SOLO

ELECTRAMECCANICA

2021 SOLO
SERVICE MANUAL

Release 1.4

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How To Use This Manual

General

CAUTION: Only qualified technicians should attempt to perform the procedures contained within this manual.

To assist in the use of this Manual, it is divided into numbered sections (shown on the previous page).

Each section is numbered from page 1, and the page number is shown at the bottom of each page.

References will be made from within a service procedure to other procedures that should be carried out as part of the main procedure.

The individual actions of the service procedures must be followed in the sequence in which they appear. Annotation numbers on the illustrations refer to the relevant numbered action after the illustration.

Actions within the service procedures will also include references to any special tools, relevant data, torque figures, specialist information and useful assembly details to allow you to successfully complete the procedure.

For reference purposes, an illustration number is shown in the bottom left hand corner of each illustration.

WARNINGS, CAUTIONS and NOTES have the following meanings:

WARNING: Procedures which must be followed precisely to avoid the possibility of injury.

CAUTION: Calls attention to procedures which must be followed to avoid damage to components.

NOTE: Gives helpful information.

References

References to the LH or RH side given in this Manual are made when viewing the vehicle from the rear.

Operations covered in this Manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the vehicle is carried out. This is of particular importance where safety related items are concerned.

Dimensions

The dimensions quoted are to design engineering specification. Service limits are included where applicable.

Specifications

ElectraMeccanica constantly strives to improve the specification, design and production of their vehicles and alterations take place accordingly. Whilst every effort has been made to ensure the accuracy of this Manual, it should not be regarded as an infallible guide to current specifications of any particular vehicle.

Repairs and Replacements

Parts

When replacement parts are required it is essential that only ElectraMeccanica recommended parts are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories.

- Safety features and corrosion prevention treatments embodied in the vehicle may be impaired if other than ElectraMeccanica recommended parts are fitted.
- Torque wrench setting figures given in this Manual must be used.
- Locking devices, where specified, must be fitted. If the efficiency of a locking device is impaired during removal it must be replaced.
- The terms of the vehicle warranty may be invalidated by the fitting of parts other than ElectraMeccanica recommended parts.

All ElectraMeccanica recommended parts have the full backing of the vehicle warranty.

High-voltage protocols (Safe handling and servicing of HV batteries)

High-voltage PPE and Tools

Only handle the batteries with appropriate PPE. Always make sure your PPE inspections have been carried out and are up to date. Ensure the equipment is clean and not damaged since last inspection.

- High-voltage rescue hook.
- 3 pieces insulated gloves (Cotton, Rubber, Leather).
- Ultra-violet protective Safety glasses with side shielding.
- Insulated hand tools (Wiha and Wera) This prevents the tools from creating a closed circuit.
- High-voltage insulated footwear.

PPE and Tools inspections

- Check all 3 gloves for rips or tears.
- Check mat for rips or tears.
- Check tools for damage.
- Check glasses for cracks.
- Make sure shoes are dry and free from damage.

High-voltage rescue hook

Keep it close and let a coworker know you're doing the work so they can help in case emergency.

High-voltage insulated footwear

CSA approved footwear with both the following symbols, or footwear that meets OHS standard number 1910.136 for the USA.

	CSA White Rectangle The CSA White rectangle with orange Greek letter omega Ω indicates soles that provide resistance to electric shock. Such certified footwear contains a sole and heel design assembly that, at the point of manufacturing, has electrical insulating properties to withstand 18,000 Volts and a leakage current not exceeding 1mA for 60 seconds.
	CSA Green Triangle The CSA Green triangle patch indicates sole puncture protection with Grade 1 Protective toe to withstand impacts up to 125 joules. Sole puncture protection is designed to withstand a force of not less than 1200 Newtons (270 pounds).

Battery Removal and Handling

Lift table

When removing or handling the high-voltage battery, always use a battery lift table. A lift table with the following specification is recommended, 1,100 lb, 63” x 31.5” is recommended.

WARNING: During battery removal or installation, make sure the wheels of the lift table are locked before starting any work.

Make sure:

- To use an insulated mat between lift table and batteries to prevent a short between the battery and the table.
- The table can handle the weight of the batteries and tools.
- The table and mat are clean, free from debris and liquids.

Create a safe work area

Ensure a safe work area by:

- Cleaning the floor and workstations, free of tripping or slipping hazards.
- Marking off the area as an active hazard zone with cones and hazard signs.
- Ensuring batteries are appropriately marked as being high voltage hazards.
- Having a Chemical extinguisher close by.

Explicitly follow ElectraMeccanica service procedures

Always follow the procedures detailed in the relevant sections of this manual on how to safely disconnect, remove and install the high-voltage batteries.

Electrical Precautions

General

The following guidelines are intended to ensure the safety of the technician 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.

Voltages

WARNING: Wear insulating protective equipment consisting of glove, shoes, face shield, and glasses before beginning work on the high voltage system.

WARNING: The electrical circuits in the vehicle work on several different voltages. In addition to 12V circuits, the battery can produce up to a potentially lethal, 144V, with a high current flow. It is imperative that all the instructions regarding electrical safety are followed, whether in this Manual, the Owner’s Handbook or on labels attached to components on the vehicle. Always observe and obey the instructions - they are there for your safety.

WARNING: Take special care with high voltage wiring (identified by the orange outer sleeving), the connectors and the components connected to the wiring.

WARNING: Never cut, or open an orange high voltage power cable or high voltage component unless the high voltage system has been disabled or you are directed to in the service procedure.

WARNING: Never assume the vehicle is shut off because it is silent. Always power the vehicle down via the ignition switch and remove the key.

WARNING: Never cut into the sealed battery enclosure due to the high voltage and electrocution risks.

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 cable and plugs of domestic electrical equipment.

Battery

The battery stores all the energy for the motor and vehicle electrical systems. As a stand alone system, the battery can sense and respond to a variety of conditions that could potentially damage the system or pose a safety risk. Its primary safety response in these circumstances is to disconnect the battery (e.g. the high voltage) from the rest of the vehicle. Also, when the battery is not in a vehicle, such as during transport or manufacturing, the pack has no high voltage connections that can be accessed without removing the enclosure cover. The battery monitors isolation resistance and HVIL integrity. If either are in a faulted state, the BMS will not close the contactors. If the contactors are closed and an isolation fault is detected, the contactors will remain closed until the car is turned off. After the contactors open, if the isolation fault persists, they will not close until the fault is repaired.

Battery Disconnect Contactors

Inside the sealed battery enclosures are two normally-open contactors in series with the positive and negative output from the pack. These contactors will close, providing high voltage to the rest of the vehicle, only if a number of conditions are met. It is important to note that these contactors will not close unless energized by the Battery Management System (BMS); thus, in the event of a system failure, the contactors will default to an open state and withdraw the high voltage supply from the vehicle.

When the 12V battery is connected, the high voltage system can be active at any time.

To fully isolate all electrical systems disconnect the 12V battery negative cable and the high voltage batteries.

Connectors and harnesses

The highway 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 multi plugs 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 by using tools to pry apart or by pulling on the wiring harness.
- Always ensure locking tabs are disengaged before disconnection, and match orientation to enable correct reconnection.
- Ensure that any protection (covers, insulation etc.) is replaced if disturbed.
- When replacing the component keep oily hands away from electrical connection areas and push connectors home until any locking tabs fully engage.

Disciplines

Lower door glass, remove the key fob out of transmitter range prior to making any connection or disconnection in the system as an electrical surge caused by disconnecting 'live' connections can damage electrical components.

Ensure hands and work surfaces are clean and free of grease, swarf, etc. Grease collects dirt which can cause electrical tracking (short-circuits) or high resistance contacts.

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

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

Prior to starting testing, and periodically during testing, touch a good ground, to discharge body static as some electronic components are vulnerable to static electricity.

Grease for electrical connectors

Some under hood and under body connectors may be protected against corrosion by the application of a special grease during vehicle production. Should connectors of this type be disturbed, repaired, or replaced, a grease of this type, should again be applied.

Do not apply grease to any connectors that do not have grease applied as standard.

Use of other greases must be avoided as they can migrate into relays, switches, etc. contaminating the contacts and leading to intermittent operation or failure

First aid measures

Under normal conditions of use, the constituent battery cells are hermetically sealed. Contents of an open (broken) constituent battery cell can cause skin irritation and/or chemical burns.

If materials from a ruptured or otherwise damaged battery contact skin, flush immediately with water and wash affected area with soap and water. Avoid inhaling any vented gases. If a chemical burn occurs or if irritation persists, seek medical assistance. For eye contact, flush with significant amounts of water for 15 minutes and see physician at once.

Seek immediate medical assistance if an electrical shock or electrocution has occurred (or is suspected).

Storage precautions

Do not store a high-voltage battery in a manner that allows terminals to short circuit. Do not place near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in reduced battery service life.

The desired longer-term storage temperature for the high-voltage batteries is between -20°C and 40°C (-4°F and 104°F). Similarly, these products should not be exposed to relative humidity greater than 80% for long periods of time.

The high-voltage batteries should only be stored in approved packaging or on non-conductive surfaces with removal of all nearby loose metal (and other conductive materials) so that accidental shorting can be avoided. Similarly, signs should be posted to alert passers by, of the Shock, Fire, and potential High Voltage risks.

Batteries should be stored in Electra Meccanica approved packaging, and must not be stacked more than two (2) packages high.

A battery should not be stored either at a full state of charge (SOC) or completely discharged since both conditions adversely impact battery life. Battery SOC should be between 40-60% when put into storage.

Electra Meccanica recommends that a high voltage battery should not be stored untended longer than three (3) months since battery service life likely will be adversely impacted. If longer storage is anticipated, please contact Electra Meccanica for instructions.

Disposal procedures

The lithium ion cells contained in the high-voltage batteries do not contain heavy metals such as lead, cadmium, or mercury.

The high-voltage batteries contain recyclable materials and Electra Meccanica encourages recycling. For information on the recycling of a battery, please contact Electra Meccanica for instructions.

General Precautions

Dangerous substances

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

WARNING: Many liquids and substances used in motor vehicles are poisonous and should under no circumstances be consumed; they should be kept as far as possible from the skin.

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

Health protection precautions

The following precautions should be observed at all times:

- Be sure to wear insulating protective equipment consisting of glove, shoes, face shield, and glasses before beginning work on the high voltage system.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- 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 moisturizers 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, de-grease 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.

NOTE: If adequate personal protection equipment is not available, notify your workshop supervisor immediately.

Environmental Precautions

General

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 minimized, thus reducing the impact on the environment.

Solvents

Some of the cleaning agents used are solvent based and will evaporate to atmosphere if used carelessly, or if cans 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 minimized to reduce solvent emissions.

Refrigerant

Discharge and replacement of these materials from air conditioning units should only be carried out using the correct equipment:

Checklist

- Keep lids on containers of solvents;
- Only use the minimum quantity;
- Consider alternative materials;
- Minimize over-spray when painting.
- 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 curb 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 the 'Waste Management' topic.

Land contamination

Oils, fuels and 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, see 'Spillage prevention' list.

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

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

Waste materials 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.

General Fitting Instructions

Component removal

Whenever possible, clean components and surrounding area before removal.

- Blank off openings exposed by component removal.
- Immediately seal 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 oil ways exposed by component removal with tapered hardwood plugs or conspicuous plastic plugs.
- Immediately after 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 dismantling a component.

Dismantling

Observe scrupulous cleanliness when dismantling components, particularly when brake or Air Conditioning (A/C) 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, oil ways and fluid passages with an air line. Ensure that any O-rings used for sealing are replaced if disturbed during the process.
- Use marking ink to identify mating parts and ensure correct reassembly. Do not use a center 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 replaced, 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 replacement 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 de greasing agents are being used. Do not use de greasing 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 reassembled.

- 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 indicators 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.

Oil Seals

General

Always replace 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 every 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. Replace 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 grease.

Locking Devices

General

Always replace locking devices with ones of the same design.

Locking tabs and washers

Always inspect locking tabs and washers. Do not re-use if damaged.

Pipe and hose unions

To prevent rotational damage to components, use two wrenches when loosening and tightening unions.

Nyloc and torque nuts

Discard and replace Nyloc and torque nuts after removal.

Encapsulated and Patch bolts

Discard and replace encapsulated and patch bolts after removal.

Locking compounds

Approved locking agents must be applied to some threads on reassembly where indicated in the procedure.

NOTE: If original bolts are to be re-used, clean old compound off both male and female threads with a solvent cleaner and a wire brush before re-applying locking compound.

NOTE: Even if new bolts are being fitted, ensure all internal and external thread surfaces are clean and dry before applying locking compound.

Applying LOCTITE®

WARNING: Please consult the Manufacturer's Material Safety Data Sheet (MSDS) before handling any chemical product.

Leaving the first thread clean, a bead of LOCTITE® should be applied to the complete diameter of the bolts leading threads for the first 10mm.

NOTE: Please consult the Manufacturers Technical Data Sheet (TDS) for general application and storage information.

Loctite is a registered trademark of Henkel Corporation

Flexible Pipes and Hoses

General

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

- Absolute cleanliness must be observed with hydraulic components at all times.
- Obtain appropriate plugs or caps before detaching hose end fittings, so that the ports can be immediately covered to prevent the ingress of dirt.
- Fit a cap to seal a hydraulic union and a plug to its socket after removal to prevent ingress of dirt.
- After any work on hydraulic systems, carefully inspect for leaks underneath the vehicle while a second operator applies maximum brake pressure to the brakes (servo pump running).

For information about assembling refrigerant pipes and hoses, refer to *Air Conditioning System Precautions.*

Air Conditioning System Precautions

General

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 emphasize 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.

The refrigerant used in the air conditioning system is HFC-134a (Hydrofluorocarbon) R134a.

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

WARNING: R134a is a hazardous liquid and when handled incorrectly can cause serious injury. Suitable protective clothing, consisting of face protection, heat-proof gloves, rubber boots and apron or waterproof overalls, must be worn when carrying out operations on the air conditioning system.

Remedial actions

WARNING: Due to its low evaporating temperature, R134a must be handled with care. R134a splashed on any part of the body will cause immediate freezing of that area.

If an accident involving R134a should occur, conduct the following remedial actions:

- If liquid R134a 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 liquid R134a 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.

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 utilized.
- 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 wrench must be used to hold the union to prevent twisting of the pipe when tightening connections.
- All protective plugs must remain in place to seal the component 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 caps 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.
- The receiver/drier should be the last component connected to the system to ensure optimum dehydration and maximum moisture protection of the system.
- If the A/C system has been damaged and the system internals exposed to atmosphere, the receiver/drier must be replaced immediately before evacuating and recharging the system.
- Use alcohol and a clean, lint-free cloth to clean dirty connections.
- Ensure that all new parts fitted are suitable for use with R134a.

HVAC line installation

Always carry out the following procedure before connecting any hose or pipe:

1. All refrigeration fittings require oiling with the recommended refrigerant oil before installation.
2. When connecting refrigeration fittings, ensure that the O-ring is positioned correctly. Push the joint together until the O-ring disappears before attempting to tighten the nut. The nut should start by hand; if a wrench is required then the joint is misaligned. Tighten the joint to the torque shown.
3. The refrigeration system must be kept clean and capped at all stages. At no time must any hoses be left open to atmosphere as the oil in the system is hygroscopic (absorbs moisture). The connection to the drier should only be completed just prior to commissioning (or at least the system should be vacuumed to keep the system dry so any moisture generally in the pipe work does not affect the oil or 'wet' the receiver drier).
4. Keep the lid on oil containers such that a small amount can be dispensed at any time and then at the end of the week, the whole can is disposed of to avoid using contaminated oil. Oil containers kept to lubricate O-rings should not be used to top up oil in systems due to potential contamination.

When a major repair has been completed, a leak test should be conducted; refer to the Air Conditioning section of this manual for the correct procedure.

Refrigerant oil

The compressor contains a lubricant, which has greater electrical insulating properties than the A/C lubrication oil normally used for standard mechanical belt driven A/C pumps. It is important that the compressor is kept upright at all times to retain the lubricant in the compressor's sump.

⚠ *CAUTION: Use of the incorrect oil may affect the dielectric strength of the motor and potentially cause an internal short circuit as well potentially affecting the bearing life.*

⚠ *CAUTION: Refrigerant oil easily absorbs water and must not be stored for long periods. Do not pour unused refrigerant oil back into the container.*

Compressor

A new compressor is sealed. Ensure that no foreign material is allowed to enter the compressor.

⚠ *CAUTION: Do not remove the cap(s) until immediately prior to connecting the air conditioning pipes to the compressor. Foreign material entering the compressor is likely to cause significant damage requiring replacement.*

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. The compressor must be removed and all the remaining oil in the compressor drained and refilled as instructed in the air conditioning section of this manual.

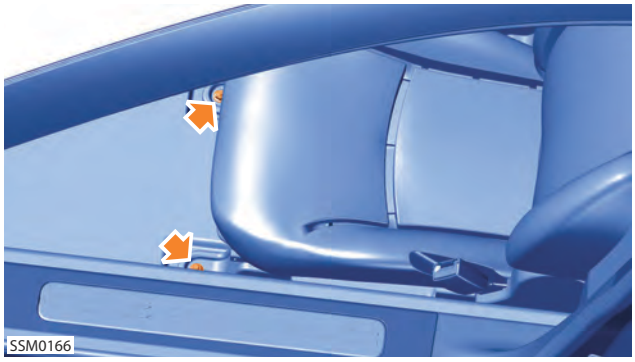
Seat

NOTE: Install protective covers on rocker panel covers to prevent damage when removing seat.

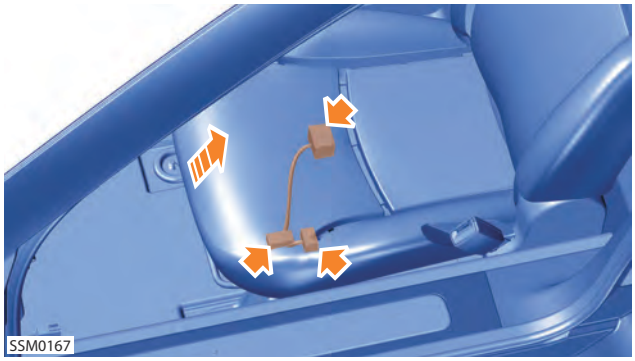
Removal

1. Slide seat fully forward.

2. Remove and discard Nyloc nuts (x2) securing rear of seat rails to body.
   Torque 36 Nm (26.6 lbf·ft).
3. Disconnect harness connector from seat belt buckle.



4. Remove and discard Nyloc nuts (x2) securing front of seat rails to body.
   Torque 36 Nm (26.6 lbf·ft).



5. Lift front edge of seat and disconnect harness connectors (x3) from seat.
6. Move seat forward and recline seat backrest to aid removal.
7. Using assistance, tilt seat backrest towards door opening and carefully remove seat from vehicle.

   CAUTION: Take care not to scratch rocker panel covers or door panels.

Installation

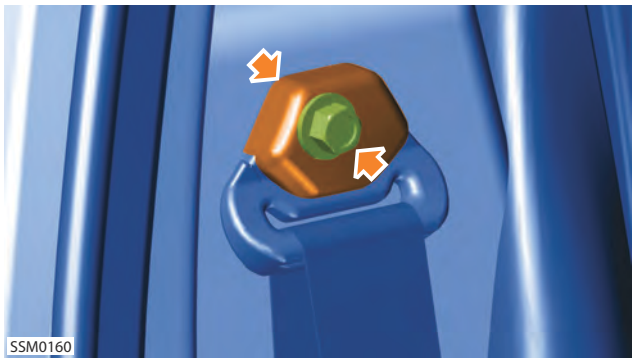
1. Installation procedure is reverse of removal.

   WARNING: Replace all Nyloc Nuts. Never reuse a self locking fastener or apply additional thread lock compounds.

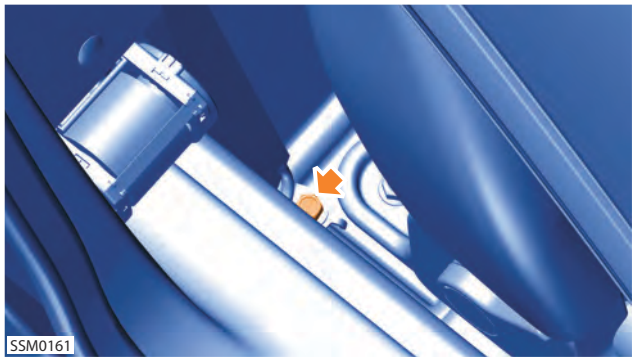
Seat Belt Assembly

Removal

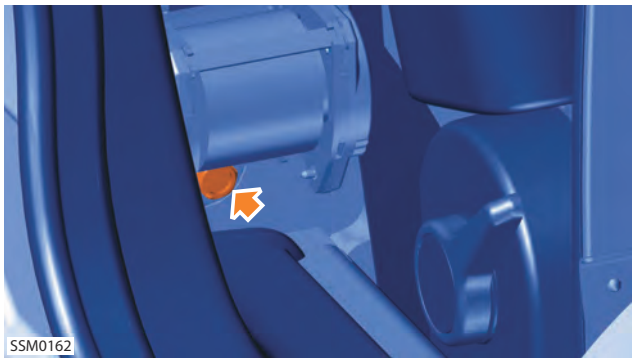
1. Lift lever and slide seat fully forward for access.



2. Remove cover from seat belt upper anchor mounting bolt.
3. Remove bolt securing seat belt upper anchor to body.
   Torque 55Nm (41 lbf·ft).



4. Remove bolt securing seat belt lower anchor to body.
   Torque 55Nm (41 lbf·ft).



5. Remove bolt securing seat belt reel to body.
   Torque 55Nm (41 lbf·ft).
6. Remove seat belt assembly.

Installation

1. Installation procedure is reverse of removal except for the following:
2. Ensure that seat belt does not become twisted during installation. Ensure the seat belt moves freely on upper and lower mounts and retracts smoothly into the reel.

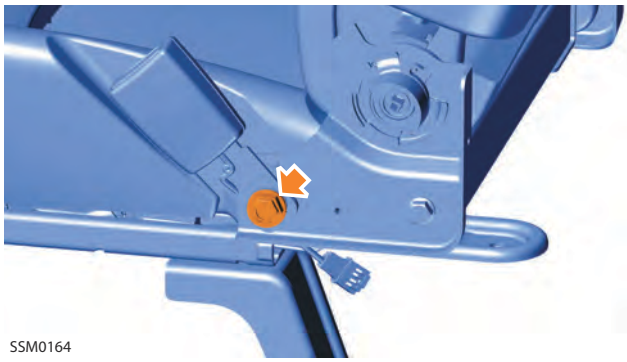
Seat Belt Buckle

Removal

1. Remove seat. Refer to *"Seat", page 1-1.*


SSM0163

2. Remove screws (x2) securing cover to seat.
3. Remove cover.


SSM0164

4. Remove bolt securing seat belt buckle to seat.
   Torque 55Nm (41 lbf·ft).
5. Remove seat belt buckle by carefully feeding the harness through seat frame.

Installation

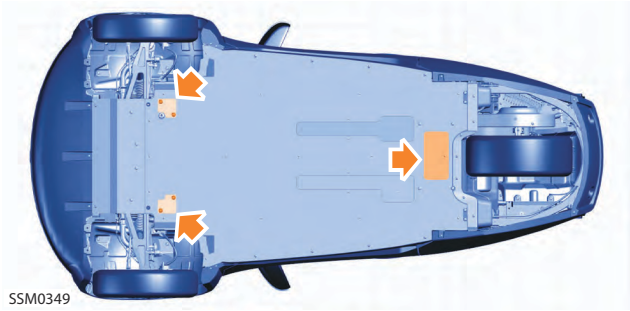
1. Installation procedure is reverse of removal.

Lifting and Supporting the Vehicle

CAUTION: The underside of the SOLO is constructed with a composite structure that is mostly protected by a thin flat aluminum panel. Do not use a floor jack to lift against the aluminum panel. Using a floor jack will bend the aluminum panel and crack the composite structure, causing severe damage to the vehicle.

CAUTION: Only use a safe and correctly rated (for the vehicle weight) wide and flat lifting equipment. Wide and flat lift equipment distributes the lifting pressure to the underside of the vehicle.

Lifting



1. Only use the marked lifting points (A) to avoid damaging your vehicle.

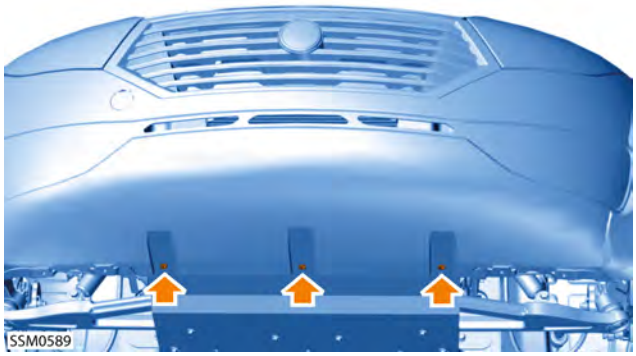
   NOTE: 5.5" ground clearance under the vehicle.

   NOTE: 3.5" ground clearance on the rear sprocket

Front Bumper

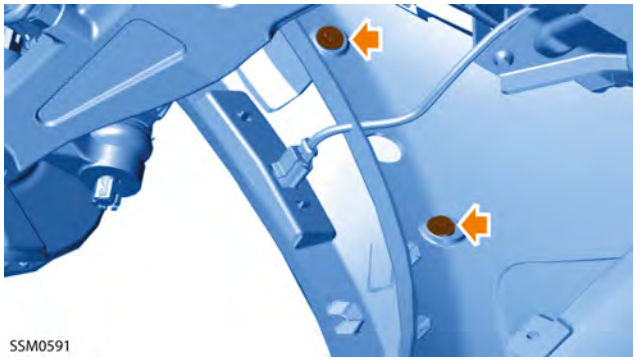
Removal

1. Remove both front wheels. Refer to *"Wheel - Front", page 8-1.*
2. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*

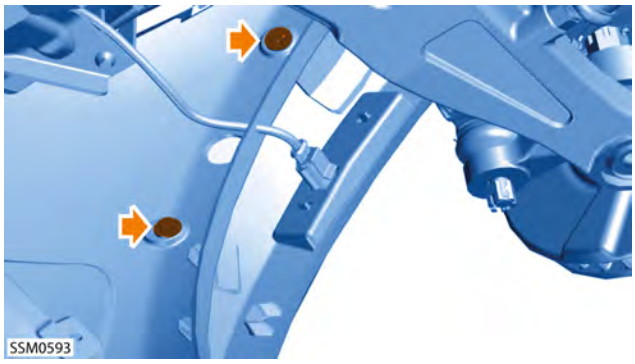


3. Remove screws (x3) securing lower edge of front bumper to body.

4. Remove push pins (x4) securing wheel arch liners to front bumper.
5. Release wheel arch liners from front fenders.



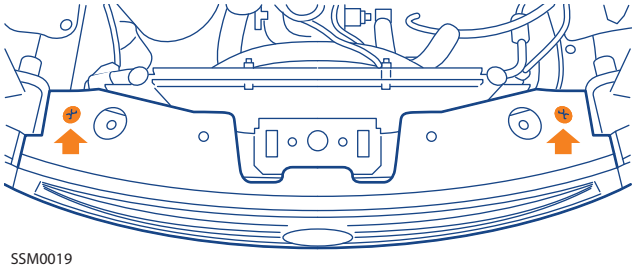
6. Remove bolts (x2) securing LH side of front bumper to fender. Collect washers.



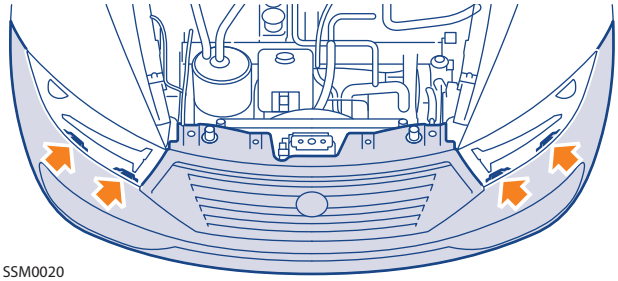
7. Remove bolts (x2) securing RH side of front bumper to fender. Collect washers.

8. Remove screws (x2) securing LH side of front bumper to body.

9. Remove screws (x2) securing RH side of front bumper to body.



10. Remove screws (x2) securing top edge of bumper to body.



SSM0020

11. Carefully release clips (x4) securing bumper to headlights.
12. Remove bumper.

Installation

1. Installation procedure is reverse of removal.

Front Grille

Removal

1. Remove front bumper. Refer to *"Front Bumper", page 2-2.*

SSM0021

2. Remove screws (x7) securing grille to bumper.
3. Remove grille from front bumper.

Installation

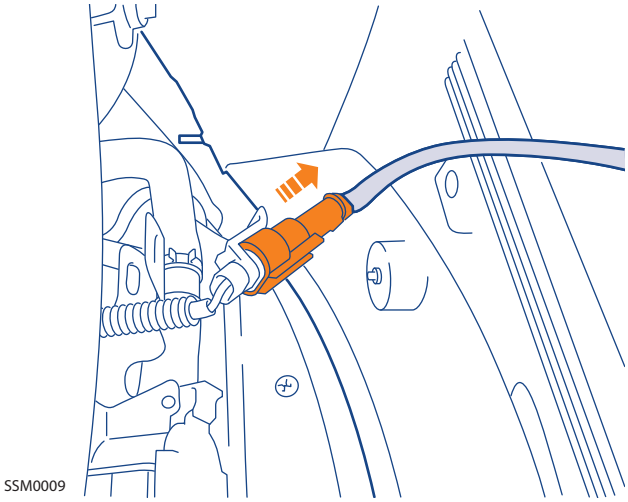
1. Installation procedure is reverse of removal.

Rear Bumper

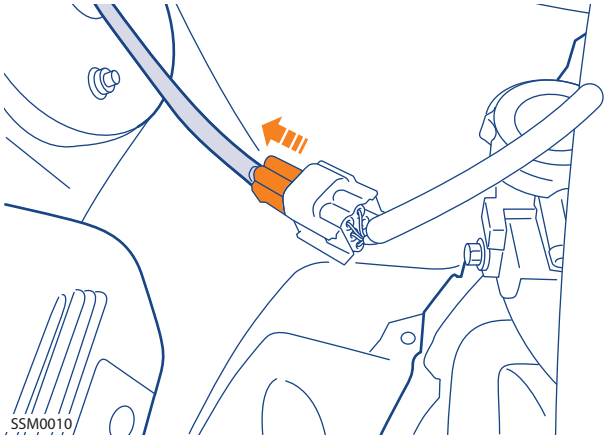
Removal

1. Remove license plate holder. Refer to *"License Plate Holder/Charging Port Cover", page 2-5.*

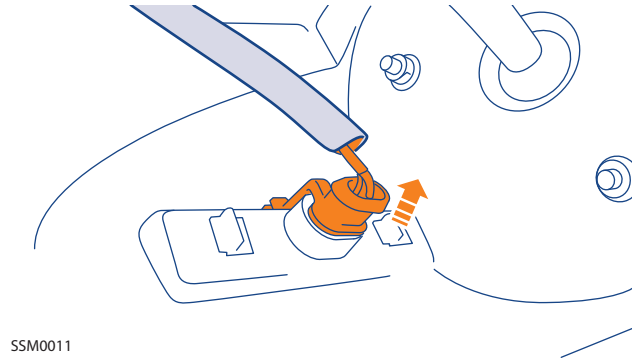
2. Remove screws x2 securing bumper to body.



3. Disconnect license plate light connector from harness



4. Disconnect rear tail light connectors x2 from harness.



5. Disconnect connectors (x2) from side marker lights.
6. Remove rear bumper.

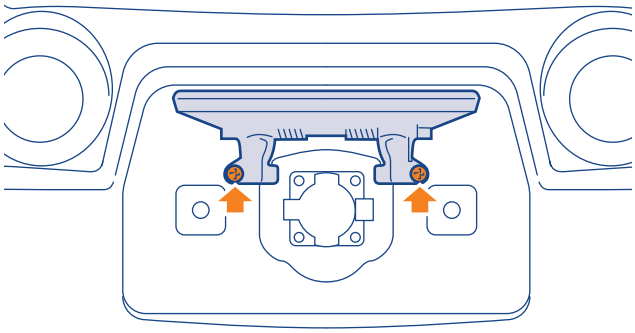
Installation

1. Installation procedure is reverse of removal.

License Plate Holder/Charging Port Cover

Removal

1. Open license holder and support.



SSM0012

2. Remove screws (x2) securing cover to body.
   Torque 8 Nm (6 lbf·ft).
3. Remove license plate holder.

Installation

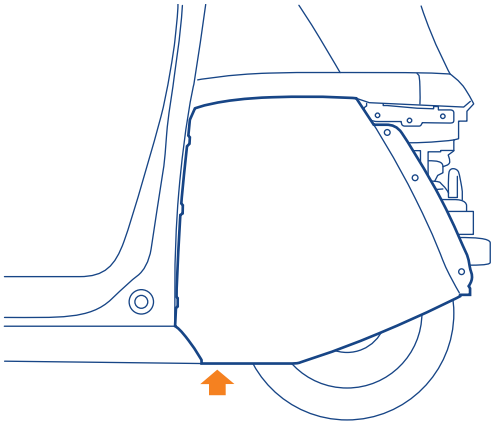
1. Installation procedure is reverse of removal.

Rear Side Cover

NOTE: Procedure for Left and Right sides is the same.

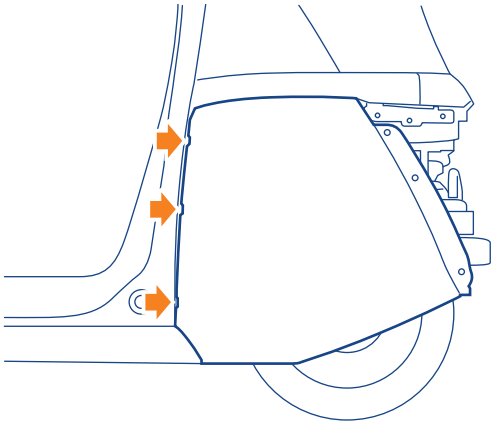
Removal

1. Remove rear bumper. Refer to *"Rear Bumper", page 2-4.*
2. Open door.



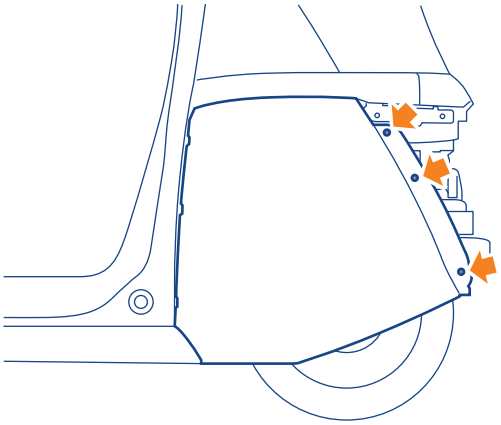
SSM0004

3. Remove screw securing underside of cover to body



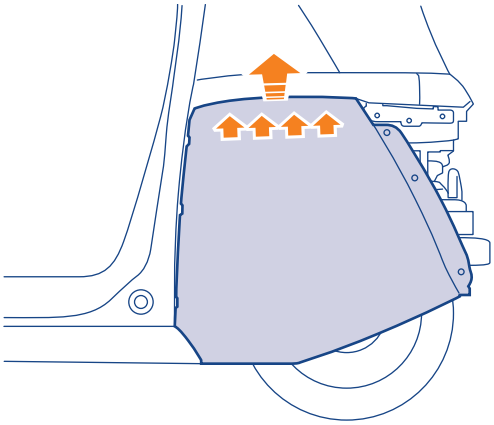
SSM0005

4. Remove screws (x3) securing cover to B Pillar.



SSM0006

5. Remove screws (x3) securing cover to crash structure.



SSM0007

6. Release clips (x4) securing top edge of cover to body.
7. Remove rear side cover.

Installation

1. Installation procedure is reverse of removal.

Front Skid Plate

Removal

1. Raise and support vehicle. Refer to *"Lifting and Supporting the Vehicle", page 2-1.*

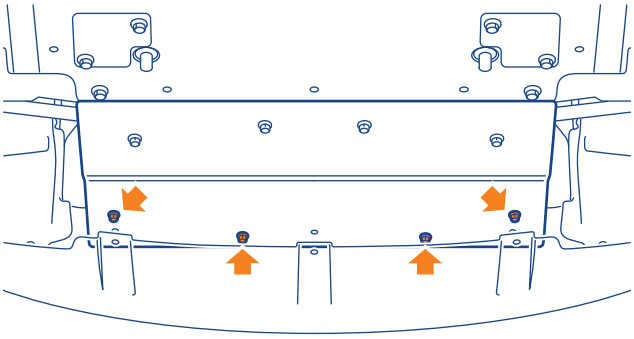
WARNING: Do not work on an incorrectly supported vehicle.

SSM0362

2. Remove scrivets (x4) securing LH and RH wheel arch liners to front bumper.

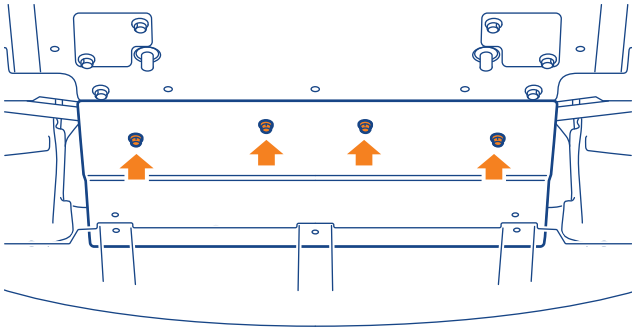
SSM0363

3. Remove screws (x3) securing lower edge of front bumper to body.
4. Carefully pull down on lower edge of bumper for access.



SSM0364

5. Remove bolts (x4) securing skid plate to body.



SSM0039

6. Remove bolts (x4) securing skid plate to chassis.

   Torque 23 Nm (17 lbf·ft).

7. Remove front skid plate.

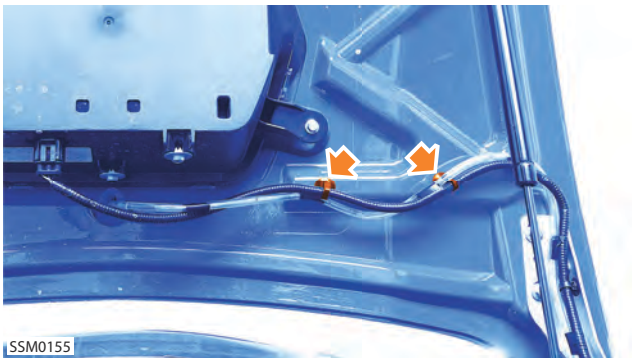
Installation

1. Installation procedure is reverse of removal.

Hood Assembly

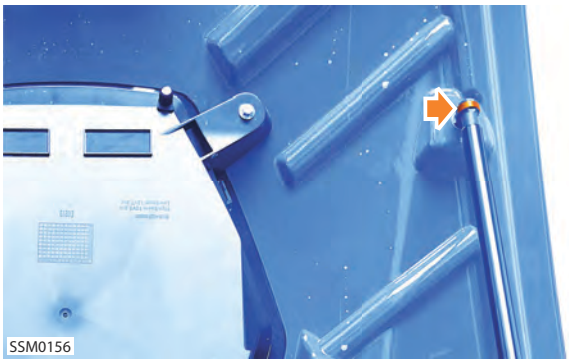
Removal

1. Remove washer jet. Refer to *"Washer Jet", page 4-3.*



SSM0155

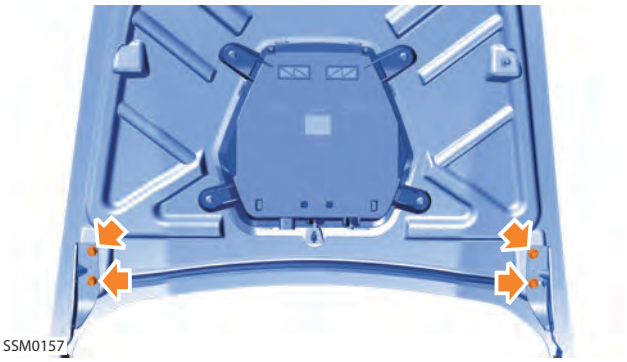
2. Using a trim removal tool, release clips (x2) securing washer hose and harness to hood.
3. Mark the position of the hinges to hood to add installation.
4. Disconnect harness connector from center headlight.



SSM0156

5. Release clip and disconnect support strut from hood.

   NOTE: Use assistance from a second person to support and remove the hood.


SSM0157

6. Remove bolts (x4) securing hinges to hood.
   Torque18 Nm (13 lbf·ft).
7. Remove hood.

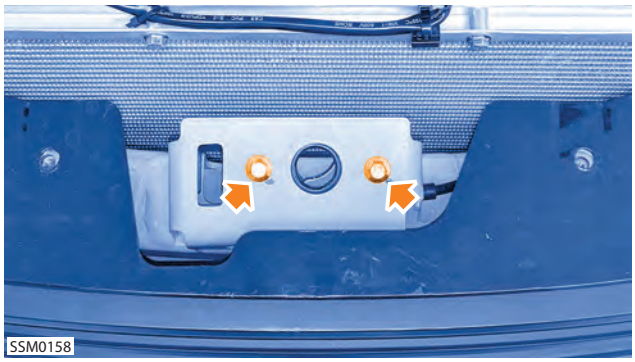
Installation

1. Installation procedure is reverse of removal except for the following;
2. Install hood using the previously marked position for the hinges and lightly tighten the hood retaining bolts.
3. Carefully lower the hood and check the alignment of the hood to the fenders and front bumper.
4. Adjust the hood position as necessary and when the panel gap is correct, the bolts can be fully tightened.

Hood Latch

Removal

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*


SSM0158

2. Remove bolts (x2) securing latch to body.
   Torque 8 Nm (6 lbf·ft).
3. Raise latch assembly


SSM0159

4. Release outer cable from bracket.
5. Disconnect inner cable from latch.
6. Remove hood latch.

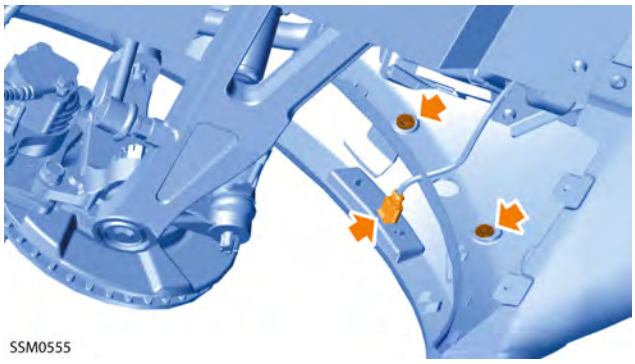
Installation

1. Installation procedure is reverse of removal.

Front Fender

Removal

1. Remove wheel arch liner. Refer to *"Wheel Arch Liner - Front", page 2-15.*

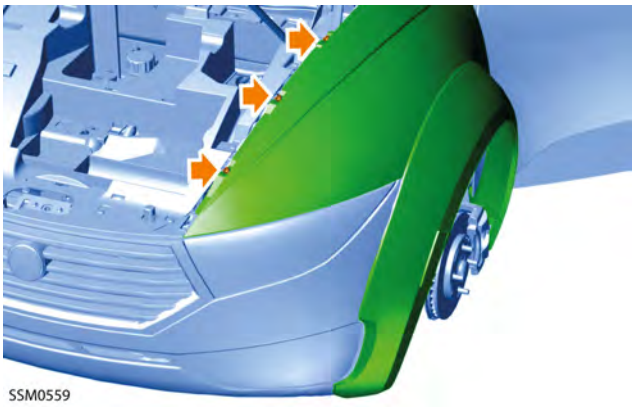


2. Disconnect harness connector from front side marker light.
3. Remove bolts (x2) securing front bumper to fender. Collect washers.

4. Remove screws (x2) securing front bumper to fender.
5. Remove bolt securing headlight to fender.
   Torque 8 Nm (6 lbf·ft).
6. Open door.

7. Remove bolt securing fender to A pillar.
   Torque 8 Nm (6 lbf·ft).

8. Remove bolts (x2) securing lower edge of fender to body.
   Torque 8 Nm (6 lbf·ft).



9. Remove bolts (x3) securing fender to body. Collect washers.
   Torque 8 Nm (6 lbf·ft).
10. Remove fender.

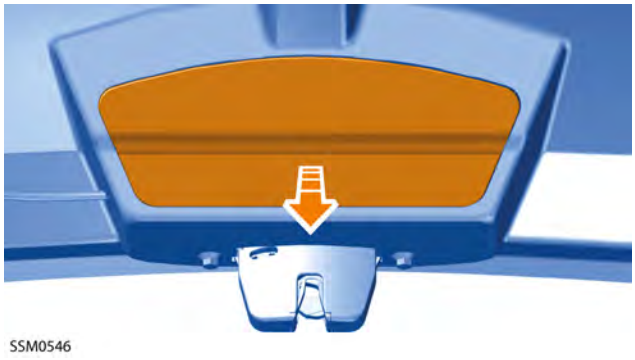
Installation

1. Installation procedure is reverse of removal except for the following;
2. Loosely install all fender retaining bolts and then align the fender to the hood and door. When the panel gap is correct, the bolts can be tightened.

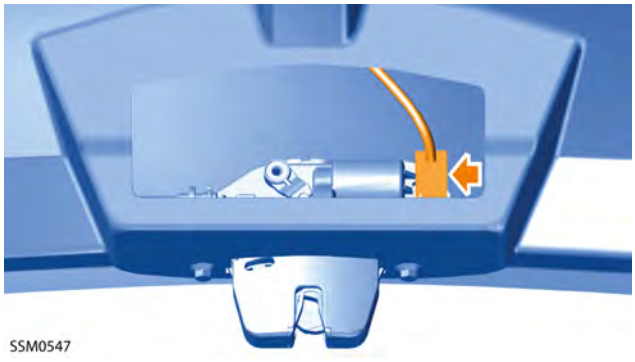
Trunk Lid

Removal

1. Remove rear view camera. Refer to *"Rear View Camera", page 11-16.*
2. Open trunk lid.

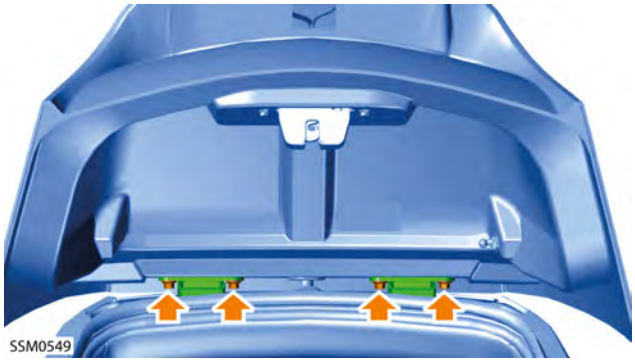


3. Remove cover from inside of trunk lid.



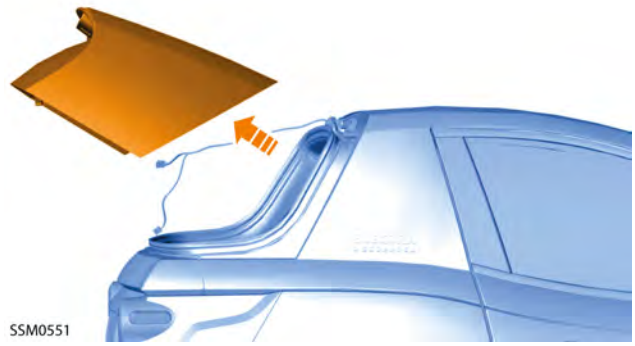
4. Disconnect harness connector from trunk lid lock.

5. Release clip and disconnect support strut from trunk lid.
6. Using assistance, support the trunk lid in the fully open position.



7. Remove bolts (x4) securing the trunk lid to the hinges.

8. Release wiring harness grommet from trunk lid.
9. Maneuver trunk lid away from vehicle whilst withdrawing the harness.



10. Remove trunk lid.

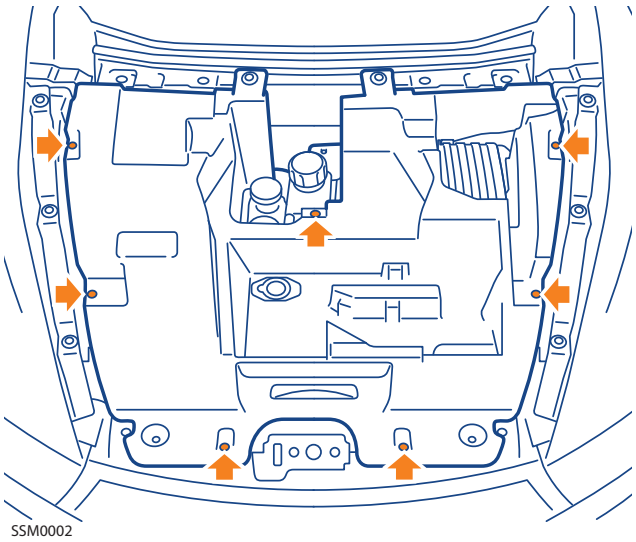
Installation

1. Installation procedure is reverse of removal.

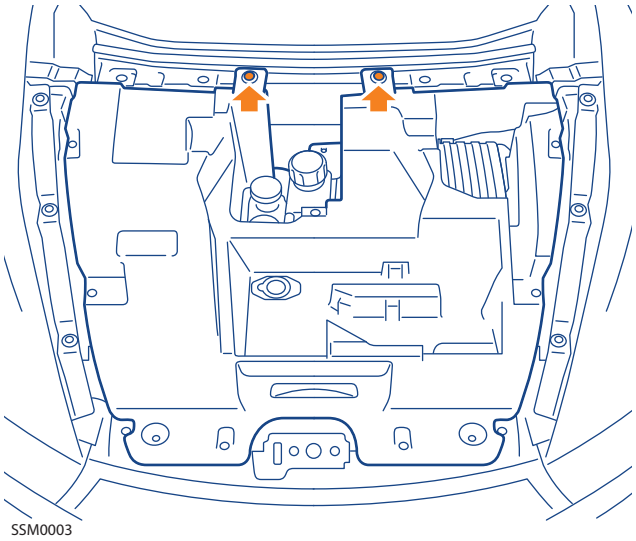
Maintenance Panel

Removal

1. Open hood.
2. Remove charging cord from maintenance panel.



3. Remove screws (x7) securing maintenance panel to body.



4. Remove bolts (x2) securing maintenance panel to bulkhead.
5. Remove maintenance panel.

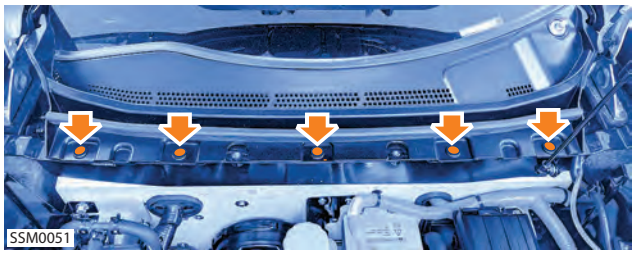
Installation

1. Installation procedure is reverse of removal.

Wiper Cover Board

Removal

1. Remove wiper arm. Refer to *"Wiper Arm", page 4-1.*
2. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



3. Remove push pins (x5) securing cover to bulkhead.

4. Carefully pull the cover upwards to release clips (x3) securing it to the body.
5. Maneuver wiper motor cover around hood hinges and remove.

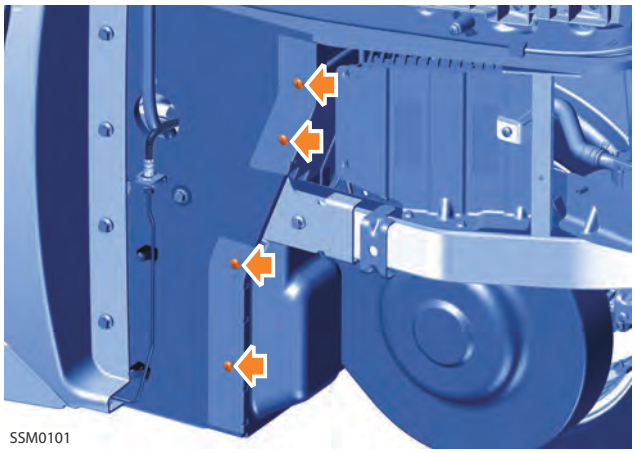
Installation

1. Installation procedure is reverse of removal.

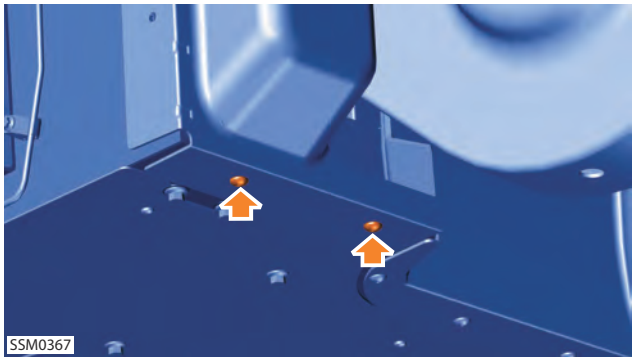
Closeout Panel - Rear - LH

Removal

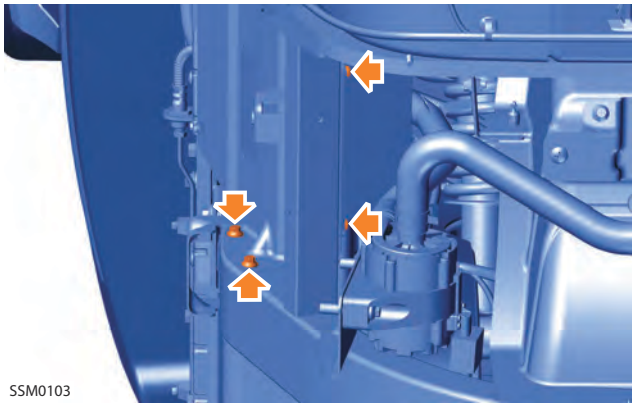
1. Remove rear wheel. Refer to "Wheel - Rear", page 8-1.
2. Remove LH rear side cover. Refer to "Rear Side Cover", page 2-5.


SSM0101

3. Remove screws (x4) securing closeout panel to body.


SSM0367

4. Remove screws (x2) securing bottom of closeout panel to body.


SSM0103

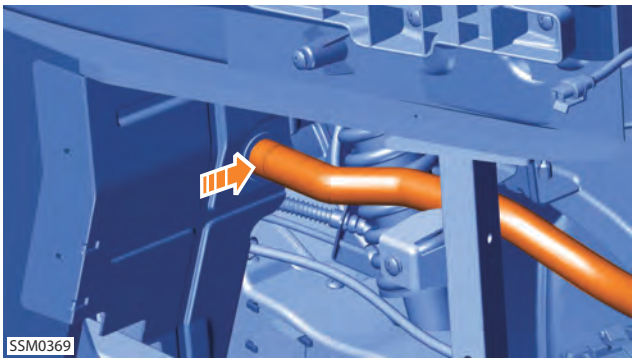
5. Remove bolts (x4) securing DC-DC converter to body.

   Torque 8 Nm (6 lbf·ft).

6. Position DC-DC converter aside for access.


SSM0368

7. Remove screw securing top of closeout panel to body.


SSM0369

8. Release coolant hose from closeout panel.

   NOTE: Closeout panel is slotted to allow the panel to be removed.

9. Maneuver and remove closeout panel from body.

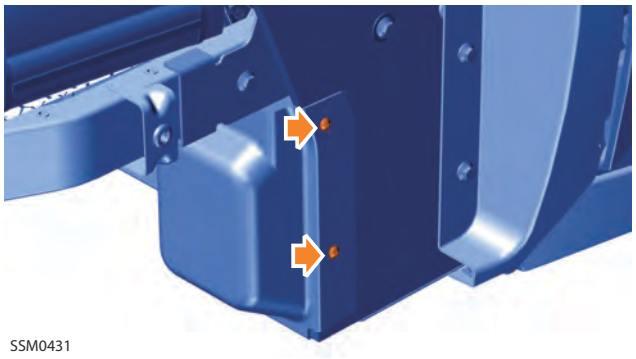
Installation

1. Installation procedure is reverse of removal.

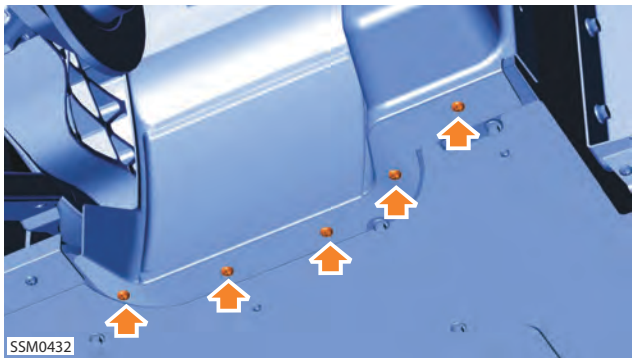
Closeout Panel - Rear - RH

Removal

1. Remove wheel arch liner. Refer to "Wheel Arch Liner - Rear", page 2-16.
2. Remove RH rear side cover. Refer to "Rear Side Cover", page 2-5.


SSM0431

3. Remove screws (x2) securing closeout panel to body.


SSM0432

4. Remove screws (x5) securing bottom of closeout panel to body.


SSM0433

5. Remove screw securing top of closeout panel to body.
6. Maneuver and remove closeout panel from body.

Installation

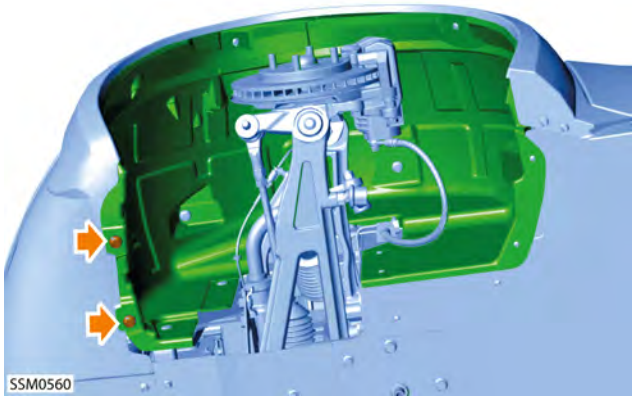
1. Installation procedure is reverse of removal.

Wheel Arch Liner - Front

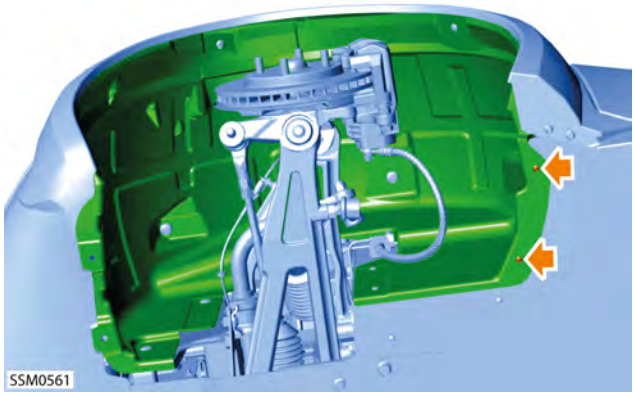
NOTE: Procedure for Left and Right sides is the same.

Removal

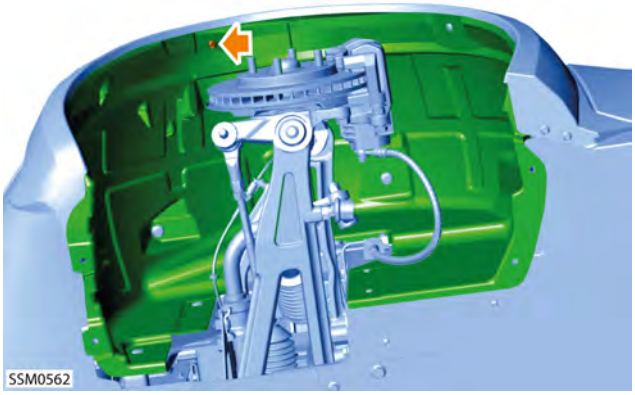
1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*



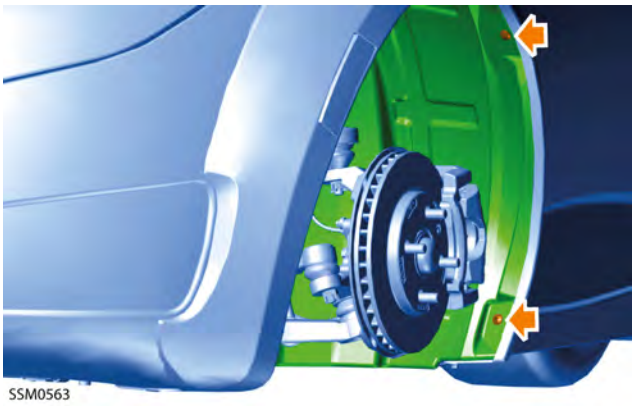
2. Remove push pins (x2) securing wheel arch liner to front bumper.



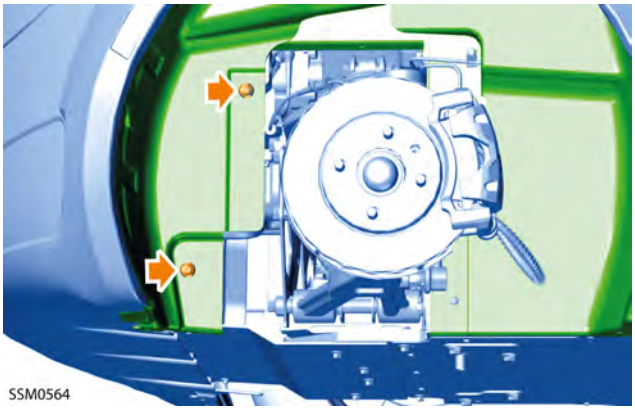
3. Remove screws (x2) securing wheel arch liner to rocker.



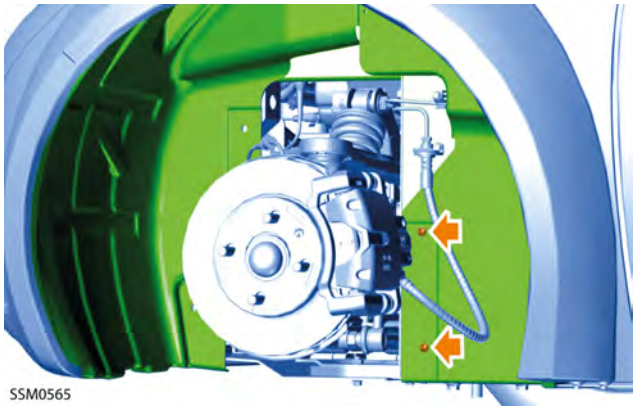
4. Remove screw securing wheel arch liner to front of fender.



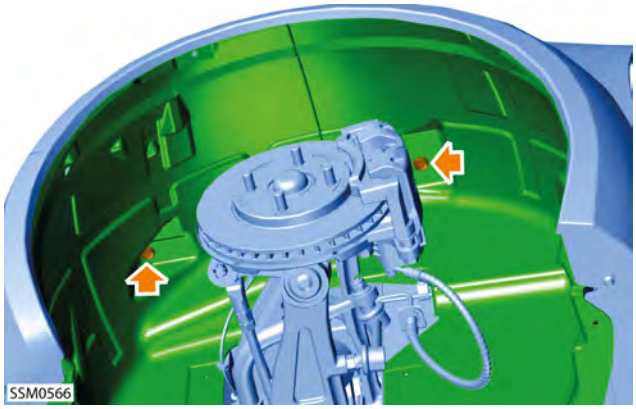
5. Remove screws (x2) securing wheel arch liner to rear of fender.



6. Remove push pins (x2) securing wheel arch liner to inner fender.



7. Remove screws (x2) securing wheel arch liner to inner fender.



8. Remove push pins (x2) securing wheel arch liner to inner fender.
9. Release wheel arch liner from fender and bumper and remove.

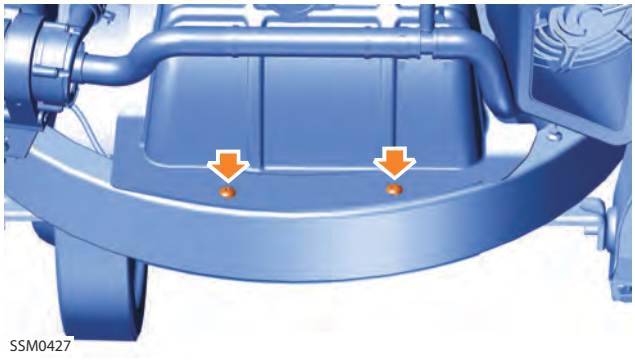
Installation

1. Installation procedure is reverse of removal.

Wheel Arch Liner - Rear

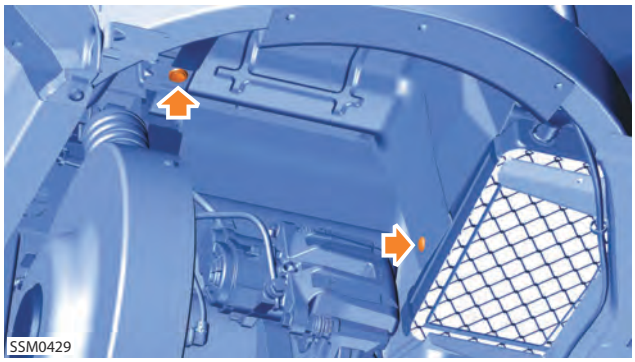
Removal

1. Remove rear bumper. Refer to *"Rear Bumper", page 2-4.*
2. Remove rear wheel. Refer to *"Wheel - Rear", page 8-1.*

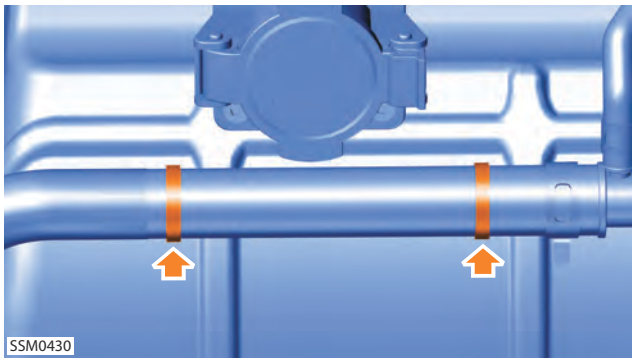


3. Remove screws (x2) securing wheel arch liner to crash structure.

4. Remove screw securing front of wheel arch liner to body.



5. Remove push pins (x2) securing wheel arch liner to body.



6. Release fasteners (x2) securing coolant hose to wheel arch liner.
7. Remove rear wheel arch liner.

Installation

1. Installation procedure is reverse of removal.

Panel - Dashboard

Removal

1. Remove both A pillar upper trim panels. Refer to *"Trim Panel - A Pillar - Upper - LH", page 2-21.*
2. Remove steering column cover. Refer to *"Cover - Steering Column", page 2-21.*

3. Release screws (x2) securing panel to dashboard.

4. Release clips (x13) securing panel to dashboard.
5. Release clips securing dust shield to upper steering column cover.

6. Disconnect harness connectors (x5) from switches.
7. Remove dashboard panel.

Installation

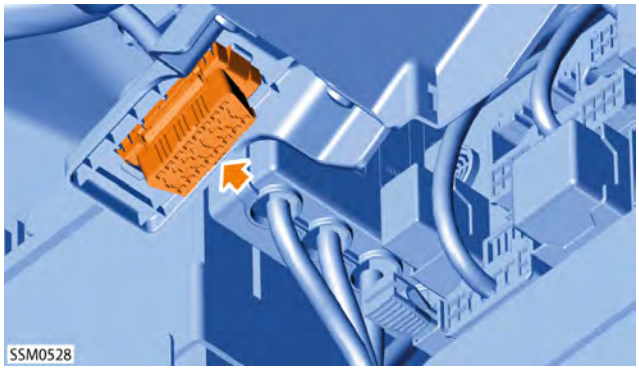
1. Installation procedure is reverse of removal.

Dashboard

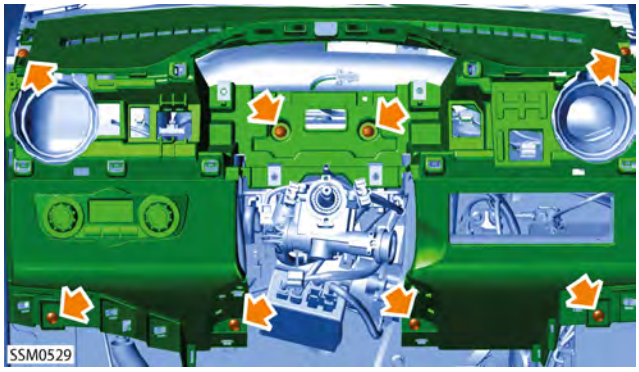
Removal

1. Remove switch exterior lighting/ wiper. Refer to "Switch - Exterior Lighting/ Wiper", page 11-11.
2. Remove instrument cluster. Refer to "Instrument Cluster", page 11-16.
3. Remove trim panel – A pillar – Lower – LH. Refer to "Trim Panel - A Pillar - Lower - LH", page 2-22.
4. Remove trim panel – A pillar – Lower – RH. Refer to "Trim Panel - A Pillar - Lower - RH", page 2-22.
5. Remove radio. Refer to "Radio", page 11-18.

6. Disconnect harness connector from rear of HVAC control panel.
7. Release door seals from LH and RH A pillars.



8. Release clips (x2) securing diagnostic connector to bracket on underside of dashboard.



9. Remove screws (x8) securing dashboard to body.

10. Release dashboard from body and remove.

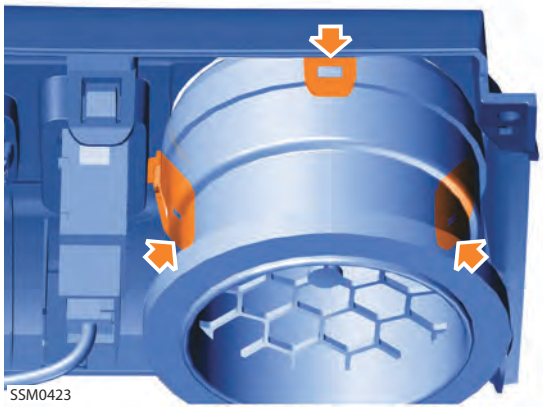
Installation

1. Installation procedure is reverse of removal.

Vent - Face Level

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



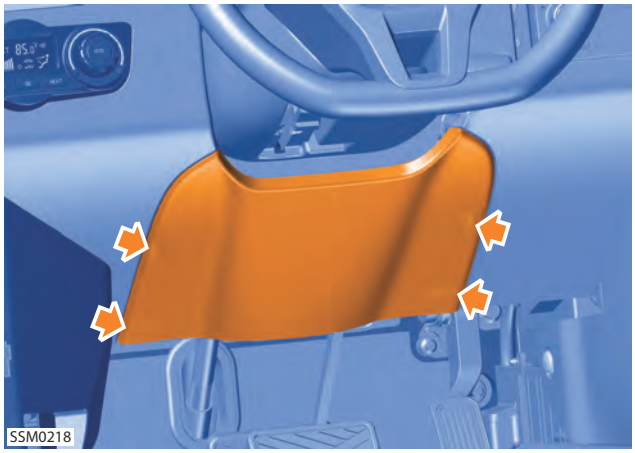
2. Using a small flat bladed screwdriver, carefully release clips (x3) securing face level vent to dashboard panel.
3. Remove face level vent.

Installation

1. Installation procedure is reverse of removal.

Closeout Panel - Dashboard

Removal



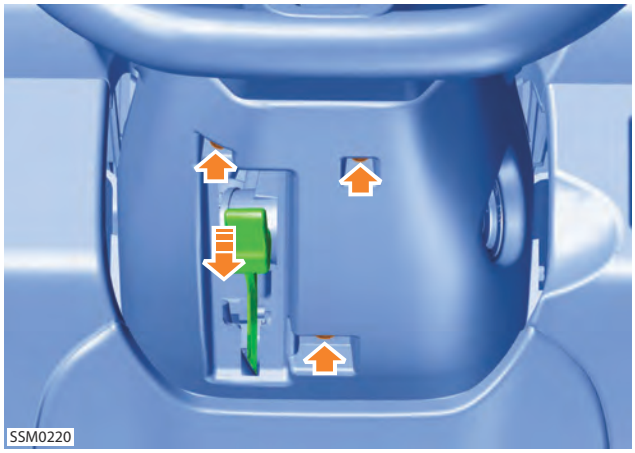
1. Release clips (x4) securing closeout panel to dashboard.
2. Remove closeout panel.

Installation

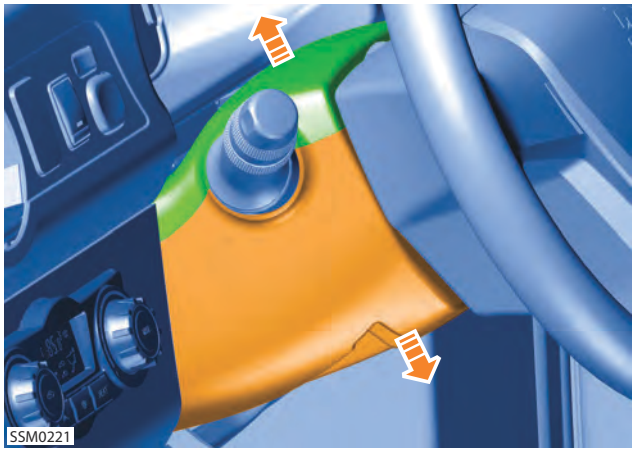
1. Installation procedure is reverse of removal.

Cover - Steering Column

Removal



1. Remove screws (x3) securing lower cover to steering column.
2. Release steering column lock and lower steering column.
3. Remove dashboard closeout panel. Refer to "Closeout Panel - Dashboard", page 2-20.



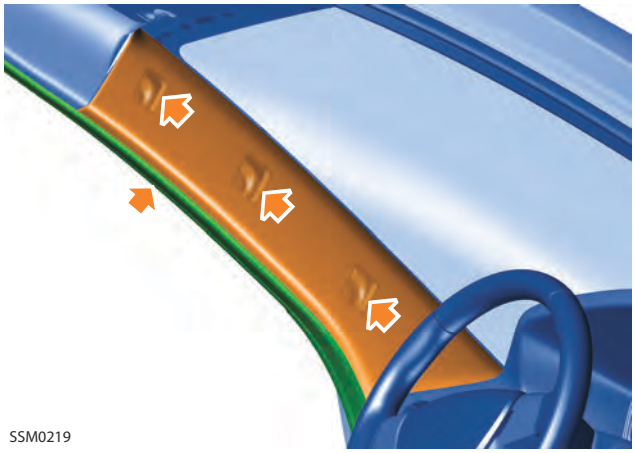
4. Release clips (x6) securing upper and lower steering column covers together.
5. Remove lower steering column cover.
6. Release clips securing dust shield to upper steering column cover.
7. Remove upper steering column cover.

Installation

1. Installation procedure is reverse of removal.

Trim Panel - A Pillar - Upper - LH

Removal



1. Release door seal from trim panel.
2. Use a plastic trim removal tool to release clips (x3) securing trim panel to A pillar.
3. Remove trim panel.

CAUTION: Take care not to damage the harness for the microphone which is located at the top of the RH A pillar.

Installation

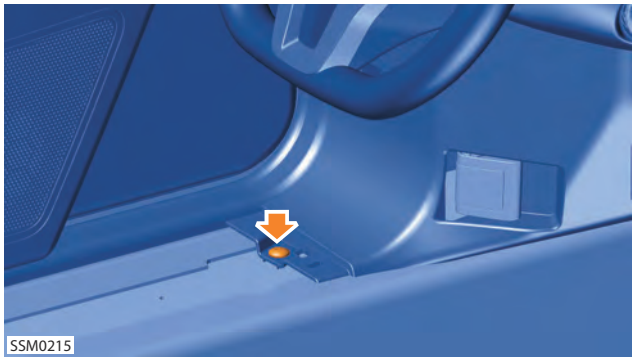
1. Installation procedure is reverse of removal.

Trim Panel - A Pillar - Lower - LH

Removal

1. Use a plastic trim removal tool to remove screw cover from trim panel.
2. Remove screw securing trim panel to body.

3. Remove push pin securing trim panel to body.
4. Remove rocker panel cover. Refer to *"Rocker Panel Cover", page 2-23.*



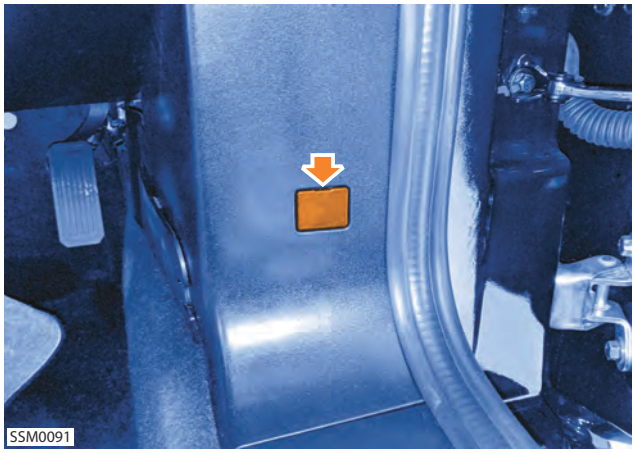
5. Remove screw securing trim panel to body.
6. Remove trim panel.

Installation

1. Installation procedure is reverse of removal.

Trim Panel - A Pillar - Lower - RH

Removal



1. Use a plastic trim removal tool to remove screw cover from trim panel.
2. Remove screw securing trim panel to body.

3. Remove push pin securing trim panel to body.
4. Remove rocker panel cover. Refer to *"Rocker Panel Cover", page 2-23.*

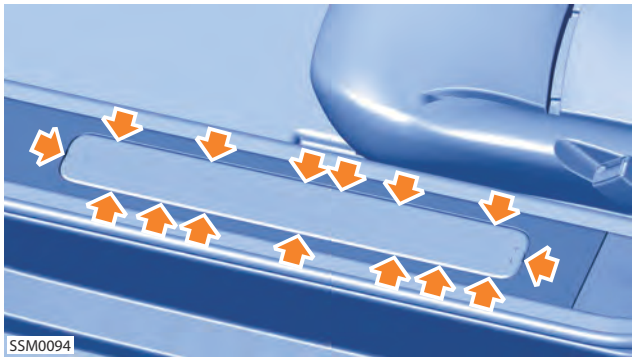
5. Remove screw securing trim panel to body.
6. Remove trim panel.

Installation

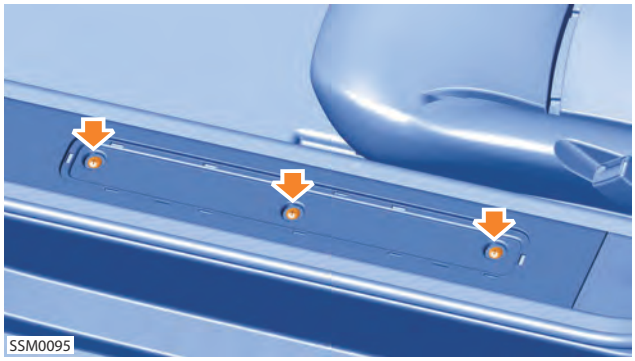
1. Installation procedure is reverse of removal.

Rocker Panel Cover

Removal



1. Use a plastic trim removal tool to release clips (x15) securing tread plate to rocker panel cover.



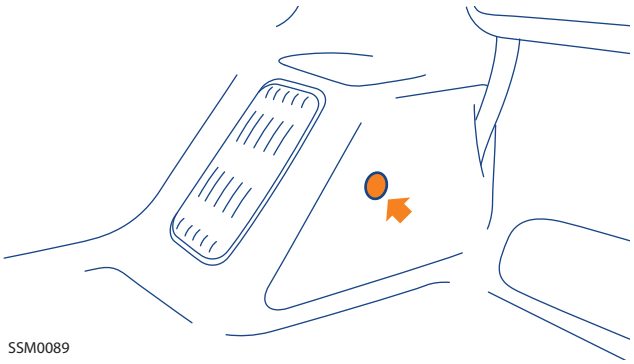
2. Remove screws (x3) securing rocker panel cover to body.
3. Remove rocker panel cover.

Installation

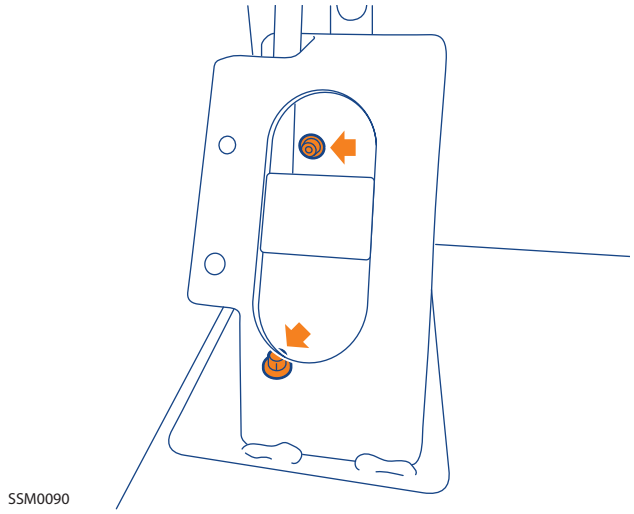
1. Installation procedure is reverse of removal.

Foot Rest

Removal


SSM0089

1. Using a trim removal tool, remove fastener securing carpet to foot rest.
2. Fold back carpet for access to foot rest.


SSM0090

3. Remove bolts (x2) securing foot rest to body.
   Torque 6 Nm (4.5 lbf·ft).
4. Remove foot rest.

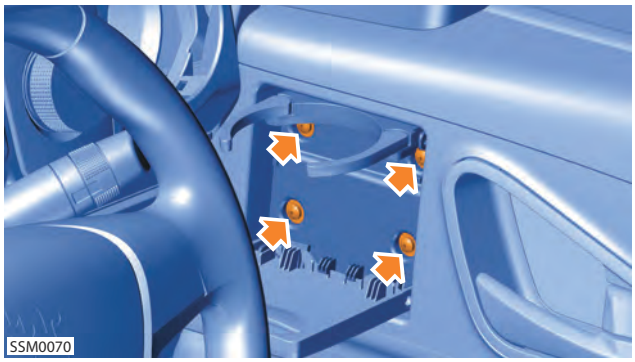
Installation

1. Installation procedure is reverse of removal.

Cup Holder

Removal

1. Open cup holder.


SSM0070

2. Remove screws (x4) securing cup holder to door panel.
3. Remove cup holder.

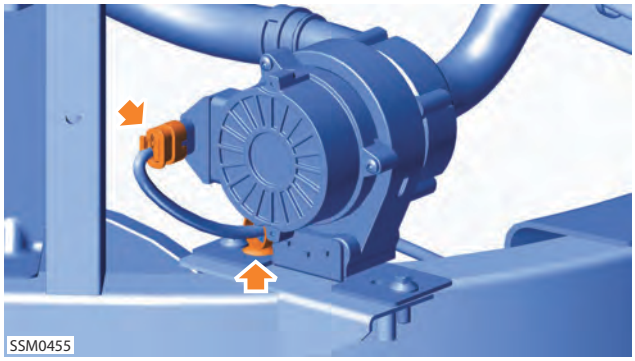
Installation

1. Installation procedure is reverse of removal.

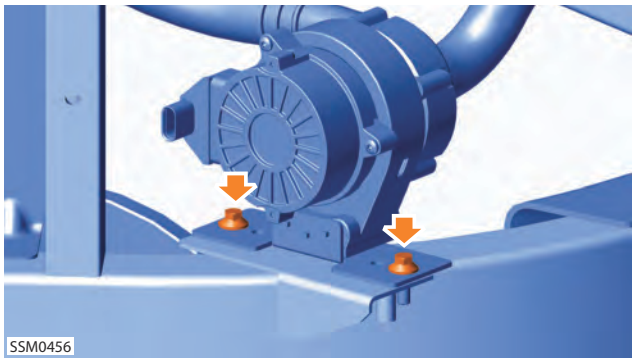
Crash Structure - Rear

Removal

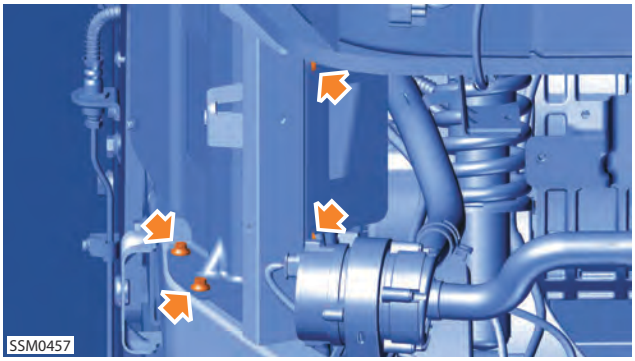
1. Remove radiator. Refer to "Radiator", page 10-12.
2. Remove LH rear closeout panel. Refer to "Closeout Panel - Rear - LH", page 2-13.
3. Remove RH rear closeout panel. Refer to "Closeout Panel - Rear - RH", page 2-14.



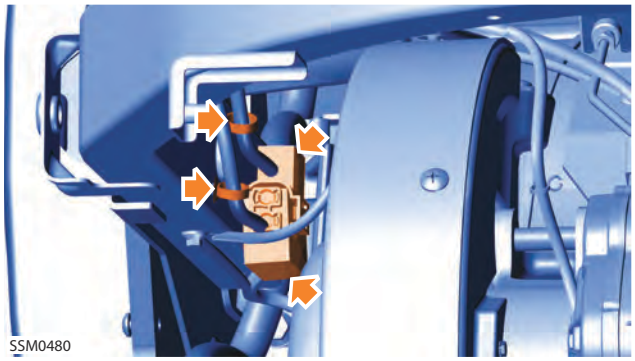
4. Disconnect harness connector from coolant pump.
5. Using a trim removal tool, release fastener securing harness to mounting bracket.



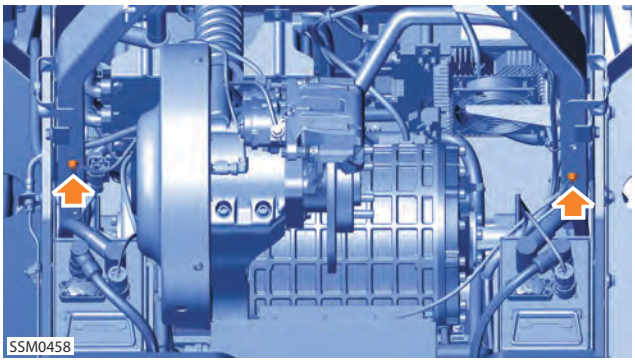
6. Remove bolts (x2) securing coolant pump to mounting bracket.
   Torque 7 Nm (5 lbf·ft).



7. Remove bolts (x4) securing DC-DC converter to body.
   Torque 8 Nm (6 lbf·ft).

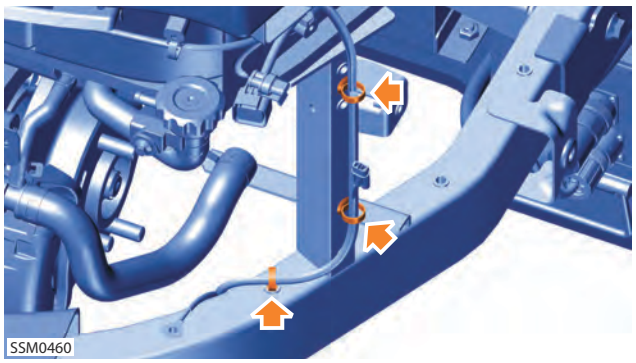


8. Using a plastic trim removal tool, release fasteners (x2) securing harnesses to rear crash structure.
9. Disconnect DC-DC harness connectors (x2) from main harness.
10. Remove DC-DC converter.

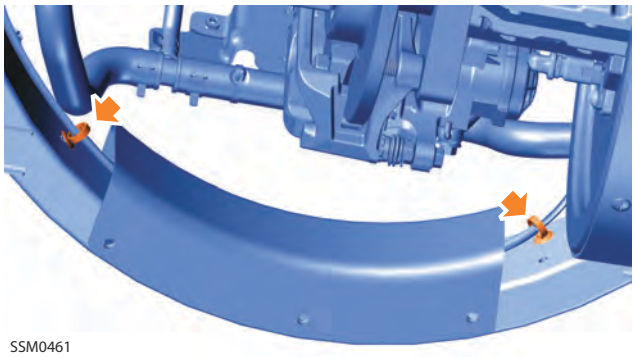


11. Remove bolts (x2) securing ground cables (x4) to underside of crash structure.
    Torque 8 Nm (6 lbf·ft).

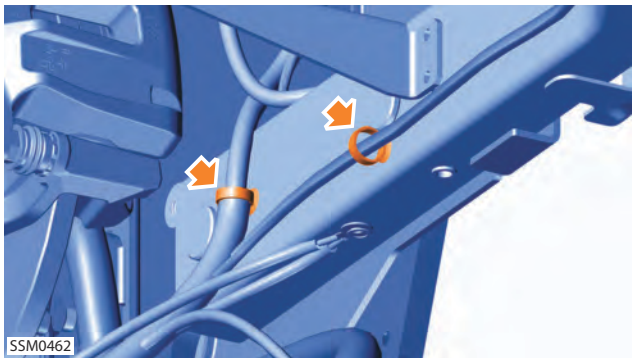
12. Remove bolts (x2) securing ground cables (x3) to crash structure.
    Torque 8 Nm (6 lbf·ft).



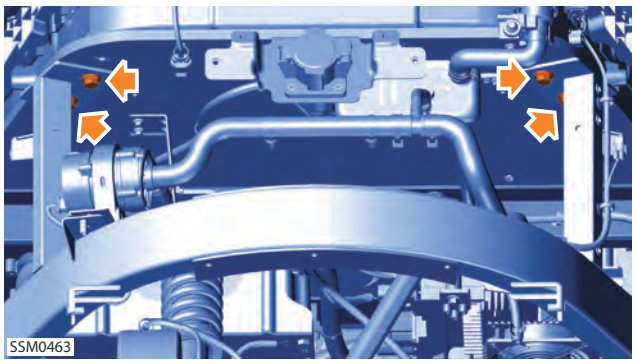
13. Using a plastic trim removal tool, release fasteners (x3) securing harness to crash structure.



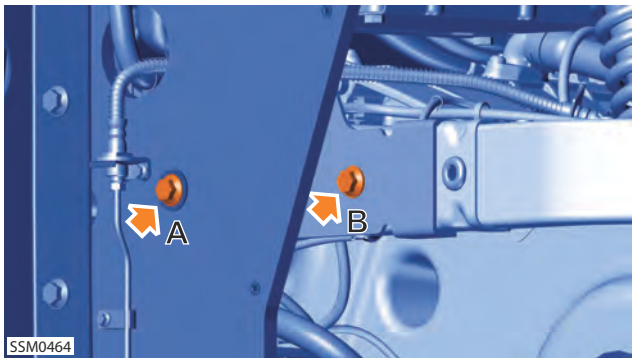
14. Using a plastic trim removal tool, release fasteners (x2) securing harness to crash structure.



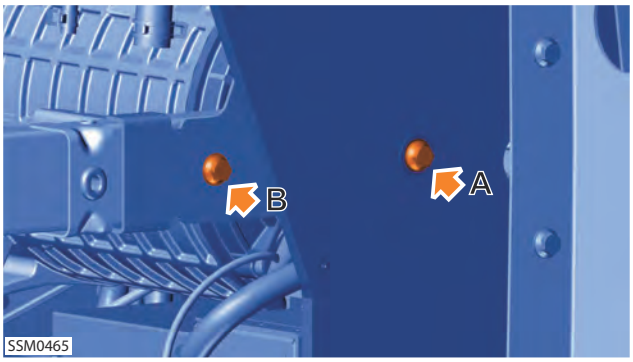
15. Using a plastic trim removal tool, release fasteners (x2) securing harness to crash structure.



16. Remove bolts (x4) securing crash structure uprights to body.
    Torque 13 Nm (10 lbf·ft).



17. Remove bolts (x2) securing LH side of crash structure to body.
    - A =
      Torque 13 Nm (10 lbf·ft).
    - B =
      Torque 33 Nm (24 lbf·ft).



18. Remove bolts (x2) securing RH side of crash structure to body.
    - **A** =
      Torque 13 Nm (10 lbf·ft).
    - **B** =
      Torque 33 Nm (24 lbf·ft).
19. Remove rear crash structure.

Installation

1. Installation procedure is reverse of removal except for the following:
2. Top-up rear cooling system. Refer to *"Coolant Drain and Refill - Rear", page 10-3.*

Exterior Mirror

Removal

1. Remove door tweeter panel. Refer to "Door Tweeter Panel", page 3-2.

2. Disconnect harness connector from exterior mirror.

   NOTE: You may need to remove the anti-rattle foam to disconnect the harness connector. Remember to install foam on installation.

3. Remove nuts (x3) securing exterior mirror to door.
4. Remove exterior mirror.

Installation

1. Installation procedure is reverse of removal.

Door Tweeter Panel

Removal

1. Lower door window.
2. Apply masking tape to protect painted surface on door.

3. Insert a plastic trim removal tool between tweeter panel and door.
4. Carefully release trim stud securing tweeter panel to door.

5. Release clips (x2) securing tweeter panel to door panel.

6. Disconnect harness connector and remove tweeter panel.

Installation

1. Installation procedure is reverse of removal.

Door Panel

Removal

1. Remove door tweeter panel. Refer to "Door Tweeter Panel", page 3-2.
2. Use a plastic trim removal tool to release screw cover from pull handle pocket.


SSM0061

3. Remove screw securing panel to door.


SSM0062

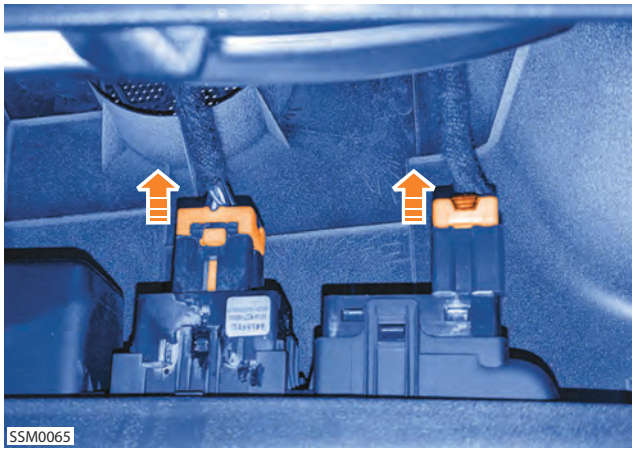
4. Use a plastic trim removal tool to remove bolt cover from interior door handle.


SSM0063

5. Remove bolts (x2) securing interior door handle to door.
6. Release interior door handle from door panel.
7. Apply masking tape to protect painted surfaces of the door.


SSM0064

8. Starting at the lower edge of the door and using a trim removal tool, release trim studs (x10) securing the door panel to door.


SSM0065

9. Using assistance, lift the door panel from the door and disconnect the harness connectors (x2) from the door switches.

   NOTE: RH door only has one harness connector.
10. Remove door panel.

Installation

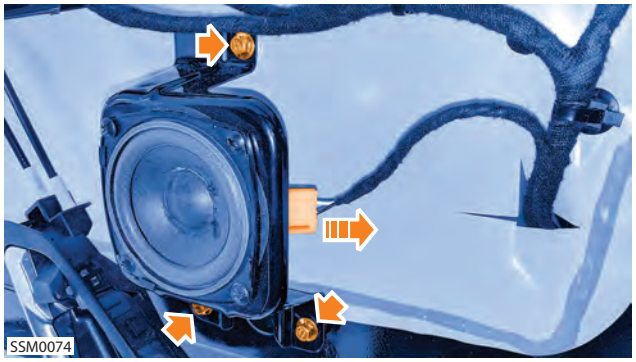
1. Installation procedure is reverse of removal.

Door Water Barrier

Removal

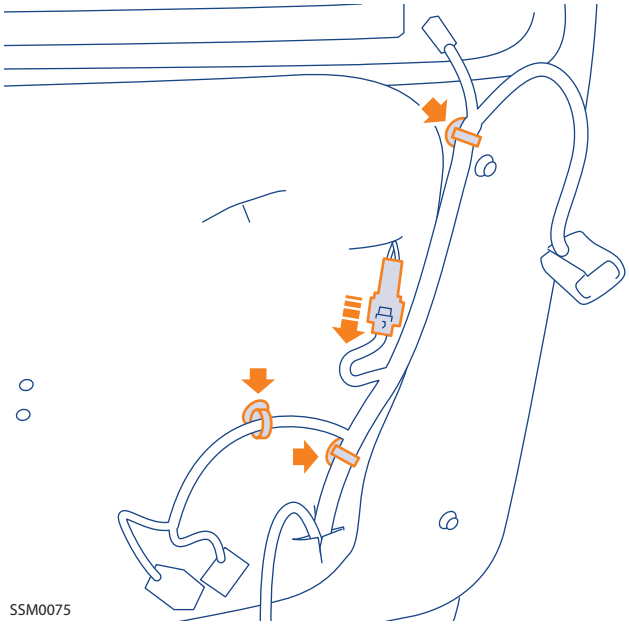
1. Remove interior door handle. Refer to "Door Handle - Interior", page 3-9.

2. Remove bolts (x2) securing armrest mounting bracket to door.
   Torque 8 Nm (6 lbf·ft).
3. Remove armrest mounting bracket.

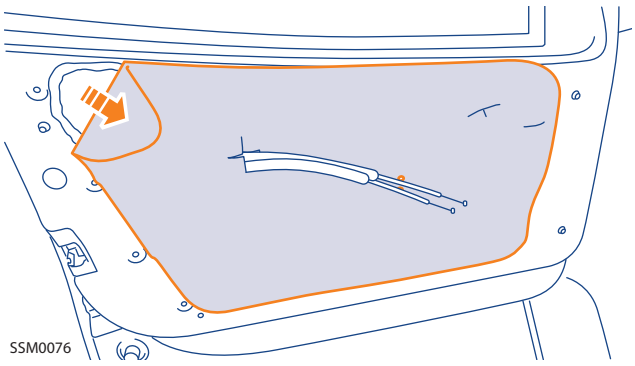


4. Disconnect harness connector from speaker.
5. Remove bolts (x3) securing speaker bracket to door.
   Torque 8 Nm (6 lbf·ft).
6. Remove speaker mounting bracket.

7. Disconnect harness connector from exterior mirror.



8. Disconnect harness connector from window motor.
9. Release clips (x3) securing harness to door.



10. Working from one corner, carefully peel back the water barrier to separate the adhesive from the door.

11. Feed the door release cables and electrical harness through the water barrrier.
12. Remove the door water barrier.

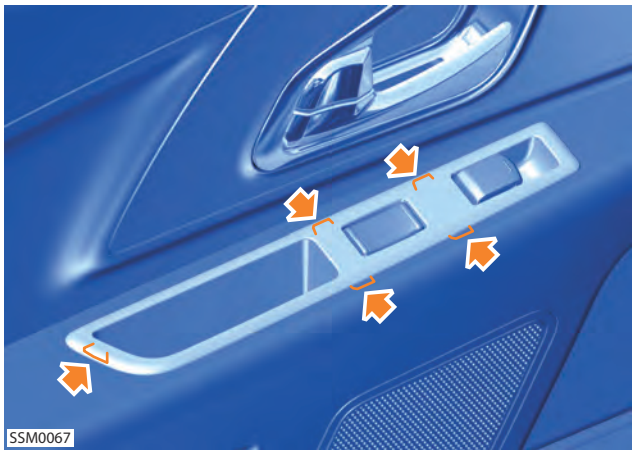
Installation

1. Installation procedure is reverse of removal.

Door Switch Panel

Removal

1. Remove door panel.



2. Carefully release clips (x5) securing switch panel to door panel.
3. Lift rear edge of switch panel and slide from door panel.

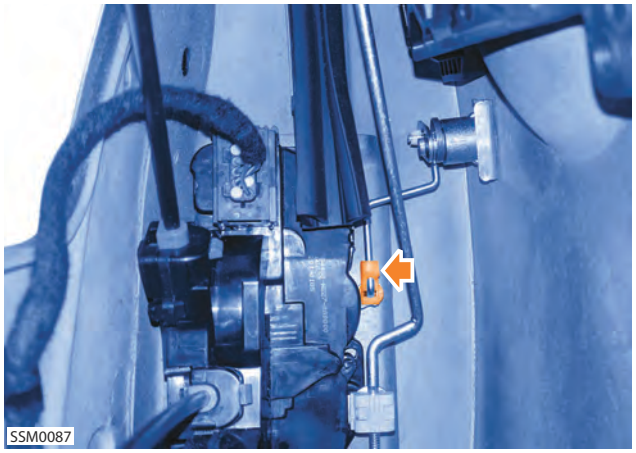
Installation

1. Installation procedure is reverse of removal.

Key Lock

Removal

1. Raise door window fully.
2. Remove door water barrier. Refer to *"Door Water Barrier", page 3-4.*



3. Release clip and disconnect key lock rod from door lock.

4. Remove key lock retaining clip.
5. Remove key lock.

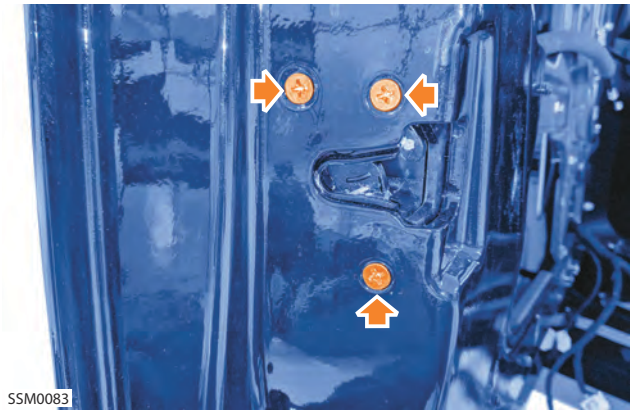
Installation

1. Installation procedure is reverse of removal.

Door Lock

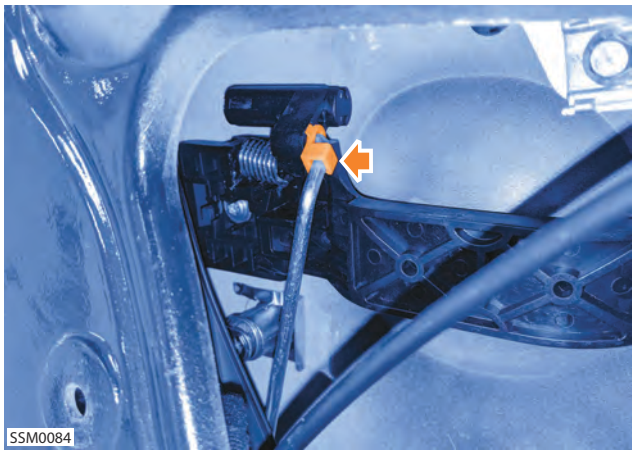
Removal

1. Raise door window fully.
2. Remove door water barrier. Refer to *"Door Water Barrier", page 3-4.*



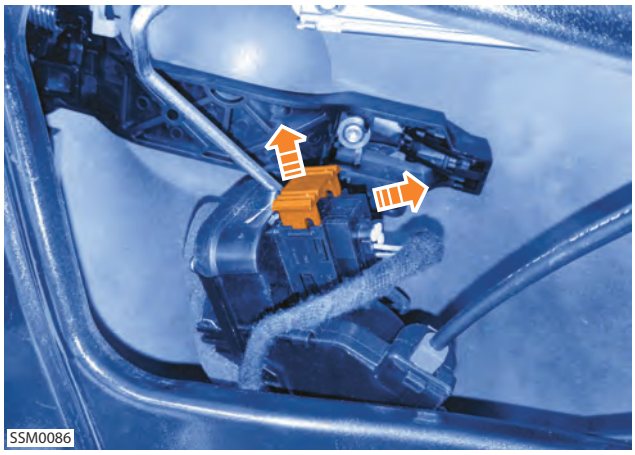
3. Remove screws x3 securing lock to door.

   NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.



4. Release clip and disconnect rod from exterior handle.

5. Release clip and disconnect key lock rod from lock.
6. Raise door lock for access to harness connector.



7. Release locking tab and disconnect harness connector from lock.
8. Remove door lock.

Installation

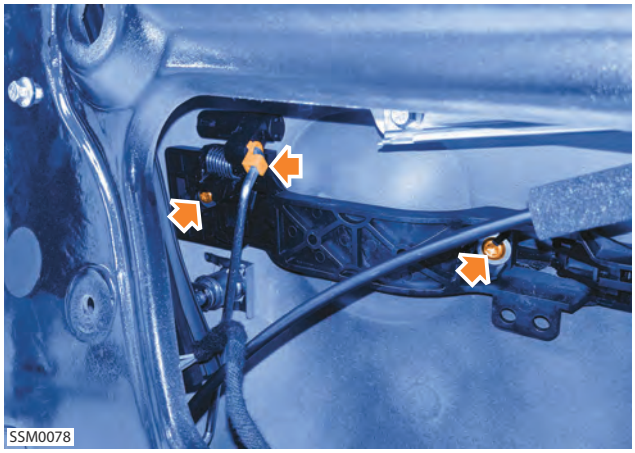
1. Installation procedure is reverse of removal.

Door Handle - Exterior

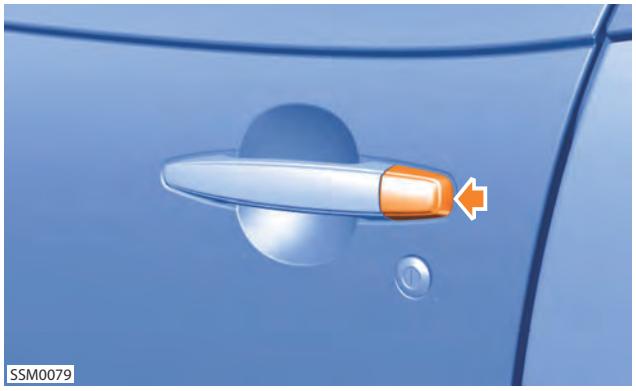
Removal

1. Raise door window fully.
2. Remove door water barrier. Refer to *"Door Water Barrier", page 3-4.*

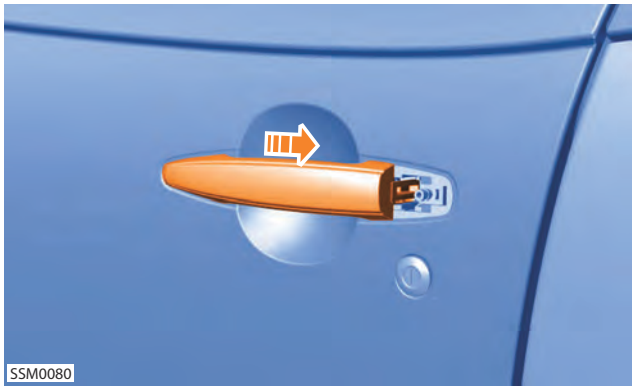
3. Remove self adhesive cover from access hole.



4. Release clip and disconnect rod from exterior handle.
5. Fully loosen Torx screws (x2) securing handle to door.



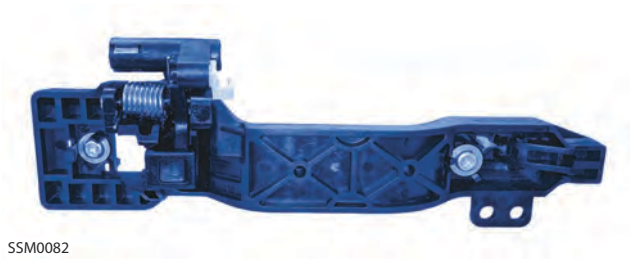
6. Remove cap from rear of exterior door handle.



7. Remove exterior door handle, by sliding it rearwards to release from the interior bracket.
8. Remove seal.

   NOTE: When installing the handle use a piece of tape to keep the seal in place.

9. Release clip securing interior bracket to door.



10. Remove interior door bracket.

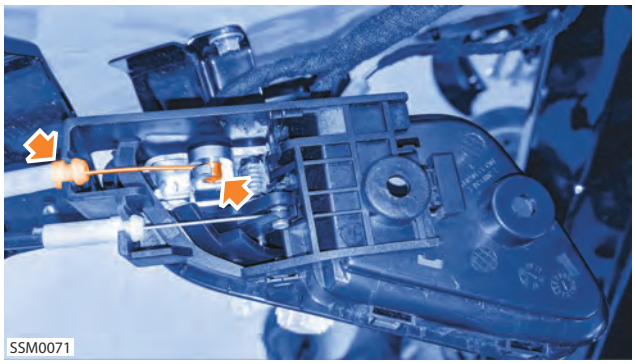
Installation

1. Installation procedure is reverse of removal.

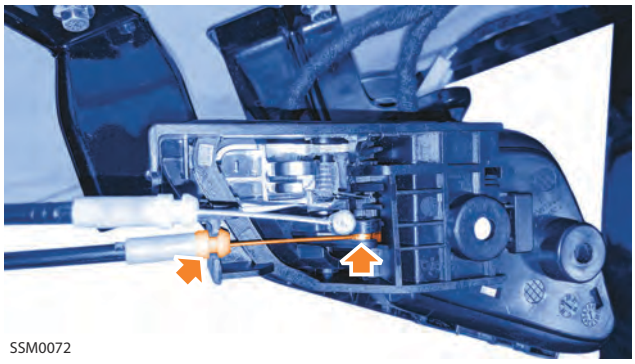
Door Handle - Interior

Removal

1. Remove door panel.



2. Release lock outer cable from bracket.
3. Disconnect lock inner cable from lever.



4. Release handle outer cable from bracket
5. Disconnect handle inner cable from lever.
6. Remove interior door handle.

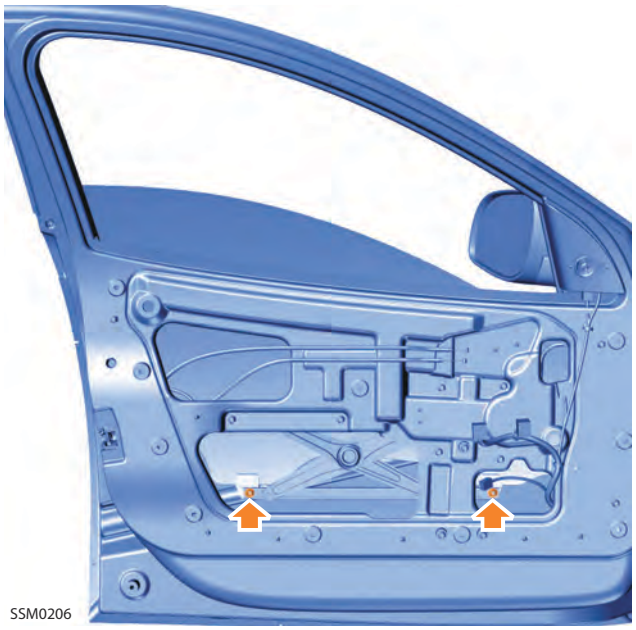
Installation

1. Installation procedure is reverse of removal.

Door Glass

Removal

1. Lower glass 2/3 down to provide access to mounting bolts.
2. Remove door water barrier. Refer to "Door Water Barrier", page 3-4.


SSM0206

3. Remove bolts (x2) securing door glass to regulator rail.
   Torque 8 Nm (6 lbf·ft).
4. Lift glass and rotate clockwise to remove from door.

Installation

1. Installation procedure is reverse of removal except for the following:

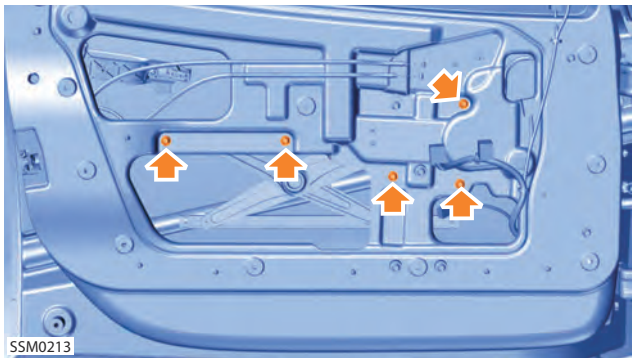

SSM0212

2. When installing glass, make sure to locate glass to the inside of the small brackets on the regulator rail.

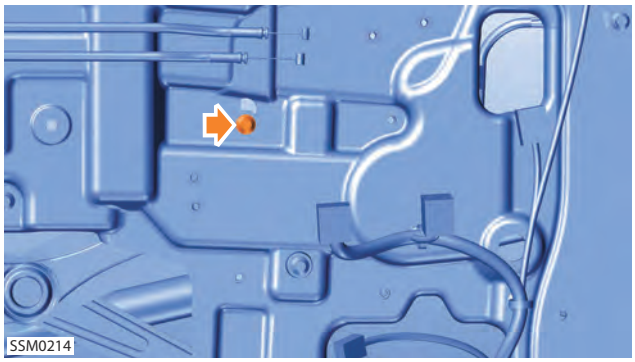
Door Glass Regulator

Removal

1. Remove door glass. Refer to "Door Glass", page 3-10.


SSM0213

2. Remove bolts (x2) securing regulator pivot rail to door.
   Torque 8 Nm (6 lbf·ft).
3. Remove bolts (x3) securing door glass motor to door.
   Torque 8 Nm (6 lbf·ft).


SSM0214

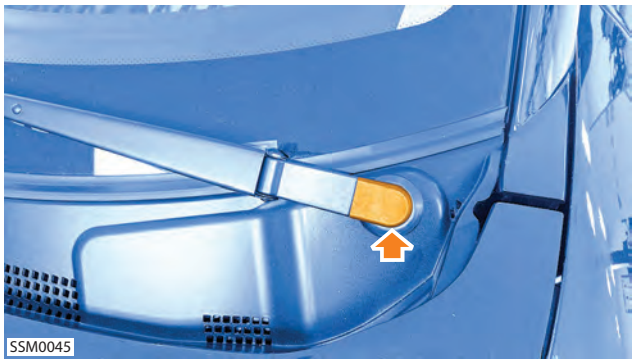
4. Loosen bolt securing door glass motor to door.
   Torque 8 Nm (6 lbf·ft).
5. Lift door glass regulator and motor assembly and release from door panel.
6. Remove door glass regulator and motor assembly through lower opening in door.

Installation

1. Installation procedure is reverse of removal.

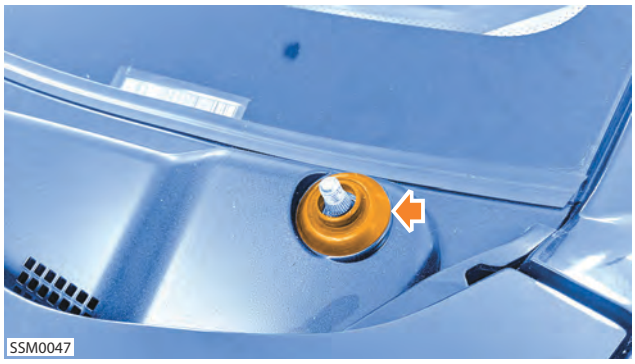
Wiper Arm

Removal



1. Remove cover from wiper arm nut.

2. Remove nut securing wiper arm to spindle.
   Torque 31 Nm (23 lbf·ft).
3. Observing the installed position of arm on screen, remove wiper arm.



4. Collect sealing washer from spindle.

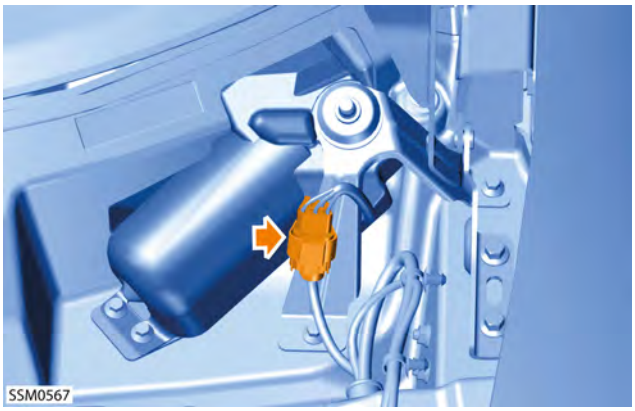
Installation

1. Installation procedure is reverse of removal.

Wiper Motor

Removal

1. Remove wiper cover board. Refer to *"Wiper Cover Board", page 2-12.*



2. Disconnect harness connector from wiper motor.

3. Remove bolts (x4) securing wiper motor to body.
   Torque 8 Nm (6 lbf·ft).
4. Remove wiper motor assembly.

Do not carry out further dismantling if component is removed for access only.

SSM0569

5. Remove rubber sleeve from wiper motor spindle.
6. Remove nut securing bracket to wiper motor.

   Note: Only tighten nut when wiper motor and bracket are installed in position on vehicle.
7. Remove rubber anti-vibration washer.

SSM0569

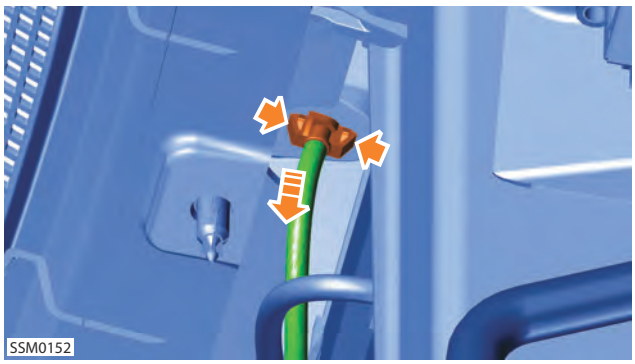
8. Remove support bracket from wiper motor.
9. Remove cover from wiper motor.

Installation

1. Installation procedure is reverse of removal.

Washer Jet

Removal



1. Disconnect hose from washer jet.
2. Squeeze clips (x2) securing washer jet to hood and remove.

Installation

1. Installation procedure is reverse of removal.

Washer Pump

Removal

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*

2. Disconnect harness connector from washer pump.
3. Disconnect hose from washer pump.

   NOTE: Place absorbent material around the washer bottle to absorb any possible fluid spillage.
4. Lift washer bottle from mounting bracket and remove.
5. Drain washer bottle of any fluid.

6. Release and remove washer pump from bottle.

Installation

1. Installation procedure is reverse of removal.

Front Wheel Alignment

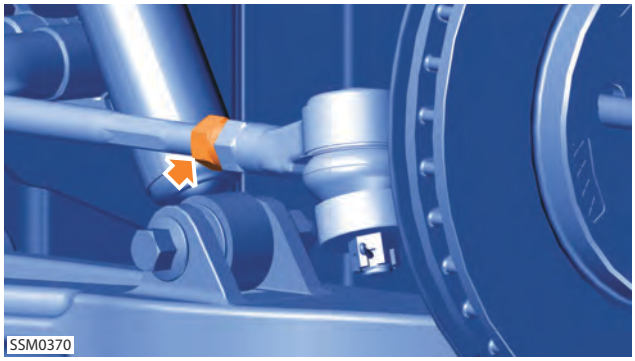
Check

1. Ensure tire pressures are correct and vehicle is at kerbside weight.
2. Roll vehicle backwards and forwards to relieve stresses in steering and suspension.
3. Ensure that equipment is properly calibrated and take an average of 3 readings.
4. Check front wheel alignment is within tolerance.

Setting	Specification
Toe angle	0°20'±6' out (per side) <6' difference side to side
Camber angle	0°±15' <15' difference side to side
Caster angle	5°±0.5' <1° difference side to side

Toe Adjustment

1. Mark position of track rod ends for reference.



2. Loosen track rod end locknuts.
3. Rotate track rod to obtain correct alignment.

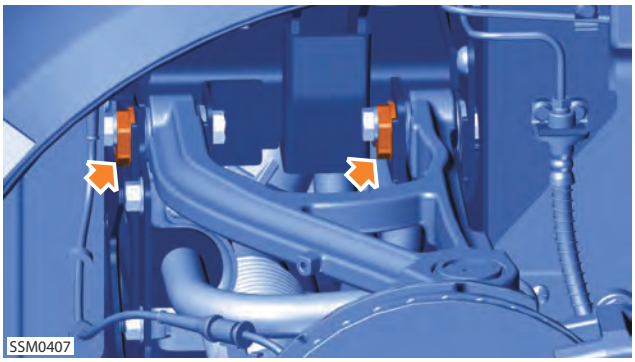
   CAUTION: Both track rods should be rotated an equal amount.

4. Recheck front wheel alignment.
5. Tighten track rod end locknuts.

   Torque 30 Nm (22 lbf·ft).

Camber/Caster Adjustment

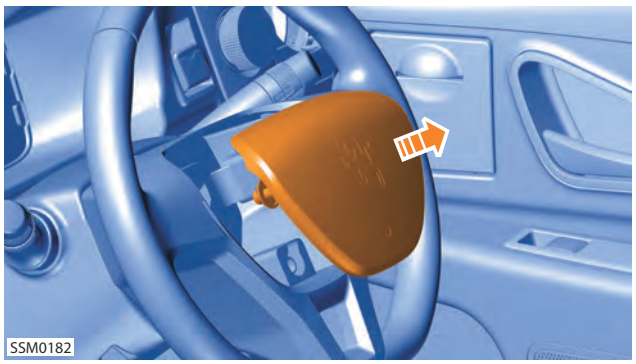
Note: Camber and caster are adjusted via the same eccentric washers on the suspension upper arms. Adjustment of the washers will make changes to both camber and caster.



1. Mark the installed position of the two eccentric washers that control the suspensions camber and caster.
2. Rotate washers to obtain correct alignment.
3. Recheck front wheel alignment.

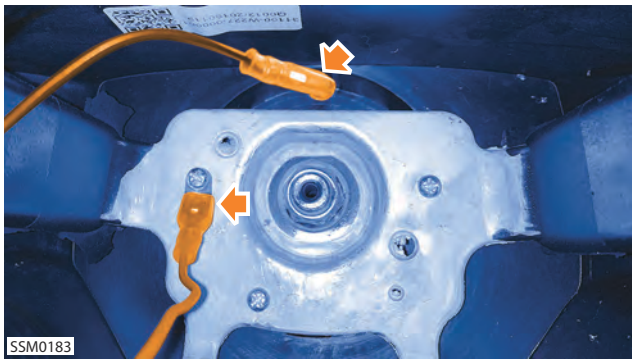
Horn Pad

Removal



1. Grab the horn pad at the top and bottom and pull to release the fasteners (x3) securing it to the steering wheel.

   CAUTION: Take care not to scratch surface of steering wheel or damage the edge of the horn button.



2. Disconnect the black wire from the horn ring connector at the top of the steering wheel.
3. Disconnect the orange wire from the connector at the center of the steering wheel.
4. Remove horn pad.

Installation

1. Installation procedure is reverse of removal.

Steering Wheel

Removal

1. Remove horn pad. Refer to *"Horn Pad", page 5-2.*
2. Position steering wheel with the front wheels aligned straight ahead.

3. Remove nut (17mm) securing steering wheel to shaft.

   Torque 45 Nm (33 lbf·ft).

4. To aid installation, mark the installed position of the steering wheel on shaft.
5. Using a suitable puller remove the steering wheel.

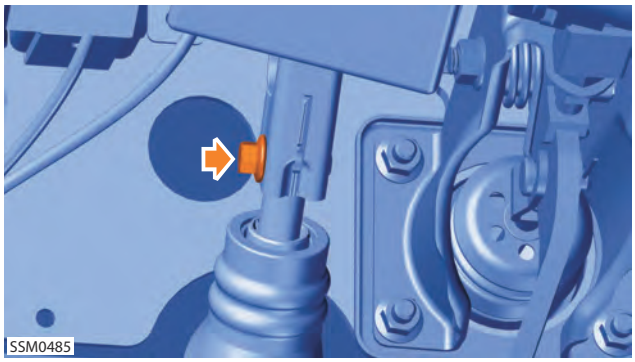
Installation

1. Installation procedure is reverse of removal except for the following:
2. Check alignment of steering wheel on road test.

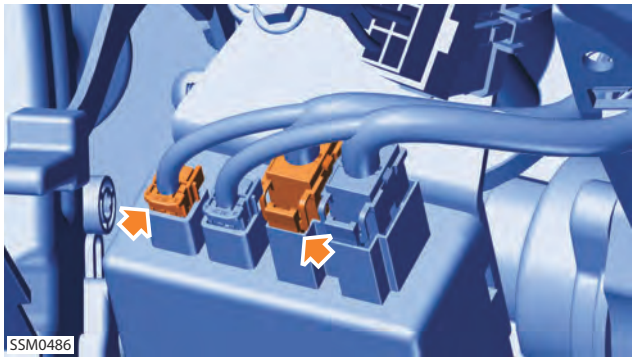
Steering Column

Removal

1. Remove steering wheel. Refer to "Steering Wheel", page 5-2.
2. Remove steering column cover. Refer to "Cover - Steering Column", page 2-21.
3. Remove dashboard closeout panel. Refer to "Closeout Panel - Dashboard", page 2-20.
4. Remove seat. Refer to "Seat", page 1-1.

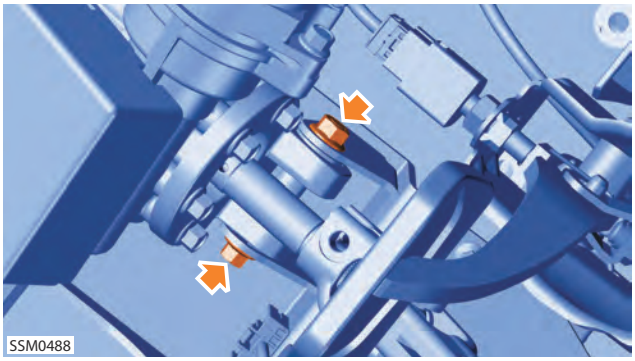


5. Mark the alignment of the steering column to intermediate shaft.
6. Remove bolt securing steering column to intermediate shaft.
   Torque 18 Nm (13 lbf·ft).

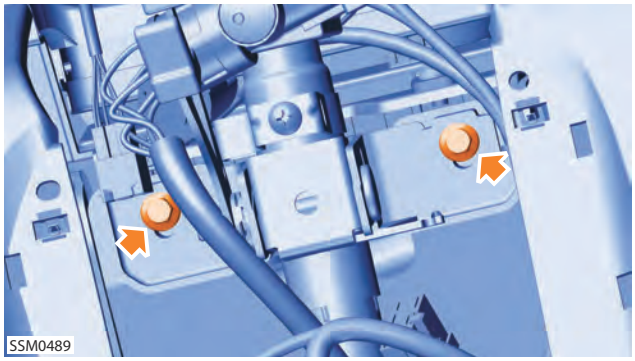


7. Disconnect cabin harness connectors (x2) from Electronic Power Steering (EPS) module.

8. Disconnect ignition switch connector from cabin harness.



9. Remove through bolt and nut securing steering column to body.
   Torque 18Nm (13 lbf·ft).



10. Remove bolts (x2) securing steering column to body.
    Torque 18 Nm (13 lbf·ft).
11. Remove steering column.

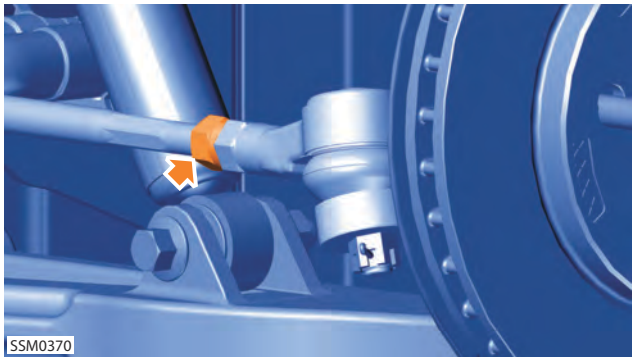
Installation

1. Installation procedure is reverse of removal.

Tie Rod End

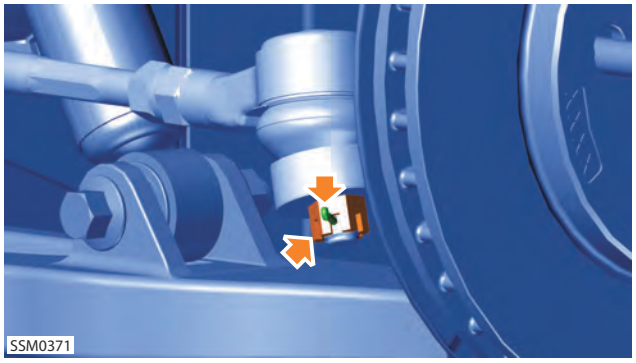
Remove

1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*



2. Loosen tie rod end locknut.
   Torque 30 Nm (22 lbf·ft).

   CAUTION: To prevent tie rod damage always restrain tie rod end with a wrench when loosening or tightening lock nut.



3. Remove cotter pin from nut securing tie rod end to steering arm.
4. Remove castellated nut securing tie rod end to steering arm.
   Torque 35 Nm (26 lbf·ft).
5. Using a suitable tool, release tie rod end from steering arm.
6. Noting the number of turns required, unscrew tie rod end from tie rod.

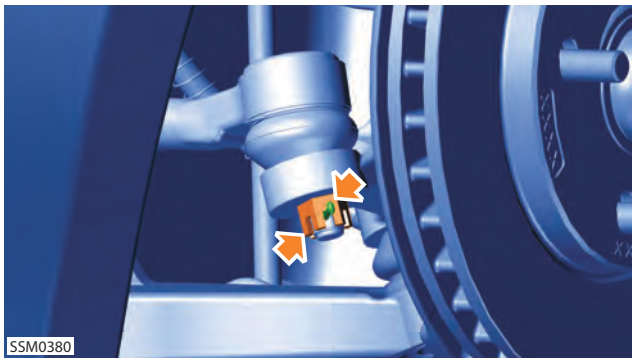
Installation

1. Installation procedure is reverse of removal except for the following.
2. Install tie rod end using same number of turns as noted during removal.
3. Check wheel alignment. Refer to *"Front Wheel Alignment", page 5-1.*

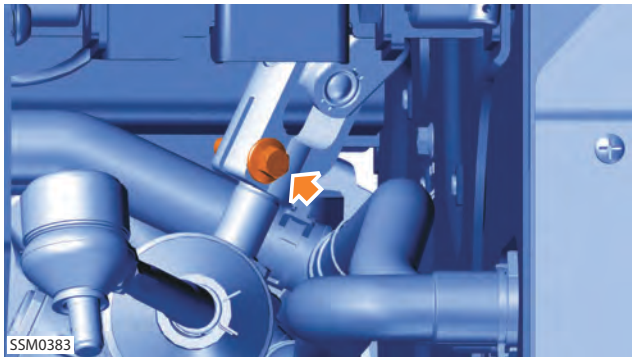
Steering Rack

Removal

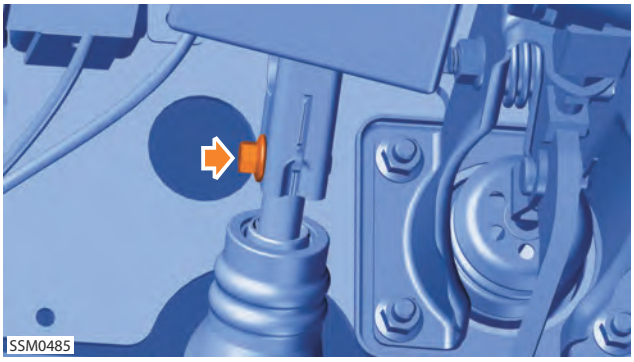
1. Position steering wheel so that the front wheels are in the straight ahead position.
2. Remove sway bar. Refer to "Sway Bar", page 6-7.
3. Remove front skid plate. Refer to "Front Skid Plate", page 2-6.



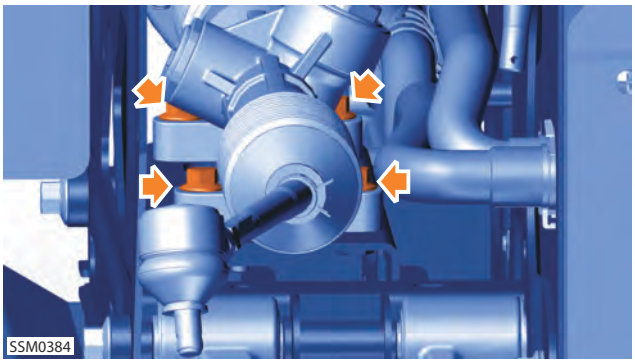
4. Remove cotter pins from nuts securing tie rod ends to steering arms.
5. Remove castellated nuts securing both tie rod ends to steering arms.
   Torque 35 Nm (26 lbf·ft).
6. Using a suitable tool, release tie rod ends from steering arms.



7. Mark the alignment of the universal joint and steering rack.
8. Remove bolt securing universal joint to steering rack.
   Torque 23 Nm (17 lbf·ft).



9. Mark the alignment of the steering column to intermediate shaft.
10. Remove bolt securing steering column to intermediate shaft.
    Torque 18 Nm (13 lbf·ft).
11. Remove intermediate shaft.



12. Remove bolts (x4) securing steering rack to body.
    Torque 36 Nm (26.5 lbf·ft).

    NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.
13. Disengage the steering rack pinion from the universal joint.

    NOTE: On assembly, align the marks on pinion housing with the universal joint before engaging the splines.
14. Maneuver and remove steering rack from vehicle.

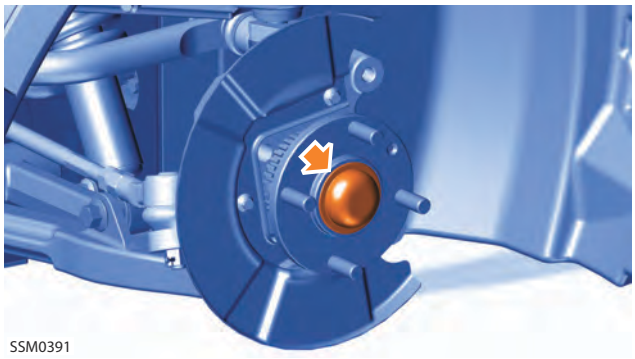
Installation

1. Installation procedure is reverse of removal except for the following.
2. Check wheel alignment. Refer to "Front Wheel Alignment", page 5-1.

Hub - Front

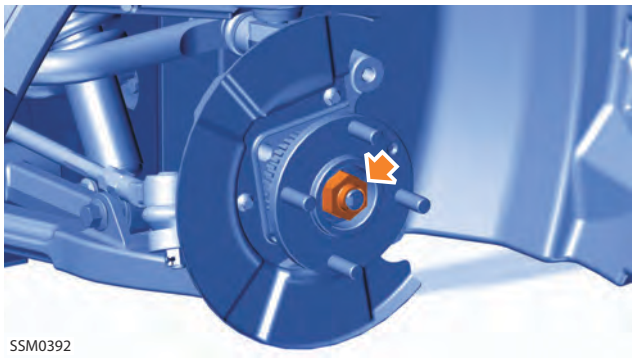
Remove

1. Remove front brake rotor. Refer to *"Brake Rotor - Rear", page 7-8.*



SSM0391

2. Remove dust cap from center of hub.



SSM0392

3. Remove and discard nut securing front hub on axle.

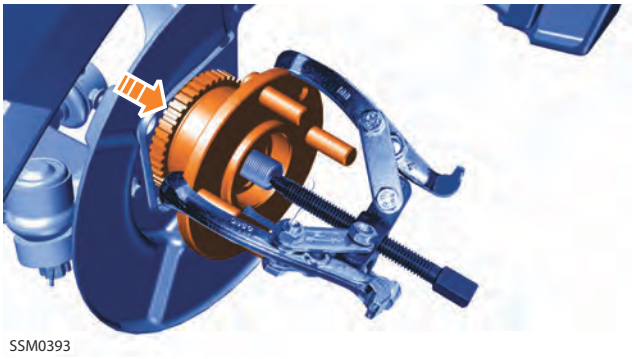
   Initial torque 60 Nm (44lbf·ft).

   Second torque 120 Nm (88 lbf·ft).

   Final torque 180 Nm (133 lbf·ft).

   WARNING: Always install a new axle nut. The nut must be staked on to the axle after tightening to the specified torque to prevent it from working loose.

   Note: Use 30mm impact socket.



SSM0393

4. Using a suitable puller, remove hub from axle.

Do not carry out further disassembly if component is removed for access only.

SSM0133

5. Remove dust seal from rear of hub.
6. Using a suitable tool remove the inner wheel bearing.

SSM0134

7. Using a suitable tool remove the outer wheel bearing.

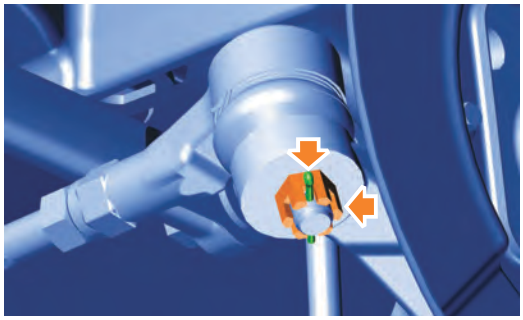
Installation

1. Installation procedure is reverse of removal.

Knuckle - Front

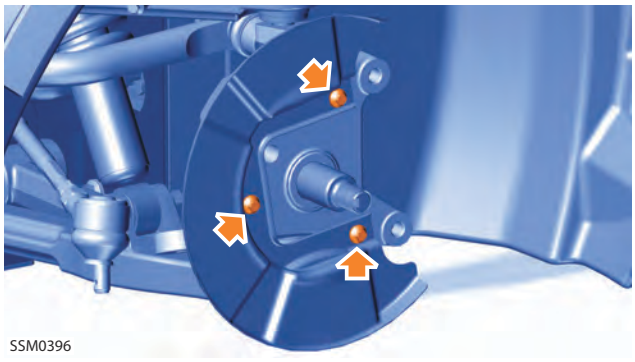
Remove

1. Remove front hub. Refer to *"Hub - Front", page 6-1.*

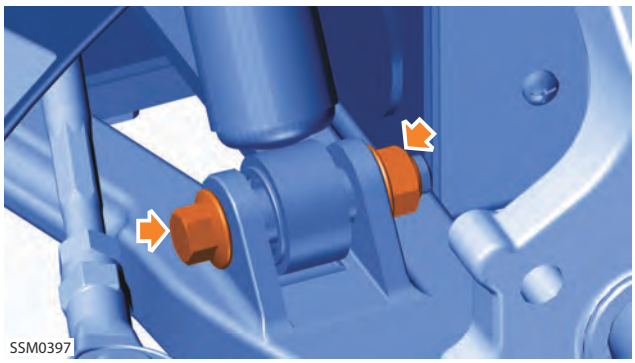


2. Remove cotter pin from nut securing tie rod end to steering arm.
3. Remove castellated nut securing tie rod end to steering arm.
   Torque 35 Nm (26 lbf·ft).
4. Using a suitable tool, release tie rod end from steering arm.

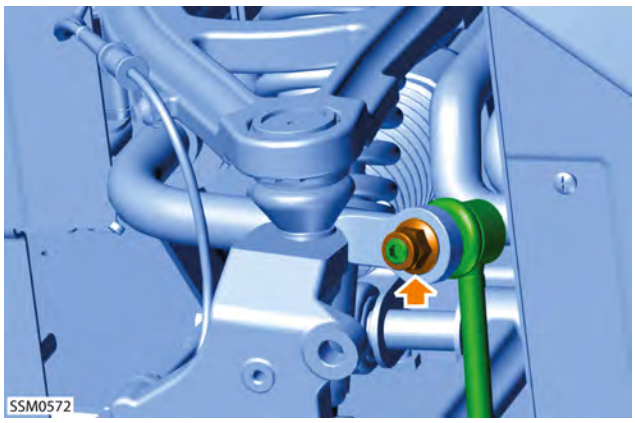
5. Remove bolt securing wheel speed sensor to knuckle.
   Torque 8 Nm (6 lbf·ft).
6. Withdraw speed sensor from hub and position aside.



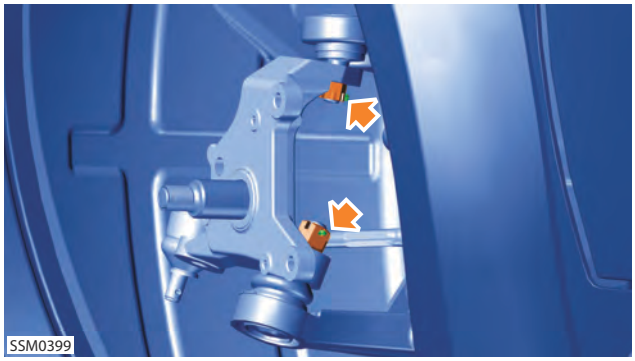
7. Remove bolts (x3) securing brake backing plate to knuckle.
   Torque 8 Nm (6 lbf·ft).
   NOTE: When installing, apply Loctite® 222 retaining compound to bolt/screw threads.
8. Remove brake backing plate.



9. Remove bolt and nut securing front spring/ damper assembly to lower suspension arm.
   Torque 95 Nm (70 lbf·ft).



10. Remove nut securing drop link to sway bar.
    Torque 65 Nm (48 lbf·ft).
11. Disconnect drop link from sway bar.



12. Remove and discard cotter pins from castellated nuts (x2) securing knuckle to upper and lower suspension arm ball joints.

    WARNING: Always install new cotter pins to prevent the ball joint nuts from working loose.

13. Loosen castellated nuts securing knuckle to upper and lower suspension arm ball joints.
    - Upper = Torque 30 Nm (22 lbf·ft).
    - Lower = Torque 45 Nm (33 lbf·ft).
14. Use a joint spreader to release the upper and lower suspension arm ball joints from the knuckle.
15. Remove the castellated nuts from the ball joints and remove the knuckle from suspension arms.

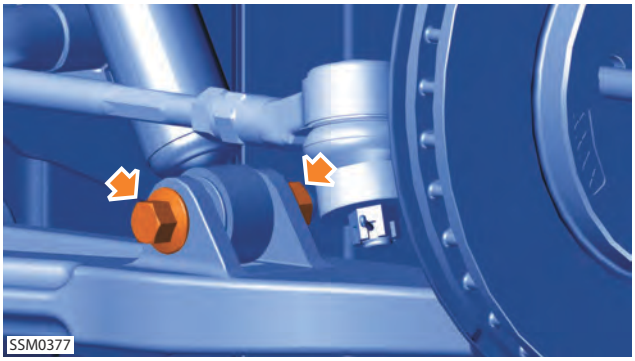
Installation

1. Installation procedure is reverse of removal.

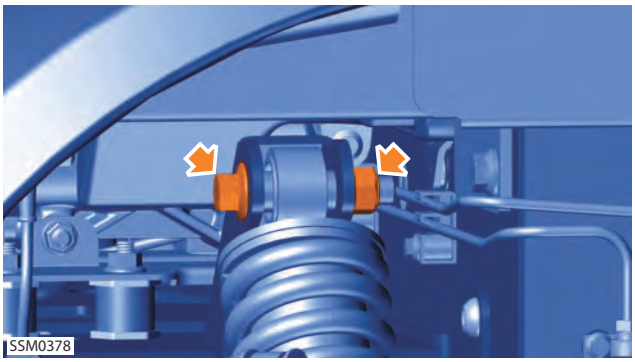
Spring/Damper Assembly - Front

Remove

1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*



2. Remove bolt and nut securing front spring/damper assembly to lower suspension arm. Collect washer.
   Torque 95 Nm (70 lbf·ft).



3. Remove nut and bolt securing spring/damper to body. Collect washer.
   Torque 95 Nm (70 lbf·ft).
4. Withdraw damper/spring assembly from below vehicle.

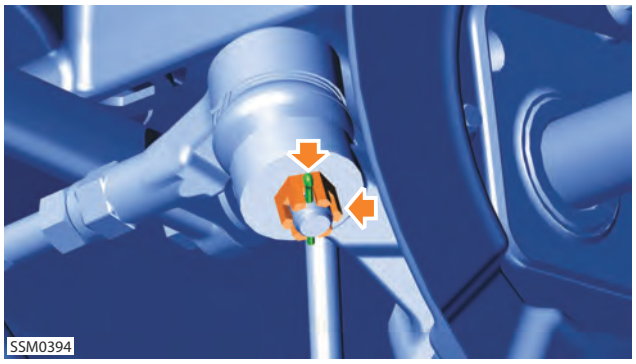
Installation

1. Installation procedure is reverse of removal.

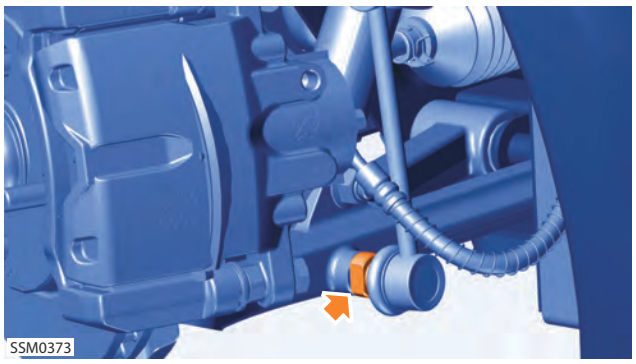
Suspension Arm - Front - Lower

Removal

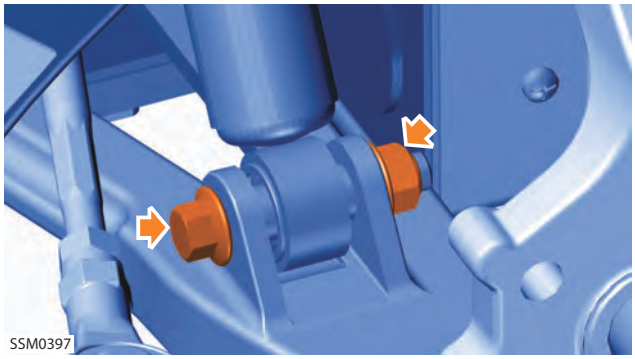
1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*
2. Remove front skid plate. Refer to *"Front Skid Plate", page 2-6.*



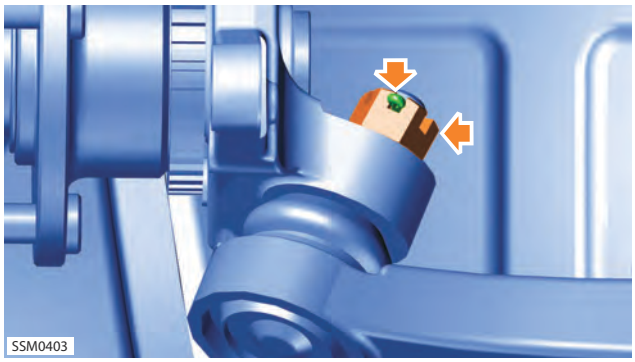
3. Remove cotter pin from nut securing tie rod end to steering arm.
4. Remove castellated nut securing tie rod end to steering arm.
   Torque 35 Nm (26 lbf·ft).
5. Using a suitable tool, release tie rod end from steering arm.



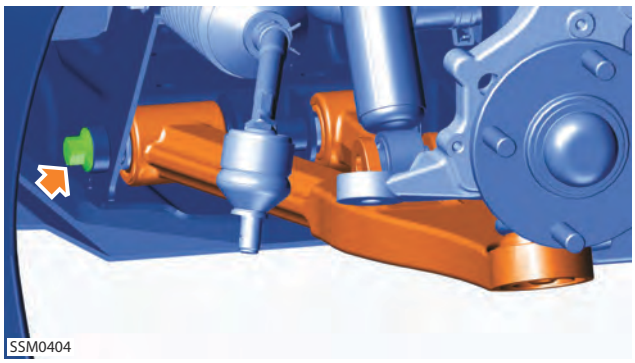
6. Loosen ball joint securing drop link to lower suspension arm.
   Torque 43Nm (32 lbf·ft).
7. Disconnect drop link from lower suspension arm.



8. Remove bolt and nut securing front spring/ damper assembly to lower suspension arm. Collect washer.
   Torque 95 Nm (70 lbf·ft).



9. Remove and discard cotter pin from castellated nut securing knuckle to lower suspension arm ball joint.
10. Loosen castellated nut securing knuckle to lower suspension arm ball joints.
    Torque 45 Nm (30 lbf·ft).
11. Use a joint spreader to release the lower suspension arm ball joint from the knuckle.



12. Remove bolt securing lower suspension arm to body.
    Torque 90Nm (66 lbf·ft).

NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.

13. Remove lower suspension arm.

Installation

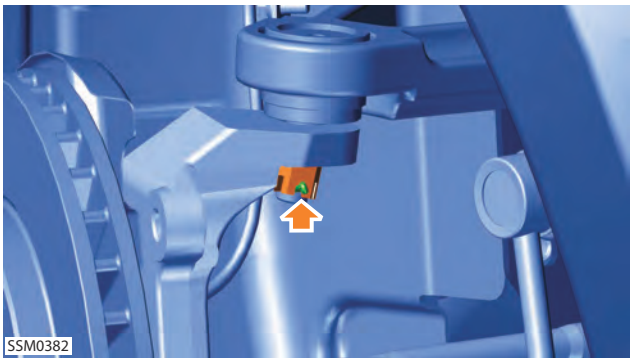
1. Installation procedure is reverse of removal.

Suspension Arm - Front - Upper

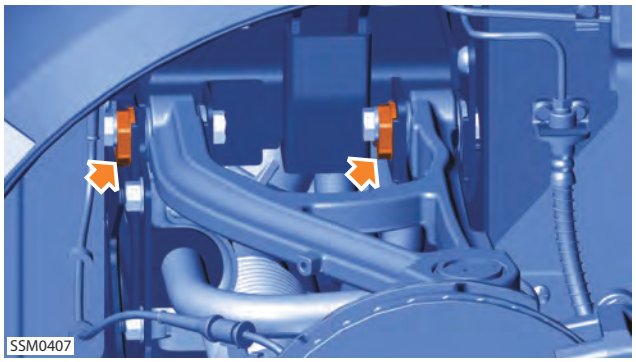
Removal

1. Remove front spring and damper assembly. Refer to "*Spring/Damper Assembly - Front*", *page 6-3.*

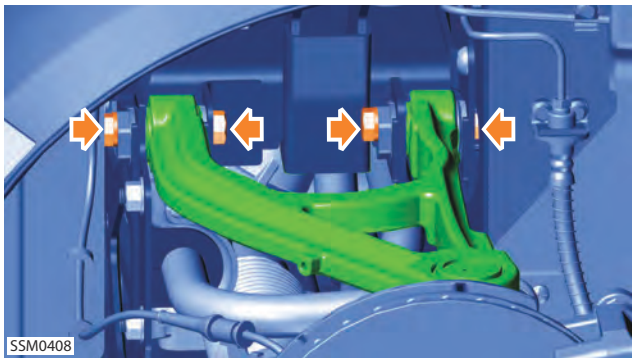
2. Remove bolt securing wheel speed sensor harness to upper suspension arm.
   Torque 8 Nm (6 lbf·ft).



3. Remove and discard cotter pin from castellated nut securing knuckle to upper suspension arm ball joint.
   Torque 35 Nm (26 lbf·ft).
4. Loosen castellated nut securing knuckle to upper suspension arm ball joint.
5. Use a joint spreader to release the upper suspension arm ball joint from the knuckle.



6. Mark the installed position of the two eccentric washers that control the suspensions camber and caster.



7. Remove bolts and nuts (x2) securing upper suspension arm to body.
   Torque 78 Nm (58 lbf·ft).

   NOTE: The nut for the rear bolt is held in a machined slot to prevent it from rotating.
8. Remove upper suspension arm.

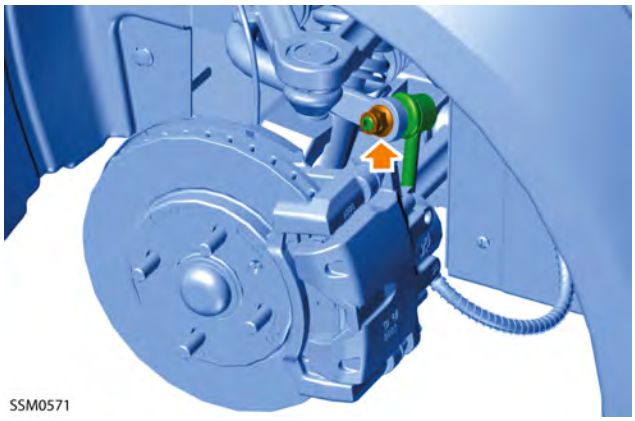
Installation

1. Installation procedure is reverse of removal.

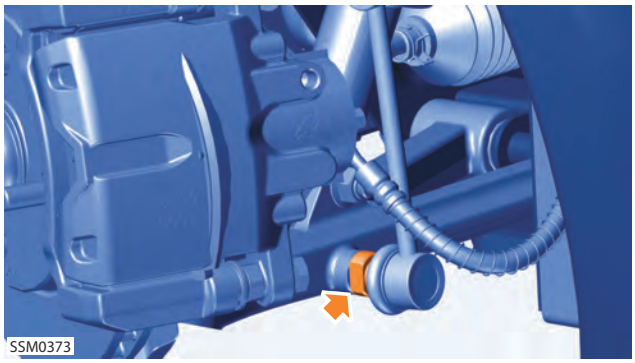
Sway Bar - Drop Link

Remove

1. Remove front road wheel. Refer to *"Wheel - Front", page 8-1.*



2. Remove nut securing drop link to sway bar.
   Torque 65 Nm (48 lbf·ft).



3. Loosen ball joint securing drop link to lower suspension arm.
   Torque 43 Nm (32 lbf·ft).
4. Remove sway bar drop link.

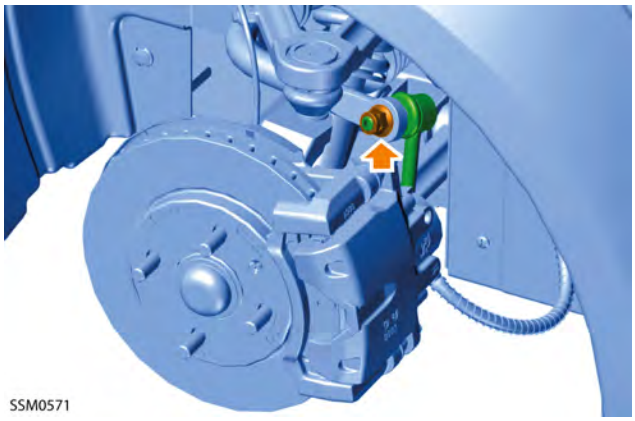
Installation

1. Installation procedure is reverse of removal.

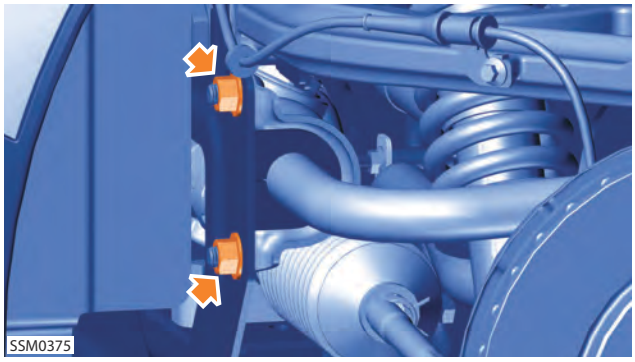
Sway Bar

Remove

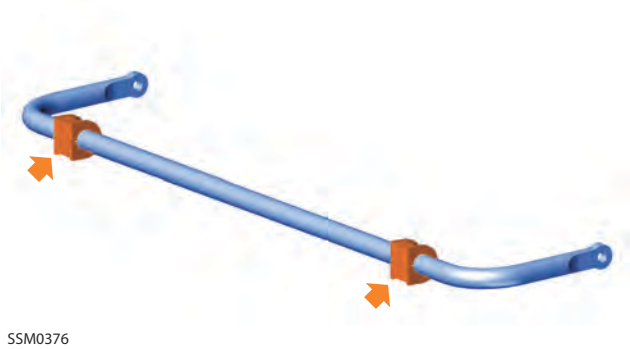
1. Remove both front road wheels. Refer to *"Wheel - Front", page 8-1.*



2. Remove nuts(x2) securing sway bar to drop links.
   Torque 65 Nm (48 lbf·ft).



3. Remove bolts and nuts (x4) securing sway bar brackets to body.
   Torque 55 Nm (40.5 lbf·ft).
4. Remove sway bar brackets.
5. Maneuver and remove sway bar from vehicle.



6. Remove sway bar bushings from sway bar.

Installation

1. Installation procedure is reverse of removal except for the following.
2. Apply recommended grease to sway bar bushing surfaces.

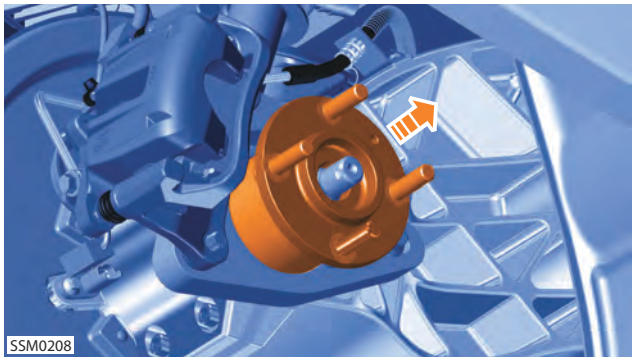
Hub - Rear

Removal

1. Remove rear wheel. Refer to "Wheel - Rear", page 8-1.

2. Remove and discard M30 nut securing rear hub on axle.
   - Initial torque 30 Nm (22 lbf·ft).
   - Second torque 70 Nm (52 lbf·ft).
   - Final torque 115 Nm (85 lbf·ft).

   WARNING: Always install a new axle nut. The nut must be staked on to the axle after tightening to the specified torque to prevent it from working loose.
3. Remove rear brake rotor. Refer to "Brake Rotor - Rear", page 7-8.



4. Using a suitable puller, remove rear hub from axle.

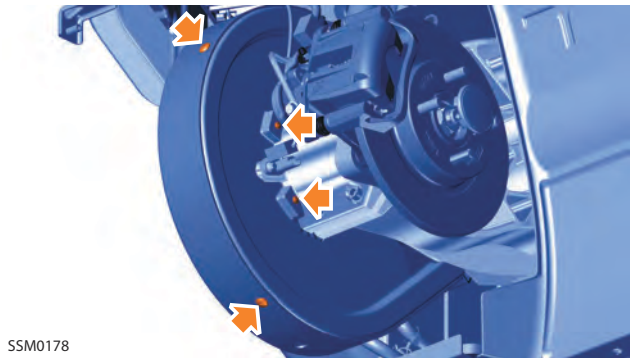
Installation

1. Installation procedure is reverse of removal.

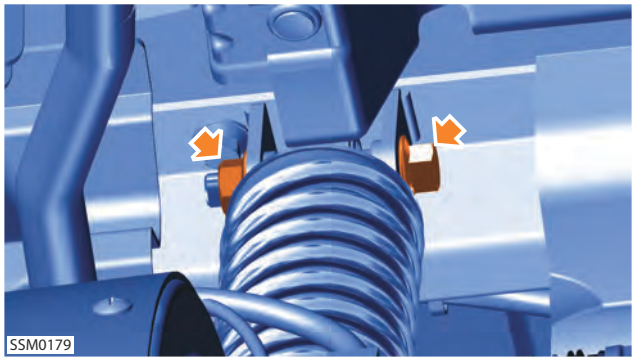
Spring/Damper Assembly - Rear

Removal

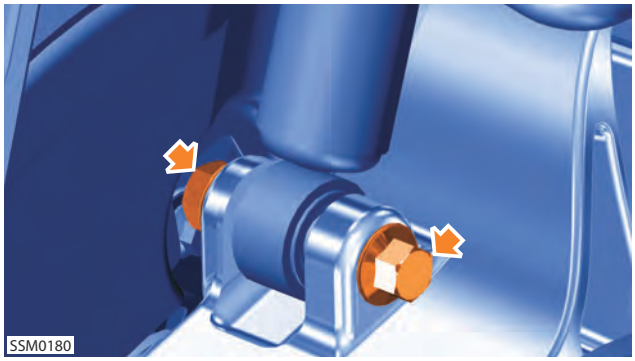
1. Remove rear wheel. Refer to "Wheel - Rear", page 8-1.
2. Remove LH rear side cover. Refer to "Rear Side Cover", page 2-5.
3. Remove RH rear side cover.



4. Remove screws (x4) securing drive belt cover to housing and swing arm.
5. Position a floor jack to support the end of the swing arm assembly.



6. Remove nut and bolt securing spring/damper assembly to body.
   - Torque 95 Nm (70 lbf·ft).



7. Remove nut and bolt securing spring/ damper assembly to swing arm.
   Torque 95 Nm (70 lbf·ft).
8. Remove rear spring/damper assembly.

Installation

1. Installation procedure is reverse of removal.

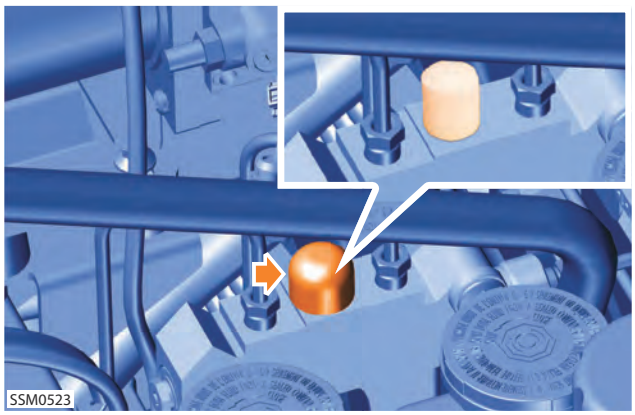
Brake Bleed - System

WARNING: Before attempting to bleed the brakes, the brake service tool must be installed in the brake combination valve. Failure to install the tool will allow the valve to move and block the fluid outlets, this will prevent fluid from being bled and may also trap air in the system.

NOTE: The front and rear braking systems have separate reservoirs and can be bled individually if required.

Brake service tool installation

1. Clean the top of the brake combination valve of any dirt.

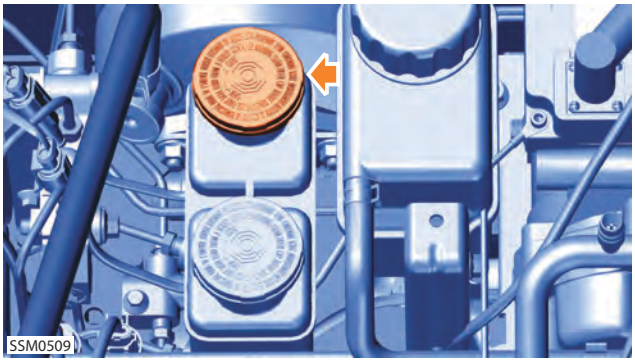


2. Remove the plastic cap from the brake combination valve.
3. Lightly lubricate the brake service tool with brake fluid.
4. Install the brake service tool in the combination valve and tighten until finger tight.

   CAUTION: Do not over tighten the brake service tool as this may cause damage to the brake combination valve preventing it from working as expected.

Rear brake system bleed

1. Remove rear wheel.
2. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*
3. Install the brake service tool in the brake combination valve.



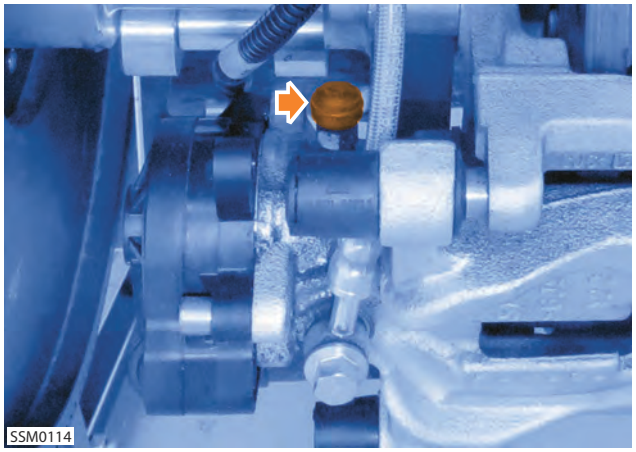
4. Clean area surrounding rear brake fluid reservoir cap and remove cap.

   CAUTION: If brake fluid is spilt on the paintwork wash off immediately with clean water.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
5. Attach pressure bleeder adapter to brake fluid reservoir ensuring a tight seal.
6. Fill pressure bleeder reservoir with the correct brake fluid meeting DOT 4 specification.

   WARNING: Only use new fluid from an airtight container. Fluid from open containers or fluid previously bled from the system will have absorbed moisture, which will adversely affect performance and must not be used.

   NOTE: Make sure there is sufficient brake fluid to replace all fluid used during bleed procedure.
7. Follow the manufacturer instructions on how to use the pressure bleeder system.



8. Remove cover from rear caliper bleed nipple.
9. Install brake bleed container to bleed nipple on caliper using a clear hose.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
10. Loosen bleed nipple one quarter turn counterclockwise.
11. Tighten bleed nipple once a flow of clean, air-free fluid is purged into container.

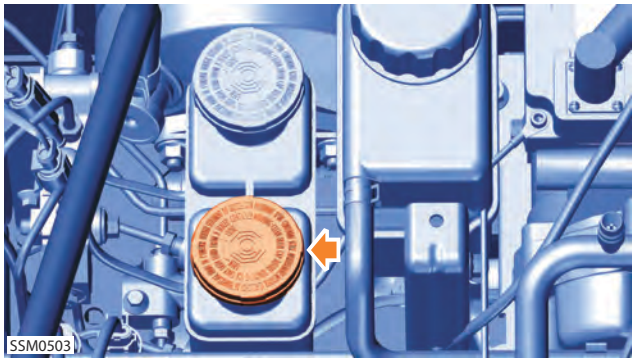
    Torque 15 Nm (11 lbf·ft).
12. Remove bleed container.
13. Clean any brake fluid from caliper.
14. Check for firm brake pedal pressure.

    NOTE: If pedal pressure feels spongy or has long travel, repeat bleed procedure.
15. Install rear wheel.
16. Remove pressure bleeder and adapter in accordance with manufacturer's instructions.
17. Remove the brake service tool from the brake combination valve and install the plastic cap.

    WARNING: Failure to remove the brake service tool will prevent the brake system from working correctly.
18. Check and top-up brake fluid level if required.
19. Install brake fluid reservoir cap.
20. Install maintenance panel.

Front brake system bleed

1. Remove both front wheels.
2. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*
3. Install the brake service tool in the brake combination valve.



4. Clean area surrounding front brake fluid reservoir cap and remove cap.

   CAUTION: If brake fluid is spilt on the paintwork wash off immediately with clean water.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
5. Attach pressure bleeder adapter to brake fluid reservoir ensuring a tight seal.
6. Fill pressure bleeder reservoir with the correct brake fluid meeting DOT 4 specification.

   WARNING: Only use new fluid from an airtight container. Fluid from open containers or fluid previously bled from the system will have absorbed moisture, which will adversely affect performance and must not be used.

   NOTE: Make sure there is sufficient brake fluid to replace all fluid used during bleed procedure.
7. Follow the manufacturer instructions on how to use the pressure bleeder system.

SSM0116

8. Connect brake bleed container to LH front caliper bleed nipple using a clear hose.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.

9. Loosen bleed nipple one quarter turn counterclockwise.
10. Tighten bleed nipple once a flow of clean, air-free fluid is purged into container.

    Torque 18 Nm (13 lbf·ft).
11. Remove bleed container.
12. Clean any brake fluid from caliper.
13. Repeat bleed procedure for RH front brake caliper.
14. Check for firm brake pedal pressure.

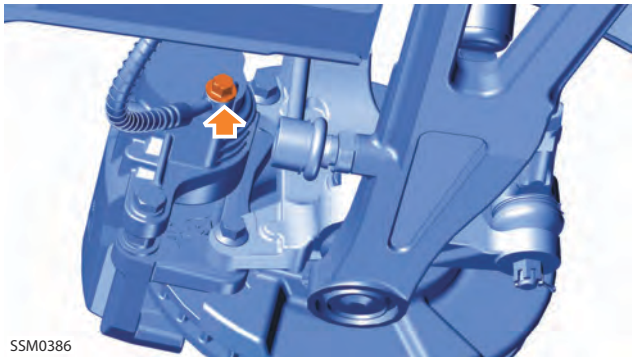
    NOTE: If pedal pressure feels spongy or has long travel, repeat bleed procedure.
15. Install front wheels.
16. Remove pressure bleeder and adapter in accordance with manufacturer's instructions.
17. Remove the brake service tool from the brake combination valve and install the plastic cap.

    WARNING: Failure to remove the brake service tool will prevent the brake system from working correctly.
18. Check and top-up brake fluid level if required.
19. Install brake fluid reservoir cap.
20. Install maintenance panel.

Brake Caliper - Front

Remove

1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*

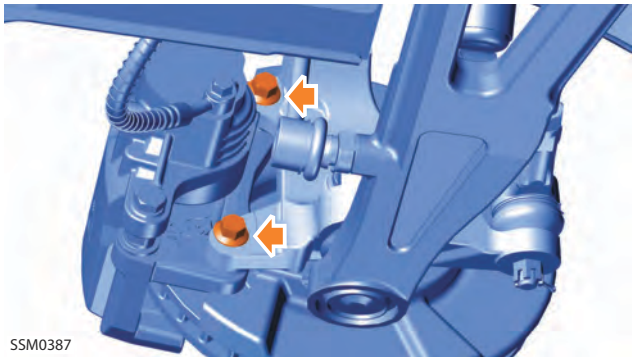

SSM0386

2. Remove banjo bolt securing brake hose to caliper and discard sealing washers (x2).
   Torque 25 Nm (18 lbf·ft).

   CAUTION: Always install new sealing washers during installation.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
3. Plug hose connection to prevent excess fluid loss and the ingress of moisture or dirt.

   CAUTION: Do not clamp the brake hose as it will be damaged and require replacing.


SSM0387

4. Remove bolts (x2) securing front caliper to front knuckle.
   Torque 65 Nm (48 lbf·ft).

   NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.
5. Remove front caliper.

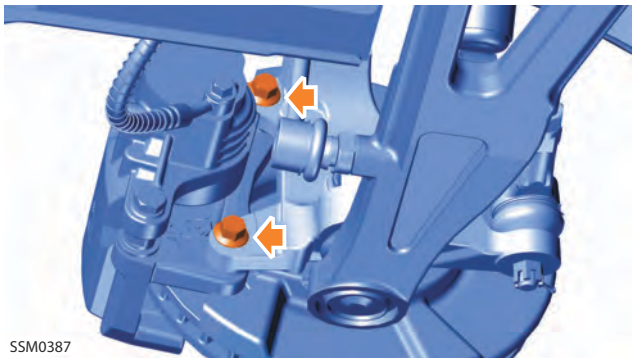
Installation

1. Installation procedure is reverse of removal except for the following actions.
2. Clean mating faces of brake caliper and upright to ensure there is no dirt/grit between the components.
3. Bleed brake system. Refer to *"Brake Bleed - System", page 7-1.*

Brake Pads - Front

Removal

1. Remove front wheel. Refer to *"Wheel - Front", page 8-1.*



SSM0387

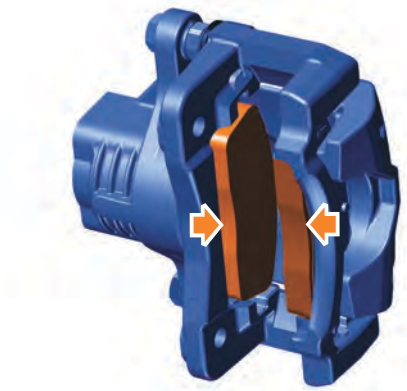
2. Remove bolts (x2) securing front caliper to front knuckle.

   Torque 65 Nm (48 lbf·ft).

   NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.

3. Remove front caliper and tie aside.

   CAUTION: Do not allow the caliper to hang by the brake hose.



SSM0123

4. Remove brake pads from caliper.

   NOTE: The brake pad with the wear indicator should be positioned against the inside face of the rotor.

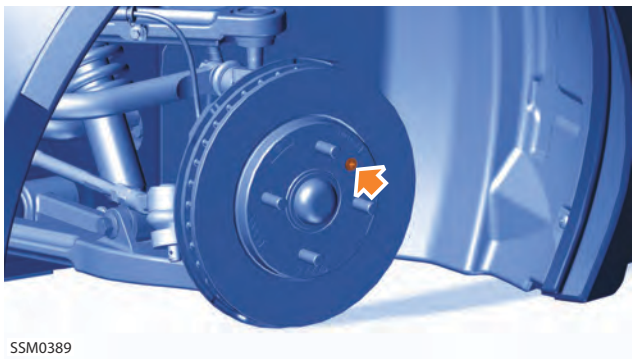
Installation

1. Installation procedure is reverse of removal except for the following:
2. Remove cap from brake reservoir and position an absorbent cloth to absorb any excess fluid loss.
3. Thoroughly clean the inside of the brake caliper and guide pins to remove any build-up of brake dust.
4. Apply silicone brake lubricant to guide pins.
5. Apply a small amount of anti-squeal grease on the contact faces of the brake pad and caliper to ensure smooth operation.
6. After installation, check and adjust brake fluid level.

Brake Rotor - Front

Remove

1. Remove front brake caliper and tie aside. Refer to "Brake Caliper - Front", page 7-4.


SSM0389

2. Remove screw securing brake rotor to hub.
   Torque 8 Nm (6 lbf·ft).
3. Remove brake rotor from hub.

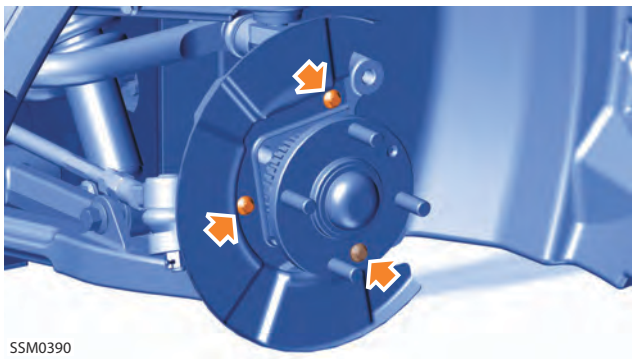
Installation

1. Installation procedure is reverse of removal.

Brake Backing Plate - Front

Removal

1. Remove front brake rotor. Refer to "Brake Rotor - Front", page 7-6.


SSM0390

2. Remove bolts (x3) securing brake backing plate to knuckle.
   Torque 8 Nm (6 lbf·ft).

   NOTE: When installing, apply Loctite® 222 retaining compound to bolt/screw threads.
3. Remove brake backing plate.

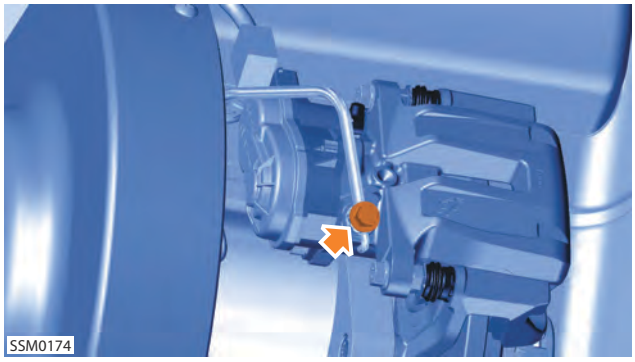
Installation

1. Installation procedure is reverse of removal.

Brake Caliper - Rear

Remove

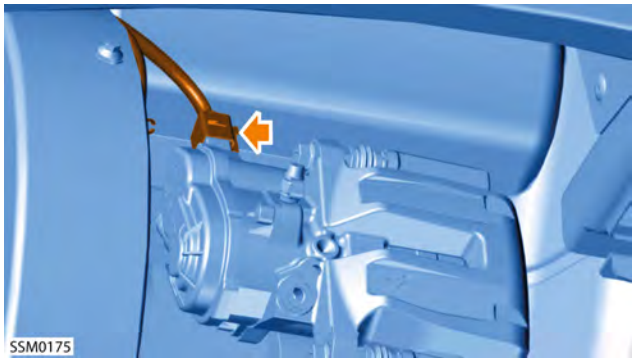
1. Remove rear wheel. Refer to "Wheel - Rear", page 8-1.
2. Release parking brake.



3. Remove banjo bolt securing brake pipe to caliper and discard sealing washers (x2).
   Torque 25 Nm (18 lbf·ft).

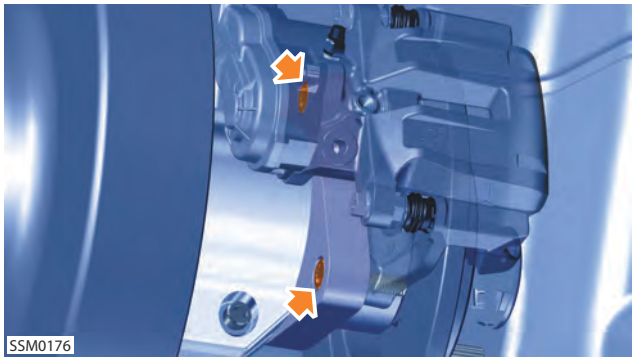
   CAUTION: Always install new sealing washers during installation.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
4. Plug pipe connection to prevent excess fluid loss and the ingress of moisture or dirt.



5. Disconnect harness connector from parking brake.

   NOTE: Press down on connector retaining clip and pull upward.



6. Remove bolts (x2) securing rear caliper to swing arm.
   Torque 60 Nm (44 lbf·ft).

   NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.
7. Remove rear caliper.

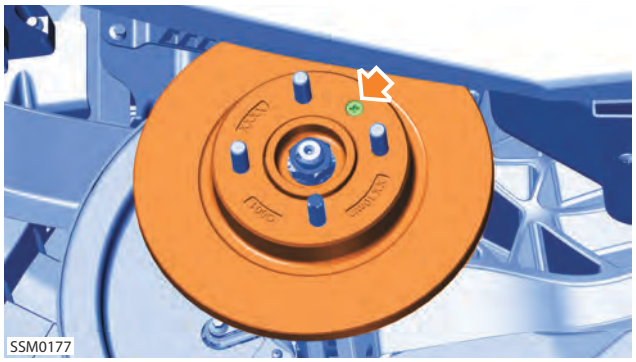
Installation

1. Installation procedure is reverse of removal except for the following actions.
2. Clean mating faces of brake caliper and swing arm to ensure there is no dirt/grit between the components.
3. Bleed brake system. Refer to "Brake Bleed - System", page 7-1.

Brake Rotor - Rear

Remove

1. Remove rear brake caliper and tie aside.
   Refer to *"Brake Caliper - Rear", page 7-7.*



2. Remove screw securing brake rotor to hub.
   Torque 8 Nm (6 lbf·ft).
3. Remove brake rotor from hub.

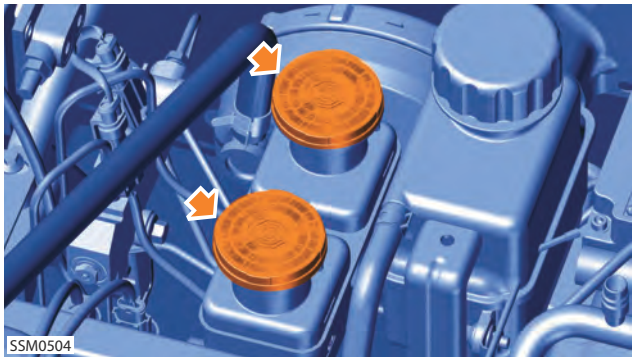
Installation

1. Installation procedure is reverse of removal.

Master Cylinder

Remove

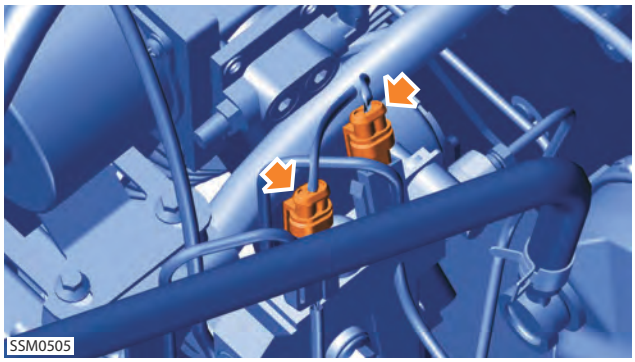
1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



2. Remove brake fluid reservoir caps (x2).
3. Using a syringe, remove all fluid from the reservoirs.

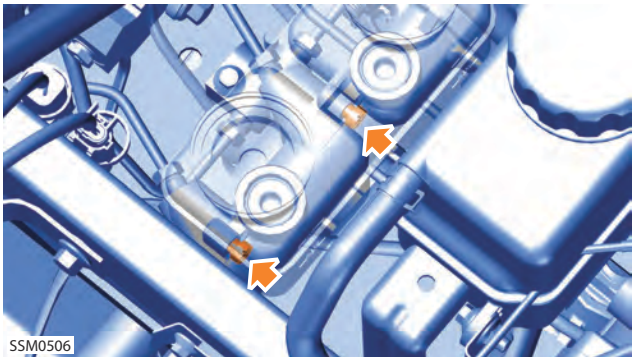
   CAUTION: If brake fluid is spilt on the paintwork wash off immediately with clean water.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.



4. Disconnect harness connectors (x2) from brake fluid level sensors.
5. Release washer fluid reservoir from mounting bracket and position aside.

   NOTE: This provides access to underside of brake fluid reservoir.

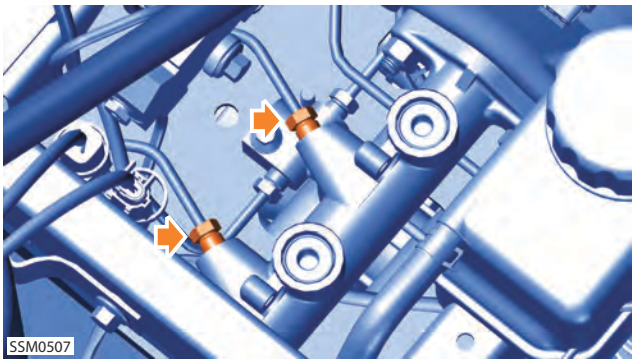


6. Remove screws (x2) securing brake fluid reservoirs to brake master cylinder.

   Torque 18 Nm (13 lbf·ft).

7. Pull fluid reservoirs upwards to release from seals on master cylinder and remove.

   CAUTION: Plug pipe connections to prevent ingress of moisture or dirt.

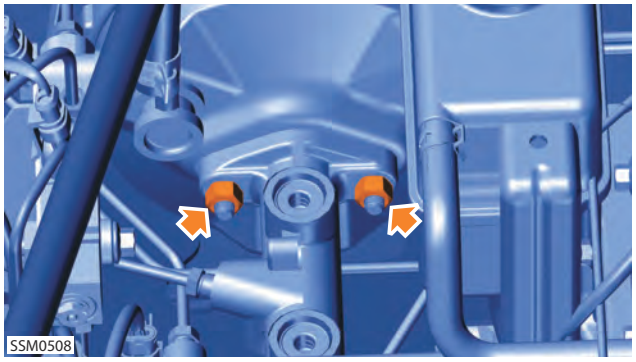


8. Loosen and disconnect brake pipe unions (x2) from master cylinder.

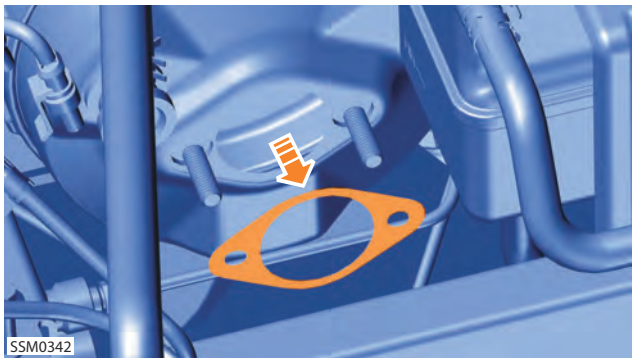
   Torque 8 Nm (6 lbf·ft).

   CAUTION: Plug pipe connections to prevent ingress of moisture or dirt.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage



9. Remove nuts (x2) securing master cylinder to bulkhead.
   Torque 18 Nm (13 lbf·ft).
10. Remove master cylinder.



11. Remove and discard seal between master cylinder and brake servo.

Installation

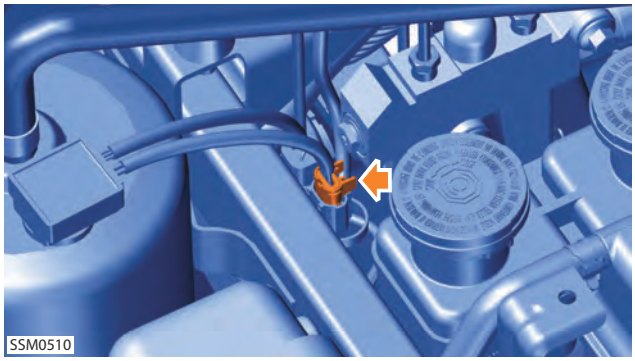
1. Installation procedure reverse of removal except for the following.

   NOTE: Clean component mating faces, prior to installation.
2. Install new seal between master cylinder and brake servo.
3. Lubricate seals on master cylinder with brake fluid before installing fluid reservoirs.
4. Bleed brake system. Refer to *"Brake Bleed - System", page 7-1.*

Brake Vacuum Pump

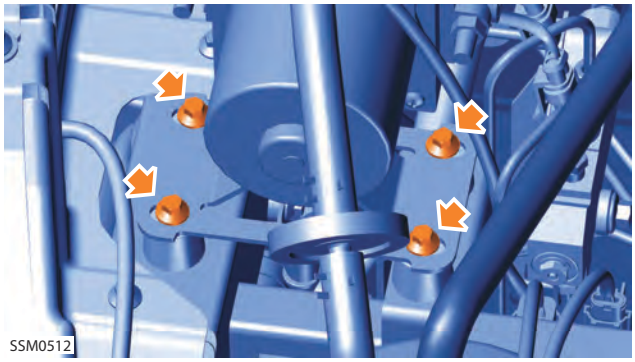
Removal

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



2. Disconnect harness connector from vacuum pump.

3. Release clip and disconnect vacuum hose from vacuum tank.



4. Remove bolts (x4) securing vacuum pump to body.
   Torque 8 Nm (6 lbf·ft).
5. Remove vacuum pump and collect rubber mounts (x4).

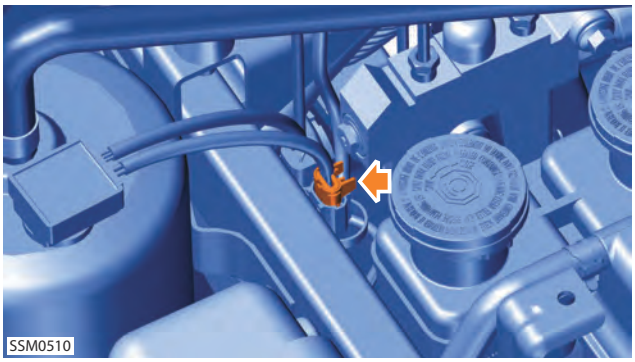
Installation

1. Installation procedure is reverse of removal.

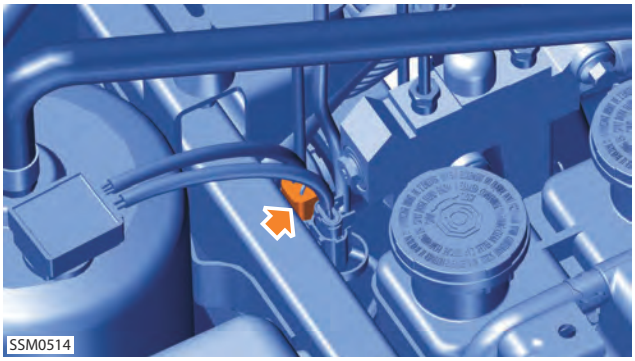
Brake Vacuum Tank

Removal

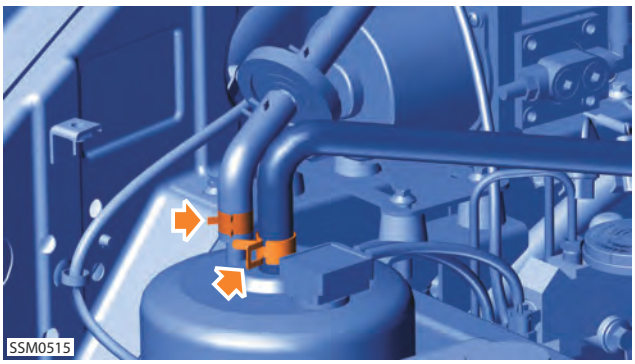
1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



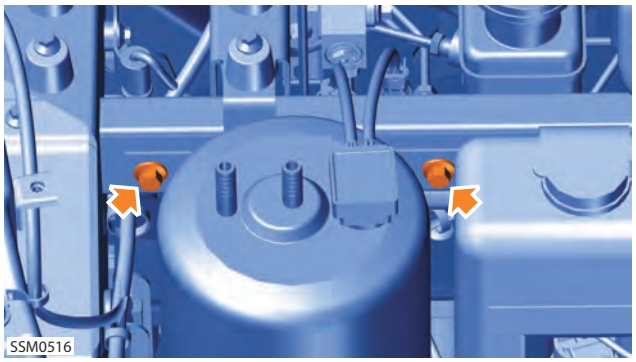
2. Disconnect harness connector from vacuum pump.



3. Disconnect harness connector from vacuum pressure sensor.



4. Release clip and disconnect vacuum hose from vacuum pump.
5. Release clip and disconnect vacuum hose from brake servo.



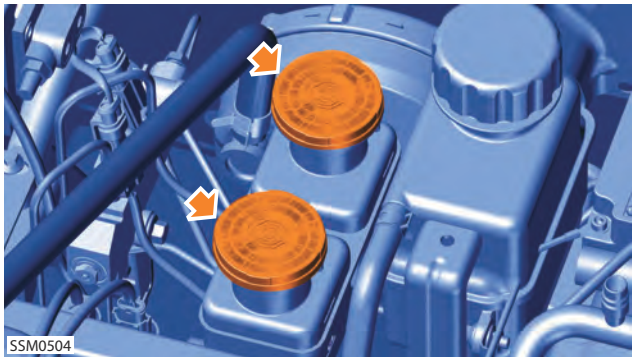
6. Remove bolts (x2) securing vacuum tank to body.
   Torque 18 Nm (13 lbf·ft).
7. Remove vacuum tank.

Installation

1. Installation procedure is reverse of removal.

Brake Combination Valve

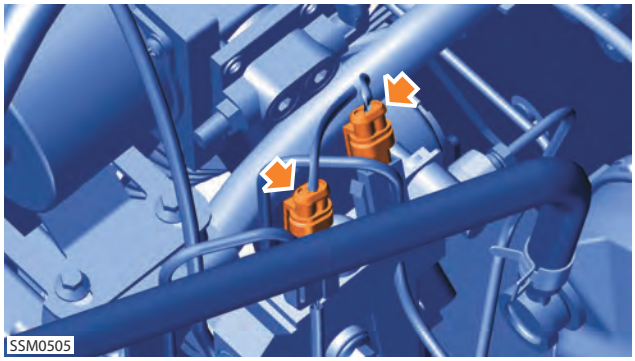
Removal



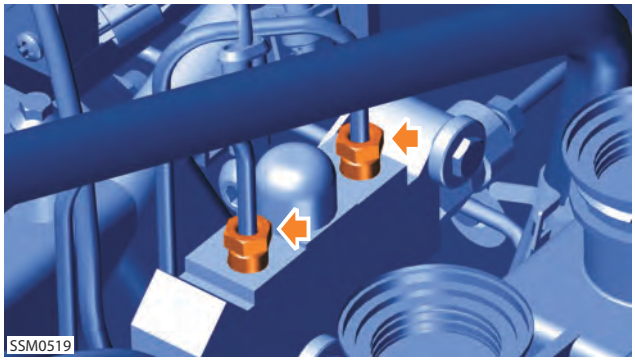
1. Remove brake fluid reservoir caps (x2).
2. Using a syringe, remove all fluid from the reservoirs.

   CAUTION: If brake fluid is spilt on the paintwork wash off immediately with clean water.

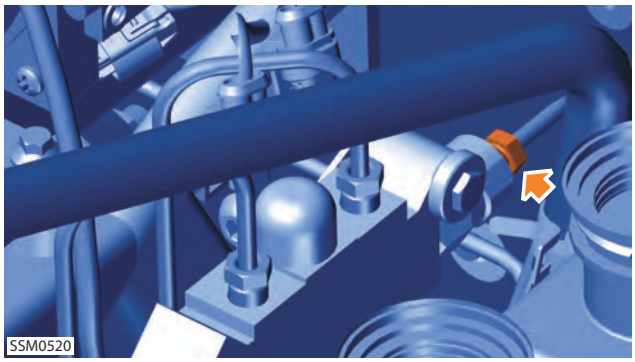
   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.



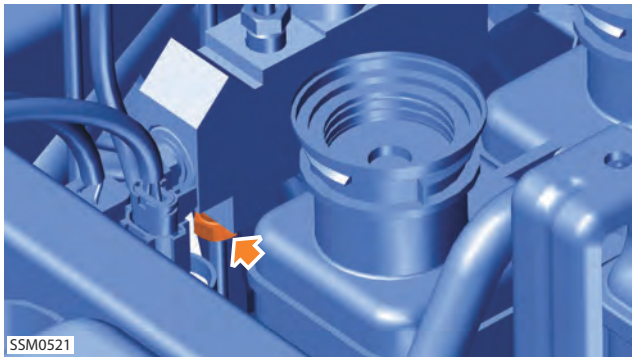
3. Disconnect harness connectors (x2) from brake fluid level sensors.
4. Place suitable absorbent material under brake combination valve to absorb any fluid spillage.



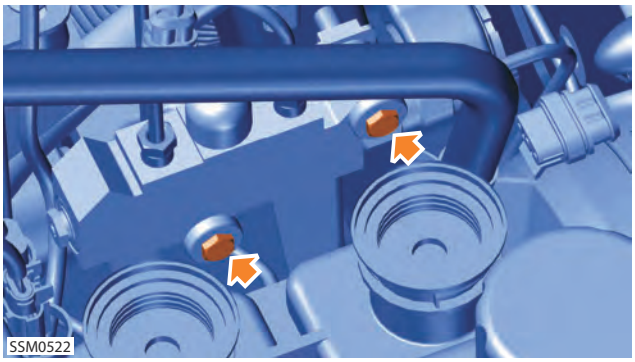
5. Loosen unions securing brake pipes (x2) from master cylinder to brake combination valve.
   Torque 18 Nm (13 lbf·ft).



6. Loosen union securing rear brake pipe to rear outlet on brake combination valve.
   Torque 18 Nm (13 lbf·ft).



7. Loosen union securing front brake pipe to outlet on bottom of brake combination valve.
   Torque 18 Nm (13 lbf·ft).



8. Remove bolts (x2) securing brake combination valve to mounting bracket.
   Torque 18 Nm (13 lbf·ft).
9. Disconnect brake pipes and remove brake combination valve.
10. Plug hose connections to prevent excess fluid loss and the ingress of moisture or dirt.

Installation

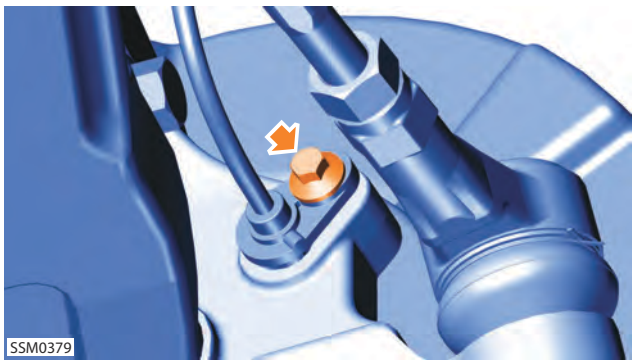
1. Installation procedure is reverse of removal except for the following actions.
2. Bleed brake system. Refer to *"Brake Bleed - System", page 7-1.*

Wheel Speed Sensor - Front

Removal

1. Raise and support vehicle. Refer to "*Lifting and Supporting the Vehicle*", page 2-1.

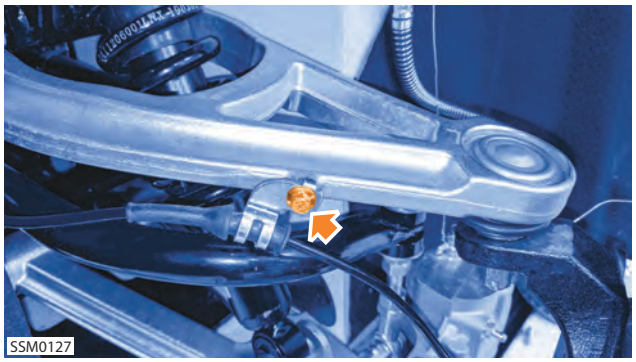
   WARNING: Do not work on an incorrectly supported vehicle.



2. Remove bolt securing wheel speed sensor to knuckle.

   Torque 8 Nm (6 lbf·ft).

3. Withdraw speed sensor from hub.



4. Remove bolt securing wheel speed sensor harness to upper suspension arm.

   Torque 8 Nm (6 lbf·ft).

5. Release wheel speed sensor harness from bracket on inner fender.

6. Disconnect harness connector from wheel speed sensor.
7. Remove wheel speed sensor.

Installation

1. Installation procedure is reverse of removal.

Wheel Speed Sensor - Rear

Removal

1. Raise and support vehicle. Refer to *"Lifting and Supporting the Vehicle", page 2-1.*

   WARNING: Do not work on an incorrectly supported vehicle.

2. Remove bolt securing wheel speed sensor to hub.

   Torque 8 Nm (6 lbf·ft).

3. Disconnect harness connector from wheel speed sensor.

   NOTE: Press down on connector retaining clip and pull outward.

4. Remove wheel speed sensor.

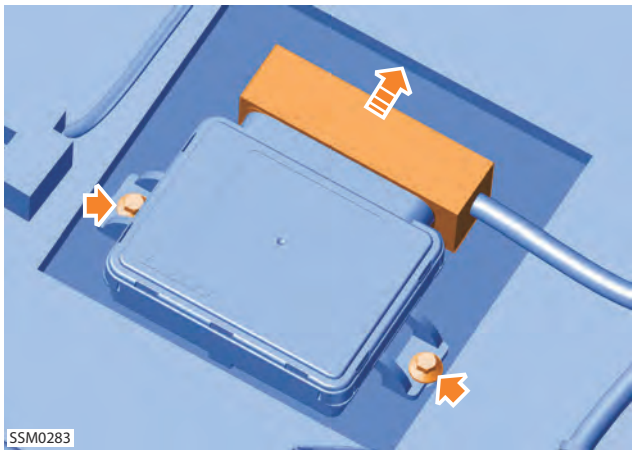
Installation

1. Installation procedure is reverse of removal.

Module - Electronic Parking Brake

Removal

1. Remove seat. Refer to *"Seat", page 1-1.*
2. Fold back access panel in carpet.



3. Remove bolts (x2) securing module to body.

   Torque 8 Nm (6 lbf·ft).

4. Disconnect harness connector from module.
5. Remove module.

Installation

1. Installation procedure is reverse of removal.

Wheel - Front

Remove

1. Before raising the vehicle, loosen nuts (x4) securing wheel to hub.
   Torque 109 Nm (80 lbf·ft).
2. Raise and support vehicle. Refer to *"Lifting and Supporting the Vehicle", page 2-1.*

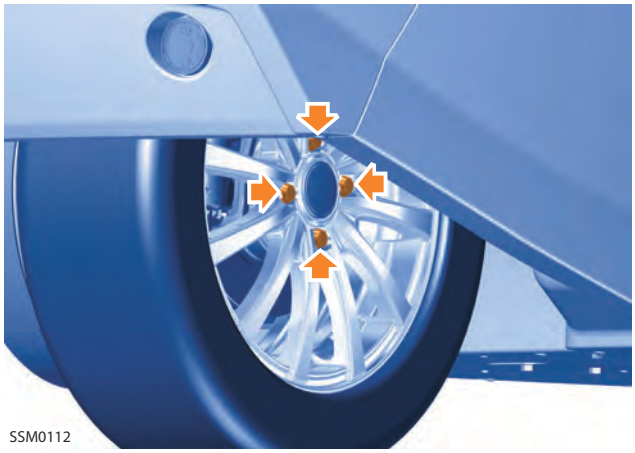
   WARNING: Do not work on an incorrectly supported vehicle.
3. Remove nuts (x4) securing wheel to hub.
4. Remove road wheel.

Installation

1. Installation procedure is reverse of removal.

Wheel - Rear

Remove



1. Before raising the vehicle, loosen nuts (x4) securing wheel to hub.
   Torque 109 Nm (80 lbf·ft).
2. Raise and support vehicle. Refer to *"Lifting and Supporting the Vehicle", page 2-1.*

   WARNING: Do not work on an incorrectly supported vehicle.
3. Remove nuts (x4) securing wheel to hub.
4. Remove road wheel.

Installation

1. Installation procedure is reverse of removal.

Drive Belt - Adjust

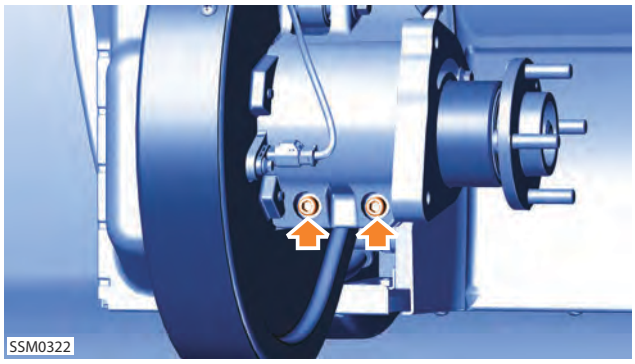
CAUTION: The drive belt tension should only be checked by using a Continental TensionRite® Belt Frequency Meter or a Gates Sonic U-508/U-507 Tension Meter. Incorrect adjustment of the drive belt can lead to premature wear or failure of the drive unit components.

Adjust

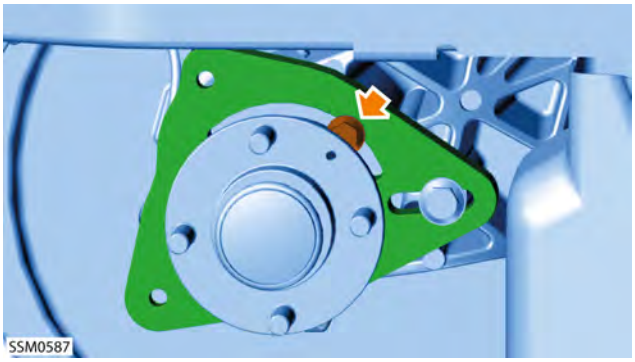
1. Remove LH rear side cover. Refer to *"Rear Side Cover", page 2-5.*
2. Remove rear brake rotor. Refer to *"Brake Rotor - Rear", page 7-8.*

3. Remove screw securing access panel to drive belt cover.
4. Remove access panel.
5. Check drive belt tension frequency through access panel opening.

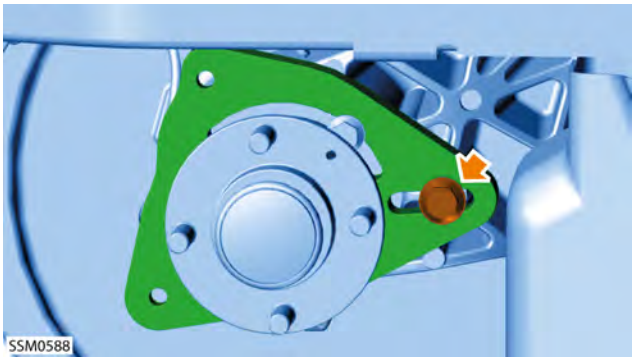
   NOTE: Follow instructions accompanied with frequency measurement tool.
6. If the drive belt tension does not fall between the range of 80Hz to 120Hz, it must be adjusted as follows.



7. Loosen bolts (x2) on swing arm clamping rear axle cylinder.

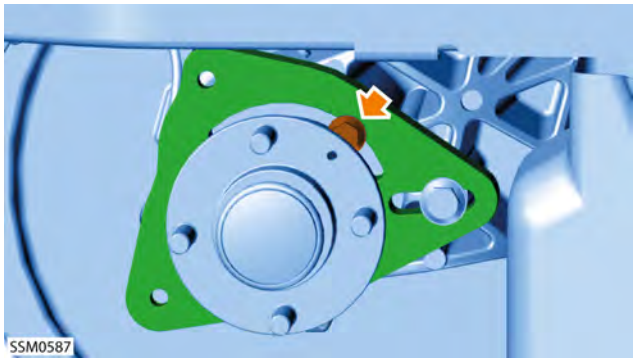


8. Loosen bolt securing brake caliper mounting bracket to rear axle cylinder.

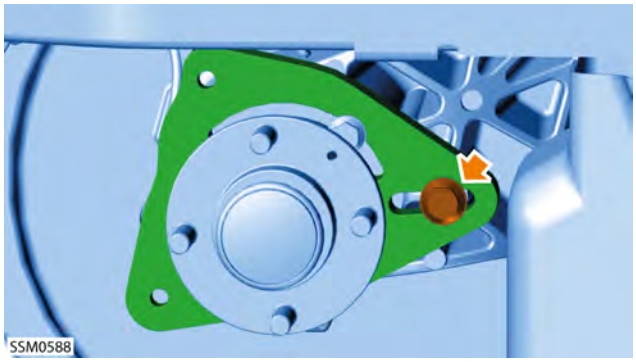


9. Loosen bolt securing brake caliper mounting bracket to swing arm.
10. Using a 120mm hook wrench or strap wrench, rotate rear axle cylinder to either tighten or loosen the drive belt.

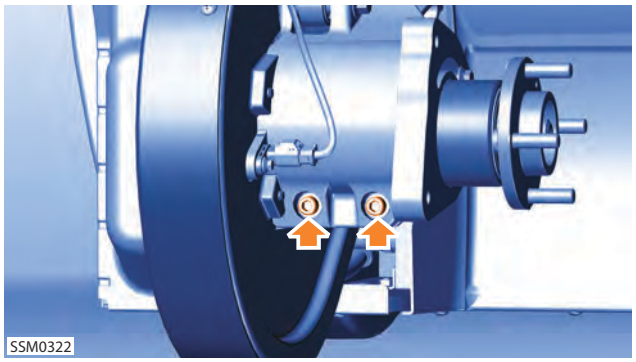
    NOTE: Rotate counterclockwise (viewed from RH side of vehicle) to loosen drive belt.
11. Rotate rear sprocket one revolution to make sure belt tension is applied evenly and repeat the measurement of belt tension.
12. Repeat tensioning and measuring until a belt frequency of 120Hz is achieved.



13. Tighten bolt securing brake caliper mounting bracket to rear axle cylinder.
    Torque 45 Nm (33 lbf·ft).



14. Tighten bolt securing brake caliper mounting bracket to swing arm.
    Torque 30 Nm (22 lbf·ft).

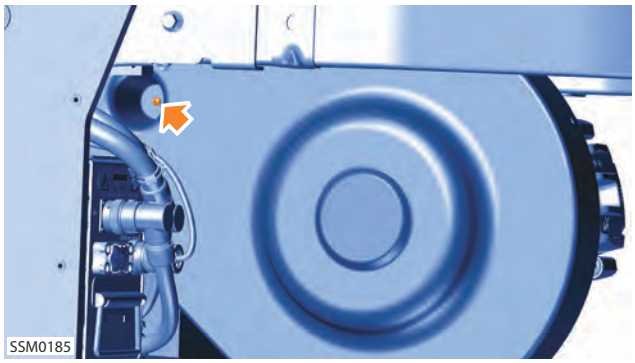


15. Tighten bolts (x2) on swing arm clamping rear axle cylinder.
    Torque 45 Nm (33 lbf·ft).
16. Install drive belt access panel and secure with screw.
17. Install rear brake caliper. Refer to *"Brake Caliper - Rear", page 7-7.*
18. Remove LH rear side cover. Refer to *"Rear Side Cover", page 2-5.*

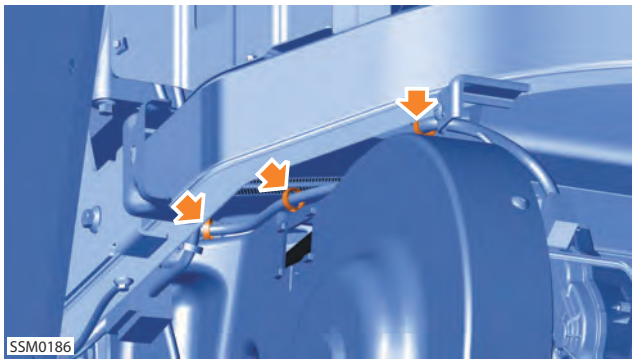
Drive Belt Cover

Removal

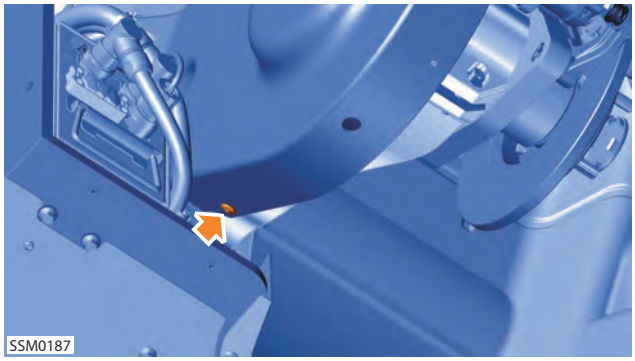
1. Remove rear spring/damper assembly. Refer to "Spring/Damper Assembly - Rear", page 6-8.
2. Remove LH rear closeout panel. Refer to "Closeout Panel - Rear - LH", page 2-13.



3. Remove center screw securing drive belt cover to housing.



4. Release clips (x3) securing harness to drive belt cover.
5. Using a floor jack positioned below the end of the swing arm, raise the swing arm to its uppermost position.



6. Remove screw securing drive belt cover to housing.
7. Remove drive belt cover.

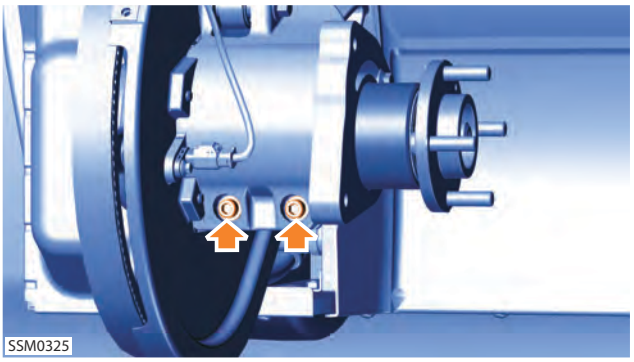
Installation

1. Installation procedure is reverse of removal.

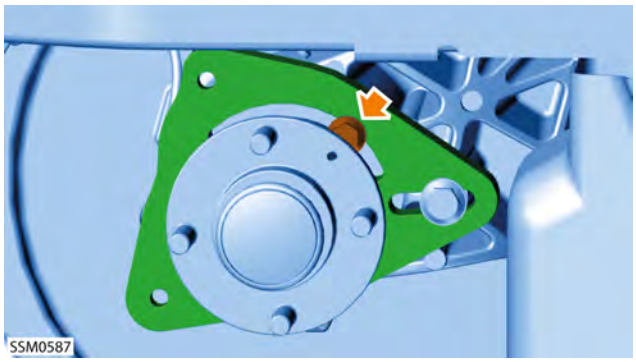
Drive Belt - Replace

Removal

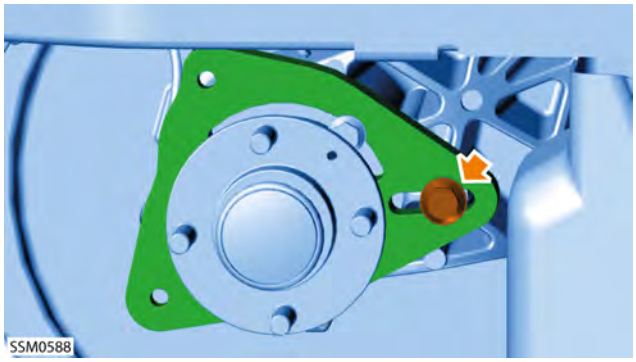
1. Remove drive belt cover. Refer to "Drive Belt Cover", page 9-3.
2. Remove rear brake rotor. Refer to "Brake Rotor - Rear", page 7-8.



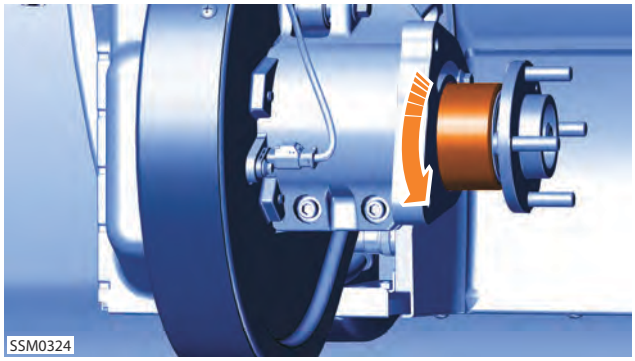
3. Loosen bolts (x2) on swing arm clamping rear axle cylinder.
   Torque 45 Nm (33 lbf·ft).



4. Loosen bolt securing brake caliper mounting bracket to rear axle cylinder.
   Torque 45 Nm (33 lbf·ft).



5. Loosen bolt securing brake caliper mounting bracket to swing arm.
   Torque 30 Nm (22 lbf·ft).



6. Using a collet wrench or strap wrench, rotate rear axle cylinder counterclockwise (viewed from RH side of vehicle) to loosen drive belt.
7. Remove drive belt.

Installation

1. Installation procedure is reverse of removal except for the following:
2. Inspect drive belt for any signs of damage (cracking or worn teeth) before installation, replace if necessary.
3. Install drive belt and rotate rear sprocket by hand to make sure belt is correctly aligned.
4. Adjust drive belt. Refer to "Drive Belt - Adjust", page 9-1.

   CAUTION: Make sure the drive belt is correctly engaged with the teeth on both sprockets before adjusting the drive belt tension.

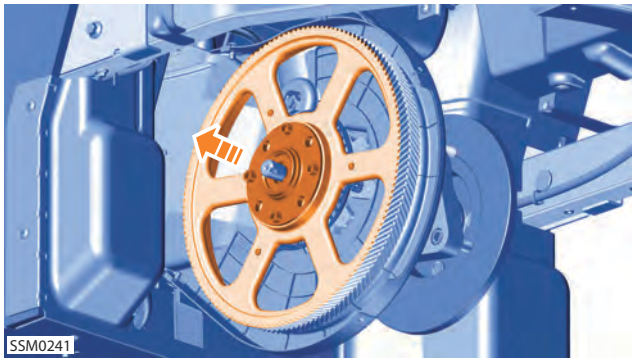
Rear Sprocket

Removal

1. Remove drive belt. Refer to *"Drive Belt - Replace", page 9-4.*

2. Remove and discard M30 nut securing rear sprocket on axle.
   - Initial torque 30 Nm (22 lbf·ft).
   - Second torque 70 Nm (52 lbf·ft).
   - Final torque 115 Nm (85 lbf·ft).

   WARNING: Always install a new axle nut. The nut must be staked on to the axle after tightening to the specified torque to prevent it from working loose.



3. Using a suitable puller, remove rear sprocket from axle.

Do not carry out further disassembly if component is removed for access only.

4. Remove bolts (x4) securing rear sprocket to hub.
   - Torque 23 Nm (17 lbf·ft).

   NOTE: When installing, apply Loctite® 242 retaining compound to bolt/screw threads.

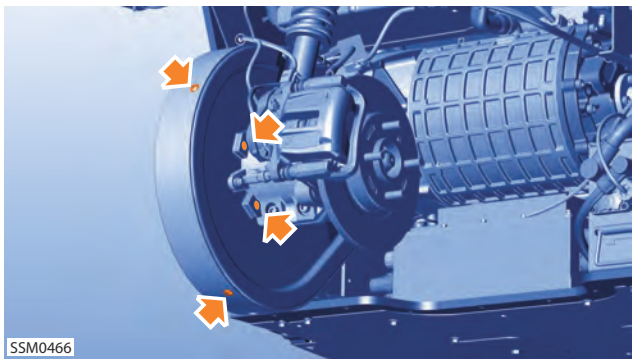
Installation

1. Installation procedure is reverse of removal except for the following:
2. Clean the mating faces of the rear sprocket and hub to make sure the components are flush fitting.

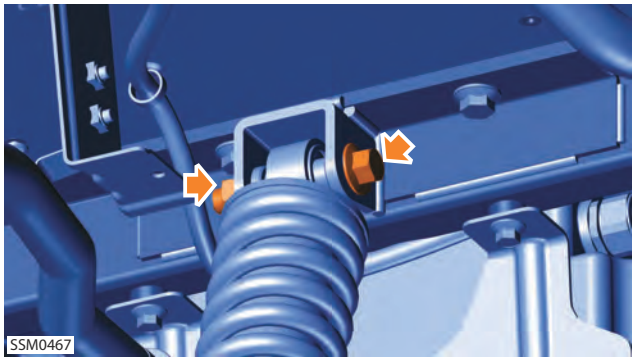
Drive Unit Assembly

Removal

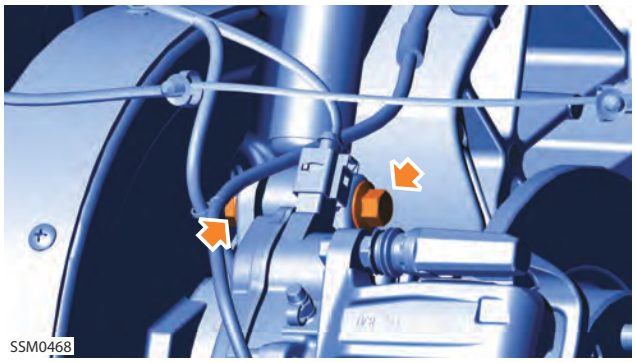
1. Release parking brake.
2. Remove rear crash structure. Refer to *"Crash Structure - Rear", page 2-25.*



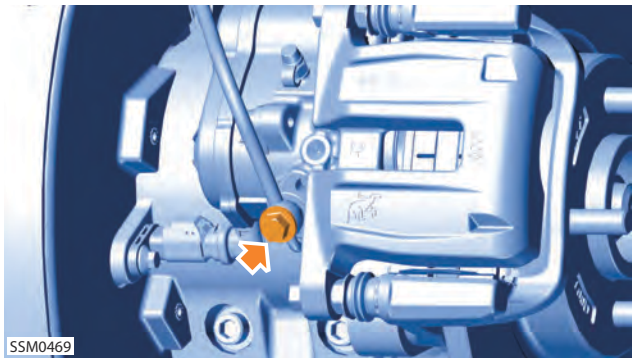
3. Remove screws (x4) securing drive belt cover to housing and swing arm.
4. Position a floor jack to support the end of the swing arm assembly.



5. Remove nut and bolt securing spring/damper assembly to body.
   Torque 95 Nm (70 lbf·ft).



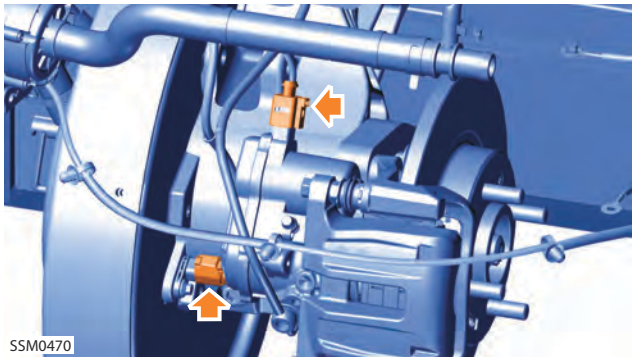
6. Remove nut and bolt securing spring/damper assembly to swing arm.
   Torque 95 Nm (70 lbf·ft).
7. Remove rear spring/damper assembly.



8. Remove banjo bolt securing brake pipe to rear brake caliper and discard sealing washers (x2).
   Torque 25 Nm (18 lbf·ft).

   CAUTION: Always install new sealing washers during installation.

   NOTE: Place suitable absorbent material around the affected area to absorb any possible fluid spillage.
9. Plug pipe connection to prevent excess fluid loss and the ingress of moisture or dirt.



10. Disconnect harness connector from parking brake.

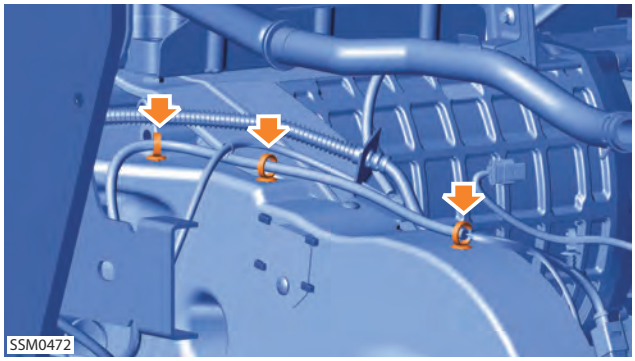
    NOTE: Press down on connector retaining clip and pull upward.
11. Disconnect harness connector from rear wheel speed sensor.

    NOTE: Press down on connector retaining clip and pull outward.

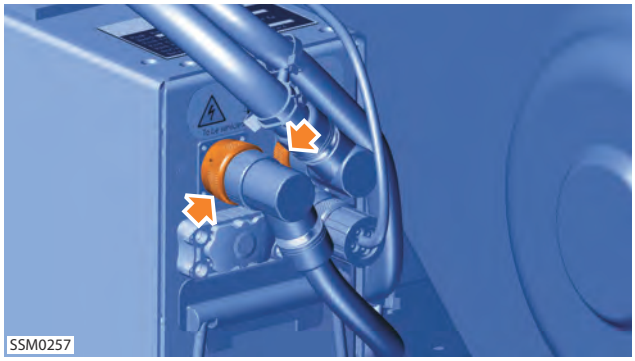
12. Remove bolt securing brake line bracket to swing arm.

    Torque 8 Nm (6 lbf·ft).

    NOTE: Two ground cables are also secured by this bolt. Make sure the cables are installed during reassembly.

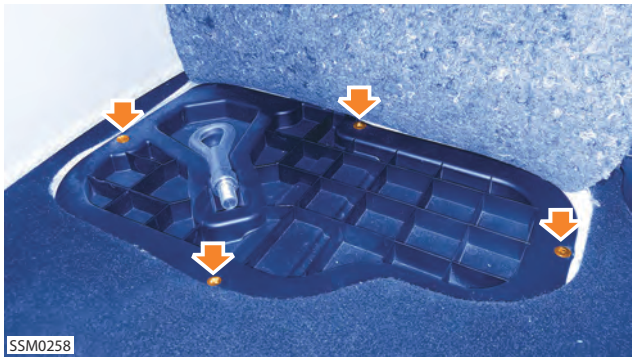


13. Using a trim removal tool, release fasteners (x3) securing harness to swing arm.

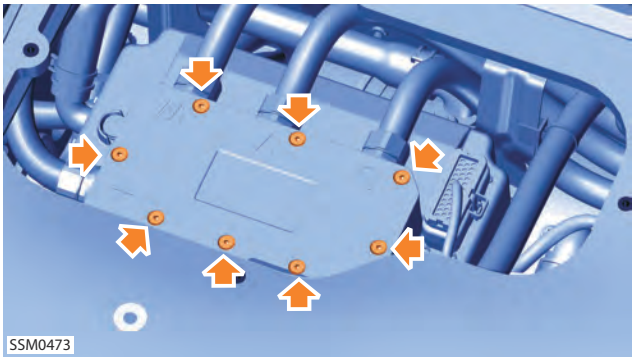


14. Rotate locking collar counterclockwise and disconnect **B-** high-voltage cables from both the LH and RH battery assemblies.
15. Rotate locking collar counterclockwise and disconnect **B+** high-voltage cables from both the LH and RH battery assemblies.

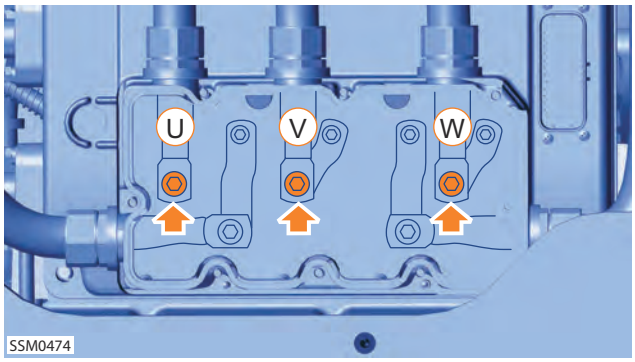
    NOTE: When reconnecting cables, ensure connector and collar are correctly aligned and then fully tighten collar clockwise.



16. Remove screws (x4) securing tow hook storage compartment to body.
17. Remove tow hook storage compartment from trunk.



18. Remove screws (x8) securing cover to drive motor controller.
19. Unscrew gland nuts securing cables to drive motor controller and withdraw cables.

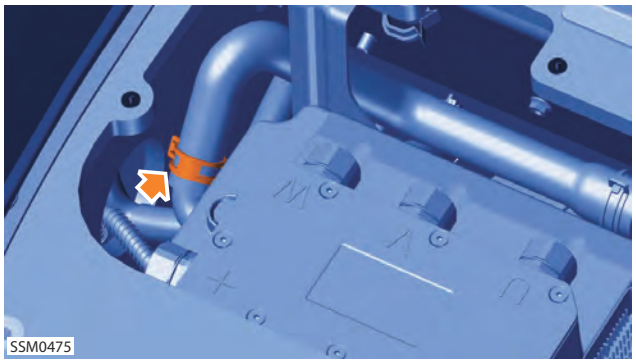


20. Taking note of installed positions, remove bolts (x3) securing motor **U**, **V**, and **W** phase cables to drive motor controller.

    Torque 12 Nm (9 lbf·ft).

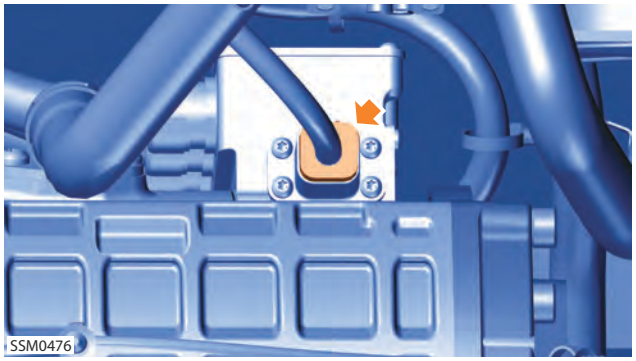
21. Unscrew gland nuts securing cables to drive motor controller and withdraw cables.

22. Install cover on drive motor controller and secure with screws to prevent the ingress of dirt and moisture.

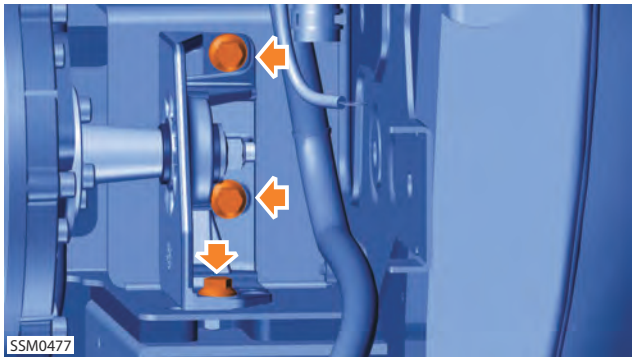


23. Release clamp and disconnect motor hose from drive motor controller.

⚠ *CAUTION: Plug hose connection to prevent ingress of foreign material.*



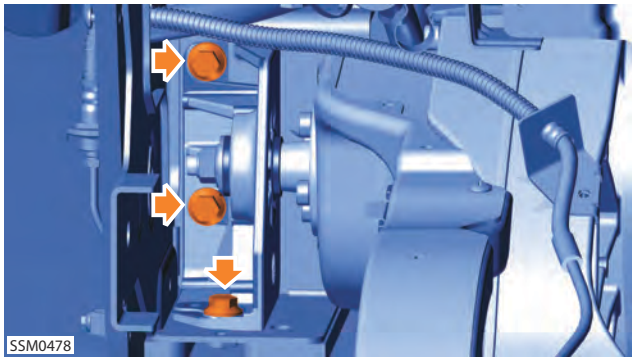
24. Disconnect the rear harness connector from the motor.



25. Remove bolts (x3) securing RH motor mounting bracket to body.

Torque 43 Nm (32 lbf·ft).

NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.

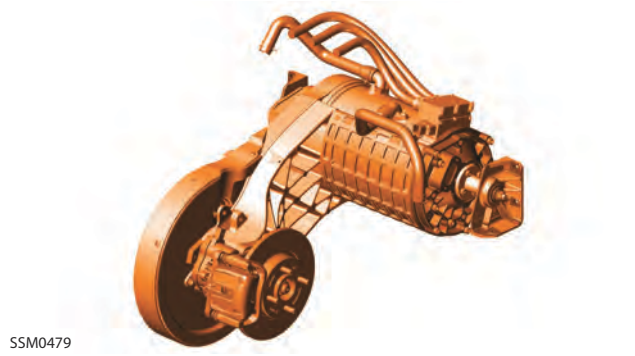


26. Remove bolts (x3) securing LH motor mounting bracket to body.

Torque 43 Nm (32 lbf·ft).

NOTE: Apply Loctite® 242 thread locking compound to bolt/screw threads on installation.

27. Position a transport dolly to support the rear drive unit assembly.



28. Using assistance, lift and slide the rear drive unit assembly onto the transport dolly and remove from vehicle.

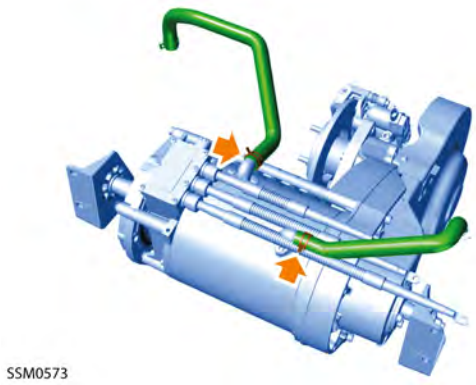
Installation

1. Installation procedure is reverse of removal except for the following:
2. Top-up rear cooling system. Refer to *"Coolant Drain and Refill - Rear", page 10-3.*
3. Bleed rear brakes. Refer to *"Brake Bleed - System", page 7-1.*

Drive Motor

Remove

1. Remove drive unit assembly.

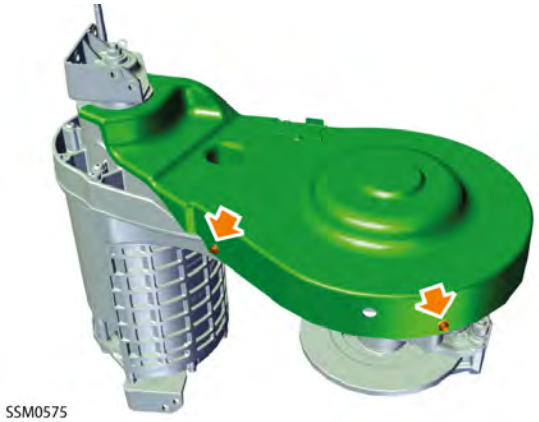


SSM0573

2. Release clip and disconnect inlet coolant hose from motor.
3. Release clip and disconnect outlet coolant hose from motor.

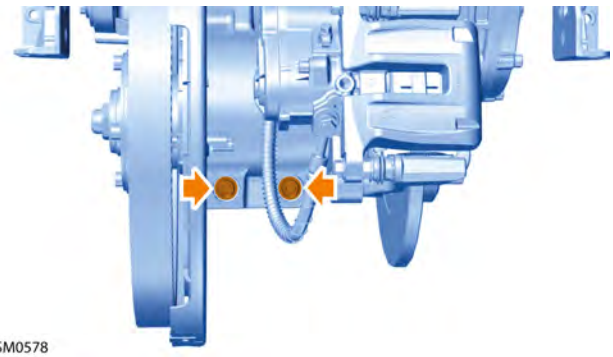
SSM0574

4. Remove bolts (x3) securing drive belt cover to swing arm.



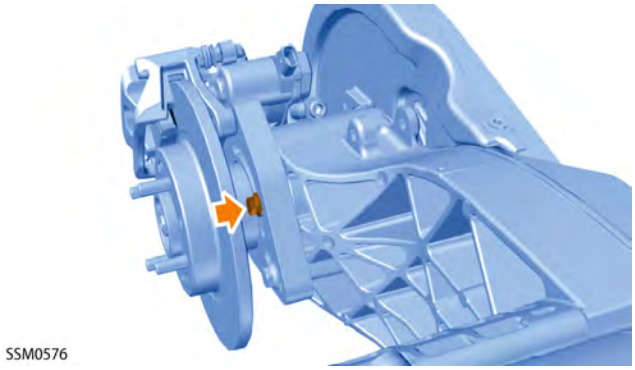
SSM0575

5. Remove bolts (x2) securing drive belt cover to swing arm.
6. Remove drive belt cover.



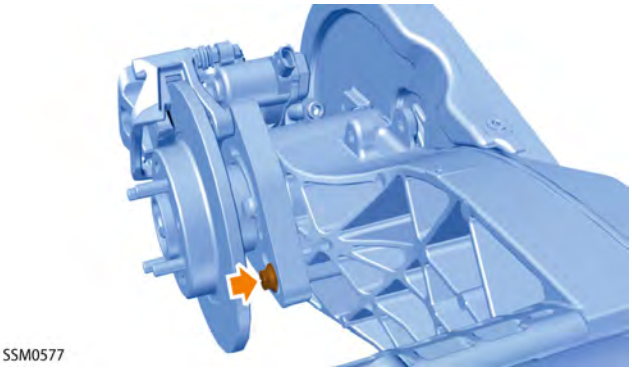
SSM0578

7. Loosen bolts (x2) on swing arm clamping rear axle cylinder.



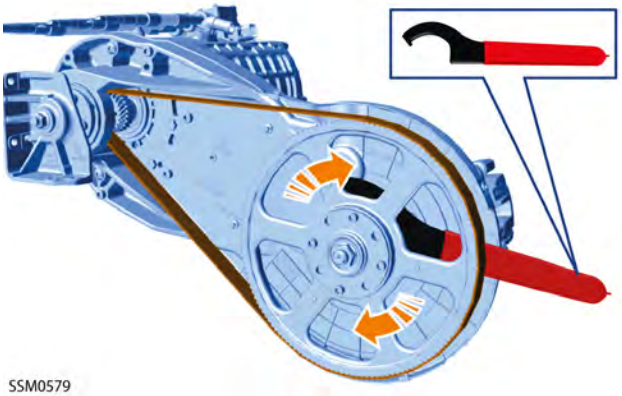
SSM0576

8. Loosen bolt securing brake caliper mounting bracket to rear axle cylinder.



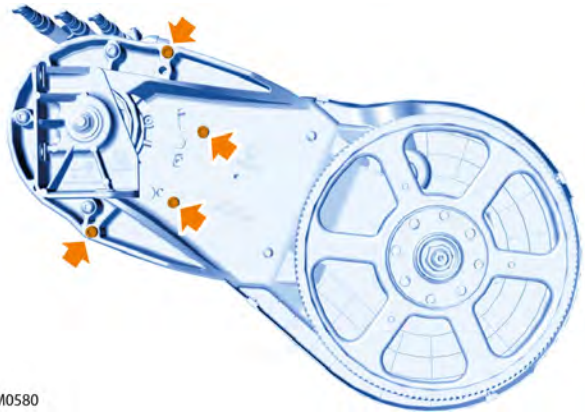
SSM0577

9. Loosen bolt securing brake caliper mounting bracket to swing arm.



SSM0579

10. Using a 120mm hook wrench, rotate rear axle cylinder clockwise to loosen the drive belt.
11. Remove drive belt.

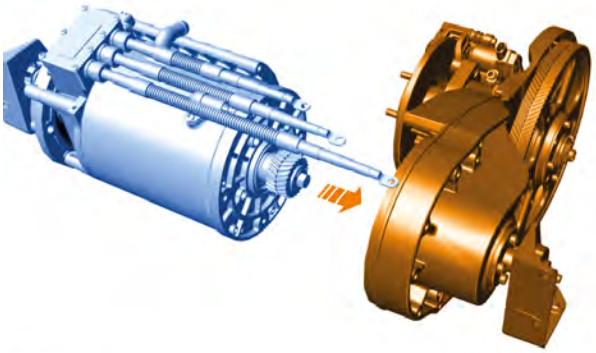


SSM0580

12. Remove bolts (x4) securing swing arm to drive motor housing.

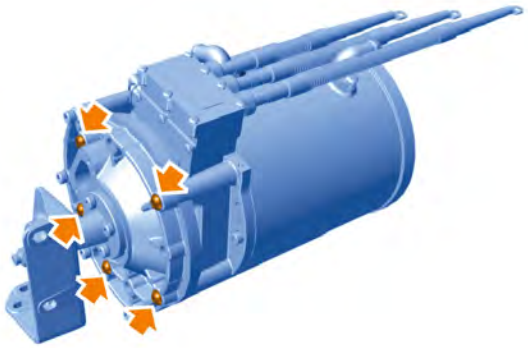
SSM0581

13. Remove bolts (x5) securing swing arm to drive motor.



SSM0582

14. Remove swing arm assembly.



SSM0583

15. Remove bolts (x5) securing drive motor housing to drive motor.

SSM0584

16. Remove drive motor housing from drive motor.

Do not carry out further dismantling if component is removed for access only.

SSM0585

17. Remove bolt securing drive sprocket to motor.

    NOTE: Use a strap wrench or an old drive belt to restrain drive sprocket.

18. Collect washer, locking washer and spacer.
19. Remove drive sprocket from motor.
20. Remove key from drive motor spindle.
21. Remove adjustment shim from spindle.

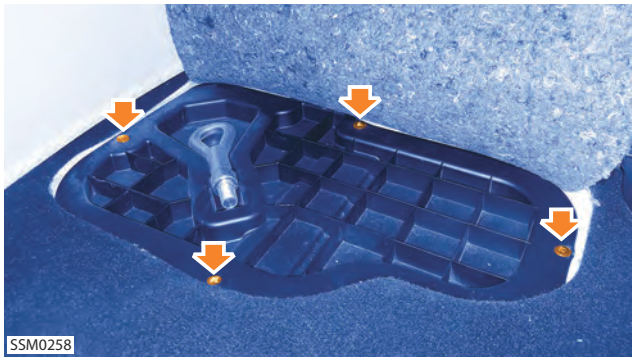
Installation

1. Installation procedure is reverse of removal.

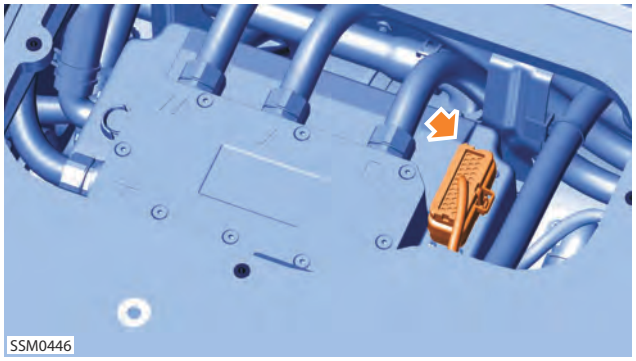
Drive Motor Controller

Removal

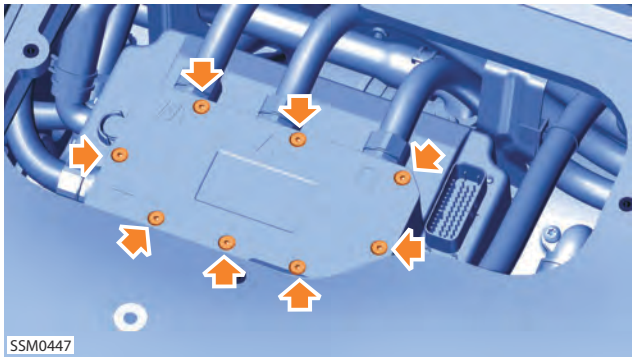
1. Disconnect high voltage batteries. Refer to *"High Voltage Batteries - Disconnect", page 12-1.*



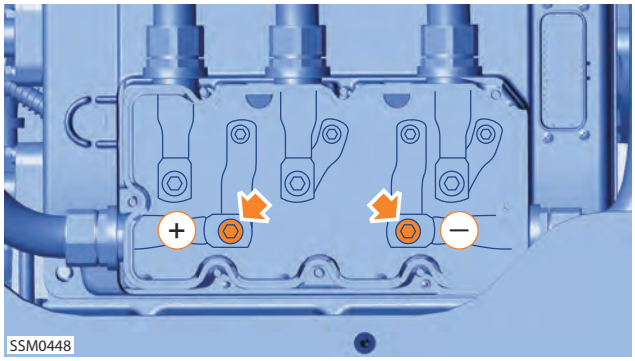
2. Remove screws (x4) securing tow hook storage compartment to body.
3. Remove tow hook storage compartment from trunk.



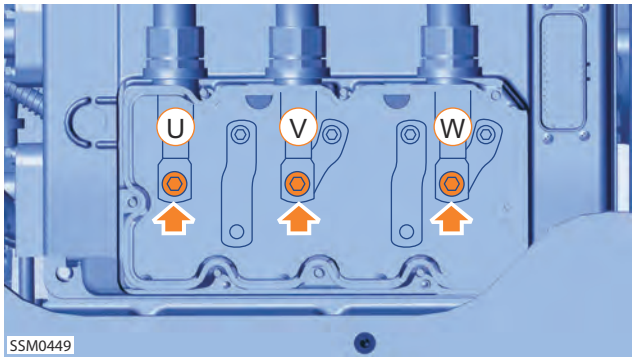
4. Disconnect harness connector from drive motor controller.



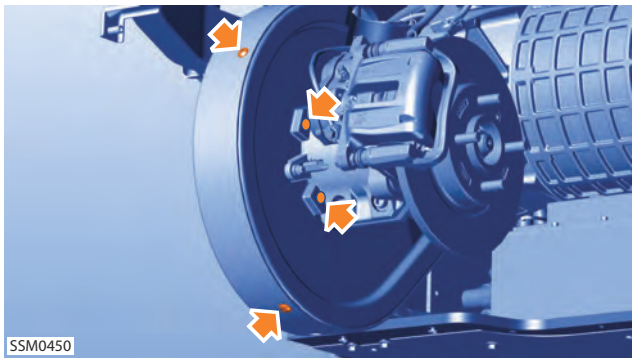
5. Remove screws (x8) securing cover to drive motor controller.



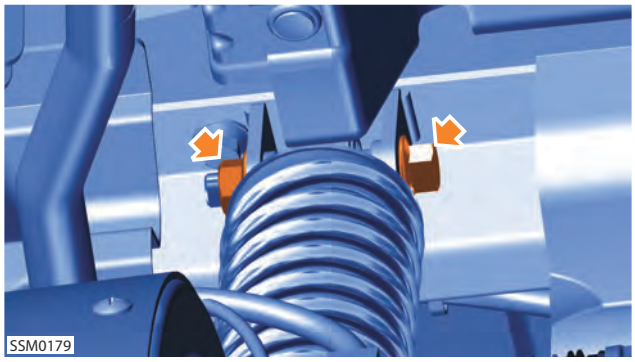
6. Remove bolt securing - cable to drive motor controller.
   Torque 12 Nm (9 lbf·ft).
7. Remove bolt securing + cable to drive motor controller.
   Torque 12 Nm (9 lbf·ft).
8. Unscrew gland nuts securing cables to drive motor controller and withdraw cables.



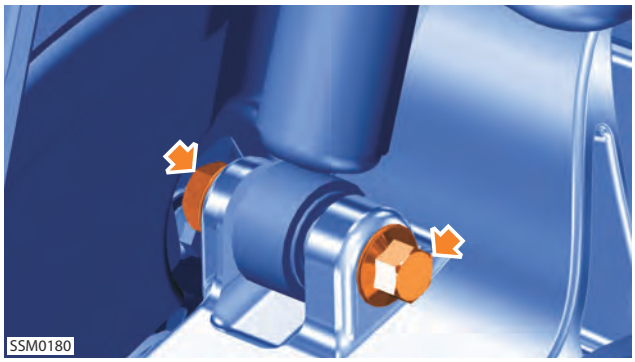
9. Taking note of installed positions, remove bolts (x3) securing motor **U**, **V**, and **W** phase cables to drive motor controller.
   Torque 12 Nm (9 lbf·ft).
10. Unscrew gland nuts securing cables to drive motor controller and withdraw cables.
11. Install cover on drive motor controller and secure with screws to prevent the ingress of dirt and moisture.



12. Remove screws (x4) securing drive belt cover to housing and swing arm.
13. Position a floor jack to support the end of the swing arm assembly.

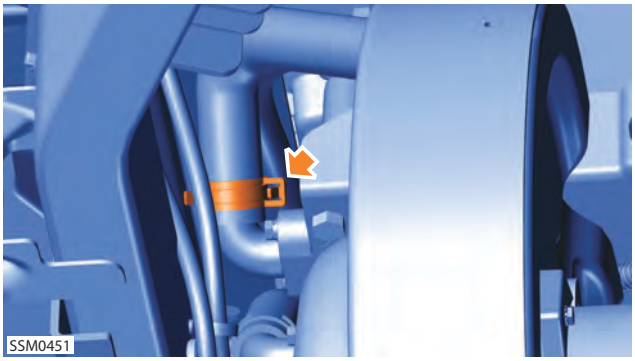


14. Remove nut and bolt securing spring/damper assembly to body.
    Torque 95 Nm (70 lbf·ft).



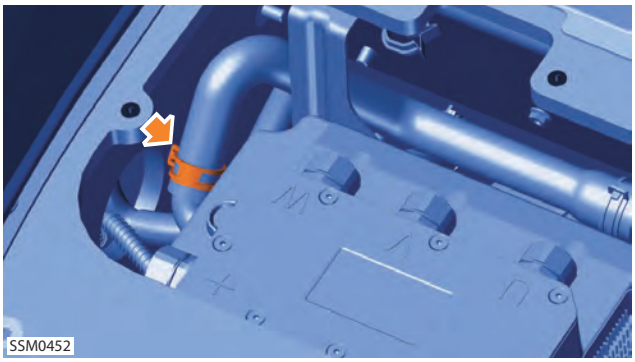
15. Remove nut and bolt securing spring/damper assembly to swing arm.
    Torque 95 Nm (70 lbf·ft).
16. Remove rear spring/damper assembly.
17. Lower swing arm to its lowest position but still supported by floor jack.
18. Position container to collect coolant loss from system.
19. Install hose pinch-off pliers to prevent excess coolant loss before disconnecting coolant hoses.

    CAUTION: Make sure the pinch-off pliers are positioned far enough back on the hose to not damage the outlet of the connected component, and to allow the hose clamp to be slid back along the hose.



20. Release clamp and disconnect coolant pump hose from drive motor controller.

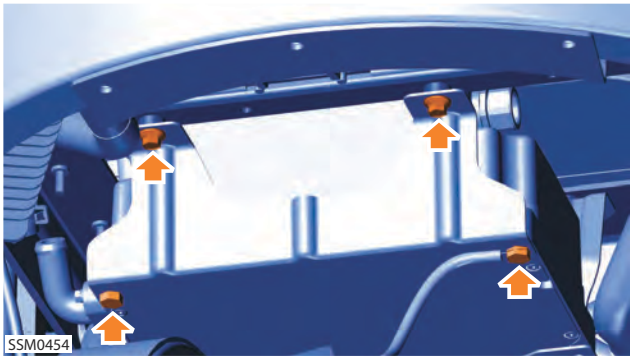
    CAUTION: Plug hose connection to prevent ingress of foreign material.



21. Release clamp and disconnect motor hose from drive motor controller.

    CAUTION: Plug hose connection to prevent ingress of foreign material.

22. Remove bolts (x2) securing drive motor controller to front mounting bracket.
    Torque 20 Nm (15 lbf·ft).



23. Remove bolts (x2) securing drive motor controller to rear mounting bracket.
    Torque 23 Nm (12 lbf·ft).

    NOTE: A ground cable is also secured by one of the bolts. Make sure this cable is installed during reassembly.

24. Supporting the drive motor controller, remove bolts (x2) securing rear mounting bracket to body.
    Torque 20 Nm (12 lbf·ft).
25. Remove rear mounting bracket.
26. Remove drive motor controller.

Installation

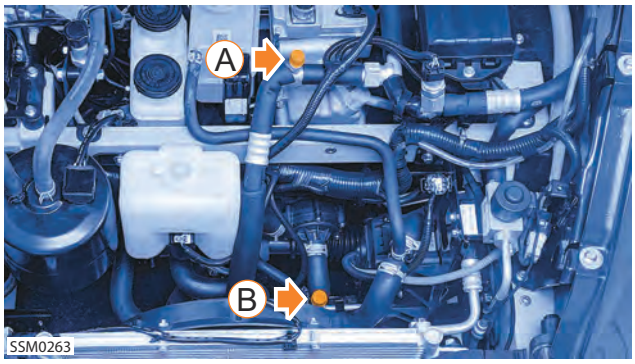
1. Installation procedure is reverse of removal except for the following:
2. Top-up rear cooling system. Refer to *"Coolant Drain and Refill - Rear", page 10-3.*

Refrigerant Recovery and Recharging

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

Recovery

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



A = High Pressure connection
B = Low Pressure Connection

2. Remove dust caps from high and low pressure air conditioning connectors.
3. Using an approved refrigerant recovery and recharging station, connect high and low pressure hoses to appropriate connections.
4. Open valves on connectors.
5. Turn valves on refrigerant station to correct positions.
6. Turn Process switch to correct position.
7. Turn Main switch to 'ON'.
8. Allow station to recover refrigerant from system.
9. Follow manufacturer's operating instructions for disconnecting the refrigerant recovery and recharging station.
10. Make a note of the amount of oil recovered from system.

Recharging

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

1. Follow manufacturer's operating instructions for operating the refrigerant recovery and recharging station.
2. Pour same quantity of refrigerant oil into oil charger as collected during recovery. If the following components have been renewed, add the following additional quantity of lubricating oil:
   - Condenser = 6g
   - Evaporator = 4g
   - Pipe or hose = 2g

   NOTE: Only use oil meeting RL68H specification.
3. Charge the system to using R134a refrigerant to 380g ± 20g (0.837 lbs ± 0.004 lbs).
4. Fit dust caps to air conditioning system connectors after recharging the system.

Coolant Drain and Refill - Front

CAUTION: Never Drive or Charge the vehicle without coolant in the system as this may damage the coolant heater.

NOTE: ElectraMeccanica recommend using a Coolant Vacuum Filler if available.

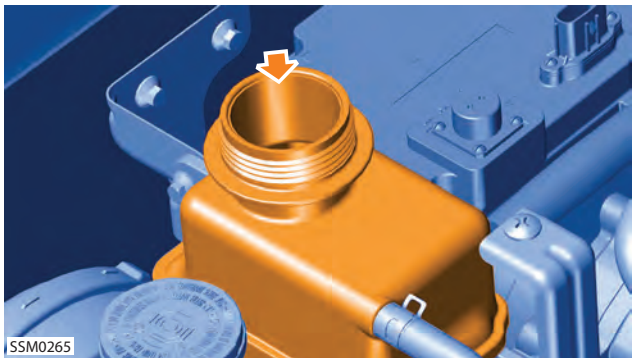
Drain

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*
2. Remove front skid plate. Refer to *"Front Skid Plate", page 2-6.*
3. Position container to collect coolant loss from system.
4. Remove reservoir filler cap.

5. Loosen and remove drain plugs (x2) from coolant hoses.
6. Allow coolant to drain.

Refill

1. Install and tighten drain plugs.



2. Slowly fill the coolant reservoir allowing the fluid level to settle before adding more fluid.

   *CAUTION: Only use a 50/50 mix of coolant meeting specification **TL 774-G (G12++)** and distilled water.*

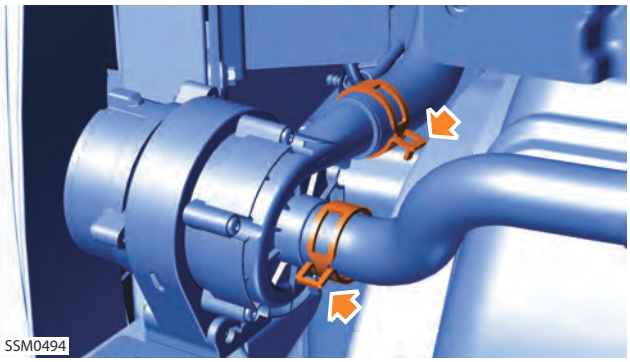
   NOTE: Gently squeezing and releasing the upper coolant hoses by hand will help to circulate the fluid around the system.
3. Fill the reservoir to the upper **MAX** mark.
4. Start the vehicle, this will allow the coolant pump to run and circulate the coolant.
5. Observe the coolant level in the reservoir and add fluid as required.
6. Allow the system to run for 10 minutes to make sure all air is bleed from the system.
7. Install reservoir filler cap.

Coolant Drain and Refill - Rear

NOTE: ElectraMeccanica recommend using a Coolant Vacuum Filler if available.

Drain

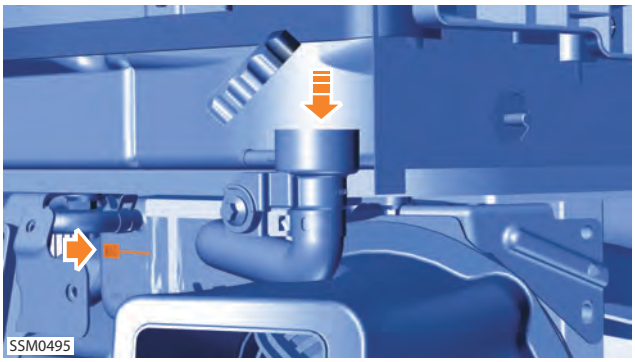
1. Remove rear bumper. Refer to *"Rear Bumper", page 2-4.*
2. Position container to collect coolant loss from system.
3. Remove reservoir filler cap.



4. Release clamp and disconnect radiator hose from coolant pump.
5. Release clamp and disconnect motor controller hose from coolant pump.
6. Allow coolant to drain.

Refill

1. Connect hoses to coolant pump and secure with clamps.



2. Slowly fill the coolant reservoir allowing the fluid level to settle before adding more fluid.

   ⚠ *CAUTION: Only use a 50/50 mix of coolant meeting specification* ***TL 774-G (G12++)*** *and distilled water.*

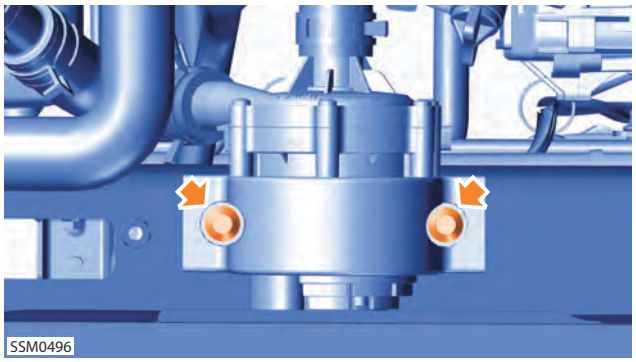
   NOTE: Gently squeezing and releasing the coolant hoses by hand will help to circulate the fluid around the system.
3. Fill the reservoir to the upper **MAX** mark.
4. Start the vehicle, this will allow the coolant pump to run and circulate the coolant.
5. Observe the coolant level in the reservoir and add fluid as required.
6. Allow the system to run for 10 minutes to make sure all air is bleed from the system.
7. Install reservoir filler cap.

Coolant Pump - Front

CAUTION: Never Drive or Charge the vehicle without coolant in the system as this may damage the coolant heater.

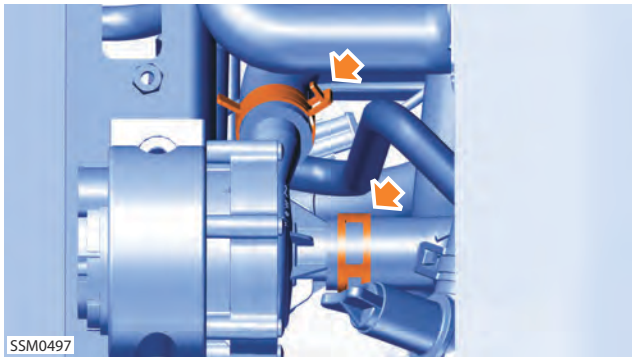
Removal

1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*
2. Remove front skid plate. Refer to *"Front Skid Plate", page 2-6.*

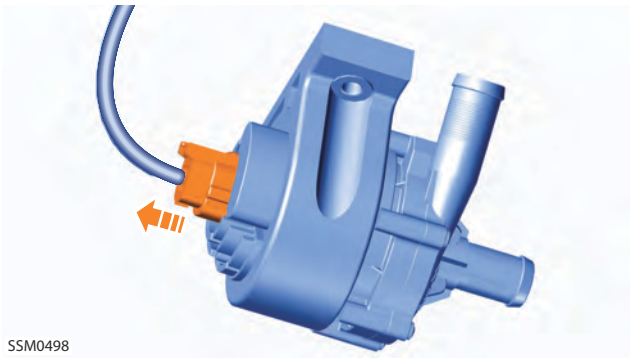

SSM0496

3. Remove bolts (x2) securing coolant pump to body.
   Torque 6 Nm (4.5 lbf·ft).
4. Position container to collect coolant loss from system.
5. Install hose pinch-off pliers to prevent excess coolant loss before disconnecting coolant hoses.

   CAUTION: Make sure the pinch-off pliers are positioned far enough back on the hose to not damage the outlet of the connected component, and to allow the hose clamp to be slid back along the hose.


SSM0497

6. Release clamp and disconnect PTC coolant heater hose from coolant pump.
7. Release clamp and disconnect coolant chiller hose from coolant pump.


SSM0498

8. Disconnect harness connector from coolant pump.
9. Remove coolant pump.

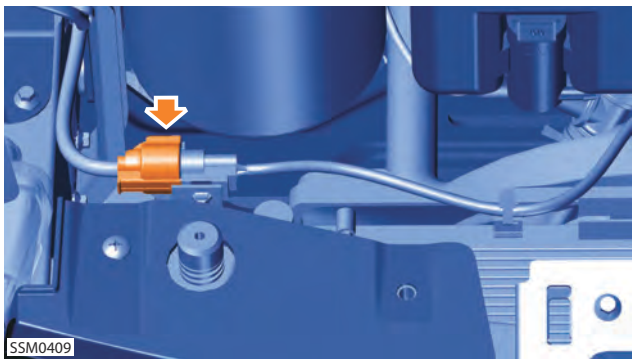
Installation

1. Installation procedure is reverse of removal except for the following:
2. Top-up front cooling system. Refer to *"Coolant Drain and Refill - Rear", page 10-3.*

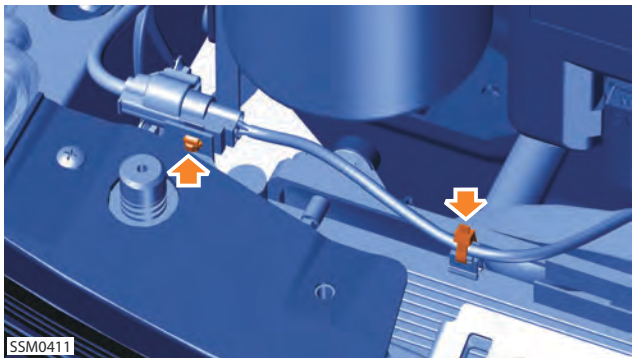
Condensor Cooling Fan

Removal

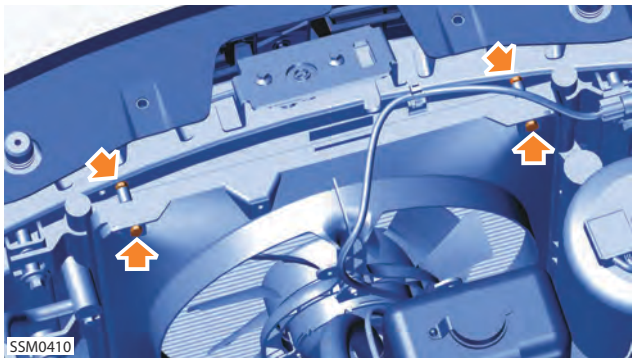
1. Remove maintenance panel. Refer to *"Maintenance Panel", page 2-12.*



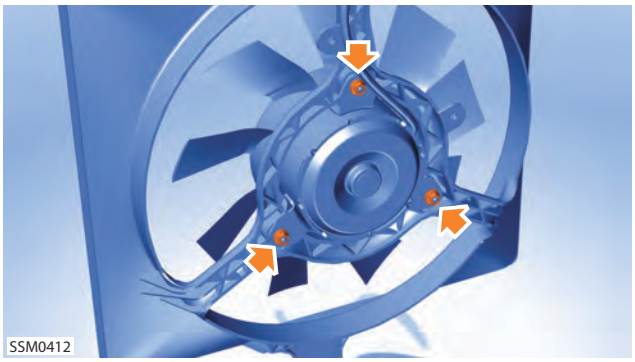
2. Disconnect harness connector from condensor cooling fan.



3. Release clips (x2) securing cooling fan harness to condensor.



4. Remove bolts (x2) and nuts (x2) securing cooling fan housing to condensor.
   Torque 8 Nm (6 lbf·ft).
5. Remove condensor cooling fan housing.



6. Remove nuts (x3) securing cooling fan to housing.
   Torque 6 Nm (4.5 lbf·ft).
7. Remove cooling fan.

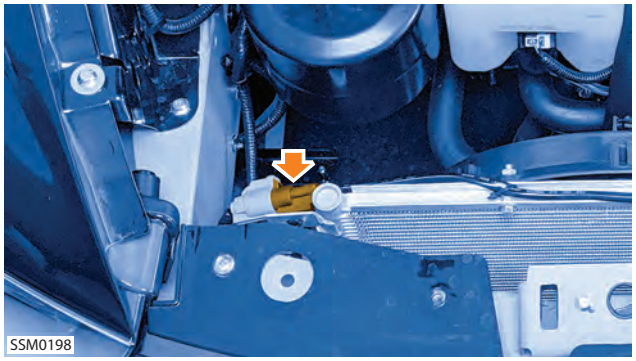
Installation

1. Installation procedure is reverse of removal.

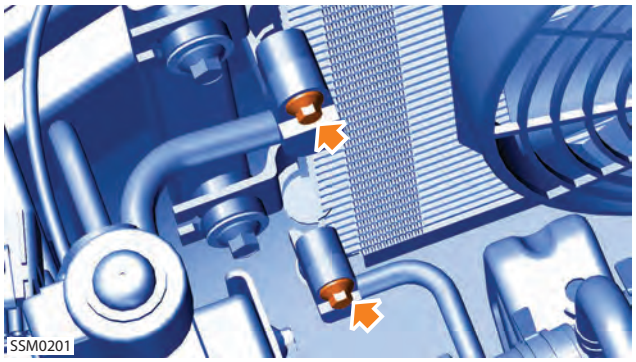
Condensor

Removal

1. Recover refrigerant from air conditioning system. Refer to "*Refrigerant Recovery and Recharging*", *page 10-1.*



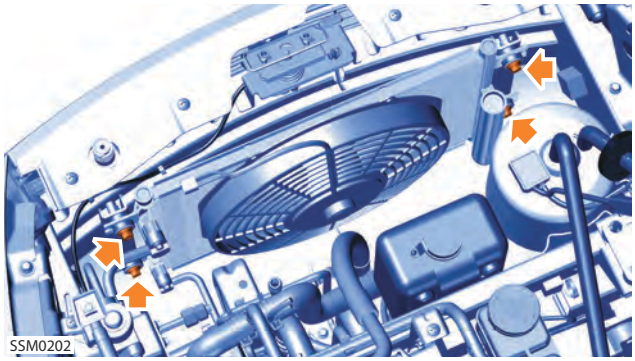
2. Disconnect harness connector from condensor cooling fan.



3. Remove bolts (x2) securing high and low pressure pipes to condensor.
   Torque 4 Nm (3 lbf·ft).
4. Release air conditioning pipes from condensor.
5. Remove and discard ‘O’ rings (x2) from air conditioning pipes.

   CAUTION: Immediately cap all air conditioning pipe and component connections to prevent the ingress of dirt and moisture into the system.

   NOTE: Lubricate new ‘O’ rings with refrigerant oil before installation.



6. Remove bolts (x4) securing condensor to body.
   Torque 13 Nm (10 lbf·ft).
7. Remove condensor.

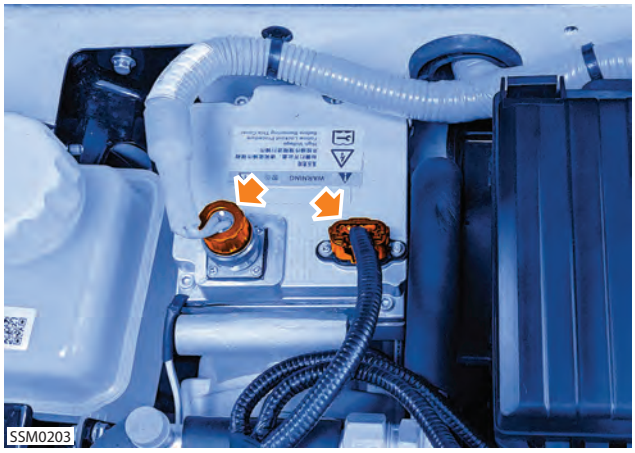
Installation

1. Installation procedure is reverse of removal.

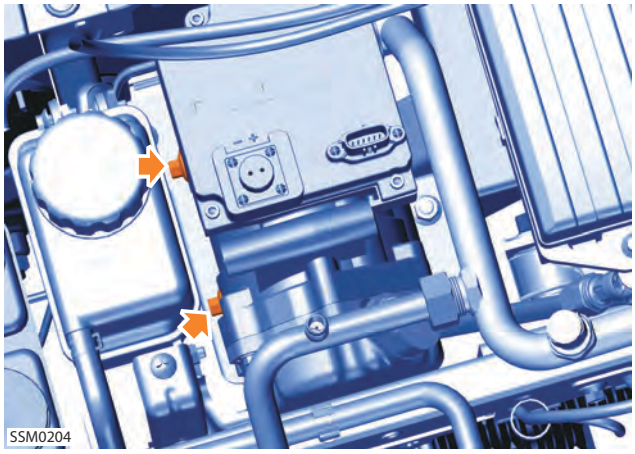
Compressor

Removal

1. Recover refrigerant from air conditioning system. Refer to *"Refrigerant Recovery and Recharging", page 10-1.*



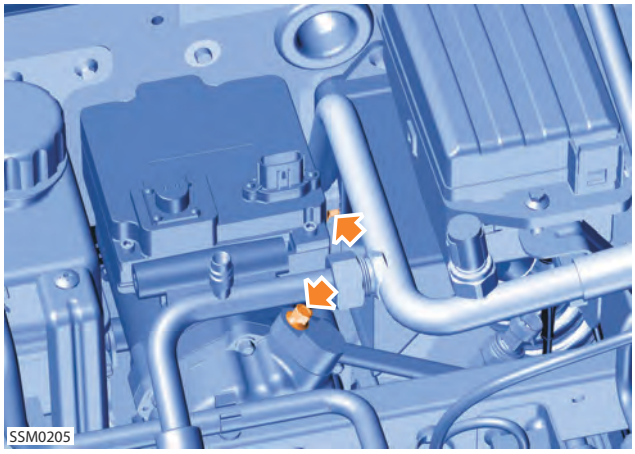
2. Rotate locking collar and disconnect high-voltage cable from compressor.
3. Disconnect low-voltage harness connector from compressor.



4. Remove bolts (x2) securing compressor to isolation panel.

   Torque 18 Nm (6 lbf·ft).

5. Remove ground strap.



6. Remove bolts (x2) securing high and low pressure air conditioning pipes to compressor.

   Torque 4 Nm (3 lbf·ft).

7. Release air conditioning pipes from compressor.
8. Remove and discard ‘O’ rings (x2) from air conditioning pipes.

   CAUTION: Immediately cap all air conditioning pipe and component connections to prevent the ingress of dirt and moisture into the system.

   NOTE: Lubricate new ‘O’ rings with refrigerant oil before installation.

9. Remove compressor.

   NOTE: Try and keep the compressor as upright as possible to reduce any oil loss.

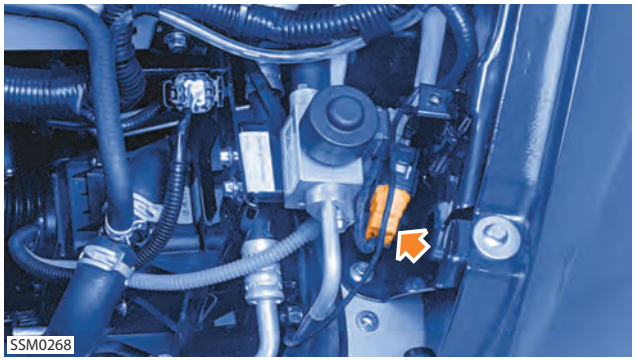
Installation

1. Installation procedure is reverse of removal except for the following:
2. Evacuate and recharge the air conditioning system. Refer to *"Refrigerant Recovery and Recharging", page 10-1.*

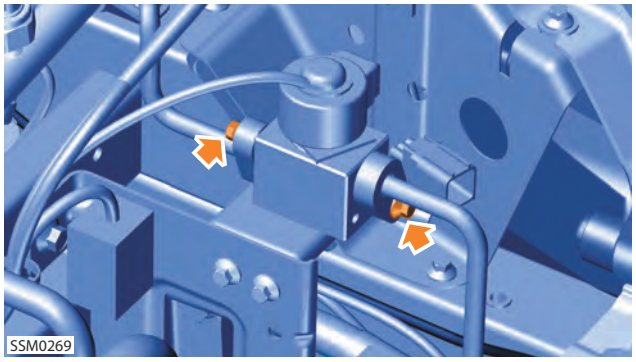
Electronic Expansion Valve (EXV)

Removal

1. Recover refrigerant from air conditioning system. Refer to "*Refrigerant Recovery and Recharging", page 10-1.*



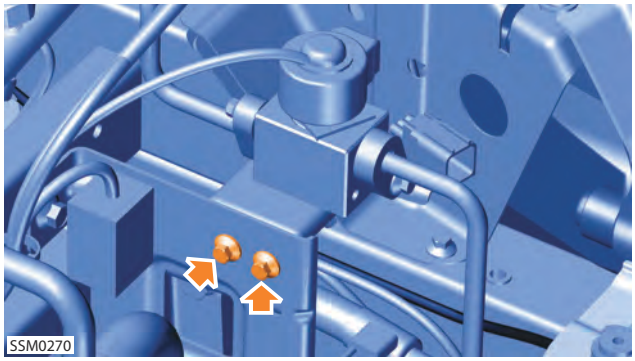
2. Disconnect harness connector from EXV.



3. Remove bolts (x2) securing high and low pressure pipes to EXV.
   Torque 4 Nm (3 lbf·ft).
4. Release air conditioning pipes from valve.
5. Remove and discard 'O' rings (x2) from air conditioning pipes.

   CAUTION: Immediately cap all air conditioning pipe and component connections to prevent the ingress of dirt and moisture into the system.

   NOTE: Lubricate new 'O' rings with refrigerant oil before installation.



6. Remove bolts (x2) securing EXV to mounting bracket.
   Torque 8 Nm (6 lbf·ft).

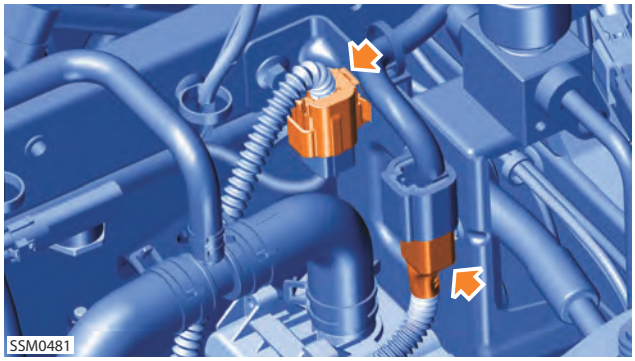
Installation

1. Installation procedure is reverse of removal except for the following:
2. Evacuate and recharge the air conditioning system. Refer to "*Refrigerant Recovery and Recharging", page 10-1.*

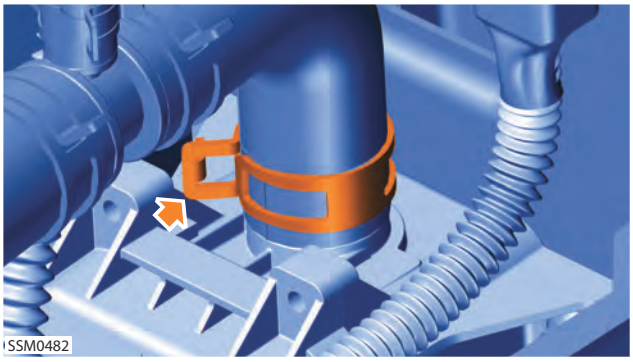
Coolant Heater (PTC)

Removal

1. Drain cooling system. Refer to *"Coolant Drain and Refill - Front", page 10-2.*

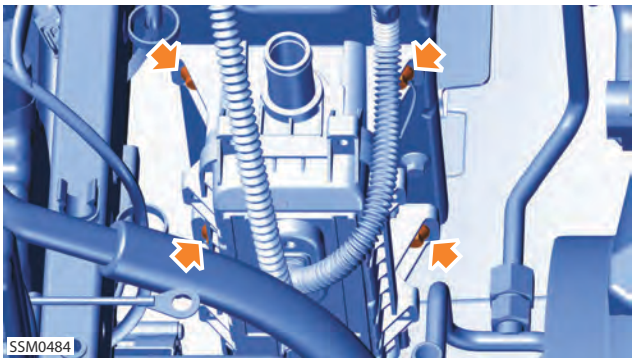


2. Disconnect coolant heater high-voltage connector from harness.
3. Disconnect coolant heater low-voltage connector from harness.
4. Using a trim removal tool, release fasteners (x2) securing connectors to body.
5. Position container to collect coolant loss from system.



6. Release clamp and disconnect upper hose from coolant heater.

7. Release clamp and disconnect lower hose from coolant heater.



8. Remove bolts (x4) securing coolant heater to body.
   Torque 8 Nm (6 lbf·ft).
9. Remove coolant heater.

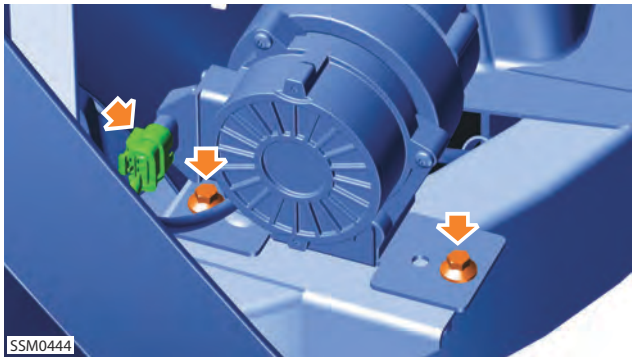
Installation

1. Installation procedure is reverse of removal.

Coolant Pump - Rear

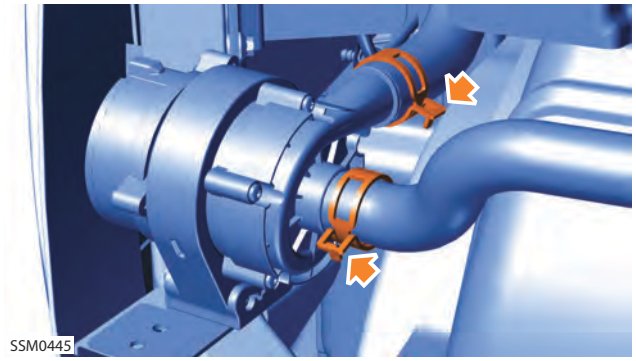
Removal

1. Remove rear bumper. Refer to "Rear Bumper", page 2-4.



2. Remove bolts (x2) securing mounting bracket to crash structure.
   Torque 6 Nm (4.5 lbf·ft).
3. Disconnect harness connector from coolant pump.
4. Position container to collect coolant loss from system.
5. Install hose pinch-off pliers to prevent excess coolant loss before disconnecting coolant hoses.

   CAUTION: Make sure the pinch-off pliers are positioned far enough back on the hose to not damage the outlet of the connected component, and to allow the hose clamp to be slid back along the hose.



6. Release clamp and disconnect radiator hose from coolant pump.
7. Release clamp and disconnect motor controller hose from coolant pump.
8. Remove coolant pump.

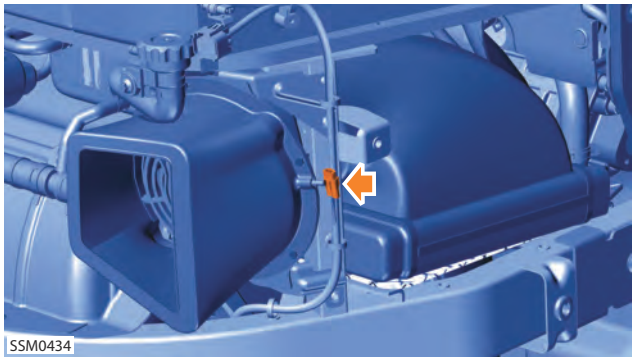
Installation

1. Installation procedure is reverse of removal except for the following:
2. Top-up rear cooling system. Refer to "Coolant Drain and Refill - Rear", page 10-3.

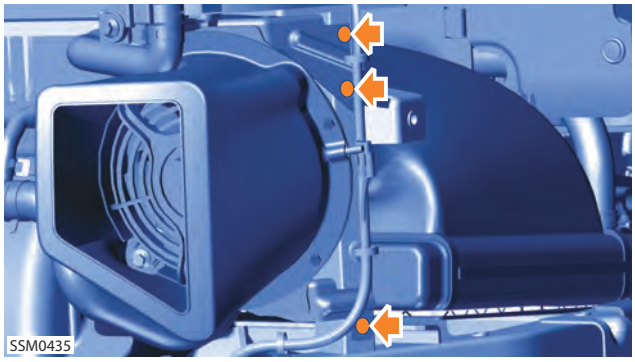
Radiator Cooling Fan

Removal

1. Remove RH rear side cover. Refer to *"Rear Side Cover", page 2-5.*


SSM0434

2. Disconnect harness connector from radiator cooling fan.


SSM0435

3. Remove bolts (x3) securing cooling fan housing to body.
   Torque 8 Nm (6 lbf·ft).
4. Remove cooling fan assembly from radiator housing.


SSM0436

5. Remove bolts and nuts (x4) securing air duct to cooling fan. Collect washer (x4).
   Torque 4 Nm (3 lbf·ft).
6. Remove air duct.


SSM0437

7. Remove bolts and nuts (x2) securing cooling fan to mounting bracket.
   Torque 8 Nm (6 lbf·ft).
8. Remove cooling fan.

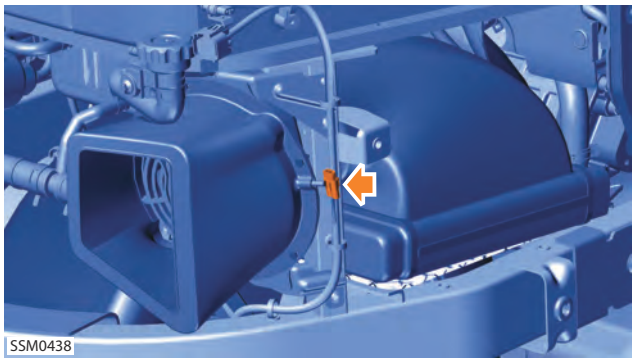
Installation

1. Installation procedure is reverse of removal.

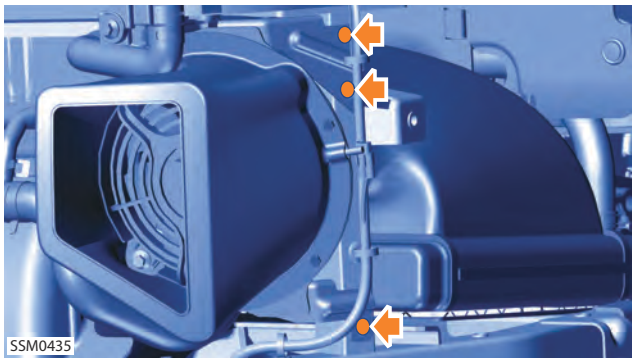
Radiator

Removal

1. Remove wheel arch liner. Refer to *"Wheel Arch Liner - Rear", page 2-16.*
2. Remove RH rear side cover. Refer to *"Rear Side Cover", page 2-5.*

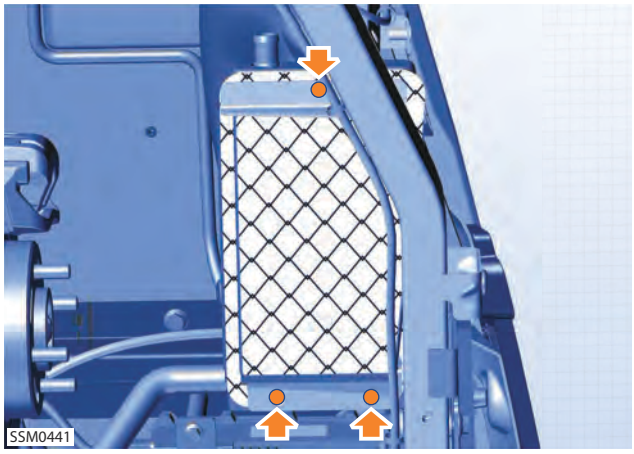


3. Disconnect harness connector from radiator cooling fan.

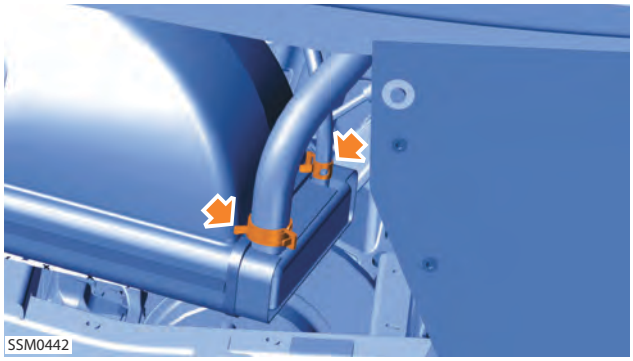


4. Remove bolts (x3) securing cooling fan housing to body.
   Torque 8 Nm (6 lbf·ft).
5. Remove cooling fan assembly from radiator housing.
6. Position container to collect coolant loss from system.
7. Remove reservoir filler cap.

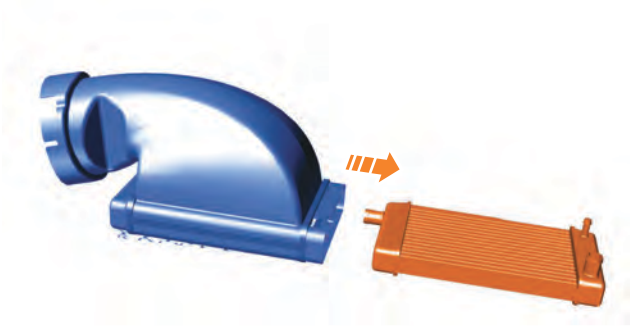
8. Release clamp and disconnect coolant pump hose from radiator.
9. Allow coolant to drain.



10. Remove bolts (x3) securing radiator assembly to body.
11. Maneuver radiator assembly to gain access to radiator hose clamps.



12. Release clamp and disconnect motor hose from radiator.
13. Release clamp and disconnect expansion tank hose from radiator.
14. Remove radiator.



SSM0443

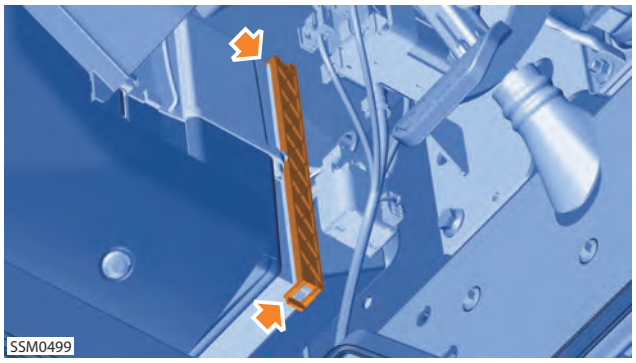
15. Remove radiator from housing.

Installation

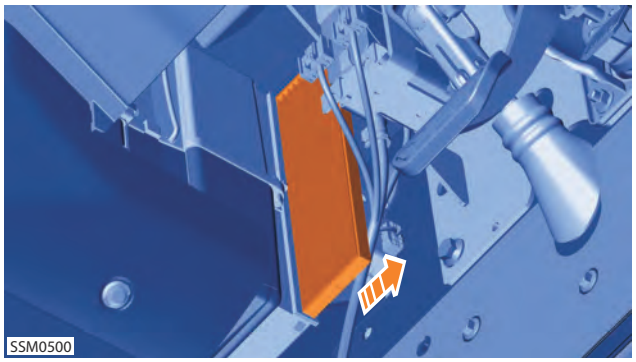
1. Installation procedure is reverse of removal except for the following:
2. Top-up rear cooling system. Refer to *"Coolant Drain and Refill - Rear", page 10-3.*

Cabin Air Filter

Removal



1. Release clips (x2) securing cover to cabin heater.



2. Remove cabin air filter.

Installation

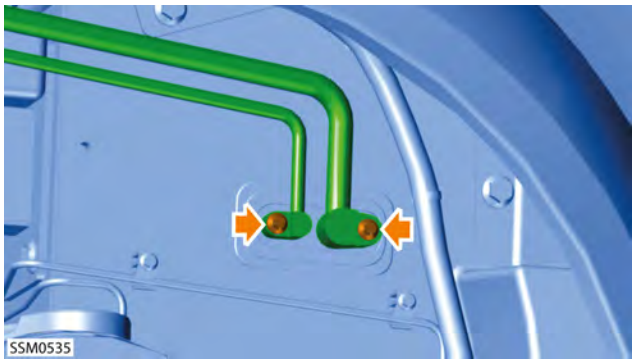
1. Installation procedure is reverse of removal except for the following:

2. Ensure the arrow on the cabin filter indicating air flow direction is facing towards the cabin interior.

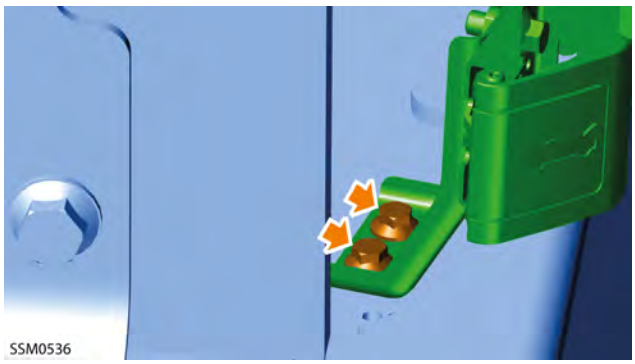
HVAC Assembly

Removal

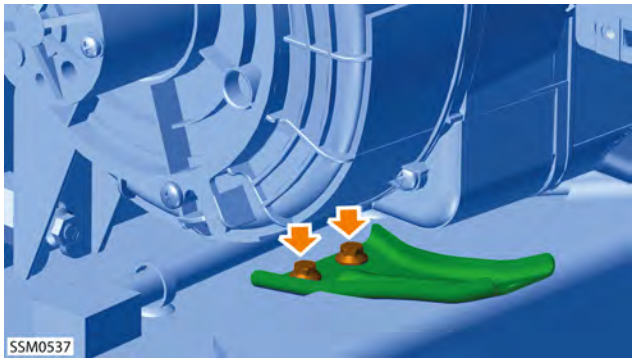
1. Discharge and recover air conditioning refrigerant. Refer to *"Refrigerant Recovery and Recharging", page 10-1.*
2. Remove seat. Refer to *"Seat", page 1-1.*
3. Remove LH front wheel arch liner. Refer to *"Wheel Arch Liner - Front", page 2-15.*



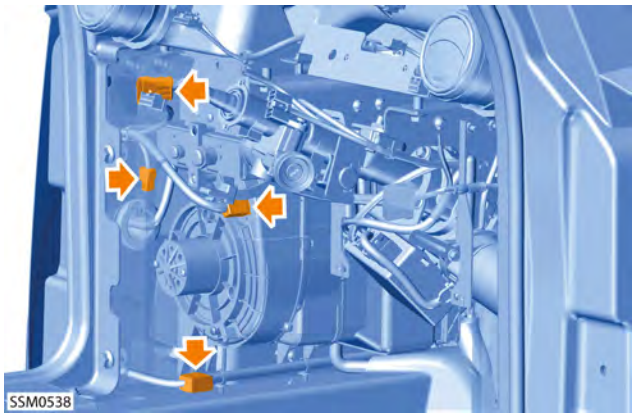
4. Remove bolts (x2) securing air conditioning pipe to HVAC assembly.
5. Disconnect air conditioning pipes from HVAC assembly and discard O ring seals (x2).
6. Remove dashboard. Refer to *"Dashboard", page 2-19.*



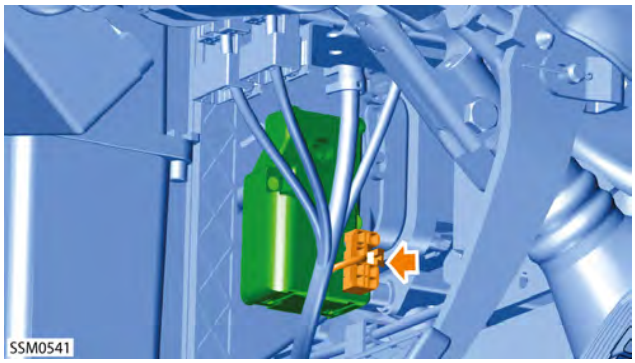
7. Remove bolts (x2) securing hood release mounting bracket to chassis.
8. Position hood release assembly aside.



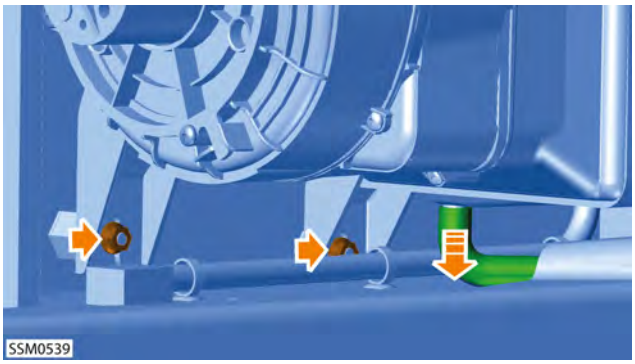
9. Remove bolts (x2) securing mounting bracket to chassis.
10. Remove mounting bracket.



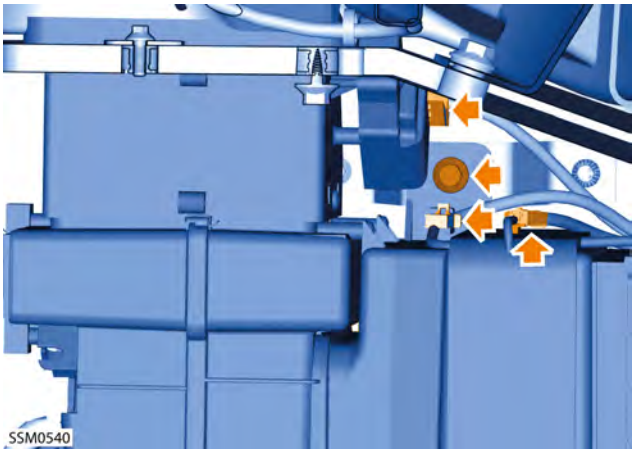
11. Disconnect harness connector from HVAC resistor.
12. Disconnect harness connector from blower motor.
13. Disconnect 12V harness connector from PTC heater.
14. Disconnect high-voltage harness connector from PTC heater.



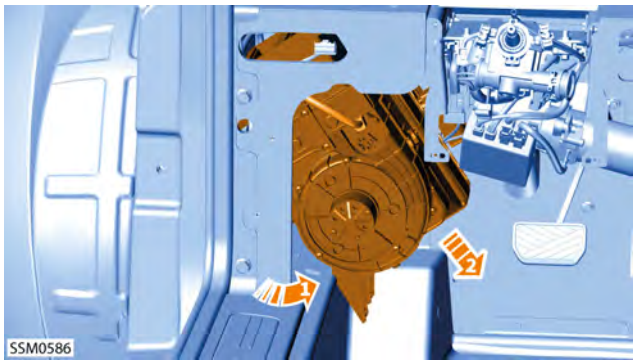
15. Disconnect harness connector from recirculated/fresh air actuator.



16. Disconnect drain hose from HVAC assembly.
17. Remove nuts (x2) securing HVAC assembly to body.



18. Disconnect harness connector from air distribution actuator.
19. Disconnect harness connector from evaporator temperature sensor.
20. Disconnect harness connector from cabin temperature sensor.
21. Remove bolt securing HVAC assembly to body.



22. Maneuver and remove HVAC assembly from vehicle.

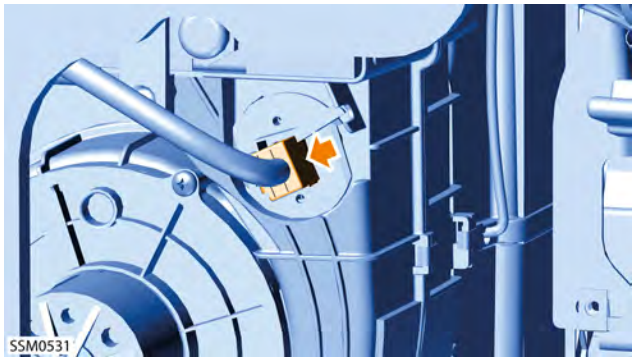
Installation

1. Installation procedure is reverse of removal.

HVAC Resistor

Removal

1. Remove dashboard. Refer to "Dashboard", page 2-19.



2. Disconnect harness connector from HVAC resistor.

3. Rotate HVAC resistor clockwise to release from HVAC assembly.
4. Remove HVAC resistor.

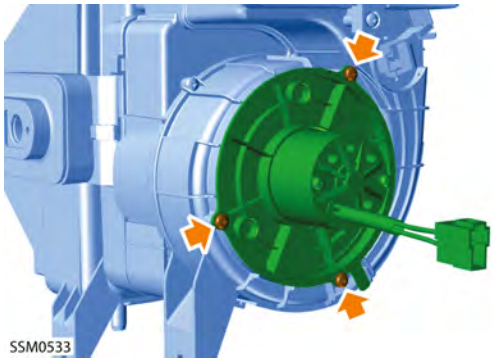
Installation

1. Installation procedure is reverse of removal.

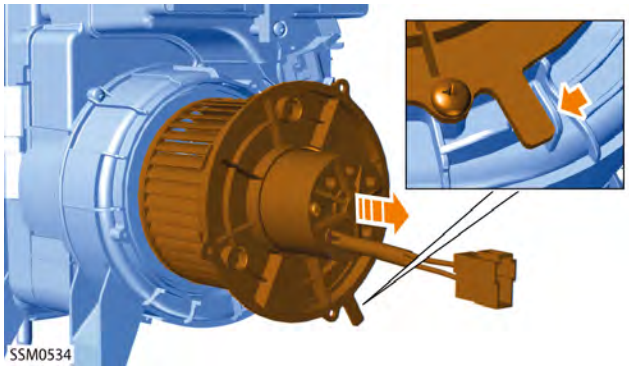
HVAC Blower Motor

Removal

1. Remove HVAC assembly. Refer to *"HVAC Assembly", page 10-14.*



2. Remove screws (x3) securing blower motor to HVAC assembly.



3. Remove blower motor.

   NOTE: On installation, make sure the tab on the blower motor is correctly located in the slot on the HVAC assembly.

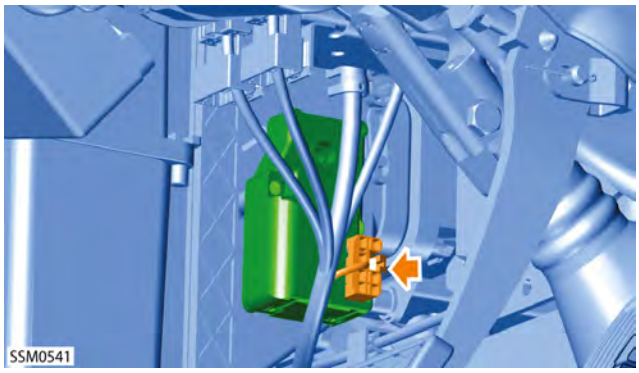
Installation

1. Installation procedure is reverse of removal.

Recirculated/Fresh Air Actuator

Removal

1. Remove dashboard. Refer to *"Dashboard", page 2-19.*



2. Disconnect harness connector from actuator.

3. Remove screws (x2) securing actuator to HVAC assembly.

   NOTE: Image shown with HVAC assembly removed from vehicle for clarity.

4. Release actuator from locating stud and disconnect actuator from control arm.
5. Remove actuator.

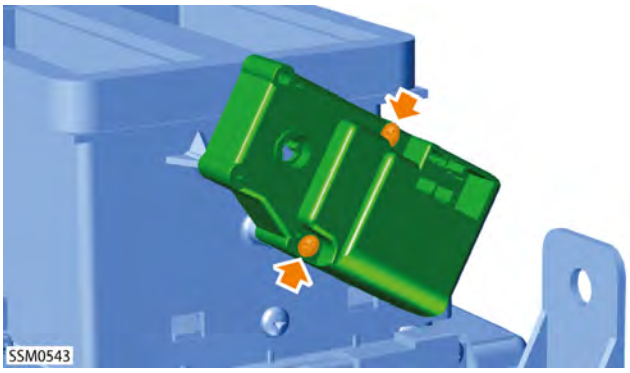
Installation

1. Installation procedure is reverse of removal.

Air Distribution Actuator

Removal

1. Remove HVAC assembly. Refer to *"HVAC Assembly", page 10-14.*



2. Remove screws (x2) securing actuator to HVAC assembly.
3. Release actuator from locating stud and disconnect actuator from control arm.
4. Remove actuator.

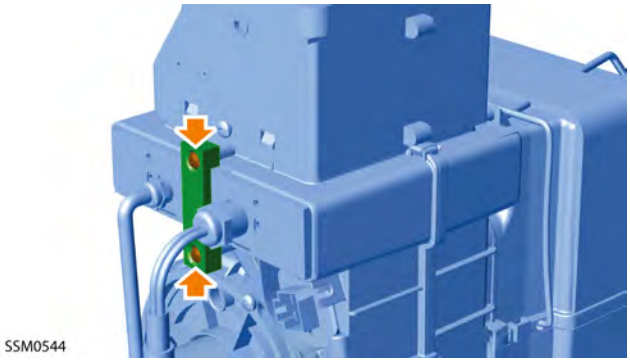
Installation

1. Installation procedure is reverse of removal.

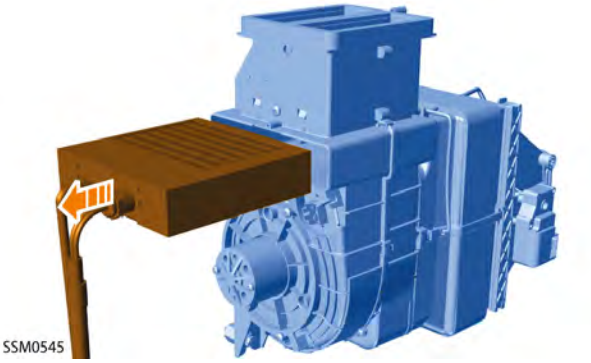
PTC Heater

Removal

1. Remove HVAC assembly. Refer to *"HVAC Assembly", page 10-14.*



2. Remove screws (x2) securing clamp to HVAC assembly.
3. Remove clamp from HVAC assembly.



4. Remove PTC heater from HVAC assembly

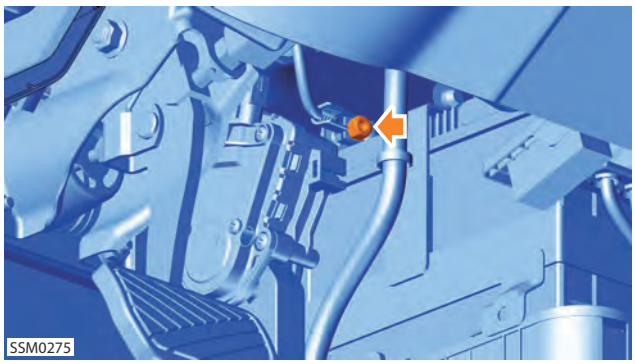
Installation

1. Installation procedure is reverse of removal.

12V Battery - Disconnect

Removal

1. Remove RH A pillar lower trim panel. Refer to *"Trim Panel - A Pillar - Lower - RH", page 2-22.*



2. Loosen nut securing negative cable to 12V battery.
   Torque 8 Nm (6 lbf·ft).
3. Disconnect negative cable and position aside.

Installation

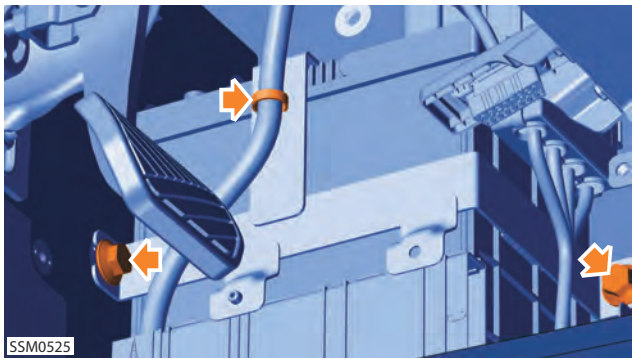
1. Installation procedure is reverse of removal.

12V Battery

Removal

1. Remove body control module. Refer to *"Module - Body Control Module/Interior Fusebox", page 11-13.*
2. Remove throttle pedal. Refer to *"Switch - Throttle Pedal", page 11-7.*

3. Open cover on battery positive terminal.
4. Loosen nut securing positive cable fuse box to 12V battery.
   Torque 8 Nm (6 lbf·ft).
5. Disconnect positive cable fuse box and position aside.



6. Using a trim removal tool, release fastener securing harness to battery retaining bracket.
7. Remove bolts (x2) securing battery retaining bracket to body.
   Torque 32 Nm (24 lbf·ft).
8. Remove battery retaining bracket.
9. Remove 12V battery.

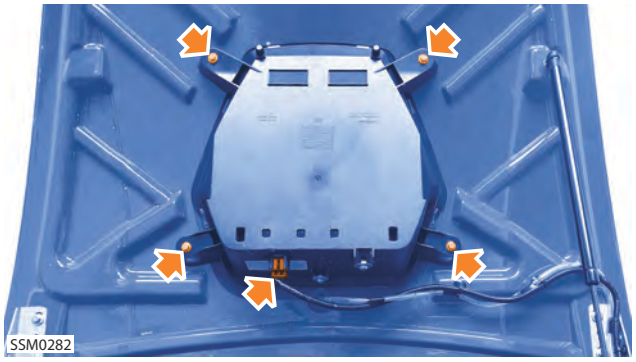
Installation

1. Installation procedure is reverse of removal.

Headlight - Center

Removal

1. Open hood.



2. Disconnect harness connector from headlight.
3. Remove bolts (x4) securing headlight to hood.
   Torque 8 Nm (6 lbf·ft).
4. Remove headlight.

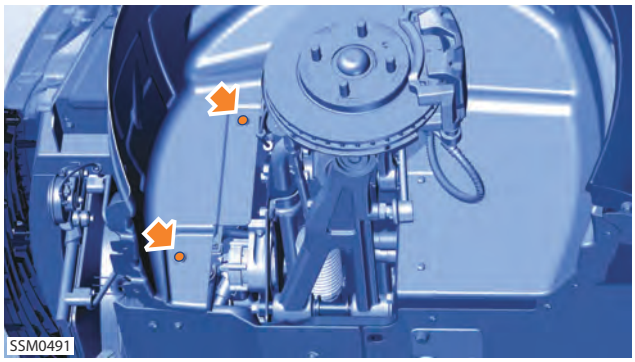
Installation

1. Installation procedure is reverse of removal.

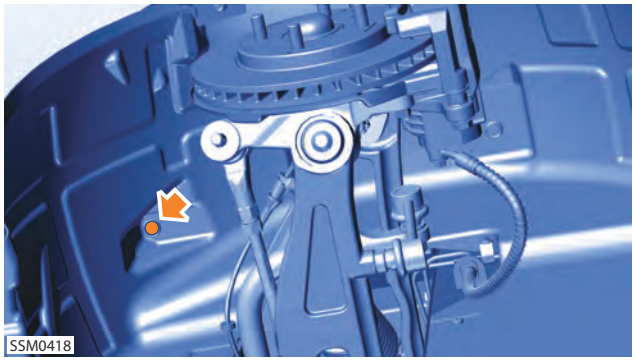
Headlight - Outer

Removal

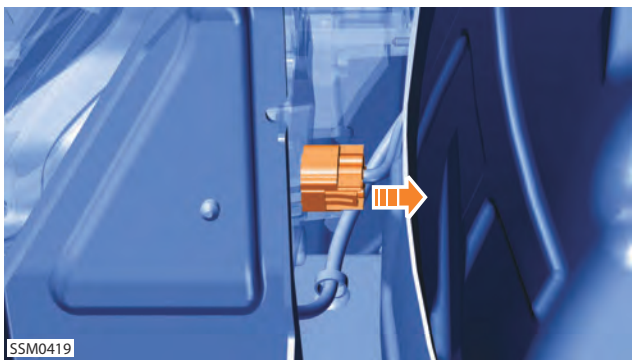
1. Remove front bumper. Refer to *"Front Bumper", page 2-2.*



2. Remove push pins (x2) securing wheel arch liner to inner fender.

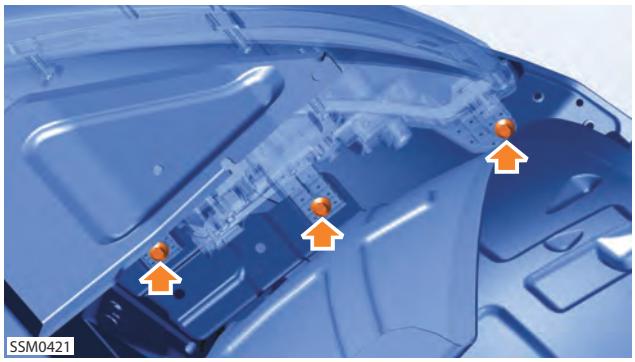


3. Remove push pin securing wheel arch liner to body.



4. Disconnect harness connector from headlight.

5. Remove bolts (x2) securing bottom of headlight to body.
   Torque 4 Nm (3 lbf·ft).



6. Remove bolts (x3) securing top of headlight to body.
   Torque 4 Nm (3 lbf·ft).

7. To provide clearance, remove bolts (x3) securing fender to body. Collect washers.
8. Remove headlight.

Installation

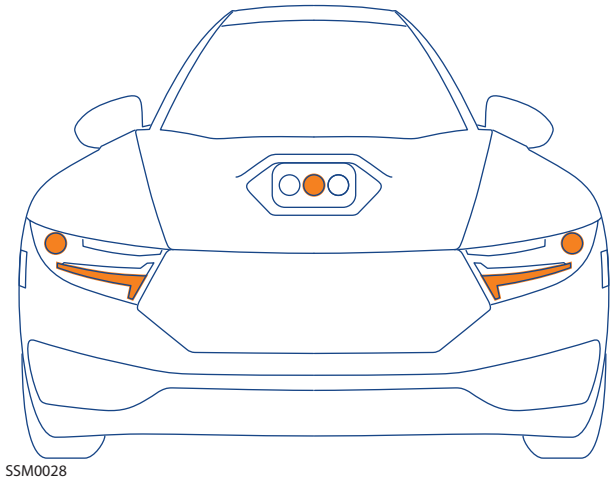
1. Installation procedure is reverse of removal except for the following:
2. Check and if necessary adjust the headlight alignment.

Headlight Alignment - Outer - Adjust

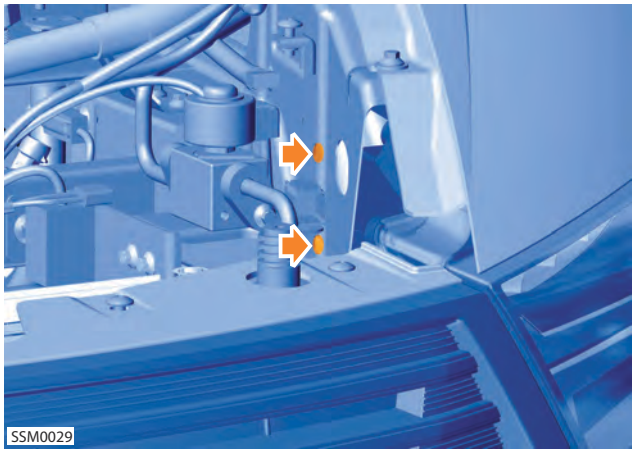
NOTE: Before adjusting the headlights, ensure the tire pressures are correct and any cargo is removed from the trunk.

Adjust

1. Park on level ground with the vehicle pulled up as close as possible to a plain wall.



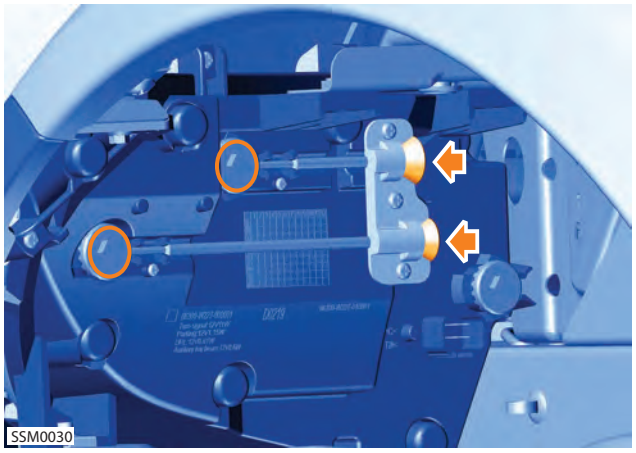
2. Turn on the headlight low beams only.
3. Using some masking tape, mark the horizontal and vertical center lines of the headlight beams on the wall. Make the vertical tape marker about two feet long, again running through the center of each low-beam.
4. Back up the vehicle until it's 25 feet (7.6m) from the wall.
5. Check the alignment of the headlight beams on the wall. For vertical aim, the top of the most intense part of the beam should be at or below the centerline of the horizontal tapeline. For horizontal aim, the most intense of the beam should be right of the vertical tapeline.
6. If the headlights require adjustment, open the hood and remove the maintenance cover.



7. The headlights are adjusted through access holes located in the inner fender.

   NOTE: Remove bolts (x2) securing brake vacuum canister to body for easier access to RH adjustment screws.

   Torque 8 Nm (6 lbf·ft).



8. Use a long screwdriver to rotate the headlight beam adjusters.

   NOTE: The upper adjuster controls the vertical alignment of the headlight. The lower adjuster controls the horizontal alignment of the headlight.

   NOTE: The headlight can also be adjusted by using the circled adjusters on the rear of the headlight.

9. Rotate the required headlight adjusters a quarter of a turn at a time and check to see where the new alignment falls.
10. Repeat adjustment as necessary until the beams are correctly aligned.

Side Marker Light - Front

Removal

1. Apply masking tape to protect painted surface along upper edge of side marker light.

2. Using a plastic trim removal tool, apply downward pressure on the top edge of side marker light while levering it outwards to release the upper retaining clip.
3. Release the lower retaining clip and withdraw the side marker light from the fender lip.

4. Disconnect harness connector from the side marker light.
5. Remove side marker light.

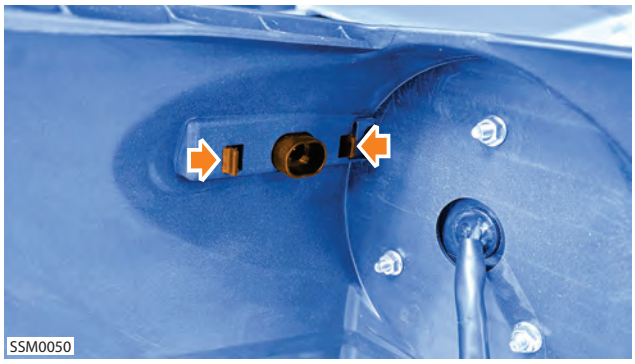
Installation

1. Installation procedure is reverse of removal.

Side Marker Light - Rear

Removal

1. Remove rear bumper. Refer to "Rear Bumper", page 2-4.



2. Release clips (x2) securing side marker light to bumper.
3. Remove side marker light.

Installation

1. Installation procedure is reverse of removal.

Tail Light

Removal

1. Remove rear bumper. Refer to "Rear Bumper", page 2-4.

2. Remove nuts (x3) securing tail light to rear bumper.
   Torque 4 Nm (3 lbf·ft).
3. Remove tail light from bumper.

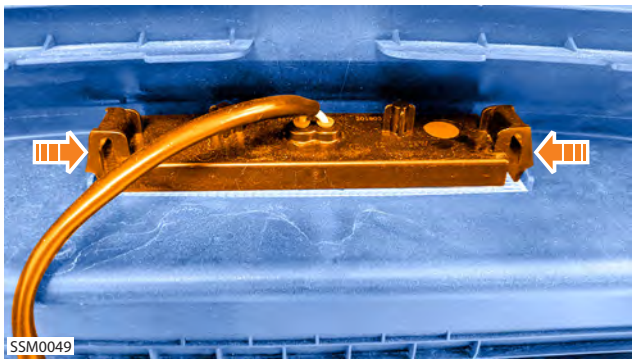
Installation

1. Installation procedure is reverse of removal.

License Plate Light

Removal

1. Remove rear bumper. Refer to "*Rear Bumper*", *page 2-4.*



2. Release clips (x2) securing license plate light to bumper.
3. Remove license plate light.

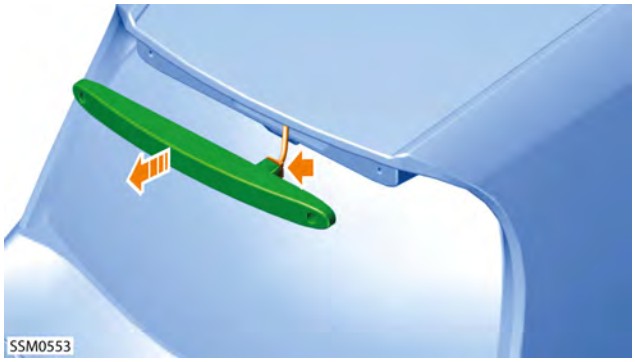
Installation

1. Installation procedure is reverse of removal.

Center High Mounted Stop Light (CHMSL)

Removal

1. Remove screws (x2) securing CHMSL to trunk cover.



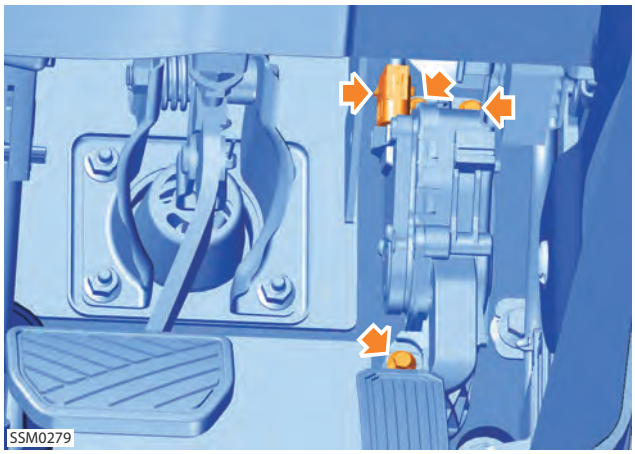
2. Disconnect harness connector from CHMSL.
3. Remove CHMSL.

Installation

1. Installation procedure is reverse of removal.

Switch - Throttle Pedal

Removal



1. Remove bolts (x3) securing throttle pedal to body.
   Torque 8 Nm (6 lbf·ft).
2. Disconnect harness connector from throttle pedal.
3. Remove throttle pedal assembly.

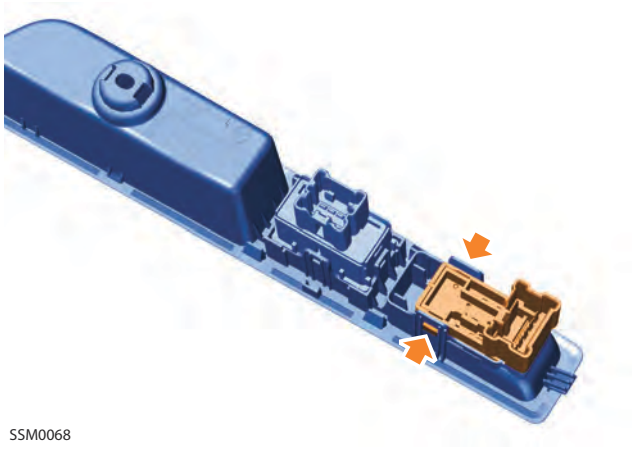
Installation

1. Installation procedure is reverse of removal.

Switch - Window

Removal

1. Remove door switch panel. Refer to *"Door Switch Panel", page 3-5.*



2. Release clips (x2) securing switch to panel.
3. Remove window switch.

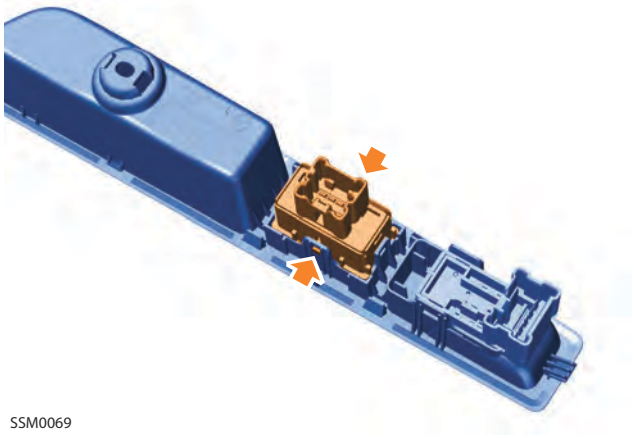
Installation

1. Installation procedure is reverse of removal.

Switch - Heated Seat

Removal

1. Remove door switch panel. Refer to *"Door Switch Panel", page 3-5.*



SSM0069

2. Release clips (x2) securing switch to panel.
3. Remove heated seat switch.

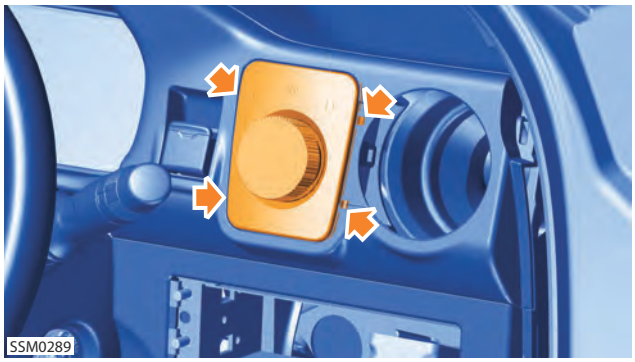
Installation

1. Installation procedure is reverse of removal.

Switch - Drive Mode

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



SSM0289

2. Release clips (x4) securing switch to dashboard.
3. Remove drive mode switch from front of dashboard panel.

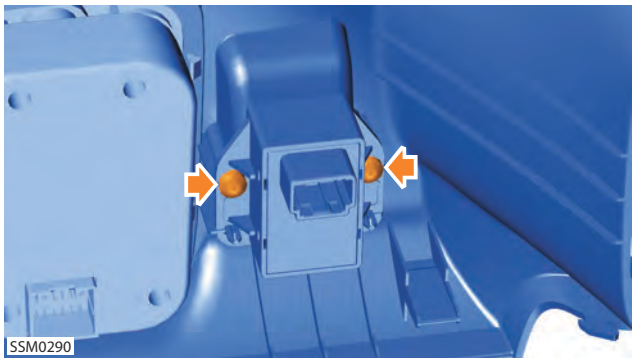
Installation

1. Installation procedure is reverse of removal.

Switch - Electronic Parking Brake

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



2. Remove screws (x2) securing switch to dashboard panel.
3. Remove parking brake switch.

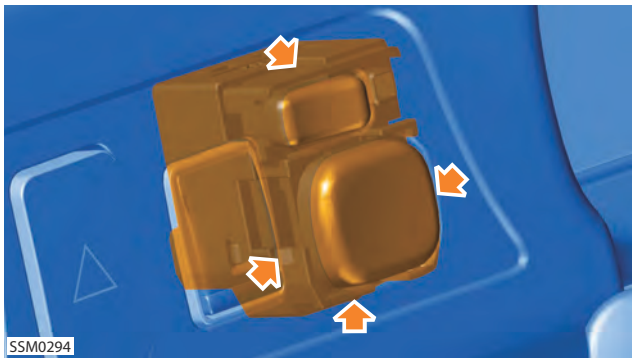
Installation

1. Installation procedure is reverse of removal.

Switch - Exterior Mirror

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



2. Release clips (x4) securing switch to dashboard.
3. Remove exterior mirror switch from rear of dashboard panel.

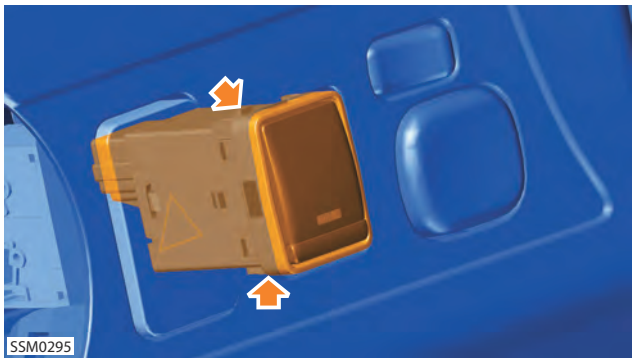
Installation

1. Installation procedure is reverse of removal.

Switch - Trunk Release

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



2. Release clips (x2) securing switch to dashboard.
3. Remove trunk release switch from front of dashboard panel.

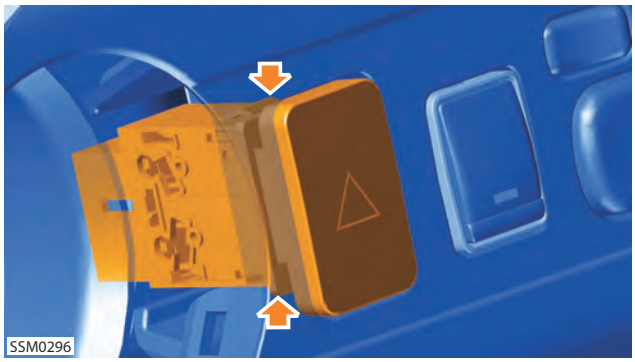
Installation

1. Installation procedure is reverse of removal.

Switch - Hazard Warning Lights

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



2. Release clips (x2) securing switch to dashboard.
3. Remove hazard warning light switch from front of dashboard panel.

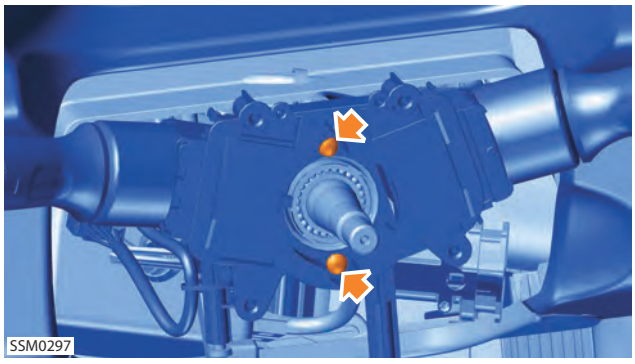
Installation

1. Installation procedure is reverse of removal.

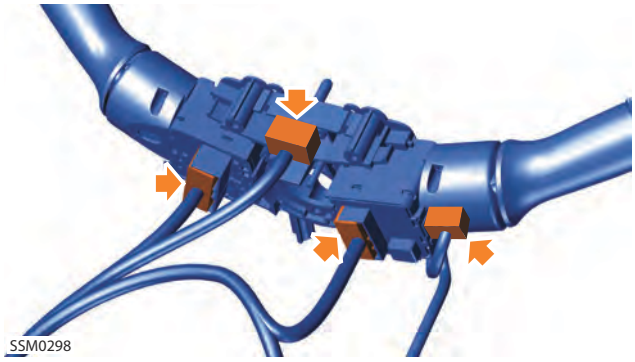
Switch - Exterior Lighting/ Wiper

Removal

1. Remove steering wheel. Refer to "Steering Wheel", page 5-2.
2. Remove steering column cover. Refer to "Cover - Steering Column", page 2-21.

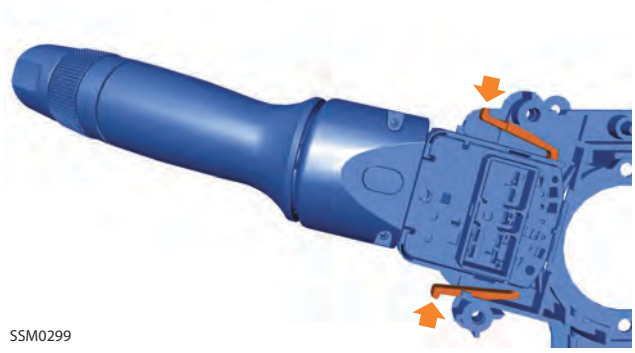


3. Remove screws (x2) securing combination switch to steering column.



4. Disconnect harness connectors (x4) from combination switch.
5. Remove combination switch.

Do not carry out further dismantling if component is removed for access only.



6. Release clips (x2) securing required switch to column hub.
7. If removing the exterior lighting switch, remove cable tie securing harness to column hub.
8. Remove switch from column hub.

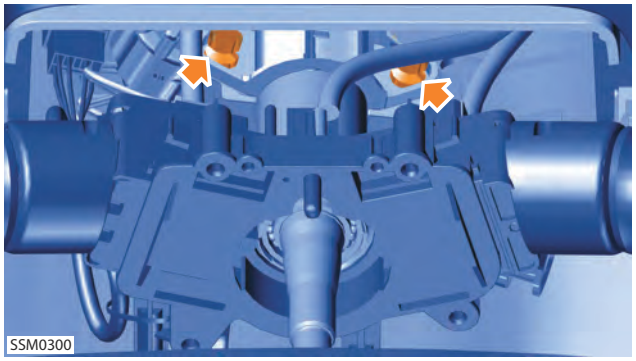
Installation

1. Installation procedure is reverse of removal.

Switch - Ignition

Removal

1. Remove exterior lighting/wiper switch. Refer to *"Switch - Exterior Lighting/ Wiper", page 11-11.*



2. Center punch and use a 5mm drill to remove the heads of the anti-theft shear bolts (x2) securing the lock assembly to the steering column.

   CAUTION: Take care not to damage the lock body if lock is to be re-installed.

   NOTE: Alternatively, the shear bolts can be loosened by using a flat chisel on the edge of the shear bolt cap and using a hammer tap it in a counterclockwise direction.

3. Disconnect switch harness connector from cabin harness.
4. Remove ignition switch/steering column lock assembly.

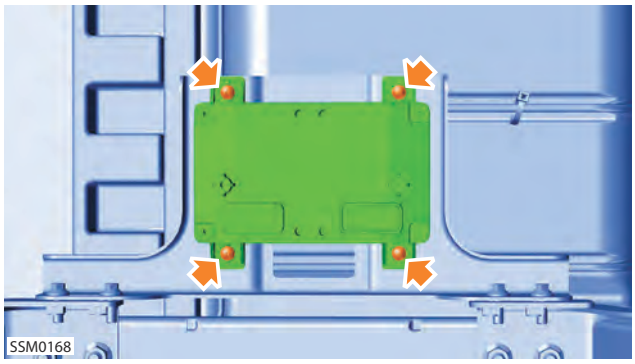
Installation

1. Installation procedure is reverse of removal except for the following:
2. Remove remaining pieces of shear bolts from lock assembly. Check threads in lock assembly are clean and free of debris.
3. Always use new anti-theft shear bolts to secure the lock assembly to steering column. Tighten bolts until heads shear off.

Module - Thermal Management System

Removal

1. Remove seat. Refer to "Seat", page 1-1.



2. Remove screws (x4) securing module to underside of seat.
3. Remove module.

Installation

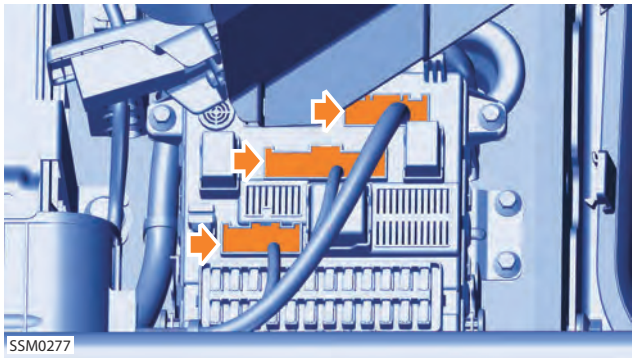
1. Installation procedure is reverse of removal.

Module - Body Control Module/Interior Fusebox

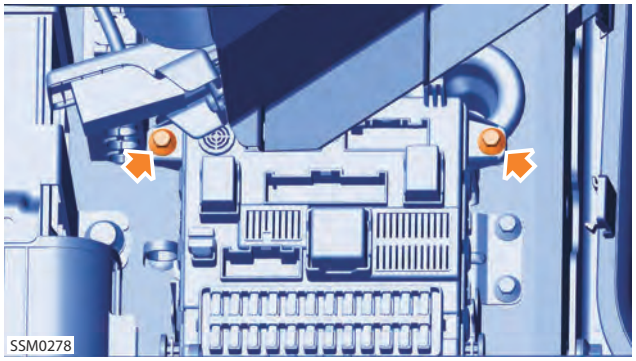
Removal

1. Disconnect 12V battery negative cable. Refer to "12V Battery - Disconnect", page 11-1.
2. Remove dashboard closeout panel. Refer to "Closeout Panel - Dashboard", page 2-20.

3. To provide better access to body control module, remove bolts (x2) securing RH side of dashboard to body.



4. Disconnect harness connectors (x3) from module.



5. Remove bolts (x2) securing top of module to mounting bracket.
   Torque 4 Nm (3 lbf·ft).
6. Lift module and slide forward to release lower mountings from bracket.
7. Disconnect harness connectors (x5) from rear of module.
8. Remove body control module.

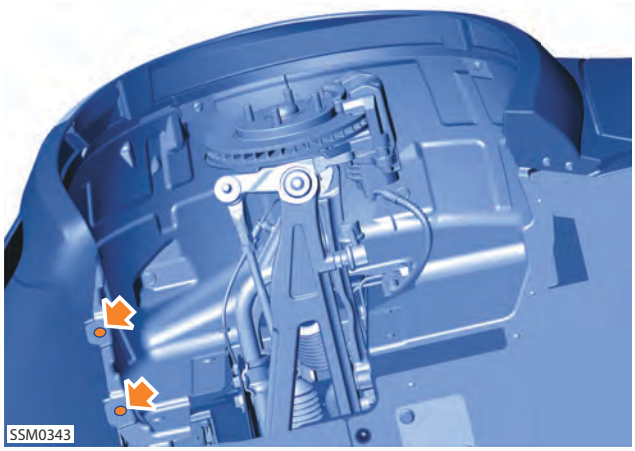
Installation

1. Installation procedure is reverse of removal.

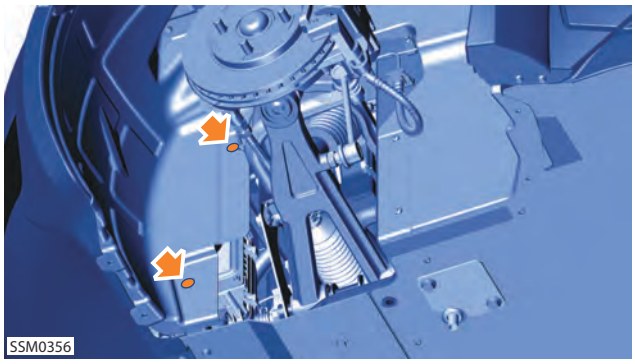
Horn

Removal

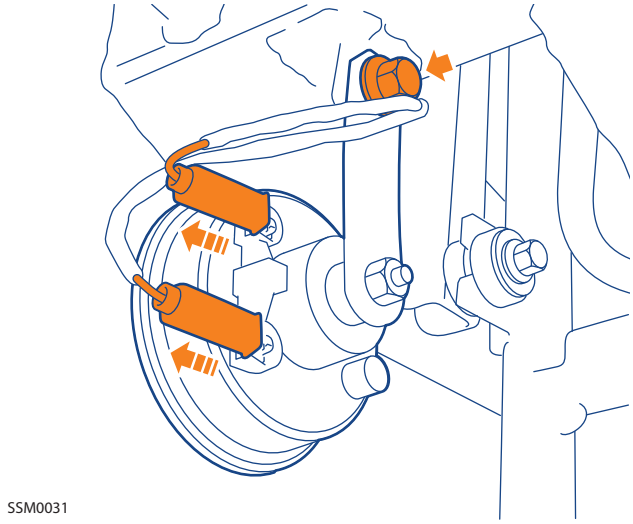
1. Remove LH front wheel. Refer to *"Wheel - Front", page 8-1.*



2. Remove push pins (x2) securing wheel arch liner to front bumper.



3. Remove push pins (x2) securing wheel arch liner to body.
4. Release wheel arch liner from front bumper.



5. Disconnect harness connectors (x2) from horn.
6. Remove bolt securing horn to mounting bracket.
   Torque 18 Nm (13 lbf·ft).
7. Remove horn.

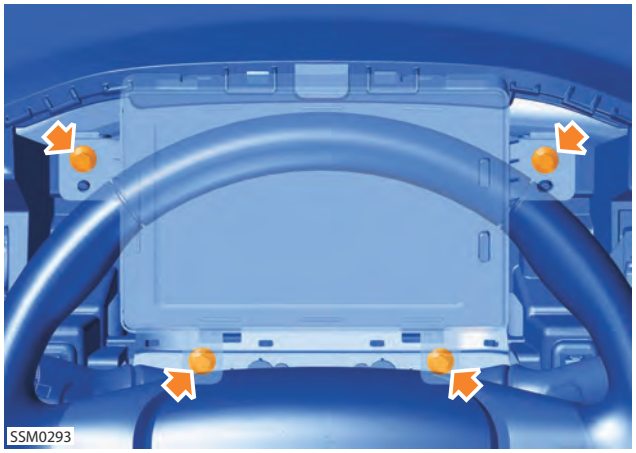
Installation

1. Installation procedure is reverse of removal.

Instrument Cluster

Removal

1. Remove dashboard panel. Refer to *"Panel - Dashboard", page 2-18.*



2. Remove bolts (x4) securing instrument cluster to dashboard.
   Torque 4 Nm (3 lbf·ft).
3. Disconnect harness connector from rear of instrument cluster.
4. Remove instrument cluster

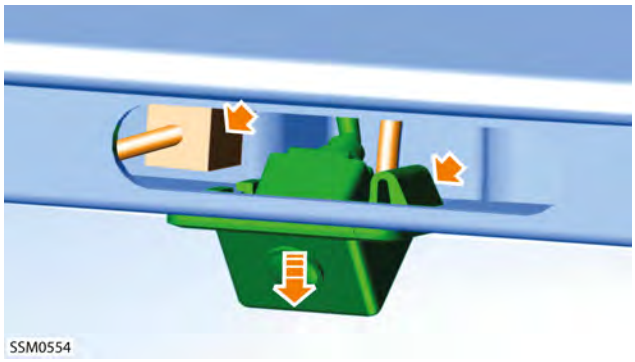
Installation

1. Installation procedure is reverse of removal.

Rear View Camera

Removal

1. Remove CHMSL. Refer to *"Center High Mounted Stop Light (CHMSL)", page 11-6.*



2. Disconnect harness connector from rear view camera.
3. Release clip securing rear view camera to trunk lid.
4. Remove rear view camera.

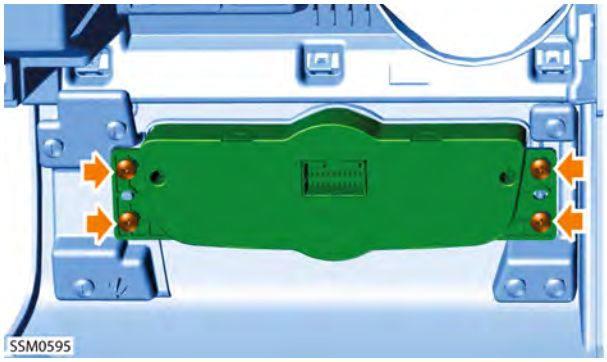
Installation

1. Installation procedure is reverse of removal.

HVAC Control Panel

Removal

1. Remove dashboard. Refer to *"Dashboard", page 2-19.*



2. Remove screws (x4) securing HVAC control panel to dashboard.
3. Remove HVAC control panel.

Installation

1. Installation procedure is reverse of removal.

Radio

Removal

1. Insert radio removal tools through holes in radio faceplate.
2. Pushing outwards on the radio removal tools, pull on the tools to release the radio from the dashboard.

3. Disconnect antenna cable from radio.
4. Disconnect harness connector (x2) from radio.
5. Remove radio.

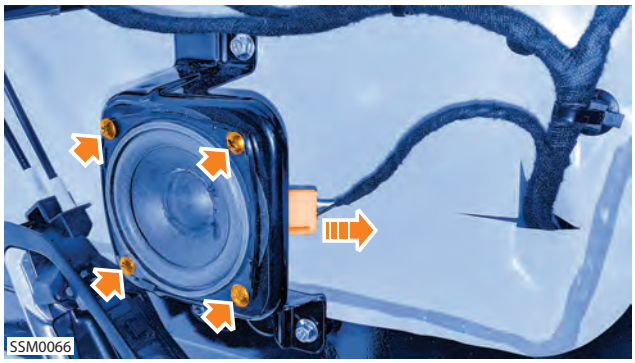
Installation

1. Installation procedure is reverse of removal.

Door Speaker

Removal

1. Remove door panel. Refer to *"Door Panel", page 3-3.*



2. Disconnect harness connector from speaker.
3. Remove screws (x4) securing speaker to mounting bracket.
4. Remove speaker.

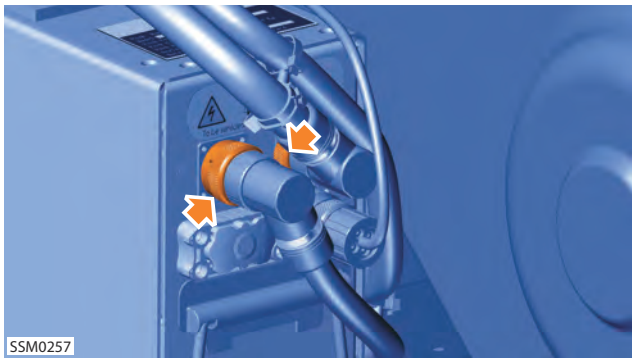
Installation

1. Installation procedure is reverse of removal.

High Voltage Batteries - Disconnect

Removal

1. Remove LH rear closeout panel. Refer to *"Closeout Panel - Rear - LH", page 2-13.*
2. Remove RH rear closeout panel. Refer to *"Closeout Panel - Rear - RH", page 2-14.*



3. Rotate locking collar and disconnect **B-** high-voltage cables from both the LH and RH battery assemblies.
4. Rotate locking collar and disconnect **B+** high-voltage cables from both the LH and RH battery assemblies.

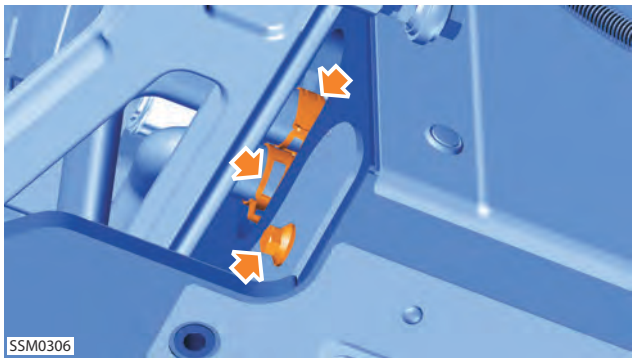
Installation

1. Installation procedure is reverse of removal.

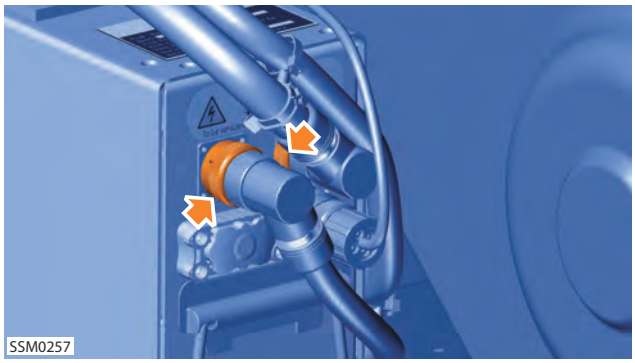
Battery Assembly - LH

Removal

1. Drain battery coolant. Refer to *"Coolant Drain and Refill - Front", page 10-2.*
2. Remove LH front wheel. Refer to *"Wheel - Front", page 8-1.*



3. Remove bolt securing front of battery to body.
   Torque 27 Nm (20 lbf·ft).
4. Position container to collect coolant loss from system.
5. Mark hoses to aid identification during installation.
6. Release clamps (x2) securing coolant hoses to battery.
7. Disconnect battery hoses (x2) from battery.
8. Remove LH rear closeout panel. Refer to *"Closeout Panel - Rear - LH", page 2-13.*



9. Rotate locking collar counterclockwise and disconnect **B-** high-voltage cable from the LH battery assembly.
10. Rotate locking collar counterclockwise and disconnect **B+** high-voltage cables from the LH battery assembly.

11. Rotate locking collar counterclockwise and disconnect **Battery signal** cable from the LH battery assembly.

    NOTE: When reconnecting cables, ensure connector and collar are correctly aligned and then fully tighten collar clockwise.

12. Remove bolts (x2) securing rear of battery to body.

    Torque 16 Nm (12 lbf·ft).

13. Using the handle on the rear of the battery, partially withdraw the battery from the body.
14. Position a transport dolly to support the battery and then fully remove the battery from the vehicle.

    WARNING: Use assistance when handling the battery assemblies as each one weighs 295 lb (134 kg).

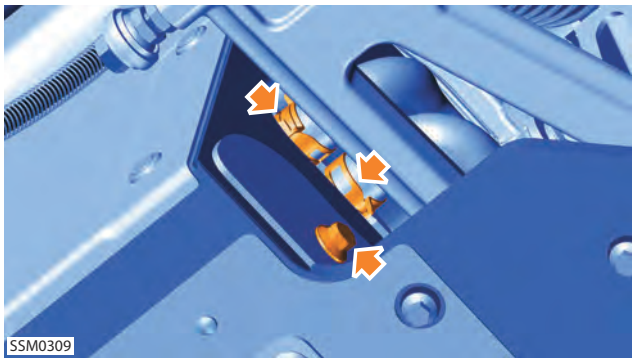
Installation

1. Installation procedure is reverse of removal.

Battery Assembly - RH

Removal

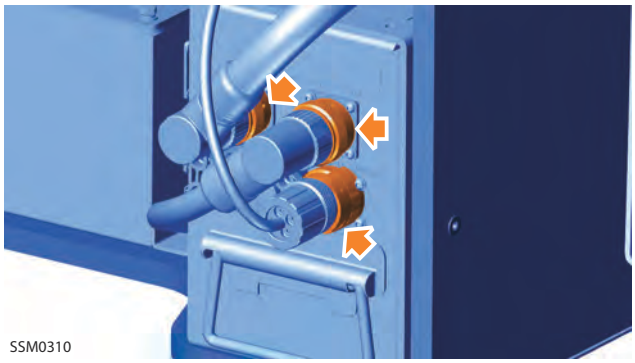
1. Drain battery coolant. Refer to *"Coolant Drain and Refill - Front", page 10-2.*
2. Remove RH front wheel. Refer to *"Wheel - Front", page 8-1.*



3. Remove bolt securing front of battery to body.

    Torque 27 Nm (20 lbf·ft).

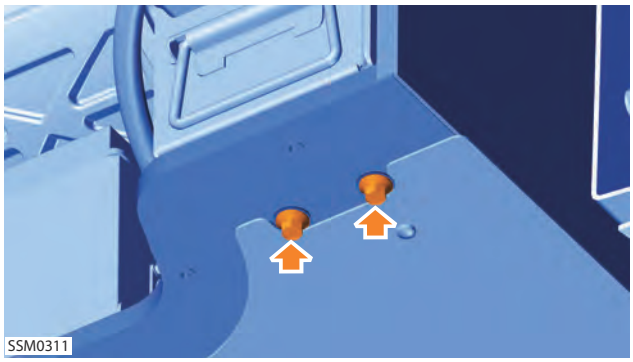
4. Position container to collect coolant loss from system.
5. Mark hoses to aid identification during installation.
6. Release clamps (x2) securing coolant hoses to battery.
7. Disconnect battery hoses (x2) from battery.
8. Remove RH rear closeout panel. Refer to *"Closeout Panel - Rear - RH", page 2-14.*



9. Rotate locking collar counterclockwise and disconnect **B-** high-voltage cable from the RH battery assembly.
10. Rotate locking collar counterclockwise and disconnect **B+** high-voltage cables from the RH battery assembly.

11. Rotate locking collar counterclockwise and disconnect **Battery signal** cable from the LH battery assembly.

    NOTE: When reconnecting cables, ensure connector and collar are correctly aligned and then fully tighten collar clockwise.



12. Remove bolts (x2) securing rear of battery to body.

    Torque 16 Nm (12 lbf·ft).

13. Using the handle on the rear of the battery, partially withdraw the battery from the body.
14. Position a transport dolly to support the battery and then fully remove the battery from the vehicle.

    WARNING: Use assistance when handling the battery assemblies as each one weighs 295 lb (134 kg).

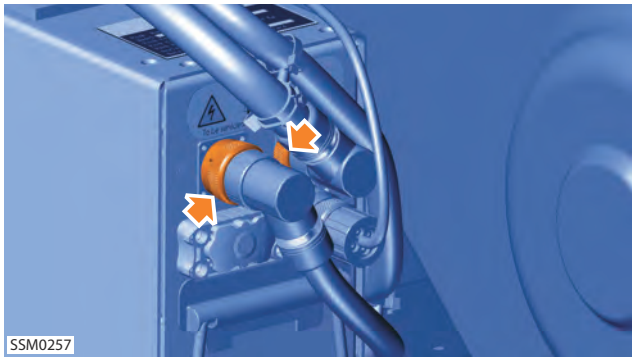
Installation

1. Installation procedure is reverse of removal.

Module - Battery Management System (BMS)

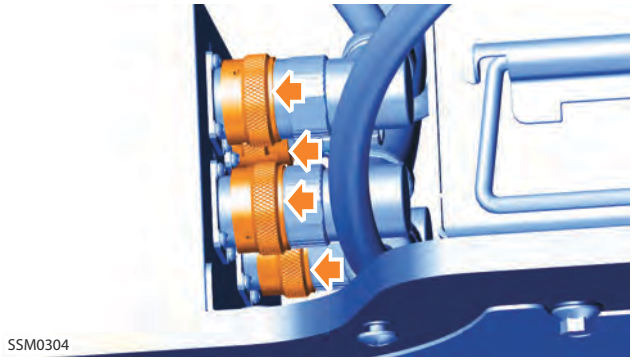
Removal

1. Remove LH rear closeout panel. Refer to "Closeout Panel - Rear - LH", page 2-13.
2. Remove RH rear closeout panel. Refer to "Closeout Panel - Rear - RH", page 2-14.

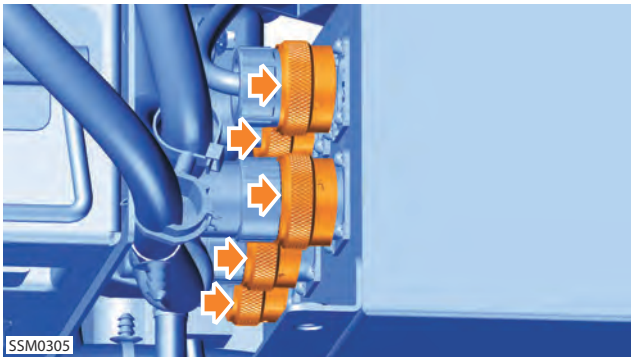


3. Rotate locking collar and disconnect **B-** high-voltage cables from both the LH and RH battery assemblies.
4. Rotate locking collar and disconnect **B+** high-voltage cables from both the LH and RH battery assemblies.

5. Remove bolts (x4) securing BMS to body.
   Torque 16 Nm (12 lbf·ft).
6. Slide the BMS as far as possible to the rear of the vehicle to access the harness connectors on RH side of the module.



7. Taking note of the installed locations, disconnect the harness connectors (x4) from RH side of the BMS.
   - **Input -** (from RH battery)
   - **Output -** (to drive motor controller)
   - **OBC** (onboard charger)
   - **Battery signal**
8. Maneuver BMS for access to harness connectors on LH side of module.



9. Taking note of the installed locations, disconnect the harness connectors (x5) from LH side of the BMS.
   - **Input +** (from LH battery)
   - **Output +** (to drive motor controller)
   - **A/C and PTC**
   - **DCDC**
   - **Vehicle signal**
10. Remove BMS module.

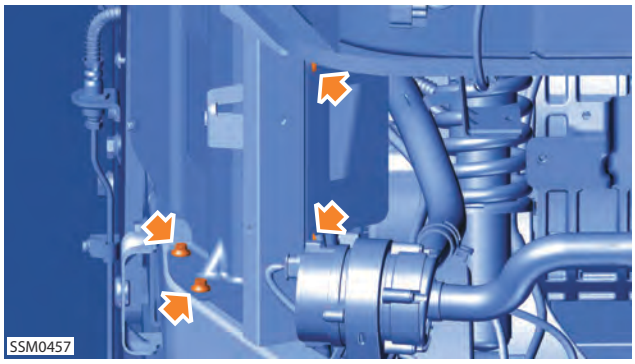
Installation

1. Installation procedure is reverse of removal.

Module - DC-DC Converter (350W Power Supply)

Removal

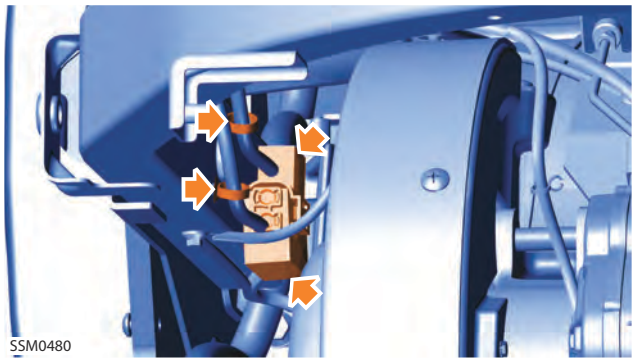
1. Remove LH rear closeout panel. Refer to *"Closeout Panel - Rear - LH", page 2-13.*



2. Remove bolts (x4) securing DC-DC converter to body.

   Torque 8 Nm (6 lbf·ft).

   CAUTION: Do not allow the DC-DC converter to hang unsupported by the electrical harnesses.



3. Using a trim removal tool, release fasteners (x2) securing harness to rear crash structure.
4. Disconnect DC-DC harness connectors (x2) from main harness.
5. Remove DC-DC converter.

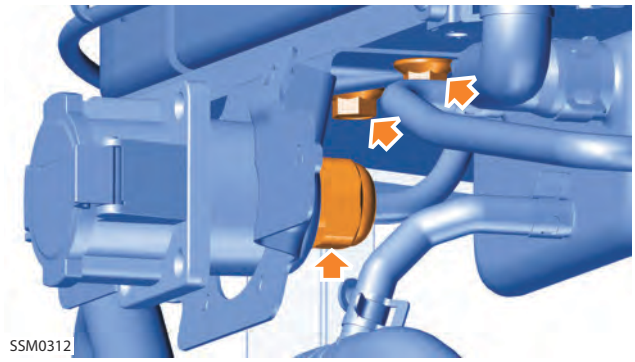
Installation

1. Installation procedure is reverse of removal.

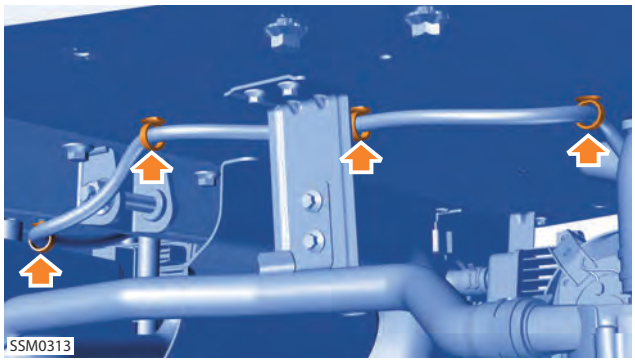
J1772 Charging Port

Removal

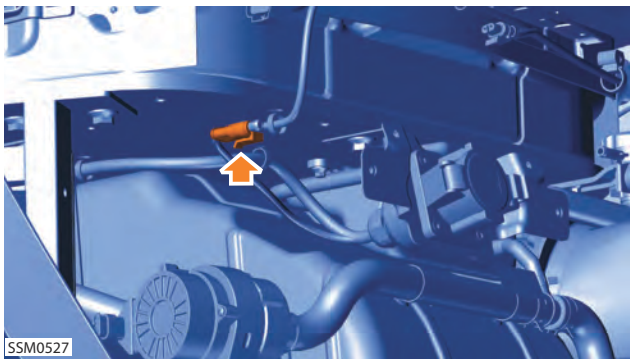
1. Remove rear wheel arch liner. Refer to *"Wheel Arch Liner - Rear", page 2-16.*



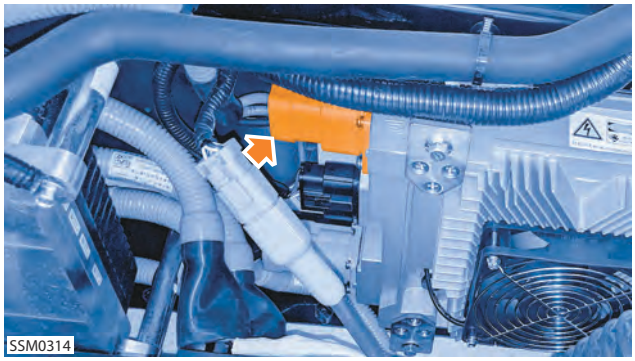
2. Remove bolts (x2) securing charging connector to body.
   Torque 36 Nm (27 lbf·ft).
3. Disconnect harness connector (2-pin) from rear of charging connector.



4. Using a trim removal tool, release fasteners (x5) securing harness to crash structure.



5. Disconnect charging port connector from rear harness.



6. Disconnect harness connector from onboard charging module.
7. Remove charging port.

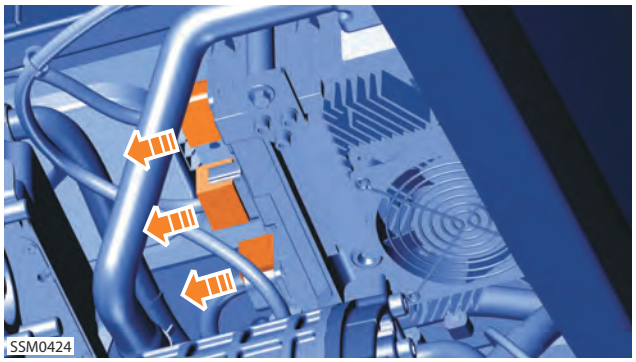
Installation

1. Installation procedure is reverse of removal.

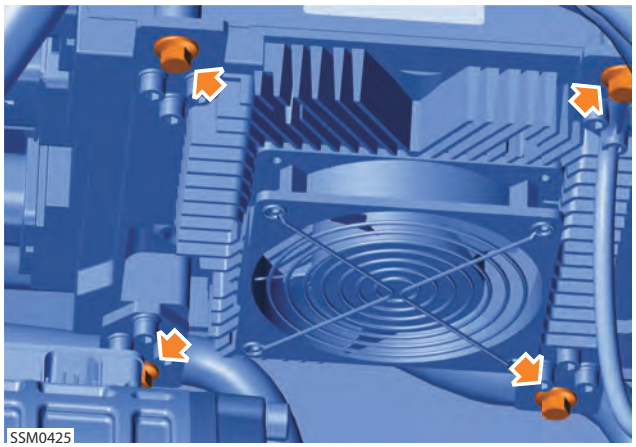
Module - Onboard Charger

Removal

1. Disconnect high voltage batteries. Refer to *"High Voltage Batteries - Disconnect", page 12-1.*
2. Remove rear wheel arch liner. Refer to *"Wheel Arch Liner - Rear", page 2-16.*



3. Disconnect harness connectors (x3) from module.



4. Remove bolts (x4) securing module to body.
   Torque 23 Nm (17 lbf·ft).

   NOTE: A ground cable is also secured by one of the bolts. Make sure this cable is installed during reassembly.
5. Remove module.

Installation

1. Installation procedure is reverse of removal.