

510 Exterior Trim, Bumpers

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GENERAL

This repair group includes repair information for the outside rear view mirrors, front and rear bumpers, and the easily removable exterior trim parts.

OUTSIDE REAR VIEW MIRROR

Many of the mirror components are separately available from an authorized BMW dealer, including the glass and outside plastic housing.

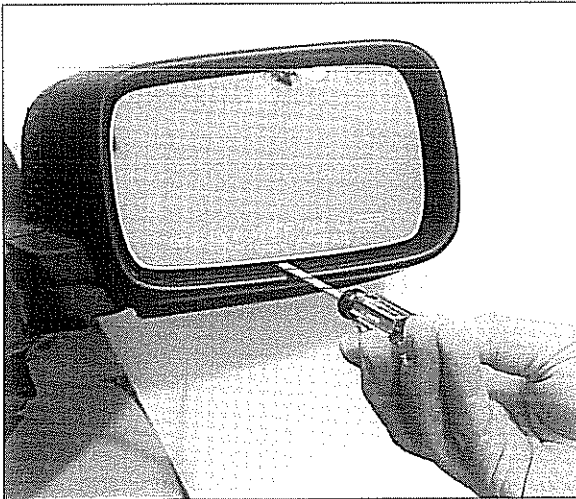
The E39 models offered two types of outside mirrors, standard mirrors or automatic dip mirrors.

Outside mirror glass, replacing

CAUTION—

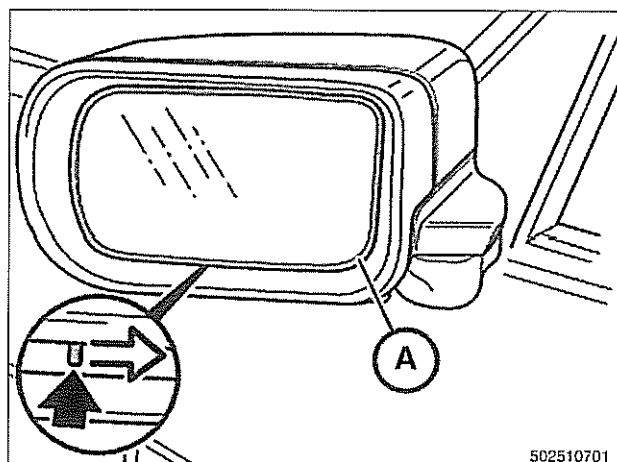
Mirror should be at or above room temperature before removal. Otherwise, small plastic parts or glass may break.

Outside mirror glass without automatic dip control, replacing

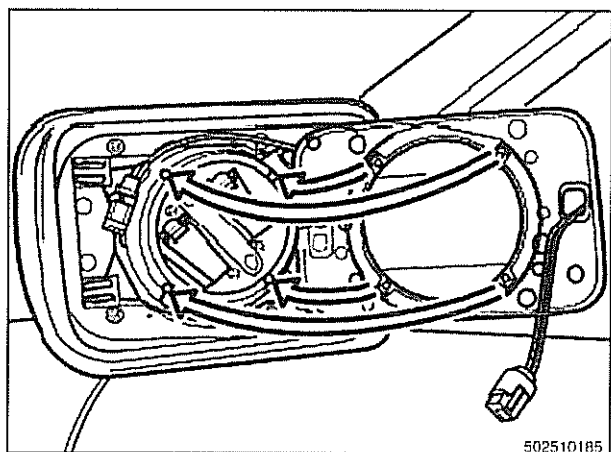


- Insert thin pry tool (plastic or tape-wrapped screwdriver) between bottom mirror edge and mirror housing and carefully pry out mirror glass from housing.
- If equipped with heated mirrors: remove heating element harness connectors from back of mirror glass.
- Installation:
 - Connect mirror heating harness if equipped.
 - Ensure correct alignment of locking pins.
 - Press mirror glass firmly until it locks in place.

Outside mirror glass with automatic dip control, replacing



- Slide locking pin (**arrow**) right to release glass (**A**).
- If equipped with heated mirrors: remove heating element harness connectors from back of mirror glass.



- Install mirror glass by placing glass on lugs (**arrows**) and turn locking pin until glass is locked in place.

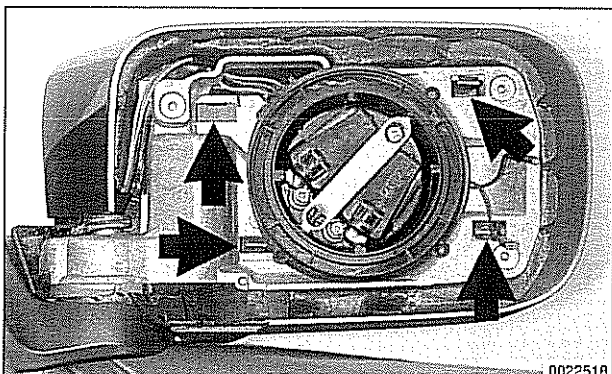
Outside mirror housing, removing and installing

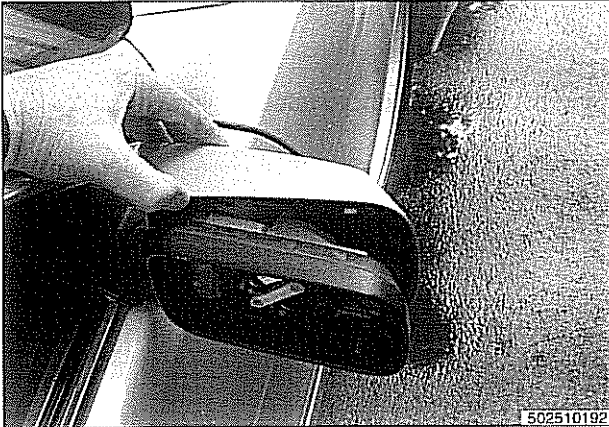
- Remove mirror glass as described above.

- Compress plastic retainers (**arrows**).

NOTE—

The front mirror housing is retained by either three or four clips, depending on model.





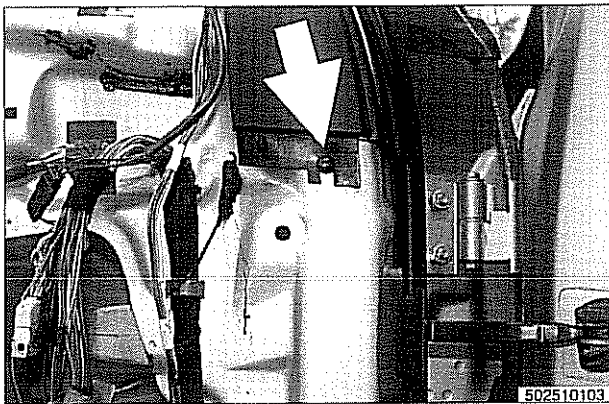
- Carefully remove mirror housing from frame.
- Installation is reverse of removal.

NOTE—

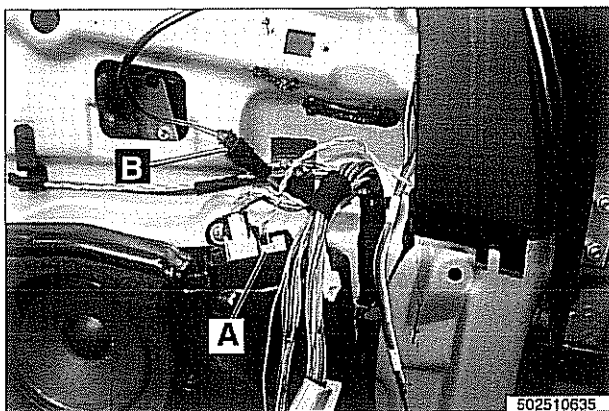
Check mirror function before installing covering parts.

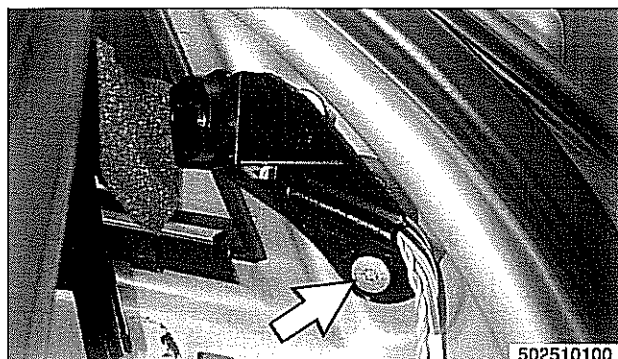
Outside mirror assembly, removing and installing

- Remove front door panel trim. See 411 Doors.
- Carefully lift inner trim panel up to remove from retaining clip (arrow).

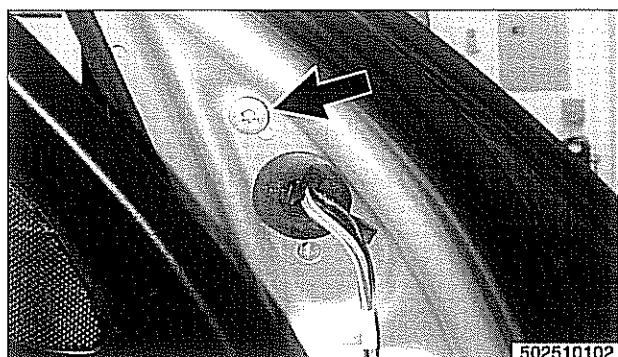


- Disconnect electrical harness connectors for window anti-trapping protection (B) and speaker (A), if equipped.





- Lift trim panel to expose speaker fastener (arrow) and remove fastener.



- While supporting mirror, remove top mounting fastener (arrow).
 - Lift mirror up to remove from door, feed mirror electrical harness through opening to remove.
- Installation is reverse of removal.

NOTE —

Check mirror function before installing covering parts.

Tightening torque

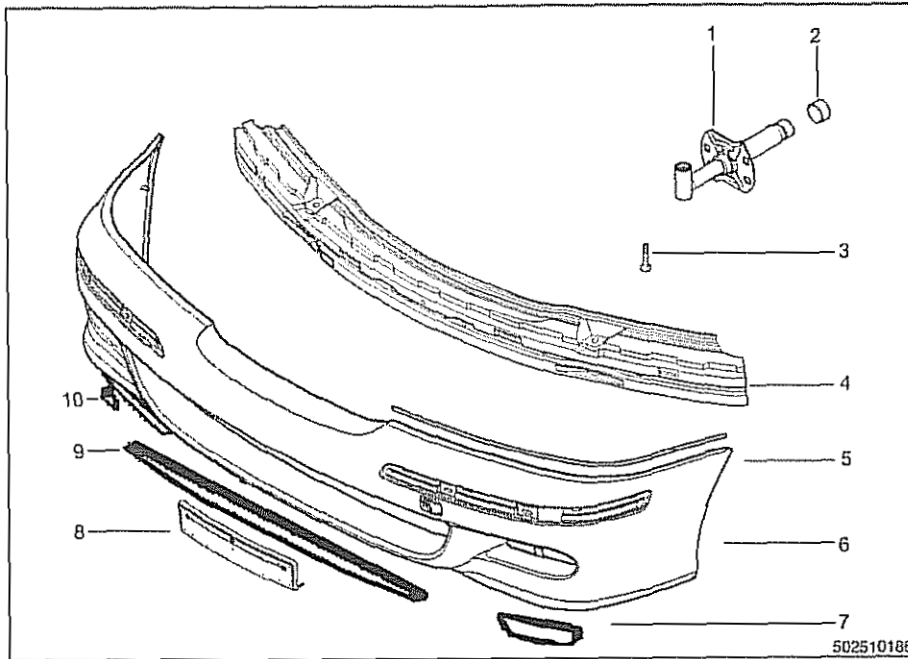
Outside mirror to door (M6)	6 Nm (4.5 ft-lb)
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BUMPERS

- Raise and properly support vehicle.

WARNING —

Make sure that the car is firmly supported on jack stands designed for the purpose. Place the jack stands under structural chassis points. Do not place jack stands under suspension parts.



Front bumper assembly

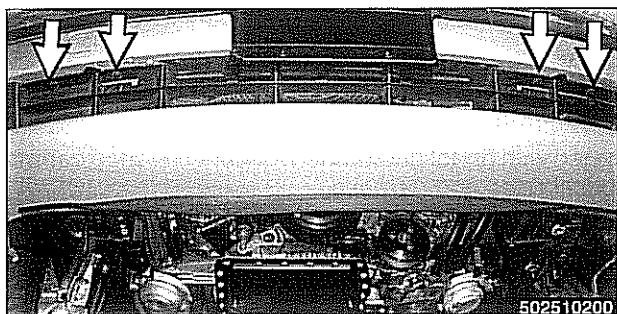
1. Bumper support shock absorber
2. Bumper support shock absorber seal
3. Bumper mounting bolt
4. Bumper support
5. Bumper to body gasket
6. Bumper cover
7. Grill panel
8. Lower bumper grill
9. Spoiler
10. Towing hinge flap

Front bumper, removing and installing



Working underneath car:

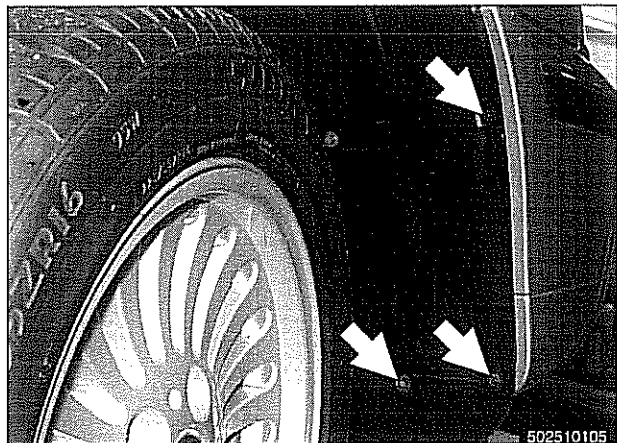
- Remove expansion rivets (**arrows**) from left and right side trim panels.
- Remove bumper trim panels.



Remove driving light mounting fasteners (**arrows**) and disconnect wiring connectors.



Working at front of wheel wells remove left and right inner panel fasteners (**arrows**).

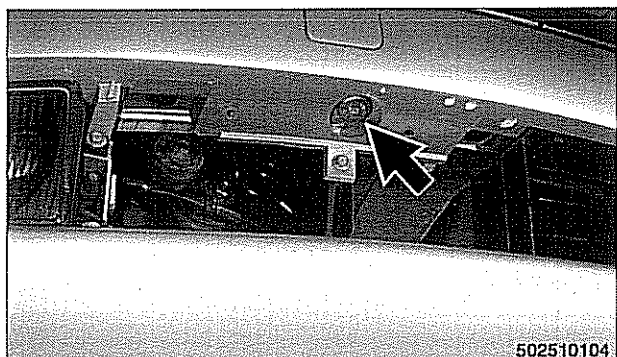


Remove left and right bumper mounting bolts (**arrow**).

— Slide bumper straight forward to remove.

NOTE—

If equipped with headlight washers or PDC (park distance control), slide bumper forward and disconnect head light washer hoses and electrical harnesses from PDC sensors.



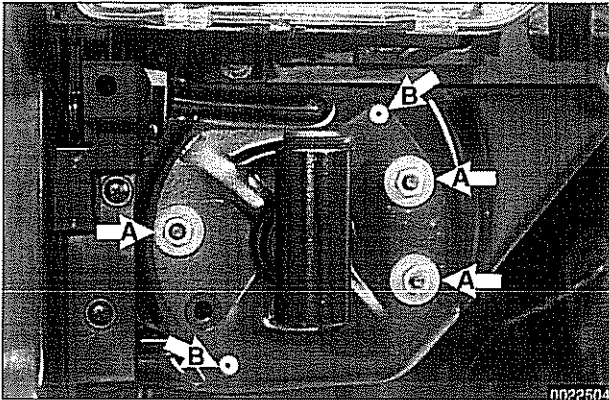
- Installation is reverse of removal, noting the following:
 - Carefully slide bumper side panels over mounting brackets on fenders.
 - Make sure gap between body and bumper is set to specifications. Adjust height as necessary. See **Front bumper height, adjusting**.
 - If equipped with headlight washers or park distance control reconnect hoses and harness.

Tightening torque

Bumper to impact absorber (M10)	41 Nm (30 ft-lb)
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Front bumper impact absorber, replacing

To access front bumper mounting bracket and impact absorber mounting hardware remove front bumper cover. See **Front bumper, removing and installing**.



- Remove front bumper impact absorber mounting nuts (A) and drill out rivets (B).

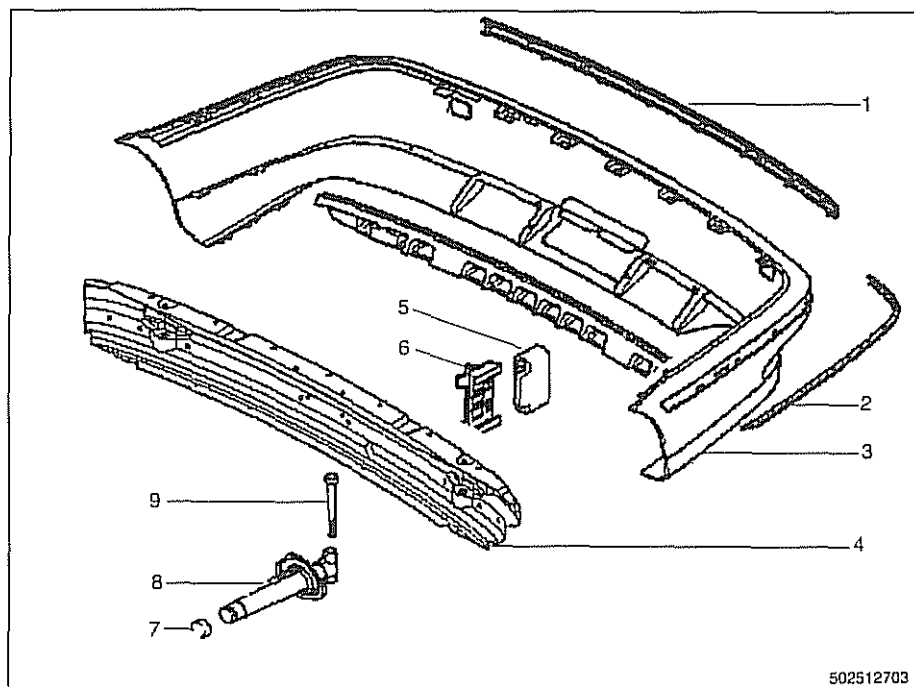
NOTE —

Install the bumper bracket bolts using thread locking compound.

- Installation is the reverse of removal.

Tightening torques

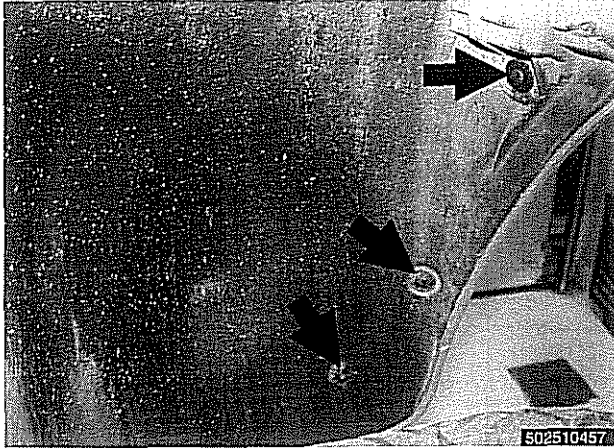
Bumper to impact absorber	41 Nm (30 ft-lb)
Impact absorber to body (6M)	9 Nm (7 ft-lb)
Impact absorber to body (8M)	22 Nm (16 ft-lb)



Rear bumper assembly

1. Center trim cover
2. Side trim cover
3. Bumper cover
4. Bumper support
5. Outer support guide
6. Inner support guide
7. Bumper shock absorber seal
8. Bumper shock absorber
9. Bumper support mount bolt

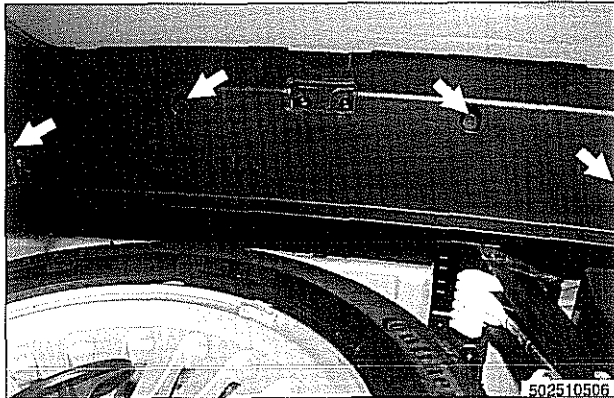
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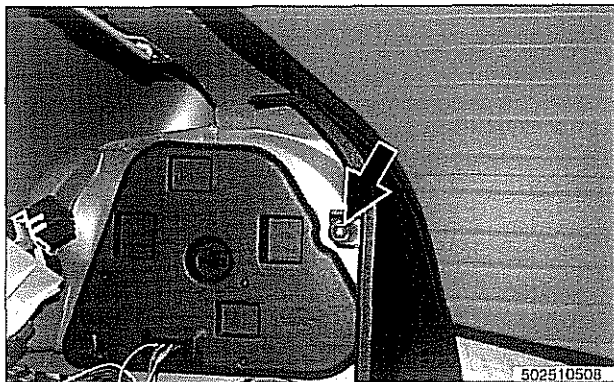
➤ Remove expansion rivets from rear inner fender well panels (arrows).

— Working in luggage compartment:

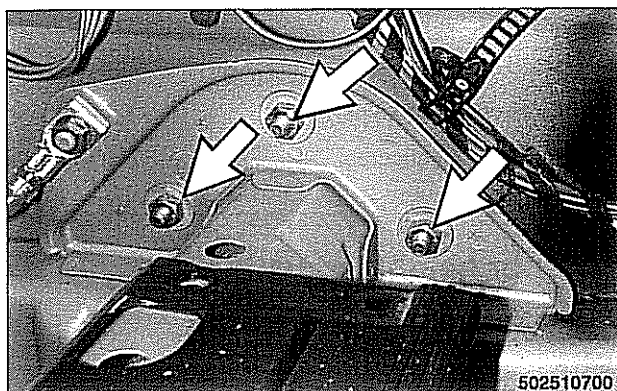
- Raise spare tire cover.
- Remove trim panel covering luggage compartment latch.
- Open battery cover trim panel on right side and luggage compartment.
- Open left side trim panel.



➤ Remove expansion rivets (arrows) from rear panel.



➤ Remove left and right side panel mounting nuts (arrow) and remove panel.



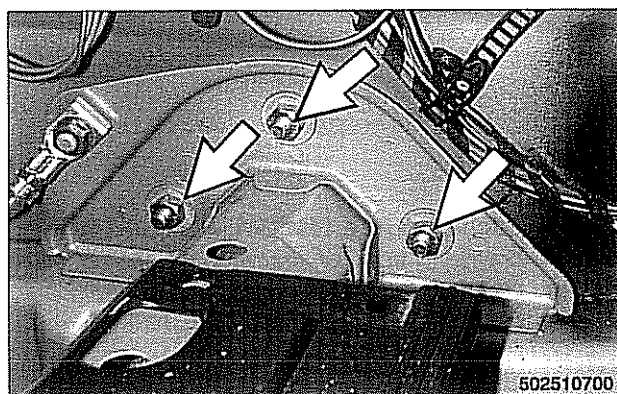
➤ Remove bumper mounting nuts (arrows).

- Slide bumper straight off bumper side mounting brackets.

NOTE —

If equipped with PDC (Park Distance Control) remove electrical harness grommet and remove harness.

- Installation is reverse of removal, noting the following:
 - Make sure gap between body and bumper is set to specifications. Adjust height as necessary.



➤ To adjust bumper height, loosen bumper mounting nuts (arrows) and adjust height.

Tightening torques

Impact absorber to chassis (M8 nut)	20 Nm (15 ft-lb)
Side bracket to body	6 Nm (53 in-ft)

Rear bumper impact absorber, replacing

- Raise and properly support vehicle.

WARNING —

Make sure that the car is firmly supported on jack stands designed for the purpose. Place the jack stands beneath structural points chassis. Do not place jack stands under suspension parts.

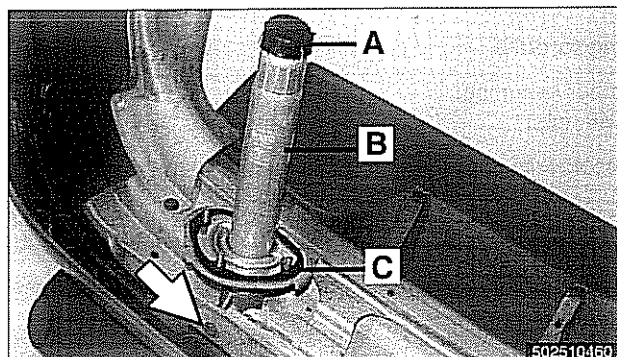
- Remove bumper. See **Rear bumper, removing and installing**.

- Remove bumper cover expanding rivets and remove cover.

➤ Remove bumper impact absorber (B) bolt (arrow).

- If necessary, replace mounting seals (C).
- On right side only, replace Impact absorber end cover (A) if necessary.

- Installation is reverse of removal.



Tightening torques

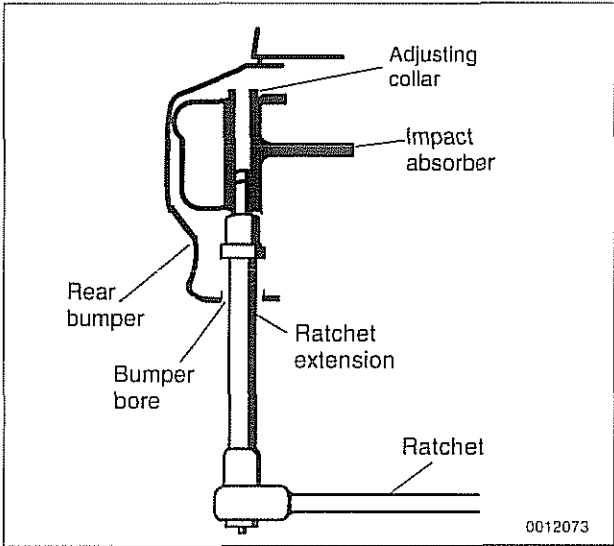
Impact absorber to chassis (M8 nut)	20 Nm (15 ft-lb)
Impact absorber to chassis (M6 nut)	9 Nm (80 in-lb)
Bumper bracket to impact absorber (M10 bolt)	45 Nm (32 ft-lb)

Front bumper height, adjusting

- A 14 mm allen socket is needed to make adjustments.
- Raise and properly support vehicle.

WARNING —
Make sure that the car is firmly supported on jack stands designed for the purpose. Place the jack stands beneath a structural chassis point. Do not place jack stands under suspension parts.

- Using a 12-inch extension and a 14 mm Allen socket, turn adjusting collar clockwise or counterclockwise as needed to change height of adjusting collar.

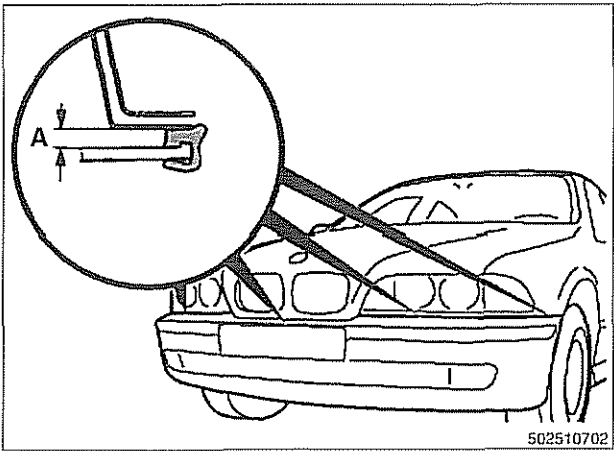


- Distance (A) must be the same at all points ($A = 5 \pm 1 \text{ mm}$ (0.2 to 0.04 in)).

- Reinstall mounting fasteners and check bumper height.

Tightening torques

Front bumper to bumper bracket (M8 nuts)	20 Nm (15 ft-lb)
Impact absorber to chassis (M6 nuts)	9 Nm (80 in-lb)
Front bumper bracket to impact absorber (M10 bolts)	41 Nm (31 ft-lb)



EXTERIOR TRIM

Exterior trim is attached to the body with plastic clips and fasteners that may be damaged during removal. Be sure to have necessary fasteners on hand when reinstalling exterior trim pieces.

BMW emblem, removing and installing

The procedure given below applies to both front and rear emblems.

- Wrap end of a screwdriver with tape.

CAUTION—

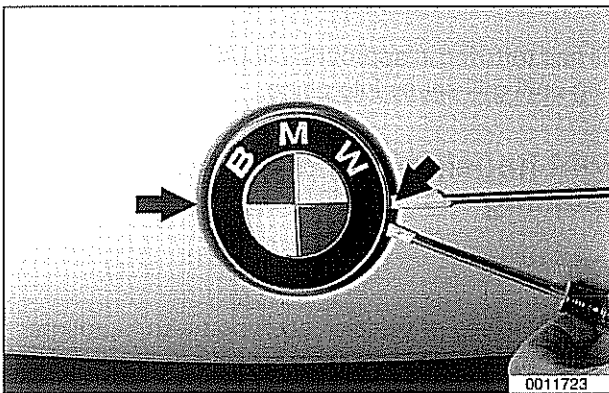
Protect hood paint by covering area around emblem with tape.

- ◀ Pry up emblem carefully on either side (arrows).

NOTE—

Notice tape on screwdriver tips.

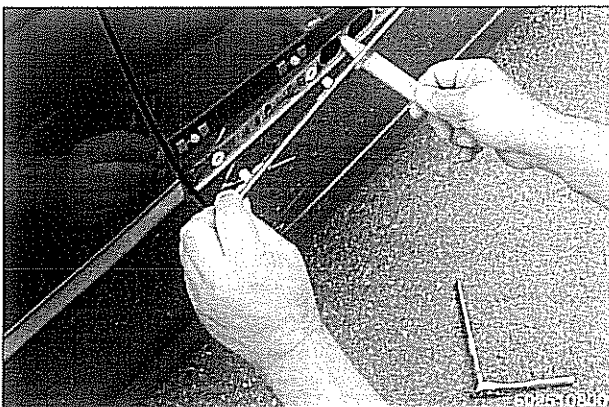
- Installation is reverse of removal.
 - Replace plastic inserts in body if damaged.
 - If emblem fits loosely, use a small amount of body molding tape or adhesive on rear of emblem before installing.

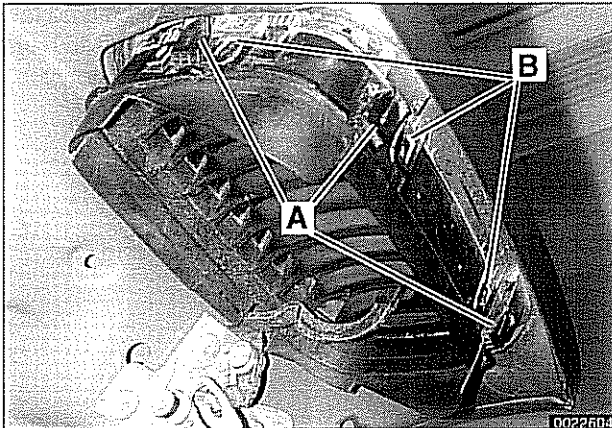


Body side molding, replacing

To remove body side moldings, carefully pry moldings straight off.

- ◀ Installation is reverse of removal. Replace any clips or clip covering boots damaged during removal.

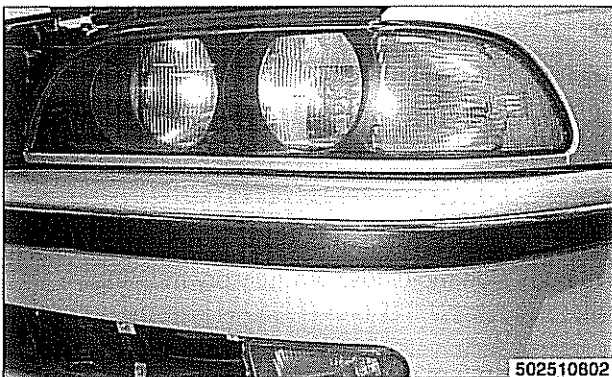




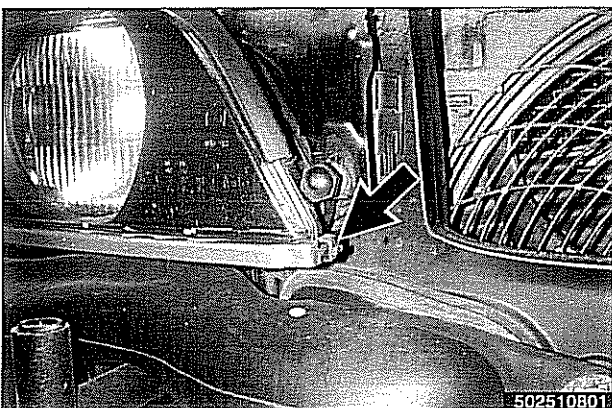
Radiator grill, removing and installing

- Open hood.
- Carefully pry out tab on left or right side of grill trim ring (A), as well as tabs on bottom.
- Push grill out through opening. Be careful of hood lever on passengers side of grill.
- Once grill is removed, pry remaining tabs (B) to separate inner grill from chrome trim ring.
- Before installation, assemble chrome trim ring and grill insert securely. Replace components if tabs or catches are broken or missing.
- Install grill and trim ring in appropriate location in hood. Press on trim ring until grill snaps into place.

Headlight housing trim panel, removing and installing



- Open hood.
- Remove spray nozzle of vehicles equipped with headlight cleaning systems. See 611 Wipers and Washers.



- Release inner tab (arrow) support.
- Swing trim out to release outer hook from fender mounting point.
- Installation is reverse of removal.



512 Door Windows

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GENERAL

This repair group covers door glass, window regulator and power window motor repair information.

CAUTION—

All E39 models are equipped with side-impact airbags in the front doors. Some models are also equipped with airbags in the rear doors. Be sure to read the airbag warnings and cautions in 721 Airbag System (SRS).

Electric window switch replacement is covered in **612 Switches**.

The windshield, rear window, fixed rear door glass, and cargo compartment glass (Sport Wagon only) are bonded using special adhesives and tools. It is recommended that bonded glass replacement be done by an authorized BMW service facility or an automotive glass installer.

Special tools

Some window repair operations require special tools.

Power windows

- Power window features in E39 models include:
 - Control of the front and rear door window motors is carried out directly by the General Module (GM III).
 - One-touch operation in both directions on all four windows.
 - Cable type window regulator used for all door windows.
 - Anti-trap protection provided by pressure sensitive finger guard.
 - Right front and each rear door has a single window switch located in door handle trim.
 - Rear door window switches can be deactivated by pressing child lock-out switch in the driver's window switch block.
 - Convenience closing/opening of the windows from driver's lock cylinder or convenience opening only from remote unlocking feature (FZV) remote key.
 - Window (FZV) operation can be owner customized with Car Memory function. See **515 Central Locking and Anti-Theft**.
 - After ignition is switched off, electric windows can be operated until a door is opened or until 16 minutes has elapsed.
 - The GM III bases window motor end position on current draw (load). There is a maximum window motor run time of 6 seconds. The motor is then switched off even if the end position load sensor fails.

Window switches



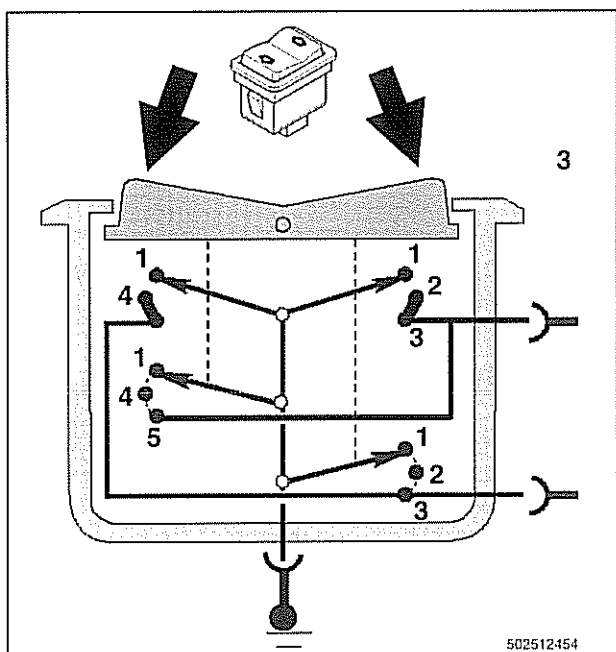
➤ The push type window switch provides the GM III with a coded ground signal. Holding a switch at the first detent provides a single ground signal on one wire requesting the GM III to open the window. When released, the ground signal is removed and the window motor stops.

- Momentarily pushing the switch to the second detent and releasing provides an additional ground signal on the second wire requesting "one touch mode". The GM III lowers the window automatically until it reaches the end position. Each window has four positions, two each for the standard mode of operation and two for the one-touch mode. All window operation signals are digital inputs to the door modules and GM III.

- The switch functions in the same manner for window closing but the ground signal sequence is reversed.

➤ Window switch positions.

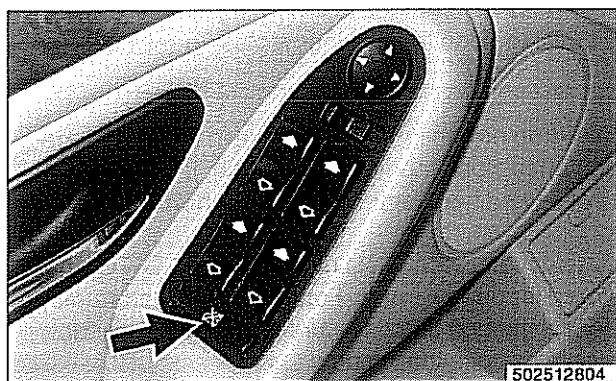
1. Off
2. Open
3. One touch open
4. Close
5. One touch close



Rear window child lockout switch

➤ The rear window child lockout switch (**arrow**) is incorporated in the driver's window switch block in left front door arm rest. When activated, it provides a constant ground signal to the GM III, preventing the windows from being operated from the rear door switches.

- The lockout switch ground signal is overridden by the GM III if a passive safety system (MRS) crash signal is received.



Power window motors

The window motors are mounted on cable regulators. The window motor control circuit consists of two wires for operating the motor in both directions.

The motors are activated by relays in the GM III. The relays provide either power or ground depending on the direction of window travel. The GM III controls the polarity based on a request to run the window from a window switch or a convenience opening/closing signal.

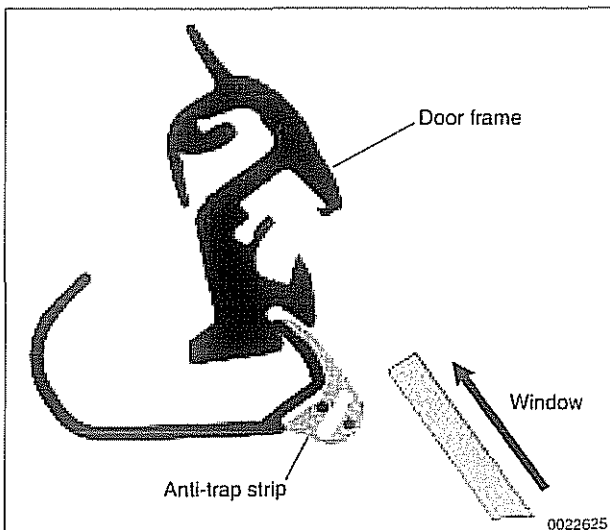
Convenience opening/closing

The GM III provides 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 (remote key) provides the same function for window opening only.

Anti-trap protection is active during convenience closing from the driver's door lock.

If the GM receives a request to operate convenience closing or opening for more than 110 seconds, the function is deactivated and a fault code is stored.

Window anti-trap protection



➤ A rubber pressure guard is located at the top edge of each door frame. It consists of two contact strips that close when subjected to pressure. When the contact strip closes (for example, a hand is trapped between the top of the window and the door frame), an anti-trap signal is sent to the GM III. The window immediately (within 10 milliseconds) reverses direction. This feature does not require initialization.

The E39 pressure sensor finger guard has a resistance of 3 Kw and it is monitored for open circuits. When pressed, the monitored resistance changes to < 1Kw. If anti-trap protection becomes faulty the one touch window closing will not function.

Window anti-trap protection is only active in the one touch and convenience close modes of operation. If the window switch is pulled and held, anti-trap protection will not function.

The anti-trap contact strip has a resistance of 1.2 K Ohm and it is monitored for open circuits. Faults with the anti-trap system will cancel the one touch feature requiring the window switch be held to close the window.

Window motor limit stop function

If repeated window activation (up/down cycles) exceeds one minute, the GM III deactivates the internal relays and disregards any further up/down requests. The GM III provides motor activation after a short duration but not for the full one minute monitoring cycle.

The GM III monitors the number of times a window motor is activated. It counts each cycle and stores the number in memory. After the stop function limit is reached and the window motor is deactivated, the GM III slowly reverses the stored count of activation until the stored number equals 0, thus allowing the window motor to cool down.

WARNING—

- *Always wear hand and eye protection when working with broken glass.*
- *If a window is broken, all of the glass bits should be vacuumed out of the door cavity. Use a blunt screwdriver to clean out any remaining glass pieces from the window guide rails.*
- *When servicing the door windows, the harness connector to the window regulator should always be disconnected to prevent pinching fingers in the moving window mechanism.*

WINDOW SERVICE

Sedan and Sport Wagon doors are similar. Use the following procedures for window service on these models.

WARNING—

- *E39 cars are fitted with side-impact airbags in the front doors. Some are equipped with airbags in the rear doors as well. When servicing the door windows on cars with side-impact airbags, always disconnect the negative (–) battery cable. See **721 Airbag System (SRS)** for cautions and procedures relating to the airbag system.*
- *Prior to disconnecting the battery, read the battery disconnection cautions given **001 General Warnings and Cautions**.*

Window anti-trap strip, testing

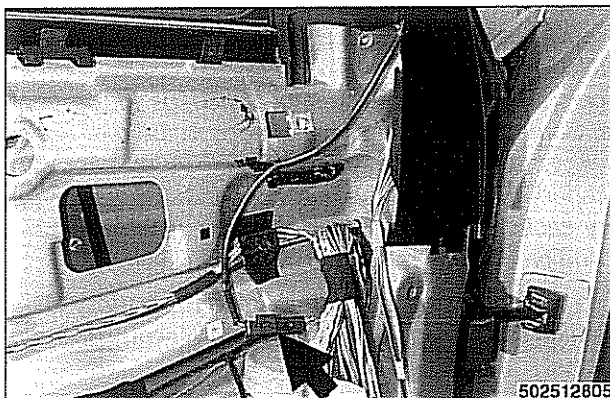
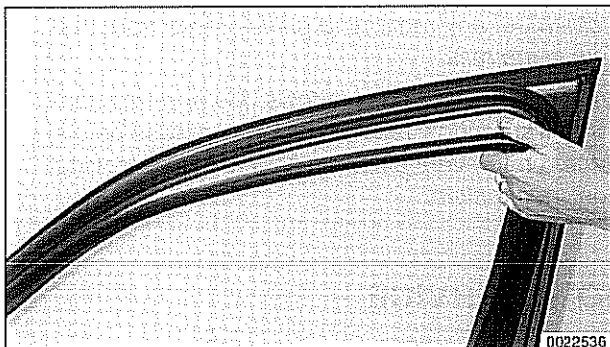
- To test function of anti-trap strip on any window:
 - With key ON and window down, pull up window switch to second detent, thus activating one-touch close operation.
 - Insert wooden block or other soft object between glass and upper door frame.
 - Window should contact block, then immediately reverse direction and lower by approximately 25 mm (1 in).

NOTE —

Anti-trap strip is integrated into the molding strip of the door window frame.

Front window anti-trap strip, removing

- Remove front door panel and vapor barrier as described in 411 Doors.
- Remove window frame molding strip and peel toward inside of vehicle.

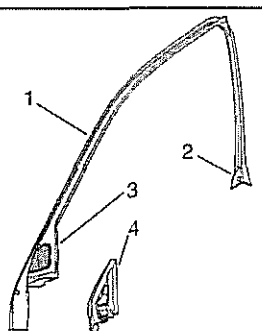


- Separate anti-trap electrical harness connector (arrow) at top front of door.

NOTE —

Wire color for anti-trap strip is dark gray.

Front window frame molding and anti-trap strip



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➤ If replacing molding with new one, transfer mounting clips and foam insulation as necessary.

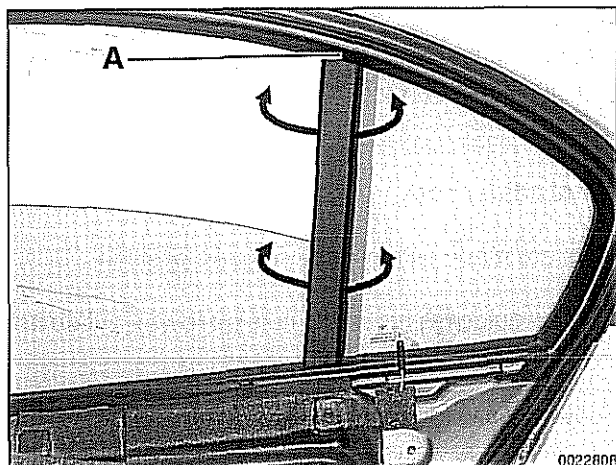
1. Window frame molding
2. Clip
3. Door corner speaker cover
4. Foam insulation

— After installation, recheck anti-trap protection.

Rear window anti-trap strip, removing

— Remove rear door panel and vapor barrier as described in **411 Doors**.

➤ Remove window frame molding strip, peeling it off fixed window partition (**arrows**). Do not tear strip in area (**A**).



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➤ Disconnect electrical harness connector (**arrow**).

— After installation, recheck anti-trap protection.



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Door window, adjusting

Whenever the door window or window regulator is removed, window adjustment should be checked. The glass should contact the top of the window squarely and should seat against the window seal uniformly.

NOTE—

If the window does not contact the window seal uniformly, wind noise or water infiltration may result.

- Remove door panel as described in **411 Doors**.
- Disconnect negative (–) cable from battery. Remove airbag unit and vapor barrier from door. See **721 Airbag System (SRS)**.

WARNING—

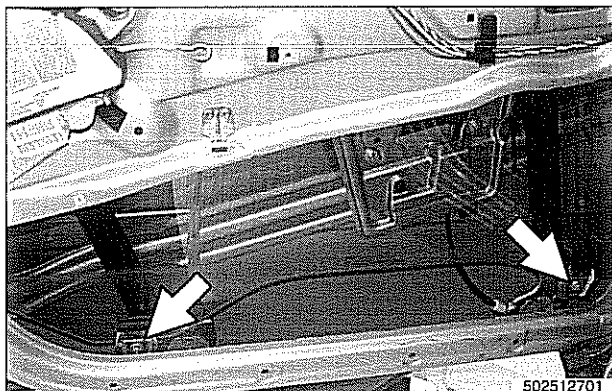
*Prior to disconnecting the battery, read the battery disconnection cautions given in **001 General Warnings and Cautions**.*

Longitudinal adjustment

- Adjustments are made with window in open position.
- Loosen window guide rail mounting nuts (**arrows**), but do not remove.
- Slide window glass in longitudinal direction to adjust.
- Tighten guide rail nuts.

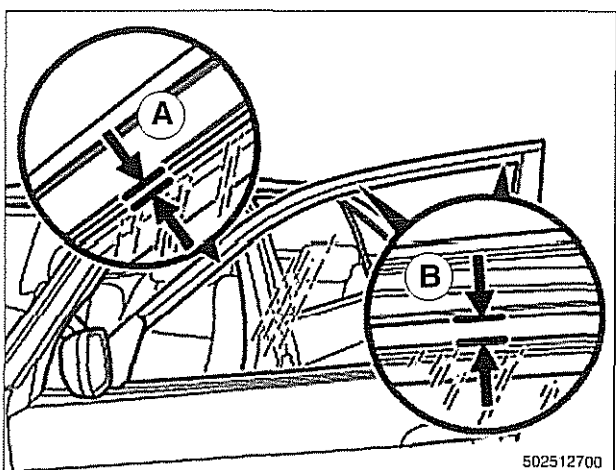
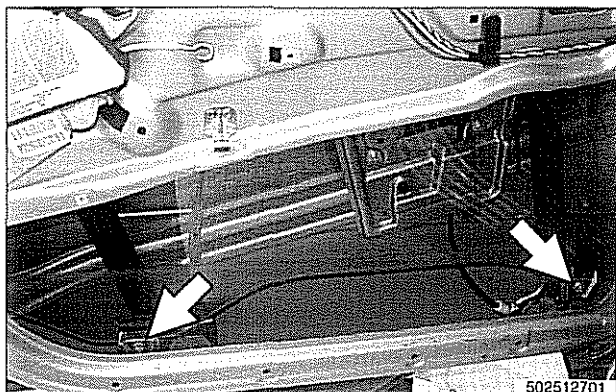
Tightening torque

Window regulator guide rail to door	10 Nm (89 in-lb)
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Vertical adjustment

- Adjustments are made with window in open position.
- Loosen window clamping fasteners (**arrows**), but do not remove.
 - Adjust rear clamp and tighten fastener.
 - Tighten front clamp fastener.



- Raise door window up to stop:
 - Check gap (A) at window front edge.
 - Check gap (B) at window top edge.

NOTE —

Measure window frame between door window edge and panel.

Front window gap settings

Front of window (A)	5.4 mm (0.21 in)
Top of window (B)	10 mm (0.39 in)

Tightening torque

Window regulator guide rail to door	10 Nm (89 in-lb)
-------------------------------------	------------------

Door window, removing and installing

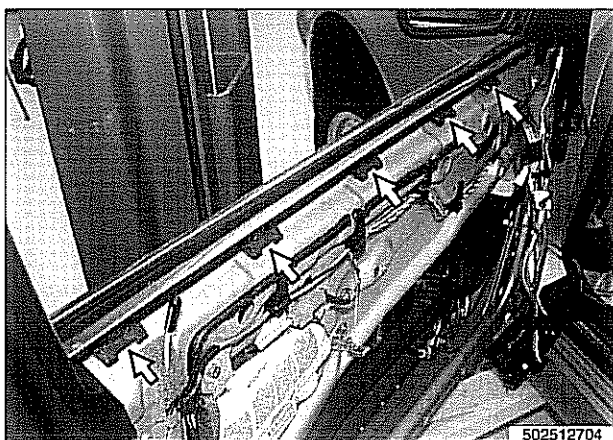
- Remove door panel as described in **411 Doors**.
- Reconnect window switch and lower window down to convenient height and disconnect window switch.
- Disconnect negative (–) cable from battery, then remove airbag unit and vapor barrier from door. See **721 Airbag System (SRS)**.

WARNING —

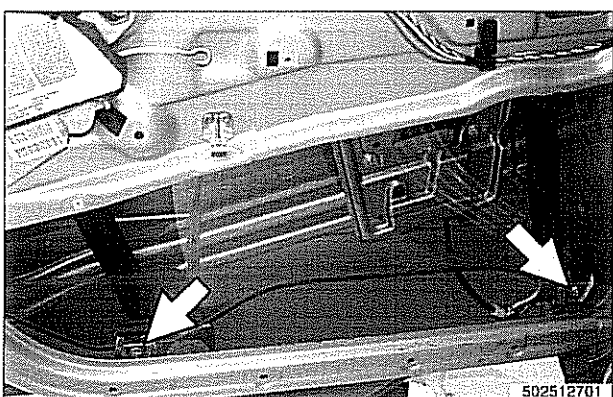
Prior to disconnecting the battery, read the battery disconnection cautions given in **001 General Warnings and Cautions**.



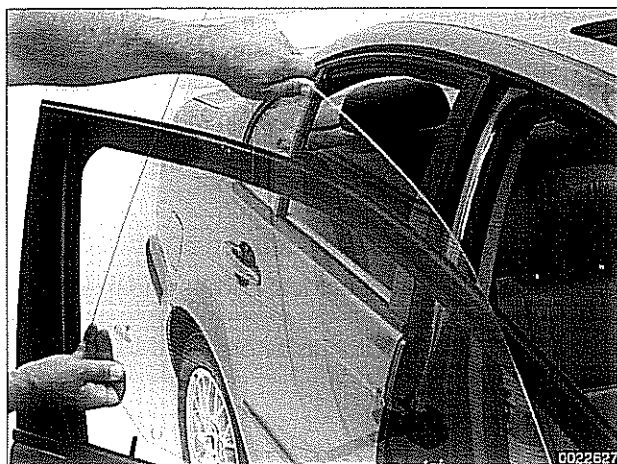
- Working carefully with a plastic prying tool, remove window trim strip from door.



- Starting from rear of inner window trim strip, carefully pry up on trim strip clips (**arrows**) to remove window trim.



- Loosen window clamping jaw fasteners (**arrows**).



- Tilt window glass carefully inside door cavity and lift out of door.
- Installation is reverse of removal.
 - Replace plastic window retainers once glass is inside door.
 - Use new mounting bolts when reinstalling side-impact airbag to door.
 - Adjust window as described earlier.

WINDOW REGULATOR SERVICE

Sedan and Sport Wagon doors are similar. There are two window rails in each front window regulator, only one in the rear. Otherwise the front and rear regulators are similar.

WARNING —

- E39 cars are fitted with side-impact airbags in the front doors. Some are equipped with airbags in the rear doors as well. When servicing the door windows on cars with side-impact airbags, always disconnect the negative (–) battery cable. See **721 Airbag System (SRS)** for cautions and procedures relating to the airbag system.
- Prior to disconnecting the battery, read the battery disconnection cautions given at the front **001 General Warnings and Cautions**.

NOTE —

Because window operation is electronically controlled, a window motor does not have mechanical end positions. For this reason it can be removed and installed with the window in any position and does not need reinitialization.

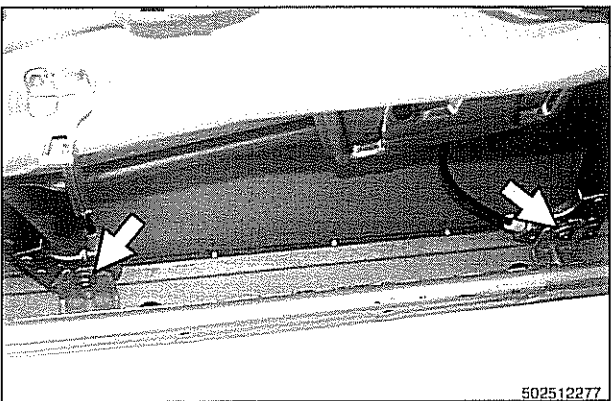
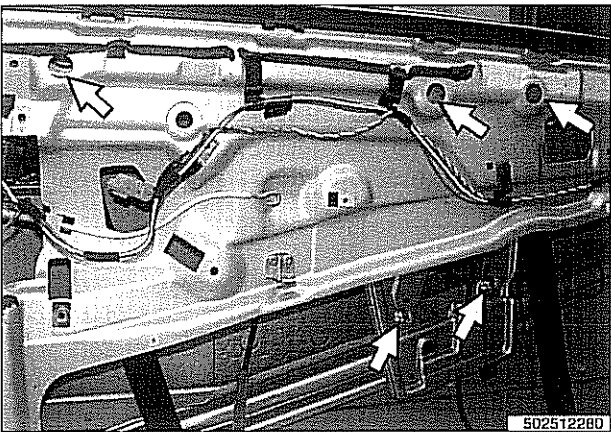
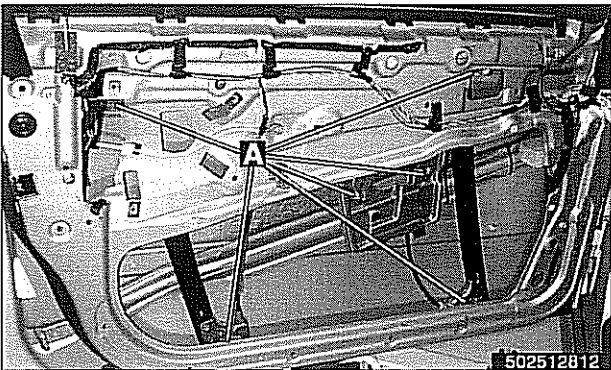
Front window regulator removing and installing

NOTE —

BMW recommends removing the window regulator and motor as one unit, then separating the two on the bench.

- Remove front door panel as described in **411 Doors**.
- Disconnect negative (–) cable from battery, then remove airbag unit and vapor barrier from door. See **721 Airbag System (SRS)**.

Door Windows



- Disconnect window from window guide rail as described in **Door window, removing and installing**. Do not remove window from door.
 - Push window up and use wedge to hold in position.
- If necessary, remove speaker unit from door.
- Removing window regulator from door:
 - Disconnect window motor electrical harness connector.
- Remove lower window regulator fasteners (**arrows**).
- Remove upper window regulator fasteners (**arrows**).
- Loosen fasteners (**arrows**) and slide regulator up to remove from mounts.
- Remove window regulator through opening in bottom of door, checking for any wiring that might become snagged during removal.
- Installation is reverse of removal.
 - Be sure to route wiring harnesses to keep them away from moving window mechanism. Use new wire ties as necessary.
 - Adjust window as described earlier.

Tightening torques

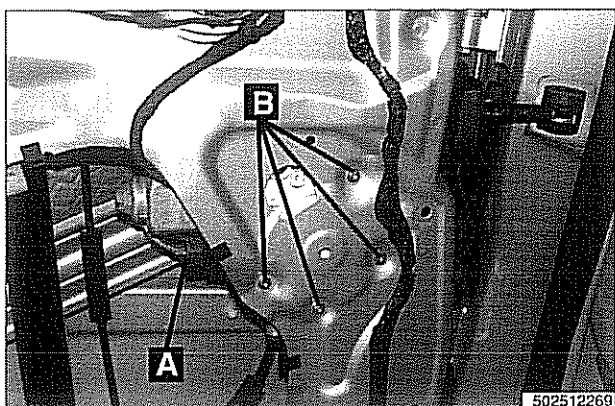
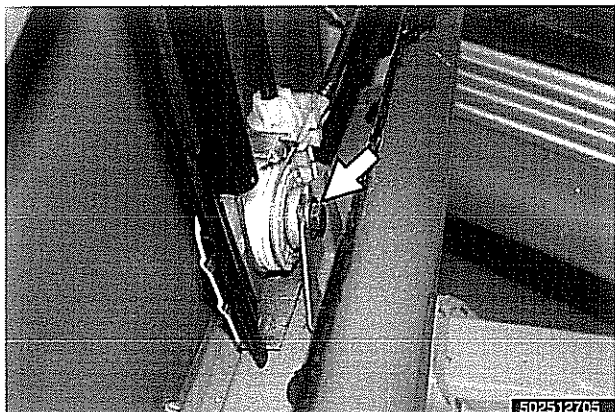
Window motor to regulator	5 Nm (44 in-lb)
Window regulator to door	8 Nm (71 in-lb)
Window to guide	8 Nm (71 in-lb)

Rear window regulator, removing and installing

NOTE—

BMW recommends removing the window regulator and motor as one unit, then separating the two on the bench.

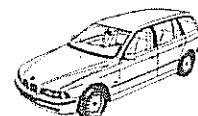
- Disconnect negative (–) cable from battery.
 - Remove door panel as described in **411 Doors**.
 - Remove airbag unit and vapor barrier from door. See **721 Airbag System (SRS)**.
 - Disconnect window from window guide rail as described in **Door window, removing and installing**. Do not remove window from door.
 - Push window up and use wedge to hold in position.
- ◀ Loosen fastener (**arrow**) and slide window regulator up and out of mount.



- ◀ Disconnect wiring harness connector (**A**) and remove fasteners (**B**).
- Remove window regulator and motor through opening in door.
- Installation is the reverse of removal.
 - Be sure to route wiring harnesses to keep them away from moving window mechanism. Use new wire ties as necessary.

Tightening torques

Window motor to regulator	5 Nm (44 in-lb)
Window regulator to door	8 Nm (71 in-lb)
Window to guide	8 Nm (71 in-lb)



513 Interior Trim

General	513-2	Window and door post trim panels,	
Interior trim repairs	513-2	removing and installing	513-12
Center Console	513-3	Dash panel support,	
Center console, removing and installing	513-3	removing and installing	513-15
Dash Panel	513-7	Rear parcel shelf panel,	
Lower dash panel assembly,		removing and installing	513-15
removing and installing	513-7	Glove compartment,	
Upper dash assembly,		removing and installing	513-16
removing and installing	513-11		

GENERAL

This repair group covers interior trim removal and installation procedures.

- Refer to the following repair groups for additional information:
 - 250 Gearshift Linkage
 - 411 Doors (interior door panels)
 - 612 Switches
 - 620 Instruments
 - 640 Heating and Air Conditioning (IHKA control panel)
 - 650 Radio
 - 721 Airbag System (SRS)

Interior trim repairs

Interior trim and finish panels are clipped or screwed into place. Many of the trim retaining clips are designed to be used only once. When removing trim that is held in place with clips, it is a good idea to have spare clips on hand before beginning the job.

WARNING—

- *Special precautions must be observed when servicing the BMW Supplemental Restraint System (SRS). Serious injury may result if system service is attempted by persons unfamiliar with the BMW SRS and its approved service procedures. BMW specifies that all inspection and service should be performed by an authorized BMW dealer.*
- *Before performing any work involving airbags, disconnect the negative (–) battery cable. See 721 Airbag System (SRS).*
- *Airbags contain a back-up power supply within the SRS control module. A 5 second discharge period should be allowed after the battery cable has been disconnected.*

CAUTION—

- *When working on electrical switches or lights, always disconnect the negative (–) cable from the battery and insulate the cable end to prevent accidental reconnection.*
- *Prior to disconnecting the battery, read the battery disconnection cautions given in 001 General Warnings and Cautions.*
- *To prevent marring the trim when working on interior components, work with plastic prying tools or wrap the tips of screwdrivers and pliers with tape before prying out switches or electrical accessories.*

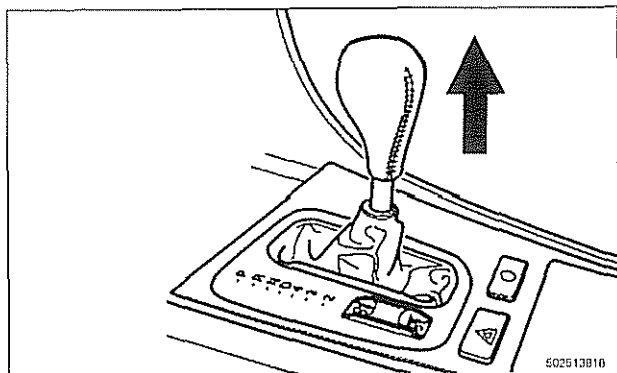
CENTER CONSOLE

The console between the two front seats starts behind the shifter housing. It houses the parking brake handle, optional telephone and oddments storage tray. The rear portion of the console houses the ashtray and covers the emergency brake cable ends.

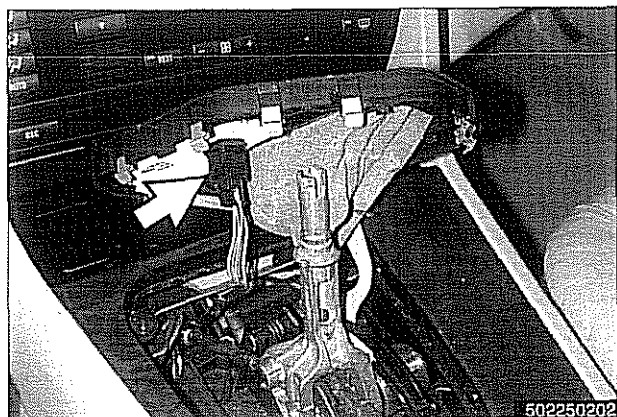
NOTE —

The accompanying photos illustrate a model with automatic transmission. Manual transmission models are similar.

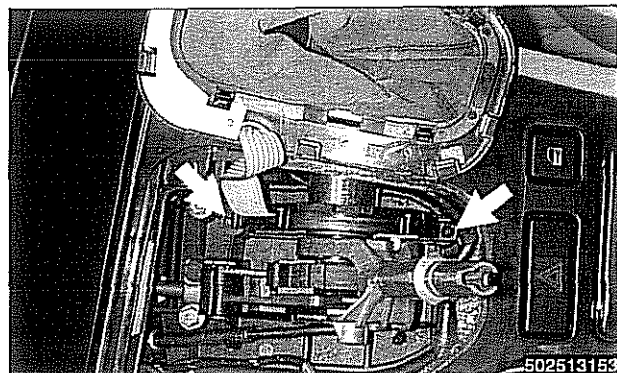
Center console, removing and installing



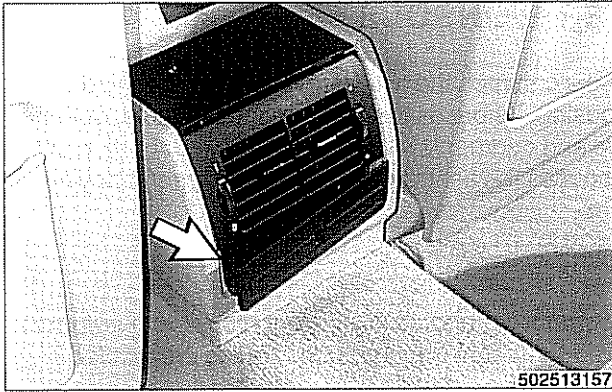
- Remove shift knob by pulling straight up (arrow).



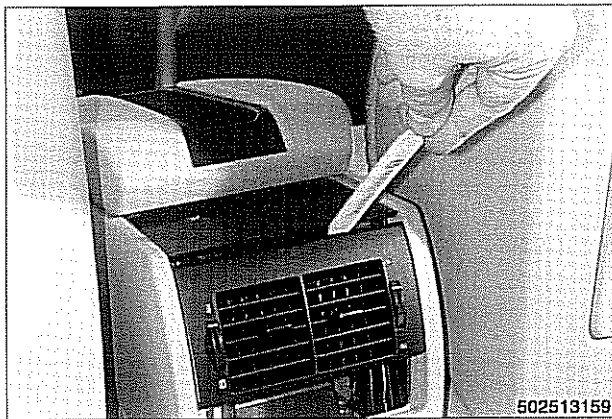
- Gently pry shift bezel up out of console and disconnect wiring harness (arrow).



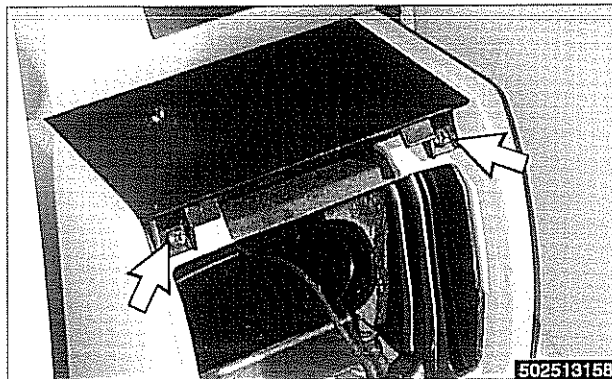
- Models equipped with automatic transmission remove neutral safety switch fasteners (arrows) and remove bezel with switch.



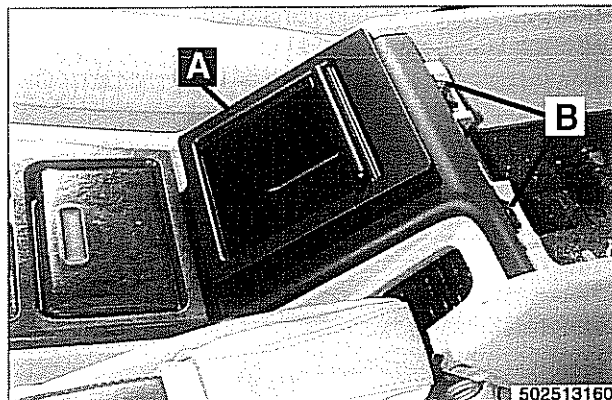
➤ Carefully pry cup holder (arrow) out of console.



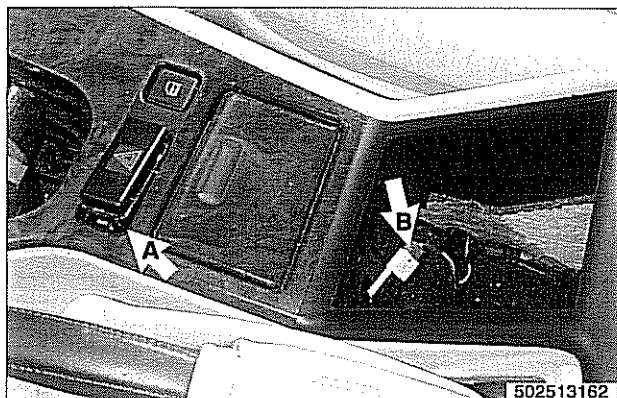
➤ Pry air vent down to release locking clips and remove.



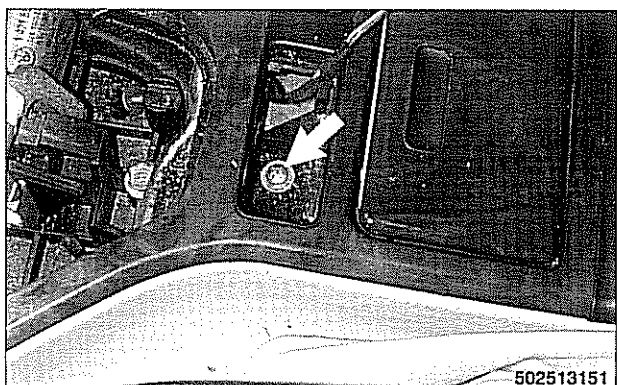
➤ Remove screws (arrows) at base of front seat armrest and slide armrest forward to remove.



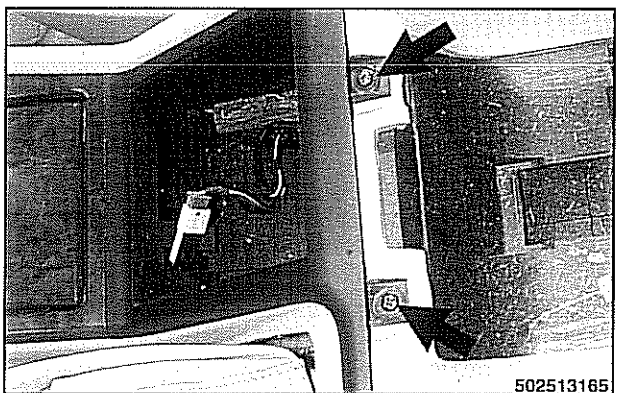
➤ Remove console glove box (A).
• Remove rear trim panel fasteners (B).



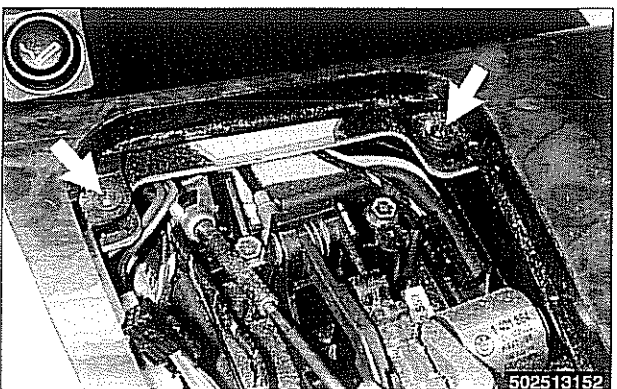
- ◀ Carefully pry out 4-way hazard flasher switch (A).
- Disconnect wiring harness (B).



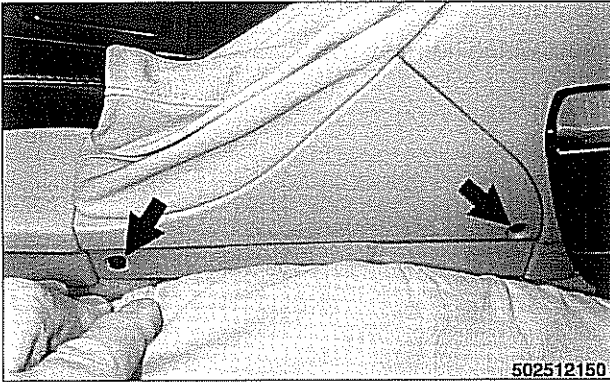
- ◀ Remove trim panel fastener (arrow) under 4 way flasher switch.



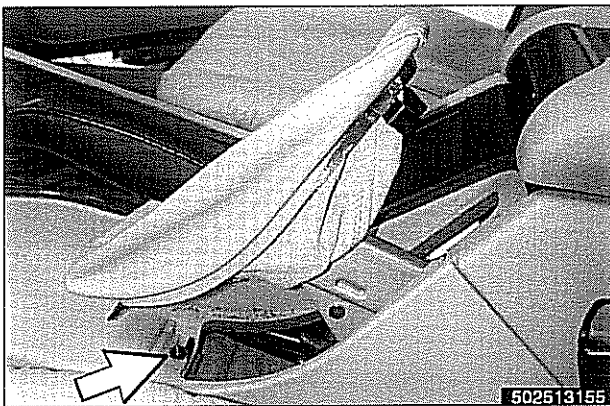
- ◀ Remove console trim panel retaining fasteners (arrow) at rear of trim panel.



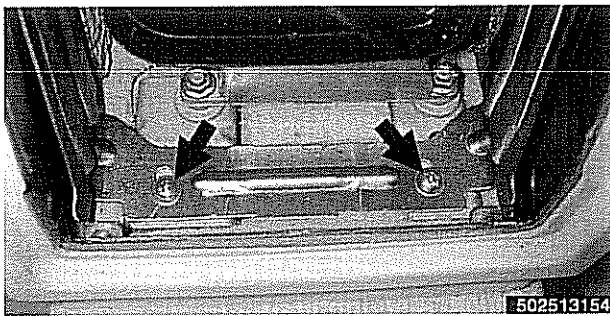
- ◀ Remove front console trim fasteners (arrows) and carefully remove trim panel.



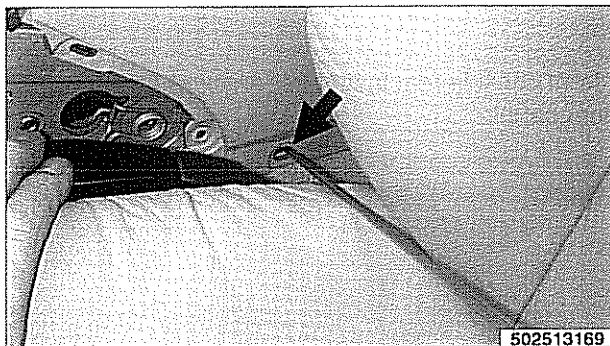
- Remove parking brake lever side cover fasteners (arrows).



- Unclip trim boot for parking brake lever and pull boot and handle forward off brake lever. Remove parking brake cover fastener (arrow) and remove cover.



- Remove fasteners at rear of console (arrows).



- With left and right seats in lowest position, remove side console fasteners (arrow).
- Remove left and right side console trim covers. See **Lower dash panel assembly, removing and installing**.
 - Remove center console.
 - Installation is reverse of removal.

DASH PANEL

The E39 dashboard assembly includes the instrument cluster, passenger side airbag, glove compartment, fuse and relay panel, radio, IHKA control panel or on-board monitor (if equipped with GPS). The dash is made up of an upper and lower sections. The lower section must be removed before the upper section can be removed.

Dashboard removal is a complex operation. Read the procedures through before starting work.

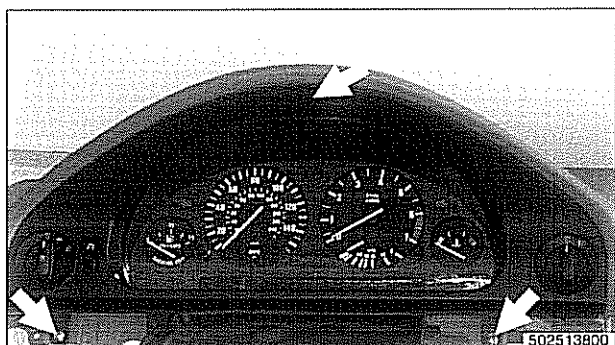
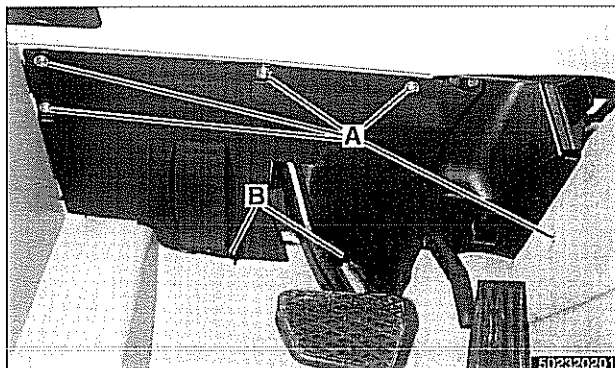
Lower dash panel assembly, removing and installing

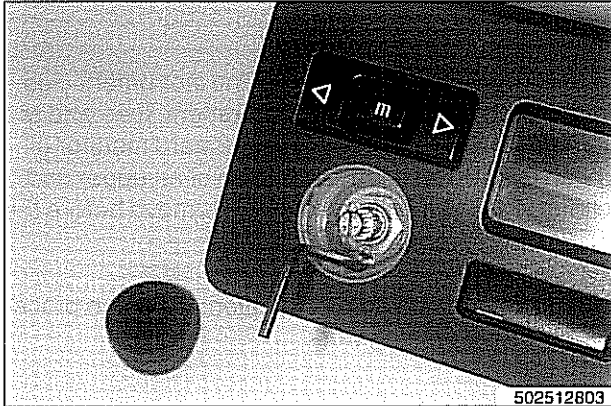
- Disconnect negative (–) cable from battery and cover terminal with insulating material.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given at the front in 001 General Warnings and Cautions.

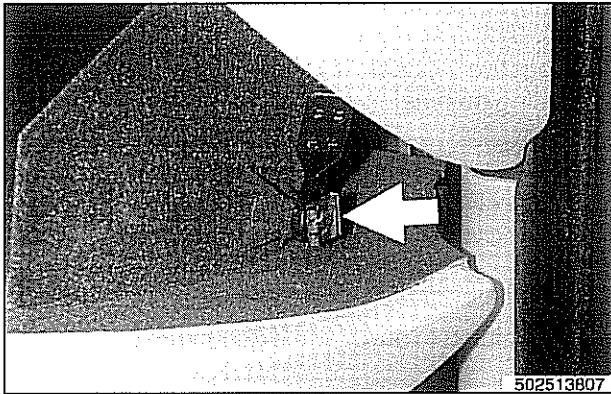
- Place steering column in down and extended position.
- Remove left side foot well panel fasteners (A and B).
- Using a plastic trim tool, gently pry left and right steering column trim panels (**white arrow**) to remove and release snap clip on column boot (**black arrow**).
- Remove instrument cluster trim panel fasteners (**arrows**).
 - Pull trim panel out and disconnect harnesses for light switches.
- Remove radio volume control knob.





➤ Insert allen wrench into slot approximately 1 mm and turn through 90°.

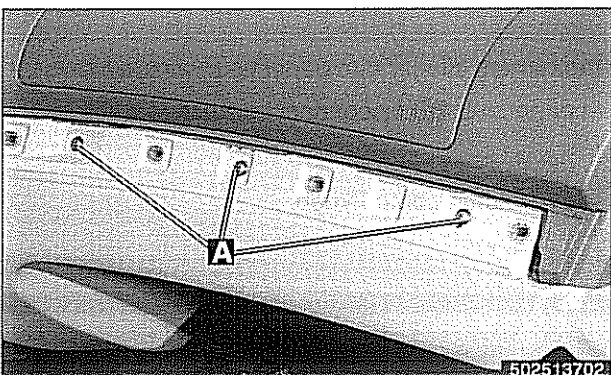
- Disconnect wiring harnesses from radio.
- Remove radio.



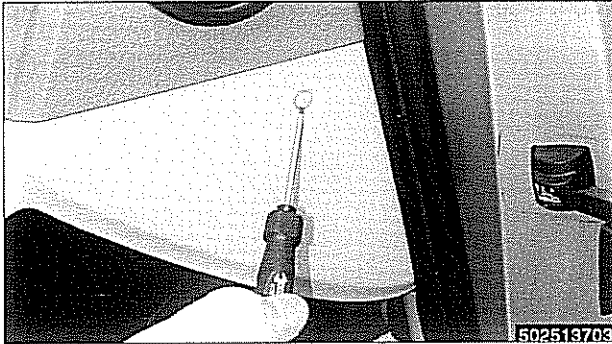
➤ Remove left and right locking clips (**arrow**) from glove compartment straps.



➤ Carefully pry left and right dashboard trim out to remove.



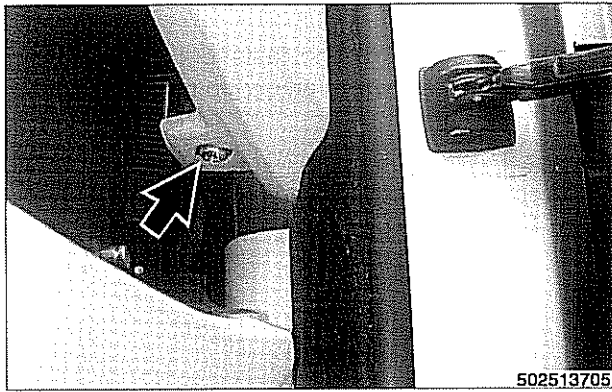
➤ Remove right side lower dash support screws (**A**).



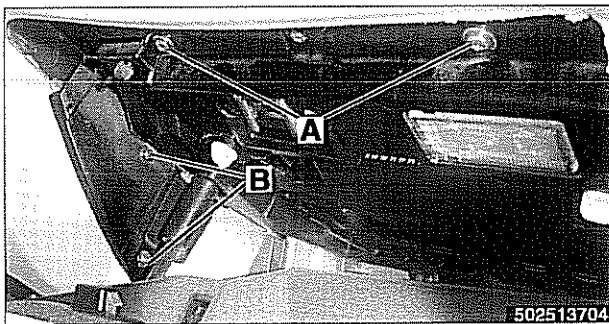
➤ Remove trim plug from right side of lower dash and remove screw.

— Open glove compartment door.

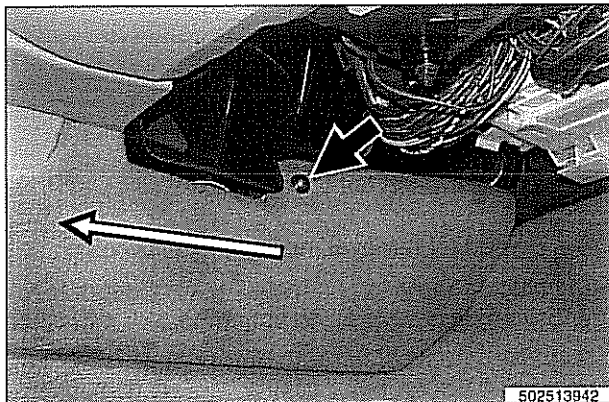
— Remove right side foot well trim panel screw and slide rim panel back to remove.



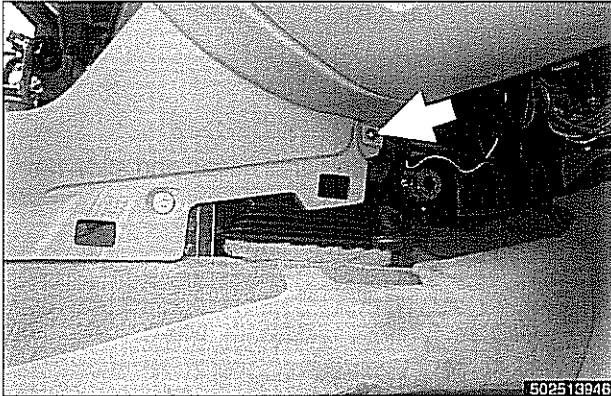
➤ Remove glove compartment mounting screw from right side of dash (arrow).



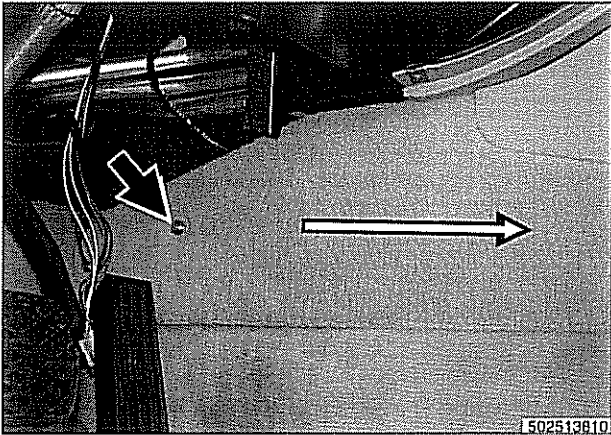
➤ Remove screws **A** and **B** inside glove compartment.



➤ Remove right side console trim panel fasteners (**black arrow**) and pull panel back (**white arrow**) to remove.



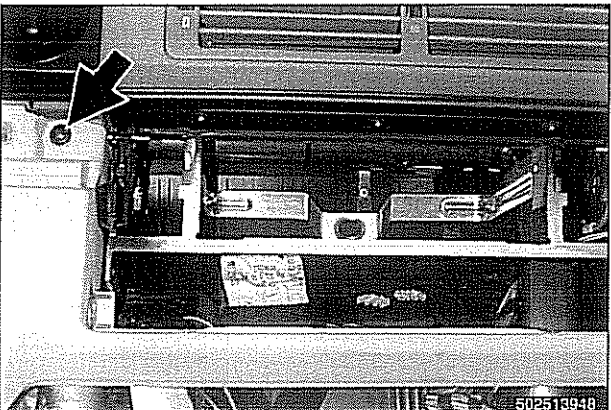
- Remove right side lower dash fastener (**arrow**).



- Remove left side console trim panel fasteners (**black arrow**) and slide panel backward (**white arrow**) to remove.

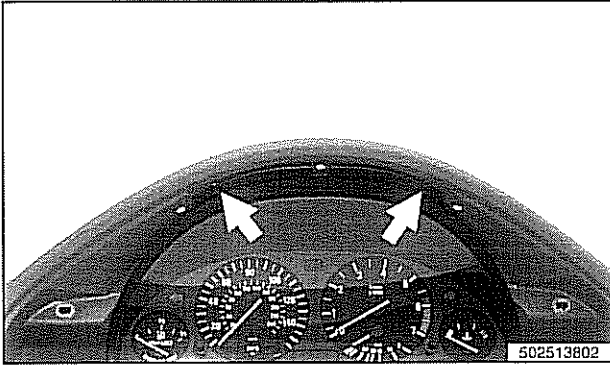


- Remove left side lower dash fastener (**arrow**).

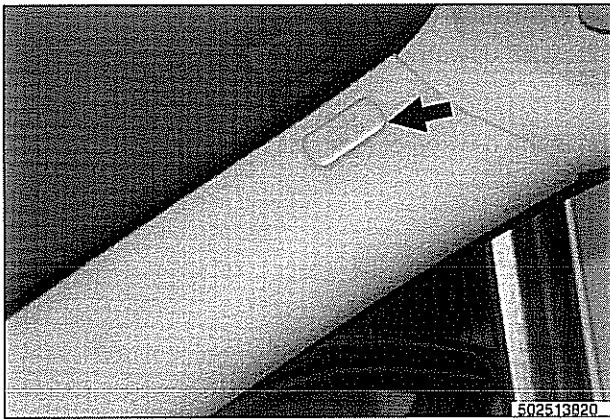


- Remove upper dash fastener (**arrow**).
- Pull bottom of lower dash out to remove.
- Installation is reverse of removal, noting the following:
- Instrument cluster harness connector locking levers must be in up position before installing connectors.
 - If replacing instrument cluster with new unit, recode new cluster using BMW scan tool DISplus, MoDiC or equivalent.

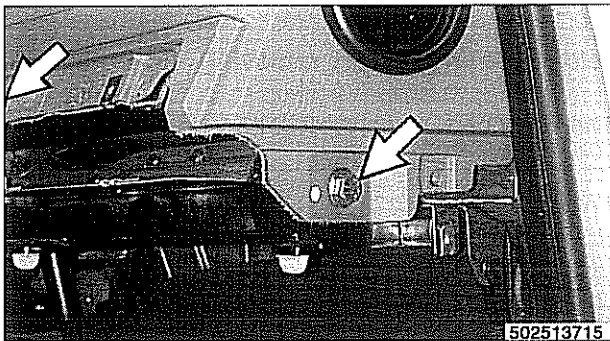
Upper dash assembly, removing and installing



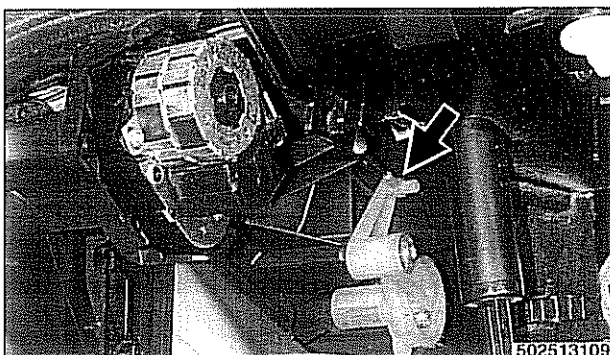
- Remove lower dash assembly. See **Lower dash panel assembly, removing and installing**.
- Remove instrument cluster fasteners (**arrows**) and swing cluster out to remove.
 - Disconnect wiring harnesses from instrument cluster.



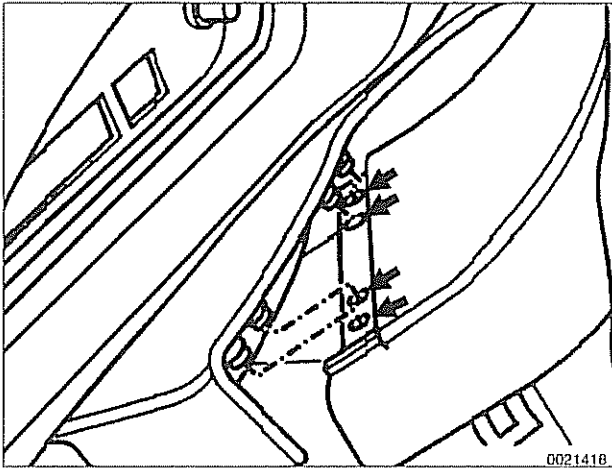
- Remove A-pillar (windshield pillar) trim on left and right sides by prying out HPS cover (**arrow**).
 - Remove screws beneath covers.
- Remove passenger side airbag. See **721 Airbag System (SRS)**.



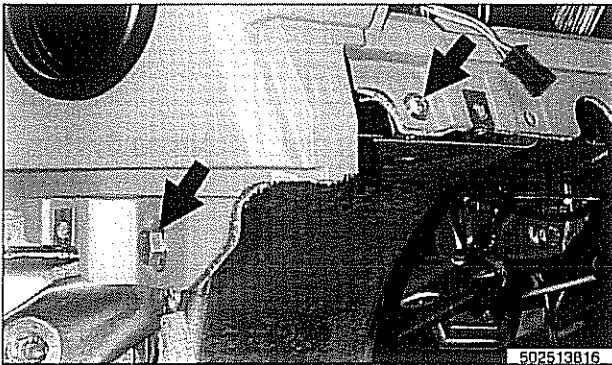
- Remove right side upper dash fasteners (**arrows**).



- Disconnect Bowden cable (**arrow**) from temperature control ventilation arm.



- Remove steering column trim panel by releasing clips (arrows).



- Remove left side mounting fasteners (arrows).
 - Lift dash panel upwards and remove through passenger door.
- Installation is the reverse of removal.

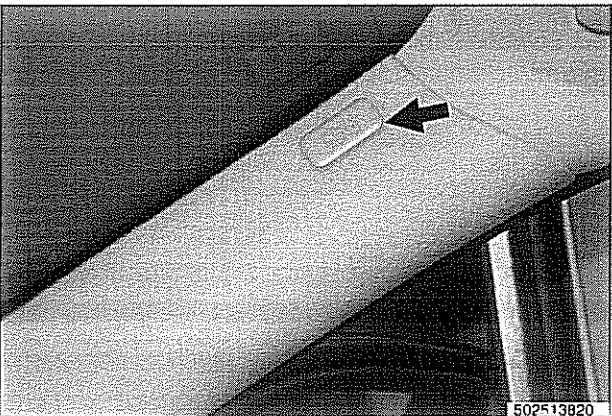
Window and door post trim panels, removing and installing

Windshield post trim (A pillar), removing and installing

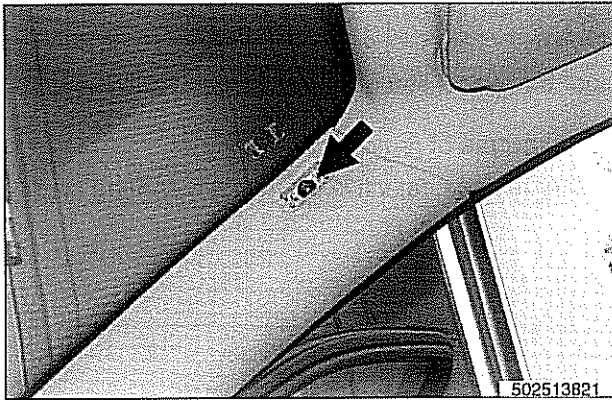
- On 1998 and later cars, disconnect battery negative (-) cable.

WARNING—

On 1998 and later models, front Head Protection System (HPS) airbags are installed in the driver and passenger side windshield post trim (A-pillar). See 721 Airbag System (SRS) for warnings and cautions regarding airbags.

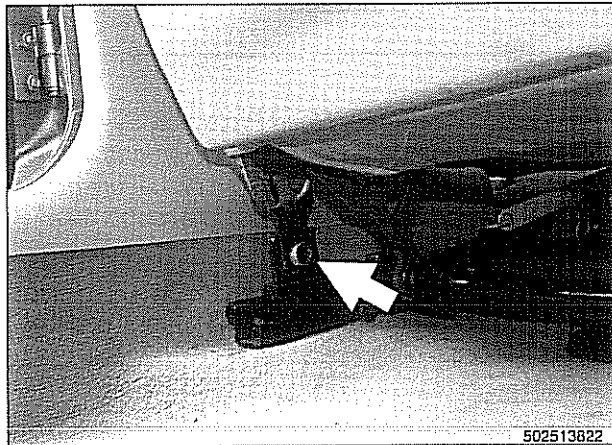


- Remove A-pillar trim panel fastener cap (arrow).

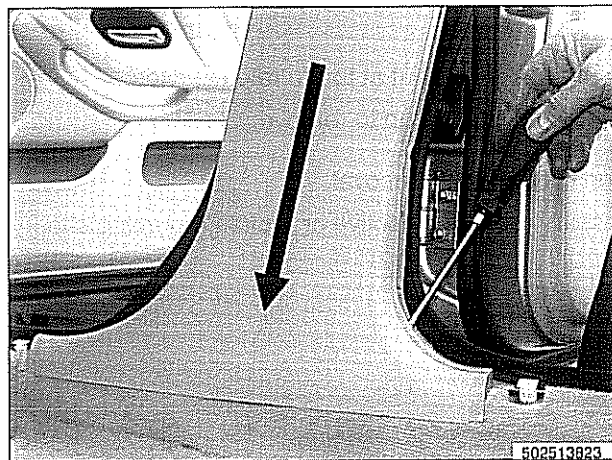


- Remove fastener (**arrow**) beneath trim cap.
 - Working from top carefully pull trim panel away from A-pillar and pull up to remove.
- Installation is reverse of removal.
 - If necessary replace defective or broken mounting clips.

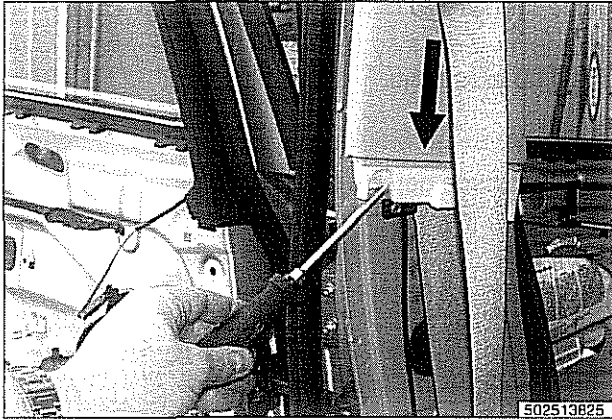
Door post trim panel (B-pillar), removing and installing



- Remove seat belt fastener (**arrow**) from seat frame.
- Remove front and rear door sill trim panels.
- Pull front and rear rubber door seal away from trim panel.



- Carefully pull bottom of lower trim panel away from door post to release clips.
 - Pull trim lower panel straight down (**arrow**) to remove.

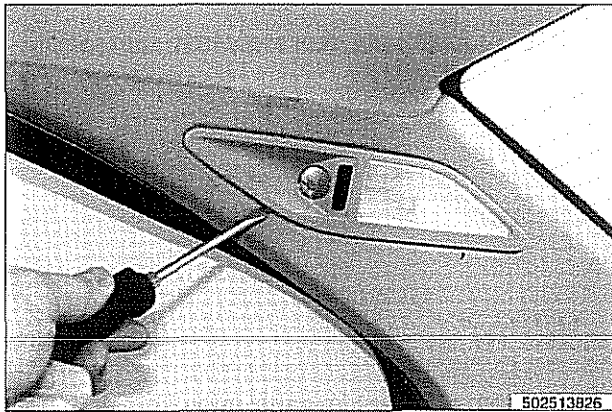


- ⚠ Carefully pry bottom of upper trim panel away from door post to release clips.
 - Pull upper trim panel straight down (**arrow**) to remove.
- Installation is reverse of removal.
 - If necessary replace defective or broken mounting clips.

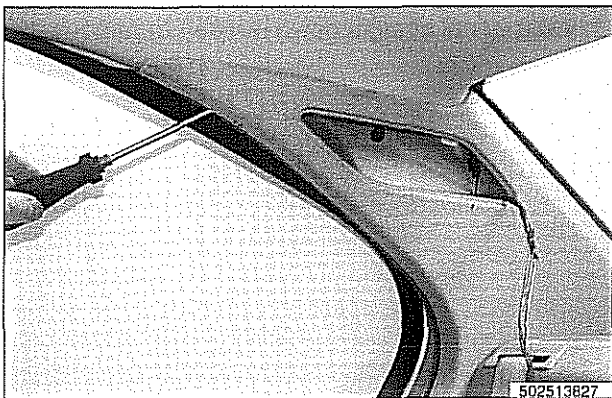
Rear window pillar trim (C-pillar), removing and installing (models without rear HPS airbags)

WARNING —

On 1998 and later models, rear Head Protection System (HPS) airbags may be installed (optional equipment) in the driver and passenger side C-pillar area. The procedure given below does not cover models with rear HPS airbags. See 721 Airbag System (SRS).

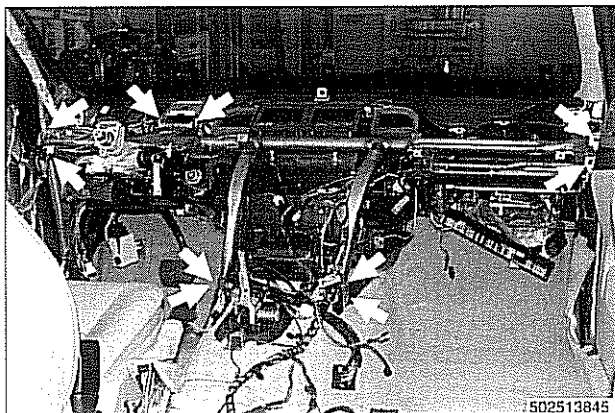


- ⚠ Carefully pry interior light out of C-pillar trim panel and disconnect wiring harness.



- ⚠ Carefully pry trim panel out at top to release clips.
 - Pull trim panel straight up to remove.
- Installation is reverse of removal.
 - If necessary replace defective or broken mounting clips.

Dash panel support, removing and installing



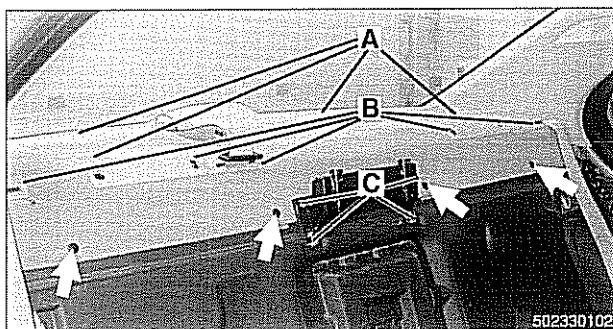
- Remove lower dash panel. See **Lower dash panel assembly, removing and installing**.
- Remove upper dash panel. See **Upper dash assembly, removing and installing**.
- Remove upper steering column fasteners. See **320 Steering and Wheel Alignment**.
- Remove dash support fasteners (**arrows**).
 - Remove wire ties as necessary and remove support.
- Installation is reverse of removal.

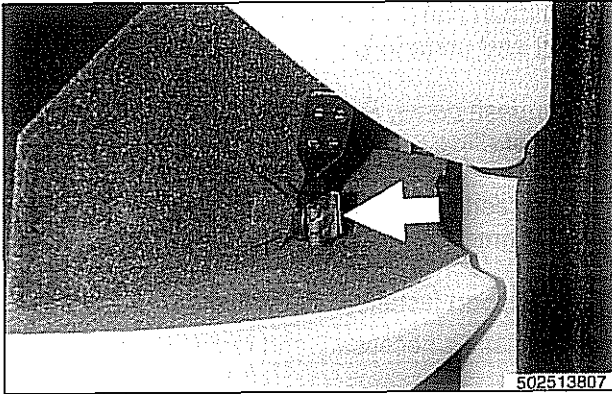
Rear parcel shelf, removing and installing (models without rear HPS airbags)

WARNING —

On 1998 and later models, rear Head Protection System (HPS) airbags may be installed (optional equipment). The procedure given below does not cover models with rear HPS airbags. See 721 Airbag System (SRS).

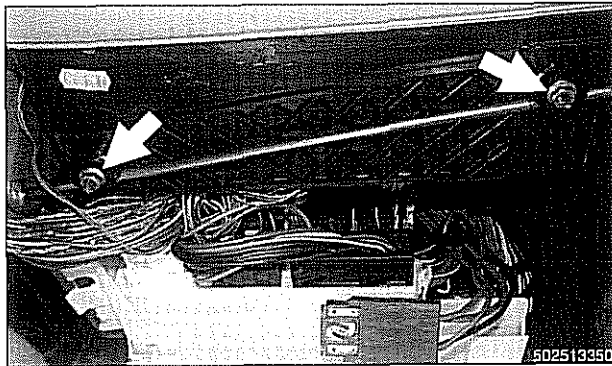
- Remove C-pillar trim panels. See **Rear window pillar trim panel (C-pillar), removing and installing**.
- Remove rear seat backrest. See **520 Seats**.
- Rear parcel shelf removing:
 - Remove center headrest fasteners.
 - Remove seatbelt floor mounting fasteners.
 - Carefully pry out safety belt trim panels and feed seatbelt through slots.
 - Remove expansion rivets and slide panel forward to remove.
- Remove expansion rivets (**arrows**).
 - Remove vent panels (A).
 - Remove speaker panels (B).
 - Remove center head rest support fasteners (C).
 - Slide parcel shelf forward to remove.
- Installation is reverse of removal.





Glove compartment, removing and installing

- Open glove compartment and remove left and right side mounting clips (**arrow**) and support straps.
 - Close glove compartment.
 - Remove right side lower dash panel.



- Working under right side of dash, remove glove compartment hinge fasteners (**arrows**).
 - While supporting glove compartment, release latch to remove.
 - Installation is reverse of removal.



515 Central Locking and Anti-Theft

General 515-2

Central Locking 515-2

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GENERAL

This section covers repair information for door, trunk and cargo compartment locks, central locking, electronic immobilization (EWS) and anti-theft alarm (DWA).

E39 cars are equipped with sophisticated self-diagnostic electrical systems. When experiencing malfunctions relating to central locking, EWS or anti-theft systems, start the diagnosis process using the BMW service tester DIS, GT 1, MoDiC or equivalent scan tool. An advanced diagnostic scan tool can usually pinpoint electrical faults quickly and safely.

Additional electrical information can be found in:

- **610 Electrical Component Locations**
- **ELE Electrical Wiring Diagrams**

CENTRAL LOCKING

Central locking in E39 vehicles controls the door locks, trunk or tailgate lock and fuel filler flap lock. The control module for the Central Body Electronics system (ZKE III), known as the General Module (GM III), controls central locking.

ZKE III manages the following central locking related functions:

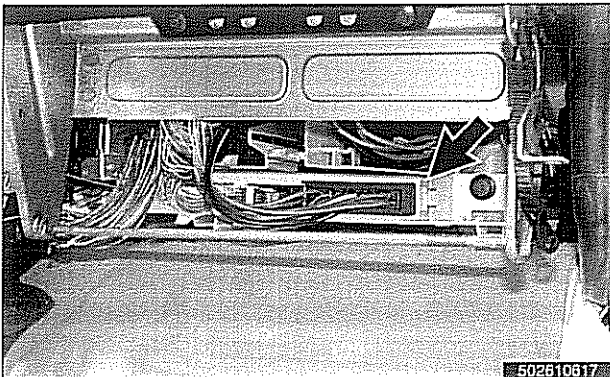
- Central locking
- Keyless entry
- Key memory
- Power trunk release
- Electric opening of tailgate
- DWA alarm system
- Diagnosis

General Module

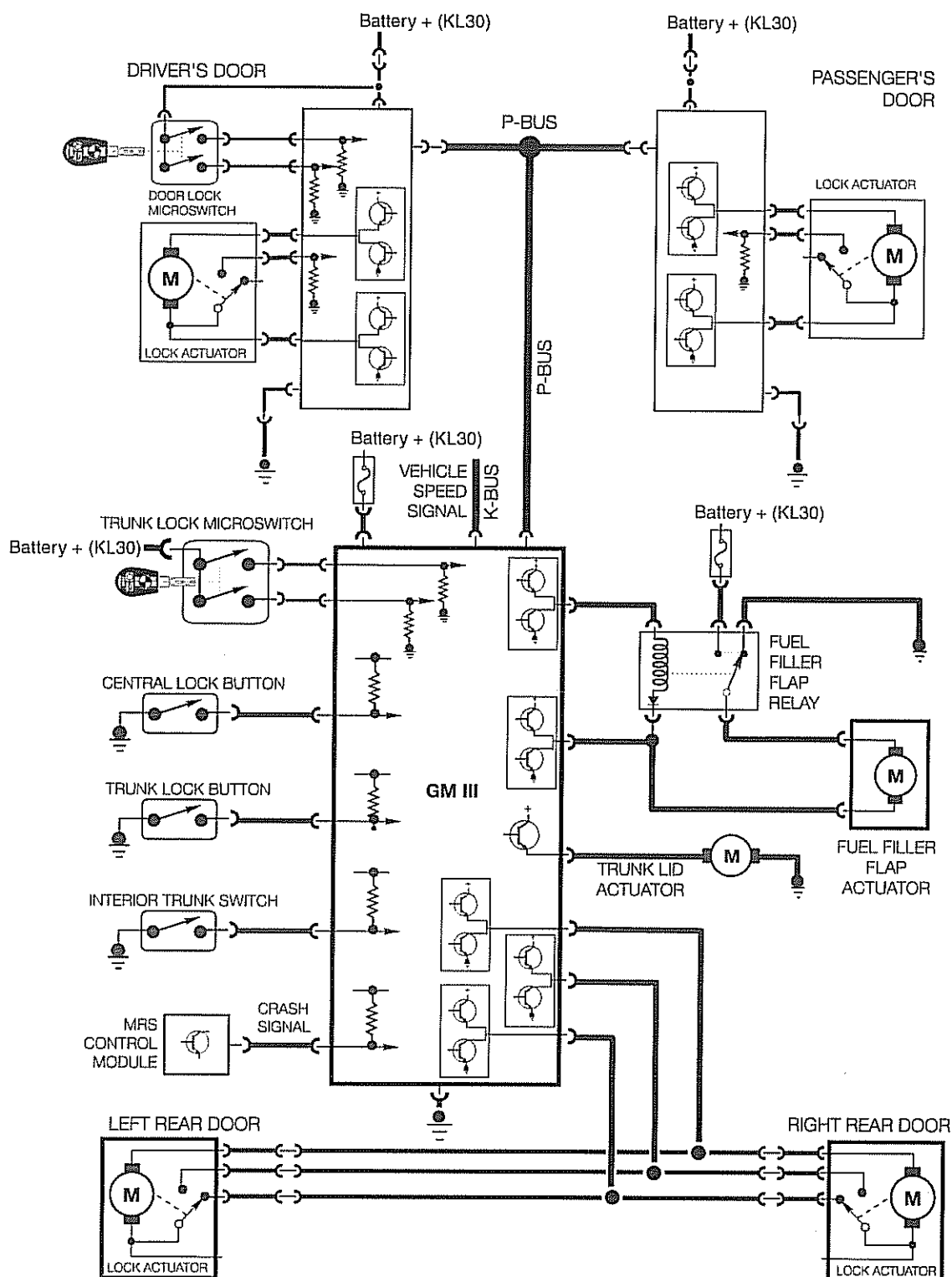
➤ The General Module (GM) (**arrow**) is responsible for the operation of central body electronics. The GM is located behind the glove compartment.

Based on input information, the GM uses internal transistors to switch current flow (providing voltage or ground) through circuits and actuators. Actuators are the final controlling devices used by GM to operate or control various output functions such as relays and motors.

The accompanying schematic, **Central locking inputs and outputs**, illustrates the GM central locking system.



Central locking inputs and outputs



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Driver's door lock

The lock/unlock signals are sent as input to the door module from two microswitches on the lock cylinder. The driver's door module carries out the locking / unlocking functions of the driver's door through its final stage control.

The signal to lock the remaining doors, trunk or tailgate and fuel flap is sent over the P-Bus to the GM and the passenger door module. Activation of the passengers door lock is carried out by the passenger door module. The rear doors, trunk or tailgate and fuel flap are locked by the final stage in the GM.

When locked from the outside, all doors are set to the double lock position and the GM will not carry out any unlock commands from the central lock button or remote trunk release button.

Selective unlocking

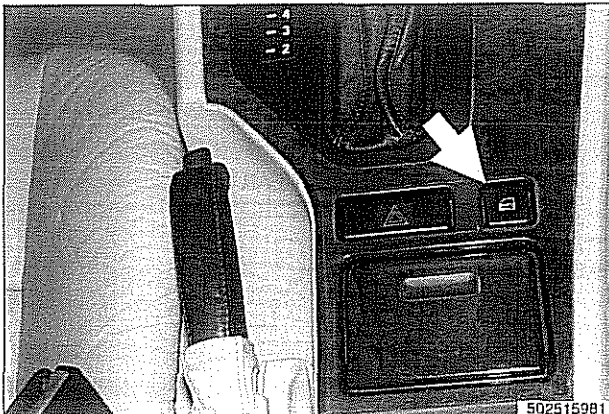
When unlocking with the key or the remote transmitter, the first unlock request will only unlock the driver's door. A second unlock request will unlock the remaining doors, trunk or tailgate and fuel flap.

Trunk locking

The vehicle can be locked/unlocked from the trunk lock cylinder. The GM locks the trunk or tailgate, rear doors and fuel filler. The locking command is passed over the P-Bus to the respective door modules to lock the driver's and passengers doors.

Locking the trunk and removing the key in the horizontal position will set the valet lock and prevent opening of the trunk with the central locking system.

Central locking switch



◀ The central locking master control switch (arrow) is located in the center console behind the shifter.

- The central locking button will only single lock the doors and trunk. The filler flap remains unlocked for refueling purposes.
- If a door is opened from inside while centrally locked, the remaining doors remain locked.
- The open door can be relocked, when closed, by manually locking or pressing the central locking button twice. This synchronizes the door locks.

DWA alarm

The DWA alarm system is armed / disarmed when the vehicle is locked / unlocked from either the door or trunk.

Convenience closing / opening

The windows and sun roof can be closed or opened by holding the key in the lock / unlock position.

Crash sensor

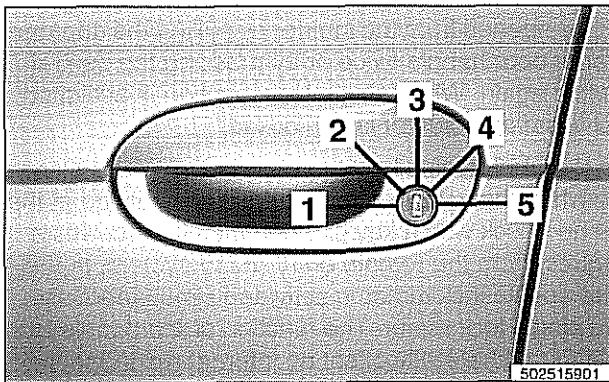
The crash sensor is located in the left front kick panel. It functions by unlocking all doors in the event of an accident.

NOTE —

Continuous and repeated locking / unlocking may cause timed arrest of the locking system. When activated, the timed arrest lasts for two minutes. The timed arrest does not affect the crash sensor unlocking the doors in case of an accident.

Door locks

The driver's door lock location is the only point outside of the vehicle where the key can mechanically control all of the central locking system functions.



◀ Door key positions for electrical / manual locking and unlocking are:

1. Manual unlock
2. Unlock, DWA disarmed, convenience open (hold until activated)
3. Neutral position
4. Lock, DWA armed, convenience closing (hold until activated)
5. Manual lock

The door lock actuators are sealed, self contained units with no replaceable parts. The actuators use Hall effect sensors in place of pin contacts and microswitches to provide DOOR OPEN / DOOR CLOSED status signal. Each door lock button only affects the actuator it controls. There is no effect on the other doors.

An automatic locking feature activates door locks when a road speed signal of 4 mph is detected via the K-Bus. The factory default coding for this feature is OFF, but can be coded ON for individual users with the Key Memory function. See **Car Memory / Key Memory** later in this section.

Each rear door is equipped with the child lock-out lever, preventing the door from being opened from the inside regardless of lock button position.

Starting with models produced after 9/1997, the General Module and electronic immobilizer (EWS) interface via the K-Bus to monitor double lock status and to initiate double lock override. This feature allows the doors to be opened from the inside if a key accepted by EWS is switched on in the ignition. See **Single lock and double lock function**.

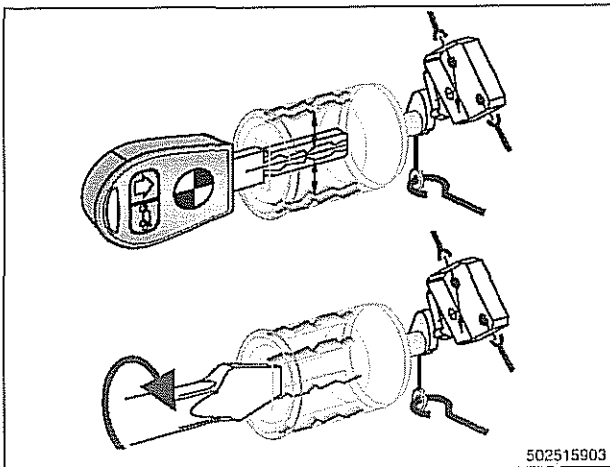
The door lock buttons are mechanically uncoupled from the actuators when locked. The remote keyless entry system (FZV) is standard equipment. This allows for elimination of the passengers side door lock cylinder.

Another function of the locking system is the soft close trunk (SCA) system, where applicable.

Single lock and double lock function (2000 and later models)

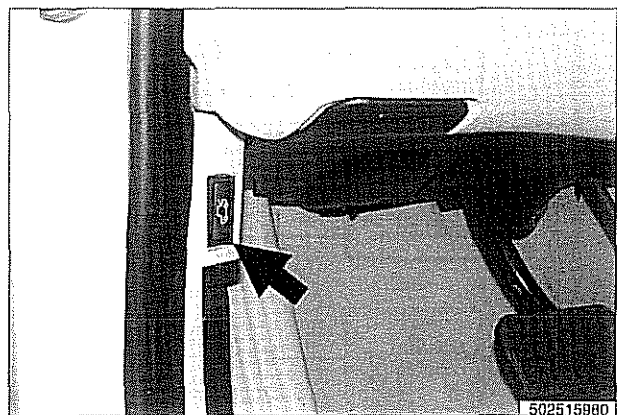
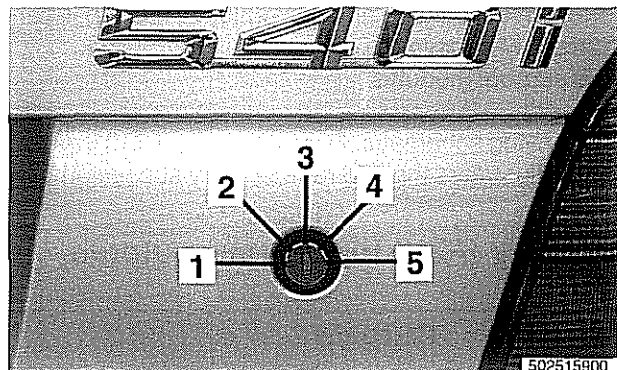
On models produced after 9/1999, each door lock actuator incorporates two motors:

- Single lock motor controls the mechanical lock mechanism when the central lock switch is pressed to single lock the vehicle. The lock mechanism is fully locked at this point but can still be opened from the interior by pulling the appropriate interior door handle twice or by pressing the central lock switch again. When single lock function is activated, the fuel filler flap actuator is not locked.
- Double lock motor, also known as central arrest, is activated only when the vehicle is locked from the outside at the driver's door lock with a key or when the GM receives a lock request from the remote entry (FZV) system. In this case the double lock motor is activated simultaneously with the single lock motor. The function of the double lock motor is to mechanically offset an internal rod in the lock actuator, disabling it from unlocking the vehicle from the interior. This prevents the doors from being unlocked by any means except from an unlock request at the driver's door or via the FZV remote key.



Lock cylinder safety

- ◀ The driver's door lock and the trunk lock incorporate an over-running lock cylinder similar to the ignition lock. If any key other than the vehicle key, or a tool such as a screwdriver or dent-puller, is inserted into the cylinder, it will cause the cylinder to freewheel or spin.



Trunk lock

Trunk key positions for electrical /manual locking and unlocking are:

1. Manual unlock
2. Unlock, DWA disarmed, convenience open (hold until activated)
3. Neutral position
4. Lock, DWA armed, Convenience closing (hold until activated)
5. Valet lock position

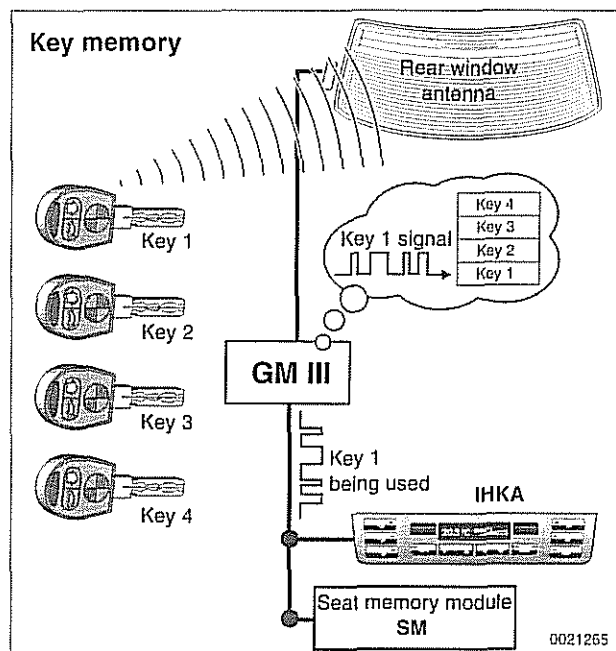
The remote trunk button (arrow) is located in the left kick panel.

- The trunk can be opened from this remote release when the doors are locked from the central locking button. The trunk remote button is disabled when the trunk is locked in the valet position or when a speed signal of 4 mph is present at the GM.

Remote entry (FZV)

The E39 remote (keyless) entry system (FZV) uses a tiny radio transmitter in the vehicle key to lock and unlock the doors and the trunk by remote control. There are a number of other features incorporated in FZV:

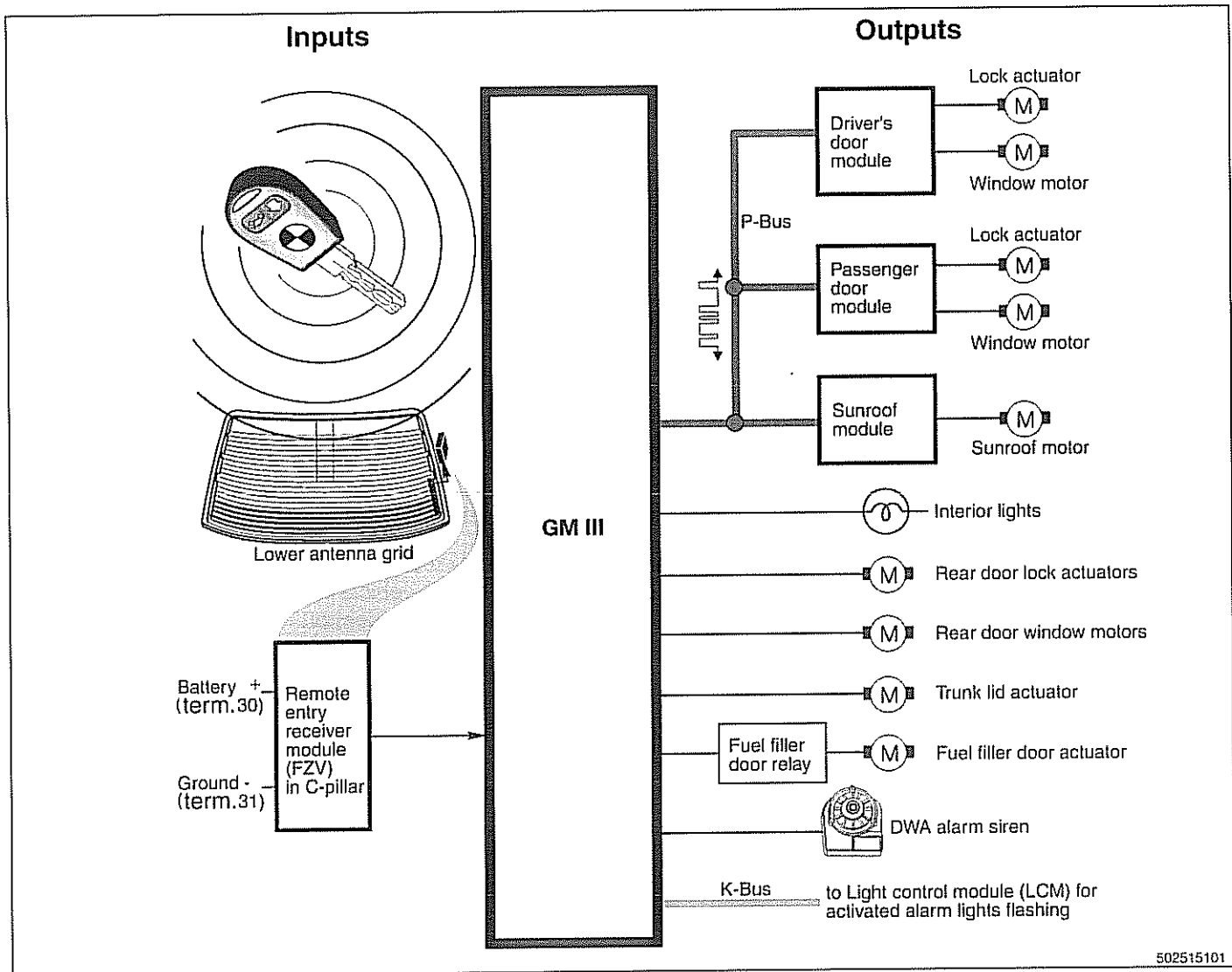
- Locking/unlocking of fuel filler lid
- Selective unlocking of driver's door (as with key in lock)
- Arming/disarming of DWA alarm system
- Remote unlocking of trunk lid or tailgate
- Comfort opening of windows and sunroof
- Interior lighting activation
- Panic mode alarm activation
- Models to 1999: Key incorporates LED. LED informs operator that an FZV signal is being transmitted. LED is also useful indicator of key initialization status and key self-test.
- Keys delivered with four different colored labels. This is helpful to differentiate FZV keys during initialization, preventing possibility of misassigning key ID which would change coded Key Memory functions.

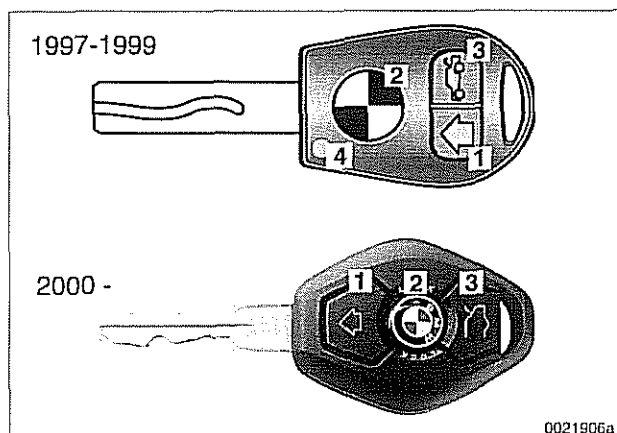


The General Module (GM) is connected to the FZV receiver module (in left rear roof pillar) via K-Bus. Locking and unlocking of doors, trunk or tailgate and convenience closing is carried out by the GM subsystem controlling the door lock, window and sunroof modules.

The accompanying schematic, **Remote entry (FZV) inputs and outputs**, illustrates the GM remote entry subsystem.

Remote entry (FZV) inputs and outputs





FZV keys

◀ FZV key button functions:

Button 1 press once:

- Unlock driver's door
- DWA disarmed
- Interior lights on

Button 1 press twice:

- Total unlocking

Button 1 hold:

- Convenience opening

Button 2 press once:

- Lock
- DWA armed
- Interior lights ON when vehicle is locked

Button 2 press twice within 10 seconds:

- Deactivate interior and tilt monitoring

Button 3 press momentarily:

- Trunk lid opens

Button 3 press and hold:

- Panic mode (alarm)

LED (4) provides feedback of system operation and battery condition. LED is eliminated from 2000 and later keys.

LED flashes indicate the following:

- One flash indicates that FZV lock / unlock signal was sent and batteries are OK.
- Quick flashing LED indicates that convenience opening signal is being sent.
- Slow flashing LED indicates that initialization procedure was successful.
- A steady-on LED [after a self test as described in **Transmitter self-test (models to 1999)**] indicates that hardware/software of transmitter are OK.
- No LED activity could indicate discharged batteries or defective transmitter.

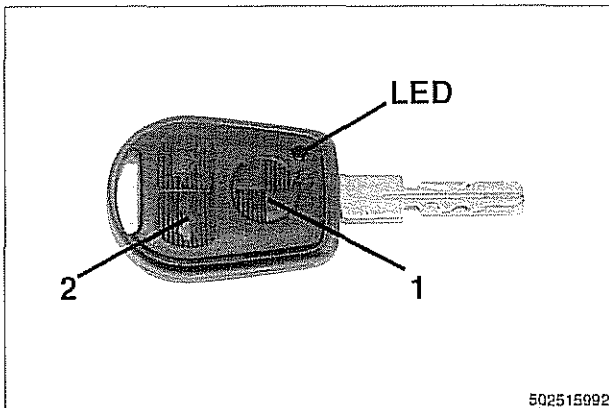
NOTE —

- A single unlock request from the driver's door with the FZV key unlocks the driver's door only. A second unlock request unlocks the remaining doors and trunk. This feature can be modified for individual users with the Key Memory capabilities to activate all lock actuators simultaneously. See **Car Memory / Key Memory** later in this section.
- Starting with 2000 models, the battery in the FZV ignition key is recharged by the ignition switch ring antenna while the key is in the ignition switch.

Transmitter self-test (models to 1999)

Press buttons **1** and **2** at the same time. This starts key transmitter self-test. Transmitter is OK when **LED** glows steadily for one second. If LED fails to illuminate, try replacing key batteries.

The state of charge of key transmitter batteries is monitored by the GM. Once the voltage level of the transmitter drops below 4.5 volts, the LED no longer signals transmitter operation. Convenience opening, initialization and self-testing are no longer possible. The GM will store a fault indicating low battery level for that particular key and illuminate an instrument cluster message.

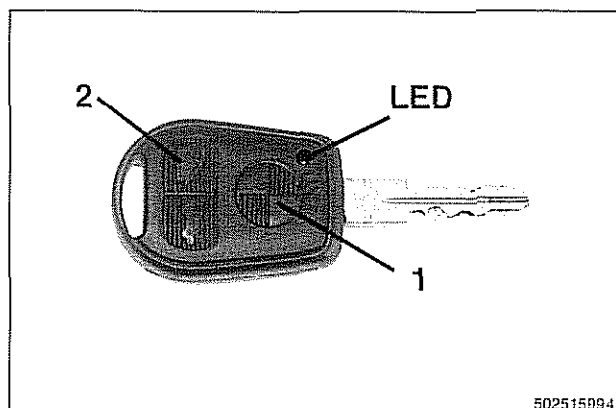
**NOTE —**

- If batteries are replaced within one minute of removal, it is not necessary to perform initialization.
- The state of charge of key batteries has no effect on electronic immobilizer (EWS) function.

Remote key initialization**NOTE —**

In the accompanying illustration, the key is from a 1998 model. 2000 and later models are equipped with a different looking key, but the button functions are the same.

- Up to four keys can be coded to operate the same system. Initialize all key transmitters at the same time.



- ◀ The initialization procedure is as follows:
- Close all doors and have all keys available.
 - Using key number 1, turn ignition switch to KL R (ACCESSORY), then switch off within 5 seconds and remove first key.
 - Within 30 seconds of turning ignition switch to OFF, press and hold button 2.
 - While holding button 2, press and release (tap) button 1 three times within 10 seconds. Models to 1999: LED flashes momentarily.
 - Release both buttons. GM immediately locks and unlocks doors to signal successful initialization.
 - Initialize remaining keys, repeating steps above.
- If acknowledgement signal (doors lock / unlocking) does not follow initialization procedure, repeat process. If ignition is switched on during process, procedure is cancelled.

NOTE —

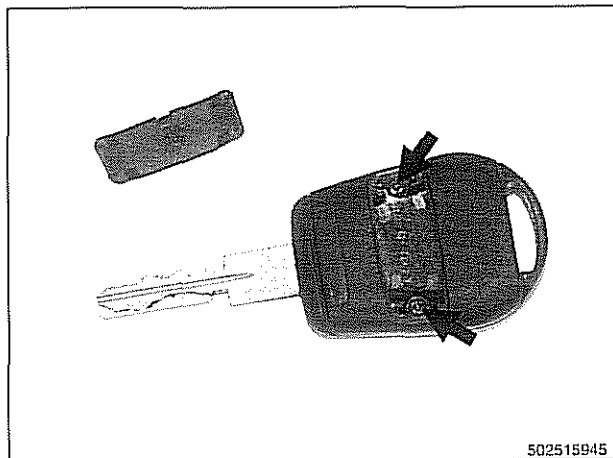
The Key Memory function of the GM responds to the key identification number of each key. If the keys are not initialized in the same order prior to initialization, the key memory functions activated by the keys will not be assigned correctly. Always initialize the keys in the same order.

Remote system coding

The E39 remote entry system uses coded signals for security purposes. The code signal sent by the transmitter is changed every time the vehicle is locked/unlocked with the transmitter. A separate code signal is used for each transmitter that is initialized to the system. This allows for each transmitter to operate independently of the others.

Due to the changing of the code each time the buttons are depressed, the system allows for a lack of synchronization between the transmitter and receiver. This would occur if the buttons on the transmitter are pressed inadvertently.

Up to 100 erroneous actuations of the transmitter are automatically corrected for by the control module. If more than 100 actuations are present, the operator need only to press the button a second time to restore system operation.



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Key battery

- 1997 — 1999 models: Two lithium batteries are used to supply power to key transmitter. When replacement is necessary, remove cover and two fasteners (**arrows**) from rear of key to access batteries.

NOTE —

If you replace the batteries within one minute, the FZV key will not require a new initialization procedure.

2000 and later models: FZV key battery is recharged by ring antenna while key is in ignition switch. There is no need to replace key battery.

Car Memory / Key Memory

A number of features and functions can be customized to the driver(s) preference. The identity of the vehicle user is provided by a signal from the keyless entry system (FZV).

Car Memory and Key Memory are actually two separate functions, although they are marketed as a combined feature.

Car Memory

Prior to new vehicle delivery, the BMW scan tool (DISplus, GT1 or MoDiC) is used to code the driver preferences into the appropriate control modules. Thereafter these choices cannot be changed without recoding with a BMW scan tool.

The functions that can be set using Car Memory include:

- Alarm system (DWA) features such as arming/disarming with keyless entry (FZV), activation of tilt sensor or interior sensor
- Interior light activation when central locking is used
- Convenience opening of windows/sunroof
- Interior and external lighting preferences
- Heating / A/C preferences (IHKA)
- Seat and mirror preferences (triggered by Key Memory)
- Instrument cluster display units (for example: km vs. miles)

Key Memory

Whenever one of the FZV keys is used to lock or unlock the car, the user is identified by the GM. A maximum of four keys can be programmed with the Key Memory feature. The use of the personalized key then triggers Car Memory functions such as heating / A/C (IHKA) settings or memory seat position adjustment.

Most programming of Key Memory requires the use of BMW scan tools (DISplus, GT1 or MoDiC). However, features such as IHKA blower speed and temperature store automatically without the use of scan tools.

Available Key Memory functions vary based on vehicle equipment. The functions that can be set include:

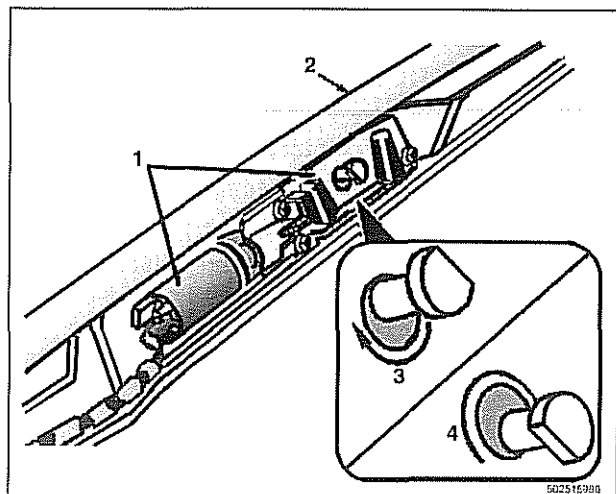
- Automatic locking after start off (vehicle speed)
- Selective locking
- Heating / A/C blower speed, heated or cooled air distribution, automatic blower setting

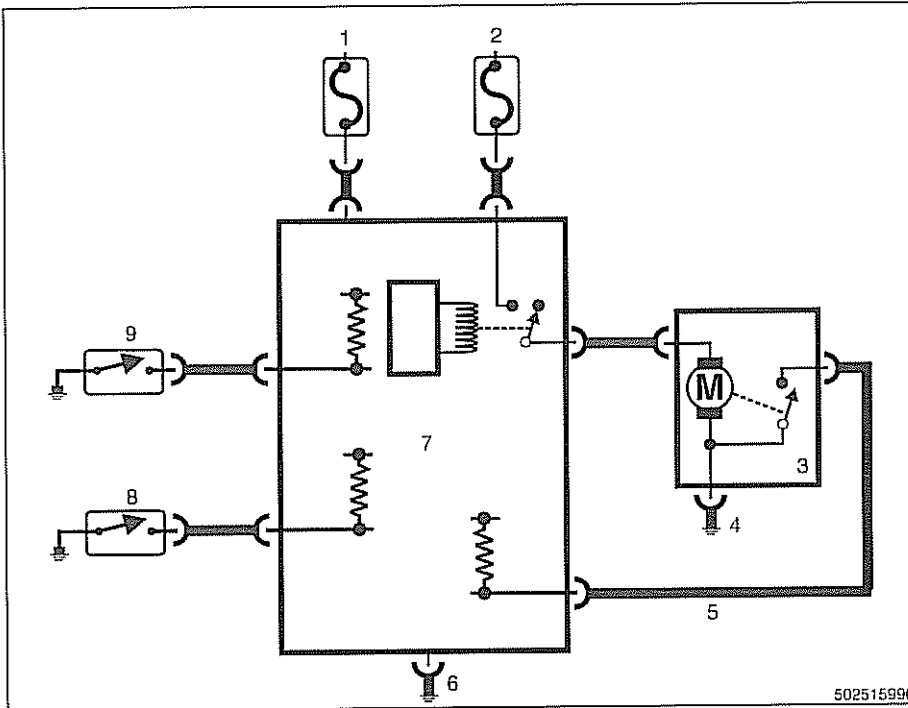
Trunk lid soft close (SCA)

◀ The optional soft close trunk feature is called SCA. The SCA actuator is located in the panel below the trunk lid.

1. SCA motor and actuator located behind trunk trim in rear wall of trunk
2. Lower edge of trunk seal
3. Cam in open position
4. Cam in closed position

The actuator is controlled by a load relay in the General Module (GM). The closing cam is mounted on an eccentric that is driven by the actuator. The cam always turns 180° in the same direction to open or close the trunk.





SCA subsystem

1. Battery power (term. 30)
2. Battery power (term. 30)
3. SCA actuator
4. Ground (term. 31)
5. Feedback OPEN
6. Ground (term. 31)
7. General Module (GM)
8. Trunk contact switch
9. Trunk opening switch

SCA operation

Three microswitches are used to operate trunk latching system.

- Microswitch mounted on lock cylinder. Pushing lock cylinder in will signal GM to activate actuator and open trunk.
- Microswitch in actuator signals GM when trunk has released. Actuator shuts off.
- When closing trunk, third microswitch (on trunk latch) signals GM to activate actuator. Cam turns to pull lid closed.

For overload protection, ON duration of actuator is limited to a max. 5 seconds.

Emergency opening of trunk is provided by a mechanical link from the lock cylinder. If the trunk has been opened by the emergency release, it can be reclosed as a conventional lid with normal pressure.

Tailgate and rear window locks

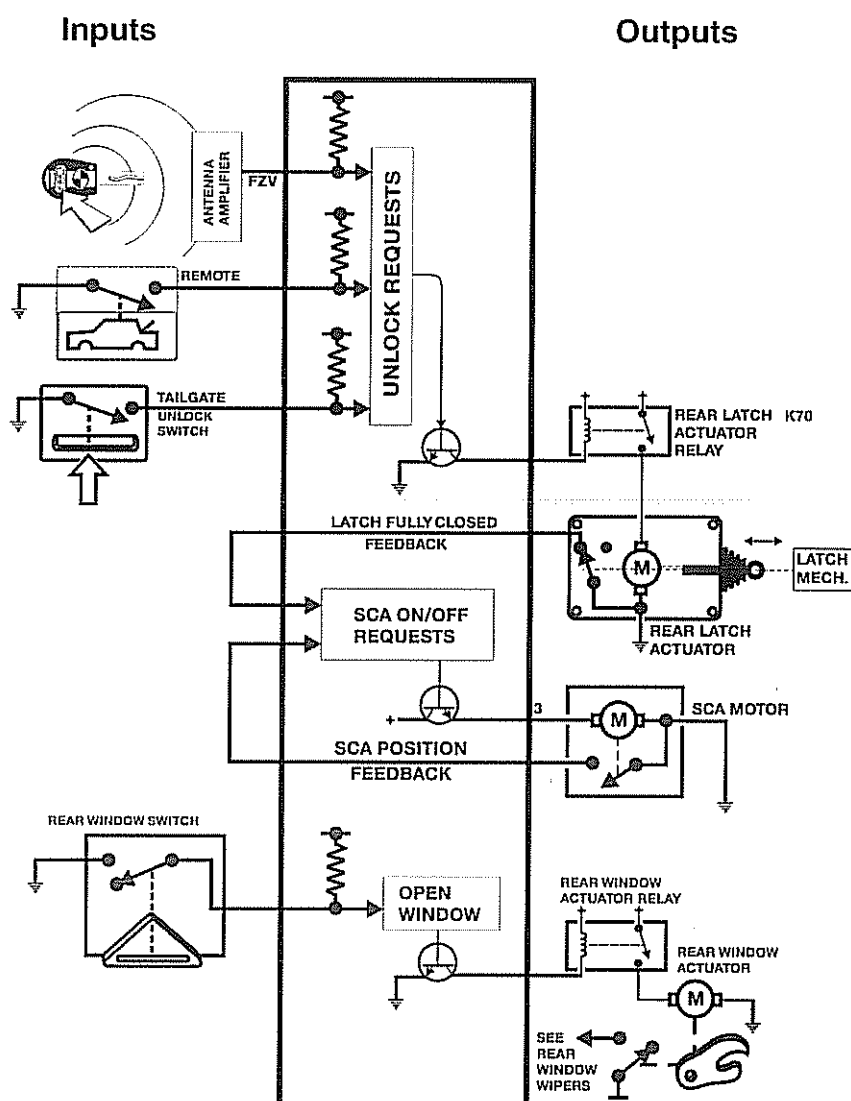
The Sport Wagon tailgate can be opened from:

- Remote key (FZV)
- Interior tailgate release button at driver's kick panel
- Unlock microswitch above rear license plate

Any of these input requests to the GM activates the tailgate latch motor. The GM will also switch on the interior lights with a tailgate unlock request.

The rear window is opened with the release switch on the rear wiper arm cover. Pressing the switch signals the GM to activate the rear window release relay.

Sport Wagon tailgate and rear window lock schematic



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DOOR HANDLES AND LOCKS

In the procedures that follow, door handle removal, door lock cylinder removal and door latch removal are covered for the left front door. Other doors are similar although simpler, due to the lack of lock cylinder.

Inside door release removal is covered in the procedure for inner door panel removal. See **411 Doors**.

Door handle (outer), removing and installing

NOTE —

If BMW special tools 51 3 201 and 51 3 203 are available, the door handle can be removed without removing the door trim panel or door airbag. Use the access hole behind the rubber sealing plug on the door edge.

- Close window on front door.
- Disconnect battery negative (–) cable.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given in **001 General Warnings and Cautions**.

- Remove front door trim panel. See **411 Doors**.
- Remove door-mounted air bag. See **721 Airbag System (SRS)**.
- Remove rubber sealing plug (arrow) from door edge.

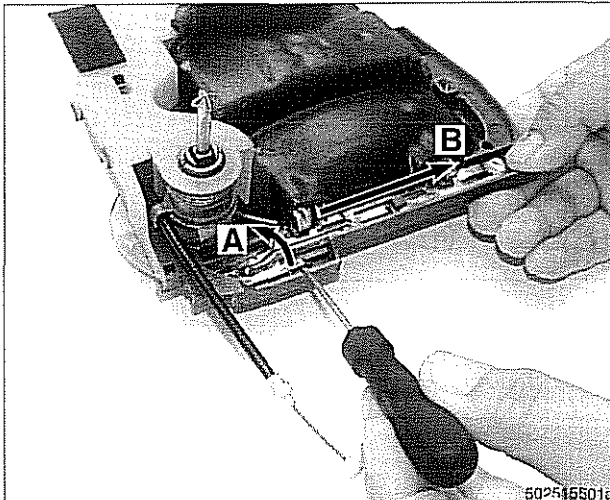
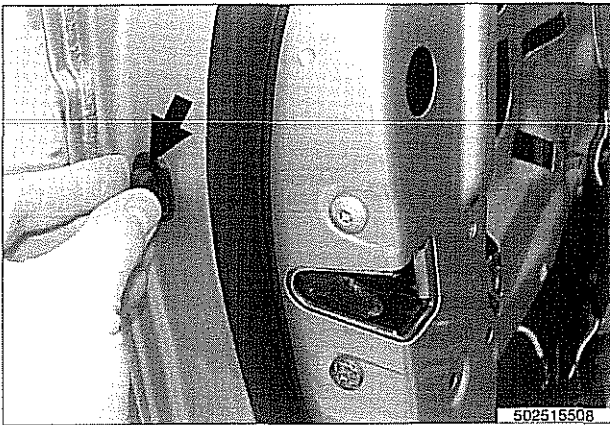
NOTE —

In the photo below, door handle and lock cylinder carrier are shown on the work bench for clarity.

- Working inside door cavity:
 - Use long thin screwdriver to release locking tab **A**. Push screwdriver through hole for rubber sealing plug.
 - Slide locking plate **B** toward front of door.
- Working on outside of door, lift out lower edge of handle and pull down to remove.
- Installation is reverse of removal.

Tightening torques

Airbag to door (replace screws)	8.5 Nm (75 in-lb)
---------------------------------	-------------------



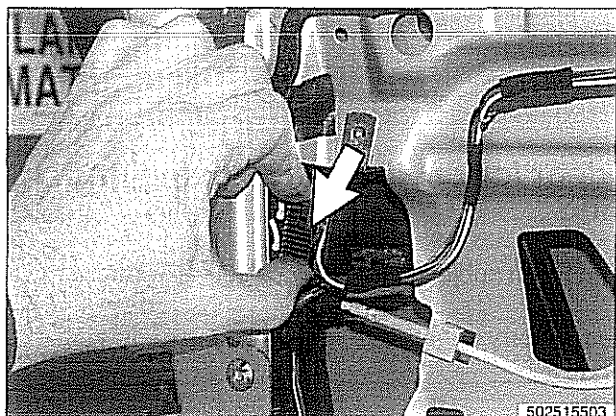
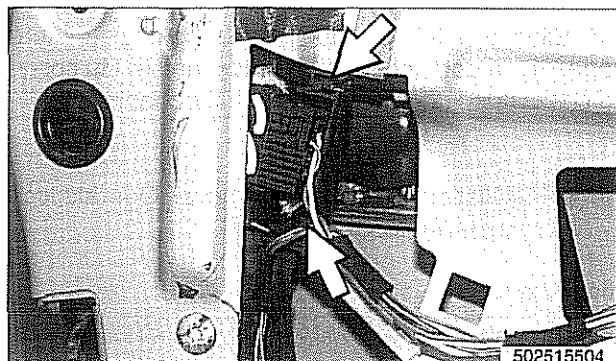
Door latch, removing and installing

- Close window on subject door and open all other windows.
- Disconnect battery negative (–) cable.

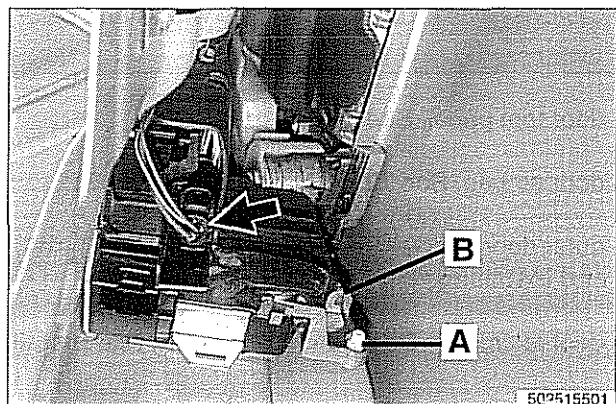
CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given in 001 General Warnings and Cautions.

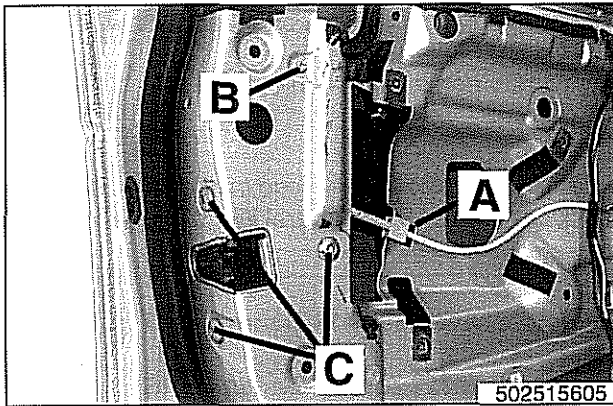
- Remove door trim panel. See 411 Doors.
- Remove air bag. See 721 Airbag System (SRS).
- Remove outer door handle. See **Door handle (outer), removing and installing**.
- Working inside door cavity, release locking tabs (arrows) and open protective cover.



- Pull down on electrical harness connector (arrow) to release.



- Working inside door cavity, next to outside door skin:
 - Disconnect door lock cylinder Bowden cable from latch assembly arm (A) and support (B).
 - Disconnect microswitch connector (arrow).

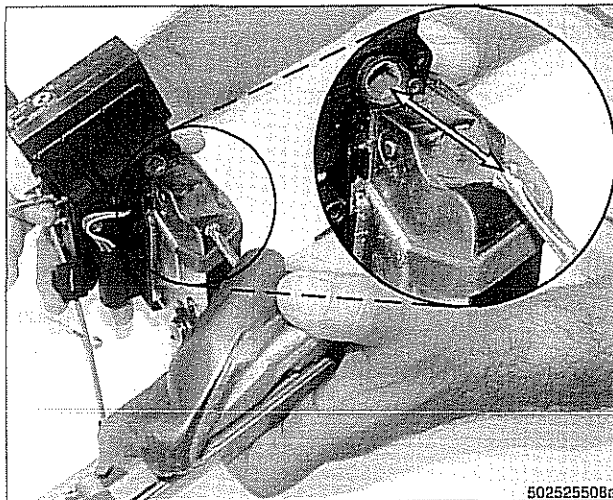


◀ Working at outer door edge:

- Disconnect inside door release Bowden cable guide by sliding mounting clip (A) forward.
- Remove latch mounting fasteners (B) and (C) and remove latch.

NOTE—

In the photo below, door handle assembly and latch assembly are shown removed from the car for clarity.



◀ Installation: Slide latch into position in door making sure that cross-shaped tip of door lock cylinder mechanism fits correctly into corresponding opening in latch mechanism (inset).

- Remainder of installation is reverse of removal. Operate lock using key before installing door trim panel.

Tightening torques

Airbag to door (replace screws)	8.5 Nm (75 in-lb)
---------------------------------	-------------------

Outer door lock cylinder, removing and installing

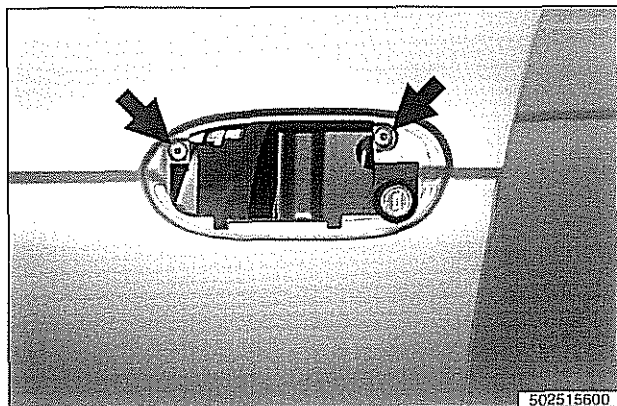
- Close window on subject door. Open all other windows.
- Disconnect battery negative (–) cable.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given in 001 General Warnings and Cautions.

- Remove door trim panel. See 411 Doors.
- Remove door air bag. See 721 Airbag System (SRS).
- Remove outer door handle. See Door handle (outer), removing and installing.
- Remove door latch. See Door latch, removing and installing.

Central Locking and Anti-Theft



➤ Remove lock cylinder carrier mounting screws (arrows).

- Working inside door cavity, turn cylinder carrier assembly counterclockwise and carefully pull down to remove.
- Installation: Place lock cylinder carrier in position in door. Install and tighten mounting screws.
- Remainder of installation is reverse of removal.

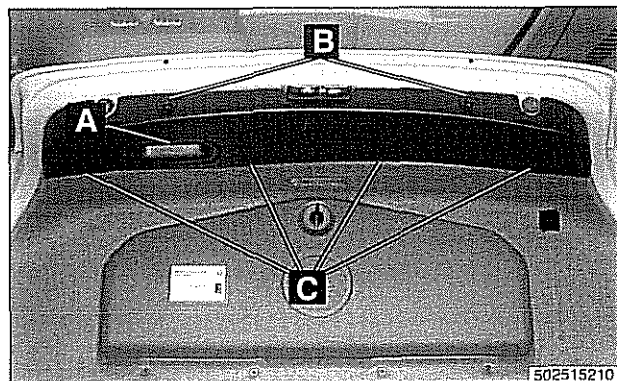
Tightening torques

Airbag to door (replace screws)

8.5 Nm (75 in-lb)

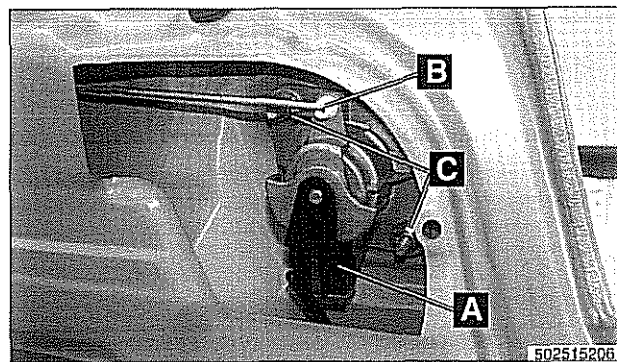
TRUNK LOCK ASSEMBLY

Trunk lock, removing and installing



➤ Remove plastic trim panel:

- Remove screw cap and screw (A).
- Remove expansion rivets (B).
- Gently pry out mount clips (C).

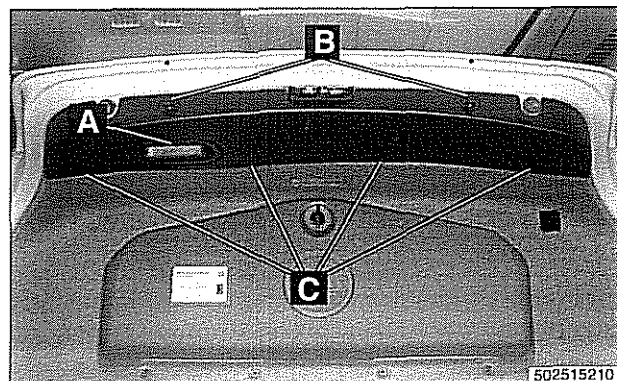


➤ To remove trunk lock:

- Disconnect electrical harness (A).
- Snap actuator rod out of mounting clip (B).
- Remove fasteners (C) and remove lock assembly.

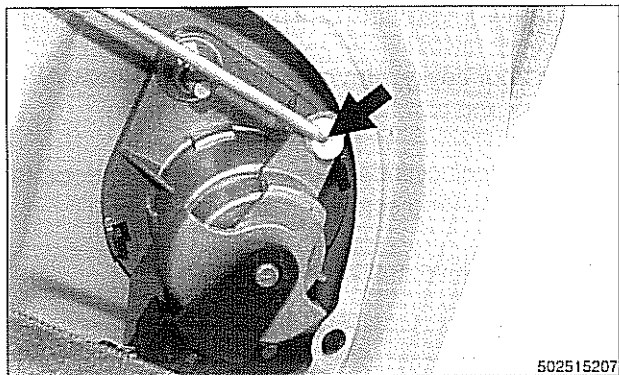
– Installation is reverse of removal.

Trunk latch, removing and installing

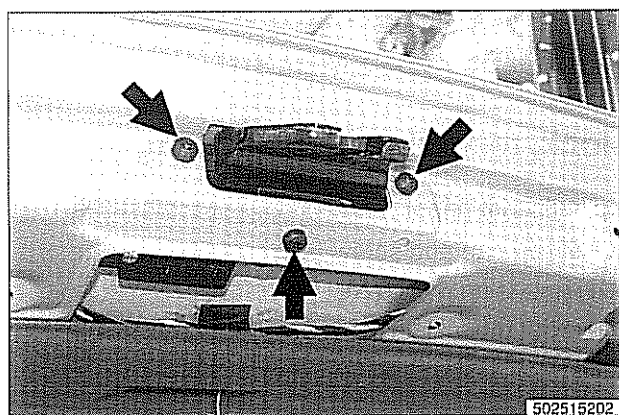


➤ Remove plastic trim panel:

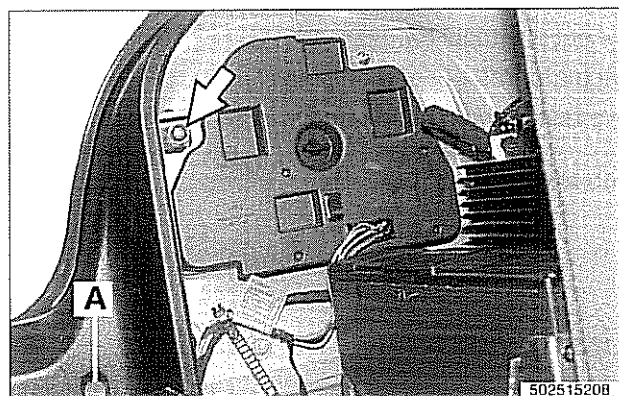
- Remove screw cap and screw (A).
- Remove expansion rivets (B).
- Gently pry out mount clips (C).



- Disconnect actuator rod (**arrow**) from trunk lock assembly.

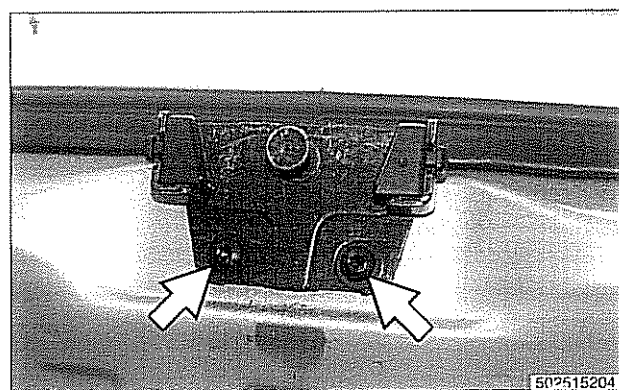


- Remove trunk latch fasteners (**arrows**).
- Remove latch and disconnect wiring harness.
- Installation is reverse of removal.



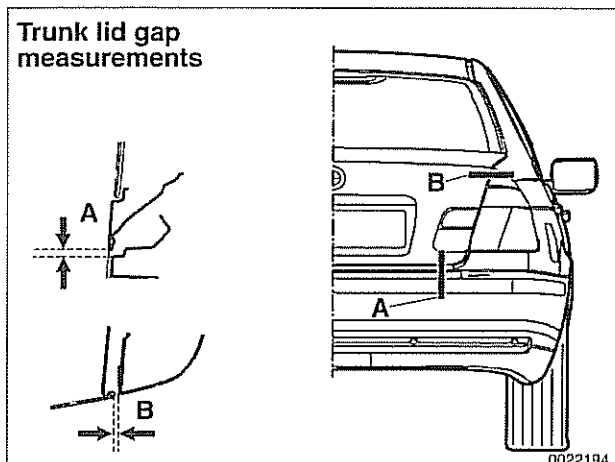
Trunk lock striker plate, removing and installing

- Remove left and right trim panel fasteners (**arrow**).
- Remove (4) trim panel expansion rivets (**A**) and remove trim panel.



- Remove striker plate mounting fasteners (**arrows**).

Trunk lid gap measurements



0022194

When installing, or adjusting trunk lid alignment, adjust position of trunk lock striker with mounting bolts finger tight.

- Check trunk lid lock operation with lid open.
- Adjust trunk lid alignment. See 412 Trunk Lid, Tailgate for lid adjustment specifications.

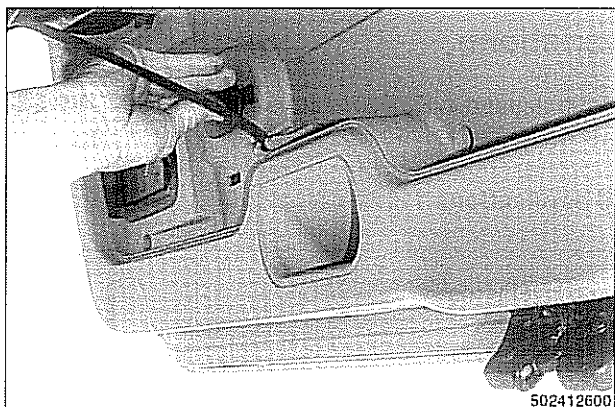
NOTE —

Do not lubricate lock or lock striker with grease.

Tailgate lock, emergency release

In case of electrical failure, there is an emergency tailgate lock release. The release is located in the tailgate behind the tool door.

- With tool door open, remove access cover and pull to the right to release tailgate.



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ELECTRONIC IMMOBILIZATION (EWS)

E39 cars are equipped with a passive theft-prevention system. The Electronic Immobilization System (EWS) makes it impossible to start the engine using any means other than the special keys furnished with the vehicle.

NOTE —

Replacement EWS control modules or DME control modules must be electronically aligned to each before the vehicle will start. This requires the use of the BMW Service Tester (DIS-plus, GT1, or MoDiC). Without alignment, the engine will not crank (for example: swapping a known good DME control module into another vehicle for test purposes will result in a no crank situation).

In the EWS system, the ignition key is embedded with a computer chip (EEPROM) and coded. The key communicates with the vehicle using a transponder in the key and a ring antenna surrounding the steering lock cylinder. Up to 6 replacement keys are permissible. Only an authorized BMW dealer can provide replacement keys.

Central Locking and Anti-Theft

- If the starter engages, the following EWS inputs are functioning normally:
 - Ignition key
 - Code function
 - Transmission range switch or clutch position switch
 - Engine speed sensor

NOTE —

- If a vehicle key is lost or stolen, the electronic authorization for that key can be cancelled using the BMW scan and diagnostic tools DISplus, GT1 or MoDiC.
- Force applied to a key can damage the electronic circuitry in the key. A damaged key will not start the engine. In that case, a new key should be purchased and initialized by an authorized BMW dealer.

EWS variations

EWS variations used in E39 cars are shown in **E39 EWS applications** table below.

E39 EWS applications

System designation	E39 production dates	Main components, changes, improvements
EWS II	SOP - 3/1997	Key with EEPROM transponder Ring antenna (surrounds ignition switch) Transmitter / receiver module located in right side steering column cover Control module located behind glove compartment, in electrical component panel
EWS III (3.2)	3 /1997 - 9/1997	Transmitter / receiver module eliminated EWS III (3.2) control module incorporates transmitter / receiver module functions Control module located to left of steering column, under dashboard K-Bus input Clutch Hall-effect switch (replaces transmission range switch input)
EWS III (3.3)	9/1997 - 2002	EWS III (3.3) control module with ISN code burned in (cannot be overwritten during alignment) Control module located to left of steering column, under dashboard Transmission range selection input from automatic transmission control module

EWS control module, replacing

NOTE—

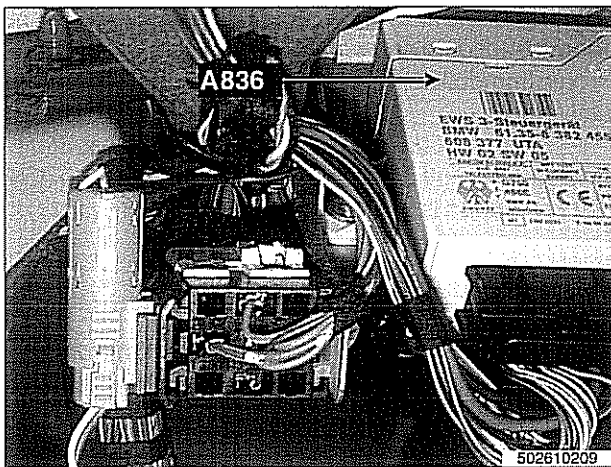
EWS control module location varies depending on version of EWS installed. Check the table **E39 EWS applications**.

- Disconnect battery negative (–) cable.

CAUTION—

Prior to disconnecting the battery, read the battery disconnection cautions given in **001 General Warnings and Cautions**.

- EWS II: Control module is accessible from behind glove compartment.
 - Remove trim below glove compartment.
 - Lower relay and module holder to access EWS control module.
- ◀ EWS III: Control module (A836) is located to left of steering column, below dash.
 - Remove trim below steering column.
 - Unplug module and remove from holder.
- Installation is reverse of removal.

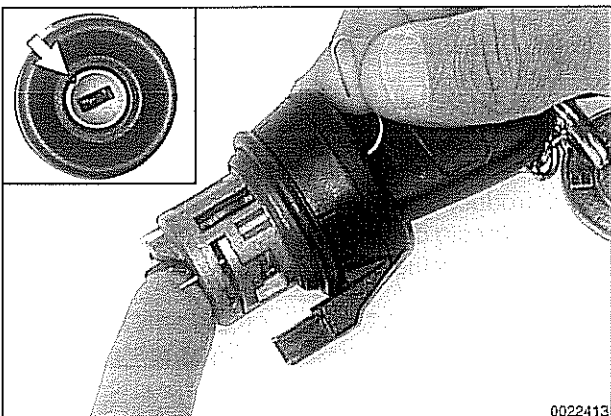


Transmitter / receiver module

Only EWS II vehicles are equipped with a separate transmitter / receiver module attached to the steering column trim on the right side of the column.

Ring antenna

- Remove ring antenna using BMW special tool 61 3 300.
 - Remove upper and lower steering column trim.
 - Disconnect harness connector to ring antenna.
 - Pry off ring antenna using BMW special tool 61 3 300 or equivalent flattened prying tool.
- ◀ Alternatively, remove ignition switch key cylinder:
 - With ignition key in ON position (60° from LOCKED), insert thin piece of stiff wire into opening (arrow) in lock cylinder and pull lock cylinder out.
 - Detach ring antenna harness connector.
 - Gently work ring antenna off key cylinder.



ANTI-THEFT SYSTEM (DWA)

When the anti-theft system (DWA) is armed, the doors, hood, windows, trunk lid or tailgate are monitored against forcible entry by switches and sensors. The vehicle is protected against being jacked up or towed away by a tilt sensor.

The control electronics for DWA are integrated in the General Module (GM). In addition to the control electronics, the system includes the following components.

- DWA horn
- DWA LED indicator
- Tilt sensor
- Monitoring switches and sensors

The system can be armed or disarmed from the driver's door lock, trunk lid lock, tailgate lock or the remote transmitter (FZV key). When armed, the alarm horn sounds for 30 seconds and the low beam headlights and turn signals flash for 5 minutes. The electronic immobilizer (EWS) is also activated when DWA is activated.

The alarm is switched off immediately if key is inserted in door lock or FZV key button is used.

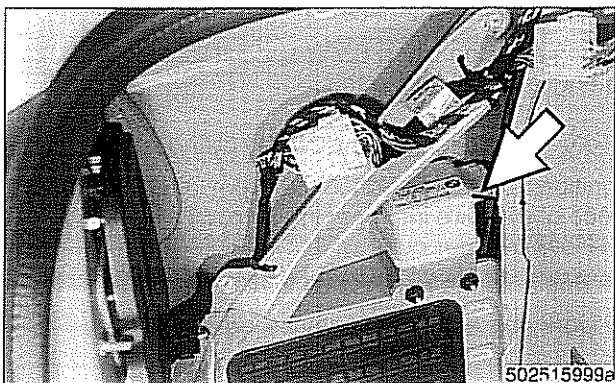
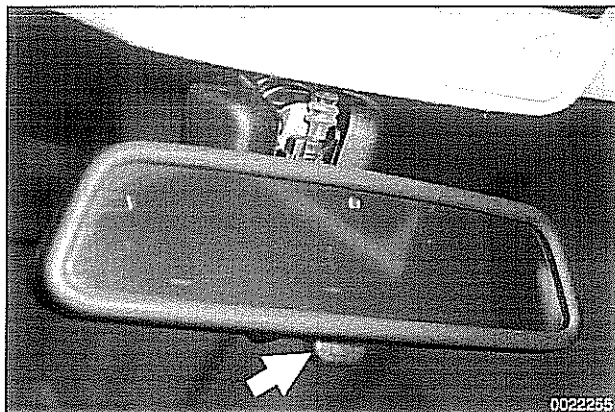
DWA LED Status

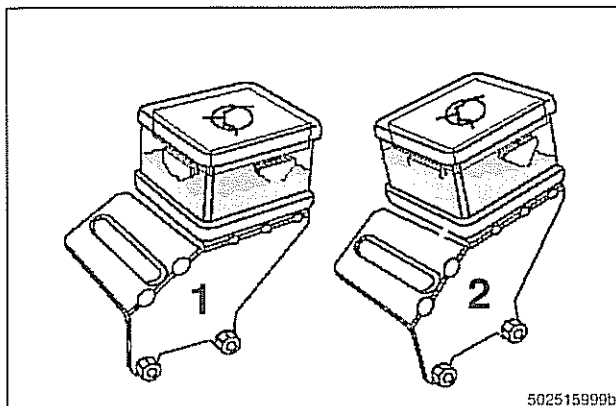
- ◀ The DWA status LED is located in the rear view mirror (arrow). When DWA is armed, the LED flashes slowly to indicate armed status.

The LED and exterior lights flash once and the alarm horn sounds when the system is successfully armed or disarmed. The LED will continue to flash slowly denoting the armed status. If any monitored input is not closed when the system is armed, the LED will flash rapidly for 10 seconds to indicate the fault.

Tilt sensor

- ◀ The tilt sensor, located on the left side of trunk or cargo compartment, consists of a conductive liquid chamber, a processor board and metal probes. The probes are submersed in the liquid and produce a resistance value dependent on the tilt of the sensor (angle of the vehicle). This resistance becomes the reference value when the DWA system is armed.





▲ Tilt sensor operation:

1. DWA armed, vehicle level. Tilt sensor sends HIGH signal to General Module (GM).
2. DWA armed, vehicle tilted. The fluid moves in sensor, changing resistance value. HIGH signal changes to LOW signal. GM activates alarm.

If the vehicle is jacked up or lifted in any way, the angle of the liquid changes, producing a change in the resistance value. The sensor signals the GM to activate the DWA alarm. The sensor resets at the new angle. This allows the DWA system to remain armed and to reactivate the alarm if the vehicle is moved again.

Locking the vehicle twice within a few seconds will deactivate the tilt alarm sensor while arming the remainder of the system. This allows the vehicle to be transported in an armed state without activating the alarm.

Interior protection

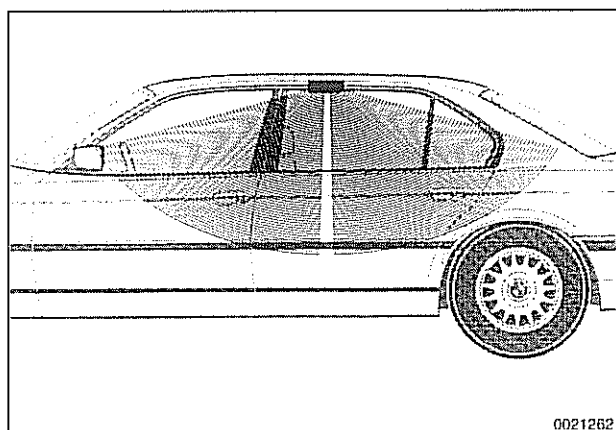
The interior motion sensor is mounted in the center of the headliner panel. Due to the design of the vehicle interior, the sensor must be installed in the correct direction to ensure proper operation of the system.

Interior sensor FIS (1997 – 1999 models)

- ▲ When the alarm system is armed, the FIS sensor emits electromagnetic waves at a frequency of 2.45 GHz. As long as nothing is moving in the vehicle, the waves are reflected back to the sensor at the same frequency. If a foreign object enters the vehicle, the frequency of the reflected signal changes. The sensor detects the changed frequency and triggers the alarm.

Every time the DWA system is armed, the sensor adapts to whatever objects might be stationary in the interior. This allows packages or objects to be left inside the car without affecting the operation of the system. The sensitivity of the sensor is set so that the moving object must be at least as large as a bumble bee. This prevents a false alarm from occurring if a small insect is caught in the vehicle.

FIS is switched off when the vehicle is locked two times within ten seconds. The DWA LED will flash one time for confirmation. This allows the sensor to be switched off to avoid false alarms when the windows are left open for venting.



Interior sensor UIS (2000 and later models)

The UIS system uses ultrasonic sound waves instead of electromagnetic waves. Ultrasonic sound waves are less susceptible to magnetic interference.

Every time the DWA system is armed, the sensor adapts to whatever objects might be stationary in the interior. The sensor emits ultrasonic waves in a programmed timed cycle. It receives echoes of the emitted waves. The UIS amplifies the received sound wave signals and compares them to the echoes of the transmitted waves. The UIS also checks the incoming echoes for background hiss (wind noise through a partially open window) and adapts for this.

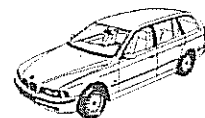
- If the echoes are consistently similar, no movement is detected.
- If the echoes are altered, (inconsistent), the UIS determines motion in the interior compartment.
- If motion is detected, the UIS changes to a constant cycle and the echo is compared again.
- If the inconsistency is still present the UIS sends the activate siren signal to the GM.

Glass breakage sensors

The door windows are monitored by inductive sensors mounted on the inside of the door behind the trim panel. A closed window is recognized by a magnetic plate on the glass lining up with the sensor. If the glass is broken, the plate falls away and the signal from the sensor changes. This causes the GM to activate the alarm.

Emergency disarming

- An emergency procedure is provided to cancel the DWA in the event that a fault occurs within the system. The procedure is as follows:
 - Driver's door mechanically unlocked and open within 30 seconds. This will cause triggering of alarm.
 - All doors closed.
 - Ignition switch turned to KL R (ACCESSORY). LED indicator will come on.
- After 10 minutes, alarm is disarmed.



520 Seats

General 520-2

Seat/Mirror/Steering Column Memory 520-2

Seat memory position, setting 520-2

Front Seats 520-4

Seat switch and memory module,

removing and installing 520-3

Front seat, removing and installing 520-5

Rear Seats 520-7

Rear seat cushion and backrest,

removing and installing (sedan only) 520-7

Headrest, removing and installing. 520-8

GENERAL

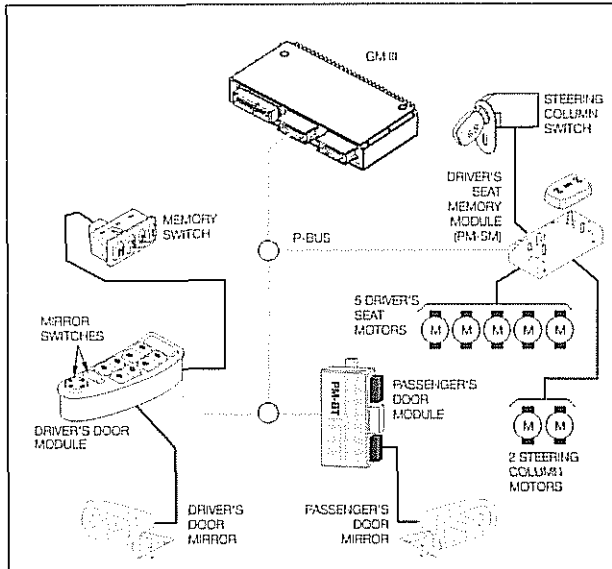
This repair group covers removal and installation of the front and rear seat.

Seat/Mirror/Steering Column Memory

- ▶ The basic features of seat/mirror/steering column operation, including memory positions are integrated into the ZKE III system. Driver adjustment positions can be memorized and stored for three different users. The seat control module is integral with the seat and mirror switches. The seat control module stores seat memory position via the "ripple" counter module.

NOTE—

Passenger seat on sedan models uses a simple control circuit and do not include a memory module or on-board diagnostics.



Seat memory position, setting

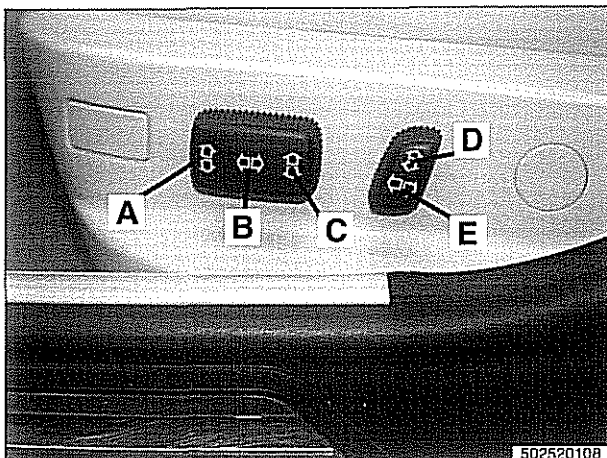
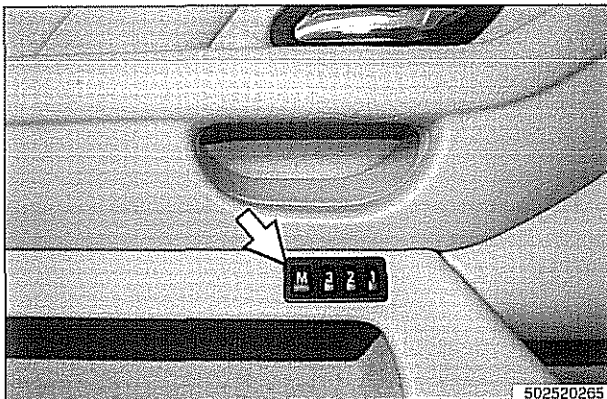
- ▶ With the transmission range selector in "P" and the mirror change over switched in the left position, switch the ignition on and press the "M" on the memory switch.
- Press one of the three position switches (1, 2 or 3) within the 7 second memory period (memory indicator lamp will illuminate for 7 seconds)
 - The current positions of the mirrors, seat and steering column will now be stored in memory.

NOTE—

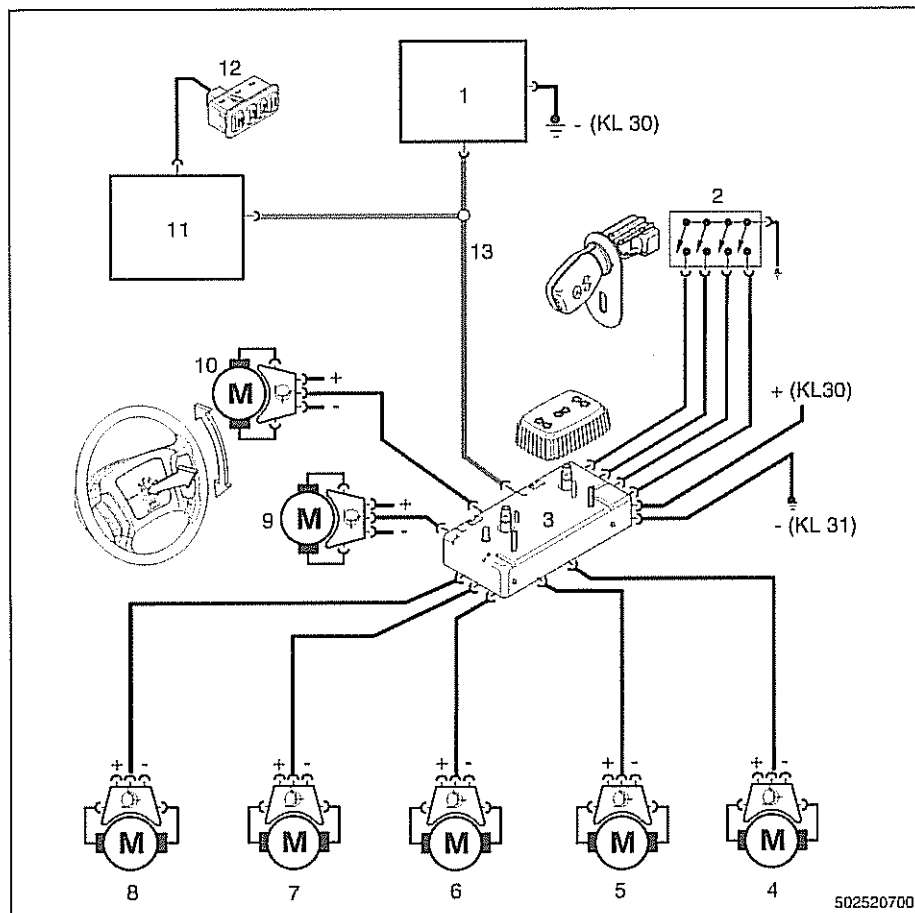
Seat memory is held in an EEPROM in the seat module and is stored in memory before the ZKE goes into its sleep mode. If the battery is disconnected before the 16 minute sleep mode activation, seat memory positions are lost and reprogramming is required.

- ▶ Power seat controls.

- A — Seat tilt
- B — Longitudinal adjustment
- C — Cushion height
- D — Head restraint height
- E — Back rest angle



ZKE seat/mirror/steering column memory operational diagram



1. General module III
2. Steering column adjustment switch
3. Seat memory module with adjustment switches
4. Headrest motor
5. Backrest motor
6. Seat base tilt angle motor
7. Seat base up — down motor
8. Seat forward — back motor
9. Steering column length motor
10. Steering column tilt motor
11. Driver's (left) door module
12. Memory switch
13. P-Bus

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FRONT SEATS

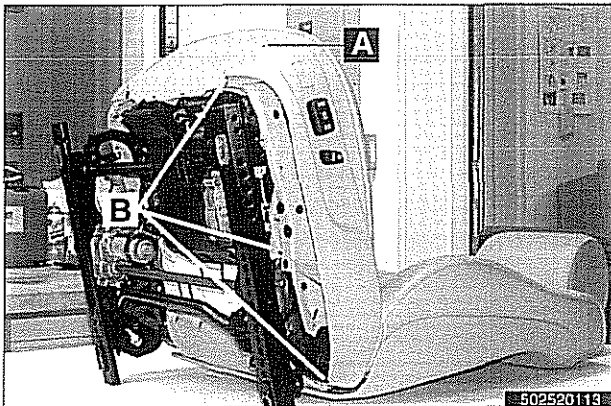
Seat repair and component replacement is possible once the seat has been removed from the vehicle.

Before servicing front seats read safety regulations on handling airbag modules and pyrotechnic seatbelt tensioners. See **720 Seat belts** and **721 Airbag system (SRS)**.

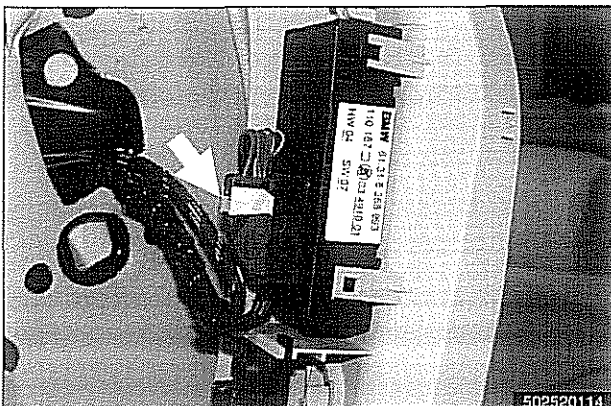
WARNING—

- The front seats are equipped with pyrotechnic seat belt tensioners. These tensioners are powerful devices and should be handled with extreme care. Incorrect handling can trigger off the tensioner and cause injury.
- BMW recommends that all repair or replacement work on pyrotechnic devices must be carried out by a qualified BMW technician.
- Be sure to disconnect the battery and wait 5 seconds before attempting to work on pyrotechnic devices.
- During body straightening and welding with an electric arc welder, always disconnect the battery and the connection to the pyrotechnic gas generators.

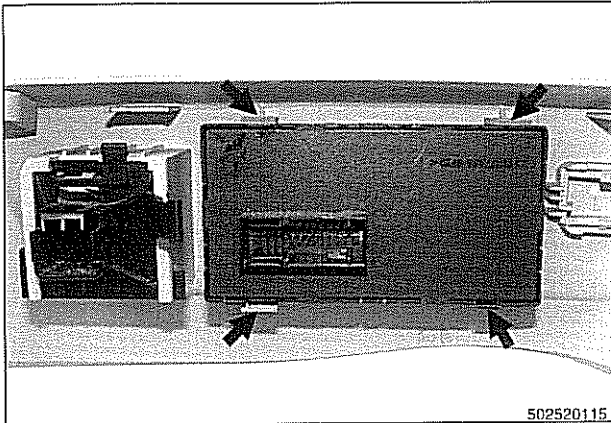
Seat switch and memory module, removing and installing



- Remove front seat. See **Front seats, removing and installing**.
- Carefully pull seat adjusting knobs straight out to remove.
- Remove screw fastener (A) and trim clips (B), turn side panel downward to remove.



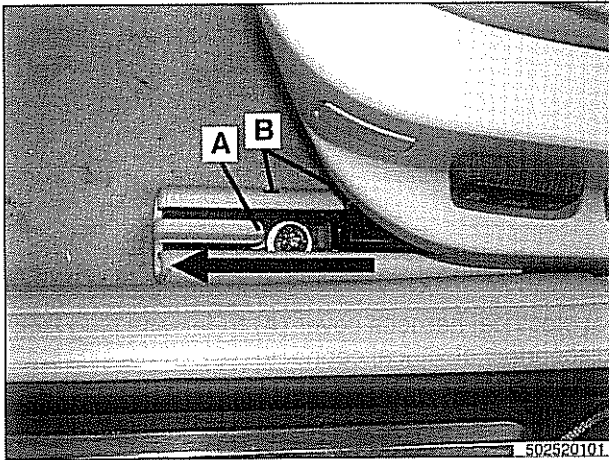
- Disconnect electrical harness connector (arrow).



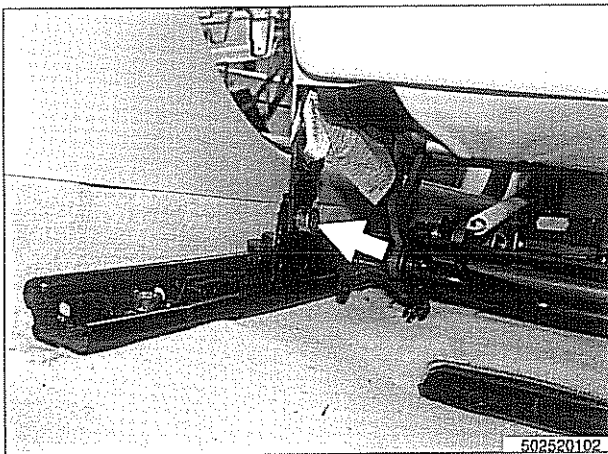
- ◀ Release mounting tabs (**arrows**) and remove switch module.

Front seat, removing and installing

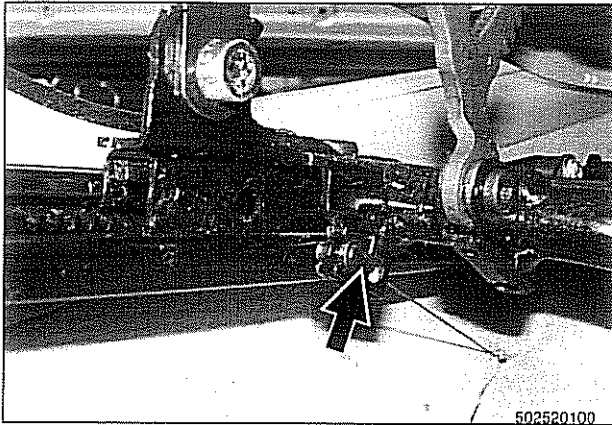
- Turn ignition switch to OFF position.



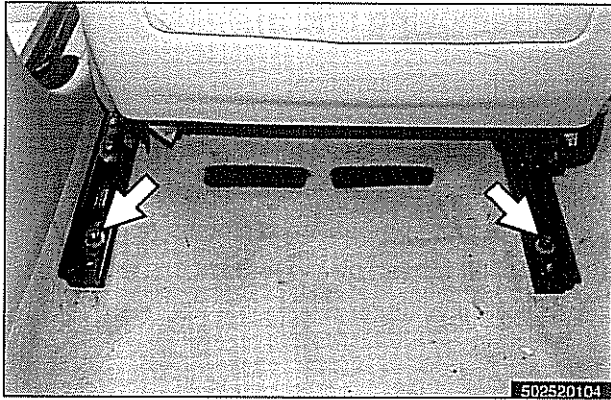
- ◀ Remove front and rear rail trim panels:
- Raise center of trim panel (**A**) to release locking pin.
 - Unlock and lift out inner mounting clips tabs (**B**).
 - Slide trim panel off rail (**arrow**) to remove.



- ◀ Remove seat belt mounting fastener (**arrow**) from seat frame.

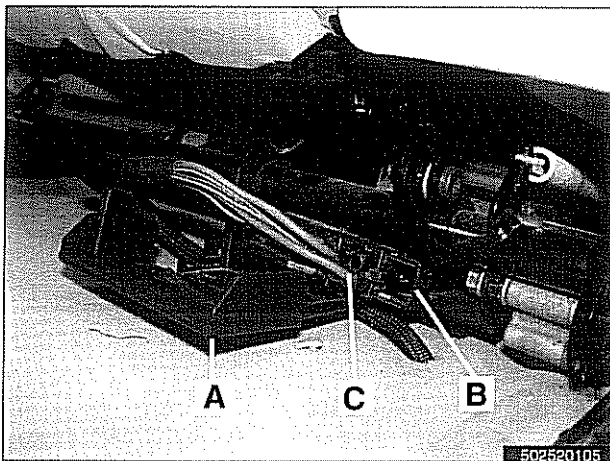


- Unlock seat belt cable pin (**arrow**) by turning locking tab upward and removing pin.

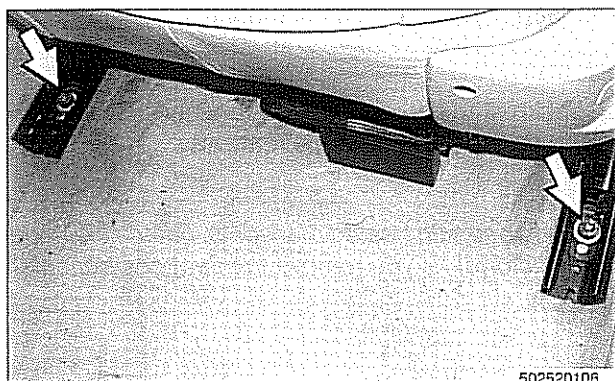


- Remove fasteners (**arrows**) from rear of seat rails.

— Move seat as far back as possible.



- Open seat electrical harness cover (**A**) to release plug lock (**B**) and disconnect electrical connector (**C**).



➤ Remove front seat rail fasteners (arrows).

- Remove front seat from car. Headrest may be removed to provide additional clearance.

NOTE—

Use a blanket to protect the door sill from scuffing by seat rails during seat removal.

- Installation is reverse of removal. Use wire ties or equivalent means to keep seat harness wiring from fraying.

Tightening torques

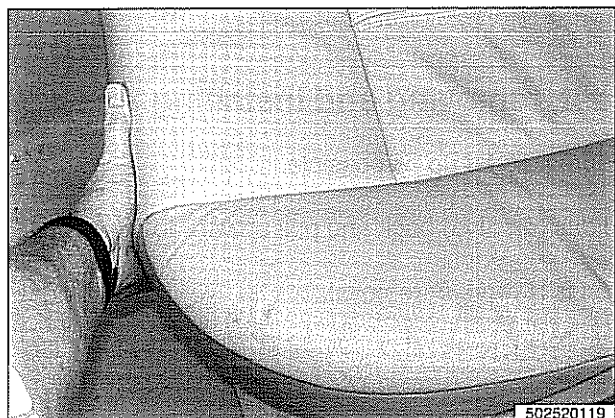
Front seat to floor	42 Nm (31 ft-lb)
Seat belt end to seat frame	48 Nm (35 ft-lb)

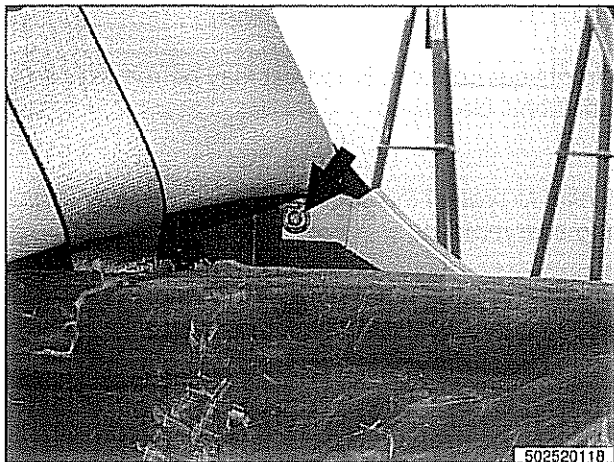
REAR SEATS

E39 models are equipped with at least three different versions of rear seats. This manual only covers the standard seat used in sedan models.

Rear seat cushion and backrest, removing and installing (sedan only)

- Pull front of rear seat cushion up to release clips. While holding front of cushion up, pull cushion forward to remove.



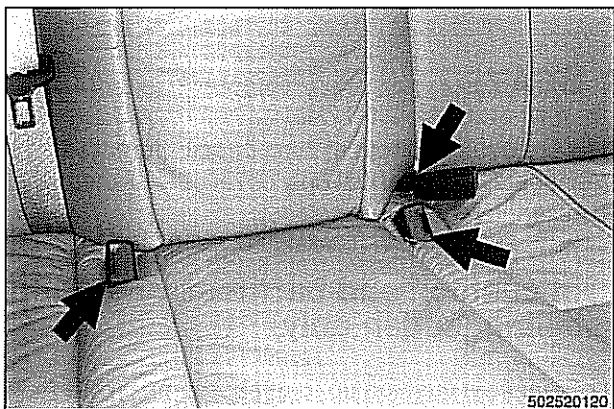


- ◀ Remove left and right side backrest mounting fasteners (**ar-row**).

- Pull up on backrest to detach from top retainers. Slide backrest to side to clear seat belts while removing.

NOTE —

If the car is equipped with heated rear seats, detach electrical harness connector(s) as you remove the seat components.



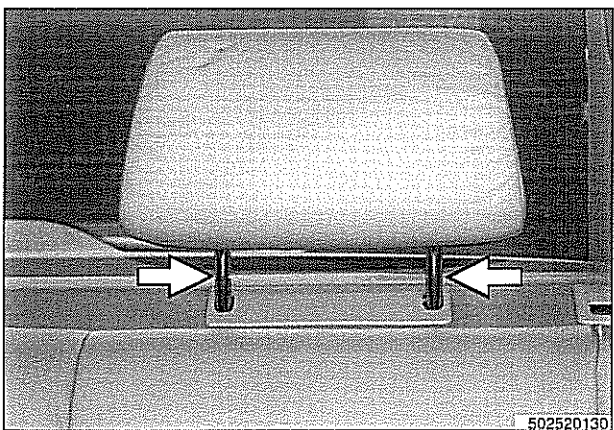
- ◀ When reinstalling, be sure to pull seat belts and buckles (**ar-rows**) up through appropriate slots in seat cushion.

Headrest, removing and installing

- Slide headrest as far up as possible.

- ◀ Press guides (**arrows**) back and pull upward to remove.

- Installation is reverse of removal.



540 Sunroof

General 540-2

Sunroof Adjustments 540-2

Sunroof electronic controls, initializing 540-2

Sunroof, normalization 540-3

Sunroof, characteristic curve 540-3

Sunroof panel, emergency closing 540-4

Sunroof, adjusting 540-5

Sunroof with steel roof panel, adjusting 540-5

Sunroof with glass roof panel, adjusting 540-7

Sunroof Components 540-8

Sunroof components (glass) 540-8

Sunroof panel, removing and
installing (steel or glass) 540-8

Sunroof panel gasket, replacing
(steel or glass) 540-9

Sunroof motor, replacing 540-10

GENERAL

This repair group covers the slide-tilt sunroof assembly. There are two types of sunroof panels available: steel or glass. Service procedures are different for each type.

Component locations, initialization, sunroof panel replacement, and sunroof height adjustment are covered. Replacement of the cable assembly or frame require that the headliner be removed. Removal and repair of the sunroof assembly and other components inside the roof cavity is beyond the scope of this manual.

When the sunroof is set to the vent position (rear of panel up), the inside headliner moves rearward approximately 120 mm (4.7 in). This provides cabin ventilation with less wind noise. A water channel is incorporated into the sunroof assembly. It automatically rises when the sunroof panel is in the vent position and prevents water from entering the interior during braking.

SUNROOF ADJUSTMENTS

Sunroof electronic controls, initializing

- Initialize the sunroof in the following situations:
 - Malfunctions such as lack of one-touch function, lack of comfort opening/closing or lack of safety (anti-trapping) features.
 - If sunroof motor has been removed and reinstalled.
 - If power supply to the sunroof has been interrupted.
 - If repairs have been performed on the slide/tilt mechanism.

NOTE —

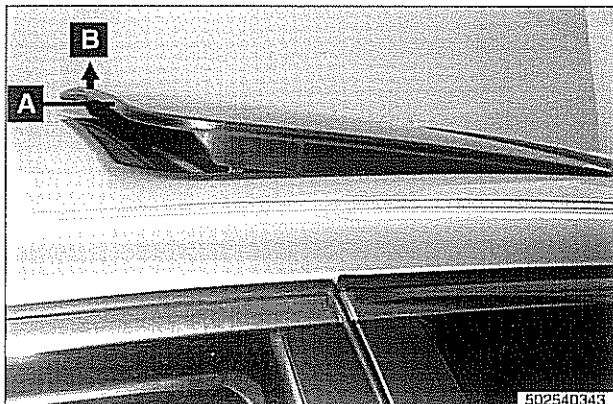
The initialization sequence is dependent on the software version of the sunroof module (in the sunroof drive unit).

WARNING —

There is no anti-trapping protection during initialization.

Sunroof, normalization

During normalization the mechanical end positions of sunroof movement are detected and stored by the General Module (GM III).



- Press and hold sunroof switch in "lift" direction.
 - After reaching end position (A), keep switch pressed for approximately 20 seconds longer.
- Normalization is complete when sunroof in lift position (A) moves briefly in direction of (B).
- Release sunroof switch.

Sunroof, characteristic curve

E39 models up to 3/1998

- The characteristic curve for E39 models built up to 3/1998 is learned automatically during operation. After normalization, open and close sunroof once by pressing switch.

NOTE —

In the event of a faulty triggering of the anti-trap protection in a specific position, the fault can be rectified by moving over the relevant position several times.

E39 models from 3/1998

- Characteristic curve is learned manually in the following steps:
 - Release switch after normalization for maximum of 5 seconds.
 - Then hold down switch in sunroof raising position until sunroof has returned to closed position after a complete opening operation.
 - Characteristic curve learning is complete, release sunroof switch.

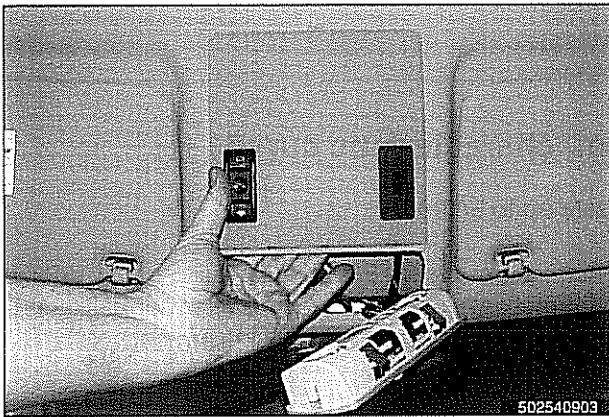
NOTE —

Carry out function check (tip function, anti-trap protection and, if necessary, comfort function).

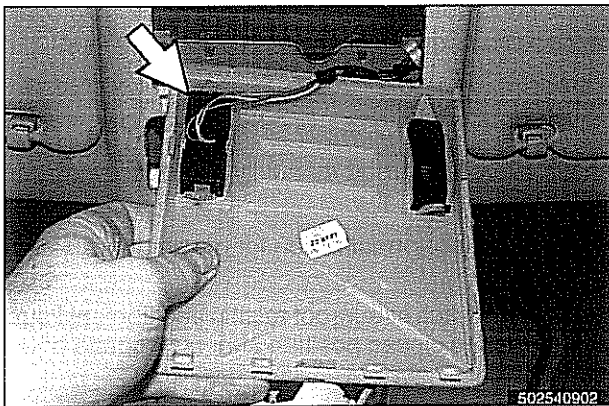
Sunroof panel, emergency closing



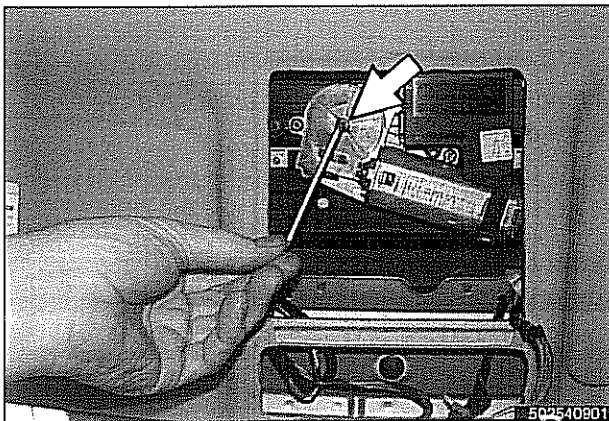
- Using a plastic tool carefully pry interior light out of headliner.



- Remove access panel from below sunroof motor by inserting fingers through light opening and pressing down.



- Disconnect electrical connections (**arrow**) and lay switch panel aside.



- Insert hex key into drive in sunroof motor (**arrow**), and turn hex key to manually close sunroof.

NOTE —

The hex key for manually (emergency) closing the sunroof can be found in the tool kit located in the trunk lid (sedan models) or under the cargo area floor panel (Sport Wagon).

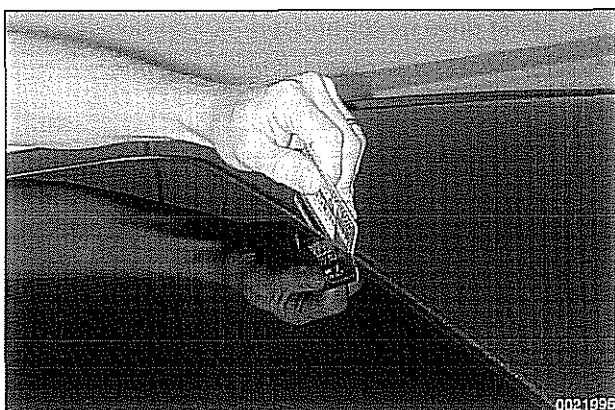
Sunroof, adjusting

The sunroof is controlled by a set of cables that move the sunroof panel along guide rails when the motor is operated. The sunroof can be adjusted without removing it from the car.

NOTE—

Be sure to check drains in front corners of sunroof carrier if water is entering car through headliner.

- The sunroof panel should be adjusted under the following circumstances:
 - Sunroof misaligned with roof.
 - Sunroof does not close squarely.
 - Wind noise at high speeds (sunroof closed).
 - Sunroof has been removed.



For correct sunroof alignment:

- Sunroof must be fully closed.
- Gap must be even all around edge of sunroof.
- Front of sunroof must be flush to 1 mm (0.04 in.) below surface of roof.
- Rear of sunroof must be flush to 1 mm (0.04) above surface of roof.

NOTE—

Use a credit card to measure the gap. The card should insert through the gap with equal resistance all around the perimeter.

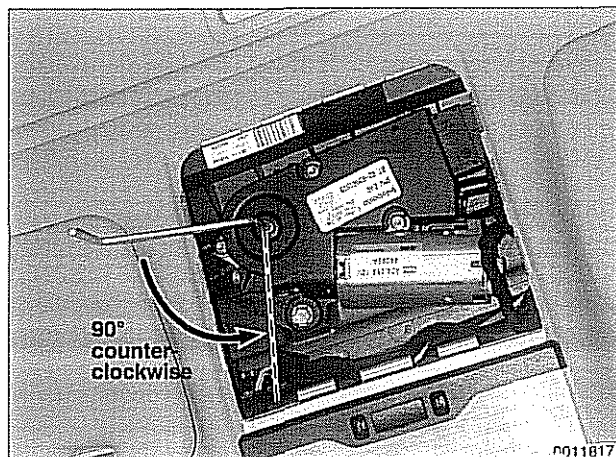
Sunroof with steel roof panel, adjusting

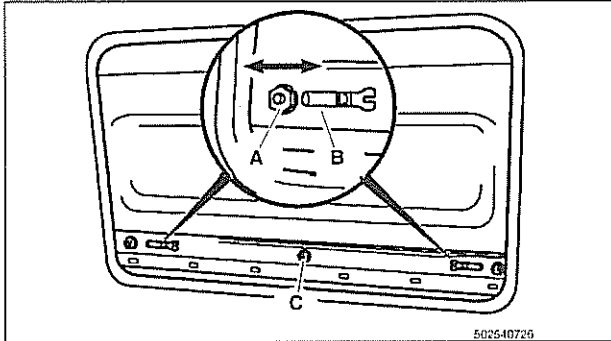
- The headliner panel must be disengaged from the drive assembly and moved rearward in order to access the roof panel attaching screws.

CAUTION—

Sunroof panel must never be moved to open position when the headliner is disengaged.

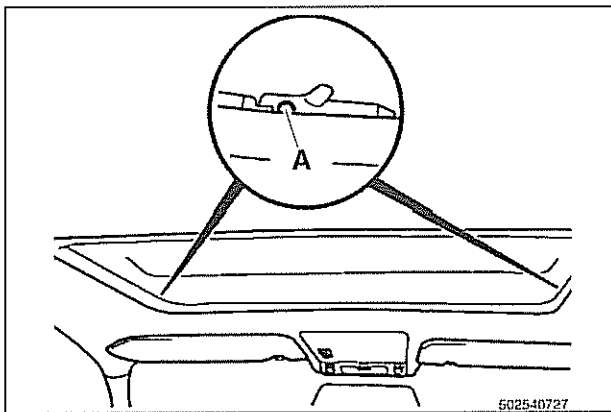
- Start with a fully closed roof panel.
- Remove drive motor access cover. See **Sunroof motor, replacing**.
- Using hex key from tool kit, turn motor drive 90° counter-clockwise.
 - Rear of sunroof panel will drop 2 to 3 mm (0.08 to 0.12 in). This disengages headliner from sunroof panel.
- Push headliner panel rearward, exposing roof panel attaching screws.





Adjusting rear roof height:

- Remove fasteners (A) and (B).
- Slide in left and right side adjusting wedges (C) until ideal setting is reached.
- Press sunroof panel forward and tighten wedge nuts (B).
- Tighten center nut (A).



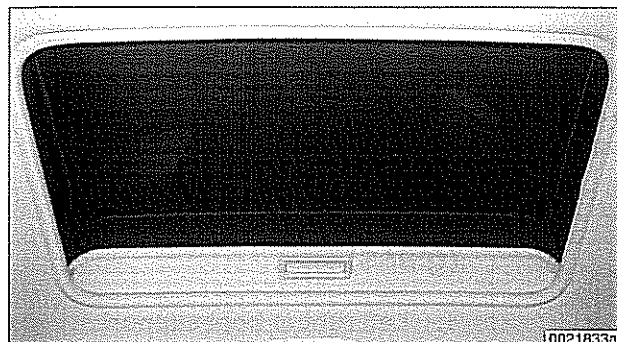
Adjusting front roof height.

- Loosen left and right fasteners (A).
- Set front of sunroof to ideal height by moving panel up or down.
- Tighten fasteners (A).
- Insert hex key in drive motor and turn 90° clockwise.
- Pull headliner panel forward until it locks in place.

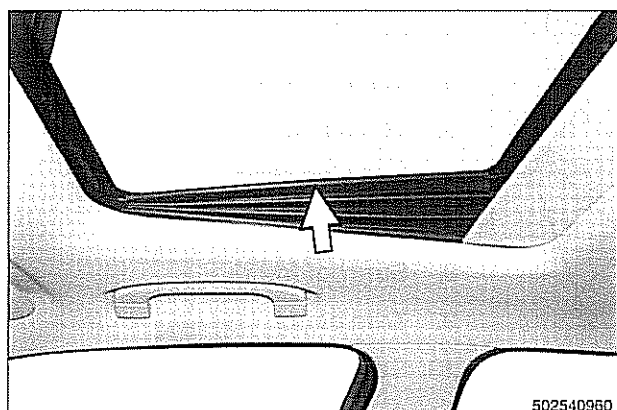
Tightening torque

Wedge locking nuts	1.5 Nm (13 in-lb)
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Sunroof with glass roof panel, adjusting



- Slide sunroof liner back into roof cavity until approx. 70 mm (2.75 in) is exposed.



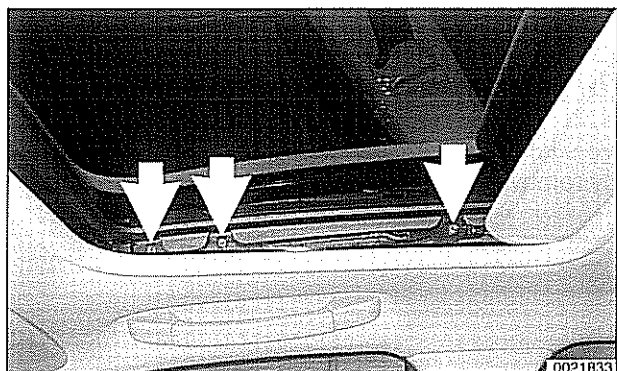
- Raise glass sunroof panel to vent position to expose rubber gaiter (**arrow**).

- Working from center section of gaiter (**arrow**), carefully pull gaiter off slotted mounting on sunroof glass panel.

CAUTION—

- The gaiters tear easily.
- Do not attempt to remove gaiters from lower edge of sliding mechanism.

- With gaiters removed, three adjusting screws are visible at front and rear of panel.



- Sunroof panel is retained by three Torx screws (**arrows**) on each side. To adjust sunroof height:

- Loosen Torx screws until sunroof can just be moved.
- Push sunroof panel forward.
- Push sunroof panel up or down until correct height is achieved.
- Reinstall sunroof gaiter.

Sunroof height adjustment specifications

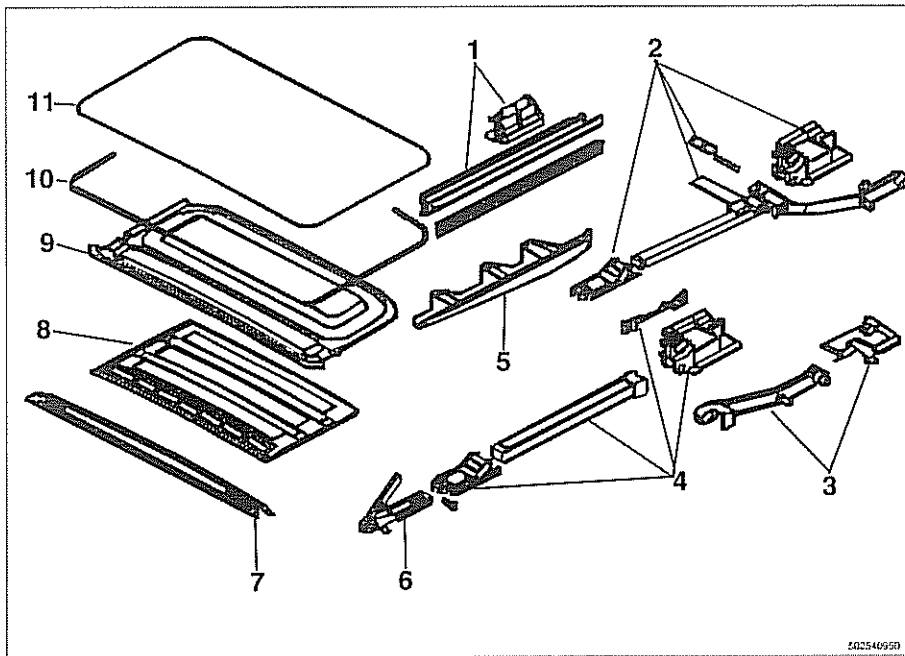
Rear	Flush/ 1 mm (0.04 in) higher than roof top
Front	Flush / 1 mm (0.04 in) lower than roof top

Tightening torque

Sunroof panel to roof (Torx)	6 Nm (4.4 in-lb)
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SUNROOF COMPONENTS

Sunroof assembly removal and installation involves headliner removal, and is not covered in this manual. After sunroof repairs, be sure to follow initialization and adjustment procedures given earlier.



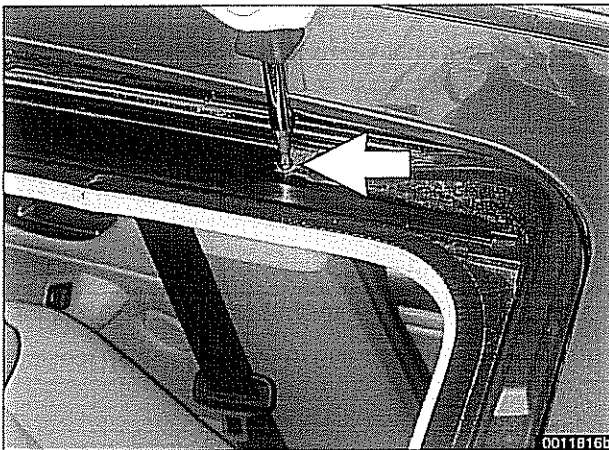
Sunroof components (glass)

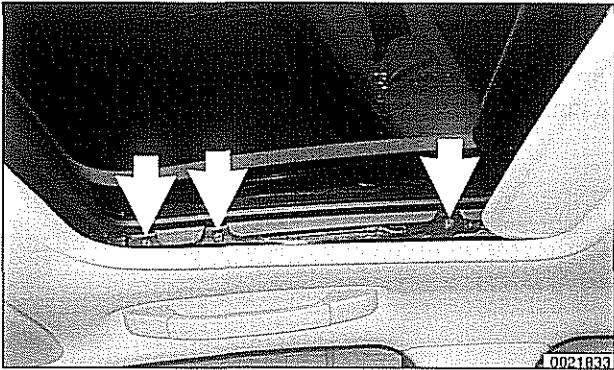
1. Left rubber boot support
2. Left upper control rail
3. Left side water channel repair kit
4. Left lower control rail
5. Left cover
6. Left side slider
7. Cross member
8. Sunroof frame
9. Trim panel
10. Gasket
11. Glass roof cover

Sunroof panel, removing and installing (steel or glass)

- To remove sunroof panel, open sunroof and remove wind blocker by removing Torx screw (arrow) on each side.

- Close sunroof and slide sunroof liner back into roof cavity until approximately 70 mm (2.75 in.) is exposed.





- Remove three Torx screws (arrows) on each side, and lift panel out.
- Installation is reverse of removal. Adjust sunroof height and gap as described earlier. See **Sunroof, adjusting**.

Tightening torques

Wind blocker to roof (Torx)	1 Nm (9 in-lb)
Sunroof panel to roof (Torx)	6 Nm (4.4 ft-lb)

Sunroof panel gasket, replacing (steel or glass)

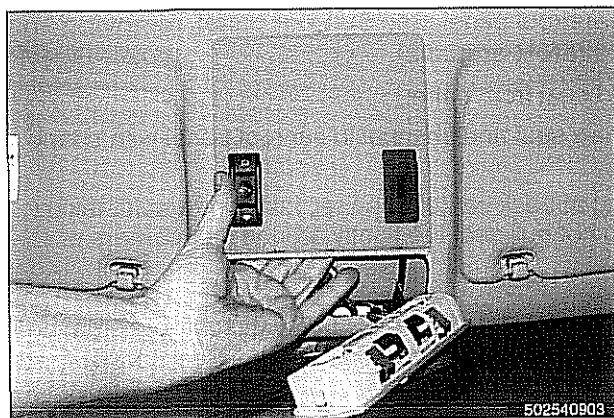
- Remove sunroof panel. See **Sunroof panel, removing and installing (steel or glass)**.
 - Pull old seal from panel.
 - Coat new seal and channel in sunroof panel with soapy water.
 - Starting at back center of panel, install new seal, taking care to not pull seal too tightly around four corners of panel.
- Installation is reverse of removal. Adjust sunroof height and gap as shown earlier in this repair group. See **Sunroof, adjusting**.

Tightening torques

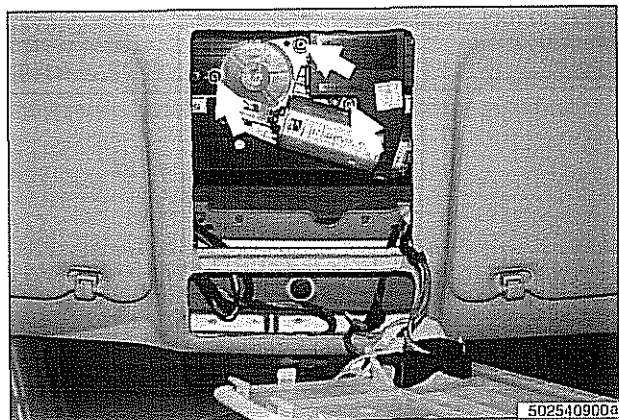
Wind blocker to roof (Torx)	1 Nm (9 in-lb)
Sunroof panel to roof (Torx)	6 Nm (4.4 ft-lb)



- Remove interior light from below sunroof motor by gently prying with a plastic tool.



- Remove access panel from below sunroof motor by inserting fingers through light opening and pressing down.



- Remove sunroof motor mounting screws (arrows).
- Installation is the reverse of removal. Perform initialization procedure as described earlier. See **Sunroof electronic controls, initializing**.

Tightening torque

Sunroof motor to sunroof carrier	2.8 Nm (25 in-lb)
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