

## Roof Opening Panel -

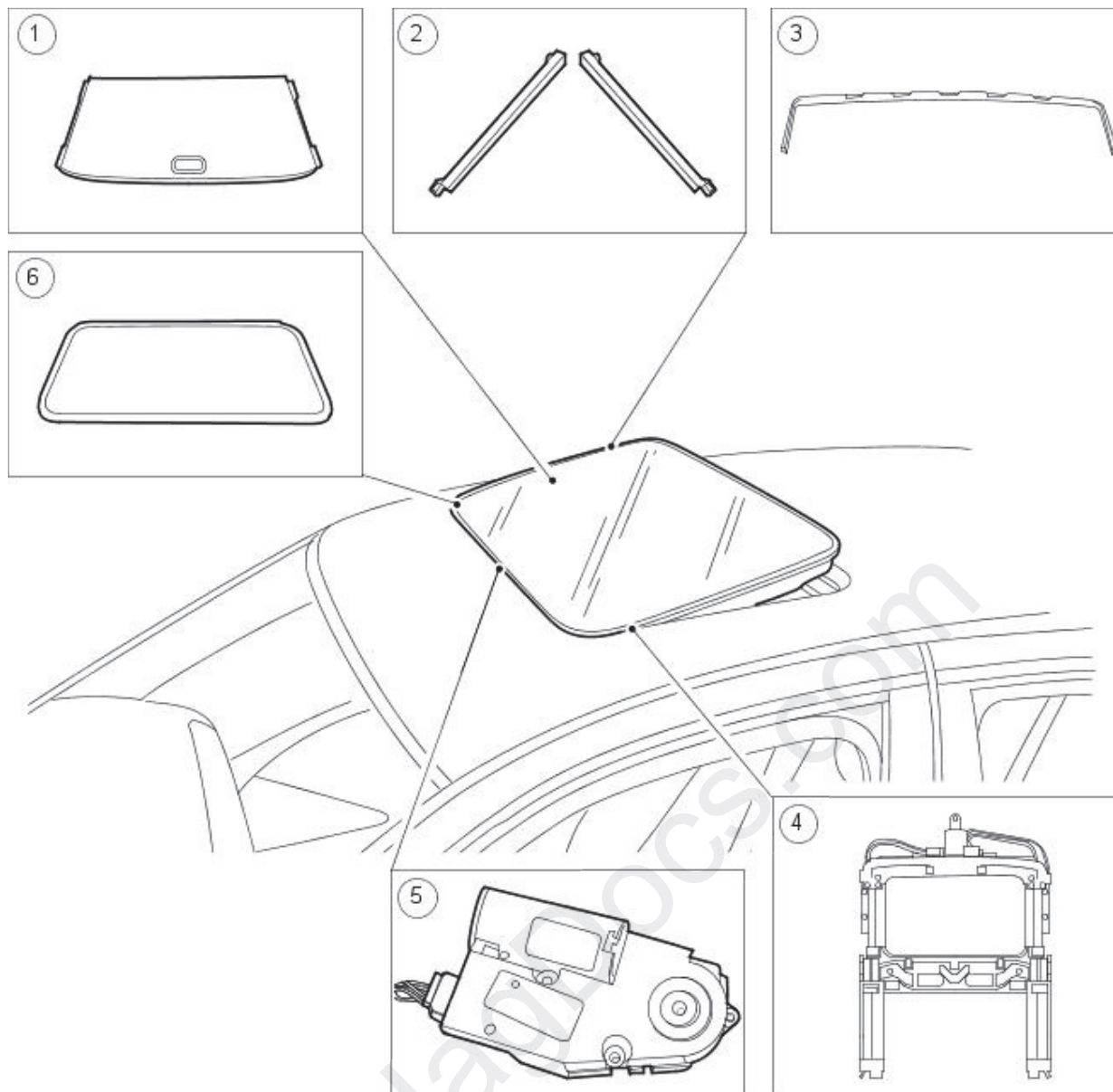
### Torque Specifications

Description	Nm	lb-ft	lb-in
Roof opening panel frame retaining bolts	9	-	80
Roof opening panel bracket retaining bolts	9	-	80
Roof opening panel motor retaining bolts	3	-	27
Roof opening panel glass retaining screws	3	-	27

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## Roof Opening Panel - Roof Opening Panel

Description and Operation



VUJ0003757

Item	Part Number	Description
1	—	Roof opening panel shield
2	—	Lifter arms
3	—	Air deflector
4	—	Roof opening panel frame
5	—	Roof opening panel motor
6	—	Roof opening panel glass

The roof opening panel is available as an option. The roof opening panel control module controls the roof opening panel. The roof opening panel motor and module are not available separately. The roof opening panel may be operated from the roof opening panel switch or the global close function.

### Roof Opening Panel Switch Operation

The system operates as follows from the roof opening panel switch:

- Press the rear of the switch to the first detent with the roof opening glass in the closed position.
  - The roof opening glass opens rearward until the roof opening panel switch is released or the roof opening panel glass reaches the full open position.
- Press the rear of the switch to the second detent with the roof opening panel glass in the closed position.
  - Activates the express open feature.
  - The roof opening glass will slide rearward until the roof opening panel switch is pressed in any direction or the roof opening glass reaches the full open position.
- Press the front of the switch to the first detent with the roof opening panel glass in the closed position.
  - The roof opening panel glass will vent up until the roof opening panel switch is released or the roof opening panel glass reaches the full vent up position.
- Press the front of the switch to the second detent with the roof opening glass in the closed position.
  - The roof opening glass will vent up until the roof opening glass reaches the full vent up position or the switch is pressed in any direction.
- Press the front of the switch to the first detent with the roof opening glass in a rearward open position.
  - The roof opening glass will slide forward until the roof opening glass reaches the fully closed position or the switch is released.
- Press the front of the switch to the second detent with the roof opening glass in a rearward position.

- The roof opening glass will close until the roof opening panel switch is pressed in any direction or the roof opening glass reaches the full closed position.
- Press the rear of the switch to the first detent with the roof opening glass in a vent up position.
  - The roof opening glass will close until the roof opening panel switch is released or the roof opening glass reaches the full closed position.
- Press the rear of the switch to the second detent with the roof opening glass in a vent up position.
  - The roof opening glass will close until the roof opening panel switch is pressed in any direction or the roof opening glass reaches the full closed position.

## Global Closing Operation

The roof opening panel is included in the global close operation. This function closes the power windows and the roof opening panel automatically. For additional information on the global close feature for the power windows, refer to [Section 501-11 Glass, Frames and Mechanisms](#).

The global close function is activated by:

- turning the driver door lock cylinder to the lock position and holding.

Global close operation is only available with the ignition in the OFF position and the ignition key removed.

When the global close operation is selected, the roof opening panel switch is not recognized by the roof opening panel control module throughout the operation and for five seconds after the operation is completed.

Global close will operate as follows.

- With the roof opening glass in the open position, activating global close will close the roof opening glass to the flush position.

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# Roof Opening Panel - Roof Opening Panel

Diagnosis and Testing

## Principles of Operation

### Roof Opening Panel Control Module

Battery power is continuously supplied to the roof opening panel control module. However, the roof opening panel will only operate from the roof opening panel switch with the ignition switch in the RUN or ACCY position. The global close feature is controlled by two circuits from the generic electronics control module (GEM). The two circuits must be at ground potential before the roof opening panel control module will acknowledge the roof opening panel switch. When the ignition switch is turned to RUN or ACCY, the GEM provides ground to these circuits.

The roof opening panel control module incorporates soft stops at the end of all travel positions. The roof opening panel control module monitors the internal switches to determine the roof opening glass position and the soft stops. The internal switches are activated by the roof opening panel motor rotation.

The roof opening panel control module supplies the power and ground to the roof opening panel motor depending on the ordered function. Power is supplied to the roof opening panel for a maximum of 12 seconds. Under normal operation, position is monitored by the roof opening panel control module and power is removed from the roof opening panel motor as soon as the roof opening panel reaches the commanded position.

### Roof Opening Panel Switch

Two circuits connect the roof opening panel switch to the roof opening panel control module. One circuit controls open and down operation. The other circuit controls the tilt and close operation. The roof opening panel control module monitors these lines for voltage fluctuation to determine which function was selected.

With the ignition switch in the RUN or ACCY position, the roof opening panel supplies a five volt reference voltage to three control lines. Activation of the roof opening panel switch connects one or more of these lines to the common return which pulls the line low. The roof opening panel control module will sense the line or lines being connected to the common line and carry out the appropriate function.

The express open function connects the open and tilt circuits to the common return when the roof opening panel switch is moved rearward to the second detent position. The operator-controlled open function connects the open circuit to the common return. The close function connects the close circuit to the common causing the roof opening panel to close from a slide or vent position.

### Global Close

One circuit connects the GEM to the roof opening panel control module for this function. Global close operation for the roof opening panel is controlled by this circuit being grounded by the GEM.

When the ignition switch is in the RUN or ACCY position, the GEM grounds this circuit allowing normal operation of the roof opening panel from the roof opening panel switch. Global close operation is only available with the ignition in the OFF position and the ignition key removed.

When global close operation is selected, the roof opening panel switch is not recognized by the roof opening panel control module throughout the operation and for five seconds after the operation is completed.

With the ignition switch in the OFF position, the roof opening panel control module supplies a constant voltage to this circuit. The roof opening panel control module monitors these lines for a low state, caused by the GEM grounding the line, to determine the ordered global function by the GEM.

Global close is commanded by the GEM grounding control line one. Line two will remain at previous voltage.

If both lines have voltage, the roof opening panel will be inoperative.

## Inspection and Verification

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

### Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> <li>● Roof opening panel track and rail assembly</li> <li>● Roof opening panel glass seal</li> <li>● Roof opening panel glass adjustment</li> <li>● Roof opening panel synchronization</li> </ul>	<ul style="list-style-type: none"> <li>● Central junction box (CJB) fuse 73 (15A)</li> <li>● Damaged, loose or corroded connectors</li> <li>● Wiring harness</li> <li>● Roof opening panel switch</li> <li>● Roof opening panel motor</li> <li>● Roof opening panel control module</li> </ul>

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 concern is not visually evident, verify the symptom and refer to the Symptom Chart.

## Symptom Chart

Refer to the Wiring Diagram manual for the connectors cited in the pinpoint tests.

### SYMPTOM CHART

Symptom	Possible Sources	Action
The roof opening panel has excessive wind noise	<ul style="list-style-type: none"> <li>* Incorrect adjustment.</li> <li>* Roof opening panel glass seal.</li> </ul>	* GO to Pinpoint Test A.
The roof opening panel leaks	<ul style="list-style-type: none"> <li>* Incorrect adjustment.</li> <li>* Roof opening panel frame drain hoses.</li> <li>* Roof opening panel glass seal.</li> </ul>	* GO to Pinpoint Test B.

The roof opening panel is noisy during operation	* Roof opening panel glass. * Roof opening panel. * Roof opening panel motor.	* GO to Pinpoint Test C.
The roof opening panel does not open or close	* Roof opening panel. * Roof opening panel control module. * Roof opening panel motor. * Generic electronics module (GEM). * Roof opening panel switch. * Circuitry.	* GO to the approved Jaguar diagnostic system.
The roof opening panel does not open or close in vent position	* Roof opening panel control module. * Roof opening panel switch. * Circuitry.	* GO to the approved Jaguar diagnostic system.
The roof opening panel does not stop in flush from any position.	* Roof opening panel adjustment. * Roof opening panel glass seal. * Roof opening panel control module.	* GO to Pinpoint Test D.
The express open is inoperative	* Roof opening panel control module. * Roof opening panel switch. * Circuitry.	* GO to the approved Jaguar diagnostic system.

### PINPOINT TEST A : THE ROOF OPENING PANEL HAS EXCESSIVE WIND NOISE

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>A1: CHECK THE ROOF OPENING GLASS FIT</b>	
	<b>1</b> Cycle the roof opening glass from the full-open to the full-closed position.
	<b>2</b> Inspect the roof opening glass seal for proper fit or damage.
	Is the roof opening glass seal OK? <b>Yes</b> <a href="#">GO to A2.</a> <b>No</b> INSTALL a new roof opening glass seal. REFER to <a href="#">Seal</a> . Test the system for normal operation.
<b>A2: CHECK THE ROOF OPENING GLASS OPERATION</b>	
	<b>1</b> Cycle the roof opening glass from the full-open to the full-closed position.
	Does the roof opening glass travel to the full-open and the full-closed position? <b>Yes</b> ADJUST the roof opening glass. REFER to <a href="#">Roof Opening Panel Alignment</a> . If the roof opening glass closes unevenly, CHECK the roof opening panel synchronization. REFER to Section <a href="#">100-00 General Information Motor Synchronization - Calibration</a> . Test the system for normal operation. <b>No</b> CHECK the roof opening panel glass seal. If necessary, INSTALL a new roof opening panel glass seal. REFER to <a href="#">Seal</a> . TEST the system for normal operation.

### PINPOINT TEST B : THE ROOF OPENING PANEL LEAKS

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>B1: CHECK THE ROOF OPENING PANEL OPERATION</b>	
	<b>1</b> Cycle the roof opening panel glass from the full-open position to the full-closed position.
	Does the roof opening glass operate smoothly and close tightly? <b>Yes</b> <a href="#">GO to B2.</a> <b>No</b> CHECK the roof opening panel glass alignment. REFER to <a href="#">Roof Opening Panel Alignment</a> . Test the system for normal operation.
<b>B2: CHECK THE ROOF OPENING PANEL FRAME DRAIN TUBES</b>	
	<b>1</b> Gain access to the roof opening panel drain tubes.
	Is there blockage or damage to the roof opening panel drain tubes? <b>Yes</b> Clear the blockage or if necessary, INSTALL a new drain tube. TEST the system for normal operation. <b>No</b> <a href="#">GO to B3.</a>
<b>B3: CHECK THE ROOF OPENING PANEL GLASS SEAL</b>	
	<b>1</b> Actuate the roof opening panel glass to the full open position.
	Is the roof opening panel glass seal damaged? <b>Yes</b> INSTALL a new roof opening panel glass seal. REFER to <a href="#">Seal</a> . TEST the system for normal operation. <b>No</b> REPAIR as necessary. TEST the system for normal operation.

### PINPOINT TEST C : THE ROOF OPENING PANEL IS NOISY DURING OPERATION

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>C1: CHECK THE OPERATION OF THE ROOF OPENING PANEL GLASS</b>	
	<b>1</b> Cycle the roof opening panel glass from the full-open to the full-closed position.
	Is the roof opening panel glass loose? <b>Yes</b> ADJUST the roof opening panel glass. REFER to <a href="#">Roof Opening Panel Alignment</a> <b>No</b> <a href="#">GO to C2.</a>
<b>C2: CHECK FOR OBSTRUCTIONS</b>	
	<b>1</b> Check the roof opening panel track and rail for foreign material, damage or looseness.
	Is the roof opening panel obstructed or damaged? <b>Yes</b> REMOVE the obstruction. If necessary, INSTALL a new roof opening panel frame. REFER to <a href="#">Roof Opening Panel Frame</a> . TEST the system for normal operation.

No	<a href="#">GO to C3.</a>
<b>C3: CHECK THE ROOF OPENING PANEL MOTOR</b>	
	<b>1</b> Cycle the roof opening glass from the full-open to the full-closed position.
	Does the roof opening panel motor make excessive noise?
<b>Yes</b>	CHECK the roof opening panel motor for correct mounting. If necessary, INSTALL a new roof opening panel motor . REFER to <a href="#">Roof Opening Panel Motor</a> TEST the system for normal operation. If the roof opening panel opens or closes unevenly, ADJUST the roof opening panel motor synchronization. REFER to <a href="#">Motor Synchronization—Calibration</a>
<b>No</b>	REFER to <a href="#">Roof Opening Panel Alignment</a> ADJUST the roof opening panel glass as necessary. TEST the system for normal operation.

**PINPOINT TEST D : THE ROOF OPENING PANEL DOES NOT STOP IN FLUSH FROM ANY POSITION**

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>D1: CHECK THE ROOF OPENING PANEL GLASS ADJUSTMENT</b>	
	<b>1</b> Check the roof opening panel glass alignment. For additional information, refer to <a href="#">Roof Opening Panel Alignment</a> .
	Is the roof opening panel glass adjusted correctly?
<b>Yes</b>	<a href="#">GO to D2.</a>
<b>No</b>	ADJUST the roof opening panel glass as necessary. TEST the system for normal operation.
<b>D2: CHECK THE ROOF OPENING GLASS SEAL</b>	
	<b>1</b> Inspect the roof opening panel glass seal for looseness, damage and correct installation.
	Is the roof opening panel glass seal OK and installed correctly?
<b>Yes</b>	<a href="#">GO to D3.</a>
<b>No</b>	REPAIR or INSTALL a new roof opening panel glass seal as necessary. For additional information, refer to <a href="#">Seal</a> . TEST the system for normal operation.
<b>D3: CHECK FOR OBSTRUCTION IN THE ROOF OPENING PANEL</b>	
	<b>1</b> Inspect the roof opening panel assembly for obstructions in the track.
	Are any obstructions found?
<b>Yes</b>	REMOVE the obstruction. If necessary, INSTALL a new roof opening panel track and rail assembly. For additional information, refer to <a href="#">Roof Opening Panel Frame</a> . TEST the system for normal operation.
<b>No</b>	INSTALL a new roof opening panel control module. For additional information, refer to <a href="#">Roof Opening Panel Motor</a>

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# Roof Opening Panel - Motor Synchronization

General Procedures

## New Roof Opening Panel Motor Synchronization Procedure

- NOTE: The roof opening panel and roof opening panel motor must be installed and the roof opening panel alignment checked prior to synchronizing the motor.
- NOTE: This procedure is for a new roof opening panel motor.

1. Operate the roof opening panel to the fully vent position.
2. Release the roof opening panel control switch, press the roof opening panel control switch again in the same direction within 0.5 seconds and hold until the glass panel stops after a complete opening and closing cycle.

## Roof Opening Panel De-Synchronization Procedure

- NOTE: This procedure is to be followed when the roof opening panel motor is detached or removed from the roof opening panel and before it is re-installed.

1. Connect the roof opening panel motor electrical connector.
2. Connect the roof opening panel control switch electrical connector.
3. Operate the roof opening panel control switch to the vent position until the roof opening panel motor stops.
4. Release the roof opening panel control switch. Operate the roof opening panel control switch again in the same direction until the roof opening panel motor stops.
5. Release the roof opening panel control switch, operate the roof opening panel control switch within 0.5 seconds in the same direction and hold for 30 seconds.
6. After 30 seconds the roof opening panel motor will start to turn in one direction.
7. Operate the roof opening panel control switch in the opposite (open) direction. The de-synchronization procedure is successful if the roof opening panel motor does not turn.

## De-Synchronized Roof Opening Panel Synchronization Procedure

- NOTE: The roof opening panel and roof opening panel motor must be installed and the roof opening panel alignment checked prior to synchronizing the motor.
- NOTE: This procedure is for a roof opening panel motor that has been previously installed and has been de-synchronized.

1. Operate the roof opening panel to the fully vent position.
2. Release the roof opening panel control switch, press the roof opening panel control switch again in the same direction and hold for 30 seconds until the glass moves slightly.
3. Release the roof opening control switch, press the roof opening panel control switch again within 0.5 seconds in the same direction until the glass panel stops after a complete opening and closing cycle.

## Roof Opening Panel - Roof Opening Panel Alignment

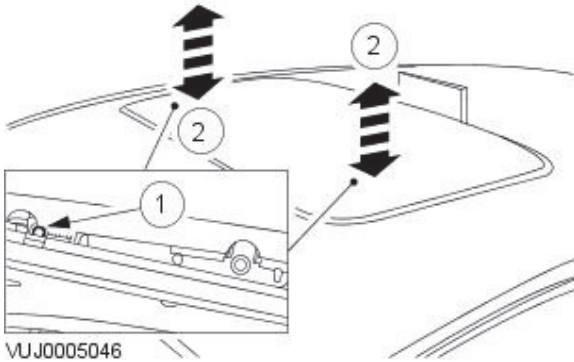
General Procedures

**1.** Place a suitable 1.0 - 1.2 mm thick plastic spacer between the roof opening panel and the roof panel.

**2.** Adjust the rear edge of the roof opening panel.

1. Loosen the rear screws on both sides.

2. Push the rear edge up/down to give correct alignment (flush to + 1 mm).

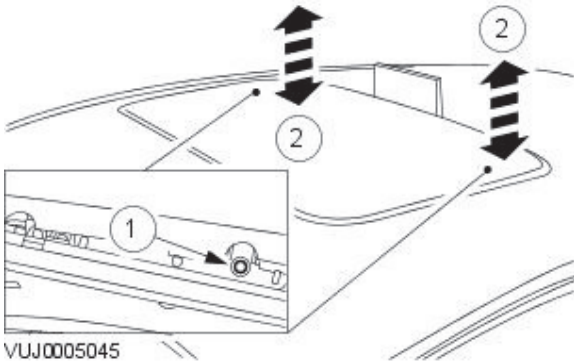


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**3.** Adjust the front edge of the roof opening panel.

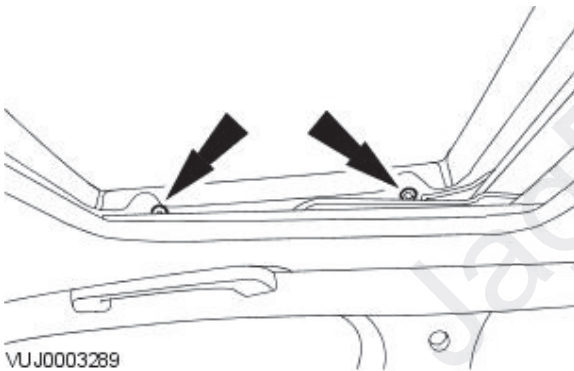
1. Loosen the front screws on both sides.

2. Push the front edge up/down to give correct alignment (flush to - 1 mm).



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**4.** Tighten to 3 Nm.



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**5.** Remove the spacer.

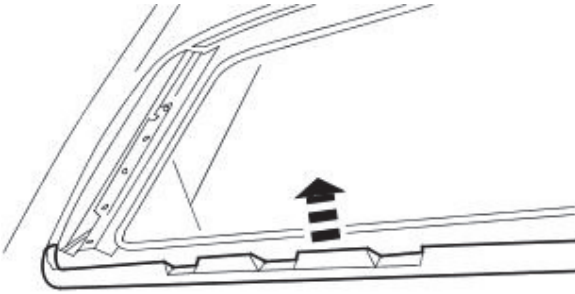


# Roof Opening Panel - Air Deflector

Removal and Installation

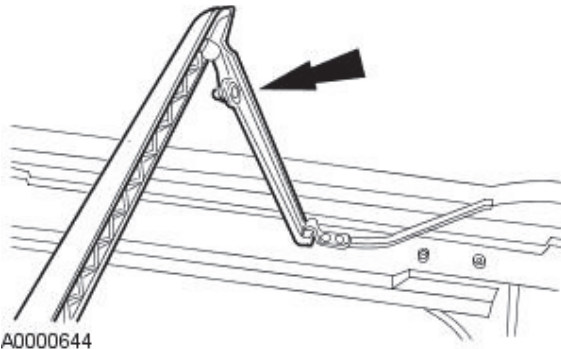
## Removal

1. Move the roof opening panel glass fully rearward.
2. Detach the air deflector.



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3. Remove the air deflector.



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## Installation

1. To install, reverse the removal procedure.

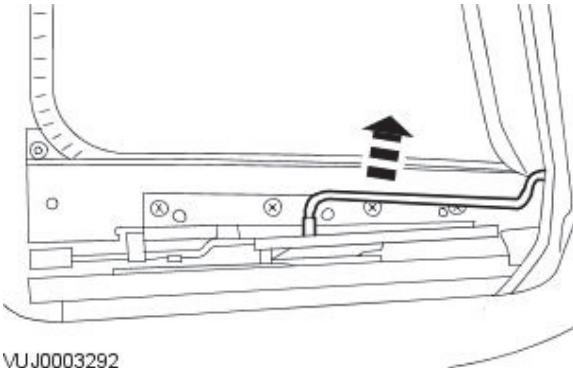
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# Roof Opening Panel - Lifter Arms

Removal and Installation

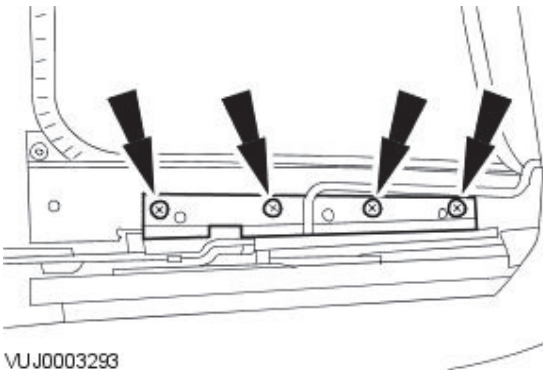
## Removal

1. Remove the roof opening panel glass. For additional information, refer to [Roof Opening Panel Glass](#).
2. Detach the control arm.



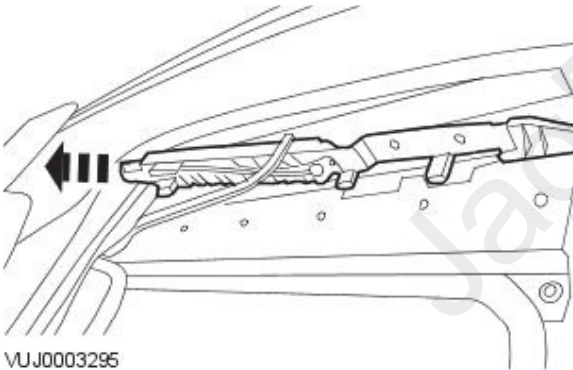
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3. Remove the lifter arm retaining plate.



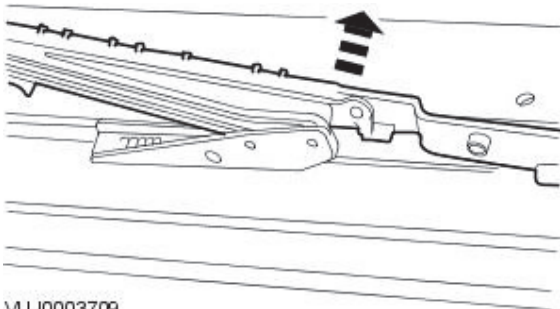
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4. Detach the lifter arm.



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5. Remove the lifter arm.



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## Installation

1. To install, reverse the removal procedure.
2. Check, and if necessary, adjust the roof opening panel alignment. For additional information, refer to [Roof Opening Panel Alignment](#).

## Roof Opening Panel - Roof Opening Panel Control Switch

Removal and Installation

1. Remove the overhead console. For additional information, refer to Section [501-12 Instrument Panel and Console](#).

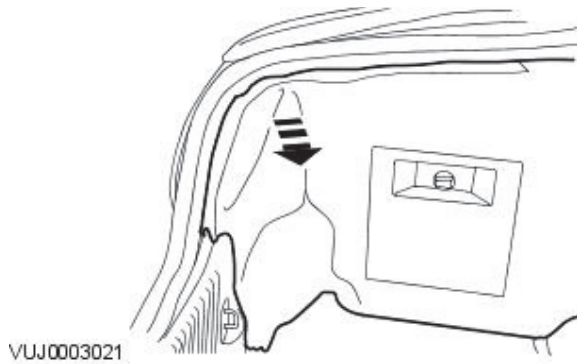
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# Roof Opening Panel - Roof Opening Panel Drain Hose

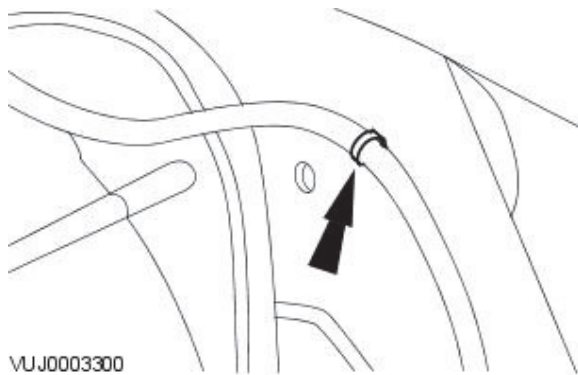
Removal and Installation

## Removal

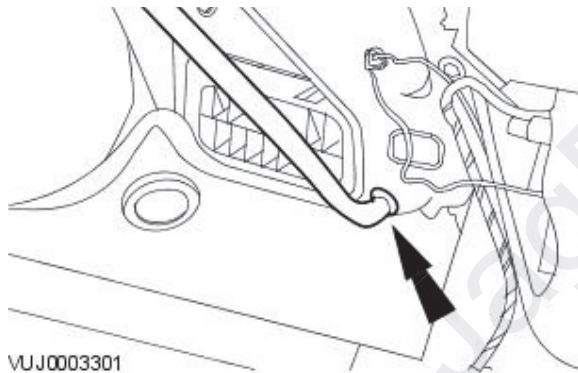
1. Detach the rear quarter trim panel.



2. Detach the drain hose from the retaining clip.

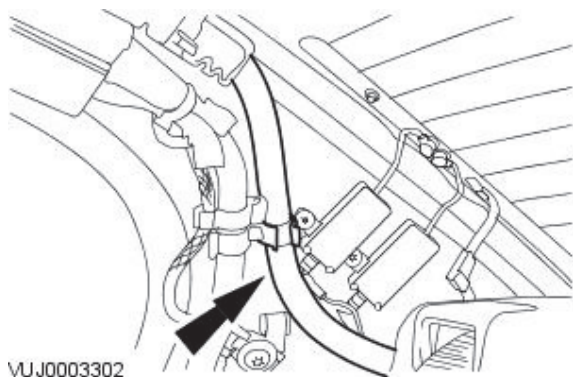


3. Detach the drain hose from the grommet.

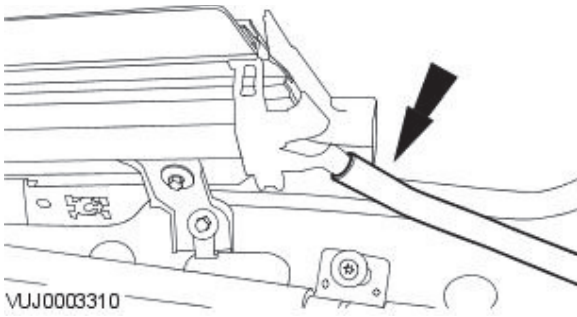


4. Remove the headliner. For additional information, refer to [Section 501-05 Interior Trim and Oramentation](#).

5. Detach the drain hose from the retaining clip.



6. Remove the drain hose.



### Installation

1. To install, reverse the removal procedure.

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# Roof Opening Panel - Roof Opening Panel Frame

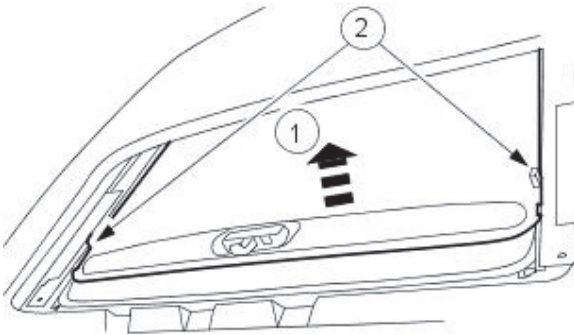
Removal and Installation

## Removal

**1.** Remove the roof opening panel glass. For additional information, refer to [Roof Opening Panel Glass](#).

**2.** Detach the roof opening panel shield.

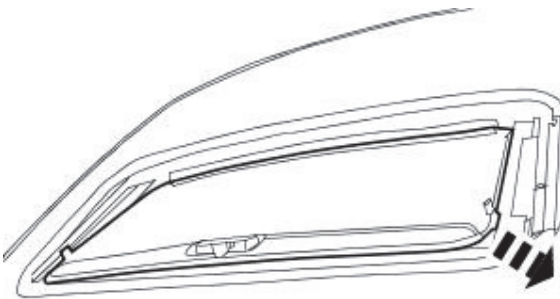
1. Position the center of the roof opening panel shield upwards.
2. Detach the roof opening panel shield guide pads.



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**3.** Remove the roof opening panel shield.

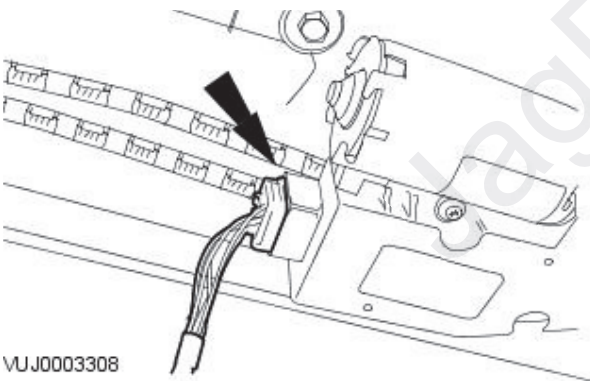
- Rotate the roof opening panel shield.



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**4.** Remove the headliner. For additional information refer to Section [501-05 Interior Trim and Oramentation](#).

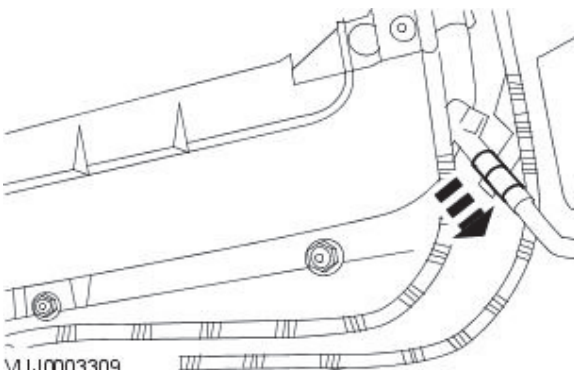
**5.** Disconnect the roof opening panel motor electrical connector.



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**6.** Detach the roof opening panel front drain hoses.

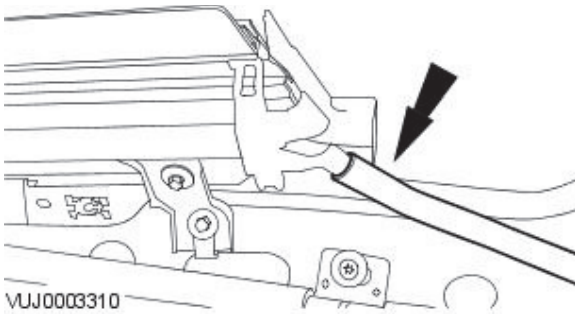
- Right-hand side shown, left-hand side similar.



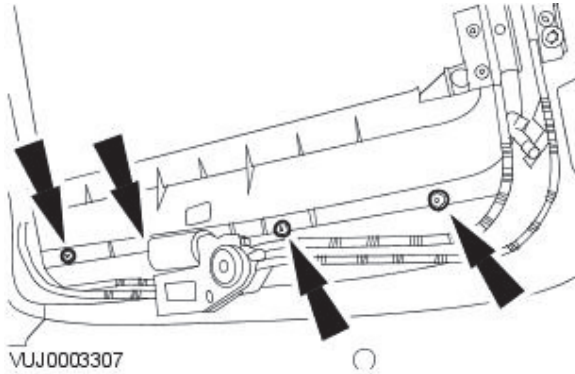
VUJ0003309

7. Detach the roof opening panel rear drain hoses.

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

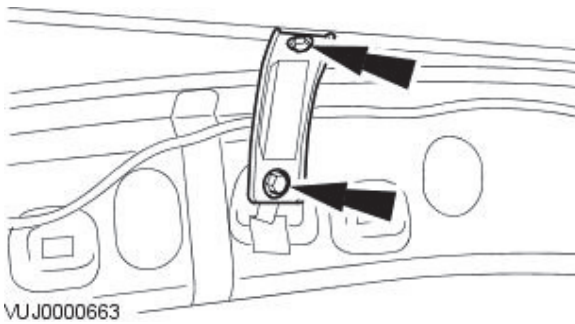


8. Detach the roof opening panel frame.



9. Remove the roof opening panel frame retaining brackets.

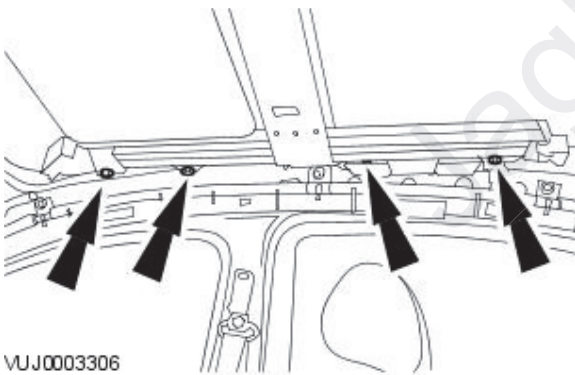
- Right-hand side shown, left-hand side similar.



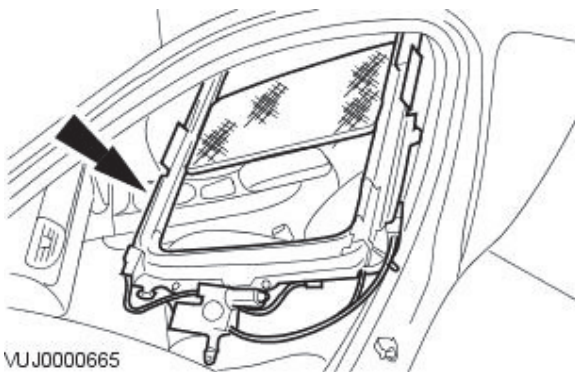
10.  CAUTION: Take care to support roof opening panel frame as final bolts are removed.

Detach the roof opening panel frame.

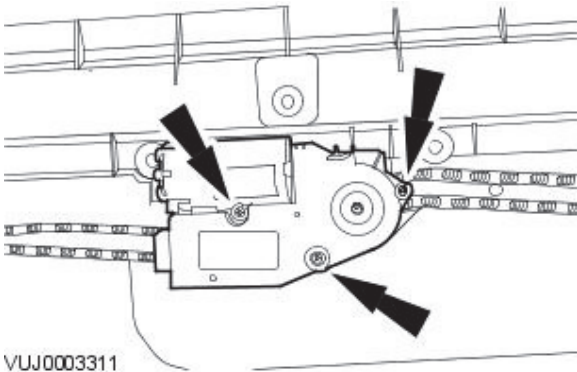
- Right-hand side shown, left-hand side similar.



11. Remove the roof opening panel frame.

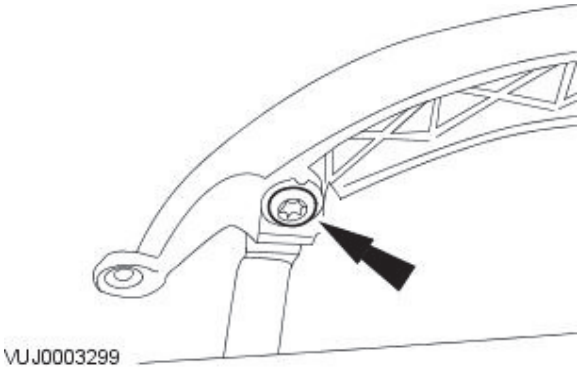


12. Remove the roof opening panel motor.



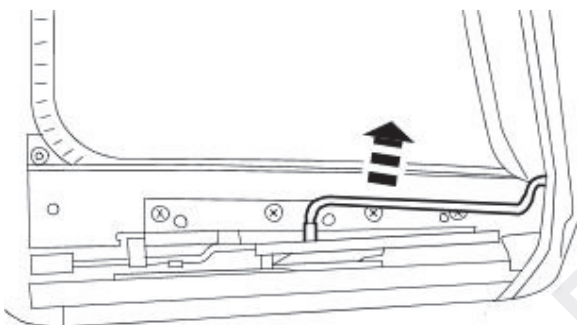
13. Remove the air deflector.

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



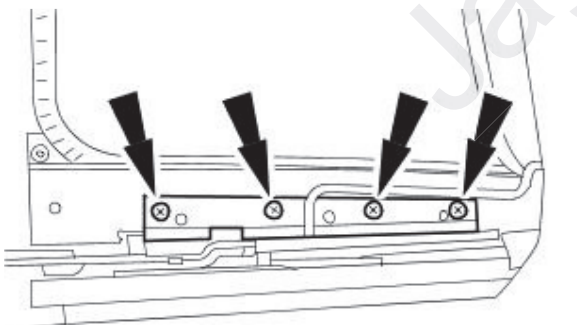
14. Detach the control arms.

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



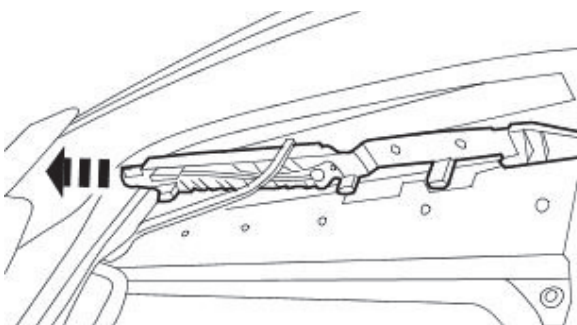
15. Remove the lifter arm retaining plates.

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



16. Detach the lifter arms.

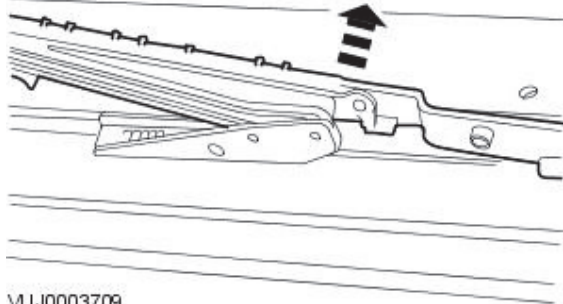
- Right-hand side shown, left-hand side similar.





17. Remove the lifter arms.

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

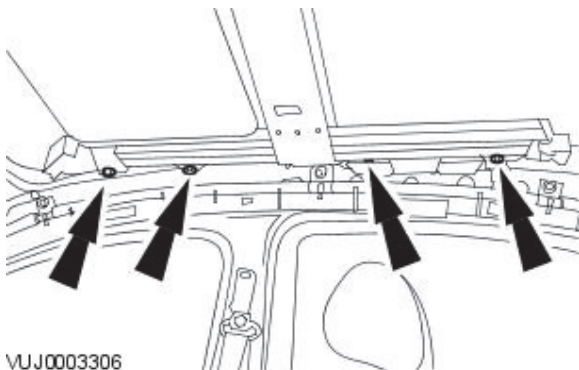


VUJ0003709

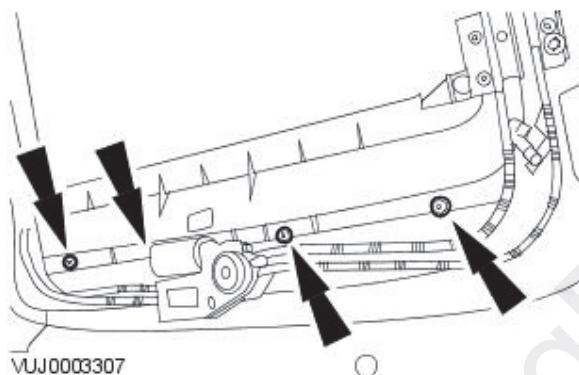
### Installation

1. To install, reverse the removal procedure.

- Tighten to 9 Nm.

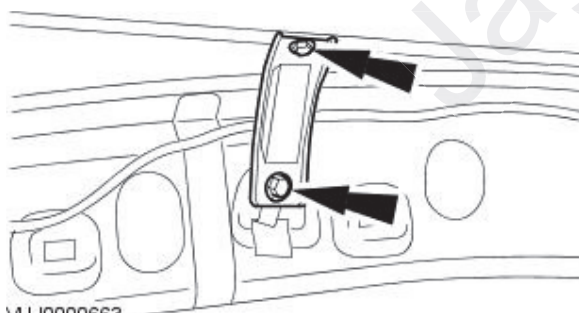


VUJ0003306



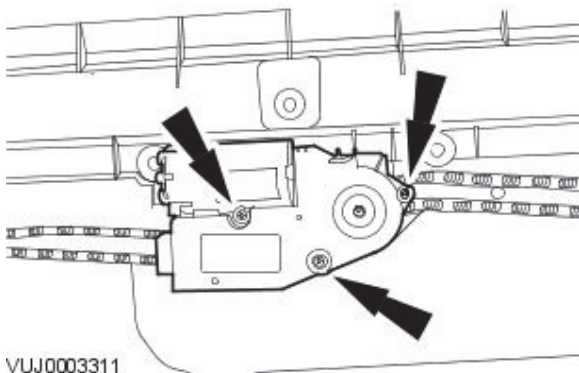
VUJ0003307

2. Tighten to 9 Nm.




VUJ0000663

3. Tighten to 9 Nm.



VUJ0003311

4. Tighten to 3 Nm.

**5.**  CAUTION: If motor oscillation is detected, loosen the motor screws, operate the roof opening panel, then retighten the motor screws. If necessary repeat this procedure.

Synchronize the roof opening panel motor. Refer to [Motor Synchronization—Calibration](#).

**6.** Check, and if necessary, adjust the roof opening panel alignment. For additional information, refer to [Roof Opening Panel Alignment](#).

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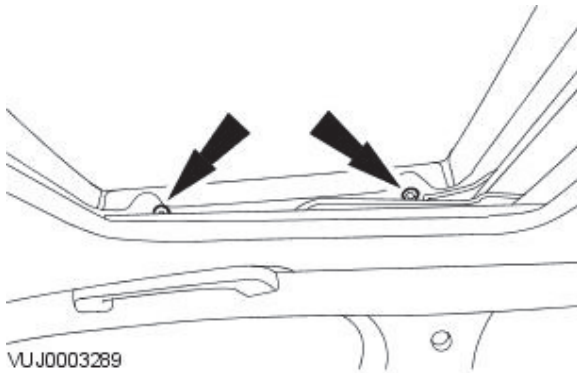
# Roof Opening Panel - Roof Opening Panel Glass

## Removal and Installation

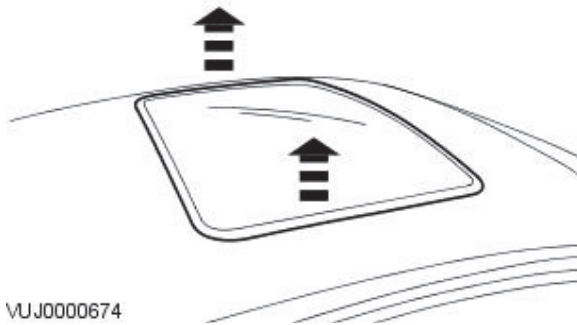
### Removal

- NOTE: Make sure the roof opening panel glass is in the closed position.

1. Remove the roof opening panel glass screws.

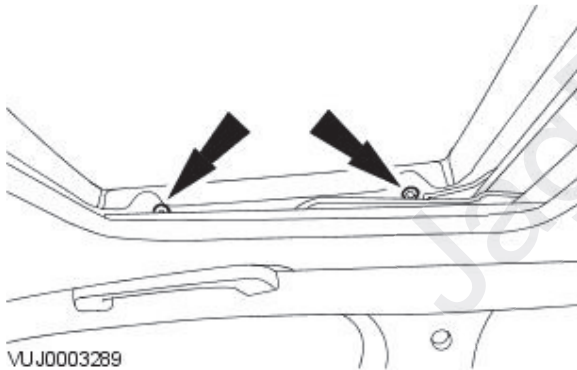


2. Remove the roof opening panel glass.



### Installation

1. To install, reverse the removal procedure.
  - Tighten to 3 Nm.



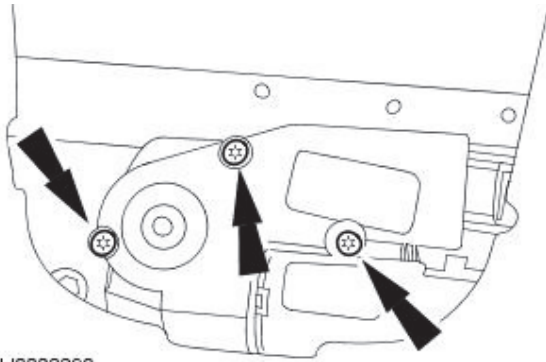
2. Check, and if necessary, adjust the roof opening panel alignment. For additional information, refer to [Roof Opening Panel Alignment](#).

# Roof Opening Panel - Roof Opening Panel Motor

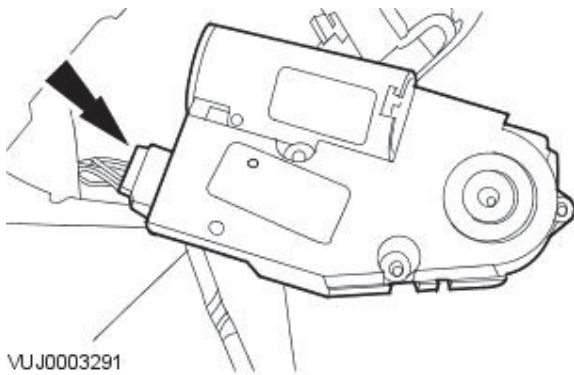
Removal and Installation

## Removal

1. Remove the overhead console. For additional information, refer to Section [501-12 Instrument Panel and Console](#).
2. Detach the roof opening panel motor.




VUJ0003290



VUJ0003291

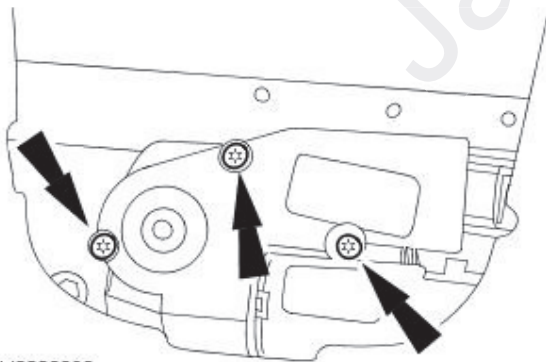
3. Remove the roof opening panel motor.
  - Disconnect the electrical connector.

## Installation

1.  **CAUTION:** If motor oscillation is detected, loosen the motor screws, operate the roof opening panel, then retighten the motor screws. If necessary repeat this procedure.

Synchronize the roof opening panel motor. Refer to [Motor Synchronization—Calibration](#).

2. To install, reverse the removal procedure.
  - Tighten to 3 Nm.



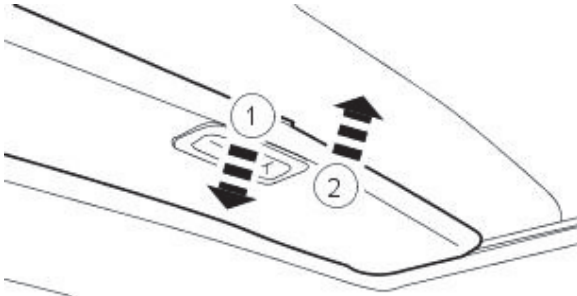
VUJ0003290

# Roof Opening Panel - Roof Opening Panel Shield

Removal and Installation

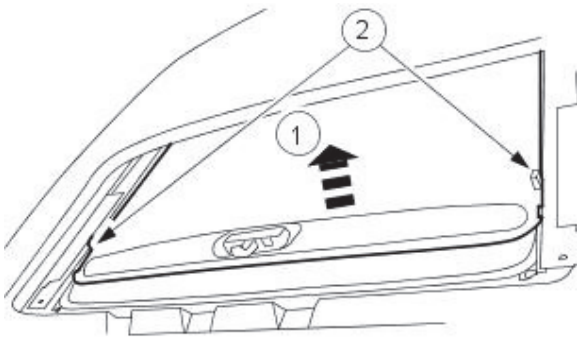
## Removal

1. Partially open the roof opening panel.
2. Detach the front of the roof opening panel shield.
  1. Position the center of the roof opening panel shield downwards.
  2. Position the roof opening panel shield forwards.



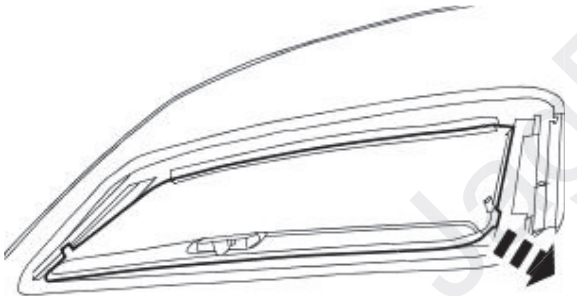
VUJ0003303

3. Fully open the roof opening panel.
4. Detach the roof opening panel shield.
  1. Position the center of the roof opening panel shield upwards.
  2. Detach the roof opening panel shield guide pads.




VUJ0003304

5. Remove the roof opening panel shield.
  - Rotate the roof opening panel shield.



VUJ0003305

## Installation

1.  **CAUTION:** To prevent damage to the roof opening panel shield use a steel rule to compress the guide pads.

To install reverse the removal procedure.

# Roof Opening Panel - Roof Opening Panel Weatherstrip

Removal and Installation

## Removal

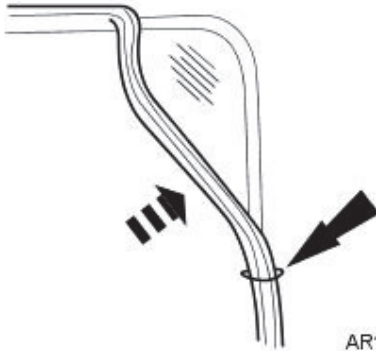
1. Remove the roof opening panel glass. For additional information, refer to [Roof Opening Panel Glass](#).
2. Remove the roof opening panel glass seal.

## Installation

1.  CAUTION: Make sure the roof opening panel glass seal is fully seated in the glass channel.

To install, reverse the removal procedure.

- Position the roof opening panel seal seam in the center of the rear facing side of the roof opening glass.



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