

2000-04 ACCESSORIES & EQUIPMENT**Power Windows - X5****DESCRIPTION & OPERATION**

WARNING: Vehicles are equipped with air bag supplemental restraint system. Before attempting ANY repairs involving steering column, instrument panel, door panels or related components, see **SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES - BMW** article in **GENERAL INFORMATION** before disconnecting battery.

POWER WINDOW SYSTEM

The power window operation on the X5 is similar to previous systems. Features of the system include:

- Control of the front and rear door window motors is carried out directly by the General Module (GM).
- One-touch operation in both directions on all 4 windows.
- Cable type window regulator used for all windows.
- Anti-trap detection is provided by the pressure sensitive finger guard.
- Push/pull window switches.
- The rear window switches located in the rear doors can be deactivated by pressing child lock out switch in the center console.
- Convenience closing/opening of the windows from the driver's lock cylinder or convenience opening only from the FZV (central lock receiver) remote key (FZV operation can be owner customized with the car memory function).
- Window operation with the ignition switched off until a door is opened or 16 minutes has elapsed after the key is switched off.
- Window load switching is through relays integral of the GM for rear windows and in the respective door switch block modules for the front windows.
- The current draw is monitored for end limit position.
- The maximum run time for the window motors is limited to 8 seconds, allowing motors to be switched off if the end limit load sensing fails.

CONVENIENCE OPENING/CLOSING

The GM and front door switch block modules provide the convenience open/close feature providing control of

the power windows (and sunroof) from outside the vehicle with the key in the driver's door lock. The FZV (central lock receiver) provides the same function for opening only. The anti-trap feature is active during convenience closing from the driver's door lock. The convenience open feature provides outside activation of the windows and sunroof in the same manner. If the GM receives a request to operate convenience close or open for more than 110 seconds, the function is deactivated and a fault code is stored. The car memory feature can activate and deactivate the convenience open feature from the central locking control.

DEACTIVATION OF OPERATION

Power windows are active when ignition is switched on. Initially, power windows are still operable after switching off ignition. Automatic cutout (deactivation) takes place after 16 minutes.

END-POSITION CUT-OUT

In automatic mode, the drive is switched off by way of current measurement. On reaching the end position, the drive is blocked temporarily, resulting in an increase in the power intake. This increase in power intake is detected in the door module (front windows) or in the rear module (rear windows) and the drive is switched off.

SWITCHES

Power windows are operated by means of the control switches integrated in the door modules and by the switches in the rear doors. The switches in the rear doors signal the switch status via 2 lines to the GM (ground signal). The door module for the driver's door, via which all windows can be operated, sends its data via the "P-bus" to the GM and the door module of the front passenger's door. All switches feature 2 switch stages. The window is opened or closed by slightly pressing or pulling back the switch. On releasing the switch the power window drive is switched off immediately. The second switch stage is activated by pressing or pulling beyond the first stage. The power window drive is now in automatic mode and is operated until the window is completely opened or closed. Automatic mode is cancelled by operating the switch once again.

ANTI-TRAP PROTECTION

Window anti-trap detection feature is only active in the one touch and convenience close modes of operation. If the window switch is pushed/pulled and held, the anti-trap feature will not function. The rubber pressure guard located at the top edge of each door frame consists of 2 contact strips that close when subjected to pressure. This provides anti-trap detection and signal generation to the general module. When the contact strip closes, the window immediately reverses direction as with previous anti-trap systems. The contact strip does not require that the anti-trap feature be initialized prior to operation. The pressure sensor finger guard has a resistance of 3.0 k/ohms and it is monitored for an open circuit. When pressed, the monitored resistance changes to less than one k/ohm. Faults with the anti-trap system require that the window switch be held to close the window.

TESTING

BMW troubleshooting charts, guides and aids for diagnosis are integrated into BMW service tools. BMW does not have stand-alone guides for trouble shooting. All OBD-II equipped BMWs are designed to be programmed and coded electronically. Diagnosis, coding, and programming on any BMW from 1996 to present may be carried out with BMW's Group Tester One (GT1) service tool.

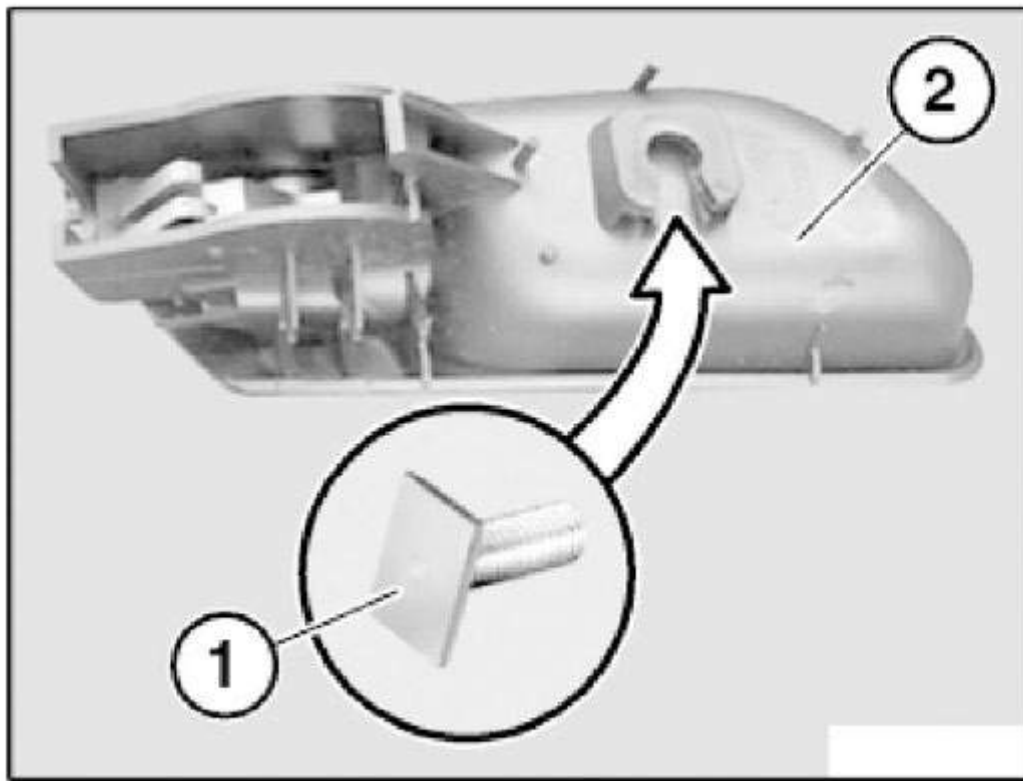
REMOVAL & INSTALLATION

AIR BAG MODULE (FRONT DOOR)

NOTE: Vehicles are equipped with air bag supplemental restraint system. Before attempting ANY repairs involving steering column, instrument panel, door panels or related components, see **SERVICE PRECAUTIONS** and **DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

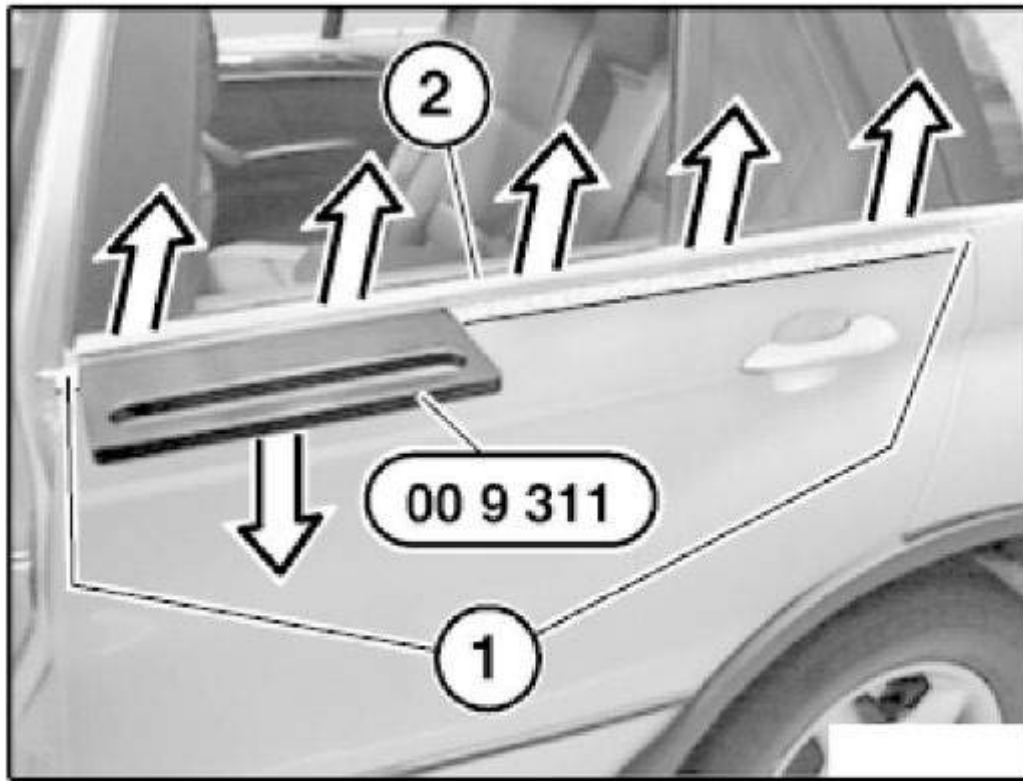
Removal

Remove front door trim panel. See **DOOR TRIM PANEL (FRONT)** . Remove screws on air bag module. See **Fig. 1** . Remove air bag module. Disconnect electrical connection on air bag module. See **Fig. 2** .



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Fig. 1: Removing Front Door Trim Panel & Air Bag Module
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 2: Disconnecting Electrical Connection On Air Bag Module
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

To install, reverse removal procedure. Replace microencapsulated screws. Tighten to specification. See **TORQUE SPECIFICATIONS** .

AIR BAG MODULE (REAR DOOR)

NOTE: Vehicles are equipped with air bag supplemental restraint system. Before attempting ANY repairs involving steering column, instrument panel, door panels or related components, see SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM in appropriate AIR BAG RESTRAINT SYSTEMS article.

Removal

Remove rear door trim panel. See **DOOR TRIM PANEL (REAR)** . Disconnect electrical connection on air bag module. Remove screws. Remove air bag module.

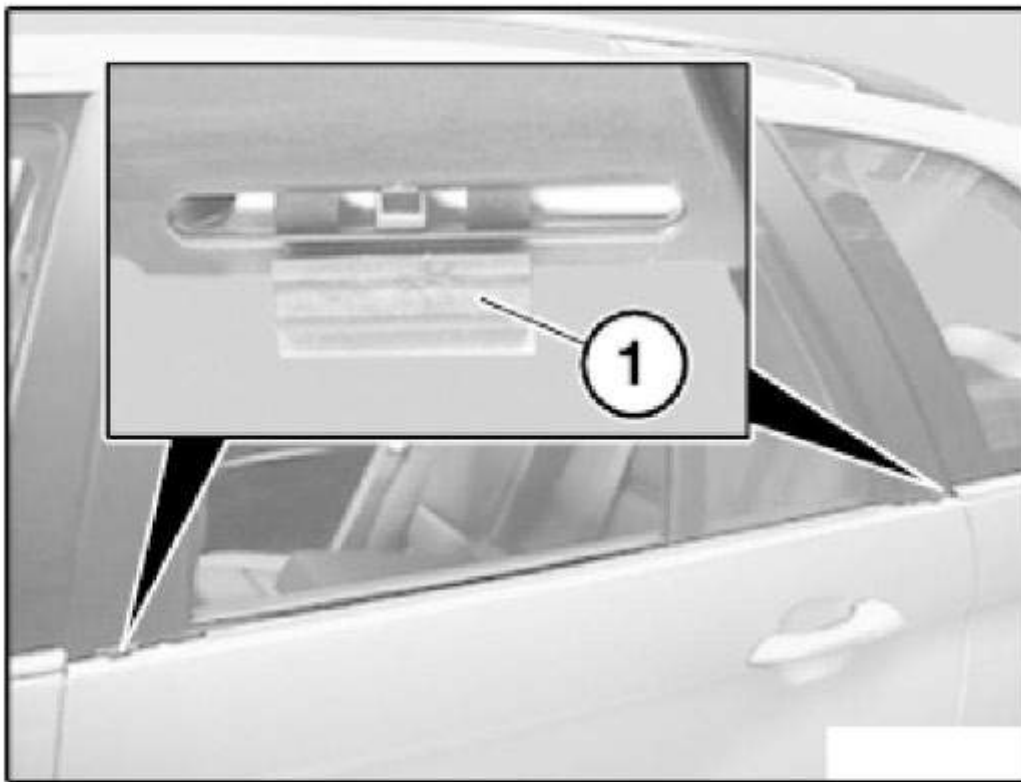
Installation

To install, reverse removal procedure. Replace microencapsulated screws. Tighten to specification. See **TORQUE SPECIFICATIONS** .

DOOR HANDLE COVER

Removal & Installation

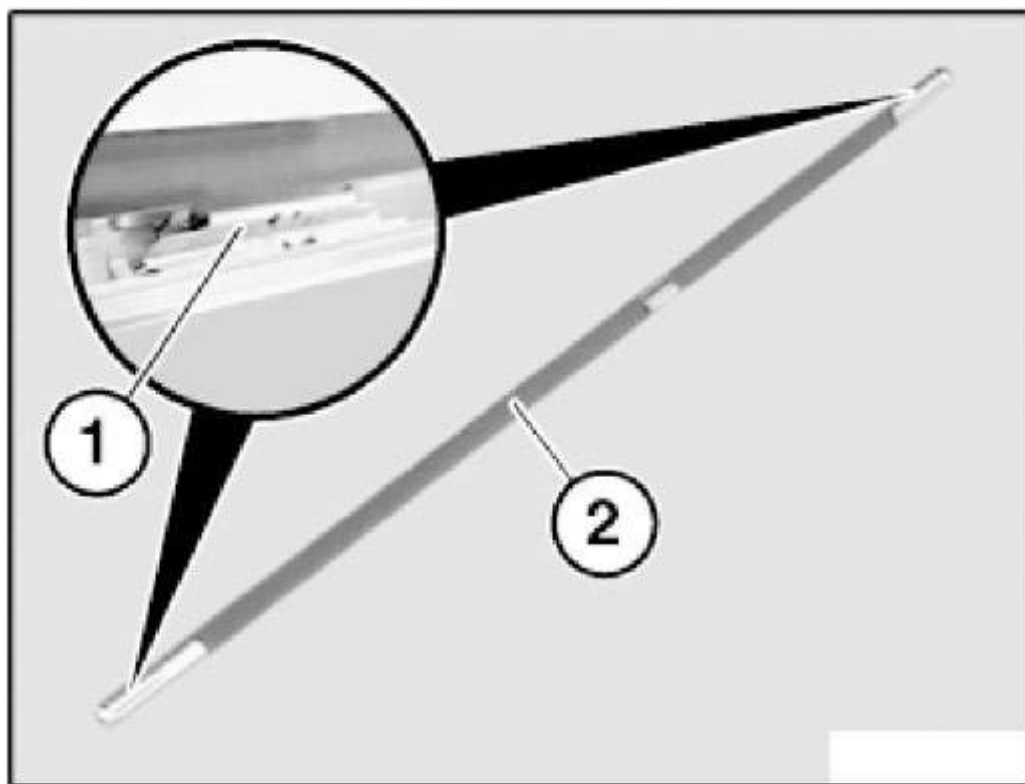
Pry out cover with Trim Panel Wedge (009317). See **Fig. 3** . On front doors, pry out toggle switch unit in direction of arrow. See **Fig. 4** . Disconnect electrical connectors. On rear door, pry out toggle switch unit in direction of arrow. See **Fig. 5** . Disconnect electrical connection. To install, reverse removal procedure. Ensure catches on cover are not damaged. See **Fig. 6** .



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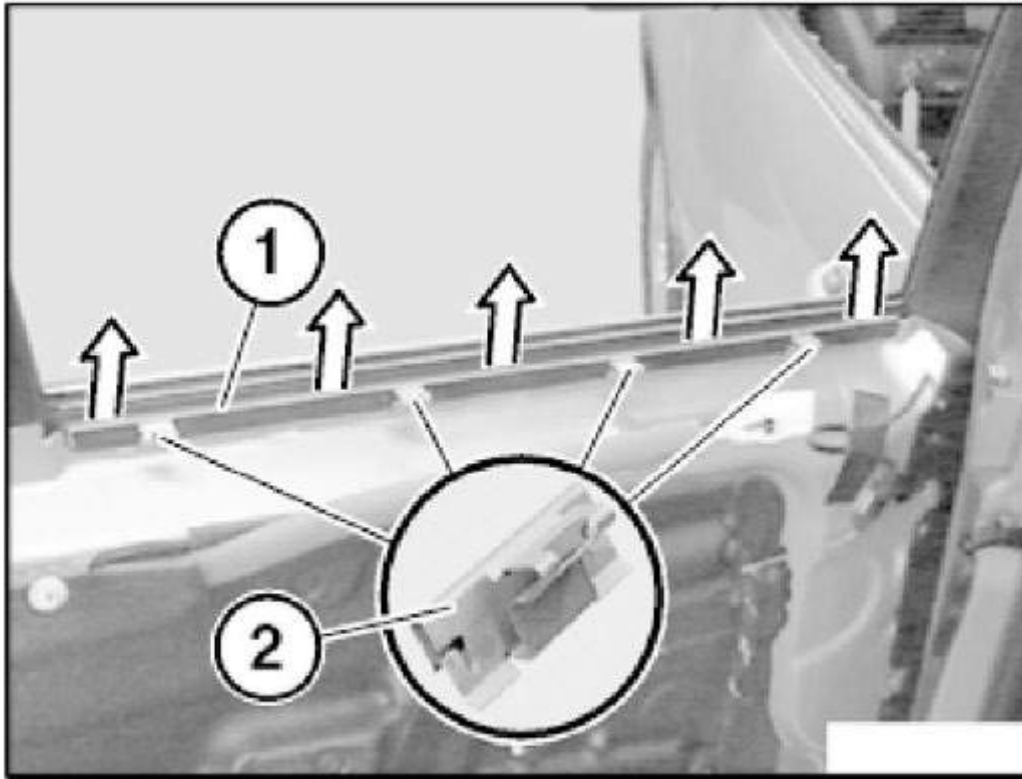
Fig. 3: Prying Out Cover With Trim Panel Wedge

Courtesy of BMW OF NORTH AMERICA, INC.



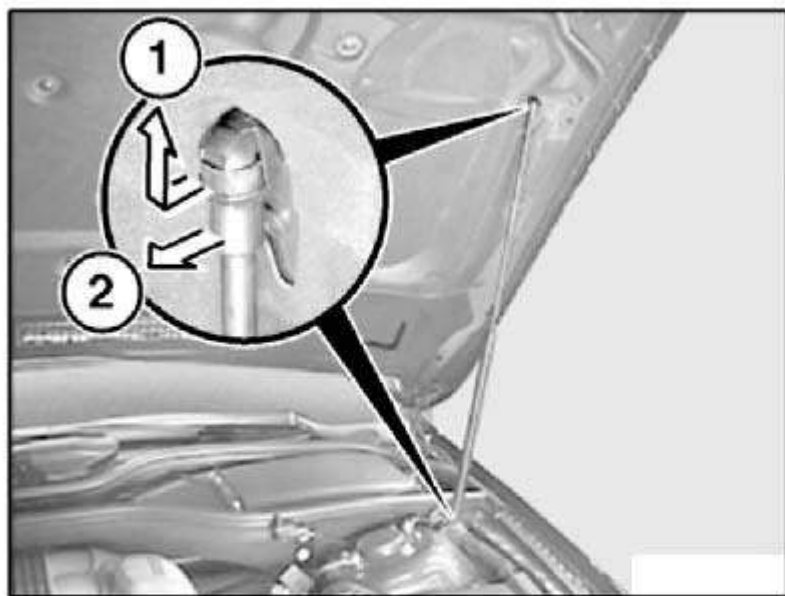
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Fig. 4: Prying Out Toggle Switch Unit (Front Door)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 5: Prying Out Toggle Switch Unit (Rear Door)
Courtesy of BMW OF NORTH AMERICA, INC.



1. Push retainer spring to end of gas spring strut
2. Remove gas spring strut from ball head.

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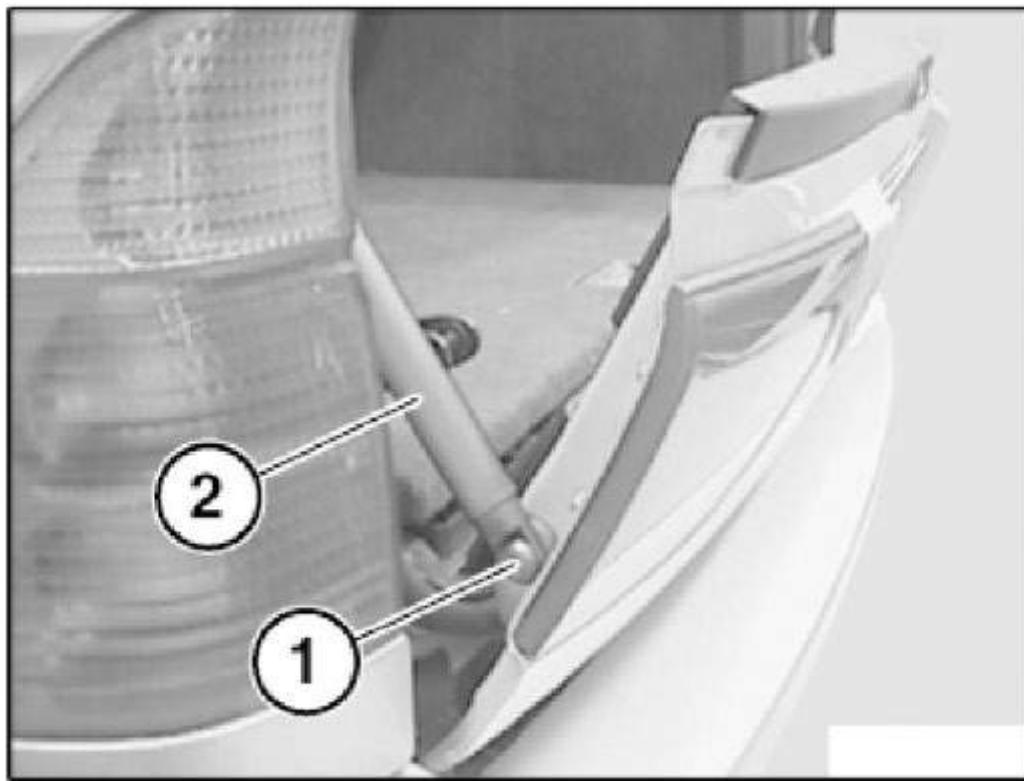
Fig. 6: Ensuring Catches On Cover Are Not Damaged
Courtesy of BMW OF NORTH AMERICA, INC.

DOOR TRIM PANEL DOOR HANDLE (FRONT)

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES - BMW** article in **GENERAL INFORMATION** before disconnecting battery.

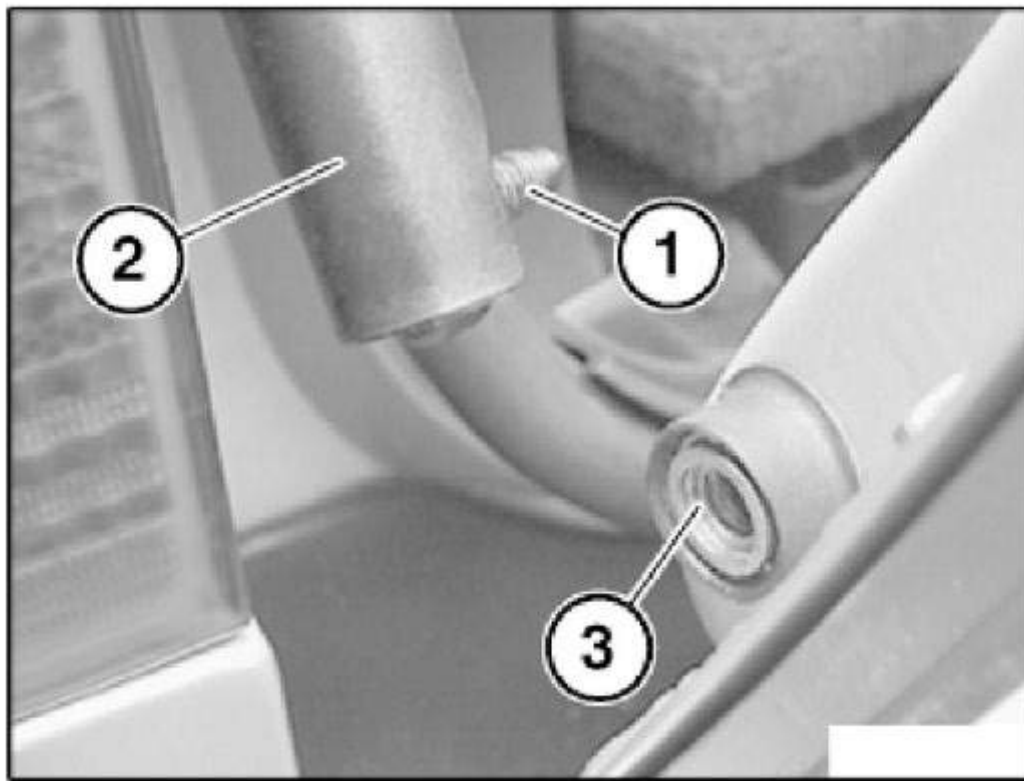
Removal & Installation

Remove front door trim panel. See **DOOR TRIM PANEL (FRONT)** . Remove cover on door handle. See **DOOR HANDLE COVER** . Remove screw at door panel. See **Fig. 7** . Remove screw and detach door handle from door trim panel. See **Fig. 8** . To install, reverse removal procedure. Ensure screw and sleeve on door handle are not damaged. See **Fig. 9** .



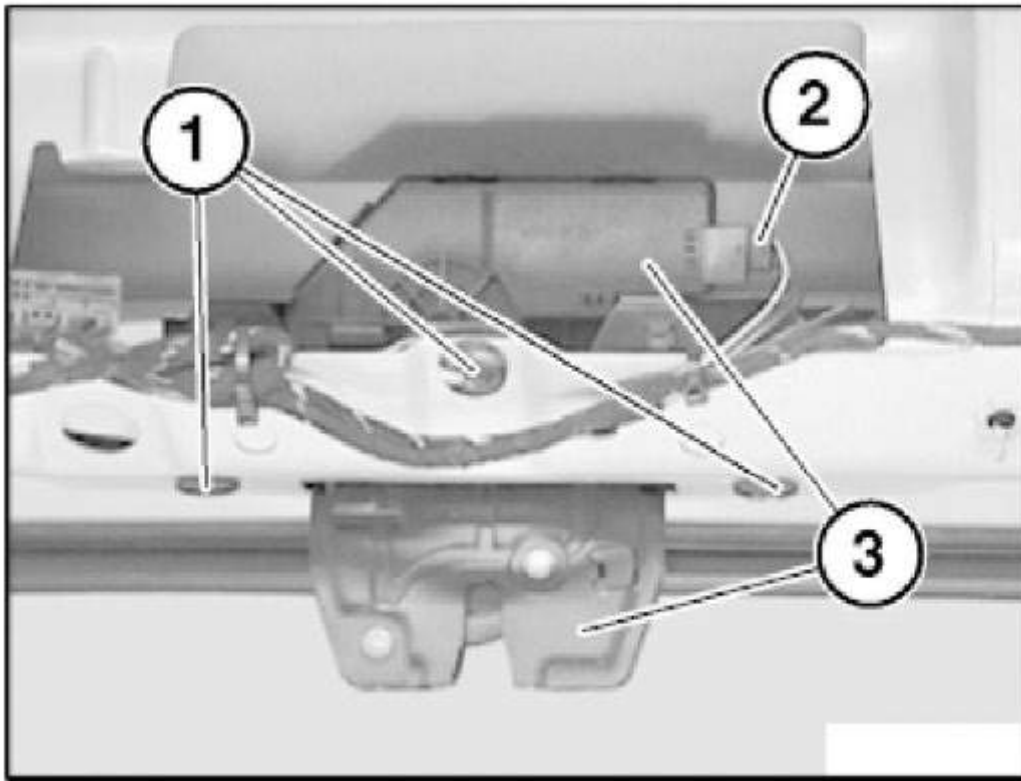
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Fig. 7: Removing Screw At Door Panel
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 8: Removing Screw & Detaching Door Handle From Door Trim Panel
Courtesy of BMW OF NORTH AMERICA, INC.



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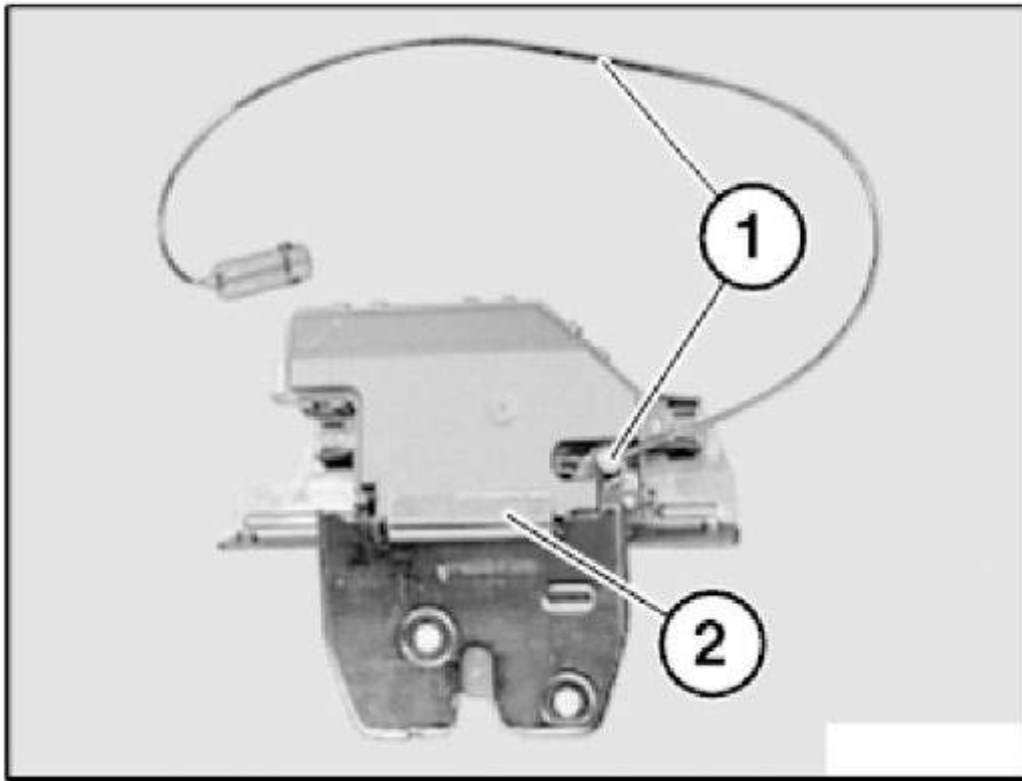
Fig. 9: Locating Screw & Sleeve On Door Handle
Courtesy of BMW OF NORTH AMERICA, INC.

DOOR TRIM PANEL (FRONT)

CAUTION: Do not use a sharp-edged tool to remove paneling as air bag damage can occur. See **SERVICE PRECAUTIONS** and **DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

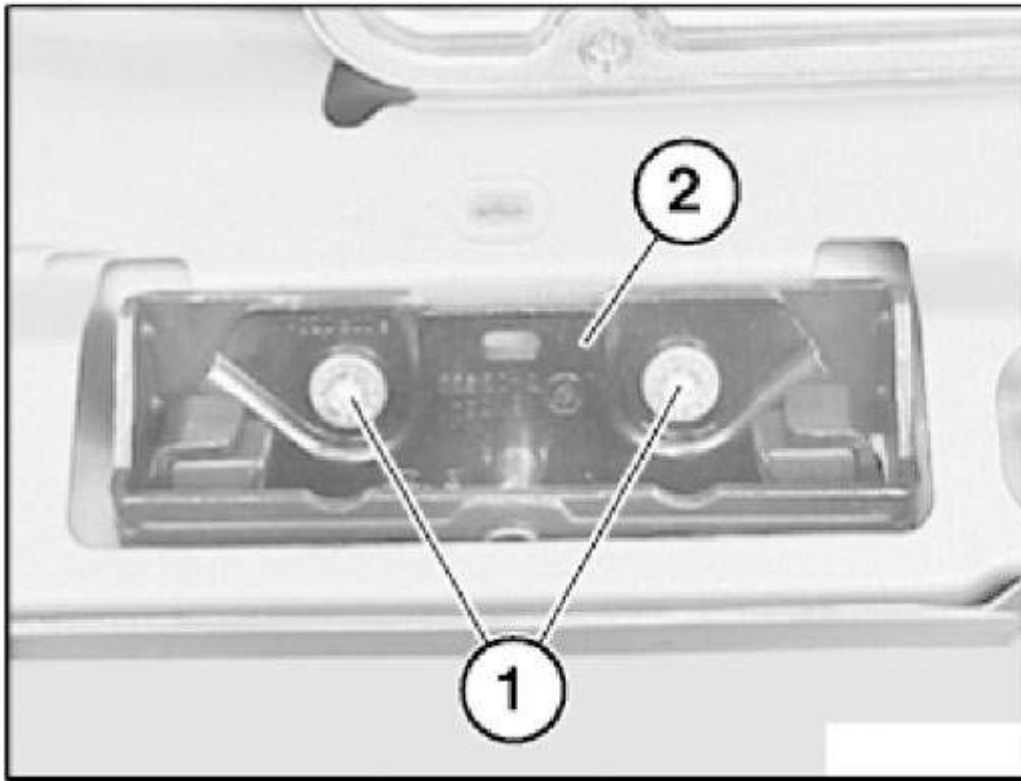
Removal

Pry off clipped-in trim (decorative strip) on door trim panel. Remove toggle switch for door window operation. See **WINDOW SWITCH ASSEMBLY**. Remove footwell light on bottom of door. Remove screws and pry out air bag label and remove screw underneath. See **Fig. 10**. Unclip door trim panel clips using Trim Panel Wedge (009317). See **Fig. 11**. Carefully unclip door trim panel at top with trim panel wedge. Feed door trim panel out of unlocking button. See **Fig. 12**. On version with lighting for inside door handle, if necessary, disconnect electrical connection on door opener. See **Fig. 13**. Unhook Bowden cable for release lever by tightening release lever, prying out lock, and detaching Bowden cable toward inside/rear. See **Fig. 14**.



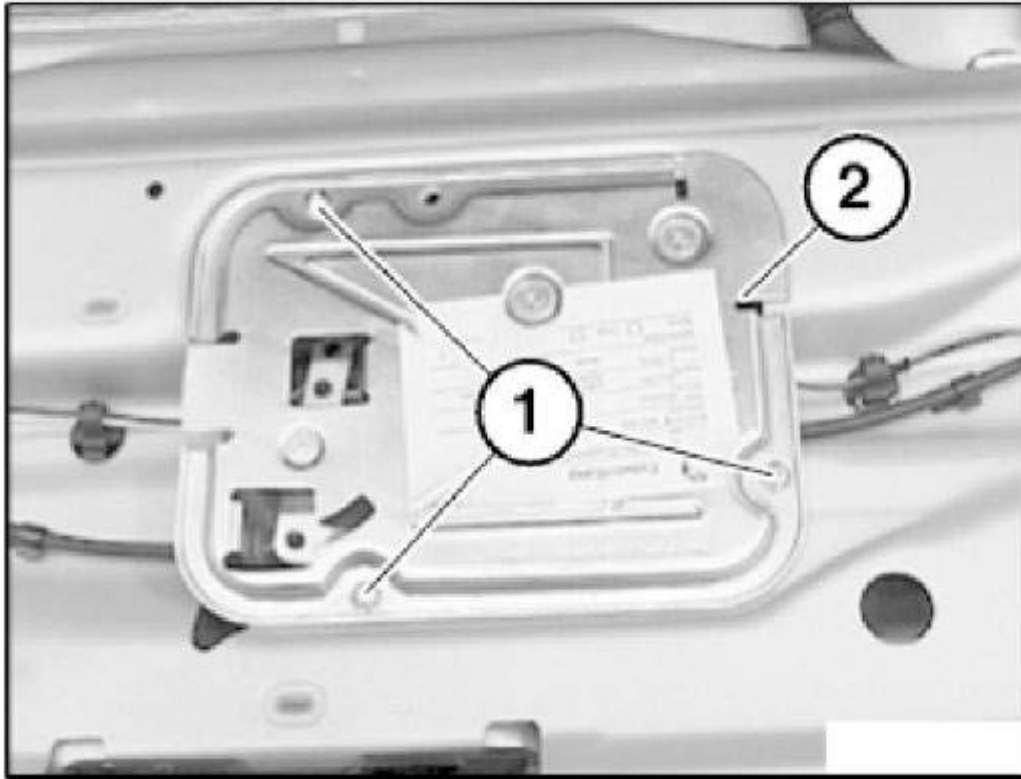
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Fig. 10: Prying Out Air Bag Label & Removing Screw Underneath (Front)
Courtesy of BMW OF NORTH AMERICA, INC.



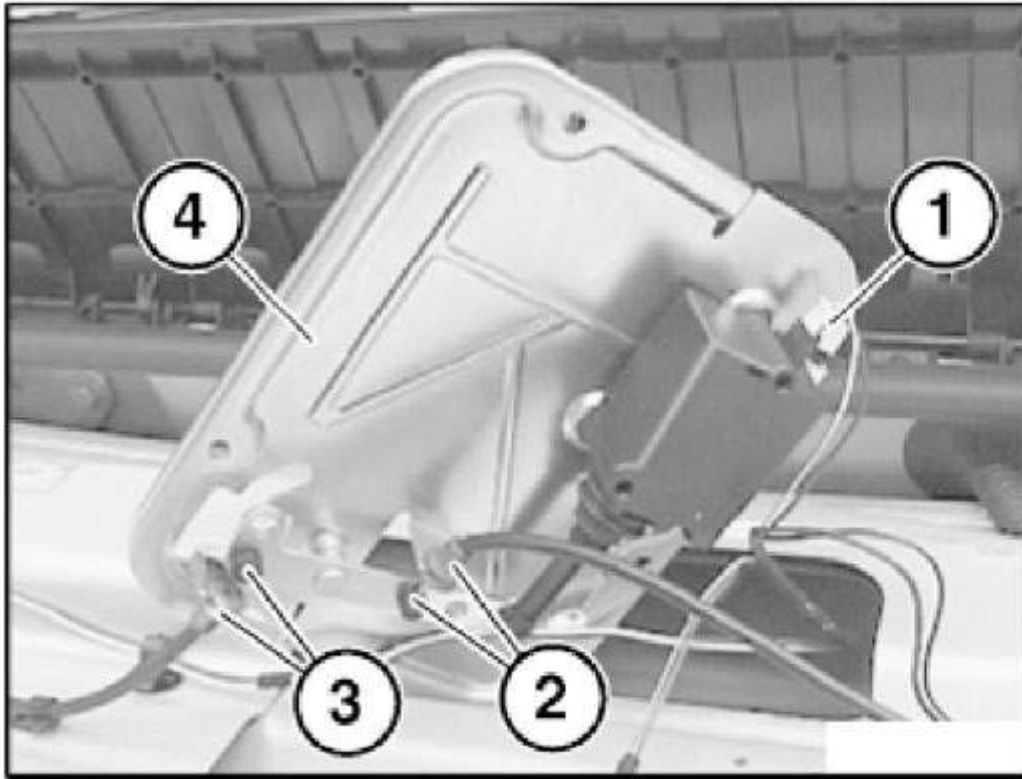
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Fig. 11: Unclipping Door Trim Panel Clips
Courtesy of BMW OF NORTH AMERICA, INC.



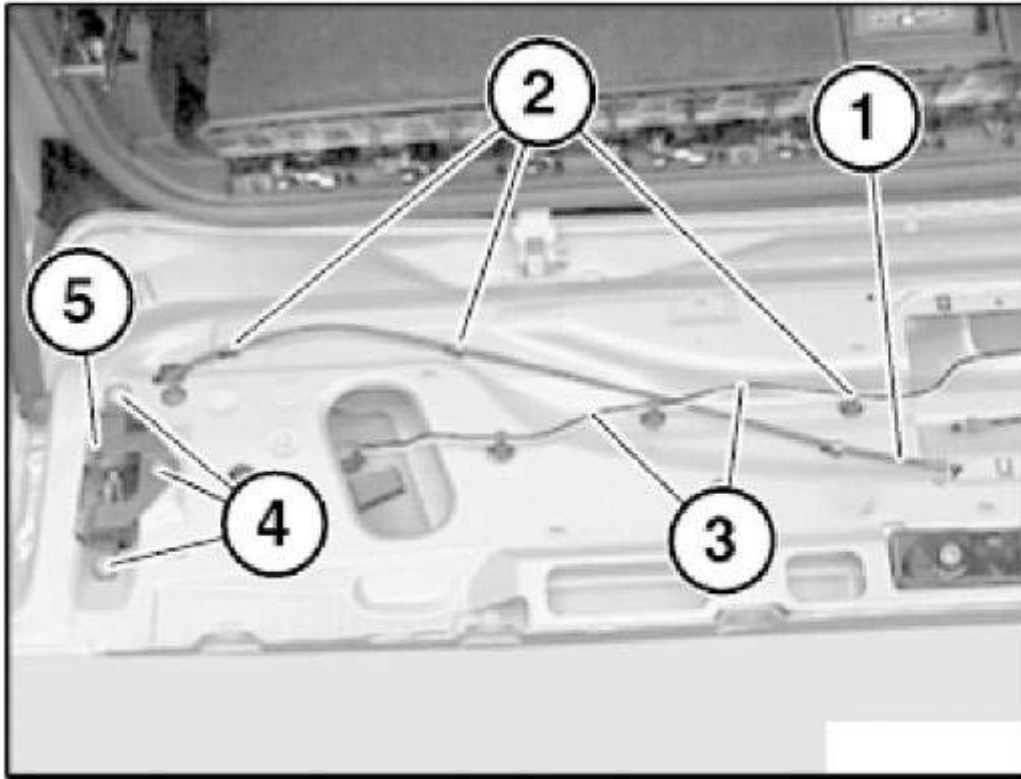
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Fig. 12: Feeding Door Trim Panel Out Of Unlocking Button
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 13: Disconnecting Door Handle Lighting Connector
Courtesy of BMW OF NORTH AMERICA, INC.

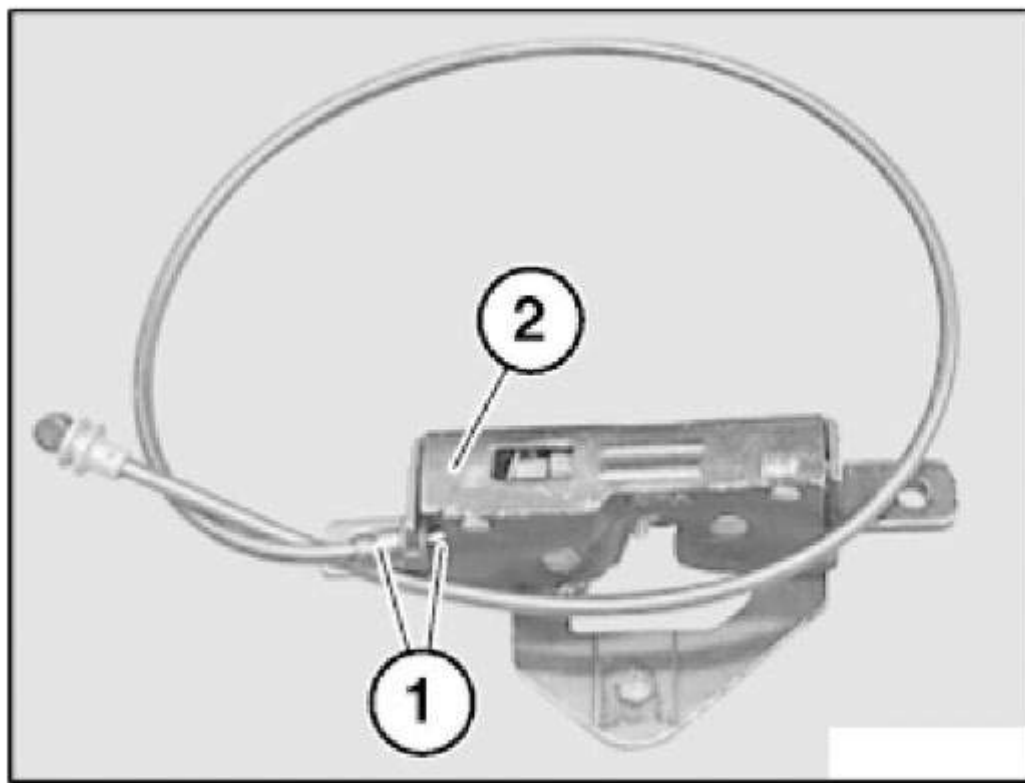


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Fig. 14: Unhooking Bowden Cable For Release Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

To install, reverse removal procedure. Bend open retainers on inner door plate for accommodating central clip. Press unlocking lever on door trim panel. Clips (1) shown in illustration are Gray and are longer than remaining clips, which are White. See **Fig. 15**. Install all clips with sealing ring. If necessary, replace faulty clips. After assembling the door trim panel open door window and car with lock with vehicle key. Check whether safety button linkage can move freely. If necessary, align linkages.



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Fig. 15: Identifying Door Panel Clips (Front)

Courtesy of BMW OF NORTH AMERICA, INC.

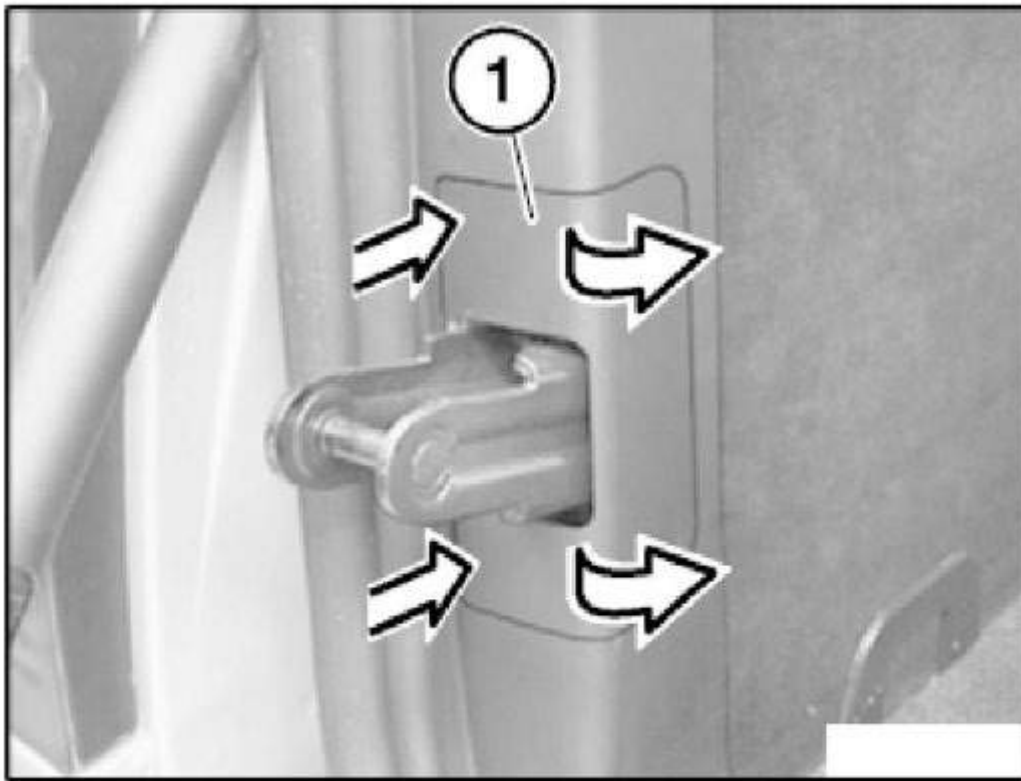
DOOR TRIM PANEL (REAR)

CAUTION: Do not use a sharp-edged tool to remove paneling as air bag damage can occur. See **SERVICE PRECAUTIONS** and **DISABLING & ACTIVATING AIR BAG SYSTEM** in appropriate **AIR BAG RESTRAINT SYSTEMS** article.

Removal

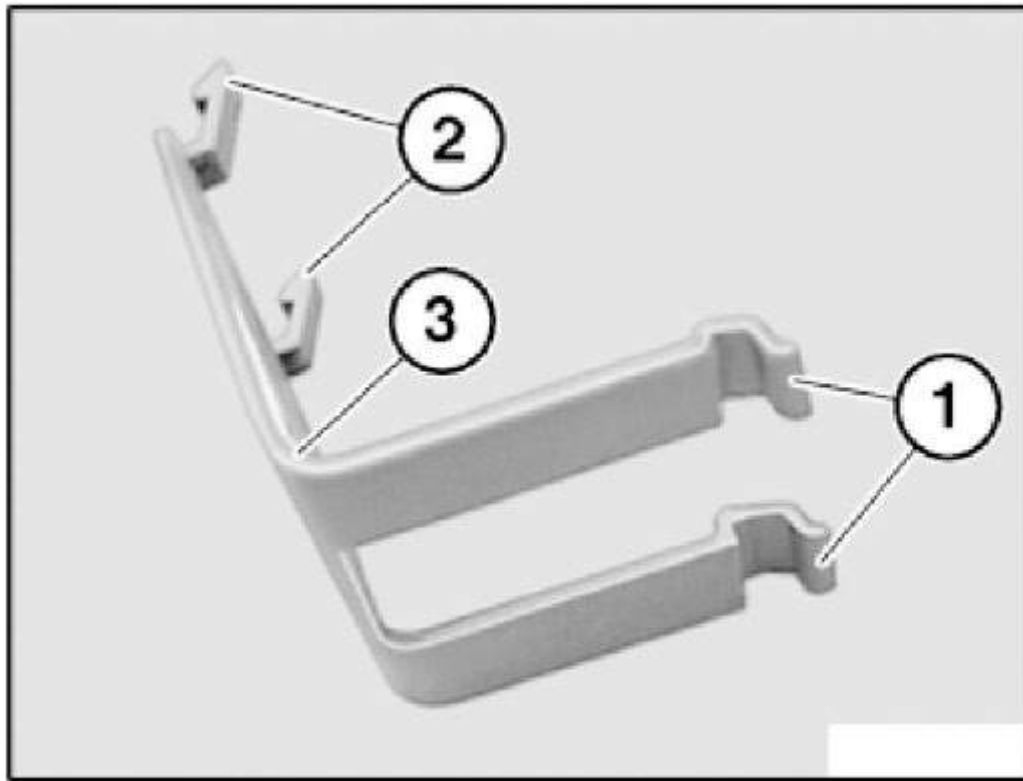
Pry off decorative strip on door trim panel. Remove toggle switch for door window operation. See **WINDOW SWITCH ASSEMBLY**. Remove footwell light on bottom of door. On vehicles with roller sun blind, remove roller sun blind on door window. See **ROLLER SUN BLIND**. See **Fig. 16**. On all vehicles, remove screws and pry out air bag label and release screw underneath. See **Fig. 17**. Unclip door panel clips with Trim Panel Wedge (009317). See **Fig. 18**. Carefully unclip door trim panel at top with trim panel wedge. See **Fig. 19**. Feed door trim panel out of unlocking button. On vehicles with lighting for inside door handle, disconnect electrical connection on inside door handle. See **Fig. 20**. On all vehicles, unhook Bowden cable for release

lever by tightening release lever and prying out lock. Detach Bowden cable toward inside/rear. See **Fig. 21** . On vehicles with additional speaker, disconnect speaker connection. See **Fig. 22** . On all models, remove door trim panel.



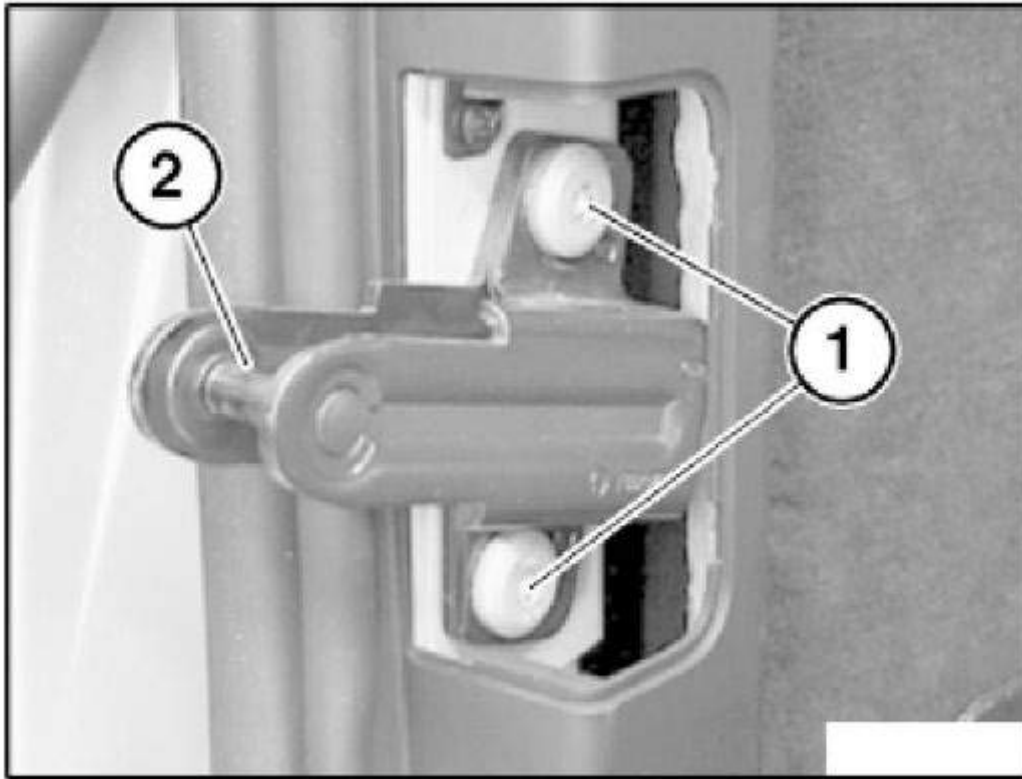
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Fig. 16: Identifying Bracket & Screw
Courtesy of BMW OF NORTH AMERICA, INC.



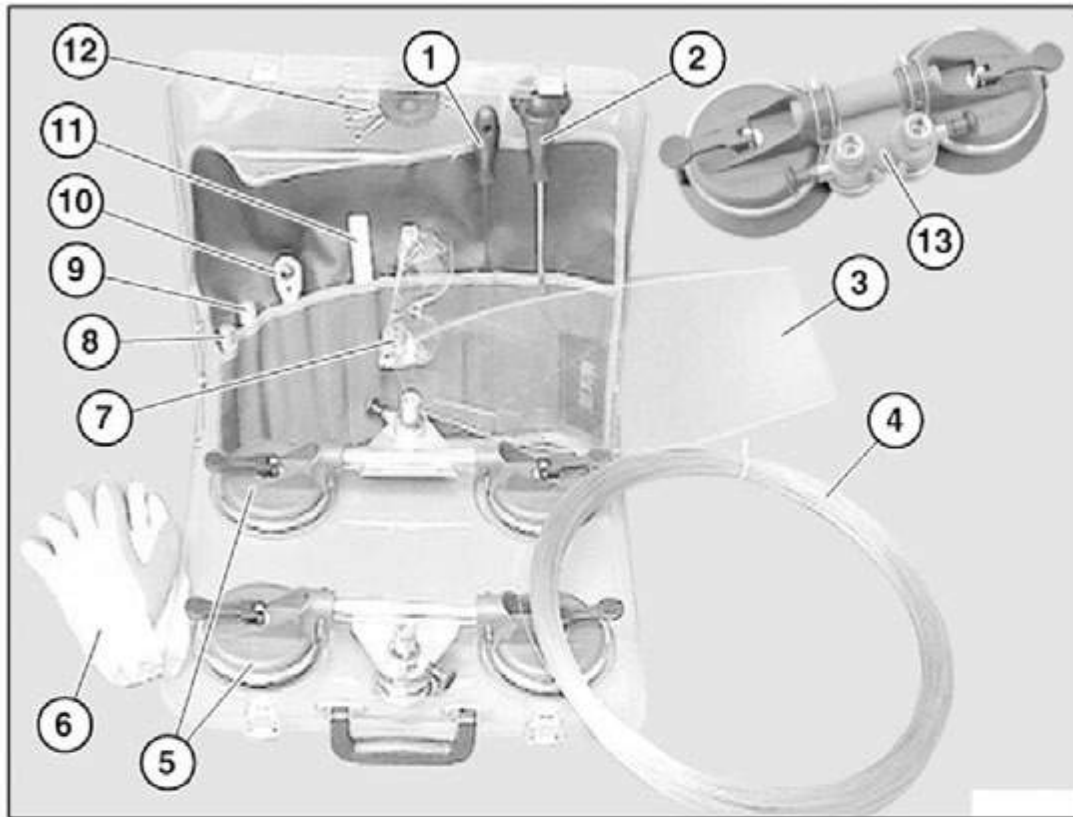
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Fig. 17: Prying Out Air Bag Label & Releasing Screw Underneath (Rear)
Courtesy of BMW OF NORTH AMERICA, INC.



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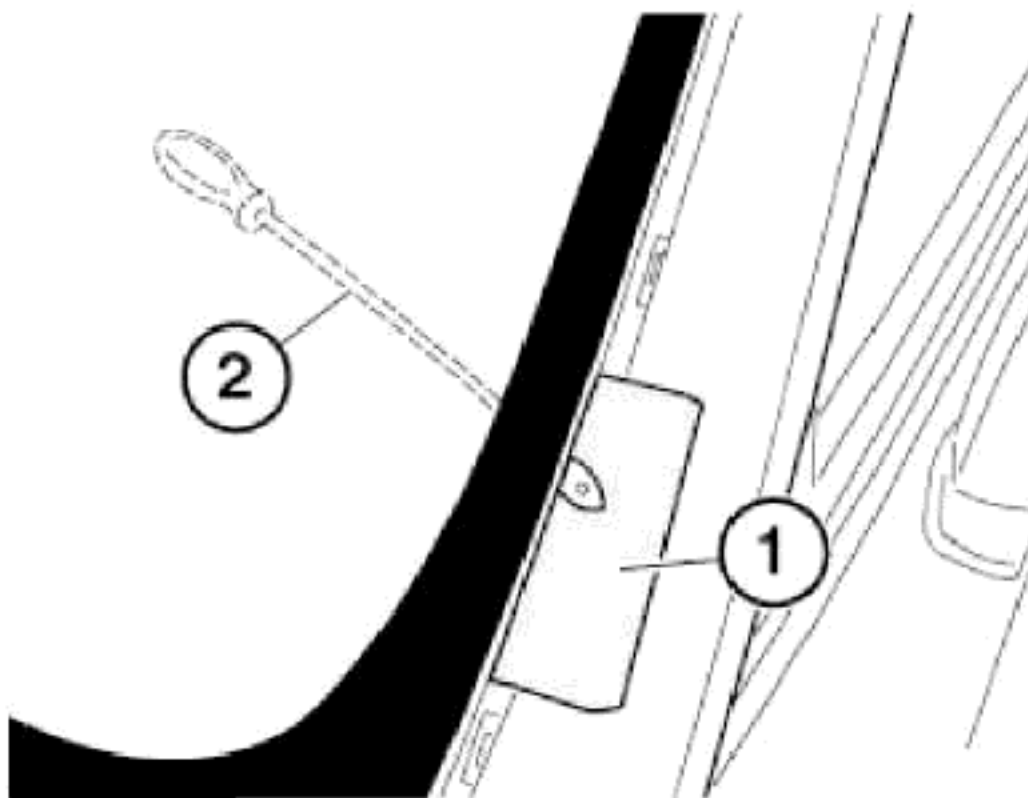
Fig. 18: Unclipping Door Panel Clips With Trim Panel Wedge
Courtesy of BMW OF NORTH AMERICA, INC.



- | | | | |
|---|---------------------|----|---------------------------|
| 1 | Wire starter | 8 | Extension (short) |
| 2 | Parabolic tool | 9 | Extension (long) |
| 3 | Plastic washer | 10 | Reversible ratchet |
| 4 | Wire cutting roller | 11 | Plastic wedge |
| 5 | Windlasses | 12 | Guide needles |
| 6 | Protective gloves | 13 | Windlass with double coil |
| 7 | Protective goggles | | |

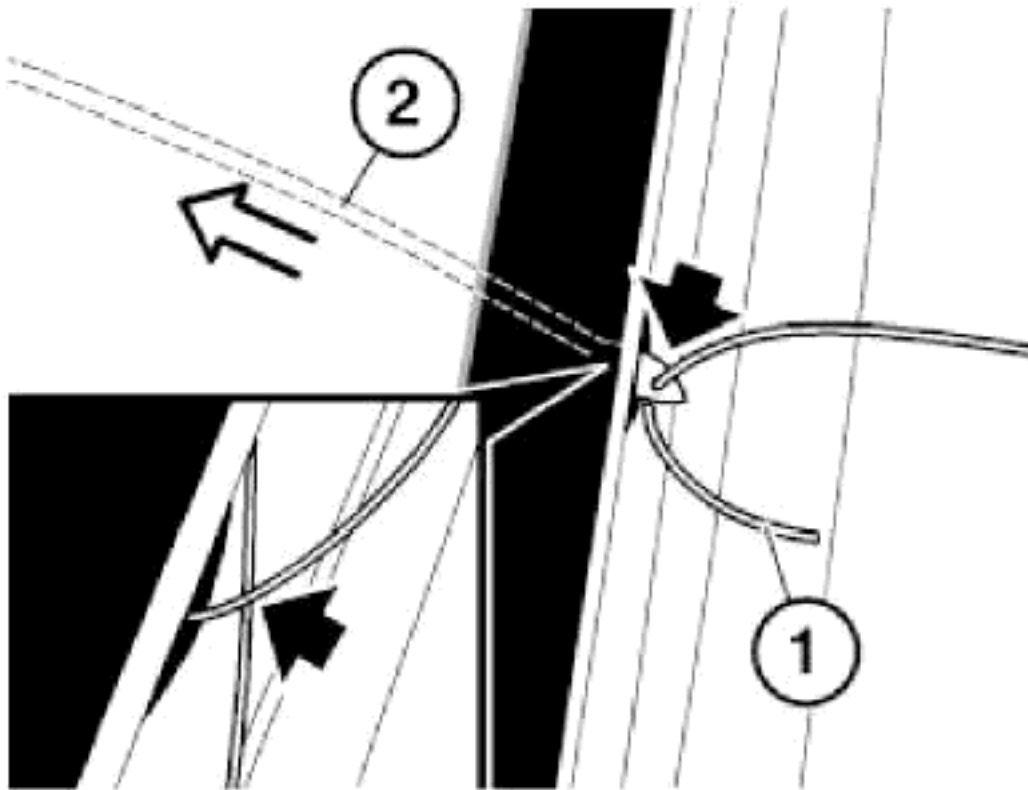
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Fig. 19: Unclipping Door Panel At Top (Removal) & Bending Open Retainers (Installation)
 Courtesy of BMW OF NORTH AMERICA, INC.



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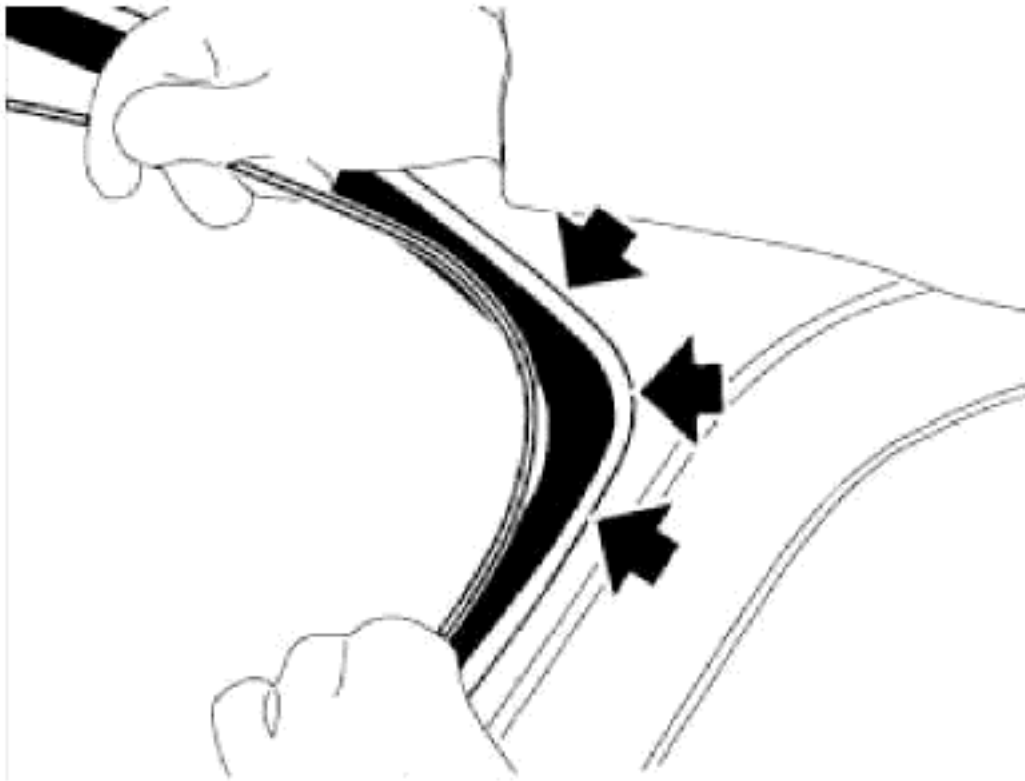
Fig. 20: Disconnecting Electrical Connection On Inside Door Handle
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 21: Removing Bowden cable

Courtesy of BMW OF NORTH AMERICA, INC.



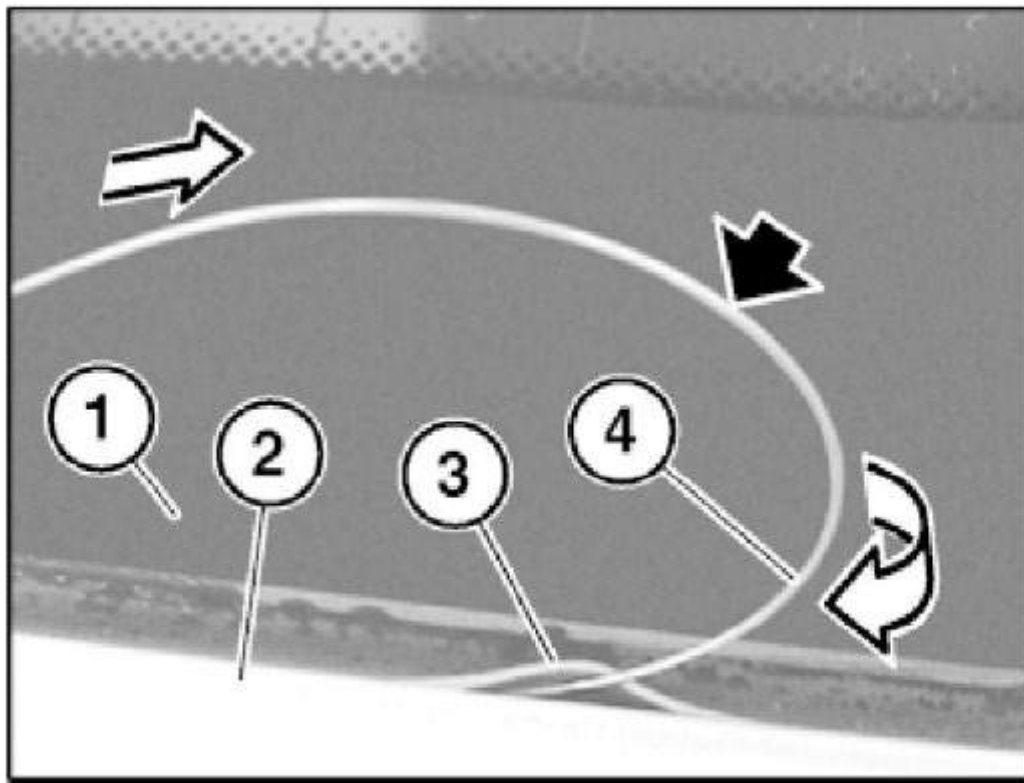
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Fig. 22: Removing Speaker

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

To install, reverse removal procedure. Bend open retainers on inner door plate for accommodating central clip. See **Fig. 19** . Press unlocking lever installation fully on door trim panel. Note that Gray clips are longer than the White clips. See **Fig. 23** . Install all clips with sealing ring. If necessary, replace faulty clips. After assembling the door trim panel, check whether linkage of safety button can move freely. If necessary, align linkage.



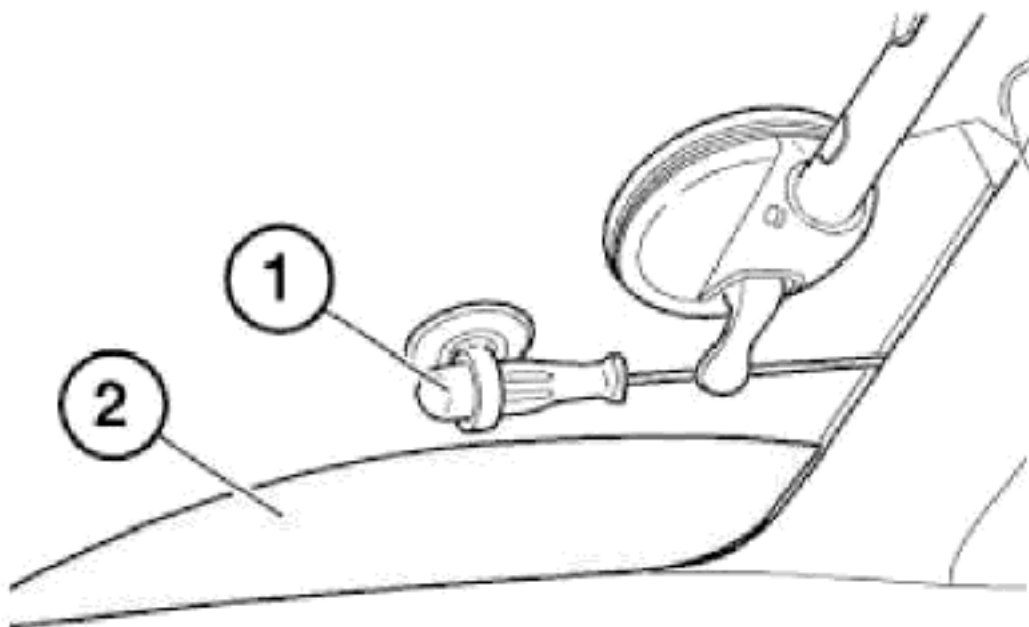
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Fig. 23: Identifying Door Panel Clips (Rear)
Courtesy of BMW OF NORTH AMERICA, INC.

ROLLER SUN BLIND

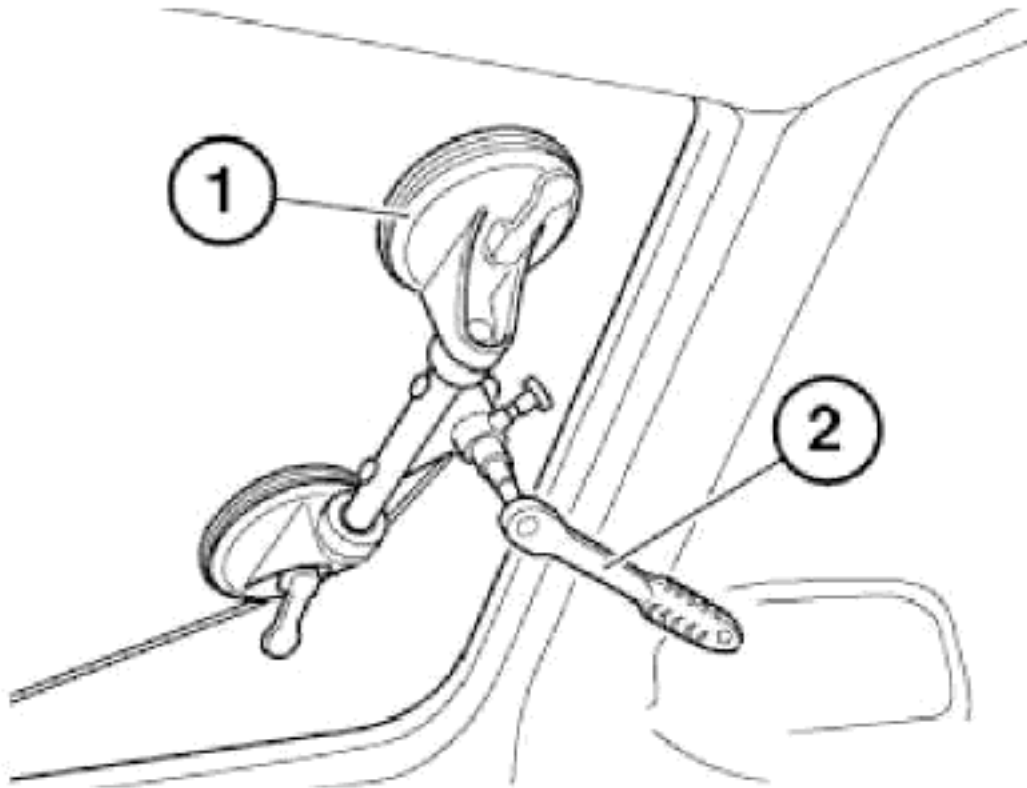
Removal & Installation

Pull roller sun blind at top toward rear and snap out spring toward top with a small screwdriver. See **Fig. 24** . Remove roller sun blind toward inside/top. See **Fig. 25** . To install, reverse removal procedure.



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Fig. 24: Pulling Roller Sun Blind At Top Toward Rear & Snapping Out Spring
Courtesy of BMW OF NORTH AMERICA, INC.



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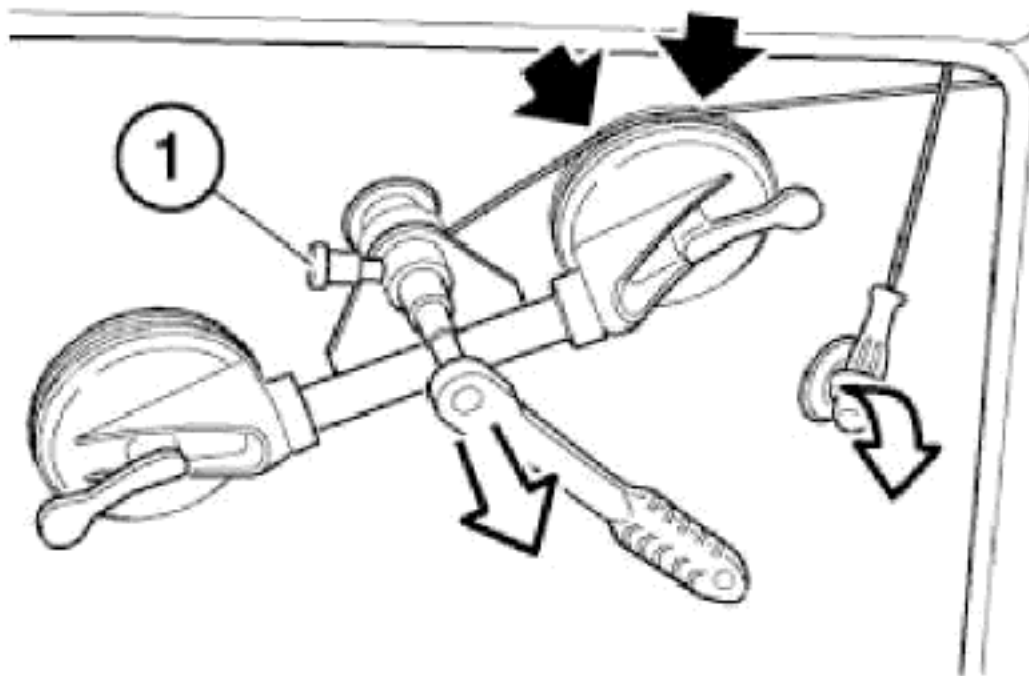
Fig. 25: Removing Roller Sun Blind Toward Inside/Top
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW CAVITY COVER STRIP

NOTE: Window cavity cover strip is located on outside of front door.

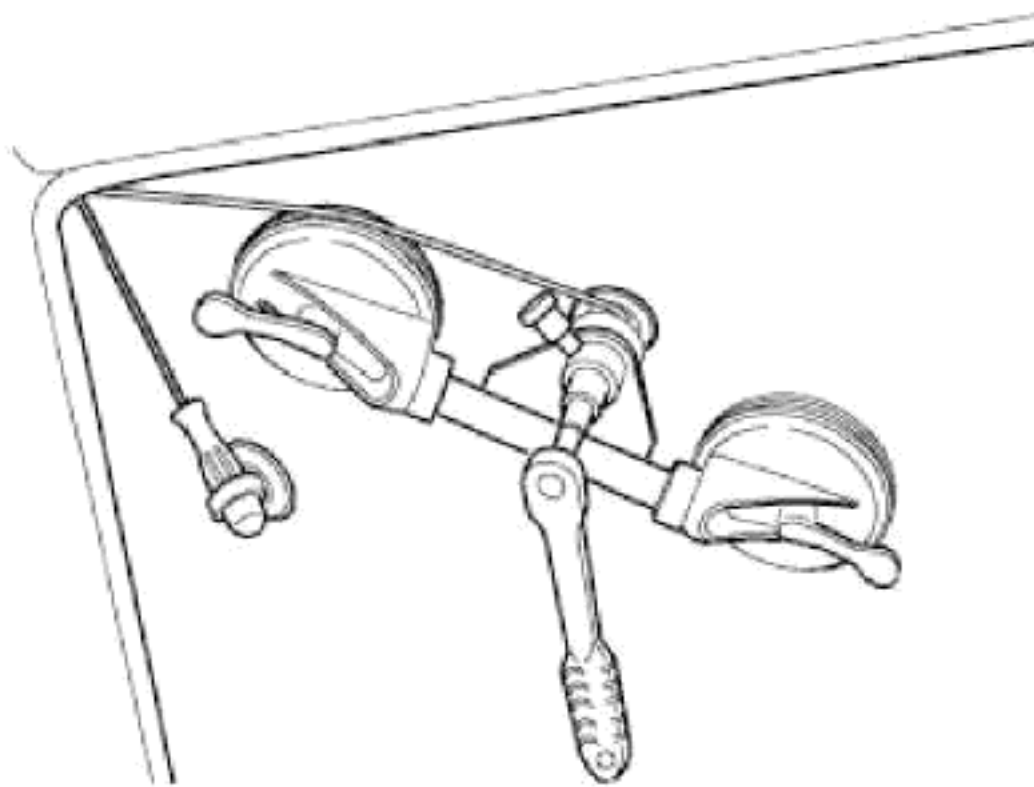
Removal & Installation

1. Attach adhesive tape below window cavity cover strip to avoid damage. Using Special Tool (009311) and proceeding from rear to front, pry out window cavity cover strip. See **Fig. 26**.
2. To install, reverse removal procedure. Coat window cavity seal with turpentine substitute. Window cavity cover strip must be flush with door edge at front and rear. Clip must not be damaged. See **Fig. 27**. Retainer of window cavity cover strip must not be damaged. See **Fig. 28**.



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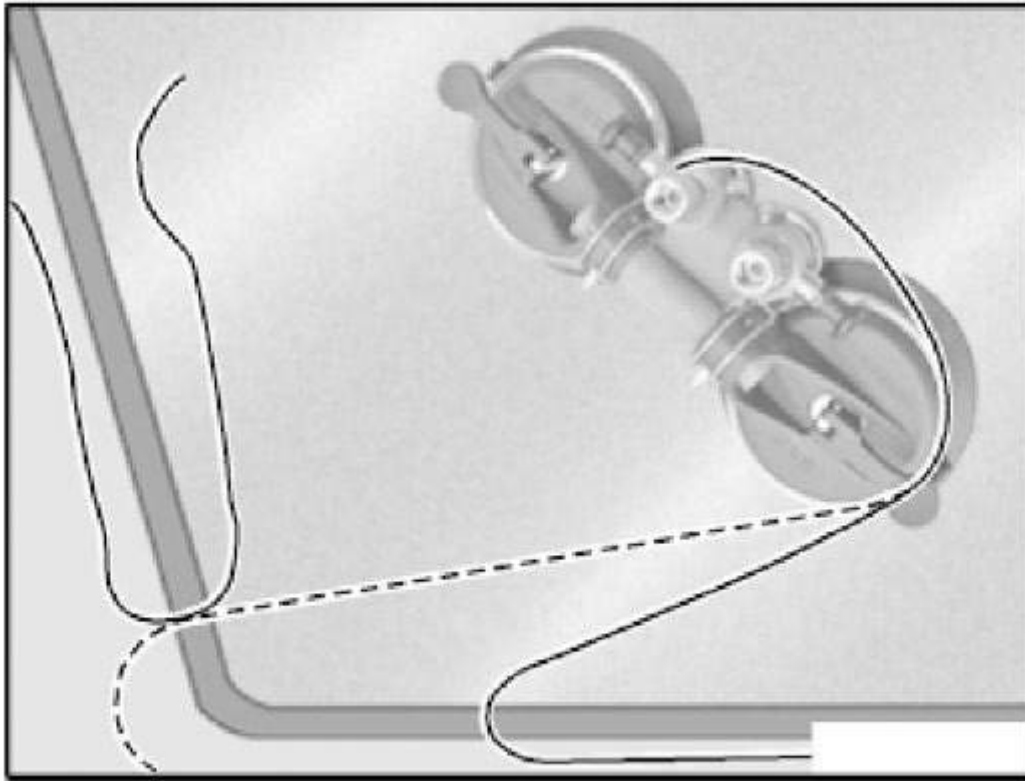
Fig. 26: Prying Out Window Cavity Cover Strip
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 27: Identifying Clip

Courtesy of BMW OF NORTH AMERICA, INC.



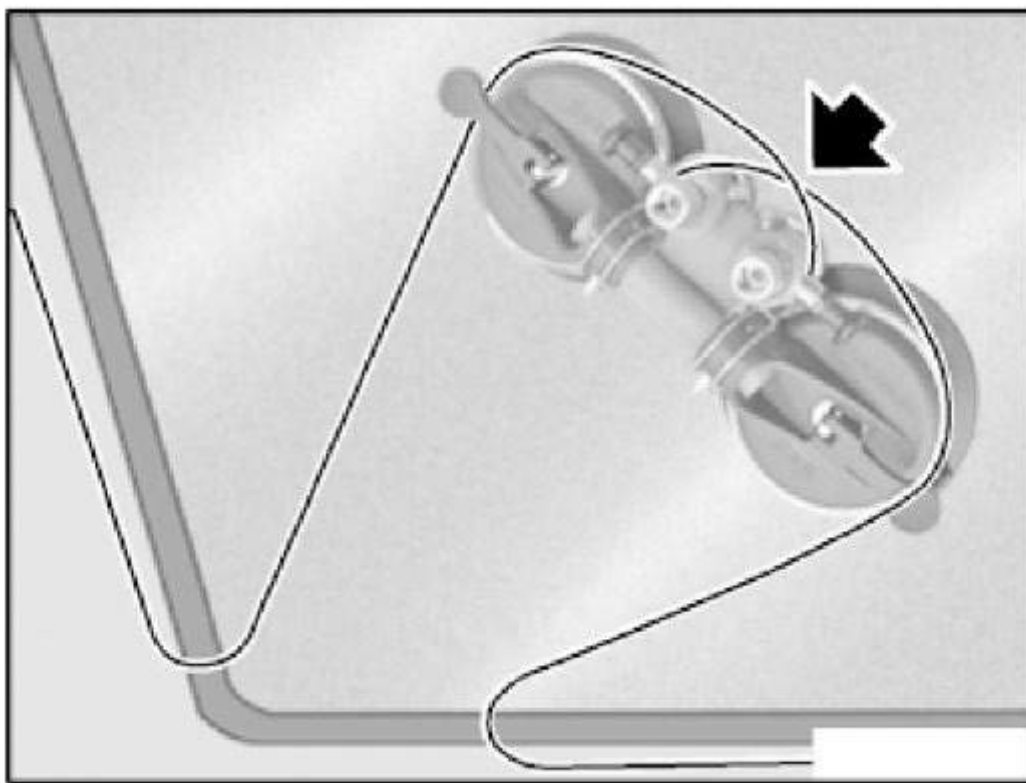
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Fig. 28: Identifying Retainer Of Window Cavity Cover Strip
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW GLASS (FRONT)

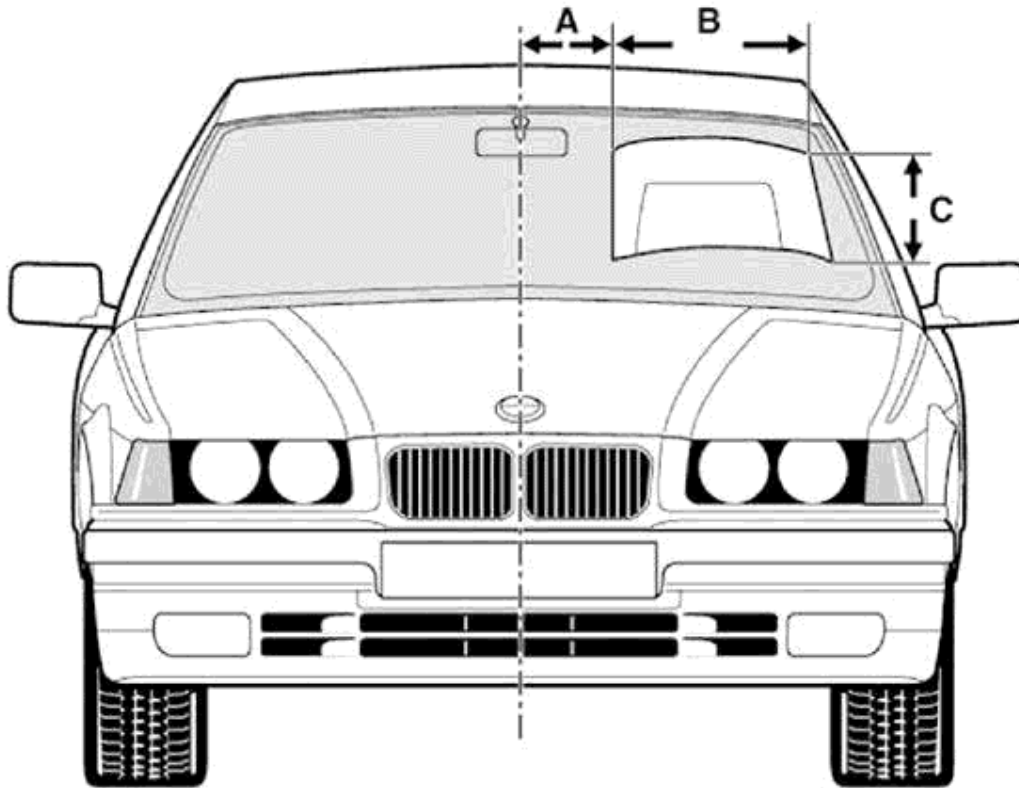
Removal & Installation

1. Disconnect negative battery cable. Remove window cavity cover strip on outside. See **WINDOW CAVITY COVER STRIP** . Remove sound insulation on front door. See **DOOR SOUND INSULATION (FRONT)** . Open door window glass approximately 5-6". Loosen screws and detach glass from window regulator. Turn and lift out glass toward rear/top from front door. See **Fig. 29** .
2. To install, reverse removal procedure. Each time the door window glass is removed or replaced, the holders must be replaced. See **Fig. 30** . If necessary, install new screws and nuts on door window glass. Adjust door window glass.



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Fig. 29: Removing Window Glass
Courtesy of BMW OF NORTH AMERICA, INC.



- A 50 mm (gap between field of view / centre of vehicle)
- B Up to end of wiper range, outside (field of view width)
- C Restriction by wiper range (height of field of view)

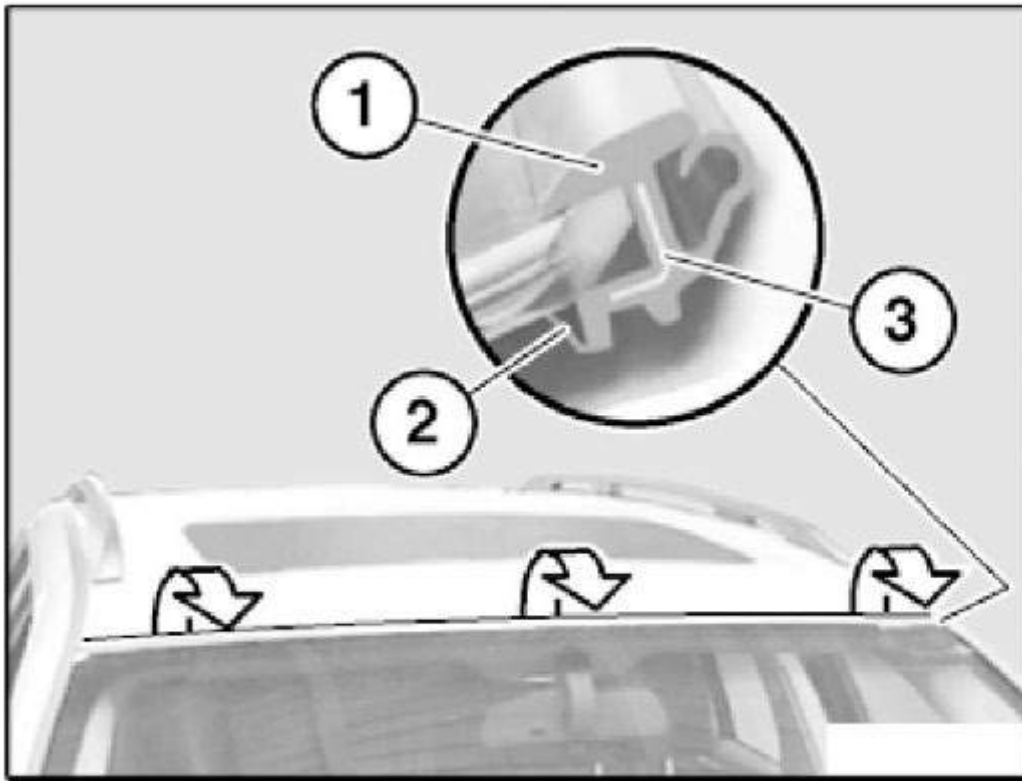
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Fig. 30: Identifying Holders On Window Glass
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW GLASS (REAR)

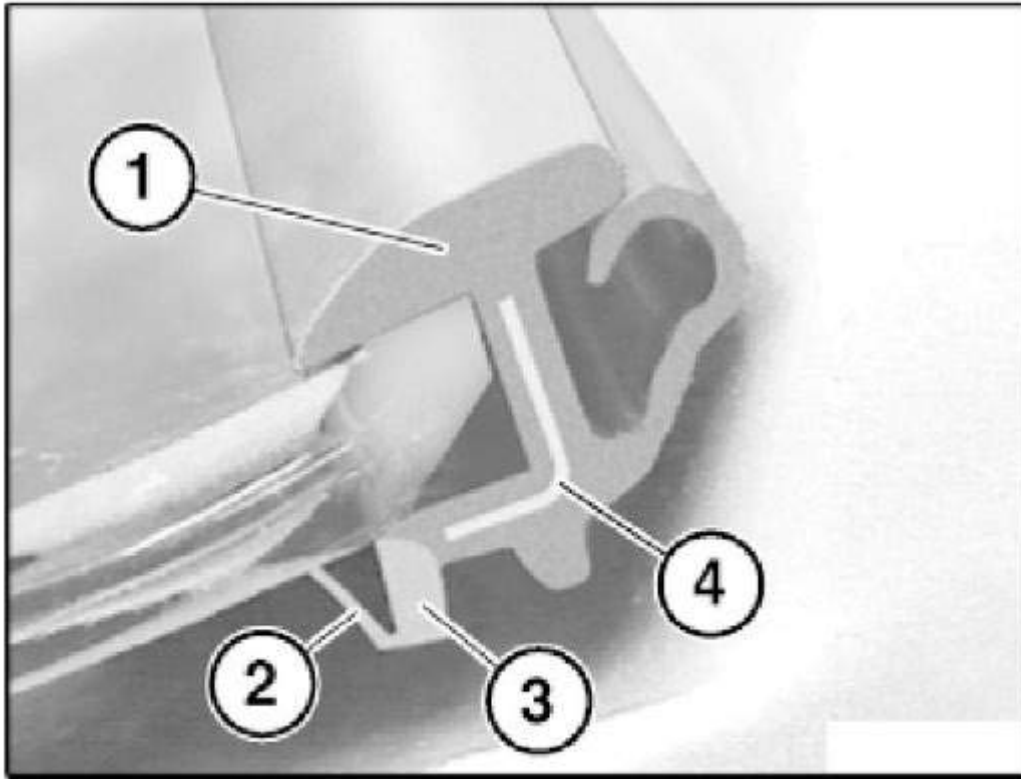
Removal & Installation

Remove rear door panel and sound insulation. See **DOOR TRIM PANEL (REAR)** . Open door window glass so approximately 3" protrudes above door. Loosen bolt. See **Fig. 31** . Remove window regulator assembly. See **WINDOW REGULATOR (REAR)** . Remove door glass. To install, reverse removal procedure. Each time door window glass is removed or replaced, the holder must be replaced. If necessary, install new screw and nut on door window glass. See **Fig. 32** . Glass adjustment is not necessary.



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Fig. 31: Identifying Rear Door Window Components
Courtesy of BMW OF NORTH AMERICA, INC.



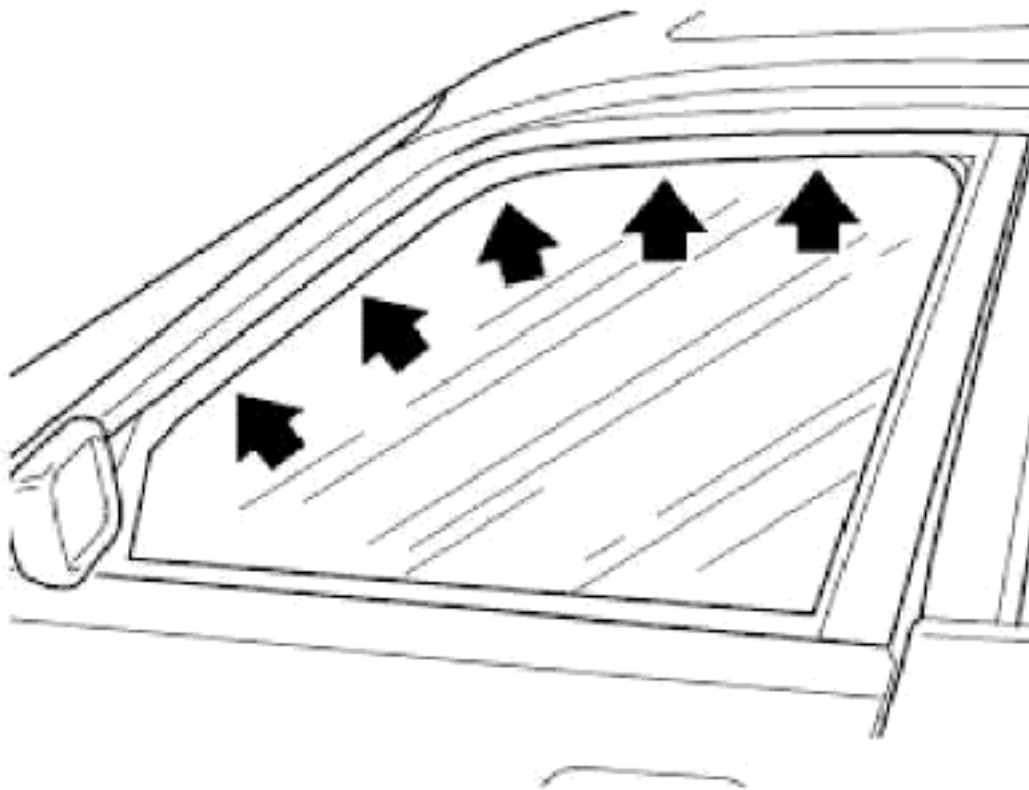
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Fig. 32: Installing New Screw & Nut On Door Window Glass
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW REGULATOR (FRONT)

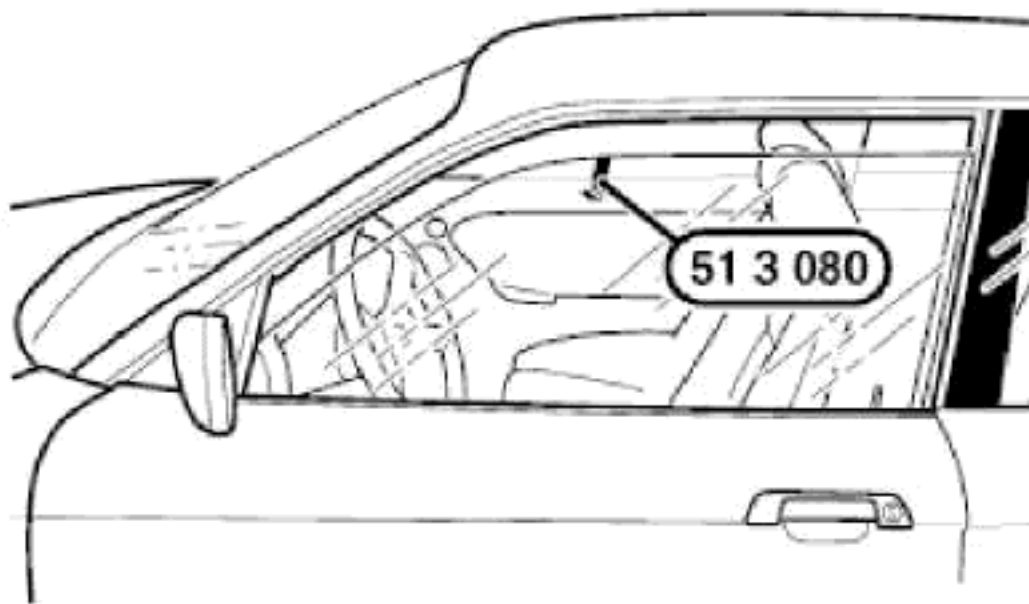
Removal & Installation

Remove door window glass. See **WINDOW GLASS (FRONT)** . Remove speaker in front door. See **Fig. 22** . Remove nuts and feed rear section of window regulator out of front door. Unhook cable from clip. Pry out foam and remove nut underneath. Disconnect electrical connection if necessary. Remove nuts. Feed rear section of window regulator with drive mechanism out of front door. See **Fig. 33 -Fig. 35** . To install, reverse removal procedure.



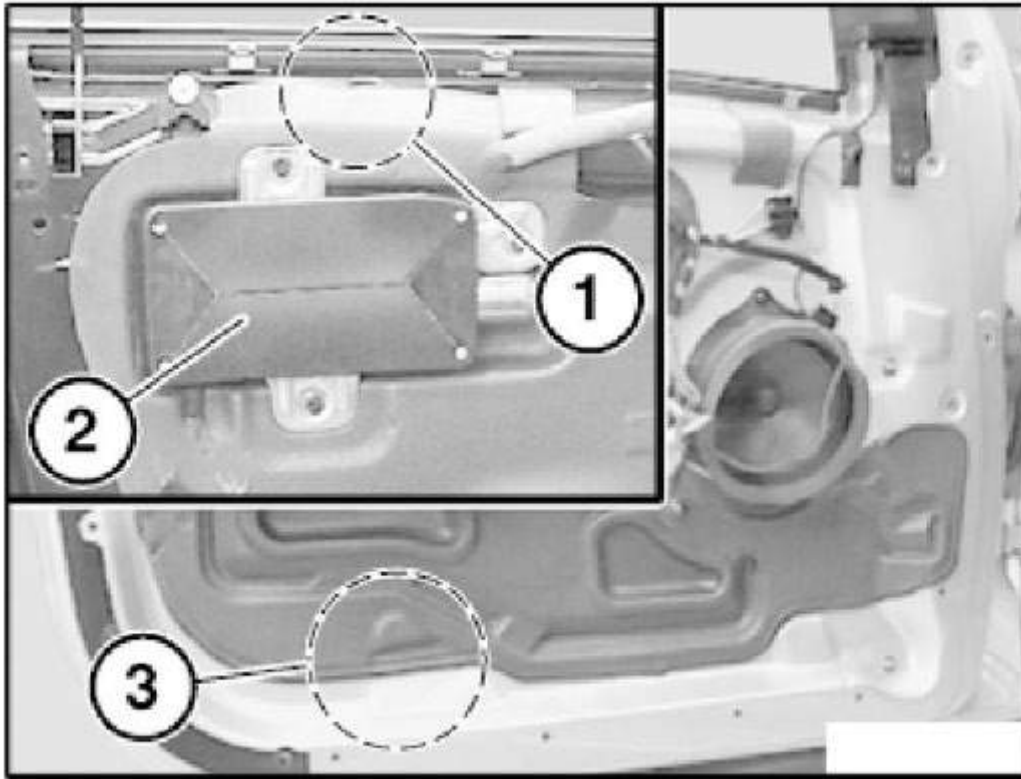
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Fig. 33: Removing Front Door Power Window Regulator (1 Of 3)
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 34: Removing Front Door Power Window Regulator (2 Of 3)
Courtesy of BMW OF NORTH AMERICA, INC.



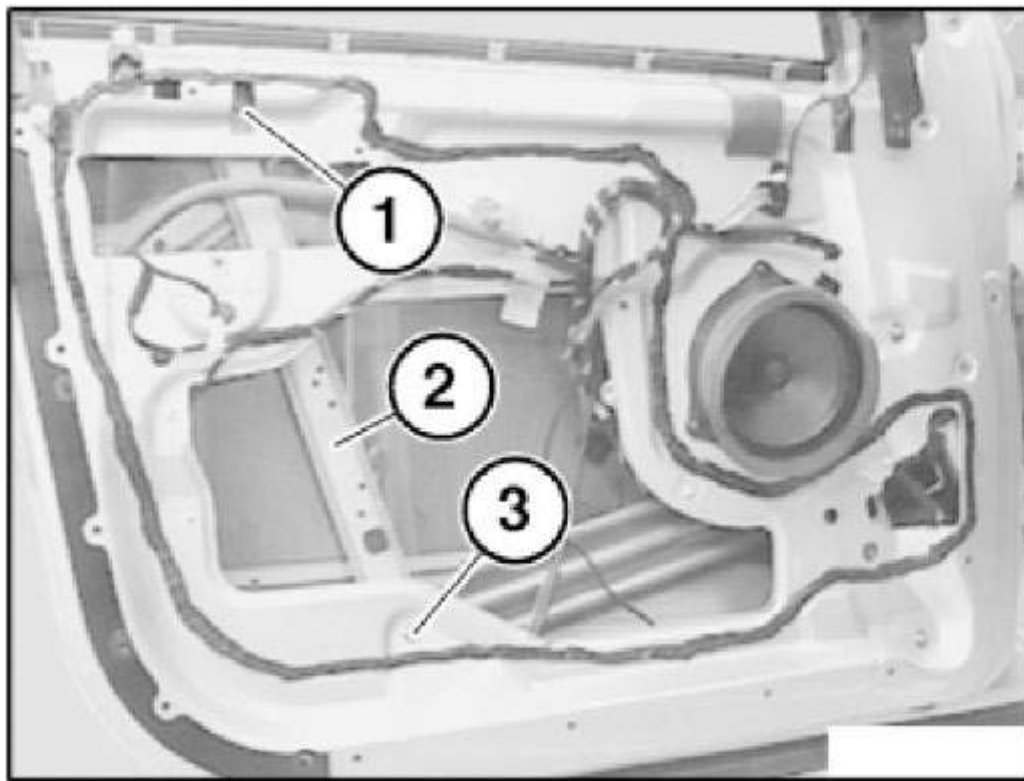
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Fig. 35: Removing Front Power Window Regulator (3 Of 3)
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW REGULATOR (REAR)

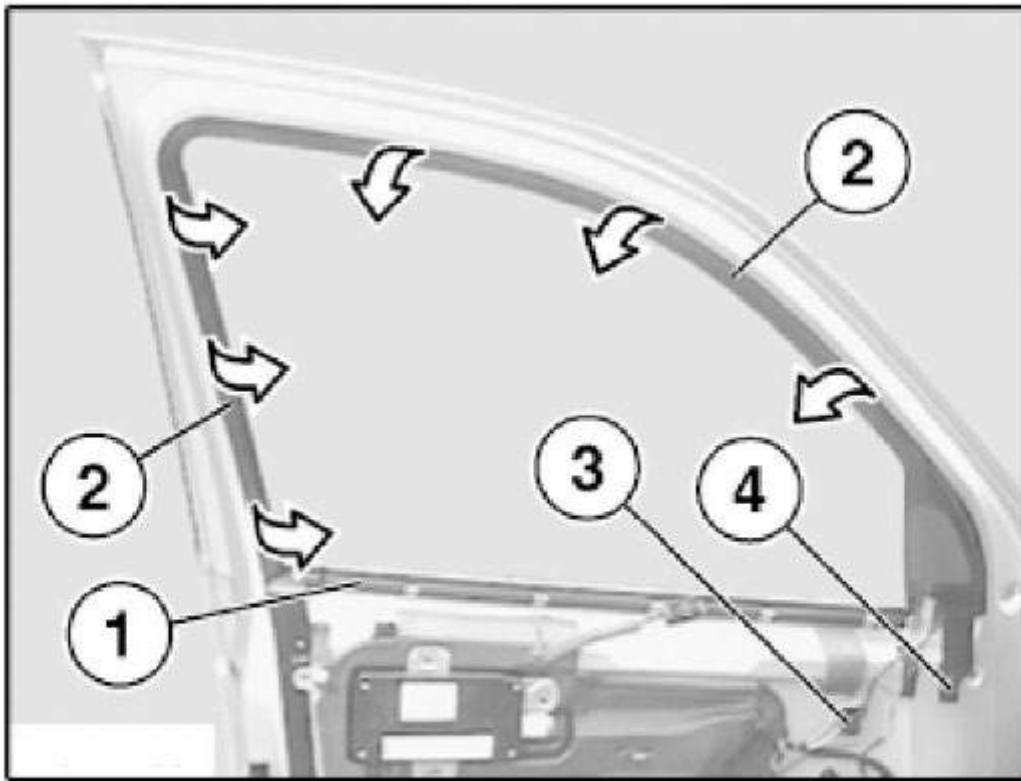
Removal & Installation

Release door window glass at rear (do not remove) and stow at bottom in rear door. See **WINDOW GLASS (REAR)** . Electrical connection must be disconnected from power window motor. Unscrew nuts. Pry out window regulator and feed out of rear door. See **Fig. 36** . To install, reverse removal procedure. Turn motor flat and detach from window regulator. Use care to not damage lower end stop. See **Fig. 37** .



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Fig. 36: Identifying Power Window Motor & Regulator Components
Courtesy of BMW OF NORTH AMERICA, INC.



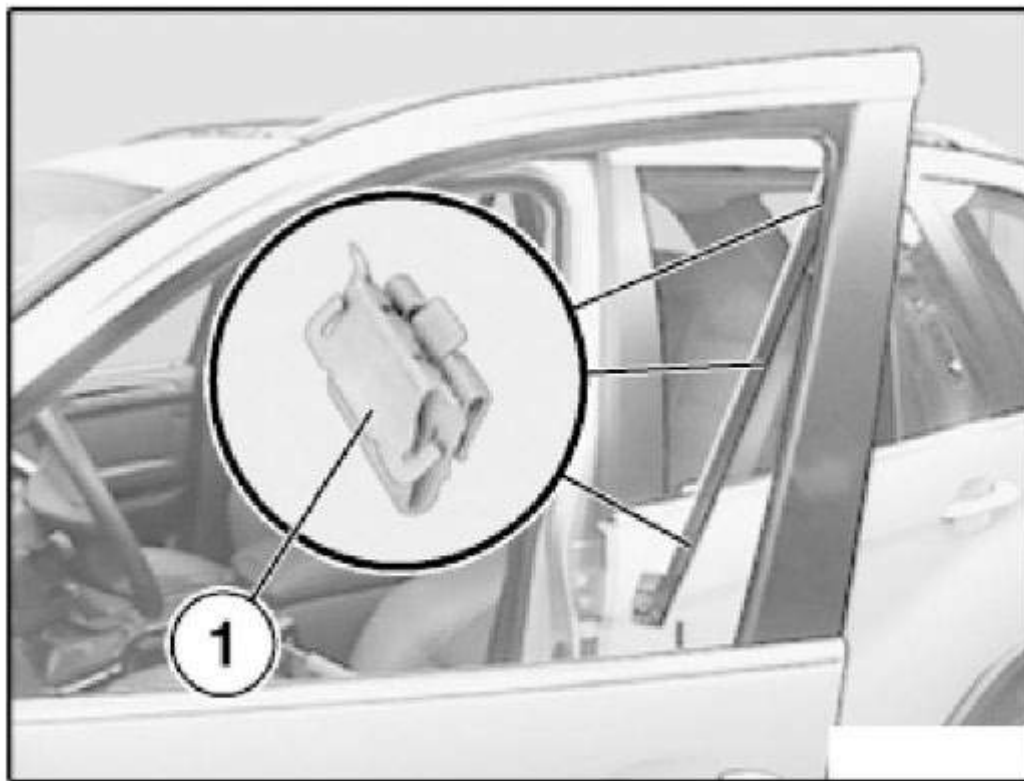
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Fig. 37: Identifying Window Regulator Components (Regulator Removed From Vehicle)
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW SWITCH ASSEMBLY

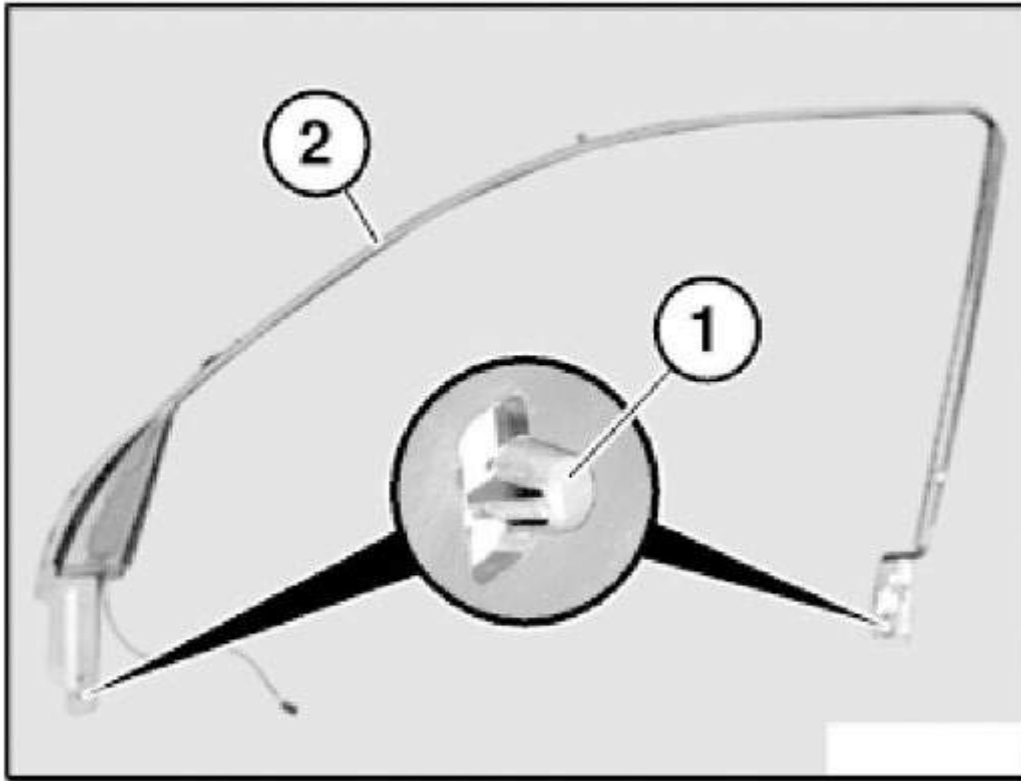
Removal & Installation

On front door, pry out door switch center in direction of arrows. Disconnect associated electrical connection(s) and remove door switch center. See **Fig. 38** . On rear door, pry out rocker switch for side window operation in direction of arrow. Disconnect associated electrical connection and remove rocker switch. See **Fig. 39** . To install, reverse removal procedure.



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Fig. 38: Removing Window Switch Assembly (Front)
Courtesy of BMW OF NORTH AMERICA, INC.



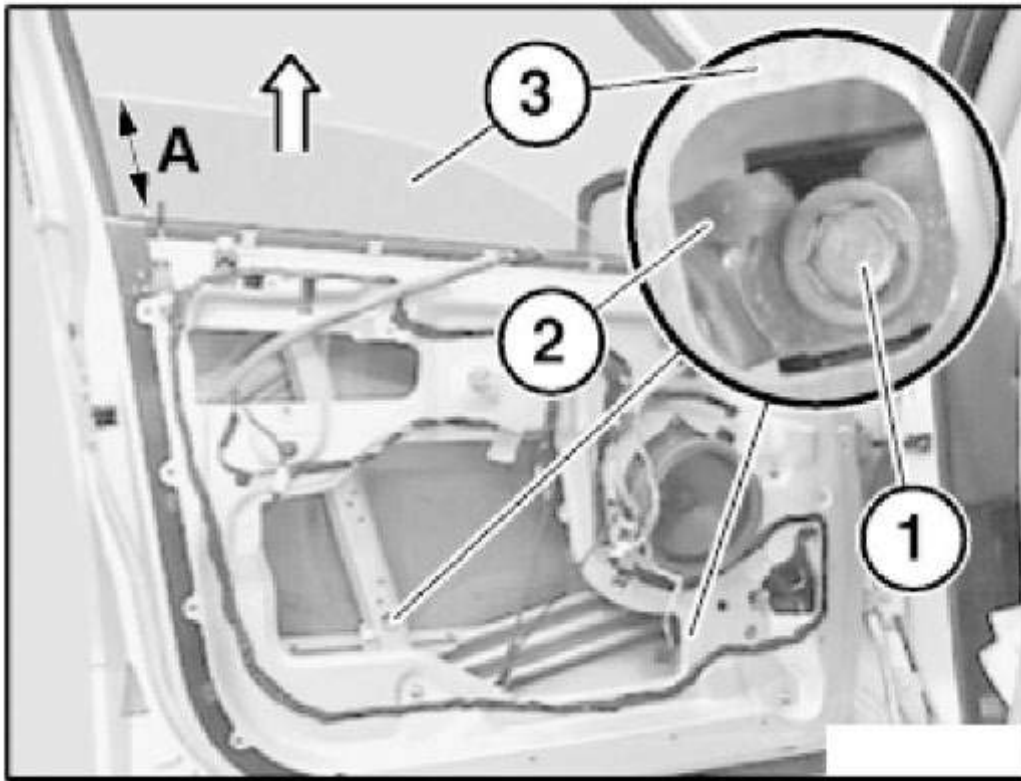
G03255864

Fig. 39: Removing Window Switch Assembly (Rear)
Courtesy of BMW OF NORTH AMERICA, INC.

DOOR SOUND INSULATION (FRONT)

Removal

Remove front door trim panel. If necessary, remove air bag module in front door. Using Trim Panel Wedge (009317), pry out sealing bead of sound insulation completely or, if necessary, partially. See **Fig. 40** . Feed air bag lead out of sound insulation.



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Fig. 40: Removing Sealing Bead

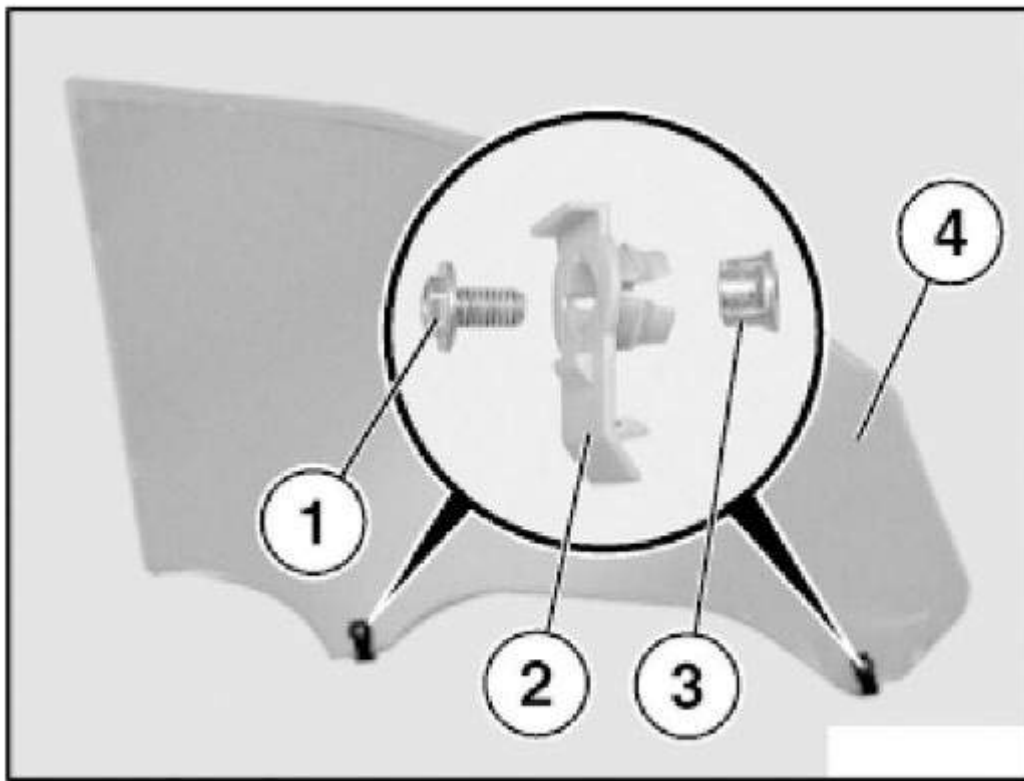
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

1. To install, reverse removal procedure. In event of replacement or partial detachment, place butylene tape on inner door panel or sound insulation. See **Fig. 41** . Seal cable penetrations with butylene tape. Note position of butylene tape on inner door panel. Install sound insulation.

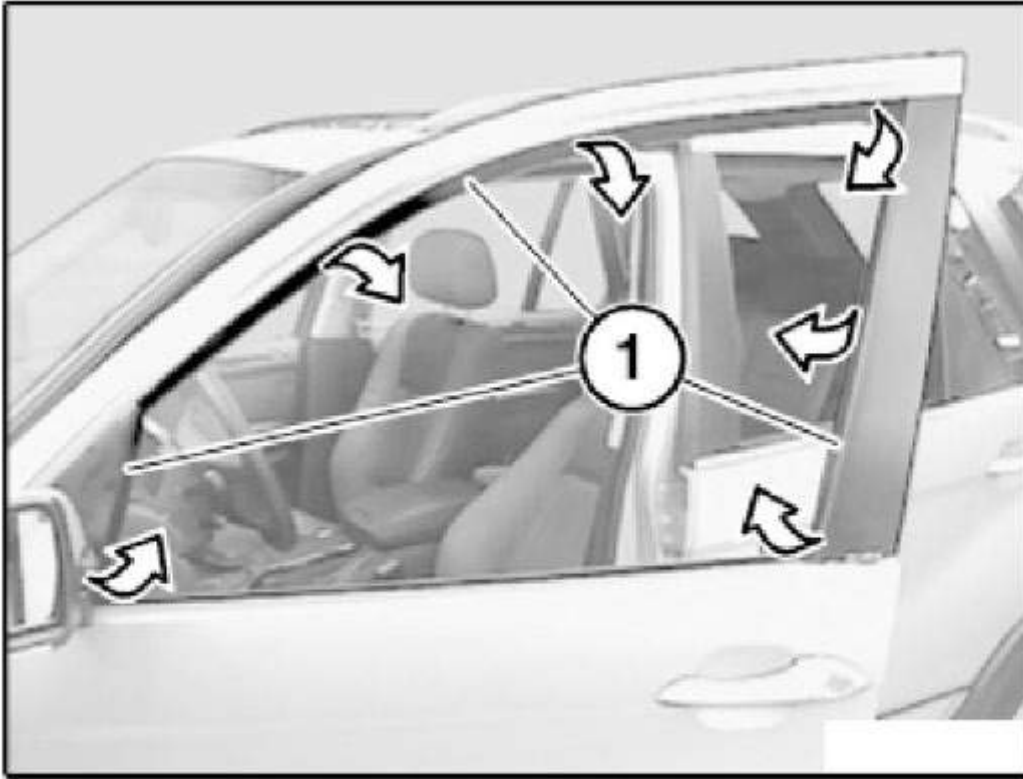
NOTE: Clean specified adhesive area with adhesive cleaner. Air drying time is one minute. The adhesive areas must be dry and free from dust and grease. After cleaning, do not touch the adhesive areas with bare hands.

2. Lay a single row of 6-mm diameter butylene tape or double row of 3-mm diameter tape in specified adhesive area. Heat butylene tape with a hot air blower and press down firmly on sound insulation. See **Fig. 42** .



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Fig. 41: Positioning Butylene Tape On Inner Door Panel
Courtesy of BMW OF NORTH AMERICA, INC.



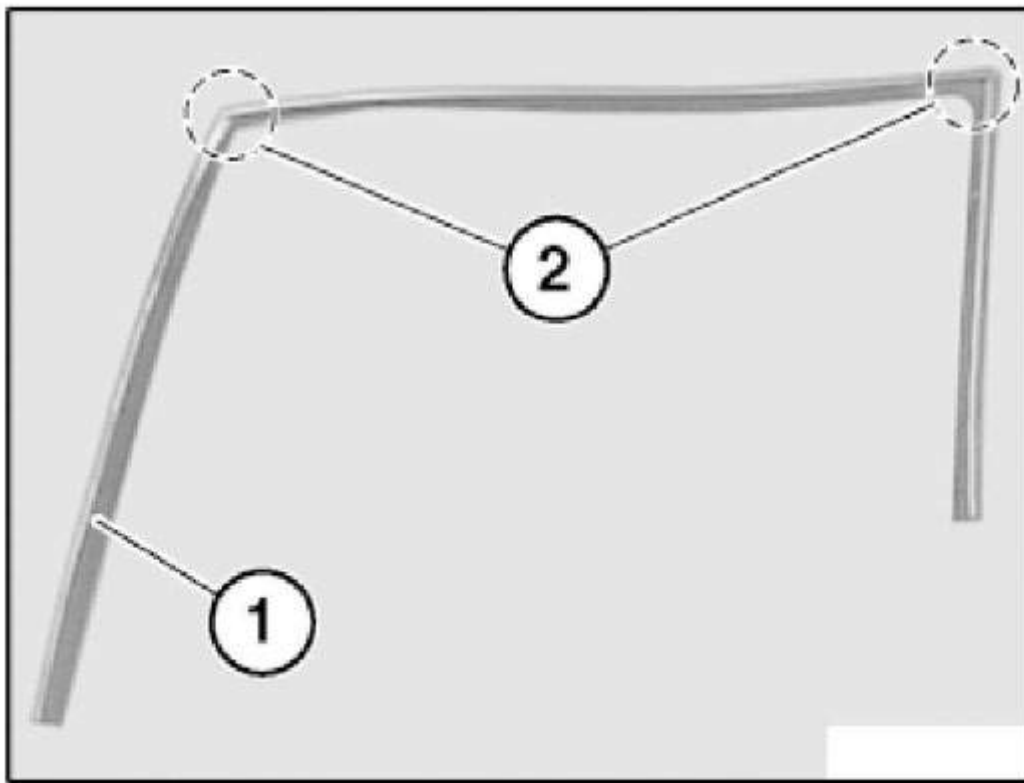
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Fig. 42: Positioning Butylene Tape On Sound Insulation
Courtesy of BMW OF NORTH AMERICA, INC.

DOOR SOUND INSULATION (REAR)

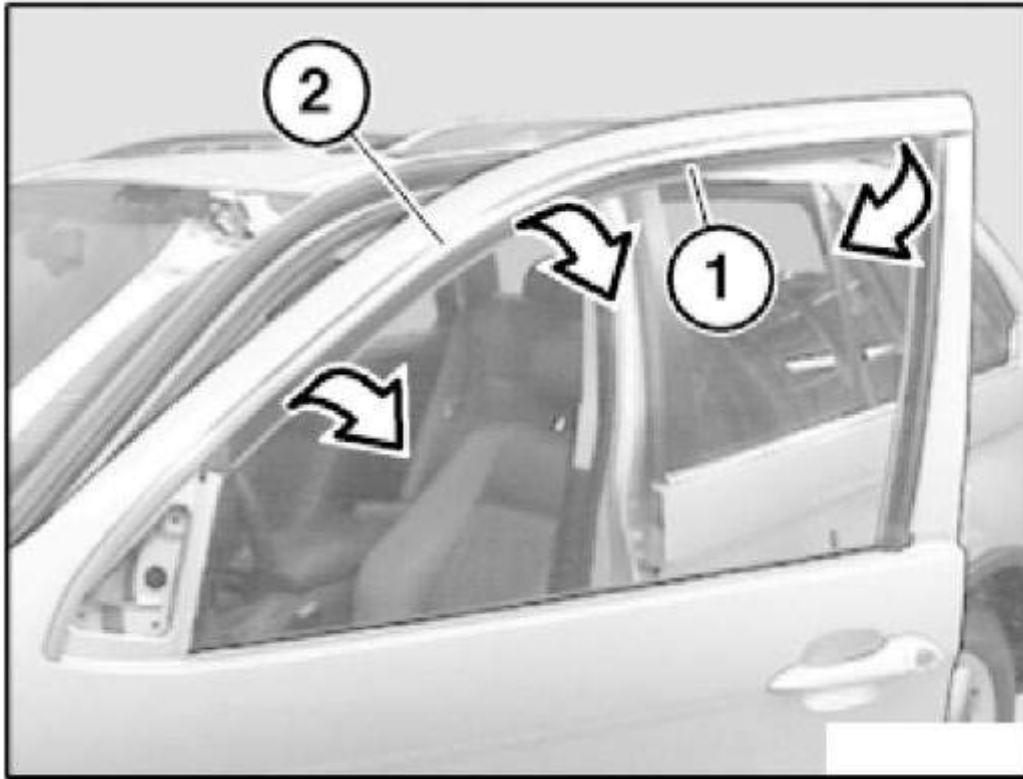
Removal & Installation

1. Remove rear door trim panel. See **DOOR TRIM PANEL (REAR)** . If necessary, remove air bag module in rear door. See **AIR BAG MODULE (REAR DOOR)** . Using Trim Panel Wedge (009317), pry out sealing bead of sound insulation completely or, if necessary, partially. See **Fig. 43** .
2. To install, reverse removal procedure. In event of replacement or partial detachment, lay butylene tape on inner door plate or sound insulation. Seal cable penetrations with butylene tape by positioning tape on inner door panel. See **Fig. 44** . Position butylene tape on sound insulation. See **Fig. 45** . Clean specified adhesive area with adhesive cleaner.



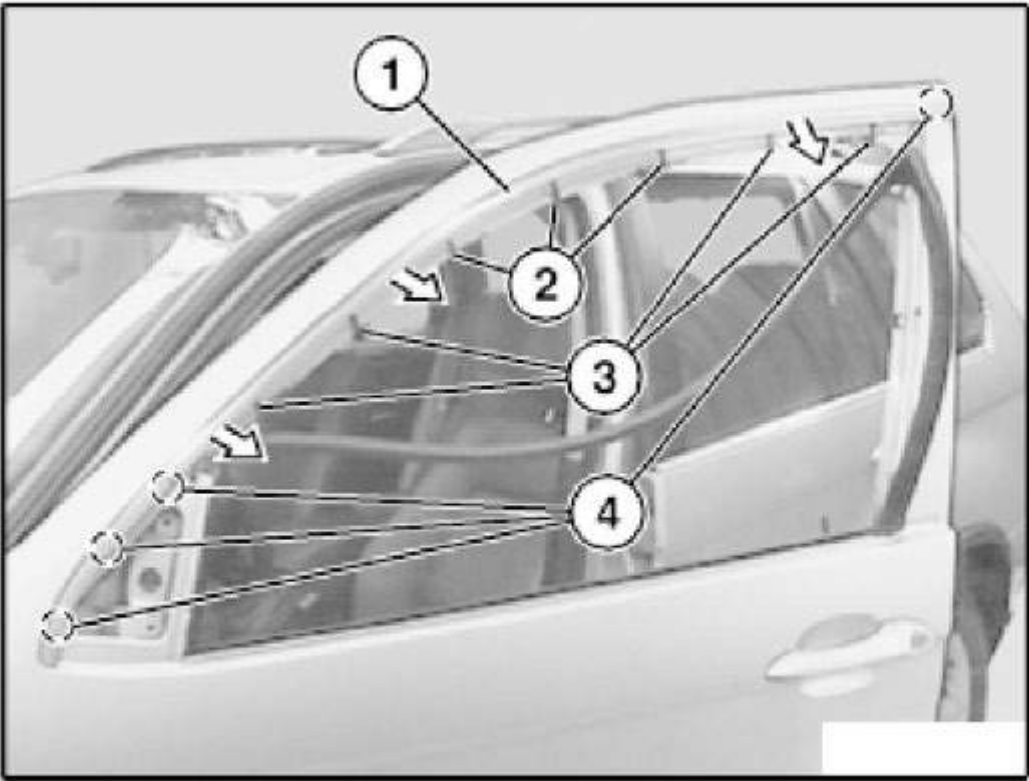
G03255868

Fig. 43: Prying Out Sealing Bead Of Sound Insulation
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 44: Location Of Butylene Tape On Inner Door Panel
Courtesy of BMW OF NORTH AMERICA, INC.



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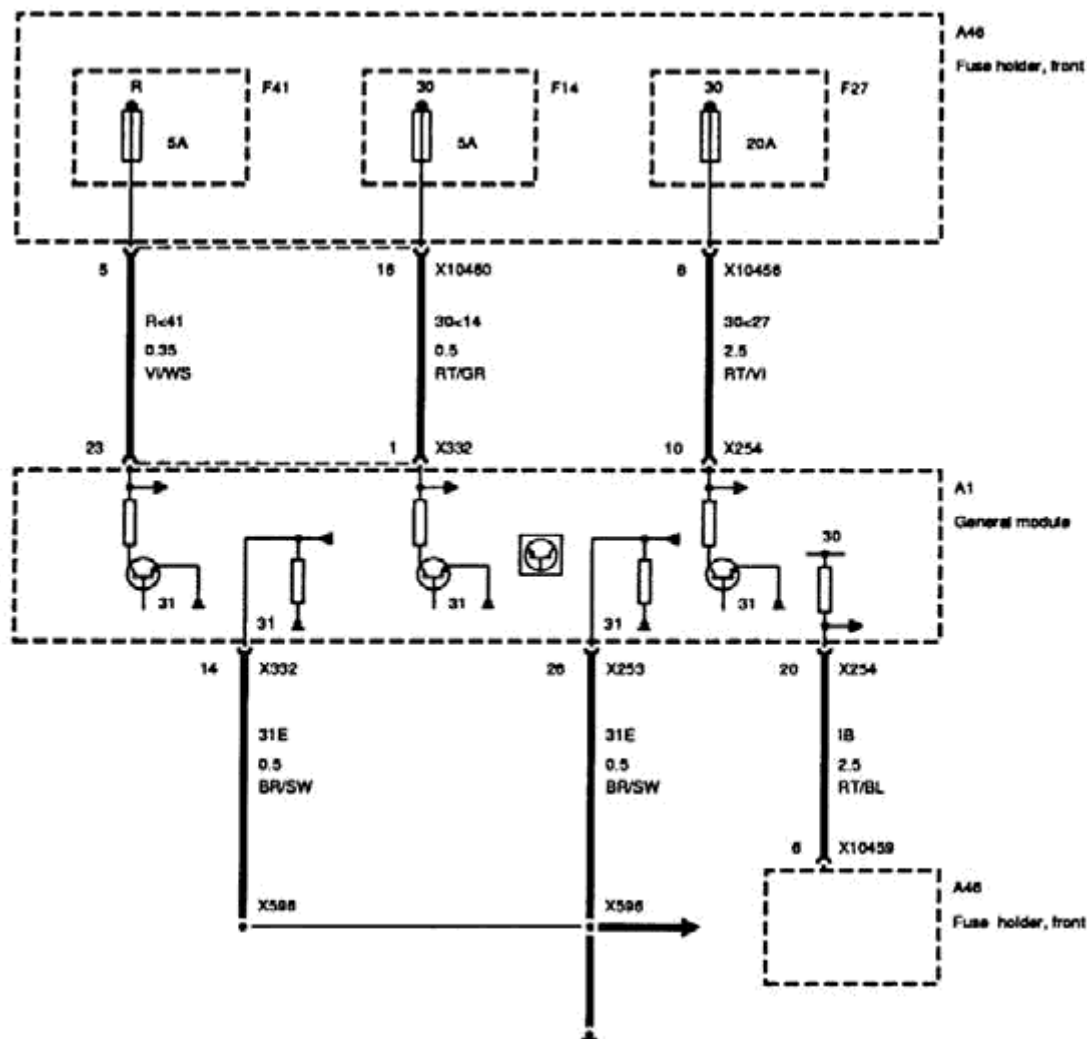
Fig. 45: Location Of Butylene Tape On Sound Insulation
Courtesy of BMW OF NORTH AMERICA, INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

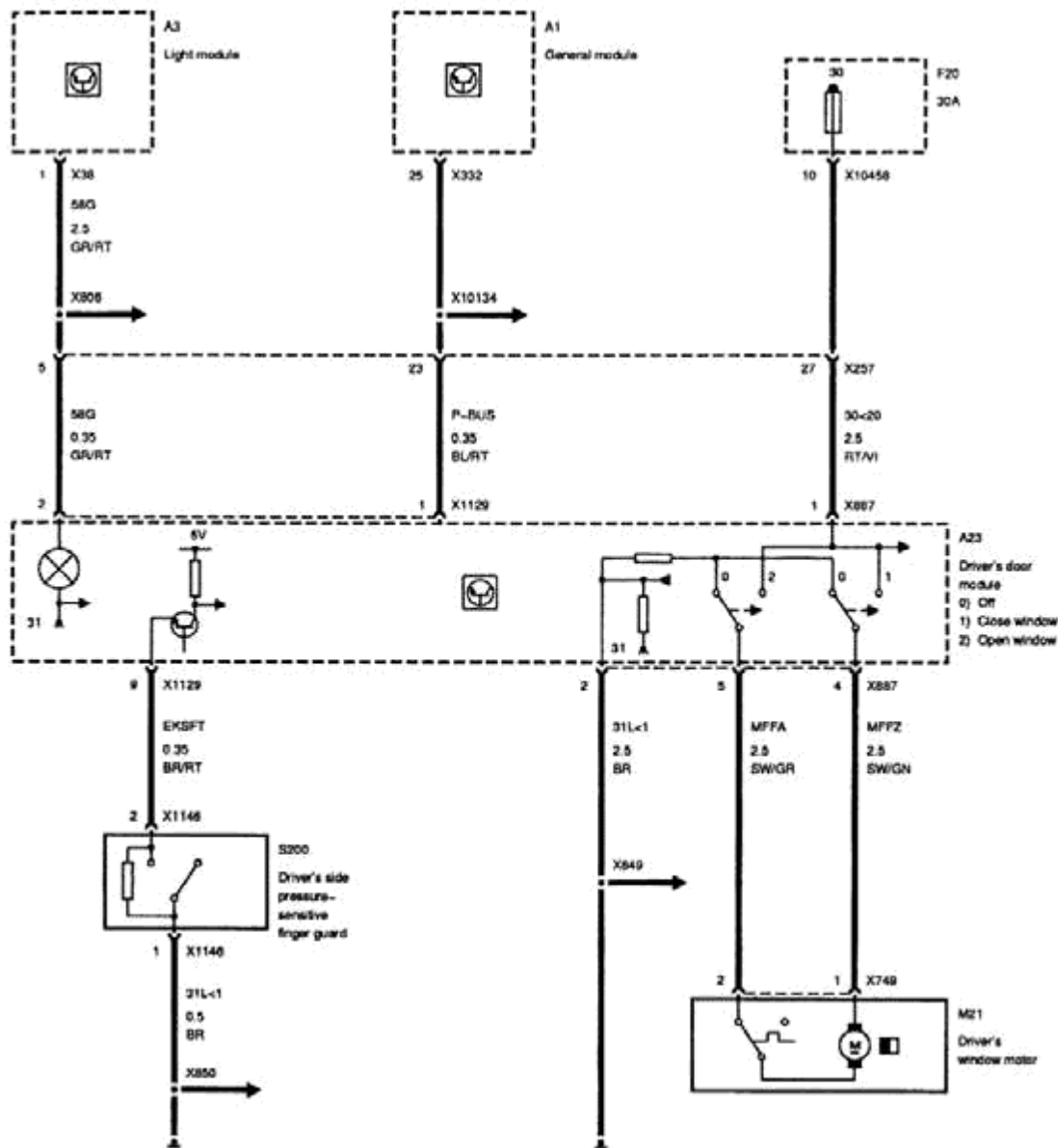
Application	INCH Lbs. (N.m)
Side (Door) Air Bag Bolts	75 (8.5)

WIRING DIAGRAMS



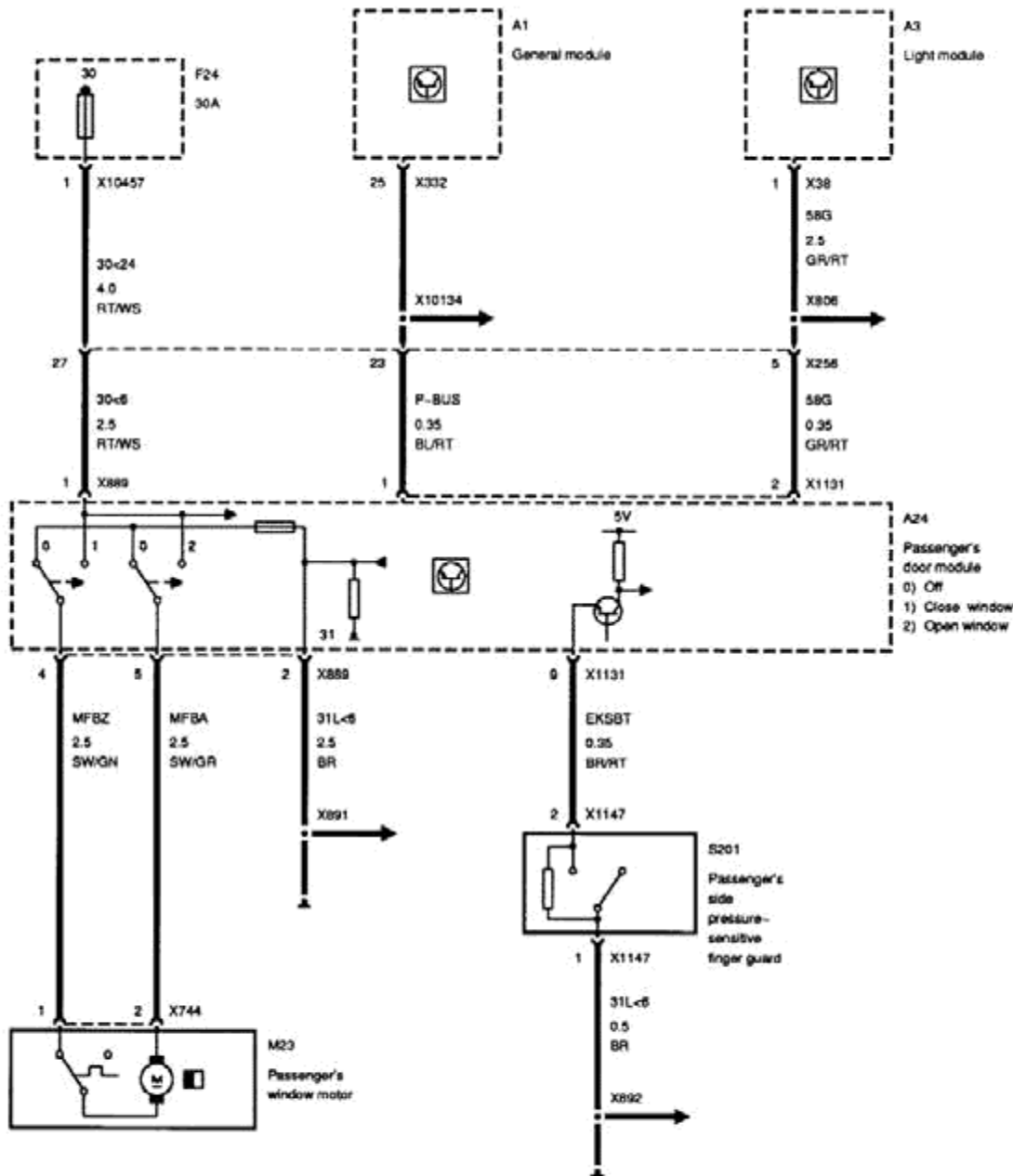
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Fig. 46: Power Window Power Circuit
Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 47: Power Window Front Driver-Side Circuit
 Courtesy of BMW OF NORTH AMERICA, INC.



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Fig. 48: Power Window Front Passenger-Side Circuit
Courtesy of BMW OF NORTH AMERICA, INC.

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Fig. 49: Power Window Left Rear Circuit
Courtesy of BMW OF NORTH AMERICA, INC.

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Fig. 50: Power Window Right Rear Circuit
Courtesy of BMW OF NORTH AMERICA, INC.



Fig. 51: Power Window Driver-Side Switch Block Lighting Circuit
Courtesy of BMW OF NORTH AMERICA, INC.