Climate Control System - General Information -

General Specifications

Item	Specification
Refrigerant	HFC 134a
Compressor oil	Polyalkyleneglycol
System oil quantity	Total system oil quantity = 160ml. New compressor supplied with 90ml, plus additonal 70ml of oil added online = 160ml

Refridgerant oil adding capacities for replacment parts.

• NOTE: Rotate the A/C compressor shaft at least 6 to 8 turns when draining the refrigerant oil.

Item	Specification
Air conditioning compressor	1. Drain old Air conditioning (A/C) compressor. With drain plug removed and ports uncapped, rotate shaft to remove A/C compressor oil and measure the amount of oil captured. 2. Drain new A/C compressor into a clean vessel. With drain plug removed and ports uncapped, rotate shaft to remove oil. Then add back a quantity of the new oil that is identical to the quantity of oil removed from the old A/C compressor. However, if this quantity is less than 30ml, then make it up to 30ml.
Air conditioning condenser	Add30 ml.
Accumulator/dehydrator	Transfer the oil from the accumulator/dehydrator being removed to a measuring cylinder. Fill the new accumulator with the same quantity of fresh oil plus 90 ml.
Air conditioning lines, if air conditioning has been operational.	Add 10 ml per AC line.

Climate Control System - General Information - Climate Control System

Description and Operation

The purpose of the air distribution system is to route air to the designated registers. This is accomplished when air enters the plenum through the fresh/recirculated air inlet and is routed to the desired outlets by the use of air distribution doors.

The air distribution system contains the heater core, A/C evaporator core, blower motor, and all of the distribution doors. All of the air is mixed and distributed inside of the plenum assembly, depending on the distribution door positions.

For additional information on the air distribution and filtering system, refer to Section 412-01 Air Distribution and Filtering.

Heating/Defrosting

The heater system is a blended air system, receiving outside air through the air inlet, which is connected to the upper cowl. Air is directed through and/or around the heater core and mixed and discharged through outlets in the plenum assembly to the floor, panel or defrost nozzles, as desired.

For additional information on heating and defrosting, refer toSection 412-02A Heating and VentilationSection 412-02B Auxiliary Heating.

Heater Core

The heater core consists of a number of fins and tubes in an arrangement to extract heat from the engine coolant and transfer that heat to the air that passes through the heater core.

Blower motor

The blower motor pulls air from the air inlet and forces it into the plenum assembly where it is mixed and distributed. The blower motor is controlled electronically by the NAV/EATC controller.

Air Conditioning

The R-134a air conditioning system uses a hydrofluorocarbon (HFC) non-CFC based refrigerant, R-134a requires the use of Jaguar refrigerant oil or equivalent meeting Jaguar specification. Do not use R-12 tools and equipment when repairing a R-134a system unless specified in the workshop manual. Never mix R-12 and R-134a refrigerants and oils. They are not compatible.

A/C System

The A/C system is a multi-piece, single case design, with an integral blower. The system allows the operator to control the temperature by delivering heated or cooled air to maintain a constant temperature. In addition, during A/C operation, it reduces the relative humidity of air inside the vehicle. Controls are provided to adjust the temperature and system functions, included blower motor speeds for desired airflow. Outside air is drawn from the cowl air inlet just below the windshield during all system operations except for MAX A/C cooling (when recirculated air is used) and OFF. For additional information on the air conditioning, refer toSection 412-03 Air Conditioning.

Control System Inputs

The climate control system inputs are selected from the climate control head.

Control System Outputs

The air distribution and air temperature blend doors are all controlled by electronic stepper motors. For additional information, refer toSection 412-04 Control Components.

Climate Control System - General Information - Climate Control System
Diagnosis and Testing

Principle of Operation

REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation).

Inspection and Verification

CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. **1.** Verify the customer concern.

2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

• NOTE: All Climate Control System tests should be run in an ambient temperature of at least 10°c (50°F)

Visual Inspection Chart

Mechanical	Electrical
• Refrigerant circuit (fill level, leakage, flow restriction) • Condenser air flow (obstructions) • Evaporator air flow (obstructions) • air distribution housing condensate drain hose (not trapped) • Pollen filter (restricted flow) • Drive belt damage • Heater control flaps • Air conditioning compressor • Air outlet ducts (obstructions)	• Battery condition (fully charged and correctly connected) • Fuse(s) • Electrical connector(s) • Wiring harness for damage or corrosion • Blower motor • Cooling fan motor

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

DTC Index

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the refrigerant compressor or Climate Control ECU is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
B1200	Climate Control Pushbutton Circuit Failure	• This DTC is logged when a Climate Control bezel button is pressed	Check for objects pressing against the control buttons. Check for contamination of the buttons which could cause them to stick. (E.g.: spilt food or drink) If there are no apparent

		continuously for more than 5 minutes when the ignition is on	external reasons for a button to stick - then suspect an internal fault and install a new combined Climate Control panel / electronic control unit as required. Clear the DTC and recheck operation of system to ensure the DTC does not reset after 5 minutes
B1239	Air Flow Blend Door Driver Circuit Failure	• NOTE: Fault is checked for whilst the motor is running. ● Short circuit (to ground or power) on any of the motor control lines ● Open circuit on any of the motor control lines ● Short to ground on the motor supply wire	• NOTE: check that the blend door is not mechanically jammed by a foreign body inside the air distribution housing Refer to the electrical circuit diagrams and check the integrity of the wiring between the blend door actuator motor and the climate control ECU. Check the motor power feed line for short to ground. Check the four control lines for open/short circuits. If no wiring defects are found install a new actuator motor. Clear the DTC and recheck that the DTC does not reset by operating the system
B1242	Air Flow Recirculation Door Driver Circuit Failure	• NOTE: Fault is checked for when the motor is not running. ● Open circuit or short circuit to ground or power on either drive line	• NOTE: check that the recirculation door is not mechanically jammed by a foreign body inside the air distribution housing Refer to the electrical circuit diagrams and check the integrity of the wiring between the recirculation door actuator motor and the climate control ECU. Check both control lines for open/short circuits. If no wiring defects are found install a new actuator motor. Clear the DTC and recheck that the DTC does not reset by operating the system
B1251	Air Temperature Internal Sensor Circuit Open	● In car temp sensor feed open circuit	Refer to the relevant circuit diagram and check the integrity of the wiring between the air temperature internal sensor and the Climate Control System ECU. Check for open circuits on the Incar Sensor Input and Sensor Ground lines between the sensor and the Climate Control ECU. If no wiring defects are found install a new Air Temperature Internal Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B1253	Air Temperature Internal Sensor Circuit Short to Ground	● In car temp sensor feed short to ground	Refer to the relevant circuit diagram and check the integrity of the wiring between the air temperature internal sensor and the Climate Control System ECU. Check for short circuits to ground on the Incar Sensor Input line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Air Temperature Internal Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B1255	Air Temperature External Sensor Circuit Open	● Ambient temp sensor feed open circuit	Refer to the relevant circuit diagram and check the integrity of the wiring between the air temperature external sensor and the Climate Control System ECU. Check for open circuits on the Ambient Sensor line and the Sensor Ground line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Ambient Temperature External Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B1257	Air Temperature External Sensor Circuit Short To Ground	● Ambient sensor feed short to ground	Refer to the relevant circuit diagram and check the integrity of the wiring between the air temperature external sensor and the Climate Control System ECU. Check for shorts to ground on the Ambient Sensor line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Ambient Temperature External Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B1261	Solar Radiation Sensor Circuit Short To Ground	● Sunload sensor short	This component is not fitted after 2005 model year. The circuit should be open in vehicles after 2005my
B1262	Servo Motor Defrost Circuit Failure	• NOTE: Fault is checked for whilst the motor is running ● Short circuit (to ground or power) on any of the motor control lines ● Open circuit on any of the motor control lines ● Short to ground on the motor supply wire	• NOTE: check that the defrost door is not mechanically jammed by a foreign body inside the air distribution housing Refer to the relevant circuit diagram and check the integrity of the wiring between the Defrost Door Servo motor and the Climate Control System ECU. Check the Defrost Power line for a short to ground. Check each of the four control lines for open circuits, or shorts to power or ground. If no wiring defects are found install a new Defrost Door actuator motor. Clear the DTC and operate the system to check that the DTC does not reset.

B1263	Panel Door Circuit Failure	• NOTE: Fault is checked for whilst the motor is running ● Short circuit (to ground or power) on any of the motor control lines ● Open circuit on any of the motor control lines ● Short to ground on the motor supply wire ●	• NOTE: check that the panel door is not mechanically jammed by a foreign body inside the air distribution housing Refer to the relevant circuit diagram and check the integrity of the wiring between the Panel Door Servo motor and the Climate Control System ECU. Check the Panel/Floor Power line for a short to ground. Check each of the four control lines for open circuits, or shorts to power or ground. If no wiring defects are found install a new Panel/floor actuator motor. Clear the DTC and operate the system to check that the DTC does not reset.
B1342	ECU is Faulted	● DTC set when ECU fails EEPROM checksum test ● DTC set when ECU fails EEPROM write test ● DTC set when ECU fails EEPROM / ROM matching software revision check	Check the battery is fully charged and the supply leads are correctly connected. Refer to the relevant circuit diagram and check the integrity of the wiring between the Climate Control ECU and Power and ground distribution components. Check the power supply lines and fuses for open circuits and volt drops. Check the ground connections for open circuits and volt drops. Repair power supply and ground connections as required. Clear the DTC and operate the system to check if the DTC does reset. If the DTC is reset install a new Climate Control ECU.
B1676	Battery Pack Voltage Out Of Range	● battery voltage outside 9 - 16 volts range	Check the battery is fully charged and the supply leads are correctly connected. Refer to the relevant circuit diagram and check the integrity of the wiring between the Climate Control ECU and the Front Power Distribution Box and ground distribution components. Check the power supply lines and fuses for open circuits and volt drops. Check the ground connections for open circuits and volt drops. Repair power supply and ground connections as required.
B2672	Discharge Air Temperature Sensor Circuit Open	● Discharge Air Temperature Sensor Open Circuit	Refer to the relevant circuit diagram and check the integrity of the wiring between the discharge air temperature sensor and the Climate Control System ECU. Check for open circuits on the Discharge Sensor line and the sensor ground line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Discharge Air Temperature Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B2673	Discharge Air Temperature Sensor Circuit Short to Ground	● Discharge Air Temperature Sensor Circuit Short to Ground	Refer to the relevant circuit diagram and check the integrity of the wiring between the discharge air temperature sensor and the Climate Control System ECU. Check for short circuits on the Discharge Sensor line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Discharge Air Temperature Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B2308	Interior Air Temperature Inlet Motor Failure	● motor stalled ● motor open or short circuit	Check the air inlet path is clear and no foreign objects are present in the air intake orifice. Check the integrity of the wiring between the Interior Air Temperature Sensor Aspirator Motor and the power distribution components. Refer to the appropriate wiring diagram and inspect fuses and relays to confirm power is present at the motor. Check the aspirator motor ground connection to the climate control ECU for open circuits. If no wiring faults are found replace the interior air temperature sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B2516	Blower Motor Failure	• NOTE: This DTC is only relavent to the ATC version of the climate control system. ● motor stalled ● motor open or short circuit ● Wiring harness fault	Validate the fault on the car. Check the blower motor is not stalled by a foreign object. Refer to the relevant circuit diagram and check the integrity of the wiring between the blower motor and the power distribution components. Check the fuses and relay which supply the motor. Check the motor supply lines between the Passenger Junction Box and motor for open or short circuits to ground. Check the motor ground lines to the ground point on the cross car beam for open circuits. Repair harness faults using approved repair kit. replace blower motor if there are no harness faults
B1946	Climate Control A/C Post Evaporator Sensor Circuit Failure	● Evaporator temperature sensor feed open circuit	Refer to the relevant circuit diagram and check the integrity of the wiring between the Climate Control A/C Post Evaporator Sensor and the Climate Control System ECU. Check for open circuits on the Evap Sensor line between the sensor and the Climate Control ECU. Check the sensor ground line for open

			circuits. If no wiring defects are found install a new Climate Control A/C Post Evaporator Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
B1947	Climate Control A/C Post Evaporator Sensor Circuit Short To Ground	• Evaporator sensor feed short to ground	Refer to the relevant circuit diagram and check the integrity of the wiring between the Climate Control A/C Post Evaporator Sensor and the Climate Control System ECU. Check for short circuits to ground on the Evap Sensor line between the sensor and the Climate Control ECU. If no wiring defects are found install a new Climate Control A/C Post Evaporator Sensor. Clear the DTC and operate the system to check that the DTC does not reset.
U1900	CAN Communication Bus Fault - Receive Error	• Communication on CAN network fault	Refer to the relevant wiring diagram and check the CAN bus wiring for open circuits, shorts to power or ground. Check termination resistance is correct. Repair harness as required using approved harness repair kit
B2477	Module Configuration Failure	• 'Configuration never programmed' or 'Configuration write failure'	Not used on X400 or set on delivered modules

Auxiliary Heaters

There are two types of auxilliary heater fitted to diesel powered vehicles according to it's intended market. An electric booster heater, which is a standard fitment, or a fuel fired booster heater which is fitted for specific extreme cold climate markets.

The electric booster heater uses 3 glowplugs mounted in a housing connected into the coolant circuit, the glowplugs are controlled automatically by the engine management system.

The fuel fired booster heater uses a separate combustion housing and heat exchanger to heat the coolant by burning diesel drawn from the vehicle fuel tank. The fuel fired booster heater is controlled automatically by an electronic control unit which also uses data from the engine management system.

Inspection and Verification

CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. **1.** Verify the customer concern.

2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Air inlet ducting to fuel burning heater free of obstructions • Exhaust outlet from fuel burning heater free of obstructions • Fuel supply lines to fuel burning heater not damaged (leaks, blockages) • Coolant hoses correctly connected • Cooling system filled and bled correctly	• Battery condition (fully charged and correctly connected) • Fuse(s) and relay(s) • Electrical connector(s) • Wiring harness for damage or corrosion • auxilliary water pump functional

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

DTC Index

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the Fuel Burning Heater is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
B2462	Aux. Heater Flame Out Fault	• Fuel supply lines to the auxilliary heater crushed, blocked, leaking • Internal fault within auxilliary heater unit	Check fuel supply lines to the auxilliary heater are free from damage, leaks or air ingress.Rectify any restrictions, leaks of air ingress. Clear DTC and test the system to verify the repair.
B1317	Battery voltage high	• Charging system fault	Check charging system REFER to: Charging System - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (414-00 Charging System - General Information, Diagnosis and Testing).
B1318	Battery Voltage Low	• Battery discharged • Wiring harness fault • Charging system fault	Check battery is fully charged. Using the appropriate circuit diagrams: Check power supply circuits from front power distribution box to the fuel fired heater unit. Using the appropriate circuit diagrams: check ground connections to the fuel fired heater unit. Repair any wiring faults using the approved harness repair kit. Clear the DTC and test the system to verify the repair. Check charging system REFER to: Charging System - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (414-00 Charging System - General Information, Diagnosis and Testing).

Climate Control System - General Information - Air Conditioning (A/C) Compressor Leak Detection

General Procedures

1. Remove the A/C compressor from the vehicle. For additional information, refer to Section 412-03 Air Conditioning.
2. Install A/C pressure test adaptor to the A/C compressor using the existing manifold bolt.
3. Connect the high and low pressure lines of R-134a manifold gauge set to the fittings on A/C pressure test adaptor.
4. Attach the center hose of R-134a manifold gauge set to a refrigerant container standing in an upright position.
5. Hand rotate the compressor shaft ten revolutions to distribute the oil inside the A/C compressor.
6. Open the low and high pressure gauge valves and the valve on the refrigerant container to allow the refrigerant vapor to flow into the A/C compressor.
7. Use R-134a automatic calibration halogen leak detector to check for leaks at the compressor shaft seal and the compressor center seal.
8. If a shaft seal leak is found, install a new shaft seal. If a leak is found at the compressor center seal, install a new A/C compressor.
9. When the leak test is finished, close the manifold gauge valves and the valve on the refrigerant container.
10. Slowly remove the gauge set hoses from A/C pressure test adapter. Allow the refrigerant in the compressor to escape.
11. Install the A/C compressor on the vehicles. For additional information, refer to Section 412-03 Air Conditioning
12. Evacuate, charge and leak test the system.

Climate Control System - General Information - Air Conditioning (A/C) System Flushing

General Procedures

1. WARNING: Use extreme care and observe all safety precautions related to the use of refrigerants. Warning: Due to refrigerant hazards, always wear safety goggles and non-penetrable gloves when working on or flushing A/C systems. Failure to follow this instruction may result to personal injury.

• CAUTIONS:

The A/C refrigerant analyzer must be used before the recovery of any vehicle's A/C refrigerant. Failure to do so puts shop bulk refrigerant at risk of contamination. If the vehicle A/C refrigerant is contaminated, refer the customer to return to the repair facility that performed the last A/C repair. If the customer wishes to pay the additional cost, use the A/C recovery equipment that is designated for recovering contaminated A/C refrigerant. All contaminated A/C refrigerant must be disposed of as hazardous waste. For all equipment, follow the equipment manufacturers procedures and instructions. Failure to follow this instruction may result to personal injury.

Suction accumulator/drier, muffler, hoses, thermal expansion valve, and fixed orifice tube should be removed when flushing the A/C system. Internal plumbing of these devices makes it impossible to correctly remove any residual flushing agent. Except for the hoses, these components are typically discarded after A/C system contamination. Hoses can normally be reused unless they are clogged with debris. The flushing solvent and filter used in the A/C Flusher are intended for use on one vehicle only. They may be used to flush both the A/C condenser core and the A/C evaporator core on an individual vehicle, but under no circumstances should they be used on more than one vehicle.

• NOTE: Prior to using A/C Flusher for the first time, review its operating instructions. Failure to follow this instruction may result to personal injury.

This procedure allows the specified components to be cleaned and flushed while installed in their normal in-vehicle location. The types of contamination flushed include particle matter that results from A/C compressor and/or desiccant failure within the suction accumulator/drier and gummy residue that may form when refrigerant oil is overheated during A/C compressor seizure. The flushing process is a two-step procedure that involves the use of an A/C Flusher to:

- Circulate the flushing solvent through the heat exchanger in the reverse direction of normal refrigerant flow (back-flushing). Particulate matter picked up during flushing is filtered from the returning solvent before the solvent is returned to the reservoir for continued circulation.
- Remove the flushing solvent from the heat exchanger. In this step of the procedure, pressurized air 621-862 kPa (90-125 psi) is used to push and/or evaporate any remaining flush solvent from the heat exchanger.

2. Reclaim the refrigerant. For additional information, refer to Discharging and Recovery.

3. Disconnect refrigerant lines from the heat exchanger(s) to

be flushed. For additional information, refer to Section 412-03 Air Conditioning

4. Connect A/C flusher and A/C flusher fitting kit to the heat exchanger to be flushed. Do not flush through the A/C evaporator core orifice, mufflers or lines. Internal plumbing and material make-up of these components make it impossible to correctly remove debris and/or residual flushing solvent.
5. Use flushing solvent to flush the heat exchanger for a minimum of 15 minutes. The flush solvent may be used for one or both heat exchangers in the A/C system. However, the flush solvent is intended for one vehicle only. The filter used on the flushing unit is also intended for use on one vehicle only.
6. Flush component for a minimum of 15 minutes.
7. Apply 621-862 kPa (90-125 psi) pressurized air to the component for a minimum of 30 minutes. The 30 minute purge time is required to force and/or evaporate all residual flush solvent from the A/C system component. Failure to successfully remove all residual solvent within the component can result in system damage when reconnected and operated. Dispose of used flush solvent and filter in accordance with local, state and federal ordinances.
8. NOTE: A/C system filtering as described in this section is optional if system flushing is performed. However, filter kit use is recommended after flushing if A/C system contamination is extensive.

   Install new suction accumulator/drier and A/C evaporator core orifice on any vehicle being repaired for A/C compressor or desiccant failure.
9. Install new refrigerant lines if clogged with debris.
10. Reconnect the heat exchanger being flushed.
11. Add additional refrigerant oil as required. For additional information, refer to Refrigerant Oil Adding.
12. Evacuate, charge and leak test A/C system.
13. Check A/C system for correct operation.

Climate Control System - General Information - Air Conditioning (A/C) System Recovery, Evacuation and Charging

General Procedures

1. WARNINGS:

 A/C refrigerant can be extremely hazardous and failure to follow the equipment manufacturers instructions may result in personal injury.

 Jaguar Cars Limited recommend the use of a charging station to carry out recover, evacuation and charging of the refrigerant system. Follow the manufactures equipment procedures and instructions. Failure to follow these instructions may result in personal injury.

• CAUTIONS:

 The A/C refrigerant analyzer must be used before the recovery of any vehicle's A/C refrigerant. Failure to do so puts shop bulk refrigerant at risk of contamination. If the vehicle A/C refrigerant is contaminated, refer the customer to return to the repair facility that carried out the last A/C repair. If the customer wishes to pay the additional cost, use the A/C recovery equipment that is designated for recovering contaminated A/C refrigerant. All contaminated A/C refrigerant must be disposed of as hazardous waste. For all equipment, follow the equipment manufacturers procedures and instructions.

 Do not add R-12 refrigerant to an A/C system that requires the use of R-134a refrigerant. These two types of refrigerant should never be mixed. Doing so may cause damage to the A/C system.

Connect the charging station. For additional information, refer to the manufactures equipment instructions.

2. Recover the refrigerant. For additional information, refer to the manufactures equipment instructions.

3. Carry out the required repair procedure.
For additional information, refer to Section 412-03 Air Conditioning.

4. Add the required amount of oil to the A/C system depending on the repair procedure.
For additional information, refer to Refrigerant Oil Adding - in this section.

5. Evacuate the A/C system. For additional information, refer to the manufactures equipment instructions.

6. Check the A/C system for a sufficient vacuum. For additional information, refer to the manufactures equipment instructions.

7. Charge the A/C system with refrigerant.

8. Check the A/C system for correct operation.

9. Carry out a leak detection test.
For additional information, refer to Leak Detection - in this section.

Climate Control System - General Information - Contaminated Refrigerant Handling

General Procedures

1. If contaminated refrigerant is detected DO NOT recover the refrigerant into your R-134a OR R-12 recovery/recycling equipment. Take the follow actions:

1. Repeat the test to verify contaminated refrigerant is present.
2. Advise the customer of the contaminated A/C system and any additional cost to repair the system. The customer may wish to return to the repair facility performing the last A/C repair.
3. Recover the contaminated refrigerant using suitable recovery only equipment designed for capturing and storing contaminated refrigerant. This equipment must only be used to recover contaminated refrigerant to prevent the spread to other vehicles. As an alternative, contact an A/C repair facility in your area with the proper equipment to perform the repair.

Climate Control System - General Information - Discharging and Recovery

General Procedures

1.  WARNING: Use extreme care and observe all safety precautions related to the use of refrigerants. Failure to follow this instruction may result in personal injury.

• CAUTIONS:

 If a refrigerant recovery or recycling station is used, the following general procedures should be observed in addition to the operating instructions provided by the equipment manufacturers. Failure to follow this instruction may result in personal injury.

 The A/C Refrigerant Analyzer must be used before the recovery of any vehicle's A/C refrigerant. Failure to do so puts shop bulk refrigerant at risk of contamination. If the vehicle A/C refrigerant is contaminated, refer the customer to return to the repair facility that performed the last A/C repair. If the customer wishes to pay the additional cost, use the A/C recovery equipment that is designated for recovering contaminated A/C refrigerant. All contaminated A/C refrigerant must be disposed of as hazardous waste. For all equipment, follow the equipment manufacturers procedures and instructions. Failure to follow this instruction may result in personal injury.

• NOTE: Hoses should have shut off devices or check valves within 305mm (12 in) of the hose end to minimize the introduction of non-condensable gases (air) into the recovery station, as well as to minimize the amount of refrigerant released when the hoses are disconnected.

• NOTE: Follow the equipment manufacturers procedures and instructions. Failure to follow this instruction may result in personal injury.

Connect R-134a A/C refrigerant center hose(s) to the vehicle gauge ports and R-134a A/C refrigerant center inlet fittings.

2. Turn on the power to R-134a A/C refrigerant center to start the recovery process. Allow R-134a A/C refrigerant center to recover refrigerant from the system until the station pressure goes into a vacuum. On some equipment, the pump will be shut off automatically by a low-pressure switch in the electrical system. On other units, it may be necessary to manually turn off the pump.

3. Once R-134a A/C refrigerant center has recovered the vehicle A/C system refrigerant, close R-134a A/C refrigerant center inlet valve (if equipped). Then switch off the power supply.

4. Allow the vehicle A/C system to remain closed for about two minutes. Observe the system vacuum level as shown on the gauge. If the pressure does not rise, disconnect R-134a A/C refrigerant center hose(s).

5. If the system pressure rises, repeat Steps 2-4 until the vacuum level remains stable for two minutes.

6. Carry out the required operations, then evacuate and recharge the A/C system. For additional information, refer to Evacuation and Charging.

Climate Control System - General Information - Electronic Leak Detection

General Procedures

1.  WARNING: Good ventilation is necessary in the area where A/C leak testing is to be carried out. If the surrounding air is contaminated with refrigerant gas, the leak detector will indicate this gas all the time. Odors from other chemicals such as antifreeze, diesel fuel, disc brake cleaner, or other cleaning solvents can cause the same problem. A fan, even in a well ventilated area, is very helpful in removing small traces of contamination from the air that might affect the leak detector. Failure to follow this instruction may result in personal injury.

Attach R-134a manifold gauge set to the service gauge port valves.

- Leave both R-134a manifold gauge set valves closed.
- Both gauges should indicate 413-551 kPa (60-80 psi) at 24°C (75°F) with the engine off.
- If little or no pressure is indicated, charge the refrigerant system. For additional information, refer to Discharging and Recovery.

2. Use R134-a Automatic calibration halogen leak detector to leak test the refrigerant system. Follow the instructions included with leak detector for handling and operation techniques.

3. If a leak is found, reclaim the refrigerant. For additional information, refer to Discharging and Recovery.

Climate Control System - General Information - Inspection and Assembly Requirements

General Procedures

1. NOTE: Any time a hose or component connection leak is observed, the component and fitting must be separated, cleaned and a new O-ring and connector should be lubricated.

O-ring seal surfaces must be free of dirt, lint, burrs and scratches. The O-ring and connector should be lubricated.

Climate Control System - General Information - Leak Detection

General Procedures

1. NOTE: On vehicles with R-134a Leak Trace Dye incorporated into the A/C system. The exact location of leaks can be pinpointed by the bright yellow-green glow of the tracer dye. Since more than one leak may exist, always inspect each component. If it is necessary to add dye, use Dye Injector. A/C systems require 7.39 ml (0.25 oz.) of Fluoro-Light/P Fluorescent Tracer Dye 164-R3712.

• NOTE: Some vehicles may have signs of refrigerant oil at the spring lock couplers. This may be caused from the assembly process which applies to the fittings before installation to aid in assembly. When a spring lock coupler is suspected of leaking,always wipe the fitting clean and verify the leak with R-134a Automatic Calibration Halogen Leak Detector.

Check for leaks using 120 Watt UV Spot Lamp.

2. Scan all components, fittings and lines of the A/C system.

3. After the leak is repaired, remove any traces of leak dye with a general purpose oil solvent.

4. Verify the repair by operating the system for a short time and inspecting with the UV lamp.

Climate Control System - General Information - Refrigerant Oil Adding

General Procedures

1. A new replacement A/C compressor contains 150 ml (5 oz.) refrigerant oil. If the amount of oil drained from the removed A/C compressor is between 90 and 150 ml (3 to 5 oz.), pour the same amount plus 28 ml (1 oz.) of clean oil into the new A/C compressor. If the amount of oil drained from the old A/C compressor is greater than 150 ml (5 oz.), pour only 150 ml (5 oz.) of clean refrigerant oil into the new A/C compressor. If the amount of refrigerant oil drained from the old A/C compressor is less than 90 ml (3 oz.), pour 90 ml (3 oz.) of clean refrigerant oil into the new compressor.
    - When replacing components of the air conditioning refrigerant system, add oil to the replacement components.

Climate Control System - General Information - Refrigerant System Tests

General Procedures

1. WARNING: Use extreme care and observe all safety precautions related to the use of refrigerants. The A/C refrigerant analyzer must be used before the recovery of any vehicle's A/C refrigerant. Failure to do so puts shop bulk refrigerant at risk of contamination. If the vehicle A/C refrigerant is contaminated, refer the customer to return to the repair facility that carried out the last A/C repair. If the customer wishes to pay the additional cost, use the A/C recovery equipment that is designated for recovering contaminated A/C refrigerant. All contaminated A/C refrigerant must be disposed of as hazardous waste. For all equipment, follow the equipment manufacturers procedures and instructions. Failure to follow this instruction may result in personal injury.

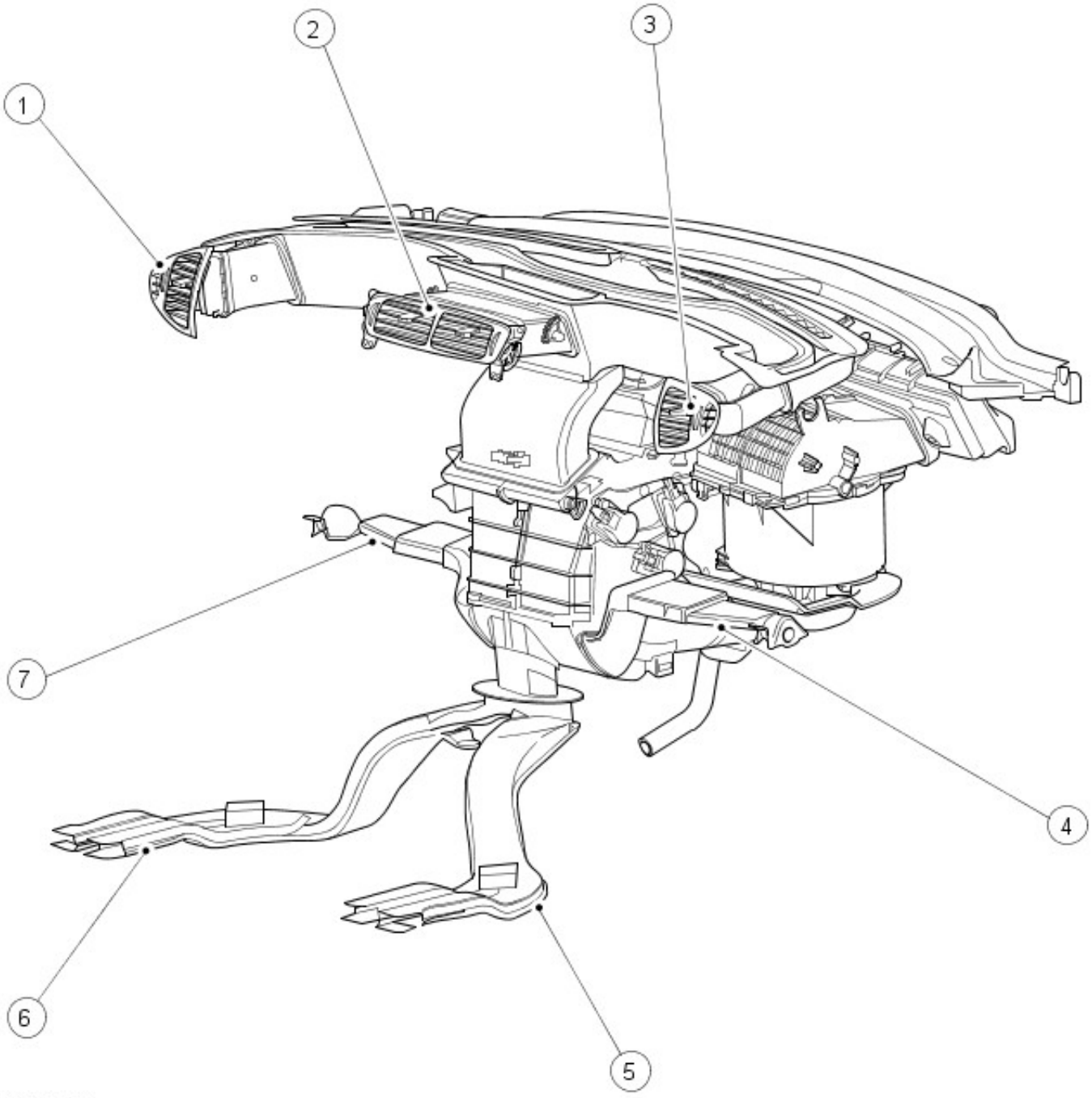
• NOTE: Jaguar Cars Ltd supports the efficient usage, recovery and recycling of the refrigerant used in passenger car air conditioners. Jaguar Cars Ltd recommends the use of UL-approved recovery/recycling device such as R-134a A/C refrigerant center (which meets SAE Standard J 1991) during any A/C system repair and recharge procedure which requires that the system be evacuated.

Use R-134a A/C refrigerant centre to evacuate and recover the A/C system.

- Follow the equipment manufacture procedures and instructions for use of equipment.

Air Distribution and Filtering - Air Distribution and Filtering

Description and Operation



VUJ0004273

Item	Part Number	Description
1	—	Left-hand side register
2	—	Center register
3	—	Right-hand side register
4	—	Right-hand side front floor duct
5	—	Right-hand side rear floor duct
6	—	Left-hand side rear floor duct
7	—	Left-hand side front floor duct

The purpose of the air distribution system is to route air to the designated registers. This is accomplished when air enters the plenum through the fresh/recirculated air inlet and is routed to the desired outlets by use of distribution doors. The incoming stream of fresh air is passed through a pollen filter.

The air distribution system consists of the heater core, air conditioning (A/C) evaporator core, A/C blower motor and all of the distribution doors. All of the air is mixed and distributed inside of the plenum chamber, depending on the distribution door positions.

Air ducts route air to specified areas of the air distribution system. These areas are the floor ducts, side window registers, windshield demister, instrument panel vents and instrument panel center registers.

Air Distribution and Filtering - Air Distribution and Filtering

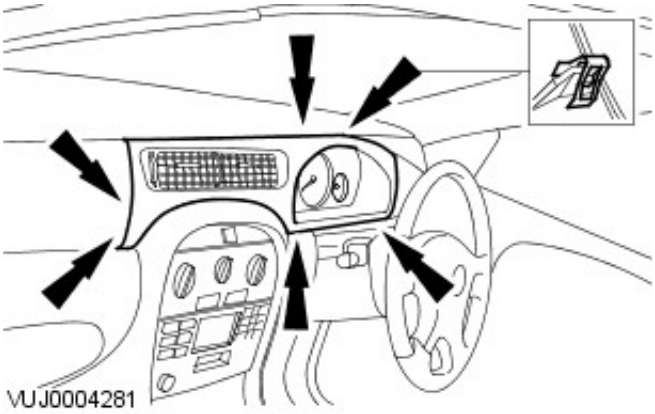
Diagnosis and Testing

For additional information, refer toSection 412-00 Climate Control System - General Information

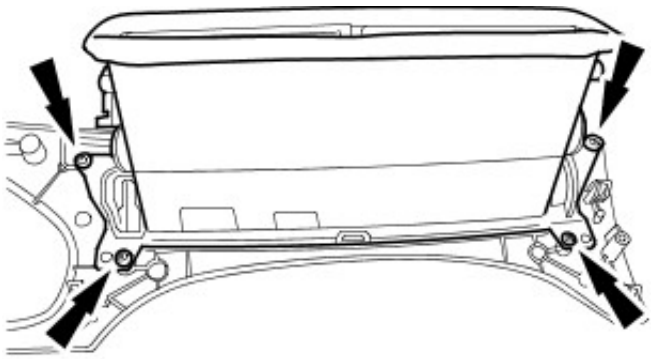
Air Distribution and Filtering - Center Registers

Removal and Installation

Removal



1. Remove the instrument panel veneer trim.



2. Remove the center registers.
   - Remove the center register retaining screws.

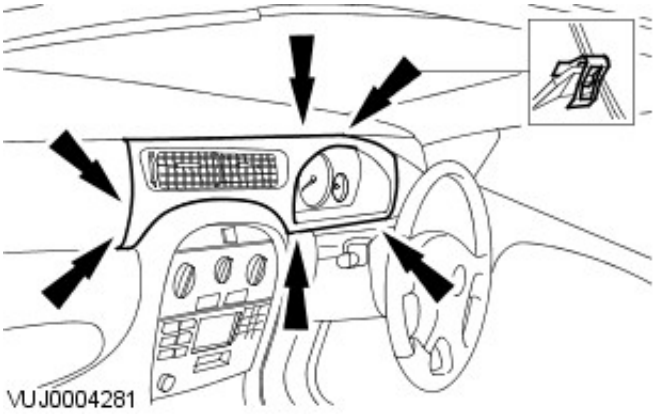
Installation

1. To install, reverse the removal procedure.

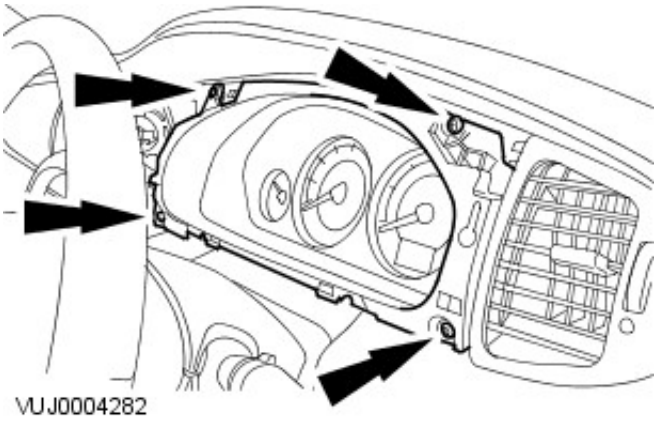
Air Distribution and Filtering - Driver Side Register

Removal and Installation

Removal

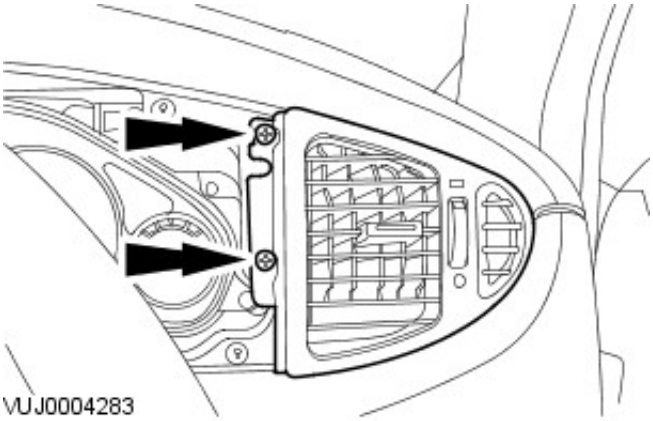


1. Remove the instrument panel veneer trim.



2. Remove the instrument panel surround.

- Remove the instrument panel surround retaining screws.



3. Remove the driver side register.

- Remove the driver side register retaining screws.

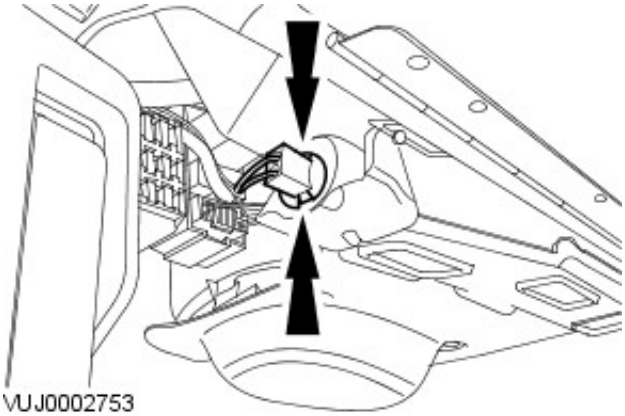
Installation

1. To install, reverse the removal procedure.

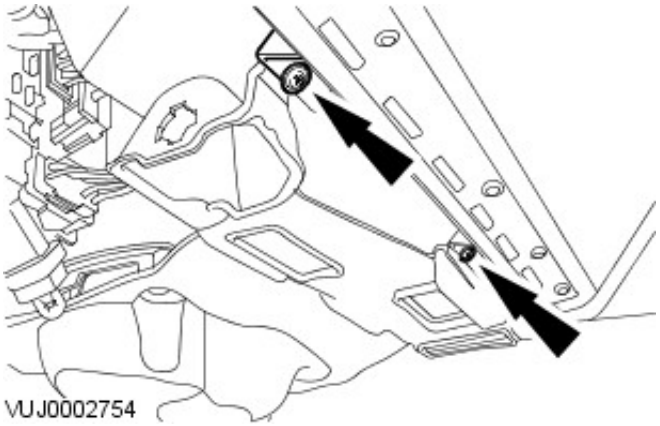
Air Distribution and Filtering - Front Footwell Duct LH

Removal and Installation

Removal

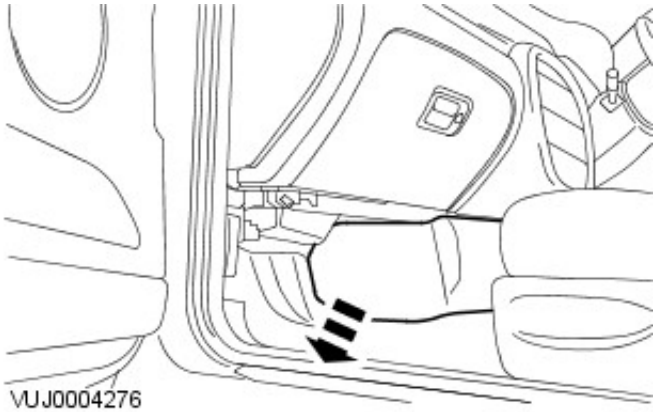

VUJ0002753

1. Detach the footwell lamp.

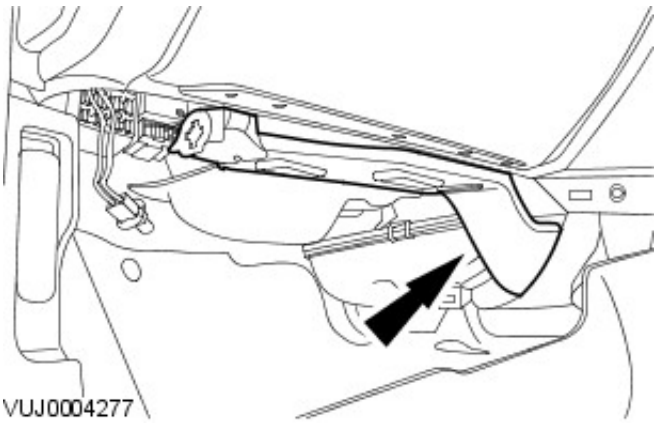

VUJ0002754

2. Detach the floor register.

- Remove the floor register retaining screws


VUJ0004276

3. Detach the front of the center consul side trim.


VUJ0004277

4. Remove the register.

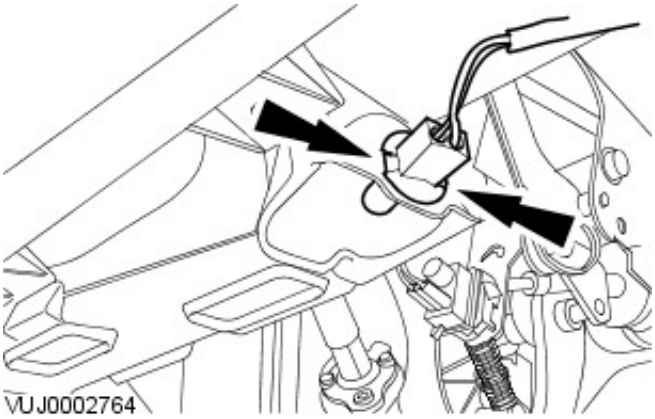
Installation

1. To install, reverse the removal procedure.

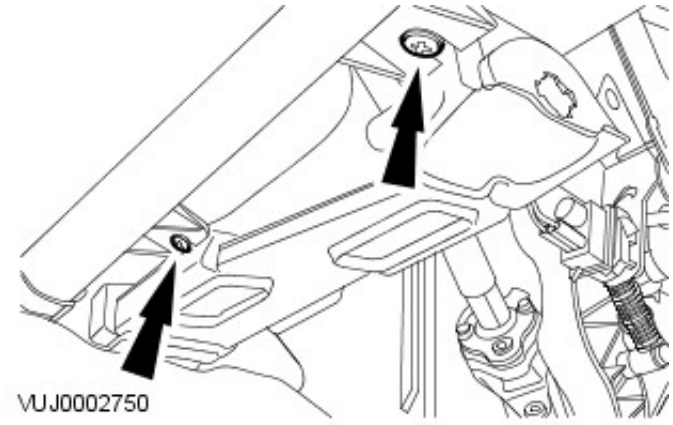
Air Distribution and Filtering - Front Footwell Duct RH

Removal and Installation

Removal

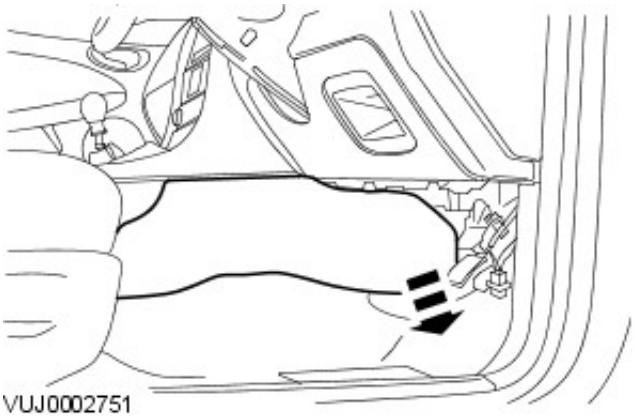


1. Detach the footwell lamp.

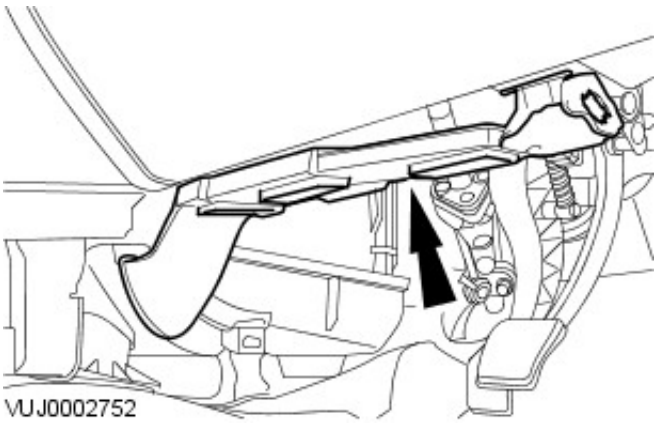


2. Detach the floor register.

- Remove the floor register retaining screws.



3. Detach the front of the center consul side trim.



4. Remove the register.

Installation

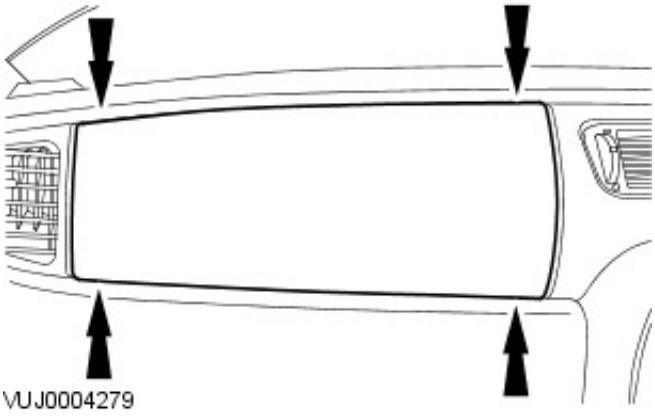
1. To install, reverse the removal procedure.

Air Distribution and Filtering - Passenger Side Register
Removal and Installation

Removal

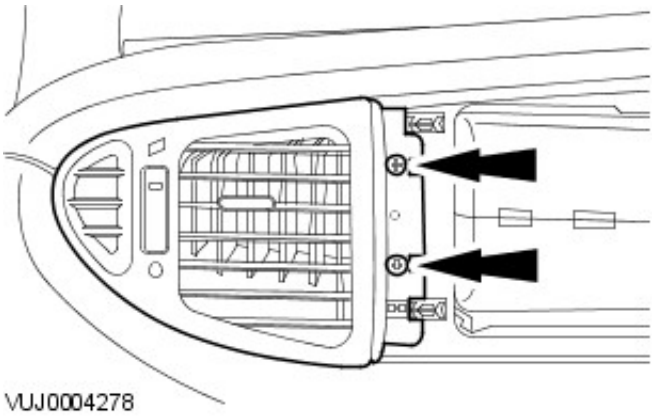
1. WARNING: To avoid accidental deployment and possible personal injury, the back up power supply must be depleted before repairing or replacing any airbag supplemental restraint system (SRS) components. To deplete the back up power supply energy, disconnect the battery ground cable and wait for one minute. Failure to follow this instruction may result in personal injury.

Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.


VUJ0004279

2. CAUTION: The passenger side air bag door is retained to the air bag by a securing strap.

Detach the passenger side air bag door.


VUJ0004278

3. Remove the passenger side register.

- Remove the passenger side register retaining screws.

Installation

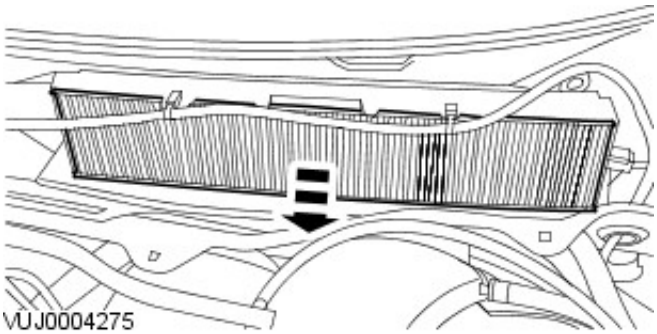
1. To install, reverse the removal procedure.

Air Distribution and Filtering - Pollen Filter

Removal and Installation

Removal

1. Remove the cowl vent screen.
   For additional information, refer to: Cowl Vent Screen (501-02 Front End Body Panels, Removal and Installation).
2. Remove the pollen filter.



Installation

1. To install, reverse the removal procedure.

Heating and Ventilation -

Lubricants, Fluids, Sealers and Adhesives

	Specification
In vehicle cross beam bonding	WSKM2G379-A1
In vehicle cross beam solvent wipe	WSKM14J251-A1

Torque Specifications

Description	Nm	lb-ft	lb-in
Evaporator core housing to in vehicle cross beam retaining bolts.	5	-	44
Blower motor housing to in vehicle cross beam retaining bolt.	7	-	62
In vehicle cross beam to vehicle body retaining bolts.	25	18	-
Evaporator core housing nut and washer assembly.	1	-	9
Pollen filter housing retaining nuts.	7	-	52

Heating and Ventilation - Heating and Ventilation

Description and Operation

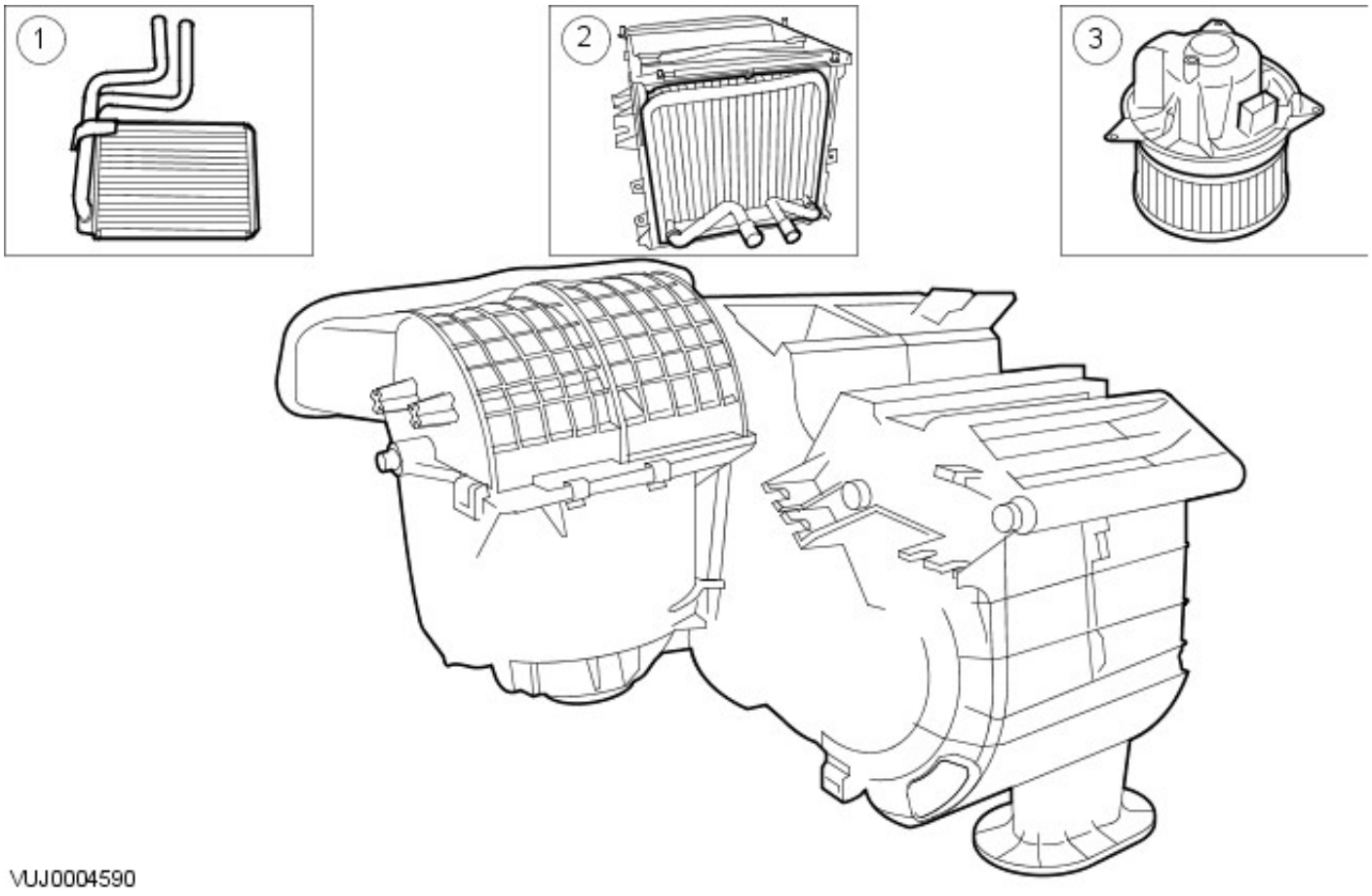
The heating and defrosting system is a blended air system and consists of a heater core, a blower motor, distribution doors and an evaporator core.

Air is directed through the heater core for heating and around for cooling, mixed and discharged through outlets in the plenum assembly to the floor, instrument panel registers or defrost nozzles as required

The heating and defrosting system:

- controls the vehicle air temperature and, during A/C operation, reduces the relative humidity of the air inside the vehicle.
- delivers heated or cooled air to maintain the vehicle interior temperature and comfort level.
- controls the A/C blower motor speed.

The blower motor draws outside air through the air inlet filter and duct during all system operations except for MAX A/C cooling (when recirculated air is used).



VUJ0004590

Item	Part Number	Description
1	—	Heater core
2	—	Evaporator core
3	—	Blower motor

Heater Core

The heater core consists of fins and tubes arranged to extract heat from the engine coolant and transfer it to air passing through the heater core. Air passing through the heater core is then directed to the relevant register.

Blower Motor

The HVAC blower motor pulls air from the air inlet and forces it into the evaporator housing and plenum assembly which is attached to the instrument panel where it is mixed and distributed.

Heating and Ventilation - Heating and Ventilation

Diagnosis and Testing

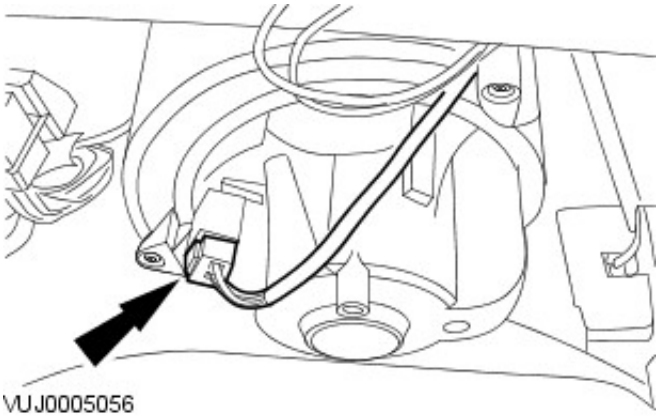
For additional information, refer to Section 412-00 Climate Control System - General Information.

Heating and Ventilation - Blower Motor

Removal and Installation

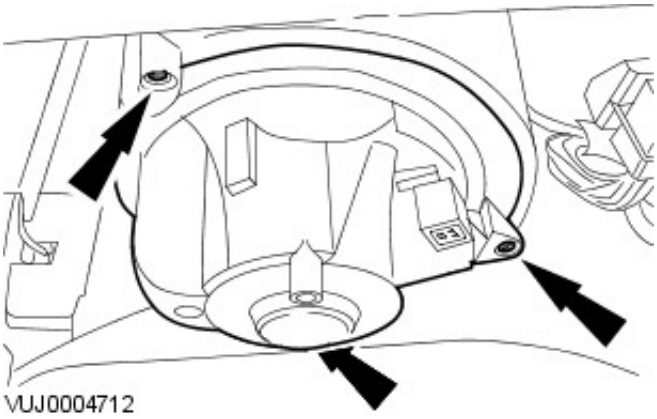
Removal

1. Remove the blower motor lower cover.
2. Disconnect the electrical connector.



VUJ0005056

3. Remove the blower motor.
   - Remove the blower motor retaining screws.



VUJ0004712

Installation

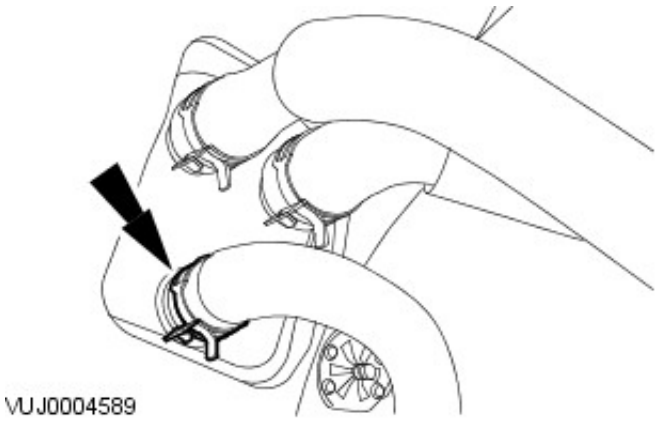
1. To install, reverse the removal procedure.

Heating and Ventilation - Evaporator Core Housing

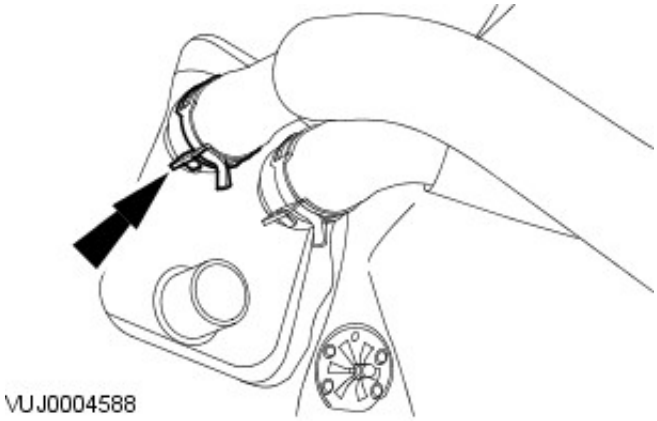
Removal and Installation

Removal

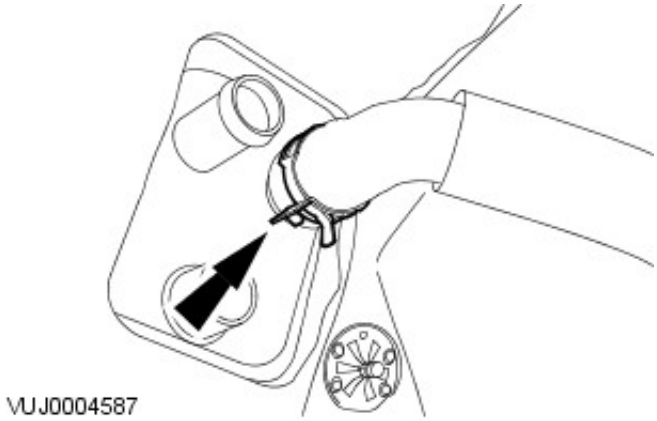
1. Disconnect the battery ground cable.
2. Recover the refrigerant. For additional information, refer to Section 412-00 Climate Control System - General Information.
3. Drain the cooling system. For additional information, refer to Section 303-03A Engine CoolingSection 303-03B Engine Cooling.
4. Disconnect the drain tube from the heater core.



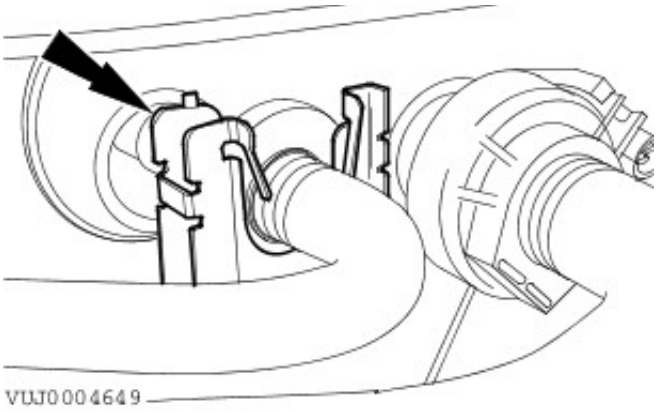
5. Disconnect the heater hose from the heater core.



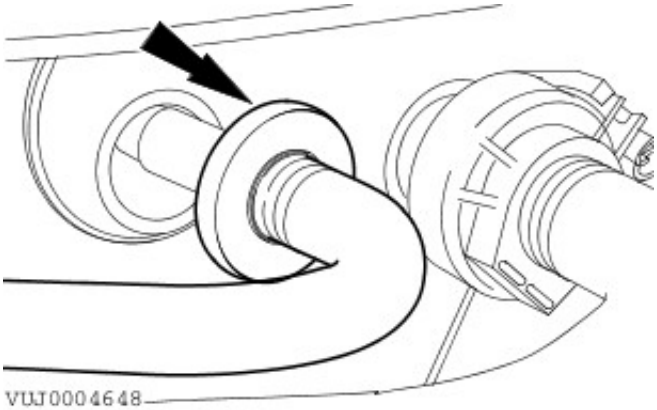
6. Disconnect the heater hose from the heater core.



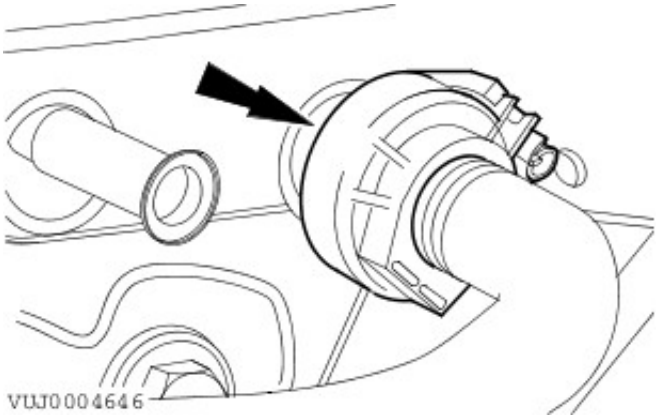
7. Lower the vehicle.
8. Remove the refrigerant line retaining clip.



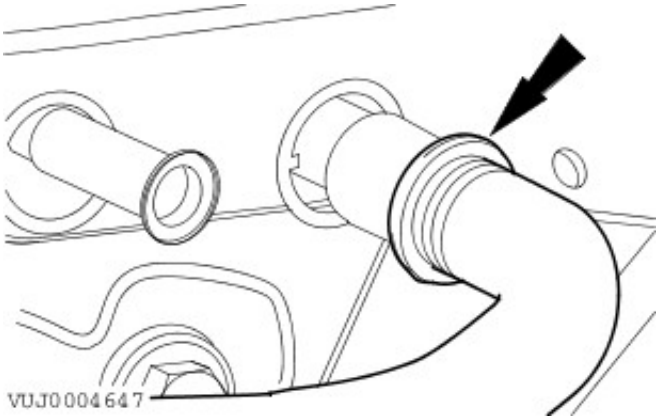
9. Using a suitable tool disconnect the refrigerant line.



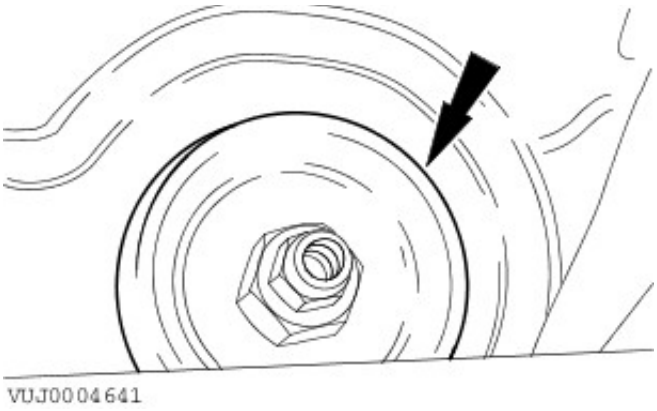
10. Remove the refrigerant line retaining clip.



11. Using a suitable tool disconnect the refrigerant line.

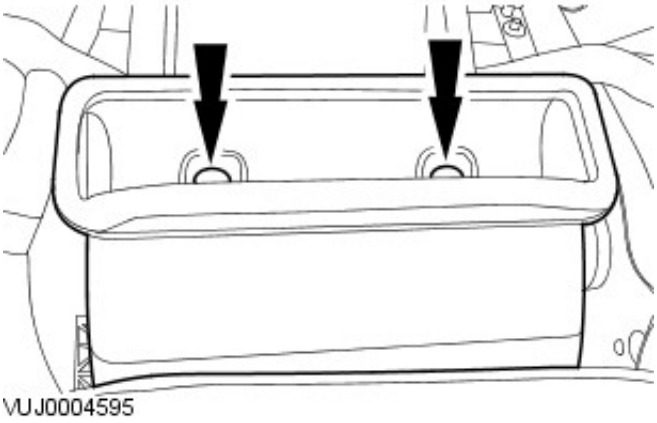


12. Remove the evaporator core housing lower securing nut.


VUJ0004641

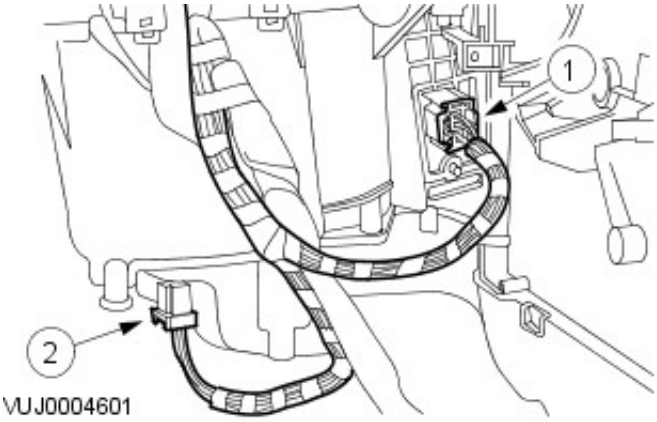
13. Remove the instrument panel. For additional information, refer to Section 501-12 Instrument Panel and Console.

14. Remove the center register air duct.


VUJ0004595

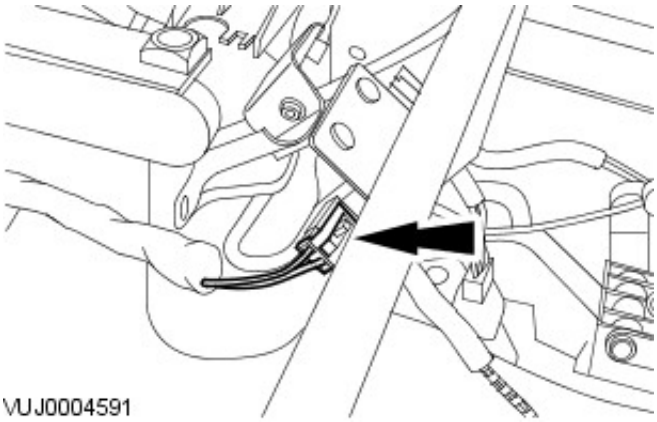
15. Disconnect the electrical connectors.

1. On manual A/C only.
2. All vehicles.



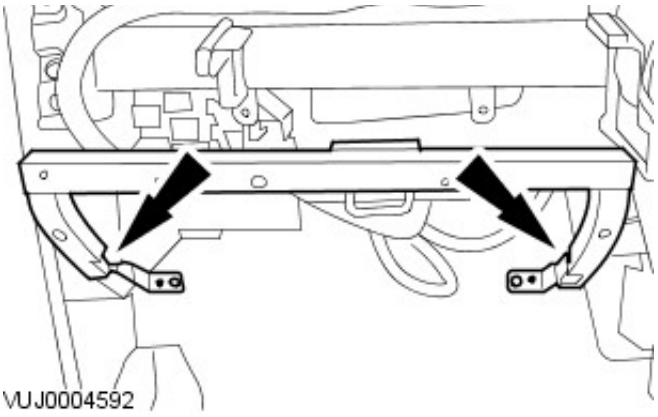
VUJ0004601

16. Disconnect the electrical connector.

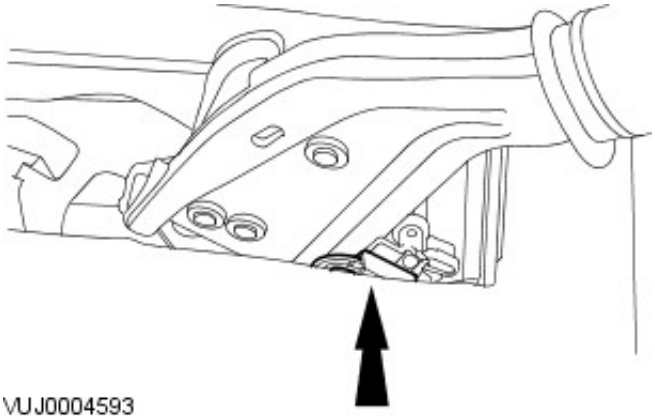

VUJ0004591

17. Remove the glove box mounting frame.

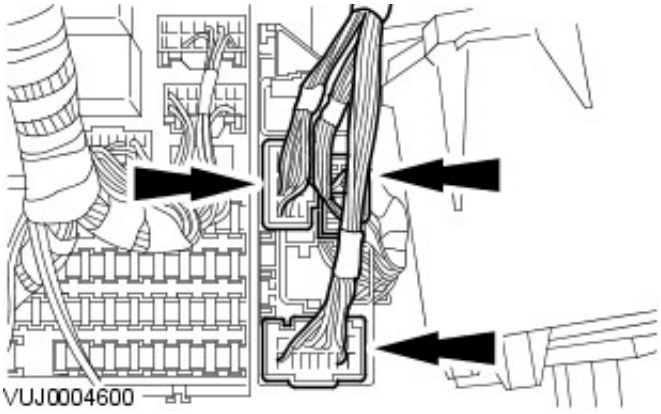
- Remove the retaining bolts.


VUJ0004592

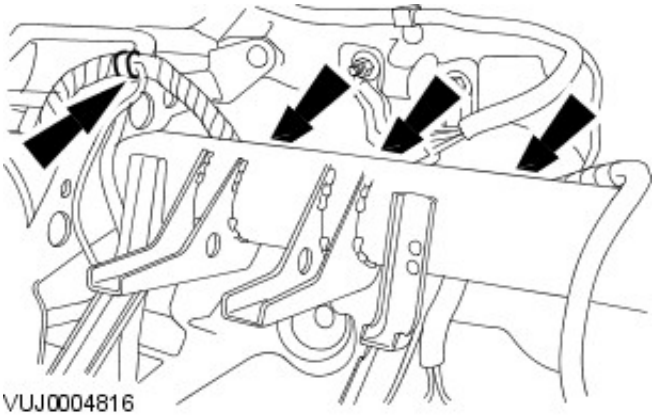
18. Disconnect the electrical connector.


VUJ0004593

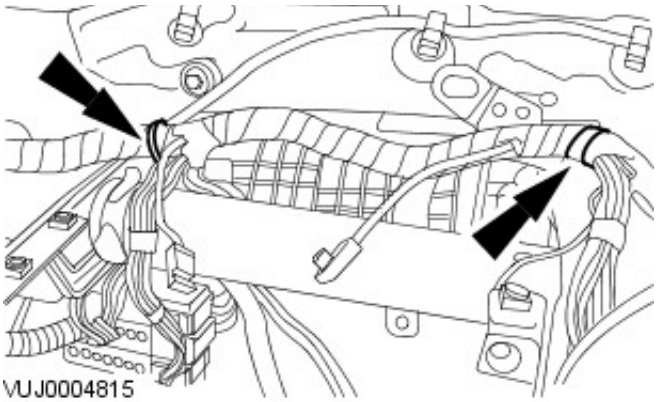
19. Disconnect the electrical connectors.


VUJ0004600

20. Detach the wiring harness.

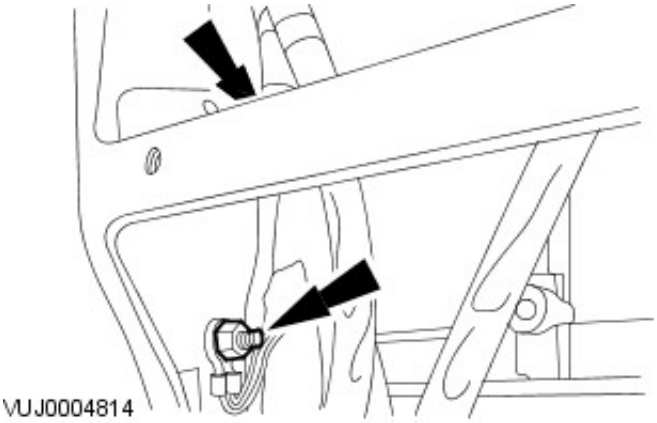

VUJ0004816

21. Detach the wiring harness.


VUJ0004815

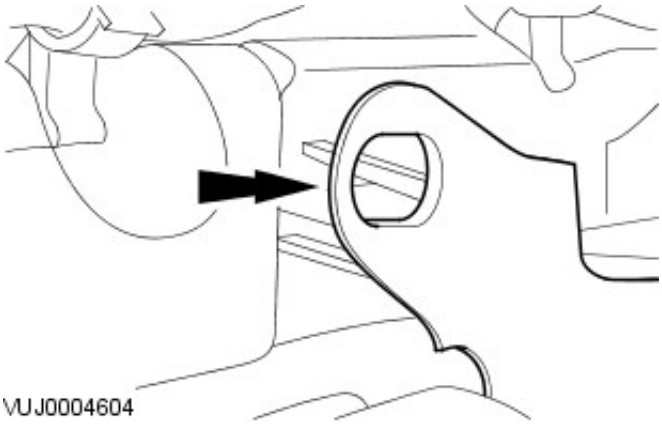
22. Detach the wiring harness.

- Remove the earth lead retaining bolt.
- Detach the wiring harness.

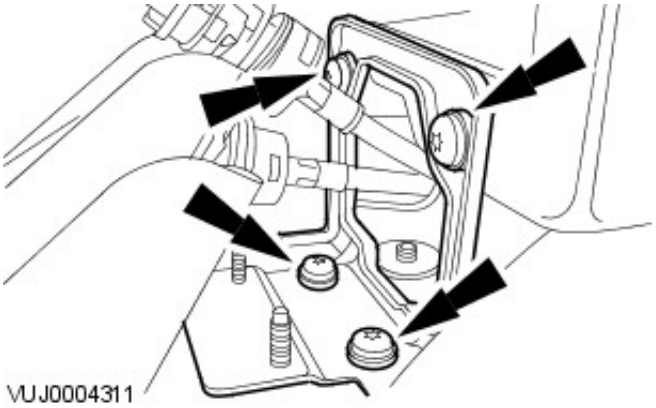

VUJ0004814

23. Using a suitable tool cut the bonding on the in vehicle cross beam.

- Left-hand side shown, right-hand side similar.

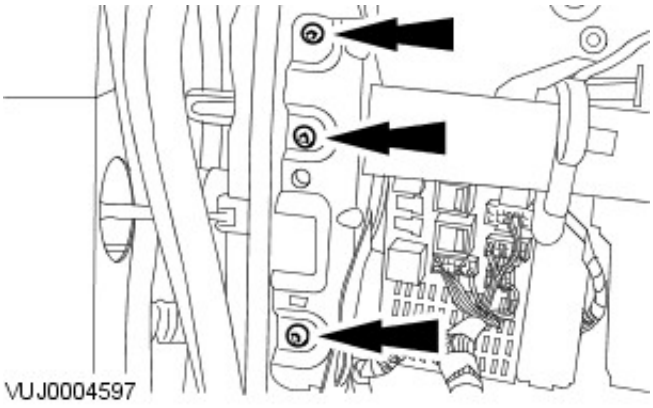

VUJ0004604

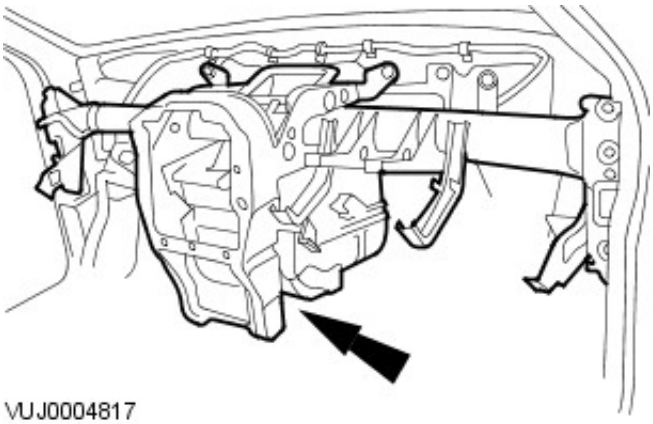
24. Detach the center of the in vehicle cross beam.


VUJ0004311

25. Remove the in vehicle cross beam retaining bolts.

- Left-hand side shown, right-hand side similar.





26. Remove the in vehicle cross beam and the evaporator core housing.

Installation

1. NOTE: Remove the PU bonding from the in vehicle cross beam.

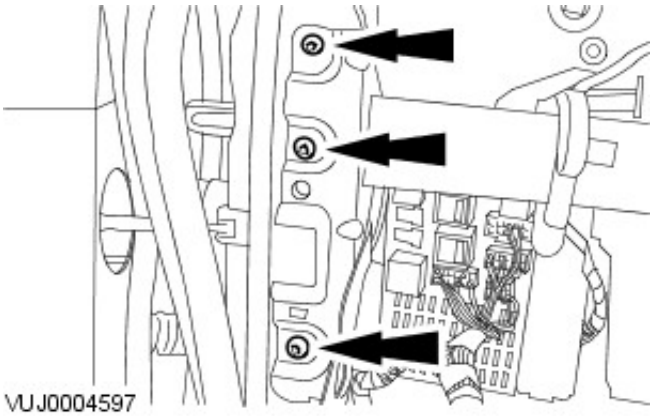
• NOTE: Clean the in vehicle cross beam locator and the vehicle body locating pegs with a solvent wipe, part number WSKM14J251-A1.

• NOTE: Apply the PU bonding, part number WSKM2G379-A1 to the in vehicle cross beam locating pegs.

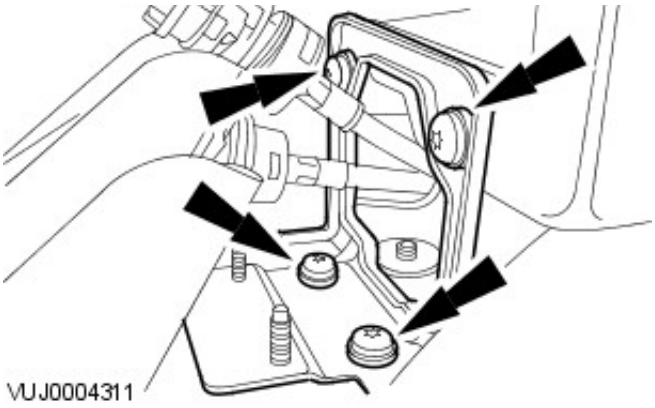
To install, reverse the removal procedure.

2. Tighten to 25 Nm.

- Left-hand side shown, right-hand side similar.



3. Tighten to 25 Nm.


VUJ0004311

Heating and Ventilation - Heater Core

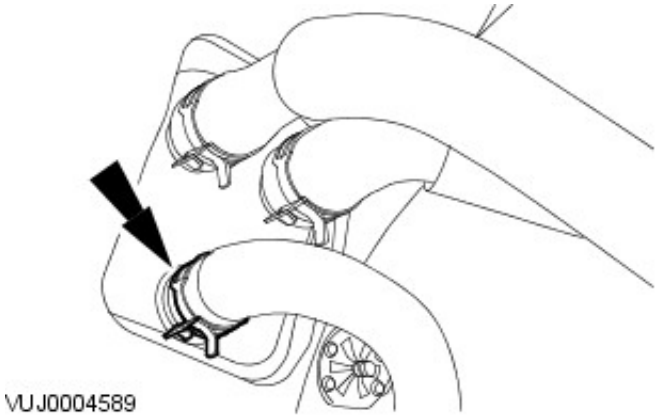
Removal and Installation

Removal

1. NOTE: If a leak is suspected, the heater core must be leak tested in the vehicle before removal. For additional information, refer to Section 412-00 Climate Control System - General Information.

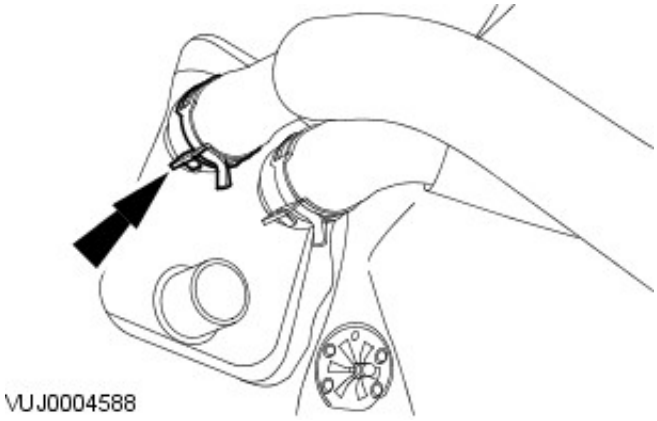
Drain the cooling system. For additional information, refer to Section 303-03A Engine CoolingSection 303-03B Engine Cooling.

2. Disconnect the drain tube from the heater core.



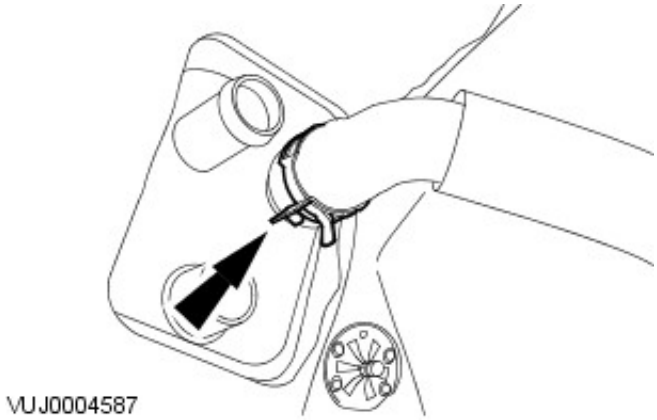
VUJ0004589

3. Disconnect the heater hose from the heater core.



VUJ0004588

4. Disconnect the heater hose from the heater core.

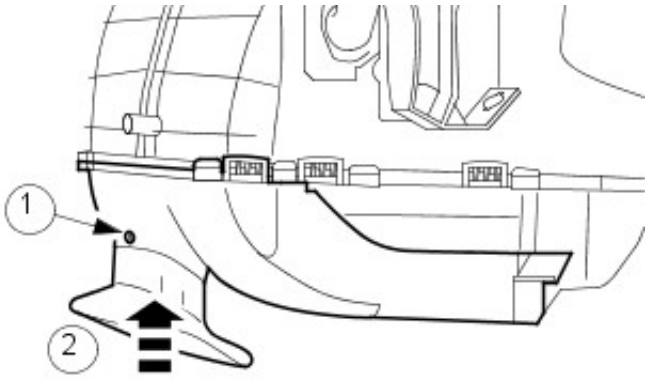


VUJ0004587

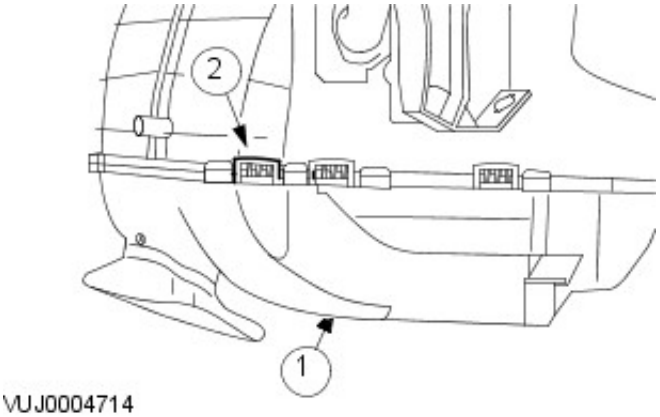
5. Remove the center console. For additional information, refer to Section 501-12 Instrument Panel and Console.

6. Position the heater core air duct up.

1. Remove the heater core air duct retaining screw.
2. Position the heater core air duct up.



VUJ0004713

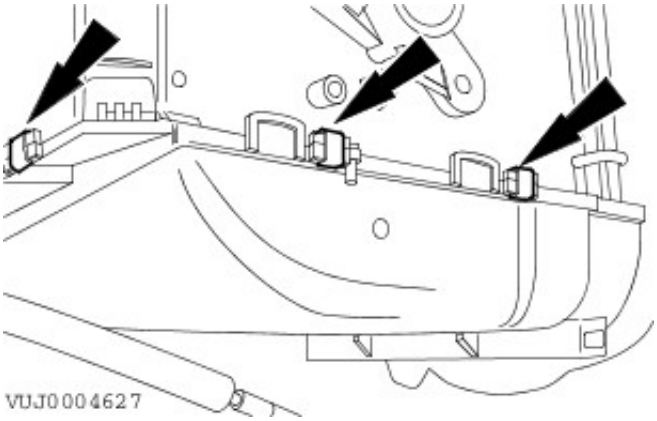


VUJ0004714

7. Remove the heater core air duct housing.

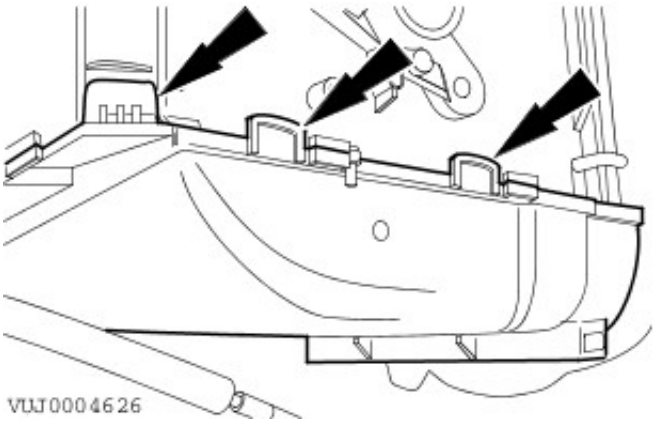
1. Remove the heater core air duct housing retaining screws.
2. Remove the heater core air duct housing.

- Release the retaining tabs.
- Right-hand side shown, left-hand side similar.


VUJ0004627

8. Remove the heater core housing retaining clips.

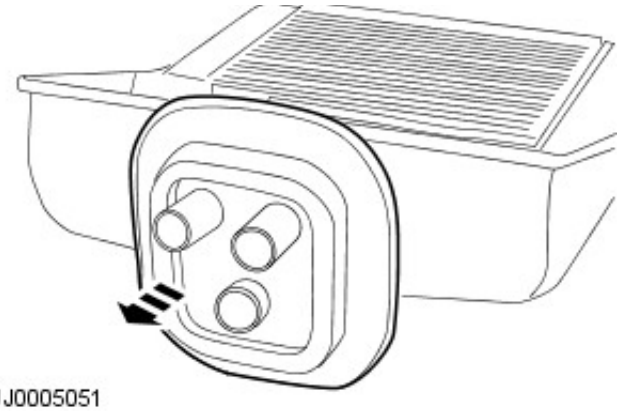
- Right-hand side shown, left-hand side similar.


VUJ0004626

9. Remove the heater core housing

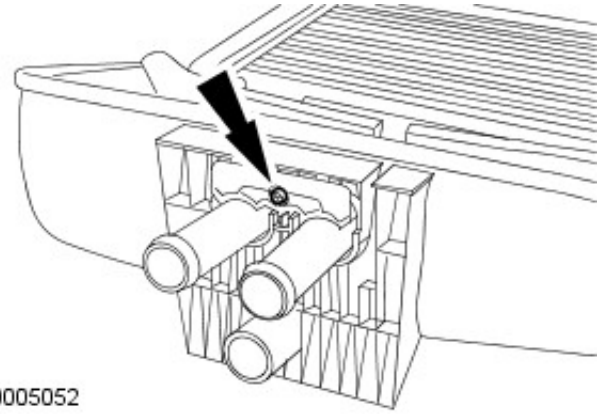
- Release the heater core housing retaining tabs.
- Right-hand side shown, left-hand side similar.

10. Remove the seal.



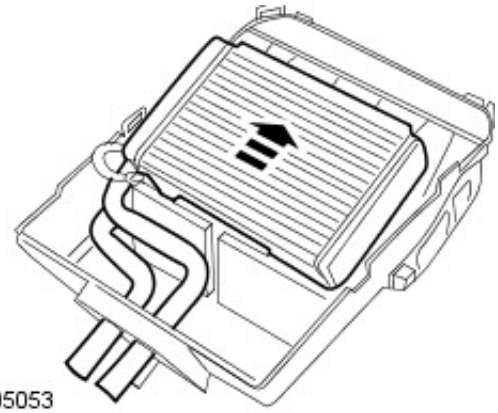
VUJ0005051

11. Remove the heater core retaining screw.



VUJ0005052

12. Remove the heater core.



VUJ0005053

Installation

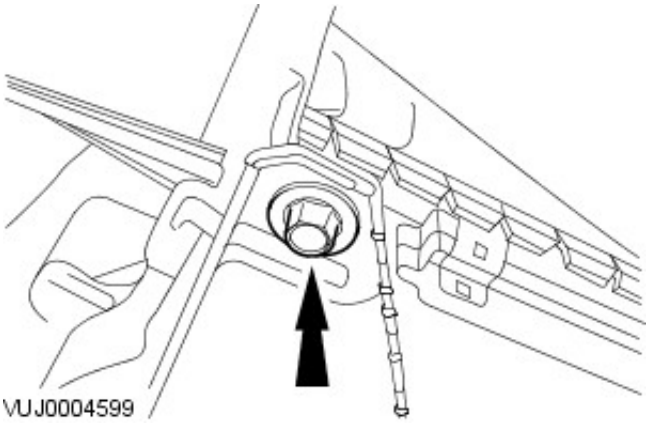
1. To install, reverse the removal procedure.

Heating and Ventilation - Evaporator Core Housing

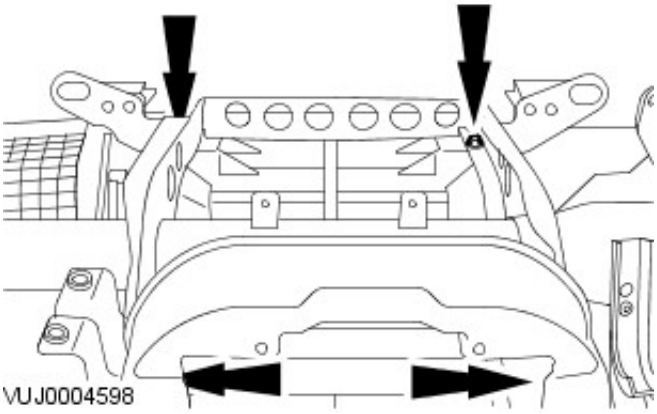
Disassembly and Assembly

Disassembly

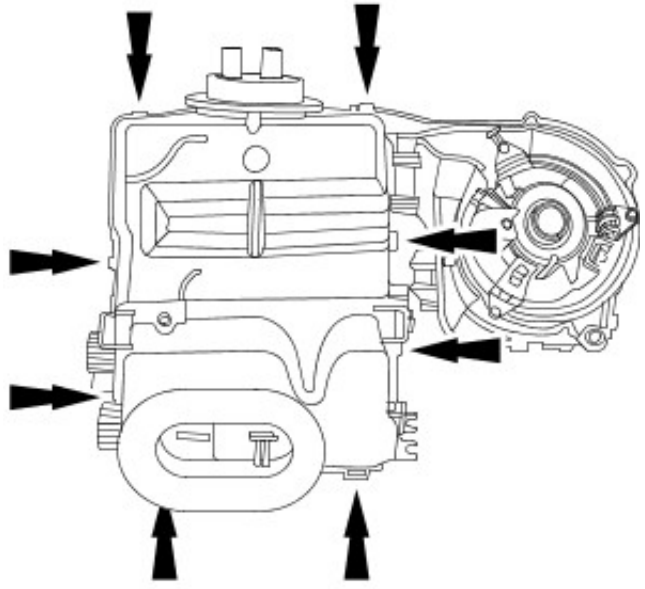
1. Remove the evaporator core housing. For additional information, refer to Evaporator Core Housing.
2. Detach the blower motor from the in vehicle cross beam..



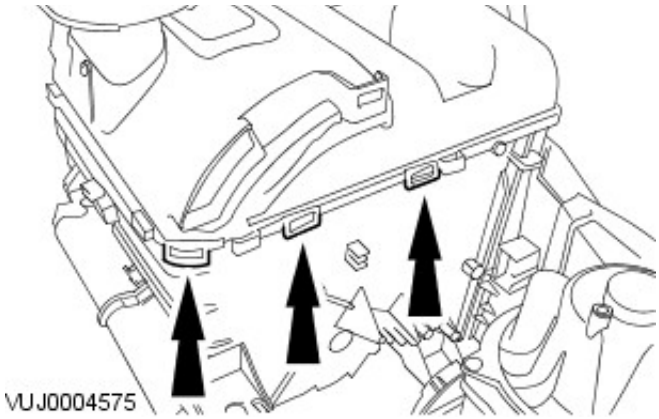
3. Remove the evaporator core housing from the in vehicle cross beam.



4. Remove the heater core retaining clips.

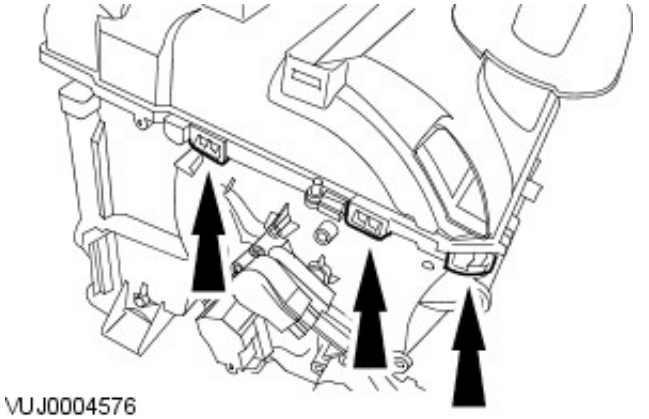


5. Release the heater core housing retaining tabs.



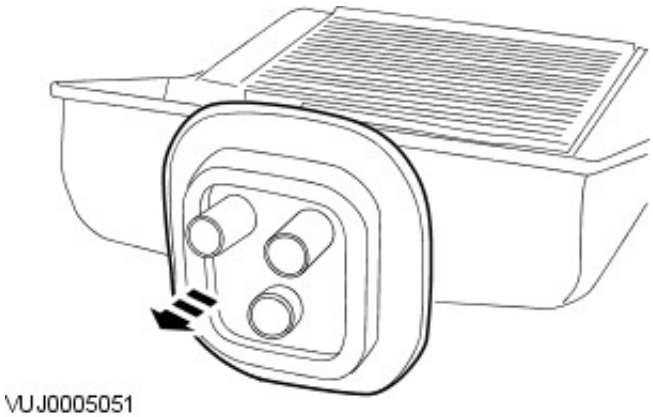
VUJ0004575

6. Remove the heater core housing.



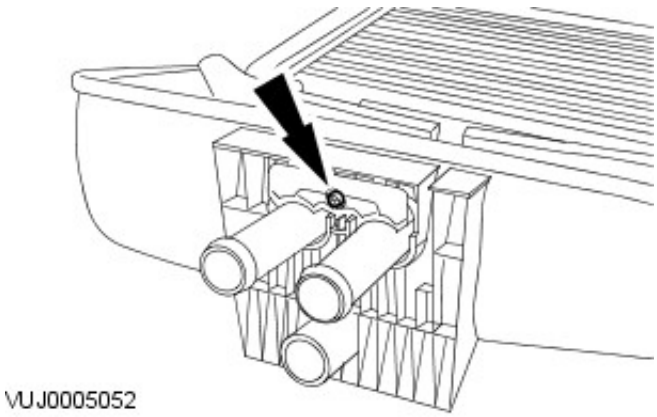
VUJ0004576

7. Remove the rubber seal.



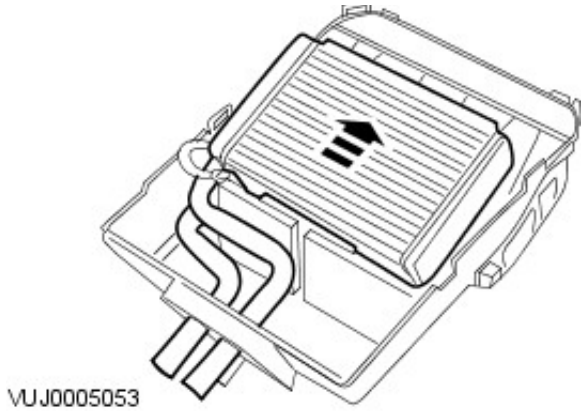
VUJ0005051

8. Remove the heater core retaining bolt.



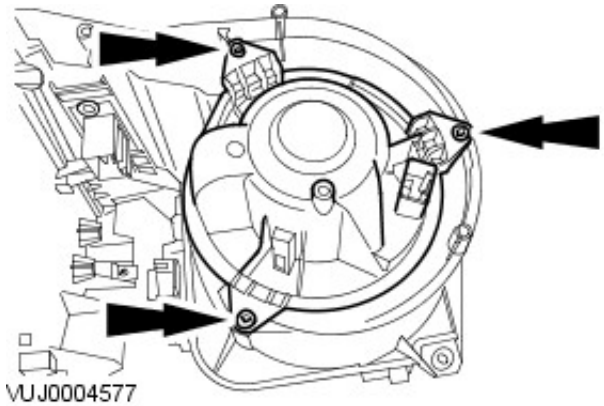
VUJ0005052

9. Remove the heater core.


VUJ0005053

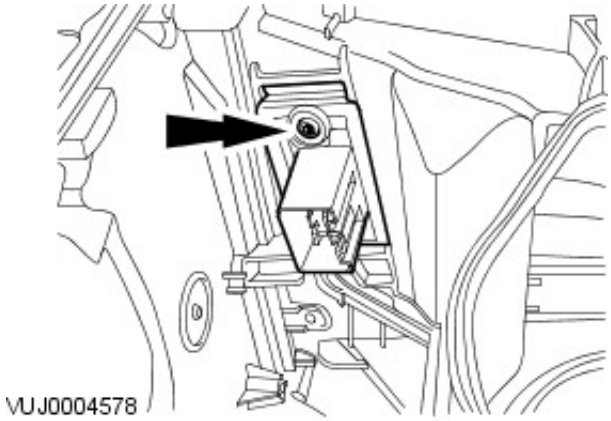
10. Remove the blower motor.

- Remove the blower motor retaining screws.

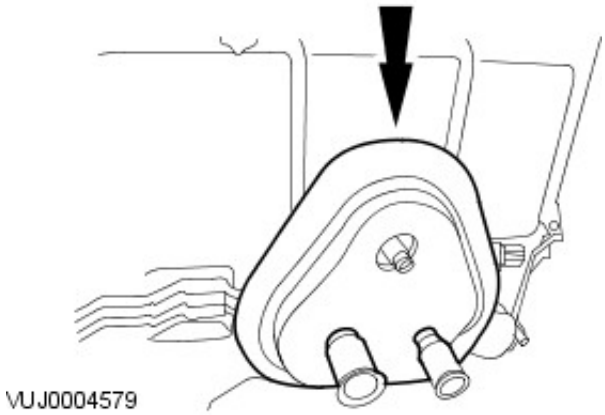

VUJ0004577

11. Remove the manual control blower motor resistor.

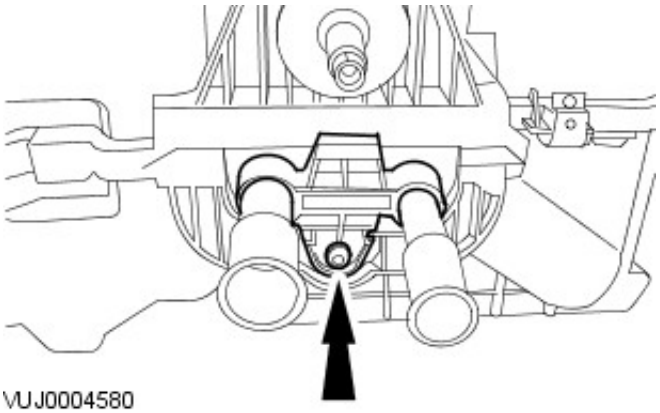
- Remove the manual control blower motor resistor retaining screw.


VUJ0004578

12. Remove the rubber seal.

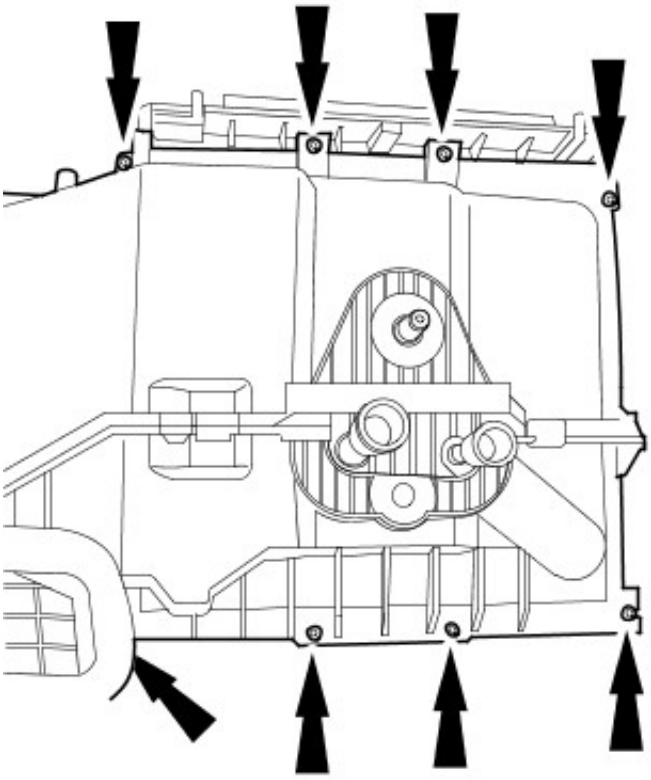

VUJ0004579

13. Remove the evaporator core retaining screw.



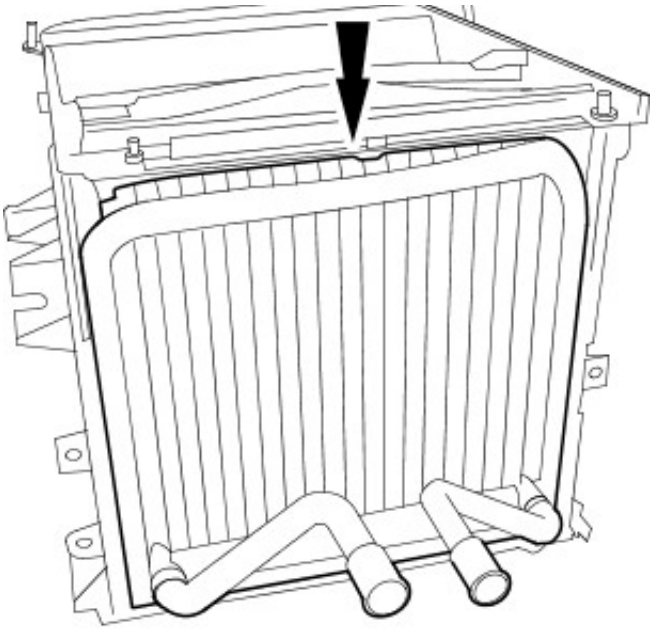
VUJ0004580

14. Remove the evaporator core upper housing.



VUJ0004581

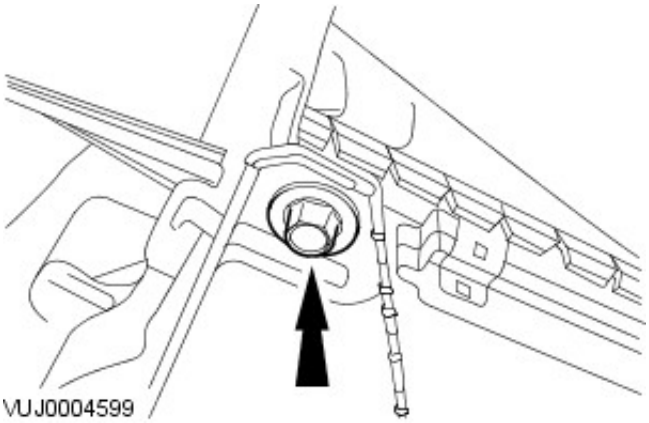
15. Remove the evaporator core.



VUJ0004582

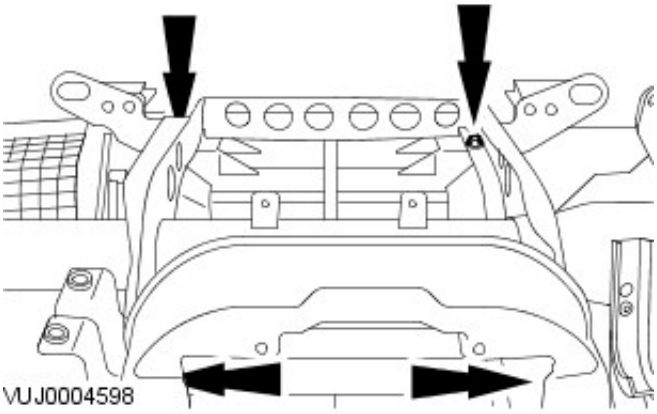
Assembly

1. To assemble, reverse the disassembly procedure.
2. Tighten to 7 Nm.



VUJ0004599

3. Tighten to 5 Nm.



VUJ0004598

Auxiliary Heating -

Torque Specifications

Description	Nm	lb-ft	lb-in
Electric booster heater retaining nuts	10	-	89
Heating element electrical connector retaining nuts	4	-	35

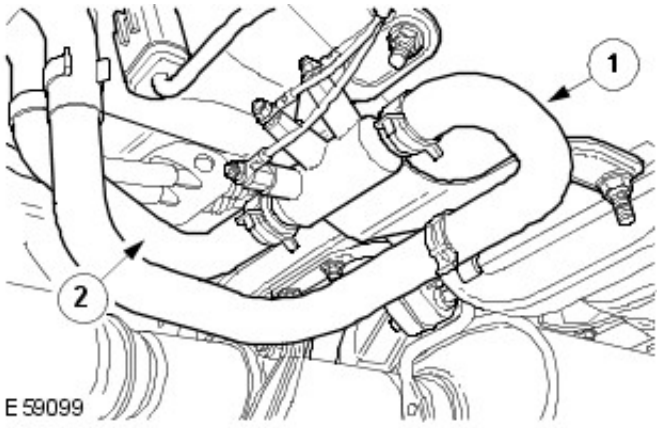
Auxiliary Heating - Electric Booster Heater

Description and Operation

Due to the high-efficiency of the diesel engine, there is insufficient waste-heat available to the heater core. An auxiliary electrical booster heater is installed as standard. When the specified operating conditions are met, the heater is activated to raise the temperature of the coolant before it enters the heater core.

The heater is located at the lower left-hand side of the bulkhead and is integral to the cooling system.

The heater comprimises of an aluminum housing into which three glow-plug elements are located. Each element has a heating capability of 300 Watts.



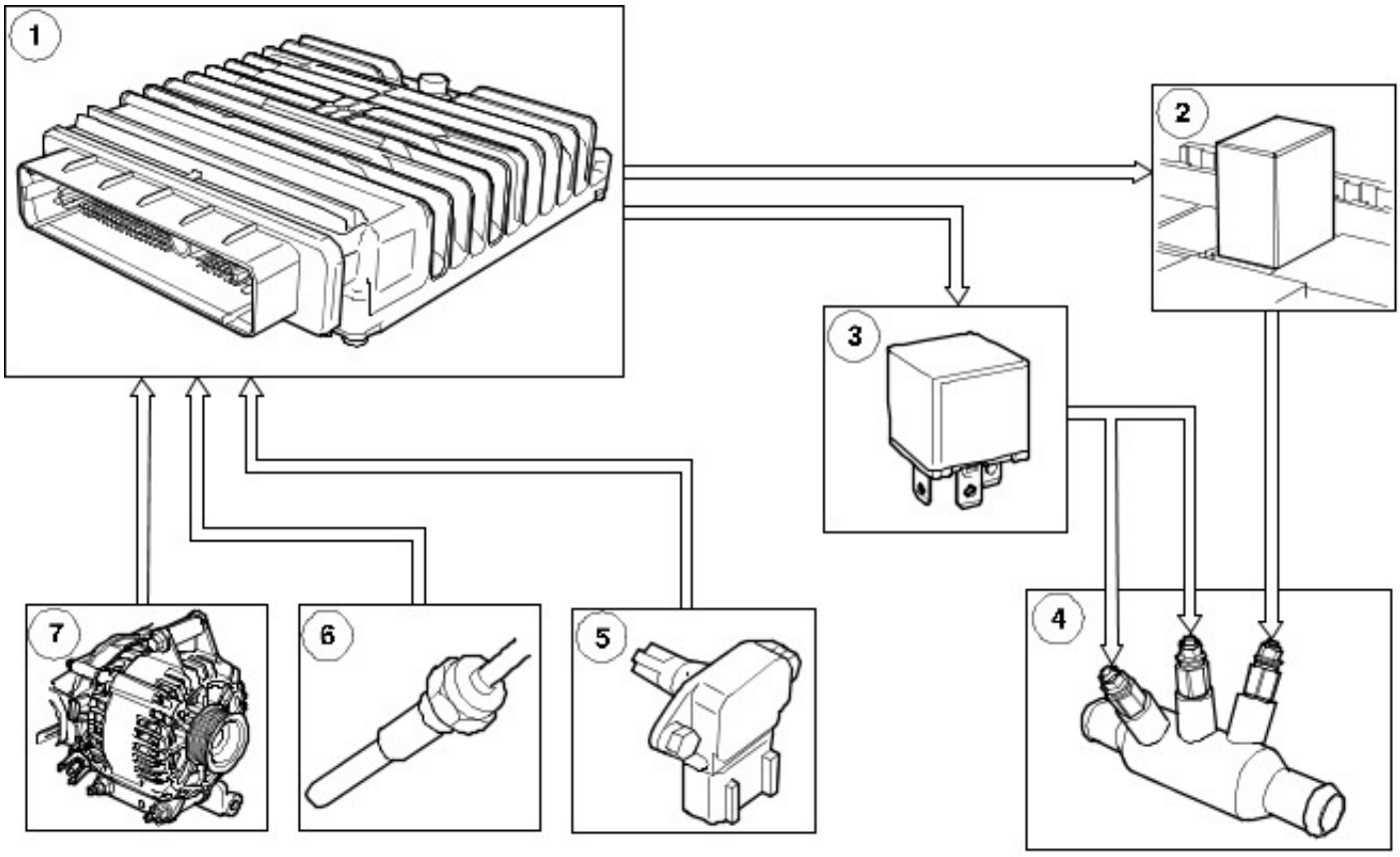
Item	Part Number	Description
1	-	Coolant inlet hose
2	-	Coolant outlet hose

The powertrain control module (PCM) determines which (if any) of the elements within the auxiliary heater are activated depending on the following:

- cylinder head temperature (CHT)
- air charge temperature (ACT)
- load condition of the generator

The auxiliary heater will:

- not activate should the ACT be greater than 5°C
- only be activated when the CHT is below 75°C and the ACT is below 5°C
- be de-activated should the CHT rise above 75°C
- not activate if the generator saturation is above 90%



E59100

Item	Part Number	Description
1	-	PCM
2	-	Relay 1
3	-	Relay 2
4	-	Heater
5	-	TMAP sensor
6	-	CHT sensor
7	-	Generator

Provided the temperature conditions are satisfied and depending on the load condition of the generator, the PCM will cause one of the following to occur:

- activation of relay 1
- activation of relay 2
- activation of both relays
- no activation of either relay

The PCM software includes a calibrated map, which is used in conjunction with generator load to define the heater switching-points relative to actual generator speed.

At all times during heater operation, the system is designed to allow as manyglow-plug elements as possible to be activated, without causing the generator to become saturated.

Auxiliary Heating - Fuel Fired Booster Heater

Description and Operation

For markets that experience extremely low temperatures, a fuel fired booster heater is installed in place of the electrical booster heater.

The fuel fired booster heater only operates when the engine is running. The fuel fired booster heater is located at the lower left-hand side of the bulkhead and is integral to the cooling system.

The fuel fired booster heater provides the following:

- automatic operation
- quickly boosts the engine up to it's optimum operating temperature range
- reduces engine wear by keeping the engine at its optimum operating temperature
- helps to create a warm and comfortable vehicle interior
- provides greater heat levels for quicker defrosting of glass
- compact design and engine compartment mounting.

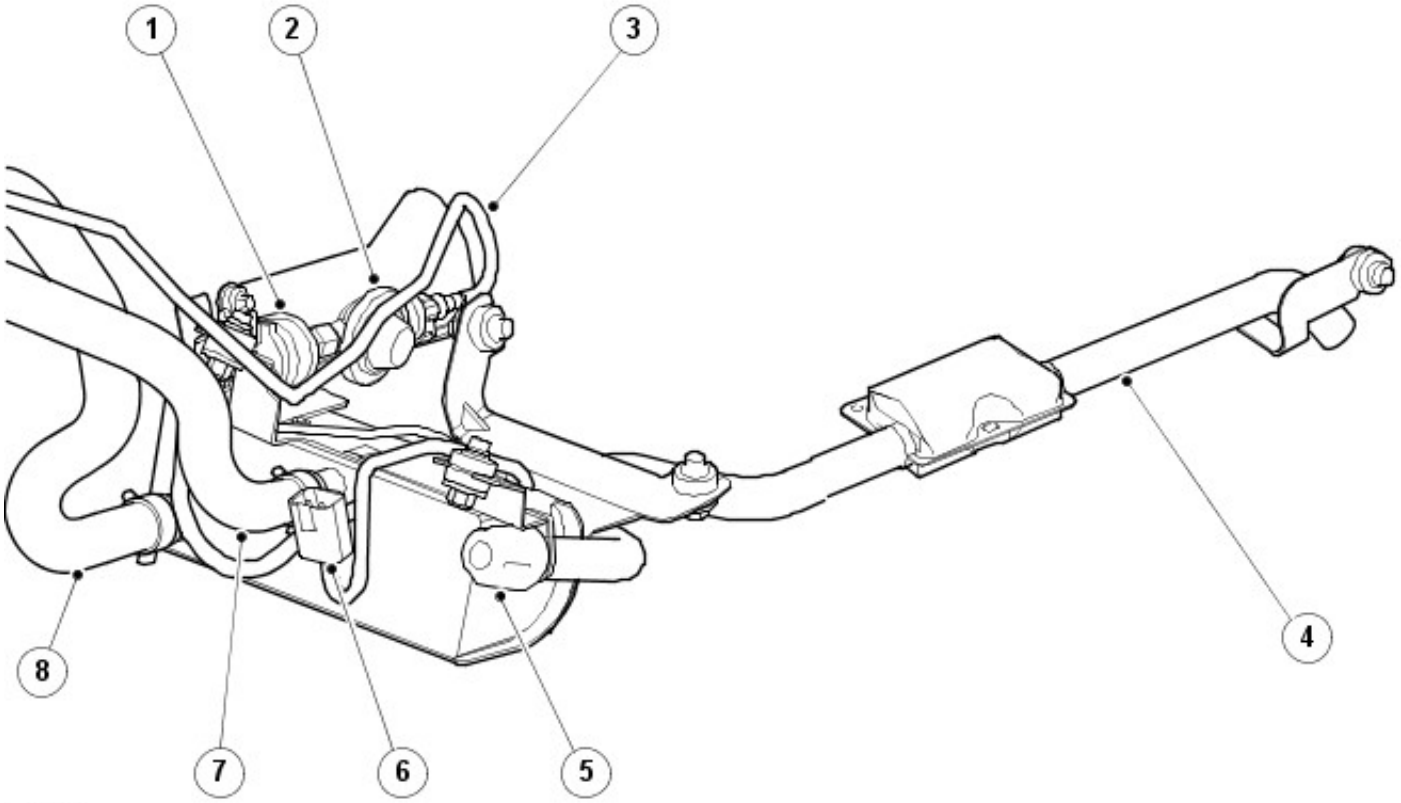
Fuel Fired Booster Heater System

The system consists of a fuel fired booster heater unit and fuel pump.

The fuel fired booster heater takes its coolant feed from the engine exhaust gas recirculation (EGR) system.

The fuel fired booster heater fuel pump is located above the heater and connected to the engine fuel-return line. The pump delivers metered quantities of fuel into the combustion chamber. A pressure-regulating valve is installed between the fuel intake and the pump to reduce the fuel pressure down to below 0.2 bar.

The fuel fired booster heater incorporates an electronic control module, this unit controls the operation of the fuel fired booster heater.

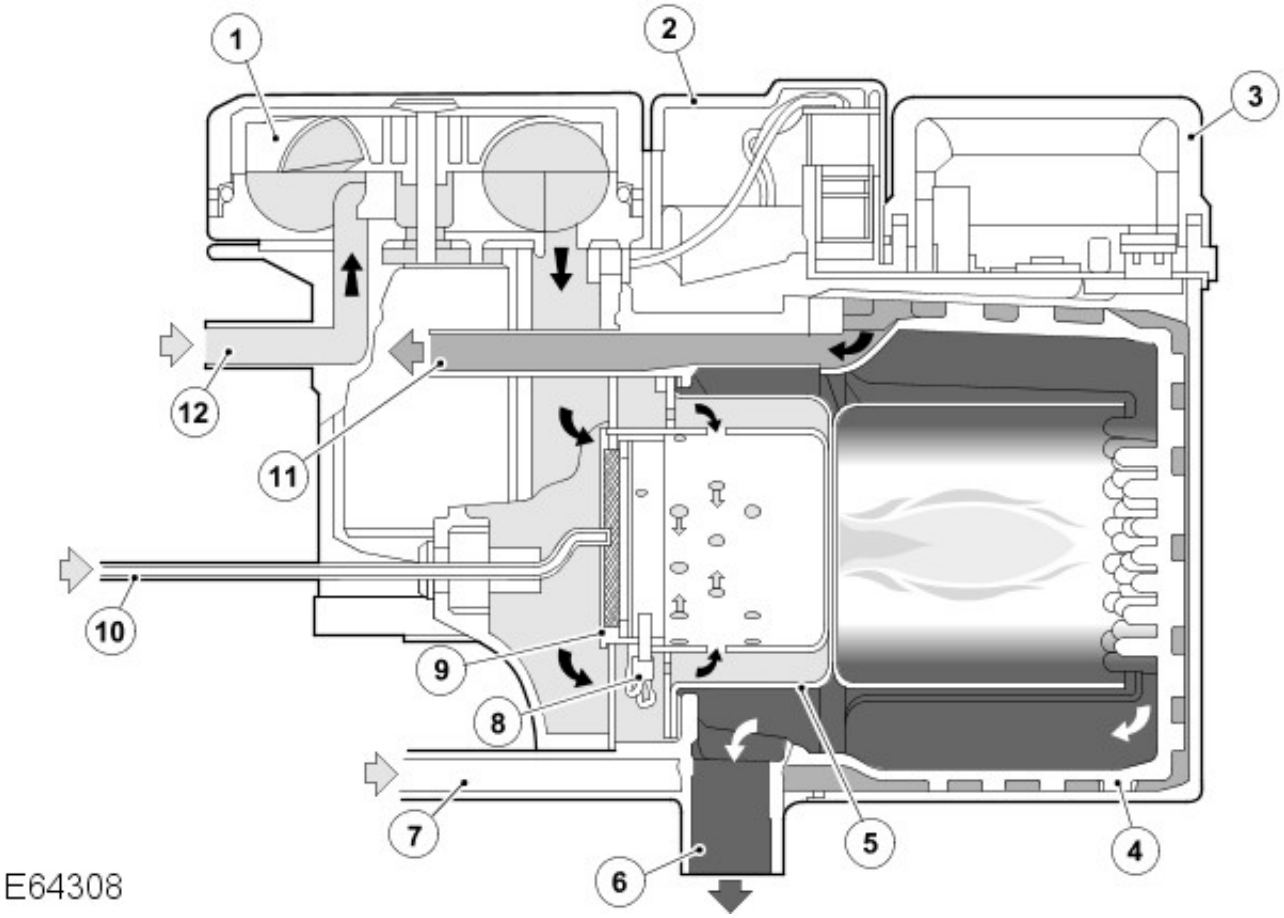


E64307

Item	Part Number	Description
1	-	Fuel pump
2	-	Regulating valve
3	-	Fuel feed pipe
4	-	Exhaust
5	-	Air intake

6	-	Electrical connector
7	-	Coolant inlet pipe
8	-	Coolant outlet pipe

Fuel Fired Booster Heater Unit Components



Item	Part Number	Description
1	-	Combustion air fan
2	-	Burner housing
3	-	Electronic control module
4	-	Heat exchanger
5	-	Burner insert
6	-	Exhaust
7	-	Coolant inlet
8	-	Glow plug / flame sensor
9	-	Evaporator
10	-	Fuel inlet
11	-	Coolant outlet
12	-	Air intake

Combustion Air Fan

The combustion air fan uses a permanent magnet motor with a fan wheel, which is driven by a pulse width modulated (PWM) voltage supply.

The combustion air fan delivers and regulates the flow of air into the fuel fired booster heater to support combustion of the fuel supplied by the fuel fired booster heater fuel pump. The combustion air fan is also used to purge and cool the fuel fired booster heater unit. A canister type muffler in the air inlet supply line is used to reduce operating noise.

Burner Housing

The burner housing incorporates the burner insert connections for the coolant ports and exhaust pipe. Exhaust gases are directed to atmosphere through a pipe and muffler.

Burner Insert

The burner insert incorporates the fuel combustion chamber, heat exchanger, evaporator and combined glow plug

and flame sensor. Fuel from the fuel fired booster heater pump is supplied to a venturi, where it enters the combustion chamber to mix with air from the combustion air fan.

When commanded by the fuel fired booster heater electronic control module the glow plug supplies a temperature of approximately 1500 °C to provide the ignition source for the fuel/air mixture. The fuel fired booster heater electronic control module establishes combustion by monitoring the flame sensor. It measures the heat from the flame by converting the resistance value of the glow plug into a voltage signal.

Heat Exchanger

The heat exchanger transfers the heat generated by the combustion process into the vehicles coolant.

Two sensors located in the heat exchanger provide the fuel fired booster heater electronic control module with temperature values for the heat exchanger's casing temperature and coolant temperature.

The values from the sensors are used for fuel fired booster heater system adaptation between full-load, part-load and stand-by.

Electronic Control Module

The electronic control module controls and monitors the combustion operation. The module is ventilated by a hose routed from the air storage compartment of the burner.

Temperature Sensor

The temperature sensor located in the heat exchanger provides an electrical resistance signal to the electronic control module to indicate the coolant temperature status.

Overheat Protection

Overheat protection is controlled by a temperature resistor located in the heat exchanger. This protects against excessive operating temperatures. Overheat protection responds at a coolant temperature in excess of 125 °C and switches the fuel fired booster heater from '**stand-by**' to '**OFF**'.

Fuel Pump

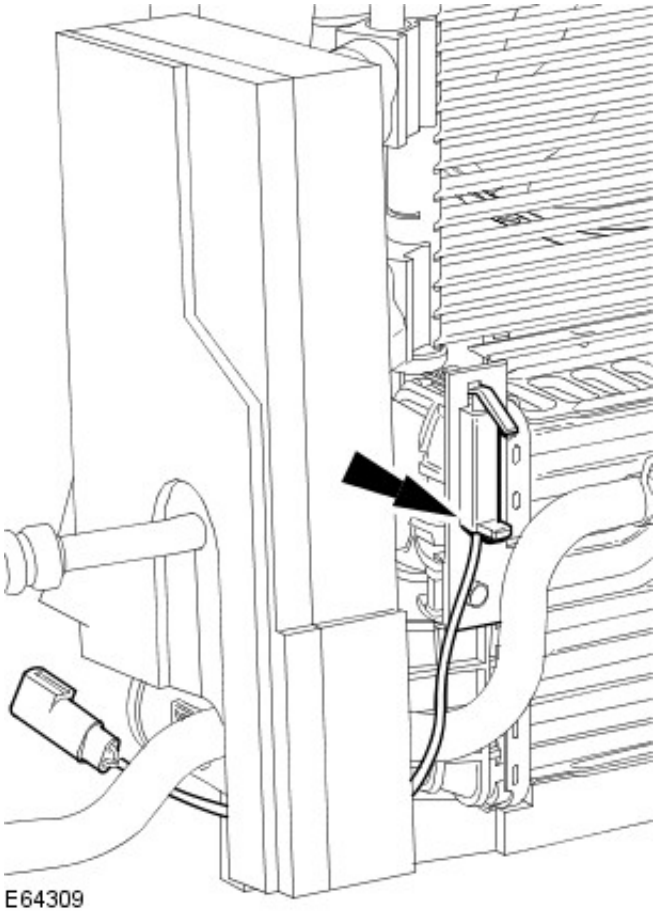
The fuel fired booster heater electronic control module outputs a PWM voltage signal to activate the pump. When the pump is de-energized it provides a positive shut-off of the fuel supply.

Fuel Fired Heater Operation

The powertrain control module (PCM) determines the ignition of the heater by a solid-state relay, which switches battery voltage to the heater control module as appropriate.

An electronic control module incorporated into the fuel fired booster heater controls the operation of the fuel fired booster heater system. The module monitors the ambient air temperature sensor and cylinder head temperature sensor. Two further sensors located in the heat exchanger provide the module with an input of the heat exchanger's casing temperature and coolant temperature.

Ambient air temperature sensor


E64309

The values from the sensors are used for fuel fired booster heater system adaptation between full-load, part-load and stand-by.

To minimize drain on the battery, the fuel fired booster heater switches from full-load to part-load, on the coolant reaching 87 °C. The fuel fired booster heater will not operate if the battery voltage is below 10.2 volts.

Part-load operation offers the following benefits:

- Low noise output
- Low power operation
- Low fuel consumption

Switch On / Starting

During engine startup the fuel fired booster heater goes into stand-by. If the coolant circuit temperature is below 87 °C and the ambient temperature is below 5 °C the fuel fired booster heater starting sequence commences.

The glow plug is activated and after a delay the fuel pump commences operation and the fuel is ignited.

The combustion air fan operation is then initiated. The combustion air fan speed is increased in two ramps to nearly full-load operation. After a stabilization phase the combustion air fan speed is again increased to full-load and the glow plug is deactivated.

After these events have been completed the fuel fired booster heater enters Automatic Heating Operation.

Automatic Heating Operation

During automatic heating operation the glow plug functions as the flame sensor to monitor the flame condition. In the event of a no flame condition, a restart is automatically initiated.

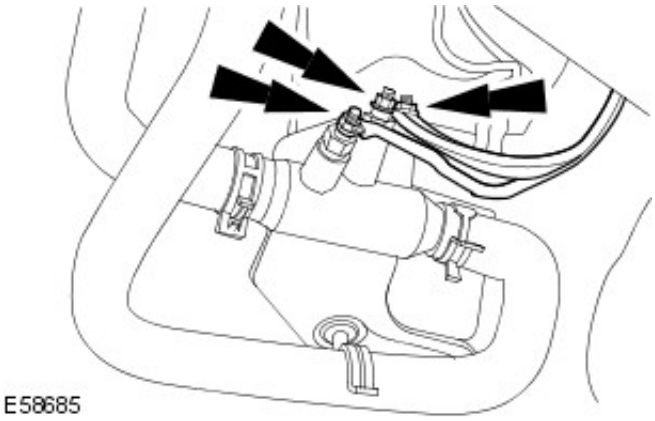
If the no flame condition persists, fuel delivery is stopped and the fuel fired booster heater enters an error lockout with a timed shutdown of the combustion air fan to cool the fuel fired booster heater unit.

Auxiliary Heating - Electric Booster Heater
Removal and Installation

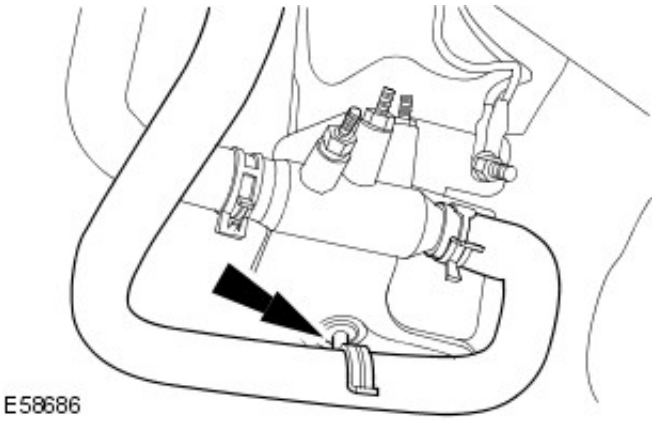
Removal

1. Remove the air deflector.
For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).

2. Detach the wiring harness.

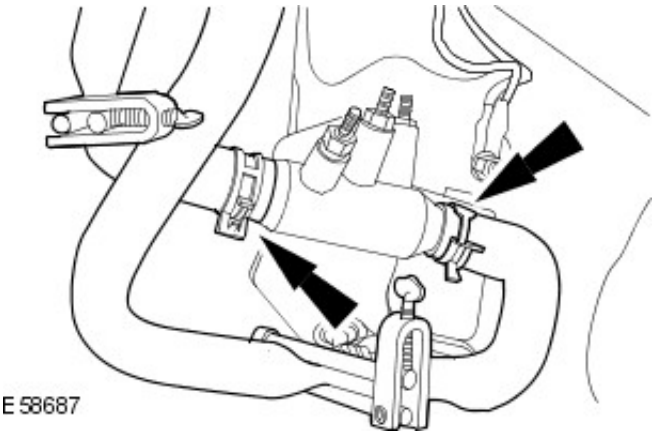

E58685

3. Detach the coolant hose.


E58686

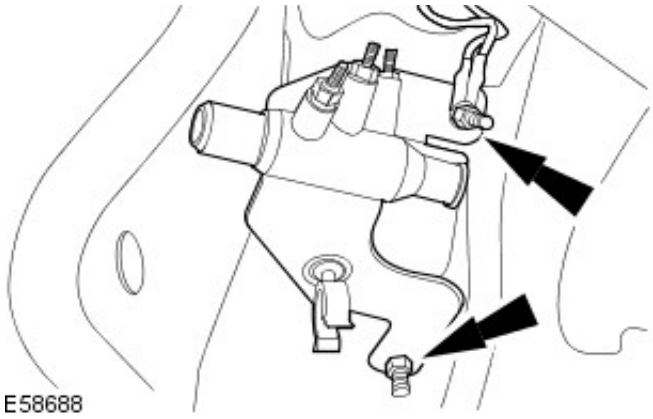
4. NOTE: Clamp the hoses to minimize coolant loss.

Disconnect the coolant hoses.

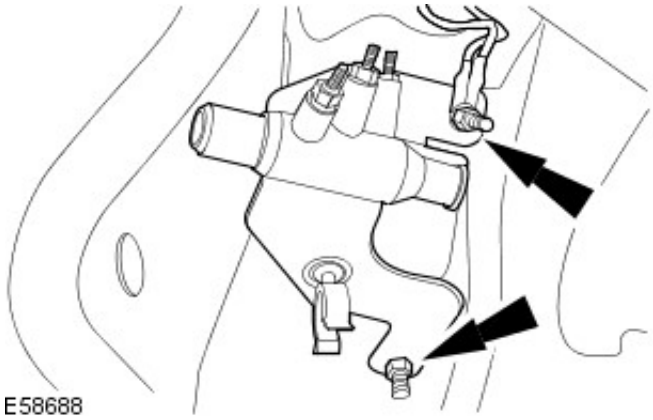

E58687

5. Remove the electric booster heater.

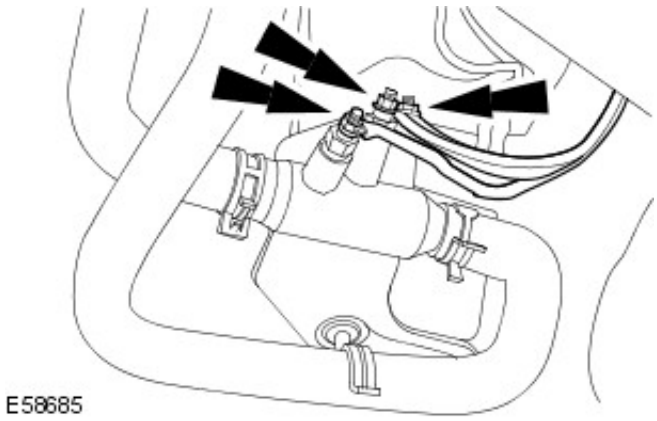
- Detach the wiring harness.



Installation



1. To install, reverse the removal procedure.
   - Tighten to 10 Nm.



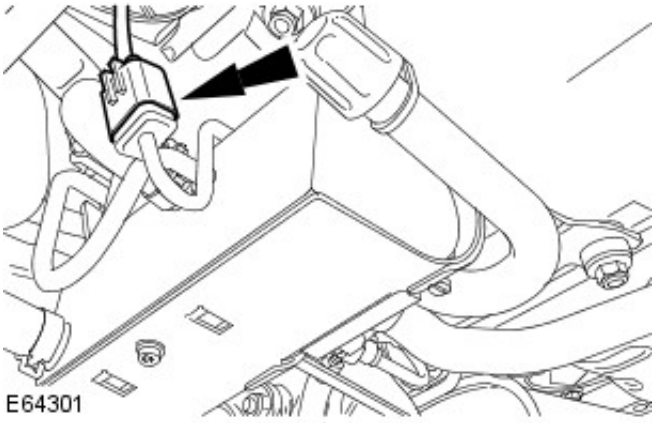
2. Tighten to 4 Nm.

3. Check and top up the coolant if necessary.

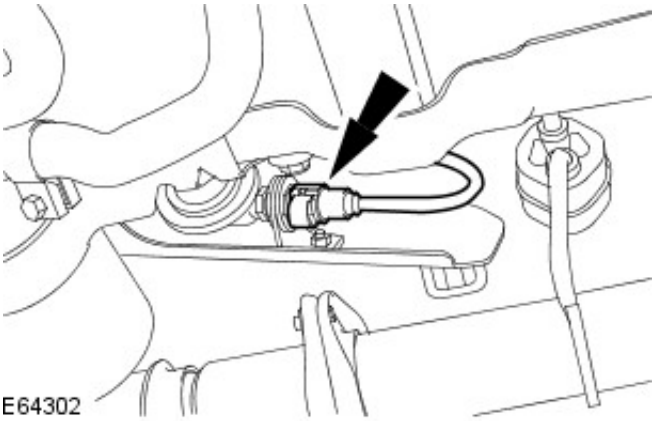
Auxiliary Heating - Fuel Fired Booster Heater
Removal and Installation

Removal

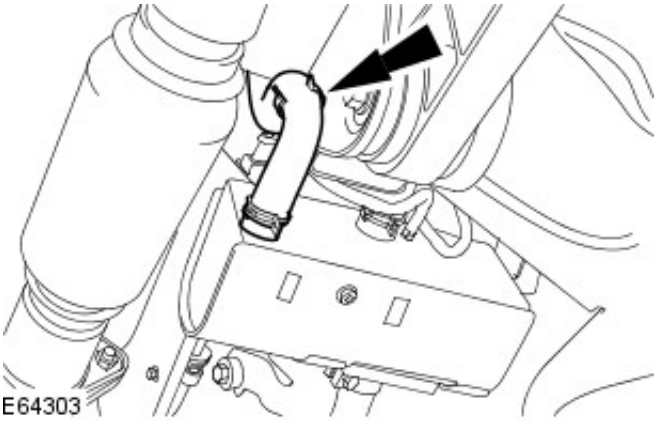
1. Remove the air deflector.
   For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).
2. Disconnect the fuel fired booster heater electrical connector.



3. Disconnect the fuel fired booster heater fuel line.

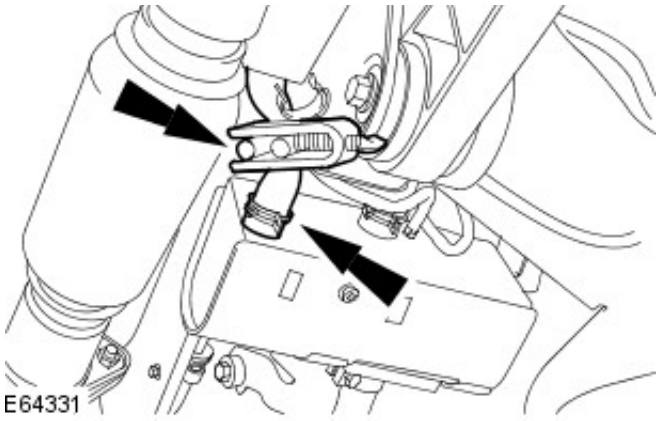


4. Detach the coolant hose.



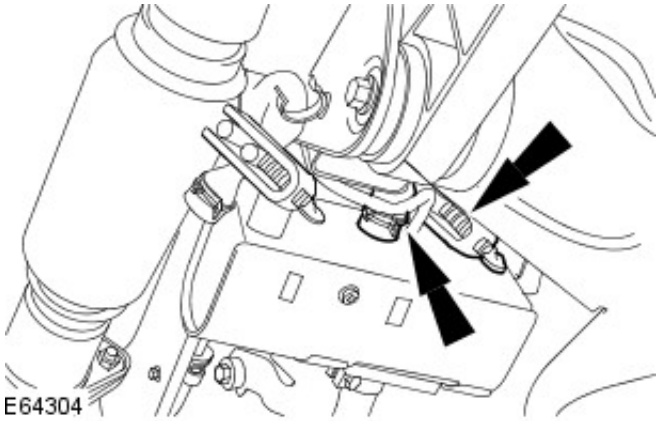
5. NOTE: Clamp the hose to minimize coolant loss.

   Disconnect the coolant hose.

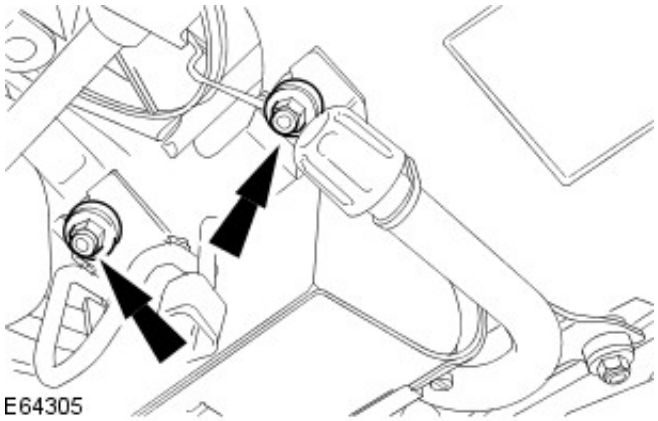


6. NOTE: Clamp the hose to minimize coolant loss.

Disconnect the coolant hose.

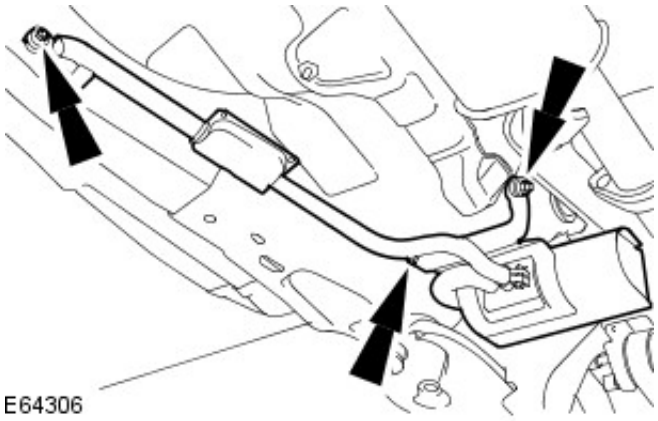


7. Remove the retaining bolts.



8. Remove the fuel fired booster heater.

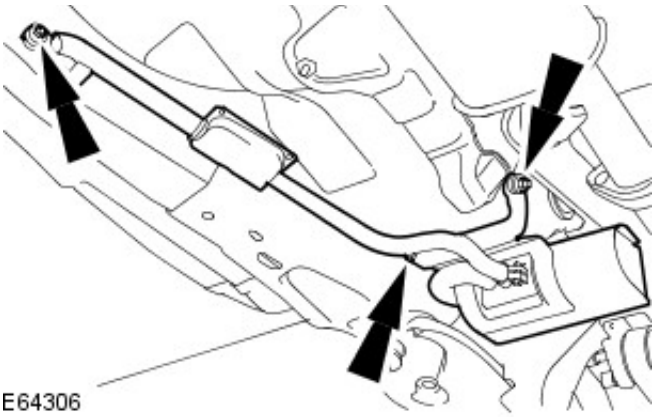
- Remove the retaining bolts.



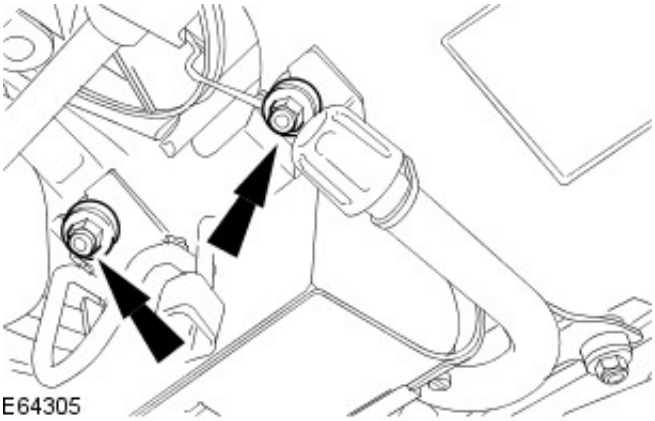
Installation

1. Install the fuel fired booster heater.

- Install the retaining bolts.

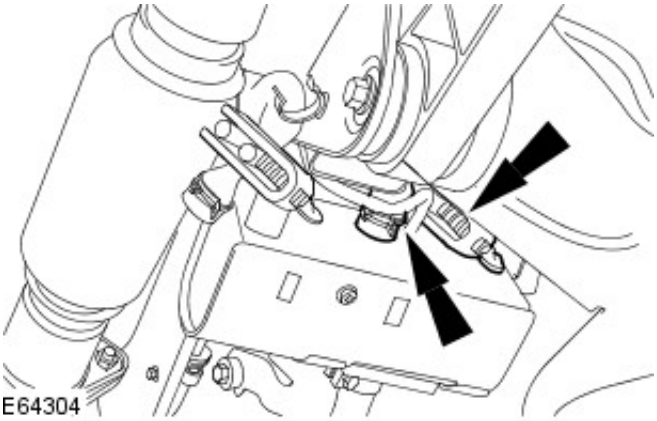

E64306

2. Install the retaining bolts.


E64305

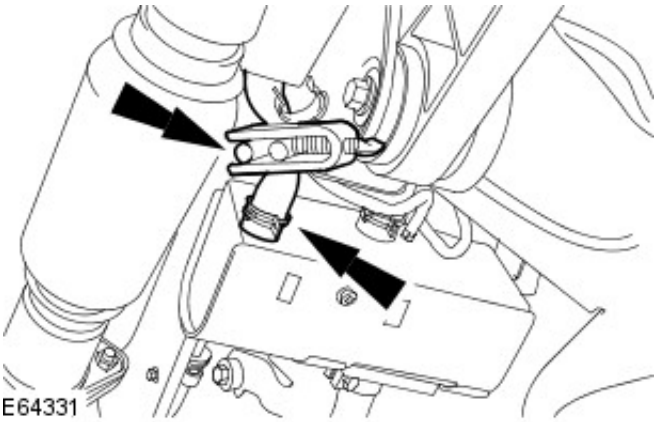
3. Connect the coolant hose.

- Remove the hose clamp.

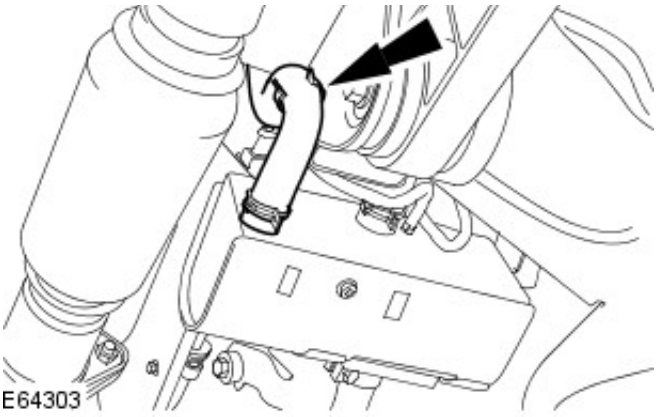

E64304

4. Connect the coolant hose.

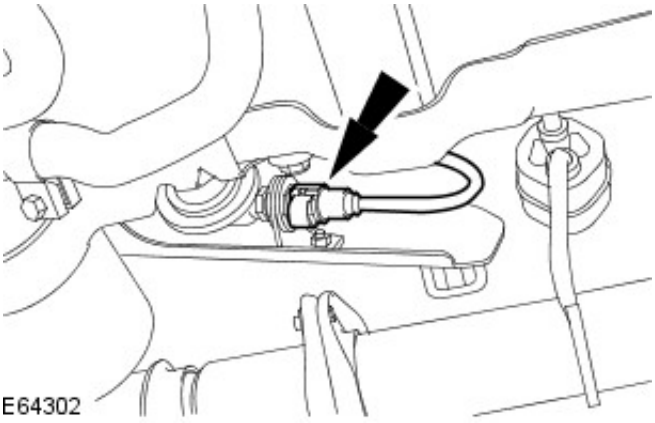
- Remove the hose clamp.


E64331

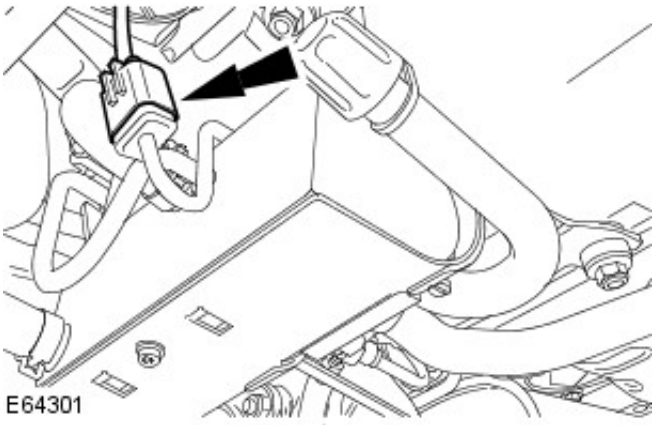
5. Attach the coolant hose.



6. Connect the fuel fired booster heater fuel line.



7. Connect the fuel fired booster heater electrical connector.



8. Install the air deflector.
For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).

9. Check and top up the coolant if necessary.

Air Conditioning -

Torque Specifications

Description	Nm	lb-ft	lb-in
Air conditioning (A/C) clutch retaining nut	26	19	-
A/C compressor retaining bolts	25	18	-
A/C compressor manifold and tube retaining bolt	20	15	-
A/C condenser core retaining bolts	7	-	62

General Specifications

Item	Specification
A/C clutch air gap	0.35 mm – 0.75 mm (0.014 in – 0.03 in)

Air Conditioning - Air Conditioning

Description and Operation

The air conditioning (A/C) system is a clutch cycling, fixed orifice tube type.

The A/C compressor is driven by the engine. The A/C compressor primes the gaseous refrigerant out of the suction accumulator and compresses it. The refrigerant heats up and is passed to the condenser core under high pressure.

At this point heat is drawn from the refrigerant by the air being forced past the cooling fins. Because of this heat loss, the refrigerant liquefies and leaves the condenser core.

An evaporator core orifice, which separates the refrigerant at high pressure from that at low pressure, is located between the condenser core and the evaporator core. This evaporator core orifice slows down the flow of the refrigerant from the A/C compressor, so that the pressure builds up in the condenser core.

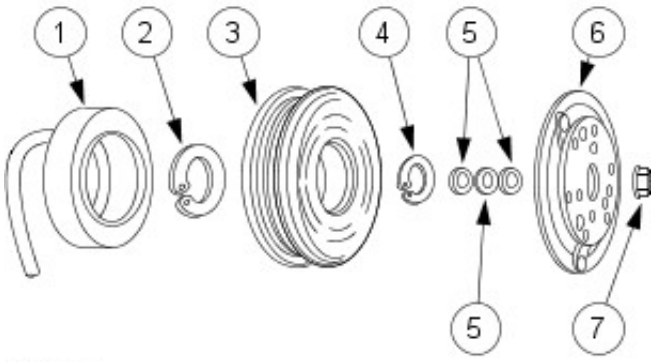
After passing through the evaporator core orifice the liquid refrigerant expands in the circuit to the evaporator core. In the evaporator core the liquid refrigerant converts back into the gaseous state and this causes heat to be extracted from the air coming into the vehicle. The air therefore cools down and the moisture it contained is given up at the evaporator core. The refrigerant enters the suction accumulator and is primed up again by the A/C compressor.

The system is protected by the pressure transducer. The pressure transducer is used to control over pressure in the high side of the A/C system.

A/C Compressor and Clutch Assembly

• NOTE: Internal A/C compressor components are not serviced separately. The A/C scroll compressor is serviced only as an assembly.

The compressor has a variable capacity via an internal valve, which can by-pass volume through the compressor when required. Compressor output varies from 100% to 30% depending on refrigerant demand, the variation being governed by the internal valve within the compressor housing. The compressor has protection in the form of a pressure relief valve and a sensing element for over temperature conditions.



A0000907

Item	Part Number	Description
1	—	A/C clutch field coil
2	—	Field coil snap ring
3	—	A/C clutch pulley
4	—	Pulley snap ring
5	—	A/C clutch hub spacer
6	—	A/C clutch
7	—	A/C clutch nut

The magnetic A/C clutch has the following characteristics:

- It drives the compressor shaft.
- When battery positive voltage is applied to the A/C clutch field coil, the clutch disc and hub assembly is drawn toward the A/C clutch pulley.
- The magnetic force locks the clutch disc and hub assembly and the A/C clutch pulley together as one unit, causing the compressor shaft to rotate.
- When battery positive voltage is removed from the A/C clutch field coil, springs in the clutch disc and hub assembly move the clutch disc away from the A/C clutch pulley.

A/C Condenser Core

The A/C condenser core has the following characteristics:

- It is an aluminum fin and tube design heat exchanger located in front of the vehicle radiator.

- It cools compressed refrigerant gas by allowing air to pass over fins and tubes to extract heat and by condensing gas to liquid refrigerant as it is cooled.

A/C Evaporator Core

The A/C evaporator core is mounted within the passenger compartment and is situated with the heater core in a single housing.

Suction/Accumulator

The suction/accumulator is mounted under the right-hand front wheel arch liner.

The suction/accumulator is connected to the low pressure side of the A/C system and is used to make sure only refrigerant gas is passed to the compressor and not liquid.

The suction/accumulator also removes moisture from the refrigerant.

A/C Pressure transducer

The pressure transducer is used to control over pressure in the high side of the A/C system.

Fixed orifice tube

The fixed orifice tube system allows the compressed liquid to expand, by metering the liquid into the low pressure area of the evaporator.

The low pressure being created by the restriction of the fixed orifice tube and the suction of the scroll type compressor.

The liquid begins to change state by transferring from a high pressure liquid into a low pressure gas immediately it leaves the fixed orifice tube.

Service Gauge Port Valves

The service gauge port valves are located on the right-hand side at the rear of the engine bay.

The fitting is an integral part of the refrigerant line or component.

- Special couplings are necessary for both the high side and low side service gauge ports.

Air Conditioning - Air Conditioning

Diagnosis and Testing

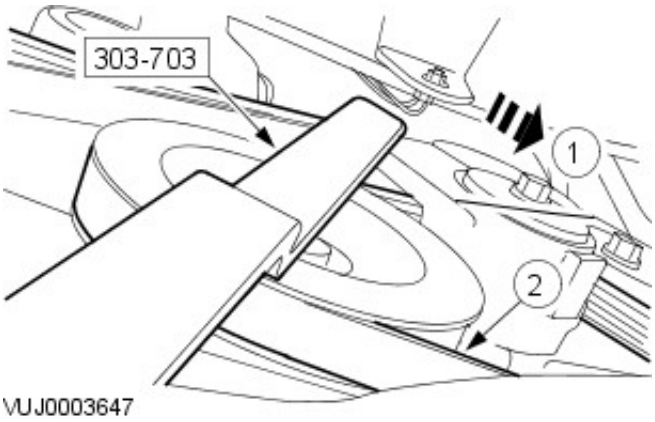
For additional information refer toSection 412-00 Climate Control System - General Information.

Air Conditioning - Air Conditioning (A/C) Compressor2.5L NA V6 - AJV6 / 2.0L NA V6 - AJV6 / 3.0L NA V6 - AJ27

Removal and Installation

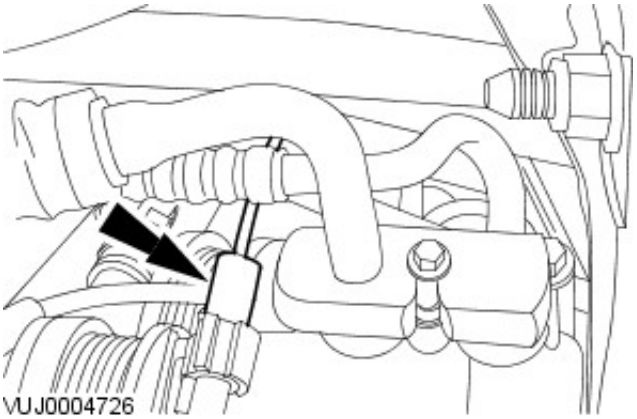
Removal

1. Reclaim the refrigerant. For additional information, refer toSection 412-00 Climate Control System - General Information.
2. Raise and support the vehicle. For additional information, refer to Section 100-02 Jacking and Lifting.
3. Detach the accessory drivebelt.
    1. Using the special tool, rotate the belt tensioner counter clockwise.
    2. Detach the accessory drivebelt



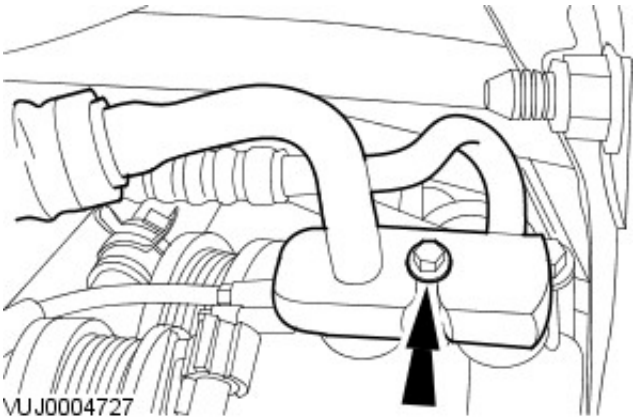
VUJ0003647

4. Disconnect the electrical connector.

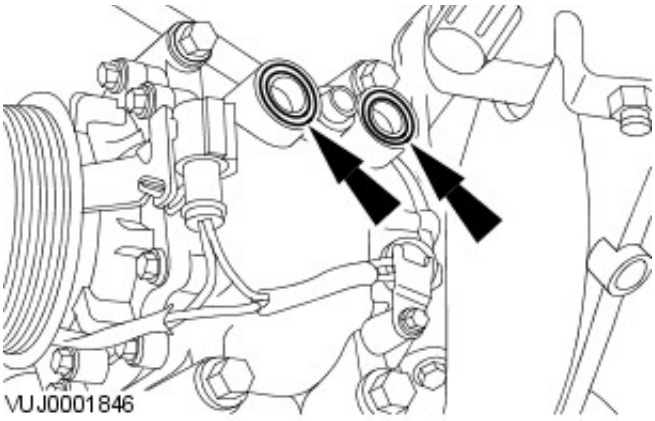

VUJ0004726

5. NOTE: Seal the tube and the compressor with plugs

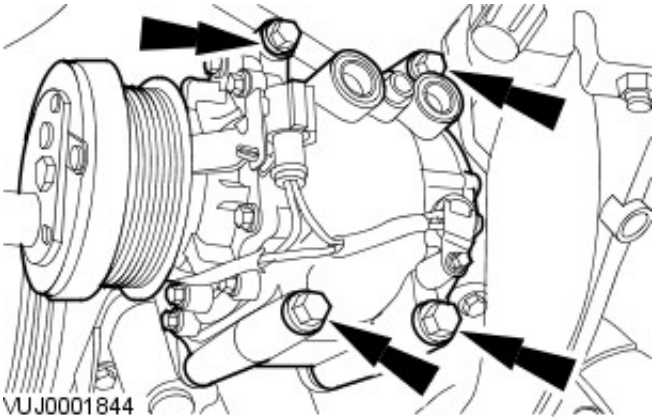
   Detach the compressor supply and return tubes.


VUJ0004727

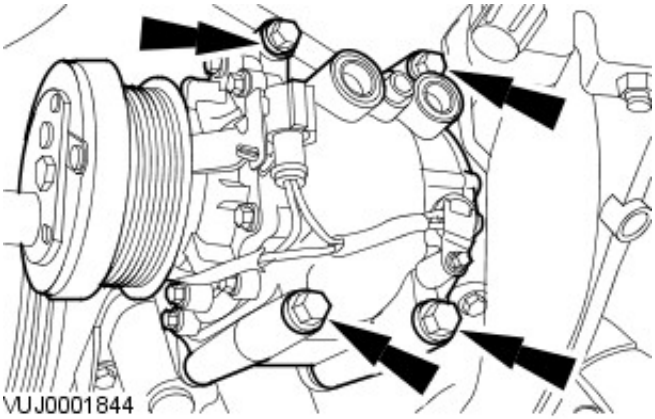
6. Remove and discard the compressor O-rings.



7. Remove the compressor.



Installation



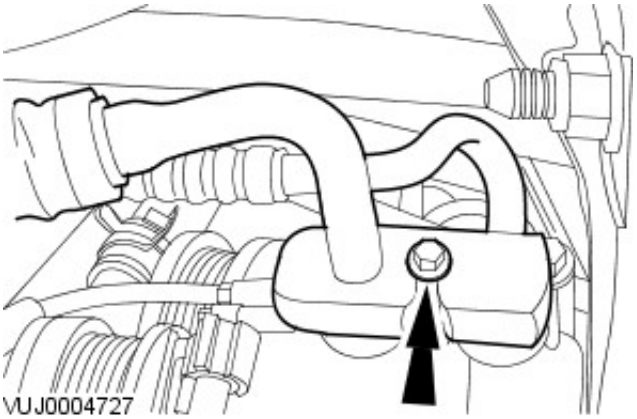
1. NOTE: Install new O-ring seals.

• NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

• NOTE: 5oz of oil are contained in the new compressor. The air conditioning system requires a total of 7oz of oil.

To install, reverse the removal procedure.

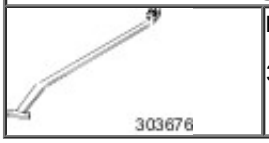
- Tighten to 25 Nm.



2. Tighten to 25 Nm.

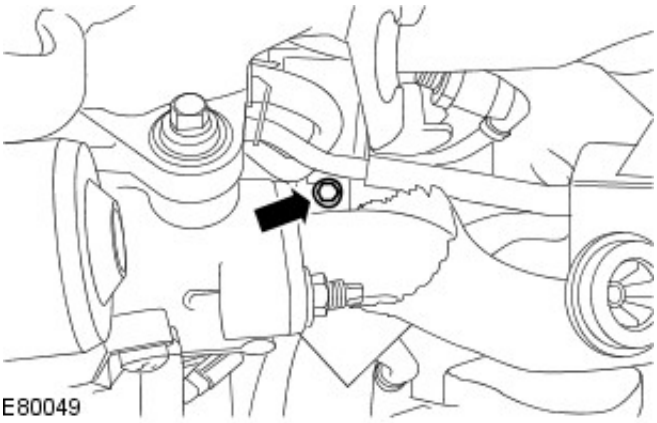
Air Conditioning - Air Conditioning (A/C) Compressor2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi

Removal and Installation

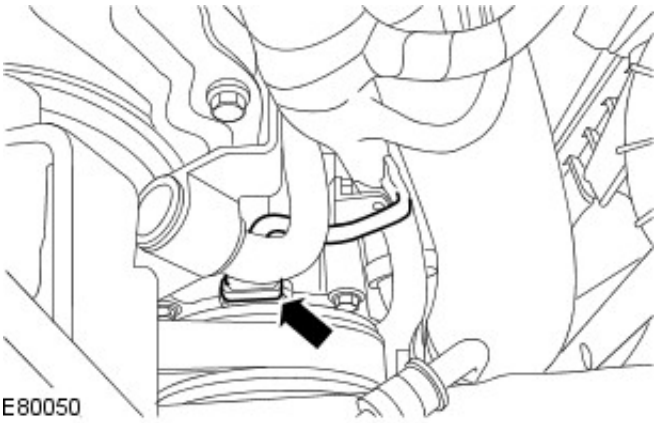
Special Tool(s)	
 303676	Release tool, belt tensioner 303-676

Removal

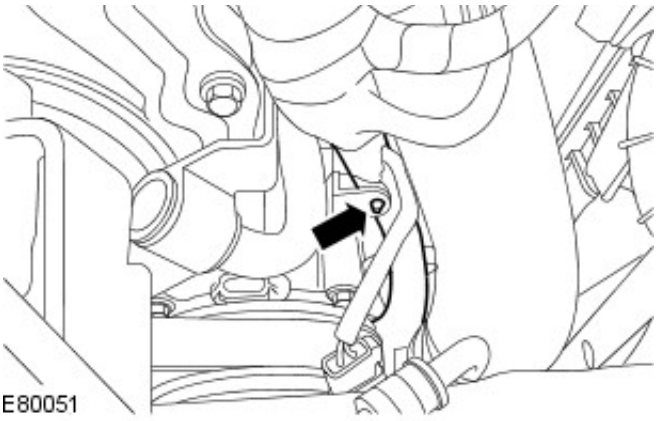
1. Recover the air conditioning (A/C) refrigerant.
   For additional information, refer to: Air Conditioning (A/C) System Recovery, Evacuation and Charging (412-00 Climate Control System - General Information, General Procedures).
2. Remove the air cleaner.
   For additional information, refer to: Air Cleaner (303-12B Intake Air Distribution and Filtering - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Removal and Installation).
3. Loosen the A/C compressor supply and return tubes retaining bolt.


E80049

4. Disconnect the electrical connector.


E80050

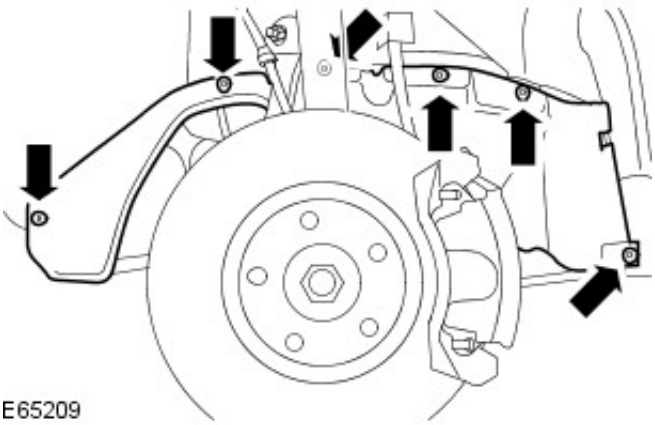
5. Detach the engine wiring harness from the retaining bracket.



6. Remove the air deflector.
For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).

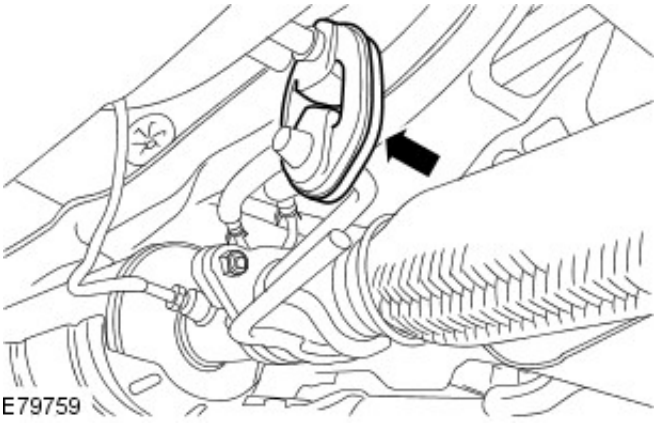
7. NOTE: Road wheel shown removed for clarity.

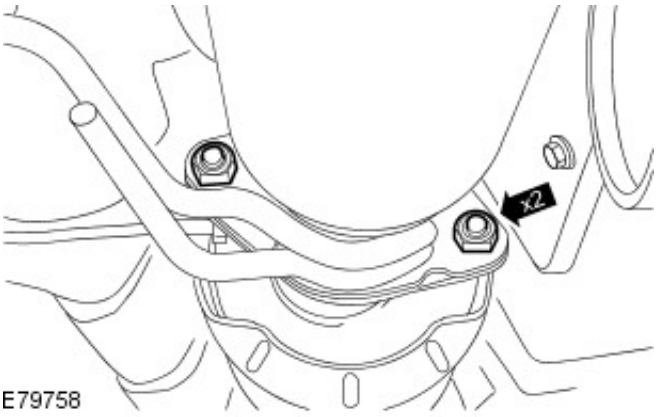
Remove the right-hand wheel arch liner access panels.



8. Using the special tool, detach the accessory drive belt.

9. Detach the exhaust flexible pipe support isolator.

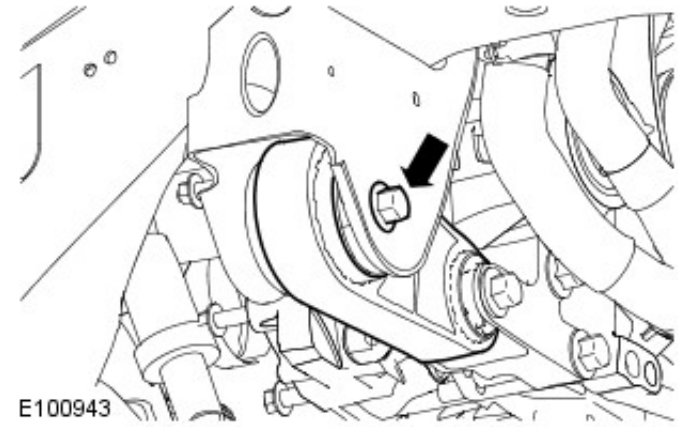




10. CAUTION: Make sure that the exhaust flexible pipe is positioned below the diesel partciculate filter (DPF) flange. Failure to follow this instruction may result in damage to exhaust flexible pipe.

Release the exhaust flexible pipe from the diesel particulate filter (DPF).

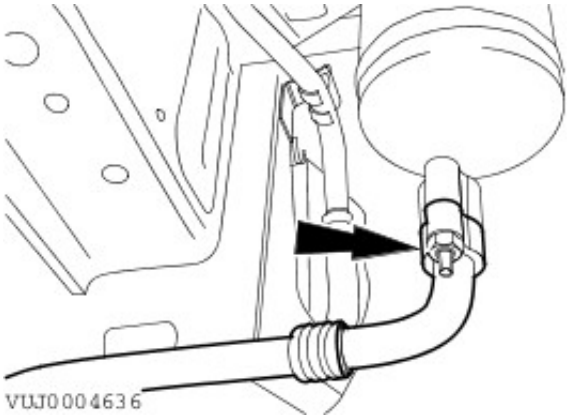
- Remove the exhaust flexible pipe retaining nuts.
- Remove and discard the gasket and nuts.



11. CAUTION: Care must be taken to avoid damaging components when positioning the block.

Displace the engine approximately 40mm rearwards.

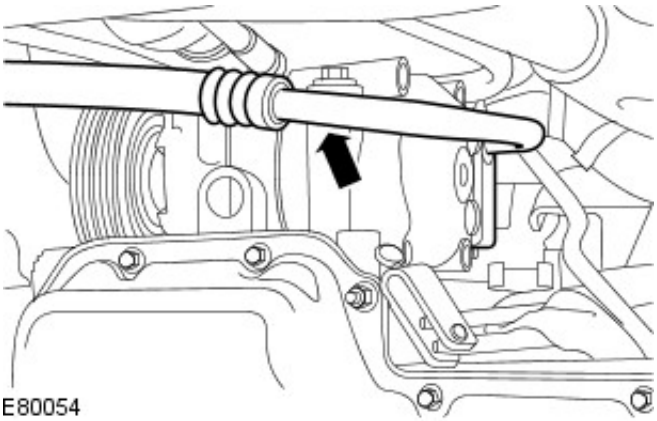
- Remove the roll restrictor rear retaining bolt.
- With assistance displace the engine and support in an appropriate position using a suitable block.



12. NOTE: Seal the tube and the suction accumulator with plugs.

Detach the suction accumulator pipe.

- Remove and discard the O-ring seal.
- Install blanking plugs to the exposed ports.



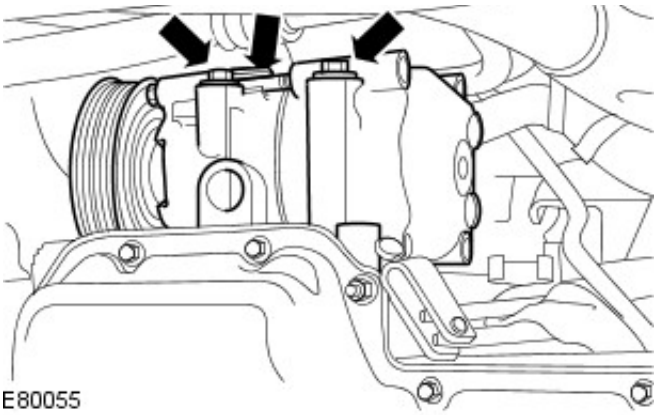
13. NOTE: Remove and discard the O-ring seals if the old A/C compressor is to be refitted.

Detach the A/C compressor supply and return tubes.

- Install blanking plugs to the exposed ports.
- Displace the A/C tubes to a position above the A/C compressor.

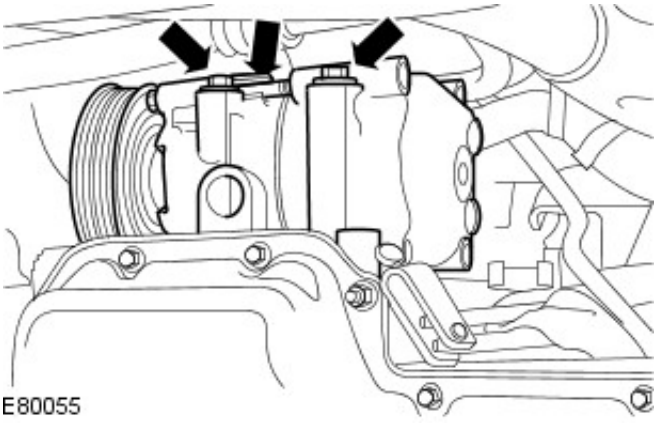
14. Remove the A/C compressor.

- Remove the retaining bolts.


E80055

Installation

1. Add refrigerant oil to the new A/C compressor.
For additional information, refer to: Refrigerant Oil Adding (412-00 Climate Control System - General Information, General Procedures).


E80055

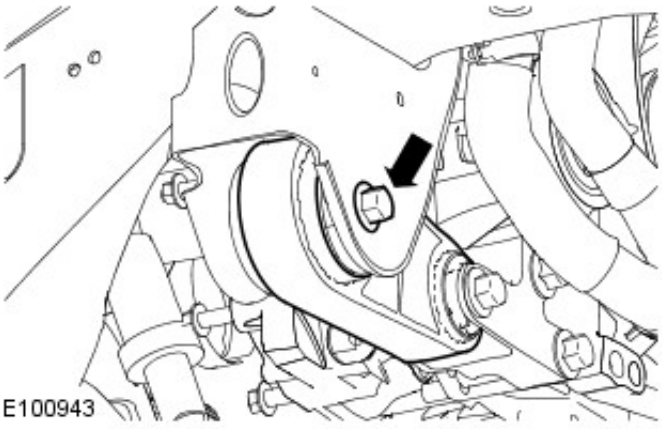
2. NOTE: If installing the old A/C compressor, install new O-ring seals.

• NOTE: If installing a new A/C compressor, make sure that new O-ring seals are already installed.

• NOTE: Coat the A/C compressor O-ring seals in clean refrigerant oil prior to installation.

To install, reverse the removal procedure.

- Tighten to 25 Nm.

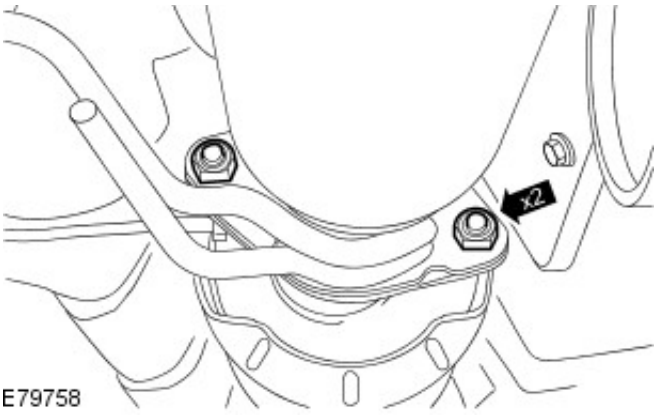

E100943

3. Tighten to 80 Nm.

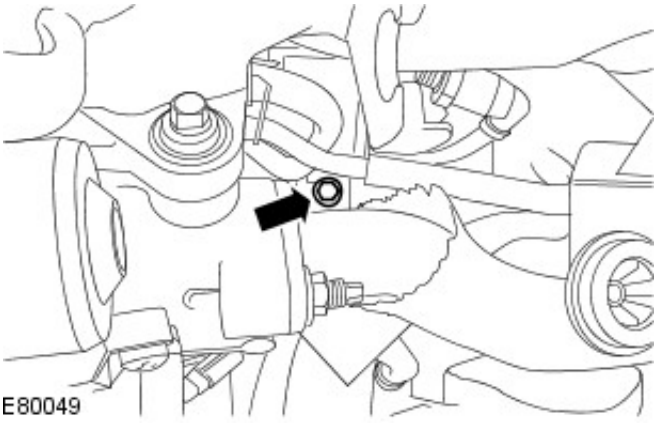
- With assistance remove the engine support block.

4. Tighten to 46 Nm.

- Install a new exhaust flexible pipe gasket and nuts.



E79758


E80049

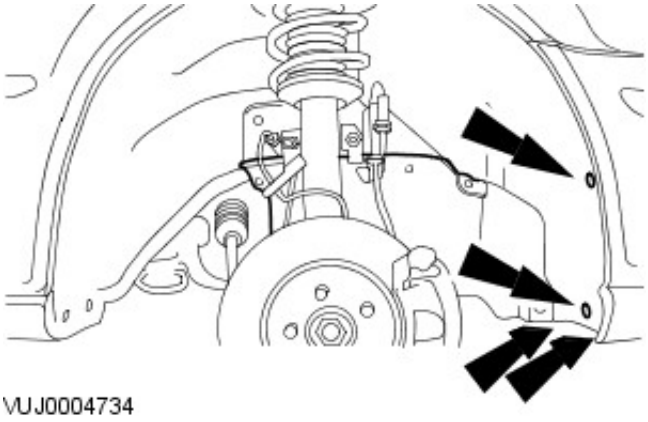
5. Tighten to 20 Nm.

Air Conditioning - Air Conditioning (A/C) Pressure Transducer

Removal and Installation

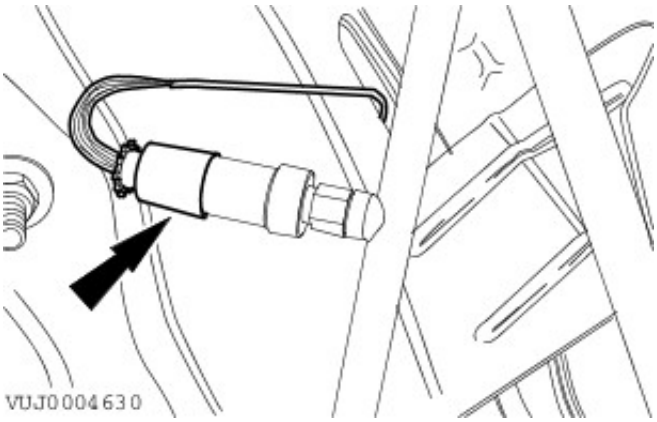
Removal

1. Remove the front wheel and tire. For additional information, refer to Section 204-04 Wheels and Tires.
2. Detach the wheel arch liner.



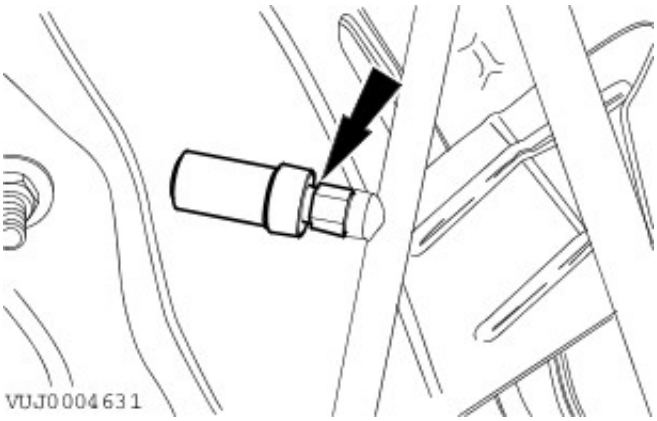
VUJ0004734

3. Disconnect the electrical connector.



VUJ0004630

4. Remove the pressure transducer.



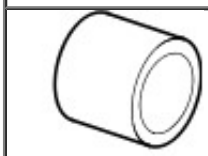
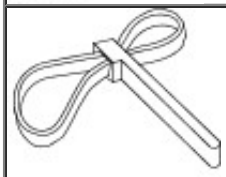
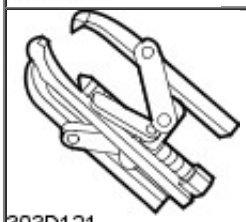
VUJ0004631

Installation

1. To install, reverse the removal procedure.

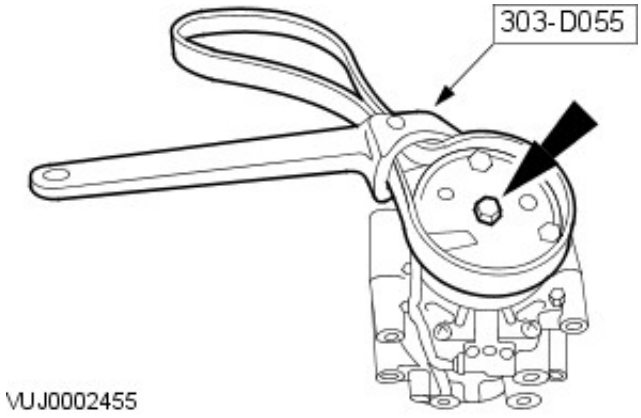
Air Conditioning - Clutch and Clutch Field Coil2.5L NA V6 - AJV6 / 2.0L NA V6 - AJV6 / 3.0L NA V6 - AJ27

Removal and Installation

Special Tool(s)	
 412109	Pulley Replacer 412-109
 303D055	Wrench Strap-Universal 303-D055
 303D121	Crankshaft Damper Remover 303-D121

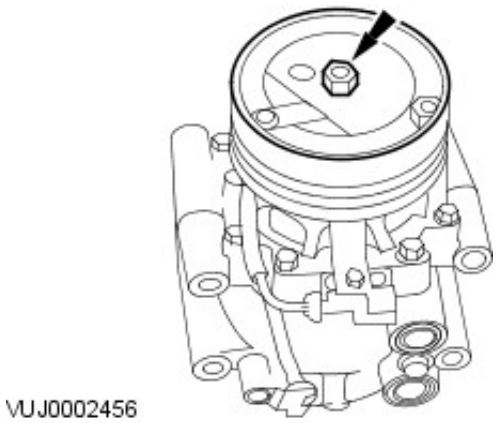
Removal

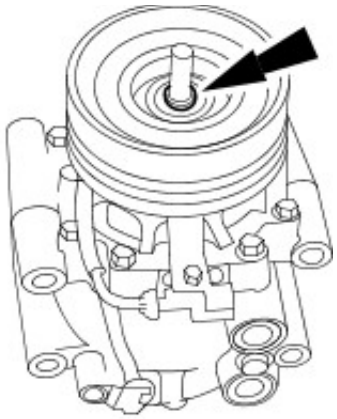
1. Remove the air conditioning (A/C) compressor.
   For additional information, refer to: Air Conditioning (A/C) Compressor - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (412-03 Air Conditioning, Removal and Installation).
2. Using the special tool, loosen the A/C clutch retaining nut.



VUJ0002455

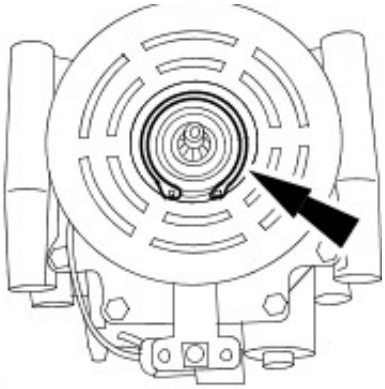
3. Remove the A/C clutch.
   - Remove the A/C clutch retaining nut.


VUJ0002456



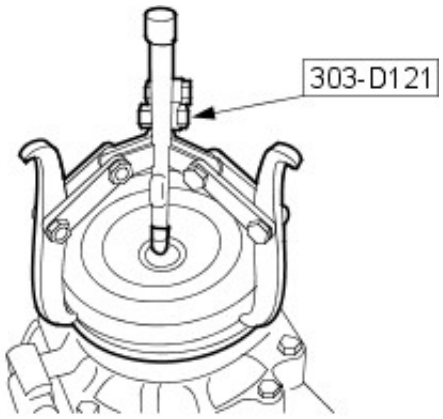
VUJ0002457

4. Remove the A/C clutch shim.



VUJ0002458

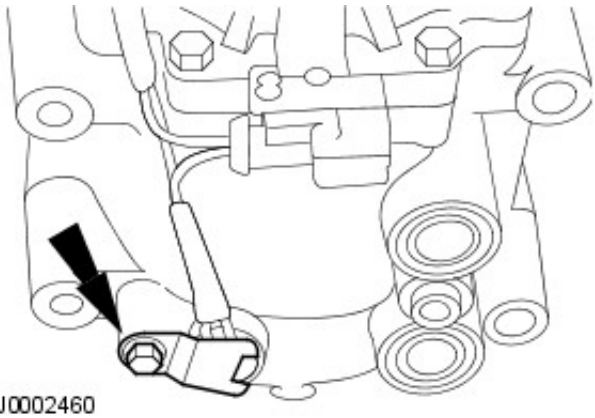
5. Remove the A/C clutch pulley circlip.



VUJ0002459

6. CAUTION: Do not use air tools. Failure to follow this instruction may result in damage to the component.

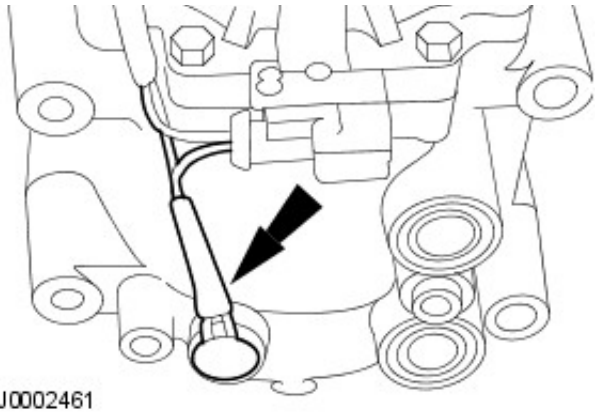
Using the special tool, remove the A/C clutch pulley.



VUJ0002460

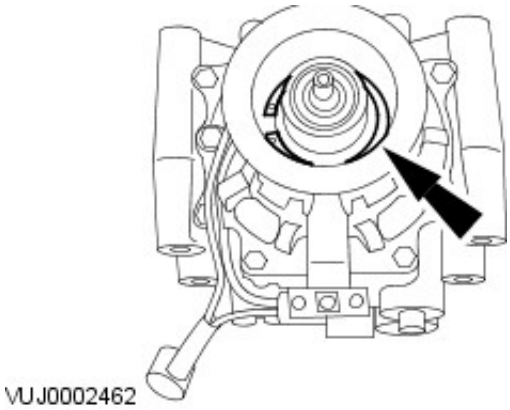
7. Remove the A/C sensor retaining plate.

8. Detach the A/C sensor.



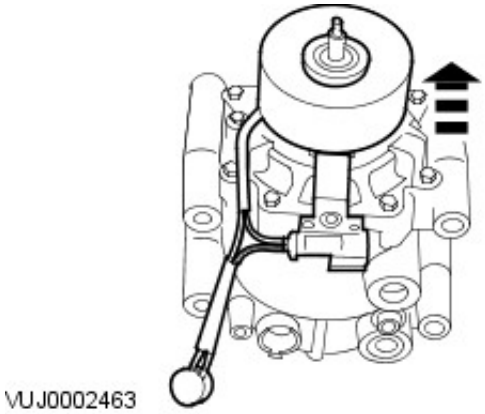
VUJ0002461

9. Remove the A/C clutch and clutch field coil circlip.



VUJ0002462

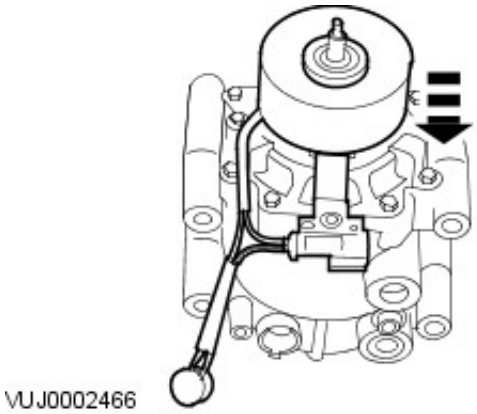
10. Remove the A/C clutch and clutch field coil.



VUJ0002463

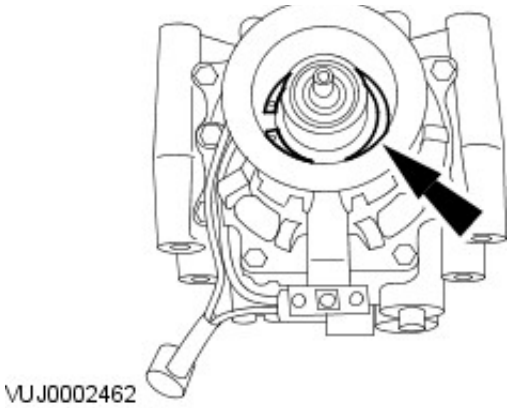
Installation

1. Install the A/C clutch and clutch field coil.



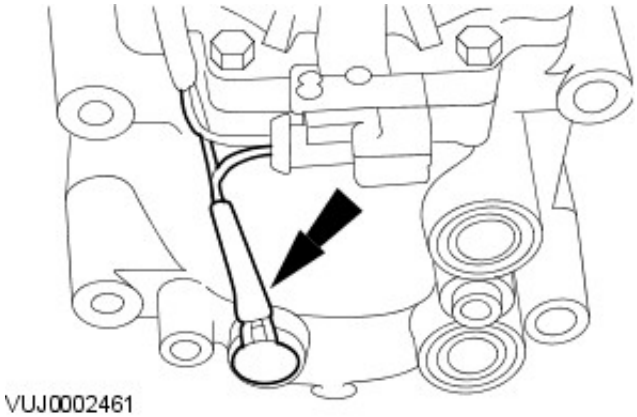
VUJ0002466

2. CAUTION: Make sure the circlip is installed and seated correctly. Failure to follow this instruction may result in damage to the vehicle.



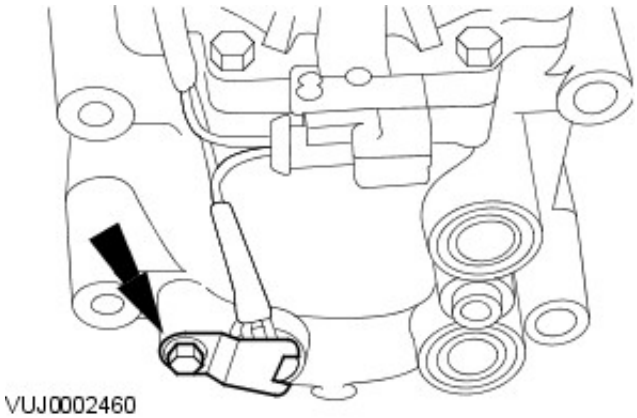
VUJ0002462

Install the A/C clutch and clutch field coil circlip.



VUJ0002461

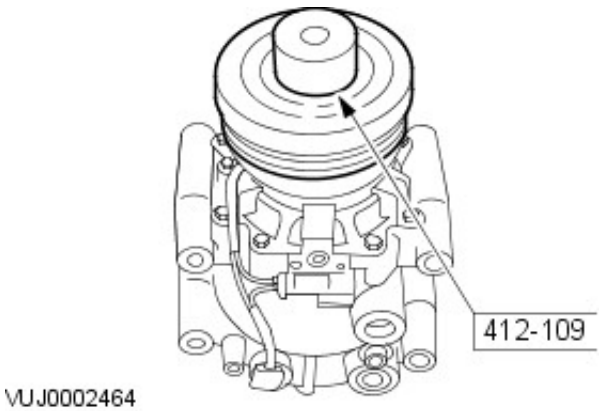
3. Attach the A/C temperature sensor.



VUJ0002460

4. Install the A/C temperature sensor retaining plate.

- Tighten to 6 Nm.



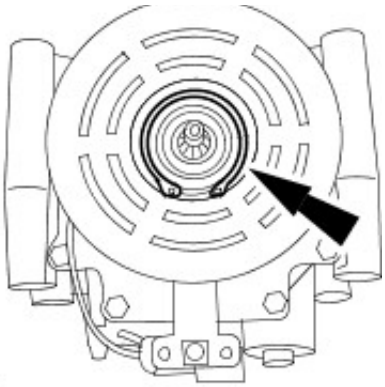
VUJ0002464

5. NOTE: The A/C clutch bearing and pulley is a slip fit on the compressor. If correctly aligned it should slip on easily. If difficulty is experienced on installation, use the special tool and gently tap the A/C clutch pulley.

Using the special tool, install the A/C clutch pulley.

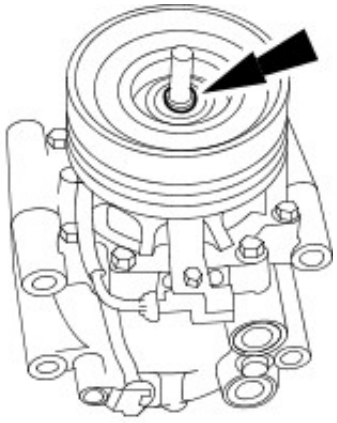
6. CAUTION: Make sure the circlip is installed and seated correctly. Failure to follow this instruction may result in damage to the vehicle.

Install the A/C clutch pulley circlip.



VUJ0002458

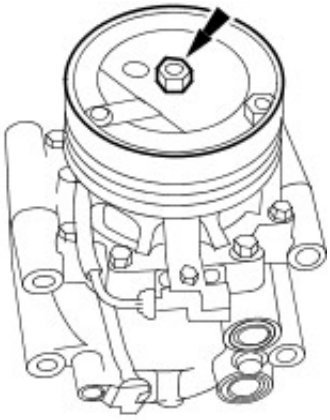
7. Install the A/C clutch shim.



VUJ0002457

8. Install the A/C clutch.

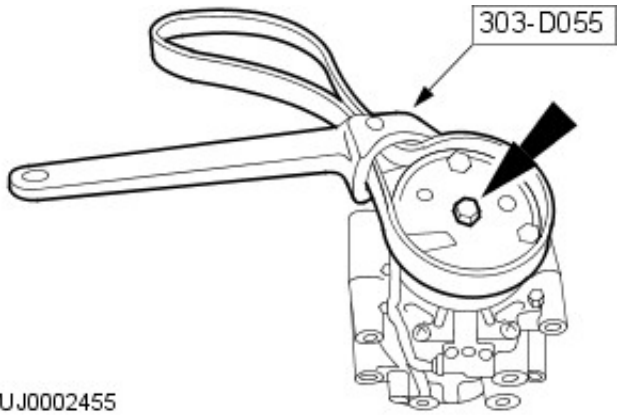
- Install the A/C clutch retaining nut.



VUJ0002456

9. Using the special tool, tighten the A/C clutch retaining nut.

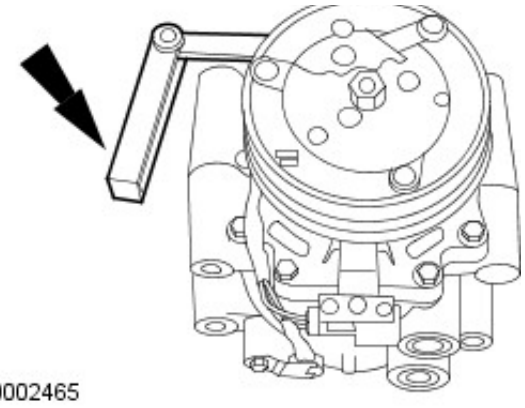
- Tighten to 26 Nm.



VUJ0002455

10. Measure and adjust the A/C clutch air gap by removing or installing A/C clutch shims.

- A/C clutch air gap to be set between 0.35 mm (0.014 in) and 0.75 mm (0.03 in).



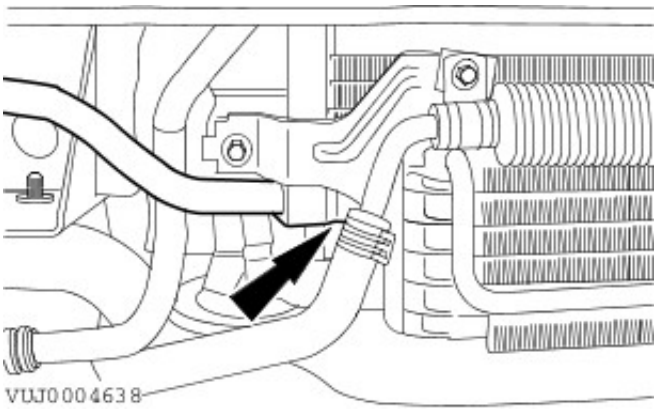
VUJ0002465

11. Install the A/C compressor.
For additional information, refer to: Air Conditioning (A/C) Compressor - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (412-03 Air Conditioning, Removal and Installation).

Air Conditioning - Condenser Core
Removal and Installation

Removal

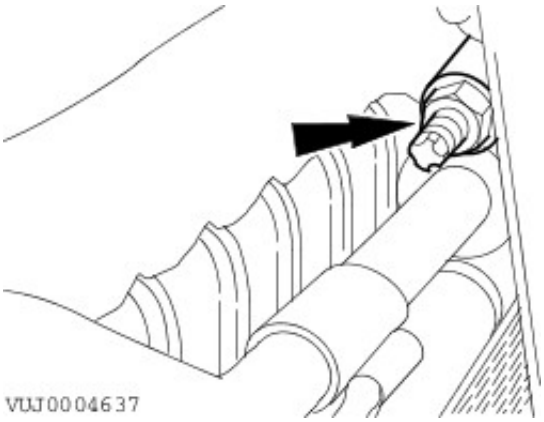
1. Reclaim the refrigerant. For additional information, refer to Section 412-00 Climate Control System - General Information.
2. Remove the front bumper cover. For additional information, refer to Section 501-19 Bumpers.



3. NOTE: Seal the tube and the condenser with plugs

   Detach the air conditioning tube.

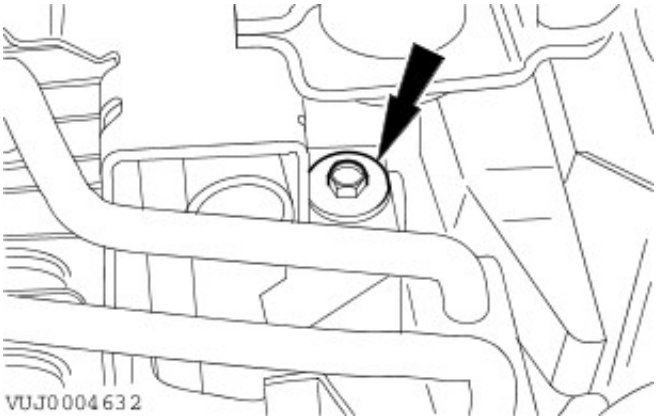
   - Remove and discard the O-ring seal.



4. NOTE: Seal the tube and the condenser with plugs

   Detach the air conditioning tube.

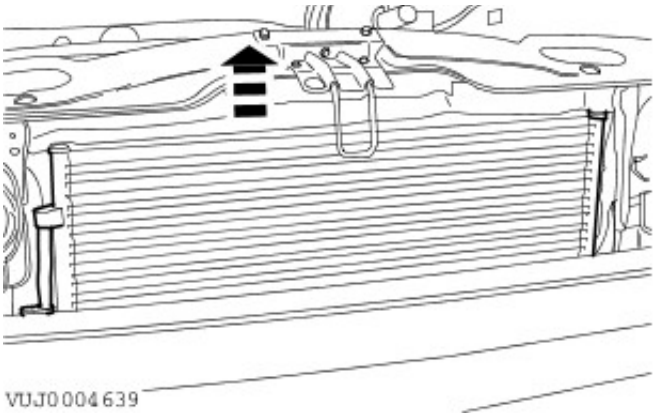
   - Remove and discard the O-ring seal.



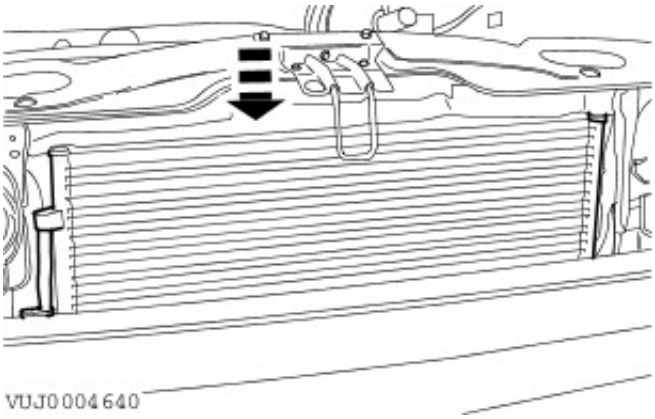
5. Detach the condenser.

   - Remove the retaining bolts.
   - Right-hand side shown, left-hand side similar.

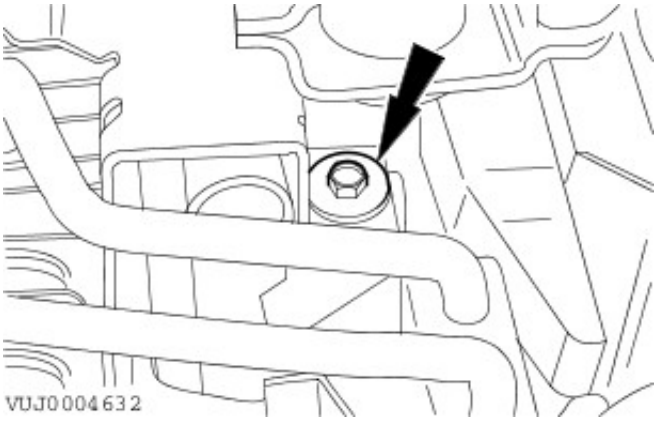
6. Lower the vehicle.
7. Remove the condenser.



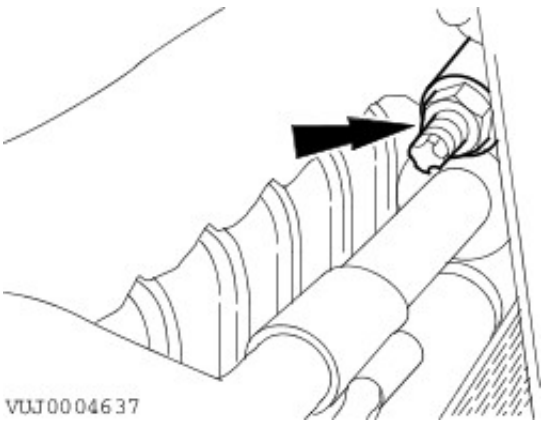
Installation



1. To install, reverse the removal procedure.



2. Tighten 7 Nm.

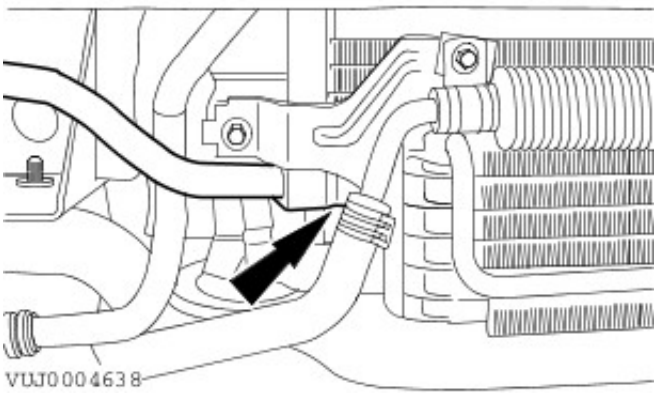


3. NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

Install a new O-ring seal.

4. NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

Install a new O-ring seal.

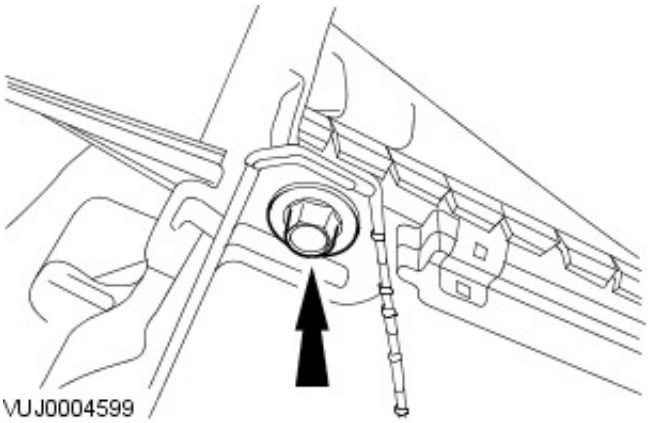

VUJ0004638

Air Conditioning - Evaporator Core

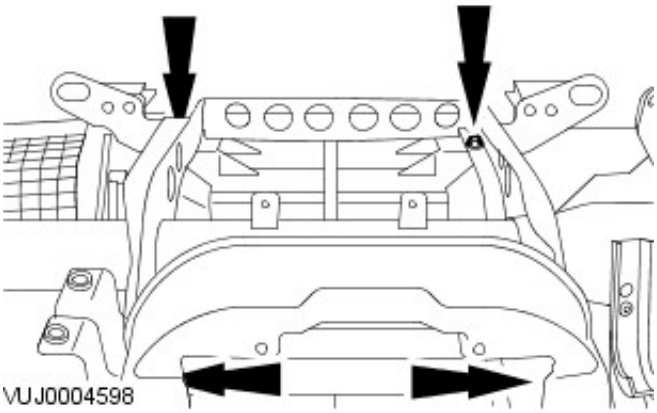
Removal and Installation

Removal

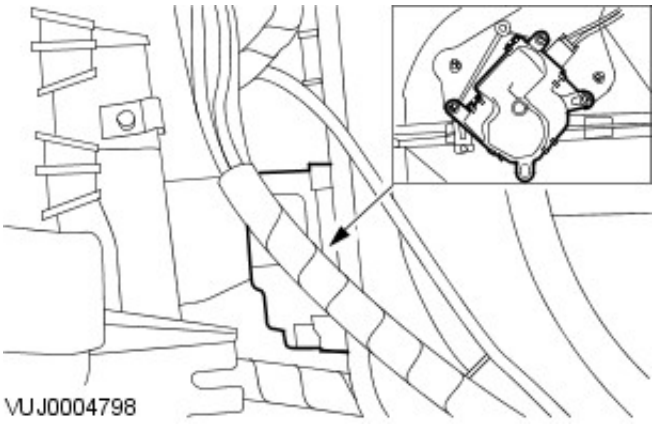
1. Remove the in vehicle cross beam and evaporator core housing. For additional information, refer to Section 412-02A Heating and VentilationSection 412-02B Auxiliary Heating.
2. Detach the blower motor housing from the in vehicle cross beam..



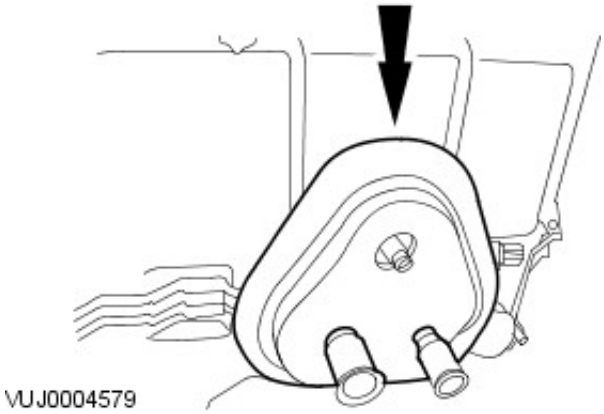
3. Remove the evaporator core housing from the in vehicle cross beam.



4. Remove the air inlet blend door actuator.
   - Remove the retaining screws.
   - Disconnect the electrical connector.



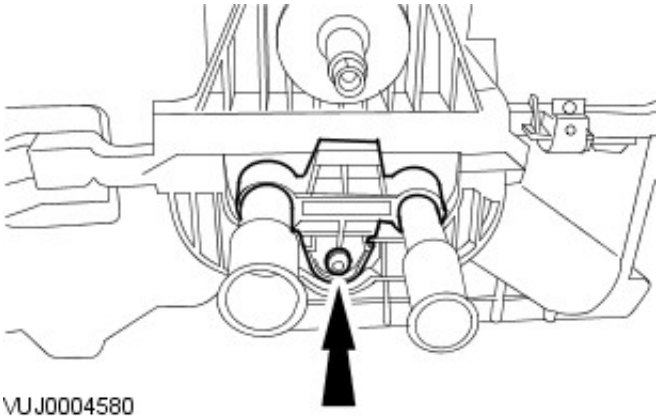
5. Remove the rubber seal.



VUJ0004579

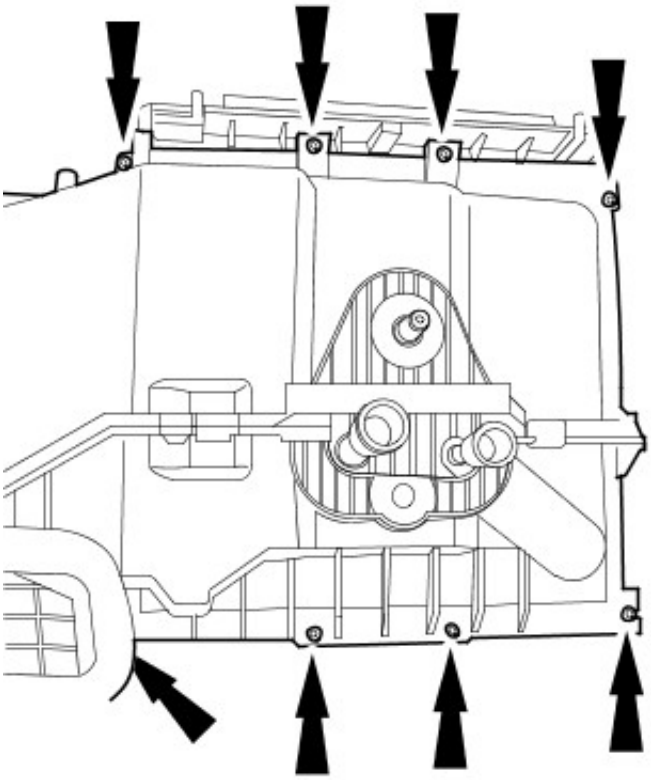
6. Remove the evaporator core support bracket.

- Remove the retaining screw.



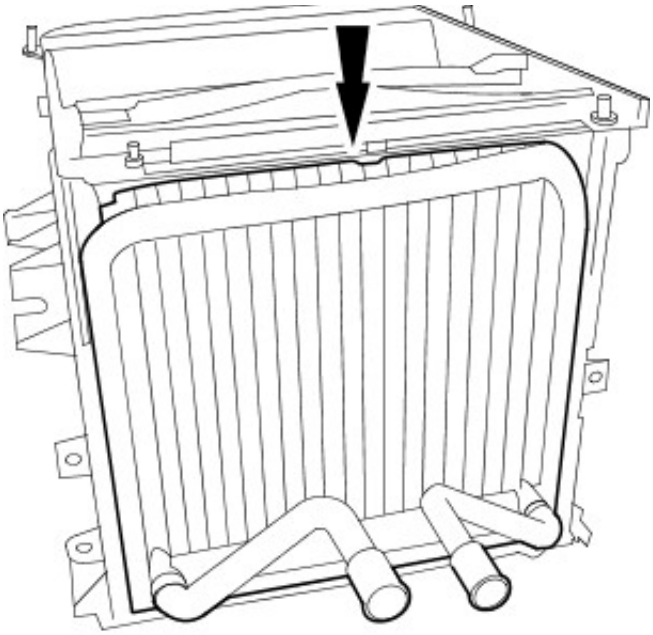
VUJ0004580

7. Remove the evaporator core housing.



VUJ0004581

8. Remove the evaporator core.



VUJ0004582

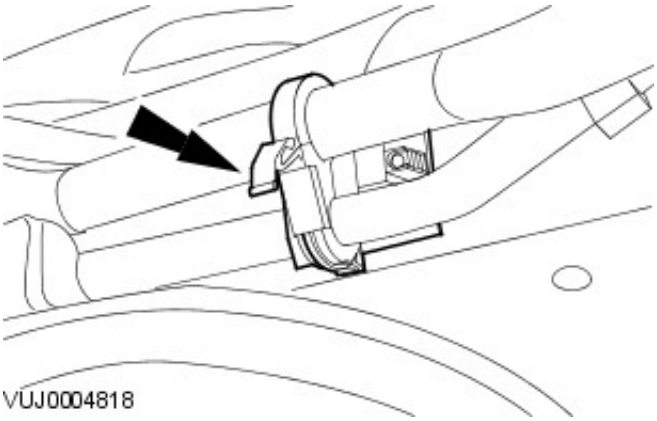
Installation

1. To install, reverse the removal procedure.

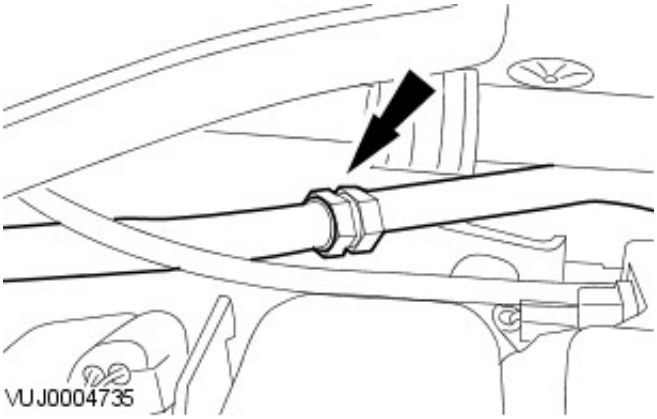
Air Conditioning - Evaporator Core Orifice
Removal and Installation

Removal

1. Reclaim the refrigerant. For additional information, refer toSection 412-00 Climate Control System - General Information.
2. Detach the evaporator core orifice refrigerant tube.



3. Disconnect the refrigerant line.
   - Remove and discard the O-ring seals.



4. Using a suitable tool. Remove the evaporator core orifice.

Installation

1. NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

To install, reverse the removal procedure.

- Install new O-ring seals.

Air Conditioning - Suction Accumulator

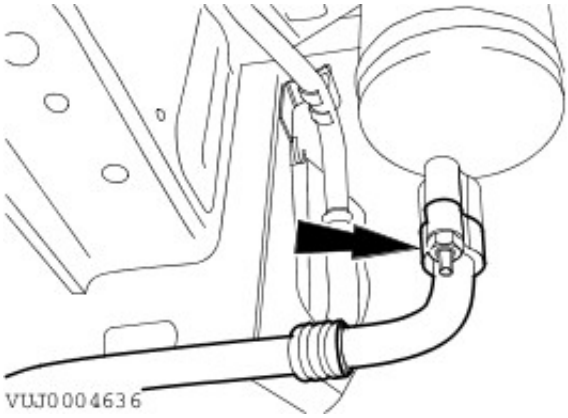
Removal and Installation

Removal

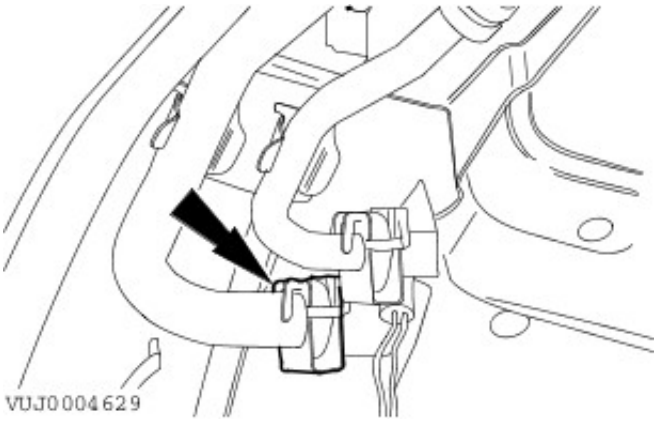
1. Reclaim the refrigerant. For additional information, refer toSection 412-00 Climate Control System - General Information.
2. Remove the washer resevoir. For additional information, refer to Section 501-16 Wipers and Washers.
3. NOTE: Seal the tube and the suction accumulator with plugs.

   Detach the suction accumulator pipe.

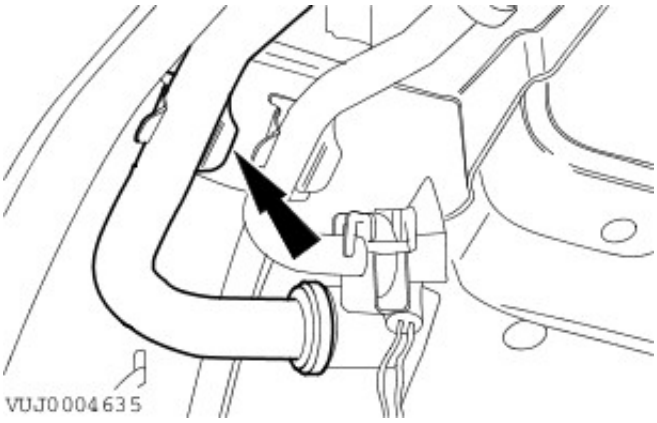
   - Remove and discard the O-ring seal.



4. Remove the suction accumulator pipe retaining clip.

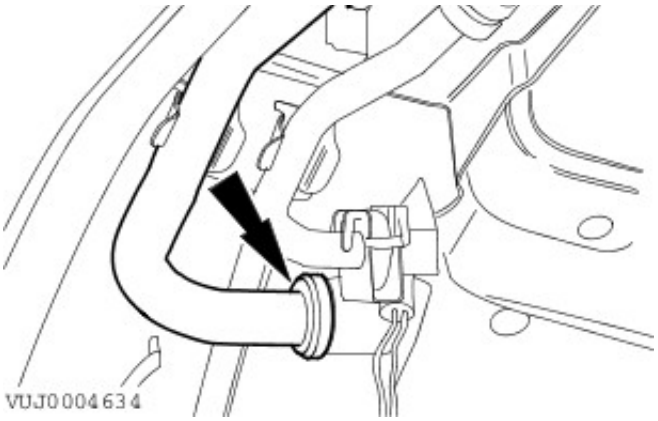


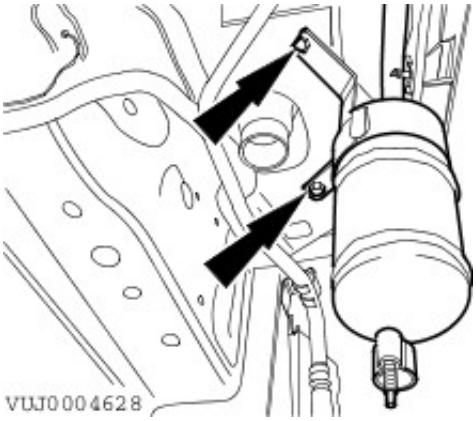
5. Detach the suction accumulator pipe.



6. Using a suitable tool detach the suction accumulator pipe.

   - Remove and discard the O-ring seals.





7. Remove the suction accumulator.

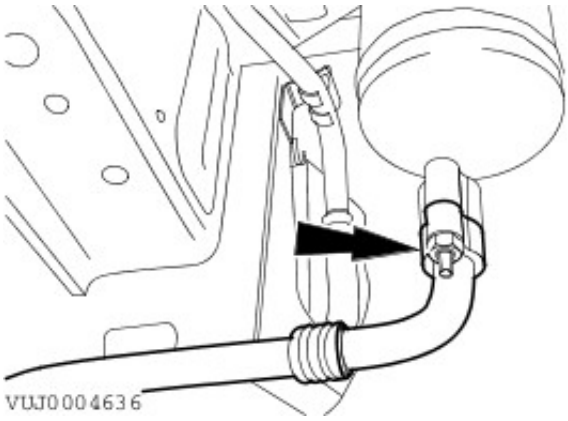
- Remove the retaining bolts.

Installation

1. To install, reverse the removal procedure.

2. NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

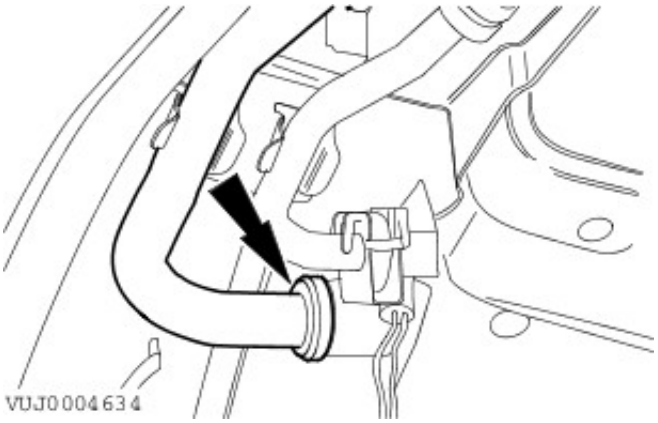
Install a new O-ring seal.



3. NOTE: Coat the refrigerant line O-ring seals in clean refrigerant oil prior to installation.

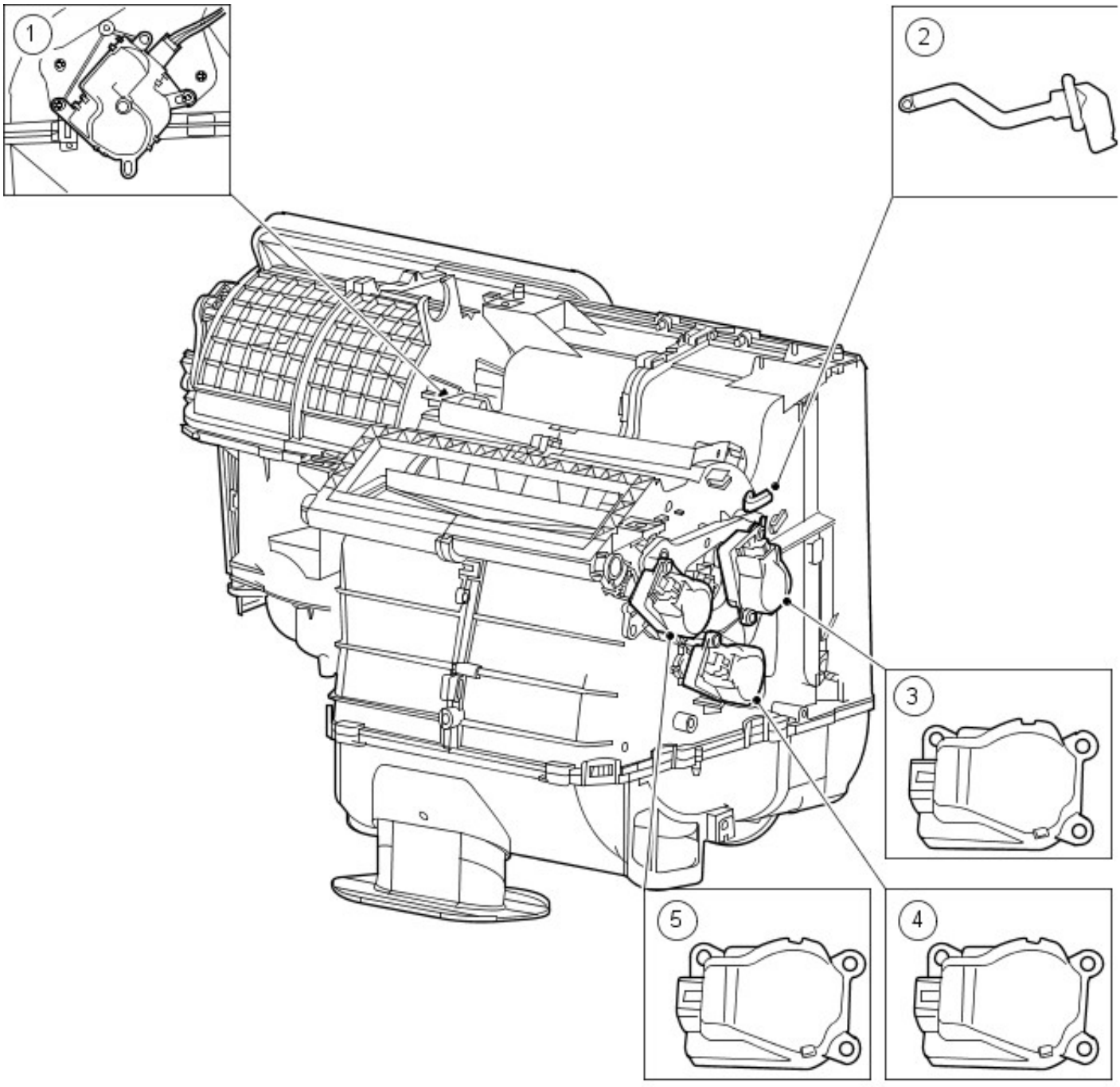
Install the retaining clip.

- Install a new O-ring seal.



Control Components - Control Components

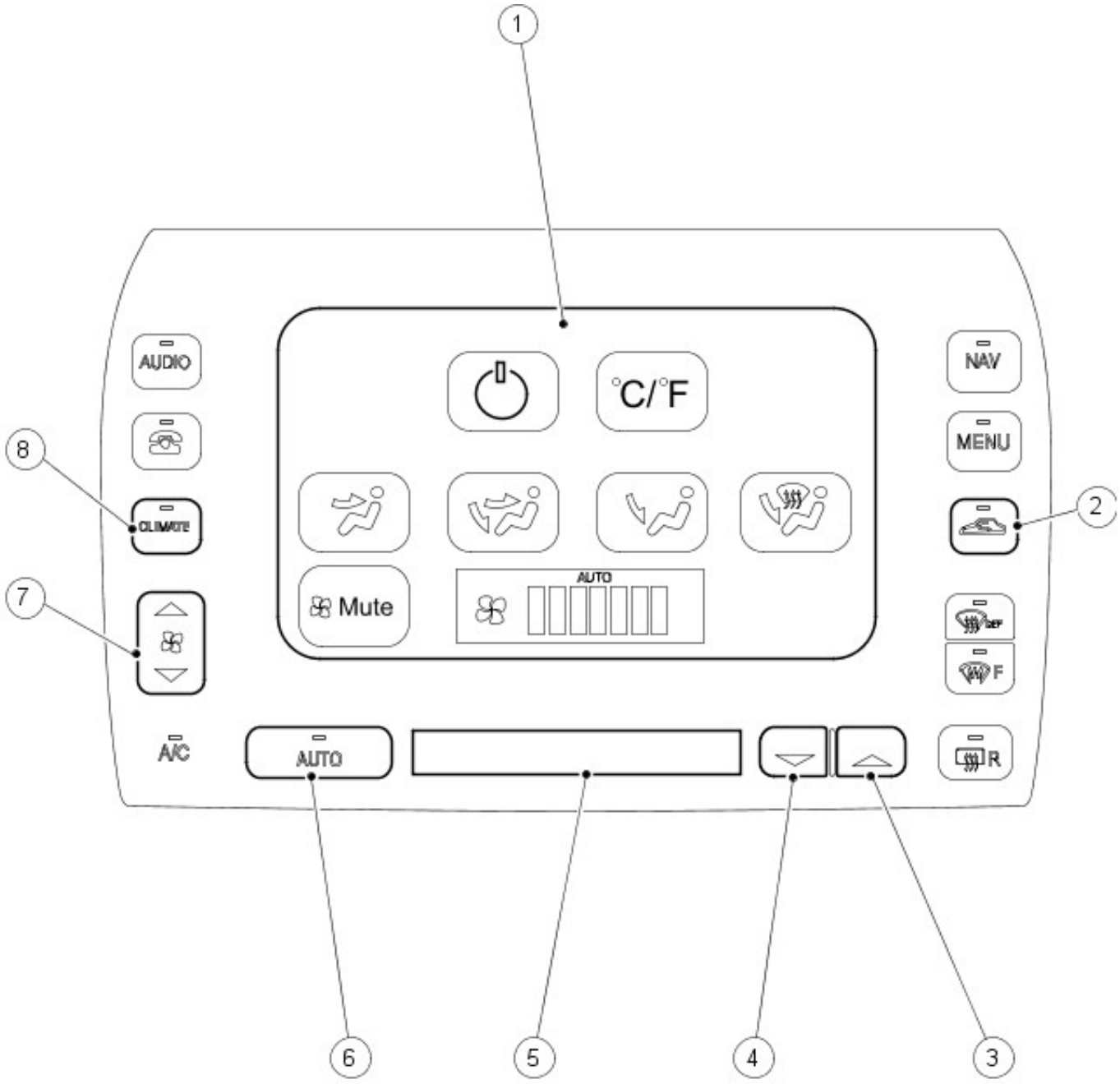
Description and Operation



VUJ0004796

Item	Part Number	Description
1	—	Air inlet blend door actuator
2	—	Air discharge temperature sensor
3	—	Defrost vent/register blend door actuator
4	—	Temperature blend door actuator
5	—	Footwell vent/duct blend door actuator

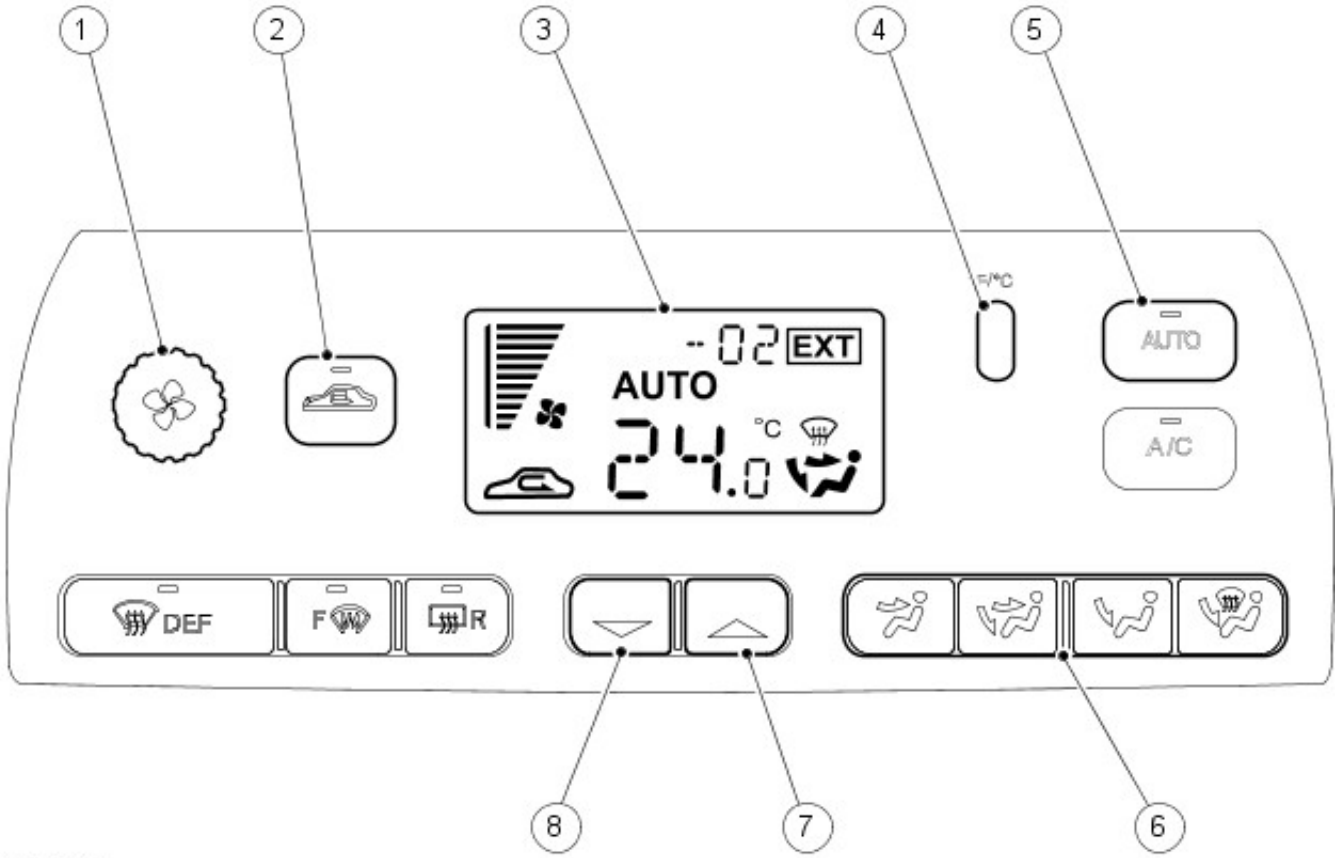
Automatic climate control with touch screen



VUJ0004797

Item	Part Number	Description
1	—	Touch screen switch
2	—	Recirculated air switch
3	—	Increase set temperature switch
4	—	Decrease set temperature switch
5	—	Temperature/clock display
6	—	Automatic operation switch
7	—	Fan speed switch
8	—	Climate control select switch

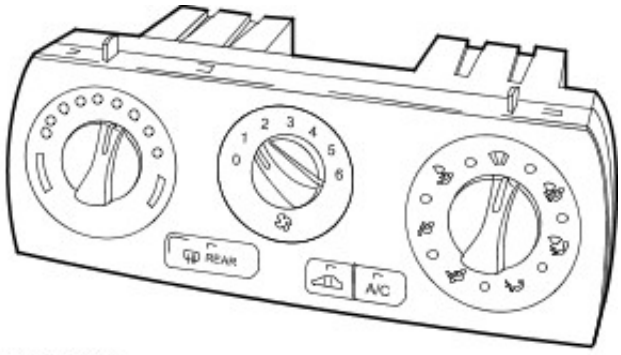
Automatic climate control with liquid crystal display (LCD)



VUJ0004799

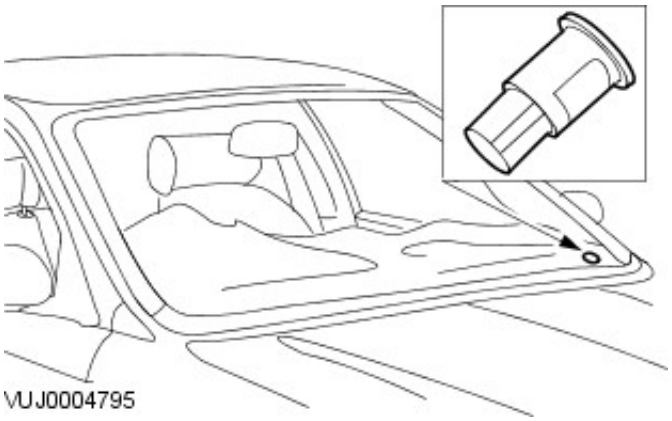
Item	Part Number	Description
1	—	Fan speed and ON/OFF switch
2	—	Recirculated air switch
3	—	Screen display
4	—	Celsius/Fahrenheit select switch
5	—	Automatic operation switch
6	—	Air distribution switches
7	—	Increase set temperature switch
8	—	Decrease set temperature switch

Manual climate control



VUJ0004794

Item	Part Number	Description
1	—	Climate control assembly



Item	Part Number	Description
1	—	Sunload sensor

This vehicle is fitted with one of the following climate control systems:

- manual climate control
- automatic climate control with a liquid crystal display (LCD) screen
- automatic climate control with a touch screen

Each system has a unique control panel located in the center console above the radio and audio controls.

Control Components - Control Components

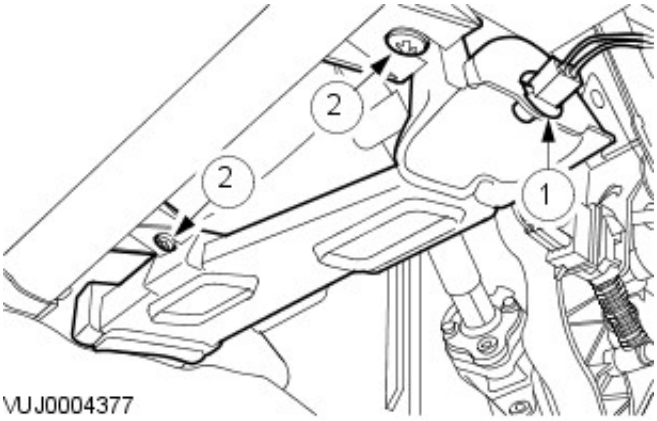
Diagnosis and Testing

For additional information, refer to Section 412-00 Climate Control System - General Information.

Control Components - Air Discharge Temperature Sensor

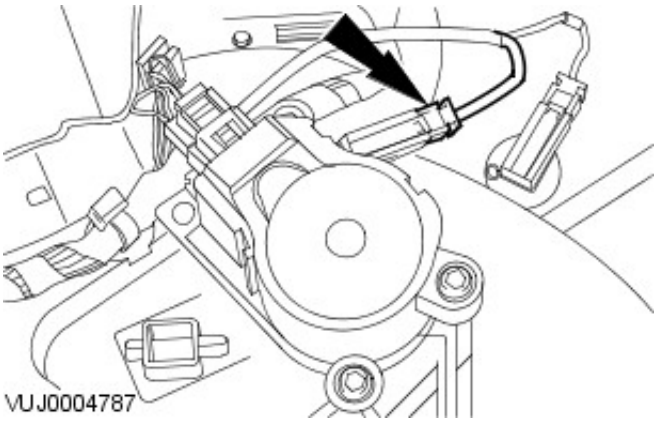
Removal and Installation

Removal

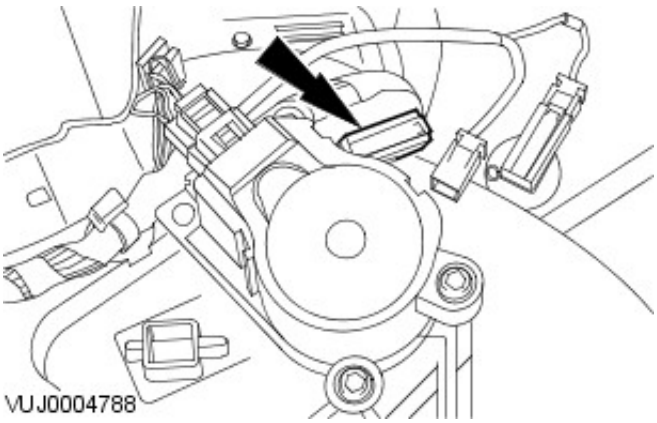


1. Remove the lower vent.

1. Detach the bulb holder.
2. Remove the lower vent.



2. Disconnect the air discharge temperature sensor electrical connector.



3. Remove the air discharge temperature sensor.

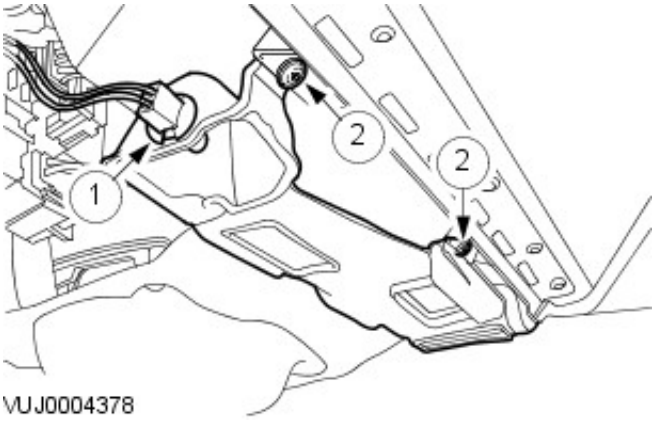
Installation

1. To install, reverse the removal procedure.

Control Components - Air Inlet Blend Door Actuator

Removal and Installation

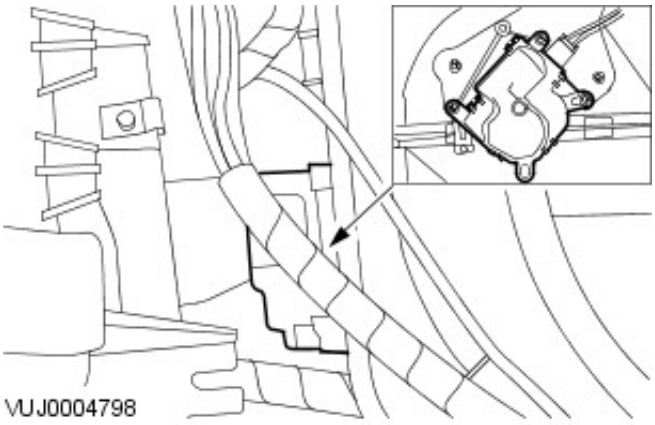
Removal



VUJ0004378

1. Remove the lower vent.

1. Detach the bulb holder.
2. Remove the lower vent.


VUJ0004798

2. Remove the air inlet blend door actuator.

- Remove the retaining screws.
- Disconnect the electrical connector.

Installation

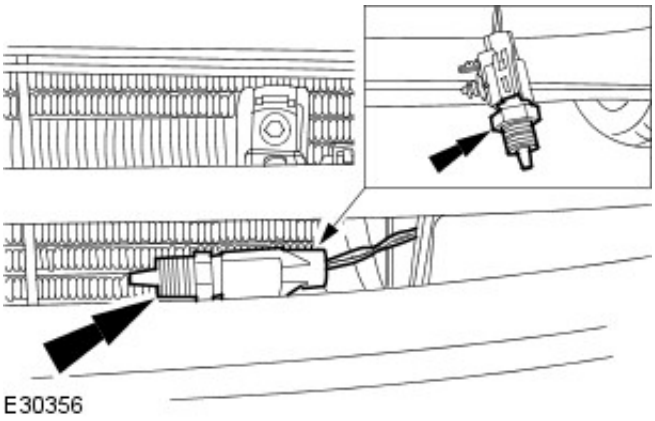
1. To install, reverse the removal procedure.

Control Components - Ambient Air Temperature Sensor

Removal and Installation

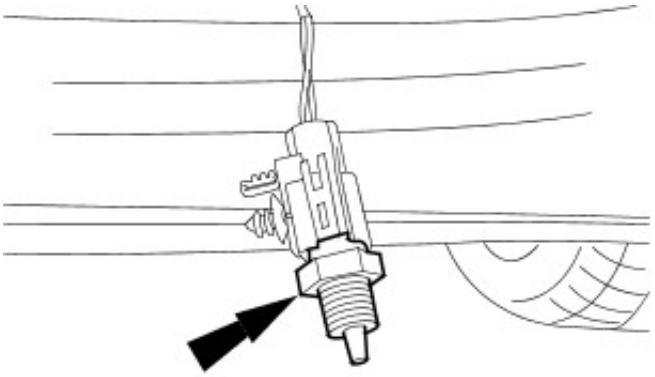
Removal

CAUTION: Make sure the ignition switch is in the off position before disconnecting the ambient air temperature sensor.



E30356

1. Detach the ambient air temperature sensor from the power assisted steering cooler bracket.



E30357

2. Remove the ambient air temperature sensor.
   - Disconnect the electrical connector.

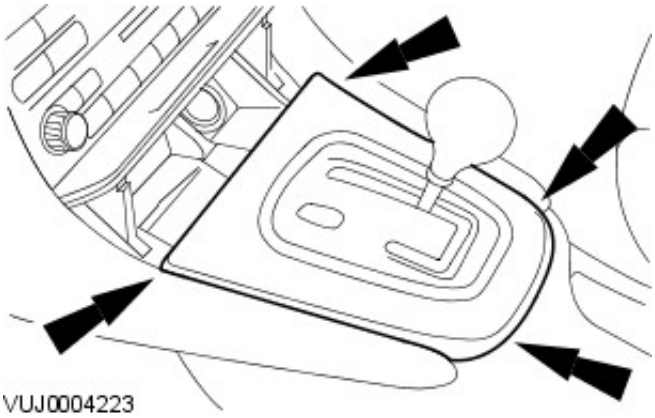
Installation

1. To install, reverse the removal procedure.

Control Components - Climate Control Assembly
Removal and Installation

Removal

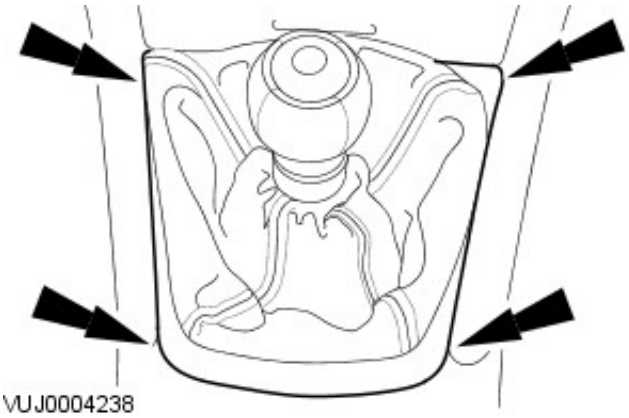
Vehicles with automatic transaxle


VUJ0004223

1. NOTE: To aid removal of the climate control assembly place the J-gate selector in the neutral position.

Remove the J-gate surround.

Vehicles with manual transaxle

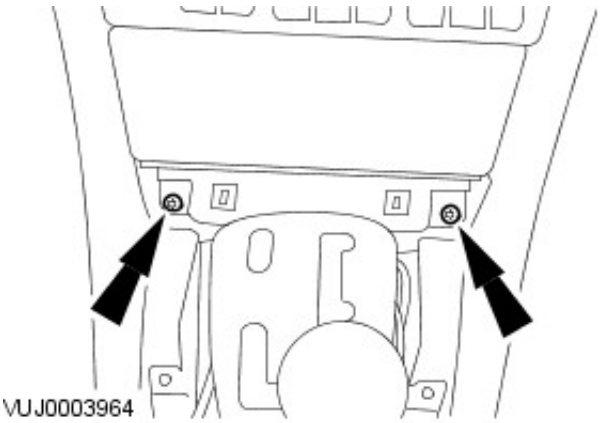

VUJ0004238

2. Detach the gear selector surround.

All vehicles

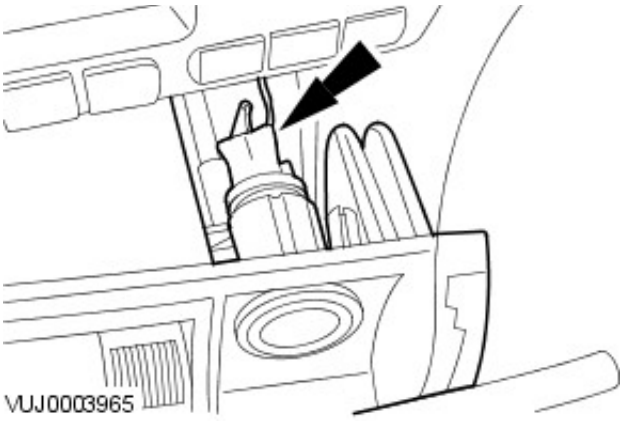
3. Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.

4. Remove the ashtray retaining screws.

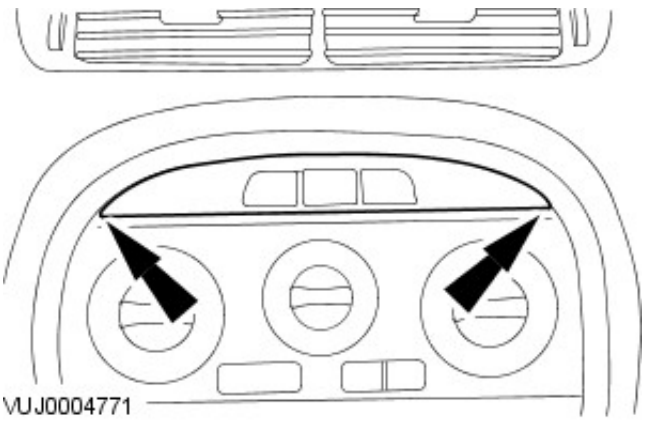

VUJ0003964

5. Remove the ashtray.

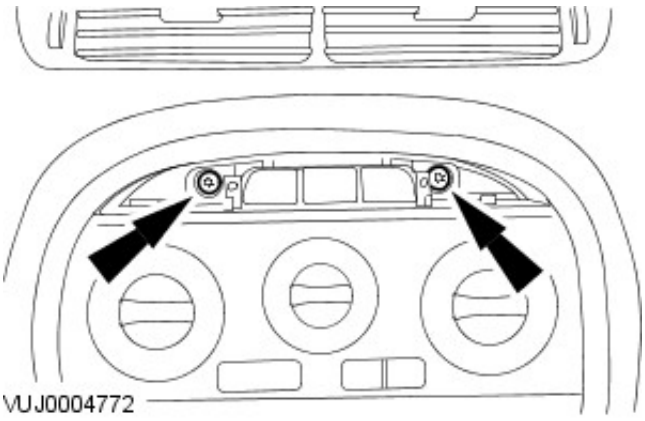
- Disconnect the electrical connectors.



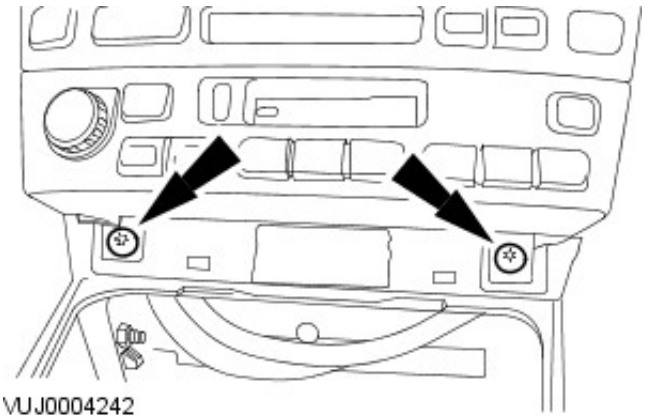
6. Remove the climate control assembly mounting bracket upper retaining screws cover.



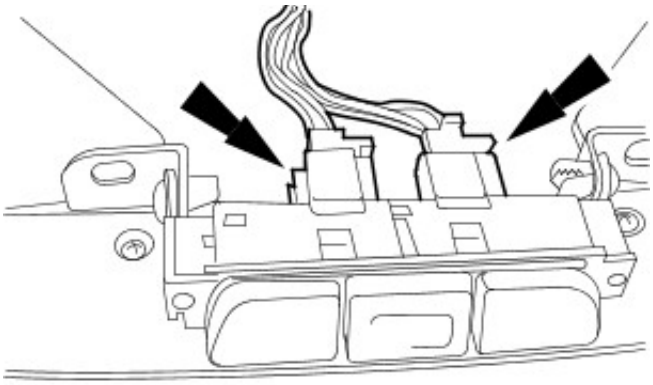
7. Remove the climate control assembly mounting bracket upper retaining screws.



8. Remove the climate control assembly mounting bracket lower retaining screws.

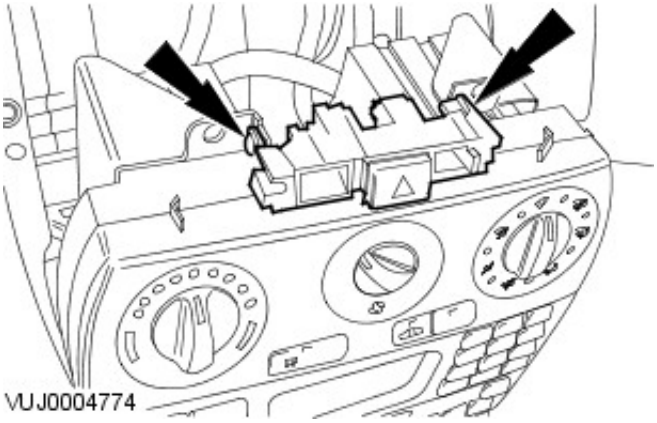


9. Disconnect the hazard lamp switch assembly electrical connectors.

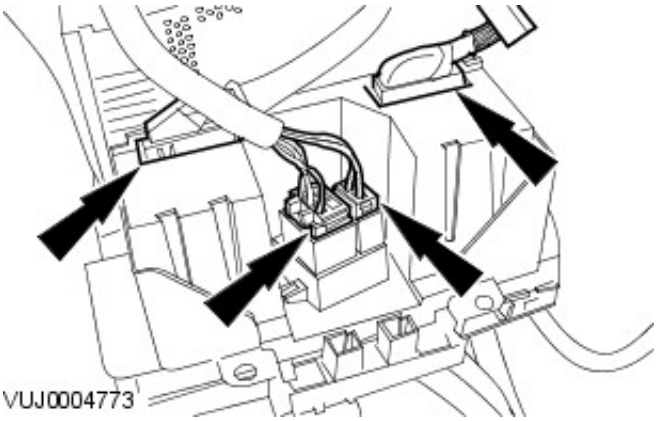

VUJ0004243

10. Remove the hazard lamp switch assembly.

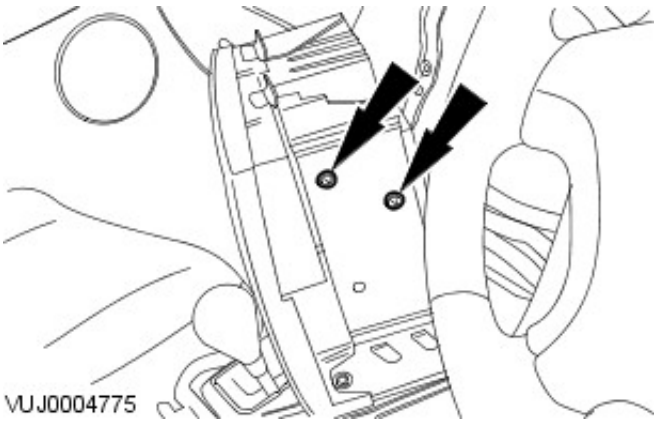
- Remove the retaining screws.


VUJ0004774

11. Disconnect the climate control assembly electrical connectors.

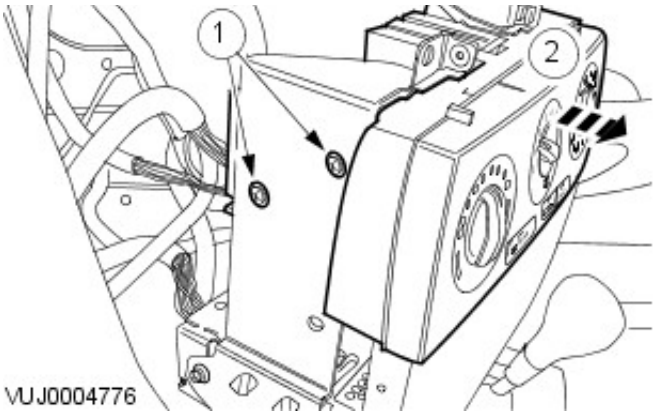

VUJ0004773

12. Remove the climate control assembly retaining screws.


VUJ0004775

13. Remove the climate control assembly.

1. Remove the retaining screws.
2. Remove the climate control assembly.



Installation

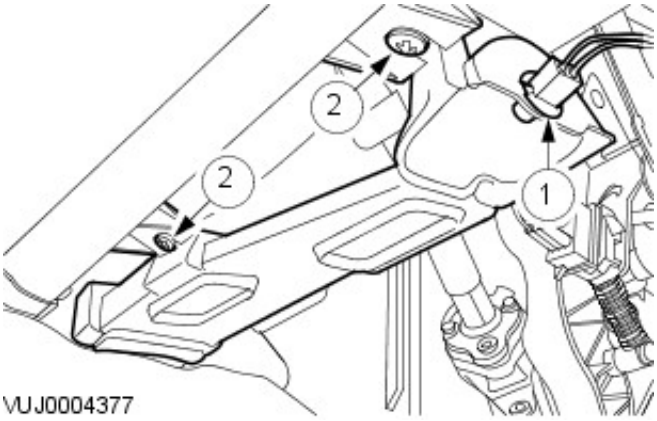
1. NOTE: Make sure the climate control assembly is correctly located into the audio unit.

To install, reverse the removal procedure.

Control Components - Defrost Vent / Register Blend Door Actuator

Removal and Installation

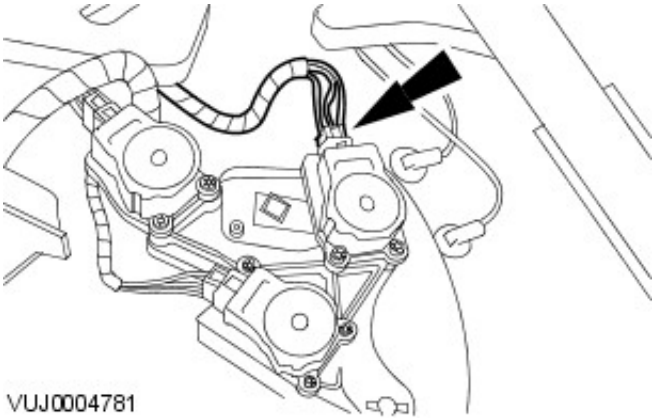
Removal



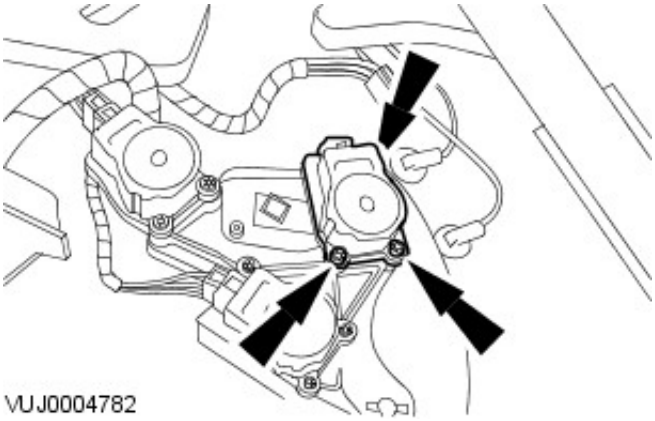
VUJ0004377

1. Remove the lower vent.

1. Detach the bulb holder.
2. Remove the lower vent.


VUJ0004781

2. Disconnect the defrost vent/register blend door actuator electrical connector.


VUJ0004782

3. Remove the defrost vent/register blend door actuator.

- Remove the retaining screws.

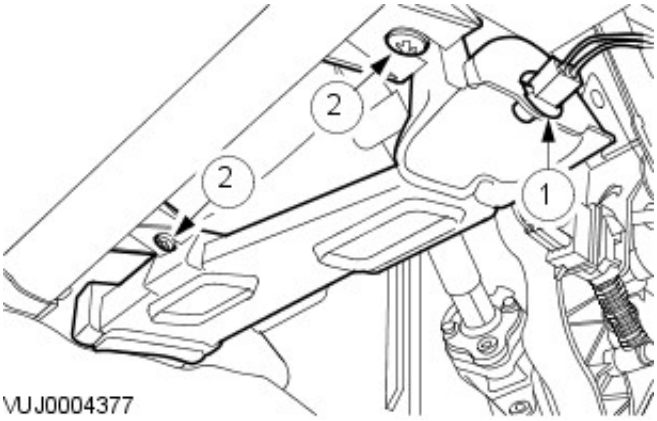
Installation

1. To install, reverse the removal procedure.

Control Components - Footwell Vent / Duct Blend Door Actuator

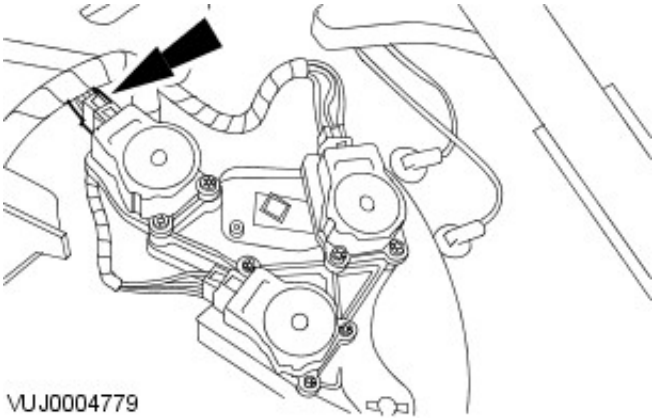
Removal and Installation

Removal

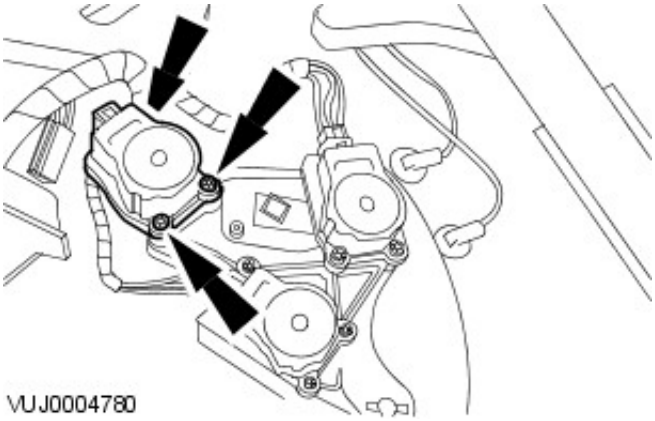


1. Remove the lower vent.

1. Detach the bulb holder.
2. Remove the lower vent.



2. Disconnect the footwell vent/duct blend door actuator electrical connector.



3. Remove the footwell vent/duct blend door actuator.

- Remove the retaining screws.

Installation

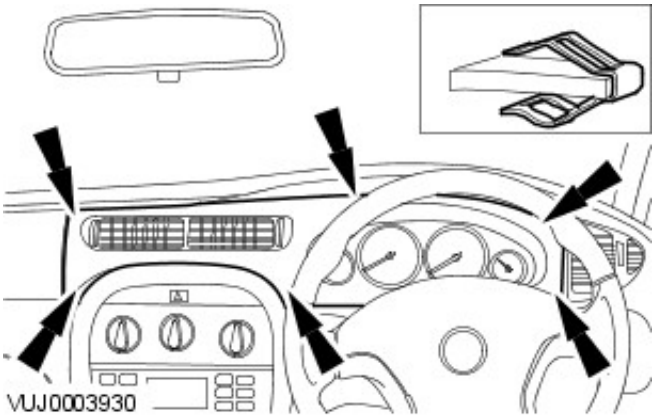
1. NOTE: Make sure the drive gear is fully meshed with the driven gear before tightening the retaining screws.

To install, reverse the removal procedure.

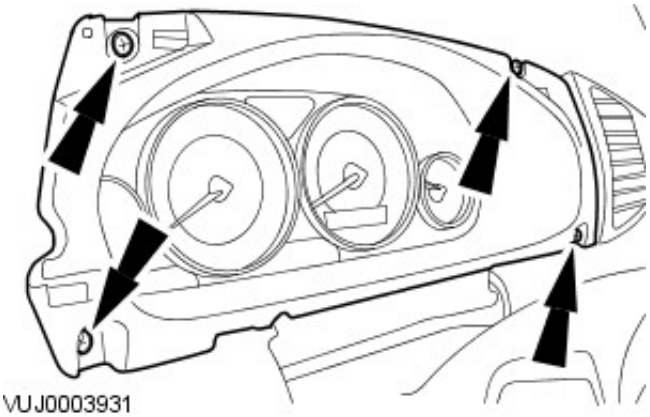
Control Components - Sunload Sensor

Removal and Installation

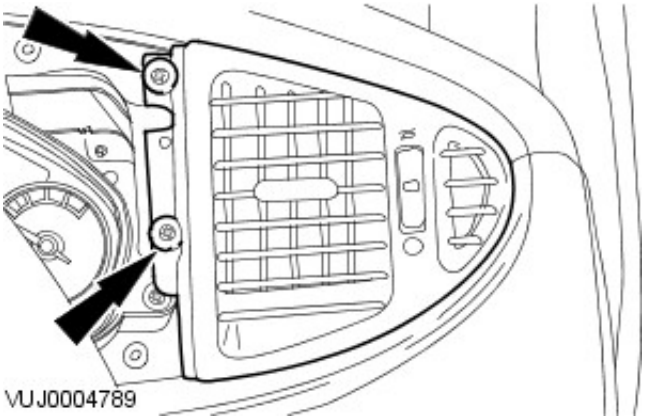
Removal



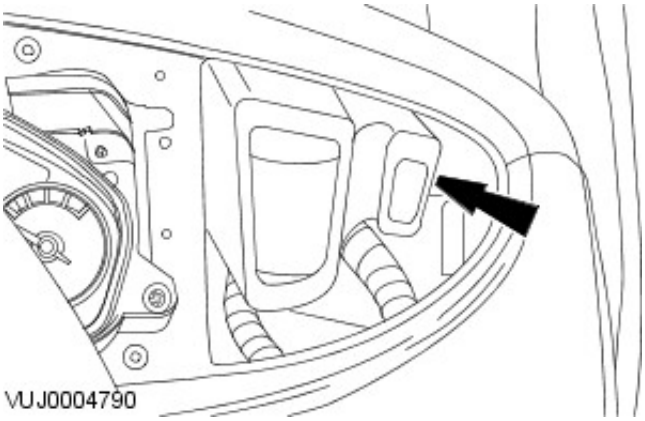
1. Remove the instrument cluster and vent finish panel.



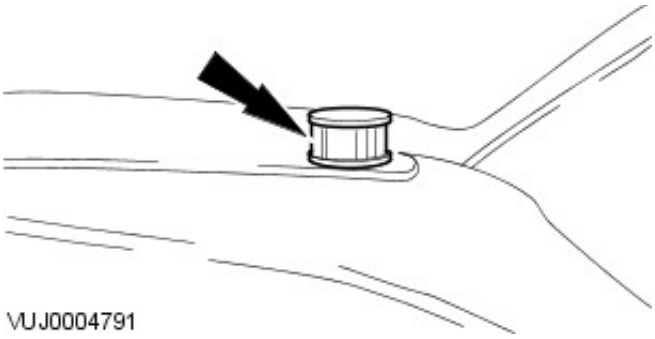
2. Remove the instrument cluster finish panel.



3. Remove the side air vent.



4. Disconnect the sunload sensor electrical connector.



5. Remove the sunload sensor.

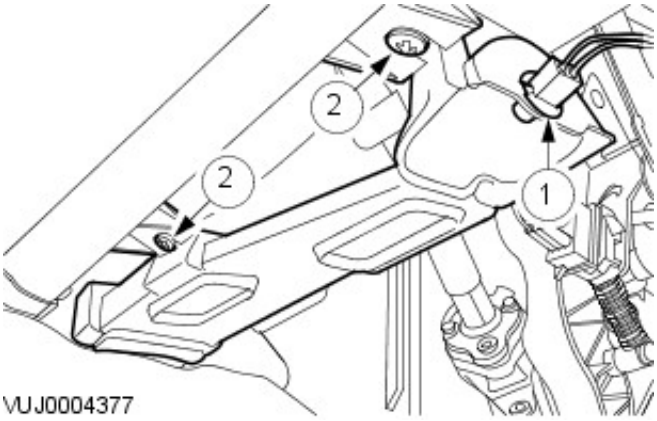
Installation

1. To install, reverse the removal procedure.

Control Components - Temperature Blend Door Actuator

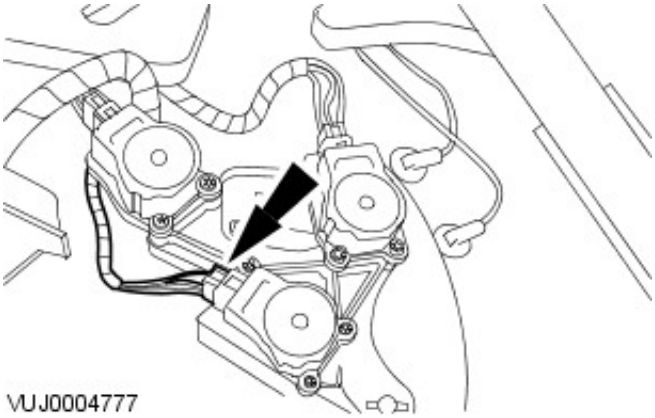
Removal and Installation

Removal

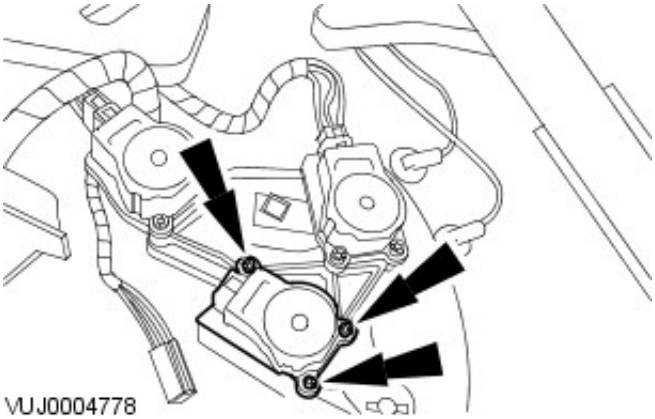


1. Remove the lower vent.

1. Detach the bulb holder.
2. Remove the lower vent.



2. Disconnect the temperature blend door actuator electrical connector.



3. Remove the temperature blend door actuator.

- Remove the retaining screws.

Installation

1. To install, reverse the removal procedure.

Instrument Cluster and Panel Illumination - Instrument Cluster and Panel Illumination

Diagnosis and Testing

The complexity of the electronics involved with the instrument cluster preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the Jaguar Approved Diagnostic System for detailed instructions on testing the instrument cluster.

The Jaguar Approved Diagnostic System tests and analyses, in detail, all functions of the instrument cluster.

Where a fault involving the instrument cluster is indicated by the Jaguar Approved Diagnostic System, some basic diagnostic methods may be necessary to confirm that connections are good and that the wiring is not damaged, before installing new components.

1. **1.** Verify the customer concern by operating the system.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

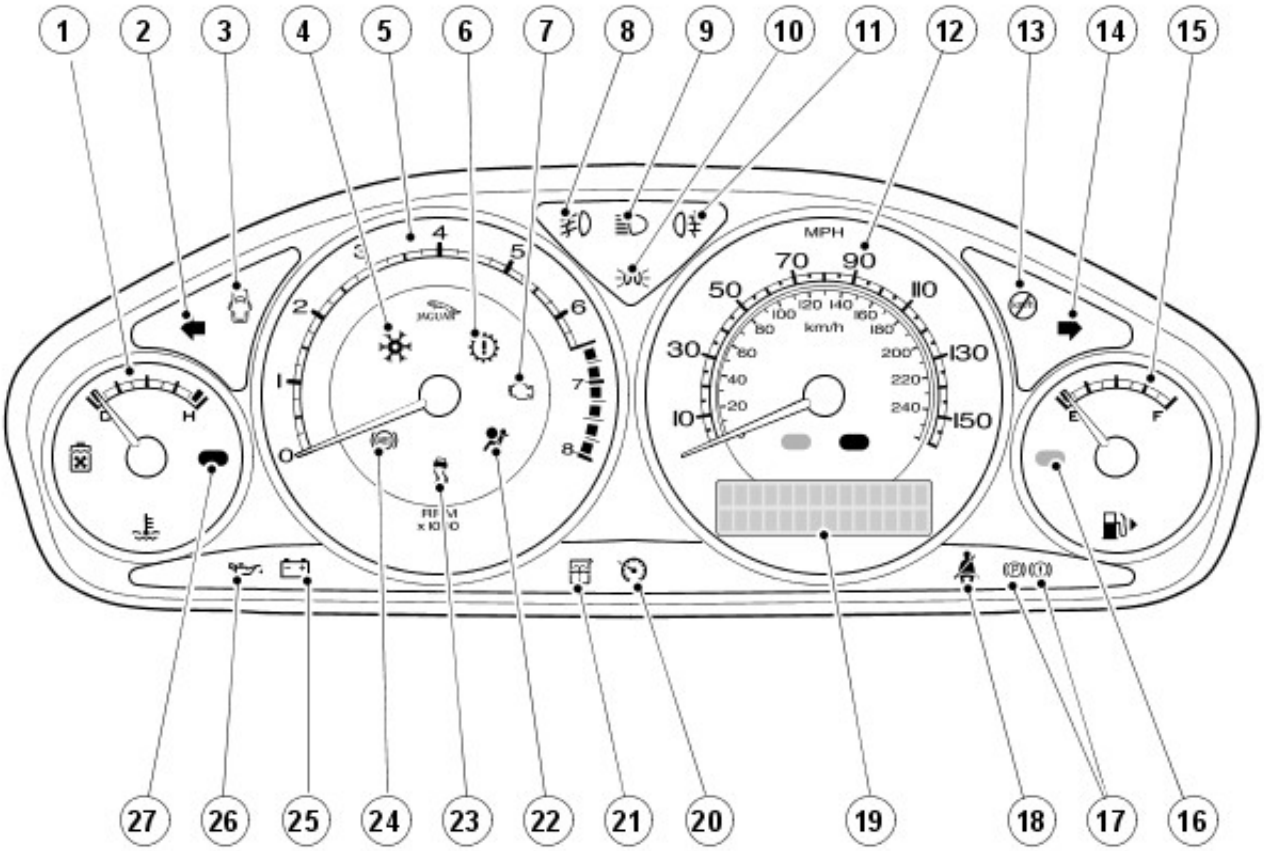
Mechanical	Electrical
• Fluid level(s) • Accessory installations	• Bulb(s)/LED(s) • Fuse(s) • Damaged or corroded wiring harness • Electrical connector(s) • Engine/engine compartment or underbody components • Instrument cluster

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the sympton and refer to the Jaguar Approved Diagnostic System.

Instrument Cluster - Instrument Cluster

Description and Operation

Vehicles With 2.0L, 2.5L And 3.0L Engines

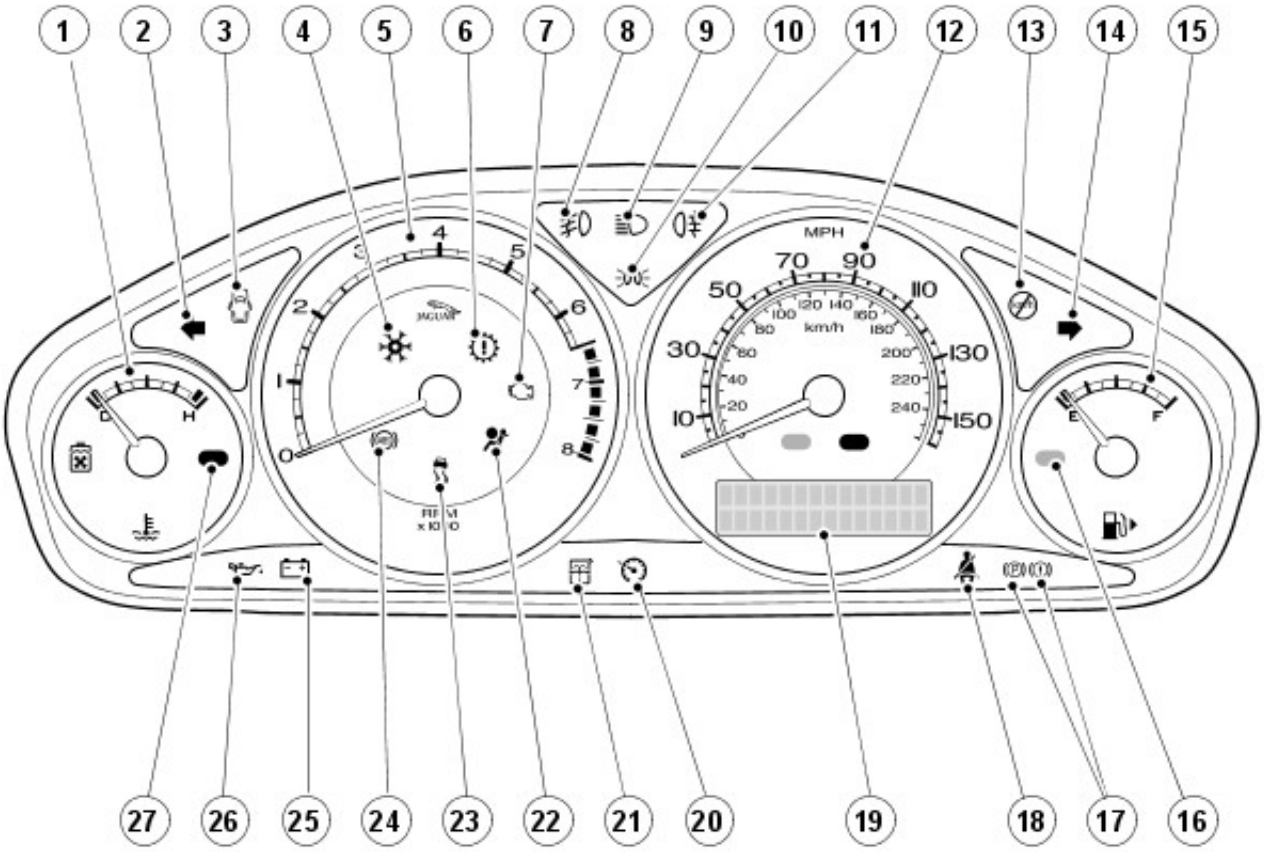


E45859

Item	Part Number	Description
1	—	Engine temperature gauge
2	—	Left hand direction indicator
3	—	Door ajar warning
4	—	Low exterior temperature warning
5	—	Tachometer
6	—	Powertrain malfunction
7	—	Engine malfunction
8	—	Front fog lamps
9	—	Main beam
10	—	Side (Parking) lamps
11	—	Rear fog lamps
12	—	Speedometer
13	—	Overspeed warning (Gulf coast countries only)
14	—	Right hand direction indicator
15	—	Fuel level gauge
16	—	Low fuel remainder lamp
17	—	Parking/Low brake fluid indicator/EBD system failure
18	—	Safety belt indicator
19	—	Trip odometer
20	—	Cruise (speed) control activated
21	—	Low washer fluid level
22	—	Airbag warning indicator
23	—	Traction control/Dynamic Stability Control (DSC) indicator
24	—	Anti-lock Brake System (ABS) warning indicator
25	—	Charge warning indicator
26	—	Oil pressure warning indicator

27	—	High engine temperature warning

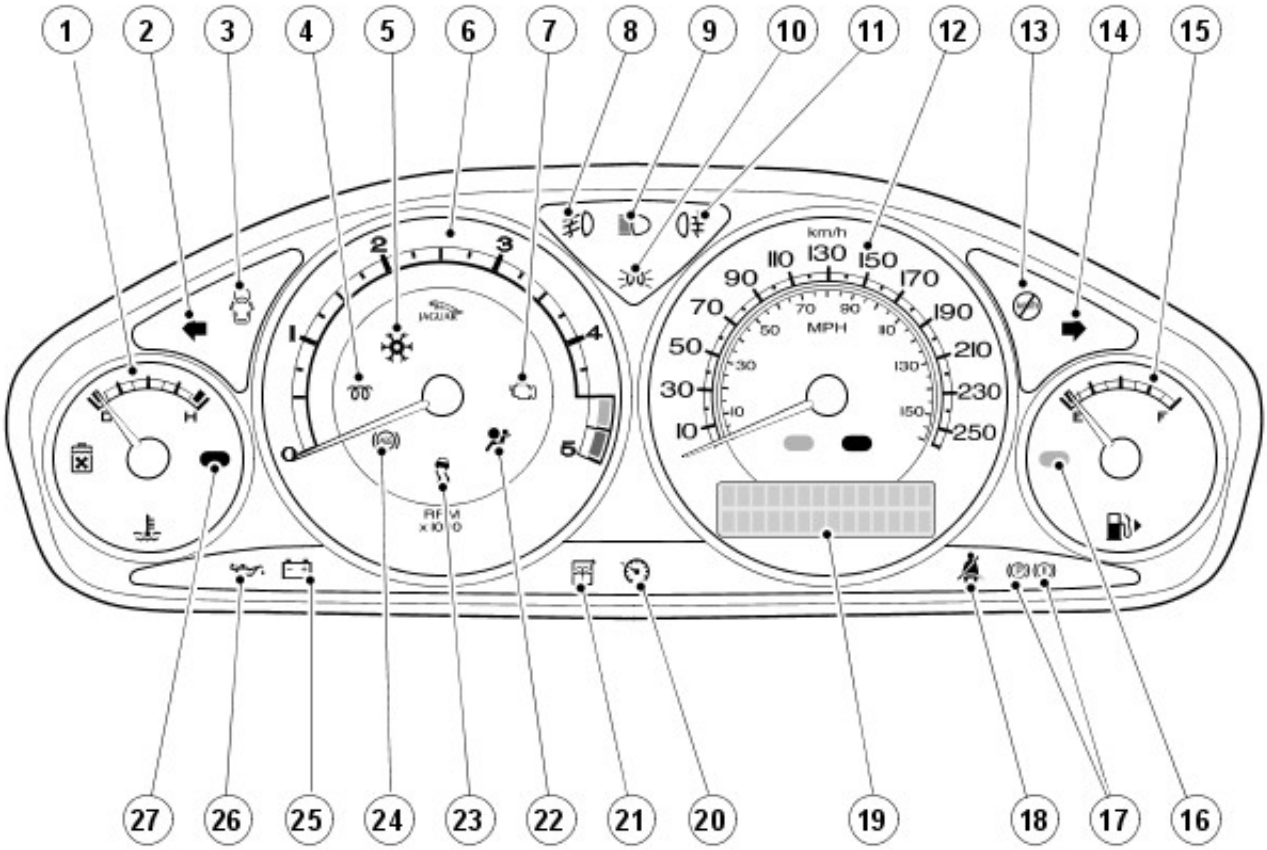
Vehicles With 2.0L, 2.5L And 3.0L Engines



E45859

Item	Part Number	Description
1	—	Engine temperature gauge
2	—	Left hand direction indicator
3	—	Door ajar warning
4	—	Low exterior temperature warning
5	—	Tachometer
6	—	Powertrain malfunction
7	—	Engine malfunction
8	—	Front fog lamps
9	—	Main beam
10	—	Side (Parking) lamps
11	—	Rear fog lamps
12	—	Speedometer
13	—	Overspeed warning (Gulf coast countries only)
14	—	Right hand direction indicator
15	—	Fuel level gauge
16	—	Low fuel remainder lamp
17	—	Parking/Low brake fluid indicator/EBD system failure
18	—	Safety belt indicator
19	—	Trip odometer
20	—	Cruise (speed) control activated
21	—	Low washer fluid level
22	—	Airbag warning indicator
23	—	Traction control/Dynamic Stability Control (DSC) indicator
24	—	Anti-lock Brake System (ABS) warning indicator
25	—	Charge warning indicator
26	—	Oil pressure warning indicator
27	—	High engine temperature warning

Vehicles With 2.0L Diesel Engine



E45858

Item	Part Number	Description
1	—	Engine temperature gauge
2	—	Left hand direction indicator
3	—	Door ajar warning
4	—	Glow plug warning lamp
5	—	Low exterior temperature warning
6	—	Tachometer
7	—	Engine malfunction
8	—	Front fog lamps
9	—	Main beam
10	—	Side (Parking) lamps
11	—	Rear fog lamps
12	—	Speedometer
13	—	Overspeed warning (Gulf coast countries only)
14	—	Right hand direction indicator
15	—	Fuel level gauge
16	—	Low fuel remainder lamp
17	—	Parking/Low brake fluid indicator/EBD system failure
18	—	Safety belt indicator
19	—	Trip odometer
20	—	Cruise (speed) control activated
21	—	Low washer fluid level
22	—	Airbag warning indicator
23	—	Traction control/Dynamic Stability Control (DSC) indicator
24	—	Anti-lock Brake System (ABS) warning indicator
25	—	Charge warning indicator
26	—	Oil pressure warning indicator
27	—	High engine temperature warning

The instrument cluster provides the driver with information, indicators and warning indicators on the vehicle systems.

The gauges and warning indicators may use the outputs from common sensors to carry out their respective functions.

Instrument Cluster - Instrument Cluster
Diagnosis and Testing

Principle of Operation

For a detailed description of the instrument cluster, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Instrument Cluster (413-01 Instrument Cluster, Description and Operation).

Inspection and Verification

The complexity of the electronics involved with the instrument cluster, preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the approved Jaguar diagnostic system for detailed instructions on testing the instrument cluster circuits.

Where a fault involving the instrument cluster is indicated by the approved Jaguar diagnostic system, some basic diagnostic methods may be necessary to confirm that connections are good and that wiring is not damaged, before installing new component .

1. **1.** Verify the customer concern by operating the system.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
• Engine oil filter • Oil pump • Engine oil level • Oil pressure switch • Engine coolant level • Coolant thermostat • Fuel gauge • Door adjustment	• Fuse(s) • Bulb(s) • LED(s) • Wiring harness • Electrical connector(s) • Sensor(s) • Instrument cluster • Instrument cluster printed circuit

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

   • NOTE: If all of the following systems are not operating correctly this may indicate a concern with the GEM. If one or more of the following systems operate correctly this may indicate an instrument cluster concern.

   3.

4. **4.** Verify the following systems are working correctly by operating the system.
   - Charging
   - Turn signals
   - Headlamps
5. **5.** If the concern is not visually evident, refer to the approved Jaguar diagnostic system for detailed instructions on testing the instrument cluster.

DTC Index

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action

B1202	Fuel sender circuit failure	• Instrument cluster, fuel sender circuit open	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check the rear electronic module, fuel sender circuit for open circuit.
B1204	Fuel sender circuit short to ground	• Instrument cluster, fuel sender circuit short to ground	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check the rear electronic module, fuel sender circuit for short to ground.
B1205	EIC switch-1 assembly circuit failure	• Instrument cluster, auxiliary lighting switch pack - circuit fault	Refer to electrical circuit diagrams, notes and check instrument cluster, auxiliary lighting switch pack for circuit fault
B1213	Anti-theft number of programmed keys is below minimum	• Number of programmed keys below minimum (2 keys minimum)	Count number of stored keys using the manufacturer approved diagnostic system. Add keys as required.
B1317	Battery voltage high	• Instrument cluster, power supply voltage above high limit, generator voltage is regulated by the engine control module.	Refer to electrical circuit diagrams, notes, and check instrument cluster, power supply for voltage fault.
B1318	Battery voltage low	• Instrument cluster, power supply voltage below low limit, generator voltage is regulated by the engine control module.	Refer to electrical circuit diagrams, notes, and check instrument cluster, power supply for voltage fault.
B1342	ECU is faulted	• Instrument cluster - memory fault with ROM or EEPROM checksum	Suspect instrument cluster module, check and install a new instrument cluster as required, refer to the new module installation note at the top of the DTC index.
B1359	Ignition run/Acc circuit failure	• Instrument cluster - ignition power input voltage low (more than 15 seconds, starter crank timeout)	Refer to electrical circuit diagrams, notes and check instrument cluster, ignition power and ground for circuit faults.
B1600	PATS ignition key transponder signal not received	• (LED flash 13) instrument cluster - no PATS code received from key transponder (key fault)	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Check for transponder key fault
B1601	PATS received incorrect key-code from ignition key transponder	• (LED flash 15) Instrument cluster - a non programmed transponder key is in the ignition switch	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams and notes, check transponder key is programmed to the vehicle
B1602	PATS received invalid format of key-code from ignition key	• (LED flash 14) instrument cluster - PATS code received from transceiver	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check instrument cluster communication to PATS transceiver module circuit for faults.

	transponder	module is incomplete	
B1681	PATS transceiver module signal is not received	• (LED flash 11) instrument cluster - no communication with the PATS transceiver module	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check PATS transceiver module for fault
B2103	Antenna not connected	• (LED flash 12) PATS transceiver circuit fault	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Check other modules for related DTCs. Refer to electrical circuit diagrams, notes and check instrument cluster circuit to PATS transceiver for fault.
B2141	NVM configuration failure	• (LED flash 22) instrument cluster, vehicle ID is not stored in cluster	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Enter vehicle ID into the instrument cluster (Enable PCM ID transfer) using the manufacturer approved diagnostic system.
B2143	NVM memory failure	• Instrument cluster - internal EEPROM failure	Carry out any pinpoint test associate with this DTC using the manufacturer approved diagnostic system. Suspect instrument cluster internal failure. Clear DTC carry out battery reset, if DTC returns suspect instrument cluster internal failure, check and replace as required. Refer to the new module installation note at the top of the DTC index
B2431	Transponder programming failed	• instrument cluster, transponder keyfob PATS code transmit fault	Suspect transponder keyfob PATS code transmit fault. Check and replace key fob as required.
B2477	Module configuration failure	• Instrument cluster, vehicle configuration not programmed or configuration write failure	Enter vehicle configuration into instrument cluster using the manufacturer approved diagnostic system
B2627	Fuel sender circuit open #2	• Fuel tank level sender circuit to rear electronic module - circuit open	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check the rear electronic module, fuel sender circuit for open circuit.
B2628	Fuel sender circuit short to ground #2	• Fuel tank level sender circuit to rear electronic module - circuit short to ground	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check the rear electronic module, fuel sender circuit for short to ground.
B2879	Fuel tank jet pump fault	• Fuel pump module, fuel tank jet pump fault • Fuel level (check both sides of the saddle tank)	Refer to electrical circuit diagrams, notes and check fuel level senders and fuel tank jet pump circuits for faults
C1778	Power steering failure	• Instrument cluster, incorrect reply from variable assist steering actuator output transistor or NVM checksum error	Suspect instrument cluster electronic failure. Check and install a new instrument cluster as required, refer to the new module installation note at the top of the DTC index
C1922	VAPS solenoid actuator	• Instrument cluster, variable	Refer to electrical circuit diagrams, notes and check instrument cluster, variable assist steering actuator for open circuit

	output circuit open	assist steering actuator output - open circuit	
C1923	VAPS solenoid actuator output circuit short to battery	• Instrument cluster, variable assist steering actuator output - short to power	Refer to electrical circuit diagrams, notes and check instrument cluster, variable assist steering actuator for short to power
C1924	VAPS solenoid actuator output circuit short to ground	• Instrument cluster, variable assist steering actuator output - short to ground	Refer to electrical circuit diagrams, notes and check instrument cluster, variable assist steering actuator for short to ground
U1900	CAN communication bus fault - receive error	• Instrument cluster, missing messages on CAN bus	Refer to electrical circuit diagrams, notes and check instrument cluster CAN bus circuit for faults
U2510	CAN-invalid data for vehicle security	• (LED flash 23) instrument cluster, engine control module PATS identification wrong/mismatch with cluster	Enable engine control module PATS identification transfer to instrument cluster using the manufacturer approved diagnostic system
U2511	CAN-data mismatch	• (LED flash 23) Instrument cluster, engine control module PATS identification wrong/mismatch with cluster	Enable engine control module PATS identification transfer to instrument cluster using the manufacturer approved diagnostic system
U2196	Invalid engine RPM data	• Instrument cluster receive CAN bus message with default data for > 1 second	Check dynamic stability control module for stored DTCs
U2197	Invalid vehicle speed data	• Instrument cluster receive CAN bus message with default data for > 1 second	Check dynamic stability control module for stored DTCs
U2199	Invalid engine coolant temperature data	• Instrument cluster, missing messages on CAN bus	Check engine control module for stored DTCs
U2200	Invalid ODO count data	• Instrument cluster, missing messages on CAN bus	Check dynamic stability control module for stored DTCs

Instrument Cluster - Instrument Cluster

Removal and Installation

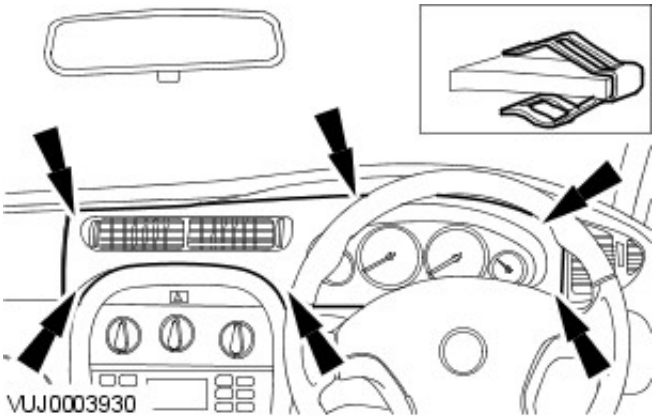
Removal

1. CAUTION: Do not leave the instrument cluster face down for any length of time.

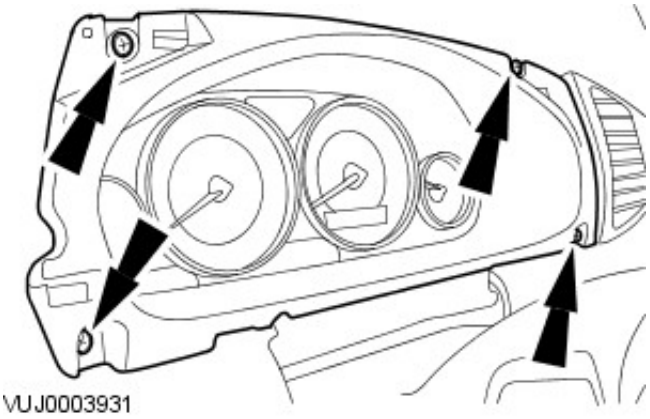
   Lower and extend the steering column to its maximum rearward position.

2. Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.

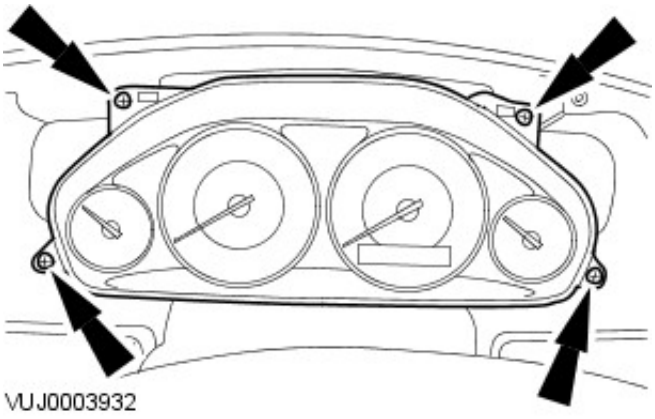
3. Remove the instrument cluster and vent finish panel.



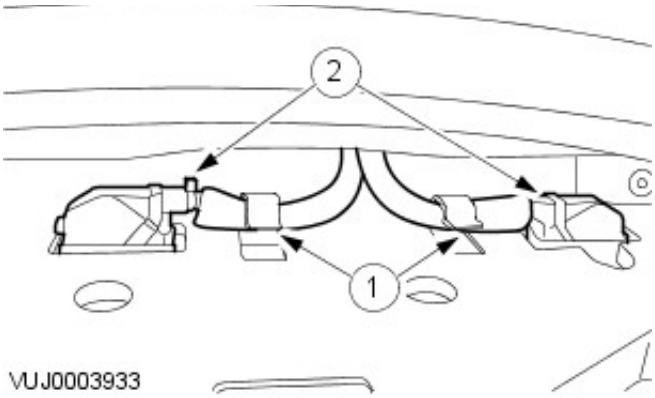
4. Remove the instrument cluster finish panel.



5. Detach the instrument cluster.



6. Remove the instrument cluster.
   1. Detach the wiring harnesses.
   2. Disconnect the electrical connectors.
   3. Remove the instrument cluster.



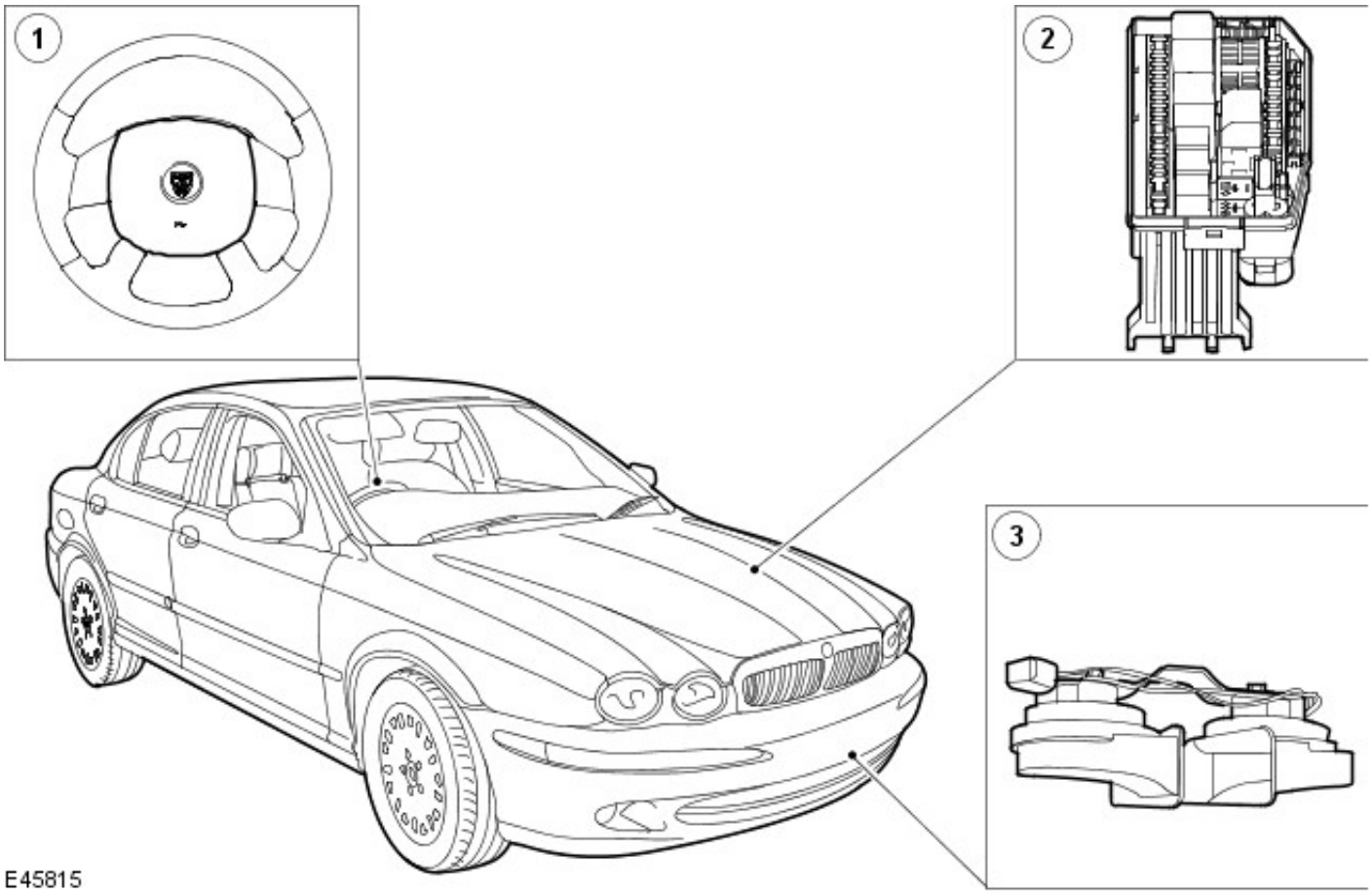
Installation

1. To install, reverse the removal procedure.

Horn - Horn

Description and Operation

Vehicles With 2.0L, 2.5L And 3.0L engines

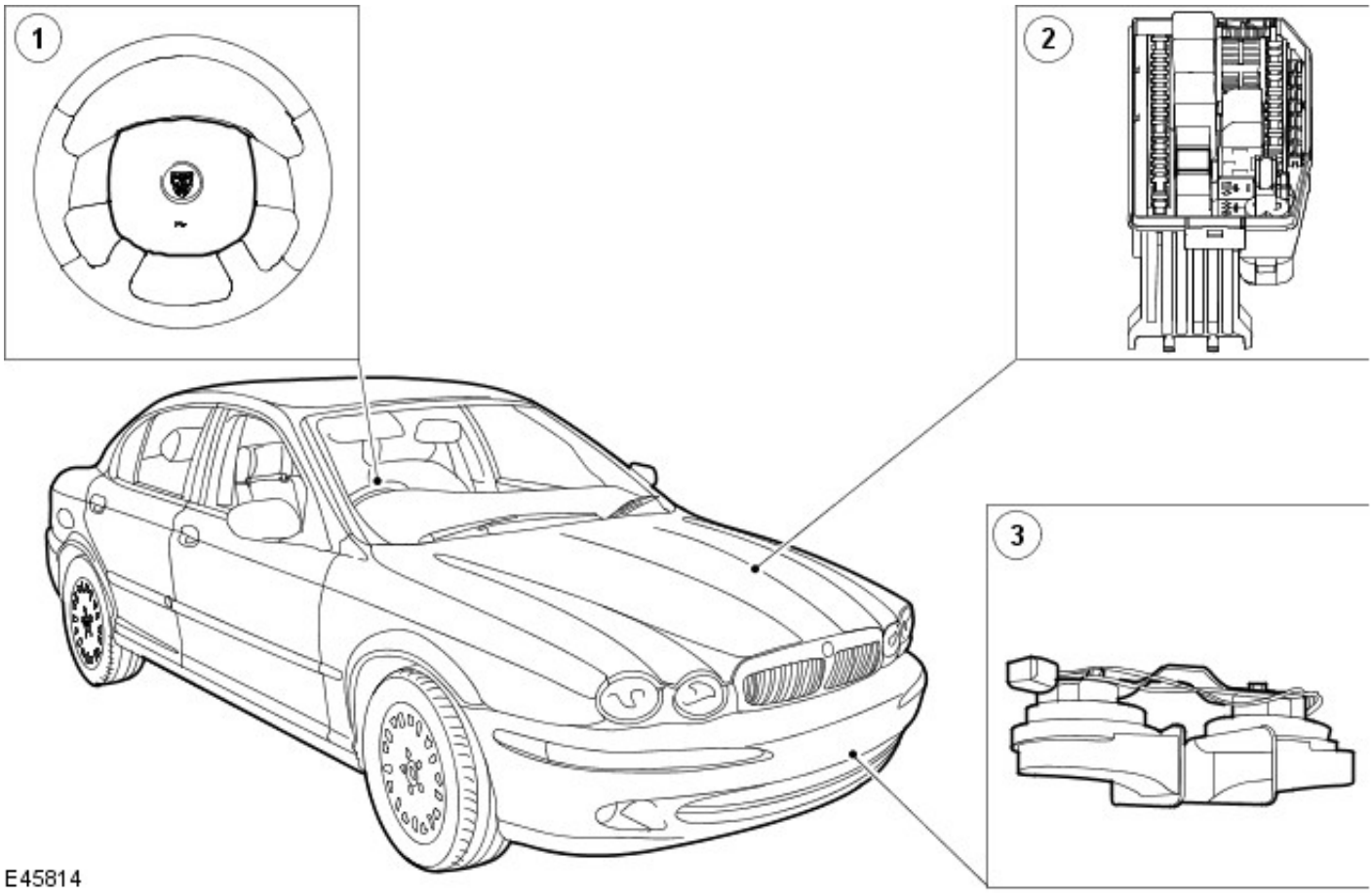


Item	Part Number	Description
1	—	Horn switch
2	—	Power distribution box
3	—	Horn

The horn system consists of the following:

- Power distribution box fuse 38 (20A)
- Power distribution box with integral relay
- Horn
- Air bag sliding contact
- Wiring harness
- Horn switch
- Generic electronic module

Vehicles with 2.0L Diesel Engine



Item	Part Number	Description
1	—	Horn switch
2	—	Horn relay
3	—	Horn

The horn system consists of the following:

- Power distribution box fuse 3 (20A)
- Power distribution box relay 2
- Horn
- Air bag sliding contact
- Wiring harness
- Horn switch
- Generic electronic module

The horn system is designed to sound the horn when the horn switch is operated. The horn relay is supplied voltage at all times through power distribution box. Operating the horn switch provides a ground circuit to the coil side of the horn relay. In turn, the switch side of the horn relay is closed, allowing voltage to be supplied to the horn.

Horn - Horn

Diagnosis and Testing

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Switch • Horn • Relay(s)	• Fuse(s) • Electrical connector(s) • Damaged or corroded Wiring harness

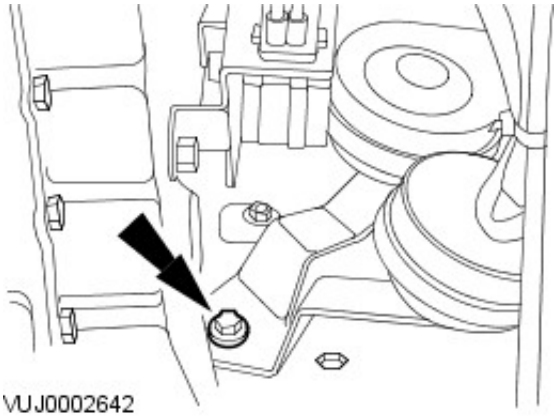
3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Horn - Horn

Removal and Installation

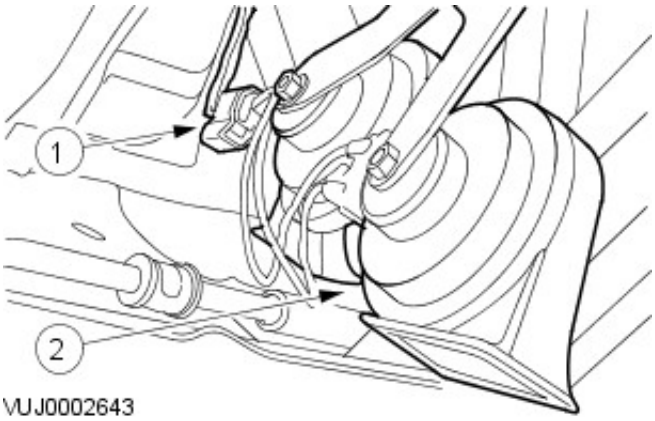
Removal

1. Raise and support the vehicle. For additional information, refer toSection 100-02 Jacking and Lifting.
2. Detach the horn.



VUJ0002642

3. Remove the horn.
    1. Disconnect the horn electrical connector.
    2. Remove the horn.



VUJ0002643

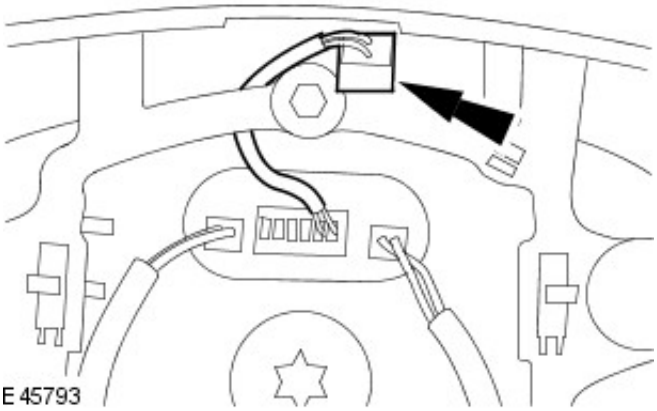
Installation

1. To install, reverse the removal procedure.

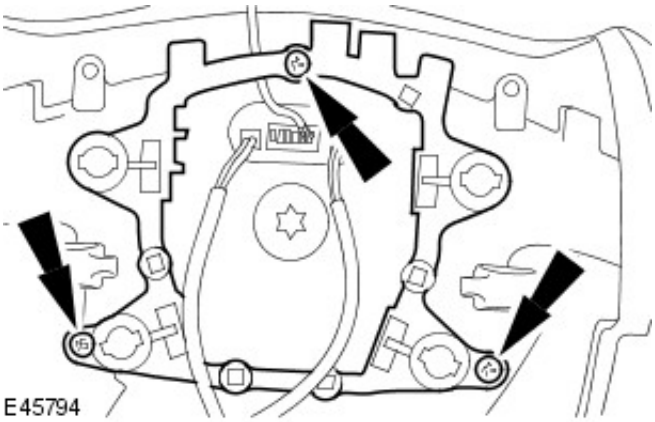
Horn - Horn Switch
Removal and Installation

Removal

1. Remove the driver air bag module.
   For additional information, refer to: Driver Air Bag Module (501-20B Supplemental Restraint System, Removal and Installation).
2. Disconnect the horn switch electrical connector.



3. Remove the horn switch.
   - Remove the horn switch retaining screws.

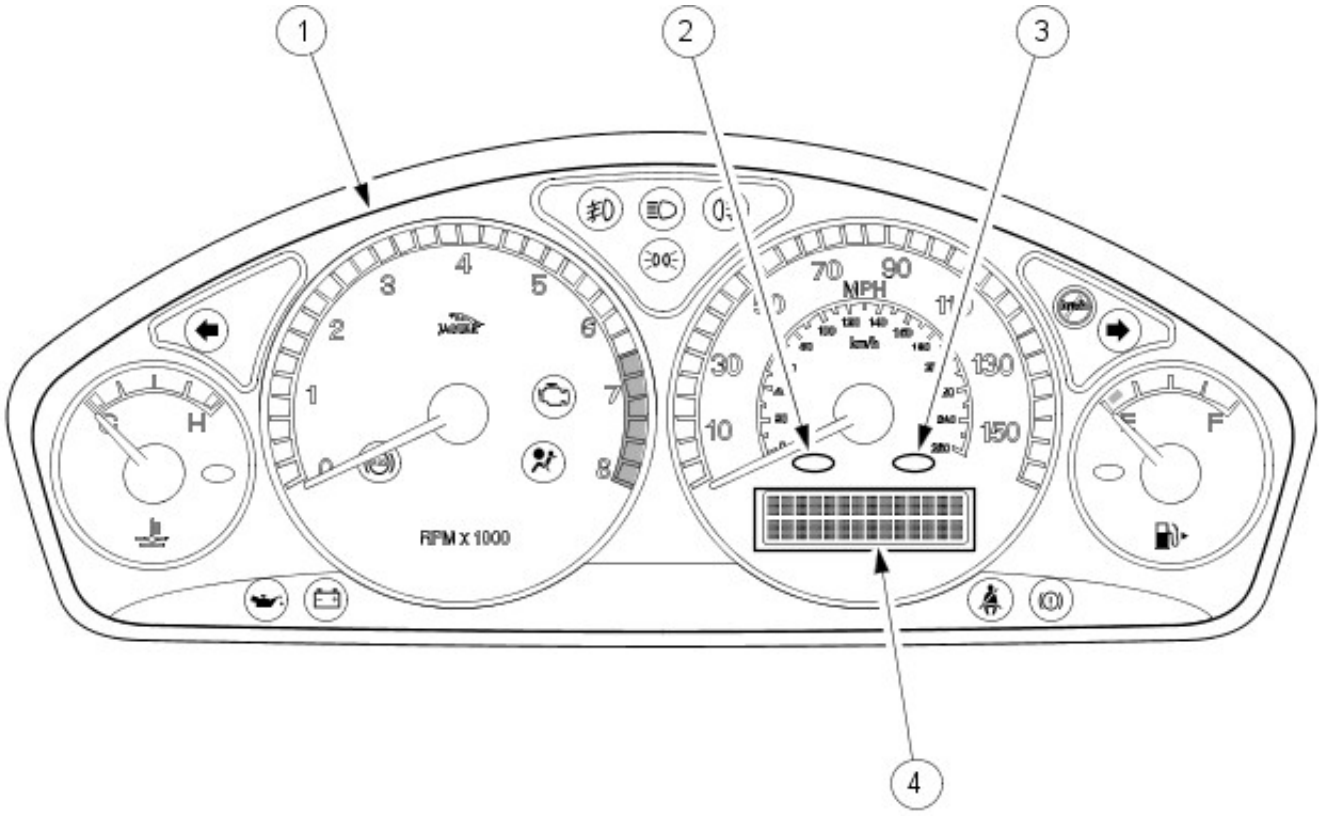


Installation

1. To install, reverse the removal procedure.

Information and Message Center - Information and Message Center

Description and Operation



VUJ0003855

Item	Part Number	Description
1	—	Instrument Cluster
2	—	Red Warning Lamp
3	—	Amber Warning Lamp
4	—	Driver's Information/Message Center

The driver's information/message center has a dot matrix LCD (liquid crystal display) and is located in the lower area of the speedometer.

The message center displays messages in text form for the driver, including odometer readings and trip computer data. It can also provide information normally covered by conventional warning lamps or typically indicate that a feature such as the cruise control is operating.

Located above the message center are two lamps, red for warning and amber for caution. When a message is displayed, the appropriate lamp will illuminate to attract the driver's attention and to signify the importance of the message.

On 2.2L Diesel vehicles from 2009MY using the AW F21 transmission, when 'Sport' mode is selected using the selector lever, 'S' is displayed and when in Jaguar Sequential Shift mode the selected gear (1, 2, 3, 4, 5, or 6) is displayed.

Trip Computer

The trip computer can be accessed by pressing the trip computer button located on the end of the LH (left-hand) steering column multifunction switch. Pressing the trip button displays trip data on the message center. Warning and information messages have priority over trip data. If a driver information message is displayed prior to activation of the trip computer, the trip data will appear for 10 seconds only, before being replaced by the original message.

Each successive press of the trip button causes the computer to continually cycle through the stored data which is then displayed on the message center.

The trip computer button is only enabled while the trip computer output is displayed. Refer to the Drivers Handbook for full operating instructions.

Service Interval Indicator - Vehicles with Diesel Particulate Filter (DPF)

The Service Interval Indicator informs the driver that the engine requires an engine oil change due to excessive build-

up of fuel within the engine oil. This is due to the Diesel Particulate Filter (DPF) regeneration process where additional fuel quantities are added to increase exhaust gas temperatures. As a result small quantities of unburnt fuel remain in the combustion chamber and bypass the piston rings into the engine oil.

The amount of excessive fuel is calculated by the ECM (engine control module). The ECM monitors the engine operating conditions and the values from the exhaust gas temperature sensor during the DPF regeneration process and calculates the amount of fuel in the oil. If the fuel content exceeds the permitted level, the ECM will illuminate the service interval indicator in the instrument cluster message center.

After the engine oil has been changed, a service indicator reset procedure must be carried out.
For additional information, refer to: Oil Change Indicator Reset (413-09 Warning Devices, General Procedures).

Information and Message Center - Information and Message Center

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
• Fuse(s) • Electrical connector(s) • Damaged or corroded wiring harness • Engine/engine compartment or underbody components • Instrument cluster

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Information and Message Center - Message Center

Removal and Installation

1. The information and message center is built integral to the speedometer. For additional information, refer to Section 413-01 Instrument Cluster.

Information and Message Center - Message Center Switch

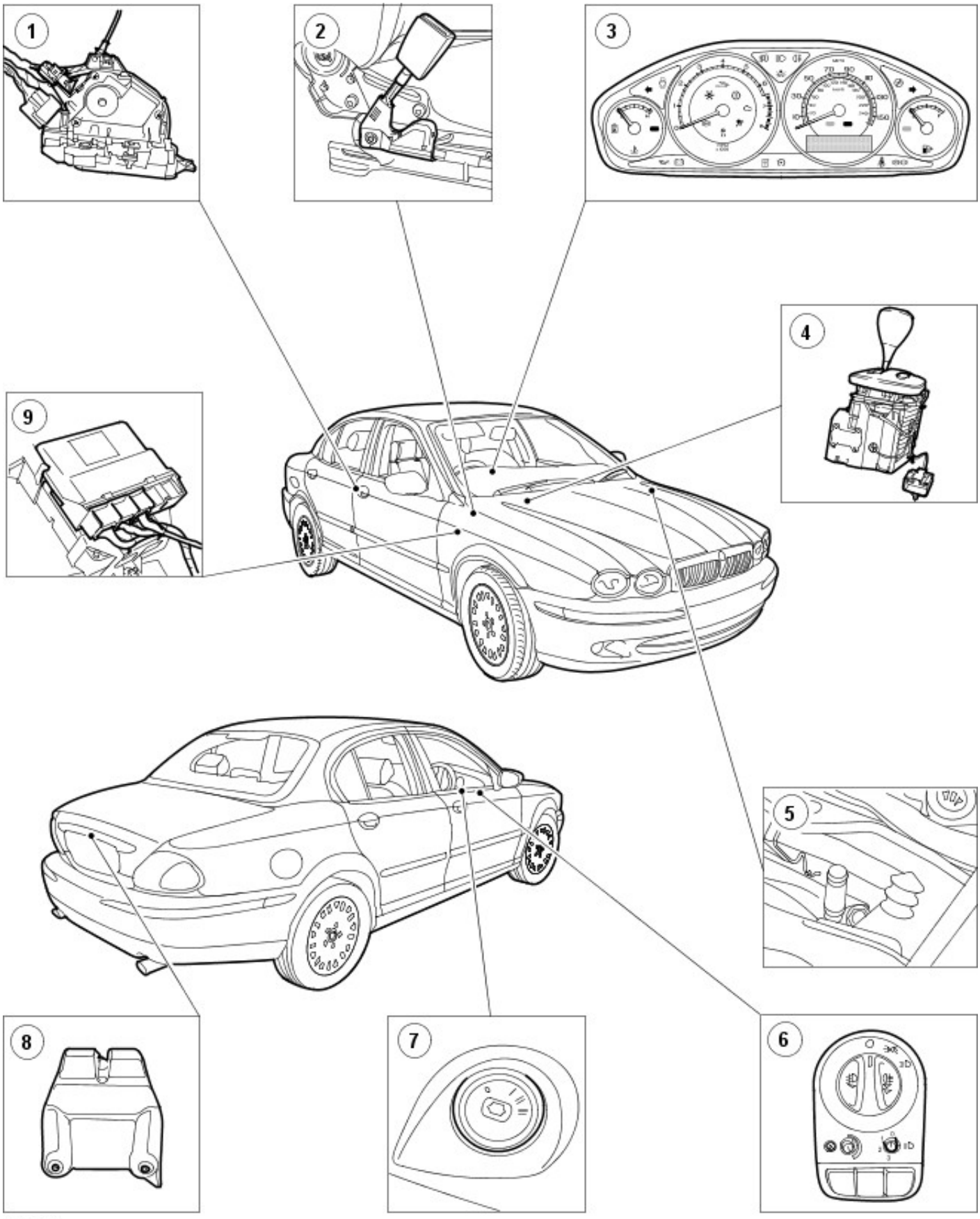
Removal and Installation

1. The trip computer switch is built integral to the headlamp switch. For additional information, refer to Section 417-01 Exterior Lighting.

Warning Devices - Warning Devices

Description and Operation

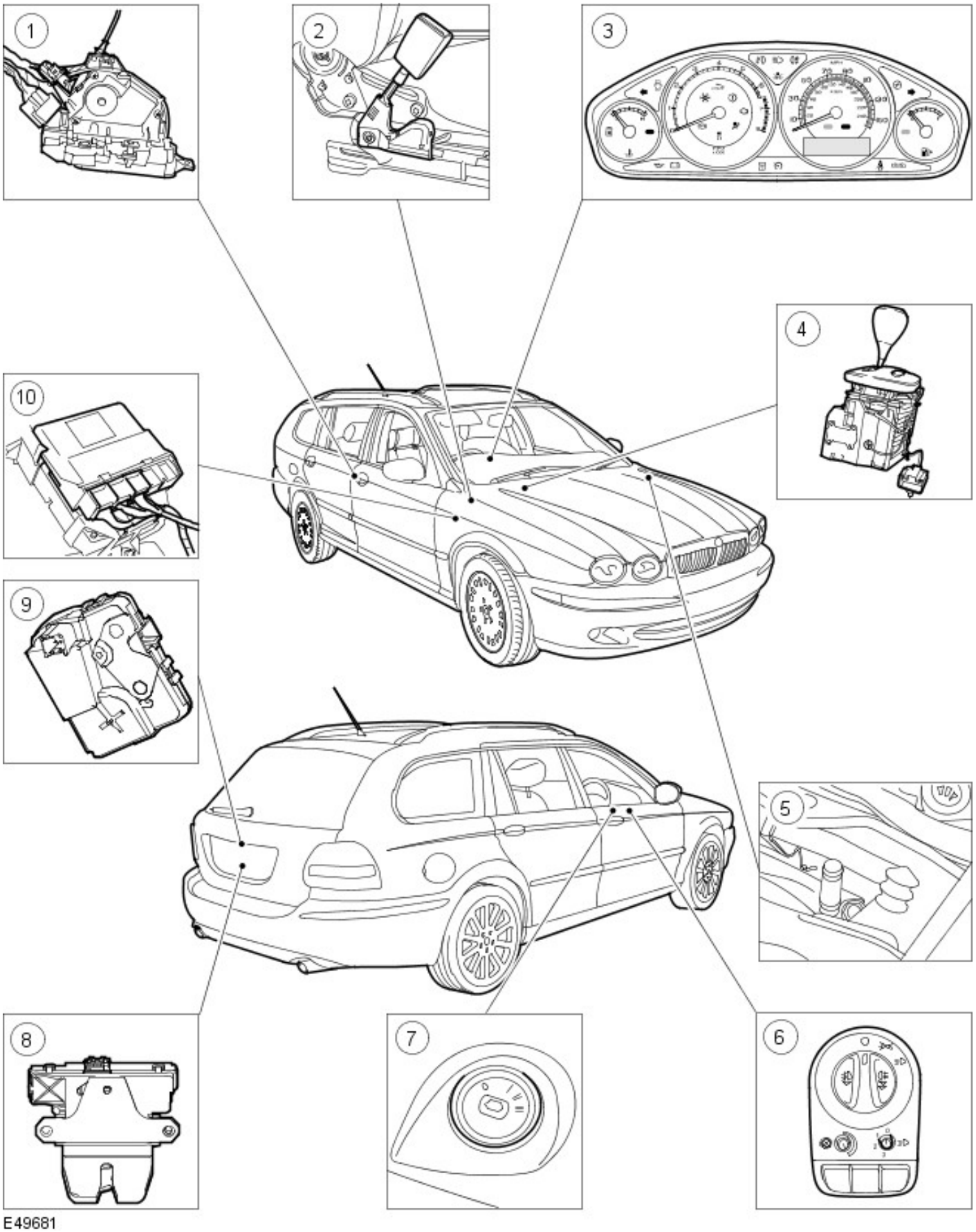
4-door



E48971

Item	Part Number	Description
1	—	Door actuator
2	—	Safety belt buckle
3	—	Instrument cluster
4	—	J Gate (Automatic only)
5	—	Engine compartment switch - visual warning only
6	—	Headlamp switch
7	—	Ignition switch
8	—	Luggage compartment switch - visual warning only
9	—	Generic electronic module (GEM)

Wagon



E49681

Item	Part Number	Description
1	—	Door actuator
2	—	Safety belt buckle
3	—	Instrument cluster

4	—	J Gate (Automatic only)
5	—	Engine compartment switch - visual warning only
6	—	Headlamp switch
7	—	Ignition switch
8	—	Liftgate switch - visual warning only
9	—	Liftgate window glass switch - visual warning only
10	—	Generic electronic module (GEM)

The driver warning chime provides the driver with an audible warning:

- when the key is in the ignition and the driver door is open (North American vehicles only).
- when the headlamps are on and the driver door is open with the ignition off.
- when the engine is running and the safety belt is not engaged (driver side only).

The driver will also be provided with a visual warning or visual message displayed in the information message center (if fitted). The system uses a number of inputs to provide the driver with audible and visual warnings.

Instrument Cluster

The instrument cluster acts as a system monitor for the visual warnings. It receives inputs from switches and sensors directly or through the multiplex link from another module and triggers the necessary visual warning

Ignition Switch Lock Cylinder (North America Only)

A warning chime will sound continuously when the driver door is open and the key is in the ignition, on removal of the key the warning will cease. The switch is an integral part of the ignition lock cylinder and therefore can only be installed with the lock cylinder.

Door Ajar Switches

The door ajar switches (within the latch) activate the system to provide a visual warning when the ignition is in the RUN position and any of the doors are open/ajar.

Luggage Compartment Switch - 4 Door Vehicles

The luggage compartment switch activates the system to provide a visual warning when the ignition is in the RUN position and the luggage compartment is open/ajar.

Liftgate Switch - Wagon

The liftgate switch (within the liftgate latch) activates the system to provide a visual warning when the ignition is in the RUN position and the liftgate is open/ajar.

Liftgate Opening Window - Wagon

The liftgate opening window switch (within the liftgate window glass latch) activates the system to provide a visual warning when the ignition is in the RUN position and the liftgate window glass is open/ajar.

Engine Compartment Switch

The engine compartment switch activates the system to provide a visual warning when the ignition is in the RUN position and the hood is open/ajar.

Headlamp Switch

A warning chime will sound continuously when the driver door is open/ajar and the vehicle lamps are on. This warning is provided only with the ignition off and will cease after 30 minutes, when the lamps are switched off or when the door is closed.

Safety Belt Switch (North America, Japan, Mexico and Dominican Republic Only)

A warning chime will sound continuously for approximately six seconds when the driver turns the ignition to the RUN position and the safety belt is not engaged. The warning chime will cease if the safety belt is engaged. The switch is an integral part of the driver safety belt buckle and therefore can only be installed with a safety belt buckle. A visual warning will also be provided on the instrument cluster.

Cooling Over Temperature

Engine temperatures above 120°C activate the system to provide a visual warning in the instrument cluster. The temperature warning light is illuminated constantly and a HIGH ENGINE TEMPERATURE is displayed in the message center (if fitted).

Air Bag Malfunction Chime

If a fault is detected with the air bag visual indication circuit five short warning chimes will be generated and repeated five times. This sequence is repeated every 30 minutes.

J Gate (Automatic vehicles only)

A warning chime will sound if the J Gate selector is not in PARK and the ignition is turned from RUN to ACC. The chime continues for 10 seconds or until the selector is placed in PARK.

Warning Devices - Warning Devices

Diagnosis and Testing

The complexity of the electronics involved with the instrument cluster and general electronic module (GEM), of which the message center is a part, and the multiplexed communication network which are connected to it preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the Jaguar Approved Diagnostic System for detailed instructions on testing the message center.

The Jaguar Approved Diagnostic System tests and analyses, in detail, all functions of the message center.

Where a fault involving the message center is indicated by the Jaguar Approved Diagnostic System, some basic diagnostic methods may be necessary to confirm that connections are good and that the wiring is not damaged, before installing new components.

1. **1.** Verify the customer concern by operating the system.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
Safety belt buckle and pretensioner	Fuse(s)
Headlamp switch	Wiring harness
Fuel gauge	Electrical connector(s)
	Switch(es)
	Sensor(s)

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Warning Devices - Oil Change Indicator Reset

General Procedures

1. NOTE: Steps 2 to 5 must be completed within 3 seconds for successful service mode resetting.

• NOTE: Ignition key in the **OFF** position.

Press and hold down the trip computer **RESET** button.

2. Continue to hold down the trip computer **RESET** button and turn the ignition switch to the **ON** position.

3. Release the trip computer **RESET** button.

4. Press and hold down the trip computer **TRIP** button located on the left-hand steering column multifunction switch.

5. Continue to hold down the trip computer **TRIP** button and press and hold down the trip computer **RESET** button.

6. Continue to hold down the trip computer **TRIP** and **RESET** buttons, **RESETTING SERVICE MODE** will display in the information and message center if steps 2 to 5 are completed successfully.

7. After 10 seconds the information and message center will then display **SERVICE MODE RESET** once the process is complete.

8. NOTE: If the information and message center does **NOT** display **SERVICE MODE RESET**, steps 1 to 8 must be repeated.

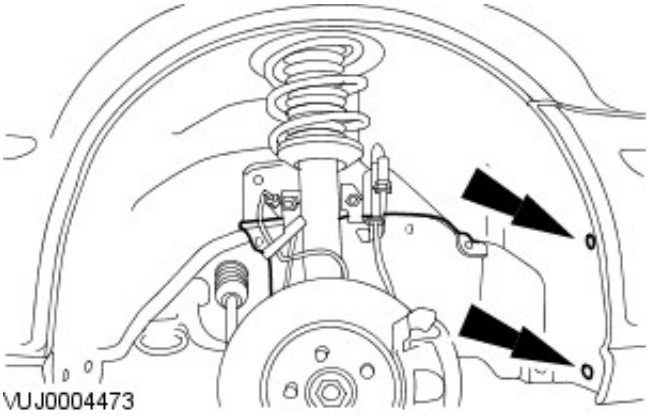
Release the trip computer **TRIP** and **RESET** buttons and turn the ignition switch to the **OFF** position.

Warning Devices - Low Washer Fluid Warning Indicator Switch

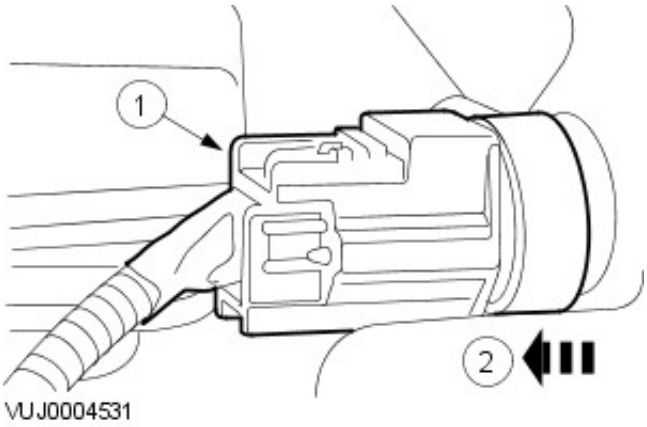
Removal and Installation

Removal

1. Remove the wheel and tire. For additional information, refer to Section 204-04 Wheels and Tires.
2. Detach the wheel arch liner.


VUJ0004473

3. Remove the reservoir fluid level switch.
    1. Disconnect the reservoir fluid level electrical connector.
    2. Remove the reservoir fluid level switch.



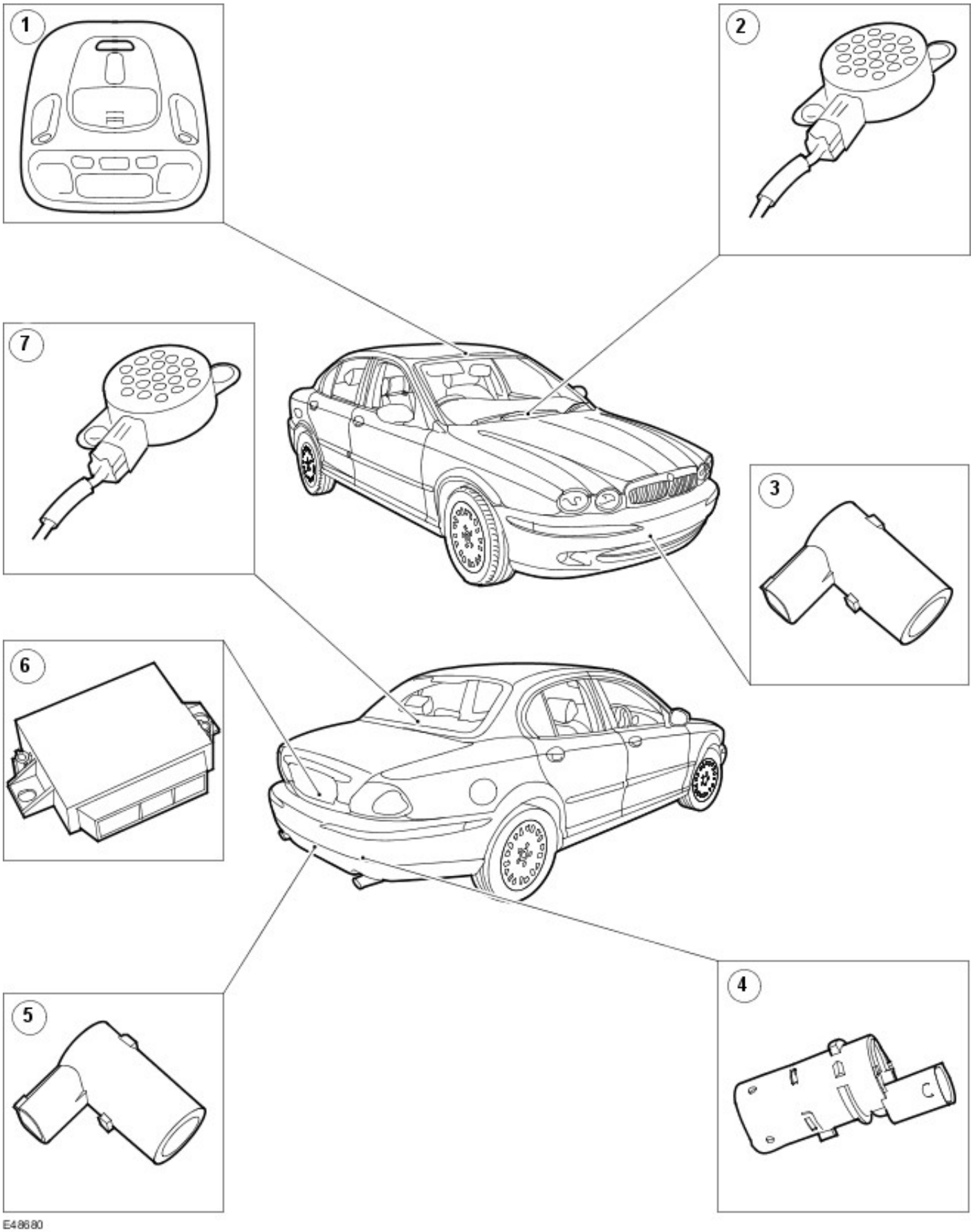
VUJ0004531

Installation

1. To install, reverse the removal procedure.

Parking Aid - Parking Aid

Description and Operation



E48680

Item	Part Number	Description
1	—	Parking aid switch

2	—	Front parking aid speaker
3	—	Front parking aid sensor
4	—	Rear outer parking aid sensor
5	—	Rear centre parking aid sensor
6	—	Parking aid module
7	—	Rear parking aid speaker

The function of the parking aid is to provide an audible warning to the driver of the distance to obstacles near the bumpers of the vehicle when parking. The system provides an assistance to the driver when parking in order to help avoid collision with obstacles.

The sensor range at the rear of the vehicle is 1.8 meters (5.9 ft). This extends the full width of the rear bumper and reduces to 0.6 meters (2 ft.), at the vehicle corners. The vertical range is adequate to protect the highest and lowest points of the vehicle. The system will detect curbs with heights of at least 18 cm (7.1 inches). Obstacles, such as curbs, that are low enough to pass under the vehicle until they make contact with the tires will not be detected.

The sensor range at the front of the vehicle is 0.8 meters (2.6 ft). This extends the full width of the front bumper and reduces to 0.6 meters (2 ft), at the vehicle corners. The vertical range is adequate to protect the highest and lowest points of the front of the vehicle. The system will detect curbs with heights of at least 18 cm (7.1 inches). Obstacles, such as curbs, that are low enough to pass under the vehicle until they make contact with the tires will not be detected.

The system activates a specific speaker at the front or the rear of the vehicle with a tone signifying the distance to the obstacle. The tone consists of a beep and defined space ratio which varies depending on the calculated distance. When the distance to the obstacle is less than 20 cm (7.8 inches) the speaker tone is continuous.

The parking aid system comprises of:

- a module mounted in the spare wheel well just rearward of the spare tire.
- four rear bumper mounted sensors of which the two inner sensors have a 90° angled electrical connector, and the two outer sensors have a straight electrical connector plug.
- four front bumper mounted sensors all with a 90° angled electrical connector.
- two audible speakers, the rear mounted on the rear parcel shelf on 4-door vehicles or behind the left hand loadspace trim on wagon, and the front mounted above the audio unit.
- a cancellation switch that is mounted into the roof console. This is fitted for the driver to disable the system when in slow moving traffic. This stops the front parking aid continuously monitoring the vehicle in front.

• NOTE: On vehicles from 2009MY, smaller parking aid sensors are fitted in the rear bumper. There is no change to system functionality.

The overhead console switch contains a Light Emitting Diode (LED) to inform the driver of the system status:

- LED **ON** - System Active
- LED **OFF** - System Inactive
- LED **FLASHING** - System Fault

The reverse parking aid is active when reverse gear is selected, unless towing (with a Jaguar approved towbar) when the system automatically switches off. If the parking aid system develops a fault the tone will sound continuously for three seconds when the ignition is switched on or when the reverse gear is selected, and the overhead console switch LED will flash.

The front parking aid remains inactive after the ignition is switched to the **ON** position until the overhead console switch is pressed or reverse gear is selected. The system will then remain active up to 15 kph (9.5 mph) in a forward gear, or until the overhead console switch is pressed. The front parking aid system becomes inactive if the overhead console switch is pressed while the system is active, or at all forward speeds above 15 kph (9.5 mph).

Parking Aid - Parking Aid
Diagnosis and Testing

Principle of Operation

For a detailed description of the parking aid, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Parking Aid (413-13 Parking Aid, Description and Operation).

Parking Aid

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Relay(s) • Speaker • Reverse lamp switch • Obstructions or damage to the sensors • Parking sensor face obstructed (e.g. snow, ice, dirt, flies etc)	• Electrical connector(s) • Damaged or corroded wiring harness • Sensor(s) • Parking aid module

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

DTC Index

DTC Index

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: If the control module/component is suspect and the vehicle remains under warranty, refer to the warranty policy and procedures manual (section B1.2) or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
C1699	Left Rear Outer Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1700	Left Rear Outer Sensor Circuit Failure or Blockage	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1701	Left Rear Outer Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1702	Right Rear Outer Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1704	Right Rear Outer Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1705	Left Rear	• Wiring harness	Refer to electrical circuit diagrams. Check if data line is short circuit

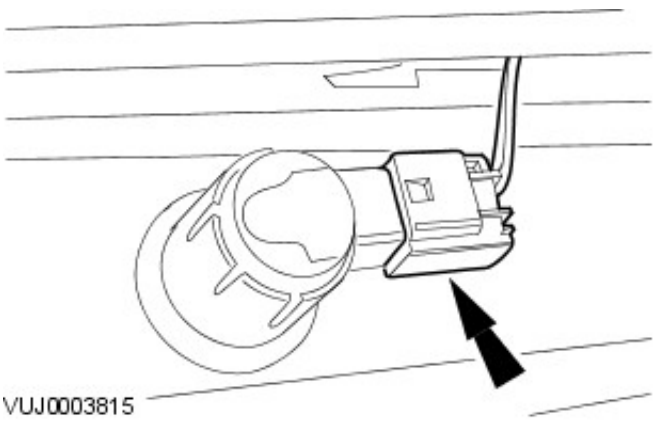
	Center Sensor Circuit Short to Vbat	concern	to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1706	Left Rear Center Sensor Circuit Failure	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1707	Left Rear Center Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1708	Right Rear Center Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1709	Right Rear Center Sensor Circuit Failure	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1710	Right Rear Center Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1711	Left Front Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1712	Left Front Sensor Circuit Failure	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1713	Left Front Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1714	Right Front Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1715	Right Front Sensor Circuit Failure	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1716	Right Front Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1717	Left Front Center Sensor Circuit Short to Vbat	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1718	Left Front Center Sensor Circuit Failure	• Wiring harness concern	Refer to electrical circuit diagrams. Check if data line is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1719	Left Front Center Sensor Circuit Fault	• Sensor fault	Check sensor for correct mounting and cleanliness, renew sensor as required. Clear DTC and retest system to confirm correct operation.
C1742	Rear Sounder Circuit Failure	• Wiring harness concern	This fault is detected when speaker is off, refer to electrical circuit diagrams. Check if rear sounder circuit is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1743	Rear	• Wiring harness	This fault is detected when the speaker is on, refer to electrical circuit

	Sounder Circuit Short to Vbatt	concern	diagrams. Check if rear sounder circuit is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1744	Front Sounder Circuit Failure	• Wiring harness concern	This fault is detected when speaker is off, refer to electrical circuit diagrams. Check if front sounder circuit is open circuit or short circuit to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1745	Front Sounder Circuit Short to Vbatt	• Wiring harness concern	This fault is detected when the speaker is on, refer to electrical circuit diagrams. Check if front sounder circuit is short circuit to power. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
C1920	Led #1 Circuit Failure	• LED circuit fault	Refer to electrical circuit diagrams. Check if LED circuit is short to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
B1299	Power Supply Sensor Circuit Short To Ground	• Parking aid module, parking distance sensor (rear) power circuit short to ground	Refer to electrical circuit diagrams, check parking aid module rear sensor power circuit for short to ground. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
B1342	ECU Is Faulted	• Parking aid module memory failure (RAM)	Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC index
B2207	ECU ROM Checksum Error	• Parking aid module - memory failure (ROM)	Suspect faulty module, check and install as required, refer to the new module installation note at the top of the DTC index
B2373	LED #1 Circuit Short to Battery	• Parking aid module, parking aid status (roof console LED) circuit - short to power or open circuit	Refer to electrical diagrams, check parking aid status LED circuit for short to power or open circuit. Repair wiring harness using approved methods and materials, clear DTC and retest system to confirm correct operation.
B2477	Module Configuration Failure	• Parking aid module - configuration failure (EEPROM error during power up)	Reconfigure. If this fails suspect faulty module, check and install as required. Refer to new module installation note at the top of the DTC index

Parking Aid - Front Parking Aid Sensor
Removal and Installation

Removal

1. Remove the front bumper cover.
   For additional information, refer to: Front Bumper Cover (501-19 Bumpers, Removal and Installation).
2. Disconnect the electrical connector.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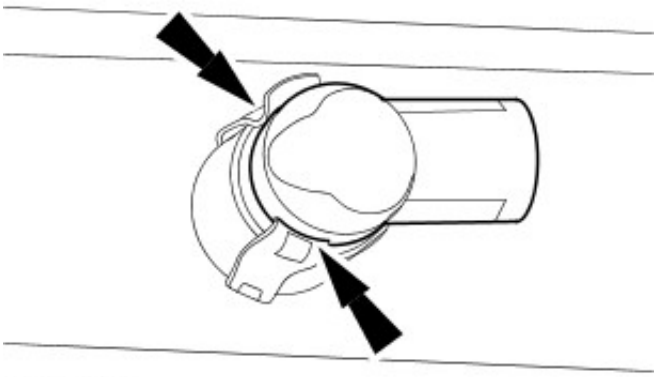

VUJ0003816

3. CAUTION: Make sure excessive pressure or tools are not used when removing the front parking aid sensor from the parking aid sensor housing.

   Remove the front parking aid sensor.

   - Detach the front parking aid sensor from the parking aid sensor housing.

Installation

1. To install, reverse the removal procedure.

Parking Aid - Front Parking Aid Speaker
Removal and Installation

Removal

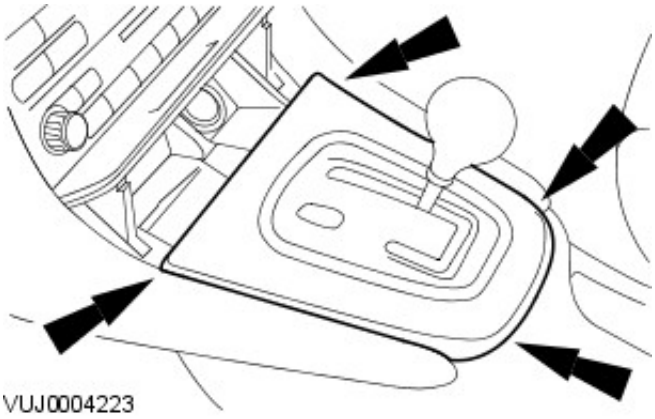
All vehicles

1. Disconnect the battery ground cable.
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

Vehicles with automatic transmission

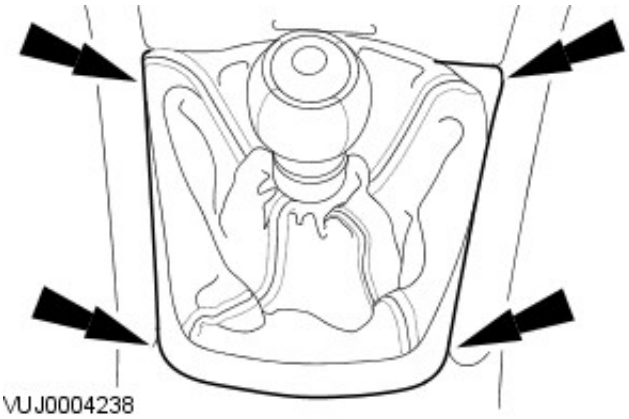
2. NOTE: To aid removal of the navigation module and audio unit place the transmission selector lever in the 'D' position.

   Remove the transmission selector lever surround.


VUJ0004223

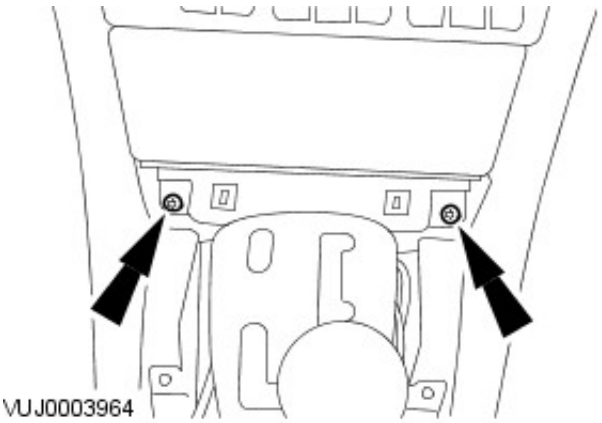
Vehicles with manual transmission

3. Detach the gearshift lever surround.


VUJ0004238

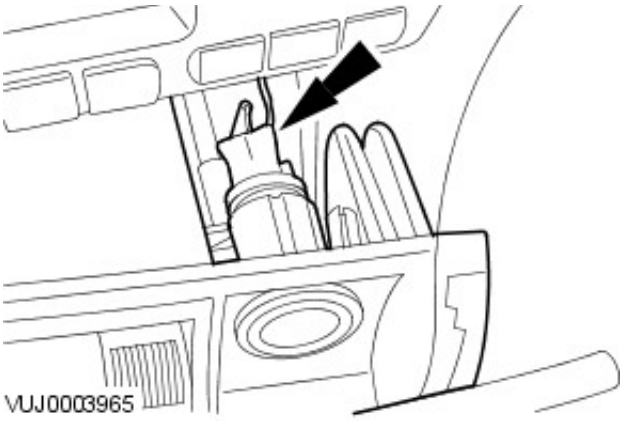
All vehicles

4. Remove the ashtray retaining screws.

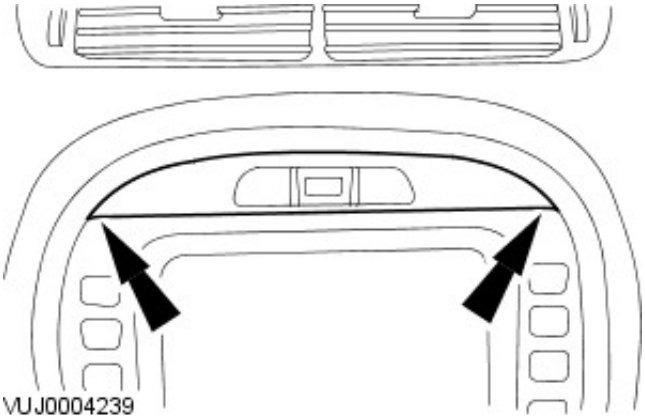

VUJ0003964

5. Remove the ashtray
   - Disconnect the electrical connectors.

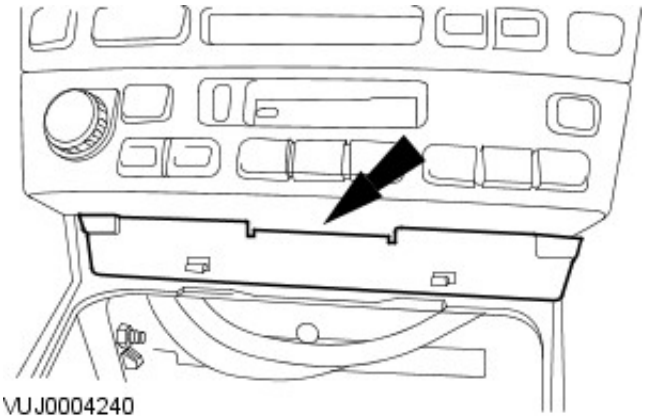
- Remove the ashtray.



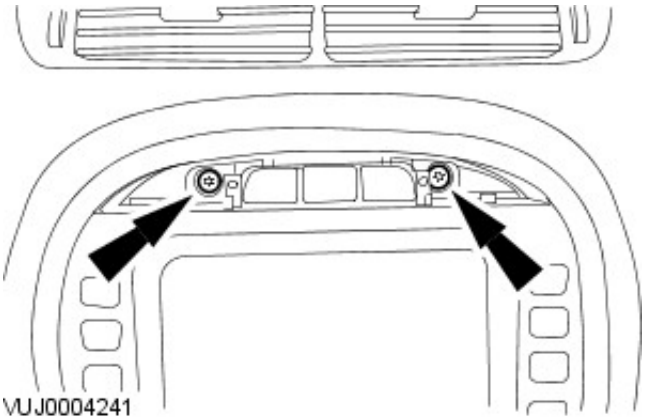
6. Remove the switch pack trim cover.



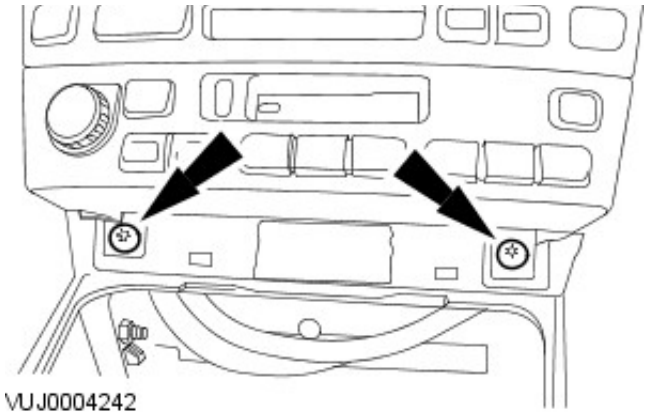
7. Remove the retaining screw cover plate.



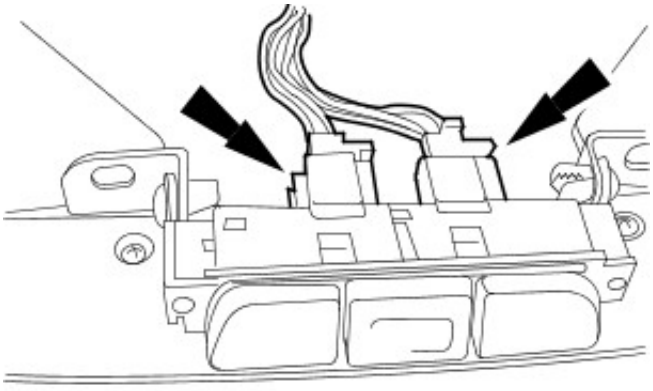
8. Remove the display mounting bracket upper retaining screws.



9. Remove the display mounting bracket lower retaining screws.

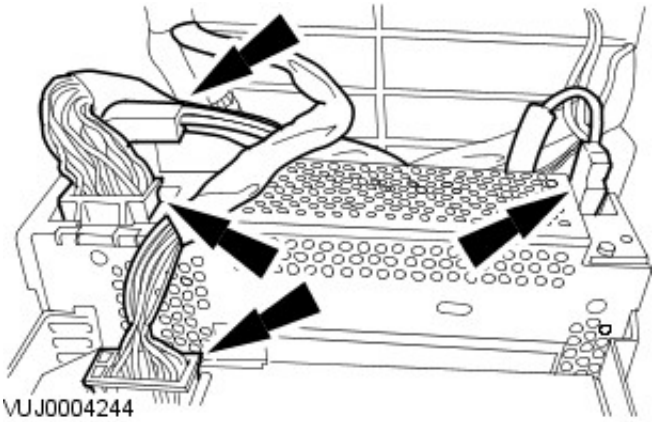

VUJ0004242

10. Disconnect the electrical connectors.

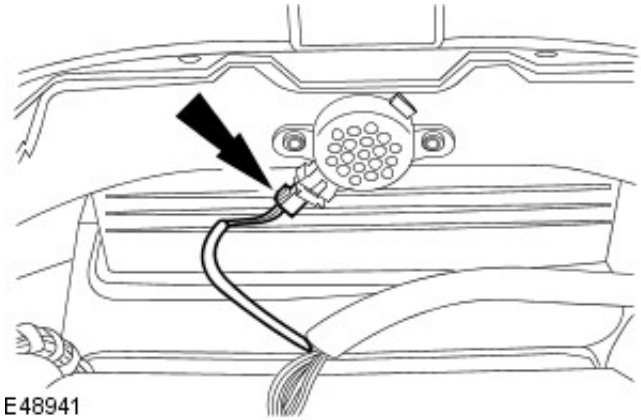

VUJ0004243

11. Remove the display module and audio unit.

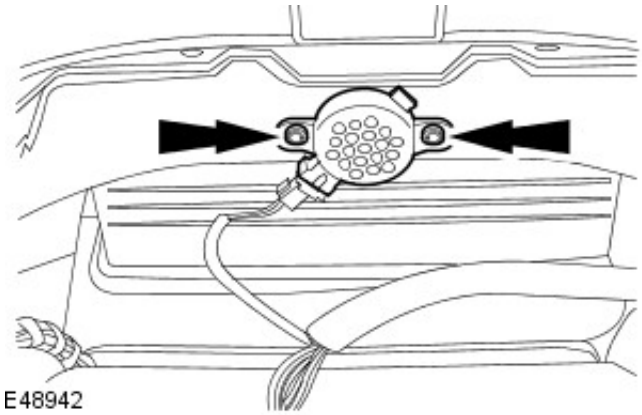
1. Disconnect the electrical connectors and the fibre optic connector.
2. Remove the display module and audio unit.


VUJ0004244

12. Disconnect the front parking aid speaker electrical connector.


E48941

13. Remove the front parking aid speaker.



Installation

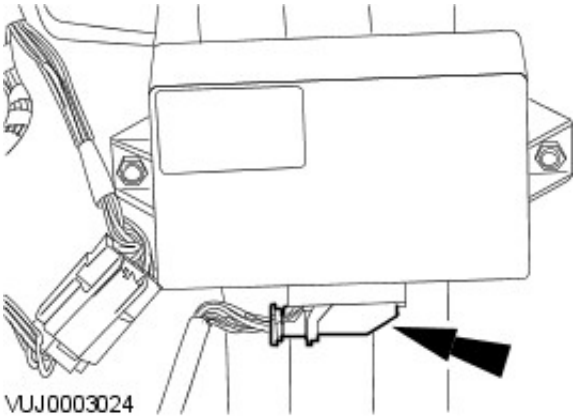
1. To install, reverse the removal procedure.
2. Connect the battery ground cable.
   For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

Parking Aid - Parking Aid Module4-Door

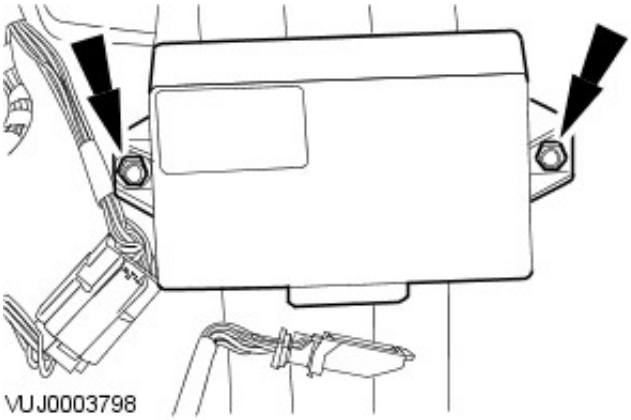
Removal and Installation

Removal

1. Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.
2. Remove the spare wheel.
3. Disconnect the electrical connector.



4. Remove the parking aid control module.



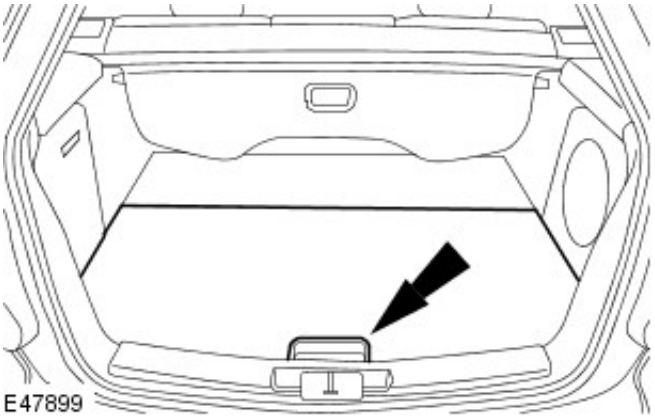
Installation

1. To install, reverse the removal procedure.

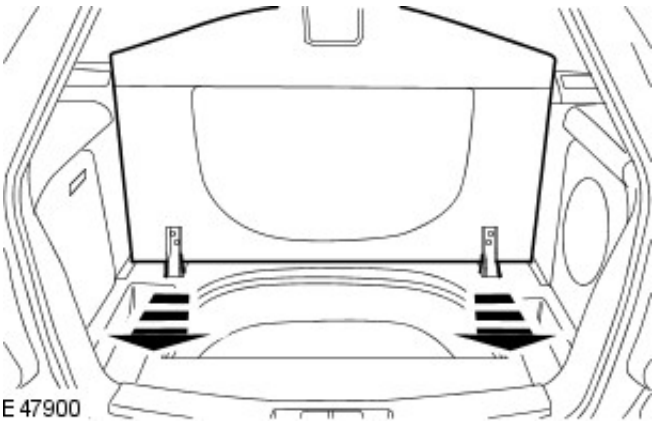
Parking Aid - Parking Aid ModuleWagon

Removal and Installation

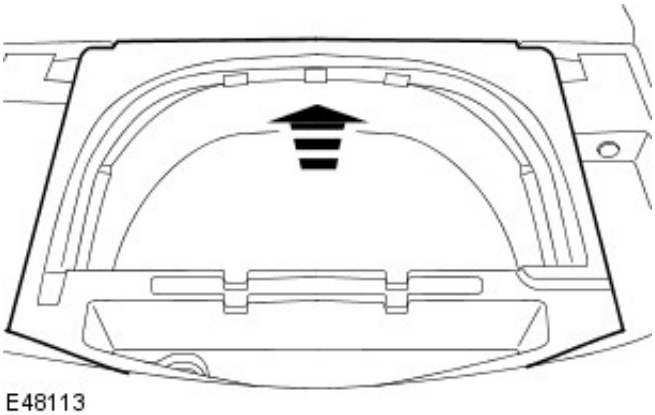
Removal



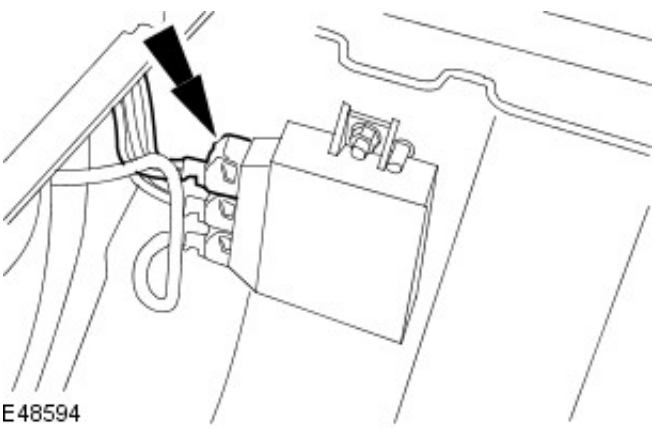
1. Raise the loadspace floor covering.



2. Remove the loadspace floor covering.

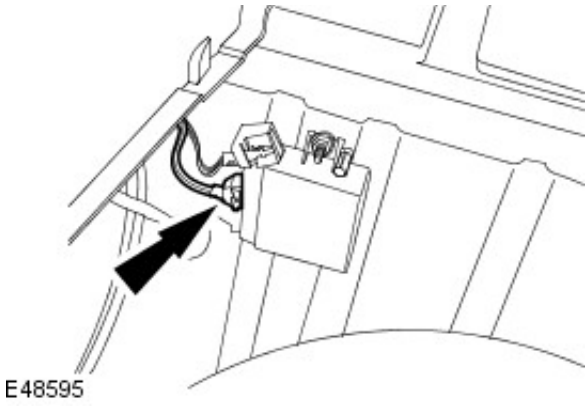


3. Remove the centre loadspace stowage compartment.

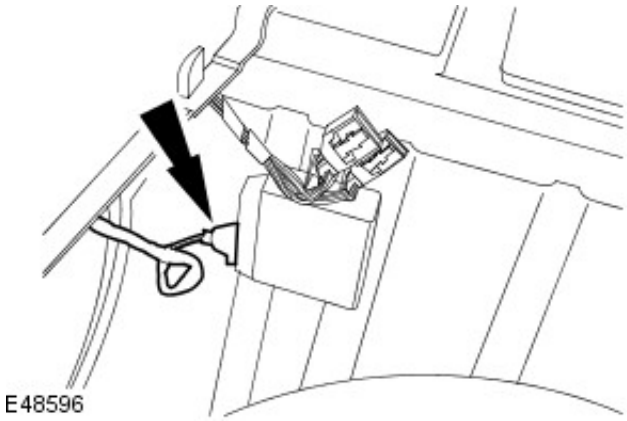


4. Disconnect the electrical connector.

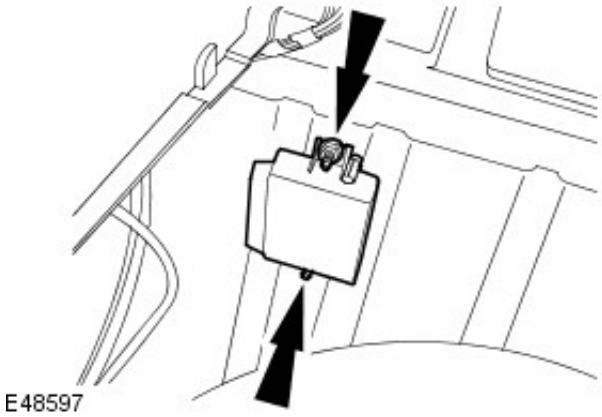
5. Disconnect the electrical connector.


E48595

6. Disconnect the electrical connector.


E48596

7. Remove the parking aid module.


E48597

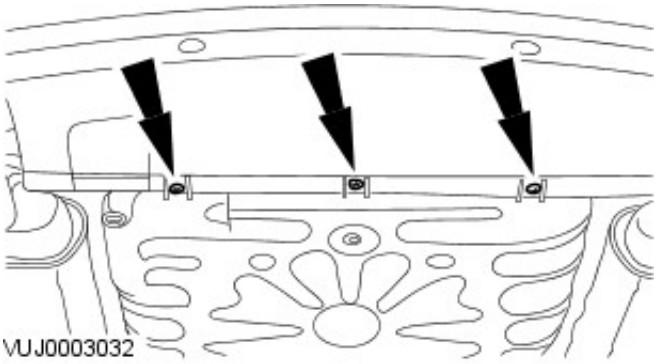
Installation

1. To install, reverse the removal procedure.

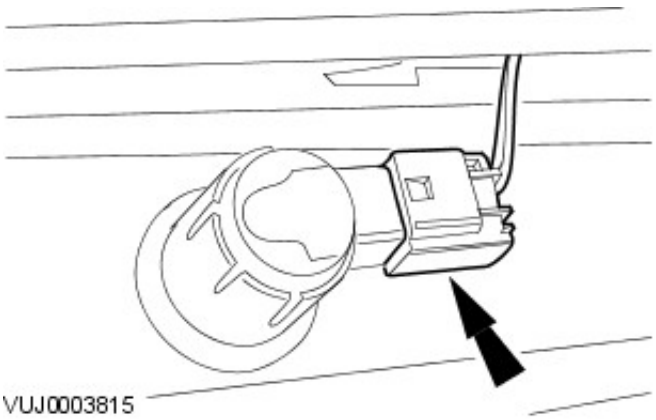
Parking Aid - Rear Parking Aid Sensor

Removal and Installation

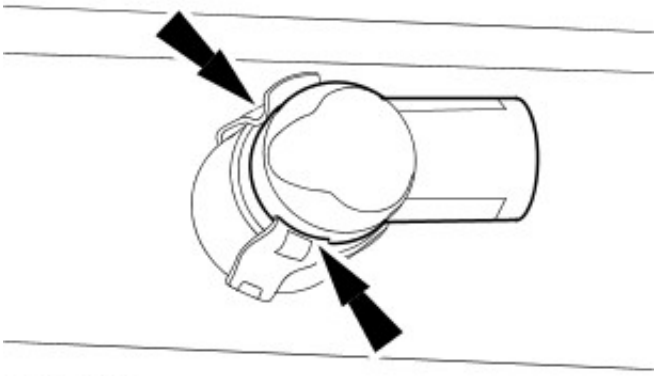
Removal



1. Detach the bumper lower black out panel.



2. Disconnect the electrical connector.



3. CAUTION: Make sure excessive pressure or tools are not used when removing the sensor from the sensor housing.

Remove the sensor.

- Unclip the sensor from the sensor housing.

Installation

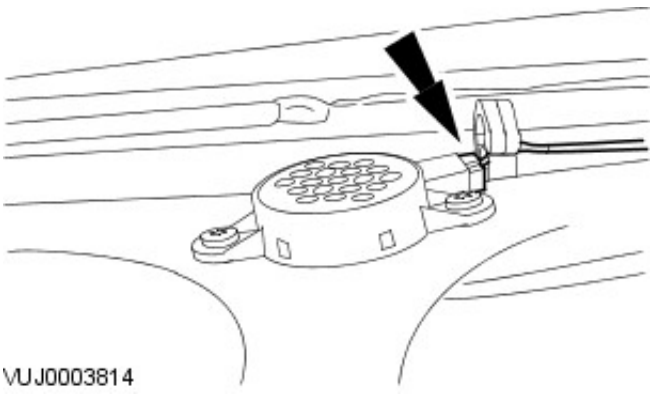
1. To install, reverse the removal procedure.

Parking Aid - Rear Parking Aid Speaker4-Door

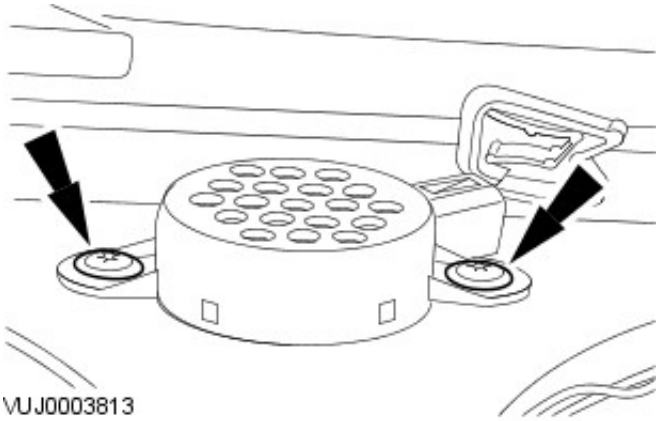
Removal and Installation

Removal

1. Remove the rear parcel shelf. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
2. Disconnect the electrical connector.



3. Remove the speaker.
   - Remove and discard the rivets.



Installation

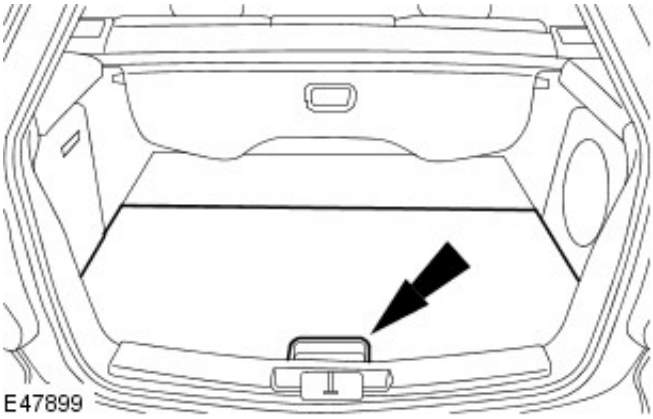
1. NOTE: Install new rivets.

To install, reverse the removal procedure.

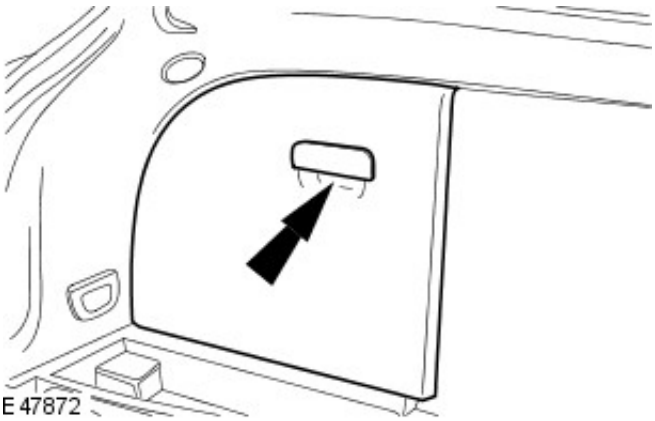
Parking Aid - Rear Parking Aid SpeakerWagon, VIN Range: D86655->E43419

Removal and Installation

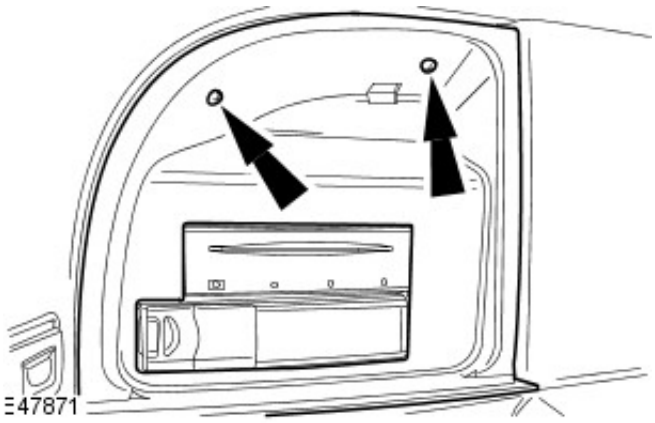
Removal



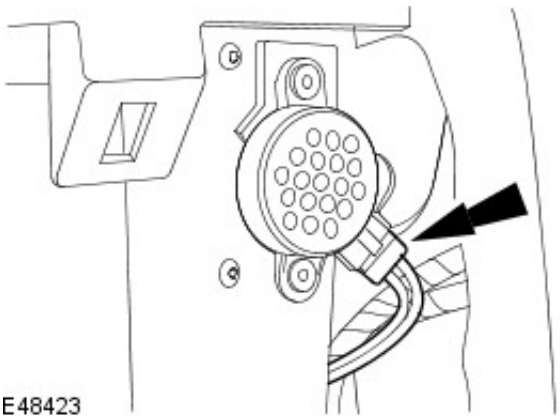
1. Raise the loadspace floor covering.



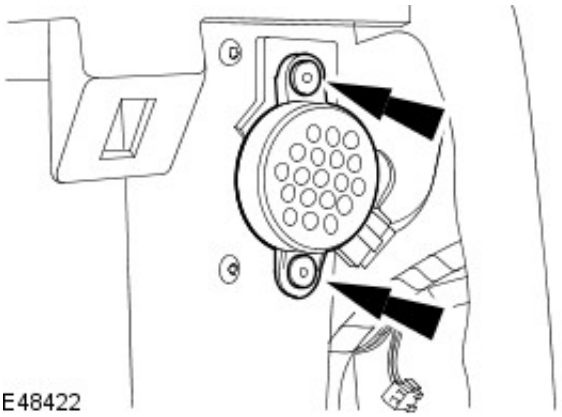
2. Remove the loadspace stowage compartment trim panel.



3. Remove the loadspace stowage compartment.



4. Disconnect the rear parking aid speaker electrical connector.



5. Remove the rear parking aid speaker.

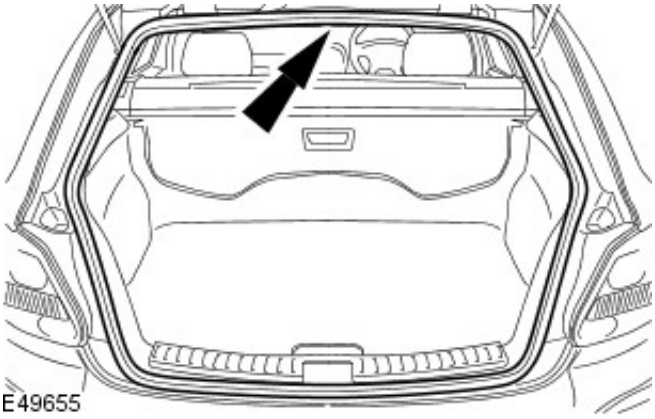
Installation

1. To install, reverse the removal procedure.

Parking Aid - Rear Parking Aid SpeakerWagon, VIN Range: E43420->V99999

Removal and Installation

Removal


E49655

1. NOTE: The liftgate weatherstrip must be replaced once removed.

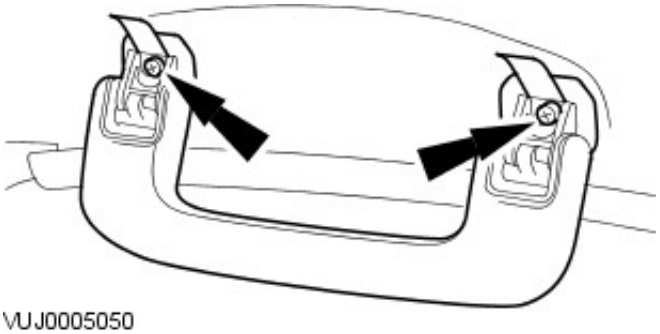
Remove and discard the liftgate opening weatherstrip.

2. Remove both C-pillar trim panels.
For additional information, refer to: C-Pillar Trim Panel - Wagon (501-05 Interior Trim and Ornamentation, Removal and Installation).

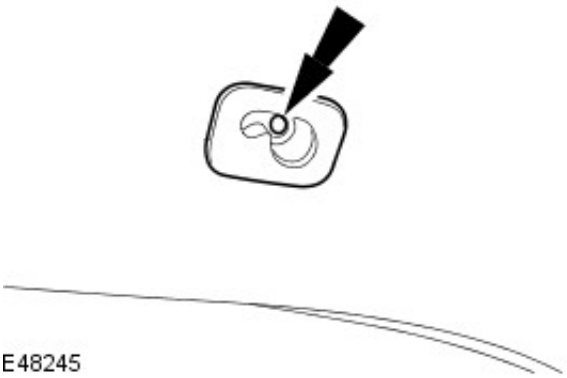
3. Remove both D-pillar trim panels.
For additional information, refer to: D-Pillar Trim Panel (501-05 Interior Trim and Ornamentation, Removal and Installation).

4. Remove the rear grab handles.

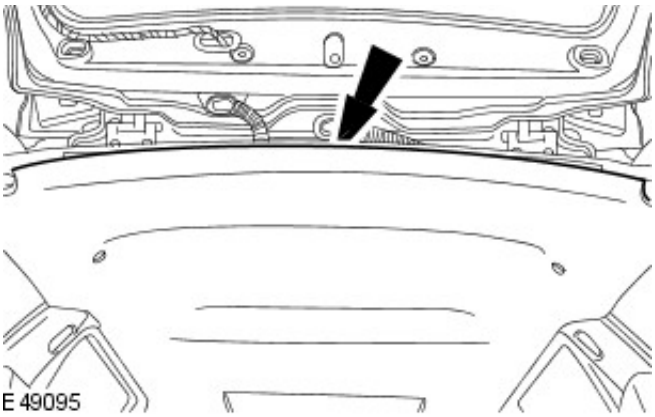
- Reposition the screw covers.
- Remove the screws.


VUJ0005050

5. Remove both luggage net retaining clips.


E48245

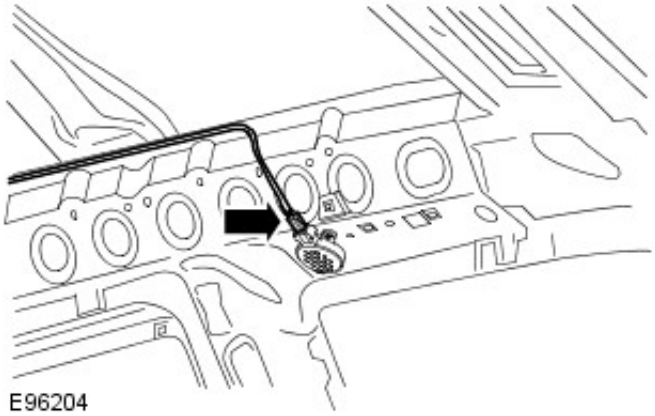
6. Detach the headliner.


E49095

7. CAUTION: Make sure the headliner is not creased or folded. Failure to follow this instruction may result in damage to the vehicle.

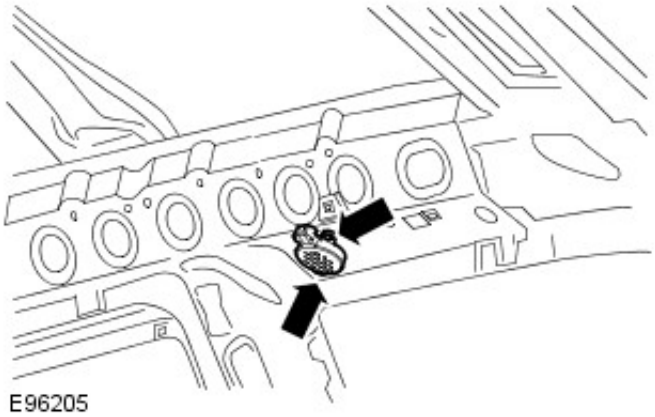
Lower the rear of the headliner to gain access to the rear parking aid speaker.

8. Disconnect rear parking aid speaker electrical connector.


E96204

9. Remove the rear parking aid speaker.

- Remove the 2 screws.


E96205

Installation

1. To install, reverse the removal procedure.

- Install a new liftgate opening weatherstrip.

Charging System - General Information - Charging System
Description and Operation

Vehicles with 2.0L, 2.5L or 3.0L engines

The charging system consists of a 120 amp output generator and regulator assembly which generates current to supply the vehicle electrical system with electricity when the engine is running and maintain the battery in a charged condition.

The generator is belt driven by the accessory drive belt.
For additional information, refer to: Accessory Drive (303-05 Accessory Drive, Description and Operation).
When the engine is started, the generator begins to generate alternating current (AC) which is converted to direct current (DC) internally. The DC current and voltage is controlled by the voltage regulator, (located inside the generator), and then supplied to the battery through the main battery positive cable.

The generator is solidly mounted to the engine timing cover and is driven at 2.8 times the engine speed.

Vehicles fitted with manual transmission have a one way clutch fitted to the drive pulley, which prevents torsional vibrations from the engine being transmitted to the generator.

The engine control module (ECM) can switch the voltage regulator between two voltages to optimize the charging of the battery.

The low voltage regulator setting is 13.6 volts and the high voltage regulator setting is 15.3 volts, measured with the generator at 25°C (77°F) and charging at a rate of 5 amps. These values decrease with a rise in temperature or current flow.

The ECM determines the voltage setting of the voltage regulator. The high voltage setting is always selected by the ECM once the vehicle has started. The ECM determines the period of time that the high voltage setting is selected for.

There are three different time periods selected by the ECM which is dependent upon the vehicle conditions when the vehicle is started:

- The longest time period is selected if the ECM determines that the vehicle has been 'soaking' for sufficient time to allow the engine coolant temperature (ECT) and the intake air temperature (IAT) to fall within 3°C (37°F) of each other.
- The intermediate time period is selected when the ECT and the IAT is below 5°C (41°F).
- The shortest time period is the default time and is used to provide a short period of boost charge.

At the end of these time periods the voltage is always set to the low voltage setting to prevent the battery from being overcharged.

The time periods are variable depending upon the temperature and the battery voltage. The target voltage of the battery varies between 14 volts and 15 volts depending upon the ambient temperature and the vehicle operating conditions. Once this target voltage has been achieved, providing the vehicle has been operating for at least the shortest time period, the ECM will reduce the voltage regulator to the minimum setting of 13.6 volts.

There are three wires connected to the generator from the ECM by connector EN16:

- EN49-1; RG wire, is the voltage regulator request setting from the ECM to the generator.
- EN49-3; OG wire, is a pulse width modulated signal (PWM) from the generator to the ECM which enables the ECM to monitor the generator load on the engine.
- EN49-4; U wire, is the charge warning lamp signal wire from the generator to the ECM.

If the voltage request signal wire (EN 49-1) is open circuit or short to battery positive, the generator will charge the battery at a setting of 15.3 volts. If the wire is short circuit to ground, the generator will charge the battery at a setting of 13.6 volts.

A fault in the wiring or the connections from the generator to the ECM, will cause a fault code to be generated and stored in the ECM and the charge warning indicator lamp to be displayed in the instrument cluster (IC) after a short time.

The charge warning indicator lamp is operated by the IC after receiving a signal from the ECM through the control area network (CAN).

With the ignition switch in the RUN position the charge warning indicator lamp will be displayed in the IC when the generator is not generating power.

If a fault is detected with the generator a fault code will be generated and stored by the ECM. The charge warning indicator lamp will also be displayed in the IC.

Units should be repaired as an assembly and not dismantled for repair.
For additional information, refer to: Generator - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (414-02 Generator and Regulator, Removal and Installation).

Vehicles with 2.0L and 2.2L diesel engine

The diesel charging system differs from that used in petrol-engined variants in that it incorporates a **'smartcharge'** function.

This function is capable of supplying infinitely variable voltages to the battery, depending on the temperature and on the current requirements of the battery.

The system continuously monitors the battery voltage and temperature (via the ambient air temperature sensor), and uses a map of both to deliver the optimum charge to the battery.

Another feature of this system is that it uses a 'wake-up' and 'sleep' strategy, initiated by the ignition switch position and ECM, rather than being constantly active, to avoid current drain.

Charging System - General Information - Charging System2.5L NA V6 - AJV6 / 2.0L NA V6 - AJV6 / 3.0L NA V6 - AJ27

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern by operating the system.
2. **2.** Visually inspect for obvious signs of mechanical and electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Drive belt • Drive belt tensioner • Generator • Generator pulley (vehicles fitted with manual transmission)	• Battery • Generator • Fuse • Circuit • Wiring harness for damage or corrosion • Electrical connectors • Warning lamp operation

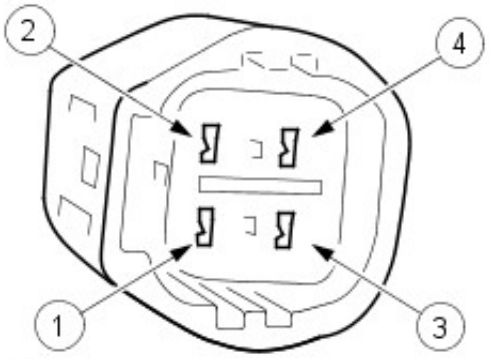
3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Symptom chart

Charging system faults/codes and related causes

Symptom	Possible Sources	Action
DTC P1146 Low input from the Engine control module (ECM) on the voltage regulator request signal wire	* Circuit. * Generator. * ECM.	* GO to Pinpoint Test B.
DTC P1244 Generator overcharging	* Generator. * Circuit. * Battery.	* GO to Pinpoint Test C.
DTC P1629 Generator load monitoring signal failure	* Circuit. * Generator. * ECM.	* GO to Pinpoint Test D.
DTC P1632 Charging system failure	* Fuse 82 (20A). * Circuit. * Generator. * Battery. * ECM.	* GO to Pinpoint Test A.
The charging system warning indicator is on, intermittent or flickers with the engine running	* Accessory drive belt. * Fuse 82 (20A). * Circuit. * Generator. * Generator pulley (vehicles fitted with manual transmission). * Battery. * ECM. * Instrument cluster (IC). * Control area network (CAN).	* CHECK the accessory drive belt tension. For additional information, refer to Section 303-05 Accessory Drive . * GO to Pinpoint Test A.
Generator not charging, battery keeps going flat	* Accessory drive belt. * Fuse 82 (20A). * Circuit. * Generator. * Generator pulley (vehicles fitted with manual transmission). * Battery.	* CHECK drive belt tension. For additional information, refer to Section 303-05 Accessory Drive . * GO to Pinpoint Test A.
Generator noisy	* Accessory drive belt. * Accessory drive belt tensioner.	* CHECK the accessory drive belt and tensioner. For additional information, refer to Section 303-05 Accessory Drive .

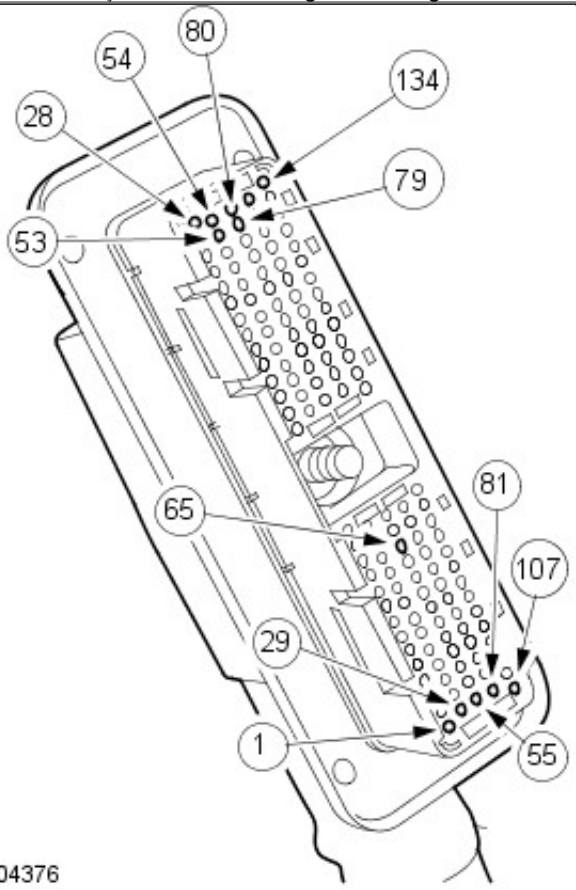
	* Generator pulley (vehicles fitted with manual transmission).	* GO to Pinpoint Test G.
Radio interference	* Circuit. * Generator.	* GO to Pinpoint Test H.



VUJ0004301

Generator Electrical Connector (EN49, Harness Side)

Pin Number	Circuit Function	Circuit Color
1	Voltage Request Input Signal from ECM	Red/Green
2	Power Supply (12 volts) from Fuse 82 of the Passenger Compartment Fuse Box	Green/Red
3	PWM Output Signal to ECM	Orange/Green
4	Generator Charge Warning Indicator Lamp Output Signal to ECM	Blue



VUJ0004376

Engine Control Module (ECM) Electrical Connector (EN16, Harness Side)

Pin Number	Circuit Function	Circuit Color
53	Voltage Request Output Signal to Generator	Red/Green
65	PWM Input Signal from Generator	Orange/Green
79	Generator Charge Warning Indicator Lamp Input Signal from Generator	Blue

PINPOINT TEST A : LOW INPUT ON THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FROM THE ECM (P1146)	
TEST	DETAILS / RESULTS / ACTIONS

CONDITIONS	
A1: CHECK THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FOR A SHORT TO GROUND	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between electrical connector EN49-1 and ground.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR short to ground between the generator and the ECM. CLEAR the DTC. TEST the system for normal operation. **No** GO to A2. .
A2: CHECK THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FOR OPEN CIRCUIT	
	1 Measure the resistance between electrical connector EN49-1 and the ECM electrical connector EN16-53.
	Is the resistance less than 5 ohms? **Yes** REPAIR the circuit from the ECM to the generator. CLEAR the DTC. TEST the system for normal operation. **No** GO to A3. .
A3: CHECK THE OPERATION OF THE GENERATOR CHARGE WARNING INDICATOR LAMP	
	1 Connect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Clear the DTC. START and RUN the engine at 1500 RPM with no electrical load applied.
	Does the generator charge warning indicator lamp illuminate within 30 seconds of the engine being started? **Yes** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls . **No** GO to A4. .
A4: CHECK THE OPERATION OF THE GENERATOR CHARGE WARNING INDICATOR LAMP AFTER 15 MINUTES	
	1 RUN the engine at idle for 15 minutes and then increase the engine speed to 1500 RPM for one minute with no electrical load applied.
	Does the generator charge warning indicator lamp illuminate or is the DTC repeated? **Yes** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls . **No** DIAGNOSE the ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls .

PINPOINT TEST B : GENERATOR OVERCHARGING (P1244)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1: CHECK THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FOR A SHORT TO BATTERY POSITIVE	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between electrical connector EN49-1 and the generator battery positive cable.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR short to the generator battery positive cable. CLEAR the DTC. TEST the system for normal operation. **No** GO to B2. .
B2: CHECK THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FOR OPEN CIRCUIT	
	1 Measure the resistance between electrical connector EN49-1 and the ECM electrical connector EN16-53.
	Is the resistance less than 5 ohms? **Yes** REPAIR the circuit from the ECM to the generator. CLEAR the DTC. TEST the system for normal operation. **No** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls .

PINPOINT TEST C : CHARGING SYSTEM FAILURE (P1632)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: CHECK THE BATTERY VOLTAGE WITH THE ENGINE RUNNING AND NO ELECTRICAL LOADS APPLIED	
	1 START and RUN the engine at 1500 RPM with no electrical load applied.
	2 Measure the battery voltage.
	Is the voltage less than 14.5 volts? **Yes** GO to C2. . **No** INSTALL a fully charged battery.GO to C4. .
C2: CHECK CONTINUITY OF THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between electrical connector EN49-1 and the ECM electrical connector EN16-53.
	Is the resistance less than 5 ohms? **Yes** REPAIR the circuit from the ECM to the generator. Clear the DTC. TEST the system for normal operation. **No** GO to C3. .
C3: CHECK THE VOLTAGE REGULATOR REQUEST SIGNAL WIRE FOR A SHORT GROUND	
	1 Measure the resistance between electrical connector EN49-1 and the ECM electrical connector EN16-53.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the circuit from the ECM to the generator. Clear the DTC. TEST the system for normal operation. **No** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls .
C4: CHECK THE GENERATOR CHARGE WARNING INDICATOR LAMP AND COOLING FAN OPERATION WITH THE ENGINE RUNNING AT IDLE SPEED	
	1 START and RUN the engine at idle speed for 15 minutes with no electrical load applied.
	Is the generator charge warning indicator lamp illuminated and the cooling fans operating at maximum speed? **Yes** GO to C6. . **No** GO to C5. .
C5: CHECK THE GENERATOR CHARGE WARNING INDICATOR LAMP AND COOLING FAN OPERATION WITH THE ENGINE RUNNING FOR A FURTHER MINUTE AT 1500 RPM.	
	1 Increase the engine speed to 1500 RPM for one minute with no electrical load applied.
	Is the generator charge warning indicator lamp illuminated? **Yes** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls . **No** INSTALL a fully charged slave battery. CLEAR the DTC. TEST the system for normal operation.
C6: CHECK FOR A SHORT TO BATTERY POSITIVE CABLE	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between electrical connector EN49-1 and the generator battery positive cable.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the circuit from the ECM to the generator. CLEAR the DTC. TEST the system for normal operation. **No** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls .

PINPOINT TEST D : GENERATOR LOAD MONITORING SIGNAL FAILURE (P1629)

TEST	DETAILS/RESULTS/ACTIONS

CONDITIONS	
D1: CHECK THE SIGNAL WIRE FOR OPEN CIRCUIT	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between electrical connector EN49-3 and the ECM electrical connector EN16-65.
	Is the resistance less than 5 ohms? **Yes** GO to D2. . **No** REPAIR the circuit from the ECM to the generator. CLEAR the DTC. TEST the system for normal operation.
D2: CHECK THE SIGNAL WIRE FOR A SHORT TO BATTERY POSITIVE	
	1 Measure the resistance between electrical connector EN49-3 and the generator battery positive cable.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR short to the generator battery positive cable. CLEAR the DTC. TEST the system for normal operation. **No** GO to D3. .
D3: CHECK THE SIGNAL WIRE FOR A SHORT TO GROUND	
	1 Measure the resistance between electrical connector EN49-3 and ground.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the circuit from the ECM to the generator. CLEAR the DTC. TEST the system for normal operation. **No** INSTALL a new generator. CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. For additional information, refer to Section 303-14A Electronic Engine ControlsSection 303-14B Electronic Engine Controls .

PINPOINT TEST E : THE GENERATOR CHARGE WARNING INDICATOR LAMP IS ON WITH THE ENGINE RUNNING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1: CHECK THE BATTERY VOLTAGE	
	1 Measure the battery voltage.
	Is the voltage less than 12 volts? **Yes** Charge the battery.GO to E2. . **No** GO to E3. .
E2: CHECK THE BATTERY	
	1 Carry out a Battery Condition Test.
	Is the battery OK? **Yes** GO to E3. . **No** INSTALL a new battery. TEST the system for normal operation.
E3: CHECK THE BATTERY VOLTAGE WITH THE ENGINE RUNNING AND NO ELECTRICAL LOADS APPLIED	
	1 START and RUN the engine at 1500 RPM. Measure the battery voltage.
	Is the voltage less than 13 volts? **Yes** For vehicles fitted with manual transmissionGO to E4. . For vehicles fitted with automatic transmissionGO to E5. . **No** GO to E11. .
E4: CHECK THE GENERATOR DRIVE PULLEY (VEHICLES FITTED WITH MANUAL TRANSMISSION)	
	1 REMOVE the accessory drive belt. For additional information, refer to Section 303-05 Accessory Drive .
	2 ROTATE the generator pulley by hand.
	Does the alternator rotor shaft rotate with the pulley? **Yes** GO to E5. . **No** INSTALL a new generator. TEST the system for normal operation.

E5: CHECK THE GENERATOR OUTPUT VOLTAGE AT THE GENERATOR BATTERY POSITIVE CABLE TERMINAL, WITH THE ENGINE RUNNING AND NO ELECTRICAL LOADS APPLIED	
	1 START and RUN the engine at 1500 RPM. Measure the voltage between the generator battery positive cable electrical connector; ST4 and ground.
	Is the voltage less than 13 volts? **Yes** GO to E6. . **No** REPAIR the permanent live supply circuit from the battery to the generator. TEST the system for normal operation.
E6: CHECK THE GENERATOR GROUND CIRCUIT	
	1 Measure the resistance between the generator casing and the battery ground terminal.
	Is the resistance less than 5 ohms? **Yes** GO to E7. . **No** REPAIR the ground circuit between the generator and the battery ground terminal. TEST the system for normal operation.
E7: CHECK IGNITION SUPPLY VOLTAGE TO THE GENERATOR	
	1 Turn the ignition switch to the RUN position. Measure the voltage between the generator ignition supply terminal, EN49-2 and ground.
	Is the voltage less than 10 volts? **Yes** GO to E8. . **No** INSTALL a new generator. TEST the system for normal operation.
E8: CHECK FUSE 82 IN THE PASSENGER COMPARTMENT FUSE BOX	
	1 Check the fuse.
	Is the fuse OK? **Yes** GO to E9. . **No** GO to E10. .
E9: CHECK FOR IGNITION SUPPLY VOLTAGE AT FUSE 82 OF THE PASSENGER COMPARTMENT FUSE BOX	
	1 Turn the ignition switch to the RUN position. Measure the voltage between the passenger compartment fuse box; JB51-14 and ground.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the passenger compartment fuse box and the ignition relay. TEST the system for normal operation. **No** REPAIR the circuit between the passenger compartment fuse box and the generator. TEST the system for normal operation.
E10: CHECK FUSE 82 OF THE PASSENGER COMPARTMENT FUSE BOX FOR A SHORT TO GROUND	
	1 Measure the resistance between electrical connector JB51-14 of the passenger compartment fuse box and ground.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR short to ground between the passenger compartment fuse box and the generator. INSTALL a new fuse. TEST the system for normal operation. **No** INSTALL a new fuse. TEST the system for normal operation.
E11: CHECK THE CONTINUITY OF THE GENERATOR CHARGE WARNING INDICATOR LAMP SIGNAL WIRE	
	1 Disconnect the ECM electrical connector; EN16 and the generator electrical connector; EN49.
	2 Measure the resistance between EN49-4 and EN1-79.
	Is the resistance less than 5 ohms? **Yes** Refer to the approved Jaguar diagnostic system. **No** REPAIR the circuit from the ECM to the generator. TEST the system for normal operation.

PINPOINT TEST F : GENERATOR NOT CHARGING — BATTERY KEEPS GOING FLAT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
F1: CHECK THE CHARGE WARNING LAMP IS ILLUMINATED WITH THE ENGINE RUNNING	
	1 START and RUN the engine at 1500 RPM. INSPECT the generator charge warning indicator lamp.

	Is the warning lamp illuminated? **Yes** GO to F2. . **No** GO to F4. .
F2: CHECK THE BATTERY VOLTAGE WITH IGNITION OFF AND NO ELECTRICAL LOADS APPLIED	
	1 Measure the battery voltage.
	Is the voltage less than 12 volts? **Yes** Charge the battery.GO to F3. . **No** GO to F4. .
F3: CHECK THE BATTERY	
	1 Carry out a Battery Condition Test.
	Is the battery OK? **Yes** GO to F4. . **No** INSTALL a new battery. TEST the system for normal operation.
F4: CHECK THE BATTERY VOLTAGE WITH THE ENGINE RUNNING AND NO ELECTRICAL LOADS APPLIED	
	1 START and RUN the engine at 1500 RPM. Measure the battery voltage.
	Is the voltage less than 13 volts? **Yes** For vehicles fitted with manual transmissionGO to F5. . For vehicles fitted with automatic transmissionGO to F6. . **No** GO to F10. .
F5: CHECK THE GENERATOR DRIVE PULLEY (VEHICLES FITTED WITH MANUAL TRANSMISSION)	
	1 REMOVE the accessory drive belt. For additional information, refer to Section 303-05 Accessory Drive .
	2 ROTATE the generator pulley by hand.
	Does the alternator rotor shaft rotate with the pulley? **Yes** GO to F6. . **No** INSTALL a new generator. TEST the system for normal operation.
F6: CHECK THE GENERATOR OUTPUT VOLTAGE AT THE GENERATOR MAIN TERMINAL WITH THE ENGINE RUNNING AND NO ELECTRICAL LOADS APPLIED	
	1 START and RUN the engine at 1500 RPM. Measure the voltage between the generator main output electrical connector; ST4 and ground.
	Is the voltage less than 13 volts? **Yes** GO to F7. . **No** REPAIR the permanent live supply circuit from the battery to the generator. TEST the system for normal operation.
F7: CHECK FUSE 82 IN THE PASSENGER COMPARTMENT FUSE BOX	
	1 Check the fuse.
	Is the fuse OK? **Yes** GO to F9. . **No** GO to F8. .
F8: CHECK FUSE 82 OF THE PASSENGER COMPARTMENT FUSE BOX FOR A SHORT TO GROUND	
	1 Measure the resistance between electrical connector JB51-14 of the passenger compartment fuse box and ground.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR short to ground between the passenger compartment fuse box and the generator. INSTALL a new fuse. TEST the system for normal operation. **No** INSTALL a new fuse. TEST the system for normal operation.
F9: CHECK FOR IGNITION SUPPLY VOLTAGE AT FUSE 82 OF THE PASSENGER COMPARTMENT FUSE BOX	
	1 Turn the ignition switch to the RUN position. Measure the voltage between the passenger compartment fuse box; JB51-14 and ground.
	Is the voltage less than 10 volts?

	Yes REPAIR the circuit between the passenger compartment fuse box and the ignition relay. TEST the system for normal operation. **No** REPAIR the circuit between the passenger compartment fuse box and the generator. TEST the system for normal operation.
F10: CHECK THE CONTINUITY OF THE GENERATOR CHARGE WARNING INDICATOR LAMP SIGNAL WIRE	
	1 Disconnect the ECM electrical connector EN16 and the generator electrical connector EN49.
	2 Measure the resistance between EN49-4 and EN1-79.
	Is the resistance less than 5 ohms? **Yes** Refer to the approved Jaguar diagnostic system. **No** REPAIR the circuit from the ECM to the generator. TEST the system for normal operation.

PINPOINT TEST G : GENERATOR NOISY	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
G1: CHECK GENERATOR FOR SECURITY	
	1 INSPECT the generator fixings.
	Is the generator loose? **Yes** TIGHTEN generator fixings. TEST the system for normal operation. **No** GO to G2. .
G2: CHECK THE ACCESSORY DRIVE BELT	
	1 REMOVE and INSPECT the accessory drive belt. For additional information, refer to Section 303-05 Accessory Drive .
	Is the accessory drive belt OK? **Yes** GO to G3. . **No** INSTALL a new accessory drive belt. TEST the system for normal operation.
G3: CHECK THE ACCESSORY DRIVE BELT TENSIONER	
	1 REMOVE and INSPECT the accessory drive belt tensioner. For additional information, refer to Section 303-05 Accessory Drive .
	Is the accessory drive belt tensioner OK? **Yes** GO to G4. . **No** INSTALL a new accessory drive belt tensioner. For additional information, refer to Section 303-05 Accessory Drive . TEST the system for normal operation.
G4: CHECK GENERATOR FOR MECHANICAL NOISE	
	1 ROTATE the generator pulley by hand.
	Does the generator rotor shaft rotate smoothly? **Yes** For vehicles fitted with manual transmissionGO to G5. . For vehicles fitted with automatic transmissionGO to G6. . **No** INSTALL a new generator. TEST the system for normal operation.
G5: CHECK GENERATOR DRIVE PULLEY (VEHICLES FITTED WITH MANUAL TRANSMISSION)	
	1 ROTATE the generator pulley quickly by hand.
	2 Stop the generator pulley from spinning by holding the pulley.
	Does the generator rotor shaft continue to rotate? **Yes** GO to G6. . **No** INSTALL a new generator. TEST the system for normal operation.
G6: CHECK THE ACCESSORY DRIVE BELT IDLER PULLEYS	
	1 ROTATE the accessory drive belt idler pulleys by hand.
	Do the accessory drive belt idler pulleys rotate smoothly? **Yes** GO to G7. . **No** INSTALL new accessory drive belt pulleys as necessary. TEST the system for normal operation.
G7: CHECK GENERATOR FOR ELECTRICAL NOISE	

	1 INSTALL the accessory drive belt. For additional information, refer to Section 303-05 Accessory Drive .
	2 START and RUN the engine at 1500 RPM. APPLY a high electrical load to the battery.
	Is the noise only heard with the high electrical load applied? **Yes** GO to G8. . **No** CHECK the air conditioning compressor. For additional information, refer to Section 412-03 Air Conditioning . CHECK the power steering pump. For additional information, refer to Section 211-02 Power Steering . TEST the system for normal operation.
G8: ELIMINATE THE GENERATOR AS THE CAUSE OF ELECTRICAL NOISE	
	1 REMOVE fuse 82 from the passenger compartment fuse box.
	2 START and RUN the engine at 1500 RPM.
	Is the noise still present? **Yes** CHECK the air conditioning compressor. For additional information, refer to Section 412-03 Air Conditioning . CHECK the power steering pump. For additional information, refer to Section 211-02 Power Steering . TEST the system for normal operation. **No** INSTALL a new generator. TEST the system for normal operation.

PINPOINT TEST H : RADIO INTERFERENCE	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
H1: CHECK THE GENERATOR FOR THE CAUSE OF RADIO INTERFERENCE	
	1 START and RUN the engine at 1500 RPM.
	2 TURN the radio switch to the ON position.
	Is radio interference present? **Yes** GO to H3. . **No** GO to H2. .
H2: CHECK THE GENERATOR FOR THE CAUSE OF RADIO INTERFERENCE WITH A HIGH ELECTRICAL LOAD APPLIED TO THE BATTERY	
	1 START and RUN the engine at 1500 RPM
	2 APPLY a high electrical load to the battery.
	3 TURN the radio switch to the ON position.
	Is radio interference present? **Yes** GO to H3. . **No** DIAGNOSE the entertainment system. For additional information, refer to Section 415-00 Information and Entertainment System - General Information .
H3: ELIMINATE THE GENERATOR AS THE CAUSE OF RADIO INTERFERENCE	
	1 REMOVE fuse 82 from the passenger compartment fuse box.
	2 START and RUN the engine at 1500 RPM.
	3 TURN the radio switch to the ON position.
	Is radio interference still present? **Yes** Diagnose the Entertainment System. For additional information, refer to Section 415-00 Information and Entertainment System - General Information . **No** CLEAN and TIGHTEN all mounting points, positive and ground cable connections. INSTALL fuse 82 in the passenger compartment fuse box. TEST the system for normal operation. If interference is still present, INSTALL a new generator.

Base Voltage Test

• NOTE: Prior to running this test, turn the headlamps on for 30 seconds to remove any surface charge from the battery. Wait until the voltage stabilizes before carrying out the base voltage test.

1. **1.** With the ignition switch in the OFF position and no electrical loads applied to the battery, connect the negative lead of a digital multimeter to the battery ground cable clamp.
2. **2.** Connect the positive lead of the digital multimeter to the battery positive terminal cable clamp.
3. **3.** Read and record the battery voltage shown on the digital multimeter. This is called base voltage and will be used in later tests.

No-Load Test

1. **1.** Connect the digital multimeter leads across the battery terminals.
2. **2.** Read the voltage (base voltage). If the battery voltage is less than 12 volts. Charge the battery before test.
3. **3.** Start the engine.
4. **4.** Run the engine to 1500 RPM with no electrical load applied to the battery.
5. **5.** Read the voltage. If the voltage increase is less than 0.5 volts above the base voltage, carry out the Battery Condition Test. If there is no voltage increase, diagnose the charging system. For additional information refer to the symptom chart.

Battery Condition Test

• WARNINGS:

 Batteries contain sulphuric acid and explosive mixtures of Hydrogen and Oxygen gasses; protective clothing should be worn to avoid the risk of personal injury.

 Avoid sparks and all sources of ignition when working on the battery.

• CAUTIONS:

 Do not carry out this test if the battery voltage is below 12.5 volts.

 Do not carry out this test for longer than 15 seconds or damage to the battery may occur.

• NOTE: Make sure that the high rate discharge tester is capable of applying a load of 300 Amps to the battery.

1. **1.** Connect the high rate discharge tester to the battery.
2. **2.** Observe and record the voltage reading of the battery.
3. **3.** Turn the switch to the ON position for 15 seconds.
4. **4.** Observe and record the minimum voltage reading of the battery.
5. **5.** Turn the switch to the OFF position.
6. **6.** Observe the voltage reading of the battery.

The battery voltage should not fall below 9.6 volts at a temperature of 21°C (70°F) when carrying out the test.

The battery should recover to the original voltage when the test is complete.

Charging System - General Information - Charging System2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi

Diagnosis and Testing

Principle of operation

The diesel charging system differs from that used in petrol-engined variants in that it incorporates a **'smartcharge'** function.

This function is capable of supplying infinitely variable voltages to the battery, depending on the temperature and on the current requirements of the battery.

The system continuously monitors the battery voltage and temperature (via the ambient air temperature sensor), and uses a map of both to deliver the optimum charge to the battery.

Another feature of this system is that it uses a 'wake-up' and 'sleep' strategy, initiated by the ignition switch position and engine control module (ECM) to avoid current drain.

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.
3. **3.** Check the vehicle battery condition and state of charge before condemning any of the charging system components. For additional information, refer to the battery care manual.

Visual Inspection Chart

Mechanical	Electrical
• Generator • Drive belt • Drive belt tensioner • Generator pulley • Check the security of the generator fittings	• Generator • Battery • Charging system warning light function (ignition **ON**, engine **OFF**) • Fuse 36 (7.5A) front power distribution box (battery voltage sense) • Engine/Generator ground connection • Circuit(s) • Electrical connector(s) • Engine control module (ECM)

4. **4.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
5. **5.** If the cause is not visually evident and the Jaguar approved diagnostic system is not available, use a scan tool to retrieve the fault codes before proceeding to the symptom chart.

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

• NOTE: When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

Symptom Chart

• NOTE: For a full list of DTCs,
REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Diagnosis and Testing).

DTC	Condition	Possible Source	Action
P0622	Generator monitor circuit fault	• Generator monitor circuit: open circuit, high resistance, short circuit to B+, short circuit to ground • Generator regulator failure • ECM fault	For generator monitor circuit tests, GO to Pinpoint Test C.

P0623	Generator warning light circuit fault	• Generator warning light circuit: open circuit, short circuit	For generator warning light circuit tests, REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Diagnosis and Testing).
P1632	Generator communications circuit fault	• Generator communications circuit: open circuit, high resistance, short circuit to B+, short circuit to ground • Generator regulator failure • ECM fault	For generator communications circuit tests, GO to Pinpoint Test D.
None	The battery warning light is on, intermittent, or flickers with the engine running	• Battery, low voltage • Accessory drive belt tension • Generator failure • ECM • Instrument cluster (IC) fault	Check the battery condition and state of charge. Refer to the battery care manual. Check the accessory drive belt tension, REFER to: Accessory Drive Belt Tensioner - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation). Check the generator output, GO to Pinpoint Test B. and GO to Pinpoint Test A.. For CAN circuit tests, REFER to: Communications Network - VIN Range: E96603->J28492 (418-00 Module Communications Network, Diagnosis and Testing).
None	The battery keeps discharging	• Battery fault • Battery cables • Battery quiescent drain • Accessory drive belt tension • Generator failure • Generator pulley fault	Check the battery condition and state of charge. Refer to the battery care manual. Check the volt drop across the charging circuit, GO to Pinpoint Test G. Check the accessory drive belt tension, REFER to: Accessory Drive Belt Tensioner - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation). Check the generator output, GO to Pinpoint Test B. and GO to Pinpoint Test A. Check that the generator pulley does not turn independently of the generator.
None	Generator noisy	• Generator failure • Accessory drive belt tension • Accessory drive belt • Accessory drive belt tensioner	For generator mechanical tests, GO to Pinpoint Test E. Check the accessory drive belt and tensioners, REFER to: Accessory Drive Belt Tensioner - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation).
None	Radio interference	• Generator • Wiring harness	For interference tests, GO to Pinpoint Test F.

Pinpoint tests

PINPOINT TEST A : CHECK THE GENERATOR OUTPUT UNDER LOAD AT IDLE	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
A1: CHECK THE GENERATOR OUTPUT AT IDLE	
	1 Start the engine and allow to idle.
	2 Turn the headlights **ON**.
	3 With the engine idling, measure the voltage between the battery positive terminal and GROUND over ten seconds.
	Was the average voltage greater than 12.85 volts? **Yes** GO to A2. **No** Check the volt drop across the charging circuit, GO to Pinpoint Test G.. If the volt drop is within limits, install a new generator. REFER to: Generator.
A2: CHECK THE GENERATOR OUTPUT AT IDLE FOR OVERCHARGE	
	1 With the engine idling and headlights still **ON**, measure the voltage between the battery positive terminal and GROUND over ten seconds.

	Was the average voltage greater than 15.25 volts? **Yes** The generator is overcharging. INSTALL a new generator. REFER to: Generator. **No** Charging system is within limits.

PINPOINT TEST B : CHECK THE GENERATOR OUTPUT UNDER LOAD	
• NOTE: Before beginning this test, make sure the warning light function is normal without the engine running (see visual inspection table).	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1: CHECK THE FUNCTION OF THE CHARGING SYSTEM WARNING LIGHT	
	1 Start the engine and allow to idle.
	Is the charging system warning light illuminated? **Yes** Check for DTC P0623. REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Diagnosis and Testing). **No** GO to B2.
B2: CHECK THE CHARGING SYSTEM OUTPUT UNDER LOAD (LOW VOLTAGE)	
	1 Turn the headlights and heated rear window to the **ON** position.
	2 Raise the engine speed to between 2,800 rpm and 3,200 rpm and hold for ten seconds.
	3 Whilst holding the engine rpm in the above range, measure the voltage between the battery positive terminal and GROUND.
	4 Allow the engine to idle.
	Was the average battery voltage less than 12.85 volts? **Yes** GO to B4. **No** GO to B3.
B3: CHECK THE CHARGING SYSTEM OUTPUT UNDER LOAD (HIGH VOLTAGE)	
	1 Raise the engine speed to between 2,800 rpm and 3,200 rpm and hold for ten seconds.
	2 Whilst holding the engine rpm in the above range, measure the voltage between the battery positive terminal and GROUND.
	3 Allow the engine to idle.
	Was the average battery voltage greater than 15.25 volts? **Yes** INSTALL a new generator. REFER to: Generator. CLEAR the DTC. TEST the system for normal operation. **No** Charging system output is within limits.
B4: CHECK THE CHARGING SYSTEM VOLTAGE AT THE GENERATOR CONNECTOR, PIN 01	
WARNING: The following test may involve working in close proximity to hot components. Observe caution when working in this area. Failure to follow this instruction may result in personal injury.	
	1 Turn the headlights and heated rear window to the **OFF** position.
	2 Turn the ignition switch to the **OFF** position.
	3 Disconnect the generator three-way connector.
	4 Connect a voltmeter between the generator, pin 01 and GROUND.
	5 Start the engine.
	6 Turn the headlights and heated rear window to the **ON** position.
	7 Raise the engine speed to between 2,800 rpm and 3,200 rpm and hold for ten seconds.
	8 Whilst holding the engine rpm in the above range, measure the voltage between the generator connector, pin 01 and GROUND.
	9 Allow the engine to idle.
	Was the voltage between 11 and 16 volts? **Yes** Generator is within limits, suspect generator cables. GO to Pinpoint Test G. **No** INSTALL a new generator. REFER to: Generator. CLEAR the DTC. TEST the system for normal operation.

PINPOINT TEST C : P0622: GENERATOR MONITOR CONTROL CIRCUIT FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
C1: CHECK THE GENERATOR MONITOR CIRCUIT FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the generator three-way connector.
	4 Disconnect the ECM connector, DL01.
	5 Measure the resistance between the three-way connector, pin 01 (W) and DL01, pin 47 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** GO to C2.
C2: CHECK THE GENERATOR MONITOR CIRCUIT FOR SHORT TO B+	
	1 Reconnect the battery negative terminal.
	2 Measure the voltage between DL01, pin 47 (W) and GROUND.
	Is the voltage greater than 1 volt? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** GO to C3.
C3: CHECK THE GENERATOR MONITOR CIRCUIT FOR SHORT TO GROUND	
	1 Measure the resistance between DL01, pin 47 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** RECHECK DTCs.

PINPOINT TEST D : P1632: GENERATOR COMMUNICATIONS CIRCUIT FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
D1: CHECK THE GENERATOR COMMUNICATIONS CIRCUIT FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the generator three-way connector.
	4 Disconnect the ECM connector, DL01.
	5 Measure the resistance between the three-way connector, pin 02 (N) and DL01, pin 112 (N).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** GO to D2.
D2: CHECK THE GENERATOR COMMUNICATIONS CIRCUIT FOR SHORT TO B+	
	1 Reconnect the battery negative terminal.
	2 Measure the voltage between DL01, pin 112 (N) and GROUND.
	Is the voltage greater than 1 volt? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** GO to D3.
D3: CHECK THE GENERATOR COMMUNICATIONS CIRCUIT FOR SHORT TO GROUND	
	1 Measure the resistance between DL01, pin 112 (N) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation. **No** RECHECK DTCs.

PINPOINT TEST E : GENERATOR NOISY	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1: CHECK THE GENERATOR FOR SECURITY	
	1 Inspect the generator fixings.
	Is the generator secure? **Yes** GO to E2. **No** SECURE the generator. REFER to: Generator. TEST the system for normal operation.
E2: CHECK THE ACCESSORY DRIVE BELT	
	1 Remove and inspect the accessory drive belt. For additional information REFER to: Accessory Drive Belt - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation).
	Is the accessory drive belt in good condition? **Yes** GO to E3. **No** INSTALL a new accessory drive belt. REFER to: Accessory Drive Belt - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation). TEST the system for normal operation.
E3: CHECK THE ACCESSORY DRIVE BELT TENSIONER	
	1 Remove and inspect the accessory drive belt tensioner. REFER to: Accessory Drive Belt - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation).
	Is the accessory drive belt tensioner in good condition? **Yes** GO to E4. **No** INSTALL a new accessory drive belt tensioner. REFER to: Accessory Drive Belt Tensioner - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation). TEST the system for normal operation.
E4: CHECK THE GENERATOR FOR MECHANICAL NOISE	
	1 Rotate the generator pulley by hand.
	Does the generator rotor shaft rotate smoothly and quietly? **Yes** GO to E5. **No** INSTALL a new generator. REFER to: Generator. TEST the system for normal operation.
E5: CHECK THE ACCESSORY DRIVE BELT IDLER PULLEYS	
	1 Rotate the accessory drive belt idler pulleys by hand.
	Do the accessory drive belt idler pulleys rotate smoothly and quietly? **Yes** GO to E6. **No** INSTALL new accessory drive belt pulleys as necessary. REFER to: Accessory Drive Belt Tensioner - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation). TEST the system for normal operation.
E6: CHECK THE GENERATOR FOR ELECTRICAL NOISE	
	1 Install the accessory drive belt. REFER to: Accessory Drive Belt - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (303-05 Accessory Drive, Removal and Installation).
	2 Start and run the engine at 1500 rpm. Apply a high electrical load to the battery.
	Is the noise only heard with the high electrical load applied? **Yes** GO to E7. **No** CHECK the air conditioning compressor. For additional information REFER to: Air Conditioning (A/C) Compressor - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (412-03 Air Conditioning, Removal and Installation).

	CHECK the power steering pump. For additional information REFER to: Power Steering Pump - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (211-02 Power Steering, Removal and Installation). TEST the system for normal operation.
E7: ELIMINATE THE GENERATOR AS THE CAUSE OF ELECTRICAL NOISE	
	1 Remove fuse 15 from the primary junction fuse box.
	2 Start and run the engine at 1500 rpm.
	Is the noise still present? **Yes** CHECK the air conditioning compressor. For additional information REFER to: Air Conditioning (A/C) Compressor - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (412-03 Air Conditioning, Removal and Installation). CHECK the power steering pump. For additional information REFER to: Power Steering Pump - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (211-02 Power Steering, Removal and Installation). TEST the system for normal operation. **No** INSTALL a new generator. REFER to: Generator. TEST the system for normal operation.

PINPOINT TEST F : RADIO INTERFERENCE	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
F1: CHECK IF THE GENERATOR IS THE CAUSE OF THE RADIO INTERFERENCE	
	1 Start and run the engine at 1500 rpm.
	2 Turn the radio to the **ON** position, and select the affected station.
	Is the radio interference present? **Yes** GO to F3. **No** GO to F2.
F2: CHECK IF THE GENERATOR IS THE CAUSE OF THE RADIO INTERFERENCE WITH A HIGH ELECTRICAL LOAD APPLIED TO THE BATTERY	
	1 Start and run the engine at 1500 rpm.
	2 Apply a high electrical load to the battery.
	3 Turn the radio to the **ON** position, and select the affected station.
	Is the radio interference present? **Yes** GO to F3. **No** DIAGNOSE the entertainment system. For additional information REFER to: Audio System (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).
F3: ELIMINATE THE GENERATOR AS THE CAUSE OF RADIO INTERFERENCE	
	1 Remove fuse 33 from the primary junction fuse box.
	2 Start and run the engine at 1500 rpm.
	3 Turn the radio to the **ON** position, and select the affected station.
	Is the radio interference present? **Yes** DIAGNOSE the entertainment system. For additional information REFER to: Audio System (415-00 Information and Entertainment System - General Information, Diagnosis and Testing). **No** CLEAN and tighten all mounting points, positive and negative cable connections (including the bonnet, boot and engine GROUND straps). INSTALL fuse 15 from the primary junction fuse box. TEST the system for normal operation. If interference is still present, INSTALL a new generator. REFER to: Generator.

PINPOINT TEST G : CHECK THE VOLT DROP ACROSS THE BATTERY CABLES	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
G1: CHECK THE VOLT DROP BETWEEN THE BATTERY AND THE GENERATOR	
	1 Measure the voltage between the battery terminals.
	2 With the negative probe still on the battery negative terminal, connect the positive probe to the generator output terminal.

	3 Compare the voltages. Is the voltage difference greater than 1 volt? **Yes** INSTALL a new battery cable. REFER to: Battery Cables - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (414-01 Battery, Mounting and Cables, Removal and Installation). **No** CHECK for DTCs. Check the generator output.

Charging System - General Information - Battery Charging

General Procedures

1. For additional information, refer to the battery care manual (BCM).

Battery, Mounting and Cables -

General Specifications

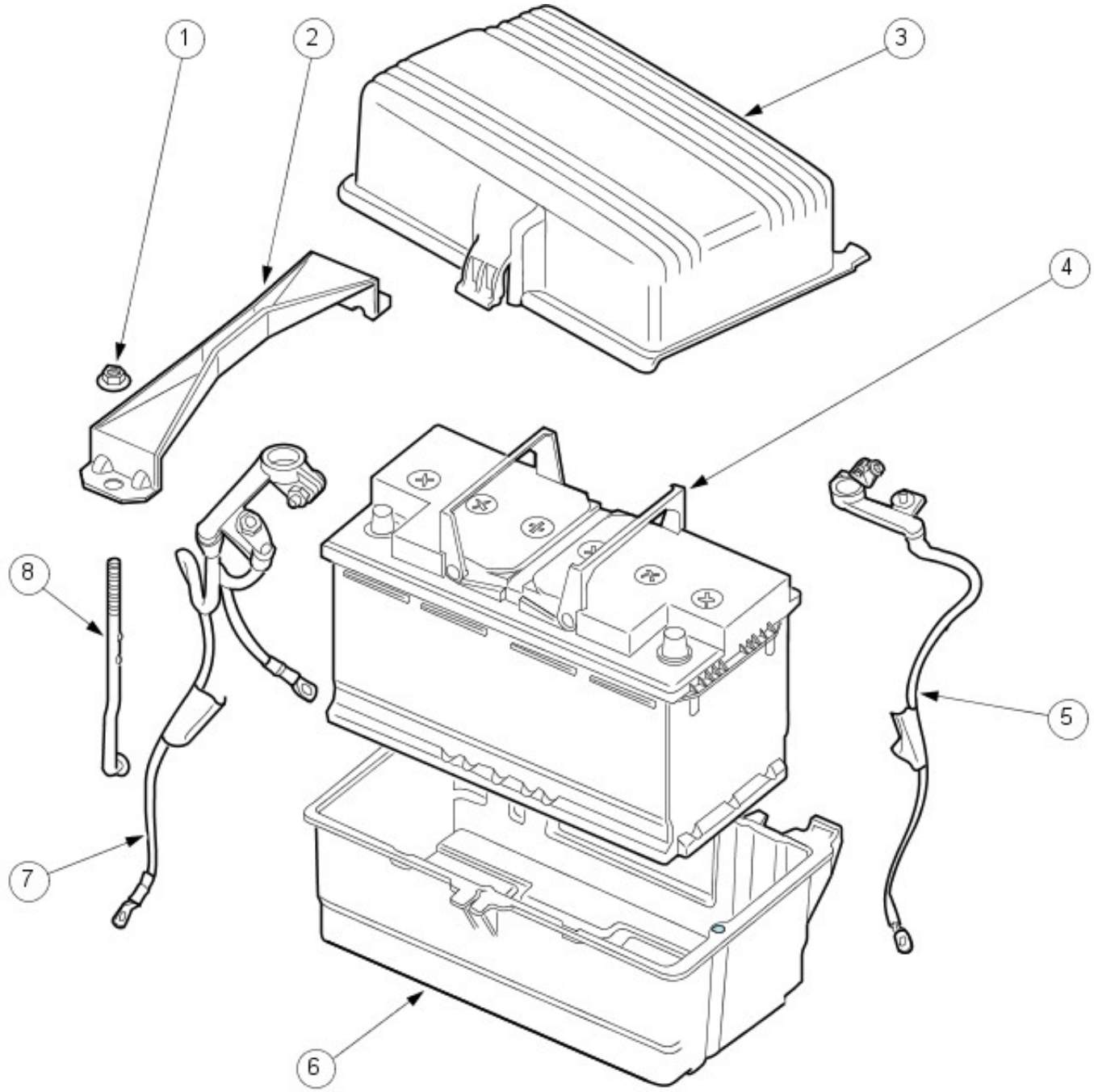
Item	Specification
Battery Capacity Vehicles With Petrol Engines	80 Ah
Battery Capacity Vehicles With Diesel Engines	80 Ah
Battery Cold Cranking Vehicles With Petrol Engines	680 Amps
Battery Cold Cranking Vehicles With Diesel Engines	640 Amps

Torque Specifications

Description	Nm	lb-ft	lb-in
Battery to starter motor solenoid cable retaining nut - vehicles with 2.0L, 2.5L or 3.0L engines	12	9	-
Battery ground cable to body retaining bolt	25	18	-
Battery ground cable to transmision retaining bolt	25	18	-
Battery ground cable to starter motor retaining bolt - vehicles with manual transmission and 2.0L, 2.5L or 3.0L engines	35	26	-
Generator positive cable retaining nut - vehicles with 2.0L diesel engine	8	-	71

Battery, Mounting and Cables - Battery and Cables
Description and Operation

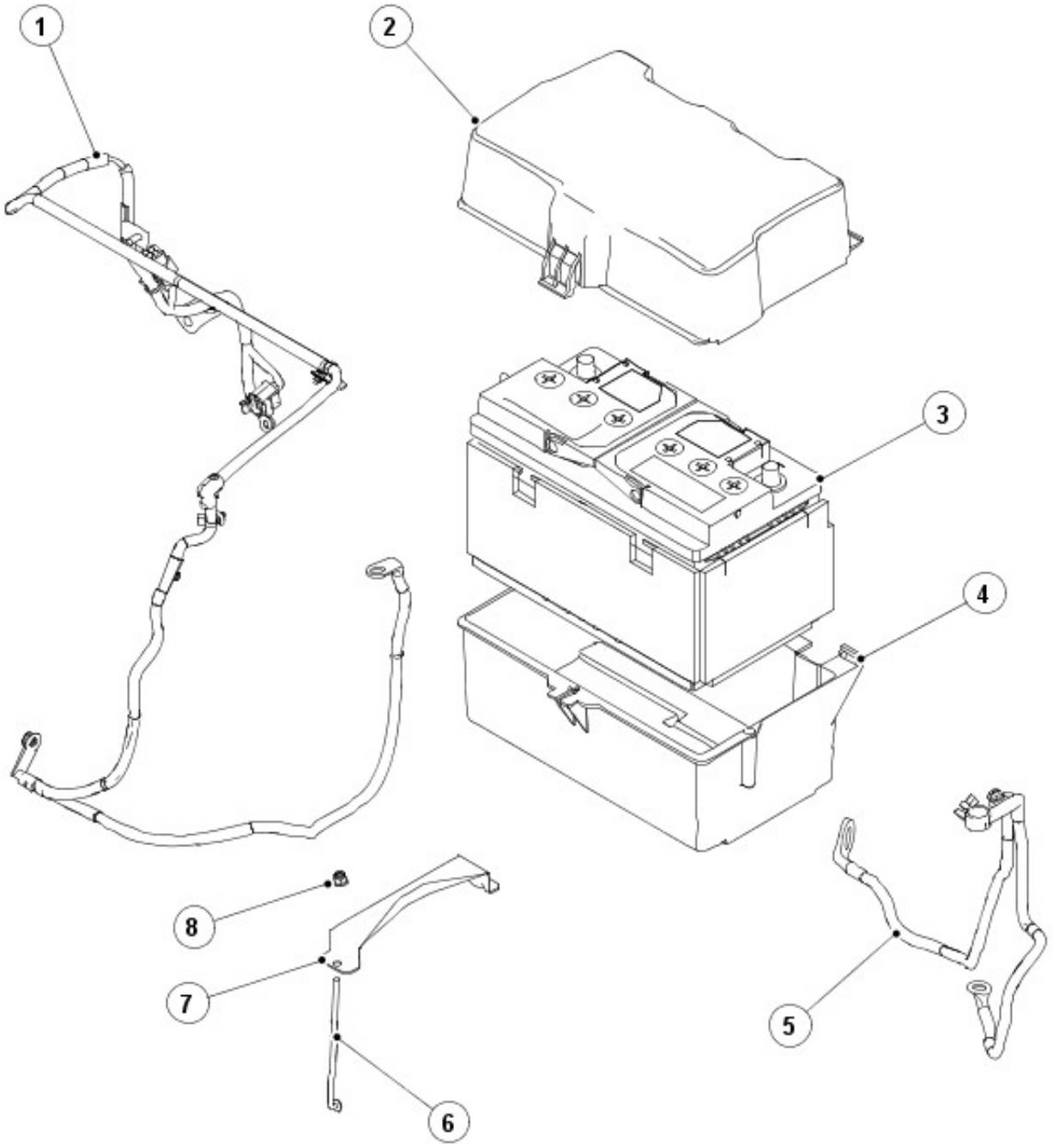
Vehicles fitted with 2.0L, 2.5L and 3.0L engines



VUJ0003823

Item	Part Number	Description
1	—	Battery clamp retaining nut
2	—	Battery clamp
3	—	Battery cover
4	—	Battery
5	—	Battery to starter motor solenoid cable
6	—	Battery tray
7	—	Battery ground cable
8	—	Battery clamp retaining bolt

Vehicles fitted with 2.0L diesel engines



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Item	Part Number	Description
1	—	Battery to generator and starter motor positive cable
2	—	Battery cover
3	—	Battery
4	—	Battery tray
5	—	Battery ground cable
6	—	Battery clamp retaining bolt
7	—	Battery clamp
8	—	Battery clamp retaining nut

The battery fitted is a 12 volts (DC) 80 ampere hour.

The battery ground cable consists of two heavy duty cables which are connected between the battery ground distributor pole and both the vehicle body and transmission.

Battery, Mounting and Cables - Battery

Diagnosis and Testing

For additional information, refer to the battery care manual.

Contents

INTRODUCTION

This publication sets out, for the benefit of importers and dealers worldwide, requirements for the care and maintenance of batteries, from the vehicle's despatch from the factory to its hand-over to the customer.

The clearly laid-out and illustrated sections guide importers and dealers through each stage of the vehicle's receipt, storage, pre-delivery and customer hand-over. Likewise, this publication can be used has a guide to the handling and care of batteries in service. It is vital to appreciate that unless each process is rigorously applied on all vehicles, the customer will receive a vehicle with a battery which will not provide a satisfactory service life.

It is very important that open circuit voltage and all other test results quoted throughout this publication are adhered to. If they are applied incorrectly batteries could be scrapped unnecessarily. Refer to **BATTERY TESTING SECTION** for detailed information (see page 10 onwards).

It is equally important therefore to note the following key points:

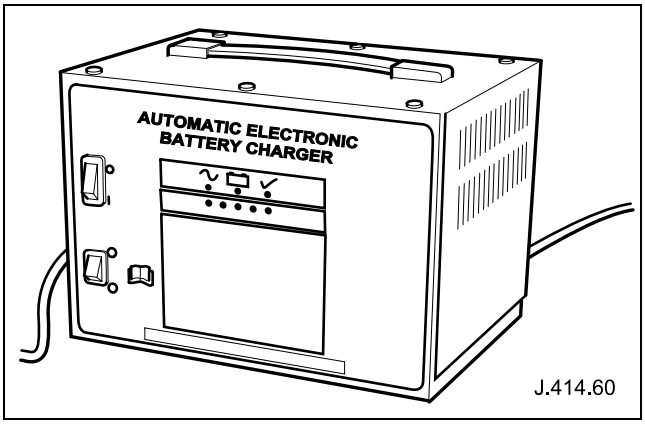
- All new vehicles leave Jaguar Cars fitted with a transit relay and, on certain models, have fused circuits disabled. The transit relay must be removed and the fuses (where applicable) refitted **NOT MORE THAN 24 HOURS** before the customer takes delivery.
- The battery will be damaged if it is allowed to slowly discharge over a number of weeks / months, or is left in a discharged state for a lengthy or indeterminable time period. For this reason the battery must be tested / re-charged if necessary every month, and MUST BE re-charged after every three-month period of storage (refer to the New Vehicle Storage Manual) and update the Storage History Sheet.
- The battery, under no circumstances should be disconnected with the engine running because, under these conditions, the alternator can give a very high output voltage. This high transient voltage will damage the electronic components in the vehicle. Loose or incomplete battery connections may also cause high transient voltage.
- Ignition keys must not be left in the ignition lock barrel when the transit relay has been removed and the fuses re-installed, otherwise quiescent current will increase and the battery will discharge more rapidly.

Both importers and dealers will appreciate their responsibility to ensure that only vehicles having a fully satisfactory battery may be processed further through the distribution selling chain.

EQUIPMENT (Minimum standard)

Existing minimum standards requirements are presently specified as follows:

Traction Battery Charger



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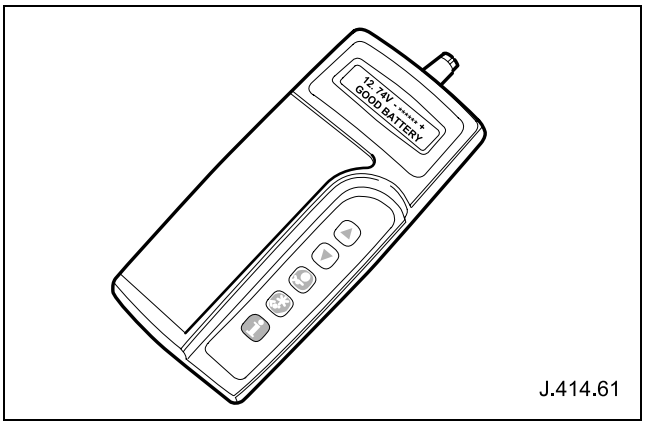
Midtronics Tester



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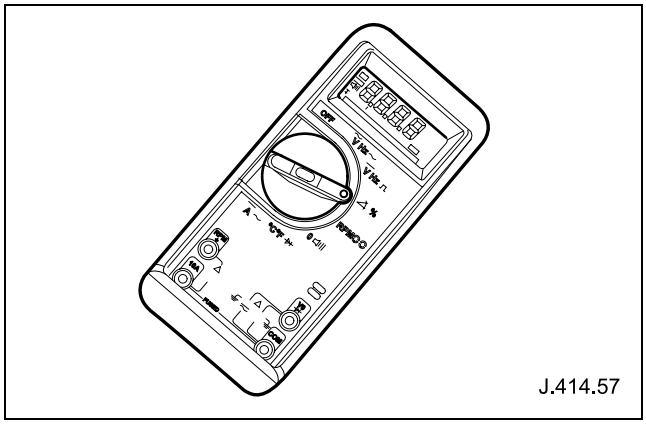
EQUIPMENT (Optional)

Further equipment recommended by Jaguar:

Digital Multi-meter: 3.5 digit.



HEALTH AND SAFETY PRECAUTIONS

BATTERY CELLS CONTAIN SULPHURIC ACID AND EXPLOSIVE MIXTURES OF HYDROGEN AND OXYGEN GASES. IT IS THEREFORE ESSENTIAL THAT THE FOLLOWING SAFETY PRECAUTIONS ARE OBSERVED:

1. Batteries emit highly explosive hydrogen at all times, particularly during charging. To prevent any potential form of ignition occurring when working in the vicinity of a battery:
   - Do not smoke when working near batteries.
   - Avoid sparks, short circuits or other sources of ignition in the battery vicinity.
   - Switch off current before making or breaking electrical connections.
   - Ensure the battery charging area is well ventilated.
   - Ensure the charger is switched off when: a) connecting to a battery; b) disconnecting from the battery.
   - Always disconnect the ground cable from the battery terminal first and reconnect it last.

2. Batteries contain poisonous and highly corrosive acid. To prevent personal injury, or damage to clothing or the vehicle, the following working practices should be followed when topping-up, checking the electrolyte specific gravity, removal, refitting or carrying batteries:

   Always wear suitable protective clothing (an apron or similar), safety glasses, a face mask and suitable gloves. If acid is spilled or splashed onto clothing or the body, it must be neutralised immediately, then rinsed with clean water. A solution of baking soda, or household ammonia and water may be used as a neutraliser.

   In the event of contact with the skin, drench the affected area with water. In the case of contact with the eyes, bathe the affected areas with cool clean water for approximately 15 minutes and seek urgent medical attention.

   If battery acid is spilled or splashed on any surface of a vehicle, it should be neutralised and rinsed with clean water.

   Heat is generated when acid is mixed with water. If it becomes necessary to prepare electrolyte of a desired specific gravity, SLOWLY pour the concentrated acid into water (NOT water into acid), adding small amounts of acid while stirring. Allow the electrolyte to cool if noticeable heat develops. With the exception of lead or lead-lined containers, always use non-metallic receptacles and / or funnels. Do not store acid in excessively warm locations or in direct sunlight.

3. Due to their hazardous contents, the disposal of batteries is strictly controlled.

   When a battery is scrapped, ensure it is disposed of safely, complying with local environmental regulations. If in doubt, contact the local authority for advice on disposal facilities.

SCENARIOS

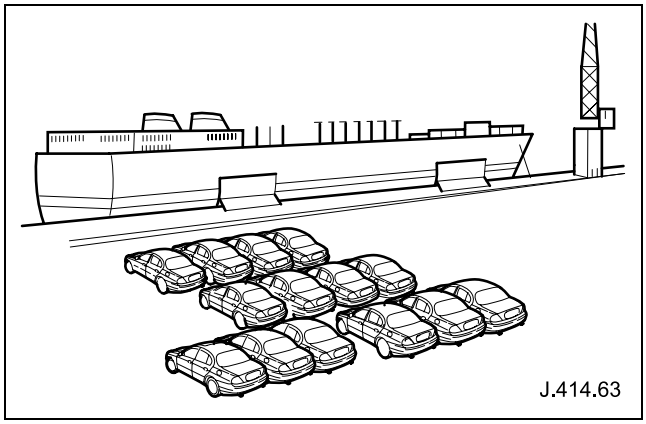
A **Midtronics tester** if available, may be used to determine the battery condition in the scenarios below:

PORT OF ENTRY

Immediately following the receipt of a vehicle at the port of entry, proceed as follows:

Carry out an open circuit voltage test (see page 13).

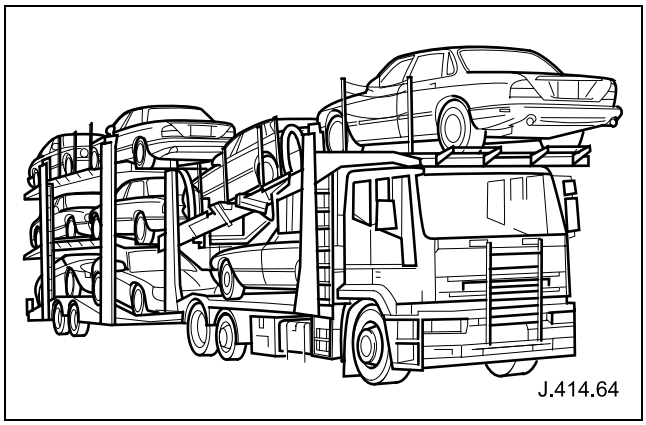
Compare your results ~ carry out the recommended actions accordingly.


J.414.63

ARRIVAL AT THE DEALERSHIP

On arrival at the dealer a battery open circuit voltage test (see page 13) must be carried out to ensure the vehicle's battery is in a satisfactory condition to put into storage.

Compare your results ~ carry out the recommended actions accordingly.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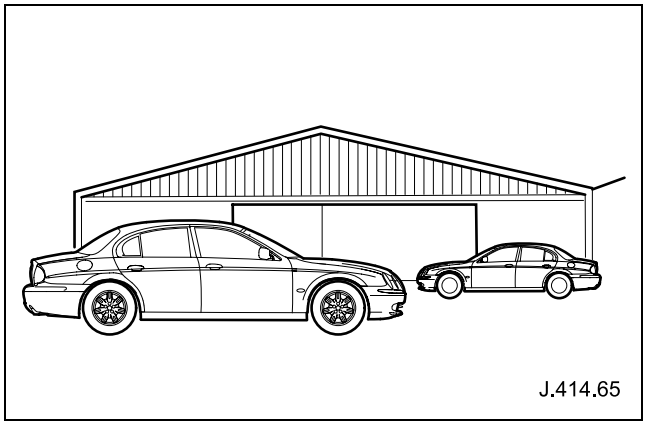
VEHICLES IN STORAGE

Perform an open circuit voltage test (see page 13). Compare your results ~ carry out the recommended actions accordingly. Providing the battery open circuit voltage is 12.5 volts or above, the transit relay in place, or the battery disconnected, the vehicle may be stored. The battery must be tested and / or re-charged every month, and MUST BE re-charged after every three-month period irrespective of any test. Record your test results on the Storage History Sheet (see New Vehicle Storage Manual) to indicate when a re-charge will be necessary.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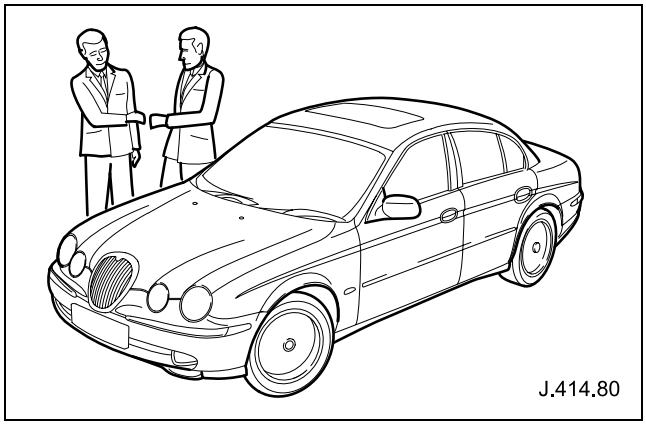
DELIVERY TO THE CUSTOMER

It is essential that the following actions are conducted in the 24 hours prior to the agreed hand-over time:

Perform an open circuit voltage test (see page 13) then set clock, set radio etc.

Compare your results ~ carry out the recommended actions accordingly.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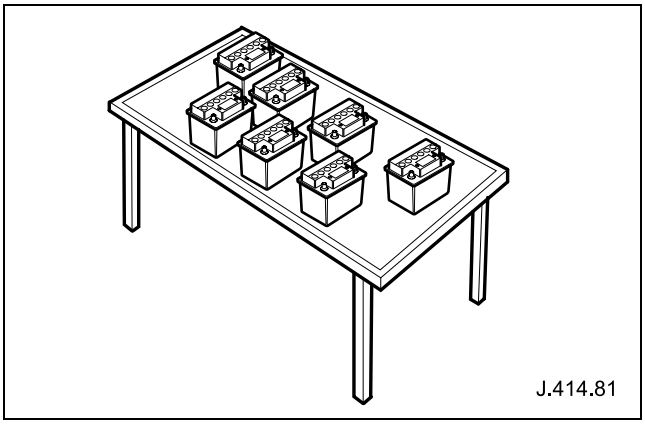
NEW BATTERY STORAGE & CHARGING

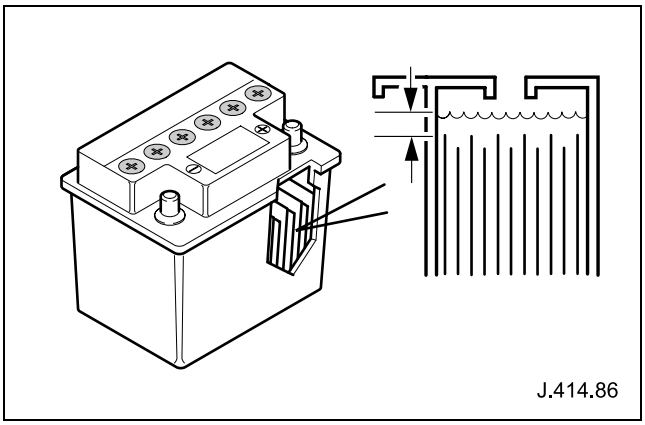
It is essential that a suitably ventilated defined area exists in each dealership for battery charging and post-charge checking. Likewise, an area should be allotted for scrap batteries, and clearly indicated as such. It is recommended that dealers always have fully charged batteries ready for use. However the battery MUST BE tested and charged if necessary every month, and charged after three months irrespective of any test.

Battery must be re-charged after a maximum of 3 months storage (see Storage History Sheet in the New Vehicle Storage Manual).



To bring a serviceable but discharged battery back to a fully charged condition proceed as follows:

- Check electrolyte level by visual inspection of the maximum level indicator on the battery casing, indicating adequate level above the battery separators.
- Charge the battery by following the instructions given with the charger in use (see note below).
- Carry out a post-charge test (see page 8).



Note: Jaguar currently use two types of batteries which consist of Lead Antimony Sb and Lead Calcium Ca. It is very important that when charging batteries using the traction charger that the switch selector on the charger is selected for the correct type of battery. If the wrong switch is selected the result would be a battery that is not charged fully and / or overheating can occur.

Use the table below as a guide to the type of battery fitted and select the switch accordingly before commencement of charging.

Part Number	Battery Type
JLM 10453	Lead Antimony (Sb)
LMC 1250 AA1	
LRA 1250 AA	
XR83 10655 AA	
Other part numbers	Lead calcium (Ca)

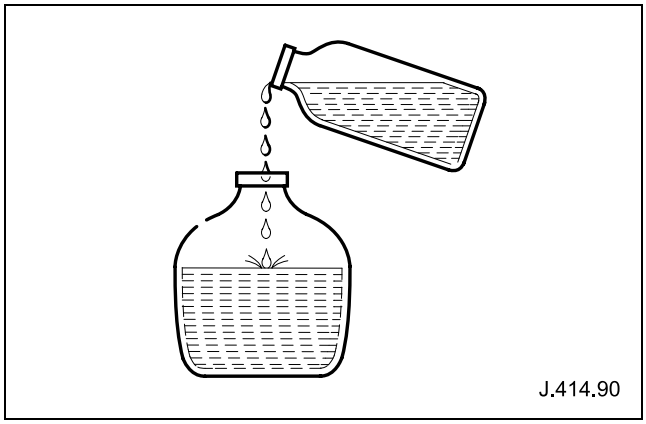
DRY CHARGE COMMISSIONING (overseas markets)

This specific gravity acid is correct at 25°C, for different temperatures apply the following formulae:

For each 10°C above 25°C subtract 0.007 and for each 10°C below add 0.007

Thus:

45°C = 1.2686
35°C = 1.2693
25°C = 1.270
15°C = 1.2707
5°C = 1.2714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Note: Always pour concentrated acid slowly into water; not water into acid.

- Pour the concentrated acid slowly into the water then check the specific gravity (using the table above).
- Fill the cells with 1.270 @ 25°C specific gravity acid electrolyte to the maximum mark indicated on the battery casing.
- Allow battery to stand for 15 minutes.
- Add extra acid electrolyte if necessary to the maximum mark indicated on the battery casing.
- Within 5 minutes place the battery on charge for 24 hours.
- After the charge period, check electrolyte level by visual inspection of the maximum level indicator on the battery casing, indicating adequate level above the battery separators.
- Fit vent lids and perform a post-charge test (see page 8).

POST-CHARGE TEST

This test can be carried out with the use of a **Midtronics tester**, if available.

The purpose of this test is to ensure that the charging process has fully charged the battery and should always follow dry charge commissioning or new battery storage and charging.

Note: The figures quoted below only apply to new batteries; the post-charge test needs to show the battery has recovered to the higher voltage before putting it into storage.

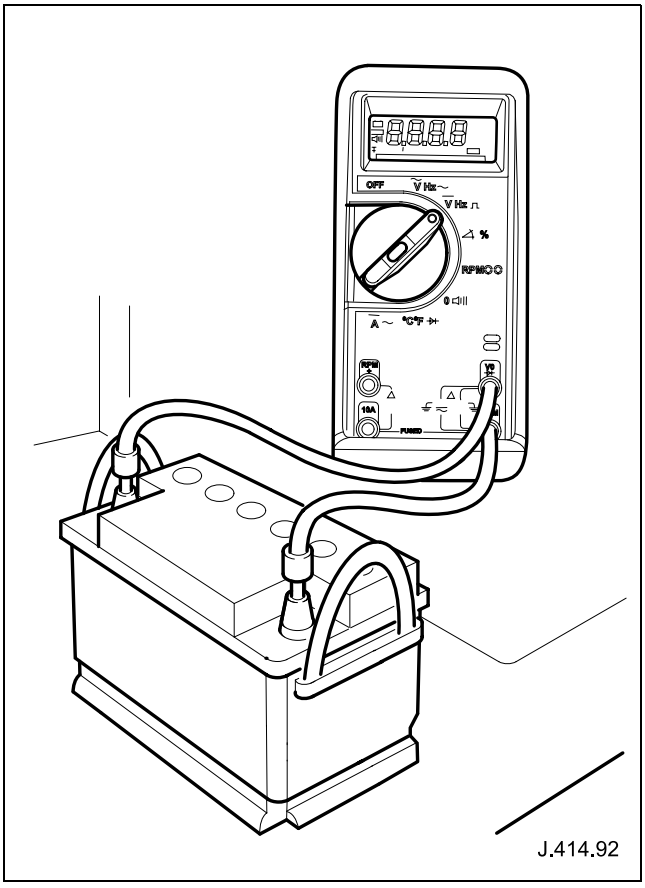
AT LEAST 24 HOURS AFTER THE CHARGE CYCLE IS COMPLETED or if this time restraint is unacceptable due to circumstances then:

- Remove the battery surface charge (see page 13).
- Carry out an open circuit voltage test (see page 13).

Then compare your results with those below if the battery is new and carry out the recommended actions accordingly (or refer to the figures on page 13 for in service batteries).

O/C voltage ~ **12.69 or less: Scrap battery and / or submit for warranty**.

O/C voltage ~ **12.7 or above: OK to use or store**.

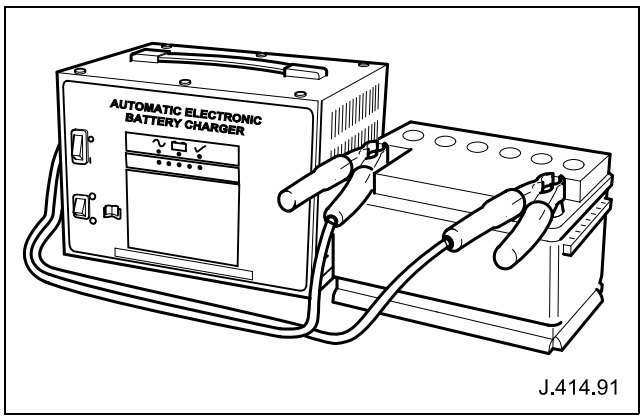


CHARGING IN SERVICE BATTERIES

CHARGING EQUIPMENT MUST BE USED IN THE FOLLOWING MANNER

1. Do not boost charge the battery.
2. Do not charge at more than 16 volts.
3. Do not charge at more than 40 amps.
4. Do not during charging let the battery exceed a temperature of 50°C.
5. Do not charge more than one battery per charger.
6. Do not leave a battery in a discharged condition but promptly re-charge.
7. Use chargers with the following specification:
   - Automatic controls, no manual boost charge.
   - Automatic switch off at charge termination.

   (The use of such chargers will minimise potential battery damage caused by over charging.)
8. Always check the electrolyte levels before and after charging, top-up with distilled water if necessary.
9. After charging is complete, carry out a post-charge test (see page 8) and carry out the recommended actions accordingly.



BATTERY TESTING SECTION

Note: Due to this manual being published during a period when the Traction charger and Midtronics tester are to become mandatory equipment. We appreciate there will be a time period for the necessary equipment to reach all dealers and therefore have included 2 report forms for your convenience, one which includes the Midtronics recommended process and one without to allow for all dealers to become fully equipped. Only one of the forms should be filled and returned dependent on the level of equipment available. Likewise the test processes are also included detailing information on how to carry out a specific gravity test and a battery high rate discharge test to aid those dealers at the time of publication of this document who are still without their full equipment compilation. However the next publication of this document will not include the latter information and it will be expected that all dealers will be fully equipped well in time for the revised document.

The following section gives a detailed description of how to accurately diagnose a battery condition.

The first page is a Battery Report Form which must be used in conjunction with the test pages. Mandatory fields on the Report Form are shaded and they must be filled in. Likewise, we actively encourage all other fields to be filled in with as much information and detail as possible.

To accurately determine the battery condition, you MUST carry out battery testing as indicated on the battery report. Following the tests in the order shown on the Report Form will encourage a logical and methodical approach to accurately diagnosing battery faults, failure to follow this routine rigorously and the result will be incorrectly diagnosed battery conditions.

BATTERY REPORT FORM (Midtronics)

GENERAL INFORMATION (**Note:** Mandatory fields are shown as shaded and must be filled in)													
Customer's Name							Dealer Code (Export)						
Job Number							Corporate I.D. (UK)						
Date							Battery Date Code						
Technician's Name							No. of Battery Changes						
Vehicle Make & model							Customer's Signature						
VIN							Technician's Signature						

Give a detailed description of the symptoms experienced by the customer (attach separate sheet if necessary)

DIAGNOSTICS (Battery Testing)													
1. Loose battery clamps	YES		NO		10. Quiescent drain (page 15)				mA				
2. Loose hold down clamps	YES		NO		11. Voltage reading under load @ 2000 rpm (page 17)								
3. Corroded terminal / posts	YES		NO		HF / RW – headlamps – heater			–					
4. Physical damage / leaks	YES		NO		Type of Midtronics tester used for diagnosis								
5. Low electrolyte	YES		NO		Jaguar		Tick one box Only						
6. Alternator ~ belt tension	OK		NOT		Land Rover								
7. Surface charge removed	YES		NO		Volvo								
8. Wait 10 min. O/C V. (page 13)				–			Comments:						
9. Midtronics test (page 14)													
Code before charge													

If initial O/C voltage is below 12.5 volts, charge battery for 24 hours. Then remove surface charge.

Code after charge						
Result after charge						

If 'charge and re-test' is the result before and after charge, then replace battery.

If the test after charging gives a result 'good & re-charge', charge a further 24 hours, then re-test.

Replace battery only if 'replace battery', 'bad cell' or 'charge & re-test' has been displayed twice.

BATTERY REPORT FORM (dealers without Midtronics)

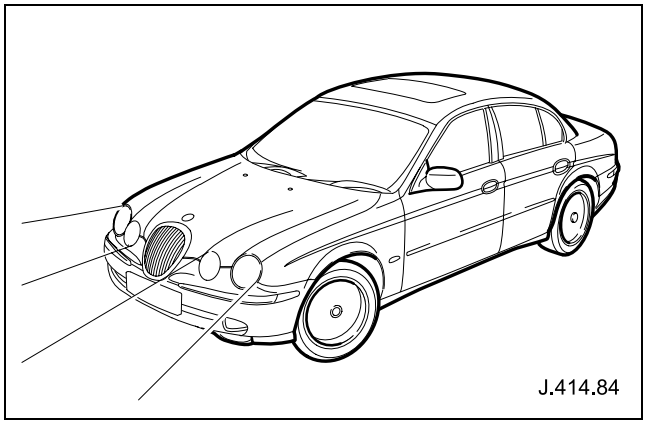
GENERAL INFORMATION (**Note:** Mandatory fields are shown as shaded and must be filled in)												
Customer's Name							Dealer Code (Export)					
Job Number							Corporate I.D. (UK)					
Date							Battery Date Code					
Technician's Name							No. of Battery Changes					
Vehicle Make & model							Customer's Signature					
VIN							Technician's Signature					

Give a detailed description of the symptoms experienced by the customer (attach separate sheet if necessary)

DIAGNOSTICS (Battery Testing)						
1. Loose battery clamps	YES		NO		11. Voltage reading under load @ 2000 rpm (page 17)	
2. Loose hold down clamps	YES		NO		HF / RW – headlamps – heater	–
3. Corroded terminal / posts	YES		NO		12. High rate discharge test (page 18)	
4. Physical damage / leaks	YES		NO		Temperature	°C °F
5. Low electrolyte	YES		NO		Reading after 15 seconds	–
6. Alternator ~ belt tension	OK		NOT		Comments:	
7. Surface charge removed	YES		NO			
8. Wait 10 min. O/C V. (page 13)			–			
9. Quiescent drain (page 15)				mA		
10. Specific Gravity (without Midtronics) (page 17)						
No. 1 Cell		–				
No. 2 Cell		–				
No. 3 Cell		–				
No. 4 Cell		–				
No. 5 Cell		–				
No. 6 Cell		–				

OPEN CIRCUIT VOLTAGE TEST

SURFACE CHARGE (Removal)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Before carrying out an open circuit voltage check, you must ensure that there is no battery surface charge present. The battery may be tested either on a bench or on the vehicle. A vehicle which has had it's battery charged or been driven within 24 hours prior to the test must have it's surface charge removed using one of the following methods:

- Wait 24 hours before the test is performed.
- Or switch on the headlights on main-beam for 5 minutes for all models except X-TYPE which should be for 2 minutes only.

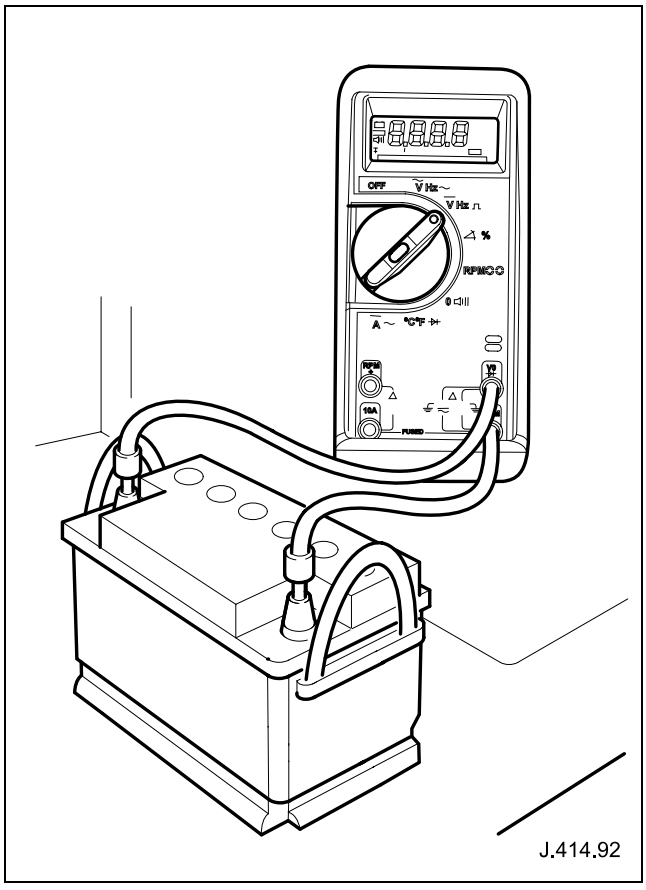
Open circuit voltage test (Multi-meter connections)

Battery O/C voltage should be measured after 10 minutes has elapsed following surface charge removal. Measure the O/C voltage of the battery by using your Midtronics tester or a 3.5 digital multi-meter. Connect the red positive lead of the digital multi-meter to the battery positive terminal post and the black negative meter lead to the negative battery terminal post, as shown below (**with no additional loads present and engine stationary**).

- Compare your results and carry out the recommended actions accordingly, as shown below.

Note: If preliminary findings give unsatisfactory results (i.e. 12.45 volts or less) then enter the readings obtained onto the Battery Report Form, and proceed with a full battery diagnosis.

Results obtained:



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Open circuit voltage ~ 12.45 volts or less

- Fit replacement battery.
- Scrap or return removed battery.

Unsatisfactory result: See note above and carry out a full diagnostic routine.

Open circuit voltage ~ 12.45 to 12.49 volts

- Remove and re-charge battery.
- Charge the battery by following the instructions given with the charger in use (see note on charging on page 6).
- Carry out a post-charge check (see page 8).
- If the result after charging the battery is 12.49 volts or less then fit a replacement battery.
- Scrap or return removed battery.

Open circuit voltage ~ 12.5 volts or above

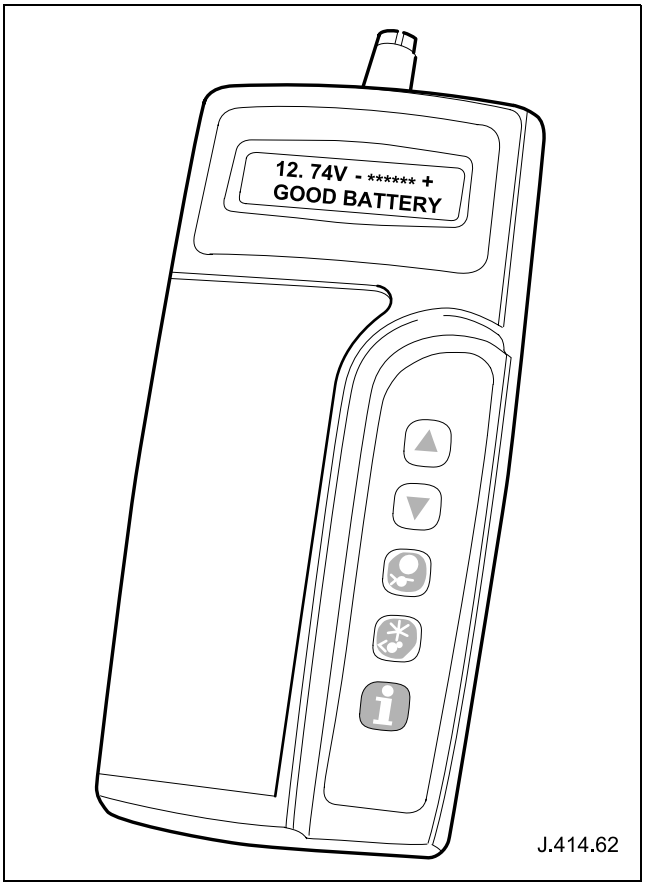
Do one of the following:

- @ Port of entry ~ deliver to the dealership.
- @ Dealership ~ deliver to the customer or put into storage.

MIDTRONICS TESTING

(Suitable for 12 volts batteries only)

Note: The battery surface charge must be removed before this test (see page 13).



TEST PROCEDURE

- Ensure the battery terminals / connectors are clean.
- Connect red clip to positive (+) battery terminal.
- Connect black clip to negative (–) battery terminal.
- Rock clips back and fourth to ensure a good connection to the battery.

Note: DO NOT connect the tester to any other circuit or chassis point.

Step 1

Use the 'Arrow' buttons to scroll to the battery's labelled CCA rating.

Step 2

Press the 'Test' button that corresponds to the correct battery temperature. i.e. if the temperature is above 0°C press the 'Sun' button. If the battery temperature is below 0°C press the 'Ice Crystal' button. Carry out action, based on tester results (see table below).

Step 3

Press the 'Information' button to view the test code.

Step 4

- Enter the readings obtained on to the Battery Report Form (see page 11).

Tester Results	Actions
GOOD BATTERY	Return to service.
GOOD – RE-CHARGE	Fully charge the battery and return to service.
CHARGE & RE-TEST	Fully charge the battery. Before re-testing remove surface charge. If this result remains after surface charge removal – replace the battery.
REPLACE BATTERY or BAD CELL BATTERY	Ensure surface charge was removed, if so, disconnect the battery from the vehicle and re-test. If this result remains after surface charge removal – replace the battery. * **Warning: Do not charge** *
UNABLE TO TEST	Disconnect the battery from the vehicle and re-test.

Press the 'Information' button and carefully note the 6-digit 'test code' on the battery, job card and the Battery Report Form. The battery tester will always generate a 'test code' on completion of every test.

VEHICLE QUIESCENT CURRENT TESTING

If an open circuit voltage test gives a result in the region of 12.45 to 12.49 volts, it is recommended that you ensure the battery isn't slowly being discharged by an electrical consumer that is remaining on after the vehicle's shutdown period (see page 16 for typical shutdown periods). Likewise if a customer complains of a vehicle battery that discharges continuously or when left for a prolonged period of time it is recommended that you perform a quiescent drain test as described below:

Method of Measurement

In order to correctly measure quiescent drain, it is preferable to use WDS with the current probe attachment. If this is not possible, then an ammeter may be used. Whichever method is used, technicians MUST adhere to the following procedure.

Note: Do NOT use a multi-meter to check the battery drain on vehicles with an electronic throttle (e.g. XK8 1997~) as the current drawn by the throttle is in excess of the fuse rating in most multi-meters, and damage to your multi-meter may result.

Using WDS with current probe

- Switch off all electrical loads and remove the ignition key.
- Connect current probe to WDS.
- Calibrate the probe.
- Clamp around the battery lead / fuse box lead. **Go to Test results.**

Using a multi-meter rather than WDS

- Disconnect the battery negative lead.
- Connect the ammeter between the battery negative post and negative lead using clips.
- Select high meter range (i.e. equal or more than 10 amps) then switch the multi-meter on. **Go to Test results.**

Test results (both methods)

- Switch ignition 'on' then 'off' (DO NOT CRANK) and remove the key.
- Close or latch all doors and remove any other potential electrical consumers.
- Observe / compare the readings obtained over the timescales identified (see page 16).
- Enter the reading obtained on to the Battery Report Form (see page 12).

Note: The preferred method of testing following an excessive current consumption figure is to use the clamp of the ammeter around individual fuse box leads to the various suspected circuits to identify a potential cause. Rather than the old method of pulling fuses out, in a one after the other fashion.

The main reasons for using the current probe to determine which fuse box / circuit the drain is going through are:

1. Many modules take a considerable time to power down, every time the fuse is removed and refitted, the quiescent drain figures will need 45 minutes to reset.
2. Sometimes the drain is caused by a module 'holding on' to something that has been switched off. Sometimes it is only a relay winding that is activated. Pulling the fuse can allow this to 'reset' and the drain will be lost and undiagnosed. Similarly, if for example, the headlights of an S-TYPE are switched on, removing the switch input will not turn them off. Therefore the reading obtained would be incorrect and could mislead.

BATTERY CURRENT DRAIN TYPICAL VALUES

The battery drain should be measured (see page 15 using WDS where available) with the vehicle in the double-locked armed state (i.e. vehicle alarm fully armed), with all doors and other body apertures either closed or latched, so as to appear closed from an electrical point of view.

The test should take place after the vehicle has entered shutdown mode. The time taken for this to occur after key-off varies according to model. (Refer to the table below.)

Note: When the vehicle is armed, the effect of the LED flashing is to cause a pulsation in the measured current drain. In this case, either the time average current should be taken (using a meter with an averaging function) or the current reading should be taken, ignoring the brief high current peaks.

The current drain after the initial shutdown period, should not exceed the value shown in table.

Model	Shutdown Period (minutes)	Typical Values Battery Drain (mA)
XJS 3.2	60	< 30.0
SOV 3.2	60	< 37.3
XJ6 4.0	60	< 38.6
XJS	60	< 43.9
XJ6 (95 MY)	60	< 43.0 *
XJ8	60	< 30.0
XK8	60	< 30.0
S-TYPE	40	< 30.0
X-TYPE	30	< 30.0
XJ6 (New Model)	40	< 30.0
XJ8 (New)	40	< 30.0

Note:

1. * Further drop after 72 hours, to 30 mA, but this would not be part of the standard test.
2. The total current drain will be higher if certain Jaguar-approved accessories (e.g. Tracker; Cool bag; Trailer Tow Module) are fitted.

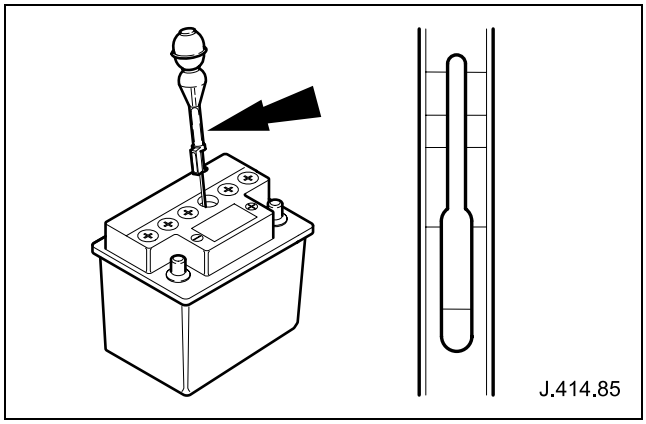
SPECIFIC GRAVITY TESTING

(Dealers without Midtronics)

The SI (System International) measures the strength of the battery electrolyte as density in grams per cubic metre (g/m^3) @ 25°C.

This can be measured by means of a battery hydrometer which measures the battery electrolyte specific gravity (density).

Temperature correction is necessary if readings are taken at anything other than 25°C.



Test procedure

- Remove all battery cell covers or caps, and visually inspect to ensure sufficient electrolyte is present, do not top-up any cells before testing. If topping-up is necessary then you must charge the battery fully then remove any surface charge before continuing with this test.
- Squeeze the bulb of the battery hydrometer and insert the tube into the first cell (No. 1 cell) and draw the battery electrolyte out of the cell and into the hydrometer.
- Allow for any air bubbles to disappear and the float level to stabilise before reading the value displayed by the level of the fluid on the float. Then enter this figure onto the Battery Report Form for cell No. 1.
- Repeat the above operation for the remaining five cells and enter the readings onto the Battery Report Form (see page 12).

Results

- Compare the six cells for consistent readings, regardless of what the readings are, they should ALL be similiar. A significantly lower / higher reading in one cell indicates a bad cell and the battery must be replaced.

Readings obtained	Condition	Actions necessary
1:110 – 1:130	Discharged	Re-charge battery fully ~ Remove surface charge then re-test.
1:230 – 1:250	Approx. 70% charged	Re-charge battery fully ~ Remove surface charge then re-test.
1:270 – 1:290	Charged	Battery serviceable ~ Carry out the remaining tests on Battery Report Form.

VOLTAGE READING UNDER LOAD @ 2000 rpm

Connect the red positive lead of a 3.5 digital multi-meter to the battery positive terminal post and the black negative meter lead to the negative battery terminal post.

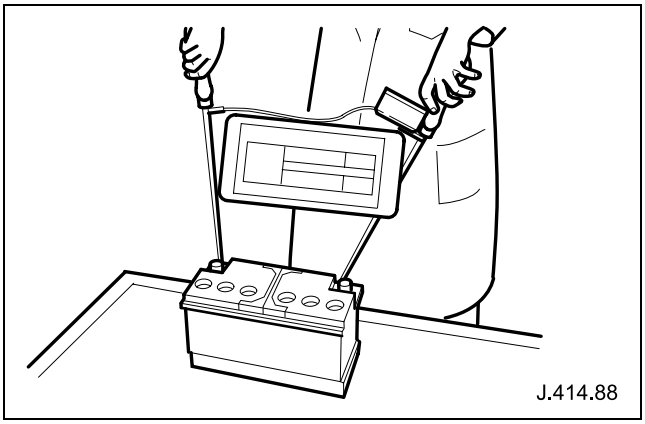
- Start the vehicle's engine and leave to idle for a few minutes.
- Switch on electrical loads: Heated front and / or heated rear screens, headlamps on main-beam and the heater blower on full speed.
- Increase the engine's speed to 2000 rpm.
- When the rpm has remained stable for a few minutes read the voltage on the multi-meter.
- Enter the reading obtained on to the Battery Report Form (see page 12).

BATTERY HIGH RATE DISCHARGE TEST

(Dealers without Midtronics)

The purpose of this test is to ensure that the battery is in a satisfactory condition for service. (This is a severe test for the battery and generally indicates the ability of the battery to perform under heavy load.) It will determine if the battery can perform under such loads that it may have to deal with when starting in cold conditions for example.

Note: You should remove the battery from the vehicle when carrying out a High Rate Discharge test. It is essential that the battery is fully re-charged (see page 6) subsequent to this test.



Perform an open circuit voltage test (see page 13).

Open circuit voltage ~ 12.5 volts or above and with a room temperature of 20°C.

Connect the high rate discharge tester as follows:

- Remove the battery from the vehicle and take off cell tops (during this test observe cells for excessive gassing and bubbling from individual cells indicating a potential faulty cell).
- Connect the testers red lead to the positive and the black lead to the negative battery leads.
- Set the current at 300 amps for new vehicles and new batteries, **for 15 seconds** OR 210 amps for in service vehicles and in service batteries.
- The voltmeter should read 9.6 volts or above after 15 seconds have elapsed.
- Enter the reading obtained on to the Battery Report Form (see page 12).

The battery must be charged after this test (see page 6).

If the voltage is 9.6 volts (or greater) at 20°C (or greater) throughout the 15-second test period, then the battery is serviceable.

With open circuit temperatures that differ from those recommended for testing, refer to the table below:

Degrees °C	Degrees °F	Minimum acceptance voltage
20	70	9.6
15	60	9.5
10	50	9.4
4	40	9.3
Note: Testing below 4°C is not recommended.		

Battery, Mounting and Cables - Battery Connect

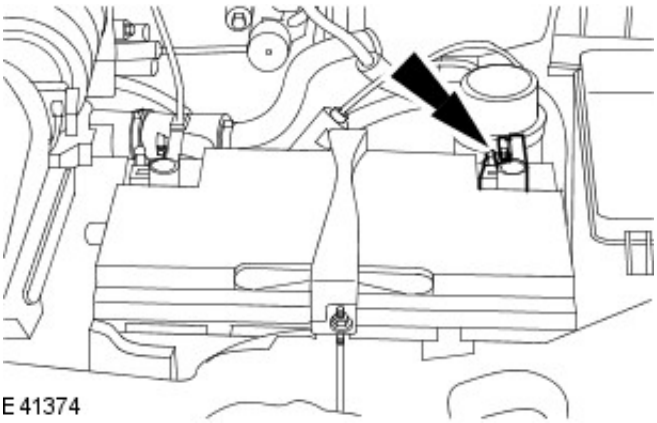
General Procedures

• WARNINGS:

Batteries normally produce explosive gases which may cause personal injury, therefore do not allow lighted substances to come near the battery. When charging or working near the battery always shield your face and protect your eyes. Always provide adequate ventilation. Failure to follow these instructions may result in personal injury.

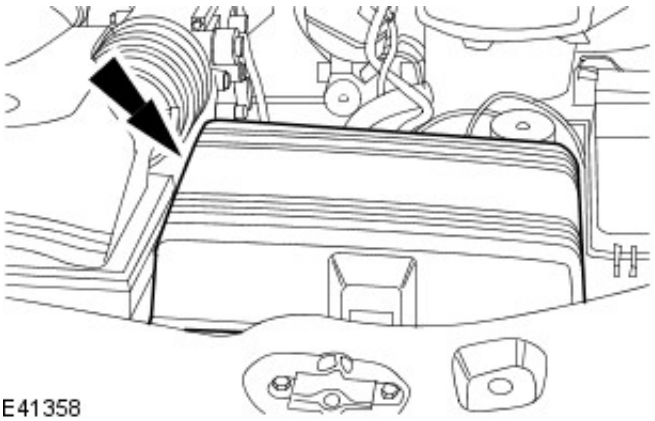
Batteries contain sulphuric acid, avoid contact with skin, eyes or clothing. Shield your face and protect your eyes when working near the battery to guard against possible splashing of the acid solution. In case of acid contact with the skin or eyes, flush immediately for a minimum of 15 minutes and seek prompt medical attention. If swallowed, call a physician immediately. Failure to follow these instructions may result in personal injury.

CAUTION: Make sure all electrical systems are OFF before connecting the battery ground cable. Failure to follow this instruction may result in damage to the vehicles electrical system.


E41374

1. NOTE: Petrol engine shown, diesel engine similar.

Connect the battery ground cable.


E41358

2. NOTE: Petrol engine shown, diesel engine similar.

Install the battery cover.

3. Enter the audio unit keycode and preset radio frequencies.

4. Reset the clock to the correct time.

5. NOTE: When the battery has been disconnected and connected the settings for the windows one touch facility and the anti-trap facility will have been erased.

Initialize the door window motors.
For additional information, refer to: Door Window Motor Initialization (501-11 Glass, Frames and Mechanisms, General Procedures).

6. NOTE: When the battery has been disconnected and connected, the stored idle and drive values contained within the engine control module (ECM) will have been erased. The ECM must relearn the idle and drive values.

Relearn the ECM fueling adaptations.
For additional information, refer to: Evaporative Emissions -

2.0L NA V6 - AJV6 (303-13 Evaporative Emissions, Diagnosis and Testing) /
Evaporative Emissions - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27 (303-13 Evaporative Emissions, Diagnosis and Testing).

Battery, Mounting and Cables - Battery Disconnect and Connect

General Procedures

Disconnect

• WARNINGS:

Batteries normally produce explosive gases which may cause personal injury, therefore do not allow lighted substances to come near the battery. When charging or working near the battery always shield your face and protect your eyes. Always provide adequate ventilation. Failure to follow these instructions may result in personal injury.

Batteries contain sulphuric acid, avoid contact with skin, eyes or clothing. Shield your face and protect your eyes when working near the battery to guard against possible splashing of the acid solution. In case of acid contact with the skin or eyes, flush immediately for a minimum of 15 minutes and seek prompt medical attention. If swallowed, call a physician immediately. Failure to follow these instructions may result in personal injury.

Audio unit key code saving devices must not be used when working on supplemental restraint or fuel systems. When using these devices the vehicle electrical system is still live but with a reduced current flow. Failure to follow this instruction may result in personal injury.

CAUTION: Make sure the engine is not running before disconnecting the battery ground cable. Failure to follow this instruction may result in damage to the vehicles electrical system.

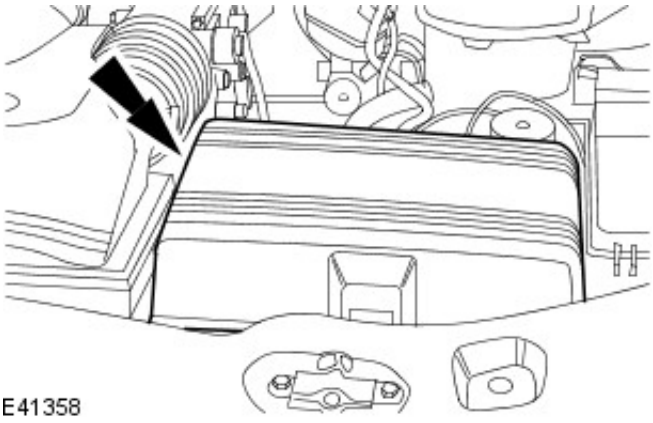
• NOTE: Before disconnecting the battery make sure that no data is required from the engine control module (ECM), as battery cable disconnection will erase any fault codes and idle/drive values held in the keep alive memory (KAM). It is not necessary to disconnect or remove electronic control modules.

• NOTE: This procedure should be used to disconnect the battery while carrying out repairs that refer to the battery being disconnected.

1. Obtain and record the audio unit keycode and preset radio frequencies.

2. NOTE: Petrol engine shown, diesel engine similar.

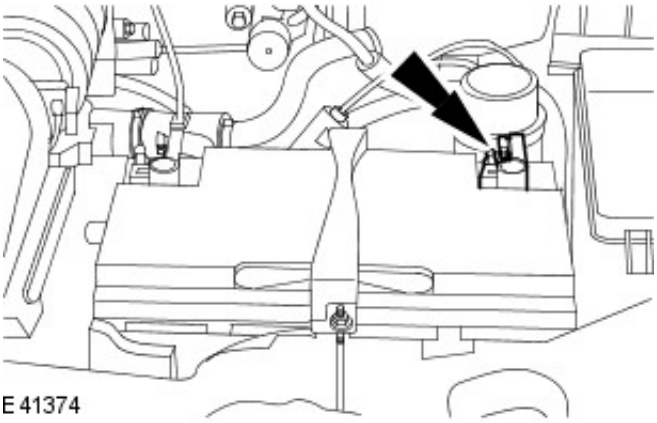
Remove the battery cover.



E41358

3. NOTE: Petrol engine shown, diesel engine similar.

Disconnect the battery ground cable.

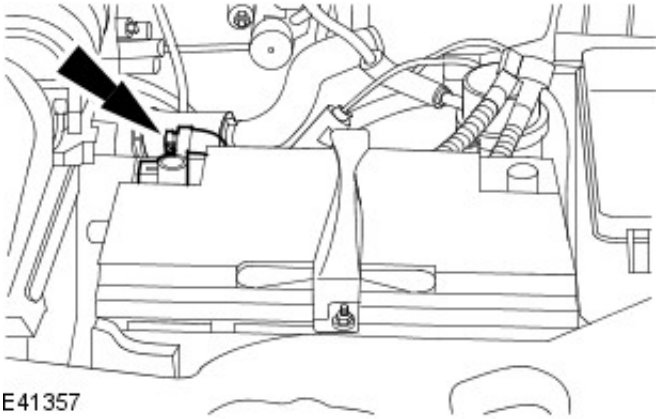


E41374

Battery, Mounting and Cables - Battery
Removal and Installation

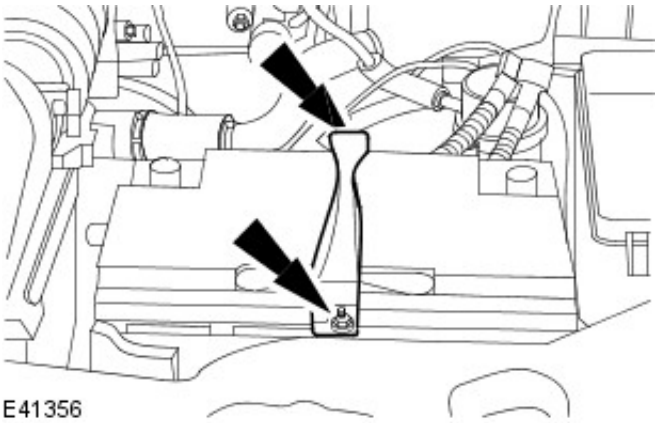
Removal

1. Disconnect the battery ground cable.
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).


E41357

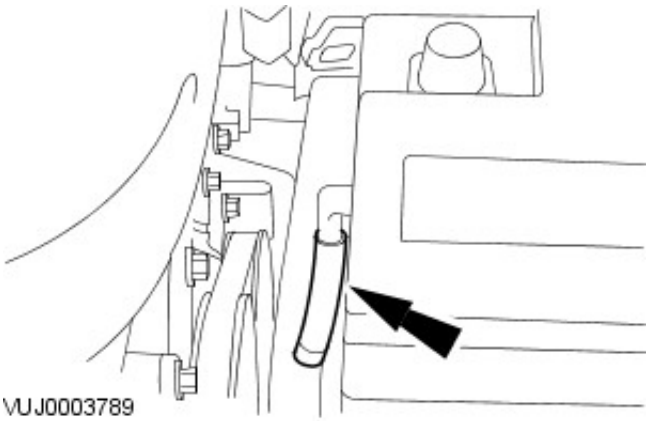
2. NOTE: Petrol engine shown, diesel engine similar.

   Disconnect the battery positive cable.


E41356

3. NOTE: Petrol engine shown, diesel engine similar.

   Remove the battery clamp.

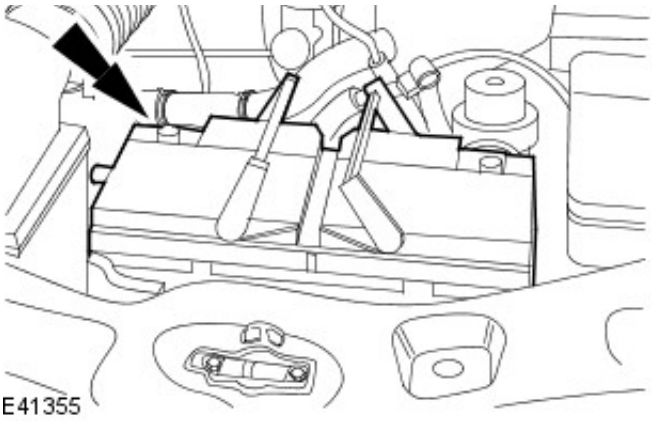

VUJ0003789

4. NOTE: Petrol engine shown, diesel engine similar.

   Disconnect the battery vent tube.

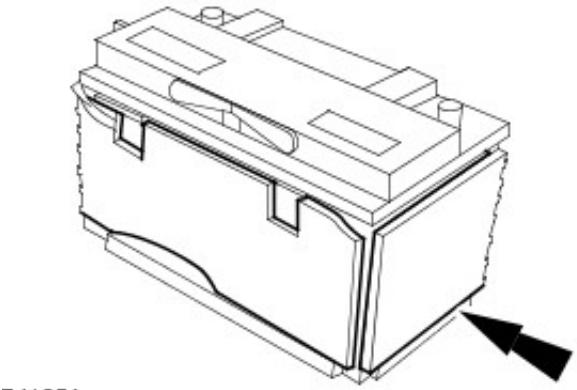
5. NOTE: Petrol engine shown, diesel engine similar.

   Remove the battery.


E41355

6. NOTE: Petrol engine shown, diesel engine similar.

Remove the battery heat shield.


E41354

Installation

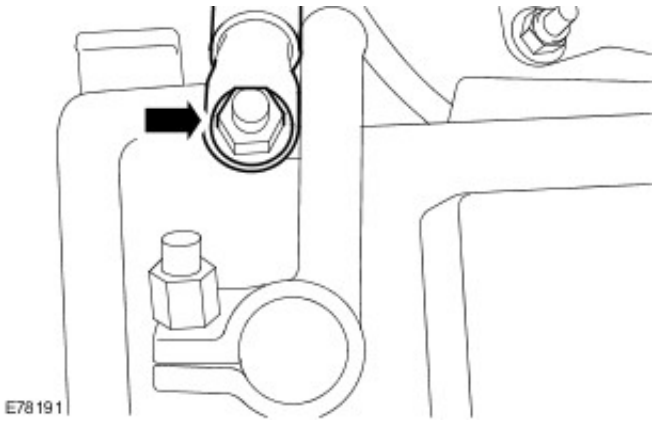
1. To install, reverse the removal procedure.

Battery, Mounting and Cables - Battery Cables2.5L NA V6 - AJV6 / 2.0L NA V6 - AJV6 / 3.0L NA V6 - AJ27

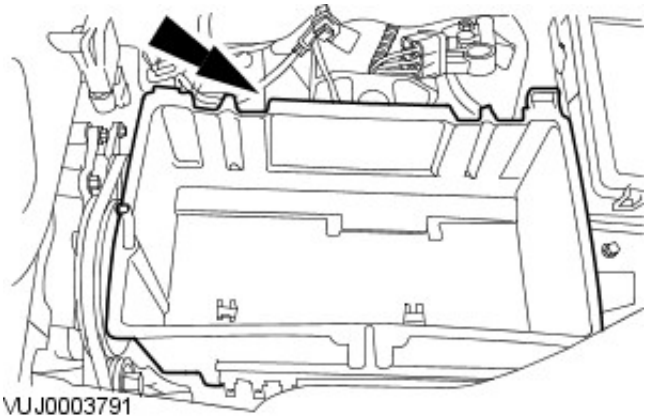
Removal and Installation

Removal

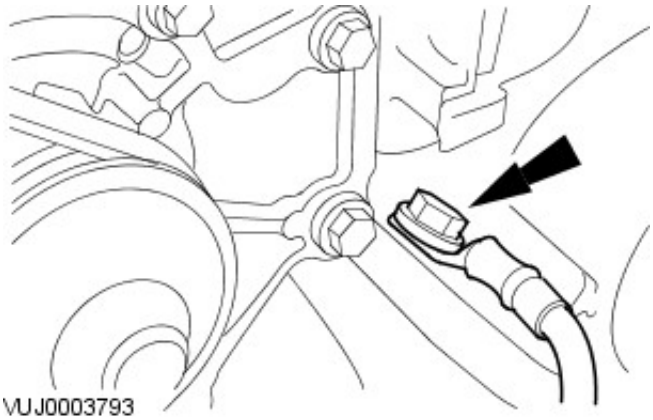
1. Disconnect the battery.
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
2. Detach the battery junction box positive cable.
   - Remove the retaining nut.



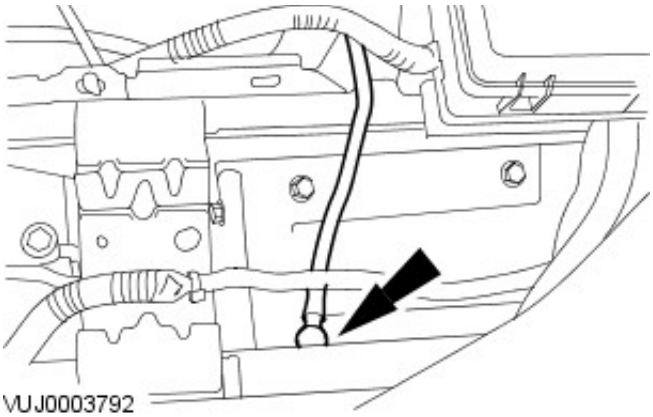
3. Remove the battery.
   For additional information, refer to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).
4. Remove the battery tray.



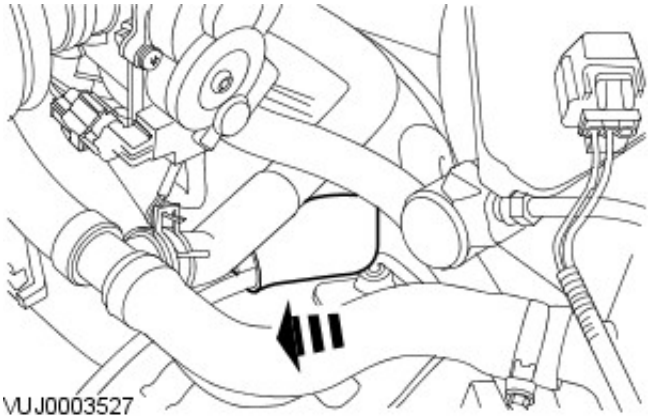
5. Detach the battery ground cable.
   - Remove the retaining bolt.



6. Remove the battery ground cable.
   - Remove the retaining bolt.

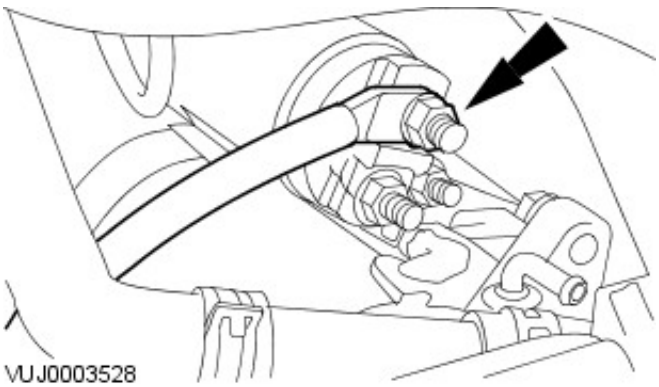


7. Detach the battery to starter motor solenoid cable cover.



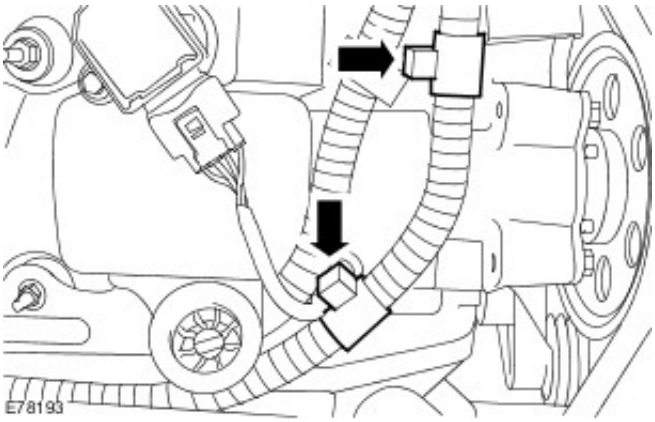
8. Remove the battery to starter motor solenoid cable.

- Remove the retaining nut.

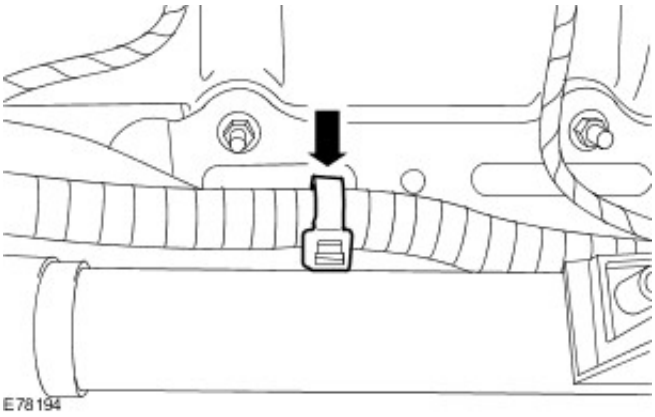


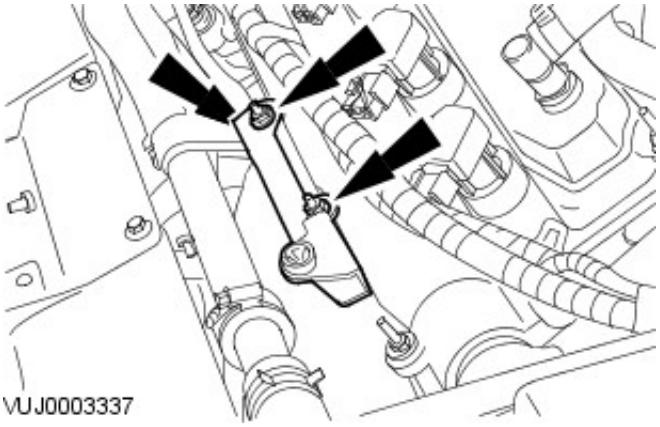
9. Remove the air cleaner assembly.
For additional information, refer to: Air Cleaner (303-12A Intake Air Distribution and Filtering - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Removal and Installation).

10. Detach the wiring harness.



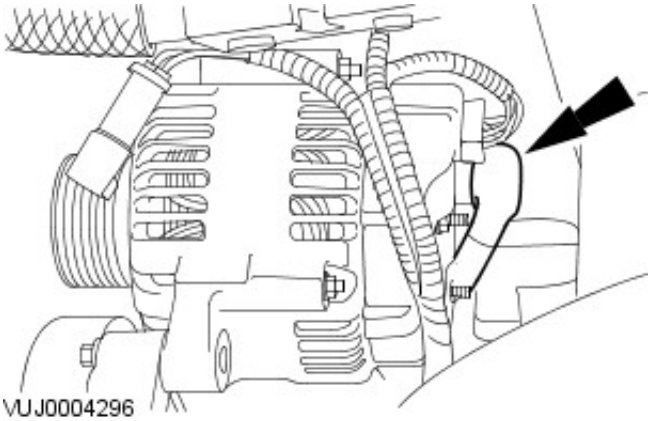
11. Detach the wiring harness.



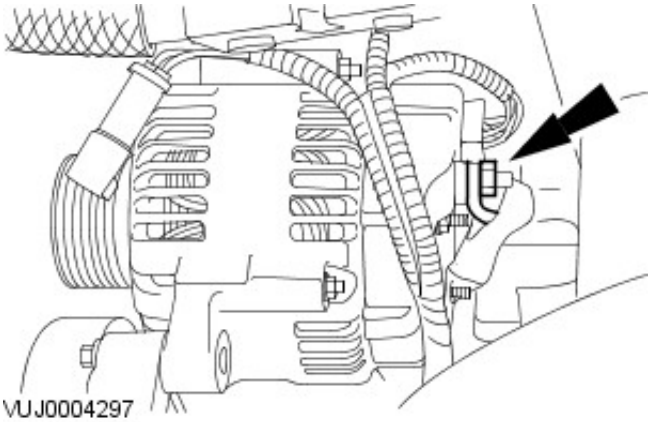


12. Remove the air filter retaining bracket.

- Remove the retaining nuts.



13. Detach the generator battery positive cable protective cover.



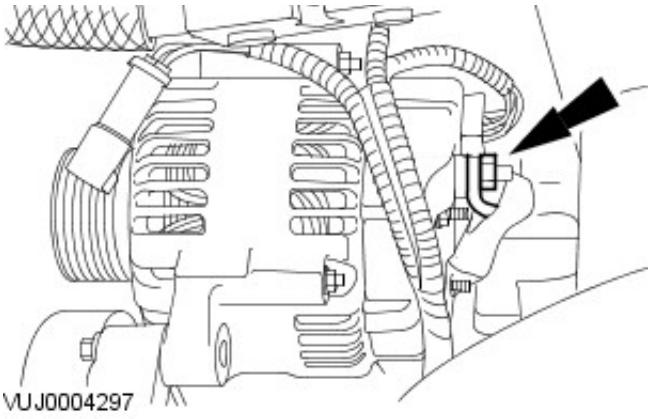
14. Remove the battery positive cable.

- Detach the generator battery positive cable electrical connector.
- Remove the retaining nut.

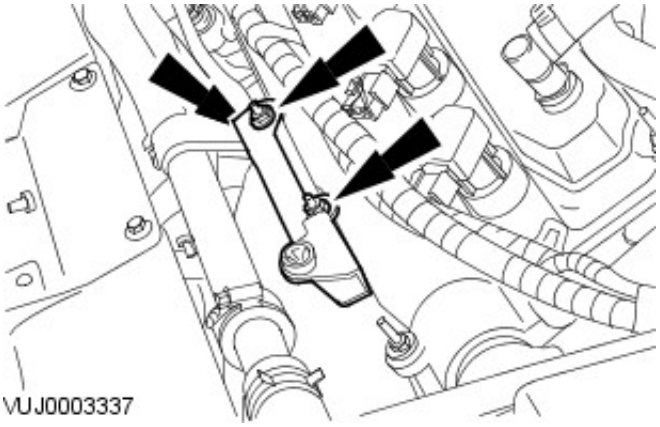
Installation

1. To install, reverse the removal procedure.

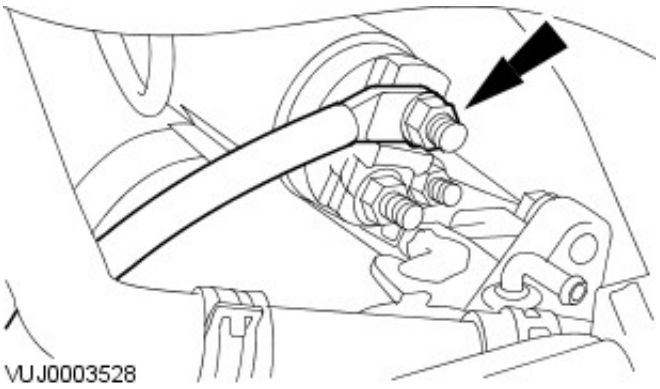
- Tighten to 12 Nm.



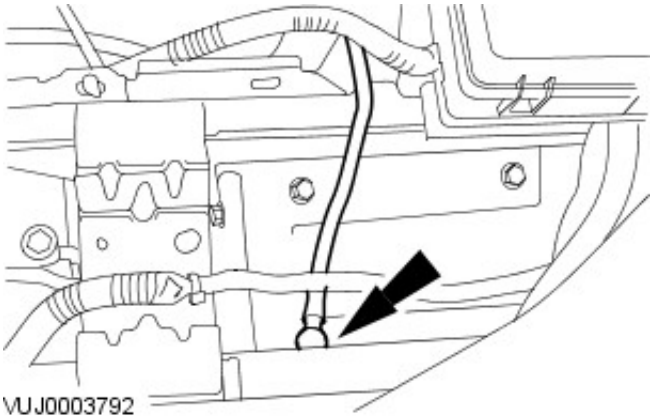
2. Tighten to 6 Nm.



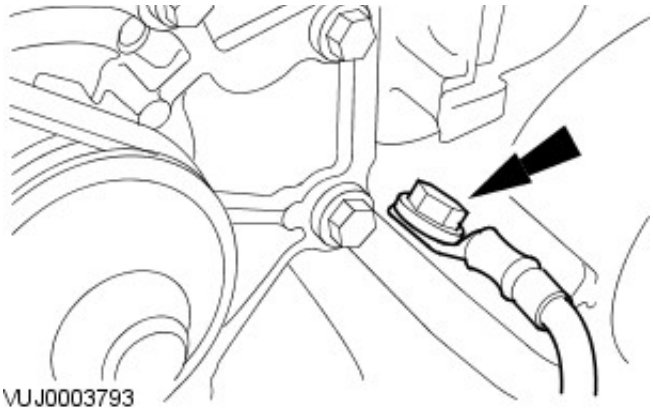
3. Tighten to 12 Nm.

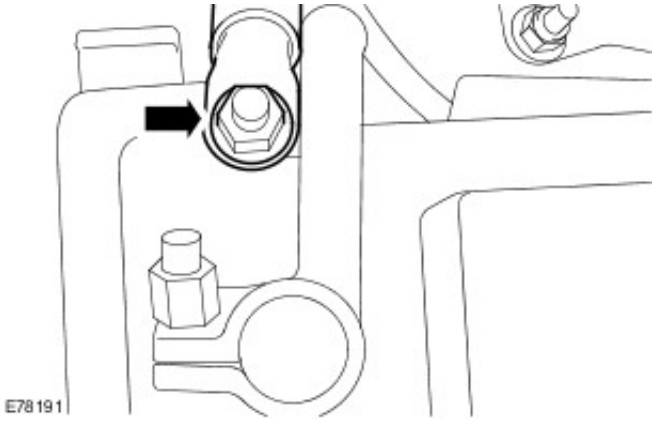


4. Tighten to 25 Nm.



5. Tighten to 25 Nm.





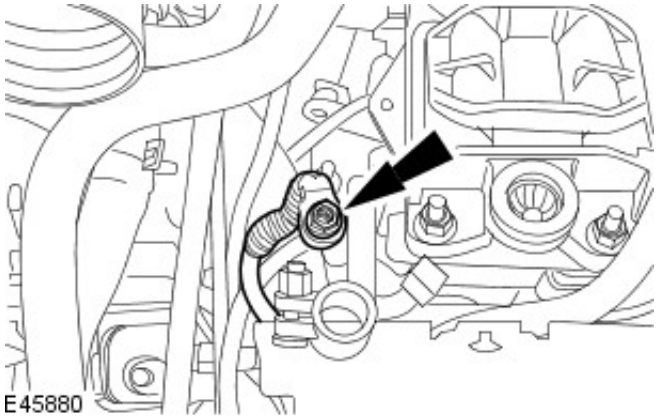
6. Tighten to 4 Nm.

Battery, Mounting and Cables - Battery Cables2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi

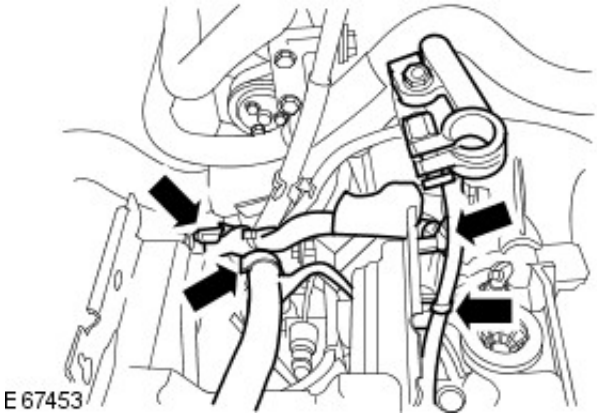
Removal and Installation

Removal

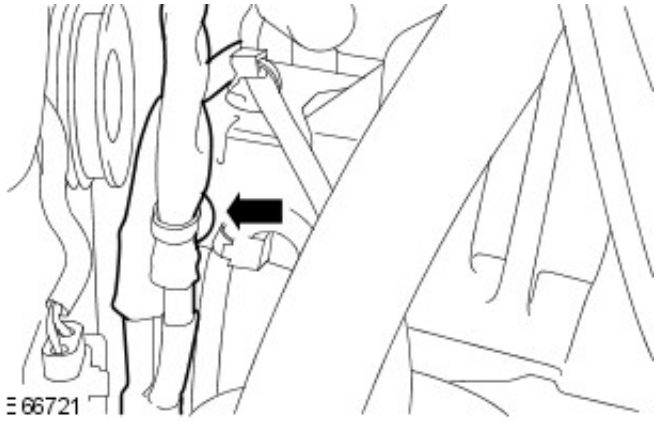
1. Remove the battery tray.
   For additional information, refer to: Battery Tray (414-01 Battery, Mounting and Cables, Removal and Installation).
2. Remove the air cleaner.
   For additional information, refer to: Air Cleaner (303-12B Intake Air Distribution and Filtering - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Removal and Installation).
3. Detach the generator and starter motor positive cable away from the battery positive terminal.



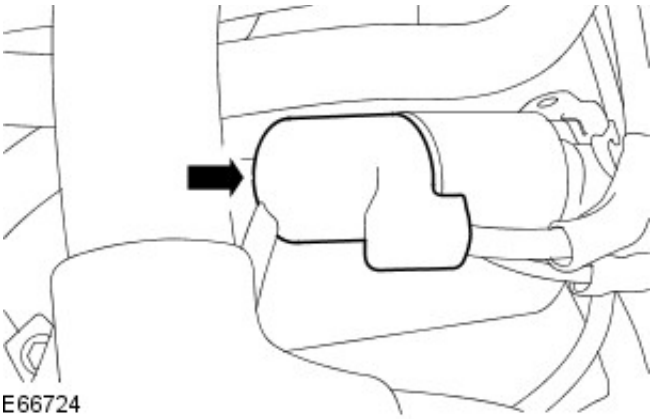
4. Detach the generator and starter motor positive cable from the battery bracket and the wiring harness.

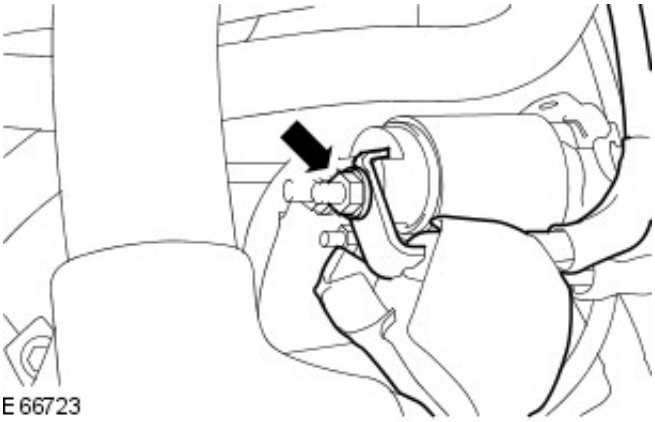


5. Detach the generator and starter motor positive cable from the starter motor wiring harness support bracket.

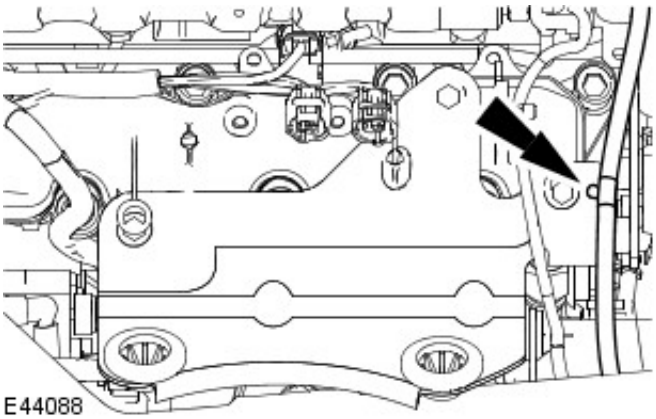


6. Reposition the starter motor solenoid protective cover.

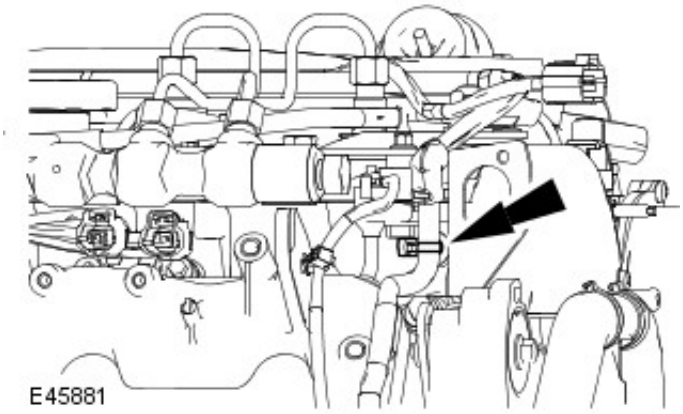




7. Detach the generator and starter motor positive cable from the starter motor.

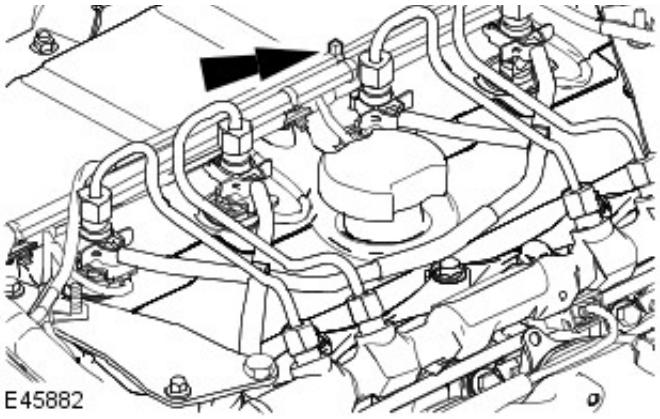


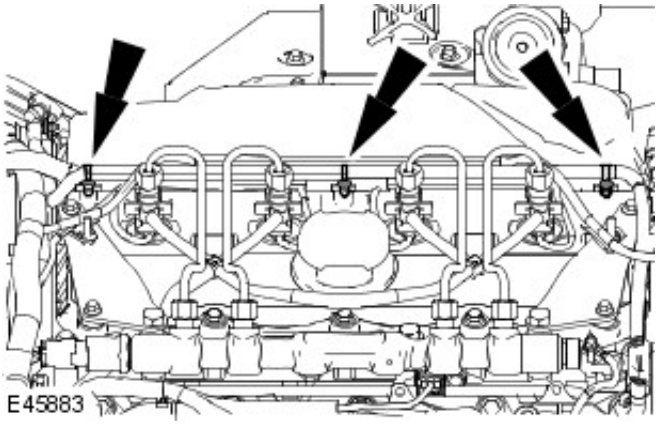
8. Detach the generator and starter motor positive cable from the air cleaner mounting bracket.



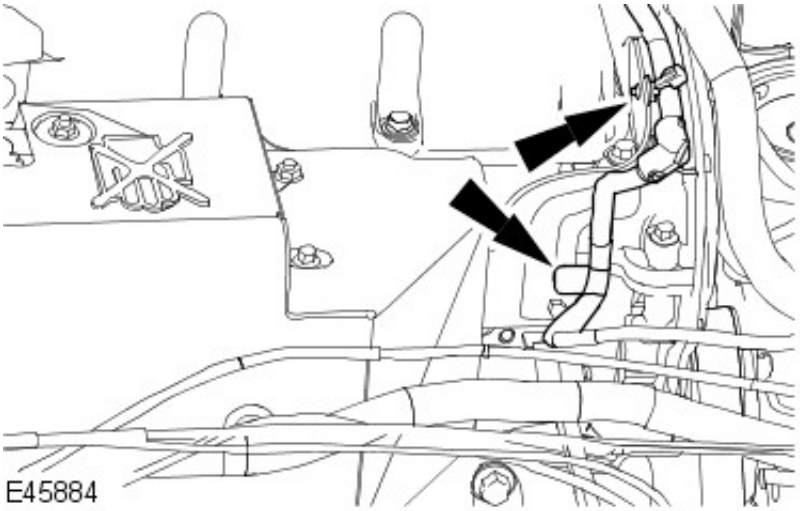
9. Detach the generator and starter motor positive cable from the power steering pump belt cover mounting bracket.

10. Remove the retaining strap.

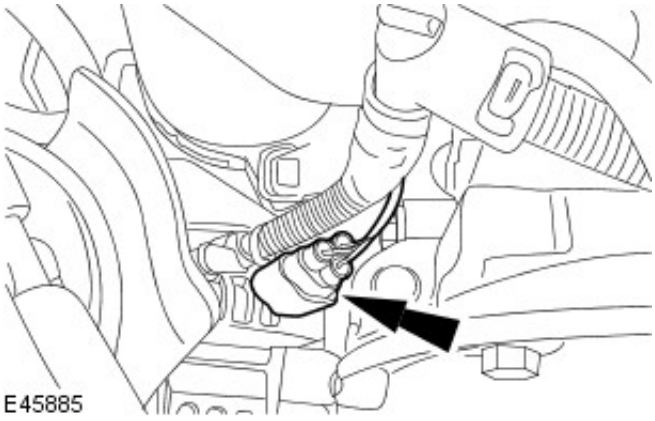




11. Detach the generator and starter motor positive cable from the engine harness.

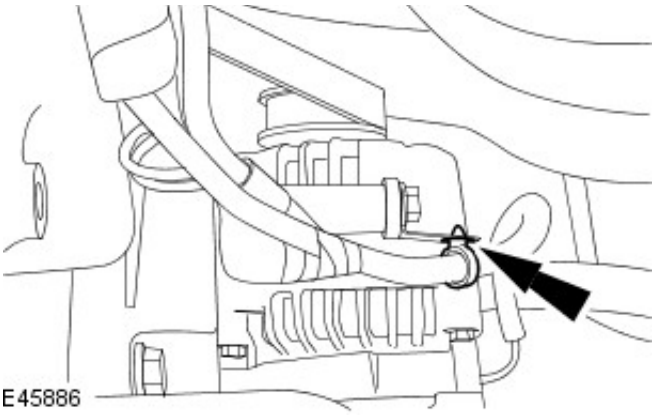


12. Detach the generator and starter motor positive cable from the engine cover mounting bracket.

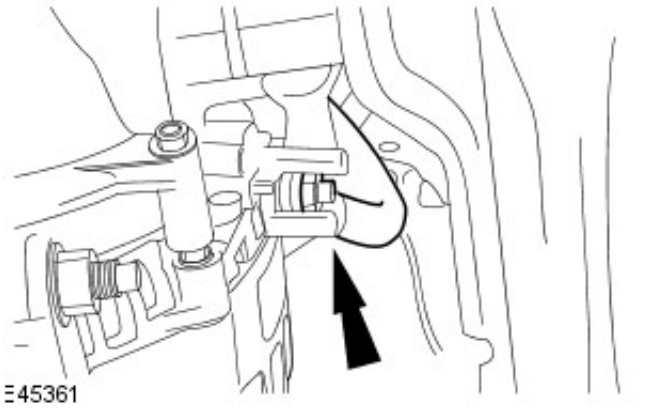


13. Disconnect the generator wiring harness electrical connector.

14. Detach the generator and starter motor positive cable from the generator cable mounting bracket.

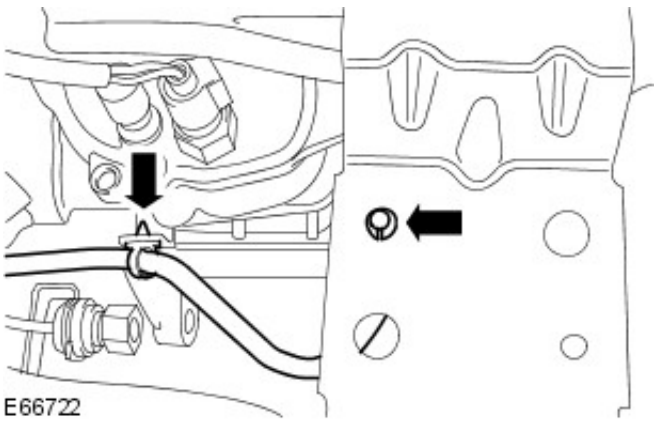


15. Detach the generator positive cable.

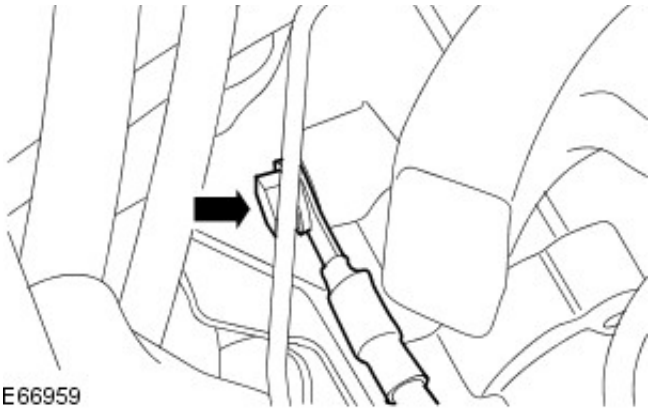


16. Disconnect the generator electrical connector.

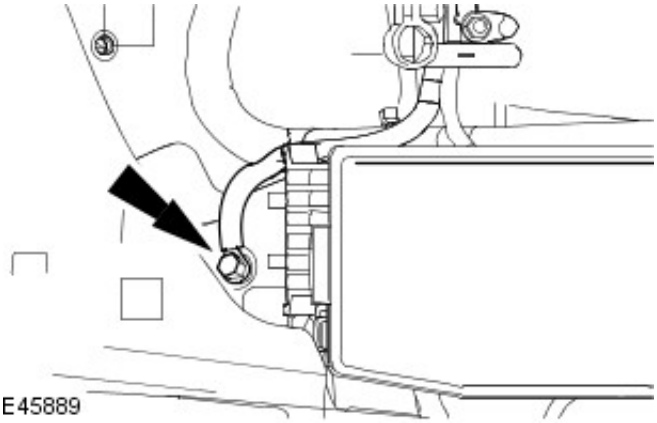
17. Detach the battery ground cable from the transmission retaining bracket and battery bracket.



18. Detach the battery ground cable from the transmission.



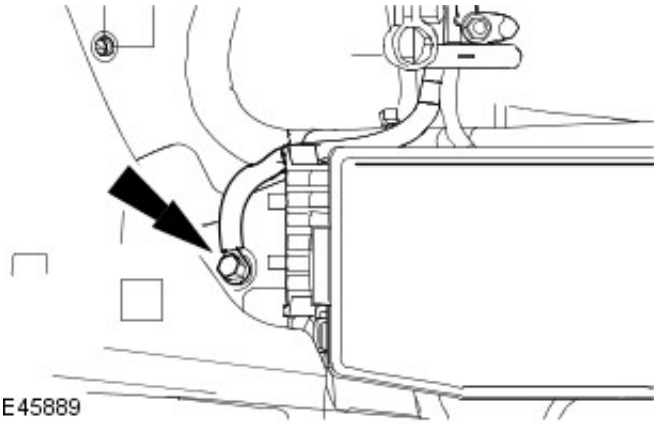
19. Remove the battery ground cable.



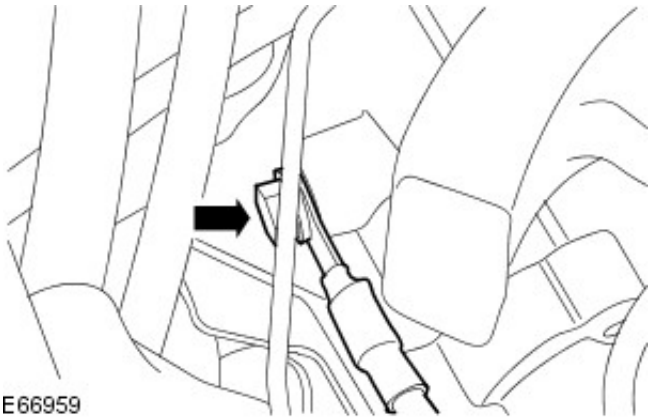
Installation

1. To install, reverse the removal procedure.

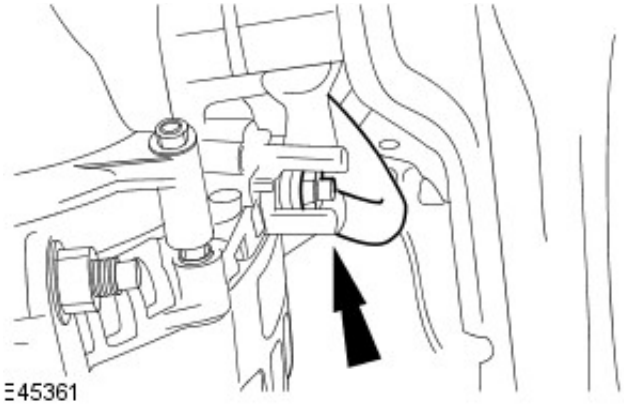
- Tighten to 25 Nm.



2. Tighten to 25 Nm.



3. Tighten to 8 Nm.



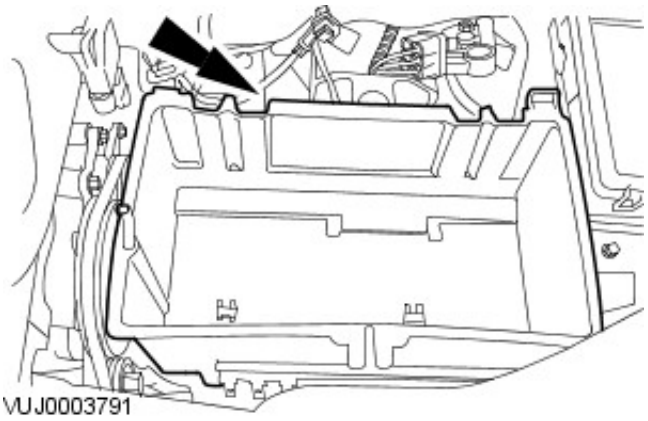
4. Tighten to 8 Nm.

Battery, Mounting and Cables - Battery Tray
Removal and Installation

Removal

1. Remove the battery.
   For additional information, refer to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).
2. NOTE: Petrol engine shown, diesel engine similar.

   Remove the battery tray.



Installation

1. To install, reverse the removal procedure.

Generator and Regulator -

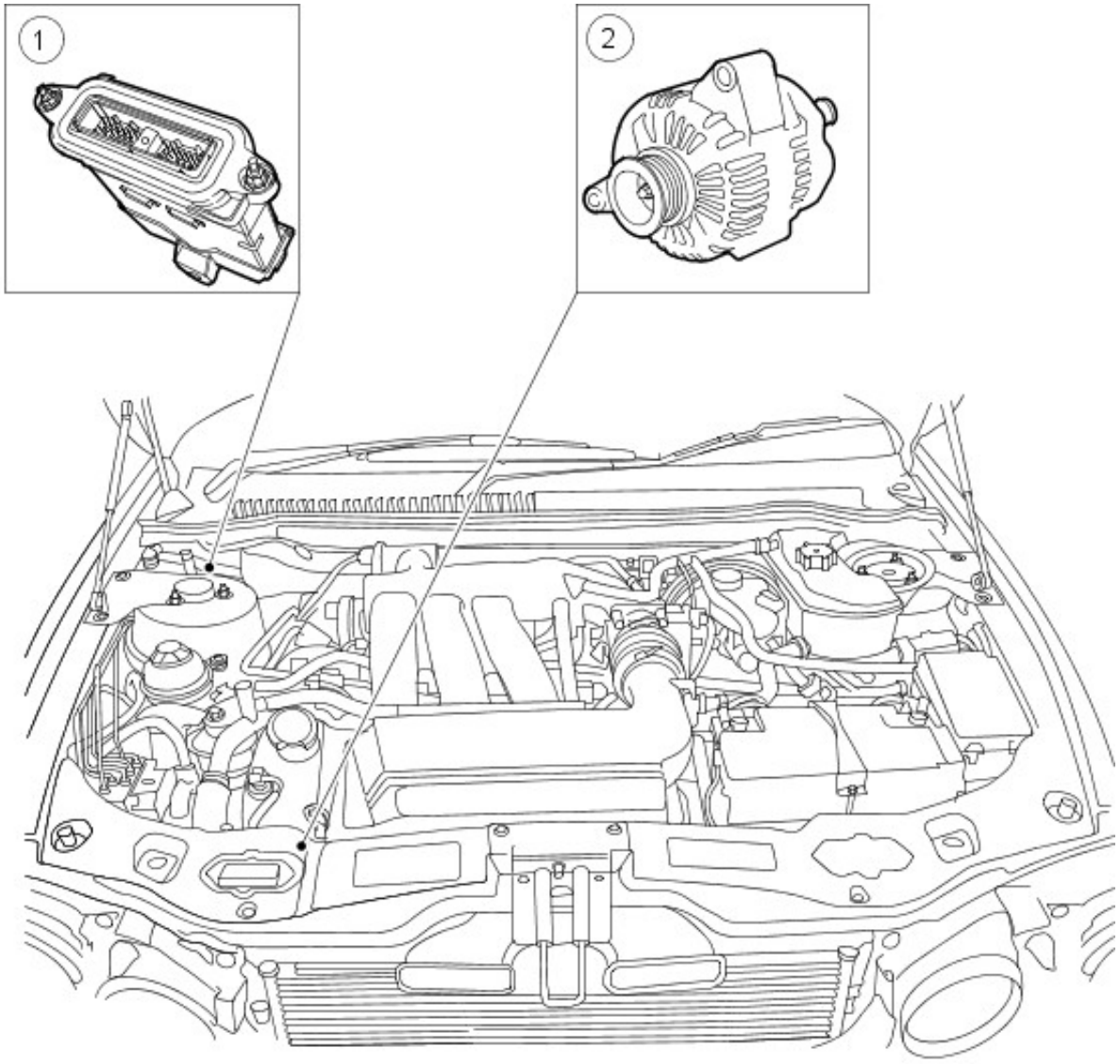
Torque Specifications

Description	Nm	lb-ft	lb-in
Generator upper retaining bolt	47	35	-
Generator lower retaining bolts - vehicles with 2.0L, 2.5L or 3.0L engine	25	18	-
Generator lower mounting studs - vehicles with 2.0L diesel engine	15	11	-
Generator lower retaining nuts - vehicles with 2.0L diesel engine	47	35	-
Generator battery positive cable retaining nut	12	9	-
Generator cooling duct retaining nuts - vehicles with 2.0L diesel engine	4	-	35

Generator and Regulator - Generator
Description and Operation

Charging system components

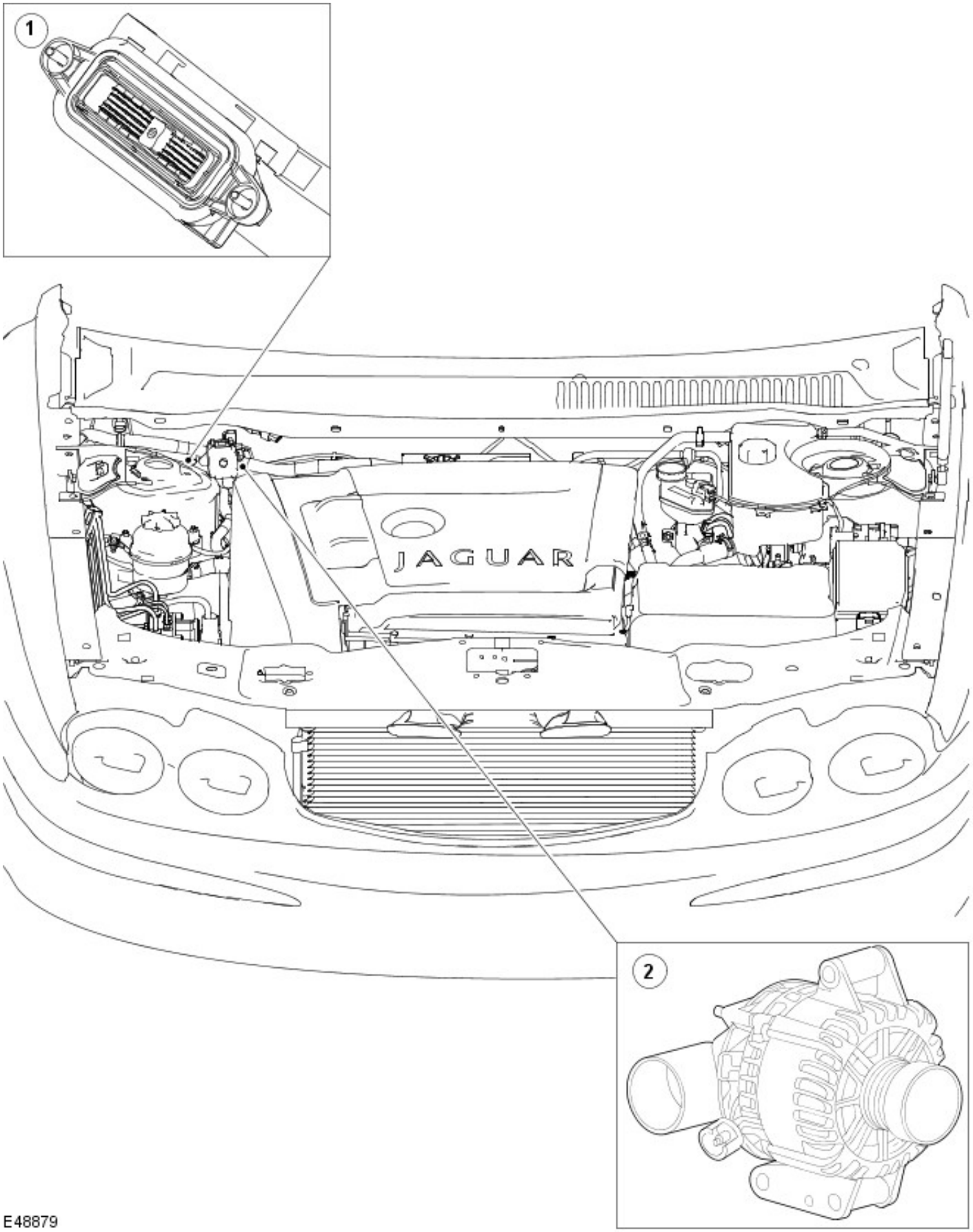
Vehicles with 2.0L, 2.5L or 3.0L engine



VUJ0004295

Item	Part Number	Description
1	—	Engine Control Module (ECM)
2	—	Generator

Vehicles with 2.0L diesel engine



E48879

Item	Part Number	Description
1	—	Engine Control Module (ECM)
2	—	Generator

• NOTE: Generators should be serviced as a unit and not dismantled for overhaul.

Generator and Regulator - Generator

Diagnosis and Testing

2.0L/2.5L/3.0L Vehicles

REFER to: Charging System - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27 (414-00 Charging System - General Information, Diagnosis and Testing).

2.0L Diesel Vehicle

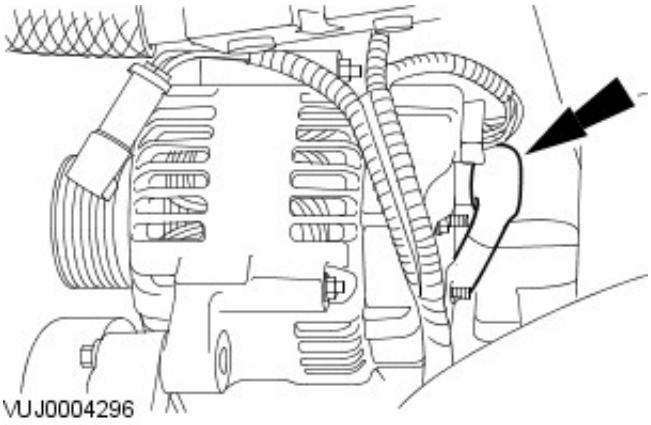
REFER to: Charging System - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (414-00 Charging System - General Information, Diagnosis and Testing).

Generator and Regulator - Generator2.5L NA V6 - AJV6 / 2.0L NA V6 - AJV6 / 3.0L NA V6 - AJ27

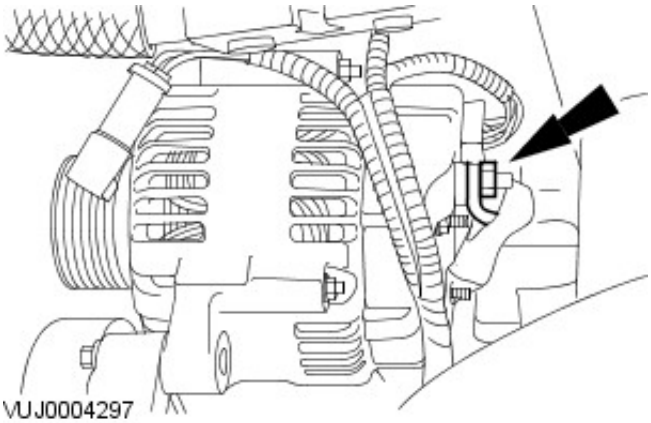
Removal and Installation

Removal

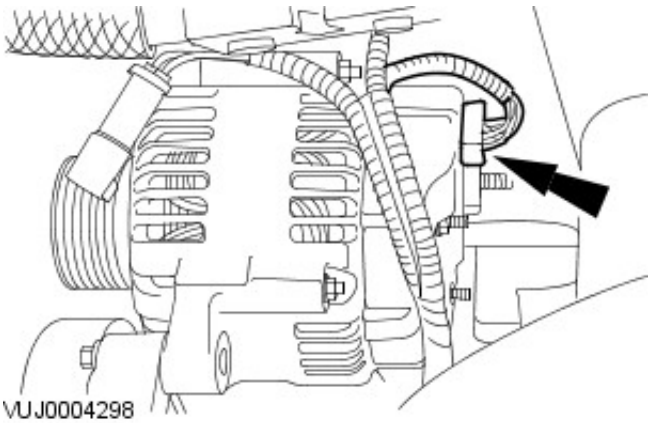
1. Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.
2. Remove air conditioning compressor. For additional information, refer to Section 412-03 Air Conditioning.
3. Detach the generator battery positive cable protective cover.



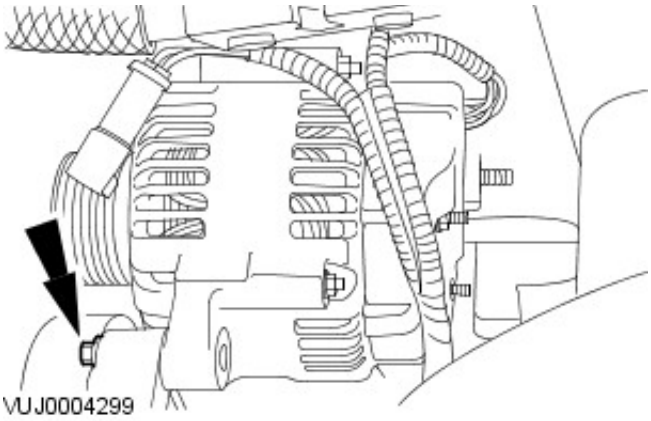
4. Disconnect the generator battery positive cable electrical connector.

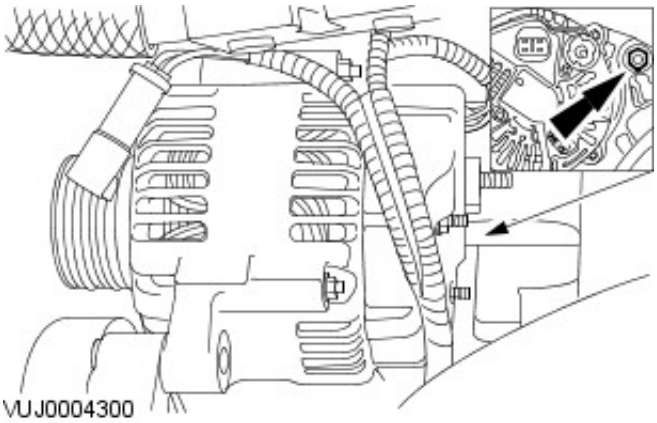


5. Disconnect the generator electrical connector.



6. Remove the generator lower retaining bolt.

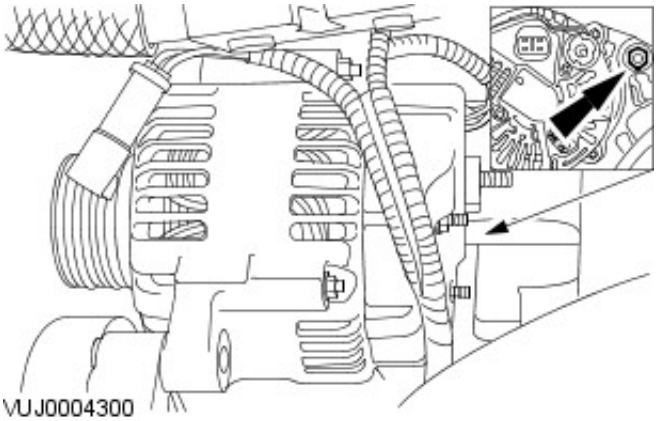




7. Remove the generator.

- Remove the generator upper retaining bolts.

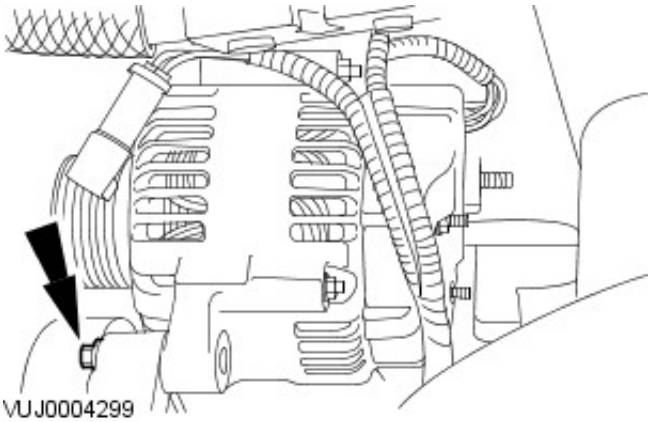
Installation



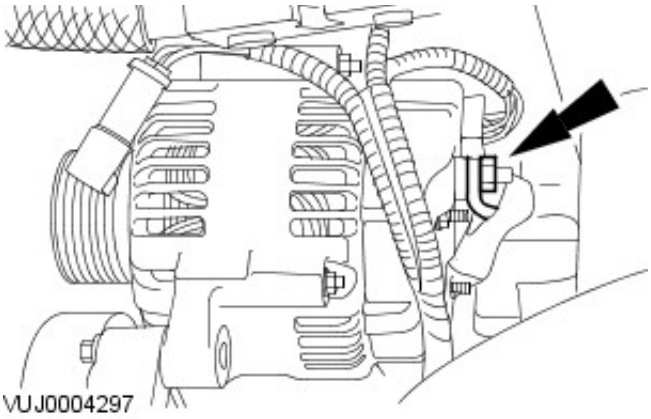
1. To install, reverse the removal procedure.

- Tighten to 47 Nm.

2. Tighten to 25 Nm.

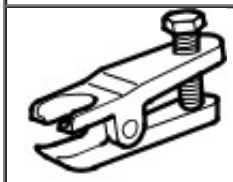
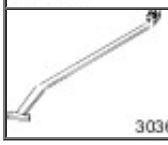


3. Tighten to 12 Nm.


VUJ0004297

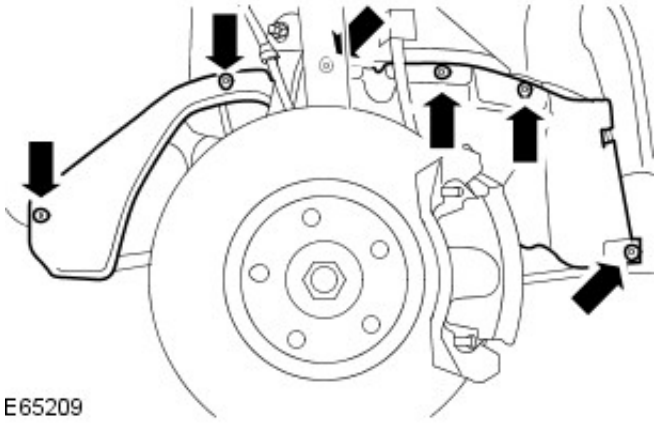
Generator and Regulator - Generator2.2L Duratorq-TDCi (110kW / 150PS) - Puma / 2.0L Duratorq-TDCi

Removal and Installation

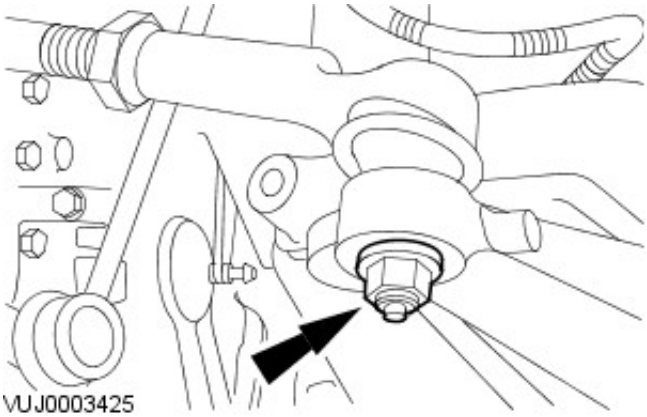
Special Tool(s)	
 204-192	Separator, ball joint 204-192
 303676	Release tool, belt tensioner 303-676

Removal

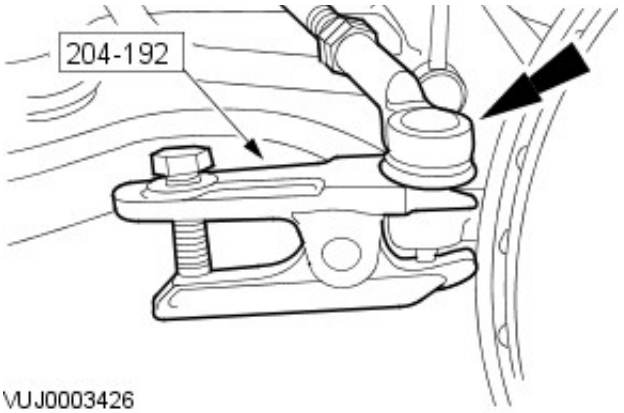
1. Disconnect the battery ground cable.
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
2. Remove the air deflector.
   For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).
3. Remove the front, right-hand wheel and tire.
   For additional information, refer to: Wheel and Tire (204-04 Wheels and Tires, Removal and Installation).
4. Remove the right-hand wheel arch liner access cover.


E65209

5. Remove the tie-rod end retaining nut.

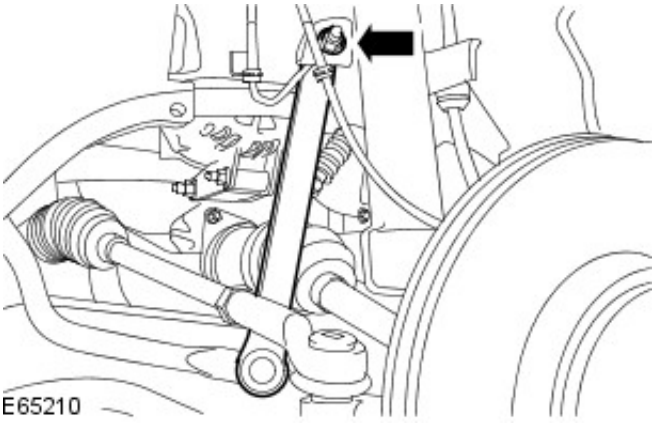

VUJ0003425

6. NOTE: When the tie-rod end is separated from the wheel hub assembly, the ball joint seal should be protected to prevent damage.



VUJ0003426

Using the special tool, detach the tie-rod end.

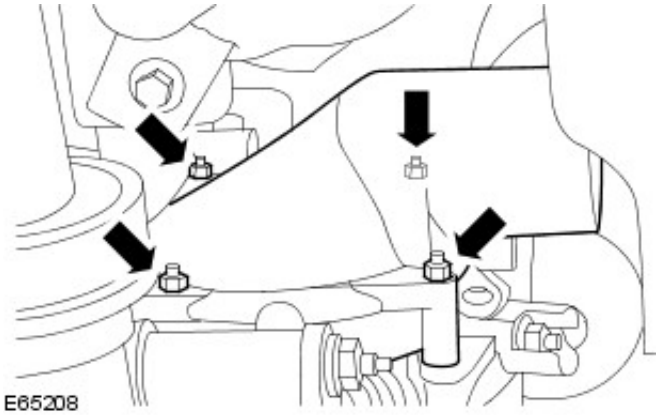

E65210

7. Detach the right-hand stabilizer bar link.

- Reposition the anti-lock brake system (ABS) wiring harness mounting bracket.

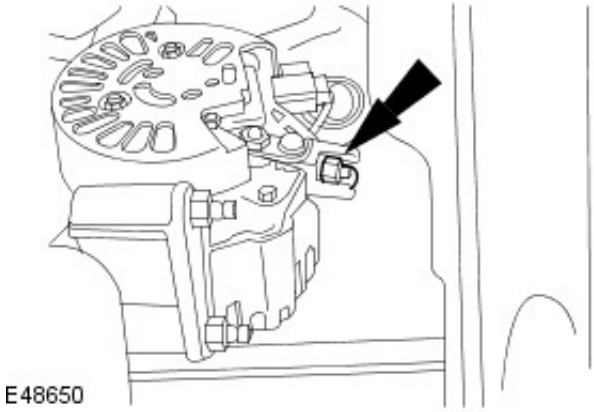
E45360

8. Using the special tool, detach the accessory drive belt.


E65208

9. Remove the generator cooling duct from the generator.

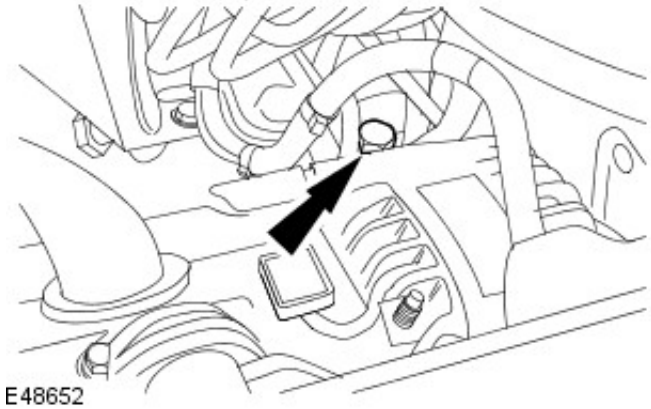
10. Detach the generator positive cable.


E48650

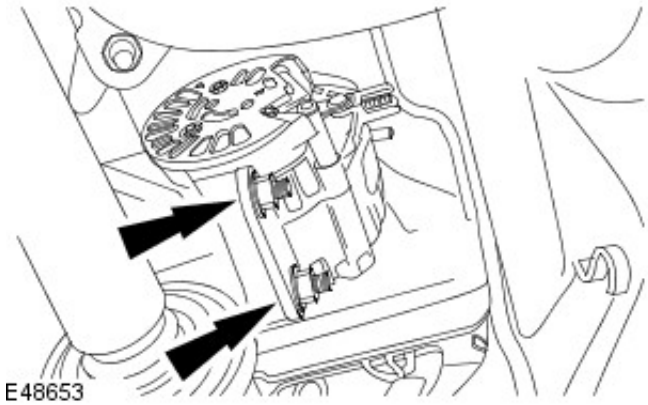
11. Disconnect the generator electrical connector.


E48651

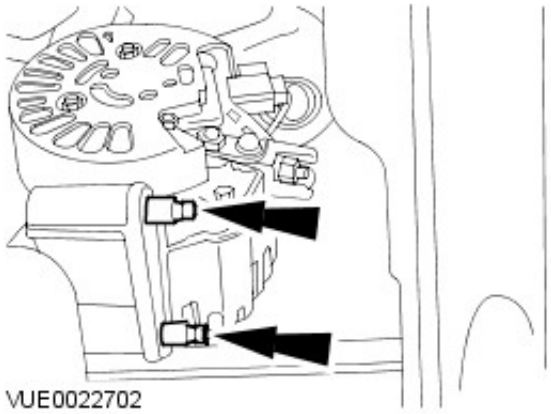
12. Remove the generator upper retaining bolt.


E48652

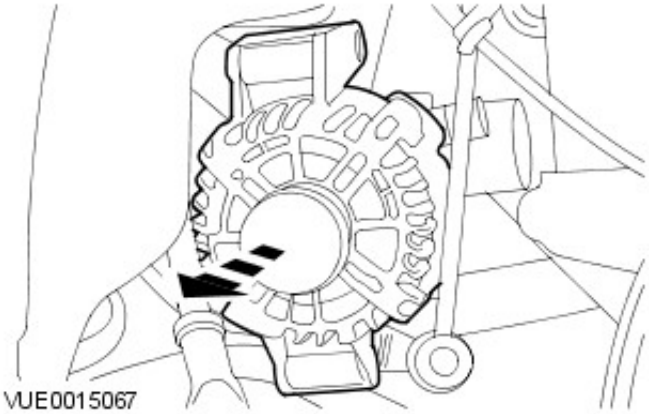
13. Remove the generator retaining nuts.


E48653

14. Remove the generator mounting studs.

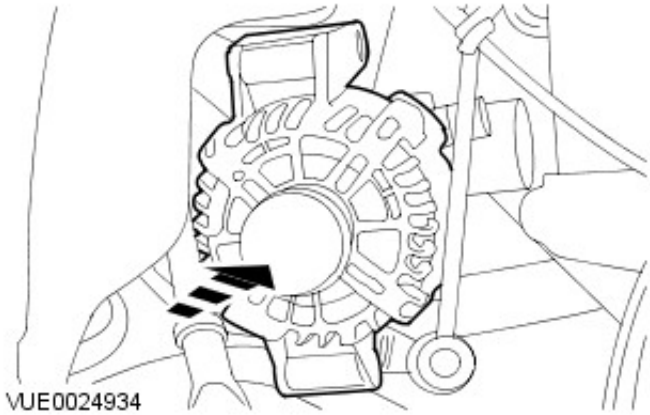

VUE0022702

15. Remove the generator.


VUE0015067

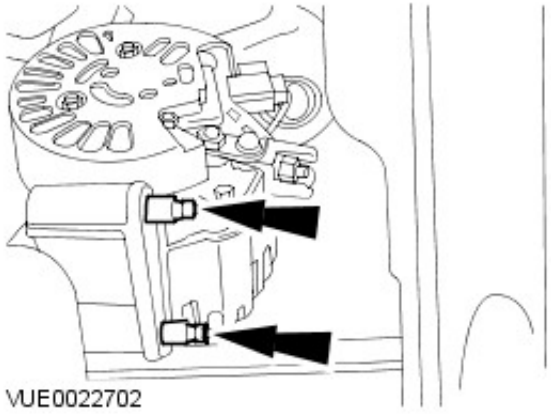
Installation

1. Install the generator.

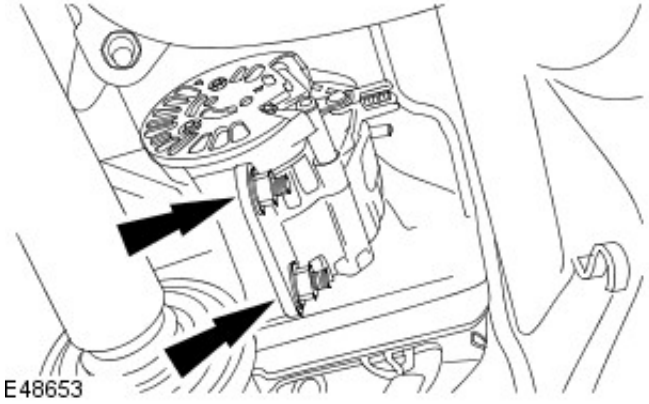

VUE0024934

2. Install the generator mounting studs.

- Tighten to 15 Nm.

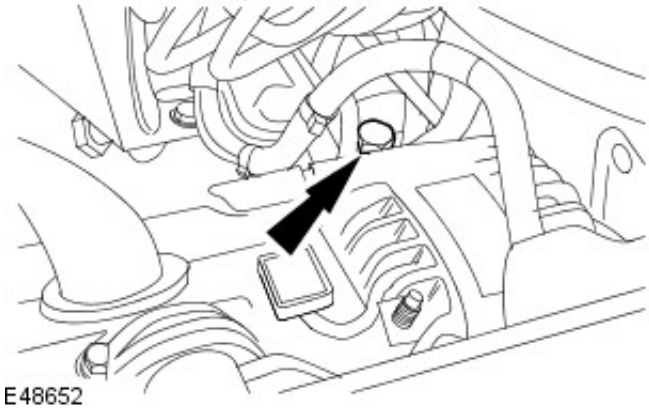

VUE0022702

3. Loosely install the generator retaining nuts.

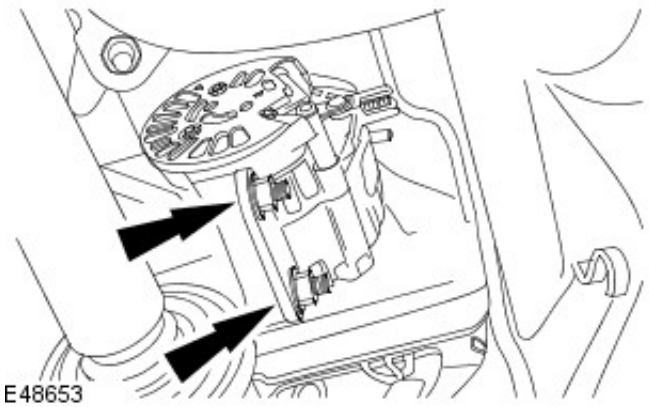

E48653

4. Install the generator upper retaining bolt.

1. Tighten to 47 Nm.


E48652

5. Tighten to 47 Nm.

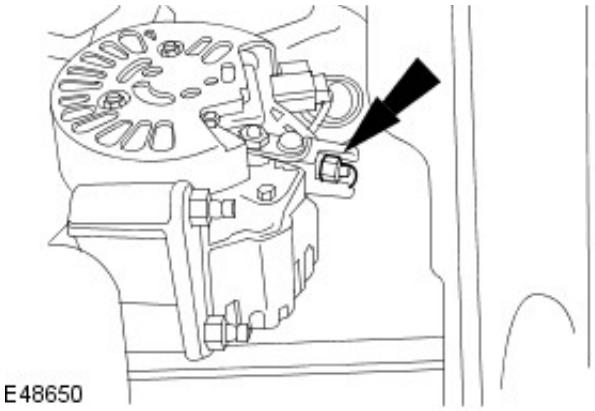

E48653

6. Connect the generator electrical connector.


E48651

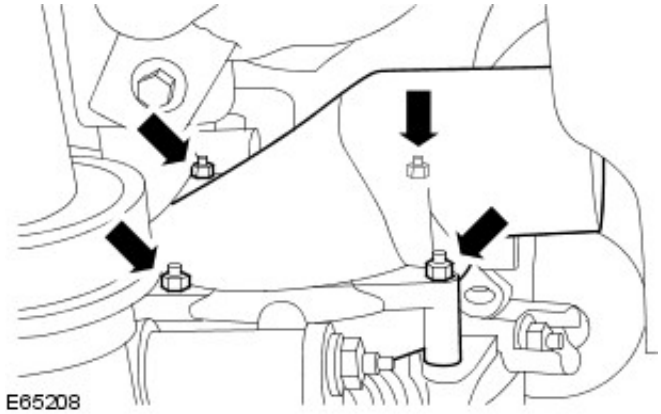
7. Attach the generator positive cable.

- Tighten to 12 Nm.


E48650

8. Install the generator cooling duct to the generator.

- Tighten to 4 Nm.

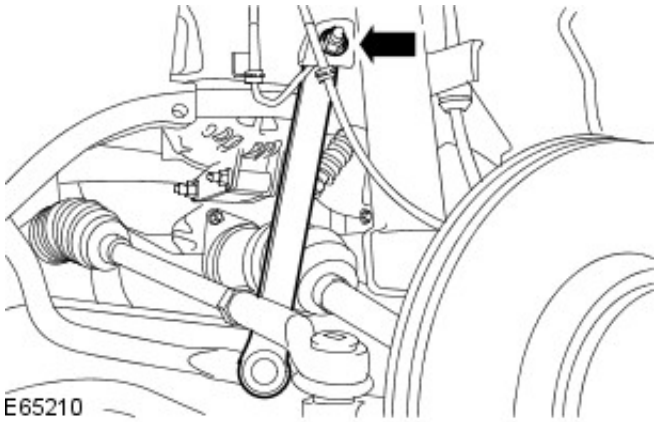

E65208

9. Using the special tool, attach the accessory drive belt.

E45360

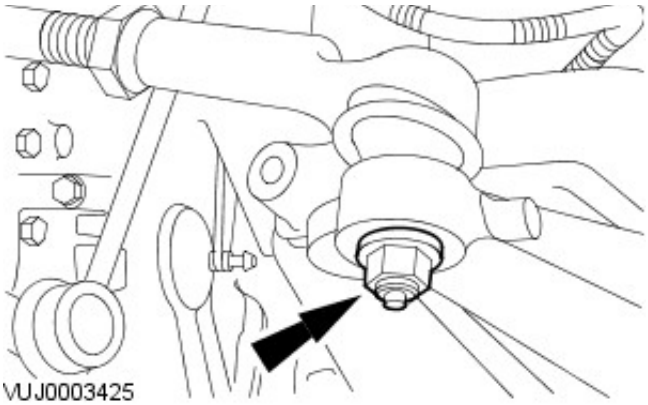
10. Attach the right-hand stabilizer bar link.

- Attach the ABS wiring harness mounting bracket.
- Tighten to 48 Nm.

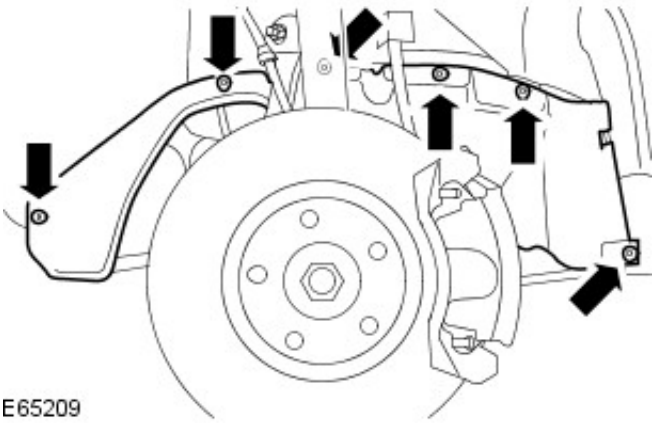

E65210

11. Install the tie-rod end and the tie-rod end retaining nut.

- Tighten to 35 Nm.



12. Install the right-hand wheel arch liner access cover.



13. Install the front, right-hand wheel and tire.
For additional information, refer to: Wheel and Tire (204-04 Wheels and Tires, Removal and Installation).

14. Install the air deflector.
For additional information, refer to: Air Deflector - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi (501-02 Front End Body Panels, Removal and Installation).

15. Connect the battery ground cable.
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

Information and Entertainment System - General Information - Audio System

Diagnosis and Testing

Principle of Operation

For a detailed description of the Audio System and components, refer to the relevant Description and Operation section in the workshop manual. REFER to:

Audio System (415-01 Audio Unit, Description and Operation),
Antenna (415-02 Antenna, Description and Operation),
Speakers (415-03 Speakers, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

• NOTE: Before any testing of the 'audio sound quality' make sure that the cassette tape mechanism is cleaned using the Jaguar cleaning tape. Any testing material (tape, CD, radio, mini disc) should be of known 'good quality'. Avoid using tapes that are old, home recordings, or damaged. Avoid using compact discs that are scratched, dirty, CDR's or CDRW's. Avoid using radio stations that are in the AM band, weak signal strength, inside buildings or poor reception areas. Use a good sound source for testing.

Mechanical	Electrical
• Cassette tape mechanism cleanliness • Compact disc cleanliness • Mini disc cleanliness	• Fuse(s) • Wiring Harness For Damage And Corrosion • Electrical Connector(s) Loose, Damaged Or Corrosion

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. • NOTE: If a new audio unit is being installed under warranty, please supply the digital data bus (D2B) ring configuration and the diagnostic trouble code(s) with the returned unit to aid fault replication.

   4. If the cause is not visually evident, verify the symptom and refer to the Jaguar approved diagnostic system.

DTC Index

Gateway module

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: When performing voltage or resistance tests, always use a digital multi meter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Causes	Action
B11A4	DAB L Band Antenna	• Gateway module (digital audio broadcast band L band) antenna circuit - short to power, ground or open circuit	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check (digital audio broadcast L band) antenna circuit for short to power, ground or open circuit
B11A5	DAB Band 3 Antenna	• Gateway module (digital audio	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to

		broadcast band 3) antenna circuit - short to power, ground or open circuit	electrical circuit diagrams, notes and check (digital audio broadcast band 3) antenna circuit for short to power, ground or open circuit
B1238	High Temperature	• Gateway module - over temperature	Check gateway module and location for causes of excessive temperature, install a new gateway module as required, refer to the new module installation note at the top of the DTC Index
B1342	Internal failure in Gateway module	• Gateway module - internal failure	Internal failure install a new gateway module as required, refer to the new module installation note at the top of the DTC Index
B1A89	SDARS or Digital Tuner Antenna	• Gateway module satellite radio module or digital tuner antenna circuit - short to power, ground or open circuit	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check satellite radio module or digital tuner antenna circuit for short to power, ground or open circuit
B2477	Module Configuration Failure	• Gateway module - configuration failure	The module can be configured using the new module procedure. Check and configure as required
U0193	Lost Communication with Digital Audio Control Module A Satellite Radio Module	• Gateway module - lost communication with satellite radio module	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check satellite radio module power and bus circuit to gateway module on MOST ring
U0194	Lost Communication with Digital Audio Control Module B Digital Audio Broadcast Module	• Gateway module - lost communication with digital audio broadcast module	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check digital audio broadcast module power and bus circuit to gateway module on MOST ring
U0237	Lost Communication with Digital Audio Control Module C IBOC In Band On Channel / HD Radio	• Gateway module - lost communication with Digital Audio Control Module C	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check Digital Audio Control Module C power and bus circuit to gateway module on MOST ring
U1A15	Incomplete MOST Ring Reported By ICM	• Gateway module - (MOST) ring break	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check (MOST) circuit for ring break
U2601	(D2B)Wake-up Line Short to Ground	• Gateway module - wake-up line short to ground	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check gateway module (D2B) wake-up line for short to ground
U2609	(D2B)Wake-up pulse width out of spec	• Gateway module - wake-up line fault (pulse< 50mS, pulse > 110mS)	Refer to electrical circuit diagrams, notes and check gateway module (D2B) wake-up line circuit for fault
U2610	(D2B) Slave ECU fails to receive a report position	• Gateway module - during initialization no position status report is received from one or more slave modules	Refer to electrical circuit diagrams, notes and check (D2B) slave modules and circuit for fault, replace as required, refer to the new module installation note at the top of the DTC Index
U2611	(D2B) Slave ECU fails to receive an alarm clear command	• Gateway module - on entering alarm state, slave ECU has failed to receive alarm clear command	Refer to electrical circuit diagrams, notes and check (D2B) slave modules and circuit for fault, replace as required, refer to the new module installation note at the top of the DTC Index
U3004	Digital Tuner (Most slave) Internal fault	• Gateway module - digital tuner MOST slave module is inoperative	Refer to electrical circuit diagrams, notes and check digital tuner module replace as required, refer to the new module/component installation note at the top of the DTC Index

U3098	Digital Tuner (Most slave) Over temperature	• Gateway module - digital tuner (Most slave) is hot	Check digital tuner module and location for causes of excessive temperature, install a new module as required, refer to the new module installation note at the top of the DTC Index

Radio Head Unit

 CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Causes	Action
B1238	Over Temperature Fault	• Radio head unit, CD multichanger - overheated (+80 degrees Celsius)	Check cd multichanger module and location for causes of excessive temperature, install a new module as required, refer to the new module installation note at the top of the DTC Index
B1342	ECU Internal Failure	• Radio head unit - no radio function	Refer to electrical circuit diagrams, notes and check Radio head unit radio functions for fault, replace as required, refer to the new module installation note at the top of the DTC Index
B2004	Internal Media Over Temperature Fault	• Radio head unit - internal cd/md has overheated	Check Radio head unit and location for causes of excessive temperature, install a new module as required, refer to the new module installation note at the top of the DTC Index
B2401	Audio Tape Deck Mechanism Fault	• Radio head unit - tape loading, tape eject, tape stuck, tape cut and seek stop error	Refer to electrical circuit diagrams, check radio head unit install a new module as required, refer to the new module installation note at the top of the DTC Index
B2403	Audio CD/DJ Internal Fault	• Radio head unit, CD multichanger module - cd eject error, cd loading error	Refer to electrical circuit diagrams, notes and check cd multichanger module install a new module as required, refer to the new module installation note at the top of the DTC Index
B2477	Module Configuration Failure	• Radio head unit - configuration failure	The module can be configured using the new module procedure. Check and configure as required
B2888	Audio Headunit Media Fault	• Radio head unit - tape loading, tape eject, tape stuck, tape cut and seek stop error	Check radio head unit install a new module as required, refer to the new module installation note at the top of the DTC Index
C1977	Audio Steering	• Radio head	Refer to electrical circuit diagrams, notes suspect the audio steering

	Wheel Switch Circuit Short To Ground	unit, audio steering wheel switch circuit - short to ground	wheel switch check for circuit short to ground
U0147	Lost Communication With Gateway "B"	• Radio head unit, gateway module - no response (D2B/MOST)	Refer to electrical circuit diagrams, notes and check radio head unit to gateway module control and power circuit`s, install a new module as required, refer to the new module installation note at the top of the DTC Index
U1262	SCP (J1850) Communication Bus Fault	• Radio head unit, ECU not responding - internal standard corporate protocol (SCP) chip failure	Refer to electrical circuit diagrams, notes and check radio head unit SCP circuit for fault, suspect the radio head unit, install a new module as required, refer to the new module installation note at the top of the DTC Index
U2003	Audio Compact Disk / Disk Jockey Unit is Not Responding	• Radio head unit, CD multichanger - no response(D2B)	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check cd multichanger module and D2B circuit for fault, install a new module as required, refer to the new module installation note at the top of the DTC Index
U2008	Audio Phone Not Responding	• Radio head unit, telephone control module - no response(D2B)	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check telephone control module and D2B circuit for fault, install a new module as required, refer to the new module installation note at the top of the DTC Index
U2019	Audio Voice Module Not Responding	• Radio head unit, audio voice module - no response(D2B)	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check audio voice module and D2B circuit for fault, install a new module as required, refer to the new module/component installation note at the top of the DTC Index
U2601	(D2B)Wake-up Line Short To Ground	• Radio head unit, gateway module - wake-up line short to ground	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check gateway module (D2B) wake-up line for short to ground
U2602	Incomplete MOST Ring (fault report received)	• Radio head unit - (MOST) ring circuit fault	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check radio head unit for most ring circuit fault
U2603	Incomplete MOST Ring (No Fault Report Received)	• Radio head unit - (MOST) ring circuit fault	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check (MOST) ring for circuit fault
U2604	Incomplete MOST Ring (Corrupted Fault Report Received)	• Radio head unit - (MOST) ring circuit fault	Refer to electrical circuit diagrams, notes and check (MOST) ring for circuit fault
U2605	Master ECU Unable To Initialize It's Address	• Radio head unit - (MOST) ring circuit fault (more than one master on the MOST ring)	Refer to electrical circuit diagrams, notes and check for configuration fault on (MOST) ring modules. Install a new module as required, refer to the new module installation note at the top of the DTC Index
U2606	Slave ECU Unable To Initialize It's Address	• Radio head unit - (MOST) ring circuit fault slave ecu	Refer to electrical circuit diagrams, notes and check for configuration fault on (MOST) ring modules. Install a new module as required, refer to the new module installation note at the top of the DTC Index

		configuration fault	
U2607	Slave ECU (switched into bypass mode)	• Radio head unit - (MOST) ring circuit fault (slave ecu configuration fault)	The module can be configured using the new module procedure. Check and configure as required
U2609	(D2B)Circuit Wake-up Line (pulse width out of spec)	• Radio head unit - wake up line circuit fault (pulse< 50mS, pulse > 110mS)	Refer to electrical circuit diagrams, notes and check radio head unit(D2B) wake up line circuit for fault
U2613	Navigation Module Not Responding on D2B	• Radio head unit - no response from navigation module	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check navigation module to front audio control module circuit
U2614	Amp Module Not Responding on D2B	• Radio head unit - no response from audio amplifier module	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Check audio amplifier module to front audio control module circuit

Digital Audio Broadcast Module

 CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

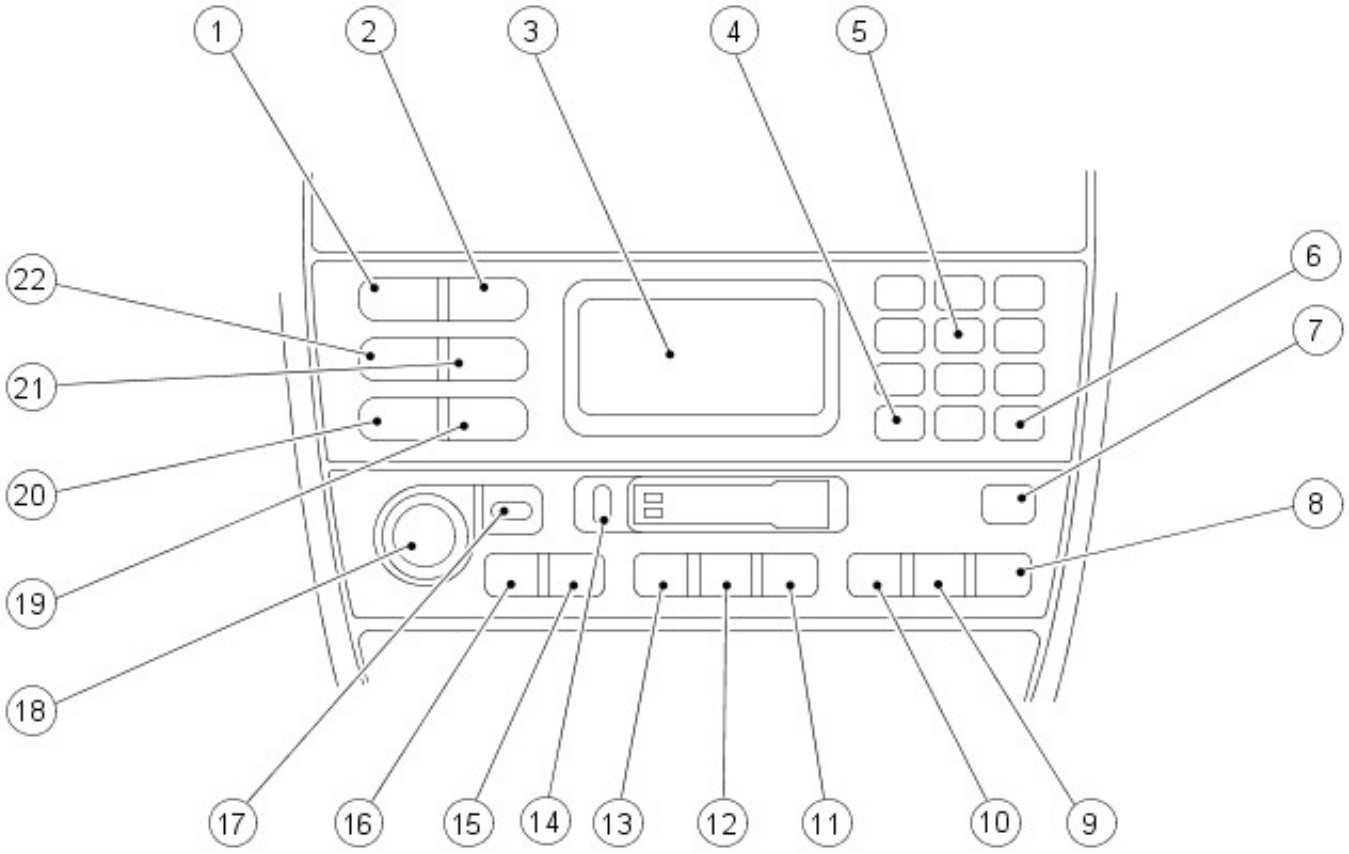
DTC	Description	Possible Causes	Action
B11A411	L-Band antenna	• DAB L-Band antenna Circuit - short to ground	Refer to electrical circuit diagrams and check DAB L-band antenna circuit for short to ground
B11A413	L-Band antenna	• DAB L-Band antenna Circuit - open circuit	Refer to electrical circuit diagrams and check DAB L-band antenna circuit for open circuit
B11-A511	Band 3 antenna	• DAB band 3 antenna circuit - short to ground	Refer to electrical circuit diagrams and check DAB band 3 antenna circuit for short to ground
B11-A513	Band 3 antenna	• DAB band 3 antenna circuit - open circuit	Refer to electrical circuit diagrams and check DAB band 3 antenna circuit for open circuit
U300004	Control module	• System internal failure	Install a new digital audio broadcast module
U30004A	Control module	• Incorrect component	Install a new digital audio broadcast module or reconfigure the digital audio broadcast module using the manufacturer approved

		installed	diagnostic system
U300055	Control module	• Incorrect car configuration file data received	Check/update car configuration file using manufacturer approved diagnostic system
U300087	Control module	• Missing message	Check GEM for DTCs and refer to DTC index. Check information and entertainment module for car configuration file and MOST network DTCs and refer to relevant DTC index. Carry out MOST/CAN network tests using the manufacturer approved equipment.
U300098	Control module	• Component or system over temperature	Check for additional DTCs and refer to relevant DTC index, check/monitor system for re-occurence
U300362	Battery voltage	• Mis-match in battery voltage of 2 volts or more between digital broadcast module and GEM	Refer to electrical circuit diagrams and check power distribution to the DAB module and GEM. Repair any wirirng faults using approved materials and methods. Clear DTCs and tetest system to ensure correct operation.

Audio Unit - Audio System

Description and Operation

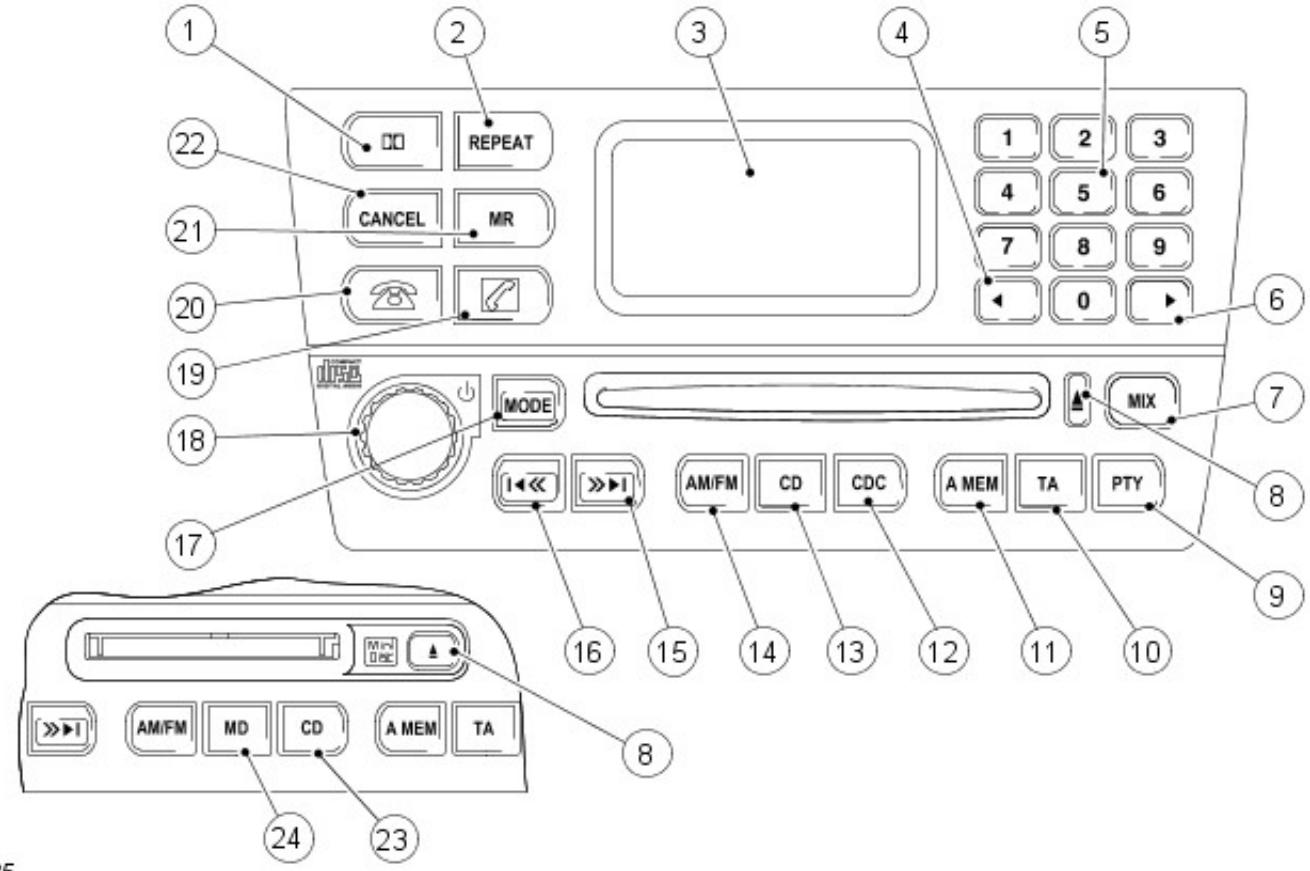
Base cassette



VUJ0004284

Item	Part Number	Description
1	—	Dolby noise reduction button
2	—	Repeat CD button
3	—	Audio system display
4	-	Seek a stored number from the phones memory
5	—	Radio station pre-set buttons
6	—	Seek a stored number from the phones memory
7	—	CD track mix button
8	—	Priority programme type button
9	—	Traffic announcement button
10	—	Auto memory button
11	—	Select CD changer
12	—	Cassette play and side change button
13	—	Audio Source - AM/FM radio
14	-	Cassette eject button
15	—	CD seek forward, cassette fast forward, radio seek forward button
16	—	CD seek back, cassette fast rewind, radio seek back button
17	—	Mode button (volume/bass/treble/balance/fade)
18	—	ON/OFF push (rotary volume/bass/treble/balance/fade) knob
19	—	Phone mode - send/end button
20	—	Phone mode select button
21	—	Memory recall button
22	—	Cancel button

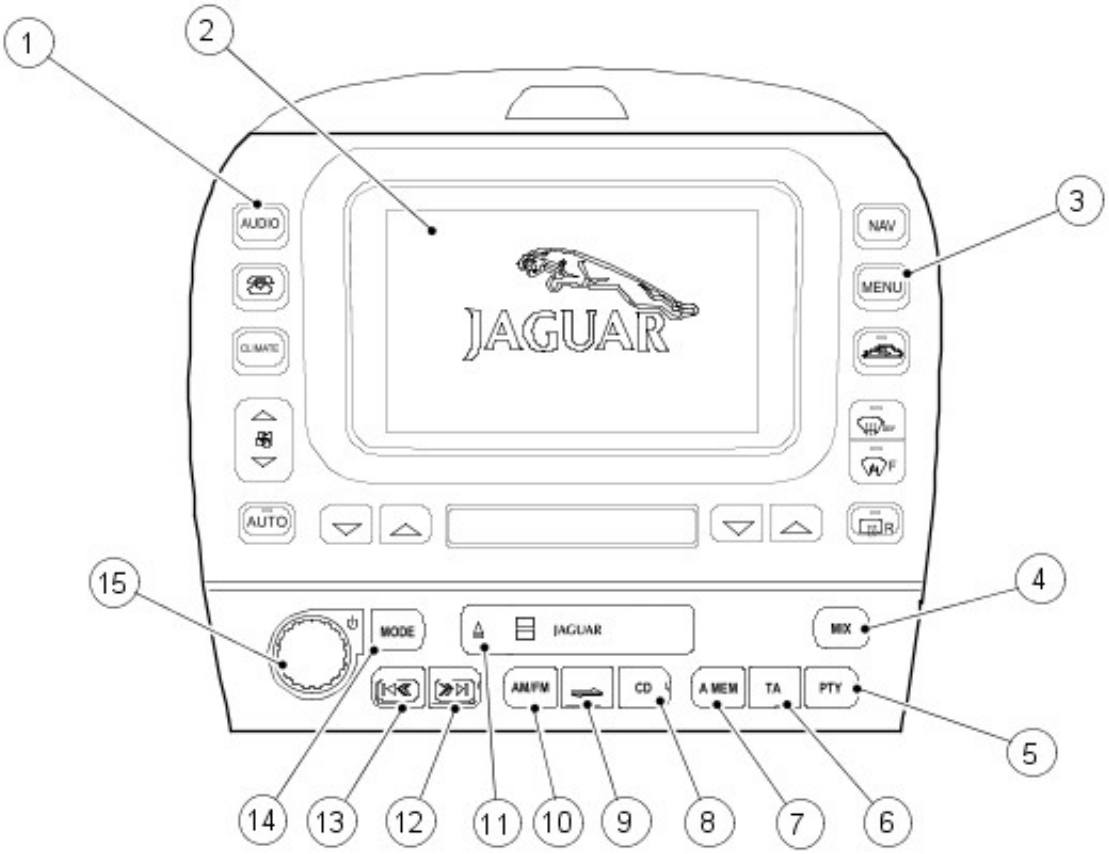
Base CD/MD



E30385

Item	Part Number	Description
1	-	Mutes audio
2	-	Repeat CD button
3	-	Audio system display
4	-	Seek a stored number from the phones memory
5	-	Radio station pre-set buttons
6	-	Seek a stored number from the phones memory
7	-	Mix CDs or CD/MD tracks button
8	-	Eject CD or MD
9	-	Priority programme type button
10	-	Traffic announcement button
11	-	Auto memory button
12	-	Select CD changer
13	-	Select compact disc when in other audio mode, or CD pause
14	-	Audio Source - AM/FM radio
15	-	CD seek forward, cassette fast forward, radio seek forward button
16	-	CD seek back, cassette fast rewind, radio seek back button
17	-	Mode button (volume/bass/treble/balance/fade)
18	-	ON/OFF push (rotary volume/bass/treble/balance/fade) knob
19	-	Phone mode - send/end button
20	-	Phone mode select button
21	-	Memory recall button
22	-	Cancel button
23	-	Select CD changer
24	-	Select mini disc play when in other audio mode or MD pause

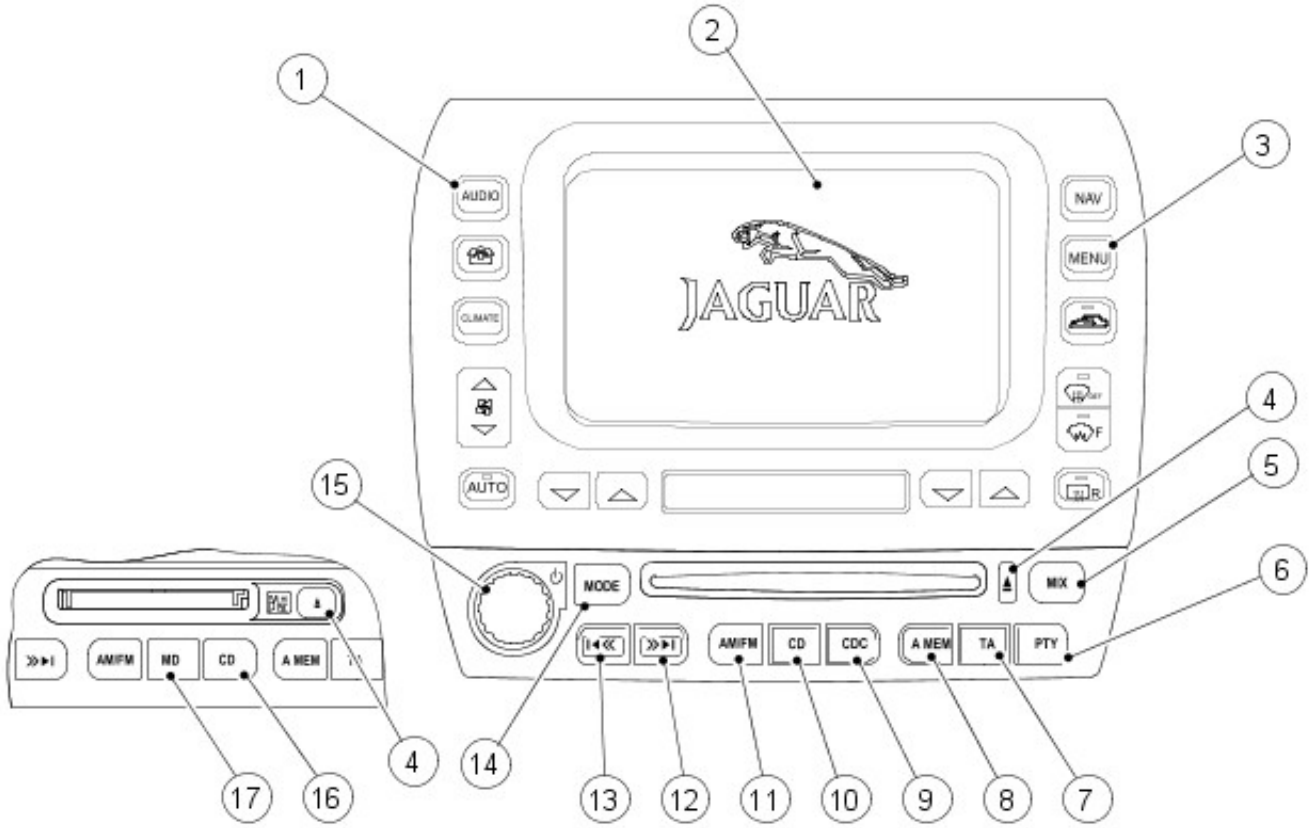
Touch screen cassette



E 30386

Item	Part Number	Description
1	-	On/Off push for touch-screen controls
2	-	Touch-screen display
3	-	Press to access touch-screen options
4	-	CD track mix button
5	-	Priority programme type button
6	-	Traffic announcement button
7	-	Auto memory button
8	-	Select CD changer
9	-	Cassette play and side change button
10	-	Audio Source - AM/FM radio
11	-	Cassette eject button
12	-	CD seek forward, cassette fast forward, radio seek forward button
13	-	CD seek back, cassette fast rewind, radio seek back button
14	-	Mode button (volume/bass/treble/balance/fade)
15	-	ON/OFF push (rotary volume/bass/treble/balance/fade) knob

Touch screen CD/MD



E30387

Item	Part Number	Description
1	-	On/Off push for touch-screen controls
2	-	Touch-screen display
3	-	Press to access touch-screen options
4	-	Eject CD or MD
5	-	Mix CDs or CD/MD tracks button
6	-	Priority programme type button
7	-	Traffic announcement button
8	-	Auto memory button
9	-	Select CD changer
10	-	Select compact disc when in other audio mode, or CD pause
11	-	Audio Source - AM/FM radio
12	-	CD seek forward, cassette fast forward, radio seek forward button
13	-	CD seek back, cassette fast rewind, radio seek back button
14	-	Mode button (volume/bass/treble/balance/fade)
15	-	ON/OFF push (rotary volume/bass/treble/balance/fade) knob
16	-	Select CD changer
17	-	Select mini disc play when in other audio mode or MD pause

The choice of two entertainment systems is available; base or premium. The radio or mini disc player and the aerial are common to both. Both systems may be operated remotely by use of switches located on the steering wheel.

The premium system has the addition of different speakers, touch screen control and a CD autochanger. The CD autochanger is located in the luggage compartment.

Refer to the Sound System Handbook for setting-up procedures and use, after diagnostic or repair operations.

Audio Unit - Audio System

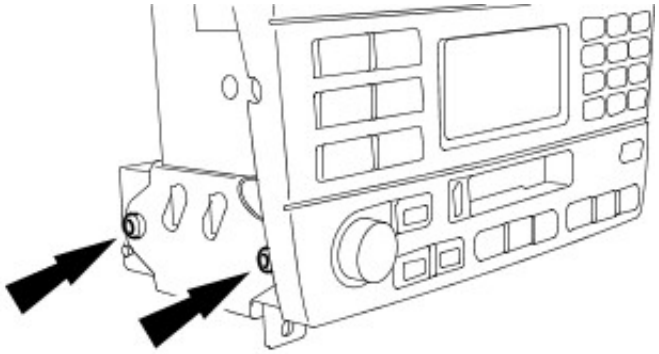
Diagnosis and Testing

For additional information, refer toSection 415-00 Information and Entertainment System - General Information.

Audio Unit - Audio Unit
Removal and Installation

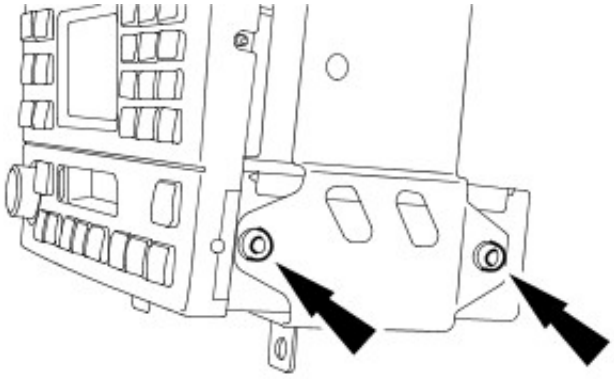
Removal

1. Remove the climate control panel.
   For additional information, refer to Section 412-04 Control Components.
2. Remove the navigation system screen (where fitted).
   For additional information, refer to Section 419-07 Navigation System.
3. Remove the audio unit screws.



VUJ0004289

4. Remove the audio unit.



VUJ0004290

Installation

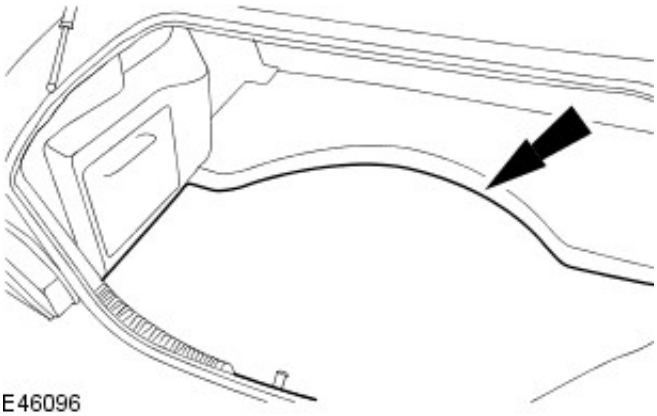
1. NOTE: A new audio unit must be configured using the Jaguar approved diagnostic equipment.

To install, reverse the removal procedure.

Audio Unit - Audio Unit Amplifier4-Door

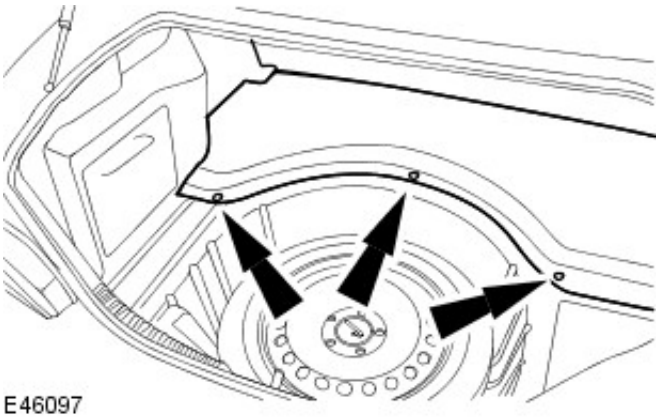
Removal and Installation

Removal



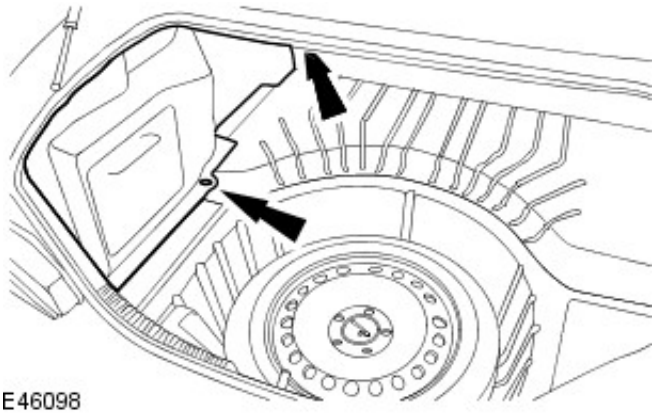
E46096

1. Remove the luggage compartment front floor carpet.



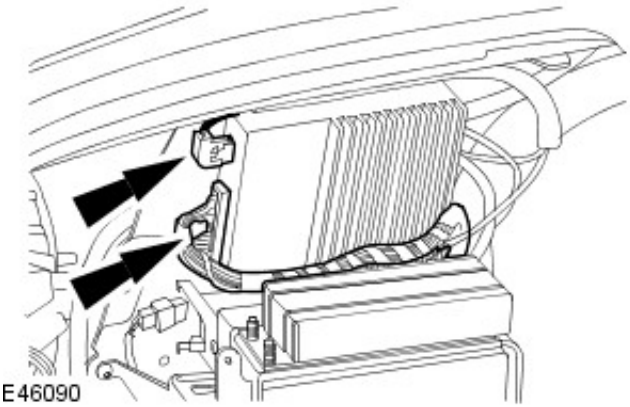
E46097

2. Remove the luggage compartment rear floor carpet.



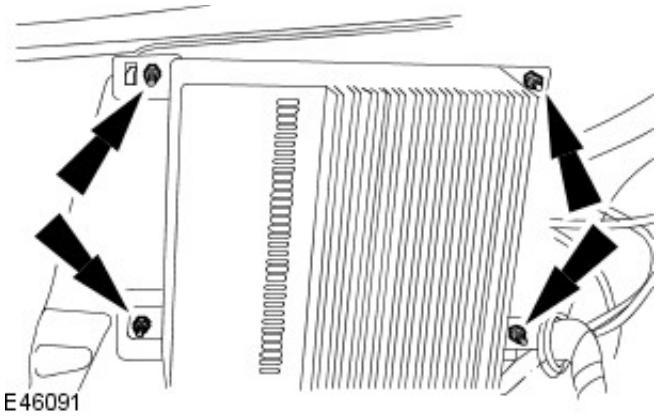
E46098

3. Remove the luggage compartment interior trim.



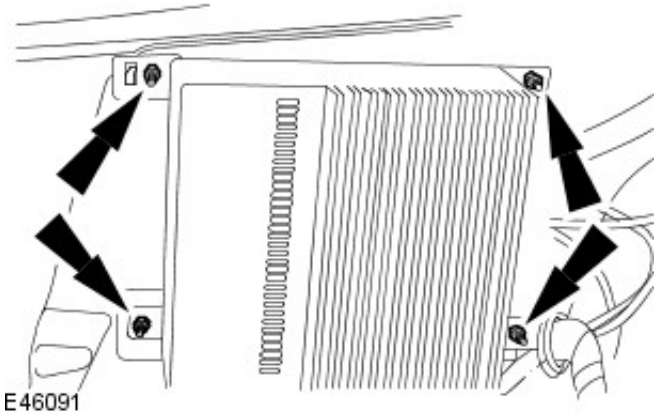
E46090

4. Disconnect the audio unit amplifier electrical connectors.



5. Remove the audio unit amplifier.

Installation



1. To install, reverse the removal procedure.

- Tighten to 9 Nm.

2. Using the Jaguar approved diagnostic system configure the audio unit amplifier.

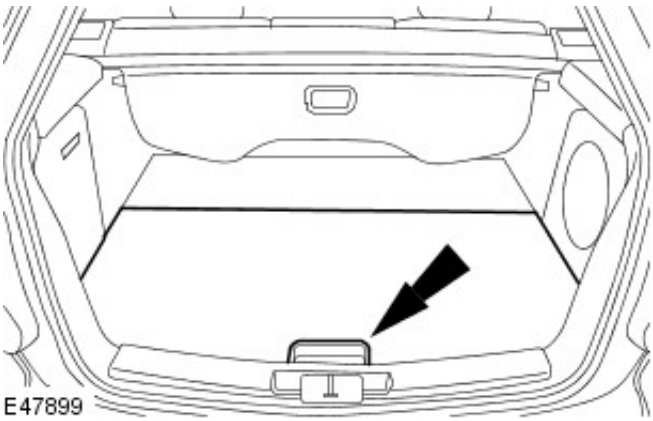
Audio Unit - Audio Unit AmplifierWagon
Removal and Installation

Removal

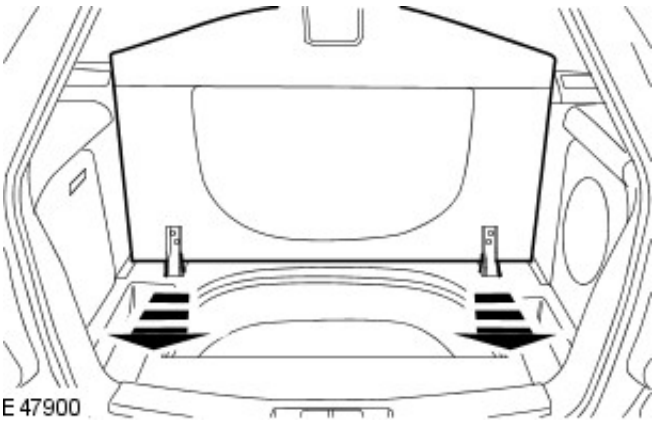
1. NOTE: Make sure the audio unit pin code is available before disconnecting the battery ground cable.

Disconnect the battery ground cable.
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

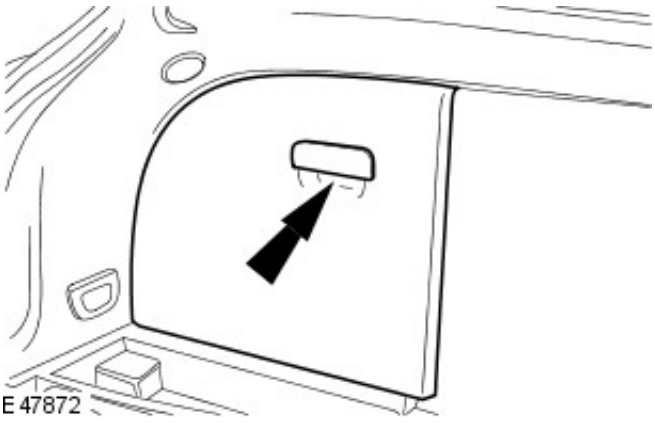
2. Raise the loadspace floor covering.


E47899

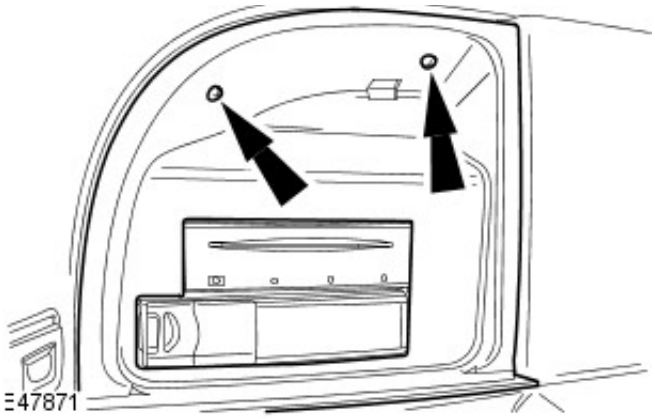
3. Remove the loadspace floor covering.


E47900

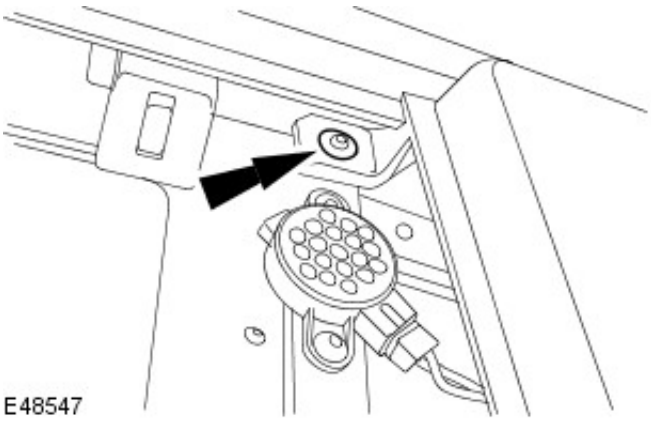
4. Remove the loadspace stowage compartment trim panel.


E47872

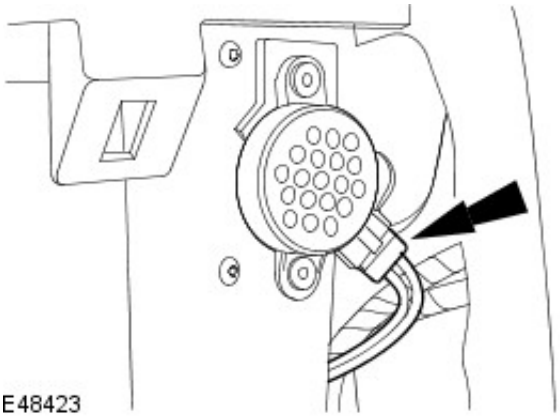
5. Remove the loadspace stowage compartment.



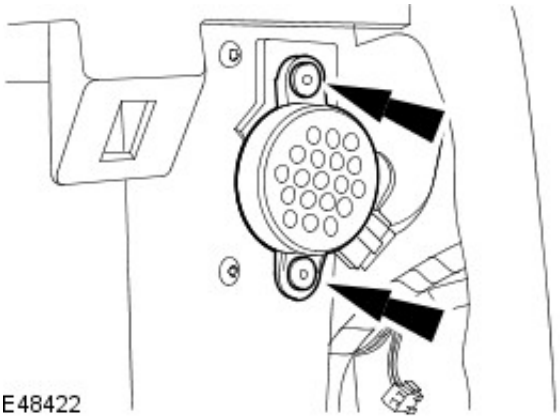
6. Remove the left-hand loadspace side trim panel retaining screw.



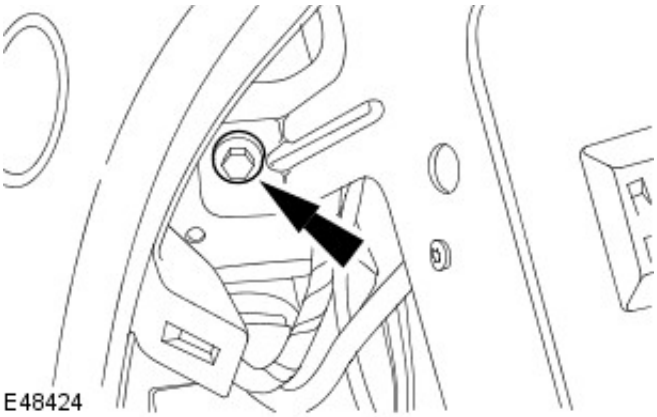
7. Disconnect the parking aid speaker electrical connector.



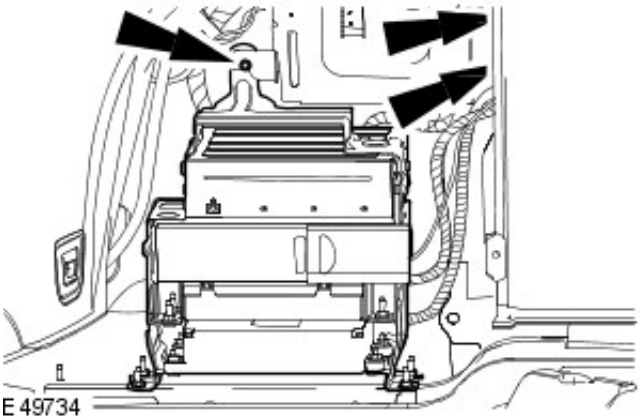
8. Remove the parking aid speaker.



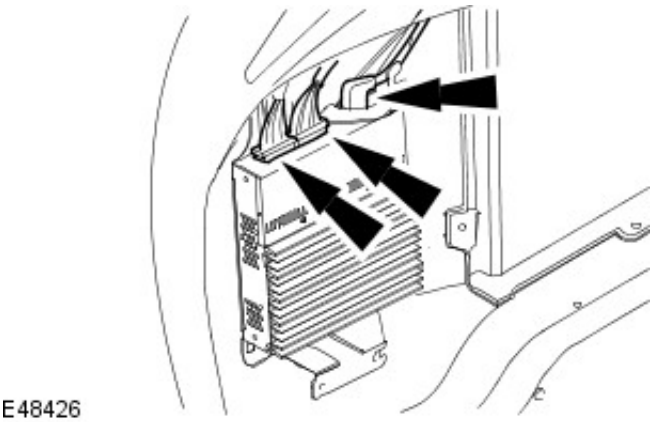
9. Remove the audio unit amplifier retaining bolt.


E48424

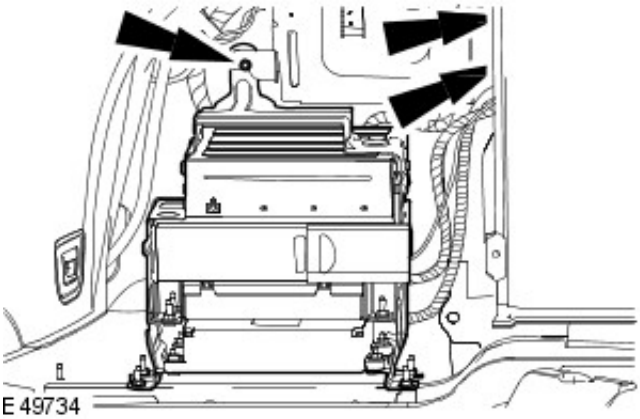
10. Remove the audio unit amplifier retaining bolts.


E49734

11. Remove the audio unit amplifier.


E48426

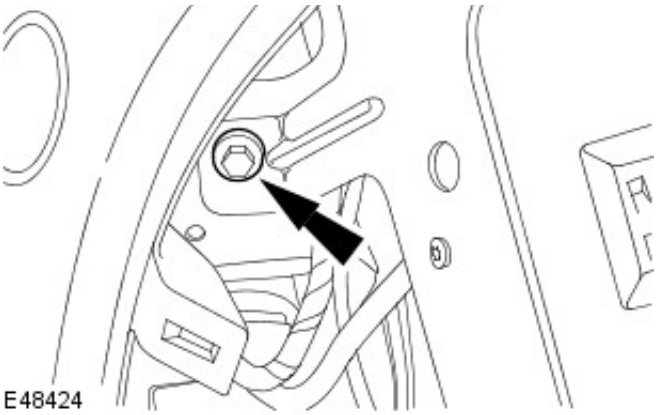
Installation


E49734

1. To install, reverse the removal procedure.

- Tighten to 9 Nm.

2. Tighten to 9 Nm.



3. Connect the battery ground cable.
   For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).
4. Using the Jaguar approved diagnostic system configure the audio unit amplifier.

Audio Unit - Compact Disc (CD) Changer4-Door

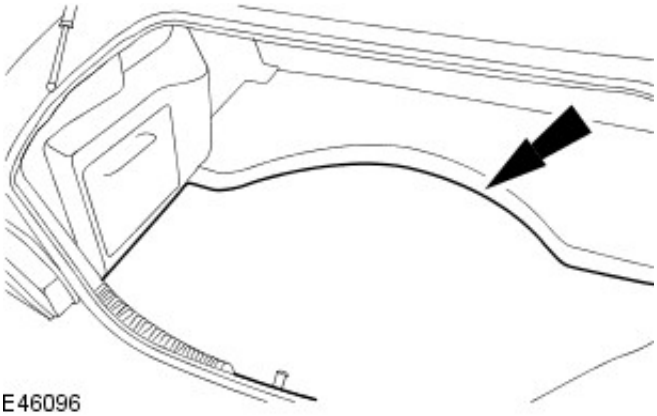
Removal and Installation

Removal

1. NOTE: Make sure the ICE pin code is available before disconnecting the battery ground cable.

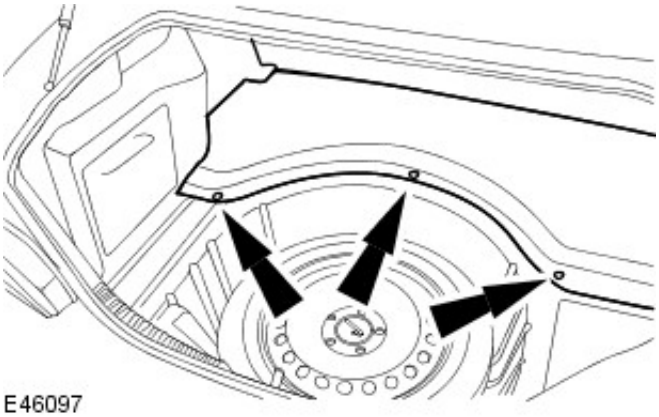
Disconnect the battery ground cable.
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

2. Remove the luggage compartment front floor carpet.



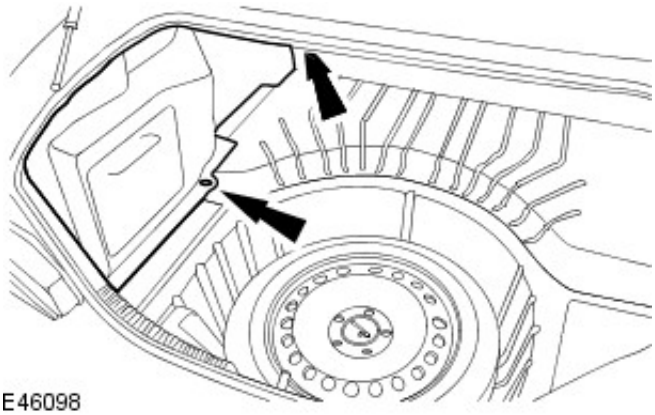
E46096

3. Remove the luggage compartment rear floor carpet.



E46097

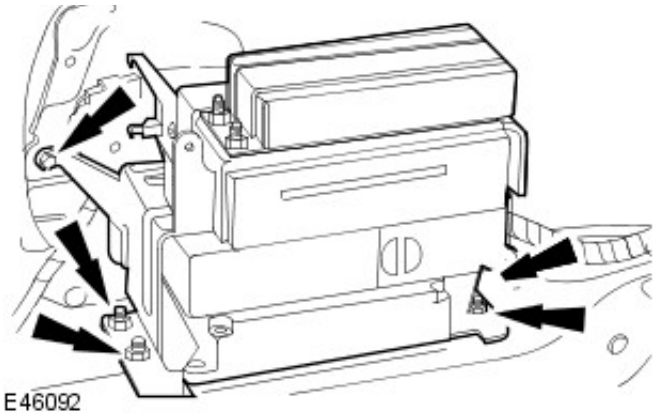
4. Remove the luggage compartment interior trim.



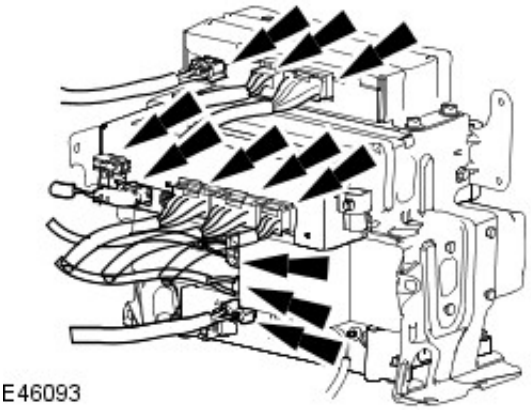
E46098

5. Remove the audio unit amplifer.
For additional information, refer to: Audio Unit Amplifier - 4-Door (415-01 Audio Unit, Removal and Installation).

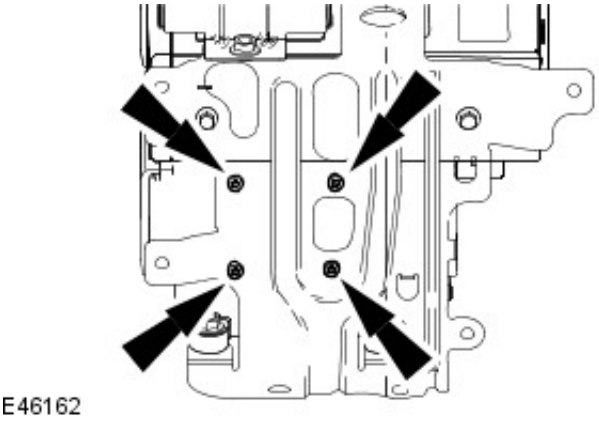
6. Detach the module retaining bracket.


E46092

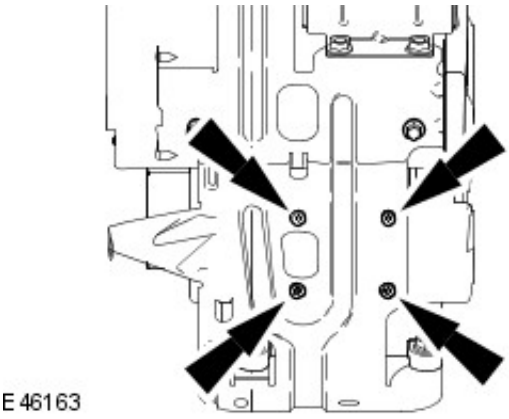
7. Disconnect the electrical connectors.


E46093

8. Remove the compact disc (CD) player retaining bolts.


E46162

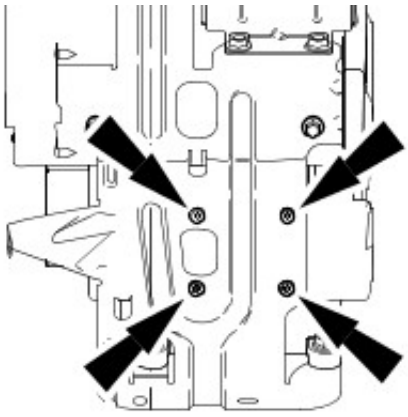
9. Remove the CD player.


E46163

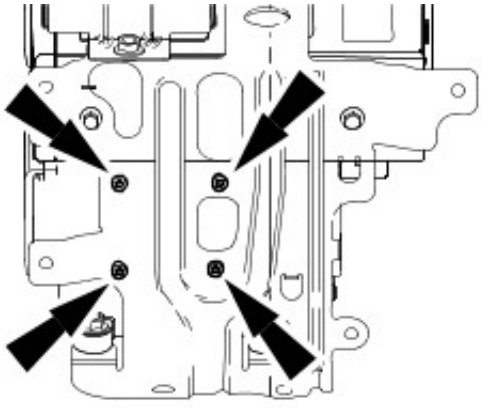
Installation

1. To install, reverse the removal procedure.

- Tighten to 1 Nm.



E46163



E46162

2. Tighten to 1 Nm.

3. Connect the battery ground cable.
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

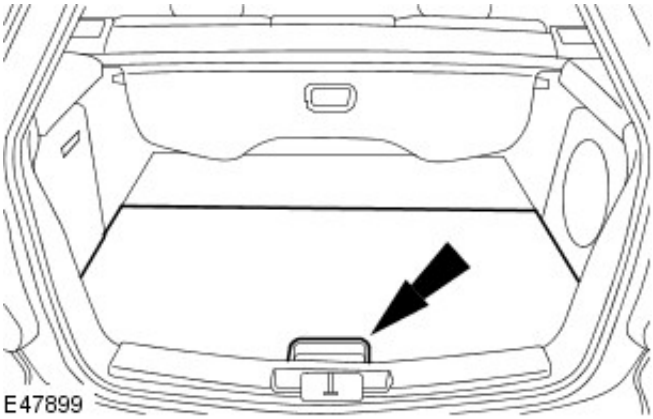
Audio Unit - Compact Disc (CD) ChangerWagon
Removal and Installation

Removal

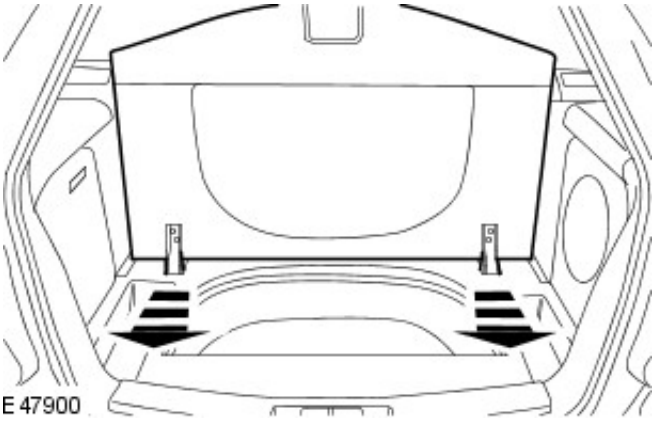
1. NOTE: Make sure the audio unit pin code is available before disconnecting the battery ground cable.

Disconnect the battery ground cable.
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

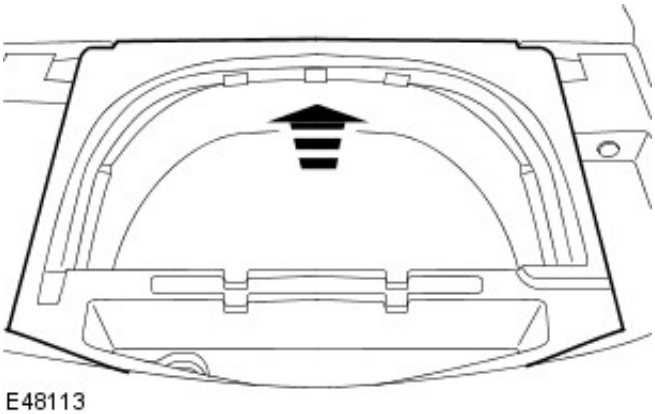
2. Raise the loadspace floor covering.


E47899

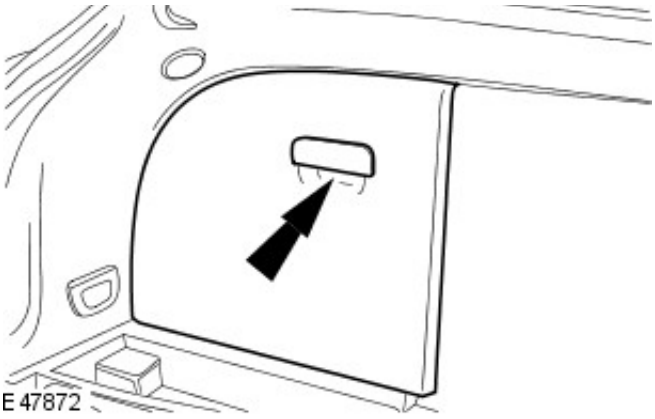
3. Remove the loadspace floor covering.


E47900

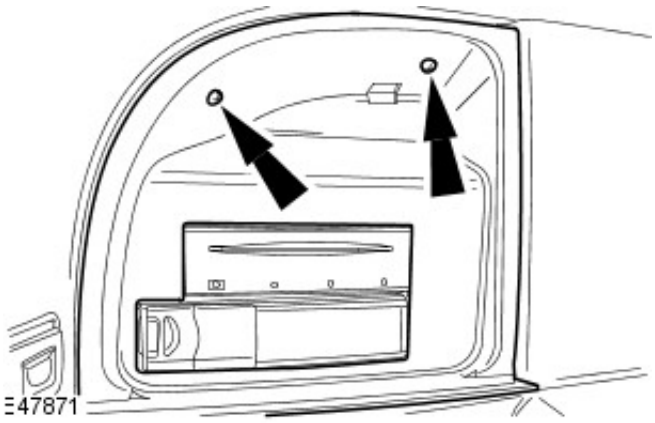
4. Remove the centre loadspace stowage compartment.


E48113

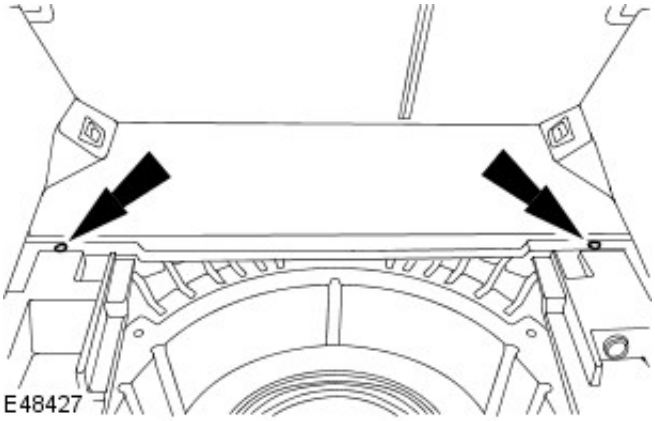
5. Remove the loadspace stowage compartment trim panel.



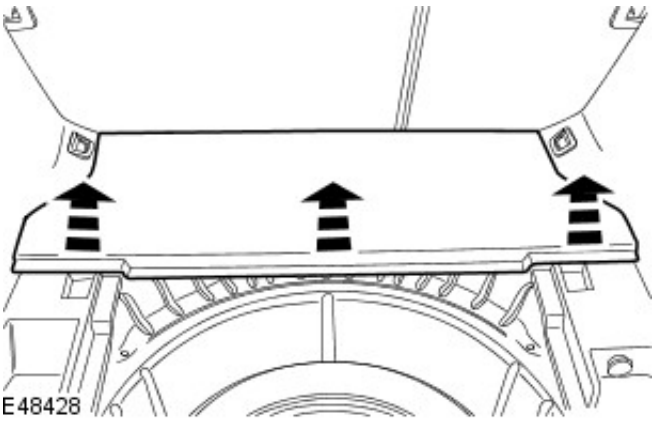
6. Remove the loadspace stowage compartment.



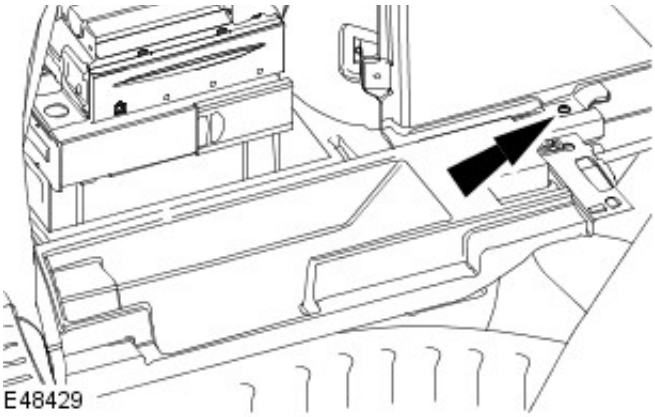
7. Remove the loadspace floor covering retaining screws.



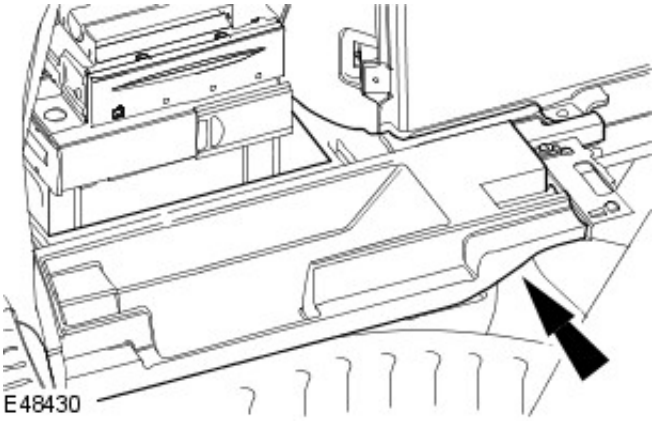
8. Detach the loadspace floor covering upwards.



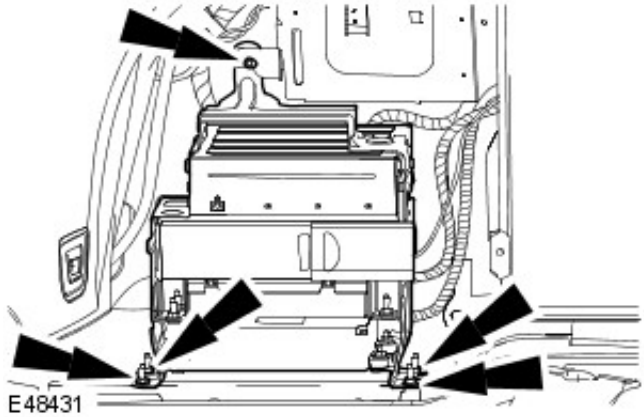
9. Remove the left-hand loadspace stowage compartment retaining screw.



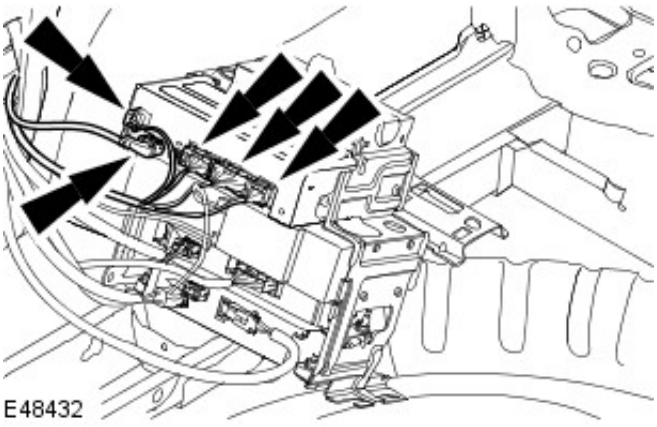
10. Remove the left-hand loadspace stowage compartment.



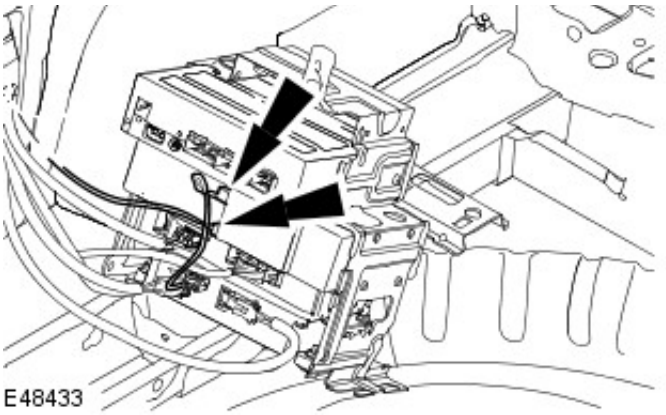
11. Detach the module retaining bracket.



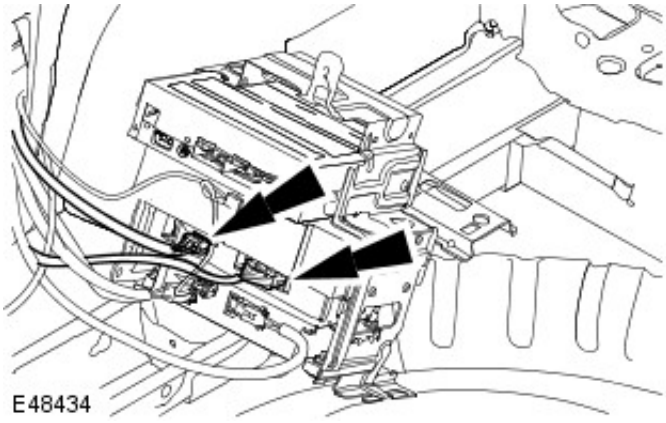
12. Disconnect the navigation system module electrical connectors.



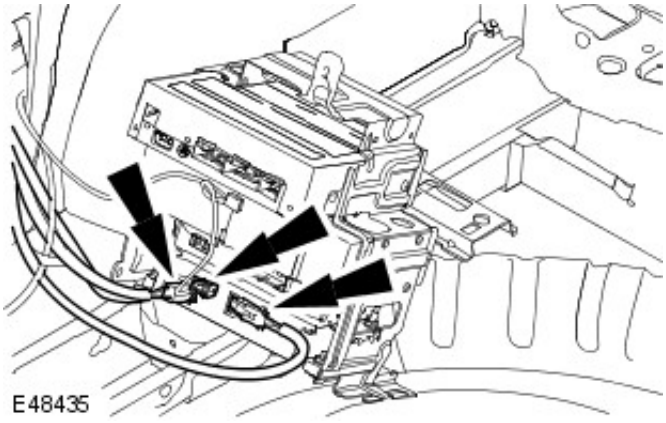
13. Disconnect the compact disc (CD) changer electrical connectors.


E48433

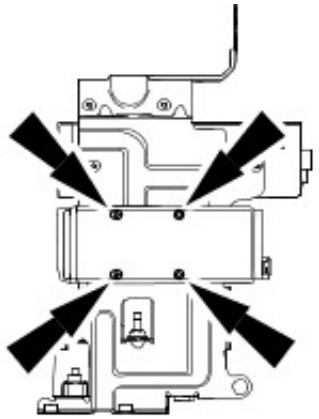
14. Disconnect the multifunction voice activated module electrical connectors.


E48434

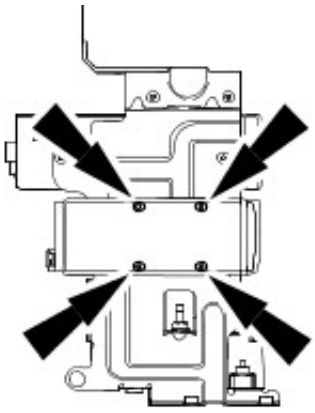
15. Disconnect the cellular phone module electrical connectors.


E48435

16. Remove the CD player retaining bolts.


E48436

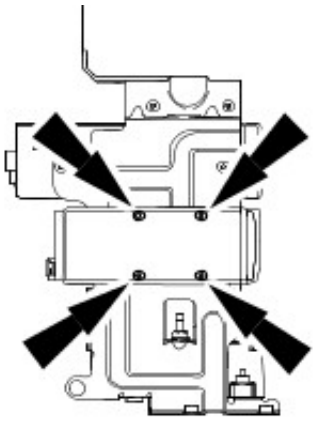
17. Remove the CD player.


E48437

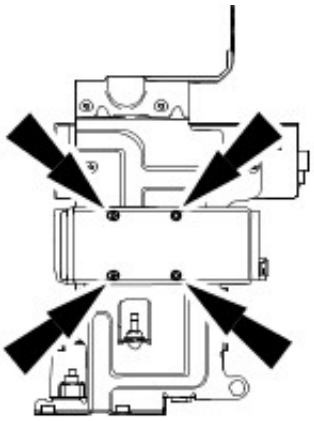
Installation

1. To install, reverse the removal procedure.

- Tighten to 1 Nm.

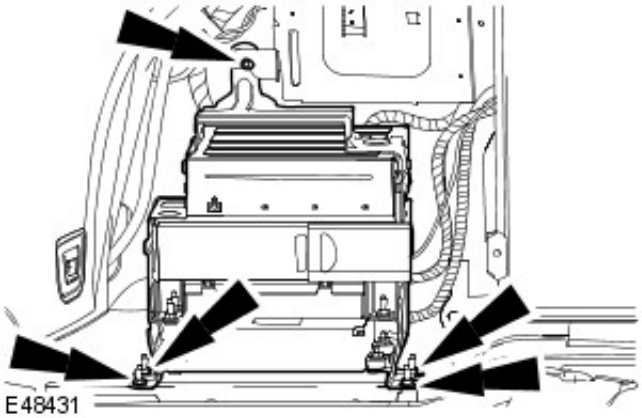

E48437

2. Tighten to 1 Nm.


E48436

3. Tighten the module retaining bracket upper and lower fixings.

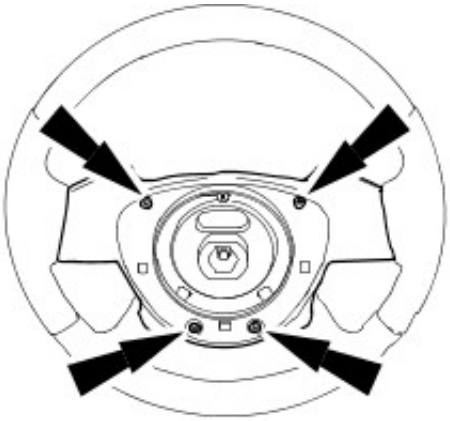
- Tighten the lower retaining nuts to 4 Nm.
- Tighten the upper retaining bolt to 9 Nm.


E48431

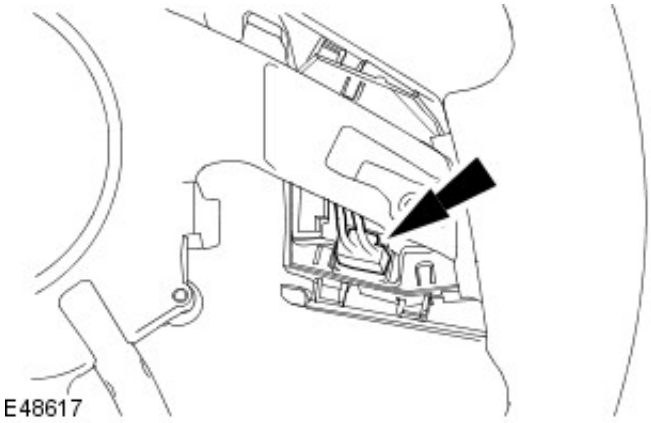
4. Connect the battery ground cable
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

Audio Unit - Steering Wheel Audio Controls
Removal and Installation

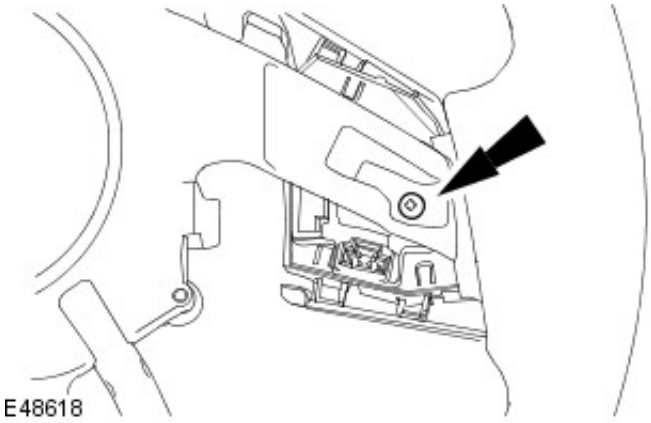
1. Remove the steering wheel.
   For additional information, refer to: Steering Wheel (211-04 Steering Column, Removal and Installation).
2. Remove the steering wheel finisher trim panel.


E48616

3. Disconnect the electrical connector.

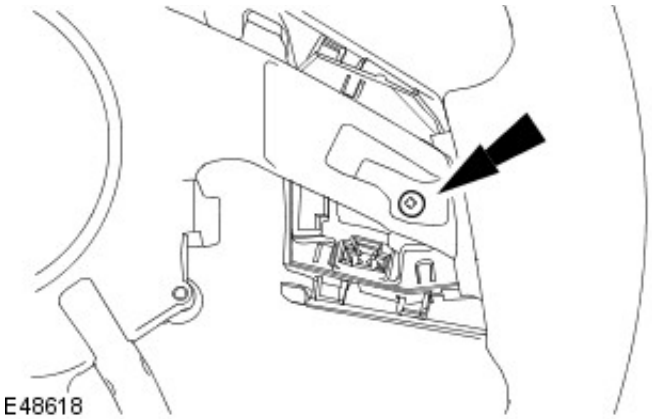

E48617

4. Remove the steering wheel audio controls.


E48618

Installation

1. To install, reverse the removal procedure.
   - Tighten to 4 Nm.


E48618

Antenna -

Torque Specifications

Description	Nm	lb-ft	lb-in
Module retaining bolt - 4 Door	9	–	80
Antenna retaining nut - Wagon	7	–	62

Antenna - Antenna
Description and Operation

ANTENNA - 4 DOOR

Item	Part Number	Description
1	—	Roof pod antenna module (vehicles from 2009MY)
2	—	FM antenna
3	—	AM Antenna
4	-	Digital Audio Broadcast (DAB)/Vehicle Information and Communication System (VICS - Japan only) antenna
5	-	TV antenna
6	-	DAB/VICS antenna amplifier
7	-	AM/FM antenna amplifier

4-Door - Vehicles up to 2009MY

The audio unit to antenna module cable is located in the body wiring harness. The antenna module to antenna cable is located along the C-pillar.

There are two antennas fitted to the vehicle, an AM antenna and an FM antenna, both located in the rear windshield glass.

4 Door - Vehicles from 2009MY

Vehicles from 2009MY are fitted with a roof pod antenna module. The module is secured to the vehicle roof panel with 2 lock nuts and washers screwed onto captive studs in the module. The module can contain the following antennae dependant on the vehicle equipment specification:

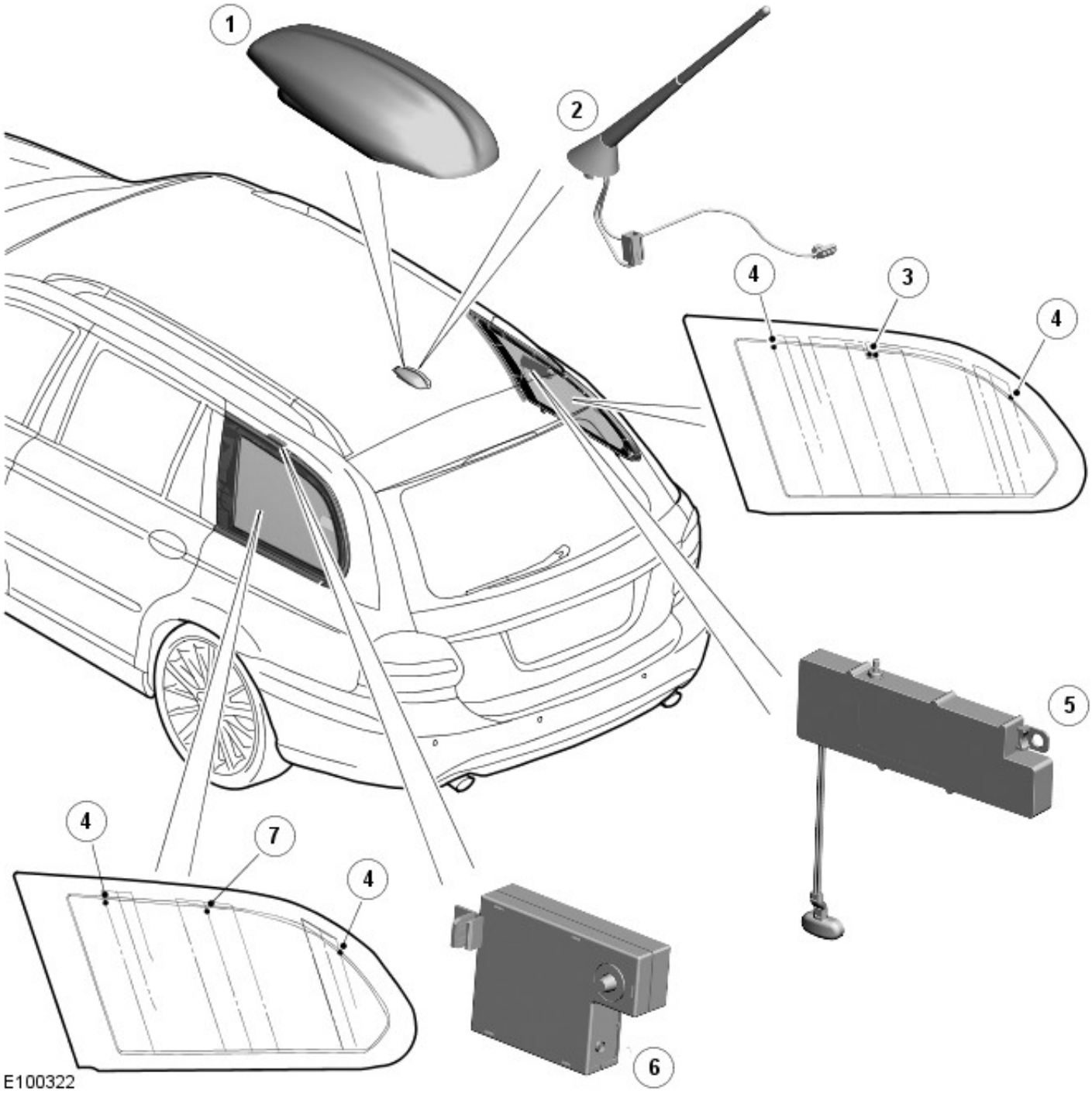
- DAB antenna only
- GPS (global positioning system) antenna only
- DAB and GPS antennae.

• NOTE: On vehicles not fitted with DAB or GPS an empty module is fitted.

The DAB system uses the antenna in the roof pod antenna module and also the rear window heater elements for DAB reception. The antenna module receives L band signals which are passed directly to the DAB module in the luggage compartment. The rear window elements receive band 3 signals. The band 3 signals received by the rear window elements are passed through a DAB antenna amplifier before being passed to the DAB module located in the luggage compartment. The DAB antenna amplifier is located on the RH (right-hand) 'C' pillar adjacent to the rear window. The amplifier is connected to the rear screen elements by a connector which attaches to the uppermost press stud on the RH of the rear screen

The AM/FM signals are received by elements in the rear window. The AM signals are received by elements located mainly in the upper LH (left-hand) side of the rear window. The FM signals are received by elements across the whole of the rear window. The received signals are passed through an AM/FM antenna amplifier before being passed to the audio unit. The AM/FM antenna amplifier is located on the LH 'C' pillar adjacent to the rear window. The amplifier is connected to the rear screen elements by a connector which attaches to press studs on the rear screen elements. The rear window elements also incorporate reception for TV signals where a TV system is fitted.

ANTENNA - WAGON



Item	Part Number	Description
1	-	Roof pod antenna module (vehicles from 2009MY)
2	-	Antenna assembly (vehicles up to 2009MY)
3	-	AM/FM antenna
4	-	Television (TV) antenna
5	-	AM/FM antenna amplifier
6	-	DAB/VICS antenna amplifier
7	-	DAB/VICS (Japan only) antenna

Wagon - Vehicles up to 2009MY

The antenna assembly is mounted at the rear of the roof panel, and incorporates the AM, FM and Cellular Phone functions.

The antenna is available in two versions:

- AM, FM and Cellular Phone.
- AM and FM only.

All vehicles with the pre-installed cellular phone wiring are fitted with the AM/FM and cellular phone antenna as standard.

Access to the antenna assembly fixing nut can only be gained by lowering the headliner.

Wagon - Vehicles from 2009MY

Vehicles from 2009MY are fitted with a roof pod antenna module. The module is secured to the vehicle roof panel with 2 lock nuts and washers screwed onto captive studs in the module. The module can contain the following antennae dependant on the vehicle equipment specification:

- DAB antenna only
- GPS antenna only
- DAB and GPS antennae.

• NOTE: On vehicles not fitted with DAB or GPS an empty module is fitted.

The DAB system uses the antenna in the roof pod antenna module and also elements in the LH rear side window for DAB reception. The antenna module receives L band signals which are passed directly to the DAB module in the luggage compartment. The side window elements receive band 3 signals. The band 3 signals received by the side window elements are passed through a DAB antenna amplifier before being passed to the DAB module located in the luggage compartment. The DAB antenna amplifier is located on the body above the side window. The amplifier is connected to the elements by a connector which attaches to the center press stud on the LH side window elements. The LH side window also incorporates elements for the TV system if fitted.

The AM/FM signals are received by elements in the RH rear side window. The AM/FM signals are received by the elements located centrally in the side window. The received signals are passed through an AM/FM antenna amplifier before being passed to the audio unit. The AM/FM antenna amplifier is located on the body above the side window. The amplifier is connected to the elements by a connector which attaches to press studs on the side window elements. The RH side window also incorporates elements for the TV system if fitted.

Antenna - Antenna

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

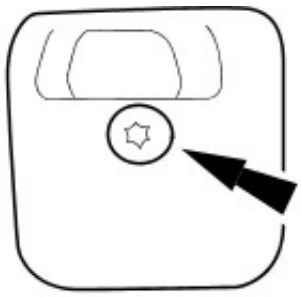
Electrical
• Module • FM anntena • AM antenna • Wiring harness for damage or corrosion • Electrical connector(s)

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Antenna - AntennaWagon
Removal and Installation

Removal

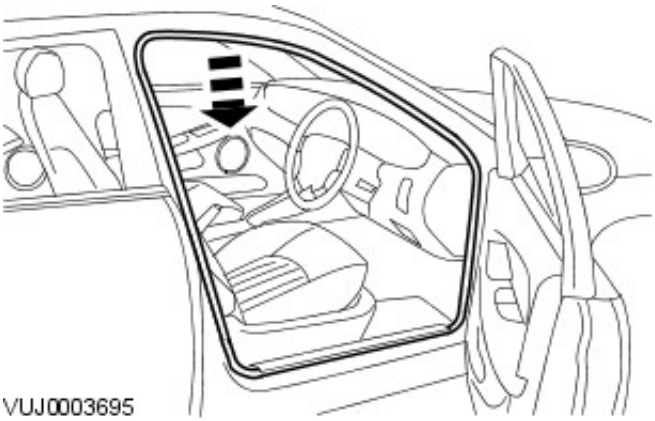
1. Remove the overhead console.
   For additional information, refer to: Overhead Console (501-12 Instrument Panel and Console, Removal and Installation).
2. Remove the both sun visors.
   For additional information, refer to: Sun Visor (501-05 Interior Trim and Ornamentation, Removal and Installation).
3. Remove the sun visor retaining clips.



VUJ0003728

4. NOTE: Right-hand shown, left-hand similar.

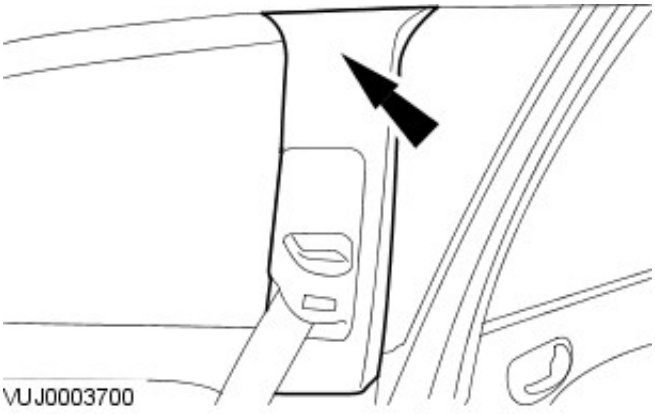
   Detach the front door opening weatherstrip.



VUJ0003695

5. Remove both A-pillar trim panels.
   For additional information, refer to: A-Pillar Trim Panel (501-05 Interior Trim and Ornamentation, Removal and Installation).
6. NOTE: Right-hand shown, left-hand similar.

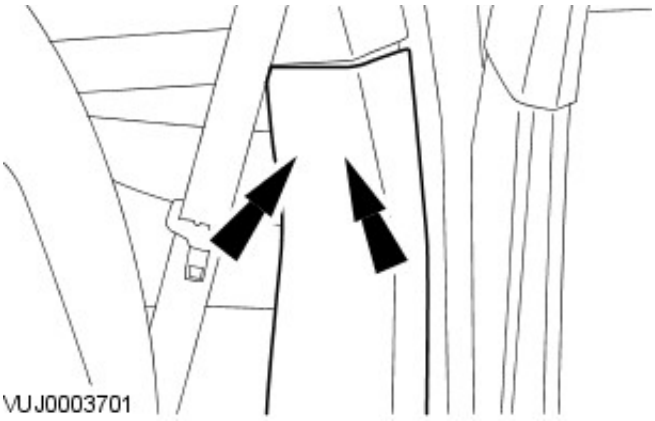
   Detach the B-pillar upper trim panel.



VUJ0003700

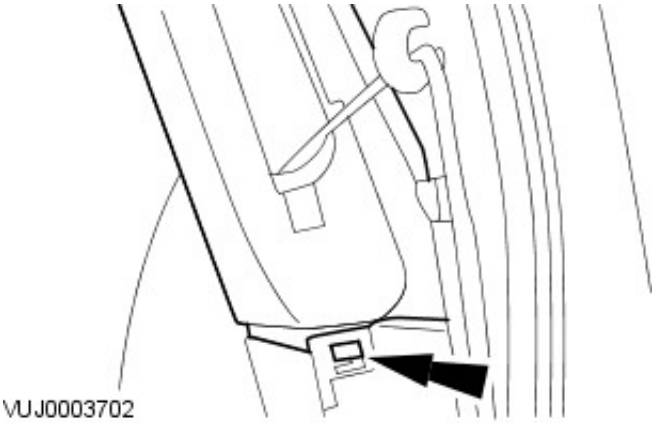
7. NOTE: Right-hand shown, left-hand similar.

   Detach the B-pillar lower trim panel.


VUJ0003701

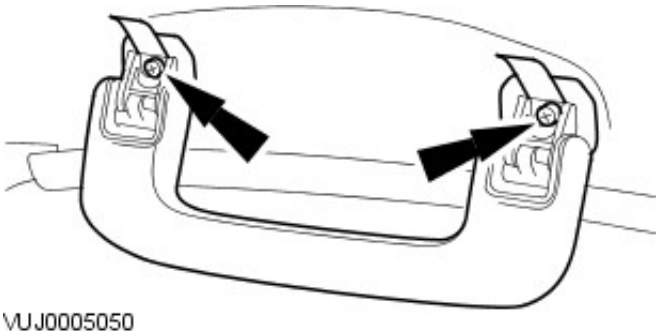
8. NOTE: Right-hand shown, left-hand similar.

Detach the B-pillar upper trim panel from the B-pillar trim lower trim panel.


VUJ0003702

9. Remove both C-pillar trim panel.
For additional information, refer to: C-Pillar Trim Panel - Wagon (501-05 Interior Trim and Ornamentation, Removal and Installation).

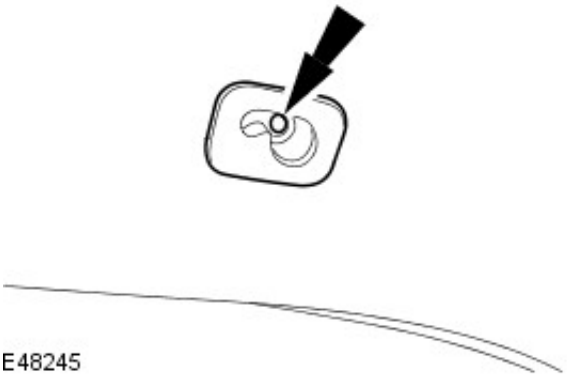
10. Detach the covers to expose the screws and remove the driver and passenger assist handles.

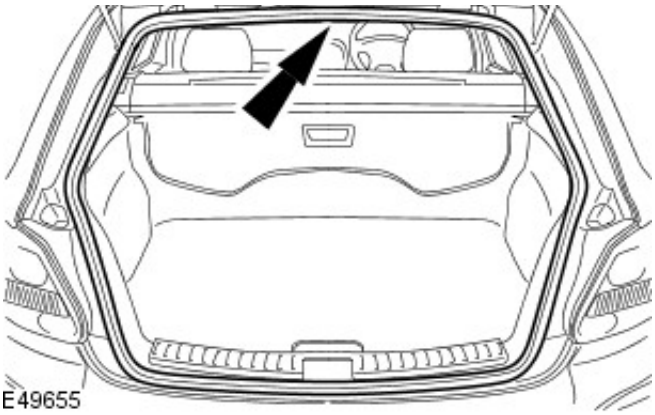

VUJ0005050

11. Remove both D-pillar trim panels.
For additional information, refer to: D-Pillar Trim Panel (501-05 Interior Trim and Ornamentation, Removal and Installation).

12. NOTE: Right-hand shown, left-hand similar.

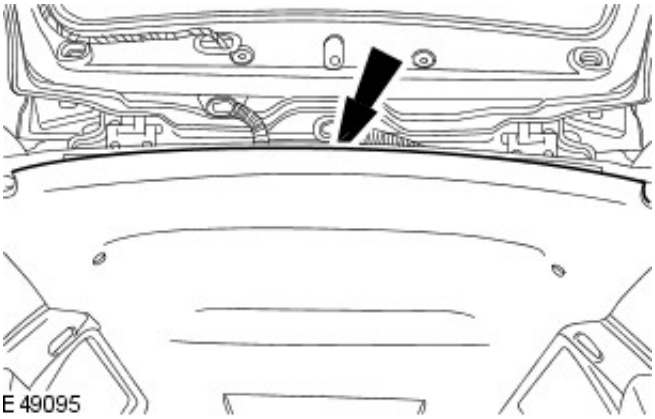
Remove the luggage net retaining clip.


E48245

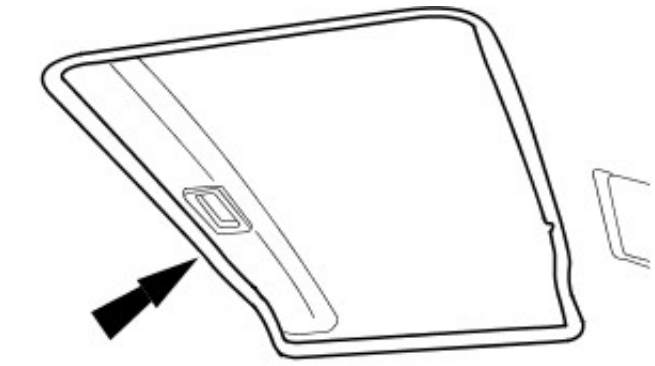

E49655

13. NOTE: The liftgate weatherstrip must be replaced once removed.

Remove and discard the liftgate opening weatherstrip.


E49095

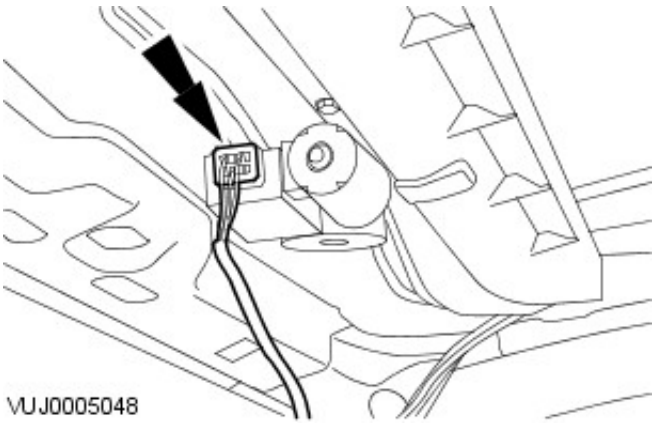
14. Detach the headliner.


VUJ0005047

15. CAUTION: The headliner must not be creased or folded during removal or installation. Failure to follow this instruction may result in damage to the component.

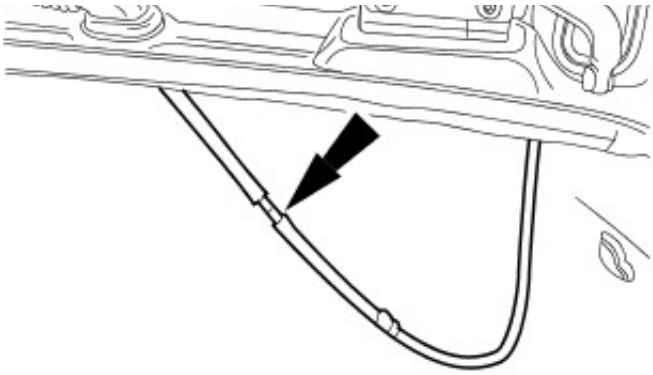
Lower the headliner.

- Remove the sunroof opening panel weatherstrip.


VUJ0005048

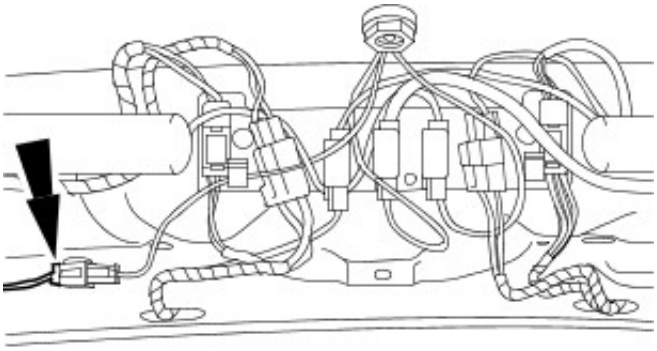
16. Disconnect the sunroof motor electrical connector.

17. Disconnect the rear washer hose connector.



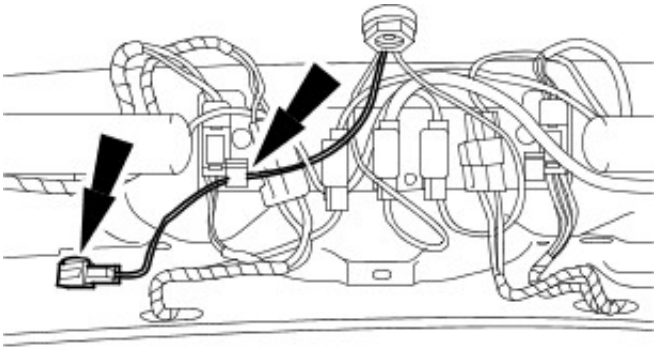
E48246

18. Disconnect the electrical connector.



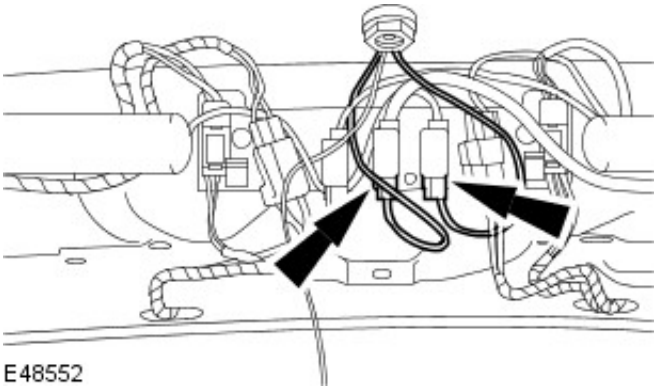
E48550

19. Detach the antenna harness.



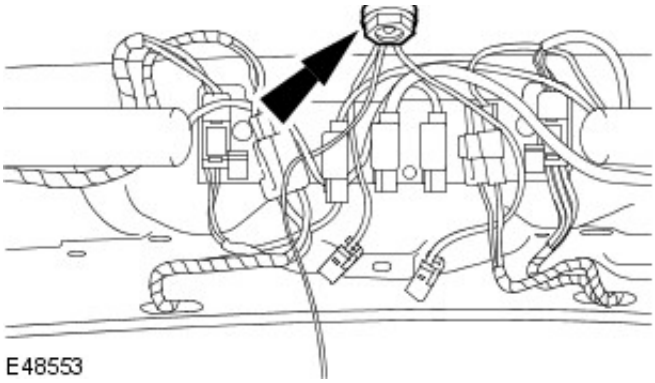
E48551

20. Disconnect the electrical connectors.

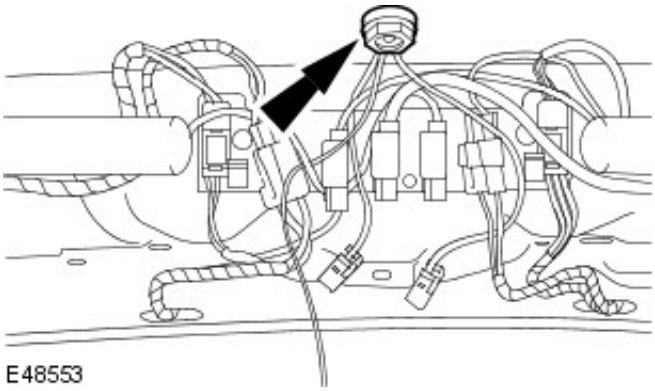


E48552

21. Remove the antenna.

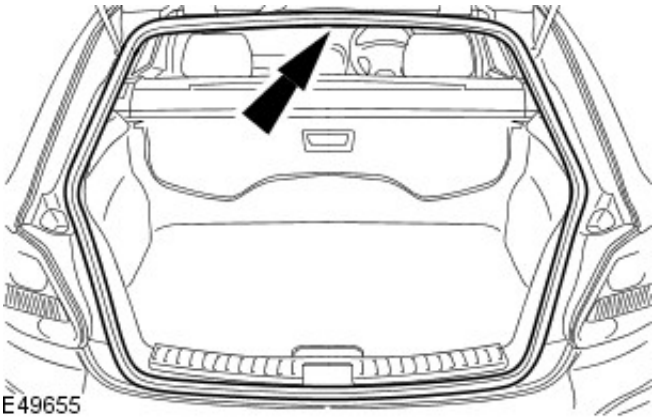


Installation



1. To install, reverse the removal procedure.

- Tighten to 7 Nm.



2. NOTE: The liftgate weatherstrip must be replaced once removed.

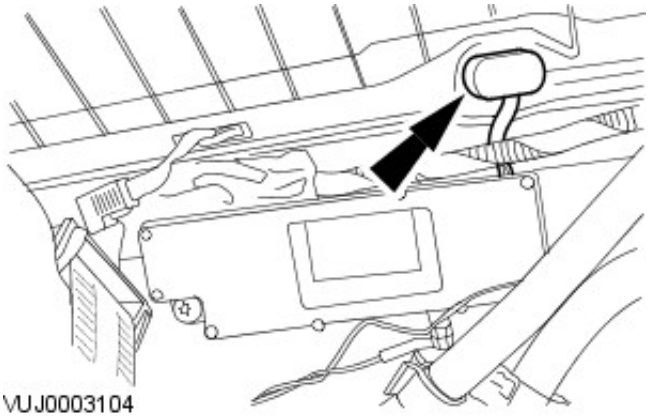
Install a new liftgate opening weatherstrip.

Antenna - Module
Removal and Installation

Removal

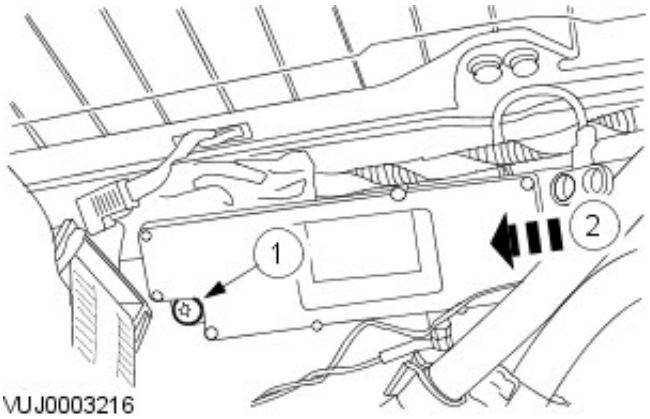
1. Remove the C-pillar trim. For additional information, refer toSection 501-05 Interior Trim and Ornamentation.

2. Disconnect the antenna cable electrical connector.


VUJ0003104

3. Detach the module.

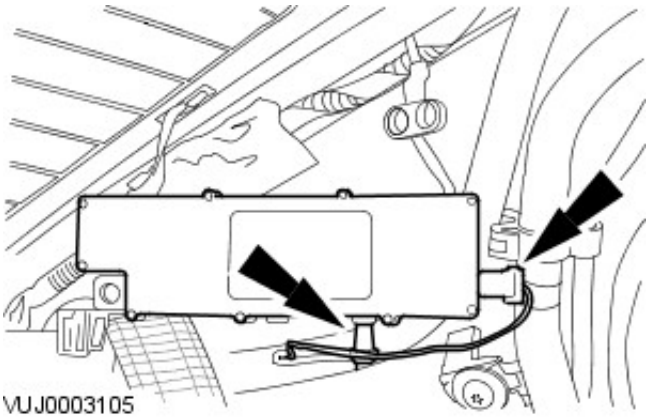
1. Remove the module retaining bolt.
2. Detach the module.



VUJ0003216

4. Remove the module.

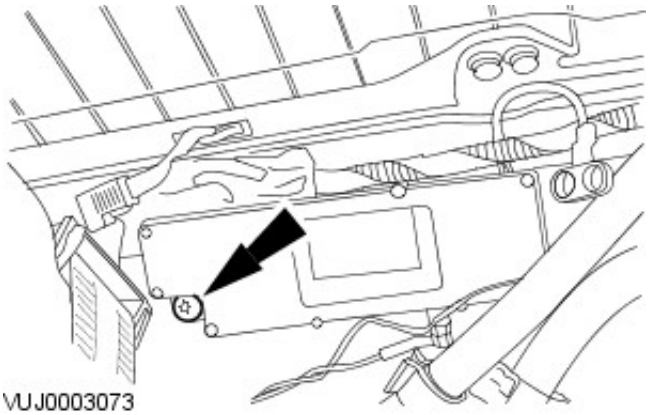
- Disconnect the module electrical connectors.


VUJ0003105

Installation

1. To install, reverse the removal procedure.

- Tighten to 9 Nm.



VUJ0003073

Speakers - Speakers

Description and Operation

All Vehicles

Optimum acoustic detail is achieved through mounting the speakers high on each door panel.

The premium sound system speakers are powered by a separate, remote amplifier.
For additional information, refer to: Audio System (415-01 Audio Unit, Description and Operation).

The standard sound system speakers are powered by the audio unit.

4-Door

The standard sound system comprises six speakers, two mid/bass and two tweeters in the front doors, and two full range speakers in the rear doors.

The premium sound system comprises ten speakers:

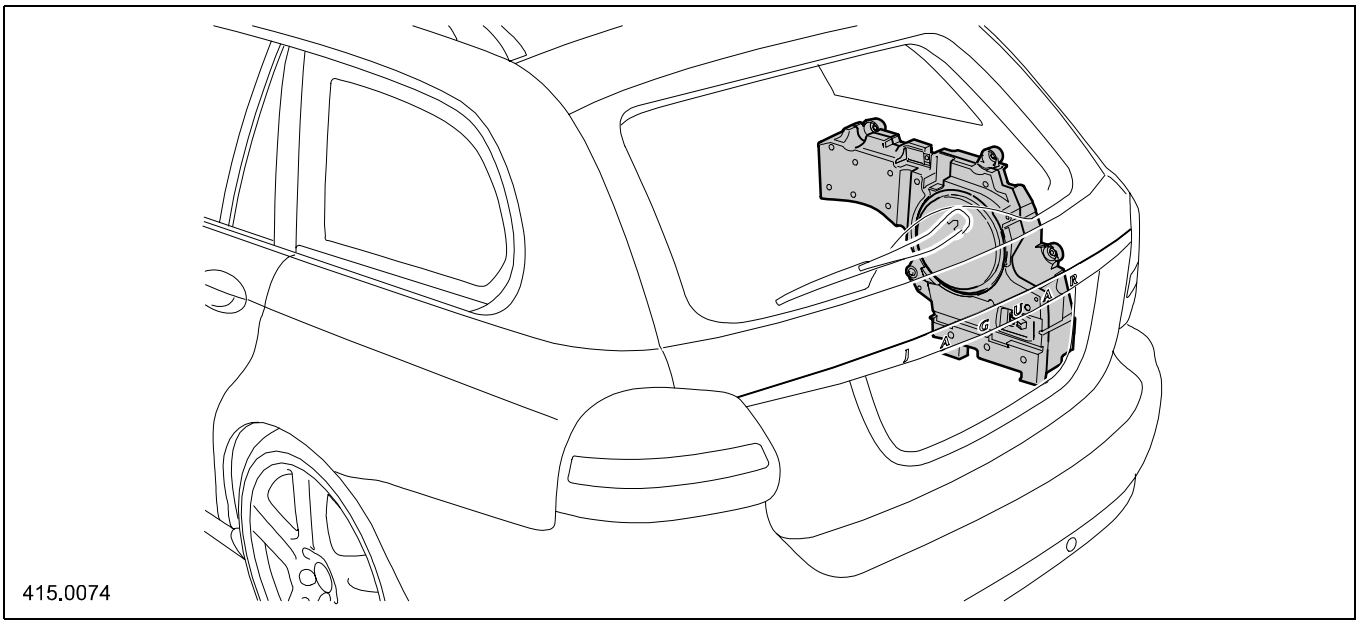
- Four high power and high quality speakers mounted in each door.
- Four door mounted tweeters.
- Two sub-woofers mounted beneath the rear parcel shelf.

Wagon

The standard sound system on wagon comprises six speakers, two mid/bass and two tweeters in the front doors, and two full range speakers in the rear doors.

The premium sound system comprises nine speakers:

- Four high power and high quality speakers mounted in each door.
- Four door mounted tweeters.
- An enclosed sub-woofer mounted behind the right-hand loadspace trim.



Estate Premium Audio Sound sub-woofer enclosure

Speakers - Speakers

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of electrical damage.

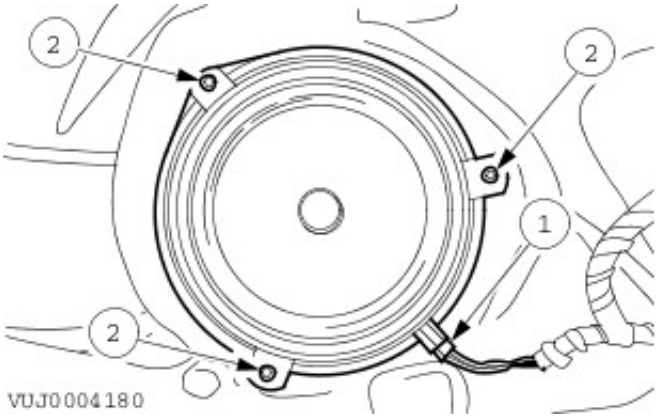
Visual Inspection Chart

Electrical
• Wiring for damage and corrosion • Electrical connectors • Speakers for damage or deterioration • Rear speaker amplifier

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Speakers - Front Door Speaker
Removal and Installation

Removal



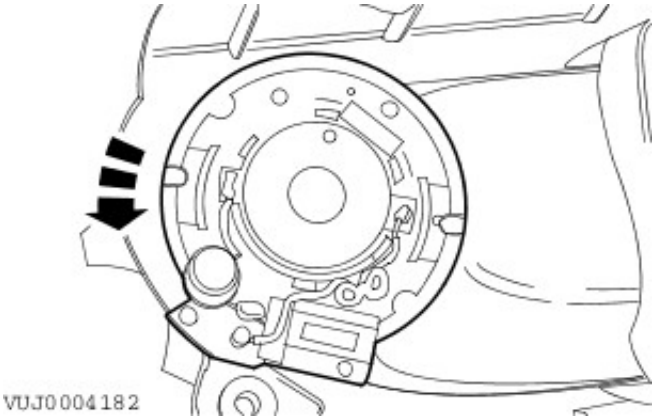
1. Remove the door trim panel. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
2. Remove the front speaker.
    1. Disconnect the electrical connector.
    2. Remove the front speaker.

Installation

1. To install, reverse the removal procedure.

Speakers - Front Door Tweeter Speaker
Removal and Installation

Removal



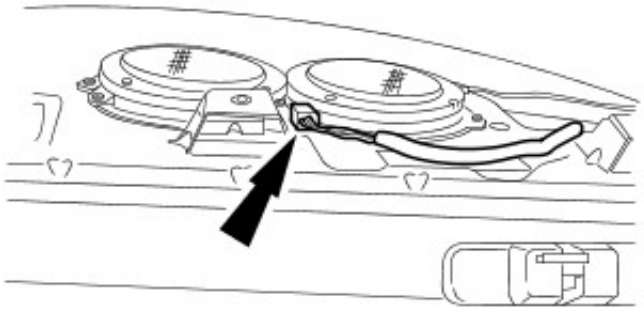
1. Remove the door trim panel. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
2. Remove the front tweeter speaker.

Installation

1. To install, reverse the removal procedure.

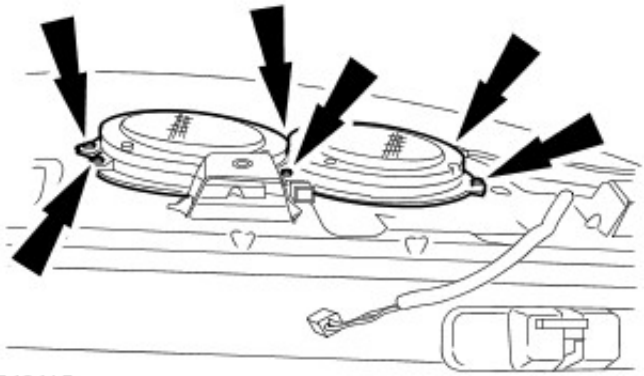
Speakers - Parcel Shelf Speaker
Removal and Installation

1. Remove the parcel shelf.
   For additional information, refer to: Parcel Shelf (501-05 Interior Trim and Ornamentation, Removal and Installation).
2. Disconnect the electrical connector.



E49414

3. Remove the parcel shelf speaker.

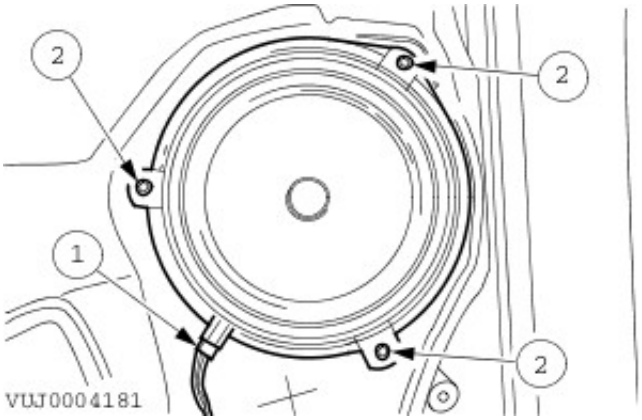


E49415

Installation

1. To install, reverse the removal procedure.

Speakers - Rear Door Speaker
Removal and Installation



Removal

1. Remove the door trim panel. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
2. Remove the rear speaker.
    1. Disconnect the electrical connector.
    2. Remove the rear speaker.

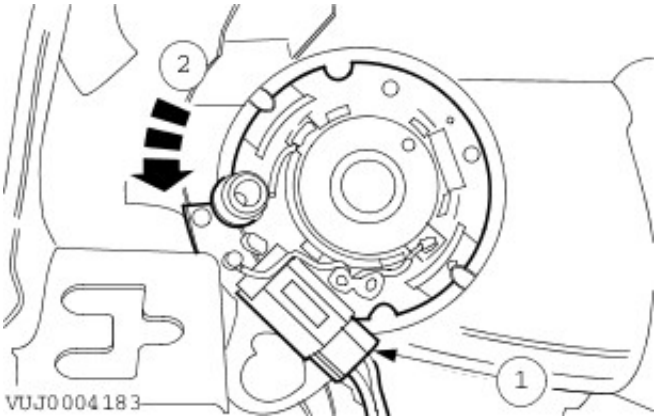
Installation

1. To install, reverse the removal procedure.

Speakers - Rear Door Tweeter Speaker

Removal and Installation

Removal



1. Remove the door trim panel. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
2. Remove the rear tweeter speaker.
    1. Disconnect the electrical connector.
    2. Remove the rear tweeter speaker.

Installation

1. To install, reverse the removal procedure.

Exterior Lighting -

General Specifications

Item	Specification
Front turn signal lamp bulb	PY21W
Front fog lamp bulb	H1-55W
Parking/Side lamp bulb	W5W
Low beam lamp bulb	H1-55W
High beam lamp bulb	H1-55W
High intensity discharge (HID) lamp bulb	D2s-35W
Rear turn signal lamp bulb	PY21W
Rear fog lamp bulb	P21W
Stoplamp/rear lamp bulb	P21/5W
Rear lamp bulb	P21/5W
Reversing lamp bulb	P21W
Side repeater lamp bulb	W5W
Side marker lamp bulb	W5W

Exterior Lighting - Exterior Lighting

Description and Operation

The headlamp switch is located on the driver side of the instrument panel. It also operates the sidelamps, fog lamps, "Auto Mode", headlamp levelling and the trip switch.

Each headlamp assembly consists of two lamps. The side lamp and the high beam lamp are the inner and the low beam and turn signal lamp are the outer. Access for bulb replacement is from the engine compartment.

High intensity discharge (HID) lighting is fitted as an option.

 WARNING: Voltages of up to 25 KV are possible with HID lighting.

Burner wear for HID lamps is so low that the burner lasts the lifetime of the vehicle under normal use. The HID bulbs are dealer replaceable only.

• NOTE: After replacement of a sensor or module the HID lamps will need to be calibrated using a Jaguar Approved Diagnostic System.

The front fog lamps are located in recesses in the front bumper. The two retaining screws are located behind the splitter vane and are accessible after removing the radiator splash shield.

The license plate lamp bulbs on all vehicles can be accessed by releasing the retaining tangs on the side of the lamps.

Each rear lamp assembly incorporates a stop/tail lamp, a fog lamp, a reversing lamp and a turn signal lamp. Access for bulb replacement is from the luggage compartment.

The high mounted stop lamps for both 4-door vehicles and wagon are replaceable as units. On 4-door vehicles, the two retaining screws are located behind the headliner and are accessible after the headliner has been removed. On wagon, the three retaining screws are located below the tailgate spoiler, and are accessible after the tailgate spoiler has been removed.

On vehicles up to 2009MY, the side repeater lamps are located in the front fender. On vehicles from 2009MY, the side repeater lamps are located in the door mirrors.

The side marker lamps on 4-door vehicles are located in the front bumper and rear bumper cover. These are located in each bumper cover by tangs on one side of the unit and held in position by a spring clip on the other side. The rear side marker lamps on wagon are incorporated in to each rear lamp assembly.

Exterior Lighting - Headlamps

Diagnosis and Testing

Principle of Operation

For a detailed description of the lighting system, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Exterior Lighting (417-01 Exterior Lighting, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Switch • Headlamp levelling motor • Levelling sensors • Relay(s)	• Wiring harness for damage or corrosion • Electrical connector(s) • Bulb(s) • Fuse(s) • Control module

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

DTC Index

WARNING: Voltages of up to 25 KV are possible with HID lighting

• CAUTIONS:

Observe all recommended safety precautions relating to the operation and repair of headlamp systems. Refer to health and safety guidance in the owner guide and repair manual for further details.

When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
B1318	Battery voltage low	• Charging system fault • Wiring harness concern	Battery voltage low, check charging system for faults. Charge level is controlled by engine control module.
B1342	ECU is faulted	• Auto levelling ECU internal error	Detectable internal defect (RAM/EEPROM error), check module for external connection problems, replace module as required.
B2477	Module configuration failure	• Control module not configured	Configure control module using manufacturer approved diagnostic system

		• Wiring harness concern	
B2608	ECU output to left headlamp stepper motor short to ground		Refer to electrical circuit diagrams, check left headlamp stepper motor circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2609	ECU output to left headlamp stepper motor circuit failure	• Wiring harness concern	Refer to electrical circuit diagrams, check left headlamp stepper motor circuit open circuit or short to power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2610	ECU output driver to left headlamp stepper motor overtemperature	• Headlamp fault	Check headlamp unit for blocking of stepper motor movement, or continuous operation. Replace headlamp components as required. Clear DTC and retest system to ensure correct operation
B2611	ECU output to right headlamp stepper motor short to ground	• Wiring harness concern	Refer to electrical circuit diagrams, check right headlamp stepper motor circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2612	ECU output to right headlamp stepper motor circuit failure	• Wiring harness concern	Refer to electrical circuit diagrams, check left headlamp stepper motor circuit open circuit or short to power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2613	ECU output driver to right headlamp stepper motor overtemperature	• Headlamp fault	Check headlamp unit for blocking of stepper motor movement, or continuous operation. Replace headlamp components as required. Clear DTC and retest system to ensure correct operation
B2614	Front or rear axle vehicle level sensor supply short to ground	• Wiring harness concern	Refer to electrical circuit diagrams, check level sensor power supply circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2615	Front or rear axle vehicle level sensor supply circuit failure	• Wiring harness concern	Refer to electrical circuit diagrams, check level sensor power supply circuit for short to power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2616	Front axle vehicle level sensor signal circuit failure	• Wiring harness concern	Refer to electrical circuit diagrams, check level sensor signal circuit for open circuit, short to 5 volts, short to battery power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2617	Front axle vehicle level sensor signal short to ground	• Wiring harness concern	Refer to electrical circuit diagrams, check front level sensor signal circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2618	Front axle vehicle level sensor signal not plausible	• Sensor fault/adjustment • wiring harness concern	Front sensor signal out of range. Check lever position and adjustment of sensor. Replace sensor if signal cannot be brought into range. Refer to electrical circuit diagrams, check level sensor signal circuit for faults. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2619	Rear axle vehicle level sensor signal circuit failure	• Wiring harness concern	Refer to electrical circuit diagrams, check level sensor signal circuit for open circuit, short to 5 volts, short to battery power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2620	Rear axle vehicle level sensor signal short to ground	• Wiring harness concern	Refer to electrical circuit diagrams, check rear level sensor signal circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2621	Rear axle vehicle level sensor signal not plausible	• Sensor fault/adjustment • wiring harness concern	Rear sensor signal out of range. Check lever position and adjustment of sensor. Replace sensor if signal cannot be brought into range. Refer to electrical circuit diagrams, check level sensor signal circuit for faults. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2622	Auto levelling ECU speed message invalid / not available	• CAN message invalid or not available • wiring harness concern	Refer to electrical circuit diagrams, check CAN circuits for faults. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
		•	

B2623	Auto levelling ECU low beam message invalid / not available	◦ CAN message invalid or not available • wiring harness concern	Refer to electrical circuit diagrams, check CAN circuits for faults. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2624	Auto levelling ECU speed signal not available	• speed signal circuit malfunction • wiring harness concern	Refer to electrical circuit diagrams, check CAN circuits for faults. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2625	Auto levelling ECU low beam signal input open circuit	• Wiring harness concern	Refer to electrical circuit diagrams, check ECU low beam input circuits for open circuits. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2626	Auto levelling ECU not calibrated	• ECU not calibrated or adjusted	Calibrate and adjust the headlamp levelling ECU using the manufacturer approved diagnostic system. Clear DTC and retest system to confirm correct operation

Exterior Lighting - Headlamp Adjustment

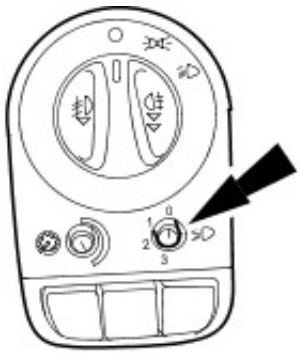
General Procedures

1. NOTE: Headlamp adjustment should be made at room temperature.

Prepare the vehicle for headlamp adjustment.

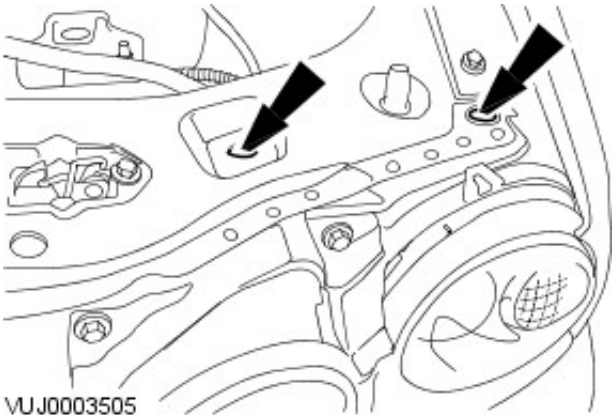
1. Place the vehicle on a level surface.
2. Before adjusting the headlamps, check for faulty lenses, reflectors and blackened bulbs. Install new components as necessary.
3. Check the tire pressures and correct as necessary. For additional information, refer to Section 204-04 Wheels and Tires.
4. The vehicle must be at normal weight.
5. Normalize the suspension.

2. Rotate the headlamp adjustment switch to the 'O' position.



VUJ0003066

3. Adjust the headlamp using the adjustment bolts.

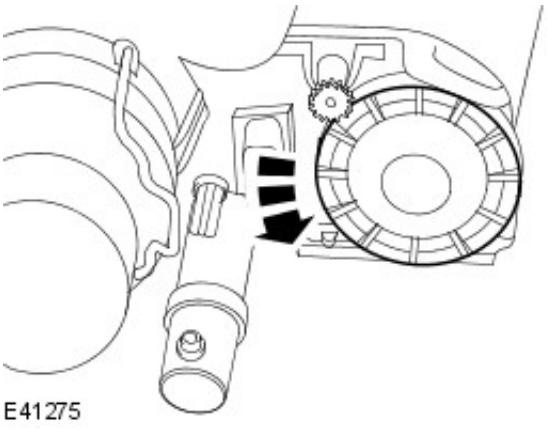


VUJ0003505

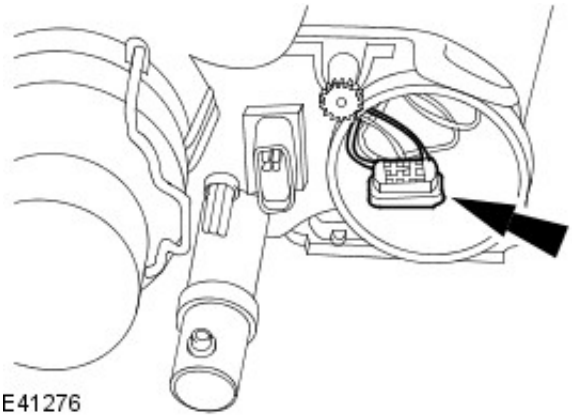
Exterior Lighting - Ballast
Removal and Installation

Removal

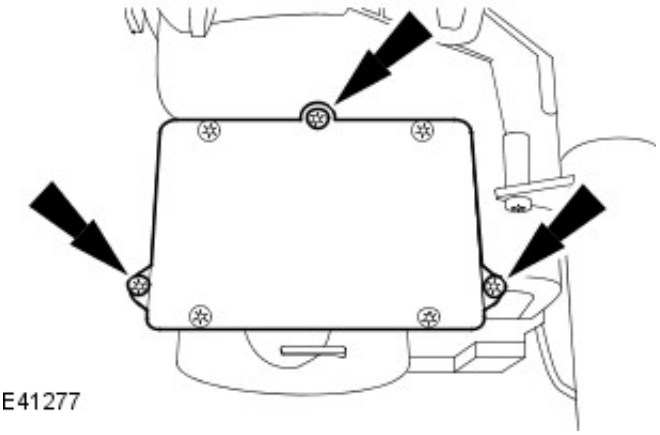
1. Remove the headlamp assembly.
   For additional information, refer to Headlamp Assembly - in this section.
2. Remove the bulb cover.


E41275

3. Disconnect the ballast module electrical connector.


E41276

4. Remove the ballast module.


E41277

Installation

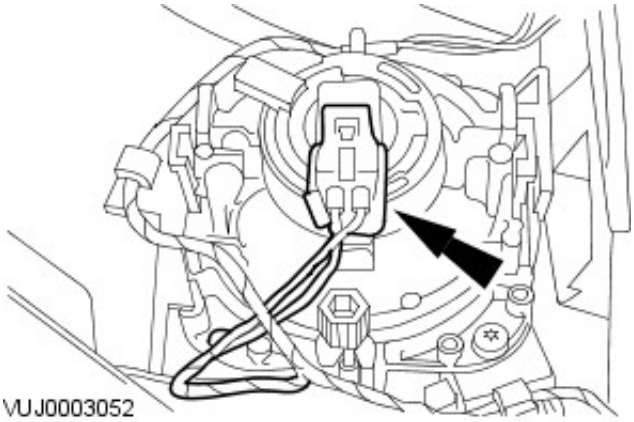
1. To install, reverse the removal procedure.

Exterior Lighting - Front Fog Lamp

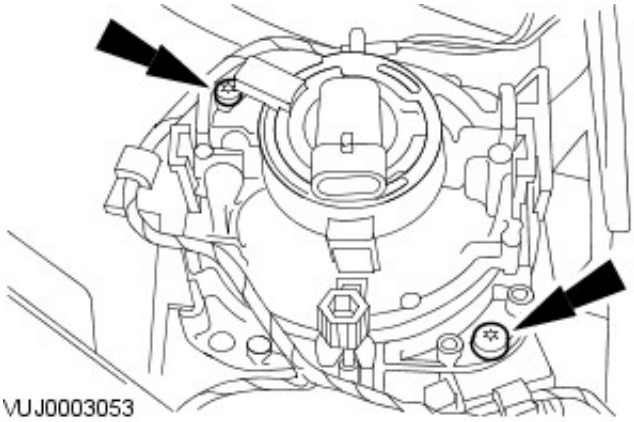
Removal and Installation

Removal

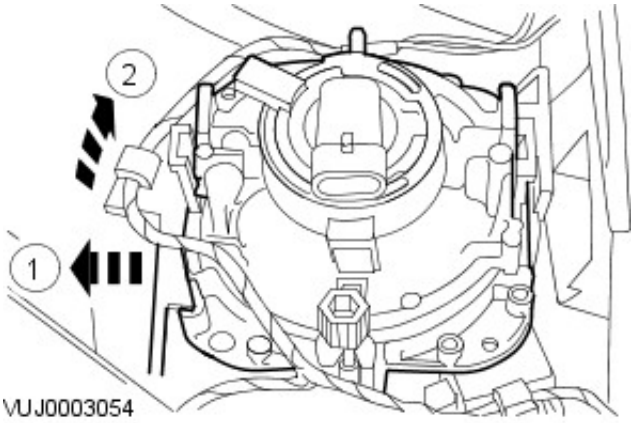
1. Remove the radiator splash shield. For additional information, refer toSection 501-02 Front End Body Panels.
2. Disconnect the fog lamp electrical connector.



3. Remove the fog lamp retaining screws.



4. Remove the fog lamp.
    1. Release the fog lamp retaining tang.
    2. Remove the fog lamp.



Installation

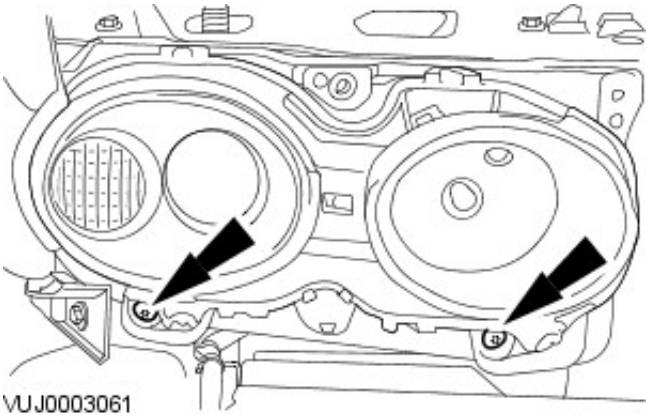
1. To install, reverse the removal procedure.

Exterior Lighting - Headlamp Assembly
Removal and Installation

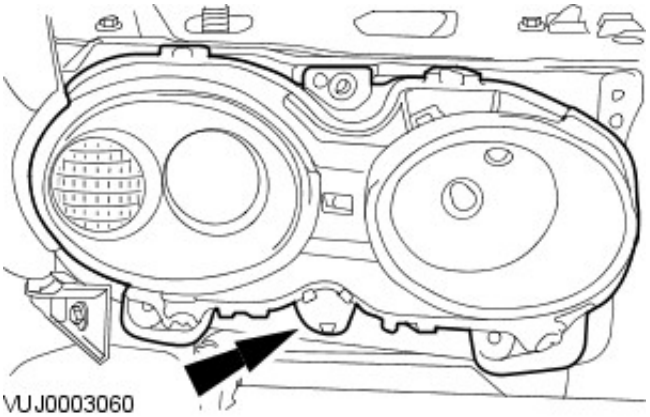
Removal

All vehicles

1. Remove the front bumper cover. For additional information, refer to
   For additional information, refer to: Front Bumper Cover (501-19 Bumpers, Removal and Installation).
   .
2. Remove the headlamp assembly retaining bolts.

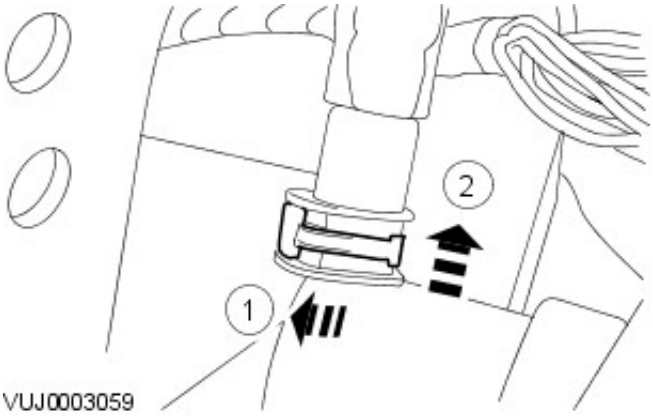

VUJ0003061

3. Detach the headlamp assembly.


VUJ0003060

Vehicles with headlamp washers

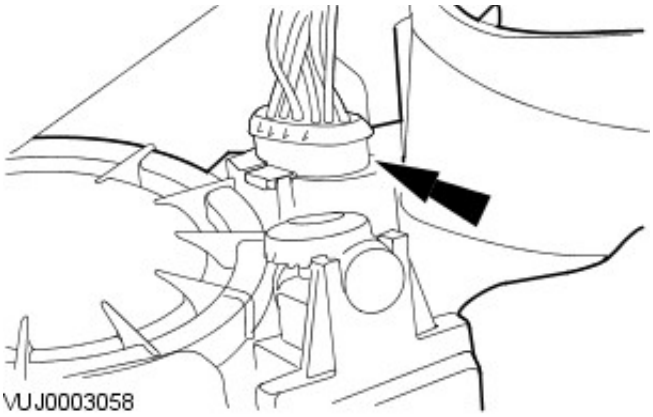
4. Disconnect the headlamp washer hose.
   1. Release the headlamp washer hose retaining clip.
   2. Disconnect the headlamp washer hose.



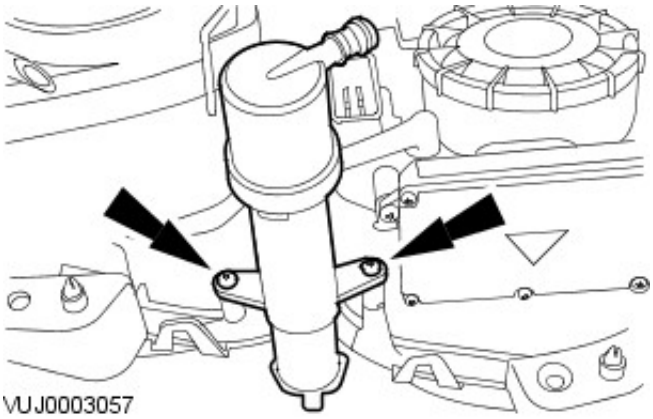
VUJ0003059

All vehicles

5. Remove the headlamp assembly.
   - Disconnect the electrical connector.



Vehicles with headlamp washers



6. Remove the headlamp washer motor.

Installation

1. To install, reverse the removal procedure.
2. Check the headlamp adjustment, refer to
   For additional information, refer to: Headlamp Adjustment (417-01 Exterior Lighting, General Procedures).

Exterior Lighting - Headlamp BulbVehicles With: High Intensity Discharge Headlamps

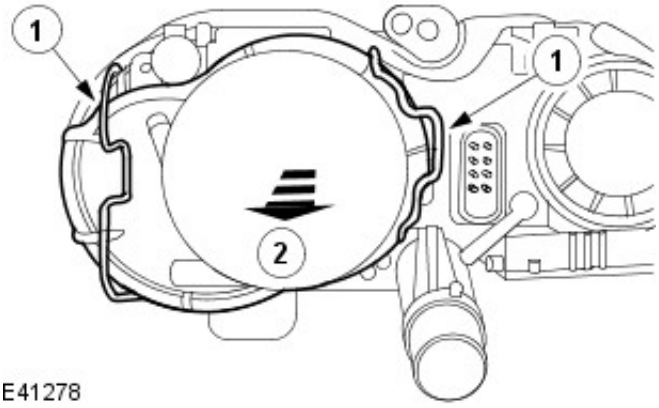
Removal and Installation

Removal

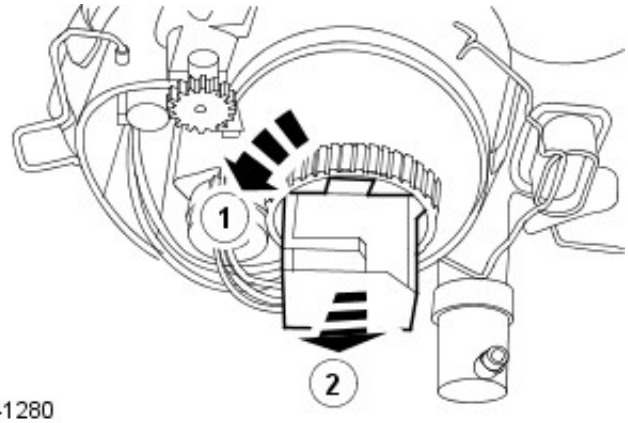
1. Remove the headlamp assembly.
For additional information, refer to Headlamp Assembly - in this section.

2. Remove the bulb cover.

1. Detach the bulb cover retaining clips.
2. Remove the bulb cover.



E41278



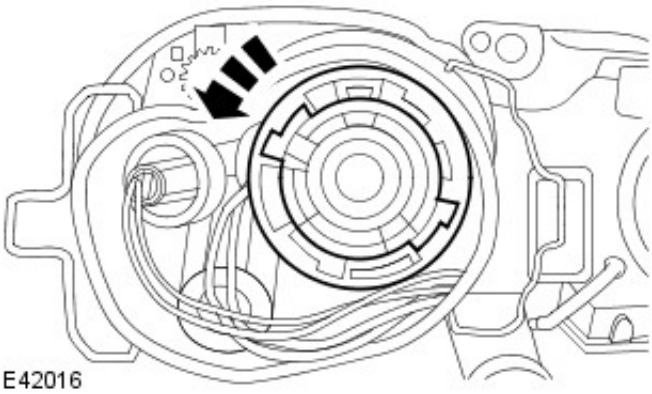
E41280

3. NOTE: The igniter assembly electrical connector will automatically release as the igniter assembly is rotated.

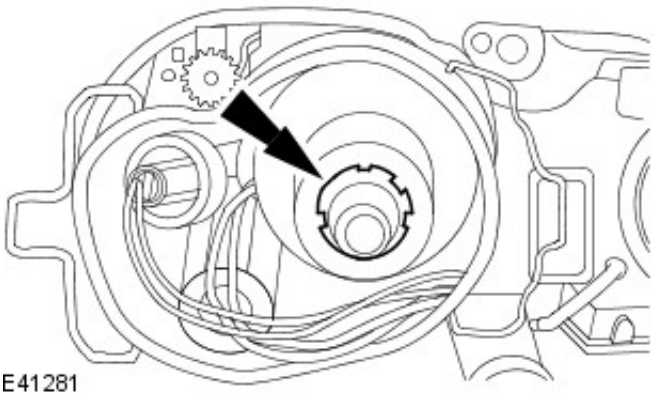
Remove the igniter assembly.

1. Detach the igniter assembly.
2. Remove the igniter assembly.

4. Remove the headlamp bulb retaining ring.


E42016

5. Remove the headlamp bulb.


E41281

Installation

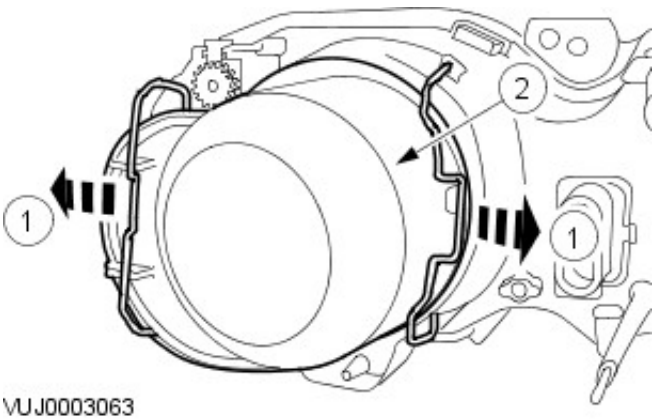
1. To install, reverse the removal procedure.

Exterior Lighting - Headlamp Leveling Module

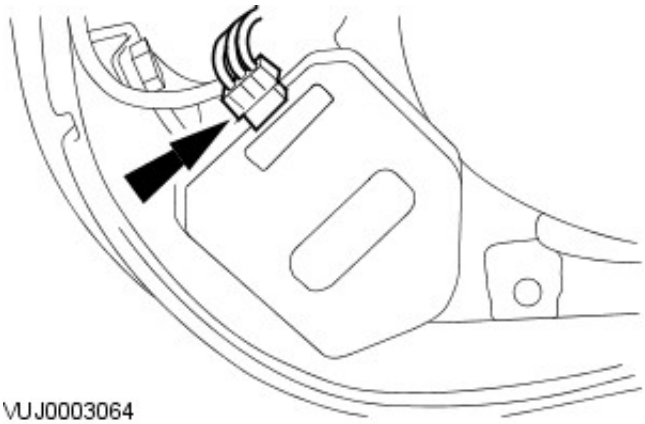
Removal and Installation

Removal

1. Remove the headlamp assembly. For additional information, refer to Headlamp Assembly
2. Remove the headlamp bulb cover.

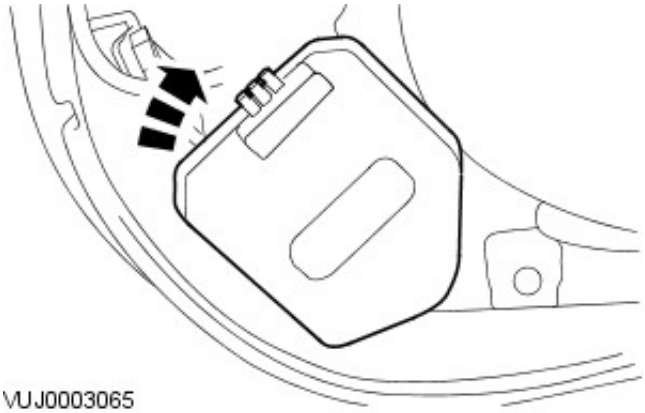


VUJ0003063



VUJ0003064

3. Disconnect the headlamp adjustment module electrical connector.
4. Remove the headlamp adjustment module.
   - Remove and discard the O-ring seal.



VUJ0003065

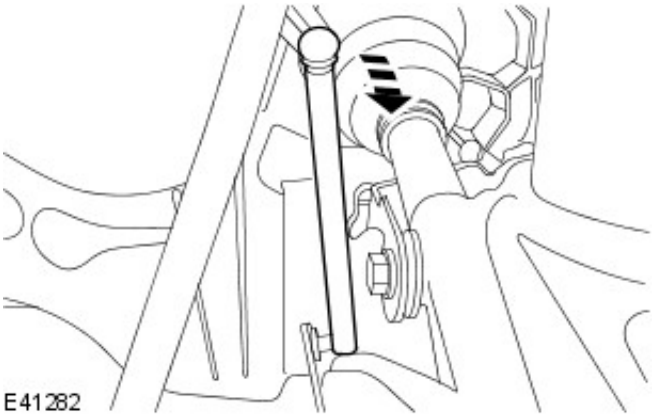
Installation

1. To install, reverse the removal procedure.
   - Install a new O-ring seal.

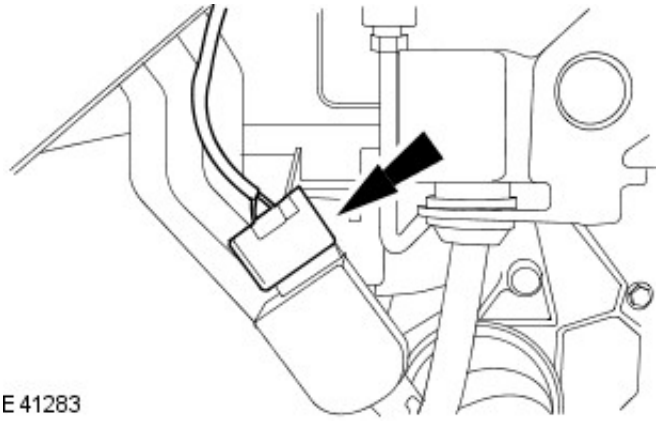
Exterior Lighting - Headlamp Leveling Sensor
Removal and Installation

Removal

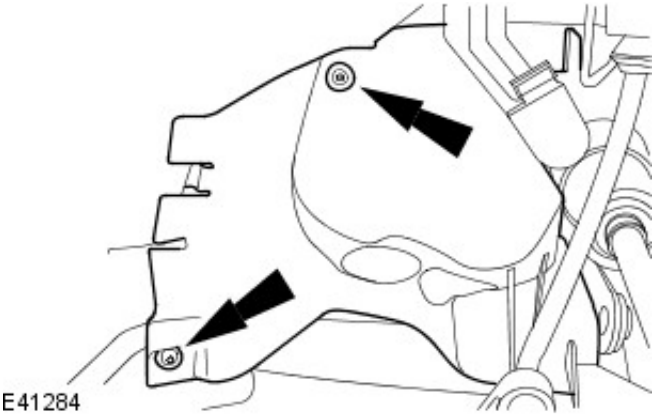
1. Remove the wheel and tire assembly.
   For additional information, refer to Section 204-04 Wheels and Tires.
2. Detach the link rod from the headlamp leveling sensor.



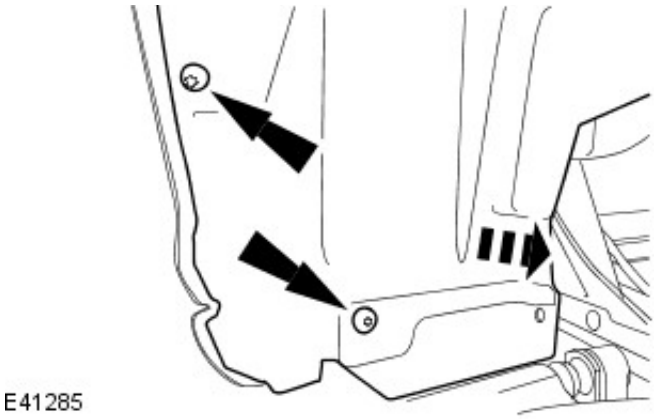
3. Disconnect the headlamp leveling sensor electrical connector.



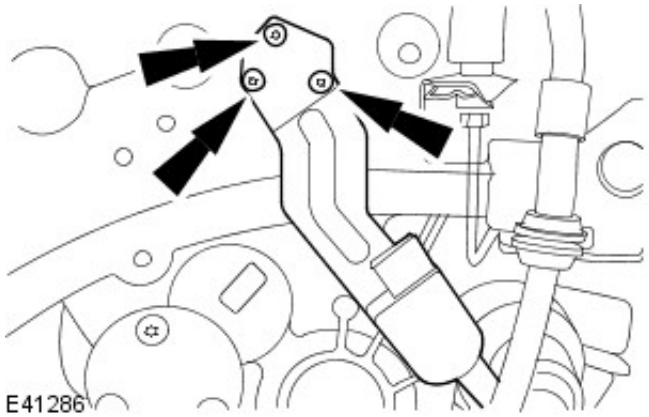
4. Remove the fender splash shield access panel.



5. Detach the fender splash shield.


E41285

6. Remove the headlamp leveling sensor.


E41286

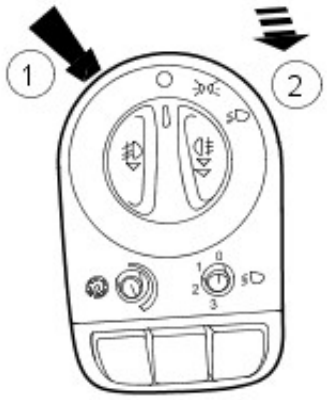
Installation

1. To install, reverse the removal procedure.

Exterior Lighting - Headlamp Switch

Removal and Installation

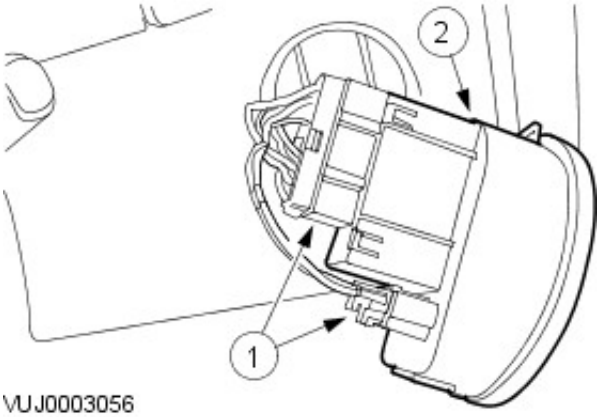
Removal



VUJ0003055

1. Detach the headlamp switch.

1. Release the retaining tang.
2. Detach the headlamp switch.



VUJ0003056

2. Remove the headlamp switch.

1. Disconnect the headlamp switch electrical connectors.
2. Remove the headlamp switch.

Installation

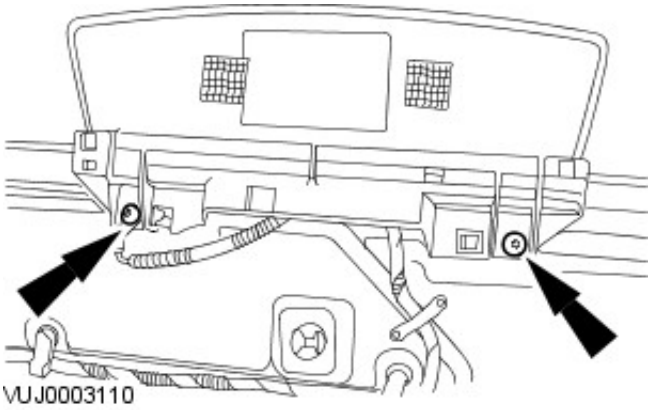
1. To install, reverse the removal procedure.

Exterior Lighting - High Mounted Stoplamp4-Door

Removal and Installation

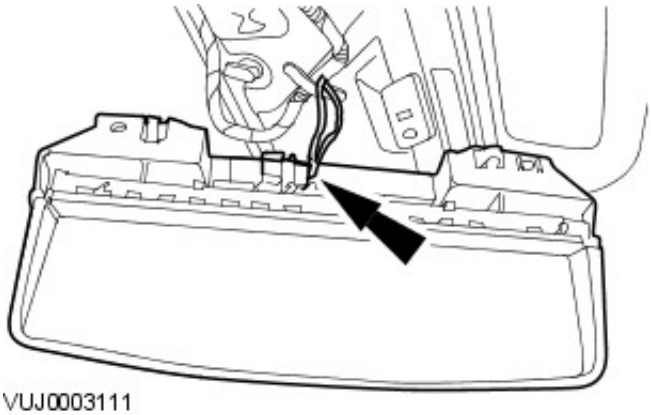
Removal

1. Remove the headliner, for additional information, refer toSection 501-05 Interior Trim and Ornamentation.
2. Remove the high mounted stoplamp retaining screws.



VUJ0003110

3. Remove the high mounted stoplamp.
   - Disconnect the electrical connector.



VUJ0003111

Installation

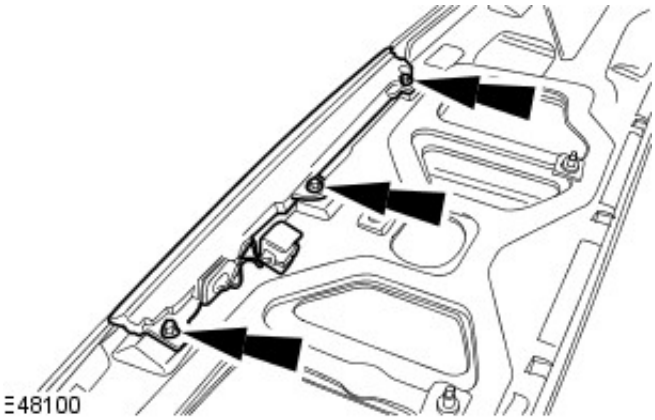
1. To install, reverse the removal procedure.

Exterior Lighting - High Mounted StoplampWagon

Removal and Installation

Removal

1. Remove the rear spoiler
   For additional information, refer to: Rear Spoiler - Wagon (501-08 Exterior Trim and Ornamentation, Removal and Installation).
2. Remove the high mounted stoplamp.



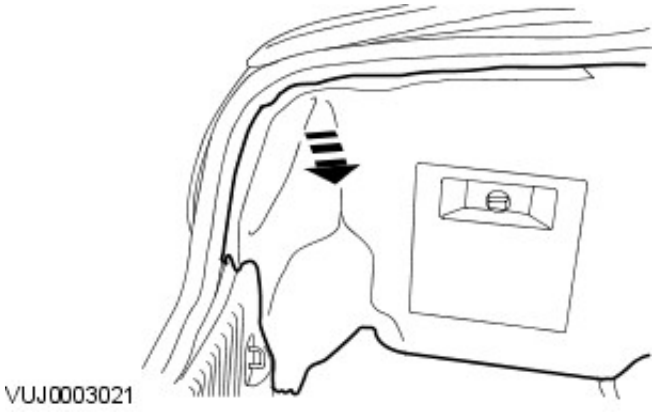
Installation

1. To install, reverse the removal procedure.

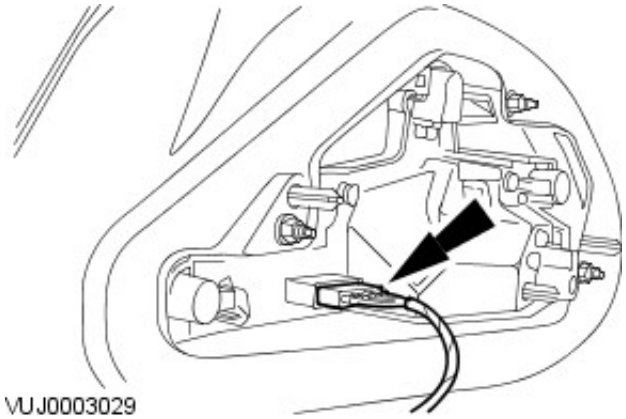
Exterior Lighting - Rear Lamp Assembly4-Door

Removal and Installation

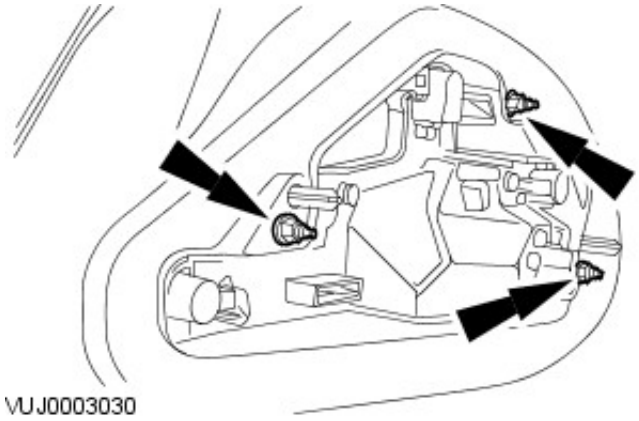
Removal


VUJ0003021

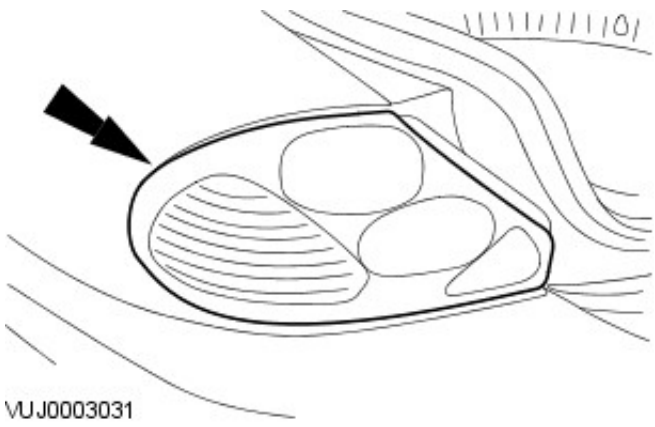
1. Detach and reposition the rear quarter trim panel.


VUJ0003029

2. Disconnect the rear lamp assembly electrical connector.


VUJ0003030

3. Remove the rear lamp assembly retaining nuts.


VUJ0003031

4. Remove the rear lamp assembly.

Installation

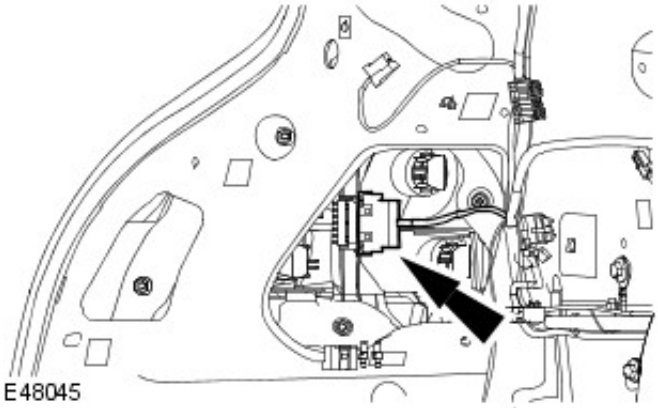
1. To install, reverse the removal procedure.

Exterior Lighting - Rear Lamp AssemblyWagon

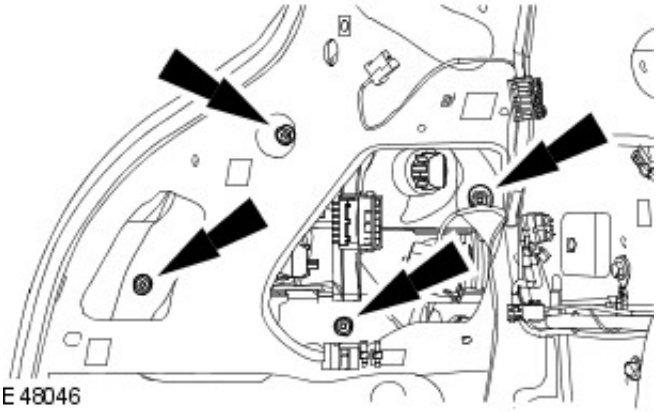
Removal and Installation

Removal

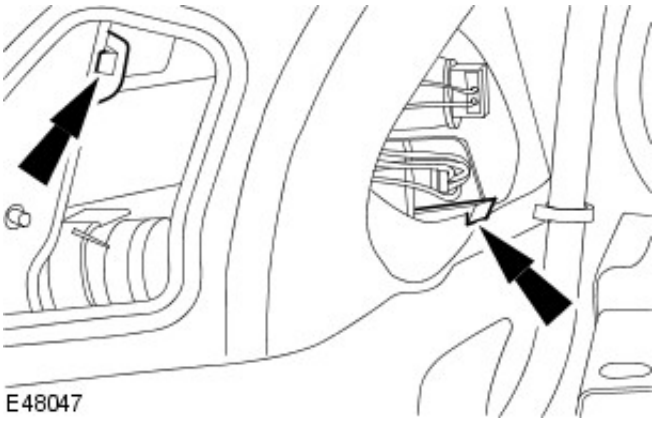
1. Remove the loadspace trim panel.
   For additional information, refer to: Loadspace Trim Panel (501-05 Interior Trim and Ornamentation, Removal and Installation).
2. Disconnect the rear lamp assembly electrical connector.



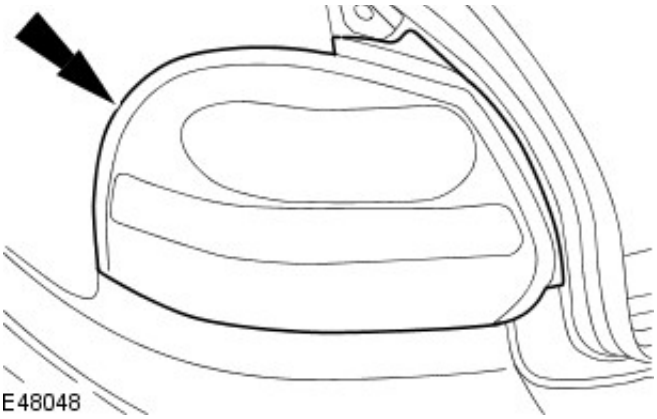
3. Remove the rear lamp assembly retaining nuts.



4. Detach the rear lamp assembly.
   - Press the tangs.



5. Remove the rear lamp assembly.



Installation

1. To install, reverse the removal procedure.

Interior Lighting - Interior Lighting

Description and Operation

The interior lighting system consists of the following components:

- One front interior lamp.
- Two map reading lamps.
- Two front footwell lamps
- One rear interior lamp.
- Two front door/puddle lamps
- One glove compartment lamp.
- Two vanity mirror lamps.
- One luggage compartment lamp on 4-door vehicles.
- Two loadspace lamps on wagon.

The automatic operation of the interior lights is controlled by the general electronics module (GEM). Pressing the interior lamp switch in the overhead console switches the interior lighting control from automatic to ON position. When the switch is in the ON position, if any of the doors are open, only the rear interior lamp can be turned off.

If the rear interior lamp switch is in the AUTOMATIC position, the front interior lamp switch can operate the rear interior lamp.

In the AUTOMATIC position, when the interior lights have faded out, each lamp can be switched on or off by pressing the associated switch.

If the interior lamps are switched on and the ignition switch is turned to the OFF or ACCESSORY position, the lights will automatically turn off after ten minutes.

With the switch in the AUTOMATIC position the following times apply to the interior lights fading out assuming lights on.

Condition	Fade out time
Open any door with key not in ignition, close door	Lamps will fade out after twenty seconds
Open any door with engine in RUN position, close door	Lamps will fade out immediately
Open any door, switch ignition to the RUN position, close door	Lamps will fade out immediately

Interior Lighting - Interior Lighting

Diagnosis and Testing

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Door switch(s) • Interior lamp switch(s)	• Electrical connector(s) • Wiring harness for damage or corrosion • Bulb(s) • Fuse(s) • General electronics module(GEM)

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Interior Lighting - Front Interior Lamp

Removal and Installation

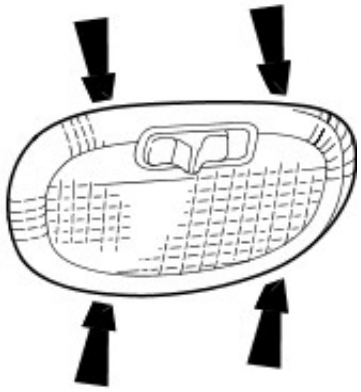
1. Remove the overhead console. For additional information, refer to Section 501-12 Instrument Panel and Console.

Interior Lighting - Rear Interior Lamp

Removal and Installation

Removal

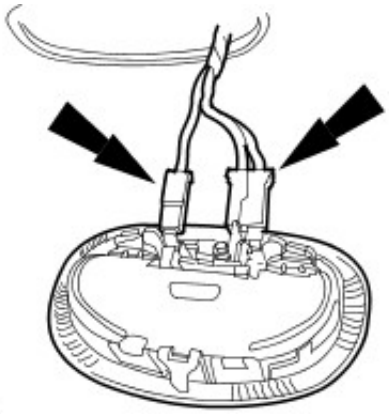
1. Detach the interior lamp.



VUJ0002758

2. Remove the interior lamp.

- Disconnect the electrical connectors.



VUJ0002757

Installation

1. To install, reverse the removal procedure.

Daytime Running Lamps (DRL) - Daytime Running Lamps (DRL)

Description and Operation

DRL use the full intensity low beam headlamps which are permanently illuminated when the vehicle is being driven. DRL are used in a number of markets and there are two systems to cover these markets.

DRL CANADIAN MARKET

DRL for this market use full intensity low beam headlamps. The side marker lamps and license plate lamps will be on, but instrument cluster illumination will be off. DRL are active when the following parameters are met:

- Parking brake is off on vehicles with manual transmission or PARK is not selected on vehicles with automatic transmission
- Ignition switch is in the ignition position (II)
- The central junction box receives an engine running signal
- The lighting control switch is in the off or side lamps position. If the switch is in the 'AUTO' position the DRL will be active when the light sensor is not operating the headlamps using the auto lamps function.

If the above conditions are met, the low beam headlamps are illuminated by a Pulse Width Modulated signal (PWM) for the vehicles fitted with halogen headlamps (when the average voltage exceeds 14V). Vehicles with High Intensity Discharge (HID) headlamps operate the dip beam at normal supply voltage.

The front park lamps (including front side markers) and low beam lamps are illuminated from the Front Electronic Module (FEM), the rear park lamps (including the rear side markers and the license plate lamps) are illuminated by the Rear Electronic Module (REM).

If the lighting control switch is moved to the side lamp or headlamp positions or the auto lamps feature has activated the headlamps, DRL are deactivated and normal side lamp and headlamp functionality is operational.

• NOTE: When DRL are active, the headlamp flash function using the left hand steering column multifunction switch will operate normally. The high beam headlamp function using the left hand steering column stalk switch will be deactivated.

When the parking brake is applied on manual transmission vehicles or the selector lever is in the PARK position on automatic transmission vehicles, DRL are turned off. This is to reduce battery discharge during long periods of engine idling in cold climate conditions. When the parking brake is released or the selector lever is moved from the PARK position, normal DRL functionality is restored.

DRL DENMARK, HOLLAND, NORWAY, SWEDEN, FINLAND AND POLAND

• NOTE: DRL for Poland is on vehicles from 2008MY.

DRL for these markets use full intensity low beam headlamps. Side lamps and license plate lamps will be on, but instrument cluster illumination will be off. DRL are active when the following parameters are met:

- Ignition switch is in the ignition position (II)
- The central junction box receives an engine running signal
- The lighting control switch is in the off position. If the switch is in the 'AUTO' position the DRL will be active when the light sensor is not operating headlamps using the auto lamps function.

If the above conditions are met, the low beam headlamps are illuminated by a Pulse Width Modulated signal (PWM) for the vehicles fitted with halogen headlamps (when the average voltage exceeds 14V). Vehicles with High Intensity Discharge (HID) headlamps operate the dip beam at normal supply voltage.

The front park lamps (including front side markers) and low beam lamps are illuminated from the Front Electronic Module (FEM), the rear park lamps (including the rear side markers and the license plate lamps) are illuminated by the Rear Electronic Module (REM).

If the lighting control switch is moved to the side lamp or headlamp positions or the auto lamps feature has activated the headlamps, DRL are deactivated and normal side lamp and headlamp functionality is operational.

• NOTE: When DRL are active, the headlamp flash function using the left hand steering column multifunction switch will operate normally. The high beam headlamp function using the left hand steering column stalk switch will be deactivated.

Daytime Running Lamps (DRL) - Daytime Running Lamps (DRL)
Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

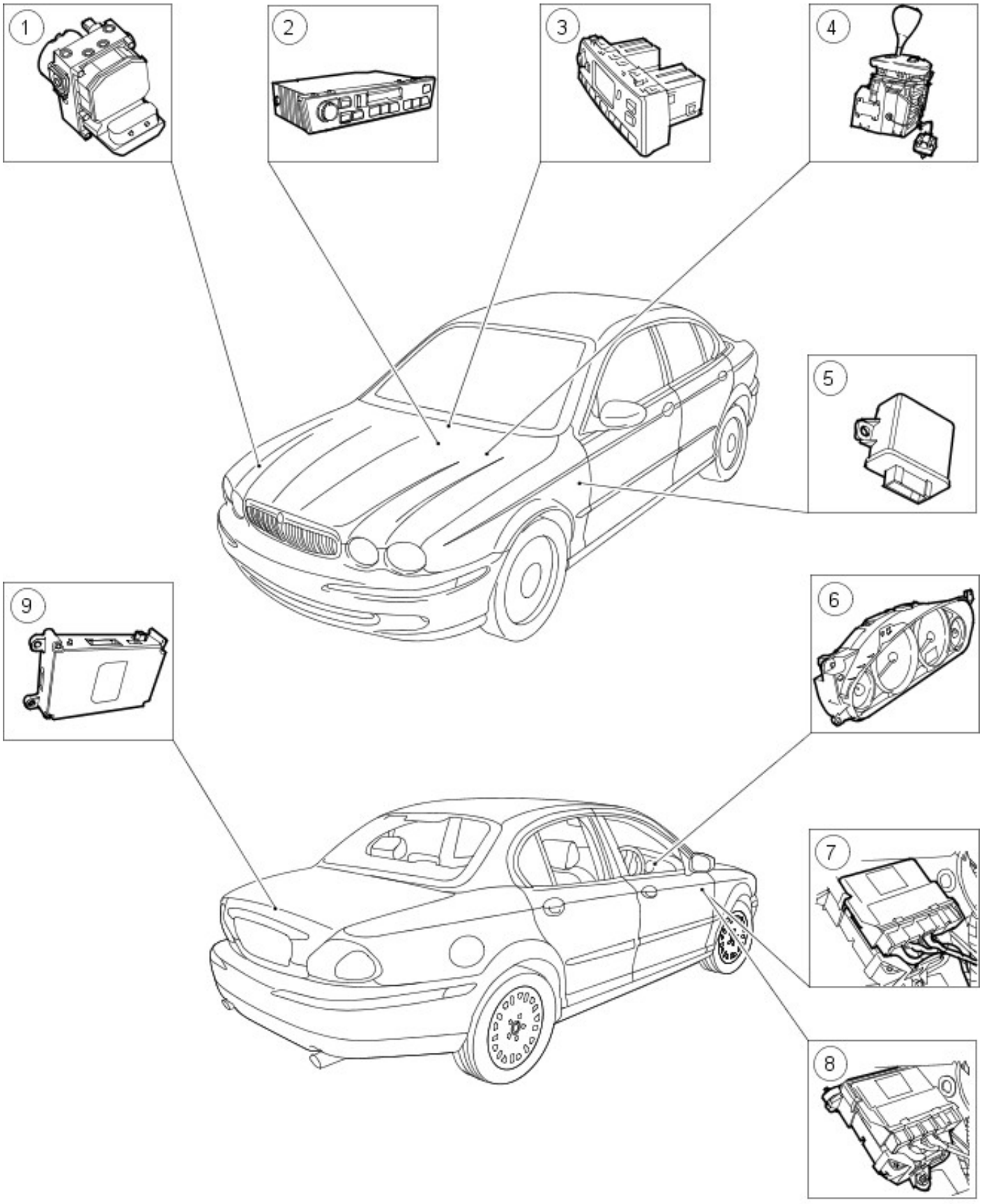
Visual Inspection Chart

Mechanical	Electrical
• Master lighting switch • Relay(s)	• Bulb(s) • Electrical connector(s) • Damaged or corroded wiring harness • Fuse(s) • Battery junction box (BJB) • Central electrical junction box (CEJB)

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Module Communications Network - Communications Network

Description and Operation



VUJ0004096

Item	Part Number	Description

1	—	Anti-lock brake control module
2	—	In car entertainment (ICE) module
3	—	Dual automatic temperature control (DATC)
4	—	J Gate module (JGM)
5	—	High intensity dipped (HID) headlight module
6	—	Instrument cluster (message center optional)
7	—	Generic electronic module (GEM)
8	—	Engine control module (ECM)
9	—	Voice activated control module (VACM)

Module Communications Network - Communications NetworkVIN Range: E96603->J28492

Diagnosis and Testing

Principles of Operation

The vehicle has four module communication networks. Only three of which are connected to the diagnostic connector. The **standard corporate protocol (SCP)** and **controller area network (CAN)**, which are an unshielded twisted pair cable: data bus **+** and data bus **-** and the **International Standard Organization (ISO)** 9141 communication network, which is a single wire network.

The **domestic data bus (D2B)**, which is a fibre optic ring network, can be diagnosed through the SCP network, and with the optical bus tester.

The SCP, CAN and ISO networks can be connected to the Jaguar approved diagnostic system by one diagnostic connector. This makes troubleshooting these systems easier by allowing one smart tester to be able to diagnose any module on the three networks from one connector. On-board diagnosis of the D2B network is through the in car entertainment (ICE) head.

The diagnostic connector is located under the instrument panel.

The ISO 9141 communications network does not permit inter-module communications. When the Jaguar approved diagnostic system communicates with modules on the ISO 9141 communication network, the diagnostic system must ask for all information, the modules will not initiate communications.

The SCP communication network remains operational even with severing of one of the bus wires. Communications will also continue if one of the bus wires is shorted to ground or battery positive voltage (B+), or if some (but not all) termination resistors are lost.

Unlike the SCP communication network, the ISO 9141 communication network will not function if the wire is shorted to ground or battery positive voltage (B+). Also, if one of the modules on the ISO 9141 network loses power or shorts internally, communication to that module will fail.

The anti-lock brake control module is connected to the CAN communication network. The module comes in two forms. The first type is the standard equipped anti-lock brake system (ABS) with traction control. It controls the brake pressure to the four wheels to keep the vehicle under control while braking. The second type of ABS is optional and is called dynamic stability control (DSC). This module adds yaw and steering wheel angle sensors to the package to help in sensing a loss of vehicle control. For additional information,
REFER to: Anti-Lock Control - Stability Assist (206-09 Anti-Lock Control - Stability Assist, Description and Operation).

The in car entertainment (ICE) head is connected to the SCP communication network and also to the D2B network. The D2B communicates with the compact disc player, cellular phone transceiver, navigation system, amplifier, and the voice control module. For additional information on the compact disc,
REFER to: Audio System (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).
For additional information on the cellular phone,
REFER to: Cellular Phone (419-08 Cellular Phone, Diagnosis and Testing).
For additional information on the navigation system,
REFER to: Navigation System (419-07 Navigation System, Diagnosis and Testing).
For additional information on the amplifier,
REFER to: Audio System (415-01 Audio Unit, Description and Operation).
For additional information on the voice activated control system,
REFER to: Multifunction Electronic Module (419-10 Multifunction Electronic Modules, Diagnosis and Testing).

The electronic automatic temperature control (EATC) module is connected to the CAN communication network. The EATC module controls automatic climate functions that maintain the vehicle at a constant temperature setting. For additional information,
REFER to: Climate Control System (412-00 Climate Control System - General Information, Diagnosis and Testing).

The instrument cluster (also known as an instrument cluster module ICM) is connected to the CAN and SCP communication networks. The instrument cluster displays information received on the SCP including speedometer, odometer, fuel, and message center warnings. The instrument cluster displays information received on the CAN including ABS, air conditioning, transmission and engine condition. The instrument cluster also controls the passive anti-theft system (PATS). For additional information;
REFER to: Instrument Cluster and Panel Illumination (413-00 Instrument Cluster and Panel Illumination, Diagnosis and Testing).
For instrument cluster operation and
REFER to: Anti-Theft - Passive (419-01B Anti-Theft - Passive, Diagnosis and Testing).
for PATS.

The general electronic module (GEM) is connected to the SCP communication network. The GEM controls both interior and exterior lighting, active anti-theft functions and warning chimes. For additional information on interior lamps,

REFER to: Interior Lighting (417-02 Interior Lighting, Diagnosis and Testing).
For additional information on exterior lighting,
REFER to: Headlamps (417-01 Exterior Lighting, Diagnosis and Testing).
For additional information on active anti-theft,
REFER to: Anti-Theft - Active (419-01A Anti-Theft - Active, Diagnosis and Testing).
For additional information on warning chimes,
REFER to: Warning Devices (413-09 Warning Devices, Diagnosis and Testing).

The engine control module (ECM) is connected to both the CAN and ISO 9141 communication networks. The ECM controls the engine performance, electronic ignition, emission controls, speed control, and on board diagnostics. For additional information;
REFER to: Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing).
,
REFER to: Electronic Engine Controls - 2.0L NA V6 - AJV6 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing).
or
REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Diagnosis and Testing).

The 'phone module is connected to the D2B communication network, and incorporates the VEMS, or Vehicle Emergency Messaging System. The module allows a user to request emergency assistance (police, ambulance, fire, recovery) or directions to a desired location at the touch of a button. Also, if any of the vehicle's airbags are deployed while the VEMS system is powered ON, the system automatically issues a call for emergency assistance. For additional information,
REFER to: Compact Disc (CD) Changer - 4-Door (415-01 Audio Unit, Removal and Installation).

The airbag restraints module is connected to the ISO 9141 communication network. The airbag control module controls the deployment of the air bags based on sensor input. For additional information;
REFER to: Air Bag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).

The voice activated control module (VACM) is connected to the D2B communication network. This allows the user to select functions by giving a voice command. The VACM sends the command information by D2B to the correct module or audio unit.

The navigation system (NAV) is connected to the D2B communication network, and performs it's diagnostics via the SCP network. The NAV receives inputs from the GPS antenna and various other sensors. For additional information,
REFER to: Navigation System (419-07 Navigation System, Diagnosis and Testing).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical, electrical or optical damage.

Electrical
• Fuses • Wiring harness • Loose or corroded connections • Correct engagement of electrical connectors Controller area network (CAN) • Instrument cluster (IC) • Steering wheel rotation sensor (SWRS) • Gear selector module (GSI) • Headlight levelling module (HID) • Yaw rate sensor • Electronic air temperature control module (EATCM) • Memory seat control module • Transmission control module (TCM) • Anti-lock brake control module with or without dynamic stability control (ABS/DSC) • Engine control module (ECM) Standard corporate protocol (SCP) • Generic electronic module (GEM) • Instrument cluster (IC) • In-car entertainment (ICE) • Navigation system (NAV) • Engine control module (ECM)

International standards organisation (ISO)

- Fuel fired heater module
- Reverse park aid module
- Restraints control module (RCM)
- Headlight levelling module (HID)
- Roof console scanner

Domestic data bus (D2B)

- ICE head unit (HU)
- Compact disc changer (CD)
- Cellular phone module (CPM)
- Voice module (VACM)
- Navigation system module (NSM)
- Amplifier (AMP)

Visual Inspection Chart

Optical
• Routing of fibre optic harnesses • Correct engagement of optical connectors • Correct placement of optical connectors (ring order) • Damage to fibre (chafing, abrasion, kinking, cuts, etc) • Correct assembly of optical connectors (backout, etc)

Default Modes

Possible TCM default

- Fixed 4th gear
- Erratic gear shifts

Possible ECM default

- Throttle motor and relay disabled
- Throttle valve opening set to default value
- Idle speed controlled by fuel injection intervention
- Idle speed adaptation inhibited
- Throttle opening limited to 30%
- Vehicle speed limited
- Speed (cruise) control limited
- Maximum throttle opening for N range inhibited
- Maximum engine speed reduced
- HO2 sensor control circuit inhibited
- Maximum ignition retard

Symptom Chart

• NOTE: Network DTCs may be set by an error or communications failure in the network. Individual DTCs are in the table, alongside their respective modules, but may also be set by a combination of factors affecting the network, which would result in multiple DTCs being set for one error, or, as in the case of an open circuit, no DTC being set.

DTC	Description	Possible Source	Action
P1573	CAN throttle angle error	• TP sensor fault (additional DTCs logged) • ECM CAN message error	For TP sensor circuit tests, REFER to: Electronic Engine Controls - 2.0L NA V6 - AJV6 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Error message sent on CAN, but not CAN related. Check for additional DTCs indicating cause.
P1601	Incorrect ECM or TCM fitted to vehicle	• ECM configuration • TCM configuration	Configure the modules using the Jaguar approved diagnostic system.
P1603	TCM EEPROM failure	• Battery disconnected	For TCM EEPROM tests, GO to Pinpoint Test B.

		while the ignition switched ON • B+ power supply circuit; open circuit • TCM failure	
P1609	ECM microprocessor to microprocessor communication failure	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1611	ECM sub CPU failure	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1633	ECM main CPU failure	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1634	Throttle 'watch-dog' circuit malfunction	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1637	CAN ECM to ABS/TCCM or DSC control module network malfunction	• Module power supply or ground interruption • CAN open circuit fault; ABS/TCCM or DSC to ECM • CAN short circuit fault • ABS/TCCM or DSC module failure • ECM failure	Refer to power and ground test for suspect module. For ABS/TCCM or DSC CAN circuit tests, GO to Pinpoint Test C. Please check part is not on any form of prior authorisation before replacement.
P1638	CAN ECM / IC network malfunction	• Module power supply or ground interruption • CAN open circuit fault; IC to ECM • CAN short circuit fault • IC failure • ECM failure	Refer to power and ground test for suspect module. For IC CAN circuit tests, GO to Pinpoint Test D. Please check part is not on any form of prior authorisation before replacement.
P1642	CAN circuit malfunction	• Module power supply or ground interruption • CAN short circuit fault • Control module failure; Check for additional logged DTCs to locate module source	Refer to power and ground test for suspect module. For network short circuit tests, GO to Pinpoint Test E.
P1643	CAN ECM / TCM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; TCM to ECM • CAN short circuit fault	Refer to power and ground test for suspect module. For CAN open circuit tests, GO to Pinpoint Test A. For network short circuit tests, GO to Pinpoint Test E. Please check part is not on any form of prior authorisation before replacement.

		• TCM failure • ECM failure	
P1646	ECM HO2 sensor control malfunction, right-hand bank	• HO2 sensor heater failure • HO2 sensor sensing circuit; short circuit to ground, short circuit to high voltage, open circuit • ECM failure	For HO2 sensor circuit tests, REFER to: Electronic Engine Controls - 2.0L NA V6 - AJV6 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Please check part is not on any form of prior authorisation before replacement.
P1647	ECM HO2 sensor control malfunction, left-hand bank	• HO2 sensor heater failure • HO2 sensor sensing circuit; short circuit to ground, short circuit to high voltage, open circuit • ECM failure	For HO2 sensor circuit tests, REFER to: Electronic Engine Controls - 2.0L NA V6 - AJV6 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Please check part is not on any form of prior authorisation before replacement.
P1648	ECM KS self-test failure	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1656	TP sensor amplifier circuit malfunction	• ECM failure	Please check part is not on any form of prior authorisation before replacement.
P1699	CAN ECM to EATCM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; EATCM to ECM • CAN short circuit fault; EATCM to ECM • EATCM failure • ECM failure	Refer to power and ground test for suspect module. For EATCM open circuit tests, GO to Pinpoint Test A. For network short circuit tests, GO to Pinpoint Test F. Please check part is not on any form of prior authorisation before replacement.
P1777	CAN torque reduction error	• ECM CAN message error	Error message sent on CAN, but not CAN related. Check for additional DTCs indicating cause.
P1796	CAN network malfunction	• Module power supply or ground interruption • CAN short circuit fault • TCM failure	Refer to power and ground test for suspect module. For network short circuit test, GO to Pinpoint Test A.
P1797	CAN TCM/ECM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; TCM to ECM • CAN short circuit fault • TCM failure • ECM failure	Refer to power and ground test for suspect module. For TCM open/short circuit tests, GO to Pinpoint Test C.
P1799	CAN TCM to ABS/TCCM or DSC module network	• Module power supply or ground interruption	Refer to power and ground test for suspect module. For ABS/TCCM short circuit tests, GO to Pinpoint Test G.

	malfunction	• CAN short circuit fault • ABS/TCCM or DSC module failure • TCM failure	
U1041	GEM SCP network invalid vehicle speed data	• ABS/DSC wheel speed message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1135	GEM SCP network invalid ignition switch data	• Instrument cluster ignition switch message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1147	GEM anti-theft SCP network invalid ignition key-in data	• GEM key-in message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1262	GEM SCP network ignition switch state message missing	• SCP circuit(s); open circuit • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1262	ICE SCP network circuit fault	• SCP network circuit; open circuit, short circuit to B+, short circuit to ground • SCP network circuit fault • Audio unit fault	For ICE SCP network tests, GO to Pinpoint Test I.
U1900	CAN instrumentation messages missing	• Engine management, ABS, or DSC fault • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U1900	Automatic climate control CAN fault	• CAN circuit; open circuit, short circuit to B+, short circuit to ground • Automatic climate control module internal CAN fault • CAN network fault	For EATC CAN network tests, GO to Pinpoint Test F.
U1900	ABS CAN fault	• CAN circuit: open circuit, short circuit to B+, short circuit to ground • ABS control module internal CAN fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.

		• CAN network fault	
U1900	DSC CAN fault	• CAN circuit; open circuit, short circuit to B+, short circuit to ground • DSC control module internal CAN fault • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2003	CD autochanger not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For CD autochanger D2B network tests, GO to Pinpoint Test J. For D2B permanent supply tests, GO to Pinpoint Test R.
U2008	Cellular telephone not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For cellular telephone D2B network tests, GO to Pinpoint Test L. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S. For D2B ignition switched supply tests, GO to Pinpoint Test T.
U2019	VACM not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For VACM D2B network tests, GO to Pinpoint Test M. For D2B accessory switched supply tests, GO to Pinpoint Test S. For D2B ignition switched supply tests, GO to Pinpoint Test T.
U2196	Instrument cluster CAN engine speed message invalid	• Verify integrity of engine management system • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2197	Instrument cluster CAN engine speed message invalid	• Verify integrity of engine management system • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2199	Instrument cluster CAN engine coolant temperature message invalid	• Verify integrity of engine management system • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2200	Instrument cluster CAN odometer count message invalid	• Verify integrity of ABS or DSC systems • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.

U2202	Invalid DSC control module CAN configuration data received from ECM	• Reconfigure the ECM using the Jaguar approved diagnostic system • CAN network fault	For ECM CAN network tests, GO to Pinpoint Test E.
U2202	Invalid ABS control module CAN configuration data received from ECM	• Reconfigure the ECM using the Jaguar approved diagnostic system • CAN network fault	For ECM CAN network tests, GO to Pinpoint Test E.
U2509	ECM unable to fulfill ABS CAN torque reduction request	• Verify integrity of engine management system • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2509	ECM unable to fulfill DSC CAN torque reduction request	• Verify integrity of engine management system • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2510 (security flash code 23)	Anti-theft ECM identification mismatch	• ECM configuration fault • Incorrect ECM installed	Reconfigure ECM using the Jaguar approved diagnostic system. Please check part is not on any form of prior authorisation before replacement.
U2511	Anti-theft ECM invalid data	• ECM configuration fault • Incorrect ECM installed • SCP network error	Reconfigure ECM using the Jaguar approved diagnostic system. Please check part is not on any form of prior authorisation before replacement.
U2514	GEM wash/wipe SCP network vehicle speed message missing	• SCP circuit(s); open circuit • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U2520	Memory seats	• CAN open circuit fault: memory seat module to diagnostic connector • CAN short circuit fault • Memory seat module failure	For CAN open/short circuit tests, GO to Pinpoint Test A.
U2600	Audio D2B network 'wake-up' circuit fault	• D2B network 'wake-up' circuit; short circuit to B+	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2601	Audio D2B network 'wake-up' circuit fault	• D2B network 'wake-up' circuit; short circuit to B+	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.

U2601	Voice activation module D2B network 'wake-up' circuit fault	• D2B network 'wake-up' circuit; short circuit to ground	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2602	Break in optical ring **FROM** ICE head unit (transmitter)	• D2B network module disconnected • D2B network optical ring broken	For optical ring tests, GO to Pinpoint Test P.
U2603	Break in optical ring **TO** ICE head unit (receiver)	• D2B network module disconnected • D2B network optical ring broken	For optical ring tests, GO to Pinpoint Test Q.
U2609	Voice activation module D2B network 'wake-up' signal out of specification	• D2B network 'wake-up' circuit; high resistance • Voice activation module failure	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2610	Voice activation module D2B network 'position status report' not received	• D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2611	Voice activation module D2B network 'alarm clear command' not received	• D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2613	Navigation control module not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault • Module permanent supply fault • Module accessory switched supply fault • Module ignition switched supply fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For navigation module optical tests, GO to Pinpoint Test N. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S.
U2614	Amplifier not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For amplifier optical tests, GO to Pinpoint Test O. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S.
None	ISO circuit malfunction, RCM	• RCM K-line circuit; open circuit	For RCM ISO tests, GO to Pinpoint Test AP.

		• RCM K-line circuit; short circuit	
None	ISO circuit malfunction, HID module	• HID module K-line circuit; open circuit • HID module K-line circuit; short circuit	For HID module ISO tests, GO to Pinpoint Test AQ.
None	ISO circuit malfunction, roof console module	• Roof console module K-line circuit; open circuit • Roof console module K-line circuit; short circuit	For roof console module ISO tests, GO to Pinpoint Test AR.
None	ISO circuit malfunction, reverse park aid module	• Reverse park aid module K-line circuit; open circuit • Reverse park aid module K-line circuit; short circuit	For reverse park aid module ISO tests, GO to Pinpoint Test AS.
None	ISO circuit malfunction, ECM	• ECM K-line circuit; open circuit • ECM K-line circuit; short circuit	For ECM ISO tests, GO to Pinpoint Test AT.
None	ISO circuit malfunction, fuel fired heater (FFH) module	• FFH module K-line circuit; open circuit • FFH module K-line circuit; short circuit	For FFH module ISO tests, GO to Pinpoint Test AU.

Power and Ground circuit test index

Modules may log DTCs if the power supply or GROUND is interrupted. Supply and GROUND tests are covered below by module name.

Description	Possible source	Action
IC supply or ground fault	• **B+** supply failure • **Ign+** supply failure • **Acc+** supply failure • **GROUND** failure	For IC circuit tests, GO to Pinpoint Test U.
SWRS supply or ground fault	• **Module** supply failure • **GROUND** failure	For SWRS circuit tests, GO to Pinpoint Test V.
Yaw rate sensor supply or ground fault	• **Module** supply failure • **GROUND** failure	For yaw rate sensor circuit tests, GO to Pinpoint Test W.
ABS/TCCM supply or ground fault	• **Ign+** supply	For ABS/TCCM circuit tests, GO to Pinpoint Test X.

	failure • **Pump+** supply failure • **Solenoid+** supply failure • **GROUND** failure • Motor **GROUND** failure	
DSC module supply or ground fault	• **Ign+** supply failure • **Pump+** supply failure • **Solenoid+** supply failure • **GROUND** failure • Motor **GROUND** failure	For DSC module circuit tests, GO to Pinpoint Test Y.
GSI module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For GSI module circuit tests, GO to Pinpoint Test Z.
HID module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For HID module circuit tests, GO to Pinpoint Test AA.
EATC module supply or ground fault	• **B+** supply failure • **B+save** supply failure • **Ign+** supply failure • **GROUND** failure	For EATC module circuit tests, GO to Pinpoint Test AB.
Memory seat module supply or ground fault	• **B+1** supply failure • **B+2** supply failure • **Ign+** supply failure • Electronic **GROUND** failure • Power **GROUND** failure • Signal **GROUND** failure	For memory seat module circuit tests, GO to Pinpoint Test AC.
TCM supply or ground fault (16 bit)	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For 16 bit TCM circuit tests, GO to Pinpoint Test AD.
TCM supply or ground fault (32 bit)	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For 32 bit TCM circuit tests, GO to Pinpoint Test AE.

ECM supply or ground fault, vehicles with 2.0L petrol engine	• **B+memory** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.0L petrol engines, GO to Pinpoint Test AF.
ECM supply or ground fault, vehicles with 2.5/3.0L petrol engine	• **B+memory** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.5/3.0L petrol engines, GO to Pinpoint Test AG.
ECM supply or ground fault, vehicles with 2.0L diesel engine	• **Vpwr** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.0L diesel engines, GO to Pinpoint Test AH.
ICE supply or ground fault	• **B+memory** supply failure • **Acc+** supply failure • **GROUND** failure	For ICE circuit tests, GO to Pinpoint Test AI.
CD supply or ground fault	• **B+** supply failure • **GROUND** failure	For CD changer circuit tests, GO to Pinpoint Test AJ.
NAV module supply or ground fault	• **B+** supply failure • **Acc+** supply failure • **GROUND** failure	For NAV module circuit tests, GO to Pinpoint Test AK.
FFH module supply or ground fault	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For FFH module circuit tests, GO to Pinpoint Test AL.
Park aid module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For park aid module circuit tests, GO to Pinpoint Test AM.
RCM supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For RCM circuit tests, GO to Pinpoint Test AN.
GEM supply or ground fault	• **B+** supply failure	For GEM circuit tests, GO to Pinpoint Test AO.
Amplifier supply or ground fault	• **B+** supply failure • **GROUND** failure	For amplifier circuit tests, GO to Pinpoint Test AV.

Pinpoint tests

• CAUTIONS:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Each vehicle is configured to it's own vehicle identification data (VID) block, and substitution of control modules may not only not confirm a fault, but may cause faults in the vehicle being tested and/or the donor vehicle. Failure to follow this instruction may result in damage to the vehicle.

Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result. Failure to follow this instruction may result in damage to the vehicle.

When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00. Failure to follow this instruction may result in damage to the vehicle.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Before beginning any diagnosis of the D2B system, codes B1342, U2602, or U2603 must be rectified. No D2B function is possible with these failures present.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: If DTCs are recorded and the symptom is not present when performing the pinpoint tests, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

PINPOINT TEST A : CHECK THE CONTROLLER AREA NETWORK (CAN) CONTINUITY	
• NOTE: The following test is based on the maximum number of modules in the network. Refer to the wiring diagrams for information on networks with fewer modules.	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
A1: CHECK THE RESISTANCE OF THE CAN NETWORK	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between pins 06 (Y) and 14 (G) of the diagnostic connector.
	Is the resistance between 50 and 70 ohms? **Yes** GO to A3. **No** GO to A2.
A2: CHECK THE CAN NETWORK FOR SHORT CIRCUIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between pins 06 (Y) and 14 (G) of the diagnostic connector.
	Is the resistance less than 50 ohms? **Yes** CHECK the network for short circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A3.
A3: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE STEERING WHEEL ROTATION SENSOR	
	1 Disconnect the steering wheel rotation sensor connector, IP19.
	2 Measure the resistance between IP19, pin 03 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A4.
A4: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE STEERING WHEEL ROTATION SENSOR	
	1 Measure the resistance between IP19, pin 04 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A5.
A5: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE YAW RATE SENSOR	
	1 Disconnect the yaw rate sensor connector, IP20.

	2 Measure the resistance between IP20, pin 03 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A6.
A6: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE YAW RATE SENSOR	
	1 Measure the resistance between IP20, pin 02 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A7.
A7: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE MEMORY SEAT MODULE (WHERE FITTED)	
	1 Disconnect the memory seat module connector, DM01.
	2 Measure the resistance between DM01, pin 12 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A8.
A8: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE MEMORY SEAT MODULE (WHERE FITTED)	
	1 Measure the resistance between DM01, pin 02 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A9.
A9: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS/DSC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between JB45/JB185, pin 24 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A10.
A10: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS/DSC MODULE	
	1 Measure the resistance between JB45/JB185, pin 40 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A11.
A11: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE HID MODULE (WHERE FITTED)	
	1 Disconnect the HID module connector, IP130.
	2 Measure the resistance between IP130, pin 02 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A12.
A12: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE HID MODULE (WHERE FITTED)	
	1 Measure the resistance between IP130, pin 03 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes**

	REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** NO circuit fault found. Check DTCs for indications of a module fault.

PINPOINT TEST B : P1603. TCM EEPROM FAILURE	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check battery voltage.
	Has the battery been discharged to a voltage where the engine would not crank? **Yes** CHARGE and test the battery. Install a new battery, if required. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation). Carry out a drive-cycle. (The vehicle may lose it's adaptive values and will need to re-learn them. These values will depend on the owner's driving style, and can only be learnt by normal use.) **No** GO to B2.
B2: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check the TCM for signs of water ingress.
	Does the TCM show any indication of water ingress? **Yes** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to B3.
B3: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check if the battery has been disconnected with the ignition switched on.
	Has the battery been disconnected with the ignition switched on? **Yes** CARRY out a drive-cycle. For additional information, refer to the DTC section of JTIS. (The vehicle may lose it's adaptive values and will need to re-learn them. These values will depend on the owner's driving style, and can only be learnt by normal use.) **No** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST C : P1637: CAN NETWORK MALFUNCTION, TRANSMISSION CONTROL MODULE (TCM)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
C1: CHECK TCM FOR DAMAGE	
	1 Inspect the TCM
	Does the TCM indicate any signs of damage? **Yes** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to C2.
C2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C3.
C3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms?

	Yes REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C4.
C4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C5.
C5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C6.
C6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Measure the resistance between the diagnostic connector, pins 6 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C7.
C7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN DIAGNOSTIC CONNECTOR AND THE TCM	
	1 Disconnect the battery negative terminal. Vehicles with 16 bit modules - • Disconnect the TCM connector, JB131. • Measure the resistance between the diagnostic connector, pin 06 (Y) and JB131, pin 33 (Y). Vehicles with 32 bit modules - • Disconnect the TCM connector, JB230. • Measure the resistance between the diagnostic connector, pin 06 (Y) and JB230, pin 05 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C8.
C8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE TCM	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and: Vehicles with 16 bit modules - • JB131, pin 12 (G). Vehicles with 32 bit modules - • JB230, pin 06 (G).
	Is the resistance less than 5 ohms? **Yes** GO to C9. **No** REPAIR the CAN - circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
C9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the TCM connector, JB131 or JB230.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms?

	Yes INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to C10.
C10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the CAN + circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C11.
C11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the CAN - circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C12.
C12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Measure the resistance between pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • Measure the resistance between pins 88 and 89 of the ECM. Vehicles with 2.0L diesel engine - • Measure the resistance between pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to C13. **No** Please check part is not on any form of prior authorisation before replacement.
C13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	

	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** POSSIBLE intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST D : P1638: CAN NETWORK MALFUNCTION, INSTRUMENT CLUSTER (IC)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
D1: CHECK THE IC FOR DAMAGE	
	1 Inspect the IC for damage.
	Does the IC indicate any signs of damage? **Yes** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to D2.
D2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D3.
D3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06 (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D4.
D4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D5.
D5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D6.
D6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D7.
D7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE IC	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and IP10, pin 17 (Y).

	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D8.
D8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE IC	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D9.
D9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to D10.
D10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D11.
D11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D12.
D12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between:

	Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to D13. **No** Please check part is not on any form of prior authorisation before replacement.
D13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST E : P1642; P1643; P1797: CAN NETWORK MALFUNCTION, ECM	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1: CHECK THE ECM FOR DAMAGE	
	1 Inspect the ECM.
	Does the ECM indicate any signs of damage? **Yes** Please check part is not on any form of prior authorisation before replacement. **No** GO to E2.
E2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E3.
E3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E4.
E4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E5.
E5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E6.

E6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E7.
E7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
	1 Disconnect the battery negative terminal. Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16. • Measure the resistance between IP22 pin 06 (Y) and EN16, pin 124 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65. • Measure the resistance between IP22 pin 06 (Y) and EN65, pin 89 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01. • Measure the resistance between the diagnostic connector, pin 06 (Y) and DL01, pin 54 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E8.
E8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and EN16, pin 123 (G). Vehicles with 2.0L petrol engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and EN65, pin 88 (G). Vehicles with 2.0L diesel engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and DL01, pin 73 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E9.
E9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the ECM connector.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** Please check part is not on any form of prior authorisation before replacement. **No** GO to E10.
E10: CHECK CONTINUITY OF THE CAN + CIRCUIT	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10.

	• Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E11.
E11: CHECK CONTINUITY OF THE CAN - CIRCUIT	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E12.
E12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to E13. **No** Please check part is not on any form of prior authorisation before replacement.
E13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST F : P1699: CAN NETWORK MALFUNCTION, ELECTRONIC AUTOMATIC TEMPERATURE CONTROL (EATC) MODULE	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
F1: CHECK THE EATC MODULE FOR DAMAGE	
	1 Inspect the EATC module for damage.
	Does the EATC module indicate any signs of damage? **Yes**

	INSTALL a new EATC module. REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation). CLEAR the DTC, test the system for normal operation. **No** GO to F2.
F2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F3.
F3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F4.
F4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F5.
F5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F6.
F6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F7.
F7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE EATC MODULE	
	1 Disconnect the EATC module connector, IP101.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and IP101, pin 22 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F8.
F8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE EATC MODULE	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and IP101, pin 23 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F9.
F9: CHECK FOR CORRECT BUS TERMINATION	

	1 Reconnect the EATC module connector, IP101.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new EATC module. REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation). CLEAR the DTC, test the system for normal operation. **No** GO to F10.
F10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F11.
F11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F12.
F12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to F13. **No**

	Please check part is not on any form of prior authorisation before replacement.
F13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** POSSIBLE intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST G : P1799: CAN NETWORK MALFUNCTION, ANTI-LOCK BRAKE (ABS) / DYNAMIC STABILITY CONTROL (DSC) CONTROL MODULE	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
G1: CHECK THE ABS OR DSC MODULE FOR DAMAGE	
	1 Inspect the ABS/TCCM or DSC module.
	Does the ABS/TCCM or DSC module indicate any signs of damage? **Yes** INSTALL a new ABS/TCCM or DSC module. REFER to: Hydraulic Control Unit (HCU) - VIN Range: C00001->J12991 (206-09 Anti-Lock Control - Stability Assist, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to G2.
G2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G3.
G3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G4.
G4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G5.
G5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G6.
G6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No**

	GO to G7.
G7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS OR DSC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and JB45/JB185, pin 24 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G9.
G8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS OR DSC MODULE	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and JB45/JB185, pin 40 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G9.
G9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the ABS/TCCM module connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new ABS/TCCM module, or DSC module. REFER to: Hydraulic Control Unit (HCU) - VIN Range: C00001->J12991 (206-09 Anti-Lock Control - Stability Assist, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to G10.
G10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G11.
G11: CHECK CONTINUITY OF THE CAN - CIRCUIT	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms?

	Yes REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G12.
G12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to G13. **No** Please check part is not on any form of prior authorisation before replacement.
G13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the instrument cluster.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. Repeat tests from A1. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST H : SCP NETWORK MALFUNCTION, GENERIC ELECTRONIC MODULE (GEM)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
H1: CHECK GEM FOR DAMAGE	
	1 Inspect the GEM for damage.
	Does the GEM indicate any signs of damage? **Yes** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to H2.
H2: CHECK THE SCP + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H3.
H3: CHECK THE SCP + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 02 (Y) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H4.
H4: CHECK THE SCP - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC,

	test the system for normal operation. **No** GO to H5.
H5: CHECK THE SCP - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H6.
H6: CHECK FOR SHORT CIRCUIT BETWEEN SCP + AND SCP -	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 02, (Y).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H7.
H7: CHECK FOR OPEN CIRCUIT ON SCP + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE GEM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the GEM connector, IP05.
	4 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H8.
H8: CHECK FOR OPEN CIRCUIT ON SCP - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE GEM	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and IP05, pin 18 (U).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H9.
H9: CHECK FOR CORRECT BUS TERMINATION ON SCP +	
	1 Reconnect the battery negative terminal.
	2 Reconnect the GEM connector, IP05.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance 150 to 210 ohms? **Yes** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to H10.
H10: CHECK THE CONTINUITY OF THE GENERIC ELECTRONIC MODULE (GEM) SCP + CIRCUIT	
	1 Disconnect the battery negative terminal.
	2 Disconnect the GEM connector, IP05.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H11.
H11: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE GEM	
	1 Disconnect the GEM connector, IP06.
	2 Measure the resistance between IP05, pin 19, and IP06, pin 01 of the GEM.
	Is the resistance 320 to 400 ohms? **Yes** GO to H12.

	No INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation.
H12: CHECK CONTINUITY OF THE INSTRUMENT CLUSTER (IC) SCP + CIRCUIT	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP10, pin 22 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H13.
H13: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE INSTRUMENT CLUSTER	
	1 Measure the resistance between pins 22 and 08 of the IC.
	Is the resistance 320 to 400 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new IC. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST I : SCP NETWORK MALFUNCTION, IN CAR ENTERTAINMENT (ICE) HEAD	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
I1: CHECK ICE FOR DAMAGE	
	1 Inspect the ICE head for damage.
	Does the ICE head indicate any signs of damage? **Yes** INSTALL a new ICE head. REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to I2.
I2: CHECK THE SCP + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I3.
I3: CHECK THE SCP + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 02 (Y) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I4.
I4: CHECK THE SCP - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I5.
I5: CHECK THE SCP - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

	No GO to I6.
I6: CHECK FOR SHORT CIRCUIT BETWEEN SCP + AND SCP -	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 02 (Y).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I7.
I7: CHECK FOR OPEN CIRCUIT ON SCP + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ICE HEAD UNIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the ICE connector, IP65.
	4 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP65, pin 09 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I8.
I8: CHECK FOR OPEN CIRCUIT ON SCP - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ICE HEAD UNIT	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and IP65, pin 10 (U).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I9.
I9: CHECK FOR CORRECT BUS TERMINATION ON SCP +	
	1 Reconnect the ICE connector, IP65.
	2 Reconnect the battery negative terminal.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance 150 to 210 ohms? **Yes** INSTALL a new ICE head unit. REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to I10.
I10: CHECK THE CONTINUITY OF THE GENERIC ELECTRONIC MODULE (GEM) SCP + CIRCUIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the GEM connector, IP05.
	4 Measure the resistance between IP22, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I11.
I11: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE GEM	
	1 Disconnect the GEM connector, IP06.
	2 Measure the resistance between IP05, pin 19, and IP06, pin 01 of the GEM.
	Is the resistance 320 to 400 ohms? **Yes** GO to I12. **No** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation).
I12: CHECK CONTINUITY OF THE IC SCP + CIRCUIT	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP10, pin 22 (Y).
	Is the resistance greater than 5 ohms?

	Yes REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I13.
I13: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE IC	
	1 Measure the resistance between IP10, pin 22 (Y) and IP11, pin 08 of the IC.
	Is the resistance 320 to 400 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new IC. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST J : U2003: COMPACT DISC CHANGER NOT RESPONDING	
CAUTION: The following tests involve disconnection of the fibre optic harnesses. The harness connectors must be protected by suitable dust caps as soon as they are disconnected, or damage may result. The use of tools to unlatch connectors must be avoided, or the connector locking function may be lost. Failure to follow this instruction may result in damage to the vehicle.	
• NOTE: The following test sequence is based on a five node network. Refer to the wiring diagrams for network configuration for networks with a diferent number of nodes (all possible network combinations are shown in the wiring diagrams).	
• NOTE: Should a break occur in the D2B ring, then codes, U2602, or U2603 will be set, depending on the location of the break. U2602 will set if the break is in the optical harness **FROM** the ICE head unit (the transmitter signal). U2603 will set if the break is in the optical harness **TO** the ICE head unit (the receiver signal). GO to Pinpoint Test P. GO to Pinpoint Test Q.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
J1: CHECK CD CHANGER MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD02.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2003 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to J2.
J2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** Recheck DTCs. No break in optical harness.

PINPOINT TEST K : ONE OR MORE D2B MODULES NOT RESPONDING. 'WAKE-UP' SIGNAL FAULT	
• NOTE: The D2B 'wake-up' signal is not a constant, but will generate a pulse at each cycle of the ignition key. The ignition key must be turned to the OFF position following each step of the tests, and turned to the position indicated by the test step for each module. To avoid missing the signal, use an assistant to operate the key while reading the oscilloscope. The 'wake-up' line is battery voltage, switching to 0 volts for between 50 milliseconds and 110 milliseconds as the ICE head unit sends it's signal.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
K1: CHECK THE 'WAKE-UP' SIGNAL TO THE CD CHANGER	
	1 Disconnect the CD changer connector, CA301.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between CA301, pin 03 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K2. **No** REPAIR the circuit between CA301, pin 03 and the ICE head unit connector, IP65, pin 19. For

	additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
K2: CHECK THE 'WAKE-UP' SIGNAL TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH02, pin 14 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K3. **No** REPAIR the circuit between PH02, pin 14 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
K3: CHECK THE 'WAKE-UP' SIGNAL TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH01, pin 23 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K4. **No** REPAIR the circuit between PH01, pin 23 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
K4: CHECK THE 'WAKE-UP' SIGNAL TO THE NAVIGATION COMPUTER	
	1 Disconnect the navigation system connector, NA07.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between NA07, pin 03 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K5. **No** REPAIR the circuit between NA07, pin 03 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
K5: CHECK THE 'WAKE-UP' SIGNAL TO THE AMPLIFIER	
	1 Disconnect the amplifier connector, CA425.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between CA425, pin 05 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** CHECK for DTCs indicating a module failure. **No** REPAIR the circuit between CA425, pin 05 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST L : U2008: 'PHONE MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
L1: CHECK 'PHONE MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD03.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2008 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to L2.

L2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST M : U2019: VOICE CONTROL MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
M1: CHECK VOICE CONTROL MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD04.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2019 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to M2.
M2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST N : U2613: NAVIGATION CONTROL MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
N1: CHECK NAVIGATION CONTROL MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic connector, CD05.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for DTCs.
	Is U2613 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to N2.
N2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST O : U2614: AMPLIFIER NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
O1: CHECK AMPLIFIER, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic connector, CD07.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for DTCs.
	Is U2614 set? **Yes** CHECK the 'wake-up' signal to the module. **No**

	GO to O2.
O2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST P : U2602: BREAK IN OPTICAL HARNESS FROM ICE HEAD UNIT (TRANSMITTER)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
P1: CHECK FIBRE OPTIC LEAD BETWEEN LUGGAGE COMPARTMENT JOINT AND CD CHANGER	
	1 Disconnect the fibre optic connector, CD02.
	2 Disconnect the fibre optic connector, CD06.
	3 Connect the Optical Bus Tester to the fibre optic connector, CD06.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD02.
	Are light pulses visible? **Yes** GO to P2. **No** INSTALL a new telematic harness between CD06 and CD02. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P2: CHECK CABIN FIBRE OPTIC HARNESS	
	1 Disconnect the fibre optic connector, CD01.
	2 Disconnect the fibre optic connector, CD06.
	3 Connect the Optical Bus Tester to CD01 using adaptor lead.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD06.
	Are light pulses visible? **Yes** GO to P3. **No** INSTALL a new cabin optical harness between CD06 and CD01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P3: CHECK FIBRE OPTIC LEAD BETWEEN 'A' POST AND ICE HEAD UNIT	
	1 Disconnect the fibre optic connector, ID01.
	2 Connect the Optical Bus Tester to ID01 using the adaptor lead.
	3 Set the Optical Bus Tester to **TX**.
	4 Set the Optical Bus Tester to **ON**.
	5 Check for light pulses at the receiver pin of disconnected D2B connector, CD001.
	Are light pulses visible? **Yes** GO to P4. **No** INSTALL a new instrument optical harness between CD01 and ID01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P4: CHECK THE ICE HEAD UNIT	
	1 Turn the ignition switch to the **ACC** position.
	2 Wait for 10 seconds.
	3 Check for light pulses at the transmitter pin of disconnected D2B connector, ID01 (rear of ICE head unit).
	Are light pulses visible? **Yes** GO to P5. **No** INSTALL a new ICE head unit, REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation.
P5: CHECK THE FIBRE OPTIC LEAD FROM THE CD CHANGER TO THE 'PHONE MODULE	
	1 Disconnect the fibre optic connector CD02.

	2 Disconnect the fibre optic connector CD03.
	3 Connect the Optical Bus Tester to CD02.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD03.
	Are light pulses visible? **Yes** GO to P6. **No** INSTALL a new telematic harness between CD03 and CD02. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P6: CHECK THE FIBRE OPTIC LEAD FROM THE 'PHONE MODULE TO THE VOICE MODULE	
	1 Disconnect the fibre optic connector CD04.
	2 Connect the Optical Bus Tester to CD03.
	3 Set the Optical Bus Tester to **TX**.
	4 Set the Optical Bus Tester to **ON**.
	5 Check for light pulses at the transmitter pin of disconnected D2B connector, CD04.
	Are light pulses visible? **Yes** GO to P7. **No** INSTALL a new telematic harness between CD03 and CD04. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P7: CHECK THE FIBRE OPTIC LEAD FROM THE VOICE MODULE TO THE NAVIGATION COMPUTER	
	1 Disconnect the fibre optic connector CD04.
	2 Disconnect the fibre optic connector CD05.
	3 Connect the Optical Bus Tester to CD04.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD05.
	Are light pulses visible? **Yes** GO to P8. **No** INSTALL a new telematic harness between CD05 and CD04. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P8: CHECK THE FIBRE OPTIC LEAD FROM THE NAVIGATION COMPUTER TO THE AMPLIFIER	
	1 Disconnect the fibre optic connector CD07.
	2 Disconnect the fibre optic connector CD05.
	3 Connect the Optical Bus Tester to CD05.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD07.
	Are light pulses visible? **Yes** CHECK for DTC U2603. **No** INSTALL a new telematic harness between CD05 and CD07. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST Q : U2603: BREAK IN OPTICAL HARNESS TO ICE HEAD UNIT (RECEIVER)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Q1: CHECK FIBRE OPTIC LEAD BETWEEN LUGGAGE COMPARTMENT JOINT AND AMPLIFIER	
	1 Disconnect the fibre optic connector, CD06.
	2 Disconnect the fibre optic connector, CD07.
	3 Connect the Optical Bus Tester to CD07.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD06.
	Are light pulses visible? **Yes** GO to Q2. **No** INSTALL a new telematic harness between CD06 and C07. For additional information, refer to the

	wiring diagrams. CLEAR the DTC,test the system for normal operation.
Q2: CHECK CABIN FIBRE OPTIC HARNESS	
	1 Disconnect the fibre optic connector, CD01.
	2 Disconnect the fibre optic connector, CD06.
	3 Connect the Optical Bus Tester to CD06 using adaptor lead.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD01.
	Are light pulses visible? **Yes** GO to Q3. **No** INSTALL a new cabin optical harness between CD06 and CD01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
Q3: CHECK FIBRE OPTIC LEAD BETWEEN 'A' POST AND ICE HEAD UNIT	
	1 Connect the Optical Bus Tester to ID01.
	2 Set the Optical Bus Tester to **TX**.
	3 Set the Optical Bus Tester to **ON**.
	4 Check for light pulses at the receiver pin of disconnected D2B connector, ID01.
	Are light pulses visible? **Yes** GO to Q4. **No** INSTALL a new instrument optical harness between CD01 and ID01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
Q4: CHECK THE ICE HEAD UNIT	
	1 Connect the optical short link between the receiver and transmitter of the ICE head unit.
	2 Turn the ignition switch to the **ACC** position.
	3 Wait for 10 seconds.
	4 Check for DTC.
	Is U2603 logged? **Yes** INSTALL a new ICE head unit, REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC. TEST the system for normal operation. **No** RECHECK DTCs. No fault found in D2B system.

PINPOINT TEST R : ONE OR MORE D2B MODULES NOT RESPONDING. PERMANENT SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
R1: CHECK THE PERMANENT SUPPLY TO THE CD CHANGER	
	1 Disconnect the CD changer connector, CA301.
	2 Measure the voltage between CA301, pin 02 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the CD changer connector, CA301, pin 02, and fuse 72 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new CD Changer. REFER to: Compact Disc (CD) Changer - 4-Door (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R2.
R2: CHECK THE PERMANENT SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Measure the voltage between PH02, pin 22 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 22, and fuse 71 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new VACM. REFER to: Multifunction Voice Activated Module - 4-Door (419-10 Multifunction Electronic Modules, Removal and Installation).

	CLEAR the DTC, test the system for normal operation.GO to R3.
R3: CHECK THE PERMANENT SUPPLY TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Measure the voltage between PH01, pins 12 and 13 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pins 12 and 13 and fuse 71 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new 'phone module. REFER to: Module - 4-Door (419-08 Cellular Phone, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R4.
R4: CHECK THE PERMANENT SUPPLY TO THE NAVIGATION MODULE	
	1 Disconnect the navigation module connector, NA07.
	2 Measure the voltage between NA07, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** Repair the circuit between the navigation module connector, NA07, pin 01 and fuse 72 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new navigation module. REFER to: Navigation System Module - 4-Door (419-07 Navigation System, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R5.
R5: CHECK THE PERMANENT SUPPLY TO THE AMPLIFIER	
	1 Disconnect the amplifier connector, CA425.
	2 Measure the voltage between CA425, pin 09 (NR) and GROUND.
	3 Measure the voltage between CA425, pin 03 (NR) and GROUND.
	Is either voltage less than 10 volts? **Yes** Repair the circuit between the amplifier connector, CA425 and fuse 20 of the primary junction box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new amplifier. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST S : ONE OR MORE D2B MODULES NOT RESPONDING. ACCESSORY SWITCHED SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
S1: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH02, pin 08 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 08 and the ignition switch. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. (This circu t includes the central junct on fuse box, fuse 69) . **No** GO to S2.
S2: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH01, pin 14 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pin 14 and the ignition switch. This circuit includes the central junction fuse box, fuse 69. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to S3.

S3: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE NAVIGATION MODULE	
	1 Disconnect the navigation module electrical connector, NA07.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between NA07, pin 11 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the navigation module connector, NA07, pin 11 and the ignition switch. This circuit includes the central junction fuse box, fuse 69. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new navigation module. REFER to: Navigation System Module - 4-Door (419-07 Navigation System, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST T : ONE OR MORE D2B MODULES NOT RESPONDING. IGNITION SWITCHED SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
T1: CHECK THE IGNITION SWITCHED SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between PH02, pin 06 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 06 and the central junction fuse box, fuse 67. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to T2.
T2: CHECK THE IGNITION SWITCHED SUPPLY TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between PH01, pin 29 (Y) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pin 29 and the central junction fuse box, fuse 78. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Check the module for GROUND. INSTALL a new 'phone module. REFER to: Module - 4-Door (419-08 Cellular Phone, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST U : IC SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
U1: CHECK THE B+ SUPPLY TO THE IC	
	1 Disconnect the IC connector, IP11.
	2 Measure the voltage between IP11, pin 07 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 07 and battery. This circuit includes the primary junction box, fuse 45. For additional information, refer to the wiring diagrams. **No** GO to U2.
U2: CHECK THE ACC SUPPLY TO THE IC	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between IP11, pin 13 (YU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 13 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to U3.

U3: CHECK THE IGNITION SUPPLY TO THE IC	
	1 Turn the ignition switch to the **IGN** position.
	2 Measure the voltage between IP11, pin 11 (GR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 11 and battery. This circuit includes the primary junction box, fuse 54. For additional information, refer to the wiring diagrams. **No** GO to U4.
U4: CHECK THE GROUND TO THE IC	
	1 Measure the resistance between IP11, pin 08 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST V : SWRS SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
V1: CHECK THE MODULE SUPPLY TO THE SWRS	
	1 Disconnect the SWRS connector, IP19.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP19, pin 02 (GW) and GROUND.
	Is the voltage less than 4 volts? **Yes** GO to V2. **No** GO to V3.
V2: CHECK THE MODULE SUPPLY CIRCUIT TO THE SWRS FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the DSC module connector, JB185.
	3 Measure the resistance between IP19, pin 02 (GW) and JB185, pin 39 (GW).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to V3.
V3: CHECK THE GROUND TO THE SWRS	
	1 Reconnect the DSC module connector, JB185.
	2 Measure the resistance between IP19, pin 08 (U) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST W : YAW RATE SENSOR SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
W1: CHECK THE MODULE SUPPLY TO THE YAW RATE SENSOR	
	1 Disconnect the yaw rate sensor connector, IP20.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP20, pin 04 (GW) and GROUND.
	Is the voltage less than 4 volts? **Yes** GO to W2. **No** GO to W3.
W2: CHECK THE MODULE SUPPLY CIRCUIT TO THE YAW RATE SENSOR FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the DSC module connector, JB185.
	3 Measure the resistance between IP20, pin 04 (GW) and JB185, pin 39 (GW).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to W3.

W3: CHECK THE GROUND TO THE YAW RATE SENSOR	
	1 Measure the resistance between IP20, pin 01 (U) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST X : ABS/TCCM SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
X1: CHECK THE IGNITION SUPPLY TO THE ABS/TC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between JB45, pin 23 (GW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 23 and battery. This circuit includes the front power distribution box, fuse 13 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to X2.
X2: CHECK THE PUMP+ SUPPLY TO THE ABS/TCCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB45, pin 02 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 02 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to X3.
X3: CHECK THE SOLENOID+ SUPPLY TO THE ABS/TCCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB45, pin 06 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 06 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to X4.
X4: CHECK THE GROUND TO THE ABS/TCCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB45, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to X5.
X5: CHECK THE MOTOR GROUND TO THE ABS/TCCM	
	1 Measure the resistance between JB45, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST Y : DSC MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Y1: CHECK THE IGNITION SUPPLY TO THE DSC MODULE	
	1 Disconnect the DSC module connector, JB185.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between JB185, pin 23 (GW) and GROUND.
	Is the voltage less than 10 volts? **Yes**

	REPAIR the circuit between JB45, pin 23 and battery. This circuit includes the front power distribution box, fuse 13 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to Y2.
Y2: CHECK THE PUMP+ SUPPLY TO THE DSC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB185, pin 02 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB185, pin 02 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to Y3.
Y3: CHECK THE SOLENOID+ SUPPLY TO THE DSC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB185, pin 06 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB185, pin 06 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to Y4.
Y4: CHECK THE GROUND TO THE DSC MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB185, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to Y5.
Y5: CHECK THE MOTOR GROUND TO THE DSC MODULE	
	1 Measure the resistance between JB185, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST Z : GSI MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Z1: CHECK THE IGNITION SUPPLY TO THE GSI MODULE	
	1 Disconnect the GSI module connector, IP14.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP14, pin 01 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP14, pin 01 and battery. This circuit includes the primary junction box, fuse 50. For additional information, refer to the wiring diagrams. **No** GO to Z2.
Z2: CHECK THE GROUND TO THE GSI MODULE	
	1 Measure the resistance between IP14, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AA : HID MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AA1: CHECK THE IGNITION SUPPLY TO THE HID MODULE	
	1 Disconnect the HID module connector, IP130.
	2 Turn the ignition switch to the **ON** position.

	3 Measure the voltage between IP130, pin 23 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP130, pin 23 and battery. This circuit includes the primary junction box, fuse 39. For additional information, refer to the wiring diagrams. **No** GO to AA2.
AA2: CHECK THE GROUND TO THE HID MODULE	
	1 Measure the resistance between IP130, pin 24 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AB : EATC MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AB1: CHECK THE B+ SUPPLY TO THE EATC MODULE	
	1 Disconnect the EATC module connector, IP101.
	2 Measure the voltage between IP101, pin 14 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 14 and battery. This circuit includes the primary junction box, fuse 45. For additional information, refer to the wiring diagrams. **No** GO to AB2.
AB2: CHECK THE IGNITION SUPPLY TO THE EATC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between IP101, pin 02 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 02 and battery. This circuit includes the primary junction box, fuse 39, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AB3.
AB3: CHECK THE B+ SAVE SUPPLY TO THE EATC MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the voltage between IP101, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 01 and battery. This circuit includes the primary junction box, fuse 49, and the battery save relay. For additional information, refer to the wiring diagrams. **No** GO to AB4.
AB4: CHECK THE GROUND TO THE EATC MODULE	
	1 Measure the resistance between IP101, pin 15 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AC : MEMORY SEAT MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AC1: CHECK THE B+1 SUPPLY TO THE MEMORY SEAT MODULE	
	1 Disconnect the memory seat module connector, DM02.
	2 Measure the voltage between DM02, pin 01 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DM02, pin 01 and battery. This circuit includes the primary junction box, fuse 16. For additional information, refer to the wiring diagrams. **No** GO to AC2.
AC2: CHECK THE B+2 SUPPLY TO THE MEMORY SEAT MODULE	

	1 Measure the voltage between DM02, pin 06 (GB) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DM02, pin 06 and battery. This circuit includes the primary junction box, fuse 09. For additional information, refer to the wiring diagrams. **No** GO to AC3.
AC3: CHECK THE IGNITION SUPPLY TO THE MEMORY SEAT MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between DM02, pin 04 (GB) and GROUND.
	Is the voltage less than 4 volts? **Yes** REPAIR the circuit between DM02, pin 04 and battery. This circuit includes the primary junction box, fuse 07. For additional information, refer to the wiring diagrams. **No** GO to AC4.
AC4: CHECK THE ELECTRONIC GROUND TO THE MEMORY SEAT MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between DM02, pin 10 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AC5.
AC5: CHECK THE POWER GROUND TO THE MEMORY SEAT MODULE	
	1 Measure the resistance between DM02, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AC6.
AC6: CHECK THE SIGNAL GROUND TO THE MEMORY SEAT MODULE	
	1 Measure the resistance between DM02, pin 03 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AD : TCM (16 BIT) SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AD1: CHECK THE B+ SUPPLY TO THE TCM	
	1 Disconnect the TCM connector, JB131.
	2 Measure the voltage between JB131, pin 06 (UY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB131, pin 06 and battery. This circuit includes the front power distribution box, fuse 32. For additional information, refer to the wiring diagrams. **No** GO to AD2.
AD2: CHECK THE IGNITION 1 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB131, pin 36 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB131, pin 36 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AD3.
AD3: CHECK THE IGNITION 2 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB131, pin 54 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes**

	REPAIR the circuit between JB131, pin 54 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AD4.
AD4: CHECK THE GROUND 1 TO THE TCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB131, pin 09 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AD5.
AD5: CHECK THE GROUND 2 TO THE TCM	
	1 Measure the resistance between JB131, pin 38 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AE : TCM (32 BIT) SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AE1: CHECK THE B+ SUPPLY TO THE TCM	
	1 Disconnect the TCM connector, JB231.
	2 Measure the voltage between JB231, pin 28 (UY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 28 and battery. This circuit includes the front power distribution box, fuse 32. For additional information, refer to the wiring diagrams. **No** GO to AE2.
AE2: CHECK THE IGNITION 1 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB231, pin 10 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 10 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AE3.
AE3: CHECK THE IGNITION 2 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB231, pin 19 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 19 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AE4.
AE4: CHECK THE GROUND 1 TO THE TCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB231, pin 25 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AE5.
AE5: CHECK THE GROUND 2 TO THE TCM	
	1 Measure the resistance between JB231, pin 38 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams.

	No No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AF : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.0L PETROL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AF1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, EN65.
	3 Measure the voltage between EN65, pin 21 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN65, pin 21 and battery. This circuit includes the front power distribution box, fuse 36. For additional information, refer to the wiring diagrams. **No** GO to AF2.
AF2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between EN65, pin 69 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN65, pin 69 and battery. This circuit includes the EMS control relay, pin 2. For additional information, refer to the wiring diagrams. **No** GO to AF3.
AF3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between EN65, pin 19 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AF4.
AF4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between EN65, pin 18 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AG : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.5/3.0L PETROL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AG1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, EN16.
	3 Measure the voltage between EN16, pin 22 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN16, pin 22 and battery. This circuit includes the front power distribution box, fuse 36. For additional information, refer to the wiring diagrams. **No** GO to AG2.
AG2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between EN16, pin 40 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN16, pin 40 and battery. This circuit includes the EMS control relay, pin 02. For additional information, refer to the wiring diagrams. **No** GO to AG3.
AG3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between EN16, pin 04 (B) and GROUND.

	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AG4.
AG4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between EN16, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AH : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.0L DIESEL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AH1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, DL01.
	3 Measure the voltage between DL01, pin 03 (WG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DL01, pin 03 and battery. This circuit includes the front power distribution box, fuse 21, and the EMS control relay. For additional information, refer to the wiring diagrams. **No** GO to AH2.
AH2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between DL01, pin 09 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DL01, pin 09 and battery. This circuit includes the EMS control relay, pin 02. For additional information, refer to the wiring diagrams. **No** GO to AH3.
AH3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between DL01, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH4.
AH4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between DL01, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH5.
AH5: CHECK THE POWER GROUND (3) TO THE ECM	
	1 Measure the resistance between DL01, pin 28 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH6.
AH6: CHECK THE POWER GROUND (4) TO THE ECM	
	1 Measure the resistance between DL01, pin 66 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH7.
AH7: CHECK THE POWER GROUND (5) TO THE ECM	

	1 Measure the resistance between DL01, pin 88 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AI : ICE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AI1: CHECK THE B+ SUPPLY TO THE ICE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ICE connector, IP65.
	3 Measure the voltage between IP65, pin 11 (NW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP65, pin 11 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AI2.
AI2: CHECK THE ACC SUPPLY TO THE ICE	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between IP65, pin 02 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP65, pin 02 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to AI3.
AI3: CHECK THE GROUND TO THE ICE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between IP65, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AJ : CD CHANGER SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AJ1: CHECK THE B+ SUPPLY TO THE CD CHANGER	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the CD changer connector, CA301.
	3 Measure the voltage between CA301, pin 02 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between CA301, pin 02 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AJ2.
AJ2: CHECK THE GROUND TO THE CD CHANGER	
	1 Measure the resistance between CA301, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AK : NAV MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AK1: CHECK THE B+ SUPPLY TO THE NAV MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the NAV module connector, NA07.

	3 Measure the voltage between NA07, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between NA07, pin 01 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AK2.
AK2: CHECK THE ACC SUPPLY TO THE NAV MODULE	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between NA07, pin 11 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between NA07, pin 11 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to AK3.
AK3: CHECK THE GROUND TO THE NAV MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between NA07, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AL : FFH MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AL1: CHECK THE B+ SUPPLY TO THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the FFH module connector, JB232.
	3 Measure the voltage between JB232, pin 01 (GR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB232, pin 01 and battery. This circuit includes the front power distribution box, fuse 31. For additional information, refer to the wiring diagrams. **No** GO to AL2.
AL2: CHECK THE IGNITION SUPPLY TO THE FFH MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB232, pin 04 (RW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB232, pin 04 and battery. This circuit includes the front power distribution box, fuse 12. For additional information, refer to the wiring diagrams. **No** GO to AL3.
AL3: CHECK THE GROUND TO THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB232, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AM : PARK AID MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AM1: CHECK THE IGNITION SUPPLY TO THE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the park aid module connector, CA418.
	3 Turn the ignition switch to the **ON** position.
	4 Measure the voltage between CA418, pin 01 (N) and GROUND.
	Is the voltage less than 10 volts?

	Yes REPAIR the circuit between CA418, pin 01 and battery. This circuit includes the primary junction box, fuse 33 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AM2.
AM2: CHECK THE GROUND TO THE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between CA418, pin 16 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AN : RCM SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AN1: CHECK THE IGNITION SUPPLY TO THE RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the RCM connector, IP74.
	3 Turn the ignition switch to the **ON** position.
	4 Measure the voltage between IP74, pin 12 (G) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP74, pin 12 and battery. This circuit includes the primary junction box, fuse 53 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AN2.
AN2: CHECK THE GROUND TO THE RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between IP74, pin 16 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AO : GEM SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AO1: CHECK THE B+ SUPPLY TO THE GEM	
	1 Disconnect the GEM connector, JB172.
	2 Measure the voltage between JB172, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB172, pin 01 and battery. This circuit includes the primary junction box, fuse 22. For additional information, refer to the wiring diagrams. **No** No fault found with power supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AP : RESTRAINTS CONTROL MODULE (RCM) ISO CIRCUIT MALFUNCTION	
WARNING: To avoid accidental deployment and possible injury, the backup power supply must be depleted before repairing or replacing any airbag supplemental restraint system (SRS) components. To deplete the backup power supply energy, disconnect the battery ground cable and wait one minute. Failure to follow this instruction may result in personal injury.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AP1: CHECK THE RCM FOR DAMAGE	
	1 Inspect the RCM for damage.
	Does the RCM indicate signs of damage? **Yes** INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No**

	GO to AP2.
AP2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AP3.
AP3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pins 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AP4.
AP4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN DIAGNOSTIC CONNECTOR AND RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the RCM connector, IP74.
	4 Measure the resistance between diagnostic connector, pin 07 (W) (K-line) and IP74, pin 11 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AQ : HEADLAMP LEVELLING MODULE (HID) ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AQ1: CHECK HEADLAMP LEVELLING MODULE FOR DAMAGE	
	1 Inspect the HID module for damage.
	Does the HID module indicate signs of damage? **Yes** INSTALL a new HID module. REFER to: Headlamp Leveling Module (417-01 Exterior Lighting, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to AQ2.
AQ2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AQ3.
AQ3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pins 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AQ4.
AQ4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN DIAGNOSTIC CONNECTOR AND HID MODULE	
	1 Disconnect the HID module connector, IP130.
	2 Measure the resistance between diagnostic connector, pin 07 (W) and IP130, pin 05 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR

	the DTC, test the system for normal operation. **No** INSTALL a new HID module. REFER to: Headlamp Leveling Module (417-01 Exterior Lighting, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AR : ROOF CONSOLE ISO CIRCUIT MALFUNCTION	
• NOTE: There are two levels of Roof Console. High-line, with moon roof, and/or reading lamps, plus VEMS and/or garage door opener (electrical connector, RC22). Low-line, with moon roof and/or reading lamps only (electrical connector, RC33).	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AR1: CHECK ROOF CONSOLE MODULE FOR DAMAGE	
	1 Inspect the roof console module for damage.
	Does the roof console module indicate signs of damage? **Yes** INSTALL a new roof console module. CLEAR the DTC, test the system for normal operation. **No** GO to AR2.
AR2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AR3.
AR3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AR4.
AR4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ROOF CONSOLE MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the roof console module connector (RC23, high-line, RC33, low-line).
	4 Measure the resistance between the diagnostic connector, pin 07 (W) and: Vehicles with low-line console - • RC23, pin 08 (W). Vehicles with high-line console - • RC33, pin 03 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new roof console module. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AS : REVERSE PARK AID ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AS1: CHECK THE REVERSE PARK AID MODULE FOR DAMAGE	
	1 Inspect the reverse park aid module for damage.
	Does the reverse park aid module indicate signs of damage? **Yes** INSTALL a new reverse park aid module. REFER to: Parking Aid Module - 4-Door (413-13 Parking Aid, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No**

	GO to AS2.
AS2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AS3.
AS3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AS4.
AS4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE REVERSE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the reverse park aid module connector, RB07.
	4 Measure the resistance between diagnostic connector, pin 07 (W) and RB07, pin 05 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new reverse park aid module. REFER to: Parking Aid Module - 4-Door (413-13 Parking Aid, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AT : ECM ISO CIRCUIT MALFUNCTION	
• NOTE: These pinpoint tests apply only to OBD2 diagnostics. The ECM does most of it's diagnostics via CAN.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AT1: CHECK ECM FOR DAMAGE	
	1 Inspect the ECM for damage.
	Does the ECM indicate signs of damage? **Yes** Please check part is not on any form of prior authorisation before replacement. **No** GO to AT2.
AT2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AT3.
AT3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 07 (W) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AT4.
AT4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
• NOTE: The diesel ECM is not part of the ISO network.	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal. Vehicles with 2.5 and 3.0L engine -

	• Disconnect the ECM connector, EN16. • Measure the resistance between the diagnostic connector, pin 07 (W) and EN16, pin 105 (W). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65. • Measure the resistance between the diagnostic connector, pin 07 (W) and EN65, pin 39 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Please check part is not on any form of prior authorisation before replacement.

PINPOINT TEST AU : FUEL FIRED HEATER (FFH) MODULE ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AU1: CHECK THE FFH MODULE FOR DAMAGE	
	1 Inspect the FFH module for damage.
	Does the FFH module indicate signs of damage? **Yes** Please check part is not on any form of prior authorisation before replacement. **No** GO to AU2.
AU2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AU3.
AU3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 07 (W) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AU4.
AU4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the FFH module connector, JB232.
	4 Measure the resistance between the diagnostic connector, pin 07 (W) and JB232, pin 03 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Please check part is not on any form of prior authorisation before replacement.

PINPOINT TEST AV : AMPLIFIER SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AV1: CHECK THE B+ SUPPLY TO THE AMPLIFIER	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the amplifier connector, CA425.
	3 Measure the voltage between CA425, pin 03 (NR) and GROUND.
	4 Measure the voltage between CA425, pin 09 (NR) and GROUND.
	Is either voltage less than 10 volts? **Yes** REPAIR the circuit between CA425, pins 03/09 and battery. This circuit includes the primary junction box, fuse 20. For additional information, refer to the wiring diagrams. **No** GO to AV2.
AV2: CHECK THE GROUND TO THE AMPLIFIER	

	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between CA425, pin 02 (B) and GROUND.
	3 Measure the resistance between CA425, pin 08 (B) and GROUND.
	Is either resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

Module Communications Network - Communications NetworkVIN Range: J28493->V99999

Diagnosis and Testing

Principles of Operation

The vehicle has four module communication networks. Only three of which are connected to the diagnostic connector. The **standard corporate protocol (SCP)** and **controller area network (CAN)**, which are an unshielded twisted pair cable: data bus **+** and data bus **-** and the **International Standard Organization (ISO)** 9141 communication network, which is a single wire network.

The **domestic data bus (D2B)**, which is a fibre optic ring network, can be diagnosed through the SCP network, and with the optical bus tester.

The SCP, CAN and ISO networks can be connected to the Jaguar approved diagnostic system by one diagnostic connector. This makes troubleshooting these systems easier by allowing one smart tester to be able to diagnose any module on the three networks from one connector. On-board diagnosis of the D2B network is through the in car entertainment (ICE) head.

The diagnostic connector is located under the instrument panel.

The ISO 9141 communications network does not permit inter-module communications. When the Jaguar approved diagnostic system communicates with modules on the ISO 9141 communication network, the diagnostic system must ask for all information, the modules will not initiate communications.

The SCP communication network remains operational even with severing of one of the bus wires. Communications will also continue if one of the bus wires is shorted to ground or battery positive voltage (B+), or if some (but not all) termination resistors are lost.

Unlike the SCP communication network, the ISO 9141 communication network will not function if the wire is shorted to ground or battery positive voltage (B+). Also, if one of the modules on the ISO 9141 network loses power or shorts internally, communication to that module will fail.

The anti-lock brake control module is connected to the CAN communication network. The module comes in two forms. The first type is the standard equipped anti-lock brake system (ABS) with traction control. It controls the brake pressure to the four wheels to keep the vehicle under control while braking. The second type of ABS is optional and is called dynamic stability control (DSC). This module adds yaw and steering wheel angle sensors to the package to help in sensing a loss of vehicle control. For additional information,
REFER to: Anti-Lock Control - Stability Assist (206-09 Anti-Lock Control - Stability Assist, Description and Operation).

The in car entertainment (ICE) head is connected to the SCP communication network and also to the D2B network. The D2B communicates with the compact disc player, cellular phone transceiver, navigation system, amplifier, and the voice control module. For additional information on the compact disc,
REFER to: Audio System (415-00 Information and Entertainment System - General Information, Diagnosis and Testing).
For additional information on the cellular phone,
REFER to: Cellular Phone (419-08 Cellular Phone, Diagnosis and Testing).
For additional information on the navigation system,
REFER to: Navigation System (419-07 Navigation System, Diagnosis and Testing).
For additional information on the amplifier,
REFER to: Audio System (415-01 Audio Unit, Description and Operation).
For additional information on the voice activated control system,
REFER to: Multifunction Electronic Module (419-10 Multifunction Electronic Modules, Diagnosis and Testing).

The electronic automatic temperature control (EATC) module is connected to the CAN communication network. The EATC module controls automatic climate functions that maintain the vehicle at a constant temperature setting. For additional information,
REFER to: Climate Control System (412-00 Climate Control System - General Information, Diagnosis and Testing).

The instrument cluster (also known as an instrument cluster module ICM) is connected to the CAN and SCP communication networks. The instrument cluster displays information received on the SCP including speedometer, odometer, fuel, and message center warnings. The instrument cluster displays information received on the CAN including ABS, air conditioning, transmission and engine condition. The instrument cluster also controls the passive anti-theft system (PATS). For additional information;
REFER to: Instrument Cluster and Panel Illumination (413-00 Instrument Cluster and Panel Illumination, Diagnosis and Testing).
For instrument cluster operation and
REFER to: Anti-Theft - Passive (419-01B Anti-Theft - Passive, Diagnosis and Testing).
for PATS.

The general electronic module (GEM) is connected to the SCP communication network. The GEM controls both interior and exterior lighting, active anti-theft functions and warning chimes. For additional information on interior lamps,

REFER to: Interior Lighting (417-02 Interior Lighting, Diagnosis and Testing).
For additional information on exterior lighting,
REFER to: Headlamps (417-01 Exterior Lighting, Diagnosis and Testing).
For additional information on active anti-theft,
REFER to: Anti-Theft - Active (419-01A Anti-Theft - Active, Diagnosis and Testing).
For additional information on warning chimes,
REFER to: Warning Devices (413-09 Warning Devices, Diagnosis and Testing).

The engine control module (ECM) is connected to both the CAN and ISO 9141 communication networks. The ECM controls the engine performance, electronic ignition, emission controls, speed control, and on board diagnostics. For additional information;
REFER to: Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing).
,
REFER to: Electronic Engine Controls - 2.0L NA V6 - AJV6 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing).
or
REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 2.2L Duratorq-TDCi (110kW/150PS) - Puma/2.0L Duratorq-TDCi, Diagnosis and Testing).

The 'phone module is connected to the D2B communication network, and incorporates the VEMS, or Vehicle Emergency Messaging System. The module allows a user to request emergency assistance (police, ambulance, fire, recovery) or directions to a desired location at the touch of a button. Also, if any of the vehicle's airbags are deployed while the VEMS system is powered ON, the system automatically issues a call for emergency assistance. For additional information,
REFER to: Compact Disc (CD) Changer - 4-Door (415-01 Audio Unit, Removal and Installation).

The airbag restraints module is connected to the ISO 9141 communication network. The airbag control module controls the deployment of the air bags based on sensor input. For additional information;
REFER to: Air Bag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Diagnosis and Testing).

The voice activated control module (VACM) is connected to the D2B communication network. This allows the user to select functions by giving a voice command. The VACM sends the command information by D2B to the correct module or audio unit.

The navigation system (NAV) is connected to the D2B communication network, and performs it's diagnostics via the SCP network. The NAV receives inputs from the GPS antenna and various other sensors. For additional information,
REFER to: Navigation System (419-07 Navigation System, Diagnosis and Testing).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical, electrical or optical damage.

Electrical
• Fuses • Wiring harness • Loose or corroded connections • Correct engagement of electrical connectors • **Controller area network (CAN)** • Instrument cluster (IC) • Steering wheel rotation sensor (SWRS) • Gear selector module (GSI) • Headlight levelling module (HID) • Yaw rate sensor • Electronic air temperature control module (EATCM) • Memory seat control module • Transmission control module (TCM) • Anti-lock brake control module with or without dynamic stability control (ABS/DSC) • Engine control module (ECM) • **Standard corporate protocol (SCP)** • Generic electronic module (GEM) • Instrument cluster (IC) • In-car entertainment (ICE) • Navigation system (NAV) • Engine control module (ECM) • **International standards organization (ISO)** • Fuel fired heater module • Reverse park aid module • Restraints control module (RCM)

- Headlight levelling module (HID)
- Roof console scanner
- **Domestic data bus (D2B)**
- ICE head unit (HU)
- Compact disc changer (CD)
- Cellular phone module (CPM)
- Voice module (VACM)
- Navigation system module (NSM)
- Amplifier (AMP)

Visual Inspection Chart

Optical
• Routing of fibre optic harnesses • Correct engagement of optical connectors • Correct placement of optical connectors (ring order) • Damage to fibre (chafing, abrasion, kinking, cuts, etc) • Correct assembly of optical connectors (backout, etc)

Default Modes

Possible TCM default

- Fixed 4th gear
- Erratic gear shifts

Possible ECM default

- Throttle motor and relay disabled
- Throttle valve opening set to default value
- Idle speed controlled by fuel injection intervention
- Idle speed adaptation inhibited
- Throttle opening limited to 30%
- Vehicle speed limited
- Speed (cruise) control limited
- Maximum throttle opening for N range inhibited
- Maximum engine speed reduced
- HO2 sensor control circuit inhibited
- Maximum ignition retard

Symptom Chart

• NOTE: Network DTCs may be set by an error or communications failure in the network. Individual DTCs are in the table, alongside their respective modules, but may also be set by a combination of factors affecting the network, which would result in multiple DTCs being set for one error, or, as in the case of an open circuit, no DTC being set.

DTC	Description	Possible Source	Action
P0860	CAN ECM / JGM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; JGM to ECM • CAN short circuit fault • JGM failure • ECM failure	Refer to power and ground test for suspect module. For JGM CAN circuit tests, GO to Pinpoint Test AW. Please check part is not on any form of prior authorization before replacement.
P1573	CAN throttle angle error	• TP sensor fault (additional DTCs logged) • ECM CAN message error	For TP sensor circuit tests, REFER to: Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Error message sent on CAN, but not CAN related. Check for additional DTCs indicating cause.

P1601	Incorrect ECM or TCM fitted to vehicle	• ECM configuration • TCM configuration	Configure the modules using the Jaguar approved diagnostic system.
P1603	TCM EEPROM failure	• Battery disconnected while the ignition switched ON • B+ power supply circuit; open circuit • TCM failure	For TCM EEPROM tests, GO to Pinpoint Test B.
P1609	ECM microprocessor to microprocessor communication failure	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1611	ECM sub CPU failure	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1633	ECM main CPU failure	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1634	Throttle 'watch-dog' circuit malfunction	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1637	CAN ECM to ABS/TCCM or DSC control module network malfunction	• Module power supply or ground interruption • CAN open circuit fault; ABS/TCCM or DSC to ECM • CAN short circuit fault • ABS/TCCM or DSC module failure • ECM failure	Refer to power and ground test for suspect module. For ABS/TCCM or DSC CAN circuit tests, GO to Pinpoint Test C. Please check part is not on any form of prior authorization before replacement.
P1638	CAN ECM / IC network malfunction	• Module power supply or ground interruption • CAN open circuit fault; IC to ECM • CAN short circuit fault • IC failure • ECM failure	Refer to power and ground test for suspect module. For IC CAN circuit tests, GO to Pinpoint Test D. Please check part is not on any form of prior authorization before replacement.
P1642	CAN circuit malfunction	• Module power supply or ground interruption • CAN short circuit fault • Control module failure; Check for additional logged DTCs to locate module source	Refer to power and ground test for suspect module. For network short circuit tests, GO to Pinpoint Test E.
P1643	CAN ECM / TCM	• Module power	Refer to power and ground test for suspect module. For CAN open

	network malfunction	supply or ground interruption • CAN open circuit fault; TCM to ECM • CAN short circuit fault • TCM failure • ECM failure	circuit tests, GO to Pinpoint Test A. For network short circuit tests, GO to Pinpoint Test E. Please check part is not on any form of prior authorization before replacement.
P1646	ECM HO2 sensor control malfunction, right-hand bank	• HO2 sensor heater failure • HO2 sensor sensing circuit; short circuit to ground, short circuit to high voltage, open circuit • ECM failure	For HO2 sensor circuit tests, REFER to: Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Please check part is not on any form of prior authorization before replacement.
P1647	ECM HO2 sensor control malfunction, left-hand bank	• HO2 sensor heater failure • HO2 sensor sensing circuit; short circuit to ground, short circuit to high voltage, open circuit • ECM failure	For HO2 sensor circuit tests, REFER to: Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing) / Electronic Engine Controls - 2.5L NA V6 - AJV6/3.0L NA V6 - AJ27, VIN Range: E96603->J28492 (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Diagnosis and Testing). Please check part is not on any form of prior authorization before replacement.
P1648	ECM KS self-test failure	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1656	TP sensor amplifier circuit malfunction	• ECM failure	Please check part is not on any form of prior authorization before replacement.
P1699	CAN ECM to EATCM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; EATCM to ECM • CAN short circuit fault; EATCM to ECM • EATCM failure • ECM failure	Refer to power and ground test for suspect module. For EATCM open circuit tests, GO to Pinpoint Test A. For network short circuit tests, GO to Pinpoint Test F. Please check part is not on any form of prior authorization before replacement.
P1777	CAN torque reduction error	• ECM CAN message error	Error message sent on CAN, but not CAN related. Check for additional DTCs indicating cause.
P1796	CAN network malfunction	• Module power supply or ground interruption • CAN short circuit fault • TCM failure	Refer to power and ground test for suspect module. For network short circuit test, GO to Pinpoint Test A.
P1797	CAN TCM/ECM network malfunction	• Module power supply or ground interruption • CAN open circuit fault; TCM to ECM • CAN short	Refer to power and ground test for suspect module. For TCM open/short circuit tests, GO to Pinpoint Test C.

		circuit fault • TCM failure • ECM failure	
P1799	CAN TCM to ABS/TCCM or DSC module network malfunction	• Module power supply or ground interruption • CAN short circuit fault • ABS/TCCM or DSC module failure • TCM failure	Refer to power and ground test for suspect module. For ABS/TCCM short circuit tests, GO to Pinpoint Test G.
U1041	GEM SCP network invalid vehicle speed data	• ABS/DSC wheel speed message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1135	GEM SCP network invalid ignition switch data	• Instrument cluster ignition switch message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1147	GEM anti-theft SCP network invalid ignition key-in data	• GEM key-in message error • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1262	GEM SCP network ignition switch state message missing	• SCP circuit(s); open circuit • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U1262	ICE SCP network circuit fault	• SCP network circuit; open circuit, short circuit to B+, short circuit to ground • SCP network circuit fault • Audio unit fault	For ICE SCP network tests, GO to Pinpoint Test I.
U1900	CAN instrumentation messages missing	• Engine management, ABS, or DSC fault • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U1900	Automatic climate control CAN fault	• CAN circuit; open circuit, short circuit to B+, short circuit to ground • Automatic climate control module internal CAN fault • CAN network fault	For EATC CAN network tests, GO to Pinpoint Test F.
U1900	ABS CAN fault	• CAN circuit:	For ABS/DSC CAN network tests, GO to Pinpoint Test G.

		open circuit, short circuit to B+, short circuit to ground • ABS control module internal CAN fault • CAN network fault	
U1900	DSC CAN fault	• CAN circuit; open circuit, short circuit to B+, short circuit to ground • DSC control module internal CAN fault • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2003	CD autochanger not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For CD autochanger D2B network tests, GO to Pinpoint Test J. For D2B permanent supply tests, GO to Pinpoint Test R.
U2008	Cellular telephone not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For cellular telephone D2B network tests, GO to Pinpoint Test L. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S. For D2B ignition switched supply tests, GO to Pinpoint Test T.
U2019	VACM not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For VACM D2B network tests, GO to Pinpoint Test M. For D2B accessory switched supply tests, GO to Pinpoint Test S. For D2B ignition switched supply tests, GO to Pinpoint Test T.
U2196	Instrument cluster CAN engine speed message invalid	• Verify integrity of engine management system • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2197	Instrument cluster CAN engine speed message invalid	• Verify integrity of engine management system • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2199	Instrument cluster CAN engine coolant temperature message invalid	• Verify integrity of engine management system • CAN network	For instrument cluster CAN network tests, GO to Pinpoint Test D.

		fault	
U2200	Instrument cluster CAN odometer count message invalid	• Verify integrity of ABS or DSC systems • CAN network fault	For instrument cluster CAN network tests, GO to Pinpoint Test D.
U2202	Invalid DSC control module CAN configuration data received from ECM	• Reconfigure the ECM using the Jaguar approved diagnostic system • CAN network fault	For ECM CAN network tests, GO to Pinpoint Test E.
U2202	Invalid ABS control module CAN configuration data received from ECM	• Reconfigure the ECM using the Jaguar approved diagnostic system • CAN network fault	For ECM CAN network tests, GO to Pinpoint Test E.
U2509	ECM unable to fulfill ABS CAN torque reduction request	• Verify integrity of engine management system • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2509	ECM unable to fulfill DSC CAN torque reduction request	• Verify integrity of engine management system • CAN network fault	For ABS/DSC CAN network tests, GO to Pinpoint Test G.
U2510 (security flash code 23)	Anti-theft ECM identification mismatch	• ECM configuration fault • Incorrect ECM installed	Reconfigure ECM using the Jaguar approved diagnostic system. Please check part is not on any form of prior authorization before replacement.
U2511	Anti-theft ECM invalid data	• ECM configuration fault • Incorrect ECM installed • SCP network error	Reconfigure ECM using the Jaguar approved diagnostic system. Please check part is not on any form of prior authorization before replacement.
U2514	GEM wash/wipe SCP network vehicle speed message missing	• SCP circuit(s); open circuit • SCP network error	For GEM SCP network tests, GO to Pinpoint Test H.
U2520	Memory seats	• CAN open circuit fault: memory seat module to diagnostic connector • CAN short circuit fault • Memory seat module failure	For CAN open/short circuit tests, GO to Pinpoint Test A.
U2600	Audio D2B network 'wake-	• D2B network 'wake-up'	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.

	up' circuit fault	circuit; short circuit to B+	
U2601	Audio D2B network 'wake-up' circuit fault	• D2B network 'wake-up' circuit; short circuit to B+	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2601	Voice activation module D2B network 'wake-up' circuit fault	• D2B network 'wake-up' circuit; short circuit to ground	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2602	Break in optical ring **FROM** ICE head unit (transmitter)	• D2B network module disconnected • D2B network optical ring broken	For optical ring tests, GO to Pinpoint Test P.
U2603	Break in optical ring **TO** ICE head unit (receiver)	• D2B network module disconnected • D2B network optical ring broken	For optical ring tests, GO to Pinpoint Test Q.
U2609	Voice activation module D2B network 'wake-up' signal out of specification	• D2B network 'wake-up' circuit; high resistance • Voice activation module failure	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2610	Voice activation module D2B network 'position status report' not received	• D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2611	Voice activation module D2B network 'alarm clear command' not received	• D2B network fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K.
U2613	Navigation control module not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+, short circuit to ground • D2B network fault • Module permanent supply fault • Module accessory switched supply fault • Module ignition switched supply fault	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For navigation module optical tests, GO to Pinpoint Test N. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S.
U2614	Amplifier not responding on D2B network	• D2B network 'wake-up' circuit; short circuit to B+,	For D2B 'wake-up' circuit tests, GO to Pinpoint Test K. For amplifier optical tests, GO to Pinpoint Test O. For D2B permanent supply tests, GO to Pinpoint Test R. For D2B accessory switched supply tests, GO to Pinpoint Test S.

		• short circuit to ground • D2B network fault	
None	ISO circuit malfunction, RCM	• RCM K-line circuit; open circuit • RCM K-line circuit; short circuit	For RCM ISO tests, GO to Pinpoint Test AP.
None	ISO circuit malfunction, HID module	• HID module K-line circuit; open circuit • HID module K-line circuit; short circuit	For HID module ISO tests, GO to Pinpoint Test AQ.
None	ISO circuit malfunction, roof console module	• Roof console module K-line circuit; open circuit • Roof console module K-line circuit; short circuit	For roof console module ISO tests, GO to Pinpoint Test AR.
None	ISO circuit malfunction, reverse park aid module	• Reverse park aid module K-line circuit; open circuit • Reverse park aid module K-line circuit; short circuit	For reverse park aid module ISO tests, GO to Pinpoint Test AS.
None	ISO circuit malfunction, ECM	• ECM K-line circuit; open circuit • ECM K-line circuit; short circuit	For ECM ISO tests, GO to Pinpoint Test AT.
None	ISO circuit malfunction, fuel fired heater (FFH) module	• FFH module K-line circuit; open circuit • FFH module K-line circuit; short circuit	For FFH module ISO tests, GO to Pinpoint Test AU.

Power and Ground circuit test index

Modules may log DTCs if the power supply or GROUND is interrupted. Supply and GROUND tests are covered below by module name.

Description	Possible source	Action
IC supply or ground fault	• **B+** supply failure • **Ign+** supply failure • **Acc+** supply failure • **GROUND** failure	For IC circuit tests, GO to Pinpoint Test U.
SWRS supply or ground fault	• **Module** supply failure • **GROUND** failure	For SWRS circuit tests, GO to Pinpoint Test V.

Yaw rate sensor supply or ground fault	• **Module** supply failure • **GROUND** failure	For yaw rate sensor circuit tests, GO to Pinpoint Test W.
ABS/TCCM supply or ground fault	• **Ign+** supply failure • **Pump+** supply failure • **Solenoid+** supply failure • **GROUND** failure • Motor **GROUND** failure	For ABS/TCCM circuit tests, GO to Pinpoint Test X.
DSC module supply or ground fault	• **Ign+** supply failure • **Pump+** supply failure • **Solenoid+** supply failure • **GROUND** failure • Motor **GROUND** failure	For DSC module circuit tests, GO to Pinpoint Test Y.
GSI module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For GSI module circuit tests, GO to Pinpoint Test Z.
HID module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For HID module circuit tests, GO to Pinpoint Test AA.
EATC module supply or ground fault	• **B+** supply failure • **B+save** supply failure • **Ign+** supply failure • **GROUND** failure	For EATC module circuit tests, GO to Pinpoint Test AB.
Memory seat module supply or ground fault	• **B+1** supply failure • **B+2** supply failure • **Ign+** supply failure • Electronic **GROUND** failure • Power **GROUND** failure • Signal **GROUND** failure	For memory seat module circuit tests, GO to Pinpoint Test AC.
TCM supply or ground fault (16 bit)	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For 16 bit TCM circuit tests, GO to Pinpoint Test AD.

TCM supply or ground fault (32 bit)	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For 32 bit TCM circuit tests, GO to Pinpoint Test AE.
ECM supply or ground fault, vehicles with 2.0L petrol engine	• **B+memory** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.0L petrol engines, GO to Pinpoint Test AF.
ECM supply or ground fault, vehicles with 2.5/3.0L petrol engine	• **B+memory** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.5/3.0L petrol engines, GO to Pinpoint Test AG.
ECM supply or ground fault, vehicles with 2.0L diesel engine	• **Vpwr** supply failure • **Control** supply failure • **GROUND** failure	For ECM circuit tests, vehicles with 2.0L diesel engines, GO to Pinpoint Test AH.
ICE supply or ground fault	• **B+memory** supply failure • **Acc+** supply failure • **GROUND** failure	For ICE circuit tests, GO to Pinpoint Test AI.
CD supply or ground fault	• **B+** supply failure • **GROUND** failure	For CD changer circuit tests, GO to Pinpoint Test AJ.
NAV module supply or ground fault	• **B+** supply failure • **Acc+** supply failure • **GROUND** failure	For NAV module circuit tests, GO to Pinpoint Test AK.
FFH module supply or ground fault	• **B+** supply failure • **Ign+** supply failure • **GROUND** failure	For FFH module circuit tests, GO to Pinpoint Test AL.
Park aid module supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For park aid module circuit tests, GO to Pinpoint Test AM.
RCM supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For RCM circuit tests, GO to Pinpoint Test AN.
GEM supply or ground fault	• **B+** supply failure	For GEM circuit tests, GO to Pinpoint Test AO.
Amplifier supply or ground fault	• **B+** supply failure • **GROUND** failure	For amplifier circuit tests, GO to Pinpoint Test AV.

JGM supply or ground fault	• **Ign+** supply failure • **GROUND** failure	For JGM circuit tests, GO to Pinpoint Test AX.

Pinpoint tests

• CAUTIONS:

 Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Each vehicle is configured to it's own vehicle identification data (VID) block, and substitution of control modules may not only not confirm a fault, but may cause faults in the vehicle being tested and/or the donor vehicle. Failure to follow this instruction may result in damage to the vehicle.

 Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result. Failure to follow this instruction may result in damage to the vehicle.

 When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00. Failure to follow this instruction may result in damage to the vehicle.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Before beginning any diagnosis of the D2B system, codes B1342, U2602, or U2603 must be rectified. No D2B function is possible with these failures present.

• NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

• NOTE: If DTCs are recorded and the symptom is not present when performing the pinpoint tests, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

PINPOINT TEST A : CHECK THE CONTROLLER AREA NETWORK (CAN) CONTINUITY	
• NOTE: The following test is based on the maximum number of modules in the network. Refer to the wiring diagrams for information on networks with fewer modules.	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
A1: CHECK THE RESISTANCE OF THE CAN NETWORK	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between pins 06 (Y) and 14 (G) of the diagnostic connector.
	Is the resistance between 50 and 70 ohms? **Yes** GO to A3. **No** GO to A2.
A2: CHECK THE CAN NETWORK FOR SHORT CIRCUIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between pins 06 (Y) and 14 (G) of the diagnostic connector.
	Is the resistance less than 50 ohms? **Yes** CHECK the network for short circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A3.
A3: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE STEERING WHEEL ROTATION SENSOR	
	1 Disconnect the steering wheel rotation sensor connector, IP19.
	2 Measure the resistance between IP19, pin 03 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A4.
A4: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE STEERING WHEEL ROTATION SENSOR	

	1 Measure the resistance between IP19, pin 04 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A5.
A5: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE YAW RATE SENSOR	
	1 Disconnect the yaw rate sensor connector, IP20.
	2 Measure the resistance between IP20, pin 03 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A6.
A6: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE YAW RATE SENSOR	
	1 Measure the resistance between IP20, pin 02 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A7.
A7: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE MEMORY SEAT MODULE (WHERE FITTED)	
	1 Disconnect the memory seat module connector, DM01.
	2 Measure the resistance between DM01, pin 12 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A8.
A8: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE MEMORY SEAT MODULE (WHERE FITTED)	
	1 Measure the resistance between DM01, pin 02 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A9.
A9: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS/DSC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between JB45/JB185, pin 24 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A10.
A10: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS/DSC MODULE	
	1 Measure the resistance between JB45/JB185, pin 40 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A11.
A11: CHECK THE CAN + CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE HID MODULE (WHERE FITTED)	
	1 Disconnect the HID module connector, IP130.
	2 Measure the resistance between IP130, pin 02 (Y) and the diagnostic connector, pin 06 (Y).
	Is the resistance greater than 5 ohms? **Yes**

	REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** GO to A12.
A12: CHECK THE CAN - CIRCUIT BETWEEN THE DIAGNOSTIC CONNECTOR AND THE HID MODULE (WHERE FITTED)	
	1 Measure the resistance between IP130, pin 03 (G) and the diagnostic connector, pin 14 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. Clear any DTCs, test the system for normal operation. **No** NO circuit fault found. Check DTCs for indications of a module fault.

PINPOINT TEST B : P1603. TCM EEPROM FAILURE	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check battery voltage.
	Has the battery been discharged to a voltage where the engine would not crank? **Yes** CHARGE and test the battery. Install a new battery, if required. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation). Carry out a drive-cycle. (The vehicle may lose it's adaptive values and will need to re-learn them. These values will depend on the owner's driving style, and can only be learnt by normal use.) **No** GO to B2.
B2: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check the TCM for signs of water ingress.
	Does the TCM show any indication of water ingress? **Yes** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to B3.
B3: DTC SET BY 3 POSSIBLE FACTORS	
	1 Check if the battery has been disconnected with the ignition switched on.
	Has the battery been disconnected with the ignition switched on? **Yes** CARRY out a drive-cycle. For additional information, refer to the DTC section of GTR. (The vehicle may lose it's adaptive values and will need to re-learn them. These values will depend on the owner's driving style, and can only be learnt by normal use.) **No** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST C : P1637: CAN NETWORK MALFUNCTION, TRANSMISSION CONTROL MODULE (TCM)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
C1: CHECK TCM FOR DAMAGE	
	1 Inspect the TCM
	Does the TCM indicate any signs of damage? **Yes** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to C2.
C2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and GROUND.

	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C3.
C3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C4.
C4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C5.
C5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C6.
C6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Measure the resistance between the diagnostic connector, pins 6 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C7.
C7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN DIAGNOSTIC CONNECTOR AND THE TCM	
	1 Disconnect the battery negative terminal. Vehicles with 16 bit modules - • Disconnect the TCM connector, JB131. • Measure the resistance between the diagnostic connector, pin 06 (Y) and JB131, pin 33 (Y). Vehicles with 32 bit modules - • Disconnect the TCM connector, JB230. • Measure the resistance between the diagnostic connector, pin 06 (Y) and JB230, pin 05 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C8.
C8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE TCM	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and: Vehicles with 16 bit modules - • JB131, pin 12 (G). Vehicles with 32 bit modules - • JB230, pin 06 (G).
	Is the resistance less than 5 ohms? **Yes**

	GO to C9. **No** REPAIR the CAN - circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
C9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the TCM connector, JB131 or JB230.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new TCM. REFER to: Transmission Control Module (TCM) (307-01B Automatic Transmission/Transaxle - Vehicles With: 6-Speed Automatic Transaxle - AWF21, In-vehicle Repair). CLEAR the DTC, test the system for normal operation. **No** GO to C10.
C10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the CAN + circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C11.
C11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the CAN - circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to C12.
C12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Measure the resistance between pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • Measure the resistance between pins 88 and 89 of the ECM. Vehicles with 2.0L and 2.2L diesel engine -

	• Measure the resistance between pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to C13. **No** Please check part is not on any form of prior authorization before replacement.
C13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** POSSIBLE intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST D : P1638: CAN NETWORK MALFUNCTION, INSTRUMENT CLUSTER (IC)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
D1: CHECK THE IC FOR DAMAGE	
	1 Inspect the IC for damage.
	Does the IC indicate any signs of damage? **Yes** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to D2.
D2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D3.
D3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06 (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D4.
D4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D5.
D5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D6.
D6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes**

	REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D7.
D7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE IC	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D8.
D8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE IC	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D9.
D9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to D10.
D10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D11.
D11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms?

	Yes REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to D12.
D12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L and 2.2L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to D13. **No** Please check part is not on any form of prior authorization before replacement.
D13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST E : P1642; P1643; P1797: CAN NETWORK MALFUNCTION, ECM	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1: CHECK THE ECM FOR DAMAGE	
	1 Inspect the ECM.
	Does the ECM indicate any signs of damage? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to E2.
E2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E3.
E3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E4.
E4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E5.

E5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E6.
E6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E7.
E7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
	1 Disconnect the battery negative terminal. Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16. • Measure the resistance between IP22 pin 06 (Y) and EN16, pin 124 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65. • Measure the resistance between IP22 pin 06 (Y) and EN65, pin 89 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01. • Measure the resistance between the diagnostic connector, pin 06 (Y) and DL01, pin 54 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E8.
E8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and EN16, pin 123 (G). Vehicles with 2.0L petrol engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and EN65, pin 88 (G). Vehicles with 2.0L and 2.2L diesel engine - • Measure the resistance between the diagnostic connector, pin 14 (G) and DL01, pin 73 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E9.
E9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the ECM connector.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to E10.
E10: CHECK CONTINUITY OF THE CAN + CIRCUIT	
	1 To test:

	Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E11.
E11: CHECK CONTINUITY OF THE CAN - CIRCUIT	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to E12.
E12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L and 2.2L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to E13. **No** Please check part is not on any form of prior authorization before replacement.
E13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST F : P1699: CAN NETWORK MALFUNCTION, ELECTRONIC AUTOMATIC TEMPERATURE

CONTROL (EATC) MODULE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
F1: CHECK THE EATC MODULE FOR DAMAGE	
	1 Inspect the EATC module for damage.
	Does the EATC module indicate any signs of damage? **Yes** INSTALL a new EATC module. REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation). CLEAR the DTC, test the system for normal operation. **No** GO to F2.
F2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F3.
F3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F4.
F4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F5.
F5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F6.
F6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F7.
F7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE EATC MODULE	
	1 Disconnect the EATC module connector, IP101.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and IP101, pin 22 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F8.
F8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE EATC MODULE	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and IP101, pin 23 (G).

	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F9.
F9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the EATC module connector, IP101.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new EATC module. REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation). CLEAR the DTC, test the system for normal operation. **No** GO to F10.
F10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F11.
F11: CHECK CONTINUITY OF THE CAN - CIRCUIT BETWEEN THE ECM AND THE IC	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to F12.
F12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM.

	Vehicles with 2.0L and 2.2L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to F13. **No** Please check part is not on any form of prior authorization before replacement.
F13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** POSSIBLE intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST G : P1799: CAN NETWORK MALFUNCTION, ANTI-LOCK BRAKE (ABS) / DYNAMIC STABILITY CONTROL (DSC) CONTROL MODULE	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
G1: CHECK THE ABS OR DSC MODULE FOR DAMAGE	
	1 Inspect the ABS/TCCM or DSC module.
	Does the ABS/TCCM or DSC module indicate any signs of damage? **Yes** INSTALL a new ABS/TCCM or DSC module. REFER to: Hydraulic Control Unit (HCU) - VIN Range: J12992->V99999 (206-09 Anti-Lock Control - Stability Assist, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to G2.
G2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G3.
G3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G4.
G4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G5.
G5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G6.

G6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	
	1 Disconnect the battery negative terminal.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G7.
G7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS OR DSC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between the diagnostic connector, pin 06 (Y) and JB45/JB185, pin 24 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G9.
G8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ABS OR DSC MODULE	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and JB45/JB185, pin 40 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G9.
G9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the ABS/TCCM module connector, JB45, or DSC module connector, JB185.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** INSTALL a new ABS/TCCM module, or DSC module. REFER to: Hydraulic Control Unit (HCU) - VIN Range: J12992->V99999 (206-09 Anti-Lock Control - Stability Assist, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to G10.
G10: CHECK CONTINUITY OF THE CAN + CIRCUIT BETWEEN THE ECM AND THE IC	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G11.
G11: CHECK CONTINUITY OF THE CAN - CIRCUIT	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G).

	Vehicles with 2.0L petrol engine - • EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to G12.
G12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L and 2.2L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to G13. **No** Please check part is not on any form of prior authorization before replacement.
G13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the instrument cluster.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. Repeat tests from A1. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST H : SCP NETWORK MALFUNCTION, GENERIC ELECTRONIC MODULE (GEM)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
H1: CHECK GEM FOR DAMAGE	
	1 Inspect the GEM for damage.
	Does the GEM indicate any signs of damage? **Yes** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to H2.
H2: CHECK THE SCP + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H3.
H3: CHECK THE SCP + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 02 (Y) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC,

	test the system for normal operation. **No** GO to H4.
H4: CHECK THE SCP - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H5.
H5: CHECK THE SCP - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H6.
H6: CHECK FOR SHORT CIRCUIT BETWEEN SCP + AND SCP -	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 02, (Y).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H7.
H7: CHECK FOR OPEN CIRCUIT ON SCP + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE GEM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the GEM connector, IP05.
	4 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H8.
H8: CHECK FOR OPEN CIRCUIT ON SCP - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE GEM	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and IP05, pin 18 (U).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H9.
H9: CHECK FOR CORRECT BUS TERMINATION ON SCP +	
	1 Reconnect the battery negative terminal.
	2 Reconnect the GEM connector, IP05.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance 150 to 210 ohms? **Yes** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to H10.
H10: CHECK THE CONTINUITY OF THE GENERIC ELECTRONIC MODULE (GEM) SCP + CIRCUIT	
	1 Disconnect the battery negative terminal.
	2 Disconnect the GEM connector, IP05.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

	No GO to H11.
H11: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE GEM	
	1 Disconnect the GEM connector, IP06.
	2 Measure the resistance between IP05, pin 19, and IP06, pin 01 of the GEM.
	Is the resistance 320 to 400 ohms? **Yes** GO to H12. **No** INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation.
H12: CHECK CONTINUITY OF THE INSTRUMENT CLUSTER (IC) SCP + CIRCUIT	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP10, pin 22 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to H13.
H13: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE INSTRUMENT CLUSTER	
	1 Measure the resistance between pins 22 and 08 of the IC.
	Is the resistance 320 to 400 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new IC. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST I : SCP NETWORK MALFUNCTION, IN CAR ENTERTAINMENT (ICE) HEAD	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
I1: CHECK ICE FOR DAMAGE	
	1 Inspect the ICE head for damage.
	Does the ICE head indicate any signs of damage? **Yes** INSTALL a new ICE head. REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to I2.
I2: CHECK THE SCP + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I3.
I3: CHECK THE SCP + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 02 (Y) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I4.
I4: CHECK THE SCP - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No**

	GO to I5.
I5: CHECK THE SCP - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I6.
I6: CHECK FOR SHORT CIRCUIT BETWEEN SCP + AND SCP -	
	1 Measure the resistance between the diagnostic connector, pins 10 (U) and 02 (Y).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I7.
I7: CHECK FOR OPEN CIRCUIT ON SCP + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ICE HEAD UNIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the ICE connector, IP65.
	4 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP65, pin 09 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I8.
I8: CHECK FOR OPEN CIRCUIT ON SCP - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ICE HEAD UNIT	
	1 Measure the resistance between the diagnostic connector, pin 10 (U) and IP65, pin 10 (U).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I9.
I9: CHECK FOR CORRECT BUS TERMINATION ON SCP +	
	1 Reconnect the ICE connector, IP65.
	2 Reconnect the battery negative terminal.
	3 Measure the resistance between the diagnostic connector, pin 02 (Y) and GROUND.
	Is the resistance 150 to 210 ohms? **Yes** INSTALL a new ICE head unit. REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to I10.
I10: CHECK THE CONTINUITY OF THE GENERIC ELECTRONIC MODULE (GEM) SCP + CIRCUIT	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the GEM connector, IP05.
	4 Measure the resistance between IP22, pin 02 (Y) and IP05, pin 19 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I11.
I11: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE GEM	
	1 Disconnect the GEM connector, IP06.
	2 Measure the resistance between IP05, pin 19, and IP06, pin 01 of the GEM.
	Is the resistance 320 to 400 ohms? **Yes** GO to I12. **No**

	INSTALL a new GEM. REFER to: Generic Electronic Module (GEM) (419-10 Multifunction Electronic Modules, Removal and Installation).
I12: CHECK CONTINUITY OF THE IC SCP + CIRCUIT	
	1 Disconnect the IC connector, IP10.
	2 Measure the resistance between the diagnostic connector, pin 02 (Y) and IP10, pin 22 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to I13.
I13: CHECK FOR LOSS OF SCP + TERMINATION WITHIN THE IC	
	1 Measure the resistance between IP10, pin 22 (Y) and IP11, pin 08 of the IC.
	Is the resistance 320 to 400 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new IC. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST J : U2003: COMPACT DISC CHANGER NOT RESPONDING	
CAUTION: The following tests involve disconnection of the fibre optic harnesses. The harness connectors must be protected by suitable dust caps as soon as they are disconnected, or damage may result. The use of tools to unlatch connectors must be avoided, or the connector locking function may be lost. Failure to follow this instruction may result in damage to the vehicle.	
• NOTE: The following test sequence is based on a five node network. Refer to the wiring diagrams for network configuration for networks with a different number of nodes (all possible network combinations are shown in the wiring diagrams).	
• NOTE: Should a break occur in the D2B ring, then codes, U2602, or U2603 will be set, depending on the location of the break. U2602 will set if the break is in the optical harness **FROM** the ICE head unit (the transmitter signal). U2603 will set if the break is in the optical harness **TO** the ICE head unit (the receiver signal). GO to Pinpoint Test P. GO to Pinpoint Test Q.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
J1: CHECK CD CHANGER MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD02.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2003 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to J2.
J2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** Recheck DTCs. No break in optical harness.

PINPOINT TEST K : ONE OR MORE D2B MODULES NOT RESPONDING. 'WAKE-UP' SIGNAL FAULT	
• NOTE: The D2B 'wake-up' signal is not a constant, but will generate a pulse at each cycle of the ignition key. The ignition key must be turned to the OFF position following each step of the tests, and turned to the position indicated by the test step for each module. To avoid missing the signal, use an assistant to operate the key while reading the oscilloscope. The 'wake-up' line is battery voltage, switching to 0 volts for between 50 milliseconds and 110 milliseconds as the ICE head unit sends it's signal.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
K1: CHECK THE 'WAKE-UP' SIGNAL TO THE CD CHANGER	

	1 Disconnect the CD changer connector, CA301.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between CA301, pin 03 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K2. **No** REPAIR the circuit between CA301, pin 03 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
K2: CHECK THE 'WAKE-UP' SIGNAL TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH02, pin 14 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K3. **No** REPAIR the circuit between PH02, pin 14 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
K3: CHECK THE 'WAKE-UP' SIGNAL TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH01, pin 23 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K4. **No** REPAIR the circuit between PH01, pin 23 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
K4: CHECK THE 'WAKE-UP' SIGNAL TO THE NAVIGATION COMPUTER	
	1 Disconnect the navigation system connector, NA07.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between NA07, pin 03 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** GO to K5. **No** REPAIR the circuit between NA07, pin 03 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
K5: CHECK THE 'WAKE-UP' SIGNAL TO THE AMPLIFIER	
	1 Disconnect the amplifier connector, CA425.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between CA425, pin 05 (O) and GROUND, using an oscilloscope (see note above).
	Does the oscilloscope show a 'wake-up' signal as described? **Yes** CHECK for DTCs indicating a module failure. **No** REPAIR the circuit between CA425, pin 05 and the ICE head unit connector, IP65, pin 19. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST L : U2008: 'PHONE MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
L1: CHECK 'PHONE MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD03.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.

	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2008 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to L2.
L2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST M : U2019: VOICE CONTROL MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
M1: CHECK VOICE CONTROL MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic lead connector, CD04.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for 'not responding' DTCs.
	Is U2019 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to M2.
M2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST N : U2613: NAVIGATION CONTROL MODULE NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
N1: CHECK NAVIGATION CONTROL MODULE, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic connector, CD05.
	2 Set the Optical Bus Tester to **BY-PASS**.
	3 Clear the DTC.
	4 Turn the ignition switch to the **ACC** position.
	5 Wait for 10 seconds.
	6 Check for DTCs.
	Is U2613 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to N2.
N2: CHECK FOR DTC U2602 OR U2603	
	1 Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.

PINPOINT TEST O : U2614: AMPLIFIER NOT RESPONDING	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
O1: CHECK AMPLIFIER, USING OPTICAL BUS TESTER	
	1 Connect the Optical Bus Tester to the fibre optic connector, CD07.

	2	Set the Optical Bus Tester to **BY-PASS**.
	3	Clear the DTC.
	4	Turn the ignition switch to the **ACC** position.
	5	Wait for 10 seconds.
	6	Check for DTCs.
	Is U2614 set? **Yes** CHECK the 'wake-up' signal to the module. **No** GO to O2.	
O2: CHECK FOR DTC U2602 OR U2603		
	1	Check DTCs.
	Are codes U2602 or U2603 logged? **Yes** CHECK for break in optical harness. **No** RECHECK DTCs. No break in optical harness.	

PINPOINT TEST P : U2602: BREAK IN OPTICAL HARNESS FROM ICE HEAD UNIT (TRANSMITTER)		
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**	
P1: CHECK FIBRE OPTIC LEAD BETWEEN LUGGAGE COMPARTMENT JOINT AND CD CHANGER		
	1	Disconnect the fibre optic connector, CD02.
	2	Disconnect the fibre optic connector, CD06.
	3	Connect the Optical Bus Tester to the fibre optic connector, CD06.
	4	Set the Optical Bus Tester to **TX**.
	5	Set the Optical Bus Tester to **ON**.
	6	Check for light pulses at the receiver pin of disconnected D2B connector, CD02.
	Are light pulses visible? **Yes** GO to P2. **No** INSTALL a new telematic harness between CD06 and CD02. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.	
P2: CHECK CABIN FIBRE OPTIC HARNESS		
	1	Disconnect the fibre optic connector, CD01.
	2	Disconnect the fibre optic connector, CD06.
	3	Connect the Optical Bus Tester to CD01 using adaptor lead.
	4	Set the Optical Bus Tester to **TX**.
	5	Set the Optical Bus Tester to **ON**.
	6	Check for light pulses at the receiver pin of disconnected D2B connector, CD06.
	Are light pulses visible? **Yes** GO to P3. **No** INSTALL a new cabin optical harness between CD06 and CD01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.	
P3: CHECK FIBRE OPTIC LEAD BETWEEN 'A' POST AND ICE HEAD UNIT		
	1	Disconnect the fibre optic connector, ID01.
	2	Connect the Optical Bus Tester to ID01 using the adaptor lead.
	3	Set the Optical Bus Tester to **TX**.
	4	Set the Optical Bus Tester to **ON**.
	5	Check for light pulses at the receiver pin of disconnected D2B connector, CD001.
	Are light pulses visible? **Yes** GO to P4. **No** INSTALL a new instrument optical harness between CD01 and ID01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.	
P4: CHECK THE ICE HEAD UNIT		
	1	Turn the ignition switch to the **ACC** position.
	2	Wait for 10 seconds.
	3	Check for light pulses at the transmitter pin of disconnected D2B connector, ID01 (rear of ICE head unit).

	Are light pulses visible? **Yes** GO to P5. **No** INSTALL a new ICE head unit, REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation.
P5: CHECK THE FIBRE OPTIC LEAD FROM THE CD CHANGER TO THE 'PHONE MODULE	
	1 Disconnect the fibre optic connector CD02.
	2 Disconnect the fibre optic connector CD03.
	3 Connect the Optical Bus Tester to CD02.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD03.
	Are light pulses visible? **Yes** GO to P6. **No** INSTALL a new telematic harness between CD03 and CD02. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P6: CHECK THE FIBRE OPTIC LEAD FROM THE 'PHONE MODULE TO THE VOICE MODULE	
	1 Disconnect the fibre optic connector CD04.
	2 Connect the Optical Bus Tester to CD03.
	3 Set the Optical Bus Tester to **TX**.
	4 Set the Optical Bus Tester to **ON**.
	5 Check for light pulses at the transmitter pin of disconnected D2B connector, CD04.
	Are light pulses visible? **Yes** GO to P7. **No** INSTALL a new telematic harness between CD03 and CD04. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P7: CHECK THE FIBRE OPTIC LEAD FROM THE VOICE MODULE TO THE NAVIGATION COMPUTER	
	1 Disconnect the fibre optic connector CD04.
	2 Disconnect the fibre optic connector CD05.
	3 Connect the Optical Bus Tester to CD04.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD05.
	Are light pulses visible? **Yes** GO to P8. **No** INSTALL a new telematic harness between CD05 and CD04. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
P8: CHECK THE FIBRE OPTIC LEAD FROM THE NAVIGATION COMPUTER TO THE AMPLIFIER	
	1 Disconnect the fibre optic connector CD07.
	2 Disconnect the fibre optic connector CD05.
	3 Connect the Optical Bus Tester to CD05.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the transmitter pin of disconnected D2B connector, CD07.
	Are light pulses visible? **Yes** CHECK for DTC U2603. **No** INSTALL a new telematic harness between CD05 and CD07. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST Q : U2603: BREAK IN OPTICAL HARNESS TO ICE HEAD UNIT (RECEIVER)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Q1: CHECK FIBRE OPTIC LEAD BETWEEN LUGGAGE COMPARTMENT JOINT AND AMPLIFIER	
	1 Disconnect the fibre optic connector, CD06.
	2 Disconnect the fibre optic connector, CD07.

	3 Connect the Optical Bus Tester to CD07.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD06.
	Are light pulses visible? **Yes** GO to Q2. **No** INSTALL a new telematic harness between CD06 and C07. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
Q2: CHECK CABIN FIBRE OPTIC HARNESS	
	1 Disconnect the fibre optic connector, CD01.
	2 Disconnect the fibre optic connector, CD06.
	3 Connect the Optical Bus Tester to CD06 using adaptor lead.
	4 Set the Optical Bus Tester to **TX**.
	5 Set the Optical Bus Tester to **ON**.
	6 Check for light pulses at the receiver pin of disconnected D2B connector, CD01.
	Are light pulses visible? **Yes** GO to Q3. **No** INSTALL a new cabin optical harness between CD06 and CD01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
Q3: CHECK FIBRE OPTIC LEAD BETWEEN 'A' POST AND ICE HEAD UNIT	
	1 Connect the Optical Bus Tester to ID01.
	2 Set the Optical Bus Tester to **TX**.
	3 Set the Optical Bus Tester to **ON**.
	4 Check for light pulses at the receiver pin of disconnected D2B connector, ID01.
	Are light pulses visible? **Yes** GO to Q4. **No** INSTALL a new instrument optical harness between CD01 and ID01. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation.
Q4: CHECK THE ICE HEAD UNIT	
	1 Connect the optical short link between the receiver and transmitter of the ICE head unit.
	2 Turn the ignition switch to the **ACC** position.
	3 Wait for 10 seconds.
	4 Check for DTC.
	Is U2603 logged? **Yes** INSTALL a new ICE head unit, REFER to: Audio Unit (415-01 Audio Unit, Removal and Installation). CLEAR the DTC. TEST the system for normal operation. **No** RECHECK DTCs. No fault found in D2B system.

PINPOINT TEST R : ONE OR MORE D2B MODULES NOT RESPONDING. PERMANENT SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
R1: CHECK THE PERMANENT SUPPLY TO THE CD CHANGER	
	1 Disconnect the CD changer connector, CA301.
	2 Measure the voltage between CA301, pin 02 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the CD changer connector, CA301, pin 02, and fuse 72 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new CD Changer. REFER to: Compact Disc (CD) Changer - 4-Door (415-01 Audio Unit, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R2.
R2: CHECK THE PERMANENT SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Measure the voltage between PH02, pin 22 (NR) and GROUND.

	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 22, and fuse 71 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new VACM. REFER to: Multifunction Voice Activated Module - 4-Door (419-10 Multifunction Electronic Modules, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R3.
R3: CHECK THE PERMANENT SUPPLY TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Measure the voltage between PH01, pins 12 and 13 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pins 12 and 13 and fuse 71 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new 'phone module. REFER to: Module - 4-Door (419-08 Cellular Phone, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R4.
R4: CHECK THE PERMANENT SUPPLY TO THE NAVIGATION MODULE	
	1 Disconnect the navigation module connector, NA07.
	2 Measure the voltage between NA07, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** Repair the circuit between the navigation module connector, NA07, pin 01 and fuse 72 of the central junction fuse box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new navigation module. REFER to: Navigation System Module - 4-Door (419-07 Navigation System, Removal and Installation). CLEAR the DTC, test the system for normal operation.GO to R5.
R5: CHECK THE PERMANENT SUPPLY TO THE AMPLIFIER	
	1 Disconnect the amplifier connector, CA425.
	2 Measure the voltage between CA425, pin 09 (NR) and GROUND.
	3 Measure the voltage between CA425, pin 03 (NR) and GROUND.
	Is either voltage less than 10 volts? **Yes** Repair the circuit between the amplifier connector, CA425 and fuse 20 of the primary junction box. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new amplifier. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST S : ONE OR MORE D2B MODULES NOT RESPONDING. ACCESSORY SWITCHED SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
S1: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH02, pin 08 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 08 and the ignition switch. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. (This circu t includes the central junct on fuse box, fuse 69) . **No** GO to S2.
S2: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE 'PHONE MODULE	

	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between PH01, pin 14 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pin 14 and the ignition switch. This circuit includes the central junction fuse box, fuse 69. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to S3.
S3: CHECK THE ACCESSORY SWITCHED SUPPLY TO THE NAVIGATION MODULE	
	1 Disconnect the navigation module electrical connector, NA07.
	2 Turn the ignition switch to the **ACC** position.
	3 Measure the voltage between NA07, pin 11 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the navigation module connector, NA07, pin 11 and the ignition switch. This circuit includes the central junction fuse box, fuse 69. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** CHECK the module for GROUND. INSTALL a new navigation module. REFER to: Navigation System Module - 4-Door (419-07 Navigation System, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST T : ONE OR MORE D2B MODULES NOT RESPONDING. IGNITION SWITCHED SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
T1: CHECK THE IGNITION SWITCHED SUPPLY TO THE VOICE ACTIVATED CONTROL MODULE	
	1 Disconnect the voice activated control module connector, PH02.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between PH02, pin 06 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the voice activated control module connector, PH02, pin 06 and the central junction fuse box, fuse 67. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to T2.
T2: CHECK THE IGNITION SWITCHED SUPPLY TO THE 'PHONE MODULE	
	1 Disconnect the 'phone module connector, PH01.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between PH01, pin 29 (Y) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between the 'phone module connector, PH01, pin 29 and the central junction fuse box, fuse 78. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Check the module for GROUND. INSTALL a new 'phone module. REFER to: Module - 4-Door (419-08 Cellular Phone, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST U : IC SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
U1: CHECK THE B+ SUPPLY TO THE IC	
	1 Disconnect the IC connector, IP11.
	2 Measure the voltage between IP11, pin 07 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 07 and battery. This circuit includes the primary junction box, fuse 45. For additional information, refer to the wiring diagrams. **No** GO to U2.

U2: CHECK THE ACC SUPPLY TO THE IC	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between IP11, pin 13 (YU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 13 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to U3.
U3: CHECK THE IGNITION SUPPLY TO THE IC	
	1 Turn the ignition switch to the **IGN** position.
	2 Measure the voltage between IP11, pin 11 (GR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP11, pin 11 and battery. This circuit includes the primary junction box, fuse 54. For additional information, refer to the wiring diagrams. **No** GO to U4.
U4: CHECK THE GROUND TO THE IC	
	1 Measure the resistance between IP11, pin 08 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST V : SWRS SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
V1: CHECK THE MODULE SUPPLY TO THE SWRS	
	1 Disconnect the SWRS connector, IP19.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP19, pin 02 (GW) and GROUND.
	Is the voltage less than 4 volts? **Yes** GO to V2. **No** GO to V3.
V2: CHECK THE MODULE SUPPLY CIRCUIT TO THE SWRS FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the DSC module connector, JB185.
	3 Measure the resistance between IP19, pin 02 (GW) and JB185, pin 39 (GW).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to V3.
V3: CHECK THE GROUND TO THE SWRS	
	1 Reconnect the DSC module connector, JB185.
	2 Measure the resistance between IP19, pin 08 (U) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST W : YAW RATE SENSOR SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
W1: CHECK THE MODULE SUPPLY TO THE YAW RATE SENSOR	
	1 Disconnect the yaw rate sensor connector, IP20.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP20, pin 04 (GW) and GROUND.
	Is the voltage less than 4 volts? **Yes** GO to W2. **No** GO to W3.

W2: CHECK THE MODULE SUPPLY CIRCUIT TO THE YAW RATE SENSOR FOR HIGH RESISTANCE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the DSC module connector, JB185.
	3 Measure the resistance between IP20, pin 04 (GW) and JB185, pin 39 (GW).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to W3.
W3: CHECK THE GROUND TO THE YAW RATE SENSOR	
	1 Measure the resistance between IP20, pin 01 (U) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST X : ABS/TCCM SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
X1: CHECK THE IGNITION SUPPLY TO THE ABS/TC MODULE	
	1 Disconnect the ABS/TCCM connector, JB45.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between JB45, pin 23 (GW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 23 and battery. This circuit includes the front power distribution box, fuse 13 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to X2.
X2: CHECK THE PUMP+ SUPPLY TO THE ABS/TCCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB45, pin 02 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 02 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to X3.
X3: CHECK THE SOLENOID+ SUPPLY TO THE ABS/TCCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB45, pin 06 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 06 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to X4.
X4: CHECK THE GROUND TO THE ABS/TCCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB45, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to X5.
X5: CHECK THE MOTOR GROUND TO THE ABS/TCCM	
	1 Measure the resistance between JB45, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST Y : DSC MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Y1: CHECK THE IGNITION SUPPLY TO THE DSC MODULE	
	1 Disconnect the DSC module connector, JB185.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between JB185, pin 23 (GW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB45, pin 23 and battery. This circuit includes the front power distribution box, fuse 13 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to Y2.
Y2: CHECK THE PUMP+ SUPPLY TO THE DSC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB185, pin 02 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB185, pin 02 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to Y3.
Y3: CHECK THE SOLENOID+ SUPPLY TO THE DSC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB185, pin 06 (R) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB185, pin 06 and battery. This circuit includes the front power distribution box, fuse 41. For additional information, refer to the wiring diagrams. **No** GO to Y4.
Y4: CHECK THE GROUND TO THE DSC MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB185, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to Y5.
Y5: CHECK THE MOTOR GROUND TO THE DSC MODULE	
	1 Measure the resistance between JB185, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST Z : GSI MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Z1: CHECK THE IGNITION SUPPLY TO THE GSI MODULE	
	1 Disconnect the GSI module connector, IP14.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP14, pin 01 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP14, pin 01 and battery. This circuit includes the primary junction box, fuse 50. For additional information, refer to the wiring diagrams. **No** GO to Z2.
Z2: CHECK THE GROUND TO THE GSI MODULE	
	1 Measure the resistance between IP14, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams.

	No No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AA : HID MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AA1: CHECK THE IGNITION SUPPLY TO THE HID MODULE	
	1 Disconnect the HID module connector, IP130.
	2 Turn the ignition switch to the **ON** position.
	3 Measure the voltage between IP130, pin 23 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP130, pin 23 and battery. This circuit includes the primary junction box, fuse 39. For additional information, refer to the wiring diagrams. **No** GO to AA2.
AA2: CHECK THE GROUND TO THE HID MODULE	
	1 Measure the resistance between IP130, pin 24 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AB : EATC MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AB1: CHECK THE B+ SUPPLY TO THE EATC MODULE	
	1 Disconnect the EATC module connector, IP101.
	2 Measure the voltage between IP101, pin 14 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 14 and battery. This circuit includes the primary junction box, fuse 45. For additional information, refer to the wiring diagrams. **No** GO to AB2.
AB2: CHECK THE IGNITION SUPPLY TO THE EATC MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between IP101, pin 02 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 02 and battery. This circuit includes the primary junction box, fuse 39, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AB3.
AB3: CHECK THE B+ SAVE SUPPLY TO THE EATC MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the voltage between IP101, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP101, pin 01 and battery. This circuit includes the primary junction box, fuse 49, and the battery save relay. For additional information, refer to the wiring diagrams. **No** GO to AB4.
AB4: CHECK THE GROUND TO THE EATC MODULE	
	1 Measure the resistance between IP101, pin 15 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AC : MEMORY SEAT MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**

AC1: CHECK THE B+1 SUPPLY TO THE MEMORY SEAT MODULE	
	1 Disconnect the memory seat module connector, DM02.
	2 Measure the voltage between DM02, pin 01 (OG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DM02, pin 01 and battery. This circuit includes the primary junction box, fuse 16. For additional information, refer to the wiring diagrams. **No** GO to AC2.
AC2: CHECK THE B+2 SUPPLY TO THE MEMORY SEAT MODULE	
	1 Measure the voltage between DM02, pin 06 (GB) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DM02, pin 06 and battery. This circuit includes the primary junction box, fuse 09. For additional information, refer to the wiring diagrams. **No** GO to AC3.
AC3: CHECK THE IGNITION SUPPLY TO THE MEMORY SEAT MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between DM02, pin 04 (GB) and GROUND.
	Is the voltage less than 4 volts? **Yes** REPAIR the circuit between DM02, pin 04 and battery. This circuit includes the primary junction box, fuse 07. For additional information, refer to the wiring diagrams. **No** GO to AC4.
AC4: CHECK THE ELECTRONIC GROUND TO THE MEMORY SEAT MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between DM02, pin 10 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AC5.
AC5: CHECK THE POWER GROUND TO THE MEMORY SEAT MODULE	
	1 Measure the resistance between DM02, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AC6.
AC6: CHECK THE SIGNAL GROUND TO THE MEMORY SEAT MODULE	
	1 Measure the resistance between DM02, pin 03 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AD : TCM (16 BIT) SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AD1: CHECK THE B+ SUPPLY TO THE TCM	
	1 Disconnect the TCM connector, JB131.
	2 Measure the voltage between JB131, pin 06 (UY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB131, pin 06 and battery. This circuit includes the front power distribution box, fuse 32. For additional information, refer to the wiring diagrams. **No** GO to AD2.
AD2: CHECK THE IGNITION 1 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB131, pin 36 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB131, pin 36 and battery. This circuit includes the front power

	distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AD3.
AD3: CHECK THE IGNITION 2 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB131, pin 54 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB131, pin 54 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AD4.
AD4: CHECK THE GROUND 1 TO THE TCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB131, pin 09 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AD5.
AD5: CHECK THE GROUND 2 TO THE TCM	
	1 Measure the resistance between JB131, pin 38 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AE : TCM (32 BIT) SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AE1: CHECK THE B+ SUPPLY TO THE TCM	
	1 Disconnect the TCM connector, JB231.
	2 Measure the voltage between JB231, pin 28 (UY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 28 and battery. This circuit includes the front power distribution box, fuse 32. For additional information, refer to the wiring diagrams. **No** GO to AE2.
AE2: CHECK THE IGNITION 1 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB231, pin 10 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 10 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AE3.
AE3: CHECK THE IGNITION 2 SUPPLY TO THE TCM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB231, pin 19 (WU) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB231, pin 19 and battery. This circuit includes the front power distribution box, fuse 11, and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AE4.
AE4: CHECK THE GROUND 1 TO THE TCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB231, pin 25 (B) and GROUND.

	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AE5.
AE5: CHECK THE GROUND 2 TO THE TCM	
	1 Measure the resistance between JB231, pin 38 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AF : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.0L PETROL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AF1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, EN65.
	3 Measure the voltage between EN65, pin 21 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN65, pin 21 and battery. This circuit includes the front power distribution box, fuse 36. For additional information, refer to the wiring diagrams. **No** GO to AF2.
AF2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between EN65, pin 69 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN65, pin 69 and battery. This circuit includes the EMS control relay, pin 2. For additional information, refer to the wiring diagrams. **No** GO to AF3.
AF3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between EN65, pin 19 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AF4.
AF4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between EN65, pin 18 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AG : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.5/3.0L PETROL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AG1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, EN16.
	3 Measure the voltage between EN16, pin 22 (NR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN16, pin 22 and battery. This circuit includes the front power distribution box, fuse 36. For additional information, refer to the wiring diagrams. **No** GO to AG2.
AG2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.

	2 Measure the voltage between EN16, pin 40 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between EN16, pin 40 and battery. This circuit includes the EMS control relay, pin 02. For additional information, refer to the wiring diagrams. **No** GO to AG3.
AG3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between EN16, pin 04 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AG4.
AG4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between EN16, pin 05 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AH : ECM SUPPLY OR GROUND FAULT (VEHICLES WITH 2.0L DIESEL ENGINE)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AH1: CHECK THE B+ SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ECM connector, DL01.
	3 Measure the voltage between DL01, pin 03 (WG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DL01, pin 03 and battery. This circuit includes the front power distribution box, fuse 21, and the EMS control relay. For additional information, refer to the wiring diagrams. **No** GO to AH2.
AH2: CHECK THE CONTROL SUPPLY TO THE ECM	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between DL01, pin 09 (B) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between DL01, pin 09 and battery. This circuit includes the EMS control relay, pin 02. For additional information, refer to the wiring diagrams. **No** GO to AH3.
AH3: CHECK THE POWER GROUND (1) TO THE ECM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between DL01, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH4.
AH4: CHECK THE POWER GROUND (2) TO THE ECM	
	1 Measure the resistance between DL01, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH5.
AH5: CHECK THE POWER GROUND (3) TO THE ECM	
	1 Measure the resistance between DL01, pin 28 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes**

	REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH6.
AH6: CHECK THE POWER GROUND (4) TO THE ECM	
	1 Measure the resistance between DL01, pin 66 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** GO to AH7.
AH7: CHECK THE POWER GROUND (5) TO THE ECM	
	1 Measure the resistance between DL01, pin 88 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AI : ICE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AI1: CHECK THE B+ SUPPLY TO THE ICE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the ICE connector, IP65.
	3 Measure the voltage between IP65, pin 11 (NW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP65, pin 11 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AI2.
AI2: CHECK THE ACC SUPPLY TO THE ICE	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between IP65, pin 02 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP65, pin 02 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to AI3.
AI3: CHECK THE GROUND TO THE ICE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between IP65, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AJ : CD CHANGER SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AJ1: CHECK THE B+ SUPPLY TO THE CD CHANGER	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the CD changer connector, CA301.
	3 Measure the voltage between CA301, pin 02 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between CA301, pin 02 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AJ2.
AJ2: CHECK THE GROUND TO THE CD CHANGER	
	1 Measure the resistance between CA301, pin 01 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes**

	REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AK : NAV MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AK1: CHECK THE B+ SUPPLY TO THE NAV MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the NAV module connector, NA07.
	3 Measure the voltage between NA07, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between NA07, pin 01 and battery. This circuit includes the primary junction box, fuse 44. For additional information, refer to the wiring diagrams. **No** GO to AK2.
AK2: CHECK THE ACC SUPPLY TO THE NAV MODULE	
	1 Turn the ignition switch to the **ACC** position.
	2 Measure the voltage between NA07, pin 11 (YG) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between NA07, pin 11 and battery. This circuit includes the primary junction box, fuse 43. For additional information, refer to the wiring diagrams. **No** GO to AK3.
AK3: CHECK THE GROUND TO THE NAV MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between NA07, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AL : FFH MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AL1: CHECK THE B+ SUPPLY TO THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the FFH module connector, JB232.
	3 Measure the voltage between JB232, pin 01 (GR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB232, pin 01 and battery. This circuit includes the front power distribution box, fuse 31. For additional information, refer to the wiring diagrams. **No** GO to AL2.
AL2: CHECK THE IGNITION SUPPLY TO THE FFH MODULE	
	1 Turn the ignition switch to the **ON** position.
	2 Measure the voltage between JB232, pin 04 (RW) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB232, pin 04 and battery. This circuit includes the front power distribution box, fuse 12. For additional information, refer to the wiring diagrams. **No** GO to AL3.
AL3: CHECK THE GROUND TO THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between JB232, pin 02 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AM : PARK AID MODULE SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AM1: CHECK THE IGNITION SUPPLY TO THE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the park aid module connector, CA418.
	3 Turn the ignition switch to the **ON** position.
	4 Measure the voltage between CA418, pin 01 (N) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between CA418, pin 01 and battery. This circuit includes the primary junction box, fuse 33 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AM2.
AM2: CHECK THE GROUND TO THE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between CA418, pin 16 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AN : RCM SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AN1: CHECK THE IGNITION SUPPLY TO THE RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the RCM connector, IP74.
	3 Turn the ignition switch to the **ON** position.
	4 Measure the voltage between IP74, pin 12 (G) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP74, pin 12 and battery. This circuit includes the primary junction box, fuse 53 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AN2.
AN2: CHECK THE GROUND TO THE RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between IP74, pin 16 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AO : GEM SUPPLY FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AO1: CHECK THE B+ SUPPLY TO THE GEM	
	1 Disconnect the GEM connector, JB172.
	2 Measure the voltage between JB172, pin 01 (OY) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between JB172, pin 01 and battery. This circuit includes the primary junction box, fuse 22. For additional information, refer to the wiring diagrams. **No** No fault found with power supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AP : RESTRAINTS CONTROL MODULE (RCM) ISO CIRCUIT MALFUNCTION
WARNING: To avoid accidental deployment and possible injury, the backup power supply must be depleted before repairing or replacing any airbag supplemental restraint system (SRS) components. To deplete the backup power supply energy, disconnect the battery ground cable and wait one minute. Failure to follow this instruction may result in personal injury.

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
AP1: CHECK THE RCM FOR DAMAGE	
	1 Inspect the RCM for damage.
	Does the RCM indicate signs of damage? **Yes** INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to AP2.
AP2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AP3.
AP3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pins 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AP4.
AP4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN DIAGNOSTIC CONNECTOR AND RCM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the RCM connector, IP74.
	4 Measure the resistance between diagnostic connector, pin 07 (W) (K-line) and IP74, pin 11 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AQ : HEADLAMP LEVELLING MODULE (HID) ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AQ1: CHECK HEADLAMP LEVELLING MODULE FOR DAMAGE	
	1 Inspect the HID module for damage.
	Does the HID module indicate signs of damage? **Yes** INSTALL a new HID module. REFER to: Headlamp Leveling Module (417-01 Exterior Lighting, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to AQ2.
AQ2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AQ3.
AQ3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	

	1 Measure the resistance between diagnostic connector, pins 07 (W) and pin 16 (OY). Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AQ4.
AQ4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN DIAGNOSTIC CONNECTOR AND HID MODULE	
	1 Disconnect the HID module connector, IP130.
	2 Measure the resistance between diagnostic connector, pin 07 (W) and IP130, pin 05 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new HID module. REFER to: Headlamp Leveling Module (417-01 Exterior Lighting, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AR : ROOF CONSOLE ISO CIRCUIT MALFUNCTION	
• NOTE: There are two levels of Roof Console. High-line, with moon roof, and/or reading lamps, plus VEMS and/or garage door opener (electrical connector, RC22). Low-line, with moon roof and/or reading lamps only (electrical connector, RC33).	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AR1: CHECK ROOF CONSOLE MODULE FOR DAMAGE	
	1 Inspect the roof console module for damage.
	Does the roof console module indicate signs of damage? **Yes** INSTALL a new roof console module. CLEAR the DTC, test the system for normal operation. **No** GO to AR2.
AR2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AR3.
AR3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AR4.
AR4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ROOF CONSOLE MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the roof console module connector (RC23, high-line, RC33, low-line).
	4 Measure the resistance between the diagnostic connector, pin 07 (W) and: Vehicles with low-line console - • RC23, pin 08 (W). Vehicles with high-line console - • RC33, pin 03 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new roof console module. CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AS : REVERSE PARK AID ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AS1: CHECK THE REVERSE PARK AID MODULE FOR DAMAGE	
	1 Inspect the reverse park aid module for damage.
	Does the reverse park aid module indicate signs of damage? **Yes** INSTALL a new reverse park aid module. REFER to: Parking Aid Module - 4-Door (413-13 Parking Aid, Removal and Installation). CLEAR the DTC, test the system for normal operation. **No** GO to AS2.
AS2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AS3.
AS3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between diagnostic connector, pin 07 (W) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AS4.
AS4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE REVERSE PARK AID MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the reverse park aid module connector, RB07.
	4 Measure the resistance between diagnostic connector, pin 07 (W) and RB07, pin 05 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** INSTALL a new reverse park aid module. REFER to: Parking Aid Module - 4-Door (413-13 Parking Aid, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AT : ECM ISO CIRCUIT MALFUNCTION	
• NOTE: These pinpoint tests apply only to OBD2 diagnostics. The ECM does most of it's diagnostics via CAN.	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AT1: CHECK ECM FOR DAMAGE	
	1 Inspect the ECM for damage.
	Does the ECM indicate signs of damage? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to AT2.
AT2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AT3.
AT3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	

	1 Measure the resistance between the diagnostic connector, pins 07 (W) and 16 (OY). Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AT4.
AT4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE ECM	
• NOTE: The diesel ECM is not part of the ISO network.	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal. Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16. • Measure the resistance between the diagnostic connector, pin 07 (W) and EN16, pin 105 (W). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65. • Measure the resistance between the diagnostic connector, pin 07 (W) and EN65, pin 39 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Please check part is not on any form of prior authorization before replacement.

PINPOINT TEST AU : FUEL FIRED HEATER (FFH) MODULE ISO CIRCUIT MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AU1: CHECK THE FFH MODULE FOR DAMAGE	
	1 Inspect the FFH module for damage.
	Does the FFH module indicate signs of damage? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to AU2.
AU2: CHECK K-LINE FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 07 (W) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AU3.
AU3: CHECK K-LINE FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 07 (W) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AU4.
AU4: CHECK FOR OPEN CIRCUIT ON K-LINE BETWEEN THE DIAGNOSTIC CONNECTOR AND THE FFH MODULE	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the battery negative terminal.
	3 Disconnect the FFH module connector, JB232.
	4 Measure the resistance between the diagnostic connector, pin 07 (W) and JB232, pin 03 (W).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** Please check part is not on any form of prior authorization before replacement.

PINPOINT TEST AV : AMPLIFIER SUPPLY OR GROUND FAULT

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
AV1: CHECK THE B+ SUPPLY TO THE AMPLIFIER	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the amplifier connector, CA425.
	3 Measure the voltage between CA425, pin 03 (NR) and GROUND.
	4 Measure the voltage between CA425, pin 09 (NR) and GROUND.
	Is either voltage less than 10 volts? **Yes** REPAIR the circuit between CA425, pins 03/09 and battery. This circuit includes the primary junction box, fuse 20. For additional information, refer to the wiring diagrams. **No** GO to AV2.
AV2: CHECK THE GROUND TO THE AMPLIFIER	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between CA425, pin 02 (B) and GROUND.
	3 Measure the resistance between CA425, pin 08 (B) and GROUND.
	Is either resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

PINPOINT TEST AW : P0860: CAN ECM / JGM NETWORK MALFUNCTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AW1: CHECK THE JGM FOR DAMAGE	
	1 Inspect the JGM.
	Does the JGM indicate any signs of damage? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to AW2.
AW2: CHECK CAN + FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW3.
AW3: CHECK CAN + FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pin 06, (Y) and pin 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW4.
AW4: CHECK CAN - FOR SHORT CIRCUIT TO GROUND	
	1 Measure the resistance between the diagnostic connector, pin 14 (G) and GROUND.
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW5.
AW5: CHECK CAN - FOR SHORT CIRCUIT TO BATTERY	
	1 Measure the resistance between the diagnostic connector, pins 14 (G) and 16 (OY).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW6.
AW6: CHECK FOR SHORT CIRCUIT BETWEEN CAN + AND CAN -	

	1 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance less than 10,000 ohms? **Yes** REPAIR the short circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW7.
AW7: CHECK FOR OPEN CIRCUIT ON CAN + BETWEEN THE DIAGNOSTIC CONNECTOR AND THE JGM	
	1 Disconnect the battery negative terminal. • Disconnect the JGM connector, IP14. • Measure the resistance between IP22 pin 06 (Y) and IP14, pin 11 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW8.
AW8: CHECK FOR OPEN CIRCUIT ON CAN - BETWEEN THE DIAGNOSTIC CONNECTOR AND THE JGM	
	1 To test: • Measure the resistance between the diagnostic connector, pin 14 (G) and IP14, pin 12 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW9.
AW9: CHECK FOR CORRECT BUS TERMINATION	
	1 Reconnect the ECM connector.
	2 Measure the resistance between the diagnostic connector, pins 06 (Y) and 14 (G).
	Is the resistance between 50 and 70 ohms? **Yes** Please check part is not on any form of prior authorization before replacement. **No** GO to AW10.
AW10: CHECK CONTINUITY OF THE CAN + CIRCUIT	
	1 To test: Vehicles with 2.5 and 3.0L engine - • Disconnect the ECM connector, EN16, and the IC connector, IP10. • Measure the resistance between EN16, pin 124 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L petrol engine - • Disconnect the ECM connector, EN65, and the IC connector, IP10. • Measure the resistance between EN65, pin 89 (Y) and IP10, pin 17 (Y). Vehicles with 2.0L and 2.2L diesel engine - • Disconnect the ECM connector, DL01, and the IC connector, IP10. • Measure the resistance between DL01, pin 54 (Y) and IP10, pin 17 (Y).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW11.
AW11: CHECK CONTINUITY OF THE CAN - CIRCUIT	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • EN16, pin 123 (G) and IP10, pin 18 (G). Vehicles with 2.0L petrol engine -

	• EN65, pin 88 (G) and IP10, pin 18 (G). Vehicles with 2.0L and 2.2L diesel engine - • DL01, pin 73 (G) and IP10, pin 18 (G).
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC, test the system for normal operation. **No** GO to AW12.
AW12: CHECK FOR LOSS OF TERMINATION WITHIN THE ECM	
	1 Measure the resistance between: Vehicles with 2.5 and 3.0L engine - • pins 123 and 124 of the ECM. Vehicles with 2.0L petrol engine - • pins 88 and 89 of the ECM. Vehicles with 2.0L and 2.2L diesel engine - • pins 54 and 73 of the ECM.
	Is the resistance between 110 and 140 ohms? **Yes** GO to AW13. **No** Please check part is not on any form of prior authorization before replacement.
AW13: CHECK FOR LOSS OF TERMINATION WITHIN THE IC	
	1 Measure the resistance between pins 17 and 18 of the IC.
	Is the resistance between 110 and 140 ohms? **Yes** Possible intermittent fault. Recheck DTCs. **No** INSTALL a new instrument cluster. REFER to: Instrument Cluster (413-01 Instrument Cluster, Removal and Installation). CLEAR the DTC, test the system for normal operation.

PINPOINT TEST AX : JGM SUPPLY OR GROUND FAULT	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
AX1: CHECK THE IGNITION SUPPLY TO THE JGM	
	1 Turn the ignition switch to the **OFF** position.
	2 Disconnect the JGM connector, IP14.
	3 Turn the ignition switch to the **ON** position.
	4 Measure the voltage between IP14, pin 1 (WR) and GROUND.
	Is the voltage less than 10 volts? **Yes** REPAIR the circuit between IP14, pin 1 and battery. This circuit includes the primary junction box, fuse 50 and the ignition relay. For additional information, refer to the wiring diagrams. **No** GO to AX2.
AX2: CHECK THE GROUND TO THE JGM	
	1 Turn the ignition switch to the **OFF** position.
	2 Measure the resistance between IP14, pin 2 (B) and GROUND.
	Is the resistance greater than 5 ohms? **Yes** REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. **No** No fault found with power or ground supplies. Check for DTCs indicating a module fault.

Module Configuration - Module Configuration
Diagnosis and Testing

Principles of Operation

• NOTE: Newly released modules will require configuration after being installed on the vehicle. All configurable modules will be packaged in a kit which contains a warning label and a multi-language sheet re-emphasizing the requirements to configure replacement modules.

• NOTE: Newly released modules must be configured using the Jaguar approved diagnostic system.

Module Configuration

There are two types of configuration data. The first type is 'market configuration' data, this data is required so that the module can interact with the vehicle correctly. By using the Jaguar approved diagnostic system this data will be retrieved in the following ways:

- indirectly from a mirrored image of the old module's data stored in the engine control module's (ECM) vehicle identification data (VID) block
- indirectly from information stored in the Jaguar approved diagnostic system vehicle configuration and test system (VCATS)

Modules on the vehicle that require configuration when installing a replacement module are:

- instrument cluster (IC)
- engine control module (ECM)
- high intensity discharge (HID) headlights
- intrusion sensor module (ISM)
- phone module
- transmission control module (TCM)
- voice module (VACM)
- generic electronic module (GEM)
- electronic automatic temperature control (EATC) module
- airbag control module

- audio unit

Inhale / exhale procedure

For all modules, except diesel engine control module:

- Install the new module
- Upload the information from the VID block using the Jaguar approved diagnostic system
- Download the information to the VID block using the Jaguar approved diagnostic system

For diesel engine control module:

- Upload the information from the VID block using the Jaguar approved diagnostic system
- Install the new module
- Download the information to the VID block using the Jaguar approved diagnostic system

CAUTION: If the diesel engine control module is removed before 'inhaling' it's information, adaptations may be lost.

• NOTE: The Jaguar approved diagnostic system will not retain the stored configuration information for longer than 24 hours.

For additional information on the IC,
REFER to: Instrument Cluster (413-01 Instrument Cluster, Description and Operation).
For additional information on the ECM,
REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.5L NA V6 - AJV6/2.0L NA V6 - AJV6/3.0L NA V6 - AJ27, Description and Operation).
For additional information on the HID,
REFER to: Exterior Lighting (417-01 Exterior Lighting, Description and Operation).
For additional information on the ISM,
REFER to: Anti-Theft - Active (419-01A Anti-Theft - Active, Description and Operation).
For additional information on the phone module,
REFER to: Cellular Phone (419-08 Cellular Phone, Description and Operation).
For additional information on the TCM,
REFER to: Transmission Description (307-01 Automatic Transmission/Transaxle, Description and Operation).
For additional information on the voice module,
REFER to: Cellular Phone (419-08 Cellular Phone, Description and Operation).

For additional information on the GEM,
REFER to: Module Controlled Functions (419-10 Multifunction Electronic Modules, Description and Operation).
For additional information on the EATC,
REFER to: Climate Control System (412-00 Climate Control System - General Information, Description and Operation).
For additional information on the airbag control module,
REFER to: Air Bag Supplemental Restraint System (SRS) (501-20B Supplemental Restraint System, Description and Operation).

Customer Driven Preferences

The second type of configuration data is customer preference driven. These are items that the customer may or may not want to have enabled. Typically, customer preference items can be toggled on or off by the use of the Jaguar approved diagnostic system.

To carry out the customer configuration process, select the option the customer wants enabled or disabled from the configuration menu.

The current status of each option will be displayed, and the options can be enabled or disabled from this menu by following the instructions on-screen.

Module Configuration - Module Configuration

General Procedures

1. The complexity of the electronics involved with module configuration, of which the GEM and instrument cluster are a part, and the multiplexed communication network which are connected to them preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the Jaguar Approved Diagnostic System User Guide for detailed instructions on module configuration.

Wiring Harnesses - Wiring Harness

Description and Operation

Introduction

CAUTION: Do **not** use any other heat shrink sleeve other than the approved glue lined heat shrink sleeve mentioned in the repair procedure.

The purpose of this document is to promote quick and efficient minor repair to harness connectors or cables using approved methods and the wiring harness repair kit. Repairs may only be made to cables and connectors which have been mechanically, **not electrically** damaged. It also applies where the whole extent of the damage can be clearly identified and rectified.

Care and neatness are essential requirements in making a perfect repair.

Caution:

At the time of this first issue of the Harness Repair Guide, do not approve repairs to any of the following circuits:

- Any media orientated system transport network harnesses.
- Supplement restraint system (SRS) firing circuits (Air bags).
- Link lead assembles, which are unique to safety critical circuits such as anti-lock brake system (ABS) and thermocouple circuits. An example of this is the ABS wheel speed sensors with moulded connectors.
- 4. Screened cables, leads and wiring harness(s).

If any harness(s) with defective electrical connector terminals or wires from the above circuits are a concern, new components must be installed.

Repair Kit

CAUTION: Where the repair procedure indicates that a glue lined heat shrink sleeve should be applied, apply sufficient heat to the glue lined heat shrink to melt the glue in order to provide a water tight seal. Do **not** over heat the glue lined heat shrink sleeve so that the wiring harness insulation becomes damaged.

The wiring harness repair kit has been produced which comprises:

- Pre-terminated wiring harness(s) of different sizes and types
- Three sizes of butt splice connectors
- A selection of colored cable identification sleeves
- Two sizes of glue lined heat shrink sleeves
- Crimping pliers
- A wire cutter and insulation stripper
- An electrical connector terminal extraction handle and tips

A suitable heat source, for shrinking heat shrink sleeves will be required.

The pre-insulated diamond grip range of electrical connector terminals and in-line, butt splice connectors contained within the wiring harness repair kit are the **only** acceptable product for the repairs of wiring harnesses. The butt connectors not only grip the wire but also the insulation, making a very secure joint.

If an electrical connector terminal is not included in the wiring harness repair kit then approval for the repair is **NOT** given and in these circumstances a new wiring harness must be installed.

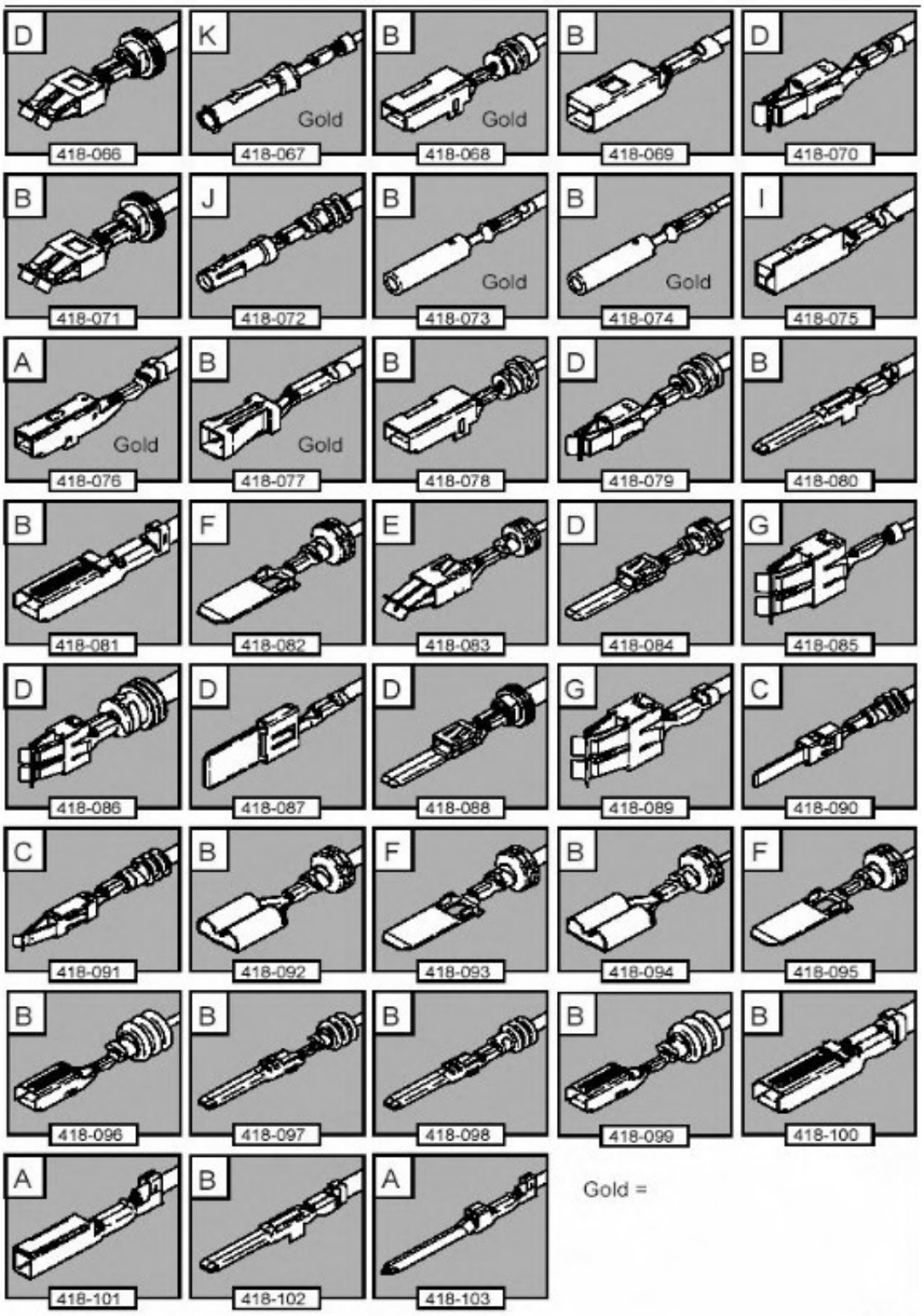
Pre-Terminated Wiring Harness(s) and Butt Splice Connectors

All pre-terminated wiring harness(s) and butt splice connectors in the wiring harness repair kit are contained in bags which can be resealed after use. Each bag is marked with the part number of the items stored within the bag. Each storage compartment in the wiring harness repair kit is identified with the corresponding part number. Make sure that pre-terminated wiring harness(s) and connectors are not mixed up it is advisable to only open one bag at a time and to reseal the bag securely before opening another bag. Also, replace the bag in its mating part number compartment within the case.

The pre-terminated wiring harness(s) are supplied with the insulation in one of three colors, red, blue or yellow. The colors do not apply to any particular circuit but to the harness wire size. See the Relationship Table in the Repair Method section.

Butt splice connectors are also supplied with red, blue or yellow coverings, which must be matched to the pre-terminated wiring harness insulation color.

Pre-Terminated Wiring Harness(s)



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The illustration shows:

- The pre-terminated wiring harness(s) which are included in the wiring harness repair kit
- The part number of the pre-terminated wiring harness

- The letter showing the extractor tip which must be used to remove this type of electrical connector terminal
- Those electrical connector terminals which are gold

Some of the pre-terminated wiring harness(s) have seals installed to the insulation for sealed connector applications. It is essential for prevention of moisture ingress that a sealed pre-terminated wiring harness must be used where a sealed terminal was removed.

CAUTION: Where the repair procedure indicates that a glue lined heat shrink sleeve should be applied, apply sufficient heat to the glue lined heat shrink to melt the glue in order to provide a water tight seal. Do **not** over heat the glue lined heat shrink sleeve so that the wiring harness insulation becomes damaged.

Two sizes of heat shrink sleeving are supplied in the wiring harness repair kit. Each heat shrink sleeve contains a sealant glue. These must be used when connecting wiring harness(s) or electrical connector terminal(s) at all times. The smaller diameter heat shrink sleeve is to be used with the red and blue butt splice connectors and the larger diameter sleeve with the yellow butt splice connectors.

For ease and speed, some of the pre-terminated wiring harness(s) may already have the insulation partly stripped at the splice end. If the repair requires insulation to be stripped from the cable, refer to the Relationship Table for the correct length of insulation to be stripped.

The Pre-Terminated Wiring Harness(s) illustration shows the electrical connector terminal type, the part number of the pre-terminated wiring harness and the letter of the extractor tip which must be used to extract the electrical connector terminal from the connector housing. Additionally, those electrical connector terminal(s) which are gold are identified, all others are therefore, tinned and not gold.

Wiring Harness Cable Identification Sleeves

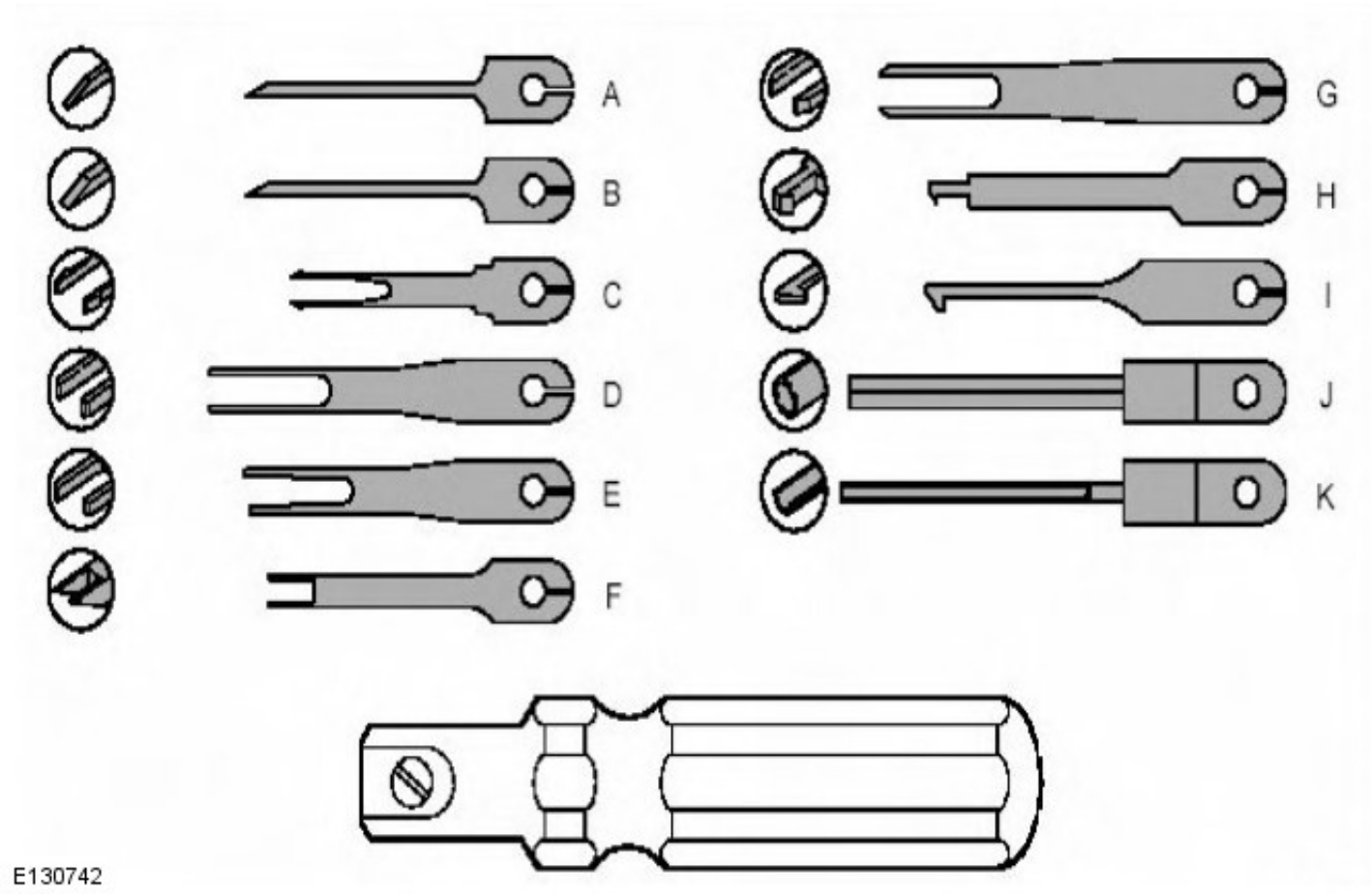
A selection of colored sleeves are contained in the wiring harness repair kit for maintaining the wiring harness cable identification on the pre-terminated wiring harness. Place the correct colored sleeve(s) over the pre-terminated wiring harness insulation as near to the electrical connector as possible with the main wiring harness cable color nearest to the electrical connector.

For example, if the original wiring harness cable color is pink with a black trace put the pink wiring harness cable identification sleeve on the pre-terminated wiring harness first followed by a black sleeve, and slide both along the wiring harness cable to the electrical connector terminal.

Extraction Handle and Tips

The extraction handle, in conjunction with the correct tip, is used to remove a terminal from an electrical connector. Each tip contained in the wiring harness repair kit is marked with an identification letter, A to K inclusive. Each tip has been specially designed to extract a particular type of electrical connector terminal. The use of any other tool is **not** recommended and is liable to cause damage to the electrical connector. The tip is fastened to the handle by a screw which holds the tip firmly yet allows it to be easily replaced.

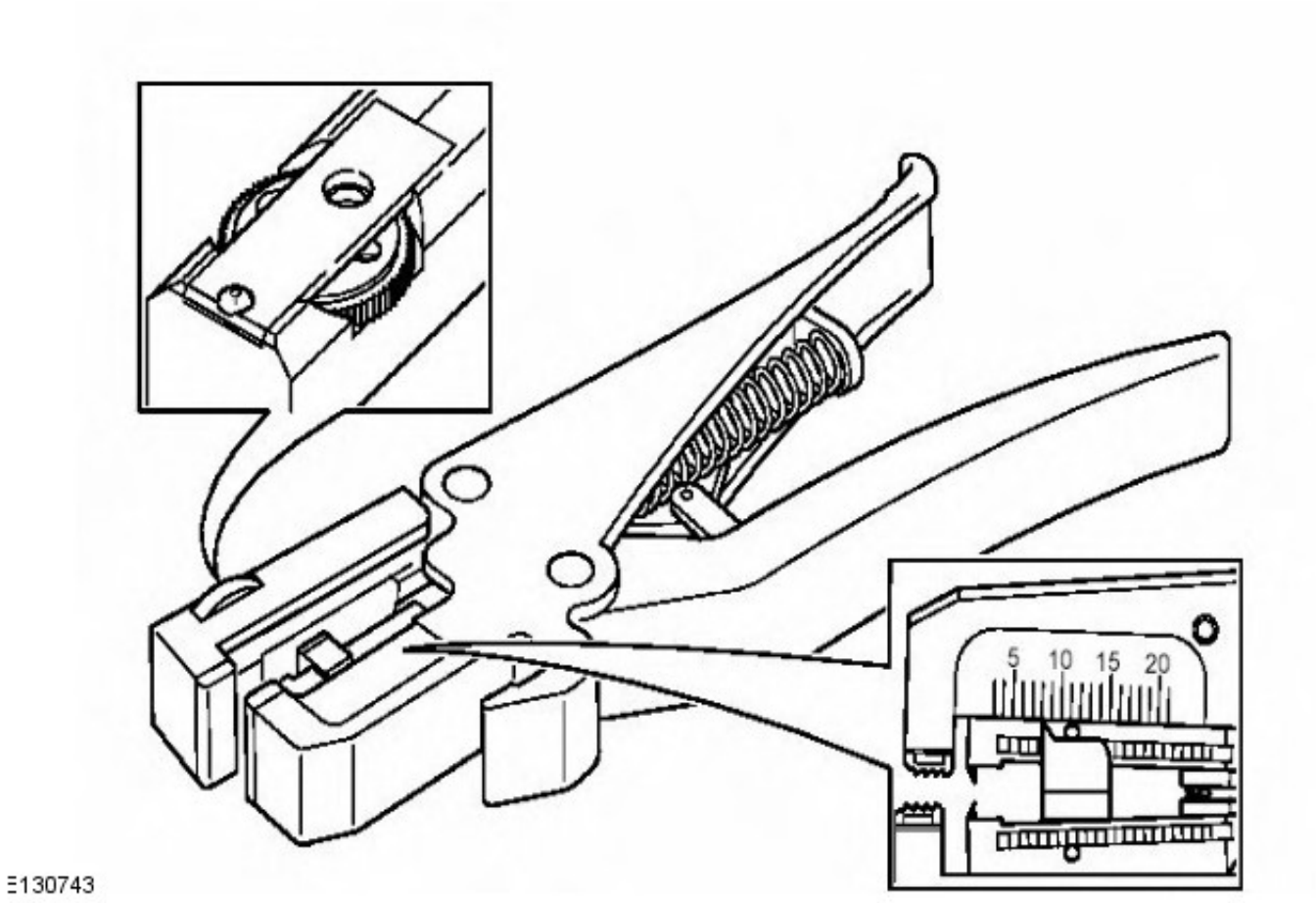
Extraction Handle and Tips



Insulation Stripper

The moving jaw has an adjuster wheel which has a series of holes in it. Turning the wheel and placing the cable in the matching size hole will automatically adjust the jaw to the correct pressure. Note that some wiring harness(s) may have a harder insulation and slight adjustment of the wheel may be needed to make a clean strip but exercise care not to damage the wire.

Insulation Stripper



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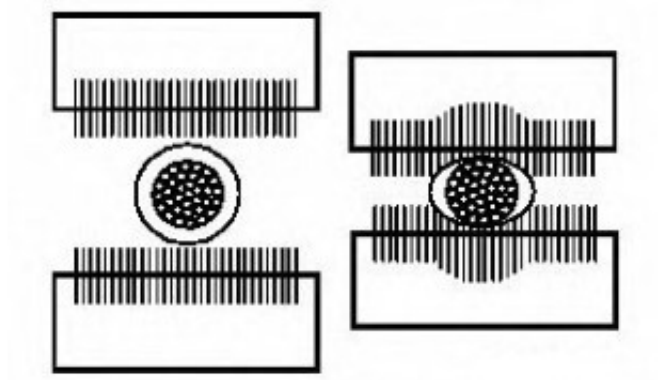
By pressing the outer edges of the wiring harness cable length stop together the adjuster can be slid up or down the jaw. This decreases or increases the length by which the wiring harness cable insulation will be stripped from the pre-terminated wiring harness or wiring harness wire. The adjuster has a position indicator to align with a graduated scale and this sets the correct length in millimetres, of insulation to be stripped. The amount of insulation to be stripped is shown in the Relationship Table.

The illustration shows the insulation stripper tool and a wiring harness correctly gripped in the jaws. A wire cutter is provided on the outer side of the fixed jaw.

Cable Correctly Gripped in Stripper Blades



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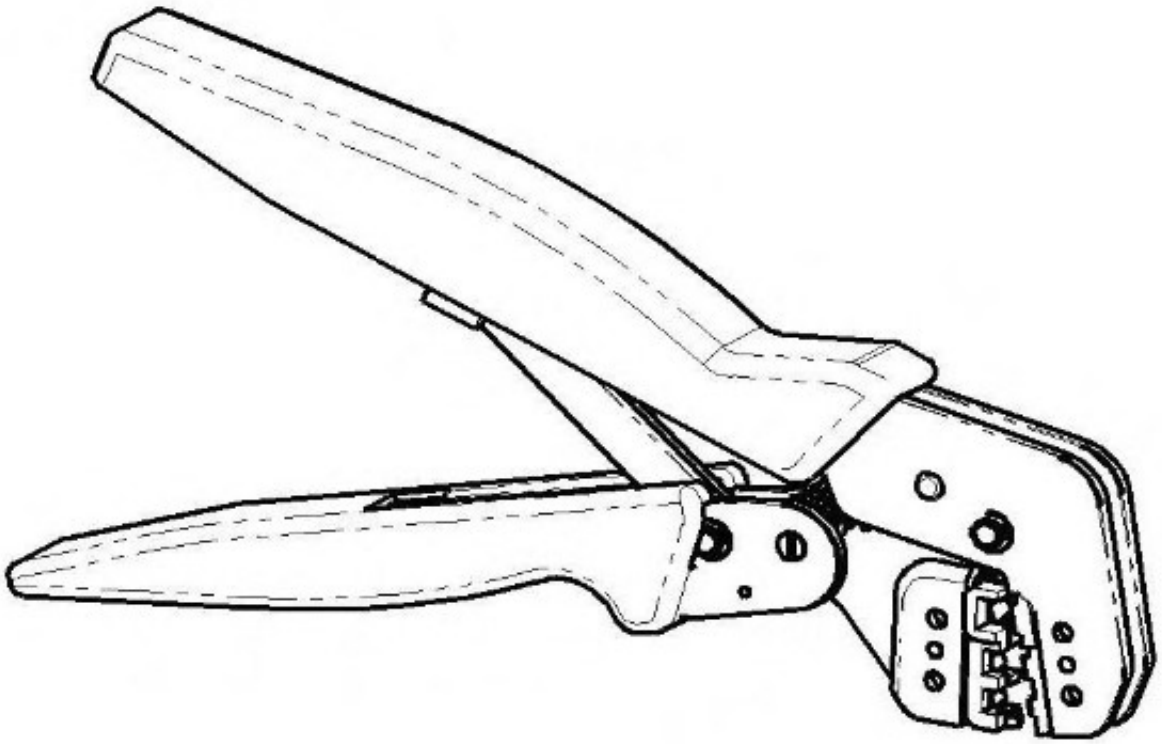
Crimping Pliers

Crimping Pliers



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The crimping pliers have a moving jaw and a stationary jaw, with three different sized crimping enclosures. Each of the enclosures is identified by a red, blue or yellow coloured dot which corresponds to the three colours of the pre-terminated wiring harness(s) and butt splice connector colors.

List of Parts

Description	Part Number	Quantity
Wiring Harness Repair Kit	418-S065	1
Pre-Terminated Wiring Harness(s)	418-066 to 418-103 inclusive	10 each
Glue Lined Heat Shrink Pack – small diameter	418-104	25 per pack
Glue Lined Heat Shrink Pack – larger diameter	418-105	10 per pack
Case Assembly Comprising – carry case, lid, inner lid, base, insert, trays foam spacers	418-106	1
Butt Splice Connector – Red	418-107	50 per pack
Butt Splice Connector – Blue	418-108	50 per pack
Butt Splice Connector – Yellow	418-109	20 per pack
Extraction Tool Handle	418-110	1
Extraction Tip Pack consists of 2 spare screws plus	418-S111	1
Tip A	418-118	1
Tip B	418-119	1
Tip C	418-120	1
Tip D	418-121	1
Tip E	418-122	1
Tip F	418-123	1
Tip G	418-124	1
Tip H	418-125	1
Tip I	418-126	1

Tip J	418-127	1
Tip K	418-128	1
Sleeve Identification Pack – for Red insulation	418-112	500
Sleeve Identification Pack – for Blue insulation	418-113	500
Sleeve Identification Pack – for Yellow insulation	418-114	500
Instruction Manual	JTP 593	1
Crimping Pliers	YRW500010	1
Wire Stripping Tool	418-117	1

Items can be ordered from:

SPX United Kingdom Limited

Ironstone Way

Brixworth

Northants

NN6 9UD

United Kingdom

Telephone: +44 (0) 1327 704461

Fax: +44 (0) 1327 706632

Repair Methods

CAUTION: **Several different types and sizes of terminal may be found in a single electrical connector housing.**

It is necessary to identify:

- The conductor (wire) size of the affected wiring harness
- The electrical connector range from which the damaged wiring harness is to be removed
- The terminal type

Use of the approved diagnostic tool will greatly assist in the quick identification of electrical connectors and faulty pin terminal(s).

Reference can also be made to the vehicle Electrical Guides, held by Dealers, to identify wiring harness(s) and electrical connector(s).

By using the Relationship Table, the wiring harness conductor (wire) size can be related to a suitable pre-terminated wiring harness by the color of the insulation. Also, the correct length of insulation to be stripped from the wiring harness lead is identified.

Relationship Table

CABLE RANGE	SPLICE	STRIP LENGTH
0.35 mm^2 to 1.50 mm^2	RED	6.00 to 7.00 mm
1.00 mm^2 to 2.50 mm^2	BLUE	6.00 to 7.00 mm
4.00 mm^2 to 6.00 mm^2	YELLOW	9.00 to 9.50 mm

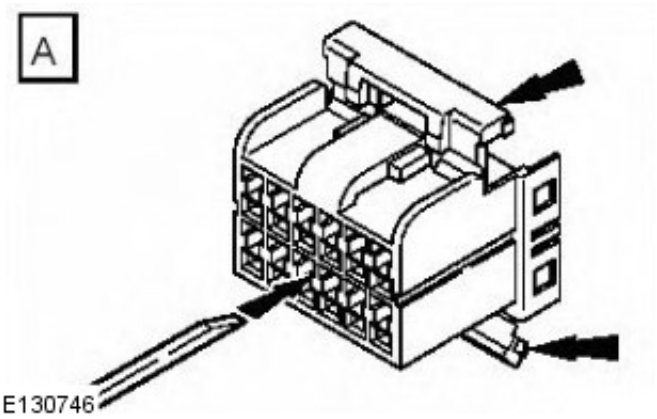
Electrical Connector Terminal Extraction

It must be noted that some electrical connector(s) have anti-backout devices which prevent the terminals from being removed from the electrical connector. Some examples of these are shown in following illustrations. The anti-backout device must be released before attempting to remove the terminal from the electrical connector. Some anti-backout devices require a special tip to release the device and these have been included in the kit. Most can be released by carefully using a suitable small screwdriver.

Various types of electrical connector have seals installed internally or externally to prevent moisture ingress. These normally do not have to be removed but make sure that they are installed when the electrical connectors are connected.

The illustrations show examples of each tip used on different types of electrical connector(s). There are a large number of different types of electrical connector used on vehicles therefore only one example using each tip is shown. Technicians experience and judgement will dictate which type of tip should be used for those electrical connector(s) which are not shown. Care should be exercised to avoid further damage when removing the terminals from the electrical connector.

• NOTE: **Examples of the extraction tips and anti-backout tips.**



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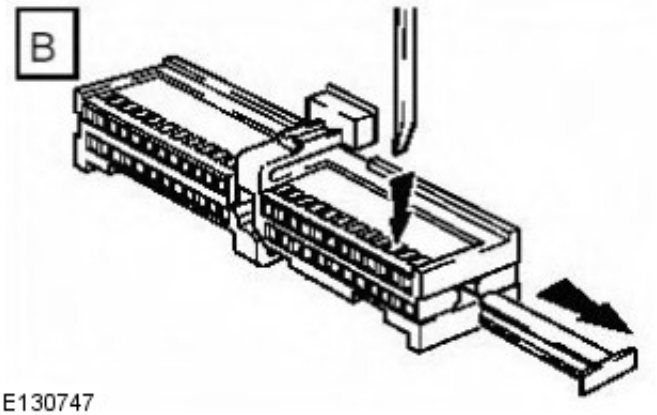

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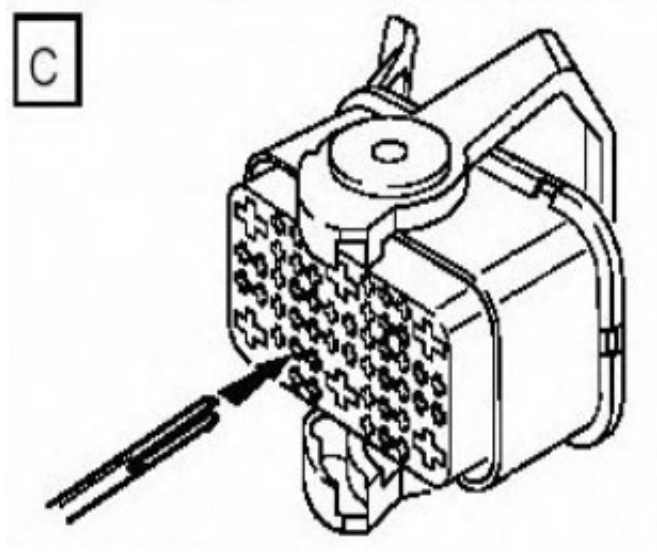

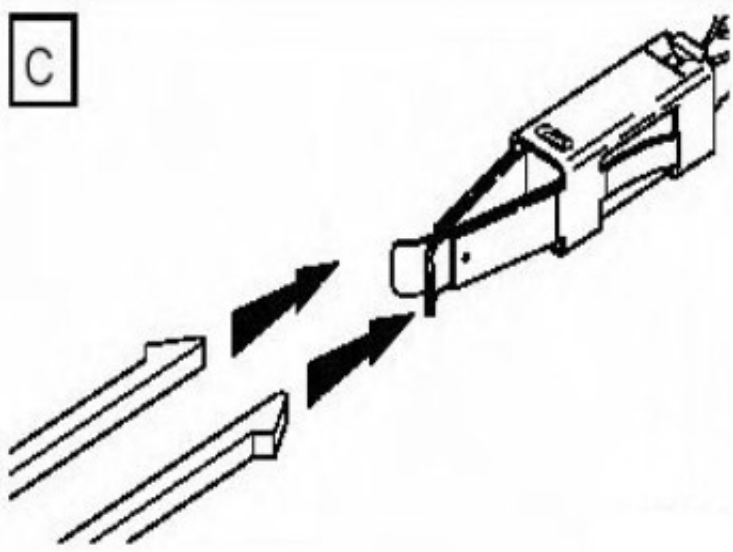

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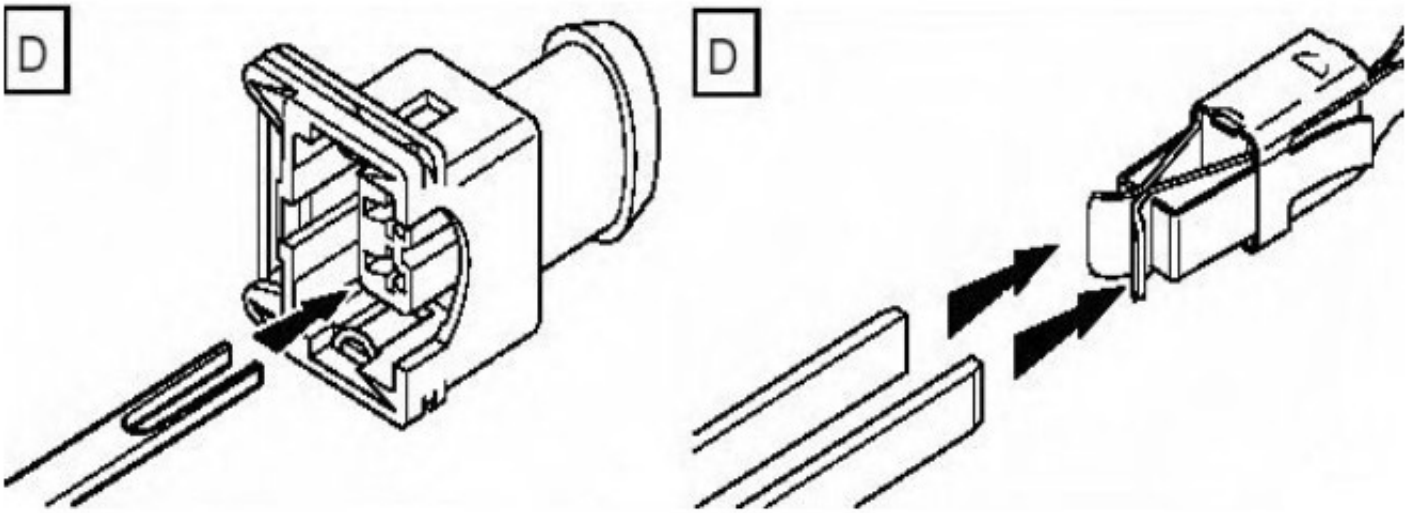

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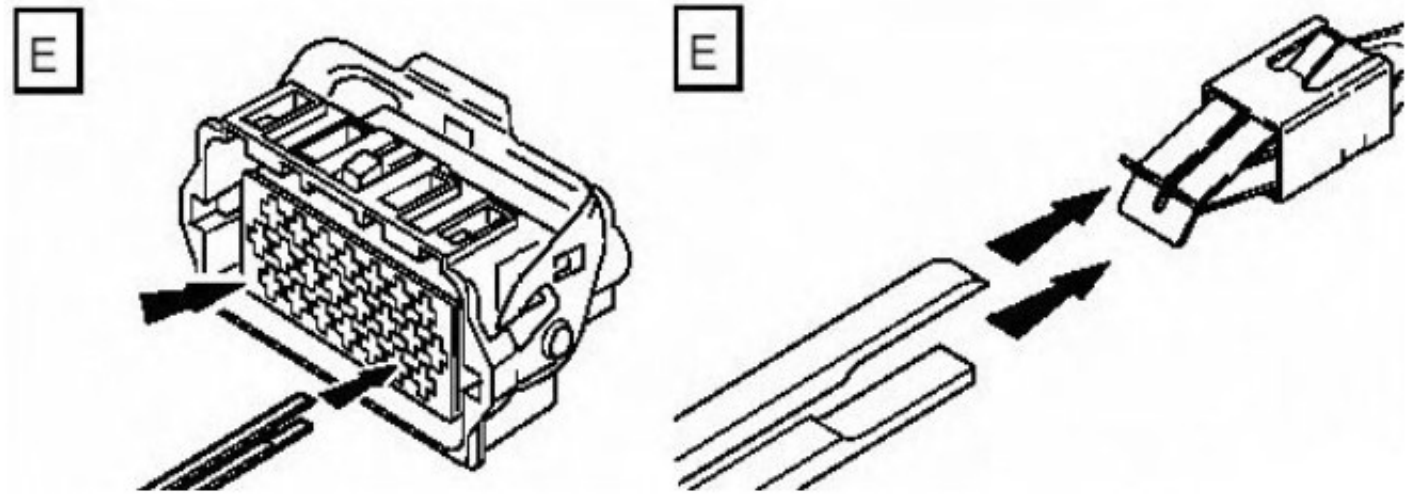

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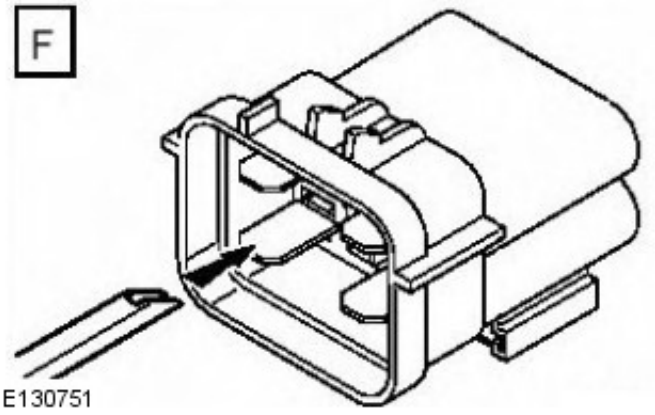

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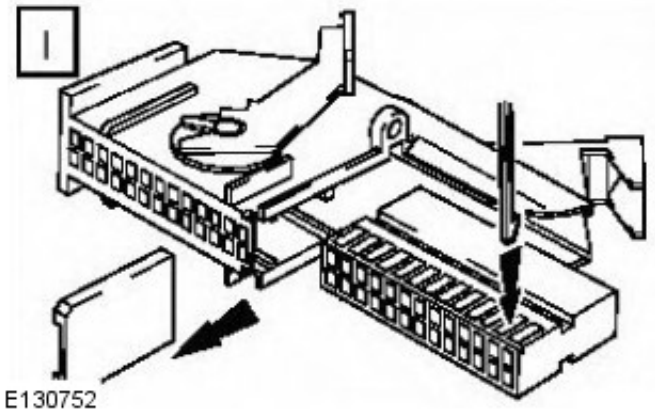

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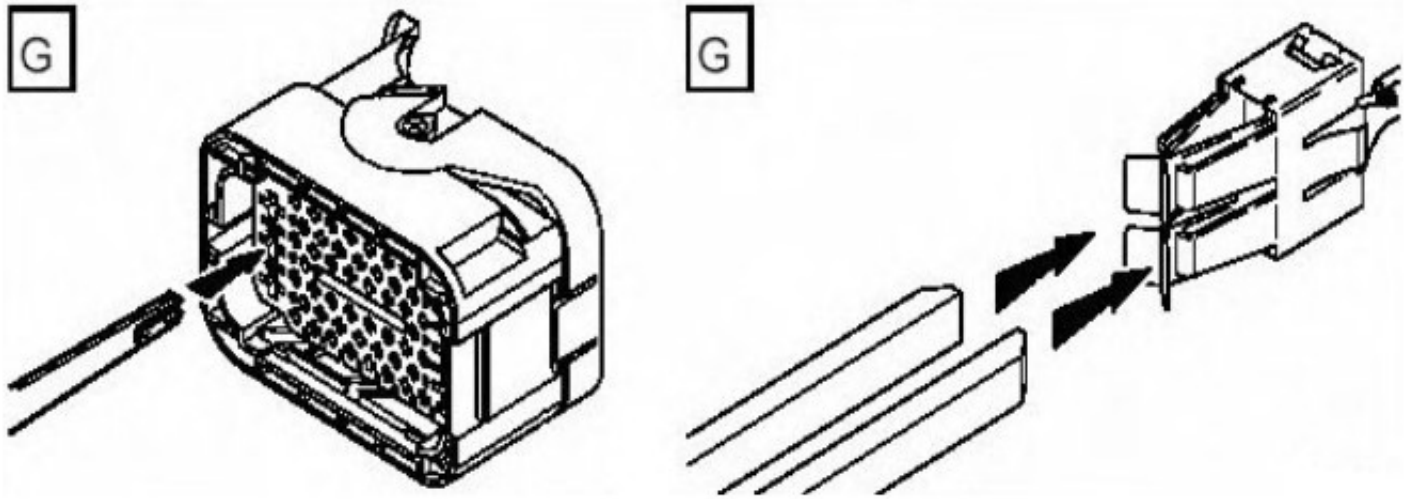

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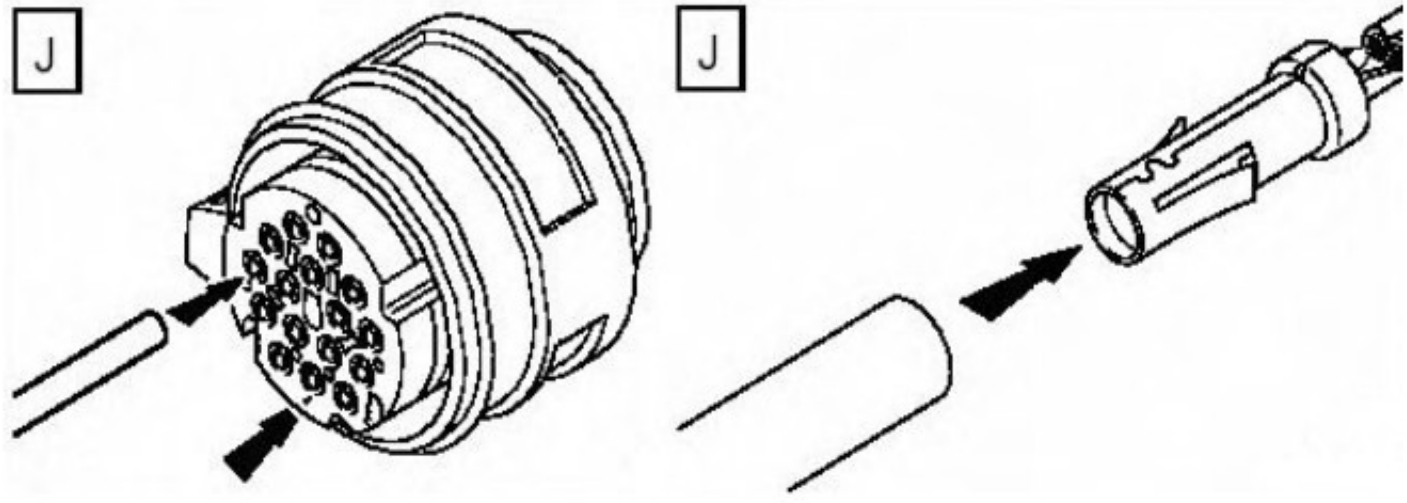

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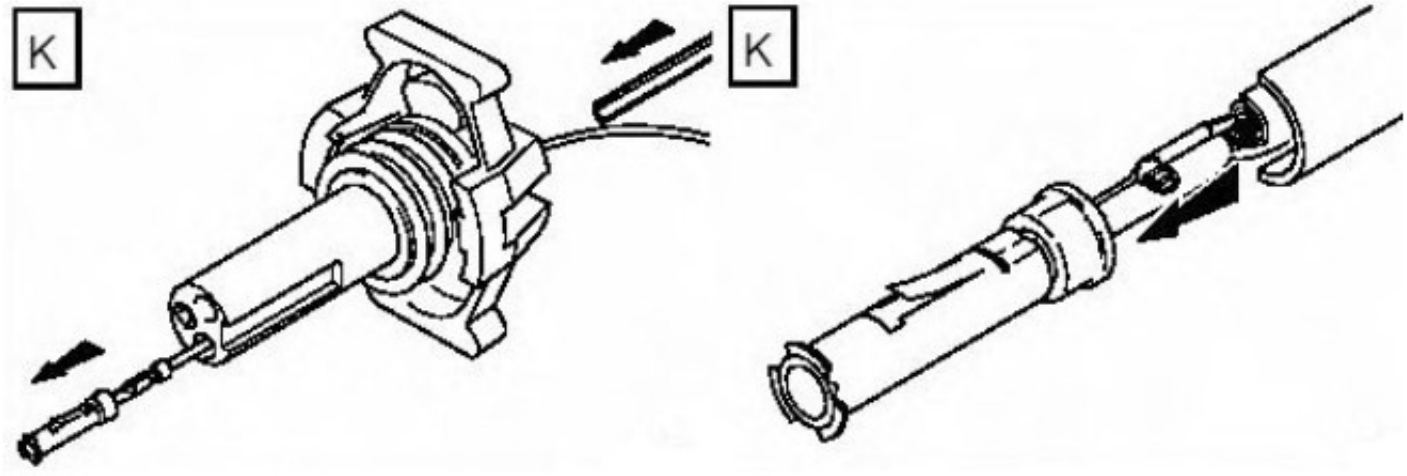

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• NOTE: The chart shows the electrical connector types, terminal pins/sockets, extractor tip and anti-backout tip.

Electrical connector terminal type	Pin or socket	Extractor tip	Anti-backout tip
Mulitlock 040 series	D	A	
Mulitlock 040 series	B	A	
Mulitlock 070 series	B	B	
Mulitlock 040 series	D	B	
Econoseal III 070 series	D	B	
Econoseal III 070 series	B	B	
Econoseal III 070 series	B	B	
Econoseal III J2	D	B	
Econoseal III 250 series	B	F	
Econoseal III 250 series	D	B	
Econoseal III 250 series	B	F	
Econoseal III 250 series	D	B	
Micro-timer II 1.5mm	D	C	
Micro-timer II 1.5mm	B	C	
Std power timer 4.8 flat	D	G	
Std power timer 5.8 flat	B	D	
Std power timer 5.8 flat	B	D	
Std power timer 2.8 flat	D	D	
Std power timer 4.8 flat	D	G	
Std power timer 5.8 flat	B	D	
Ford 2.8 flat	D	E	H
Mulitlock 070 series	D	B	
Mulitlock 070 series	B	B	
Junior power timer 2.8 flat	D	D	
Sumitomo TS90 connector	B	B	H
Modu IV gold plated	D	B	
Mulitlock 040 series gold plated	D	A	
Micro qualock	D	I	
EECV	D	B	
EECV	D	B	
Kostal dia 1.50 series	D	J	
AMP 6.3 flat	D	B	
Junior power timer 2.8 flat	D	D	
2.8 series	D	B	I
Sumitomo TS90 connector	D	B	H
Ducon 0.60 gold plated	D	K	
AMP 6.3 flat	D	D	

Repair Procedure

• CAUTIONS:

 Do not use crimping pliers, insulation strippers, butt splice connectors, heat shrink sleeves or pre-terminated wiring harness(s) that are not supplied with the Jaguar wiring harness repair kit. Each part has been designed to be used only with the other parts in this wiring harness repair kit.

 Where the repair procedure indicates that a glue lined heat shrink sleeve should be applied, apply sufficient heat to the glue lined heat shrink to melt the glue in order to provide a water tight seal. Do **not** over heat the glue lined heat shrink sleeve so that the wiring harness insulation becomes damaged.

It is not correct to make more than five repair joints on the wiring harness to any electrical connector and if more damage is found at the same electrical connector then a new wiring harness must be installed.

- Remove the faulty terminal from the electrical connector using the extractor tool and correct tip. Make sure that any anti-backout device is released before trying to remove the terminal.
-  CAUTION: : A number of electrical connector terminals are gold plated or gold flashed. When defective, they must be installed with a gold pre-terminated wiring harness(s) from the wiring harness repair kit. It is not always easy to identify the female as gold but the male pins are visually easier, therefore always check both male and female terminals to identify those which are gold. Under no circumstances are gold and tin terminals to be mixed as this will lead to early failure of the electrical contact.

  • NOTE: Never use a harness lead with a smaller diameter than the original harness lead.

  Select the correct size and type of pre-terminated wiring harness and butt splice connector from the wiring harness repair kit.
- Using the wire cutter on the stripping tool, cut the pre-terminated wiring harness and the harness cable to the required length.
- • NOTE: See illustration: **Stripping Insulation**

  From the Relationship Table, find the correct length of insulation to be stripped from the pre-terminated wiring harness and set the adjustable cable length stop to the correct length. Place the pre-terminated wiring harness in the wire stripper and remove the insulation.
- Put the cable identification sleeve(s) on to the wiring harness with the main cable colour nearest to the terminal.
- During this next step do not overtighten. Place the selected butt splice connector in the crimping tool, matching the aperture and the butt connector colours. Make sure that the window indentation in the butt connector is resting over the guide bar on the lower jaw. Partially close the grip until the butt connector is securely held in the aperture. This will give support to the butt connector while the pre-terminated wiring harness is inserted into it.
- • NOTE: See illustration: **Spice Correctly Located**

  Insert the pre-terminated wiring harness into the butt connector and make sure that the wire is against the wire stop. Close the grip firmly, crimping the lead to the butt connector. When the handles have been completely closed the butt connector will be freed from the tool as the handles are released. If the handles have not been completely closed then the jaws will hold the butt connector and it cannot be removed from the tool until the crimp is fully made by closing the handles completely.
- Make sure that the harness cable has been squarely cut and the correct length of insulation removed. If more than one splice is needed the butt connectors must be not be crimped to the wiring harness at the same distance from the connector. The splices must be staggered to prevent a bulk of splices in the same area of the wiring harness.
- It is preferable to cover the butt splice joint with heat shrink sleeve. This is desirable not essential, except where the electrical connector is a sealed electrical connector. Use the smaller diameter sleeve for red and blue pre-terminated wiring harness(s) and the large diameter sleeve for the yellow pre-terminated wiring harness(s). It is advisable to place the heat shrink over the completed joint but in some instances the sleeve will not pass over the terminal. Check, and if required, place the correct size sleeve onto the harness cable or pre-terminated wiring harness before crimping the butt splice to the wiring harness.
- Place the harness cable into the butt splice with the splice window over the guide bar. Make sure that the cable harness wire is against the stop in the butt splice, crimp the butt splice connector to the wiring harness.
- Gently pull the harness cables each side of the butt splice to make sure that a secure joint has been made.
-  WARNING: Do not use a naked flame in areas where fuel or oil have been spilt. Clean the area of residual oil and fuel and wait until the fuel spill has fully evaporated.

  • CAUTIONS:

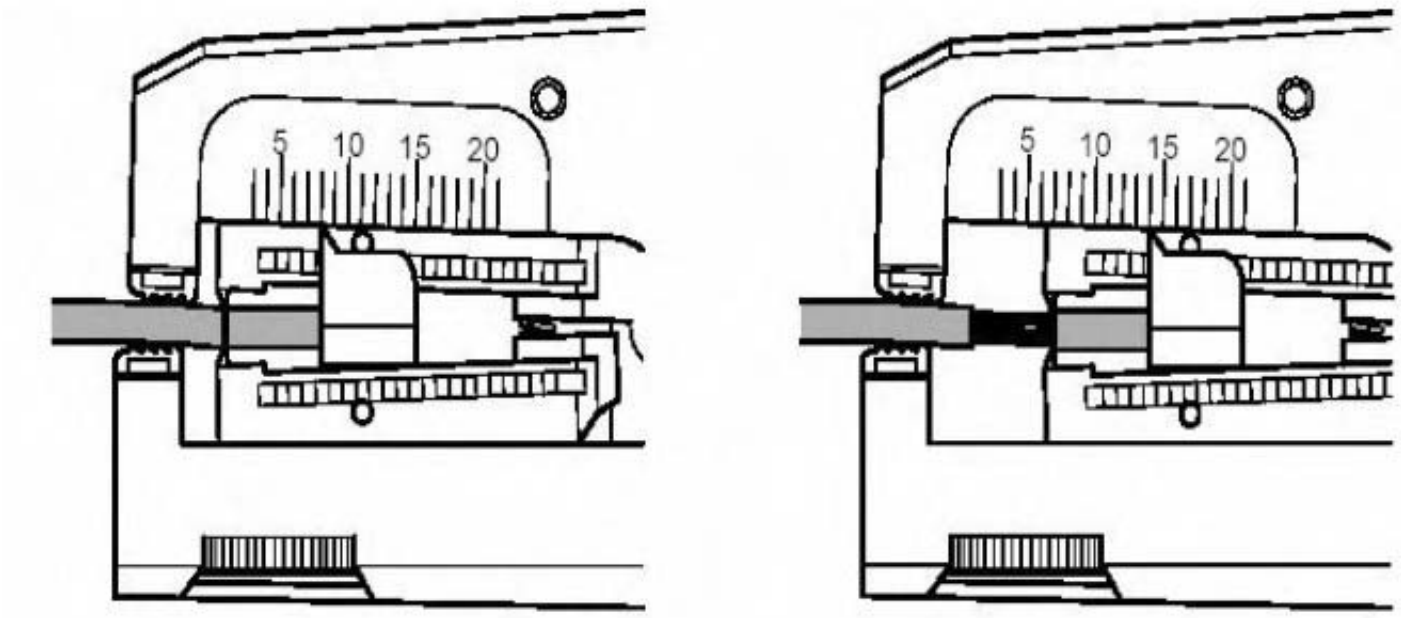
When using a heat source make sure that it is localised and causes no damage to surrounding materials.

Where the repair procedure indicates that a glue lined heat shrink sleeve should be applied, apply sufficient heat to the glue lined heat shrink to melt the glue in order to provide a water tight seal. Do **not** over heat the glue lined heat shrink sleeve so that the wiring harness insulation becomes damaged.

Using a suitable heat source, shrink the sleeve over the butt splice.

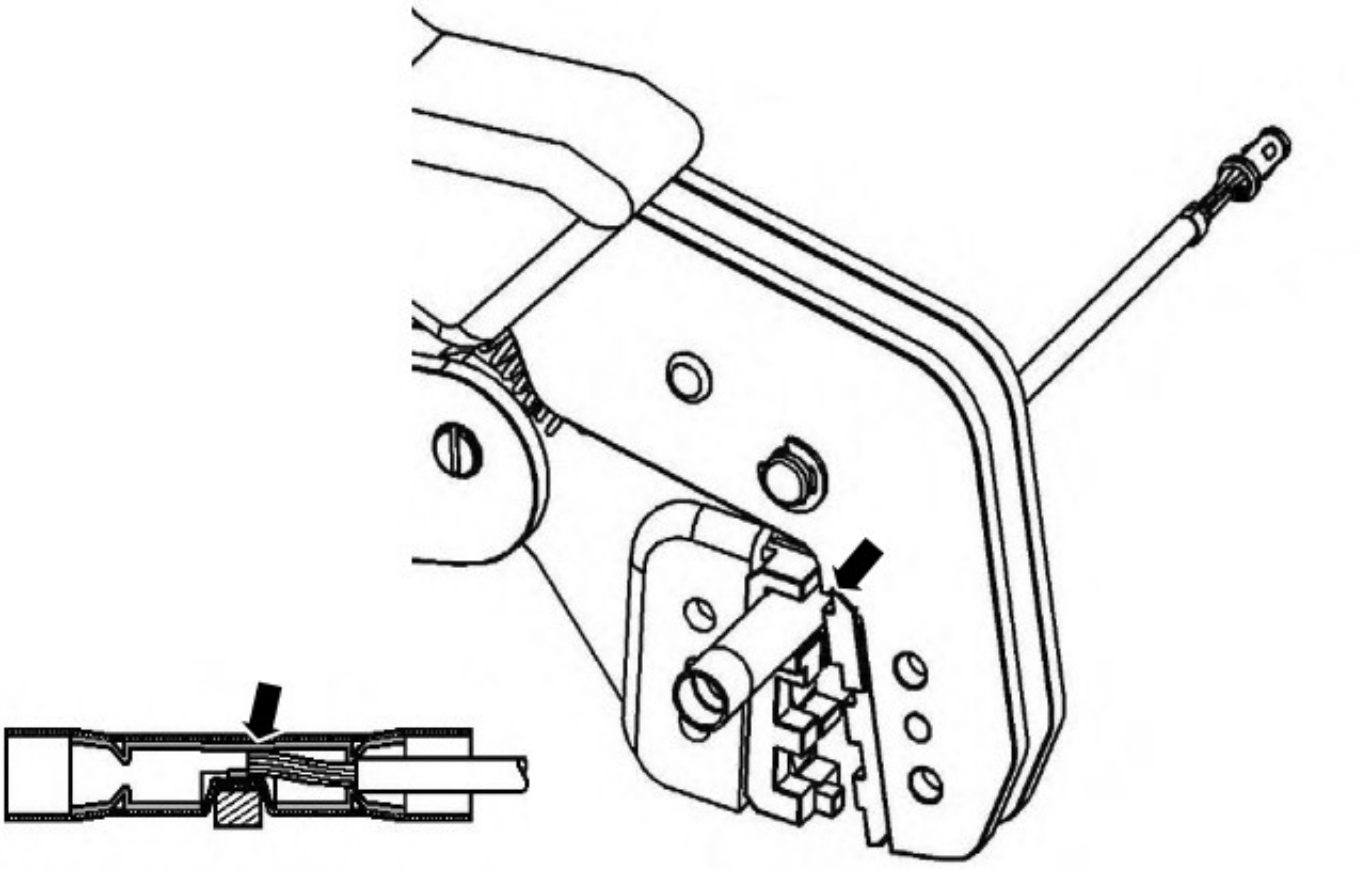
- If further pre-terminated wiring harness(s) are to be installed to the same electrical connector, make sure that the lead is cut at a different length to the previous joint. This makes sure that the splices will, where possible, be staggered on the wiring harness and prevent a bulk of splices in one area.
- When all of the splices have been made, fit the terminal(s) to the electrical connector, taking care that the terminals are correctly orientated.
- Install the wiring harness cover and secure with adhesive electrical tape. Do not cover the wiring harness right to the electrical connector as the terminals must have a little movement and not be firmly bound to the electrical connector or wiring harness. Make sure that the cable identification sleeve(s) are showing at the wiring harness electrical connector.

Stripping Insulation



E130756

Spice Correctly Located



E130757

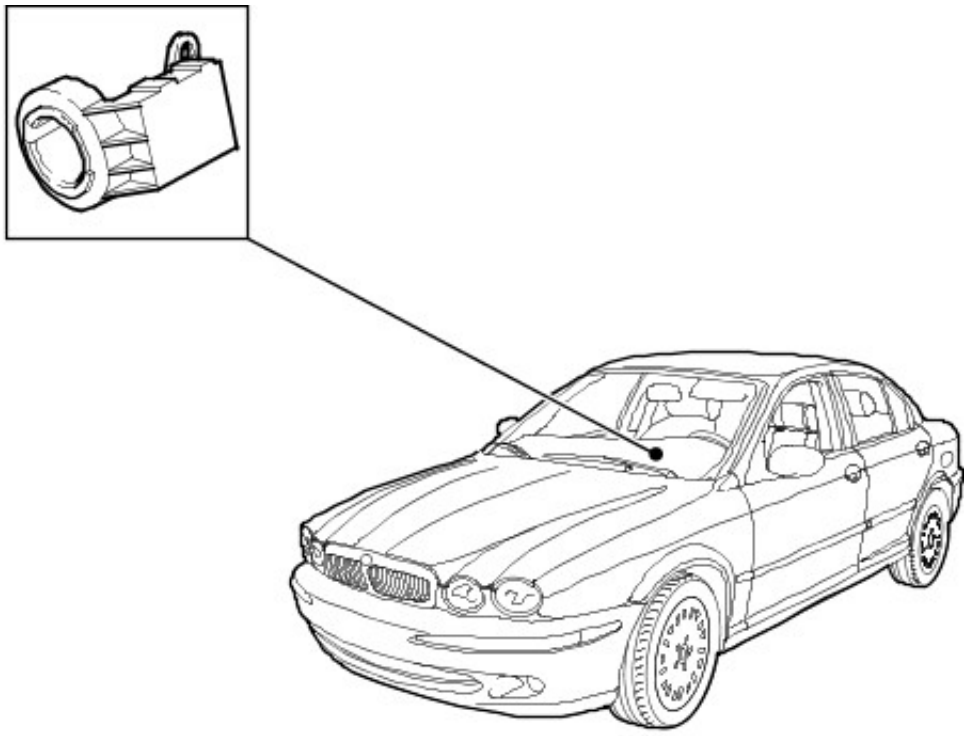
Wiring Harnesses - Wiring Harness Repair

General Procedures

1. For additional information, refer to: Wiring Harness (418-02 Wiring Harnesses, Description and Operation).

Anti-Theft - Passive - Anti-Theft - Passive

Description and Operation



VUJ0005615

Item	Part Number	Description
1	—	PATS transceiver module

The passive anti theft system (PATS) is a feature to prevent the vehicle from being driven away by an unauthorized person. The PATS system consists of electronically coded keys, a transceiver device and a control module. When the ignition is switched to position II, the transceiver energizes the ignition key to read it's electronic code that is transmitted back. If the code read equals a code stored in the control module, the engine control module (ECM) will let the engine start. Otherwise, starting of the engine is disabled (through the starter disable relay and the ECM). Note a different code is used by the PATS system everytime.

Anti-Theft - Passive - Anti-Theft - Passive

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Ignition lock cylinder • PATS key • Two PATS keys on the same keyring • Uncoded PATS key	• Wiring harness for damage or corrosion • Electrical connector(s) • Relay(s) • Ignition switch • Range sensor (Auto transmission) • Engine control module (ECM) • Tansceiver • fuse(s)

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

Anti-Theft - Passive - Anti-Theft Security Access

General Procedures

1. The complexity of the electronics involved with the anti theft, of which the security access is a part, and the multiplexed communication network which are connected to it preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the WDS User Guide for detailed instructions on security access . The WDS systematically tests and analyses all functions and the various systems affected by it. Where a fault is indicated, some basic diagnostic methods may be necessary to confirm that connections are good and that wiring is not damaged before installing a new component.

Anti-Theft - Passive - Key Programming Using Diagnostic Equipment

General Procedures

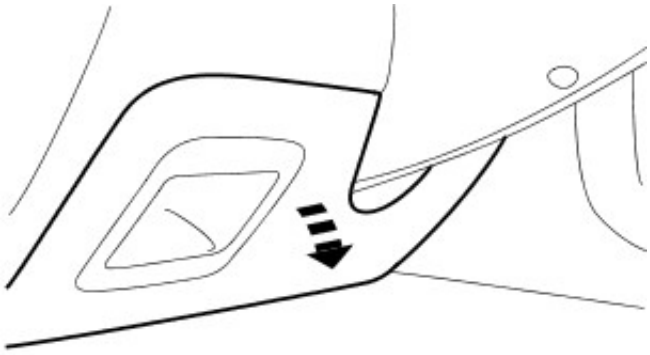
1. The complexity of the electronics involved with the anti theft, of which the key programming is a part, and the multiplexed communication network which are connected to it preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the WDS User Guide for detailed instructions on key programming . The WDS systematically tests and analyses all functions and the various systems affected by it. Where a fault is indicated, some basic diagnostic methods may be necessary to confirm that connections are good and that wiring is not damaged before installing a new component.

Anti-Theft - Passive - Passive Anti-Theft System (PATS) Transceiver
Removal and Installation

Removal

Vehicles without driver lower air bag

1. Remove the instrument panel lower trim panel.



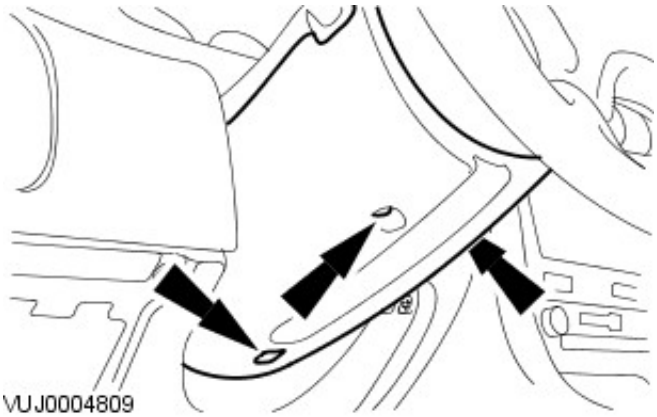
VUJ0004808

Vehicles with driver lower air bag

2. Remove the driver lower airbag module.
   For additional information, refer to: Driver Lower Air Bag Module (501-20B Supplemental Restraint System, Removal and Installation).

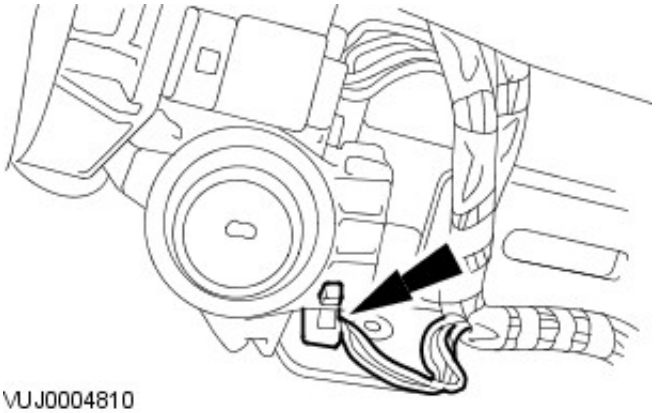
All vehicles

3. Remove the steering column lower shroud.



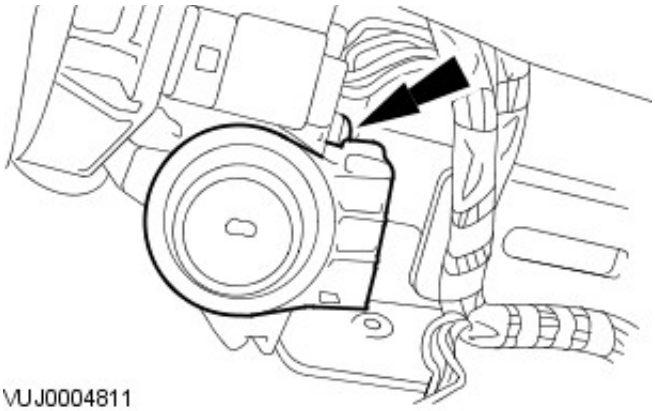
VUJ0004809

4. Disconnect the passive anti-theft system (PATS) transceiver electrical connector.



VUJ0004810

5. Remove the PATS transceiver module.



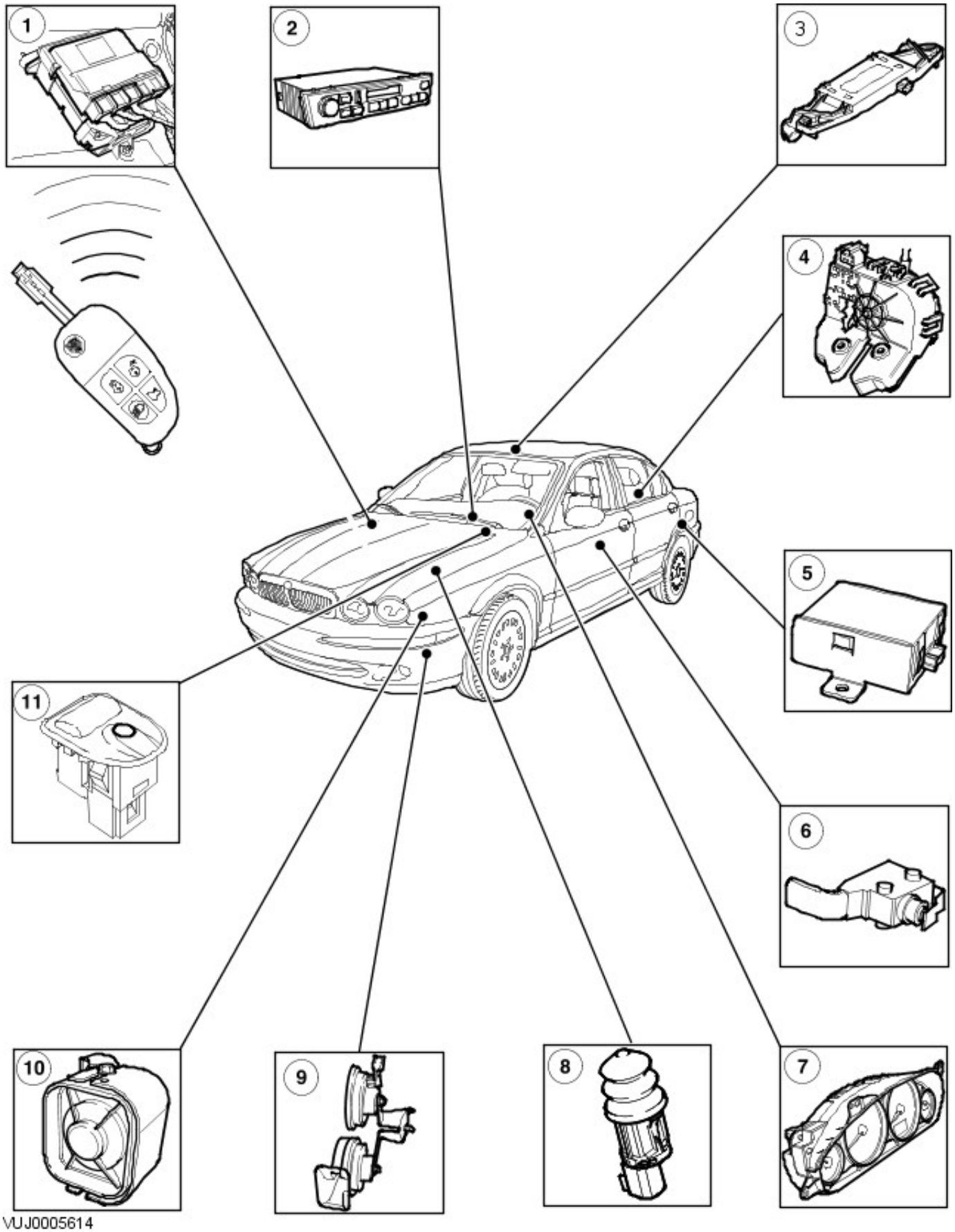
VUJ0004811

Installation

1. To install, reverse the removal procedure.

Anti-Theft - Active - Anti-Theft - Active

Description and Operation



VUJ0005614

Item	Part Number	Description
1	—	General electronic module

2	—	Audio unit
3	—	Intrusion sensor (if equipped)
4	—	Door actuator
5	—	Inclination sensor (if equipped)
6	—	Door latch and ajar switch
7	—	Instrument cluster
8	—	Hood switch
9	—	Vehicle horn
10	—	Battery back up sounder (if equipped)
11	—	Security LED

The anti theft system provides protection from unauthorized entry into the vehicle. The system is incorporated and controlled by the generic electronic module (GEM). When the alarm is triggered the system flashes the turn signal lamps and sounds the alarm system horns.

The security LED (light) provides the driver with the status of the security system when the ignition is switched in the off position and the PATS system when the ignition is switched to position II. When the ignition is switched in the off position, the LED will flash every four seconds when the security system is in the pre-arm or armed state. The security LED will illuminate for three seconds when the ignition is turned to position II, while the key is read. If there is a fault in the system, a fault code will be flashed out on the LED 60 seconds after the key entered position II.

Security System Arming

The system will be activated by the keyless entry remote transmitter when the following input sequence is followed:

1. **1.** Make sure the ignition is off and the key is not in the ignition barrel.
2. **2.** Close all the doors (unlocked), trunk and hood.
3. **3.** Operate the lock button on the transmitter to lock the doors. The turn signal lamps will flash once.
4. **4.** Operate the lock button a second time within three seconds to double lock the doors. The turn signal lamps will provide a long flash.
5. **5.** If any door, trunk or hood is ajar when the lock button is operated on the transmitter, there will be two short horn chirps and five flashes of the turn signal lamps to alert the driver that the car is not secure and has not been locked.

The system will also be activated when the following input sequence is followed:

6. **6.** Make sure the ignition is off and the key is not in the ignition barrel.
7. **7.** Close all the doors (unlocked), trunk and hood.
8. **8.** Lock all the doors, with the ignition key in the drivers door key barrel. The turn signal lamps will flash once.
9. **9.** The vehicle will lock even if there is a door open when using the key, however there will be two short horn chirps and five flashes of the turn signal lamps to alert the driver that the car is not secure.
10. **10.** To double lock the car through the drivers key barrel follow steps six and seven and then cycle the key to the unlocked position and then to the locked position within three seconds. The turn signal lamps will provide a long flash. If a door is open when an attempt is made to double lock, the car WILL NOT double lock, but follow the actions in step nine.

Opening any of the doors or the hood, after the system has been armed for 20 seconds (pre arm phase) will trigger the alarm. The alarm will sound for up to 28 seconds and will be accompanied by the turn signal warning lamps flashing (60 seconds in NA).

Disarming The Alarm System

The system can be disarmed by carrying out one of the following procedures, which would also stop the alarm from sounding.

- Driver door is unlocked with the ignition key (non EURO markets)
- If unlocked from the drivers door (EURO markets) the ignition is switched to position II (with a valid ignition key).
- Turn the ignition switch to position II with a valid ignition key at any time.

Or

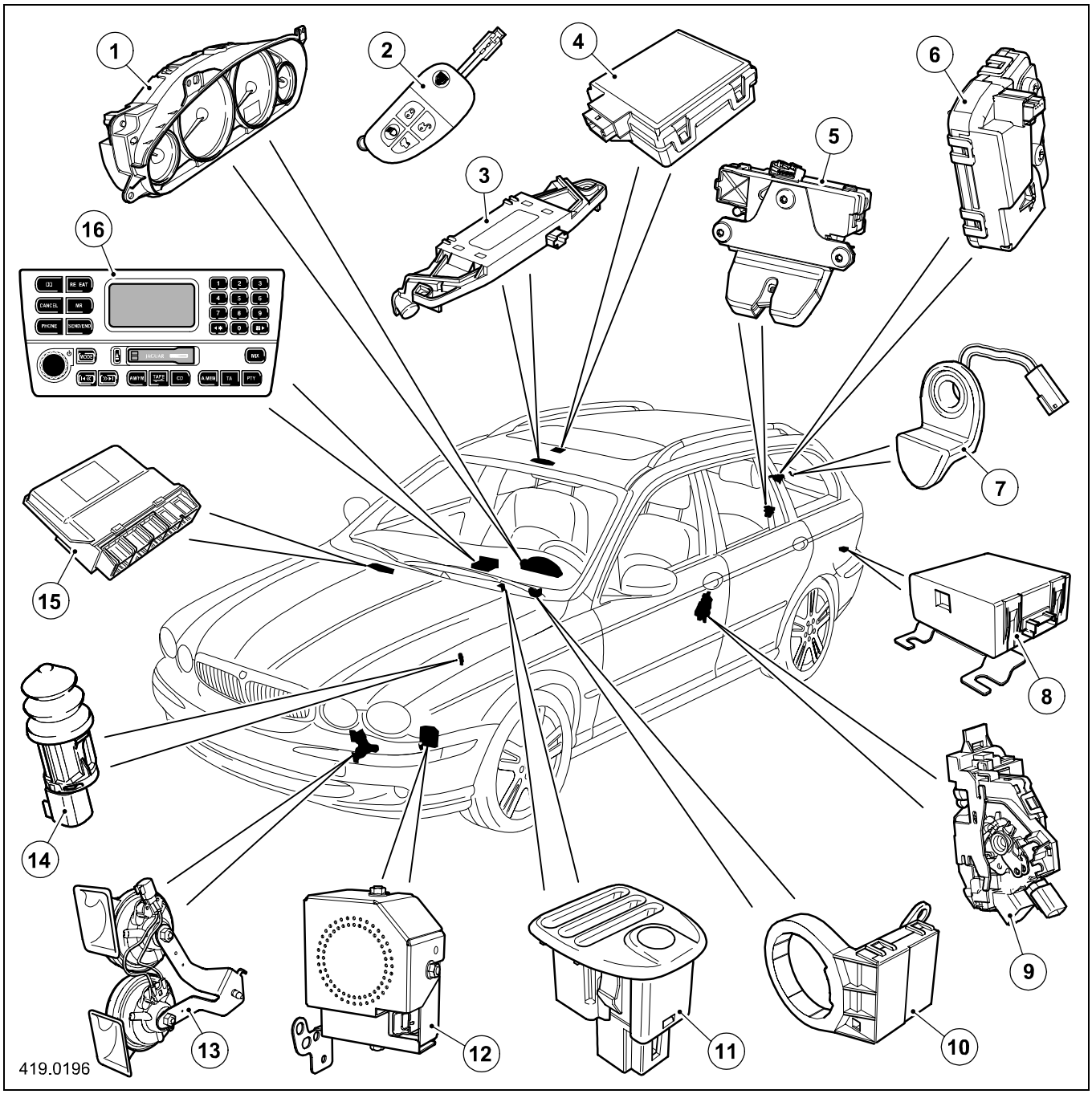
- Operate the UNLOCK button on the keyless entry remote transmitter.

Panic Alarm Activation (All Markets)

Operating the headlamp convenience button on the remote keyless entry transmitter three times within three seconds will activate the panic alarm. The alarm will be sounded for up to 28 seconds and be accompanied by the turn signals flashing.

The panic alarm can be stopped by again by pressing the headlamp convenience button three times within three seconds, or operating the unlock button on the transmitter, or switching the ignition to position II (with a valid key). It is also possible to stop the panic alarm through the drivers door key barrel (non EURO markets) if the vehicle is in the locked and armed state.

Anti-Theft (Estate)



- Anti-theft component locations

Key

1. Instrument cluster
2. Remote keyless entry RF transmitter
3. Intrusion sensors (modified)
4. Stand alone remote keyless entry RF receiver - new
5. Tailgate latch/ajar switch (new)
6. Opening backlight latch/ajar switch (new)
7. Opening backlight handle with release button (new)
8. Inclination sensor (modified)
9. Door ajar switch
10. Transceiver coil
11. Security system indicator LED (modified)
12. Battery-backed sounder (modified)
13. Horns (modified)
14. Hood ajar switch
15. GECM (modified) - adjacent to ECU
16. Audio unit (non-telematics version)

The estate security system is carry-over sedan with the following changes:

- The perimeter alarm system replaces the trunk latch ajar switch with individual tailgate door and opening backlight latch ajar switches. They are under the control of the General Electronic Control Module (GECM).
- The intrusion sensor is modified to provide coverage to the rear luggage area of the estate. One part now covers both sedan and estate with two settings.
- The battery-backed sounder is modified for the estate and sedan.
- The inclination sensor is attached with a bracket to allow a common estate/sedan solution.

Anti-Theft - Active - Anti-Theft - Active

Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

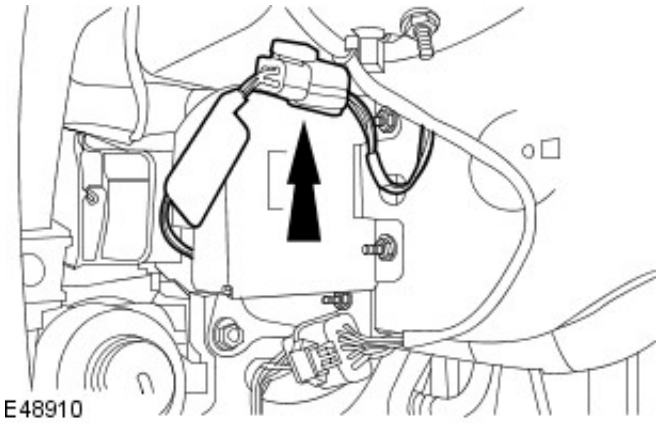
Mechanical	Electrical
• Door cylinder(s) • Door lock linkage(s) • Door lock cable(s) • Switch(s)	• Fuse(s) • Wiring harness for damage or corrosion • Electrical connector(s) • Switch(s) • Module (GEM) • Sensor(s) • Siren

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

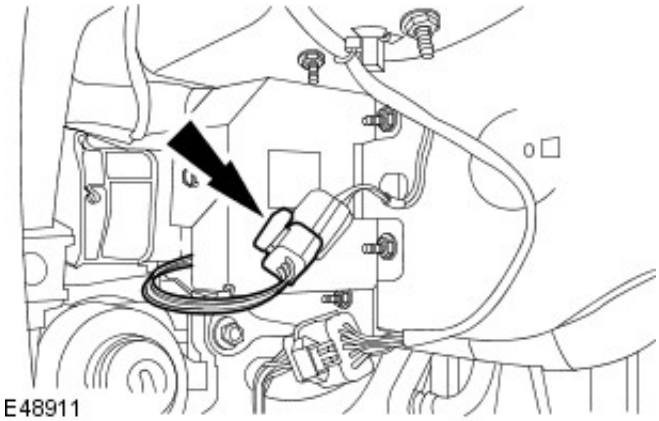
Anti-Theft - Active - Anti-Theft Alarm Horn
Removal and Installation

Removal

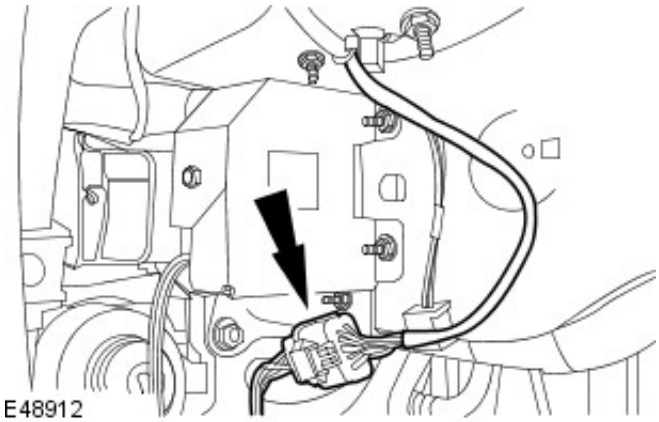
1. Remove the left-hand front fender splash shield.
   For additional information, refer to: Fender Splash Shield (501-02 Front End Body Panels, Removal and Installation).
2. Detach the anti-theft alarm horn electrical connector.


E48910

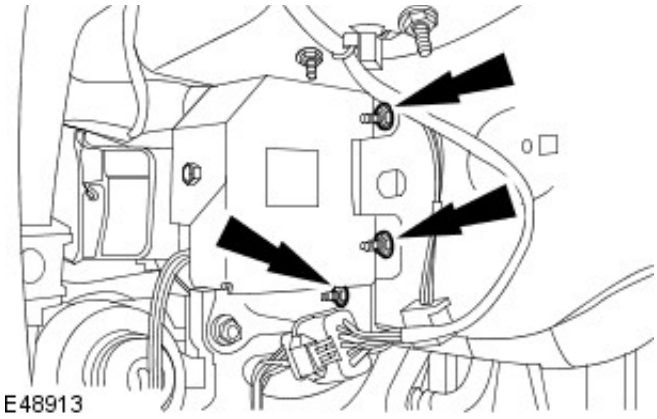
3. Disconnect the anti-theft alarm horn electrical connector.


E48911

4. Detach the front bumper electrical connector.


E48912

5. Remove the anti-theft alarm horn.

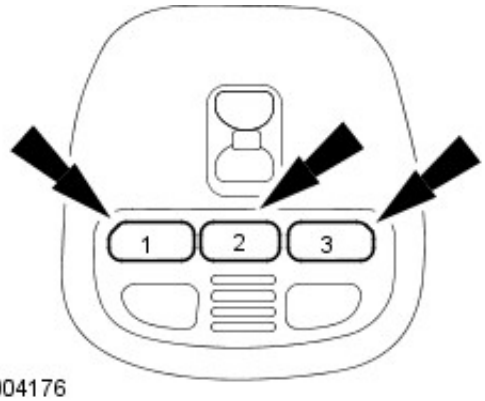


Installation

1. To install, reverse the removal procedure.

Remote Convenience - Universal Transmitter

Description and Operation



VUJ0004176

The HomeLink☐ universal transmitter provides a convenient way to replace up to three hand-held transmitters with a single built-in device. The universal transmitter:

- will operate garage doors, gates and home/office lighting and security systems.
- will actually learn and transmit the radio frequency of up to three hand-held transmitters from any of the systems mentioned above.
- is an integral part of the roof console assembly and is powered by the vehicle battery and charging system.

Remote Convenience - Universal Transmitter
Diagnosis and Testing

Inspection and Verification

1. **1.** Verify the customer concern by operating the system.
2. **2.** Visually inspect for obvious signs of mechanical damage.

Visual Inspection

Mechanical
• Damaged universal transmitter • Damaged receiver

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the concern is not visually evident, verify the concern and refer to the Symptom Chart. Refer to the electrical circuit diagrams for schematic and connector information.

Symptom Chart

Symptom	Possible Cause	Action
The universal transmitter is inoperative	• Universal transmitter • Receiver unit	GO to Pinpoint Test A.

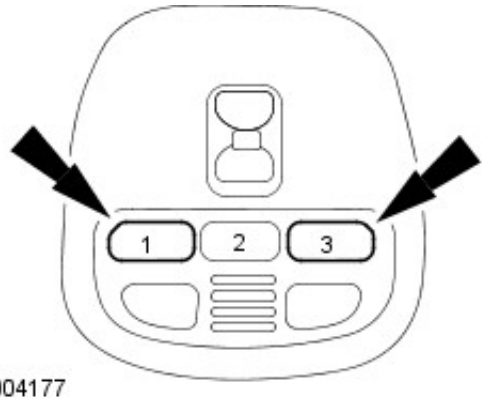
Pinpoint Tests

PINPOINT TEST A : THE UNIVERSAL TRANSMITTER IS INOPERATIVE	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
A1: CHECK THE ROOF CONSOLE ASSEMBLY OPERATION	
	1 Check the illumination of the interior lamp.
	Does the interior lamp illuminate? **Yes** GO to A2. . **No** Check and rectify fault with interior lamp circuit. TEST the system for normal operation.
A2: PROGRAM HAND-HELD TRANSMITTER INTO UNIVERSAL TRANSMITTER	
	• NOTE: If the garage door is equipped with rolling codes, refer to Training a Garage Door Opener Equipped With "Rolling Codes." **1** Program the universal transmitter. REFER to: Universal Transmitter Programming (419-02 Remote Convenience, General Procedures).
	Did the universal transmitter program successfully? **Yes** The universal transmitter is OK. VERIFY receiver operation. **No** REPLACE the roof console assembly. TEST the system for normal operation.

Remote Convenience - Universal Transmitter Programming

General Procedures

WARNING: A garage door opening system that cannot stop or reverse itself after detecting an object in its path does not meet current federal safety standards. To decrease the risk of serious injury or death, do not use this HomeLink□transmitter with a door opening system that lacks stop and reverse features as required by federal standards. This includes any garage door opening system manufactured before April 1, 1982. For more information, call HomeLink□customer assistance at 1-800-355-3515.



VUJ0004177

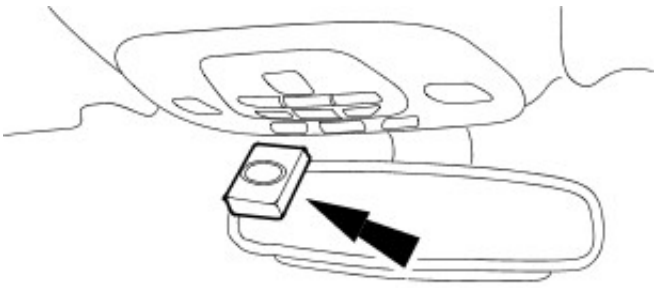
1. CAUTION: During this procedure, the system that you are programming will be made to operate. Make sure that people or objects are clear of the garage door or gate being programmed.

Verify the hand-held transmitter is operative.

2. Prepare for programming the universal transmitter by erasing all three channels by holding down the two outside buttons until the red light begins to flash (20-30 seconds). Release both buttons.

3. Select one of the three universal transmitter channels to be programmed by pressing the desired button.

4. Hold the end of the hand-held transmitter 50-150mm (2-6 in) from the front surface of the universal transmitter so that the red light can still be seen.



VUJ0004178

5. NOTE: During programming, the hand-held transmitter may automatically stop transmitting after two seconds, which may not be long enough to program the universal transmitter. If programming this type of hand-held transmitter, continue to hold the button on the universal transmitter while re-pressing the hand-held transmitter button every two seconds (Canada only).

Use both hands to press the hand-held transmitter button and the desired button on the universal transmitter. Do not release either button.

6. Hold down both buttons until the red light on the universal transmitter flashes, first slowly and then rapidly. Release both buttons when the rapid flashing begins. The universal transmitter has successfully learned the new frequency signal and can be used in place of the hand-held transmitter(s).

7. NOTE: If the hand-held transmitter appears to program the universal transmitter but does not open the garage door, the garage door opener may have a "code protected" or "rolling code" feature.

To operate, simply press the appropriate button on the universal transmitter. The red light is on while the signal is being transmitted.

Training a Garage Door Opener Equipped With "Rolling Codes"

1. Program the hand-held transmitter to the universal transmitter.
For additional information, refer to Universal Transmitter Programming in this section.

2. Train the garage door opener receiver to recognize the universal transmitter.

1. Remove the cover panel from the garage door opener receiver.
2. Locate the training button on the garage door opener receiver. Location and color of the button may vary by garage door opener manufacturer. Refer to the garage door opener instruction manual or call HomeLink□customer assistance at 1-800-355-3515.
3. Press the training button on the garage door opener receiver for 1-2 seconds.
4. Press the programmed universal transmitter button for as long as the universal transmitter red light flashes (1-2 seconds). Release the button and re-press the button to confirm that the universal transmitter is trained to the receiver.
5. The garage door opener should recognize the universal transmitter.

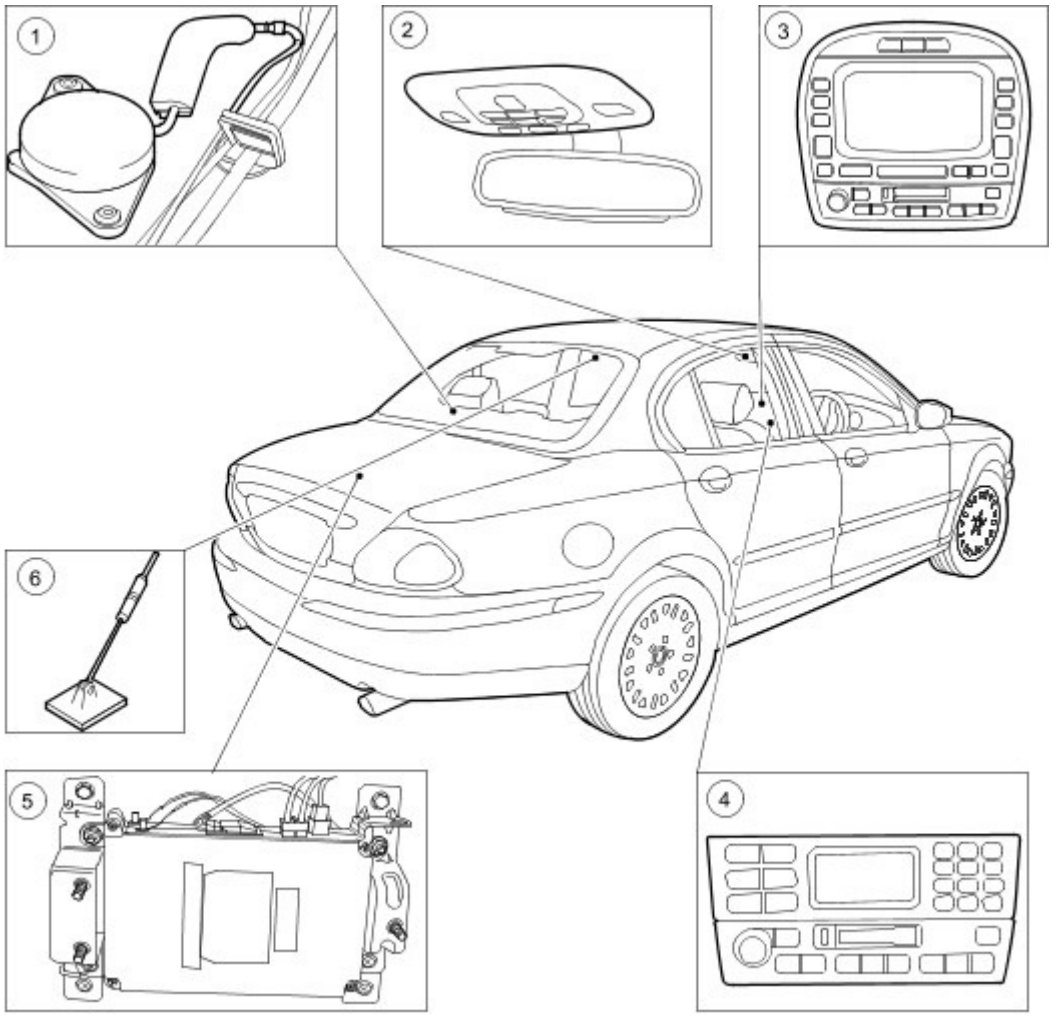
Erasing Channels

1. NOTE: Individual channels cannot be erased, but can be reprogrammed using the procedures for programming.
For additional information, refer to Universal Transmitter Programming in this section.

To erase all three programmed channels, hold down the two outside buttons until the red light begins to flash (20-30 seconds). Release both buttons.

Published: Dec 6, 2001

Telematics



VUJ0004190

Item	Part Number	Description
1	—	GPS Antenna - JaguarNet
2	—	Roof console
3	—	Navigation and VEMS (JaguarNet) display
4	—	Base level audio display and VEMS (JaguarNet) display
5	—	VEMS module
6	-	VEMS (JaguarNet)/ Phone antenna

System / Component Description

The vehicle emergency message system (JaguarNet) allows a user to request emergency assistance (police, ambulance, fire) or roadside assistance. Also, if any of the vehicle's airbags are deployed while JaguarNet is operational, the system automatically issues a call for emergency assistance.

1 . The JaguarNet consists of four components: VEMS module. Navigation display/base level audio unit display. Global Positioning Sensor (GPS) antenna. The cellular phone system.

The VEMS module controls the system. It is embedded in the vehicle's cellular phone system, audio unit, restraint control module (RCM), navigation system and GPS antenna. The VEMS module uses the cellular phone system to place calls to the response center. JaguarNet mutes the audio unit upon placing a call and re-instates the audio when the call is ended. The RCM monitors the air bag circuit to determine if an airbag has deployed and provides the user with visual feedback during an activation by displaying status messages on the navigation display/base level audio display.

The navigation display and roof console provide the user with two buttons, (i) and (SOS) for activating the system. The navigation display is used to place a call for emergency and roadside assistance. Additional buttons (i) and (SOS) are also provided in the roof console.

The GPS antenna receives data from a group of GPS satellites and is used by the VEMS module to determine the location of the vehicle when the system is activated.

Powering Up

The VEMS module powers up when the ignition switch is in the RUN position. During power up, the VEMS module will carry out a check of the system. The system check takes about 15 seconds. If a failure is detected, the VEMS module will illuminate the tell-tail LED's in the roof console.

Pressing i, SOS and Airbag Deployment

When info, emergency/roadside assistance is selected, or one of the air bags is deployed, JaguarNet will take control of the cellular phone and inform the user that an activation is in progress by displaying INFO REQUEST/SOS REQUEST on the navigation display/base level audio display. JaguarNet will also mute the audio unit causing PHONE to be displayed on the audio unit.

If JaguarNet determines that the cellular phone is not correctly connected, the navigation unit will display CELLULAR PHONE REMOVED followed by ASSIST FEATURE DISABLED then UNABLE TO PLACE CALL and INSTALL PHONE TO CONTINUE (US ONLY).

If a cellular phone is connected, but JaguarNet determines that the phone is not JaguarNet compatible, NON-ASSIST PHONE will be displayed on the navigation display (US ONLY).

Upon determining that the cellular phone is connected and communication with it can be established, JaguarNet checks to see if cellular service is available (a cellular signal is sensed by the vehicle's cellular phone).

If cellular service is not available, JaguarNet will continue to check for service for up to two minutes. During this time, NO CELLULAR SIGNAL followed by WAITING TO ACQUIRE are continually displayed in rotation on the navigation display. If service is still not available after two minutes, UNABLE TO PLACE CALL is displayed on the navigation display and the activation is terminated.

If service is available, JaguarNet places a data call to the response center and CALL IN PROGRESS is displayed on the navigation display.

If the call has difficulty going through because the cellular system is busy, JaguarNet will continue trying to place the call for up to one minute. During this time, CELLULAR SYSTEM BUSY followed by PLEASE WAIT are continuously displayed in rotation on the navigation display/base level audio unit display, and then the activation is terminated. If the data call goes through, RINGING RESPONSE CENTER is displayed on the navigation display

Once the data call is answered by the response center, JaguarNet sends an electronic data message. This message includes: the type of activation (emergency/roadside or air bag), a customer identification number (CID), the mostly recorded location (latitude and longitude), speed and direction of travel of the vehicle, the time at which the location and speed data was taken, and the systems cellular phone number. While this data is being transmitted the system updates the navigation display with SENDING LOCATION DATA (US ONLY).

After the data has been received by the response center, DATA RECEIVED will be displayed on the navigation display (US ONLY). The call will then be displayed on the navigation display. The call will then be forwarded to the response center operator switchboard.

If the data call fails to go through, JaguarNet will carry out a voice call redial to the response center operator switchboard. While this call is being placed, REDIAL IN PROGRESS will be displayed on the navigation display. While the system is waiting for an operator to answer, WAITING FOR OPERATOR will be displayed on the navigation display.

Upon answering the call, the operator will attempt to talk with the caller to determine the level of assistance required. The operator will contact the appropriate emergency service provider if required.

Throughout the rest of the call CID..., LAT..., and LON... data that was sent to the response center will be continually displayed in rotation on the navigation display.

If the call is initiated by the deployment of an airbag, the caller has no control of the phone and all communication with the response center operator will occur hands-free. If the call is initiated by pressing the navigation display or roof console i button, communication with the response center operator defaults to hands-free but may be switched to private mode (using the phone's internal speaker and microphone) by removing the phone from its holder.

When the call is ended, the navigation display will return to displaying vehicle information and the audio unit will return to its previous operating mode.

Powering Down

When the ignition switch is in the OFF position, JaguarNet will be powered off, so no status messages will be displayed. If the ignition is switched from RUN to OFF or ACC while the JaguarNet is in a call, the call will continue, but the navigation display will be switched off.

Telematics

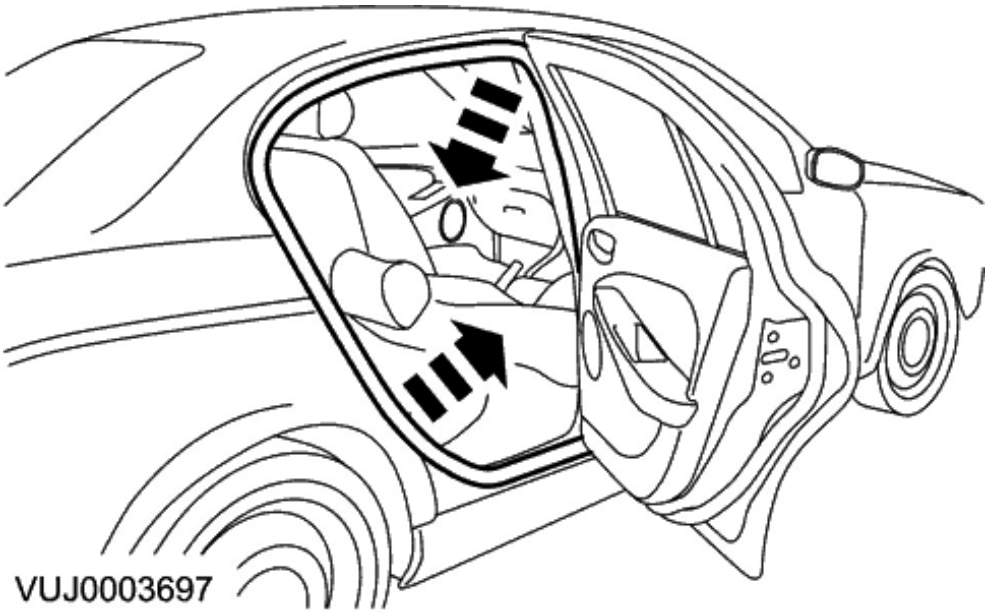
The complexity of the electronics involved with the JaguarNet system, of which the GPS antenna and navigation display are parts, and the multiplexed communication network which are connected to it preclude the use of workshop general electrical test equipment. Therefore, reference should be made to the approved Jaguar diagnostic system for detailed instructions on testing the VEMS unit.

The approved Jaguar diagnostic system tests and analyses all functions of the VEMS and the various systems affected by it.

Where a fault is indicated, some basic diagnostic methods may be necessary to confirm that connections are good and that wiring is not damaged before installing a new component.

Antenna

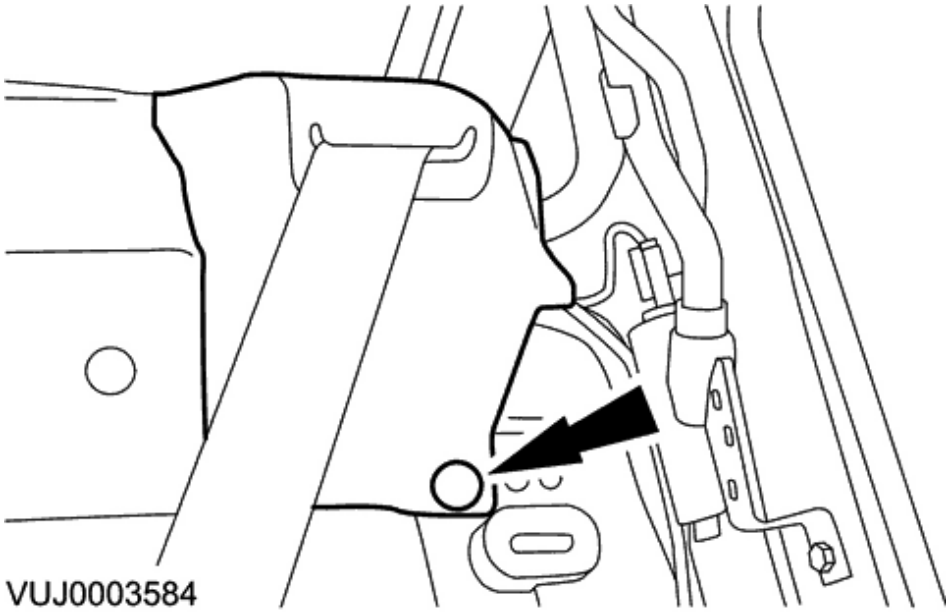
Removal



1. Detach the rear door opening weather-strips.
   - Right-hand shown, left-hand similar.

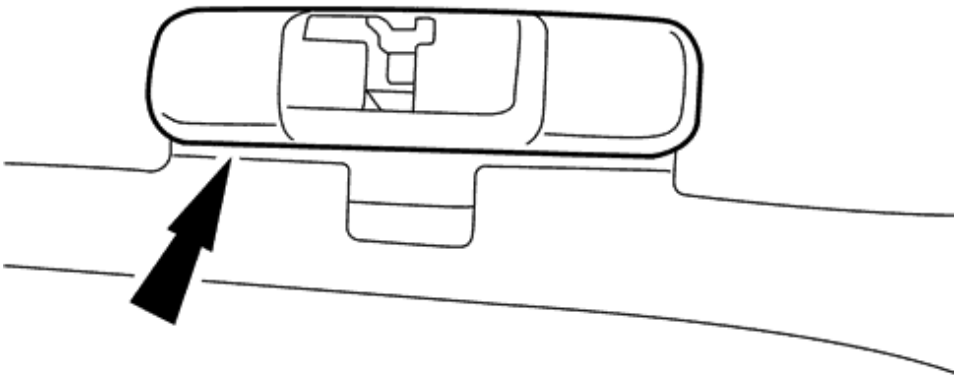
2. Remove the rear seat side bolsters. For additional information, refer to **<<501-10>>**.

3. Remove the C-pillar trim panels. For additional information, refer to **<<501-05>>**.



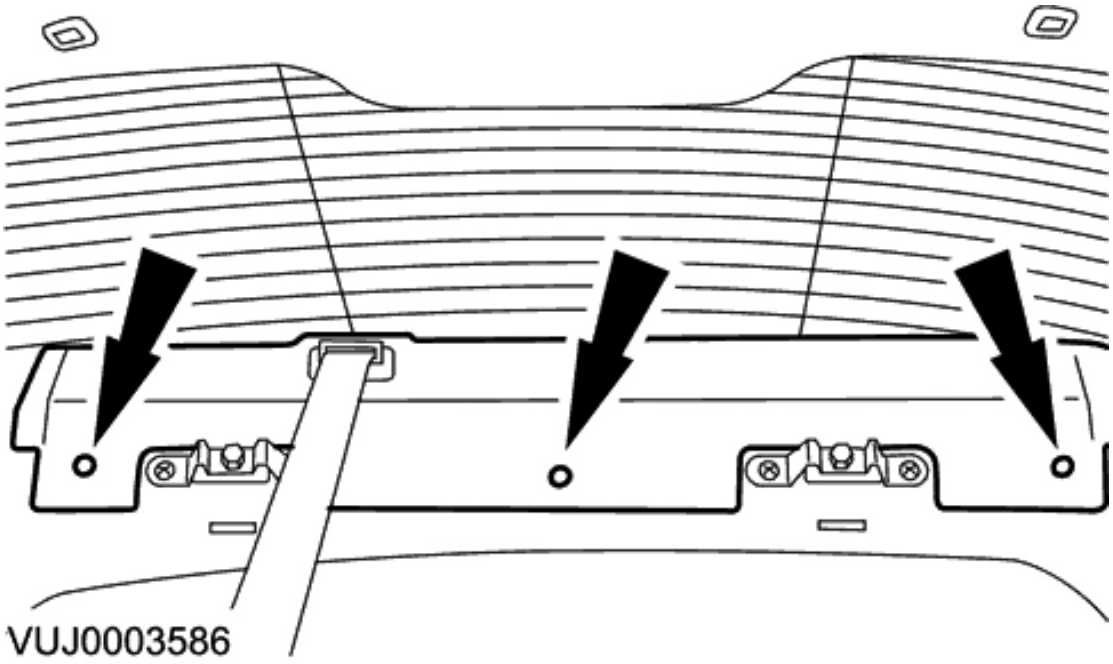
4. Detach the seat belt reel trim panels.

- Right-hand shown, left-hand similar.



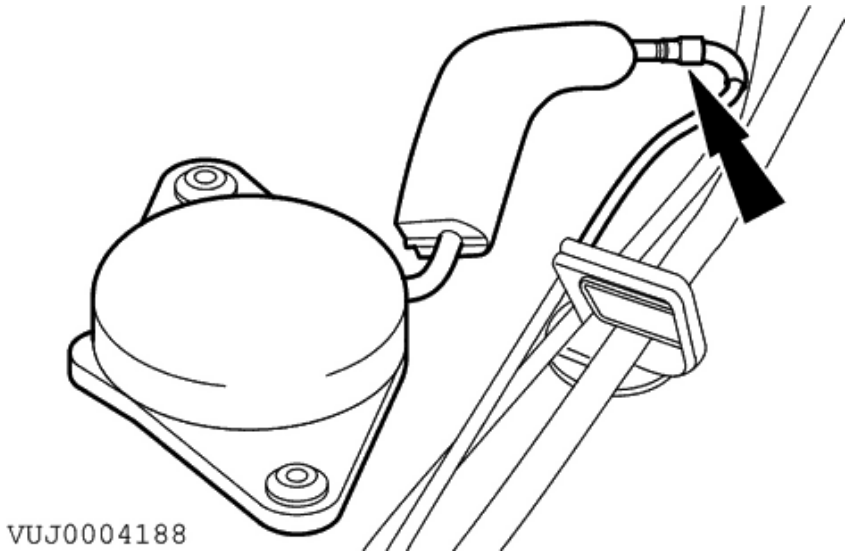
VUJ0003585

5. Remove the rear seat backrest latch covers.
   - Right-hand shown, left-hand similar.

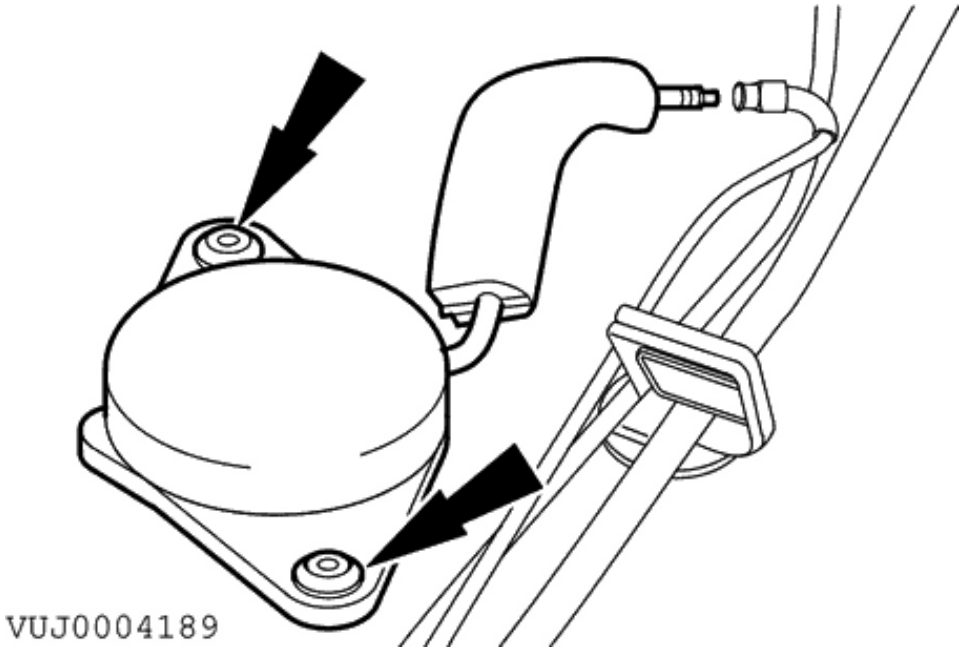


VUJ0003586

6. Detach the parcel shelf trim panel.



7. Disconnect the GPS VEMS antenna electrical connector.



8. Remove the GPS VEMS antenna.

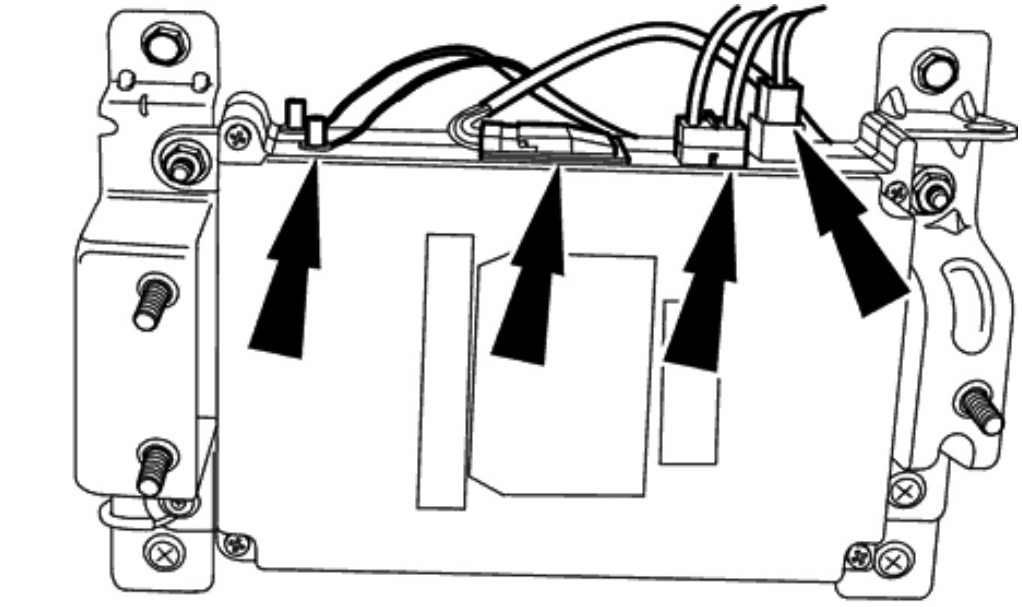
Installation

1. To install, reverse the removal procedure.

Module 86.56.59

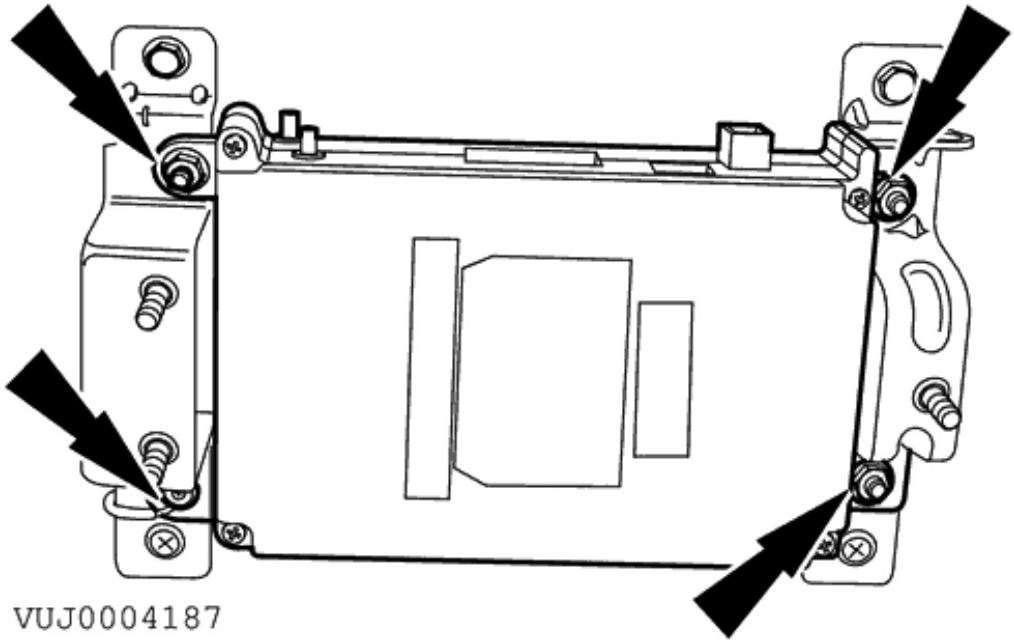
Removal

1. Remove the voice activated control module. For additional information, refer to **<<419-10>>**.



VUJ0004186

2. Disconnect the cellular phone module electrical connector, fibre optic connector, GPS and phone antenna.



VUJ0004187

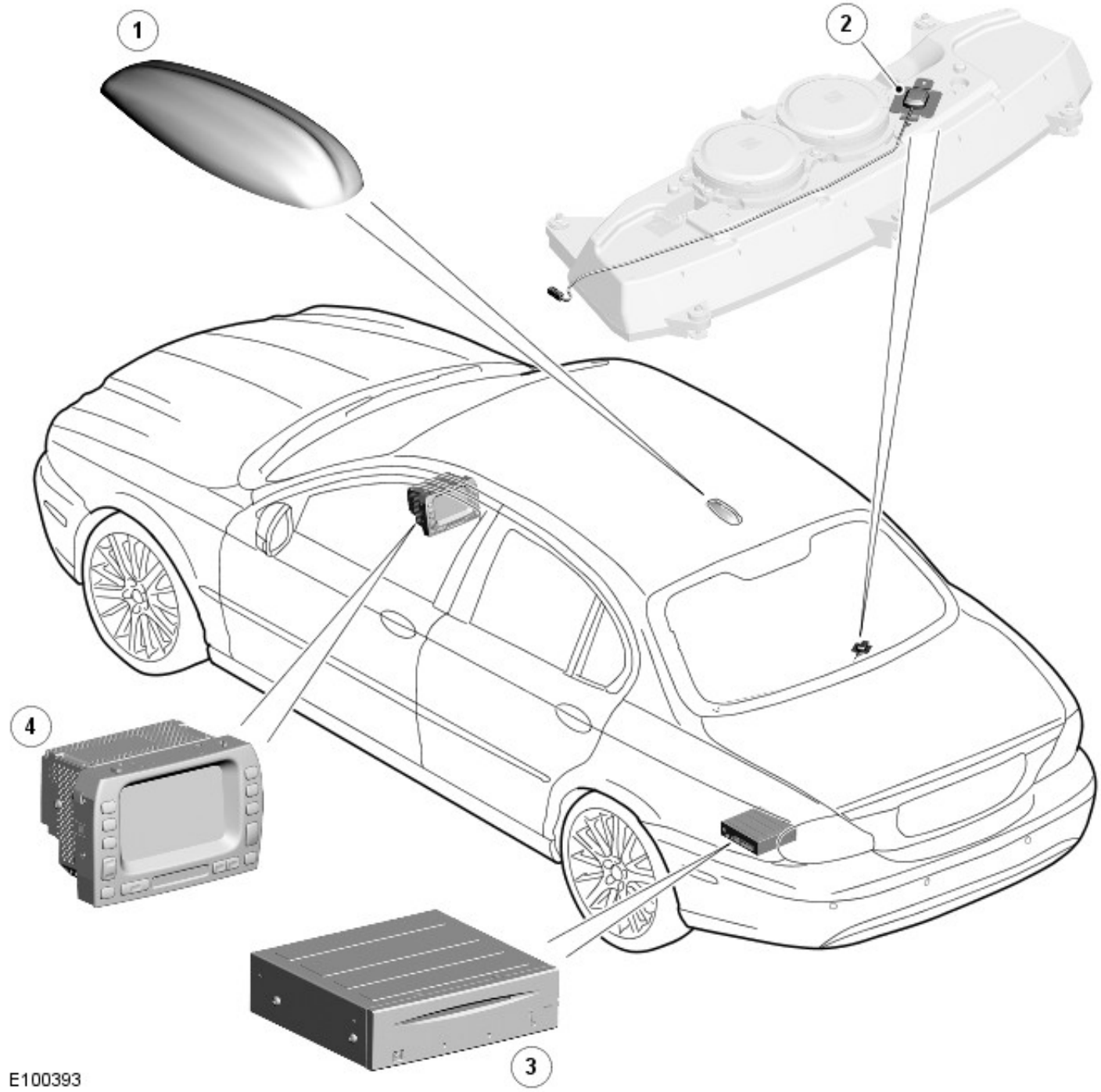
3. Remove the cellular phone module.

Installation

1. To install, reverse the removal procedure.

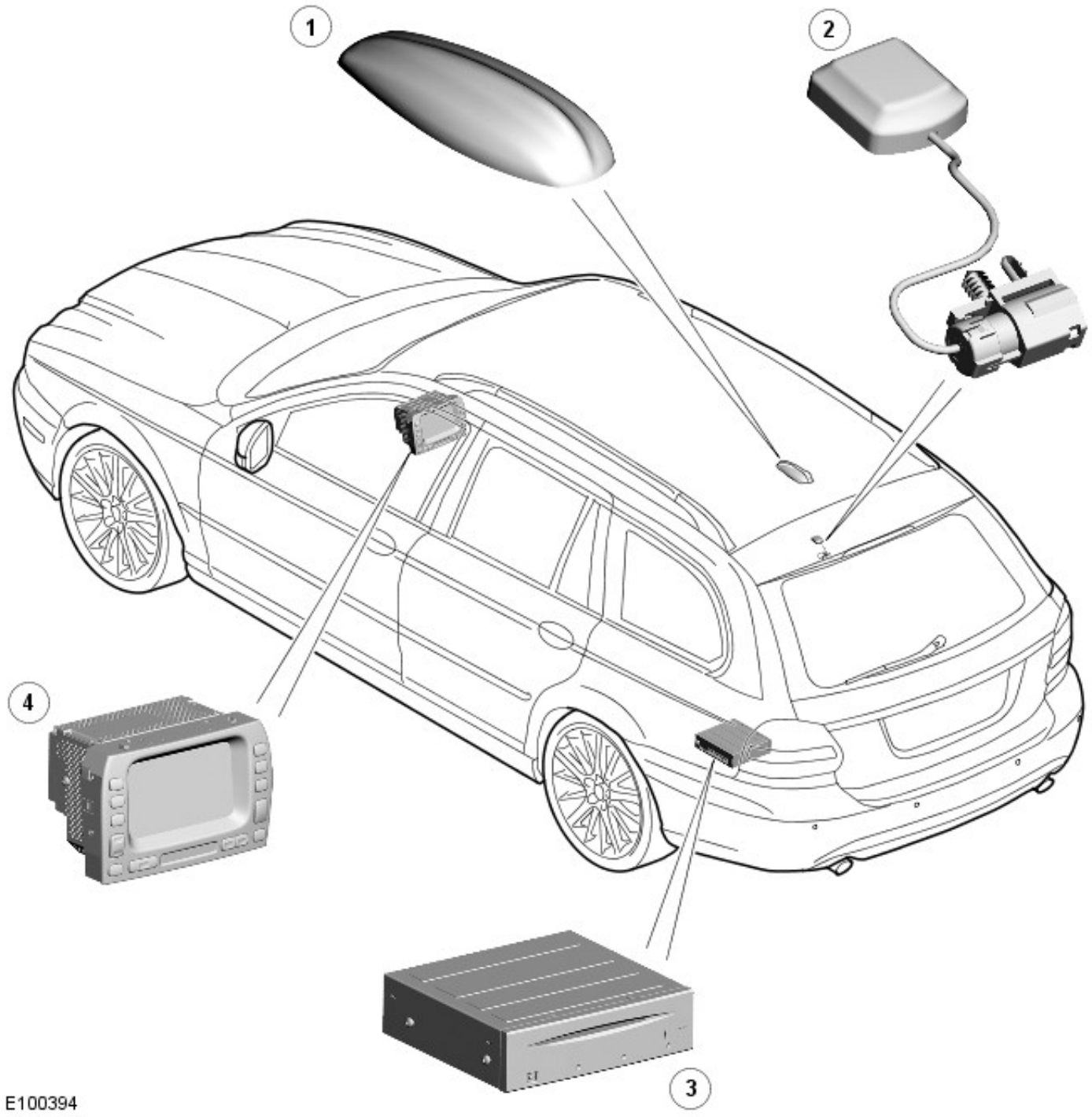
Navigation System - Navigation System
Description and Operation

4-Door



Item	Part Number	Description
1	—	Roof pod antenna module (from 2009MY)
2	—	Navigation GPS antenna (up to 2009MY)
3	—	Navigation computer
4	-	Navigation system display

Wagon



Item	Part Number	Description
1	-	Roof pod antenna module (from 2009MY)
2	-	Navigation GPS antenna (up to 2009MY)
3	-	Navigation computer
4	-	Navigation system display

The navigation system utilizes the following functions.

- Voice guidance volume controlled via audio head unit
- Screen brightness controlled via on screen menus
- Any key turns system "ON"
- Language choice controlled via on screen menus

The navigation head unit comprises of a 7" full color screen which also provides control of the phone, audio system, climate control, vehicle emergency messaging system (VEMS), voice control, and TV. The navigation computer is situated in the luggage compartment on the LH (left-hand) side and is covered by a protective trim panel.

On vehicles up to 2009MY, the GPS (global positioning system) antenna is located beneath the parcel shelf trim on a

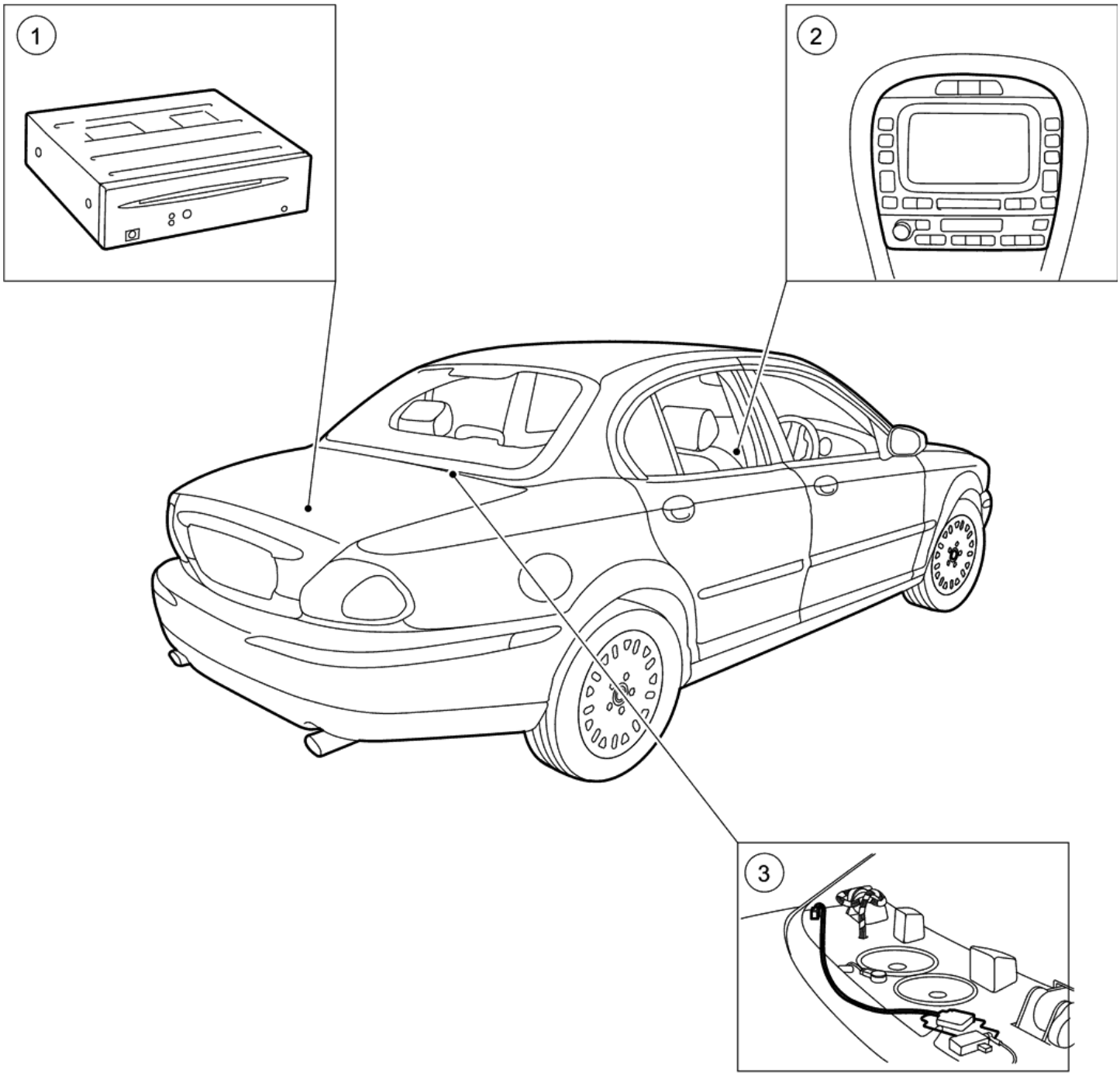
4-door vehicle and beneath the rear spoiler on wagon.

On vehicles from 2009MY, the GPS antenna is located in the roof pod antenna module on both the 4-door and the wagon.

The system utilizes signals from the GPS antenna, speed messages from the instrument cluster, ABS (anti-lock brake system) unit and the GYRO sensor's signals to enable the navigation computer to calculate, with the aid of DVD (digital versatile disc) map data, the position of the vehicle. After entering the required destination, the driver is guided along by both visual guidance and voice instructions. Even if the driver strays off the route, the system calculates a new route showing the easiest way back to the original destination. On route, it can also point out useful landmarks such as, petrol stations, restaurants, hotels, Jaguar dealers, and car parks.

Japanese market vehicles have a navigation computer with integrated voice recognition for control of the navigation system. The Japanese system also has the addition of Vehicle Information and Communication System (VICS) which provides real time traffic information.

Navigation System



VUJ0004234

Item	Description
1	Navigation module
2	Navigation system display
3	Navigation GPS antenna

The navigation system utilizes the following functions.

- Voice guidance volume controlled via audio head unit
- Screen brightness controlled via on screen menus
- Any key turns system 'ON'
- Language choice controlled via on screen menus

The navigation head unit comprises of a 7' full color screen which also provides control of the phone, audio system, climate control, vehicle emergency messaging system (VEMS), voice control, and TV. The navigation module is situated in the luggage compartment on the left-hand side and is covered by a protective trim panel. The Global Positioning System (GPS) antenna is located beneath the parcel shelf trim.

The system utilizes signals from the GPS antenna, speed messages from the instrument cluster, ABS unit and the GYRO sensor's signals to enable the navigation module to calculate, with the aid of DVD map data, the position of the vehicle. After entering the required destination, the driver is guided along by both visual guidance and voice instructions. Even, if the driver strays off the route, the system calculates a new route showing the easiest way back to the original destination. On route, it can also point out useful landmarks such as, petrol stations, restaurants, hotels, Jaguar dealers, and car parks.

Japanese market vehicles only have a navigation module with integrated voice recognition for control of the navigation system. The Japanese system also has the addition of VICS which provides real time traffic information.

Navigation System - Navigation System
Diagnosis and Testing

Principle of Operation

For a detailed description of the navigation system, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Navigation System (419-07 Navigation System, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Navigation system DVD player Mechanism	• Navigation system display • Navigation system module • GPS antenna • Wiring harness for damage and corrosion • Electrical connector(s) • ABS Module • Audio unit

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

DTC Index

CAUTION: When probing connectors to take measurements in the course of pin point tests, use the adapter kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the warranty policy and procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new component.

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Cause	Action
B1342	ECU is defective	• Satellite navigation system module - internal ECU failure	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. check navigation system module for internal failure. Install a new module as required, refer to the new module installation not at the top of the DTC index.
B2197	TV module error	• Satellite navigation system display - module or switch fault	Carry out any pinpoint tests associated with this DTC using the manufacturers approved diagnostic equipment. Check the satellite navigation system module for failure. Install a new module as required, refer to the new module installation note at the top of the DTC index.
B2198	Traffic Master module error	• Satellite navigation system module - traffic master module fault	Refer to electrical circuit diagrams, notes and check navigation system module communication circuit to traffic master module for failure. install a new module as required, refer to the new module installation note at the top of the DTC index.
B2199	VICS Module Error	• Satellite navigation system module - VICS (vehicle information control system) module fault	Refer to electrical circuit diagrams, notes and check navigation system module communication circuit to vehicle information control system module for faults. install a new module as required, refer to the new module installation

			note at the top of the DTC index.
B2201	No communication with traffic master module	• Satellite navigation system module - traffic master communication fault. This DTC is logged if the module is not fitted. It must be masked out by the tester when the module is not fitted to a particular vehicle	Refer to electrical circuit diagrams, notes and check navigation system module communication circuit to traffic master module for a fault. Install a new module as required, refer to the new module installation note at the top of the DTC index.
B2202	No communication to VICS module	• Satellite navigation system module to vehicle information control module - communication fault. This DTC is logged if the module is not fitted. It must be masked out when it is not fitted to a particular vehicle.	Refer to electrical diagrams, nots and check navigation system module communications circuit to vehicle information control module for faults.
B2204	GPS Antenna connection open or short	• Satellite navigation module (GPS) Antenna - open circuit or short circuit	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. refer to electrical circuit diagrams, notes and check navigation system module (GPS) antenna for open or short circuit.
B2205	GPS receiver fault	• Satellite navigation system module - global positioning satellite receiver fault	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to the electrical circuit diagrams, notes and check navigation system module global positioning satellite (GPS) antenna circuit. Check the antenna is not obstructed (vehicle must be outside when being tested). Replace module is fault persists.
B2206	Gyroscope fault	• Satellite navigation system module - gyroscope fault	Carry out any pinpoint tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, nots and check navigation system module for faults. Install a new module as required, refer to the new module/component installation note at the top of the DTC index.
B2207	Internal ECU ROM checksum fault	• Satellite navigation system - module internal failure	Refer to electrical circuit diagrams, notes and check the navigation system module for faults. Install a new module as required, refer to the new module/component installation note at them top of the DTC index.
B2208	Navigation module to display and switch module communication error	• Satellite navigation system module - communication to display and switch module fault.	Refer to electrical circuit diagrams, notes and check navigation system display and switch module communication circuit for fault
B2646	Antenna circuit open circuit #1	• Satellite navigation system module navigation system antenna - open circuit	refer to electrical diagrams, notes and check navigation systems antenna circuit for open circuit. To restore power the fault must be removed and the user must key off and on.
B2647	Antenna circuit open circuit #2	• Satellite navigation system module navigation system antenna - open circuit	Refer to electrical diagrams, notes and check navigation systems antenna circuit for open circuit. To restore power the fault must be removed and the user must key off and on.
B2648	Antenna circuit open circuit #3	• Satellite navigation system module navigation system antenna - open circuit	Refer to electrical diagrams, notes and check navigation systems antenna circuit for open circuit. To restore power the fault must be removed and the user must key off and on.
B2649	Antenna circuit open circuit #4	• Satellite navigation system module navigation system antenna - open circuit	Refer to electrical diagrams, notes and check navigation systems antenna circuit for open circuit. To restore power the fault must be removed and the user must key off and on.
B2650	Antenna circuit short circuit #1	• Satellite navigation system module navigation system antenna - short to power or ground	Refer to electrical diagrams, notes and check navigation systems antenna circuit for short to power or ground. To restore power the fault must be removed and the user must key off and on.
B2651	Antenna circuit short circuit	• Satellite navigation system module navigation system	Refer to electrical diagrams, notes and check navigation systems antenna circuit for short to power or ground. To

	#2	antenna - short to power or ground	restore power the fault must be removed and the user must key off and on.
B2652	Antenna circuit short circuit #3	• Satellite navigation system module navigation system antenna - short to power or ground	Refer to electrical diagrams, notes and check navigation systems antenna circuit for short to power or ground. To restore power the fault must be removed and the user must key off and on.
B2653	Antenna circuit short circuit #4	• Satellite navigation system module navigation system antenna - short to power or ground	Refer to electrical diagrams, notes and check navigation systems antenna circuit for short to power or ground. To restore power the fault must be removed and the user must key off and on.
B2655	Switch and display module is defective	• Satellite navigation system module - display faulty	Refer to electrical circuit diagrams, notes and check navigation system display and switch module for failure. Install a new display module as required. Refer to the new module/component installation note at the top of the DTC index
B2656	DVD (Digital Versatile Disk) error	• Satellite navigation system module -DVD error (DVD is integral to the navigation system module ECU)	Refer to electrical circuit diagrams, notes and check navigation system module for faults. Install a new module as required. Refer to the new module/component installation note at the top of the DTC index

Navigation System

Inspection and Verification

1. Verify the customer concern.

2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Navigation system DVD player Mechanism	• Navigation system display • Navigation system module • GPS antenna • Wiring harness for damage and corrosion • Electrical connector(s) • ABS Module • Audio unit

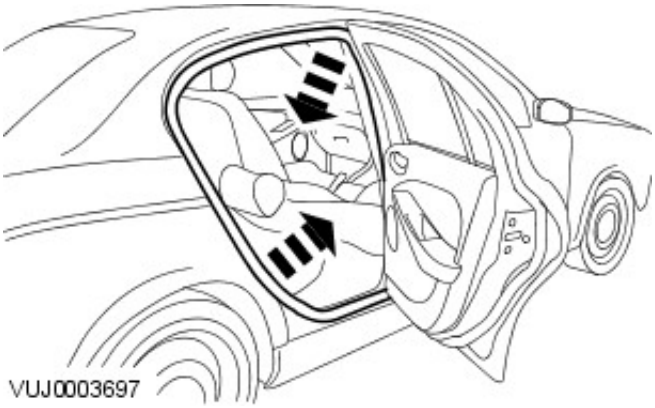
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4. If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

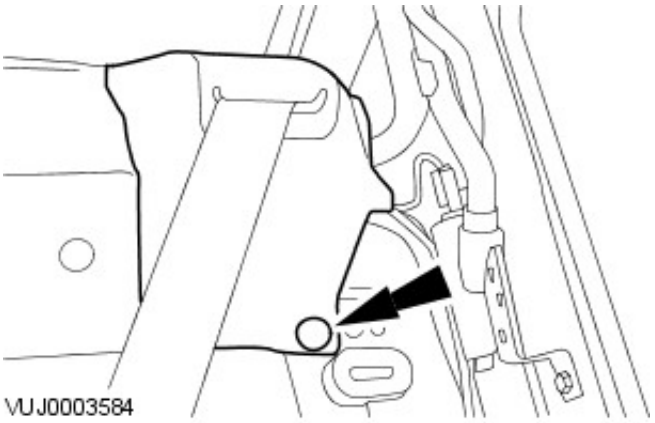
Navigation System - Navigation System Antenna4-Door, VIN Range: E96603->J39905

Removal and Installation

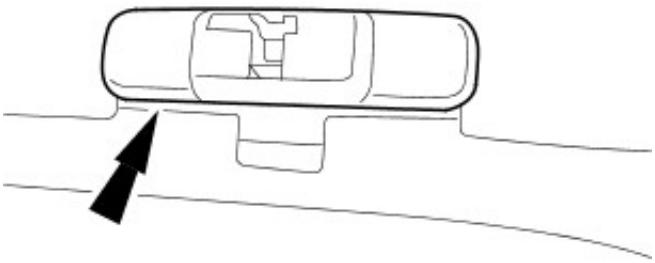
Removal


VUJ0003697

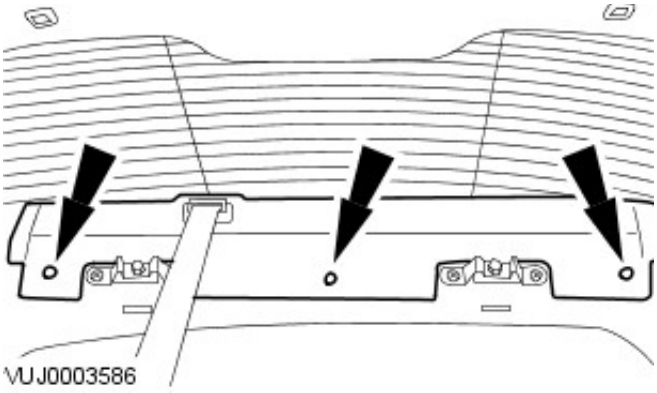
1. Detach the rear door opening weather-strips.
   - Left-hand shown, right-hand similar.
2. Remove the rear seat side bolsters. For additional information, refer to Section 501-10 Seating.
3. Remove the C-pillar trim panels. For additional information, refer to Section 501-05 Interior Trim and Ornamentation.
4. Detach the seat belt reel trim panels.
   - Left-hand shown, right-hand similar.

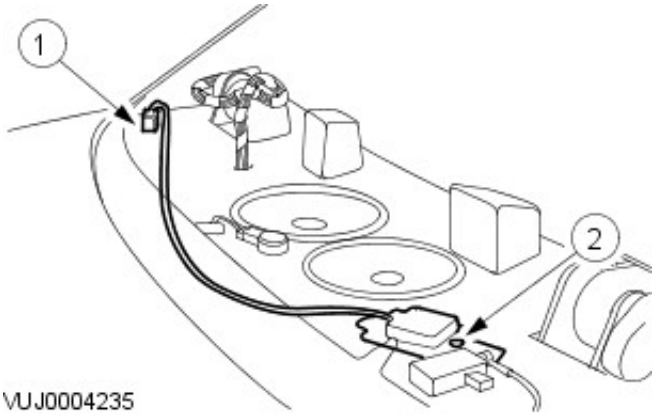

VUJ0003584

5. Remove the rear seat backrest latch covers.
   - Left-hand shown, right-hand similar.


VUJ0003585

6. Detach the parcel shelf trim panel.





7. Remove the GPS antenna.

1. Disconnect the GPS antenna electrical connector.
2. Remove the GPS antenna.
    1. Remove the pop rivet.

Installation

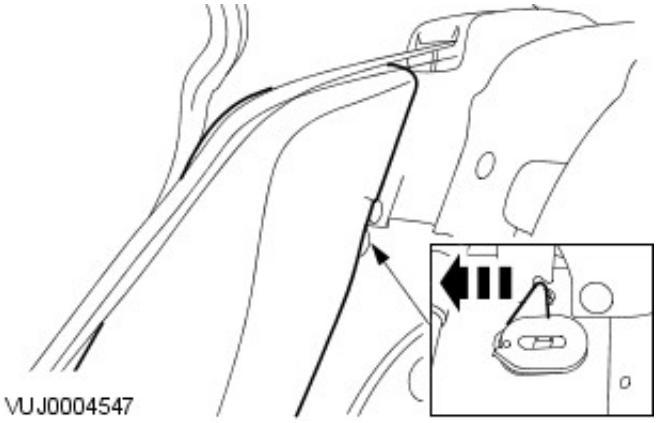
1. To install, reverse the removal procedure.

Navigation System - Navigation System Antenna4-Door, VIN Range: J39906->V99999

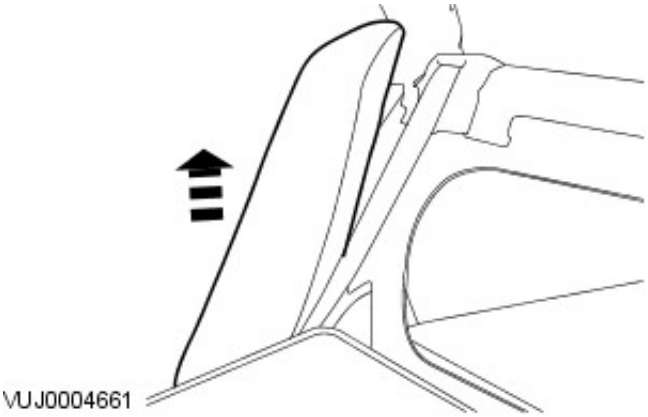
Removal and Installation

Removal

1. Fold down the rear seat backrests.
2. Detach the rear seat backrest bolsters.
   - Press the tangs.

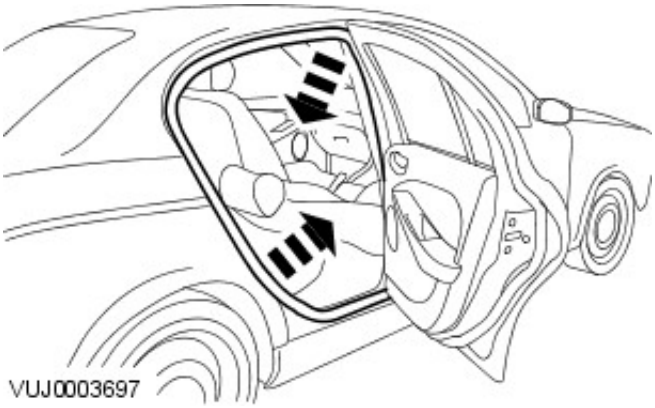

VUJ0004547

3. Remove the rear seat backrest bolsters.


VUJ0004661

4. NOTE: Right-hand shown, left-hand similar.

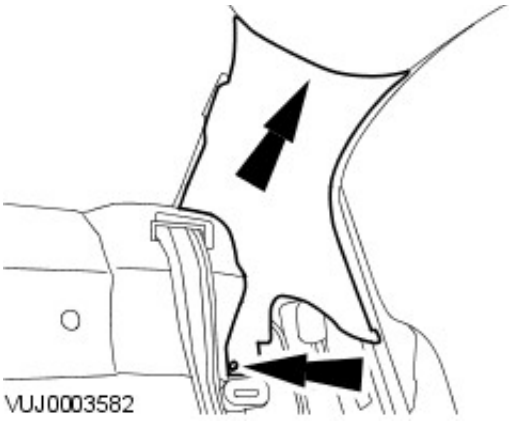
   Detach the rear door opening weather-strips.


VUJ0003697

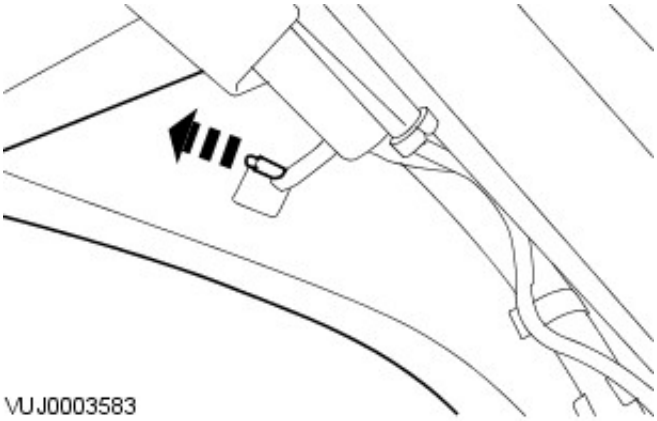
5. NOTE: The C-pillar trim panel is secured to the top of the C-pillar by a retaining strap. The retaining strap must be detached from the C-pillar before the C-pillar trim panel is removed.

• NOTE: Left-hand shown, right-hand similar.

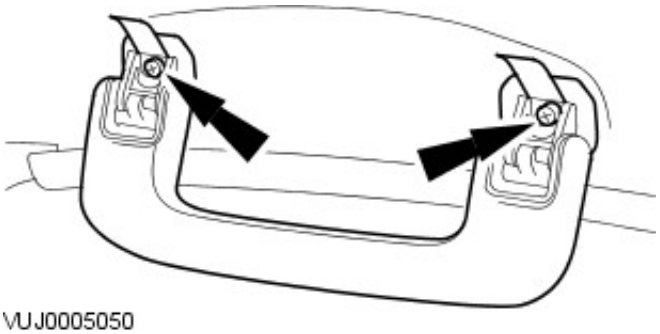
Detach the C-pillar trim panels.



6. Remove the C-pillar trim panels.

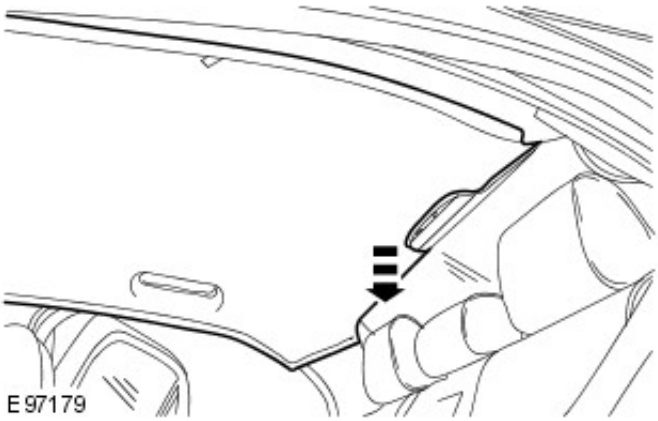


7. Detach the covers to expose the screws and remove the rear passenger assist handles.



8. NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

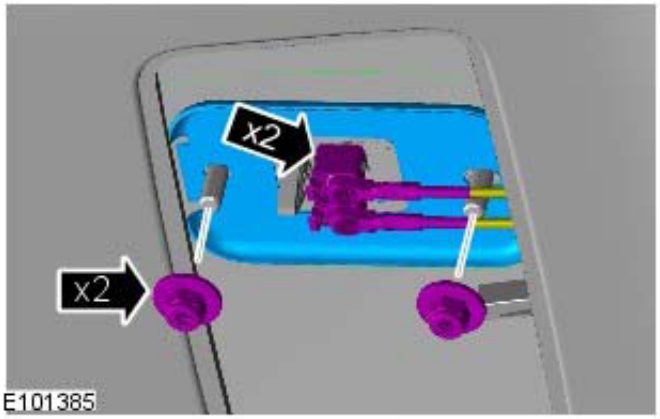
Detach the rear of the headliner.



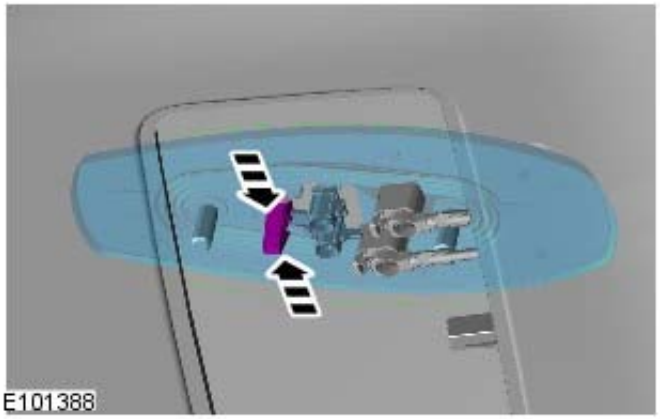
9. CAUTION: Make sure that the latch is pressed before disconnecting the electrical connector.

• NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Release the global positioning sensor (GPS) antenna.



- Disconnect the 2 electrical connectors.
- Remove the 2 nuts.



10. NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Remove the GPS antenna.

- Release the retaining clip.

Installation

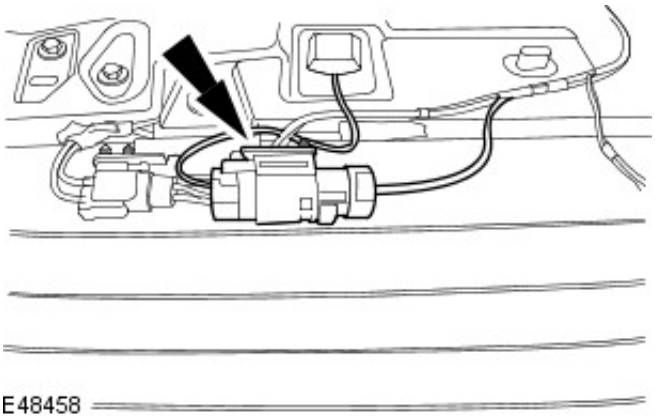
1. To install, reverse the removal procedure.

- Tighten to 6 Nm.

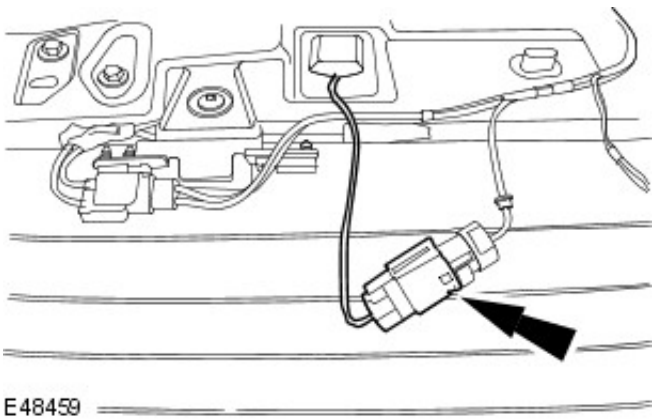
Navigation System - Navigation System AntennaWagon
Removal and Installation

Removal

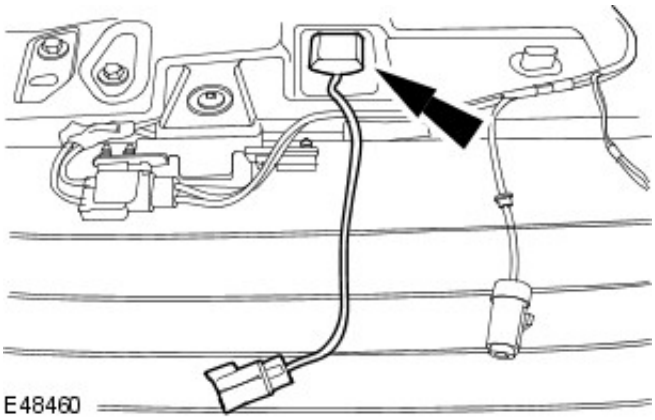
1. Remove the rear spoiler
   For additional information, refer to: Rear Spoiler - Wagon (501-08 Exterior Trim and Ornamentation, Removal and Installation).
2. Detach the electrical connector.



3. Disconnect the electrical connector.



4. Remove the navigation system antenna.



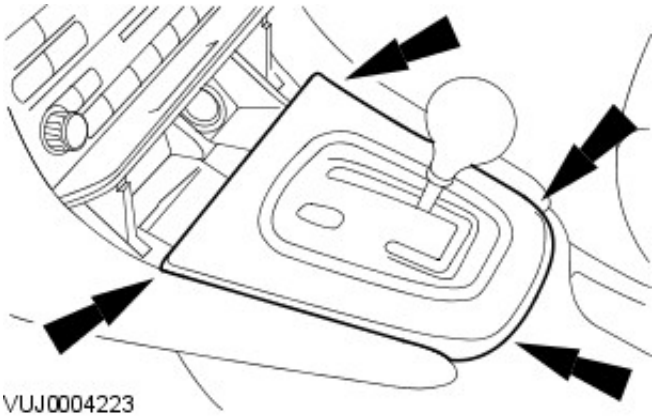
Installation

1. To install, reverse the removal procedure.

Navigation System - Navigation System Display Module
Removal and Installation

Removal

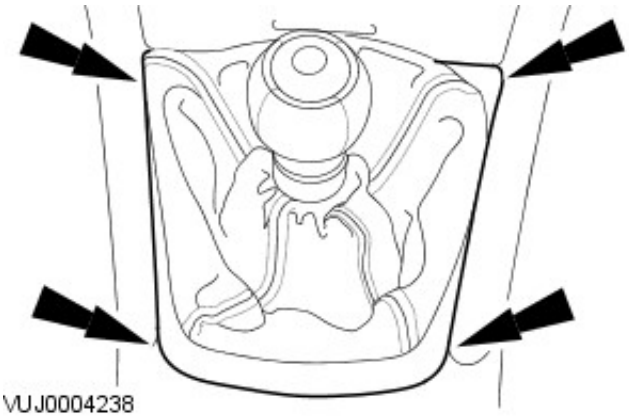
Vehicles with automatic transmission


VUJ0004223

1. NOTE: To aid removal of the navigation module and audio unit place the J-gate in the 'D' position.

   Remove the J-gate surround.

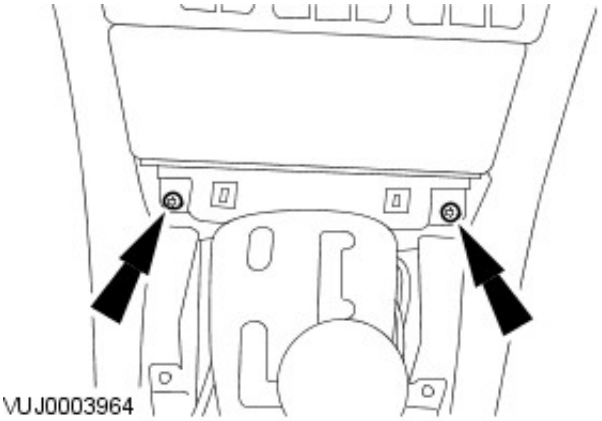
Vehicles with manual transmission


VUJ0004238

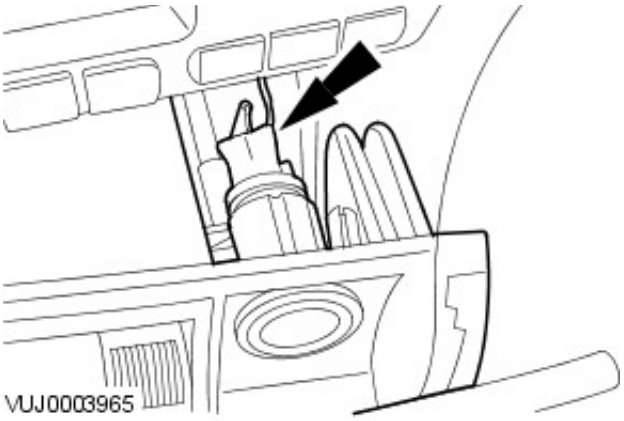
2. Detach the gear selector surround.

All vehicles

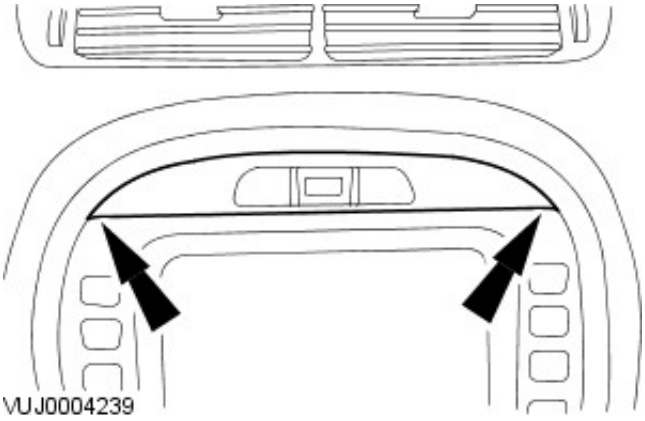
3. Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.
4. Remove the ashtray retaining screws.


VUJ0003964

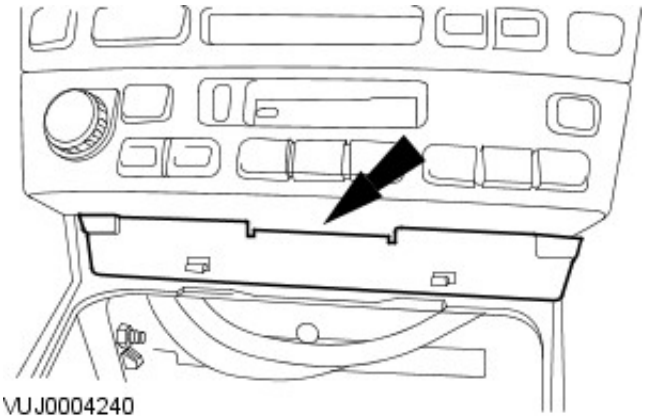
5. Remove the ashtray
   - Disconnect the electrical connectors.
   - Remove the ashtray.



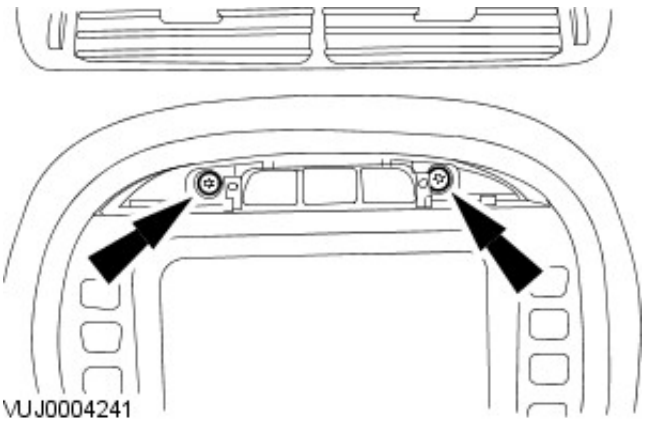
6. Remove the switch pack trim cover.



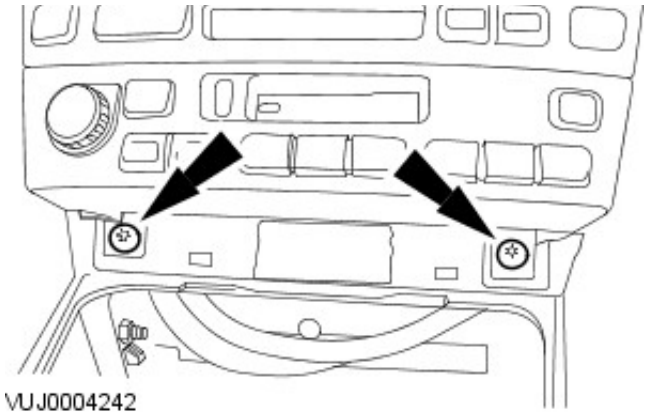
7. Remove the retaining screw cover plate.



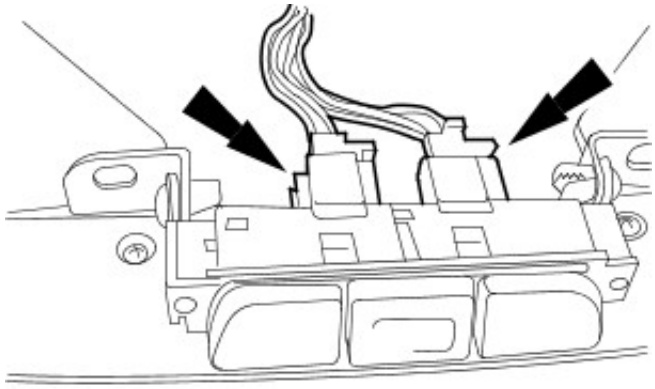
8. Remove the display mounting bracket upper retaining screws.



9. Remove the display mounting bracket lower retaining screws.

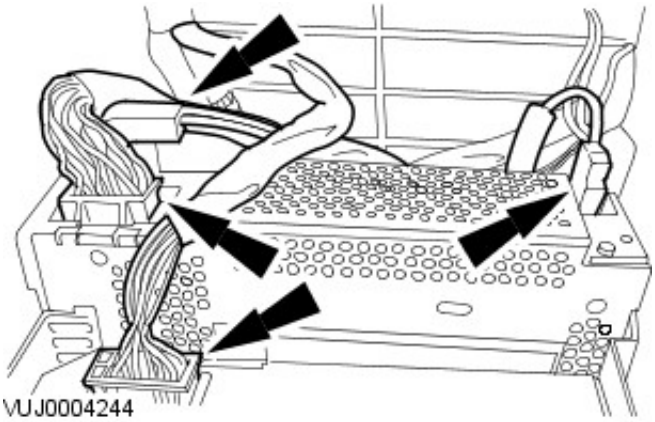

VUJ0004242

10. Disconnect the electrical connectors.


VUJ0004243

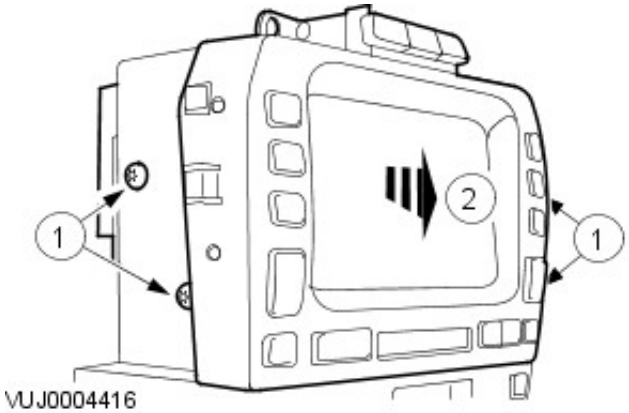
11. Remove the display module and audio unit.

1. Disconnect the electrical connectors and the fibre optic connector.
2. Remove the display module and audio unit.


VUJ0004244

12. Remove the navigation system display module.

1. Remove the navigation system display retaining screws.
2. Remove the navigation system display module.



VUJ0004416

Installation

1. To install, reverse the removal procedure.

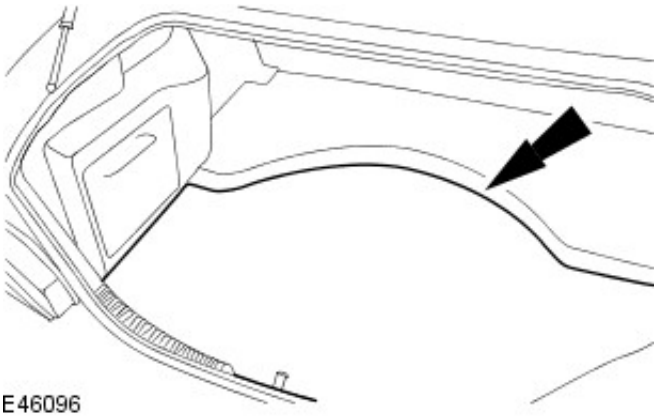
Navigation System - Navigation System Module4-Door
Removal and Installation

Removal

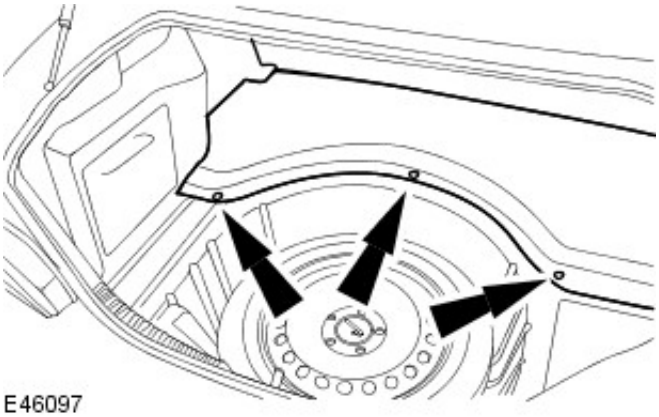
1. NOTE: Make sure the navigation DVD has been removed and the ICE pin code is available before disconnecting the battery ground cable.

Disconnect the battery ground cable.
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

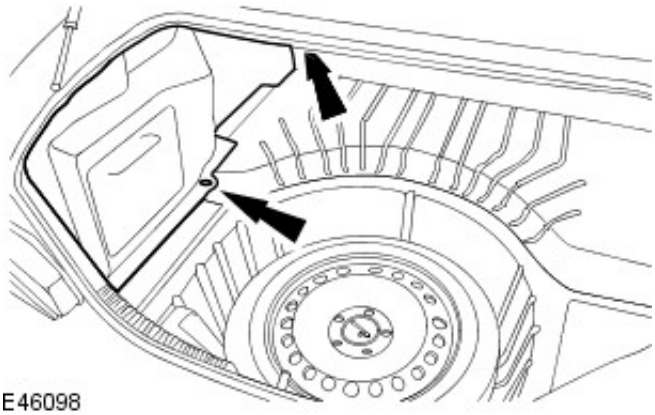
2. Remove the luggage compartment front floor carpet.


E46096

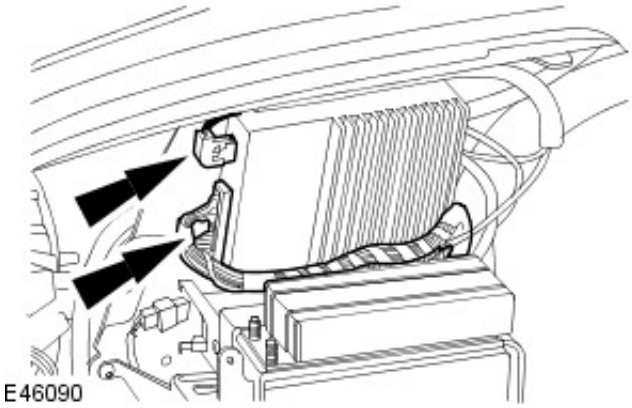
3. Remove the luggage compartment rear floor carpet.


E46097

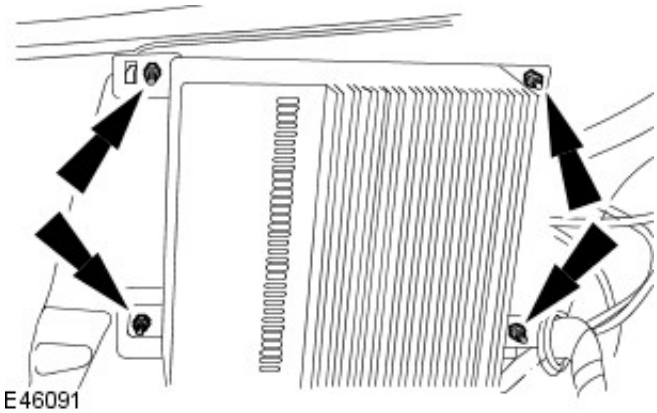
4. Remove the luggage compartment interior trim.


E46098

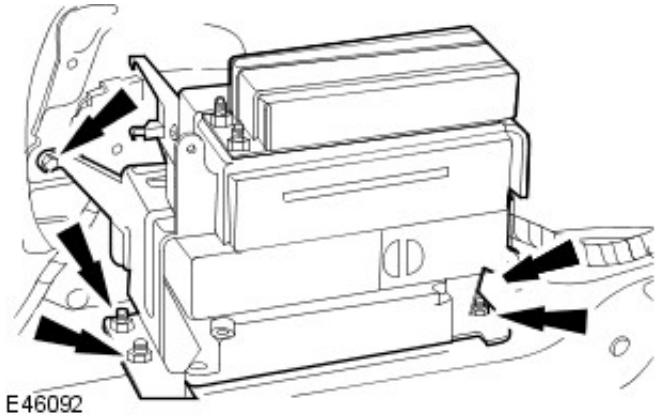
5. Disconnect the audio unit amplifier electrical connectors.


E46090

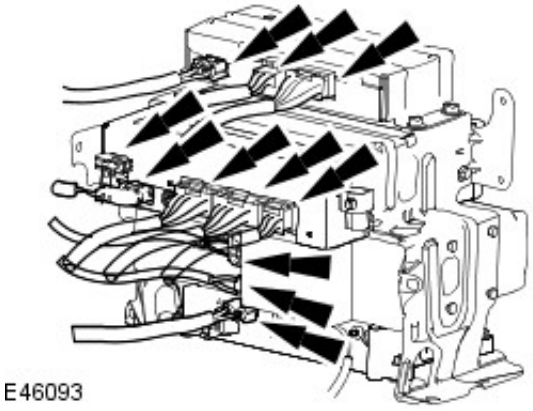
6. Remove the audio unit amplifier.


E46091

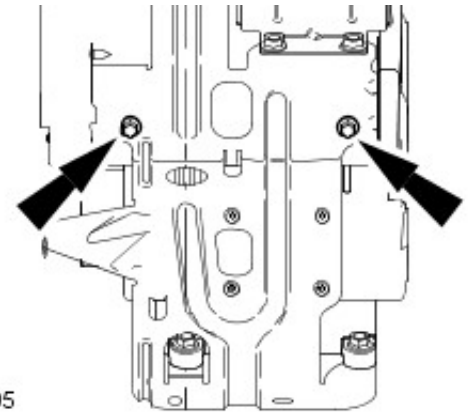
7. Detach the module retaining bracket.


E46092

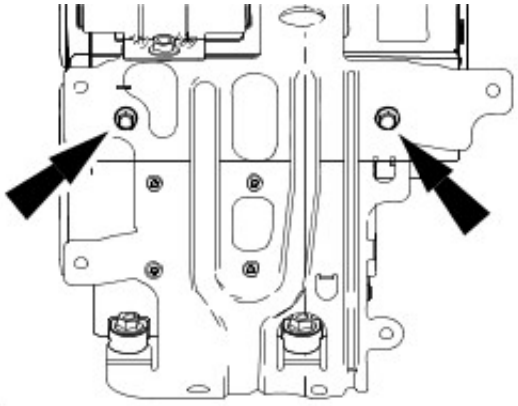
8. Disconnect the electrical connectors.


E46093

9. Remove the navigation module retaining bolts.



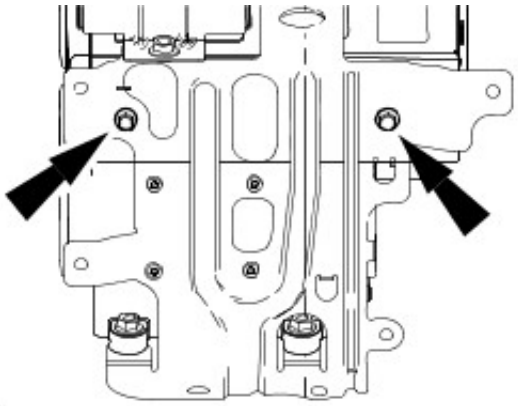
E46095



E46094

10. Remove the navigation module.

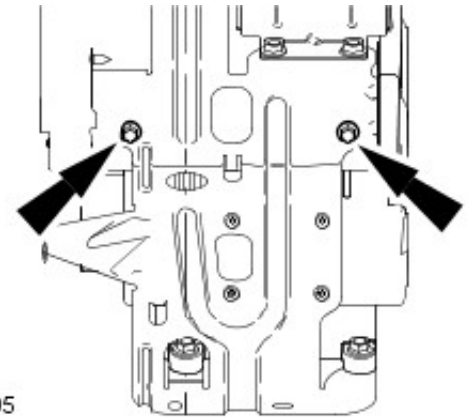
Installation



E46094

1. To install, reverse the removal procedure.

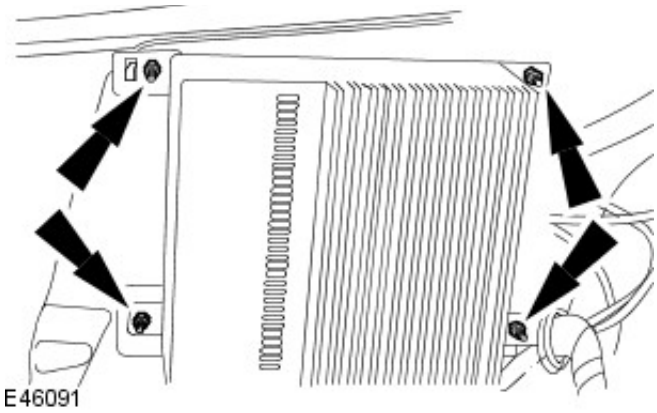
- Tighten to 3 Nm.



E46095

2. Tighten to 3 Nm.

3. Tighten to 9 Nm.



4. Connect the battery ground cable.
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

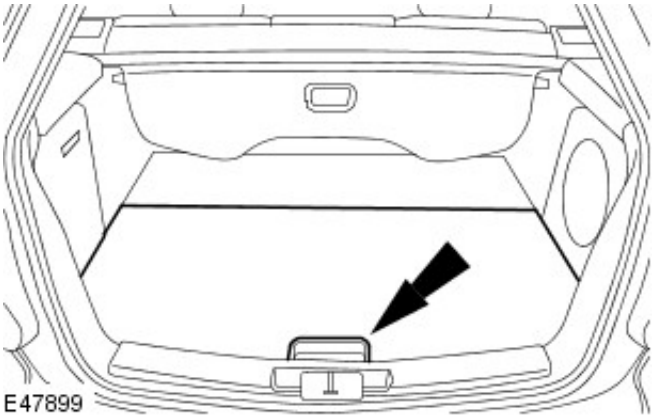
Navigation System - Navigation System ModuleWagon
Removal and Installation

Removal

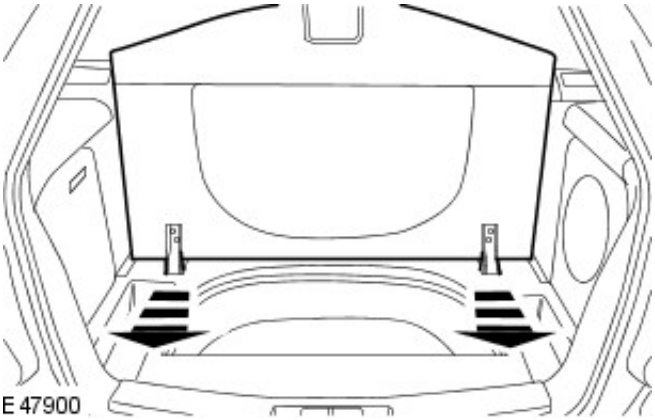
1. NOTE: Make sure the navigation DVD disc has been removed and the audio unit pin code is available before disconnecting the battery ground cable.

Disconnect the battery ground cable
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

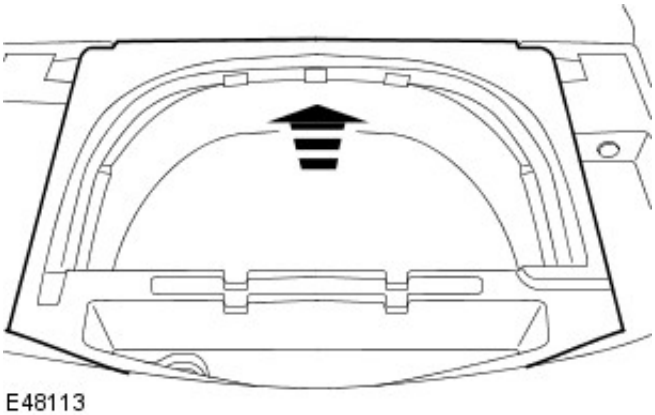
2. Raise the loadspace floor covering.


E47899

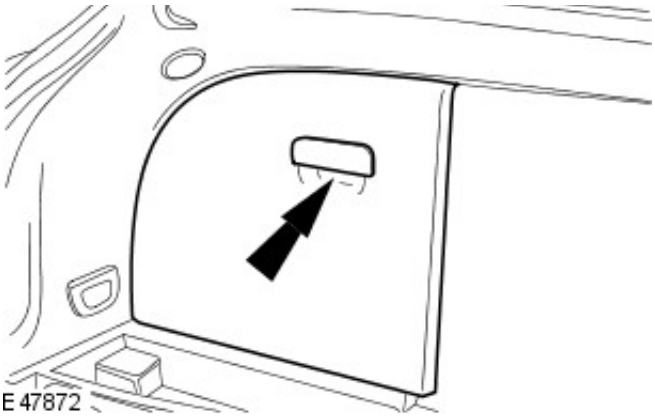
3. Remove the loadspace floor covering.


E47900

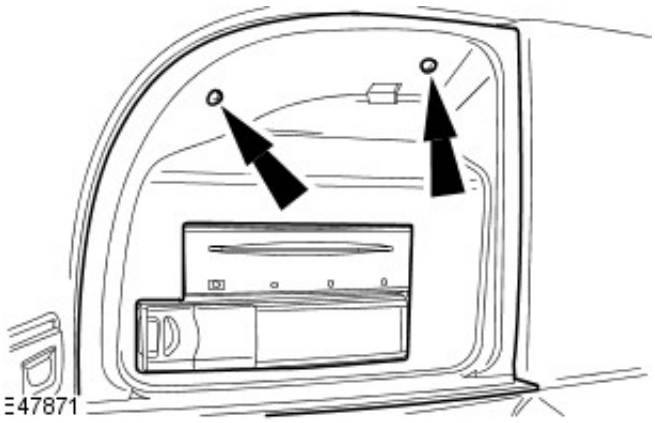
4. Remove the centre loadspace stowage compartment.


E48113

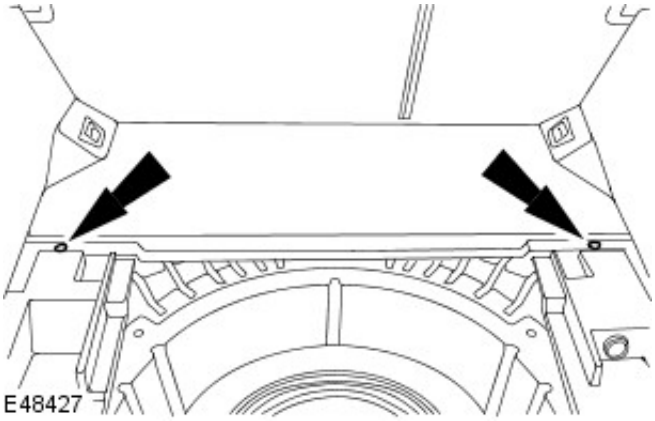
5. Remove the loadspace stowage compartment trim panel.



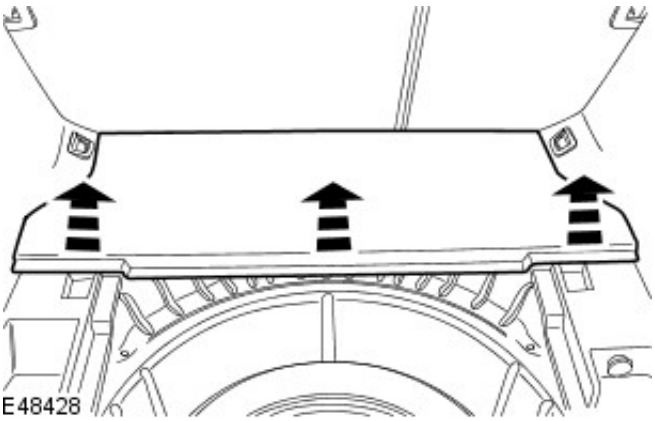
6. Remove the loadspace stowage compartment.



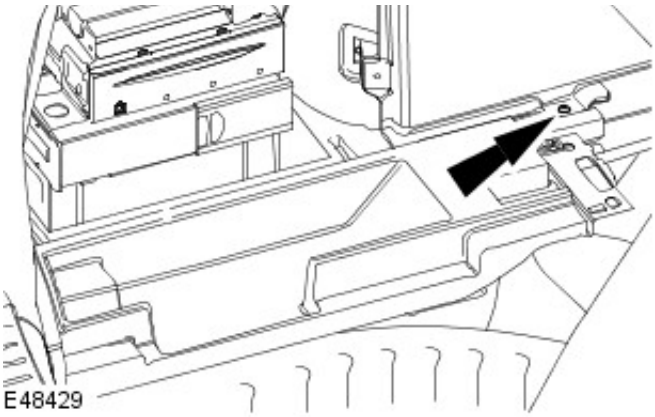
7. Remove the loadspace floor covering retaining screws.



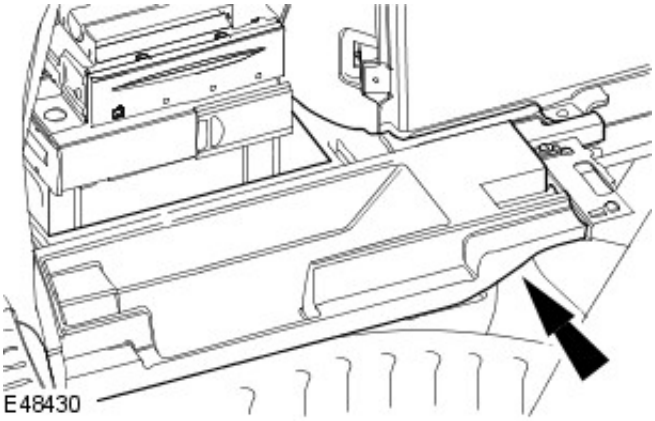
8. Detach the loadspace floor covering upwards.



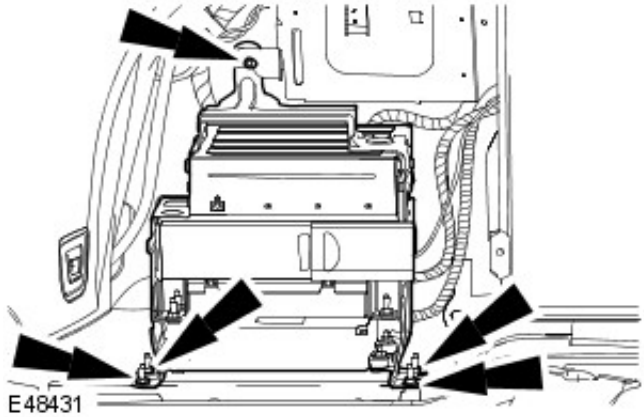
9. Remove the left-hand loadspace stowage compartment retaining screw.



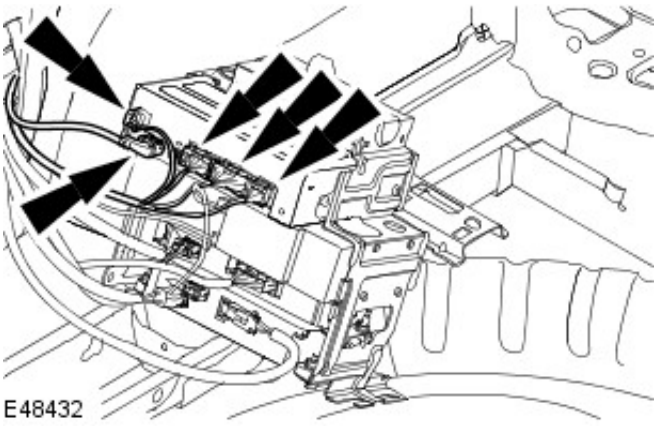
10. Remove the left-hand loadspace stowage compartment.



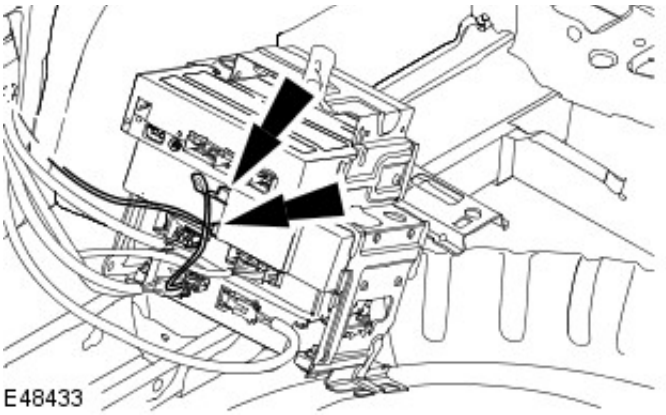
11. Detach the module retaining bracket.



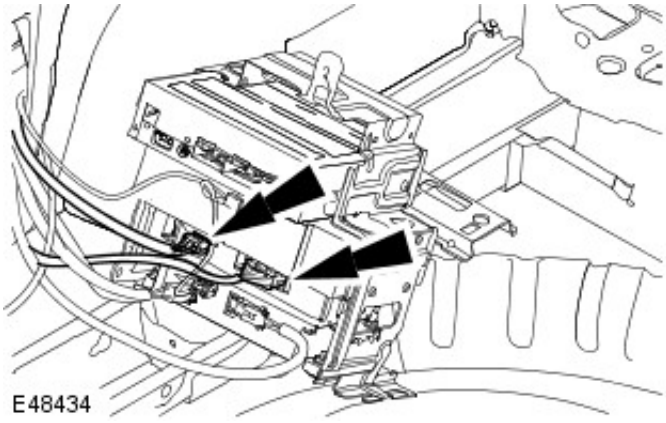
12. Disconnect the navigation system module electrical connectors.



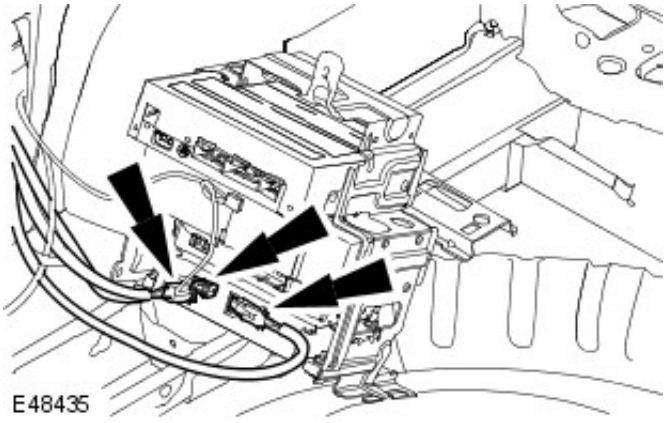
13. Disconnect the compact disc (CD) changer electrical connectors.


E48433

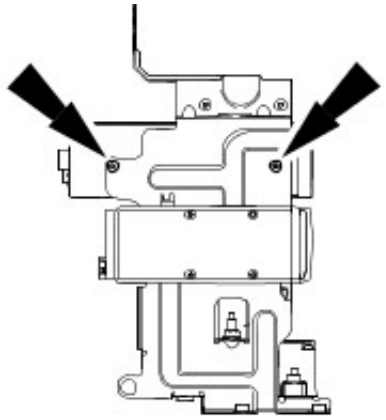
14. Disconnect the voice activated control module (VACM) electrical connectors.


E48434

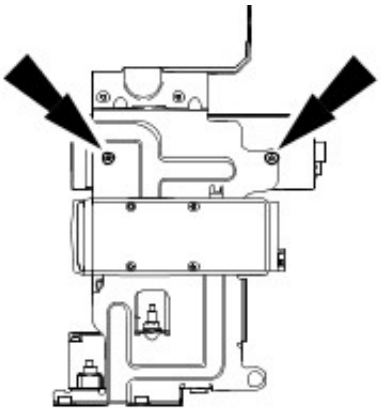
15. Disconnect the cellular phone module electrical connectors.


E48435

16. Remove the navigation system module retaining bolts.


E48450

17. Remove the system navigation module.

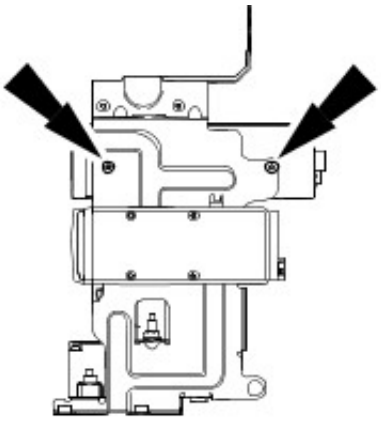


E48451

Installation

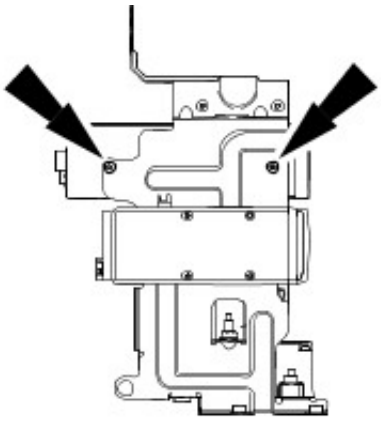
1. To install, reverse the removal procedure.

- Tighten to 3 Nm.



E48451

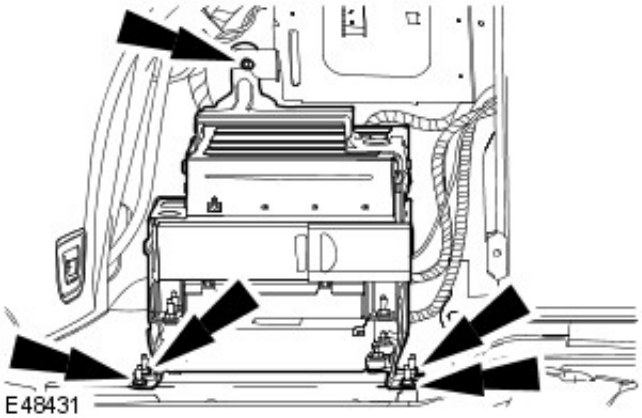
2. Tighten to 3 Nm.



E48450

3. Tighten the module retaining bracket upper and lower fixings.

- Tighten the lower retaining nuts to 4 Nm.
- Tighten the upper retaining bolt to 9 Nm.



E48431

4. Connect the battery ground cable
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

Cellular Phone -

Torque Specifications

Description	Nm	lb-ft	lb-in
Cellular phone module	5	-	44

Cellular Phone

The portable cellular phone system consists of:

- Cellular phone handset (GSM).
- Cradle (GSM).
- Cellular portable (US Only).
- Handset battery (US Only).
- Hang up cup (US Only).
- Roof console mounted microphone.
- Steering wheel switch controls.
- Portable support electronics (PSE) module (US Only).
- Transceiver (GSM).
- In-bumper cellular phone antenna.
- Antenna cable.
- Audio unit controls.

The cellular phone handset is located within the center console armrest. The audio control unit and the steering wheel controls are utilized to operate the system.

The vehicle utilizes two unique cellular phones systems:

- GSM
- US CDMA/TDMA digital and AMPS analogue systems

The voice activation control module provides the handsfree operation for cellular phone.

To activate the handsfree function:

1. Switch the ignition to the RUN position. After 4-6 seconds the system will be initialized and 'VOICE READY' will be displayed in the message center.

2. Operate the VOICE/PHONE switch on the steering wheel.

3. Clearly state the command when 'LISTENING' is displayed in the message center.

4. Operate the VOICE/PHONE switch on the steering wheel or remain silent for 1 second. If speech is detected 'PROCESSING' will be displayed in the message center. Operating the VOICE/PHONE switch again will cancel the voice session.

Refer to the Cellular Phone user guide for complete operating instructions.

For additional information on the voice activation control module, refer to **<<419-10>>** .

Cellular Phone - Cellular Phone

Description and Operation

CELLULAR PHONE - UP TO 2006MY

The portable cellular phone system consists of:

- Cellular phone handset (GSM).
- Cradle (GSM).
- Cellular portable (US Only).
- Handset battery (US Only).
- Hang up cup (US Only).
- Roof console mounted microphone.
- Steering wheel switch controls.
- Portable support electronics (PSE) module (US Only).
- Transceiver (GSM).
- In-bumper cellular phone antenna.
- Antenna cable.
- Audio unit controls.

The cellular phone handset is located within the floor console armrest. The audio control unit and the steering wheel controls are utilized to operate the system.

The vehicle utilizes two unique cellular phones systems:

- GSM
- US CDMA/TDMA digital and AMPS analogue systems

The voice activation control module provides the handsfree operation for cellular phone.

To activate the handsfree function:

1. **1.** Switch the ignition to the RUN position. After 4-6 seconds the system will be initialized and "VOICE READY" will be displayed in the message center.
2. **2.** Operate the VOICE/PHONE switch on the steering wheel.
3. **3.** Clearly state the command when "LISTENING" is displayed in the message center.
4. **4.** Operate the VOICE/PHONE switch on the steering wheel or remain silent for 1 second. If speech is detected "PROCESSING" will be displayed in the message center. Operating the VOICE/PHONE switch again will cancel the voice session.

Refer to the Cellular Phone user guide for complete operating instructions.

For additional information on the voice activation control module, refer to
For additional information, refer to: Module Controlled Functions (419-10 Multifunction Electronic Modules, Description and Operation).
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CELLULAR PHONE - FROM 2006MY - UP TO 2009MY

The system allows the driver to use a Bluetooth™ equipped cellular phone handset through the vehicle's Information and Entertainment system. Bluetooth™ is an international standard that allows electronic components to communicate with each other, using a short-range radio link. Bluetooth eliminates the need for wires or cables: typically, devices can communicate at a range of up to 10 metres (33 feet). Bluetooth™ is a registered trademark of Bluetooth SIG, Inc.

The Bluetooth™ system is as described in the following section for vehicles from 2009MY with the exception that only 1 telephone can be paired with the system and the Bluetooth™ antenna is located in the floor console.

Telephone Voice Control

The vehicle system is able to use any voice tags which are stored in the mobile telephone. There is no voice dialling feature of the cellular telephone system. Voice dialling is accessed via a long press of the voice button on the LH (left-hand) side of the steering wheel. The audio unit displays that Voice Tag dialling is in progress and an audible prompt is generated from the Bluetooth™ phone module. After the prompt the handset waits several seconds for the voice command. Refer to the Owners Handbook for further details on voice operation.

CELLULAR PHONE - FROM 2009MY

The system allows the driver to use a Bluetooth™ equipped cellular phone handset through the vehicles Information and Entertainment system. Bluetooth™ is an international standard that allows electronic components to communicate

with each other, using a short-range radio link. Bluetooth eliminates the need for wires or cables: typically, devices can communicate at a range of up to 10 metres (33 feet). Bluetooth™ is a registered trademark of Bluetooth SIG, Inc.

The Bluetooth in-car telephone system allows certain mobile phones to be used hands-free in your vehicle: there is no need to connect the mobile phone to a cradle or cable. The vehicle's Bluetooth telephone system can be used with an appropriate, Bluetooth™ equipped mobile phone. The mobile phone must be paired with the vehicle system before use - Refer to the Owners Handbook for details.

• NOTE: There is no physical connection (cradle) between the phone handset and the telephone control module. Communications between the 2 components are purely Bluetooth™. This can limit the available functions dependant on the handset used.

Once paired, the mobile phone can be operated via the steering wheel switches or the keypad and phone buttons on the audio panel or touch-screen. The mobile phone doesn't need to be physically connected to the vehicle: it can be left in a jacket pocket, for instance. Calls are routed through the vehicle's audio speakers, and a dedicated microphone is fitted in the overhead console, near the driver's head.

The system can be used to answer or reject incoming calls, make outgoing calls or alter the call volume. The system does not support Short Message Service (SMS) text messages. The vehicle starter switch must be set to position I or II in order to use the phone.

The volume of telephone calls can be adjusted for hands-free phone operation. To adjust the volume, operate the audio system's ON/OFF volume control on the steering wheel or audio unit during a phone call. If the audio system is in use when the phone becomes active, the audio system source is suppressed for the duration of the call. The Jaguar telephone system is designed to function with a wide variety of Bluetooth™ equipped mobile phones. The audio and echo characteristics vary between models of mobile phones: as a result, it may take a few seconds for the vehicle system to adapt to provide optimal audio performance. In order to achieve the best possible audio performance, it may be necessary to reduce the system volume slightly when using certain mobile phones.

Phone related messages are shown on the audio unit panel display or touch-screen when the phone system is active. The Bluetooth™ telephone system can be used in conjunction with the Voice Activation system to provide the driver with completely hands-free communication. Voice commands are picked up by the system microphone.

The cellular phone system comprises the following components:

- Bluetooth™ phone module
- Microphone
- Bluetooth™ antenna.

Phone dialling is achieved using one of the following methods:

- Dialling a number using the audio unit or touch screen
- Selecting a number from the handsets phonebook via the audio unit and the Bluetooth™ phone module
- Selecting from the handsets call register via the Bluetooth™ phone module.

The Bluetooth™ phone module is connected to the Information and Entertainment system on the D2B bus. This allows audio and control signals to be routed to and from the Bluetooth™ phone module. The Bluetooth™ phone module has a separate integral Bluetooth™ antenna located on the LH side of the luggage compartment on wagon vehicles and on the rear parcel shelf on 4 door vehicles.

Telephone handsets must be paired with the Bluetooth™ phone module before they can be used with the vehicle system. Up to 5 telephone handsets can be paired with the vehicle, but only 1 telephone can used at a time. If more than one phone is present in the vehicle, the last connected phone will be given priority on connection. Phone connection is active at ignition on. The phone will be disconnected 6 minutes after the ignition is switched off.

Phonebook and last number redial list are stored & synchronized for each of the 5 phones and are resynchronized when each phone reconnects.

Bluetooth™ Phone Module

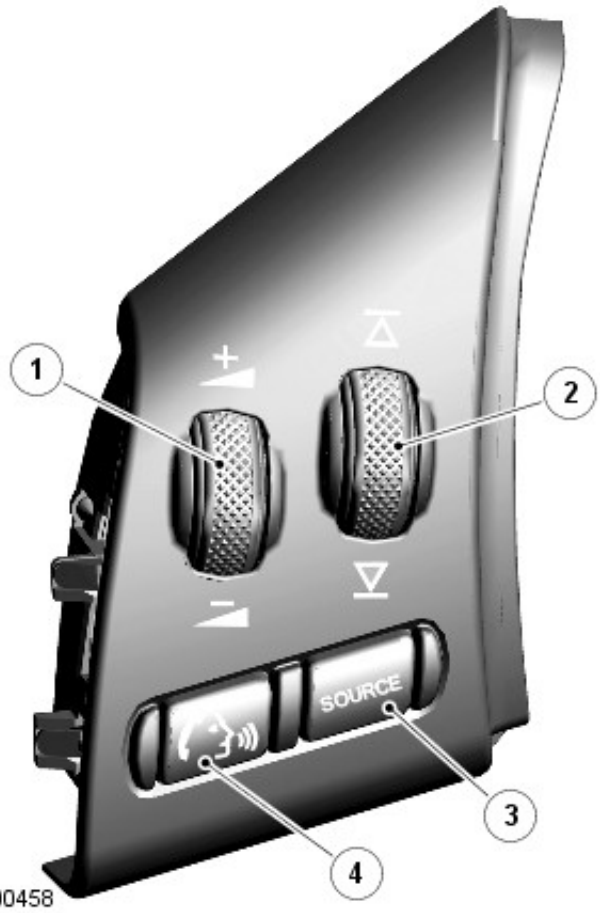
E88681

The Bluetooth™ phone module is located in the rear LH side of the luggage compartment. The Bluetooth™ phone module is connected on the D2B ring to the voice control module. The D2B ring allows control instructions and audio to be transferred to the relevant modules.

Microphone

The microphone is located adjacent to the overhead console which surrounds the front interior lamp. The microphone is hardwired to the voice module and the Bluetooth™ phone module.

Telephone Control Switches



E100458

Item	Part Number	Description
1	-	Rotary Volume control
2	-	Rotary control Telephone mode - scroll through stored numbers
3	-	Phone mode select button
4	-	Start voice mode button, answer telephone or send/end in phone mode

The telephone switches are located on the LH side of the steering wheel. Two rotary thumbwheels operate the volume of the selected audio function including the telephone and also allow the driver to scroll through stored telephone

numbers when in phone mode or select radio stations or CD's when in audio modes. The 'source' switch allows the driver to select phone mode by pressing the switch for 2 seconds. The switch can also be used to cycle through the AM, FM radio stations and CD's in the auto changer. The voice button will allow the start of the voice function or mute when voice system is not fitted and also answer a call when phone ringing and also send/end when in a phone call.

Bluetooth™ Antenna

E94941

The Bluetooth™ antenna is located on the LH side of the luggage compartment on wagon vehicles and on the rear parcel shelf on 4 door vehicles. The antenna is used to connect the Bluetooth™ phone module to a Bluetooth™ compatible phone.

Telephone Voice Control

The vehicle system is able to use any voice tags which are stored in the Jaguar Voice system. There is no voice dialling feature of the cellular telephone system. Voice dialling is accessed via a short press of the voice button on the LH side of the steering wheel. Refer to the Owners Handbook for further details on voice operation.

Cellular Phone - Cellular Phone

Diagnosis and Testing

Principle of Operation

For a detailed description of the phone system, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Cellular Phone (419-08 Cellular Phone, Description and Operation).

Inspection and Verification

Where a fault involving the cellular phone is indicated by the Jaguar Approved Diagnostic System, some basic diagnostic methods may be necessary to confirm that connections are good and that the wiring is not damaged, before installing new components.

1. **1.** Verify the customer concern by operating the portable cellular phone both in portable mode and while connected to the vehicle.
2. **2.** Make sure the portable convertible phone (US Only) is switched ON. With the power button ON, the system should be on while the ignition switch is in ACC or RUN.
3. **3.** Make sure the customer is calling within the coverage area. No Svc will appear in the display if the customer is calling from outside the coverage area.
4. **4.** Check to see if the Roam indicator is on. If so, follow the roaming instructions in the Cellular Phone User Guide.
5. **5.** Check to see if the display reads Locked CDMA/TDMA or pin for GSM. If so, press Clr and enter the customer three-digit unlock code for CDMA/TDMA or the customer pin number on the phone handset for GSM.
6. **6.** Make sure the portable cellular phone (US Only) is securely seated in the holder.
7. **7.** Make sure the GSM handset coil cord connector is correctly fitted to the armrest connector.
8. **8.** Check the portable cellular phone (US Only) antenna connections.
9. **9.** Check the portable cellular phone system registration (US Only). Also, check to make sure that the portable cellular phone is correctly programmed. Incorrect programming can result in single system scanning, loss of speed dialing, loss of hands-free audio, loss of auto redial, loss of dial tone multi-frequency tones, and the loss of other keypad/portable cellular phone functions.
10. **10.** Make sure that a valid SIM card is inserted in the handset SIM card reader (GSM Only)
11. **11.** Check the customer account status with the cellular carrier.

If the customer concern is still present, follow these steps to diagnose the concern:

12. **12.** Visually inspect for obvious signs of mechanical or electrical damage:

Visual Inspection Chart

Mechanical	Electrical
• Portable cellular phone (US only) • Microphone • Portable cellular phone holder (US only) • Coil cord	• Electrical connectors • Wiring harness for damage or corrosion • Fuses

System/Carrier Concerns - All Systems

Dropped calls, bad connections, noisy audio and other intermittent symptoms usually indicate a system or cellular carrier concern, and are not the fault of the phone itself. Such symptoms may occur in situations such as the following:

- In certain geographic areas (for example: areas of excessive foliage or hills) or at the edge of coverage areas.
- At the same place each day.
- At the same time each day.
- Under bridges, tunnels, in lower freeways, or in congested downtown areas.

If the customer phone exhibits any of the above symptoms or symptoms occur under the above conditions, the customer or the dealer should contact customer assistance at their particular cellular provider/carrier or call the assistance number provided in the Jaguar Cellular System Dealer kit.

Other Possible Concerns - All Systems

1. **1.** If, for some reason, the customer's electronic serial number was incorrectly recorded in the carrier switch, the phone will not work. Call the assistance number provided in the Jaguar Cellular System Dealer kit to check the electronic serial number CDMA/TDMA only.
2. **2.** A customer initial call must be made in his/her home coverage area for correct activation of the Jaguar Cellular System.
3. **3.** A customer may have to wait until after 24 hours of the coverage activation before making a call from outside of his/her home coverage area or the phone might be reported stolen and coverage stopped.
4. **4.** There may be a slight delay in activation after leaving the dealership from initial delivery.

If, after checking these possibilities, the phone still does not function, do not attempt to repair the phone. Call the cellular phone distributor.

DTC Index

 CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adapter kit, part number 3548-1358-00

• NOTE: If the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty policy and procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module or component

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults before beginning diagnostic routines that involve pinpoint tests

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion

• NOTE: If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

DTC	Description	Possible Source	Action
B1038	Microphone input circuit - short to ground	• Microphone fault • Wiring harness fault	Refer to appropriate circuit diagram, check microphone input circuits for short to ground. Repair circuit faults using appropriate materials and methods. Clear DTC, retest system to verify correct operation.
B1039	Microphone input circuit - short to battery	• Microphone fault • Wiring harness fault	Refer to appropriate circuit diagram, check microphone input circuits for short to battery. Repair circuit faults using appropriate materials and methods. Clear DTC, retest system to verify correct operation.
B1342	ECU is defective	• Internal ECU fault	This DTC also includes memory failure. Replace telephone ECU and clear DTC. retest system to verify correct operation.
B1893	GPS antenna open circuit	• GPS Antenna • Wiring harness fault	Check Antenna circuit for open circuits, repair wiring faults using approved methods and materials, clear DTC and retest to confirm correct operation.
B2102	Antenna circuit short to ground	• GPS Antenna • Wiring harness fault	Check Antenna circuit for short circuits, repair wiring faults using approved methods and materials, clear DTC and retest to confirm correct operation.
B2103	Antenna not connected	• GSM or Bluetooth Antenna • Wiring harness fault	Check GSM and Bluetooth antenna circuits for open circuits, repair wiring faults using approved methods and materials, clear DTC and retest to confirm correct operation.
B2141	NVM configuration failure	• No phone number • invalid phone number	Software error or SIM card error, confirm SIM is valid and download new software to phone module. Clear DTC and retest system to confirm operation.
B2477	Module configuration failure	• Configuration fault	No vehicle identification number present, configure vehicle. Clear DTC and recheck system to confirm correct operation.
B2633	Microphone not	• Microphone	Check microphone is connected correctly, Check microphone lines for

	connected	• Wiring harness fault	open circuits. install connectors correctly or repair wiring harness using appropriate methods and materials.
B2636	SOS switch input short circuit to ground	• SOS switch • Wiring harness fault	Check SOS switch is not stuck. Check SOS switch input line for short circuit to ground. Repair wiring harness faults using appropriate methods and materials. Replace SOS switch as required. Clear DTC and retest system for correct operation.
B2637	Information switch input short to ground	• Information switch • Wiring harness fault	Check information switch for faults, check wiring harness for information switch circuits shorted to ground. Repair wiring harness faults using approved methods and materials. Clear DTC and retest system for correct operation.
B2638	Phone rechargeable battery fault	• Phone battery faulty • Wiring harness fault	Check if the phone battery is correct for the phone in use. Confirm battery charging connections are in good condition and are connected to the power supply.
B2640	Deployment indication input short to ground	• Wiring harness	Check wiring harness for airbag deployment indication circuit short to ground. Repair wiring fault using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2641	Deployment indication input short to battery	• Wiring harness	Check wiring harness for airbag deployment indication circuit short to power. Repair wiring fault using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2904	Partial mute circuit failure	• Wiring harness	Check mute circuits from phone ECU to radio head unit and nav system ECUs are not short to ground. Repair wiring harness using approved methods and materials
U2601	D2B wake up short to ground	• Wiring harness	Check D2B wake up circuit for short to ground. Repair Wiring harness using approved materials and methods. Clear DTC and retest to confirm correct operation.
U2609	D2B wake up pulse width out of specification	• Module software issue	D2B pulse width specification is <50mS - >110mS, if the pulse width is outside this range check the module configuration and programming. Reconfigure and reprogramme module, clear DTC and retest system to confirm correct operation.
U2610	D2B Slave ECU fails to receive a report position	• D2B network concern	During initialisation no position status report is received, check D2B network for open circuits, shorts. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.
U2611	D2B Slave ECU fails to receive an alarm clear command	• D2B network concern	On entering alarm state, slave ECU has fail to receive alarm clear command, check D2B network for open circuits, shorts. Repair wiring harness using approved methods and materials. Clear DTC and retest system to ensure correct operation.

Cellular Phone - Cellular PhoneVehicles With: Bluetooth
Diagnosis and Testing

Overview

This section covers the components of the Bluetooth cellular phone system.

For information on the description and operation of the Bluetooth cellular phone system :
REFER to: Cellular Phone - VIN Range: N52048->N99999 (419-08 Cellular Phone, Description and Operation).

For additional information on the Bluetooth cellular phone system : REFER to owner information - Bluetooth telephone system handbook.

Inspection and Verification

• NOTE: **Only cellular phones and software versions featured in the Jaguar Bluetooth approved phones and software list can be guaranteed to operate correctly.**

Check the D2B ring order and circuit integrity.

Before pairing a handset to the Bluetooth phone system make sure that the handbook for the specific handset is available.

1. **1.** Verify the customer concern by operating the system using the customers cellular phone.
2. **2.** Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
• Fuse(s) • Wiring harness • Electrical connector(s) • Bluetooth cellular phone • Microphone • Steering wheel control • Bluetooth upgrade module • Portable support electronics (PSE) module • Voice module

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** Use the approved diagnostic system or a scan tool to retrieve any DTCs before moving onto the symptom chart.
    - Make sure that all DTCs are cleared following rectification.

Symptom Chart

Symptom	Action
"NO PHONE FITTED" (touch-screen) message displayed continuously or "NO PHONE" message displayed every time the phone mode button is pressed	GO to Pinpoint Test A.
"HANDSET IN USE" (touch-screen) message displayed for more than 2 minutes, or "HANDSET" message displayed every time the phone mode button is pressed and never changes to "SIG*"	GO to Pinpoint Test B.
Unable to pair the handset to telephone system	GO to Pinpoint Test C.
"PHONE OFF" message displayed (touch-screen only)	GO to Pinpoint Test D.
Cannot answer/reject/end call from the audio head unit/touch screen/steering wheel control	GO to Pinpoint Test E.
Unable to connect the handset to telephone system	GO to Pinpoint Test F.
Bluetooth connection is dropped	GO to

	Pinpoint Test G.
Incorrect or no phonebook entries	GO to Pinpoint Test H.
No third party audio	GO to Pinpoint Test I.
No in-vehicle audio	GO to Pinpoint Test J.
No ringing heard through the vehicle speakers	GO to Pinpoint Test K.
Low audio volume	GO to Pinpoint Test L.
Cannot dial out from audio head unit/touch-screen/steering wheel control	GO to Pinpoint Test M.
Voice activated phone functions inoperative	GO to Pinpoint Test N.
Call is dropped	GO to Pinpoint Test O.
Interference and distortion	GO to Pinpoint Test P.
Unable to transfer call between hands free and handset	GO to Pinpoint Test Q.

Pinpoint Tests

• NOTE: When performing voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the DMM leads into account.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If a control module or component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, before the replacement of a component.

PINPOINT TEST A : "NO PHONE FITTED" (TOUCH-SCREEN) MESSAGE DISPLAYED CONTINUOUSLY OR "NO PHONE" MESSAGE DISPLAYED EVERY TIME THE PHONE MODE BUTTON IS PRESSED	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
A1:	
	1
	Is the car a USA/Mexico/Canada car? **Yes** GO to A3. **No** GO to A2.
A2:	
	1
	Is the VIN of the car post VIN break for Bluetooth? (Refer to Technical Helpline for VIN break information). **Yes** GO to A3. **No** The Bluetooth system cannot be retrofitted to rest of world cars pre-VIN break or to those cars not fitted with the Bluetooth pre-wire due to a harness architecture change.
A3:	
	1
	Has the correct harness been fitted to the car?

	Yes GO to A4. **No** The Bluetooth system cannot be retrofitted to rest of world cars pre-VIN break or to those cars not fitted with the Bluetooth pre-wire due to a harness architecture change. (Refer to Technical Helpline for VIN break and pre-wire information).
A4:	
	1
	Does the display ever return to the main phone screen or ever display "PHONE"? **Yes** GO to A6. **No** GO to A5.
A5:	
	1
	Check the part number of the portable support electronics (PSE) module. Has the correct part been fitted? **Yes** Check power, ignition and ground circuits/connections at the PSE module.GO to A7. **No** Refer to the warranty policy and procedures manual if the PSE module is suspect.
A6:	
	1
	Are any of the D2B connections loose or damaged? **Yes** Reconnect/change/repair the D2B leads and check for normal operation. **No** GO to A7.
A7:	
	1
	Are power, ignition and ground being supplied to the portable support electronics (PSE) module? **Yes** Refer to the warranty policy and procedures manual if the PSE module is suspect. **No** Rectify as necessary. Refer to the electrical guides.

PINPOINT TEST B : "HANDSET IN USE" (TOUCH-SCREEN) MESSAGE DISPLAYED FOR MORE THAN 2 MINUTES OR "HANDSET" MESSAGE DISPLAYED EVERY TIME THE PHONE MODE BUTTON IS PRESSED AND NEVER CHANGES TO "SIG*"	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1:	
	1
	Has the system been paired to a handset? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. The Bluetooth upgrade module remains active for 6 minutes after the ignition has been switched off. It is important to wait this 6 minutes so that a clean boot-up of the Bluetooth upgrade module is achieved and the correct information is stored. Switch off the paired handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on, make sure the Bluetooth function is on and the handset is within range. Key on ignition. GO to B2. **No** GO to B3.
B2:	
	1
	Does the system still display "HANDSET IN USE" (touch-screen) message displayed for more than 2 minutes, or "HANDSET" message displayed every time the phone mode button is pressed and then drops out of phone mode? **Yes** GO to B3. **No** Problem may have been due to the Bluetooth link being disconnected.
B3:	
	1
	Is the connection between the Bluetooth upgrade module and the phone harness loose? **Yes**

	Reconnect the Bluetooth upgrade module and check for normal operation. **No** GO to B5.
B4:	
	1
	Are any of the Bluetooth upgrade module pins damaged? **Yes** Refer to the warranty policy and procedures manual if the Bluetooth upgrade module is suspect. **No** Check harness to/from the Bluetooth upgrade module and the portable support electronics (PSE) module.GO to B5.
B5:	
	1
	Is power being supplied to the Bluetooth upgrade module? **Yes** Refer to the warranty policy and procedures manual if the Bluetooth upgrade module is suspect. **No** GO to B6.
B6:	
	1
	Are power, ignition, and ground being supplied to the portable support electronics (PSE) module? **Yes** Refer to the warranty policy and procedures manual if the PSE module is suspect. **No** Rectify as necessary. Refer to the electrical guides.

PINPOINT TEST C : - UNABLE TO PAIR THE HANDSET TO TELEPHONE SYSTEM	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
C1:	
	1
	Has another handset previously been paired to the system? **Yes** GO to C2. **No** GO to C3.
C2:	
	1
	Is the "HANDSET IN USE" (touch-screen) or "HANDSET" message displayed, or does the system drop out of phone mode? **Yes** Go to'"HANDSET IN USE" or "HANDSET"' message displayed - GO to Pinpoint Test B. **No** GO to C3.
C3:	
	1
	Does the touch-screen display "Discover Me" with 4 or 5 bars (The 5th bar will flash slowly) or does the audio head unit display "SIG****" or "SIG*****" (The 5th '*' will flash slowly)? **Yes** Retry the pairing process following the 'quick guide information' for the specific handset.GO to C4. **No** Enter the ##3#*# pairing key sequence.GO to C5.
C4:	
	1
	Has the handset paired with the system successfully? ("Phone connected" displayed (touch screen) or "SIG*" displayed (audio head unit display))? **Yes** Problem may have been due to a faulty Bluetooth connection. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. The Bluetooth upgrade module remains active for 6 minutes after the ignition has been switched off. It is important to wait this 6 minutes so that a clean boot-up of the Bluetooth upgrade module is achieved and the correct information is stored. Switch off the paired handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on, make sure the Bluetooth function is on and the handset is within range. Key on ignition. GO to C7.
C5:	

	Does the touch-screen display "Discover Me" with 4 or 5 bars (The 5th bar will flash slowly) or does the audio head unit display "SIG****" or "SIG*****" (The 5th '*' will flash slowly)? **Yes** Retry the pairing process following the 'quick guide information' for the specific handset. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. GO to C6.
C6:	
	1
	Does the touch-screen display "Discover Me" with 4 or 5 bars (The 5th bar will flash slowly) or does the audio head unit display "SIG****" or "SIG*****" (The 5th '*' will flash slowly)? **Yes** Retry the pairing process following the 'quick guide information' for the specific handset. **No** GO to C9.
C7:	
	1
	Has the handset paired with the system successfully ("Phone connected" displayed (touch screen) or "SIG*" displayed (audio head unit display))? **Yes** Problem may have been due to a faulty Bluetooth connection. **No** Pair and connect a different known 'good' handset to the vehicle phone system. GO to C8.
C8:	
	1
	Has the handset paired with the system successfully ("Phone connected" displayed (touch screen) or "SIG*" displayed (audio head unit display))? **Yes** Problem may be an issue with the user's handset, consult the handset supplier. **No** GO to C9.
C9:	
	1
	Is the connection between the Bluetooth upgrade module and the phone harness loose? **Yes** Reconnect the Bluetooth upgrade module and check for normal operation. **No** GO to C10.
C10:	
	1
	Is power being supplied to the Bluetooth upgrade module? **Yes** Refer to the warranty policy and procedures manual if the Bluetooth upgrade module is suspect. **No** GO to C11.
C11:	
	1
	Are power, ignition, and ground being supplied to the portable support electronics (PSE) module? **Yes** Refer to the warranty policy and procedures manual if the PSE module is suspect. **No** Rectify as necessary. Refer to the electrical guides.

PINPOINT TEST D : "PHONE OFF" MESSAGE DISPLAYED (TOUCH-SCREEN ONLY)	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
D1:	
	1
	Is the Bluetooth system paired to a mobile phone handset? **Yes** GO to D2. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition.GO to D5.
D2:	
	1

	Is the paired phone handset within range and switched on? **Yes** GO to D3. **No** GO to D4.
D3:	
	1
	Is the paired phone handset 'connected' to the vehicle phone system? **Yes** GO to D4. **No** Follow instructions to 'connect' specific handset with the vehicle phone system.GO to D4.
D4:	
	1
	Has the user switched out of phone mode e.g. audio, and then back to phone mode? **Yes** This is a system issue carried over from the previous phone system. Make sure that the last paired phone is on and within range, and test for normal operation. **No** Call Technical Helpline.
D5:	
	1
	Does the display still show the "PHONE OFF" message? **Yes** GO to D6. **No** Check for normal operation.
D6:	
	1
	Are the D2B connections loose or damaged? **Yes** Reconnect/change/repair the D2B leads and check for normal operation. **No** GO to D7.
D7:	
	1
	Check all connections/connectivity to and from the portable support electronics (PSE) module and the Bluetooth upgrade module. Are any of the harness connections loose or damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST E : CANNOT ANSWER/REJECT/END CALL FROM THE AUDIO HEAD UNIT/TOUCH SCREEN/STEERING WHEEL CONTROL	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1:	
	1
	Cannot answer call? **Yes** Read DTCs from the portable support electronics (PSE) module using the approved diagnostic system and rectify as necessary.GO to E3. **No** GO to E2.
E2:	
	1
	Cannot reject/end call? **Yes** This is a network dependant feature, consult the relevant mobile phone network before continuing. Read DTCs from the portable support electronics (PSE) module using the approved diagnostic system and rectify as necessary.GO to E3. **No** GO to E3.
E3:	
	1

	Can call be answered/rejected/ended from the handset (with Bluetooth link still connected)? **Yes** GO to E4. **No** Disconnect the Bluetooth link between the handset and vehicle phone system and re-try the call.GO to E5.
E4:	
	1
	Is audio heard during call/call set up? **Yes** Refer to audio head unit diagnostics using the approved diagnostic system. **No** Check D2B ring is complete. Rectify as necessary.
E5:	
	1
	Can call be answered/rejected/ended from the handset with Bluetooth link disconnected? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Switch off the handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on. Key on ignition. Make sure the Bluetooth link is reconnected and re-try the call.GO to E6. **No** This may be a handset issue, consult the handset supplier.
E6:	
	1
	Can the call be answered/rejected/ended from the handset (with Bluetooth link connected)? **Yes** Problem may have been due to the Bluetooth link being inoperative. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call.GO to E7.
E7:	
	1
	Can the call be answered/rejected/ended from the handset (with Bluetooth link connected)? **Yes** This may be a handset issue, consult the handset supplier. **No** GO to E8.
E8:	
	1
	Check all connections/connectivity to and from the portable support electronics (PSE) module and the Bluetooth upgrade module. Are any of the harness connections loose or damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST F : UNABLE TO CONNECT THE HANDSET TO TELEPHONE SYSTEM	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
F1:	
	1
	Was the handset the last device to be connected to the vehicle? **Yes** GO to F2. **No** In the handset Bluetooth menu, delete any existing "Jaguar" devices from the list. Enter the ##3#*# key sequence to initiate the pairing process. Follow pairing process for the specific handset. GO to F6.
F2:	
	1
	In the handset Bluetooth menu, is "Jaguar" listed as a paired device? **Yes** GO to F3. **No** Follow pairing process for the specific handset. GO to F6.

F3:

	1
	Is the handset 'connected' to another Bluetooth device (i.e. not "Jaguar")? **Yes** Check "Active Devices" in the handset's Bluetooth menu and disconnect the handset from the other Bluetooth device. Follow the instructions for the specific handset to allow the handset to 'connect' to the vehicle.GO to F8. **No** GO to F4.

F4:

	1
	What message does the vehicle display show, "Connected" or "No BT Phone"? **Yes** Follow the vehicle un-pairing process, delete "Jaguar" from the handset device list and key off ignition for 6 minutes. Key on ignition. Follow the pairing process for the specific handset.GO to F6. **No** GO to F5.

F5:

	1
	Is the vehicle in "Discover Me" mode? **Yes** Follow pairing process for the specific handset. GO to F6. **No** Go to'"HANDSET IN USE" or "HANDSET"' message displayed - GO to Pinpoint Test B.

F6:

	1
	Has the handset paired successfully with the vehicle? **Yes** GO to F7. **No** Go to 'Unable to pair' - GO to Pinpoint Test C.

F7:

	1
	Has the handset automatically connected to the vehicle phone system? **Yes** Following the instructions for the specific handset to make sure that the Bluetooth settings are set for automatic connection, connection should now be complete. **No** Follow the instructions for the specific handset to allow the handset to 'connect' to the vehicle.GO to F8.

F8:

	1
	Has the handset connected to the vehicle phone system? **Yes** Following the instructions for the specific handset to make sure that the Bluetooth settings are set for automatic connection, connection should now be complete. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Switch off the handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on. Key on ignition. Re-try pairing and connecting. GO to F9.

F9:

	1
	Has the handset connected to the vehicle phone system? **Yes** Following the instructions for the specific handset to make sure that the Bluetooth settings are set for automatic connection, connection should now be complete. **No** Pair and connect a different known 'good' handset to the vehicle phone system. GO to F10.

F10:

	1
	Does the handset 'connect' OK? **Yes** This is a handset issue, consult the handset supplier. **No** Refer to the warranty policy and procedures manual if the Bluetooth upgrade module is suspect.

PINPOINT TEST G : BLUETOOTH CONNECTION IS DROPPED

TEST CONDITIONS	DETAILS / RESULTS / ACTIONS
G1:	
	1
	Does the handset battery have a good level of charge? **Yes** GO to G2. **No** Recharge the handset battery. Bluetooth performance cannot be guaranteed with low battery power.
G2:	
	1
	Does the handset show good signal strength? **Yes** GO to G3. **No** Without good signal strength, the vehicle display will show "SIG_____" or "No BT Phone" or "No Service". Move into an area with good signal strength and check for normal operation.
G3:	
	1
	Check the handset menu. Has auto connect been turned on? **Yes** GO to G4. **No** Switch auto connect on and check for normal operation.
G4:	
	1
	Has the user tried to transfer a call from hands free to handset? **Yes** Check the handset guide info, some handsets will not auto reconnect Bluetooth after a handset call. **No** GO to G5.
G5:	
	1
	Does the handset display show that it is connected to the vehicle? **Yes** GO to G7. **No** GO to G6.
G6:	
	1
	Does the vehicle display "SIG_____" or "No BT Phone"? **Yes** Follow instructions for the specific handset to 'connect' the handset to vehicle.GO to G10. **No** GO to G7.
G7:	
	1
	Does the vehicle display "SIG*" or "Phone Connected"? **Yes** Bluetooth connection has not been dropped, check for normal operation. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Switch off the handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on. Key on ignition. GO to G8.
G8:	
	1
	Does the vehicle display "SIG*" or "Phone Connected"? **Yes** Check for normal operation. **No** Follow the vehicle un-pairing process, delete "Jaguar" from the handset device list and key off ignition for 6 minutes. Key on ignition. Follow pairing process for the specific handset. GO to G9.
G9:	
	1

	Has the handset paired successfully with the vehicle? **Yes** Follow instructions for the specific handset to 'connect' the handset to vehicle.GO to G10. **No** Go to 'Unable to pair' - GO to Pinpoint Test C.
G10:	
	1
	Does the handset 'connect'? **Yes** GO to G11. **No** Go to 'Unable to connect' - GO to Pinpoint Test F.
G11:	
	1
	Does the vehicle display show that it is 'connected'? **Yes** Check for normal operation. **No** Refer to the warranty policy and procedures manual if the Bluetooth upgrade module is suspect.

PINPOINT TEST H : INCORRECT OR NO PHONEBOOK ENTRIES	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
H1:	
	1
	Check the Jaguar Bluetooth approved phone list guide: Does the handset support phonebook download? **Yes** GO to H2. **No** Advise user that the handset does not support phonebook download.
H2:	
	1
	Is the Bluetooth system paired and connected to a phone handset? **Yes** GO to H3. **No** Pair and connect an approved handset to the vehicle phone system.GO to H2.
H3:	
	1
	Has the user followed vehicle and handset instructions for downloading phonebook? **Yes** GO to H4. **No** Refer to the vehicle handbooks/handset 'quick guide information' regarding phonebook download. Check for normal operation.
H4:	
	1
	After "Downloading the phonebook" has the ignition been switched off for 6 minutes? **Yes** GO to H7. **No** Make sure that the ignition has been switched off for 6 minutes after following process for downloading phonebook. The Bluetooth upgrade module remains active for 6 minutes after the ignition has been switched off. It is important to wait this 6 minutes so that a clean boot-up of the Bluetooth upgrade module is achieved and the correct information is stored. Switch ignition on to prompt the portable support electronics (PSE) module to pull phonebook entries from the Bluetooth upgrade module. GO to H5.
H5:	
	1
	Can the user view the phonebook entries on the vehicle display? **Yes** End. **No** GO to H6.

H6:

	1
	Have two or more handsets been tried? **Yes** GO to H9. **No** Pair and connect a different known 'good' handset which will automatically download the phonebook to the vehicle phone system. GO to H9.

H7:

	1
	After switching the ignition back on, does the handset connect to the vehicle phone system? **Yes** GO to H8. **No** Reconnect the handset and make sure auto-reconnect is set to on.GO to H7.

H8:

	1
	Is the phonebook available on the vehicle display? **Yes** End **No** Pair and connect a different known 'good' handset which will automatically download the phonebook to the vehicle phone system.GO to H9.

H9:

	1
	Is the phonebook available on the vehicle display? **Yes** This is an issue with the user's handset, consult the handset supplier. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST I : NO THIRD PARTY AUDIO	
TEST CONDITIONS	**DETAILS / RESULTS / ACTIONS**
I1:	
	1 Check the handset manual and the handset settings to make sure user's speech is routed through the vehicle microphone and not the handset microphone.
	Does 3rd party call audio work with the call in 'handset' mode? **Yes** Check for telephone related DTCs using the approved diagnostic system. Rectify as necessary.GO to I5. **No** GO to I2.
I2:	
	1
	Is there any 3rd party call audio with the handset disconnected from the Bluetooth system? **Yes** Pair and connect a different known 'good' handset to the vehicle phone system and make a call to the 3rd party. GO to I4. **No** Try calling another 3rd party from the handset.GO to I3.
I3:	
	1
	Is there any 3rd party audio? **Yes** Initial audio problem may be due to a fault at 3rd party end. Check by calling them on another number. **No** This may be a handset issue, consult the handset supplier.
I4:	
	1
	Does the 3rd party call audio work with the Bluetooth system? **Yes** This may be a handset issue, consult the handset supplier. **No** Check for telephone related DTCs using the approved diagnostic system. Rectify as necessary.GO to I5.

I5:	
	1
	Is there any 3rd party audio? **Yes** End. **No** Disconnect the Bluetooth link between the handset and vehicle phone system and re-try the call.GO to I6.
I6:	
	1
	Does the 3rd party call audio work with the mobile phone disconnected from the vehicle? **Yes** Re-connect the Bluetooth link between the handset and the vehicle phone system and re-try the call.GO to I8. **No** Switch off the handset, remove the battery from the back of the handset. Replace the battery into the handset and switch on. Make sure the Bluetooth link is disconnected and re-try the call.GO to I7.
I7:	
	1
	Does the 3rd party call audio work with the mobile phone disconnected from the vehicle? **Yes** Problem may be due to a faulty Bluetooth connection. **No** This may be a handset issue, consult the handset supplier.
I8:	
	1
	Does the 3rd party call audio work with the Bluetooth system? **Yes** Problem may be due to a faulty Bluetooth connection. **No** GO to I9.
I9:	
	1
	Does the 3rd party call audio work with the mobile phone in 'handset' mode? **Yes** GO to I10. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Make sure the Bluetooth link is re-connected and re-try the call pairing and connecting.GO to I14.
I10:	
	1
	Does the vehicle have voice control fitted? **Yes** GO to I11. **No** GO to I12.
I11:	
	1
	Does the voice control pick up commands from the user? **Yes** Check harness connections between the microphone and the portable support electronics (PSE) module are not loose or damaged.GO to I16. **No** Refer to the warranty policy and procedures manual if the voice control module is suspect.
I12:	
	1
	Is the vehicle a USA/Canada/Mexico vehicle? **Yes** GO to I13. **No** Check harness connections between the microphone and the portable support electronics (PSE) module are not loose or damaged.GO to I16.
I13:	
	1

	Yes Check harness connections between the microphone and the portable support electronics (PSE) module are not loose or damaged.GO to I16. **No** Fit the voice control shorting loop and check for normal operation.
I14:	
	1
	Does the 3rd party call audio work with the Bluetooth system? **Yes** Problem may be due to a faulty Bluetooth connection. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call.GO to I15.
I15:	
	1
	Does the 3rd party call audio work with the Bluetooth system? **Yes** This may be a handset issue, consult the handset supplier. **No** Check harness connections between the microphone and the portable support electronics (PSE) module are not loose or damaged.GO to I16.
I16:	
	1
	Are the microphone harness connections damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Replace the microphone and re-try the call. GO to I17.
I17:	
	1
	Does the 3rd party call audio work with the Bluetooth system? **Yes** Problem may have been due to a faulty microphone. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST J : NO IN-VEHICLE AUDIO	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
J1:	
	1
	Can the audio sources be heard through the vehicle speakers e.g. radio? **Yes** GO to J2. **No** Check D2B connections are not loose or damaged. Reconnect/change/repair the D2B leads and check for normal operation.
J2:	
	1
	Can the call be heard when transferred to the handset? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Make sure the Bluetooth link is reconnected and re-try the call. GO to J3. **No** Disconnect the Bluetooth link between the handset and vehicle phone system and re-try the call. GO to J4.
J3:	
	1
	Can the audio be heard through the vehicle speakers? **Yes** The audio problem may have been due to the Bluetooth link being disconnected. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make a call to the 3rd party.GO to J7.
J4:	
	1

	Does the handset audio work with mobile phone disconnected from the vehicle? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Switch off the handset; remove the battery from the back of the handset. Replace the battery into the handset and switch on. Key on ignition. Make sure the Bluetooth link is reconnected and re-try the call. GO to J6. **No** Try calling another 3rd party from the handset. GO to J5.
J5:	
	1
	Is there any call audio on the handset? **Yes** Initial audio problem may be due to a fault at the 3rd party end, check by calling them on another number. **No** This may be a handset issue, consult the handset supplier.
J6:	
	1
	Can the audio be heard through the vehicle speakers? **Yes** The audio problem may have been due to the Bluetooth link being disconnected. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make a call to the 3rd party.GO to J7.
J7:	
	1
	Can the audio be heard through the vehicle speakers? **Yes** This may be a handset issue, consult the handset supplier. **No** Check harness connections between the Bluetooth upgrade module and the portable support electronics (PSE) module. GO to J8.
J8:	
	1
	Are any of the harness connections damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST K : NO RINGING HEARD THROUGH THE VEHICLE SPEAKERS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
K1:	
	1
	When there is no call in progress, and the audio source is changed, is any audio heard e.g. from radio? **Yes** GO to K3. **No** Check D2B connections are not loose and that all nodes are connected on the D2B ring. Rectify as necessary.GO to K2.
K2:	
	1
	Are any of the D2B connections damaged? **Yes** Change/repair the D2B leads and check for normal operation. **No** Call Technical Helpline.
K3:	
	1
	Is the vehicle phone system volume set to more than 15? **Yes** GO to K4. **No** Make sure that the vehicle phone system is set to more than 15 and retry the call.
K4:	

	1
	Is the message "incoming call" displayed? **Yes** GO to K5. **No** GO to K6.
K5:	
	1
	On answering the incoming call using the vehicle controls, can the 3rd party be heard through the vehicle speakers? **Yes** GO to K6. **No** Go to 'No in-vehicle audio' - GO to Pinpoint Test J.
K6:	
	1
	Is there any ringing heard on the handset with the Bluetooth link connected? **Yes** GO to K7. **No** GO to K10.
K7:	
	1
	Does the handset support in-band ringing or send its ringing status to the Bluetooth upgrade module? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Make sure the Bluetooth link is re-connected and re-try the call. GO to K8. **No** This is a handset issue, contact the handset supplier or replace with another handset from the approved list.
K8:	
	1
	Can any ringing be heard through the vehicle speakers? **Yes** The audio problem may have been due to the Bluetooth link being disconnected. **No** Un-pair the current handset and pair/connect a known good handset with the vehicle. Make an incoming call. GO to K9.
K9:	
	1
	Can any ringing be heard through the vehicle speakers? **Yes** Contact the handset supplier, the handset may be faulty. **No** GO to K10.
K10:	
	1
	Is the message "incoming call" displayed? **Yes** Check the handset instructions to find "profile" settings.GO to K14. **No** GO to K11.
K11:	
	1
	Does the handset have good signal strength? **Yes** Disconnect the Bluetooth connection. Make sure the handset is not set to silent. Then make an incoming call. GO to K12. **No** Move into area where the handset receives good signal strength. Make an incoming call and check for normal operation.
K12:	
	1
	Is there any ringing heard on the handset with the Bluetooth link disconnected? **Yes** Reconnect the Bluetooth connection, and then make an incoming call. GO to K13.

	No Contact the handset supplier, the handset may be faulty.
K13:	
	1
	Can any ringing be heard through the vehicle speakers? **Yes** Problem due to a faulty Bluetooth link. **No** GO to K4.
K14:	
	1
	Has the handset "profile" been set to "silent"? **Yes** Change settings within profile, make an incoming call and check for normal operation. **No** GO to K15.
K15:	
	1
	Has the handset volume been set to minimum? **Yes** Increase volume setting, make an incoming call and check for normal operation. **No** Check Bluetooth connection between the handset and vehicle is OK. GO to K16.
K16:	
	1
	Is the Bluetooth connection OK? **Yes** Disconnect the Bluetooth connection. Make sure that the handset is NOT set to silent, then make an incoming call.GO to K17. **No** Follow the handset instructions for 'connecting' the Bluetooth link, then make an incoming call and check for normal operation.
K17:	
	1
	Is there any ringing heard on the handset? **Yes** Reconnect Bluetooth link between the handset and vehicle.GO to K18. **No** Un-pair the current handset and pair/connect a known good handset with the vehicle. Make an incoming call. GO to K9.
K18:	
	1
	Can any ringing be heard through the vehicle speakers? **Yes** Change settings within profile, make an incoming call and check for normal operation. **No** Check harness connections between the Bluetooth upgrade module and the portable support electronics (PSE) module.GO to K19.
K19:	
	1
	Are any of the harness connections damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST L : LOW AUDIO VOLUME	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
L1:	
	1
	Low volume in vehicle (rather than at 3rd party)? **Yes** GO to L2. **No** If volume is low at 3rd party.GO to L9.

L2:

	1
	Is the vehicle phone volume set at 12 or above? **Yes** Check fade & balance are both set at '0' or mid point on slider controls. GO to L3. **No** Increase phone volume to above 12. GO to L1.

L3:

	1
	Is radio volume OK? **Yes** GO to L4. **No** Call Technical Helpline.

L4:

	1
	Is Bluetooth link between the handset and vehicle still connected? **Yes** GO to L5. **No** Re-connect the Bluetooth link and re-try the call.GO to L1.

L5:

	1
	Is call volume still low when call transferred to 'handset' mode? **Yes** GO to L6. **No** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition and re-try the call. GO to L16.

L6:

	1
	Is the call volume still low with the handset disconnected from the Bluetooth system? **Yes** GO to L7. **No** Try calling another 3rd party from the handset.GO to L8.

L7:

	1
	Is the handset volume setting low? **Yes** Increase the handset volume setting and re-try the call.GO to L6. **No** Low audio issue due to the handset, consult the handset supplier.

L8:

	1
	Is the call volume still low with the handset disconnected from the Bluetooth system? **Yes** Low audio issue due to the handset, consult the handset supplier. **No** Initial audio problem may be due to a fault at the 3rd party end. Check by calling them on another number.

L9:

	1
	Check that handset volume setting and signal strength are not low. Is call volume still low when call transferred to 'handset' mode? **Yes** GO to L14. **No** GO to L10.

L10:

	1
	Is the microphone fitted OK? Check DTCs using the approved diagnostic system. **Yes** GO to L12. **No** Rectify as necessary.GO to L11.

L11:

	1
	Is volume still low? **Yes** GO to L12. **No** Issue caused by faulty microphone or microphone circuit.

L12:

	1
	Is voice control fitted to vehicle? **Yes** Disconnect the voice control module and fit the voice control shorting loop to the wiring harness.GO to L13. **No** GO to L14.

L13:

	1
	Is volume still low? **Yes** GO to L14. **No** Refer to voice control diagnostics.

L14:

	1
	Is the 3rd party call audio still low with the handset disconnected from the Bluetooth system? **Yes** Pair and connect a different known 'good' handset to the vehicle phone system and make a call to a 3rd party.GO to L17. **No** Re-connect Bluetooth link and re-try the call.GO to L15.

L15:

	1
	Is volume still low? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition and re-try the call.GO to L16. **No** Issue caused by a faulty Bluetooth connection.

L16:

	1
	Is volume still low? **Yes** Refer to the warranty policy and procedures manual if a module is suspect. **No** Issue caused by a faulty Bluetooth connection.

L17:

	1
	Is volume still low? **Yes** Refer to the warranty policy and procedures manual if a module is suspect. **No** Low audio issue caused by the handset, consult the handset supplier.

PINPOINT TEST M : CANNOT DIAL OUT FROM AUDIO HEAD UNIT/TOUCH-SCREEN/STEERING WHEEL CONTROL

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
M1:	
	1
	Is D2B ring complete? **Yes** GO to M2. **No** Reconnect/change/repair the D2B leads and check for normal operation.
M2:	
	1

	Does display show "NO SERVICE" or drop out of phone mode? **Yes** GO to M3. **No** GO to M4.
M3:	
	1
	Signal strength on the handset greater than 1? **Yes** GO to M4. **No** Re-try call in a stronger signal strength area, low signal strength can cause interference and distortion in car and at 3rd party.
M4:	
	1
	Can user dial out from the handset? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Make sure the Bluetooth link is reconnected and re-try the call.GO to M5. **No** Switch off the handset, remove the battery from the back of the handset. Replace the battery into the handset and switch on. Make sure the Bluetooth link is reconnected and re-try the call.GO to M5.
M5:	
	1
	Can user dial out from audio head unit or steering wheel control? **Yes** Problem may have been caused by the Bluetooth link being disconnected. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call.GO to M6.
M6:	
	1
	Can user dial out from audio head unit or steering wheel control? **Yes** This may be a handset issue, consult the handset supplier. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST N : VOICE ACTIVATED PHONE FUNCTIONS INOPERATIVE	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
N1:	
	1 Make sure that the customer has completed voice recognition training.
	Check audio head unit DTCs using the approved diagnostic system, are there any audio head unit DTCs stored? **Yes** Carry out the pinpoint tests associated with the relevant DTCs using the manufacturer approved diagnostic system. **No** GO to N2.
N2:	
	1
	Is there a dial problem? **Yes** GO to N3. **No** GO to N5.
N3:	
	1
	Dials wrong number? **Yes** GO to N7. **No** GO to N4.
N4:	

	1
	Will not dial? **Yes** GO to N9. **No** GO to N5.
N5:	
	1
	Cannot dial using voice control? **Yes** GO to N8. **No** GO to N6.
N6:	
	1
	Cannot turn phone on/off? **Yes** GO to N8. **No** GO to N10.
N7:	
	1
	Is the handset on the approved phone list? **Yes** Call Technical Helpline. **No** Only handsets specified in the approved list with the correct level of software can be guaranteed to work.
N8:	
	1
	Is voice control on the D2B ring? **Yes** GO to N9. **No** Not a phone issue.
N9:	
	1
	Does verbal communication confirm correct number? **Yes** GO to N10. **No** Not a phone issue.
N10:	
	1
	Does the audio head unit/touch-screen show "NO PHONE" or "PHONE NOT FITTED" (i.e. is phone off the D2B ring)? **Yes** GO to N11. **No** GO to N12.
N11:	
	1 Are any of the D2B connections loose or damaged?
	Yes Reconnect/change/repair the D2B leads and check for normal operation. **No** Refer to the warranty policy and procedures manual if a module is suspect.
N12:	
	1
	Check all connections/connectivity to and from the portable support electronics (PSE) module and the Bluetooth upgrade module. Are any of the harness connections loose or damaged? **Yes** Rectify as necessary. Refer to the electrical guides. **No** Refer to the warranty policy and procedures manual if a module is suspect.

PINPOINT TEST O : CALL IS DROPPED

CONDITIONS	
O1:	
	1
	Is the 3rd party call to another cellular phone? **Yes** GO to O3. **No** GO to O2.
O2:	
	1
	Is the 3rd party call to a landline? **Yes** Disconnect the Bluetooth link between the handset and vehicle phone system. Re-try the call in the vehicle, preferably with the handset in the same position as when connected via the Bluetooth link. GO to O4. **No** GO to O5.
O3:	
	1
	Is the signal strength on the 3rd party handset greater than 1? **Yes** Disconnect the Bluetooth link between the handset and vehicle phone system. Re-try the call in the vehicle, preferably with the handset in the same position as when connected via the Bluetooth link. GO to O4. **No** Re-try call in stronger signal strength area. Low signal strength can lead to calls being dropped.
O4:	
	1
	Is the call dropped again? **Yes** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call. GO to O7. **No** Switch off the handset, remove the battery from the back of the handset. Replace the battery into the handset and switch on. Make sure the Bluetooth link is reconnected and re-try the call.GO to O5.
O5:	
	1
	Is the call dropped again? **Yes** Key off ignition and wait 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition. Make sure the Bluetooth link is reconnected and re-try the call.GO to O6. **No** Problem may have been caused by the Bluetooth link being disconnected.
O6:	
	1
	Is the call dropped again? **Yes** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call.GO to O7. **No** Problem may have been caused by the Bluetooth link being disconnected.
O7:	
	1
	Is the call dropped again? **Yes** Refer to the warranty policy and procedures manual if a module is suspect. **No** This may be a handset issue, consult the handset supplier.

PINPOINT TEST P : INTERFERENCE AND DISTORTION	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
P1:	
	1

	Yes GO to P2. **No** Check for external sources of interference. Drive to where the customer has problems to identify if location dependant. Test in an area of known high signal strength.GO to P4.
P2:	
	1
	Is it present with a different known 'good' handset paired/connected? **Yes** GO to P3. **No** This may be a handset issue, consult the handset supplier.
P3:	
	1
	Is it present with other network carriers? **Yes** Check for external sources of interference. Drive to where the customer has problems to identify if location dependant. Test in an area of known high signal strength.GO to P4. **No** This may be a network or handset issue, consult the handset supplier/network provider.
P4:	
	1
	Are there any powered items/aftermarket accessories in the car? **Yes** Switch off any powered items/aftermarket accessories in the car.GO to P5. **No** Refer to the warranty policy and procedures manual if a module is suspect.
P5:	
	1
	Is interference still present? **Yes** Refer to the warranty policy and procedures manual if a module is suspect. **No** User to be advised of interference from aftermarket accessories.

PINPOINT TEST Q : UNABLE TO TRANSFER CALL BETWEEN HANDS FREE AND HANDSET	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
Q1:	
	1
	Does the specific handset guide state that the handset does not support call transfer? **Yes** Advise user that some software levels are not guaranteed to function correctly. Software to be changed to approved level or the handset to be changed. **No** Switch off the handset, remove the battery from the back of the handset. Replace the battery into the handset and switch on. Make sure the Bluetooth link is reconnected and re-try the call.GO to Q2.
Q2:	
	1
	Can the call be transferred between hands free and handset? **Yes** Problem may have been caused by the Bluetooth link being disconnected. **No** Key off ignition for 6 minutes for the portable support electronics (PSE) module to shut down. Key on ignition and re-try the call.GO to Q3.
Q3:	
	1
	Can the call be transferred between hands free and handset? **Yes** Problem may have been caused by the Bluetooth link being disconnected. **No** Pair and connect a different known 'good' handset to the vehicle phone system and make an incoming call. GO to Q4.
Q4:	

	1 Can the call be transferred between hands free and handset? **Yes** This is a handset issue, consult the handset supplier. **No** Refer to the warranty policy and procedures manual if a module is suspect.

Cellular Phone - Bluetooth Module
Removal and Installation


E74336

Removal

1. Remove the floor console.
   For additional information, refer to: Floor Console (501-12 Instrument Panel and Console, Removal and Installation).
2. Remove the Bluetooth module.

Installation

1. To install, reverse the removal procedure.

Cellular Phone - Handset Holder
Removal and Installation

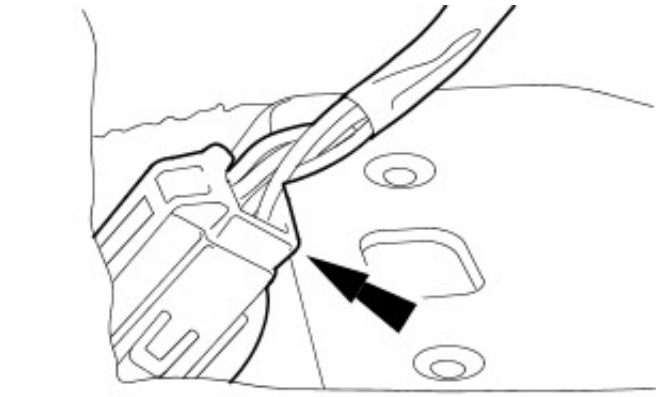
Removal

All vehicles

1. Remove the floor console
For additional information, refer to: Floor Console (501-12 Instrument Panel and Console, Removal and Installation).

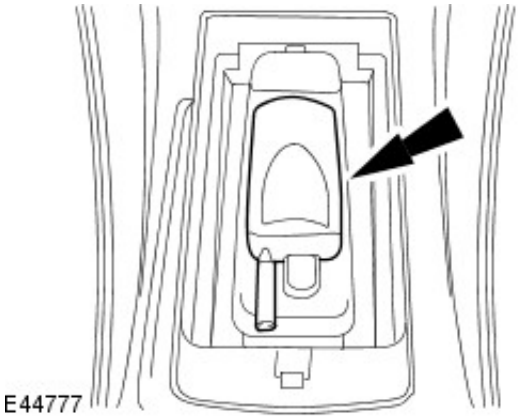
2. NOTE: US models only have an additional antenna connector.

Disconnect the cellular phone electrical connector.


VUJ0004386

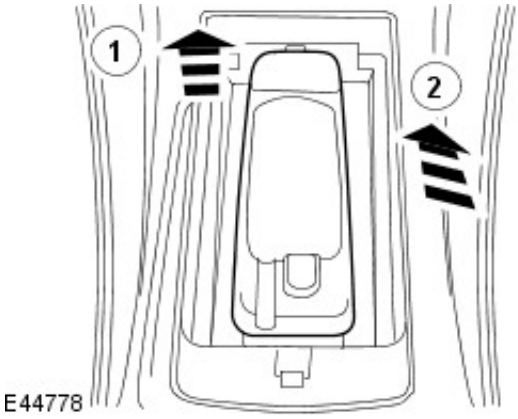
Vehicles with cordless cellular phone

3. Remove the cellular phone.


E44777

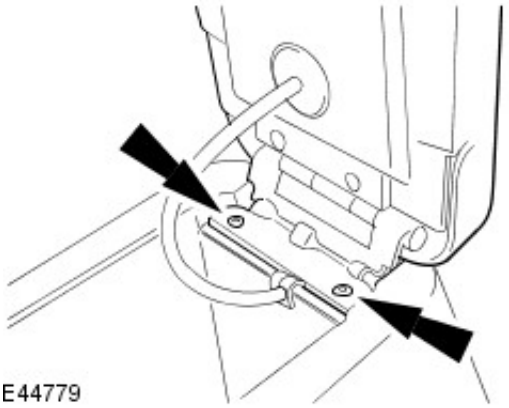
4. Remove the handset holder.

1. Detach the handset holder.
2. Remove the handset holder.



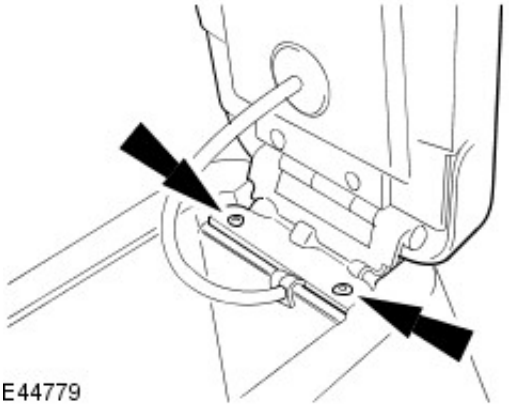
E44778

5. Remove the armrest.



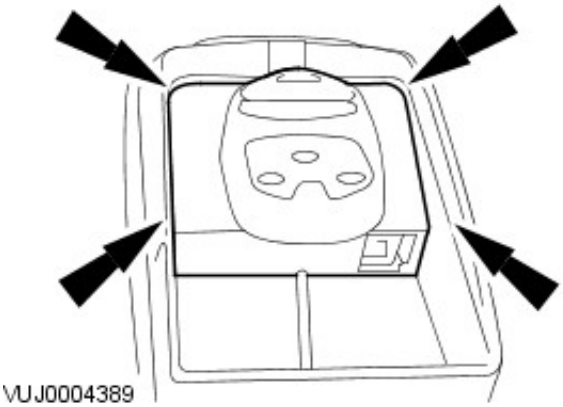
Vehicles with corded cellular phone

6. Remove the armrest.



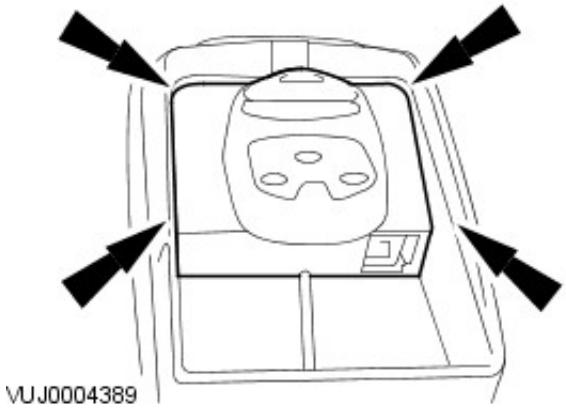
7. Remove the non slip mat.

8. Remove the handset hang up cup.



Installation

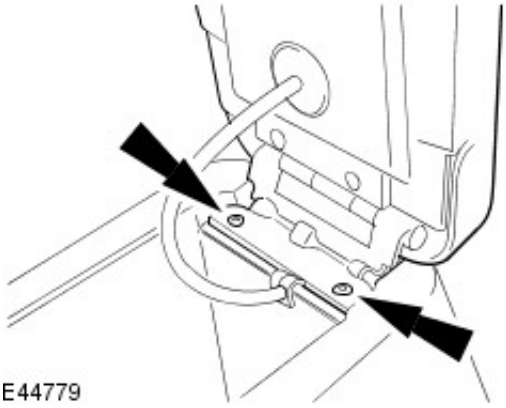
Vehicles with corded cellular phone


VUJ0004389

1. Install the handset hang up cup.

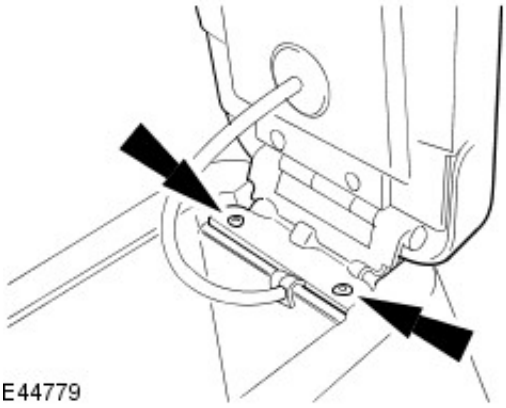

VUJ0004388

2. Install the non slip mat.


E44779

3. Install the armrest.

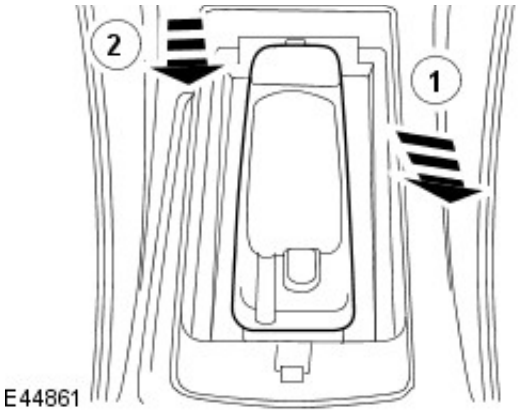
Vehicles with cordless cellular phone

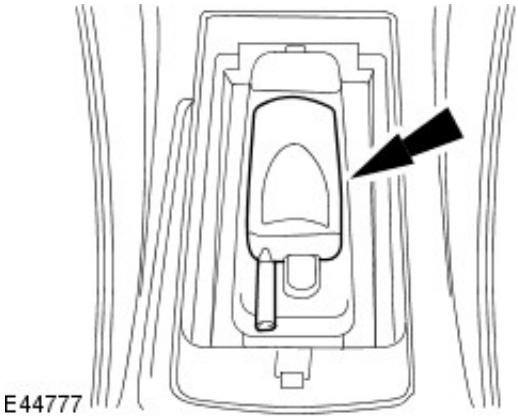

E44779

4. Install the armrest.

5. Attach the handset holder.

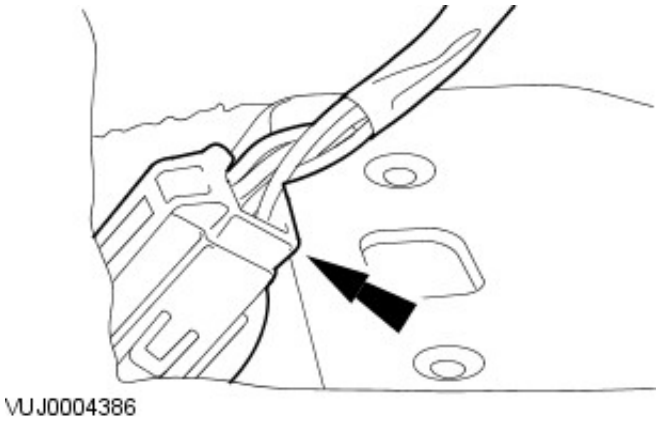
1. Install the handset holder.
2. Attach the handset holder.





6. Install the cellular phone.

All vehicles



7. NOTE: US models only have an additional antenna connector.

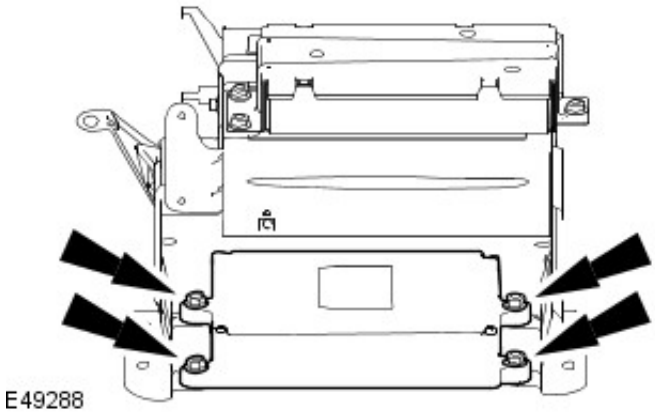
Connect the cellular phone electrical connector.

8. Install the floor console
For additional information, refer to: Floor Console (501-12 Instrument Panel and Console, Removal and Installation).

Cellular Phone - Module4-Door

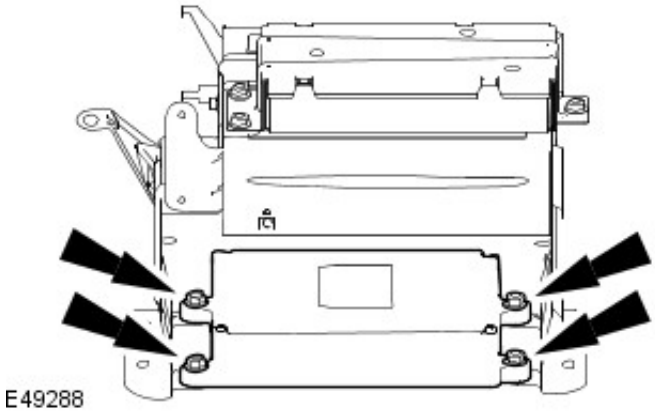
Removal and Installation

Removal



1. Remove the compact disc (CD) changer
   For additional information, refer to: Compact Disc (CD) Changer - 4-Door (415-01 Audio Unit, Removal and Installation).
2. Remove the module.

Installation



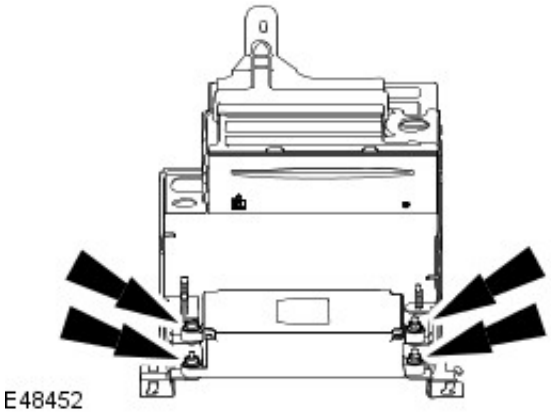
1. To install, reverse the removal procedure.
   - Tighten to 5 Nm.

Cellular Phone - ModuleWagon

Removal and Installation

Removal

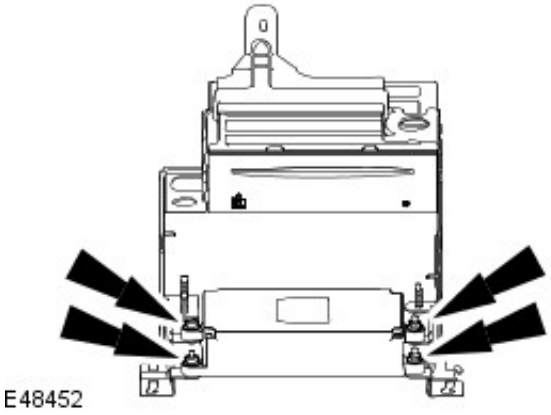
1. Disconnect the battery ground cable
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
2. Remove the compact disc changer
   For additional information, refer to: Compact Disc (CD) Changer - Wagon (415-01 Audio Unit, Removal and Installation).
3. Remove the multifunction voice activated module
   For additional information, refer to: Multifunction Voice Activated Module - Wagon (419-10 Multifunction Electronic Modules, Removal and Installation).
4. Remove the module.



E48452

Installation

1. To install, reverse the removal procedure.
   - Tighten to 5 Nm.



E48452

2. Connect the battery ground cable
   For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

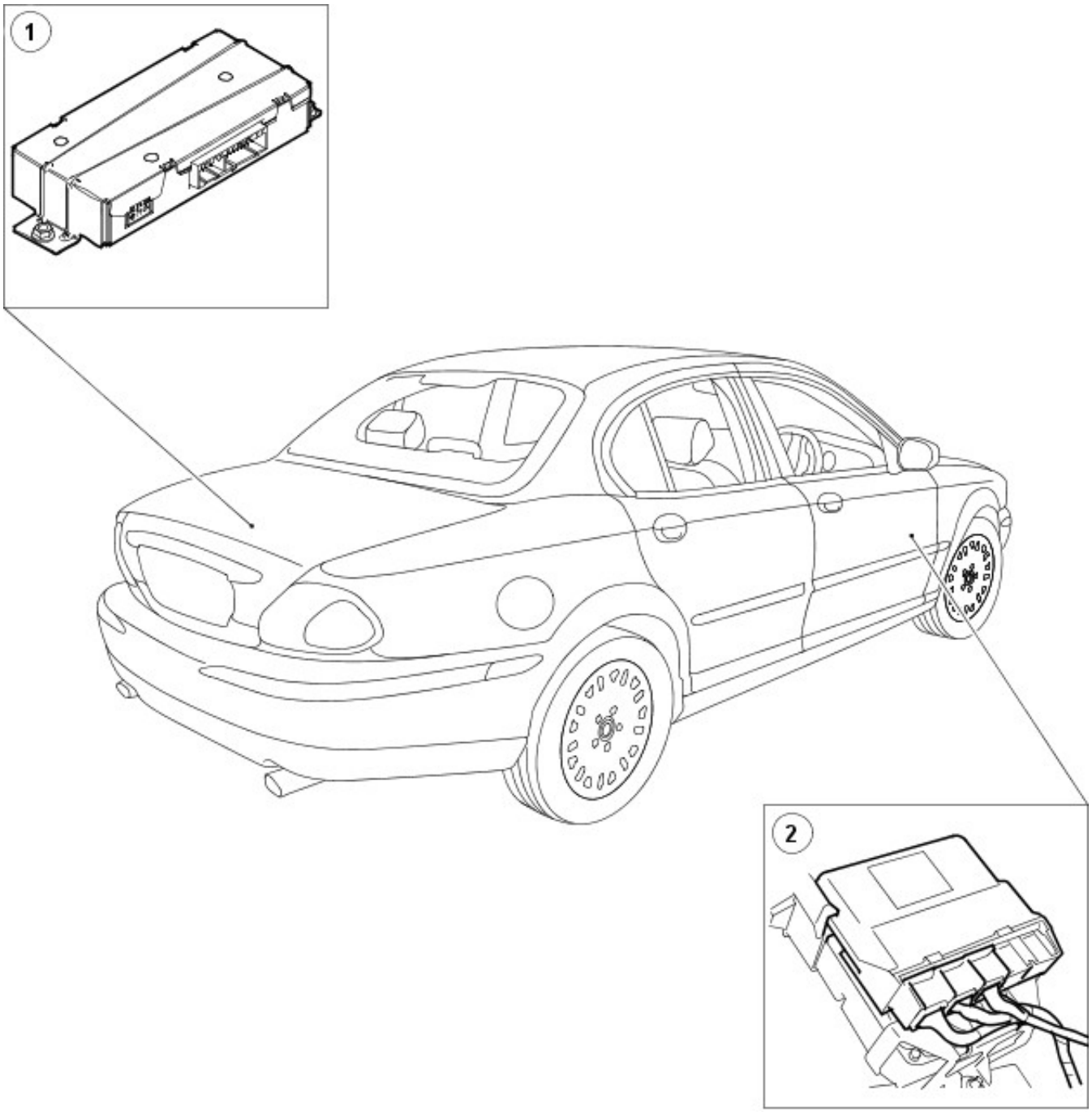
Multifunction Electronic Modules -

Torque Specifications

Description	Nm	lb-ft	lb-in
Voice activated control module	5	-	44

Multifunction Electronic Modules - Module Controlled Functions

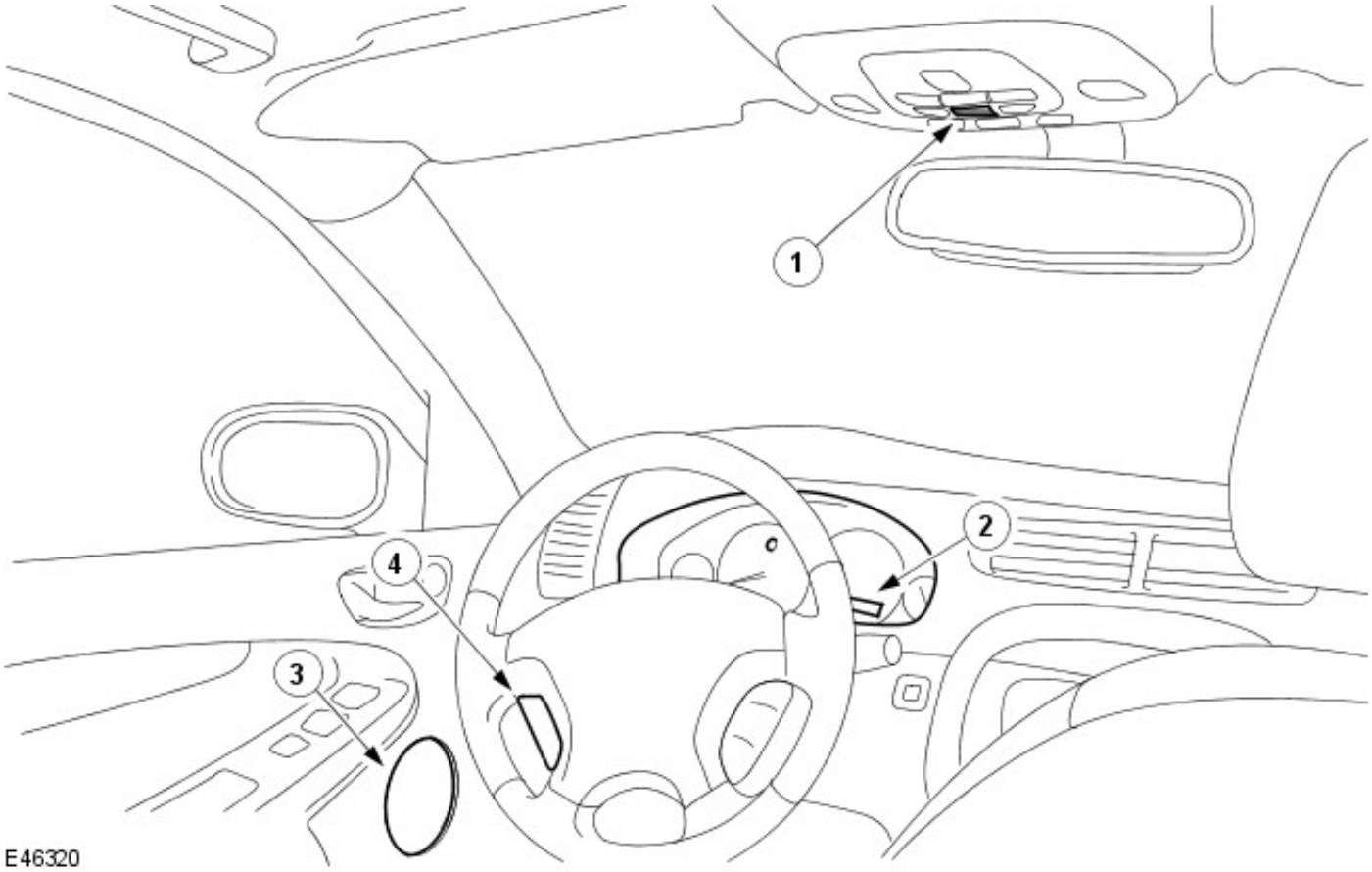
Description and Operation



E46101

Item	Part Number	Description
1	—	Voice activated control module (VACM)
2	—	Generic electronic module (GEM)

Voice Activated Control Component Location



Item	Part Number	Description
1	—	Microphone
2	—	Visual feedback message center display
3	—	Audible feedback (incorporated in audio system)
4	—	Steering wheel controls

Generic Electronic Module (GEM)

The GEM module is located on the right hand side, below the instrument panel. The GEM module controls the wiper and security systems.

Voice Activated Control Module (VACM)

The VACM is located in the left hand side luggage compartment behind the trim panel. The VACM module controls and processes all the voice commands given by the driver, then delivers this information to the audio unit, navigation system module, television module, intergrated cellular phones and the climate control modules which then carry out these commands.

Microphone

The microphone is used for the cellular phone and to receive voice commands. The microphone supplies the information to the VACM which processes the commands and supplies the necessary information to the correct modules.

Visual Feedback Message Center Display

This display keeps the driver informed of the function which is being selected or processed.

Audible Feedback (Speakers)

This audible tone informs the driver when the system is able to receive commands for processing.

The verbal feedback speakers are incorporated in the audio speakers. These speakers are utilized to confirm to the driver that there verbal command has been accepted and is being proceeded.

Steering Wheel Controls VOICE / PHONE Button

This button is automatically configured by the audio unit depending on which systems are installed on the vehicle. For additional information, refer to the Owner Guide.

Multifunction Electronic Modules - Multifunction Electronic Module

Diagnosis and Testing

Principle of Operation

For a detailed description of the multifunction electronic modules, refer to the relevant Description and Operation sections in the workshop manual. REFER to: Module Controlled Functions (419-10 Multifunction Electronic Modules, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
• Electrical connector(s) • Wiring harness for damage or corrosion • VACM module • GEM module • Microphone • Instrument cluster • Switch(s) • Speakers

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Jaguar Approved Diagnostic System.

DTC Index

Voice Activated Control Module

CAUTION: when probing connectors to take measurements in the course of pinpoint tests, use the adapter kit, part number 3548-1358-00

• NOTE: if the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module or component.

• NOTE: When performing voltage or resistance tests always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults first before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connectors and corroded terminals.

DTC	Description	Possible Causes	Action
U2601	D2B wake up - short to ground	• Voice activated control module • Wake up line short to ground	Refer to electrical circuit diagrams, check D2B wake up circuit for shorts to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
U2609	D2B wake up - pulse width out of spec	• Voice activated control module wake up line - circuit fault (pulse <50mS - pulse >110mS)	Refer to electrical circuit diagrams and notes, check voice activated control module D2B wake up line circuit for faults. Repair any defects, clear DTC and retest to confirm correct operation.
U2610	D2B slave ECU fails to receive a	• During initialization no position status	Carry out any pin point tests associated with this DTC using the manufacturer approved diagnostic system. Refer to electrical circuit diagrams, notes and check D2B slave modules and circuit for faults.

	report position	report is received from one or more slave modules	Replace as required, refer to the new module installation note at the top of the DTC index. Repair any defects, clear DTC and retest to confirm correct operation.
U2611	D2B slave ECU fails to receive an alarm clear command	• Voice activated control module - on entering alarm state, slave ECU has failed to receive alarm clear command	Refer to electrical circuit diagrams, notes and check D2B slave modules and circuit for faults. Replace as required, refer to the new module installation note at the top of the DTC index. Repair any defects, clear DTC and retest to confirm correct operation.
B2477	Module configuration failure	• Voice activated control module - module configuration failure	The module can be configured using the new module procedure. Check and configure as required.

Generic Electronic Module

 CAUTION: when probing connectors to take measurements in the course of pinpoint tests, use the adapter kit, part number 3548-1358-00

• NOTE: if the control module/component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module or component.

• NOTE: When performing voltage or resistance tests always use a digital multimeter (DMM) accurate to three decimal places and with a current calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

• NOTE: Check and rectify basic faults first before beginning diagnostic routines that involve pinpoint tests.

• NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

• NOTE: If DTCs are recorded and, after performing pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connectors and corroded terminals.

DTC	Description	Possible Causes	Action
C1445	Vehicle speed failure	• Vehicle speed signal circuit failure	Refer to electrical diagrams, check vehicle speed signal circuit for faults such as open circuits, short to ground or power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1298	Power supply sensor circuit short to battery	• Intrusion and inclination sensor power supply short to Battery.	Refer to electrical diagrams, check intrusion and inclination sensor circuits for short to power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1299	Power supply sensor circuit short to ground	• Intrusion and inclination sensor power supply short to ground.	Refer to electrical diagrams, check intrusion and inclination sensor circuits for short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1315	Battery saver relay coil circuit short to battery	• Battery saver relay fault • Wiring harness fault	Refer to electrical diagrams, battery saver relay coil circuits for short to power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation. Replace relay as required, clear DTC and retest system to ensure correct operation.
B1549	Power window master circuit short to battery	• Global closing output circuit shorted to battery	Refer to electrical diagrams, power window master circuit for short to power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1550	Power window master circuit short to ground	• Global closing output circuit shorted to ground	Refer to electrical diagrams, power window master circuit for short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.

		• Wiring harness concern	
B1570	Lamp headlamp high-beam circuit short to ground	• Headlamp high beam circuit shorted to ground • wiring harness concern	Refer to electrical diagrams, headlamp high beam circuit for short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1438	Wiper mode select switch circuit failure	• Wiper switch stuck or in wrong position during wiper test routine • Wiring harness concern	Inspect switch for signs of damage or incorrect operation or sticking, replace switch as required. Check wiper control switch circuits for open circuits, shorts to power or ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1446	Wiper park sense circuit failure	• Wiper park to park time incorrect (12 second limit exceeded)	Inspect wiper motor harness for damage, Refer to electrical circuit diagrams and check wiper motor circuits for open circuits, shorts to ground or power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1450	Wiper wash/delay switch circuit failure	• Wrong position or short circuit to battery detected during wiper test diagnostic routine • Wiring harness concern	Check wiper wash/delay switch for correct operation. Refer to electrical diagrams, check wiper control circuits for short to battery. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1499	Lamp turn signal left circuit failure	• Left turn signal lamp circuit open circuit or short to ground	Refer to electrical diagrams, check left turn signal circuit for open circuits or short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1503	Lamp turn signal right circuit failure	• Right turn signal lamp circuit open circuit or short to ground	Refer to electrical diagrams, check right turn signal circuit for open circuits or short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1553	Deck lid release circuit short to battery	• Deck lid release circuit shorted to battery • Wiring harness concern	Refer to electrical diagrams, check deck lid release circuit for short to power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B1554	Deck lid release circuit short to ground	• Deck lid release circuit shorted to ground • Wiring harness concern	Refer to electrical diagrams, check deck lid release circuit for short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2108	Front wiper short to battery	• Wiper motor relay • Wiring harness concern	Inspect from wiper motor relay, replace as required. Refer to electrical wiring circuit diagrams, check wiper relay circuit for short to power. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2111	Front wiper short to ground	• Wiper motor relay • Wiring harness concern	Inspect from wiper motor relay, replace as required. Refer to electrical wiring circuit diagrams, check wiper relay circuit for short to ground. Repair faults using approved methods and materials. Clear DTC and retest system to ensure correct operation.
B2114	Front washer input short to ground	• Switch stuck or short circuited to ground • wiring harness concern	Check front washer switch operation for sticking. Replace switch as required. Refer to electrical circuit wiring diagrams. Check washer input circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.

B2177	Interior scanning sensor circuit failure	• Interior sensor missing or failed • Wiring harness concern	Check sensor is present and appears undamaged. Refer to electrical circuit wiring diagrams. Check sensor circuit for open circuits, short to power or ground. Replace sensor as required, repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2258	Headlamp washer relay circuit short to battery	• Headlamp wash relay fault • Wiring harness concern	Refer to electrical circuit diagrams, check headlamp washer relay circuits for open circuits, short to power or ground. Repair any faults found using approved methods and materials. Replace relay as required. Clear DTC and retest system to confirm correct operation.
B2281	Right turn switch short to ground	• Turn switch faulty • Wiring harness concern	Check right turn switch operation for sticking. Replace switch as required. Refer to electrical circuit wiring diagrams. Check right turn switch input circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2282	Left turn switch short to ground	• Turn switch faulty • Wiring harness concern	Check left turn switch operation for sticking. Replace switch as required. Refer to electrical circuit wiring diagrams. Check left turn switch input circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2283	Turn signal chime short to battery	• Wiring harness concern, ECU output to loud speaker in steering column switchgear is short circuit to power	Refer to electrical circuit wiring diagrams. Check ECU output circuit to the steering column speaker for short to power. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2284	Turn signal chime short to ground	• wiring harness concern, ECU output to loud speaker in steering column switchgear is short circuit to ground	Refer to electrical circuit wiring diagrams. Check ECU output circuit to the steering column speaker for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2287	Inclination sensor circuit failure	• Sensor missing or failed • Wiring harness concern	Inspect vehicle for presence of and condition of inclination sensor. Replace sensor if required. Refer to electrical circuit wiring diagrams. Check inclination sensor circuits for open circuits or short to power or ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2414	Headlamp washer relay circuit short circuit to ground	• Headlamp wash relay internal fault • Wiring harness concern	Check headlamp wash relay for condition, replace as required. Refer to electrical circuit wiring diagrams. Check headlamp washer relay circuits for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2477	Module configuration failure	• ECU configuration issue	The ECU has not been configured or has been configured incorrectly. Use the manufacturer approved diagnostic equipment to configure the ECU correctly then retest to ensure correct operation.
B2494	Anti theft horn output circuit short to battery	• Wiring harness concern	Refer to electrical circuit wiring diagrams. Check anti theft horn output circuit for short to battery. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2496	Anti theft horn output circuit short to ground	• Wiring harness concern	Refer to electrical circuit wiring diagrams. Check anti theft horn output circuit for short to ground. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2511	Horn output relay circuit short to battery	• Wiring harness concern	Refer to electrical circuit wiring diagrams. Check vehicle horn output relay circuit for short to battery. Repair wiring harness using approved methods and materials. Clear DTC and retest system to confirm correct operation.
B2555	Dome lamp output circuit short to battery	• courtesy lamp fault • Wiring harness concern	Inspect Dome lamp for defects which may cause a short circuit to power. Replace or repair as required. If no faults are found in the dome lamp itself, check ECU output circuit to dome lamp for shorts to battery. Repair wiring harness using approved methods and materials.

			Clear DTC and retest system to confirm correct operation.
U1041	SCP (J1850) invalid or missing data for vehicle speed	• Data in the speed signal message is missing or outside of normal limits	Refer to electrical circuit diagrams, check for SCP network wire broken, or short circuit to power or ground. Repair wiring harness using approved materials and methods. Clear DTC and retest system to ensure correct operation.
U1135	SCP (J1850) invalid or missing data for ignition switch/starter	• Data in the ignition signal message is missing or outside of normal limits	Refer to electrical circuit diagrams, check for SCP network wire broken, or short circuit to power or ground. Repair wiring harness using approved materials and methods. Clear DTC and retest system to ensure correct operation.
U1147	SCP (J1850) invalid or missing data for vehicle security	• Data in the security key message is missing or outside of normal limits	Refer to electrical circuit diagrams, check for SCP network wire broken, or short circuit to power or ground. Repair wiring harness using approved materials and methods. Clear DTC and retest system to ensure correct operation.
U1262	SCP (J1850) communication bus fault	• Missing message • Wiring harness concern	Refer to electrical circuit diagrams, check for SCP network wire broken. Repair wiring harness using approved materials and methods. Clear DTC and retest system to ensure correct operation.
B1823	Wiper rear park sense input circuit open	• Rear wiper park sense switch • Wiring harness concern	Rear wiper park sense switch not detected for 4 seconds. Refer to electrical circuit diagrams and check rear wiper circuits for open circuits, short to power or short to ground. Repair wiring harness using approved materials and methods. Clear DTC and retest system to ensure correct operation.
U2514	Missing message for vehicle speed	• Wiring harness concern	Refer to electrical wiring diagrams, Check SCP network for open circuit. Repair wiring harness using approved methods and materials. Clear DTC and retest to ensure correct operation.
B1041	Direction indicator power feed fuse blown	• Power distribution box • Wiring harness concern	Check power distribution box fuses, if blown refer to electrical circuit diagrams and check for short circuits to ground on indicator circuits. Repair wiring harness and fit replacement fuses as required. Clear DTC and retest system to ensure correct operation.
B2090	Remote key entry data line failure	• Wiring harness concern	Refer to electrical circuit diagrams, check RKE data line for short to ground. Repair wiring harness, clear DTC and retest system to ensure correct operation.
B2091	Remote key communication failure	• Wiring harness concern	Refer to electrical circuit diagrams, check RKE data line for short to battery. Repair wiring harness, clear DTC and retest system to ensure correct operation.

Multifunction Electronic Modules - Generic Electronic Module (GEM)

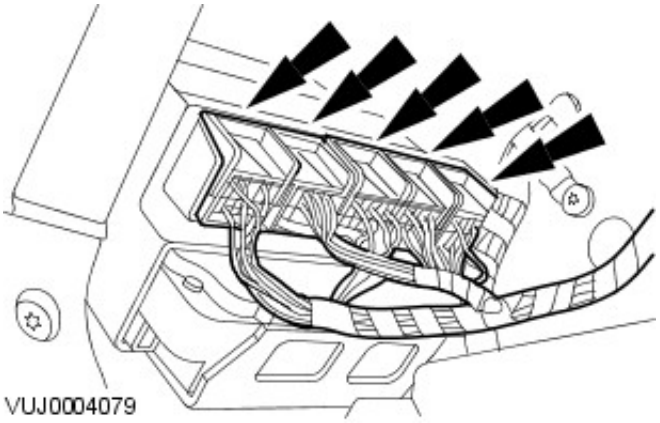
Removal and Installation

Removal

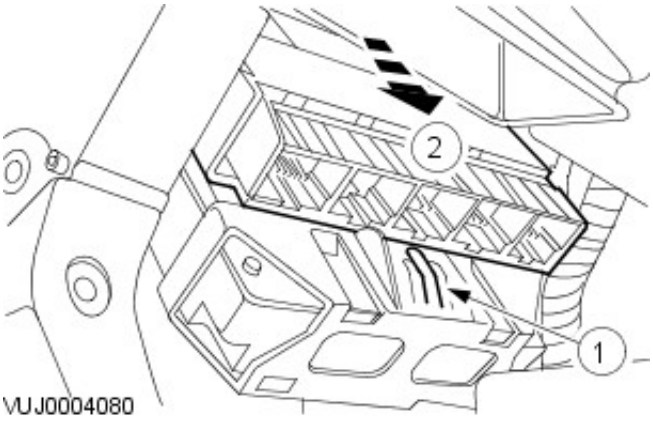
1. CAUTION: Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result.

   Disconnect the battery ground cable. For additional information, refer to Section 414-01 Battery, Mounting and Cables.

2. Disconnect the generic electronic module (GEM) electrical connectors.



3. Remove the GEM.
   1. Press the tang.
   2. Remove the GEM



Installation

1. To install, reverse the removal procedure.

Multifunction Electronic Modules - Multifunction Voice Activated Module4-Door

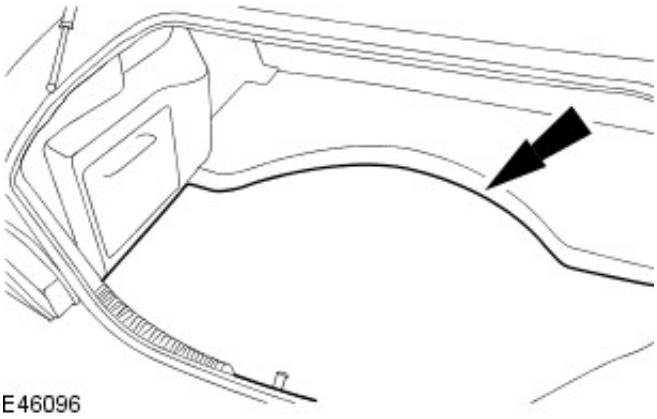
Removal and Installation

Removal

1. CAUTION: Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result.

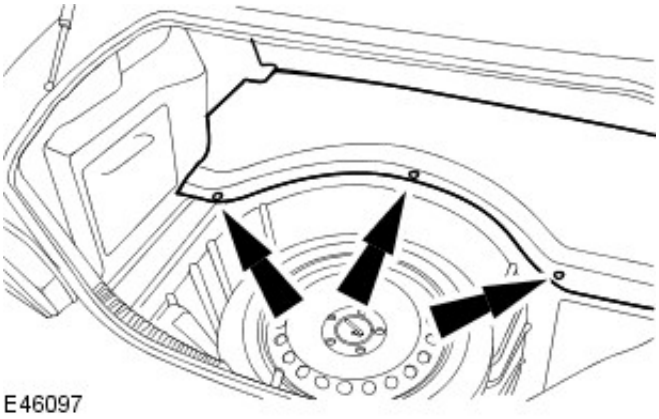
Disconnect the battery ground cable.
For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).

2. Remove the luggage compartment front floor carpet.



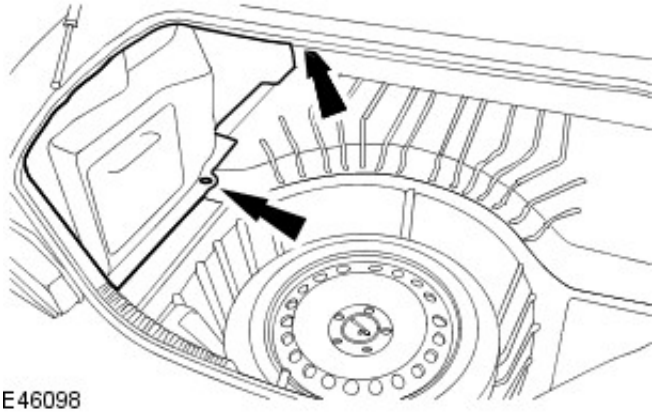
E46096

3. Remove the luggage compartment rear floor carpet.



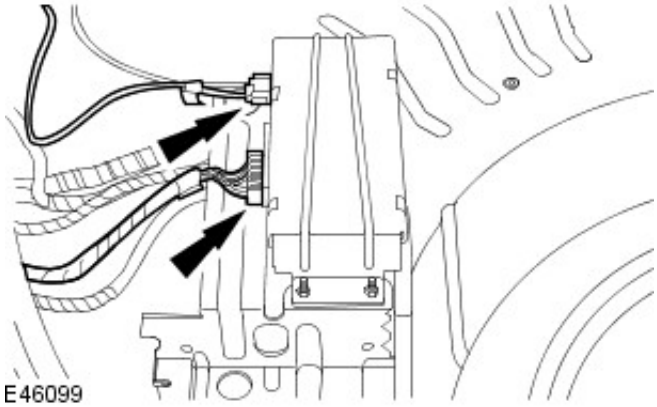
E46097

4. Remove the luggage compartment interior trim.

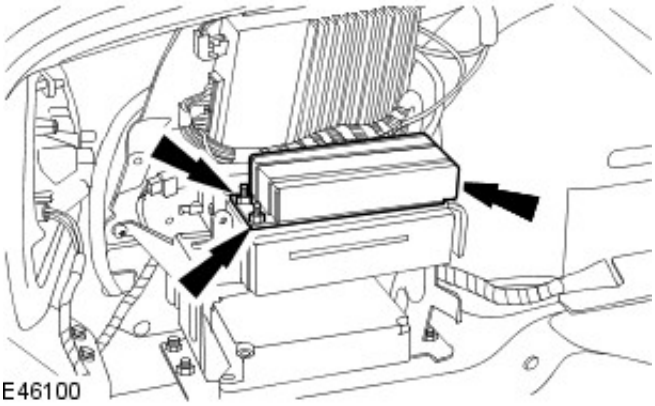


E46098

5. Disconnect the voice activated control module (VACM) electrical connector and fibre optic connector.



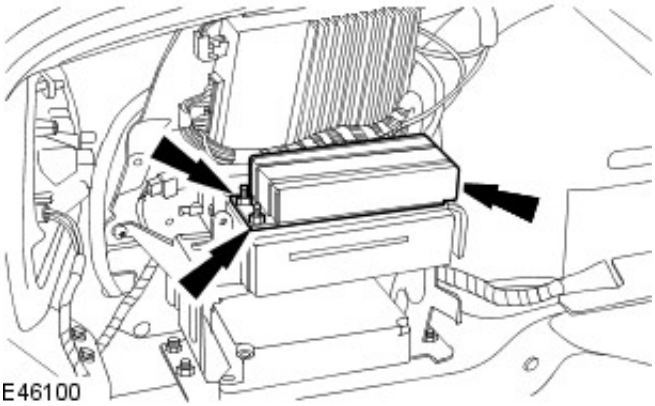
6. Remove the VACM.



Installation

1. To install, reverse the removal procedure.

- Tighten to 6 Nm.



2. Connect the battery ground cable.
For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).

3. Configure the voice activated control module using the Jaguar approved diagnostic system.

4. Test the operation to confirm that the correct language is installed, if the language is wrong then replace the voice module for the correct language.

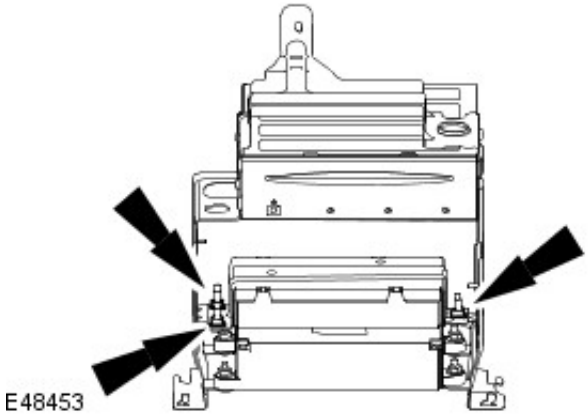
5. Switch the ignition on and wait for the system to initialize. Press the voice button and say the command "Voice Help" list the options given in the feedback.

6. Compare the options given with the vehicle specification if there is an error reconfigure the voice module and repeat steps 4 and 5.

Multifunction Electronic Modules - Multifunction Voice Activated ModuleWagon

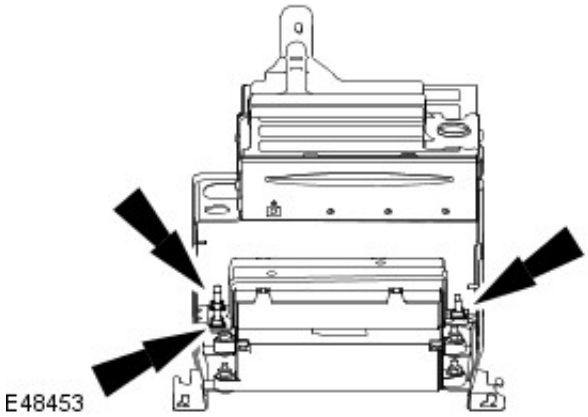
Removal and Installation

Removal



1. Disconnect the battery ground cable
   For additional information, refer to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
2. Remove the Compact Disc changer
   For additional information, refer to: Compact Disc (CD) Changer - Wagon (415-01 Audio Unit, Removal and Installation).
3. Remove the voice activated control module.

Installation



1. To install, reverse the removal procedure.
   - Tighten to 5 Nm.
2. Connect the battery ground cable
   For additional information, refer to: Battery Connect (414-01 Battery, Mounting and Cables, General Procedures).