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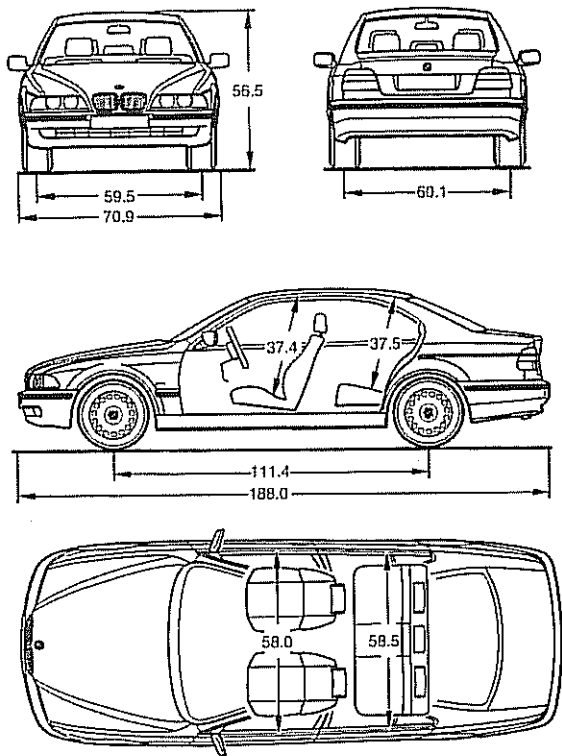
GENERAL

This chapter covers system descriptions and general information for the repair groups found in sections 4 **Body** and 5 **Body Equipment**.

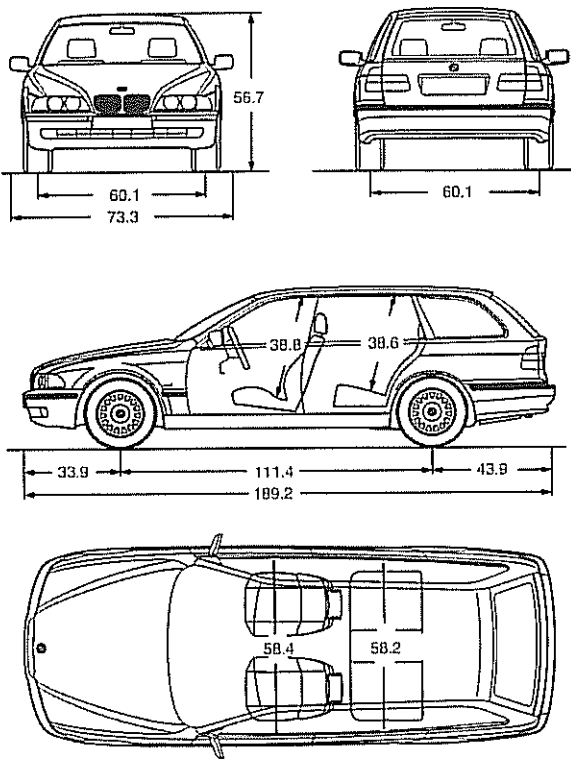
BODY ASSEMBLY

Body dimensions (in inches)

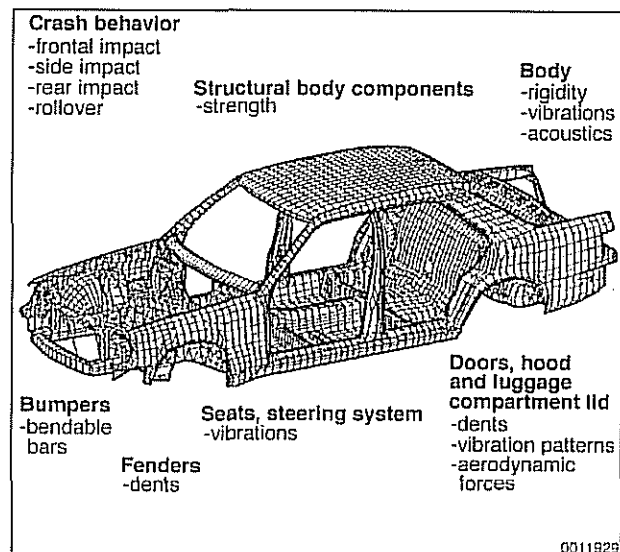
E39 sedan



E39 Sport Wagon



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Body shell

The BMW 5 Series chassis is a unibody design constructed of high strength steel. Attaching parts, such as the front fenders, rear quarter panels, doors, trunk lid and hood are also constructed of steel.

- ◀ Computer aided design (CAD) techniques have been used in refining the E39 body to reduce vehicle weight while retaining strength and increasing torsional rigidity. For good handling purposes, the more rigid the structure the more precisely the suspension can operate.

Exterior and aerodynamics

With its traditional styling features, such as the kidney grille, circular headlights behind a glass cover (for reasons of streamlining), and the "kick" in the rear most roof pillar (C-pillar), the E39 can be immediately recognized as a BMW.

Wind resistance

Windows bonded flush to the body and the guided flow of cooling air into the engine compartment provide the car with a good coefficient of drag (Cd). E39 cars have been designed for balanced aerodynamics but not necessarily an extremely low Cd. See table below.

Windshield wipers are designed for effectiveness at speeds up to and beyond 200 kph (124 mph).

Coefficient of aerodynamic drag (Cd)

6-cylinder sedan	0.30
V-8 sedan	0.31
6-cylinder Sport Wagon	0.31
V-8 Sport Wagon	0.33

Fenders

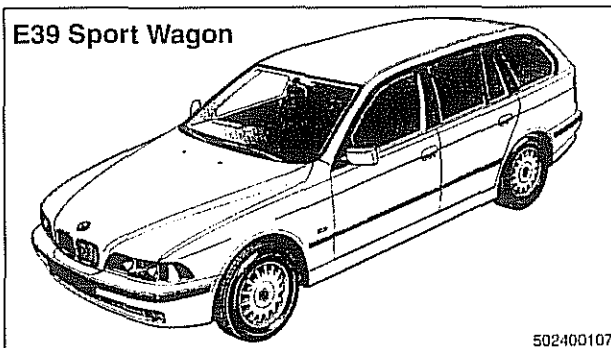
The exterior panels are corrosion-resistant zinc coated (galvanized) steel. The front fenders are bolted on. For front fender replacement information, see **410 Fenders, Engine Hood**.

Bumpers

The front and rear bumpers are clad in high quality deformable plastic and, at solid barrier impact speeds of 4 kph (2.5 mph), provide protection with virtually no damage to the bumper or the vehicle. In addition to hydraulic dampeners, which absorb the initial impact energy, these bumpers are backed by compressible tubes. These deform in a controlled manner at impact speeds greater than that for which bumpers and hydraulic dampeners are designed. This helps avoid expensive damage to the body at impact speeds up to 14 kph (9 mph).

SPORT WAGON

E39 Sport Wagon



◀ The E39 Sport Wagon was introduced to the US market in 9/1998 (model year 1999). It shares many components with the E39 sedan and is identical to it from the B-pillar forward.

US market 5 Series Sport Wagons are available in two variants:

- 6-cylinder (525i, 528i) powered by the 2.8 liter M52 TU engine (1999) or the 2.5 liter M54 engine (2000 and later)
- V-8 (540i) powered by the 4.4 liter M62 TU engine

The wheelbase of the Sport Wagon is the same as the sedan. However the body is 30 mm (1.2 in) longer and 10 mm (0.4 in) higher.

The Sport Wagon rear suspension was redesigned to eliminate the upper rear spring strut mounting on the E39 sedan. The use of separate coil springs and shock absorbers results in a flat, wide floor in the cargo area. See **300 Suspension, Steering and Brakes-General**.

The self-leveling air spring suspension system (electronic height control or EHC) is standard on Sport Wagon V-8 models and optional on 6-cylinder models.

Sport Wagon cargo capacities are shown below.

Sport Wagon load capacities

Cargo capacity

- | | |
|-------------------------|--------------------------|
| • Rear seat up | 909 liters (32.1 cu ft) |
| • Rear seat folded down | 1809 liters (63.9 cu ft) |

Load limit

- | | |
|---------------------|------------------|
| • Cargo compartment | 460 Kg (1014 lb) |
| • Roof | 100 Kg (220 lb) |

Tailgate

The E39 Sport Wagon tailgate is large with a low sill for easy cargo loading. The tailgate opens to an angle of 88° measured from the rear roof pillar (D-pillar) and to a height of 2029 mm (79.8 in) measured from the ground to the upper edge of the raised tailgate.

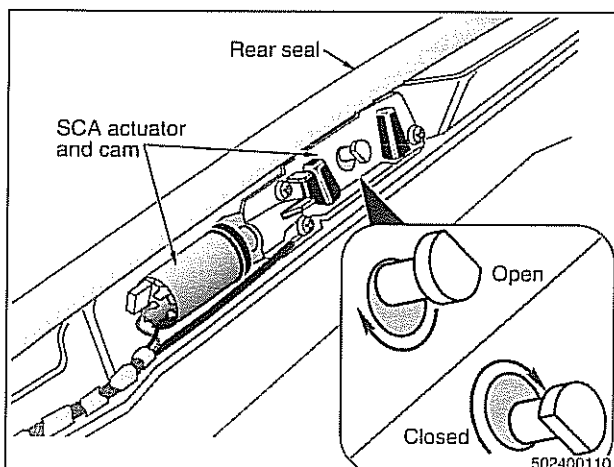
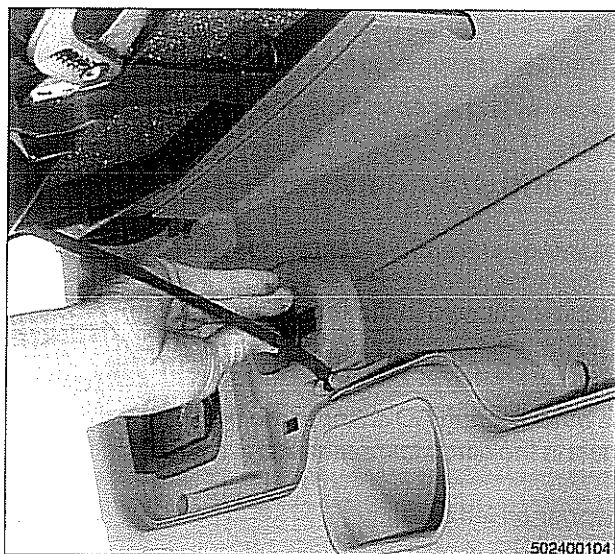
The rear window is bonded to a load bearing frame and can be opened separately from the main tailgate. Tailgate support gas springs are recessed into cavities in the roof.

Tailgate lock system

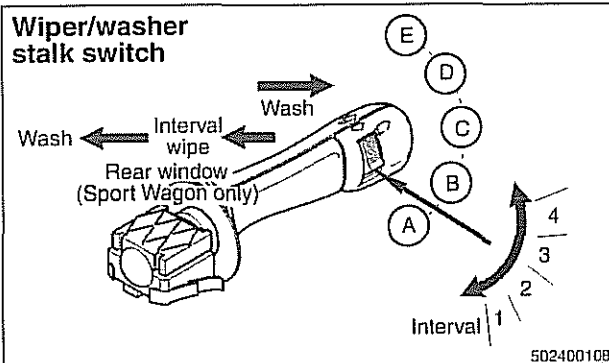
A mechanical tailgate lock cylinder is not used; the tailgate is opened by the unlock pad above the license plate, the remote tailgate switch located in the drivers kick panel, or via FZV (keyless entry) control.

- An emergency release mechanism is incorporated into the latch assembly to open the hatch from the vehicle interior if a malfunction occurs.

The tailgate lock assembly includes an automatic soft close (SCA) feature. The electrical operation of SCA is a function of central body electronics (ZKE III). The SCA actuator is located in the rear cowl panel below the tailgate. The actuator is controlled by a load relay in the General Module. A locking cam is mounted on an eccentric that is driven by the actuator.



- The SCA cam always turns in the same direction to open or close the tailgate. The cam turns 180° to open or to close. When the cam turns in the up direction the notch in the cam pushes on a lever on the back of the latch in the tailgate. This mechanically unlocks the latch. The tailgate is raised up and can be opened.



Rear wiper system

The rear wiper assembly on the E39 Sport Wagon is a self-contained unit. The control electronics are integrated into the gear drive that is part of the motor assembly. The control electronics contain two hall sensors, one for the park position and one for the end stop or to signal reverse direction of the wiper motor.

◀ The rear wiper is controlled through the stalk switch on the steering column. The switch includes the following functions:

- Intermittent rear window wiping
- Programmed rear window wiping interval
- Operation of rear window washer

The wiper system automatically controls the following safety and convenience features:

- Wiper interrupted when rear glass is opened
- Wiper interrupted if wiper arm is blocked
- Continuous wiping when vehicle is shifted into reverse

Antenna and sound system

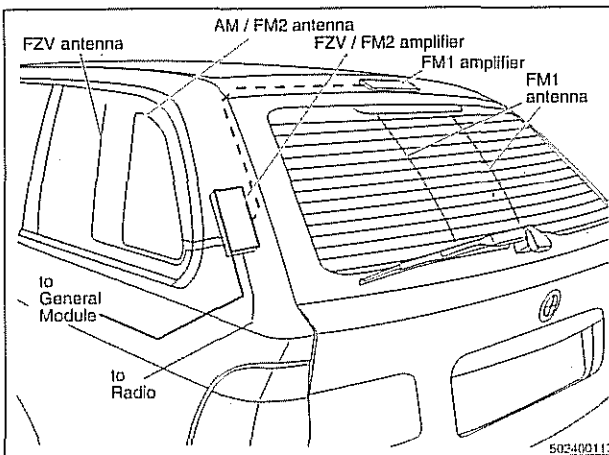
◀ There are two diversity FM antenna amplifiers:

- FM1 amplifier located in the rear window frame
- FM2 / FZV amplifier located in the left D-pillar

The radio amplifier and CD changer are behind the side access panels in the cargo compartment:

- CD changer on left side
- Sound system subwoofer on right side

The subwoofer has a hold down knob and is mounted on a hinge. It can be swung out to access the battery and fuse panel by unscrewing the knob.

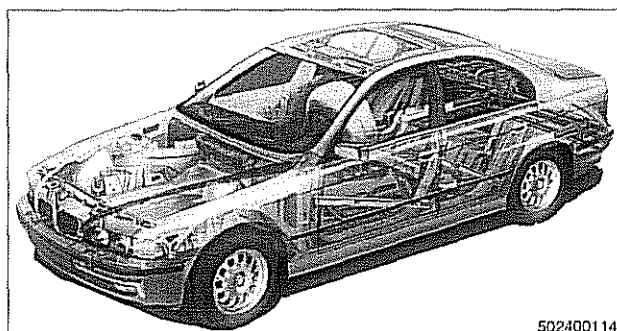


SAFETY AND SECURITY FEATURES

A number of new or improved safety and security features are incorporated in E39 cars.

Safety cage

- The body safety cage is a continuation of an established BMW concept for passenger protection. Tubular impact structures built into the body provide protection against passenger injury during front or rear impacts.



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Door locks and door handles

- The door handles allow easy door opening, but are secure in accidents.

Electrical components in the locks are fully encapsulated and cannot be picked easily. The door handles, latches and lock assemblies offer reliability and security against theft.

Door position and lock condition are detected by hall sensors.



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Roof padding

In addition to the side and head protection airbags, there is supplementary padding at the roof pillars and along the roof above the doors. This is positioned to present energy absorbing surfaces to passengers thrown around by side impact forces.

Seat belts

Each front seat belt assembly has a height-adjustable anchor at the B-pillar.

An automatic pyrotechnic (explosive charge) tensioner tightens the front belt at the buckle upon impact, snugging up lap and shoulder segments of the belt. The tensioners are designed to automatically tension the belts by about 2 inches (55 mm) in the event of a collision.

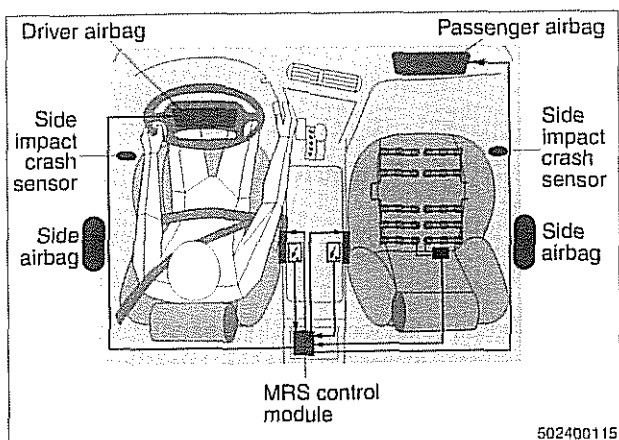
A force limiter puts an upper limit on the amount of force each belt can exert on the passenger.

Airbags

Front airbags, side airbags, pyrotechnic seat belt tensioners and the Battery Safety Terminal (BST) are integrated into the Supplemental Restraint System (SRS) and its variants.

NOTE —

The BMW SRS system is called Multiple Restraint System (MRS). Over the years, E39 cars were equipped with MRS, MRS II, MRS III. Each version offers varied features and improvements over the previous system.



As many as 8 airbags may be installed in E39 cars, depending on model and MRS version.

The front airbags operate without sodium azide propellant, widely considered an irritant when an airbag is deployed.

Starting with 1999 models, "smart" front passenger and driver airbags were installed. These are of the dual-threshold, dual stage design, including a sensor to help prevent the unnecessary deployment of the passenger side airbag if the seat is unoccupied.

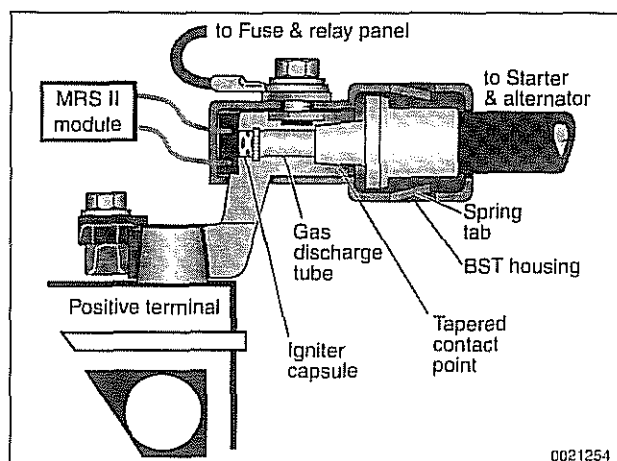
Depending on options chosen, one airbag may be installed in each door of the sedan and Sport Wagon models, protecting passengers against side impacts.

Head Protection System (ITS) airbags stretch diagonally across the tops of the front doors.

Airbag deployment automatically triggers fuel shutoff, turns on the hazard and interior lights, and unlocks the doors.

WARNING —

- Airbags are inflated by an explosive device. Handled improperly or without adequate safeguards, airbag units can be very dangerous. Special precautions must be observed prior to any work at or near any of the airbags. See 721 Airbag System (SRS).
- Always disconnect the battery and cover the negative (-) battery terminal with an insulator before starting diagnostic, troubleshooting or service work on cars fitted with SRS, and before doing any welding on the car.



Battery safety terminal (BST)

- Starting with 1999 models (9/98 production and later), a pyrotechnic (explosive charge) device automatically disconnects the battery positive terminal during impacts. Key features, like power windows and door locks, remain operational.

Security

Electronic immobilization (EWS)

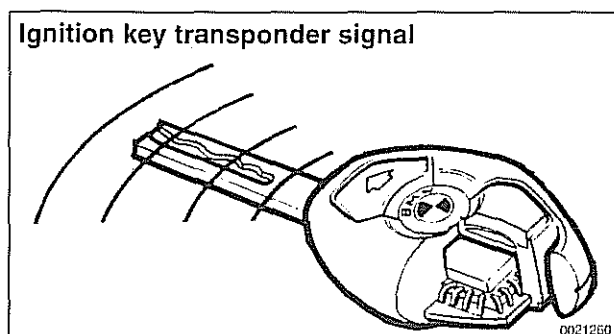
- All E39 vehicles incorporate an electronic immobilization system known as EWS. This system uses a wireless communication link between a transponder chip in the ignition key and the ring antenna surrounding the ignition switch. The EWS control module blocks the starting of the vehicle unless the correct coded ignition key is used.

NOTE —

Electronic immobilization is sometimes referred to as the driveway protection system.

Antitheft alarm (DWA)

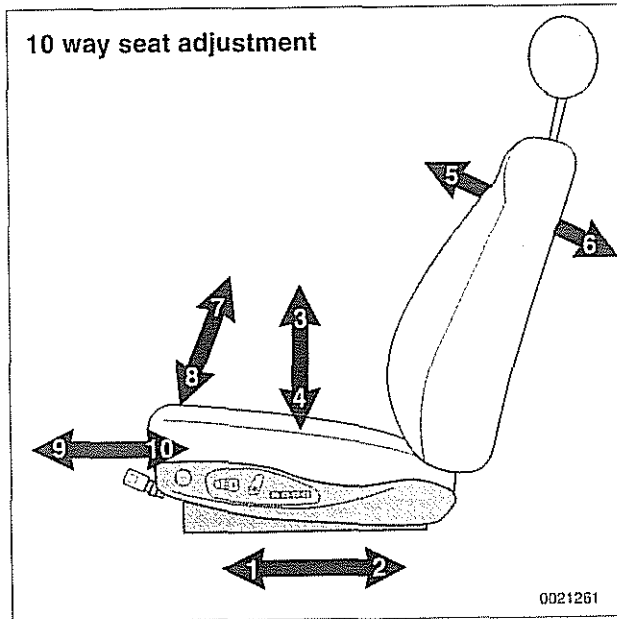
This is a dealer-installed option for which the E39 vehicles are factory-wired. When armed, the system monitors door lock contacts and trunk and engine hood locks and sounds a siren if it detects tampering.



INTERIOR FEATURES

E39 interiors have a unique character, with a combination of sporty features and innovative design. All body versions were made in a wide choice of interior and exterior colors. New colors with matching leather or leatherette upholstery were introduced for each model year.

Driving comfort is enhanced by power steering, tilt steering wheel, height-adjustable front seats, and electrically adjustable and heated rear-view mirrors. Inside the car there are reading lights at four seating positions.



Seats

- ◀ Anatomically correct seats are constructed from polyurethane foam containing areas or "zones" of different firmness. They offer good lateral support without constricting the occupant.

The seats have a passive internal ventilation system: Cylindrical cavities within the cushions and backrests generate a pumping effect as the ride motions cause occupant motion. This helps remove moisture and feeds fresh air into the seats.

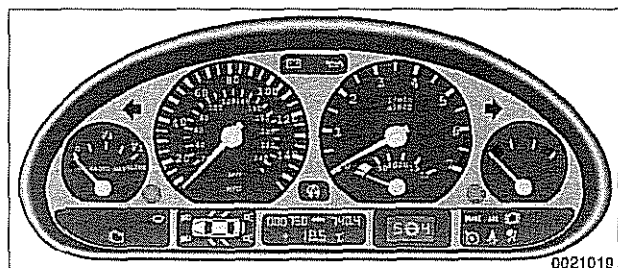
Other features of the seating system:

- The seat bases have steel springs for added support and strength.
- The seat control switches are along the outside edge of the seat.
- Heated seats are an option in all models.
- In cars equipped with seat position memory, three different seat configurations can be memorized by the seat control module(s). *Seat memory coordinates with outside mirror memory.* These functions are controlled by the seat memory module(s).
- For security reasons, the release lever to fold the rear seat backrest forward is installed in the trunk.
- Sport Wagon models: Rear seat backs are split 60/40, with the center armrest on the left seat back.
- The center armrest incorporates a non adjustable headrest. When folded down, the armrest opens out with cup-holders and a storage compartment. See 520 Seats for more details.

Instruments and controls

Everything in the interior passenger compartment essential to the driver is logically grouped and easy to reach. All instruments and controls have been arranged ergonomically and are fully integrated into the overall design of the vehicle.

- Tilt-telescopic steering wheel has 30 mm (1.2 in) of vertical and longitudinal adjustment.
- Multifunction steering wheel contains two key pads containing controls for the sound system, telephone and cruise control.
- Padded dashboard houses the instrument cluster and the ventilation and heating system.



Instrument cluster

- Instrument cluster uses large easy-to-read analog instruments and is removable as a unit without removing the dashboard. On-board computer and Check Control functions are integrated into the instrument cluster displays.

Service Interval Display

Service Interval Display calculates vehicle service needs based on current driving patterns, and indicates to the driver when the car requires service.

On-board navigation

An integrated on-board navigation system, based on Global Positioning System (GPS) technology, is optionally available on E39 cars. When installed, a multifunction monitor is included in the center of the dash above the radio. In addition to displaying navigation system information, this monitor accesses On-Board Computer functions, audio system controls, mobile phone dialling and memory, and automatic ventilation.

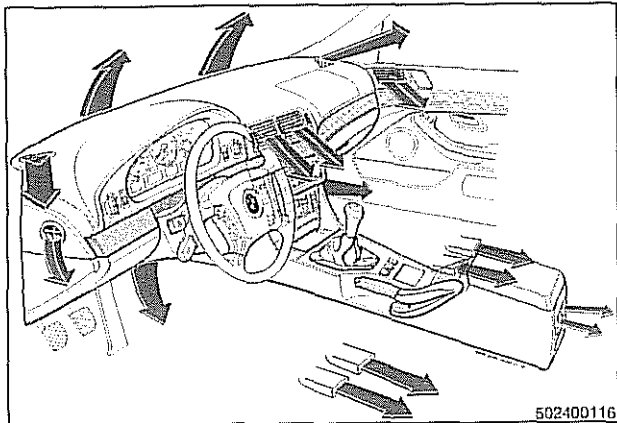
Park Distance Control (PDC)

Park Distance Control (PDC) is an optional system which uses ultrasonic sensors in the rear bumper trim to warn the driver of approaching too close to obstacles when parking.

Central body electronics

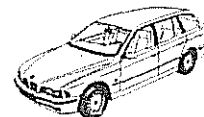
E39 vehicles are equipped with an integrated complex of electronic modules connected mostly via K-Bus. This system, called central body electronics (ZKE III), is primarily controlled by the general module (GM III). An overview of ZKE III functions is found in **600 Electrical System-General**. Details of ZKE III functioning is in the following repair groups:

- 512 Door Windows
- 515 Central Locking and Anti-Theft
- 520 Seats
- 540 Sunroof
- 611 Wipers and Washers
- 620 Instruments



HEATING AND AIR CONDITIONING (IHKA)

- ◀ The integrated heating and air conditioning (IHKA) system uses an extra large, infinitely variable radial blower motor for *good distribution of air*. Fresh air enters through the grille below the engine hood and into the passenger compartment via the dashboard and footwell vents.
- Repair information for the heating and air conditioning system is covered in **640 Heating and Air Conditioning**.



410 Fenders, Engine Hood

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GENERAL

This repair group covers replacement of the front fenders and removal and installation of the engine hood.

NOTE —

The body is painted at the factory after assembly. Realignment of body panels may expose unpainted metal. Paint all exposed metal once the work is complete.

Special tools

Most body repairs can be performed using regular automotive service tools. Some BMW special tools are required to set body pieces into the service positions.

FRONT FENDERS

Front fender, removing and installing

- Raise front of vehicle and remove wheel.

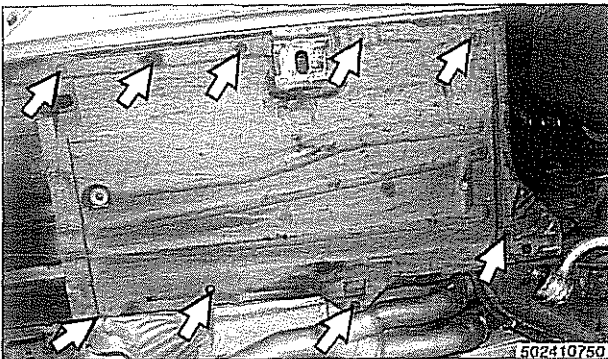
WARNING —

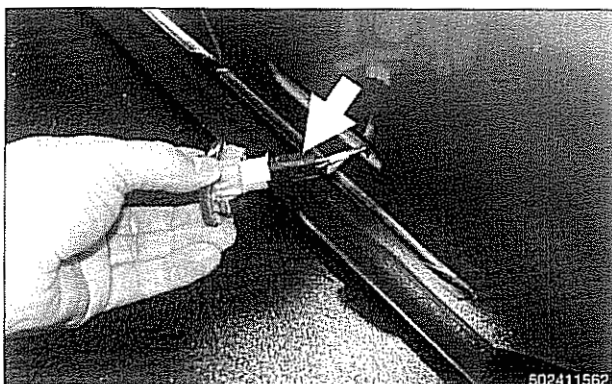
Make sure that the car is firmly supported on jack stands designed for the purpose. Place jack stands beneath structural chassis points. Do not place jack stands under suspension parts.

- Raise hood to service position. See **Hood, raising to service position.**

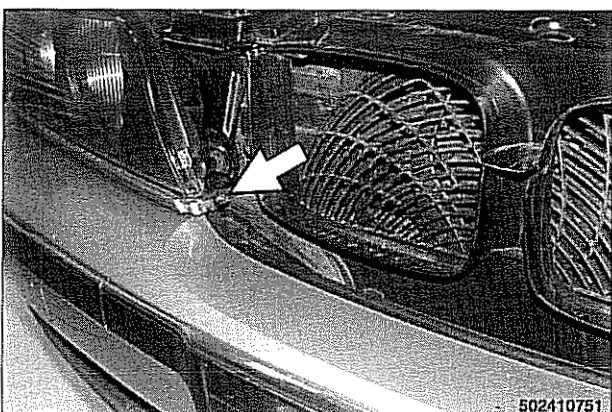
- ◀ Working beneath vehicle, remove fasteners (arrows) from left side floor panel and remove panel.

- Remove inner plastic liner from wheel housing.





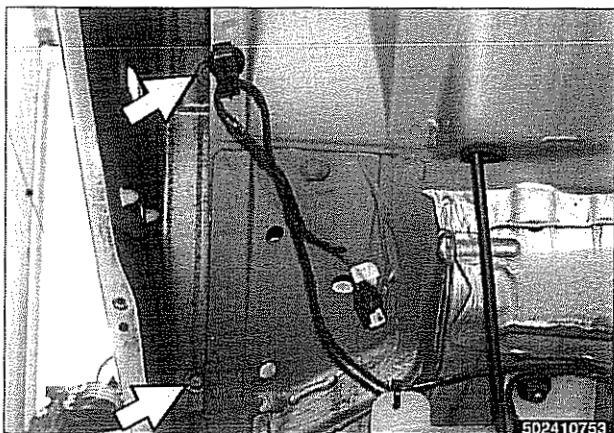
- ◀ Carefully pry front turn signal assembly from fender and disconnect electrical harness (arrow).



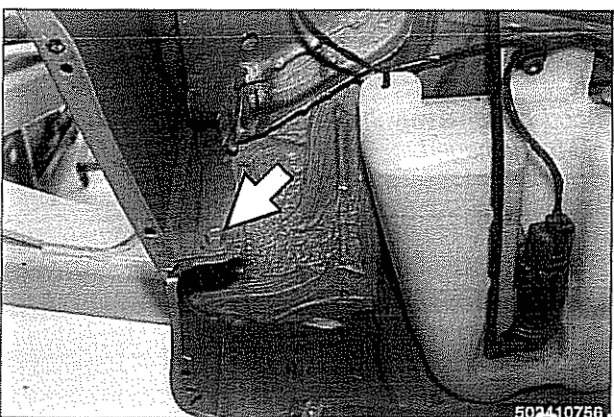
- ◀ Release headlight trim panel locking clip with a screwdriver (arrow).

- Working at corner of side trim panel, pull trim panel out from side of fender to remove.

- Remove front bumper. See 510 Exterior Trim, Bumpers.

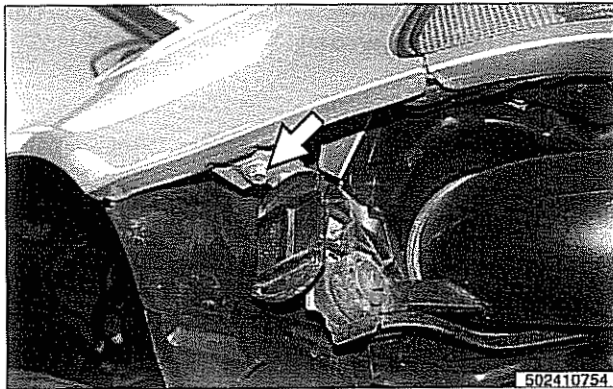


- ◀ Working at rear of fender well, remove fender mounting fasteners (arrows).

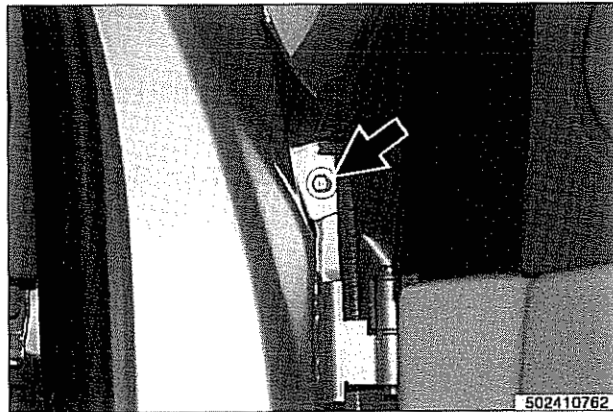


- ◀ Remove lower fender attaching bolts (arrow) at rear of wheel housing.

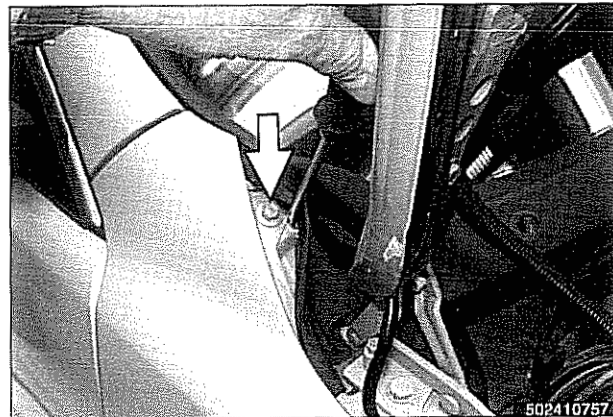
Fenders, Engine Hood



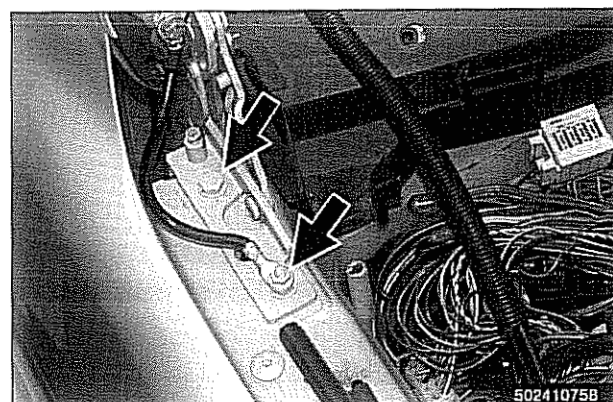
- Working from below, remove front wheel arch fastener (arrow).



- With door open remove fastener (arrow) attaching upper fender to door post.



- Remove screw (arrow) at front of fender.



- Remove ground strap nut and hood hinge bolts (arrows).

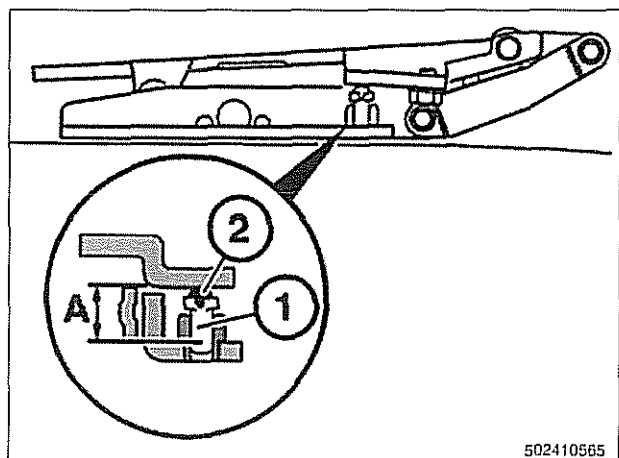
CAUTION—

Secure hood in such a way that the windshield and body panels will not be damaged.



➤ Remove bolts (**arrows**) along top edge of fender.

— Carefully remove fender from body.



➤ Detent screw on left and right hood hinge (1) must be set at 25 ± 1 mm ($1 \pm .04$ in).

— Installation is reverse of removal, noting the following:

- Before installing new fender, clean old sealant and protective coating from mounting surfaces.
- Position new fender and loosely install all mounting bolts.
- Align fender with door pillar and inner fender, then tighten bolts.
- Repair any paint damage and paint any exposed metal.
- Reseal and apply protective coating to mounting surfaces.

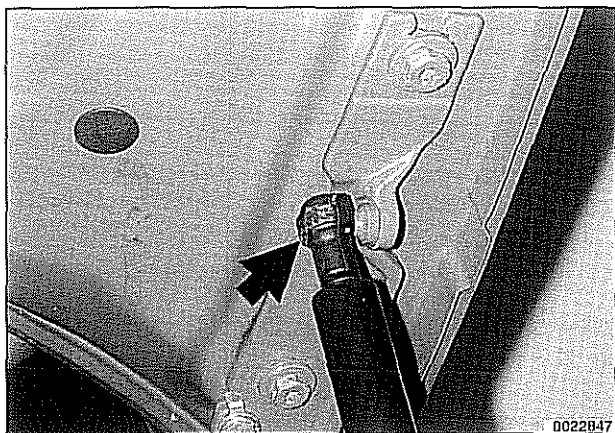
ENGINE HOOD

Hood, raising to service position

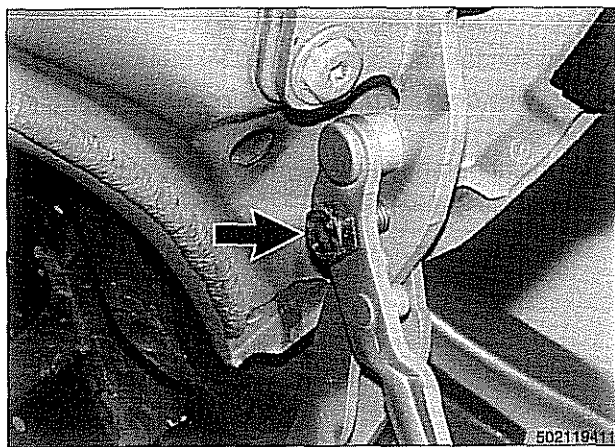
CAUTION—

- Do not switch on the windshield wipers with the engine hood raised. As a precaution, remove the wiper motor fuse. See **610 Electrical Component Locations**.
- The hood is heavy. Before removing the hood supports, be sure to have an assistant help support the hood.

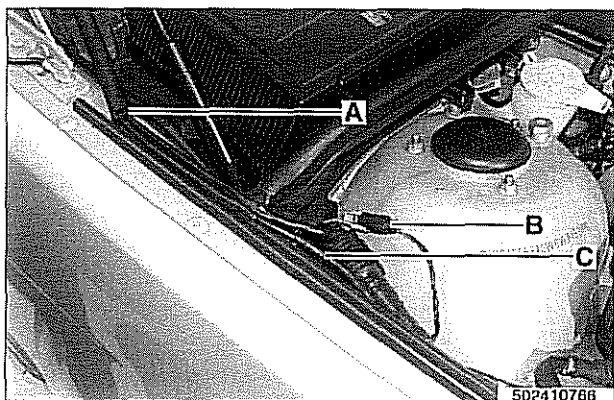
- Open hood fully. With the help of a partner, support hood and remove retaining clips (**arrow**) on upper end of pressurized lifting struts. Pull struts off hood.



- Raise hood to service position and lock in position by placing bolts (**arrow**) in right and left hinges.



Hood, removing and installing



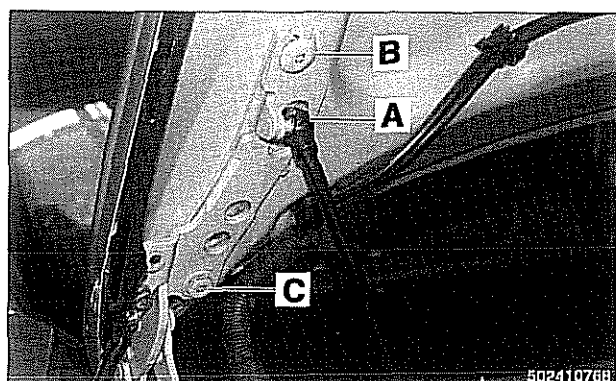
◀ With hood open:

- Remove hood wiring harness mounting clip (A).
- Disconnect electrical harness connector (B).
- Unplug windshield washer hose (C).

WARNING—

The hood is heavy. Before removing the hood supports, be sure to have an assistant help support the hood.

- Mark position of hinge plates.

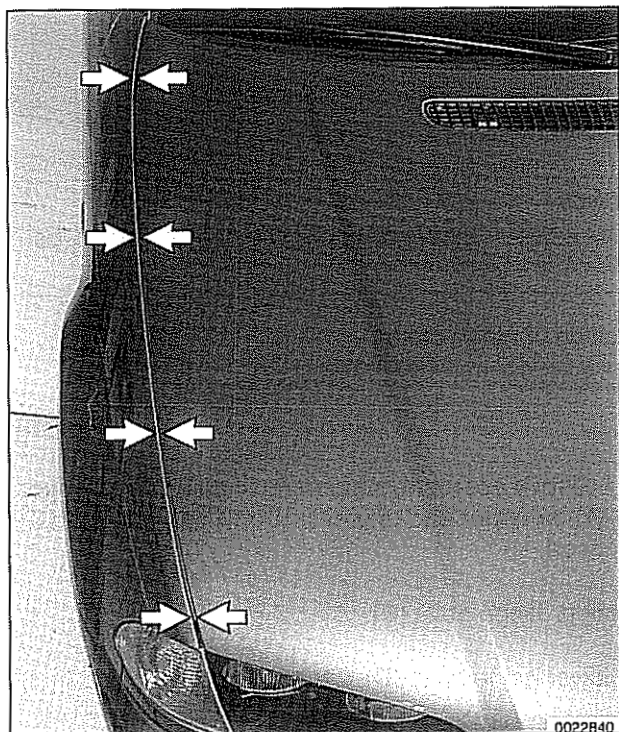


◀ With the help of a assistant, support hood and remove retaining clips (A) on upper end of pressurized lifting struts. Pull struts off hood.

- Loosen upper hinge bolts (B).
- Remove lower hinge bolts (C). Lift hood off carefully.
- Installation is reverse of removal.
 - Repair any paint damage and paint any exposed metal.
 - Check hood alignment. See **Hood, aligning**.

NOTE—

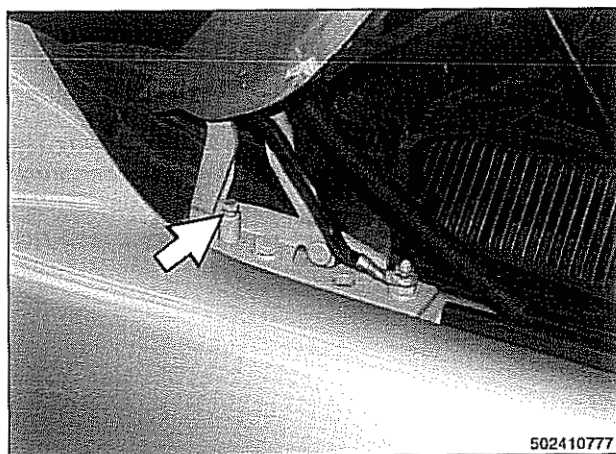
The hood was fitted and attached to an unfinished body at the factory. Unfinished surfaces exposed by this procedure must be touched up with paint.



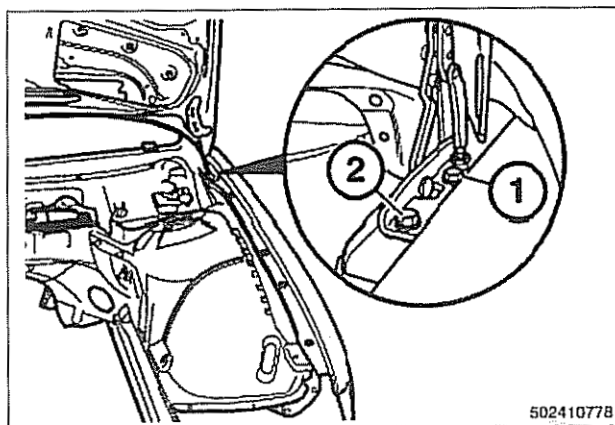
Hood, aligning

When installing the hood, align the hinges as close to the original painted surface as possible. Movement of the hood on its attaching hardware may require touch-up paint.

- The hood should be aligned so that gap (**arrows**) to fender is as even as possible.

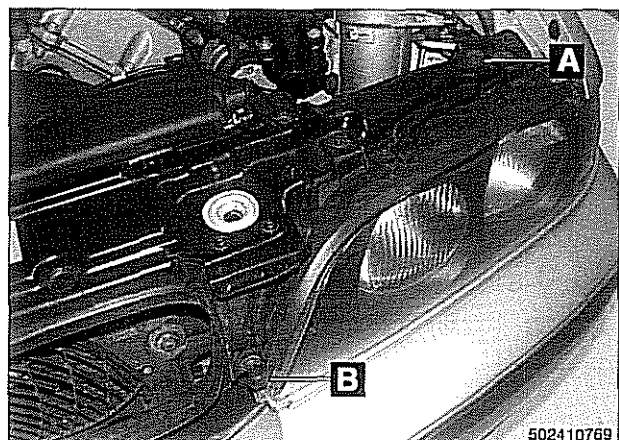


- If height adjustment at rear of hood is off, adjust height using adjusting screw in lower hinge (**arrow**). Loosen and reposition as necessary.



- If height adjustment at rear of hood cannot be completed using adjusting screw:

- Loosen lower hinge screws (1) and (2).
- Add or remove washers as needed to correct height setting.

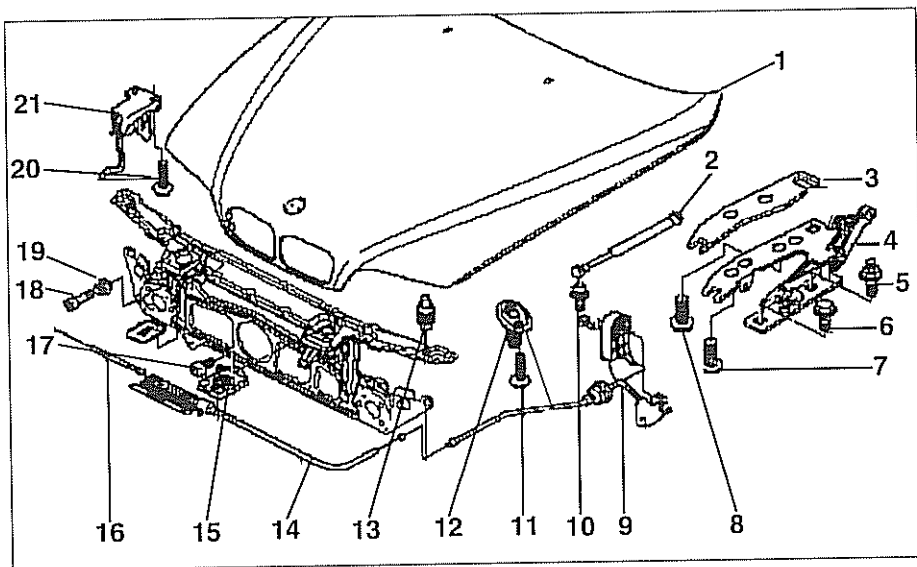


◀ Adjusting detent buffers for hood:

- Raise hood.
 - Shape pieces of rubber (butyl) tape into two 10mm columns and place on buffers (A).
 - Close hood.
 - Measure dimension of the compressed rubber tape.
 - Using measurement dimension, adjust detent buffer (A). Hood should be under a slight preload. (+0.5 mm).
 - Follow the same procedure on the front buffers (B).
- After adjustment have been made, check that hood lid is flush against detent buffers and if necessary repeat the adjustment.

CAUTION—

To avoid excessive wind noise, the hood must not protrude beyond the front side panels.

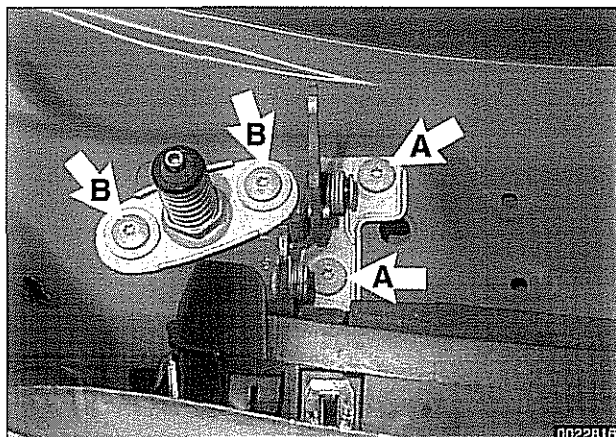


Hood latch components

1. Hood
2. Gas pressurized strut
3. Spacer
4. Hinge
5. Ground stud
6. Torx bolt
7. Torx bolt
8. Hex bolt
9. Bowden cable bracket
10. Ball pin
11. Torx bolt
12. Spring pin
13. Stop buffer
14. Bowden cable
15. Lower hood lock
16. Bowden cable
17. Torx bolt
18. Stop buffer
19. Hex nut
20. Torx bolt
21. Hood latch

Hood release cable and spring pins, adjusting

Before adjusting hood pins, be sure the hood is aligned evenly to fenders and front panel.



- Make sure bowden cable, which connects both hood locks together, is seated in lock guide on both left and right locks.

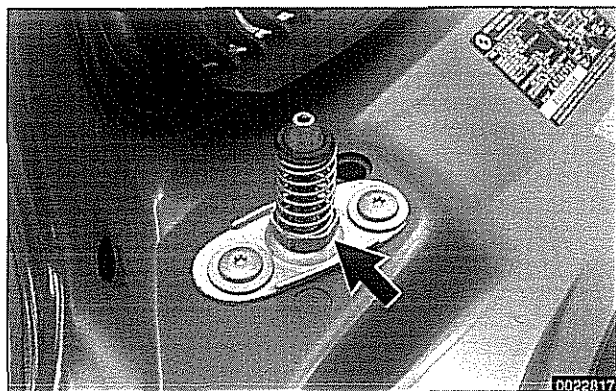
Loosen hood spring pin bolts (A) and retaining hook bolts (B) at hood on left and right sides only enough to allow movement.

- Lower (but do not fully latch) hood several times so pins on hood center themselves in lower locks.

NOTE—

Do not let hood lock with latch bolts loose.

- Tighten hood spring pin bolts and latch bolts when alignment is correct.
- Remove one bolt at a time from each side, clean and coat with Loctite® 270 or equivalent, and reinstall. Repeat process on all other bolts.
- Adjust rubber stop buffers above headlight assemblies. See **Hood, aligning.**
- Test hood for correct closure and opening. If hood does not spring open, lengthen spring pins.
- To lengthen spring pin, loosen locknut (arrow) with wrench inserted through spring, then turn pin counterclockwise.



411 Doors

General 411-2

Doors 411-2

Front or rear door, removing
and installing 411-2

Door check, replacing 411-4

Door hinge adjustment 411-5

Door hinge assembly 411-6

Door Panels 411-7

Door trim panel, removing and installing ... 411-7

Sill trim panels 411-10

GENERAL

This repair group covers front and rear door repair information. It includes removal and installation of front and rear doors and trim panels.

For information on airbag removal and installation, see **721 airbag**.

For information on the power door windows and door glass replacement, see **512 Door Windows**.

For information on the power door locking system, see **515 Central Locking and Anti-Theft**.

DOORS

WARNING—

*E39 cars are fitted with side-impact airbags in the front doors and optional side impact airbags in the rear doors. When servicing doors, always disconnect the negative (-) battery terminal. See **721 Airbag System (SRS)** for cautions and procedures relating to the airbag system.*

Front or rear door, removing and installing

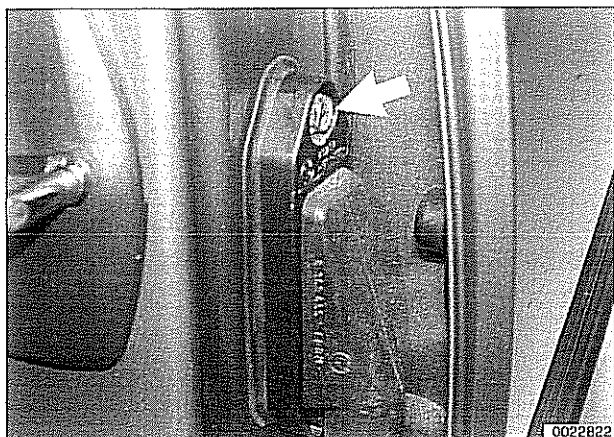
- Disconnect negative (-) battery cable.

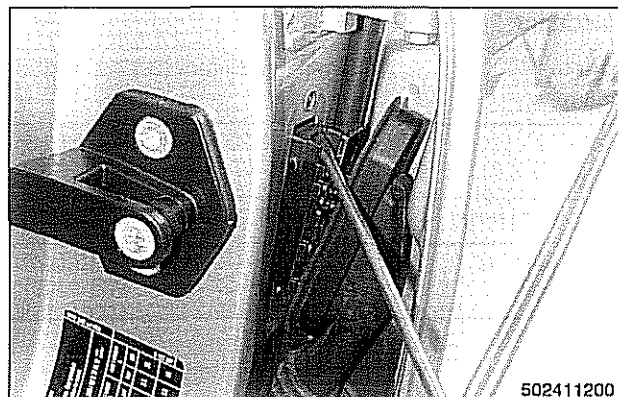
CAUTION—

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

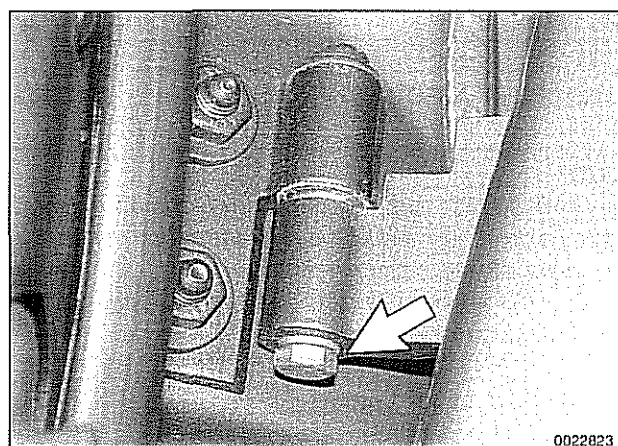


- Remove harness connector mounting bolt (**arrow**) at door pillar.

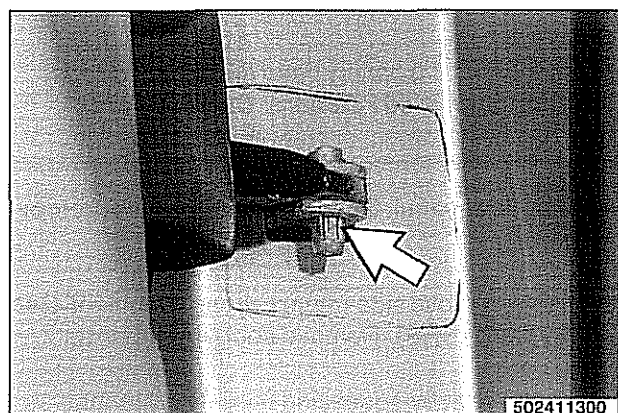




- Pull up on locking clip and remove connector.



- With door fully open, unscrew pin bolts (**arrow**) from top and bottom hinges.



- Disconnect door check by squeezing mounting pin tabs (**arrow**) and driving pin up.

- Remove door by lifting up off lower hinge halves.

CAUTION—

Be careful not to damage door or other painted body surfaces. Make sure no load is placed on wiring harness.

- Installation is reverse of removal. Keep in mind the following:
 - Mount and align rear doors first, followed by the front doors.
 - Align door so that panel gaps are equal on either side, see specifications at the end of this procedure. If necessary, adjust door hinges. See **Door hinge adjustment**.
 - Adjust door striker so that trailing edge of front door is slightly higher (1 mm / 0.04 in.) than leading edge of rear door. See **515 Central Locking and Anti-Theft**.
 - Repair any paint damage and paint any exposed metal.

Door adjustment

Front fender to front door gap	4.25 mm $\pm$ 0.25 mm (0.17 $\pm$ 0.01 in)
Front door to rear door gap	4.5 mm $\pm$ 0.25 mm (0.18 $\pm$ 0.01 in)
Rear door to rear fender	4.0 mm $\pm$ 0.25 mm (0.16 $\pm$ 0.01 in)
Permissible deviation from parallel	1.0 mm (0.04 in)

Tightening torque

Door hinge to door frame	20 Nm (15 ft-lb)
--------------------------	------------------

Door check, replacing**WARNING—**

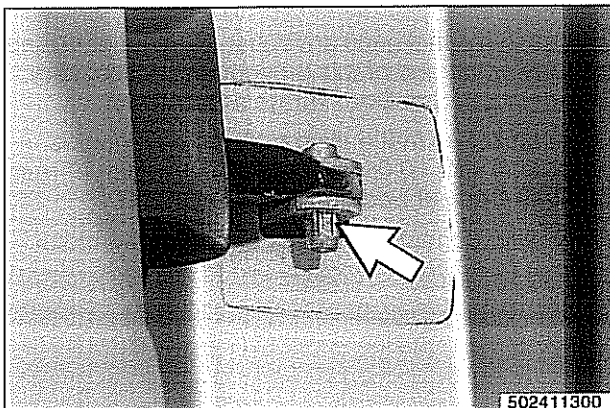
*E39 cars are fitted with side-impact airbags in the front doors and optional side impact airbags in the rear doors. When servicing doors, always disconnect the negative (-) battery terminal. See **721 Airbag System (SRS)** for cautions and procedures relating to the airbag system.*

- Close door window completely.
- Disconnect negative (-) battery cable.

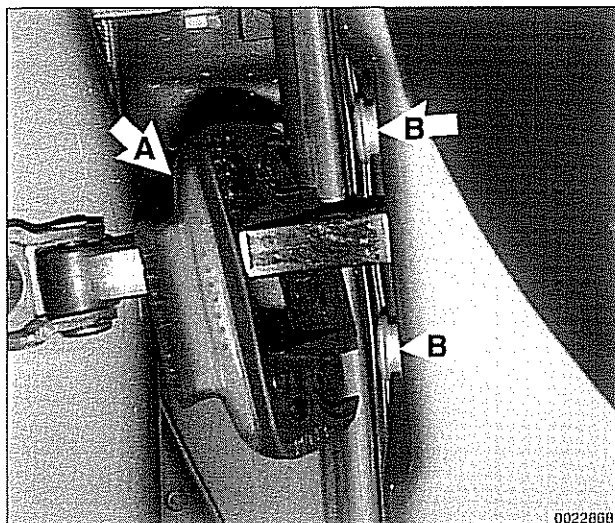
CAUTION—

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

- Remove interior door panel. See **Door trim panels, removing and installing**.
- Where applicable, remove side-impact airbag from door. See **721 Airbag System (SRS)**. Remove door vapor barrier.
- Disconnect door check by squeezing mounting pin tabs (arrow) and removing pin.



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➤ Remove rubber cover (A) and bolts (B) from door check lock-plate on door.

- Working inside door, remove door check assembly.
- Installation is reverse of removal.
 - Lubricate door check before installing.
 - If removed, use new mounting bolts when reinstalling side-impact airbag to door.

Tightening torque

Door check to door frame	24 Nm (16 ft-lb)
--------------------------	------------------

Door hinge adjustment

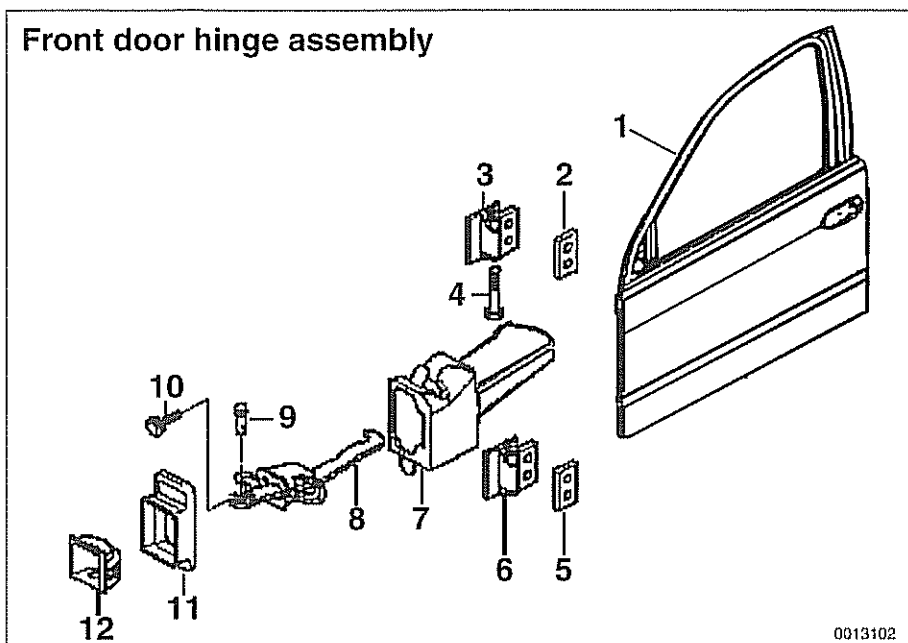
If the installed door is uneven or out of parallel, spacers can be used to correct its position. Spacers are placed behind the hinge and are available in two different thicknesses (0.5 mm and 1.0 mm).

- Front and rear door adjustment procedure is similar.

Tightening torque

Door hinge to door frame	20 Nm (15 ft-lb)
--------------------------	------------------

Front door hinge assembly



0013102

Door hinge assembly

1. Door
2. Spacer ring
3. Upper hinge
4. Hex bolt
5. Spacer ring
6. Lower hinge
7. Door check gasket
8. Door check
9. Pin
10. Torx bolt
11. Gasket
12. Cover

DOOR PANELS

WARNING—

*E39 cars are fitted with side-impact airbags in the front doors and optional side impact airbags in the rear doors. When servicing doors, always disconnect the negative (-) battery terminal. See **721 Airbag System (SRS)** for cautions and procedures relating to the airbag system.*

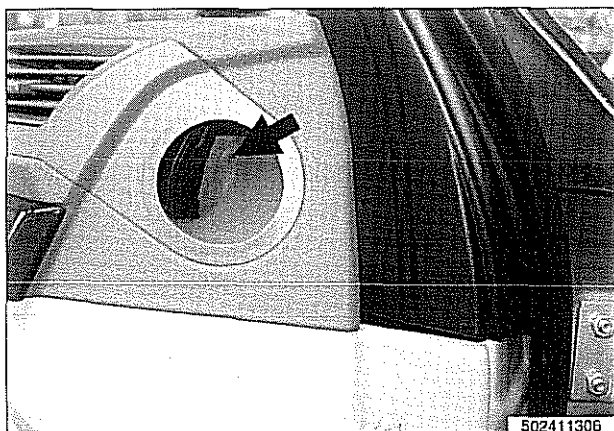
Door trim panel, removing and installing

- Disconnect negative (-) battery cable.

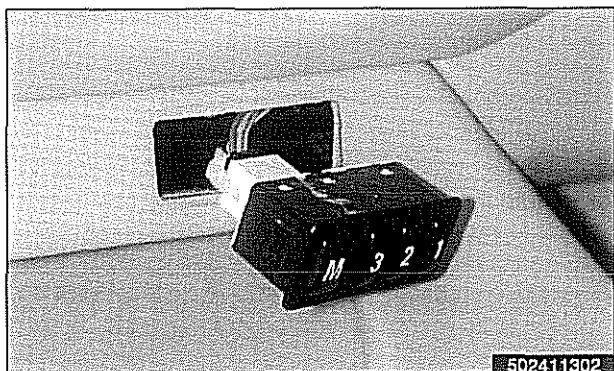
CAUTION—

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

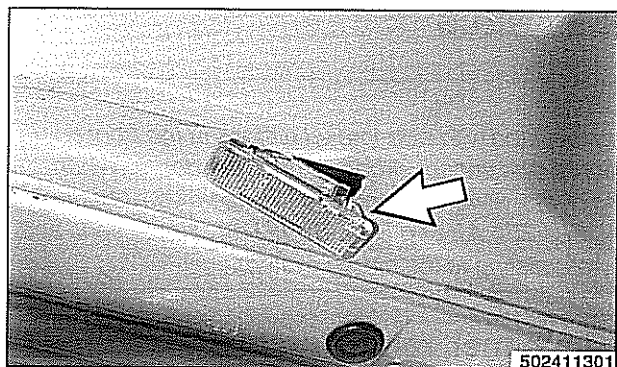
- ◀ Open door, and remove screw (arrow) located in air duct.



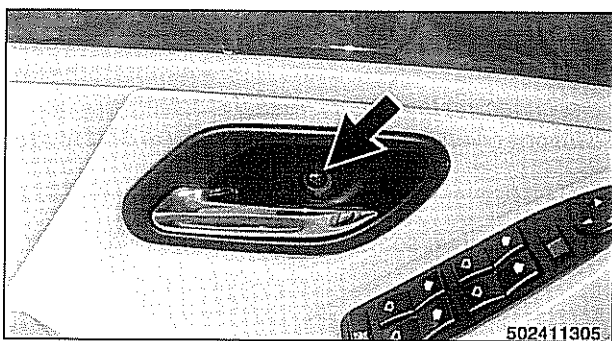
- ◀ Pry out seat memory switch and disconnect wiring harness.



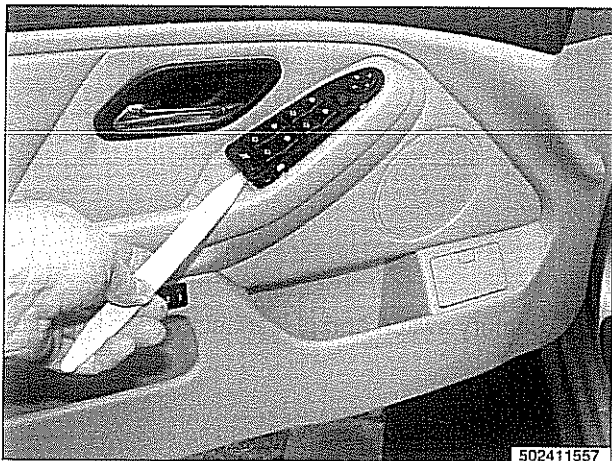
Doors



- Working at bottom of door, pry out door panel light (arrow) and disconnect wiring harness.



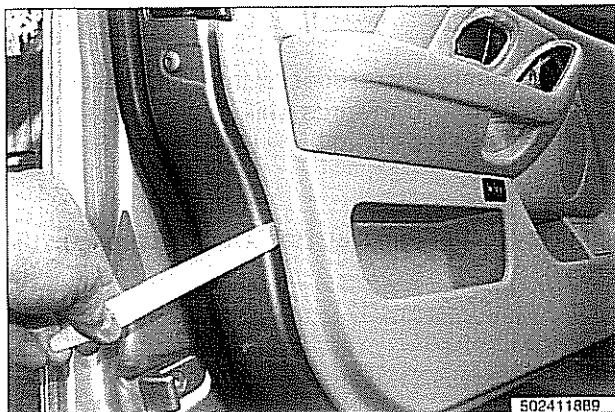
- Pry off plastic plug (arrow) from door handle trim and remove screw.



- Carefully pry out window switch panel and disconnect electrical harness plugs.

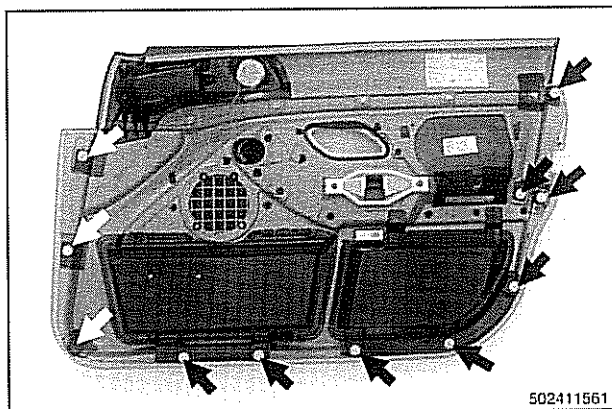


- Slide door handle through trim panel.



➤ Unclip door panel from door perimeter using a plastic trim panel tool. Pry panel retaining clips off one at a time.

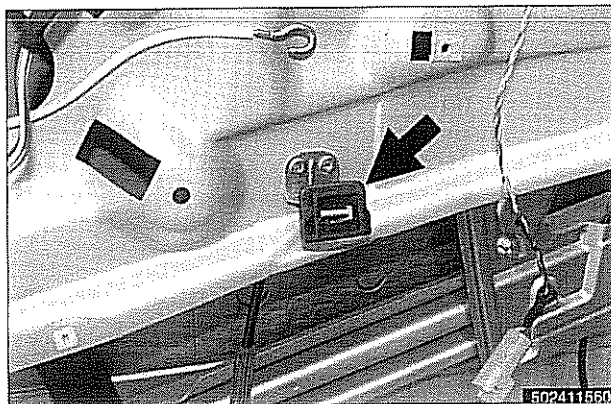
- Lift bottom of door trim panel up and away from window trim to release clips.
- Pull door panel upwards to release center mount clip.
- Disconnect radio speaker wiring harness.
- Remove door trim panel.



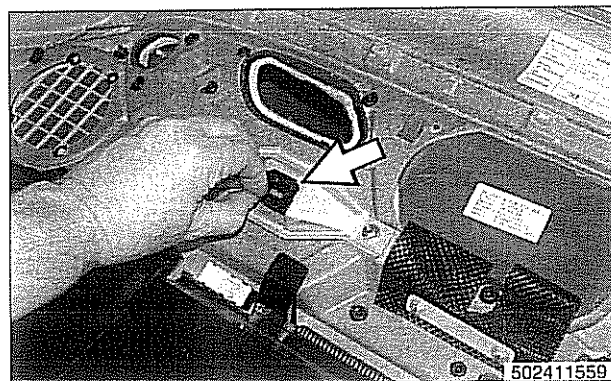
➤ Before installing door trim panel, replace any damaged plastic clips (**arrows**).

NOTE —

Yellow door trim clips (**white arrows**) at front are longer than white door trim clips (**black arrows**).



➤ Check if support clip for door bracket remains on door (**arrow**).



➤ If so, remove support clip from door and replace in bracket on door trim panel (**arrow**).

- Remainder of installation is reverse of removal. Note the following:
 - Align metal retainers on window sill with openings on top of door panel.
 - Check door-lock mechanism and window for ease of movement.



Sill trim panels

- ◀ Using a trim tool, gently pry up door sill trim. Starting at A-pillar, press radius of trim downwards while sliding trim forward off trim clips. Remove clips from body using pliers. Save for installation.
- Installation is reverse of removal. Replace any damaged plastic parts or clips.



412 Trunk Lid, Tailgate

General 412-2

Trunk Lid 412-2

Trunk lid, removing and installing 412-2

Trunk lid, adjusting 412-4

Trunk lid support strut,
removing and installing 412-6

Tailgate (Sport Wagon Models) 412-6

Tailgate, emergency release 412-6

Tailgate and window strut diagram 412-7

Window strut removal diagram 412-8

Rear window gas strut,
removing and installing 412-9

Tailgate gas strut,
removing and installing 412-10

Tailgate, removing and installing 412-11

Rear window, removing and installing 412-12

Rear window and tailgate, alignment 412-13

GENERAL

This repair group covers trunk lid and tailgate removal and installation. Also included here are replacement procedures for the gas-charged support struts that hold the trunk lid or tailgate in the open position.

NOTE —

The body is painted at the factory after assembly. Realignment of body panels may expose unpainted metal. Paint all exposed metal once the work is complete.

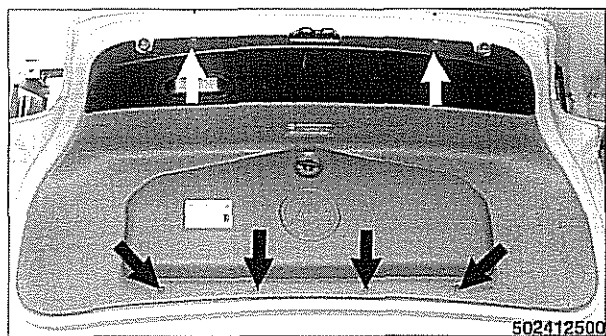
TRUNK LID

Trunk lid, removing and installing

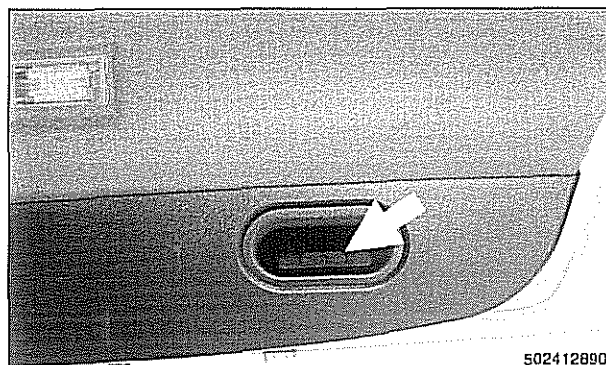


Raise trunk lid.

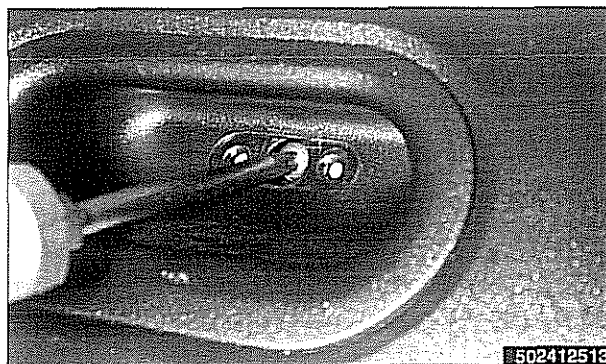
- Open tool kit cover and remove screws attaching tool kit to trunk lid (**black arrows**).
- Disconnect tool kit cover retaining strap from trunk lid and remove tool kit.
- Remove insulating liner expansion rivets (**white arrows**).



Pry out moulded trim cover (**arrow**).



Remove trim handle mounting screw.

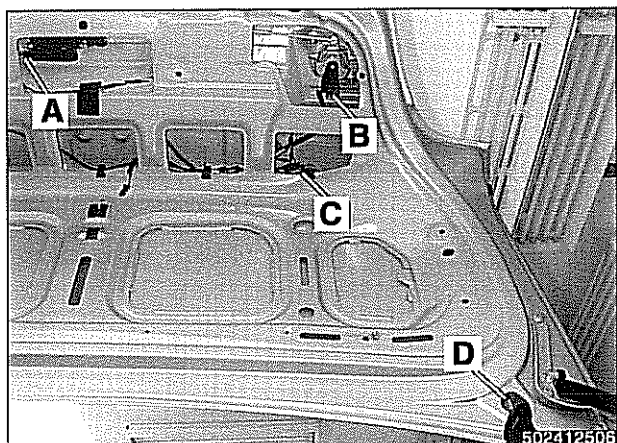


Trunk Lid, Tailgate

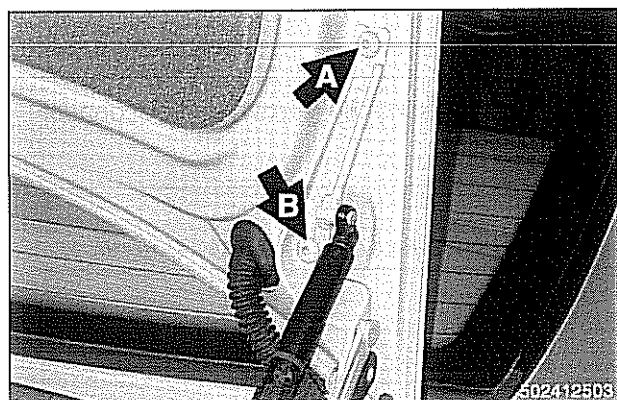


➤ Pry out trunk light and disconnect electrical harness plug connector.

- Gently pry trunk liner away from lid and remove.



➤ Disconnect Wiring connectors A, B and C. Remove wiring harness by pulling through opening in lid frame D.

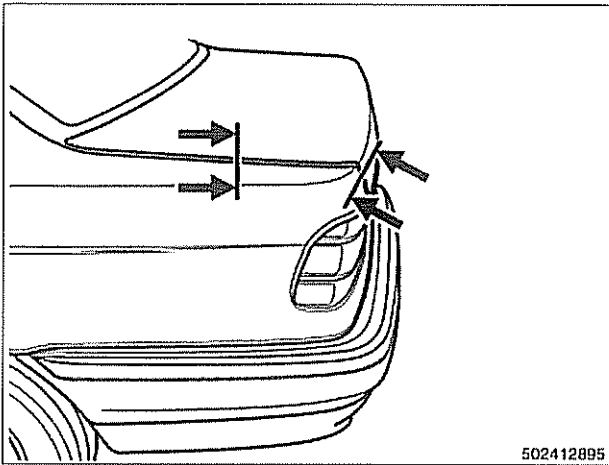


➤ While supporting trunk lid, loosen left and right top hinge fasteners (arrow A) and remove lower fasteners (arrow B).

NOTE —

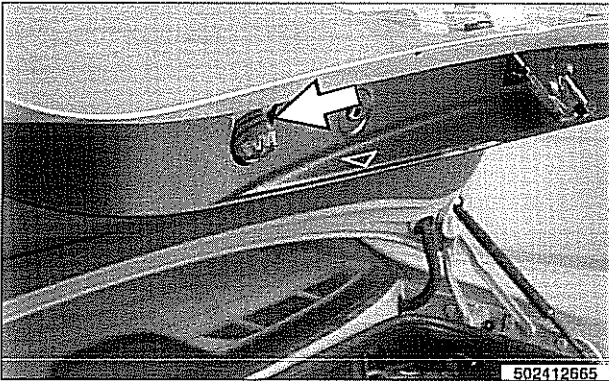
Before loosening hinge bolts, mark hinge and hinge bolt locations for reinstallation.

- Lift trunk lid straight up to remove.
- Installation is reverse of removal. If necessary, align trunk lid to body as described in **Trunk lid, adjusting**.

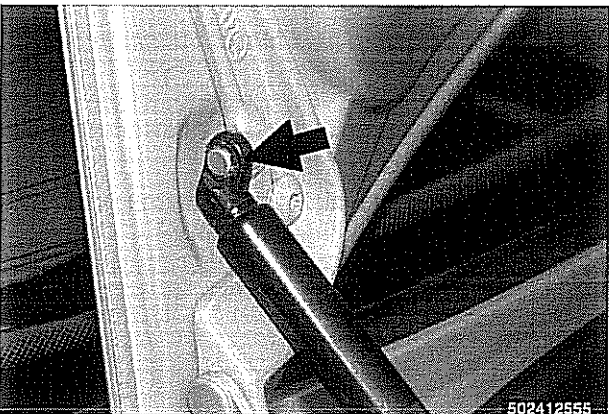


Trunk lid, adjusting

- Trunk lid must be parallel to both side panels and should be mounted flush with body side panels (**arrows**). Lid fit tolerance is ± 1 mm (0.04 in).
- Raise trunk lid and support in open position.



- Turn trunk lid detent buffers in.

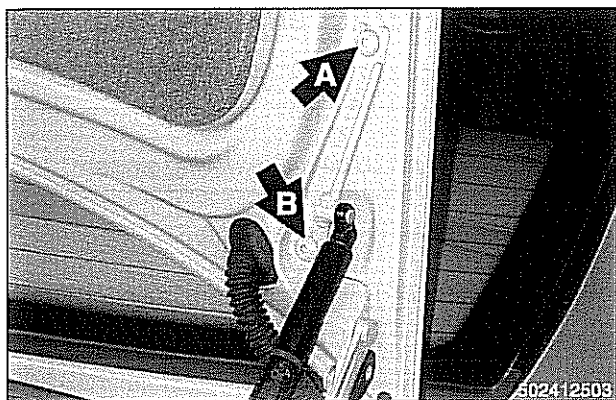


- Remove trunk strut retaining clip (**arrow**) and disconnect struts.

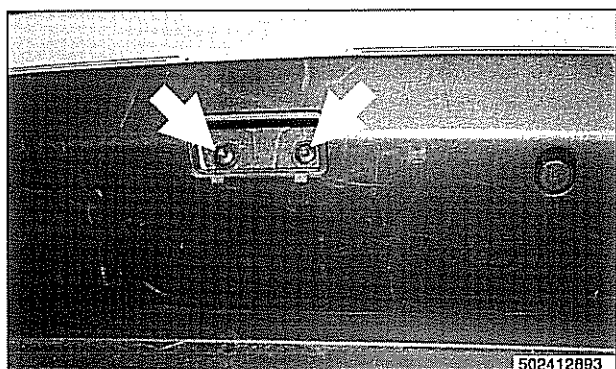
WARNING—

Make sure to support trunk lid before removing struts.

Trunk Lid, Tailgate



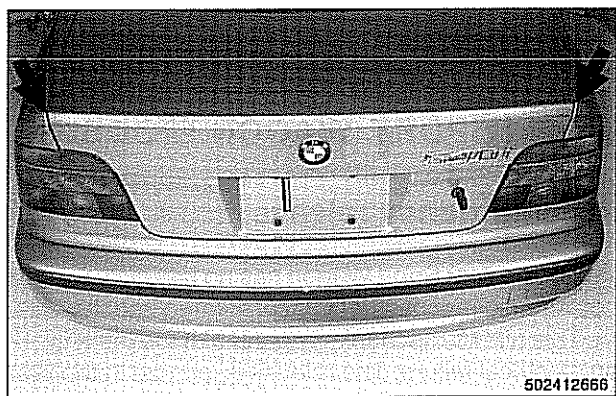
- Loosen bolts at left and right trunk hinges fasteners (arrows) to point where lid can be moved.



- Remove plastic cover from lower trunk lock. Loosen lock bolts (arrows) until lock assembly can be moved.

CAUTION—

Before locking trunk lid, check that trunk lid is not able to damage the body or rear window.



- Carefully close trunk lid and check side gaps (arrows). Minimum gap is 0.5 mm (0.02 in).

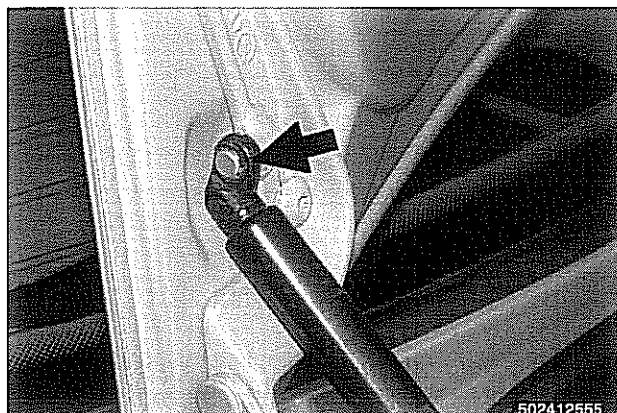
- Adjust to fit side body panels.
- Open trunk lid. Be careful not to alter adjustments.
- Tighten lower trunk lock fasteners.
- Close trunk lid and check adjustments.
- Repeat process if necessary.

- Close trunk lid. Measure gap between trunk lid and lower body panel.

- Position lower section of rear trunk lid lock higher or lower so that a gap of 5.0 mm (0.04 in) exists between trunk lid and lower body panel.
- Check adjustment and repeat if necessary.



- Screw out detent buffers (arrow) until left and right sides of trunk lid rest against detent buffers with lid closed.

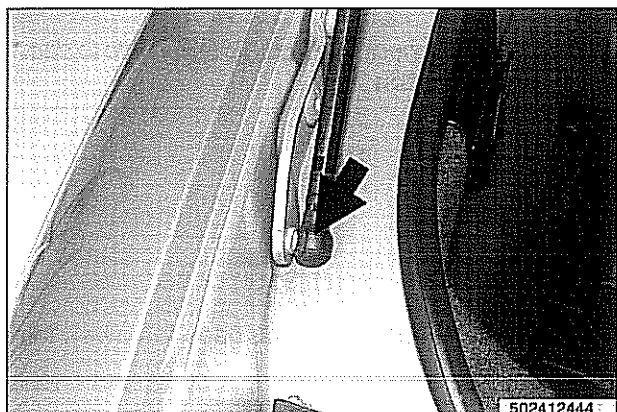


Trunk lid support strut, removing and installing

CAUTION—

Make sure to support trunk lid before removing struts.

- Open trunk lid and support in open position.
- Remove trunk strut retaining clip (**arrow**) and disconnect struts.
- Remove spring clip (**arrow**) from lower end of strut and remove strut.
- Installation is reverse of removal. Replace retaining clips damaged during removal.

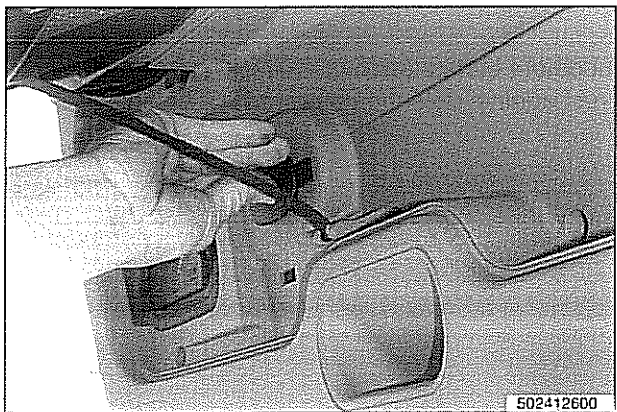


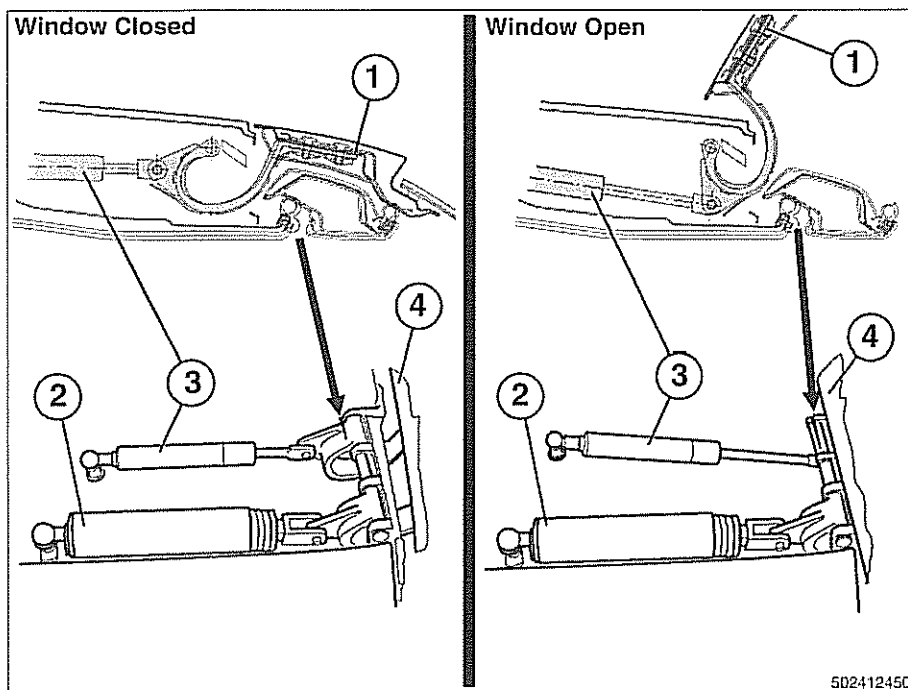
TAILGATE (SPORT WAGON MODELS)

Tailgate, emergency release

The tailgate of the E39 Sport Wagon has no key cylinder. An emergency release mechanism is incorporated into the tailgate latch. This allows mechanical opening of the latch in case of an electrical failure. The release is located in the rear cargo area, along the lower edge of the rear apron behind a small access cover.

- Working inside car, at base of tailgate:
 - Open tool compartment cover.
 - Pry out emergency release cable cover.
 - Pull plastic cable to release rear tailgate latch.

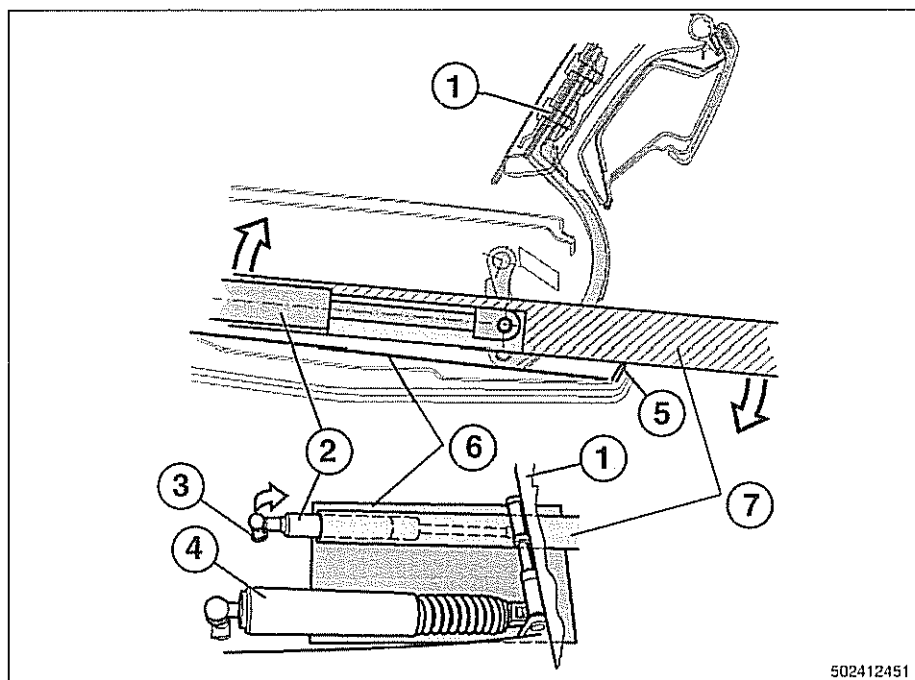




Tailgate and window strut diagram

1. Rear window frame
2. Gas struts for tailgate
3. Gas struts for rear window
4. Rear window frame

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Window strut removal diagram

1. Rear window
2. Rear window gas strut
3. Inner strut support
4. Tailgate gas strut
5. Area to install protective tape
6. BMW special tool 51 2 153
7. BMW special tool 51 2 152

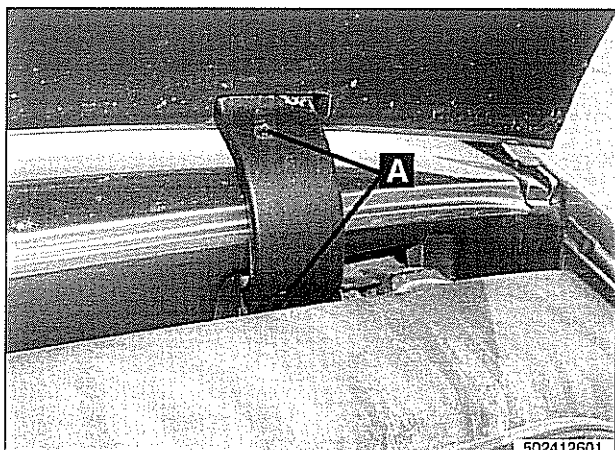
Rear window gas strut, removing and installing

- Tailgate and window struts are located in left and right sides of roof.
- Open rear window.

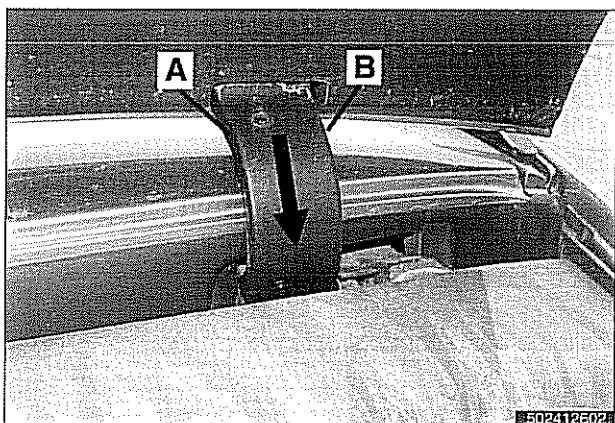
WARNING —

The tailgate is very heavy and will close without both pressurized lifting struts installed. Properly support tailgate prior to removal of the lifting struts.

- Remove fasteners (A) from rear window hinge trim cover.

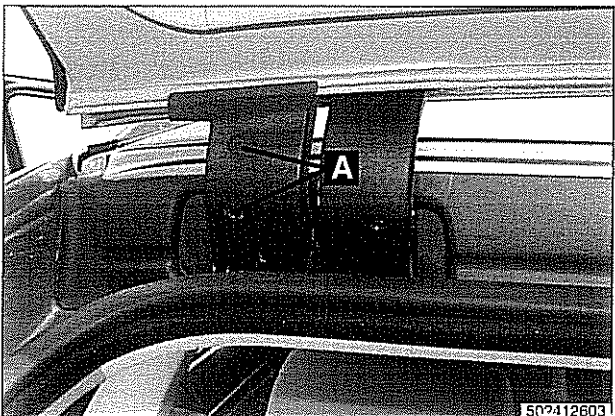


- While pressing detents (A) and (B) pull down (arrow) on trim panel to remove.

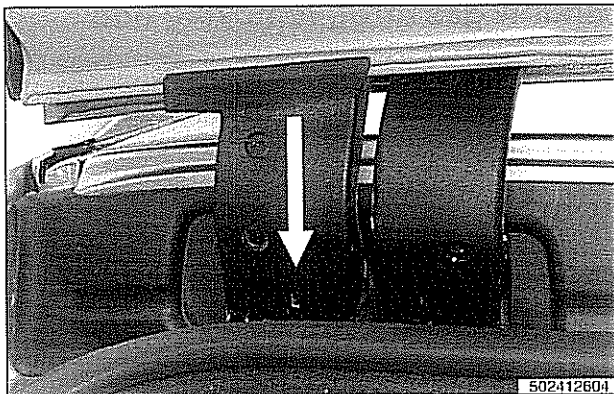


- Close rear window and open tailgate and support.
- Remove weather stripping along rear of roof panel.

- Remove tailgate hinge trim panel fasteners (A).



Trunk Lid, Tailgate



- ◀ Starting at top, pull down (**arrow**) on trim cover. Carefully remove wiring harness support clip from trim cover.

NOTE —

Tailgate window trim cover and weather stripping shown in place.

- Insert BMW special tool 51 2 153 into body cavity below hinge.

WARNING —

The tailgate is very heavy and will close without both pressurized lifting struts installed. Properly support tailgate prior to removal of the lifting struts.

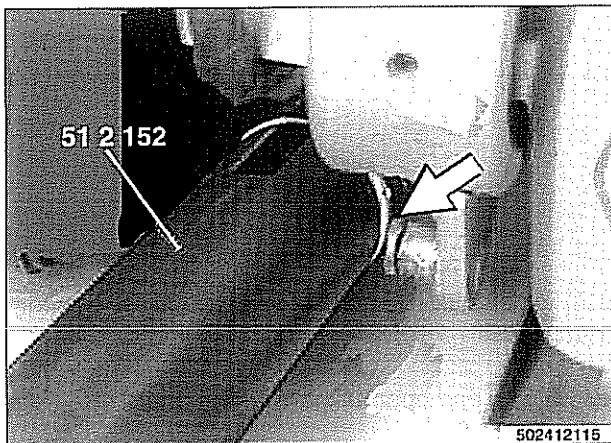
- Working at hinge end of strut, remove strut retaining clip and remove strut from mounting pin.

- ◀ Slide BMW special tool 51 2 152 over strut until end of tool is aligned with strut pin (**arrow**).

- Press down on outer end of special tool to release inner strut mount.
- Remove special tool with strut.

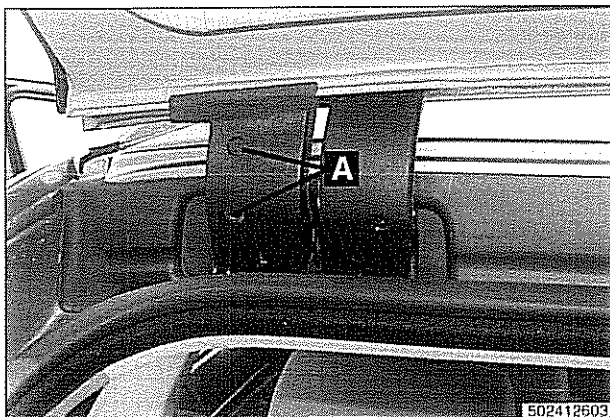
- When installing strut make sure ball cup is pointing straight down.

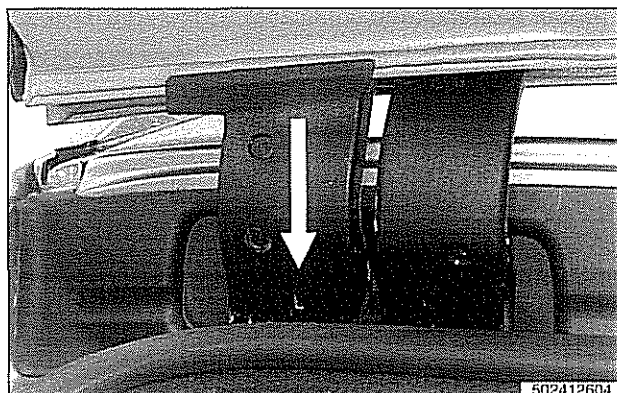
- Remainder of installation is reverse of removal.

**Tailgate gas strut, removing and installing**

- Open tailgate and support.

- ◀ Remove tailgate hinge trim panel fasteners (**A**).





- Starting at top, pull down (**arrow**) on trim cover. Carefully remove wiring harness support clip from trim cover.

- Install protective plate (BMW special tool 51 2 153) between roof panel and hinges.

WARNING —

The tailgate is very heavy and will close without both pressurized lifting struts installed. Properly support tailgate prior to removal of the lifting struts.

- Working at left side:
 - Remove gas strut retaining clip and pin (**arrow**).

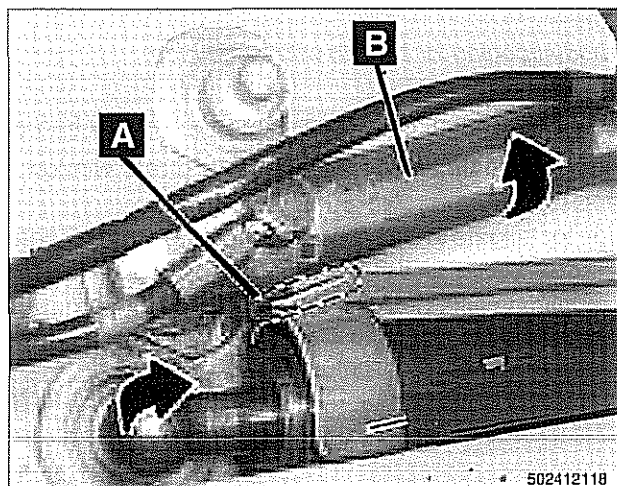
- Insert BMW special tool 51 2 151 over strut.

NOTE —

BMW special tool 51 2 151 must be chamfered in area (A).

- Press tool down to release inner end of gas strut.
- Push strut forward and toward center of vehicle to remove.

- When installing strut make sure ball cup is pointing straight down.
- Remainder of installation is reverse of removal.



Tailgate, removing and installing

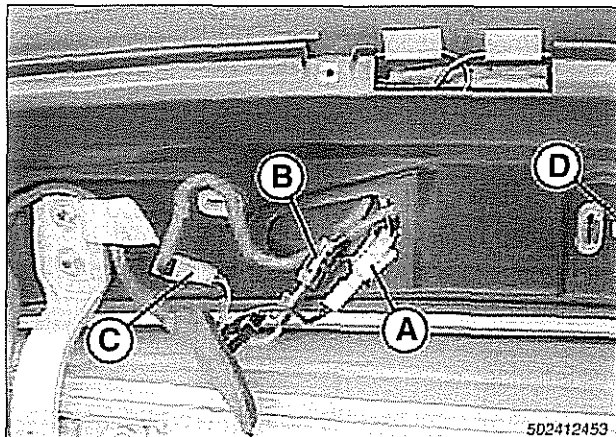
- Remove radio antenna amplifier. See **650 Radio**.
- Disconnect outer end of window and tailgate gas struts. See **Rear window gas strut, removing and installing** and **Tailgate gas strut, removing and installing**.

WARNING —

The tailgate is very heavy, and will close without both pressurized lifting struts installed. Properly support tailgate prior to removal of the lifting struts.

- Remove trim panel from tailgate.

Trunk Lid, Tailgate



- Remove rubber grommet and applicable connectors. Disconnect rear window washer hose.

NOTE —

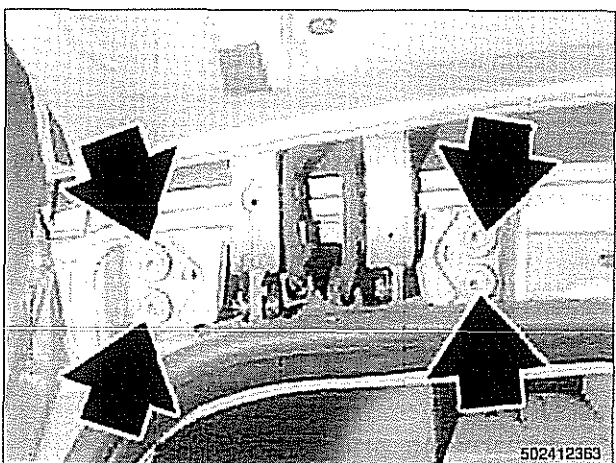
To facilitate installation, mark position of hinges for tailgate and rear window frame on body.

WARNING —

- The tailgate is very heavy and will close without both pressurized lifting struts installed. Properly support tailgate prior to removal of the lifting struts.
- There is risk of fingers being trapped once tailgate fasteners are removed.

CAUTION —

Protect body opening for tailgate with fabric tape.



- Remove hinge fasteners for tailgate and rear window frame.
 - Lower tailgate so that hinge for tailgate and rear window can be tilted.
 - Tilt hinge for tailgate and rear window frame so that tailgate can be moved towards the rear with rear window frame.
 - Remove tailgate with rear window frame towards rear.
- Installation is the reverse of removal.

Rear window, removing and installing

- Disconnect electrical harnesses.
- Support window in open position.
 - Loosen fasteners on each window hinge.

NOTE —

Note positions of any spacers for reinstallation.

CAUTION —

Rear window is heavy. Use a second person to support window prior to releasing from hinges.

- Remove window hinge fasteners and lift off window.
- Installation is reverse of removal. Replace waterproofing sheeting where disturbed.
- Align window. See Rear window and tailgate, alignment.

Rear window and tailgate, alignment

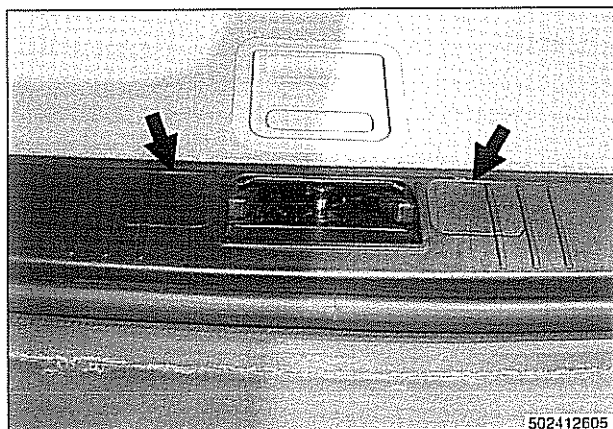
- Alignment procedures involve adjusting tailgate, window, and spoiler to have equal space between left and right sides and to be flush with body. Measurement locations and specific dimensions are shown.
- If alignment has been disturbed during repair, adjust fit of tailgate to body. Then adjust fit of rear window to tailgate.
 - Clearance of the rear window is adjusted by adding or removing shims between hinge bracket and rear window (maximum of three shims).
 - Adjust spoiler gap to body last.
 - Height of spoiler is set by alignment of the rear tailgate.
 - Gap of spoiler to body is set by adjusting spoiler attachment fasteners.
- Lateral and vertical alignment of the window and tailgate is done using hinge bolts. Fine adjustment of the tailgate to the body is made using rubber stop buffers and latch assembly.

Spoiler gap specification

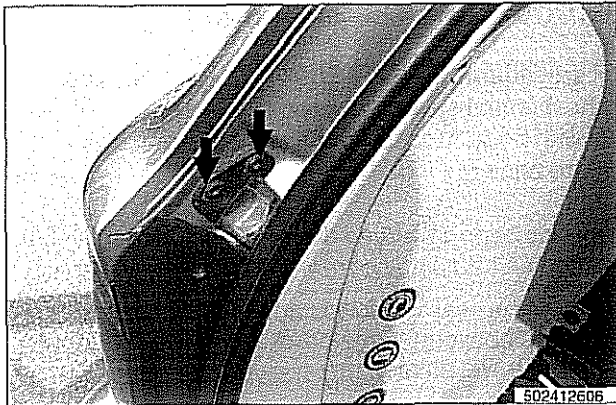
Rear spoiler to roof	4.25 - 5 mm (0.167 - 0.197 in)
Max. deviation from parallel	0.5 mm (0.019 in)

Tailgate alignment, preliminary work

- Open rear window and tailgate.
- Remove lower sill trim panel fasteners covers (**arrows**) and fasteners.
- Remove rear window and tailgate trim panel.
- Check left and right side lateral guides and tailgate latch fulcrums for wear or damage. Replace if necessary.



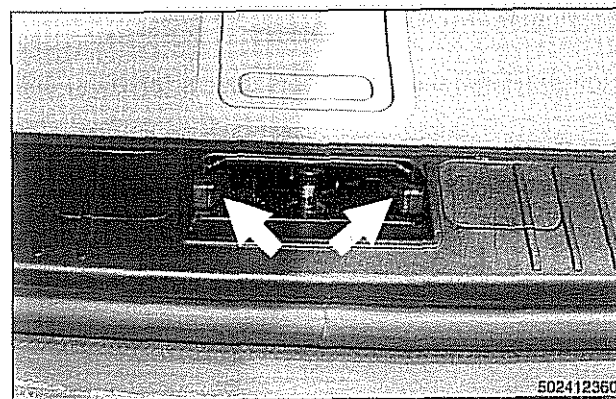
Trunk Lid, Tailgate



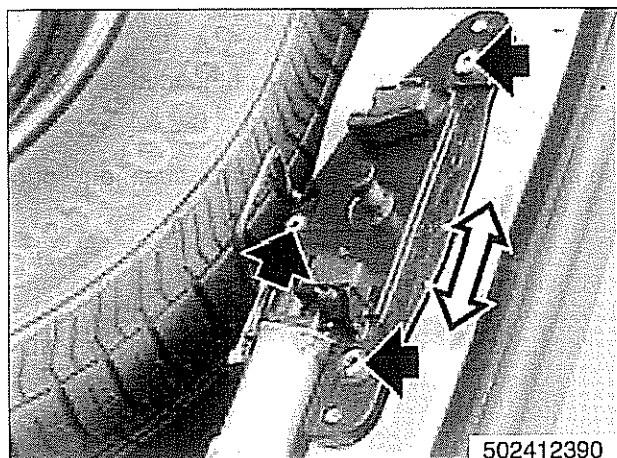
- Loosen left and right lateral guide to body fasteners (**arrows**) until guide can be moved.



- Loosen left and right tailgate lateral guide fasteners (**arrow**) and fully retract guides.



- Check fulcrum pads (**arrows**) on lower section of tailgate lock for damage. Replace if necessary.



- ◀ Loosen lower tailgate lock fasteners (**arrows**) so that tailgate lock can center itself.

CAUTION—

- The lower section of tailgate lock must not scrape against the upper section.
- The eccentric pin on the lower section of the tailgate lock rotates when being locked from upper section of tailgate lock.

- Disconnect tailgate latch actuator motor by squeeze locking tabs on electrical harness connector and disconnecting.

CAUTION—

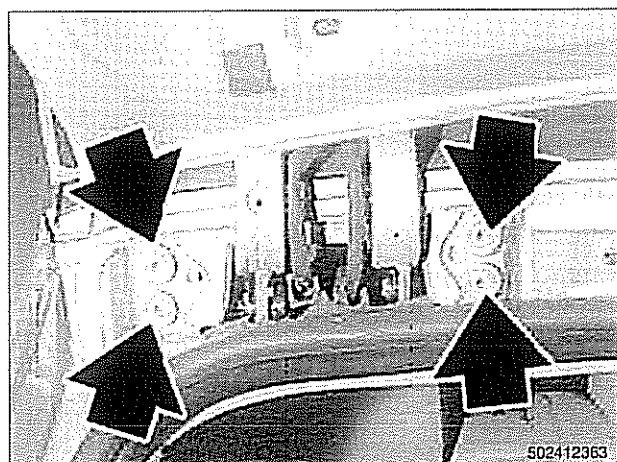
- Eccentric pin in lower section of trunk lid lock must be at lower dead center.
- After disconnecting plug connector from actuator motor, tailgate is opened by electric unlocking fixture of upper section of tailgate lock.
- For this reason, the cable connections to the upper section of the tailgate lock must remain connected. Otherwise the tailgate can only be opened by the emergency handle. Eccentric pin of lower section of tailgate lock remains at bottom dead center point after unlocking.

Tailgate alignment, height adjustment

- ◀ Loosen left and right tailgate hinge fasteners (**arrows**) to allow tailgate to be adjusted.

CAUTION—

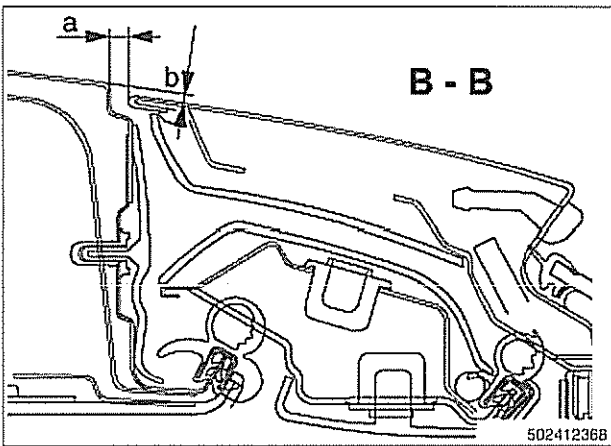
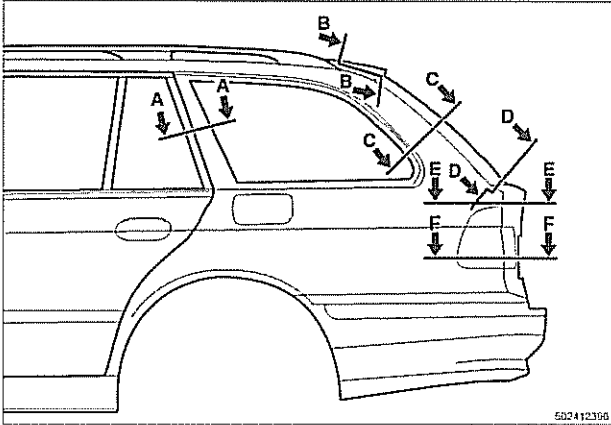
- When the hinge screws for the tailgate are released, the position of the overall assembly changes with respect to the body.
- The position of the rear window frame to the tailgate remains unchanged.



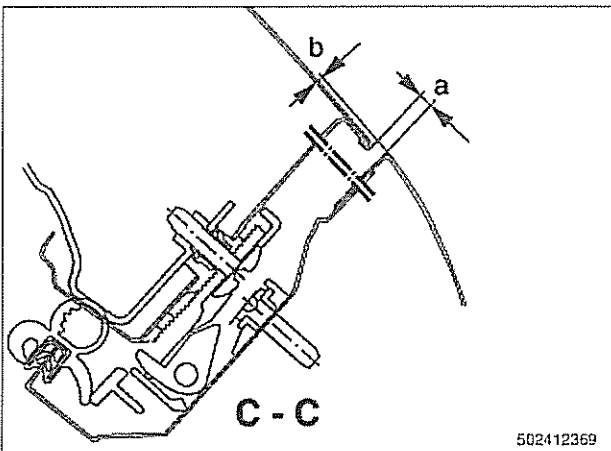
- Close tailgate carefully and check gap dimensions. See **Tailgate alignment specifications** below.
- Tighten hinge screws when gap dimensions are correct.

Tailgate alignment specifications

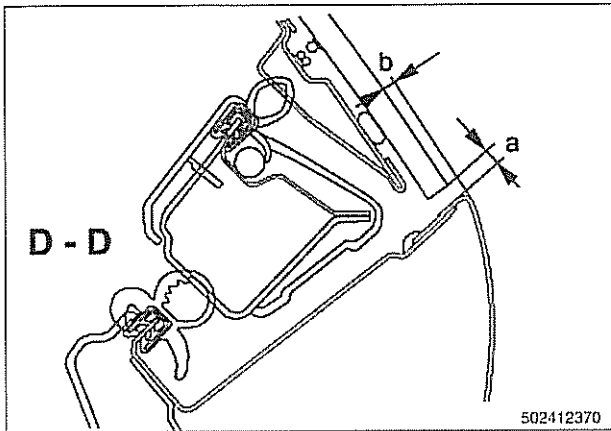
- The following illustrations show details of the tailgate adjustment at each marked point.
- ◀ Adjust gap dimensions in accordance with adjustment specifications B, C, D, E, and F.



- ◀ Adjustment B:
 - $a = +1/-0.5 \text{ mm} (+0.04 \text{ in} / -0.02 \text{ in})$
 - $b = 1 \text{ mm} +1/-0.5 \text{ mm} (+0.04 \text{ in} / -0.02 \text{ in})$

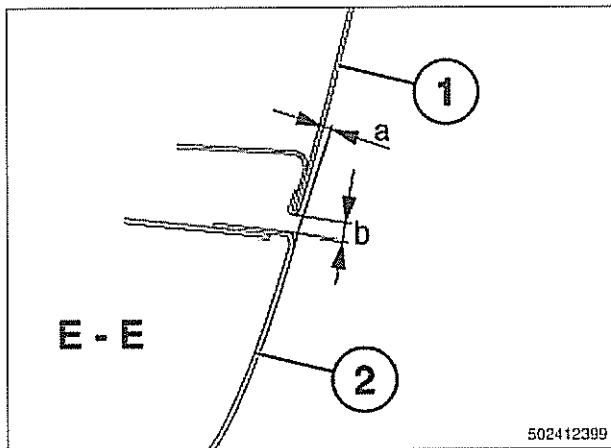


- ◀ Adjustment C:
 - $a = 4.5 \text{ mm} +1/-0.5 \text{ mm} (0.18 \text{ in} + 0.04 / -0.02 \text{ in})$
 - $b = 0.8 \text{ mm} \pm 0.6 \text{ mm} (0.03 \text{ in} \pm 0.02 \text{ in})$



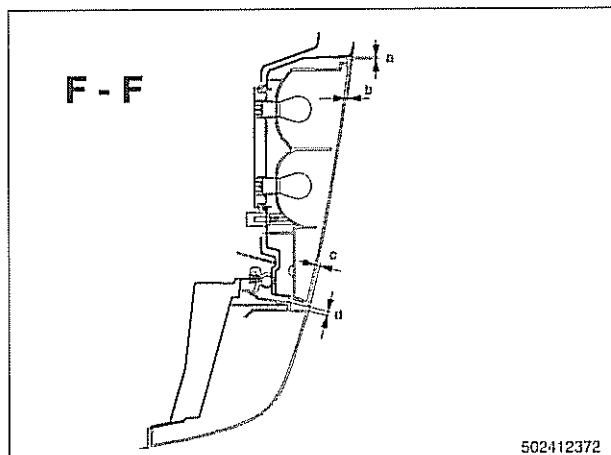
◀ Adjustment D:

- $a = 4.5 \text{ mm} + 1 / - 0.5 \text{ mm}$ (0.18 in + 0.04 / - 0.02 in)
- $b = 3.7 \text{ mm} + 2 / - 1 \text{ mm}$ (0.15 in + 0.08 / - 0.04 in)



◀ Adjustment E:

- 1 tailgate lid
- $a = 1.3 \text{ mm} \pm 1 \text{ mm}$ (0.05 in $\pm$ 0.04 in)
- 2 rear side panel
- $b = 4.5 \text{ mm} + 1 / - 0.5 \text{ mm}$ (0.18 in + 0.04 / - 0.02 in)

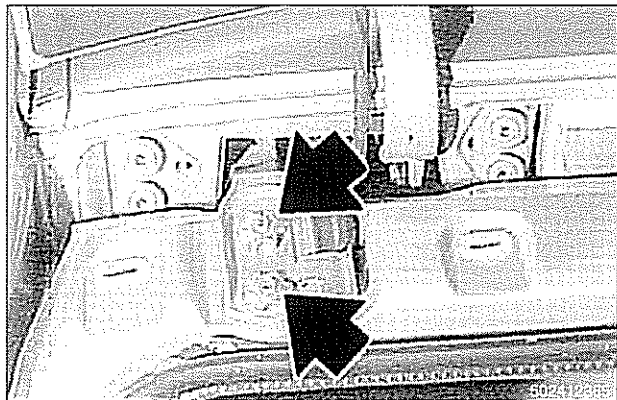


◀ Adjustment F:

- $a = 1.3 \text{ mm} \pm 1 \text{ mm}$ (0.05 in $\pm$ 0.04 in)
- $b = 1 \text{ mm} \pm 0.5 \text{ mm}$ (0.04 $\pm$ 0.02 in)
- $c = 1.3 \text{ mm} + 1 \text{ mm} / - 1.3 \text{ mm}$ (0.05 in + 0.04 in - 0.05 in)
- $d = 4.5 \text{ mm} + 1 \text{ mm} / - 0.5 \text{ mm}$ (0.18 in + 0.04 / - 0.02 in)

CAUTION—

Rear window frame must not extend above height of roof.
Otherwise, wind noise will be created.



Tailgate gap and length adjustment

- Close tailgate and open rear window.

- ◀ Loosen left and right tailgate hinge bracket fasteners (arrows) to allow movement of tailgate.

CAUTION—

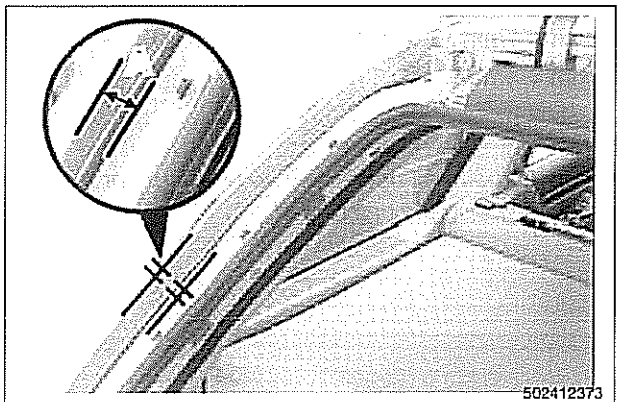
- When the hinge bracket fasteners are loosened, the position of the rear window frame changes with respect to the tailgate.
- Always check the settings of the rear window frame to the tailgate and make adjustment if necessary.



- ◀ Adjust gap dimensions and position of tailgate. See **Tailgate alignment specifications**.

NOTE—

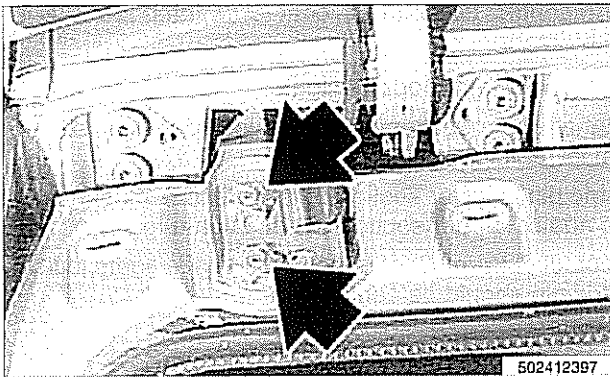
The tailgate should be approximately 1 mm lower than side walls.



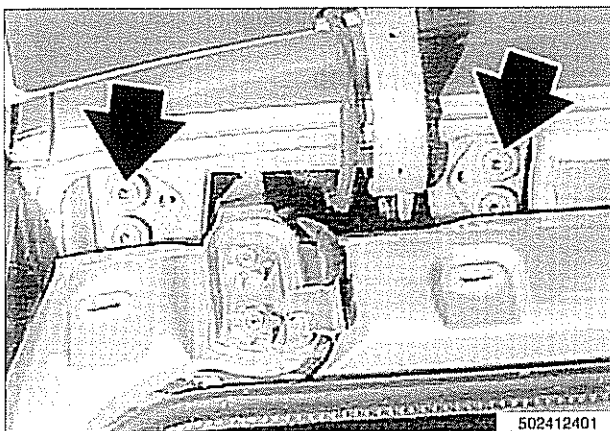
- ◀ To obtain tailgate to body parallel alignment, top edge of tailgate must first be adjusted parallel to the edge of D-pillar (A).

D-pillar gap	27 mm (1.6 in)
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- Adjust gap with window open and tailgate closed.

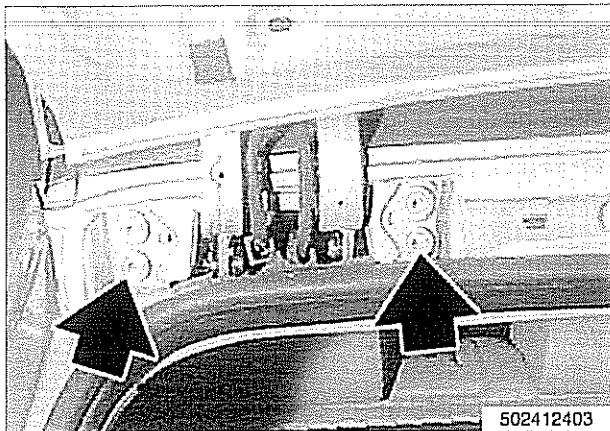


- ◀ Tighten left and right tailgate bracket fasteners (arrows).



- ◀ Tighten upper left and right tailgate fasteners (arrows).

- Open tailgate while taking care not to change hinge positions.



- ◀ Tighten lower tailgate hinge fasteners (arrows).

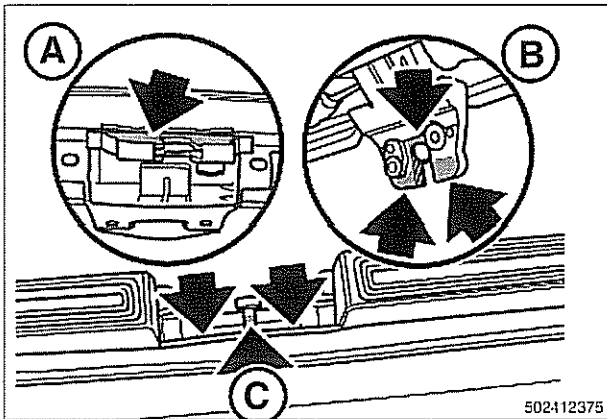
- Reconnect eccentric pin actuator motor electrical harness plug.

CAUTION—

The eccentric pin in the lower section of the tailgate lock turns in the tailgate when the button is pressed.

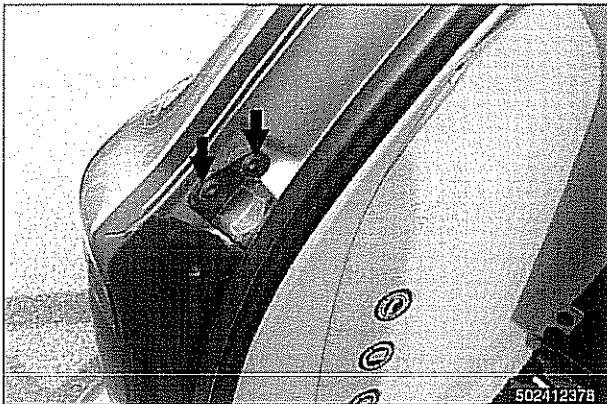
- Operate button in tailgate to actuate locking motor. Eccentric pin should move to top dead center position.

Trunk Lid, Tailgate

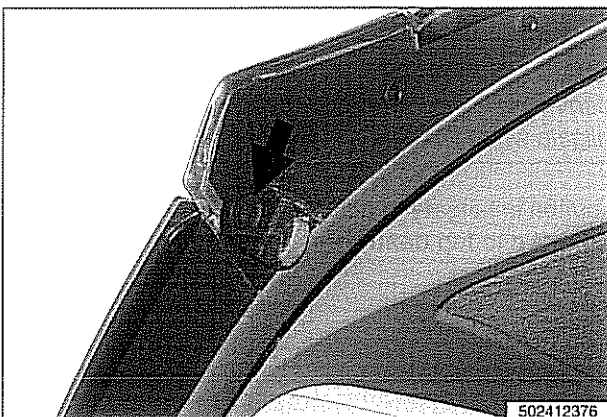


- To perform contact pattern test, coat lower latch areas **A**, **B** and **C** with grease.
 - Carefully close and reopen tailgate.
 - Check that upper section of tailgate lock does not scrape against lower latch.
 - Eccentric pin in lower section of tailgate lock must not scrape against upper section (**B**) of tailgate lock.
 - The contact pattern (**C**) of upper section of tailgate lock on eccentric pin should be centered.
- To adjust height of upper section of tailgate lock, loosen fasteners, move upper section of lock and retighten fasteners.
 - Repeat contact pattern test after height adjustment.

Tailgate lateral guide, adjusting



- If necessary, loosen lateral guide to body fasteners (**arrows**) to allow it to move.
 - Move lateral guides to center position.



- Loosen lateral guide to tailgate fasteners to allow it to move.
 - Close tailgate to center guides with respect to each other.

NOTE —

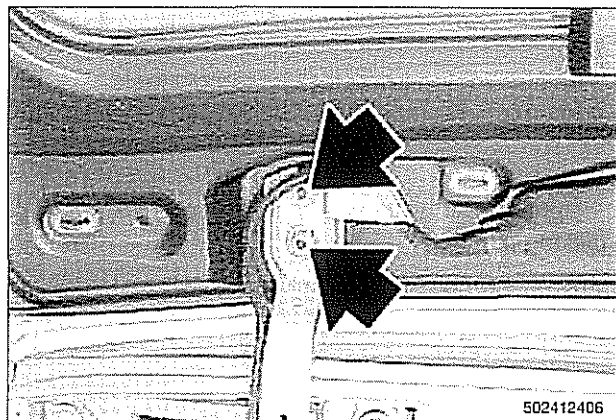
The bracket of the lateral guide continues to touch against the body without clearance as does the lateral guide against the tailgate.

- Open tailgate and tighten guide fasteners.

Rear window, adjusting

NOTE—

- Three versions of rear window are used on Sport Wagon models.
- Tailgate must be correctly adjusted before rear window adjustments are made.



- ◀ With tailgate closed and rear window open, loosen hinge fasteners (**arrows**) to allow hinge to move.
- Loosen fasteners in lower section of lock to allow movement.
- Carefully close rear window:
 - Adjust gap dimensions and position of rear window relative to body panel. See **Tailgate alignment specifications**.

CAUTION—

On transition area between roof/tailgate, tailgate must not extend above height of roof otherwise wind noise will be created.

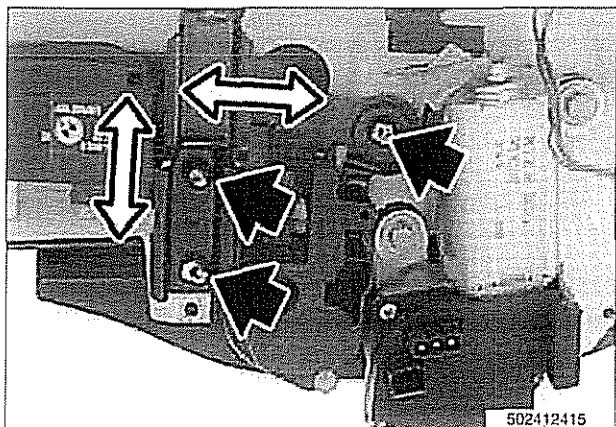
- If necessary, adjust height of rear window frame by inserting spacers between the hinge and the frame.
- Carefully open rear window, taking care not to alter adjustment.
 - Tighten left and right rear window fasteners.
 - Close rear window and check adjustment, repeat step if necessary. See **Tailgate alignment specifications**.

Rear window locking pin, adjusting

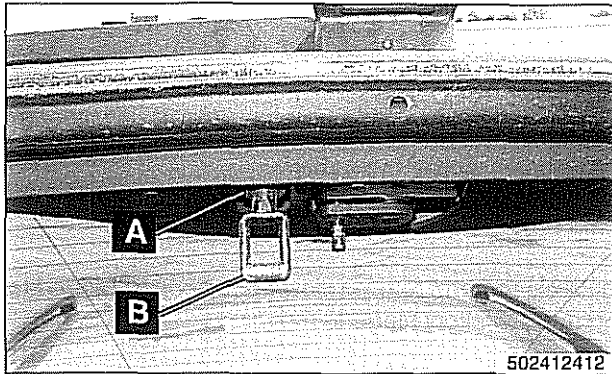
NOTE—

- Several versions of rear window locking pin are used on Sport Wagon models. 1999 528i model is shown. Other models are similar.
- For rear window adjustment specifications, see **Tailgate alignment specifications**.

- ◀ Loosen lower lock assembly fasteners (**arrows**).



Trunk Lid, Tailgate



- ◀ With rear window open, loosen lock nut (A) so that inclination of locking pin (B) can be adjusted.

- Carefully close rear window, while ensuring that locking pin is centered in rotary latch in lower section.

NOTE—

When closing rear window, be sure that there is a gap of approximately 1 mm (0.04 in) between the locking pin and the rotary latch in the lower section of lock.

- Open tailgate and tighten lower lock assembly fasteners. Be careful not to alter inclination of locking pin (B) when tightening lock nut (A).

- ◀ To adjust height of rear window at lock, loosen lock nut (A) and turn locking pin (B).

- Be careful not alter position of locking pin when tightening lock nut (A).

CAUTION—

After adjusting rear window, always check position of wiper axis relative to drive disc and limit stop on rear window wiper motor. Adjust if necessary. See 611 Wipers and Washers.

