

Published: 11-May-2011

Rear View Mirrors -

Interior Rear View Mirror Types

Item	Land Rover Part No.
Prismatic / manual dipping mirror	6H52 17K695 AB
Electrochromatic mirror	6H52 17e678 AB
Electrochromatic mirror with Humidity sensor	6H52 17E678 BB

Torque Specifications

Description	Nm	lb-ft
Exterior mirror bolts	10	7

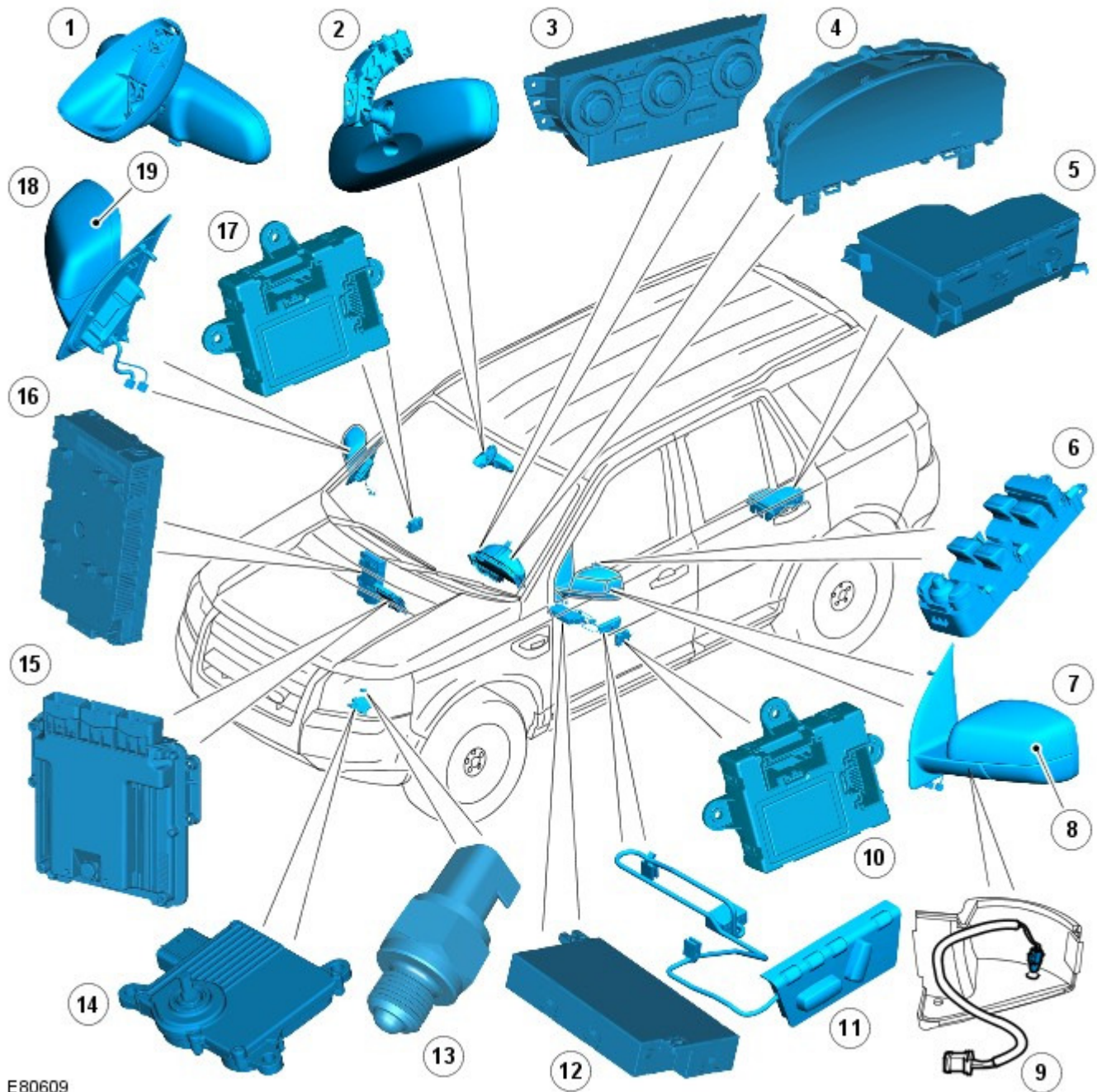
Part Number Rear View Mirrors - Rear View Mirrors

Description and Operation

Published: 11-May-2011

COMPONENT LOCATION

NOTE: Left-Hand Drive (LHD) shown; Right-Hand Drive (RHD) similar.



E80609

Item	Part Number	Description
1	-	Manual dimming interior mirror
2	-	Automatic dimming interior mirror
3	-	Automatic Temperature Control (ATC) module
4	-	Instrument cluster
5	-	Auxiliary Junction Box (AJB)
6	-	Exterior mirror switch pack
7	-	Left-Hand (LH) exterior mirror
8	-	LH exterior mirror motor
9	-	Ambient air temperature sensor

10		LH door control module
11		Driver's memory seat switch pack
12		Driver's memory seat control module
13		Reverse gear switch - manual transmission
14		Transmission Control Module (TCM) - automatic transmission
15		Engine Control Module (ECM)
16		Central Junction Box (CJB)
17		Right-Hand (RH) door control module
18		RH exterior mirror
19		RH exterior mirror motor

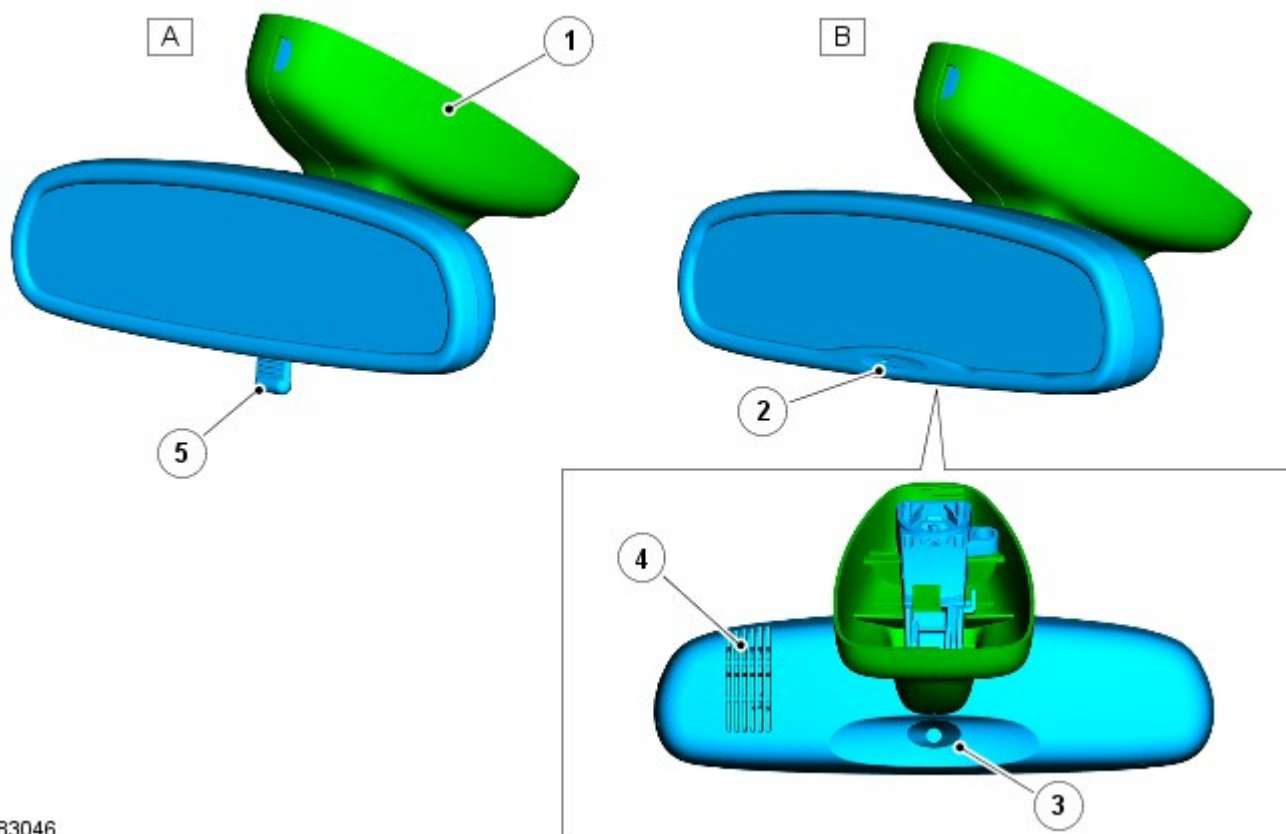
OVERVIEW

The rear view mirrors comprise an interior mirror mounted to the windshield, and an exterior mirror mounted on each front door cheater.

For Japanese specification vehicles, a driver proximity mirror is installed on the LH front corner of the hood.

The types of mirrors and associated operating functions installed depend on the specification and trim level of the vehicle.

INTERIOR MIRROR



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Item		Description
A		Manual dimming mirror
B		Automatic dimming mirror
1		Mirror stem cover (2 piece)
2		Rearward facing light sensor
3		Forward facing light sensor
4		Cabin humidity sensor
5		Manual dimming mirror lever

The interior rear view mirror is provided as a manual dimming or an electrically operated automatic dimming type. On certain vehicles, a cabin humidity sensor is incorporated in the electrically operated mirror casing.

Manual Dimming Mirror

The manual dimming mirror comprises a prismatic glass housed within a surrounding case that is attached with a ball joint connector to the mirror stem.

Manual dimming of the mirror is achieved using the lever mounted on the underside of the mirror body. Operating the lever will tilt the mirror head from the 'day' position to the 'night' position.

Automatic Dimming Mirror

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. The mirror stem incorporates an 8-pin electrical connector that is connected to the roof panel wiring harness. The wiring harness provides hardwired and a Local Interconnect Network (LIN) connection to the CJB.

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.

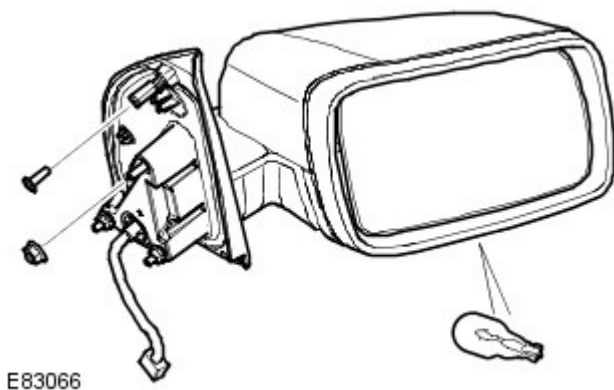
Automatic dimming is inhibited when reverse gear is selected to provide the driver with maximum vision. On vehicles with automatic transmission, the reverse gear signal is provided by the TCM via the high speed Controller Area Network (CAN) bus to the CJB. The CJB then provides a power feed to the mirror.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

Cabin Humidity Sensor

Depending on the vehicle specification, the automatic dimming interior mirror may also incorporate a cabin humidity sensor. The cabin humidity sensor is located in the mirror rear casing near to the windshield, and provides the ATC module with information regarding the probability of windshield misting. This information is used to vary the automatic operation of the climate control system.

For additional information, refer to: [Control Components](#) (412-01 Climate Control, Description and Operation).

EXTERIOR MIRRORS



Electrically operated and heated exterior mirrors are installed as standard. Depending on the specification and trim level of the vehicle, the following options are available:

- Power fold (switch pack operated feature) and auto fold (remote handset operated feature)
- Memory recall
- Reverse gear mirror dip
- Exterior mirror lamps.

The power fold/auto fold feature is available only when power fold mirrors are installed to the vehicle.

The auto fold and reverse gear mirror dip functions are not customer configurable, but may be enabled or disabled by the dealer using the Land Rover approved diagnostic system. The diagnostic system enables or disables either or both functions by setting the EEPROM contained within the instrument cluster.

The LH door mirror incorporates an ambient air temperature sensor that is hardwired to the ECM. The ECM is connected to the CJB and other control modules via the high speed CAN bus. The sensor provides information to the ECM that is then transmitted on the medium speed CAN bus for use by other control modules. On vehicles installed with a high-line instrument cluster, the CJB transmits the temperature signal to the instrument cluster that provides a display of the ambient temperature to the driver.

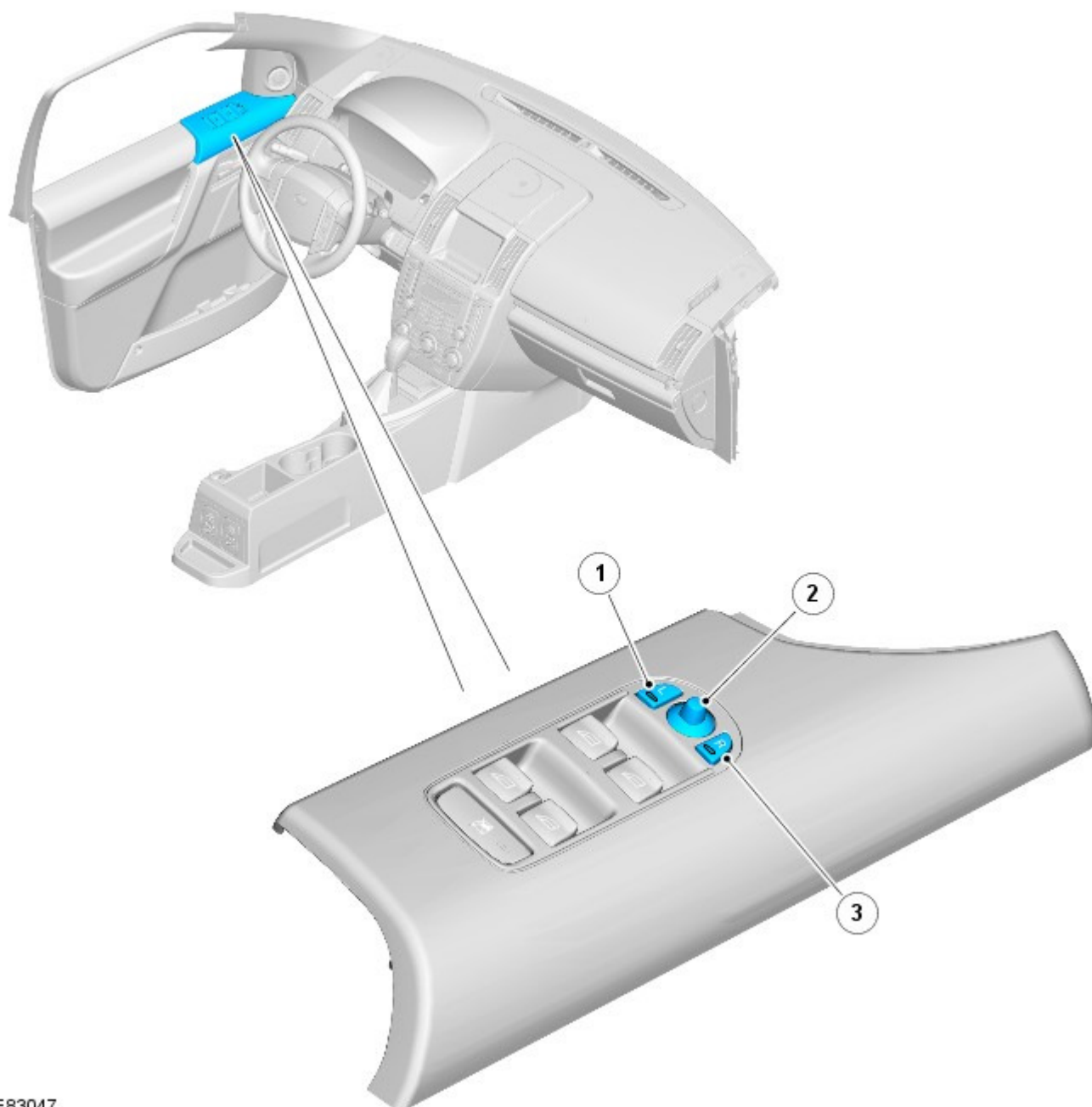
For additional information, refer to:

Electronic Engine Controls - 2.2L Diesel (303-14 Electronic Engine Controls - 2.2L Diesel, Description and Operation),
[Information and Message Center](#) (413-08 Information and Message Center, Description and Operation).

The exterior mirror lamps are controlled by the interior lighting function.

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

Exterior Mirror Adjustment



E83047

Item		Description
1		LH exterior mirror select switch
2		4-way directional joystick
3		RH exterior mirror select switch

The door mirrors are controlled using a switch pack located on the driver's door. The switch pack contains 2 non-latching mirror select switches labeled 'L' and 'R' and a 4-way directional joystick. The switch pack is connected to the driver door control module via the LIN bus. The driver and front passenger door control modules are connected via the medium speed CAN bus. A hardwired connection between each door control module and the corresponding door mirror, provides the supply and ground paths for the mirror motors.

Each exterior door mirror incorporates 2 motors to control horizontal (left/right) and vertical (up/down) adjustments.

On vehicles installed with a driver's power operated memory seat and memory exterior mirrors, a potentiometer is incorporated within each mirror motor and is used to provide information regarding the actual motor positions. The current position and memory positions of each door mirror motor are maintained and stored within the corresponding door control module.

The memory exterior mirror positions are also monitored and stored within door control module memory when the reverse

gear mirror dip function is used.

When reverse gear is selected, the door control modules store the current mirror positions and will then dip both the driver and passenger mirror glass to a default dip position. While reverse gear is selected it is possible to store a preferred dipped mirror position by adjusting the driver/passenger mirror glass to the desired position via the mirror switch pack. When the desired position is achieved using the switches, the new dip positions will be automatically stored by the door control modules when reverse gear is de-selected. Therefore when reverse gear is re-selected, the dip position recalled by the door control modules will be the new reverse gear mirror dip stored position. When reverse gear is deselected the mirror glass will automatically move to the previous stored position prior to reverse gear selection.

Reverse gear mirror dip is only available when memory mirrors are installed, and reverse gear mirror dip is enabled within the instrument cluster.

If the driver selects a memory recall function using the memory seat switch pack, the driver's memory seat and exterior memory mirrors are moved to a stored memory position.

For additional information, refer to: [Seats](#) (501-10 Seating, Description and Operation).

Mirror Power Fold and Auto Fold Feature

Exterior mirrors with the power fold/auto fold feature incorporate a motor located in the hinge of each exterior mirror arm. Operation of the power fold feature is achieved using the exterior mirror switch pack. Operation of the auto fold feature is achieved using the remote handset.

The power fold function is active when the ignition is in power mode 6 (Ignition).

Both exterior mirrors will power fold when the mirror switch pack 'L' and 'R' switches are pressed together. Pressing the switches again will unfold the mirrors.

When the instrument cluster is configured for the auto fold feature, the mirrors will fold in when the remote handset lock button is pressed. The mirrors will unfold when the vehicle is unlocked using the remote handset unlock button.

NOTE: If the mirrors are folded in using the mirror switch pack (power fold) and the vehicle is then locked, subsequent unlocking of the vehicle will not unfold the mirrors.

When the remote handset unlock button is operated, the CJB recognizes the remote handset for that vehicle and acknowledges the request. The door control modules are connected directly to the AJB for power supply to the exterior mirror folding motors.

When the vehicle is locked the door control modules reverse the polarity of the mirror fold motor, power and ground connections to operate the mirrors in the opposite direction.

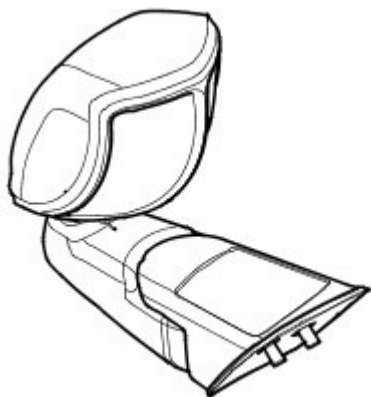
Exterior Mirror Heating

Exterior mirror heating is provided with heater elements bonded to the back of the mirror glass. Power supply for the mirror heating elements is provided by the corresponding driver or passenger door control module via the AJB.

The door control modules receive a power supply from the AJB, and are both connected on the medium speed CAN bus to the ATC module. A ground terminal from each door control module completes the circuit. The ATC module automatically controls the mirror heating function whenever the ignition is in power mode 4 (Accessory) and power mode 6 (Ignition).

For additional information, refer to: [Control Components](#) (412-01 Climate Control, Description and Operation).

DRIVER PROXIMITY MIRROR (JAPANESE SPECIFICATION ONLY)

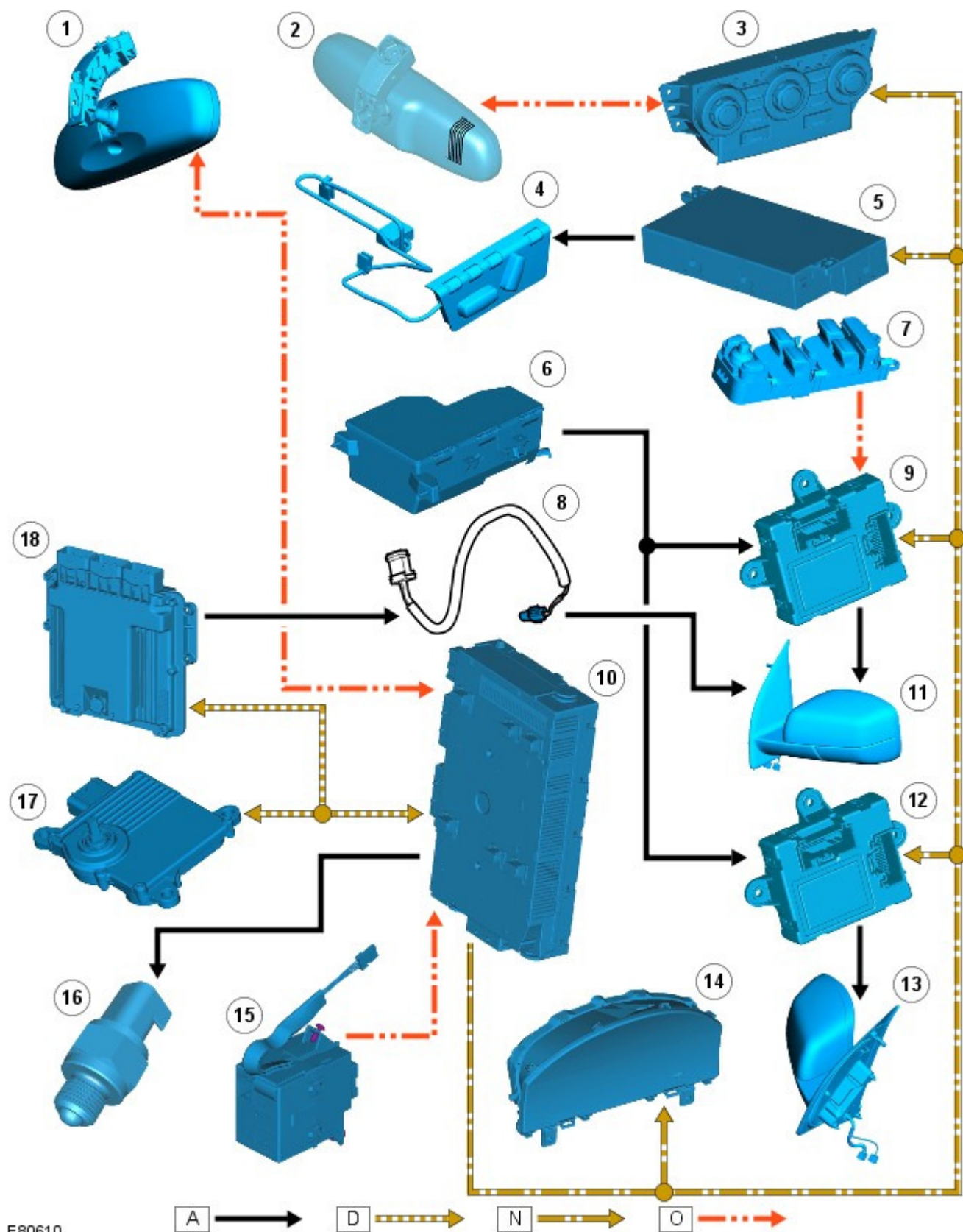


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The proximity mirror allows the driver to view the 'blind spots' below the level of the hood when performing low speed maneuvering. The mirror is manufactured in plastic and comprises a lens housing attached to a pivot arm that is attached to the LH front corner of the hood. Two lenses in the housing provide coverage across the front and along the LH side of the vehicle. The mirror is manually adjusted in the horizontal plane only.

CONTROL DIAGRAM

NOTE: **A** = Hardwired; **D** = High speed CAN bus; **N** = Medium speed CAN bus; **O** = LIN bus.



E80610

Item	Description
1	Automatic dimming interior mirror
2	Automatic dimming interior mirror (with ATC humidity sensor)
3	ATC module
4	Driver's memory seat switch pack
5	Driver's memory seat control module
6	AJB

7	Exterior mirror switch pack
8	Ambient air temperature sensor
9	LH door control module
10	CJB
11	LH exterior mirror
12	RH door control module
13	RH exterior mirror
14	Instrument cluster
15	Start control module
16	Reverse gear switch - manual transmission
17	TCM - automatic transmission
18	ECM

Rear View Mirrors - Rear View Mirrors

Diagnosis and Testing

Principles of Operation

For a detailed description of the rear view mirror systems, refer to the relevant Description and Operation section in the workshop manual.

REFER to: [Rear View Mirrors](#) (501-09 Rear View Mirrors, Description and Operation).

Inspection and Verification



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

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

Visual Inspection

Mechanical	Electrical
<ul style="list-style-type: none"> Condition, correct installation and security of rear view mirrors 	<ul style="list-style-type: none"> Fuses/relays (refer to electrical guide) Wiring harness Correct engagement of electrical connectors Loose or corroded connections

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

DTC Index

NOTE: 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.

NOTE: 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 extra information read by the manufacturer-approved diagnostic system).

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

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

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

DTC	Description	Possible Causes	Action
B116311	Left Mirror Heater Output short to ground	<ul style="list-style-type: none"> Short to ground 	Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to ground
B116315	Left Mirror Heater Output short to power	<ul style="list-style-type: none"> Short to power or open circuit 	Refer to the electrical circuit diagrams and test left mirror heater output circuit for short to power or open circuit
B116411	Right Mirror Heater Output short to ground	<ul style="list-style-type: none"> Short to ground 	Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to ground
B116415	Right Mirror Heater Output short to power	<ul style="list-style-type: none"> Short to power or open circuit 	Refer to the electrical circuit diagrams and test right mirror heater output circuit for short to power or open circuit
B1A9411	Driver Mirror	<ul style="list-style-type: none"> Short to ground 	Refer to the electrical circuit diagrams and test driver mirror fold motor circuit for short to ground
B1A9415	Driver Mirror	<ul style="list-style-type: none"> Short to power or open circuit 	Refer to the electrical circuit diagrams and test driver mirror fold motor circuit for short to power or open circuit
B1A9511	Passenger Mirror	<ul style="list-style-type: none"> Short to ground 	Refer to the electrical circuit diagrams and test passenger mirror fold motor circuit for short to ground
B1A9515	Passenger Mirror	<ul style="list-style-type: none"> Short to power or open circuit 	Refer to the electrical circuit diagrams and test passenger mirror fold motor circuit for short to power or open circuit
B1C0911	Driver Left/Right Mirror Motor Circuit	<ul style="list-style-type: none"> Short to ground 	Refer to the electrical circuit diagrams and test driver left/right mirror motor circuit for short to ground

DTC	Description	Possible Causes	Action
B1C0915	Driver Left/Right Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test driver left/right mirror motor circuit for short to power or open circuit
B1C1011	Driver Up/Down Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to ground 	Refer to the electrical circuit diagrams and test driver up/down mirror motor circuit for short to ground
B1C1015	Driver Up/Down Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test driver up/down mirror motor circuit for short to power or open circuit
B1C1111	Passenger Left/Right Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to ground 	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C1115	Passenger Left/Right Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C1211	Passenger Up/Down Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to ground 	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C1215	Passenger Up/Down Mirror Motor Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Carry out pinpoint tests associated with this DTC using the manufacturer approved diagnostic system
B1C1311	Driver Up/Down Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to ground 	Refer to the electrical circuit diagrams and test driver up/down mirror motor feedback circuit for short to ground
B1C1315	Driver Up/Down Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test driver up/down mirror motor feedback circuit for short to power or open circuit
B1C1411	Driver Left/Right Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to ground 	Refer to the electrical circuit diagrams and test driver left/right mirror motor feedback circuit for short to ground
B1C1415	Driver Left/Right Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test driver left/right mirror motor feedback circuit for short to power or open circuit
B1C1511	Passenger Up/Down Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to ground 	Refer to the electrical circuit diagrams and test passenger up/down mirror motor feedback circuit for short to ground
B1C1515	Passenger Up/Down Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test passenger up/down mirror motor feedback circuit for short to power or open circuit
B1C1611	Passenger Left/Right Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to ground 	Refer to the electrical circuit diagrams and test passenger left/right mirror motor feedback circuit for short to ground
B1C1615	Passenger Left/Right Mirror Motor Feedback Circuit	<ul style="list-style-type: none"> ● Short to power or open circuit 	Refer to the electrical circuit diagrams and test passenger left/right mirror motor feedback circuit for short to power or open circuit

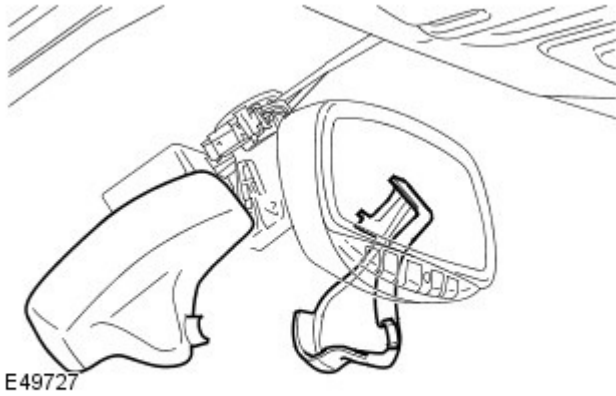
Published: 11-May-2011

Rear View Mirrors - Interior Rear View Mirror

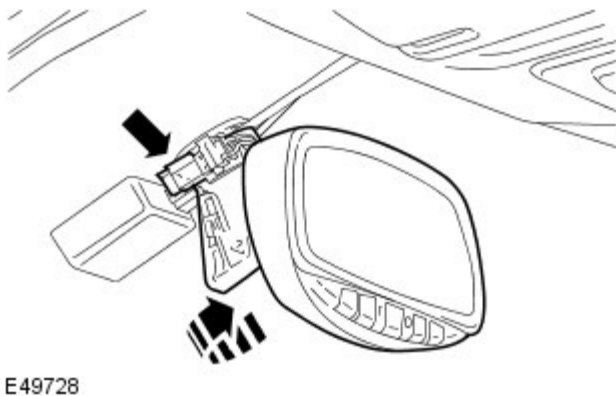
Removal and Installation

Removal

NOTE: A humidity sensor is installed to certain derivatives. It is part of the interior rear view mirror and cannot be serviced separately.



1.



2.

- Disconnect the electrical connector.
- Rotate the mirror stem at its base to release from the windshield.

Installation

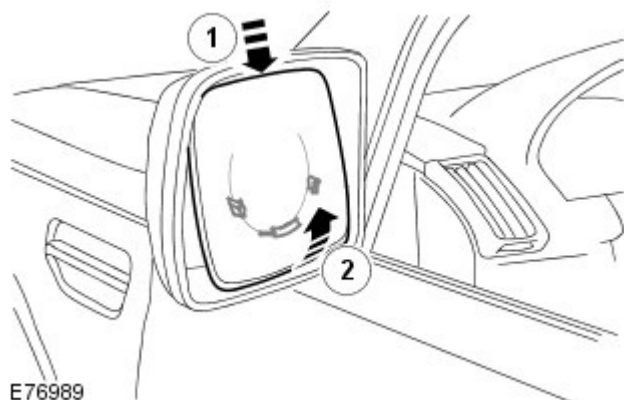
1. To install, reverse the removal procedure.

Published: 11-May-2011

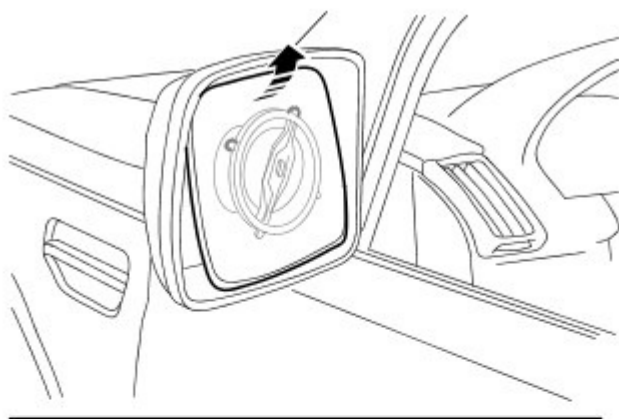
Rear View Mirrors - Exterior Mirror Glass

Removal and Installation

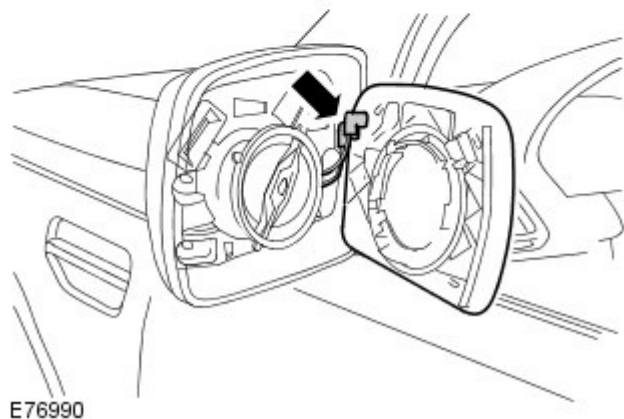
Removal



1. Release the exterior mirror glass.



2. Remove the exterior mirror glass.



Installation

1. To install, reverse the removal procedure.

Rear View Mirrors - Exterior Mirror

Removal and Installation

Removal

NOTE: Removal steps in this procedure may contain installation details.

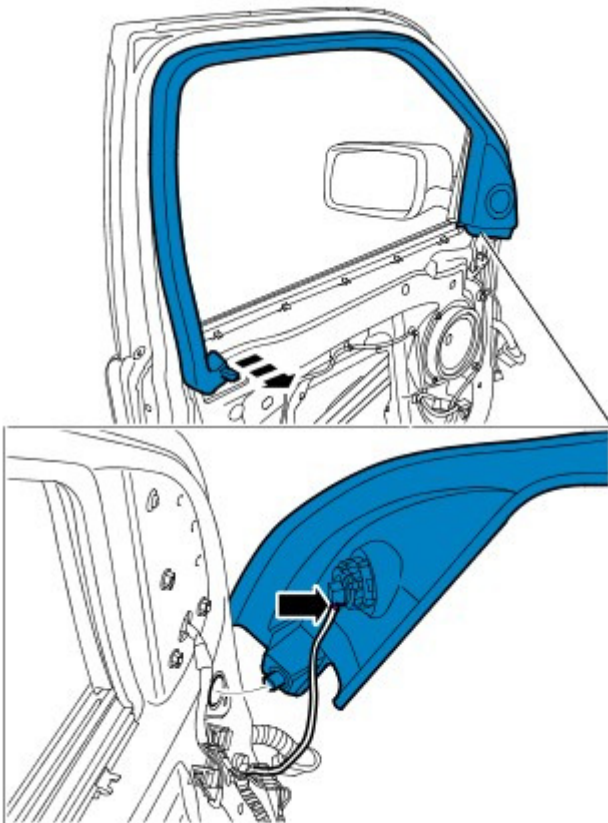
1. Lower the window glass.
2. Disconnect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

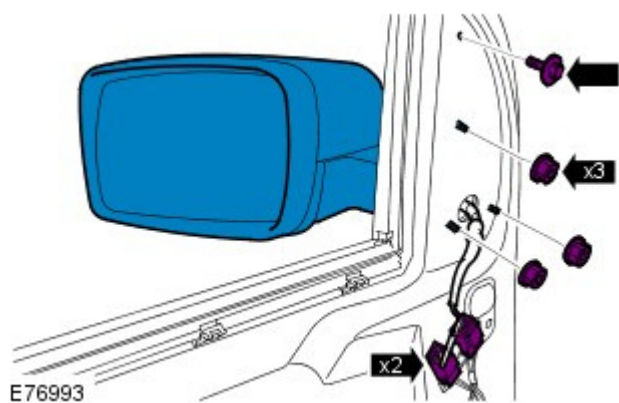
3. Remove the front door trim panel.

Refer to: [Front Door Trim Panel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

4. Remove the front door frame trim.



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5.

- Torque: 10 Nm

Installation

1. To install, reverse the removal procedure.

Published: 11-May-2011

Rear View Mirrors - Exterior Mirror Motor

Removal and Installation

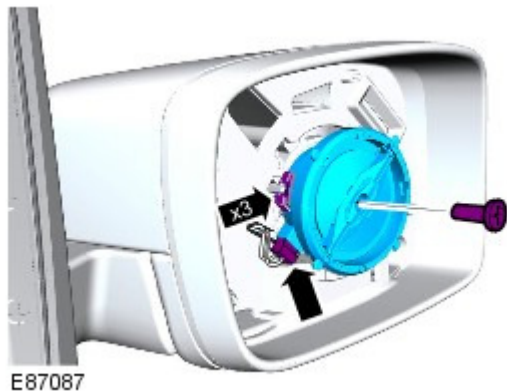
Removal

NOTE: Removal steps in this procedure may contain installation details.

1. Remove the exterior mirror glass.

Refer to: [Exterior Mirror Glass](#) (501-09 Rear View Mirrors, Removal and Installation).

2. Torque: 5 Nm



Installation

1. To install, reverse the removal procedure.