

2012.0 RANGE ROVER (LM), 501-08

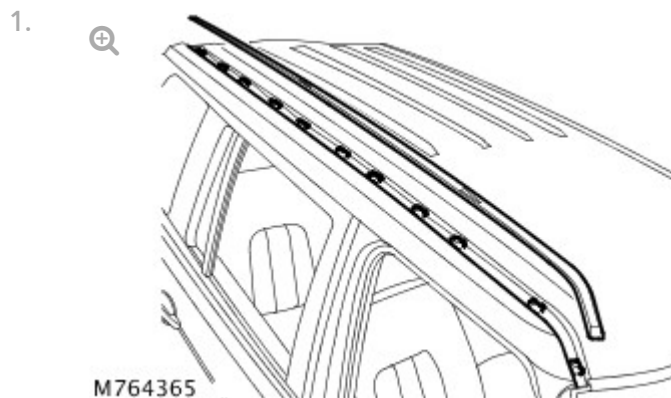
EXTERIOR TRIM AND ORNAMENTATION

ROOF MOULDING (G928161)

REMOVAL AND INSTALLATION

76.43.68	MOULDING - ROOF - EACH - RENEW	ALL DERIVATIVES	0.2	USED WITHINS	+
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REMOVAL



Remove the roof moulding.

- Start at the front edge of the roof moulding, raise and release the roof moulding from the 11 clips.

2. Remove the 11 clips from the roof panel.

INSTALLATION

1. Clean the roof moulding recess.

2. Install the clips to the roof moulding.

3. Install the roof moulding.

- Position and align the clips to the roof panel recess.

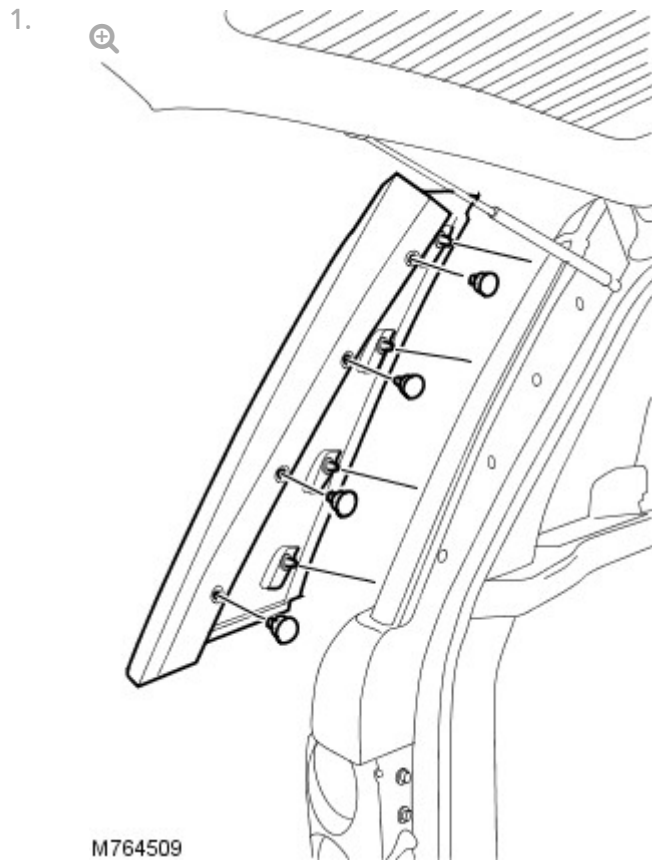
2012.0 RANGE ROVER (LM), 501-08

EXTERIOR TRIM AND ORNAMENTATION

REAR QUARTER PANEL MOULDING (G926954)

REMOVAL AND INSTALLATION

REMOVAL



Remove the 4 clips securing the rear quarter panel moulding.

2.

NOTE:

Do not disassemble further if the component is removed for access only.

Remove the rear quarter panel moulding.

- Release the 4 clips.

3. Remove and discard the rear quarter panel moulding clips.

4. Remove and discard the rear quarter panel clips.

INSTALLATION

1. Install new clips to the rear quarter panel.
2. Install new clips to the rear quarter panel moulding.
3. Install the rear quarter panel moulding.
 - Secure with the clips.

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EXTERIOR TRIM AND ORNAMENTATION

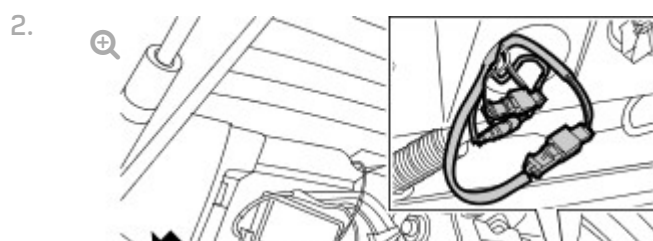
REAR SPOILER (G928365)

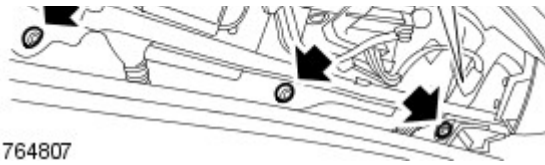
REMOVAL AND INSTALLATION

REMOVAL

1. Remove the liftgate upper trim panel.

For additional information, refer to: Liftgate Upper Trim Panel (501-05, Removal and Installation).





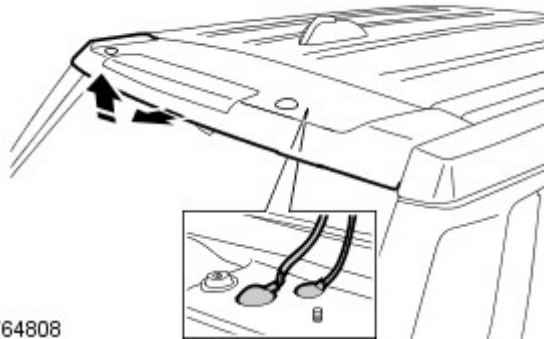
M764807

Remove the 3 bolts securing the rear spoiler to tailgate.

3. Disconnect the electrical connector.

4. If equipped disconnect the electrical connector from the parking aid camera.

5. 



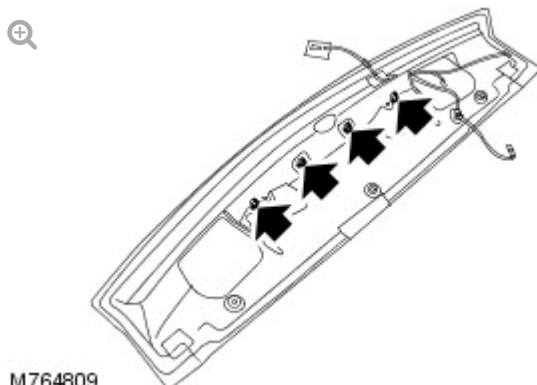
M764808

Remove the rear spoiler.

- Carefully release the clips.
- Release the electrical harness.

6. **NOTE:**

Do not disassemble further if the component is removed for access only.

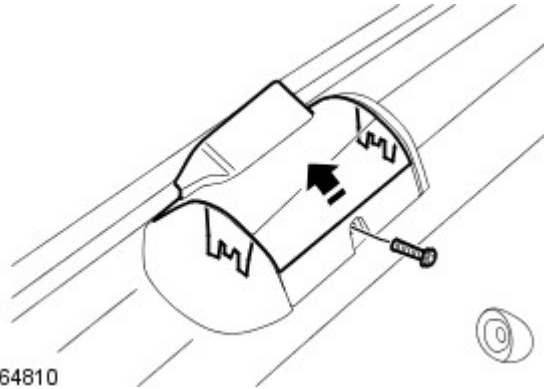


M764809

Remove the high mounted stoplamp.

- Remove the 4 screws.
- Remove the wiring harness.

7.



M764810

Remove the parking aid camera.

- Remove the screw.
- Carefully release the 2 clips.

8.



M764811

If equipped remove the parking aid camera bracket.

- Drill out the rivet.
- Remove the adhesive pad.

INSTALLATION

1. If equipped install the parking aid camera.

- Install the rivet.

Install the adhesive pad

- Install the adhesive pad.

2. If equipped install the parking aid camera.

- Install the clips.
- Install the screws.

3. Install the high mounted stoplamp.

- Secure the wiring harness.
- Install the screws.

4. Install the rear spoiler to the tailgate.

- Tighten the bolts to 10 Nm (7 lb.ft).

5. Connect the electrical connector.

6. If equipped connect the electrical connector to the parking aid camera.

7. Install the liftgate upper trim panel.

For additional information, refer to: Liftgate Upper Trim Panel (501-05, Removal and Installation).

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EXTERIOR TRIM AND ORNAMENTATION

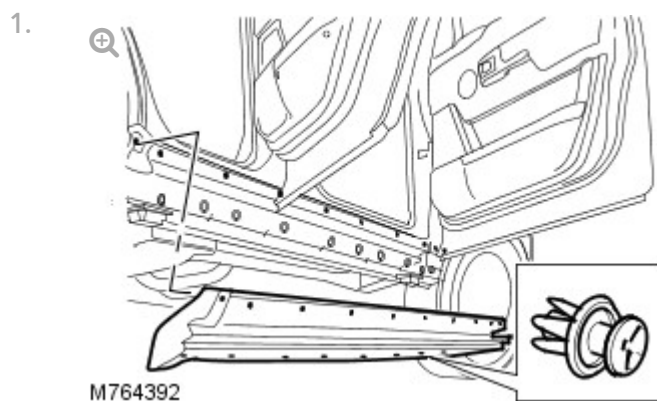
ROCKER PANEL MOULDING

[G935636]

REMOVAL AND INSTALLATION

76.43.28	MOULDING - ROCKER PANEL - LOWER - RENEW	ALL DERIVATIVES	0.2	USED WITHINS	+
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REMOVAL



Remove the 8 clips from the underside of the rocker panel moulding.

2.

NOTE:

Do not disassemble further if the component is removed for

access only.

Remove the rocker panel moulding.

- Release the 10 clips.

-
3. Remove the 10 clips from the rocker panel moulding.

INSTALLATION

-
1. Install the clips to the rocker panel moulding.

-
2. Install the rocker panel moulding.

- Secure with the clips.

2012.0 RANGE ROVER (LM), 501-08

EXTERIOR TRIM AND ORNAMENTATION

TAILGATE MOULDING (G928160)

REMOVAL AND INSTALLATION

76.43.99	FINISHER - TAILDOOR/GATE - LOWER - RENEW	ALL DERIVATIVES	0.3	USED WITHINS	+
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REMOVAL

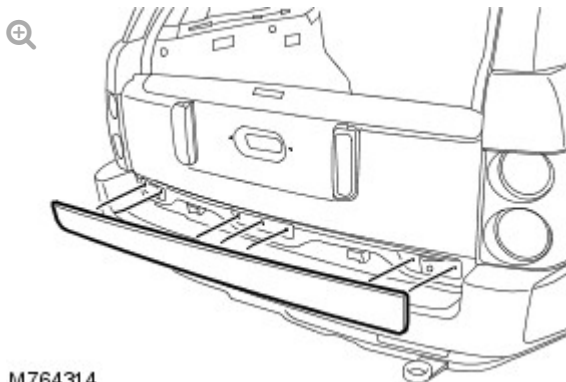
1.

CAUTION:

Always protect paintwork and glass when removing exterior components.

NOTE:

Do not disassemble further if the component is removed for access only.



M764314

Remove the tailgate trim panel.

- Release the 7 clips.

2.





Remove the 7 clips from the tailgate trim panel.

-
3. Remove and discard the 4 adhesive backed clips from the tailgate trim panel.
 - Note the position of the 4 adhesive backed clips to aid assembly.

INSTALLATION

-
1. Install the adhesive clips to the tailgate trim panel.

 2. Install the clips to the tailgate trim panel.

 3. Clean the component mating faces.

 4. Install the tailgate trim panel.
 - Remove the protective covering from the adhesive clips.
 - Align and secure the tailgate trim panel clips.
 - Make sure the adhesive clips are secured into position.

2012.0 RANGE ROVER (LM), 501-08

EXTERIOR TRIM AND ORNAMENTATION

TOWBAR (G927760)

REMOVAL AND INSTALLATION

76.11.41	TOWBAR - RENEW	ALL DERIVATIVES	1.4	USED WITHINS	+
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REMOVAL

1. Remove the rear bumper.
For additional information, refer to: Rear Bumper (501-19, Removal and Installation).
-

2. 

Remove the towbar locking pin.

3. Remove the towball mounting.

- Remove the nut and bolt.
-

4. 

Reposition the towbar electrical connection socket.

- Remove the 2 bolts.
-

5. 

Remove the exhaust mountings from the rear subframe.

- Remove the 4 nuts.
-

6. Remove the exhaust mountings from the towbar.

- Support the exhaust assembly.
 - Remove the 4 nuts.
-

7. Lower the exhaust assembly sufficiently, to gain access to the towbar securing bolts.

8. 

With assistance, remove the towbar.

- Remove the 4 bolts.
-

INSTALLATION

1. With assistance, install the towbar.

- Tighten the bolts to 165 Nm (122 lb.ft).

2. Secure the towbar electrical connection socket.

- Tighten the bolts to 25 Nm (18 lb.ft).

3. Install the exhaust mountings to the towbar and subframe.

- Raise the exhaust to the original position.
- Tighten the bolts to 25 Nm (18 lb.ft).

4. Install the towball mounting.

- Tighten the nut and bolt to 300 Nm (221 lb.ft).

5. Install the towbar mounting locking pin.

6. Install the rear bumper.

For additional information, refer to: Rear Bumper (501-19, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-09

REAR VIEW MIRRORS

SPECIFICATIONS

Torque Specifications

DESCRIPTION	NM	LB-FT
Exterior mirror Torx screws	8	6

2012.0 RANGE ROVER (LM), 501-09

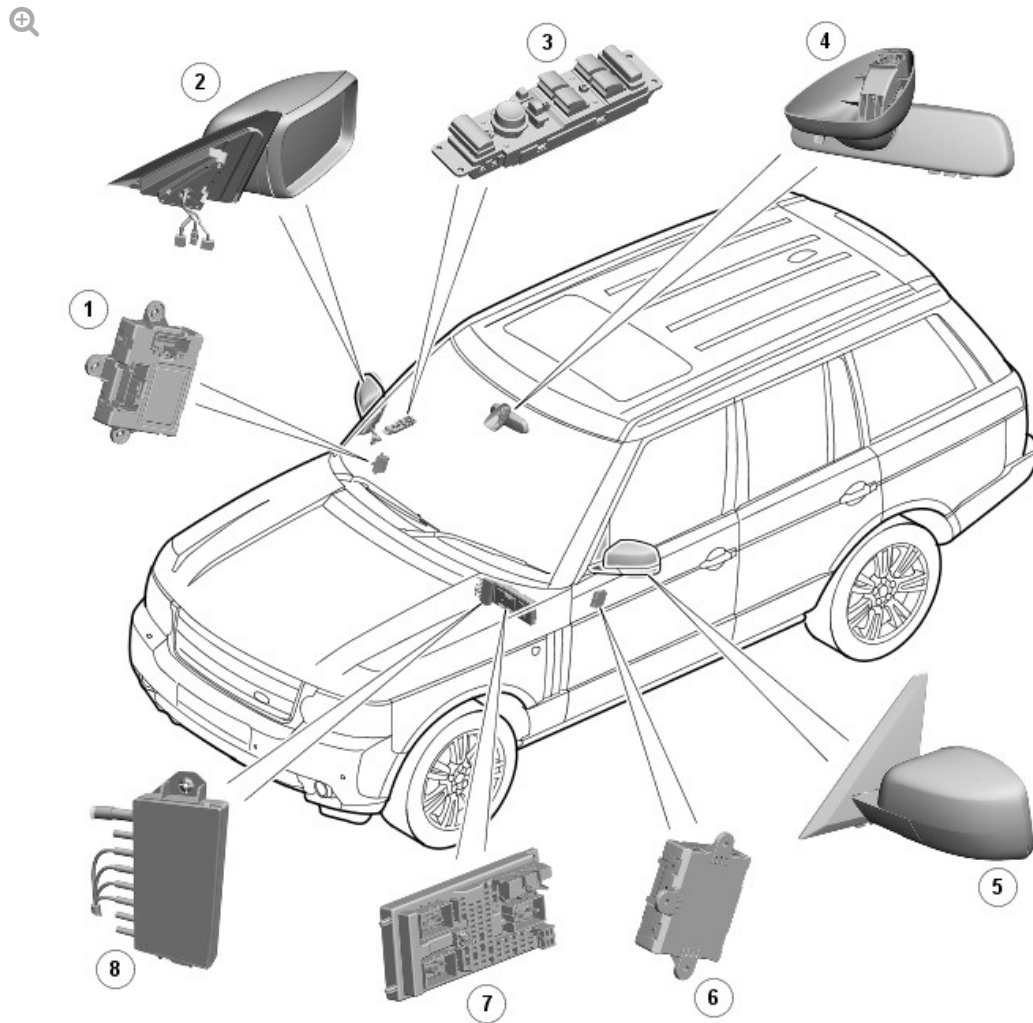
REAR VIEW MIRRORS

DESCRIPTION AND OPERATION

COMPONENT LOCATION

NOTE:

right-hand drive (RHD) shown, left-hand drive (LHD) similar



E120585

ITEM	DESCRIPTION
1	DDM (driver door module)
2	RH (right-hand) exterior mirror
3	Mirror switch
4	Interior mirror
5	LH (left-hand) exterior mirror

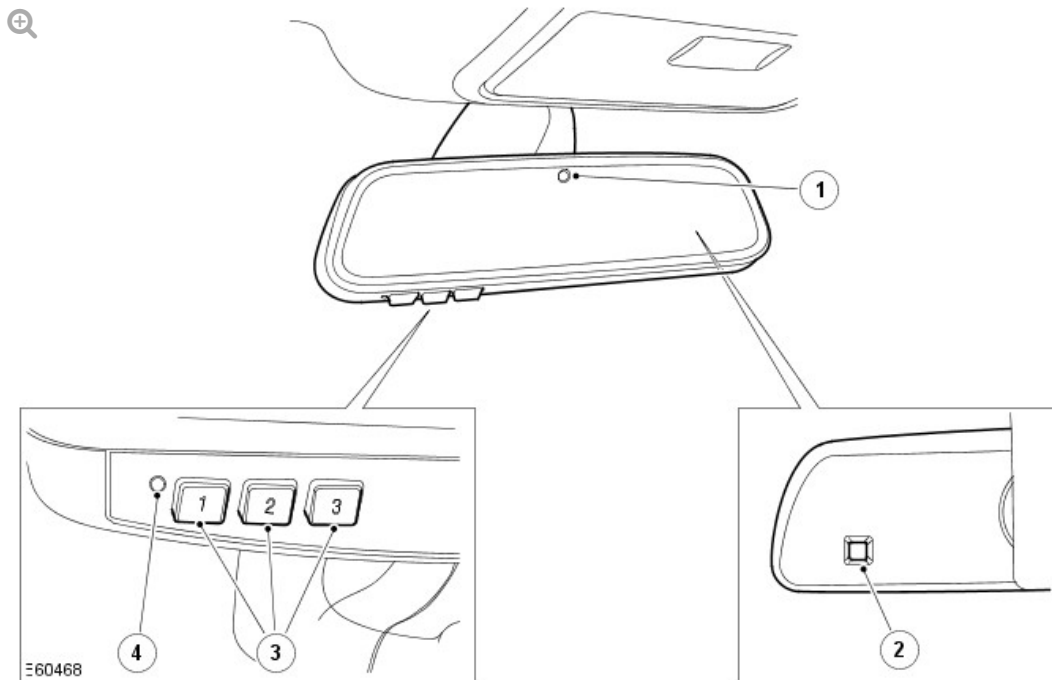
6	PDM (passenger door module)
7	CJB (central junction box)
8	BJB (battery junction box)

OVERVIEW

Rear view mirrors consist of an interior mirror on the windshield, an exterior mirror on each front door cheater.

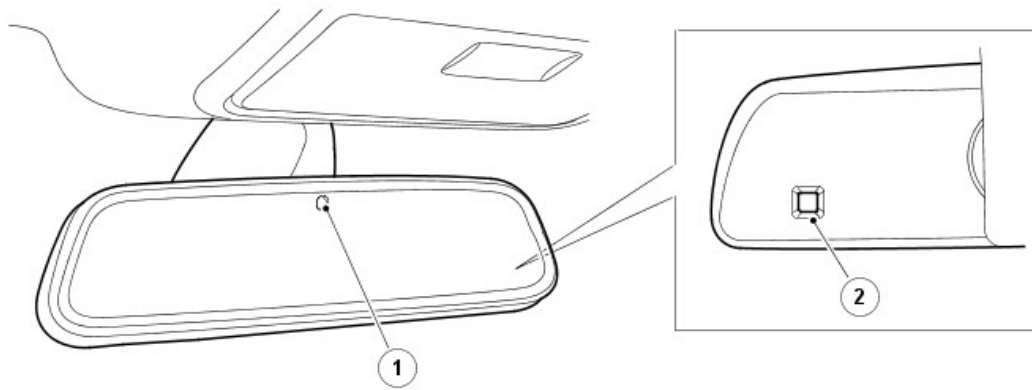
INTERIOR MIRRORS

Automatic Dimming Interior Mirror (All Except Japan)



ITEM	DESCRIPTION
1	Rear light sensor
2	Front light sensor
3	Universal transmitter channel button (market dependant)
4	Universal transmitter light emitting diode (LED) (market dependant)





E125625

ITEM	DESCRIPTION
1	Rear light sensor
2	Front light sensor

The interior rear view mirror is provided as a electrically operated automatic dimming type.

The automatic dimming mirror comprises an electro-chromatic glass housed within a surrounding case that is attached with a ball joint connector to the mirror stem.

Light sensors are mounted on the front and rear of the mirror surround case. The sensors control the automatic dimming feature to reduce glare from the headlights of following vehicles.

The automatic dimming function is permanently active when the ignition is in power mode 4 (Accessory) and power mode 6 (Ignition). The forward facing light sensor monitors the ambient light level at the front of the vehicle; the rearward facing light sensor monitors the light level coming from the rear of the vehicle. When light from the rear of the vehicle exceeds the ambient light level from the front of the vehicle, the automatic dimming circuit darkens the interior mirror surface.

Automatic dimming is inhibited when reverse gear is selected to provide the driver with maximum vision. On vehicles with automatic transmission, the reverse gear signal is provided by the TCM (transmission control module) via the high speed CAN bus to the CJB. The CJB then provides a power feed to the mirror. On vehicles with manual transmission, the reverse gear signal is

provided by a transmission switch that is hardwired to the CJB.

Automatic dimming interior mirrors are connected to the vehicle wiring by an electrical connector in the mounting stem. The electrochromic mirror circuits and, where fitted, the universal transmitter, are powered by a feed from the central junction box (CJB) when the ignition is in power mode 6.

UNIVERSAL TRANSMITTER

WARNING:

The universal transmitter must not be used with any garage door that lacks safety 'stop' and 'reverse' features, as required by federal safety standards (this includes any garage or door opener model manufactured before April 1 1982). A garage door opener which cannot 'detect' an object in the path of a closing door and then automatically 'stop' and 'reverse' the door, does not meet current federal safety standards. Using a garage door opener without these features increases the risk of serious injury or death.

NOTES:

- Universal transmitter is market dependant
- HomeLink is a registered trademark owned by Johnson Controls Inc.

The universal transmitter can operate up to 3 home or office remotely operated systems (e.g. garage door/gate openers, lighting and security systems), replacing the individual hand held transmitters required for each system. The universal transmitter can learn the radio frequency codes of most current transmitters.

NOTE:

Universal transmitter frequencies vary across markets

The universal transmitter incorporates 3 buttons, one for each channel, and an amber LED installed on the underside of the interior mirror. When one of the buttons is pressed the universal transmitter outputs the radio signal programmed for the related channel (if any) and illuminates the LED to confirm transmission.

For information on programming the universal transmitter, refer to the 'Owners Handbook'.

HIGH BEAM ASSIST

The high beam assist system is controlled by a high beam assist control module which is located in the interior rear view mirror body. The module and the CJB are connected via the medium speed CAN bus.

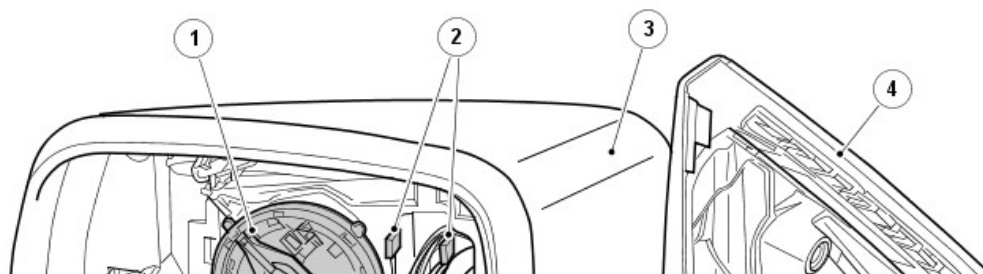
The high beam assist control module receives a power supply from the CJB when the ignition is in power mode 6 (ignition on). The rear view mirror also includes a low resolution camera (image) sensor which detects headlamps and tail lamps of preceding vehicles. The sensor is connected to the control module which evaluates the image data, checking for light intensity and location.

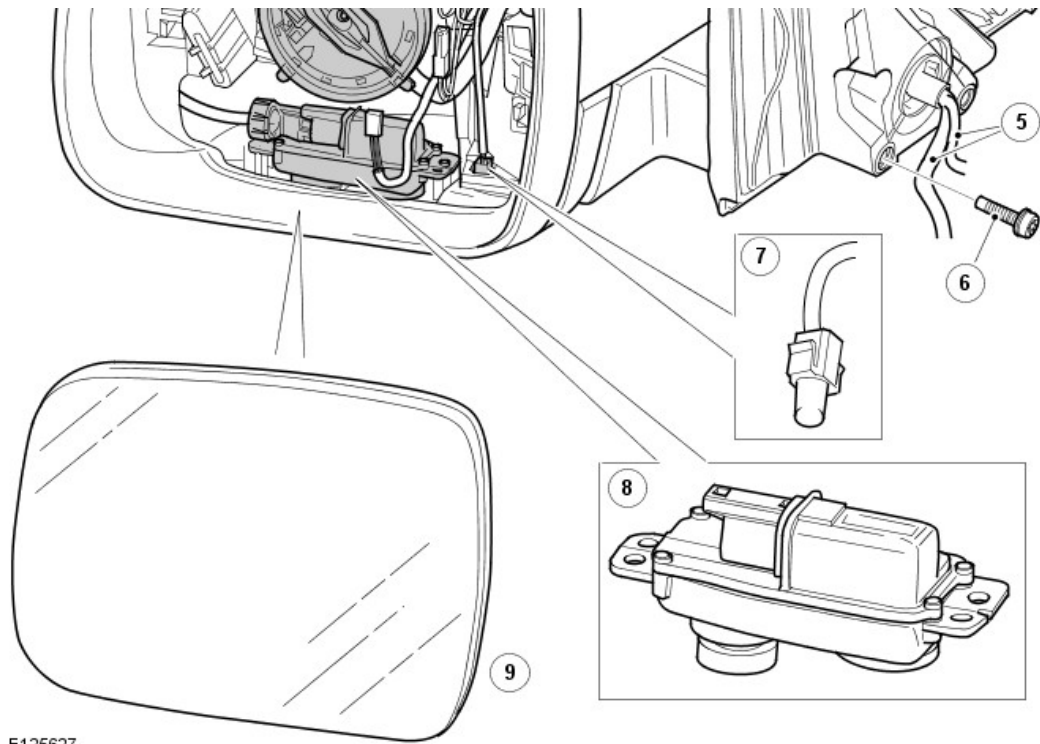
If conditions are correct and auto high beam assist has been activated, the control module will activate the high beam assist by sending a high or low beam request message to the CJB via the medium speed CAN bus. The CJB then controls the shutter in the Xenon projector module together with the high beam fill-in lamp.

For additional information, refer to: Exterior Lighting (417-01, Description and Operation).

EXTERIOR MIRRORS

Hi Line Mirror

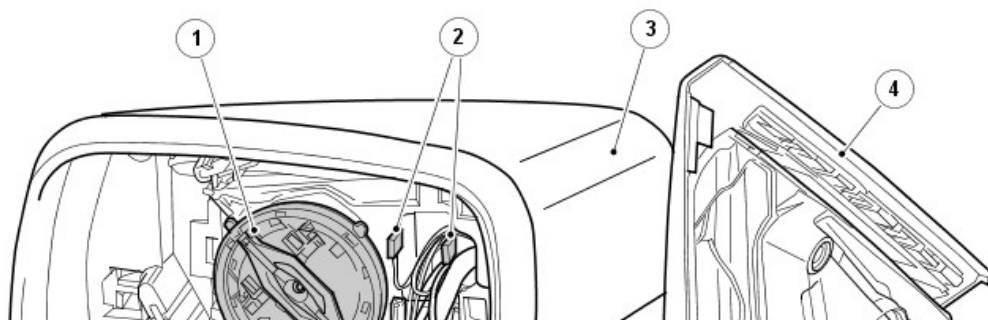


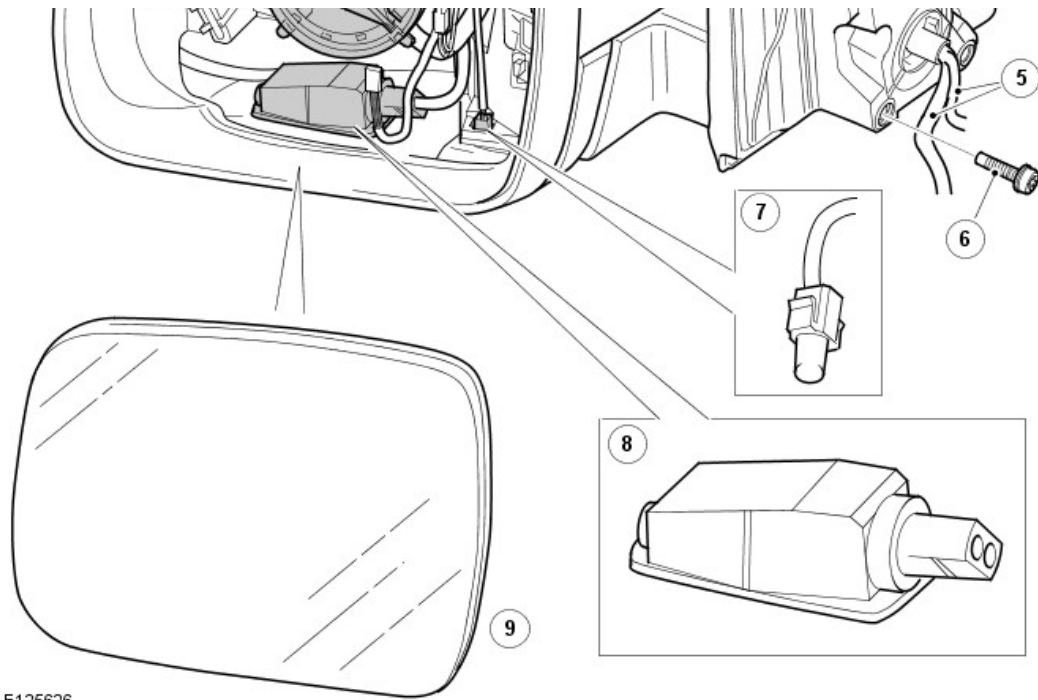


E125627

ITEM	DESCRIPTION
1	Vertical and horizontal adjustment motor
2	Heating element connectors
3	Mirror body
4	Base frame
5	Fly leads (connected to door module)
6	Screw (3 off)
7	Ambient air temperature sensor (LH mirror only)
8	Proximity camera/approach lamp
9	Mirror glass

Low Line Mirror





E125626

ITEM	DESCRIPTION
1	Vertical and horizontal adjustment motor
2	Heating element connectors
3	Mirror body
4	Base frame
5	Fly leads (connected to door module)
6	Screw (3 off)
7	Ambient air temperature sensor (LH mirror only)
8	Approach lamp
9	Mirror glass

The exterior mirrors are bolted to the front door structure and incorporate the following features:

- Convex mirror glass.
- Electric adjustment.
- Mirror heating.
- Automatic dimming (model and market dependant).
- Memory recall and reverse dipping (model and market dependant).

- Mirror fold back function (model and market dependant).
- Approach lighting (model dependant).
For additional information, refer to: Interior Lighting (417-02, Description and Operation).
- Proximity cameras (model dependant).
- Ambient air temperature sensor (LHmirror only)

Operation of the exterior mirrors is controlled by the 2 front door modules and the CJB. The door modules and the CJB communicate with each other. The door modules interpret the signals and control switch inputs into appropriate outputs for the exterior mirrors. For operation of the various exterior mirror functions the 2 door modules are powered by a permanent battery feed from the CJB.

HEATING

Heating of the exterior mirrors is controlled by the CJB and the respective door modules, and is active while the ignition is in power mode 6 or 7.

The CJB receives the ambient air temperature value from the instrument cluster via the CAN (controller area network) bus. The CJB converts the ambient air temperature value to an on-time percentage and transmits it on the medium speed CAN bus to the two door modules, which then energize the exterior mirror heating elements accordingly. The on-time percentage is increased while the windshield wipers are on.

Exterior Mirror Heating Times

Ambient Air Temperature in °C (°F)	< -10 (<14)	-10 to 0 (14 to 32)	0 to 15 (32 to 59)	15 to 25 (59 to 77)	25 to 35 (77 to 95)	> 35 (>95)
On-time Percentage	100%	75%	50%	25%	0%	0%
On-time Percentage With Wipers On	100%	100%	75%	50%	25%	0%

On vehicles with the parked heating function, exterior mirror heating may also operate when the parked heating function is active, depending on the ambient air temperature.

For additional information, refer to: Auxiliary Heater (412-02B, Description

For additional information, refer to Auxiliary Heater (412-02D, Description and Operation).

DIMMING

Exterior mirrors with automatic dimming are slaved to the interior mirror. The interior mirror determines the amount of dimming required and energizes the electrochromic elements in the exterior mirrors accordingly. Feed and ground wires from the interior mirror, for the electrochromic elements in the exterior mirrors, bypass the door modules and connect directly to the exterior mirrors.

MIRROR MEMORY

The seat, exterior mirrors and steering column memory functions are integrated into the CJB.

The driver and front passenger door modules control the mirror memory while the driver seat module controls the seat and the CJB controls the steering column memory.

Located on the outboard side of the driver seat plinth, the memory switch and memory pre-set buttons can be used to store 3 different mirror positions. When a position is stored or recalled, the information is transmitted to the CJB via the medium speed CAN. It is then relayed to the door modules. Each door module evaluates the recalling and storage commands transmitted via the medium speed CAN for positions 1 to 3 and performs the necessary adjustments.

If a manual adjustment is selected while the mirror memory is operating, it will over-ride the memory recall function.

For mirror memory to operate, the mirror adjustment potentiometers must deliver a voltage value in the range of 80mV - 4.8V. Should a voltage applied be outside of this range the mirror will not operate when memory is selected.

REVERSE DIPPING

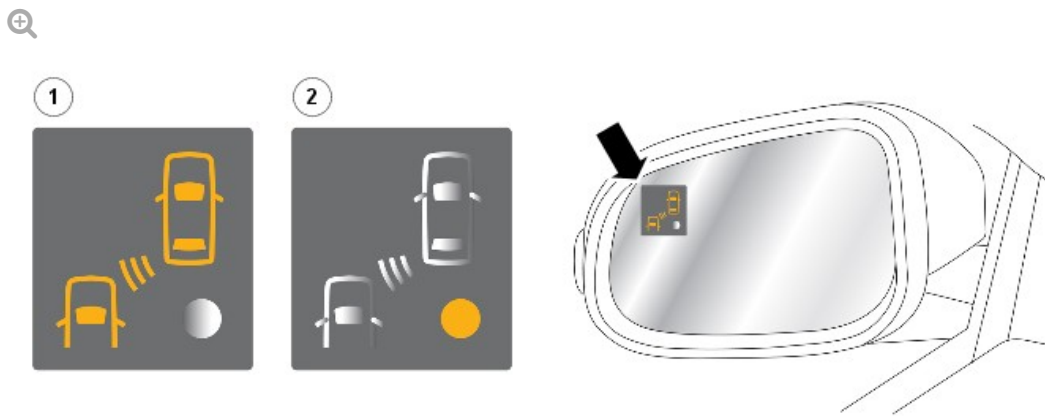
If the customer has activated reverse dipping when reverse gear is selected and the vehicle is in power mode 6 or 7, the driver and passenger exterior mirrors dip to provide a better view of the kerb. The mirrors return to their original position immediately upon reverse gear being disengaged.

The kerb view mirror position can be adjusted using the mirror adjustment multi-directional switch while reverse gear is selected and the vehicle in power mode 6 or 7.

BLIND SPOT MONITORING

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.



E97753

ITEM	DESCRIPTION
1	Warning alert icon
2	System status warning indicator

Blind spot monitoring function alerts the driver to a vehicle located in the vehicle blind spot. A warning indicator is located in each exterior mirror towards the outer edge.

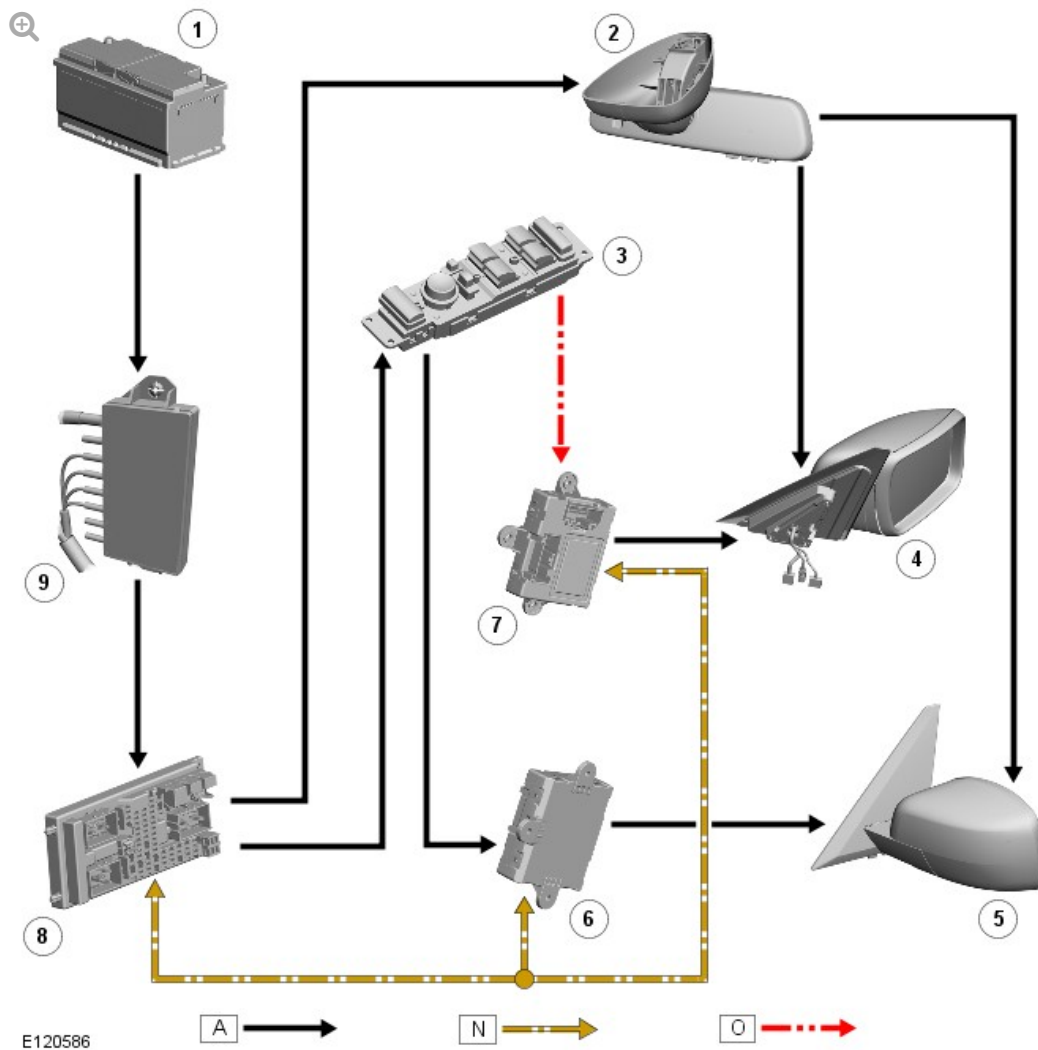
For additional information, refer to: Blind Spot Monitoring System (413-09A, Description and Operation).

CONTROL DIAGRAM

NOTE:

RHD shown, LHD similar

A = Hardwired; **N** = Medium Speed CAN; **O** = LIN Bus



E120586

ITEM	DESCRIPTION
1	Battery
2	Interior mirror
3	Exterior mirror switch
4	RH exterior mirror
5	LH exterior mirror
6	DDM
7	PDM
8	CJBDriver exterior mirror
9	R IR

PRINCIPLES OF OPERATION

ELECTROCHROMIC MIRROR

The electrochromic mirrors automatically dim to reduce glare from the headlights of following vehicles in dark or low light conditions. In addition to dimming the interior mirror, the electrochromic mirror circuits also control the dimming of the two exterior mirrors, via power feed and ground connections with the 2 exterior mirrors.

A light sensor on the front of the interior mirror monitors ambient light at the front of the vehicle and a light sensor in the interior mirror glass monitors the light coming from behind the vehicle. When the light from behind the vehicle exceeds the ambient light level, the electrochromic circuits simultaneously dim the interior and exterior mirrors. Dimming is inhibited when reverse gear is selected. The interior mirror is provided with a reverse gear signal by the lighting control module (LCM).

This section contains no data

2012.0 RANGE ROVER (LM), 501-09

REAR VIEW MIRRORS

EXTERIOR MIRROR (G455062)

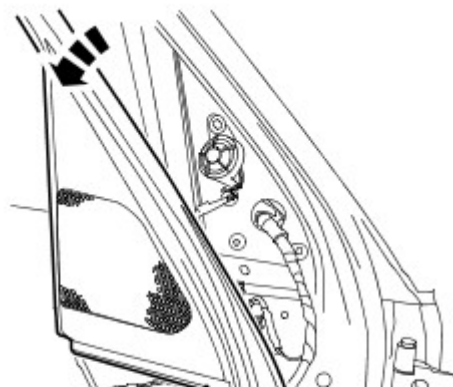
REMOVAL AND INSTALLATION

76.11.10	EXTERIOR MIRROR ASSEMBLY (ELECTRICALLY OPERATED) - LH/EACH - RENEW	ALL DERIVATIVES	0.7	USED WITHINS	+
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REMOVAL

1. Remove the front door trim panel.
For additional information, refer to: Front Door Trim Panel (501-05, Removal and Installation).
-

2.

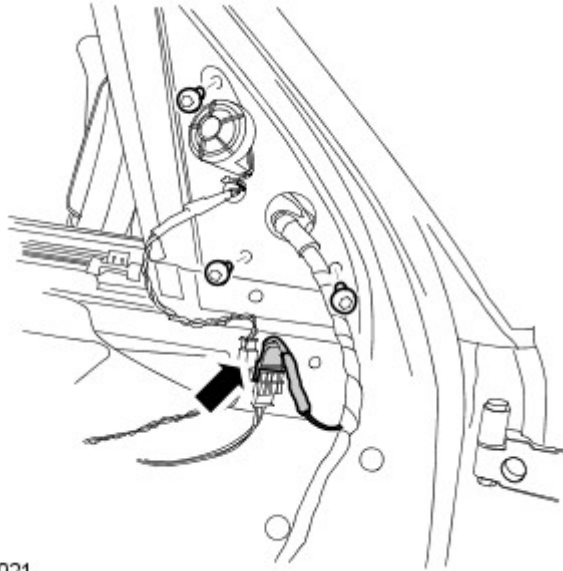




E57020

Release the window surround trim panel.

3.



E57021

Remove the exterior mirror.

- Remove the 3 Torx screws.
- Disconnect the electrical connector.

INSTALLATION

1. Install the interior mirror.
 - Tighten the Torx screws to 8 Nm (6 lb.ft).
 - Connect the electrical connector.
2. Secure the window surround trim panel.
3. Install the front door trim panel.

For additional information, refer to: Front Door Trim Panel (501-05, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-09

REAR VIEW MIRRORS

EXTERIOR MIRROR GLASS

EXTERIOR MIRROR GLASS

[G1236369]

REMOVAL AND INSTALLATION

76.11.08	GLASS - EXTERIOR MIRROR (ELECTRIC) - RENEW	ALL DERIVATIVES	0.1	USED WITHINS	+
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REMOVAL

1. 

2. 

INSTALLATION

1. To install, reverse the removal procedure.

2012.0 RANGE ROVER (LM), 501-09

REAR VIEW MIRRORS

EXTERIOR MIRROR MOTOR

[G927833]

REMOVAL AND INSTALLATION

76.11.09	MOTOR - EXTERIOR MIRROR - RENEW	ALL DERIVATIVES	0.1	USED WITHINS	+
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REMOVAL

-
1. Remove the exterior mirror glass.

For additional information, refer to: Exterior Mirror Glass (501-09, Removal and Installation).

-
- 2.



Remove the exterior mirror motor.

- Remove the screw.
- Release the 3 clips.
- Disconnect the electrical connector.

INSTALLATION

-
1. Install the exterior mirror motor.

- Connect the electrical connector.
- Secure the clips.
- Install the screw.

-
2. Install the exterior mirror glass.

For additional information, refer to: Exterior Mirror Glass (501-09, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-09

REAR VIEW MIRRORS

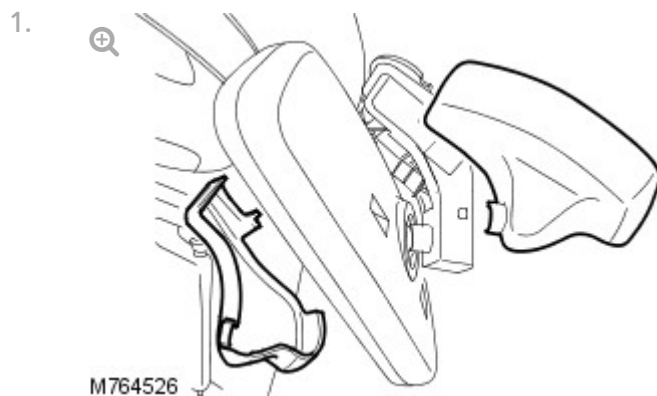
INTERIOR REAR VIEW MIRROR

(G914093)

REMOVAL AND INSTALLATION

76.10.51	MIRROR - INTERIOR - RENEW	ALL DERIVATIVES	0.1	USED WITHINS	+
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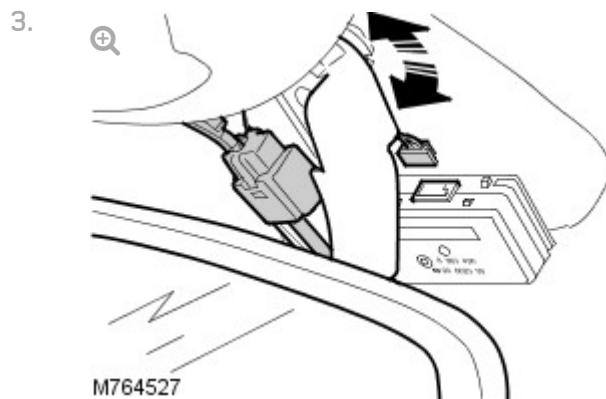
REMOVAL



Remove the 2 trim panels from the interior rear view mirror.

- Carefully release the 2 trim panels.

-
2. Release the interior rear view mirror.
 - Reposition the interior rear view mirror.



Remove the interior rear view mirror.

- Disconnect the 2 electrical connectors.
- Reposition the interior rear view mirror wiring harness from the interior rear view mirror.

INSTALLATION

-
1. Install the interior rear view mirror.
 - Reposition the interior rear view mirror wiring harness to the original position.
 - Connect the 2 electrical connectors.

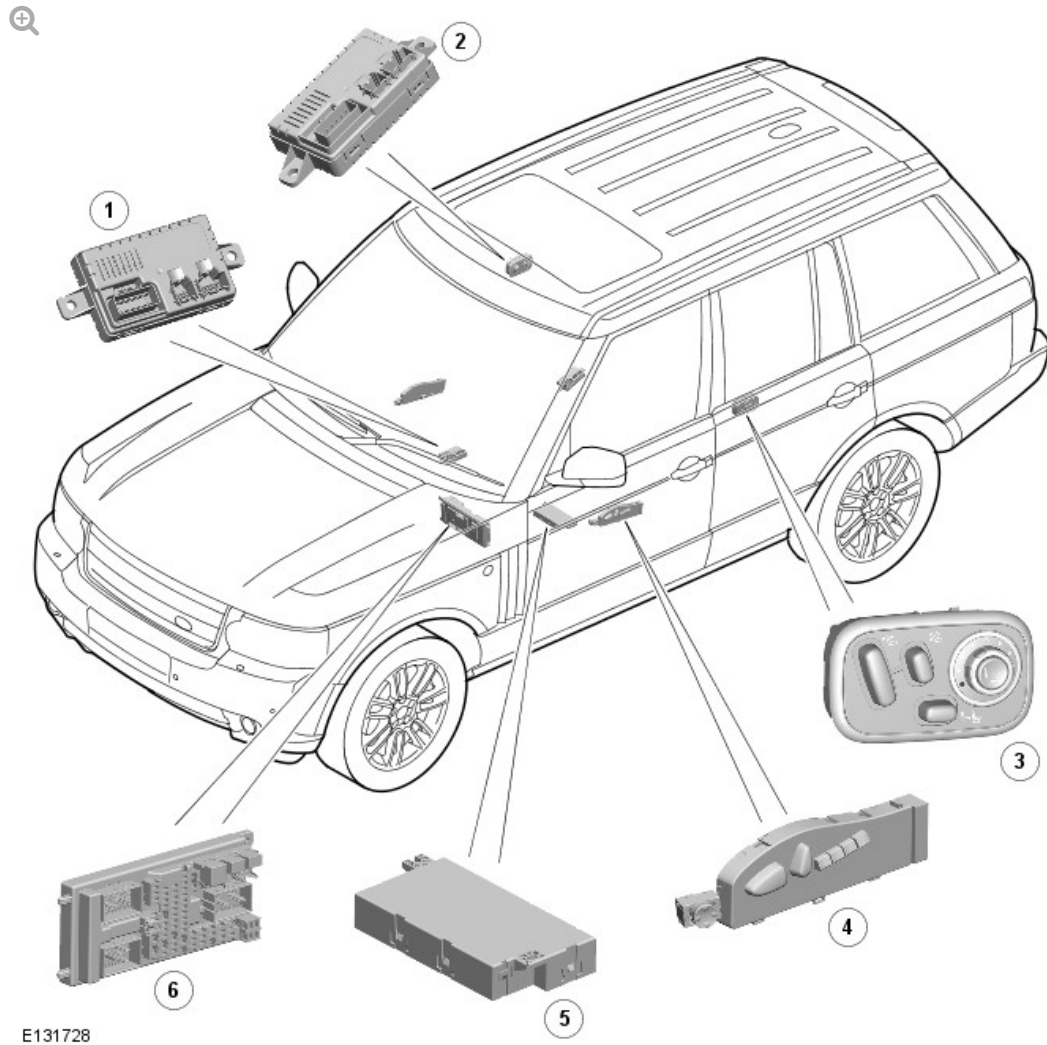
 2. Secure the interior rear view mirror.
 - Reposition the interior rear view mirror.

 3. Install the trim panels to the interior rear view mirror.

2012.0 RANGE ROVER (LM), 501-10

SEATING

COMPONENT LOCATION



E131728

ITEM	DESCRIPTION
1	Front seat climate module (where fitted)
2	Rear seat climate module (where fitted)
3	Rear seat switch pack (2 off)
4	Seat switch pack (2 off)
5	Front seat memory control module (2 off)
6	Central Junction Box (CJB)

OVERVIEW

LEATHER SEAT COVERS

Leather is a natural product, therefore it bears natural characteristics, such as grain variations, growth & bush marks. These non-weakening marks show the true nature of the hide and are the hallmarks of Leather. In order to maintain the beauty of the vehicles natural Leather upholstery it requires regular cleaning, which if neglected, may cause deterioration. Where dust and dirt are allowed to accumulate and become ingrained in the surface of the Leather, the upholstery may become permanently damaged.

Light coloured upholstery can be particularly susceptible to soiling and staining and care should be taken to ensure that where there is evidence of any soiling or staining on the upholstery then this should be cleaned immediately using the Jaguar/Land Rover approved products, failure to do this could lead to the stain becoming permanent, this applies to all leather upholstery and is not colour specific.

Leather trimmed seats will naturally exhibit areas of creasing and wrinkling over a period of time and is a normal characteristic as the Leather ages.

Particular care should be taken where there is evidence of soiling or staining on the leather, this should be cleaned immediately. Failure to do this could lead to the stain becoming permanent.

Particular care should be taken to prevent damage from studs, zips and buckles.

NOTES:

- Please refer to Leather care label attached to seats for more information.
- Creasing and wrinkling does not represent a manufacturing defect.
- Damage from studs, zips and buckles do not represent manufacturing defects.
- Use only Jaguar/Land Rover approved products in accordance with

the instructions for use.

GENERAL

Two variants of driver and passenger front seats are available:

- Low line seat with 8-way adjustment
- High line seat with 10-way adjustment.



E84291

ITEM	DESCRIPTION
A	Low line front seat
B	High line front seat

The front seats are fitted with the seat belt bolted to the seat rail. The frames are common to both variants and are equipped with the following:

- Seat control switches
- Cushion front height adjustment
- Cushion rear height adjustment
- Cushion front tilt adjustment (high line only)
- Backrest adjustment
- Head restraint adjustment
- Lumbar adjustment
- Seat forward and rearward adjustment
- Side air bag module
- Backrest heating
- Cushion heating
- Seat climatic control (available as an option on the high line version).

WARNING:

Prior to removal of the front seats and before disconnecting the front seat wiring harness electrical connectors (which includes the side air bag module electrical connectors), the battery ground cable should be disconnected and a period of at least 1 minute allowed to elapse. The same amount of care should be taken when handling and storing the front seats, as would be taken when handling and storing air bag modules.

Both variants of the front seats are fitted with a manually adjustable folding armrest on the inboard side of the seat. The memory recall functions are also available on higher specification vehicles.

The driver and passenger front seats, although almost identical, have some unique components:

- The front driver seat has a seat position sensor
- The front passenger seat on North American Specification (NAS) vehicles have a seat occupant classification system

- The front passenger seat on Rest Of the World (ROW) vehicles, except Australia, has a seat occupancy detection system.

The occupant classification system and the seat occupancy detection system both form an integral part of the Supplemental Restraint System (SRS).

For additional information, refer to: [Air Bag and Safety Belt Pretensioner Supplemental Restraint System \(SRS\)](#) (501-20B Supplemental Restraint System, Description and Operation).

The rear bench seats are designed to fold forward to increase the rear load space. a 60:40 split gives the owner increased flexibility when loading the vehicle with large objects. All rear seats are equipped with 3-point seat belts and adjustable head restraints. The seats can also be fitted with seat cushion heaters in both outboard seats, climate control and also the following electric adjustment:

- Backrest adjustment
- Lumbar support adjustment.



E84292

INTEGRATED WHIPLASH REDUCTION SYSTEM

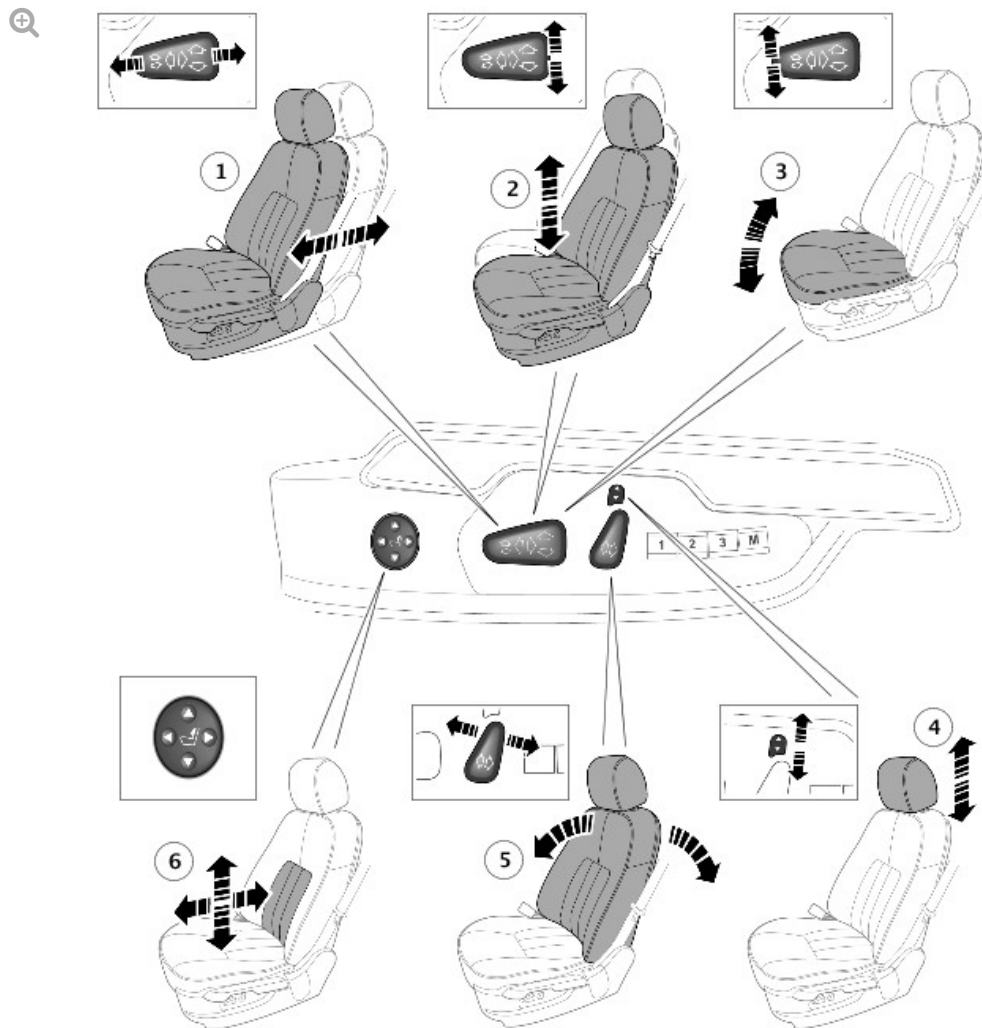
The integrated whiplash reduction system is incorporated into the backrest of the front seats. Head restraint forward positioning is activated by the natural occupant rearward displacement during low speed rear impacts. The

head restraint forward positioning is achieved by 10.8 degrees maximum movement of an integral seat deployment paddle.

FRONT SEAT CONTROLS

NOTE:

Hi-line version shown, lo-line similar.



E131729

ITEM	DESCRIPTION
1	Forward and back adjustment
2	Height adjustment
3	Cushion angle adjustment
4	Headrest adjustment

5	Backrest adjustment
6	Lumbar support adjustment

The switch pack is mounted on the seat valance of the driver and passenger seats and provides movement in the following axis:

- Seat forward/rearward adjustment
- Seat height adjustment
- Seat angle adjustment
- Backrest angle adjustment
- Head restraint height adjustment (electric only on hi-line - manual on lo-line)

Electric adjustment of the seat position can be carried out at any time, having priority over memory recall. For more information regarding seat operation, refer to the owner's handbook.

FRONT SEATS

On seats with the memory function, seat position is monitored by the seat memory control module using Hall sensors incorporated into the motors. Seat memory is standard on the driver's seat and optional on the passenger seat. Each seat memory can be configured for 3 memory positions, which are set using the seat memory switch and stored in the seat memory control module.

The switches for electrically adjusting the seats are located in the seat switch pack on the seat valance. The seat memory control module is located under the seat and controls the movement of the seat via hard-wired connections to the motors.

On passenger seats without the memory function, the seat switch pack is connected directly to the seat motors.

SEAT MOTORS

The seat motors are permanent magnet motors. Two pins within the seat switch pack control the motors. Both pins are connected to ground.

switch pack control the motors. Both pins are connected to ground.

Operating a switch in one direction will apply voltage to that pin while the other pin remains connected to ground. Operating the switch in the opposite direction reverses power and ground to the motor allowing the motor to run in the opposite direction.

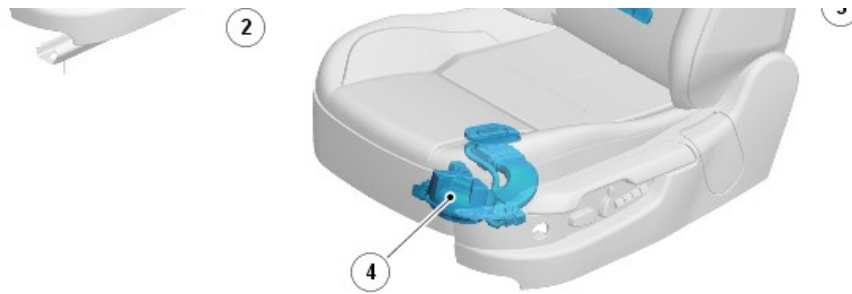
The seats can be manually adjusted at any time. Positioning is interrupted if manual adjustment is required during automatic adjustment (memory recall). The manual adjustment is not effective before the switch is operated again.

Due to the sequential activation of the drive motors, the switch requests are prioritised in the following order:

- Forward/rearward adjustment
- Backrest
- Height
- Angle
- Head restraint
- Backrest head
- Steering column angle
- Steering column forward/rearward adjustment.

HEATED FRONT SEATS





E84294

ITEM	DESCRIPTION
1	Seat back heater
2	Seat cushion heater
3	Seat back climate control motor (optional on high line variants)
4	Seat cushion climate control motor (optional on high line variants)

The seat heater elements are located in the seat cushion and backrest. The cushion and backrest heater elements are wired in series. The cushion heater element has an input feed from the temperature control unit and an output to the backrest heater element, which outputs to ground.

The seat heaters are thermostatically controlled and will operate intermittently to maintain a predetermined temperature. The indicators in the switches will remain illuminated until the heaters are either manually turned off, or the starter switch is turned off.

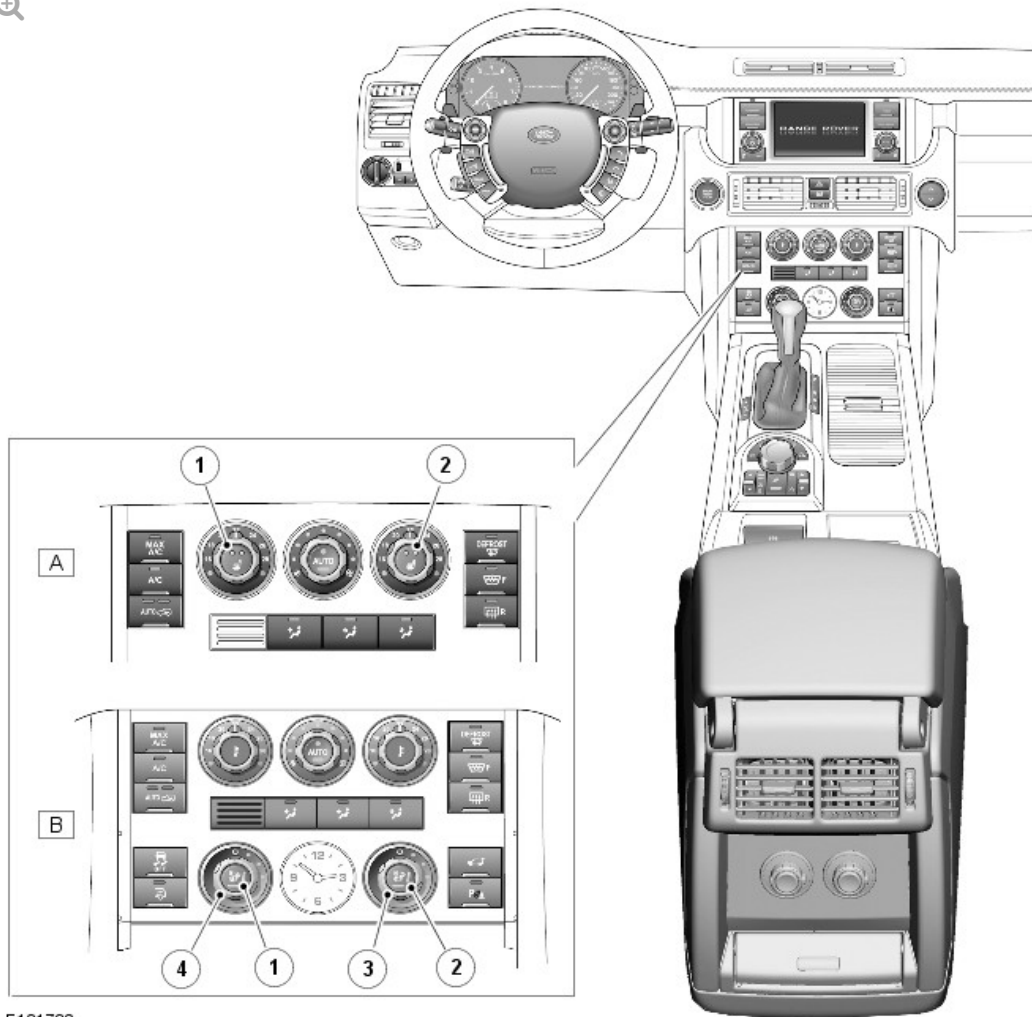
Feedback of the seat temperature is via a NTC (negative temperature coefficient) sensor within the seat cushion. The resistance of this sensor changes with the temperature of the seat cushion allowing the ATC (automatic temperature control) module to raise or lower the voltage to the seat heater elements to raise or lower their temperature.

An ignition feed is supplied to each sensor via the relevant seat heater switch.

Operation of the heated seats is controlled by the ATC module. Two push-button switches are mounted in the ATC module panel. Each switch has 2 integral Light Emitting Diodes (LED) to display the level of heating selected.

CLIMATE FRONT SEATS

Front Seat Heating/Climate Controls



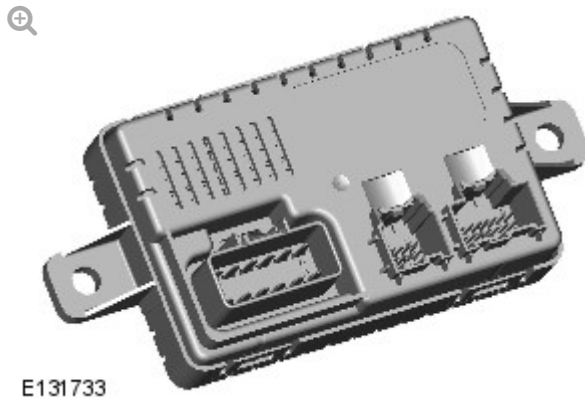
E131732

ITEM	DESCRIPTION
A	Lo-line and hi-line variants with heated front seats
B	Hi-line variant with heated front seats and climatic control option
1	LH front seat heater switch
2	RH front seat heater switch
3	RH seat climate rotary control
4	LH seat climate rotary control

High specification vehicles are fitted with climatic seats, which are able to deliver heating and cooling to the front seat occupants. Vehicles fitted with climatic seats feature 2 additional rotary controllers mounted in the ATC module switch pack, adjacent to the clock. The rotary controllers are used to

select cooling and heating. Three levels of cooling and heating are available, dependant on the degree of controller rotation. The center of the controller is pressed once to ventilate both the seat back and cushion (both indicators on the switch will illuminate). A second press of the switch will ventilate the seat back rest only (the cushion indicator will extinguish).

Front Seat Climate Control Module



ITEM	DESCRIPTION
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NOTES:

- If climatic seats are fitted, heated seat switches are not featured on the ATC module control panel. They are located in the lower panel, either side of the clock.
- The ATC module does not control any aspect of climatic seat operation.

The controlling software for the climatic seats is contained within a front seat climate module mounted on the floorpan, below the front passenger seat. When a temperature selection is made through either of the rotary seat climate controllers, the ATC module switchpack provides a medium speed CAN (controller area network) bus message to the climate module. The climate module interprets the medium speed CAN bus message as a temperature value and attempts to heat or cool the seat accordingly.

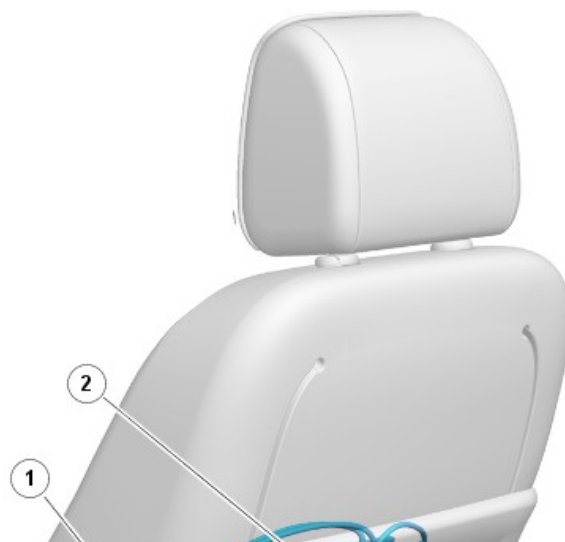
Both climatic front seats contain two Delphi relays, one in the cushion and one in

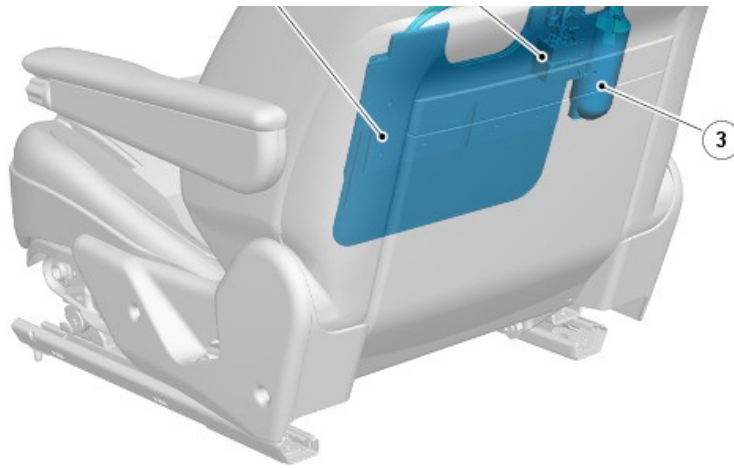
BOTH CLIMATIC FRONT SEATS contain two Peltier cells; one in the cushion, one in the backrest. The Peltier cells are able to deliver heating and cooling based on a voltage provided by the climate module. Each seat also contains a fan, which blows air over the Peltier cells to distribute heating or cooling throughout the seat. The Peltier effect occurs when an electrical current is passed through a junction formed by two dissimilar conductors, creating a heat pump. A heat pump absorbs heat from one side of the system, causing it to cool, and then transfers the heat to the other side, causing it to warm. The cell is capable of cooling the incoming air by approximately 8°C (12.4°F), which means that temperature output will depend on the ambient temperature inside the vehicle.

The climate module monitors seat heating through a NTC temperature sensor. The temperature sensor is only used to monitor seat heating. Seat cooling is open loop, with no temperature signal provided back to the climate module. When a temperature selection is made through either of the rotary controllers, the ATC module switchpack provides a medium speed CAN bus message to the climate module as a temperature value and attempts to heat or cool the seat accordingly.

Although the rotary control LED (light emitting diode)'s will illuminate if a selection is made when the ignition is in the on mode, the Peltier cells will not operate until the engine is running. After the ignition is in the off mode, the climate module will retain the current temperature settings for approximately 15 minutes. After this period, the seats will be set to 'off' when the ignition is in the on mode.

FRONT SEAT LUMBAR ADJUSTMENT





E84297

ITEM	DESCRIPTION
1	Bladder
2	Solenoid
3	Pump

Lumbar adjustment is provided by an inflatable cushion with dual air cells and an air pump installed in the seat backrest. A valve block containing solenoid valves controls the inflation of the cushion in relation to switch selections made on a 4-way switch.

The 4-way switch is located on the seat switchpack and controls the operation of the backrest lumbar pump and valve block solenoids.

The lumbar pump inflates cells in a cushion in the backrest via a valve block, which provides extra support for the seat occupant. With no load on the seat it takes approximately 10 seconds to completely inflate the bladder. With a load of 25 kg (55 lb) it takes approximately 15 seconds to inflate the cushion. A pressure cut off switch in the system will operate at 0.12 to 1.93 bar (1.8 to 28 lbf.in²).

SEAT MEMORY CONTROL MODULE

The seat memory control module is located on the underside of the seat frame of the seat it controls. The module relies upon a number of inputs to control various outputs. As with all electronic control modules, the unit needs information regarding the current operating conditions of the engine

and other related systems before it can make calculations, which determine the appropriate outputs.

The memory control module can store up to 3 different driver seating, mirror and steering column positions for each key. The passenger seat memory module only stores memory positions relating to the front passenger seat.

All memory values are stored in the non-volatile memory, EEPROM. The current motor positions, which are monitored by the seat memory control module using Hall sensors integral with the motors, are stored in the EEPROM. If a loss of power occurs, when the power supply is restored the current motor positions are recalled from the memory and adopted as the current positions. This allows the relative memory positions to be retained without any need to re-calibrate. The memory control module checks the integrity of all data stored in the EEPROM each time it exits stand-by mode. In the event that the data is corrupt, the control module adopts the default values for all of the programming options. All memory positions are deemed as invalid and the software will perform as if there are no memory positions stored. Following the procedure for storing a memory position again will reset the relevant memory and allow full functionality.

MEMORY FUNCTION

Controlled by the driver's seat memory control module, the memory function stores and recalls the position of the driver's seat, the steering column and the exterior mirrors.

The memory recall functions are:

- Forward/backward adjustment
- Seat height
- Seat angle
- Backrest angle
- External mirror adjustment
- Steering column adjustment

The seat, steering column, and exterior mirrors will move to the stored

position whenever the relevant memory-recall button is pressed.

The passenger seat memory control module stores and recalls the position of the front passenger seat only. The memory recall function for the passenger seat are as follows:

- Forward/backward adjustment
- Seat height
- Seat angle
- Backrest angle.

For more information regarding the operation of the memory function, refer to the owner's handbook.

NOTE:

Seat, steering column and exterior mirror movement will be halted if any seat adjustment switch (including memory buttons) or the steering column adjustment switch is moved or pressed. To re-start movement of these, the relevant seat memory button will need to be pressed again.

On vehicles with electric rear seats, the power supplies for the seat motors are supplied via the seat memory control modules. Therefore, it is possible for a vehicle to have a non-memory passenger seat but have the seat memory control module located below it to provide power to the rear, passenger side seat motors.

EASY ENTRY/EXIT

The 'Easy Entry/Exit' mode provides automatic movement of the steering column to allow easier entry to or exit from the vehicle.

NOTE:

If the adjustment switch is moved during entry/exit operation, steering column movement will stop.

When the ignition is in the on mode and the vehicle smart key is sensed by the Keyless Vehicle Module (KVM), the steering column, door mirrors and driver's seat will return to the stored position relating to that smart key. If, however, the memorised driver position has been changed (using the seat memory switches or another smart key transmitter), the steering wheel, door mirrors and the seat will move to the new stored memory position.

When the ignition is in the off mode, the steering column will move to the uppermost rake to allow easier exit from the vehicle cabin.

STALL DETECTION

Seat, steering column and mirror motors are deemed to have stalled if there is no change in the inputs that are received from the corresponding feedback sensors while that axis motor is being driven.

If a stall condition is detected, then the drive to that axis motor is cancelled for the remainder of that memory operation (memory recall) or until the switch is re-selected (manual movement).

If the motor movement has stopped due to loss of sensor feedback, either, stall or sensor failure, then that axis motor may be activated again, to move past the stall position, by re-selecting the appropriate switch. This allows control of the motor to be maintained if sensor feedback is lost.

Upon re-selection of movement, if sensor pulses are detected then the motor will continue to be driven until the switch is released or another stall condition is detected. If sensor feedback is not detected then the motor is only driven for 0.5 second and then stops until the switch is released and then pressed again, when a further 0.5 second of activation is permitted, and so on.

For all seat motor and steering column manual movements, whenever a motor is driven and a stall occurs, the seat memory control module records the position at which the stall occurred. If movement occurs beyond a stall position, then that position is erased from the seat control module's memory. This will always allow movement past a previously recorded stall position once movement has been registered beyond that position. This is the case for both manual and memory movement.

REAR SEATS

The switches for electrically adjusting the rear seat backrest are located in the rear door trims. Two versions of the switch are available; one lo-line switch with one switch for rear back rest adjustment and one switch with rear back rest adjustment, lumbar adjustment and a rotary switch for climate control. The switch corresponding to the front passenger seat is fitted with a front seat forward/backwards switch to allow for legroom adjustment.

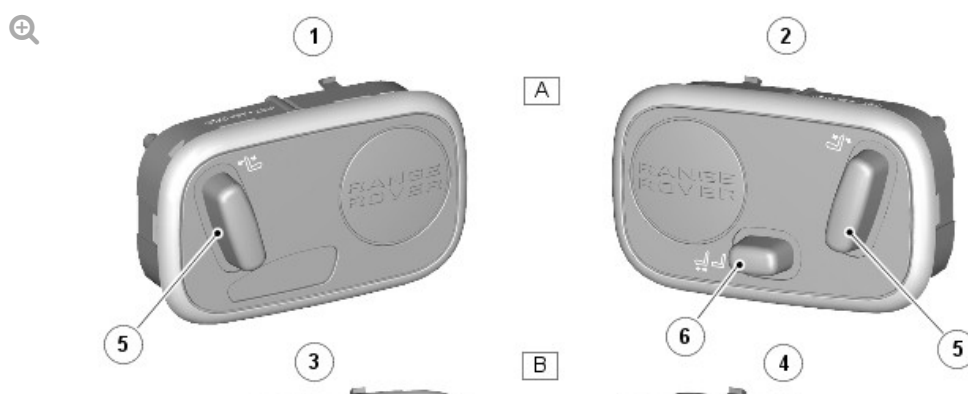
On vehicles with non-climate, non-electric adjustment heated rear seats, the rear seat heaters are selected by switches on the rear of the floor console and controlled by the ATC module.

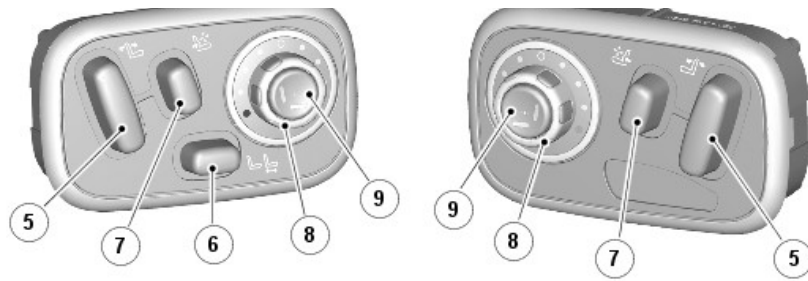
On vehicles with electric adjustment, non-climate seats, the rear seat heaters and electrical adjustment are selected by switches located in the door trims.

On vehicles with electrical adjustment and climate control the climate seat controls and electrical adjustment are selected by switches located in the door trims.

On vehicles with electric and climate controlled rear seats, the power supplies for the motors and climate functions are supplied from the front seat memory control module. On vehicles with a passenger front seat without the memory function, the seat memory control module is still fitted to the front passenger seat to supply the power for the passenger side rear seat functions. The seat memory control module is connected to the rear seat control switch and controls the movement of the rear seat via hard-wired connections to the motors.

Rear Seat Control Switch





E131730

ITEM	DESCRIPTION
A	Lo line Switch (LHD vehicle)
B	Hi line switch (RHD vehicle)
1	LH (driver's side) rear seat control switch
2	RH (passenger side) rear seat control switch
3	LH (passenger side) rear seat control switch
4	RH (driver's side) rear seat control switch
5	Backrest adjustment
6	Front passenger seat - Forward and back adjustment
7	Lumbar support adjustment
8	Climate rotary control
9	Seat heat select switch

HEATED REAR SEATS - NON-CLIMATE SEATS

The rear seat heater elements are located in the outboard seat cushions and backrests. The cushion and backrest heater elements are wired in series. The cushion heater element has an input feed from the floor console mounted climate switch pack and an output to the backrest heater element, which outputs to ground.

The seat heaters are thermostatically controlled and will operate intermittently to maintain a predetermined temperature. The indicators in the switches will remain illuminated until the heaters are either manually turned off, or the ignition is in the off mode.

Feedback of the seat temperature is via a NTC sensor within the seat cushion. The resistance of this sensor changes with the temperature of the seat cushion and a signal relating to the temperature is used to raise or

seat cushion and a signal relating to the temperature is used to raise or lower the voltage to the seat heater elements to raise or lower their temperature.

Operation of the heated rear seat elements is controlled by the switches on the floor console climate switch pack. Two push-button seat heater switches are mounted in the switch pack. Each switch has 2 integral LED's to display the level of heating selected. The switch can be pressed once to select the seat back rest heater or twice to select both the seat backrest heater and the seat cushion heater. The appropriate LED's will illuminate to show which elements have been selected.

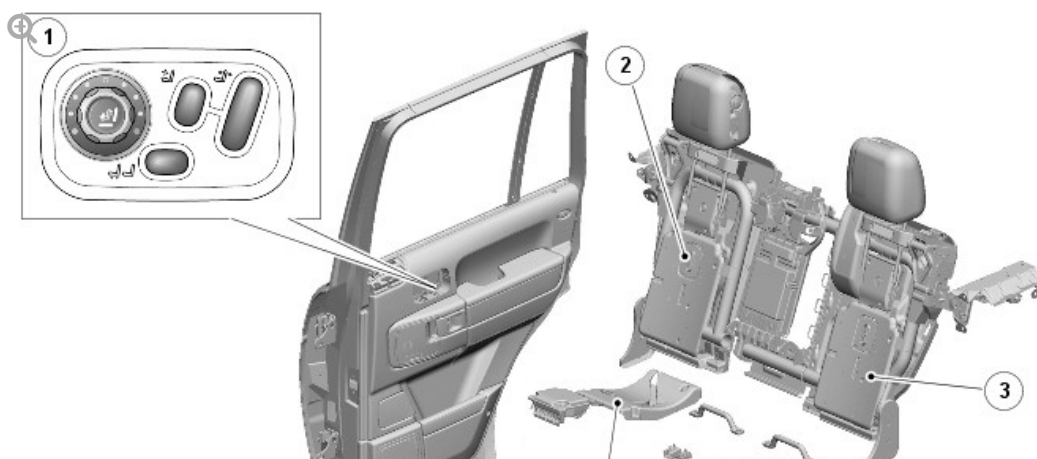
2 Zone Climate Control

The rear seat heater elements are connected directly to the climate switch pack in the floor console. The switchpack receives power supplies from the ATC module and also supplies a rear heat temperature signal to the ATC module. The ATC module uses the temperature signal to regulate the power supplied to seat heater elements and control their temperature.

4 Zone Climate Control

The rear seat heater elements are connected to the climate switchpack in the floor console. The switchpack receives power supplies from the RJB (rear junction box) and it also has a LIN (local interconnect network) connection to rear ATC module which is located under the front passenger seat. The rear ATC module controls the power supply to the rear seat heater elements via a CAN message to the RJB which regulates the power supplied to the rear seat heater elements and control their temperature.

HEATED/COOLED REAR CLIMATE SEATS





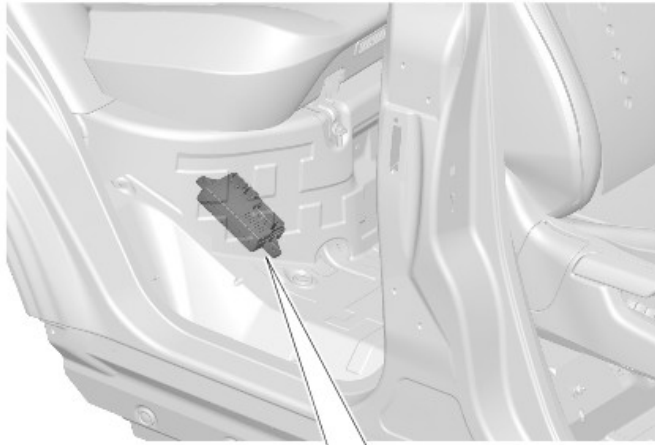
E131324

ITEM	DESCRIPTION
1	Rear seat control switch
2	Right Hand (RH) rear seat backrest heater/cooler unit
3	Left Hand (LH) rear seat backrest heater/cooler unit
4	LH rear seat cushion heater/cooler unit
5	RH rear seat cushion heater/cooler unit
6	LH front seat memory control module
7	RH front seat memory control module

Vehicles with rear climate seats have rotary climate controls located in the switch packs mounted in the door trim of each rear door. A rear seat climate module controls the functions of the climate seats. The heating and cooling functions of the climate rear seats operate using 2 Peltier cells; one in the seat cushion and one in the seat backrest. The climate functions of the seats are only active when the engine is running to preserve battery power.

The controlling software for the rear climate seats is contained with the rear seat climate control module, located under the RH (right-hand) side of the rear seat cushion. The module is connected to other vehicle system on the medium speed CAN bus. The module receives climate rotary switch temperature selections as PWM (pulse width modulation) signals and push button switch selections as ground path completions to the relative front seat memory control module. The front seat memory control module then transmits medium speed CAN bus messages to the rear climate module which then controls the rear seat heating/cooling Peltier cells to achieve the required seat temperature.

Rear Seat Climate Control Module



E131734

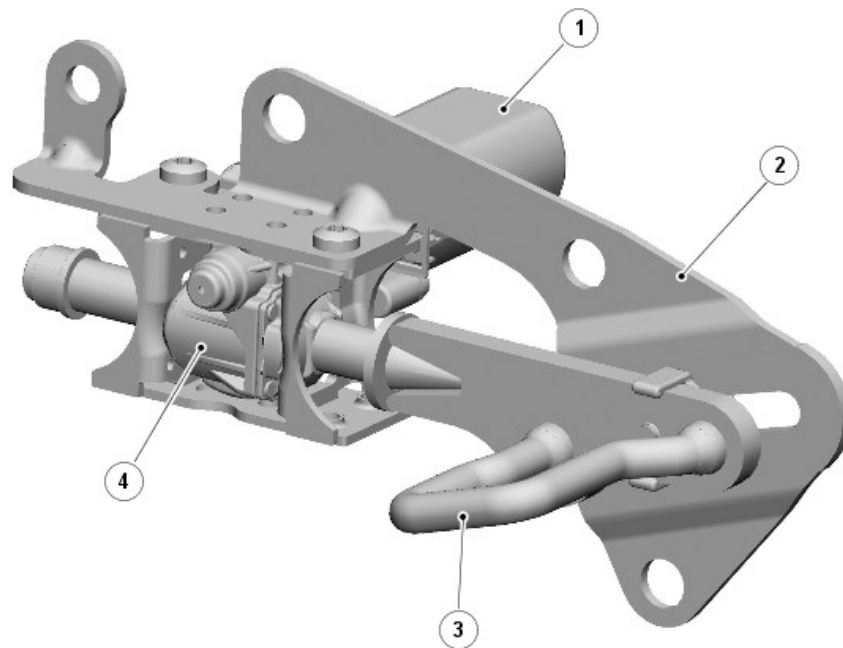
Both climatic rear seats contain two Peltier cells; one in the cushion, one in the backrest. The Peltier cells are able to deliver heating and cooling based on a voltage provided by the climate module. Each seat also contains a fan, which blows air over the Peltier cells to distribute heating or cooling throughout the seat. The Peltier effect occurs when an electrical current is passed through a junction formed by two dissimilar conductors, creating a heat pump. A heat pump absorbs heat from one side of the system, causing it to cool, and then transfers the heat to the other side, causing it to warm. The cell is capable of cooling the incoming air by approximately 8°C (12.4°F), which means that temperature output will depend on the ambient temperature inside the vehicle.

The climate module monitors seat heating through a NTC temperature sensor. The temperature sensor is only used to monitor seat heating. Seat cooling is open loop, with no temperature signal provided back to the climate module. When a temperature selection is made through either of the rotary controllers, the ATC module switchpack provides a medium speed CAN bus message to the climate module as a temperature value and

attempts to heat or cool the seat accordingly.

The rotary control switch LED's will illuminate if a selection is made when the ignition is in the on mode, but the Peltier cells will not operate until the engine is running. After the ignition is in the off mode, the climate module will retain the current temperature settings for approximately 15 minutes. After this period, the seats will be set to 'off' when the ignition is in the on mode.

ELECTRIC REAR SEATS



E131325

ITEM	DESCRIPTION
1	Seat back adjustment motor
2	Motor mounting bracket
3	Seat back latch point
4	Electric motor gearbox

The rear seat backrest can be adjusted for rake and also lumbar support using switch pack controls located in the rear door trim panel. The passenger side switch pack also contains an additional switch allow the rear seat occupant to move the front seat forward or backward to increase or decrease the rear leg room.

A motor and gearbox located in each of the rear seat backrest latches adjust the rake of the backrest in response to a request from the door switch pack. The switchpack receives a power supply from the CJB (central junction box). When a switch is operated the switch pack outputs a message on the LIN bus to the applicable front seat memory control module. The memory module then outputs the required power supplies to the seat motors to power them to the required position.

Each seat motor has four electrical connections; motor incline and recline, position sense and position sensor ground. The seat motor is operated using power supplies from the applicable front seat memory control module. The polarity of the power supplies is switched to provide the incline/recline functions. A position sensor sends signals back to the memory control module to prevent excessive seat movement.

The rear seats also have a lumbar adjustment in the backrest. This is a similar system to that used for the front seat. A 4-way switch lumbar control switch is located in the rear door switchpack and controls the operation of the backrest lumbar pump and valve block solenoids.

2012.0 RANGE ROVER (LM), 501-10

SEATING

DESCRIPTION AND OPERATION

LEATHER SEAT COVERS

Leather is a natural product, therefore it bears natural characteristics, such as grain variations, growth & bush marks. These non-weakening marks show the true nature of the hide and are the hallmarks of Leather. In order to maintain the beauty of the vehicles natural leather upholstery it requires regular cleaning, which if neglected, may cause deterioration. Where dust

and dirt are allowed to accumulate and become ingrained in the surface of the leather, the upholstery may become permanently damaged.

Light coloured upholstery can be particularly susceptible to soiling and staining and care should be taken to ensure that where there is evidence of any soiling or staining on the upholstery then this should be cleaned immediately using the Jaguar/Land Rover approved products, failure to do this could lead to the stain becoming permanent, this applies to all leather upholstery and is not colour specific.

Leather trimmed seats will naturally exhibit areas of creasing and wrinkling over a period of time and is a normal characteristic as the leather ages.

Particular care should be taken where there is evidence of soiling or staining on the leather, this should be cleaned immediately. Failure to do this could lead to the stain becoming permanent.

Particular care should be taken to prevent damage from studs, zips and buckles.

SEAT COVER REPLACEMENT

Rest of World Vehicles

Reference should be made to the list of documents below before any seat cover is replaced in Jaguar Land Rover warranty.

- Global Warranty Policy and Procedure Manual on TOPIx.
- Leather Seat Cover Finishing Process on the Excellence Academy.
- Seat Smoothing Procedure in the workshop manual.

All seat covers that are replaced should be done using all available TOPIx guides. Any damage that has been done to other components during the seat cover replacement process will not be paid under warranty.

NAS vehicles

Reference should be made to the list of documents below before any seat cover is replaced in Jaguar Land Rover warranty.

cover is replaced in Jaguar Land Rover warranty.

- Warranty Policy and Procedure Manual.
- Leather Seat Cover Finishing Process on the Excellence Academy.
- Seat Smoothing Procedure in the workshop manual.

All seat covers that are replaced should be done using all available TOPIx guides. Any damage that has been done to other components during the seat cover replacement process will not be paid under warranty.

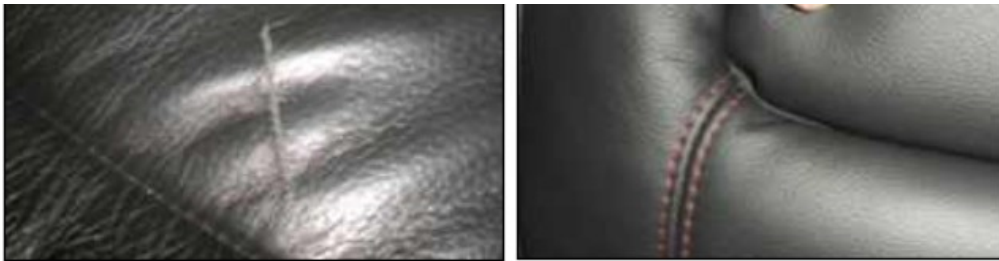
LEATHER SEAT COVERS MANUFACTURING DEFECT GUIDELINES

Examples of Damage to Seat Cover

Below are some examples of damage that would not be accepted under the terms of the Jaguar Land Rover warranty agreement. Please note: these are examples only and do not represent all warrantable/non warrantable customer concerns.

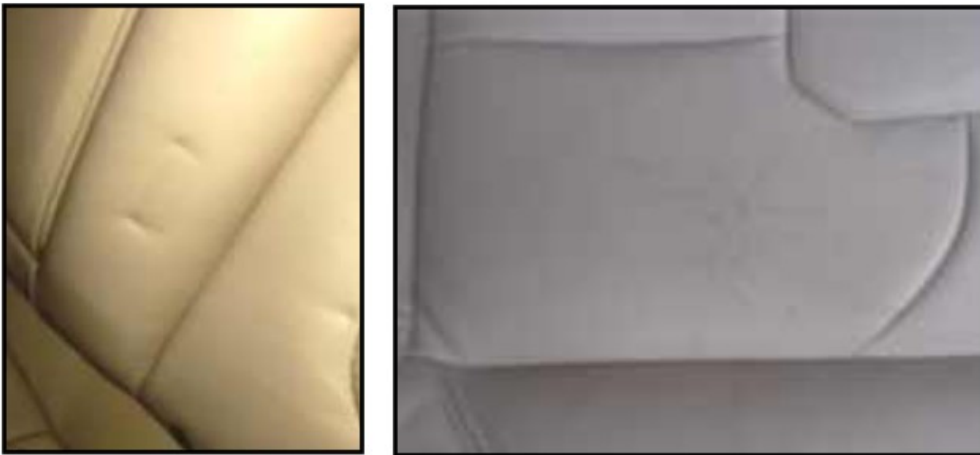
The examples below show damage such as cuts, tears and puncture holes. These types of damage would not be accepted under the terms of the Jaguar Land Rover warranty agreement (unless the seat cover damage was noted on the Pre Delivery Inspection).





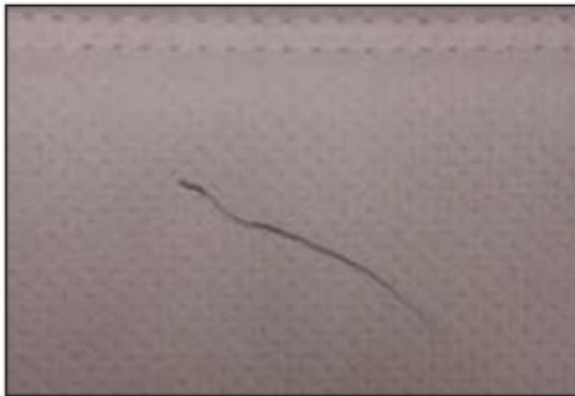
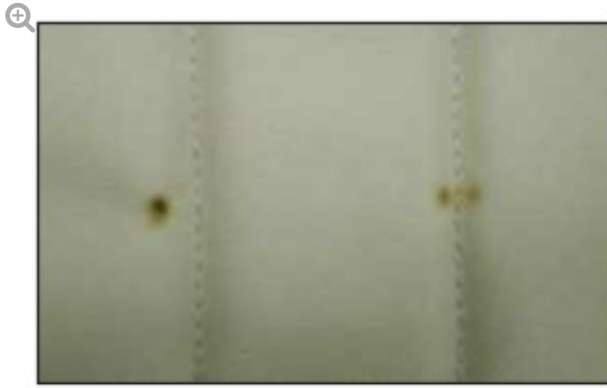
E167177

The examples below show damage such as scratches, scrapes, snags and indentation marks. These types of damage would not be accepted under the terms of the Jaguar Land Rover warranty agreement (unless the seat cover damage was noted on the Pre Delivery Inspection).



E167178

The examples below show damage such as pen marks and visual surface burns. These types of damage would not be accepted under the terms of the Jaguar Land Rover warranty agreement (unless the seat cover damage was noted on the Pre Delivery Inspection).



E167179

Examples of Natural Characteristics of Leather

Below are some examples of the natural characteristics of leather which will mature with use and ageing. These examples of the natural characteristics of leather are not manufacturing defects. Improvements in the seat cover can be achieved by following the smoothing process.

The examples below show the natural characteristics of leather on the front seat cushion. These types of natural characteristics of leather would not be accepted under the terms of the Jaguar Land Rover warranty agreement.





E167180

The examples below show the natural characteristics of leather on the front seat back and squab bolsters. These types of natural characteristics of leather would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



E167181

The examples below show the natural characteristics of leather on the rear seat. These types of natural characteristics of leather would not be accepted

seat. These types of natural characteristics of leather would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



E167182

Examples of Soiling, Stains and Incorrect Cleaning

Below are some examples of soiling, stains and incorrect cleaning that would not be accepted under the terms of the Jaguar Land Rover warranty agreement. Please note: these are examples only and do not represent all warrantable/non warrantable customer concerns.

The example below shows soiling on the seat cover. This type of soiling would not be accepted under the terms of the Jaguar Land Rover warranty agreement.





E167183

The examples below show staining on the seat cover. These type of staining would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



E167184

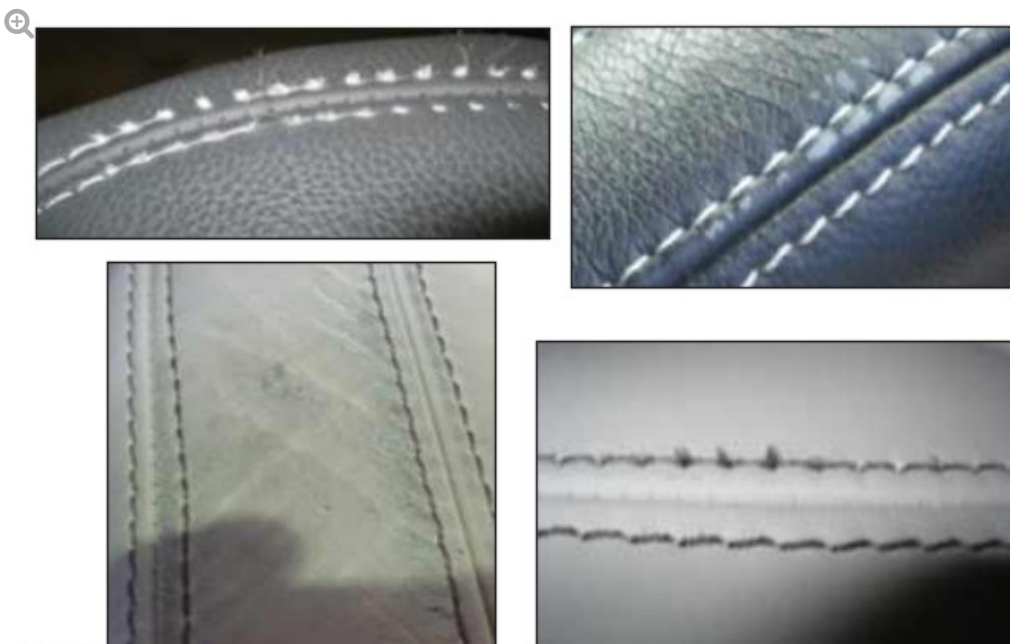
The example below shows incorrect cleaning on the seat cover. This type of incorrect cleaning would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



Examples of Excessive Wear

Below are some examples of excessive wear on the seat covers that is often caused by studs, zips and buckles. This would not be accepted under the terms of the Jaguar Land Rover warranty agreement. Please note: these are examples only and do not represent all warrantable/non warrantable customer concerns.

The examples below show excessive wear on the seat covers, when studs, zips and buckles are in contact with the seat cover while entering and exiting the vehicle. These types of wear would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



E167186

Seat Cover Replacement

Below are some examples of issues on the seat covers after they have been replaced. This would not be accepted under the terms of the Jaguar Land Rover warranty agreement. Please note: these are examples only and do not represent all warrantable/non warrantable customer concerns.

The example below shows excessive wrinkling or looseness due to incorrect fitment of the front seat covers. These types of incorrect fitment would not be accepted under the terms of the Jaguar Land Rover warranty agreement.



E167187

The example below shows excessive wrinkling or looseness due to incorrect fitment of the rear seat covers. This type of incorrect fitment would not be accepted under the terms of the Jaguar Land Rover warranty agreement.





E167188

2012.0 RANGE ROVER (LM), 501-10

SEATING

DIAGNOSIS AND TESTING

PRINCIPLES OF OPERATION

For a detailed description of the Heater Mats, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Seats](#) (501-10 Seating, 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.

NOTES:

- If a control module or a component is suspect and the vehicle

- If a control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern

1. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none"> ▪ Seat heater switches 	<ul style="list-style-type: none"> ▪ Fuses ▪ Wiring harnesses and connectors

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

1. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index

1. Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
---------	-----------------	--------

Seat heating performance poor or inoperative	<ul style="list-style-type: none"> ▪ Seat heater element circuit short circuit to ground, short circuit to power, open circuit, high resistance 	<ul style="list-style-type: none"> ▪ GO to Pinpoint Test A.
--	--	--

SEAT HEATER MAT FAULTS - DIAGNOSTIC GUIDANCE

- **Seat Heater Sensor Faults** - Each seat has two heating elements: one in the base (seat cushion), and one in the back (squab). There is only one sensor, which is located in the base. This sensor controls both heating elements. If there is a fault with the sensor signal, neither element will operate. If the signal fault is traced to the sensor itself (in the base/seat cushion mat), there is no need to replace the back/squab heater mat.
- **Diagnosis Of Seat Heater Elements Using Resistance Measurements** - The back/squab heater mat consists of a heating element, the base/seat cushion heater mat consists of a heating element with a sensor. Most faults can be confirmed by simple electrical resistance measurements, using the values listed below. It is possible that the sensor could develop a fault causing it to exhibit either higher resistance (resulting in the seat heaters operating at too high a temperature), or lower resistance (resulting in the seat heaters operating at too low a temperature or not at all), but these kinds of faults are uncommon. The maximum resistance of the seat elements are only about 1 ohm each under normal operation, so it is difficult to take an exact reading with a standard multimeter. However, the most likely cause of failure is breaks in a number of the heater element wires, which causes both a significant loss of heating and a corresponding significant increase in resistance. In this situation, both (seat cushion AND squab) elements produce less heat, but contrary to expectation, it is the undamaged element which will show the greatest loss of heating. Given this, suspected seat heater element failures should always be confirmed by electrical resistance tests before replacement. Do not replace components based only on temperature performance.
- **Simultaneous Failure of Both Seat Heater Mats Is Unlikely** - The base/seat cushion and back/squab seat heater elements connect to the automatic temperature control module, but the control module only acts as a splice box and the elements are electrically wired in series (each

drawing proportion of battery voltage). The only way for one element to operate while the other is faulty is if one of the elements has a short-circuit fault. Under normal circumstances, where short-circuit faults are present these will be detected by the automatic temperature control module which will switch off both elements. Similarly, if the sensor (in the base/seat cushion element) is faulty, the automatic temperature control module will not apply voltage to the elements and, if one element is open-circuit, then no voltage can be supplied to the other element. Given this, while it may often be the case that both elements cease to operate, it is extremely unlikely that both heater mats are faulty. Consequently, if a fault is confirmed with one of the seat heater mats, do not also replace the other.

- Seat Heater Sensor Open Circuit Faults** - Previous investigations have found the mostly likely failure mode to be associated with the seat heater sensor (in the base/seat cushion element) developing an open-circuit fault. This can be measured by disconnecting the 4-way plug from the automatic temperature control module, and (Test 1) testing the circuit into the harness; if an open-circuit fault is detected, then test the circuit at the connector under the seat (Test 2). If the open-circuit fault is present both at Test 1 and Test 2, then suspect the seat heater sensor and replace the base/seat cushion element. If the open circuit fault is detected at Test 1 but NOT at Test 2, then the harness is most likely faulty

SEAT HEATER MAT APPLICATION CHART

NOTE:

To ensure an accurate resistance reading, calibrated test equipment **must** be used.

VEHICLE /YEAR	CUSHION / BACKREST	HEATER MAT / NTC RESISTOR	LEFT HAND DRIVE		RIGHT HAND DRIVE	
			PASSENGER SIDE CONNECTOR / PIN	DRIVER SIDE CONNECTOR / PIN	PASSENGER SIDE CONNECTOR / PIN	DRIVE CONN / PIN
Discovery 3 (L319) 2006	Cushion	Heater element	C2950-1 and C2950-4	C0085-1 and C0085-4	C2950-1 and C2950-4	C0085- C0085-

		NTC resistor	C2950-2 and C2950-3	C0085-2 and C0085-3	C2950-2 and C2950-3	C0085-C0085
	Backrest	Heater element	connected in series	connected in series	connected in series	connected in series
Discovery 4 (L319) 2010	Cushion	Heater element	C3542-1 and C3542-4	C3542-1 and C3542-4	C3542-1 and C3542-4	C3542-C3542
		NTC resistor	C3542-2 and C3542-3	C3542-2 and C3542-3	C3542-2 and C3542-3	C3542-C3542
	Backrest	Heater element	C3543-1 and C3543-2	C3543-1 and C3543-2	C3543-1 and C3543-2	C3543-C3543
Range Rover Sport (L320) 2010	Cushion	Heater element	C3542-1 and C3542-4	C3542-1 and C3542-4	C3542-1 and C3542-4	C3542-C3542
		NTC resistor	C3542-2 and C3542-3	C3542-2 and C3542-3	C3542-2 and C3542-3	C3542-C3542
	Backrest	Heater element	C3543-1 and C3543-2	C3543-1 and C3543-2	C3543-1 and C3543-2	C3543-C3543
Freelander 2 (L359)	Cushion	Heater element	C3HS08C-1 and C3HS08C-4	C3HS03C-1 and C3HS03C-4	C3HS08C-1 and C3HS08C-4	C3HS0 and C34
		NTC resistor	C3HS08C-2 and C3HS08C-3	C3HS03C-2 and C3HS03C-3	C3HS08C-2 and C3HS08C-3	C3HS0 and C33
	Backrest	Heater element	C3HS08B-1 and C3HS08B-2	C3HS03B-1 and C3HS03B-2	C3HS08B-1 and C3HS08B-2	C3HS0 and C32
Range Rover (L322) 2010	Cushion	Heater element	C0969-1 and C0969-4	C2090-1 and C2090-4	C2090-1 and C2090-4	C0969-C0969
		NTC resistor	C0969-2 and C0969-3	C2090-2 and C2090-3	C2090-2 and C2090-3	C0969-C0969
	Backrest	Heater element	C0971-1 and C0971-2	C2091-1 and C2091-2	C2091-1 and C2091-2	C0971-C0971
	Rear Seat Cushion	Heater element	C2043-2 and C3030-1	C2042-2 and C3030-1	C2042-2 and C3030-1	C2043-C3030
		NTC resistor	C2043-1 and C2043-3	C2042-1 and C2042-3	C2042-1 and C2042-3	C2043-C2043
	Rear Seat Backrest	Heater element	C3030-1 and C3030-2	C2993-1 and C2993-2	C2993-1 and C2993-2	C3030-C3030
Range Rover Evoque(L538)	Cushion	Heater element	C3HS07BBM-1 and C3HS07BBM-4	C3HS02ABM-1 and C3HS02ABM-4	C3HS07BBM-1 and C3HS07BBM-4	C3HS0 and C3HS0

		NTC resistor	C3HS07BBM-2 and C3HS07BBM-3	C3HS02ABM-2 and C3HS02ABM-3	C3HS07BBM-2 and C3HS07BBM-3	C3HS0 and C3HS0
	Backrest	Heater element	C3HS06ABM-1 and C3HS06ABM-2	C3HS01ABM-1 and C3HS01ABM-2	C3HS06ABM-1 and C3HS06ABM-2	C3HS0 and C3HS0
Discovery Sport(L550)	Cushion	Heater mat	C3HS07BBM-1 and C3HS07BBM-4	C3HS02ABM-1 and C3HS02ABM-4	C3HS07BBM-1 and C3HS07BBM-4	C3HS0 1 and C3HS0
		NTC resistor	C3HS07BBM-2 and C3HS07BBM-3	C3HS02ABM-2 and C3HS02ABM-3	C3HS07BBM-2 and C3HS07BBM-3	C3HS0 and C3HS0
	Backrest	Heater mat	C3HS06AAM-1 and C3HS06AAM-2	C3HS01AAM-1 and C3HS01AAM-2	C3HS06AAM-1 and C3HS06AAM-2	C3HS0 1 and C3HS0 2
Defender (L316)	Cushion	Heater mat	C0237-1 and C0237-2	C0237-1 and C0237-2	C0237-1 and C0237-2	C0237- C0237-
		NTC resistor	-	-	-	-
	Backrest	Heater mat	-	-	-	-

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.

PINPOINT TESTS

NOTE:

On full power the seat should be hot to touch

NOTE:

The seat heater power supply cycles on and off dependant on the seat and cabin temperature and may only switch on for 5 seconds in 30 seconds.

NOTES:

- Ensure the multimeter used is calibrated and a resistance reading of 0 ohms is shown when the test leads are connected together. Alternately, subtract any resistance shown from the result.
- The heated seat element circuits should be checked at the seat heater module connector (where possible).
- Refer to the electrical circuit diagrams and to confirm the total resistance of the circuit the cushion and backrest are connected in series.

PINPOINT TEST A : HEATED SEAT TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: DTC READ	
	<p>1 Using the manufacturer approved diagnostic system, check the climate control system for related DTCs (where possible)</p>
	<p>Are any heated seat DTCs set?</p> <p>Yes Perform the relevant corrective actions. Clear the DTCs and retest. If the fault persists, GO to A2.</p> <p>No GO to A2.</p>
A2: MANUAL CHECK	
	<p>1 If necessary, operate the vehicle air conditioning on full for 10 minutes to reduce the temperature of the vehicle interior</p>
	<p>2 Operate the heated seats on full power</p>
	<p>Do the heated seats operate correctly?</p> <p>Yes Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest. If the operation of the heated seats is correct no further action is necessary</p> <p>No GO to A2</p>

GO to A3.

A3: SHORT CIRCUIT TO GROUND

	1 Refer to the electrical circuit diagrams and the Seat Heater Mat Application Chart (see above) to identify the connector
	2 Disconnect the connector
	3 Refer to the electrical circuit diagrams and check the heated seat element circuit for short circuit to ground
	Is there a short circuit to ground? Yes Repair the circuit or install a new heated seat element as necessary. Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest No GO to A4.

A4: CIRCUIT CONTINUITY TEST

	1 Refer to the electrical circuit diagrams and check the heated seat element circuit for open circuit, high resistance
	Is the heated seat element circuit resistance within specification? Yes GO to A5. No Repair the circuit or install a new heated seat element as necessary. Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest

A5: POWER CONSUMPTION

	1 Reconnect the connector
	2 If necessary, operate the vehicle air conditioning on full for 10 minutes to reduce the temperature of the vehicle interior
	3 Connect an inductive ammeter (current clamp) to the heated seat element circuit
	4 Operate the heated seats on full power
	5 Use the Seat Heater Mat Application Chart to calculate a typical current value (using $I=V/R$, Current equals Volts divided by Resistance). For example: <ul style="list-style-type: none">▪ 12 volts / 0.5 ohms = 24 amps▪ 12 volts / 1 ohms = 12 amps▪ 12 volts / 2 ohms = 6 amps
	Does the heated seat circuit draw the correct quantity of current? Yes Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest. If the operation of the heated seats is correct no further action is necessary

No
GO to A6.

A6: RESISTANCE CHECK

	<p>1 Refer to the electrical circuit diagrams and the Seat Heater Mat Application Chart (see above) to identify the connector and terminals</p>
	<p>2 Disconnect the connector</p>
	<p>3 Using a multimeter, perform resistance measurements of the heated seat element circuit and the NTC resistor circuit (where possible)</p>
	<p>4 Compare the results to the Seat Heater Mat Application Chart</p>
	<p>Are the results within specification at the given ambient temperature? (tolerance ± 0.5 ohms)</p> <p>Yes</p> <p>Reconnect the connector. Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest. If the fault persists, refer to electrical circuit diagrams and check the power and ground circuits</p> <p>No</p> <p>Repair the circuit or install a new heated seat element as necessary. Using the manufacturer approved diagnostic system, clear the DTCs (where possible) and retest</p>

SEATING

DIAGNOSIS AND TESTING

PRINCIPLE OF OPERATION

For a detailed description of the seating systems and operation, refer to the relevant Description and Operation section of the workshop manual

REFER to: [Seats](#) (501-10 Seating, 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 checked and/or the donor vehicle

NOTES:

- If the control module is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual or determine if any prior approval programme is in operation, prior to the installation of a new module
- Generic scan tools may not read the codes listed, or may read only five digit codes. Match the five digits from the scan tool to the first five digits of the seven digit code listed to identify the fault (the last two digits give additional information read by the manufacturer approved diagnostic system)
- When performing electrical 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

- Inspect connectors for signs of water ingress, and pins for damage and/or corrosion
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests
- 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
- The climate system functions in a manner that means any detected error state either intermittent or permanent will shut down the complete seat climate system until the next ignition cycle, this does not mean that both climate units within the one seat have failed. This shut down is design intent to protect the system to ensure that the fault detected does not damage the units, it is possible that both units are functioning correctly and that the fault lies elsewhere within the system. The following process can be carried out without removing either the seats or the climate units from the vehicle and should correctly identify any failed units, this should ensure that only failed units are changed under warranty. Any units exhibiting the correct reading as per process below, should **NOT** be changed under warranty. If all units have a correct reading then re-confirm customer symptom, if customer symptom is still present then carry out further system checks
- The DTC Index containing an actions list is for guidance only and any reference to "Install a new heater and blower assembly if necessary" should only be carried out following unit failure confirmation using the Pin Out Diagnostics and/or the Over Temperature and Fluid Air Leak Diagnostics contained below, the recording of a DTC does **NOT** signify a permanently failed unit

1. Verify the customer concern

1. Visually inspect for obvious signs of mechanical or electrical damage

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

correct the cause (if possible) before proceeding to the next step

1. If the cause is not visually evident, carry out normal dealer warranty process, ODST, check for DTC's and refer to the relevant DTC Index
1. 30 mins should have elapsed since last seat/cooled operation prior to carrying out pin testing detailed below. (Connector and Pin Information)
1. Unbolt appropriate seat and tilt it back to gain access to connector!
Connector C3140 location in MY 2007-2009 located beneath driver seat, in 2010-2012 located beneath right front seat (Refer to Electrical Information - Electrical Reference Library, contained in TOPIx)
1. Locate and disconnect connector C3140 prior to pin test
1. Using ohm-meter to probe each heat/cooled unit pins(rear of connector), reading should achieve no greater than 10 ohms after 1 minute (initial drift will occur using ohm-meter, post 1 minute reading will have stabilized)

Connector and Pin Information

Left Hand Drive					
All Model years	Passenger Cushion (UG_Blue/Green)	Passenger Cushion (UY_Blue/Yellow)	Passenger Backrest (G_Green)	Passenger Backrest (GN_Green/Brown)	Driver Cushion (RN_Red/Brown)
Right Hand Drive					
Model years 2007-2009	Passenger Cushion (UG_Blue/Green)	Passenger Cushion (UY_Blue/Yellow)	Passenger Backrest (G_Green)	Passenger Backrest (GN_Green/Brown)	Driver Cushion (RN_Red/Brown)
Model years 2010-2012	Driver Cushion (UG_Blue/Green)	Driver Cushion (UY_Blue/Yellow)	Driver Backrest (G_Green)	Driver Backrest (GN_Green/Brown)	Passenger Cushion (RN_Red/Brown)

1. If a unit reads greater than 10 ohms, replace only that defective unit
1. If all units read less than 10 ohms, do not replace any units. (Refer to step 12)

1. Final check - when unit has been identified strip seat to access unit connector, REFER to: Seats (501-10, Removal & Installation) and re check ohm reading to confirm greater than 10 ohms prior to removing unit
1. For vehicles where the above diagnostic routine does **NOT** identify a failed unit please refer to Over Temperature and Fluid/Air Leak Diagnostics below, also check for any live technical service bulletins referring to the seat climate system

SEAT CLIMATE CONTROL MODULE/SEAT CLIMATE ASSEMBLY - FURTHER DIAGNOSTICS

In the event of suspected climate seat faults use the pinpoint tests detailed below

Connector Checks

First, check the integrity of the three seat climate control module harness connectors:

1. Disconnect each connector
1. Inspect each connector for cracks and breaks, replace as required
1. Check the integrity of connector terminals for bent terminals, backed-out or badly crimped wires. Rectify as required
1. Reconnect all connectors and retest. If seat climate functions are still faulty, note any DTCs that have been logged by the seat climate control module(s) and refer to the table and pinpoint tests below:

DTC LOGGED	PINPOINT TEST REQUIRED
<p>NOTE:</p> <p>Where DTCs are marked in bold, this means that there are two possible diagnostic processes that may be applied to resolve these faults. Check the listings below to reference an alternative</p>	<p>GO to Pinpoint Test A.</p>

these faults. Check the listings below to reference an alternative set of pinpoint tests for these DTCs

- B10B9-13 Blower Control - Circuit open
- B10B9-4B Blower Control - Over temperature
- B1157-13 Blower Control B - Circuit open
- B1157-4B Blower Control B - Over temperature
- **B120E-4B** Right Thermal Electric Device Control - Over temperature
- **B1224-4B** Left Thermal Electric Device Control - Over temperature
- B122A-11 Right Seat Cushion Blower Speed Sensor - Circuit short to ground
- B122A-12 Right Seat Cushion Blower Speed Sensor - Circuit short to battery
- B122B-11 Right Seat Back Blower Speed Sensor - Circuit short to ground
- B122B-12 Right Seat Back Blower Speed Sensor - Circuit short to battery
- B122C-11 Left Seat Cushion Blower Speed Sensor - Circuit short to ground
- B122C-12 Left Seat Cushion Blower Speed Sensor - Circuit short to battery
- B122D-11 Left Seat Back Blower Speed Sensor - Circuit short to ground
- B122D-12 Left Seat Back Blower Speed Sensor - Circuit short to battery

NOTE:

Where DTCs are marked in bold, this means that there are two possible diagnostic processes that may be applied to resolve these faults. Check the listings below to reference an alternative set of pinpoint tests for these DTCs

- **B120E-13** Right Thermal Electric Device Control - Circuit open
- **B120E-19** Right Thermal Electric Device Control - Circuit current above threshold
- **B1223-13** Right Seat Cushion Temperature Sensor - Circuit open
- **B1224-13** Left Thermal Electric Device Control - Circuit open
- **B1224-19** Left Thermal Electric Device Control - Circuit current above threshold
- **B1225-13** Right Seat Back Temperature Sensor - Circuit open
- **B1229-13** Left Seat Back Temperature Sensor - Circuit open
- **B1235-13** Left Seat Cushion Temperature Sensor - Circuit open

GO to Pinpoint Test **B**.

<ul style="list-style-type: none"> ▪ B120F-98 Left Seat Cushion - Component or system over temperature ▪ B122E-98 Right Seat Cushion - Component or system over temperature ▪ B122F-98 Right Seat Back - Component or system over temperature ▪ B1230-98 Left Seat Back - Component or system over temperature ▪ B1231-7A Right Seat - Fluid leak or seal failure ▪ B1232-7A Left Seat - Fluid leak or seal failure 	<p>GO to Pinpoint Test C.</p>
<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Where DTCs are marked in bold, this means that there are two possible diagnostic processes that may be applied to resolve these faults. Check the listings above to reference an alternative set of pinpoint tests for these DTCs</p> </div> <ul style="list-style-type: none"> ▪ B120E-4B Right Thermal Electric Device Control - Over temperature ▪ B120E-13 Right Thermal Electric Device Control - Circuit open ▪ B120E-19 Right Thermal Electric Device Control - Circuit current above threshold ▪ B1223-13 Right Seat Cushion Temperature Sensor - Circuit open ▪ B1224-4B Left Thermal Electric Device Control - Over temperature ▪ B1224-13 Left Thermal Electric Device Control - Circuit open ▪ B1224-19 Left Thermal Electric Device Control - Circuit current above threshold ▪ B1225-13 Right Seat Back Temperature Sensor - Circuit open ▪ B1229-13 Left Seat Back Temperature Sensor - Circuit open ▪ B1235-13 Left Seat Cushion Temperature Sensor - Circuit open 	<p>GO to Pinpoint Test D.</p>

PINPOINT TEST A : CLIMATE SEATS ASSEMBLY - BLOWER DIAGNOSTICS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: CLIMATE SEATS ASSEMBLY - BLOWER SPEED CONTROL CIRCUIT RESISTANCE CHECKS AT SEAT TO VEHICLE CONNECTOR	
	<ol style="list-style-type: none"> 1 Uncouple connector C3142 from the seat climate control module
	<ol style="list-style-type: none"> 2 Check the resistance of the climate seats blower speed control circuits at connector C3142 <ul style="list-style-type: none"> ▪ For right-side seat cushion blower, check resistance at pins 3 and 7 ▪ For right-side seat backrest blower, check resistance at pins 4 and 7 ▪ For left-side seat cushion blower, check resistance at pins 11 and 15

	<ul style="list-style-type: none"> For left-side seat backrest blower, check resistance at pins 12 and 15
	<p>Is the resistance between 290 and 420 kilo-ohms?</p> <p>Yes No circuit faults present. No further action</p> <p>No GO to A2.</p>

A2: CLIMATE SEATS ASSEMBLY - BLOWER POWER CIRCUIT RESISTANCE CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Locate the appropriate seat backrest/seat cushion climate assembly connector
	2 Disconnect connector
	3 Check the integrity of connector terminals for bent terminals, backed-out or badly crimped wires. Rectify as required
	4 Check the resistance of the climate seats blower power circuits at the climate assembly connector, pins 2 and 4
	<p>Is the resistance between 290 and 420 kilo-ohms?</p> <p>Yes GO to A3.</p> <p>No Replace the seat climate assembly</p>

A3: CLIMATE SEATS ASSEMBLY - BLOWER SPEED CONTROL CIRCUIT RESISTANCE CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Check the resistance of the climate seats blower control circuits at the climate assembly connector, pins 4 and 7
	<p>Is the resistance between 290 and 420 kilo-ohms?</p> <p>Yes No internal circuit faults present. Check for circuit faults in wiring harness between seat climate control module and climate seat assembly and replace as required</p> <p>No Replace the seat climate assembly</p>

PINPOINT TEST B : CLIMATE SEATS ASSEMBLY - THERMAL ELECTRIC DEVICE (TED) DIAGNOSTICS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: CLIMATE SEATS ASSEMBLY - TED SENSOR CIRCUIT RESISTANCE CHECKS AT SEAT TO VEHICLE CONNECTOR	
	1 Uncouple connector C3141 from the seat climate control module
	<p>2 Check the resistance of the climate seats TED sensor circuits at connector C3141</p> <ul style="list-style-type: none"> For right-side seat cushion TED sensor circuits, check resistance at

	<p>pins 2 and 3</p> <ul style="list-style-type: none"> ▪ For right-side seat backrest TED sensor circuits, check resistance at pins 4 and 5 ▪ For left-side seat cushion TED sensor circuits, check resistance at pins 7 and 8 ▪ For left-side seat backrest TED sensor circuits, check resistance at pins 9 and 10
--	--

	<p>Is the resistance between 0.9 and 1.1 kilo-ohms? (Note: these values are based on an ambient temperature of 22°C/72°F)</p> <p>Yes No circuit faults present. No further action</p> <p>No GO to B2.</p>
--	--

B2: CLIMATE SEATS ASSEMBLY - TED SENSOR CIRCUIT RESISTANCE CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Locate the appropriate seat backrest/seat cushion climate assembly connector
	2 Disconnect connector
	3 Check the integrity of connector terminals for bent terminals, backed-out or badly crimped wires. Rectify as required
	4 Check the resistance of the climate seats TED sensor circuits at the climate assembly connector, pins 5 and 8 (Green and Green wires)
	<p>Is the resistance between 0.9 and 1.1 kilo-ohms? (Note: these values are based on an ambient temperature of 22°C/72°F)</p> <p>Yes GO to B3.</p> <p>No Replace the seat climate assembly</p>

B3: CLIMATE SEATS ASSEMBLY - TED SUPPLY CIRCUIT OPEN CIRCUIT CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Check the TED supply circuits at the climate assembly connector, pins 1 and 3 (Blue and Yellow wires) for open circuit faults
	<p>Is an open-circuit fault present?</p> <p>Yes Replace the seat climate assembly</p> <p>No No internal circuit faults present. Check for circuit faults in wiring harness between seat climate control module and climate seat assembly and replace as required</p>

PINPOINT TEST C : CLIMATE SEATS ASSEMBLY - BLOWER AND DUCTING DIAGNOSTICS

TEST
CONDITIONS

DETAILS/RESULTS/ACTIONS

**C1: CLIMATE SEATS ASSEMBLY - BLOWER SPEED CONTROL CIRCUIT
RESISTANCE CHECKS AT SEAT TO VEHICLE CONNECTOR**

	1 Uncouple connector C3142 from the seat climate control module
	2 Check the resistance of the climate seats blower speed control circuits at connector C3142 <ul style="list-style-type: none"> ▪ For right-side seat cushion blower, check resistance at pins 3 and 7 ▪ For right-side seat backrest blower, check resistance at pins 4 and 7 ▪ For left-side seat cushion blower, check resistance at pins 11 and 15 ▪ For left-side seat backrest blower, check resistance at pins 12 and 15
	Is the resistance between 290 and 420 kilo-ohms? Yes No circuit faults present. No further action No GO to C2.

**C2: CLIMATE SEATS ASSEMBLY - BLOWER CIRCUIT RESISTANCE CHECKS AT
SEAT CLIMATE ASSEMBLY CONNECTOR**

	1 Locate the appropriate seat backrest/seat cushion climate assembly connector
	2 Disconnect connector
	3 Check the integrity of connector terminals for bent terminals, backed-out or badly crimped wires. Rectify as required
	4 Check the resistance of the climate seats blower circuits at the climate assembly connector, pins 2 and 4 (Violet and Black wires)
	Is the resistance between 290 and 420 kilo-ohms? Yes GO to C3. No Replace the seat climate assembly

**C3: CLIMATE SEATS ASSEMBLY - BLOWER CONTROL CIRCUIT RESISTANCE
CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR**

	1 Check the resistance of the climate seats blower control circuits at the climate assembly connector, pins 4 and 7 (Black and Purple wires)
	Is the resistance between 290 and 420 kilo-ohms? Yes No internal circuit faults present. Check for circuit faults in wiring harness between seat climate control module and climate seat assembly and replace as required. If no harness faults are found, GO to C4. No Replace the seat climate assembly

Replace the seat climate assembly

C4: CLIMATE SEATS ASSEMBLY - BLOWER DUCTING INSPECTION

	1 Check that the ducting is securely attached to the blower and thermal electric device
	2 Check the ducting for holes, cuts or tears
	Is the ducting undamaged and securely attached to the blower and thermal electric device? Yes GO to C5. No Replace the seat climate assembly

C5: CLIMATE SEATS ASSEMBLY - EXHAUST AIRFLOW CHECKS

	1 Check for blockages or restrictions at the thermal electric device exhaust vent
	Are blockages or restrictions present? Yes Rectify as required No GO to C6.

C6: CLIMATE SEATS ASSEMBLY - BLOWER AIRFLOW CHECKS

	1 Check for blockages or restrictions at the blower air intake
	2 Check that the blower fan movement is not restricted
	Are there any air intake blockages or restrictions to the blower fan movement? Yes Rectify as required No No further action

PINPOINT TEST D : CLIMATE SEATS ASSEMBLY - THERMAL ELECTRIC DEVICE (TED) AND DUCTING DIAGNOSTICS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
D1: CLIMATE SEATS ASSEMBLY - TED SENSOR CIRCUIT RESISTANCE CHECKS AT SEAT TO VEHICLE CONNECTOR	
	1 Uncouple connector C3141 from the seat climate control module
	2 Check the resistance of the climate seats TED sensor circuits at connector C3141 <ul style="list-style-type: none">▪ For right-side seat cushion TED sensor circuits, check resistance at pins 2 and 3▪ For right-side seat backrest TED sensor circuits, check resistance at pins 4 and 5

	<ul style="list-style-type: none"> ▪ For left-side seat cushion TED sensor circuits, check resistance at pins 7 and 8 ▪ For left-side seat backrest TED sensor circuits, check resistance at pins 9 and 10
	<p>Is the resistance between 0.9 and 1.1 kilo-ohms? (Note: these values are based on an ambient temperature of 22°C/72°F)</p> <p>Yes No circuit faults present. No further action</p> <p>No GO to D2.</p>

D2: CLIMATE SEATS ASSEMBLY - TED SENSOR CIRCUIT RESISTANCE CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Locate the appropriate seat backrest/seat cushion climate assembly connector
	2 Disconnect connector
	3 Check the integrity of connector terminals for bent terminals, backed-out or badly crimped wires. Rectify as required
	4 Check the resistance of the climate seats TED sensor circuits at the climate assembly connector, pins 5 and 8 (Green and Green wires)
	<p>Is the resistance between 0.9 and 1.1 kilo-ohms? (Note: these values are based on an ambient temperature of 22°C/72°F)</p> <p>Yes GO to D3.</p> <p>No Replace the seat climate assembly</p>

D3: CLIMATE SEATS ASSEMBLY - TED SUPPLY CIRCUIT OPEN CIRCUIT CHECKS AT SEAT CLIMATE ASSEMBLY CONNECTOR

	1 Check the TED supply circuits at the climate assembly connector, pins 1 and 3 (Blue and Yellow wires) for open circuit faults
	<p>Is an open-circuit fault present?</p> <p>Yes Replace the seat climate assembly</p> <p>No No internal circuit faults present. Check for circuit faults in wiring harness between seat climate control module and climate seat assembly and replace as required. If no harness faults are found, GO to D4.</p>

D4: CLIMATE SEATS ASSEMBLY - TED DUCTING INSPECTION

	1 Check that the ducting is securely attached to the blower and thermal electric device
	2 Check the ducting for holes, cuts or tears
	Is the ducting undamaged and securely attached to the blower and thermal electric device?

	<p>Yes GO to D5.</p> <p>No Replace the seat climate assembly</p>
--	--

D5: CLIMATE SEATS ASSEMBLY - EXHAUST AIRFLOW CHECKS

	1 Check for blockages or restrictions at the thermal electric device exhaust vent
	<p>Are blockages or restrictions present?</p> <p>Yes Rectify as required</p> <p>No GO to D6.</p>

D6: CLIMATE SEATS ASSEMBLY - BLOWER AIRFLOW CHECKS

	1 Check for blockages or restrictions at the blower air intake
	2 Check that the blower fan movement is not restricted
	<p>Are there any air intake blockages or restrictions to the blower fan movement?</p> <p>Yes Rectify as required</p> <p>No No further action</p>

OVER TEMPERATURE AND FLUID/AIR LEAK DIAGNOSTICS

Model years 2007-2009	
<p>Affected DTC's</p> <ul style="list-style-type: none"> ▪ B1151-98 ▪ B1152-98 ▪ B1153-98 ▪ B1154-98 ▪ B1155-7A ▪ B1156-7A 	<ul style="list-style-type: none"> ▪ Once the diagnostic process detailed above has been carried out and it has been identified that there has not been a failure of any of the climate units then you should refer back to the relevant climate system DTC codes that have been recorded ▪ DTC codes listed that have 7A or 98 following the code signify a possible air leak or air flow restriction within the system ▪ In these circumstances starting with the seat base you should check all ducting connections for correct engagement and inspect ducting for signs of damage which could result in an air leak (for connection issues re-connect and test system) Only in the event of finding damage to the ducting of one of the units should the unit be replaced and it should be noted that only that unit should be replaced ▪ Due to the design function of the system both climate units in the one seat operate as one, therefore if an issue is detected in one of the units then both units are shut down to protect the system until next ignition cycle, in these circumstances you should change only the damaged unit and NOT change both units

Model years 2010-2012

Affected DTCs	
<ul style="list-style-type: none">▪ B120F-98▪ B122E-98▪ B122F-98▪ B1230-98▪ B1231-7A▪ B1232-7A	<ul style="list-style-type: none">▪ Once the diagnostic process detailed above has been carried out and it has been identified that there has not been a failure of any of the climate units then you should refer back to the relevant climate system DTC codes that have been recorded▪ DTC codes listed that have 7A or 98 following the code signify a possible air leak or air flow restriction within the system▪ In these circumstances starting with the seat base you should check all ducting connections for correct engagement and inspect ducting for signs of damage which could result in an air leak (for connection issues re-connect and test system) Only in the event of finding damage to the ducting of one of the units should the unit be replaced and it should be noted that only that unit should be replaced▪ Due to the design function of the system both climate units in the one seat operate as one, therefore if an issue is detected in one of the units then both units are shut down to protect the system until next ignition cycle, in these circumstances you should change only the damaged unit and NOT change both units

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code \(DTC\) Index - DTC: Module Name: Seat Control Module E/F - Front Climatic Seats](#) (100-00 General Information, Description and Operation).

2012.0 RANGE ROVER (LM), 501-10

SEATING

DIAGNOSIS AND TESTING

PRINCIPLE OF OPERATION

For a detailed description of the seating systems and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: Seats (501-10, 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 checked and/or the donor vehicle.

NOTES:

- If the control module or a 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 programme is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern.

1. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none">▪ Lumbar/massage air pump(s)▪ Upper massage cells▪ Lower massage cells▪ Seat massage air hoses	<ul style="list-style-type: none">▪ Fuses▪ Wiring harnesses and connectors▪ Driver seat module▪ Passenger seat module▪ Rear left seat module

- Rear right seat module
- Touch screen
- LIN bus
- Massage switchpack(s)
- Lumbar/massage air pump(s)
- Lumbar/massage solenoid(s)
- Massage master solenoid(s)
- Massage slave solenoid(s)

1. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
1. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.
1. Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

SYMPTOM CHART

Lumbar

NOTE:

The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.

SYMPTOM	POSSIBLE CAUSES	ACTION
All seat functions inoperative	<ul style="list-style-type: none"> ▪ Seat system fault ▪ Seat switchpack power or ground circuit open circuit 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary

	<p>open circuit, high resistance</p> <ul style="list-style-type: none"> ▪ Seat switchpack internal failure 	
Lumbar inflate inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar air pump circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hose blocked ▪ Air hose leaking ▪ Air cell leaking 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and check the lumbar air pump circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar air pump as necessary ▪ Remove air hose blockage or repair or replace as necessary
Lumbar deflate inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hose blocked 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar solenoid as necessary ▪ Remove air hose blockage
Lumbar forward/up/down AND bolster inflate inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar air pump circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hose blocked ▪ Air hose leaking ▪ Relief valve stuck open 	<p>NOTES:</p> <ul style="list-style-type: none"> ▪ Lumbar/massage air pump operation will be inhibited if the motor temperature exceeds $72\pm 4^{\circ}\text{C}$ ($162\pm 7^{\circ}\text{F}$). The lumbar/massage air pump will not re-start until 10 minutes after the temperature has decreased below the cut-off temperature. This condition is not a fault. ▪ The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.

		<ul style="list-style-type: none"> ■ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ■ Refer to the electrical circuit diagrams and check the lumbar air pump circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar air pump as necessary ■ Remove air hose blockage or repair or replace as necessary
Lumbar forward inoperative	<ul style="list-style-type: none"> ■ Seat switchpack internal failure ■ Lumbar solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ■ Air hose blocked ■ Air hose leaking ■ Air cell leaking 	<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div> <ul style="list-style-type: none"> ■ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ■ Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar solenoid as necessary ■ Remove air hose blockage or repair or replace as necessary
Lumbar rearward inoperative	<ul style="list-style-type: none"> ■ Seat switchpack internal failure ■ Lumbar solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ■ Air hose 	<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div>

	<ul style="list-style-type: none"> ▪ Air hose blocked 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar air pump as necessary ▪ Remove air hose blockage
Lumbar up inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hose blocked ▪ Air hose leaking ▪ Air cell leaking 	<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div> <ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar solenoid as necessary ▪ Remove air hose blockage or repair or replace as necessary
Lumbar down inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hose blocked ▪ Air hose leaking 	<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div> <ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new

	<ul style="list-style-type: none"> ▪ Air cell leaking 	<p>repair the wiring harness or install a new seat switchpack as necessary</p> <ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar solenoid as necessary ▪ Remove air hose blockage or repair or replace as necessary
Bolster inflate inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Lumbar air pump circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hoses blocked/leaking ▪ Air cells leaking 	<p>NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div> <ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and check the lumbar air pump circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar air pump as necessary ▪ Remove air hose blockage or repair or replace as necessary
Bolster deflate inoperative	<ul style="list-style-type: none"> ▪ Seat switchpack internal failure ▪ Bolster solenoid circuit short circuit to ground, short circuit to power, open circuit, high resistance ▪ Air hoses blocked 	<p>NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>The Lumbar/Massage solenoid block is fitted with an air exhaust valve that is designed to expel air under operating conditions. This is not an air leak and does not represent a solenoid block failure.</p> </div> <ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the seat switchpack power or ground circuit for open circuit, high resistance. Repair the wiring harness or install a new seat switchpack as necessary ▪ Refer to the electrical circuit diagrams and

- | | | |
|--|--|---|
| | | <ul style="list-style-type: none">Refer to the electrical circuit diagrams and check the lumbar solenoid circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Repair the wiring harness or install a new lumbar solenoid as necessaryRemove air hose blockage |
|--|--|---|

ON DEMAND SELF TEST (ODST)

The On Demand Self Test (ODST) is performed using the Jaguar Land Rover approved diagnostic equipment as follows:

1. Begin a Diagnostic session
1. Select 'Body'
1. Select 'Seating'
1. Select the relevant seat
1. Run the On Demand Self Test (ODST) application

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: Diagnostic Trouble Code (DTC) Index - DTC: Driver/Passenger Seat Module (DSM/PSM) (100-00, Description and Operation).

2012.0 RANGE ROVER (LM), 501-10

SEATING

SEAT SMOOTHING [G1774019]

GENERAL PROCEDURES

CHECK

WARNINGS:

- Make sure that the steamer is in the OFF position before connecting or disconnecting from the electrical outlet.
- Do not use another high wattage device on the same electrical circuit.
- If the use of an extension cord is absolutely necessary, the cord must be rated at a minimum of 10 amps.
- To avoid the risk of electrical shock, check the condition of the power cord and the steamer before use.
- Make sure that the steamer is disconnected from the electrical outlet before filling or emptying the water reservoir.

- The steamer must only be used and placed on its stand on a stable surface.
- To prevent injury such as burns, take care whilst using the steamer. Avoid coming into contact with the hot surface of the steamer and do not direct steam toward any persons.
- The steamer must ALWAYS be switched off when not in use or left unattended.
- Do not allow the power cord to come into contact with the hot surface of the steamer.

CAUTIONS:

- Protect the surrounding paintwork to avoid damage.
- Protect the paintwork during this operation.
- Do not use any additives in the steamer. Damage to the steamer or the seat cover can result if used.

NOTE:

Some variation in the illustrations may occur, but the essential information is always correct.

1.

NOTE:

The seat smoothing process should be used to improve all natural leather characteristics before the seat cover is replaced. Use the below examples and the seat cover inspection procedure as a guide for when to use the seat smoothing process.

Refer to: [Seat Cover Inspection](#) (501-10 Seating, Description and Operation).

2.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can** be improved using the seat smoothing process.



3.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can** be improved using the seat smoothing process.



4.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can** be improved using the seat smoothing process.



5.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can** be improved using the seat smoothing process.



6.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can** be improved using the seat smoothing process.



7.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can not** be improved using the seat smoothing process.



8.

NOTE:

The example in the illustration shows the natural characteristics of leather that **can not** be improved using the seat smoothing process.



9.

CAUTIONS:

- Steam the leather cushions evenly and progressively. Do not use excessive force.
- Take care not to damage the leather whilst steaming into the corners.
- Do not hold the steamer in one place for longer than 10 seconds, as this will burn the leather and damage the covers.



SEATING

CLIMATE CONTROLLED SEAT SWITCH (G897380)

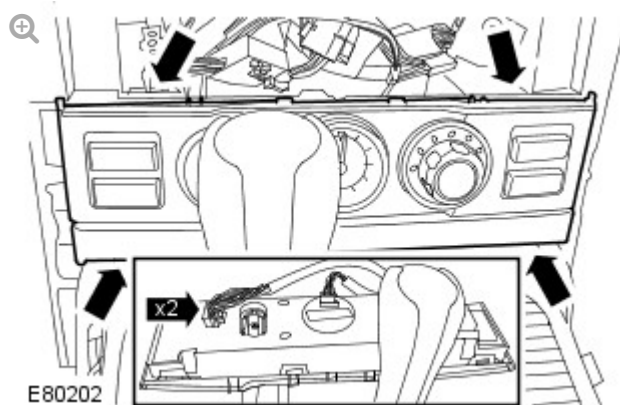
REMOVAL AND INSTALLATION

REMOVAL

1. Remove the climate control assembly.

For additional information, refer to: Climate Control Assembly (412-04, Removal and Installation).

- 2.



Remove the heated front seat switch.

- Release the 4 clips.
 - Disconnect the 2 electrical connectors.
-

- 3.

NOTE:

Do not disassemble further if the component is removed for access only.



E77126

Remove the clock.

- Release the 2 clips.

INSTALLATION

1. Install the clock.
 - Secure the 2 clips.
2. Install the heated front seat switch.
 - Connect the 2 electrical connectors.
 - Secure the 4 clips.
3. Install the climate control assembly.

For additional information, refer to: Climate Control Assembly (412-04, Removal and Installation).

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SEATING

FRONT SEAT (G873655)

REMOVAL AND INSTALLATION

FRONT
SEAT -
REMOVE

ALL

USED

REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

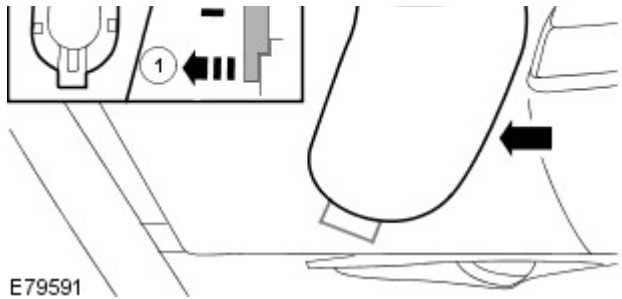
-
1. Position the front seat fully forwards.

2.

NOTES:

- Release the front safety belt lower anchor bolt cover clip upwards and away from the front seat base side trim panel.
- Raise the seat base for access.





E79591

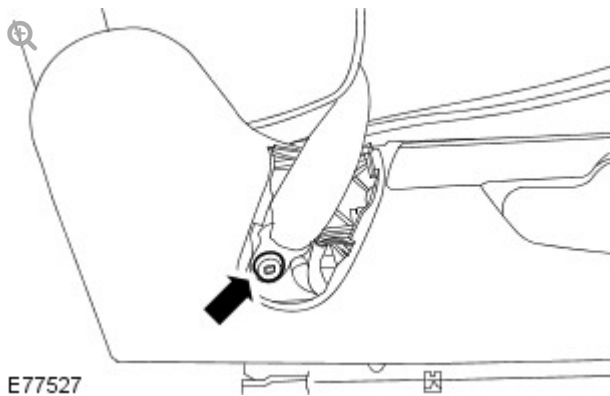
Remove the safety belt lower anchor bolt cover.

1. Carefully release the clip from behind the front seat base side trim panel.
2. Remove the cover.

3.

NOTE:

Lower the seat base for access.



E77527

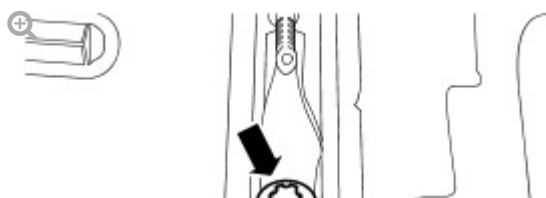
Release the safety belt lower anchor from the front seat.

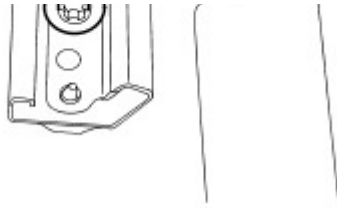
- Remove and discard the bolt.

4.

NOTE:

Right-hand shown, left-hand similar.





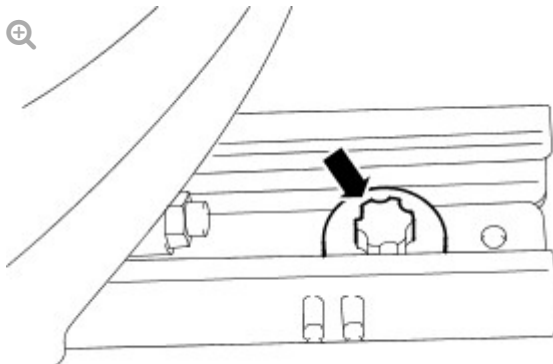
E77528

Remove the 2 rear bolts from the front seat.

5.

NOTE:

Right-hand shown, left-hand similar.



E77529

Remove the 2 front bolts from the front seat.

- Position the front seat fully rearwards.

6. Reposition the front seat to the central position.

- Reposition the front seat backrest to the fully upright position.
- Lower the front seat head restraint to the fully lowered position.

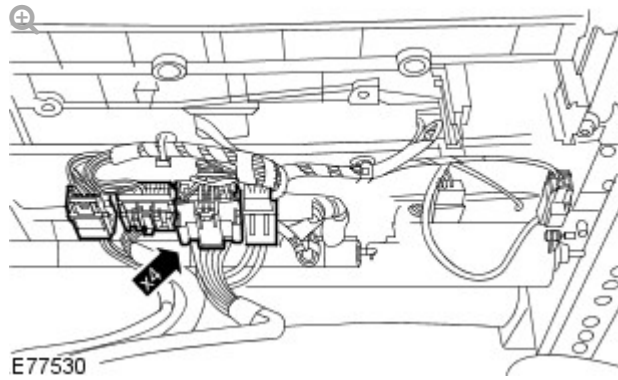
7. Disconnect the battery ground cable.

For additional information, refer to: [Specifications - Armoured](#) (414-00 Battery and Charging System - General Information, Specifications).

8. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: [Standard Workshop Practices](#)

9.



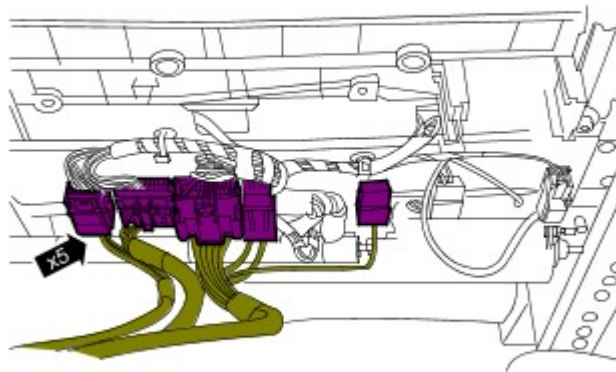
Reposition the front seat for access.

- Disconnect the 4 electrical connectors.

10.

NOTE:

Ultimate edition only.



E137121

Reposition the RH front seat for access.

- Disconnect the 5 electrical connectors.

11.

NOTE:

Make sure no damage is caused to the vehicle trim when

removing the front seat.

With assistance carefully remove the front seat.

- Fit protection around the door aperture to protect the interior.

INSTALLATION

1.

NOTE:

Make sure no damage is caused to the vehicle trim when installing the front seat.

With assistance carefully install the front seat.

- Remove the protection from around the door aperture.

2.

CAUTION:

Make sure the wiring harness is installed to its original position.

Reposition the front seat for access.

- Connect the 4 electrical connectors.

3.

CAUTION:

Make sure the wiring harness is installed to its original position.

NOTE:

Ultimate edition only.

Reposition the front seat for access.

- Connect the 5 electrical connectors.

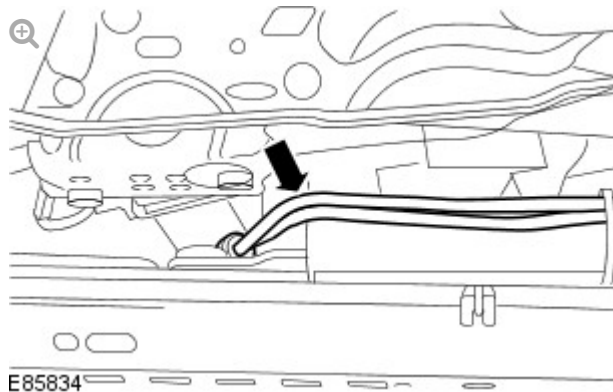
4.

WARNING:

Make sure the front safety belt buckle wiring harness is correctly routed and secured in the position shown. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front safety belt buckle wiring harness is correctly routed and secured in the position shown. Failure to follow this instruction may result in damage to the vehicle.



Reposition the front safety belt buckle wiring harness.

5. Connect the battery ground cable.

For additional information, refer to: [Specifications - Armoured](#) (414-00 Battery and Charging System - General Information, Specifications).

6.

NOTE:

Make sure the 3 seat rail covers are fitted to their original

Make sure the 3 seat rail covers are fitted to their original positions. Note: The inner front seat rail does not have a seat rail cover.

Install the 2 front bolts to the front seat.

- Align the front seat locating pegs.
- Position the front seat fully rearwards.
- Tighten the front seat front bolts to 45 Nm (33 lb.ft).

7.

NOTE:

Make sure the 3 seat rail covers are fitted to their original positions. Note: The inner front seat rail does not have a seat rail cover.

Install the 2 rear bolts to the front seat.

- Position the front seat fully forwards.
- Tighten the front seat rear bolts to 45 Nm (33 lb.ft).

8. Attach the safety belt lower anchor to the seat.

- Install a new bolt and tighten to 45 Nm (33 lb.ft).

9. Install the safety belt lower anchor bolt cover.

10. Reposition the front seat to the original position.

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT BACKREST COVER [G874619]

REMOVAL AND INSTALLATION

78.90.06	COVER - SEAT BACK - FRONT SEAT - HEATING AND CLIMATE CONTROL - RENEW	ALL DERIVATIVES	1.7	USED WITHINS	+
78.90.08	COVER - BACKREST - FRONT SEAT - RENEW	ALL DERIVATIVES	1.6	USED WITHINS	+

REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

-
2. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

-
3. Remove the front seat head restraint.

For additional information, refer to: Front Seat Head Restraint - Vehicles With: Head Restraint Video Display (501-10, Removal and Installation).

-
4. Remove the seat armrest.

For additional information, refer to: Seat Armrest (501-10, Removal and Installation).

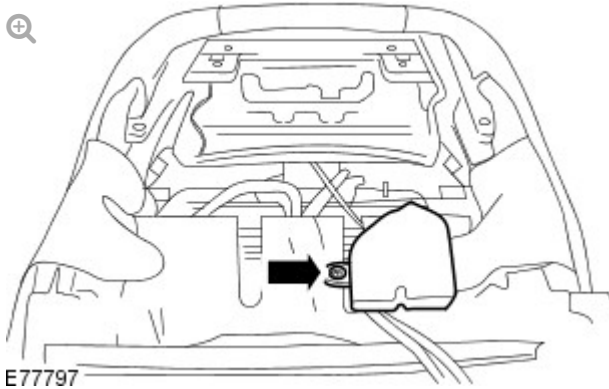
5.



Remove the front seat backrest cover upper trim panel.

- Remove the 2 screws.
- Release the front seat backrest cover from the front seat backrest upper trim panel.

6.



Remove the front seat backrest cooling duct.

- Remove the clip from the front seat backrest cooling duct.

7. Remove and discard the 2 clips from the front seat backrest cover.

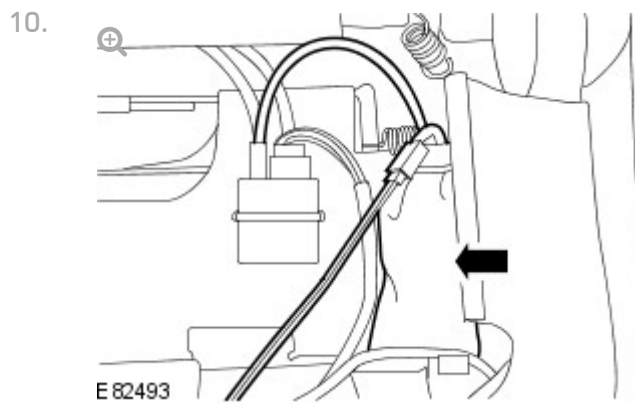
8. Release the 2 outer tension straps from the front seat backrest.

9. The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.





Release the front seat side air bag sleeve from the front seat backrest cover outer tension strap.

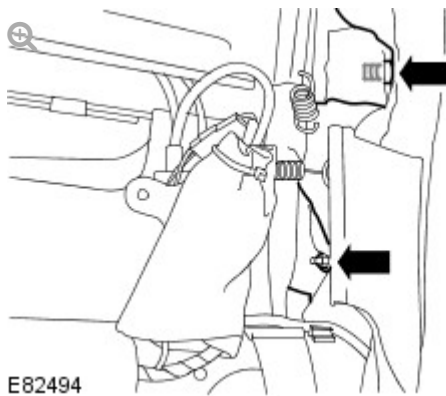


Reposition the lumbar motor control valve.

11.

WARNING:

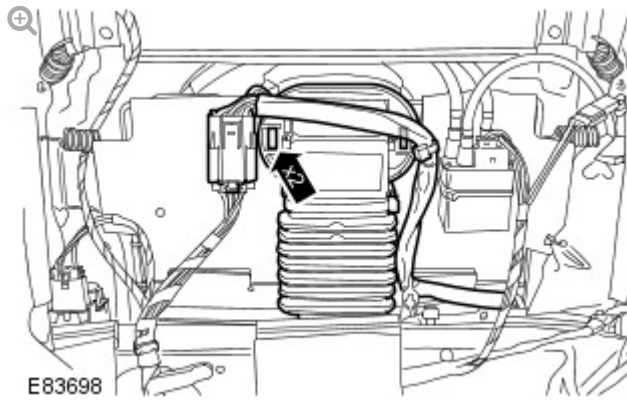
The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.



Release the front seat side air bag sleeve.

- Remove and discard the front seat side air bag sleeve bolt.
- Remove and discard the front seat side air bag lower nut.

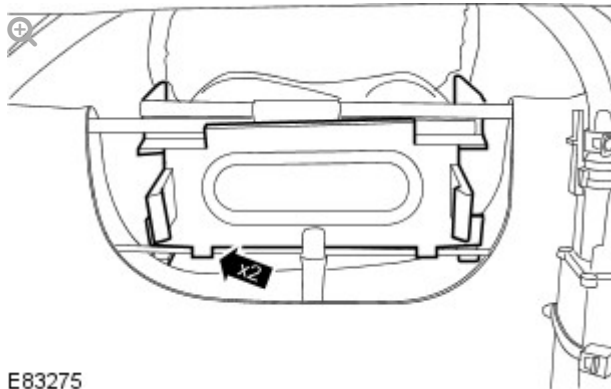
12.



Reposition the front seat backrest heater and blower motor assembly.

- Carefully release the 2 clips.

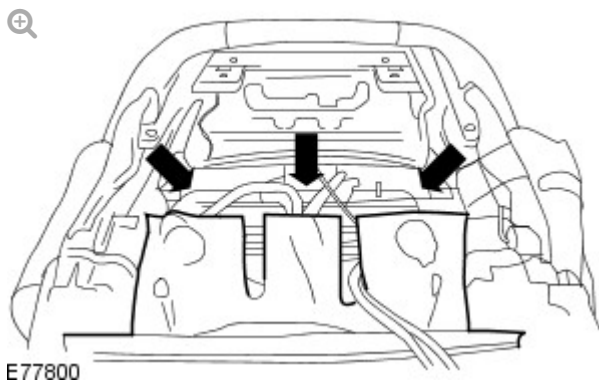
13.



Reposition the front seat backrest heater and blower motor assembly duct.

- Release the 2 clips.

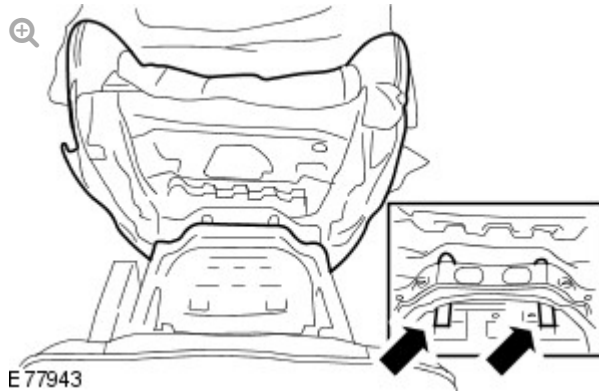
14.



Release the 3 inner central tension straps from the front seat backrest.

- Reposition the front seat backrest cover inner central tension straps to the front.

15.



Remove the front seat head restraint guide tubes.

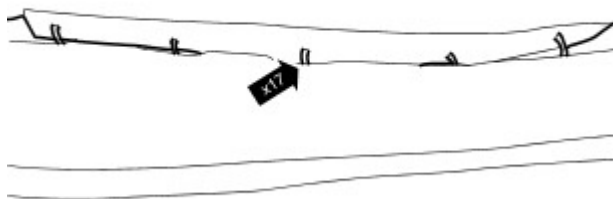
- Raise the front seat backrest cover from the front seat frame for access.
- Carefully release the 2 clips from the front seat head restraint guide tubes.

16. Remove the front seat backrest cushion and cover from the front seat frame.

17.

NOTE:

Do not disassemble further if the component is removed for access only.



E82639

Remove the front seat backrest cover from the front seat backrest cushion.

- Reposition the front seat backrest cover from the front seat backrest cushion.
- Remove and discard the 17 clips from the front seat backrest cover.

INSTALLATION

1. Install the front seat backrest cover to the front seat backrest cushion.
 - Reposition the front seat backrest cover to the front seat backrest cushion.
 - Install the 17 new clips to the front seat backrest cover.
2. Install the front seat backrest cushion and cover to the front seat frame.
3. Install the front seat head restraint guide tubes.
 - Secure the head restraint guide tube clips.
 - Reposition the front seat backrest cover to the original position.

4. **WARNING:**

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly

installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.

Secure the 3 inner central tension straps to the front seat backrest.

- Reposition the front seat backrest cover inner central tension straps to the rear.

5. Reposition the front seat backrest heater and blower motor assembly duct.

- Secure the 2 clips.

6. Reposition the front seat backrest heater and blower motor assembly.

- Secure the 2 clips.

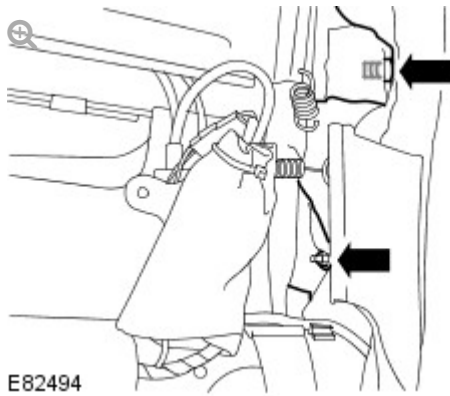
7.

WARNINGS:

- Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.
- The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.



Secure the front seat side air bag sleeve.

- Tighten the new bolt to 3 Nm (2 lb.ft).
- Tighten the new nut to 7 Nm (5 lb.ft).

8. Reposition the lumbar motor control valve.

9.

WARNINGS:

- Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.
- The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.



Secure the front seat side air bag sleeve to the front seat backrest cover outer tension strap.

10.

WARNING:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.

Secure the 2 outer tension straps to the front seat backrest.

11. Install the 2 new clips to the front seat backrest cover.

12. Install the front seat backrest cooling duct.

- Install the clip to the front seat backrest cooling duct.

13. Install the front seat backrest cover upper trim panel.

- Install the front seat backrest cover to the front seat backrest upper trim panel.
- Install the 2 screws.

14. Install the seat armrest.

For additional information, refer to: Seat Armrest (501-10, Removal and Installation).

15. Install the front seat head restraint.

For additional information, refer to: Front Seat Head Restraint - Vehicles With: Head Restraint Video Display (501-10, Removal and Installation).

16. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT BACKREST LOWER REAR COVER (G899536)

REMOVAL AND INSTALLATION

REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Disconnect the battery ground cable.

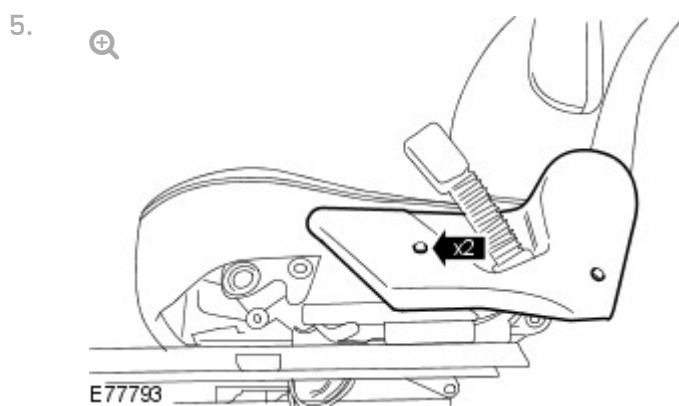
For additional information, refer to: Specifications (414-00,

Specifications).

-
2. Make the air bag supplemental restraint system (SRS) safe.
For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

-
3. Remove the front seat.
For additional information, refer to: Front Seat (501-10, Removal and Installation).

-
4. Remove the front seat side trim panel support.
 - Release the 2 clips.



Remove the front seat backrest hinge cover.

- Remove the 2 screws.
- Release the clip.

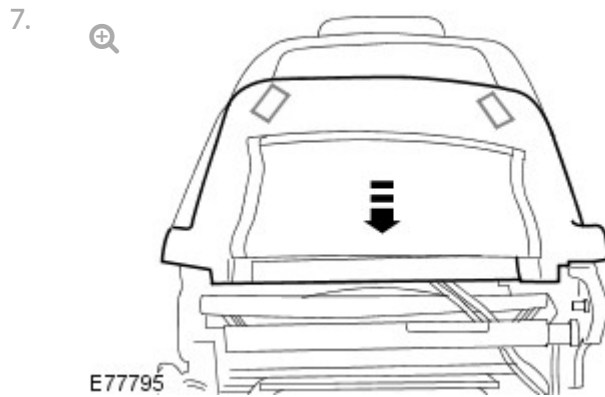
-
6. **NOTE:**

Left-hand shown, right-hand similar.



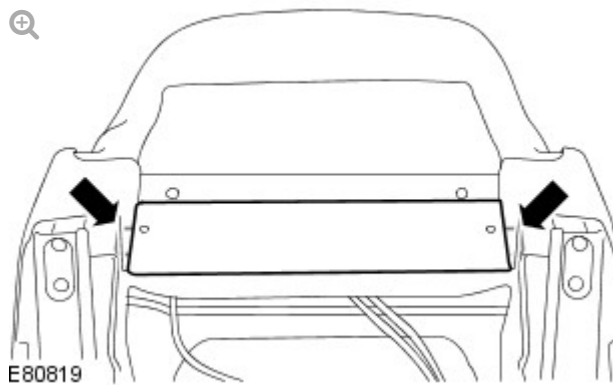


Remove the 2 clips from the front seat backrest lower rear cover.



Remove the front seat backrest lower rear cover.

- Release the front seat backrest cover lower trim panel from the 2 clips.



1. Remove the front seat side trim panel support.

- Release the 2 clips.

INSTALLATION

1. Install the front seat backrest lower rear cover.

- Secure the front seat backrest cover lower trim panel to the 2 clips.
-

2. Install the 2 clips to the front seat backrest lower rear cover.

3. Install the front seat backrest hinge cover.

- Secure the clip.
 - Install the 2 screws.
-

4. Install the seat control switch.

For additional information, refer to: Seat Control Switch (501-10, Removal and Installation).

5. Install the front seat side trim panel support.

- Secure the 2 clips.
-

6. Secure the 2 lower tension straps to the front seat base.

- Reposition the front seat backrest cover.
-

7. Install the front seat.

For additional information, refer to: Front Seat (501-10, Removal and Installation).

8. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

**FRONT SEAT BACKREST
HEATER AND BLOWER
ASSEMBLY** (G916499)

REMOVAL

WARNINGS:

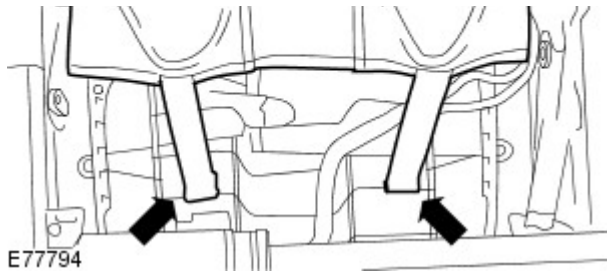
- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

1. Disconnect the battery ground cable.

2. Make the air bag supplemental restraint system (SRS) safe.
For additional information, refer to: [Standard Workshop Practices](#) (100-00 General Information, Description and Operation).

3. Remove the front seat.
For additional information, refer to: [Front Seat](#) (501-10 Seating, Removal and Installation).

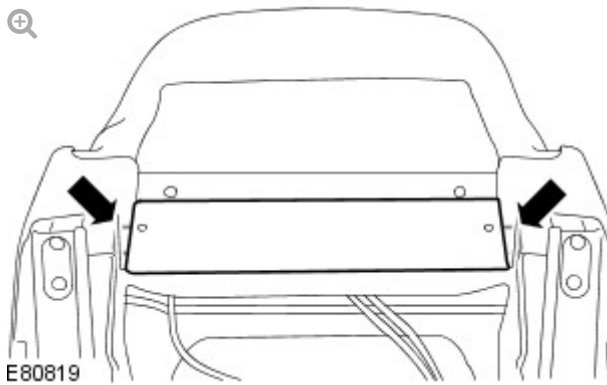
4. 



Release the 2 lower tension straps from the front seat base.

- Reposition the front seat backrest cover for access.

5.



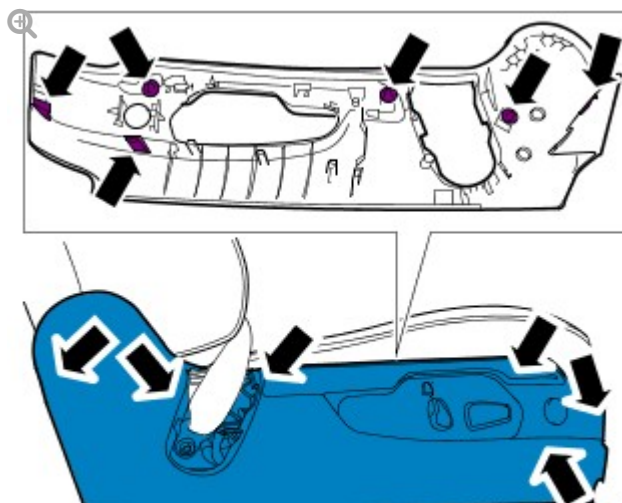
Remove the front seat side trim panel support.

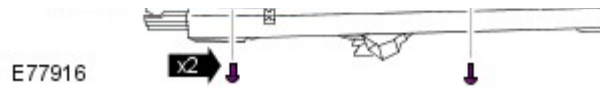
- Release the 2 clips.

6.

CAUTION:

Release the 2 front clips and the rear clip before releasing the 3 fir tree clips. Failure to follow this instruction may result in damage to the vehicle.

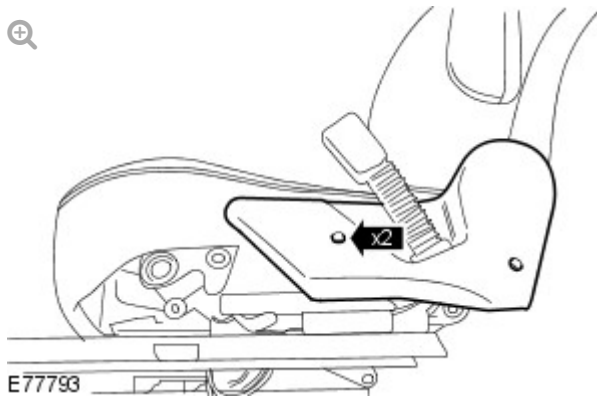




Carefully release the front seat base side trim panel.

- Remove the 2 screws.
- Release the 2 front clips.
- Release the rear clip.
- Release the 3 fir tree clips.

7.



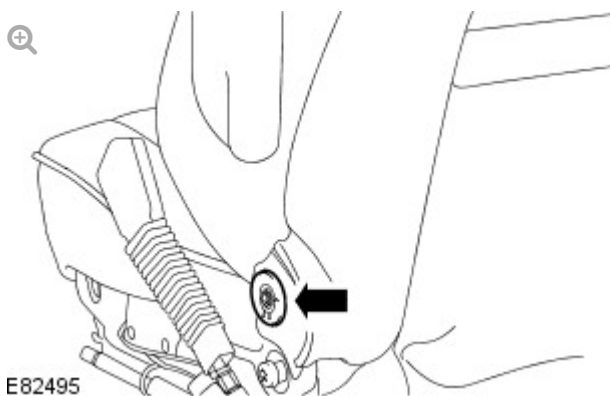
Remove the front seat backrest hinge cover.

- Remove the 2 screws.
- Release the clip.

8.

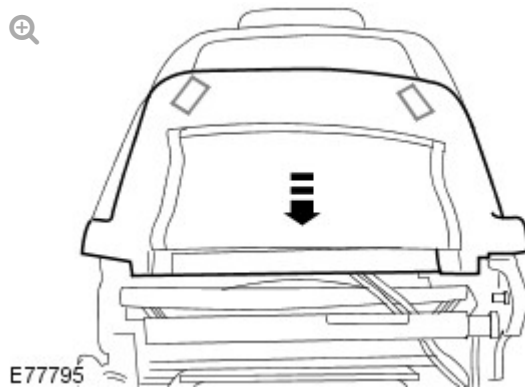
NOTE:

Left-hand shown, right-hand similar.



Remove the 2 clips from the front seat backrest lower rear cover.

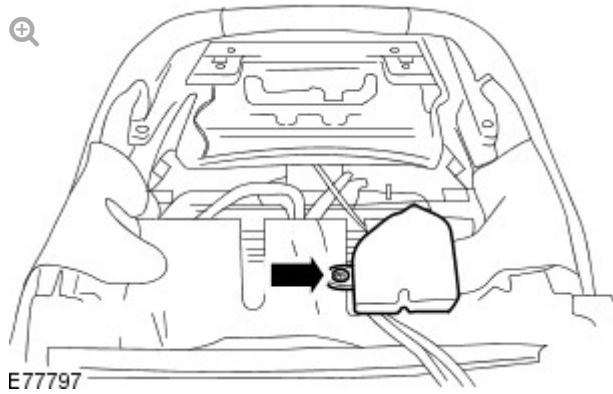
9.



Remove the front seat backrest lower rear cover.

- Release the front seat backrest cover lower trim panel from the 2 clips.

10.



Remove the front seat backrest cooling duct.

- Remove the clip from the front seat backrest cooling duct.

11.



Remove and discard the clip from the front seat backrest cover.

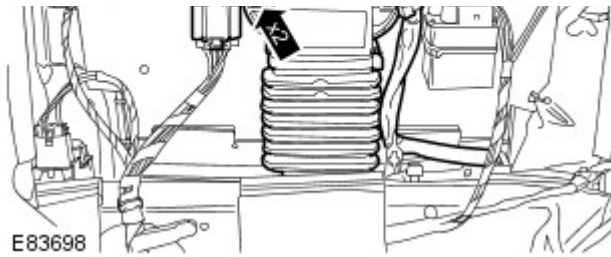
12.



Release the front seat backrest cover RH inner tension strap.

13.





Reposition the front seat backrest heater and blower motor assembly.

- Carefully release the 2 clips.

14. 

Remove the 3 screws from the front seat backrest heater and blower motor assembly.

15. 

Remove the front seat backrest heater and blower motor assembly.

- Disconnect the front seat backrest heater and blower motor assembly electrical connector.

INSTALLATION

1. Install the front seat backrest heater and blower motor assembly.

- Connect the front seat backrest heater and blower motor assembly electrical connector.

2. Install the 3 screws to the front seat backrest heater and blower motor assembly.

3. Reposition the front seat backrest heater and blower motor assembly.

- Secure the 2 clips.

4. Secure the front seat backrest cover RH inner tension stran

11. Secure the front seat backrest cover to the inner tension strap.

5. Install the new clip to the front seat backrest cover.

6. Install the front seat backrest cooling duct.

- Install the clip to the front seat backrest cooling duct.
-

7. Install the front seat backrest lower rear cover.

- Secure the front seat backrest cover lower trim panel to the 2 clips.
-

8. Install the 2 clips to the front seat backrest lower rear cover.

9. Install the front seat backrest hinge cover.

- Secure the clip.
 - Install the 2 screws.
-

10. Secure the front seat base side trim panel.

- Secure the 6 clips.
 - Install the 2 screws.
-

11. Install the front seat side trim panel support.

- Secure the 2 clips.
-

12. Secure the 2 lower tension straps to the front seat base.

- Reposition the front seat backrest cover.
-

13. Install the front seat.

For additional information, refer to: [Front Seat](#) (501-10 Seating, Removal and Installation).

14. Connect the battery ground cable.

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT CUSHION HEATER AND BLOWER ASSEMBLY (G916500)

REMOVAL AND INSTALLATION

REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.

- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

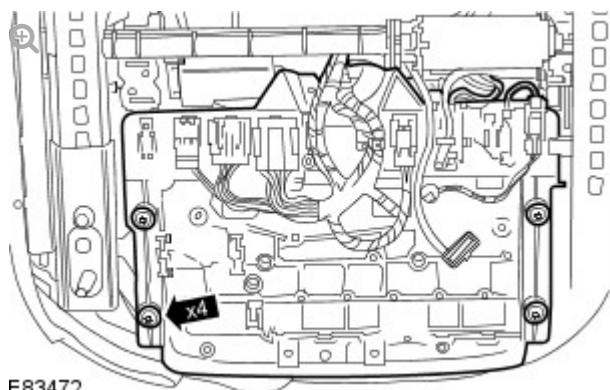
-
2. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

-
3. Remove the front seat cushion and front seat cushion cover from the front seat base.

For additional information, refer to: Front Seat Cushion Cover (501-10, Removal and Installation).

-
- 4.



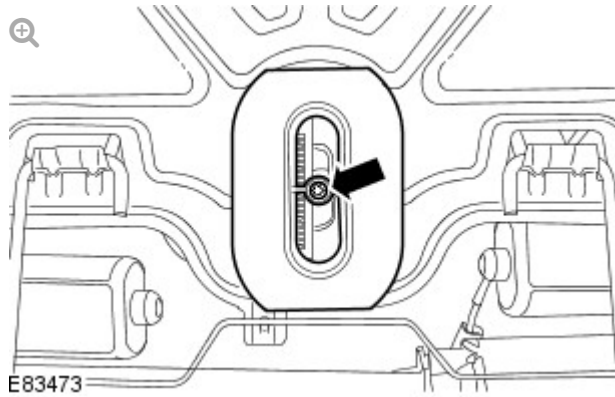
Reposition the front seat base wiring harness trim panel.

- Reposition the front seat for access.

Remove the 4 screws

- Remove the 4 screws.

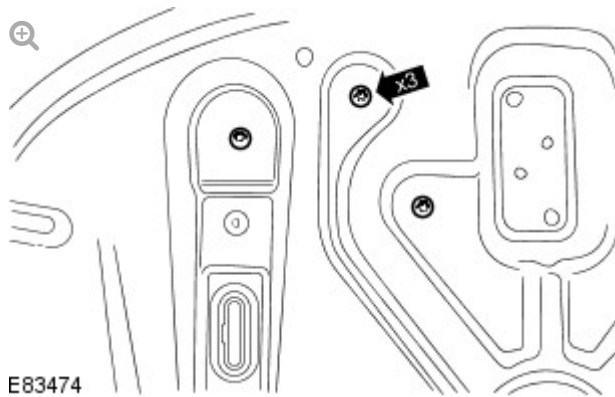
5.



Remove the front seat cushion heater and blower motor assembly duct.

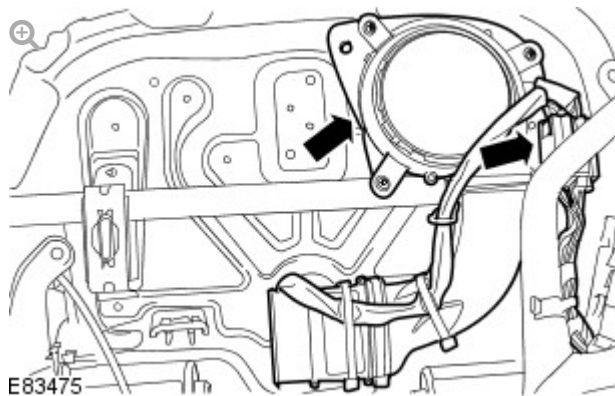
- Remove the screw.

6.



Remove the 3 screws from the front seat heater and blower motor assembly.

7.



Remove the front seat cushion heater and blower motor assembly.

- Disconnect the front seat cushion heater and blower motor assembly electrical connector.

INSTALLATION

1. Install the front seat cushion heater and blower motor assembly.
 - Connect the front seat cushion heater and blower motor assembly electrical connector.
2. Install the 3 screws to the front seat cushion heater and blower motor assembly.
3. Install the front seat cushion heater and blower motor assembly duct.
 - Install the screw.
4. Reposition the front seat base wiring harness trim panel.
 - Reposition the front seat for access.
 - Install the 4 screws.
5. Install the front seat cushion and cover to the front seat base.
For additional information, refer to: Front Seat Cushion Cover (501-10, Removal and Installation).
6. Connect the battery ground cable.
For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT CUSHION COVER (G874698)

REMOVAL AND INSTALLATION

78.30.01	COVER - ONE PIECE - FRONT SEAT SEAT CUSHION - RENEW	ALL DERIVATIVES	1.3	USED WITHINS	+
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REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.

- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

CAUTION:

The front passenger seat occupant classification sensor is available only as a service kit. No attempt should be made to replace individual components. Failure to follow this instruction may result in personal injury.

1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

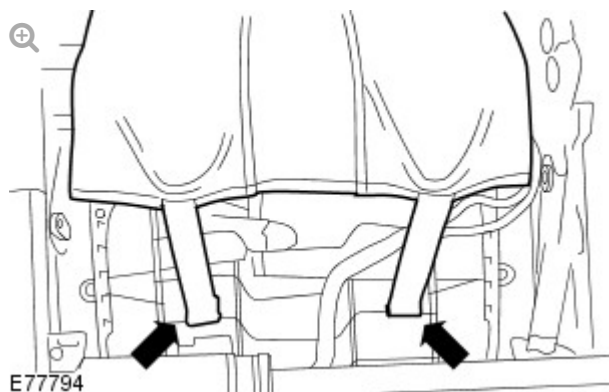
2. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

3. Remove the front seat.

For additional information, refer to: Front Seat (501-10, Removal and Installation).

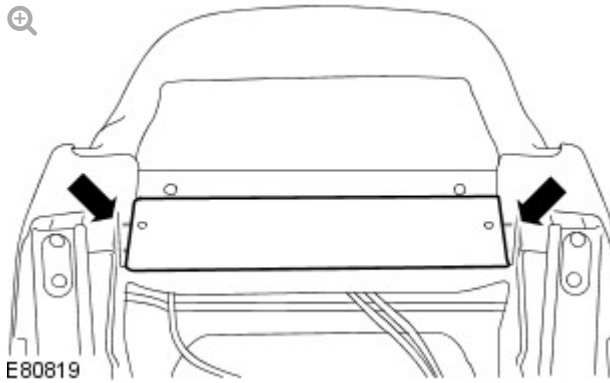
- 4.



Release the 2 lower tension straps from the front seat base.

- Reposition the front seat backrest cover for access.

5.



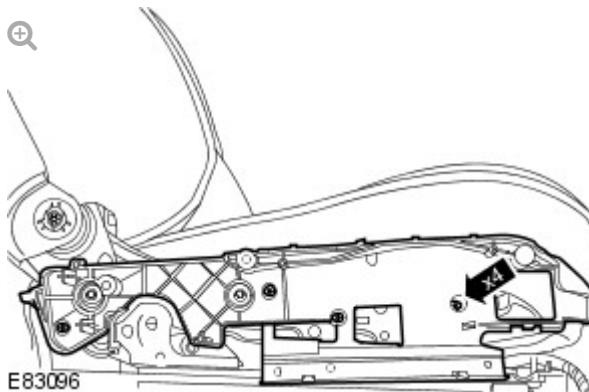
Remove the front seat side trim panel support.

- Release the 2 clips.

6. Remove the seat control switch.

For additional information, refer to: Seat Control Switch (501-10, Removal and Installation).

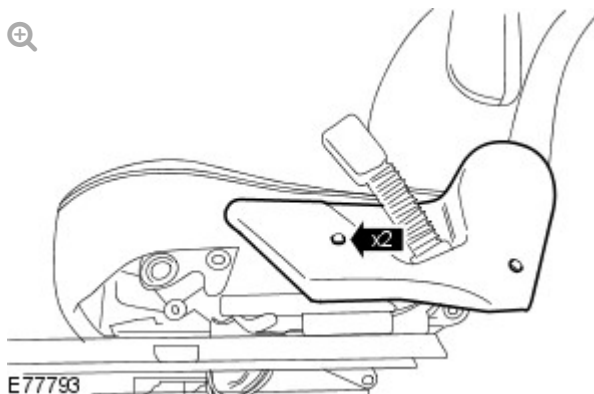
7.



Remove the front seat base side trim panel mounting bracket.

- Release the 2 wiring harness clips.
- Remove the 4 screws.

8.



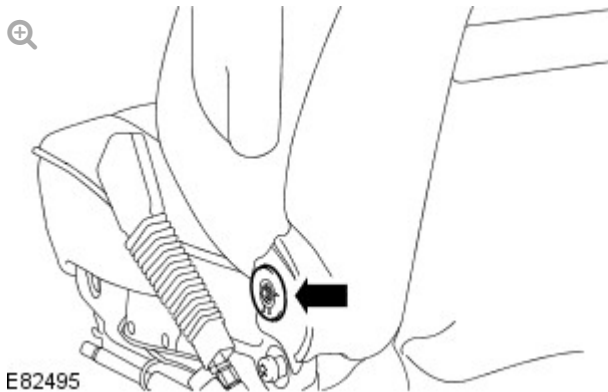
Remove the front seat backrest hinge cover.

- Remove the 2 screws.
- Release the clip.

9.

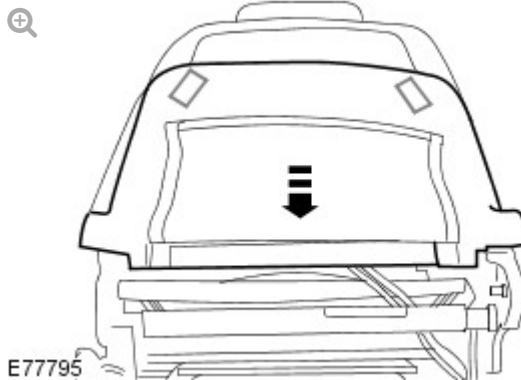
NOTE:

Left-hand shown, right-hand similar.



Remove the 2 clips from the front seat backrest cover lower trim panel.

10.



Remove the front seat backrest cover lower trim panel.

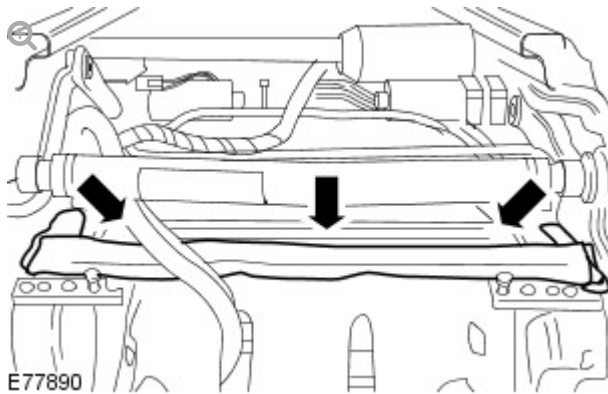
- Release the front seat backrest cover lower trim panel from the 2 clips.

11.

WARNING:

The front seat base has sharp edges, hand protection must be worn when releasing the front seat cushion cover from the

front seat base. Failure to follow this instruction may result in personal injury.



Release the front seat cushion cover from the rear of the front seat base.

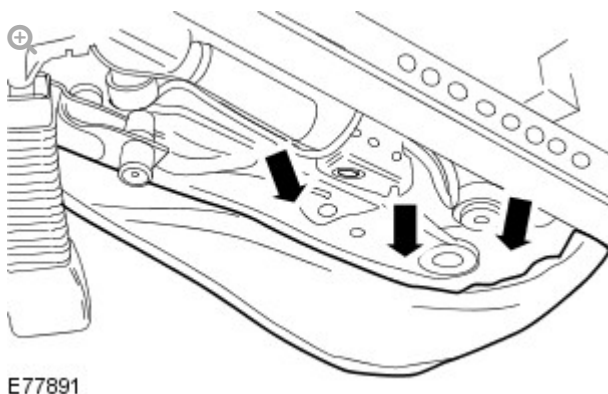
12.

WARNING:

The front seat base has sharp edges, hand protection must be worn when releasing the front seat cushion cover from the front seat base. Failure to follow this instruction may result in personal injury.

NOTE:

Left-hand shown, right-hand similar.



Release the front seat cushion cover from the left-hand side of the

front seat base.

13.

WARNING:

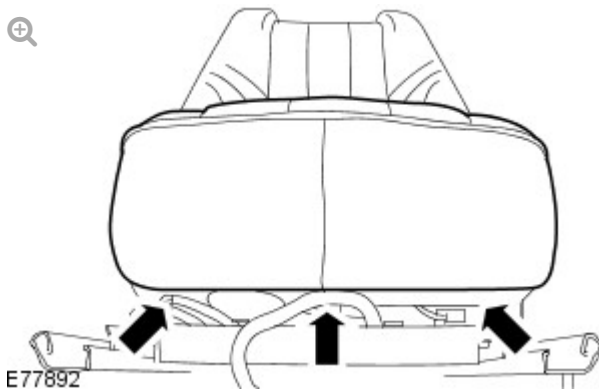
The front seat base has sharp edges, hand protection must be worn when releasing the front seat cushion cover from the front seat base. Failure to follow this instruction may result in personal injury.

Release the front seat cushion cover from the right-hand side of the front seat base.

14.

WARNING:

The front seat base has sharp edges, hand protection must be worn when releasing the front seat cushion cover from the front seat base. Failure to follow this instruction may result in personal injury.



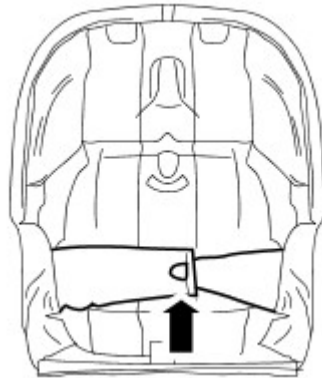
Remove the front seat cushion and front seat cushion cover from the front seat base.

- Reposition the front seat for access.
- Release the front seat cushion cover from the front of the front seat base.

15.

NOTE:

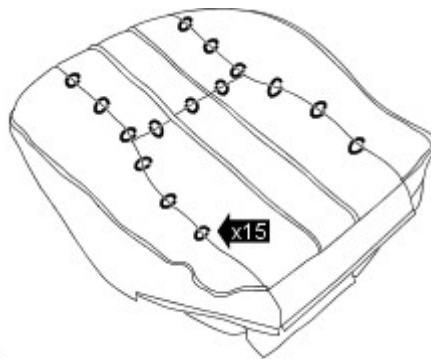
Do not disassemble further if the component is removed for access only.



E77893

Release the front seat cushion cover tension strap.

16.

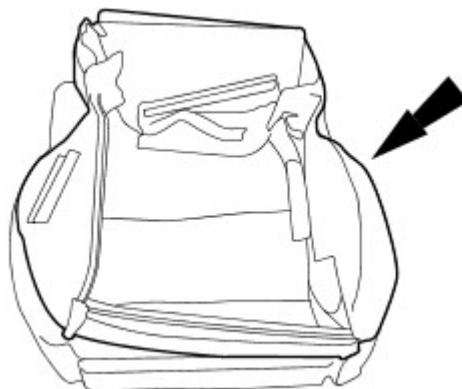


E77894

Remove and discard the 15 clips from the front seat cushion cover.

- Reposition the front seat cushion cover for access.

17.



E39156

Remove the front seat cushion cover from the front seat cushion.

1. Install the front seat cushion cover to the front seat cushion.

2. Install the 15 new clips to the front seat cushion cover.

- Reposition the front seat cushion cover to the front seat cushion.

3. Secure the front seat cushion cover tension strap.

4.

WARNING:

The front seat base has sharp edges, hand protection must be worn when securing the front seat cushion cover to front seat base. Failure to follow this instruction may result in personal injury.

Install the front seat cushion and cover to the front seat base.

- Reposition the front seat for access.
- Secure the front seat cushion cover to the front of the front seat base.

5.

WARNING:

The front seat base has sharp edges, hand protection must be worn when securing the front seat cushion cover to front seat base. Failure to follow this instruction may result in personal injury.

Secure the front seat cushion cover to the right-hand side of the front seat base.

6.

WARNING:

The front seat base has sharp edges, hand protection must be worn when securing the front seat cushion cover to front seat base. Failure to follow this instruction may result in personal injury.

Secure the front seat cushion cover to the left-hand side of the front seat base.

7.

WARNING:

The front seat base has sharp edges, hand protection must be worn when securing the front seat cushion cover to front seat base. Failure to follow this instruction may result in personal injury.

Secure the front seat cushion cover to the rear of the front seat base.

8. Install the front seat backrest cover lower trim panel.

- Secure the front seat backrest cover lower trim panel to the 2 clips.

9. Install the 2 clips to the front seat backrest cover lower trim panel.

10. Install the front seat backrest hinge cover.

- Secure the clip.
- Install the 2 screws.

11. Install the front seat base side trim panel mounting bracket.

- Install the 4 screws.
- Secure the 2 wiring harness clips.

12. Install the seat control switch.

For additional information, refer to: Seat Control Switch (501-10,

Removal and Installation).

13. Install the front seat side trim panel support.

- Secure the 2 clips.

14. Secure the 2 lower tension straps to the front seat base.

- Reposition the front seat backrest cover.

15. Install the front seat.

For additional information, refer to: Front Seat (501-10, Removal and Installation).

16. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

17. Using the Land Rover approved diagnostic system, calibrate the occupant classification sensor.

2012.0 RANGE ROVER (LM), 501-10

SEATING

**FRONT SEAT HEAD
RESTRAINT - VEHICLES
WITH: HEAD RESTRAINT
VIDEO DISPLAY**

VIDEO DISPLAY (G1240173)

REMOVAL AND INSTALLATION

REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Reposition the front seat backrest for access.
 - Reposition the front seat head restraint to the fully extended position.
-
2. Disconnect the battery ground cable.

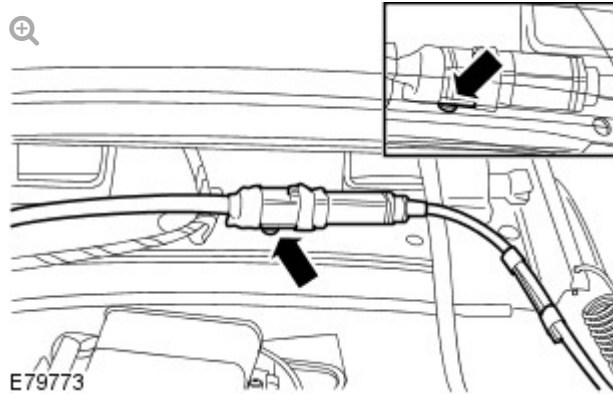
For additional information, refer to: Specifications (414-00, Specifications).
-
3. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

4. Remove the front seat backrest lower rear cover.

For additional information, refer to: Front Seat Backrest Lower Rear Cover (501-10, Removal and Installation).

- 5.



Disconnect the front seat head restraint video display electrical connector.

- Release the clip.

- 6.

CAUTION:

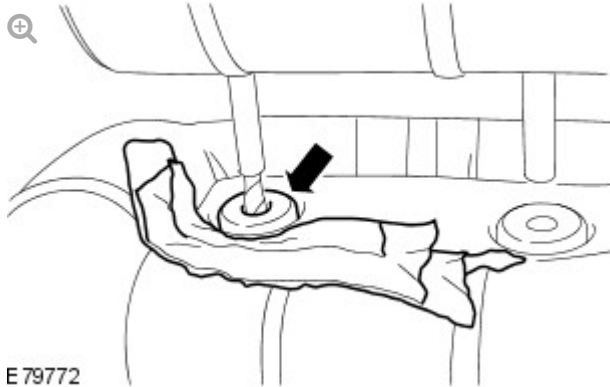
Make sure that the head restraint is not withdrawn further than 15 mm (0.60 inch) from the head restraint guide tubes.



Release the front seat head restraint.

- Release the front seat head restraint from the head restraint clips.

7.



Release the RH head restraint guide tube.

- Apply suitable protective tape around the RH head restraint guide tube.
- Using a suitable tool, release the RH head restraint guide tube.

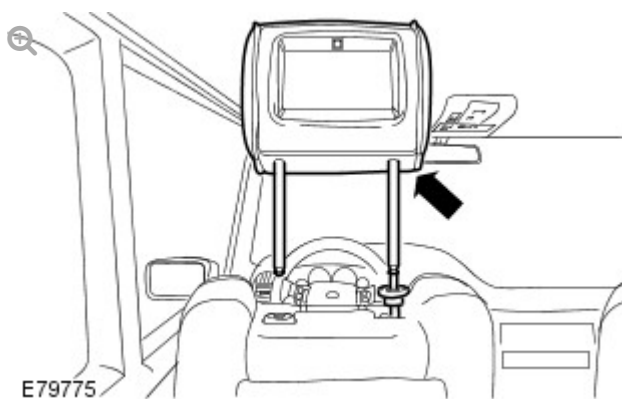
8.

CAUTION:

Make sure no damage occurs to the video display wiring harness.

NOTE:

Note the position of the wiring harnesses to aid installation.



Remove the front seat head restraint.

- Feed the front seat head restraint video wiring harness

through the front seat backrest cover and the seat frame.

INSTALLATION

1. **CAUTIONS:**

- Make sure the wiring harness is installed to its original position.
- Make sure no damage occurs to the video display wiring harness.

Install the front seat head restraint.

- Feed the front seat head restraint video wiring harness through the front seat backrest cover and the seat frame.

2. Secure the RH head restraint guide tube.

- Remove the protective tape from around the RH head restraint guide tube.

3. Remove the suitable tape from the front seat head restraint post clip.

- Secure the front seat head restraint post clip to the RH head restraint post.

4. **CAUTION:**

Make sure the plastic insert is correctly installed to the RH head restraint post. Failure to follow this instruction may result in damage to the vehicle.

Secure the front seat head restraint.

- Secure the front seat head restraint to the head restraint clips.

5. Connect the front seat head restraint video display electrical connector.

- Secure the clip.

6. Install the front seat backrest lower rear cover.

For additional information, refer to: Front Seat Backrest Lower Rear Cover (501-10, Removal and Installation).

7. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

8. Reposition the front seat backrest to its original position.

- Reposition the front seat head restraint to its original position.

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT HEAD RESTRAINT - VEHICLES WITHOUT: HEAD RESTRAINT VIDEO DISPLAY (G878314)

REMOVAL AND INSTALLATION

REMOVAL

1. Reposition the front seat backrest for access.
-

2. **WARNING:**

The head restraint will release suddenly, keep face clear during removal. Failure to follow this instruction may result in personal injury.



Remove the front seat head restraint.

- Reposition the front seat head restraint to the fully extended position.
- Release the front seat head restraint from the head restraint clips.

INSTALLATION

1. Install the front seat head restraint.
 - Secure the front seat head restraint to the head restraint clips.
 - Reposition the front seat head restraint to the original position.
 2. Reposition the front seat backrest to the original position.
-

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT HEAD RESTRAINT MOTOR (G875471)

REMOVAL AND INSTALLATION

78.70.31	MOTOR - HEIGHT ADJUSTMENT - HEAD RESTRAINT - FRONT SEAT - RENEW	ALL DERIVATIVES	1.3	USED WITHINS	+
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REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.

- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

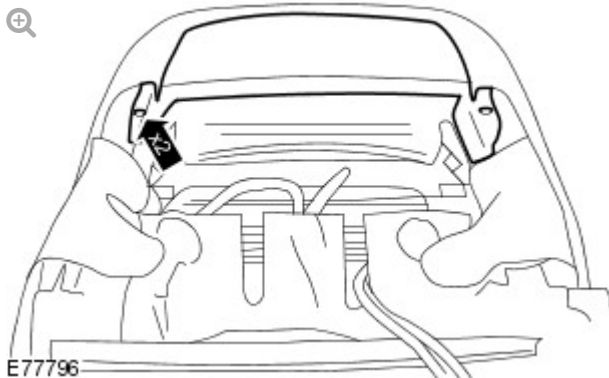
3. Remove the front seat head restraint.

For additional information, refer to: Front Seat Head Restraint - Vehicles With: Head Restraint Video Display (501-10, Removal and Installation).

4. Remove the seat armrest.

For additional information, refer to: Seat Armrest (501-10, Removal and Installation).

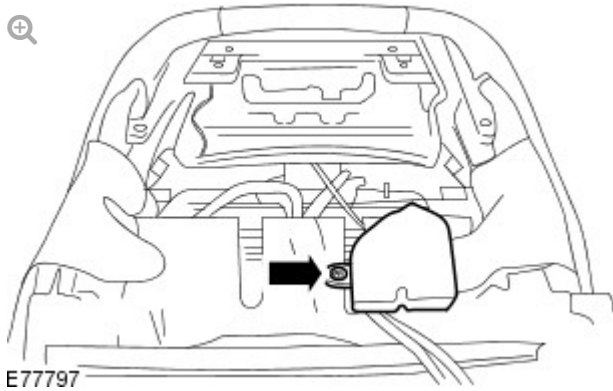
- 5.



Remove the front seat backrest cover upper trim panel.

- Remove the 2 screws.
- Release the front seat backrest cover from the front seat backrest upper trim panel.

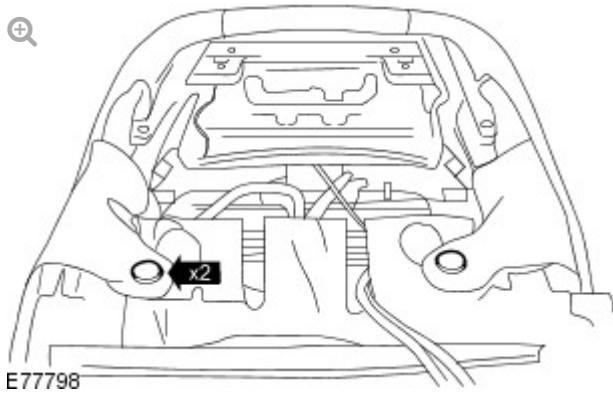
6.



Remove the front seat backrest cooling duct.

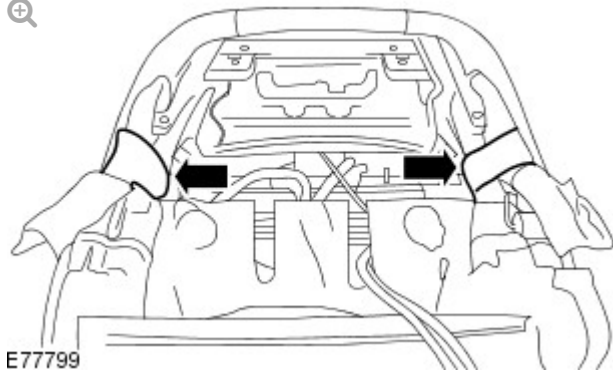
- Remove the clip from the front seat backrest cooling duct.

7.



Remove and discard the 2 clips from the front seat backrest cover.

8.



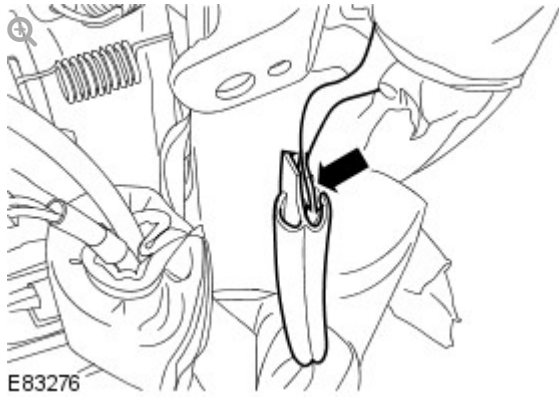
Release the 2 outer tension straps from the front seat backrest.

9.

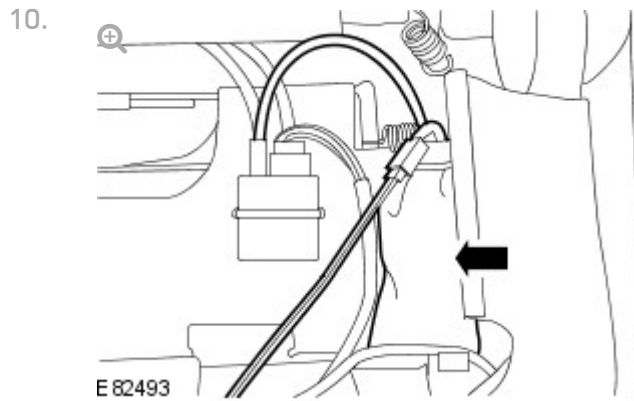
WARNING:

The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury

may result in personal injury.



Release the front seat side air bag sleeve from the front seat backrest cover outer tension strap.



Reposition the lumbar motor control valve.

11.

WARNING:

The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.



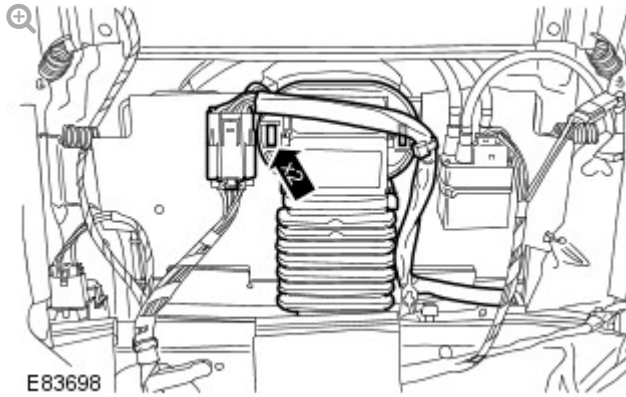
E82494



Release the front seat side air bag sleeve.

- Remove and discard the front seat side air bag sleeve bolt.
- Remove and discard the front seat side air bag lower nut.

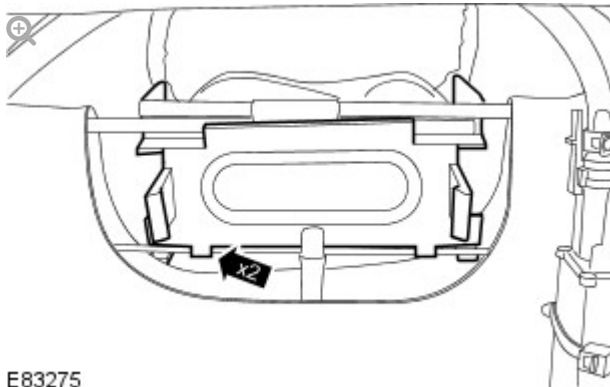
12.



Reposition the front seat backrest heater and blower motor assembly.

- Carefully release the 2 clips.

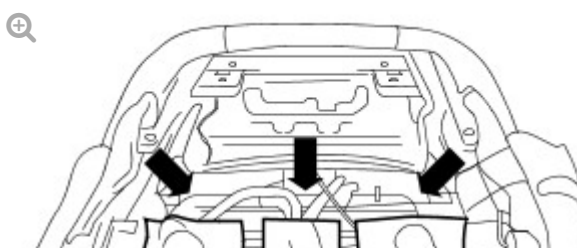
13.

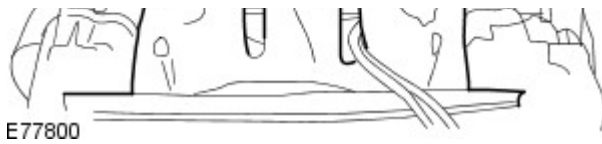


Reposition the front seat backrest heater and blower motor assembly duct.

- Release the 2 clips.

14.

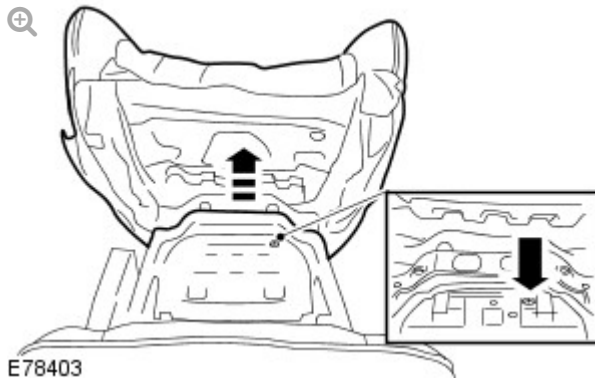




Release the 3 inner central tension straps from the front seat backrest.

- Reposition the front seat backrest cover inner central tension straps to the front.

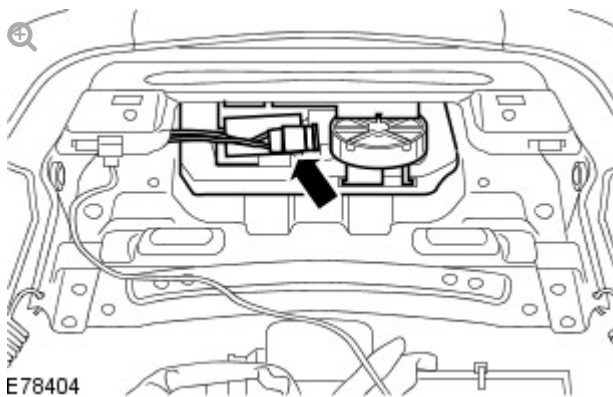
15.



Remove the front seat head restraint motor screw.

- Raise the front seat backrest cover from the front seat frame for access.

16.



Remove the front seat head restraint motor.

- Disconnect the electrical connector.
- Release the front seat head restraint motor from the front seat frame.

-
1. Install the front seat head restraint motor.
 - Secure the front seat head restraint motor to the front seat frame.
 - Connect the electrical connector.

-
2. Install the front seat head restraint motor screw.
 - Reposition the front seat backrest cover to the original position.

3. **WARNING:**

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.

Secure the 3 inner central tension straps to the front seat backrest.

- Reposition the front seat backrest cover inner central tension straps to the rear.
-
4. Reposition the front seat backrest heater and blower motor assembly duct.
 - Secure the 2 clips.
-

5. Reposition the front seat backrest heater and blower motor assembly.
 - Secure the 2 clips.

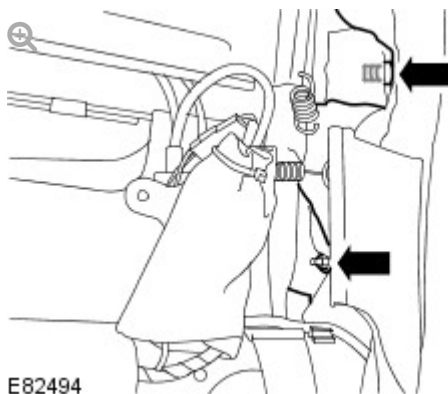
6.

WARNINGS:

- Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.
- The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.



Secure the front seat side air bag sleeve.

- Tighten the new bolt to 3 Nm (2 lb.ft).
- Tighten the new nut to 7 Nm (5 lb.ft).

7. Reposition the lumbar motor control valve.

8.

WARNINGS:

- Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.
- The air bag is mounted directly under this component, extreme care is necessary. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.



Secure the front seat side air bag sleeve to the front seat backrest cover outer tension strap.

9.

WARNING:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in personal injury.

CAUTION:

Make sure the front seat air bag sleeve and front seat backrest cover outer tension straps, are secure and correctly installed to the front seat frame to allow the air bag to deploy correctly. Failure to follow this instruction may result in damage to the vehicle.

Secure the 2 outer tension straps to the front seat backrest.

-
10. Install the 2 new clips to the front seat backrest cover.
-
11. Install the front seat backrest cooling duct.
 - Install the clip to the front seat backrest cooling duct.
-
12. Install the front seat backrest cover upper trim panel.
 - Install the front seat backrest cover to the front seat backrest upper trim panel.
 - Install the 2 screws.
-
13. Install the seat armrest.

For additional information, refer to: Seat Armrest (501-10, Removal and Installation).
-
14. Install the front seat head restraint.

For additional information, refer to: Front Seat Head Restraint - Vehicles With: Head Restraint Video Display (501-10, Removal and Installation).

15. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

FRONT SEAT RECLINER MOTOR (G875487)

78.70.34	MOTOR - RECLINING MECHANISM - FRONT SEAT - RENEW	ALL DERIVATIVES	1.4	USED WITHINS	+
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REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

-
2. Make the air bag supplemental restraint system (SRS) safe.

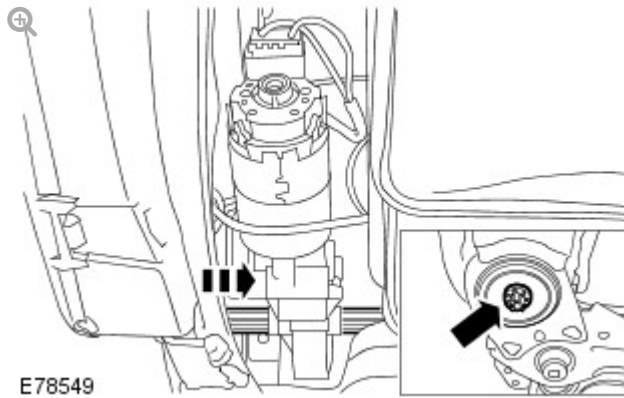
For additional information, refer to: Standard Workshop Practices

(100-00, Description and Operation).

3. Remove the front seat backrest cover.

For additional information, refer to: Front Seat Backrest Cover (501-10, Removal and Installation).

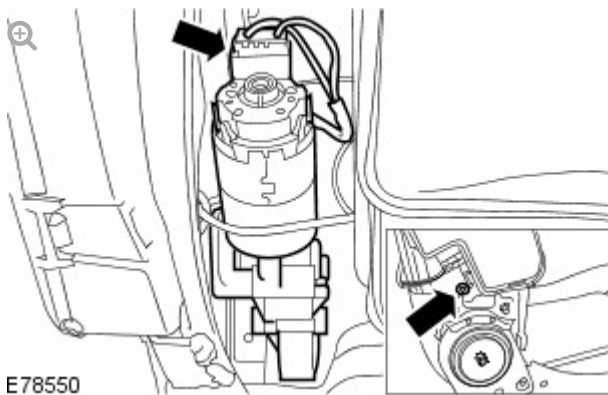
- 4.



Reposition the front seat backrest shaft.

- Remove and discard the front seat backrest shaft clip.

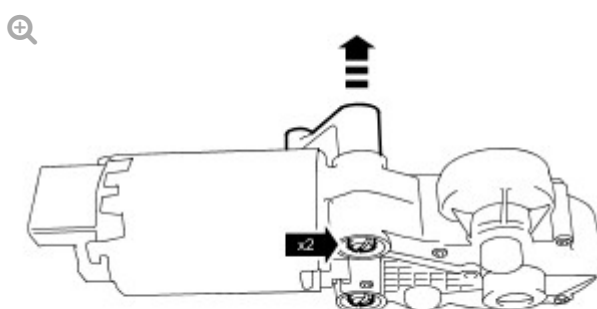
- 5.



Remove the front seat recliner motor.

- Disconnect the electrical connector.
- Remove the front seat recliner motor bolt.

- 6.



Remove the front seat recliner motor bracket.

- Release the 2 clips.

INSTALLATION

1. Install the front seat recliner motor bracket.
 - Secure the 2 clips.
2. Install the front seat recliner motor.
 - Loosely install the front seat recliner motor bolt.
 - Connect the electrical connector.
3. Reposition the front seat backrest shaft.
 - Install the new front seat backrest shaft clip.
 - Tighten the front seat recliner motor bolt.
4. Install the front seat backrest cover.

For additional information, refer to: Front Seat Backrest Cover (501-10, Removal and Installation).
5. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).
6. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

LUMBAR ASSEMBLY (G875350)

REMOVAL AND INSTALLATION

78.60.01	BLADDER - LUMBAR SUPPORT - FRONT SEAT - RENEW	ALL DERIVATIVES	0.9	USED WITHINS	+
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REMOVAL

WARNINGS:

- Persons working on the supplemental restraint system (SRS) must be fully trained and have been issued with the safety guidelines.
- Allow a period of 10 minutes to elapse after disconnecting the battery before undertaking any work on the SRS.
- The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.
- The correct procedures must always be used when working on SRS components.
- It is imperative that before any work is undertaken on the SRS system, the appropriate information is read thoroughly.
- Always disconnect both battery cables before beginning work on the SRS system. Disconnect the ground cable first. Never reverse connect the battery.
- Take extra care when handling SRS components.

-
1. Disconnect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

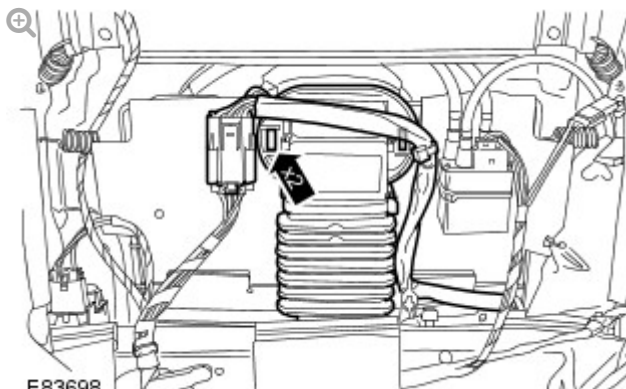
-
2. Make the air bag supplemental restraint system (SRS) safe.

For additional information, refer to: Standard Workshop Practices (100-00, Description and Operation).

-
3. Remove the front seat backrest lower rear cover.

For additional information, refer to: Front Seat Backrest Lower Rear Cover (501-10, Removal and Installation).

-
- 4.



Reposition the front seat backrest heater and blower motor assembly.

- Carefully release the 2 clips.

5.

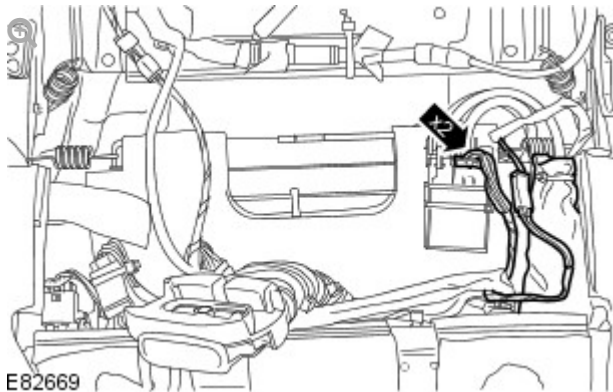


E83275

Reposition the front seat backrest heater and blower motor assembly duct.

- Release the 2 clips.

6.

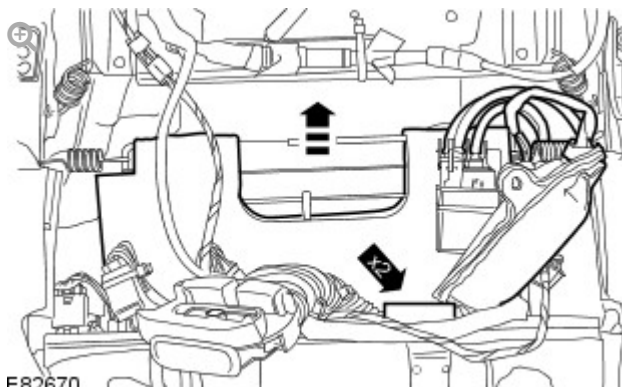


E82669

Reposition the lumbar motor control valve.

- Disconnect the 2 electrical connectors.

7.



E82670

Remove the lumbar assembly.

- Release the 2 retaining tangs.

INSTALLATION

1.

NOTE:

Make sure the lumbar assembly is installed to its original position.

Install the lumbar assembly.

- Secure the 2 retaining tangs.

2. Reposition the lumbar motor control valve.

- Connect the 2 electrical connectors.

3. Reposition the front seat backrest heater and blower motor assembly duct.

- Secure the 2 clips.

4. Reposition the front seat backrest heater and blower motor assembly.

- Secure the 2 clips.

5. Install the front seat backrest lower rear cover.

For additional information, refer to: Front Seat Backrest Lower Rear Cover (501-10, Removal and Installation).

6. Connect the battery ground cable.

For additional information, refer to: Specifications (414-00, Specifications).

2012.0 RANGE ROVER (LM), 501-10

SEATING

LUMBAR CONTROL SWITCH

[G873656]

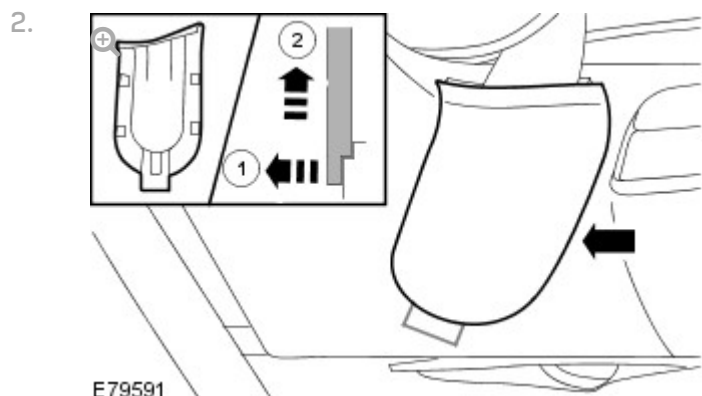
REMOVAL AND INSTALLATION

REMOVAL

NOTE:

Front seat shown removed for clarity.

1. Position the front seat fully forwards.
-



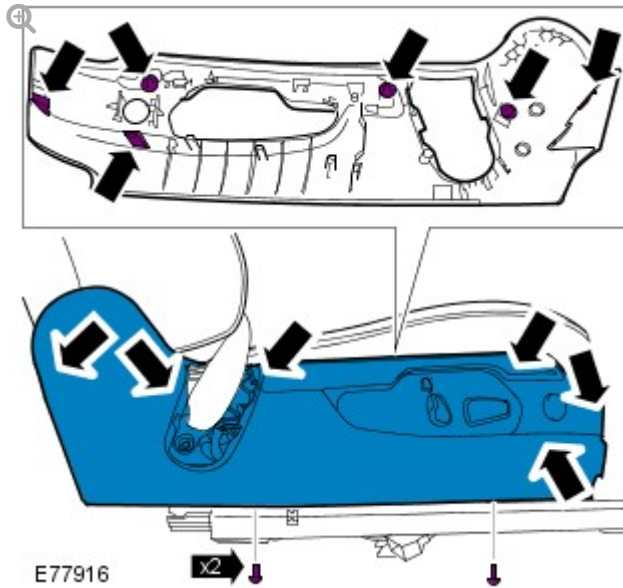
Remove the safety belt lower anchor bolt cover.

- 1 Carefully release the clip from behind the front seat base

1. Carefully release the clip from behind the front seat base side trim panel.

2. Remove the cover.

3.



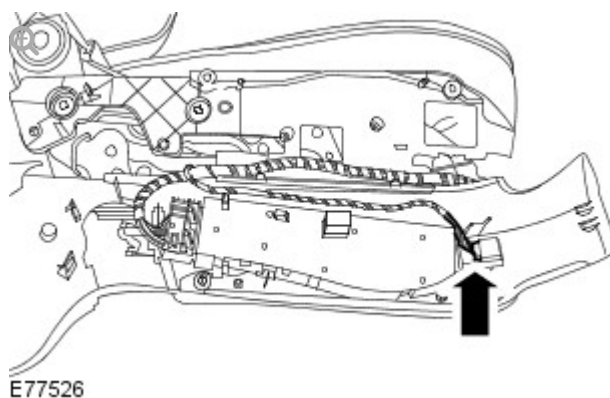
Carefully release the front seat base side trim panel.

- Remove the 2 screws.
- Release the 6 clips.

4.

NOTE:

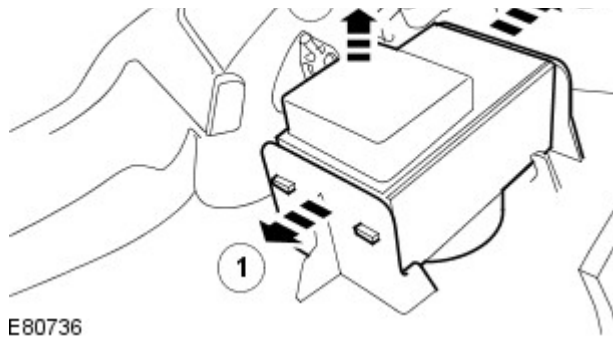
Safety belt shown removed for clarity.



Disconnect the lumbar control switch electrical connector.

5.





Remove the lumbar control switch.

1. Release the 2 clips.
2. Remove the switch.

INSTALLATION

1. Install the lumbar control switch.
 - Install the switch.
 - Secure the 2 clips.
2. Connect the lumbar control switch electrical connector.
3. Carefully install the front seat base side trim panel.
 - Secure the 6 clips.
 - Install the 2 screws.
4. Install the safety belt lower anchor bolt cover.
5. Reposition the front seat to the original position.

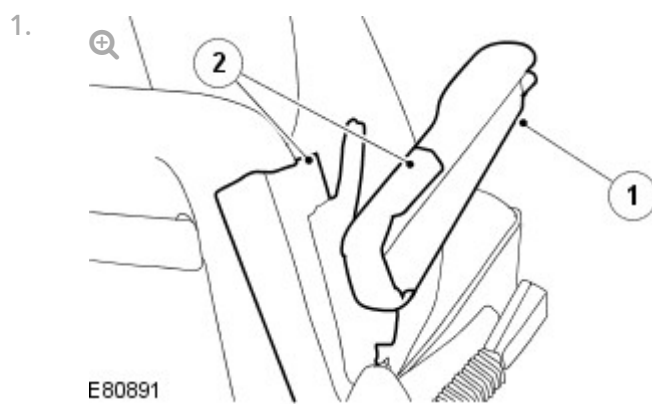
2012.0 RANGE ROVER (LM), 501-10

SEATING

SEAT ARMREST (G873659)

78.10.01	ARMREST ASSEMBLY - FRONT SEAT - RENEW	ALL DERIVATIVES	0.1	USED WITHINS	+
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REMOVAL



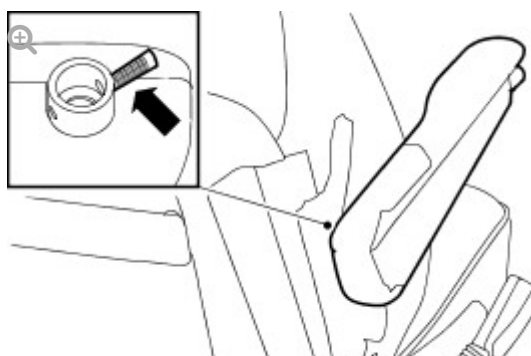
Reposition the front seat for access.

1. Reposition the seat armrest to the central position.
2. Apply suitable protective tape around the seat armrest.

2.

CAUTION:

Make sure no damage is caused to the seat trim when removing the seat armrest.





Remove the seat armrest.

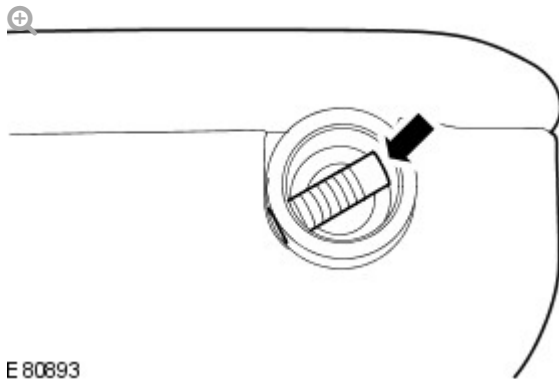
- Remove the T27 Torx bolt.

INSTALLATION

1.

CAUTIONS:

- Make sure no damage is caused to the seat trim when installing the seat armrest.
- Make sure the seat armrest bolt is fully seated.



E 80893

Install the seat armrest.

- Align the seat armrest.
- Install the T27 Torx bolt and tighten to 25 Nm (18 lb.ft).

2. Reposition the front seat to the original position.

- Remove the suitable protective tape from around the seat armrest.
- Reposition the seat armrest to the original position.

2012.0 RANGE ROVER (LM), 501-10

SEATING

SEAT CONTROL SWITCH (G873657)

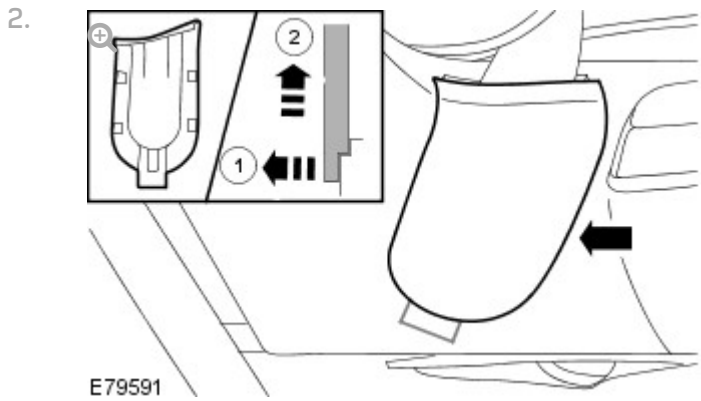
REMOVAL AND INSTALLATION

REMOVAL

NOTE:

Front seat shown removed for clarity.

1. Position the front seat fully forwards.



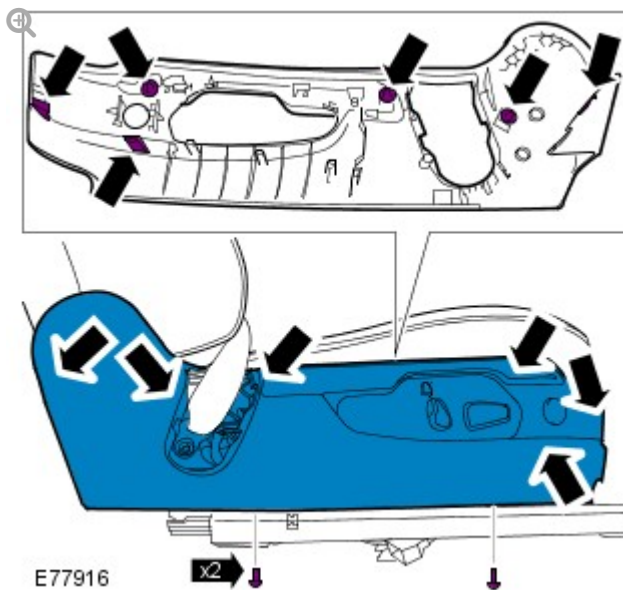
Remove the safety belt lower anchor bolt cover.

1. Carefully release the clip from behind the front seat base side trim panel.
2. Remove the cover.

- 3.

CAUTION:

Release the 2 front clips and the rear clip before releasing the 3 fir tree clips. Failure to follow this instruction may result in damage to the vehicle.



Carefully release the front seat base side trim panel.

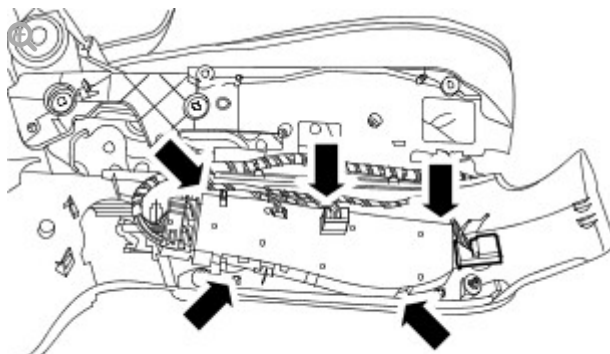
- Remove the 2 screws.

- Release the 2 front clips.
- Release the rear clip.
- Release the 3 fir tree clips.

4.

NOTE:

Safety belt shown removed for clarity.



E77918

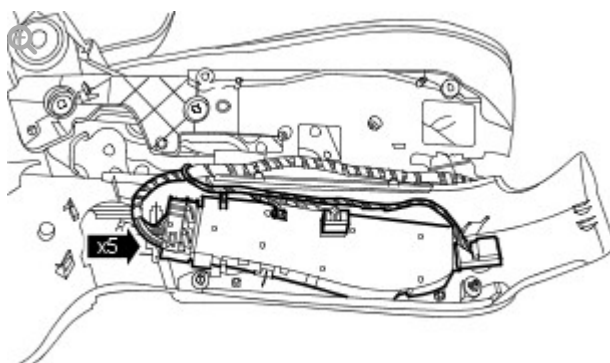
Release the seat control switch.

- Release the 5 clips.

5.

NOTE:

Safety belt shown removed for clarity.



E77919

Remove the seat control switch.

- Disconnect the 5 electrical connectors.

INSTALLATION

1. Install the seat control switch.
 - Connect the 5 electrical connectors.
2. Secure the seat control switch.
 - Secure the 5 clips.
3. Secure the front seat base side trim panel.
 - Secure the 6 clips.
 - Install the 2 screws.
4. Install the safety belt lower anchor bolt cover.
5. Reposition the front seat to the original position.

2012.0 RANGE ROVER (LM), 501-10

SEATING

REAR SEAT (G878482)

REMOVAL AND INSTALLATION

REMOVAL

1.



Remove the 2 bolts from the front of the rear seat hinge plates.

- Fit protection around the door aperture to protect the interior.
- Remove the 2 bolt covers from the front of the rear seat hinge plates.

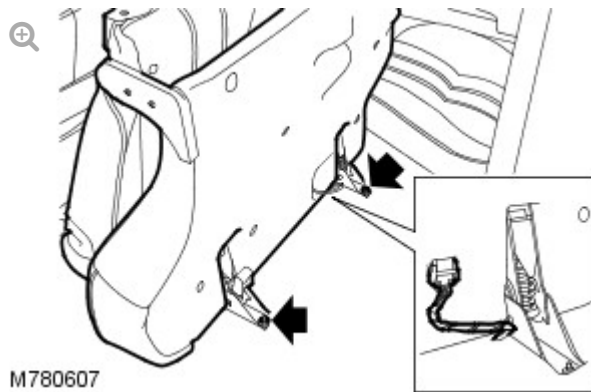
2. Fold the rear seat fully forwards.

- Release the rear seat backrest catch.

3.

CAUTION:

Make sure no damage is caused to the vehicle trim when removing the rear seat.



With assistance carefully remove the rear seat.

- Disconnect the electrical connector.
- Remove the 2 nuts from the rear of the rear seat hinge plates.

INSTALLATION

1.

CAUTION:

Make sure no damage is caused to the vehicle trim when installing the rear seat.

With assistance carefully install the rear seat.

- Install the 2 nuts to the rear of the rear seat hinge plates.
- Tighten to 25 Nm (18 lb.ft).
- Connect the electrical connector.

2. Fold the rear seat fully rearwards.

- Secure the rear seat backrest catch.

3. Install the 2 bolts to the front of the rear seat hinge plates.

- Tighten to 25 Nm (18 lb.ft).
- Install the 2 bolt covers to the front of the rear seat hinge plates.
- Remove the protection from around the door aperture.

2012.0 RANGE ROVER (LM), 501-10

SEATING

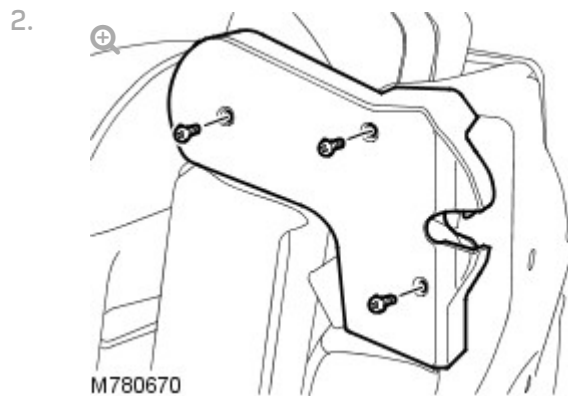
REAR SEAT ARMREST (G915106)

REMOVAL AND INSTALLATION

78.10.07	ARMREST - REAR SEAT - RENEW	ALL DERIVATIVES	0.2	USED WITHINS	+
----------	--------------------------------------	--------------------	-----	-----------------	---

REMOVAL

1. Reposition the RH rear seat fully forward.
 - Release the RH rear seat backrest catch.
-



Remove the LH rear seat backrest inner hinge cover.

- Remove the 3 screws.
-

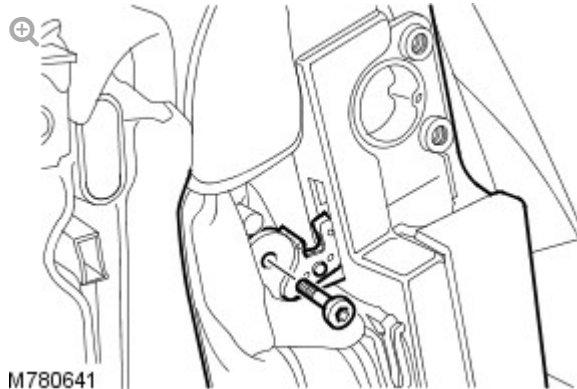
3. Reposition the rear seat armrest fully forwards.
 - Release the rear seat armrest catch.
-



Release the rear seat armrest cover from the rear seat backrest.

- Release the rear seat armrest cover securing strip.
- Release the rear seat armrest cover securing rail.

5.



Remove the rear seat armrest.

- Remove the bolt.
- Reposition the rear seat armrest from the rear seat armrest hinge.

INSTALLATION

1. Install the rear seat armrest.

- Reposition the rear seat armrest to the rear seat armrest hinge.
- Install the bolt and tighten to 10 Nm (7 lb.ft).

2. Secure the rear seat armrest cover to the rear seat backrest.

- Secure the rear seat armrest cover securing rail.
- Secure the rear seat armrest cover securing strip.

3. Reposition the rear seat armrest to the original position.

- Secure the rear seat armrest catch.

4. Install the LH rear seat backrest inner hinge cover.

- Install the 3 screws.

5. Reposition the RH rear seat to the original position.

- Secure the RH rear seat backrest catch.

2012.0 RANGE ROVER (LM), 501-10

SEATING

REAR SEAT BACKREST COVER (G899499)

REMOVAL AND INSTALLATION

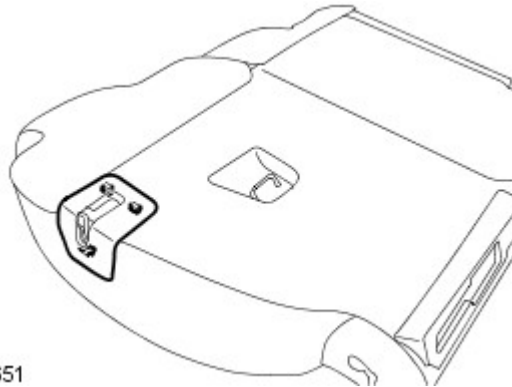
78.90.12	COVER - BACKREST - REAR SEAT - SIDE - LH/EACH - RENEW	ALL DERIVATIVES	1.5	USED WITHINS	+
----------	---	--------------------	-----	-----------------	---

REMOVAL

1. Remove the rear seat.

For additional information, refer to: Rear Seat (501-10, Removal and Installation).

2. 

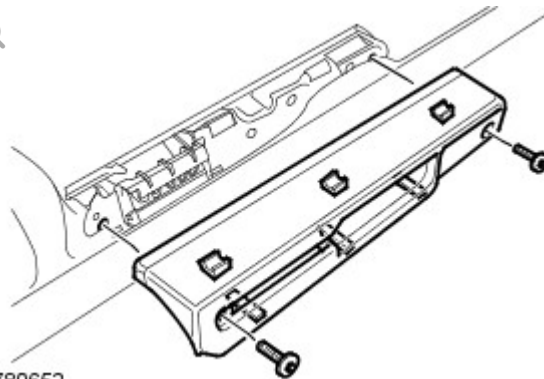


M780651

Remove the rear seat backrest catch trim panel.

- Release the 3 clips.
-

3. 

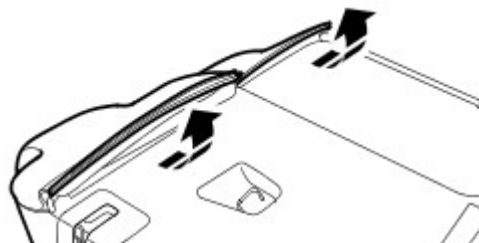


M780652

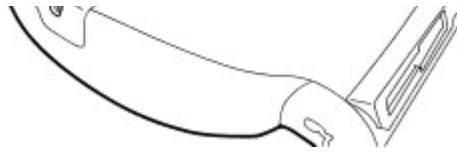
Remove the rear seat backrest rear cover lower trim panel.

- Remove the 2 screws.
 - Release the 3 clips.
-

4. 

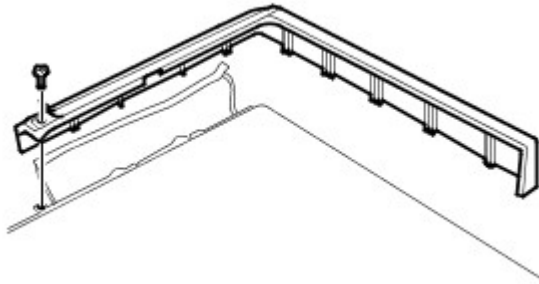


M780653



Carefully release the rear seat backrest cover from the upper part of the rear seat frame.

5.



M780654

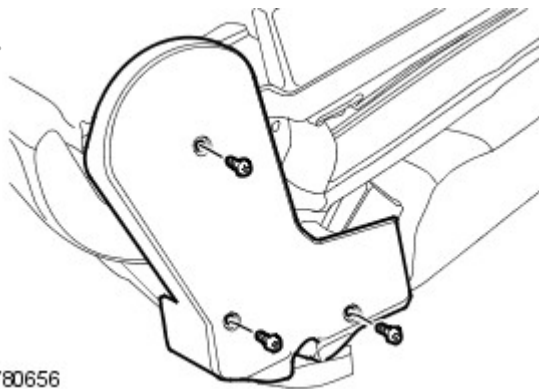
Remove the rear seat backrest rear cover inner side trim panel.

- Release the rear seat armrest cover securing strip.
- Remove the screw.
- Release the 11 inner side trim panel clips from the rear seat backrest cover.

6. Remove the rear seat backrest rear cover.

- Release the rear seat backrest rear cover adhesive.

7.



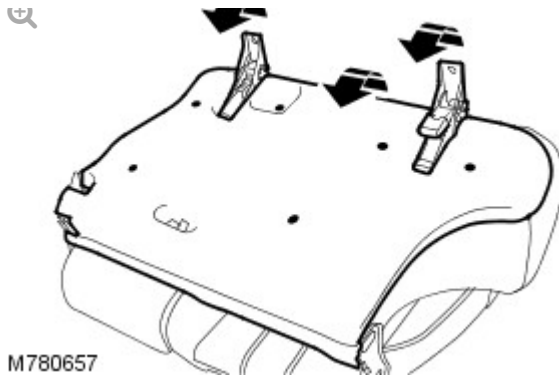
M780656

Remove the rear seat backrest inner hinge cover.

- Remove the 3 screws.

8.



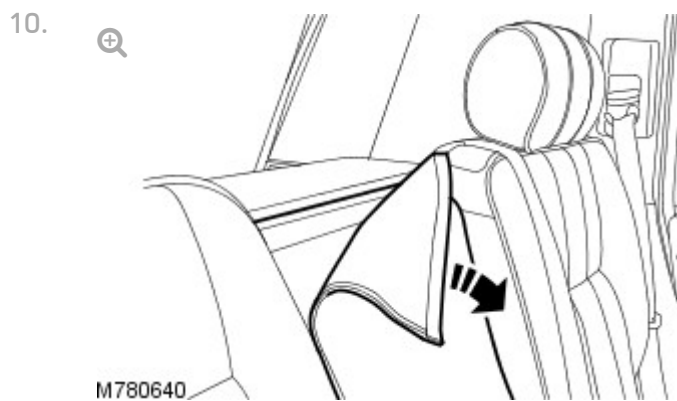


Remove the rear seat base lower trim panel.

- Remove the 6 clips.
- Reposition the rear seat hinge plates for access.

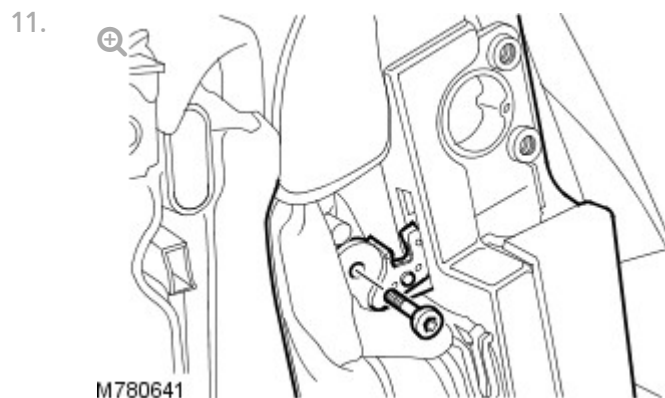
9. Reposition the rear seat armrest fully forwards.

- Release the rear seat armrest catch.



Release the rear seat armrest cover from the rear seat backrest.

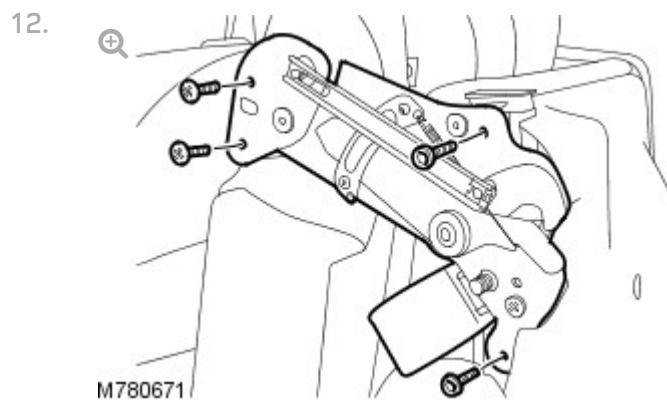
- Release the rear seat armrest cover securing strip.
- Release the rear seat armrest cover securing rail.



Remove the rear seat armrest

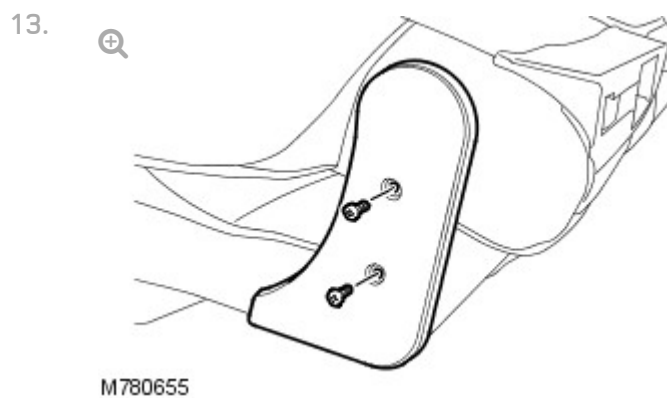
Remove the rear seat armrest.

- Remove the bolt.
- Reposition the rear seat armrest from the rear seat armrest hinge.



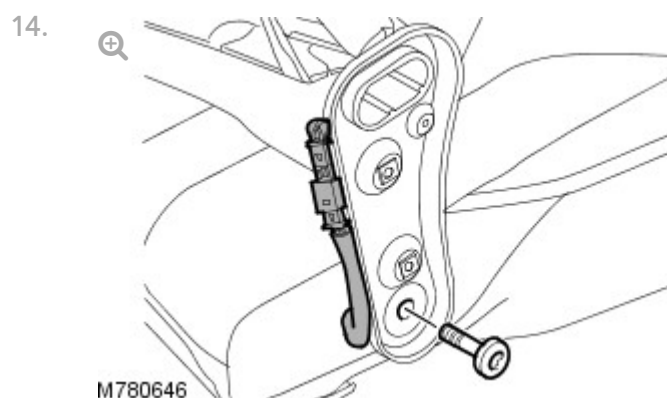
Remove the rear seat backrest inner hinge.

- Remove the 4 bolts.
- Discard the 2 lower bolts.



Remove the rear seat backrest outer hinge cover.

- Remove the 2 screws.



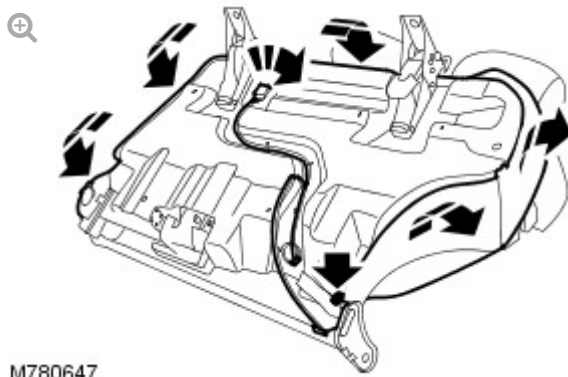
Remove the rear seat backrest from the rear seat base.

- Remove the rear seat backrest outer hinge bolt.

15. Remove the rear seat backrest hinge wiring harness clip.

- Remove the 2 clips.
- Release the rear seat base wiring harness electrical connector from the rear seat backrest cover.
- Disconnect the rear seat base wiring harness electrical connector.

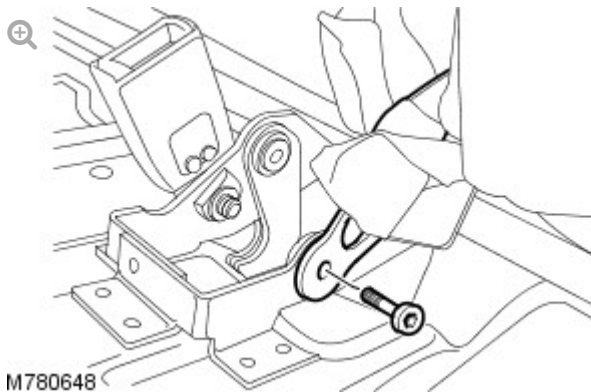
16.



M780647

Release the rear seat cushion cover from the rear seat base.

17.



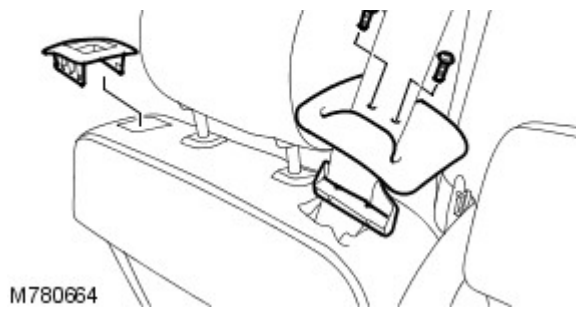
M780648

Reposition the safety belt through the rear seat cushion cover and the rear seat cushion.

- Remove and discard the safety belt bolt from the rear seat base.

18.

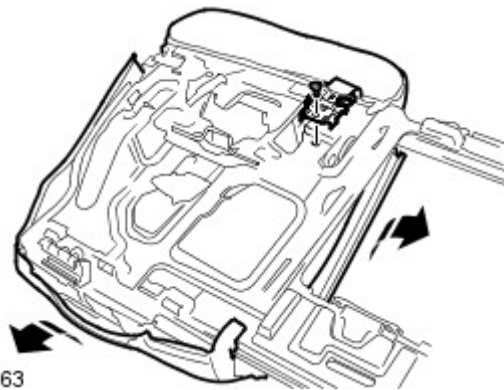




Remove the rear seat backrest cover safety belt trim panel.

- Remove the 2 screws.

19.



Release the rear seat backrest cover from the rear seat backrest.

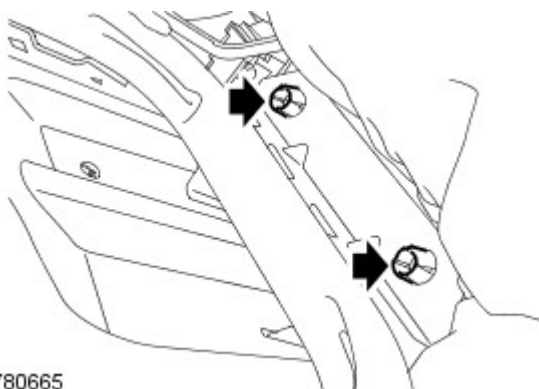
20. Remove the rear seat backrest catch trim panel.

- Carefully release the 4 clips.

21. Reposition the rear seat backrest cushion and cover from the rear seat backrest for access.

22. Reposition the safety belt through the rear seat backrest cushion and cover.

23.



Using a suitable tool, release the head restraint guide tubes.

- Release the 6 clips.

24. Remove the rear seat backrest cushion and cover from the rear seat backrest.

- Reposition the safety belt.

25.

NOTE:

Do not disassemble further if the component is removed for access only.



Remove the rear seat backrest cover from the rear seat backrest cushion.

- Remove and discard the 16 clips from the rear seat backrest cover.

INSTALLATION

1. Install the rear seat backrest cover to the rear seat backrest cushion.

- Install the 16 new clips to the rear seat backrest cover.

2. Install the rear seat backrest cushion and cover to the rear seat backrest.

- Reposition the safety belt.

-
3. Install the head restraint guide tubes.
 - Secure the 6 clips.

 4. Reposition the safety belt through the rear seat backrest cushion and cover.

 5. Reposition the rear seat backrest cushion and cover to the rear seat backrest.

 6. Install the rear seat backrest catch trim panel.
 - Secure the 4 clips.

 7. Secure the rear seat backrest cover to the rear seat backrest.

 8. Install the rear seat backrest cover safety belt trim panel.
 - Install the 2 screws.

 9. Reposition the safety belt through the rear seat cushion cover and the rear seat cushion.
 - Install the new safety belt bolt to the rear seat base and tighten to 31 Nm (23 lb.ft).

 10. Secure the rear seat cushion cover to the rear seat base.

 11. Install the rear seat backrest hinge wiring harness clip.
 - Secure the 2 clips.
 - Secure the rear seat base wiring harness electrical connector to the rear seat backrest cover.
 - Connect the rear seat base wiring harness electrical connector.

 12. Secure the rear seat backrest to the rear seat base.
 - Install the rear seat backrest outer hinge bolt and tighten to 45 Nm (33 lb.ft).
-

13. Install the rear seat backrest outer hinge cover.

- Install the 2 screws.
-

14. Install the rear seat backrest inner hinge.

- Install the 2 upper bolts.
 - Install the 2 new lower bolts.
 - Tighten the bolts to 25 Nm (18 lb.ft).
-

15. Install the rear seat armrest.

- Install the bolt.
 - Reposition the rear seat armrest to the rear seat armrest hinge.
-

16. Secure the rear seat armrest cover to the rear seat backrest.

- Secure the rear seat armrest cover securing strip.
 - Secure the rear seat armrest cover securing rail.
-

17. Reposition the rear seat armrest to the original position.

- Secure the rear seat armrest catch.
-

18. Install the rear seat base lower trim panel.

- Install the 6 clips.
 - Reposition the rear seat hinge plates for access.
-

19. Install the rear seat backrest inner hinge cover.

- Install the 3 screws.
-

20. Install the rear seat backrest rear cover.

- Apply a suitable adhesive to the rear seat backrest rear cover.
-

21. Install the rear seat backrest rear cover inner side trim panel.

- Secure the 11 inner side trim panel clips to the rear seat backrest cover.

- Install the screw.
- Secure the rear seat armrest cover securing strip.

22. Carefully secure the rear seat backrest cover to the upper part of the rear seat frame.

23. Install the rear seat backrest rear cover lower trim panel.

- Secure the 3 clips.
- Install the 2 screws.

24. Install the rear seat backrest catch trim panel.

- Secure the 3 clips.

25. Install the rear seat.

For additional information, refer to: Rear Seat (501-10, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-10

SEATING

REAR SEAT CUSHION COVER

(G899500)

REMOVAL AND INSTALLATION

REMOVAL

1. Remove the LH rear seat.

For additional information, refer to: Rear Seat (501-10, Removal and Installation).

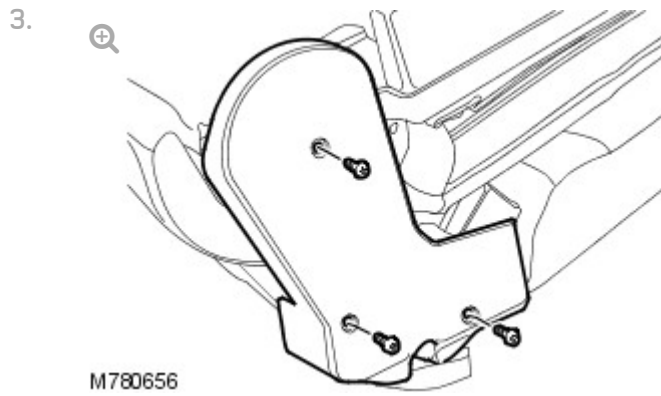
2.



M780655

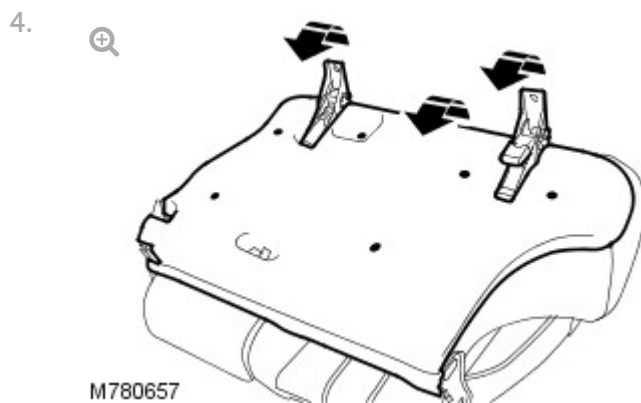
Remove the rear seat backrest outer hinge cover.

- Remove the 2 screws.



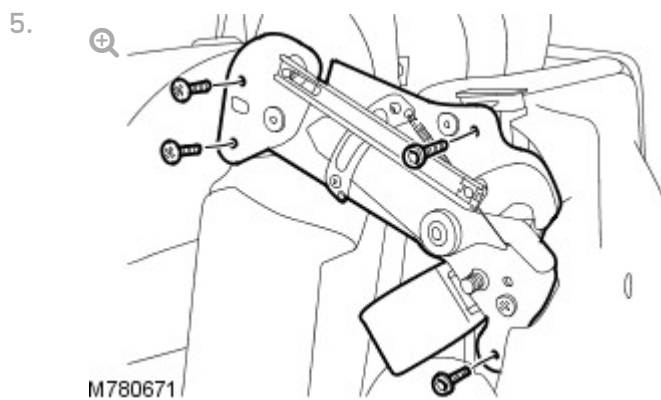
Remove the rear seat backrest inner hinge cover.

- Remove the 3 screws.



Remove the rear seat base lower trim panel.

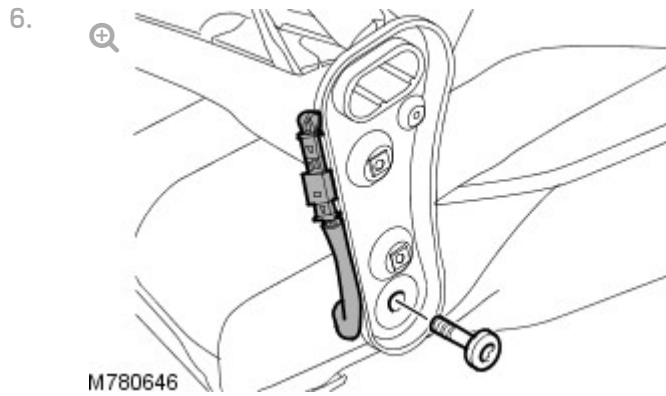
- Remove the 6 clips.
- Reposition the rear seat hinge plates for access.



Remove the rear seat backrest inner hinge.

- Remove the 4 bolts.

- Discard the 2 lower bolts.

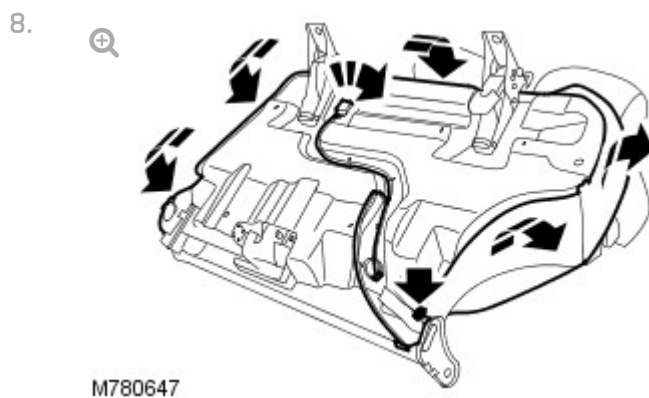


Remove the rear seat backrest from the rear seat base.

- Remove the rear seat backrest outer hinge bolt.

7. Remove the rear seat backrest hinge wiring harness clip.

- Remove the 2 clips.
- Release the rear seat base wiring harness electrical connector from the rear seat backrest cover.
- Disconnect the rear seat base wiring harness electrical connector.

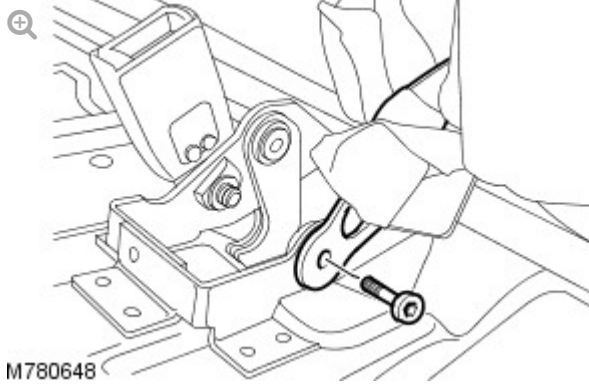


Release the rear seat cushion cover from the rear seat base.

9. Reposition the rear seat base wiring harness through the rear seat base.

- Release the rear seat base wiring harness electrical connector from the clip.
- Release the 5 wiring harness clips.

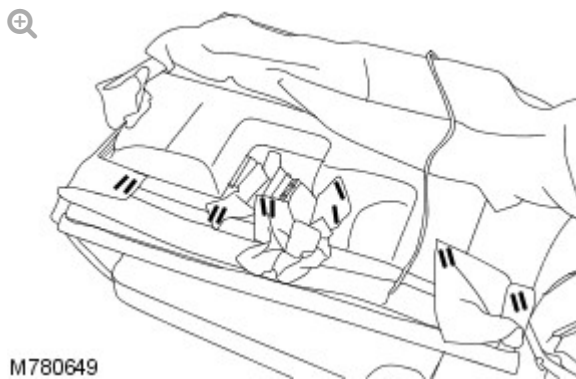
10.



Reposition the safety belt through the rear seat cushion cover and the rear seat cushion.

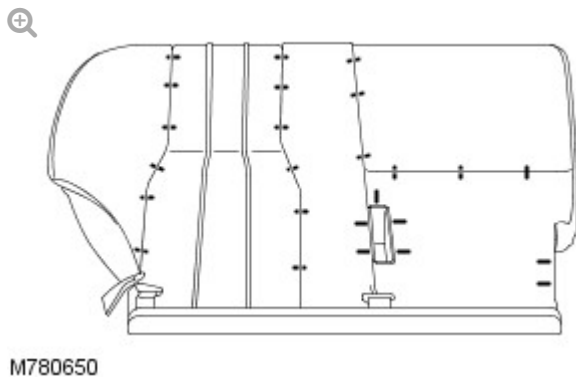
- Remove and discard the safety belt bolt from the rear seat base.

11.



Remove the rear seat cushion cover and the rear seat cushion.

12.



Remove the rear seat cushion cover from the rear seat cushion.

- Remove and discard the 25 rear seat cushion cover clips.

-
1. Install the rear seat cushion cover to the rear seat cushion.
 - Install the 25 new rear seat cushion cover clips.

 2. Install the rear seat cushion cover and the rear seat cushion.

 3. Reposition the safety belt through the rear seat cushion cover and the rear seat cushion.
 - Install the new safety belt bolt to the rear seat base and tighten to 31 Nm (23 lb.ft).

 4. Reposition the rear seat base wiring harness through the rear seat base.
 - Secure the 5 wiring harness clips.
 - Install the rear seat base wiring harness electrical connector to the clip.

 5. Secure the rear seat cushion cover to the rear seat base.

 6. Install the rear seat backrest hinge wiring harness clip.
 - Install the 2 clips.
 - Connect the rear seat base wiring harness electrical connector.
 - Secure the rear seat base wiring harness electrical connector to the rear seat backrest cover.

 7. Install the rear seat backrest to the rear seat base.
 - Install the rear seat backrest outer hinge bolt and tighten to 45Nm (33 lb.ft).

 8. Install the rear seat backrest inner hinge.
 - Install the 4 bolts.
 - Install the 2 new lower bolts.

- Tighten the bolts to 45 Nm (33 lb.ft).

9. Install the rear seat base lower trim panel.

- Reposition the rear seat hinge plates for access.
- Install the 6 clips.

10. Install the rear seat backrest inner hinge cover.

- Install the 3 screws.

11. Install the rear seat backrest outer hinge cover.

- Install the 2 screws.

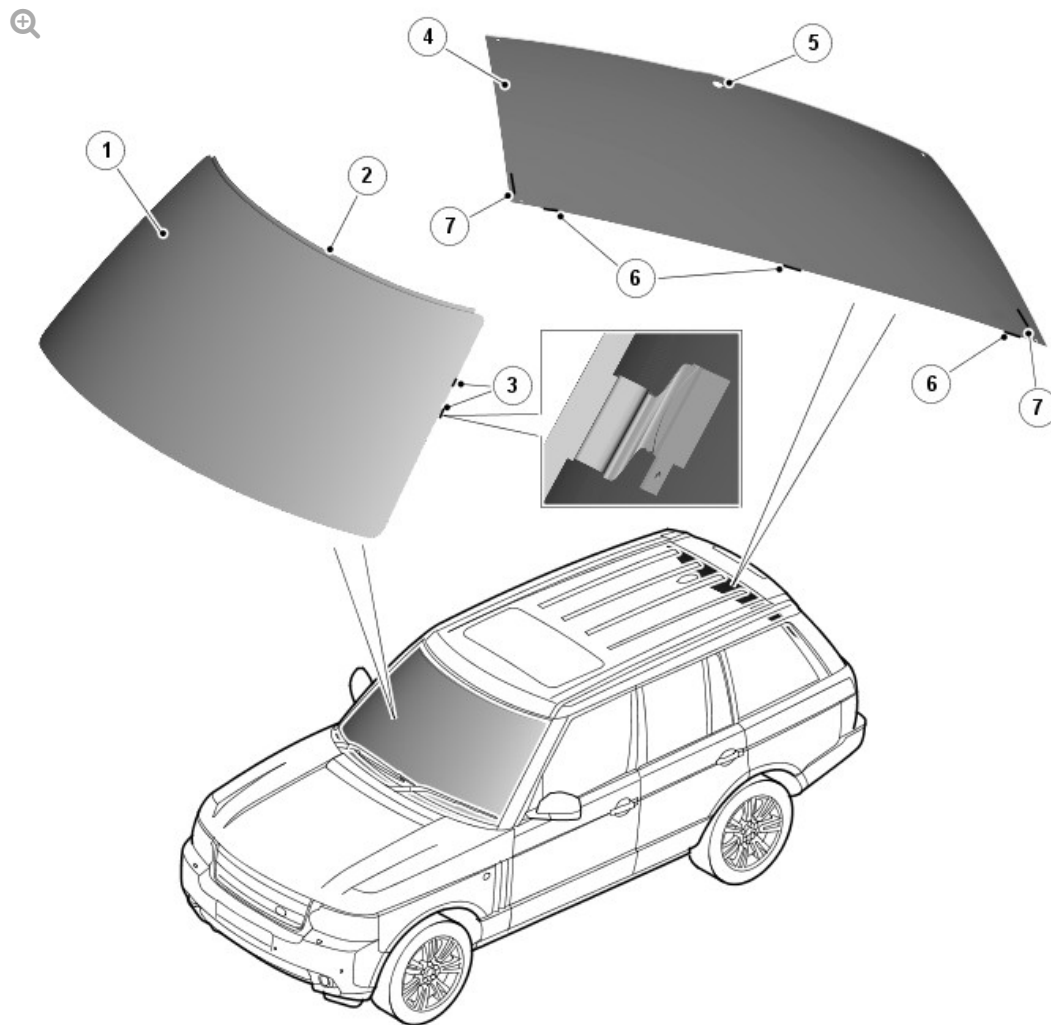
12. Install the LH rear seat.

For additional information, refer to: Rear Seat (501-10, Removal and Installation).

GLASS, FRAMES AND MECHANISMS

DESCRIPTION AND OPERATION

COMPONENT LOCATION - SHEET 1 OF 2



E144989

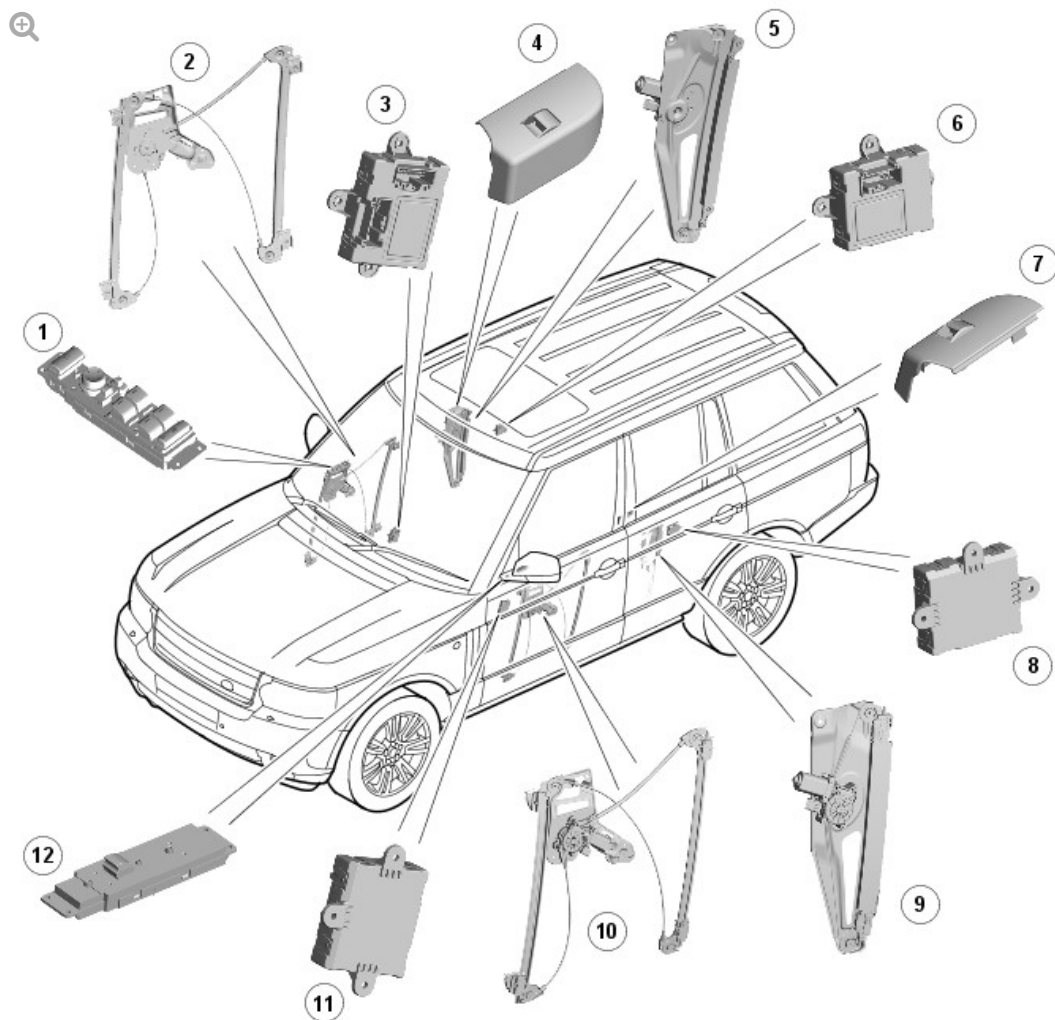
ITEM	DESCRIPTION
1	Windshield
2	Finisher
3	Heated windshield connectors
4	Rear window
5	Rear wiper motor aperture

6	Spacers
7	Heated rear window connectors

COMPONENT LOCATION - SHEET 2 OF 2

NOTE:

RHD (right-hand drive) shown, LHD (left-hand drive) similar.



E144990

ITEM	DESCRIPTION
1	Driver window switches
2	Driver window regulator
3	DDM (driver door module)

4	RH (right-hand) rear window switch
5	RH rear window regulator
6	RHRDM (rear door module)
7	LH (left-hand) rear window switch
8	LHRDM
9	LH rear window regulator
10	Front passenger window regulator
11	PDM (passenger door module)
12	Front passenger window switch

GENERAL

WINDSHIELD

The laminated windshield is bonded and sealed to the body aperture using PU sealant. Heat bonded to the inner surface of the screen is the optical unit for the rain sensor and the interior mirror mounting boss.

Vertical fine-wire multi-strand elements are fitted between the glass laminations to de-ice and demist the screen. At the bottom of the screen ten horizontal heating elements bonded to the interior glass surface prevent the wiper blades freezing to the screen during adverse weather conditions.

The screen is supplied with the heating element flat foil connectors fitted to a sealed terminal block. This terminal block is wired to a connector for connecting to the vehicle harness.

REAR WINDOW

The tempered glass rear window is bonded to the upper tail doorframe using PU sealant. Fitted to the inner surface of the rear window are the heating elements and antennas.

The heating element is connected by two Lucar terminals while the antennas are connected to the vehicle by a twin and single stud connectors.

ELECTRIC WINDOWS

Electric windows are installed in all four doors. All of the electric windows incorporate one-shot up, one-shot down and anti-trap features.

In each door, the window is operated by a regulator, which is controlled by the related door module in response to inputs from window switches. The door modules also operate the windows in response to inputs from the CJB (central junction box) for global opening and closing.

WINDOW SWITCHES

Driver Window Switches



Passenger Window Switch



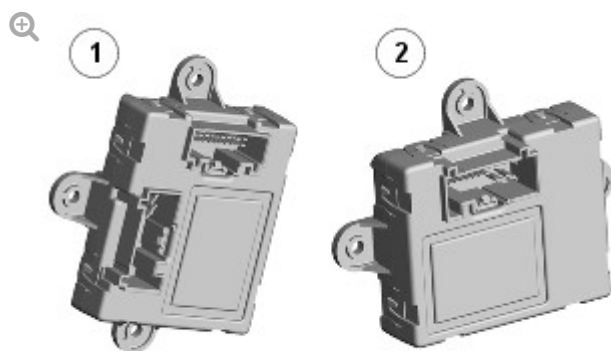
Individual window switches are installed in each of the three passenger doors. Window switches for all of the windows and a rear window isolation switch are installed in the driver door switchpack in the top surface of the door trim.

All window switches are of the non-latching rocker type. The switches have two switching positions in each direction, inch up/down and one-shot

up/down. Operating the switch to the second detent position will activate the one-shot feature.

The driver door switchpack is powered by a permanent battery feed from the CJB. When the switches in the driver door switchpack are used, the switchpack translates the switch movement into a LIN (local interconnect network) bus message. A LIN bus connects the driver door switchpack to the driver door module and the driver side RDM. Each passenger window switch is hardwired into circuits with the related door module.

DOOR MODULES



E144993

ITEM	DESCRIPTION
1	Front door module
2	Rear door module

In addition to controlling the window lift system, the front door modules also control:

- Door locking.
For additional information, refer to: [Handles, Locks, Latches and Entry Systems](#) (501-14 Handles, Locks, Latches and Entry Systems, Description and Operation).
- Door mirror adjustment and heating.
For additional information, refer to: [Rear View Mirrors](#) (501-09 Rear View Mirrors, Description and Operation).

mirrors, Description and Operation).

- Door mirror lamps.

For additional information, refer to: [Interior Lighting - Ultimate](#) (417-02 Interior Lighting, Description and Operation).

The rear door modules control window lift and door locking only.

The door modules are color coded for position on the vehicle. The driver door module and both rear door modules are black. The passenger door module is gray. The electrical wiring harness connectors are also color coded to match the door modules.

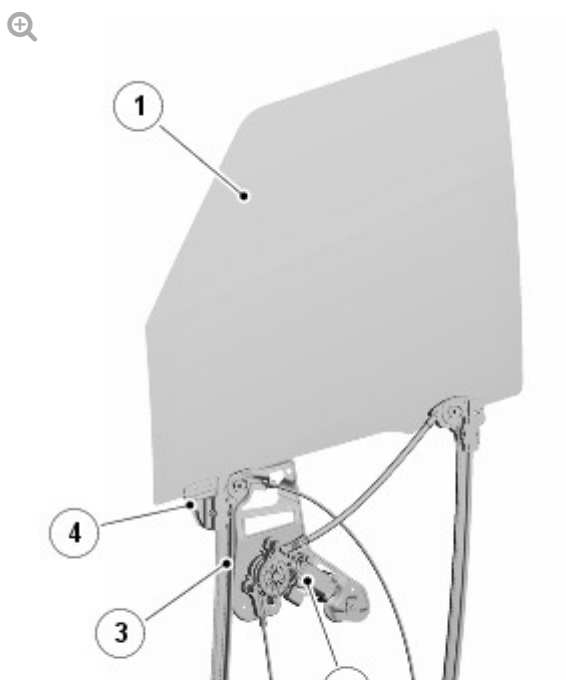
NOTE:

Both rear door modules are identical.

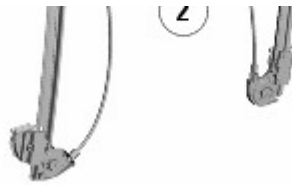
If a front door module develops a fault, a DTC (diagnostic trouble code) is stored in its memory. The DTC can be read using the Land Rover approved diagnostic system. If either of the rear door modules develops a fault, the DTC is stored in the respective front door module.

WINDOW REGULATORS

FRONT WINDOW REGULATORS



E144994



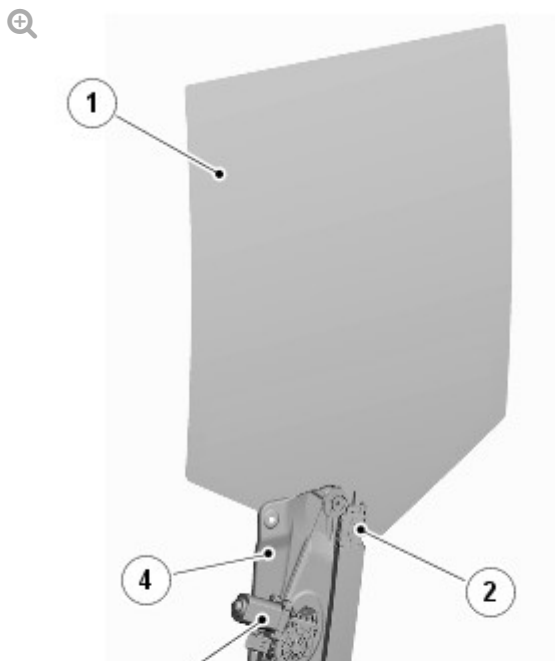
ITEM	DESCRIPTION
1	Window Glass
2	Window motor
3	Mounting frame
4	Glass carrier

The front window regulator and motor is supplied as an assembly and is handed. Each assembly comprises a front and rear runner, a continuous cable and a motor.

The runners are secured in the door frame with five bolts. The door glass is located in two carriers, which are located in tracks in the runners. The glass is retained in friction pads in each carrier and secured with clamp bolts.

Each carrier is attached to the cable which, in turn, is attached to a drum driven by the motor. When the motor is operated the drum pulls the cable in the required direction to raise or lower the glass.

REAR WINDOW REGULATORS





E144995

ITEM	DESCRIPTION
1	Window Glass
2	Glass carrier
3	Window motor
4	Mounting frame

The rear window regulator and motor is supplied as an assembly and is handed. Each assembly comprises a runner, a continuous cable and a motor.

The runner is secured in the door frame with three bolts. The door glass is located in a carrier located in a track in the runner. The glass is retained in friction pads in the carrier and secured with a clamp bolt.

The carrier is attached to the cable which, in turn, is attached to a drum driven by the motor. When the motor is operated, the drum pulls the cable in the required direction to raise or lower the glass.

OPERATION

The electric windows will operate in power modes 6 (ignition on) and 7 (engine running), and for five minutes after the ignition is switched off provided none of the doors are opened.

When a window open or closed selection is made, the related door module supplies power to the window motor to drive it in the appropriate direction. In the inch mode, the motor stops when the switch is released or the window reaches the end of its travel. In the one-shot mode, the motor stops when if the switch is operated again (either up or down) or the window reaches the end of its travel.

When the passenger window switches are used, they produce an open or

close request by completing a circuit with the related door module.

When the driver window switches are used, the driver door switchpack outputs a request message for the appropriate door module on the LIN bus. If the message is for a door module on the opposite side of the vehicle to the driver, the DDM relays the message to the PDM on the medium speed CAN (controller area network) bus. If necessary, the PDM then sends a LIN bus message to the RDM on its side of the vehicle.

If any of the passenger windows have opposing up and down requests from two separate switches, for example, a passenger window switch and the related window switch on the driver door switchpack, then the operation of that window will cease, until one or both of the switches are released.

While the isolator switch engaged, the switch tell-tale is illuminated and the rear door modules ignore requests from their related passenger window switches.

Global opening and closing requests are output from the CJB on the medium speed CAN bus. The DDM and the PDM then relay the request to their respective RDM.

ONE-SHOT WINDOW OPERATION RESET

If the battery is disconnected or discharged, or the power supply to a door module is interrupted, one-shot window operation is disabled until the window position is re-established by the affected door module(s). To reset one-shot window operation:

- 1** Close the window fully.
- 2** Release the switch, then pull up and hold the switch for one second.
- 3** If necessary, repeat the procedure for the other windows.

ANTI-TRAP PROTECTION

The anti-trap feature is incorporated for all of the door windows in both the inching and one-shot modes. If the anti-trap function is activated while a window is closing, the window motor reverses for 0.5 second.

Each window motor has a Hall sensor to enable the related door module to monitor the motor speed. If the motor speed decreases below a set

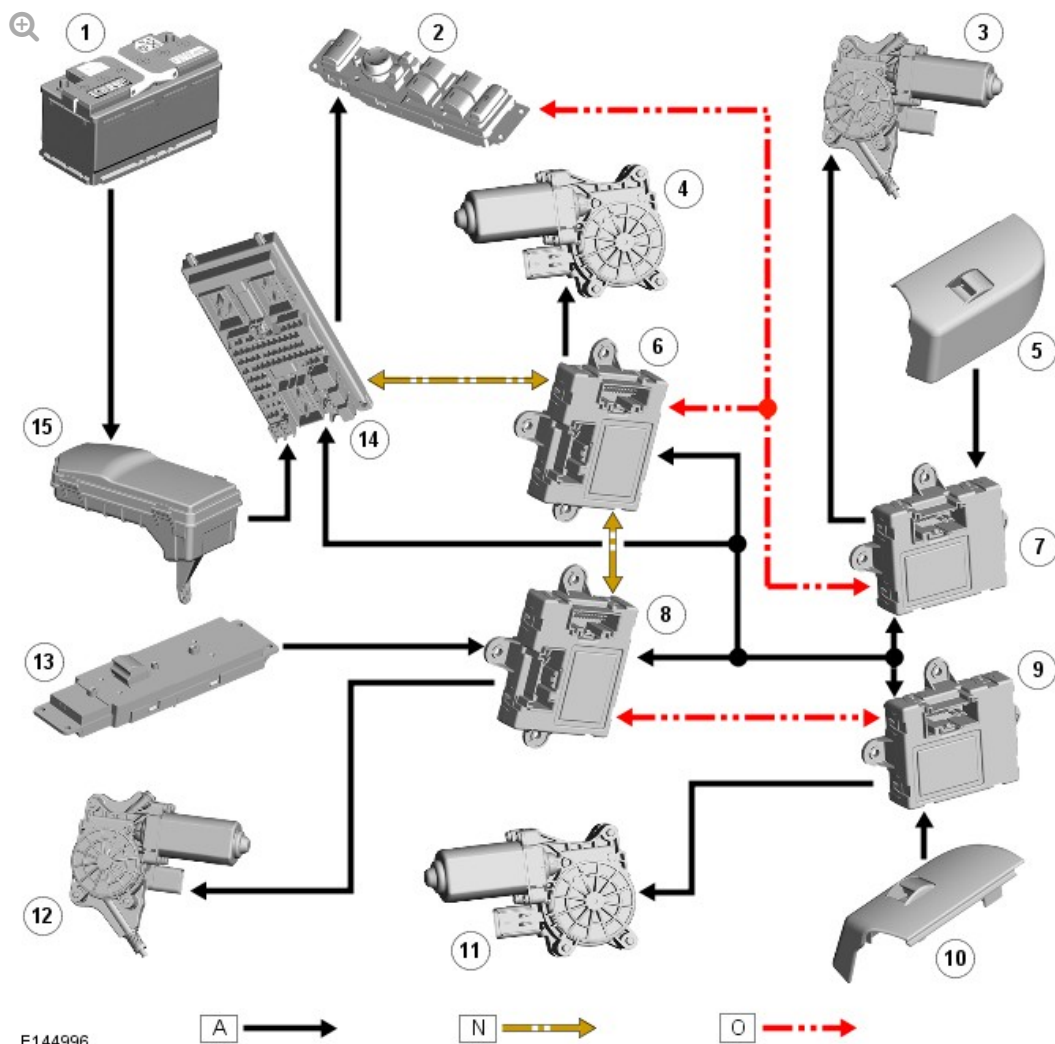
threshold, indicating an obstruction, the power feed to the motor is reversed so the window goes back down.

If it is still necessary to raise the window, the anti-trap protection can be overridden by attempting to close the window at intervals of less than 10 seconds. On the third attempt the window will move up with increased force to try and overcome the obstruction. If the obstruction cannot be overcome, one-shot operation is disabled.

WINDOW CONTROL DIAGRAM

NOTE:

A = Hardwired, **N** = Medium speed CAN bus; **O** = LIN bus.



ITEM	DESCRIPTION
1	Battery
2	Driver door switch pack
3	Rear door glass motor
4	Driver door glass motor
5	Rear door window lift switch
6	DDM
7	RDM
8	PDM
9	RDM
10	Rear door window lift switch
11	Rear door glass motor
12	Passenger door glass motor
13	Passenger door window lift switch
14	CJB
15	EJB (engine junction box)

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GLASS, FRAMES AND MECHANISMS

DIAGNOSIS AND TESTING

PRINCIPLE OF OPERATION

For a detailed description of the glass, frames and mechanisms and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: Glass, Frames and Mechanisms (501-11 Glass,

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 checked and/or the donor vehicle.

NOTE:

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

1. Verify the customer concern.

1. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none">▪ Window control switches condition and installation▪ Window motors/regulators▪ Window channels/runners▪ Window cables	<ul style="list-style-type: none">▪ Fuses▪ Harnesses and connectors▪ Window lift relay▪ Window control switches▪ Window motors

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

1. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Window(s) inoperative	<ul style="list-style-type: none"> ▪ Fuse(s) ▪ Switch fault ▪ Front switch isolator fault ▪ Motor/Regulator fault ▪ Channel/Runner fault ▪ Cable fault ▪ Harness fault 	<ul style="list-style-type: none"> ▪ Check the fuses. Check the suspect window operation from the individual door switch and from the driver door master switch (it is unlikely that both switches would fail at the same time, so if the window is inoperative from either switch, suspect a fault other than a switch). ▪ If the inoperative window is a rear unit, check the function of the rear isolator at the master switch. ▪ If the concern persists and a noise cannot be heard when operating the door window glass, GO to Pinpoint Test B. ▪ If the concern persists and a noise can be heard when operating the door window glass, GO to Pinpoint Test C.
Window(s) 'one-shot' function inoperative	<ul style="list-style-type: none"> ▪ Window motor initialization required ▪ Switch fault 	<p style="text-align: center;">NOTE:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Do not install a new door window regulator motor for this concern.</p> </div> <p>If the battery has been disconnected, carry out the initialization procedure. REFER to: Door Window Motor Initialization (501-11, General Procedures). . Check the switch function after initialization.</p>
Window(s) noisy during operation	<ul style="list-style-type: none"> ▪ Channel/Runner fault ▪ Cable fault ▪ Motor/Regulator fault ▪ Incorrect adjustment of door window glass 	GO to Pinpoint Test A .
Rear window does not defrost	<ul style="list-style-type: none"> ▪ Fuse ▪ Switch fault ▪ Relay fault ▪ Element fault 	Check fuse. Check the operation of the heated rear window switch and relay. Check the element for continuity. Check the heated rear window circuit. Refer to the electrical guides.

	<ul style="list-style-type: none"> ▪ Element fault ▪ Circuit fault 	
Slow or partial window operation	<ul style="list-style-type: none"> ▪ Fuse ▪ Switch fault ▪ Relay fault ▪ Element fault ▪ Circuit fault 	GO to Pinpoint Test D .
Wind noise between the door window glass and seal	<ul style="list-style-type: none"> ▪ Incorrect adjustment of door window glass ▪ Channel/Runner fault ▪ Cable fault ▪ Motor/Regulator fault 	GO to Pinpoint Test E .
Rear door window bounce back	<ul style="list-style-type: none"> ▪ Window motor initialization required (using IDS/SDD) 	<p>NOTE:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Do not install a new door window regulator motor for this concern.</p> </div> <p>Refer to IDS/SDD.</p>
Front door window bounce back	<ul style="list-style-type: none"> ▪ Window motor initialization required ▪ Channel/Runner fault 	<p>NOTE:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Do not install a new door window regulator motor for this concern.</p> </div> <p>GO to Pinpoint Test F.</p>

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: (100-00 General Information)

Diagnostic Trouble Code (DTC) Index - DTC: Module Name: Central Junction Box (Description and Operation)

PINPOINT TEST

PINPOINT TEST A : WINDOW(S) NOISY DURING OPERATION

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: CHECK THE DOOR WINDOW GLASS IS SECURE	
	<p>1 Remove the door window glass outer waist seal.</p>
	<p>2 Check if the door glass installed correctly and secured to the door window regulator.</p>
	<p>Is the door window glass correctly installed and secure? Yes GO to A2. No Make sure that the door window glass retaining bracket(s) are secured to the door window glass (bonded), if damaged, install a new door window glass as necessary. REFER to: Front Door Window Glass (501-11, Removal and Installation) / Rear Door Window Glass (501-11, Removal and Installation). If the door window glass retaining bracket(s) are OK, adjust the door window glass referring to the door glass setting procedure in this procedure.</p>
A2: CHECK THE OPERATION OF THE DOOR WINDOW REGULATOR MOTOR	
	<p>1 Remove the door window glass as necessary. REFER to: Front Door Window Glass (501-11, Removal and Installation) / Rear Door Window Glass (501-11, Removal and Installation).</p>
	<p>2 Operate the door window regulator four times.</p>
	<p>Does the door window regulator operate correctly (without noise)? Yes Remove any foreign material from door window regulator and lubricate the window runners. Test the system for normal operation. If the concern persists, GO to A3. No Install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p>
A3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL	

	1 Check for any foreign material or obstruction in the door window glass seal.
	Is the door window glass seal free from foreign material? Yes GO to A4. No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.

A4: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY

	1 Check that the door window glass seal is installed correctly.
	Is the door window glass seal installed correctly? Yes GO to A5. No Install the door window glass seal correctly. Test the system for normal operation.

A5: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS

	1 Visually check that the door window glass seal is not worn in the door channels.
	Is the door window glass seal worn in the channels? Yes Install a new door window glass seal as necessary. Test the system for normal operation. No Install the door window glass. Adjust the door window glass referring to the Door glass setting procedure in this procedure.

PINPOINT TEST B : WINDOW(S) INOPERATIVE (MOTOR NOISE CANNOT BE HEARD)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
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B1: CHECK FOR DOOR WINDOW REGULATOR MOTOR NOISE

	1 Operate the door window regulator motor as necessary.
	Is there a noise from the door window regulator motor when operated? Yes GO to B3. No GO to B2.

B2: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR

	1 Using a multimeter, check the voltage to the door window regulator motor.
	Is the voltage greater than 10 volts?

	<p>Yes Install a new door window regulator motor as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p> <p>No Repair the wiring harness. Test the system for normal operation.</p>
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B3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL

	<p>1 Check for any foreign material or obstruction in the door window glass seal.</p>
	<p>Is the door window glass seal free from foreign material?</p> <p>Yes GO to B4.</p> <p>No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.</p>

B4: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY

	<p>1 Check that the door window glass seal is installed correctly.</p>
	<p>Is the door window glass seal installed correctly?</p> <p>Yes GO to B5.</p> <p>No Install the door window glass seal correctly. Test the system for normal operation.</p>

B5: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS

	<p>1 Visually check that the door window glass seal is not worn in the door channels.</p>
	<p>Is the door window glass seal worn in the channels?</p> <p>Yes Install a new door window glass seal as necessary. Adjust the door window glass referring to the Door glass setting procedure in this procedure. Test the system for normal operation.</p> <p>No Adjust the door window glass referring to the Door glass setting procedure in this procedure.</p>

PINPOINT TEST C : WINDOW(S) INOPERATIVE (MOTOR NOISE CAN BE HEARD)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: CHECK THE DOOR WINDOW GLASS IS SECURE	
	<p>1 Remove the door window glass outer waist seal.</p>
	<p>2 Check if the door glass installed correctly and secured to the door window regulator.</p>

	<p>Is the door window glass correctly installed and secure?</p> <p>Yes GO to C2.</p> <p>No Install a new door window glass as necessary. REFER to: Front Door Window Glass (501-11, Removal and Installation) / Rear Door Window Glass (501-11, Removal and Installation).</p>
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C2: CHECK THE DOOR WINDOW REGULATOR INTEGRITY

	<p>1 Visually inspect the cables, rollers and rail sliders for foreign material.</p>
	<p>Are the cables, rollers and rail sliders free from foreign material?</p> <p>Yes GO to C3.</p> <p>No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p>

C3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL

	<p>1 Check for any foreign material or obstruction in the door window glass seal.</p>
	<p>Is the door window glass seal free from foreign material?</p> <p>Yes GO to C4.</p> <p>No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.</p>

C4: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY

	<p>1 Check that the door window glass seal is installed correctly.</p>
	<p>Is the door window glass seal installed correctly?</p> <p>Yes GO to C5.</p> <p>No Install the door window glass seal correctly. Test the system for normal operation.</p>

C5: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS

	<p>1 Visually check that the door window glass seal is not worn in the door channels.</p>
	<p>Is the door window glass seal worn in the channels?</p> <p>Yes Install a new door window glass seal as necessary. Test the system for normal operation.</p>

	<p>normal operation.</p> <p>No Adjust the door window glass referring to the door glass setting procedure in this procedure.</p>
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PINPOINT TEST D : SLOW OR PARTIAL WINDOW OPERATION	
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TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
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D1: CHECK THE DOOR WINDOW GLASS IS SECURE	
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	<p>1 Remove the door window glass outer waist seal.</p>
	<p>2 Check if the door glass installed correctly and secured to the door window regulator.</p>
	<p>Is the door window glass correctly installed and secure?</p> <p>Yes GO to D2.</p> <p>No Install a new door window glass as necessary. REFER to: Front Door Window Glass (501-11, Removal and Installation) / Rear Door Window Glass (501-11, Removal and Installation).</p>

D2: CHECK THE OPERATION OF THE DOOR WINDOW REGULATOR	
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	<p>1 Remove the door window glass as necessary. REFER to: Front Door Window Glass (501-11, Removal and Installation) / Rear Door Window Glass (501-11, Removal and Installation).</p>
	<p>2 Operate the door window regulator as necessary.</p>
	<p>Does the door window regulator operate correctly?</p> <p>Yes GO to D3.</p> <p>No GO to D6.</p>

D3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL	
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	<p>1 Check for any foreign material or obstruction in the door window glass seal.</p>
	<p>Is the door window glass seal free from foreign material?</p> <p>Yes GO to D4.</p> <p>No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.</p>

D4: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY	
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	<p>1 Check that the door window glass seal is installed correctly.</p>
	<p>Is the door window glass seal installed correctly?</p>

	<p>Yes GO to D5.</p> <p>No Install the door window glass seal correctly. Test the system for normal operation.</p>
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D5: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS

	<p>1 Visually check that the door window glass seal is not worn in the door channels.</p>
	<p>Is the door window glass seal worn in the channels?</p> <p>Yes Install a new door window glass seal as necessary. Test the system for normal operation.</p> <p>No Install the door window glass. Adjust the door window glass referring to the Door glass setting procedure in this procedure. Test the system for normal operation.</p>

D6: CHECK THE DOOR WINDOW REGULATOR MOTOR INTEGRITY

	<p>1 Visually inspect the cables, rollers and rail sliders for foreign material.</p>
	<p>Are the cables, rollers and rail sliders free from foreign material?</p> <p>Yes GO to D7.</p> <p>No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p>

D7: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR

	<p>1 Using a multimeter, check the voltage to the door window regulator motor.</p>
	<p>Is the voltage greater than 10 volts?</p> <p>Yes Install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p> <p>No Repair the wiring harness. Test the system for normal operation. If the concern continues, install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p>

SEAL

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E1: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL	
	<p>1 Check for any foreign material or obstruction in the door window glass seal.</p>
	<p>Is the door window glass seal free from foreign material?</p> <p>Yes GO to E2.</p> <p>No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.</p>
E2: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY	
	<p>1 Check that the door window glass seal is installed correctly.</p>
	<p>Is the door window glass seal installed correctly?</p> <p>Yes GO to E3.</p> <p>No Install the door window glass seal correctly. Test the system for normal operation.</p>
E3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS	
	<p>1 Visually check that the door window glass seal is not worn in the door channels.</p>
	<p>Is the door window glass seal worn in the channels?</p> <p>Yes Install a new door window glass seal as necessary. Test the system for normal operation.</p> <p>No GO to E4.</p>
E4: CHECK THE DOOR WINDOW REGULATOR INTEGRITY	
	<p>1 Visually inspect the cables, rollers and rail sliders for foreign material.</p>
	<p>Are the cables, rollers and rail sliders free from foreign material?</p> <p>Yes GO to E5.</p> <p>No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation) / Rear Door Window Regulator Motor (501-11, Removal and Installation).</p>
E5: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR	

	1 Using a multimeter, check the voltage to the door window regulator motor.
	Is the voltage greater than 10 volts? Yes Adjust the door window glass referring to the door glass setting procedure in this procedure. No Repair the wiring harness. Test the system for normal operation.

PINPOINT TEST F : FRONT DOOR WINDOW GLASS BOUNCE BACK

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
F1: CHECK WINDOW MOTOR INITIALIZATION	
	1 Initialize the door window motor. REFER to: Door Window Motor Initialization (501-11, General Procedures).
	Did the initialization work? Yes Test the system for normal operation. No GO to F2.
F2: CHECK THAT THE DOOR WINDOW GLASS SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window glass seal.
	Is the door window glass seal free from foreign material? Yes GO to F3. No Remove any foreign material from door window glass seal and lubricate the seal. Test the system for normal operation.
F3: CHECK THAT THE DOOR WINDOW GLASS SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window glass seal is installed correctly.
	Is the door window glass seal installed correctly? Yes GO to F4. No Install the door window glass seal correctly. Test the system for normal operation.
F4: CHECK THAT THE DOOR WINDOW GLASS SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window glass seal is not worn in the door channels.
	Is the door window glass seal worn in the channels? Yes

	<p>Install a new door window glass seal as necessary. Test the system for normal operation.</p> <p>No GO to F5.</p>
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F5: CHECK THE DOOR WINDOW GLASS IS SECURE

	<p>1 Remove the door window glass outer waist seal.</p>
	<p>2 Check if the door glass installed correctly and secured to the door window regulator.</p>
	<p>Is the door window glass correctly installed and secure?</p> <p>Yes Test the system for normal operation.</p> <p>No Adust the door window glass referring to the door glass setting procedure in this procedure. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: Front Door Window Regulator Motor (501-11, Removal and Installation).</p>

DOOR GLASS SETTING PROCEDURE

NOTE:

Make sure that this procedure is carried out if any concern is with noise or if directed by a pinpoint test.

- 1.** Remove the door trim panel as necessary.
REFER to: Front Door Trim Panel (501-05, Removal and Installation) / Rear Door Trim Panel (501-05, Removal and Installation).
- 1.** Release but do not remove the door window glass retaining clip(s) bolt(s).
- 1.** Operate the window switch up and down seven times to make sure that the door window glass is correctly installed to the door window seal.



NOTE:

Make sure that the retaining clips are installed as illustrated.

1. Install the door window glass to the retaining clips, first to the front retaining clip and then to the rear.
1. Push the door window glass to the rear of the door to make sure correct installation in to the door window glass seal.

NOTE:

Tighten the rear retaining clip bolt first then the front bolt.

1. Tighten the door window glass retaining clip bolts to 10 Nm.

NOTE:

Make sure that there is a minimum of 5mm engagement of the door window glass to the rear door channel when the door window glass is fully closed.

1. Check the system for normal operation.

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GLASS, FRAMES AND MECHANISMS

DIAGNOSIS AND TESTING

PRINCIPLES OF OPERATION

For a detailed description of the Glass, Frames and Mechanisms, refer to the relevant Description and Operation section in the workshop manual.

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.

NOTES:

- If a control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.
- Refer to Section 100-00 General Information for window glass health and safety precautions.

1. Verify the customer concern

1. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

ELECTRICAL
<ul style="list-style-type: none"> ▪ Physical damage to the windshield

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

1. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index

1. Check DDW for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and carry out the recommendations as required

NOTES:

- The warranty period for the windshield is twelve months with the exception of delamination and electrical faults.
- Warranty repairs should be completed using genuine parts, in accordance with the Warranty Policy and Procedures Manual.

1. Draw a line around the windshield damage using a marker pen.
1. Photograph the entire windshield. If the damage extends behind any trim, remove the trim and take further photographs.
1. Photograph the trademark logo and code to validate the windshield as factory fitment.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Scratches	<ul style="list-style-type: none">▪ Debris trapped under a wiper blade▪ Foreign object damage▪ Fouling by trim	<ul style="list-style-type: none">▪ GO to Pinpoint Test A.
Chips	<ul style="list-style-type: none">▪ Foreign object damage	<ul style="list-style-type: none">▪ GO to Pinpoint Test B.
Cracks	<ul style="list-style-type: none">▪ Foreign object damage▪ Impact damage during assembly	<ul style="list-style-type: none">▪ GO to Pinpoint Test C.
Delamination	<ul style="list-style-type: none">▪ Manufacturing defect	<ul style="list-style-type: none">▪ GO to Pinpoint Test D.

PINPOINT TESTS

NOTE:

A scratch will usually be regular in shape, following the line of the object that caused it.

PINPOINT TEST A : SCRATCH TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: SCRATCH TEST 1	
	1 Probe using the tip of a pencil to identify a groove in the windshield surface.
	Is there a groove? Yes Windshield scratched. GO to A2. No Defect not valid.
A2: SCRATCH TEST 2	
	1 Check for trim, body panels, or foreign objects that may have caused the scratch.
	Was the scratch caused by a foreign object? Yes The damage is not due to a defect or an assembly error. No Rectify as appropriate.

NOTE:

Impact damage may cause a crack to form.

PINPOINT TEST B : CHIP TESTS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: CHIP TEST 1	
	1 Assess the damage by probing with the tip of a pencil.
	Is the damaged area rough (indicating a breach of the windshield surface)? Yes Damage caused by the impact of a foreign object. Not a manufacturing defect. No Install a new windshield.


NOTE:

Multiple cracks will radiate out from the source.

PINPOINT TEST C : CRACK TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: CRACK TEST 1	
	<p>NOTE:</p> <p>A crack will be detectable as a step in the glass.</p> <p>1 Confirm the presence of a crack by probing with the tip of a pencil.</p>
	<p>Is the windshield cracked?</p> <p>Yes Windshield cracked. GO to C2.</p> <p>No Windshield not cracked. GO to Pinpoint Test A.</p>
C2: CRACK TEST 2	
	<p>1 Assess the source of the crack by probing with the tip of a pencil.</p>
	<p>Is there evidence of impact damage being the source of the crack?</p> <p>Yes GO to Pinpoint Test B.</p> <p>No Install a new windshield.</p>

PINPOINT TEST D : DELAMINATION TESTS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
D1: DELAMINATION TEST 1	
	<p>1 Visually assess the windshield for delamination.</p>
	<p>Have the glass laminates separated?</p> <p>Yes Install a new windshield.</p> <p>No No further action.</p>

DTC INDEX

For a complete list of all Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.

DOOR WINDOW MOTOR INITIALIZATION (G1345535)

GENERAL PROCEDURES

NOTES:

- Make sure that the vehicle battery is fully charged before carrying out this procedure.
- After the battery has been disconnected or a new window regulator and motor or door module has been installed, it is necessary to initialize each door window motor separately to operate the **one-touch** and anti-trap function.
- In addition to this manual procedure, the approved diagnostic tool can also be used to initialize the door window motor.

-
1. Start the engine.
-
2. Operate the window control switch until the door window glass is in the fully closed position, continue to operate the window control switch for a further two seconds.
-
3. Release the window control switch.
-
4. Operate the window control switch in the closed position and continue to operate the window control switch for a further two seconds.
-
5. Operate the window control switch until the door window glass is in the fully open position (**one-touch** down).

6.

NOTES:

- If the door window motor initialization has been completed correctly, when the window control switch is operated, the door window glass should move to the fully closed position (**one-touch** up) automatically.
- If the door window glass does not fully close automatically (**one-touch** up), repeat the complete procedure.

Operate the window control switch once to the close position.

- If multiple attempts have failed to initialize the door window motor, refer the diagnosis and testing procedure.

For additional information, refer to: [Glass, Frames and Mechanisms](#) (501-11 Glass, Frames and Mechanisms, Diagnosis and Testing).

-
7. Repeat the door window motor initialization for each door window motor.

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

DRIVER DOOR WINDOW CONTROL SWITCH (G905939)

REMOVAL AND INSTALLATION

86.25.08

SWITCH -
MASTER

ALL

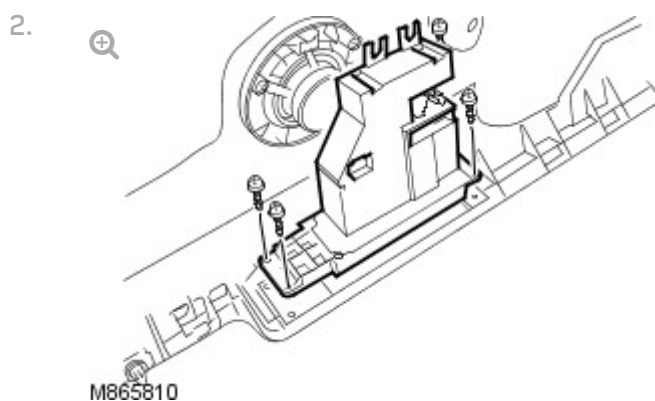
0.4

USED

+

REMOVAL

1. Remove the front door trim panel.
For additional information, refer to: Front Door Trim Panel (501-05, Removal and Installation).



Remove the driver door window control switch.

- Remove the 4 screws.

INSTALLATION

1. Install the driver door window control switch.
 - Tighten the screws.
2. Install the front door trim panel.
For additional information, refer to: Front Door Trim Panel (501-05, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

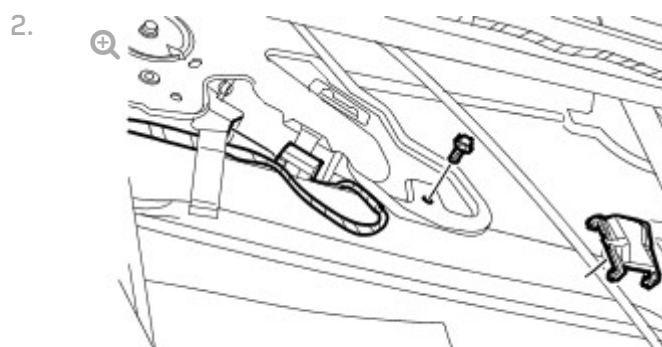
FRONT DOOR WINDOW REGULATOR MOTOR (G916874)

REMOVAL AND INSTALLATION

REMOVAL

1. Remove the front door window glass.

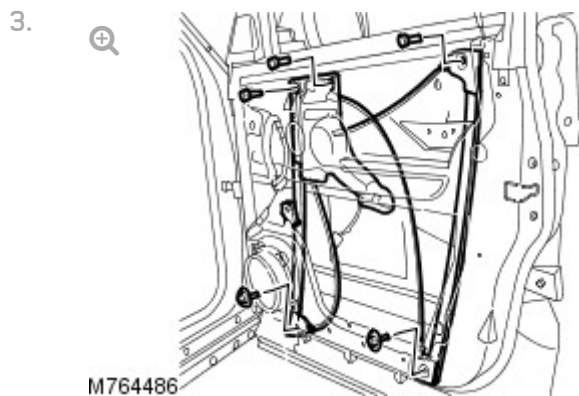
For additional information, refer to: Front Door Window Glass (501-11, Removal and Installation).



M764485

Release the front door window regulator and motor from the side impact protection beam.

- Disconnect the electrical connector.
- Remove the bolt.
- Remove the clip.
- Remove the clamp.



Remove the front door window regulator and motor.

- Remove and discard the 2 lower bolts.
- Remove the 3 upper bolts.

INSTALLATION

1. Install the front door window regulator and motor.
 - Remove the 2 clips.
 - Install the clamp.
 - Tighten the 4 upper bolts to 10 Nm (7 lb.ft).
 - Tighten the 2 new lower bolts to 10 Nm (7 lb.ft).
 - Install the clip.
2. Connect the front door window regulator and motor electrical connector.

3. Install the front door window glass.

For additional information, refer to: Front Door Window Glass (501-11, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

FRONT DOOR WINDOW REGULATOR MOTOR - ARMOURED (G840482)

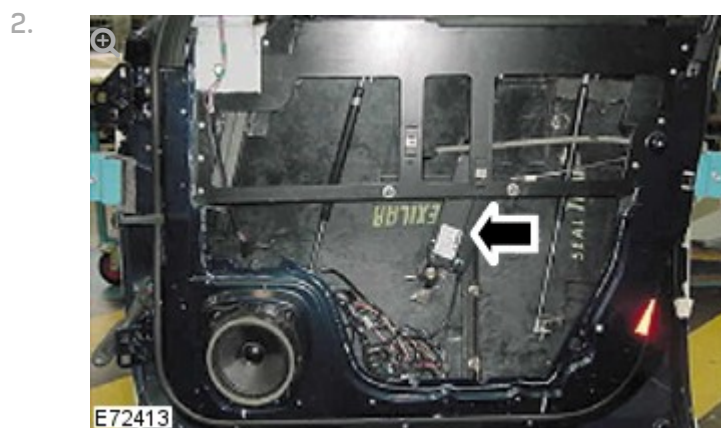
REMOVAL AND INSTALLATION

REMOVAL

NOTE:

This procedure covers the removal and install of the electric strut.

1. Remove the trim casing from the door. For additional information, refer to: (501-05)
Front Door Trim Panel (Removal and Installation),
Rear Door Trim Panel (Removal and Installation).



The position of the electric strut is arrowed.



Disconnect the electrical lead.

-
4. Remove the nuts from the strut top and bottom mountings.
-
5. Pull the strut downwards and extract from the door.
-

INSTALLATION

1. To refit the electric strut, reverse the removal procedure. Tighten the window electric strut fixings to 25 Nm (18 lbf.ft).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

FRONT DOOR WINDOW GLASS (G916875)

REMOVAL AND INSTALLATION

76.31.01	GLASS - FRONT DOOR - RENEW	ALL DERIVATIVES	0.6	USED WITHINS	+
----------	-------------------------------------	--------------------	-----	-----------------	---

REMOVAL

1. Lower the front door window glass.
2. Disconnect the battery ground cable.
For additional information, refer to: Specifications (414-00, Specifications).
3. Remove the side air bag module.
For additional information, refer to: Side Air Bag Module (501-20, Removal and Installation).
4. Disconnect the door speaker electrical connector.
5. Remove the front door inner weathershield.



Release the front door window glass from the regulator.

- Loosen the 2 bolts.

7. Remove the front door window glass.

INSTALLATION

1. Install the front door window glass.

- Install the bolts, but do not tighten fully at this stage.

2. Raise the front door window glass.

- Check and adjust the alignment of the front door window glass.
- Tighten the 2 bolts to 10 Nm (7 lb.ft).

3. Install the front door inner weathershield.

4. Connect the door speaker electrical connector.

5. Install the side air bag module.

For additional information, refer to: Side Air Bag Module (501-20, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

FRONT DOOR WINDOW GLASS - ARMoured (G840489)

REMOVAL AND INSTALLATION

76.31.01	GLASS - FRONT DOOR - RENEW	ALL DERIVATIVES	0.6	USED WITHINS	+
----------	-------------------------------------	--------------------	-----	-----------------	---

REMOVAL

WARNING:

It is essential that the glass is fully supported before loosening any fixings.

-
1. Remove the trim panel from the door.
For additional information, refer to: Front Door Trim Panel (501-05, Removal and Installation).

-
2. Remove the outer waist seal from the front door, as described in the Range Rover Workshop Manual.

-
3. Remove the inner waist seal from the front door, as described in the Range Rover Workshop Manual.

-
4. Obtain a length of nylon webbing strap and cut into two lengths suitable for supporting the glass in the door frame.

-
5. 

Pass the support straps underneath the glass and secure them around the window frame.

-
6. Remove the electric strut from the door.
For additional information, refer to: Front Door Window Regulator Motor (501-11, Removal and Installation).

-
7. Remove both gas struts from the door.

-
8. **WARNING:**

The window glass is extremely heavy and two people are needed to remove it safely.



With an assistant, remove the support straps, then move the glass downwards and forwards, then tilt outwards and extract from the door to the outside of the vehicle.

INSTALLATION

-
1. To install the window glass, reverse the removal procedure.

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

LIFTGATE WINDOW GLASS

[G927834]

REMOVAL AND INSTALLATION

76.31.22	GLASS/SEALING RUBBER - TAILGATE/DOOR - RENEW	ALL DERIVATIVES	2	USED WITHINS	+
----------	---	--------------------	---	-----------------	---

REMOVAL

NOTE:

The following equipment is required: Cutting wire and handles. Reciprocating cutting knife. Glazing knife. Windshield glass replacement kit. Sealant applicator. Suction cups. Felt covered table or a felt covered glazing support stand.


1. Remove the rear window wiper pivot arm.
For additional information, refer to: [Rear Window Wiper Pivot Arm](#) (501-16 Wipers and Washers, Removal and Installation).
2. Remove the liftgate lower trim panel.
For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
3. Remove the liftgate LH and RH inner side trim panels.

4. Remove the liftgate window glass outer finisher trim panel.

5. 

Disconnect the 3 electrical connectors from the liftgate window glass.

6. Apply protection to the exterior paintwork, adjacent to the liftgate window glass.

7. 

Using a glazing knife, cut through the lower edge of the liftgate window glass sealant from the inside.

- Do not use the oscillating type of glazing knife, as the Liftgate window glass is very close to the liftgate.
-

8. Cut through the remaining top and sides of the liftgate window glass sealant, using the cutting wire method as required.

- Use of a reciprocating flat blade glazing knife is permissible.
-

9.

CAUTION:

Lay the glass on felt covered supports. Do not stand on edge as this can cause chips which subsequently develop into cracks.

With assistance, remove the liftgate window glass.

- Attach suction cups to aid liftgate window glass removal.
-

10. 

Remove the 2 liftgate window glass support blocks from the liftgate.

-
11. Remove the liftgate window glass sealant from the liftgate.
 - Make sure when the sealant has been removed that the finished surface is clean and smooth.

-
12. Remove liftgate window glass sealant from the liftgate window glass.
 - Make sure when the sealant has been removed, that the surface is clean and smooth and without damage to the obscuration band.

INSTALLATION

-
1. Install the finisher trim to the liftgate window glass.

-
2. Install the liftgate window glass support blocks to the liftgate.

-
3. 

With assistance, install the liftgate window glass and centralize in the liftgate aperture.

- Use masking tape to establish reference marks and to aid as an alignment guide.
- Attach suction cups to aid alignment and install.

-
4. With assistance, remove the liftgate window glass and place on the felt covered supports.

-
5. Using the recommended solvent, clean the sealant mating faces of the liftgate and the liftgate window glass.

-
6. Apply etch primer to any liftgate bare metal.

-
- 7.

CAUTION:

Correct preparation of body apertures “post painting” to ensure satisfactory glass adhesion, must be carried out in line with industry practise.

Apply primer over the previously applied etch primer.

8. Apply glass primer to the sealant mating face of the liftgate window glass and allow to cure.

9. Apply activator over the old sealant on the liftgate and allow to cure.

10. Install the pre-cut nozzle to sealant cartridge and remove the lid and shake out the crystals, followed by installing the cartridge to the applicator tool.

- If necessary, modify the nozzle to achieve the required bead section.

11. 

Apply a continuous bead of sealant to the liftgate window glass as shown.

12. With assistance, install and align the liftgate window glass.

- Lightly press the liftgate window glass to seat the sealant.

13. Remove the masking tape and exterior paintwork protection.

14. Connect the liftgate window glass electrical connectors.

15. Test the liftgate window glass sealant for leaks.

- If water is used as a means for the leak check, then allow sealant to dry before testing.
- Spray water around the liftgate window glass, mark any area

that leaks. Dry the liftgate window glass and sealant before applying additional sealant.

16. Install the liftgate LH and RH inner side trim panels.

17. Install the liftgate lower trim panel.

For additional information, refer to: [Liftgate Lower Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

18. Install the rear window wiper pivot arm.

For additional information, refer to: [Rear Window Wiper Pivot Arm](#) (501-16 Wipers and Washers, Removal and Installation).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

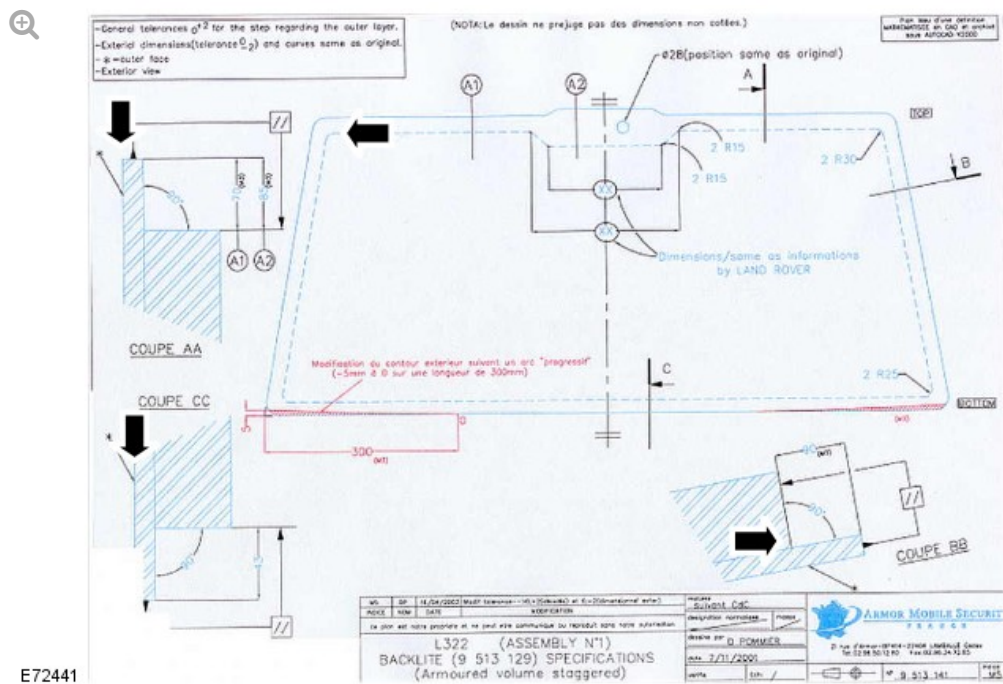
LIFTGATE WINDOW GLASS - ARMoured (G840492)

REMOVAL AND INSTALLATION

76.31.22 GLASS/SEALING RUBBER - ALL 2 USED +
TAILGATE/DOOR DERIVATIVES WITHINS
- RENEW

REMOVAL

Liftgate window glass specification drawing



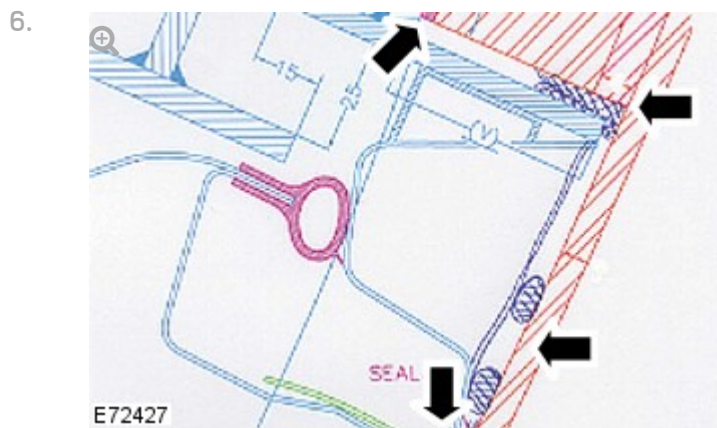
CAUTION:

Protect the paintwork before attempting to remove the rear screen.

1. Remove the tailgate spoiler as described in the Range Rover Workshop Manual.
2. Remove the rear wiper arm as described in the Range Rover Workshop Manual.
3. Disconnect the electrical leads from the rear screen heater and remove the leather trimmed covers.

-
- Cut the rubber finishing strip along the edge of the screen and remove the seal, using pliers.

-
- Place adhesive tape around the edge of the rear screen and, following the arrow (1), cut around the glass using a special diamond disk. Cut 3 mm (0.12 inch) outside the dimension shown on the drawing of the rear screen at the start of this procedure.



Using a pneumatic knife, cut the rubber and PU seals between the glass frame and glass, in the direction of arrow (2). Remove the outer perimeter of glass (4).

-
- Using the pneumatic knife, cut through the PU seal between the armoured frame and the armoured glass. Remove all the remaining sealer (3) and clean the surface.

-
- WARNING:**

The window glass is extremely heavy and two people are needed to remove it safely.

Attach to suction cups to the rear screen and remove from the tailgate by pulling from the outside and pushing from the inside.

-
- Clean all the seal remaining around the periphery of the frame.

-
- WARNING:**

The window glass is extremely heavy. Ensure that sufficient people are available to lift the screen safely.

With 4 people available for lifting the rear screen, attach suction cups and position the screen in the tailgate, without a seal. Check the gaps around the edge of the screen, mark the position of the screen then remove the rear screen.

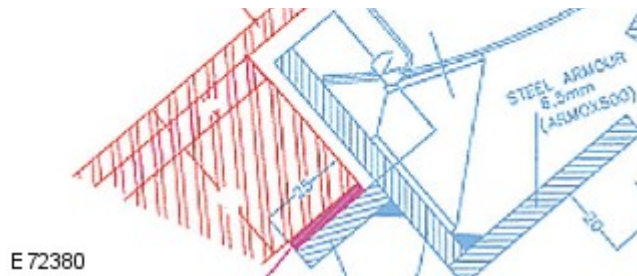
INSTALLATION

1. Clean the surface of the glass which will be in contact with the PU with Betawipe 4000.
2. Apply glass primer (Betaprime 5001) on the area of the glass which will be in contact with the frame and also on the side of the armoured glass. Wait 1 hour for the primer to dry.
3. Apply painted sheet steel primer (Betaprime 5404) on the frame. Wait 1 hour for the primer to dry.

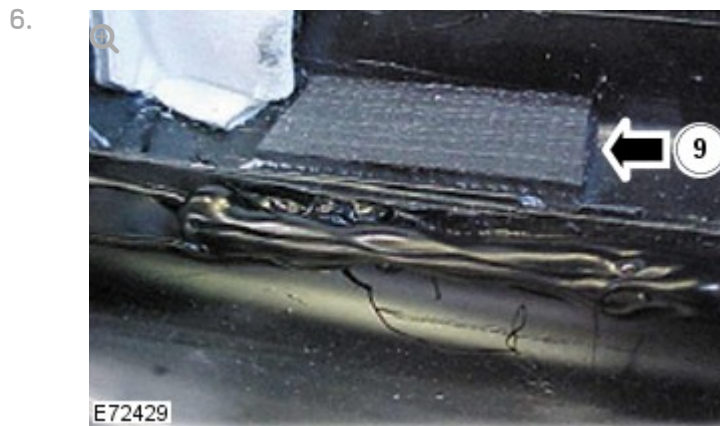


Fit the adhesive rubber seal (AMS Ref: 12591) on the side of the tailgate (5)





Apply two beads of non adhesive seal (Sika 710), around the rear screen frame, (6, 7, 8).



Position rubber pads (9) at the bottom of the window frame and glue in position. The rear screen will locate on these pads.

7. Make sure all the surfaces are clean and no dust is behind the glass. Around the edge of the armoured frame and also around the side of the armoured glass make a 8 mm (0.3 in) thick PU (Betaseal HV3) seal (10).

8. **WARNING:**

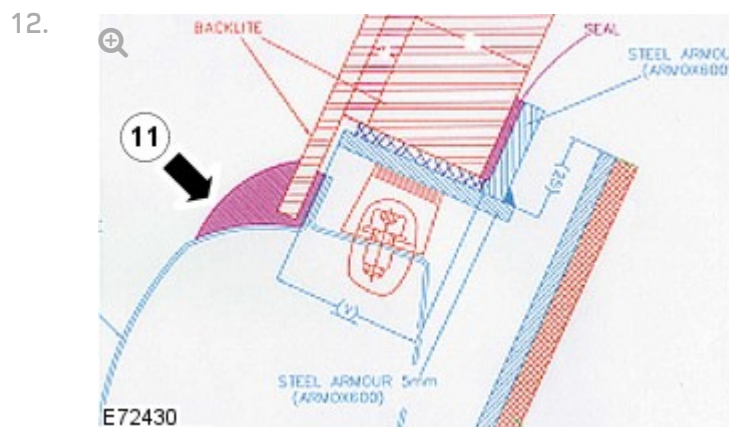
The window glass is extremely heavy. Ensure that sufficient people are available to lift the screen safely.

With 4 people available for lifting the rear screen, attach suction cups and position the screen in the tailgate.

9. Position the screen in the aperture and secure in place with adhesive tape. Leave the screen for 24 hours without moving the tailgate.

-
10. Fit the modified finishing rubber seal (AMS Ref: 9433129), and mark the position of the seal on the glass with adhesive tape. Then remove the seal.

 11. Degrease the glass with Betawipe 4000 and apply glass primer (Betaprime 5001) on the glass where the seal will be glued.



Apply painted sheet steel primer (Betaprime 5404) inside the seal. Make a 4 mm PU (Betaseal HV3) seal on the glass and place the seal in position. (11).

-
13. Using soapy water smooth the rear screen seal. Apply non adhesive seal (Sika 710) at the top of the glass.

 14. Fit the rear wiper and the tailgate spoiler. Connect the rear screen heater.

 15. Clean the glass and polycarbonate window with a non aggressive solution (isopropyl, alcohol, teepol).

2012.0 RANGE ROVER (LM), 501-11

GLASS, FRAMES AND MECHANISMS

REAR DOOR WINDOW GLASS

[G916876]

REMOVAL AND INSTALLATION

76.31.02	GLASS - REAR DOOR - RENEW	ALL DERIVATIVES	0.5	USED WITHINS	+
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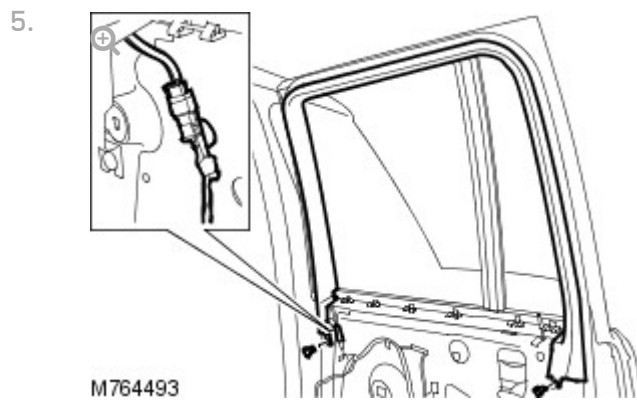
REMOVAL

1. Lower the rear door window glass.
 2. Remove the rear door trim panel.
-

For additional information, refer to: Rear Door Trim Panel (501-05, Removal and Installation).

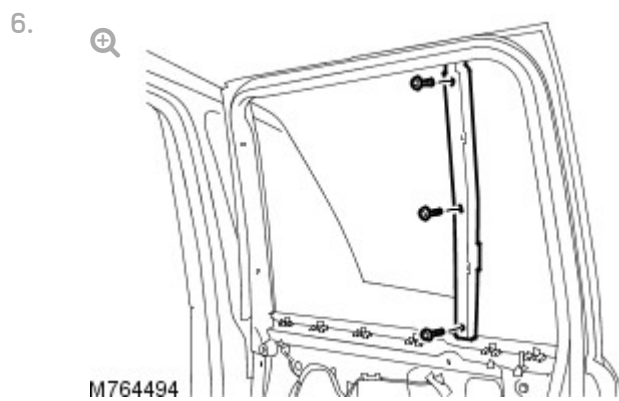
3. Disconnect the door speaker electrical connector.

4. Remove the rear door inner weathershield.



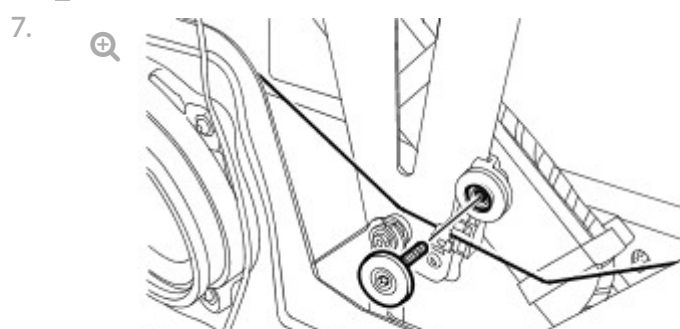
Remove the rear door upper trim panel.

- Release the 2 clips.
- Disconnect the electrical connector.



Remove the rear window glass guide channel.

- Remove the 3 screws.





Remove the rear door window glass.

- Remove the bolt.

INSTALLATION

1. Install the rear door window glass.
 - Install the bolt and tighten to 10 Nm (7 lb.ft).
2. Install the rear window glass guide channel.
 - Install the 3 screws.
 - Install the seal.
3. Install the rear door upper trim panel.
 - Connect the electrical connector.
4. Connect the door speaker electrical connector.
5. Install the rear door inner weathershield.
6. Check correct operation of the rear door window glass.
7. Install the rear door trim panel.

For additional information, refer to: Rear Door Trim Panel (501-05, Removal and Installation).

