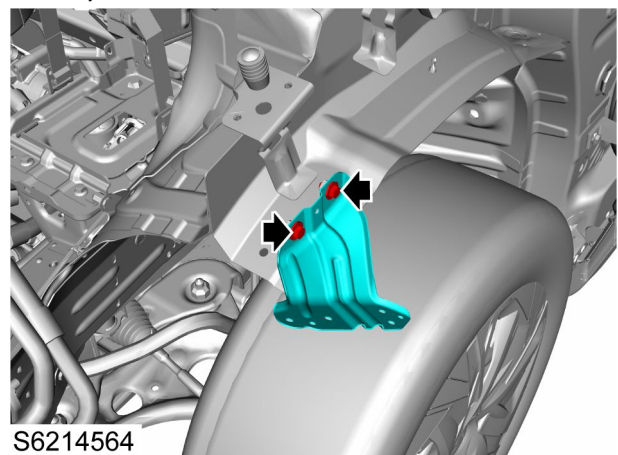
5. Loosen the clips, and remove the windscreen trim cover.



6. Open the front door, and remove 1 screw (1) fixing the fender to the body.
7. Remove the soundproof cotton, remove 7 bolts (2) and 1 nut (3) fixing the fender to the body, and remove the fender.



8. If necessary, remove 2 bolts fixing the fender to the body, and remove the fender bracket.



Refit

1. If removed, fix the fender bracket to the body, fit and tighten 2 bolts.
2. Locate the fender on the body, fit the fasteners and pre-tighten them.
3. Adjust the clearance between the fender and adjacent panels. For clearance information, please refer to "Body

Dimension" in the "Body Panel and Painting" section.

**Front End Information**

4. Fit the windscreen trim cover, and press the clip in place.
5. After adjustment, tighten 7 bolts fixing the fender to the body to **7-10Nm**; tighten 1 nut fixing the fender to the body to **7-10Nm**; tighten 1 screw fixing the fender to the body to **7-10Nm**; check the torque, and fit the soundproof cotton.
6. Fit the A/C air inlet grille side corner and press the clip in place.
7. Fit the A/C air inlet grille panel seal and press the clip in place.
8. Fit the A/C air inlet grille panel side seal.
9. Fit the front wheelhouse liner.

**Front Wheelhouse Liner Refit**

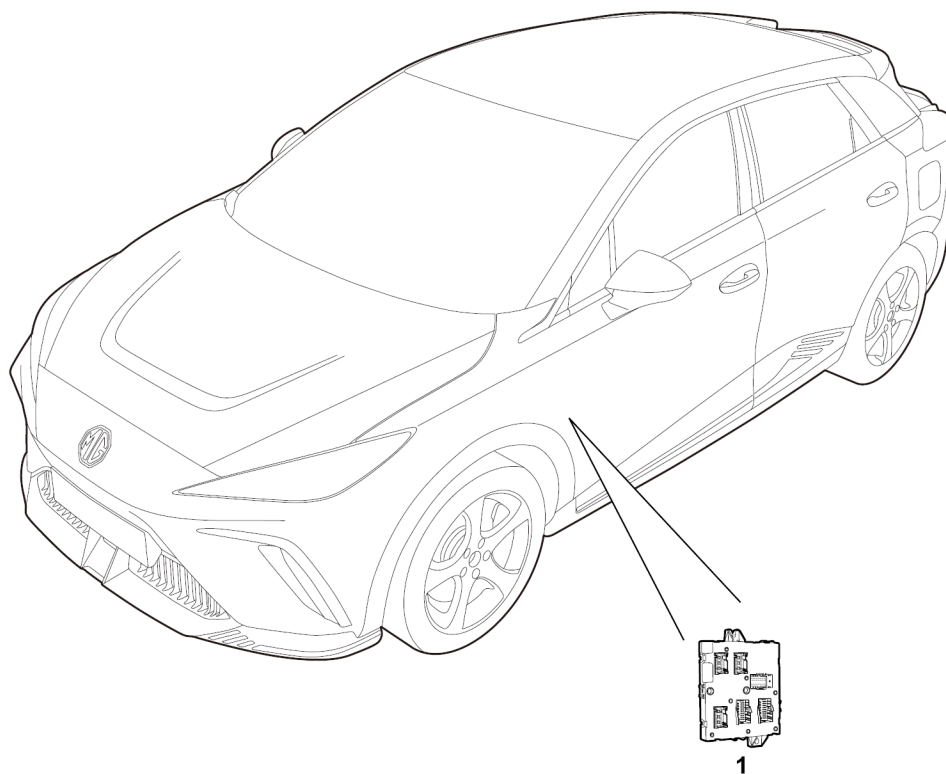
10. Fit the headlamp assembly.

**Headlamp Assembly Refit**

Body Control

Description and Operation

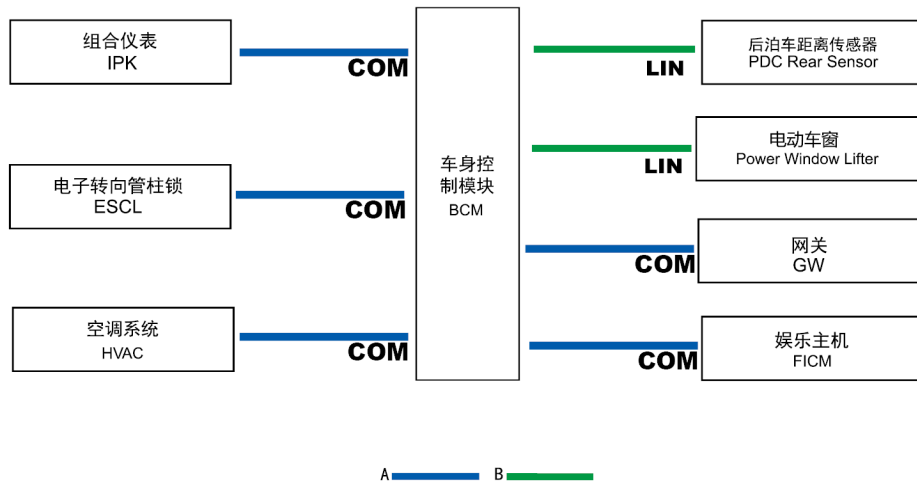
System Layout



S8361178

I. Body Control Module

System Control Diagram



S8360241

A = Comfort CAN Bus; B = LIN Bus

Description

Mounting position:

The BCM is located behind the driver side lower trim panel.

The BCM includes the microprocessor, memory, electrically erasable programmable read-only memory (EEPROM), CAN, LIN transceiver and power supply in low power mode. The BCM contains discrete input/output terminals which control most of the body functions. It interacts with other primary electrical systems through the HSCANbus and with other secondary electrical systems through the LINbus. The power mode master control module (PMM) of the BCM provides power for most of the vehicle electric components.

The BCM communicates directly with the following components through the body HSCANbus:

- IPK (Instrument Pack) (
- HVAC
- FLSM (Front Left Seat Module)
- FICM (Front Infotainment Control Module)
- PACM (Pedestrian Alert Control Module)
- ESCL (Electronic Steering Column Lock)
- GW

The BCM communicates directly with the following components through the LINbus:

- PDC (Parking Distance Control)
- PWL (Power Window Regulator Motor)

Operation

Overview

When the start switch is in "ACC" position, the BCM allows the washer/wiper, the power window system and some lighting systems to operate. When the start switch is in "ON/RUNNING" position, the BCM communicates with and transmits information to other ECU through CAN and LIN buses.

Load Management

The BCM can manage the load of some electric appliances by configuration and ensure low battery power consumption during storage and transportation or idle time.

Production Mode

It is configured for the BCM during vehicle assembly.

Transportation Mode

After vehicle assembly, programme the BCM so that the transportation mode can be used during transportation. And low battery problem can be avoided when the factory delivers the vehicle to the MG Authorised Repairer. This mode may restrict the function of some electric appliances:

- The rear fog lamp does not work when the engine is off.
- The high beam headlamp does not work when the engine is off.
- The low beam headlamp does not work when the engine is off.
- The reverse lamp does not work when the engine is off.
- The direction indicator lamp does not work when the engine is off.
- The daytime running lamp does not work when the engine is off.
- "Follow Me Home" and "Vehicle Locating" cannot be used.
- If the engine is disabled, the hazard warning lamp backlight does not work, but the function of this lamp is not affected.
- The auto lamp control does not work when the engine is off.
- When the engine is disabled, the window can be ascended, but cannot be descended.

With the aftermarket diagnostic tool, the MG Authorised Repairer can shift the vehicle load management configuration from transportation mode to normal mode.

Normal Mode

This mode applies the default setting, after completion of the PDI, the vehicle can enter into normal operation.

Sleep Mode

With the start switch off, and the BCM and LIN buses disabled, if the battery is still connected, the BCM will stay in sleep mode and be always ready for receiving the wake-up signal.

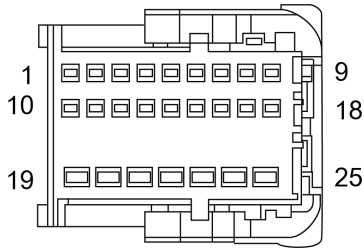
Wake-up Mode

In sleep mode, when one of the following operations is done, the BCM will be waken up.

- Activation signal of hazard warning lamp switch is received.
- Activation signal of direction indicator lamp switch is received.
- LOCK signal of internal lock is received.
- UNLOCK signal of internal lock is received.
- Activation signal of driver door switch is received.
- Activation signal of passenger door switch is received.
- Activation signal of bonnet switch is received.
- Activation signal of tail gate switch is received.
- Activation signal of tail gate release switch is received.
- Activation signal of driver door lock switch is received.
- Activation signal of driver door unlock switch is received.
- The start switch is in "ACC" position.
- The start switch is in "ON/RUNNING" position.
- Signal of depressing brake pedal
- SSB (PEPS)
- Activation signal of internal lamp switch
- Wake-up signal from LIN bus
- Wake-up signal from CAN bus
- Wake-up signal from local hard wire
- Valid radio frequency signal

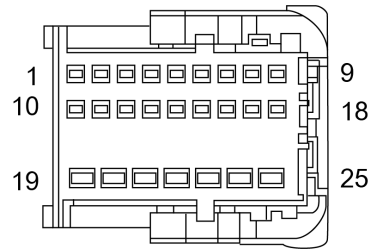
Detailed Information List of Pins

End View and Pin Information of BCM Harness Connector BY001



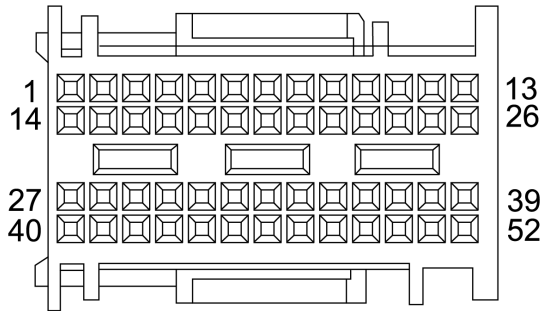
Pin No.	Description
1	-
2	-
3	DRVFuelFlapLckMot_DRV+
4	Tail Gate Lock_DRV
5	-
6	-
7	-
8	BCM_LIN4
9	BCM_LIN6
10	-
11	Ground 2
12	Left Tail Lamp Assembly_HSD
13	PosLamp_F_HSD
14	-
15	Left Tail Lamp Assembly_DIAG_SIG
16	BCM_LIN1
17	BCM_LIN8
18	-
19	Ground 6

End View and Pin Information of BCM Harness Connector BY002



Pin No.	Description
1	-
2	CotsyRoofLamp_HSD
3	-
4	TmdDlyLamp_HSD
5	-
6	-
7	High-mounted Stop Lamp_HSD
8	PosLamp_R_HSD
9	-
10	-
11	-
12	-
13	Trunk Lamp_HSD
14	WakeupEnable
15	License Plate Lamp_HSD
16	Reverse Lamp_HSD
17	Brake Lamp_RH_HSD
18	Rear Fog Lamp_HSD
19	DoorLckMot_DRV+
20	DoorLckMot_DRV
21	-
22	-
23	KL30.2
24	-
25	-

End View and Pin Information of BCM Harness Connector BY003



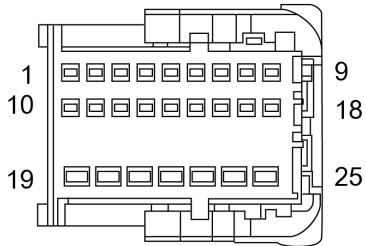
Pin No.	Description
1	MstrLckStsIndr_HSD
2	MstrLck/UnlckSw_SIG
3	-
4	-
5	Ground I
6	Front Passenger Passive Entry Switch_SIG
7	-
8	-
9	Driver Passenger Passive Entry Switch_SIG
10	Left Rear Window Motor Down Relay_DRV
11	-
12	Right Rear Window Motor Up Relay_DRV
13	-
14	-
15	BLISIndr_RH_HSD
16	BLISIndr_LH_HSD
17	DoorAjarSw_FP_SIG
18	-
19	Tail Gate Opening Switch ON_SIG
20	Tail Gate Opening Switch OFF_SIG
21	ChrgFlapDoorAjarSw_SIG
22	DoorAjarSw_DP_SIG

23	Right Rear Window Down Relay_DRV
24	Front Passenger Window Motor Down Relay_DRV
25	Front Passenger Window Motor Up Relay_DRV
26	Left Rear Window Motor Up Relay_DRV
27	PEPS Rear Bumper Antenna Ground
28	PEPS Rear Bumper Antenna Power Supply
29	PEPS Interior Rear Antenna Power Supply
30	PEPS Interior Rear Antenna Ground
31	DWSP_RRAutoSw_SIG
32	DWSP_RLDwnSw_SIG
33	DWSP_RLAutoSw_SIG
34	DoorAjarSw_RL_SIG
35	Driver Door Lock UNLOCK/LOCK_SIG
36	PDWSPUpSw_SIG
37	-
38	-
39	CAN_H
40	Front Passenger Door Antenna Power Supply
41	Front Passenger Door Antenna Ground
42	Driver Door Antenna Ground
43	Driver Door Antenna Power Supply
44	DWSP_RRDwnSw_SIG
45	DWSP_RRUpSw_SIG
46	DWSP_RLUpSw_SIG
47	PDWSPAUTOsw_SIG
48	DoorAjarSw_RR_SIG
49	PDWSPDwnSw_SIG
50	-

Body System

51	-
52	CAN_L

End View and Pin Information of BCM Harness Connector FC002

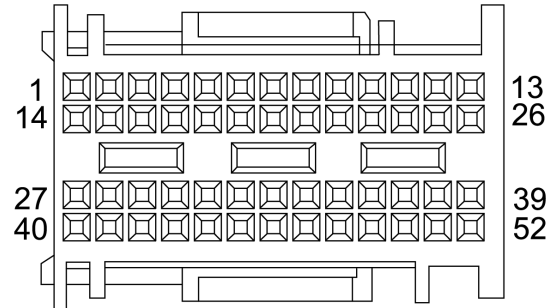


Pin No.	Description
1	Front Right Direction Indicator Lamp_HSD
2	-
3	Right Front Low Beam_HSD
4	Right Headlamp_HSD
5	Left Front Low Beam_HSD
6	Left Headlamp_HSD
7	-
8	KL.I5SwdPwrRelay_DRV
9	IGN Relay_DRV
10	-
11	-
12	-
13	-
14	Front Left Daytime Running Lamp_HSD
15	Front Left Direction Indicator Lamp_HSD
16	-
17	-
18	-
19	KL30.1
20	KL30.3
21	KL30.5
22	KL30.6

Body Control

23	-
24	-
25	KL30.7

End View and Pin Information of BCM Harness Connector FA001

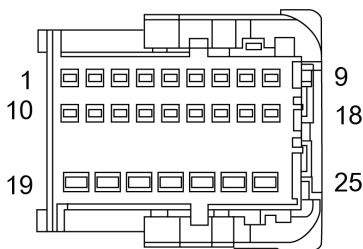


Pin No.	Description
1	-
2	Light Lever Switch_SIG
3	-
4	DrvrDetnSnsrRefc_SIG
5	-
6	-
7	KL.RPwrRelay_DRV
8	-
9	-
10	Mobile Phone Wireless Charging Enb
11	-
12	-
13	-
14	-
15	-
16	HzrdSw_SIG
17	IgnRelay
18	-
19	Light Stalk Switch Ground
20	CrashOut
21	-
22-25	-
26	Horn Switch_SIG

Body Control

27	-
28	FrtWiperIntmtSw_SIG
29	LghtSnsr_PWR
30-35	-
36	LghtSW_SIG
37	-
38	PEPS Interior Front Antenna Power Supply
39	PEPS Interior Front Antenna Ground
40	MainBeamSw_SIG
41	-
42	LghtSnsr_SIG
43	FrtWndsrnWshSw_SIG
44	FrtWiperSw_SIG1
45	-
46	-
47	-
48	FrtWiperSw_SIG2
49	-
50	-
51	PEPS Interior Middle Antenna Power Supply
52	PEPS Interior Middle Antenna Ground

End View and Pin Information of BCM Harness Connector BY001

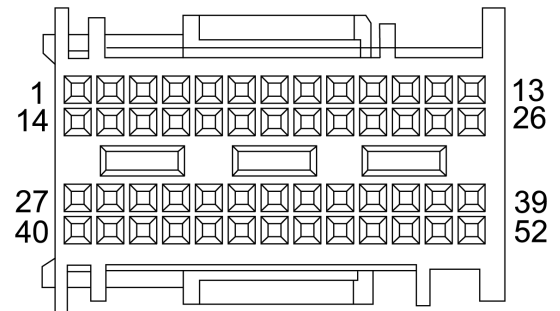


Pin No.	Description
1	-
2	-
3	DRVFuelFlapLckMot_DRV+

Body System

4	Tail Gate Lock_DRV
5	-
6	-
7	-
8	BCM_LIN4
9	BCM_LIN6
10	-
11	Ground 2
12	Left Tail Lamp Assembly_HSD
13	PosLamp_F_HSD
14	-
15	Left Tail Lamp Assembly_DIAG_SIG
16	BCM_LIN1
17	BCM_LIN8
18	-
19	Ground 6

End View and Pin Information of BCM Harness Connector FC001



Pin No.	Description
1	-
2	-
3	-
4	Front Wiper Switch_SIG
5	Left Headlamp Assembly Input
6	-
7	-
8	-

Body System**Body Control**

9	Brake Lamp Switch_SIG
10	-
11	-
12	-
13	Bonnet Open Switch_SIG
14	-
15	-
16	-
17	-
18	-
19	Right Headlamp Assembly Input
20	-
21-22	-
23	BCM_LIN7
24	
25	DrvrDetnSnsr_SIG
26	-
27	-
28	Windscreen Washer Relay_DRV
29	-
30	-
31	-
32	-
33-39	-
39	Front Wiper Speed Relay_DRV
40	-
41	Horn Relay_DRV
42	-
43	-
44	-
45	-
46	-
47	-
48	-
49	-
50	-

51	-
52	Front Wiper Enable Relay_DRV

Service Guide**Body Control Module (BCM)****Remove**

1. Disconnect the negative battery cable.
2. Remove the driver side lower closure panel.

 **Instrument Panel Lower Closure Panel**

3. Disconnect the harness connector (1) of the BCM.
4. Remove 2 bolts (2) fixing the BCM to the body, and remove the BCM.

**Refit**

1. Connect the harness connector of the BCM.
2. Connect the negative battery cable.
3. Programme and encode the BCM.



4. Fix the BCM to the body, fit 2 bolts, tighten them to **5-7Nm**, and check the torque.
5. Fit the driver side lower closure panel.

 **Instrument Panel Lower Closure Panel**

Front-end Module**Specification****New sTOTopic**

Description	Value
Bolt-water tank upper cross member to front buffer beam support	7-10Nm
Bolt-water tank upper cross member bracket to body	7-10Nm
Bolt-evaporation tank pipeline to water tank upper cross member	7-10Nm
Bolt-water tank upper cross member bracket to water tank upper cross member	7-10Nm
Bolt-front buffer beam support to body	19-25Nm

Service Guide

Upper Radiator Beam Remove

1. Remove the front bumper.

 **Front Bumper Remove**

2. Remove the beauty cover.

 **Beauty Cover Remove**

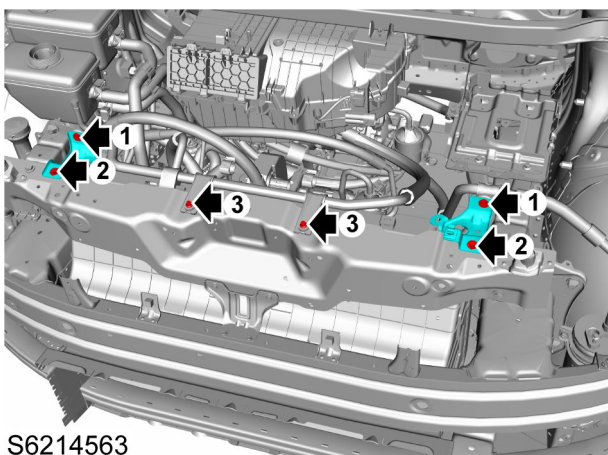
3. Remove the bonnet lock.

 **Bonnet Lock Assembly Remove**

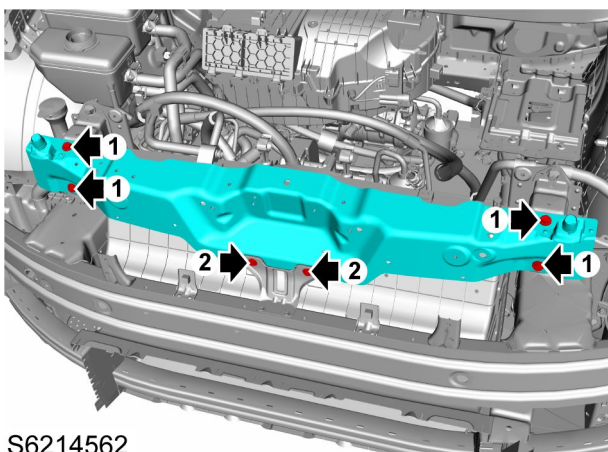
4. Remove the bonnet support rod.

 **Bonnet Support Rod Remove**

5. Remove 2 bolts (1) fixing the upper radiator beam bracket to the body.
6. Remove 2 bolts (2) fixing the upper radiator beam bracket to the upper radiator beam, and remove the upper radiator beam bracket.
7. Remove 2 bolts (3) fixing the pipeline - A/C evaporator to compressor to the upper radiator beam, and remove the pipeline harness.



8. Remove 4 bolts (1) fixing the upper radiator beam to the body.
9. Remove 2 bolts (2) fixing the upper radiator beam to the front bumper beam bracket, and remove the upper radiator beam.



Refit

1. Locate the upper radiator beam to the body.
2. Fit 2 bolts fixing the upper radiator beam to the front bumper beam bracket, tighten them to **7-10Nm** and check the torque.
3. Fit 4 bolts fixing the upper radiator beam to the body, tighten them to **7-10Nm** and check the torque.
4. Fit 2 bolts fixing the pipeline - A/C evaporator to compressor to the upper radiator beam, tighten them to **7-10Nm**, and check the torque.
5. Fit 2 bolts fixing the upper radiator beam bracket to the upper radiator beam, tighten them to **7-10Nm** and check the torque.
6. Fit 2 bolts fixing the upper radiator beam bracket to the body, tighten them to **7-10Nm** and check the torque.
7. Fit the bonnet support rod.

 **Bonnet Support Rod Refit**

8. Fit the bonnet lock.

 **Bonnet Lock Body Refit**

9. Fit the beauty cover

 **Beauty Cover Refit**

10. Fit the front bumper.

 **Front Bumper Refit**

Front Bumper Beam Remove

1. Remove the front bumper.

Front Bumper Remove

2. Remove the gas-liquid separator (If equipped).

Gas-Liquid Separator (If equipped) Remove

3. Remove the windscreen washer reservoir.

Windscreen Washer Reservoir Remove

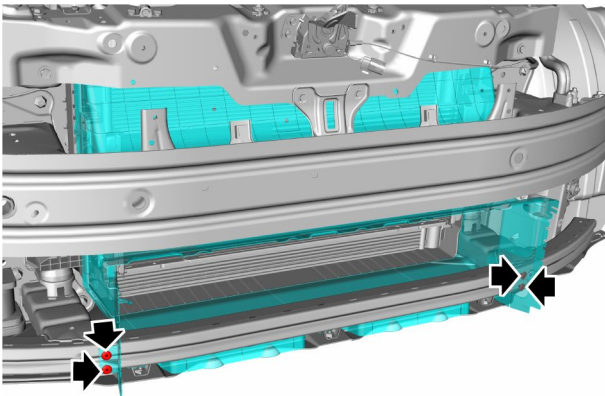
4. Remove the pedestrian alert speaker.

Pedestrian Alert Speaker Remove

5. Remove the horn.

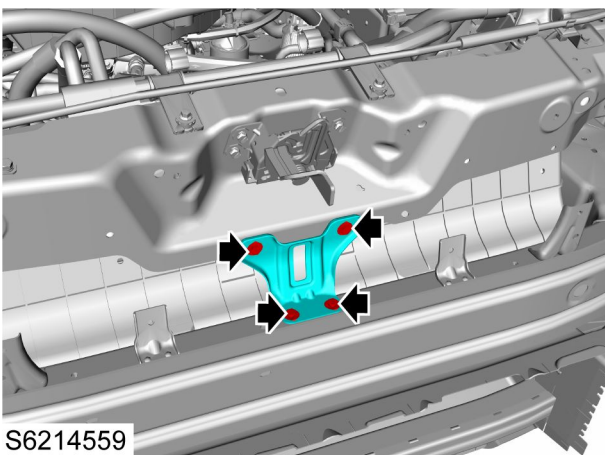
Horn Remove

6. Remove 4 split pins fixing the A/C box wind scooper to the front bumper beam.



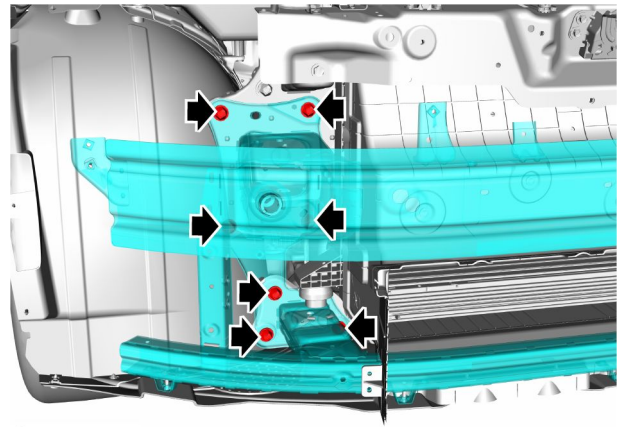
S6214561

7. Remove 4 bolts fixing the front bumper beam bracket to the front bumper beam and the upper radiator beam, and remove the front bumper beam bracket.



S6214559

8. Remove 7 bolts fixing the front bumper beam to the left (right) side of the body, move the wind scooper away and remove the front bumper beam.



S6214558

Refit

1. Locate the front bumper beam to the body, and locate the A/C box wind scooper to the front bumper beam.
2. Fit 4 bolts fixing the front bumper beam bracket to the front bumper beam and the upper radiator beam, tighten them to **19-25Nm** and check the torque.
3. Fit 4 split pins fixing the A/C box wind scooper to the front bumper beam, and press them in place.
4. Fit the horn.

Horn Refit

5. Fit the pedestrian alert speaker.

Pedestrian Alert Speaker Refit

6. Fit the windscreen washer reservoir.

Windscreen Washer Reservoir Refit

7. Fit the gas-liquid separator (If equipped).

Gas-Liquid Separator (If equipped) Refit

8. Fit the front bumper.

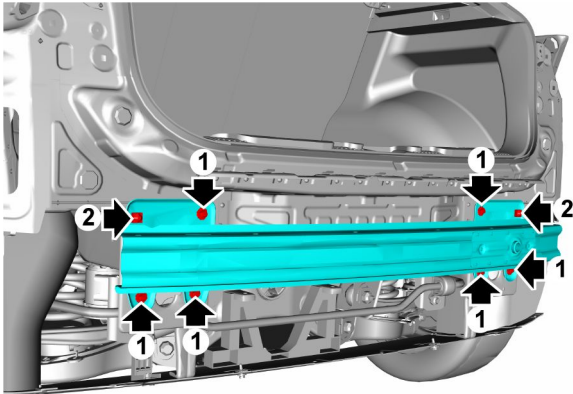
Front Bumper Refit

Rear Bumper Beam Remove

1. Remove the rear bumper assembly.

Rear Bumper Assembly Remove

2. Remove 6 bolts (1) and 2 nuts (2) fixing the rear bumper beam to the rear body.

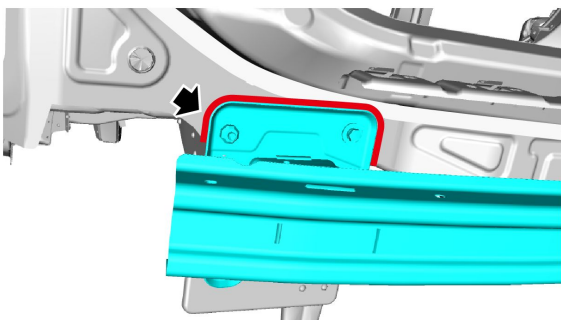


S6214557

3. With assistance, remove the rear bumper beam.

Refit

1. Locate the rear bumper beam to the body, fit 6 bolts and 2 nuts, tighten them to **19-25Nm**, and check the torque.
2. After installation, please seal the matching surface along the rear bumper beam with PVC glue on both side. The gluing width is 5-9mm and needs to be brushed (red area in the figure on rear bumper beam's left side, same with the right side), otherwise there will be a risk of water leakage.



S6214655

3. Fit the rear bumper assembly.

Rear Bumper Assembly Refit

Horn**Specification****Torque**

[A60110] 文档

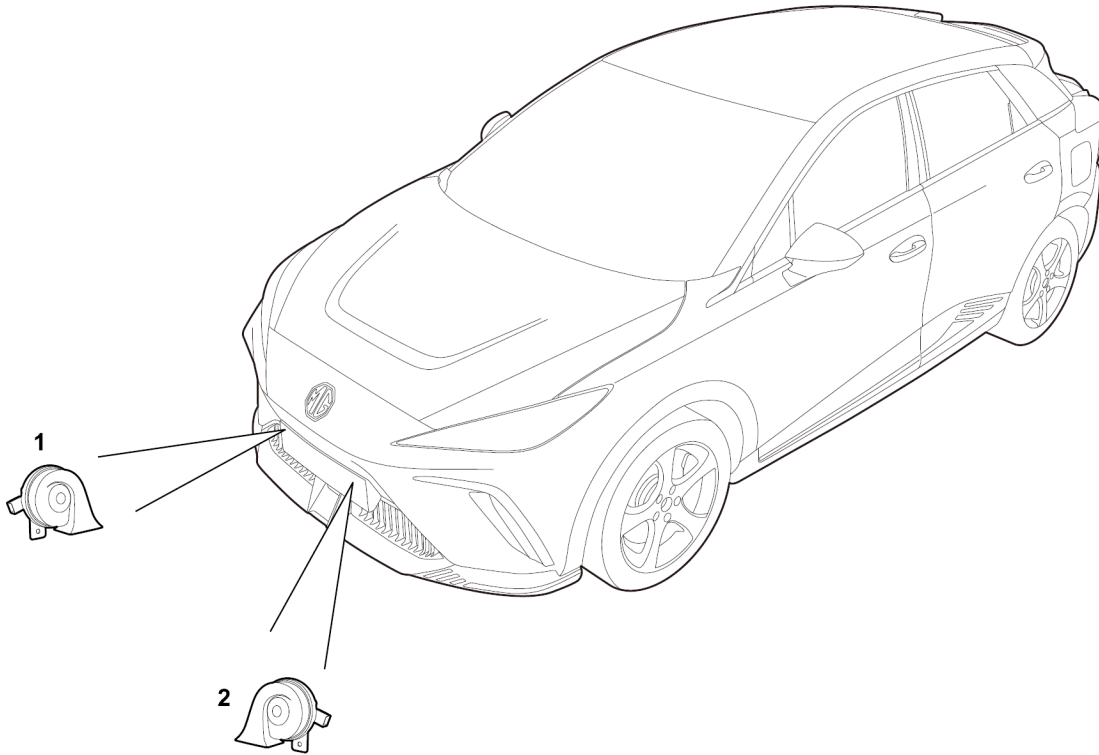
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错误: 无法打开文档

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Description and Operation
System Layout

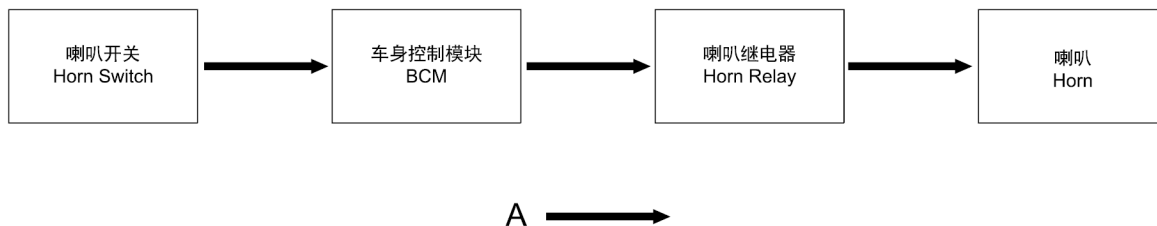


S8611250

1. Low Horn

2. High Horn

System Control Diagram

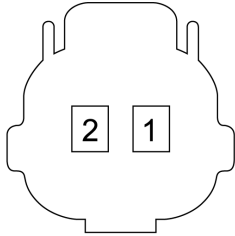


S8311001

A = Hard Wire

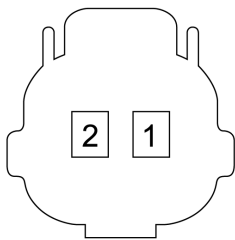
Detailed Information List of Component Pins

End View and Pin Information of Tweeter Harness Connector
FC033



Pin No.	Description
1	Power Supply
2	Ground

End View and Pin Information of Woofer Harness Connector
FC034



Pin No.	Description
1	Power Supply
2	Ground

Service Guide

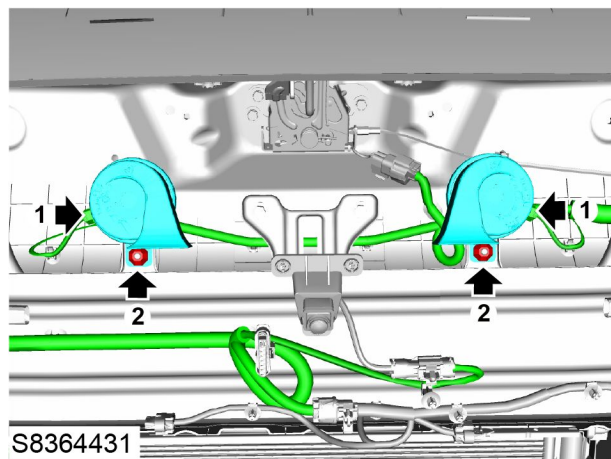
Horn

Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

 Front Bumper

3. Disconnect the harness connector (1) of the tweeter/woofer.
4. Remove 1 nut (2) fixing the tweeter/woofer to the front bumper beam, and remove the tweeter/woofer.



Refit

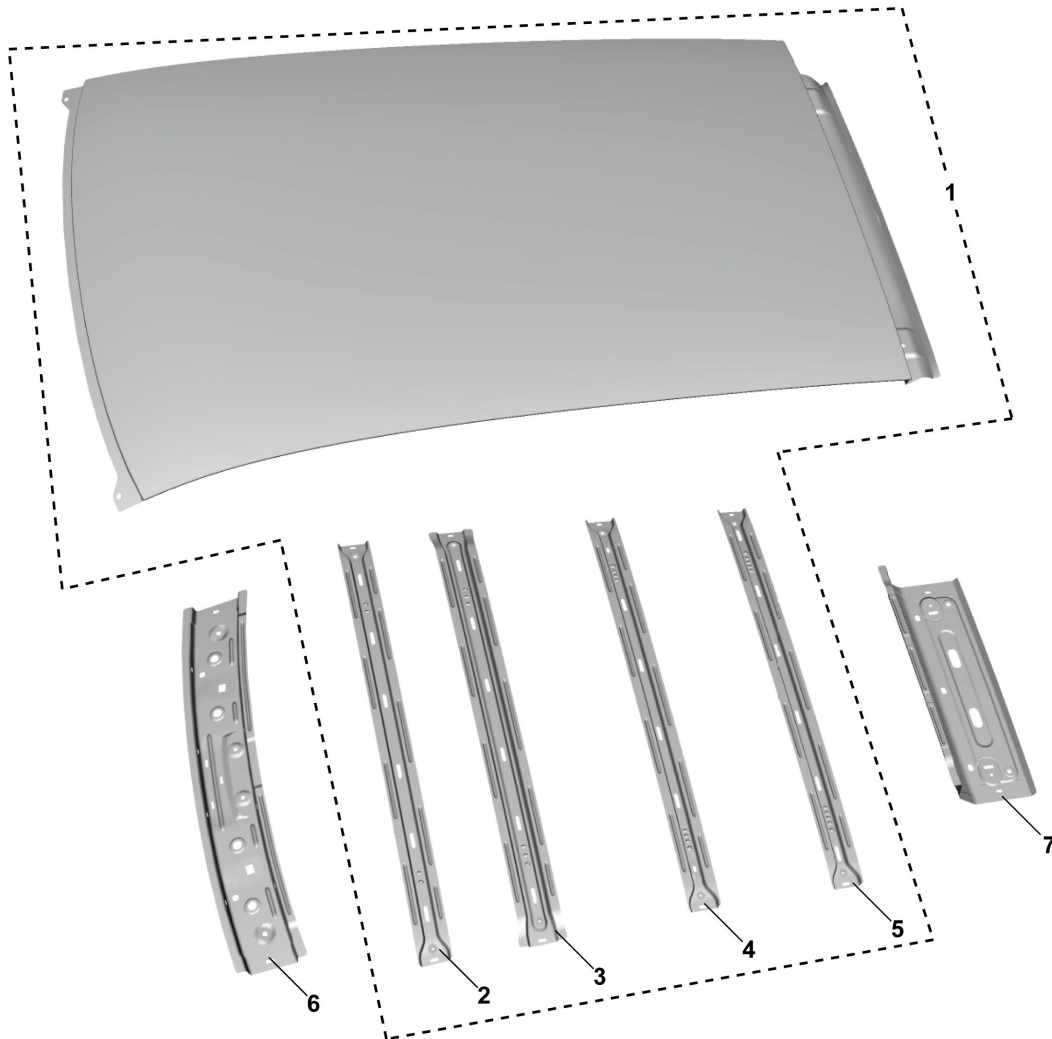
1. Fix the tweeter/woofer to the front bumper beam, fit 1 nut each, tighten them to **7-10N**, and check the torque.
2. Connect the harness connector of the tweeter/woofer.
3. Fit the front bumper.

 Front Bumper

4. Connect the negative battery cable.

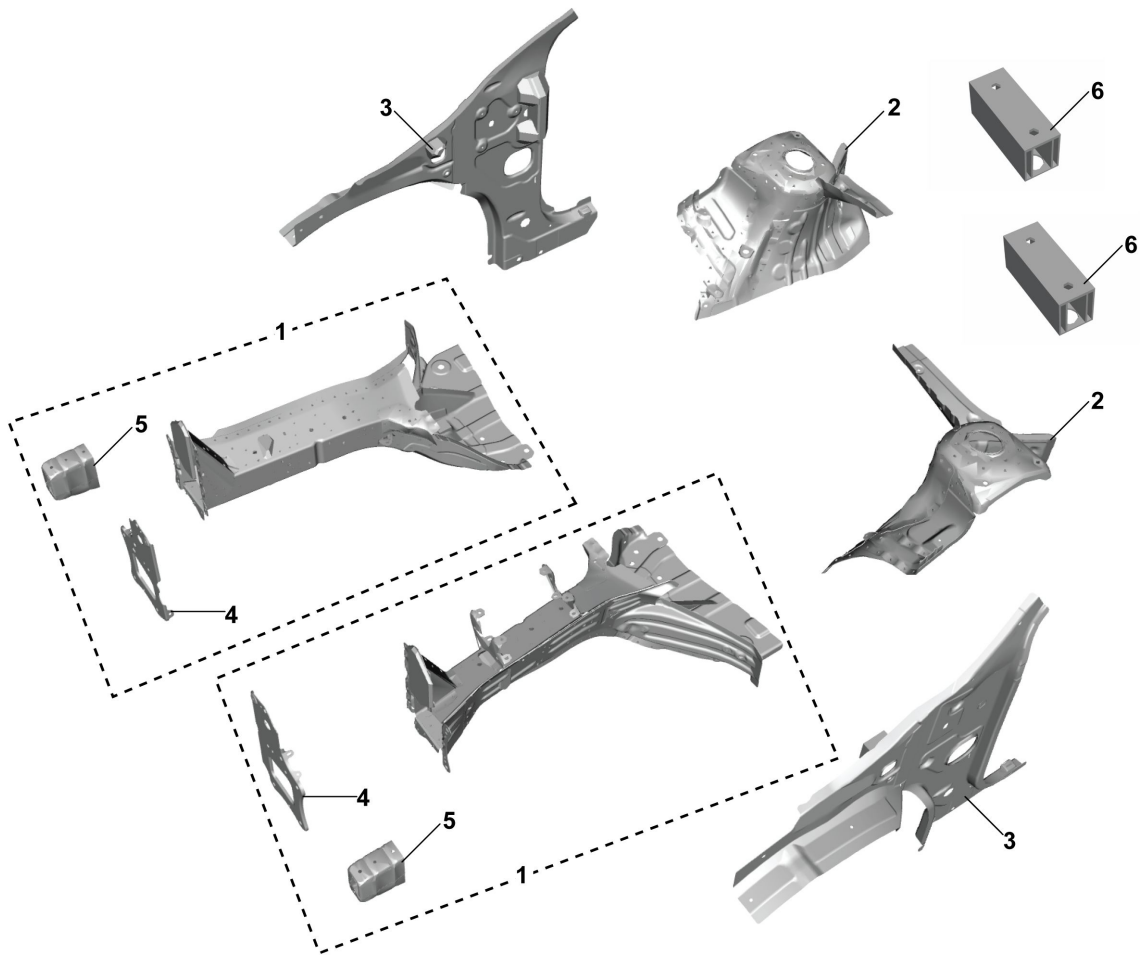
Serviceable Panels Information

Roof Panel



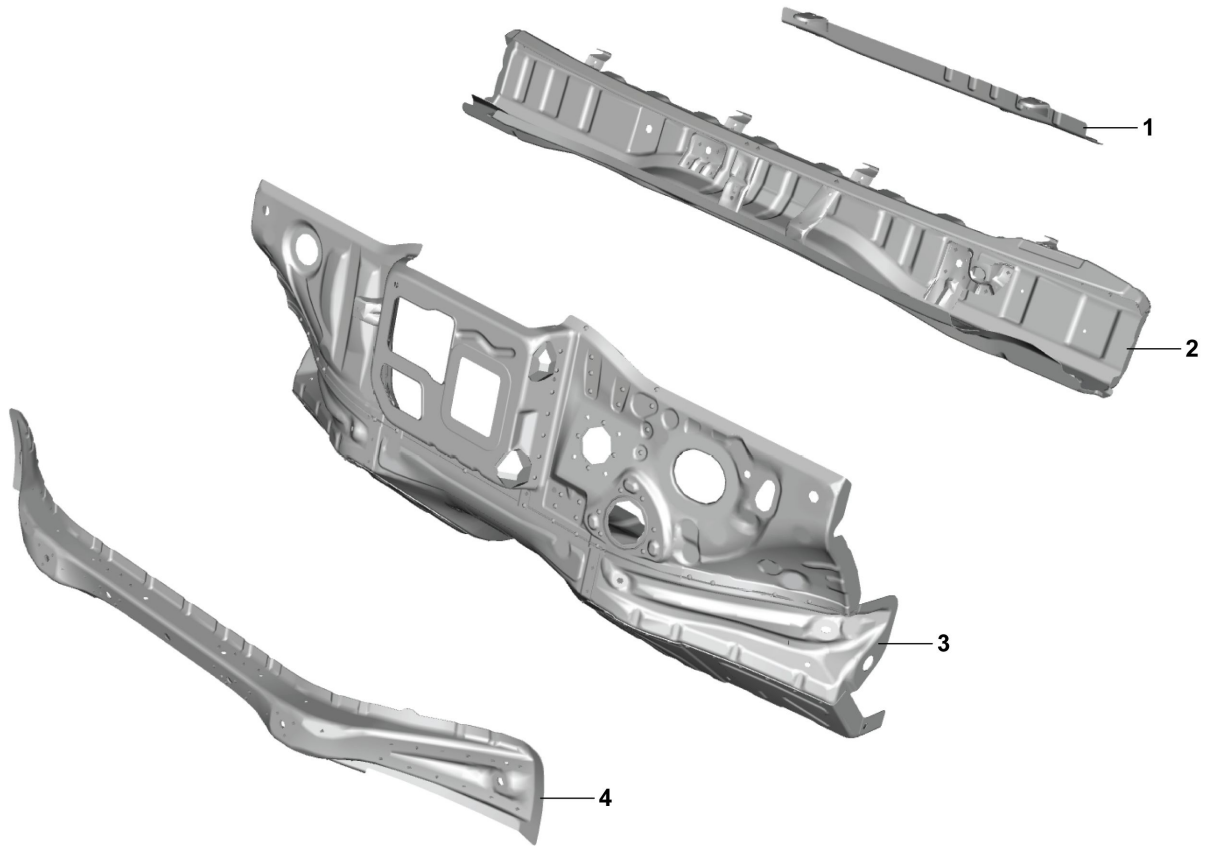
- 1. Roof Panel Assembly
- 2. Middle Roof No.1 Beam
- 3. Middle Roof No.2 Beam
- 4. Middle Roof No.3 Beam
- 5. Middle Roof No.4 Beam
- 6. Front Roof Beam Assembly
- 7. Rear Roof Beam Assembly

Engine Compartment Panel



- 1. Front Longitudinal Beam Assembly
- 2. Front Wheelhouse Assembly
- 3. A Pillar Inner Panel Assembly
- 4. Front Longitudinal Beam Front Bumper Bracket
- 5. Front Longitudinal Beam Energy Absorbing Box Subassembly
- 6. Power Battery Mounting Bracket Assembly

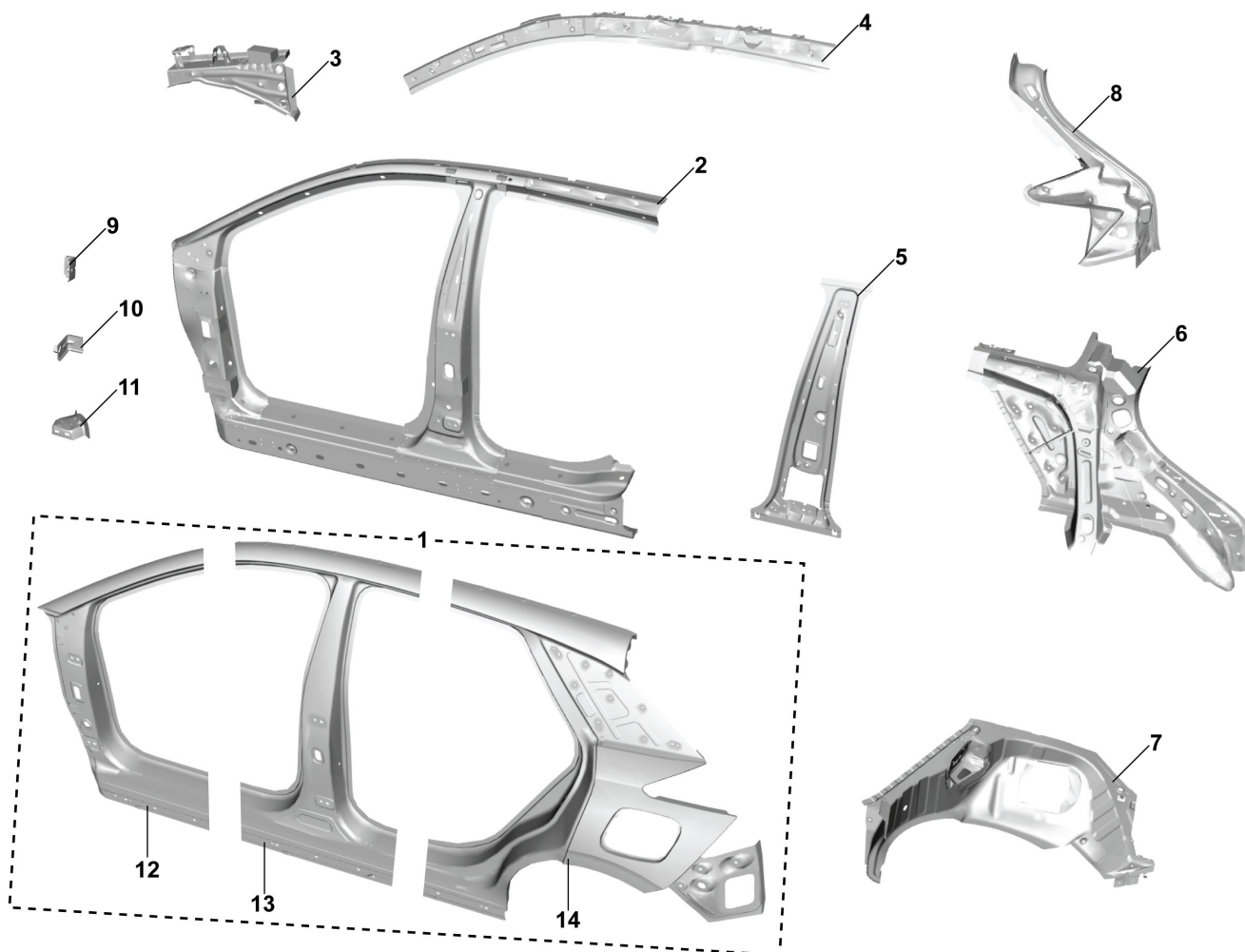
Dash Panel



- 1. Dash Panel Upper Beam Reinforcement
- 2. Vent Panel Assembly

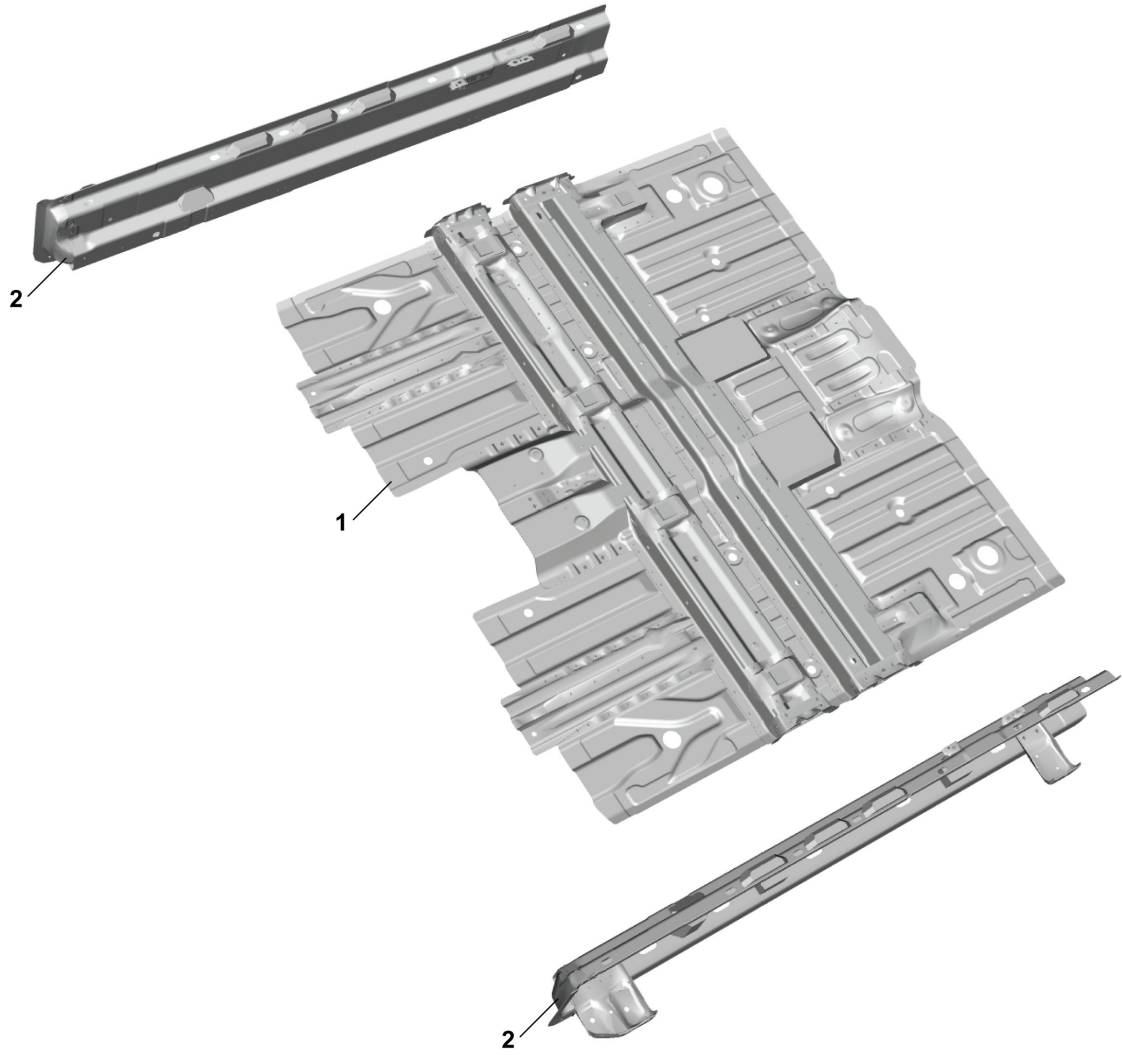
- 3. Dash Panel Assembly
- 4. Dash Panel Lower Beam Assembly

Bodyside Panel



- | | |
|--|---|
| 1. Bodyside Outer Panel | 8. Tail Lamp Mounting Panel Assembly |
| 2. Bodyside Outer Panel Reinforcement Panel Assembly | 9. Upper Front Fender Bracket Assembly |
| 3. Dash Panel Upper Beam Assembly | 10. Middle Front Fender Bracket Assembly |
| 4. Upper Side Beam Closure Panel Assembly | 11. Lower Front Fender Bracket Assembly |
| 5. B Pillar Inner Closure Panel Assembly | 12. Bodyside Outer Panel Assembly - Front |
| 6. Rear Bodyside Inner Panel Assembly | 13. Bodyside Outer Panel Assembly - Central |
| 7. Rear Wheelhouse Outer Panel Assembly | 14. Bodyside Outer Panel Assembly - Rear |

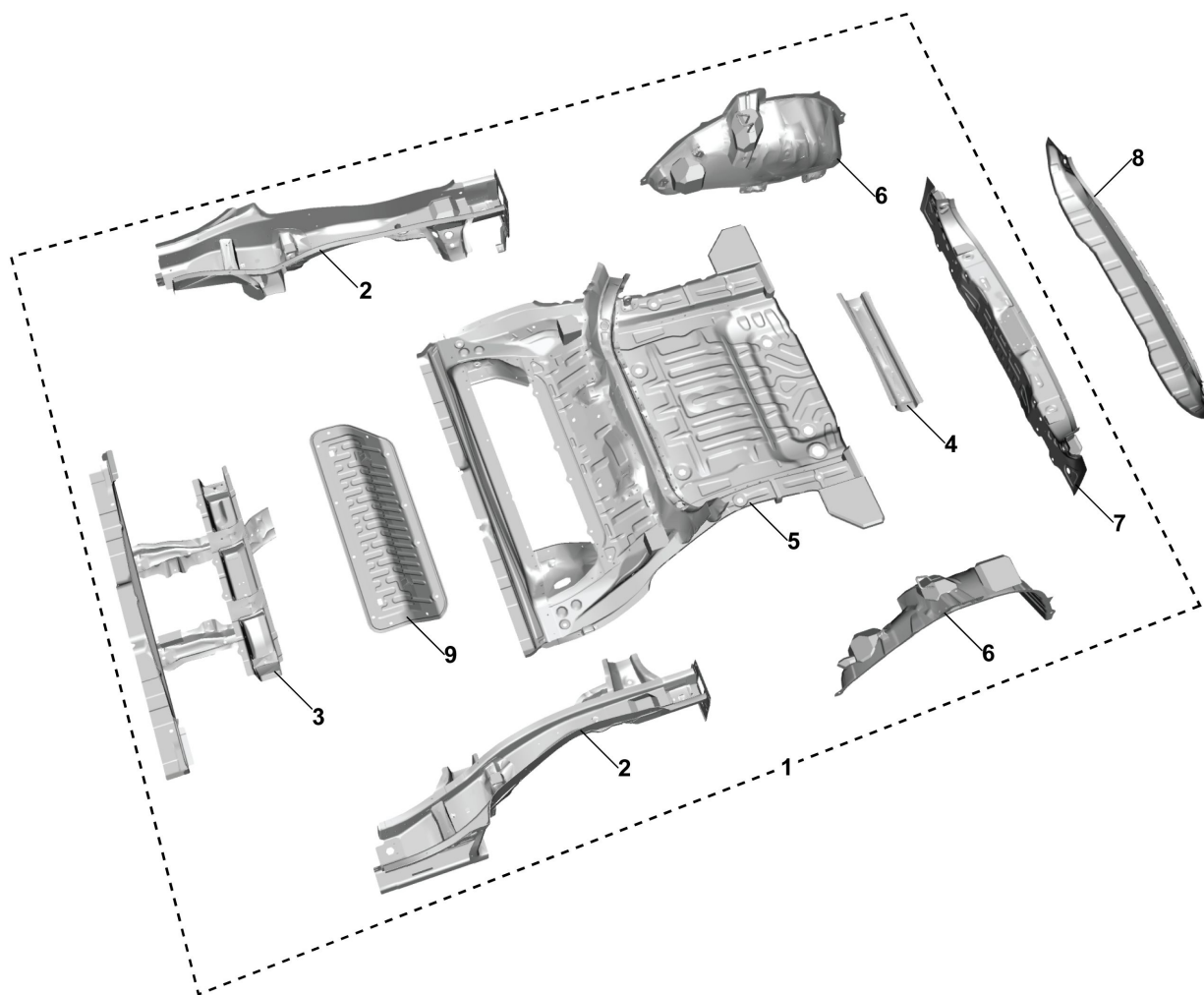
Front Floor



1. Front Floor Assembly

2. Door Sill Inner Panel Assembly

Rear Floor



- 1. Rear Floor Assembly
- 2. Rear Longitudinal Beam Assembly
- 3. Rear Longitudinal Beam Subassembly
- 4. Rear Floor Lower Beam Assembly
- 5. Rear Floor Subassembly
- 6. Rear Wheelhouse Inner Panel Assembly
- 7. Rear End Panel Reinforcement Assembly
- 8. Rear End Panel Assembly
- 9. Rear Seat Plate Assembly

Door Panel Assembly



1. Front Door Assembly

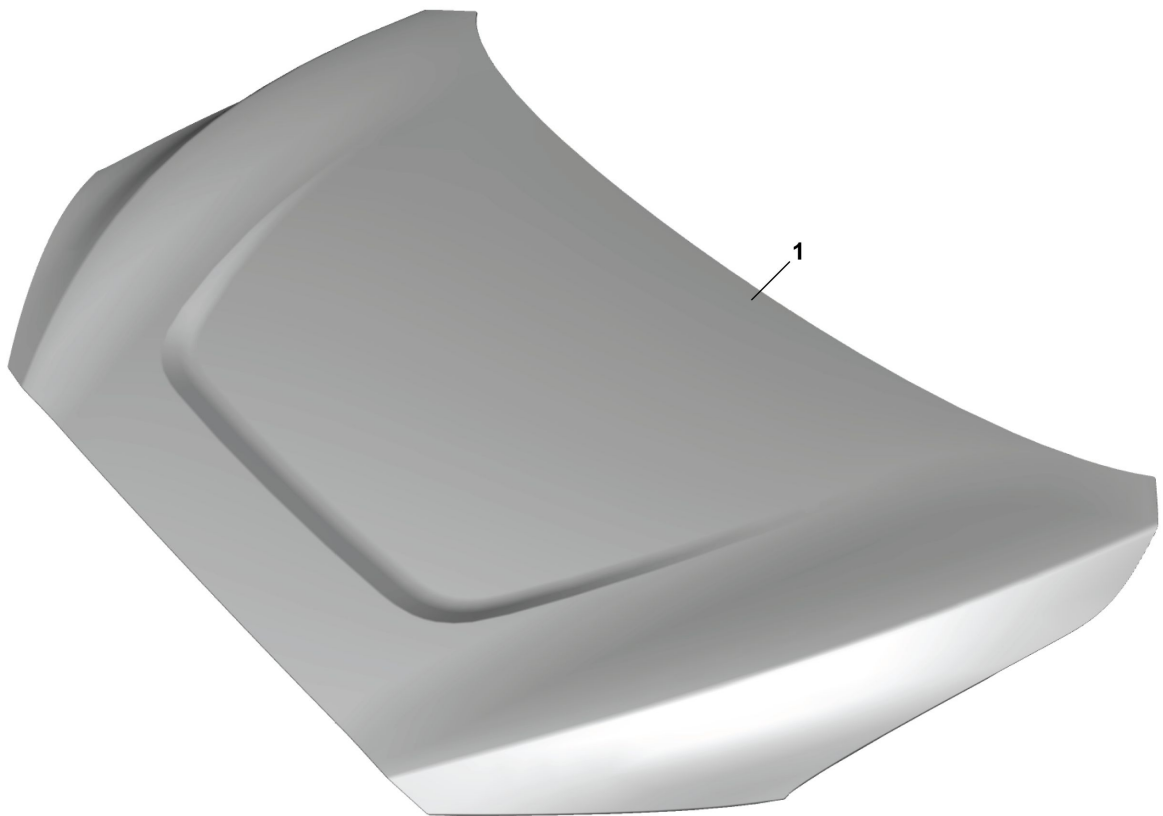
2. Rear Door Assembly

Tail Gate Panel Assembly



I. Tail Gate Assembly

Bonnet Panel Assembly



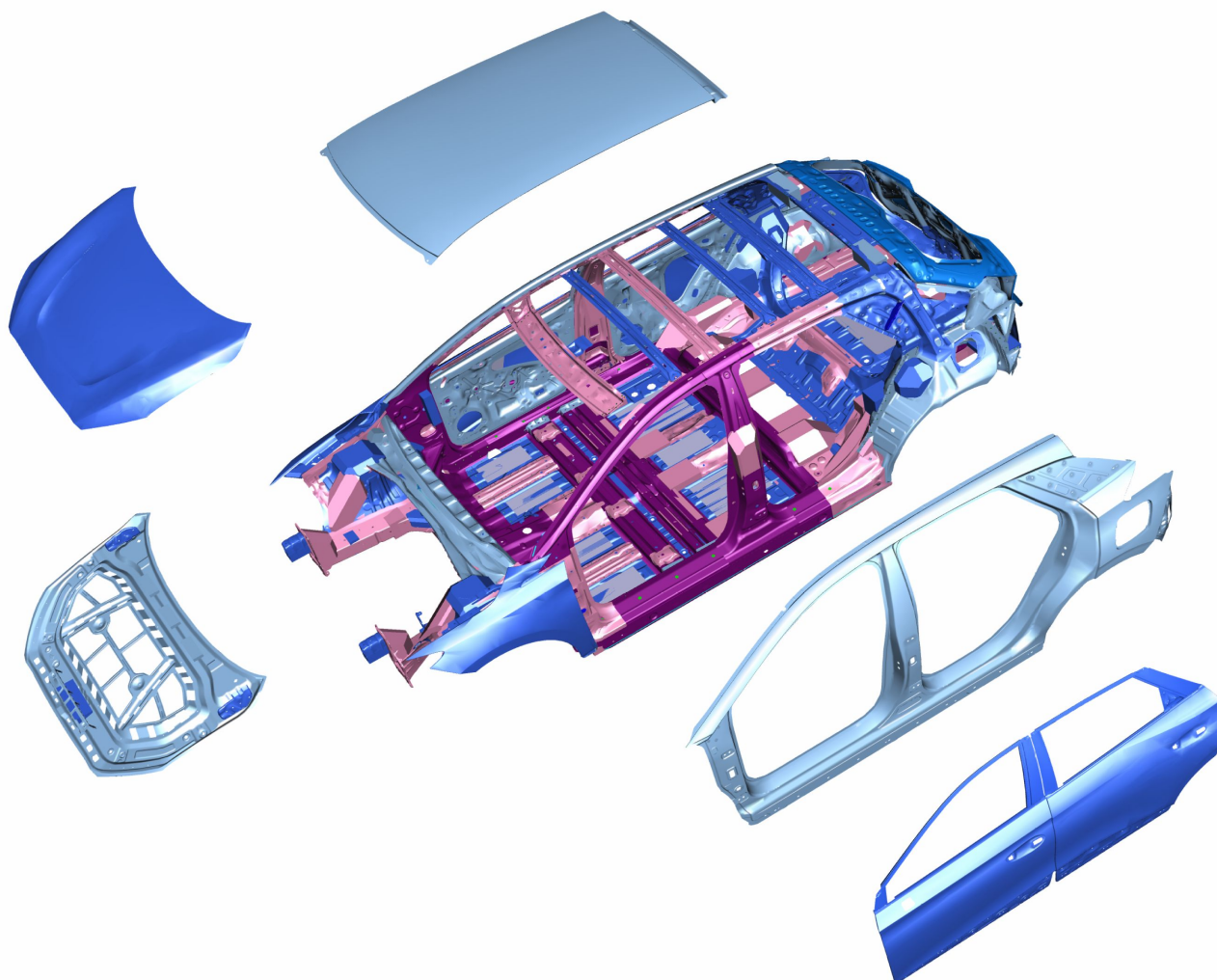
I. Bonnet Panel Assembly




Collision Repair

Body Material

For different strength requirements of different body parts, this model adopts various high strength steel plates and ultra high

strength steel plates (hot formed steel plate). The detailed positions of different materials are as follows:



	软钢 Mild steel	<340MPa
	高强度钢板 High strenght steel plate	340~590MPa
	先进高强度钢板 Advanced high strenght steel plate	340~590MPa
	超高强度钢板 Ultra high strenght steel plate	590~980MPa
	超高强度钢板 Ultra high strenght steel plate	>1300MPa

It is only allowed to make repairs as per relevant instructions in the manufacturer's Service Manual, and repair the extra-high strength steel plates and hot formed steel plates as per the modern inverter technology.

When repairing the galvanized steel plate, the following matters should be noted:

- The paint and zinc coating should be completely ground off before grinding. Be careful when grinding.

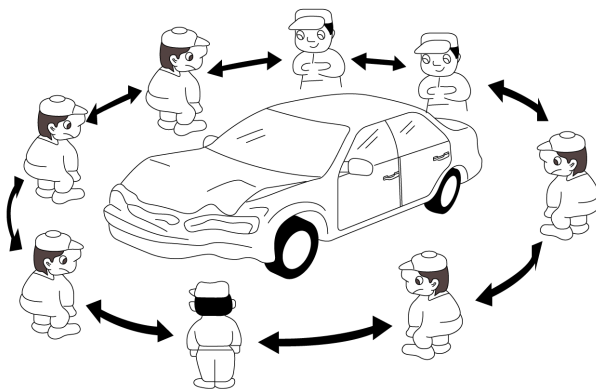
- Apply the spot welding paint between the weld contact surfaces before the spot welding (with a hairbrush or a spray).
- Particles on the surfaces will be absorbed by the electrode, so it is necessary to clean the electrode tip frequently.

Damage Diagnosis

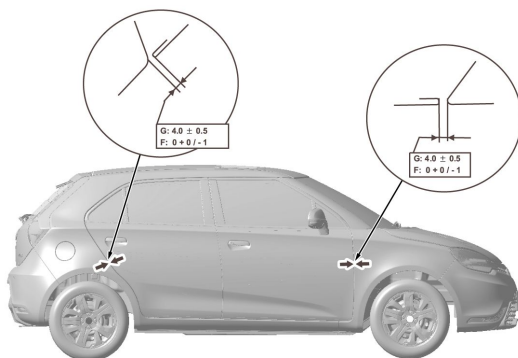
Damage Detection

During the damage detection, it is required to visually estimate the collided position, determine the collision direction and magnitude of collision force, and check the possible damage. For the vehicle damaged in an accident, it is required to ask about the speed at the moment when the accident takes place, and the position, direction and angle to the crash or rollover to grasp the impact form, position, angle, etc of the collided vehicle and intuitively determine the position damaged by the collision and the area that may be affected. A comprehensive inspection can also be conducted to the vehicle in combination with test drive and measuring equipment to confirm whether the underbody is deformed, whether the body suffers from overall damage and overall skew, whether the door can be opened smoothly, etc to determine the extent of damage and repair method.

1. Visual inspection to the vehicle



2. Visual inspection to the specific position

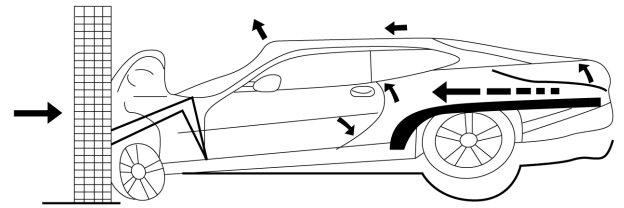


Identify all damaged positions

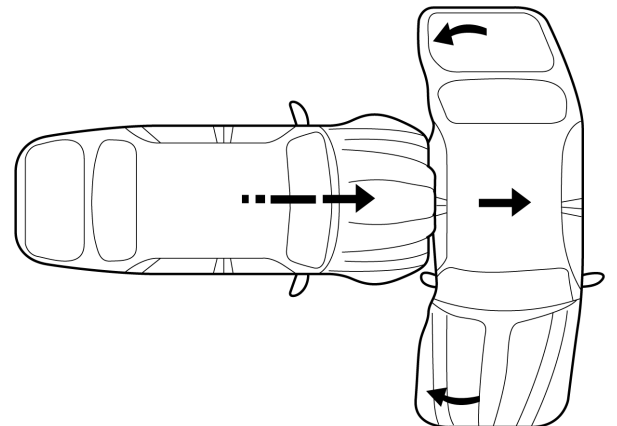
After a vehicle is collided, beyond the deformation damage from the collided position, its entire body, including frame, suspension, engine and other parts, may also be deformed. During the detection, it is required to check all damages of the related parts along the collided route system till there has been no trace of damage and those to the surrounding area.

Characteristics of body damage:

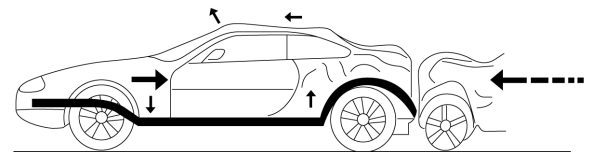
- Characteristics of front collision damage



- Characteristics of middle collision damage



- Characteristics of rear collision damage



Measurement of the damaged position

Accurate measurement is one of the procedures required to successfully perform a variety of collision repairs. For the integral body, the measurement is even more important for successful damage repair, because most of the steering and suspension systems are fitted on the vehicle body while some suspension systems are designed according to the assembly requirements. To guarantee the correct steering and driving operation performance of the vehicle, the fit tolerance of the key processing dimensions should be controlled within the allowed range.

The measurement work should be carried out in conjunction with the disassembly work, or it will be unable to accurately identify all the damages. To facilitate the body maintenance and thorough damage inspection while avoid unnecessary damage caused by the maintenance to the disassembled parts, it is required to disassemble the related parts. The disassembly should follow the principle to minimize damage and destruction of the parts.

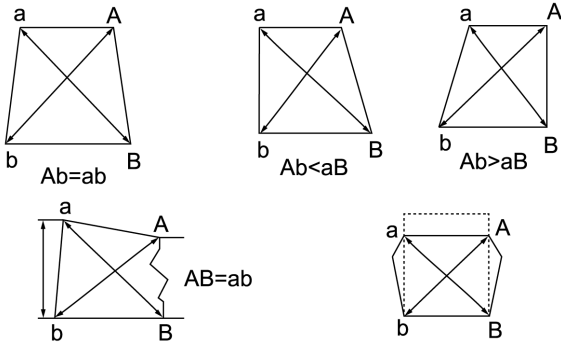
Selection of measuring point:

- Screw hole and process hole for parts installation;
- Lap point of body steel plates;

- Machining gap or raised impression on steel plate.

Measuring methods:

- Distance measuring method: it is the simplest and most practical measuring method employing a steel tape to measure the distance from each component to the datum point.



- Centring gauge method: measure with the centring gauge.
- Three-dimensional coordinate measuring method: measure the three-dimensional coordinate data of the selected measuring point, and compare them with the original vehicle data to determine the body damage.
- Electronic measuring: more accurate and more effective.

Main reasons accounting for the measuring error of body size:

The error caused by accuracy of the measuring tool or equipment itself;

The error caused by human factors:

- Failure to accurately locate position of the measuring point;
- Failure to select a correct measuring method;
- Failure to use the measuring tool and equipment in a correct manner.

Precautions for measurement:

- Adjust the body to the horizontal position before the measurement;
- Mark measuring points on the body to prevent messing up the points during the measurement;
- Conduct the measurement in an accurate manner;
- Repeat the measurement for several times;
- Verify all measuring results repeatedly.

Confirmation of Maintenance Scheme**Underbody Correction**

When the car is severely damaged, involving deformation of the underbody, there is no need to replace the body and it is required to conduct underbody correction in the first place. Completion of the underbody correction can guarantee three-dimensional position of the underbody and overall position of the body, determine placement position of the engine assembly and front suspension, and restore positioning angle of the wheel and positioning of other assemblies. The body panel repair should be carried out after completion of the underbody correction.

Correction of Body and Its Covering Part

When the body and its covering part only suffer from repairable depressed deformation and minor damage in a collision, there will be no need for part replacement while it is required to adopt a correction method to restore their original shapes.

Panel Replacement

For a certain position of the body or a part suffering from multiple breakages, when the damage/corrosion has reached a certain degree, making the repair meaningless or the required technical standards and functional requirements unable to be reached after repair, the damaged panel should be replaced.

Body Replacement

When the vehicle is seriously damaged, the entire body is almost smashed up, the underbody is severely deformed, and both sides, roof, bonnet and trunk lid are almost destroyed, therefore replacement of entire body can be made according to the needs of users if it is determined that the entire body is irreparable. Remove all serviceable assemblies and parts from the damaged vehicle, and conduct thorough check and repair for the principal assemblies of engine, etc. Replace the body assembly with a new one and all the parts requiring replacement, then conduct re-assembly in accordance with the vehicle assembly process.

Partial Body Replacement

When the vehicle is partially damaged in a collision, for example, when the front/rear fender, door, bonnet, or trunk lid is damaged, partial replacement can be made for the body to achieve the purposes of trouble saving, time saving, and cost reduction.

Body Pillar Replacement

When the body pillar, windscreen pillar, or front/rear wall pillar is beyond repair after being seriously damaged, it can only be replaced. Only after the deformation of a large area is restored can a regular pillar of the same shape can be fitted as a substitute.

Body Correction

Body correction is to eliminate the deformation (plastic deformation) and residual stress caused by vehicle collision so as to restore the correct location and size of the panel.

Introduction to Correction Equipment

The correction equipment should have the following characteristics:

- High-strength body positioning and fixing devices.
- Maintenance pullers of multiple shapes and different functions can meet the demands for repairing different parts.
- The capacity to carry out multi-point, all-round correction and drawing.
- The capacity to conduct accurate measurement, precisely detect deviation of each datum point, and fix error.

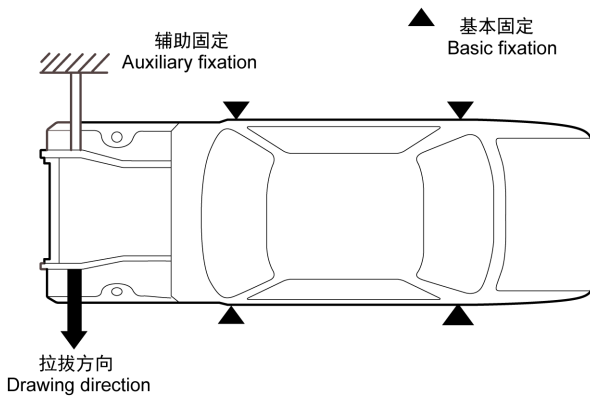
Operating Procedures of Correction Equipment

No matter which kind of equipment is employed, its operation will be roughly divided into the following four steps:

1. Get on the vehicle.
2. Positioning and clamping.
3. Drawing.
4. Measuring.

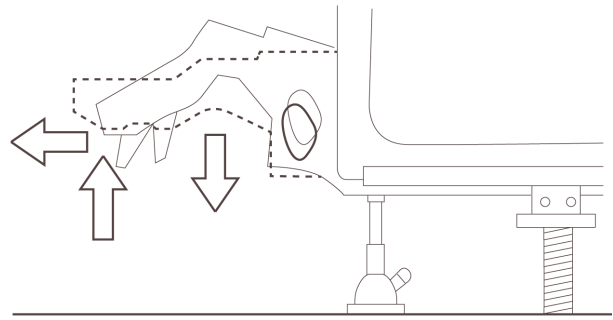
Auxiliary fixation:

- Prevent movement of the body;
- Evenly spread the force generated by drawing;



Auxiliary support:

- Prevent drawing-caused secondary damage to the body;
- Concentrate the drawing force on the damaged position to improve efficiency of the drawing;
- Prevent torque from being produced during the drawing;



Stretching-based Correction Method

Drawing Sequence

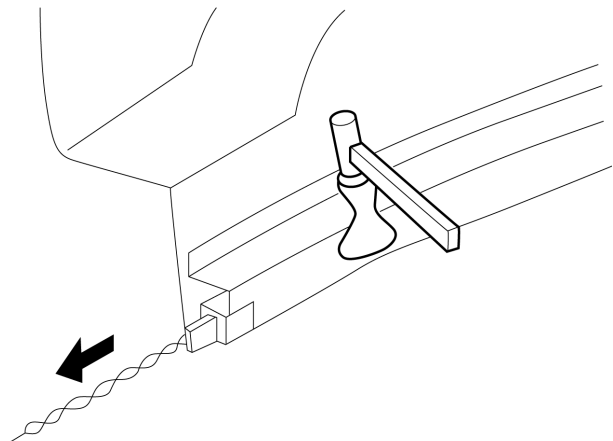
During the stretching, attention should be paid to methods and procedures: for stretching, the stretching amplitude of each time should be modest, then release the chain for force unloading and measuring. The operation should be completed according to the sequence "from the inside out".

1. Firstly, it is the length. Stretch the longitudinal direction of the vehicle along the centre line of the vehicle.
2. Then, it is the width correction. Correct the lateral direction of the vehicle.
3. Finally, it is the height correction.

Stress Relief

During the drawing, attention should be paid to stress relief:

- Beat the raised position and its back at the side of the deformed area;
- Beat the welded position of the deformed area;
- Beat the ridge line of the deformed area;
- Beat the reinforcement plate of the deformed area;



When being heated, the high-strength integral body will become very sensitive; therefore, generally, do not try to complete the stretching for correction in one step. Generally, the process of stretching – balance keeping – a second stretching – a second balance keeping should be followed and repeated. When a vehicle body gets folded tightly after being collided, if the metal undergoes the risk of being damaged, it need be heated. For heating, it should be noted that only the ridge line or the two-layered plate that gets connected too tight can be heated. Heating can only be used as a method to

relieve metal stress, rather than a method to soften a certain position.

Note: do not use the oxyacetylene heating method to repair the body.

Impose tensile force on the pre-determined position to slowly and carefully restore the damaged steel plate to its original size and shape; when stress of the bending steel plate is completely eliminated, accurate body repair can be achieved.

Note: avoid over-stretching during body correction. The only solution to over-stretching is to replace the damaged panel.

Panel Shaping**Panel Shaping Methods****Ring-pulling Method for Panel Repair (meson machine)**

As a panel repair method introduced in recent years, the so-called ring-pulling traction repair method involves a certain number of flat-washer-based rings welded based on size of the damaged panel; the ring acts as the traction medium; penetrate the wire rope into the medium, then use manpower or machine to pull the wire rope to make the damaged panel drawn outwards via the medium to its original position and shape; the ring-pulling traction repair method is more flexible, especially for the deformation of a large area, double-layered panel, position not easy to be approached, corner transition, door pillar, etc.

Heating Shrinkage Method

The local heating shrinkage method is a common method for panel repair. The deformation of panel is mainly the tensile deformation of the related position; with the heating shrinkage method employed, the tensile stress can be eliminated to make the panel restore its original shape.

Repair Method by Hammer and Jacking Block

The repair method by hammer and jacking block is a traditional method for panel repair. Holding hammer in one hand and jacking block or other tools in the other hand, the sheet-metal worker will beat the panel for shaping repair. Manual operation for panel requires skill and experience of the sheet-metal worker while superb panel repair skill cannot be acquired overnight; the panel repair mainly involves shaping for deformed surface and contour correction.

Technical Requirements for Panel Shaping

No matter which kind of repair method is employed to repair the body surface, the specified technical requirements should be met to restore the original performance and surface appearance quality of the vehicle.

Restoration of Appearance

In the repair, both the smooth structure of a large area and the wedge-shaped structure at the local transitional position should be restored to their original shapes. The original shape can be appropriately tuned when it cannot be 100% restored; however, the appearance should be symmetrically beautiful and durable.

Integrity and Refinement of Continuous Surface

Most of the car body is mass-produced by die stamping, the surface of which thus is featured by integrity and refinement. In the repair, for streamlined surface, continuous transition should be made; for surface turning point, smooth transition should be made; after being repaired, the outer surface should be as bright as new with no ripple, wrinkle, dent,

beat-caused mark, scratch or obvious flaw visible to the naked eye or perceivable by hand touch. Integrity, stream linearity, continuity and refinement of the continuous surface should be guaranteed especially for large-area repair.

Sufficient Strength and Stiffness

The original design gives sufficient strength and stiffness to the body; therefore, after being repaired, the body should not lose its strength and stiffness. Vibration noise of the body after being repaired should be controlled within the allowable range; no abnormal sound caused by vibration is accepted. It is required to ensure that the body will not suffer from fatigue damage in a certain driving range; the entire body should have a certain degree of stiffness to ensure that the body panel in use will have the capacity to maintain its original shape.

Panel Replacement

Panel replacement mainly involves the following process:

1. Preparations before cutting the damaged and new panels.
2. Removal of the damaged panels.
3. Alignment and cutting of the new panel.
4. Pre-weld treatment and corrosion protection.
5. Final alignment and welding of the panels.
6. Post-weld Treatment
7. Accessories refit and inspection after completion.

Principles for Panel Replacement

Thin Panel Replacement

Replacement of thin panels should follow the principle of being beautiful and observe the following requirements:

1. Select the shortest position to cut the position more than 15mm away from any foam part, to avoid welding-caused foam damage;
2. For replacement of the A pillar and rear fender, it is suggested to remove the windshield;
3. It is not allowed to cut any position with built-in reinforcement.

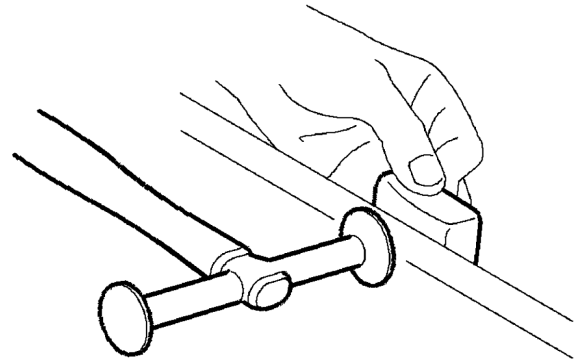
Thick Panel Replacement

Replacement of thick panels should follow the principle of being strong and observe the following requirements:

1. It is not allowed to cut the position where the energy absorption area is located.
2. It is not allowed to cut the position within 50mm before/after the laser welding position;
3. Select the shortest position to cut the position more than 15mm away from any foam part, to avoid welding-caused foam damage;
4. It is not allowed to cut any position with built-in reinforcement.
5. The size of the cutting seam should be equal to thickness of the panel, and the purpose is to guarantee weld penetration.

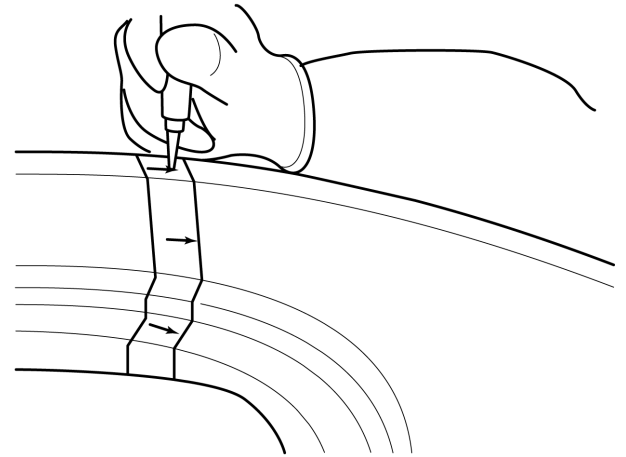
Preparations before Cutting Damaged and New Panels

1. Use a hot-air gun to remove all the residual sealants to reduce the heat-generated toxic fumes during welding.
2. Straighten the existing panel's seam edge with form block and hammer.



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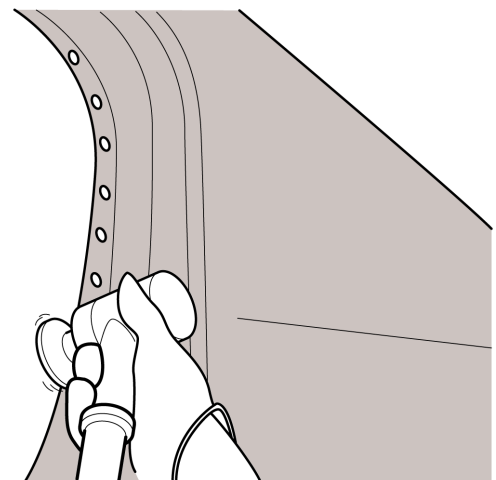
3. Mark the actual cutting position (with 15mm reserved for pasting paper self-adhesive tape) on the body's damaged part and all the positions with welding spot to be removed. (Link to OEM welding information)



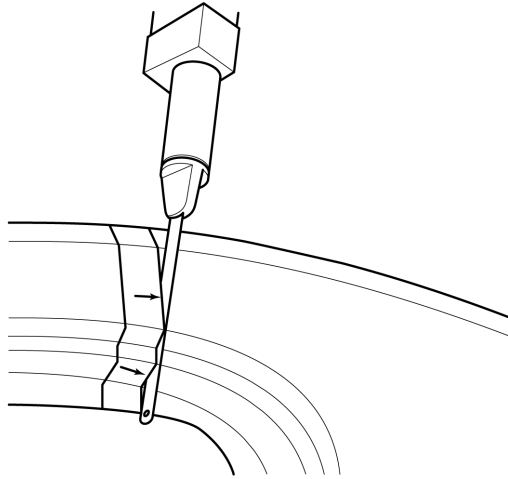
4. Mark the actual cutting position on the body's new part and paste the paper self-adhesive tape.

Damaged Panel Remove

1. Apply positioning punch to the welding spot.
2. Abrade the welding spot.



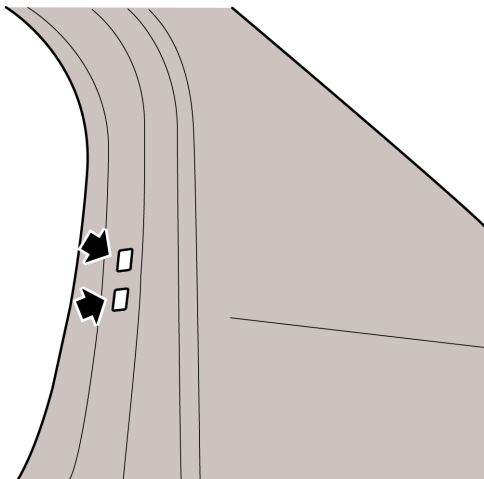
3. Conduct rough cutting and shave the welding spot.



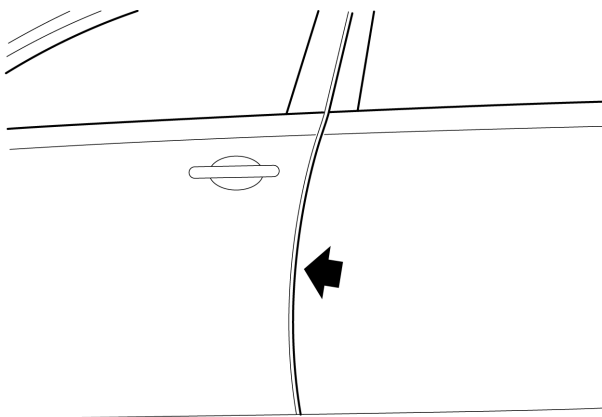
4. Remove the damaged panel.

Alignment and Cutting of New Panels

1. Locate the new panel to the body and adjust the position size.
 - Compare the space;



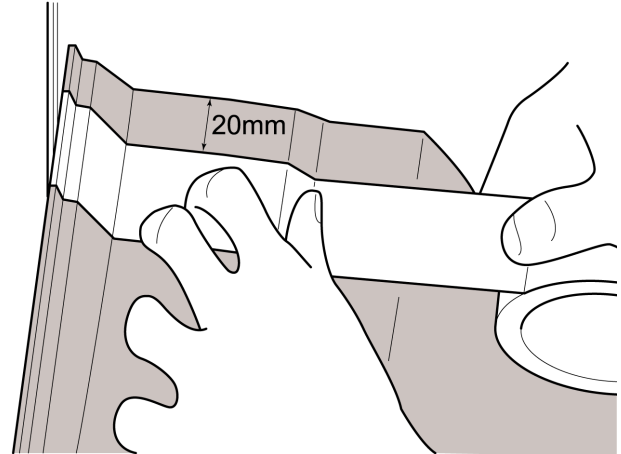
- Adjust the clearance;



- Adjust the difference between high and low surfaces;
2. Cut the overlap of the damaged and new panels; during the cutting, do not cut any reinforcement built in the body; cut off the extra damaged panel by segmentation after the new panel is taken off.
 3. Mark the hole punching position for plug welding.

Pre-weld Treatment and Corrosion Protection

1. New body panels: abrade all positions welded and glued to remove the paint layer.
2. Abrade all positions welded and glued to remove the old coating, burr, and rusty spot (paint removal at the position 20mm away from the welding port) while do not polish the abutting port's cross section.

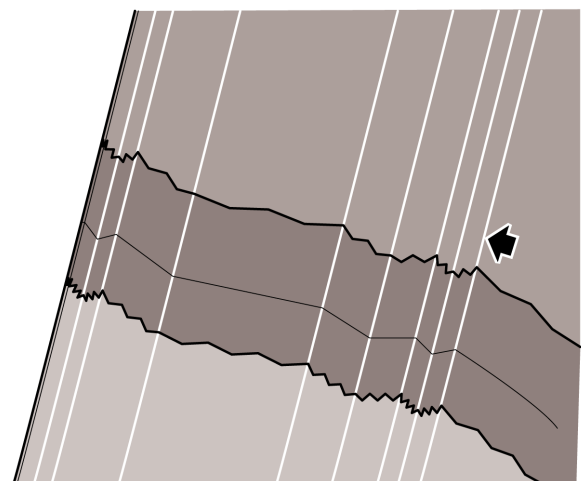


3. Clean the new panel and all positions to be welded and glued on the body; and leave them alone for 5-10 minutes for volatilization of the cleaning agent.
4. Apply zinc spray to the new panel and all welding junction surfaces with no need to be glued, and control thickness of the zinc spray.
5. Applying of structural adhesive: before the structural adhesive is applied, it is required to tap out and discard 10cm of glue to ensure that the panel will be glued evenly. The welding should be completed within the operating time as prescribed by the structural adhesive, or the gluing effect of the panel will be affected.

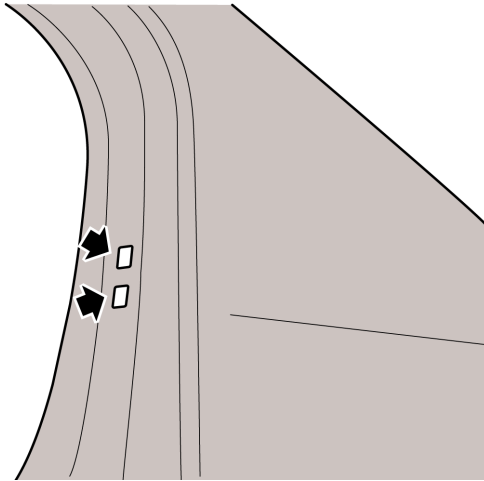
Final Alignment and Welding of Panels

Panel Refit and Adjustment

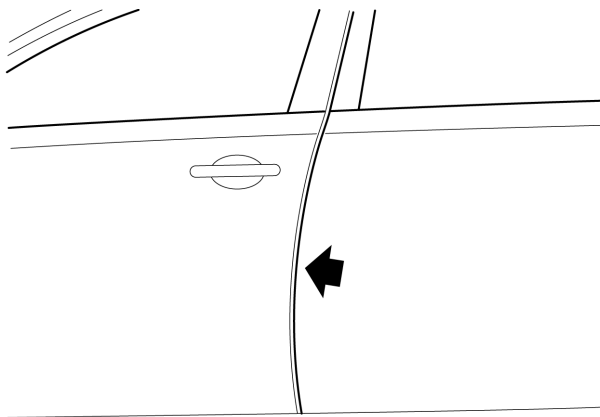
1. Determine the ridge line position;



2. Compare the space;



3. Adjust the peripheral clearance;



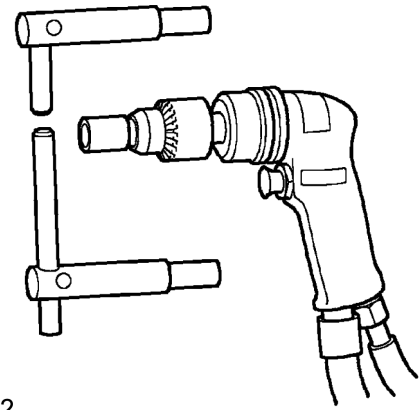
4. Adjust the difference between high and low surfaces.

Positioning for Gas Shielded Welding

1. The selected gas ratio is 80% argon and 20% CO2.
2. To guarantee the accuracy of positioning, it is not advisable to conduct positioning welding on the ridge line position; position of the positioning welding should fall on both sides of the corner angle; meanwhile, it is required to control spacing of the positioning welding above 30mm.

Trial Welding before Spot Welding

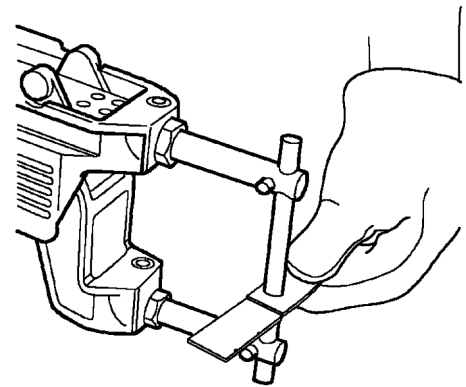
1. Select the welding arm for resistance spot welding and use the welding nozzle finisher to shape the electrode tip. Trim the welding nozzle to make its diameter equivalent to 2 times the thickness of the metal to be welded and an additional 3.0mm.



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Caution : Use welding arms not exceeding 300 mm in length.

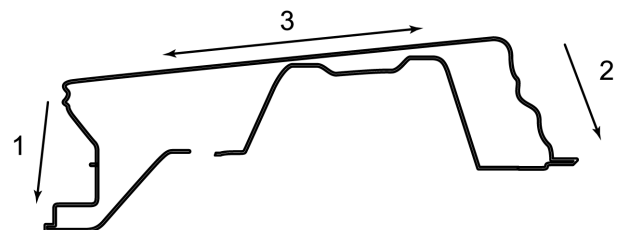
2. Use test silicon wafer and fit resistance spot welding arms and test equipment to satisfy the operational requirements. If there is no monitoring device, the welding strength can be tested by checking welding pool pull wires around the metal under tensile force during the stretching.



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Welding Sequence

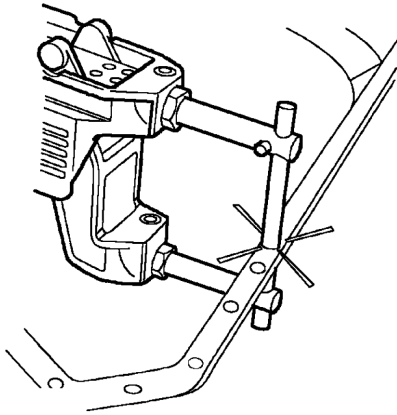
- Welding sequence: to reduce the decline of weld strength caused by welding shunt, it is suggested to start welding from double-sided spot welding according to the sequence as shown in the figure below; spacing of the welding spots is 25mm.



Welding Requirements

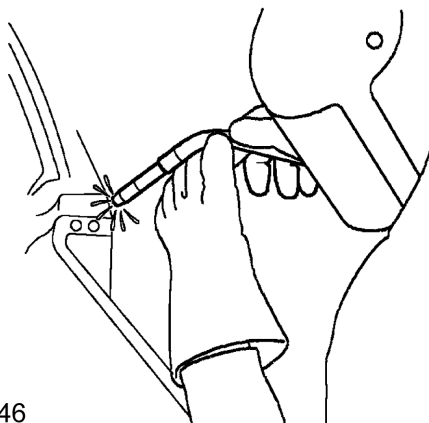
- Provided that the resistance spot welding has been used during the production, it is required to conduct another resistance spot welding in other possible position. To conduct spot welding, it is suggested to fabricate the test silicon wafer of the same metal gauge and material to perform the peeling test, thus ensuring the welding quality

will be qualified. If conditions permit, the welding quality monitoring machine can be employed to guarantee the welding quality. When the desired spot welding cannot be achieved, it is required to resort to plug welding.



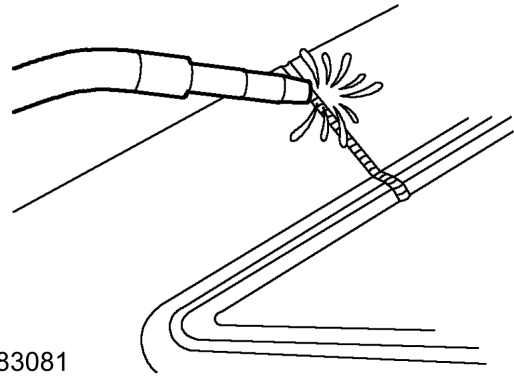
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- Length of the welding electrode hold for hand-held spot welding gun should not exceed 300mm.
- It is prohibited to conduct single-sided spot welding;
- Unless otherwise specified in the production, It is prohibited to conduct braze welding and gas welding.
- Gas shielded welding - plug welding: to weld the area of the third and above layer, or when the nozzle approaches the restricted area, if the resistance spot welding cannot be applied, metal active-gas plug welding can be employed instead through the hole left by the cutting machine for spot welding or the hole punched/drilled dedicatedly. Diameter of the welding hole for plug welding of the structural part is 8mm and that of the covering part is 5mm; the number of the welding spots for plug welding is equal to that of the original manufacturer.



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- Gas shielded welding - butt welding.

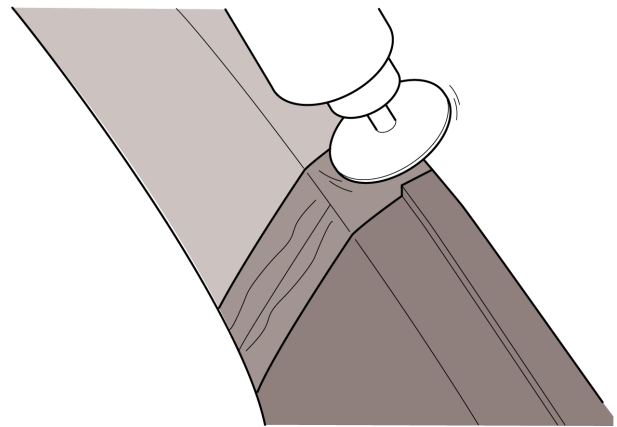


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Post-weld Treatment

Anti-corrosion Treatment Process

1. Use P36 sand disc grinder or belt grinder to grind and trim all welds and clean all welding positions.



2. Apply anti-rust primer, which can not only prevent rust, but also make the sealant better attached.
3. Apply sealant to fill the gap between the panels, thus reaching the purposes of gap filling and prevention against water leakage. (Link to information of sealant positions)
4. Hand over the vehicle to the painter for paint spraying.
5. Before the accessories are fitted, apply anti-corrosion wax to the cavity. (Link to application information of cavity protective wax)

Paint

Overview

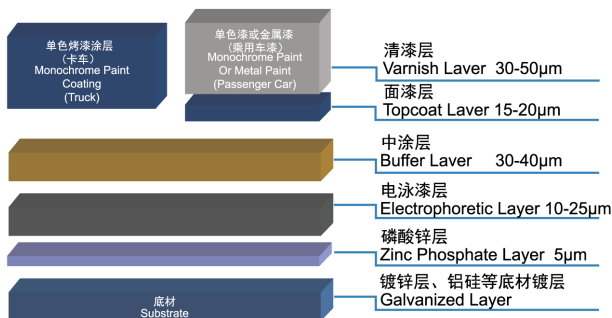
The purpose of automotive painting is to provide an excellent appearance, decoration, gloss protection, color protection, corrosion resistance and a longer service life for vehicle, so it has distinctive features:

- Automotive painting is a high-level protective painting, and the coating must have a superb corrosion resistance, weather resistance, acid/alkali resistance, inclusion resistance and an extensive adaptability, etc.
- Automotive painting (mainly refers to vehicle body painting) is also a high-level decorative painting, and careful design, good working environment and conditions are required for providing the coating with good decoration. Vehicle decoration mainly relies on painting, and the quality of the painting has a direct influence on the commercial value of the vehicle.
- Automotive painting is the most typical industrial painting, it requires reasonable and effective pretreatment method, drying method and process preparation.
- Automotive painting is a multi-coating painting system, and the painting quality and process control of each coating is of great importance.

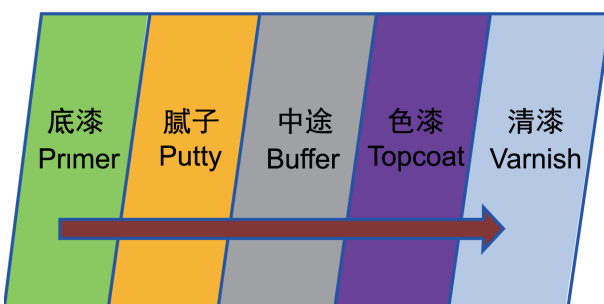
Coating Introduction

Coating Composition

During manufacture, paint coating consists of the corrosion resistant coating (zinc coating) of the raw material, zinc phosphate layer, electrophoretic layer, buffer layer and topcoat layer.



After-sale paint repair coating is mainly composed of the primer layer, putty layer, buffer layer, topcoat layer and varnish layer.



Function of Each Coating

1. Galvanized layer: with a good function of anti-corrosion/anti-rust, good paint adhesion, decorative performance and forming property.
2. Zinc phosphate layer: the first paint that is directly applied to the treated workpiece surface and is the base for the whole coating. Its characteristics are as follows:
 - It shall have a good adhesion to the treated surface of the workpiece, and the primer film formed shall have an excellent mechanical strength;
 - It shall serve as a corrosion inhibitor, and the primer coating shall have an excellent corrosion resistance, water resistance and chemical resistance;
 - It shall well fit the buffer layer or topcoat layer;
 - It shall have a good workability.
3. Electrophoretic layer: enhance cavity corrosion resistance; improve the uniformity and leveling of the paint film thickness; improve the quality of the paint film, painting efficiency and paint utilization rate.
4. Putty layer: used for the object surface with primer precoat so as to fill the pit, weld seam, scratch, rust hole, etc on the object surface, until the surface becomes flat and smooth.
5. Buffer layer: it is the last buffer layer before applying the topcoat, its binder content is between the primer and the topcoat, and the paint film is bright and semi-bright. It provides the following functions:
 - Enhance the adhesion between the primer and the topcoat;
 - Increase the total thickness of the coating and improve the richness;
 - Improve the corrosion resistance and weather resistance of the primer/top coat;
 - Repair minor defects on the substrate surface;
 - Improve the decoration performance of the topcoat.
6. Topcoat: topcoat is used for the final coating of the multi-coatings, and it directly affects the decoration performance, weather resistance, gloss protection, color protection, chemical resistance, contaminant resistance and appearance of the vehicle.

Classification of Topcoat

The classification of the topcoat by color effect is as follows:

- Pure pigmented paint: consists of resin, pigment and additive only.
- Metal paint: pigmented paint with metal powder provides better gloss and richness.

- Pearl paint: compared with metallic paint, pearl paint replaces metal powder with mica powder containing TiO_2 and FeO_2 , improving the film texture and gloss.

By application procedure, it can be classified into the following processes:

- Single-process: a system that uses one type of paint to form a complete surface coating. Single-process pure pigmented paint and metal paint are included.
- Double-process: a system that uses two different types of paints to form a complete surface coating, generally, the pigmented paint is applied before the finishing varnish is painted. Double-process pure pigmented paint, metal paint and pearl paint are included.
- Three-process: usually, a layer of primer is required for this system, then a layer of pearl paint, and finally a layer of finishing varnish, the combination of these three coatings forms a complete surface coating. Three-process pearl paint and colored varnish are included.

Principles of Paint Repairs

The following principles must be observed in the paint surface finishing process:

1. Seal inner and outer seams with an approved seam sealant.
2. Repair any damaged area of underbody sealant.
3. Use a double-paint repair system and keep it consistent with original production part.
4. Apply cavity wax to all inner surfaces that have not received paint finishing.
5. Before carrying out paint repairs, clean the vehicle thoroughly with a steam cleaner or high-pressure cleaner.
6. Wash locally repaired areas using a mild water-soluble detergent and wipe them clean with solvent, which is immediately before paint application.
7. To ensure that the exposed metal area due to a damaged paintwork is thoroughly cleaned, the cleaning area shall be larger than the original damaged area.
8. Treat the exposed metal with phosphate to remove all traces of dust and to provide a good repair environment for new paint coating.

Flat Lacquer

The flat lacquer is a special kind of paint and special care should be taken in car wash and car care.

It is recommended to wash the car manually, please do not use rough sponge or car wash cloth. When washing and wiping, please do not use excessive force. Do not wash the car in direct sunlight.

- Do not use high pressure or steam to wash the car. If the car is dirty, it needs to be pre-cleaned before washing

to first clean the body dust and other particles that may damage the paintwork.

- Spray the body with plenty of water and dry the body after washing from the top down using a soft sponge and a neutral wax-free car wash liquid.

In daily car care, the followings shall also be noted:

- If the paint film comes in contact with resin or grease, as well as insect residue or bird excrement, etc., please remove them immediately to avoid irreversible damage to the flat lacquer.
- If there is oil or fingerprint on the flat lacquer, remove them immediately with a clean rag; do not use excessive force to avoid irreversible damage to the flat lacquer.
- To maintain the matte effect of the paintwork, abrasives, polishing agents and polishing waxes cannot be used and the body cannot be polished.
- Do not use any stickers, patches, magnets and other similar things to prevent damage to the paintwork.
- Always have the paint film repaired in a qualified professional repair shop.
- Flat lacquer surface repair requires whole piece spray treatment.

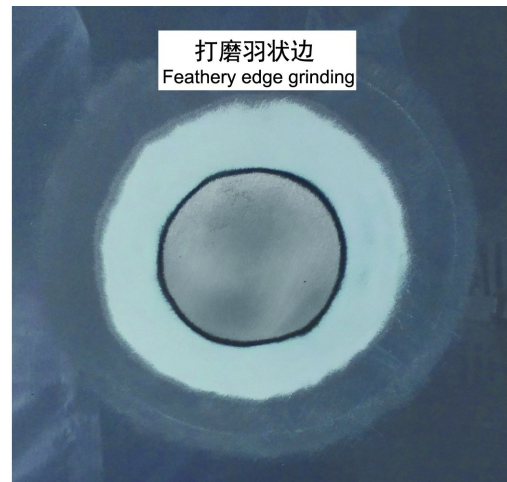
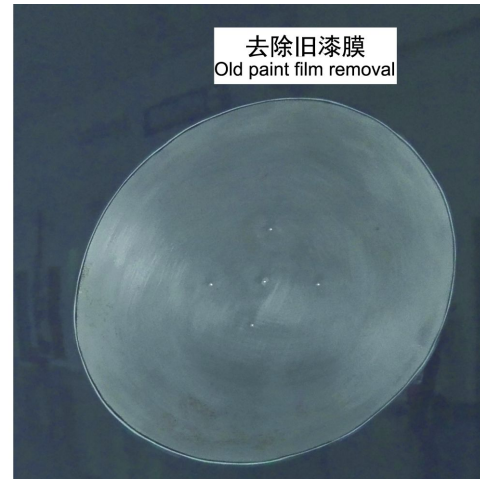
Coating Process

The automobile coating process is generally divided into two sections: One is the metal surface treatment before coating, also known as pretreatment technology; the other is the coating application process.

Surface Pretreatment

The surface pretreatment mainly consists of:

1. Surface cleaning: The mud, dirt and other foreign objects on the complete vehicle should be cleaned thoroughly during coating operation, particularly pay attention to the dirt at the door frame, trunk, bonnet apertures and wheelhouse; if not cleaned up, the new painted film may be splotchy.
 - Chemical soluble substance treatment: Apply the degreasing agent to the surface with a piece of special cleaning cloth, and wipe off the degreasing agent and removed residues, such as grease, with another clean and dry cloth.
 - Treatment of water and floating dust: Use a piece of clean and dry dust-sticking cloth to absorb the water and floating dust, then blow it dry with a high pressure air gun.
2. Coating Identification and Damage Assessment:
 - Coating identification: It is important to identify the category of the coating on the body panels in repainting process. If it is not correctly identified, the serious problems may occur during top coat application. If one vehicle has not been resprayed up to now, the category of the coating can be identified based on its model manual, but the category of body coating must be identified when repaired if the body has been resprayed.
 - Damage assessment: Evaluating the damage properly is one of the critical factors to determine the repair cost and ensure the coating quality. The repair scope can only be determined after the proper damage assessment, then the scope of each treatment process, transition area, the area to be covered and the parts to be removed, etc. can be defined, which will lay the foundation for the correct implementation of subsequent processes and satisfactory repair quality. The assessment methods for film damage include visual, touch and ruler assessment:
3. Old film removal: Examine the body coating carefully after washing the body to find the damage signs on the film, such as bubbles, cracks, peeling, rust and some damages resulted from paint baking, make-up, gas welding and other repairs. For the above damages, the old film must be wholly or partially removed based on the degree of old film damage and the quality requirement after repainting. The #P80 - P180 abrasive papers are recommended to make out the feather edges (not less than 3 cm).



Precautions for mechanical polishing:

- a. Do not use the electric sander to make cross sanding on surfaces with large curve radian and high projection or very low dent;
- b. Do not use the electric sander to sand the corners, wrinkle gaps, welding seams, sticking joints or the area that has been applied with plastic sealant;
- c. The sander can only be activated to sand when contacting with the panel surface, do not apply pressure, or deep scratches will be made, and also the sander should be aligned with edge line to be sanded before it is activated;
- d. To avoid the panel deformation caused by overheating, do not place the sander in the same position for a long time;
- e. Do not make the well painted surface around the sanded area contact with the coarse sand abrasive, and it is better to protect the perfect coating with tapes.

Sanding operation: The refined processing to the surface that has experienced rough sanding is aimed to obtain a more flat surface. Align the front of the rotating grinding wheel with the sanding surface, and get the rear part

away from the surface a little. Keep this angle and move the sander up and down to sand, and the covered area between each grinding crack is better to be 50% - 60%.

Panel replacement: Use #P280 - P320 abrasive paper to carry out dry sanding over the electrophoretic primer layer of the new part.

4. Grease and rust removal from metal surface:

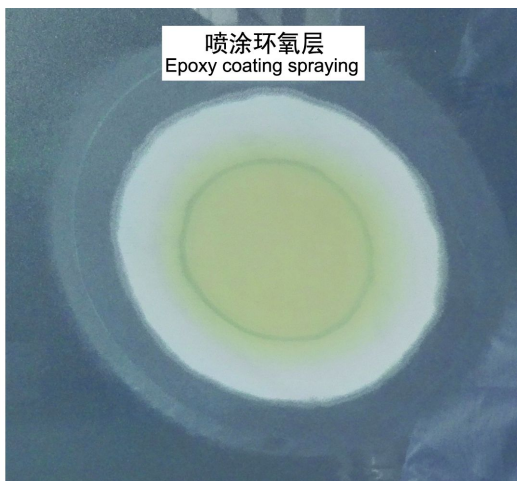
- Remove the rust spots from the surface. The methods used to remove the rust from metal include: manual rust removal (polishing, sanding, high pressure water, etc.), mechanical, chemical and ultrasonic rust removals. Different rust removal methods are selected depending on the rust conditions.
- Clean the metal surface again.

Each Coating Application

When you perform coating repairs over the panels which have experienced surface pretreatment, please refer to the detailed process as below:

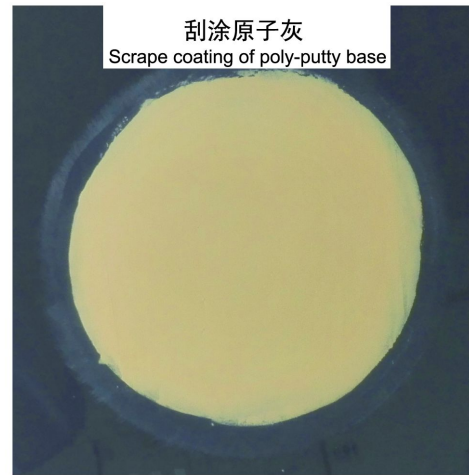
1. Primer Spraying

- Cover the surrounding of the repaired area;
- Wipe the surface to be sprayed with a piece of soft cloth soaked with detergent, while wipe the detergent left on the surface with another clean and soft cloth;
- Blow the surface clean with compressed air;
- Spray the anti-corrosive primer and let it dry;

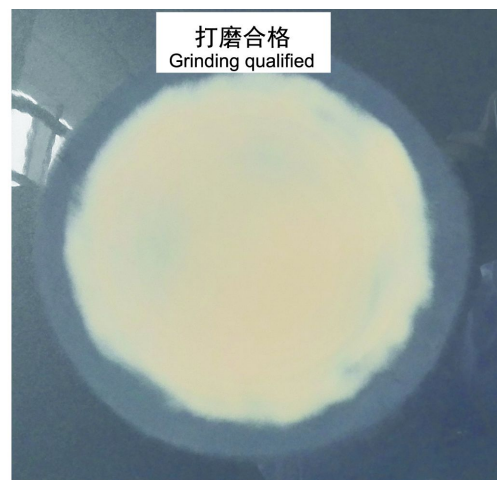


2. Putty application (not required when replacing new parts)

- Mix the putty and curing agent in the proportion defined in the instructions;
- Use a clean putty mixing plate; only mix the amount of putty to be used by this time;
- Fill up the sanding scratches and air pores, then apply the putty thoroughly;



- Let it dry for 5 minutes after application, and bake it with an infrared baked lamp according to the requirement in putty instructions;
- Wear the respirator, select the proper type of abrasive paper, then sand the surface together with hard sanding pad. The rail sander can also be used, but be careful not to sand the surrounding areas. When the sanding pad is used, it should sand in the horizontal direction and move from up to down gradually.
- Use the air blow gun to clean the repairing surface;

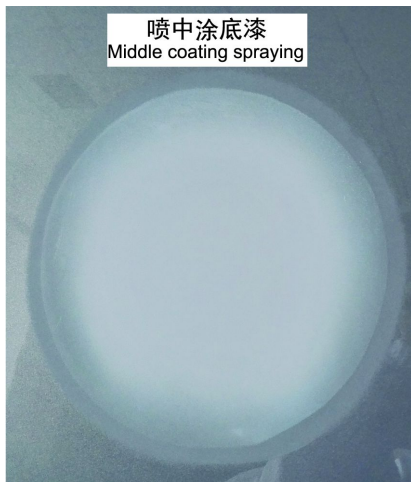


- Wipe the surface with a piece of soft cloth soaked with detergent, while dry the surface with another clean cloth;

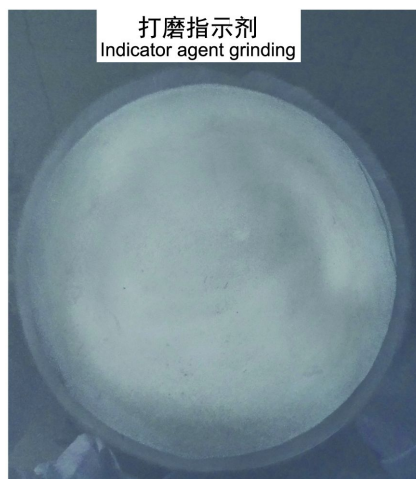
3. Middle Coating Primer Application

- Cover the surrounding of the repairing area and prepare to spray the middle coating primer, and the periphery of the covered area should be longer than the area to be sprayed by more than 10cm;
- Wipe the surface to be sprayed with a piece of soft cloth soaked with detergent, while wipe the detergent left on the surface with another clean and soft cloth;
- Blow the surface clean with compressed air;
- Mix the middle coating primer, curing agent and diluent in the proportion defined in the instructions;

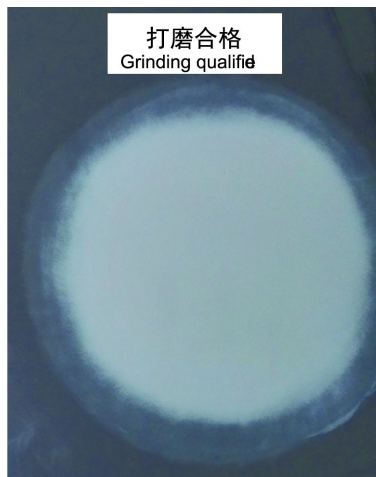
- Firstly, spray a layer of middle coating primer lightly and let it dry for 5 minutes, then wet spray it twice;



- When the paint film flows level for 10 – 15 minutes, the film can be cured with an infrared baked lamp;
- Spray the sanding indication layer on the surface, so that it is easy to find the uneven locations when sanding.



- Sand the surface roughly with #P240 - P400 abrasive paper, then sand it finely with #P600 - P800 paper;



- Remove the masking paper along the periphery of repairing area, then blow the inner and outer surfaces

of this area clean with compressed air to remove the abrasive dust and water thoroughly;

4. Top Coat Application

- Check the color code, and find out the color formulation according to the codes;
- Polish the body surface around the repairing area to obtain the exact color matching;
- Check the difference between the mix color and the original body color with the assistance of daylight stage lamp or in the sunlight;
- Spray the color test board under the same conditions with the vehicle to be sprayed (dilution rate, spray distance, air pressure, amount of sprayed paint, temperature, dry time, etc.);
- Let the test board dry for 15 minutes, then bake the board at the specified temperature within the set time. Note that do not overheat the test board when heating and curing;
- Wipe the area to be repaired with a piece of soft cloth soaked with detergent, while dry it with another clean cloth;
- Cover the surrounding of the repairing area, start to paste the papers from the inside of the repairing area, and be careful not to tear the masking papers;
- Blow the panel to be sprayed and the complete vehicle clean with compressed air, be careful not to tear the masking papers, and finally wipe the surface with dust-sticking cloth;
- To prevent the dust, particles and other impurities from entering into the paint, pour the mixed paint into the gun tank with the help of screen;
- Try to spray to check the air pressure, the amount of sprayed paint, sector pattern and atomization;
- Wet spray two layers of colorant, and the leveling between each layer takes 5 - 10 minutes;
- For the aluminum paint, make a virtual sprayed layer finally to ensure the aluminum powder is distributed evenly;

5. Varnish Application

- After spraying the pigmented paint layer, let it dry for about 15 minutes (the colorant layer totally loses the gloss), and spray the varnish: firstly, wet spray a layer of varnish and let it dry for 5 – 10 minutes; next, wet spray the second varnish layer, let it dry for 15 minutes and carry out heating and baking; (Note: Do not turn off the ventilation system fitted in the spraying booth during the phase of drying after spraying)
- Heat and cure the film at the specified product temperature within the set time. Or, dry it forcibly for 15 minutes using a far infrared baked lamp;

- After heating and curing, the further treatment (e.g. sanding, polishing) can only be done when the film is cooled down completely.

6. Polishing and Waxing

- #P1500 or P2000 abrasive papers can be used to polish the defects on the coating, such as dust spots and sags, when the film is completely cooled down.
- Grind the sanded area using slack waxes together with wool wheels. At the start of grinding, the rotating speed of polishing machine should not be too high but increase slowly;

- Perform the polishing with fine wax and sponge wheel;
- Replace with a clean sponge wheel and remove the swirl marks left by polishing with polishing wax to allow the coating to restore its original gloss.
- Examine the accuracy of color mixture at the spraying area in the lamp light, move it to outdoor and check it under sunlight.

7. Cosmetic and Cleaning

8. Information for Various Brands of Paint

	Recommended Paint Manufacturer and Product Model		
	PPG	Sherwin-Williams	Akzo Nobel
Primer	P565-895 P565-9850 P565-9085	E2G973 GBP988-AR UPO7299 UPO7226-3	Sikkens #680 Primer Grey Protective Green Primer Sikkens Universal Plastic Primer Alloy Primer IK ICF/EF
Putty	P551-1050 P551-1052 P551-1057	18380221	Sikkens Kombi Filler Alloy Putty
Middle Coating Primer	P565-510/511 P565-5601/5605/5607	P30 P50	Sikkens Autosurfacer® Classic Sikkens Autosurfacer® Classic - Rapid
Clearcoat	P190-376 P190-6850 P190-6060 P190-6208+P210-6863 P190-588AP210-790/938/939 P190-588+P210-760/790	CC645HS HPC15 CC939 CC931 CC930 CC655	Sikkens Autoclear® Plus HS Sikkens Autoclear® Xcel Autoclear® II Clearcoat Autoclear® Rapid Autoclear® Mat Clearcoat
Top Coat	NEXA Autocolor 2K (oil paint) Aquabase plus (water paint)	Ultra 7000 (oil paint) AWX (water paint)	Sikkens (oil paint) Sikkens Autowave (water paint)

Film Inspection Method and Defect Identification

Paint Film Defects Caused by Application and Treatments

Particles

The phenomenon that bumps in the film coatings are spread over the whole or local surface in granular form.

Analysis of Possible Causes:

- Poor air cleanliness and impurities in the painting environment, such as dust;
- Workers wear dirty clothes or the fibers contained in the materials are easy to fall out, substrates that are not properly handled have bumps, the vehicle body is not cleaned thoroughly, etc.
- The painting pressure is insufficient, atomization is poor, the spray gun is not cleaned up and an improper screen is selected;
- The pigments or flashing materials in the paints are badly dispersed, the paints are unfiltered or filtered improperly, the paints become deteriorated and show abnormal signs, such as precipitation, flocculation.
- The film is moved out of the baking booth before drying the surface to dust-free.

Preventive measures:

- Ensure that the spraying environment is clean;
- Ensure that the objects to be painted and workers are cleaned thoroughly before entering the baking booth;
- Ensure the paints' performance, and the deteriorated and poorly dispersed paints are not applicable;
- Set the optimal parameters for paints' application and use the spray gun to spray after the paints are filtered.

Defect treatments: The tiny dirty spots can be polished after being removed by abrasive paper; if the impurity particles are large or the dirty spots on the surfaces of primer and even surfaces of middle coating primer can only be ground to the extent that the spots disappear completely, perform the spraying again.

Sags

Upon the liquid paint is sprayed onto the workpiece surfaces, some wet film surface runs down, creating unevenly stripes and sags, which are thin on the top and thick on the bottom, resulting in the local thicker film on vertical surface. It can be divided into sinking, sagging and running depending on the shapes of sags.

Analysis of Possible Causes:

- The painted workpiece surface is too low in temperature;
- Low application environment temperature, slow wind speed and high solvent vapor content in the ambient air;

- Low product temperature, low spraying pressure, slow gunning speed, short distance to spray gun, and thicker film;
- Large caliber of spray gun, and poor atomization of spray gun;
- Slow solvent evaporation rate and low paints' viscosity;
- Short distance between spray gun and workpiece, slower gunning speed, and thicker spraying coatings;
- Insufficient flash-off intervals between layers;

Precautions

- Improve the painting environment, and control the appropriate ambient temperature, humidity and wind speed.
- Choose the correct solvent and pay attention to select the dissolving capacity and evaporation rate of the solvent;
- Strictly control the viscosity and the temperature for coating application;
- Reduce the amount of paints from spray gun, and increase the gun distance and gunning speed;
- Full flash-off between layers;

Defect treatments: For the slightly local varnish sagging, it can be sanded to eliminate the sagging defects before being polished if this defect exists; or if the sagging defect is more severe or it appears on the middle coating primer and the pigmented paint (finally revealed on the layer of varnish), the sagging must be sanded thoroughly and make the spraying again.

Needle Holes/Eyes

The blisters or solvent bubbles appear on the film and there are small needle holes on the top of them, which are referred to as needle holes (the solvent contained in the film coatings evaporates rapidly during the surface drying, its left trace forms hole); these needle holes are known as defects that the holes are still visible on the surface after spraying the top coat due to some holes on the substrate are not filled up. They are easily generated at the corners of workpieces.

Analysis of Possible Causes:

- Needle holes: The paints are mixed with impurities, for example water enters into the solvent based coating; the painted objects have dirt on their surfaces; the flash-off intervals between layers is insufficient during application; the continuous spraying is too thick; the temperature rises up suddenly and the surface is dried rapidly when stoving.
- Needle eyes: The uneven locations on the original workpiece surface are not filled up;

Precautions and Improvements:

- Set appropriate temperature and humidity for application. Wind speed and other conditions;
- Mix the paint and solvent in proportion to ensure the proper fluidness;
- It should be heated up slowly to avoid the rapid solvent evaporation.
- Full flash-off intervals between layers;

Defect treatments: The defects should be completely ground to remove the needle holes and needle eyes, then respray them.

Blistering

Part of the film coating floats from the painted surface or prime coat and is filled with liquid or gas, which is about 1-5mm in diameter or floats in large pieces. If there is some water under the film, the vapor generated by evaporation of water will plump up the film to form blister when the temperature rises up.

Analysis of Possible Causes:

- The ambient humidity is high and the film is dried naturally after spraying, resulting in moisture infiltrating into the film;
- The substrate is not dried properly, the drying time is short between coatings, and heating and drying are too fast;
- Grind the putty while adding water and the putty absorbs water;
- There is oil or water in the compressed air lines;

Preventive measures:

- Grind the dry putty;
- Ensure that the previous coating has met the requirements for cleanness and dryness before spraying;
- Reduce the humidity in the painting and spraying room;
- Use the curing agent and diluent suitable for environment temperature, and make it dry as soon as possible once the spraying is completed to prevent the moisture from infiltrating into the film.

Defect treatments: Once blisters appear on the film surface, this surface should be ground to remove the blistering defects completely, then respray it depending on the surface conditions.

Orange Skin

The orange skin is used to describe the leveling property of the film: When you observe the film surface against the light, you can see different ripples of 1 - 5mm presenting on the film surface, and the brightness and plumpness vary in different ripple areas; such texture on the film surface, which is similar to orange peel, is known as orange skin.

Analysis of Possible Causes:

- The substrate is not flat or the top coat is sprayed to the surfaces of middle coating primer without having the orange skin ground smooth;
- The ambient temperature is high, the wind speed is fast and the substrate temperature is high;
- The diluent volatilizes rapidly, the paint has high viscosity and the film is too thin;
- The distance from spray gun is too far, the gunning speed is too fast, the spraying pressure is low and the amount of paint out of spray gun is little;

Preventive measures:

- Grind the intermediate coat layer to be completely smooth according to the process requirements;
- Control the ambient temperature and wind speed (0.2 - 0.6m/s);
- Use the diluent suitable for that temperature, and adjust the paint viscosity as per the paint manufacturers' product instructions.
- Adjust the gun pressure, then regulate the gun distance to proper distance and reduce the gunning speed as per the manufacturers' instructions;
- Spray the appropriate layers to ensure that the film reaches the desired thickness;

Defect treatments: Only perform the grinding and polishing if the defect of orange skin is slight; the orange skin should be ground to completely removed and be resprayed if the defect is serious.

Sanding Scratches

The sanding scratches left by sanding substrate are visible on the film after spraying the paint. Sometimes, the sanding scratches on the substrate will extend due to the erosion caused by solvent contained in the film, the upper film would be subsided gradually after a period, resulting in the sanding scratches more and more obvious.

Analysis of Possible Causes:

- If the improper abrasive papers are used to sand the substrate, the sanding scratches will be wide and unable to be covered and filled up by upper film;
- If the lower film is sanded and sprayed with upper film over it before it is totally dry, it is easy to make the sanding scratches to extend due to the erosion caused by solvent in the upper film and form the sanding scratches defect;
- The diluent that has high solubility for upper coating or too slow to dry has been misused.

Preventive measures:

- When you select the abrasive paper number to make sanding, you should observe the principle that the

abrasive paper number should not be jumped by 2 levels for each replacement;

- Ensure that the lower film is totally dry before sanding;
- Select the correct upper film solvent as per the product instructions;

Defect treatments: For slight sanding scratches, they can be removed or made less obvious by sanding and polishing as they have been filled up by paint; for the sanding scratches that are more obvious, they cannot be removed by sanding and polishing, it should be resprayed after removing the scratches.

Putty Marks

A putty mark means the defect that trace is left along the edges of putty application areas after spraying the middle coating primer or top coat.

Analysis of Possible Causes:

- The feather edges are improperly treated before putty application;
- The putty is mixed with curing agent in improper proportion;
- The next action is taken before the putty is completely dry (sanding, spraying the middle coating primer, etc.);
- The putty is not flat enough, the feather edges do not meet the standard, and it is higher or lower than the old surrounding coatings or metal;
- The curing agent and diluent mixed in the middle coating primer or top coat are dried slowly, or the flash-off intervals between layers are too short when spraying the middle coating primer or top coat, and the solvent penetrates and erodes the putty, resulting in the edges expanded and extended.

Preventive measures:

- The width of the feather edges must be 20 - 30mm and the surface is smooth without steps before putty application;
- Add the curing agent in proper proportion according to the product instructions;
- Make sure to perform the sanding and spray the middle coating primer when the putty is totally dry.
- Use the correct curing agent and diluent, and ensure the flash-off interval between layers is enough.
- The periphery of putty must be sanded to be qualified. Not only the putty, but also the extended old surrounding coatings should be sanded when you sand the putty edges to allow the putty together with the surroundings to form flat surface.

Defect treatments: Once the putty marks appear, those areas should be sanded, and apply the putty again and respray the middle coating primer and top coat.

Lifting

The lower-layer paint is single-component, or even if it is two-component, it is not dry and cured completely (including improper amount of curing agent is used), when the paint is sprayed above it, the solvent contained in upper film will erode the lower film, causing the uplift and shrinks present on the lower film surface.

Analysis of Possible Causes:

- The lower film is not totally dry;
- The lower film becomes deteriorated;
- The continuous spraying of middle coating primer or top coat results in too thick surface, or the used curing agent and diluent are too slow to dry, or the diluent with high solubility is used, or the flash-off intervals between layers are too short when spraying the middle coating primer or top coat, or the low air temperature during the spray causes the infiltration and erosion of solvent contained in the middle coating primer or top coat, resulting in the lifting at the putty edges, one-component putty or middle coating primer edges.

Preventive measures:

- For the film not totally dry, it must be sanded and sprayed with the next layer paint after it is completely dry. If it cannot be totally dry due to the improper adding of curing agent, it needs to respray the paint mixed with proper curing agent after film removal.
- For the deteriorated film, shown as chalking, cracking, loss of gloss, it must be removed totally and resprayed with two-component middle coating primer or top coat;
- Use the correct supporting curing agent and diluent, and ensure the flash-off interval between layers is enough.
- Use the two-component putty and middle coating primer.

Defect treatments: When the lifting defect appears, it should be sanded to remove any defects at the lifting area, if the lifting is severe, the film that has lifting should also be sanded and removed completely, then spray the two-component middle coating primer and top coat.

Paint Film Defects Caused by Operating Environment and Treatments

Paint film defects caused by external corrosive materials

Defect phenomenon: The film defects occur when the film is affected by the acidic and alkaline materials as well as industrial fall-outs, such as asphalt, oil, battery electrolyte, bird droppings, sap, acid rain, pollen, dust produced by steel plant and black carbon from boiler stack. It generally appears as uplift, discolor and even cracking and peeling caused by the contaminants infiltrating into the film.

Defect treatments: If the film defect is tiny, it can be recovered only by polishing the surface damage; if the film has

been discolored, the defective areas should be sanded until eliminating the defect, then respray it.

Water Spots

Defect phenomenon: When the rainwater on the film surface or the tap-water left by car washing is heated to evaporate, a white ring drop mark will be left on the water-drop area and cannot be removed by common cleaning methods.

Causes: As the water contains mineral substances, such as calcium, when the water is heated to evaporate, some warm water will infiltrate into the softened film with heat, and the left mineral substances infiltrate into the coating.

Defect preventions and treatments: Try not to wash the car under the sunlight, and wipe the water drops off the vehicle surface after washing to avoid evaporation caused by heating. It should only be polished when water spots appear.

Stone-crash Damages

Defect phenomenon: Some small stones may hit the film and cause the film peeling during vehicle traveling, the area where the film is peeled off usually forms the surface with sharp and jagged edges, and sometimes a small indentation will appear in the middle of this area. The front edges of the vehicle bonnet or the roof is usually damaged by stones.

Defect treatments: When the stone-crash damages occur, the film on the defective area must be removed and sanded to feather edges, and filled up with putty or middle coating primer, then continue to apply the middle coating primer and top coat; if the area hit by stones is rusted, the rust must be removed thoroughly.

When new original parts are sprayed, if the top coat is directly sprayed onto the electrophoretic coating without spraying middle coating primer, and when the plastic parts are sprayed, if the middle coating primer and top coat are not added with softening agent depending on the plastic hardness, the stone crash protection capability for the film will be reduced and the film is easy to hit off by stones and sands.

Discolor/Chalking/Loss of Gloss

Defect phenomenon: As the vehicle exposes to the ultraviolet rays, the pigment deterioration of the film causes color fading, the resin deterioration causes yellowing, the film peels off as powder and loses gloss.

Defect treatments: Color fading is a representation of film aging, and it usually shows up together with chalking and full loss of gloss. Once any one of these defects occurs, the defective film must be sanded and removed thoroughly, then respray the two-component middle coating primer and top coat.

Sealing

Overview

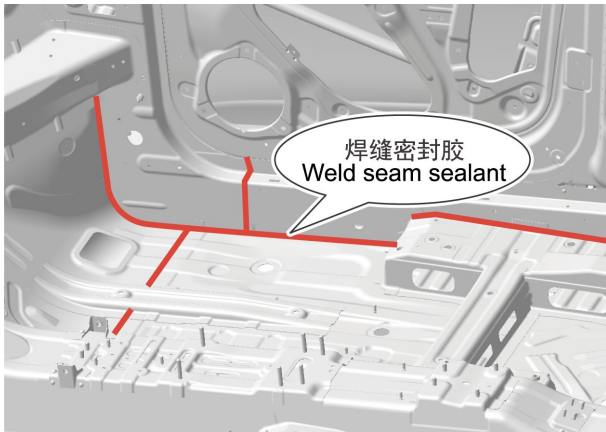
Processing Area of Underbody Seal

Platform floor areas and sill outer panels should be processed with Plastisol PVC underbody sealer. This sealer is not suitable for reuse. When repairing the sealant for the underfloor areas, the underbody sealer upon delivery should be peeled off and returned to the proper breakpoint. Do not expose the clean metal surface, and the current sealing edge should also be firmly attached to the panels.

Use new underbody sealer between primer and intermediate coat. If necessary, use the joint sealant before applying the underbody sealer. Before applying the underbody sealer, do firstly fit the plugs and insulating ring on the disk type floor (except for the part for wax spraying). Refit the heat-fusible plugs damaged in repair with heat blower or replace them with rubber insulating ring.

Caution : Ensure that suspension units, wheels, tyres, power unit, exhaust system and brake system (including all mounting points) are covered prior to application of new underbody sealer.

Joint Sealant



Joint sealant is used after applying the primer and before applying the intermediate coat and top coat. Joint sealant must be sprayed smoothly and continuously, and the spraying line depends on the joint type. If the sealant is coated by brush, pay special attention to keeping the due coverage for joint. At the places needing sealant molding, cloth dipped in the solvent oil can be used to complete the required operations.

Do seal all the joints to be processed after each repair. When the vehicle is damaged, the area away from the impact point is usually twisted. Thus, in the following repair and calibration, the sealant at these places is often touched. Check all the joints around the repaired area to see whether there is damage, and process the damages as required, then apply new sealant. Specific steps are as follows:

1. Clean the affected joints, re-process the exposed metal area with proper etch primer;




2. Apply proper sealant at the required places;
3. Process the affected area with acid-etch primer (underbody sealer is also available), and apply proper color paint film.

After reassembling or refitting the parts, if the joint is plugged, then paste joint sealant can be applied on such joint. After the panels are repaired, the joint can also be plugged. Under this circumstance, apply the sealant and spray the paint before the final assembly. If the entrance size is suitable, apply the joint sealant on both sides of joint. If the spraying operation can be only performed on one side (such as compartment), use cavity wax to process the affected compartment beam.

The joint sealed with sealant when assembling is described in detail as below:

Caution : Check all the joints near the repair areas thoroughly. If necessary, all the combined, repaired or replaced areas should be sealed. These areas should not be contaminated by moisture. Sealing could protect from moisture and wind noises and so on. Before the final inspection, it is necessary to check all the sealed areas.

PVC sealer applying method:

Process	Operation Mode	End View of Implementation Effect	Implementation Parts
PVC Glue	Frictioning Glue		On the mating faces where the components are going to be fitted and the seam parts with aesthetic requirements such as the tail lamp, joint area of the bodyside and head cover, and visible areas after assembly.
	Brushing Glue		To the seam parts without aesthetic or assembly requirements (cover the seams, the width < 50mm) such as interior floor seams, and underbody.
	Tube Glue		At the covered edges of four doors and two lids (1-2.5 mm in thickness, 5-9 mm in width)

Plug

Plug Category	Single-pack Plug	Two-pack Plug
Application Workshop	Paint or Assembly Workshop	Paint Workshop
Material	EPDM, TPE, PA6, TEEE, etc.	(PA6-GF) + heat-fusible sealer, sheet metal + heat-fusible sealer TPE + heat-fusible sealer, etc.
Sealing Performance	Leak doesn't occur in the event of 10 minutes' 30 mm height of sprout	Leak doesn't occur in the event of 10 minutes' 500mm height of sprout
Application Part	Areas around four doors, bodyside, etc.	Areas around the floor, spare tyre compartment, etc.
Remarks	To seal the holes indirectly connected to the passenger compartment or those unlikely to contact with water	To seal the holes directly connected to the passenger compartment and the exterior horizontal arrangements.

Tightness Inspection

Overview

Handling of the leaking problem needs to combine techniques, experiences and instincts to take proper and effective measures. Do not come to conclusions fast only by naked eyes.

Inspection Tools and Instruments

When checking and correcting the leaking problems, the tools and instruments below are recommended to use:

1. Garden Sprayer (hand-operated)
2. Wet/Dry Vacuum Cleaner
3. Dry, Absorbent Cloths
4. Electric Torch
5. Mirror
6. Weatherstrip Locating Tool
7. Trim Panel Remover
8. Small Wooden or Plastic Wedges
9. Dry Compressed Air Supply
10. Hot Blower
11. Sealer Applicators
12. Ultrasonic Leak Detector

When checking the leakage, at least the following parts should be checked:

- Front Inner Space;
- Rear Seat Space;
- Storage Box or Trunk

Inspection Methods and Measures

The operators at the fittings centre can judge from where to check the leakage by information offered by the customers. The next step is to find the leaking spot after the leaking place is founded.

For the first case, an easy and effective method is the common garden sprayer. Nozzle of this extruding garden sprayer ought to be adjusted, so that water can be sucked into the nozzle directly and spray out proper spray. At the dark corners, a mirror or electric torch can be used (the test light using supply voltage is not available).

The test order is very important. Begin from the lowest point and go up gradually, this can avoid blocking off the other leaking place when an area is being checked. If the test begins from the windscreen, any water flowing into the pumping chamber may drop on the pedal by baffle insulating ring. Even though, it may be judged wrongly that seal of the windscreen fails.

Another part for leaking check is to visually observe whether the door hole seal, insulating ring or weatherstrip is damaged, aged or displaced. Meanwhile, align the door with the seal.

Note : Check the colour of the leaked water. If the water is dirty, the leak is from under the vehicle. If the water is clean, it is from above the vehicle.

When the leaking spot is checked, the following methods are necessary to resolve the leaking problems:

1. Replace all of the damaged, displaced and aged door hole seals and weatherstrips.
2. Check all the vehicle seal and ensure it is fixed on the fixing flange/fixing face correctly. If necessary, simitar can be used.
3. Blow the vehicle welding lines to be processed with compressed air and/or hot blower at required place.
4. If necessary, the sealant on the outer side of the joints can be applied to prevent water.
5. When correcting leakage of the windscreen and weatherstrip (or polishing between the upper glass and the body directly), try best not to remove the glass. Use qualified materials at proper places (such as glass to the weatherstrip or glass to the body).

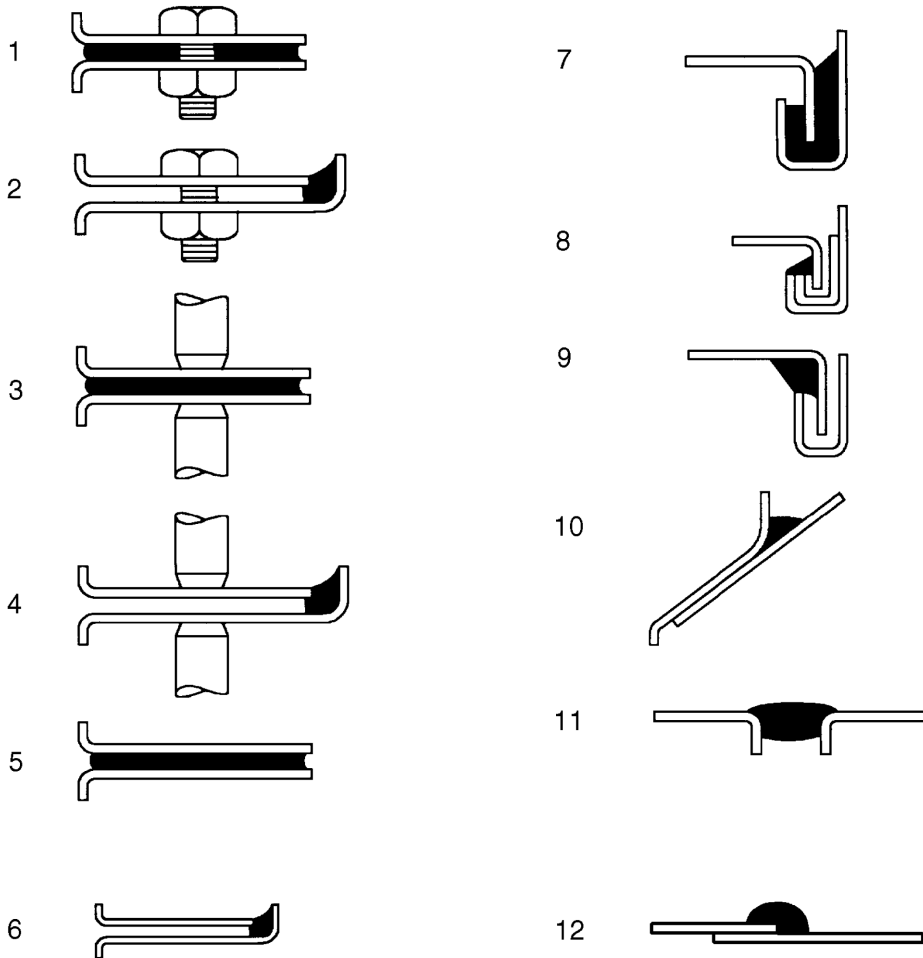
Initial Door Weatherstrip Replacement

The initial weatherstrips of the front and rear doors shall be pasted in a fixed position. Do comply with the following regulations when replacing the seals:

- Clean the places to be stuck with seals on the door thoroughly. Do not clean the doors with paint diluent agent.
- The perfect temperature for the sealing strip is 25°C(77°F). When the temperature is below 18°C (64°F), the paste effect for either the door or other sealed locations will be worse.
- The strength should not be too big when sticking the sealing strip, this is easy for either disassembly or re-installation. If the sealing strip needs re-sticking, do not touch the contact face or stain it.

Position Information of Sealant

Body Seal Identification



S882053

- 1. Between Panels - Bolted Connection
- 2. Panel Edges - Bolted Connection
- 3. Between Panels - Spot Welding
- 4. Panel Edges - Spot Welding
- 5. Between Panels - Bonding
- 6. Panel Edges - Bonding

- 7. Riveting Joints - Type (a)
- 8. Riveting Joints - Type (b)
- 9. Riveting Joints - Type (c)
- 10. Panel Gaps - Type (a)
- 11. Panel Gaps - Type (b)
- 12. Lap Joints

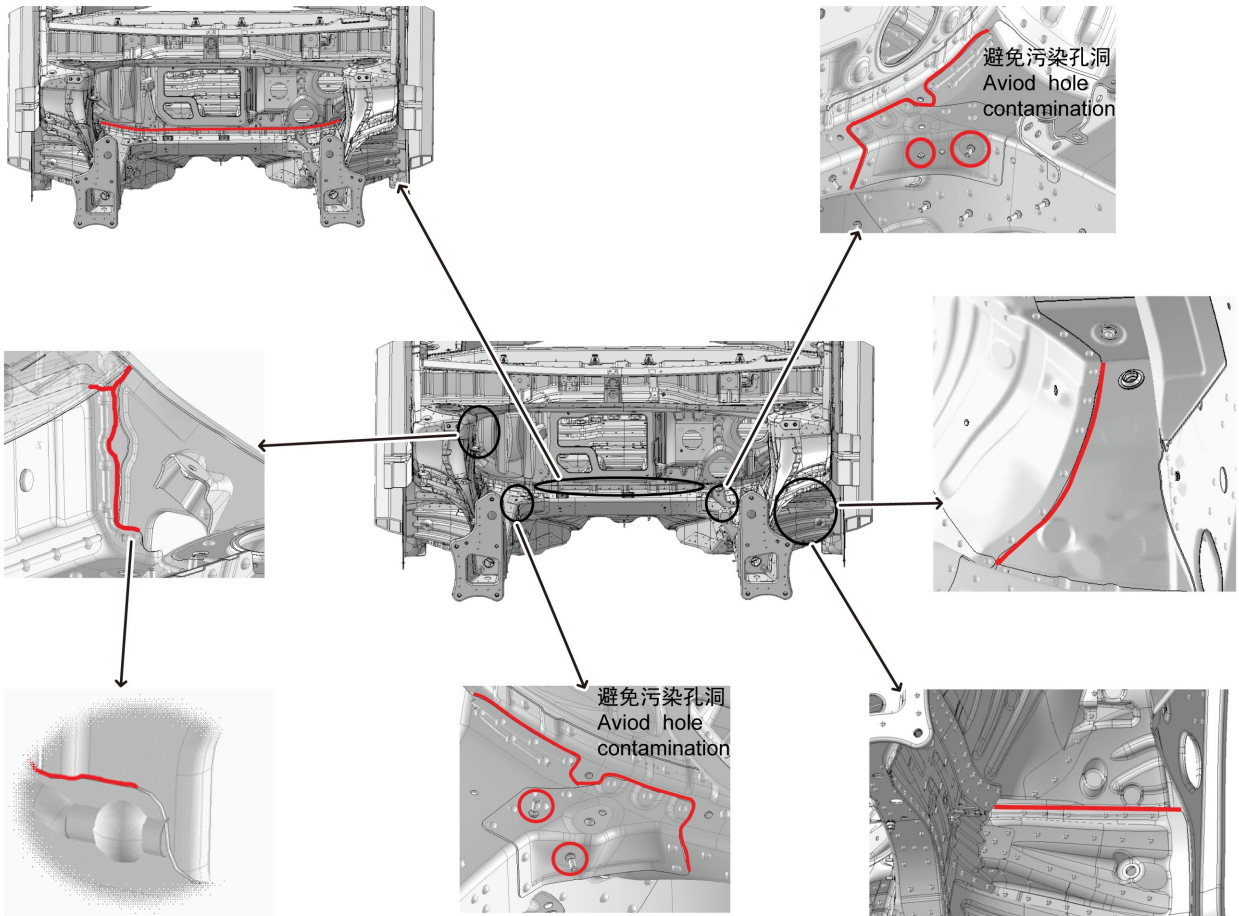
Sealant Information

After the panel is welded or replaced for repair, it is required to use PVC sealant to seal the weld seam and the new panel according to the following construction principles and the instructions on gluing position given by the original manufacturer to guarantee the repair quality:

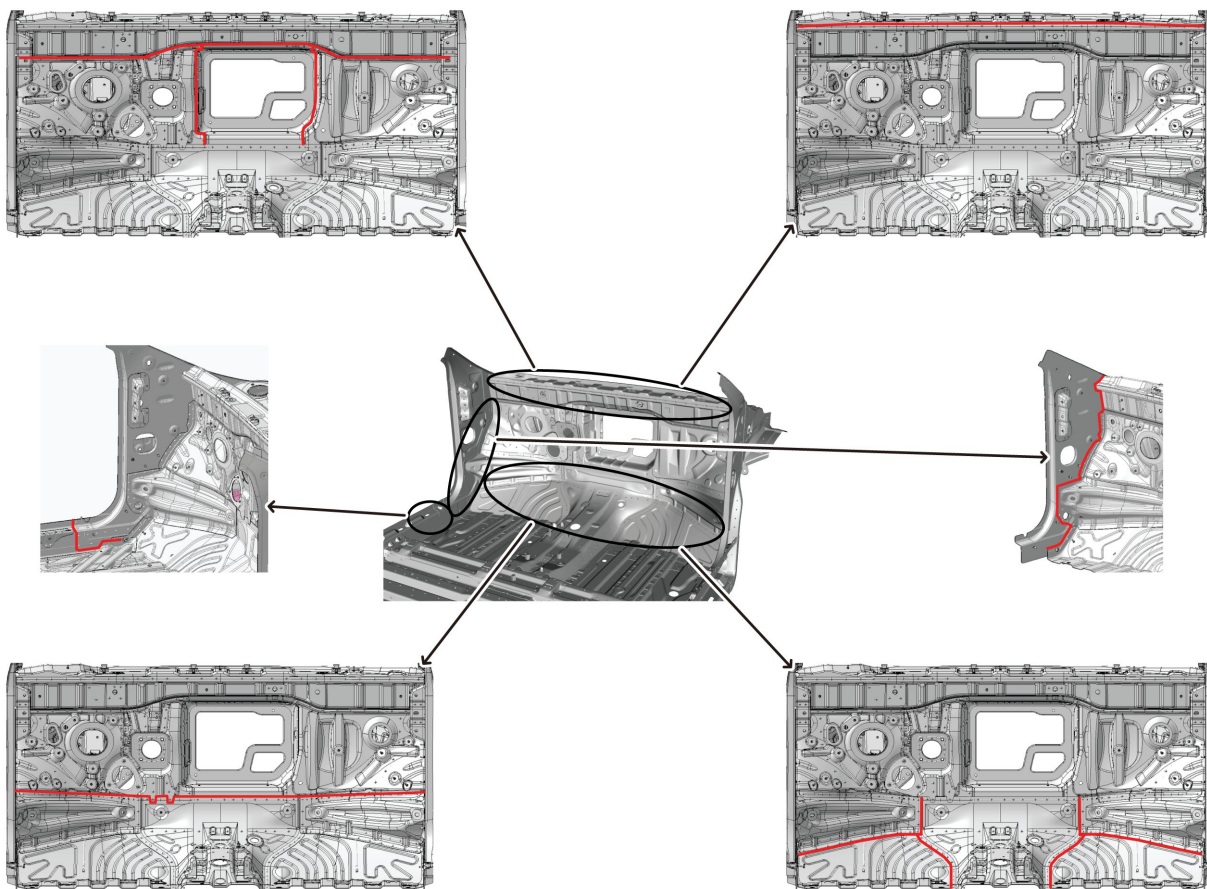
- PVC brushing glue requirements: cover the weld seam to make the surface smooth and even without fillets, and the width is less than 50mm.
- PVC tube glue requirements: cover the weld seam to make the surface smooth and even, the width is 5-9mm and the thickness is 1-2.5mm.

- PVC frictioning glue requirements: cover the weld seam to make the surface smooth and even without pinholes or bubbles.
- Apply thumb glue in the following red dots, and for any place not specifically described in the figure below, brushing glue shall be applied.

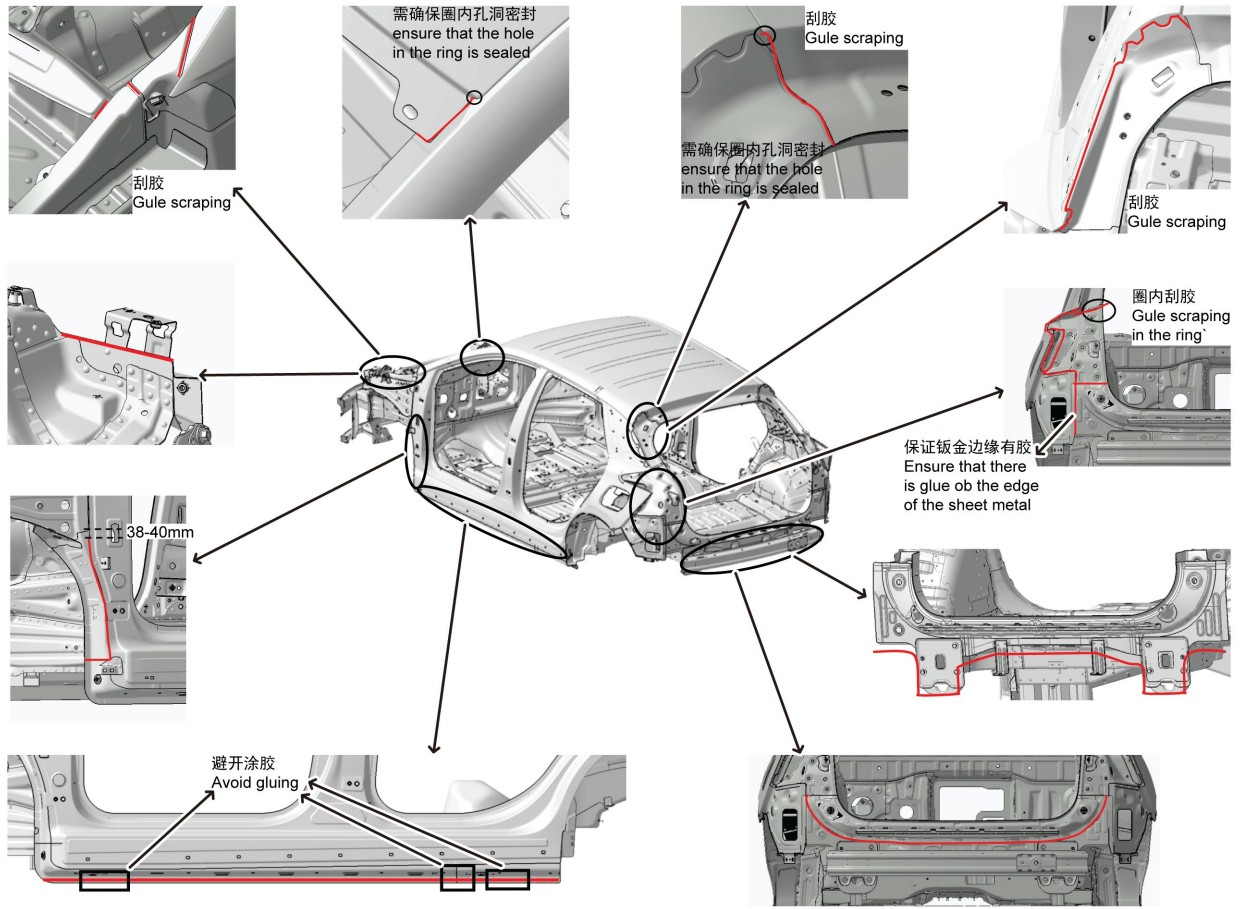
Front Compartment



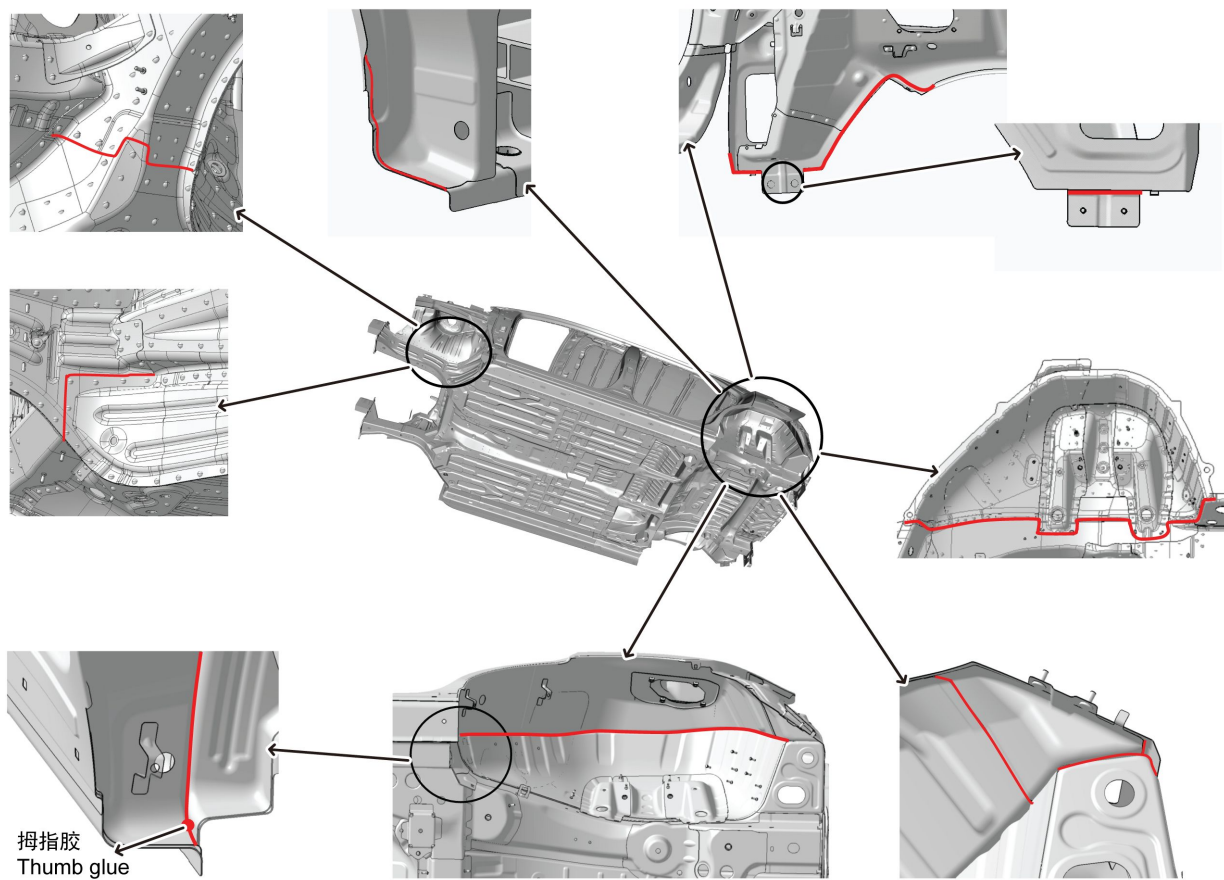
Dash Panel



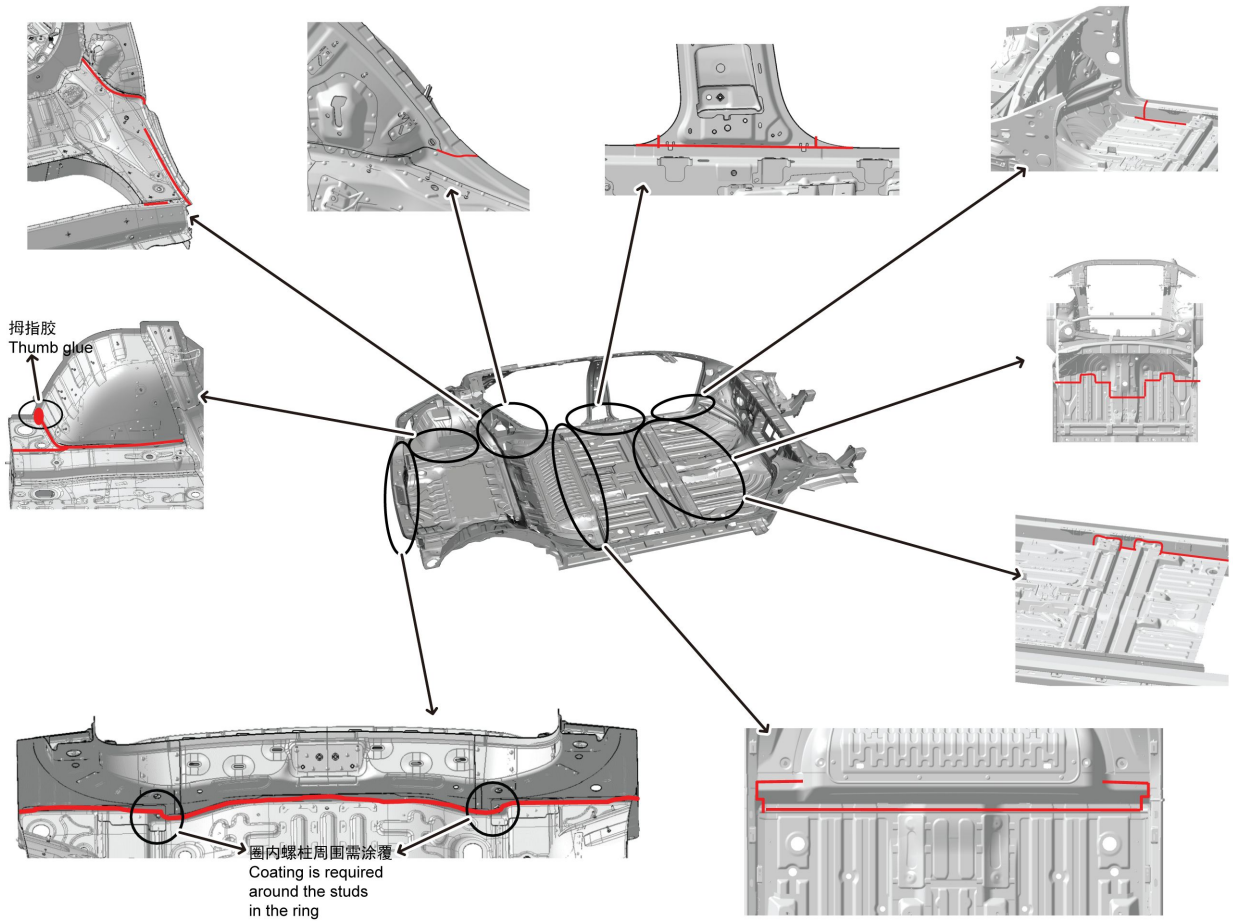
Door Sill Side Panel



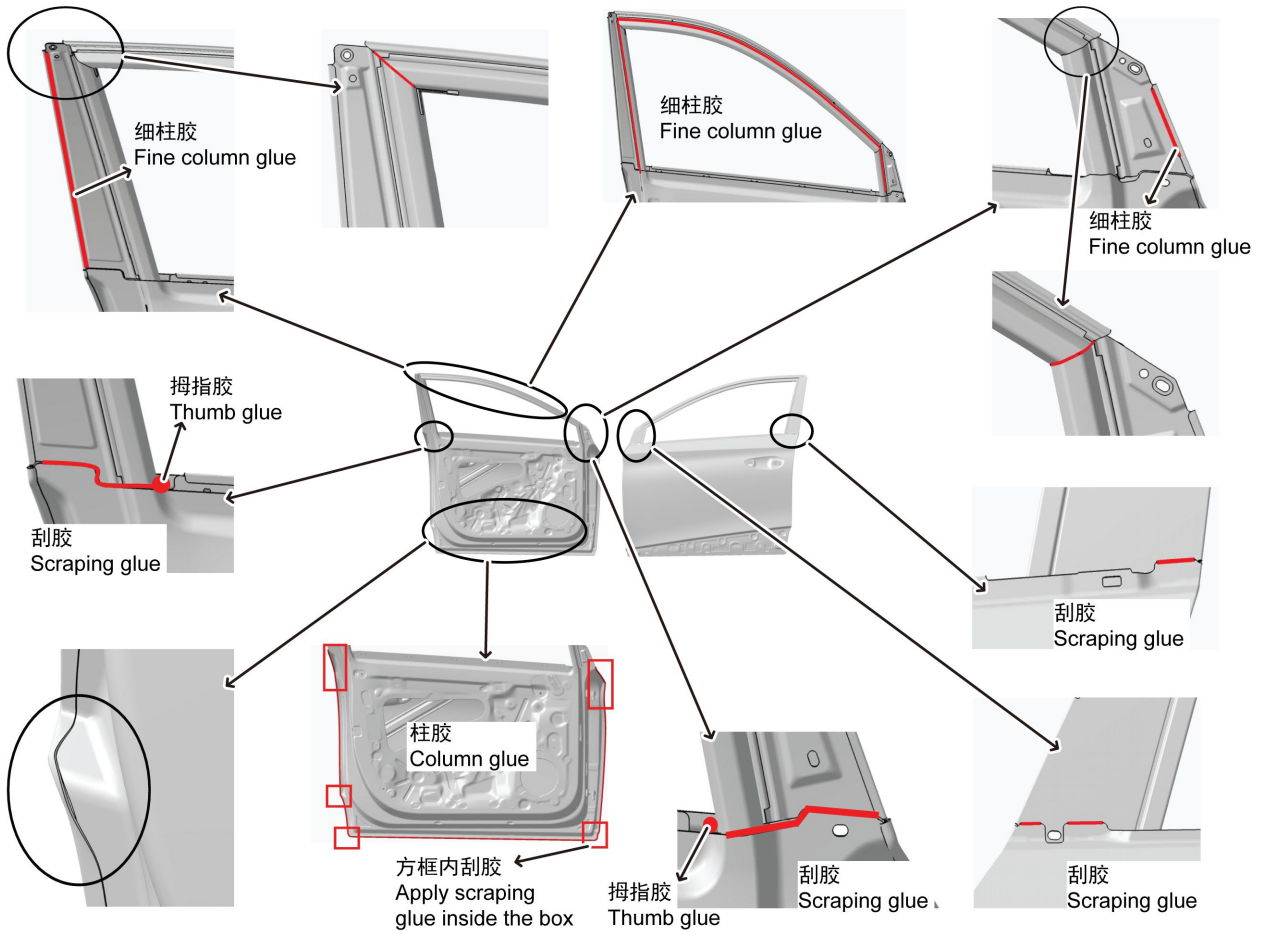
Chassis



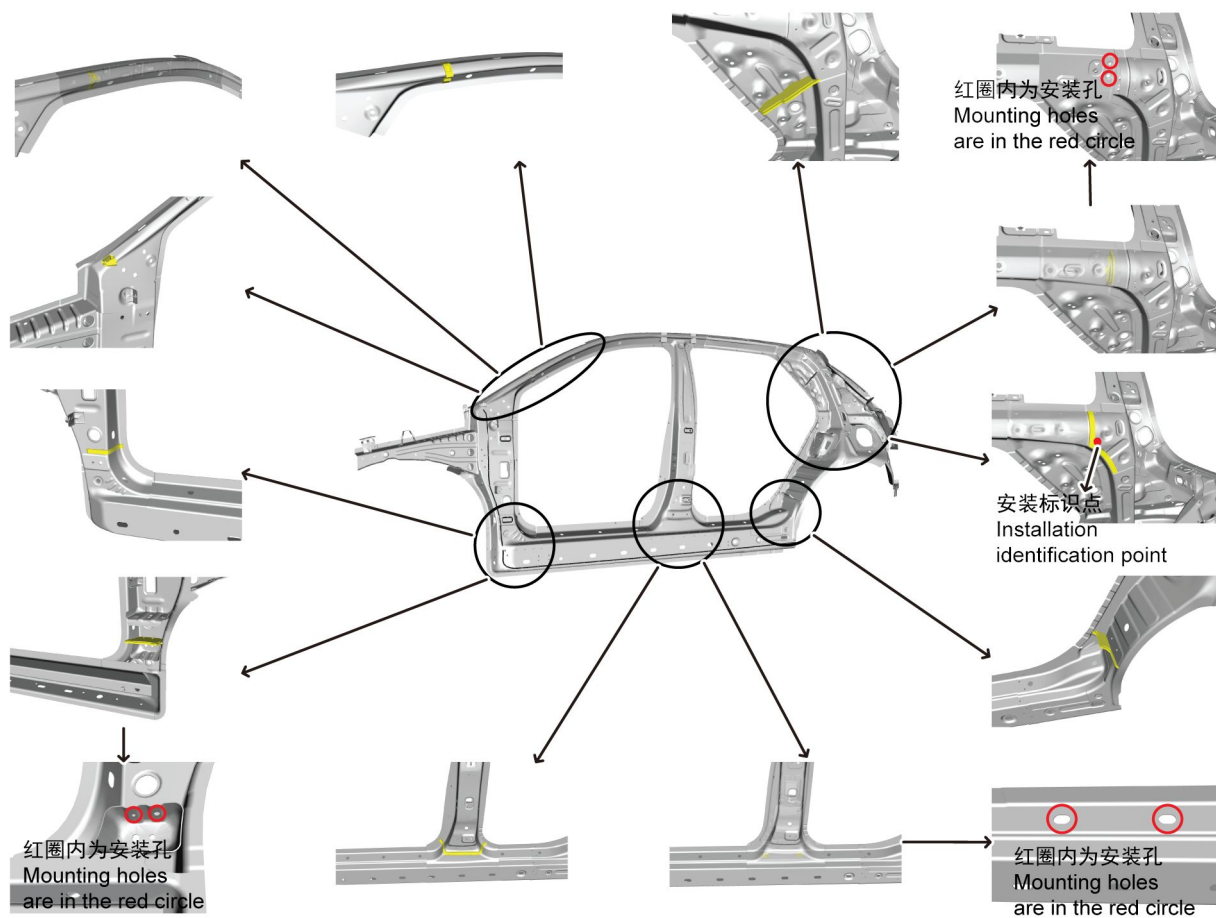
Interior Compartment



Front Door



Position Information of Foam Parts



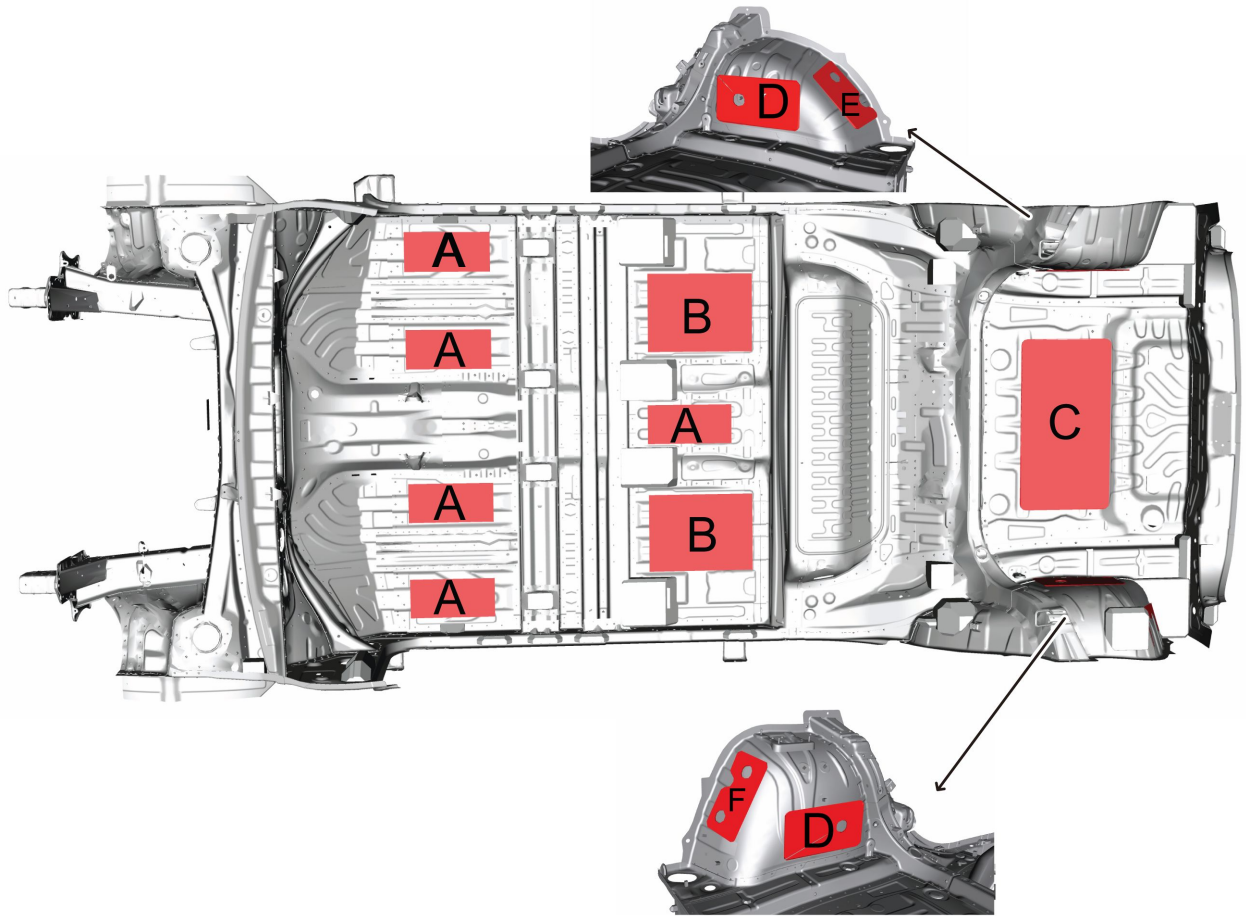
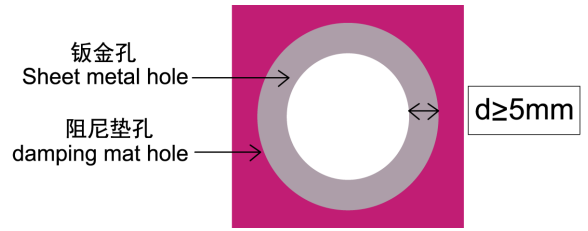
Position Information of Gaskets

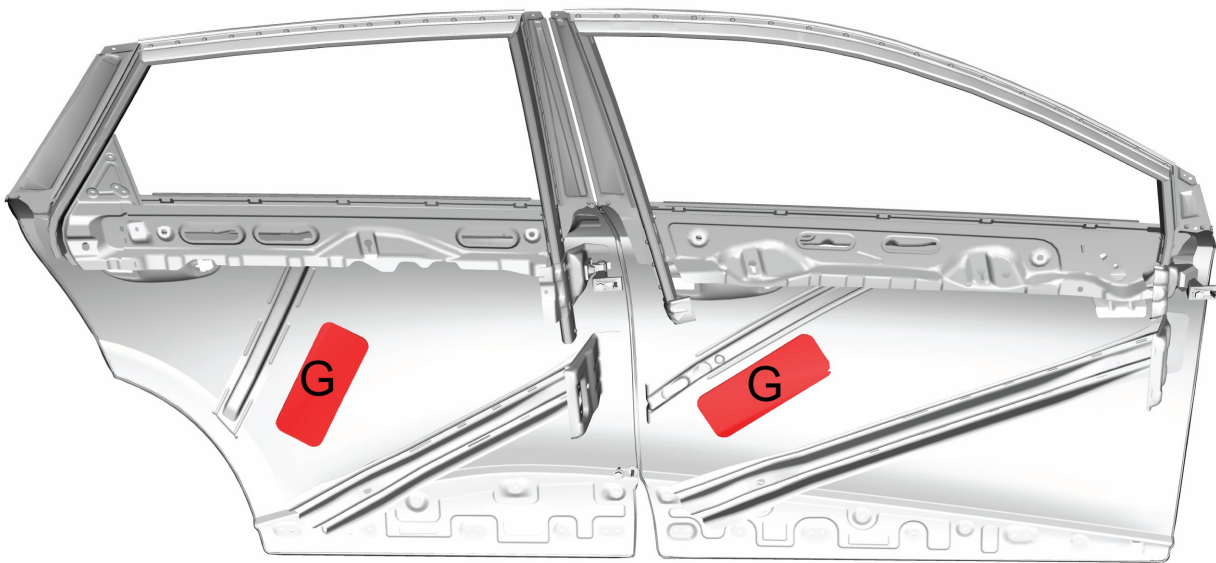
Damping mats are used in the base plate, dash panel, rear end panel, rear wheelhouse and central passage. When making panel repairs or replacements in these areas, tailor new gaskets according to the size of original ones and paste them as the following instructions:

- Clean the panel part to be pasted prior to pasting the new gasket.

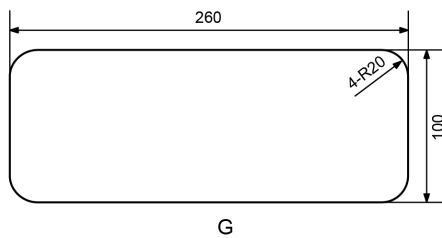
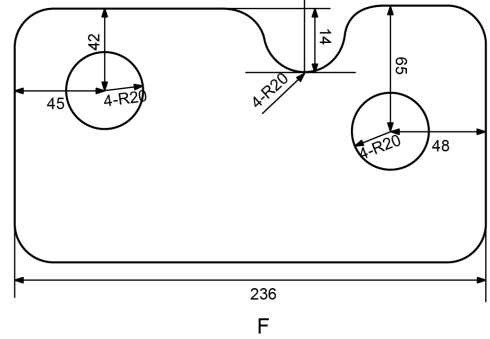
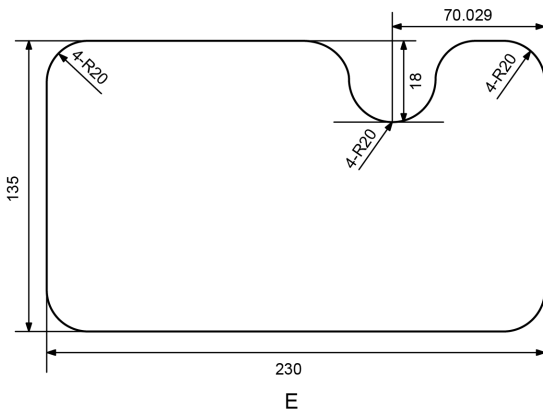
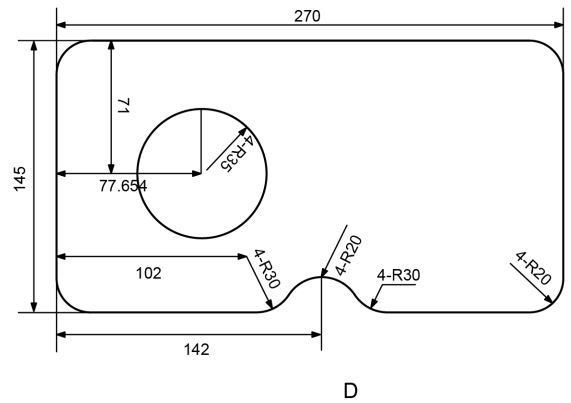
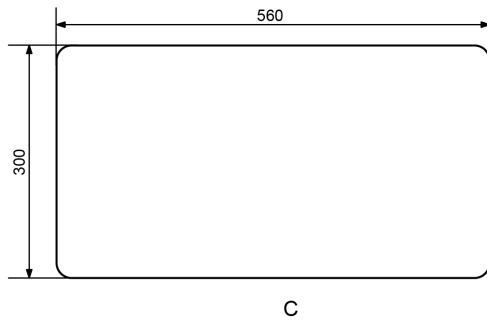
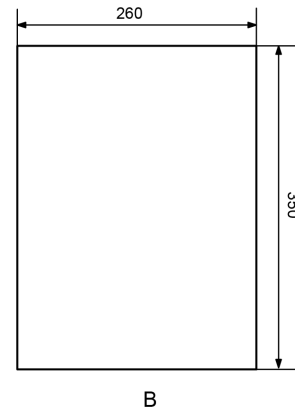
Gasket Pasting Position Information

- Follow the size requirements in the figure below.





Gasket Size Information



Anti Corrosion

Overview

Treatment during Production

During production, vehicle body is treated with the following anti-corrosion materials:

- Galvanized steel plates are used;
- Dipping and electrophoresis of phosphate antirust primer;
- Stone crash protection coating.
- Underbody coating: applied on the underbody of the main floor and the rear floor, and on the rear wheel arches;
- Cavity wax: sprayed on the sheet metals like sill panel and rear shelf panel, bodyside extensions and the lower areas of the door panels;
- Protective wax: applied to areas of the wheel arch not covered by the wheelhouse.

Whenever body repairs are carried out, ensure the anti-corrosion materials in the affected area are repaired or renewed as necessary. Ensure the materials used are also the approved anti-corrosion materials.

Precautions during Body Repair and Handling

Take care when handling the vehicle body in the workshop. Underbody sealer, seam sealing material, underbody sealing wax and body panel may be damaged if the vehicle is carelessly lifted.

When fitting accessories, ensure that the vehicle's corrosion protection is not affected, either by broken protective coating or moisture.

Do not screw self-tapping screws directly into body panels. Fit suitable plastic inserts on the body panel beforehand. Always ensure that the edges of holes drilled into panels, chassis components and other body parts are protected with a suitable zinc-rich or acid-etch primer, and applied with a protective wax coating onto the surrounding area.

Do not allow painted metal surfaces of any accessory to directly touch the vehicle body unless suitably protected. Suitable media must be available between metal surfaces to be bolted together, such as weldable zinc-rich primer or zinc strip.

Due to the high temperature generated by steam cleaning equipment, there is a risk of damaging certain decorative components, softening or liquefying some adhesives and anti-corrosion materials. Therefore, adjust the equipment so that the nozzle temperature does not exceed 90°C (194°F). Take care not to allow the steam nozzle to dwell on one area, and keep the nozzle at least 300 mm from panel surface.

DO NOT remove protective wax or paint from underbody or underhood during repairs. If steam must be used to clean these areas, apply a new coating of protective wax or underbody protective layer as soon as possible.

Inspection during Maintenance and Service

Carry out the following operations to check the vehicle body for corrosion:

- Raise the vehicle, and visually check the underbody sealer for damage;
- Lower the vehicle, check the body exterior paintwork for damage and the body panels for corrosion.

Note : *If the vehicle to be inspected is dirty, it will need to be washed prior to body inspection.*

The checks described above refer to visual check only. It is not necessary for operators to remove trim panels or acoustic materials when checking the vehicle for corrosion and paint damage.

1. After raising the vehicle, by using the detection lamps or spotlights, inspectors can visually check the followings:

- Corrosive damage and paintwork damage, and the condition of underbody sealer at the front and rear lower panels, door sills and wheel arches;
- Damage to underbody sealer. Corrosion in areas adjacent to suspension mounting points and fuel tank mounting points.

Note: In case of no exposed metal, the little bubble on underbody sealing material can be ignored.

Pay special attention to signs of damage caused to panels or anti-corrosion material by incorrect lifting method.

Warning : *It is essential to follow the correct jacking and lifting procedures.*

2. After lowering the vehicle, visually check all visible paint surfaces for signs of damage and corrosion, and pay special attention to the followings:

- Front edge of bonnet.
- Visible flanges in engine compartment.
- Lower body and door panels.

Any signs of body damage or corrosion found during inspection shall be corrected by practicable method as soon as possible. These include minimizing the extent of the damage and ensuring the long term effectiveness of the anti-corrosion treatment used in production. If the corroded area becomes clear, and spreads out from the bottom of replaceable parts (such as: various trim panels, window glass, seats, etc.), it's required to replace the parts, so as to achieve the most effective repair.

Underbody Protective Repair

Whenever body repair is carried out, ensure that the sealing and anti-corrosion measures are restored. This applies not only to the repair work on the damaged areas, but also to the repair work on some areas where protection layer has been indirectly impaired as a result of accident or repair operations.

Remove the anti-corrosion protection layer from the damaged area before straightening or panel repair. This applies in particular to panels coated with protective wax, underbody with PVC, acoustic panel, etc.

Warning : *DO NOT use oxy-acetylene gas equipment to remove anti-corrosion materials. Because these materials will release a lot of smoke and gas when burning.*

Note : *The device used for removing strong anti-corrosion sealant can provide several rates and efficiencies. The scraper (not pneumatic chisel) driven by compressed air provides a relatively quiet mechanical method by using a very rapid reciprocating motion. Move the operating edge of the tool along the workpiece surface to remove the sealing material.*

The most common method of removal is to use a heat blower integrated with scraper. One of the most efficient methods is to use 'hot knife' with rapid cutting feature. This tool uses a wide blade and is able to easily enter the outer contour areas where it is hard to reach by other methods.

Use the following procedure when repairing underbody coatings:

1. Remove existing underbody coatings;
2. After panel repair, wipe and clean the affected area with solvent, and treat exposed metal with an etch phosphate material;
3. Re-apply the primer to the affected area;

Caution : *DO NOT apply underbody sealer directly to bare metal surfaces under any circumstances.*

4. Replace all damaged heat-fusible plugs. Where such plugs do not use rubber grommets of equivalent size, ensure that they are embedded in sealer;
5. After mechanical components, hoses and pipe clips on the underbody have been removed, cover all the mounting surfaces. Underbody sealer must be applied before such components are refitted;
6. Brush sealer to all exposed joints;
7. Spray the affected area with an approved underbody sealer;
8. Remove masking from component mounting surfaces.

After refitting mechanical components, including hoses, pipes and other fixtures, cover the brake discs and apply a coat of approved underbody protective wax. The underbody

protective wax should be re-applied after panels at damaged wheel arches are repaired. This layer of protective wax also applies to various paintworks and underbody sealers. Remove old underbody protective wax completely from a zone extending at least 200 mm beyond the area where new underbody sealer is to be applied.

Note : *During repairs, for the areas requiring application of underbody protective wax and coating, be sure to carry out paint operations before applying protective wax.*

Cavity Wax Injection

After repairs, always treat areas with an approved cavity wax. In addition, treat all interior surfaces which have been damaged during repairs whether they have been treated in production or not. This includes all cavities and door interiors. It is permissible to drill extra holes for access where necessary, provided that these holes are not in load-bearing members. Ensure that such holes are treated with a suitable zinc-rich primer, brushed with protective wax and sealed with rubber grommets.

Before wax injection, ensure that the cavity to be treated is free from any contamination or foreign matter. Where necessary, remove any debris inside with compressed air.

Ensure that cavity wax is injected AFTER spraying the final paintwork and BEFORE refitting any other components.

During application, ensure that the cavity wax covers all flange and joint areas and that it is adequately applied to all repaired areas of both new and existing panels.

It should be noted that wax injection is not required when new panel and complete body shells are assembled. Ensure that such operation is carried out after repairs.

Effective cavity wax protection is vital. Always observe the following points:

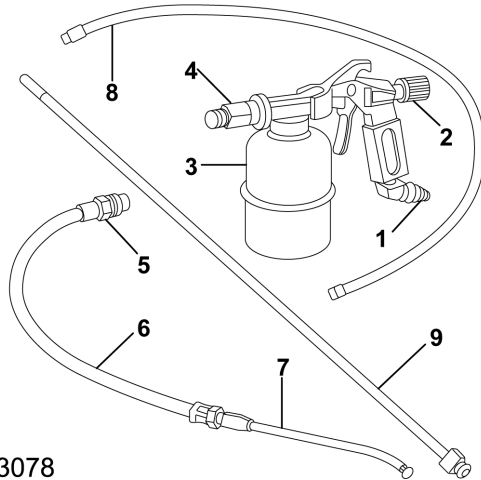
- Complete all paint finishing operations before wax injection.
- Clean body panel areas and blow-clean cavity if necessary before operation.
- Maintain a temperature of 18°C (64°F) during wax injection and drying.
- Check the injection mode of injection equipment.
- Cover all areas needing no wax protection layer and areas where could be contaminated by overspraying protective wax.
- If there is a risk of contamination, remove body devices, such as seat belt retractor;
- Move door glasses up to fully closed position before treating door interiors.
- Apply wax to body areas normally covered by trims before refitting components.

- Check that drain holes at the body and door are cleaned up after the protective wax has dried.
- Keep all equipment clean, especially wax injection nozzles.

Anti-corrosion Products and Processes

Equipment and Supplier

Cavity Wax Injection Equipment and Technology



S883078

1. Air inlet
2. Flow control (by adjusting the injection mode)
3. Pressure cup (with a capacity of 1 liter). Maximum pressure: 140 PSI (9.7 bar, 9.84 kg/cm³)
4. Spray gun connector
5. Spray gun tube-nozzle connection
6. Retractable spray gun tube
7. Rigid directional hook rod (forward tapered spray mode)
8. Movable nylon spray gun tube (1100 mm, 360° spray mode)
9. Rigid spray gun tube (1100 mm, 360° spray mode)

During repair, if the wax-sprayed area is scratched, it need be re-processed. It is required to use the compressed air spray gun with an integral pressure cup and a replaceable spray gun tube.

It should be configured based on the additional equipment; during the use, the following points should be strictly observed:

- To process the coating area, use a rigid or movable spray gun for 360° spray to achieve maximum coverage;
- Where the opening is restricted, a hook-type nozzle should be used to provide a more directional injection (such as the trunk with a narrow internal space or a short length);
- The wax will be directly sprayed from the smaller nozzle device of the spray gun onto the bottom surface to disconnect the liquid connection.

1100mm rigid spray gun: the rigid spray gun nozzle will generate a 360° circular forward tapered spray. When the wax pattern is sprayed through a single stroke, the entire trunk surface will be affected; however, when it is sprayed from inside and outside a spray gun, both the long straight structure and the trunk can be effectively and completely covered with

wax film. By visual inspection, the rigid nozzle also provides the positioning accuracy required to process the molded parts.

Caution : *Do not force the spray gun into the mouth of vessel to be sprayed when using this device.*

1100 mm movable nylon nozzle: although the elastic nylon spray gun is similar to the rigid spray gun in style, it provides a stronger penetrability, which is ideal for bent parts or vessels to be sprayed that are not readily accessible for the nozzle. The main weakness of the elastic nylon spray gun lies in its inability of precise positioning to the inner space. When the spraying is carried out, outward spraying will be achieved under the action of the spray gun's stroke. Therefore, to pull out the spray gun, slow withdrawal will be required to guarantee the integrity of the spray that has been completed. It is inadvisable to pull out the spray gun too quickly. Make sure that the spray gun's nylon tube is connected into the hole while being kept away from the edge to avoid wear of the nylon tube and to prolong its service life. It is required to make sure that the spray has been stopped before the nozzle is pulled out of the access port. To assist in the completion of this step, apply red paint to the last 30mm of the rear end of the nozzle.

Movable Spray Gun with Hook-type Nozzle

The spray gun with a rigid hook-type nozzle will produce a forward spray effect, whose full tapered spray mode is featured by long range and good dispersity. The combination of these two features can produce a good directivity, which thus can either be applied to the short and narrow area to be sprayed, or to the direct spraying of inner wheel arch and other scenarios.

In use, place the smooth area at the end of the spray gun to form a spraying angle of 180° with the position sprayed by the nozzle. In this way, when the area to be sprayed is hidden in a box section or enters into a hole, it will help guide the spraying to be completed more accurately.

For general spraying, the nozzle should be moved from one end to the other in an arched manner as required to ensure that the surface will be fully sprayed.

Note : *Always clean the spray gun with appropriate solvent after spraying to maintain working efficiency.*

Recommended Equipment

3M body Schuetz pistol spray gun 08996: Composed of casing and processed light alloy, pistol spray gun in collaboration with 3M screws will be fitted on the body's Schuetz container.

3M pneumatic shell gun-like spray gun 08012: Direct feed pneumatic gun is applied to 3M cartridge products. Its excellent performance lies in the ease for spraying; meanwhile, it is equipped with a control valve for extra control.

3M pneumatic machine-gun-like spray gun - 08006/7: direct feed pneumatic gun is used for 3M sealed bagged products (the gun numbered as 08006 is suitable for the bagged products of

200ml and 310ml to be sprayed; the gun numbered as 08007 is suitable for various models of bagged products to be sprayed, including the product of 600ml to be sprayed).

Other available spray guns: heavy pistol 08013.

3M glue gun 08190: this model of spray gun is suitable for the structural gluing 08120 of 3M.

3M cavity wax pattern glue gun 08997: This device can carry a loading tank of 1 liter and is equipped with a hose with a length of 750 mm. The approval system can be obtained from all 3M surface finishing coefficients. Cooper Pegler Falcon primary pneumatic spray gun (airtight): this pneumatic sprayer is mainly used to spray the transit wax; equipped with a container of 5 liters that is attached with a complete hand pump, it can carry out effective wax spraying with no compressed air or extra operation required. The use of nozzle, spray gun, hose, and a trigger valve with a complete filter can make the application more convenient and flexible. Other applications include general maintenance, wax injection and paint spraying. Heavy-duty materials may be used. All parts are fully replaceable and can be configured with various nozzles.

SATA Schuetz gun model UBE: SATA Schuetz gun is used to reprocess the lower part of the vehicle coated with protective paint; the gun is placed in a one-way dedicated one-liter container. The threaded fittings (the gun with internal thread) meet the criteria for most of the Schuetz type packages

Specification of the model UBE:	
Air consumption	7 ft3/min (200 litres/ min) @ 45 lbf.in2
Weight:	23.3 oz (220 grams)

SATA HKDI wax injection equipment: this equipment is used for reprocessing of cavity wax. SATA HKDI device consists of the following parts: high quality forging, a gun with a pressure feed vessel of 1 liter, a retractable nylon spray gun, a steel pipe with a length of 1100 mm, and a hook-shaped rod tube. As a rapid changeover connector for standard fittings, it can facilitate re-connection of the tube instrument. Each spray gun has a complete processing nozzle featured by dedicated spraying to adapt to the type of trunk to be handled.

Note : *Always clean the spray gun with appropriate solvent after spraying to maintain working efficiency.*

Contact Information of 3M Supplier

3M (China) Limited

Address: 38F, Maxdo Centre, No.8 Xingyi Road, Shanghai, China

Postal code: 200336

Tel.: 86-21-62753535

Website: www.3M.com

Zinc Spray

For any area where metal inert-gas welding (MIG)/metal active-gas welding (MAG) or spot welding is required, the area near the joint surface should be sprayed with the zinc-rich primer while that to be welded should be left alone.

The zinc spray is commonly used in the following two situations:

- The damaged cutting surface or coating of the panel requires zinc spray;
- The welding contact surface requires zinc spray to prevent rust of the spot welding.

Cavity Protection Wax

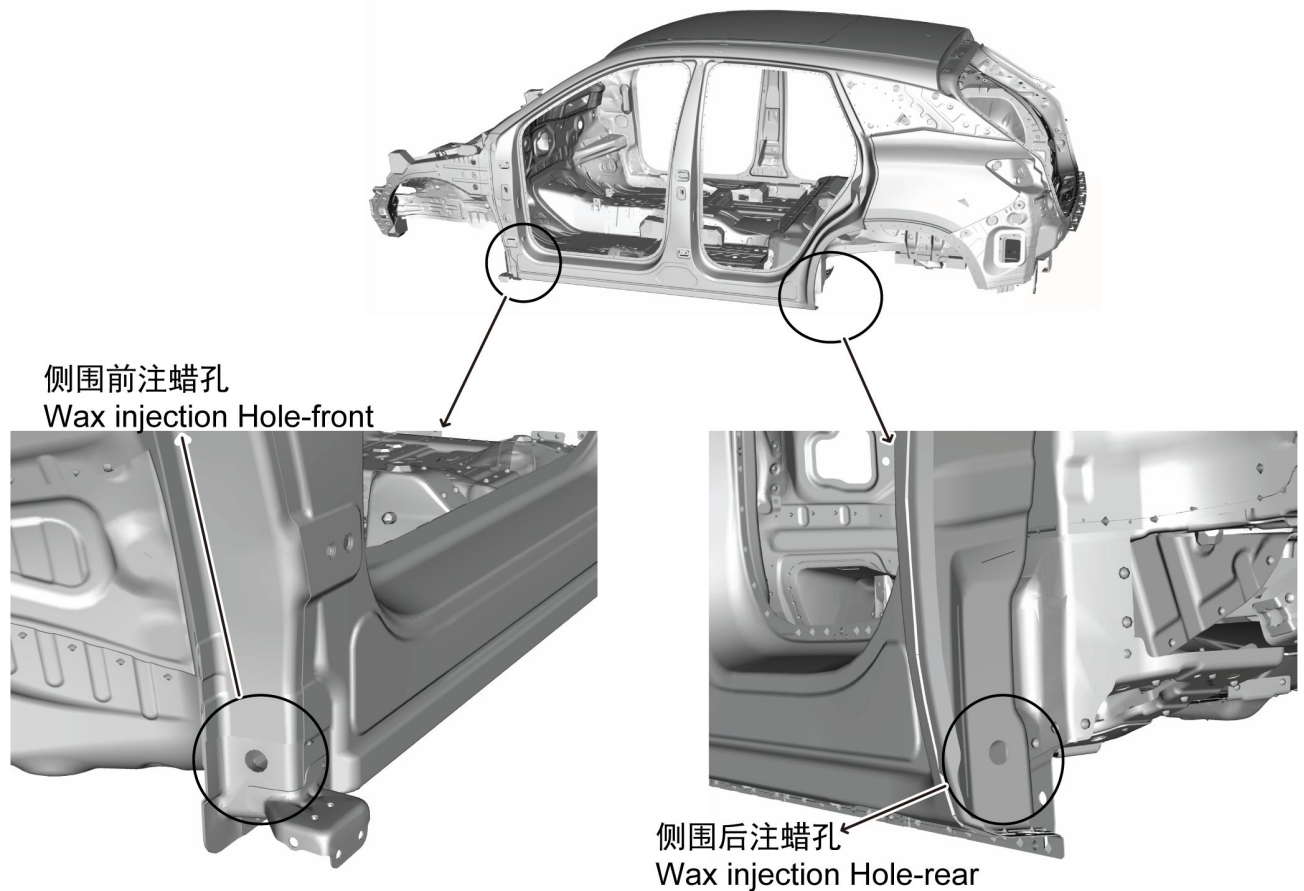
Application Process of Cavity Wax

Application tool:

- Pressurized spray gun with tank;
- Hook-like probe;
- Flexible/semi-rigid nylon probe;
- Rubber plug;

Application Information of Cavity Protection Wax

Door Sill

**Underbody Sealer****Functions of underbody sealer:**

- Improve the stone chip performance of the underbody;
- Improve the anti-corrosion performance of the underbody panel;
- Improve the sealing performance of the underbody panel crack;
- Improve the sound insulation performance of the underbody.

Caution : Ensure that suspension units, wheels, tyres, power unit, exhaust system and brake system (including all mounting points) are covered prior to application of new underbody sealer.

Construction steps of underbody sealer:

1. Cleaning: to ensure maximum viscosity of the product, it is required to thoroughly clean the surface of the underbody to remove dirt, oil, grease or wax residue.
2. Check: before starting, it is required to thoroughly check the underbody to confirm whether there is any potential damage or rusty area. The key parts include: wheel arch, door sill, seam, and lap joint.
3. Dust removal: use a small shovel or wire brush to remove all the rust spots from the underbody. Special attention should be paid to the hard-to-reach places, such as wheel frame, overlapped joints or seams.
4. Check the type of the underbody coating: check which type of the underbody coating is used to select an appropriate product.
5. Read the instructions for use: before starting work, please read the operating instructions on the product packaging and view the technical data sheet. Read the safety instructions in the material safety data sheet carefully to minimize potential risks and hazards and to achieve the possible optimal effect.
6. Use the cross spraying technology: spray the anti-rust protection product at a distance of approximately 30cm, first in the horizontal direction, then spray the bottom plate stiffener at a suitable angle (cross spraying technology). At least three times of spraying can bring about the optimal wet film thickness of 1.5mm.
7. Drying time: a specific drying time is required to make the coating material tightly and permanently attached to the underbody. The drying time will vary with the type of the solution and the thickness of the coating. The drying time

for the product containing high volatile solvent will at least last for 2 hours.

8. Spray gun cleaning: clean the spray gun with a dedicated detergent immediately after the completion of the operation.

Welding Process

Overview of Welding Methods

Welding Process Characteristics:

- It is not restricted in shape; it is suitable for connecting integral body structure, which, after being welded, can still maintain its intactness;
- With no adapting piece needed, it can reduce the weight;
- Good sealing performance against air and water;
- High productivity;
- Strength of the welded joint will be affected by the operator's technical level;
- In case of overheating, the surrounding panels will be deformed.

Generally, GMAW, resistance spot welding and braze welding are adopted for the body welding of modern automobiles. When the body panel should be welded for repair, based on specific conditions, it is required to adopt an optimal welding method that will not reduce original strength and durability of the body; it is advisable to use spot welding or inert-gas welding where possible.

Gas Metal Arc Welding (GMAW)

GMAW is mainly used to weld high-strength and low-alloy steel bodies and cast aluminum parts. The advantages include:

- The operation method is easy to be mastered;
- It can 100% melt a variety of base metals; when being applied to a thin metal, it can use weak current to reduce the damage to the strength of adjacent parts;
- The arc is stable and easy to be controlled;
- It is suitable for welding of parts with gaps and mismatches;
- Able to control the welding temperature and duration, it can shorten heating time of the welded zone, thus reducing fatigue and deformation of the base metal.

Typical welding positions and welding methods:

- Butt welding. Mount two adjacent metal edges together, then conduct welding along the edge of the two metal plates mated or butted;
- Overlap welding. Weld two overlapped metal plates;
- Plug welding. Drill a hole in one or several workpieces outside to make the arc access the workpiece inside through the hole which will be filled with molten metal;
- Spot welding. When the timing pulse for wire feeding is triggered, the current will be introduced into the two metal plates to be welded.

Resistance Spot Welding

As the most commonly used method for welding of the integral body, resistance spot welding is suitable for thin steel

plates of the body requiring high welding strength without deformation. Roof, door window, door sill plate, external components, etc. The welding quality of the resistance spot welding will be affected by the voltage, current, pressurized time, thickness of the welded metal plate, and other related factors, which are expounded as follows:

- Material and degree of cleanliness of the welding parts: the contact points between welding parts and between the welding parts and the electrodes should be carefully polished and cleaned;
- Electrode pressing force: if the pressure is insufficient, weld spatter will be caused at the contact point; if the pressure is excessive, although the current flowing through is large, owing to the enlarged heat distribution area, the welding spot diameter and weld penetration will become smaller instead;
- Welding current: both welding spot diameter and welding strength will be increased with the increase of welding current; however, when the current is excessive but the pressure is insufficient, the weld spatter will also be caused between the plates, whereas it may be minimized;
- Power-on duration: the effects exerted by long power-on duration on the welding spot include abundant heat generated, large welding spot diameter, and deep weld penetration. However, if the power-on duration is excessively prolonged, electrode indentation and thermal deformation will be caused instead of increased welding spot;
- Arrangement of welding spot: both spacing and margin (the distance from the welding spot to the plate edge) of the welding spot will also impose a decisive effect on the strength of the welding spot. Although shortening spacing of the welding spot can improve the connection strength of the welding parts, in fact, there is a limit, because when the spacing exceeds a certain limit, the welding current will be diverted and leaked through the last welding spot; at this point, the increased welding spot will lose its effect to enhance the connection strength of the welding parts, but will lead to counterproductive effect; therefore, spacing of the welding spot should step outside leakage area of the current.

The use of resistance spot welding method requires a correct welding sequence; generally, the spot welding should not be conducted continuously along a single direction; when the electrode tip becomes hot and changes its color, the welding should be stopped immediately to cool it down. Do not weld any edge at the corner, so as to prevent cracking caused by stress concentration.

Aluminum Welding

With the use of new materials, many vehicle panels are made of aluminum which is more difficult to be repaired as compared to steel. Aluminum is softer than steel and is more difficult to be processed and formed after being subject to work hardening, and is easily deformed after heating. The thickness of aluminum body and vehicle structure is usually as 1.5-2.0 times as that of the steel parts, so during processing of aluminum panels, pay attention to the following points:

Aluminum Plate Calibration

Aluminum material is highly extensible and can hardly be restored to its original shape or size after being collided. During repair, use wooden hammer or rubber hammer to perform roller hammer malposition strike, so as to reduce extension of aluminum material. If it is necessary to perform roller hammer normal-position strike, strike gently for many times, otherwise, it will worsen the damage degree of aluminum materials. Prior to aluminum plate repair, first distinguish the category of deformation: flexibly strike the protruding parts with wooden hammer or rubber hammer to release the stress generated by collision, so as to reduce the possibility of bending at the hard damaged part; for repair of depressed part, avoid stretching the aluminum plate instead of raising too much during each repair. For aluminum panel repair, you can also use aluminum shaper to level the damaged part. After completion of repair, use spacial tool to cut down the entire Meson welding screw and polish it evenly. For steel body, when the panel and inner structure are deformed at the same time, separately repair the inner and the outer layers, then articulate the folding edge. But for aluminum panel, this method does not apply. If using this method to repair the aluminum panel, the folding part will crack or fracture due to low aluminum toughness.

If using heat shrinkage method to calibrate the aluminum plate, keep in mind the major differences between steel plate calibration and aluminum plate calibration: during steel plate calibration, avoid heating as much as possible so as to prevent the steel strength being reduced; during aluminum plate calibration, restore the lowered plasticity during work hardening by heating. Without heating, the aluminum plate will crack when the calibration force is applied to the aluminum plate. Prior to calibration, heat the damaged aluminum plate with welding torch. As aluminum does not change color at high temperature, it is likely to be overheated. In this case, the thermal coating or thermal pen that changes color at the temperature of 120°C can be used to control the heating temperature.

When the aluminum plate extends, it can be treated with the heat shrinkage method. During operation, slowly cool the contracted part instead of cooling it down rapidly, so as to avoid plate deformation due to excessive shrinkage. In addition,

during repair of aluminum plate, do not use the contraction hammer or contraction shim plate that are used to repair steel body, so as to avoid crack of the damaged part.

Aluminum Plate Welding

In normal cases, alloy aluminum can be welded with the method of inert-gas arc welding. However, because of the annealing effect in welding process, there is a great loss of strength at the welding part. After repair, the welding part will crack due to vehicle vibration and bumpy driving. So, welding is rarely applied to aluminum body repair, and bonding and riveting are normally used instead. Nevertheless, welding is not an unnecessary process during aluminum body repair. During replacement of structural parts, welding is generally used between structural parts so as to strengthen the integrity and conductivity of the vehicle.

Compared to steel plate welding, during aluminum plate welding, pay attention to the following points:

- During aluminum plate welding, the wire feed speed is higher and more stable, and by using aluminum welding wire and 100% argon, the amount of airflow increases by about 50% as compared to steel body welding.
- During aluminum plate welding, the welding torch should be closer to the vertical position, and the welding direction can only be tilted from the vertical direction by 5-15°;
- Use the positive-direction welding method without pushing or pulling. For vertical welding, weld from the bottom up;
- During aluminum plate welding, the amount of protective air increases by about 50%, and there are more spatters, so apply anti-spattering agent to the nozzle and the conductive steel nozzle;
- The distance between the conductive steel nozzle and the workpiece is generally within the range of 7-14mm.

Repair through Tin Soldering

For curved surface shape partially unrepairable or difficult to repair, use tin soldering to fill the part to be repaired into curved surface shape. Prior to tin soldering, apply tin soldering paste to the repair welding surface, toast the panel surface with the welding torch flame, melt the tin solder, and weld it on the surface to be repaired at a thickness determined by the curved surface, so as to make the surface restore to its original shape after welding. After tin soldering repair, the surface tends to be not perfect enough. In this case, use grinding wheel and sand paper to polish the surface until it is smooth.

Welding Protection Measures

Electronic Control Unit

The Electronic Control Unit (ECU) fitted to the vehicle makes it advisable to follow suitable precautions prior to carrying out welding repair operations. During these operations, a large amount of heat and severe vibration may be generated, which could cause damage to the ECU.

In particular, it is essential to follow the appropriate precautions when disconnecting or removing the sensing diagnostic module (SDM).

Supplementary Restraint System Precautions

When performing any work related to removal or replacement of any item of the SRS, extra care shall be taken and appropriate precautions shall be observed.

Equipment

When starting any test on the vehicle, ensure that the relevant test equipment works normally and all harnesses and connectors are in good condition. This is especially important to the ECU.

Seat Belt Riveting Points

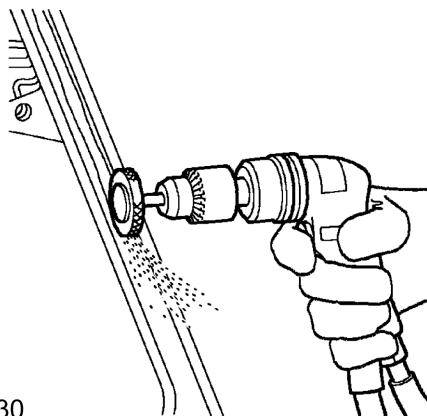
Seat belt riveting points are the key to safety. When making repairs in these areas, it is essential to follow the following design specifications. Note: High Strength Low Alloy (HSLA) steel may be used for seat belt mounting position.

Where possible, the original production assembly should be used, including seat belt riveting points, or the cutting line should be so arranged that the original seat belt riveting points are not disturbed.

All welds within 250 mm at seat belt riveting points must be carefully checked for welding quality, including spacing of spot welding.

Welding Parts Remove

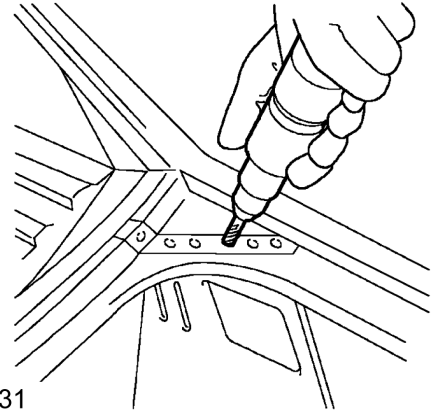
1. Expose resistance spot welds. For those spot welds which are not obviously visible, use a rotary drum sander or wire brush fitted to an air drill, or alternatively a hand held wire brush.



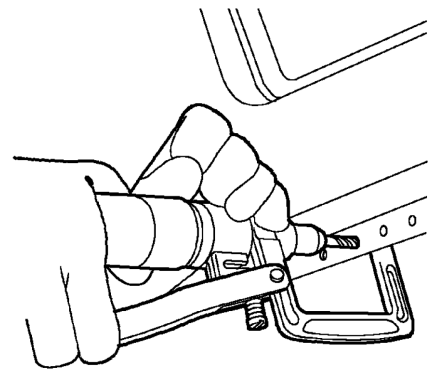
S883030

Caution : In wheel arch areas, it may be necessary to soften underbody coating, using a hot air gun, prior to exposing spot welds.

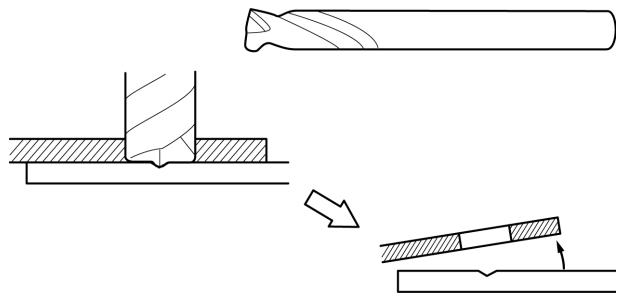
2. Cut out welds using a cobalt drill. Alternatively, use a clamp-type spot weld remover.



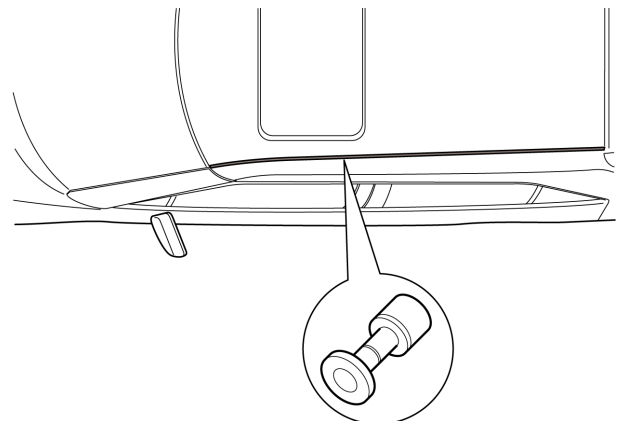
S883031



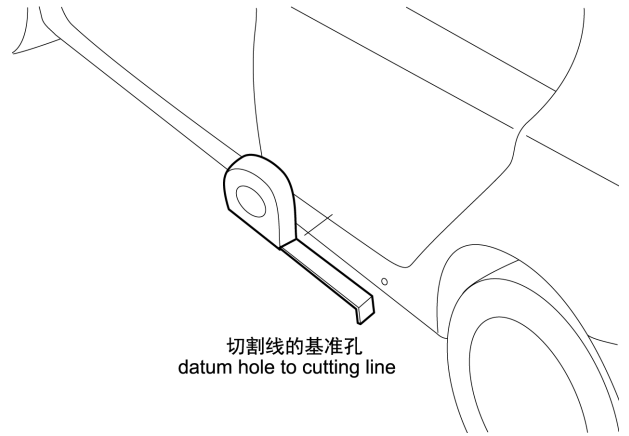
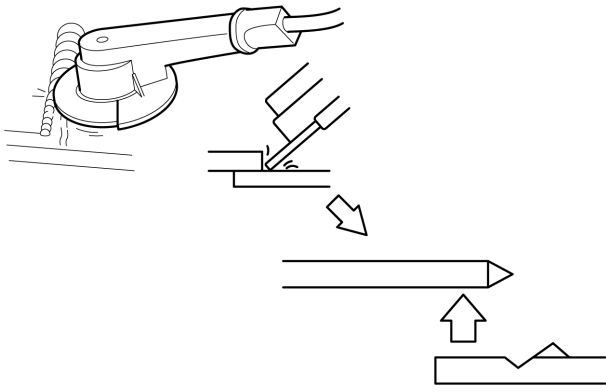
S883032



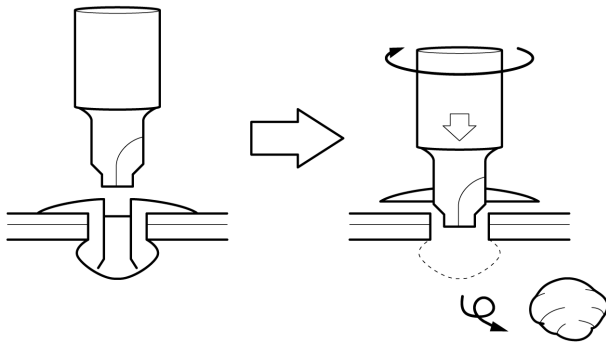
3. Laser weld parts: grind with grinder and grinding disc.



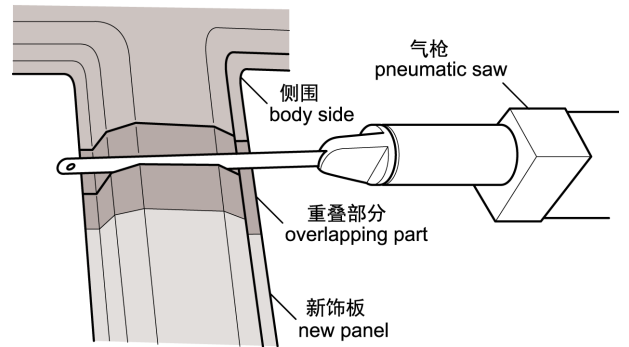
4. CO2-MAG Arc Welding Parts



5. Rivet Joint Parts

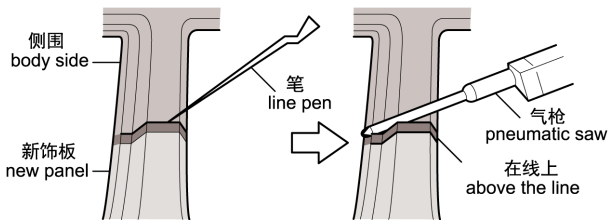


d. Overlap cutting method



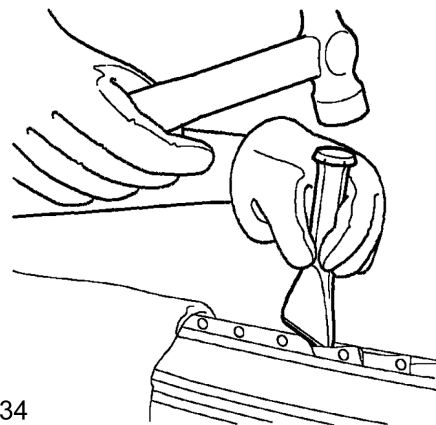
6. Large Panel Cut

a. Cut using steel plate edge



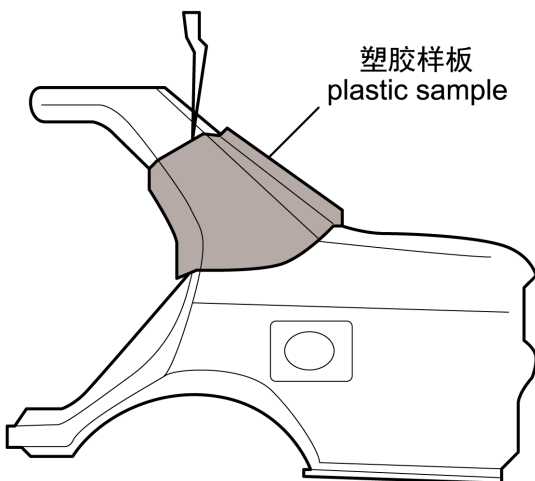
Caution : Before cutting out the large panel, a sander shall be used to remove MIG welds and braze at certain panel joints.

7. Separate spot welded joints and remove panel remnants using hammer, bolster chisel and pincers.



S883034

b. Plastic sample plate cutting method



c. Dimension measurement method

Laser Welded Roof Repair

Roof Remove

1. Remove the accessories around the roof.

Before removing the roof, remove necessary peripheral accessories, including front and rear windcreens, interior trim panels, sunroof, ceilings, curtain airbags, etc. Before removing, disconnect the negative battery cable for two minutes.

2. Knock out the welding spots between the roof and the beam.

Use an electric hand drill to drill out the original welding points of the roof on the upper part of the front and rear windcreens, so as to separate the roof from the body beam.

3. Remove bonding between the roof and the roof beam.

Remove the bonding between the roof and the roof beam with a cutting disk.

4. Cut and remove the old roof.

Before cutting, it needs to drill a hole on the roof to facilitate cutting. Use a pneumatic saw to cut the old car roof, and remove the whole old roof.

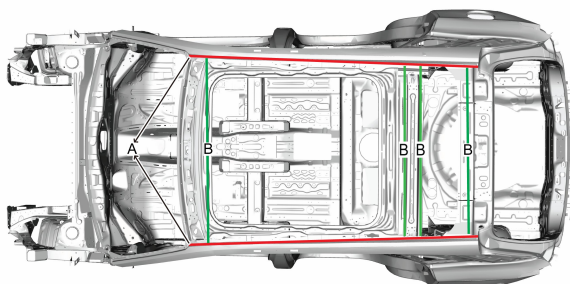
Roof Refit

1. Roof position measurement.

To fit a new roof, first measure and position it according to the actual standard of body size.

2. Grind and clean the roof bonding area.

As bare steel plates are required for structural adhesive bonding, before applying structural adhesive, it needs to use a grinder to polish the adhesive positions of the roof and both bodysides, and remove the paint in the area coated with structural adhesive (the position A of structural adhesive is marked in the figure below) to ensure the strength of structural adhesive, and clean the adhesive areas with cleaning agents. The position B in the figure shows the application position of panel sealant.



3. Glue Application on the Roof

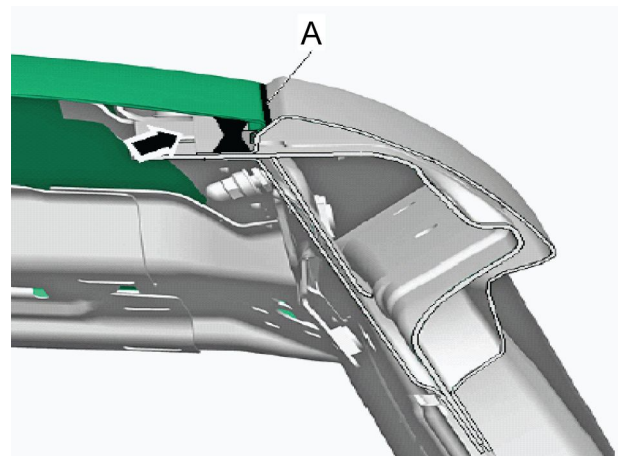
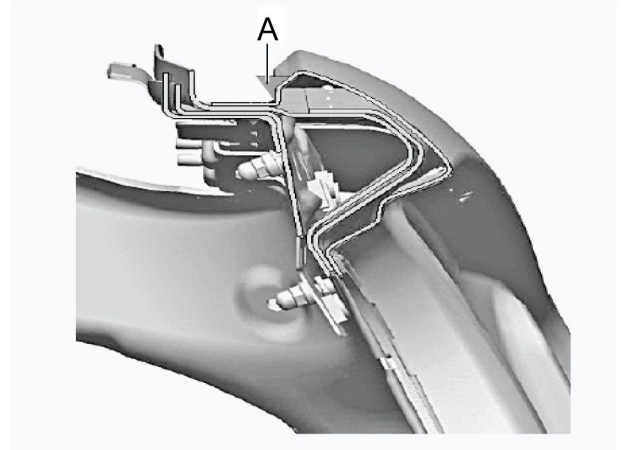
Apply the panel sealant to the roof beam.

Apply the two-component structural adhesive for panel bonding on the edge of the roof (position A in the

following figure), and squeeze out about 5g structural adhesive before use to ensure that the structural adhesive is mixed evenly.

Before applying the structural adhesive, stick adhesive tapes on the paint surface of roof and the bodyside to prevent the adhesive from overflowing and sticking to the paint surface.

After applying the structural adhesive, use a plastic scraper to evenly spread the adhesive overflowing from the roof joint, and repair the appearance.



4. Fix the bonded roof.

Fix and stick the two sides of the roof with straps, snap and fix 4 corners of the roof with lock wrenches until the structural adhesive is dry, and remove the straps and lock wrenches.

5. Heat treatment of bonded roof.

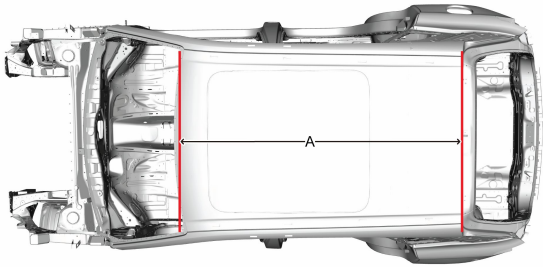
When the indoor temperature is lower than 20 °C, the structural adhesive must be heated by infrared oven lamp before it can be hardened; or move the vehicle to the paint baking room for baking.

Note that the temperature shall not be higher than 60 °C during heating

If the indoor temperature is higher than 20°C, after applying the structural adhesive, the vehicle needs to be placed statically for 36 hours without heating.

6. Weld the front/rear end of roof and beams.

Use CO₂ welding to weld the edges of front and rear windcreens of roof (figure A below) and polish them.



OEM Welding Information

Welding Identification

●—2 layers of welding

■—4 layers of welding

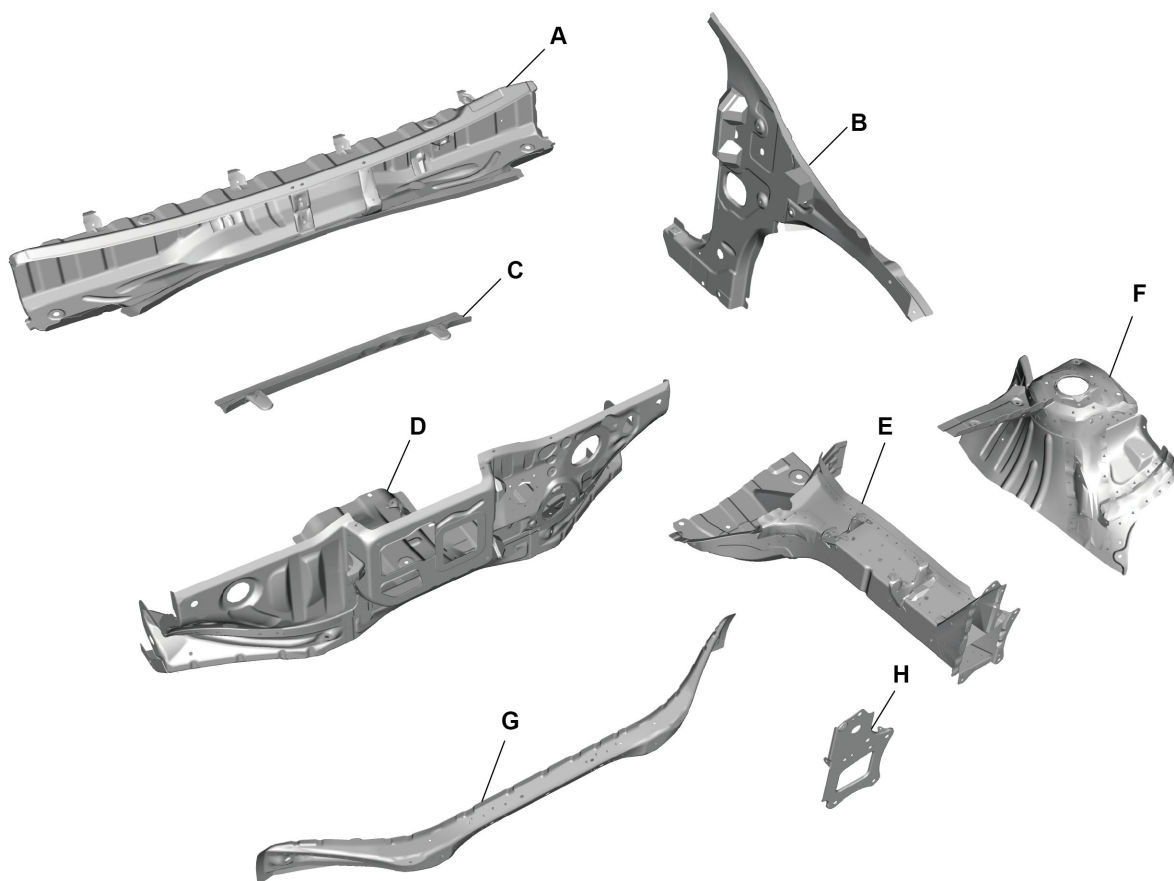
▲—3 layers of welding

■- MAG welding

Welding Information of Main Parts

Front-end Area

Structure



A - Vent Panel Assembly

C - Dash Panel Upper Beam Reinforcement Panel

E - Front Longitudinal Beam Assembly

G - Dash Panel Lower Beam Assembly

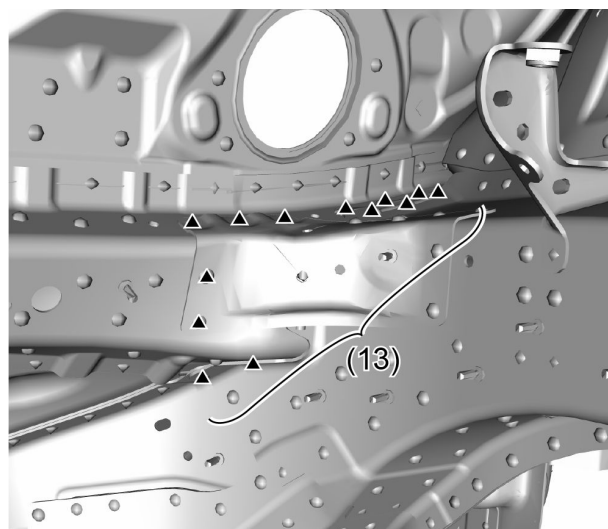
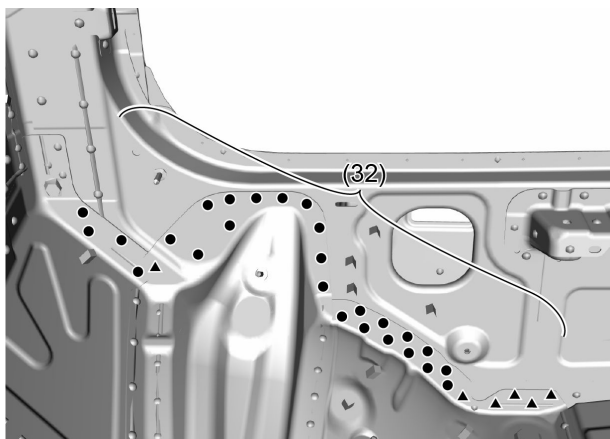
B - A Pillar Inner Panel Assembly

D - Dash Panel Assembly

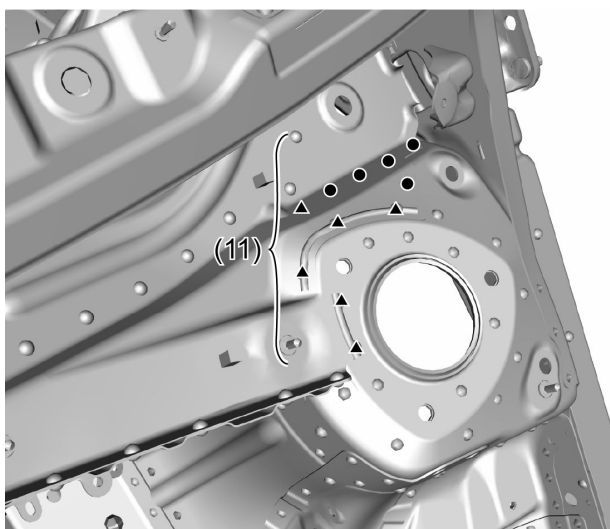
F - Front Wheelhouse Assembly

H - Front Longitudinal Beam Front Bumper Bracket

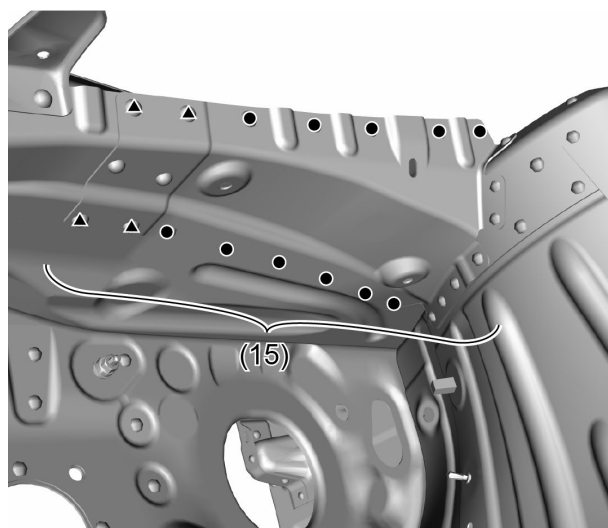
1. A Pillar Inner Panel Assembly to Dash Panel Assembly;



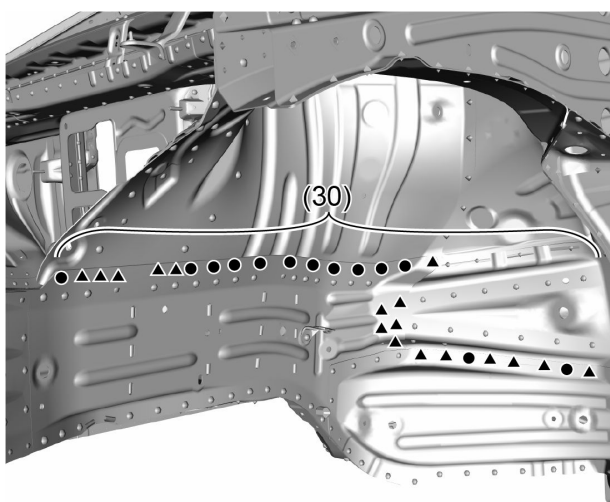
2. Front Wheelhouse Assembly to Vent Panel Assembly;



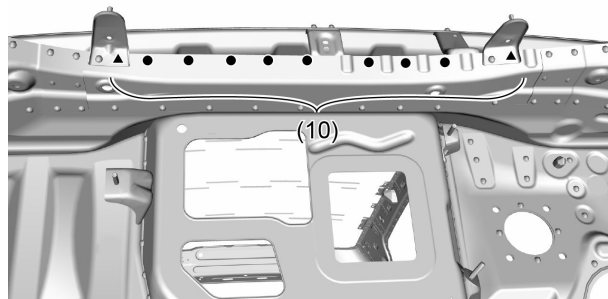
5. Front Wheelhouse Assembly to Dash Panel Upper Beam Reinforcement Panel;



3. Front Longitudinal Beam Assembly to Front Wheelhouse Assembly, Dash Panel Lower Beam Assembly;

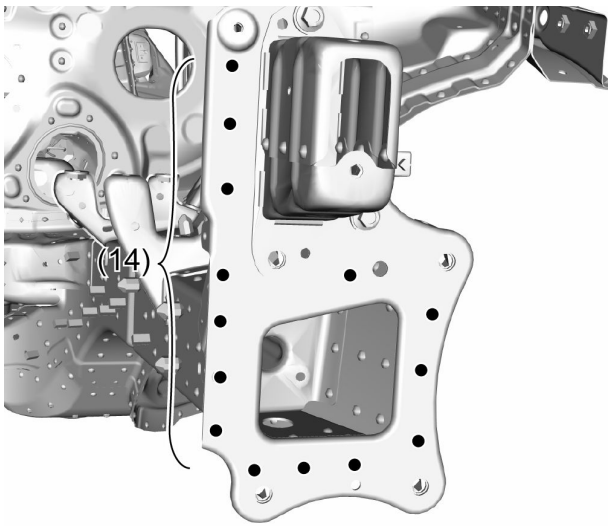


6. Dash Panel Upper Beam Reinforcement Panel to Vent Panel Assembly;

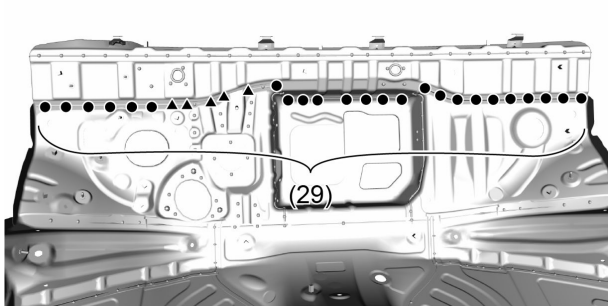


4. Front Longitudinal Beam Assembly to Dash Panel Lower Beam Assembly;

7. Front Longitudinal Beam Front Bumper Bracket to Front Longitudinal Beam Assembly;

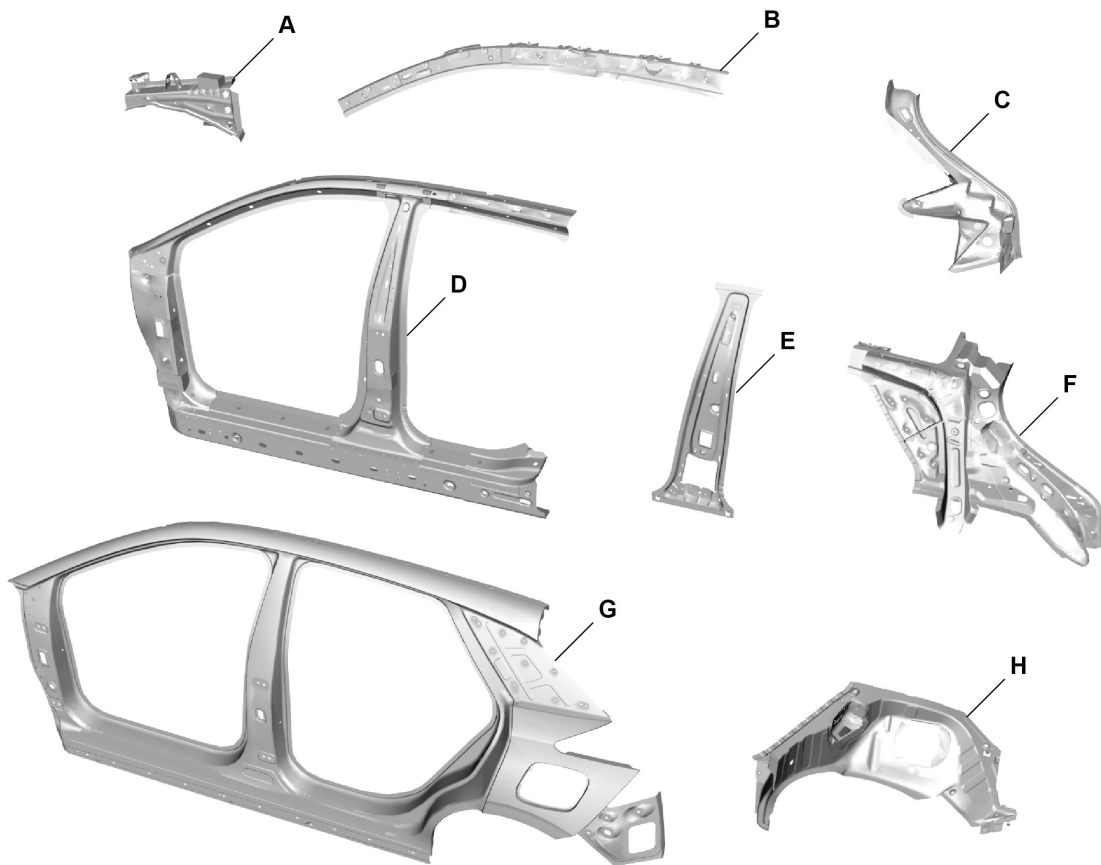


8. Vent Panel Assembly to Dash Panel Assembly;



Bodyside

Structure



A - Dash Panel Upper Beam Assembly

C - Tail Lamp Mounting Panel Assembly

E - B Pillar Inner Closure Panel Assembly

G - Bodyside Outer Panel

B - Upper Side Beam Closure Panel Assembly

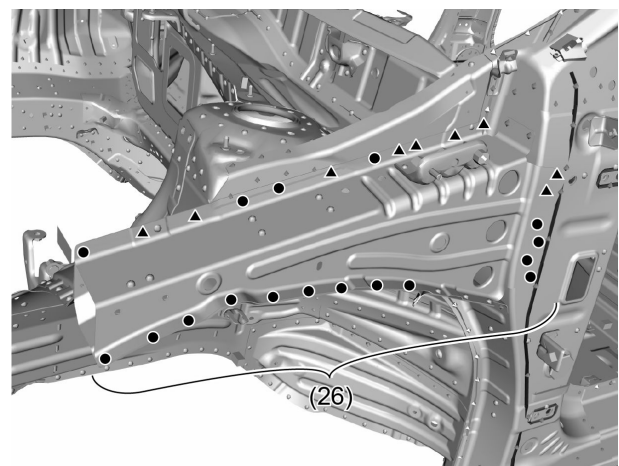
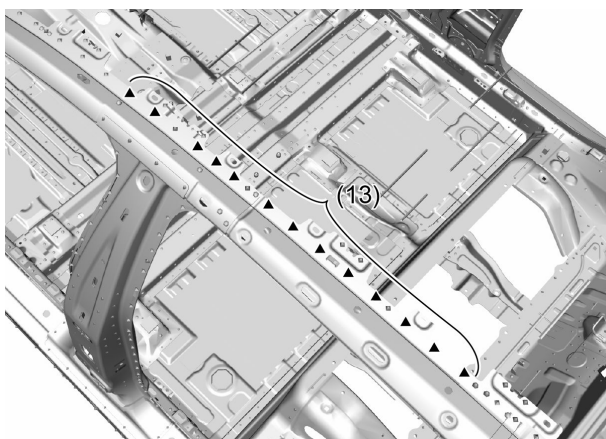
D - Bodyside Outer Panel Reinforcement Panel Assembly

F - Rear Bodyside Inner Panel Assembly

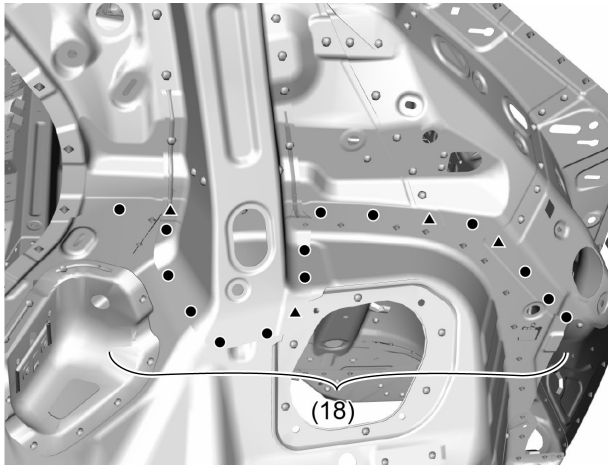
H - Rear Wheelhouse Inner Panel Assembly

1. Upper Side Beam Closure Panel Assembly to Bodyside Outer Panel Reinforcement Panel Assembly;

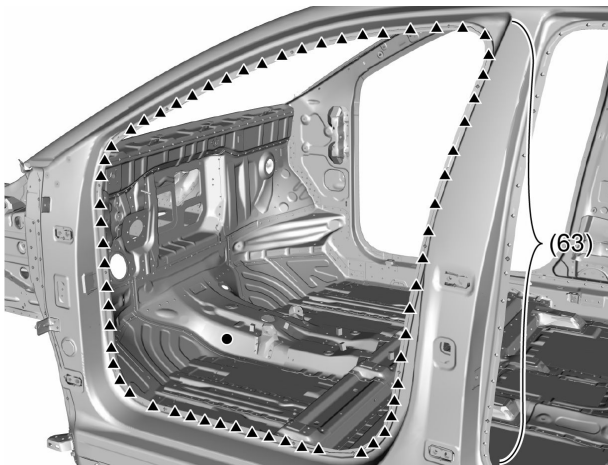
2. Dash Panel Upper Beam Assembly to A Pillar Inner Panel Assembly;



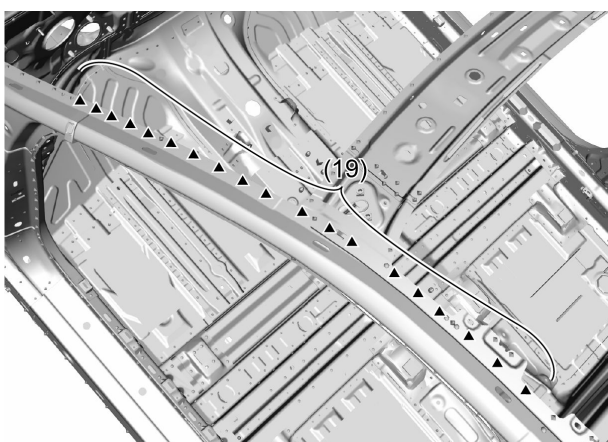
3. Rear Bodyside Inner Panel Assembly to Rear Wheelhouse Outer Panel Assembly;



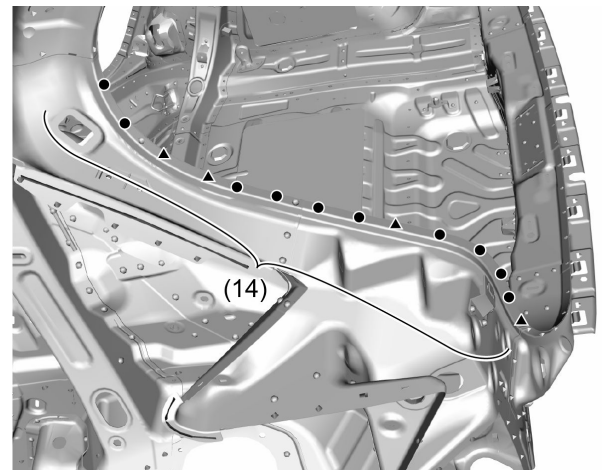
4. Bodyside Outer Panel to Bodyside Outer Panel Reinforcement Panel Assembly;



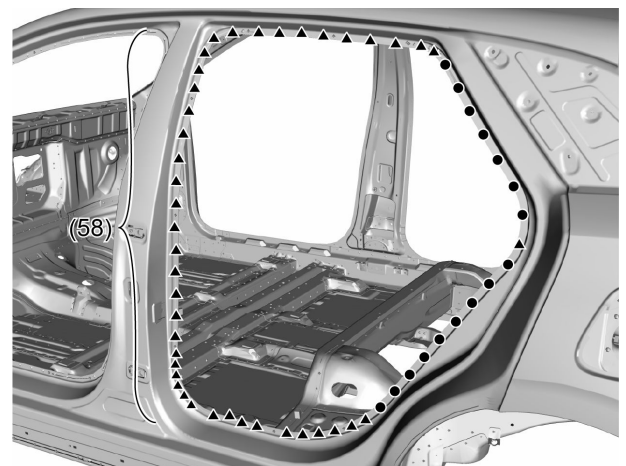
5. Upper Side Beam Closure Panel Assembly to Bodyside Outer Panel Reinforcement Panel Assembly;



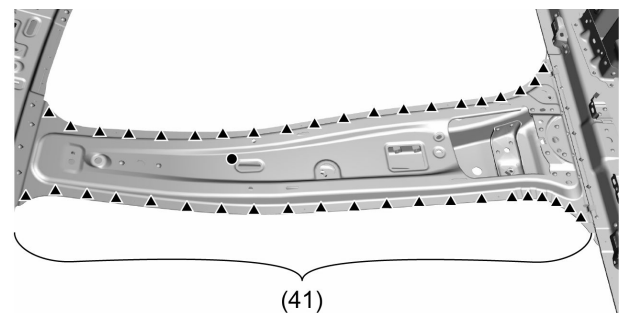
6. Tail Lamp Mounting Panel to Rear Bodyside Inner Panel Assembly;



7. Bodyside Outer Panel to Bodyside Outer Panel Reinforcement Panel Assembly;

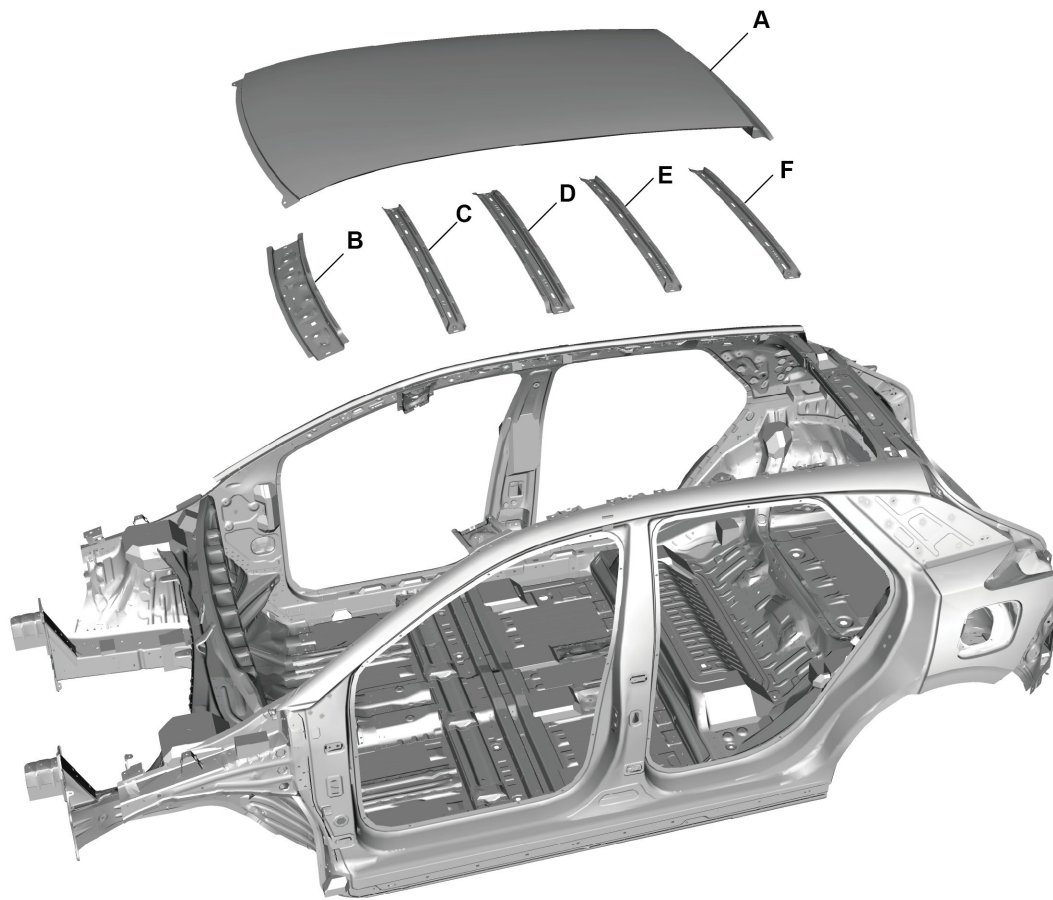


8. B Pillar Inner Closure Panel Assembly to Bodyside Outer Panel Reinforcement Panel Assembly;



Roof Area

Structure



A - Roof Panel Assembly

C - Middle Roof No.1 Beam

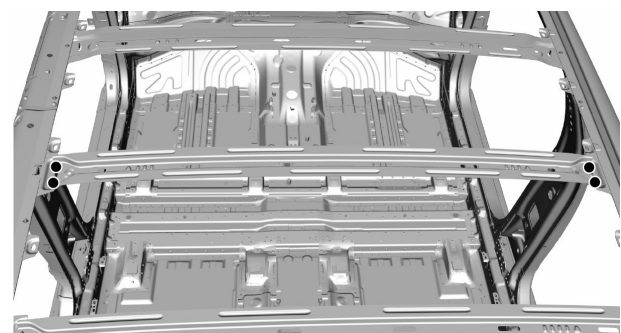
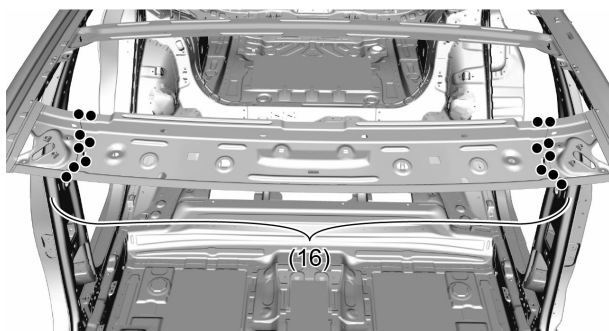
E - Middle Roof No.3 Beam

B - Front Roof Beam Assembly

D - Middle Roof No.2 Beam

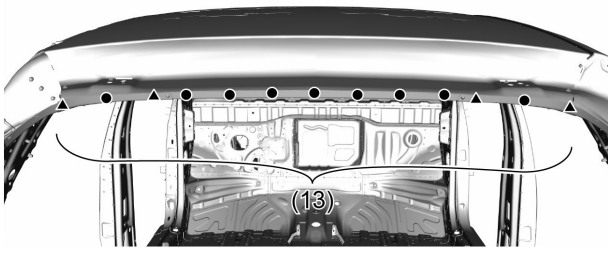
F - Middle Roof No.4 Beam

1. Front Roof Beam Assembly to B Pillar Inner Closure Panel Assembly;

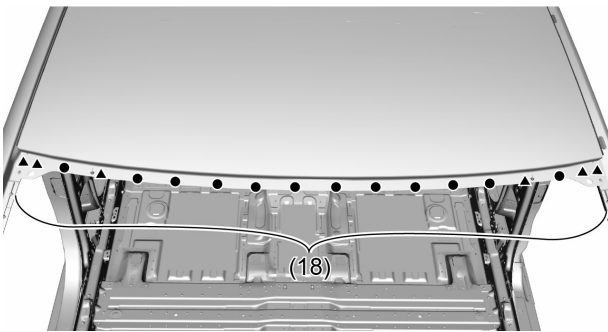


3. Roof Panel Assembly to Rear Roof Beam, Rear Bodyside Inner Panel Assembly;

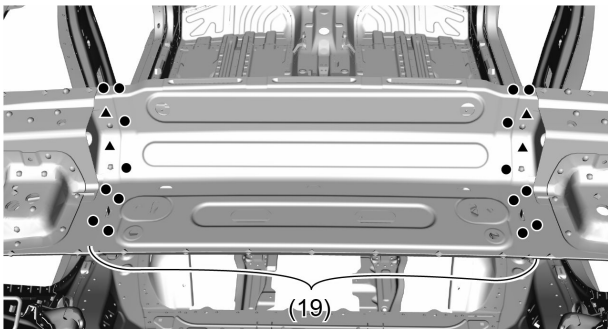
2. Middle Roof No.3 Beam to B Pillar Inner Closure Panel Assembly;



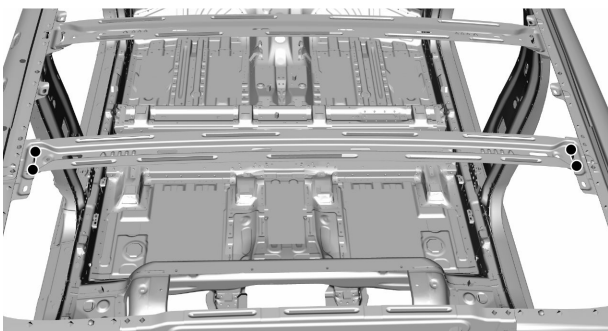
4. Roof Panel Assembly to Front Roof Beam, B Pillar Inner Closure Panel Assembly;



5. Rear Roof Beam to Rear Bodyside Inner Panel Assembly;



6. Middle Roof No.4 Beam to Rear Bodyside Inner Panel Assembly;

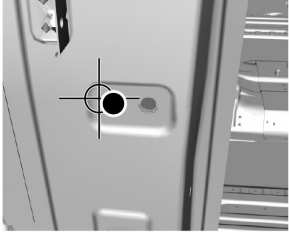


Body Size

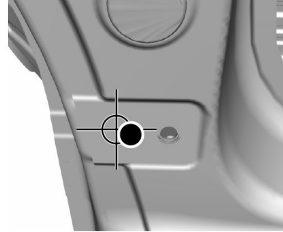
Point-to-point Dimension

Bodyside and Top Information

A
前门上铰链安装孔 $\Phi 11$
Front door upper hinge mounting hole



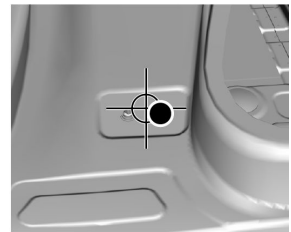
B
前门下铰链安装孔 $\Phi 11$
Front door lower hinge mounting hole



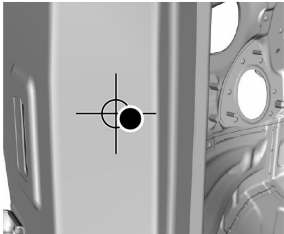
C
后门上铰链安装孔 $\Phi 14$
Rear door upper hinge mounting hole



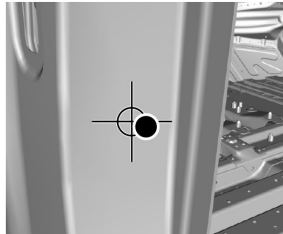
D
后门下铰链安装孔 $\Phi 14$
Rear door lower hinge mounting hole



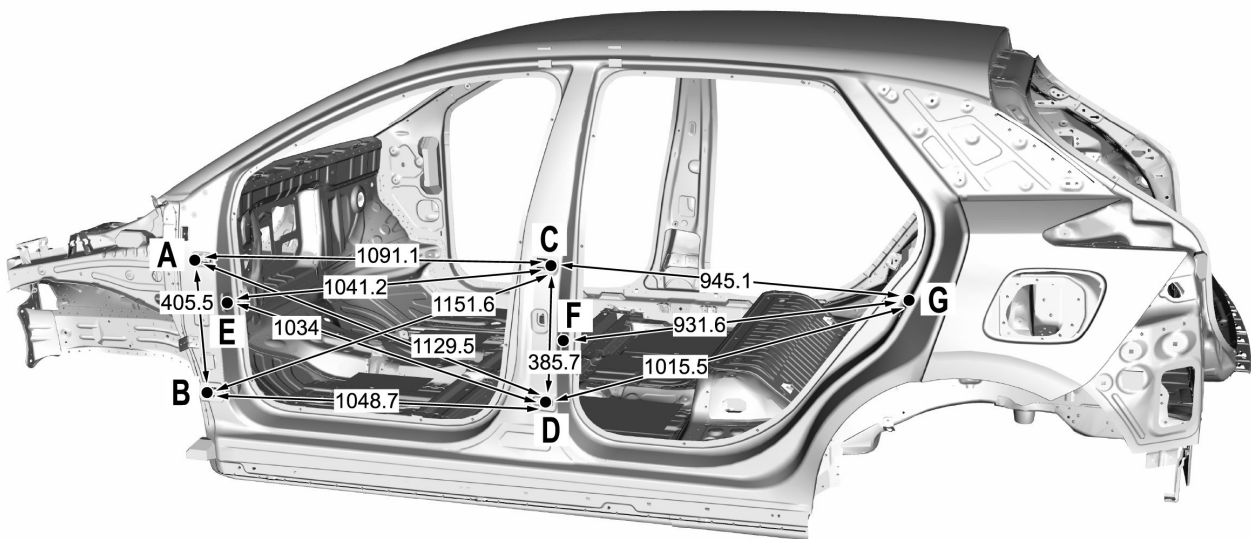
E
前门限位器安装孔 $\Phi 11$
Front door retainer mounting hole



F
后门限位器安装孔 $\Phi 11$
Rear door retainer mounting hole



G
后门锁扣安装孔 $\Phi 9$
Rear door swith mounting hole

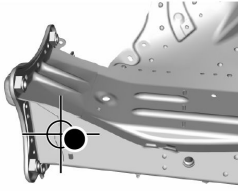


Note : All dimensions refer to central dimensions of hole (slotted hole).

Bottom Plate Information

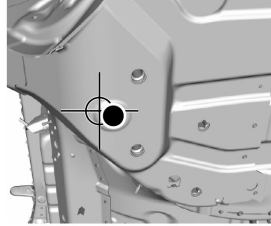
A1A2

基准孔 $\Phi 25$
Reference hole



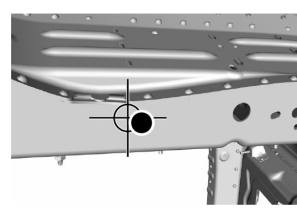
B1B2

前副车架安装孔 $\Phi 16$
Front subframe mounting hole



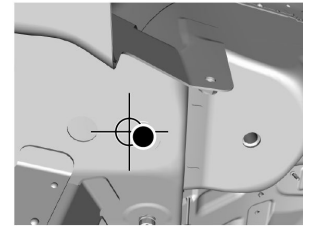
b

主基准孔 $\Phi 18$
Main reference hole



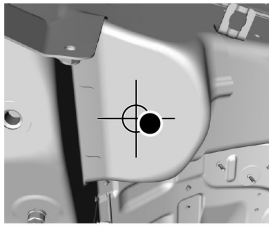
C1C2

后副车架安装孔 $\Phi 14$
Rear subframe mounting hole



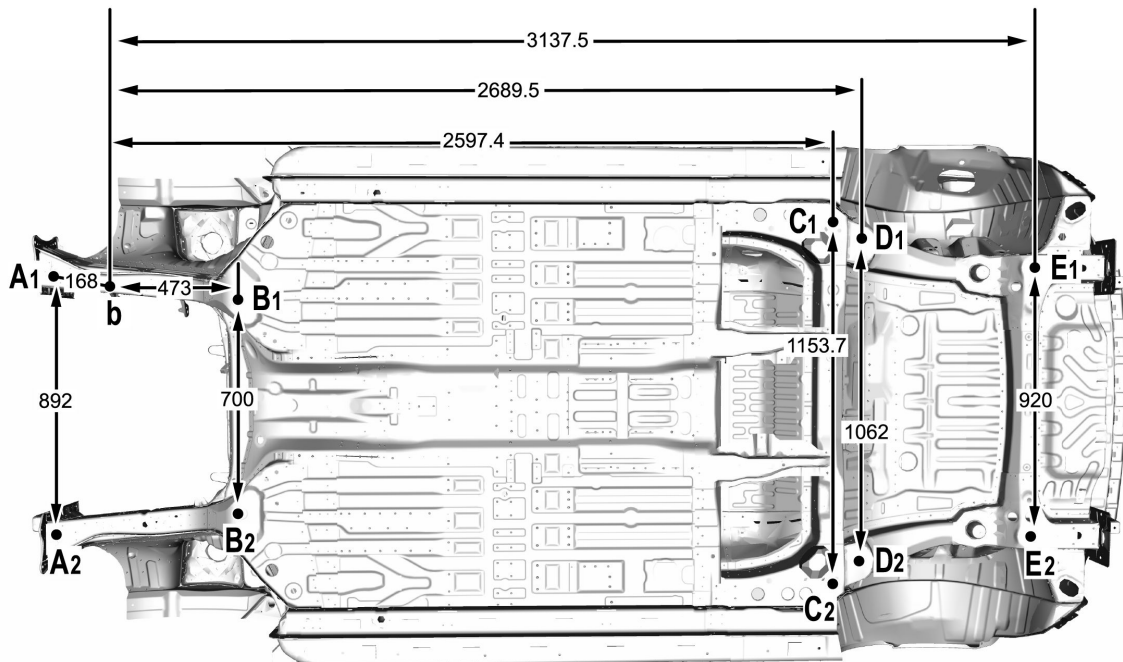
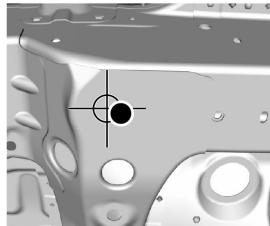
D1D2

后悬安装孔 $\Phi 16$
Rear suspension mounting hole



E1E2

后副车架安装孔 $\Phi 16$
Rear subframe mounting hole

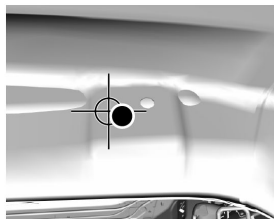


Note : All dimensions refer to central dimensions of hole (slotted hole).

Rear End Information

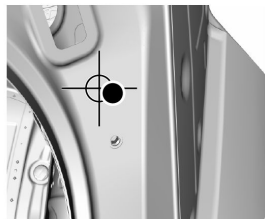
A1A2

尾门铰链安装孔 $\Phi 12$
Tail door link mounting hole



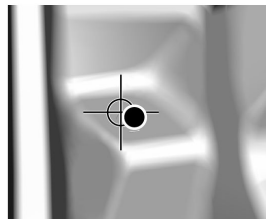
B1B2

尾门气弹簧安装孔 $\Phi 6.6$
Tailgate gas spring mounting hole



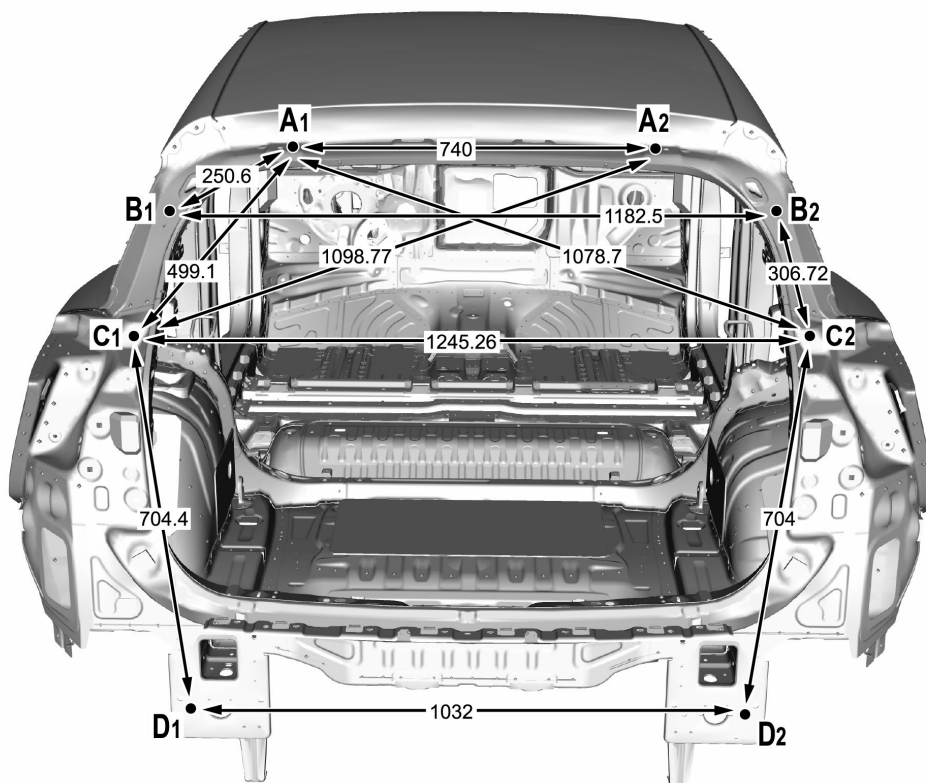
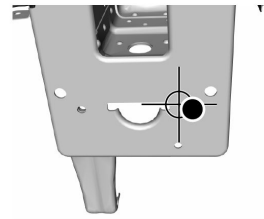
C1C2

尾灯安装孔 $\Phi 5$
Tail lamp mounting hole



D1D2

后缓冲梁安装孔 $\Phi 8$
Rear bumper beam mounting hole



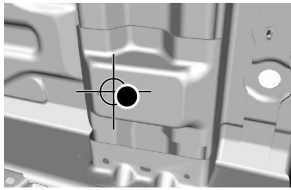
Note : All dimensions refer to central dimensions of hole (slotted hole).

Internal Information

A1A2

前排座椅安装孔 $\Phi 9$

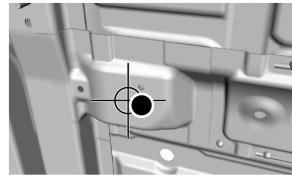
Front seat mounting hole



B1B2

前排座椅安装孔 $\Phi 9$

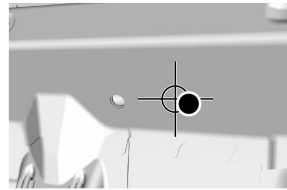
Front seat mounting hole



C

后排座椅安装孔 $\Phi 10$

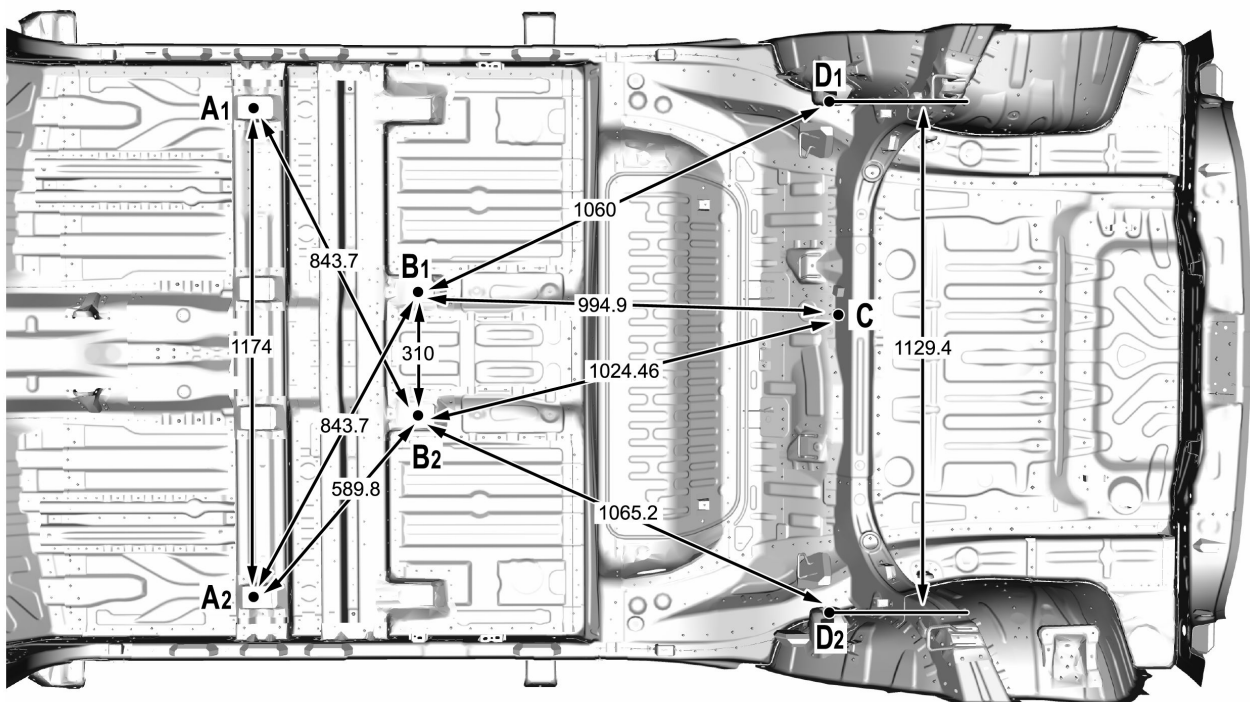
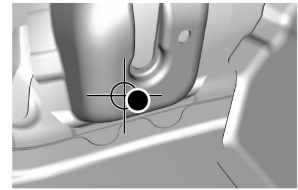
Rear seat mounting hole



D1D2

后排座椅安装孔 $\Phi 8$

Rear seat mounting hole

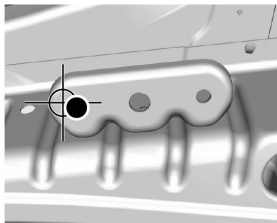


Note : All dimensions refer to central dimensions of hole (slotted hole).

Front End Information

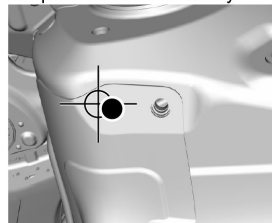
A1A2

发动机罩铰链安装孔 $\Phi 8$
Hood hinge mounting hole



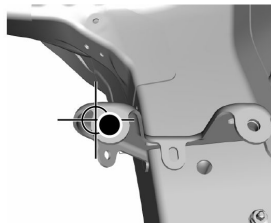
B1B2

前舱横梁总成安装孔 $\Phi 8$
Mounting hole of front compartment beam assembly



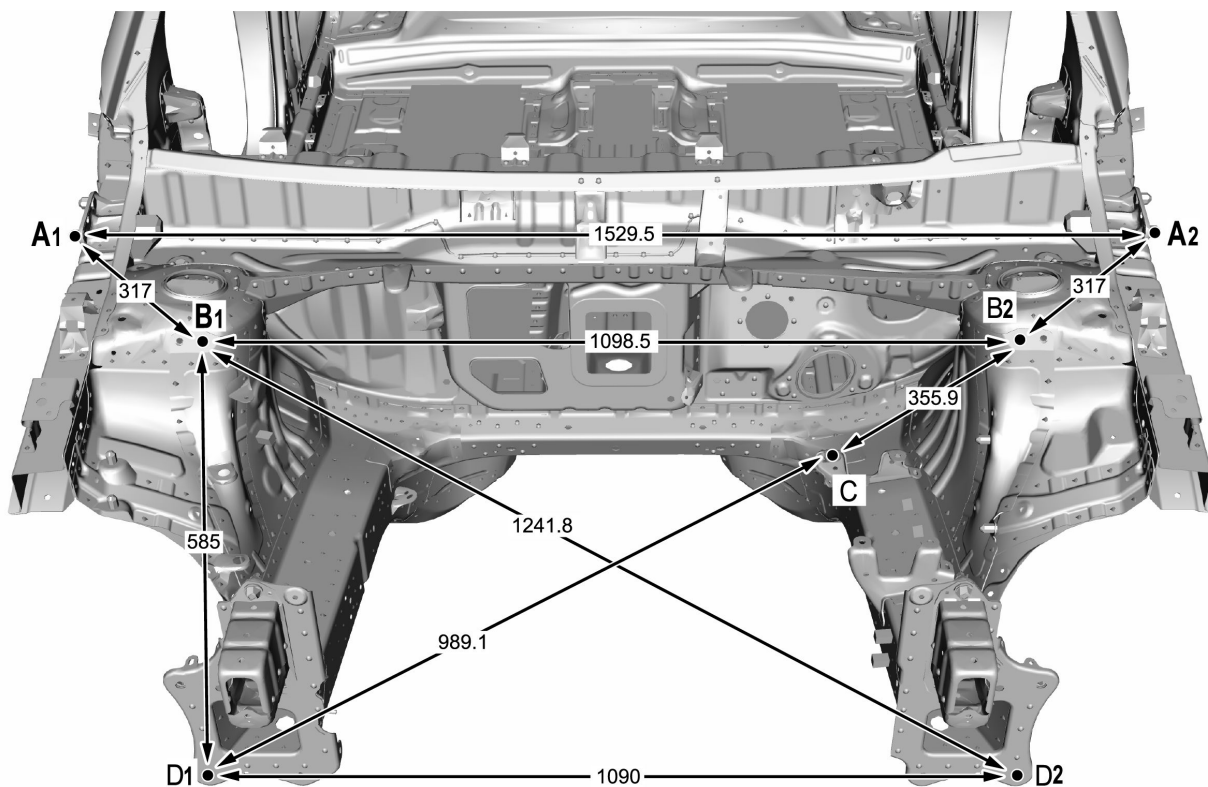
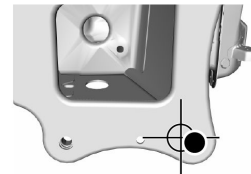
C

蓄电池安装孔 $\Phi 8$
Battery mounting hole



D1D2

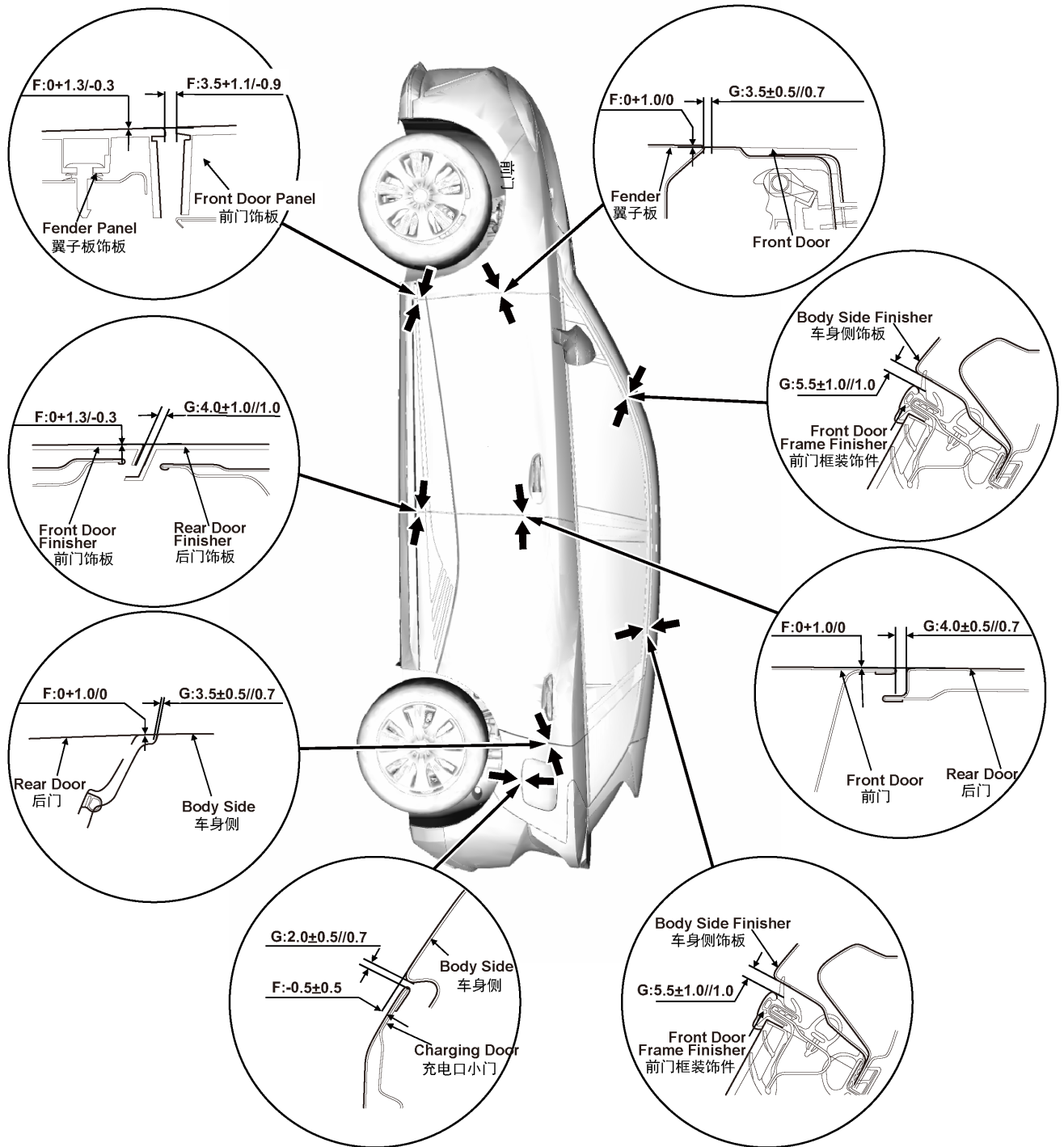
前缓冲梁安装孔 $\Phi 10$
Front buffer beam mounting hole



Note : All dimensions refer to central dimensions of hole (slotted hole).

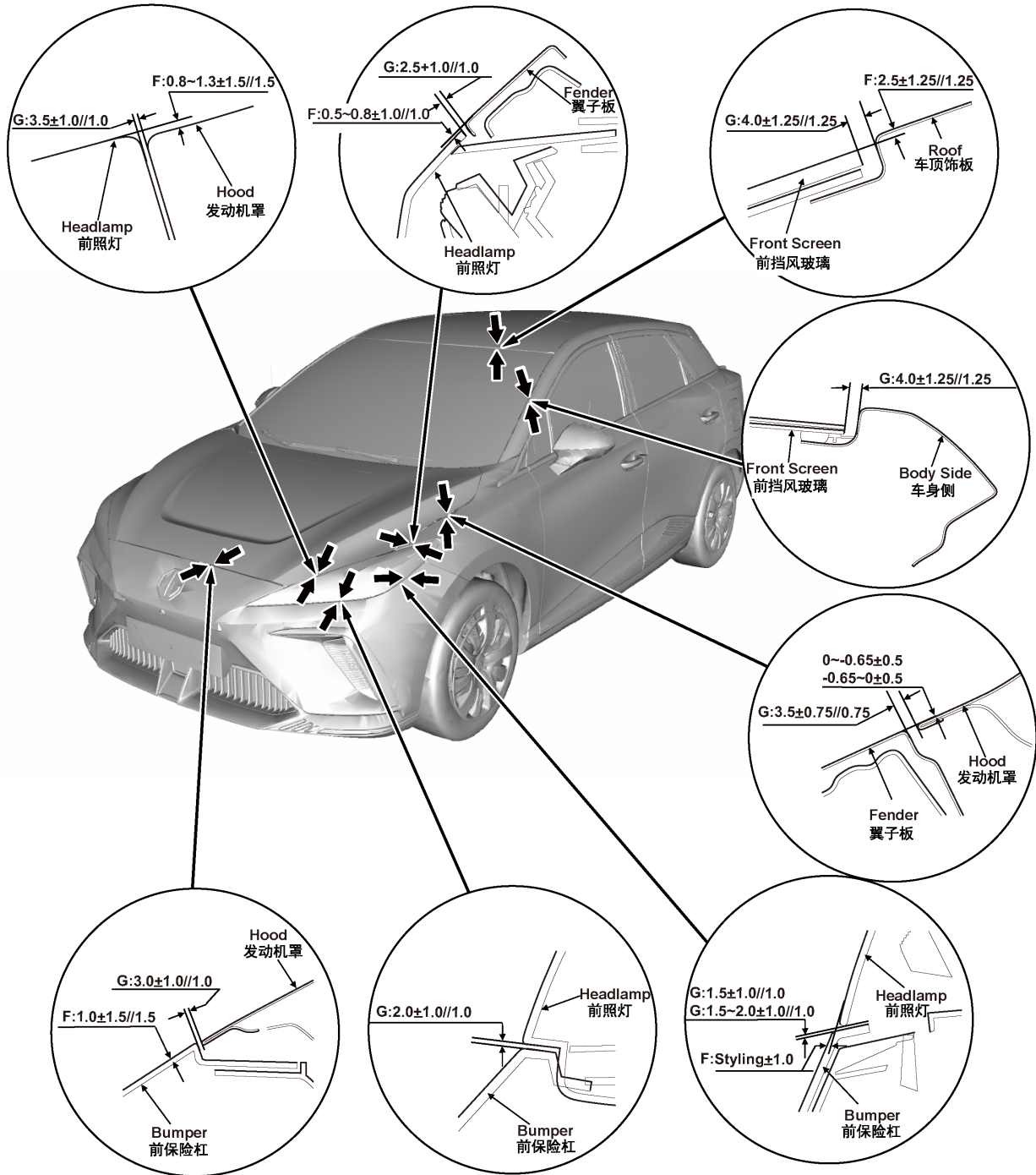
Gap Size

Body Side and Fuel Filler Cap Information



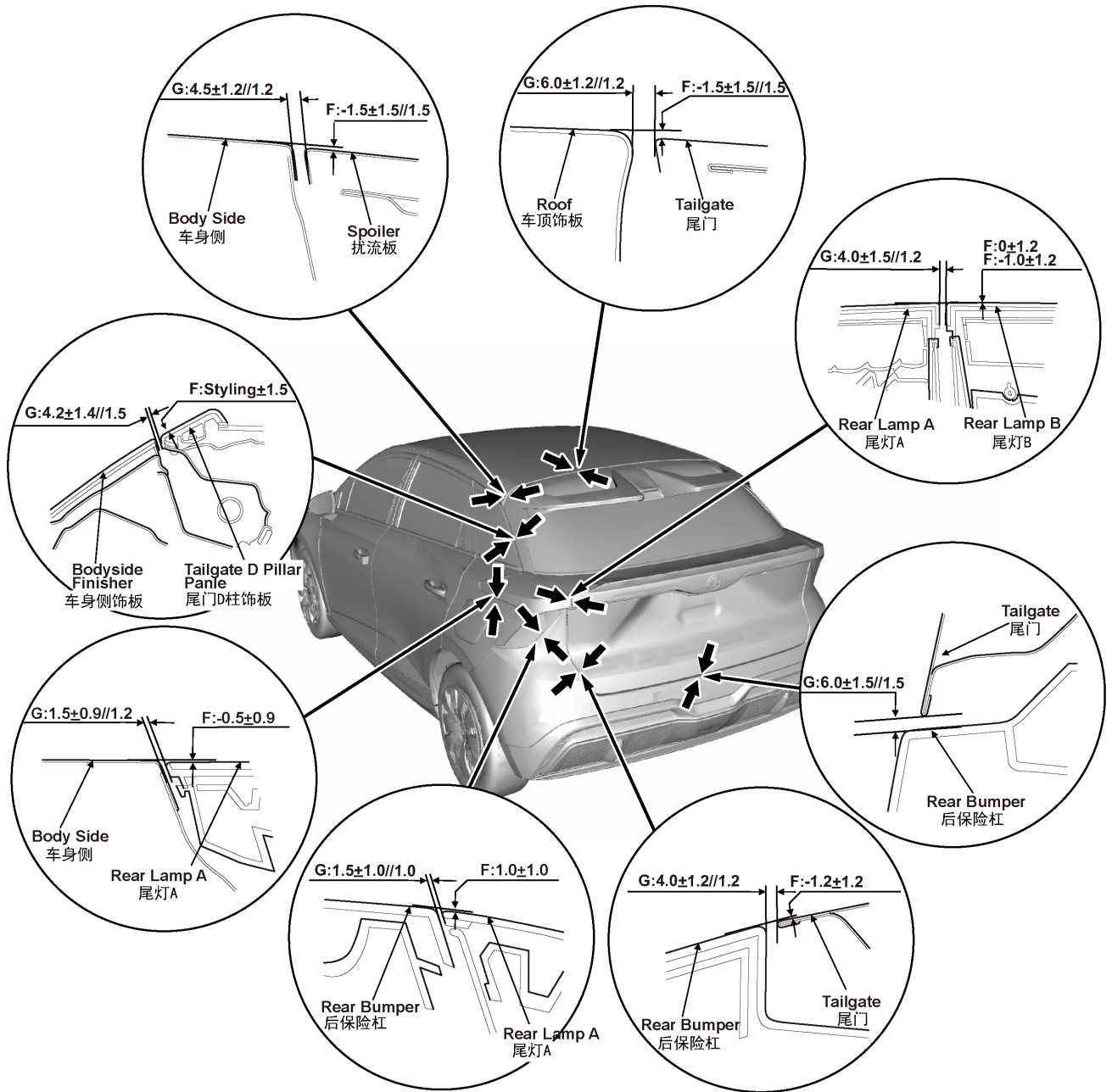
Note : "://" represents requirements for uniformity, which means the difference between maximum and minimum values of measured gap shall be within the specified range.

Front End Information



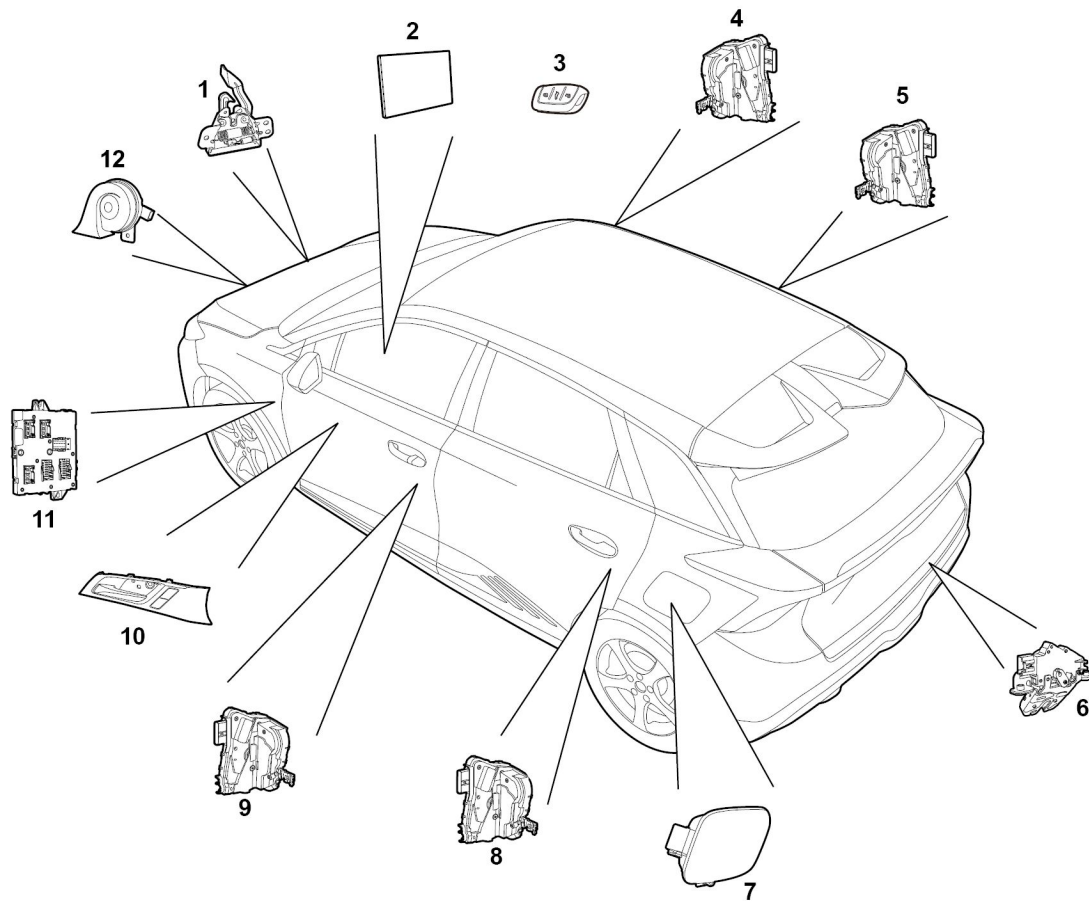
Note : "//" represents requirements for uniformity, which means the difference between maximum and minimum values of measured gap shall be within the specified range.

Rear End Information



Note : "//" represents requirements for uniformity, which means the difference between maximum and minimum values of measured gap shall be within the specified range.

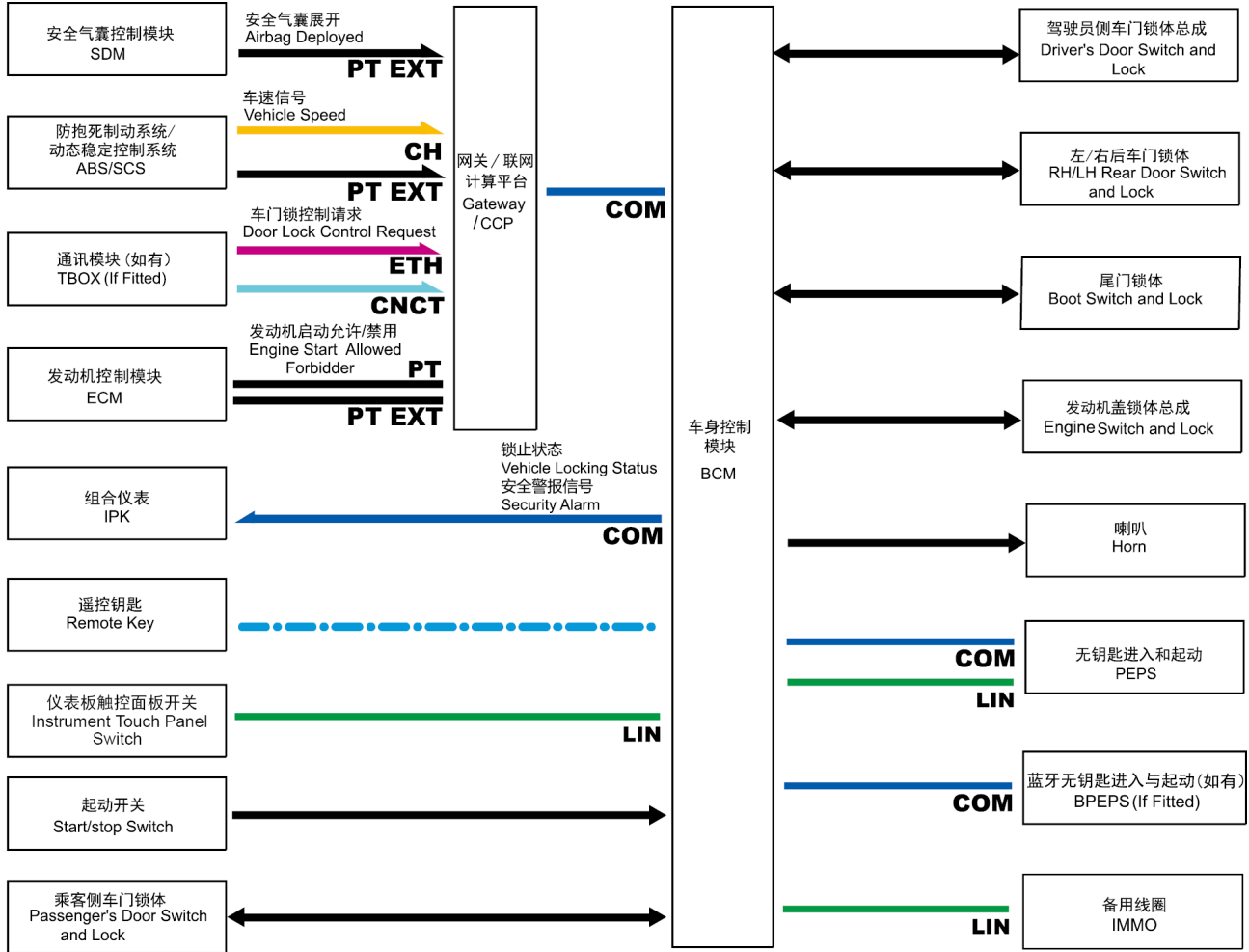
Vehicle Access and Safety
Description and Operation
System Layout



S8210064

- | | |
|------------------------------------|--|
| 1. Front Compartment Lock Assembly | 7. Charging Port Door Lock Assembly |
| 2. Instrument Pack | 8. Left Rear Door Lock Assembly |
| 3. Keys | 9. Driver Side Door Lock Body Assembly |
| 4. Front Right Door Lock Assembly | 10. Door Lock Switch |
| 5. Right Rear Door Lock Assembly | 11. Body Control Module |
| 6. Tail Gate Lock Assembly | 12. Horn |

System Control Diagram



A —●●● B ——— C ——— D ——— E ——— F ——— G ——— H ———

S8221230

A = RF Signal; B = Power HS/Power Extension CAN Bus; C = Chassis HS CAN Bus; D = Hard Wire; E = Ethernet CAN Bus; F = Connection CAN Bus; G = Comfort CAN Bus; H = LIN Bus

Operation

Overview

Operation of Vehicle Access and Anti-theft System

The vehicle security system includes the following three parts:

1. Peripheral system:
 - Bonnet, door and tail gate OPEN switch
 - Start Switch
 - Instrument panel touch panel switch (unlock/lock)
2. Acoustic alarm: vehicle horn
3. Visible alarm: hazard warning lamp

The security system is divided into three independent zones, and each zone includes many discrete input signals (see the table below). When the security system is working, any intrusion into these zones can trigger the alarm.

Safety zone	Discrete signal
1 (front)	<ul style="list-style-type: none"> • Bonnet open switch
2 (middle/inside)	<ul style="list-style-type: none"> • Driver door open switch • Front passenger door open switch • Left rear door open switch • Rear right door open switch • Driver door key unlock (timed for 15s) • Central lock LOCK/UNLOCK switch
3 (rear)	<ul style="list-style-type: none"> • Tailgate release switch

Complete Anti-theft Status

When the three zones of the security system are closed, if a LOCK request from the remote key, mechanical key, PEPS, etc. is received, the security system formally enters the complete anti-theft status. Once in the complete anti-theft status, all activated safety zones will be monitored at all times. When the switch of zone 2 or 3 is enabled (except for the driver door), if you attempt to lock the system from outside, the vehicle will enter the partial lock status and give an error lock alarm.

TheBCMwill monitor the following outside LOCK request signals:

- Valid LOCK request from the remote key is received.
- Valid LOCK request from the PEPS control module is received.
- Valid LOCK request from the driver door lock switch is received.
- Valid LOCK request from TBOX is received (if equipped)

When the security system enters the complete anti-theft status, theBCMwill allow the direction indicator lamp to give three flashes.

Complete Anti-theft Status to Partial Anti-theft Status

In the complete anti-theft system, if a valid UNLOCK request of the tail gate is received, theBCMopens the tail gate and the security system enters the partial anti-theft status.

Partial Anti-theft Status

If the error lock is caused by zone 1 only (for example, the bonnet is open), zone 2 and 3 will enter the complete anti-theft status.

If the error lock is caused by zone 2 only (for example, 1 door or more doors are open), zones 1 and 3 will enter the complete anti-theft status.

If the error lock is caused by zone 3 only (for example, the tail gate is open), zone 1 and 2 will enter the complete anti-theft status.

Partial Anti-theft Status to Complete Anti-theft Status

When each safety zone is in anti-theft status, the vehicle will enter the complete anti-theft status.

For partial locks caused by error lock due to open door, when the security system enters the anti-theft status, it can be disabled after being enabled within 5 seconds, and the alarm will not be triggered.

If the partial anti-theft is caused by several zones, when the relevant doors/lids of these zones are closed, these zones will enter the complete anti-theft status. The entire security system enters the complete anti-theft status only when all the zones enter the status.

Error Lock Alarm

With the door (bonnet, tail gate) open, and the start switch in ACC or ON/RUNNING position or the engine running, when using the mechanical key or remote key to lock the vehicle from outside and when using the PEPS LOCK request, theBCMwill activate the horn to send an acoustic alarm to indicate error lock.

Disable Security System

Any of the following operations will cause theBCMto disable the security system:

- Valid UNLOCK request from the remote key is received.
- Valid UNLOCK request from the PEPS control module is received.
- Valid UNLOCK request from the driver door switch is received.
- Valid UNLOCK request from TBOX is received (if any)

Caution : If the driver door unlock switch is stuck or the switch circuit is short-circuited, the emergency key will not

be used to disable the alarm; while the remote key will not be affected.

If the driver door unlock switch is stuck or the switch circuit is short-circuited, the emergency key will not be used to disable the alarm; while the remote key will not be affected.

When the security system is disabled, the BCM will allow the direction indicator lamp to flash once.

Unlock Triggered by Impact

When the airbag control module senses an impact, it will send an UNLOCK request, and the door will unlock automatically except in the case of external locking.

Auto Relock

After being unlocked with the remote key, the vehicle will automatically return to the previously locked status if there is no operation within 30 seconds. In the automatically re-locked status, if the start switch is in the "ACC" position or a valid key exists, the current timing of the re-locked timer is canceled, and the auto re-locked function is canceled.

Auto Lock

If the driver door is closed and the vehicle is unlocked, when the vehicle speed reaches a certain value, the door will lock automatically.

Auto Unlock

With the vehicle in an internally locked state, turn the start switch to "OFF" position, the vehicle will unlock automatically.

Door Lock Controlled by Instrument Panel Touch Panel Switch

With the driver door closed and the impact signals disabled, press the LOCK button of the instrument panel touch panel switch to lock all doors.

With the vehicle internally locked, press the UNLOCK button of the instrument panel touch panel switch to unlock all doors.

When an impact occurs and the impact signal is triggered, the door unlocks automatically.

Passive Entry and Passive Start System

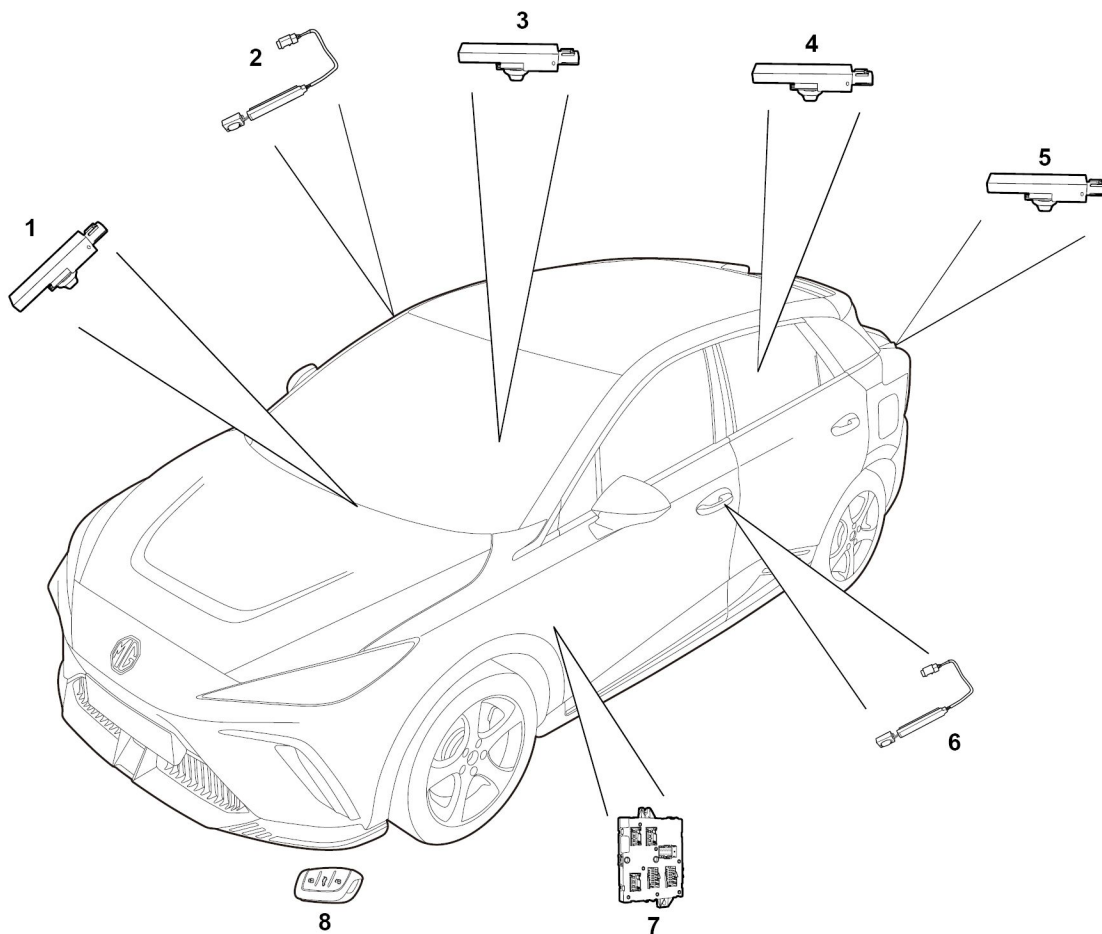
Specification

Torque

Description
Value

Description and Operation

System Layout

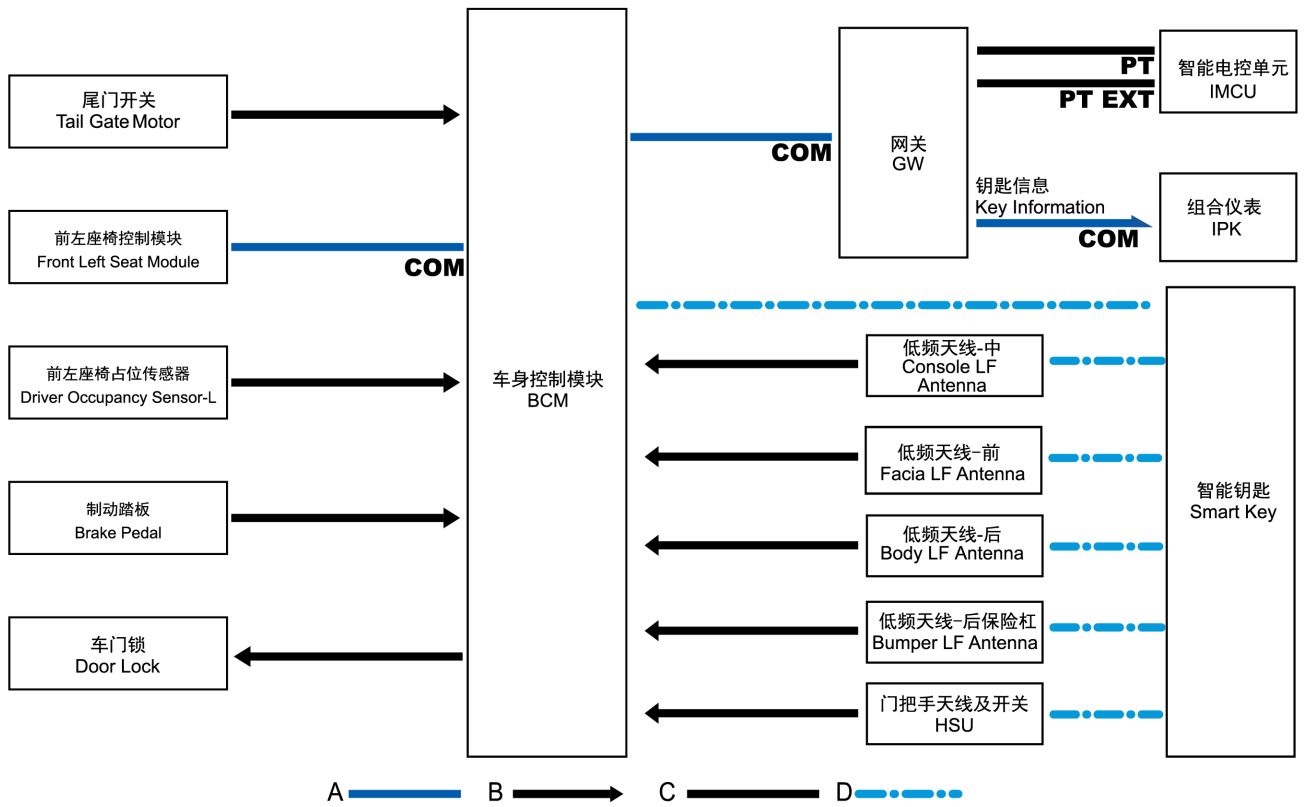


S8220060

- | | |
|---|--|
| 1. LF Antenna - Front | 5. LF Antenna - Rear Bumper Fascia |
| 2. Front Passenger Side Exterior Door Handle Antenna and Switch | 6. Driver Side Exterior Door Handle Antenna and Switch |
| 3. LF Antenna - Centre | 7. Body Control Module |
| 4. LF Antenna - Rear | 8. Keys |

System Control Diagram

PEPS Control Diagram



S8210063

A = Comfort CAN Bus; B = Hard Wire; C = Power HS/Powertrain Expansion CAN Bus; D = RF Signal

Description

PEPS System Overview

For vehicles with PEPSsystem, the traditional key is replaced by the smart key, and the operation of PEPS is achieved by LF/RF (wireless) communication between the smart key and the vehicle.

- Passive entry: No action is required for the smart key. You just need to take the smart key with you, and you can enter into your vehicle by simply pressing the button on the door handle and pulling the handle.
- Passive start: You just need to put the smart key in the vehicle, driver sat on the driver seat and control pedal to start the vehicle without traditional insertion/removal of the key.

The PEPSsystem includes: smart key, interior LF antenna, exterior door handle antenna/switch, exterior door handle button switch and rear bumper fascia LF antenna.

Operation

In the vicinity of the closed door and in the driver compartment, the PEPSsystem can monitor and identify the smart key.

Identifier/Smart Key

The smart key is a hand-held electronic device which is powered by the lithium battery. Each vehicle is provided with 2 matching smart keys. Once the match is finished, the smart key can perform LF/RF communication in the PEPSsystem. As long as the lithium battery provides power, the smart key can receive LF signals and communicate with the BCMto lock/unlock and start the vehicle normally.

The smart key detects LF electromagnetic field signal from the vehicle LF antenna and exterior door handle antenna/switch.

Function of Smart Key in PEPSSystem

The passive entry or passive start system must have a smart key.

The passive entry or passive start system must have a smart key.

- PE mode (passive entry): The smart key receives the LF signal and sends the RF signal to complete the authentication and match in the LF coverage area.
- Remote key entry mode: When pressing the button on the key, the authentication code transmitted by the RF signal will be used as the LOCK/UNLOCK request for the door or tailgate.
- Low battery mode of the smart key: The smart key is provided with a mechanical key matching the vehicle lock, which can be used to lock/unlock the vehicle.

Effect of Smart Key on Vehicle Start

- PS mode (passive start): The smart key receives the LF signal and sends the RF signal to complete the authentication and match.
- Low battery mode of the smart key: The smart key shall be close to the spare coil, where the smart key is authenticated in the transponder mode through the BCMcontrol.

Smart Key/Identifier Management

At the time of delivery, the vehicle is provided with 2 matching smart keys, the smart keys can be added or deleted later through an after-sales diagnosis device.

Exterior Door Handle Antenna/Switch/Button Switch

Exterior door handle antenna/switch is an assembly of the LF antenna and switch. The exterior door handle button switches are the passive entry button switches on the power sliding doors. They are connected to the BCM. The BCMdrives the LF antenna to generate a magnetic field. The BCMreads the status of the switch, i.e. detects the action of the user.

Function of Exterior Door Handle Antenna/Switch/Button Switch in PEPSSystem

The LF antenna generates an LF electromagnetic induction area near the door so that the user can request locking/unlocking the door. Only when a matching smart key is detected by the vehicle in the LF antenna coverage area, and the LOCK/UNLOCK request received matches the status of the door lock, can the lock and unlock operation be performed.

When the user operates the button switch on the door handle or the door handle of the power sliding door, the BCMwill drive the LF antenna to generate an electromagnetic field signal. The smart key carried by the user can detect/receive the electromagnetic field signal and give a response to the BCMby the RF signal, and the PEPSsystem validates the legality of the key and unlocks the door eventually, ensuring entry of the legal user into the vehicle.

LF Antenna

The independent LF antenna consists of 3 internal LF antennas and 1 LF antenna of the rear bumper fascia. To ensure the smart key can receive the LF signal in the coverage area of antenna, the antenna generates the LF magnetic field signal.

Function of LF Antenna in PEPSSystem

The LF antenna transmits LF signal in the PEPSsystem and communicates with the smart key.

Internal LF Antenna

The internal LF antenna is necessary for passive start, which sends the LF signal to the smart key, and the feedback RF signal of the smart key sends the authentication information to BCM. After the legal authentication is successful, the vehicle is allowed to start.

The internal LF antenna can also be used to search the smart key in the driver compartment and determine if the vehicle can be locked, this prevents the user from leaving the smart key in the vehicle when locking the vehicle.

LF Antenna of Rear Bumper Fascia

In the passive entry system, the antenna of the rear bumper fascia is used to separately open the tailgate, and cannot be used for passive start. The LF antenna of the rear bumper fascia sends the LF signal to the smart key near the tailgate, and the smart key returns RF signal to the BCM. After the authentication of the BCM, the tailgate is unlocked.

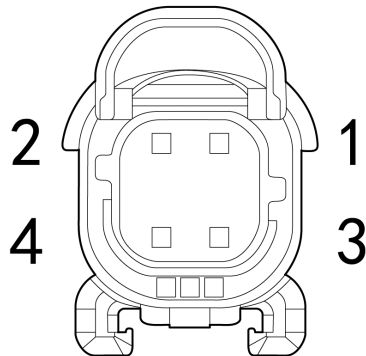
If the smart key is simultaneously covered by the LF signal of the internal antenna and the LF signal of rear bumper fascia antenna, the smart key cannot unlock the tailgate or the vehicle.

BCMand Peripheral Equipment

The RF signal from the smart key is received by the RF receiver in the BCM, and the BCMmatches and authenticates the current smart key.

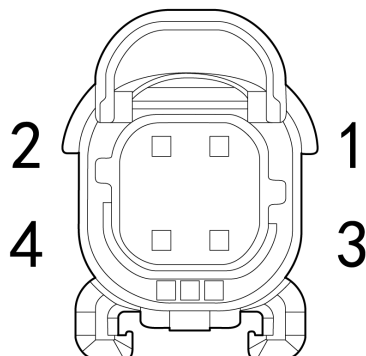
Detailed Information List of Component Pins

End View and Pin Information of Driver Door Handle Antenna Harness Connector DD008



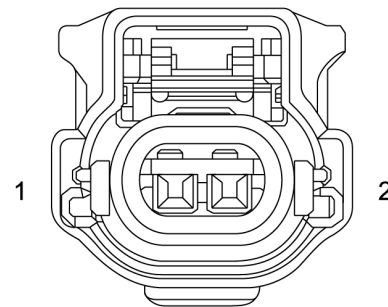
Pin No.	Description
1	Driver Door Handle LF Antenna Signal - High
2	Driver Door Handle LF Antenna Signal - Low
3	Driver Door Handle Switch Signal
4	Ground

End View and Pin Information of Passenger Door Handle Antenna Harness Connector PD007



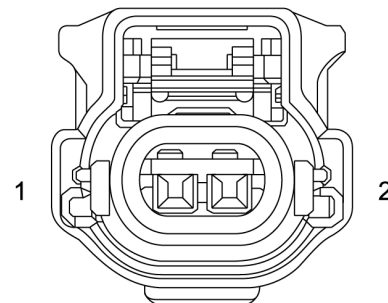
Pin No.	Description
1	Passenger Door Handle LF Antenna Signal - High
2	Passenger Door Handle LF Antenna Signal - Low
3	Passenger Door Handle Switch Signal
4	Ground

End View and Pin Information of Front LF Antenna Harness Connector FA027



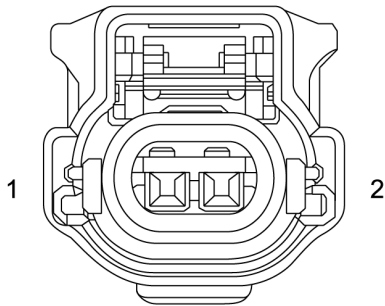
Pin No.	Description
1	Front LF Antenna Signal - High
2	Front LF Antenna Signal - Low

End View and Pin Information of Middle LF Antenna Harness Connector CS006



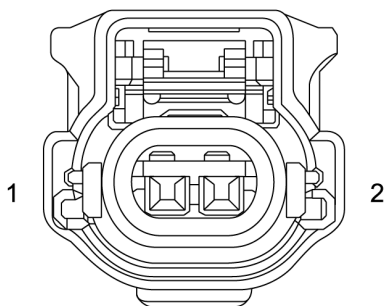
Pin No.	Description
1	Middle LF Antenna Signal - High
2	Middle LF Antenna Signal - Low

**End View and Pin Information of Rear LF Antenna
Harness Connector BY014**



Pin No.	Description
1	Rear LF Antenna Signal - High
2	Rear LF Antenna Signal - Low

**End View and Pin Information of Rear Bumper Fascia
Antenna Harness Connector BY054**



Pin No.	Description
1	Rear Bumper Fascia Antenna Signal - High
2	Rear Bumper Fascia Antenna Signal - Low

Service Guide

Passive Entry and Passive Start (PEPS)

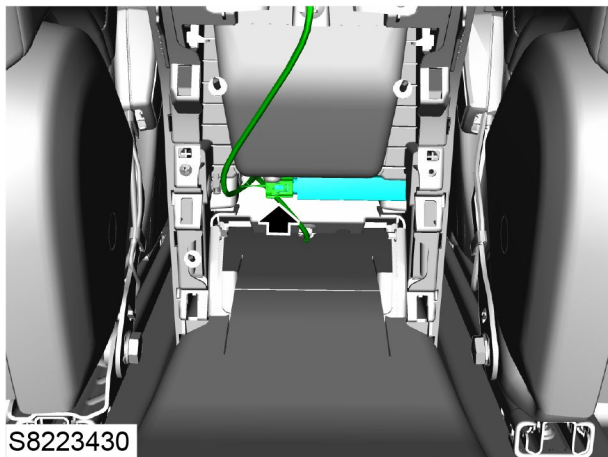
Antenna - Front

Remove

1. Disconnect the negative battery cable.
2. Remove the centre console rear panel assembly.

Centre Console Rear Panel Assembly Remove

3. Disconnect the harness connector.



4. Loosen the clip and remove the PEPS antenna - centre.

Refit

1. Align the locating point of PEPS antenna - centre with the mounting hole and press down to engage.
2. Connect the harness connector.
3. Fit the centre console rear panel assembly.

Centre Console Rear Panel Assembly Refit

4. Connect the negative battery cable.

Passive Entry and Passive Start (PEPS)

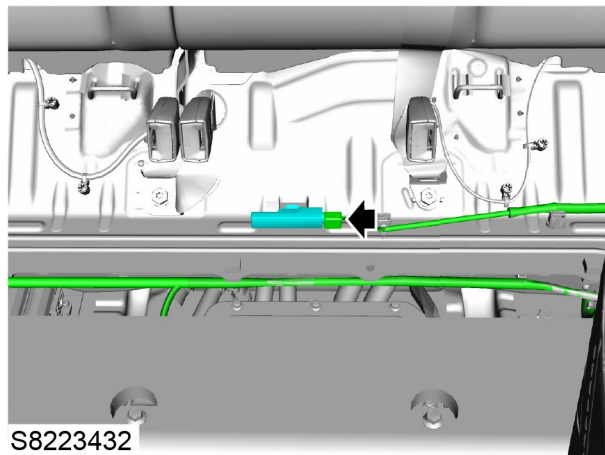
Antenna - Rear

Remove

1. Disconnect the negative battery cable.
2. Remove the rear seat cushion.

Rear Seat Cushion Remove

3. Disconnect the harness connector.



4. Loosen the clip and remove the PEPS antenna - rear.

Refit

1. Fix the PEPS antenna - rear to the body and press the clip.
2. Connect the harness connector.
3. Fit the rear seat cushion.

Rear Seat Cushion Refit

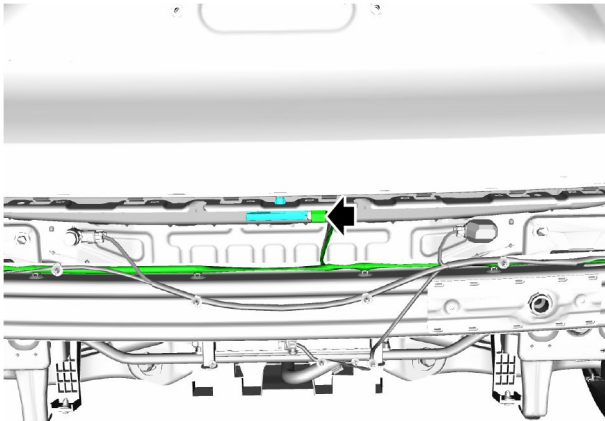
4. Connect the negative battery cable.

**Passive Entry and Passive Start (PEPS)
Antenna - Rear Bumper Fascia
Remove**

1. Disconnect the negative battery cable.
2. Remove the rear bumper.

 **Rear Bumper Remove**

3. Disconnect the harness connector, loosen the clip, and remove the PEPS antenna - rear bumper fascia.



S8223433

Refit

1. Align the locating point of antenna - rear bumper fascia with the mounting hole and press down to engage.
2. Connect the harness connector.
3. Fit the rear bumper.

 **Rear Bumper Refit**

4. Disconnect the negative battery cable.

**Passive Entry and Passive Start (PEPS)
Antenna - Door Handle
Remove**

1. Disconnect the negative battery cable.
2. For vehicles equipped with PEPS module, the outer door handle antenna (HSU) is fitted in the driver side door outer handle, so the door handle antenna can be replaced by replacing the door handle assembly.

 **Front Door Outer Handle and Lock Cylinder Assembly- Passive Keyless Entry Remove**

Refit

1. Fit the passive entry and passive start antenna - door handle.

 **Front Door Outer Handle and Lock Cylinder Assembly- Passive Keyless Entry Refit**

2. Connect the negative battery cable.

Anti-theft System

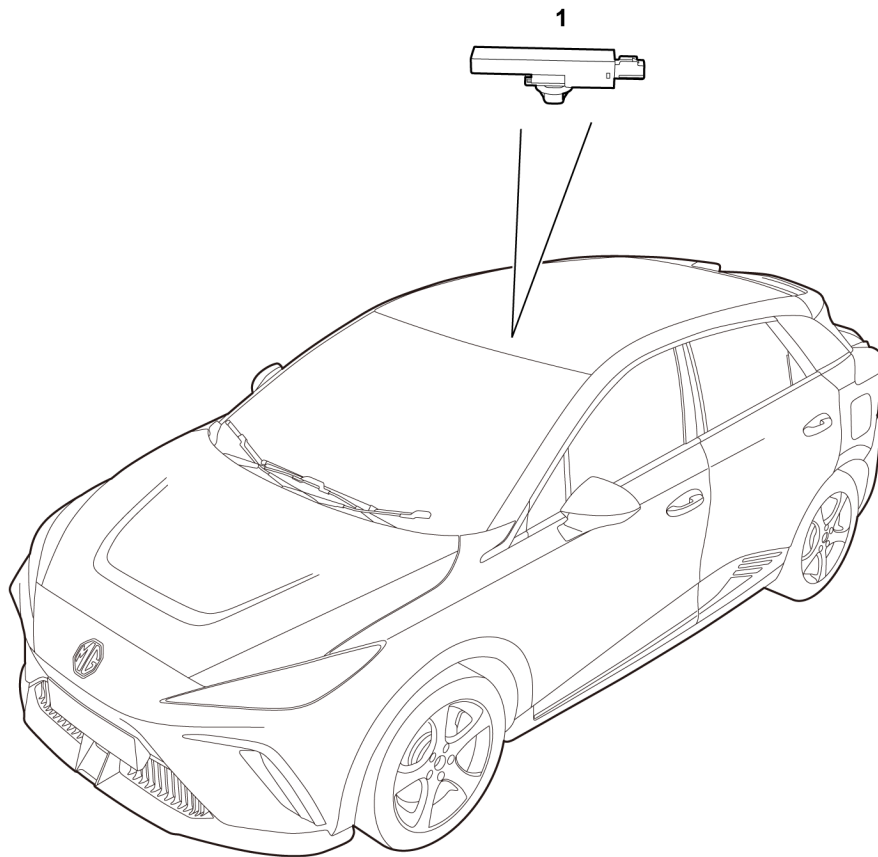
Specification

Torque

Description
Value

Description and Operation

System Layout

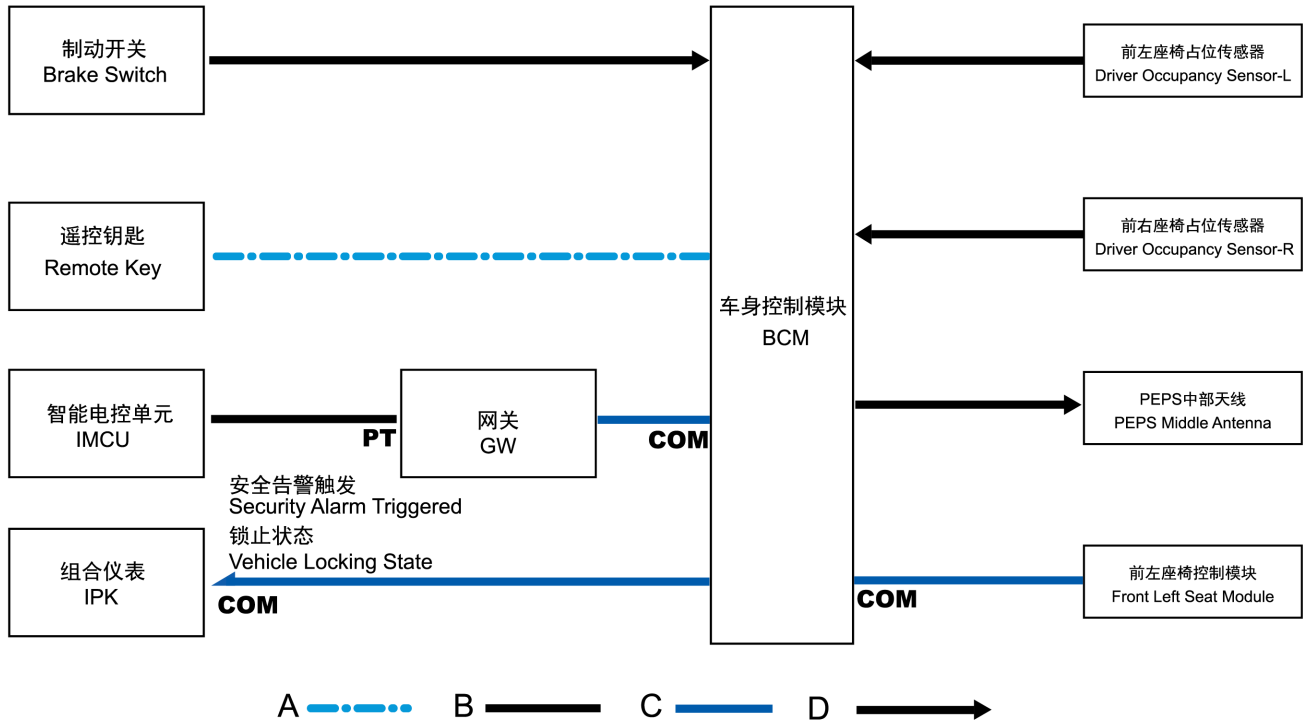


S8220044

I. Spare Coil

System Control Diagram

Immobiliser Control Diagram



S8220067

A = RF Signal; B = Power HS CAN Bus; C = Comfort CAN Bus; D = Hard Wire

Description**Description**

The vehicle is equipped with an immobiliser connected with the power unit. The characteristic value is sent from the RF transceiver for verification; as long as the value matches, the power unit can be started. When the power supply is connected, the key sends the characteristic value to the spare coil.

Mounting Position

- Immobiliser coil: fitted in the centre console armrest box.

Operation

The function of the anti-theft system is provided by the BCM, IMCU and any modules that store and report environment identifiers.

- Spare coil: When the smart key battery is low, place it in the transmitter slot, the RF transceiver transmits a signal which contains its characteristic value. The BCM receives the signal and compares the value with that stored in the memory.

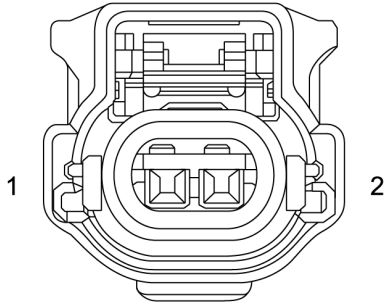
Once the two values match, the BCM will send the level I authentication result to the IMCU via the CAN bus. If the characteristic value of the smart key is not correct, the BCM sends the motor high voltage power-on prohibition to the IMCU.

The IMCU receives and verifies the level I authentication result sent by the BCM, then sends the verification password back to the BCM. The BCM calculates a verification result based on this verification password, which is sent back to the IMCU, and the IMCU will verify the verification result.

If the result calculated by the BCM matches the IMCU calculation result, the IMCU will allow the vehicle to start.

Detailed Information List of Component Pins

**End View and Pin Information of Anti-theft Antenna
Harness Connector CS005**



Pin No.	Description
1	Power Supply
2	Ground

Service Guide

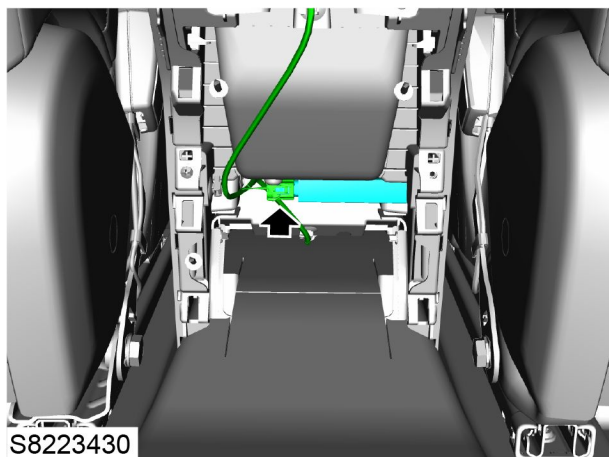
Spare Coil

Remove

1. Disconnect the negative battery cable.
2. Remove the centre console rear panel assembly.

Centre Console Rear Panel Assembly Remove

3. Disconnect the harness connector.



4. Release the clips and remove the spare coil.

Refit

1. Align the spare coil locating point with the mounting hole, and press down to engage.
2. Connect the harness connector.
3. Fit the centre console rear panel assembly.

Centre Console Rear Panel Assembly Refit

4. Connect the negative battery cable.

Gateway

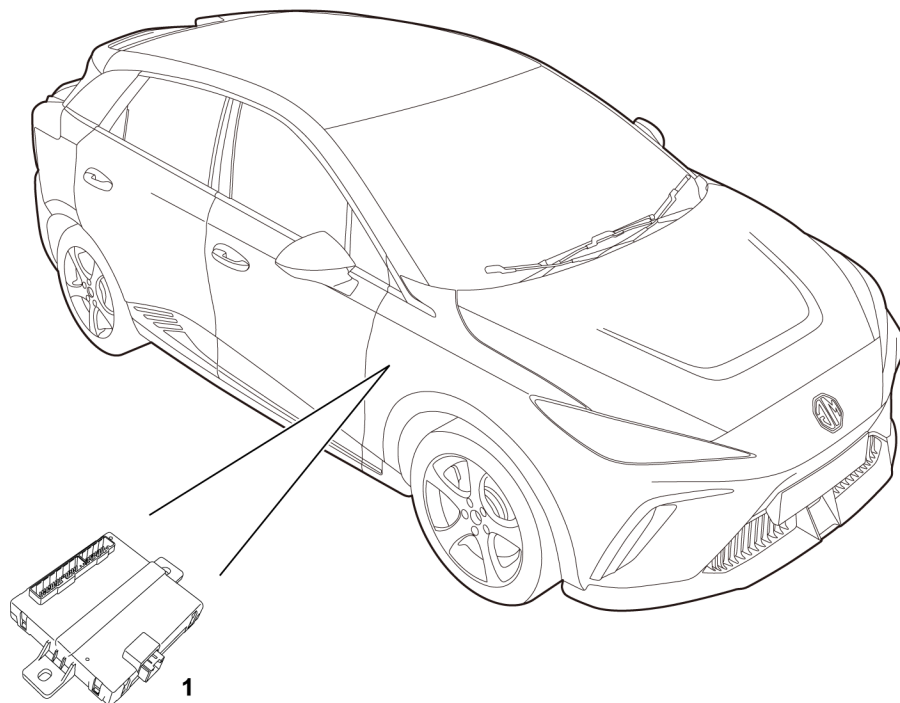
Specification

Torque

Description	Value
Bolt-GW module to Instrument Panel beam	6-8NM

Description and Operation

System Layout



S8220054

I. Gateway

Description**Mounting Position**

The GW is located at the rear of the passenger side glove box.

Overview

The GW transmits most of the function signals of the vehicle, which can wake up other controllers through hard wire, or communicate with other components through the network bus. The GW can be used to diagnose the vehicle controllers.

Operation

Definition

The Gateway mainly connects several CAN/LINnetworks and realizes signal/frame routing of the networks. It also provides input/output interface for the hard wire and realizes some controls. The GW provides the following functions:

1. Network Signal Routing
2. Network Management Master Node
3. Vehicle Power Mode Management Master Node
4. Switch Detection
5. Vehicle Configuration Information

Network Signal Routing

The function of the Gateway is to establish connection between different CANnetwork and LINnetwork, transmit signals from the source CAN/LINnetwork to the target CAN/LINnetwork according to the requirements for network design and realize information exchange and sharing among multiple networks. In addition, the Gateway supports vehicle remote diagnosis performed by the TBOX (if equipped).

Network Management Master Node

As a network management master node, the GW meets the following requirements for network management:

- When the Start switch is in ACC or ON/RUNNING position, all networks shall communicate.
- When the Start switch is turned to OFF position from ACC or ON/RUNNING position, the network communication shall delay at least for 30s, and this time can be configured by the diagnosis. If the vehicle speed is not 0, the GW shall maintain network communication; when the vehicle speed achieves 0, the GW shall maintain network communication for 10s.
- As a network management master node, the GW performs the network management strategy via CANbus, and the slave nodes on the network can communicate with each other by waking up the GW.

Vehicle Power Mode Management Master Node

- The GW determines the status of the vehicle power mode according to the status of the Start switch status or the Start switch status hard wire input provided to the GW from the BCMand PEPS. The GW sends the status of the vehicle power mode to the CANor LINnetwork. Each CANor LINmodule shall receive the status signal of the power mode from the GW, so as to enable/disable the corresponding function.
- The GW increase/decrease the corresponding high side driver according to the status of the vehicle power mode. The high side driver of KL.R, Ignition, KL.I5 switch is the relay control. When it increases, the corresponding relay closes.

Vehicle Power Mode	KL.R High Side Drive	IGN High Side Driver	KL.I5 Switch High Side Driver	ACC/ Wake-up High Side Driver	Wake-up Enable High Side Driver
OFF	Low	Low	Low	Low	Low
ACC	High	Low	Low	High	High
RUN	High	High	High	High	High
GRANK	Low	High	Low	Low	Low

- Vehicle voltage detection: the GW collects battery voltage, determines the status of the battery voltage and transmits the voltage signal to the network.

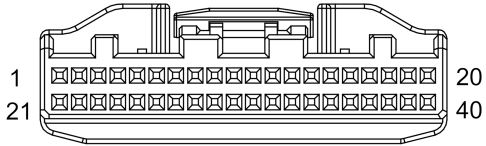
Switch Detection

- Gear shift switch: the gear shift switch of this vehicle is on the instrument desk. The GW collects the state information of the gear shift switch and sends the signal to the ECM.
- Cruise switch: the GW collects the reliable status signal of the cruise switch and sends the signal to the ECM (Engine Control Module).

Vehicle Configuration Information

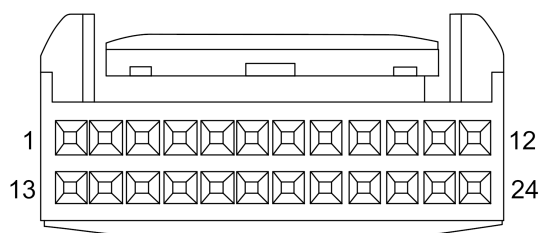
When the vehicle rolls off the assembly line, the GW configures the vehicle configuration information on-line and saves the information to the EEPROM memory of the GW. The GW sends the vehicle configuration information to the network as per the information in the EEPROM.

Detailed Information List of Component Pins

End View and Pin Information of GW Harness
Connector FA074

Pin No.	Description
1—4	-
5	GW Power 2
6-10	-
11	Diagnosis HS CAN High
12	Diagnosis HS CAN Low
13	LIN1
14	LIN2
15	Power HS CAN Low
16	Power HS CAN High
17 - 18	-
19	Comfort HS CAN Low
20	Comfort HS CAN High
21—22	-
23	Ground 2
24	Intelligent Driving HS CAN Low
25	Intelligent Driving HS CAN High
26—39	-
40	Starter Relay

End View and Pin Information of GW Harness Connector FA075



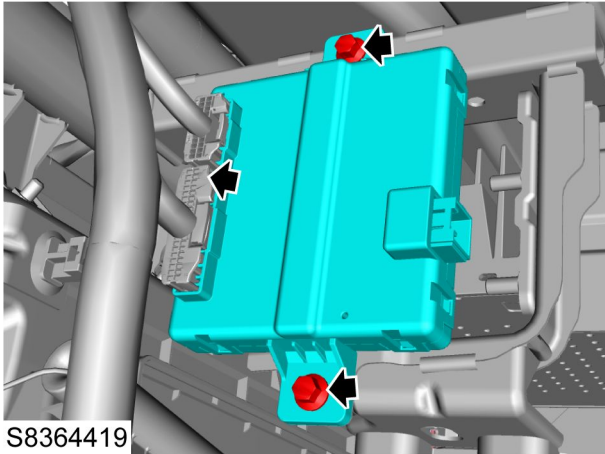
Pin No.	Description
1	Chassis HS CAN Low
2	Chassis HS CAN High
3	Connection HS CAN Low
4	Connection HS CAN High
5—9	-
10	Power Supply I
11—18	-
19	Ground I
20	-
21	Power Extension HS CAN Low
22	Power Extension HS CAN High
23—24	-

Service Guide**Gateway Module****Remove**

1. Disconnect the negative battery cable.
2. Remove the glove box assembly.

 **Glove Box Assembly Remove**

3. Remove the glove box frame.
4. Remove 2 bolts fixing the GW to the instrument panel beam, disconnect the harness connector, and remove the GW module.

**Refit**

1. Connect the harness connector of the gateway.
2. Connect the negative battery cable.
3. Programme and encode the GW.

 **Gateway Control Module (GW)**

4. Fix the GW to the instrument panel beam, fit 2 bolts, tighten them to **6-8NM**, and check the torque.
5. Fit the glove box frame.
6. Fit the glove box assembly.

 **Glove Box Assembly Refit**

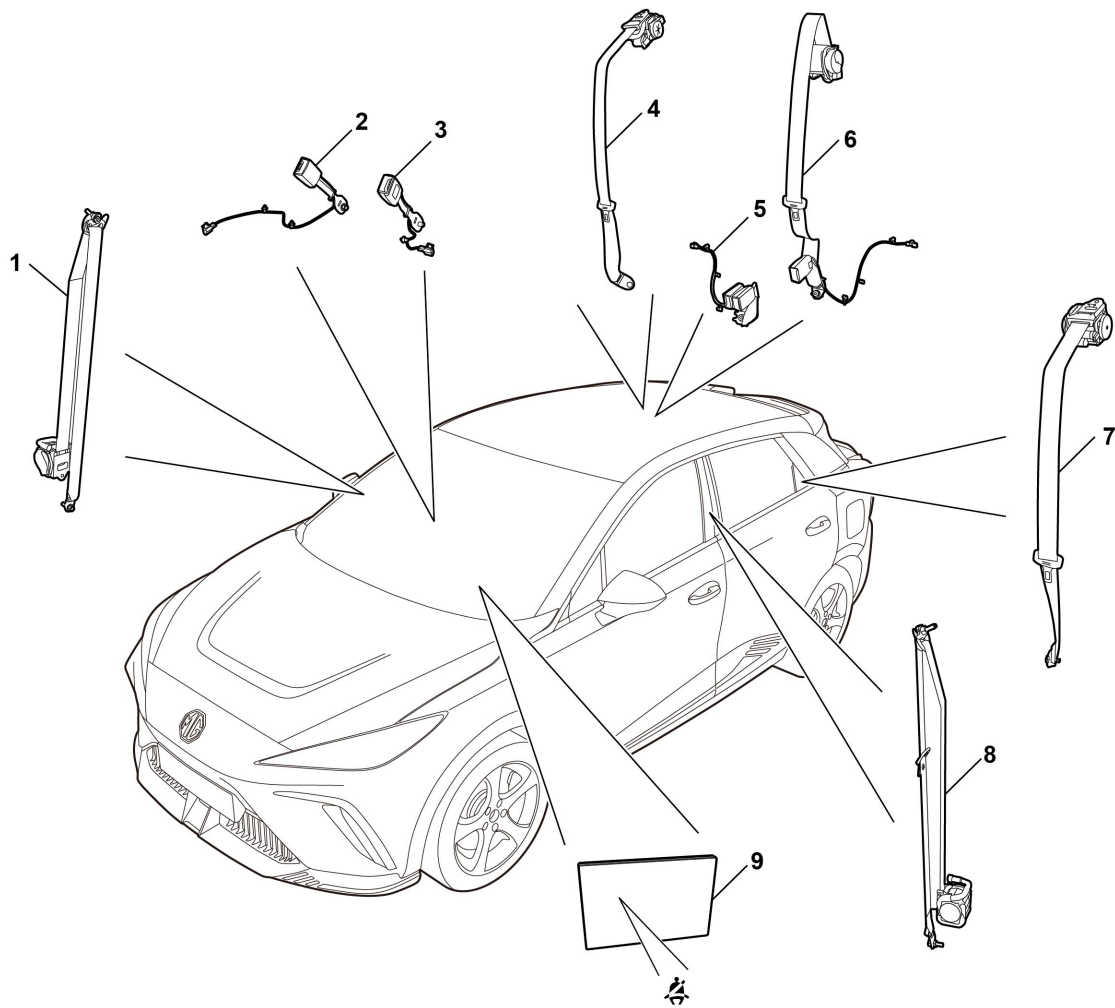
Seat Belt**Specification****New sTOTopic**

Description	Value
Bolt-Front seat belt retractor to body	35-45Nm
Bolt-Front seat belt type D ring to body	35-45Nm
Bolt-Front seat belt buckle to seat	43-53Nm
Bolt-Rear middle seat belt retractor to squab	42-48Nm
Bolt-Rear seat belt to body	35-45Nm
Bolt-Rear seat belt buckle to body	35-45Nm
Bolt-Rear middle seat belt to body	35-45Nm

Description and Operation

System Layout

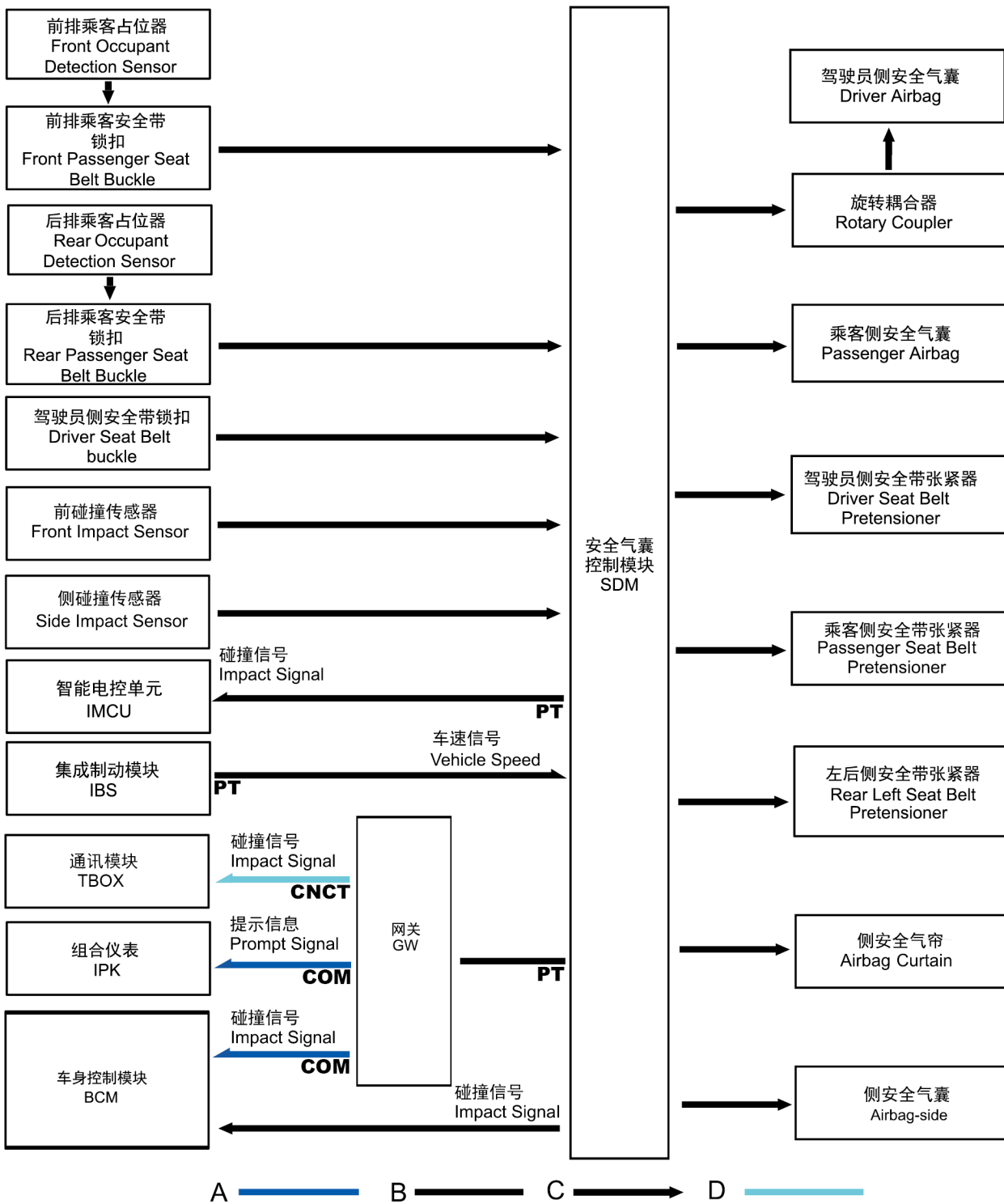
Seat Belt Layout



S4610205

- 1. Passenger Seat Belt
- 2. Front Right Seat Belt Buckle
- 3. Front Left Seat Belt Buckle
- 4. Rear Right Seat Belt Assembly
- 5. Rear Seat Belt Buckle
- 6. Rear Middle Seat Belt Assembly
- 7. Rear Left Seat Belt Assembly
- 8. Driver Seat Belt
- 9. Seat Belt Warning Lamp

System Control Diagram

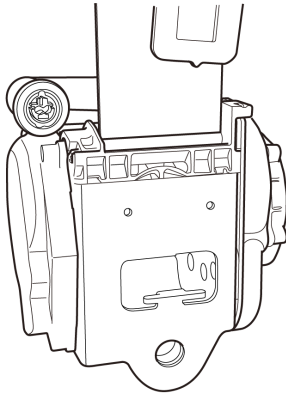


S8111065

A = Comfort HS CAN Bus; B = Power HS CAN Bus; C = Hard Wire; D = Connection HS CAN Bus

Description

Front Seat Belt Pretensioner



S4615194

In case of collision, the front seat belt pretensioner tightens, this ensures the occupants are securely kept in their seats. The seat belt pretensioner unit is fixed by bolts to the seat belt retractor assembly in the B pillar. The seat belt pretensioner connector is a 2-pin connector connected with the body harness.

In case of a collision, the seat belt pretensioner will be controlled by signals transmitted from the SRS/ ECU. The retractors of the two pretensioners are positioned and work in the same way. Each pretensioner unit is provided with an initiator and a propulsion generator which act on the rotor of the seat belt retractor.

Warning : *Once the pre-tensioner has been operated, it cannot be reset. Therefore the pre-tensioner must be replaced.*

Seat Belt

The seat belts provide the most basic protection for all occupants. The restraint system also provides further protection for the front occupants through the airbag module and the pretensioning seat belts. The front seats are all fitted with appropriate retractors and three-point belts. The inertial retractors in the vehicle are of the ELRtype.

The retractor is provided with an additional lock mechanism which includes a webbing sensor and an automotive sensor. If the webbing is suddenly pulled, the webbing sensor will immediately start the lock mechanism. If the vehicle is suddenly slowed down or tilts at a large angle, the automotive sensor will start the lock mechanism.

The retractor will lock in case of impact, so the front seat belt retractor are equipped with load limiters. If the load limit has exceeded the critical level, the load limiter will relax the webbing of the seat belt and reduce the load acting on the occupant.

Front Seat Belt



S4615232

The retractor of the front seat belt is fitted on the body, in the cavity at the bottom of the B pillar lower trim panel. Pull the belt webbing from the retractor, and fix it to the mounting point under the B pillar by pulling out the D-ring device on the upper part of the B pillar.

Rear Seat Belt Assembly



S4615233

The inertial retractors of the rear seat belts on both sides are fixed in the cavities inside the D pillar by bolts. The seat belt webbing on both sides can be pulled out from the inertial retractor axle through the luggage compartment sunshade support plate, and the other end of the webbing is secured at the mounting point of the body floor under the rear seat cushion.

The inertial retractor of the rear middle seat belt is fixed on the frame in the rear seat foam. The central webbing can be pulled out from the seat retractor axle, and the other end of the webbing is fixed on the body floor under the rear seat cushion.

Seat Belt Warning



The instrument pack of the vehicle is equipped with the seat belt warning lamp.

Some seat belt buckles are integrated with a seat belt unfastened alarm switch, which is connected to the instrument pack through SRS/ ECU. The seat belt warning will be triggered if the seat belt is not tied firmly during driving. For the front

passenger side, to prevent unnecessary warning when there is no passenger on the seat, a pressure sensor is fitted inside the foam of the passenger seat. If there is any passenger on the seat, but the pressure sensor is not activated, then the seat belt warning will not be triggered even if the occupant does not fasten the seat belt.

Operation

SRS ECU triggers the operation of pre-tensioning seat belt:

For seat belts with pre-tensioner, the initiator and propulsion generator in the seat latch assembly actuates the rotor of seat belt inertial retractor to tighten the seat belt and increase tension, so that the passengers can be restricted on the seat in the event of a collision.

Service Guide

Front Seat Belt Assembly Remove

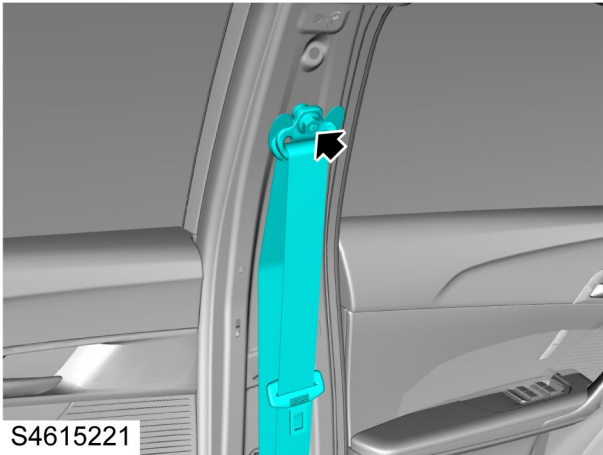
1. Disconnect the negative battery cable, and wait for 10 minutes until the SRS backup circuit is discharged.
2. Remove the B pillar upper trim panel.

B Pillar Upper Trim Panel Remove

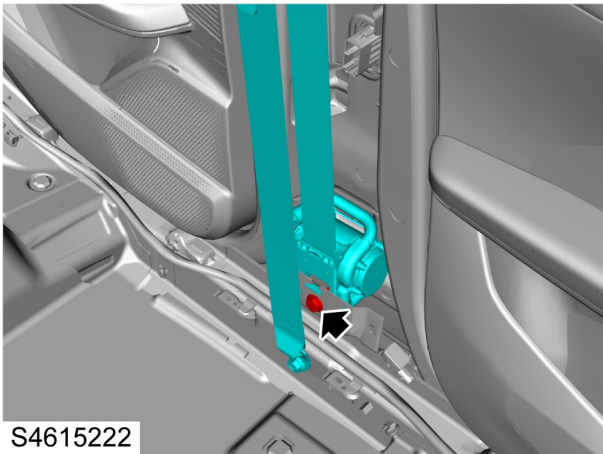
3. Remove the B pillar lower trim panel.

B Pillar Lower Trim Panel Remove

4. Remove 1 bolt fixing the D-ring of the front seat belt to the body.



5. Disconnect the harness connector.
6. Remove 1 bolt fixing the front seat belt retractor to the body.



7. Remove the front seat belt assembly.

Refit

1. Locate the front seat belt assembly to the body.
2. Fix the front seat belt retractor to the body, fit 1 bolt, tighten it to **35-45Nm**, and check the torque.
3. Connect the harness connector.
4. Fix the D-ring of the front seat belt to the body, fit 1 bolt, tighten it to **35-45Nm**, and check the torque.
5. Fit the B pillar lower trim panel.

B Pillar Lower Trim Panel Refit

6. Fit the B pillar upper trim panel.

B Pillar Upper Trim Panel Refit

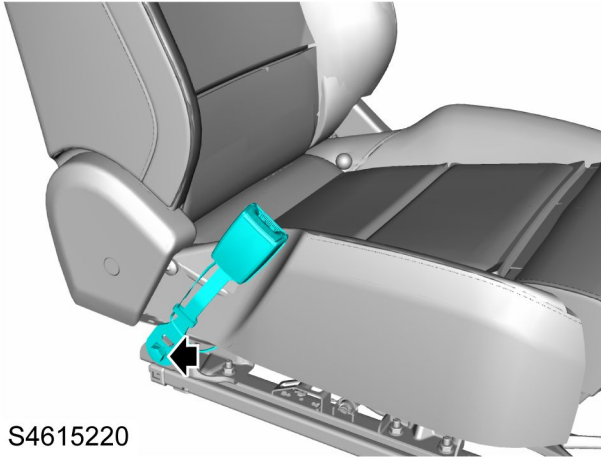
7. Connect the negative battery cable. Perform a system check, press the start switch, check if the SRS warning lamp illuminates for several seconds, and goes out.

**Front Seat Belt Buckle
Remove**

1. Remove the front seat assembly.

 **Front Seat Assembly Remove**

2. Remove 1 bolt fixing the front seat belt buckle to the seat.



S4615220

3. Disconnect the harness connector and remove the front seat belt buckle.

Refit

1. Fix the front seat belt buckle to the seat frame, fit 1 bolt, tighten it to **43-53Nm**, and check the torque.
2. Connect the harness connector.
3. Fit the front seat assembly.

 **Front Seat Assembly Refit**

**Rear Seat Belt Assembly
Remove**

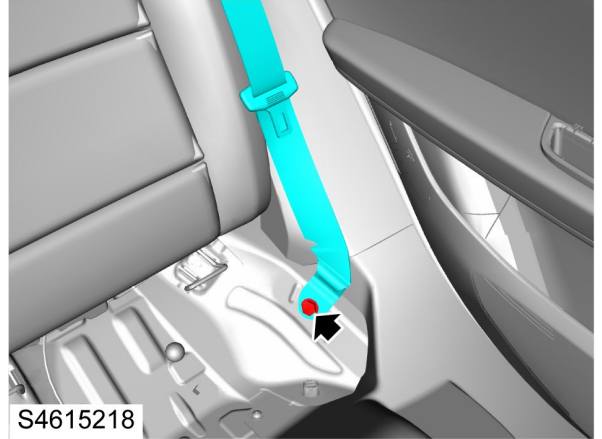
1. Remove the rear parcel shelf support plate.

 **Rear Parcel Shelf Support Plate Remove**

2. Remove the rear seat cushion.

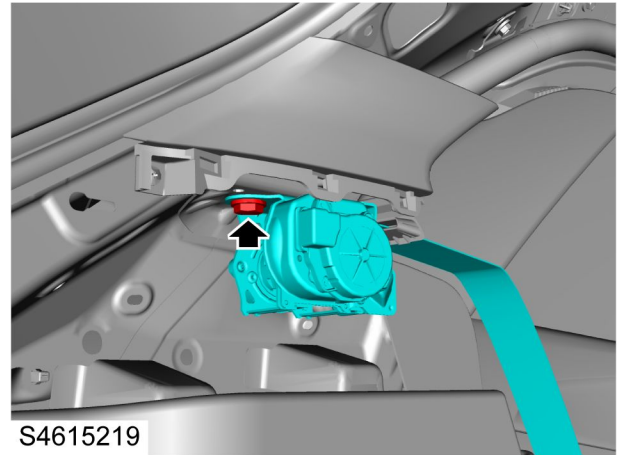
 **Rear Seat Cushion Remove**

3. Remove 1 bolt fixing the rear seat belt to the body.



S4615218

4. Remove 1 bolt fixing the rear seat belt retractor to the body from the trunk, and remove the rear seat belt assembly.



S4615219

Refit

1. Fix the rear seat belt retractor to the body, fit 1 bolt, tighten it to **42-48Nm**, and check the torque.
2. Pass the rear seat belt through the luggage cover support plate of the trunk.
3. Locate the luggage cover of trunk to the body, and press the clip in place.
4. Restore the seat back.
5. Fix the rear seat belt to the body, fit 1 bolt, tighten it to **35-45Nm**, and check the torque.
6. Fit the rear seat cushion.

 **Rear Seat Cushion Refit**

7. Fit the rear parcel shelf support plate.

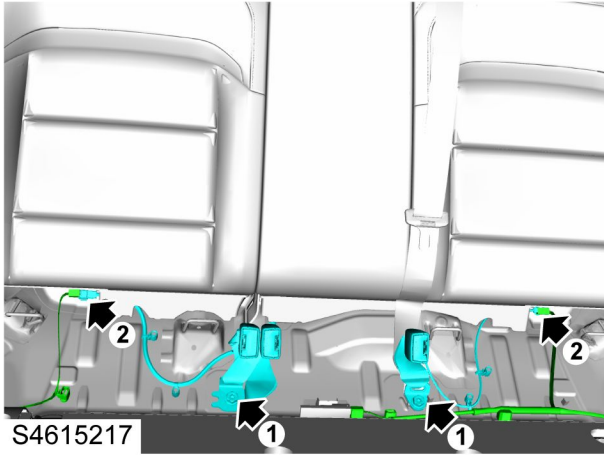
 **Rear Parcel Shelf Support Plate Refit**

**Rear Seat Belt Buckle
Remove**

1. Remove the rear seat cushion assembly.

 **Rear Seat Cushion Assembly Remove**

2. Disconnect the harness connector (2), remove 2 bolts (1) fixing the rear seat belt buckle to the body, and remove the rear seat belt buckle.



Refit

1. Fix the rear seat belt buckle to the body, fit 2 bolts, tighten them to **35-45Nm**, and check the torque.
2. Connect the harness connector.
3. Fit the rear seat cushion assembly.

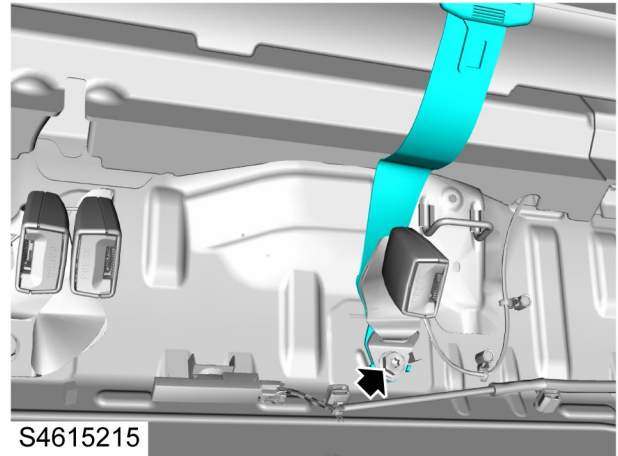
 **Rear Seat Cushion assembly Refit**

**Rear Middle Seat Belt
Remove**

1. Remove the rear seat cushion assembly.

 **Rear Seat Cushion Assembly Remove**

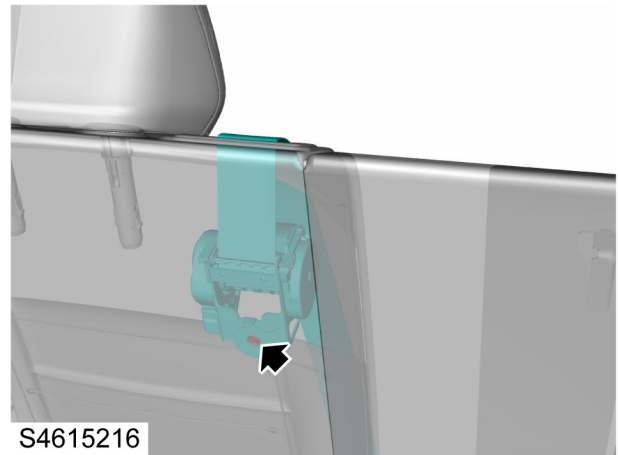
2. Remove 1 bolt fixing the rear centre seat belt to the body.



3. Remove the rear seat back cover.

 **Rear Seat Back Cover Remove**

4. Pull open the back foam, and remove 1 nut fixing the rear centre seat belt retractor to the rear seat back frame.



5. Pass the middle seat belt webbing through the decorative frame hole of the seat belt on the rear seat back, and remove the rear middle seat belt assembly.

Refit

1. Pass the rear middle seat belt webbing through the decorative frame hole of the seat belt on the rear seat back.
2. Fix the rear centre seat belt retractor to the rear seat back frame, fit 1 nut, tighten it to **42-48Nm**, and check the torque.
3. Fit the rear seat back cover.

 **Rear Seat Back Cover Refit**

4. Fix the rear centre seat belt to the body, fit 1 bolt, tighten it to **35-45Nm**, and check the torque.

5. Fit the rear seat cushion assembly.

 **Rear Seat Cushion assembly Refit**

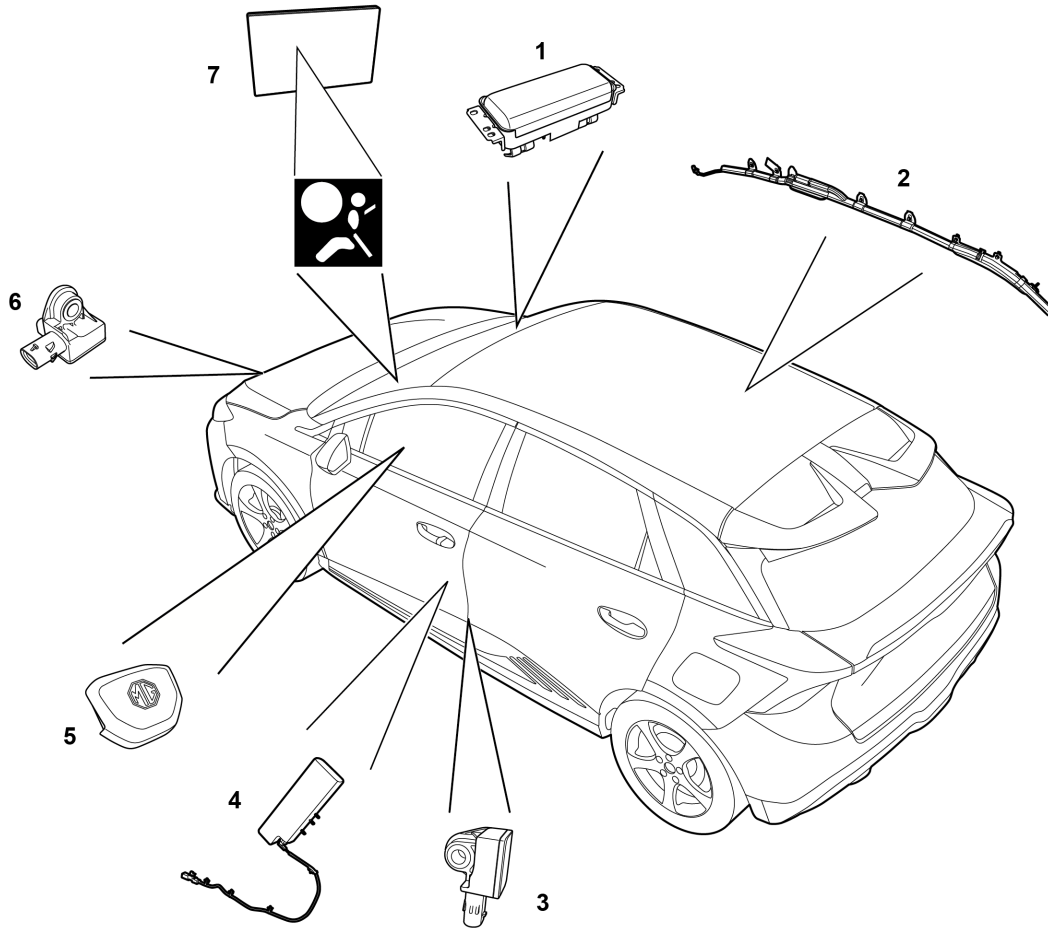
Airbag**Specification****New sTOTopic**

Description	Value
Bolt-Front passenger airbag to instrument panel	6-8Nm
Bolt-Side curtain to body	7-9Nm
Bolt-Front impact sensor to MFE	7-10Nm
Bolt-SDM to Body	7-10Nm

Description and Operation

System Layout

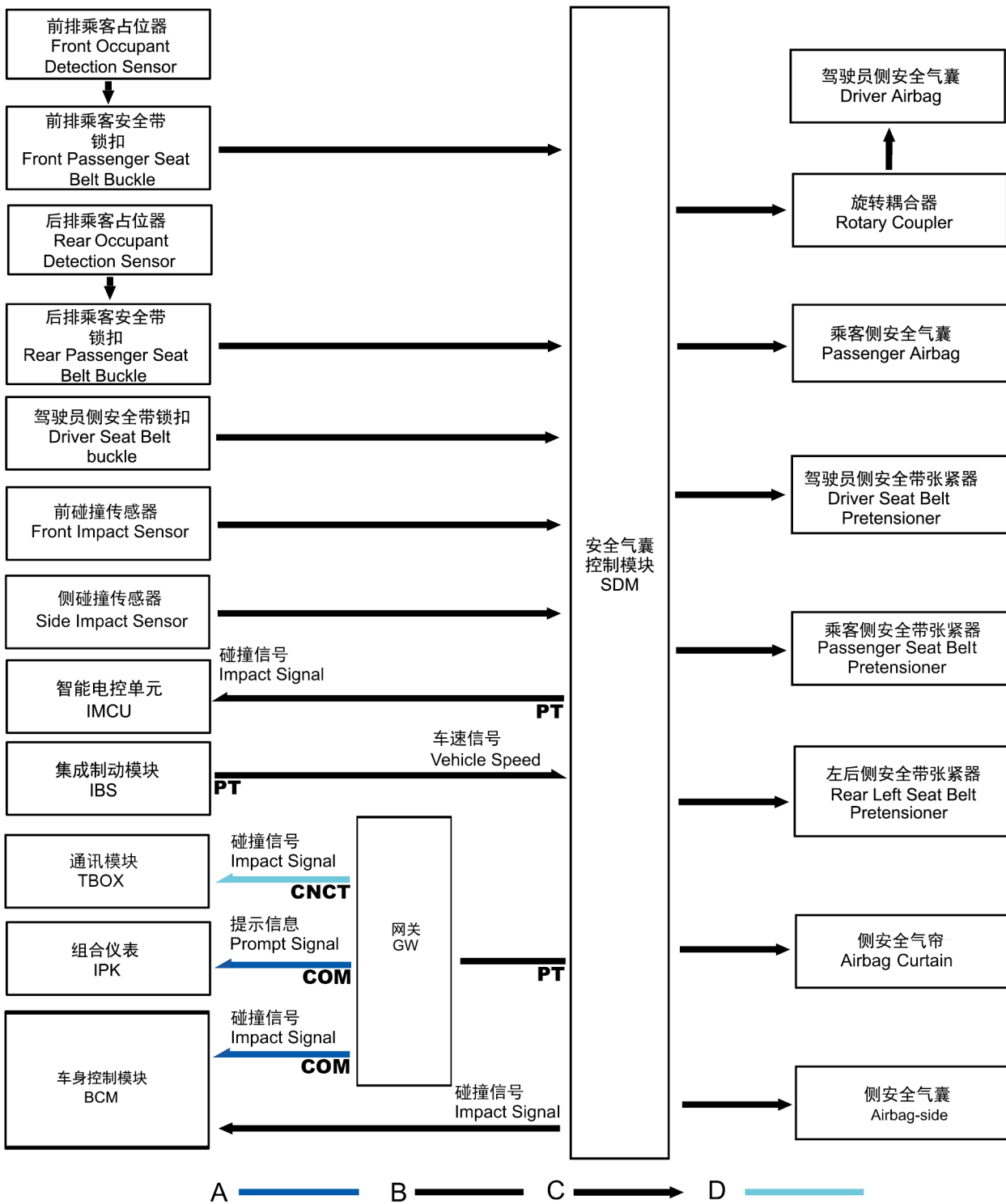
Airbag Layout



S4710205

- 1. Front Passenger Airbag
- 2. Right Side Curtain Airbag
- 3. Side Impact Sensor
- 4. Driver Seat Airbag
- 5. Steering Wheel Airbag
- 6. Front Impact Sensor
- 7. Airbag Warning Lamp

System Control Diagram



S8111065

A = Comfort HS CAN Bus; B = Power HS CAN Bus; C = Hard Wire; D = Connection HS CAN Bus

Description

Overview

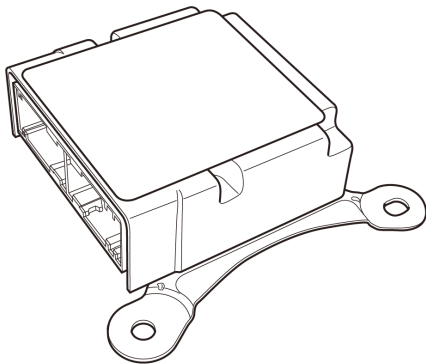
The SRScan enhance the passive protection for the passenger when severe impact occurs. This system is usually built on the basis of the appliance of the standard restraint system (seatbelts).

The SRS includes the following components:

- Supplemental restraint system diagnostic module SRSECU
- Driver airbag module
- Front passenger airbag module
- Seat side airbag module
- Head curtain airbag module
- Seat belt pretensioner
- Front impact sensor
- Side impact sensor
- SRS warning lamp (in the instrument pack)
- Seat belt not tied warning lamp (in the instrument pack)

SRSECUconnects the vehicle DLC through the HS CANbus.

Supplemental restraint system diagnostic module SRSECU



S4714129

SRSECUdetermines the affected range of the front impact, side impact or rear impact through the internal and external impactsensor (if equipped), so as to control the operation of the SRS.

SRSECUmonitors the impact state around the vehicle through the internal accelerometer and the external sensors. SRSECUcan use these input data to distinguish the type and severity of the impact so as to make sure the airbag can efficiently operate.

If the front impact severer than the preset trigger value is detected, the SRSECUwill send the signal to activate the front airbag module and seat belt pretensioners.

When fitting the side airbag and side curtain airbag, two side impact sensors shall be fitted to monitor the side impact condition. If the side impact severer than the preset trigger

value is detected, the SRSECUwill send the signal to activate the corresponding side airbag and side curtain airbag module. And the seat belt pretensioner will be activated.

If the rear impact severer than the preset trigger value is detected, the SRSECUwill send the signal to activate the seat belt pretensioner.

Caution : *The only way to guarantee normal operation of the system is to ensure that the SRS ECU is correctly fitted in the designed location, which is important.*

ECUMonitoring

While energized, SRSECUmonitors the preparation of the SRS module. After start-up, it shall perform the continuous monitoring. SRSECUmonitors the status of the following modules:

- SRSECUInternal accelerometer
- SRSECUMicro-processor
- Side impact sensor
- Front impact sensor
- Driver side airbag module
- Passenger side airbag module
- Side airbag module
- Side curtain airbag module
- Seat belt pretensioner
- Diagnosis count

If any system failure is detected, the SRSwarning lamp willilluminate to warn the driver.

The recommended diagnostic device can be used to inquire the SRSsystem malfunction. The diagnostic information read includes the current malfunction information, frequency of the occurrence of malfunction and the duration of each malfunction.

Side Impact Sensor

The side impact sensor is beside the body sill frame, which is fixed to the body by screws. The sensor is designed with a mounting position for correct installation of the sensor, and each sensor includes an electronic circuit and a sensing unit. The side impact sensor sends an acceleration signal to the ECU , ECUdetermines whether to trigger through calculation.

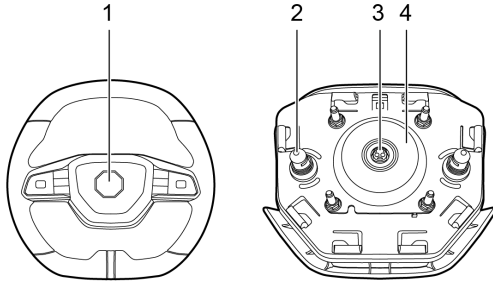
Caution : *The side impact sensors must be fitted in the correct orientation, so as to ensure the airbags can work normally at any time.*

Front Impact Sensor

The front impact sensor is in the front of the engine compartment, which is fixed to the radiator bracket by screws. The sensor is designed with a mounting position for correct installation of the sensor, and each sensor includes an

electronic circuit and a sensing unit. The front impact sensor sends an acceleration signal to the ECU, ECU determines whether to trigger through calculation.

Driver Airbag Module



S4714146

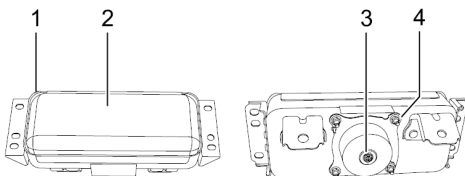
1. Airbag cover
2. Housing
3. Airbag connector
4. Gas generator

The driver airbag module is fitted on the steering wheel. It is triggered by the control signal from the SRSECU. The folding airbag and gas generator module are in the module. When severe front impact is detected by the SRSECU, the gas generator will be triggered, making the nylon bag inflate rapidly.

Front Passenger Airbag Module

Warning : After replacing the vehicle windscreen, the vehicle with Passenger Restraint System may not be driven within 24 hours.

Warning : If a new airbag module shows any sign of damage, do not use.



S4713112

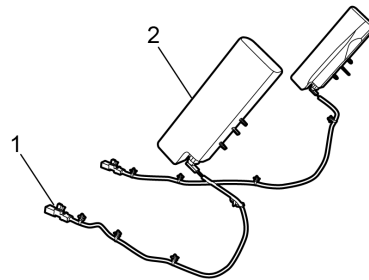
1. Airbag housing
2. Airbag cover
3. Airbag connector
4. Gas generator

The front passenger airbag module is on the glove box in the instrument panel, just in front of the passenger seat. The airbag module is fixed on the instrument panel.

It is triggered by the control signal from the SRSECU. The folding airbag and gas generator module are in the module. When severe front impact is detected by the SRSECU, the gas generator will be triggered, making the nylon bag inflate rapidly.

Side Airbag

Warning : If a new airbag module shows any sign of damage, do not use.



S4714147

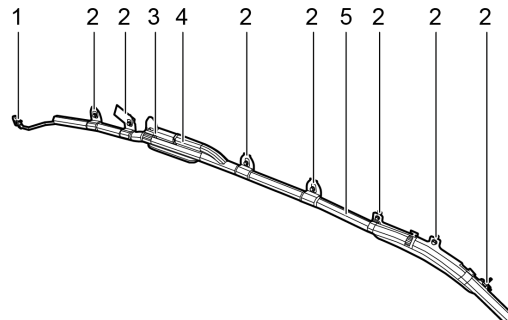
1. Airbag connector
2. Airbag housing

The seat side airbag is fitted at the outside of the seat bracket below the seat upholstery. It can protect the rib, pelvis and upper visceral organs in case of side impact. If the side impact is severe enough to deploy the seat side airbag, the control signal from the SRSECU will trigger the seat side airbag.

Caution : Do not try to remove the connector at the airbag module end, because it is a permanent connection.

Head Side Curtain Airbag Module

Warning : If a new airbag module shows any sign of damage, do not use.



S4714148

1. Retaining clip
2. Mounting point
3. Airbag connector

4. Gas generator assembly
5. Head side curtain airbag

The head side curtain airbag is provided to ensure all occupants' heads will not touch the body and intruded external objects will not hurt the occupants' bodies in case of collision. The head side curtain airbag module is in the interior trim panels above the front and rear doors.

The airbag housing and gas generator are fixed on one bracket in the middle of the airbag module. The cable at the front is under the A pillar. The airbag is fixed by plastic clips, which ensures the airbag can disconnect from the body after the airbag is inflated.

Operation

Overview

When the vehicle is powered on, the SRS will be activated.

Front Impact

If the front impact is severe and exceeds the threshold set in the SRS ECU, the front airbag module and front pretensioning seat belt will work.

When the accelerometer and front impact sensor in the SRS ECU detect any impact, the ECU will produce current to trigger the front airbag module: The driver side front airbag module is activated to expand the airbag. The passenger side front airbag module is activated to expand the airbag.

When the front airbag is fully expanded, it will release the gas immediately from the passage port and provide the passenger moving forward with gradual deceleration, this reduces the risk level of injury to the occupants.

The SRS ECU can determine the type and severity level of the impact. If the front impact detected by the sensor is severe, the SRS ECU will send an ignition signal to the front airbag module and seat belt pre-tensioner.

Side Impact

Normal operation of the seat side airbag and head curtain airbag depends on whether the severity level of the side impact detected by the side impact sensor and acceleration sensor in the SRS ECU exceeds the threshold for triggering the side impact sensor. When the SRS ECU detects severe side impact, it will activate the seat side airbag, curtain airbag module and seat belt pre-tensioner. The triggered gas generator can produce a large quantity of gas to expand the airbag. The expanded airbag will eject from the seat upholstery, similarly, if the head curtain airbag module is triggered, the airbag will eject from the interior trim panel above the door to protect the passenger from head injury. The fully expanded airbag will release excess gas to reduce the risk of passenger injury.

Front Impact with Angle

When a front impact with angle happens, whether the airbag and seat belt pre-tensioner work depends on the speed and angle of the impact. There are several conditions: The impact is below the threshold of the impact sensor in the SRS ECU, and no airbag or seat belt pre-tensioner is activated. The speed and angle of impact exceed the triggering threshold of the front impact sensor, and the front driver and passenger airbags and seat belt pre-tensioner are activated (side airbag may also be triggered).

System Continuity Fault

With the vehicle powered on, if any of the following faults occurs in the system, the SRS warning lamp will illuminate: SRS ECU fault, Harness fault, Ground connection fault, Open circuit fault, Airbag module fault, Seat belt pre-tensioner fault

If the system detects any failure during driving, the warning lamp will also illuminate to indicate failure of the SRS system. When the warning lamp illuminates, the SRS may not work when any impact occurs.

The diagnostic function of the SRS ECU monitors the SRS when the vehicle is powered on. If any failure is detected, the SRS ECU will store a related DTC in a nonvolatile memory and output a signal to illuminate the SRS warning lamp. The failure information in the memory can be read with the scan tool.

Low Voltage Failure

When the voltage supply is not within the specified range, the malfunction indicator lamp will illuminate. The DTC is stored in the memory.

Intermittent Failure

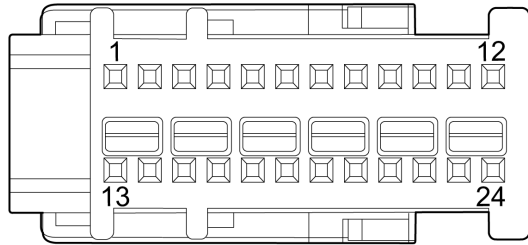
When intermittent failure occurs, the warning lamp illuminates, and it will be disabled after the failure is eliminated. The warning lamp will not illuminate in the next start unless the failure occurs again, but the DTC is still stored in the SRS ECU memory.

Permanent Failure

For a permanent failure, the SRS lamp will illuminate when the test is started, and it will remain on in every subsequent start cycle until the cause of the failure is solved. In addition, the diagnosis system will also record the information of the failure occurred. Additional information available through the scan tool for diagnostic socket includes: SRS ECU DTC, Version level of hardware and software, VIN data

The SRS ECU records fault information in the memory, and the information can be read by connecting the scan tool to the diagnostic socket below the lower trim panel of the driver side instrument panel.

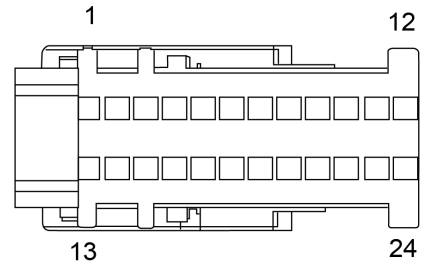
**Detailed Information List of Component Pins
End View and Pin Information of SDM Harness
Connector BY068**



Pin No.	Description
1	KL30
2	CrashOut
3	Ground
4	Driver Seat Belt Buckle Switch Signal
5	Front Passenger Seat Belt Buckle Switch Signal
6	Front Passenger Airbag Switch Signal
7	-
8	Rear Middle Seat Belt Buckle Switch Signal
9	-
10	-
11	IGN Relay
12	-
13	Left Side Curtain Airbag Low
14	Left Side Curtain Airbag High
15	Front Right Airbag High
16	Front Right Airbag Low
17	Right Side Curtain Airbag Low
18	Right Side Curtain Airbag High
19	Front Left Airbag High
20	Front Left Airbag Low

21	Front Passenger Airbag Low
22	Front Passenger Airbag High
23	Driver Airbag High
24	Driver Airbag Low

**End View and Pin Information of SDM Harness
Connector BY032**



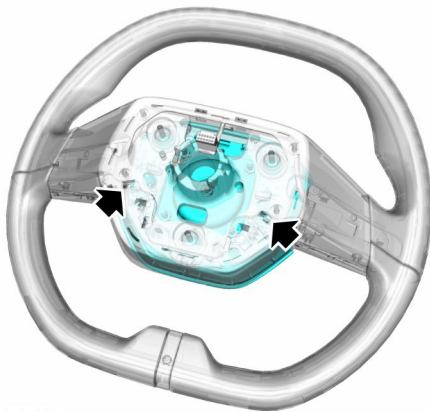
Pin No.	Description
1	Right Front Impact Sensor Low
2	Left Impact Sensor Low
3	CAN H
4	CAN L
5	Rear Left Seat Belt Buckle Switch Signal
6	Rear Right Seat Belt Buckle Switch Signal
7	Right Front Impact Sensor High
8	Left Impact Sensor High
9	Right Impact Sensor Low
10	Right Impact Sensor High
11	Left Front Impact Sensor High
12	Left Front Impact Sensor Low
13	Rear Left Pre-tensioner Low
14	Rear Left Pre-tensioner High
15	-
16	-
17	Rear Right Pre-tensioner Low

18	Rear Right Pre-tensioner High
19	-
20	-
21	-
22	-
23	Driver Seat Belt Pre-tensioner High
24	Driver Seat Belt Pre-tensioner Low

Service Guide**Steering Wheel Airbag
Remove**

Warning : *It is imperative that the appropriate information is read thoroughly before any work is undertaken on the SRS system.*

1. Disconnect the negative battery cable. Wait for 10 minutes until the SRS backup circuit is discharged.
2. Adjust the steering wheel to the lowest position, adjust the depth of the steering wheel and pull it outwards to the end.
3. Pry off the upper trim cover of the steering column to spare room for removing the airbag lock ring.
4. Rotate the steering wheel to expose the airbag lock ring.
5. Pry off 2 lock rings from the rear part of the steering wheel with a flat-bladed screwdriver to release 2 PINs fixing the airbag to the steering wheel.



S4714140

6. Disconnect the airbag connector, and remove the steering wheel airbag.

Refit

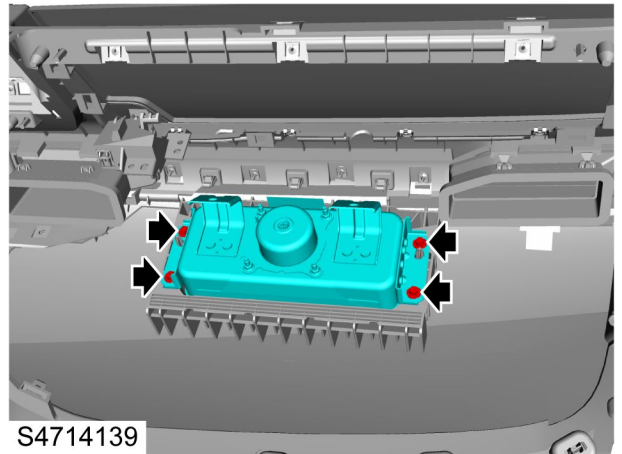
1. Connect the harness connector of the steering wheel airbag.
2. Place the driver airbag in the steering wheel mounting position, with 2 protruding PIN corners of the airbag aligned with 2 concave holes in the steering wheel.
3. Push the steering wheel airbag into the steering wheel until a click can be heard.
4. Fix the steering column upper trim cover to the lower trim cover, and press the clip in place.
5. Restore the steering wheel.
6. Connect the negative battery cable. Perform a system check, press the start switch, check if the SRS warning lamp illuminates for several seconds, and goes out.

**Instrument Panel Airbag
Remove**

1. Disconnect the negative battery cable. Wait for 10 minutes until the SRS backup circuit is discharged.
2. Remove the instrument panel body.

**Instrument Panel Body Remove**

3. Remove 4 bolts fixing the instrument panel airbag to the instrument panel, and remove the instrument panel airbag.



S4714139

Refit

1. Fix the instrument panel airbag to the instrument panel, fit 4 bolts, tighten them to **6-8Nm**, and check the torque.
2. Fit the instrument panel body.

**Instrument Panel Body Refit**

3. Connect the negative battery cable. Perform a system check, press the start switch, check if the SRS warning lamp illuminates for several seconds, and goes out.

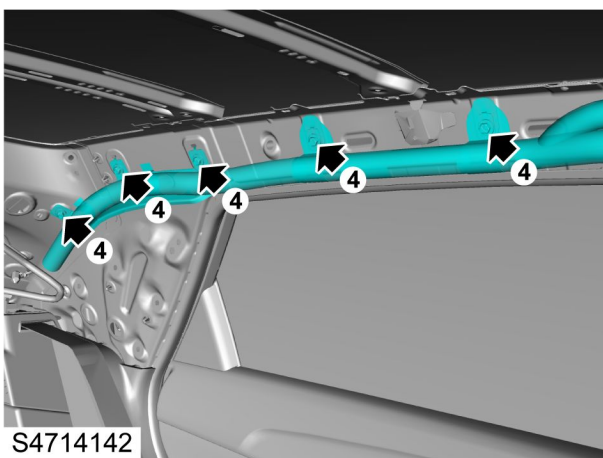
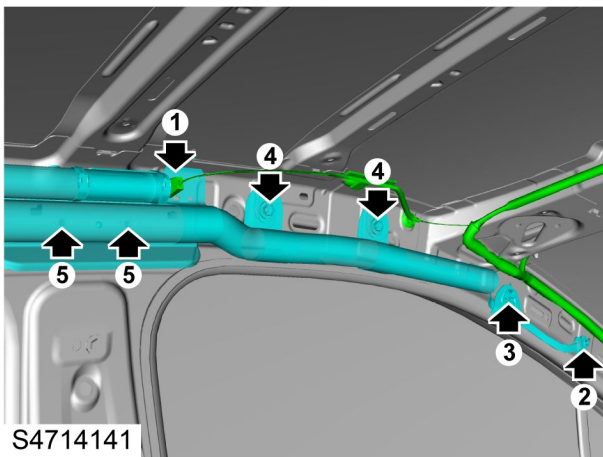
Side Curtain Airbag Remove

Warning : It is imperative that the appropriate information is read thoroughly before any work is undertaken on the SRS system.

1. Disconnect the negative battery cable. Wait for 10 minutes until the SRS backup circuit is discharged.
2. Remove the roof trim panel assembly.

Roof Trim Panel Assembly Remove

3. Remove 1 bolt (3) fixing the curtain airbag bracket to the body.
4. Pry off the clip (2) fixing the front tether of the curtain airbag.
5. Disconnect the connector (1) of the curtain airbag with the hook released.
6. Remove 7 bolts (4) fixing the curtain airbag to the body.
7. Remove 2 bolts (5) fixing the curtain airbag gas generator bracket to the body, and remove the side curtain airbag.



8. Repeat the above steps to remove the curtain airbag on the other side.

Refit

1. Locate the side curtain airbag on the roof.
2. Fit 2 bolts fixing the side curtain airbag gas generator bracket to the body, tighten them to **7-9Nm**, and check

the torque.

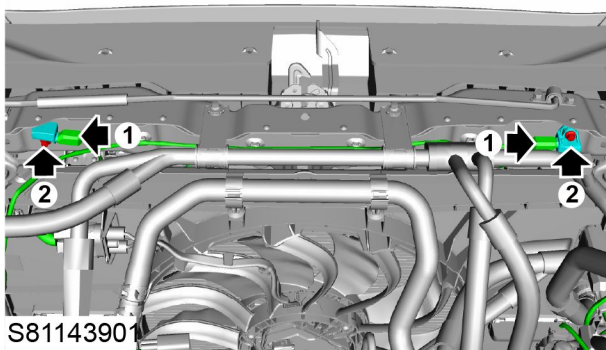
3. Fix the head curtain airbag to the roof, press the clips in place, fit 7 bolts, tighten them to **7-9Nm**, and check the torque.
4. Connect the harness connector of the side curtain airbag.
5. Fix the front drawstring of the side curtain airbag to the A pillar, fit the hooks, and press the clips.
6. Fit 1 bolt fixing the curtain airbag bracket to the body, tighten it to **7-9Nm**, and check the torque.
7. Repeat the above steps to fit the curtain airbag on the other side.
8. Fit the roof trim panel assembly.

Roof Trim Panel Assembly Refit

9. Connect the negative battery cable. Perform a system check, press the start switch, check if the SRS warning lamp illuminates for several seconds, and goes out.

SRS Front Impact Sensor Remove


1. Disconnect the negative battery cable.
2. Disconnect the harness connector (1) of the front impact sensor.
3. Remove 2 bolts (2) fixing the front impact sensor to the front-end module, and remove the front impact sensor.

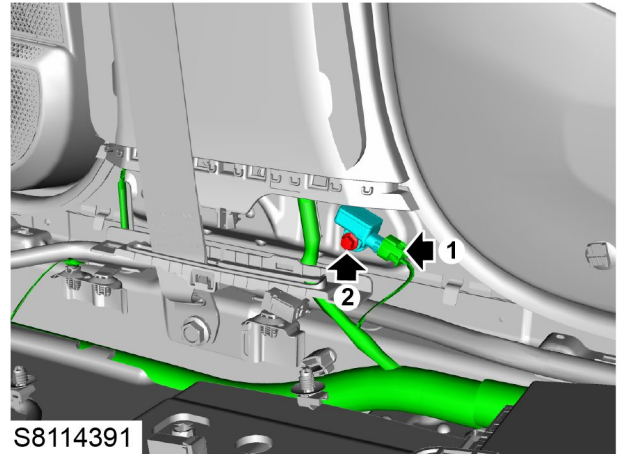


Refit

1. Connect the harness connector of the front impact sensor.
2. Fix the front impact sensor to the front-end module, fit 2 bolts, tighten them to **7-10Nm**, and check the torque.
3. Connect the negative battery cable.

SRS Side Impact Sensor Remove

1. Disconnect the negative battery cable.
 2. Remove the door sill trim panel.
-  **Door Sill Trim Panel Remove**
3. Disconnect the harness connector (1) of the side impact sensor.
 4. Remove 1 bolt (2) fixing the left (right) side impact sensor to the body, and remove the side impact sensor.



Refit

1. Connect the harness connector of the side impact sensor.
2. Fix the left (right) side impact sensor to the body, fit 1 bolt, tighten it to **7-10Nm**, and check the torque.
3. Fit the door sill trim panel.

 **Door Sill Trim Panel Refit**

4. Connect the negative battery cable.

Front Passenger Airbag Disable Switch Remove

1. Disconnect the negative battery cable.
2. Remove the left instrument panel end cover
3. Disconnect the harness connector
4. Release the clip, and remove the passenger side airbag switch from the back of the end cover.

Refit

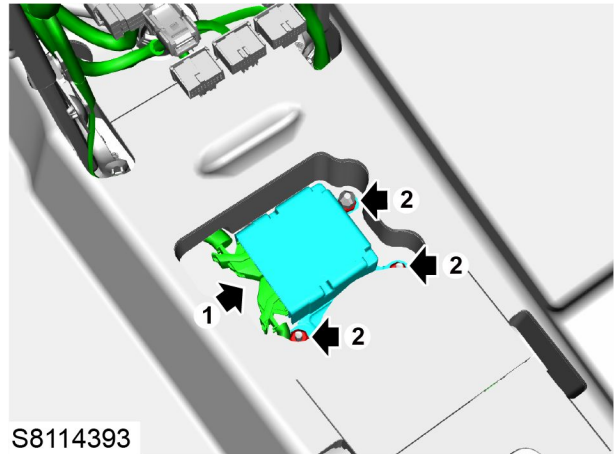
1. Fit the passenger side airbag switch from the back of the end cover.
2. Connect the harness connector.
3. Fit the left instrument end cover panel.
4. Connect the negative battery cable.

Airbag Control Module Remove

1. Disconnect the negative battery cable, wait for 10 minutes until the SRSECU internal circuit is discharged.
2. Remove the centre console assembly.

 **Centre Console Assembly Remove**

3. Disconnect the harness connector (1).
4. Remove 3 nuts (2) fixing the SDM to the body, and remove the SDM.



Refit

1. Connect the harness connector of the supplemental restraint system sensing and diagnostic module.
2. Connect the negative battery cable.
3. Programme and encode the supplemental restraint system sensing and diagnostic module (SDM).

 **Supplemental Restraint System Sensing and Diagnostic Module (SDM)**

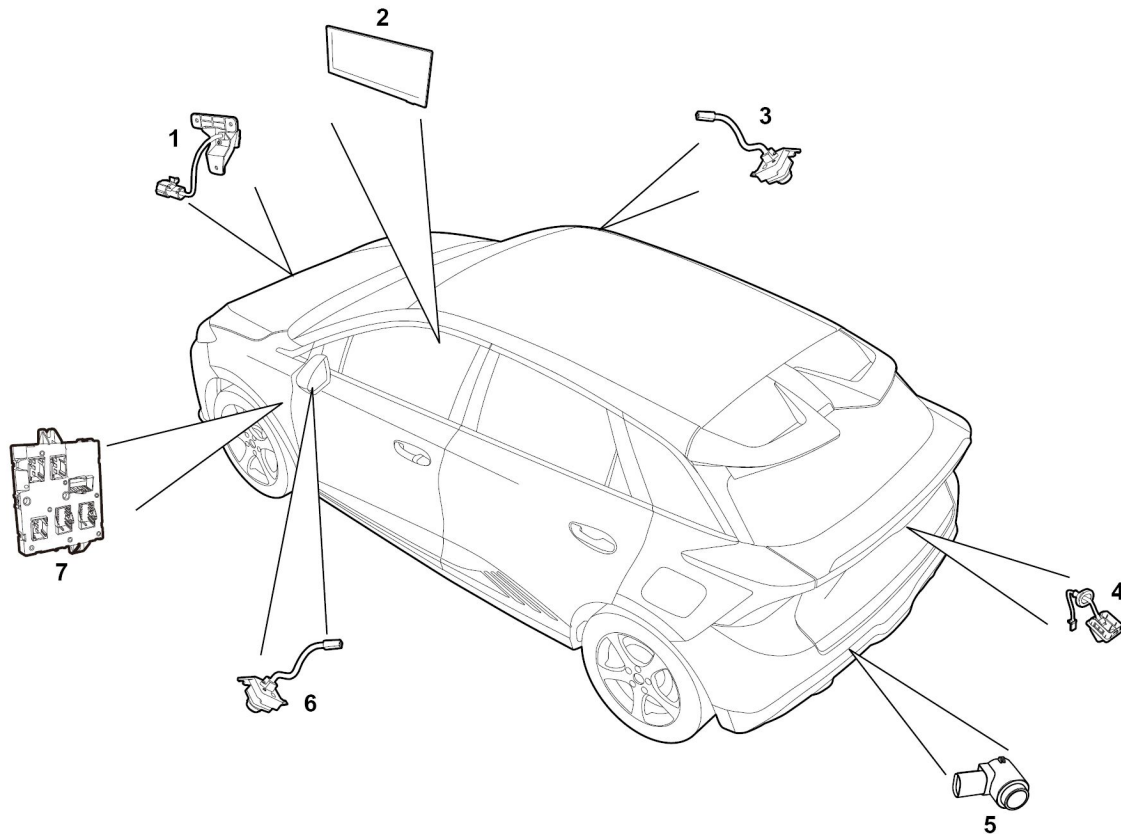
4. Fix the SDM to the body, fit 3 nuts, tighten them to **7-10Nm**, and check the torque.
5. Fit the centre console assembly.

 **Centre Console Assembly Refit**

PDC System

Description and Operation

System Layout



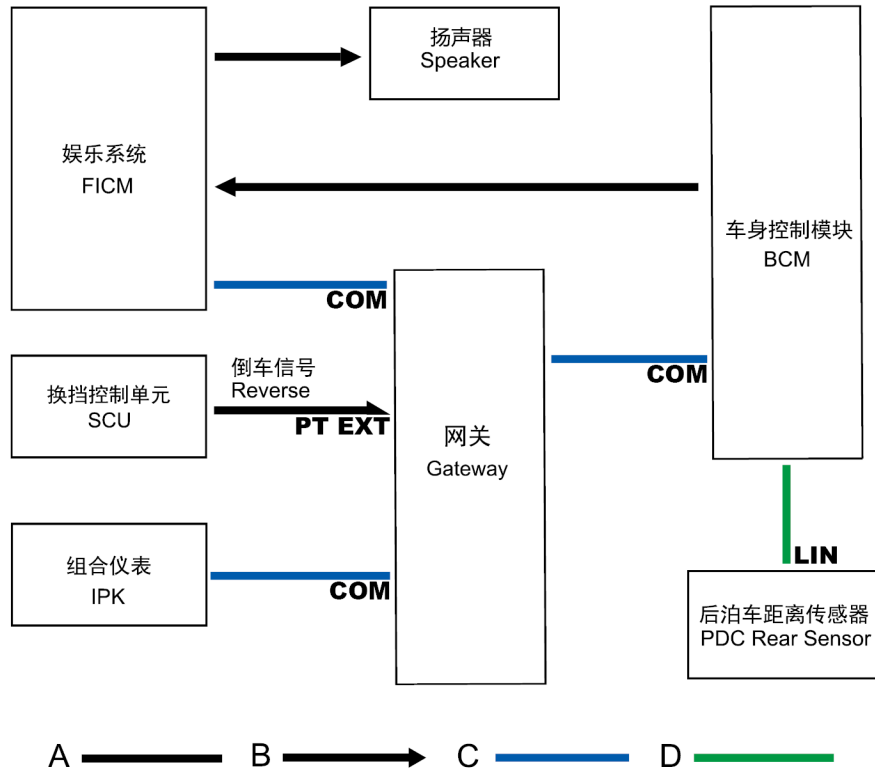
S8110241

- 1. Panoramic Imaging Front Camera
- 2. Entertainment Display
- 3. Panoramic Imaging Right Camera
- 4. Panoramic Imaging Rear Camera

- 5. Rear Ultrasonic Sensor
- 6. Panoramic Imaging Left Camera
- 7. Body Control Module

System Control Diagram

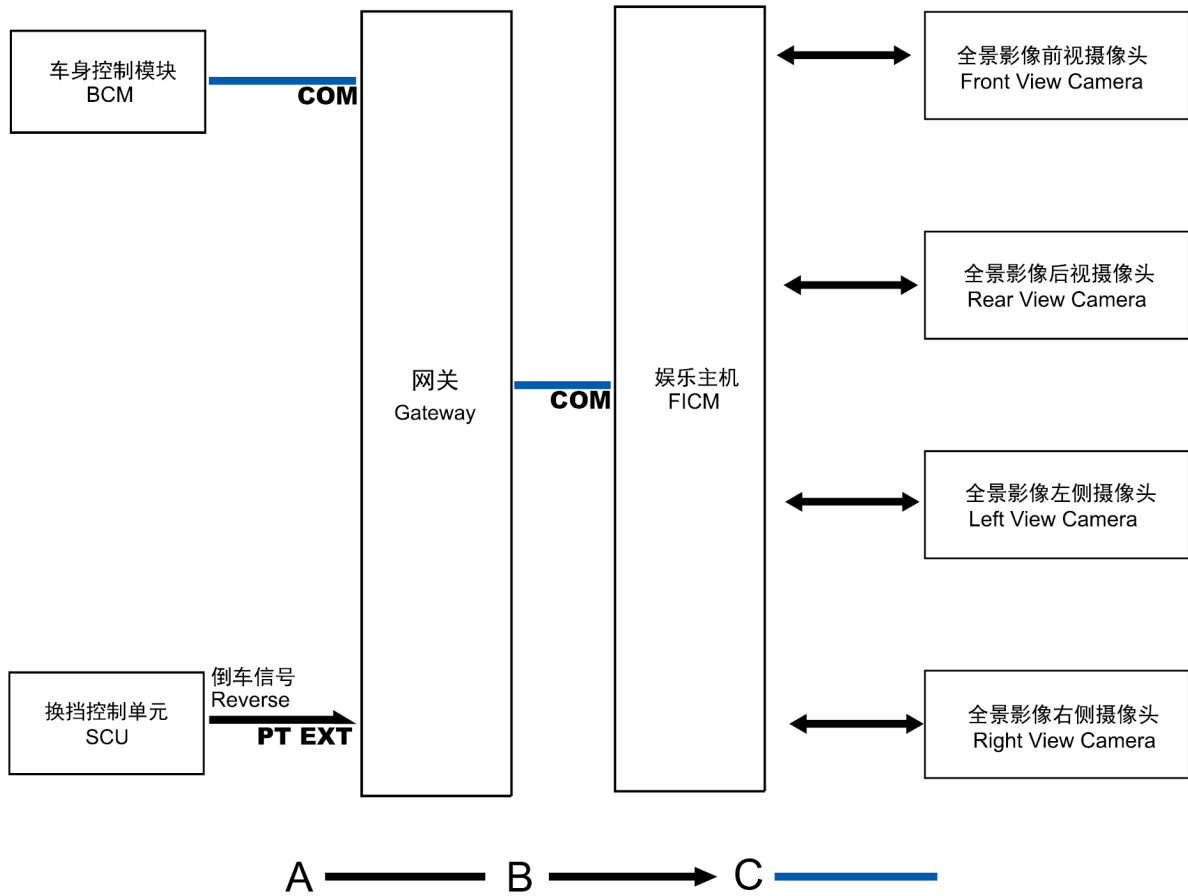
Parking Distance Control System Control Diagram



S8110069

A = Power HS CAN Bus; B = Hard Wire; C = Comfort HS CAN Bus; D = LIN Bus

Parking Distance Control System Control Diagram - with Panoramic Imaging



S8110067

A = Power HS CAN Bus; B = Hard Wire; C = Comfort HS CAN Bus

Description**Overview****Rear Obstacles Detection**

When parking the vehicle, if there are obstacles on the way that vehicle has to go through, the Parking Distance Control System (PDC) will give a warning to the driver. The system consists of following parts: ultrasonic sensors, BCM, entertainment mainframe and the speakers controlled by the entertainment mainframe. Ultrasonic sensors monitor the area around the bumper, if the monitor detects an object within the area, the speaker controlled by the entertainment mainframe will send an acoustic alarm. The system is able to detect relatively hard solid objects and objects like wire fence.

If the 360 panoramic imaging system is fitted, the image of the area around the vehicle will be displayed on the entertainment mainframe.

Ultrasonic Sensor

The ultrasonic sensors are fixed on the bumper. All the sensors share the same structure, with the colors matching with the vehicle.

360 Panoramic Imaging Switch

The 360 panoramic imaging switch is a soft switch inside the entertainment display, pushing the switch can enter the 360° panoramic imaging system display interface to view the image of the area around the vehicle at different viewing angles, so as to provide a safer driving for the driver.

360 Panoramic Imaging System

The 360 panoramic imaging system has four cameras; when the vehicle receives reverse gear signal, or clicking "360" icon, or pulling the steering lever, the entertainment mainframe will enter the panoramic imaging interface, and the user can click the screen to select the field of view to be checked, and allow the driver to learn the blind area around the vehicle body, so as to park the vehicle more intuitively and safely.

1. Front camera: under the vehicle logo.
2. Side camera: under the left/right exterior rearview mirrors.
3. Rear camera: between the two rear license plate lamps.

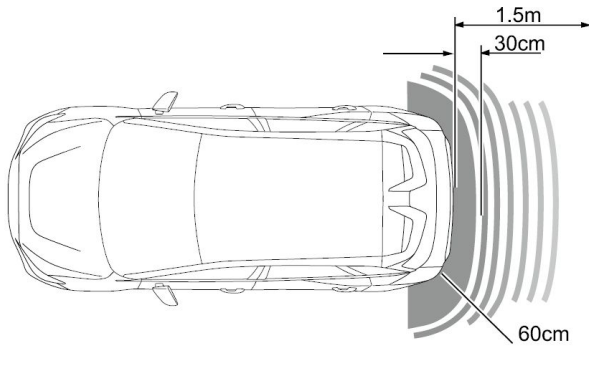
Operation

Overview

When the reverse gear is selected, the system runs.

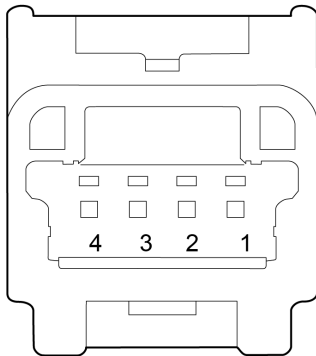
After the ultrasonic sensor receives the reverse gear signal, it outputs signals to the acoustic warning device to make it generate a single audible alarm ("beep"), which shows that the system is activated. Then, it receives the distance information from the ultrasonic sensor and determines whether there is any object in the detection range. If no object is detected within the detection range, it will not issue any audible alarm; if there are objects detected, it outputs signals to the acoustic warning device to produce a repetitive audible alarm.

From the edge of the detection zone, about 1,500mm from the rear vehicle, 600mm from the corner vehicle, the alarm frequency increases with the shortened distance between the object and the vehicle; when the object is 300mm away from the vehicle, the alarm becomes consecutive alarm.



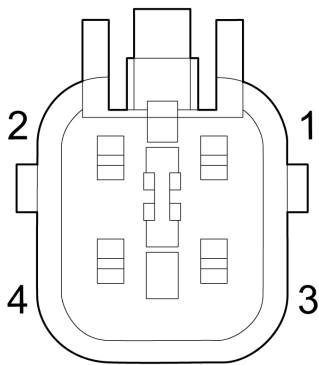
Detailed Information List of Component Pins

End View and Pin Information of 360 Panoramic Imaging Rear Camera Connector FA091



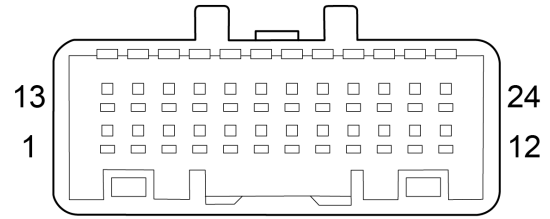
Pin No.	Description
1	Video Signal
2	Shielded Wire
3	-
4	Power Supply

End View and Pin Information of 360 Panoramic Imaging Front Camera Connector FC059



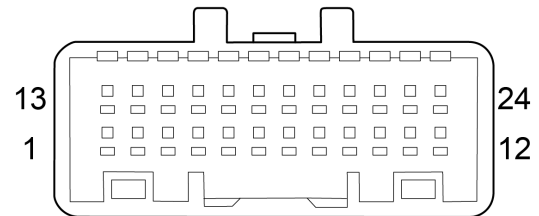
Pin No.	Description
1	-
2	Power Supply
3	Shielded Wire
4	Video Signal

End View and Pin Information of 360 Panoramic Right Camera Connector PD002



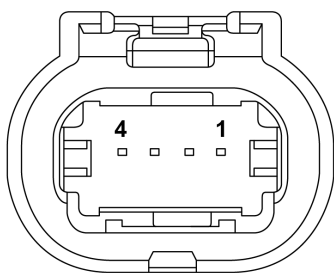
Pin No.	Description
1	Video Signal
2	Power Supply
3	Shielded Wire
4 - 24	-

End View and Pin Information of 360 Panoramic Imaging Left Camera Connector DD002



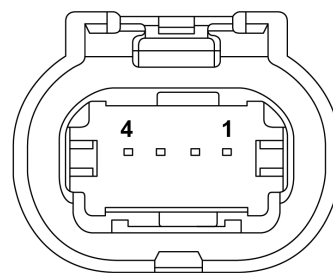
Pin No.	Description
1	Video Signal
2	Power Supply
3	Shielded Wire
4-24	-

End View and Pin Information of Right Rear PDC Sensor Connector RB002



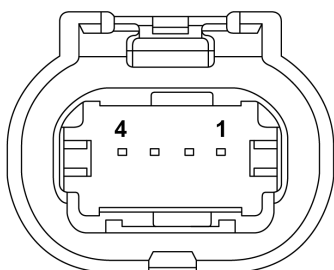
Pin No.	Description
1	Ground
2	-
3	Local LIN Bus
4	Ignition Relay

End View and Pin Information of Right Rear Middle PDC Sensor Connector RB003



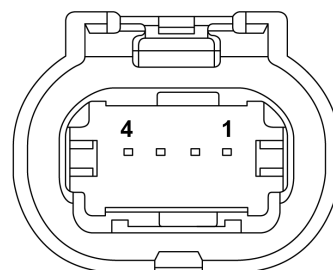
Pin No.	Description
1	Ground
2	Signal
3	Local LIN Bus
4	Ignition Relay

End View and Pin Information of Left Rear PDC Sensor Connector RB004



Pin No.	Description
1	Ground
2	Signal
3	Local LIN Bus
4	Ignition Relay

End View and Pin Information of Left Rear Middle PDC Sensor Connector RB004



Pin No.	Description
1	Ground
2	Signal
3	BCM LIN Bus
4	Ignition Relay

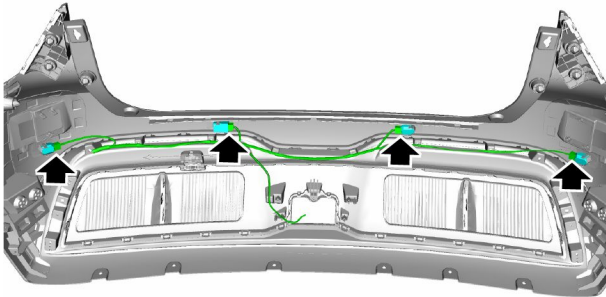
Service Guide

Rear Ultrasonic Sensor Remove

1. Disconnect the negative battery cable.
2. Remove the rear bumper.

 **Rear Bumper Remove**

3. Disconnect the harness connector, loosen the clip and remove the rear ultrasonic sensor.



S8114395

Refit

1. Connect the harness connector, and insert the rear ultrasonic sensor into the rear bumper.
2. Fit the rear bumper.

 **Rear Bumper Refit**

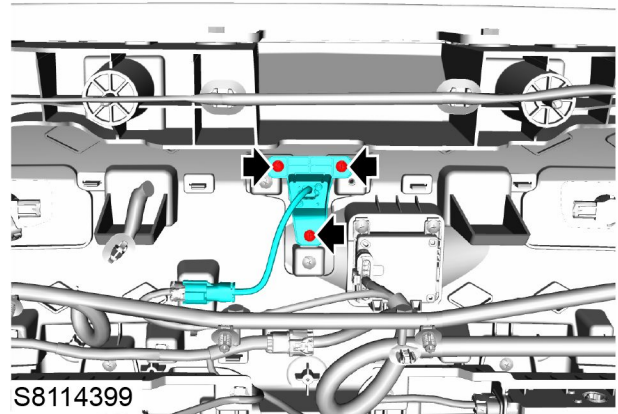
3. Connect the negative battery cable.

AVM Front View Camera Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

 **Front Bumper Remove**

3. Remove 3 screws fixing the panoramic imaging front camera to the front bumper, loosen the clips and remove the panoramic imaging front camera.



S8114399

Refit

1. Connect the harness connector.
2. Connect the negative battery cable.
3. Fix the panoramic imaging front camera to the front bumper, fit 3 screws, tighten them to **1-2Nm**, and check the torque.
4. Fit the front bumper.

 **Front Bumper Refit**

5. Calibrate the panoramic imaging front camera.

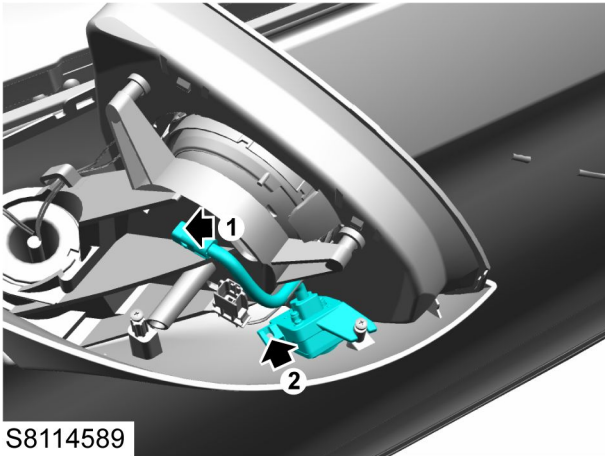
 **Around View Monitor Calibration**

**AVM Side View Camera
Remove**

1. Disconnect the negative battery cable.
2. Remove the side direction indicator lamp assembly.

 **Side Direction Indicator Lamp Assembly Remove**

3. Disconnect the harness connector (1).
4. Remove 1 screw fixing the panoramic imaging side camera to the exterior rearview mirror, and remove the panoramic imaging side camera.



S8114589

Refit

1. Connect the negative battery cable.
2. Fix the panoramic imaging side camera to the exterior rearview mirror, fit 1 screw and tighten it.
3. Connect the harness connector.
4. Fit the side direction indicator lamp assembly.

 **Side Direction Indicator Lamp Assembly Refit**

5. Calibrate the panoramic imaging camera.

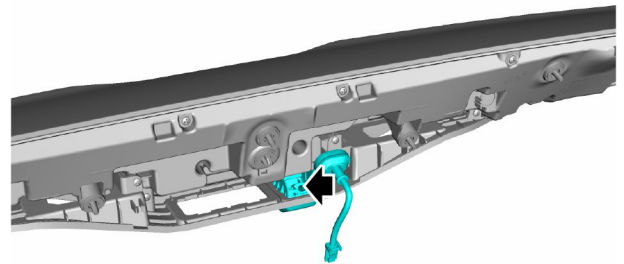
 **Around View Monitor Calibration**

**AVM Rear View Camera
Remove**

1. Disconnect the negative battery cable.
2. Remove the through-type rear width lamp assembly.

 **Through-type Rear Width Lamp Assembly Remove**

3. Press the clip, and remove the panoramic imaging rear camera.



S8114401

Refit

1. Fit the panoramic imaging rear camera, and press the clip.
2. Connect the negative battery cable.
3. Fit the through-type rear width lamp assembly.

 **Through-type Rear Width Lamp Assembly Refit**

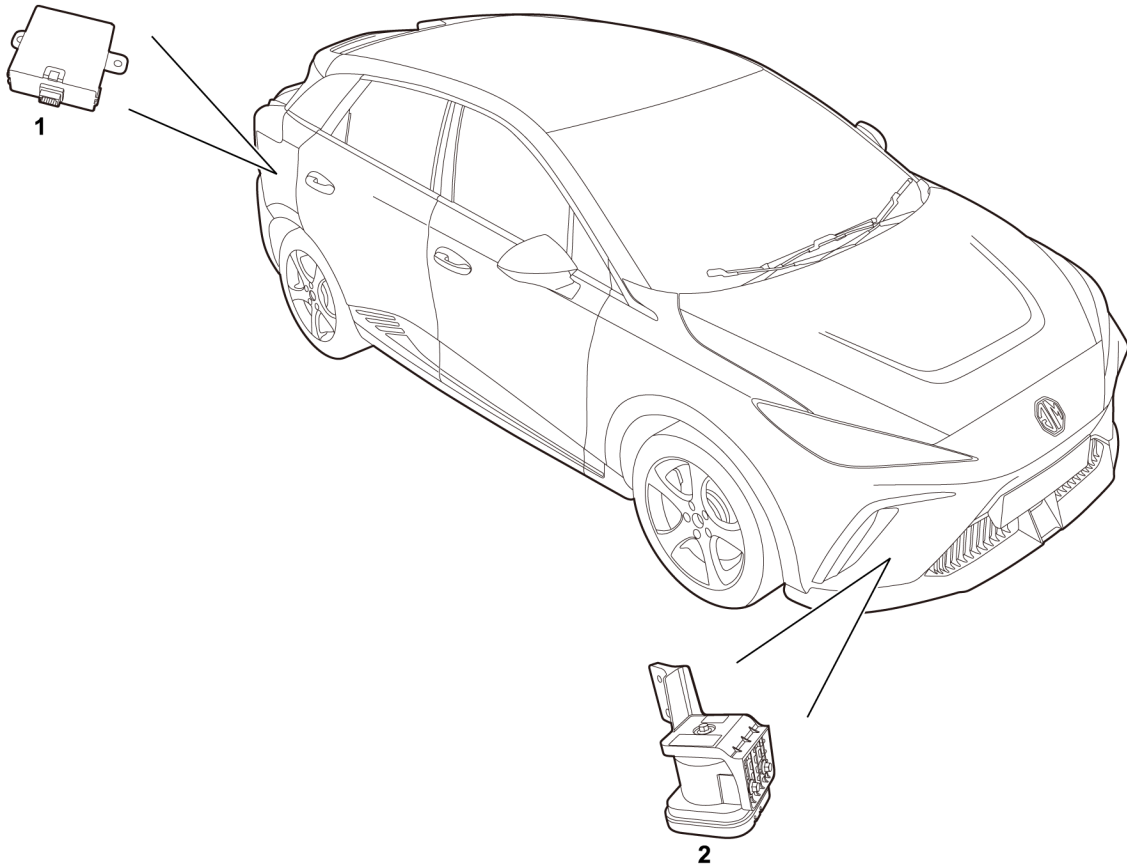
4. Calibrate the panoramic imaging camera.

 **Around View Monitor Calibration**

Pedestrian Alert Control System**Specification****Torque**

Description	Value
Nut-PACM to Body	5-7Nm
Bolt-Pedestrian Warning Speaker to Front Bumper buffer Beam	4-6NM

Description and Operation
System Layout



S8180037

- 1. Pedestrian Alert Control Module
- 2. Pedestrian Alert Speaker

System Control Diagram



S8183056

A = Comfort CAN Bus; B = Hard Wire

Description

Description

When the vehicle is in motion, the pedestrian alert control system can give appropriate prompt sounds to pedestrians, to serve as a warning to them.

The pedestrian alert control system mainly consists of 2 parts: pedestrian alert speaker and pedestrian alert control module.

Operation

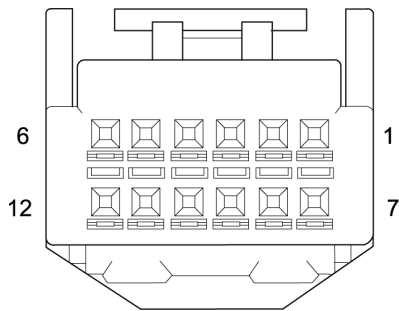
Operation

When the vehicle is operating in low speed mode, it uses the pedestrian alert module to control the pedestrian alert speakers to send audible alerts to surrounding pedestrians and vehicles, thus improving the driving safety.

Please refer to Owner's Manual for more sounding strategies of the pedestrian alert system.

Detailed Information List of Component Pins

End View and Pin Information of Pedestrian Alert Control Module Harness Connector BY050



Pin No.	Description
1	Ground
2-5	-
6	Audio Output -
7	Power Supply
8	-
9	HS CAN Low
10	HS CAN High
11	-
12	Audio Output +

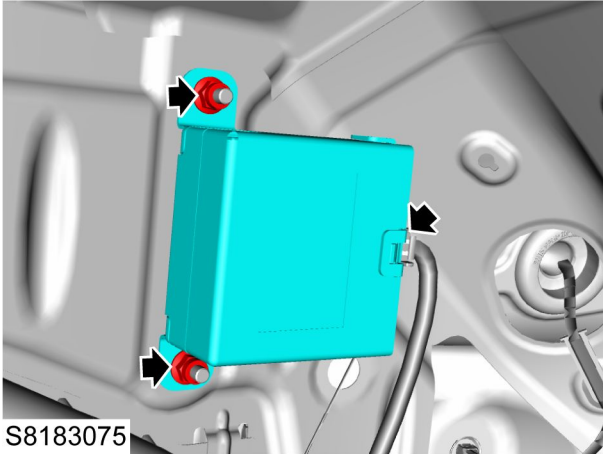
Service Guide

Pedestrian Alert Control Module Remove

1. Disconnect the negative battery cable.
2. Remove the right trunk side trim panel.

Trunk Side Trim Panel Remove

3. Remove 2 nuts fixing the pedestrian alert control module to the body, disconnect the harness connector and remove the pedestrian alert control module.



Refit

1. Connect the harness connector of the pedestrian alert control module.
2. Fix the pedestrian alert control module to the body, fit 2 nuts, tighten them to **5-7Nm**, and check the torque.
3. Fit the right trunk side trim panel.

Trunk Side Trim Panel Refit

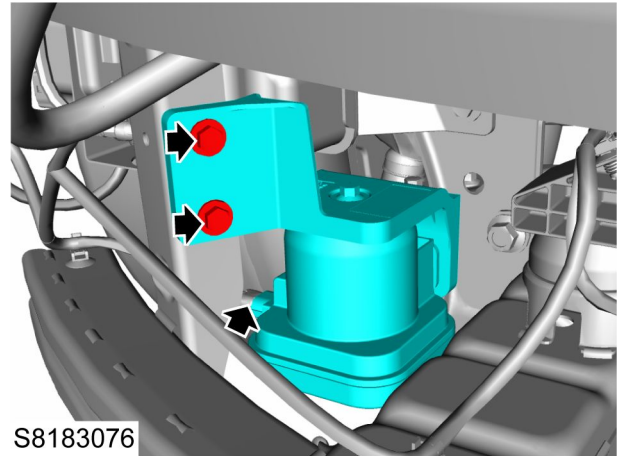
4. Connect the negative battery cable.

Pedestrian Alert Speaker Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

Front Bumper Remove

3. Remove 2 bolts fixing the pedestrian alert speaker to the front bumper beam, disconnect the harness connector, and remove the pedestrian alert speaker.



Refit

1. Connect the harness connector of the pedestrian alert speaker.
2. Fix the pedestrian alert speaker to the front bumper beam, fit 2 bolts, tighten them to **4-6NM**, and check the torque.
3. Fit the front bumper.

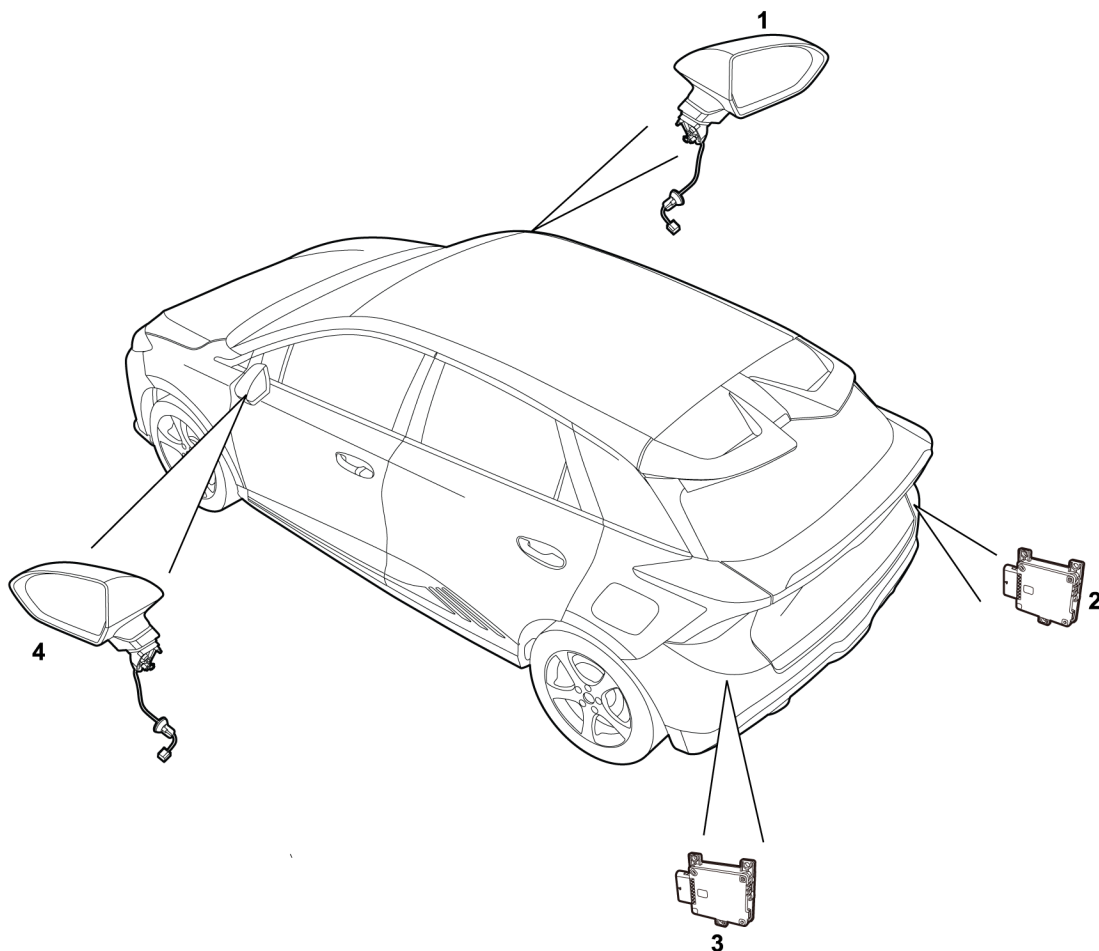
Front Bumper Refit

4. Connect the negative battery cable.

Rearward Driver Assistance System

Description and Operation

System Layout

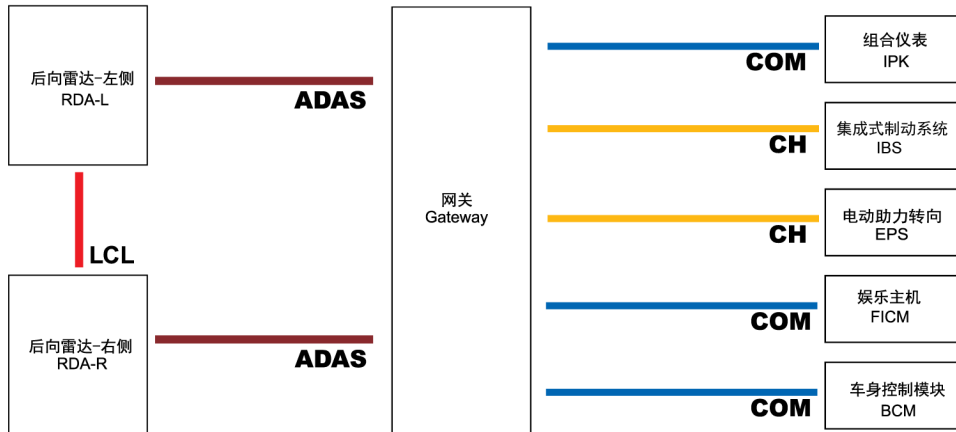


S8110049

- 1. Right Blind Spot Monitoring Indicator Lamp
- 2. Right Rear Distant Object Detection Module

- 3. Left Rear Distant Object Detection Module
- 4. Left Blind Spot Monitoring Indicator Lamp

System Control Diagram



S8181255

A = Chassis CAN Bus; B = Hard Wire; C = Local CAN Bus; D = Comfort CAN Bus; E = ADAS CAN Bus

Description**System Overview**

Two rear radars are fitted at the corner of the bumper to monitor vehicles in the adjacent lanes and areas behind. When moving objects are detected in the early warning, a warning will be issued. The alarm signal of the rear radar activates the warning lamps fitted around the exterior rearview mirrors through the BCM to give an early warning of the dangers detected on the corresponding side. The flashing and ON of the warning lamps correspond to warnings of different levels. The driver will be prompted of the running status of the RDA system through audible and visual alarms of the ICM. For the RCTB function, the emergency braking function can be realized in the dangerous scene of reversing through IBS.

Different vehicles are equipped with different rearward driver assistance functions.

Blind Spot Detection (BSD)

The function of the blind spot detection system is to monitor the vehicle's blind spot (adjacent vehicles). During lane change or potential lane change, if a potential collision is detected, the driver will be alerted through early warning. This helps to avoid traffic accidents and dangers caused by the blind spot.

Lane Change Assist (LCA)

The lane change assistance subsystem can monitor the dangerous targets in the adjacent lane of the vehicle. Before the driver changes lanes, the driver shall be reminded by visual signals to prevent potential collision hazards. The function can be used through the menu.

Rear Cross Traffic Alert System (RCTA)

When reversing, monitor the dangerous targets located at the side and rear of the vehicle, and remind the driver through visual and audio signals to prevent potential collision hazards. The function can be used through the menu.

Rear Cross Traffic Braking System (RCTB)

When reversing, monitor the dangerous targets located at the side and rear of the vehicle, and remind the driver through visual and audio signals. If the driver does not intervene in the braking or the braking force is insufficient, the system will perform emergency braking according to the degree of danger to prevent collision hazards. The function can be used through the menu.

Door Opening Warning (DOW)

The door opening warning subsystem can monitor the obstacles within the door opening range at the side of the vehicle. When the driver and passenger want to open the door, they will be reminded by flashing the atmosphere light on the door handle to prevent potential door opening collision hazards. The function can be used through the menu.

Rear Collision Warning (RCW)

In the process of driving, when other vehicles in the lane approach the vehicle and there is a risk of collision, the rear collision warning function (RCW) will give an alarm to remind the driver that there is a dangerous target approaching, and at the same time, it can remind the rear vehicles to drive safely.

Operation

System On and Off

The rearward driver assistance (RDA) system switch is a soft key on the entertainment display, which can be used to turn on or off the rearward driver assistance system or its subsystems after the display goes into the Rear Driver Assistance System Settings interface in the Vehicle Settings interface.

When the rearward driver assistance system is on, its subsystem options can be set accordingly. When the rearward driver assistance system is off, its subsystem options will be inoperable, and the rearward driver assistance system will be off.

System Operation

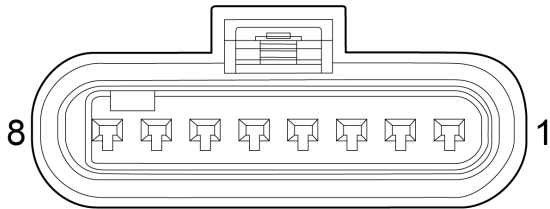
When the function of each subsystem is turned on, if the subsystem activation conditions are met, the system will alert the driver or the passenger through the warning lamps, to safely use the vehicle.

Refer to the User Manual for detailed activation conditions or warning strategies.

Detailed Information List of Component Pins

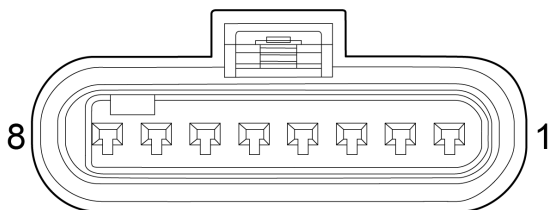
End View and Pin Information of Left Rearward Driver Assistance System Harness Connector BY056

7	ADAS CAN High
8	Power Supply



Pin No.	Description
1	Ground 2
2	-
3	Local CAN Low
4	Local CAN High
5	Ground 1
6	ADAS CAN Low
7	ADAS CAN High
8	Power Supply

End View and Pin Information of Right Rearward Driver Assistance System Harness Connector BY052



Pin No.	Description
1	Ground 2
2	Ground 3
3	Local CAN Low
4	Local CAN High
5	Ground 1
6	ADAS CAN Low

Service Guide

Rearward Driver Assistance Control Module Remove

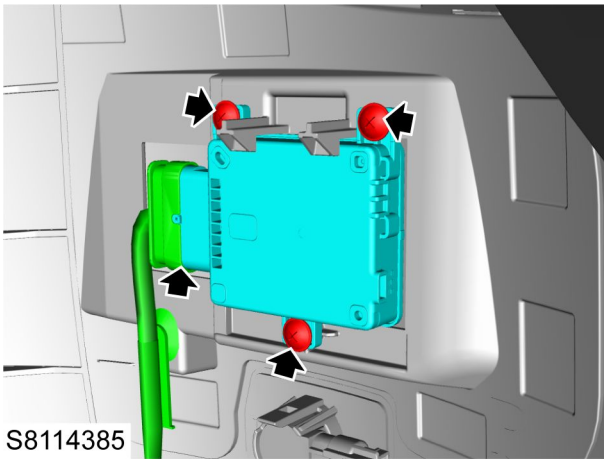
1. Disconnect the negative battery cable.
2. Raise the vehicle on a hoist.

Warning : *Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.*

3. Remove the rear bumper.

Rear Bumper Remove

4. Disconnect the harness connector of the rearward driver assistance control module.
5. Remove 3 screws fixing the rearward driver assistance control module to the rear bumper, loosen the clip, and remove the rearward driver assistance control module.



Refit

1. Fix the rearward driver assistance control module to the rear bumper, and secure with clips.
2. Fix the rearward driver assistance control module to the rear bumper, fit 3 screws, tighten them to **1-1.4Nm**, and check the torque.
3. Connect the harness connector.
4. Connect the negative battery cable.
5. Fit the rear bumper.

Rear Bumper Refit

6. Lower the vehicle.
7. Programme and encode the rearward driver assistance control module.

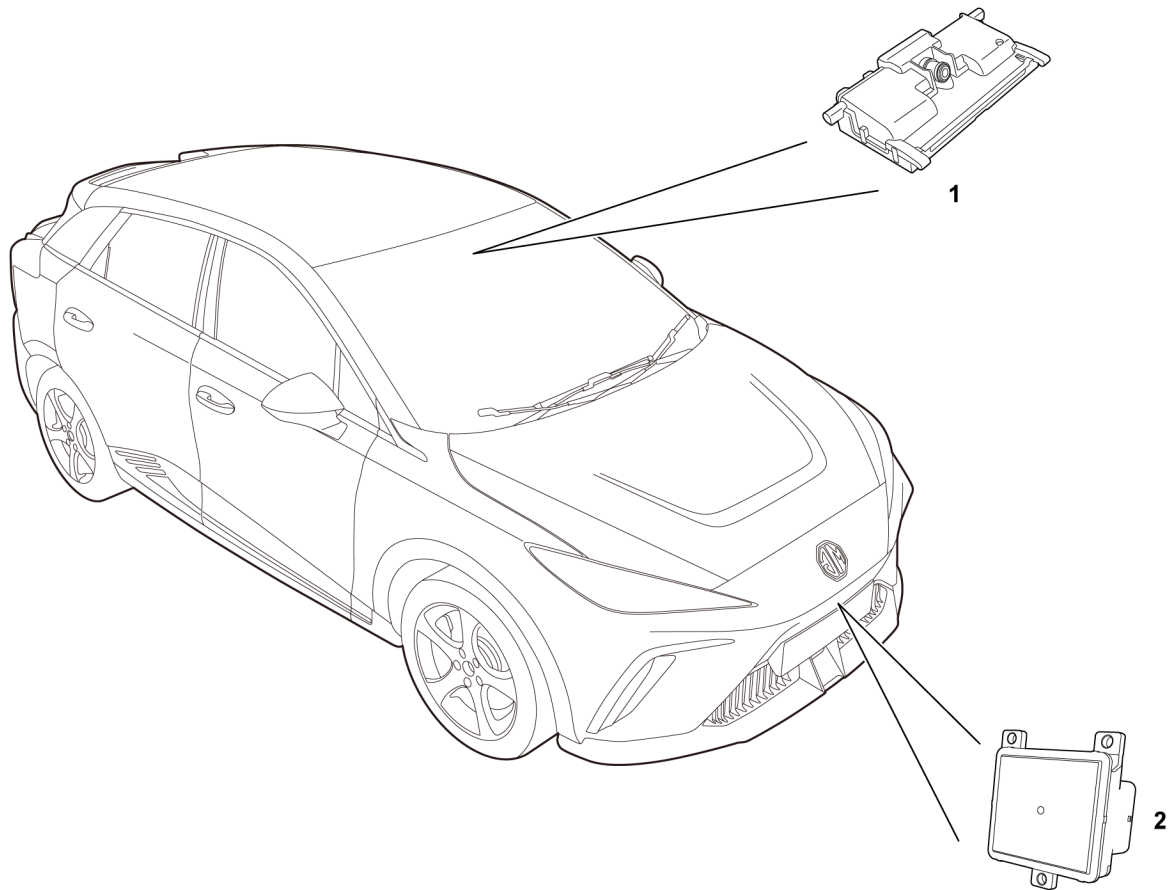
Rear Driver Assist System (RDA)

Driver Assistance System

Description and Operation

System Layout

FVCM/FDRSystem Layout



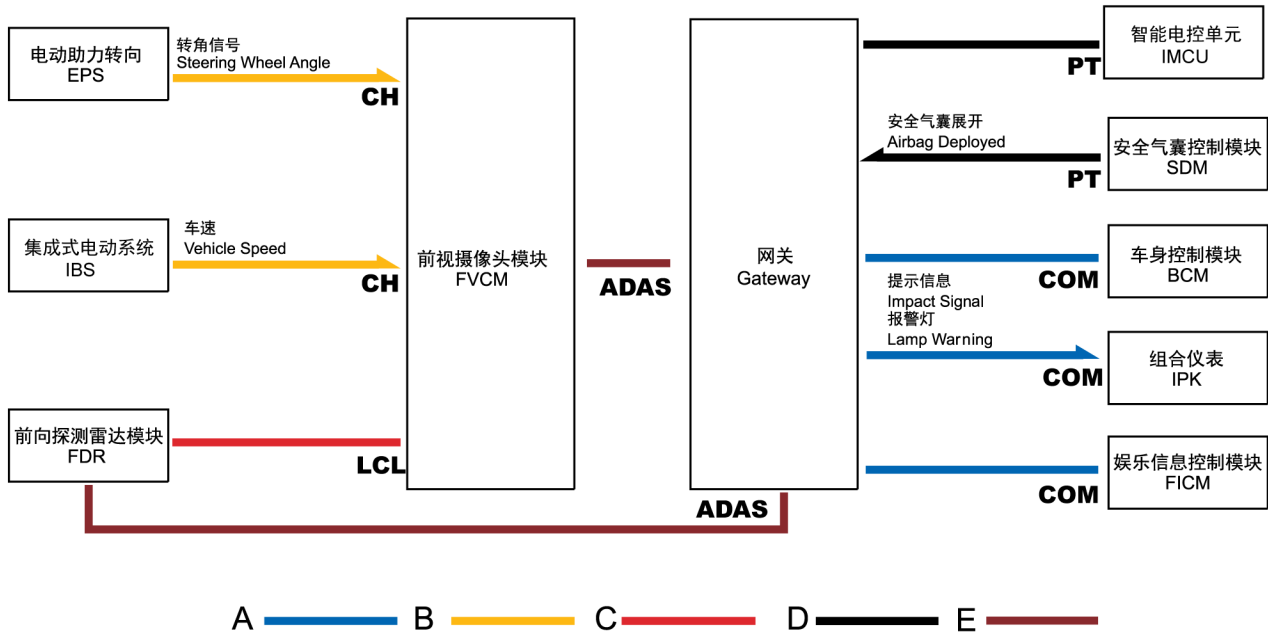
S8160146

1. Front View Camera Module

2. Forward Detection Radar

System Control Diagram

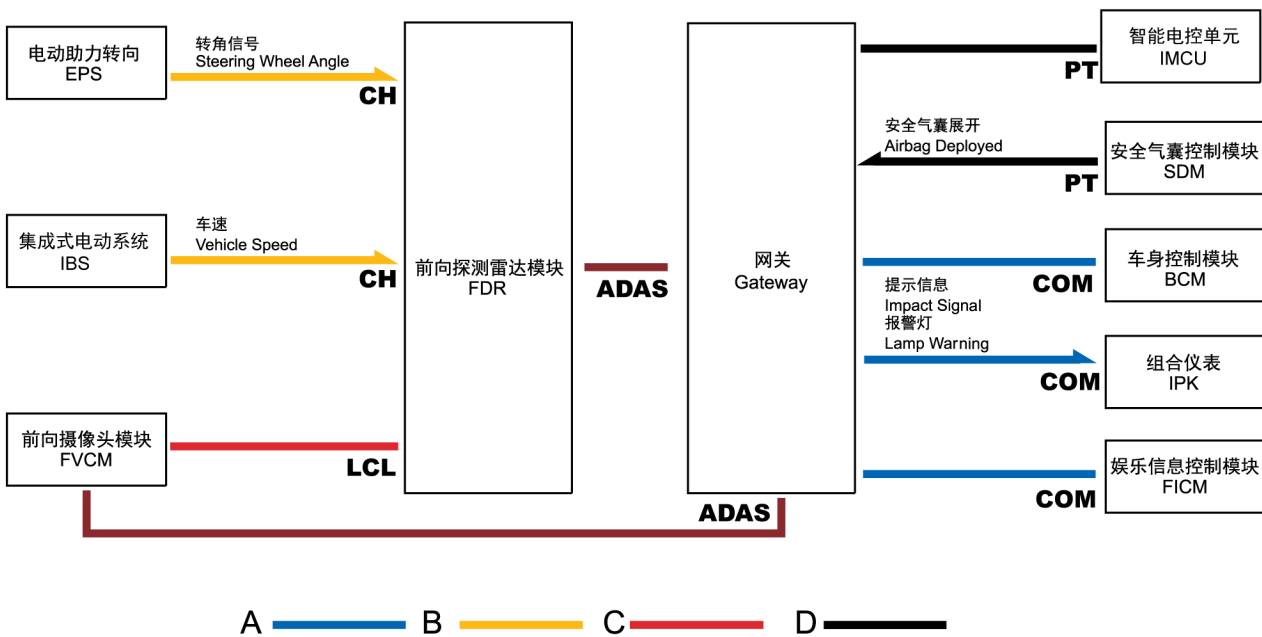
FVCMControl Diagram



S8161026

A = Comfort CAN Bus; B = Chassis CAN Bus; C = Local CAN Bus; D = Power CAN Bus; E = ADAS CAN Bus

FDRControl Diagram



S8161027

A = Comfort CAN Bus; B = Chassis CAN Wire; C = Local CAN Bus; D = Power CAN Bus

Description

The driver assistance system can detect the road and environmental information ahead of the vehicle with the front view camera located at the upper middle of the windscreen (in the interior rearview mirror base cover) and the forward detection radar located at the lower middle of the front bumper, provide the warning messages or intervene the vehicle when certain conditions are met to help the driver control the vehicle more safely and reliably.

The driver assistance system consists of the following components:

- Front View Camera Module
- Forward Detection Radar
- Driver Assistance System Switch

Front View Camera Module

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.

Forward Detection Radar

The forward detection radar is a millimeter wave radar, which is used to detect road traffic conditions and identify distant vehicles and pedestrians.

Driver Assistance System Switch

By operating the function switch on the entertainment display, the relevant functions of the driver assistance system can be enabled, disabled or set. Some functions also need to be operated through the switch on the left side of the driver's steering wheel.

Operation**Lane Keeping Assist System**

The lane keeping assist system detects the lane line in front through the front view camera. When certain conditions are met, if the wheels are about to press the line or have already pressed the line, they are about to drive up the curb or have already driven up the curb, or the vehicles of adjacent lanes in the opposite direction are close to the middle lane line, the system will send a warning to remind the driver to correct the direction in time so that the vehicle can drive within the lane line; or assist the driver to keep the vehicle running within the lane line or make emergency avoidance by applying corrective steering intervention and giving prompts.

Adaptive Cruise Control System

The adaptive cruise control system can make the vehicle cruise at a constant speed within a certain speed range, or conduct car-following cruise according to the set time distance.

Traffic Jam Assist System

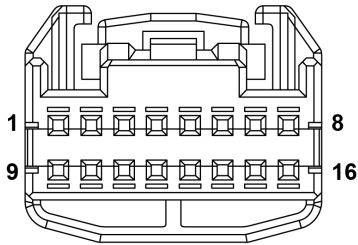
The traffic jam assist system works on the basis of the adaptive cruise system. If the lane lines ahead on the left and right sides are clear, the system will assist the vehicle in driving within the lane lines; when driving at a low speed, if there is a vehicle ahead, the system will assist the vehicle in following the track of the vehicle in front.

Forward Collision Assist System

Under certain conditions, when the system detects the risk of collision between this vehicle and the vehicle ahead or pedestrians, it will remind the driver to slow down in time and keep a relatively safe distance and speed from the vehicle ahead or pedestrians; or automatically let the brake system intervene to slow down the vehicle, so as to avoid collision or mitigate the damage of the collision.

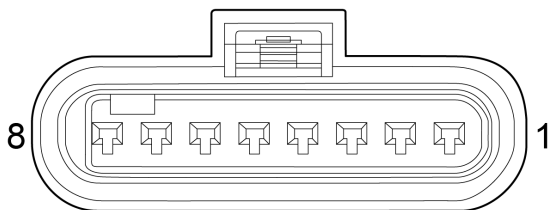
Detailed Information List of Component Pins

End View and Pin Definition of FVCM Harness Connector FA084



Mark No.	English Name
1	Power Supply
2	ADAS CAN High
3	ADAS CAN Low
4	-
5	Ground
6-9	-
10	Local CAN High
11	Local CAN Low
12-16	-

End View and Pin Definition of FDR Harness Connector FC060



Mark No.	English Name
1-2	-
3	Local CAN Low
4	Local CAN High
5	Ground
6	CAN Low
7	CAN High
8	Power Supply

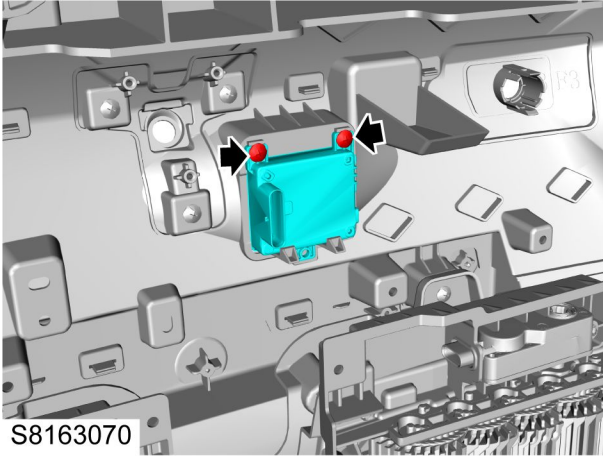
Service Guide

Forward Detection Radar Remove

1. Remove the front bumper.

Front Bumper Remove

2. Disconnect the harness connector of the forward detection radar.
3. Remove 2 screws fixing the forward detection radar to the front bumper.



4. Remove the forward detection radar.

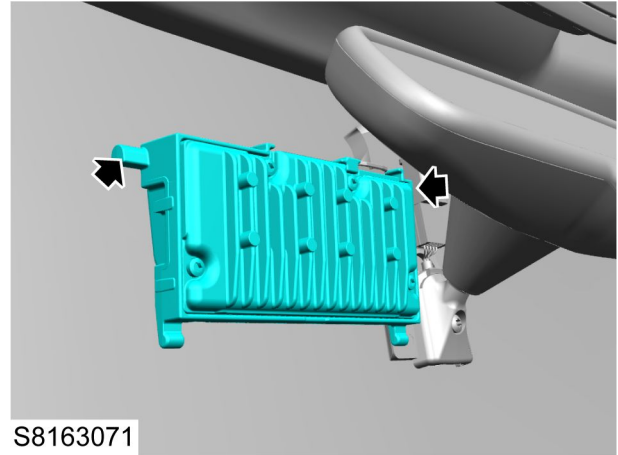
Refit

1. Fit the front view camera module and secure it with clips.
2. Connect the harness connector of the front view camera module.
3. Fit the interior rearview mirror cover.
4. Connect the negative battery cable.
5. Perform a self-learning for the front view camera module.

Front View Camera Module (FVCM)

Front View Camera Module Remove

1. Disconnect the negative battery cable.
2. Remove the interior rearview mirror cover.
3. Disconnect the harness connector of the front view camera module.
4. Use a tool to carefully pry off the clips.



5. Remove the front view camera module.

Refit

1. Locate the forward detection radar to the front bumper, fit and tighten 2 screws.
2. Connect the harness connector of the forward detection radar.
3. Fit the front bumper.

Front Bumper Refit

4. Perform a self-learning for the forward detection radar.

Front Detection Radar (FDR)

Entertainment System

Entertainment System

Specification

Torque

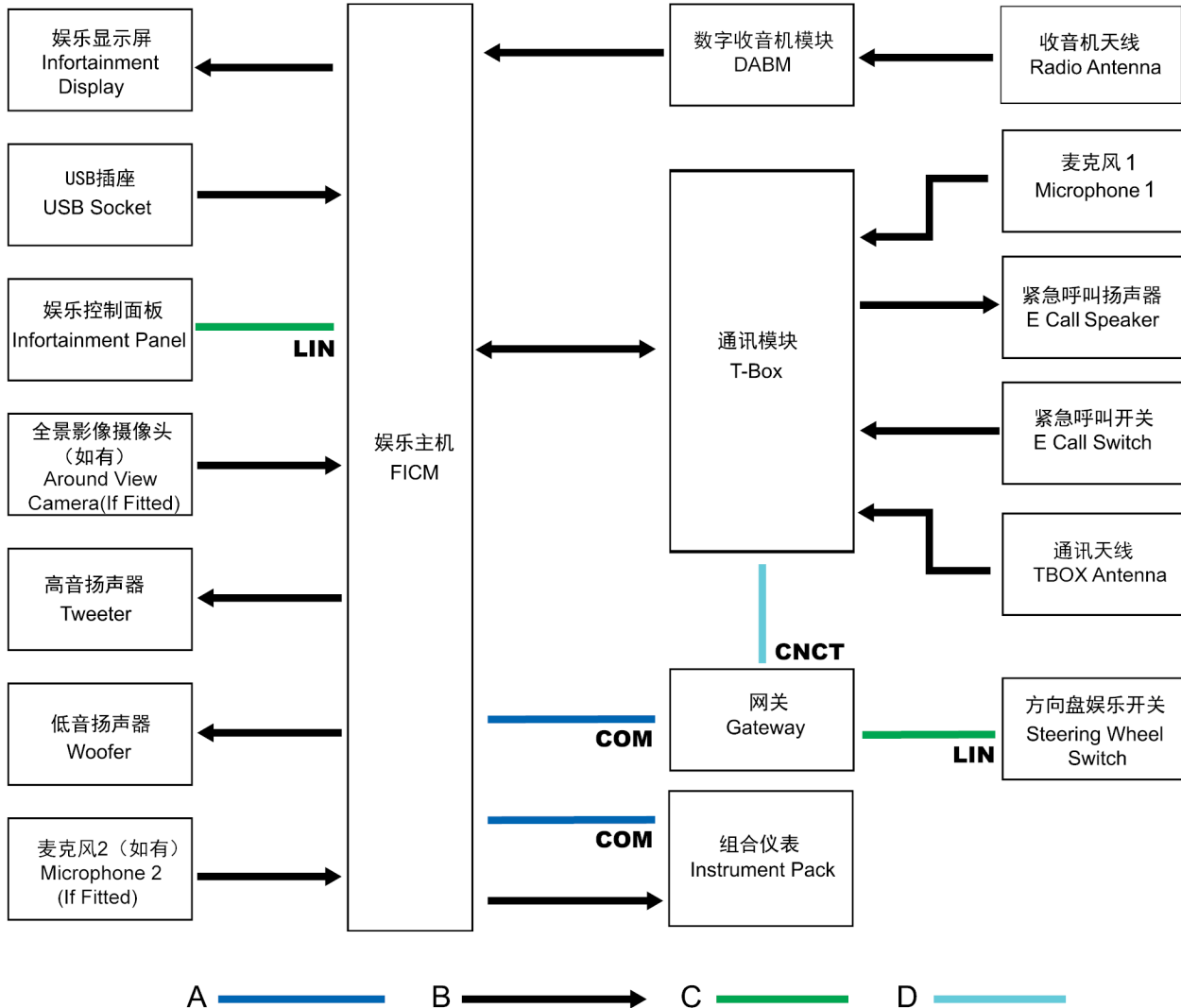
Description	Value
Screw- Display to Instrument Panel	1.3-1.9NM
Nut-FICM to Instrument Panel beam	7-10NM
Bolt-TBOX to Instrument Panel beam	7-10NM
Nut-RBRM to Instrument Panel beam	7-10NM
Screw-Multi-range Speaker to Front Door	1-2NM
Screw-E-Call to Driver Knee Applique	1.3-1.9NM
Screw-TBOX Antenna to Instrument Panel beam	1.3-1.9NM
Bolt-Radio Antenna Coil to tailgate	6.5-10NM
Bolt-Amplifier Radio Antenna to Body	6.5-10NM
Screw-DMS Camera to Steering Column Upper Cover	1-1.4NM
Nut-DMS to Instrument Panel	7-10NM

Description and Operation

System Layout

System Control Diagram

Entertainment System Control Diagram



S7310084

A = Comfort CAN Bus; B = Hard Wire; C = LIN Bus; D = Connection CAN Bus

Entertainment System

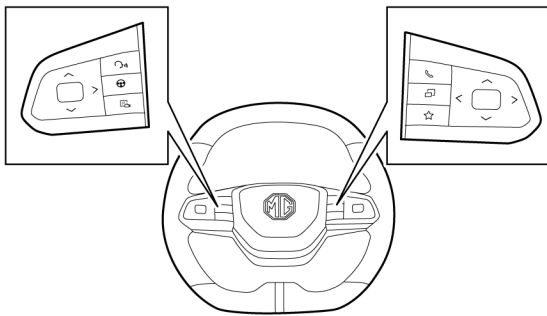
Description

Overview

1. Low configuration entertainment mainframes supports radio, USB, Bluetooth phone, video and other functions.
2. High configuration entertainment mainframes supports radio, USB, Bluetooth phone, video, navigation, 4G network and other functions.

Audio Control Button on Steering Wheel

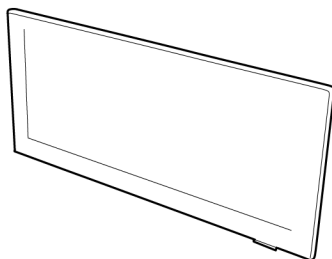
The audio device can be controlled by the remote switch on the steering wheel. These function buttons allow the most common functions in the ICESystem to be used in a much more convenient manner.



S7313390

Display

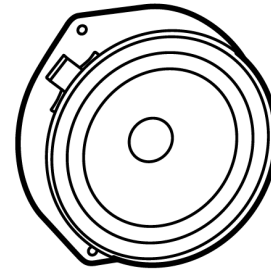
The display shows the audio information and relevant information.



S7313416

Woofers

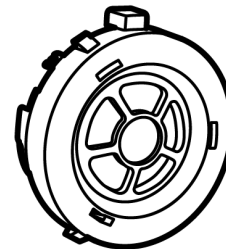
The woofers are in the four vehicle doors, which are fixed on the door panel by 3 screws.



S7313401

Tweeter

The front tweeter is fitted in the front door quarter window and fixed with clips.



S7313400

Communication Antenna

The communication antenna is fitted on the instrument desk.



S7313411

Operation

For more information about the operation of the entertainment system, please refer to "User Manual" and "Navigation Manual".

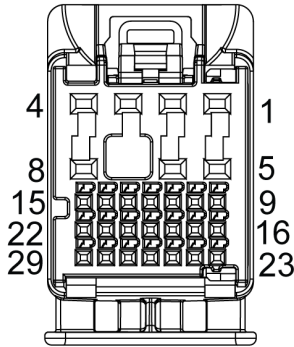
Entertainment System

Detailed Information List of Component Pins

End View and Pin Information of Low Configuration Entertainment Mainframe Connector

End View and Pin Information of Entertainment

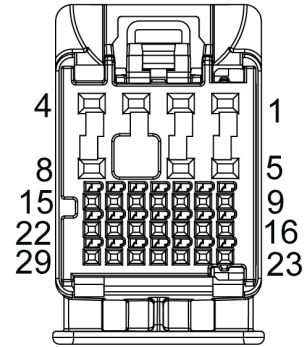
Mainframe Harness Connector FA004:



Pin No.	Description
1	Front Left Audio -
2	Front Left Audio +
3	Front Right Audio +
4	Front Right Audio -
5	Ground
6-15	-
16	TBOX Microphone Signal
17	TBOX Microphone Shielded Wire
18-22	-
23	DAB Module Left Audio Signal
24	DAB Module Left Audio Ground
25	DAB Module Audio Shielded Wire
26	DAB Module Right Audio Signal
27	DAB Module Left Audio Ground
28	TBOX Audio Signal
29	TBOX Audio Shielded Wire

End View and Pin Information of Entertainment

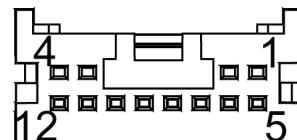
Mainframe Connector FA008:



Pin No.	Description
1 - 4	-
5	Power Supply
6-10	-
11	Entertainment Display Enable
12-13	-
14	CAN Low
15	CAN High
16-22	-
23	LIN Bus
24-26	-
27	DAB Module Enable
28-29	-

End View and Pin Information of Entertainment

Mainframe Connector FA045:

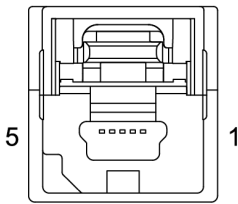


Pin No.	Description
1-2	-

Driver Information and Entertainment System

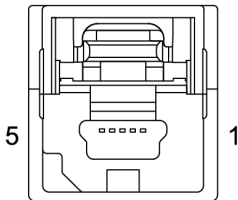
3	Entertainment Display Enable
4	-
5	Power Supply
6	Ground
7-12	-

End View and Pin Information of Entertainment Mainframe Connector FA055:



Pin No.	Description
1	USB1 5V Power Supply
2	USB1 Data -
3	USB1 Data +
4	-
5	USB1 Ground

End View and Pin Information of Entertainment Mainframe Connector FA054

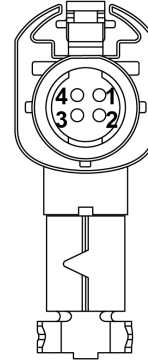


Pin No.	Description
1	USB2 5V Power Supply
2	USB2 Data -
3	USB2 Data +

Entertainment System

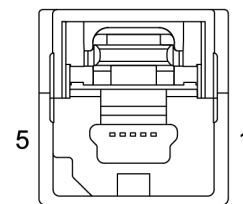
4	-
5	USB2 Ground

End View and Pin Information of Entertainment Mainframe Connector FA053



Pin No.	Description
1	USB3 5V Power Supply
2	USB3 Data +
3	USB3 Ground
4	USB3 Data -

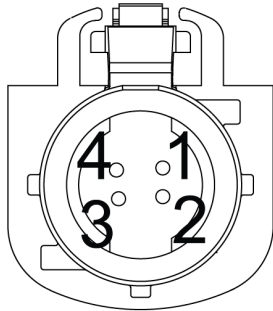
End View and Pin Information of Entertainment Mainframe Connector FA052



Pin No.	Description
1	USB4 5V Power Supply
2	USB4 Data -
3	USB4 Data +
4	-
5	USB4 Ground

Entertainment System

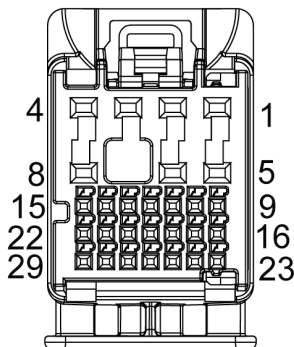
End View and Pin Information of Entertainment Mainframe Connector FA050



Pin No.	Description
1	Display LVDS 1+
2	Display LVDS 2+
3	Display LVDS 1-
4	Display LVDS 2-

End View and Pin Information of High Configuration Entertainment Mainframe Connector

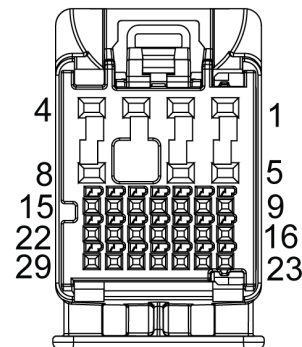
End View and Pin Information of Entertainment Mainframe Harness Connector FA057



Pin No.	Description
1	Front Left Audio -
2	Front Left Audio +
3	Right Front Audio +
4	Front Right Audio -
5	Ground
6-11	-
12	Around View Monitor Front View Camera Signal
13	Around View Monitor Front View Camera Shielded Wire

14	Around View Monitor Rear View Camera Signal
15	Around View Monitor Rear View Camera Shielded Wire
16	TBOX Microphone Signal
17	TBOX Microphone Shielded Wire
18	Front Right Microphone Signal
19	Front Right Microphone Shielded Wire
20-23	-
23	DAB Module Left Audio Signal
24	DAB Module Left Audio Ground
25	DAB Module Audio Shielded Wire
26	DAB Module Right Audio Signal
27	DAB Module Right Audio Ground
28	TBOX Audio Signal
29	TBOX Audio Shielded Wire

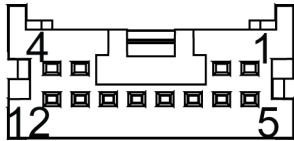
End View and Pin Information of Entertainment Mainframe Connector FA056



Pin No.	Description
1	Rear Right Audio +
2	Rear Right Audio -
3	Left Rear Audio +
4	Rear Left Audio -
5	Power Supply
6-9	-
10	Around View Monitor Front View Camera Power Supply
11	Display Enable Signal
12-13	-

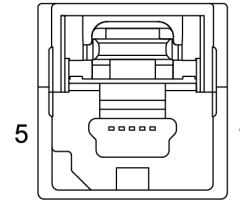
14	CAN Low
15	CAN High
16	Around View Monitor Left View Camera Signal
17	Around View Monitor Left View Camera Shielded Wire
18	Around View Monitor Right View Camera Signal
19	Around View Monitor Right View Camera Shielded Wire
20-22	-
23	LIN Bus
24-26	-
27	DAB Module Enable Signal
28-29	-

End View and Pin Information of Entertainment Mainframe Connector FA045:



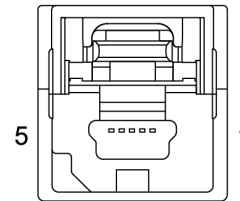
Pin No.	Description
1-2	-
3	Entertainment Display Enable
4	-
5	Power Supply
6	Ground
7-12	-

End View and Pin Information of Entertainment Mainframe Connector FA055:



Pin No.	Description
1	USB1 5V Power Supply
2	USB1 Data -
3	USB1 Data +
4	-
5	USB1 Ground

End View and Pin Information of Entertainment Mainframe Connector FA054

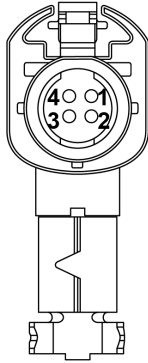


Pin No.	Description
1	USB2 5V Power Supply
2	USB2 Data -
3	USB2 Data +
4	-
5	USB2 Ground

Entertainment System

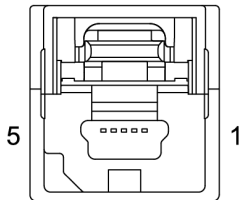
Driver Information and Entertainment System

End View and Pin Information of Entertainment Mainframe Connector FA053



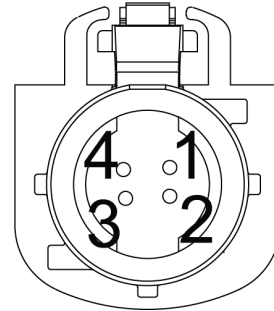
Pin No.	Description
1	USB3 5V Power Supply
2	USB3 Data +
3	USB3 Ground
4	USB3 Data -

End View and Pin Information of Entertainment Mainframe Connector FA052



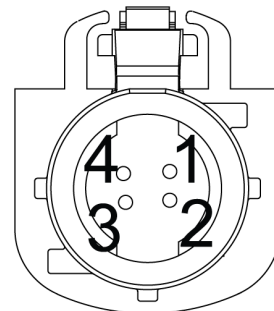
Pin No.	Description
1	USB4 5V Power Supply
2	USB4 Data -
3	USB4 Data +
4	-
5	USB4 Ground

End View and Pin Information of Entertainment Mainframe Connector FA051



Pin No.	Description
1	Instrument Pack LVDS1 +
2	Instrument Pack DRAIN2+
3	Instrument Pack LVDS1 -
4	Instrument Pack DRAIN2-

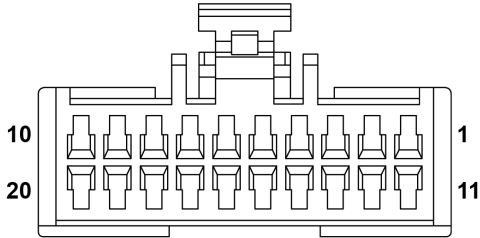
End View and Pin Information of Entertainment Mainframe Connector FA050



Pin No.	Description
1	Display LVDS 1 +
2	Display LVDS 2 +
3	Display LVDS 1 -
4	Display LVDS 2 -

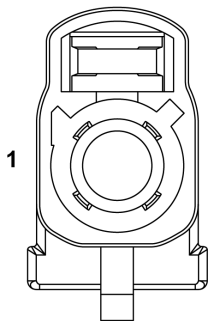
DAB Module Connector

End View and Pin Information of DAB Module Harness Connector FA063



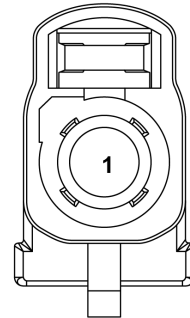
Pin No.	Description
1	DAB Module Right Audio Ground
2	DAB Module Right Audio Signal
3	Enable
4-9	-
10	Ground
11	DAB Module Left Audio Ground
12	DAB Module Left Audio Signal
13-19	-
20	Power Supply

End View and Pin Information of DAB Module Harness Connector FA090



Pin No.	Description
1	Radio Antenna Signal
2	Radio Antenna Shielded Wire

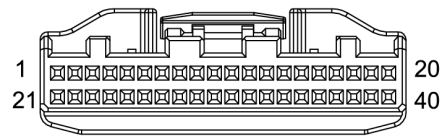
End View and Pin Information of DAB Module Harness Connector FA089:



Pin No.	Description
1	DAB Antenna Signal
2	DAB Antenna Shielded Wire

Communication Module Connector

End View and Pin Information of Communication Module Harness Connector FA067

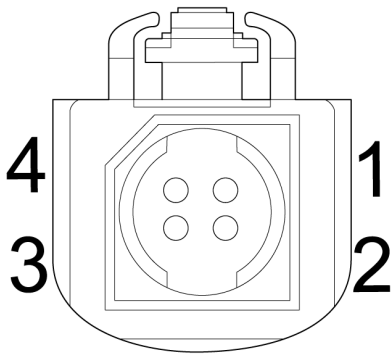


Pin No.	Description
1 - 4	-
5	Communication Module Microphone Shielded Wire
6	Front Left Microphone Signal
7	-
8	Entertainment Mainframe Audio Output Signal +
9	Emergency Call Speaker +
10	Emergency Call Switch Ground
11	-
12	Emergency Call LED Switch Ground
13 - 18	-
19	CAN High
20	Power Supply

Entertainment System

21-24	-
25	Communication Module Microphone Output Signal
26	Front Left Microphone Shielded Wire
27	-
28	Entertainment Mainframe Audio Output Signal -
29	Emergency Call Speaker -
30	Emergency Call Switch Signal
31-33	-
34	Emergency Call LED Switch Signal
35-38	-
39	CAN Low
40	Ground

**End View and Pin Information of Entertainment
Mainframe Connector FA065:**



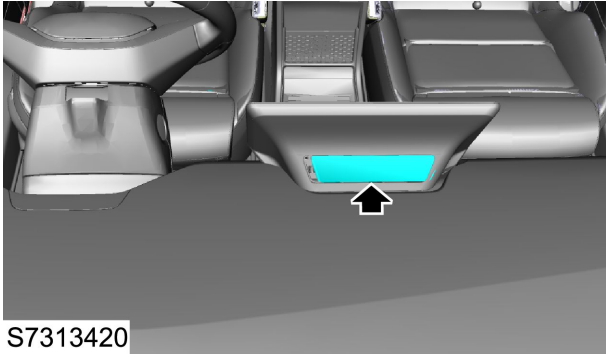
Pin No.	Description
1	USB3 Data -
2	USB3 Ground
3	USB3 Data +
4	USB3 5V Power Supply

Service Guide

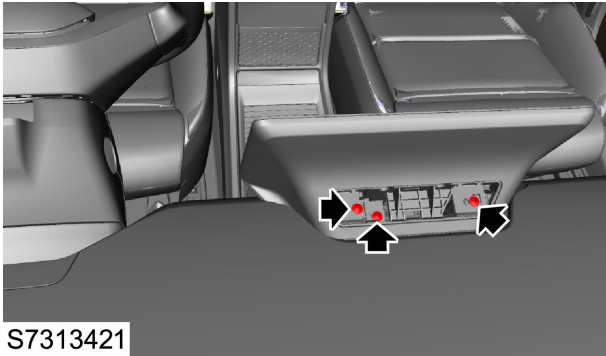
Display

Remove

1. Disconnect the negative battery cable.
2. Pry off the clip and remove the entertainment display trim panel.



3. Remove 3 screws fixing the entertainment display to the instrument panel.



4. Disconnect the harness connector and remove the entertainment display and switch.
5. Remove the entertainment panel switch.

Entertainment Panel Switch

Refit

1. Fit the entertainment panel switch.

Entertainment Panel Switch

2. Connect the harness connector.
3. Fix the entertainment display to the instrument panel, fit 3 screws, tighten them to **1.3-1.9NM**, and check the torque.
4. Fit the entertainment display trim panel.
5. Connect the negative battery cable.

Entertainment Mainframe

Remove

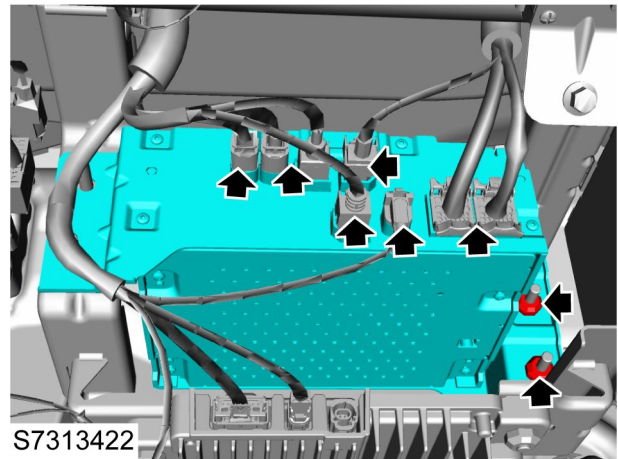
1. Disconnect the negative battery cable.
2. Remove the glove box assembly.

Glove Box Assembly

3. Remove the glove box frame.

Instrument panel body

4. Remove 2 nuts fixing the entertainment mainframe to the instrument panel beam, disconnect the harness connector, and remove the entertainment mainframe.



Refit

1. To replace the entertainment mainframe, you need to report the SN number to TCMP. Confirm the status is "reported".
2. Connect the harness connector.
3. Connect the negative battery cable.
4. Programme and encode the FICM.
5. After entertainment mainframe replacement, calibrate the 360° AVM camera (if equipped).

Instrument panel body

6. Fix the entertainment mainframe to the instrument panel beam, fit 2 nuts, tighten them to **7-10NM**, and check the torque.
7. Fit the glove box frame.

Instrument panel body

8. Fit the glove box assembly.

Glove Box Assembly

Entertainment System

Communication Module Remove

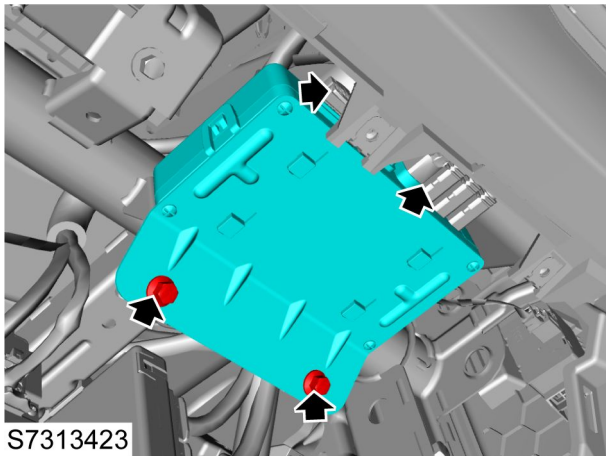
1. Disconnect the negative battery cable.
2. Remove the glove box assembly.

Glove Box Assembly Remove

3. Remove the glove box frame.

Instrument panel body

4. Remove 2 bolts fixing the communication module to the instrument panel beam, disconnect the harness connector, and remove the communication module.



Refit

1. To replace the communication module, you need to report the SN number and ICCID to TCMP. Confirm the status is "reported".
2. Connect the harness connector of the communication module.
3. Connect the negative battery cable.
4. Programme and encode the communication module (TBOX).

Communication Module (TBOX)

5. Fix the communication module to the instrument panel beam, fit 2 bolts, tighten them to **7-10NM**, and check the torque.
6. Fit the glove box frame.

Instrument panel body

7. Fit the glove box assembly.

Glove Box Assembly

Digital Audio Broadcasting (DAB) Module Remove

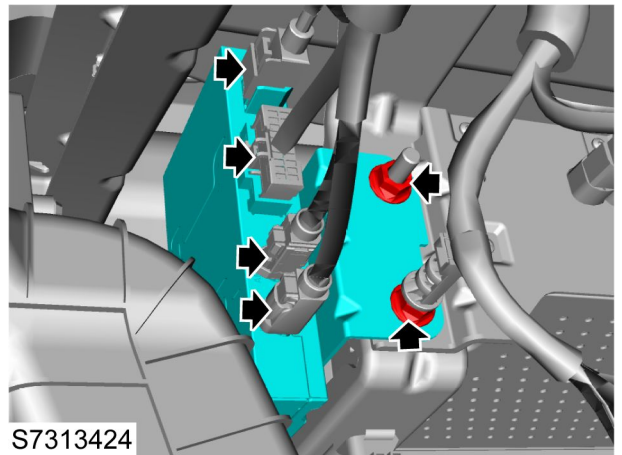
1. Disconnect the negative battery cable.
2. Remove the glove box assembly.

Glove Box Assembly

3. Remove the glove box frame.

Instrument panel body

4. Release the clip fixing the harness to the nut.
5. Remove 2 nuts fixing the DAB module to the instrument panel beam, disconnect the harness connector, and remove the DAB module.



Refit

1. Connect the harness connector of the RBRM.
2. Connect the negative battery cable.
3. Fix the RBRM to the instrument panel beam, fit 2 nuts, tighten them to **7-10NM**, and check the torque.
4. Fix the harness to the nut and secure it with clips.
5. Fit the glove box frame.

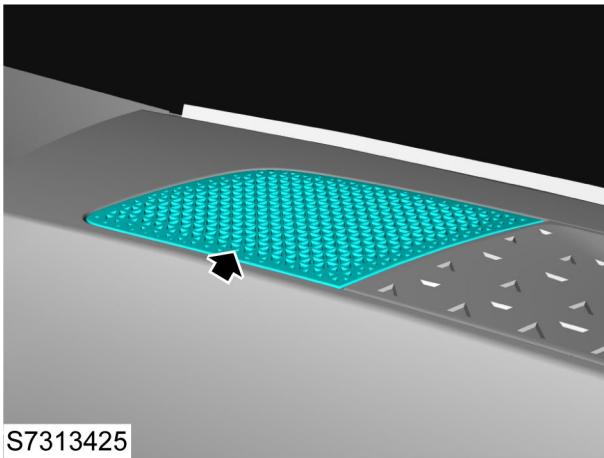
Instrument panel body

6. Fit the glove box assembly.

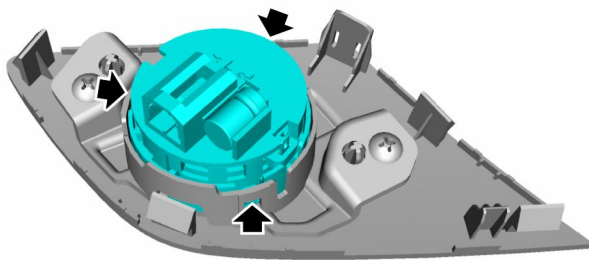
Glove Box Assembly Refit

Front Tweeter Remove

1. Disconnect the negative battery cable.
2. Pry off the front tweeter cover plate.



3. Disconnect the harness connector of the front tweeter.
4. Loosen the clip and remove the front tweeter.



Refit

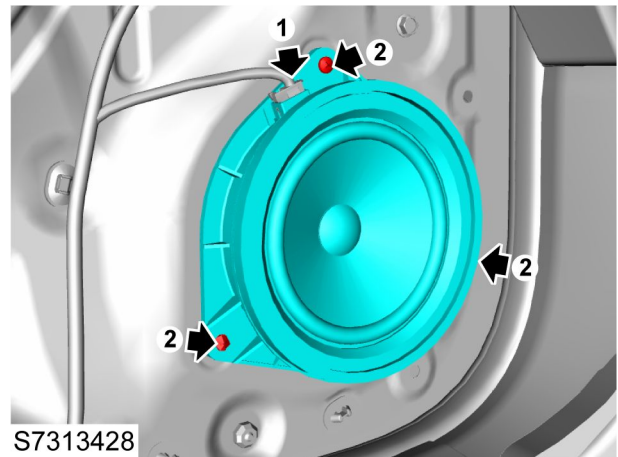
1. Push the front tweeter into the cover plate and ensure the clips are fully engaged.
2. Connect the harness connector of the front tweeter.
3. Fit the front tweeter cover plate.
4. Connect the negative battery cable.

Front Door Woofer Remove

1. Disconnect the negative battery cable.
2. Remove the front door interior trim panel.

Front Door Interior Trim Panel Remove

3. Disconnect the harness connector(1) of the woofer.
4. Remove 3 screws(2) fixing the woofer to the front door, remove the front door woofer.



Refit

1. Fix the front door woofer to the front door, fit 3 screws, tighten them to **1-2NM**, and check the torque.
2. Connect the harness connector.
3. Fit the front door interior trim panel.

front door interior trim panel Refit

4. Connect the negative battery cable.

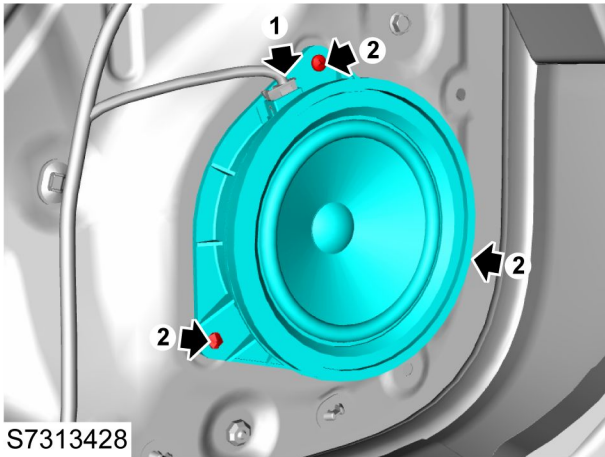
Entertainment System

Rear Door Woofer Remove

1. Disconnect the negative battery cable.
2. Remove the front door interior trim panel.

Front Door Interior Trim Panel Remove

3. Disconnect the harness connector (1).
4. Remove 3 screws (2) fixing the front door woofer to the front door, and remove the front door woofer.



Refit

1. Fix the front door woofer to the front door, fit 3 screws, tighten them to **1-2NM**, and check the torque.
2. Connect the harness connector.
3. Fit the front door interior trim panel.

Front Door Interior Trim Panel Refit

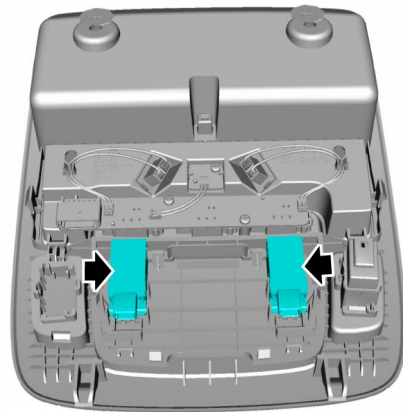
4. Connect the negative battery cable.

Microphone Remove

1. Disconnect the negative battery cable.
2. Remove the overhead console.

Overhead Console and Reading Lamp Assembly Remove

3. Release the clip, and remove the microphone from the overhead console.



Refit

1. Fix the microphone to the overhead console, and press the clip.
2. Fit the overhead console.

Overhead Console and Reading Lamp Assembly

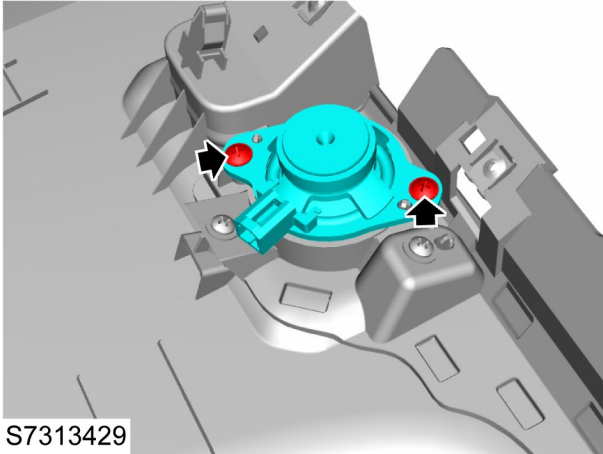
3. Connect the negative battery cable.

E-Call Speaker Remove

1. Disconnect the negative battery cable.
2. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly

3. Disconnect the harness connector of the emergency call speaker.
4. Remove 2 screws fixing the emergency call speaker to the driver side lower trim panel assembly.



5. Remove the emergency call speaker.

Refit

1. Fix the emergency call speaker to the driver side lower trim panel assembly, fit 2 screws, tighten them to **1.3-1.9NM**, and check the torque.
2. Connect the harness connector of the emergency call speaker.
3. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly

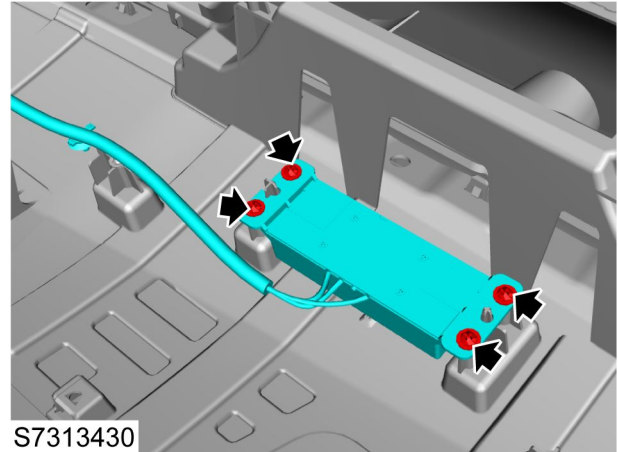
4. Connect the negative battery cable.

Communication Module Antenna Remove

1. Disconnect the negative battery cable.
2. Remove the instrument panel body.

Instrument Panel Body Remove

3. Disconnect the harness connector.
4. Remove 4 screws fixing the communication module antenna to the instrument panel, and remove the communication module antenna.



Refit

1. Fix the communication module antenna to the instrument panel, fit 4 screws, tighten them to **1.3-1.9NM**, and check the torque.
2. Connect the harness connector.
3. Fit the instrument panel body.

Instrument Panel Body Refit

4. Connect the negative battery cable.

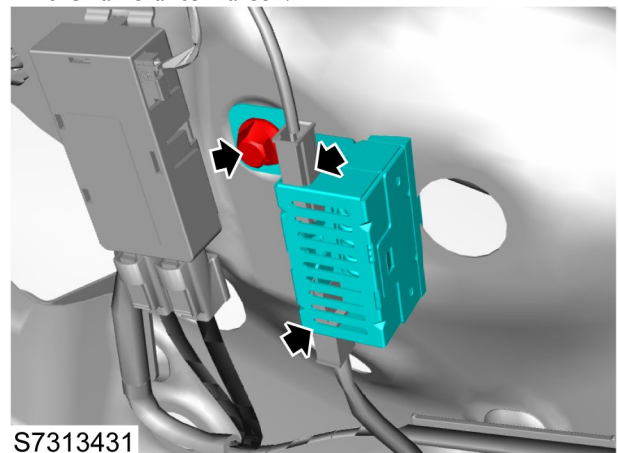
Radio Coil

Remove

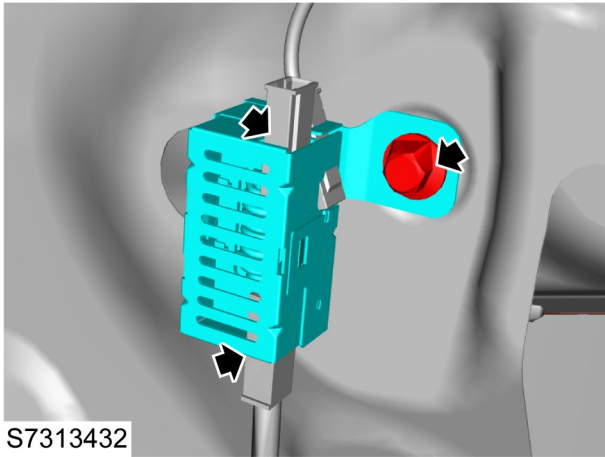
1. Disconnect the negative battery cable.
2. Remove the tail gate interior trim panel.

Tail Gate Interior Trim Panel

3. Remove 2 bolts fixing the radio antenna coil to the tail gate, disconnect the harness connector and remove the radio antenna coil.



Entertainment System



S7313432

Refit

1. Connect the harness connector of the radio antenna coil.
2. Fix the radio antenna coil to the tail gate, fit 2 bolts, tighten them to **6.5-10NM**, and check the torque.
3. Fit the tail gate interior trim panel.

 **Tail Gate Interior Trim Panel**

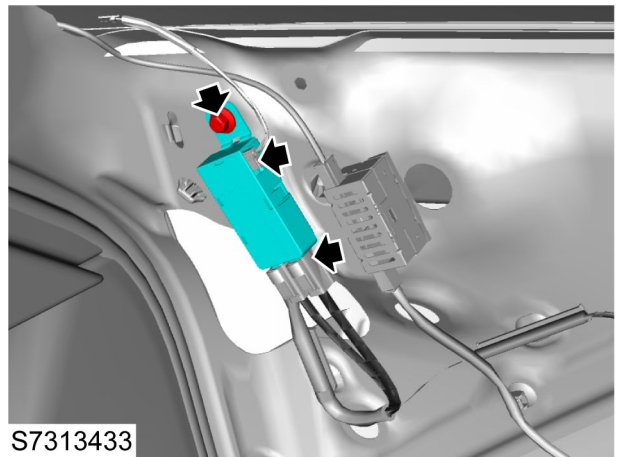
4. Connect the negative battery cable.

**Antenna Amplifier
Remove**

1. Disconnect the negative battery cable.
2. Remove the tail gate interior trim panel.

 **Tail Gate Interior Trim Panel**

3. Remove 1 bolt fixing the antenna amplifier to the body, disconnect the harness connector, and remove the antenna amplifier.



S7313433

Refit

1. Fix the antenna amplifier to the body, fit 1 bolt, tighten it to **6.5-10NM**, and check the torque.
2. Connect the harness connector of the antenna amplifier.
3. Fit the tail gate interior trim panel.

 **Tail Gate Interior Trim Panel**

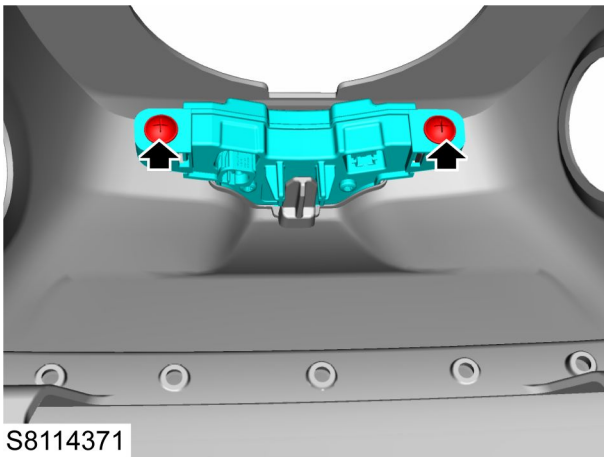
4. Connect the negative battery cable.

Driver Monitoring System Camera Remove

1. Disconnect the negative battery cable.
2. Remove the steering column upper trim cover .

Steering Column Upper Trim Cover Remove

3. Remove 2 screws fixing the driver monitoring system camera to the steering column upper trim cover, and remove the driver monitoring system camera.



Refit

1. Fix the driver monitoring system camera to the steering column upper trim cover, fit 2 screws, tighten them to **1-1.4NM**, and check the torque.
2. Fit the steering column upper trim cover.

Steering Column Upper Trim Cover Refit

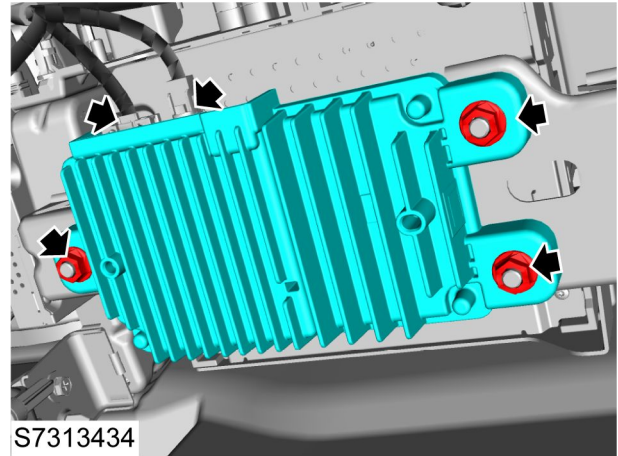
3. Connect the negative battery cable.

Driver Monitoring System Module Remove

1. Disconnect the negative battery cable.
2. Remove the passenger side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Remove

3. Remove 3 nuts fixing the driver monitoring system module to the instrument panel beam, disconnect the harness connector, and remove the driver monitoring system module.



Refit

1. Fix the driver monitoring system module to the instrument panel beam, fit 3 nuts, tighten them to **7-10NM**, and check the torque.
2. Connect the harness connector of the driver monitoring system module.
3. Fit the passenger side instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Refit

4. Connect the negative battery cable.
5. Programme and encode the driver monitoring system module (DMS).

Driver Monitoring System (DMS)

Entertainment System

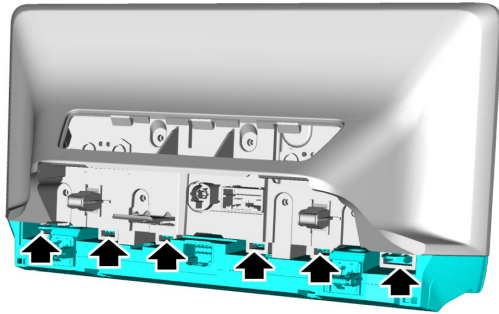
Entertainment Panel Switch

Remove

1. Disconnect the negative battery cable.
2. Remove the display.

Display

3. Loosen the clip to remove the entertainment panel switch.



S7313435

Refit

1. Fix the entertainment panel switch to the entertainment mainframe and ensure the clips are fully engaged.
2. Fit the display.

Display

3. Connect the negative battery cable.

Emergency Call Switch

Remove

1. Disconnect the negative battery cable.
2. Remove the overhead console.

Overhead Console and Reading Lamp Assembly

Remove

3. Release the clip, and remove the emergency call switch.

Refit

1. Fix the emergency call switch to the overhead console, and press the clip in place.
2. Fit the overhead console.

Overhead Console and Reading Lamp Assembly

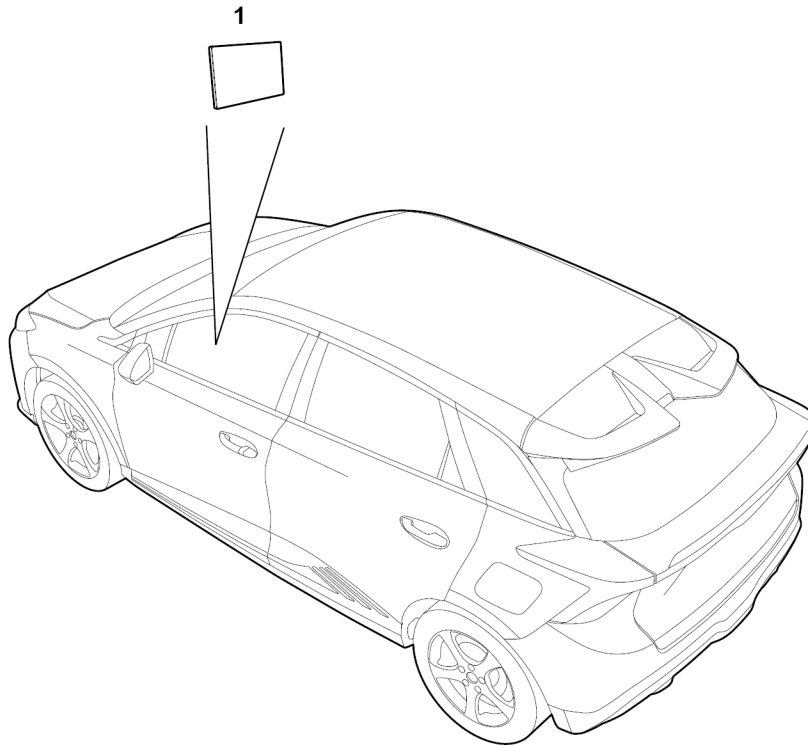
Refit

3. Connect the negative battery cable.

Display and Gauge

Description and Operation

System Layout

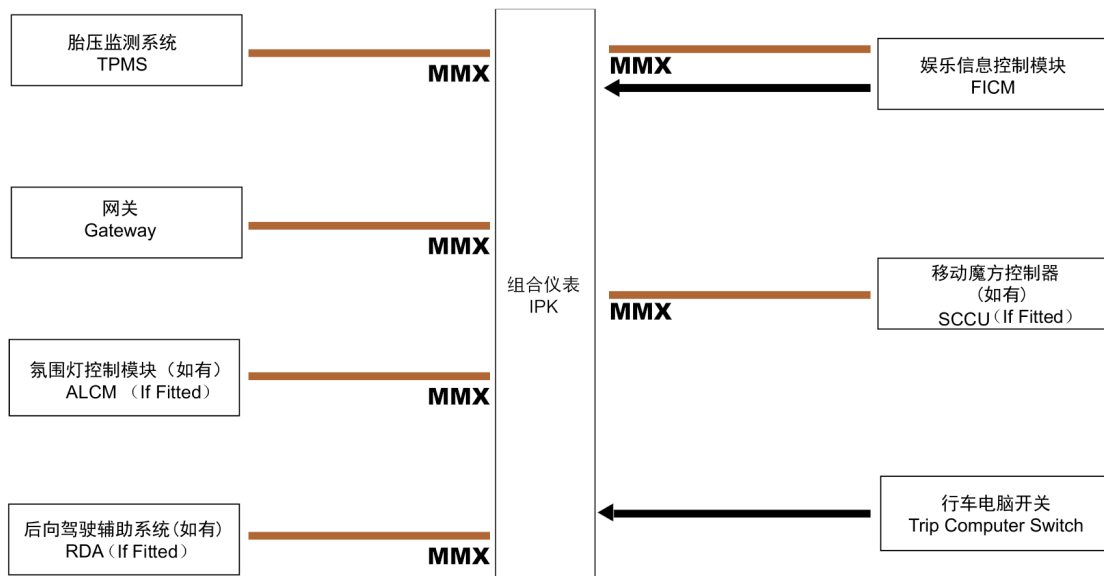


S7310163

I. Instrument Pack

Display and Gauge

System Control Diagram



A ——— B —————>

S7110038

A = Multi-media HS CAN Bus; B = Hard Wire

Description

Overview

The instrument pack is connected to the instrument harness by connectors and secured to the instrument panel assembly by 2 screws. The instrument pack is a packaged component (assembly), so it cannot be removed for maintenance.

Display Information

The instrument pack displays the following information:

- Vehicle Speed
- Power
- Gear Information
- Message Centre
- Warning Information

The message centre of instrument pack displays the warning messages in pop-up windows. The warning messages are mainly divided into the following: operation instructions, system state prompts and system malfunction alert.

- Warning Lamps and Indicator Lamps
- Driving Mode
- Energy Regeneration Mode
- Driver Assistance System Information (if any)

Refer to User Manual for more information.

Display and Gauge

Operation

Operation Mode

The specific function of the instrument pack available at a given time depends on the position of the start switch.

The instrument pack receives the status information of the Start switch via theCANnetwork or hard wire input signals.

Sleep Mode

When the IPK fully enters into the sleep mode, the static current is minimum.

Standby Mode

Some functions can be realized.

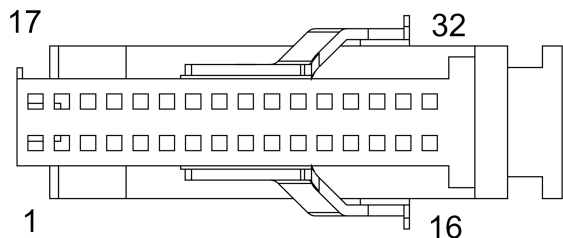
Activation Mode

All functions can be activated and operated. For example:CANsending/receiving signals, warning indicator lamp, tachometer, speedometer and other functions.

Detailed Information List of Component Pins

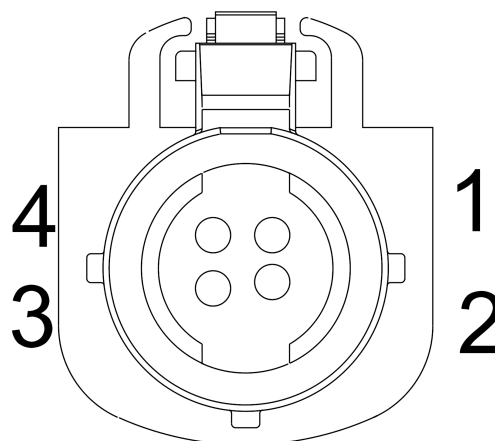
End View and Pin Information of Connector

End View and Pin Information of IPK Harness Connector FA024



Pin No.	Description
1	Power Supply
2	Ground
3 - 4	-
5	IGN Relay
6-8	-
9	Terminal Resistance +
10	Terminal Resistance -
11-21	-
22	-
23	-
24	-
25	-
26	HS CAN High Level
27	HS CAN Low Level
28	-
29	-
30	-
31-32	-

End View and Pin Information of IPK Harness Connector FA023



Pin No.	Description
1	IPK_LVDS2-_DRAIN
2	IPK_LVDS1-_SIG
3	IPK_LVDS2+_DRAIN
4	IPK_LVDS1+_SIG

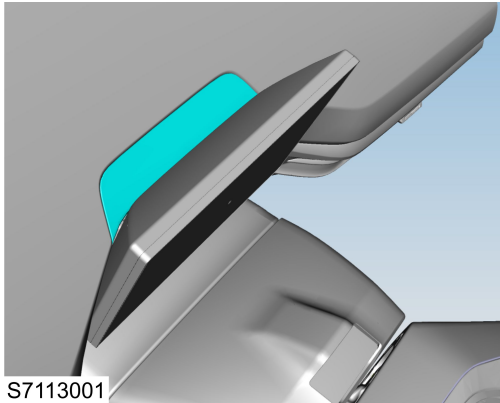
Display and Gauge

Service Guide

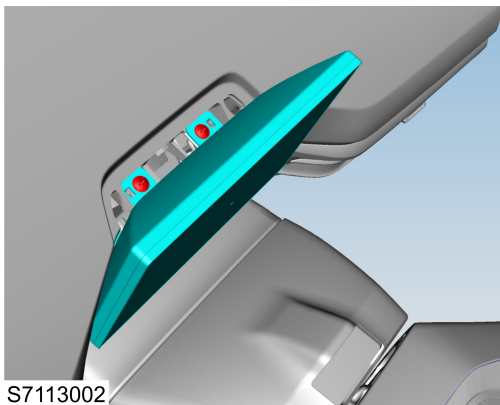
Instrument Pack

Remove

1. Disconnect the negative battery cable.
2. Pry off the clip, and remove the instrument pack upper trim cover.



3. Remove 2 screws fixing the instrument pack to the instrument panel, disconnect the harness connector and remove the instrument pack.



Refit

1. Connect the harness connector.
2. Connect the negative battery cable.
3. Programme and encode the instrument pack (IPK).

Instrument Pack (IPK)

4. Fix the IPK to the instrument panel, fit and tighten 2 screws.
5. Fit the instrument pack upper cover plate, and press the clip.

Low-voltage Fuse Box

Specification

Torque

[A60110] 文档

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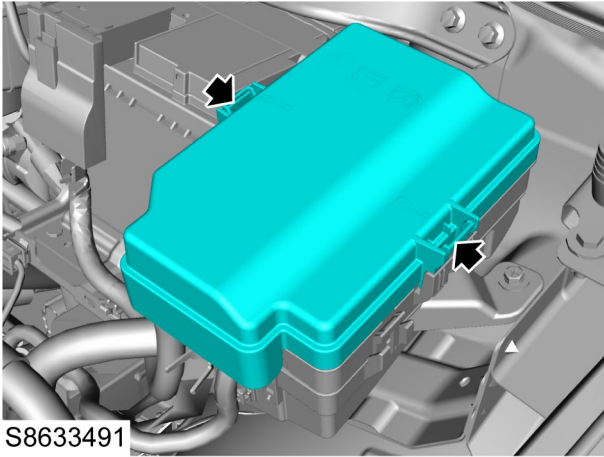
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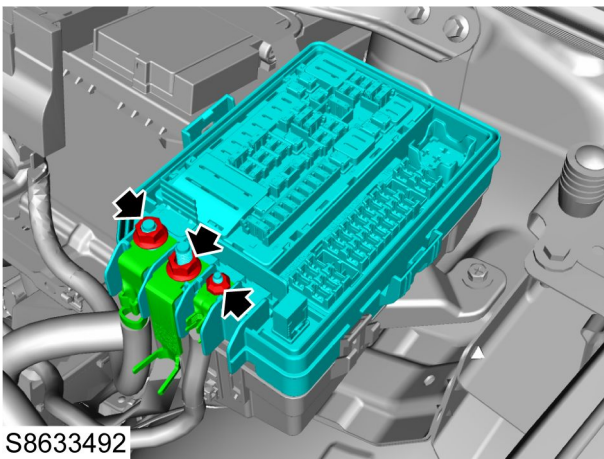
Service Guide

Front Compartment Fuse Box Remove

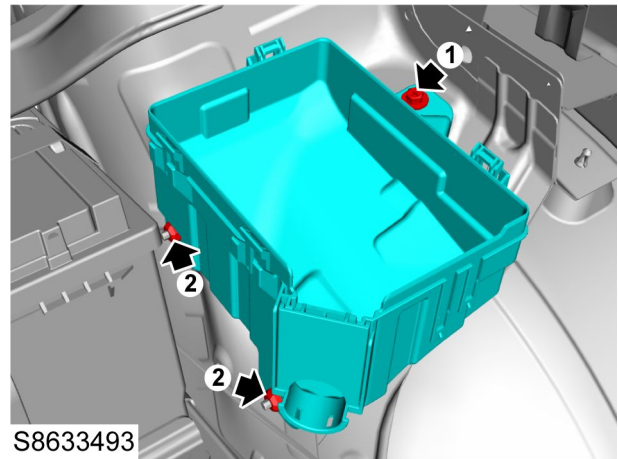
1. Disconnect the negative battery cable.
2. Loosen the clips and remove the upper cover of the front compartment fuse box.



3. Remove 3 nuts fixing the harness to the front compartment fuse box, and remove the harness.



4. Remove the front compartment fuse box harness cover.
5. Loosen the clip fixing the front compartment fuse box to the lower cover, lift the front compartment fuse box, disconnect the harness connector on the back of front compartment fuse box, and remove the harness.
6. Remove 1 bolt (1) and 2 nuts (2) fixing the front compartment fuse box lower cover to the body.



7. Remove the lower cover of the front compartment fuse box.

Refit

1. Fix the front compartment fuse box lower cover to the body, fit 1 bolt, tighten it to **6.5-9.5NM** , and check the torque.
2. Fix the front compartment fuse box lower cover to the body, fit 2 nuts, tighten them to **6.5-9.5NM** , and check the torque.
3. Connect the harness connector on the back of the front compartment fuse box, fix the front compartment fuse box to the front compartment fuse box lower cover, and secure with clips.
4. Fit the front compartment fuse box harness cover.
5. Fix the harness to the front compartment fuse box, fit 3 nuts and tighten them.
6. Fit the upper cover of the front compartment fuse box.
7. Connect the negative battery cable.

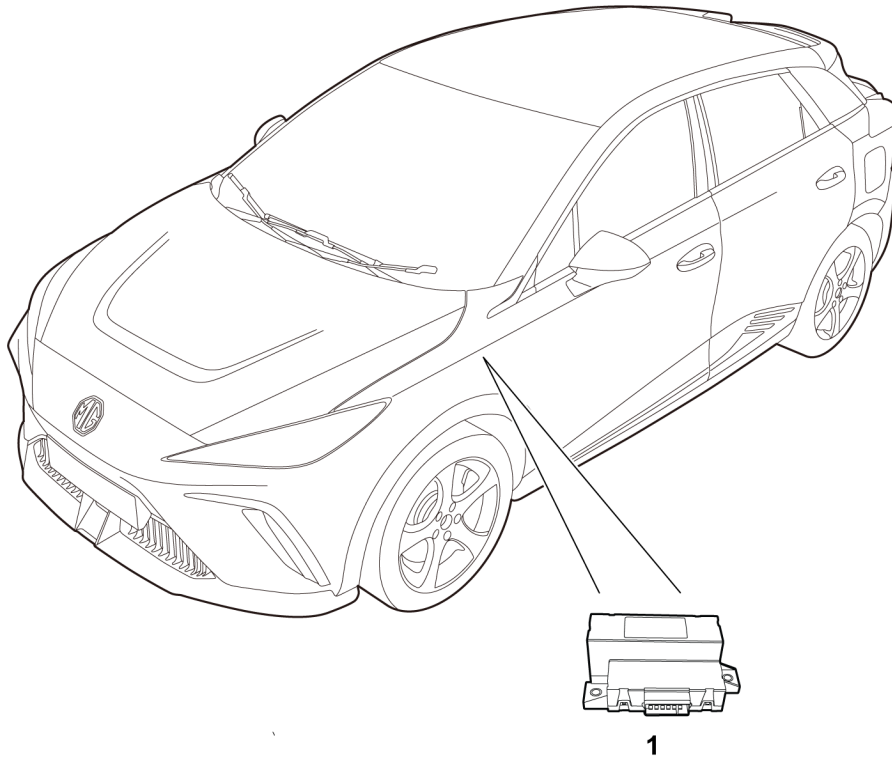
Low-voltage Battery and Its Management System

Specification

Torque

Description	Value
Nut-Battery Positive Cable to Front Compartment Fuse Block	11-15NM
Nut-Battery positive Cable to Clamp	4-6NM
Nut-Battery negative cable to Body	7-10NM
Nut-Battery negative cable to EBS	11-15NM
Bolt-Battery clip to battery	19-25NM
Nut-Battery positive cable to clamp	4-6NM
Bolt-Battery Fixing Bandage to Battery Tray	7-10NM
Nut-EBS to Clamp Mut	4.5-7.5NM
Nut-Battery negative cable to EBS	11-15NM
Bolt-Battery tray to battery bracket	19-25NM
Nut-CPM to Body	7-10Nm

**Description and Operation
System Layout**



S8410028

I. Crash Power Module

Description

Battery

Battery Instruction

All vehicles are equipped with a 12V maintenance-free lead-acid battery on the left side of the front compartment, which is fitted on the battery tray and fixed by the battery pressing plate. The battery electrodes are of post type using clamp-type connection.

Warning : *Battery fluid (electrolyte) contains sulphuric acid. It may cause severe burns if it gets on your skin or in your eyes. Wear protective clothing and a face shield. If electrolyte gets on your skin or clothes, immediately rinse it off with water. If electrolyte gets in your eyes, immediately flush eyes with water for at least 15 minutes and seek medical help.*

The battery has three main functions. Firstly, it provides power for starting the vehicle. Secondly, it is used as a voltage regulator of the electrical system. Lastly, it can provide energy for the electrical demand in a certain amount of time.

Compared with the conventional battery, the packaging battery has following advantages:

- There is no need to add water during the entire life cycle of the battery.
- It adopts the overcharge protection measures. If the voltage applied to the battery is too high, it will not receive the excessive current as the conventional battery will. For the conventional battery, if the battery continues to be charged when the voltage is too high, air leakage will occur, causing fluid loss.
- Compared with the conventional battery, self discharge does not tend to occur for this kind of battery. This is especially important when the battery is not used for a long time.
- It is more reliable to provide power for the cigar lighter and smaller electrical appliance.

Battery Charging

When the vehicle is not started, long-time operation and abnormal use of electrical appliance, vehicle electric leakage and long-time parking, or malfunction in the charging system may cause the battery charging failure, resulting in battery lack of power, or even vehicle start failure. In this condition, the battery needs to be charged.

Caution : *During battery charging or jump start, the negative cable should be connected to a good body grounding point, instead of battery negative terminal.*

Battery appearance check before charging:

- If the battery case is broken or there is a leak, DO NOT charge the battery and replace it after finding the reason.

- If the battery terminal post is broken, DO NOT charge the battery and replace it after finding the reason.
- The bulged battery due to over discharging or over charging, CAN NOT be charged. The battery should be replaced.
- Before charging, clean the terminal post, and remove the oxide skin from the surface. And apply some butter on the terminal post to avoid electric corrosion.

Charging precautions:

- PLEASE wear the safety goggles.
- Keep ventilation and normal temperature when charging.
- DO NOT smoke when charging, and avoid introduction of kindling material.
- Before charging, connect the positive cable first. After charging, disconnect the negative cable first.

Battery charging operation:

- Connect the positive pole of charger to that of battery, and connect the negative pole of charger to that of battery. If the battery is not removed from the vehicle, PLEASE connect the charger negative pole to a good ground point on the body.
- Ensure the battery terminal posts are clean, and the charging circuit is well connected.
- For the common vented battery, it is recommended to charge the battery using a constant voltage at the maximum voltage limit of $16.0 \pm 0.1V$ and the maximum current limit of 25A. When the charging current is less than 2A, it indicates that the battery is fully charged.
- During charging, if the battery temperature rises above $40^{\circ}C$, the charging must be stopped until the battery temperature drops to the room temperature.
- DO NOT charge the battery below $0^{\circ}C$.

For the battery with a voltage less than 11.0V, at the early stage of charging, it may appear that the battery cannot be charged. Due to serious power lack of battery, the specific gravity of sulfuric acid in the battery is too small, the liquid is close to pure water, and the internal resistance of the battery is too high. As the battery is charged, the specific gravity of sulfuric acid in the battery rises, and the charging current can gradually return to normal.

Battery Test

The battery can be tested with common battery tester available in the after-sales market, such as Midtronics series battery tester. If the tester type does not match, the measured data can not be used as basis to judge the battery's status.

Battery Replacement

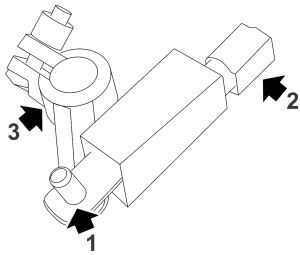
Caution : *When removing the battery, ensure that the alarm is disarmed and the start/stop switch is off. Always*

disconnect the negative terminal first, then the positive terminal. When refitting the battery, always fit the positive terminal first, then the negative terminal.

Refer to "Battery - Remove/Refit" when replacing the battery.

When charging/discharging the battery with external device or during jump start, take care not to connect the external cable directly to the battery negative pole, but connect it to a good ground point on the body. Otherwise, it may result in inaccurate battery power calculation.

Electronic Battery Sensor



S8430074

Such model is equipped with the EBS. As shown in the figure, the EBS is fitted on the negative battery terminal post with a negative battery terminal clamp (3), and connected with the negative battery cable by a bolt (1). The power of EBS is supplied by KL30 (normally on), and it is connected with the LINbus through the connector (2).

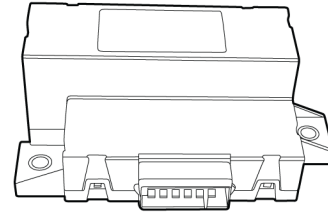
The EBS is an electronic sensor, which is used to monitor the voltage, current and temperature information of the battery, and send these internal data and information to the gateway through the LINbus, so that it executes reliable power limitation strategy when the battery is always in a good charge and service life condition.

Caution : *In order to avoid reducing the precision and service life of the battery, do not remove the EBS from the negative battery cable, except for replacing the battery. When removing or fitting the EBS, be careful to ensure that it does not get damaged.*

Caution : *After the EBS has been refitted on the battery, it takes at least 4 hours for EBS to obtain the exact status information of the battery.*

Caution : *For electrical related fault maintenance and power-off operation, it only needs to disconnect the negative cable from the EBS, instead of directly disconnecting the negative terminal. So it can take less time for EBS to obtain the exact status information of the battery.*

Crash Power Module



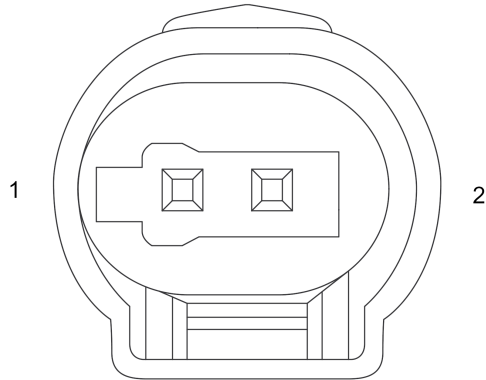
S8413555

The Crash Power Module (CPM) is a super-capacitor mounted on the driver side of the vehicle and connected in series with the low-voltage battery and the Body Control Module (BCM), and is a normal power supply module. When the vehicle is in a collision and the battery is disconnected, it can still provide power to the BCM unlock function to help passengers evacuate from the vehicle in time.

Detailed Information List of Component Pins
Electronic Battery Sensor

End View of Electronic Battery Sensor Harness Connector FC011

10	Body Control Module Power Supply I
11	KL30.1
12	IGN Relay

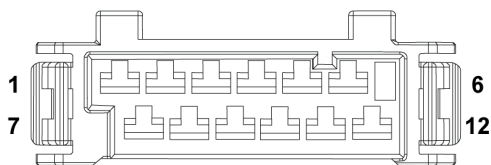


Detailed Information List of Connector Pins

Pin No.	Description
1	LIN
2	Battery Power

Crash Power Module

End View of Crash Power Module Harness Connector FC071



Detailed Information List of Connector Pins

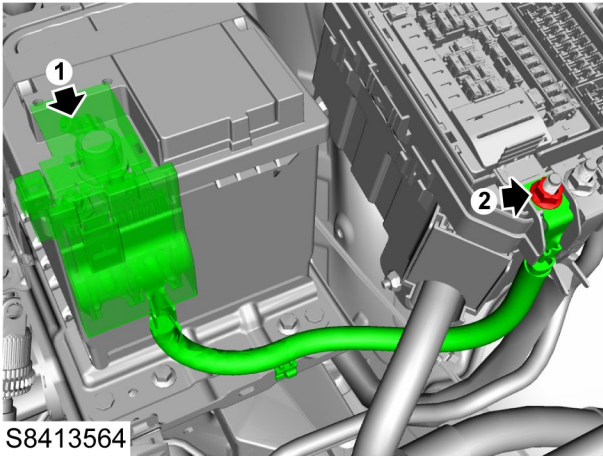
Pin No.	Description
1	Ground 1
2	-
3	Body Control Module Power Supply 6
4	KL30.2
5	-
6	-
7	Ground 2
8	-
9	-

Service Guide

Positive Battery Cable

Remove

1. Remove the upper cover of the front compartment fuse box.
2. Open the cover of the positive battery terminal, loosen 1 nut (1) fixing the positive battery cable to the battery terminal, and remove the cable.
3. Remove 1 nut (2) fixing the positive battery cable to the front compartment fuse box, and remove the cable.



4. Loosen the harness clip, and remove the positive battery cable.

Refit

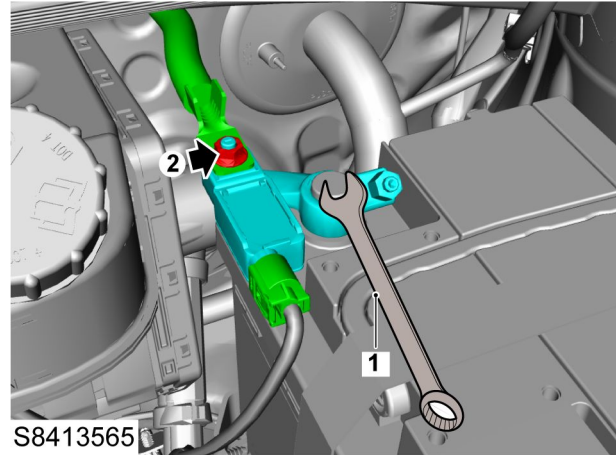
1. Arrange the positive battery cable in the front compartment, and secure it with clips.
2. Fix the positive battery cable to the front compartment fuse box, fit 1 nut, tighten it to **11-15NM**, and check the torque.
3. Fix the positive battery cable to the terminal, tighten the nut to **4-6NM**, and check the torque.
4. Fit the upper cover of the front compartment fuse box.
5. Connect the negative battery cable.

Negative Battery Cable

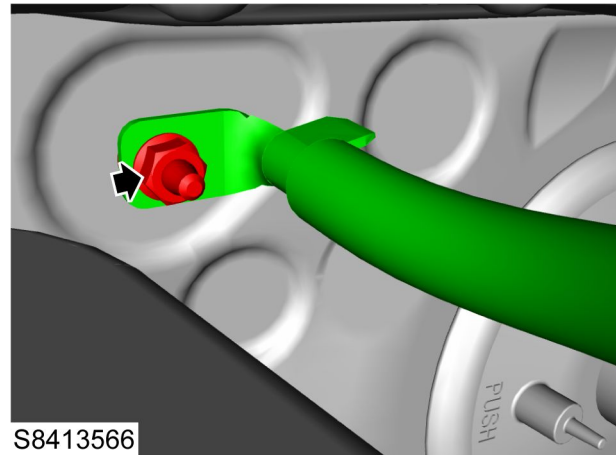
Remove

Caution : Use a locking tool to prevent damage to the EBS.

1. Clamp the negative battery terminal with an open-end wrench (1) to fix the electronic battery sensor . Remove 1 nut (2) fixing the negative battery cable to the electronic battery sensor.



2. Remove 1 nut fixing the negative battery cable to the body.



3. Remove the negative battery cable.

Refit

Caution : Use a locking tool to prevent damage to the EBS.

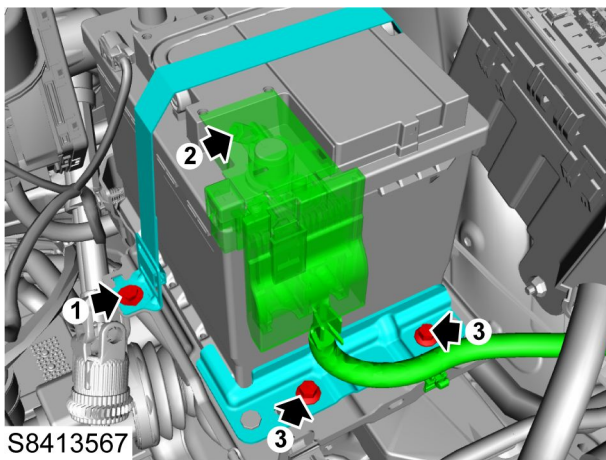
1. Fix the negative battery cable to the body, fit 1 nut, tighten it to **7-10NM**, and check the torque.
2. Clamp the negative battery terminal with an open-end wrench to fix the electronic battery sensor . Fit the nut fixing the negative battery cable to the electronic battery sensor, tighten it to **11-15NM** and check the torque.

Battery Remove

1. Remove the front compartment trim cover.

Front Compartment Trim Cover Remove

2. Disconnect the negative battery cable.
3. Remove 1 bolt (1) fixing the battery strap to the battery tray, and remove the battery strap.
4. Open the cover of the positive battery terminal, remove 1 nut (2) fixing the positive battery cable to the battery terminal, and remove the cable.
5. Remove 2 bolts (3) fixing the battery pressing plate to the battery tray.



6. Remove the battery assembly.

Refit

1. Fix the battery to the tray.
2. Fix the battery with lock blocks, fit 2 bolts, tighten them to **19-25NM**, and check the torque.
3. Fix the positive battery cable to the positive terminal, fit 1 nut, tighten it to **4-6NM**, and check the torque.
4. Fit the cover of the positive terminal.
5. Fix the battery bandage to the battery tray, fit 1 bolt, tighten it to **7-10NM**, and check the torque.
6. Connect the negative battery cable.
7. Perform "Write Battery ID" for the electronic battery sensor.

Electronic Battery Sensor (EBS)

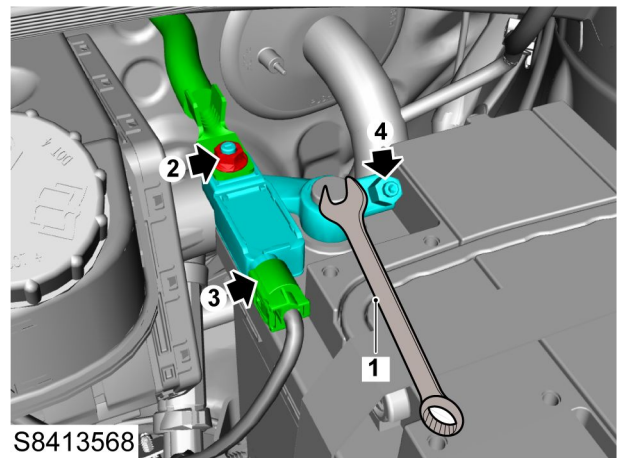
8. Fit the front compartment trim cover.

Front Compartment Trim Cover Refit

Battery Sensor Remove

Caution : Use a locking tool to prevent damage to the EBS.

1. Clamp the negative battery terminal with an open-end wrench (1) to fix the electronic battery sensor .
2. Remove 1 nut (2) fixing the battery negative cable to the electronic battery sensor, and remove the cable.
3. Disconnect the harness connector (3) of the electronic battery sensor.
4. Loosen the negative terminal nut (4) from the electronic battery sensor.



5. Remove the electronic battery sensor.

Refit

Caution : Use a locking tool to prevent damage to the EBS.

1. Clamp the electronic battery sensor negative terminal to the battery terminal and fit them onto the negative battery terminal, and rotate the electronic battery sensor to the bottom and adjust it.
2. Tighten the negative terminal nut to **4.5-7.5NM**, and check the torque.
3. Fit the negative battery cable onto the electronic battery sensor connecting post, hold the negative battery terminal with an open-end wrench, fit 1 nut, tighten it to **11-15NM** , and check the torque.
4. Connect the electronic battery sensor connector.
5. Perform "Write Battery ID" for the electronic battery sensor.

Electronic Battery Sensor (EBS)

Battery Tray Remove

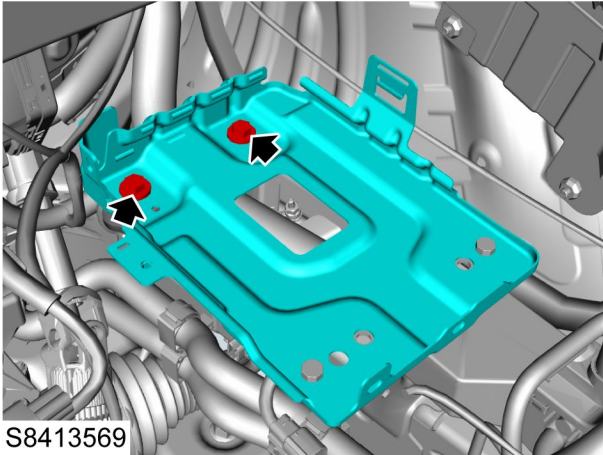
1. Remove the battery.

Battery Remove

2. Remove the manual service disconnect.

Manual Service Disconnect Remove

3. Remove the harness clip from the battery tray.
4. Remove 2 bolts fixing the battery tray to the battery tray bracket.



5. Remove the battery tray.

Refit

1. Fix the battery tray to the battery tray bracket, fit 2 bolts, tighten them to **19-25NM**, and check the torque.
2. Fit the harness clip to the battery tray.
3. Fit the manual service disconnect.

Manual Service Disconnect Refit

4. Fit the battery.

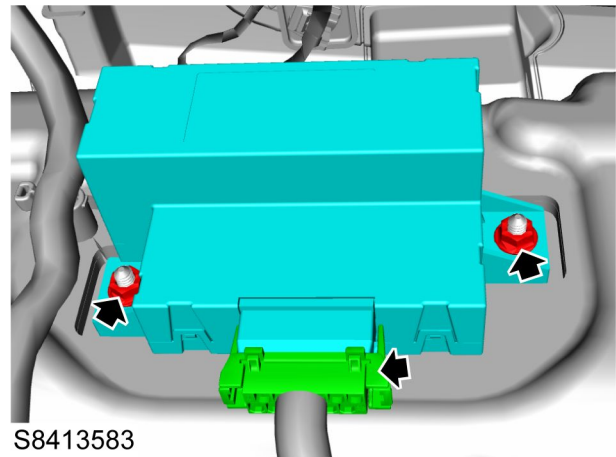
Battery Refit

Crash Power Module Remove

1. Disconnect the negative battery cable.
2. Remove the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Remove

3. Remove 2 nuts fixing the crash power module to the body, disconnect the harness connector and remove the crash power module.



Refit

1. Connect the harness connector of the crash power module.
2. Fix the crash power module to the body, fit 2 nuts, tighten them to **7-10Nm**, and check the torque.
3. Fit the driver side knee baffle assembly.

Driver Side Knee Baffle Assembly Refit

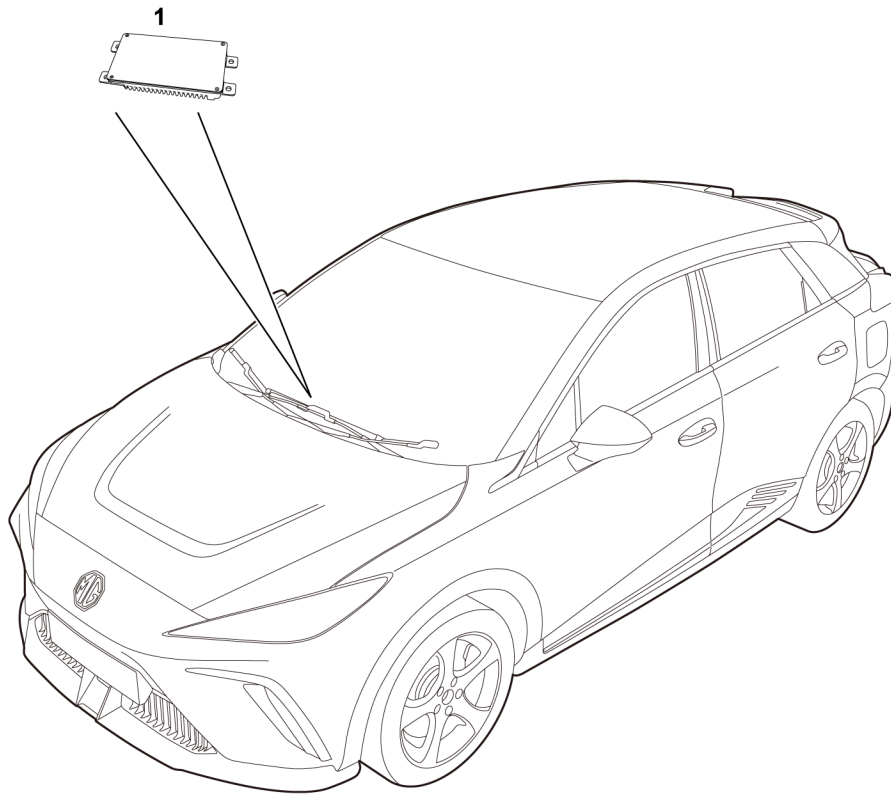
4. Connect the negative battery cable.

Mobile Phone Wireless Charging System

Mobile Phone Wireless Charging System

Description and Operation

System Layout



S8110030

I. Mobile Phone Wireless Charging Module

Description

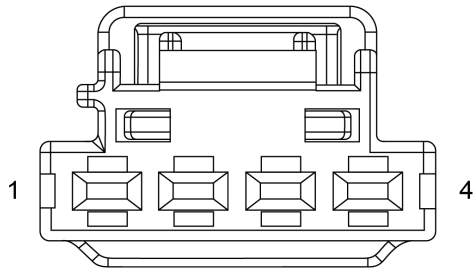
The mobile phone wireless charging function is realized by electromagnetic induction transmission mode without a wire to connect the mobile phone. The mobile phone wireless charging function is not applicable to all mobile phones but to those certified by Qi.

When the vehicle is powered on, the wireless charging function is activated.

Mobile Phone Wireless Charging System

Information List of Component Pins

End View and Pin Information of Wireless Charging Module
Harness Connector CS002



Pin No.	Description
1	Power Supply
2	Enable
3	LIN Bus
4	Ground

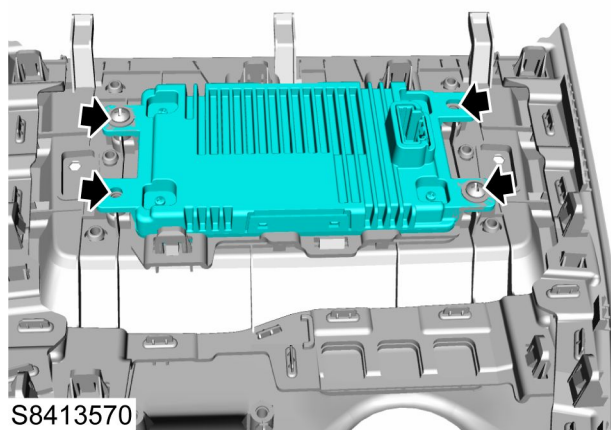
Service Guide

Mobile Phone Wireless Charging Module Remove

1. Disconnect the negative battery cable.
2. Remove the centre console upper trim panel assembly.

Centre Console Upper Trim Panel Assembly

3. Remove 4 screws fixing the mobile phone wireless charging module to the centre console upper trim panel, and remove the mobile phone wireless charging module.



Refit

1. Fix the mobile phone wireless charging module to the centre console upper trim panel, fit 4 screws, tighten them to **1.4-1.8NM**, and check the torque.
2. Fit the centre console upper trim panel assembly.

Centre Console Upper Trim Panel Assembly

3. Connect the negative battery cable.

Low Voltage Harness

Low Voltage Harness

Specification

Torque

[A60110] 文档

"C:\dita-data\PETasks\3b7f7390-fee6-4522-81d7-00309d965c25\SM016573.ditamap"

中第 1886 行的引用 (topicref)

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"C:\dita-data\PETasks\3b7f7390-fee6-4522-81d7-00309d965c25\DTO032051.dita"

Service Guide

Engine Compartment Harness Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect

3. Remove the front bumper assembly.

Front Bumper Assembly

4. Remove the Cooling System Wind Scooper Assembly.

Cooling System Wind Scooper Assembly

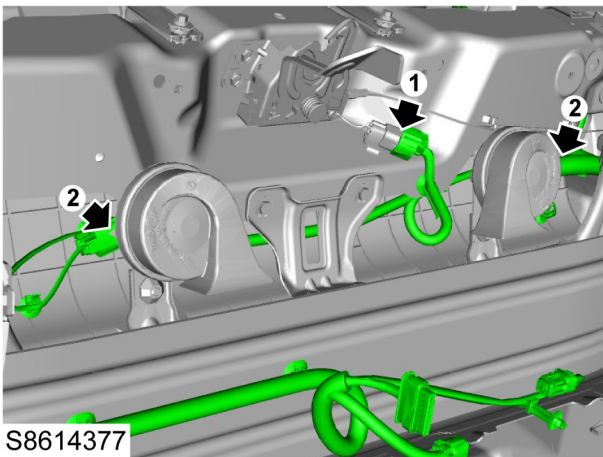
5. Remove the battery tray.

Battery Tray

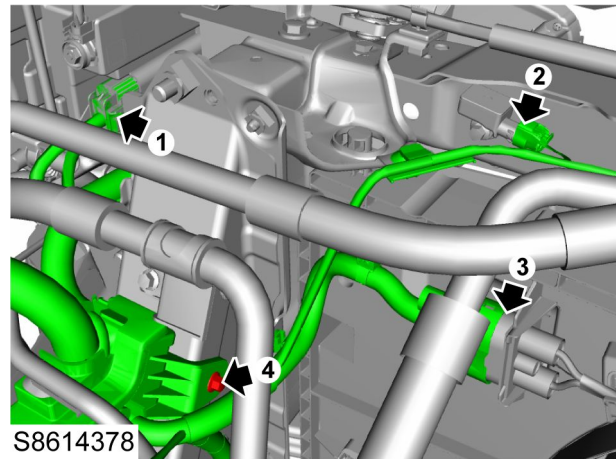
6. Remove the lower cover of the front compartment fuse box.

Front Compartment Fuse Box Lower Cover Remove

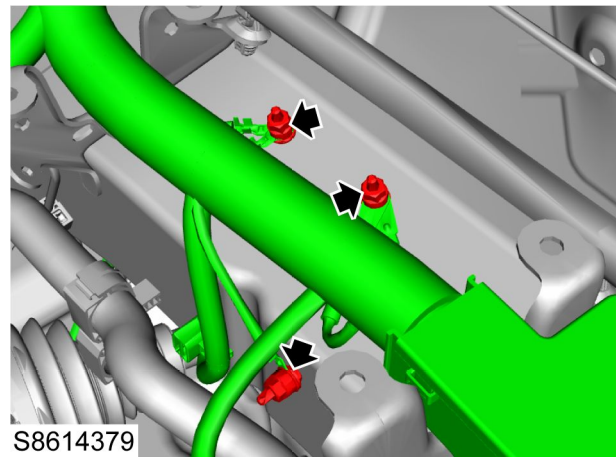
7. Disconnect the harness connector (1) of the bonnet lock.
8. Disconnect the harness connector (2) of the horn.



9. Disconnect the harness connector (1) of the left headlamp.
10. Disconnect the harness connector (2) of the front left impact sensor.
11. Disconnect the harness connector (3) of the cooling fan motor.
12. Remove 1 bolt (4) fixing the front compartment harness to the left front longitudinal beam.



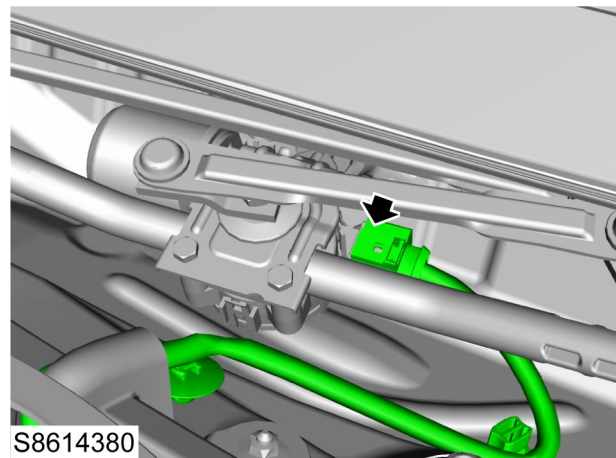
13. Loosen 3 ground terminals from the left front longitudinal beam.



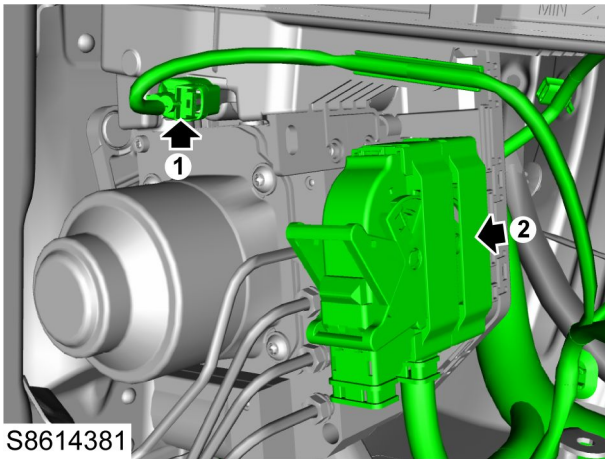
14. Remove the A/C air inlet grille side corner, panel and accessories.

A/C Air Inlet Grille Side Corner, Panel and Accessories Remove

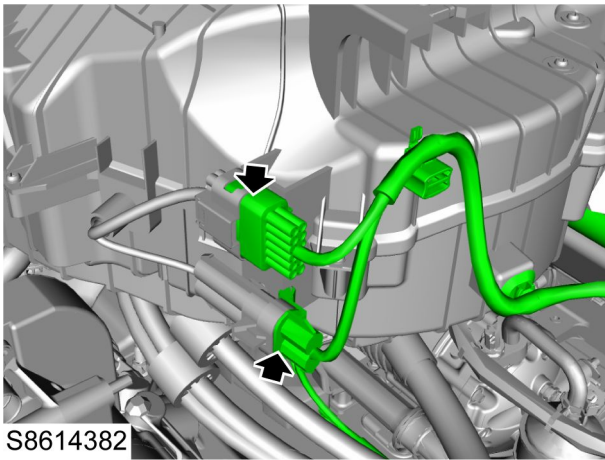
15. Disconnect the harness connector of the front wiper motor.



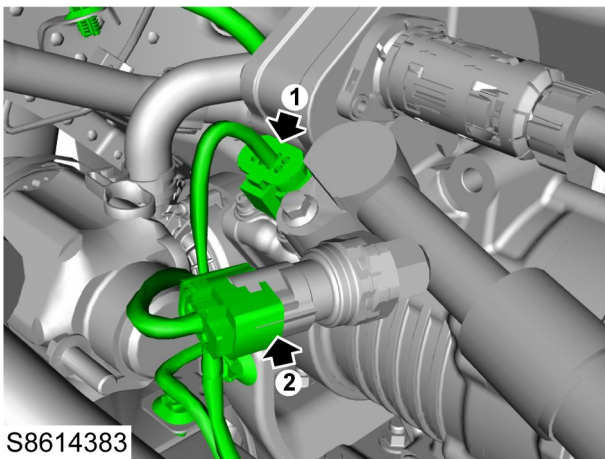
16. Disconnect the harness connector (1) of the brake fluid level sensor.
17. Disconnect the harness connector (2) of the brake master cylinder booster.



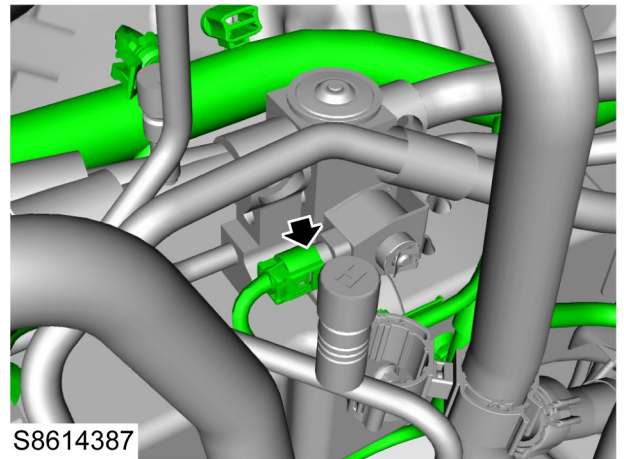
18. Disconnect the harness connector of the blower.



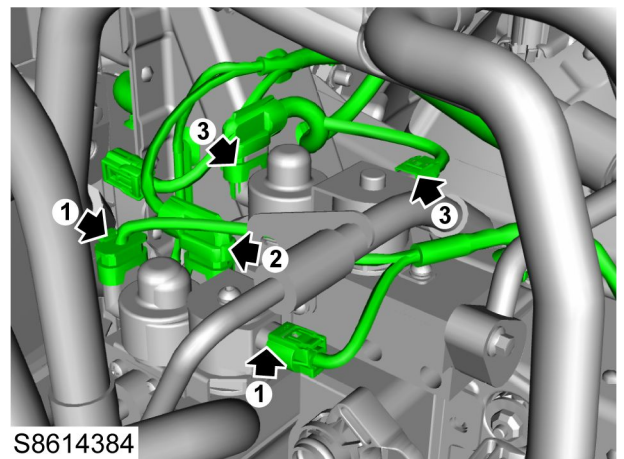
- 19. Disconnect the harness connector (1) of the A/C compressor.
- 20. Disconnect the harness connector (2) of the A/C refrigerant temperature/pressure sensor.



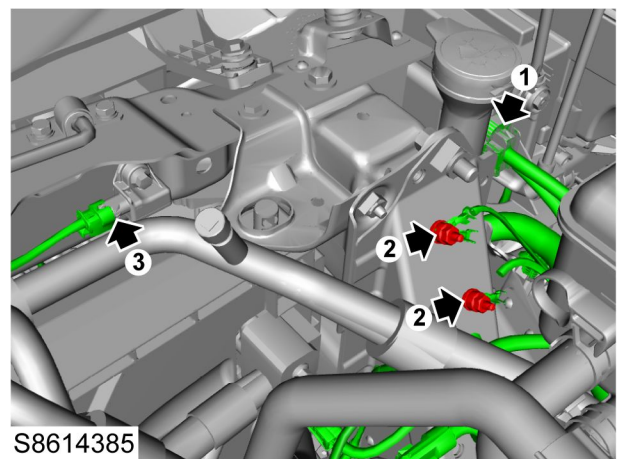
21. Disconnect the harness connector of the evaporator expansion valve.



- 22. Disconnect the harness connector (1) of the electronic expansion heating valve.
- 23. Disconnect the harness connector (2) of the A/C electronic expansion valve.
- 24. Disconnect the harness connector (3) of the electronic expansion bypass valve.



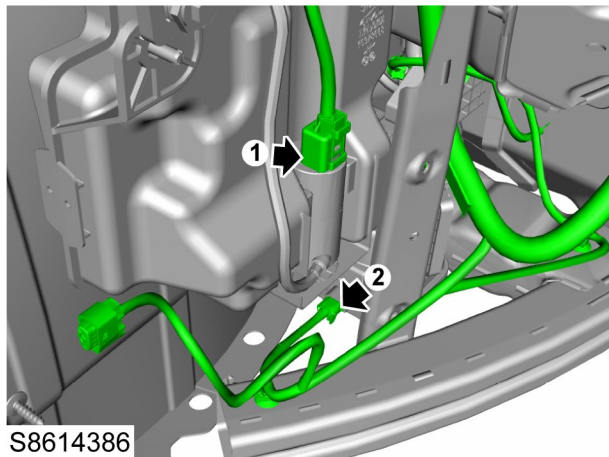
- 25. Disconnect the harness connector (1) of the right headlamp.
- 26. Disconnect 2 ground terminals (2) under the battery cooler expansion tank.
- 27. Disconnect the harness connector (3) of the front right impact sensor.



28. Disconnect the harness connector (1) of the windscreen

washer pump.

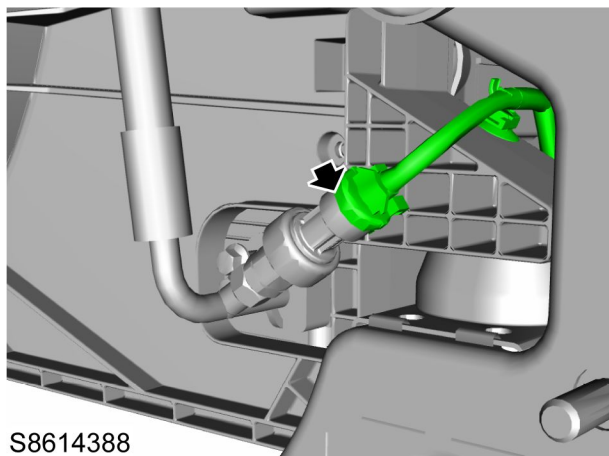
29. Disconnect the harness connector (2) of the pedestrian alert speaker.



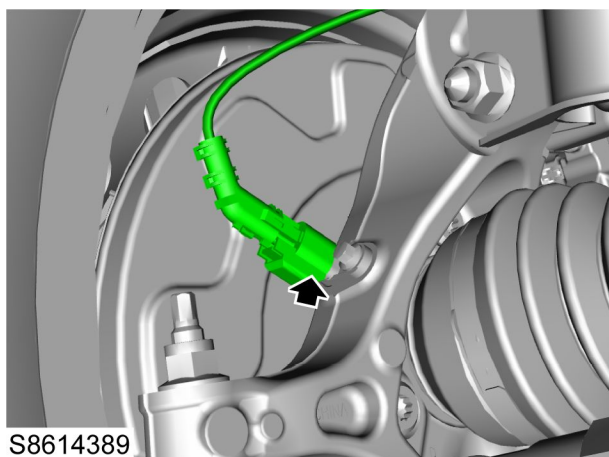
30. Remove the bottom deflector.

 **Bottom Deflector**

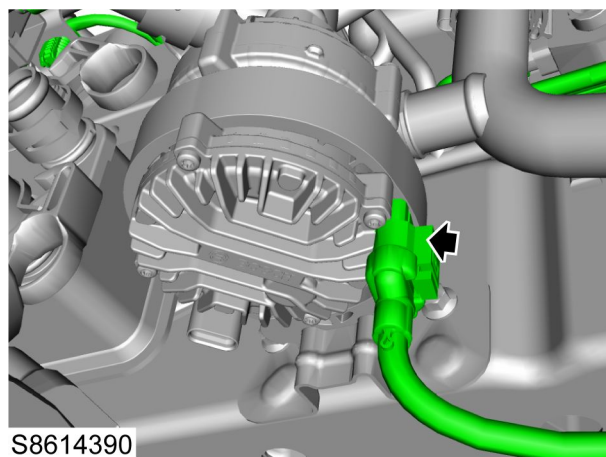
31. Disconnect the harness connector of the evaporator temperature sensor.



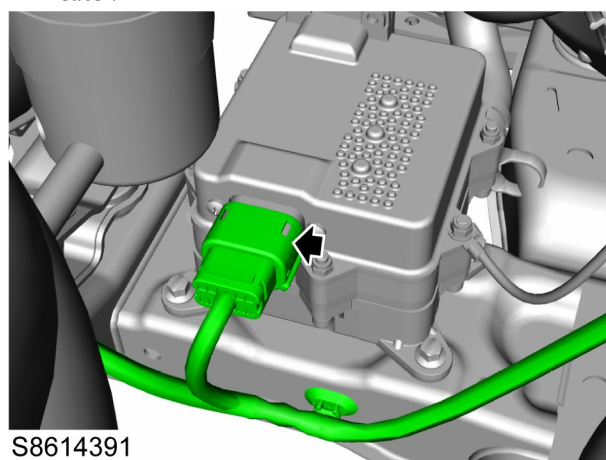
32. Disconnect the harness connectors of the front wheel speed sensors on both sides.



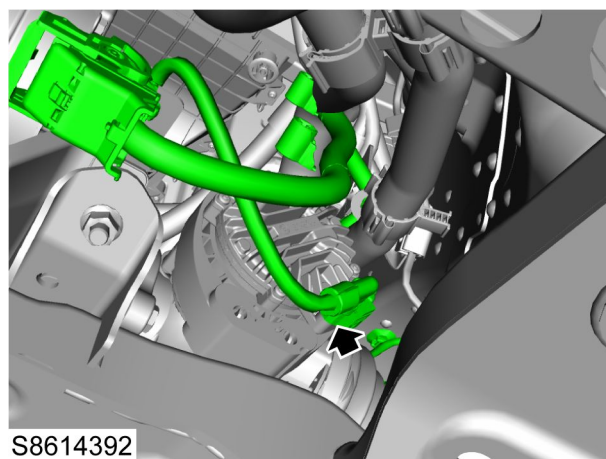
33. Disconnect the harness connector of the high voltage battery pack electric water pump.



34. Disconnect the harness connector of the power battery heater.



35. Disconnect the harness connector of the electric water pump.



36. Disconnect the front compartment harness from the electronic steering system harness.

37. Remove the instrument panel lower closure panel.

 **Instrument Panel Lower Closure Panel Remove**

38. Remove the driver Side Knee Baffle Assembly.

 **Driver Side Knee Baffle Assembly**

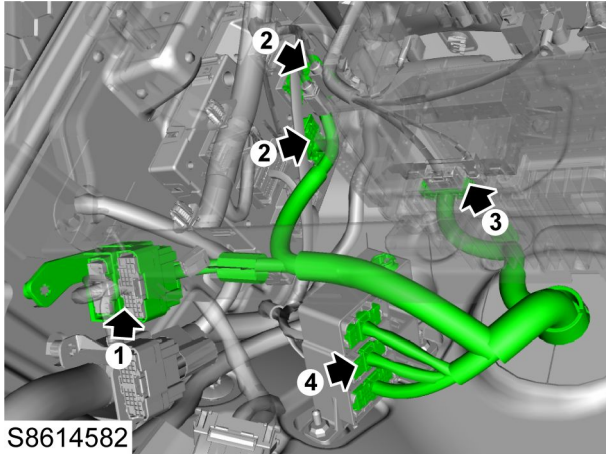
39. Remove the A pillar lower trim panel.

 **A Pillar Lower Trim Panel Remove**

40. Disconnect the front compartment harness from the

Low Voltage Harness

- instrument panel harness (passenger side) (1).
41. Disconnect the connector (2) connecting the front compartment harness to the BCM harness.
42. Disconnect the harness connector (3) of the crash power module.
43. Disconnect the front compartment harness from the body harness (passenger side) (4).



S8614582

44. Remove 1 nut fixing the front compartment harness to the front compartment fuse box, and remove the harness.
45. Disconnect the harness connector of the brake lamp switch.
46. Disconnect the accelerator pedal harness connector .
47. Disconnect the front compartment harness from the body harness (driver side) .
48. Disconnect the body harness from the instrument panel harness (driver side) .
49. Loosen the harness clip and remove the front compartment harness.

Refit

1. Arrange the front compartment harness inside the body and secure with clips.
2. Connect the body harness and the instrument panel harness (driver side).
3. Connect the harness connector of the accelerator pedal.
4. Connect the harness connector of the brake lamp switch.
5. Fix the front compartment harness to the front compartment fuse box, fit and tighten 1 nut.
6. Connect the front compartment harness to the body harness (passenger side).
7. Connect the harness connector of the crash power module.
8. Connect the front compartment harness to the BCM harness connector.

9. Connect the front compartment harness to the instrument panel harness (driver side) (1).
10. Fit the A pillar lower trim panel.

A Pillar Lower Trim Panel

11. Fit the driver Side Knee Baffle Assembly.

Driver Side Knee Baffle Assembly

12. Fit the instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Remove

13. Connect the front compartment harness to the electronic steering system harness.
14. Connect the harness connector of the electric water pump.
15. Connect the harness connector of the power battery heater.
16. Connect the harness connector of the high voltage battery pack electric water pump.
17. Connect the harness connectors of the front wheel speed sensors on both sides.
18. Connect the harness connector of the evaporator temperature sensor.
19. Fit the bottom deflector.

Bottom Deflector

20. Connect the harness connector of the pedestrian alert speaker.
21. Connect the harness connector of the windscreen washer pump.
22. Connect the harness connector of the front right impact sensor.
23. Tighten 2 ground terminals under the battery cooler expansion tank.
24. Connect the harness connector of the right headlamp.
25. Connect the harness connector of the electronic expansion bypass valve.
26. Connect the harness connector of the A/C electronic expansion valve.
27. Connect the harness connector of the electronic expansion heating valve.
28. Connect the harness connector of the evaporator expansion valve.
29. Connect the harness connector of the A/C refrigerant temperature/pressure sensor.
30. Connect the harness connector of the A/C compressor.
31. Connect the harness connector of the blower.
32. Connect the harness connector of the brake master cylinder booster.
33. Connect the harness connector of the brake fluid level

sensor.

34. Connect the harness connector of the front wiper motor.
35. Fit the A/C air inlet grille side corner, panel and accessories.

A/C Air Inlet Grille Side Corner, Panel and Accessories

36. Tighten 3 ground terminals on the left front longitudinal beam.
37. Fix the front compartment harness to the left front longitudinal beam, fit 1 bolt and tighten it.
38. Connect the harness connector of the cooling fan motor.
39. Connect the harness connector of the front left impact sensor.
40. Connect the harness connector of the left headlamp.
41. Connect the harness connector of the horn.
42. Connect the harness connector of the bonnet lock.
43. Fit the lower cover of the front compartment fuse box.

Front Compartment Fuse Box Lower Cover

44. Fit the battery tray.

Battery Tray

45. Remove the Cooling System Wind Scooper Assembly.

Cooling System Wind Scooper Assembly

46. Fit the front bumper assembly.

Front Bumper Assembly

47. Fit the manual service disconnect.

Manual Service Disconnect

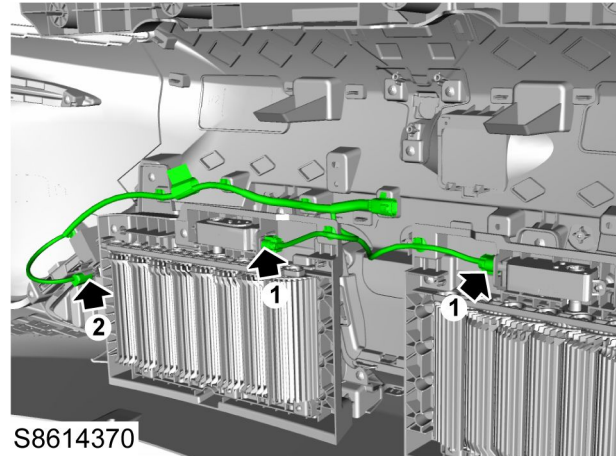
48. Connect the negative battery cable.

Front Bumper Harness Remove

1. Disconnect the negative battery cable.
2. Remove the front bumper.

Front Bumper

3. Disconnect the harness connector (1) of the active air inlet grille motor.
4. Disconnect the harness connector (2) of the ambient temperature sensor.



5. Loosen the harness clip and remove the front bumper harness.

Refit

1. Arrange the front bumper harness to the front bumper and secure with clips.
2. Connect the harness connector of the ambient temperature sensor.
3. Connect the harness connector of the active air inlet grille motor.
4. Fit the front bumper.

Front Bumper

5. Connect the negative battery cable.

Low Voltage Harness

Instrument Harness

Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect

3. Remove the instrument panel assembly.

Instrument Panel Assembly

4. Remove the A pillar lower trim panel.

A Pillar Lower Trim Panel

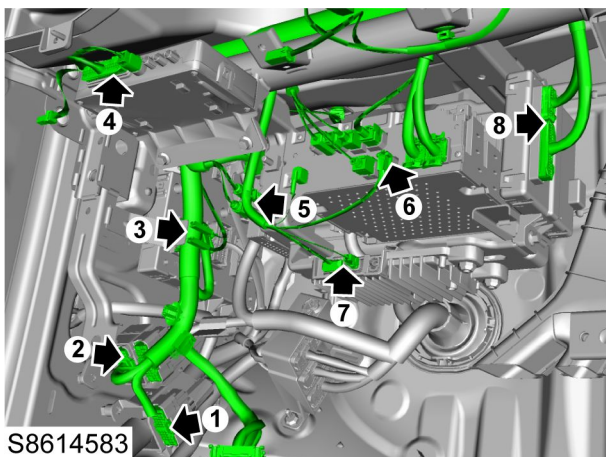
5. Remove the carpet.

Carpet

6. Remove the roof interior.

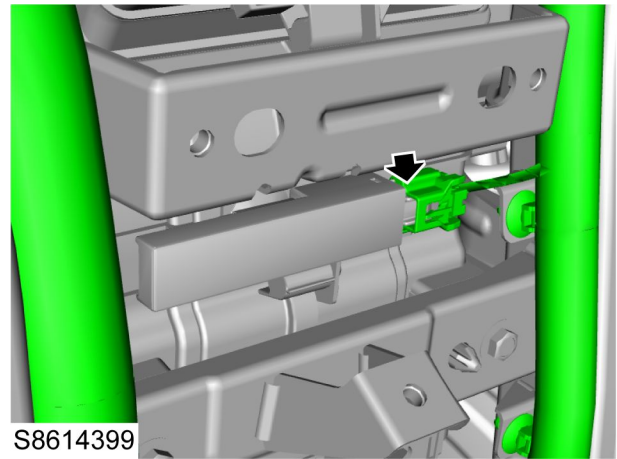
Roof Interior Trim

7. Disconnect the instrument panel harness from the body harness (passenger side) (1).
8. Disconnect the instrument panel harness from the front compartment harness (passenger side) (2).
9. Disconnect the instrument panel harness from the body control module harness connector (3).
10. Disconnect the harness connector (4) of the communication module.
11. Disconnect the harness connector (5) of the DAB module.
12. Disconnect the harness connector (6) of the entertainment mainframe.
13. Disconnect the harness connector (7) of the fatigue monitoring module.
14. Disconnect the harness connector (8) of the gateway.



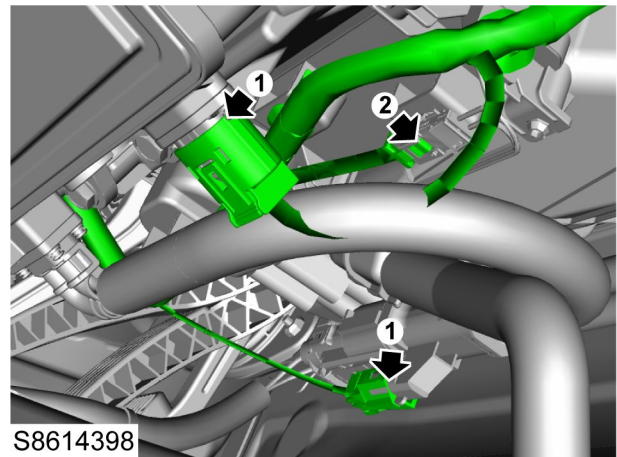
S8614583

15. Disconnect the harness connector of the left footwell air outlet temperature sensor.
16. Disconnect the harness connector of the left side electric heater temperature sensor.
17. Disconnect the harness connector of the PEPS antenna - front.



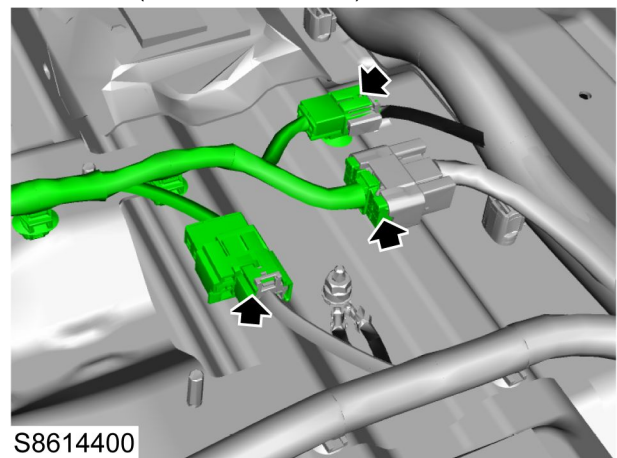
S8614399

18. Disconnect the low-voltage harness connector (1) of the electric heater.
19. Disconnect the harness connector (2) of the evaporator core.



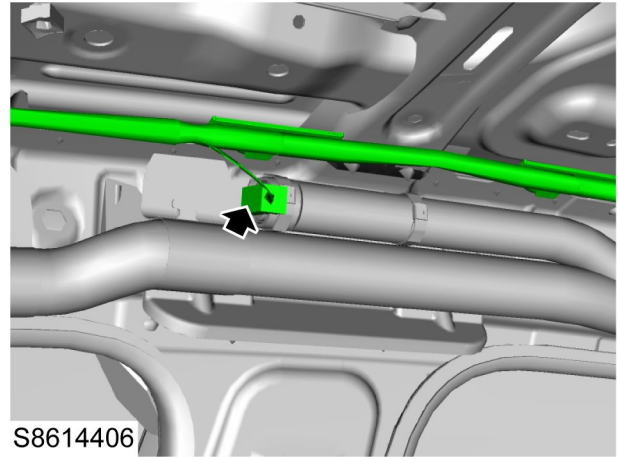
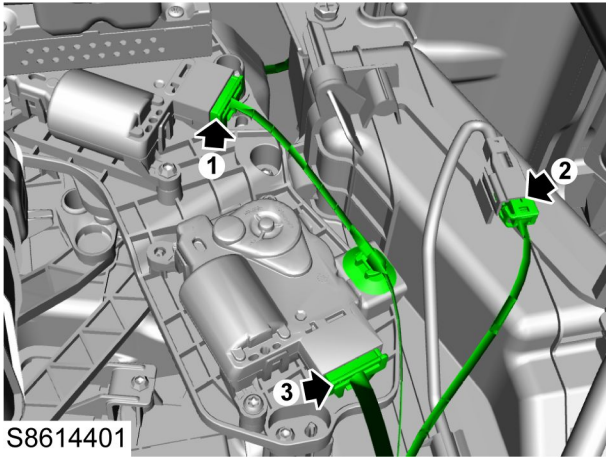
S8614398

20. Loosen the ground terminal on the front part of the SDM.
21. Disconnect the instrument panel harness from the body harness (centre console side).



S8614400

22. Disconnect the harness connector (1) of the mode damper actuator.
23. Disconnect the harness connector (2) of the evaporator temperature sensor.
24. Disconnect the harness connector (3) of the temperature damper actuator.

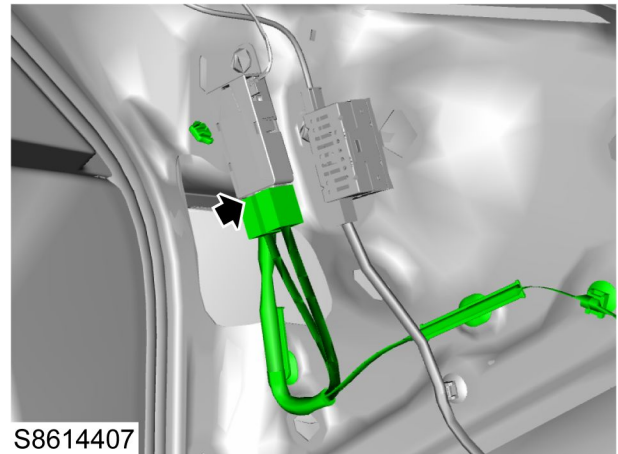
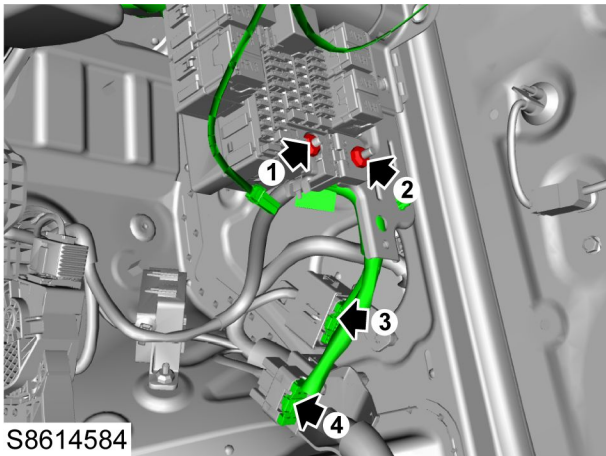


25. Remove 1 nut (1) fixing the front compartment harness to the passenger compartment fuse box, and remove the harness.
26. Remove 1 nut (2) fixing the passenger compartment fuse box to the instrument panel beam, loosen the clip, and remove the passenger compartment fuse box.
27. Disconnect the instrument panel harness from the front compartment harness (3).
28. Disconnect the instrument panel harness from the body harness (4).

31. Remove the tail gate interior trim panel.

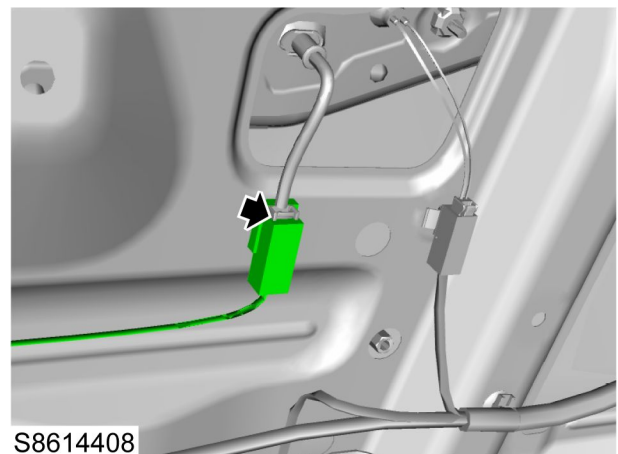
Tail Gate Interior Trim Panel

32. Disconnect the harness connector from the antenna amplifier.

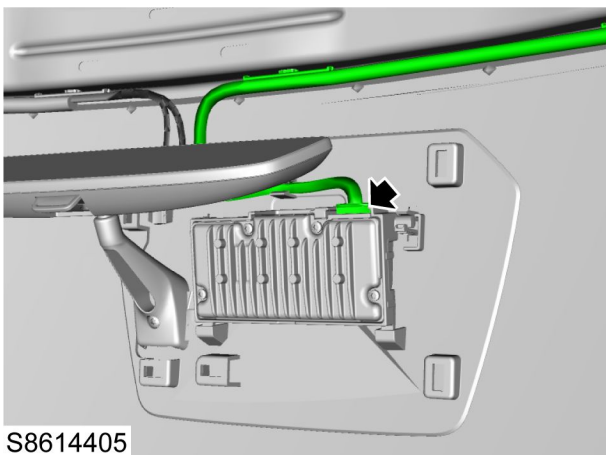


33. Disconnect the harness connector of the 360° AVM rear view camera (if any).

29. Disconnect the harness connector of the front view camera module.



34. Loosen the harness clip, and remove the instrument panel harness.









30. Disconnect the harness connector of the right ceiling curtain airbag.

Refit

1. Arrange the instrument panel harness inside the body and secure with clips.
2. Connect the harness connector of the 360° AVM rear view camera (if any).

Low Voltage Harness

3. Connect the harness connector of the antenna amplifier.
 4. Fit the tail gate interior trim panel.
-  **Tail Gate Interior Trim Panel**
5. Connect the harness connector of the right ceiling curtain airbag.
 6. Connect the harness connector of the front view camera module.
 7. Connect the instrument panel harness to the body harness.
 8. Connect the instrument panel harness to the front compartment harness.
 9. Fix the passenger compartment fuse box to the instrument panel beam, fit and tighten 1 nut.
 10. Fix the front compartment harness to the passenger compartment fuse box, fit 1 nut and tighten it.
 11. Connect the harness connector of the temperature damper actuator.
 12. Connect the harness connector of the evaporator temperature sensor.
 13. Connect the harness connector of the mode damper actuator.
 14. Connect the instrument panel harness to the body harness (centre console side).
 15. Tighten the ground terminal on the front part of the SDM.
 16. Connect the harness connector of the evaporator core.
 17. Connect the low-voltage harness connector of the electric heater.
 18. Connect the harness connector of the PEPS antenna - front.
 19. Connect the harness connector of the left electric heater temperature sensor.
 20. Connect the harness connector of the left footwell air outlet temperature sensor.
 21. Connect the harness connector of the gateway.
 22. Connect the harness connector of the fatigue monitoring module.
 23. Connect the FICM harness connector.
 24. Connect the harness connector of the DAB module.
 25. Connect the harness connector of the communication module.
 26. Connect the instrument panel harness to the body control module harness connector.
 27. Connect the instrument panel harness to the body harness (passenger side).
 28. Connect the instrument panel harness to the body harness (passenger side).
29. Fit the roof interior.
-  **Roof Interior Trim**
30. Fit the carpet.
-  **Carpet**
31. Fit the A pillar lower trim panel.
-  **A Pillar Lower Trim Panel**
32. Fit the instrument panel assembly.
-  **Instrument Panel Assembly**
33. Fit the manual service disconnect.
-  **Manual Service Disconnect**
34. Connect the negative battery cable.

Centre Console Harness Remove

1. Disconnect the negative battery cable.
2. Remove the centre console assembly.

Centre Console Assembly

3. Disconnect the harness connector (if equipped) of the mobile phone wireless charging module.
4. Disconnect the harness connector of the centre console rear USB charging module.
5. Disconnect the harness connector of the centre console rear USB charging module.
6. Loosen the harness retaining clip, and remove the centre console harness.

Refit

1. Arrange the centre console harness inside the centre console and secure with clips.
2. Connect the harness connector of the centre console rear USB charging module.
3. Connect the harness connector of the low frequency anti-theft receiving coil.
4. Connect the harness connector of the mobile phone wireless charging module (if any).
5. Fit the centre console assembly.

Centre Console Assembly

6. Connect the negative battery cable.

Body Harness Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect

3. Remove the instrument panel lower closure panel.

Instrument Panel Lower Closure Panel Remove

4. Remove the carpet.

Carpet Remove

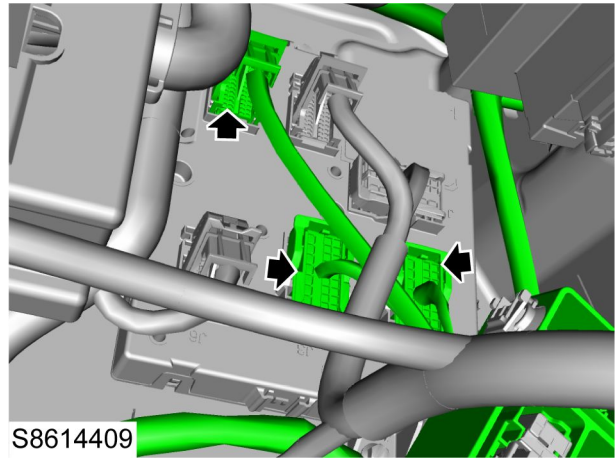
5. Remove the B pillar lower trim panel.

B Pillar Lower Trim Panel Remove

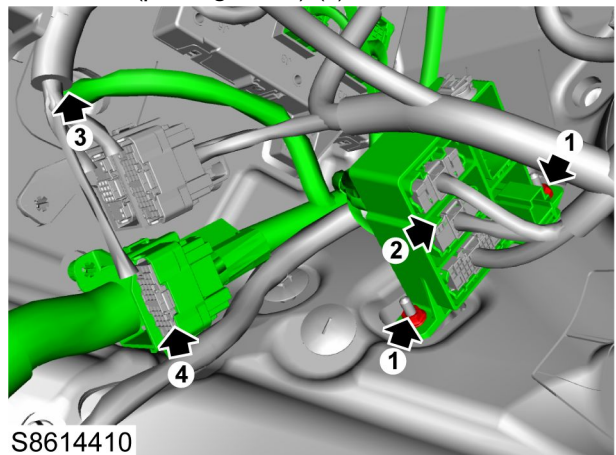
6. Remove the roof trim panel.

Roof Trim Panel Assembly Remove

7. Disconnect the body harness from the BCM harness connector.

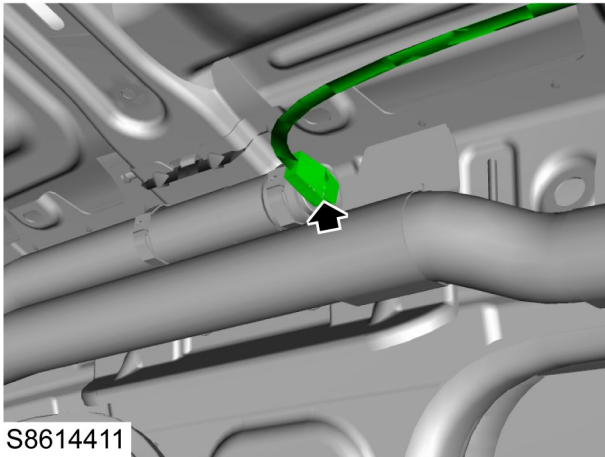


8. Remove 2 nuts (passenger side) (1) fixing the body harness to the dash panel and remove the harness.
9. Disconnect the body harness from the front compartment harness (passenger side) (2).
10. Disconnect the body harness from the driver door harness (3).
11. Disconnect the body harness from the instrument panel harness (passenger side) (4).

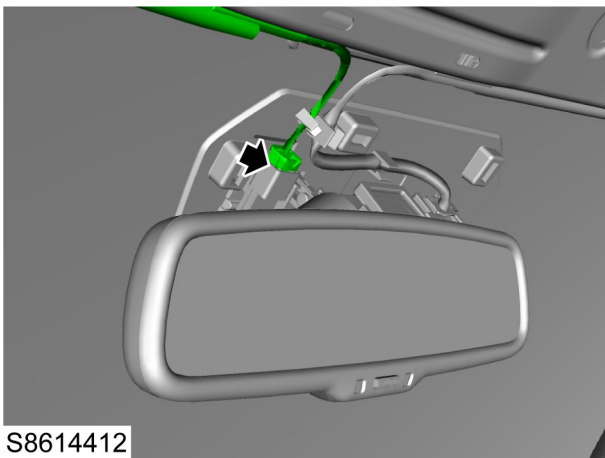


12. Disconnect the harness connector of the left ceiling curtain airbag.

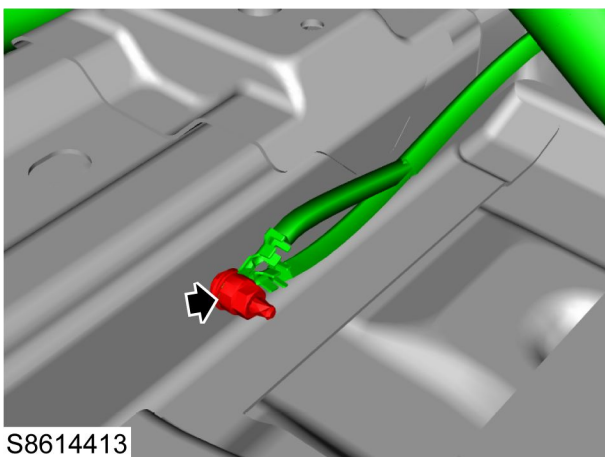
Low Voltage Harness



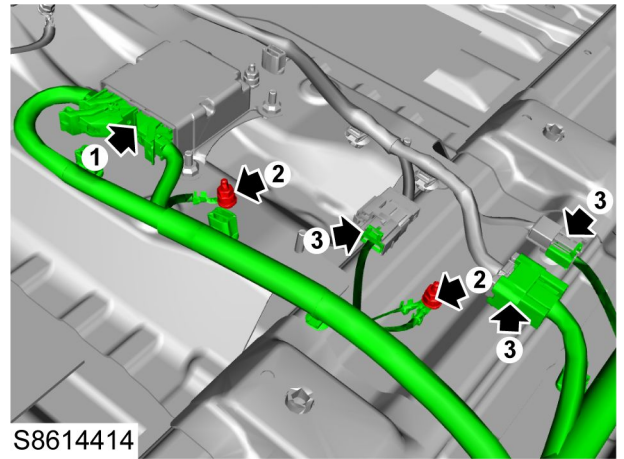
13. Disconnect the harness connector (if equipped) of the automatic anti-dazzle interior rearview mirror.



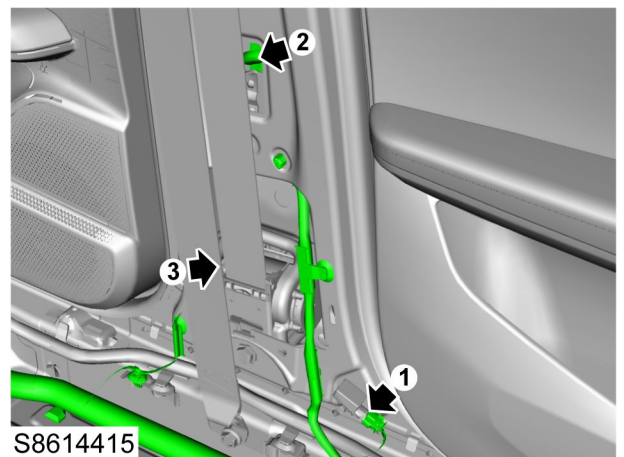
14. Loosen the ground terminal under the left front door sill trim panel.



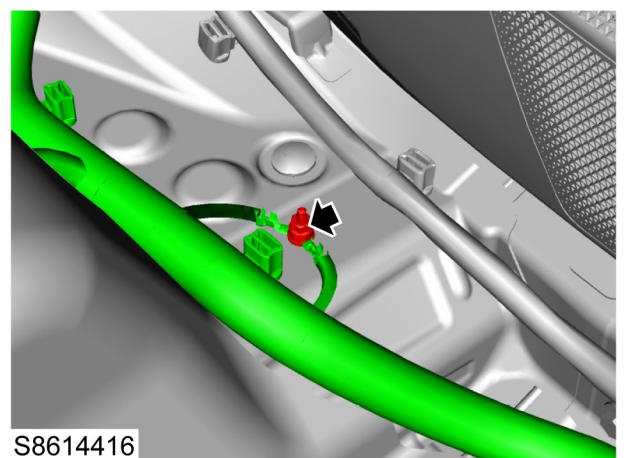
15. Disconnect the harness connector (1) of the airbag control module.
16. Loosen 2 ground terminals (2) under the centre console.
17. Disconnect the body harness from the instrument panel harness (centre console side) (3).



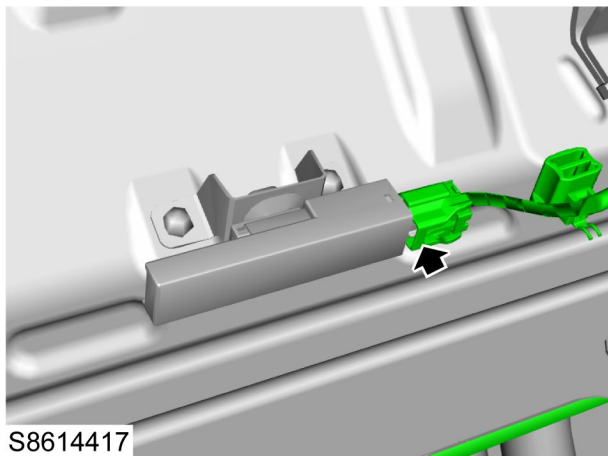
18. Disconnect the harness connector (1) of the left side impact sensor.
19. Disconnect the body harness from the rear left door harness (2).
20. Disconnect the harness connector (3) of the front left seat belt pre-tensioner.



21. Loosen the ground terminal under the rear left door sill trim panel.



22. Disconnect the harness connector of the 2nd row left seat belt buckle.
23. Disconnect the harness connector of the PEPS internal antenna - rear seat beam.



24. Remove the C pillar upper trim panel.

C Pillar Upper Trim Panel Remove

25. Remove the C pillar lower trim panel.

C Pillar Lower Trim Panel Remove

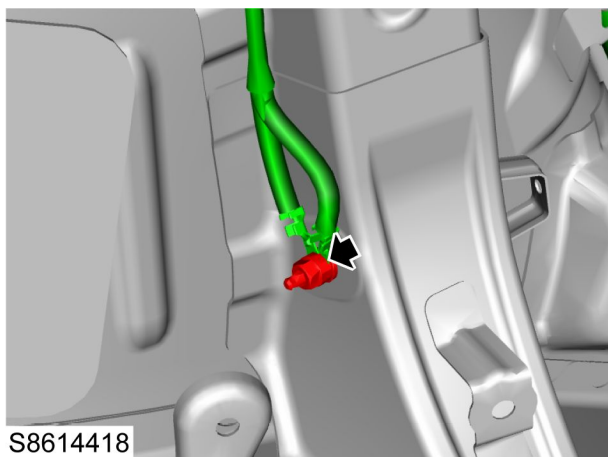
26. Remove the rear parcel shelf assembly.

Rear Parcel Shelf Assembly Remove

27. Remove the trunk side trim panel.

Trunk Side Trim Panel Remove

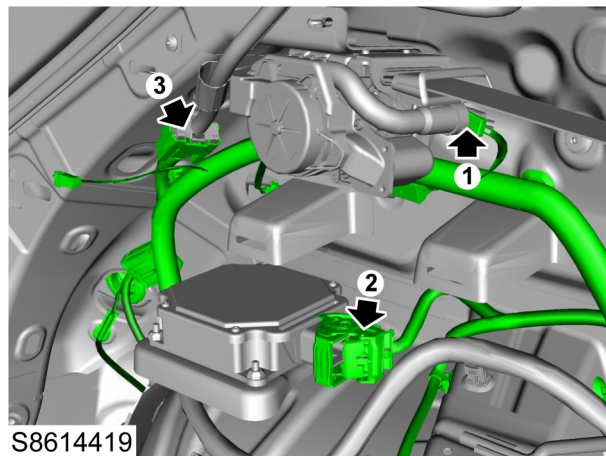
28. Loosen the harness connector of the rear left seat belt pre-tensioner.



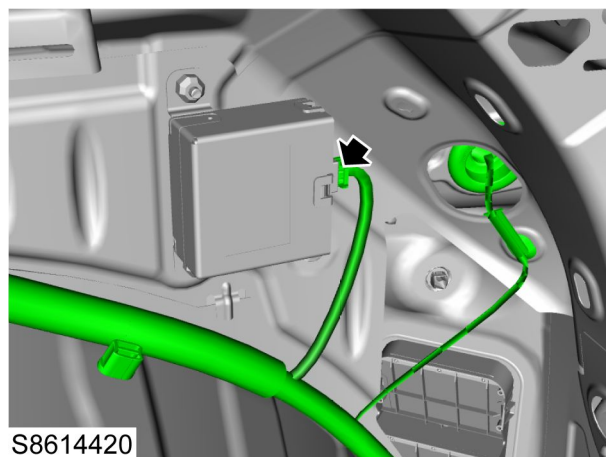
29. Disconnect the harness connector (1) of the rear left seat belt pre-tensioner.

30. Disconnect the harness connector (2) of the electric vehicle communication controller.

31. Disconnect the body harness from the tail gate harness (3).



32. Disconnect harness connector of the pedestrian alert control module.

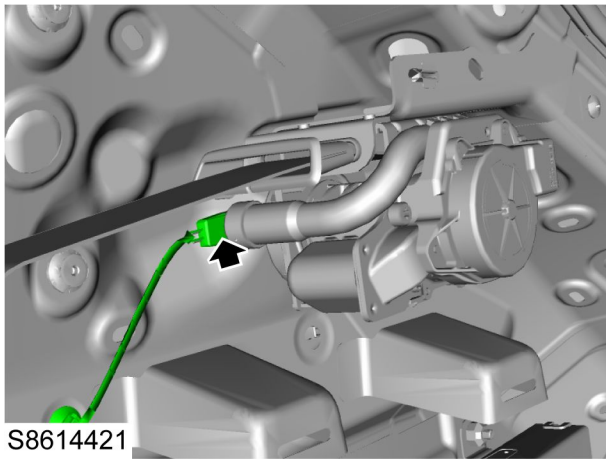


33. Loosen the ground terminal under the rear right seat belt pre-tensioner.

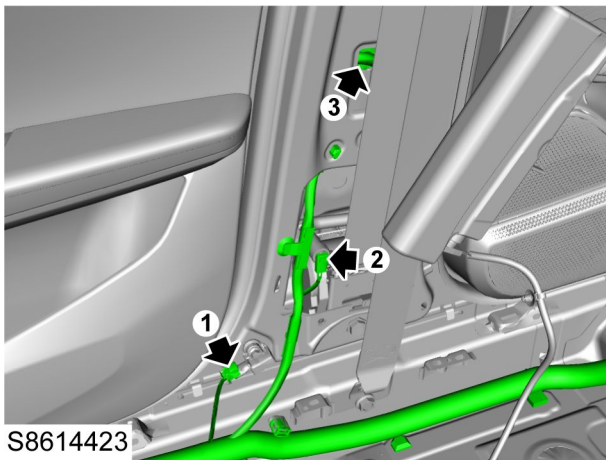


34. Disconnect the harness connector of the rear right seat belt pre-tensioner.

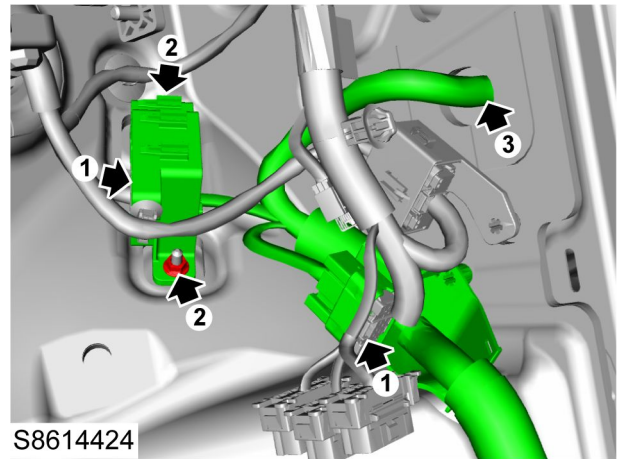
Low Voltage Harness



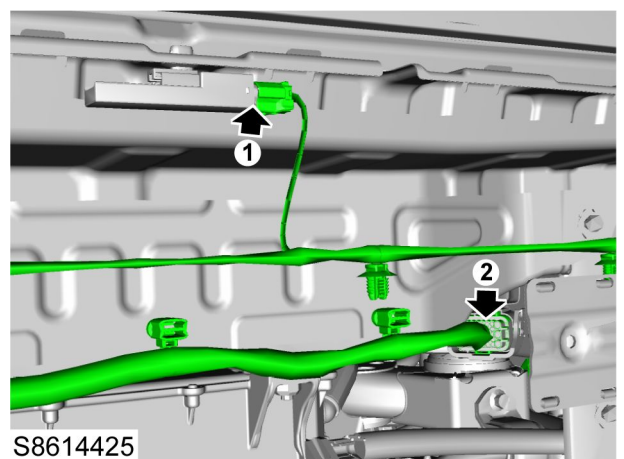
35. Disconnect the harness connector of the 2nd row right seat belt buckle.
36. Loosen the ground terminal under the rear right door sill trim panel.
37. Disconnect the harness connector (1) of the right side impact sensor.
38. Disconnect the body harness from the rear right door harness (2).
39. Disconnect the harness connector (3) of the front right seat belt pre-tensioner.



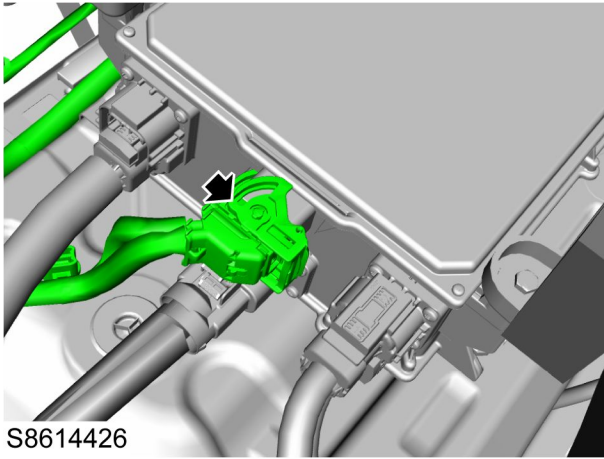
40. Loosen the ground terminal under the front right door sill trim panel.
41. Disconnect the body harness from the front compartment harness (driver side) (1).
42. Remove 2 nuts (driver side) (2) fixing the body harness to the dash panel and remove the harness.
43. Disconnect the body harness from the front right door harness (3).



44. Remove the tail lamp assembly.
 - Tail Lamp Assembly**
 45. Remove the rear bumper.
 - Rear Bumper**
 46. Remove the bottom deflector.
 - Bottom Deflector**
 47. Remove the high-voltage battery.
 - HV Battery Pack**
 48. Disconnect the PEPS antenna harness connector - rear bumper (1).
 49. Raise the vehicle with a lift.
- Warning :** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.
50. Disconnect the body harness from the rear drive unit harness (2).

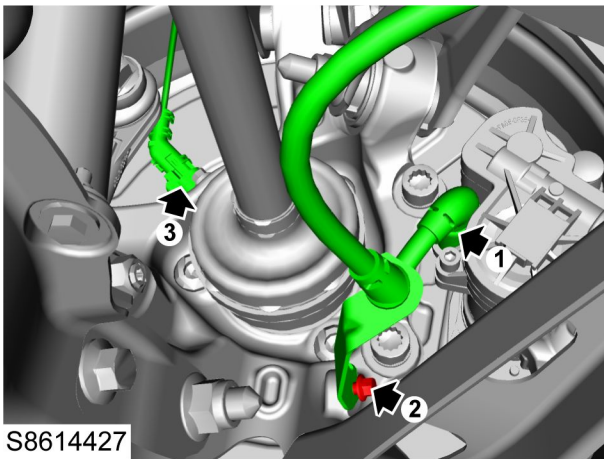


51. Disconnect the low voltage harness connector from the combined charging unit.



S8614426

52. Disconnect the harness connectors (1) of the rear electronic parking brakes on both sides.
53. Remove 1 bolt (2) fixing the body harness to the rear suspension wheel bracket and remove the harness.
54. Disconnect the harness connectors (3) of the rear wheel speed sensors on both sides.



S8614427

55. Disconnect the harness connector from the high-voltage PDU.
56. Loosen the harness clip, and remove the body harness.

Refit

1. Locate the body harness to the body and secure with clips.
2. Connect the harness connector to the high-voltage PDU.
3. Connect the harness connectors of the rear wheel speed sensors on both sides.
4. Fix the body harness to the rear suspension wheel bracket, fit 1 bolt and tighten it.
5. Connect the harness connectors of the rear electronic parking brakes on both sides.
6. Connect the low-voltage harness connector of the combined charging unit.
7. Connect the body harness to the rear drive unit harness.

8. Lower the vehicle.
9. Connect the PEPS antenna harness connector - rear bumper.
10. Fit the HV battery pack.

HV Battery Pack

11. Fit the bottom deflector.

Bottom Deflector

12. Fit the rear bumper.

Rear Bumper

13. Fit the tail lamp assembly.

Tail Lamp Assembly

14. Connect the body harness to the front right door harness.
15. Fix the body harness to the dash panel, fit 2 nuts (driver side) and tighten them.
16. Connect the body harness to the front compartment harness (driver side).
17. Tighten the ground terminal under the right front door sill trim panel.
18. Connect the harness connector of the front right seat belt pre-tensioner.
19. Connect the body harness to the rear right door harness.
20. Connect the harness connector of the right side impact sensor.
21. Tighten the ground terminal under the rear right door sill trim panel.
22. Connect the harness connector of the 2nd row right seat belt buckle.
23. Connect the harness connector of the rear right seat belt pre-tensioner.
24. Tighten the ground terminal under the rear right seat belt pre-tensioner.
25. Connect the harness connector of the pedestrian alert control module.
26. Connect the body harness to the tail gate harness.
27. Connect the harness connector of the electric vehicle communication controller.
28. Connect the harness connector of the rear left seat belt pre-tensioner.
29. Tighten the harness connector of the rear left seat belt pre-tensioner.
30. Fit the trunk side trim panel.

Trunk Side Trim Panel

31. Fit the rear parcel shelf assembly.

Rear Parcel Shelf Assembly

32. Fit the C pillar lower trim panel.

Low Voltage Harness

C Pillar Lower Trim Panel

33. Fit the C pillar upper trim panel.

C Pillar Upper Trim Panel

34. Connect the harness connector of the PEPS internal antenna - rear seat beam.
35. Connect the harness connector of the 2nd row left seat belt buckle.
36. Tighten the ground terminal under the rear left door sill trim panel.
37. Connect the harness connector of the front left seat belt pre-tensioner.
38. Connect the body harness to the rear left door harness.
39. Connect the harness connector of the left side impact sensor.
40. Connect the body harness to the instrument panel harness (centre console side).
41. Tighten 2 ground terminals under the centre console.
42. Connect the harness connector of the airbag control module.
43. Tighten the ground terminal under the left front door sill trim panel.
44. Connect the harness connector (if equipped) of the automatic anti-dazzle interior rearview mirror (if any).
45. Connect the harness connector to the left ceiling curtain airbag.
46. Connect the body harness to the instrument panel harness (passenger side).
47. Connect the body harness to the driver door harness.
48. Connect the body harness to the front compartment harness (passenger side).
49. Fix the body harness to the dash panel, fit 2 nuts (passenger side) and tighten them.
50. Connect the connector connecting the body harness to the BCM harness.
51. Fit the roof trim panel.

Roof Trim Panel Assembly

52. Fit the B pillar lower trim panel.

B Pillar Lower Trim Panel

53. Fit the carpet.

Carpet

54. Fit the instrument panel lower closure panel.

Instrument Panel Lower Closure Panel

55. Fit the manual service disconnect.

Manual Service Disconnect

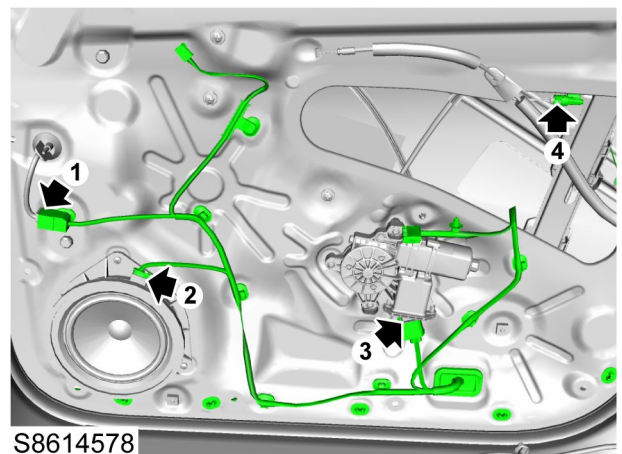
56. Connect the negative battery cable.

Front Door Harness Remove

1. Disconnect the negative battery cable.
2. Pry off the rubber seal ring on the body side and disconnect the front door harness from the body harness.
3. Remove the front door interior trim panel.

Front Door Interior Trim Panel Remove

4. Remove the exterior rearview mirror trim panel.
5. Tear off the front door waterproof membrane.
6. Disconnect the harness connector (1) from the exterior rearview mirror.
7. Disconnect the harness connector (2) of the front door woofer.
8. Disconnect the harness connector (3) of the front door window regulator motor.
9. Disconnect the harness connector (4) of the front door handle antenna.



10. Disconnect the harness connector of the front door lock motor.
11. Loosen the harness clip and remove the front door harness.

Refit

1. Arrange the front door harness to the door and secure with clips.
2. Connect the harness connector of the front door lock motor.
3. Connect the harness connector of the front door handle antenna.
4. Connect the harness connector of the front door window regulator motor.
5. Connect the harness connector of the front door woofer.
6. Connect the harness connector to the exterior rearview mirror.
7. Fit the front door waterproof membrane.

8. Fit the exterior rearview mirror trim panel.
9. Fit the front door interior trim panel.

Front Door Interior Trim Panel Refit

10. Connect the front door harness to the body harness connector, and fit the rubber seal rings.
11. Connect the negative battery cable.

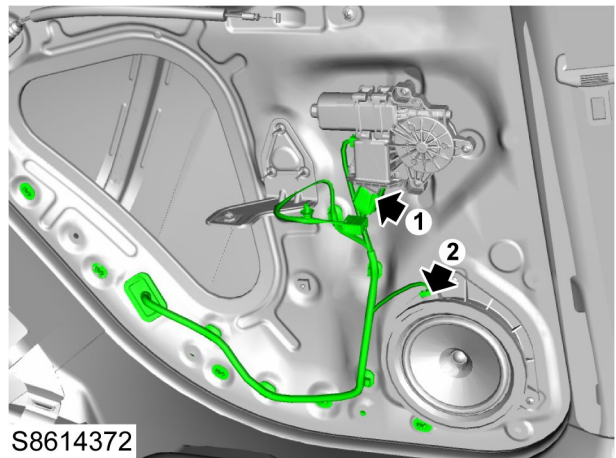
Rear Door Harness

Remove

1. Disconnect the negative battery cable.
2. Pry off the rubber seal ring on the body side and disconnect the connector between the rear door harness and the body harness.
3. Remove the rear door interior trim panel.

Rear Door Interior Trim Panel Remove

4. Tear off the rear door waterproof membrane.
5. Disconnect the harness connector (1) of the rear door window regulator motor.
6. Disconnect the harness connector (2) of the rear door woofer.



7. Disconnect the harness connector of the rear door lock motor.
8. Loosen the harness clip and remove the rear door harness.

Refit

1. Arrange the rear door harness to the rear door and secure with clips.
2. Connect the harness connector of the rear door lock motor.
3. Connect the harness connector of the rear door woofer.
4. Connect the harness connector of the rear door window regulator motor.
5. Fit the rear door waterproof membrane.
6. Fit the rear door interior trim panel.

Rear Door Interior Trim Panel Refit

7. Connect the rear door harness to the body harness connector, and fit the rubber seal rings.
8. Connect the negative battery cable.

Low Voltage Harness

Front Seat Harness Remove

1. Connect the negative battery cable.
2. Disconnect the negative battery cable.

Front Seat Assembly Remove

3. Remove the driver seat assembly.
4. Disconnect the harness connector of the driver seat upward/downward adjustment motor.
5. Disconnect the harness connector of the driver seat back adjustment motor.
6. Disconnect the harness connector of the driver seat cushion heating element (if any).
7. Disconnect the harness connector of the driver seat belt buckle switch.
8. Disconnect the harness connector of the driver seat forward/backward adjustment motor.
9. Disconnect the harness connector of the power seat memory module (if any).
10. Loosen the harness clip, and remove the driver seat harness.

Refit

1. Arrange the driver seat harness to the driver seat and secure with clips.
2. Connect the harness connector of the power seat memory module (if any).
3. Connect the harness connector of the driver seat forward/backward adjustment motor.
4. Connect the harness connector of the driver seat belt buckle switch.
5. Connect the harness connector of the driver seat cushion heating element (if any).
6. Connect the harness connector of the driver seat back adjustment motor.
7. Connect the harness connector of the driver seat upward/downward adjustment motor.
8. Connect the harness connector of the driver seat adjustment switch.
9. Fit the driver seat assembly.

Front Seat Assembly Refit

10. Connect the negative battery cable.

Tail Gate Harness Remove

1. Disconnect the negative battery cable.
2. Remove the left trunk side trim panel.

Trunk Side Trim Panel

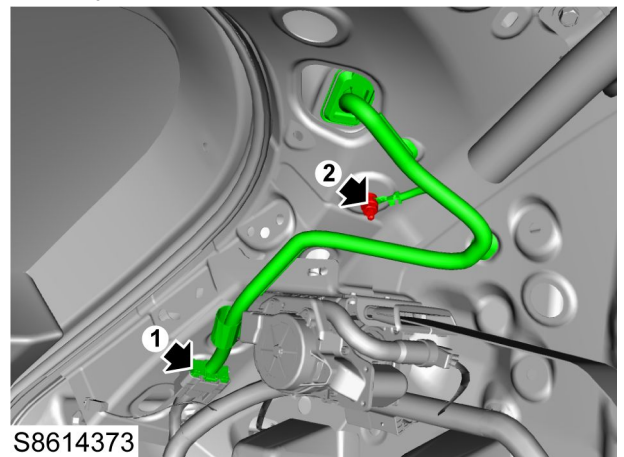
3. Remove the roof interior.

Roof Interior Trim

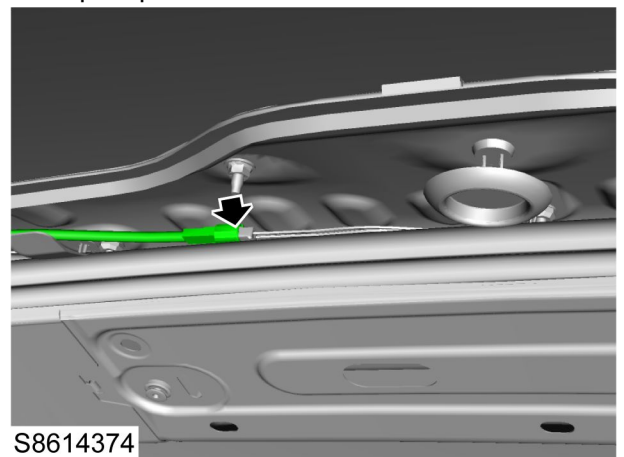
4. Remove the tail gate trim panel.

Tail Gate Trim Panel

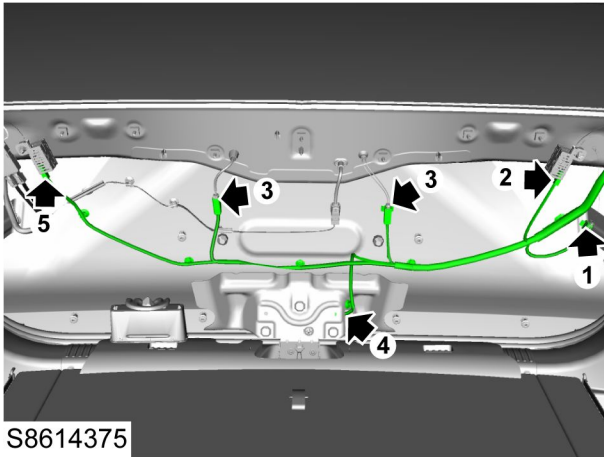
5. Disconnect the tail gate harness from the body harness (1).
6. Loosen the ground terminal (2) above the rear left seat belt pre-tensioner.



7. Disconnect the harness connector of the high-mounted stop lamp.



8. Disconnect the harness connector (1) of the left tail lamp (trunk lid side).
9. Disconnect the harness connector (2) of the radio antenna coil (power terminal).
10. Disconnect the harness connector (3) of the rear license plate lamp.
11. Disconnect the harness connector (4) of the tail gate lock.
12. Disconnect the harness connector (5) of the radio antenna coil (ground terminal).



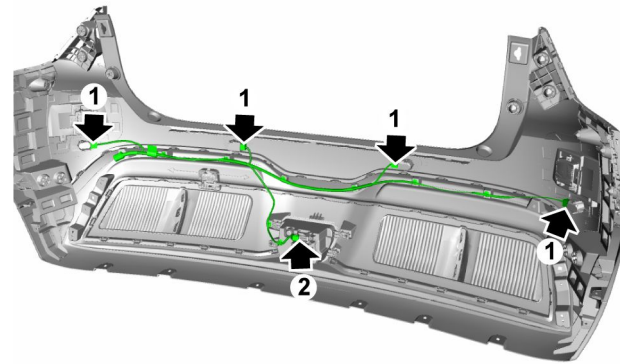
S8614375

Rear Bumper Harness Remove

1. Disconnect the negative battery cable.
2. Remove the rear bumper assembly.

Rear Bumper Assembly

3. Disconnect the harness connector (1) of the rear parking distance sensor.
4. Disconnect the harness connector (2) of the rear fog lamp.



S8614376

5. Loosen the harness clips and remove the rear bumper harness.

Refit

1. Arrange the rear bumper harness to the rear bumper and secure with clips.
2. Connect the harness connector of the rear fog lamp.
3. Connect the harness connector of the rear parking distance sensor.
4. Fit the rear bumper assembly.

Rear Bumper Assembly

5. Connect the negative battery cable.

13. Loosen the harness retaining clip and remove the tail gate harness.

Refit

1. Arrange the tail gate harness to the tail gate and secure with clips.
2. Connect the harness connector of the radio antenna coil (ground terminal).
3. Connect the harness connector of the tail gate lock.
4. Connect the harness connector of the rear license plate lamp.
5. Connect the harness connector of the radio antenna coil (power terminal).
6. Connect the harness connector of the left tail lamp (trunk lid side).
7. Connect the harness connector of the high-mounted stop lamp.
8. Tighten the ground terminal above the rear left seat belt pre-tensioner.
9. Connect the tail gate harness to the body harness.
10. Fit the tail gate trim panel.

Tail Gate Trim Panel

11. Fit the roof interior.

Roof Interior Trim

12. Fit the left trunk side trim panel.

Trunk Side Trim Panel

13. Connect the negative battery cable.

Low Voltage Harness

Electric Drive Unit Harness Remove

1. Disconnect the negative battery cable.
2. Remove the manual service disconnect.

Manual Service Disconnect

3. Remove the bottom deflector.

Bottom Deflector

4. Disconnect the body harness from the electric drive transmission harness.
5. Disconnect the harness connector of the intelligent ECU.
6. Disconnect the harness connector of the electric drive transmission.
7. Loosen the harness clip, and remove the electric drive transmission harness.

Refit

1. Arrange the electric drive transmission harness to the underbody and secure with clips.
2. Connect the harness connector to the electric drive transmission.
3. Connect the harness connector to the IMCU.
4. Connect the body harness to the electric drive transmission harness.
5. Fit the bottom deflector.

Bottom Deflector

6. Fit the manual service disconnect.

Manual Service Disconnect

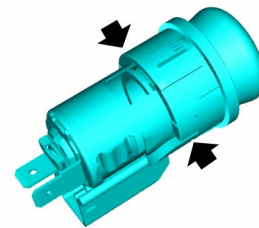
7. Connect the negative battery cable.

12V Power Socket Remove

1. Disconnect the negative battery cable.
2. Remove the centre console assembly.

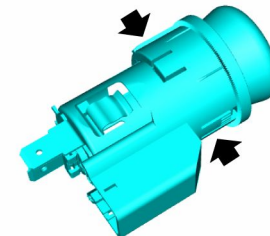
Centre Console Assembly

3. Loosen the clip fixing the power socket to the bezel, and remove the centre console power socket.



S8413506

4. Loosen the clip fixing the bezel and remove the bezel of the power socket.



S8413508

Refit

1. Fit the trim ring of centre console power socket, and secure with clips.
2. Clip the power socket onto the trim ring, and press the clip in place.
3. Remove the centre console assembly.

Centre Console Assembly

4. Connect the negative battery cable.

Power Steering System Harness

Remove

1. Disconnect the negative battery cable.
2. Remove the upper cover of the front compartment fuse box.
3. Remove 1 nut fixing the power steering system harness to the front compartment fuse, and remove the harness.
4. Disconnect the power steering system harness from the front compartment harness.
5. Disconnect the A/C compressor harness connector.
6. Remove the bottom deflector.

Bottom Deflector

7. Disconnect the steering gear harness connector.
8. Disconnect the harness connector of the electronic water pump temperature sensor in power electronic box (PEB).
9. Loosen the harness clip, and remove the power steering system harness.

Refit

1. Arrange the power steering system harness to the front compartment and secure with clips.
2. Connect the harness connector of the PEB electronic water pump temperature sensor.
3. Connect the harness connector of the steering gear.
4. Fit the bottom deflector.

Bottom Deflector

5. Connect the harness connector of the A/C compressor.
6. Connect the power steering system harness to the front compartment harness.
7. Fix the power steering system harness to the front compartment fuse box, fit 1 nut and tighten it.
8. Fit the upper cover of the front compartment fuse box.
9. Connect the negative battery cable.

High Voltage Harness

High Voltage Harness

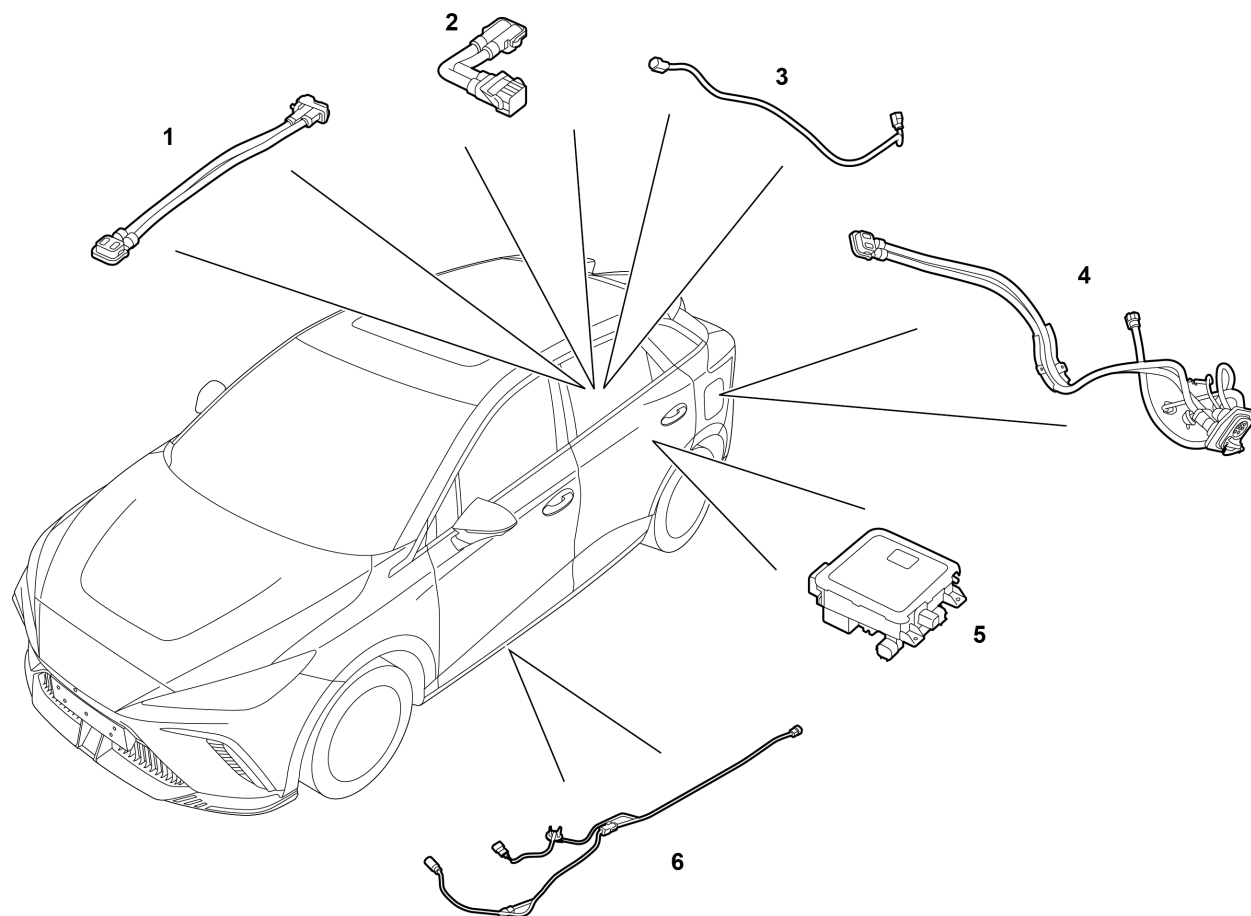
Specification

Torque

Description	Value
Bolt-PDU Upper Cover to PDU	5-7Nm

Description and Operation

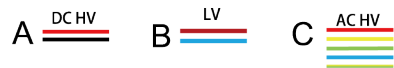
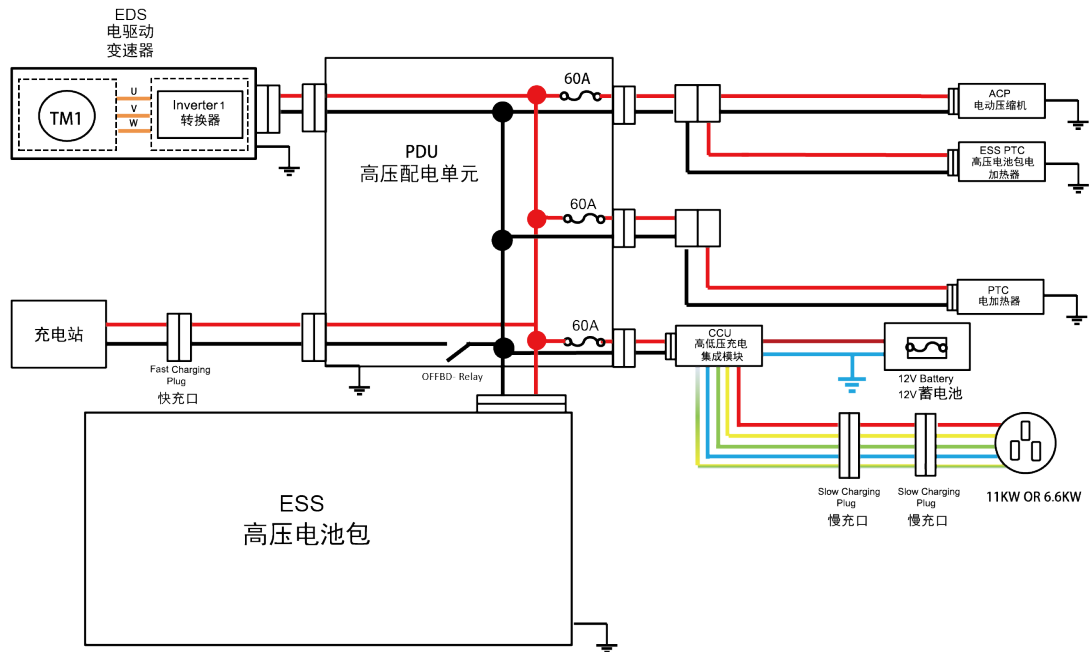
System Layout



S1121213

1. HV Harness - HV Power Distribution Unit to Electric Drive Transmission
2. HV Harness - HV Power Distribution Unit to HV Battery Pack (ESS)
3. HV Harness - HV Power Distribution Unit (PDU) to Combined Charging Unit (CCU)
4. Charging Port
5. HV Power Distribution Unit
6. HV Harness - HV Power Distribution Unit to Front Compartment

High Voltage Harness
System Control Diagram



S1123898

A = High Voltage DC; B = Low Voltage Power; C = High Voltage AC

Description

High-voltage Power Distribution Unit (PDU)

The high-voltage power distribution unit (PDU) is located at the rear part of the vehicle. Its main function is to transmit the electric energy of HV battery pack passing through the PDU to the electric heater, electric A/C compressor, HV battery pack heater and intelligent motor control unit (IMCU), realizing the transmission of electric energy. The HV battery pack is slowly charged at the slow charging port through CCU and then flowing through PDU; and it is fast charged at the fast charging port through PDU.

HV Harness - HV Power Distribution Unit (PDU) to Combined Charging Unit (CCU)

The HV harness - HV power distribution unit (PDU) to combined charging unit (CCU), located at the rear part of the vehicle, is fitted between the CCU and the PDU. Its main function is to transmit external charging current through the CCU to the PDU.

HV Harness - HV Power Distribution Unit to Electric Drive Transmission

The HV harness - HV power distribution unit (PDU) to front compartment, located at the rear part of the vehicle, is fitted between the PDU and the electric heater, and the electric A/C compressor and the HV battery pack heater. Its main function is to transmit HV DC power of the HV battery passing through the PDU to the electric A/C compressor, electric heater and HV battery pack heater to drive the compressor to work.

HV Harness - HV Power Distribution Unit to HV Battery Pack (ESS)

The HV harness - HV power distribution unit to HV battery pack (ESS), located above the HV battery pack, is fitted between the HV battery pack and the PDU. Its main function is to transmit DC power of HV battery pack to the PDU and charge the HV battery via the fast charging port.

High Voltage Harness

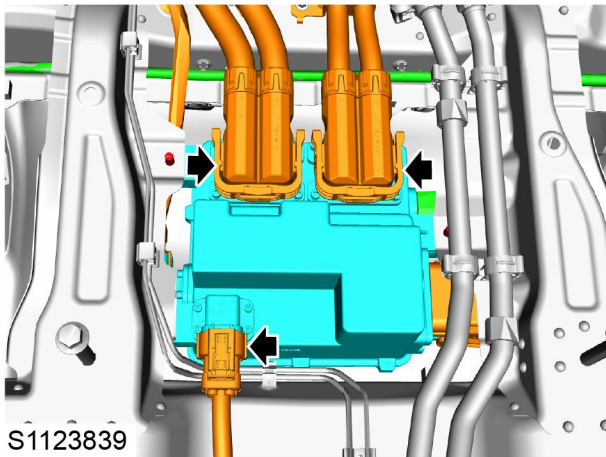
Service Guide

High-voltage Power Distribution Unit (PDU) Remove

1. Remove 12 bolts fixing the rear floor subassembly to the body, and remove the rear floor subassembly.
2. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
3. Remove the high-voltage battery.

HV Battery Pack Remove

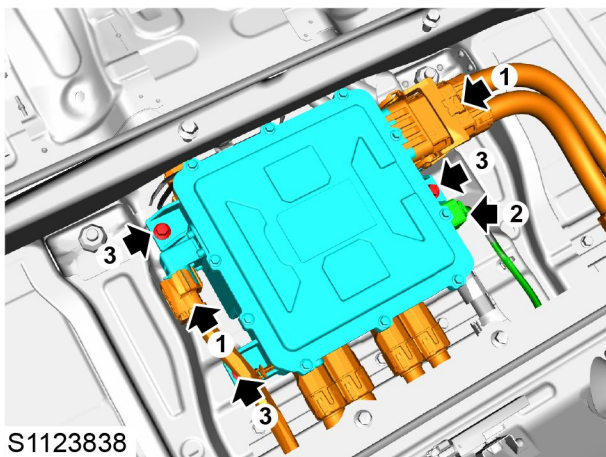
4. Disconnect the HV harness connector below the HV power distribution unit.



5. Remove the rear seat cushion.

Rear Seat Cushion Remove

6. Disconnect the HV harness connector (1) above the HV power distribution unit, loosen the harness clip, and remove the harness.
7. Disconnect the LV harness connector (2).
8. Remove 3 bolts (3) fixing the HV power distribution unit to the body, and remove the HV power distribution unit.



Refit

1. Fix the HV power distribution unit to the body, fit 3 bolts, tighten them to TBD, and check the torque.
2. Connect the LV harness connector.

3. Fix the HV harness above the HV power distribution unit to the HV power distribution unit, press the clip, and connect the HV harness connector.
4. Fix the rear floor subassembly to the body, fit and tighten 12 bolts.
5. Fit the rear seat cushion.

Rear Seat Cushion Remove

6. Connect the HV harness connector below the HV power distribution unit.
7. Fit the HV battery pack.

HV Battery Pack Remove

High-voltage Power Distribution Unit Fuse Remove

1. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

3. Remove the rear seat cushion.

Rear Seat Cushion Remove

4. Remove 12 bolts fixing the rear floor subassembly to the body, and remove the rear floor subassembly.
5. Remove the 8 bolts fixing the upper cover of the HV power distribution unit to the HV power distribution unit, then remove the upper cover.
6. Remove 6 screws fixing the PDU fuse to PDU, and remove the PDU fuse.

Refit

1. Fix the PDU fuse to the PDU, fit 2 screws and tighten them.
2. Fix the upper cover to the HV power distribution unit, fit 8 bolts, tighten them to **5-7Nm**, and check the torque.
3. Fix the rear floor subassembly to the body, fit and tighten 12 bolts.
4. Remove the rear seat cushion.

Rear Seat Cushion Remove

5. Remove the manual service disconnect.

Manual Service Disconnect Remove

High-voltage Harness - High-voltage Power Distribution Unit (PDU) to Combined Charging Unit (CCU) Remove

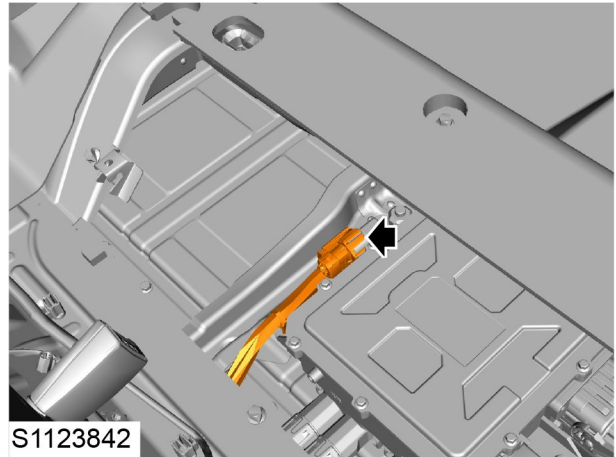
1. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

3. Remove the rear seat cushion.

Rear Seat Cushion Remove

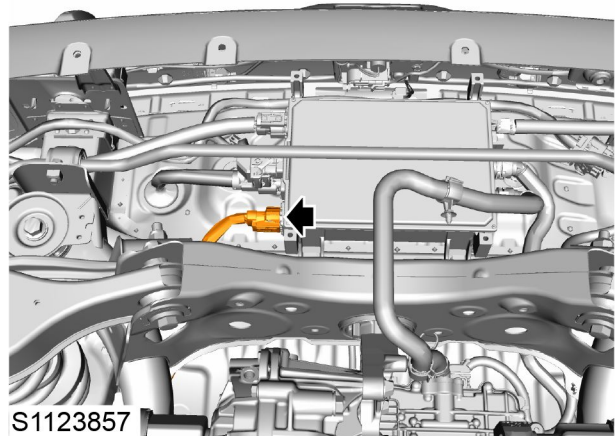
4. Disconnect the HV harness connector from PDU.



5. Remove the rear bottom deflector.

Bottom Deflector Remove

6. Disconnect the HV harness connector from CCU.



7. Remove 2 bolts fixing the charging port HV harness to the body, and loosen the harness.
8. Loosen the harness clip and remove the HV harness - PDU to CCU.

Refit

1. Fix the PDU - CCU HV harness to the body and secure with clips.
2. Fix the charging port HV harness to the body, fit and tighten 2 bolts.
3. Connect the HV harness connector at the CCU.
4. Fit the bottom deflector.

High Voltage Harness

Bottom Deflector Remove

5. Connect the HV harness connector at the PDU.
6. Fit the rear seat cushion.

Rear Seat Cushion Remove

7. Fit the manual service disconnect.

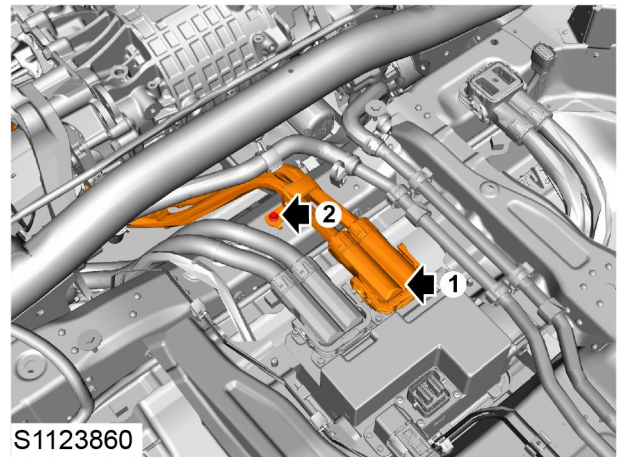
Manual Service Disconnect Remove

High-voltage Harness - High-voltage Power Distribution Unit to Electric Drive Transmission Remove

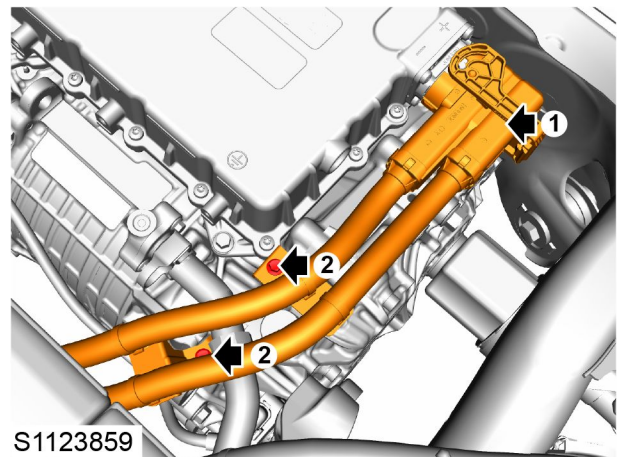
1. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
2. Remove the high-voltage battery.

HV Battery Pack Remove

3. Disconnect the HV harness connector (1) from PDU.
4. Remove 1 bolt (2) fixing the HV harness and the bracket to the body.



5. Disconnect the HV harness connector (1) from IMCU.
6. Remove 2 bolts (2) fixing the HV harness bracket to the electric drive transmission and remove the HV harness - IMCU to HV power distribution unit.



Refit

1. Fix the intelligent motor control unit (IMCU) - HV power distribution unit HV harness and the bracket to the electric drive transmission, fit and tighten 2 bolts.
2. Connect the HV harness connector at the IMCU.
3. Fix the intelligent motor control unit (IMCU) - HV power distribution unit HV harness and the bracket to the body, fit and tighten 1 bolt.
4. Connect the HV harness connector at the HV power distribution unit.

5. Fit the HV battery pack.

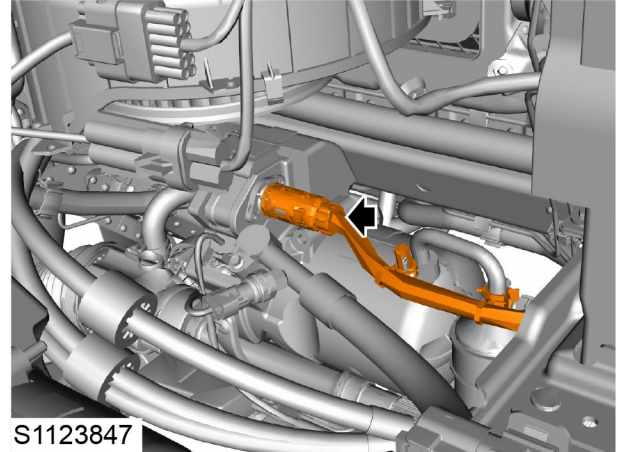
HV Battery Pack Remove

High-voltage Harness - High-voltage Power Distribution Unit to Front Compartment Remove

1. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

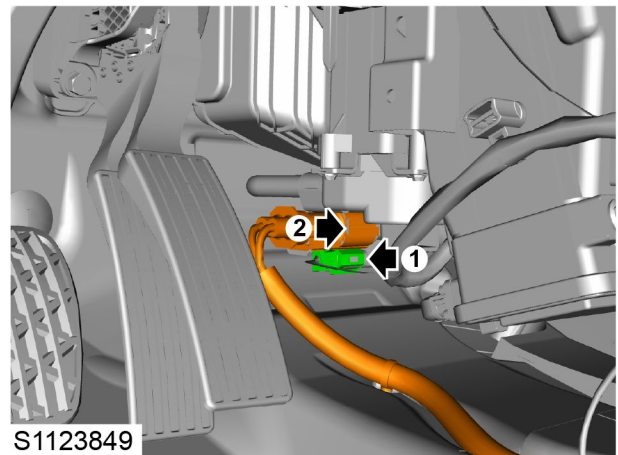
3. Disconnect the HV harness connector from the compressor.



4. Remove the left centre console heater closure panel.

Centre Console Heater Closure Panel Assembly Remove

5. Disconnect the LV harness connector (1) from the electric heater.
6. Disconnect the HV harness connector (2) from the electric heater.

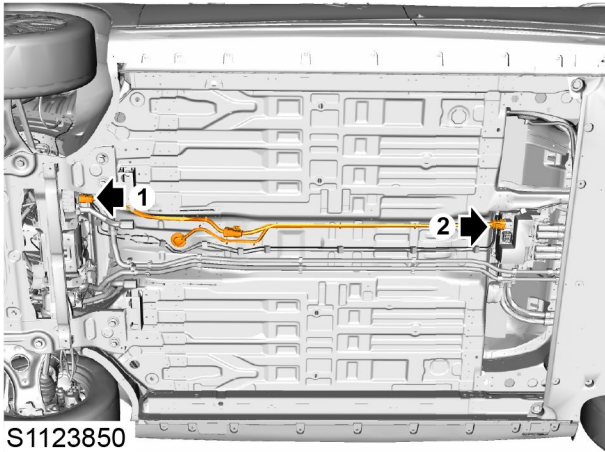


7. Release the buckle and pull out the HV harness from the electric heater.
8. Remove the high-voltage battery.

HV Battery Pack Remove

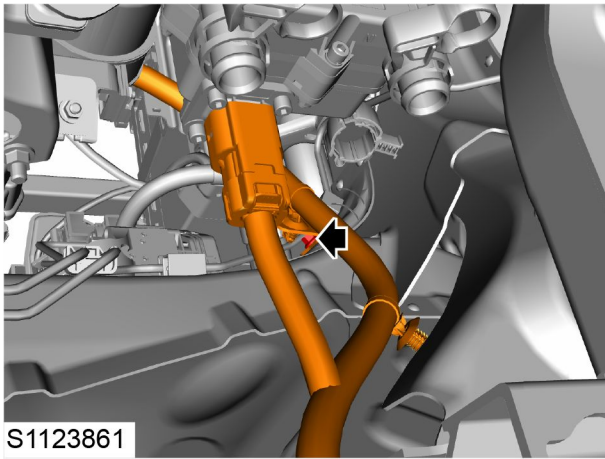
9. Disconnect the HV harness connector (1) from PTC.
10. Disconnect the HV harness connector (2) from PDU.

High Voltage Harness



S1123850

11. Remove 1 bolt securing PDU to the HV harness in the front cabin and the bracket to the body, loosen the buckle, and remove the harness from the PDU to the front cabin.



S1123861

Refit

1. Arrange PDU - front compartment HV harness in place and press the clips.
2. Fix the PDU - front compartment HV harness and the bracket to the body, fit and tighten 1 bolt.
3. Connect the HV harness connector at PDU and PTC.
4. Fit the HV battery pack.

HV Battery Pack Remove

5. Connect the HV/LV harness connector at the electric heater.
6. Fit the left centre console heater closure panel.

Centre Console Heater Closure Panel Assembly Remove

7. Connect the harness connector at the compressor.
8. Fit the manual service disconnect

Manual Service Disconnect Remove

High-voltage Harness - High-voltage Power Distribution Unit (PDU) to High-voltage Battery Pack (ESS)

Remove

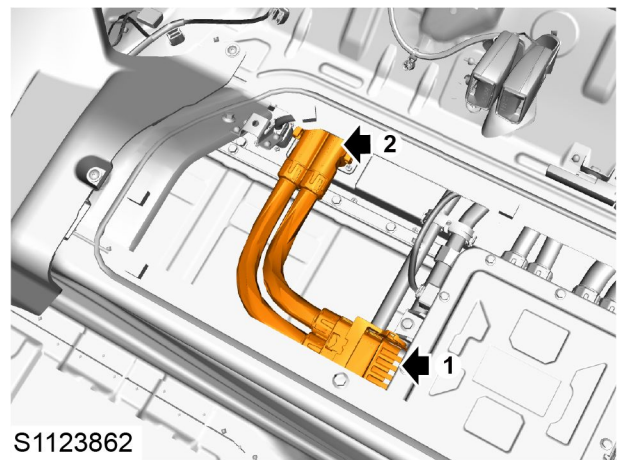
1. Turn off the start switch and let the vehicle stand for more than 5 minutes before removal.
2. Remove the manual service disconnect.

Manual Service Disconnect Remove

3. Remove the rear seat cushion.

Rear Seat Cushion Remove

4. Remove 12 bolts fixing the rear floor subassembly to the body, and remove the rear floor subassembly.
5. Disconnect the HV harness connector (1) from PDU.



S1123862

6. Remove the power battery pack assembly.

Power Battery Pack Assembly Remove

7. Remove the HV harness - PDU to HV battery pack.

Refit

1. Fit the power battery pack assembly.

Power Battery Pack Assembly Remove

2. Connect the HV harness connector at the PDU.
3. Fix the rear floor subassembly to the body, fit and tighten 12 bolts.
4. Fit the rear seat cushion.

Rear Seat Cushion Remove

5. Fit the manual service disconnect.

Manual Service Disconnect Remove

HVAC, Ventilation and Air Conditioning

Scenario and Function

Scenario	Refresh	Configuration	Self-learning	Operation Path
HVAC Replacement	①	②	③	SIPS-Programming and Coding—HVAC—Replacement
HVAC Refresh	①	②	③	SIPS-Programming and Coding—HVAC—Refresh
HVAC Configuration		①		SIPS-Programming and Coding—HVAC—Configuration
Any Actuator with Feedback Signal or A/C Box Replacement			①	SIPS-Fast Channel—A/C Damper Actuator Self-learning
Damper position changes involved during removal/refit			①	SIPS-Fast Channel—A/C Damper Actuator Self-learning

Number in ○ describes the sequence of performing the functional operations

Refresh

Function Description

This function is used to update the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Result Verification

1. The ECU refresh process ends normally;
2. Check if the A/C system operates normally and there is no relevant DTC for the control module;
3. Check that the application version and the calibration software version of the ECU are correct.

Configuration

Function Description

This function is used to configure the control functions of ECU according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Result Verification

1. The ECU configuration process ends normally;

2. Check if the A/C system operates normally and there is no relevant DTC for the control module;
3. Check and confirm that the configuration document version of ECU is correct.

A/C Damper Actuator Self-learning

Function Description

The A/C damper actuator self-learning is performed to eliminate such problems as windshield fogging caused by damper air leakage due to manufacture or assembly error.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.
4. No DTC related to the damper actuator exists.

Result Verification

- The ECU self-learning process ends normally;
- Check if the A/C system operates normally and there is no relevant DTC for the control module.

High Voltage Harness

Electric Power Steering (EPS) Module

Scenario and Route

Scenario	Refresh	Configuration	End Protection Value Erasure	Steering Wheel Angle Reset	Steering Wheel Angle Zero Position Calibration	End Protection Value Learning	Operation Route
Software Upgrade	①						SIPS - Programming and Encoding - EPS - Refresh
Configuration		①					SIPS - Programming and Encoding - EPS - Configuration
ECU Replacement	①	②	③	④	⑤	⑥	SIPS - Programming and Encoding - EPS - Replacement
Replace the upper steering column, steering gear sleeve, steering gear inner tie rod, steering gear outer tie rod and steering gear sub-assembly			①	②	③	④	SIPS - Fast Channel - Electric Power Steering System Learning

Number in ○ describes the sequence of performing the functional operations.

If an EPS module is integrated into the upper steering column or steering gear sub-assembly, follow the scenario of "ECU Replacement".

EPS Refresh

Function Description

This function is used for updating the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Execution Condition

1. P is selected;

2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;

3. Do not let vehicle power off through the screen.

EPS Configuration

Function Description

This function is used for re-configuring each control function of ECU and writing VIN.

Execution Condition

1. P is selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

End Protection Value Erasure

Function Description

This function is used to erase the currently learned end protection value.

Execution Condition

1. P is selected;
2. Ensure the steering wheel is maintained in a centralised position;
3. Start or set the vehicle to Ready mode and wait 5 seconds.

Steering Wheel Angle Reset

Function Description

This function is used to delete the current steering angle zero position information before re-learning the steering wheel angle zero position.

Execution Condition

1. P is selected;
2. Ensure the steering wheel is maintained in a centralised position;
3. Start or set the vehicle to Ready mode and wait 5 seconds.

Steering Wheel Angle Zero Position Calibration

Function Description

This function is used to learn steering wheel angle zero position information.

Execution Condition

1. P is selected;
2. Ensure the steering wheel is maintained in a centralised position;
3. Start or set the vehicle to Ready mode and wait 5 seconds.

End Protection Value Learning

Function Description

This function is used to learn the end protection value of steering gear.

Execution Condition

1. P is selected;
2. Ensure the steering wheel is maintained in a centralised position;
3. Start or set the vehicle to Ready mode and wait 5 seconds.

High Voltage Harness

Steering Column Lock Control Module (ESCL)

Scenario and Route

Scenario	Configuration	Anti-theft matching	Operation Route
Configuration	①		SIPS - Programming and Encoding - ESCL - Configuration
ECU Replacement	①	②	SIPS - Programming and Encoding - ESCL - Replacement

Number in ○ describes the sequence of performing the functional operations.

ESCL Configuration

Function Description

This function is used for re-configuring each control function of ECU and writing VIN.

Execution Condition

1. P is selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

ESCL Anti-theft Matching

Function Description

ECU is an anti-theft related module; after the ECU is replaced with a new one, it is necessary to perform anti-theft matching, including PIN code writing and key learning. The vehicle can be started normally only after the anti-theft matching is completed successfully.

Execution Condition

1. P is selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Integrated Brake System (IBS)

Scenario and Function

Scenario	A	B	C	D	E	F	G	H	Operating Steps
Software Upgrading	①	③	②	④		⑤	⑥	⑦	SIPS—P- rogram- ming and Coding— IBS—Re- fresh
Configu- ration			①						SIPS—P- rogram- ming and Coding— IBS— Configu- ration
ECU Rep- lacement	②	④	③	⑤	①			⑥	SIPS—P- rogram- ming and Coding— IBS—Rep- lacement SIPS—F- ast Cha- nnel—IB- S—Refill/ Bleeding SIPS—F- ast Cha- nnel—IBS System PSM/TMC Travel Sensor setup
Replace the rear brake system friction plate, rear brake disc, rear brake caliper housing, parking motor and rear						①	②	③	SIPS- —Fast Channel- —Parking Brake System Actuator Compon- ent Repl- acement

High Voltage Harness

brake caliper bracket, etc.									
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A: Refresh; B: IBS System PSM/TMC Travel Sensor setup; C: Configuration; D: Yaw Sensor Learning; E: Refill/Bleeding; F: Enter Service Mode; G: Exit Service Mode; H: Assembly Initialization

Number in O describes the sequence of performing the functional operations.

If the new ECU replaced is a wet-type part, which can adopt the method of manual bleeding to bleed the brake system, please refer to "Brake System Drain" in this manual.

Refresh

Function Description

This function is used for updating the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.

IBS System PSM/TMC Travel Sensor setup

Function Description

This function is used to activate the boost function of IBS.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.

Configuration

Function Description

This function is used for re-configuring each control function of ECU and writing VIN.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.

Yaw Sensor Learning

Function Description

This function is used for the calibration of internal lateral acceleration and longitudinal acceleration of IBS.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. The vehicle parks steadily on the level road.

Refill/Bleeding

Function Description

This function can bleed the air in the IBS and RBM via a diagnostic command.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen;
4. The supply voltage is not less than 12V;
5. The filling pressure is 1Bar.

Enter Service Mode

Function Description

This function is used to enter the service mode when replacing parking brake actuators including rear brake system friction plate, rear brake disc, rear brake caliper housing, parking motor and rear brake caliper bracket, etc., so that the caliper piston can return to its initial position.

Operation Conditions

1. P is Selected;
2. The vehicle parks steadily on the level road;
3. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
4. Do not let vehicle power off through the screen.

Exit Service Mode

Function Description

This function is used to exit the service mode after replacing parking brake actuators including rear brake system friction plate, rear brake disc, rear brake caliper housing, parking motor and rear brake caliper bracket, etc.

Operation Conditions

1. P is Selected;
2. The vehicle parks steadily on the level road;
3. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
4. The vehicle is in the service mode;
5. Do not let vehicle power off through the screen.

Assembly Initialization

Function Description

This function is used to conduct assembly initialization when replacing IBS or rear brake system friction plate, rear brake disc, rear brake caliper housing, parking motor and rear brake

caliper bracket, etc., learn and adjust the gap between the caliper piston and the friction plate again to match it.

Operation Conditions

1. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
2. Do not let vehicle power off through the screen;
3. The parking brake is released.

High Voltage Harness

Window Regulator

Scenario and Function

Scenario	Window Regulator Initialization	Operation Route
Battery Power Off during Window Regulation	①	Fully open the window, then lift the switch briefly in succession to raise the window to the top, then lift the switch for about 5 seconds.
Window Regulator Replacement	①	

The number inside ○ indicates the order in which the function operations are performed

Window Regulator Initialization

Function Description

For windows with the "one-touch up" and "anti-pinch" functions, this operation is used to restore the normal "one-touch up" and "anti-pinch" functions of power window after it fails.

Execution Condition

- I. the vehicle is powered on.

Instrument Pack (IPK)

Scenario and Function

Scenario	Refresh	Configuration	Operation Route
Upgrade IPK Software	①	②	SIPS - Programming and Encoding - IPK - Refresh
IPK Configuration		①	SIPS - Programming and Encoding - IPK - Configuration
IPK Replacement	①	②	SIPS - Programming and Encoding - IPK - Replacement

The number inside ○ indicates the order in which the function operations are performed

IPK Refresh

Function Description

This function is used to update the IPK application software or calibration software, and change the corresponding display function.

Execution Condition

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.

IPK Configuration

Function Description

This function is used to configure various display functions of IPK according to the actual characteristics of the vehicle, and write the vehicle identification number (VIN) at the same time.

Execution Condition

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.

High Voltage Harness

Front Infotainment Control Module (FICM)

Scenario and Function

Scenario	MPU Reprogramming	Configuration	Operation Path
Entertainment Mainframe Software Upgrade	①		Special USB Flash Disk—Brush
Entertainment Mainframe Configuration		①	SIPS-Programming and Coding—FICM—Configuration
Entertainment Mainframe Replacement	①	②	Special USB Flash Disk—Brush SIPS-Programming and Coding—FICM—Replacement

Number in ○ describes the sequence of performing the functional operations

Reprogramming - Saic I.0+

Function Description

This function is used to upgrade the software of FICM, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. Use a dedicated USB stick.

Operation Steps

1. Prepare a USB flash disk. The USB flash disk of USB2.0 or above and 64G memory formatted in FAT32 is recommended.
2. Download and decompress the upgrade package from the specified path and store it in the root directory of the USB flash disk.

After copying the upgrade data, eject the USB flash disk safely instead of pulling it out directly. Do not put other irrelevant files in the USB flash disk.

3. Insert the USB flash disk into the front left USB port.
4. In the function bar on the main interface, click [Settings] -> [System], tap the software version number repeatedly until a dialog box appears, and enter the password "200519" to enter the engineering mode.
5. Click [USB upgrade] to enter the USB flash disk upgrade interface, and select [AVN MPU] to enter the MPU upgrade interface. Follow the interface prompts to complete the MPU refresh.
6. Repeat the above operations, and select [Infotainment system ECU] on the USB flash disk upgrade interface to enter the MCU upgrade interface. Follow the interface prompts to complete the MCU refresh.

Reprogramming - Color Radio

Function Description

This function is used to upgrade the internal application or calibration software of FICM, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. The special USB flash disk is used.

Operation Steps

1. Prepare a USB flash disk. The USB flash disk of USB2.0 or above and 64G memory formatted in FAT32 is recommended.
2. Download and decompress the upgrade package from the specified path and store it in the root directory of the USB flash disk.

After copying the upgrade data, eject the USB flash disk safely instead of pulling it out directly. Do not put other irrelevant files in the USB flash disk.

3. Insert the USB flash disk into the front left USB port.
4. Swipe left on the function bar in the main interface, click [BT phone], and then enter the password "#*#4479*#" to enter the engineering mode.
5. Click [USB Update] to enter the USB flash disk upgrade interface, and select [AVN-SOC] to enter the SOC upgrade interface. Follow the interface prompts to complete the SOC refresh.
6. Repeat the above operations, and select [AVN-VIP] on the USB flash disk upgrade interface to enter the VIP upgrade interface. Follow the interface prompts to complete the VIP refresh.

Configuration

Function Description

This function is used to configure the display or control functions of FICM according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Communication Module (TBOX)

Scenario and Function

Scenario	MPU Reprogramming	MCU Reprogramming	Configuration	Setup	Restart	Operation Path
TBOX Reprogramming	①	②				1. Special Tool - Brush or USB stick - Brush 2. SIPS—Programming and Coding-TBOX- Reprogramming
TBOX Configuration			①			SIPS-Programming and Coding-TBOX- Configuration
TBOX Replacement	①	②	③	④		1. Special Tool - Brush or USB stick - Brush 2. SIPS—Programming and Coding-TBOX- Replacement
TBOX Restart					①	SIPS-Routines-TBOX Reset

Number in ○ describes the sequence of performing the functional operations

MPU Reprogramming-Special Tool

Function Description

This function is used for reprogramming the internal MPU software of the TBOX so as to realize the reprogram of TBOX control logic and control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. Connect the special flashing tool.

Operation Steps

1. Connect the U disk interface of TBOX special reprogram harness TEL00055 to the reprogramming special computer and the other end to TBOX.

Caution : The refresh tool directory should be placed in the same directory as the LTE package directory.

2. Open the special reprogram tool program and click the "Brush" button to start the reprogram.
3. The tool will identify the normal serial port, then select the package model catalogue according to MCU number,

click "OK" to confirm the information and continue the following steps to reprogram the machine.

4. After identifying the end port and package directory, the user is prompted to choose the download mode and select "Yes" for general upgrade. Overlay download will first read out the CEFS file inside the module, and take the CEFS file full coverage download, in the case of different partitions or damage, choose to use, choose "no" to proceed.

Caution : It is recommended to click "No" to overwrite and upgrade all files.

5. After reprogram will show the success of the brush.

MPU Reprogramming-USB stick (Saic I.0+)

Function Description

This function is used to upgrade the MPU software of TBOX, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. The special USB flash disk is used.

Operation Steps

1. Prepare a USB flash disk. USB2.0 or above is recommended.

2. Download and decompress the upgrade package from the specified path and store it in the root directory of the USB flash disk.

Caution : After copying the upgrade data, eject the USB flash disk safely instead of pulling it out directly, and do not put other irrelevant files in the USB flash disk.

3. Insert the USB flash disk into the front USB port.
4. On the main interface, click [setting] -> [system], then click on the software version number (Entertainment mainframe version) 5 times until the dialog box appears and enter the password '200519' to enter the engineering mode.
5. Click [USB upgrade] to enter the USB disk upgrade interface, and select [Telematic box MPU] to enter the MPU upgrade interface. Complete the MPU reprogram according to the interface prompt.

MPU Reprogramming-USB stick (Color Radio)

Function Description

This function is used to upgrade the MPU software of TBOX, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. The special USB flash disk is used.

Operation Steps

1. Prepare a USB flash disk. USB2.0 or above is recommended.
2. Download and decompress the upgrade package from the specified path and store it in the root directory of the USB flash disk.

Caution : After copying the upgrade data, eject the USB flash disk safely instead of pulling it out directly, and do not put other irrelevant files in the USB flash disk.

3. Insert the USB flash disk into the front USB port.
4. On the main interface, swipe left on the homepage, click the [BT phone] button, enter the password '###4479*##' to enter the engineering mode.
5. Click [USB Update] to enter the USB disk upgrade interface. Click the [UPDATE] button in the TBOX module, and select [Tbox soc only] to enter the MPU upgrade interface. Complete the MPU reprogram according to the interface prompt.

MCU Reprogramming

Function Description

This function is used to upgrade the MCU software of TBOX, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Configuration

Function Description

This function is used to configure the control functions of ECU according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Setup

Function Description

This function is used to exchange keys between TBOX and BCM/background when TBOX is replaced.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

TBOX Restart

Function Description

This function is used to restart TBOX.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

High Voltage Harness

Electronic Battery Sensor (EBS)

Scenario and Function

Scenario	Write Battery ID	Vehicle stationary	Operation Path
Electronic Battery Sensor Replacement	①	②	SIPS—Routine—Write Battery ID
Battery Replacement	①	②	SIPS—Routine—Write Battery ID

Number in ○ describes the sequence of performing the functional operations

Write Battery ID

Function Description

After replacing with a new electronic battery sensor or battery, the Battery ID Write operation must be performed.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Vehicle stationary

Function Description

After power off, the vehicle should stand for 4 hours to obtain the accurate battery status information.

Operation Conditions

1. Let vehicle power off through the screen.
2. The vehicle needs to remain stationary for at least 4 hours.

Intelligent Motor Control Unit (IMCU)

Scenario and Function

Scenario	Refresh	Configuration	Immobilizer Matching	Rear Drive Motor Angle Self-learning	Operation Path
IMCU Refresh	①				SIPS-Programming and Coding—TC—Refresh
IMCU Configuration		①			SIPS-Programming and Coding—TC—Configuration
IMCU or Rear Electric Drive Unit Assembly Replacement	①	②	③	④	SIPS-Programming and Coding—TC—Replacement SIPS-Fast Channel—Rear Drive Motor Angle Self-learning
Rear Drive Motor Replacement				①	SIPS-Fast Channel—Rear Drive Motor Angle Self-learning
When a DTC related to the rear drive motor angle or rear drive motor performance abnormality occurred				①	SIPS-Fast Channel—Rear Drive Motor Angle Self-learning

Number in ○ describes the sequence of performing the functional operations

IMCU Refresh

Function Description

This function is used to upgrade the internal application or calibration software of ECU, and modify the corresponding control functions.

Operation Conditions

1. P is Selected.
2. Do not sit on driver seat while operating.
3. Power off the whole vehicle through the screen before operating, ensure that the instrument "READY" is not lit.
4. Connect an external power supply to recharge the 12V battery before operating.

IMCU Configuration

Function Description

This function is used to configure the control functions of ECU according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P or N is Selected.
2. The vehicle is powered on.
3. Vehicle is NOT in READY mode or Running.

Immobilizer Matching

Function Description

IMCU is an immobilizer related module; when a new IMCU is replaced, it is required to perform immobilizer matching, including the PIN code write and key matching. After the immobilizer matching is successfully completed, the vehicle can be started normally.

Operation Conditions

1. P or N is Selected.
2. The vehicle is powered on.
3. Vehicle is NOT in READY mode or Running.

High Voltage Harness

Rear Drive Motor Angle Self-learning

Function Description

This function is used to update the current self-learning value or for the motor angle self-learning after part adjustment or replacement.

Operation Conditions

1. Ensure the energy storage system (ESS) SOC is above 15%.
2. Use suitable hoist to raise vehicle - front wheels MUST be off the ground and free to rotate.
3. Vehicle power system is in READY mode.
4. Parking brake is released.
5. N is selected.
6. Vehicle system has no stored DTC's.
7. All the door are closed and driver's seatbelt is fastened.
8. Autohold is Closed.

Intelligent Motion Control Unit (IMCU) - Shaft B - Rear

Scenario and Function

Scenario	Refresh	Configuration	Anti-theft Matching	Rear Drive Motor Angle Self-learning	Operating Steps
IMCU Refresh	①				SIPS - Programming and Coding - TC - Refresh
IMCU Configuration		①			SIPS - Programming and Coding - TC - Configuration
IMCU Replacement Rear Electric Drive Unit Assembly Replacement	①	②	③	④	SIPS - Programming and Coding - TC - Replacement
Rear Drive Motor Replacement Rear Drive Motor Angle-related DTC or Rear Drive Motor Performance Abnormalities Occurred				①	SIPS - Fast Channel - Rear Drive Motor Angle Self-learning

Number in ○ describes the sequence of performing the functional operations

IMCU Refresh

Function Description

This function is used for updating the internal application or calibration softwares of ECU, and modifying the corresponding control functions.

Operation Conditions

1. The shift lever is in "P" position.
2. The vehicle is powered on.
3. The vehicle is not started.

IMCU Configuration

Function Description

This function is used for configuring each control function of ECU according to actual characteristics of the vehicle and writing VIN at the same time.

Operation Conditions

1. The shift lever is in "P" position.
2. The vehicle is powered on.
3. The vehicle is not started.

Anti-theft Matching

Function Description

IMCU is an anti-theft related module; after the IMCU is renewed, it is required to perform anti-theft matching, which includes PIN code write-in and key matching. After the anti-theft matching is successfully completed, the vehicle can start normally.

Operation Conditions

1. The shift lever is in "P" position.
2. The vehicle is powered on.
3. The vehicle is not started.

Rear Drive Motor Angle Self-learning

Function Description

This function is used to update the current self-learning value or adjust the motor angle self-learning after replacing parts.

Operation Conditions

1. High-voltage battery pack capacity is not less than 15%.
2. Raise the vehicle to get four wheels off the ground.
3. The vehicle is READY.

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4. Release the parking brake.
5. The shift lever is in "N" position.
6. The power system is fault-free.
7. Four doors are closed and the driver seat belt is fastened.
8. Turn off Autohold function

Electronic Control Unit (SAC)

Scenario and Function

Scenario	Refresh	Configuration	Anti-theft Matching	Front Drive Motor Angle Self-learning	Operating Steps
SAC Refresh	①				SIPS - Diagnosis Function - Refresh
SAC Configuration		①			SIPS - Diagnosis Function - Configuration
SAC Replacement Front Electric Drive Unit Assembly Replacement	①	②	③	④	SIPS - Diagnosis Function - Replacement SIPS - Diagnostic Function - Fast Channel - Front Drive Motor Angle Self-learning
Front Drive Motor After the front drive motor angle-related DTC appears or front drive motor performance abnormalities occurs				①	SIPS - Diagnostic Function - Fast Channel - Front Drive Motor Angle Self-learning

Number in ○ describes the sequence of performing the functional operations

SAC Refresh

Function Description

This function is used for updating the internal application or calibration softwares of ECU, and modifying the corresponding control functions.

Operation Conditions

1. The shift lever is in "P" position.
2. The driver seat is not occupied during the whole operation.
3. The vehicle is powered off through the screen before operation, and make sure that the "READY" lamp is not illuminated.
4. 12V battery is charged from external power source before operation.

SAC Configuration

Function Description

This function is used for configuring each control function of ECU according to actual characteristics of the vehicle and writing VIN at the same time.

Operation Conditions

1. The shift lever is in "P" position.
2. The driver seat is not occupied during the whole operation.
3. The vehicle is powered off through the screen before operation, and make sure that the "READY" lamp is not illuminated.
4. 12V battery is charged from external power source before operation.

Anti-theft Matching

Function Description

IMCU is an anti-theft related module; after the IMCU is renewed, it is required to perform anti-theft matching, which includes PIN code write-in and key matching. After the anti-theft matching is successfully completed, the vehicle can start normally.

Operation Conditions

1. The shift lever is in "P" position.
2. The driver seat is not occupied during the whole operation.

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3. The vehicle is powered off through the screen before operation, and make sure that the "READY" lamp is not illuminated.
4. 12V battery is charged from external power source before operation.

Front Drive Motor Angle Self-learning

Function Description

This function is used to update the current self-learning value or adjust the motor angle self-learning after replacing parts.

Operation Conditions

1. High-voltage battery pack capacity is not less than 15%.
2. Raise the vehicle to get four wheels off the ground.
3. The vehicle is READY.
4. Release the parking brake.
5. The shift lever is in "N" position.
6. The power system is fault-free.
7. Four doors are closed and the driver seat belt is fastened.
8. Turn off Autohold function.

Shifter Control Unit (SCU)

Scenario and Function

Scenario	Refresh	Configuration	Operating Steps
SCU Refresh	①		SIPS—Programming and Coding—SCU—Refresh
SCU Configuration		①	SIPS—Programming and Coding—SCU—Configuration
SCU Replacement	①	②	SIPS—Programming and Coding—SCU—Replacement

Number in ○ describes the sequence of performing the functional operations

A. SCU Refresh

Function Description

This function is used for updating the internal application and calibration softwares of ECU so as to realize the upgrade of corresponding control logic and control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Result Verification

- The refresh process ends normally.
- The application software version of ECU is correct.

B. SCU Configuration

Function Description

This function is used for configuring each control function of ECU according to actual characteristics of the vehicle and writing VIN at the same time.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Result Verification

- The configuration process ends normally.
- The configuration file version of ECU is correct.

High Voltage Harness

Electric Parking Motor Control Unit (EPMCU)

Scenario and Function

Scenario	Refresh	Configuration	Stroke Self-learning	Operating Steps
EPMCU Refresh	①			SIPS—Programming and Coding—EPMCU—Refresh
EPMCU Configuration		①		SIPS—Programming and Coding—EPMCU—Configuration
EPMCU Replacement	①	②	③	SIPS—Programming and Coding—EPMCU—Replacement SIPS—Fast Channel—Stroke Self-learning
Replace the following components of the transmission: Parking Shaft Assembly\Parking Mechanism Assembly\Electric Drive Transmission Housing			①	SIPS—Fast Channel—Stroke Self-learning

Number in ○ describes the sequence of performing the functional operations

A. EPMCU Refresh

Function Description

This function is used for updating the internal application and calibration softwares of ECU so as to realize the upgrade of corresponding control logic and control functions.

Operation Conditions

1. P is Selected.
2. Do not sit on driver seat while operating.
3. Power off the whole vehicle through the screen before operating , ensure that the instrument "READY" is not lit.
4. Connect an external power supply to recharge the 12V battery before operating.

Result Verification

- The refresh process ends normally.
- The application software version of ECU is correct.

B. EPMCU Configuration

Function Description

This function is used for configuring each control function of ECU according to actual characteristics of the vehicle and writing VIN at the same time.

Operation Conditions

1. P is Selected.
2. Do not sit on driver seat while operating.
3. Power off the whole vehicle through the screen before operating , ensure that the instrument "READY" is not lit.

4. Connect an external power supply to recharge the 12V battery before operating.

Result Verification

- The configuration process ends normally.
- The configuration file version of ECU is correct.

C. Stroke Self-learning

Function Description

This function is used to perform the P gear stroke self-learning after replacing the related components.

Operation Conditions

1. N is selected;
2. The vehicle is powered on.
3. Vehicle is NOT in READY mode.
4. Vehicle is stationary.
5. Vehicle is parked on level ground.
6. Apply Brake Pedal.
7. Vehicle system has no stored DTC's.

After completing the above operations, press the P gear button to engage P gear.

Supplemental Restraint System Sensing and Diagnostic Module (SDM)

Scenario and Function

Scenario	Refresh	Configuration	Activation	Operation Path
SDM Refresh	①			SIPS-Programming and Coding—SDM—Refresh
SDM Replacement	①	②	③	SIPS-Programming and Coding—SDM—Replacement

Number in ○ describes the sequence of performing the functional operations

SDM Refresh

Function Description

This function is used to upgrade the internal application or calibration software of ECU, and modify the corresponding control functions.

Operation Conditions

1. P is Selected
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit
3. Do not let vehicle power off through the screen

SDM Configuration

Function Description

This function is used to configure the control functions of SDM according to actual characteristics of the vehicle and write the VIN at the same time

Operation Conditions

1. P is Selected
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit
3. Do not let vehicle power off through the screen

SDM is activated

Function Description

This function is used to activate the SDM deployment, EDR recording and other related functions when replacing SDM.

Operation Conditions

1. P is Selected
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit
3. Do not let vehicle power off through the screen

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Battery Management System (BMS)

Scenario and Function

Scenario	Refresh	Configuration	BMS Parameter Backup	BMS Parameter Writing	Operation Route
BMS Refresh	①				SIPS - Programming and Encoding - BMS - Refresh
BMS Configuration		①			SIPS - Programming and Encoding - BMS - Configuration
BMS Replacement - Old BMS Module Has Communication	②	③	①	④	SIPS—Fast Channel—BMS Parameter Backup—Backup SIPS - Programming and Encoding - BMS - Replacement SIPS—Fast Channel—BMS Parameter Backup—Write
BMS Replacement - Old BMS Module Communication Failure	①	②			SIPS - Programming and Encoding - BMS - Replacement

The number inside ○ indicates the order in which the function operations are performed

BMS Refresh

Function Description

This function is used to upgrade the application software or calibration software in the ECU, and change the control function.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.

BMS Configuration

Function Description

This function is used to configure various control functions of ECU according to the actual characteristics of the vehicle, and write the vehicle identification number (VIN) at the same time.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.

BMS Parameter Backup

Function Description

This function is to read the battery data, mileage, date and other information of the original car from the old BMS and back it up for subsequent writing into the new BMS module.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.
6. The BMS in the vehicle is the old BMS

BMS Parameter Writing

Function Description

This function is to write the backed-up battery data, mileage, date and other information of the original car into the new BMS module.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.
6. The BMS in the vehicle is the new BMS
7. The new BMS has successfully performed the replacement function in SIPS.

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Combined Charging Unit (CCU)

Scenario and Function

Scenario	Refresh	Configuration	Operation Route
CCU Refresh	①		SIPS - Programming and Encoding - CCU - Refresh
CCU Configuration		①	SIPS - Programming and Encoding - CCU - Configuration
CCU Replacement	①	②	SIPS - Programming and Encoding - CCU - Replacement

The number inside ○ indicates the order in which the function operations are performed

CCU Refresh

Function Description

This function is used to upgrade the application software or calibration software in the ECU, and change the control function.

Execution Condition

1. The shift lever is in P or N position.
2. The vehicle is powered on.
3. The vehicle is not started.
4. The vehicle is not charged.

CCU Configuration

Function Description

This function is used to configure various control functions of ECU according to the actual characteristics of the vehicle, and write the vehicle identification number (VIN) at the same time.

Execution Condition

1. The shift lever is in P or N position.
2. The vehicle is powered on.
3. The vehicle is not started.
4. The vehicle is not charged.

Electric Vehicle Communication Controller (EVCC)

Scenario and Function

Scenario	Refresh	Configuration	Operation Route
EVCC Refresh	①		SIPS - Programming and Encoding - EVCC - Refresh
EVCC Configuration		①	SIPS - Programming and Encoding - EVCC - Configuration
EVCC Replacement	①	②	SIPS - Programming and Encoding - EVCC - Replacement

The number inside ○ indicates the order in which the function operations are performed

EVCC Refresh

Function Description

This function is used to upgrade the application software or calibration software in the ECU, and change the control function.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.

EVCC Configuration

Function Description

This function is used to configure various control functions of ECU according to the actual characteristics of the vehicle, and write the vehicle identification number (VIN) at the same time.

Execution Condition

1. The shift lever is in P position.
2. Please do not sit on the main driver during the whole operation.
3. Make sure the instrument "READY" light is not lit before operation by powering down the vehicle through the large screen.
4. External power supply to recharge the 12V battery before operation.
5. Vehicle not charged.

High Voltage Harness

Coolant Refill/Bleeding

Scenario and Function

Scenario	Operation Route
Operations involving disconnection of the coolant circulation circuit of the electric drive system	SIPS - Fast Channel - Electric Drive Transmission Coolant Refill/Bleeding
Operations involving disconnection of the coolant circulation circuit of the HV battery system	SIPS - Fast Channel - HV Battery Pack Coolant Refill/Bleeding

Coolant Refill/Bleeding

Function Description

This function is used for air bleeding after the electric drive transmission and the HV battery pack cooling system are refilled with coolant.

Execution Condition

1. The shift lever is placed in "P" position.
2. The vehicle is powered on.
3. The vehicle is not started and parks on a level surface.
4. The power system has no failure.

Front View Camera Module (FVCM)

Scenario and Path

Scenario	Refresh	Configuration	Self-learning	Operation Path
Software Upgrade	①			SIPS-Programming and Coding—FVCM—Refresh
Configuration		①		SIPS-Programming and Coding—FVCM—Configuration
ECU Replacement	①	②	③	SIPS-Programming and Coding—FVCM—Replacement
During windshield replacement or other operations related to FVCM removal/refit			①	SIPS-Fast Channel-Front View Camera Module Self-learning

Number in ○ describes the sequence of performing the functional operations.

FVCM Refresh

Function Description

This function is used to update the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

FVCM Configuration

Function Description

This function is used to re-configure the control functions of ECU and write the VIN.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

FVCM Self-learning

Function Description

This function is used to calibrate the relative position of the module in the vehicle when replacing the ECU, replacing or repairing the windshield, or performing other operations related to module removal/refit. The module completes the self-learning through the driving calibration method during the after-sales repair.

Operation Conditions

1. P is Selected;

2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Note :

Learning process: the vehicle must travel for a period of time on a long straight road with clearly visible lane lines on both sides at a speed of no less than 40km/h and no more than 60km/h (the specific learning time depends on the road conditions).

Note :

When the module calibration is 100% completed, turn the power off and wait for one minute (avoid operations like opening/closing the door, the window or turning on/off the entertainment mainframe, which will wake the bus up), then turn the power on again.

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Front Detection Radar (FDR)

Scenario and Path

Scenario	Refresh	Configuration	Self-learning	Operation Path
Software Upgrade	①			SIPS-Programming and Coding-FDR-Refresh
Configuration		①		SIPS-Programming and Coding-FDR-Configuration
ECU Replacement	①	②	③	SIPS-Programming and Coding-FDR-Replacement
Replace or remove and refit the front detection radar or radar bracket Replace or remove and refit the front anti-collision beam or perform other operations involving the module removal/refit Perform the four-wheel alignment and other operations that cause the driving axis to change			①	SIPS-Fast Channel-Front Detection Radar Self-learning

Number in ○ describes the sequence of performing the functional operations.

FDR Refresh

Function Description

This function is used to update the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

FDR Configuration

Function Description

This function is used to re-configure the control functions of ECU and write the VIN.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;

3. Do not let vehicle power off through the screen.

FDR Self-learning

Function Description

This function is used to calibrate the relative position of the module in the vehicle when replacing or removing and refitting the front detection radar or radar bracket, replacing or removing and refitting the front anti-collision beam or performing other operations involving the module removal/refit, and performing the four-wheel alignment and other operations that cause the driving axis to change.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Note :

Learning process: the vehicle must travel for a period of time on a long straight road with neatly arranged markers such as electric poles on both sides at a speed of no less than 40km/h and no more than 60km/h (the specific learning time depends on the road conditions and the number of reference objects on both sides).

Note :

When the module calibration is 100% completed, turn the power off and wait for one minute (avoid operations like opening/closing the door, the window or turning on/off the entertainment mainframe, which will wake the bus up), then turn the power on again.

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Around View Monitor Calibration

Around View Monitor Calibration

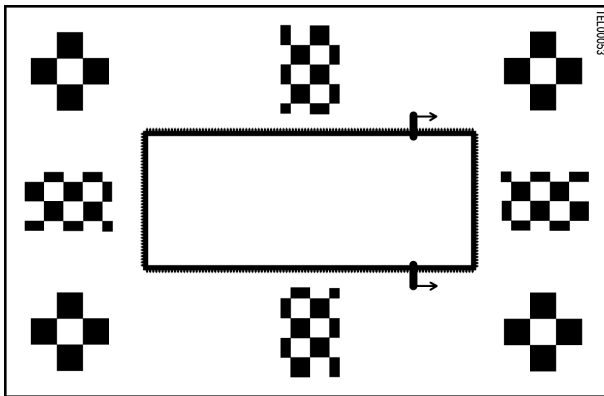
The Around View Monitor calibration can realize the image stitching function. Failure to calibrate it may lead to error in the panoramic stitching, image deformation or misalignment due to error of the camera and installation angle.

Calibration is required when the control module is replaced or a camera is replaced or moves abnormally.

Requirements for Calibration

Requirements for Calibration Tools

Special tools TEL00053 shall be arranged for the calibration, calibration tools is as follows:



Location of Calibration Tools and Vehicle

The plan is to drive the vehicle into the calibration station first, frame the calibration cloth around the vehicle, adjust the position of the calibration cloth so that the vehicle meets the following positioning accuracy requirements, and perform calibration.

1. Preparation of calibration station: before calibration, check the calibration station, confirm that the size of the calibration station meets the requirements, and ensure that the calibration cloth is clean and the calibration equipment works normally.
2. The vehicle drives into the calibration station.
3. Lay the calibration cloth and confirm that the vehicle is in the center of the calibration cloth.
 - Align the front axis marked on the calibration cloth with the center points of the two front wheels of the vehicle.
 - Move the calibration cloth so that the left inner edge of the calibration cloth is parallel to the straight line formed by the center point of the left front and left rear wheels.
 - Move the calibration cloth to ensure that the distance between the left inner edge of the calibration cloth and the right inner edge of the calibration cloth and the left and right wheels is equal.
4. After calibration, evacuate the calibration cloth from the vehicle, fold it as required, roll it up with paper core and put it into the carton.

Calibration Steps

Click the setting icon to enter the setting interface. After clicking System, click System version for 5 consecutive times. Enter the PIN code: 200519 in the pop-up input box, and click OK to enter the engineering mode.

1. Click [AVM Calibration] to enter the calibration interface.
2. Click Automatic calibration to perform automatic calibration.
3. Wait for about 5-10 seconds until the calibration result prompts. If the calibration is successful, a prompt pops up.
4. If the calibration fails, the corresponding failure reason will be prompted.

Rear Driver Assist System (RDA)

Scenario and Function

Scenario	Reprogramming	Configuration	Calibration	Operating Steps
Software Upgrade	①			SIPS-Programming & Coding—LHRDA—Refresh SIPS-Programming & Coding—RHRDA—Refresh
Configuration		①		SIPS-Programming & Coding—LHRDA—Configuration SIPS-Programming & Coding—RHRDA—Configuration
Replacement	①	②	③	SIPS-Programming & Coding—LHRDA—Replacement SIPS-Programming & Coding—RHRDA—Replacement SIPS—Routines—Left Rear Drive Assist Module Self-learning SIPS—Routines—Right Rear Drive Assist Module Self-learning
The position of rear driver assist system module changes, or the four-wheel alignment and other operations that cause the driving axis to change are performed.			①	SIPS—Routines—Left Rear Drive Assist Module Self-learning SIPS—Routines—Right Rear Drive Assist Module Self-learning

Number in ○ describes the sequence of performing the functional operations

Refresh

Function Description

This function is used to update the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Configuration

Function Description

This function is used to re-configure the control functions of ECU and write the VIN.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Self-learning

Function Description

This function is used to calibrate the relative position of the module in the vehicle when the left or right corner radar module is replaced or removed and refitted, the

High Voltage Harness

position of corner radar module changes, such as replacement or removal/refit of rear bumper, etc., and the four-wheel alignment and other operations that cause the driving axis to change are performed. The purpose of calibration is to determine the deviations between the radar antenna axis and the vehicle driving axis in the horizontal and vertical directions, and make them coincide or within an allowable range through algorithmic compensation to ensure that the relevant functions of the radar module can be used normally.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Note :

Learning process: the vehicle must travel for a period of time on a long straight road with neatly arranged markers such as electric poles on both sides at a speed of no less than 40km/h and no more than 60km/h (the specific learning time depends on the road conditions and the number of reference objects on both sides).

Note :

When the module calibration is 100% completed, turn the power off and wait for one minute (avoid operations like opening/closing the door, the window or turning on/off the entertainment mainframe, which will wake the bus up), then turn the power on again.

Driver Monitoring System (DMS)

Scenario and Function

Scenario	Refresh	Configuration	Operation Path
Software Upgrade	①		SIPS-Programming and Coding- DMS-Refresh
Configuration		①	SIPS-Programming and Coding- DMS-Configuration
ECU Replacement	①	②	SIPS-Programming and Coding- DMS-Replacement

Number in ○ describes the sequence of performing the functional operations

Refresh

Function Description

This function is used to update the internal application and calibration software of ECU so as to realize the upgrade of ECU control logic and control functions.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

Configuration

Function Description

This function is used to re-configure the control functions of ECU and write the VIN.

Operation Conditions

1. P is Selected;
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit;
3. Do not let vehicle power off through the screen.

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Gateway Control Module (GW)

Scenario and Function

Scenario	Refresh	Configuration	Power Mode Adjustment	Battery ID Write	Operation Path
GW Refresh	①				SIPS-Programming and Coding—G-W—Refresh
GW Configuration		①			SIPS-Programming and Coding—GW—Configuration
GW Replacement	①	②	③		SIPS-Programming and Coding—G-W—Replacement
PDI inspection before new vehicle delivery			①		SIPS-Fast Channel—Gateway Power Mode Adjustment
Battery Replacement Electronic Battery Sensor Replacement				①	SIPS-Fast Channel—Battery ID Write

Number in ○ describes the sequence of performing the functional operations

GW Refresh

Function Description

This function is used to update the internal application and calibration software of the GW so as to realize the upgrade of GW control logic and control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

GW Configuration

Function Description

This function is used to configure the control functions of the GW according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

GW Power Mode Adjustment

Function Description

Before the new vehicle is delivered to a customer or after replacing with a new GW, the power mode of the GW should be checked to ensure it is in normal mode and prevent the failure of some functions controlled by GW.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Battery ID Write

Function Description

After replacing with a new electronic battery sensor or battery, the Battery ID Write operation must be performed.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Body Control Module (BCM)

Scenario and Function

Scenario	Refresh	Configuration	Immobilizer Matching	Power Mode Adjustment	Key Addition	Key Deletion	Tyre Sensor Learning	Operation Path
BCM Refresh	①	②						SIPS-Programming and Coding—BCM—Refresh
BCM Configuration		①						SIPS-Programming and Coding—BCM—Configuration
BCM Replacement	①	②	③	④	⑤		⑥	SIPS-Programming and Coding—BCM—Replacement
PDI inspection before new vehicle delivery				①				SIPS-Fast Channel—BCM Power Mode Adjustment
New Key Addition					①			SIPS-Programming and Coding—BCM—Key Addition
Key Deletion						①		SIPS-Programming and Coding—BCM—Key Deletion
Tyre Sensor Replacement							①	SIPS-Fast Channel—Tyre Sensor Learning
Change of Tyre Sensor Mounting Position (Such as wheel rotation)							①	SIPS-Fast Channel—Tyre Sensor Learning

Number in ○ describes the sequence of performing the functional operations

High Voltage Harness

BCM Refresh

Function Description

This function is used to update the internal application and calibration software of the BCM so as to realize the upgrade of BCM control logic and control functions.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

BCM Configuration

Function Description

This function is used to configure the control functions of the BCM according to actual characteristics of the vehicle and write the VIN at the same time.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Immobilizer Matching

Function Description

BCM is an immobilizer related module; when a new BCM is replaced, it is required to perform immobilizer matching, including the PIN code write and key matching. After the immobilizer matching is successfully completed, the vehicle can be started normally.

Operation Conditions

1. P is Selected.
2. The hazard warning lamps are on.
3. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
4. Do not let vehicle power off through the screen.

BCM Power Mode Adjustment

Function Description

Before the new vehicle is delivered to a customer or after replacing with a new BCM, the power mode of the BCM should be checked to ensure it is in normal mode and prevent the failure of some functions controlled by BCM.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Key Addition

Function Description

A new key is added and matched in BCM and PEPS, which can be used to unlock, lock and start the vehicle after successfully added.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. The hazard warning lamps are on.
5. Insert the key to be added into the start switch or put it in the standby starting position, with other keys outside the vehicle.

Key Deletion

Function Description

An existing key in the BCM and PEPS is deleted, which cannot be used to unlock/lock or start the vehicle after successfully deleted.

Operation Conditions

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.
4. Insert the key to be retained into the start switch or put it in the standby starting position, with other keys outside the vehicle.

Tyre Sensor Learning

Function Description

This function is used to perform the tyre sensor learning after replacement of a tyre sensor or change of its mounting position, and write the ID information of the tyre sensors in fixed position into the ECU.

Operation Conditions

Note : When a learning is performed for the new tyre sensor, drive the vehicle at a speed greater than 40 km/h for more than 10 minutes consecutively before learning or noting the ID value on the new tyre sensor.

Note : When continuous learnings need to be performed for several tyre sensors, the interval between two learnings shall not be less than 2 minutes.

1. P is Selected.
2. Ensure that high power on the whole vehicle and the instrument "READY" is not lit.
3. Do not let vehicle power off through the screen.

Result Verification

- Read the tyre sensor ID value, which shall be valid and match the actual ID value of the tyre sensor;
- The tyre pressure value on the tyre inflator gauge changes accordingly.

Troubleshooting

Abnormal Result	Recommended Treatments
EPROM Writing Error	Turn the power off to reset and rerun Routine.

Glossary

Name	Description
SRS	Supplementary Restraint System
ICS	Inflatable Curtain Structure
SDM	Sensing Diagnostic Module
ECU	Electronic Control Unit
VIN	Vehicle Identification Number
CAN	Controller area network
SCU	Shifter Control Unit
°C	Celsius
PEB	Power Electrical Box
EPS	Electric Power Steering
IBS	Integrated Brake System
EPB	Electronic Park Brake
HHC	Hill Hold Control
BCM	Body Control Module
LIN	Local Interconnect Network
LED	Light Emitting Diode
PWM	Pulse Width Modulation
ECM	Engine Control Module
ABS	Anti-lock braking system
SCS	Stability Control System
FVCM	Front View Camera Module
AUTO	Automatic
TCM	Transmission Control Module
HVAC	Heating, Ventilation and Air Conditioning
GW	Gateway
PVC	Polyvinyl Chloride
HSLA	High Strength Low Alloy
PEPS	Passive Entry Passive Start
ELR	Emergency Locking Retractor
FDR	Front Detection Radar
ICE	In Car Entertainment
EBS	