

Workshop Manual

928

DR. ING. h. c. F. PORSCHE Aktiengesellschaft

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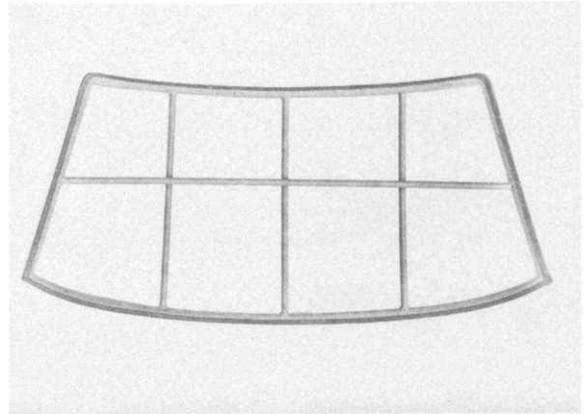
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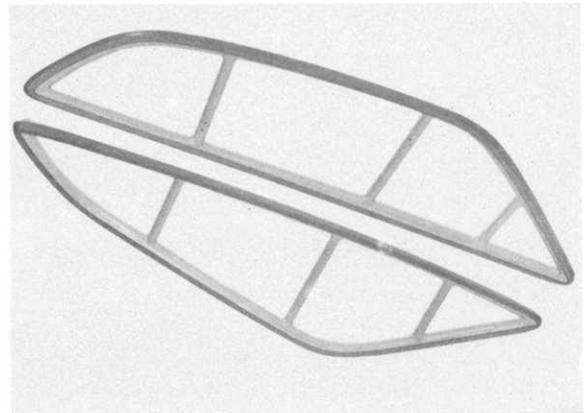
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SPECIAL TOOLS AND SHOP MATERIALS FOR BODY REPAIRS

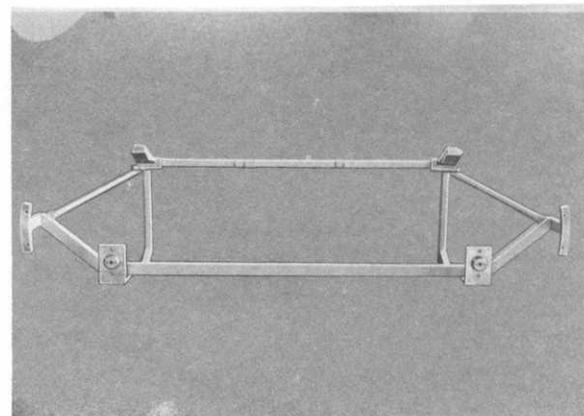
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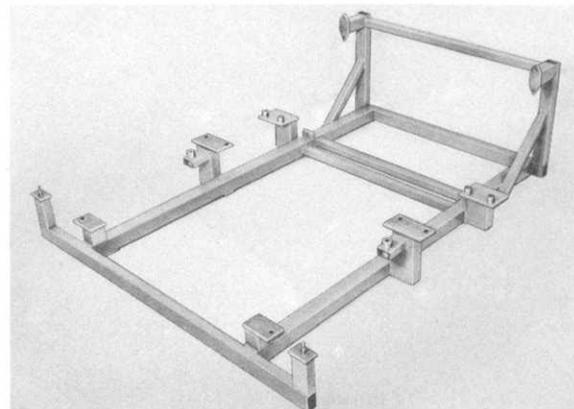
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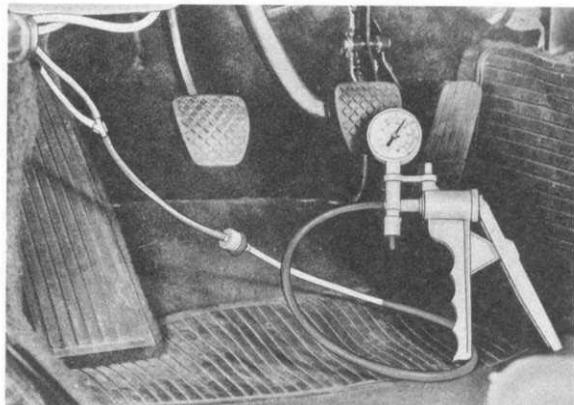
Template for rear side parts to PU trim - 9172



Front end gauge - 9174



Tester for vacuum system - 9160



Spot welder

Inert gas welder for steel and galvanized metal

Inert gas welder for aluminum parts

Gas welder

Cutting-off grinder, swing grinder

Disc grinder - angled grinder

Pneumatic gun with attachments, chisel etc.

Shouldering pliers

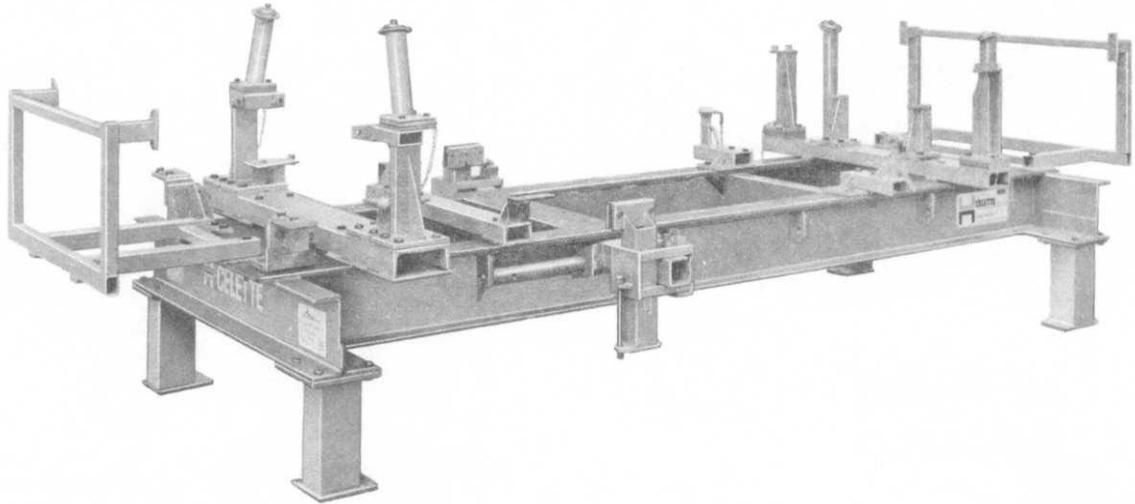
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for sealing jobs

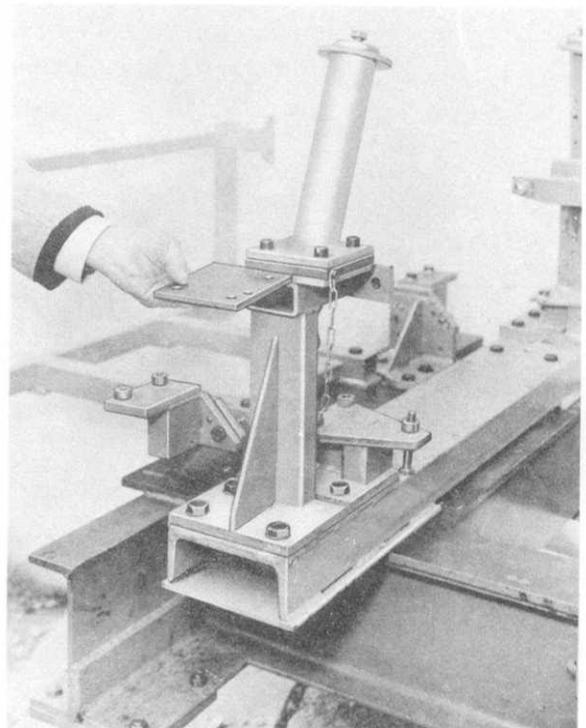
Set of Attachements ENS 243.300 for Celette Alignment/Assembly Stand

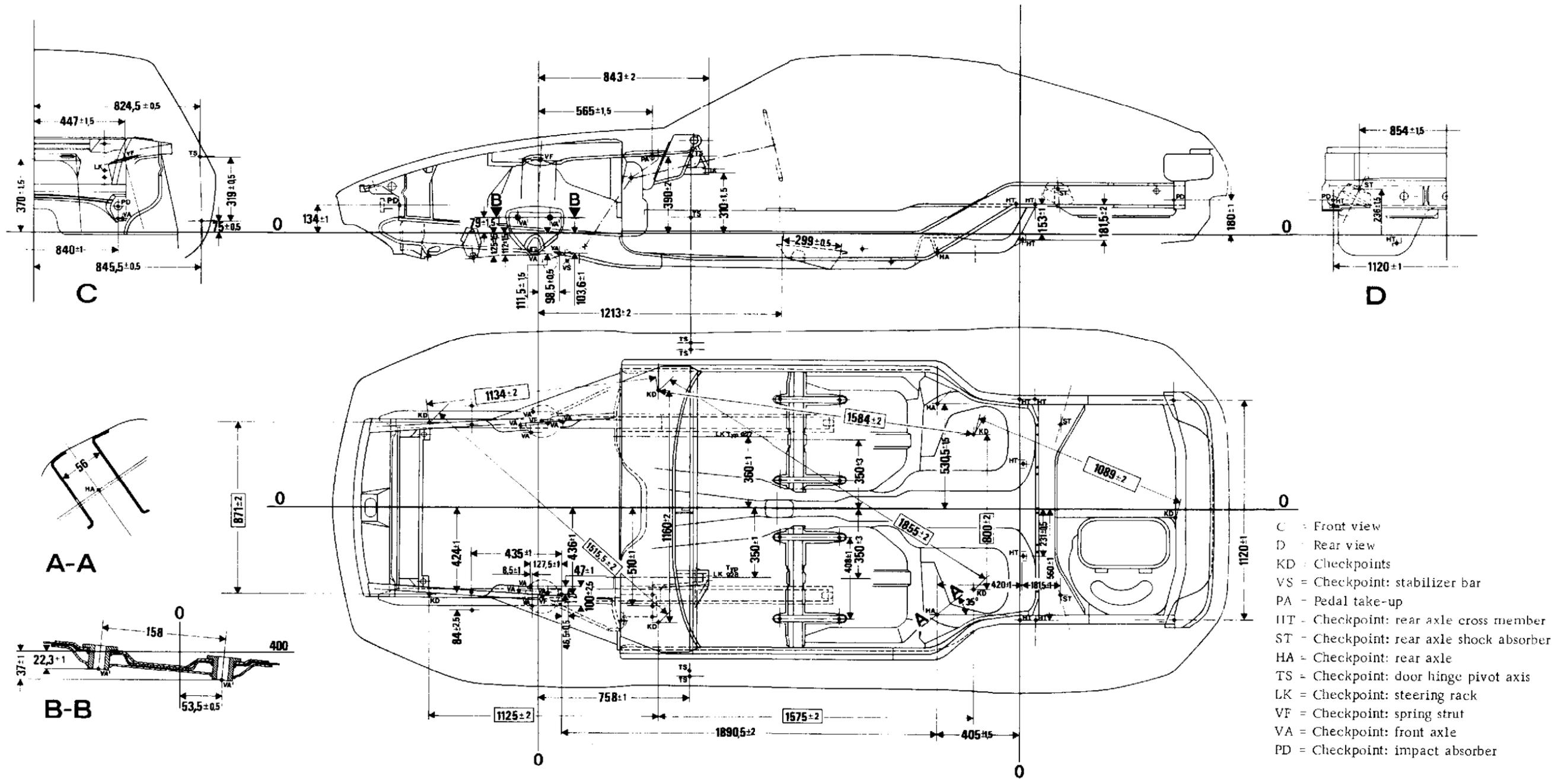


Note

Both M 10 x 80 collared bolts included in attachment set ENS 243.300 are used to bolt the side member mounts to the body as shown in the figure. BY bolting the body at these points first, deviations in distance to the other frame/floor check points can be determined and the front side members can be located accurately.

There are also two thin spacers for measurement of the upper shock absorber mounting point, instead of the thick spacers for models prior to 1979.





Safety notes

Observe the following safety notes when performing body repairs:

- Removal of components may change the gravity center of the vehicle.
The vehicle may therefore have to be tied down by additional measures on the lifting platform.
- If welding or other spark-generating operations are performed in the vicinity of the battery, the battery must be removed as a rule.
- Rooms designated for body repairs may not be used to stock other vehicles without protection (risk of fire damage due to sparks, battery, paint and body glass damage).
- Be extremely careful when grinding or welding in the vicinity of the fuel tank and other parts of the fuel system. If necessary, remove any components affected.
- Do not weld, braze or solder any parts of the filled air conditioning system. This also applies to welding, brazing or soldering operations on the vehicle that may result in the risk of components of the air conditioning system warming up.
- When drying the vehicle following a respray, do not expose the vehicle to temperatures of max. 80°C for more than 2 hours.

To protect electronic control units against excessive voltage when using electric welding equipment, observe the following safety measures:

- Disconnect clamp from negative battery terminal and cover negative battery terminal.
- Connect ground clamp of the electric welding equipment directly and as closely as possible to the component to be welded. Make sure no electrically insulated parts are located between the ground clamp and the welding location.
- Do not touch electronic control units and electric lines with the ground clamp or with the welding electrode.

Treatment of electronic control units following accident repairs

Following an accident, electronic control units have to be replaced only if at least one of the following conditions is met:

- The housing is visibly deformed or damaged.
- The support area and/or console is deformed (no outside damage evident on the unit).
- The connector is damaged or corroded due to moisture.
- Operation check and/or self-diagnosis of the units reveals the following fault:
“Control unit faulty ”.

If electronic components, e.g. the ABS control unit, have to be removed to allow repair operations to be performed and if they are to be reused afterwards, they must be checked for proper operation according to specifications after they have been refitted.

REPLACING PART OF FRONT WHEEL HOUSE

Includes

Front bumper, front side member, lock cross member, lower cross member, impact absorber mount, engine hood.

Removing

Radiator with lines, headlight with motor and linkage, engine assembly as far as required. Disconnect battery. Bumper panel with carrier and impact tubes (absorbers), radiator grill, covers beneath fender, vacuum reservoir, control unit (tempostat), both front fenders, lock lower section, hood release cable, data plate.

Note

The main headlights do not have to be removed to take off the front fenders.

Measuring Car

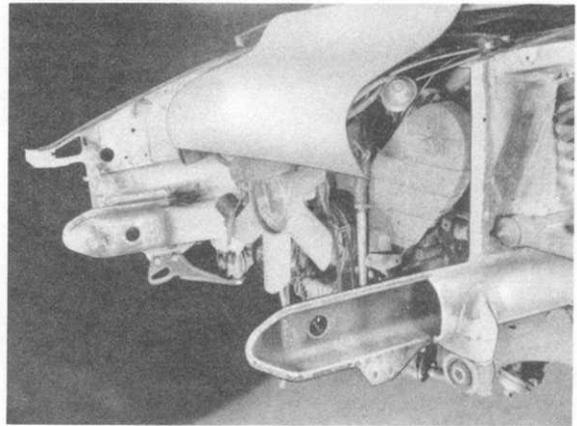
Move car on to a platform and measure front end of car with a water level and compass (see repair control dimensions).

Remarks

A front end gauge and set of Celette straightening bench attachments are being prepared.

Cutting Out Damaged Parts

1. Cut off lock cross member and lower cross member (pneumatic chisel).
2. Cut through wheel house wall as far as required with a cutting wheel and outside of side member as far as required with a cutting wheel.

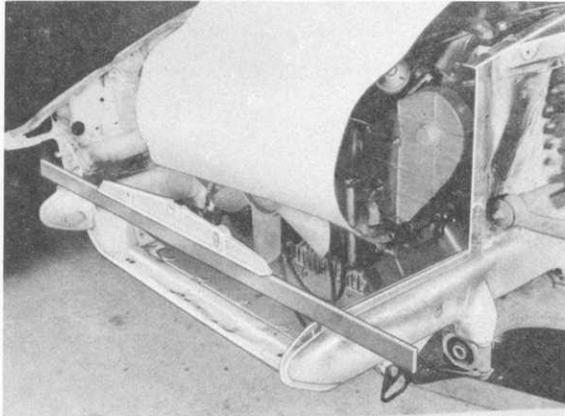


Note

Cut surfaces should be offset to each other.

3. Pull or grind off scrap metal. Straighten and grind down mating surfaces.

4. Straighten inside of side member. Check installed position with a water level.



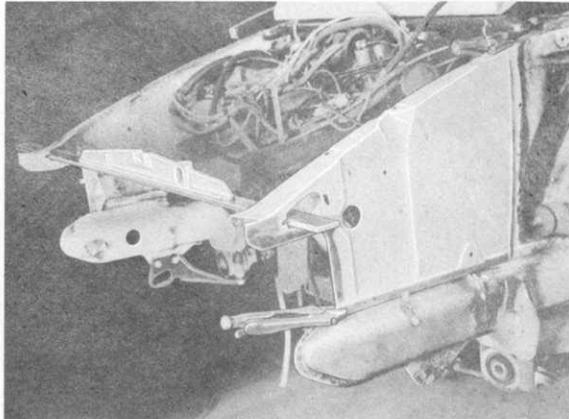
Note

Figure shows this check on car with slight front end damage.

Installing

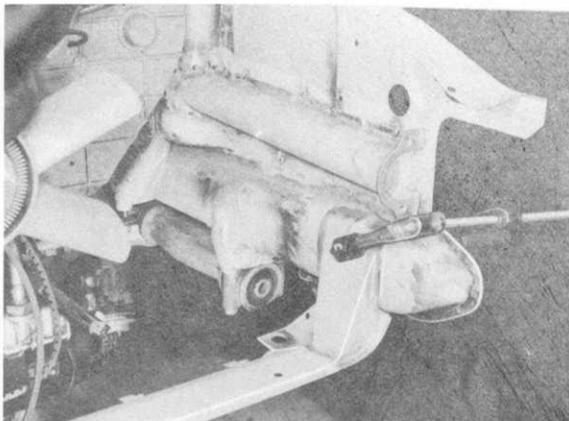
1. Fit outside of side member and cut it off to overlap by about 10 mm.
2. Grind down spot welding flange and coat with spot welding paint.
3. Spot weld side member shells and inert gas weld mating surface.

4. Fit wheel house wall, cut mating surface with an overlap and install. Check lateral position with a water level applied at opening for headlight shaft. Spot weld wheel house and arc weld vertical seam on outside.

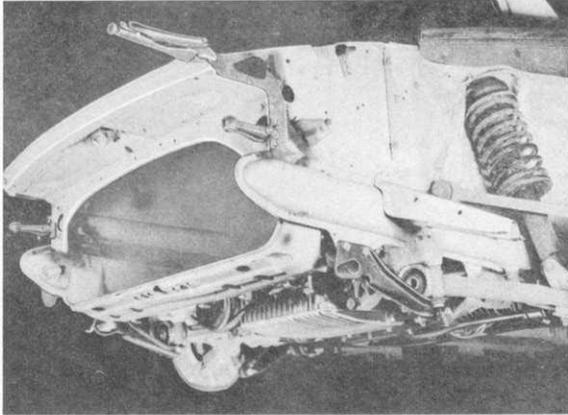


5. Install and spot weld impact absorber mount. Also tack weld with arc welder.

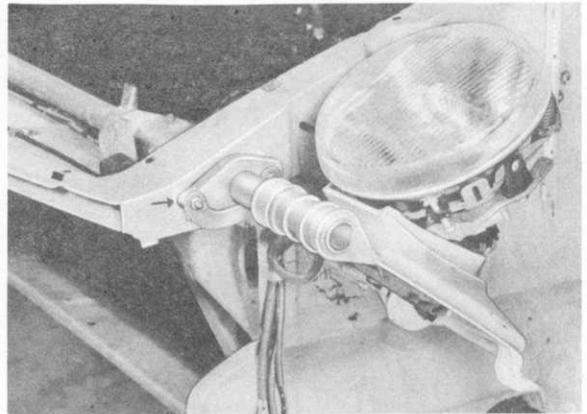
6. Install entire lower cross member, check against front axle and weld.



7. Install lock member, spot and inert gas weld it to wheel house, impact absorber mount and side members.

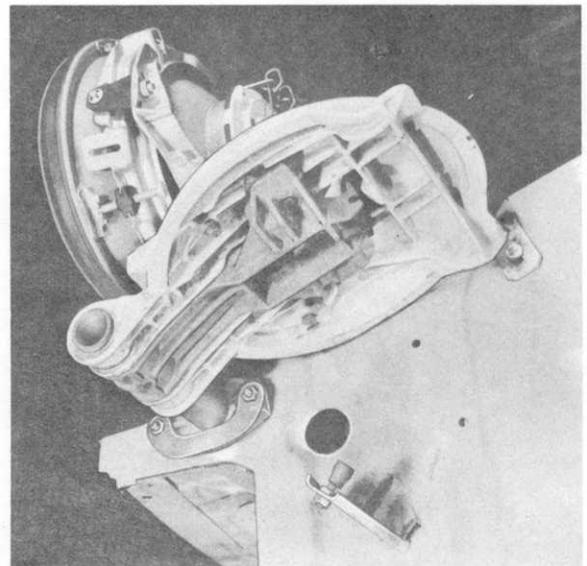
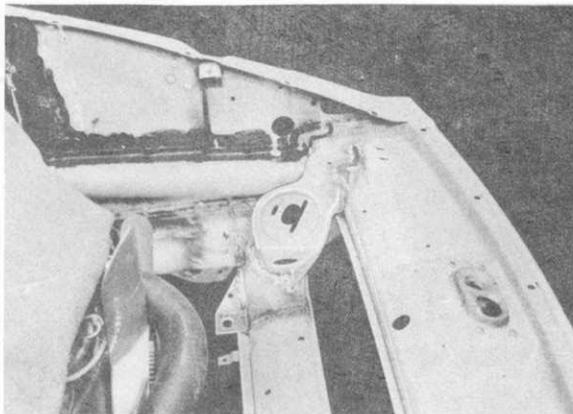


10. Install headlight shafts and mounts. Make sure that longer section of plastic plates face forward when installed (see arrow)! Install stop bracket for headlights.

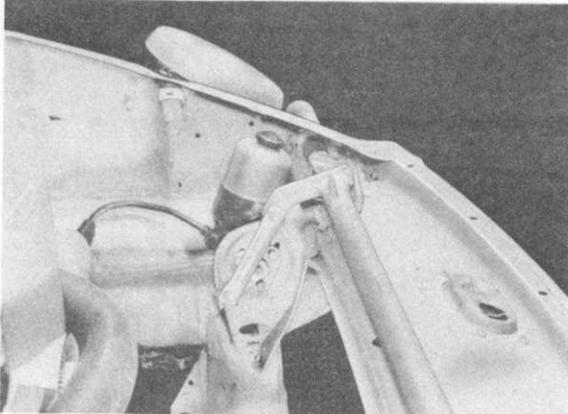


8. Install lid lock lower section. Secure it with pop rivets or 5 mm dia. screws.

9. Install and weld retractable headlight motor console perpendicular and parallel to center-line of car.



11. Install headlight motor, route wiring and fasten with straps on lock member and wheel house, connect plugs.



12. Install liners and stop pads on lock member, adjust lock cable. Install and adjust lid.
13. Fit fender roughly. Position metal nuts on wheel house and hinge pillar, and install Terostat tape. Bolt fender supports.
14. Install and bolt fender, making sure that there is uniform clearance to lid and doors.
15. Align headlight with fender, tighten mount and outer shaft.
16. Prime coat and seal (undercoat and sealing materials) all welded and spot welded seams as well as flanges.
17. Install covers above and behind lower fender.
18. Prepare car for painting.

REPLACING FRONT END PARTIALLY

General Information

The best method of repairing a damaged front end, of which the side members are bent or distorted in area of front axle or engine mounts, would not be replacing up to the deformation border, but complete replacement of side members and wheel houses at original connection points of floor or firewall.

These repairs can be best performed with help from the Celette straightening bench and pertinent attachment set ENS 243.300 or front end gauge 9174.

These instructions apply to both one-side and two-side repairs.

Removing

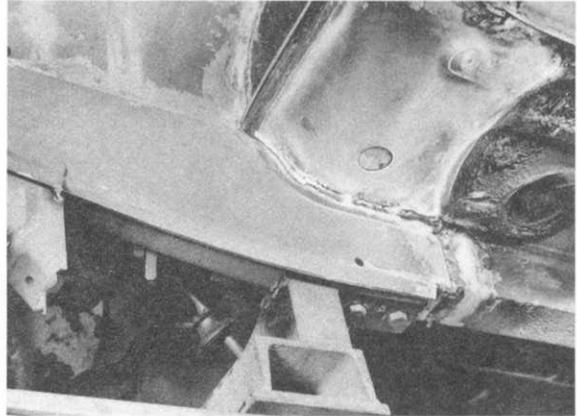
Engine, transmission and front axle, radiator, headlights with motor and holders, fenders, covers and radiator grill, bumper with brackets and impact absorbers.

Includes:

Front bumper, front side member, complete wheel house with reinforcement for spring strut, lock cross member and lower cross member.

Cutting Out Damaged Parts

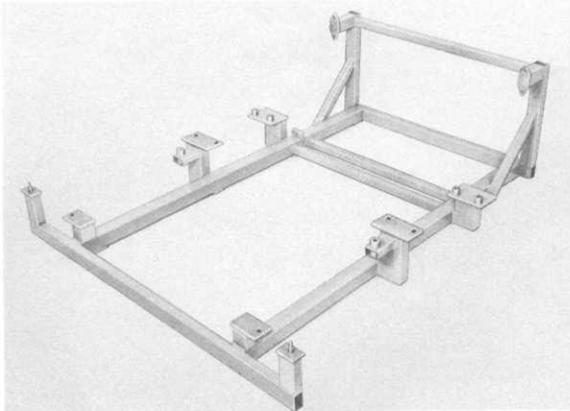
1. Cut off end plate at body floor plate.



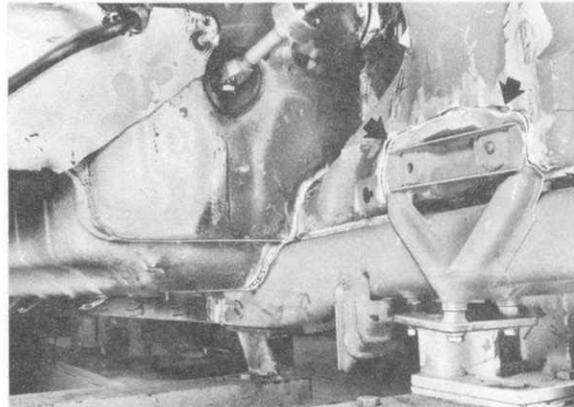
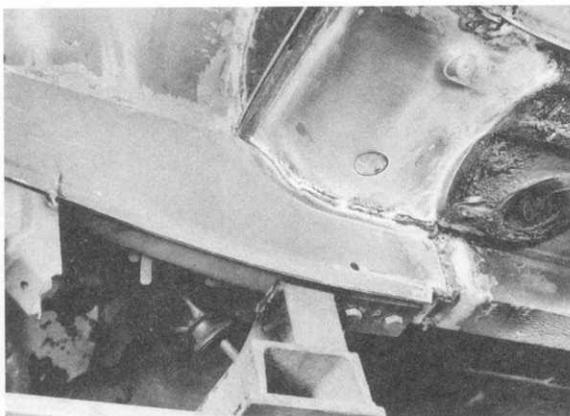
2. Cut off wheel house wall and side member along firewall with a cutting wheel or pneumatic chisel.
3. Cut off cross member and front lock carrier on damaged side, as long as only one side is being replaced.
4. Pull off scrap metal from wheel house and side member.

Repairing

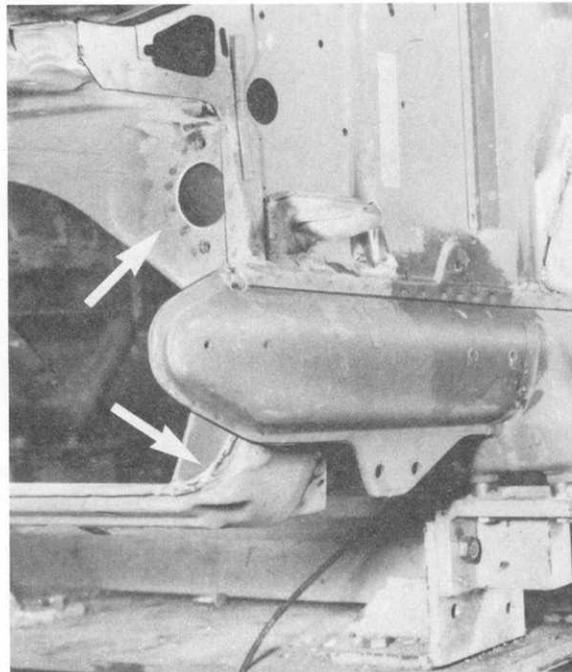
1. Place body on Celette straightening bench and bolt down or use front end gauge 9174 for repairs.



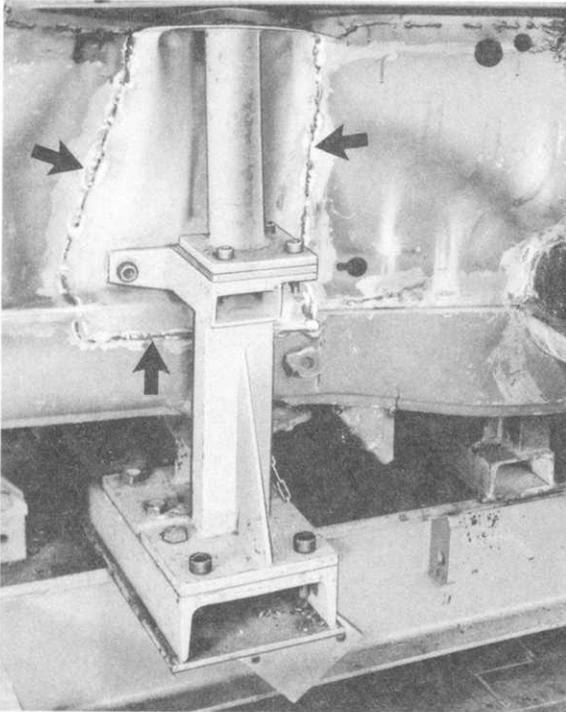
2. Position complete side member and bolt to all attachment take-up points.
3. Inert gas weld side member to floor plate and weld floor member on inside and outside all the way through.



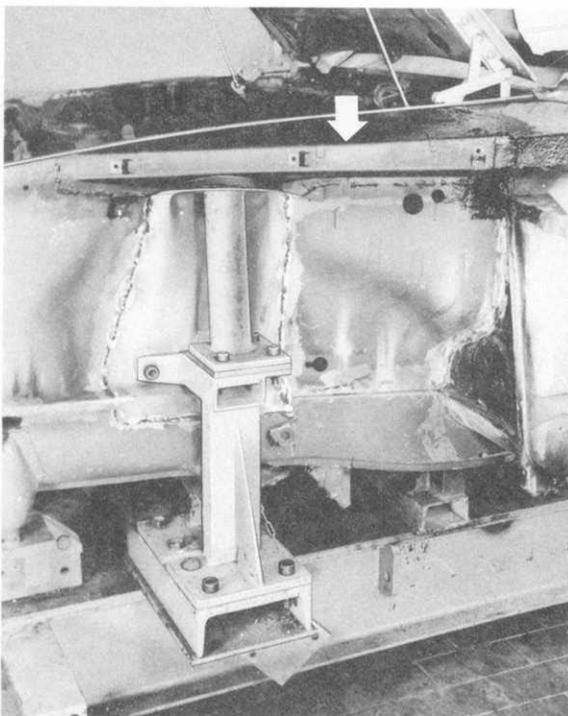
4. Install wheel house, line up at fire wall and side member and tack weld.
5. Spot or inert gas weld wheel house along side member flange and firewall.
6. Position lower cross member and lock cross member with help from attachments or front end gauge, tack weld and weld.



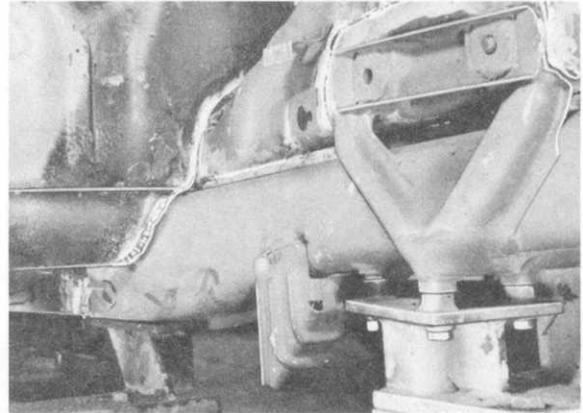
7. Install spring strut console reinforcement, hold with attachment and inert gas weld to side member and wheel house.



8. Line up top of console with wheel house and spring strut console, cut and weld.



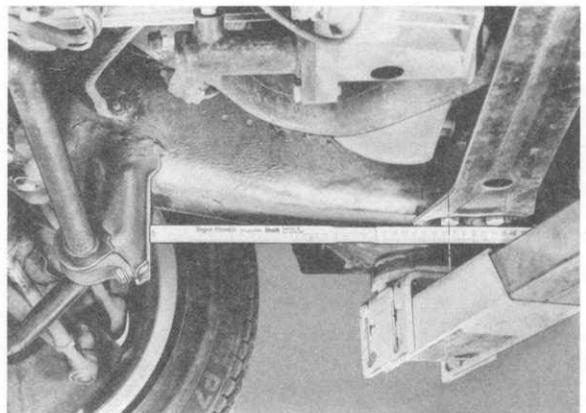
9. Weld control arm console on inside of wheel house.



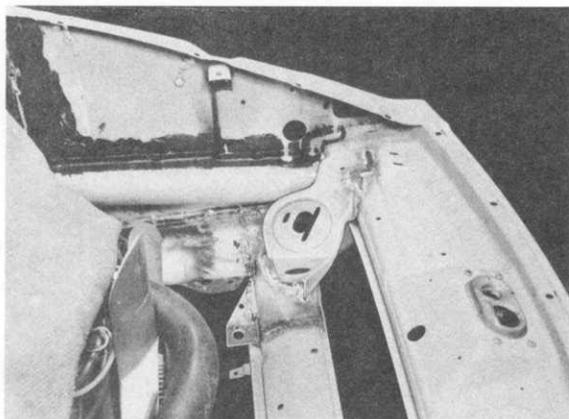
10. Position end plate with take-up shell on floor plate, clamp and tack weld.



11. Position console for stabilizer on side member (295 mm from front cross member bolt, rear edge vertical) and weld to side member.



12. Weld console for concealed headlight motor.



13. Apply prime coat paint and undercoating or sealing material to all welded seams and joints. Spray Tectyl sealant into cavities.

14. Position and mount fenders, headlights and engine hood.

15. Prepare car for painting.

MODIFICATIONS ON BODY FRONT END

From Chassis No. 928 910 0025 (on 5 cars initially),
 928 910 0703 (standard production),
 928 920 0514 (standard production)
 and 928 920 9534 (standard production)

the rear threaded inserts of different version are welded in members 1, Part No. 928 501 015 02/ 928 501 016 03, to facilitate installation of the engine carrier, Part No. 928 375 011 03.

Compare new threaded inserts (Fig. A) with the old version (Fig. B):

1. The 2 mm longer bearing surface protruding from the side member and tapered downward.
2. Inside diameter of threaded insert at bottom changed from 12.2 mm to 10.2 mm.

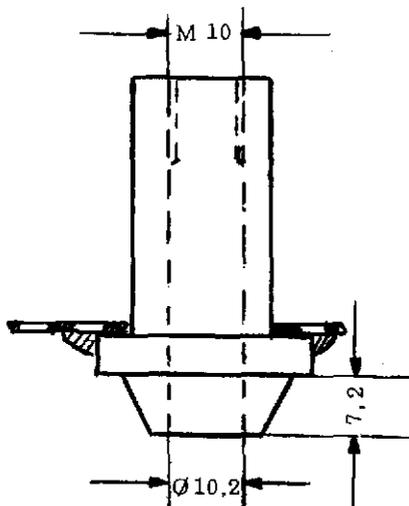


Figure A

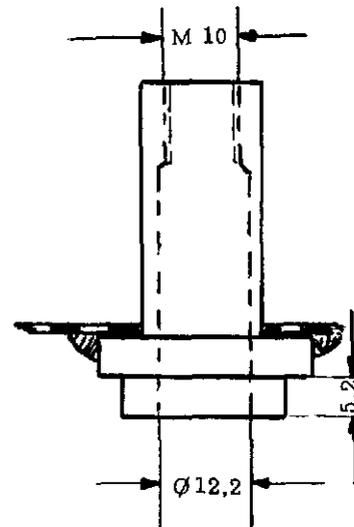


Figure B

3. M 10 x 85 mm bolts required for centering on Celette straightening bench and front end gauge.
4. Take-up pins of straightening attachment for Celette bench and front end gauge 9174 must be shortened by 2 mm for measuring procedures. Cars with old threaded inserts will then require use of 2 mm thick washers.
5. New engine carrier, Part No. 928 473 011 03, can be installed on all cars, while former engine carrier can only be used in cars with old threaded inserts.
6. Cross member, Part No. 928 501 091 02, is no longer used from the above mentioned chassis numbers, so that the welded nuts have been omitted in rear of member 1 for new cars.

7. When repairing the body front end make sure side members are replaced by a side member version corresponding to the opposite side.

The former member I,

Part No. 928 501 015 02 left or

928 501 016 03 right,

valid up to the mentioned chassis numbers, will be replaced by members with Part No. 928 501 915 00 and 928 501 916 00 after depletion of stocks. These members have welded nuts at the rear for the omitted cross member, Part No. 928 501 091 02, so that they can be used in all cars.

In only one member of new version is installed in an old car together with an old engine carrier, the tapered section of the threaded insert must be shortened (ground off) by 2 mm.

REPLACING DOOR ENTRANCE RAIL

Removing

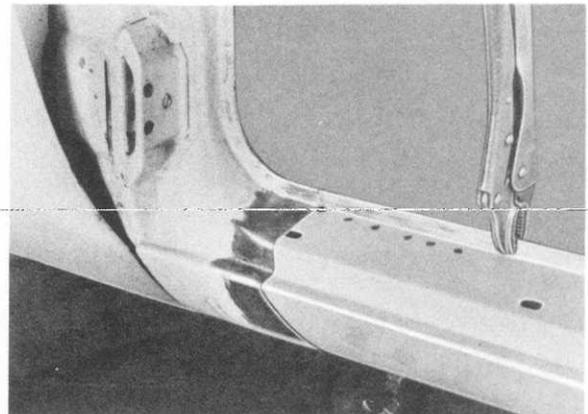
1. Jack up car or place on a platform. Make sure that body is not subjected to torsional forces. Check: doors must open and close easily.
2. Remove doors, unscrew hinges and door retainers, disconnect wire plugs, vacuum hoses and connecting pipe on side panel in footwell.
3. Remove entrance rail strip, door weatherstrip, seats, carpet, seat belts, trim and electric wires to an extent required.
4. Heat mating surface of entrance rail to fender (outer side panel) with a welding torch and melt off the tin.
5. Grind through welded seam at fender with a cutting wheel. Cut off front end of rail according to the extent of damage.
6. Cut off spot welding flange on top and bottom of entrance rail from side member. Remove entrance rail. If necessary, straighten or replace land and side member.
7. Shoulder front mating surface on rail panel with a shoulder pliers, make cuts in edges to be able to have the proper shape.
8. Grind off and pull of scrap metal on side member. Coat flanges with spot welding paint.

Cutting and Straightening

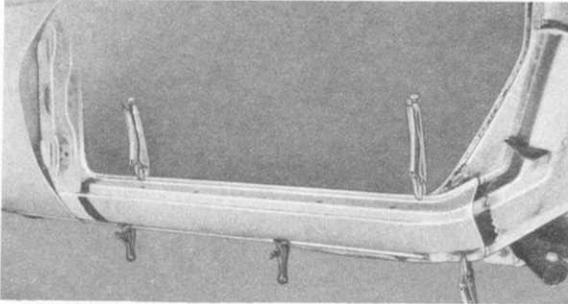
4. Heat mating surface of entrance rail to fender (outer side panel) with a welding torch and melt off the tin.
5. Grind through welded seam at fender with a cutting wheel. Cut off front end of rail according to the extent of damage.

Installing

1. Fit and cut new rail panel.

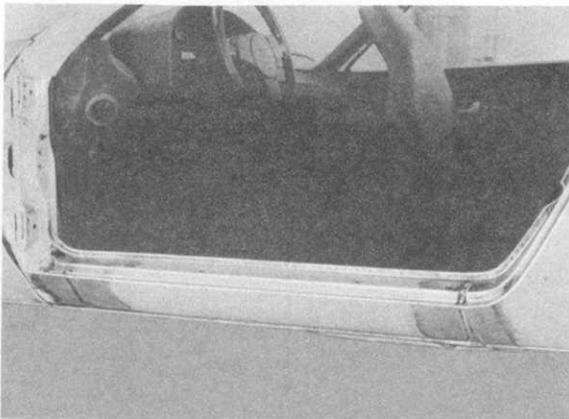


2. Push in rear end of rail on fender (figure does not show fender). Clamp and tack weld rail.

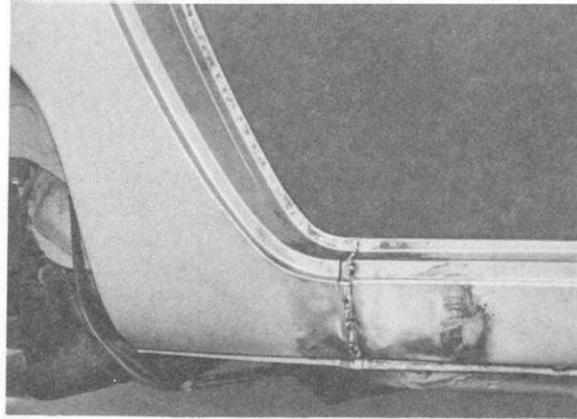


3. Install doors and check alignment with rail.

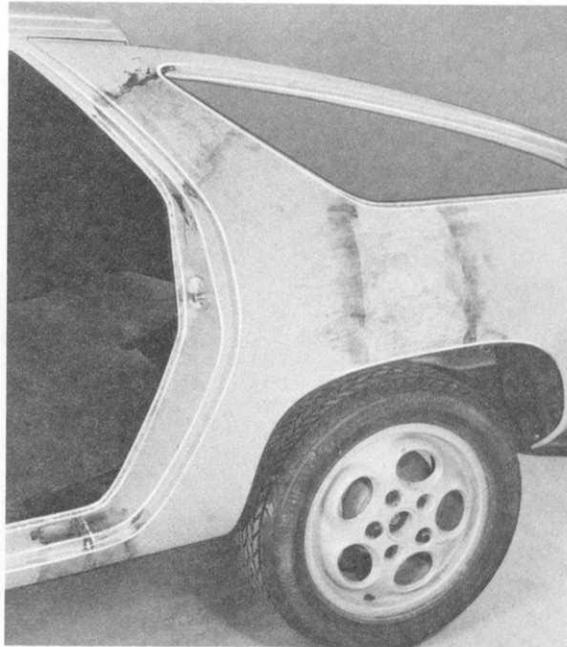
4. Inert gas weld front and rear mating surfaces. Spot weld flanges on side member.



5. Grind down welded seams, tin, solder and finish.



6. Check door alignment. Apply undercoating and cavity sealants.



Prepare car for painting.

REPLACING TAIL PANEL AND FENDER (OUTER SIDE PANEL)

Removing

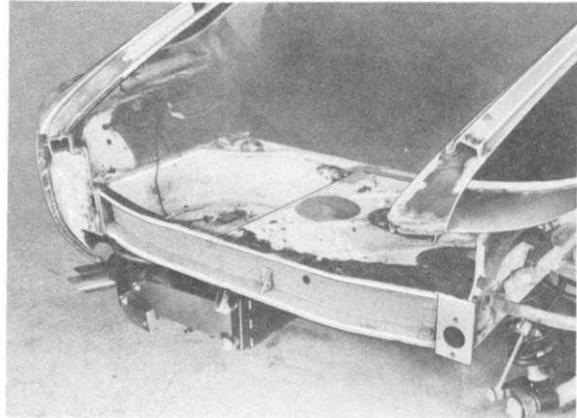
Place car on platform. Take off rear wheels. Disconnect battery wires. Unscrew covers in wheel house.

Remove bumper panel, member and impact tubes (absorbers).

Remove weatherstrips on lid and door frame, side panel trim, side window, emergency seat, seat belt, luggage compartment cover, front seat and carpets.

Remove fuel tank flap, fuel and expansion tanks, filter and fuel pump, wires, hoses and holding straps. Detach insulation sheet on inside of side panel to an extent as required.

4. Straighten rear cross member, side member and luggage compartment floor plate.



Cutting

1. Cut out damaged fender at spot welding flanges with a pneumatic chisel and at sectional surfaces with a cutting wheel. First heat and melt tin off of rail mating surface with a welding torch.

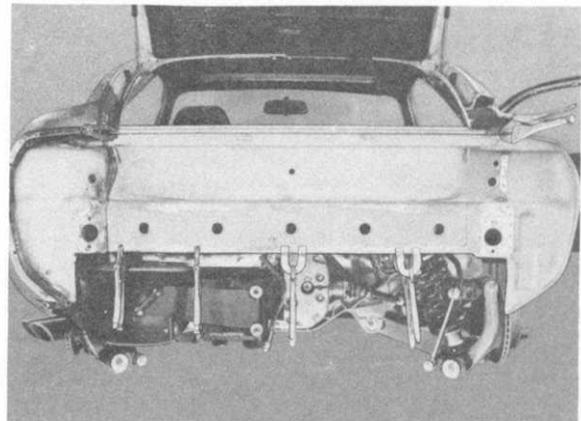
5. Straighten and grind down spot welding flange.

2. Cut off tail panel, pull off all scrap metal and weld damaged spots.

Assembling

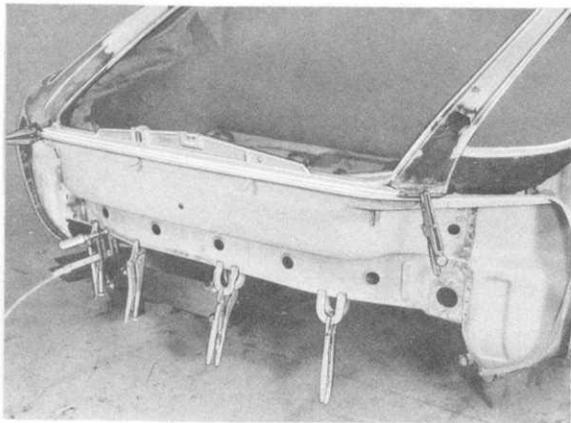
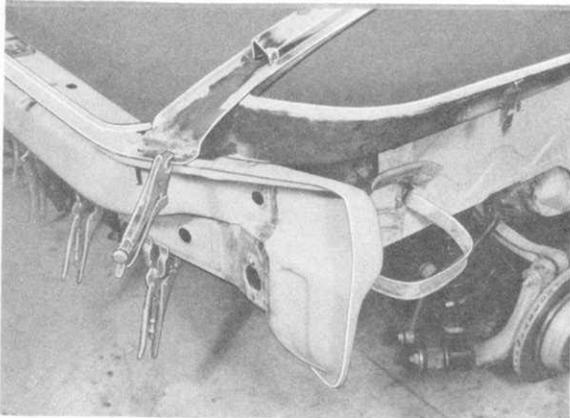
1. Spot weld tail panel and outer panel, align and cut to size.

3. Heat undercoating with a welding torch, and scrape or brush off undercoat.

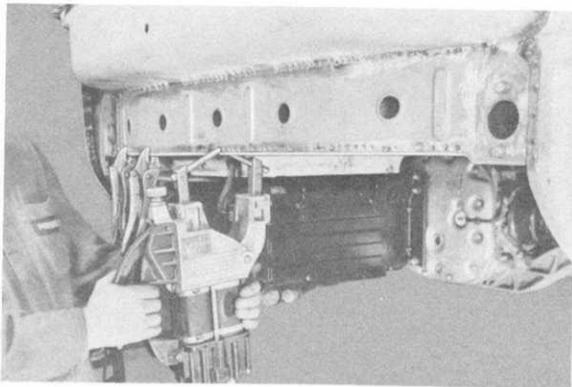


2. Coat flanges with spot welding paint. Bolt tail panel to impact tube mounts, clamp on cross member and straighten with a water level.

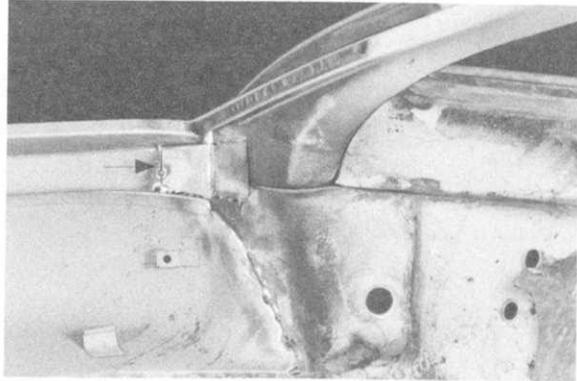
Check installed position of lock to trunk lid.



3. Depending on accessibility, spot weld if at all possible or, if not, inert gas weld the mating surfaces.



4. Weld both sides of reinforcement bracket on inside of roof frame.



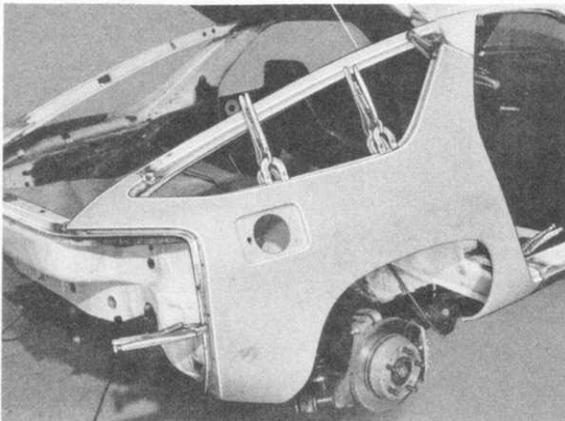
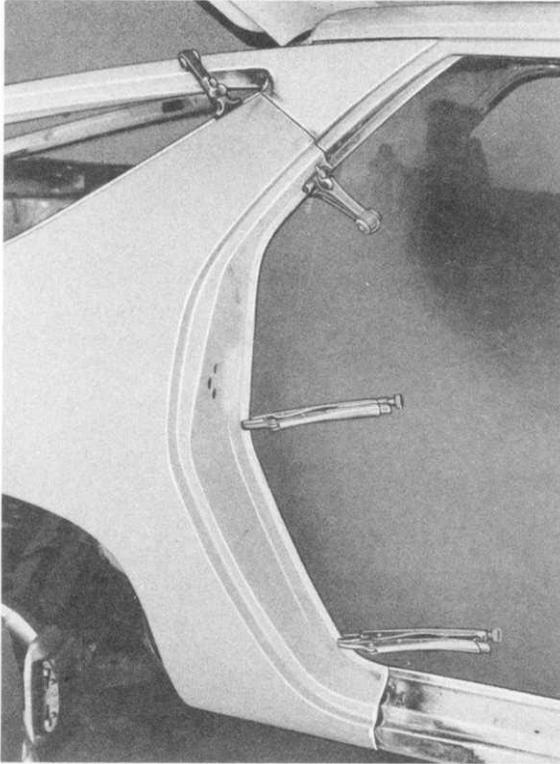
5. Coat spot welding flanges with a welding paint.

6. Fit fender and align with door and trunk lid. Check side window opening (gauges are being prepared). Align upper front mating surface with an overlap. Shoulder one surface with a shoulder pliers and make cuts in edges.

Note

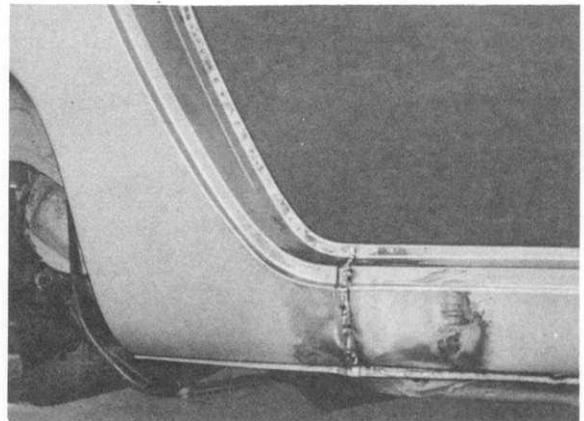
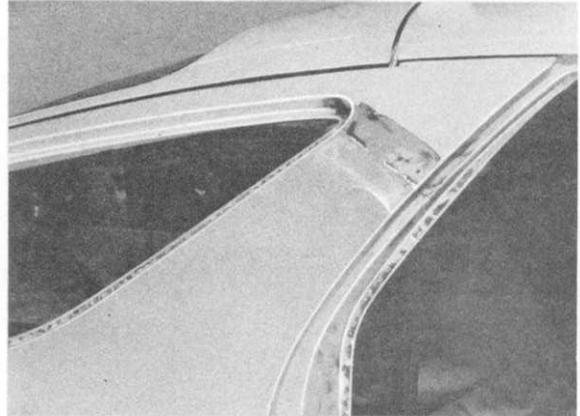
Make the cut in a manner, that as little alignment as possible will be required.

7. Clamp fender in position, check installed position with doors, lid, window opening and bumper panel, and tack weld.

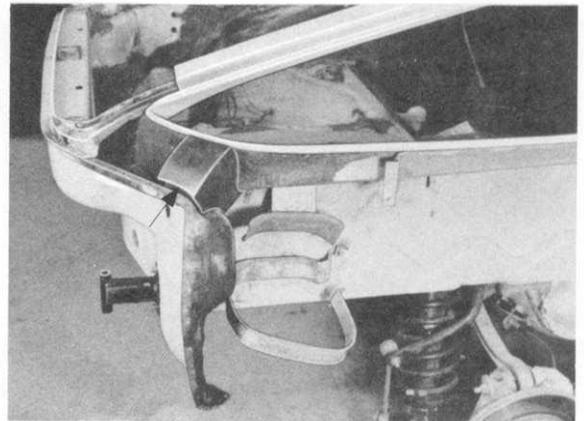


8. Spot weld fender flange all around and weld mating surfaces.

9. Straighten welded seams and flanges.



10. Paste pieces of foam rubber underneath fender on outside of tail panel and in top of door frame to provide a seal.





11. Solder welded seams on rail, door frame, lid frame and fender end section, and prepare them for painting.

12. Install lid and door locks. Check lid and door alignment, and correct if necessary.

13. Check fit of side window.

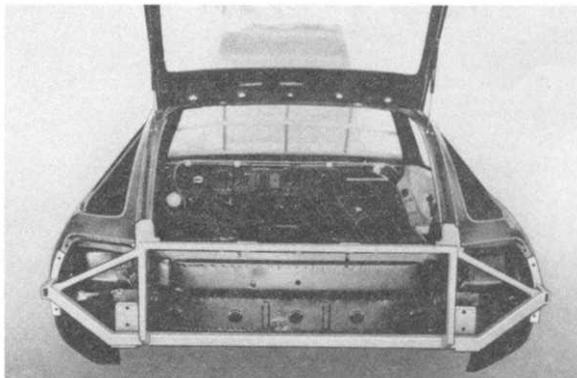
14. Fit bumper and panel, correct contour if necessary.

15. Seal spot welded flange in wheel house carefully and renew missing undercoat.

16. Prepare car for painting.

Note

Special Tool 9172 (template for rear side panels to PU trim) can be used to accurately locate the upper end points and outer bearing surfaces of rear side panels to the PU trim, starting from the threaded surfaces of the impact tubes and absorbers.



REPLACING FENDER END SECTION (OUTER SIDE PANEL)

Removing

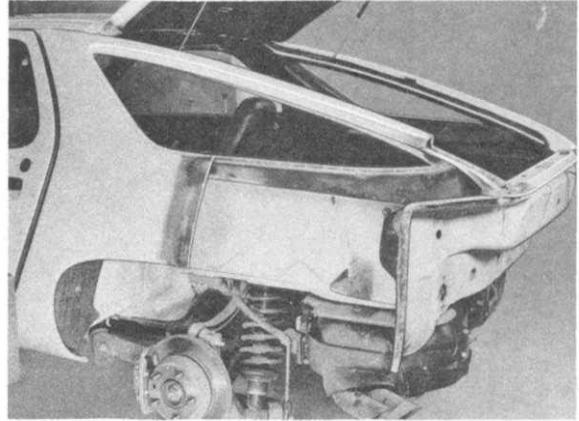
Place car on a platform and take off wheels. Disconnect battery wires. Unscrew rear cover in wheel house and remove antenna. Remove bumper panel, member and impact tubes (absorbers). Remove side panel trim, side window, luggage compartment cover and insulation material to an extent as required.

Cutting

1. Cut off fender end section with a cutting wheel, pneumatic chisel etc. (determine cutting line to agree with extent of damage).
2. Pull or grind off scrap metal. Clean mating surfaces and flanges to remove undercoating and paint, and grind smooth.
3. Weld damaged spots.

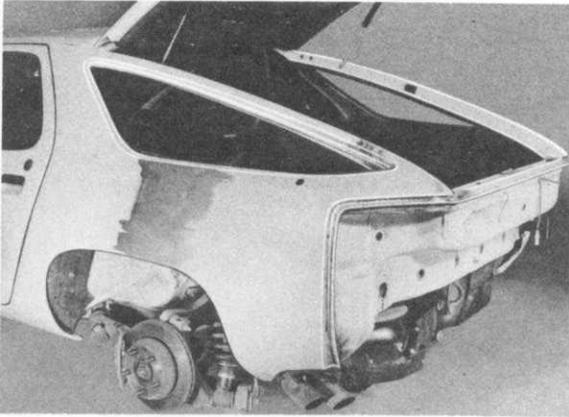
Straightening and Assembling

1. Straighten tail panel and inner frame, and replace outer tail panel if necessary. Check installed position of impact tube mounts.



2. Straighten and grind spot welding flanges.
3. Fit and cut fender. Cut mating surface at wheel opening flush. Coat spot welding flanges with spot welding paint.
4. Tack weld fender with an oxyacetylene welder, align installed position with window opening (gauge or glass pane) and lower edge of lid.
5. Spot weld flanges and weld seams.

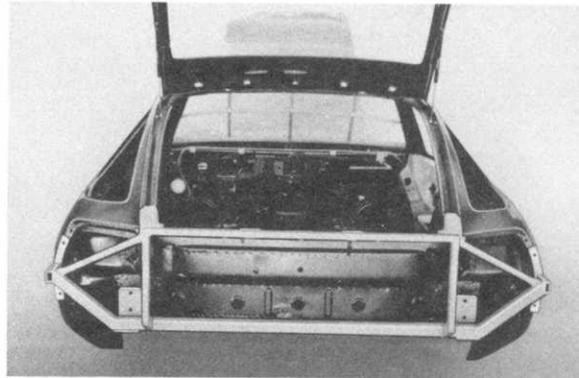
6. Straighten and tip welded seams.



Note

Special Tool 9172 (template for rear side panels to PU trim) can be used to accurately locate the upper end points and outer bearing surfaces of rear side panels to the PU trim, starting from the threaded surfaces of the impact tubes and absorbers.

7. Renew undercoat and prepare car for painting.



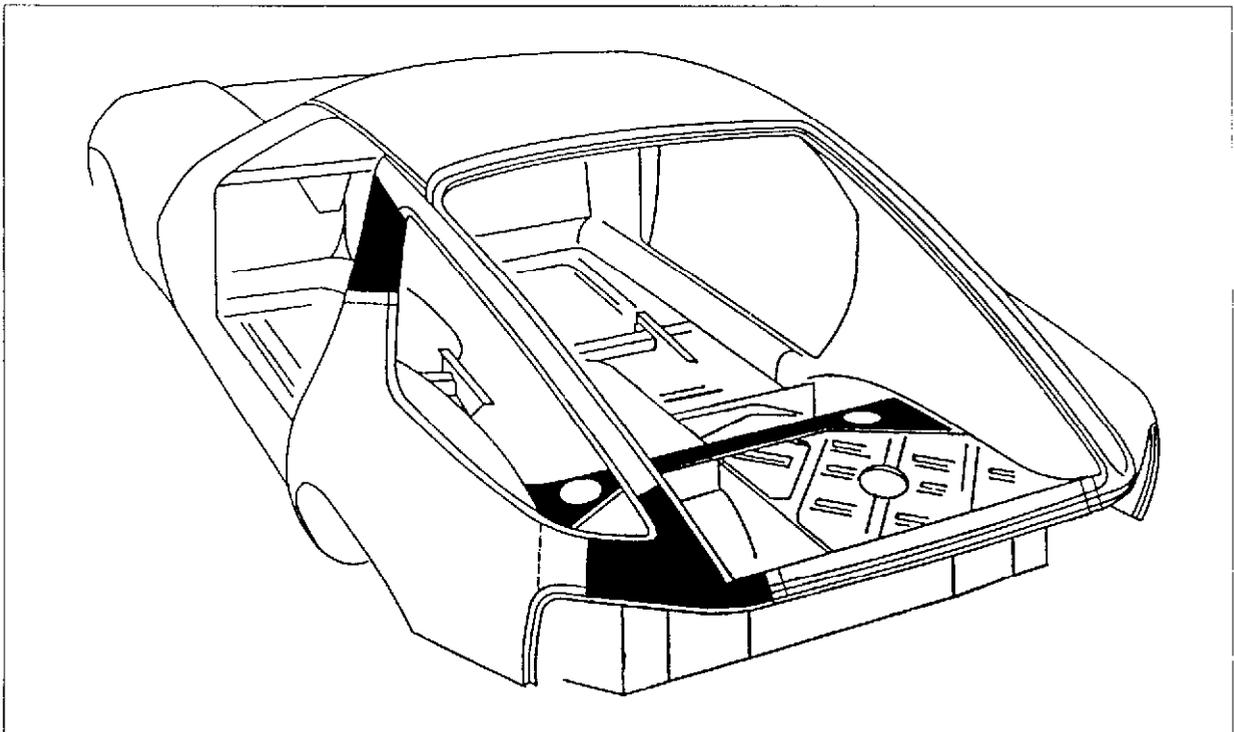
Body repairs to foam-filled cavities

Instructions for part-section repairs to body sections with foam-filled cavities to reduce running noise

Body construction work for production cars includes a number of carefully matched measures to reduce running noise. One of these measures is the injection of foam into certain body cavities in the following areas

- Upper B post
- Complete cross-member
- Lower C post
- Inner rear side panel
- Center left and right reinforcement

using a special PUR (polyurethane) moulding foam.



533 - 53

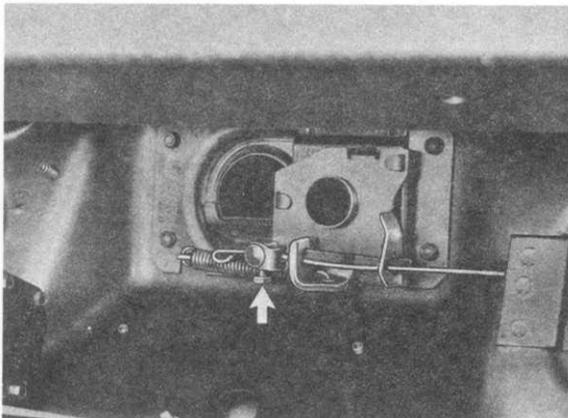
When carrying out body repairs in these areas, particularly when part-sections only are replaced, the damaged sheet metal parts must be detached by mechanical methods (**for instance by sawing, drilling and the use of suitable chisels**), so that high temperatures are avoided. Before new parts are welded on or in, the synthetic foam must be removed, again by mechanical means such as **pulling off** followed by **brushing** with a wire brush, in the areas where welding is to take place. **Note that no new foam is applied in these areas.**

REMOVING AND INSTALLING ENGINE HOOD CABLE

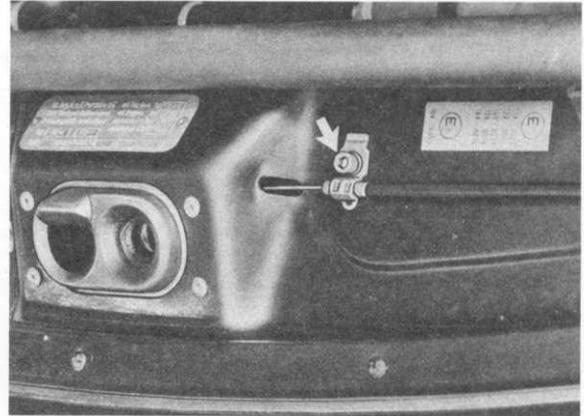
1. Remove left front wheel.
Unscrew cover in wheel housing.

2. Unscrew air inlet grill.

3. Loosen screw on bottom of hood lock.



4. Unscrew clamp on lock cross member and pull hood cable out of lock.

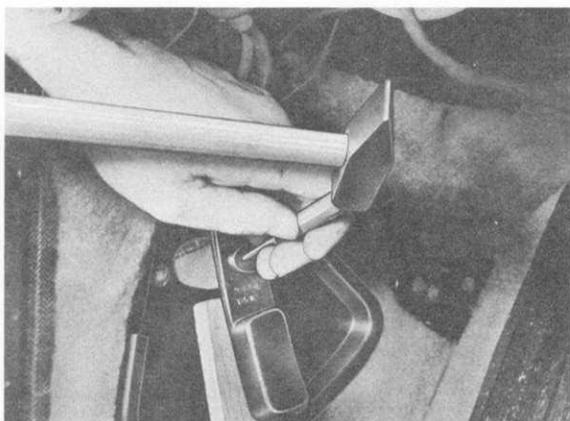


5. Detach hood cable in wheel housing.

6. Pull off carpet in footwell above hood cable grip. Use a screwdriver to lift cover at pivot point of grip and press up cover on left side.



7. Remove cable grip and lay aside. Drive out spiral pin and pull hood cable with protective sleeve forward out of the housing.



8. Pull out hood cable through grommet into footwell.

REPLACING LATCH ON REAR LID LOCK UPPER SECTION

General

If the edge of the plastic latch in lock upper section is worn and this is impairing the lock's function, the latch of an installed lock upper section can be replaced.

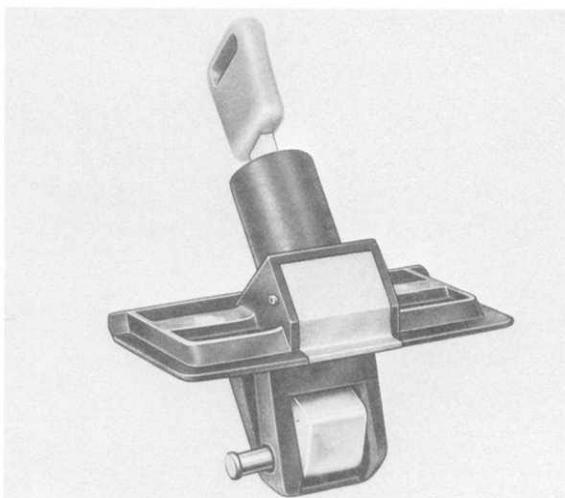
Parts required:

Latch Part No. 928 512 161 02

Rivet pin Part No. 928 512 165 02

Removing and Installing

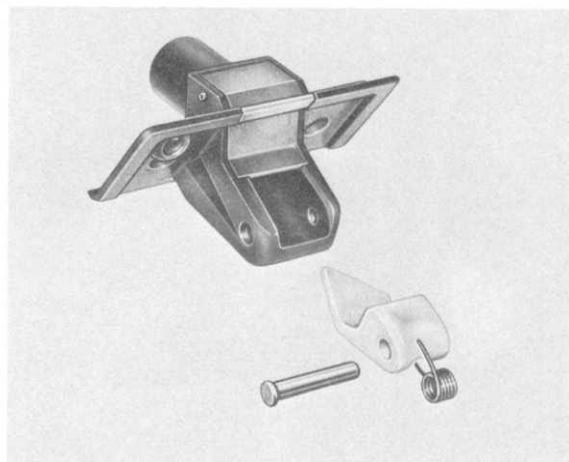
1. Drive rivet pin out of housing from the riveted side with a 3 to 4 mm dia. punch. Counterhold the opposite side!



Note

If it is difficult to drive out the rivet pin, drill out rivet with a 5 to 6 mm dia. drill bit.

2. Remove plastic latch, making sure that the spring behind is not lost.



3. Install new latch with spring, pushing in the spring with a small screwdriver until the latch bore aligns with the housing.
4. Press in rivet pin and lock by punching. Rivet pin must not have lateral play.

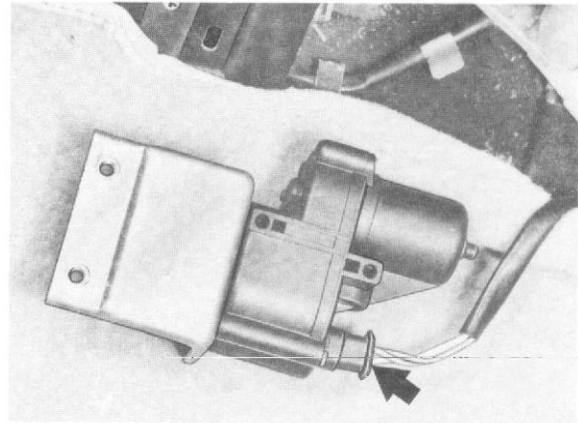
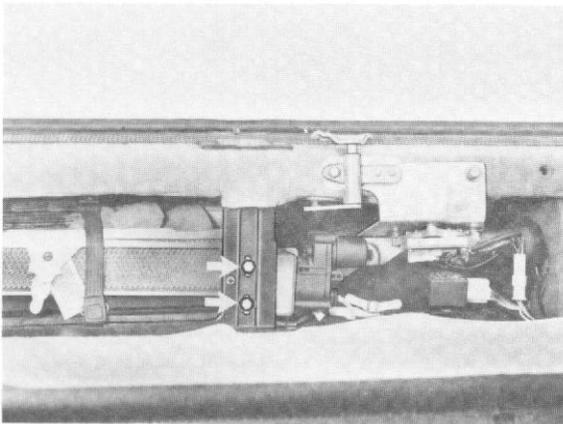
Note

If the lock cylinder has to be replaced, pull out pins on the side to be able to remove the cover.

REMOVING AND INSTALLING REAR LID UNLOCKING DEVICE

Removing

1. Loosen and remove tool plate. Remove mounting bolts of motor bracket.

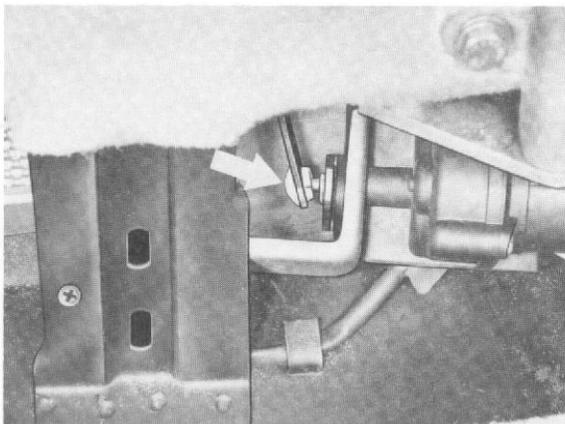


Installing

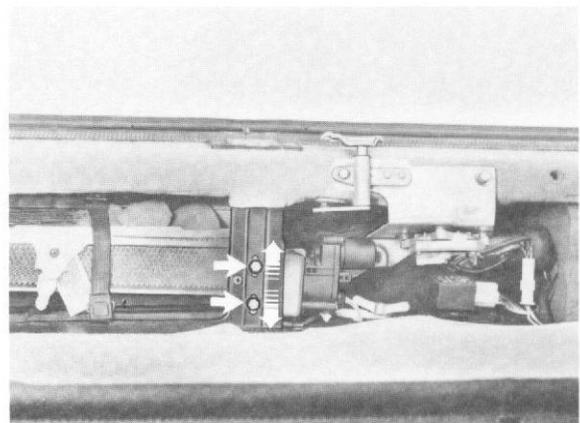
Installation is in reverse sequence.

Adjusting

2. Unclip operating rod on drive motor.



Check lid lock upper and lower sections. Close lid, loosen bolts on bracket, pull motor down until unlocking cam rests on latch of lid lock upper section (slight resistance, do not press further in unlocking direction) and tighten bracket mounting bolts.



3. Disconnect plug on drive motor.

Note:

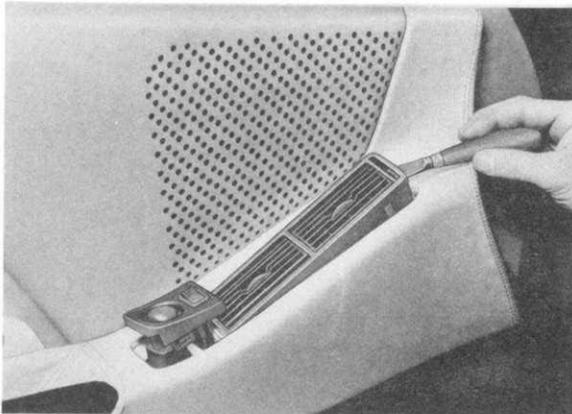
Adjustments are made from passenger compartment.

REMOVING AND INSTALLING DOOR

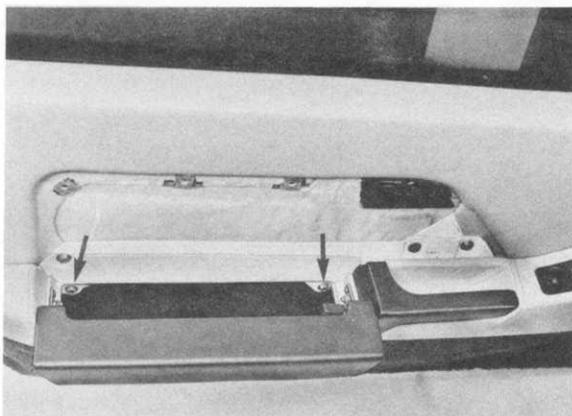
1. Pull off knob, unscrew knob liner and remove together with bearing shell.

2. Unscrew grip shell on inside grip. Remove door trim panel from clips.

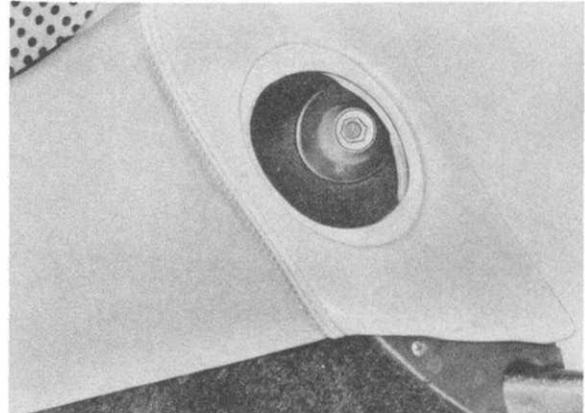
3. Remove side nozzle. Remove outside mirror switch. Note wire colors and pull off plugs.



4. Unscrew door trim panel screws, fold out armrest and unscrew screws covered with caps (see arrows).

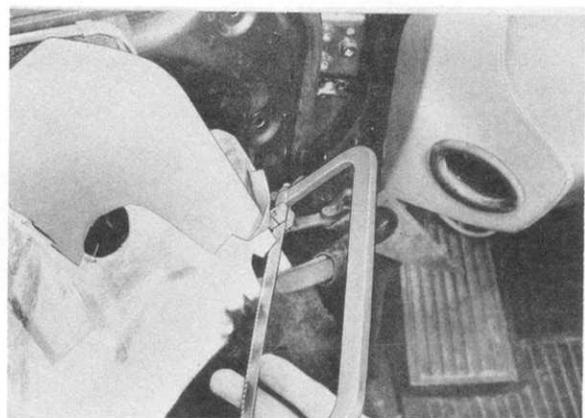


5. Remove door vent nozzle and unscrew bolt located behind latter. Detach cover on connecting tube.



6. Take off door trim panel from clips at bottom and remove with armrest.

7. Disconnect loudspeaker connections from door panel, pull off covering at narrowest opening point and saw through land, so that wire harness and vacuum hoses can be pulled through. Remove door panel.



8. Pull off inside window sealing rail. Unclip window frame trim at top carefully and remove.



9. Pull off door sealing sheet.
10. Detach door retainer and hinges, and take off door.

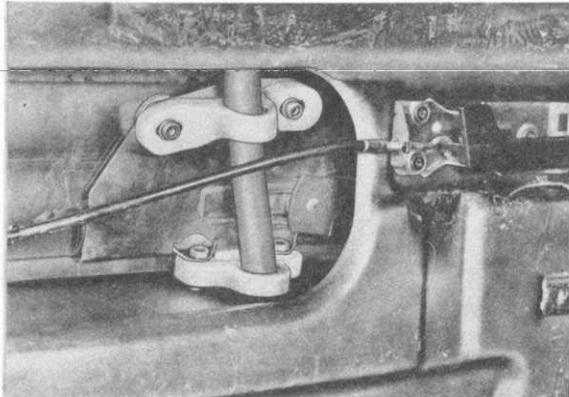
Note

If there is door retainer noise, spray door retainer and retaining rod with a sliding metal lubricant, e.g. Metal-lit from Bielefeld.

REMOVING AND INSTALLING DOOR WINDOW AND REGULATOR

Removing

1. Adjust door window (door trim panel removed), that slides on guide tube are accessible.



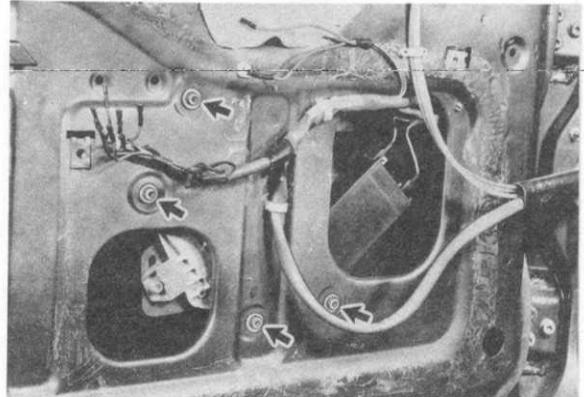
2. Now unscrew slides and detach window lifting tube at top.
3. Pull off inside window recess seal, then tilt and remove door window glass.



Note

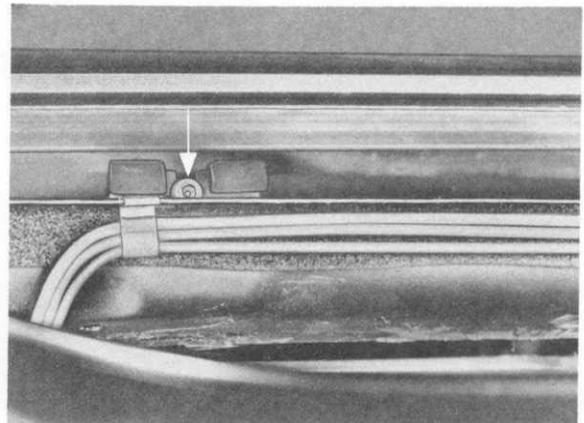
Unscrew or detach guides (arrow) in upper door recess to improve accessibility (see figure to right).

4. Unscrew window regulator from inside door panel (arrows), pull off electric wire plugs from motor and remove window regulator through large opening in inside door panel.

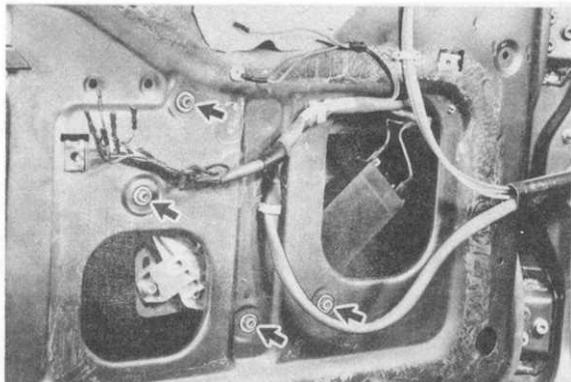


Installing

1. Place door window glass in door.
2. Install guides (position inward).



3. Guide in window regulator, connect it to lifting rail and bolt to inside door panel (arrows). Connect power supply plug.

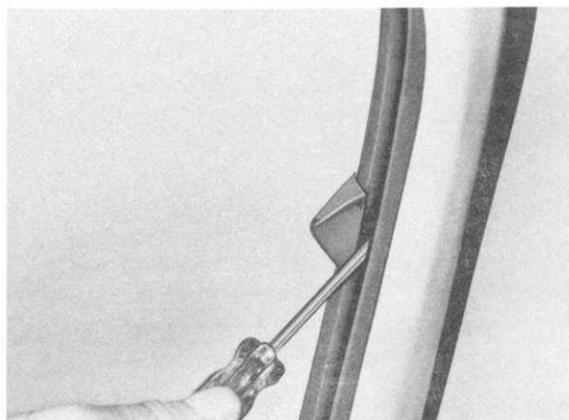


4. Install window recess seals, window guides and ornamental frame.



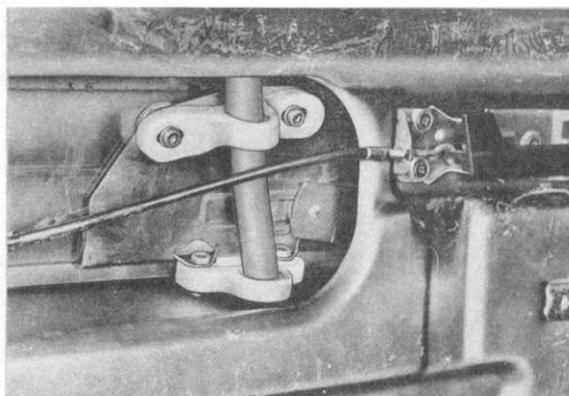
Note

Use a plastic hammer to install ornamental frame on edge of window opening. Coat rubber parts with petroleum, to facilitate pressing them into ornamental frame grooves. In the past a liner was mounted in the front curve with pop rivets, in the outer holes of which the ornamental strip corner was installed. The new corners are mounted with clips.



Stop wedges must be installed only with counter-sunk metal screws.

5. Set guide tube with mounted slides in center position and bolt to lifting rail.



Note

Make sure that wire harness is routed to outside mirror, so that it will not come in contact with glass.

Lubricate window lifting rails and guide tube with a multi-purpose grease.

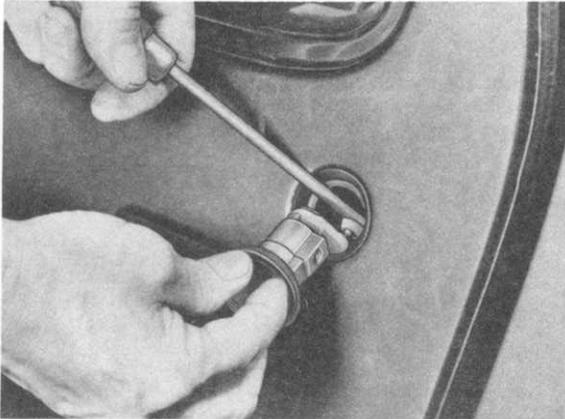
6. Run up window until it is completely in window frame, adjusting guide tube mountings if necessary.

7. Loosen both slides to relieve pressure on window glass and then tighten.

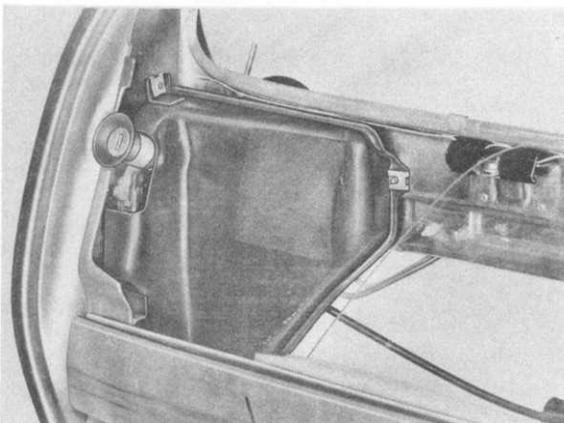
8. Lower window and measure distance to guide rail (5 to 6 mm) and adjust lower slide, that window glass runs in center of window frame. If necessary, loosen slides and tighten again after removing stress from window glass.

REMOVING AND INSTALLING DOOR LOCK

1. Remove grommet plug from door frame and unscrew socket head screw. Remove lock cylinder and detach connector from door lock.



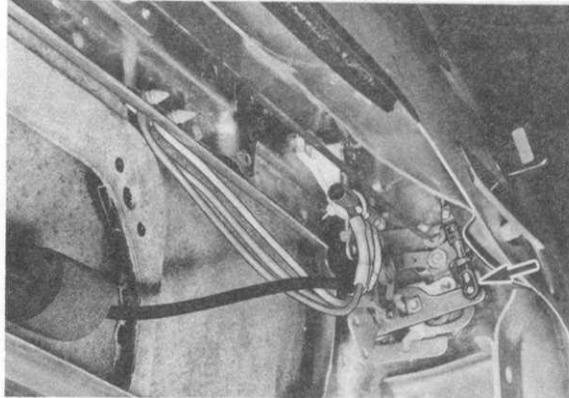
2. Unscrew and remove door lock cover.



Note

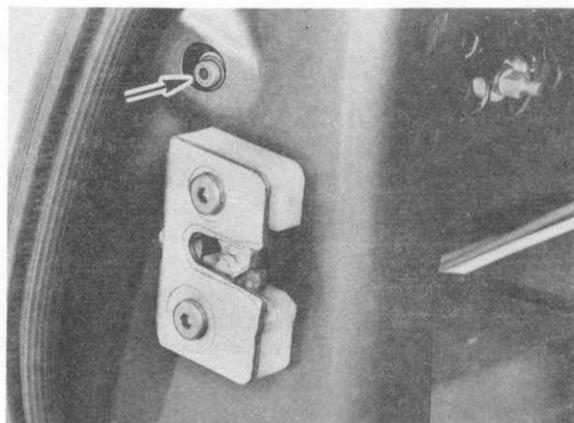
This lock cover was not used on the first cars manufactured.
The figure shows front passenger's door with a guide rail.

3. Detach connecting rod from outside door handle to lock. Unscrew and pull out outside door handle.



4. Pull off connecting hoses to control valve (driver's door) and vacuum control (passenger's door), and unscrew control parts.

5. Unscrew self-locking screws on lock outside section. Unscrew inside door control and remove with inside lock parts.



Note

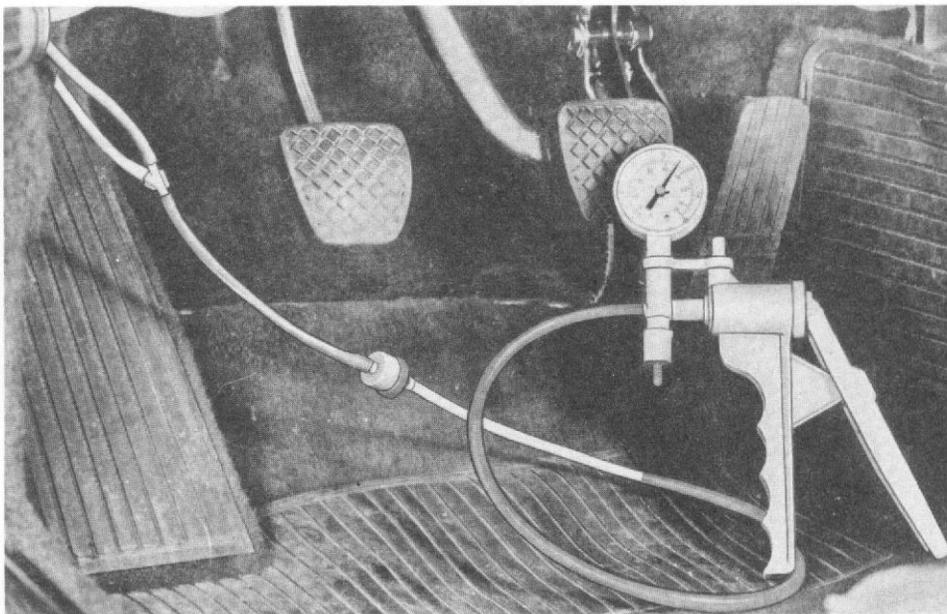
Hoses are connected on control valve in driver's door in red, blue and green as seen locking forward. In the passenger's door the red hose is connected on the vacuum switching part front inside and the green hose outside, so that locking will be simultaneous.

CHECKING DOOR CENTRAL LOCKING SYSTEM

The central locking system of the doors employs vacuum. A vacuum of at least 400 mbar is required to guarantee operation.

For testing, this vacuum can be provided by running engine for about 2 minutes or with a vacuum pump.

The necessary vacuum can be produced with just several pump actions by using Special Tool 9160 in a vacuum line, which is not connected with a vacuum tank. Pump would have to be operated about 50 times when a vacuum tank is involved.



Pump's scale shows about 45 on = 450 mm on barometric column, which is equal to about 600 mbar vacuum.

If system is in good condition, the vacuum built up by engine will be sufficient for unlocking and locking even 2 days later.

If central locking system fails, first check control lines of driver's door for leaks.

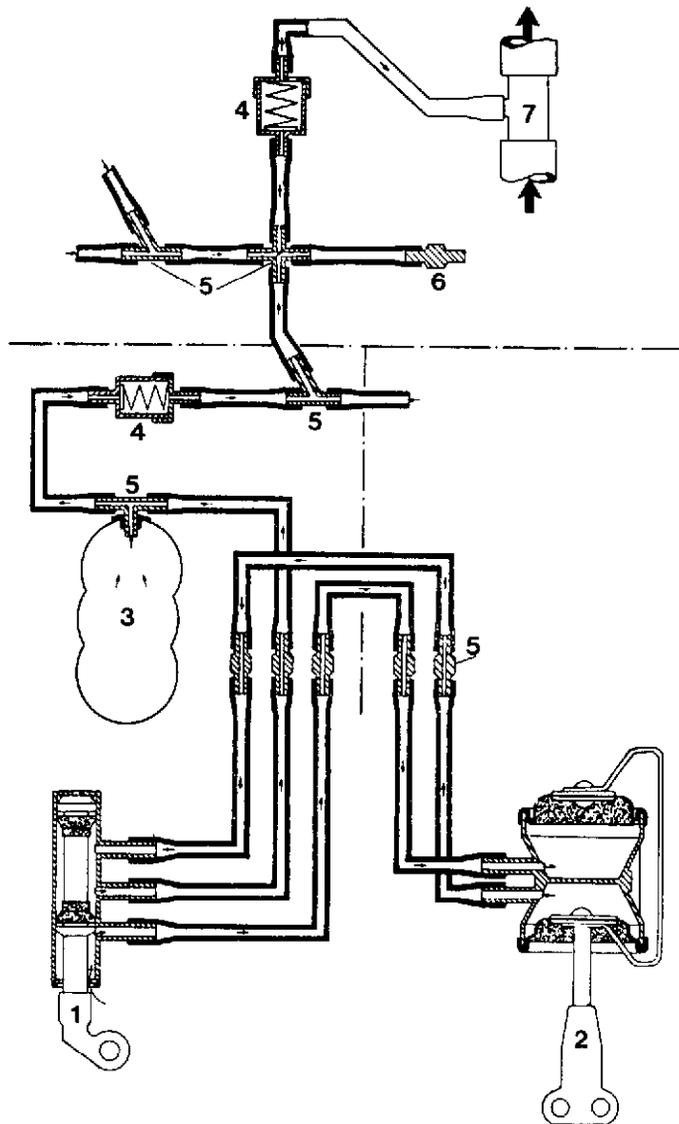
If vacuum drops obviously while testing with a vacuum pump and without operating the central locking system, the control system has a leak.

If unlocking and locking are not possible in spite of sufficient vacuum, the cause could be a mechanical defect, incorrect assembly or pinched hoses, impairing the control function.

When functioning correctly, the catch buttons of both doors must go up and down when unlocking and locking the driver's door with a key.

Doors can only be locked when doors or strikers are closed.

Layout of Central Locking System



- 1 = Control valve in driver's door
- 2 = Vacuum switch in passenger's door
- 3 = Vacuum tank in instrument panel
- 4 = Check valve
- 5 = Connector
- 6 = Plug
- 7 = Vacuum line to brake booster

Note

In order to be able to seal hose connection of vacuum pump with control lines, one each coupling must be installed in the lines.

When checking green line of driver's door with a vacuum pump, lock must lock. Red line = unlock.

No vacuum will build up in other lock position.

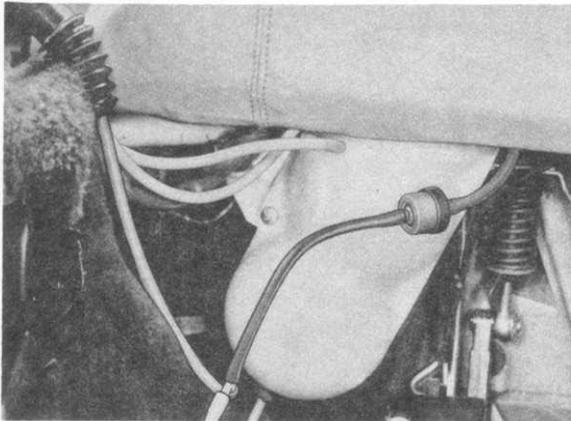
From Chassis No. 928 810 0554

928 830 9521

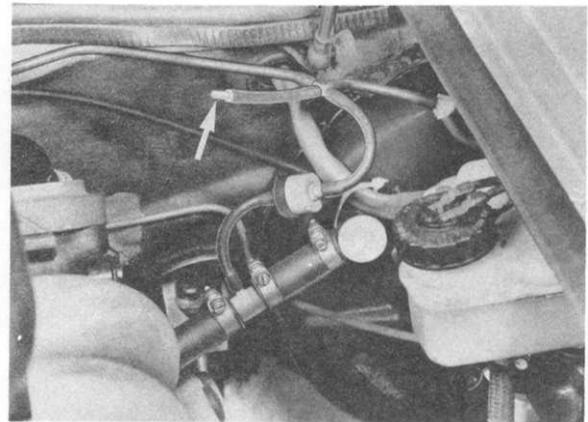
928 820 0054

a special vacuum tank and check valve are installed underneath the instrument panel for the central locking system, therefore having a separate vacuum circuit from that of the heater and fresh air controls.

The first cars were fitted with rubber hoses. The introduction of hard plastic tubes has guaranteed free through flow even in tight points.

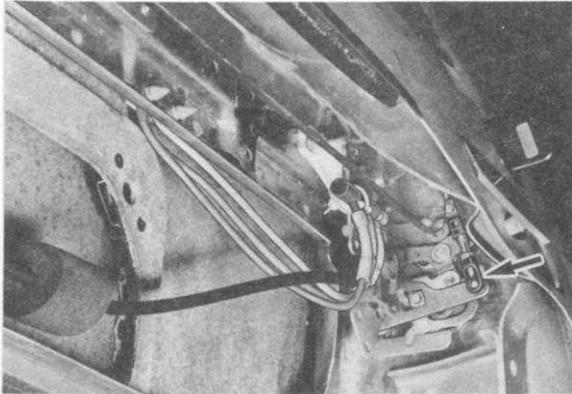


Vacuum tank underneath instrument panel

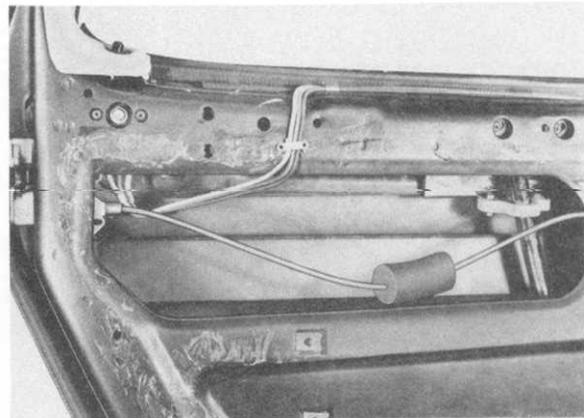
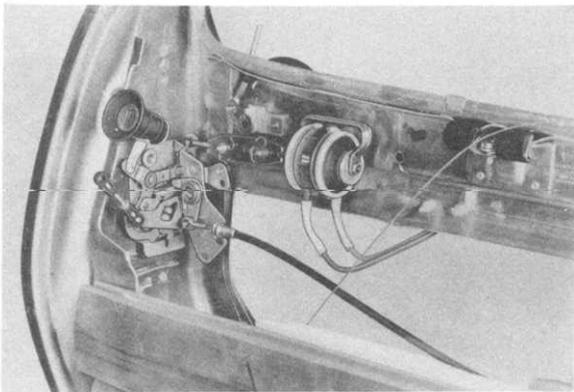
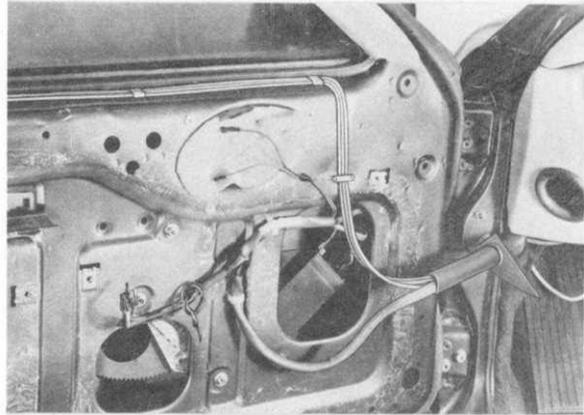


Test connection in engine compartment

As seen looking forward in car, vacuum lines on control valve of driver's door are red, blue and green. On vacuum switch in passenger's door green is connected at rear and red front inside.



Foam rubber strips must be used underneath plastic lines routed to the doors on the door inside panel. Lines are held with clamps, while downward leading lines are mounted with clips.



With this arrangement red lines are used to lock system and green for unlocking.

When checking blue line leading to driver's door with a vacuum pump, there must be no drop in pressure without operation of locks. When locking and unlocking, pressure gauge could show up to approx. 20 mbar loss in each case.

When testing the red or green line with a vacuum pump alternately, the locks of the doors must lock or unlock respectively.

Important

This test requires that the doors or strikers be closed!

TROUBLESHOOTING CENTRAL LOCKING SYSTEM

Unlock driver's door with key
 Passenger's door is not unlocked



Car was not used for longer than 2 days (permissible vacuum loss).



Start engine briefly and then check lock action.
 If system is in good condition, it should be possible to operate lock about 10 times.

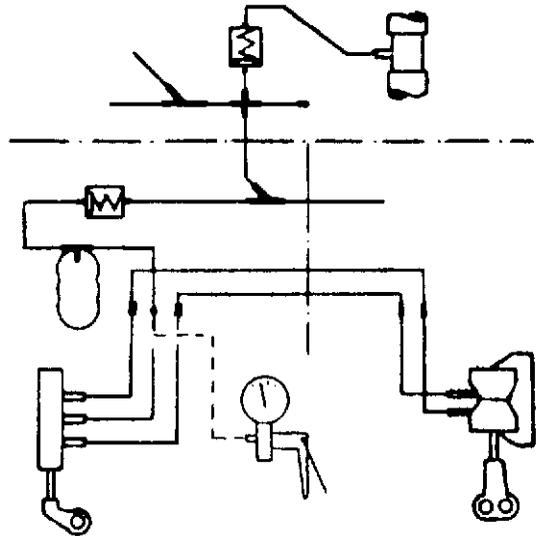
Vacuum Loss:

1. Troubleshooting - Supply Line

Disconnect blue control line in footwell on left side. Connect vacuum pump to blue hose leading to vacuum tank. Run engine briefly or build up 400 to 500 mbar with pump and observe pressure gauge. Gauge must remain constant without lock operation.

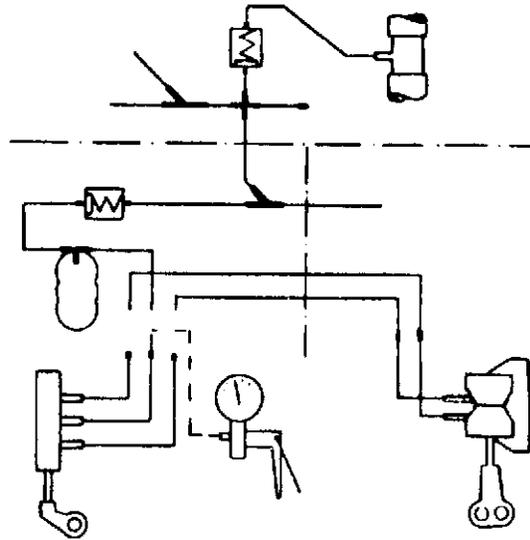


If pressure drops, check valve, vacuum tank or hoses have leaks.



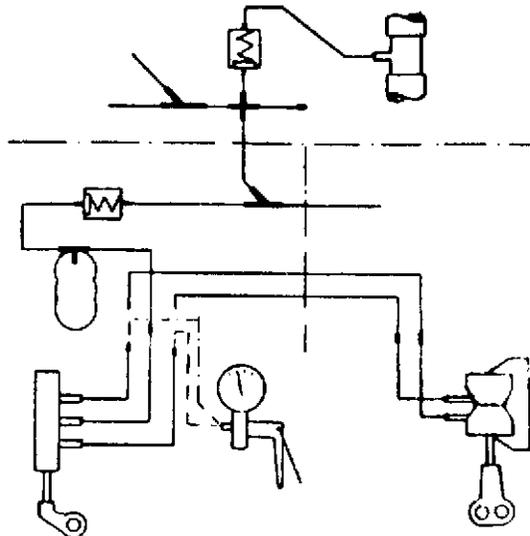
2. Troubleshooting - Left Door

Connect vacuum pump on blue hose leading to door lock and produce vacuum. Operate door lock with key and observe vacuum. Leaks could be in hoses or control valve.



Remove door trim panel and replace damaged parts.

Connect green and red lines to vacuum pump alternately.



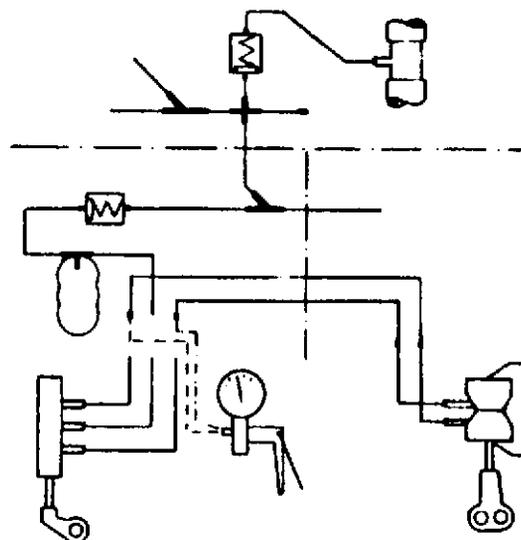
A line has been pinched. If lock does not function and there is no drop in vacuum.

Defect could be found at rubber hoses in door area or connecting tube to footwell.

If there is a loss in vacuum, control valve has a leak or there is a mechanical defect in lock mechanism.

3. Troubleshooting - Right Door

Connect vacuum pump at connecting point in footwell on left side, alternately, to red and green lines leading to right door. Vacuum built up in red line should lock and in green line unlock lock.



If pressure drops without operating of lock, connect vacuum pump at connecting points on right side of footwell. If locking system functions, the source of defect is located inbetween.

Vacuum available, but no locking action.

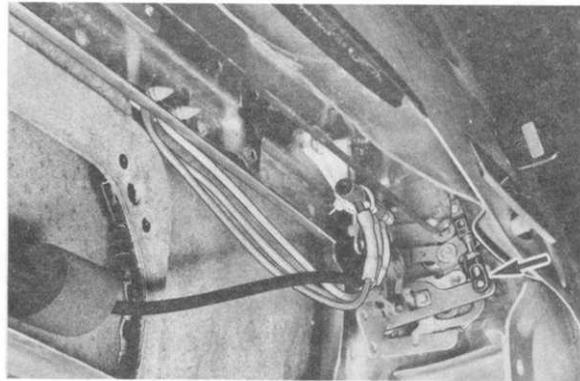
Control lines are pinched or vacuum switch is not positioned correctly.

Remove door trim panel, replace control lines if necessary or adjust position of vacuum switch in horizontal slots in inside door panel.

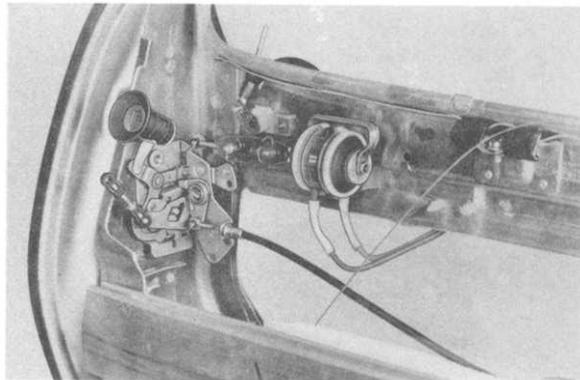
4. Troubleshooting - Lock Mechanism

Possible Defects on Both Doors:

1. Defective lock cylinder.
2. Broken drive dog on lock cylinder.
3. Detached connecting or locking rod.
4. Lock mechanism too tight or clamped.



Driver's door



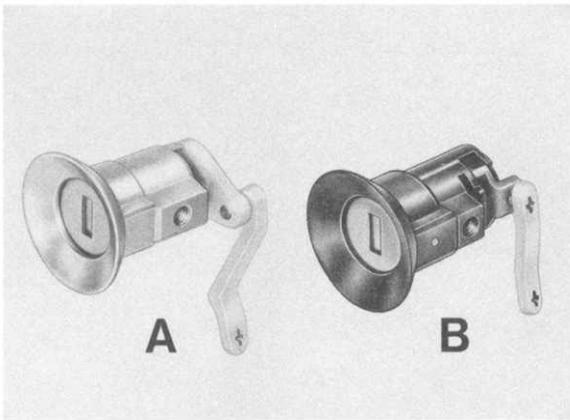
Passenger's door

REPLACING DOOR LOCK CYLINDERS

As from Chassis No. 928 810 2412
 928 820 0884
 928 920 9511

new door lock cylinders with a black escutcheon are installed in all models. The old lock cylinders with a chromeplated escutcheon are replaced by new lock cylinders, Part No. 928 537 901 02 with even codes or Part No. 928 537 903 02 with un-even codes.

If new lock cylinders are installed in cars prior to the above mentioned chassis numbers, old operating rod must also be exchanged against a new one having Part No. 928 537 111 03.

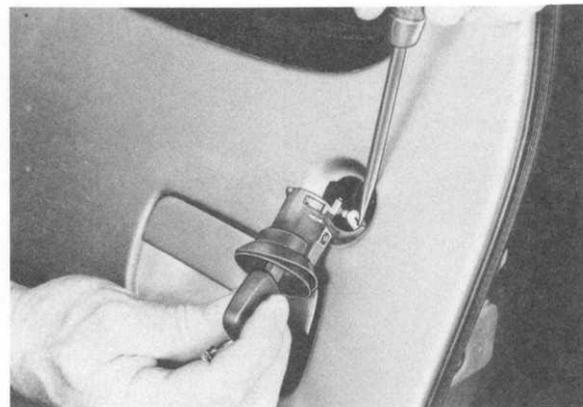
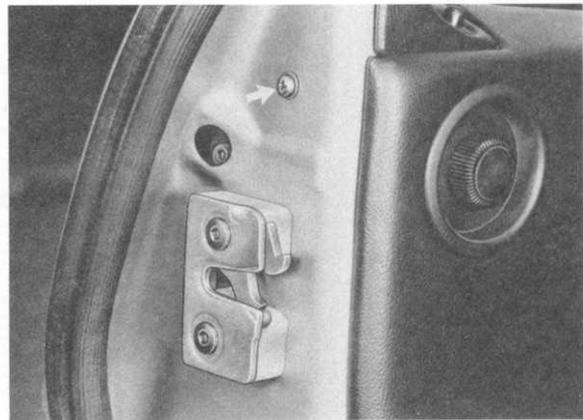


A - Old Version

B - New Version

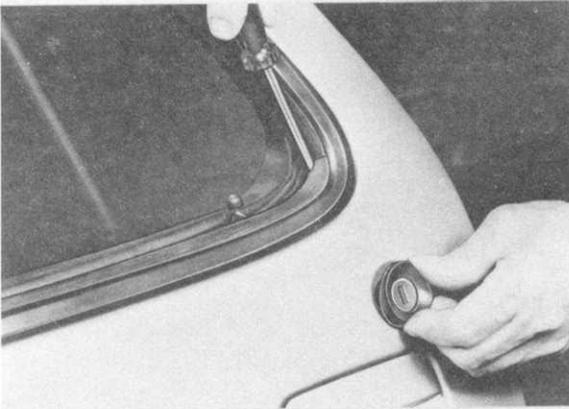
Removing and Installing

1. Pull off grommet from door frame and unscrew socket head screw.
2. Loosen metal screw (arrow) and pull out lock cylinder far enough, that operating rod can be detached.



3. Detach operating rod from inner lock. Attach new operating rod on inner lock's ball pin and lock cylinder.

4. Press lock cover plate forward with a screwdriver, so that lock cylinder can be guided in all the way.



5. Install mounting screws for lock cylinder and lock cover, and press in grommet.

Note

Never use grease containing copper powder or other electrically conductive materials near the door lock cylinder contact switch of cars with an alarm system.

The alarm system could sound off on its own through the effects of moisture and electrically conductive grease.

MODIFICATION ON ROTARY KNOB LOCK

As from Chassis No. 928 810 1853
 928 820 0661
 928 820 9552

a modified rotary knob bearing is installed in all models.

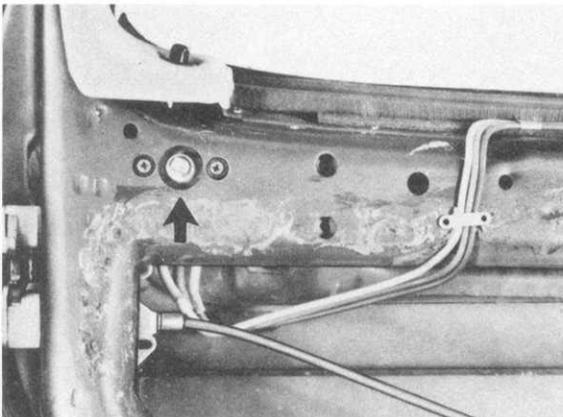
This modification covers:

1. Rotary knob bearing
 - Driver's door Part No. 928 537 095 02
 - Passenger's door Part No. 928 537 096 02
2. Bearing shell Part No. 928 537 585 02
3. Rotary knob Part No. 928 537 581 03
4. Cap Part No. 911 537 703 00

The former rotary knob bearing parts are invalid and will be replaced by the new parts.

When installing in doors of cars prior to the above mentioned chassis numbers, the door trim must be removed and the plastic sheet pulled off partially.

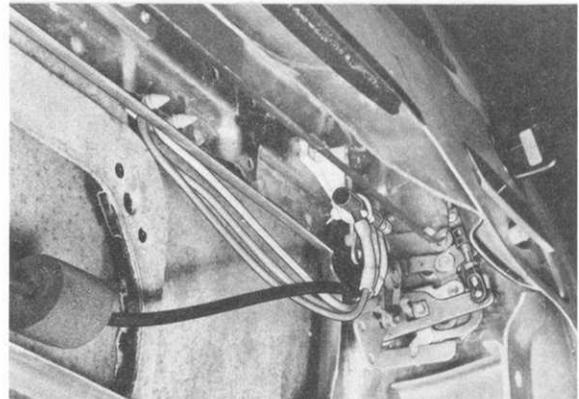
Open up opening in door inner panel for rotary knob bearing (arrow) to approx. 26 mm dia.



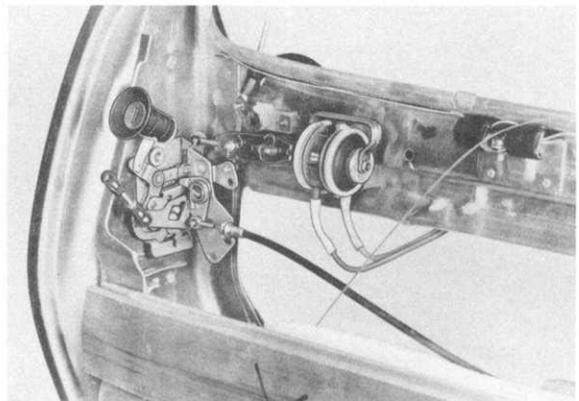
On driver's door fasten control valve with vacuum lines on rotary knob bearing at exact center with hose tape.

Installing

1. Insert rotary knob bearing. Attach safety rod on rotary knob bearing and inner lock, and mount rotary knob bearing.



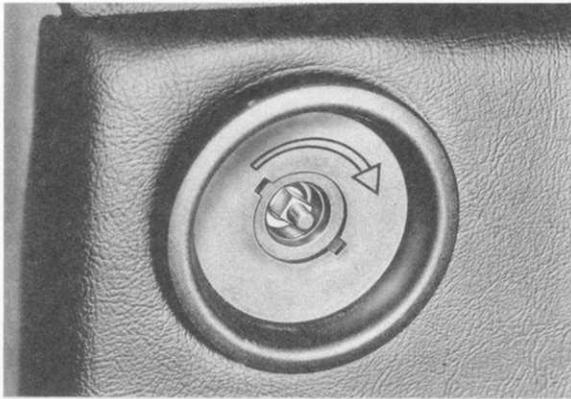
Driver's door



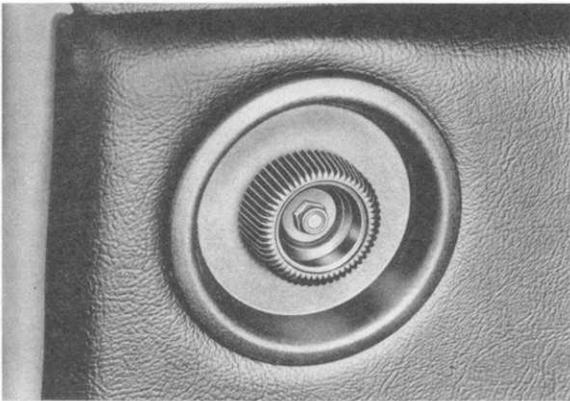
Passenger's door

2. Paste on plastic sheet and install door trim.

3. Turn up bearing shell to position on door trim.



4. Push on rotary knob and mount with washer and self-locking nut.

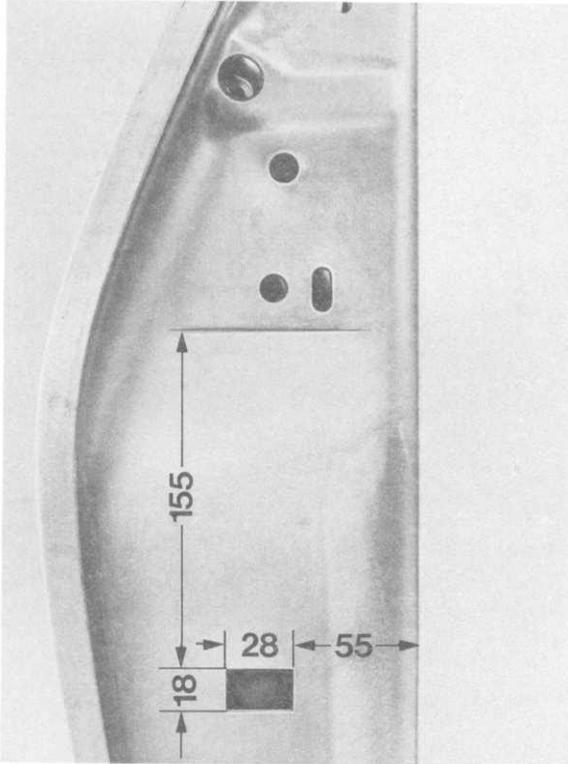


5. Press on cap.

MODIFICATION ON UNFINISHED DOOR SHELL

The opening for the door safety light must be made in spare doors at the door pillar as shown in the case of former version door shells for cars from 1980 models.

Dimensions in mm.



TROUBLESHOOTING CENTRAL LOCKING SYSTEM - From 1980 Models

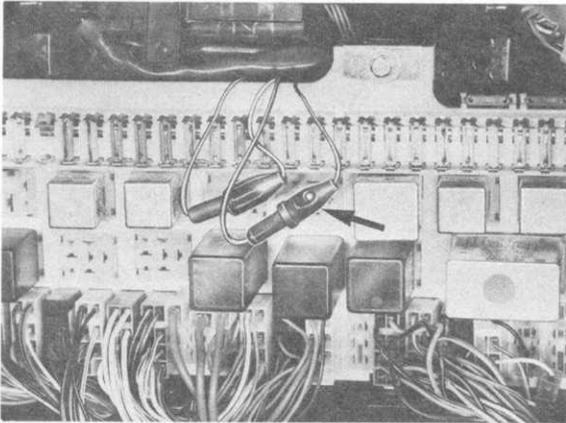
Checking Power Supply

Note

The central locking system only works with the ignition turned off. If the ignition is turned on, the window lifting relay will interrupt the power supply to the controls.

Check fuse no. 21 and both line fuses (0.4 A fine wire fuses) of left and right controls.

They are located in loose fuse holders behind the central electric board.

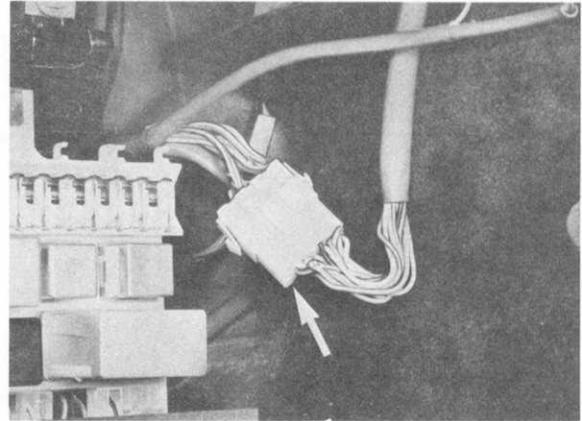


If fuses rated 0.25 A or others have been installed, replace them with 0.4 A fuses.

Finding Defective Side

Both controls are connected with each other electrically and could influence each other when defective.

To prevent this, disconnect the multiple pin plug of the wire harness in the passenger's door to the right hand side of the central electric board.



Check function of electric locking system on driver's side to find the defective side.

Note

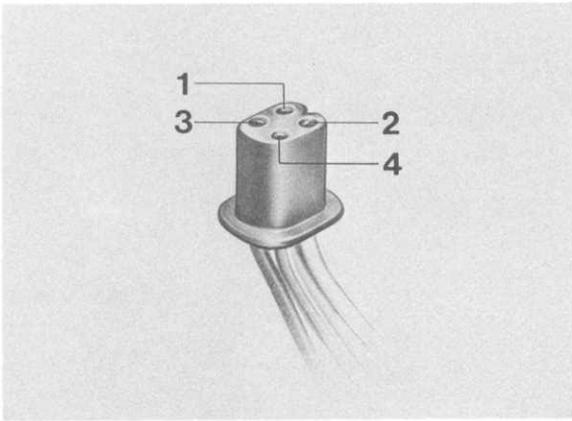
The central locking system can only function properly when the lock mechanism moves easily, does not seize and the lock cylinders are okay.

Removing Controls and Checking Function after Removal

1. Remove door trim panel.

If still disconnected, connect multiple pin plug of wire harness for passenger's door.

2. Pull off plugs on control and check plug connections.



- 1 = green/black
- 2 = yellow
- 3 = brown
- 4 = red/white

3. There should be battery voltage between lines of red/white term. 4 and brown term, 3 (ignition turned off).

4. With the opposite side in unlocked position, the following voltage conditions should be prevailing at term. 1 and 2:

Wire, yellow term. 2 - with voltage.
Wire, green/black term. 1 - without voltage.

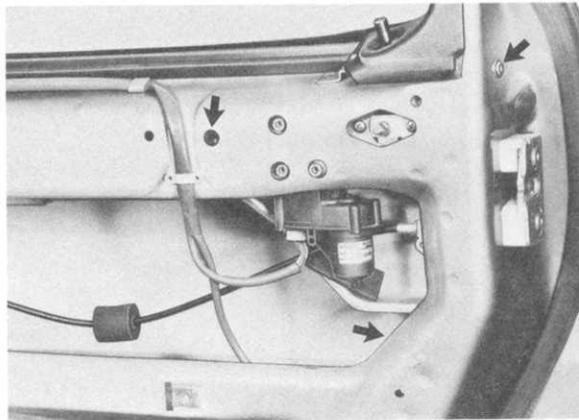
Voltage should be opposite when in locked position.

If voltage is not as described, replace control for opposite side or check wire harness.

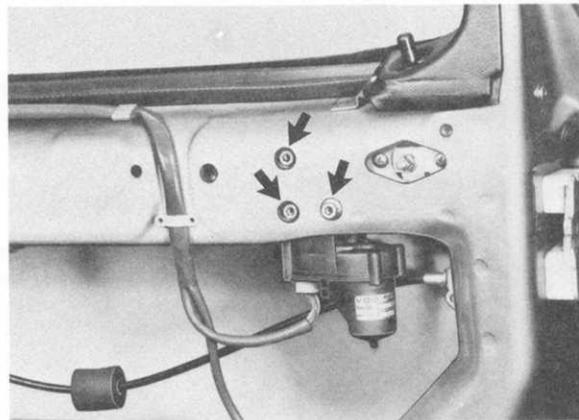
Note

If a test lamp is used to check the plugs, it could happen that the control will be switched on (power flow via test lamp).

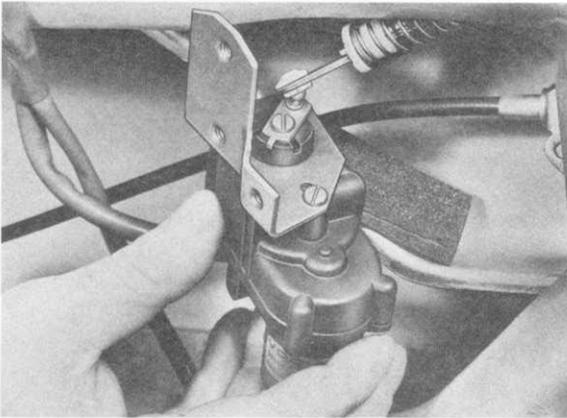
5. Remove lock cover.



6. Remove control.

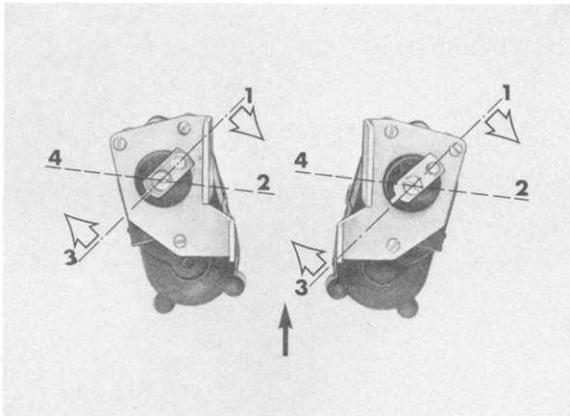


7. Disconnect transmitting linkage at winder.



Winder must turn easily from stop to stop. Replace the control when movement is hard.

8. Connect plugs on removed control (ignition turned off).



Turn winder clockwise from 1 to 2 by hand. Control should switch on in position 2 and continue turning to 3. Turn winder further by hand about 45° (3 to 4). The control should turn further to initial point 1.

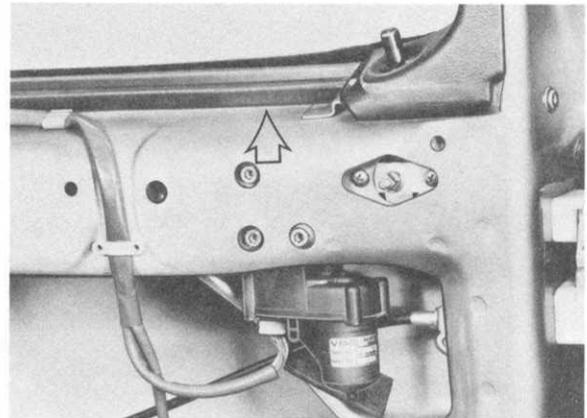
Replace control, if function is not correct.

Installing and Adjusting Control

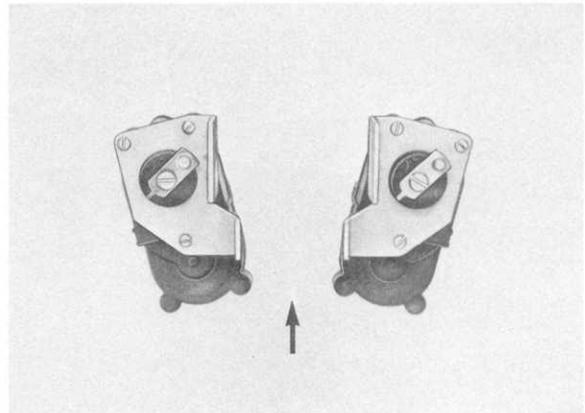
Note

Mount control with the original M 6 x 8 bolts. Longer bolts would impair clearance of winder.

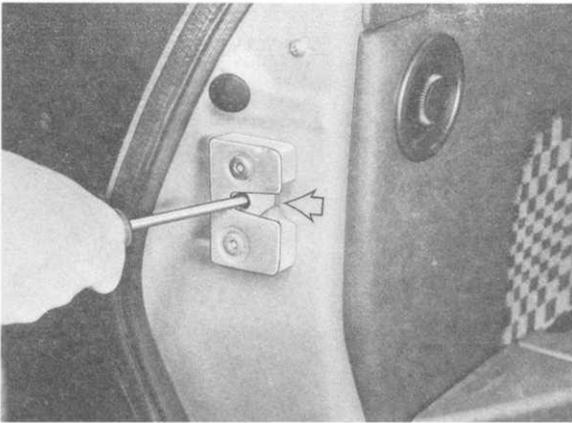
1. Install control.
2. Pull up inner door recess seal above the control, so that position of winder to transmitting linkage can be observed from above after installation of control.



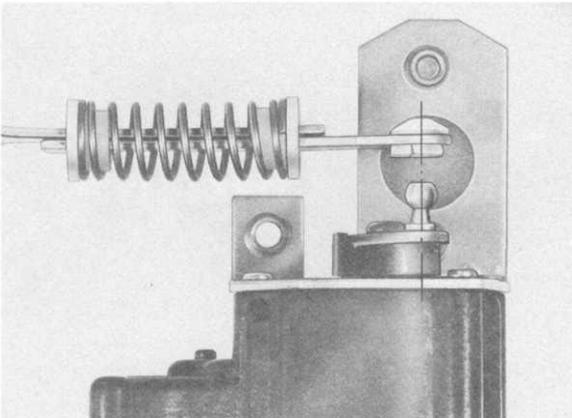
3. New controls are supplied in locked position; the winder faces right in installed position.



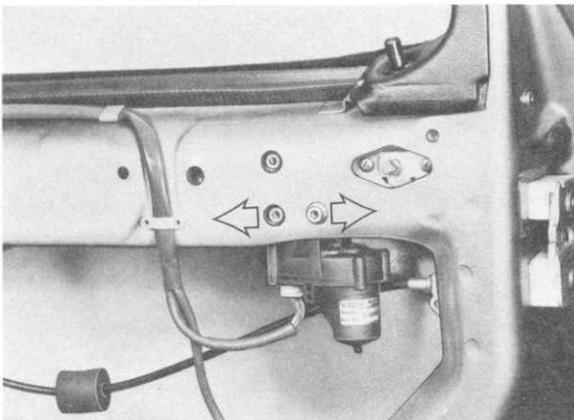
4. To adjust, move lock mechanism of opened door to "closed" position and push in locking button.



5. Hold winder of control in position 1 against stop.
Ball socket on linkage must be aligned with ball head of winder.



If ball socket and ball head are not aligned, correct position of control in mounting bores or file slots, if necessary.



6. Unlock door and open the door lock by operating the inside or outside handle.

7. Check function of locks on both doors prior to final assembly.
Locking buttons must be pushed in by at least 3 mm before the controls run.

Note

Doors can only be locked when both doors are closed. If one door is open when locking the doors, the locking system will return to open state.

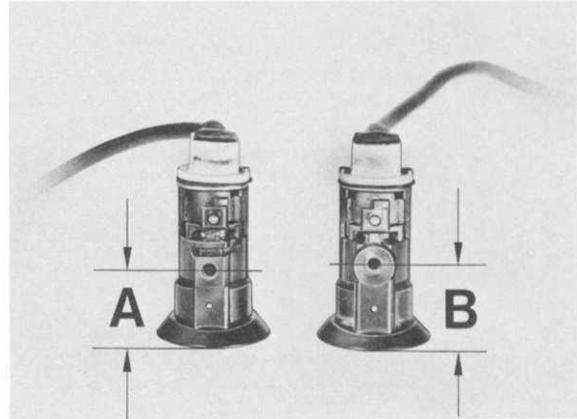
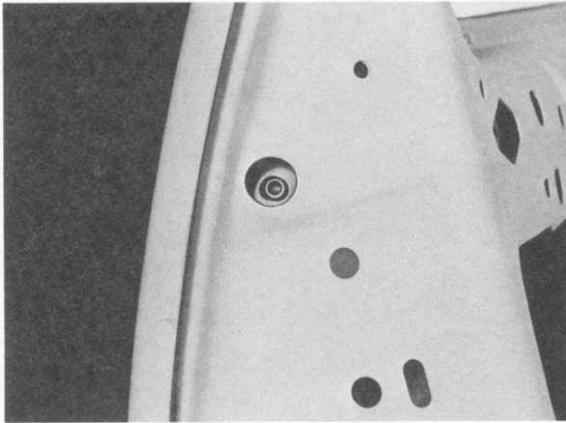
CHANGES ON DOORS AND DOOR LOCK CYLINDERS

The mounting points have been changed on doors and door lock cylinders.

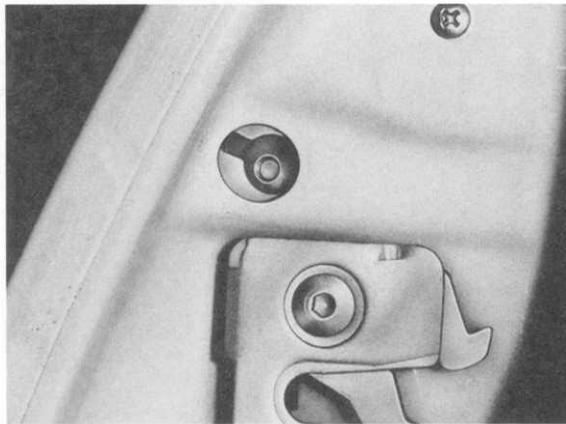
Old Version Door Lock Cylinder –
A 26 mm

New Version Door Lock Cylinder –
B 29 mm

Old Version Doors



New Version Doors

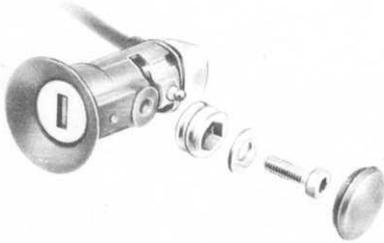


Since the old version doors still have the old mounting point, old or new door lock cylinders may be installed by filing the door mounting point.

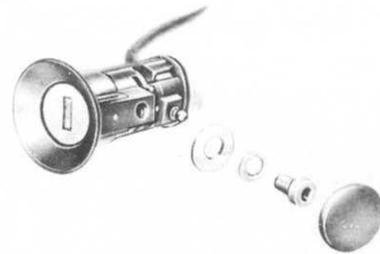
A 6.4 mm dia. washer, a 6 mm dia. lock washer and a M 6 x 8 mm fillister head screw are required to mount the door lock cylinder.



Doors with the new mounting point and new door lock cylinder require a spacer, 6.4 mm dia. washer, and a M 6 x 18 mm fillister head screw.

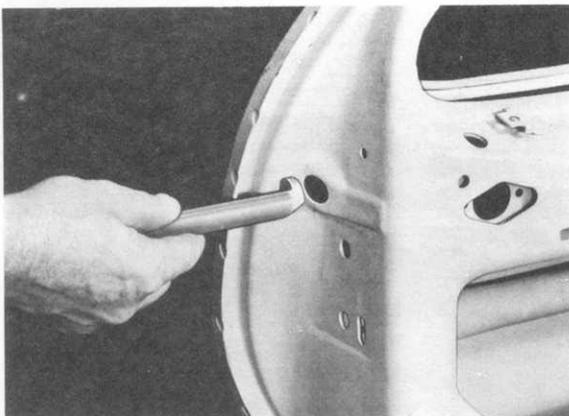


File mounting point if necessary. Installation of the door lock cylinder requires use of a 6.4 mm dia. washer, 6 mm dia. lock washer and a M 6 x 8 mm fillister head screw.



The following procedures are required to install an old door lock cylinder in doors with the new mounting point.

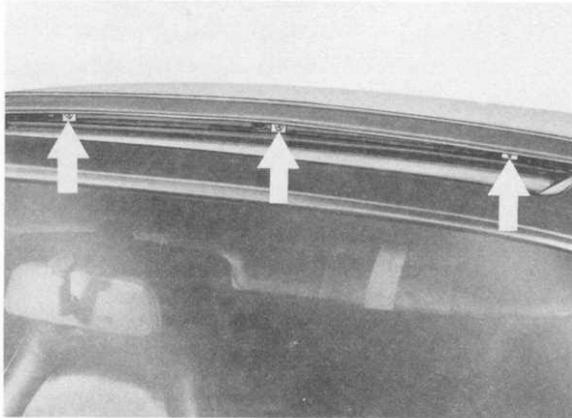
Fit in door lock cylinder. Check distance between mounting point and door lock cylinder. Change mounting point with the locally made tool in such a manner, that door lock cylinder and mounting point are in same level.



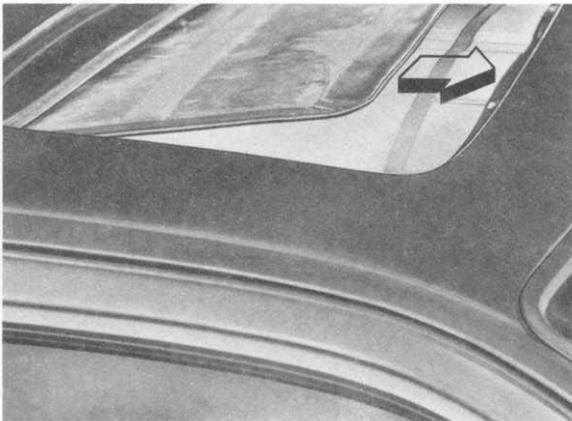
REMOVING AND INSTALLING POWER SUN ROOF (WITHOUT REMOVING GATES)

Removing

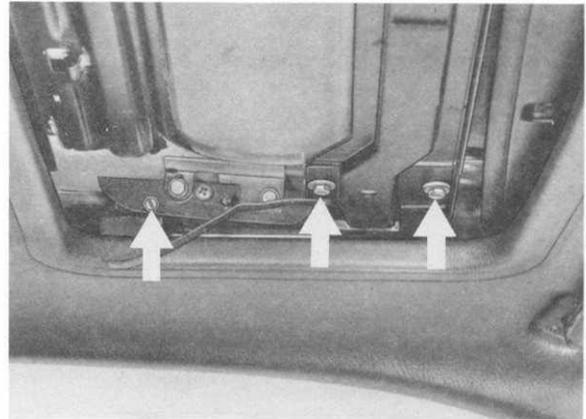
1. Open sun roof lid to rear end position.
Unscrew sun roof liner mounting screws.



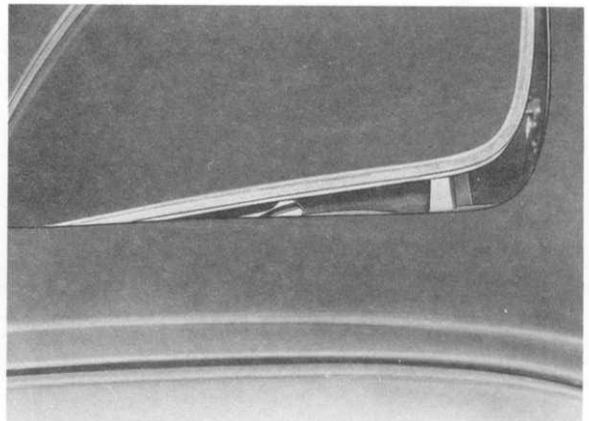
2. Pull out sun roof liner toward front.



3. Detach front guide and gates by loosening screws on sun roof.

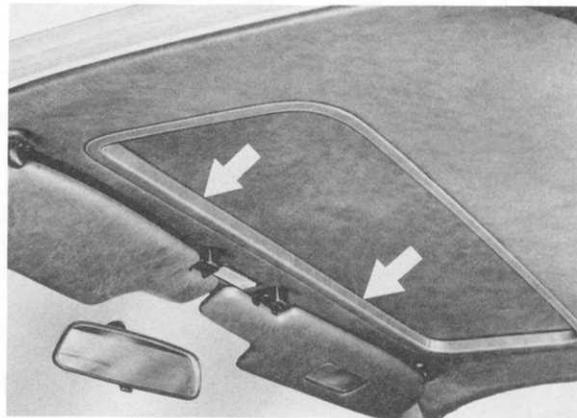
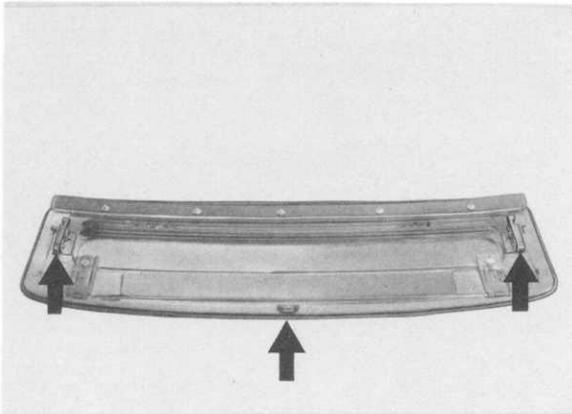


4. Close sun roof lid but for gap of approx. 10 mm. Lift front end of sun roof lid slightly, push back sun roof lid out of guides and lift off toward front.



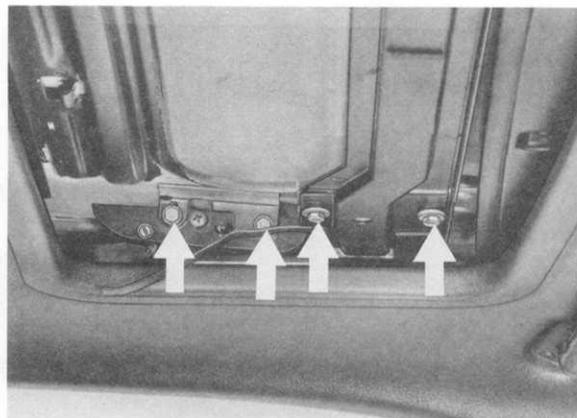
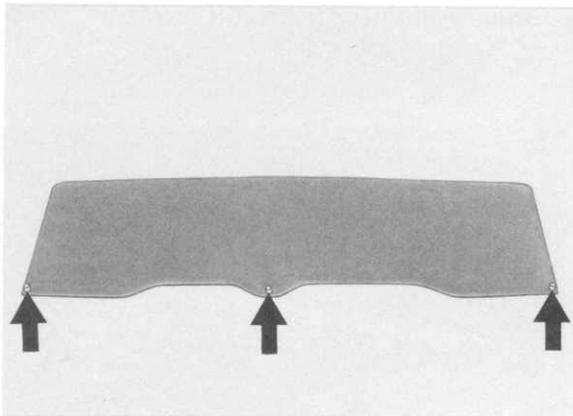
Installing

1. Check attachments before installing the sun roof lid (lid seals, gates and guides). Replace parts, if necessary.



Note

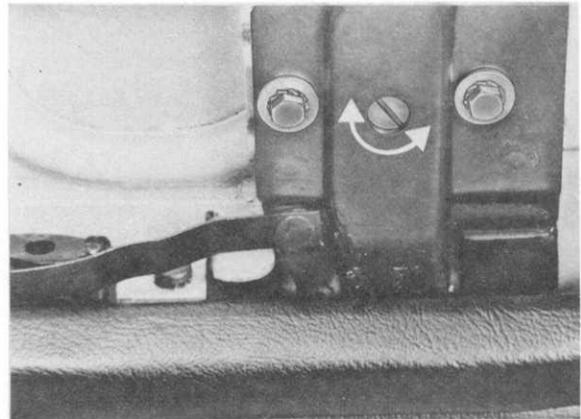
Proceed as follows, if sun roof lid had been disconnected on the gate mounting screws or the gates had been replaced.



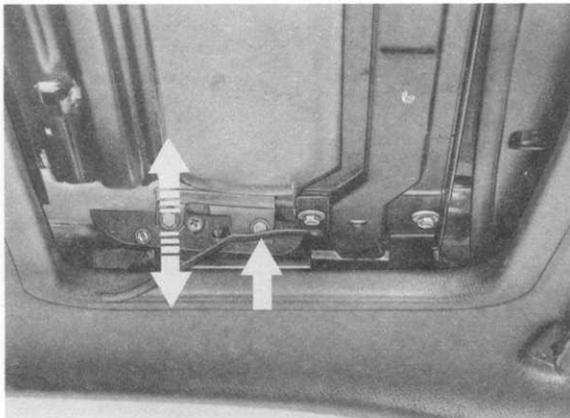
Installation is in reverse sequence.

2. Adjust sun roof liner that trim runs over roof frame without friction.

1. Correct the distance between gates, if necessary between brackets and gates, with washers.



2. After closing the sun roof lid, the rear end of the lid must be in same plane as the roof panel. Height can be corrected with the rear gate screws.

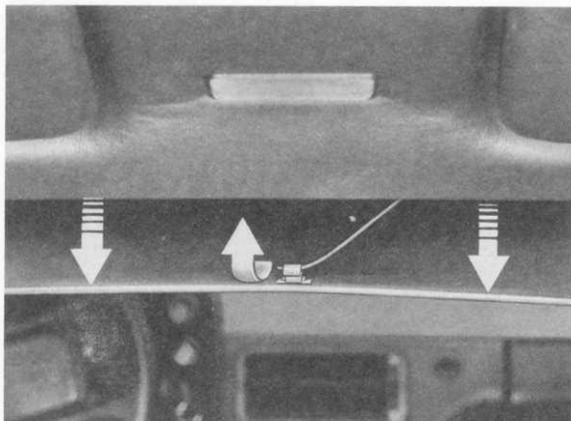


3. The lid's front edge can be adjusted to the roof plane with the recessed adjusting screws, whereby the mounting screws must be loosened first.

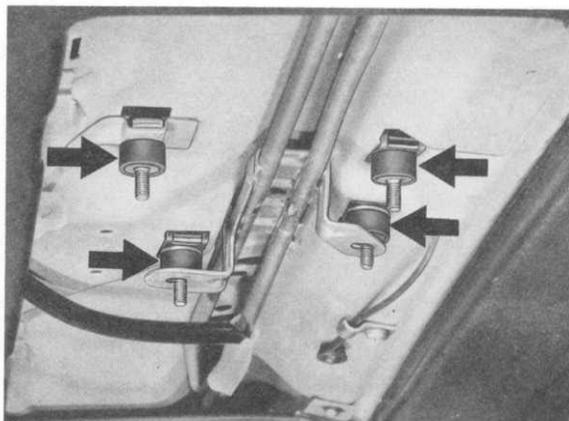
REMOVING AND INSTALLING DRIVE MOTOR AND GEARBOX FOR SUN ROOF

Removing

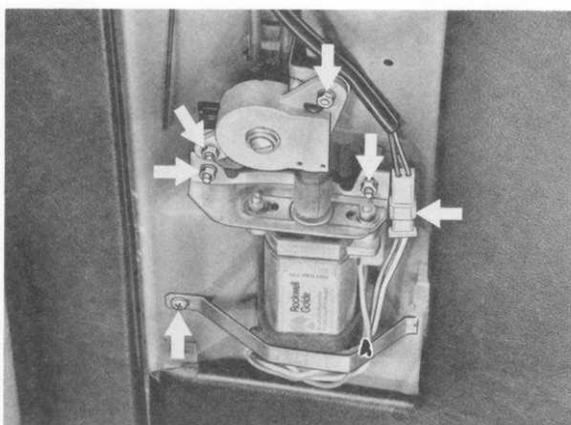
1. Pull down rear end of cover slightly, disconnect spring wire and take off cover toward rear.



3. Check rubber/metal mounts, replacing if necessary.



2. Disconnect wire plugs. Unscrew mounting nuts and screw. Take off motor and gearbox.



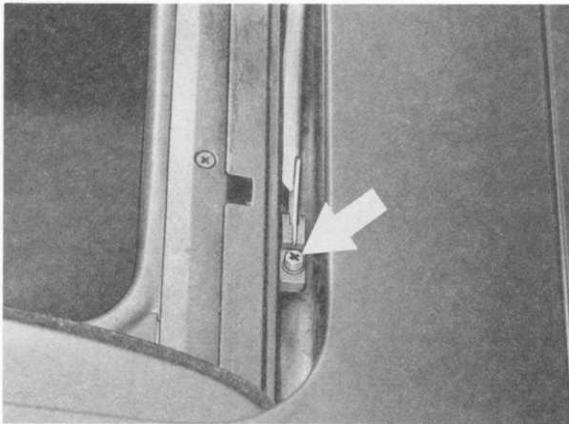
Installing

Check motor, gearbox and clutch for damage before installing, replacing if necessary. Installation is in reverse sequence.

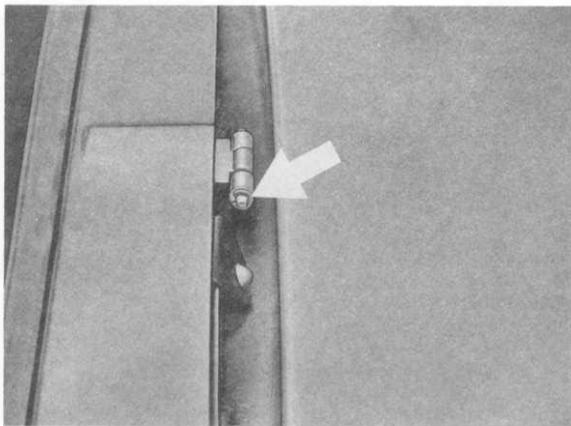
REMOVING AND INSTALLING WIND DEFLECTOR FOR SUN ROOF

Removing

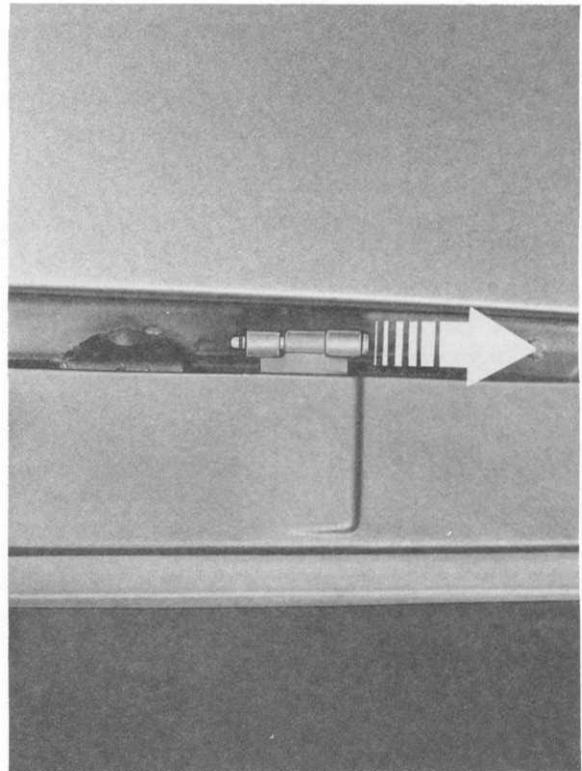
1. Open sun roof lid and unscrew deflector opener mounting screws.



2. Unclip locks on pins.

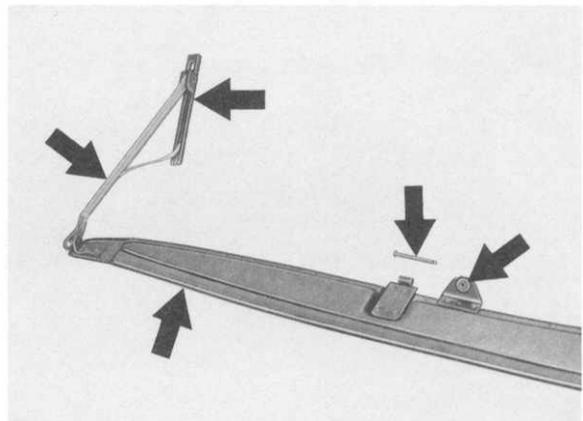


3. Press pins out of hinges and take wind deflector with opener out of car.



Installing

1. Inspect all parts (rubber pads, opener, pins, washers and locks), replacing parts when necessary, before installing the wind deflector.



2. Installation is in reverse sequence.

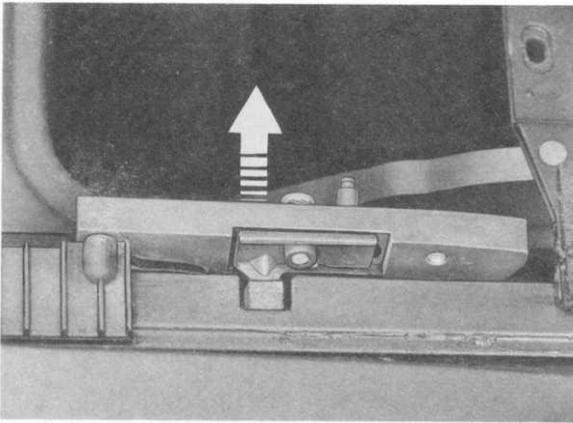
REMOVING AND INSTALLING GATES, GUIDE, CABLES AND GUIDE RAILS

Note

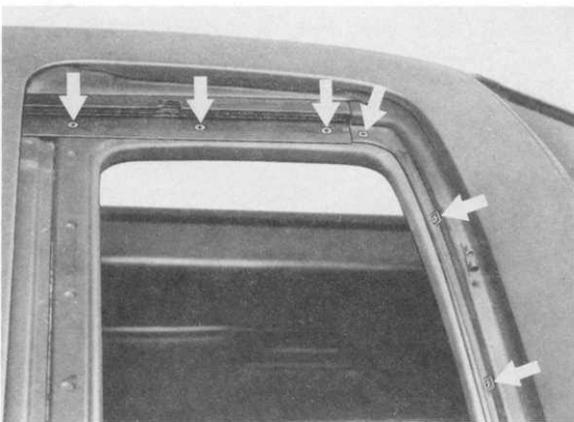
Sun roof gearbox is removed.

Removing

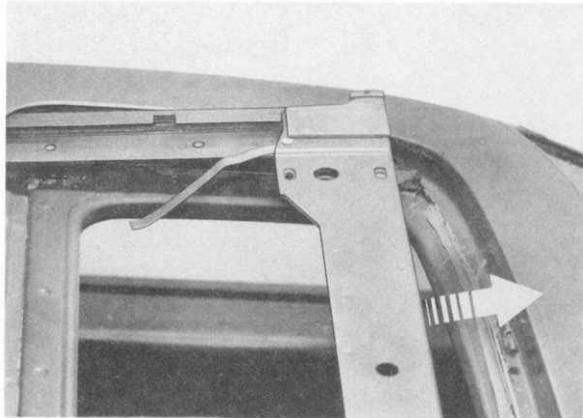
1. Take gates off of guide rails toward inside.



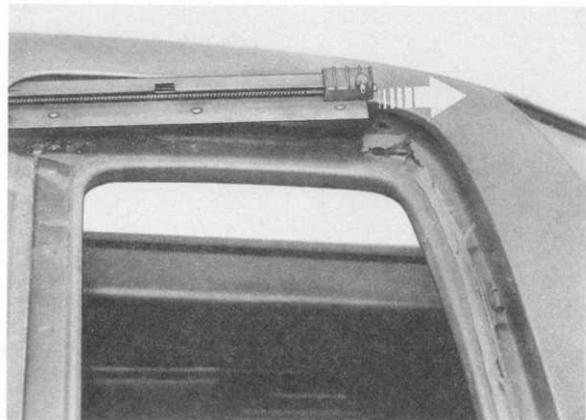
2. Push back front guide, unscrew mounting screws of front cover plate and guide rails, and lift off cover plate.



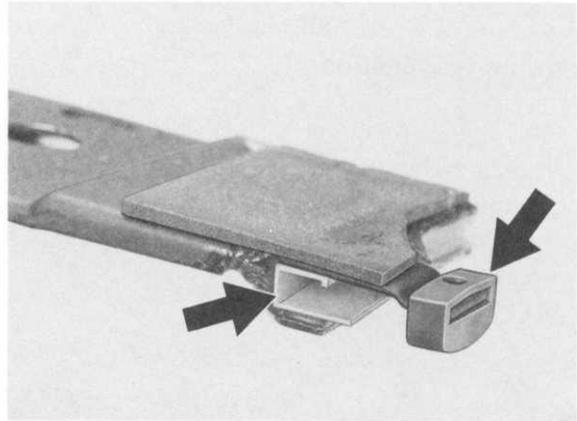
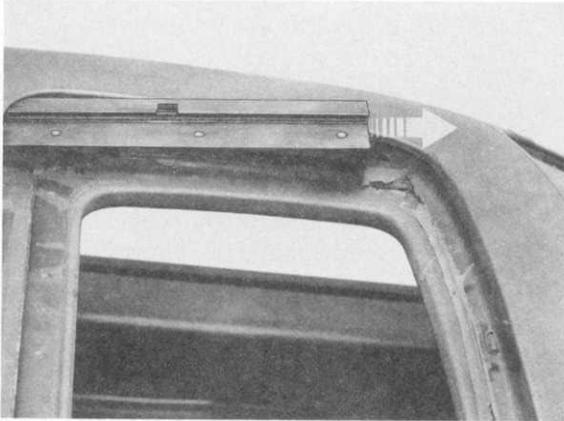
3. Lift front end of guide rails and push out guide toward front.



4. Pull out cables toward front (only possible after removal of gearbox).



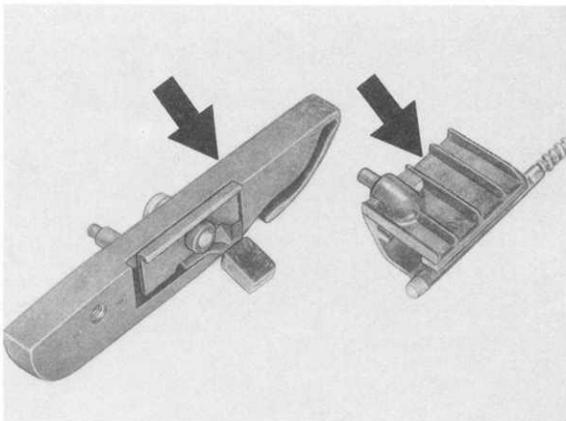
5. Pull guide rails out of spring clamps and remove toward front.



Installing

Inspect all parts for damage before installing, replacing parts if necessary.

Lubricate all parts thoroughly with a special grease, e.g. Golde LS 2049 (application range from $-20^{\circ} / 4^{\circ} \text{ F}$ + $90^{\circ} \text{ C} / 194^{\circ} \text{ F}$).

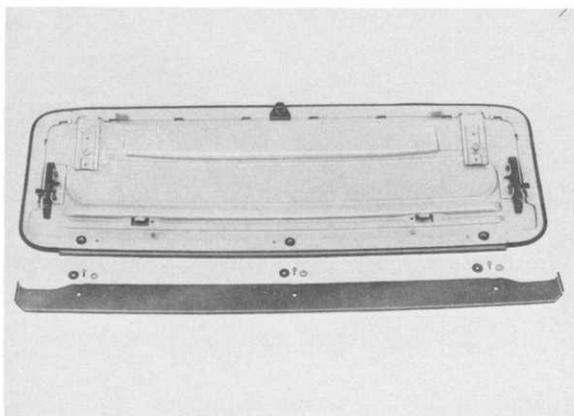


Installation is in reverse sequence.

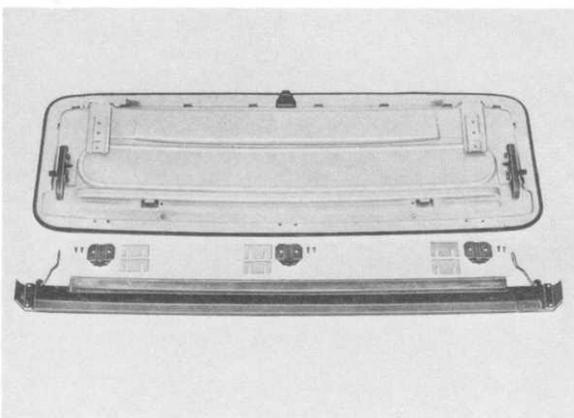
MODIFICATIONS ON SUN ROOF

Different modifications have been made on the sun roof since 1978 models to improve the function.

1. The rear cross guide with the connecting rods attached to the gates and stop plates bolted on the sun roof and shim plates have been omitted and replaced by a water drain plate, which is bolted direct to the sun roof lid at rear.

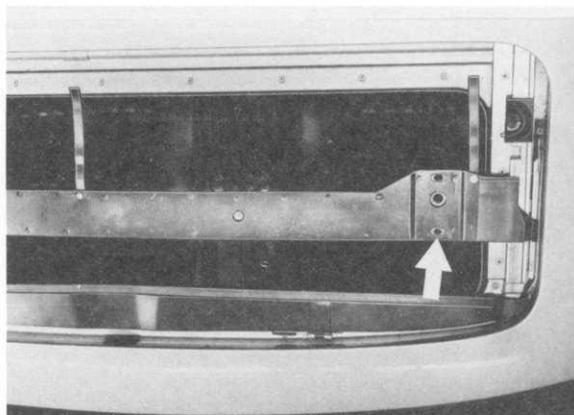


New Version



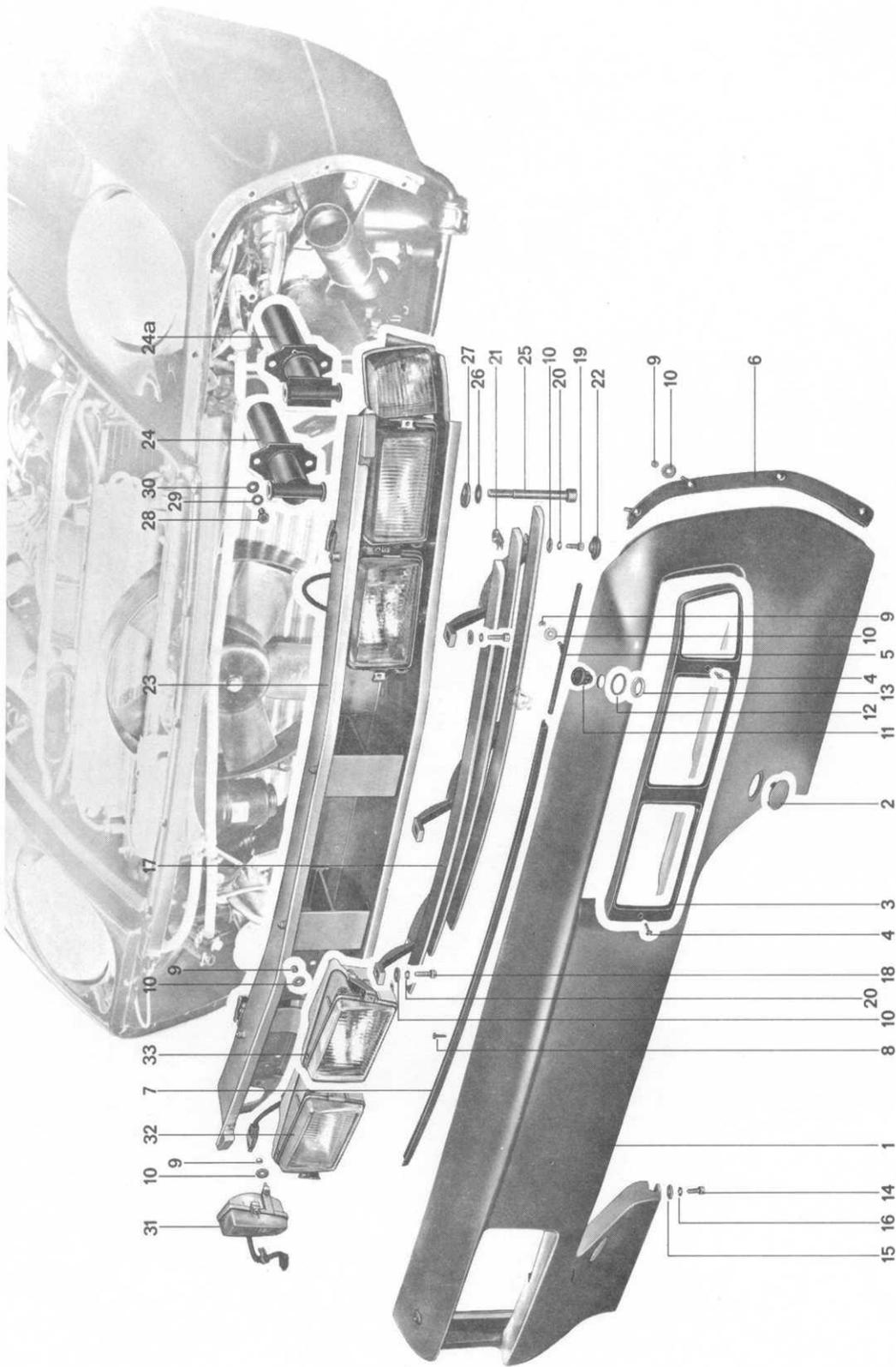
Old Version

2. The velvet strip applied on the sun roof lid all around was replaced by a new part, which has an additionally flaked lip to prevent wind noise and improve sealing.
3. The front bolt holes in the front guide rails and lid hinge have been moved forward by 12 mm. In addition, in the middle of the new guide rail there is a third spring tongue resting against the sun roof head liner.



4. The height of the sun roof frame has been increased to improve clearance for lowering and returning.

REMOVING AND INSTALLING BUMPERS



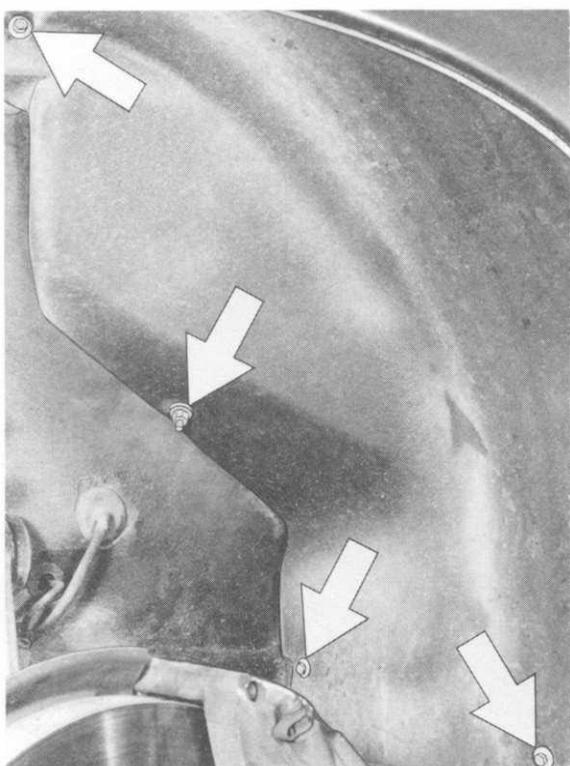
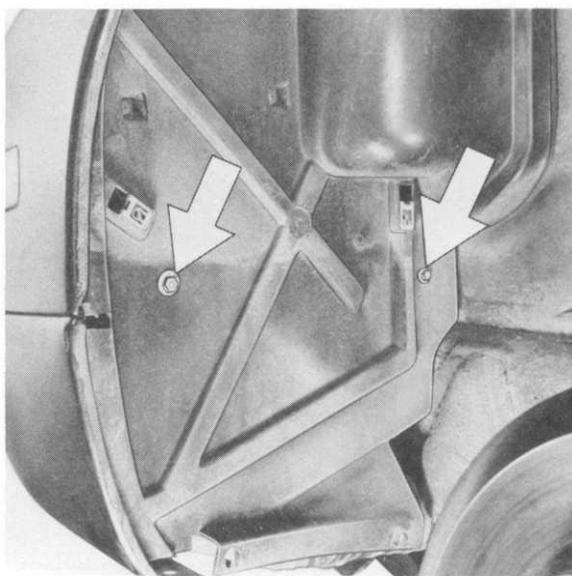
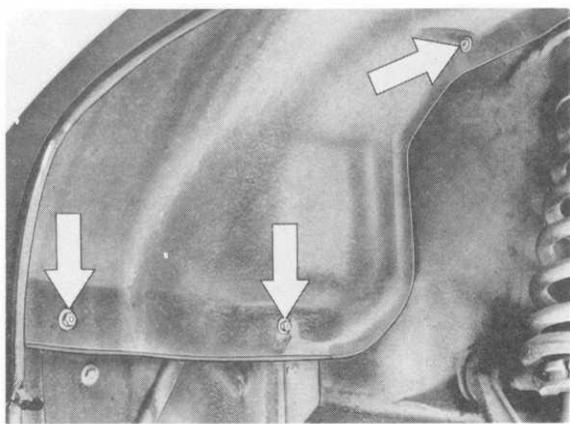
No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
1	Panel	1	Detach at fender and top and bottom cross member, then pull forward a little and disconnect hose at spray jet	First fit panel on body, machine/grind off bearing surfaces. Rivet holding strips. Paint with PUR paint and install weatherstrip	
2	End cover	2			
3	Cover frame	2			
4	Metal screw	4			
5	Holding strip, upper	2	Replace, if necessary. Drill out rivets	Mount on panel with pop rivets	
6	Holding strip, side	2	Replace, if necessary. Drill out rivets	Mount on panel with pop rivets	
7	Cover rail	1	Replace, if necessary		
8	Metal screw	5			
9	Self-locking nut	30			
10	Washer	30			
11	Headlight spray jet	2	Open hose clip, detach hose	Aim at center of headlight with 9135	
12	Gasket	2			
13	Plastic nut	2			
14	Screw	2			
15	Washer	2			
16	Lockwasher	2			
17	Radiator grill	1	Replace, if necessary	Insert plugs in mounting holes on bottom cross member	
18	Screw	3			
19	Screw	3			
20	Lockwasher	6			
21	Cage nut	3			

No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
22	Rubber plug	3			
23	Carrier	1	Straighten only slight damage, otherwise replace		
24	Impact tube	2	Replace damaged parts	Bolt on carrier to fit body	
24a	Impact absorber	2	Replace damaged parts	Bolt on carrier to fit body	
25	Cyl. head bolt	2			
26	Washer	2			
27	Eccentric disc	2		Carrier can be offset depending on installed position	
28	Bolt	4			
29	Washer	4			
30	Washer	4			
31	Turn signal	2	Remove carrier, then disassemble	Mount on carrier before installation. Adjust on finished car. Fasten wires with clips	
32	High beam headlight	2			
33	Fog headlight	2			

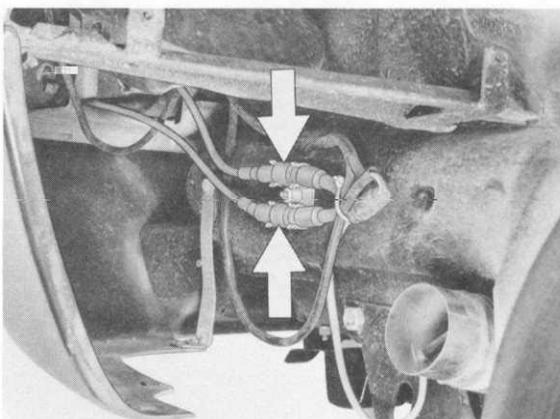
REMOVING AND INSTALLING NOSE PANEL, '87 MODELS ONWARD

Removing

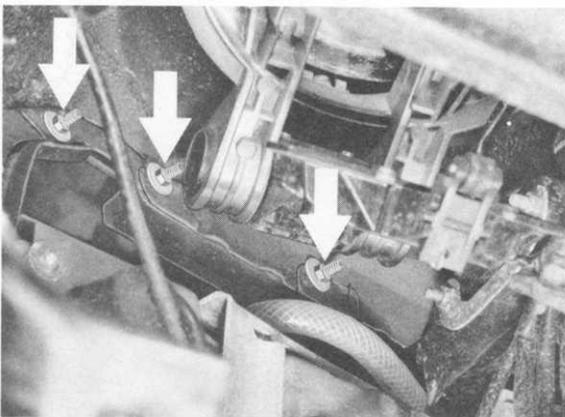
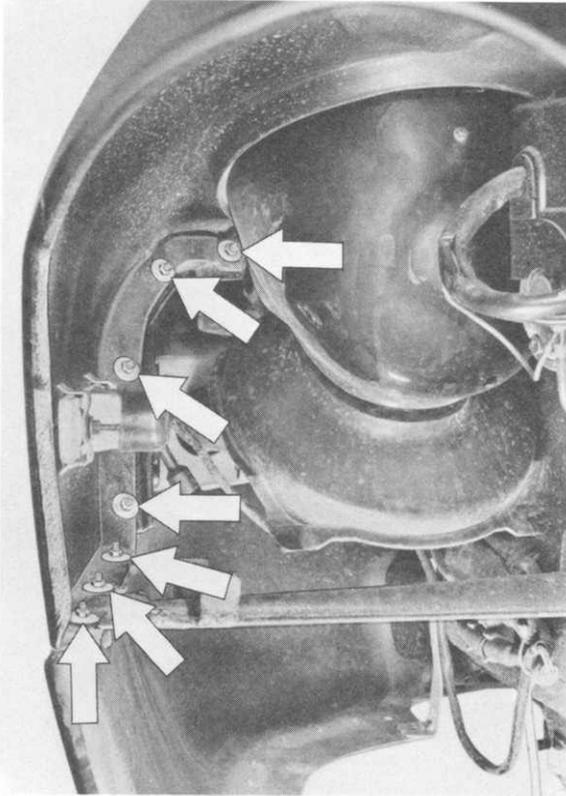
1. Remove wheels and front air dam.
2. Remove wheel-arch inner panel mounting bolts and remove wheel-arch inner panels from car.
3. Remove wheel-well cover mounting bolts, disconnect air hose for outside-temperature sensor on left-hand side of car and remove wheel-well covers.
4. Unplug electrical connections.



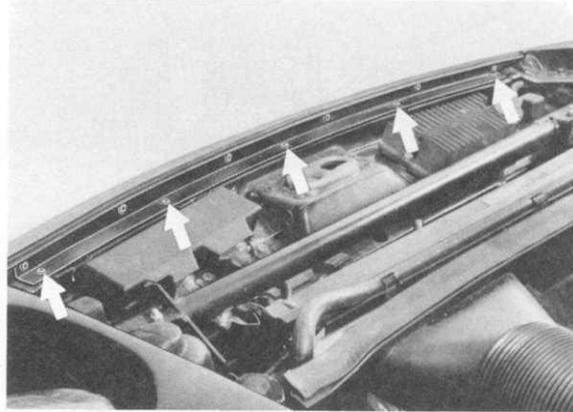
4. Unplug electrical connections.



5. Remove bolts holding panel to front fenders.

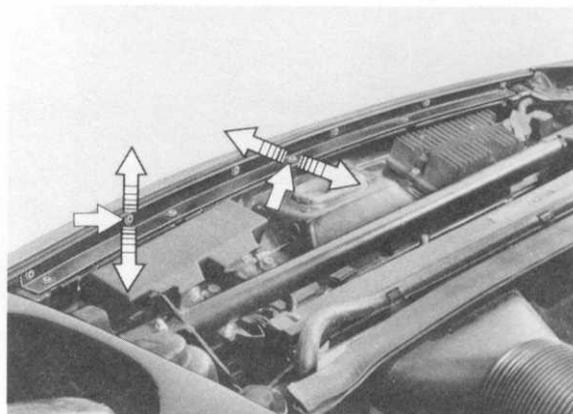


6. Remove cover-strip mounting bolts holding strip to front end section and remove panel from car.



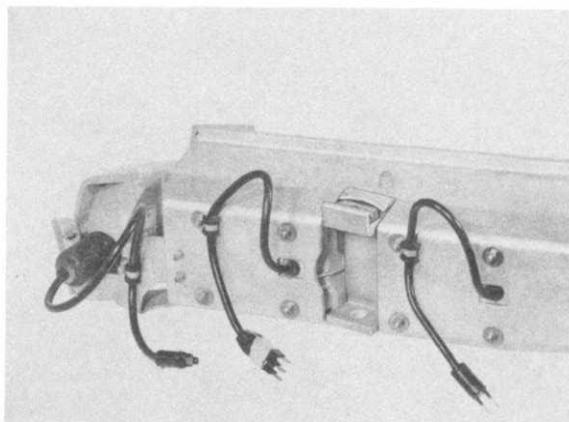
Installing

1. Before installation, check all mounting points and seals and replace seals if necessary.
2. When mounting the panel, check to ensure that the gaps between the lid and the fenders are equal and straight. Adjust at the mounting bolts of the cover strip.



DISASSEMBLING AND ASSEMBLING BUMPERS

The high beam and fog headlights as well as the turn signals are removed or installed with the carrier. Wires are fastened to the carrier with hose clips for protection.



The carrier and/or panel do not have to be removed to replace single parts.

Auxiliary headlights can be replaced after unscrewing the radiator grill and cover frame.

Single turn signal lamps and fog headlights can be replaced from underneath the fender.

Mark wires to prevent mixups!

Note

Until introduction of new PU trim, a weatherstrip is pasted along the entire mating surface to the body and fastened with clips. It is used to compensate for or cover up small irregularities in the body contour.

Painting

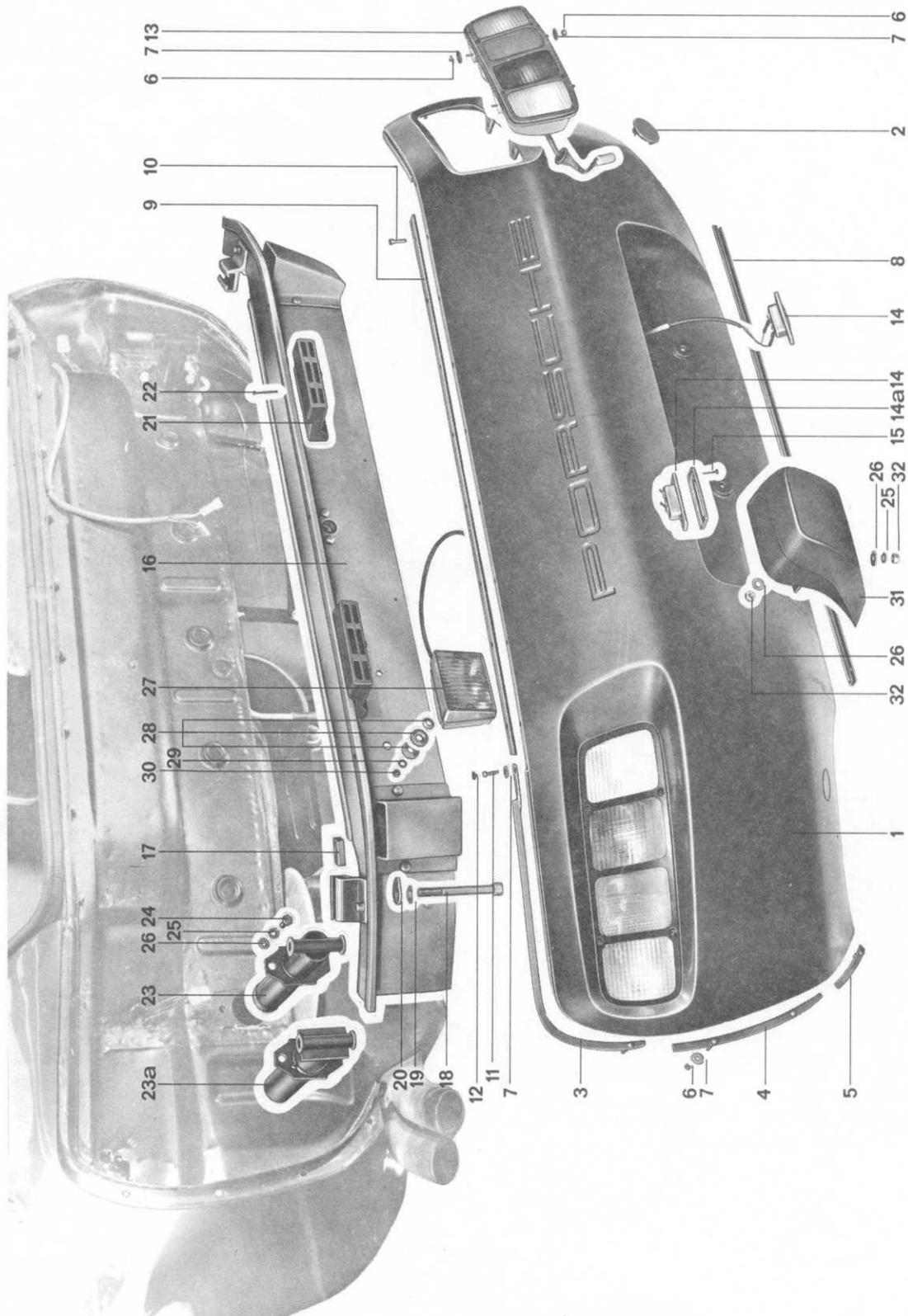
The panels are coated with a special polyurethane (PUR) paint, which is extremely elastic and scratch-proof.

New paint jobs or the painting of large areas require the use of this paint, whereby the entire part must be ground clean and sprayed.

Scratches and small damage areas can be touched up with normal body paints.

When placed in an oven for drying (max. 60^o C) the panels should be placed on aluminum carriers or special stands to prevent permanent distortion.

REMOVING AND INSTALLING BUMPERS



No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
1	Panel	1	Detach panel on inside of fender and top center	Align panel with fender, grind as required, coat with PUR paint, rivet holding strips, install weatherstrip	
2	End cover	2	Pull out, now carrier mounting bolts are accessible		
3	Holding strip, upper	2	Replace, if damaged	Mount on panel with pop rivets	
4	Holding strip, center	2	Replace, if damaged	Mount on panel with pop rivets	
5	Holding strip, lower	2	Replace, if damaged	Mount on panel with pop rivets	
6	Self-locking nut	17			
7	Washer	17			
8	Reinforcement rail	1		Mount to bottom of panel with pop rivets	
9	Cover rail	1			
10	Countersunk screw	5			
11	Allen head screw	9	Replaced by positions 9 + 10		
12	Cap	9	Replaced by positions 9 + 10		
13	Tail light	2			
14	License plate light	2			
14a	Cover frame	2	Unscrew, pull out lamp, pull off wires		
15	Metal screw	4			
16	Carrier	1	Straighten only slight damage, otherwise replace		

No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
17	Threaded plate	2		Lock in guide	
18	Cyl. head bolt	2	Accessible after removal of end cover		
19	Washer	2			
20	Eccentric disc	2		Carrier will be offset depending on installed position	
21	Support	2			
22	Metal screw	2		Bolt support to carrier	
23	Impact tube	2	Replace damaged parts	Align installed position with carrier	
23a	Impact absorber	2	Replace damaged parts	Align installed position with carrier	
24	Bolt	4			
25	Lockwasher	8			
26	Washer	8			
27	Tail fog light	1	Pull off cover frame	Cut out opening in new panel with a knife. Install light on carrier and adjust	
28	Washer	3			
29	Lockwasher	1			
30	Nut	1			
31	Rubber pad (USA)	2	Detach from carrier	Cut out holder opening in new panel, measure hole and install	
32	Self-locking nut	4			

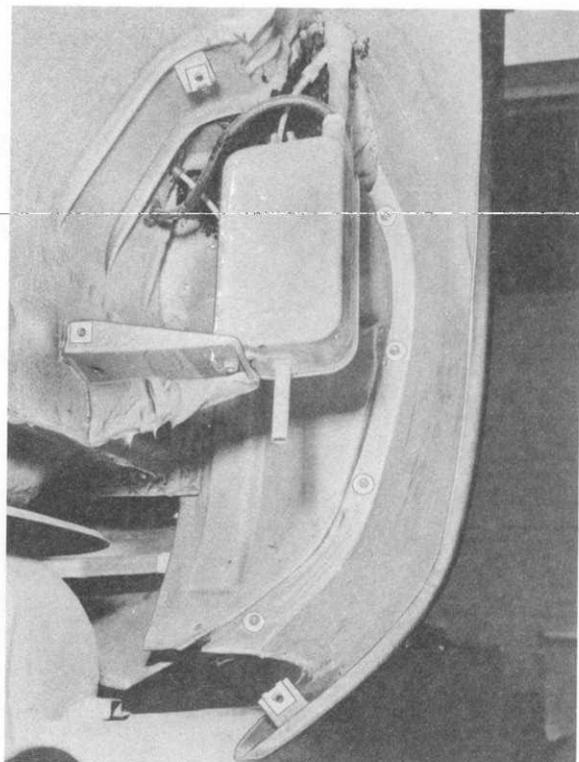
REMOVING AND INSTALLING BUMPER

1. The panel is bolted to fender with five bolts on the right side and four bolts on the left side. First remove plastic cover on left rear wheel house.



2. Until introduction of new PU panels, a weatherstrip has to be pasted on the mating surfaces to the rear side panels and fastened with clips. In this manner small irregularities in the body contour can be equalized or covered up.

3. Tail lights can be removed with the panel, if rubber grommets are pulled out of tail panel and the then accessible plugs are disconnected.

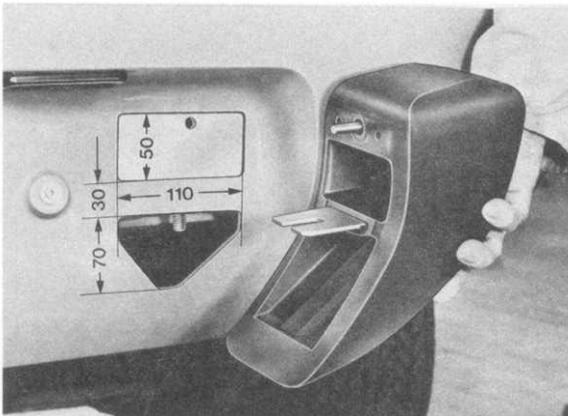


4. Tears or impressions in PU parts can be pasted and filled in with engineering adhesives from 3 M, Art. No. 8101 or 3535 B/A.

The mounting of rubber pads on the rear bumper has been changed for USA cars since the 1979 models.

Cut out the bumper trim in area of the rubber pads prior to installing.

Openings around the bolt and holder must be generous enough that the trim cannot be stressed or damaged when installing the rubber pads.



Note

It is recommended to make the openings with a piercing saw.
Dimensions in mm.

Painting

The PU panels are coated with a special polyurethane (PUR) paint, which is extremely elastic and scratchproof.

New paint jobs or the painting of large damaged areas require this paint, whereby the entire part must be ground clean and sprayed.

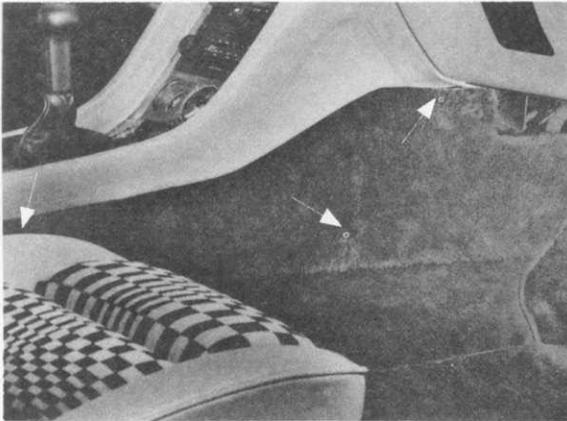
Only scratches or insignificant paint damage can be touched up with normal body paint.

Panels installed free of tension, no waves or distortion visible, do not have to be removed when car is placed in an oven for drying (max. object temperature 80° C).

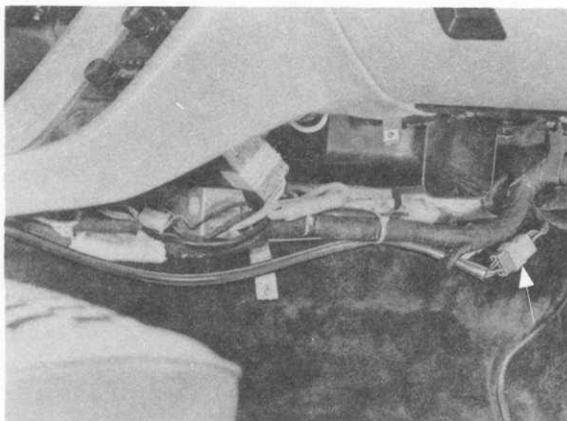
When drying panels in an oven (max. 60° C), make sure that outer surfaces are not loaded (e.g. place on styroper packing material or aluminum carriers). This will prevent permanent distortion.

REMOVING AND INSTALLING POWER WINDOW OPERATING SWITCH

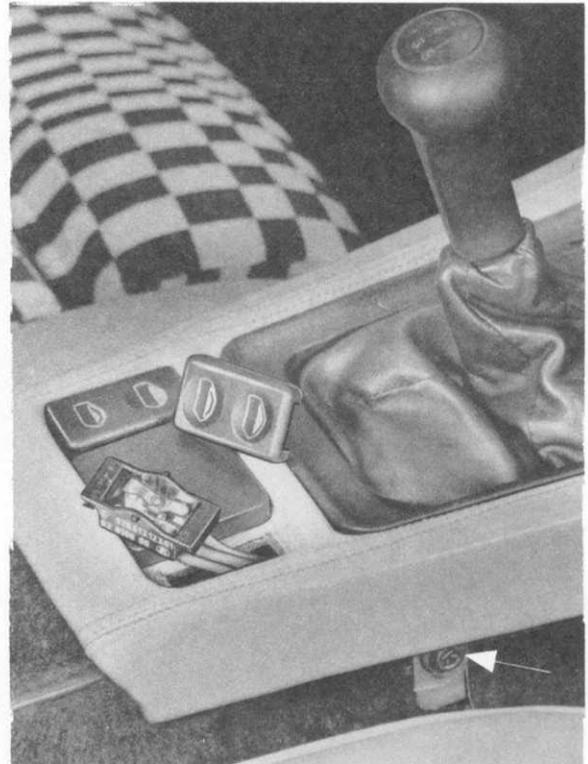
1. Unscrew side trim from center console (2 screws), pull off clip and press down trim.



2. Disconnect coupling on wire harness.



3. Loosen rear of center console, press up and press out switch.



INSTALLING ADHESIVE PLATE FOR INSIDE REAR VIEW MIRROR

An inside rear view mirror which has fallen off can be pasted again, if the adhesive plate (Part No. 477 845 043) and glass are not damaged.

Also applicable for the Sekuriflex-windshield.

Materials Required

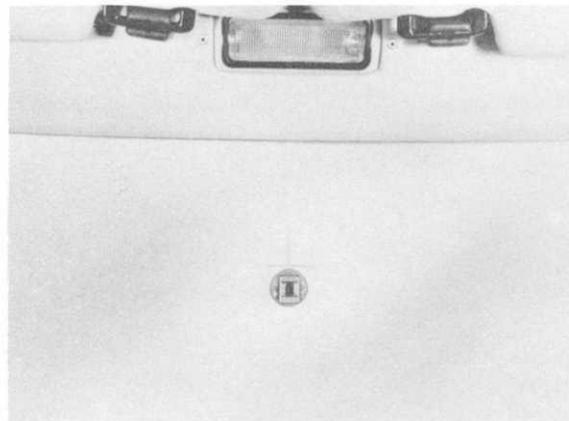
Loctite 312, Part No: 000.043.051.00

Activator Loctite NF

Part No. 000.043.052.00

Installing Mirror Base

1. Mark installed position on outside of glass. Dimensions: 110 mm from roof edge to mirror base ca. 630 mm from A pillar to center of glass.
2. Remove all remainders of adhesive from windshield and adhesive plate and clean with fresh gasolin 80/110.
3. Spray a thin coat of Activator 312 NF on adhesive surface of windshield and allow to dry about 2 minutes.
4. Inject one drop of Loctite 312 on to adhesive plate and press on firmly. Turn adhesive plate, until some Loctite squeezes out on edges.
5. Position adhesive plate correctly, holding groove vertical, and press on for about 30 to 40 seconds.
6. Install inside mirror carefully after waiting about 1 hour.

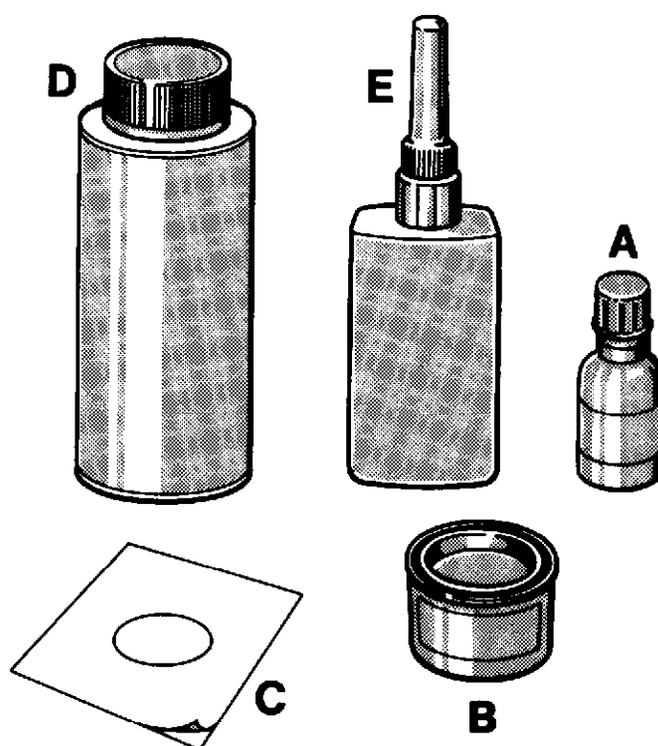


Note

After 1 hour approx. 60% and after 24 hours 100% of the adhesive strength has been reached.

Bonding the interior rearview mirror in place

The following materials are required for bonding of the complete interior rearview mirror:



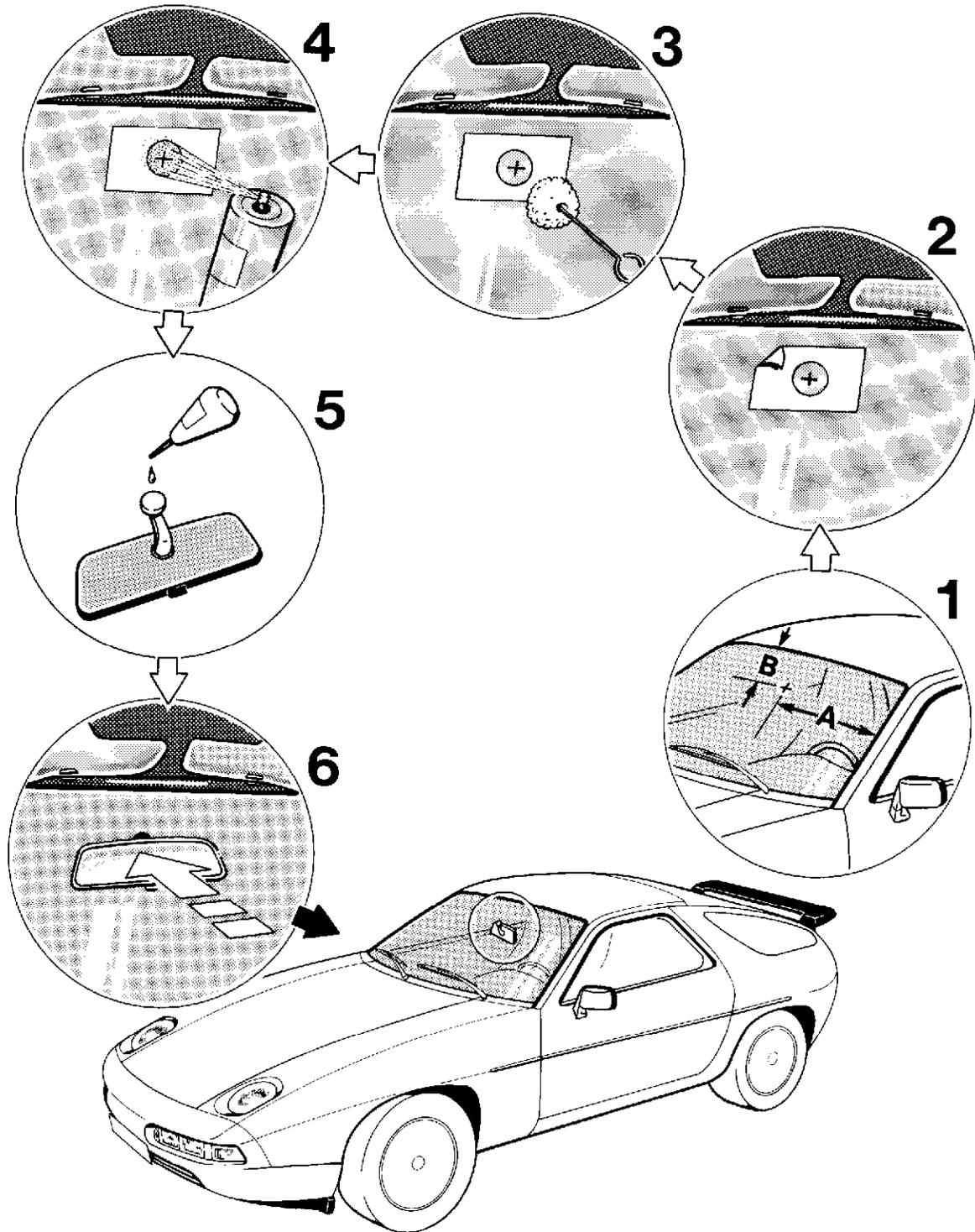
752-64

A	=	Cleaning solution (000.043.157.00)*
B	=	Primer (000.043.158.00)*
C	=	Cover sheet (000.043.177.00)*
D	=	Activator (000.043.052.00)*
E	=	Adhesive (000.043.051.00)*

* Porsche part no.

Bonding the interior rearview mirror in place

Bonding the fully assembled interior mirror to the windshield



Bonding the interior rearview mirror in place

Bonding the fully assembled interior mirror to the windshield

No.	Operation	Instructions
1	Mark position of interior rearview mirror	Mark position of adhesive plate on outside of windshield. Dimension A = 630 mm Dimension B = 110 mm
	Remove adhesive residue	Remove adhesive residue from windshield mechanically using a scraper. Remove adhesive residue from bonding plate of rearview mirror mechanically using a scraper.
	Roughen bonding plate of rearview mirror	Roughen bonding plate of rearview mirror mechanically using sanding paper.
	Clean bonding plate of rearview mirror	Clean bonding plate of rearview mirror using cleaning solution (A) .
	Clean bonding area of windshield	Clean bonding area of windshield using cleaning solution (A) .
2	Mask off bonding area of windshield	Mask off bonding area of windshield using primer template (cover sheet C). The position mark of the interior rearview mirror must be visible in the middle of the primer template.
3	Prime bonding area of windshield	Apply a thin coat of primer (B) to the masked bonding area of the windshield.

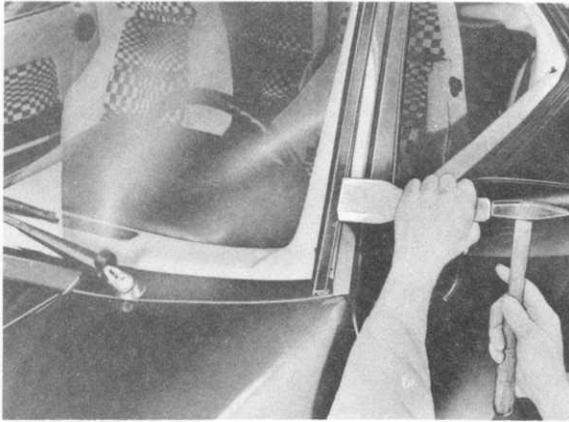
Caution: Allow a flash-off time of 15 to 20 minutes!

No.	Operation	Instructions
4	Activate bonding area of windshield	Spray activator (D) onto bonding area of the windshield. Caution: Allow a flash-off time of 2 minutes!
	Remove primer template	
5	Apply adhesive to bonding plate	Apply a drop of adhesive (E) to the bonding plate of the rearview mirror.
6	Bond rearview mirror in place	Press bonding plate of rearview mirror against primered and activated windshield area. Note: Press mirror in place for approx. 40 – 50 sec.!
		Note: Bonding strength 60 % after 1 hour 100 % after 24 hours

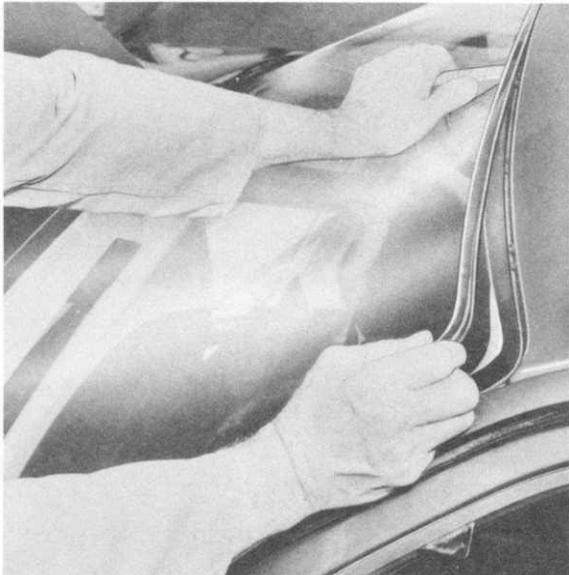
REMOVING AND INSTALLING WINDSHIELD

Removing

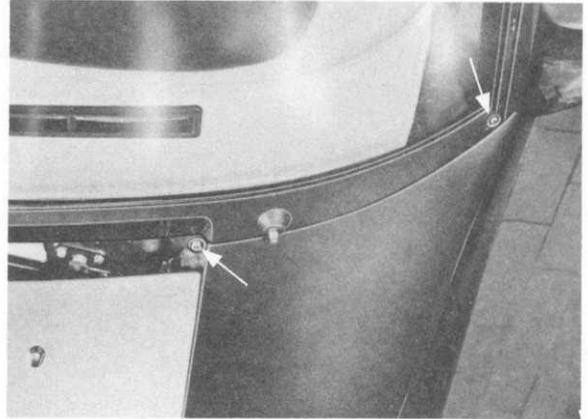
1. Lift off cap on windshield wiper and loosen screws. Set up wiper arm and move it back and forth, until the wiper arm can be removed.
2. Knock side ornamental strips off of retaining rail with a wood wedge.



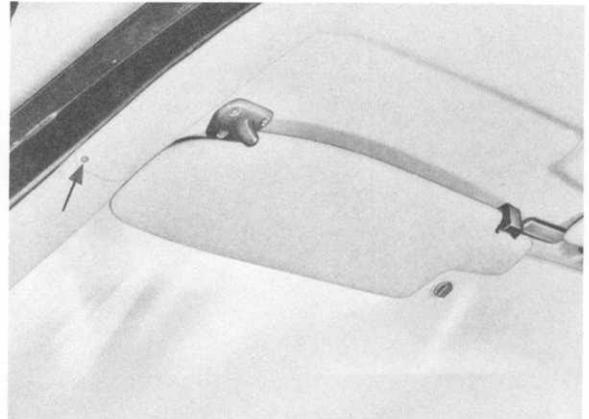
3. Pull out upper ornamental strip.



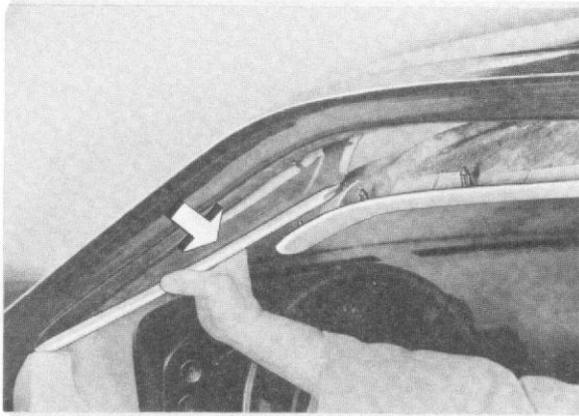
4. Open engine hood, unscrew and remove apron panel.



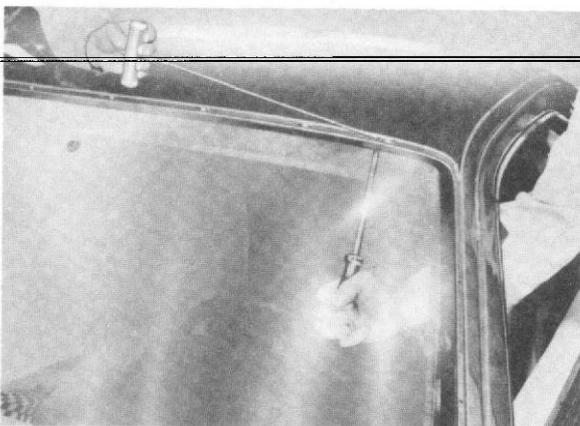
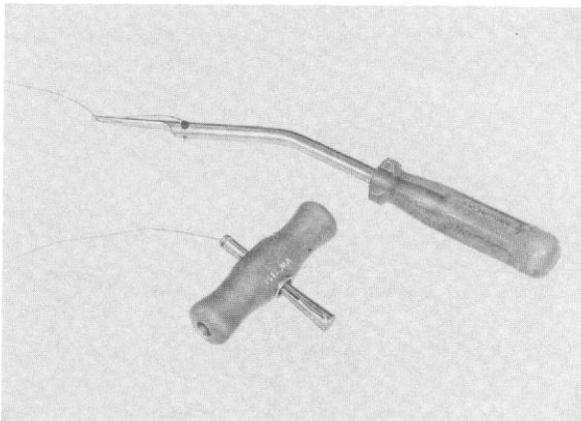
5. Unscrew sun visor mounts. Remove inside mirror by pressing up. Remove metal screw (see arrow) from A pillar. Pull down headliner on left and right sides far enough that the front clips can be disconnected.



6. First press side pads up and in, and then pull them out.



7. Press the steel wire from Repair Kit 477 898 011 through windshield weatherstrip at an upper corner and secure it inside of Special Tool VW 1351 (similar to a screwdriver). Now pull the wire toward the inside and hold it on the weatherstrip with the special tool. Use the grip to pull the wire in up to this point. Repeat this procedure around entire windshield.



Note

To prevent the weatherstrip from sticking together again, press out the window glass carefully at the same time or place a small block underneath.

Broken windows can be pressed out and the weatherstrip cut through with a knife.

Cover inside of car to protect sensitive areas against glass splitters.

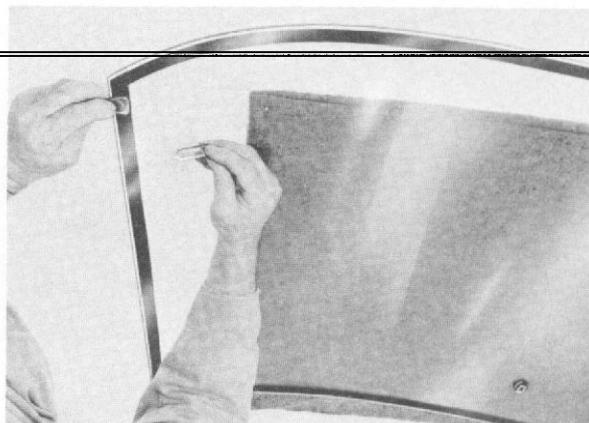
8. Remove remainders of adhesive from window and flange.

Note

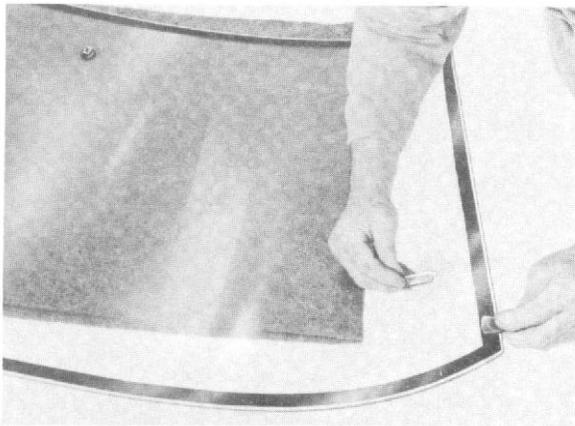
Remainders of adhesive are best removed from window and flange by dabbing with a little sealant material.

Installing

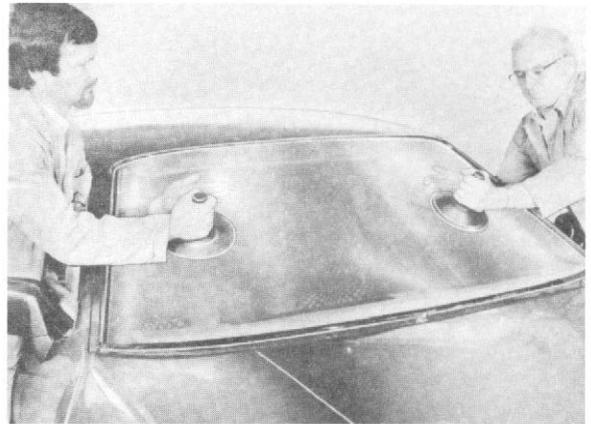
1. Place windshield in body, position and mark. Place spacer blocks on bottom window flange.
2. Clean edge of glass and flange with acetone.



3. Apply a coat of primer to adhesive surfaces on window and flange.



5. Install window glass with suction cups. Press on tight enough all around, that sealing cord fits well everywhere. Distance between flange and upper edge of glass should be 10.5 mm.



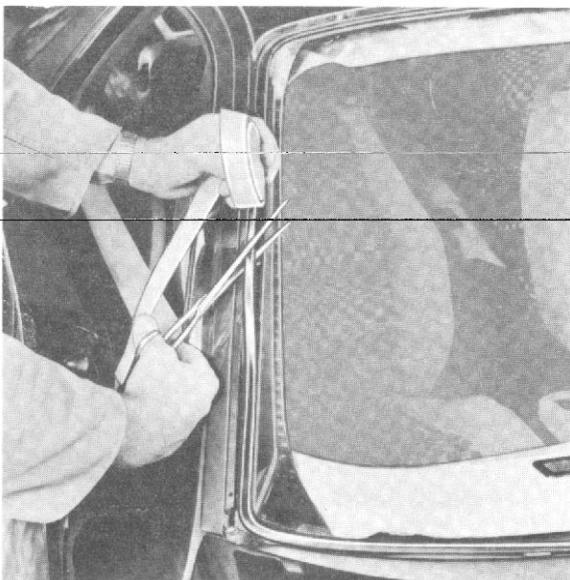
Note

Do not apply a second coat of priming solution after air-drying; this would impair adhesion.

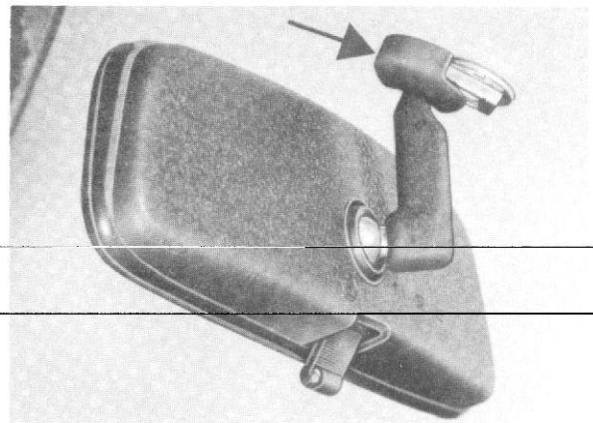
6. Install ornamental strips.

7. Install side pads, headliner and sun visors.

4. Place cord seal in window opening and connect ends with a diagonal cut.



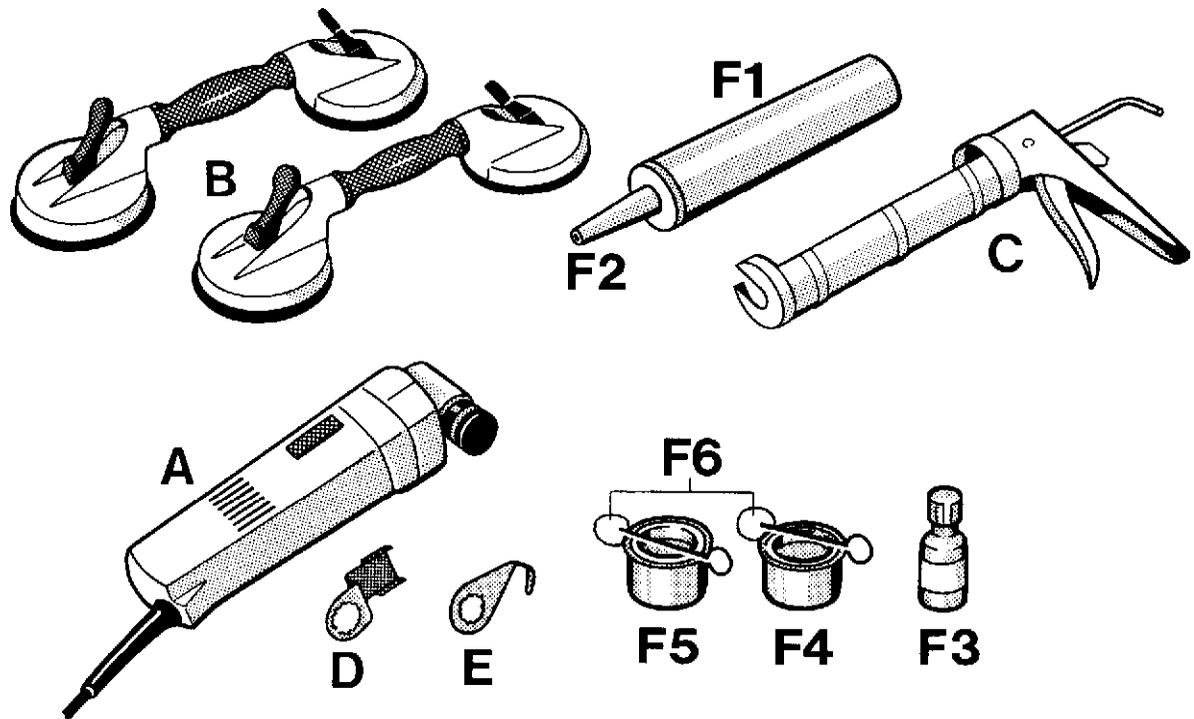
8. Install inside mirror.



9. Install apron panel and windshield wipers.

Removing and installing the bonded windshield

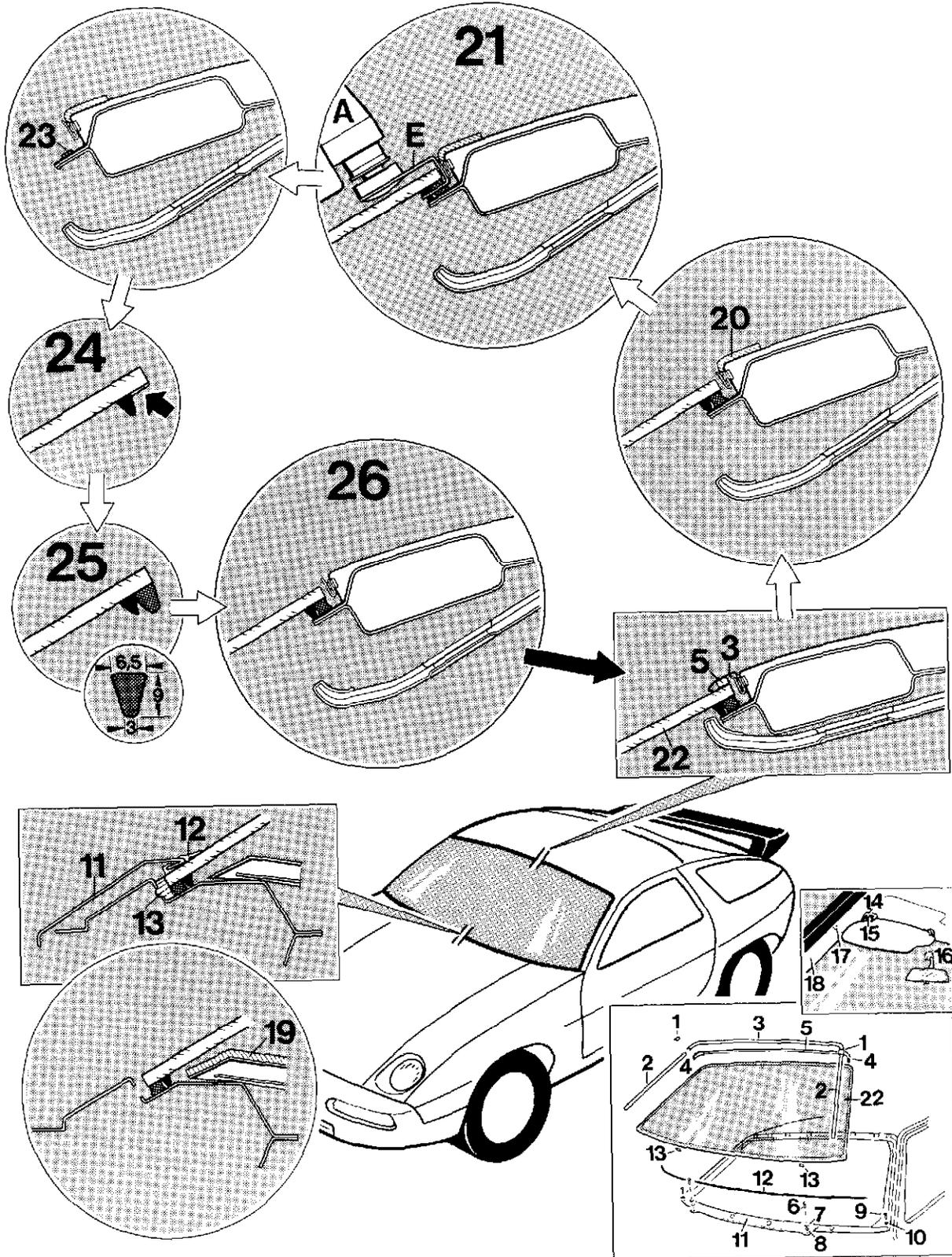
The following tools and materials are required for removal and installation of the bonded windshield:



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A	Cutting device	VAG 1561	VW Werk AG
B	Double suction cup		VAG 1344CS equipment sales
C	Glue gun	VAG 1344/1	
D	Scrapping knife	6.39.03.113.02.2	e.g. C & E FEIN GmbH & Co. Postfach 172 7000 Stuttgart 1
E	Cutting knife U-shape	6.39.03.127.01.4	
F	Adhesive set	000.043.038.01	Porsche Parts Service
F1	- Adhesive sealing comp.		
F2	- Working nozzle		
F3	- Cleaning solution		
F4	- Body primer		
F5	- Glass primer		
F6	- Swab		

Removing and installing the bonded windshield



Removing and installing the bonded windshield

No.	Work step	Instructions
	Remove the wipers	Unscrew the hexagon nuts, lift off washers and wipers.
1	<i>Move sleeves</i>	Separate transition from cover strips at top to water collection strip on right and left by moving the sleeves.
2	<i>Remove the water collection strips</i>	Drive the right and left water collection strips out of the holding rails by means of a wooden wedge.
3	Remove the top cover strip	Remove the top cover strip from the plug-in clips using a plastic or wooden wedge. Remove the adhesive tape and sealing tapes.
4	- <i>Top cover strip</i>	
4	- <i>Sealing tapes</i>	
5	- <i>Adhesive tape</i>	
6	Remove the cowl panels	Open lid. Unscrew hexagon sheet metal screws. Remove washers. Unscrew one sheet metal screw in each case at the right and left ends of the cowl panel, remove washers and remove cowl panel with seal.
7	- <i>Hexagon sheet metal screws</i>	
7	- <i>Washers</i>	
8	- <i>Sealing washers</i>	
9	- <i>Sheet metal screws</i>	
10	- <i>Washers</i>	
11	- <i>Cowl panel</i>	
12	- <i>Seal</i>	
13	<i>Remove spacerblocks</i>	Remove the spacer blocks at the bottom between the bodywork and windshield.
14	Unscrew the sun visor bearing	Unscrew the slotted oval trim-head tapping screws and remove the sun visor bearing with sun visor.
14	- <i>Slotted oval trim-head tapping screws</i>	
15	- <i>Sun visor bearing</i>	
16	Lift off the inside mirror	Lift off the inside mirror upwards from the fixing plate parallel to the windshield.

No.	Work step	Instructions
17 18	Remove the A - column panels - <i>Sheet metal screw</i> - <i>A - column panel</i>	Unscrew the sheet metal screw on the A-column. Unhook the front clips by pulling down the headlining on the right and left. Press the A-column panels inwards at the top and then pull out.
19	<i>Attach a cover to the instrument panel</i>	Cover the instrument panel to avoid soiling or damage.
	Open the door windows	Lower the door window panes. Important: The door windows must be closed again only after completion of the hardening time.
20	<i>Attach adhesive tape to the bodywork</i>	Mask the bodywork in the visible area of the window cut-out with adhesive tape to protect the paint work.
21	Cut out the windshield	Equip the cutting device (A) with a cranked knife (E). Sharpen the cutting knife with a whetting stone with the machine running. Insert the cutting knife between the bodywork and windshield and set the oscillation controller to step 4. Cut through the adhesive bonding between the windshield and bodywork all-round.
22	<i>Remove the windshield</i>	
23	<i>Remove the adhesive sealing compound on the bodywork</i>	Equip the cutting device (a) with a scraping knife (D) and remove the adhesive sealing compound on the bodywork so far that there is still a full covering of remaining adhesive.
	Clean the window cut-out in the bodywork	Clean the window cut-out in the bodywork thoroughly with cleaning solution (F3). Important: No cleaning solution residue must remain on the bodywork.

No.	Work step	Instructions
	Prime damaged locations on the bodywork	Prime damage to the top coat in the invisible area of the window cut-out with body primer (F4).
	Remove the adhesive tape on the bodywork	
	Clean the windshield	Clean the area of the windshield to be glued thoroughly with cleaning solution (F3).
24	Apply a prime coat to the windshield	Apply glass primer (F5) all-round to the area of the windshield to be glued. Important: The glass primer requires a drying time of at least 15 minutes. No adhesive sealing compound must be applied before expiry of this time.
25	Apply adhesive sealing compound to the windshield	Using the glue gun, apply adhesive sealing compound (F1) all-round on the surface of the windshield to be glued in the form of a tapered bead (C). Important: The windshield must be installed in the vehicle within a maximum of 10 minutes after adhesive application.
	Position the double suction cups on the outer side of the windshield	
	Insert the spacer blocks	Insert the spacer blocks for positioning the windshield at the bottom in the bodywork (cowl).
26	Insert the windshield in the bodywork	Place the prepared windshield in the window cut-out of the bodywork, align and press on with the double suction cups (B). The windshield must rest on the spacer blocks at the bottom.

No.	Work step	Instructions
	Clean the vision areas	Excess adhesive sealing compound must be removed immediately and the affected vision areas cleaned with cleaning solution (F3).
	Remove the cover on the instrument panel	
	Install the A-column panels	Insert the A-column panels, clip in the headlining again by pressing up and insert sheet metal screws.
	Fit the inside mirror	Push the inside mirror onto the fixing plate parallel to the windshield.
	Fit the sun visors	Secure the sun visor bearings with sun visors on the right and left with three slotted oval trim-head tapping screws in each case.
	Fit the cowl panel	Insert the cowl panel with seal and screw in the hexagon sheet metal screws with the corresponding washers. Secure the right and left ends of the cowl panel with one sheet metal screw and washer in each case.
	Fit the top cover strip	Attach the adhesive tape and sealing tapes. Secure the top cover strip to the plug-in clips with fitted sleeves.
	Install the water collection strip	Push the right and left water collection strips onto the holding rails. Produce a transition from the top cover strip to the right and left water collection strips by moving the sleeves.
	Fit the wipers	Slip on the wipers, put on washers and screw tight with hexagon nuts.

Important:

In order to guarantee sufficient strength of the adhesive bond, the following parameter conditions must be observed:

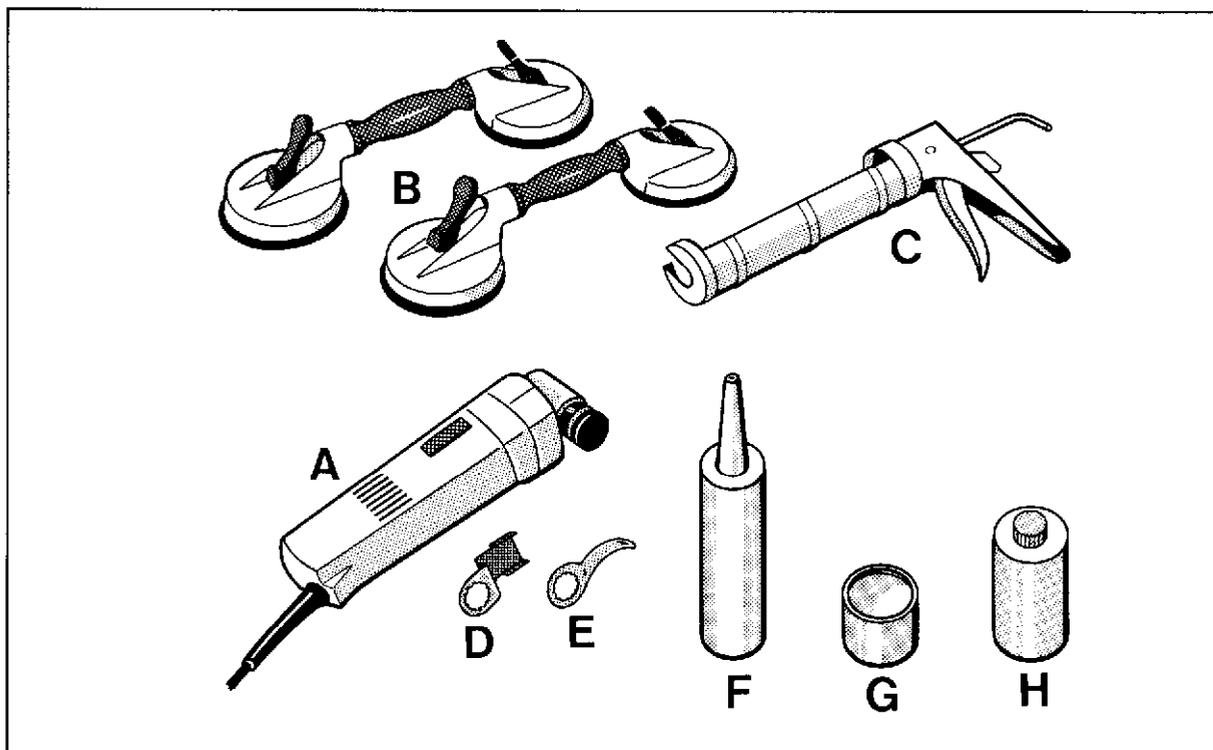
Hardening time	10 h	
Temperature	min.	15°C
Relative humidity	min. 40%	

The hardening time is extended at lower temperatures and with a lower relative humidity.

The vehicle must not be put into operation before expiry of the hardening time!

Removing and installing the bonded rear side window

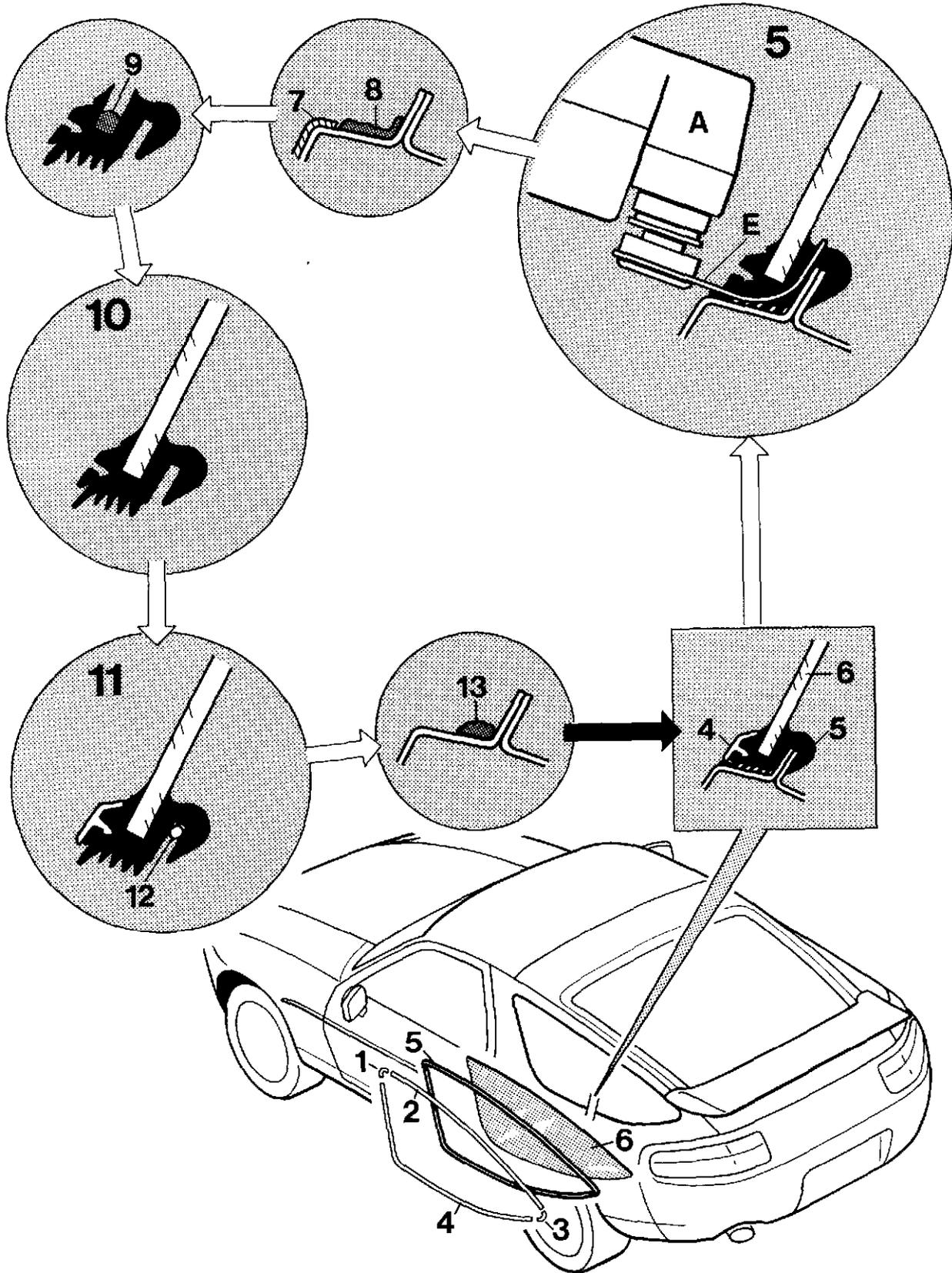
The following tools and materials are required for removal and installation of the bonded rear side windows:



64 - 114

A	Cutting device	VAG 1561	VW Werk AG
B	Double suction cups	VAG 1344	CS equipment sales
C	Glue gun	VAG 1344/1	
D	Scraping knife	6.39.03.113.02.2	e.g. C & E FEIN GmbH & Co. Postfach 172 7000 Stuttgart 1
E	Curved cutting knife	6.39.03.103.01.7	
F	Adhesive sealing comp.	999.915.400.40	Porsche Parts Service
G	Body primer	999.915.487.40	
H	Cleaning solution	999.915.478.40	

Removing and installing the bonded rear side window



Removing and installing the bonded rear side window

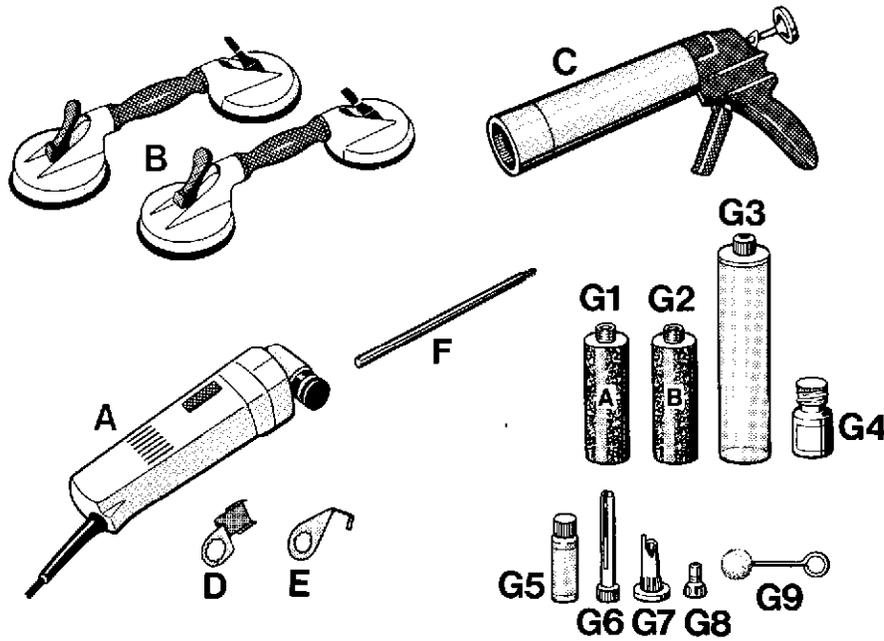
No.	Work step	Instructions
1	Pull off the decorative frame - <i>Corner piece, top</i>	Carefully release the decorative frame from the rubber seal in the area of the top corner piece using a wooden or plastic spatula. Insert fabric cloths between the decorative frame and rubber seal and pull out the decorative frame by pulling the fabric cloth along the rubber seal.
2	- <i>Decorative frame part, top</i>	
3	- <i>Corner piece, bottom</i>	
4	- <i>Decorative frame part, bottom</i>	
5	<i>Cut through</i> the rubber seal	Equip the cutting device (A) with the curved knife (E). Sharpen the cutting knife with a whetting stone when the machine is running. Insert the cutting knife in the rubber seal, set the oscillation controller to step 6 and cut through the rubber seal all-round between the rear side window and body work.
6	<i>Remove the rear side window</i> Pull the rubber seal residue off the bodywork	
7	<i>Attach</i> adhesive tape to the bodywork	Mask the bodywork in the visible area of the window cut-out with adhesive tape to protect the paint work.
8	<i>Remove the adhesive sealing compound on the bodywork</i> Clean the window cut-out in the bodywork	Equip the cutting device (A) with the scraping knife (C) and remove the adhesive sealing compound on the bodywork so far so that there is still full coverage with adhesive residue. Thoroughly clean the window cut-out in the bodywork with cleaning solution (H). Important: No cleaning solution residue must remain on the bodywork.

No.	Work step	Instructions
	Prime damaged locations on the bodywork	Prime damage to the top coat in the non-visible area of the window cut-out with body primer (G).
	Remove adhesive sealing compound on the rear side window	Carefully remove the adhesive sealing compound on the rear side window with a fixed knife. A full covering of adhesive residue may remain.
	Clean the rear side window	Thoroughly rub off the rear side window with cleaning solution (H). Important:: No cleaning solution residue must remain on the window.
	Clean the rubber seal	Clean the window channel of the rubber seal with cleaning solution (H). Important: No cleaning solution residue must remain in the window channel.
9	<i>Apply adhesive sealing compound</i> in the window channel of the rubber seal	Insert a cartridge of adhesive sealing compound (F) in the glue gun (C) and glue the window channel of the rubber seal all-round. Important: The rear side window must be installed in the vehicle within a maximum of 4 hours after adhesive application.
10	Place the rubber seal on the rear side window	
11	Complete the rubber seal with the decorative frame	Press the top decorative frame part (2) into the rubber seal. Assemble the bottom decorative frame part (4) with the top corner piece (1) and bottom corner piece (3), press into the rubber seal, connect with the top decorative frame part (2) and press the assembled decorative frame completely into the rubber seal.

No.	Work step	Instructions
12	<i>Place the assembly cord</i> in the rubber seal	Place the assembly cord for pulling in the rear side window in the rubber seal. The cord ends must cross approximately in the center of the C-column area.
	Remove the adhesive tape from the bodywork	
13	<i>Apply adhesive sealing compound</i> to the bodywork	Apply adhesive sealing compound (F) all-round in the area of the window cut-out on the bodywork with the glue gun (C).
	Fit the rear side window in the bodywork	Place the assembled and prepared rear side window in the window cut-out of the bodywork, align and press on. From the passenger compartment, pull the rubber seal onto the bodywork bead by pulling out the assembly cord.
	Clean the vision areas	Excess adhesive sealing compound must be removed immediately and the affected vision areas must be cleaned with cleaning solution (H).

Removing and installing windshield – 2-pack adhesive

The following tools and materials are required for removal and installation of the windshield:

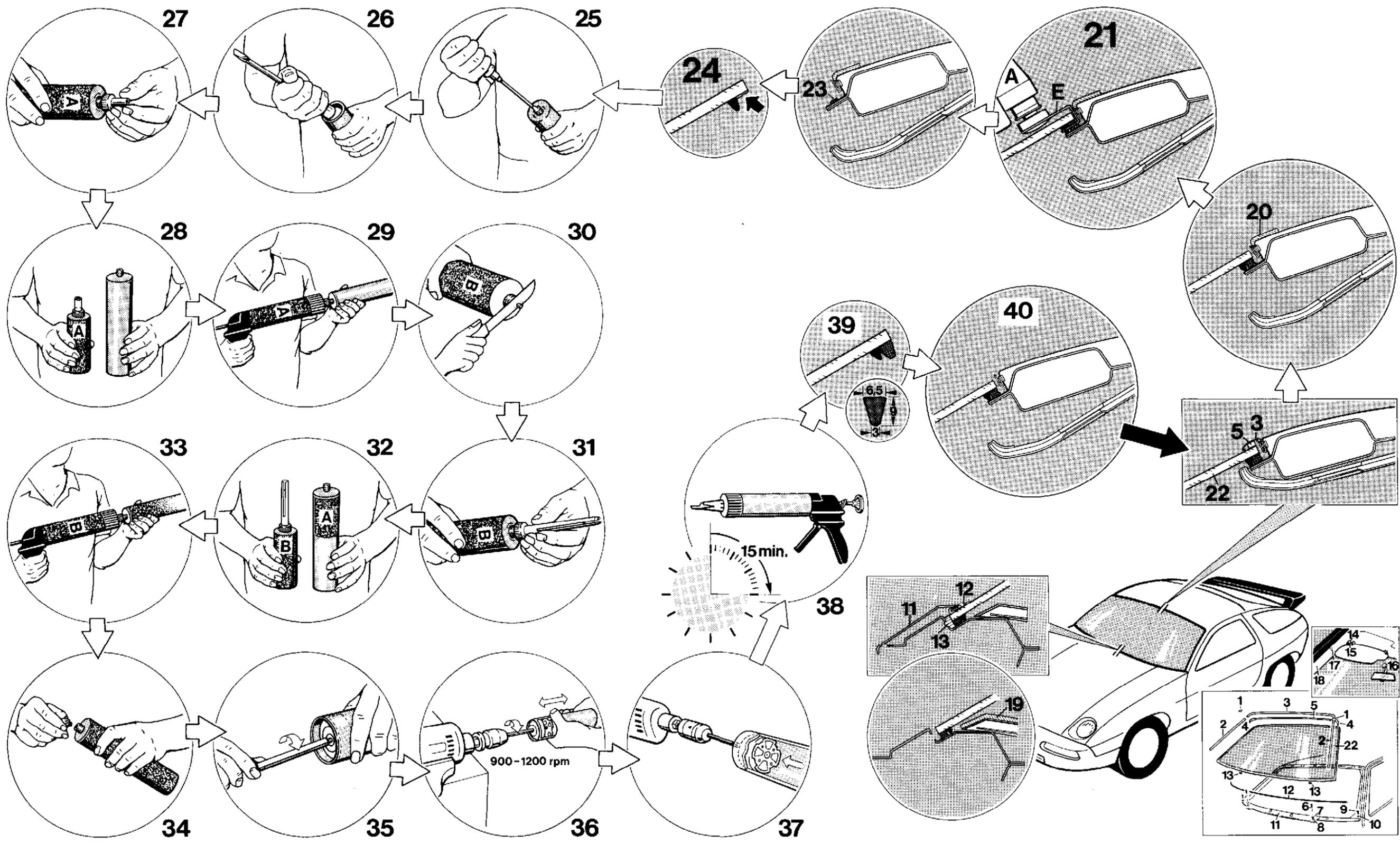


924 - 64

A	Cutter	VAG 1561	VW Werk AG
B	Twin-cup suction puller	VAG 1344	Service equipment supply
C	Bonding gun	VAG 1344/1	
D	Flashing knife	639.031.130.22	e.g. C & E FEIN GmbH & Co.
E	Cutting knife, U-type	639.031.270.14	P.O. Box 172 ; D-7000 Stuttgart 1
F	Mixing rod 9528	000.721.952.80	Porsche Parts Service
G	Adhesive set	000.043.038.01	
G1	- Cartridge component A		
G2	- Cartridge component B		
G3	- Mixing cartridge		
G4	- Primer		
G5	- Cleaning solution		
G6	- Injector nozzle		
G7	- Application nozzle		
G8	- Filling nozzle		
G9	- Touch-in tool		

Removing and installing windshield – 2-pack adhesive

Removing and installing windshield — 2-pack adhesive



Removing and installing windshield – 2-pack adhesive

Removing windshield:

No.	Operation	Instructions
	Remove windshield wipers	Undo hexagon nuts, lift off washers and wipers.
1	Relocate <i>sleeves</i>	Shift sleeves to separate junction between upper cover molding and RH and LH drip molding.
2	Remove <i>drip moldings</i>	Using a wooden wedge, separate RH and LH drip moldings from the retaining rails.
3	Remove upper cover molding	Using a plastic or wooden wedge, separate upper cover molding from the locating clamps. Remove adhesive tape and sealing tapes.
4	- <i>upper cover molding</i>	
5	- <i>sealing strips</i> - <i>adhesive tape</i>	
6	Remove cowl panel	Open cover. Remove hexagon head sheetmetal screws. Remove washers. Remove one sheetmetal screw each on right and left-hand side of cowl panel, remove washers and take out cowl panel complete with weatherstrip.
7	- <i>Hex head sheetmetal screws</i>	
8	- <i>Washers</i>	
9	- <i>Sealing washers</i>	
10	- <i>Sheetmetal screws</i>	
11	- <i>Washers</i>	
12	- <i>Cowl panel</i> - <i>Seal</i>	
13	Remove <i>spacer blocks</i>	Remove spacer blocks between body and lower windshield side.
14	Unscrew sun visor support	Remove raised countersunk sheetmetal screws and sun visor support complete with sun visor.
15	- <i>Raised countersunk sheetmetal screws</i> - <i>Sun visor support</i>	

No.	Operation	Instructions
16	Lift off interior rearview mirror	Lift rearview mirror off the subplate, following a line parallel to the windshield.
17	Remove A-pillar linings	Unscrew sheetmetal screw from A-pillar. Unclip front clips by pulling down right and left-hand sides of headlining. Press top of A-pillar linings to the inside and pull out.
18	- Sheetmetal screw - A-post lining	
19	Spread cover over instrument panel	Cover instrument panel to avoid staining or damaging the panel.
	Open door windows	Lower door windows. Attention: The door windows must not be closed before the curing time has elapsed.
20	Attach <i>adhesive tape</i> to the body	Cover body in visible area of windshield aperture with adhesive tape to protect the paintwork.
21	Cut out windshield	Insert cranked knife (E) into cutter (A). With equipment running, sharpen cutter with grindstone. Place cutting knife between body and windshield and set vibration regulator to stage 4. Cut bonding between windshield and body in a continuous line.
22	Lift out <i>windshield</i>	
23	Remove <i>adhesive sealant</i> from body	Insert flashing knife (D) into cutter (A) and remove adhesive sealant from body only to the extent that the remaining adhesive covers the whole area in a uniform manner.

No.	Operation	Instructions
	Clean windshield aperture of body	Clean windshield aperture of body thoroughly using cleaning solution (G5). Attention: Make sure no cleaning solution residues remain on the body.
	Apply primer to damaged areas of body	Use primer (G4) to coat damaged areas in non-visible section of windshield aperture.
	Remove adhesive tape from body	
	Clean windshield	Clean bonding area of windshield thoroughly using cleaning solution (G5).
24	Apply primer to windshield	Apply primer (G4) to the bonding area of the windshield in a continuous bead. Attention: Drying time of the primer is at least 15 minutes. No windshield adhesive must be applied until this time has elapsed.

**Preparing the adhesive cartridge
for application of adhesive**

No.	Operation	Instructions
25	Open nozzle fitting of cartridge containing component A	Use a screwdriver to pierce the diaphragm in the nozzle fitting of the cartridge containing component A (H1).
26	Open flanged cover of cartridge containing component A	Use the screwdriver handle to pierce the flanged cover at the end of the cartridge containing component A (H1).
27	Screw filling nozzle onto cartridge containing component A	Screw filling nozzle (H9) onto cartridge containing component A (H1).
28	Place cartridge containing component A into bonding gun	Place cartridge containing component A (H1) into bonding gun (C). Remove screw-on cap from mixing cartridge (H3).
29	Press component A into mixing cartridge	Insert filling nozzle (H9) of cartridge containing component A (H1) into mixing cartridge. Press component A into mixing cartridge (H3) using the bonding gun.
30	Open screw-on fitting of cartridge containing component B	Use a knife to cut off the tip of the nozzle fitting of the cartridge containing component B (H2).
31	Screw injector nozzle onto cartridge cont. component B	Screw injector nozzle (H7) onto cartridge containing component B (H2).
32	Place cartridge containing component B into bonding gun	Place cartridge containing component B (H2) into bonding gun (C).

No.	Operation	Instructions
33	Press component B into mixing cartridge containing component A	Introduce injector nozzle (H7) of cartridge containing component B (H2) into mixing cartridge (H3). Use the bonding gun (C) to press component B (H2) into mixing cartridge (H3) containing component A.
34	Close mixing cartridge	Pull injector nozzle (H7) out of mixing cartridge (H3) and close mixing cartridge with screw-on cap.
35	Screw mixing rod into mixing cartridge	Screw mixing rod (G) manually into internal thread of mixing disc in the mixing cartridge (H3). Clamp other end of mixing rod into a drill chuck. Fit the drill into a suitable clamping device.
36	Mix component A and component B	Switch on drill (900 to 1200 rpm) and rotate mixing cartridge 25 times from stop to stop. Perform all 25 double strokes fairly rapidly.
37	Engage mixing disc into piston	Pull back mixing cartridge until a rattling sensation is felt. Switch off drill and screw mixing rod out of mixing cartridge. The mixing disc will then engage into the piston of the mixing cartridge.
38	Place mixing cartridge into bonding gun	Insert mixing cartridge with mixed 2-pack windshield adhesive into bonding gun. Screw application nozzle (H8) onto mixing cartridge.

Caution: Open time is 15 minutes!

Open time is the time available for application of the adhesive and for installing the windshield into the aperture in the body.

Installing the windshield:

No.	Operation	Instructions
39	Apply windshield adhesive to the windshield	Using the bonding gun (C), apply a trapezoidal continuous bead of windshield adhesive to the bonding area of the windshield.
	Position twin-cup suction pullers on outside of windshield	
	Insert spacer blocks	Insert spacer blocks for positioning of bottom of windshield into body (cowl panel).
40	Insert windshield into body aperture	Place prepared windshield into aperture in body, align and press into place using the twin-cup suction pullers (B). Make sure the bottom of the windshield rests on the spacer blocks.
	Clean visible areas	Remove adhesive that has squeezed out immediately and clean the affected visible areas using cleaning solution (G5).
	Remove cover from the instrument panel	
	Install A-pillar linings	Install A-pillar linings, clip headlining into place by pressing up and fit sheetmetal screws.
	Fit interior rearview mirror	Push interior rearview mirror onto subplate, following a line parallel to the windshield.
	Fit sun visors	Using three raised countersunk sheetmetal screws per side, install sun visor support with RH and LH sun visors.

No.	Operation	Instructions
	Fit cowl panel	Put cowl panel complete with weatherstripping into place and screw in hex sheetmetal screws with washers. Tighten right-hand and left-hand sides of cowl panel with one sheetmetal screw and washer each.
	Fit upper cover molding	Attach adhesive strips and sealing strips. Install upper cover molding complete with sleeves to the locating clamps.
	Fit drip molding	Push RH and LH drip moldings onto the retaining rails. Push sleeves into place to ensure smooth transition of upper cover molding to RH and LH drip moldings.
	Fit windshield wipers	Position windshield wipers, put washers into place and tighten using hexagon nuts.

Note:

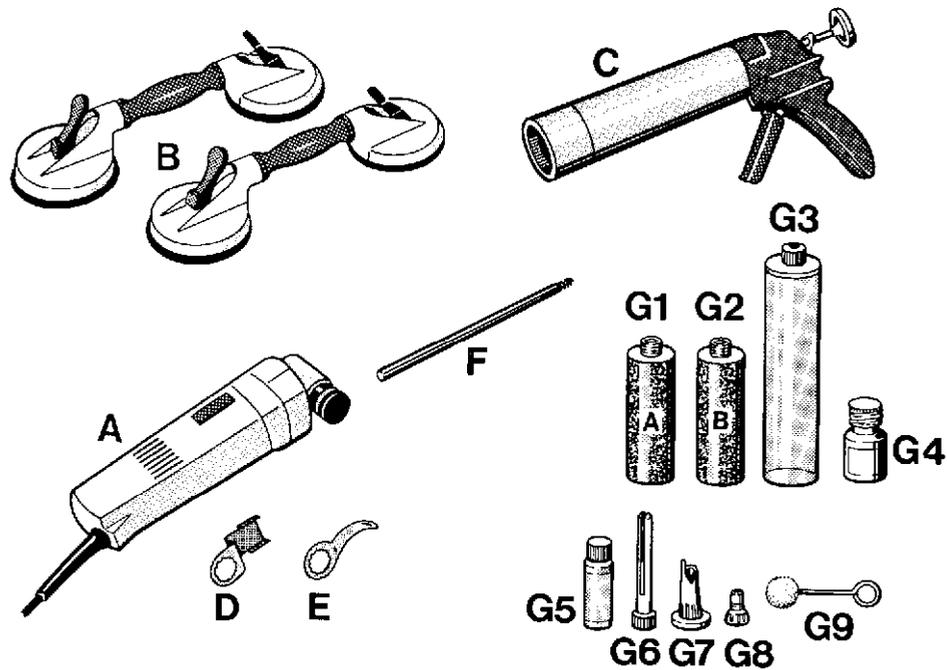
The bonding does not immediately reach its full strength. In order to ensure sufficient bonding strength, the following conditions must be adhered to:

Curing time	3 hours
Temperature	min. 5°C

Do not operate the vehicle before the curing time has elapsed!

Removing and installing bonded rear side window – 2-pack adhesive

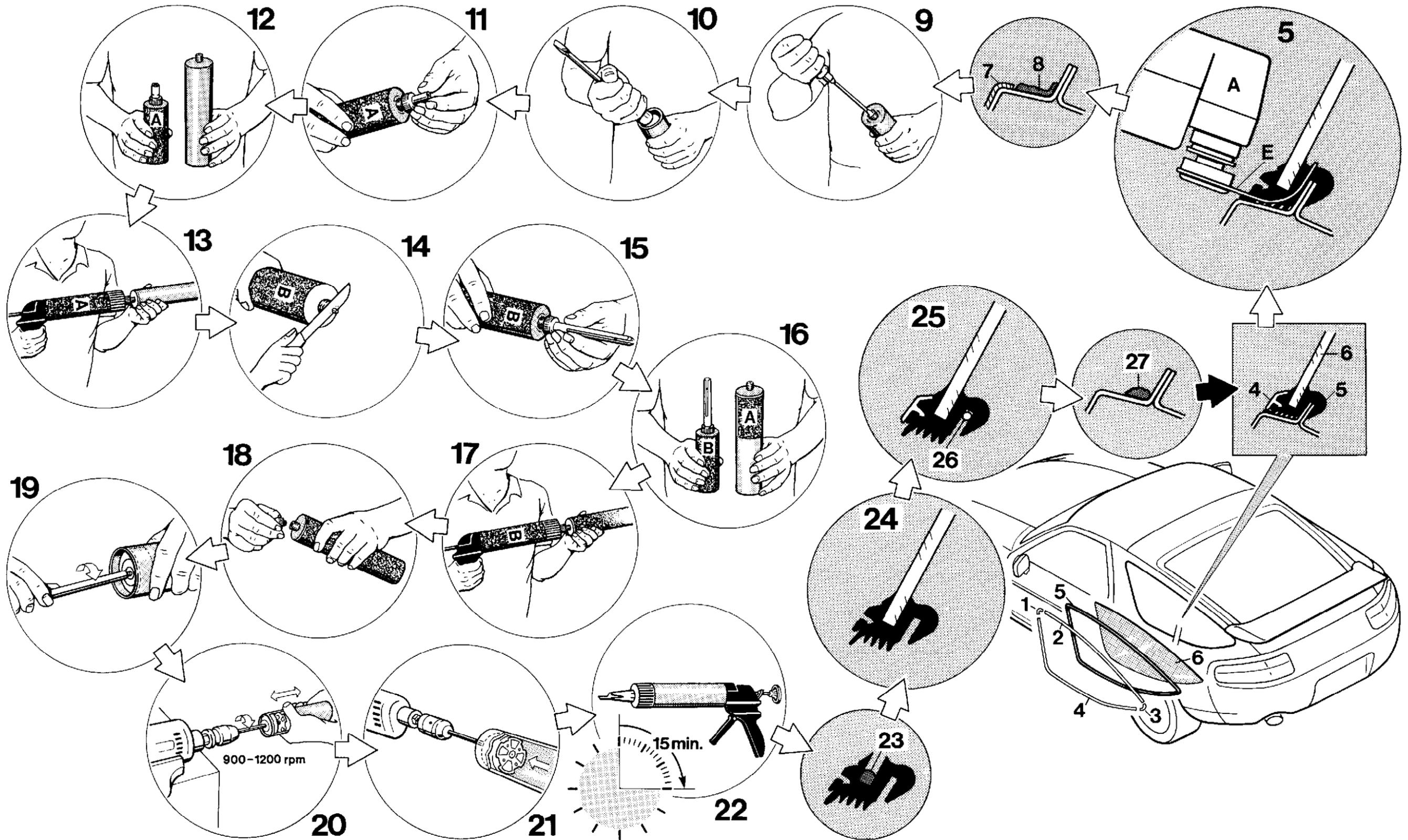
The following tools and materials are required for removal and installation of the bonded rear side window:



A	Cutter	VAG 1561	VW Werk AG
B	Twin-cup suction puller	VAG 1344	Service equipment supply
C	Bonding gun	VAG 1344/1	
D	Flashing knife	639.031.130.22	e.g. C & E FEIN GmbH & Co.
E	Cutting knife, cranked	639.031.030.17	P.O. Box 172 ; D-7000 Stuttgart 1
F	Mixing cartridge 9528	000.721.952.80	Porsche Parts Service
G	Adhesive set	000.043.038.01	
G1	- Cartridge component A		
G2	- Cartridge component B		
G3	- Mixing cartridge		
G4	- Primer		
G5	- Cleaning solution		
G6	- Injector nozzle		
G7	- Application nozzle		
G8	- Filling nozzle		
G9	- Touch-in tool		

Removing and installing bonded rear side window – 2-pack adhesive

Removing and installing bonded rear side window – 2-pack adhesive



Removing and installing bonded rear side window – 2-pack adhesive

Removing the rear side window:

No.	Operation	Instructions
1	Pull away trim molding - <i>upper corner section</i>	Using a wooden or plastic spatula, carefully lift trim molding out of the window rubber, starting in the corner section area. Place a rag between trim molding and rubber seal and pull out molding by pulling the rag along the rubber seal.
2	- <i>upper trim section</i>	
3	- <i>lower corner section</i>	
4	- <i>lower trim section</i>	
5	Cut through <i>rubber seal</i>	Insert cranked knife (E) into cutter (A). Using a grindstone, sharpen the cutting knife with the equipment running. Engage cutting knife into rubber seal, set vibration regulator to stage 6 and cut rubber seal in a continuous line between rear side window and body.
6	Lift out <i>rear side window</i>	
	Lift remains of rubber seal off the body	
7	Attach <i>adhesive tape</i> to body	Cover body in visible area of window aperture with adhesive tape to protect the paintwork.
8	Remove <i>adhesive sealant</i> from body	Insert flashing knife (D) into cutter (A) and remove adhesive only to the extent that the remaining adhesive covers the whole area in a uniform manner.

No.	Operation	Instructions
	Clean window aperture in body	Clean window aperture of body thoroughly using cleaning solution (G5). Attention: Make sure no cleaning solution residues remain on the bodywork.
	Apply primer to damaged areas of body	Use primer (G4) to coat damaged paintwork areas in non-visible section of window aperture.
	Remove adhesive sealant from rear side window	Using a fixed knife, remove adhesive residue carefully from rear side window. A thin coating of adhesive covering the bonding surface in a uniform manner may remain.
	Clean rear side window	Clean rear side window thoroughly using cleaning solution (G5). Attention: Make sure no cleaning solution residue remains on the window.
	Clean rubber seal	Clean window channel of rubber strip using cleaning solution (G5). Attention: Make sure no cleaning solution residue remains in the window channel.

Preparing the adhesive cartridge for application of adhesive

No.	Operation	Instructions
9	Open nozzle fitting of cartridge containing component A	Use a screwdriver to pierce the diaphragm in the nozzle fitting of the cartridge containing component A (H1).
10	Open flanged cover of cartridge containing component A	Use the screwdriver handle to pierce the flanged cover at the end of the cartridge containing component A (H1).
11	Screw filling nozzle onto cartridge containing component A	Screw filling nozzle (H9) onto cartridge containing component A (H1).
12	Place cartridge containing component A into bonding gun	Place cartridge containing component A (H1) into bonding gun (C). Remove screw-on cap from mixing cartridge (H3).
13	Press component A into mixing cartridge	Insert filling nozzle (H9) of cartridge containing component A (H1) into mixing cartridge. Press component A into mixing cartridge (H3) using the bonding gun.
14	Open screw-on fitting of cartridge containing component B	Use a knife to cut off the tip of the nozzle fitting of the cartridge containing component B (H2).
15	Screw injector nozzle onto cartridge cont. component B	Screw injector nozzle (H7) onto cartridge containing component B (H2).
16	Place cartridge containing component B into bonding gun	Place cartridge containing component B (H2) into bonding gun (C).
17	Press component B into mixing cartridge containing component A	Introduce injector nozzle (H7) of cartridge containing component B (H2) into mixing cartridge (H3). Use the bonding gun (C) to press component B (H2) into mixing cartridge (H3) containing component A.

No.	Operation	Instructions
18	Close mixing cartridge	Pull injector nozzle (H7) out of mixing cartridge (H3) and close mixing cartridge with screw-on cap.
19	Screw mixing rod into mixing cartridge	Screw mixing rod (G) manually into internal thread of mixing disc in the mixing cartridge (H3). Clamp other end of mixing rod into a drill chuck. Fit the drill into a suitable clamping device.
20	Mix component A and component B	Switch on drill (900 to 1200 rpm) and rotate mixing cartridge 25 times from stop to stop. Perform all 25 double strokes fairly rapidly.
21	Engage mixing disc into piston	Pull back mixing cartridge until a rattling sensation is felt. Switch off drill and screw mixing rod out of mixing cartridge. The mixing disc will then engage into the piston of the mixing cartridge.
22	Place mixing cartridge into bonding gun	Insert mixing cartridge with mixed 2-pack windshield adhesive into bonding gun. Screw application nozzle (H8) onto mixing cartridge.

Caution: Open time is 15 minutes!

Open time is the time available for application of the adhesive and for installing the windshield into the aperture in the body.

Installing the rear quarter window:

No.	Operation	Instructions
23	Apply <i>window adhesive</i> to the window channel of the rubber seal	Place cartridge with window adhesive into bonding gun (C) and apply a continuous bead of adhesive to the window channel of the rubber seal.
24	Place rubber seal onto rear side window	
25	Assemble trim molding to rubber seal	Press upper trim section (2) into rubber seal. Assemble lower trim section (4) to upper corner section (1) and lower corner section (3), press into rubber seal, assemble to upper trim section (2) and press fully assembled trim molding fully into rubber seal.
26	Place <i>assembly cord</i> into rubber seal	Place assembly cord for fitting of the rear side window into the rubber seal. The ends of the cord must cross each other near the middle of the C-pillar area.
	Remove adhesive tape from body	
27	Apply <i>window adhesive</i> to the body	Using the bonding gun (C), apply a continuous bead of window adhesive to the window aperture area to the body.
	Fit rear side window to body	Place assembled and prepared rear side window into the window aperture, align and press into place. Working from passenger compartment side, slowly pull out the assembly cord to align the rubber seal to the body flange.

No.	Operation	Instructions
	Clean visible areas	Remove adhesive that has squeezed out immediately and clean the visible areas affected using cleaning solution (G5).

PAINT COLORS – 1978

Standard :

india red	027
talbot yellow	106
continental orange	107
fern green	273
olive green	274
albert blue	387
cockney brown	408
mocca black	451
cashmire beige	502
black	700
grand prix white	908

Special :

oak green metallic	265
silver green metallic	266
lint green metallic	275
minerva blue metallic	304
petrol blue metallic	376
brown copper metallic	443
silver metallic	936

PAINT COLORS – 1979

Standard :

india red	027
talbot yellow	106
olive green	274
arrow blue	305
cockney brown	408
mocca black	451
cashmire beige	502
lilac	601
black	700
grand prix white	908

Special :

oak green metallic	265
lint green metallic	275
light blue metallic	30 T
minerva blue metallic	304
petrol blue metallic	376
brown copper metallic	443
opal metallic	463
tobacco metallic	464
black metallic	708
silver metallic	936

PAINT COLORS — 1980

Standard :

india red	027
talbot yellow	106
olive green	274
arrow blue	305
cockney brown	408
mocca black	451
cashmire beige	502
lilac	601
black	700
grand prix white	908

Special :

oak green metallic	265
lint green metallic	275
light blue metallic	30 T
minerva blue metallic	304
petrol blue metallic	376
brown copper metallic	443
opal metallic	463
tabacco metallic	464
black metallic	708
silver metallic	936

PAINT COLORS — 1981

Standard :

india red	027
arrow blue	305
mocca black	451
black	700
chiffon white	182
bamboo beige	523
burnus brown	524
mint green	20 A
grand prix white	908

Special :

light blue metallic	30 T
minerva blue metallic	304
black metallic	708
tin metallic	956
platinum metallic	655
pacific blue metallic	31 G
palisander metallic	474
moss green metallic	20 C
wine red metallic	895

RANGE OF BODY PAINT COLORS AS FROM 1982 MODELS

Standard Colors:

guards red	027
royal blue	305
mocha brown	451
black	700
chiffon white	182
bamboo beige	523
caramel brown	524
mint green	20A
grand prix white	908

Special Colors:

met. light blue	30T
met. minerva blue	304
met. black	708
met. pewter	956
met. platinum	655
met. pacific blue	31G
met. rosewood	474
met. moss green	20C
met. wine red	895
met. meteor grey	961
met. light bronze	966

RANGE OF BODY PAINT COLORS AS FROM 1983 MODELS

Standard Colors:

guards red	027
black	700
grand prix white	908
glacier blue	32Z

Special Colors:

met. pewter	956
met. platinum	655
met. moss green	20C
met. slate blue	661
met. quartz gray	662
met. kiln red	811
met. ruby red	810
met. light bronze	966

RANGE OF BODY PAINT COLORS AS FROM 1984 MODELS

Standard Colors:

india red	027
black	700
grand prix white	908
glacier blue	32Z
chiffon white	182

Special Colors:

met. pewter	956
met. platinum	655
met. moss green	20 C
met. slate blue	661
met. quartz gray	662
met. kiln red	811
met. ruby red	810
met. light bronze	966

RANGE OF BODY PAINT COLORS AS
FROM 1985 MODELS

Standard Colors:

guards red	027
black	700
grand prix white	908
pastel beige	536
marble gray	673

Special Colors:

met. nutmeg brown	492
met. garnet red	822
met. iridescent blue	33P
met. sapphire blue	33X
met. crystal green	33N
met. white gold	539
met. silver	936
met. moss green	20C
met. meteor gray	961

RANGE OF BODY PAINT COLORS, 1986 MODELS ONWARD

Standard Colors:		Special Colors:	
pastel beige	536	nutmeg brown - metallic	492
marble gray	673	garnet red - metallic	822
india red	027	iris blue - metallic	33P
grand prix white	908	prussian blue - metallic	33X
black	700	cristal green - metallic	33N
dark blue	347	white gold - metallic	539
		silver - metallic	936
		moss green - metallic	20C
		meteor - metallic	961

Body paint colors model 1987 onward

Standard:		Special:	
Grand prix white	908	Silver - metallic	980
Black	700	Lagoon green - metallic	35Y
Dark blue	347	Rock green - metallic	699
Cherry red	80F	Nougat brown - metallic	40B
Lemon yellow	10W	Diamond blue - metallic	697
Ceramic beige	499	Espresso brown - metallic	40D
Turquoise	21M	Marine blue - metallic	35V
Guards red	80K	Venice blue - metallic	(36P) 35U
		Cassis red - metallic	80D

Body paint colors model 1988 onward

Standard:		Special:	
Grand prix white	908	Silver - metallic	980
Black	700	Lagoon green - metallic	35Y
Dark blue	347	Rock green - metallic	699
Cherry red	80F	Nougat brown - metallic	40B
Lemon yellow	10W	Diamond blue - metallic	697
Ceramic beige	499	Espresso brown - metallic	40D
Turquoise	21M	Marine blue - metallic	35V
Guards red	80K	Venice blue - metallic	36P
		Cassis red - metallic	80D

Body paint colors model 1989 onward**Standard:**

Grand prix white	908
Black	700
Dark blue	347
Guards red	80K
Linen	60M
Apricot-beige	548
Murano green	22C

Special:

Silver - metallic	980
Diamond-blue metallic	697
Dove-blue metallic	37B
Stone-grey metallic	693
Slate metallic	22D
Velvet-red metallic	81L
Linen metallic	550
Pine-green metallic	22E
Cognac-brown metallic	40L
Salmon-silver metallic	81K

Body paint colors model 1990 onward

Standard:		Special:	
Grand prix white	908	Silver metallic	980
Black	700	Diamond-blue metallic	697
Dark blue	347	Dove-blue metallic	37B
India red	80K	Pepple-grey metallic	693
Linen	60 M	Slate metallic	22D
Apricot-beige	548	Velvet-red metallic	81L
Murano green	22 C	Linen metallic	550
		Pine-green metallic	22E
		Cognac-brown metallic	40L
		Salmon-silver metallic	81K

Body Paint Colors Beginning With 1991 Models

Standard Colors:

Grand Prix white	908
Black	700
Maritime blue	38B
Indian red	80K
Signal green	22S
Mint green	22R
Rubystone red	82N

Special Colors:

Polar silver metallic	92 E
Polar silver metallic	92 M*
Horizon blue metallic	37 X
Cobalt blue metallic	37 U
Oakgreen metallic	22 L
Slate gray metallic	22 D
Slate grey metallic	23 F*
Coral red metallic	82 H
Black pearl effect	738
Midnight blue metallic	37 W
Midnight blue pearl effect	39 C*
Amethyst pearl effect	38 A
Amethyst pearl effect	83 K*
Amazon green pearl effect	37 Z
Amazon green pearl effect	39 A

* = Water-base paints

Water base paints are applied exclusively by the manufacturer during production spraying. For repair of water-base paints, conventional respray paints matching the color of the original paint are used. I.e. the only prerequisite for resprays is that the correct respray paint is used (refer to Paint Manual, page L3 - 25). Color differences due to paint application do not occur.

Body Paint Colors Beginning With 1992 Models

Standard Colors:

Grand Prix white	908
Black	700
Maritime blue	38B
Indian red	80K
Signal green	22S
Mint green	22R
Rubystone red	82N

Special Colors:

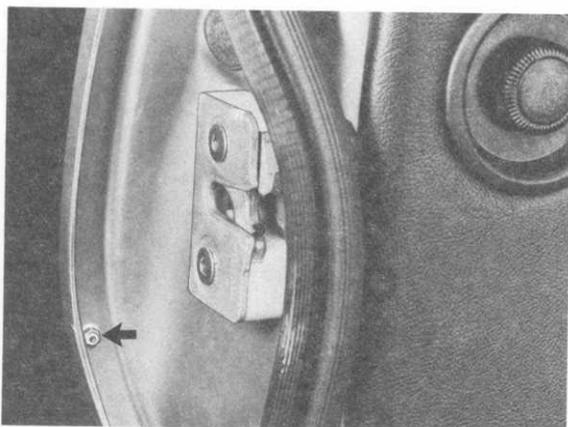
Polar silver metallic	92 E
Polar silver metallic	92 M*
Horizon blue metallic	37 X
Cobalt blue metallic	37 U
Oakgreen metallic	22 L
Slate gray metallic	22 D
Slate grey metallic	23 F*
Coral red metallic	82 H
Black pearl effect	738
Midnight blue metallic	37 W*
Amethyst pearl effect	38 A
Amethyst pearl effect	83 K*
Amazon green pearl effect	39 A

* = Water-base paints

REMOVING AND INSTALLING SIDE GUARD STRIPS

Removing

1. Pull off rubber door weatherstrip at rear in area of lock and loosen nuts of moulding strip. All other mountings are by pins in sockets and adhesive strips.



2. Loosen strips at one end, pull out pins and then detach strips by pulling at a sharp angle. Do not bend off toward the outside, since this would deform the steel insert in the strip and the strip could no longer be used. Press out pins on other end of strip carefully.



3. Used side guard strips can be used again, if the old adhesive strips are pulled off and new double-sided adhesive foam rubber strips are installed (3 M, Art. No. 4262, 19 mm wide). The primed adhesive surface of the strip must not be washed!
4. Replace damaged sockets and make sure that tongues engage behind the metal edge.

Installing

1. Clean body in working area thoroughly, with alcohol and clean cellulose. Ambient and object temperature must be at least + 20° C.
2. Press sockets into the 10 mm dia. holes.
3. Position side guard strips for the different sections and heat the strips to about 60° C to improve the adhesive force.

4. Peel off paper backing from adhesive surface and do not touch the adhesive surface.
5. First install the door's side guard strip. Guide the strip into the socket or hole with help from another person, without letting the adhesive surface make contact, so that the strip can be aligned. Press on strip firmly with a rubber roller or soft cloth (pressure about 70 - 80 N/ 7 - 8 kp). Install a washer and nut on the threaded pin and press in the rubber door weatherstrip.
6. Align front and rear mating strips with door's strip and press on as for door's strip.



SERVICE INSTALLING SIDE GUARD STRIPS

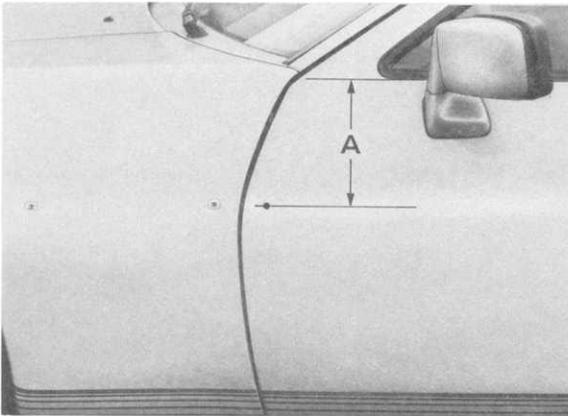
When service installing these strips, first draw the door's strip on the door according to specified dimensions and then align and drill holes for the fender's strips.

Drill 10 mm dia. holes for the sockets and one 6.5 mm dia. door hole at rear.

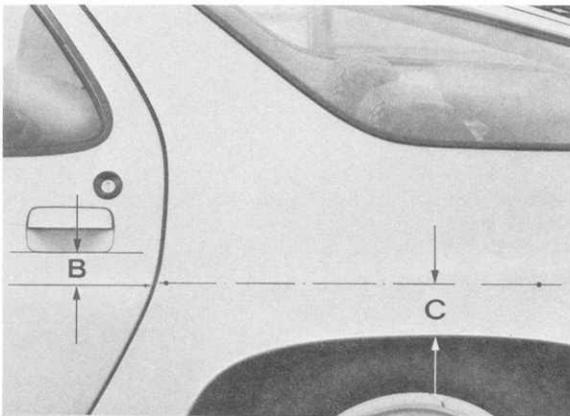
In longitudinal direction drill holes that rear door hole is at center of seal recess and all strips begin about 3 to 4 mm behind the door or fender edge.

Height distances:

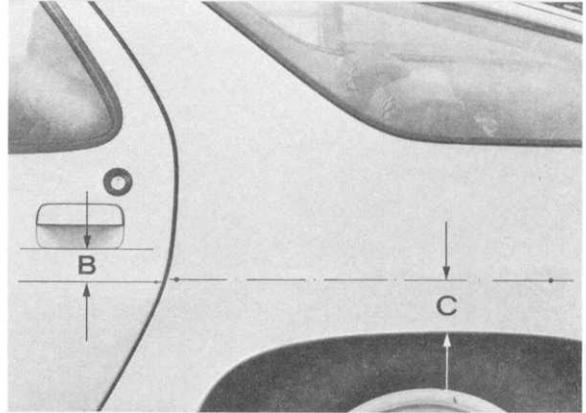
Distance A = 200 mm
(outer edge of door shoulder to center of strip)



Distance B = 48 mm
(lower edge of grip plate to center of strip)

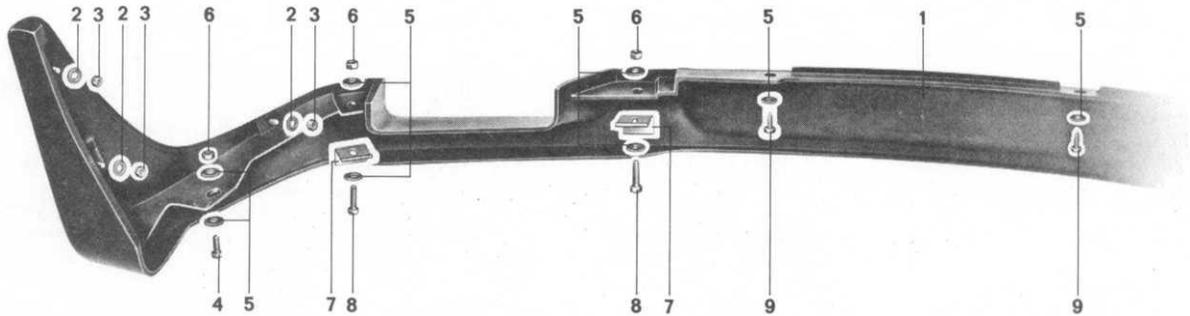


Distance C = about 78 mm
(fender opening to center of strip)



Press in sockets and make sure that tongues engage behind metal edge.

—

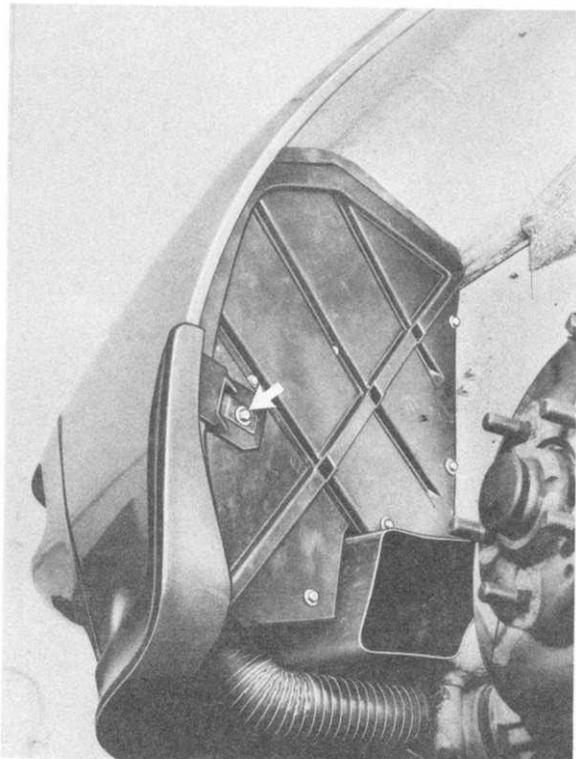


No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
1	Front spoiler	1	Disconnect at fender rim	Connect on fender rim; make sure of clean fit on outside of fender!	
2	Washer	6			
3	Locknut M 5	6		Replace, if necessary. Tighten only against stop	
4	Bolt M 6 x 16	2		Bolt with fender support	
5	Washer	12			
6	Locknut M 6	6		Use locknuts, replacing if necessary	
7	Bracket	4		Place bevelled edges against front spoiler	
8	Bolt M 6 x 25	4		Watch location to air inlet grill	
9	Screw 5.5 x 16	3		Watch threads in radiator grill, use studs if necessary	

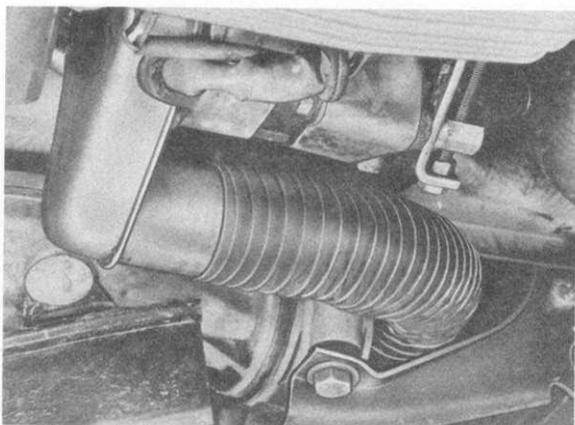
REMOVING AND INSTALLING FRONT SPOILER 928 S

Removing

1. Unscrew and remove wheel well cover and holder (arrow).

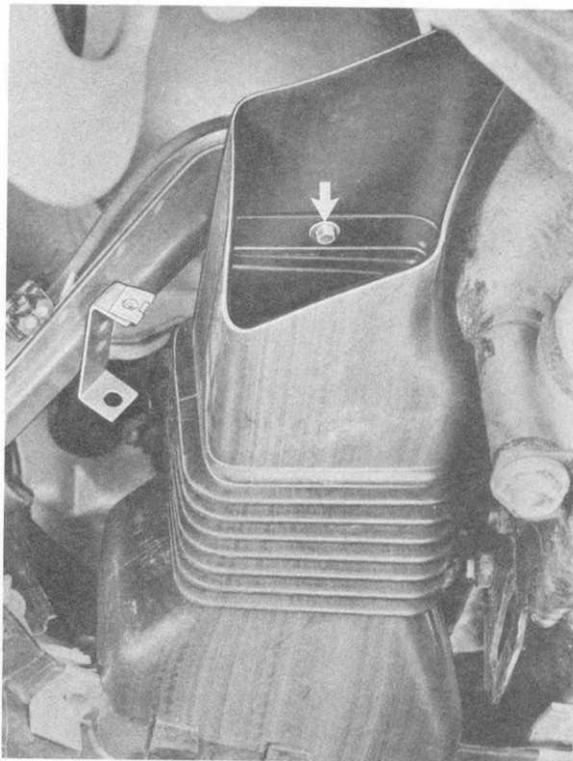


Also pull off air guide hose from alternator on left side.



Disconnect outside temperature sensor plug (air conditioner).

2. Unscrew mounting brackets in air ducts from fender supports and pull out the air ducts.

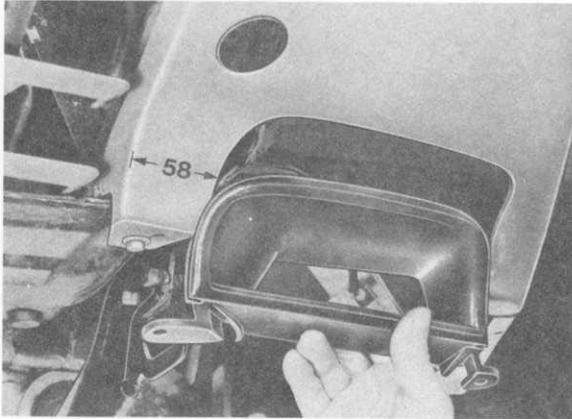


3. Unscrew front spoiler at fender, plastic part and air inlet grill. Remove front spoiler.

4. Pull out air inlet grill downward.

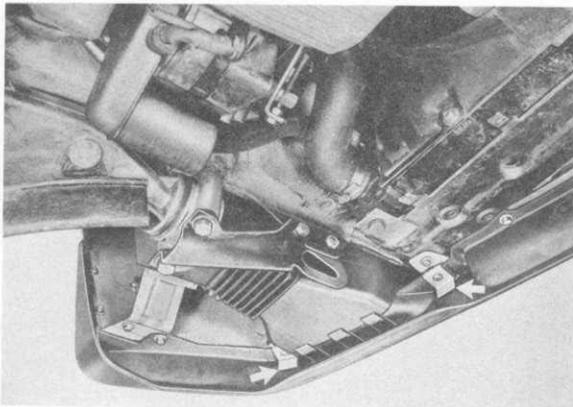
Installing

1. Push air inlet grill into openings from below. In case of new trim mark openings according to dimensions (58 mm up to opening) and make up template for air inlet grill.



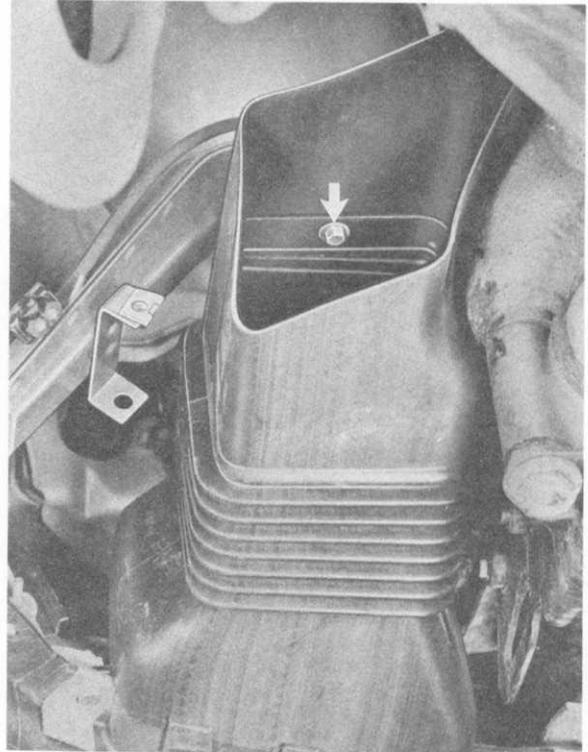
Cut out openings with a piercing saw or metal shears and, if necessary, smooth edges with a wood grater or file.

2. Install front spoiler, making sure of clean fit on fender contour and radiator grill. Secure studs with self-locking nuts. Mount front spoiler to left and right of air inlet grill with brackets.



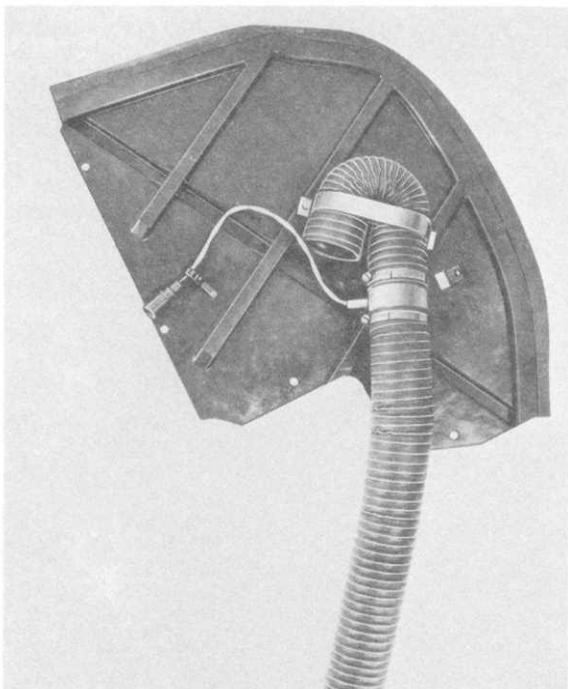
3. Insert air ducts and press in front top and bottom guide tabs on air inlet grill and front spoiler.

Mount bracket on fender support with metal screw.

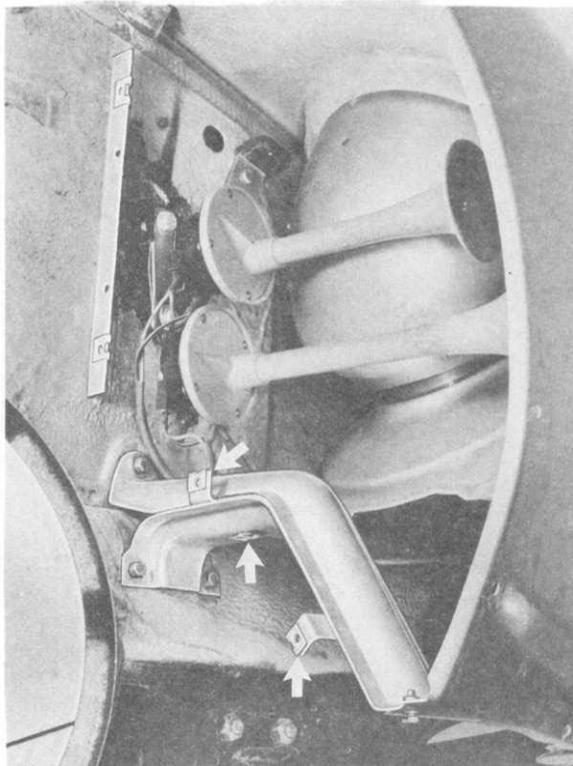


4. Install wheel well cover and secure with washers and 5,5 x 16 mm metal screws. Place and secure spacer behind fender rim. On left side also mount air guide hose on wheel well cover.

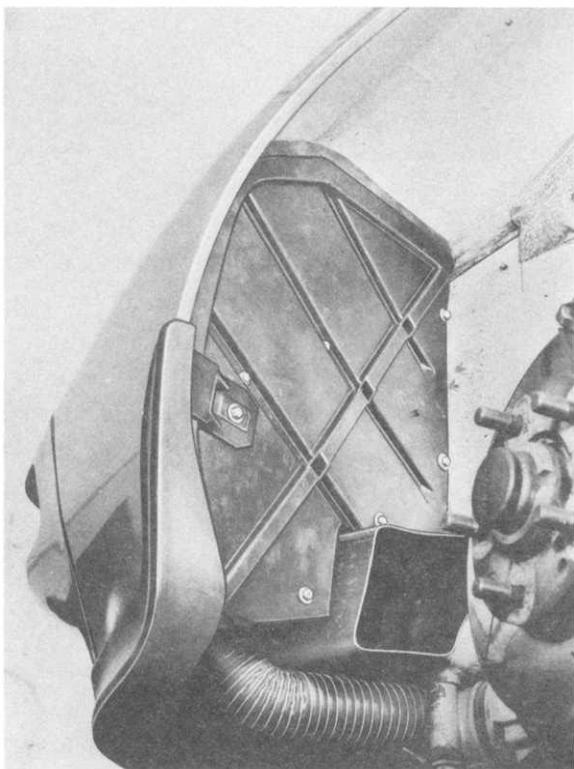
Secure plug on outside temperature sensor with a hose clamp and connect with the wire harness.



Prime coat entire new fender supports and apply a coat of undercoating. Install with self-locking metal nuts.



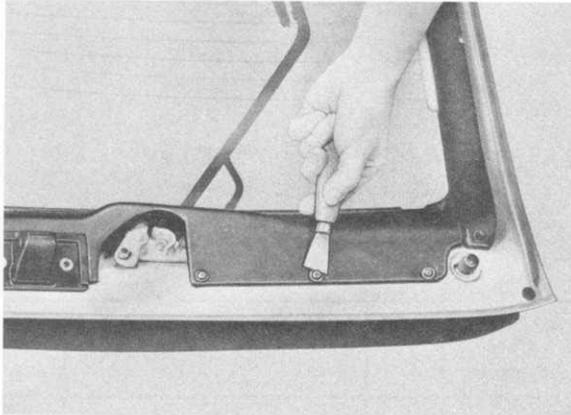
Route air guide hose underneath the air duct between the side member and cowl panel bracket, and connect on the alternator.



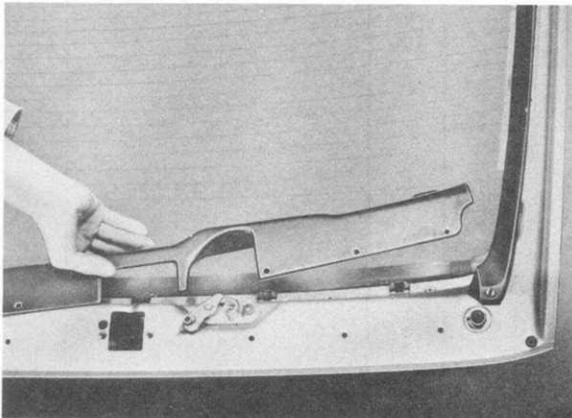
REMOVING AND INSTALLING REAR SPOILER 928 S

Removing Rear Spoiler on Lid

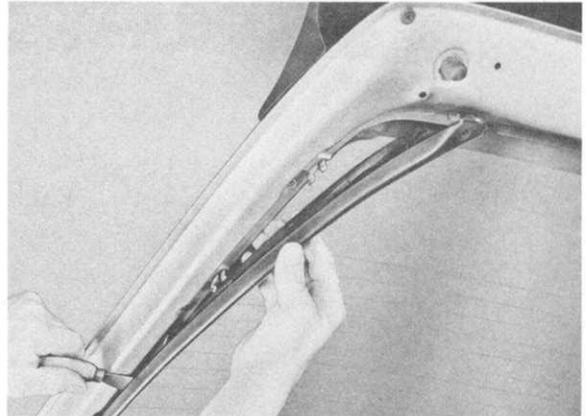
1. Remove lid lock and rear window wiper.
2. Pull spreader rivets out of lid trim panel.



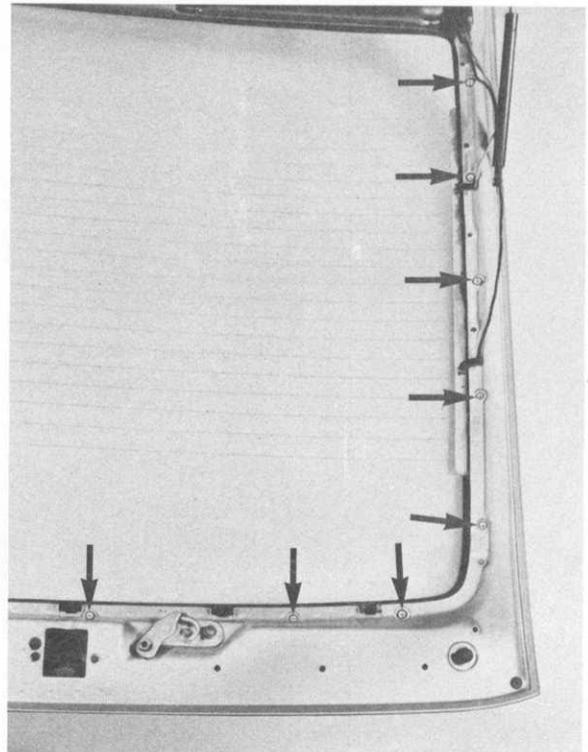
3. Press bottom of trim panel off of lid frame along window.



4. Pull down side trim panel sections, disconnecting wires at same time.

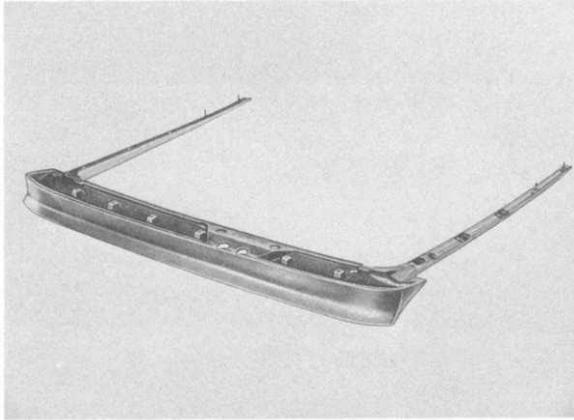


5. Unscrew all accessible Phillips screws (12) on inside of lid and two M 4 nuts on upper part of spoiler (arrows).



Installing

1. Check metal nuts inserted in the rear spoiler, replacing missing or damaged metal nuts.

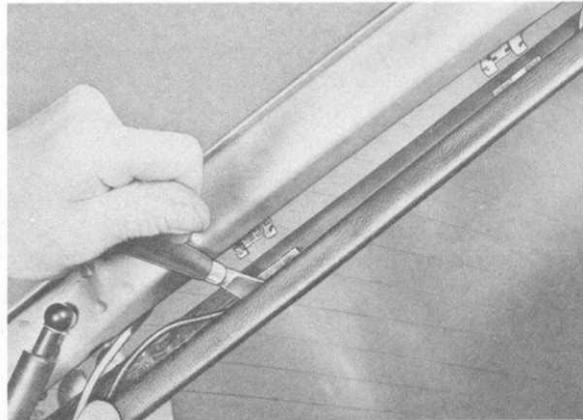


2. Check that spacers on lid are positioned correctly to bores in lid. Seal and secure loose spacers with Terostat 33 (Teroson) silicone adhesive.



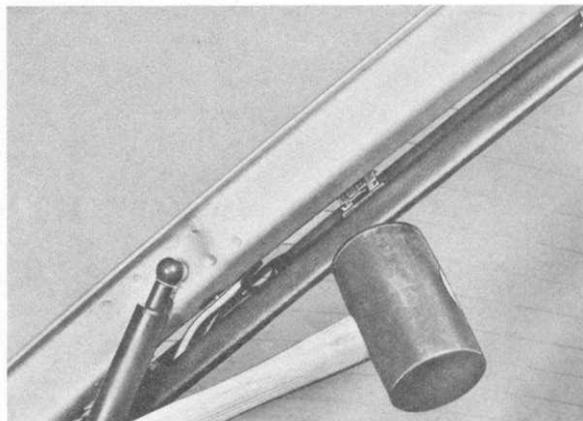
3. Install rear spoiler. Mount with 4.2 x 32 mm metal screws and washers. Watch for neat fit on lid. Use two M 4 nuts and above mentioned washers at upper part.

4. Install side lid trim sections. Press defogger wires underneath retaining tabs on outside.

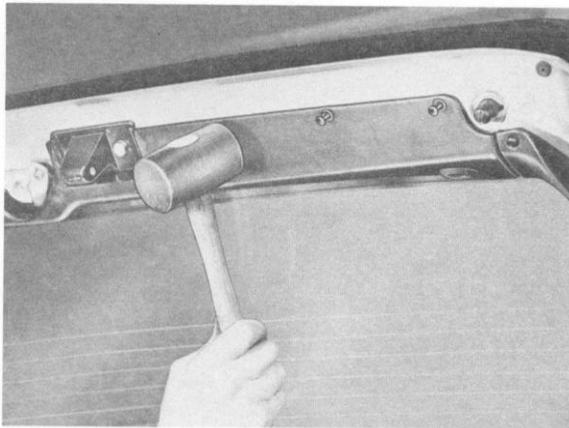
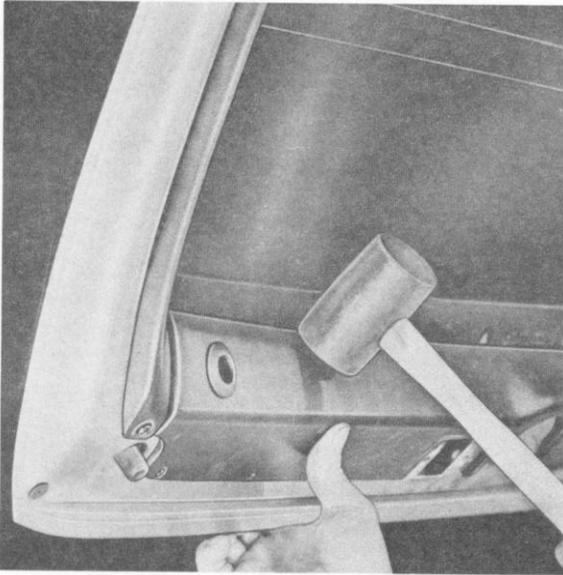


Make sure all retaining tabs engage correctly in the metal clips.

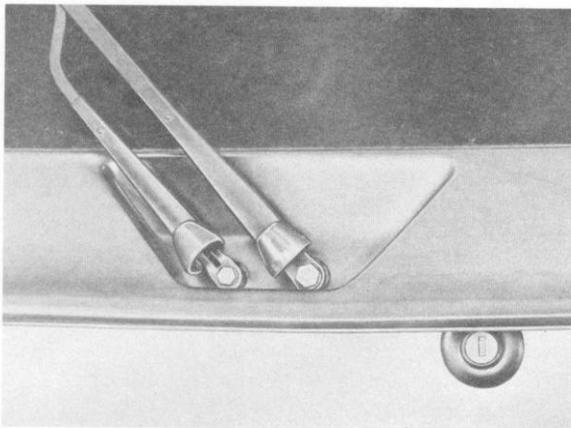
Align trim panels with lid frame and secure with new spreader rivets.



5. Insert, align and secure lower trim panel with 6 spreader rivets.

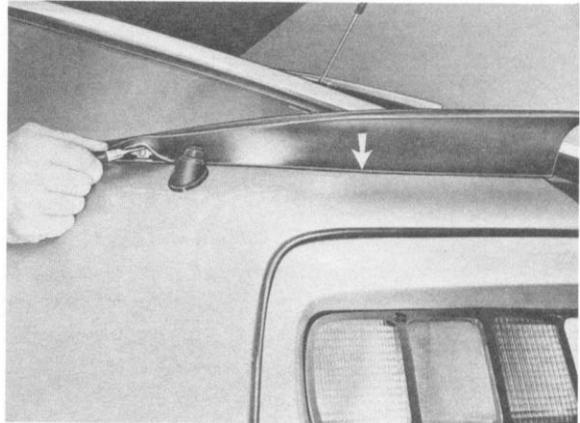


6. Install lid lock. Seal off outside of lock cylinder against upper escutcheon with a permanently elastic sealant. Install and secure rear window wiper parallel to side window strip.



Removing Side Rear Spoiler

1. Lift spoiler with a narrow putty knife about 5 cm behind the spoiler's front edge enough that the Phillips screw underneath is accessible and can be unscrewed.
2. Provide access to second metal screw (arrow) about 25 cm behind spoiler's front edge and remove screw.



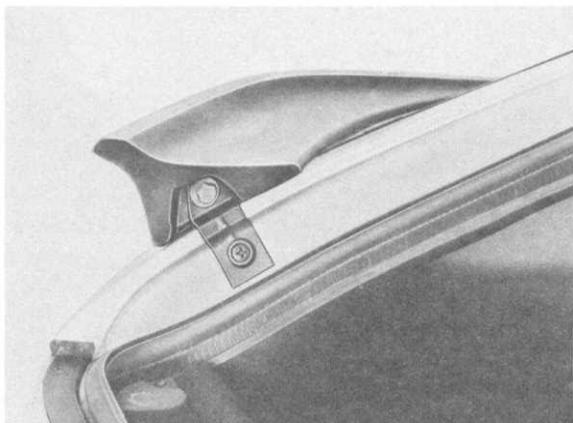
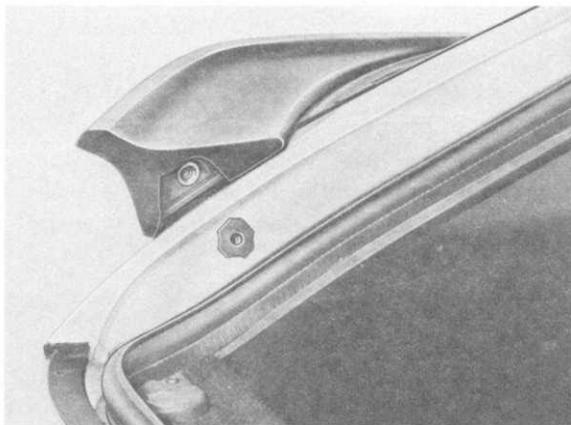
3. Unscrew bracket on inner frame. Remove spoiler.

Installing

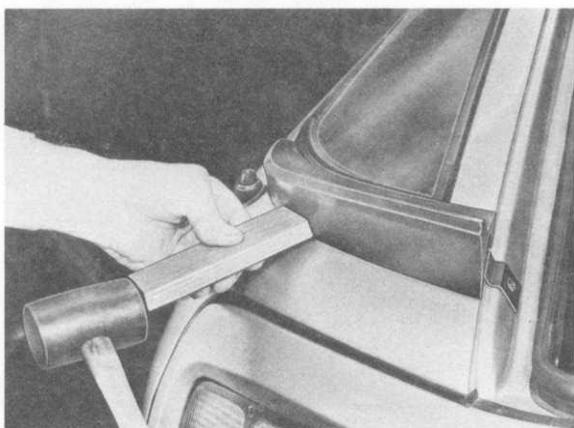
1. Insert side rear spoiler and install covered 4.2 x 9.5 mm metal screws. Check clearance between metal screw and ornamental strip at front holding block, cutting out the ornamental strip in the broken line area if necessary.



2. Mount seal on inner frame. Mount bracket on inner frame with M 6 x 16 oval head screw and on spoiler with M 6 x 10 hex. head screw with washer.



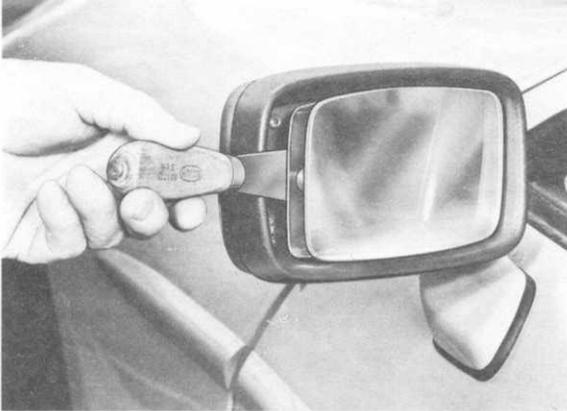
3. Check fit of spoiler on rear side section and window frame. If necessary, correct by applying light knocks against mounting surfaces with a piece of wood. Tighten bolts.



4. Check side spoiler for uniform fit to lid-mounted spoiler and correct adjustment, if necessary.

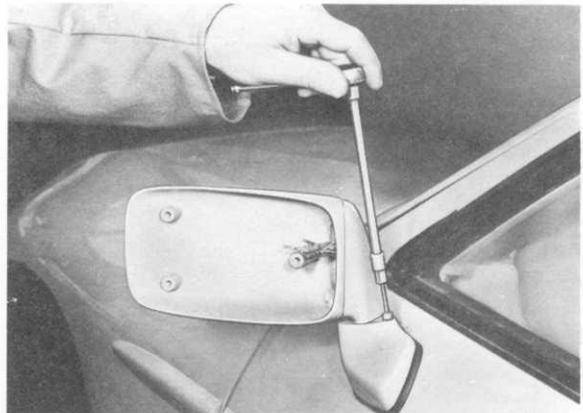
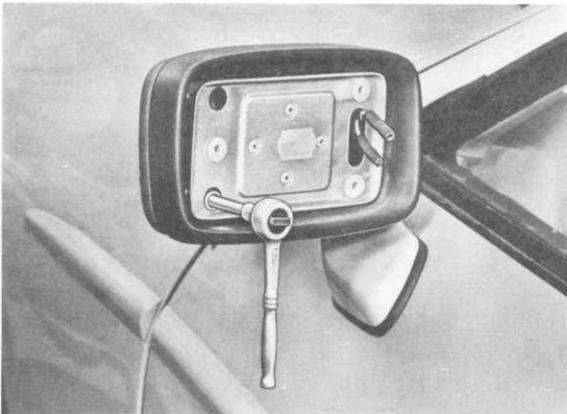
REMOVING AND INSTALLING OUTSIDE MIRROR

1. Pry off clips on mirror glass with a putty knife on backplate and disconnect contact plugs on glass carefully.



4. Unscrew fillister head screw on mirror base so that mirror can be removed with the liner.

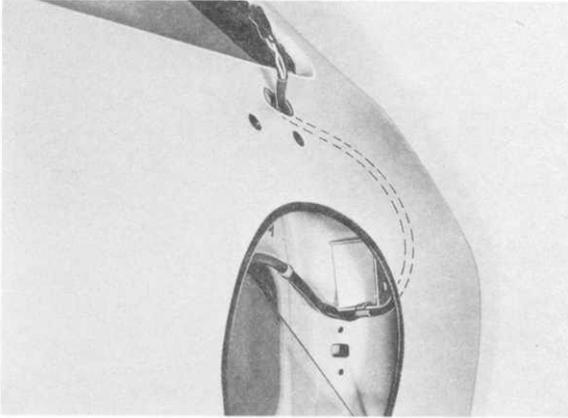
2. Unscrew 3 screws through holes in backplate, take off foam rubber part and pull off wire plugs.



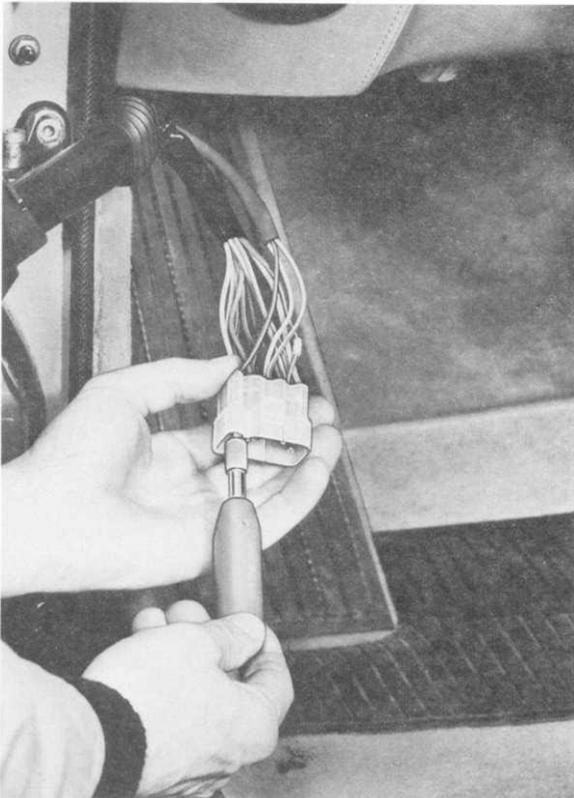
3. Note wire positions in receptacle by colors. Press in locks on each wire plug separately with an extraction tool and pull out wires.

5. Install in reverse order.

6. If wire harness in door has to be removed, take off inside door trim panel and take harness out of holders.



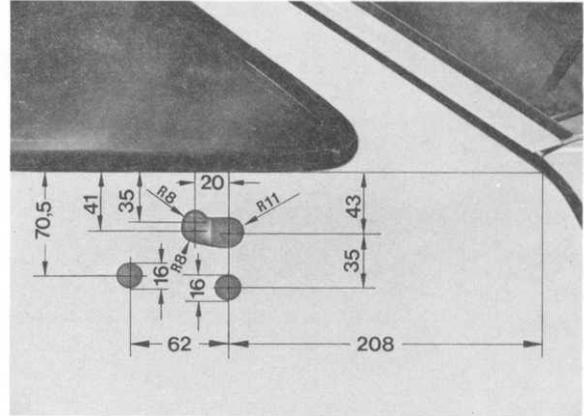
7. Disconnect plug underneath instrument panel, press out wires on outside door mirror with an extraction tool and pull out wire harness.



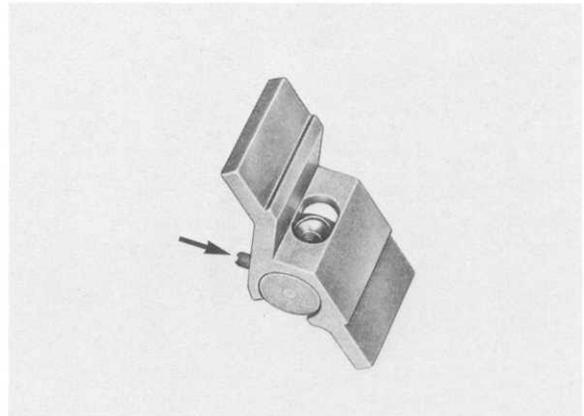
8. When installing, make sure wire harness is secured with the provided holders and cannot contact the door window glass.

SERVICE INSTALLING OUTSIDE MIRROR ON PASSENGER'S DOOR

1. Remove inside trim panels on doors. Pull off door plastic sheets partially. Remove outside mirror and wire harness on driver's door.
2. Paint mirror set to match body color of car.
3. Insert guide tube with spring and centering plates and torque to $15 + 3 \text{ Nm}$ ($130 + 2 \text{ in.lb}$) with a multiple socket wrench.



5. Push threaded insert into door reinforcement and hold with a rollpin.

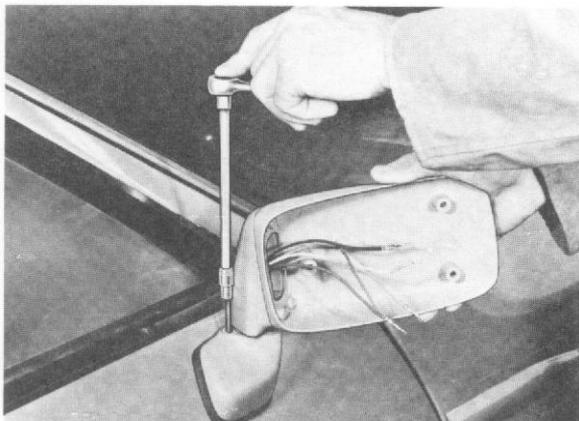


4. Mark location of hole on door outside panel according to specified dimensions, punch mark and drill 16 mm and 22 mm dia. holes with a standard compass saw. Cut out and file opening with suitable tools.

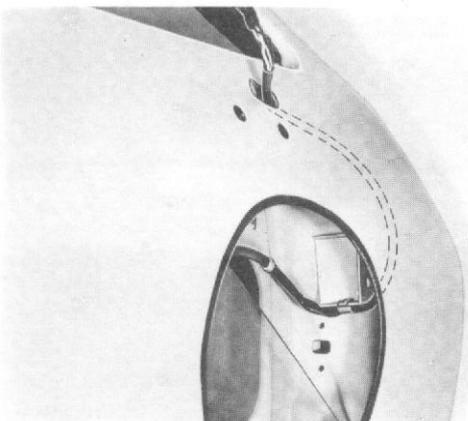
Caution!

Do not damage door reinforcement.

6. If necessary, align door reinforcement on door outside panel. Fit in mirror base, correcting drilled holes if necessary. Make sure of proper fit.
7. Install new wire harnesses from inside of door to outside and pull into mirrors. Mount mirrors and liners on doors with fillister head screws, which are torqued to 5.6 Nm (4 ftlb).



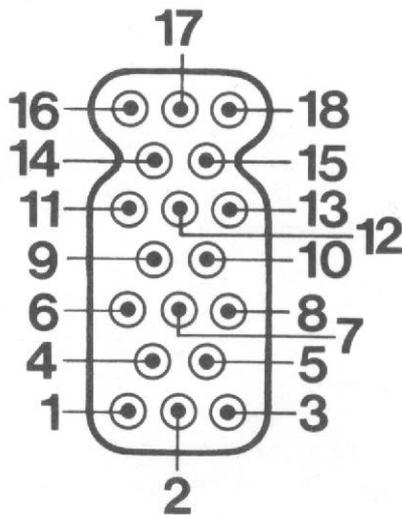
8. Wire harnesses must be secured in holders provided in a manner to prevent contact with the door window.



9. Insert wires harnesses through guides and press into plug connections according to sketches.

Right multiple pin plug (passenger's side)

Rear view:



Terminal 66 = blue

Terminal 7 = white

Terminal 8 = black

Terminal 9 = gray/green

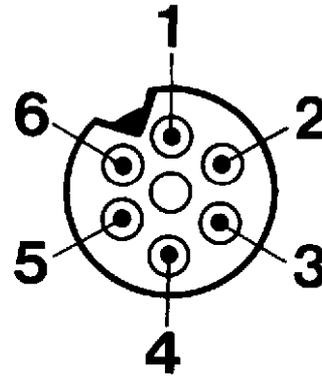
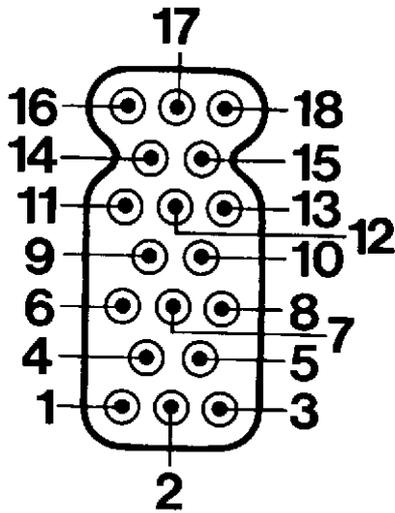
Terminal 16 = brown

Left Multiple Pin Plug (Driver's Side)

Mirror multiple pin plug (passenger's side)

Rear view:

Rear view:



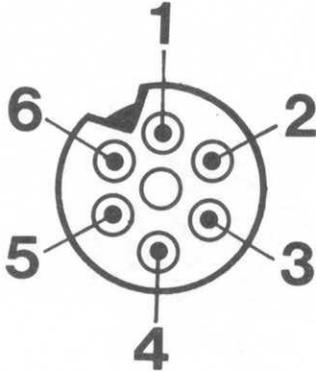
- Terminal 6 = blue
- Terminal 7 = white
- Terminal 8 = black
- Terminal 9 = gray/green
- Terminal 10 = white/red
- Terminal 16 = brown

- Terminal 1 = blue
- Terminal 2 = black
- Terminal 3 = gray/green
- Terminal 4 = brown
- Terminal 5 = brown
- Terminal 6 = white

10. Press wires in mirrors into round male plugs according to sketches.

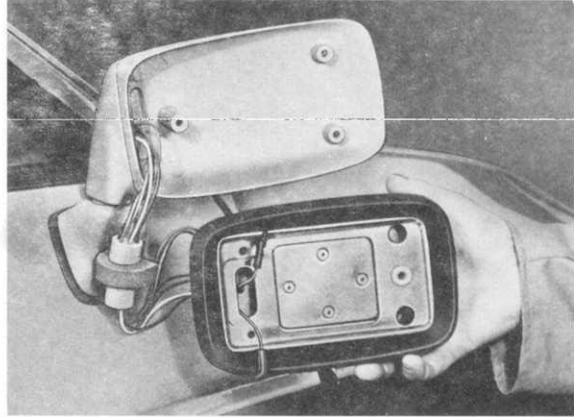
Mirror multiple pin plug (driver's door)

Rear view:



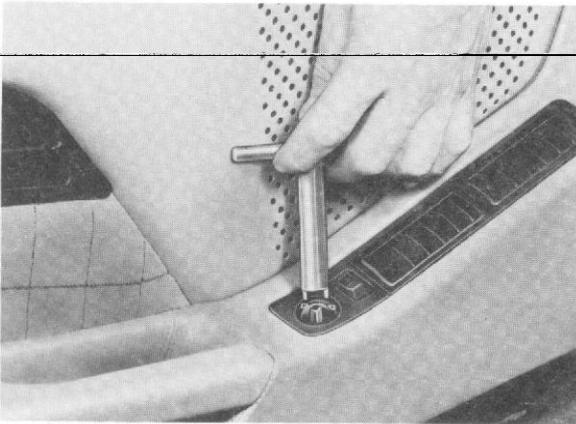
Terminal 1 = black
Terminal 2 = yellow
Terminal 3 = gray/green
Terminal 4 = brown
Terminal 5 = brown
Terminal 6 = white

11. Compress wire plugs and secure with self-adhesive tape.

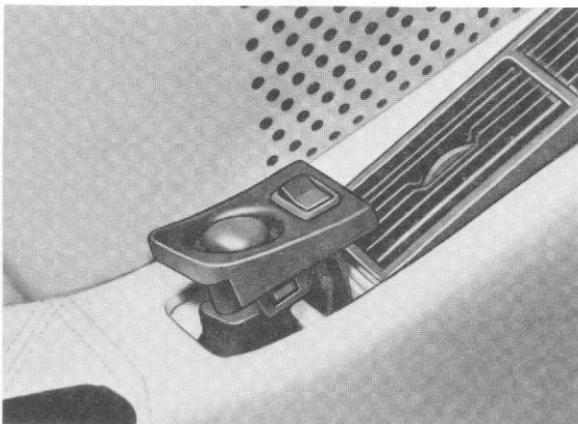


12. Mount cover with mirror glass carrier, connect and insert mirror glass.

13. Lift off knob on outside mirror switch and unscrew threaded sleeve with Special Tool 9209.



14. Remove outside mirror switch and disconnect plug. Cut out hole for switch. Insert switch in clips and connect with wire harness.

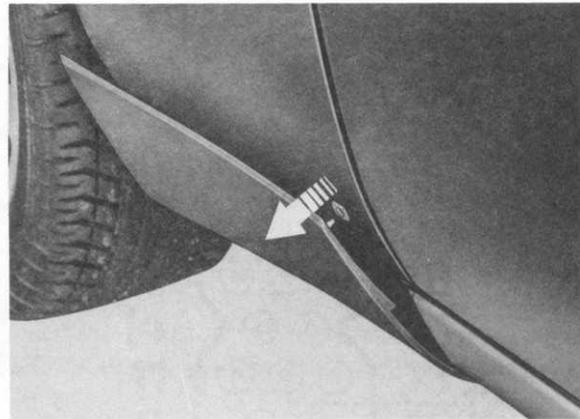
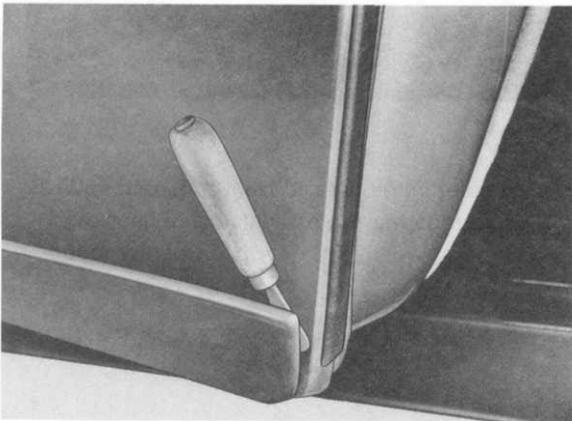


15. Paste plastic sheets on doors. Connect electric wires between door trim panels and wire harnesses with each other and install door trim panels.

REMOVING AND INSTALLING SILL COVERS

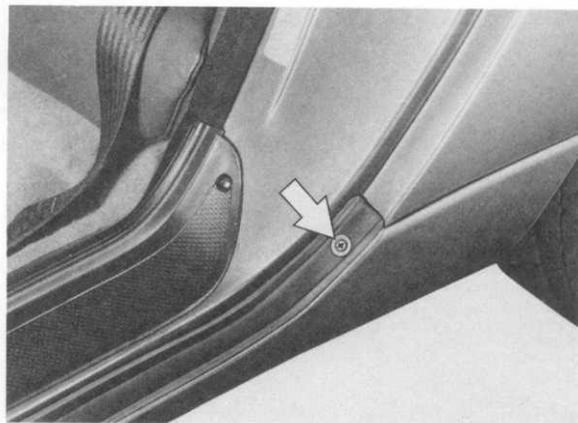
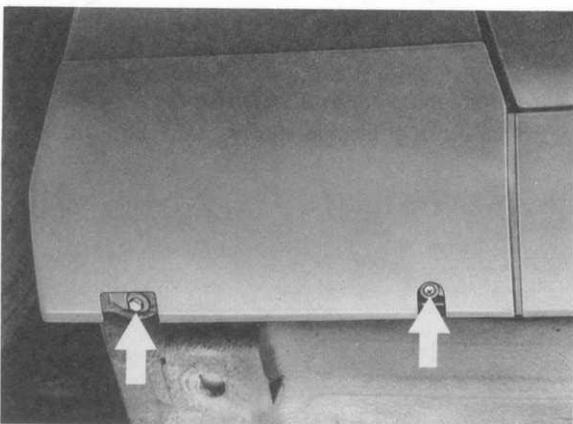
R e m o v i n g

1. Use a hot-air blower to heat sill cover on door to approx. 70°C, carefully detach with a suitable tool and pull off.

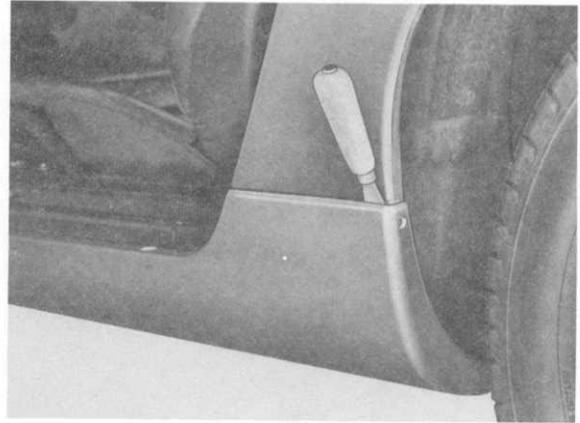
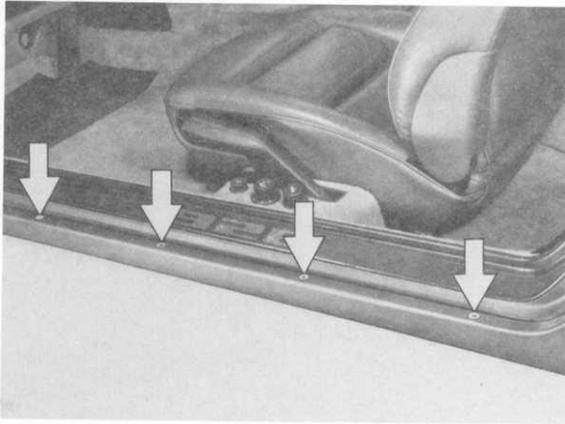


3. Remove screw holding cover strip in place.

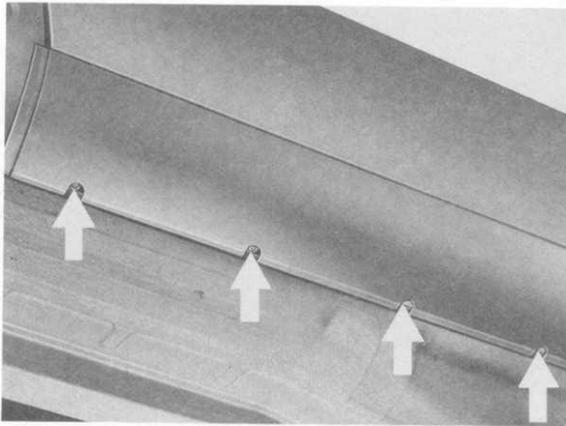
2. Remove sill strip mounting screws from front fender, use a hot-air blower to heat sill strip to approx. 70°C, carefully detach, unclip and remove.



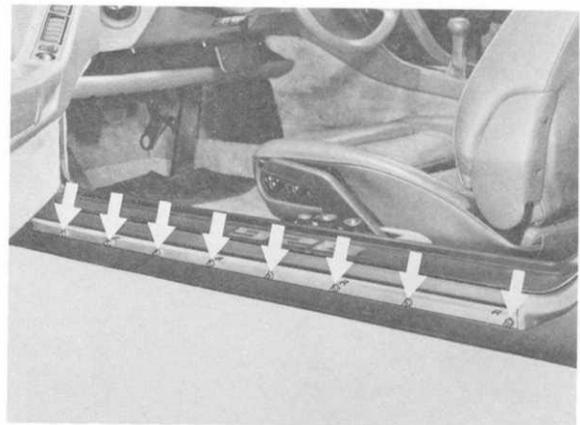
4. Unclip trim strip and remove upper securing screws of sill cover.



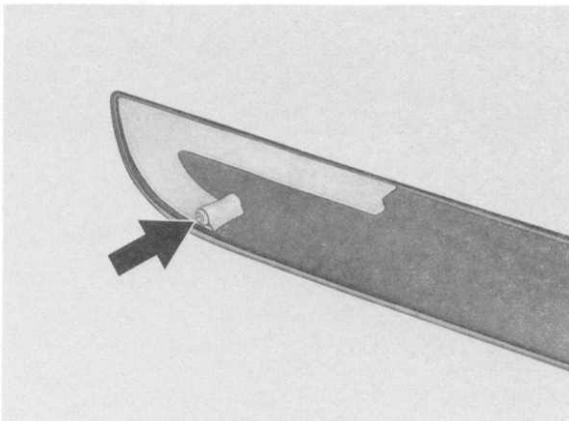
5. Remove lower securing screws from sill cover; where cover is held by adhesive, use hot-air blower to heat cover to approx. 70°C, carefully detach and pull off.



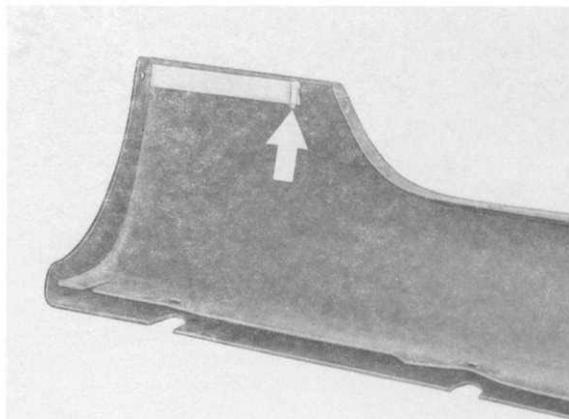
6. Remove sill cover securing nuts and remove cover from car.



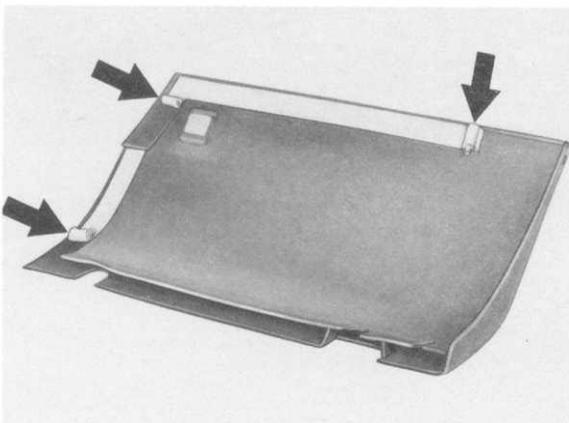
7. Lay sill cover on a level surface. To avoid damaging finish, place soft material beneath strip. Heat adhesive tape with hot-air blower to approx. 70°C and rub tape off.



9. Use a hot-air blower to heat adhesive tape on sill cover to approx. 70°C and rub off.

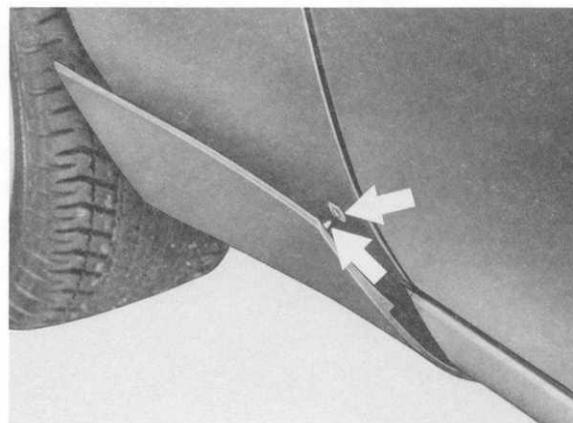
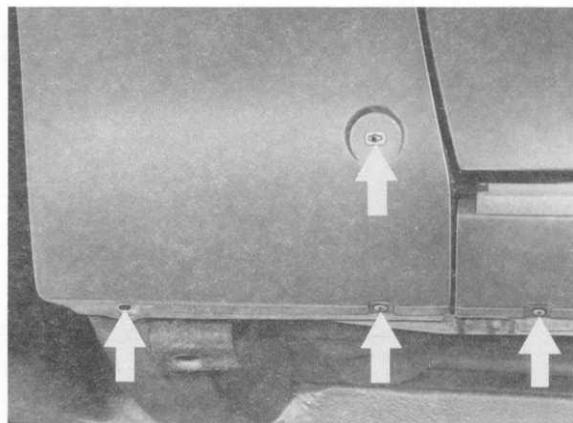


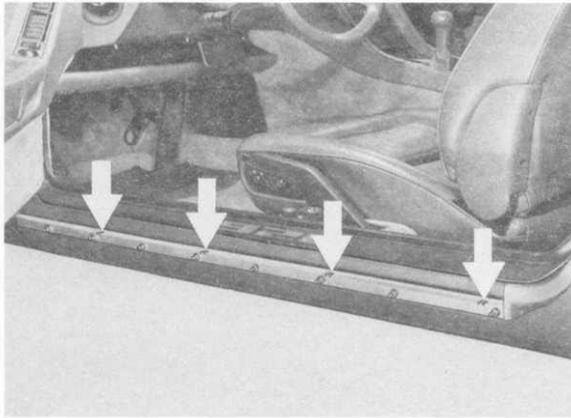
8. Use hot-air blower to heat adhesive strips on fender sill cover to approx. 70°C and rub off.



Installing

1. Check all sill cover securing points, renew if necessary.



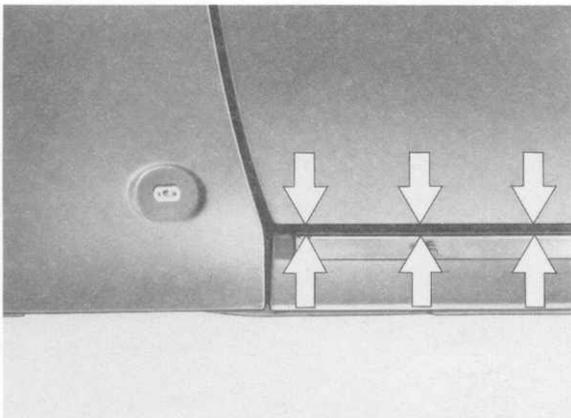


2. Clean sill covers with methylated spirits and a closed-cell cloth and apply new adhesive tape.

Note :

Never use tape older than 1 year, see date of manufacture.

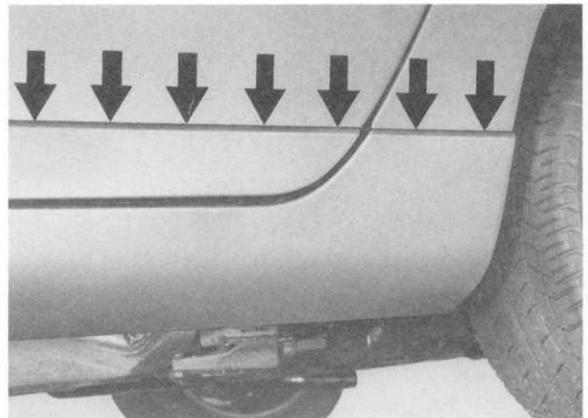
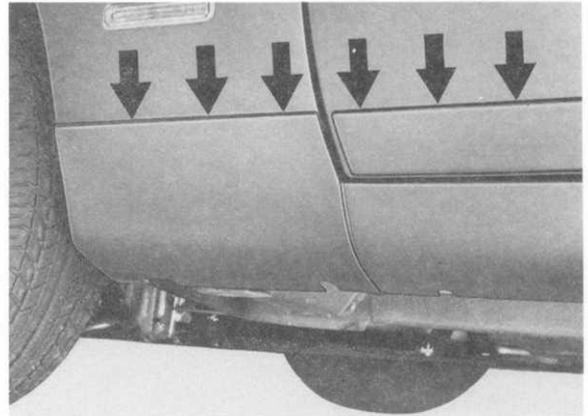
3. Install cover strip. Check that gap between door and strip is uniform throughout its length.



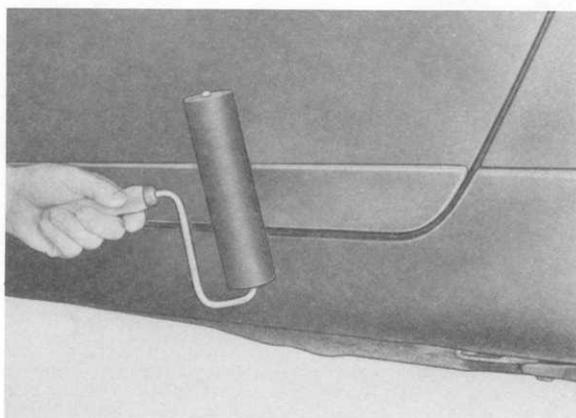
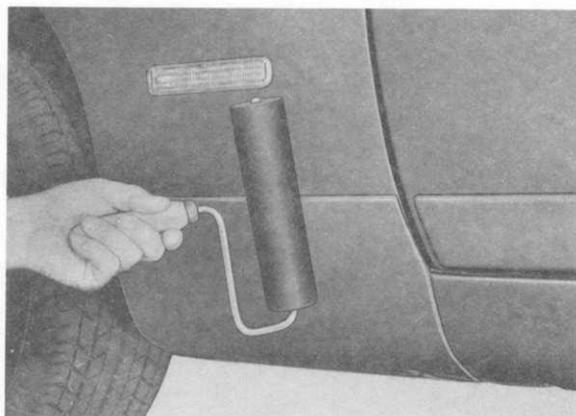
4. Carefully clean body with methylated spirits and closed-cell cloth in the area around the sill cover.

5. Peel protective backing from adhesive strips. Do not touch the adhesive surfaces.

6. Installation of the sill covers is the reverse of the removal procedure. Check that the height of the door-sill cover at front and rear corresponds to that of the other sill covers.



7. Complete installation by pressing the sill covers firmly along the adhesive strip with a rubber roller.

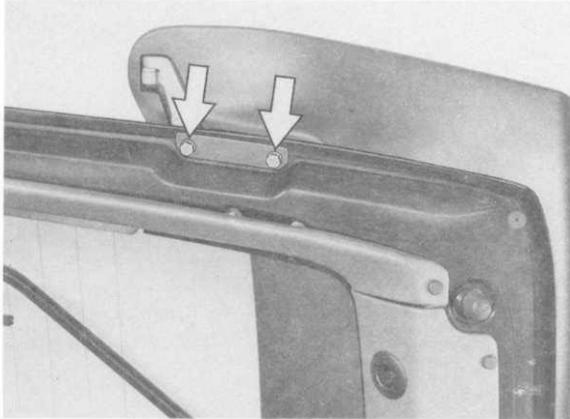


8. The ambient and vehicle temperatures must be at least 20°C.
9. After reapplication of adhesive sill strips, do not wash the car or apply preserving agents for at least 24 hours.

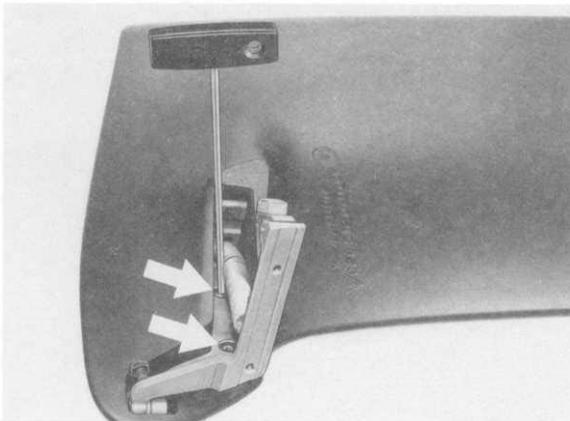
REMOVING AND INSTALLING REAR SPOILER

Removing

1. Open tailgate, remove spoiler securing screws and lift spoiler off tailgate.



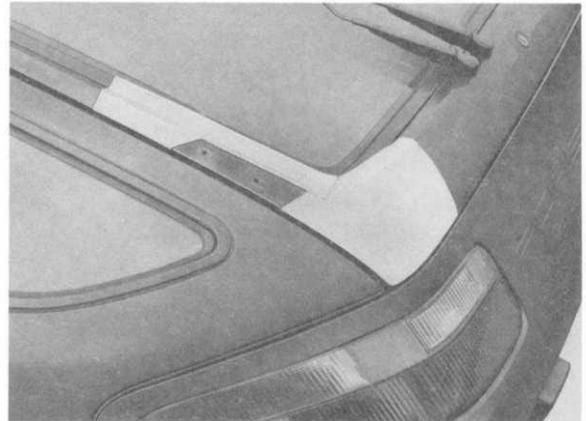
2. Place spoiler on a soft surface, unscrew securing screws from hinges and remove hinges from spoiler.



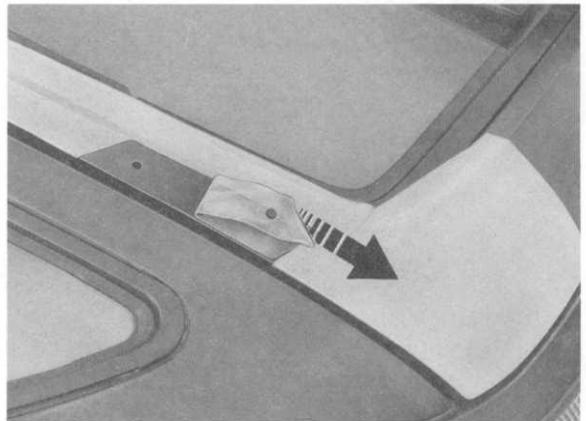
3. Check hinges, renew if necessary.

Installing

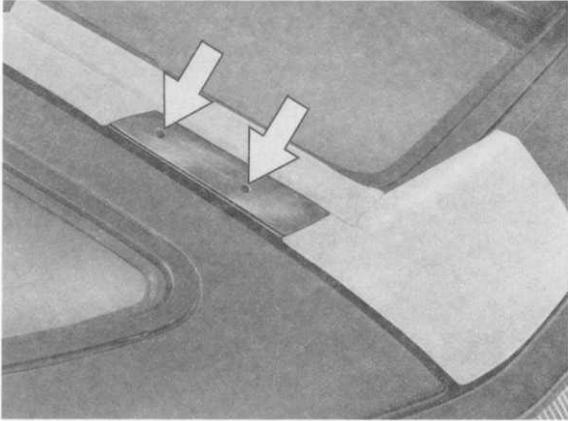
1. Using new screws, attach hinges to spoiler.
2. To protect paintwork, cover tailgate with adhesive tape.



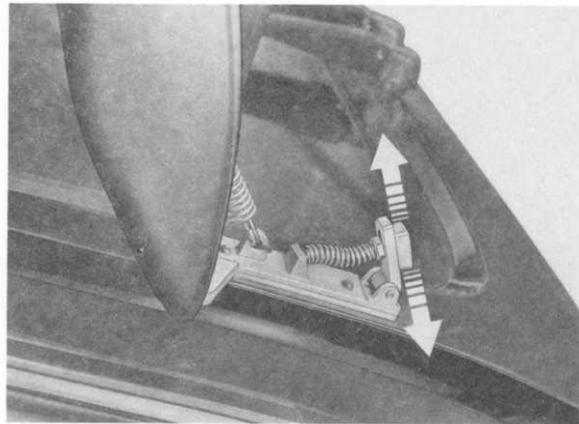
3. Inspect adhesive membrane which protects paintwork, renew if necessary, remove all traces of adhesive with methylated spirits and a closed-cell cloth.



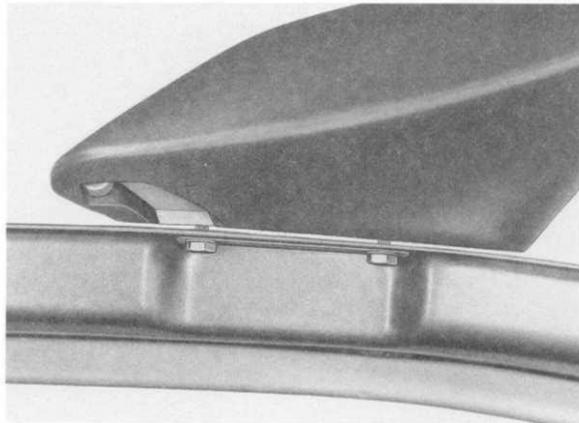
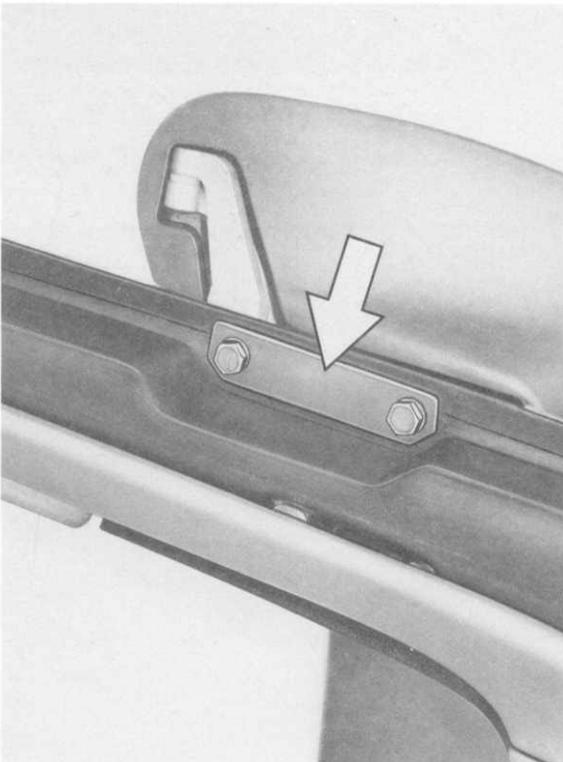
4. When the new adhesive membrane is applied, the holes in the membrane must align exactly with the holes in the tailgate.



6. To adjust, disengage spoiler, slacken screws and adjust on both sides until spoiler holders engage simultaneously without spoiler touching tailgate.



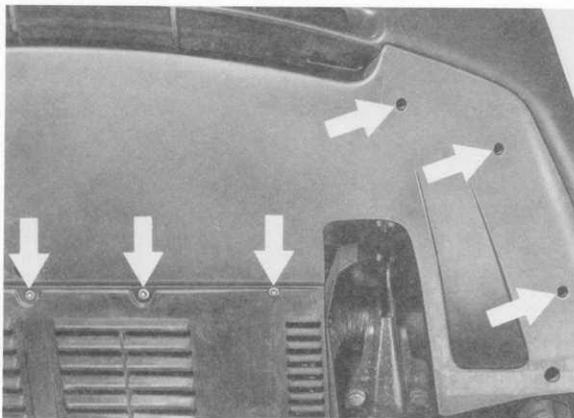
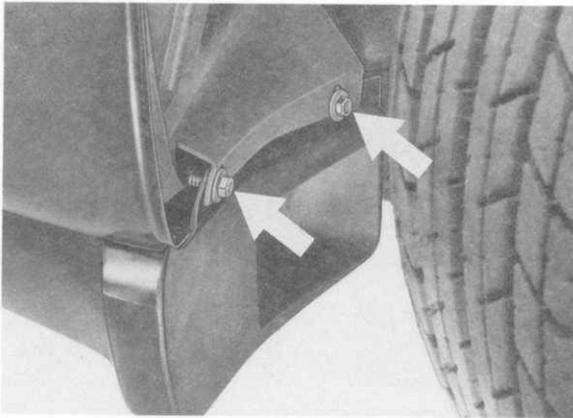
5. Set spoiler on tailgate and secure with new micro-encapsulated screws and washers.



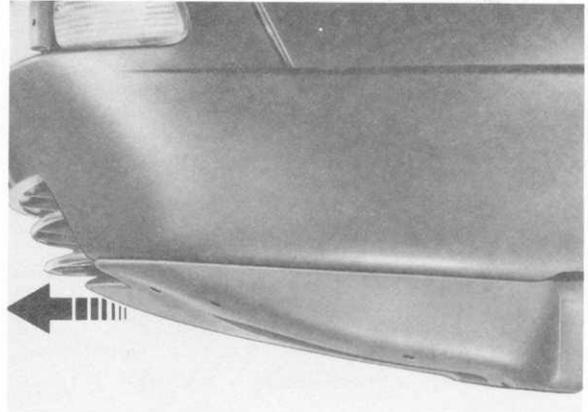
REMOVING AND INSTALLING FRONT AIR DAM

Removing

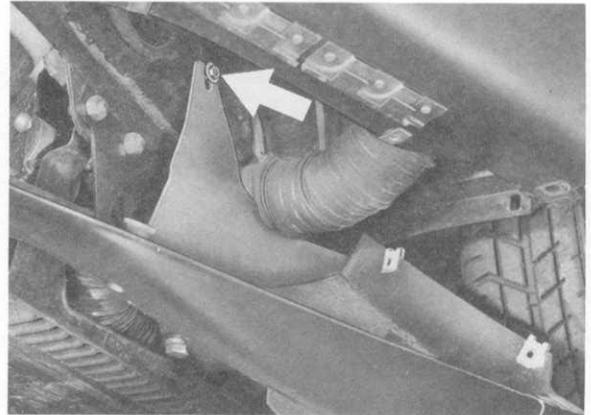
1. Remove securing screws.



2. Pull front air dam horizontally off mounting clamps.

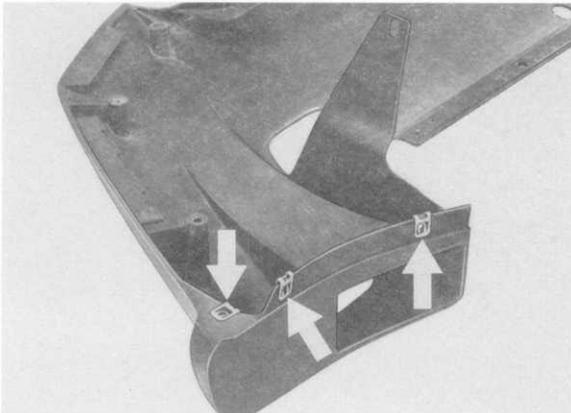


3. Press air dam down and remove the inner securing screws.

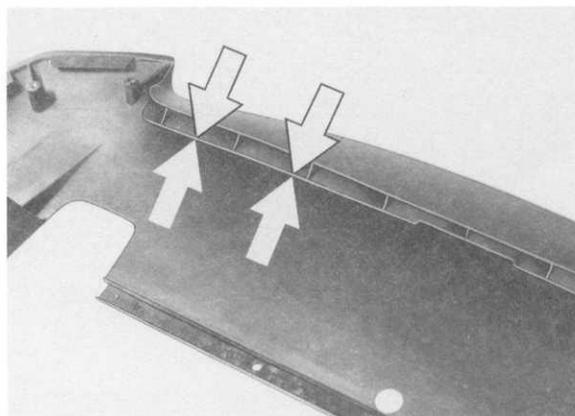
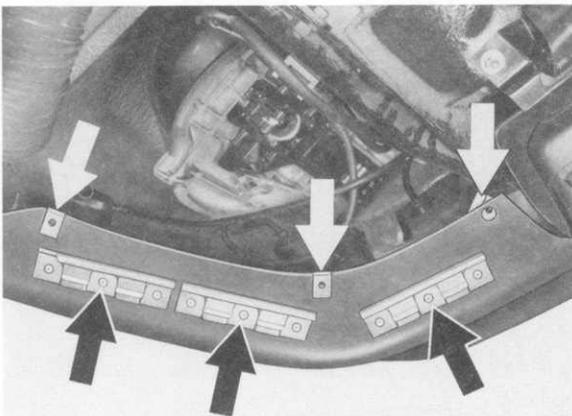
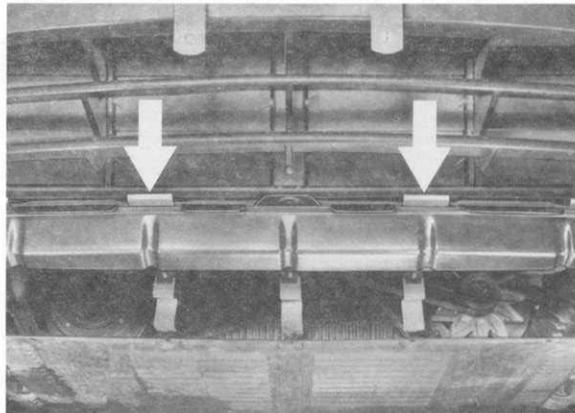


I n s t a l l i n g

1. Prior to installation of the front air dam, inspect all securing points and renew as necessary.



3. When pressing the front air dam into the securing clamps, check that the lower edge of the air dam engages the foremost holder on the transverse member.



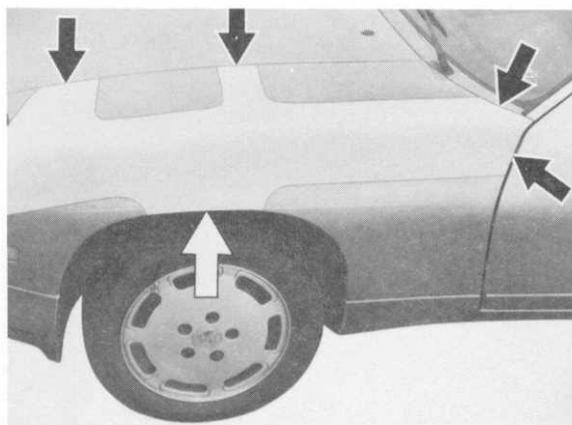
2. Installation is the reverse of the removal procedure.

Fitting the CLUB SPORT emblem

Note

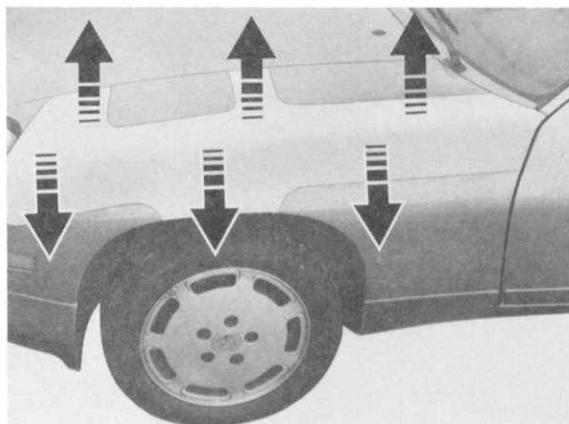
The temperature of the vehicle and that of the foil must be at least 20°C when fitting the emblem .

1. Remove any dirt from the area involved and clean with methlated spirit.
2. Dampen the area on the fender with a 50 % alcohol - water solution to ensure that the foil does not stick immediately when positioning.
3. Pull the beige protective paper from the foil and lay the foil on the edge of the fender.



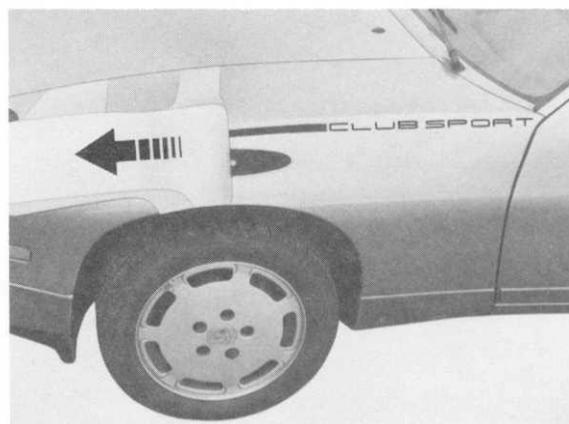
88/49A

4. Using a plastic spatula or similar, smooth out the moisture from the center outwards. Make sure that no air bubbles remain trapped.



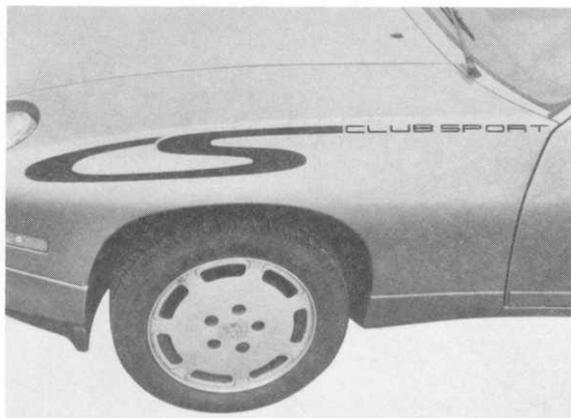
88/49B

5. Pull the outer protective paper from the foil.



88/50

6. Puncture any remaining air bubbles with a needle and press down the foil.



88/48

Retrofitting new mirror generation for vehicles as of MY '87

Note

Only for vehicles fitted with door mirrors on driver's and passenger's side.

1. Remove door mirror.
2. Assemble new door mirror.
3. Cut wire at mirror to required length (connector is engaged into the reinforcement plate).
4. Install new connectors and engage into connector housing half according to below list.
5. Fit mirror (route wire through stud into mirror housing).
6. Engage connector into connector housing half.
7. Assemble both connector housing halves and lock connector housing (6-pin) in the reinforcement plate (the 4-pin connector housing is tied out of the way).
8. Fit mirror glass.

1 - white

2 - blue

3 - black

4 - red

5 - brown

6 - brown

Vehicles with seat memory require an additional 4-pin connector (connector sockets).

1 - grey

2 - green

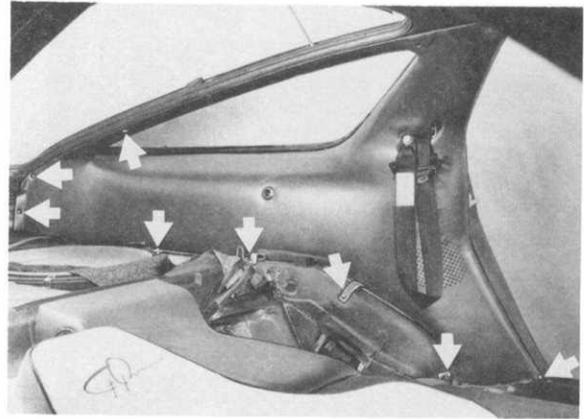
3 - pink

4 - yellow

On vehicles without seat memory, the wires not required are tied out of the way.

REMOVING AND INSTALLING REAR SIDE TRIM PANEL

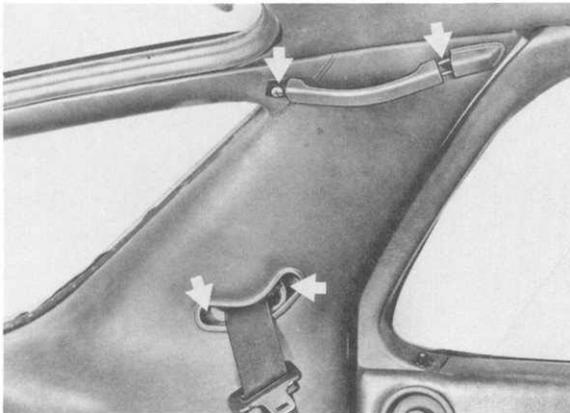
1. Disconnect and remove luggage compartment cover, tool plate, floor mat, spare wheel cover, edge guard on B pillars, parking brake cable cover, emergency seat cushions and backrests.
2. Remove seat belt on side member and seat well at outside (arrows).



5. Install in reverse order.

6. Make sure trim panel engages in proper holders in area of wheel house.

3. Remove escutcheon for seat belt and grab handle (arrows).



4. Remove screws (arrows) and pry off trim panel at top with a suitable tool (clips) and pull forward slightly. Pull off radio speaker wires, slide seat belt through opening and remove trim panel.

Safety regulations for handling airbag vehicles

The airbag units are pyrotechnical objects of danger class T 1. Handling, transport and storage are subject to the Law on Explosives.

The listed legal regulations apply to the Federal Republic of Germany. The respectively applicable regulations must be observed in all other countries.

The start of work with pyrotechnical objects must be reported to the trade board (responsible authority) 14 days previously.

Shipment

Shipment of airbag units must occur only in the transport packaging officially approved for this purpose. The airbag units must not be transported with other dangerous goods.

On company premises, transport must always occur in the trunk or cargo space of a vehicle using the above-mentioned transport packaging. Transport in the passenger compartment is prohibited.

Storage

Airbag units must be stored in accordance with the 2nd ordinance of the Law on Explosives. In accordance with this ordinance, small quantities of substances and objects can be stored in certain locations without special storage approval. In the case of pyrotechnical objects of the class T 1, these quantities are max. 20 kg (gross) in a working room and max. 200 kg (gross) in a storage room. The air bag units must be stored locked away.

When storing the airbag units, it must be ensured that the padded side faces upward (risk of injury as the result of the airbag unit being catapulted up in the event of accidental ignition).

The airbag units must not be stored with other dangerous goods (paints etc.).

Installation and adjustment work

Inspection and installation work must be performed only by competent personnel.

The following safety measures must always be taken before starting work on the airbag system as well as for work on neighboring parts where there is a risk of live parts coming close to the airbag system:

1. Switch off ignition.
2. Disconnect and cover negative terminal of the battery.

Note

Disconnect ground cable directly at the battery negative terminal on vehicles fitted with a telephone. If the ground terminal is disconnected in the luggage compartment, ground contact may be established across the telephone, thus destroying the telephone.

After disconnecting the battery, installation work or work on the vehicle with a hammer or similar tools must be started only after a waiting period of 20 minutes. This is necessary to interrupt the power supply to the airbag system and to ensure that the system is not ignited unintentionally.

Installation of the airbag units must take place immediately after removal from the storage location. They must not be left unattended under any circumstances. In the event of interruptions in work, the airbag units must be locked away again immediately.

Airbag units must not come into contact with grease, oil, cleaning agents or similar.

Airbag units must not be exposed to temperatures over 90°C, even on a short-term basis.

Airbag units, front sensors and control units which have been dropped from a height of more than 0.5 m must no longer be installed.

No additional panels, stickers or similar must be attached to the steering wheel and in the area of the passenger airbag.

No changes must be made to the cabling and components of the airbag system.

The battery must always be disconnected before the start of adjustment and welding work with an electrical welding unit.

If welding is necessary in the direct proximity of the front sensors and the control unit, these must be removed previously.

Cables from electrical auxiliary equipments must not be laid close to the airbag cable bundle.

Airbag components must not be repaired. They must always be replaced.

Note

Wash your hands after touching tripped airbag units.

Disposal of airbag units

Non-ignited airbag units represent a danger, also to the environment. Non-ignited airbag units must not be scrapped. They should be neutralized by triggering them electrically (refer to page 68 - 15).

If the airbag units cannot be ignited, return them to Porsche or to the importer of your country, respectively, using the original transport container of the spare part and returning it via the same transport route.

Disposal of airbag units

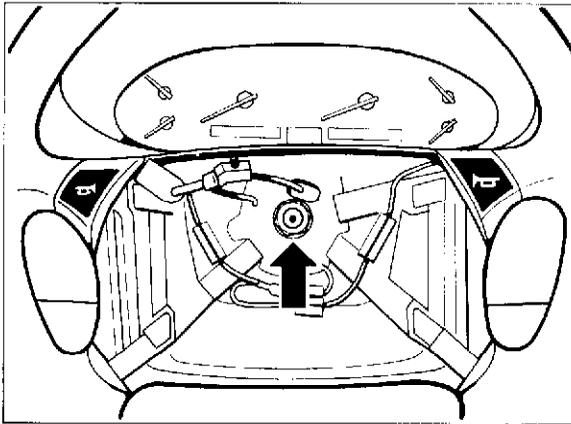
Airbag units that have not been ignited constitute a safety and environmental hazard. Never scrap airbag units that have not been ignited. Deactivate the units by igniting them electrically (refer to page 68 - 15).

If the airbag units cannot be ignited, return them to Porsche or to the respective importer using the original packaging material and the same mode of transport.

Removing and installing the airbag steering wheel

Removal

1. Disconnect the battery and cover the terminal or battery.
2. Remove the driver airbag unit (refer to Page 68 - 4).
3. Undo the hexagon nut and remove with the spring washer.



361-68

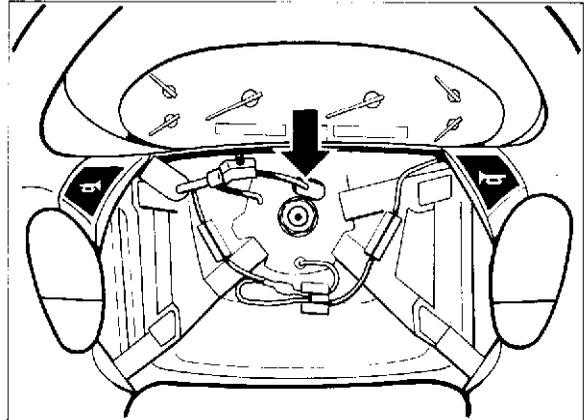
4. Mark the position of the steering wheel with respect to the steering shaft for re-installation.

Installation

1. Mount the steering wheel with the wheels in straight-ahead position or in accordance with the mark made during dismantling so that the upper steering wheel spokes are horizontal.

Note

The steering wheel must be fitted so that the cable of the contact unit is not trapped.



361-68

2. Fit the hexagon nut with spring washer and tighten with 45 Nm.
3. Install the driver airbag unit.
4. Check horn functioning.

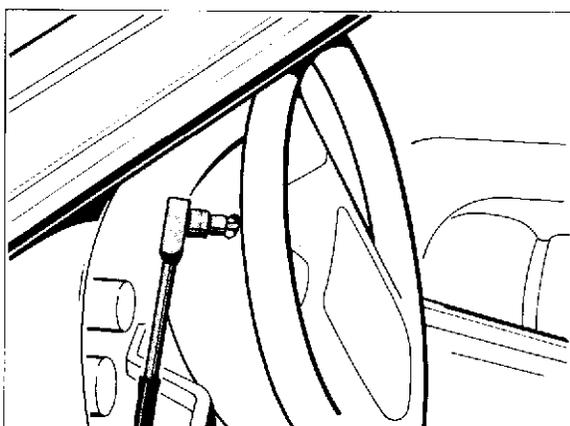
Removing and installing airbag components

Removing and installing the drive airbag unit

1. Disconnect the battery and cover the terminal or battery.
2. Undo the fixing screws (2 each) with a screwdriver for internal Torx T 30.

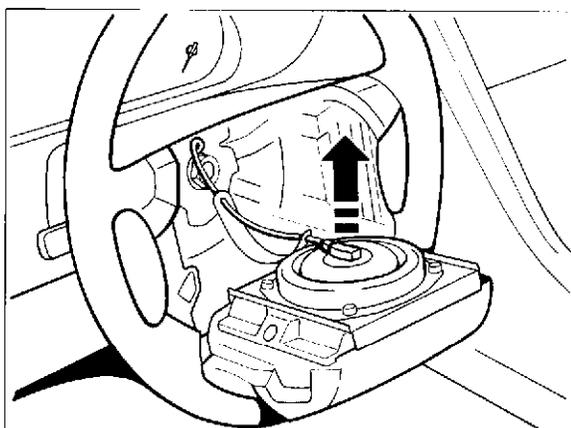
Note

The screws must be renewed after undoing. Only use screws with a collar.



362-68

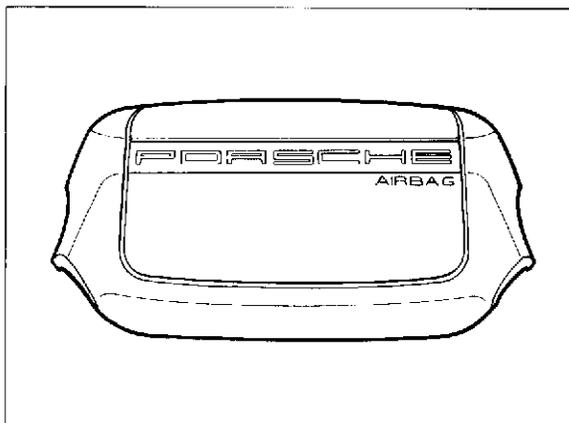
3. Disconnect the plug-in connection.



363-68

Note

The airbag unit must always be put down so that the padded side is facing upwards.



275-68

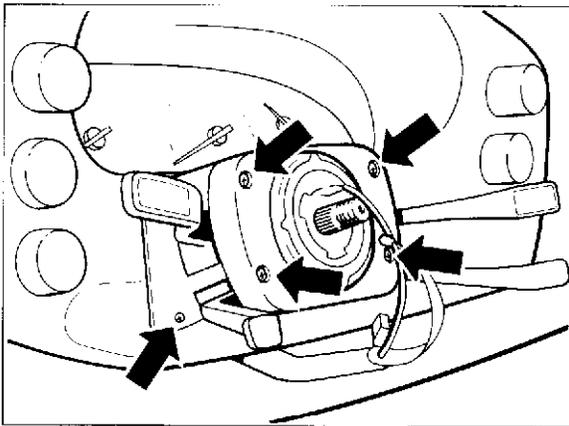
In the case of removal for a long period of time, the airbag unit must be kept locked away. Observe the safety regulations.

Tightening torque for fixing screws: 10 Nm

Removing and installing the contact unit

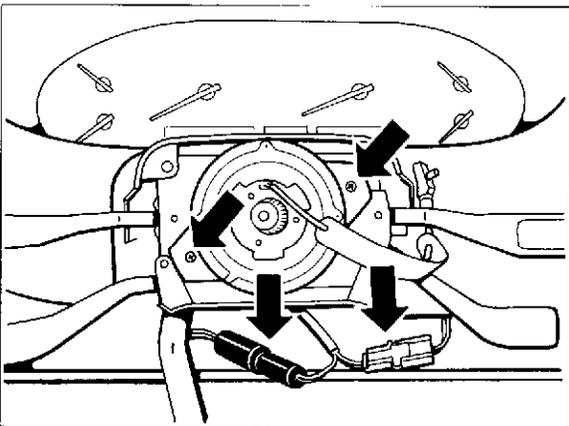
1. Remove the airbag steering wheel (refer to P. 68 - 3).

2. Undo and remove the paneling.



364-68

3. Disconnect the plug-in connections.



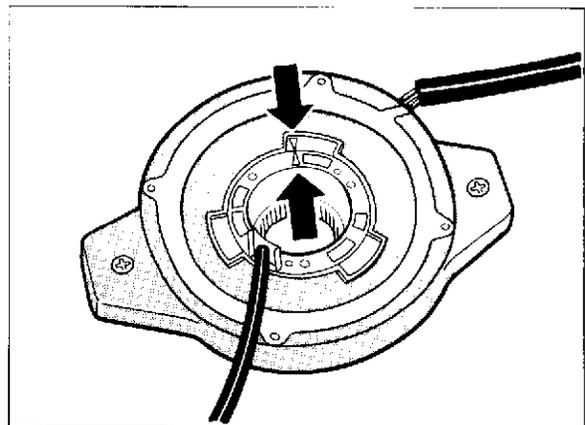
365-68

4. Undo the fixing screws.

5. Remove the contact units

Note

Before installing the contact unit, adjust the front wheels to straight-ahead position and adjust the contact unit to center position (approx. 4 1/2 turns from the left or right limit). The exact center position is indicated by the two arrows.



260-68

A new contact unit is locked in center position. The locking facility is removed only after installation of the contact unit.

Removing and installing the front sensors

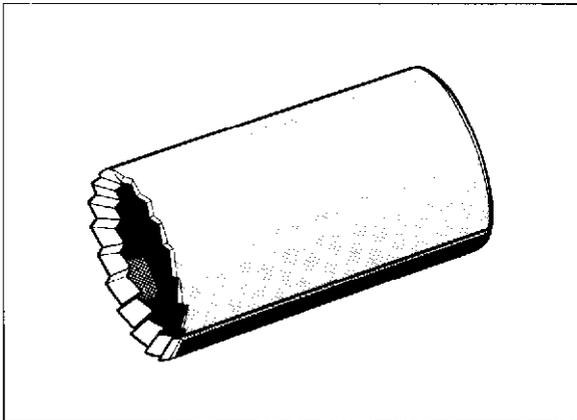
Note

The front sensors are located on the left and right in the driver and passenger footwells on the top of the wheel house wall.

The installation position is defined by the mounting:

Front sensor, left

1. Disconnect the battery and cover the terminal or battery.
2. Remove the tire pressure warning system (RdK), mirror and ABS control units.
3. Disconnect the plug-in connection. The plug-in connection is located on the reinforcement of the front car strut.
4. Undo the tear-off nut with special tool 9259.



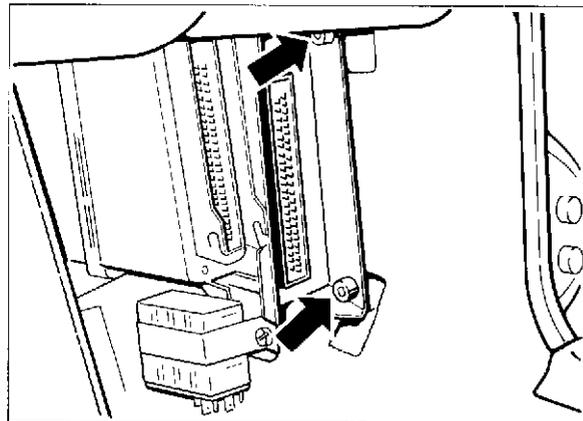
Special tool 9259

281-68

5. Undo the hexagon nut with the socket insert.

Front sensor, right

1. Disconnect the battery and cover the terminal or battery.
2. Remove the control unit cover.
3. Disconnect the plug-in connections at the LH and EZK control units, ignition circuit monitoring relay and at the coding connector.
4. Undo the fixing screws of the control unit holding plate and remove the holding plate with control units.



366-68

5. Remove the cover on the right next to the glove compartment.
6. Disconnect the plug-in connection. The plug-in connection is located next to the lamp monitoring device.
7. Undo the tear-off nut with special tool 9259.
8. Undo the hexagon nut with the socket insert

Note

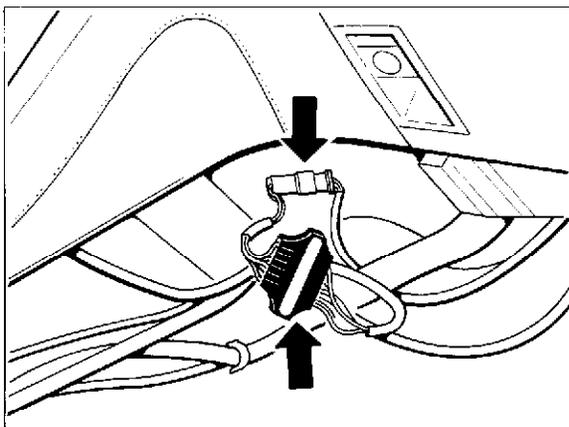
To tighten the tear-off nuts, use hexagon socket 1/4 inch.

The fixing point on the bodywork must be metallically bright. The tear-off nuts are fitted without washers, while the hexagon nuts are fitted with washers.

Removing and installing the control unit**Note**

The control unit is located on the tunnel below the center console.

1. Disconnect the battery and cover the terminal or battery.
2. Remove the side paneling of the center console on the left and right.
3. Remove the kick protection.
4. Disconnect the plug-in connections at the left front sensor, contact unit, right front sensor, right front sensor, passenger airbag unit and the 2-fold and 6-fold plug-in connections to the main cable bundle.



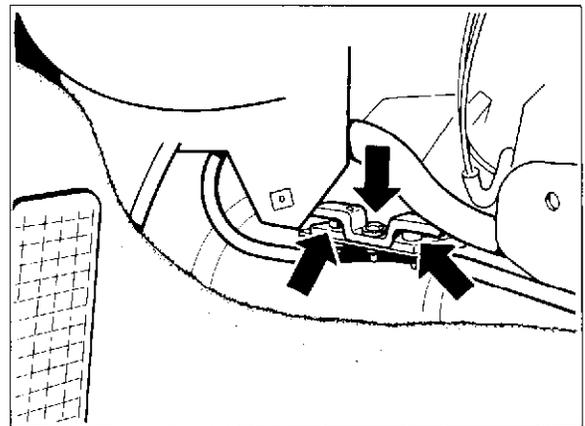
2-fold and 6-fold plug-in connections under the right side paneling

367-68

Note

The 6-fold plug-in connection is secured by a red clip which is destroyed by dismantling. The plug-in connection must be secured with a green clip during assembly.

5. Undo the cable ties along the cable bundle.
6. Undo the cover on the fixing screws.



368-68

7. Undo the tear-off screws with special tool 9259.
8. Undo the hexagon screws with a socket insert.

Note

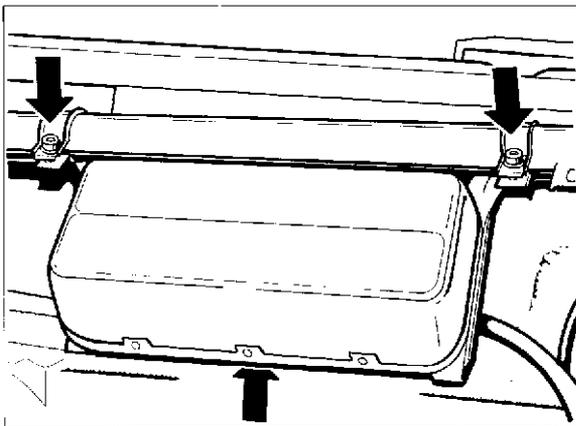
Install the tear-off screws diagonally.

The fixing points on the bodywork must be metallically bright.

Use a hexagon socket 1/4 inch to tighten the tear-off screws. The tear-off screws are installed without washers, while the hexagon screws are installed with washers.

Removing and installing the passenger airbag unit

1. Disconnect the battery and cover the terminal or battery.
2. Remove the instrument panel.
3. Disconnect the plug-in connections at the unit.
4. Undo the fixing screws.



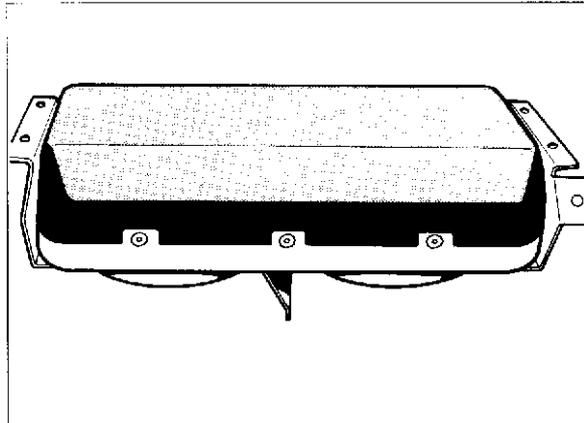
369-68

Note

The fixing screws are micro-encapsulated. Use new screws for installation.

Tightening torque: 10 Nm

The airbag unit must always be put down so that the airbag is facing up.



284-68

Checking operational readiness of airbag system

1. Check correct operation of the airbag warning light. Switch on the ignition. The airbag warning light must come on for approx. 5 seconds. If it does not come on, check the bulb and the power supply.
2. With the ignition switched on, pull out the fuse for the power supply to the instrument cluster for about 30 seconds. The airbag warning light should now indicate a fault. Obtain a readout of the fault and check whether fault code 58 (warning light: short circuit to U_B or ground, no fault present) is shown.

Note

In addition to the airbag warning light, the central warning light and the **seat belt symbol** (for U.S. vehicles only) should also come on if a fault has been stored in the fault memory.

3. Erase the fault memory.
4. Check that no trim, adhesive labels or similar items have been applied to the steering wheel or in the passenger's airbag area.
5. System checking must be confirmed by stamping the appropriate spaces in the Warranty and Maintenance Booklet.

Checking the readiness for operation of the airbag system

As of software level B 01

1. Functional check of the airbag warning

light. Switch on ignition. The airbag warning lamp must light up for approx. 5 seconds*. If the warning lamp does not light up, the bulb or the power supply should be checked.

2. Functional check of the fault memory.

Pull off fuse for instrument cluster power supply for approx. 30 seconds with the ignition switched on. The airbag warning must now display a fault. Read out fault and check if fault code 30 (Airbag warning light, signal unplausible, fault not present) is displayed.

Note

Along with the airbag warning lamp, the central warning lamp must light up as well if a fault has been stored in the fault memory.

3. Erase fault memory.
4. Check to make sure that no trim, decals or other items are attached in the passenger airbag area.
5. Visually check components for damage or modifications.
6. The system check should be confirmed in the stamp fields provided for this purpose in the Warranty and Maintenance booklet.

* Reduced to approx. 2.5 seconds as of production date June 12, 1992.

Checking the safety belts

Functional test

It must be possible to unroll the belt without jerks from the automatic retractor by uniformly pulling it over the guide fitting. The plug-in tongue of the safety belt must engage audibly in the belt lock. The automatic retractor must lock when the belt is tugged abruptly.

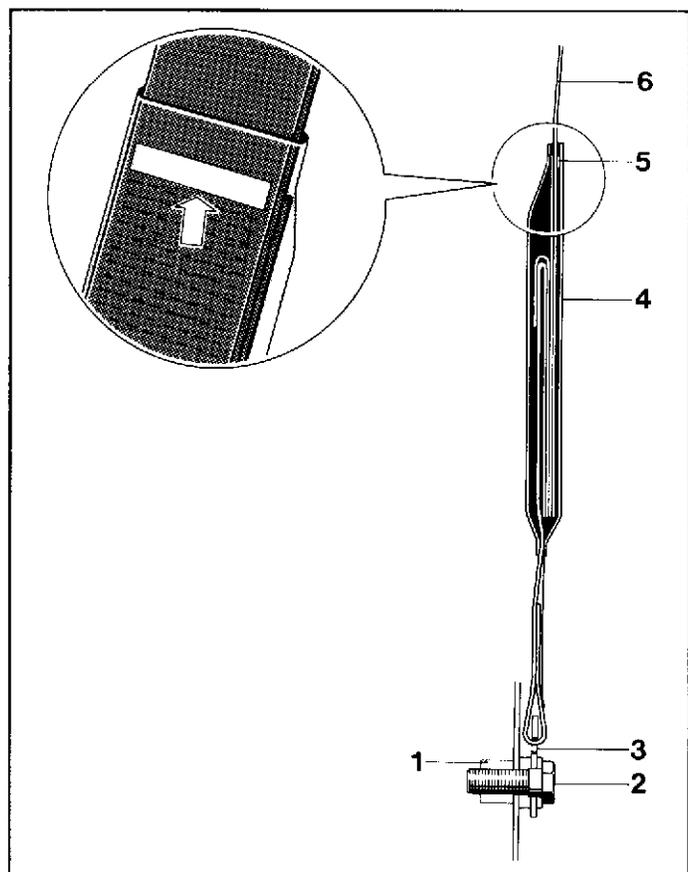
Inspection of condition

The visual inspection must not reveal any damage or wear on the belt. If the belt shows signs of damage in the form of cuts, fraying, seam tears, worn places etc., the safety belt must be replaced.

Additional inspection for safety belts with overload indicator (color marking – Airbag equipment)

In addition to the functional test and inspection of the condition of the safety belts, the color marking made above the holder fitting on the belt in the form of a white bar must not be visible outside the belt protector. This color marking acts as an overload indicator whose emergence from the belt protector indicates overloading and the necessity to replace the safety belt.

- 1 = Mounting point for holder fitting
- 2 = Fixing screw
- 3 = Holder fitting
- 4 = Belt protector
- 5 = Indicator (color mark)
- 6 = Belt



68-286

Correct disposal of airbag units

Airbag units are pyrotechnic objects and can represent an environmental hazard on account of their character as explosion-risk bodies and because of the materials they contain. For this reason, airbag units which have not yet been ignited, or complete vehicles containing such units must not be treated as "normal" waste or disposed of on any other final refuse dumps.

To avoid possible misuses, the airbag units must first be rendered harmless by electrical ignition, making sure that all the relevant precautions are complied with

In the case of airbag units incapable of igniting or if ignition cannot be carried out in safety, the airbag units must in all cases be returned to Porsche or to the relevant importer in their original spare part packs and by the usual transport channels.

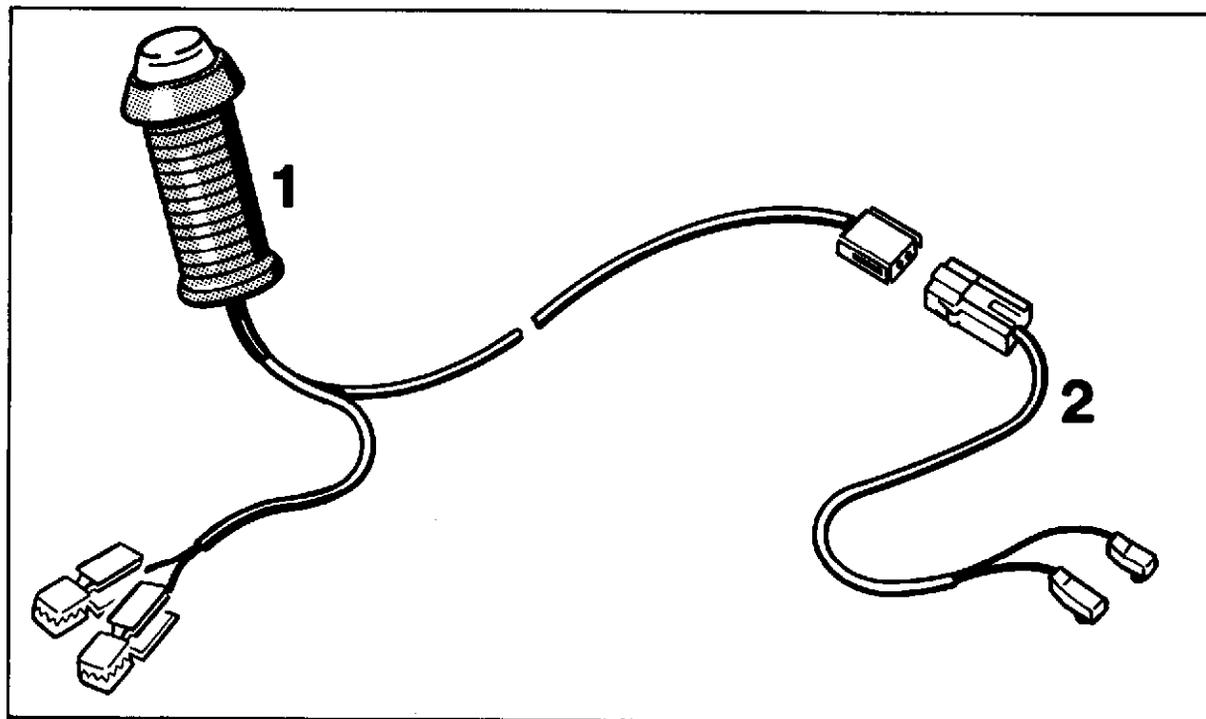
Note

Any specific local or national regulations or legal verdicts which go beyond these instructions must be complied and given preference over these instructions.

Safety measures

- Ignition and preparation should only be carried out by properly qualified personnel under the supervision of a second, responsible person.
- All other generally applicable accident prevention regulations must be complied with.
- Only ignite airbag units which are in original condition and properly installed.
- Ignite airbag units only in suitable open spaces.
- Use only the ignition equipment specifically intended for the purpose.
- First remove all loose objects from the airbag expansion area.
- Anyone likely to be affected should be warned about the noise in advance.
- Use the whole length of the ignition device's cable in order to maintain a safe distance from the airbag unit which is to be ignited.
- Do not connect the ignition device to the power source until everything else is ready.
- Position yourself and anyone else involved in front of the vehicle.
- Ignite the airbag unit with the vehicle's doors closed but the tailgate/trunk lid or side windows open.
- If ignition fails to occur, do not approach the vehicle until approx. 3 minutes have elapsed.
- Allow airbag units to cool down after ignition and observe them carefully.
- Avoid skin contact with airbag units which have been ignited.

Tools

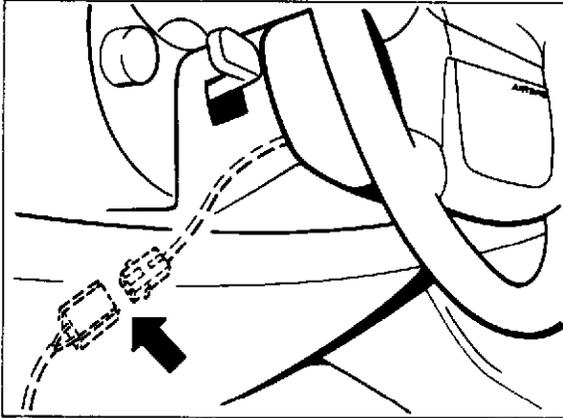


579-68

No.	Designation	Special Tool	Order number	Explanation
1	Ignition device	—	000.721.925.70	
2	Ignition cable	—	000.721.925.71	Non-reusable part

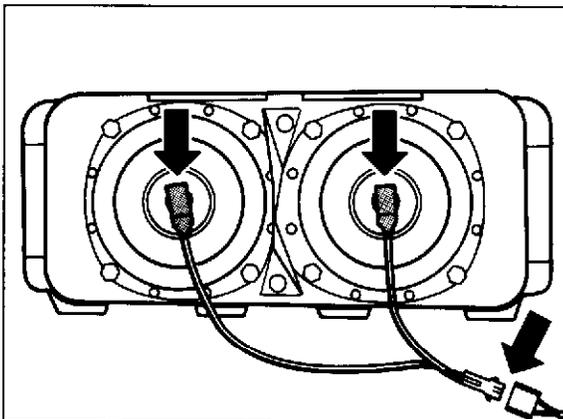
Connecting the ignition device

Driver's side



Direct to 2-pin plug of contact unit (below steering column).

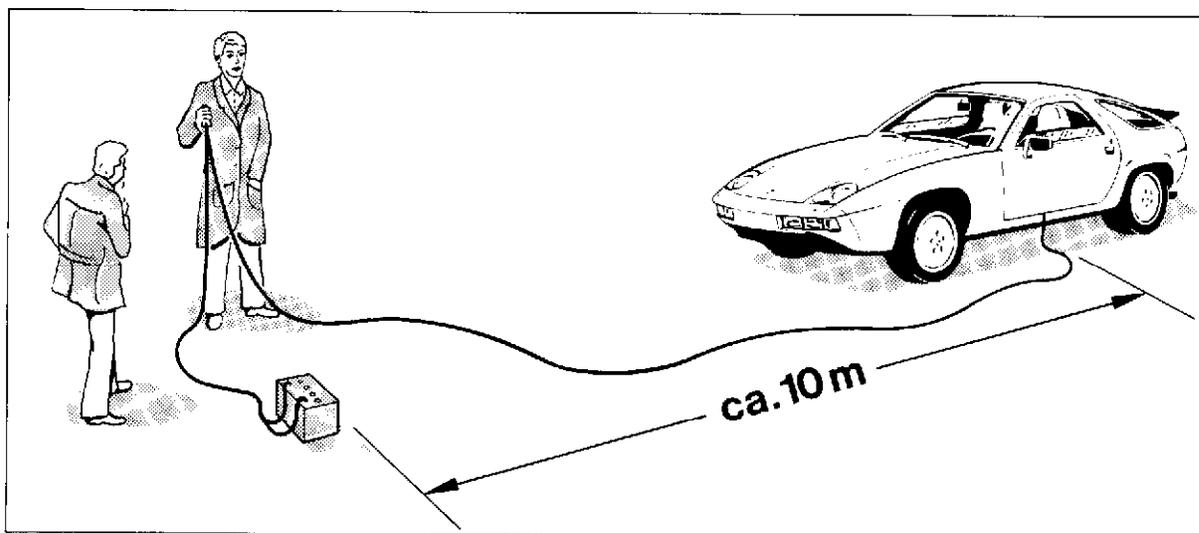
Passenger's side



With ignition cable to both gas generators.

Run the ignition device out through the door gap to a point in front of the vehicle.

Ignition



Connect the ignition device to a car battery and operate the switch.

Note

The driver's side and passenger's side airbag units must be ignited separately.

After igniting the passenger's side airbag unit, check that both gas generators have ignited (can be identified by both ignition cable plugs having melted).

Diagnosis / Troubleshooting

The airbag system is continuously monitored by a diagnosis unit in the control unit. If a fault occurs, it is indicated by a warning lamp in the instrument cluster.

In the event of a fault, the central warning lamp and this warning lamp come on. In cars for the USA, the fasten seat belts symbol also lights up.

The airbag warning lamp comes on for approx. 5 seconds when the ignition is switched on, and then goes out. When the engine is started, the warning lamp again comes on for approx. 5 seconds.

Should the warning lamp come on again later, this indicates a fault in the airbag system. The fault can be read out with System Tester 9288 and flashing code tester 9268.

Note:

The control unit needs approx. 70 seconds to identify all faults in the system, and the ignition must therefore be switched on for at least this time.

After a fault in the airbag system has been identified and rectified, **the fault memory must be erased.**

If any components are exchanged, this must be noted in the warranty and maintenance booklet. The document number should be attached in the free space provided. The document number is shown on an adhesive label which can be torn off the spare part.

Following an accident in which the airbag system was activated, the following components must be removed and renewed:

- control unit
- both front sensors
- contact unit
- both airbag units

If non-activated airbag units have to be removed, they must be ignited electrically before being disposed of (see Page 68 - 15).

Reading out the fault memory

System Tester 9288: see Repair Manual Group 03, Self-diagnosis

Tester 9268: see Technical Service Information, Model '90.

Meaning of fault codes

1st figure: 3 = Airbag system

2nd figure: 1 = Fault still present

 2 = Fault no longer present

 3 = Failure time since first fault occurrence

3rd figure: = Fault code

4th figure:

Before troubleshooting can be carried out correctly, the person concerned must

- be familiar with the component positions and the function and technical relationship of the systems to be checked (model information)
- be able to read and evaluate Porsche circuit diagrams
- understand the function of the electrical circuits and relays
- be capable of operating and assessing the information supplied by the test gear.

Important:

If the tester display or the fault list indicates that a component is defective, the fault may not necessarily be found in the component indicated but may be in the associated control unit or the connecting circuits (electrical paths) between the component and the control unit. Before the fault memory has been read out, no troubleshooting involving the pulling off of plugs or similar is to be carried out, as this could also be stored as a fault in the memory.

Note

The fault code can show two types of fault:

- Fault still present
- Fault no longer present

Faults are stored as no longer present if they occur briefly while the ignition is switched on, but are no longer present when the ignition is switched off.

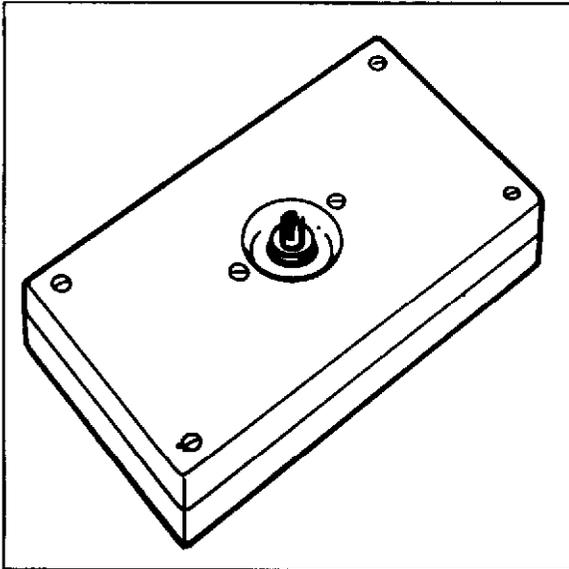
Faults still present are those which are permanent or remain present when the ignition is switched off.

Do not assume that the fault in the readout is actually present or clearly identifiable during the check.

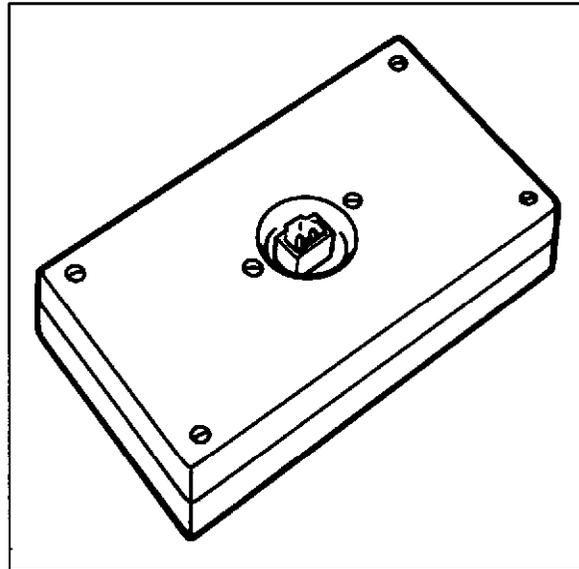
The cause of a fault being memorized may for example be undesirable interference with the airbag system wiring while the ignition was switched on.

It is therefore important in the case of faults no longer present to determine the cause of the fault in order to prevent it from recurring and to avoid renewing parts unnecessarily. Check the entire length of the airbag system wiring for damage (wires no longer intact or trapped).

Tools



560-68



561-68

Special tools 9516 and 9516/1 are used to check the ignition pill circuits.

If there is a fault in the ignition pill circuits, attach special tool 9516 in place of the airbag units, then erase the fault memory. Switch the ignition off and on again.

The fault can then be localized by means of the diagnosis unit in the control unit.

If the warning light no longer indicates a fault, the airbag unit is defective and must be renewed.

If the warning light again indicates a fault, this is to be sought in the control unit or the wiring.

A fault in ignition pill circuit 1 may also be caused by the contact unit. Disconnect the wiring from the contact unit and attach special tool 9516/1 in place of the contact unit. Erase the fault memory.

Switch the ignition off and then on again. If the warning light no longer indicates a fault, the contact unit is defective; if the warning light again indicates a fault, this must be in the control unit or the wiring.

Fault code table

Fault code	Designation of fault
11	Left front sensor: closed once
12	Left front sensor: closed several times
13	Right front sensor: closed once
14	Right front sensor: closed several times
15	Left front sensor: permanently closed*
16	Right front sensor: permanently closed
17	Left front sensor: contact resistance to U _B
18	Right front sensor: contact resistance to U _B
19	Left front sensor: contact resistance to earth/ground
20	Right front sensor: contact resistance to earth/ground
21	Left front sensor: short circuit to U _B
22	Right front sensor: short circuit to U _B
25	Left front sensor: resistance to earth/ground too high
26	Right front sensor: resistance to earth/ground too high
27	Left front sensor: break in feed wire**
28	Right front sensor: break in feed wire**
29	Left front sensor: line resistance too high
30	Right front sensor: line resistance too high
33	Ignition capacitor 1: capacitance too low
34	Ignition capacitor 2: capacitance too low
35	Ignition capacitor 1: contact resistance too high
36	Ignition capacitor 2: contact resistance too high
37	Ignition pill circuit 1: contact resistance to U _B
38	Ignition pill circuit 2: contact resistance to U _B

* Fault code 60 is also shown with fault codes 15 and 16. Renew front sensor and erase fault memory. Repeat the diagnosis. If fault code 60 appears again, renew the control unit.

** Fault code 25 or 26 also appears with fault code 27 or 28 respectively.

Fault code	Designation of fault
39	Ignition pill circuit 3: contact resistance to U _B
40	Ignition pill circuit 1: short-circuit to U _B
41	Ignition pill circuit 2: short-circuit to U _B
42	Ignition pill circuit 3: short-circuit to U _B
43	Ignition pill circuit 1: contact resistance to earth/ground
44	Ignition pill circuit 2: contact resistance to earth/ground
45	Ignition pill circuit 3: contact resistance to earth/ground
46	Ignition pill circuit 1: short-circuit to earth/ground
47	Ignition pill circuit 2: short-circuit to earth/ground
48	Ignition pill circuit 3: short-circuit to earth/ground
49	Ignition pill circuit 1: break
50	Ignition pill circuit 2: break
51	Ignition pill circuit 3: break
52	Ignition pill circuit 1: resistance too low
53	Ignition pill circuit 2: resistance too low
54	Ignition pill circuit 3: resistance too low
55	Ignition pill circuit 1: resistance too high
56	Ignition pill circuit 2: resistance too high
57	Ignition pill circuit 3: resistance too high
58	Warning lamp: short-circuit to U _B or earth/ground
59	Warning lamp: break
60	Diagnosis unit: defective
61	Correct ignition sequence (after crash)
62	Correct ignition current (after crash)
65	Ignition pill current transmitted (after crash)
67 bis 105	Internal fault*

Ignition pill circuit 1: driver's airbag

Ignition pill circuit 2 and 3: passenger's airbag

* When the airbag system is checked with the 9268 tester, fault code 60 is always indicated in the event of an internal fault.

Fault, Fault Code	Possible Causes, Elimination, Remarks
-------------------	---------------------------------------

Note

After any airbag system fault has been detected and rectified, the fault memory **must** be erased.

Test point 1

Left front sensor
closed once
Fault code 3 _ 11

- Renew front sensor.

Test point 2

Left front sensor
closed several times
Fault code 3 _ 12

- Renew front sensor.

Test point 3

Right front sensor
closed once
Fault code 3 _ 13

- Renew front sensor.

Test point 4

Right front sensor
closed several times
Fault code 3 _ 14

- Renew front sensor.

Test point 5

Left front sensor
closed permanently
Fault code 3 _ 15

- Renew front sensor.

Test point 6

Right front sensor
closed permanently
Fault code 3 _ 16

- Renew front sensor.

Fault, Fault Code	Possible Causes, Elimination, Remarks
Test point 7 Left front sensor Contact resistance to U _B Fault code 3 _ 17	– Check front sensor at plug connection with ohmmeter. 1. Ohmmeter at terminal 1 and terminal 2 Display: 10 kΩ 2. Ohmmeter at terminal 2 and terminal 3 Display: 0...0.5 Ω If measured values are within tolerance, renew the control unit; if out of tolerance, renew the front sensor.
Test point 8 Right front sensor Contact resistance to U _B Fault code 3 _ 18	– See test point 7
Test point 9 Left front sensor Contact resistance against earth/ground Fault code 3 _ 19	– See test point 7
Test point 10 Right front sensor Contact resistance against earth/ground Fault code 3 _ 20	– See test point 7
Test point 11 Left front sensor Short-circuit to U _B Fault code 3 _ 21	– See test point 7

Fault, Fault Code	Possible Causes, Elimination, Remarks
<p>Test point 12 Right front sensor Short-circuit to U_B Fault code 3 _ 22</p>	<ul style="list-style-type: none"> - See test point 7
<p>Test point 13 Left front sensor Earth/ground resistance too high Fault code 3 _ 25</p>	<ul style="list-style-type: none"> - Check front sensor: plug contacts and plug connection must engage correctly. - Check front sensor with ohmmeter; see test point 7 - Check mounting points; the metal must be bright for good electrical contact.
<p>Test point 14 Right front sensor Earth/ground resistance too high Fault code 3 _ 26</p>	<ul style="list-style-type: none"> - see test point 13
<p>Test point 15 Left front sensor Break in feed line Fault code 3 _ 27</p>	<ul style="list-style-type: none"> - Check front sensor plug connection: plug contacts and plug connection must engage correctly. - Check front sensor mit ohmmeter (see test point 7). If no fault is detected at front sensor, renew the control unit.
<p>Test point 16 Right front sensor Break in feed line Fault code 3 _ 28</p>	<ul style="list-style-type: none"> - see test point 15
<p>Test point 17 Left front sensor Line resistance too high Fault code 3 _ 29</p>	<ul style="list-style-type: none"> - Check front sensor mit ohmmeter (see test point 7). If no fault is detected at the front sensor, renew the control unit.

Fault, Fault Code	Possible Causes, Elimination, Remarks
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Test point 18

Right front sensor
Line resistance too high
Fault code 3 _ 30

- See test point 17

Test point 19

Ignition condenser 1
Capacitance too low
Fault code 3 _ 33

- Renew the control unit.

Test point 20

Ignition condenser 2
Capacitance too low
Fault code 3 _ 34

- Renew the control unit.

Test point 21

Ignition condenser 1
Contact resistance
too high
Fault code 3 _ 35

- Renew the control unit.

Test point 22

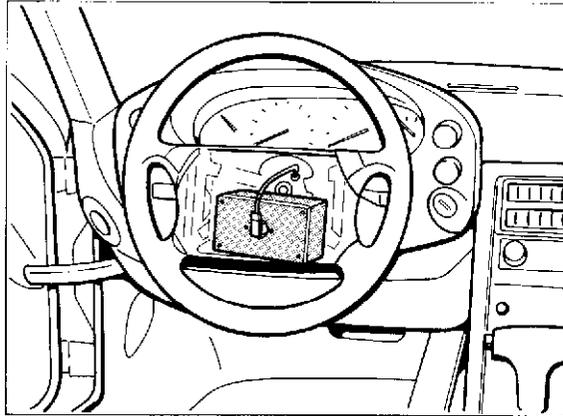
Ignition condenser 2
Contact resistance
too high
Fault code 3 _ 36

- Renew the control unit.

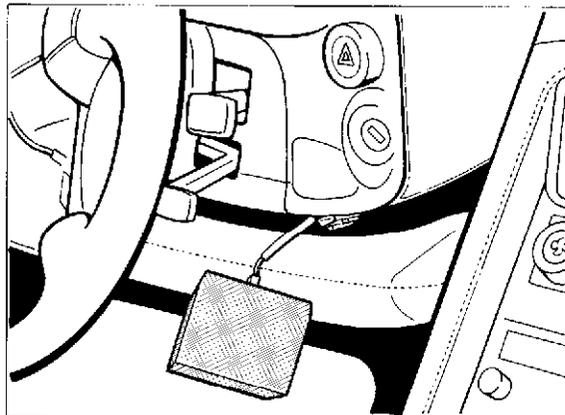
Fault, Fault Code**Possible Causes, Elimination, Remarks****Test point 23**

Ignition pill circuit 1
 Contact resistance
 to U_B
 Fault code 3 _ 37

1. Remove driver's airbag unit.
2. Attach special tool 9516 in place of the airbag unit.



3. Erase the fault memory.
4. Check whether fault is still present.
 - a) If fault is no longer present, renew the airbag unit.
 - b) If fault is still present, separate connections at contact unit and attach special tool 9516/1.



5. Erase the fault memory.
6. Check whether fault is still present.
 - a) If the fault is no longer present, renew the contact unit.
 - b) If the fault is still present, renew the control unit.

Fault, Fault Code	Possible Causes, Elimination, Remarks
	<p>Note</p> <p>Ignition pill circuit 2 is the left of the two passenger-side airbag circuits, ignition pill circuit 3 the right circuit.</p>
<p>Test point 24 Ignition pill circuit 2 Contact resistance to U_B Fault code 3 _ 38</p>	<ol style="list-style-type: none"> 1. Pull off plug at passenger-side airbag unit. 2. Attach special tool 9516. 3. Erase the fault memory. 4. Check whether fault is still present. <ol style="list-style-type: none"> a) If fault is no longer present, renew passenger-side airbag. b) If fault is still present, renew the control unit.
<p>Test point 25 Ignition pill circuit 3 Contact resistance to U_B Fault code 3 _ 39</p>	<p>– see test point 24</p>
<p>Test point 26 Ignition pill circuit 1 Short-circuit to U_B Fault code 3 _ 40</p>	<p>– see test point 23</p>
<p>Test point 27 Ignition pill circuit 2 Short-circuit to U_B Fault code 3 _ 41</p>	<p>– see test point 24</p>
<p>Test point 28 Ignition pill circuit 3 Short-circuit to U_B Fault code 3 _ 42</p>	<p>– see test point 24</p>

Fault, Fault Code	Possible Causes, Elimination, Remarks
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Test point 29

Ignition pill circuit 1 Contact resistance to earth/ground Fault code 3 _ 43	– see test point 23
---	---------------------

Test point 30

Ignition pill circuit 2 Contact resistance to earth/ground Fault code 3 _ 44	– see test point 24
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Test point 31

Ignition pill circuit 3 Contact resistance to earth/ground Fault code 3 _ 45	– see test point 24
---	---------------------

Test point 32

Ignition pill circuit 1 Short-circuit to earth/ground Fault code 3 _ 46	– see test point 23
--	---------------------

Test point 33

Ignition pill circuit 2 Short-circuit to earth/ground Fault code 3 _ 47	– see test point 24
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Test point 34

Ignition pill circuit 3 Short-circuit to earth/ground Fault code 3 _ 48	– see test point 24
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Fault, Fault Code**Possible Causes, Elimination, Remarks****Test point 35**

Ignition pill circuit 1

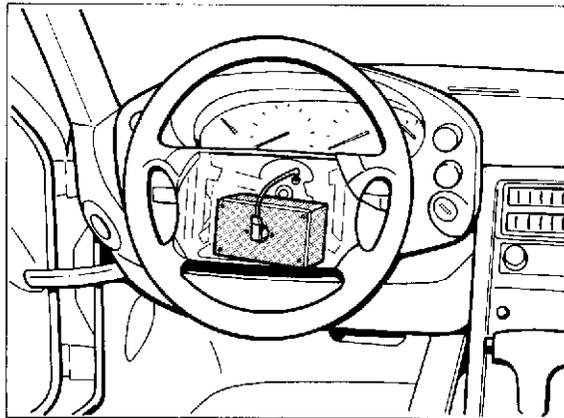
Break

Fault code 3 _ 49

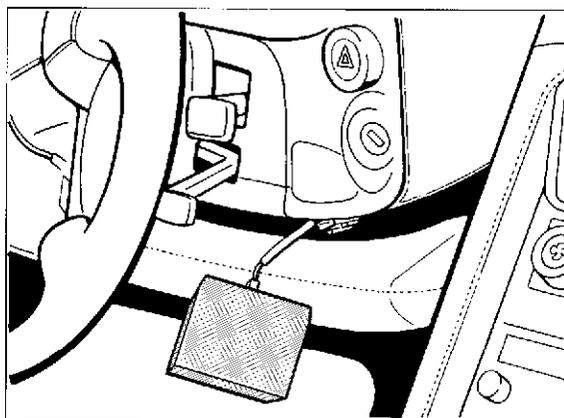
- Check that plug connection to airbag unit is correctly engaged.
- Check that plug connection to contact unit is correctly engaged.

If no fault is detected:

1. Remove driver's airbag unit.
2. Attach special tool 9516 in place of the airbag unit.



3. Erase the fault memory.
4. Check whether the fault is still present.
 - a) If the fault is no longer present, renew the airbag unit.
 - b) If the fault is still present, separate the plug connection to the contact unit and attach special tool 9516/1.



5. Erase the fault memory.

Fault, Fault Code	Possible Causes, Elimination, Remarks
	<p>6. Check whether fault is still present.</p> <p>a) If the fault is no longer present, renew the control unit.</p> <p>b) If the fault is still present, renew the control unit.</p>
<p>Test point 36 Ignition pill circuit 2 Break Fault code 3 _ 50</p>	<p>– Check that the plug connection to the airbag unit is correctly engaged.</p> <p>If no fault is detected:</p> <ol style="list-style-type: none"> 1. Pull off plug at passenger-side airbag unit. 2. Attach special tool 9516. 3. Erase the fault memory. 4. Check whether fault is still present. <p>a) If the fault is no longer present, renew the passenger-side airbag unit.</p> <p>b) If the fault is still present, renew the control unit.</p>
<p>Test point 37 Ignition pill circuit 3 Break Fault code 3 _ 51</p>	<p>– see test point 36</p>
<p>Test point 38 Ignition pill circuit 1 Resistance too low Fault code 3 _ 52</p>	<p>– see test point 23</p>
<p>Test point 39 Ignition pill circuit 2 Resistance too low Fault code 3 _ 53</p>	<p>– see test point 24</p>

Fault, Fault Code	Possible Causes, Elimination, Remarks
<p>Test point 40 Ignition pill circuit 3 Resistance too low Fault code 3 _ 54</p>	<ul style="list-style-type: none"> - see test point 24
<p>Test point 41 Ignition pill circuit 1 Resistance too high Fault code 3 _ 55</p>	<ul style="list-style-type: none"> - see test point 23
<p>Test point 42 Ignition pill circuit 2 Resistance too high Fault code 3 _ 56</p>	<ul style="list-style-type: none"> - see test point 24
<p>Test point 43 Ignition pill circuit 3 Resistance too high Fault code 3 _ 57</p>	<ul style="list-style-type: none"> - see test point 24
<p>Test point 44 Warning lamp: short-circuit to U_B or earth/ground Fault code 3 _ 58</p>	<ul style="list-style-type: none"> - Check wiring for damage. - Check instrument cluster.
<p>Test point 45 Break in circuit at warning lamp Fault code 3 _ 59</p>	<ul style="list-style-type: none"> - Check power supply fuse for instrument cluster - Check warning lamp and renew if necessary. - Check wiring for damage.

Fault, Fault Code	Possible Causes, Elimination, Remarks
Test point 46 Defective diagnosis unit Fault code 3 _ 60	– Renew the control unit
Test point 47 Ignition sequence correct (after crash) Fault code 3_61	– All airbag components must be renewed after the airbag has been activated.
Test point 48 Ignition current correct (after crash) Fault code 3 _ 62	– see test point 47
Test point 49 Ignition pill current has flowed (after crash) Fault code 3 _ 65	– see test point 47
Test point 50 Control unit defective Fault code 3 _ 67	– Renew the control unit

Note on test point 50

With the 9288 System Tester, a fault code can be displayed in the range from 67 to 105.
 On the 9268 Tester, code 60 is always displayed if the fault is in the range from 67 to 105.

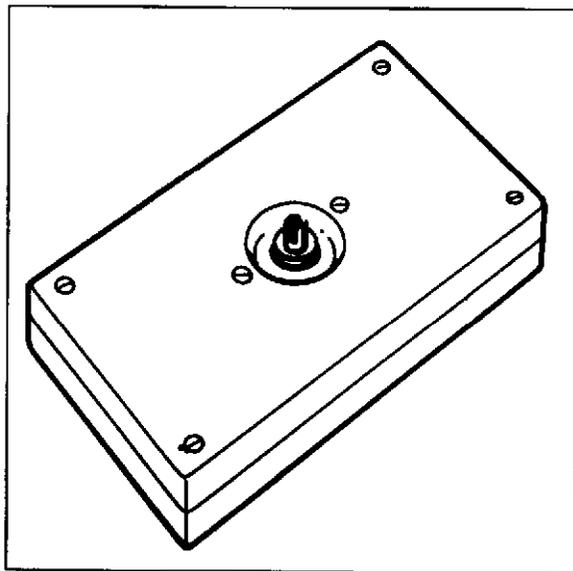
Diagnosis / Troubleshooting Airbag

As of software level B 01

As of software level B 01, the waiting time for service operations is reduced from 20 minutes to 5 minutes (also refer to page 68 - 4).

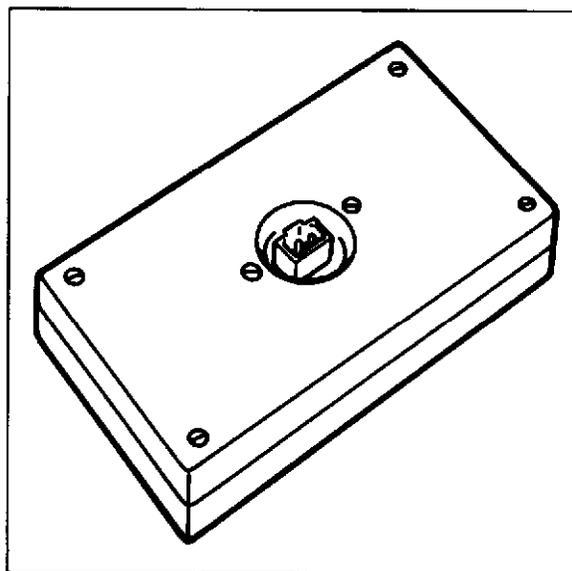
As of manufacturing date June 12, 1992, the switch-on time of the airbag warning light is reduced from approx. 5 seconds to approx. 2.5 seconds.

Tools



Special Tool 9516

580-68



Special Tool 9516/1

561-68

Special Tools 9516 and 9516/1 are used to check the ignition pill circuits.

If there is a fault in the ignition pill circuits, attach Special Tool 9516 in place of the airbag units, then erase the fault memory. Switch the ignition off and on again.

The fault can then be identified by means of the diagnosis unit in the airbag control unit.

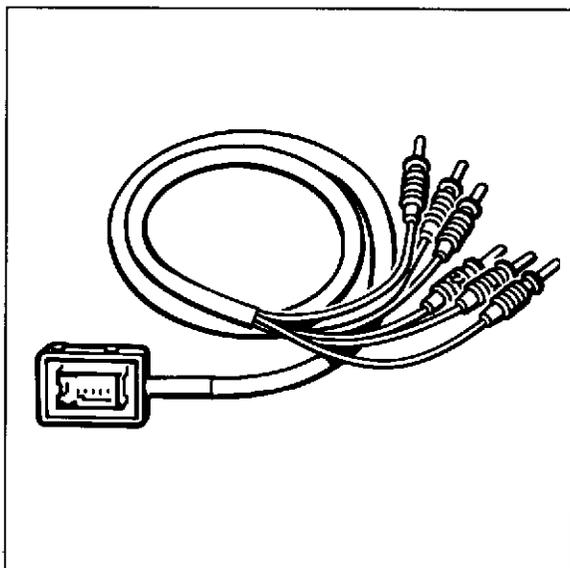
If the warning light no longer indicates a fault, the airbag unit is defective and must be replaced.

If the warning light again indicates a fault, the control unit or the wiring are at fault.

A fault in ignition pill circuit 1 may also be caused by the contact unit. Disconnect the wiring harness from the contact unit and attach Special Tool 9516/1 in place of the contact unit. Erase the fault memory. Switch the ignition off and then on again. If the warning light no longer indicates a fault, the contact unit is defective; if the warning light again indicates a fault, the control unit or the wiring are at fault.

Note

For safety reasons, never drive the vehicle with the special tools installed in place of the airbag units.



Special Tool 9541

1074-68

Special Tool 9541 is used to check the wiring of the airbag system. It is attached in place of the control unit. For safety reasons, the wiring to the ignition pills cannot be checked with this tool.

1. Fault memory

Fault code table

Fault code	Designation of fault
10	Ignition circuits <ul style="list-style-type: none"> – closed once – closed several times – permanently closed – contact resistance to U_B – contact resistance to ground – coupled 1/3 or 2/3
11	Left front sensor <ul style="list-style-type: none"> – resistance too high
12	Right front sensor <ul style="list-style-type: none"> – resistance too high
21	Ignition pill circuit 1 <ul style="list-style-type: none"> – resistance too high / too low
22	Ignition pill circuit 2 <ul style="list-style-type: none"> – resistance too high / too low
23	Ignition pill circuit 3 <ul style="list-style-type: none"> – resistance too high / too low
30	Warning light airbag <ul style="list-style-type: none"> – Signal implausible
31	<ul style="list-style-type: none"> – Control unit defective
40 to 47	<ul style="list-style-type: none"> – Control unit defective
50 to 54	<ul style="list-style-type: none"> – Control unit defective
60 to 62	<ul style="list-style-type: none"> – Control unit defective
70	Crash entry <ul style="list-style-type: none"> – only if airbag has been triggered

Fault, Fault Code	Possible Causes, Elimination, Remarks
-------------------	---------------------------------------

Note

After an airbag system fault has been detected and rectified, the fault memory **must** be erased.

Test point 1**Ignition circuits**

closed once

Fault code 10

- Replace both front impact sensors.
- Check wiring harness for squeezed sections or chafing and replace if required.

Test point 2**Ignition circuits**

closed several times

Fault code 10

- Refer to test point 1.

Test point 3**Ignition circuits**

closed permanently

Fault code 10

- Refer to test point 1.

Test point 4**Ignition circuits**

Contact resistance

to U_B

Fault code 10

- Check wiring harness to front impact sensors and ignition pills for squeezed sections and chafing. Replace if required.
- Using Special Tool 9541, check wiring to front impact sensors for short to positive terminal, replace if required.
- Check front impact sensors for short to positive terminal.
- If no fault can be detected at the front impact sensors and at the wiring, the control unit must be replaced.

Test point 5**Ignition circuits**

Contact resistance

to ground

Fault code 10

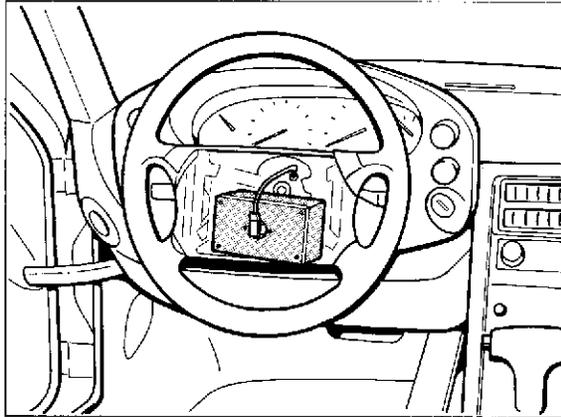
- Check wiring harness to front impact sensors and ignition pills for squeezed sections and chafing. Replace if required.
- Using Special Tool 9541, check wiring harness to front impact sensors for short to ground.
- Check front impact sensors for short to ground.
- If no fault can be detected at the front impact sensors and at the wiring harness, replace the control unit.

Fault, Fault Code	Possible Causes, Elimination, Remarks
Test point 6 Ignition circuits Coupled 1/3 or 2/3 Fault code 10	<ul style="list-style-type: none">- Check wiring harness and ignition pills for squeezed sections and chafing. Replace if required.- If no fault can be detected, replace control unit.
Test point 7 Left front sensor Resistance too high Fault code 11	<ul style="list-style-type: none">- Using an ohmmeter, check front impact sensor at connector.<ol style="list-style-type: none">1. Ohmmeter to terminals 1 and 2 Display: 10 kΩ2. Ohmmeter to terminals 2 and 3 Display: 0...0.5 Ω- Check control unit wiring to front impact sensor connector with Special Tool 9541 and ohmmeter Display: 0...0.5 Ω- If no fault is detected at the front impact sensor and at the wiring, replace control unit.
Test point 8 Right front sensor Resistance too high Fault code 12	<ul style="list-style-type: none">- refer to test point 7.

Fault, Fault Code**Possible Causes, Elimination, Remarks****Test point 9****Ignition pill circuit 1**Resistance too high /
too low

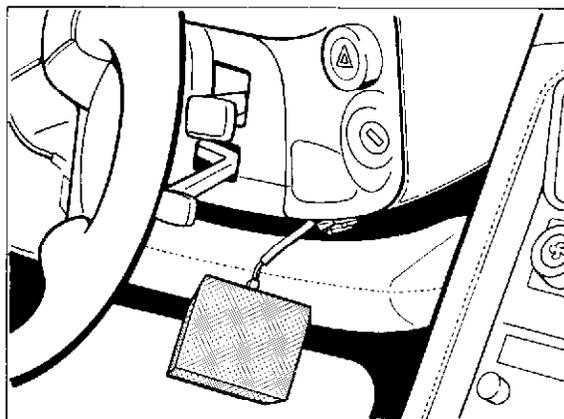
Fault code 21

1. Remove driver airbag – unit.
2. Attach Special Tool 9516 in place of airbag unit.



567-68

3. Erase fault memory.
4. Check if fault is still present.
 - a) Replace airbag unit if the fault is no longer present.
 - b) If the fault is still present, disconnect the contact unit wiring and attach Special Tool 9516/1.



568-68

5. Erase fault memory.
6. Check if fault is still present.
 - a) Replace contact unit if the fault is no longer displayed.
 - b) If the fault is still present, check wiring harness for squeezed sections and chafing. Replace if required.

Fault, Fault Code	Possible Causes, Elimination, Remarks
Test point 10 Ignition pill circuit 2 Resistance too high/too low Fault code 22	<p>c) If no fault is detected in the wiring harness, replace the control unit.</p> <p>Note</p> <p>Ignition pill circuit 2 at the passenger side airbag is the leftmost of the two circuits.</p> <ol style="list-style-type: none"> 1. Disconnect plug at passenger side airbag unit. 2. Attach Special Tool 9516. 3. Erase the fault memory. 4. Check if fault is still present. <ol style="list-style-type: none"> a) If the fault is no longer present, replace passenger side airbag unit. b) If the fault is still present, check wiring harness for squeezed sections and chafing. Replace if required. c) If no fault is detected in the wiring harness, replace the control unit.
Test point 11 Ignition pill circuit 3 Resistance too high/too low Fault code 23	<p>Ignition pill circuit 3 at the passenger-side airbag is the rightmost of the two circuits.</p> <p>– refer to test point 10.</p>
Test point 12 Airbag warning light Signal implausible Fault code 30	<p>– Check warning lamp, replace if required.</p> <p>– Check wire from control unit to instrument cluster or to diagnosis socket, respectively, for short to positive terminal.</p> <p>– Check instrument cluster.</p>
Test point 13 Control unit defective Fault code ...	<p>– Replace control unit.</p> <p>Note</p> <p>This fault message may display several fault codes: 31, 40 to 47, 50 to 54 and 60 to 62.</p>

Fault, Fault Code	Possible Causes, Elimination, Remarks
-------------------	---------------------------------------

Test point 14:**Unknown fault code**
fault code xxx

- Check secondary ignition circuit.
- Erase fault memory.

Fault, Fault Code	Possible Causes, Elimination, Remarks
-------------------	---------------------------------------

2. Failure time

The Failure Time menu item displays the time elapsed since the first fault was stored in the fault memory.

The maximum time that can be displayed is 99 hours and 59 minutes. If this time is exceeded, the ">" sign is displayed ahead of the hours.

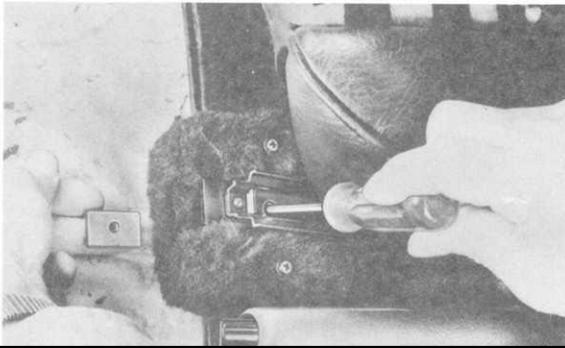
3. Results

The Results menu item displays the crash data.

REMOVING AND INSTALLING ELECTRIC SEAT

Removing

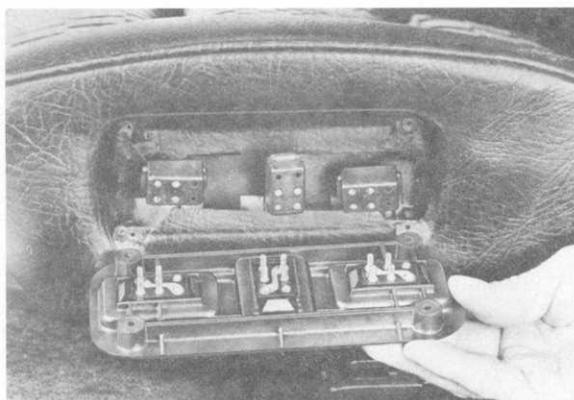
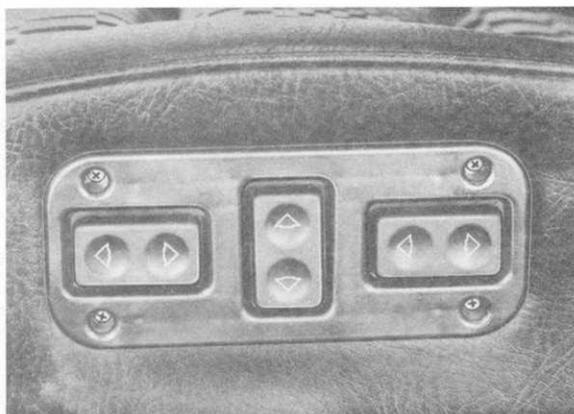
1. Fold back front carpet and remove rear carpet.
2. Move back seat all the way and unscrew front socket head screws, then move seat forward and unscrew rear screws.
3. Lift seat and disconnect wire plugs, then remove seat and take threaded plates out of seat carrier consoles.
4. Unscrew left and right seat frame trim.



Installing

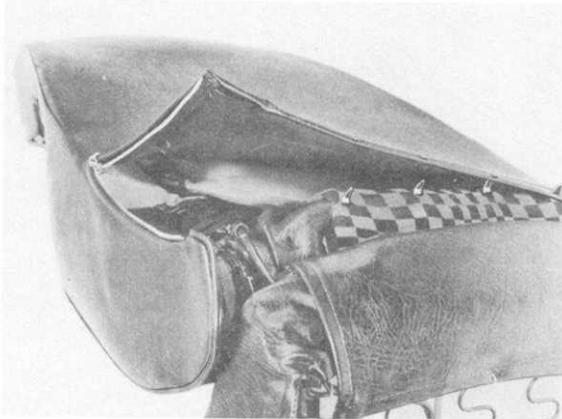
When installing the seat is normally bolted at the front holes of the seat rail carriers, but if more legroom is wanted, the holes 25 mm further back can be used.

If damaged switches or wire harnesses are causing the trouble and have to be replaced, unscrew the entire escutcheon plate. Afterwards the switches can be disconnected from the wires and removed.



REMOVING SEAT BACKREST MOTOR

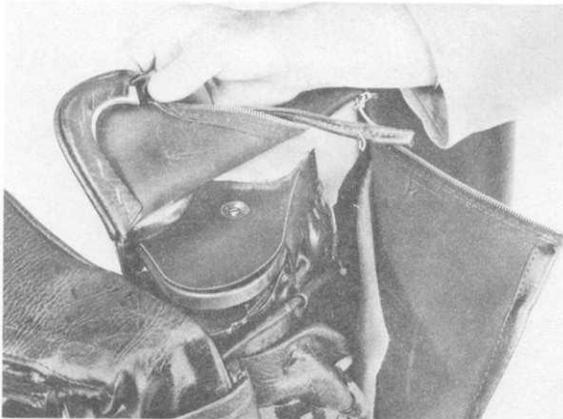
1. Open zipper. Bend open metal tabs at bottom of backrest and disconnect backrest cover.



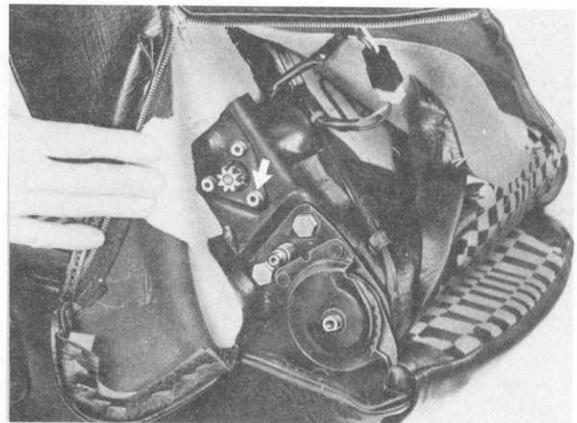
4. Unscrew gear wheels or remove circlip and take off gear wheels.



2. Disconnect side cheek and strip on backrest springs.



5. Unscrew motor screws.

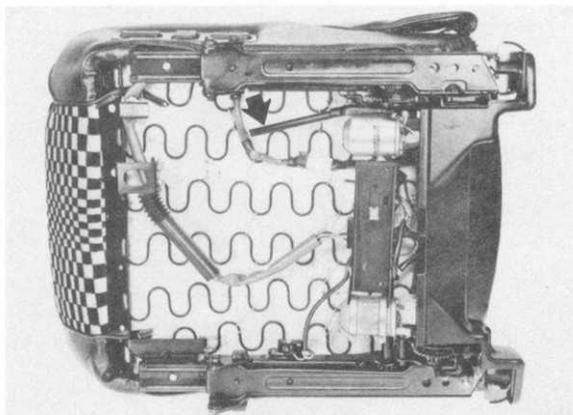


3. Detach pasted padding, unscrew cover and remove.

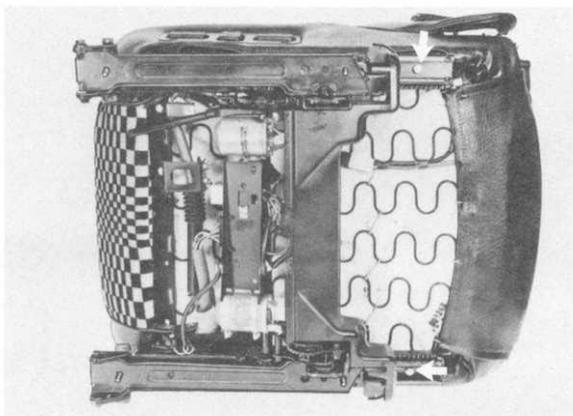
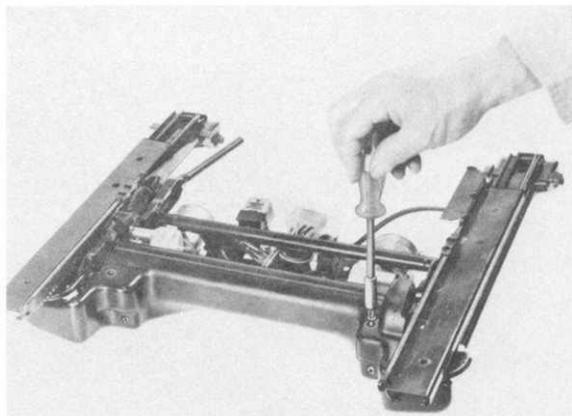
6. Detach front seat cover and pull up far enough, that motor is accessible from front and can be removed.

DISASSEMBLING SEAT CONTROLS

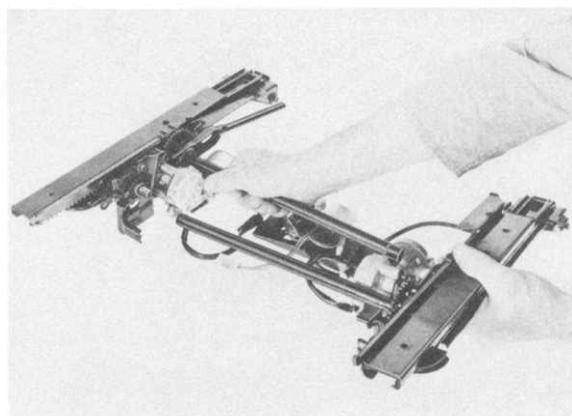
1. Operate release lever, push seat forward or back against final stop and unscrew hexagon head screws (arrows).



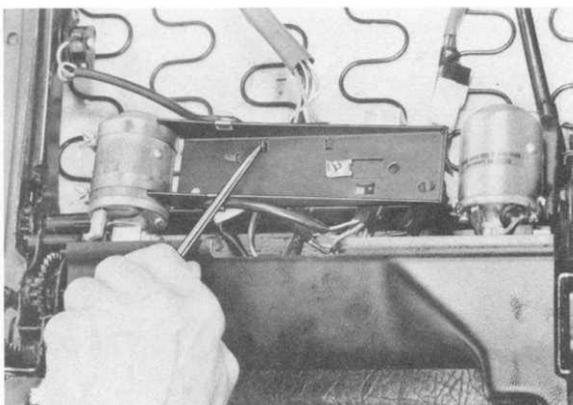
3. Remove entire seat control and unscrew cover.



4. Pull apart control halves.

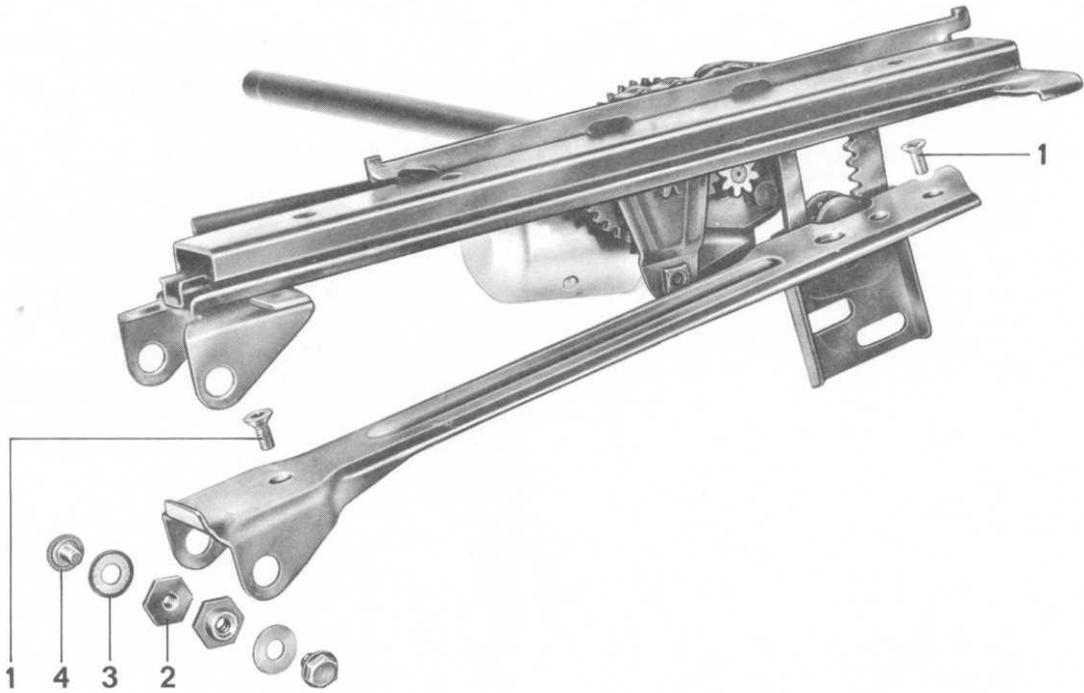


2. Detach and disconnect wire plugs.



DISASSEMBLING LEFT CONTROL HALF AND REMOVING AXIAL SEAT CONTROL MOTOR

1. Undo threaded connection at front of joint.
2. Turn up height control on transmission tube.

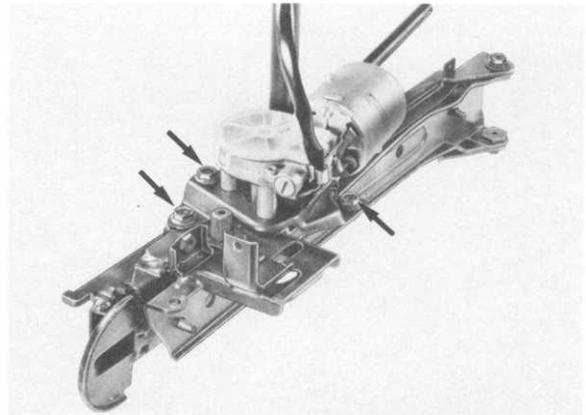


- 1 - Countersunk screw M 6
- 2 - Collar nut
- 3 - Washer
- 4 - Self-locking screw M 6

Note

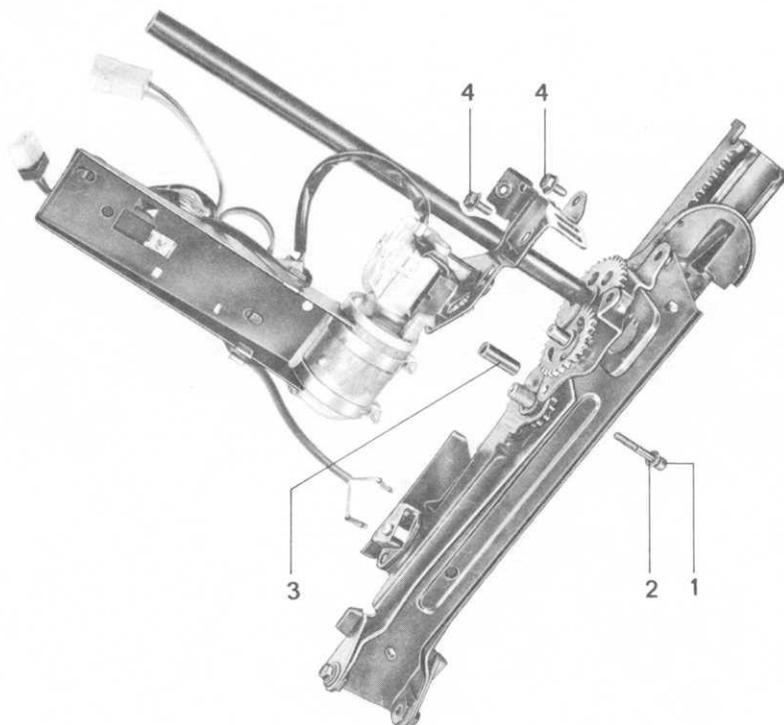
In this position the M 6 countersunk screws holding the seat carrier console could be replaced, if damaged.

3. Loosen motor carrier console and unscrew motor (3 self-locking screws).



DISASSEMBLING RIGHT CONTROL HALF AND REMOVING SEAT HEIGHT CONTROL MOTOR

1. Disconnect motor carrier console from control half.

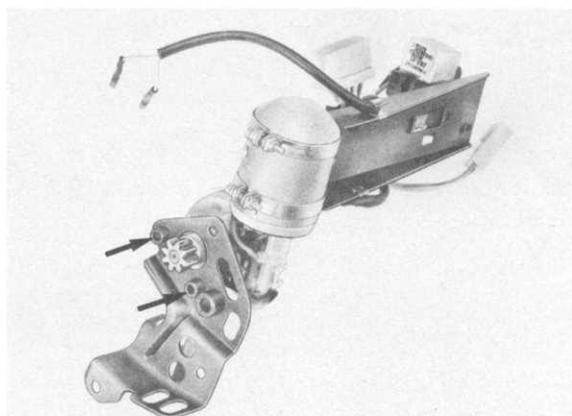


- 1 - Socket head screw
- 2 - Washer
- 3 - Sleeve
- 4 - Self-locking screw M 6 x 12 mm

Note

If the countersunk screws holding the seat on the seat carrier console have to be replaced, disconnect the threaded connection at front of joint (see page 72 - 5).

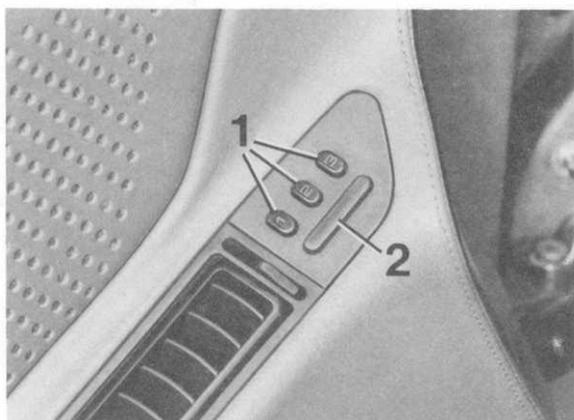
2. Unscrew socket head screws (arrows) on motor carrier console, loosen straps and pull out motor.



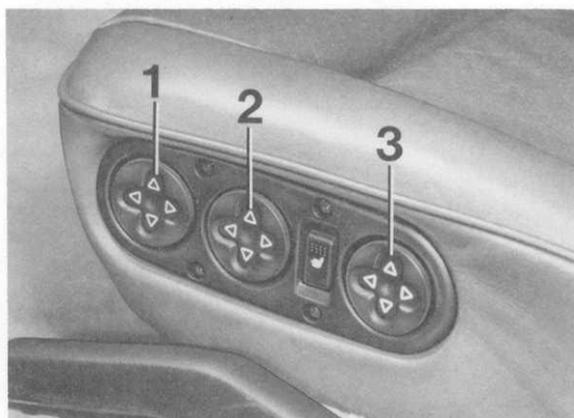
SEAT AND MIRROR POSITION CONTROL SYSTEM, '87 MODELS ONWARD

The seat and mirror position control system comprises the following components:

Control panel with 3 illuminated position keys (1) and one memory key (2) with integral pilot lamp.



3 seat switches for manual adjustment.



Switch 1

- horizontal: fore and aft adjustment
- vertical: seat height adjustment, front

Switch 2

- horizontal: backrest adjustment
- vertical: seat height adjustment, rear

Switch 3

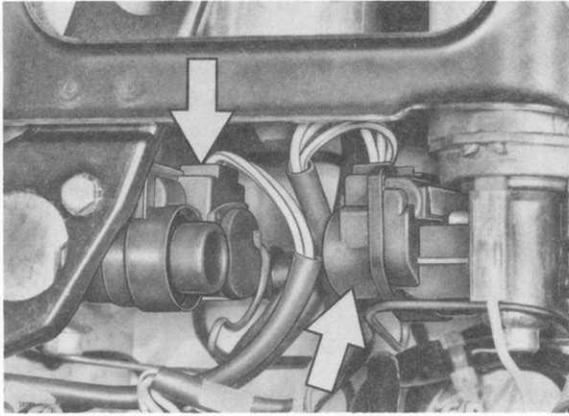
- horizontal: lumbar support shape
- vertical: lumbar support/height

6 adjusting motors



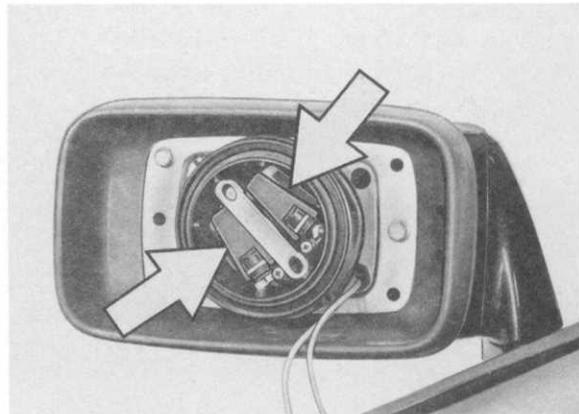
- 1 - Height, rear
- 2 - Fore-and-aft adjustment
- 3 - Height, front
- 4 - Lumbar support, height
- 5 - Backrest adjustment
- 6 - Lumbar support, size

6 potentiometers to detect seat position



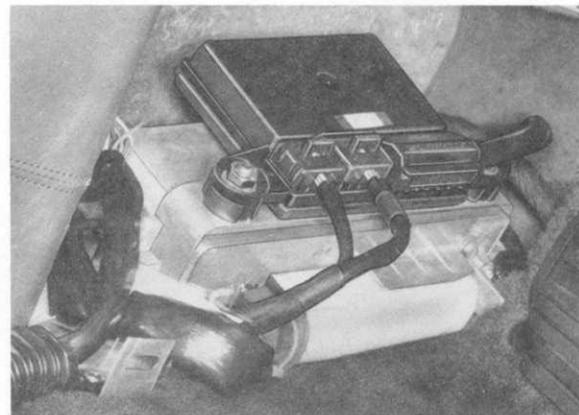
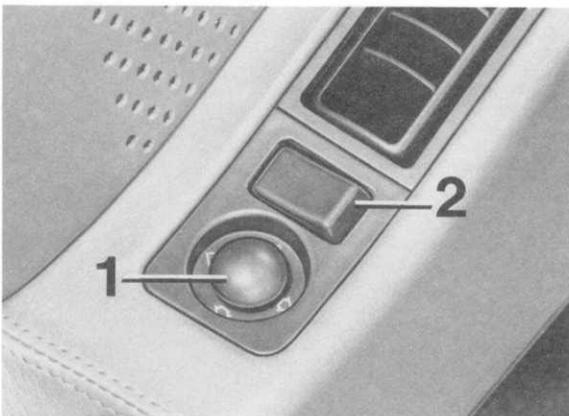
The potentiometers are mounted directly on the adjusting motors. 2 are visible in the illustration.

4 motors for mirror adjustment with 4 potentiometers to detect position of mirrors (2 for driver's-side and 2 for passenger-side mirrors).

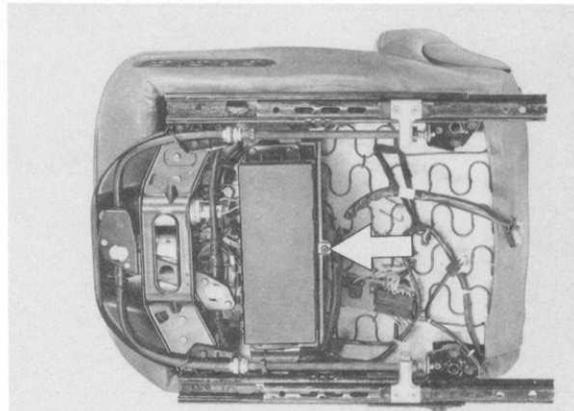


Control unit for mirror adjustment

1 mirror adjustor switch (1) and 1 mirror selector switch (2) for manual adjustment of the mirrors



Control unit for seat adjustment



2 relay units integrated in the wire harness.

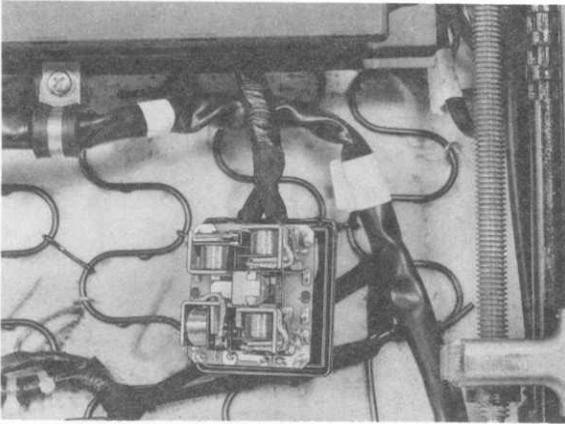
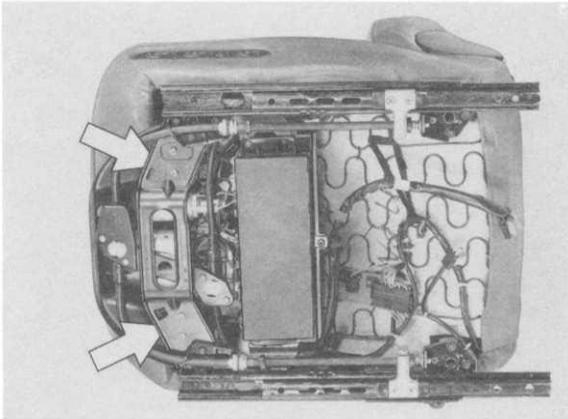


Photo shows relay unit removed with cover open.



Arrows indicate installation positions

METHOD OF OPERATION

Manual adjustment

The manual adjustment facility has been retained. This function always takes priority over automatic adjustment and is always possible regardless of vehicle status.

Storing a position

To store a position in the memory, press the memory key and the key for the desired position. The memory key must be pressed before the position key. Both keys must be held down simultaneously for at least 0.2 seconds.

Positions can be stored in the memory regardless of vehicle status.

Calling up a position

To assume a stored position automatically, hold the key for the desired position down. If the key is released, the adjustment is interrupted immediately.

The position of the mirror is not changed until approx. 0.5 seconds after the position key has been depressed. When the key is released, mirror adjustment is also interrupted unless the seat has reached its final position. Once the seat position is reached, the mirrors automatically move to the position stored in the memory.

A position can be called up regardless of vehicle status.

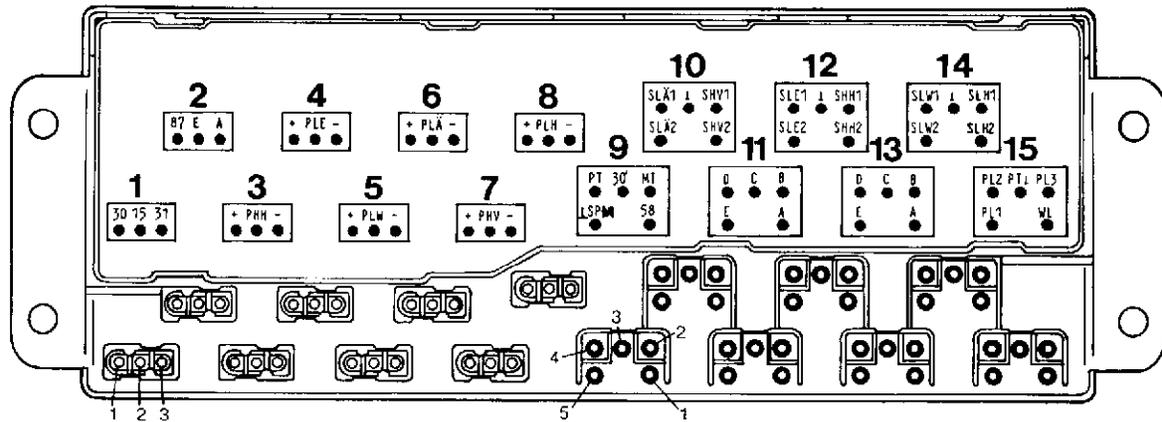
Pilot lamp in the control panel.

Three position keys illuminated to aid orientation and a red pilot lamp with the following functions are housed in the control panel:

If a position key is depressed requesting an adjustment, the pilot lamp lights up until the adjustment has been completed. If the adjustment is interrupted, the pilot lamp will not go out if the ignition is on, or will continue to burn for 60 seconds after the interruption if the ignition is off.

If the position key for a position to which the seat is already set is pressed, the red pilot lamp lights up for approx. 0.5 seconds. If the position is adjusted manually, the pilot lamp goes out.

Plug assignment, control unit for seat adjustment



Plug	Terminal designation	Pin
1	30 - Ter. 30	1
	15 - Ter. 15	2
	31 - Ter. 31	3
2*	87 - Ter. 87 seat heating relay	1
	E - Tip switch, seat heating on	2
	A - Tip switch, seat heating off	3
3	+ - Potentiometer height rear +	1
	PHH - Potentiometer, height rear, pick-off	2
	- - Potentiometer, height rear -	3
4	+ - Potentiometer backrest +	1
	PLE - Potentiometer backrest, pick-off	2
	- - Potentiometer, backrest -	3
5	+ - Potentiometer lumbar support shape +	1
	PLW - Potentiometer lumbar support pick-off	2
	- - Potentiometer lumbar support shape -	3
6	+ - Potentiometer fore-and-aft adjustment +	1
	PLÄ - Potentiometer fore-and-aft adj. pick-off	2
	- - Potentiometer fore-and-aft adjustment -	3
7	+ - Potentiometer height front +	1
	PHV - Potentiometer height, front, pick-off	2
	- - Potentiometer, height, front -	3
* as of MY '89	HZG - Seat heating	1
	E/A - Tip switch seat heating on / off	2
	P + - Potentiometer seat heating +	3

Plug	Terminal designation	Pin
8	+ - Potentiometer, lumbar support, height +	1
	PLH - Potentiometer, lum. sup. height pick-off	2
	- - Potentiometer, lumbar support, height -	3
9	58 - Ter. 58	1
	MT - Memory key	2
	30' - Ter. 30 for mirror memory control unit	3
	PT - Position key	4
	±SPM - Ter. 31 for mirror memory control unit	5
10	SHV2 - Seat switch, height, front downward	1
	SHV1 - Seat switch, height, front upward	2
	⌞ - Ter. 31 for seat switch 1	3
	SLA1 - Seat switch, fore-and-aft adjustment, toward rear	4
	SLA2 - Seat switch, fore-and-aft adjustment, toward front	5
11	A - Relay unit 2	1
	B - Relay unit 2	2
	C - Relay unit 2	3
	D - Relay unit 2	4
	E - Relay unit 2	5
12	SHH2 - Seat switch, height, rear downward	1
	SHH1 - Seat switch, height, rear upward	2
	⌞ - Ter. 31 for seat switch 2	3
	SLE1 - Seat switch, backrest, toward rear	4
	SLE2 - Seat switch, backrest, toward front	5
13	A - Relay unit 1	1
	B - Relay unit 1	2
	C - Relay unit 1	3
	D - Relay unit 1	4
	E - Relay unit 1	5
14	SLH2 - Seat switch, lum. sup. height downward	1
	SLH1 - Seat switch, lum. sup. height upward	2
	⌞ - Ter. 31 for switch 3	3
	SLW1 - Seat switch, lumbar support shape retract	4
	SLW2 - Seat switch, lumbar support shape extend	5
15	WL - Pilot lamp	1
	PL3 - Lamp for position key 3	2
	PT⌞ - Ter. 31 for operating switch	3
	PL2 - Lamp for position key 2	4
	PL1 - Lamp for position key 1	5

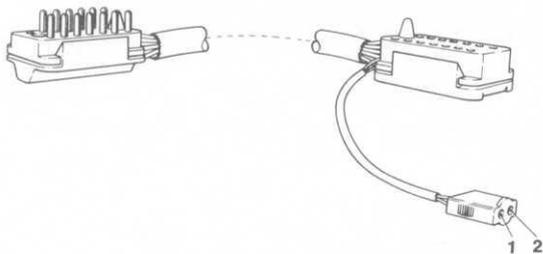
CHECKING SEAT AND MIRROR POSITION CONTROL SYSTEM

Checking seat control unit

Note:

Use the adapter cable (special tool 9269) to check the seat control unit.

Precondition for testing: charged battery



Note:

Ter. 30 and Ter. 31 can be picked off at the 2-pole plug for a number of test steps.

1 - Ter. 31

2 - Ter. 30

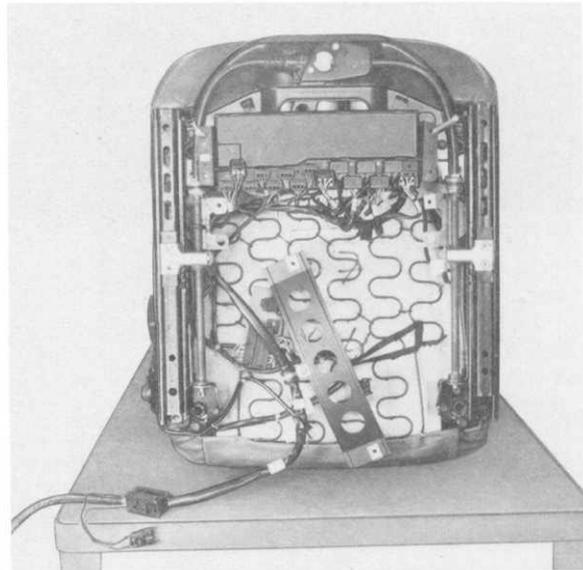
1. Remove seat.

2. Lay seat on a trolley and position trolley beside car.

3. Connect adapter cable to seat.

4. Write seat position into memory with position key 1.

5. Detach control unit, open flap and attach by means of cable clips.



6. Disconnect plug 1. Connect voltmeter to terminal 1 (plus) and Ter. 3 (minus) in plug receptacle.

Reading: battery voltage

Connect voltmeter to Ter. 2 (plus) and Ter. 3, switch on ignition.

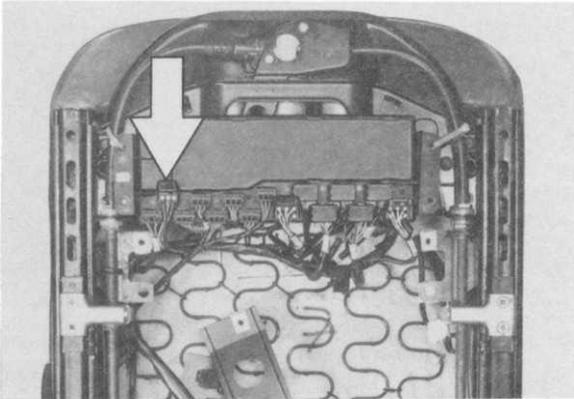
Reading: battery voltage

If there is no reading, check fuse No. 21* (Ter. 30) and No. 7** (Ter. 15) and minus cable. Reconnect plug.

* As from model 88, fuse No.20

** As from model 88, fuse No.8

7. Open receptacle of plug 2. Leave plug connected.



Connect voltmeter to minus of adapter cable and pin 1. Switch on ignition and seat heating.
Reading: battery voltage

Switch off seat heating.
Reading: 0 Volt

If there is no reading, check switch for seat heating. Switch off ignition.

Checking the seat heating as of MY '89 refer to page 72 - 33

8. Disconnect plug 3. Connect voltmeter to pin 1 (plus) and pin 3 (minus) of control unit.
Press position key 1.
Reading: approx. 5 volts

Note

Voltage is applied for only 30 - 60 seconds after the position key is pressed.

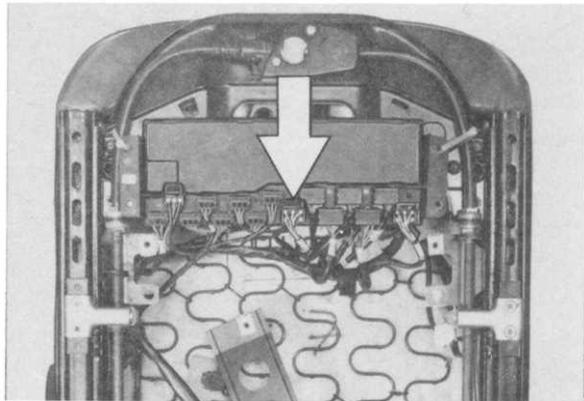
9. Connect ohmmeter to plug Ter. 1 and Ter. 3.
Reading: 2.2 - 3.2 kohm

Connect ohmmeter to Ter. 2 and Ter. 3
Reading: 0 - 3 kohm, depending upon position of the seat.

If these values are not reached, replace potentiometers.

10. Check plugs 4 through 8 in exactly the same way as described in Step 8.

11. Open plug receptacle of plug 9.
Leave plug connected.



Connect voltmeter to pin 3 (plus) and pin 5 (minus).
Press position key 1.
Reading: battery voltage

Note

Voltage is applied for only approx. 30 - 60 seconds after the position key is pressed.

Close plug receptacle and disconnect plug.

Connect voltmeter to plug, Ter. 1 and minus.
Switch on parking light.
Reading: battery voltage

12. Connect ohmmeter to Ter. 2 and minus.
Press memory key.
Reading: 0 - 2 ohm

Connect ohmmeter to Ter. 4 and minus, press position key 1.
Reading: 0 - 1 ohm

Press position key 2.
Reading: approx. 240 ohm

Press position key 3.
Reading: approx. 820 ohm.

If these values are not reached, check control panel and wiring.

13. Disconnect plug 10.
Connect voltmeter to plus and pin 3 of control unit.
Reading: battery voltage

14. Connect ohmmeter to plug Ter. 1 and Ter. 3. Press switch 1 down.
Reading: 0 - 0.3 ohm

Connect ohmmeter to Ter. 2 and Ter. 3, push switch 1 up.
Reading: 0 - 0.3 ohm

Connect ohmmeter to Ter. 3 and Ter. 4, press switch 1 toward rear.
Reading: 0 - 0.3 ohm

Connect ohmmeter to Ter. 3 and Ter. 5, push switch 1 forward.
Reading: 0 - 0.3 ohm

If the values are not reached, replace switch.

15. Disconnect plug 12.
Test switch 2 in exactly the same way as described in steps 13 and 14.

16. Disconnect plug 14.
Test switch 3 in exactly the same way as described in steps 13 and 14.

17. Disconnect plug 11.
Connect voltmeter to plus of adapter plug. Push switch 3 up. Pins 1 and 3 of the control unit must register minus.

Push switch 3 down.

Pins 2 and 3 must register minus.

Push switch 2 forward.

Pins 2 and 4 must register minus.

Push switch 2 toward rear.

Pins 1 and 4 must register minus.

Push switch 2 up.

Pins 1 and 5 must register minus.

Push switch 2 down.

Pins 2 and 5 must register minus.

18. Disconnect plug 13. Connect voltmeter to plus of adapter plug. Push switch 3 forward. Pins 1 and 3 of control unit must register minus.

Push switch 3 toward rear.

Pins 2 and 3 must register minus.

Push switch 1 forward.

Pins 2 and 4 must register minus.

Push switch 1 toward rear.

Pins 1 and 4 must register minus.

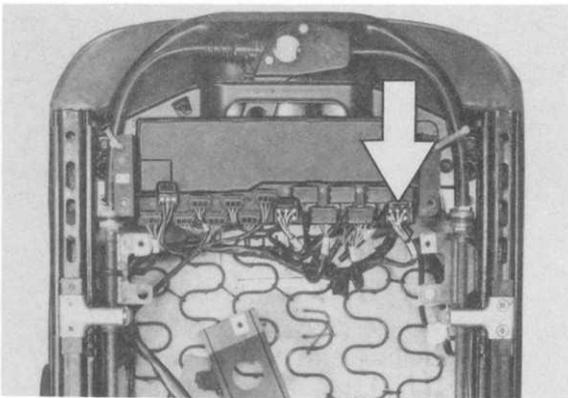
Push switch 1 up.

Pins 1 and 5 must register minus.

Push switch 1 down.

Pins 2 and 5 must register minus.

19. Open plug receptacle of plug 15.
Leave plug connected.



Connect voltmeter to minus and pin 1. Press position key 2 or 3 briefly.
Reading: battery voltage

Connect voltmeter to plus and pin 3.

Reading: battery voltage

20. Switch on lights

Connect the voltmeter to negative and pin 2.

Reading: approx. 1,8 V

21. Connect the voltmeter to negative and pin 4

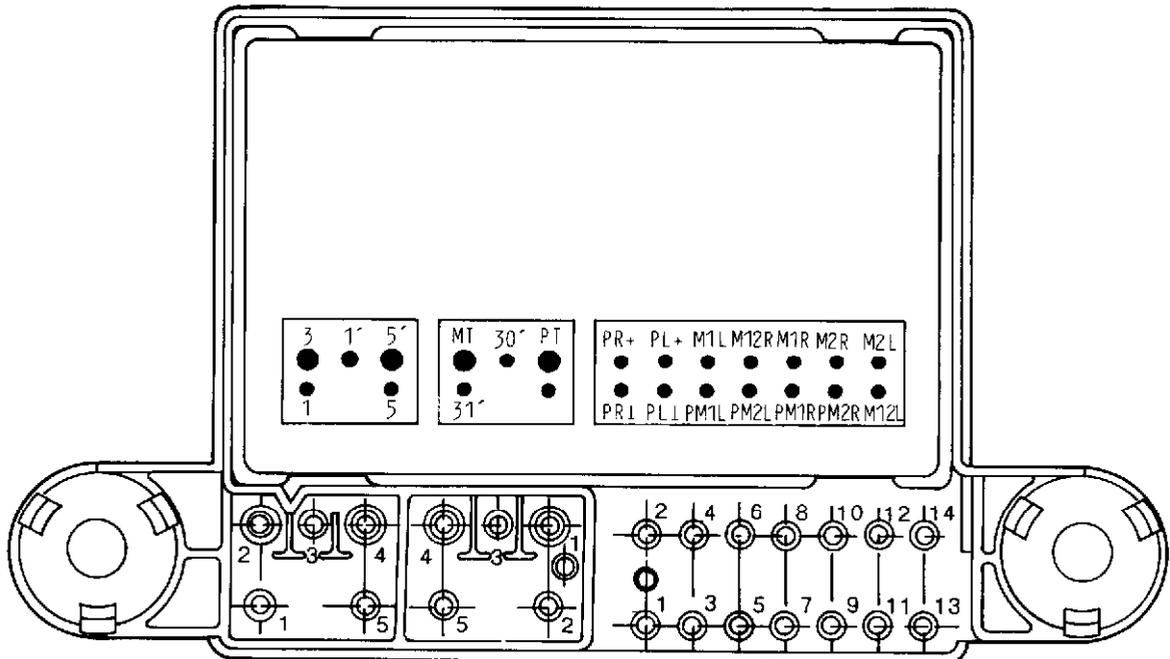
Reading: approx. 1,8 V

22. Connect the voltmeter to negative and pin 5.

Reading: approx. 1,8 V

If the values stated are not reached, the control unit is defective.

PLUG ASSIGNMENT, CONTROL UNIT FOR MIRROR ADJUSTMENT



Plug	Terminal designation	Pin
1	1 - Driver's side mirror left/right	1
	3 - Polarity, motor 1/2	2
	1' - Passenger-side mirror, left/right	3
	5' - Passenger-side mirror, up/down	4
	5 - Driver's mirror, up/down	5
2	PT - Position keys not occupied	1 2
	30' - Ter. 30 from seat memory control unit	3
	MT - Memory key	4
	31' - Ter. 31 from seat memory control unit	5

Plug	Terminal designation	Pin
3	PR - - Potentiometer right -	1
	PR + - Potentiometer right +	2
	PL - - Potentiometer left -	3
	PL + - Potentiometer left +	4
	PM1L - Potentiometer, motor 1 left	5
	M1L - Motor 1 left	6
	PM2L - Potentiometer, motor 2 left	7
	M12R - Motor 1/2, right	8
	PM1R - Potentiometer, motor 1 right	9
	M1R - Motor 1, right	10
	PM2R - Potentiometer, motor 2 right	11
	M2R - Motor 2, right	12
	M12L - Motor 1/2, left	13
	M2L - Motor 2, left	14

left - driver's-side mirror

right - passenger-side mirror

motor 1 - vertical travel

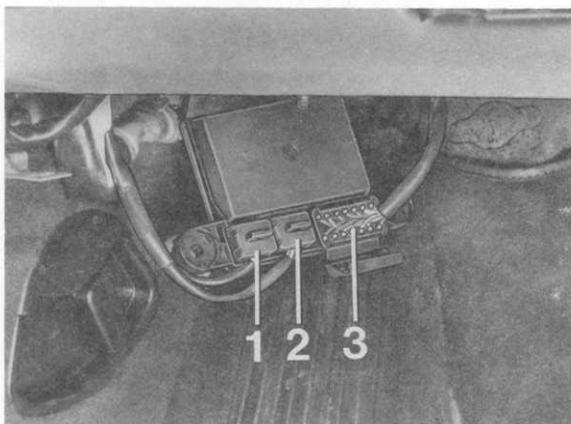
motor 2 - horizontal travel

Checking mirror control unit

Note:

The mirror control unit is mounted on the sidewall in the driver's-side footwell beside the ABS control unit.

1. Remove oddments tray.
2. Detach mirror control unit.
3. Disconnect plug 1.



4. Set mirror selector switch to driver's-side mirror.

5. Connect voltmeter to Ter. 1 (plus) and Ter. 2 (minus).

Push mirror adjuster switch to left.

Reading: battery voltage

Connect voltmeter to Ter. 1 (minus) and Ter. 2 (plus).

Push mirror adjuster switch to right.

Reading: battery voltage

6. Connect voltmeter to Ter. 5 (plus) and Ter. 2 (minus).

Push mirror adjuster switch up.

Reading: battery voltage

Connect voltmeter to Ter. 5 (minus) and Ter. 2 (plus).

Push mirror adjuster switch down.

Reading: battery voltage

7. Set mirror selector switch to passenger-side mirror.

8. Connect voltmeter to Ter. 3 (plus and Ter. 2 (minus).

Push mirror adjuster switch to left.

Reading: battery voltage

Connect voltmeter to Ter. 3 (minus) and Ter. 2 (plus).

Press mirror adjuster switch to right.

Reading: battery voltage

9. Connect voltmeter to Ter. 4 (plus) and Ter. 2 (minus).

Push mirror adjuster switch up.

Reading: battery voltage.

Connect voltmeter to Ter. 4 (minus) and Ter. 2 (plus).

Push mirror adjuster switch down.

Reading: battery voltage

10. Disconnect plug 2.
Connect ohmmeter to minus and Ter. 1, press position key 1.
Reading: 0 - 2 ohm

Press position key 2.

Reading: approx. 240 ohm

Press position key 3.

Reading: approx. 820 ohm

11. Connect ohmmeter to minus and Ter. 4.
Press memory key.

Reading: 0 - 2 ohm

If the values are not reached,
check control panel separately.

12. Connect voltmeter to Ter. 3
(plus) and Ter. 5 (minus).

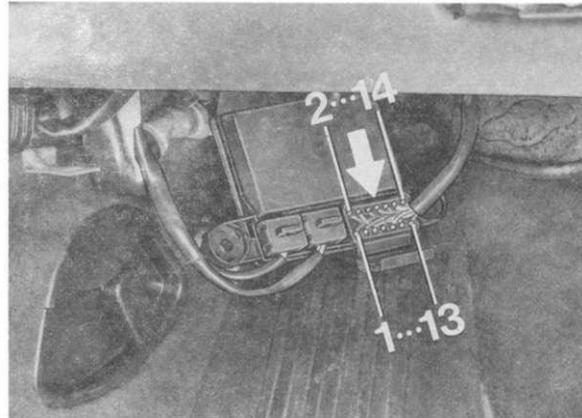
Press position key 1.

Reading: battery voltage

Note:

Voltage is applied for only approx.
30 seconds after the position keys
are pressed.

13. Open plug receptacle of plug 3.
Leave plug connected.



14. Connect voltmeter to Ter. 1
(minus) and Ter. 2 (plus).
Press position key 1

Reading: approx. 4.7 V

Note:

Voltage is applied for only approx.
30 seconds after the position keys
are pressed.

15. Connect voltmeter to Ter. 3
(minus) and Ter. 4 (plus).

Press position key 1.

Reading: approx. 4.7 V

16. Connect voltmeter to Ter. 4
(plus) and Ter. 5 (minus).

Press position key 1.

Reading: approx. 0.3 - 4.5 V

17. Connect voltmeter to Ter. 4
(plus) and Ter. 7 (minus).
Press position key 1.

Reading: 0.3 - 4.5 V

18. Connect voltmeter to Ter. 2 (plus) and Ter. 9 (minus). Press position key 1.

Reading: 0.3 - 4.5 V

19. Connect voltmeter to Ter. 2 (plus) and Ter. 11 (minus). Press position key 1.

Reading: 0.3 - 4.5 V

20. Set mirror selector switch to driver's-side mirror.

21. Connect voltmeter to Ter. 6 (plus) and Ter. 13 (minus).

Push mirror adjuster switch up.

Reading: battery voltage

22. Connect voltmeter to Ter. 6 (minus) and Ter. 13 (plus).

Push mirror adjuster switch down.

Reading: battery voltage

23. Connect voltmeter to Ter. 13 (minus) and Ter. 14 (plus). Push mirror selector switch to left.

Reading: battery voltage

24. Connect voltmeter to Ter. 13 (plus) and Ter. 14 (minus).

Push mirror adjuster switch to right.

Reading: battery voltage

25. Set mirror selector switch to passenger-side mirror.

26. Connect voltmeter to Ter. 8 (minus) and Ter. 10 (plus).

Push mirror adjuster switch up.

Reading: battery voltage

27. Connect voltmeter to Ter. 8 (plus) and Ter. 10 (minus).

Push mirror adjuster switch down.

Reading: battery voltage

28. Connect voltmeter to Ter. 8 (minus) and Ter. 12 (plus).

Push mirror adjuster switch to left.

Reading: battery voltage

29. Connect voltmeter to Ter. 8 (plus) and Ter. 12 (minus).

Push mirror adjuster switch to right.

Reading: battery voltage

If the values stated are not reached, the mirror control unit is defective.

CHECKING CONTROL PANEL

1. Remove control panel.

2. Disconnect plug.

Note

The test is conducted with the connector housing withdrawn.

3. Connect voltmeter to Ter. 1 (plus) and Ter. 4 (minus)

Reading: battery voltage

If there is no reading, check wiring to seat control unit, if necessary replace seat control unit.

4. Connect ohmmeter to Ter. 1 and Ter. 4.

Reading: ohm

Press key 1.

Reading: approx. 0 ohm

Press key 2.

Reading: approx. 240 ohm

Press key 3.

Reading: approx. 820 ohm

5. Connect ohmmeter to Ter. 2 and Ter. 4.

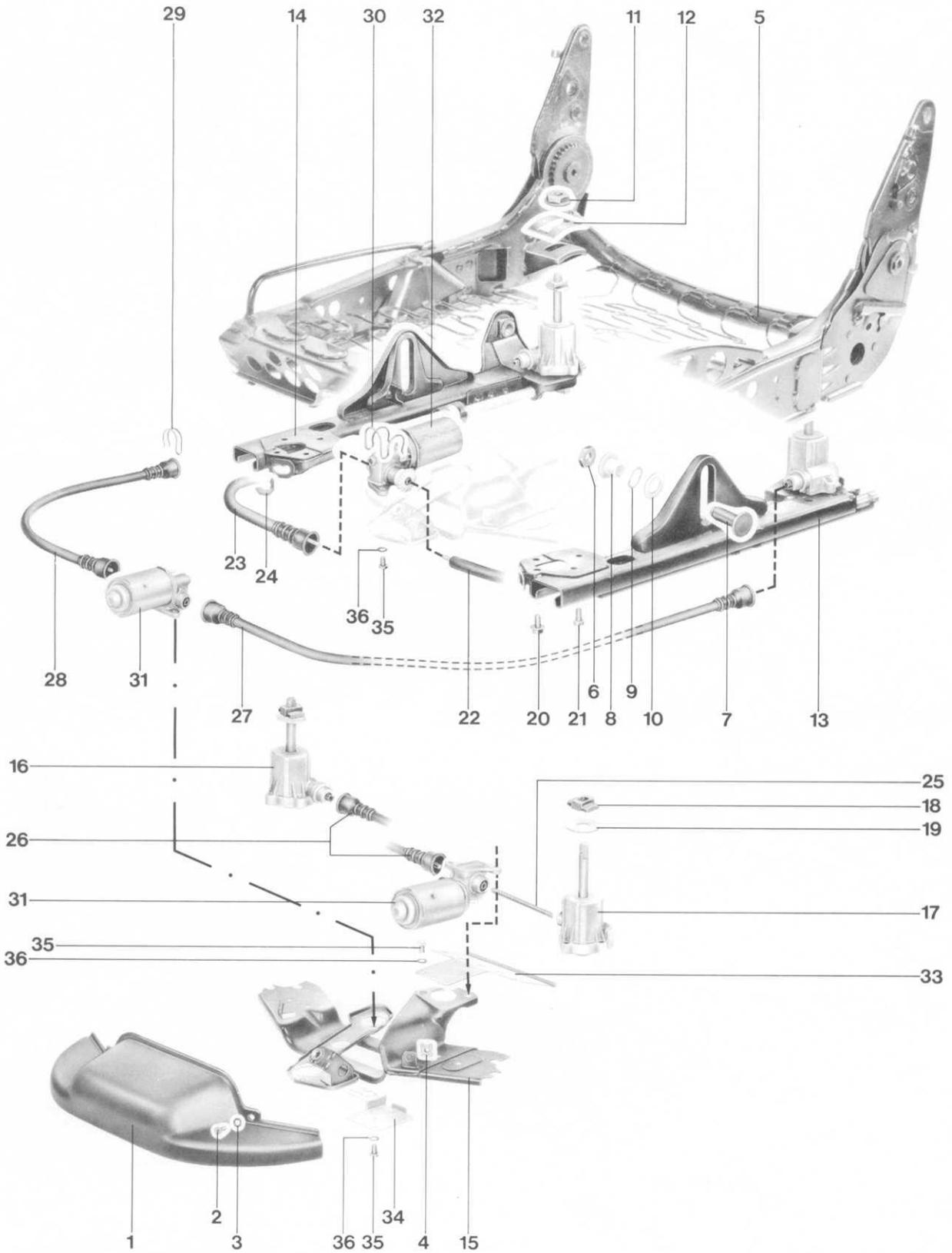
Reading: ohm

Press memory key.

Reading: approx. 0 ohm

SEAT FRAME

SEAT FRAME

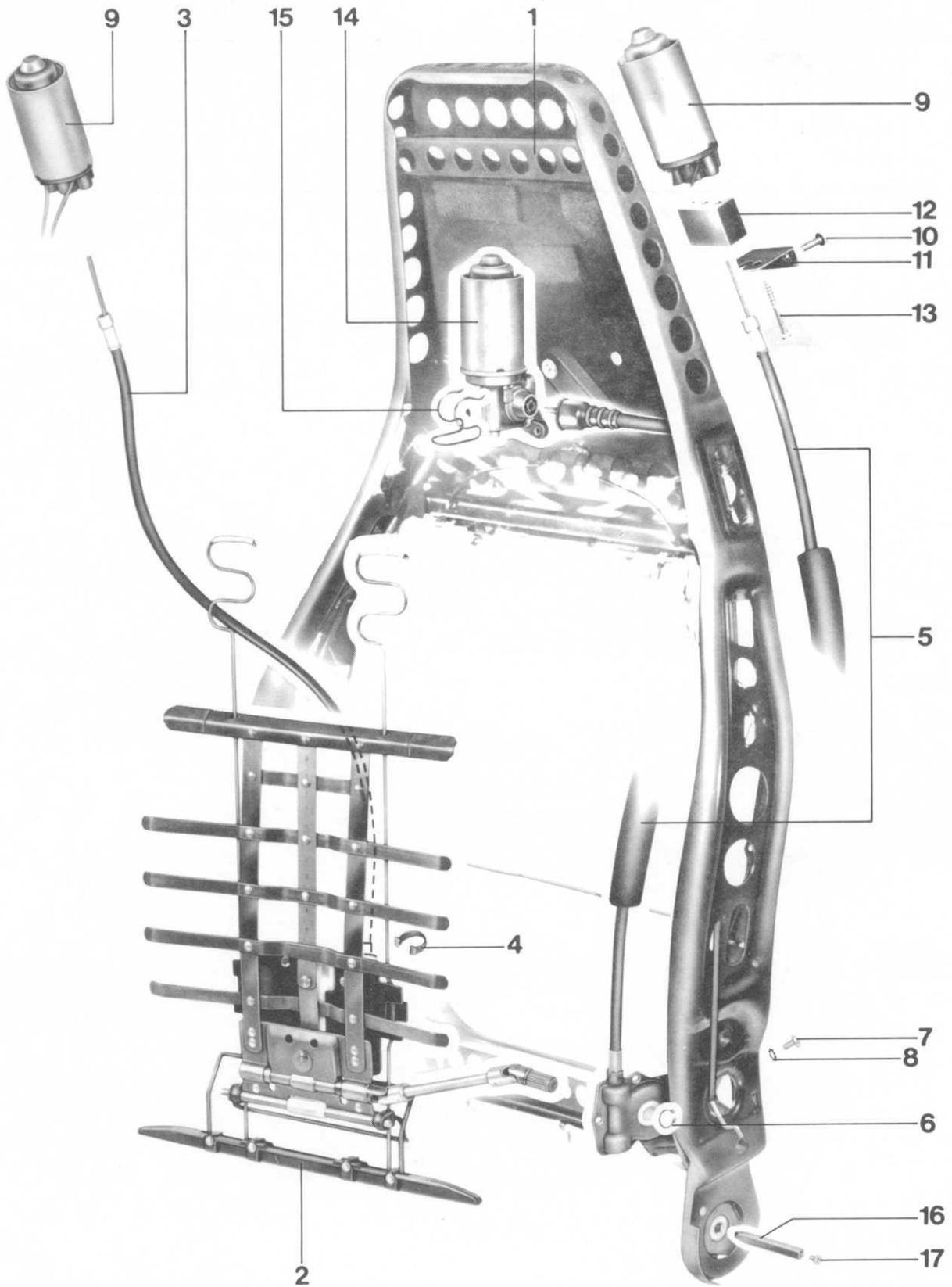


No.	Description	Qty.	Note When:	
			Removing	Installing
1	Cover	1		
2	Self-tapping screw	2		
3	Washer	2		
4	Sheet-metal nut	2		
5	Seat frame	1		
6	Hex nut	2		
7	Pin	2		
8	Sliding sleeve	2		
9	Spring washer	2		
10	Plastic washer	2		
11	Hex nut	4		
12	Guide spring	4		
13	Seat rail, left	1		
14	Seat rail, right	1		
15	Transverse strut	1		
16	Lifter, front right and rear left	2		
17	Lifter, front left and rear right	2		

No.	Description	Qty.	Note When:	
			Removing	Installing
18	Slide	4		
19	Washer	4		
20	Hex bolt	8		
21	Socket-head bolt	4		
22	Shaft, seat adjustment, left	1		
23	Shaft, seat adjustment, right	1		
24	Staple	3		
25	Shaft, height adjustment, front left	1		
26	Shaft, height adjustment, front right			
27	Shaft, height adjustment, rear left	1		
28	Shaft, height adjustment, rear right	1		
29	Shaped spring	3		
30	Shaped spring	3		
31	Electric motor	2		
32	Electric motor	1		
33	Holder	1		
34	Holder	1		

No.	Description	Qty.	Note When:	
			Removing	Installing
35	Hex bolt	6		
36	Serrated washer	6		

BACKREST



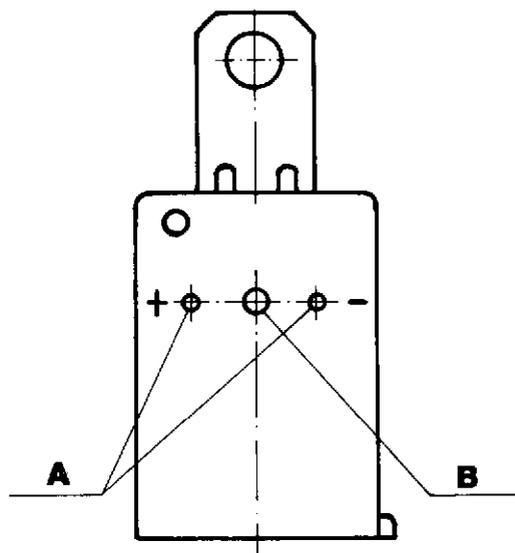
No.	Description	Qty.	Note When:	
			Removing	Installing
1	Backrest frame	1		
2	Lumbar support	1		
3	Shaft, lumbar support, height adjustment	1		
4	Circlip	1		
5	Shaft, lumbar support, curvature	1		
6	Circlip	1		
7	Cross recessed screw M 5 x 8	2		
8	Serrated washer	2		
9	Electric motor	2		
10	Cross recessed screw M 5 x 16	6		
11	Angle	2		
12	Spacer	2		
13	Hex bolt	4		
14	Electric motor, backrest adjustment	1		
15	Shaped spring	1		
16	Guide	2		
17	countersunk screw with inside hexagon head	2		

Calibrating controllable seat heating

From Model 89 onwards
Control units

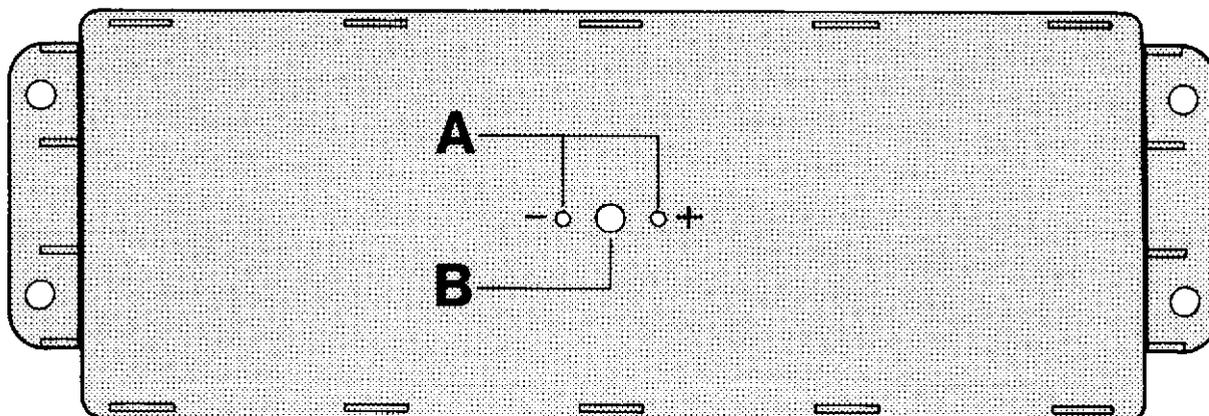
Note

The seat heating must be calibrated after the control unit or heating elements have been replaced.



Control unit for seat heating without seat-position control

165 - 72



Control unit for seat heating with seat-position control

163 - 72

A - measuring point (V)
B - Calibration potentiometer

Tools

1. Digital voltmeter with an internal resistance (R_i) $\geq 1 \text{ M}\Omega$.
2. Two measuring probes with a maximum diameter of 2 mm.
3. Thermometer (as recommended in the Workshop Handbook).
4. 2 mm wrench.
5. Two auxiliary cables to supply voltage to the removed seat (terminals 15 and 31). Use adapter cable 9269 for seat-position control.

Calibration procedure

1. Store the seat to be calibrated in the working area until it has assumed the ambient temperature.
2. Provide power supply.

Note

Do not switch on the seat heating. If switched on unintentionally, the seat must cool down until the heating elements have again adopted the ambient temperature.

3. Measure the ambient temperature and refer to the table for the relevant voltage value.
4. Connect the voltmeter to the control unit (A).
5. Set the voltage value on the calibration potentiometer (B) so that it corresponds to the appropriate value for the ambient temperature.

Table

Ambient temperature in °C	Voltage in V
0	1.50
2	1.55
4	1.60
6	1.65
8	1.70
10	1.75
12	1.80
14	1.85
16	1.90
18	1.95
20	2.00
22	2.05
24	2.10
26	2.15
28	2.20
30	2.25
32	2.30
34	2.35
36	2.40
38	2.45
40	2.50
42	2.55
44	2.60
46	2.65
48	2.70

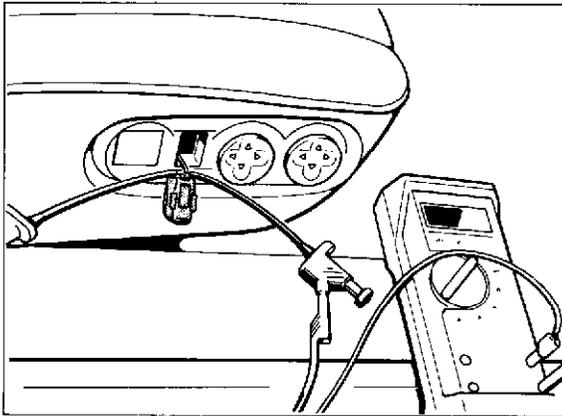
Function check

Switch on seat heating for approx. 10 seconds with maximum heating power. After switching off, measure the voltage at the control unit. The value measured now must be considerably higher.

Checking seat heating

As of Model Year '89

1. Remove switch cover (4 screws).
2. Disengage seat heating switch and pull out switch (take care not to damage the wire).
3. Switch on ignition.
4. Connect voltmeter to term. 1 (positive) and term. 2 (negative).



1343 - 72

Display: approx. 5 V

Note

If no voltage is displayed, check power supply according to wiring diagram.

5. Connect voltmeter to term. 2 (negative) and term. 3 (positive).
Display, depending on potentiometer setting: approx. 2 - 3 V
6. Push tip switch into "on" position and keep it in this position.
Display: approx. 5 V

7. Push tip switch into "off" position and keep it in this position.

Display: approx. 0 V

8. Turn knurled wheel of potentiometer all the way up.

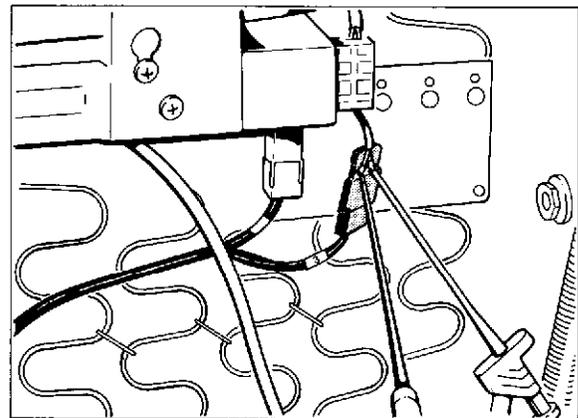
Display: approx. 3 V

9. Turn knurled wheel of potentiometer all the way down. The voltage must then drop to approx. 2 V.

10. Remove seat and connect to Special Tool 9269.

11. Switch on seat heating and set to maximum heating output.

12. Measure voltage at 2-pin connector marked with digit 3.



1344 - 72

When the seat heating is switched on, the voltage oscillates between 0 V and approx. 12 V (clocked voltage).

Checking resistance of heater elements

Note

Use a digital ohmmeter for the measurements.

1. Disconnect connector marked with digit 3.
2. Zero out ohmmeter.
3. Connect ohmmeter on pin side.
Display at 20° C ambient temperature:
1.5 to 1.8 Ω

PRECAUTIONS WHEN WORKING ON CARS WITH ELECTRONIC CONTROL UNITS

When working on cars with electronic control units, note the following:

Welding

If electric welding equipment is used, the plugs of electronic control units must be disconnected.

Painting

When painting cars, note that the max. long-term (approx. 2 hours) load for electronic control units is 80°C.

Charging battery

Disconnect battery from car electrics when charging.

Emergency start

Never use a fast charger to start the engine.

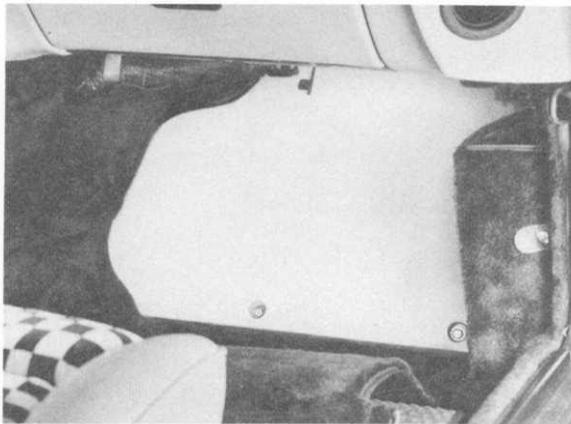
Plug-in connector

Only connect and disconnect plug-in connector of electronic control units with ignition switched off.

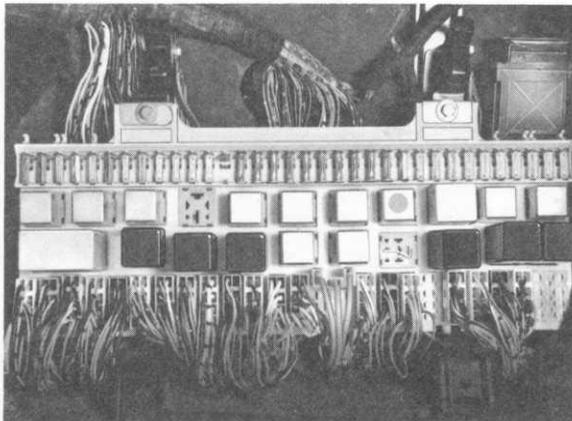
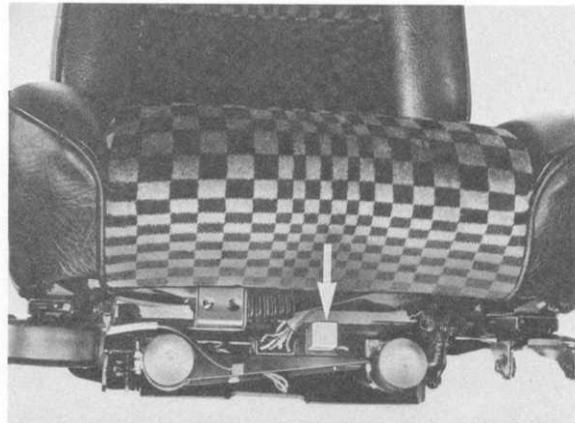
LOCATION OF RELAYS AND ELECTRONIC CONTROLS IN CAR

Central Fuse / Relay Plate

The central fuse/relay plate is accessible after removal of a cover in footwell of front passenger's side.

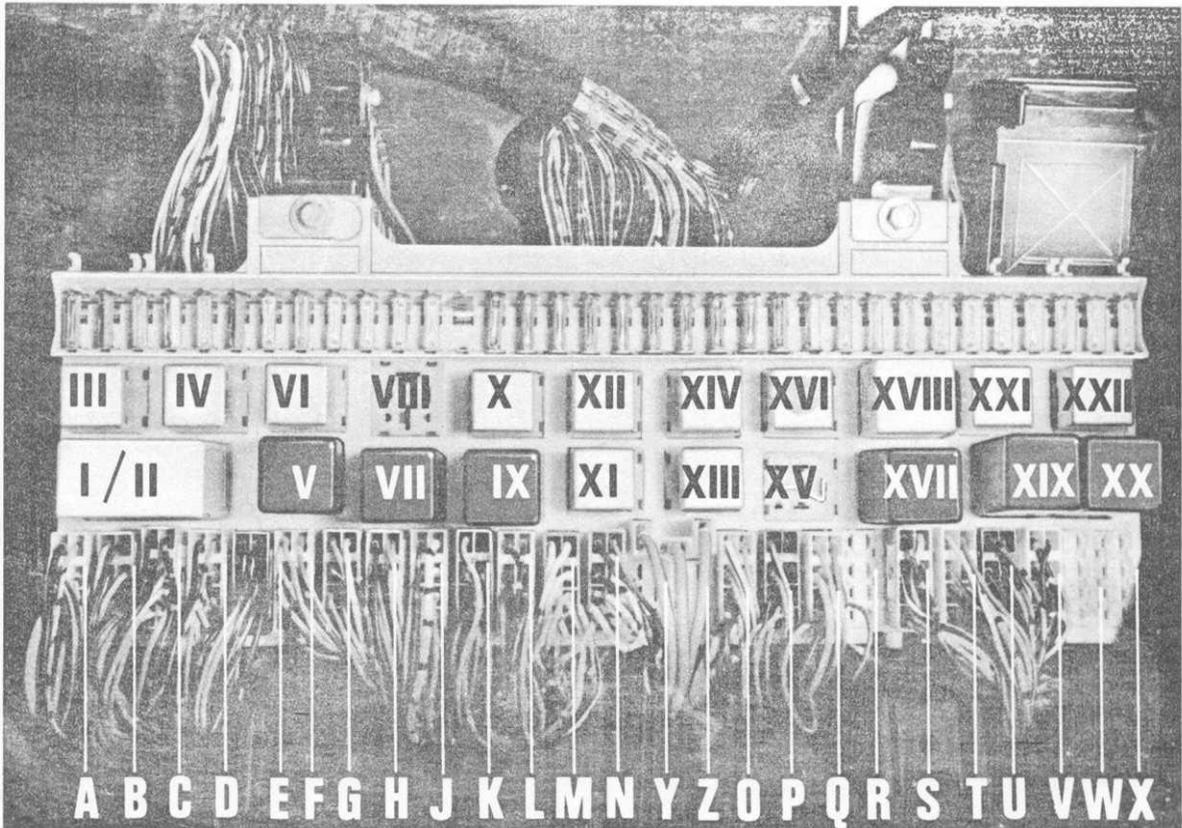


Relay for electric seat's forward movement is located underneath the seat on the adjusting frame.



Fuses are numbered consecutively from left to right and are designated S 1 through S 34 on the current flow diagram.

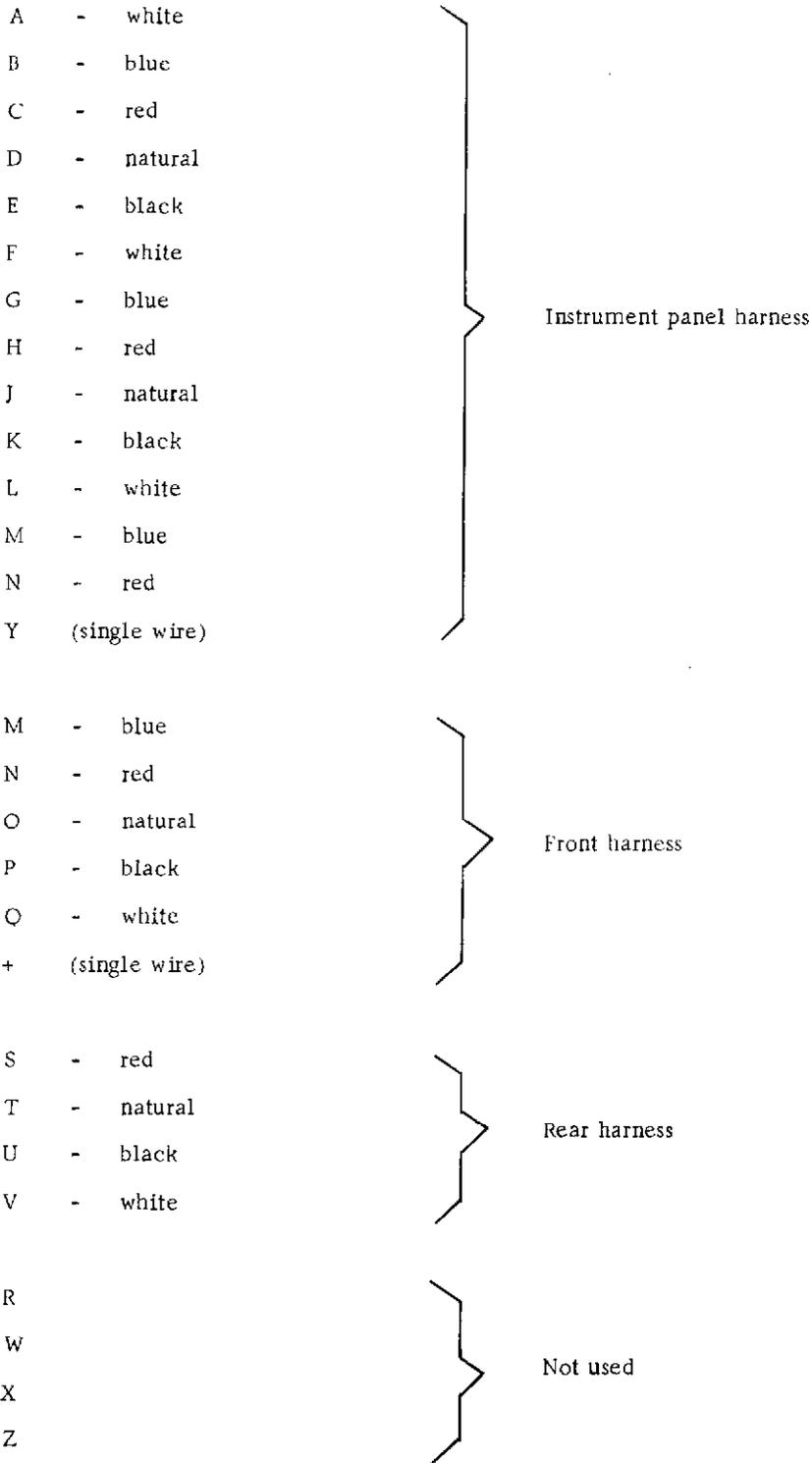
- | | |
|--|---|
| S 1 - Fog headlight | S 21 - Window controls |
| S 2 - Auxiliary headlight | S 22 - Fuel pumps, warm-up regulator, throttle bypass valve |
| S 3 - License plate light, engine compartment light | S 23 - Clock, glove box lamp, inside lights, make-up mirror light |
| S 4 - Switch light (fog headlights, tail fog light, hazard light switch, rear window wiper, rear window defogger), light for cigar lighter | S 24 - High beam headlight, left; high beam indicator lamp |
| S 5 - Cigar lighter, instrument light | S 25 - High beam headlight, right |
| S 6 - Windshield wipers, cleaning solution pump | S 26 - Low beam headlight, left |
| S 7 - Rear window wiper | S 27 - Low beam headlight, right |
| S 8 - Sliding roof | S 28 - Marker lights, left |
| S 9 - Backup light, mirror control | S 29 - Marker lights, right |
| S 10 - Stop lights, tempostat cruise control, bulb control unit | S 30 - Front turn signals, left |
| S 11 - Instruments and indicator lamps in instrument cluster, left | S 31 - Rear turn signal, left |
| S 12 - Instruments and indicator lamps in instrument cluster, right | S 32 - Front turn signals, right |
| S 13 - Not occupied | S 33 - Rear turn signal, right |
| S 14 - Seat adjustment | S 34 - Tail fog light |
| S 15 - Two-tone horns, antenna, rear window wiper return | |
| S 16 - Condenser blower for air conditioning | |
| S 17 - Fresh air blower, magnetic coupling on compressor (air conditioning) | |
| S 18 - Rear window defogger, outside mirror defogging | |
| S 19 - Retractable headlight motor | |
| S 20 - Headlight cleaner pump | |



Relays - identified with Roman numerals I through XXII on central fuse /relay plate

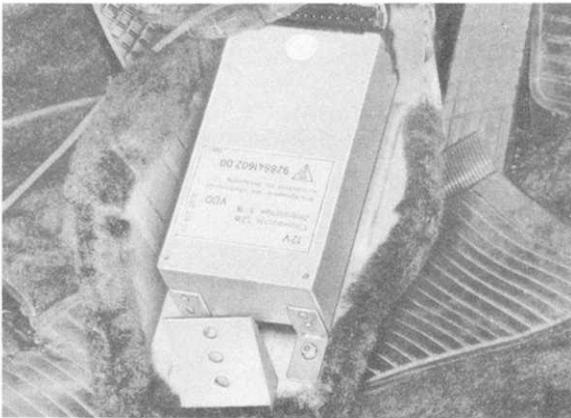
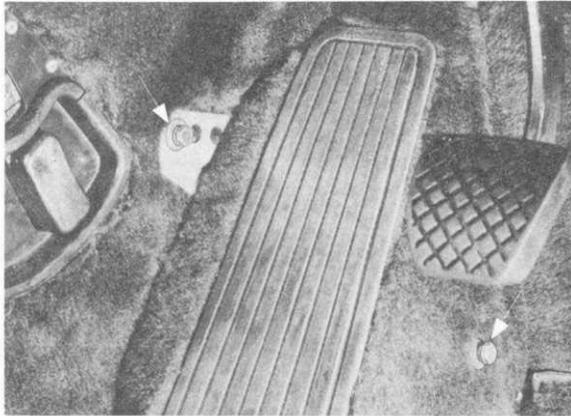
- | | | | |
|--------|----------------------------------|-------|--|
| I - II | - Rear window defogger | XIV | - Headlight high/low beam |
| III | - Headlight motor | XV | - Bridged for manual trans. (starter cut-out relay for automatic trans.) |
| IV | - Headlight main power supply | XVI | - Safety relay (headlights) |
| V | - Turn signal flasher | XVII | - Fuel pump |
| VI | - Power window | XVIII | - Radiator fan |
| VII | - Headlight washer pump | XIX | - Intermittent wiper |
| VIII | - Not used | XX | - Intensive cleaner pump |
| IX | - Time relay (seat belts) | XXI | - A/C and heater blower |
| X | - Horn | XXII | - Defrost fan |
| XI | - A/C compressor (speed limiter) | 1 | - Stop/tail light monitoring unit |
| XII | - Fog lights | | |
| XIII | - Headlight beam power supply | | |

Relay Plate Plug Receptacles



Central Warning System

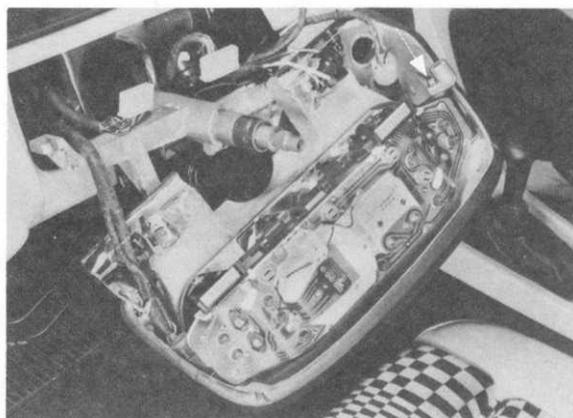
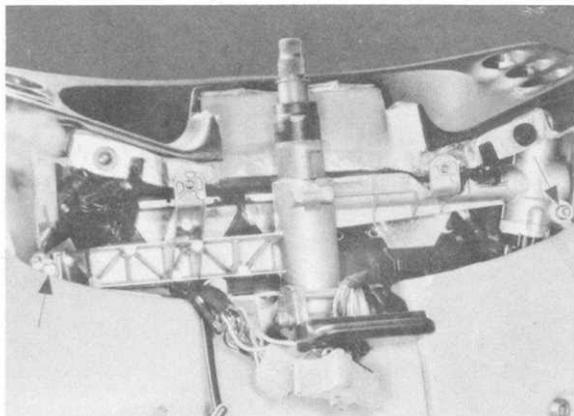
The central warning system is mounted underneath the footrest in the driver's footwell.



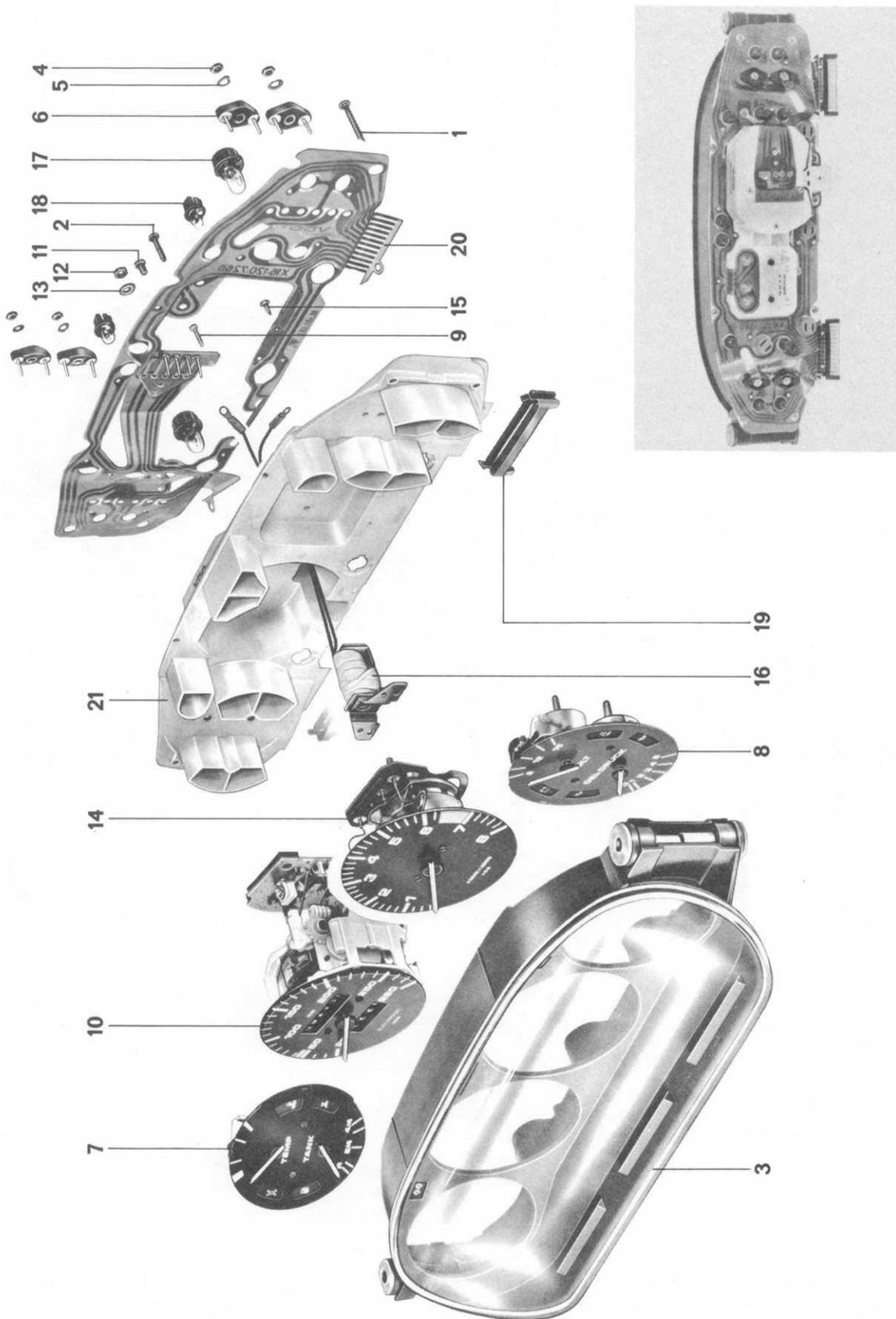
One of the 25-pin, black receptacles on the central warning system is marked with a yellow label. This label is to identify the respective receptacle terminal numbers (either yellow or black) when using the current flow wiring diagram.

REMOVING AND INSTALLING INSTRUMENT CLUSTER

1. Disconnect battery ground lead.
2. Remove steering wheel.
3. Remove steering column switch.
4. Remove instrument cover mounting screws.
7. Lift instrument cover carefully and tilt it to the rear. Unscrew mounting bolt and remove instrument cluster.



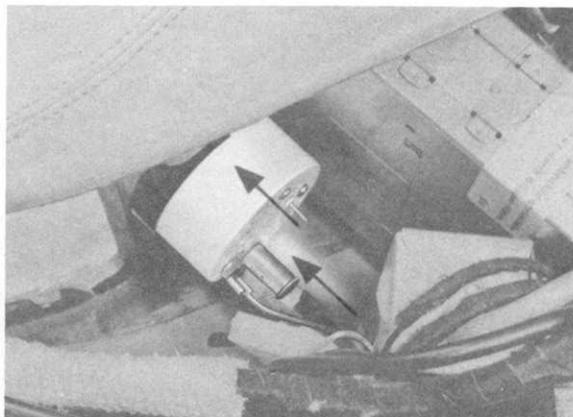
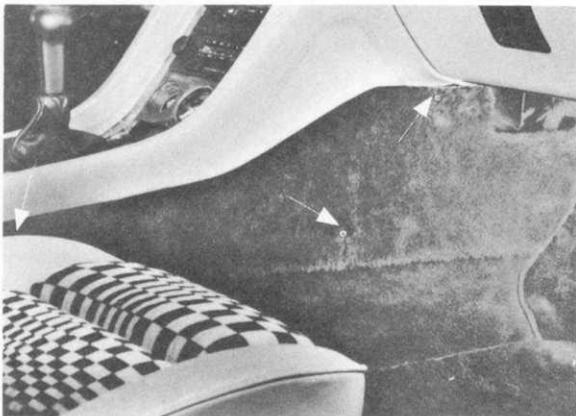
5. Remove rear window wiper and defogger switch.
6. Disconnect both 12-pin plugs at instrument cluster.



No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
1	Phillips screw (long)	4			
2	Phillips screw (short)	5			
3	Housing	1			
4	Nut	4			
5	Washer	4			
6	Connecting plug	4			
7	Temperature/fuel gauge	1			
8	Voltage/oil pressure gauge	1			
9	Phillips screw	4			
10	Speedometer	1	Remove carefully		
11	Allen head screw	2			
12	Nut	3			
13	Washer	3			
14	Tachometer	1			
15	Metal screw	2			
16	Solenoid	1			
17	Bulb with holder	4			3 W
18	Bulb with holder	11			1.2 W
19	Plug guide	2			
20	Conductor foil	1			
21	Instrument carrier	1			

REMOVING AND INSTALLING CLOCK

1. Disconnect battery ground lead.
2. Unscrew side trim (left or right) from center console (2 screws), pull off clip and press down trim.



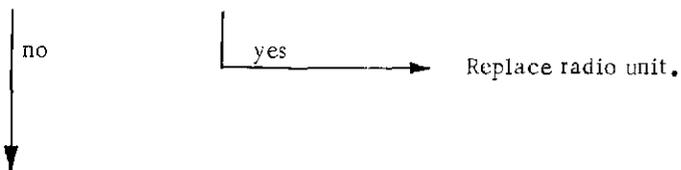
3. Remove seat belt indicator lamp and hazard light switch.
4. Disconnect wires at clock.
5. Unscrew both clock mounting screws with a short Phillips screwdriver.

TROUBLESHOOTING CAR RADIO

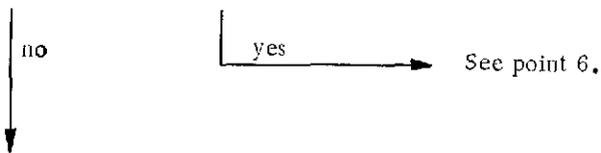
Test Requirements:

Charged battery, ignition key turned to radio position, antenna run out.

1. Are stations received only on some of the four wave ranges (MW, LW, SW, USW)?

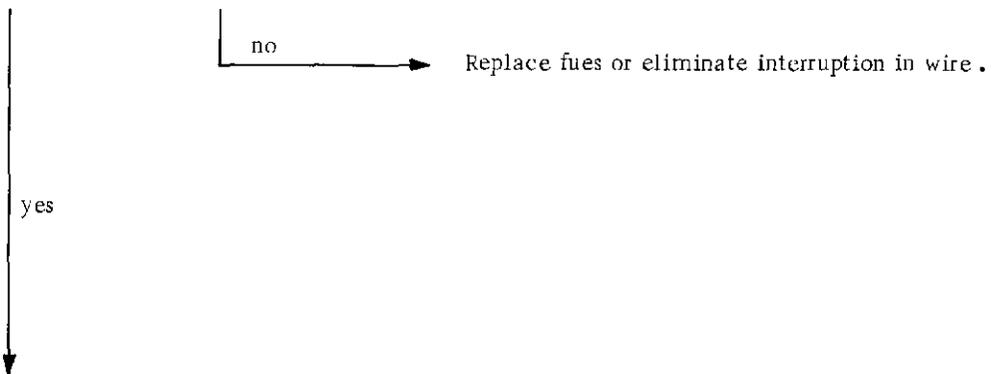


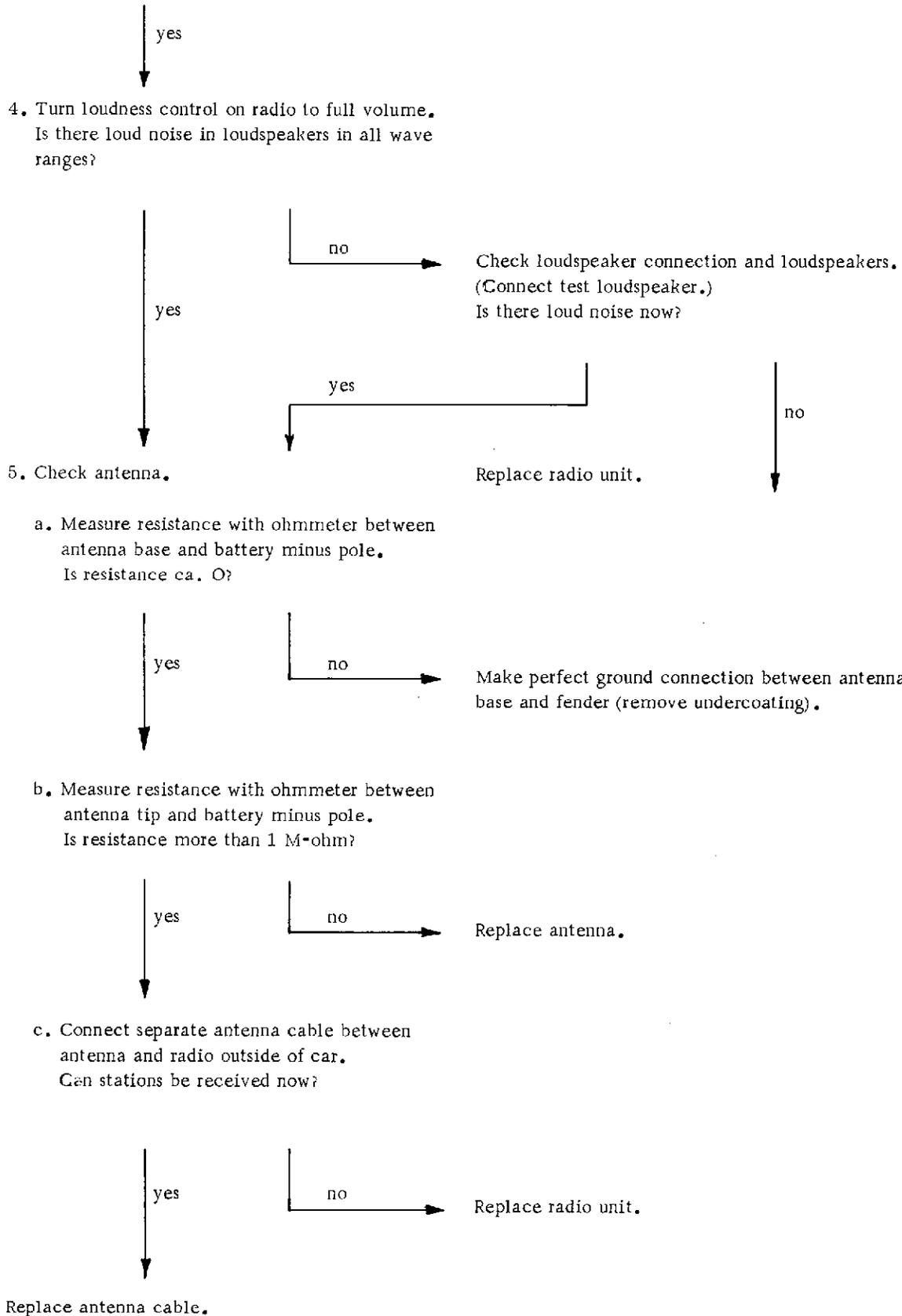
2. Are any stations at all received?



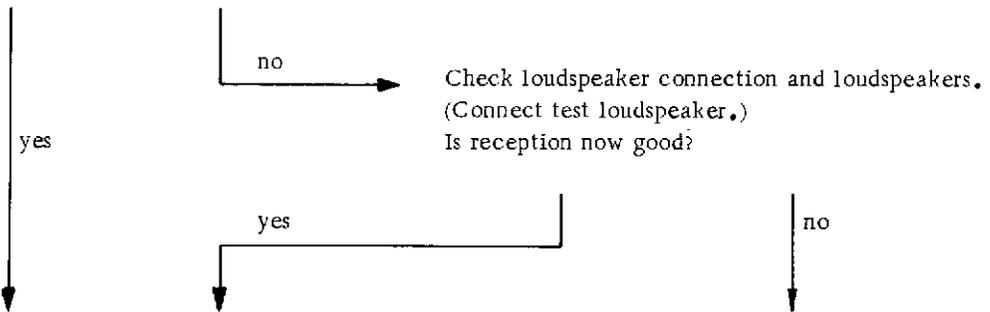
3. Check operating voltage at radio.

Is there 12 volts at radio housing?





6. Is station reception clear and undistorted?

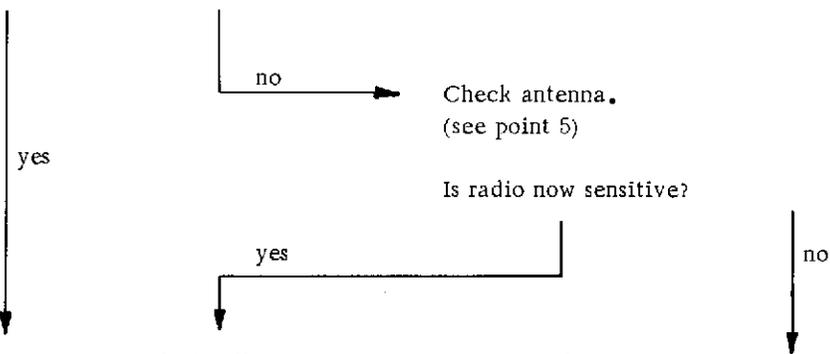


7. Is radio sensitive?

(Are remote stations received together with strong local stations?)

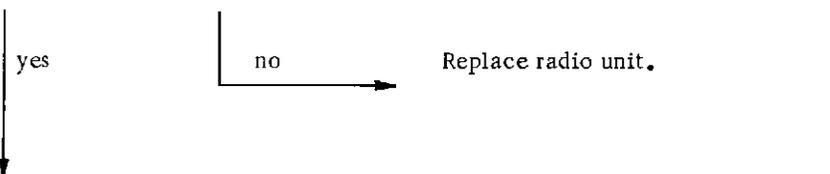
Note: Set sensitivity switch at position 1, see operating instructions.

Replace radio unit.



8. Can the stations be set exactly in all wave ranges?

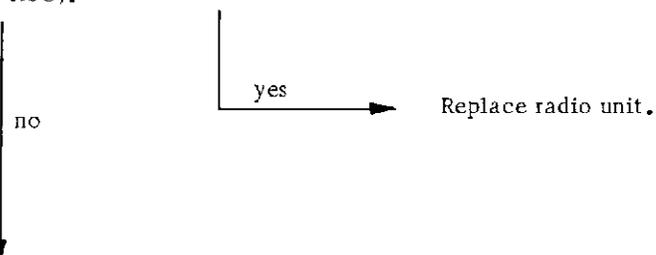
Replace radio unit.

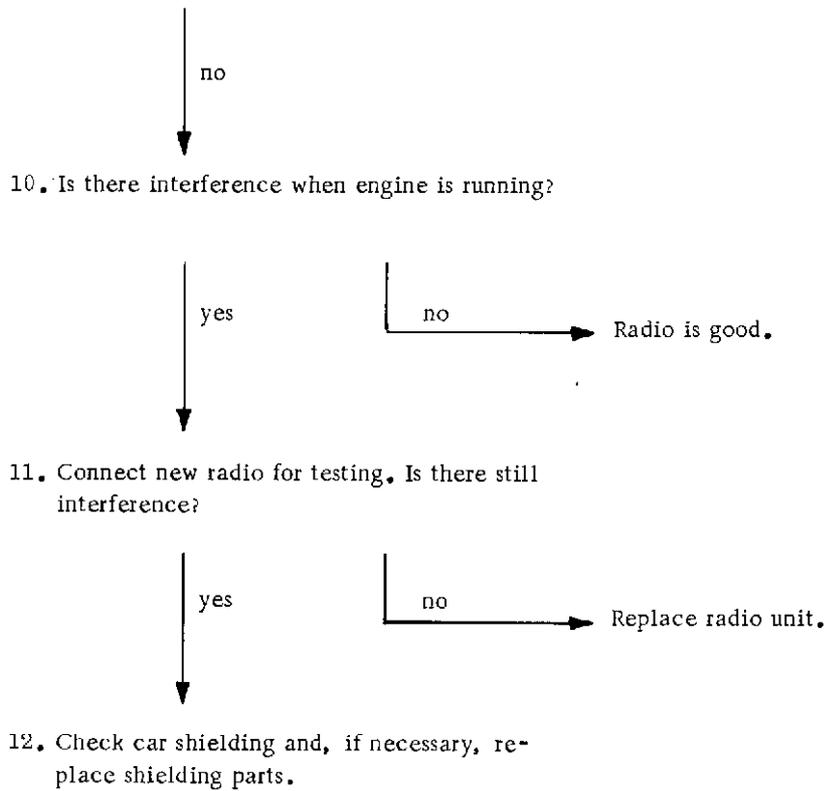


9. Is there interference when engine is not running?

Exceptions: high tension, lightning, street-car cables, street lamps (for USW reception eliminated by ASU).

Replace radio unit.





Typical Interference Noise

1. Interference from Ignition
Crackling noise depending on speed.
Run engine to speed of approx. 5000 rpm, turn off ignition and check whether interference noise stops.
2. Interference from Generator
Whistling noise depending on speed.
Remove generator belt and run engine briefly.
Whistling noise must not be heard.
3. Interference from Regulator
Clicking and crackling noise in certain speed ranges.
Switch on heavy-duty equipment (rear window defogger, headlights), which must change interference noise.
4. Interference from Tachometer
Clicking and crackling noise depending on speed.
Pull off plug receptacle G on central fuse/relay plate, which must cause interference noise to disappear.
5. Interference from Auxiliary Equipment (windshield wipers, blower etc.)
Howling and crackling noise.
Interference noise stops when equipment concerned is turned off.
6. Interference from Static Charge (in MW, LW and SW ranges)
Clicking and crackling noise at high road speeds and on dry road surfaces.
Interference noise stops when depressing the brake pedal.

Possible Interference Routes

Interference can basically make its way into a car radio via three different routes.

1. Interference via Antenna

Turning the loudness control will also change the loudness of interference noise.

Correction:

- a. Eliminate interference at its source by installing interference shields.
- b. Walk around car with a test antenna (or portable radio) and find the place on car radiating maximum interference. Eliminate interference at this point by installing ground straps (e.g. between engine hood and body) or tightening screws to have good connections between body parts.

2. Interference via Power Supply Line

Turning the loudness control will not change the loudness of interference noise.

Correction:

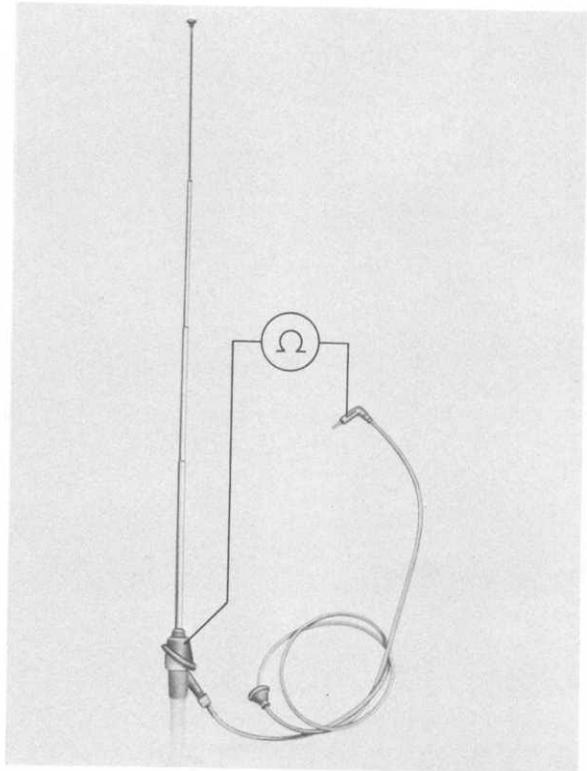
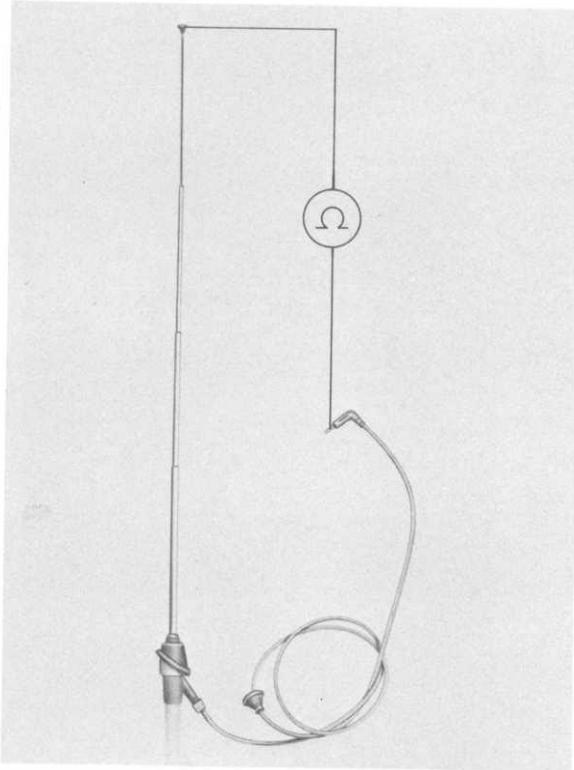
Install an interference suppressor in supply line.

3. Interference via Loudspeaker Wires

Correction:

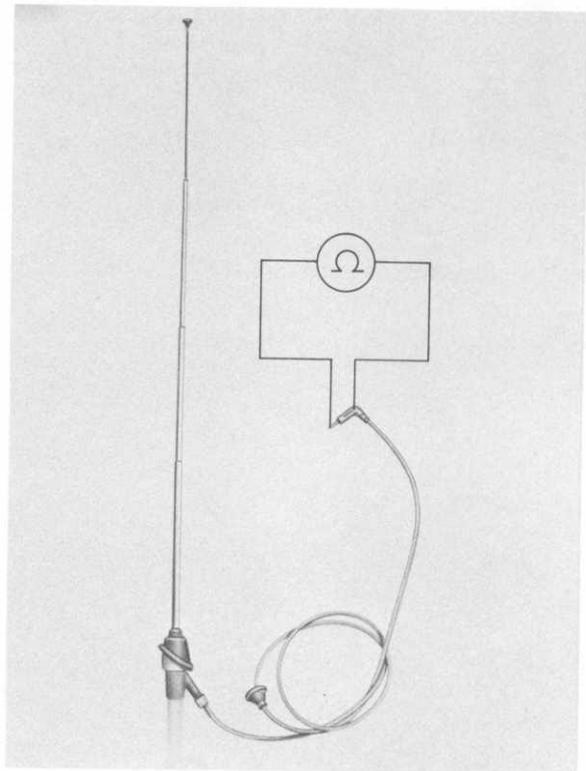
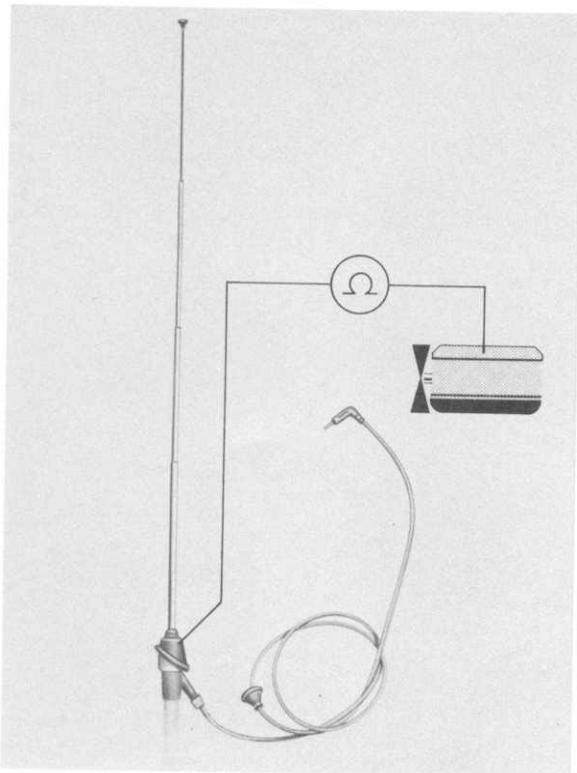
Route loudspeaker wires outside of radiation range of interfering lines and not parallel to wire harnesses.

MEASURING RESISTANCE ON ANTENNA



Through-flow = 0 to 3.5 ohms

Shielding = 0 ohms

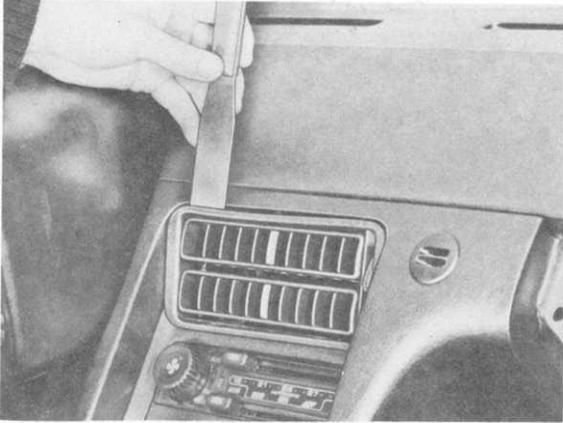


Basepoint ground to engine block = 0 ohms

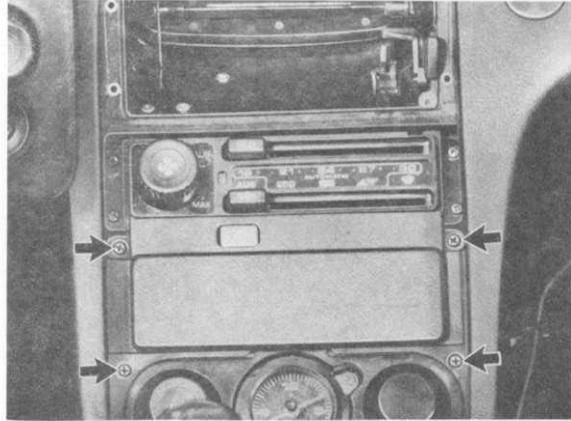
Insulation = at least 1 m-ohm

REMOVING MASK FOR RADIO OPENING

1. Push out center nozzle with a putty knife.



4. Remove mask.

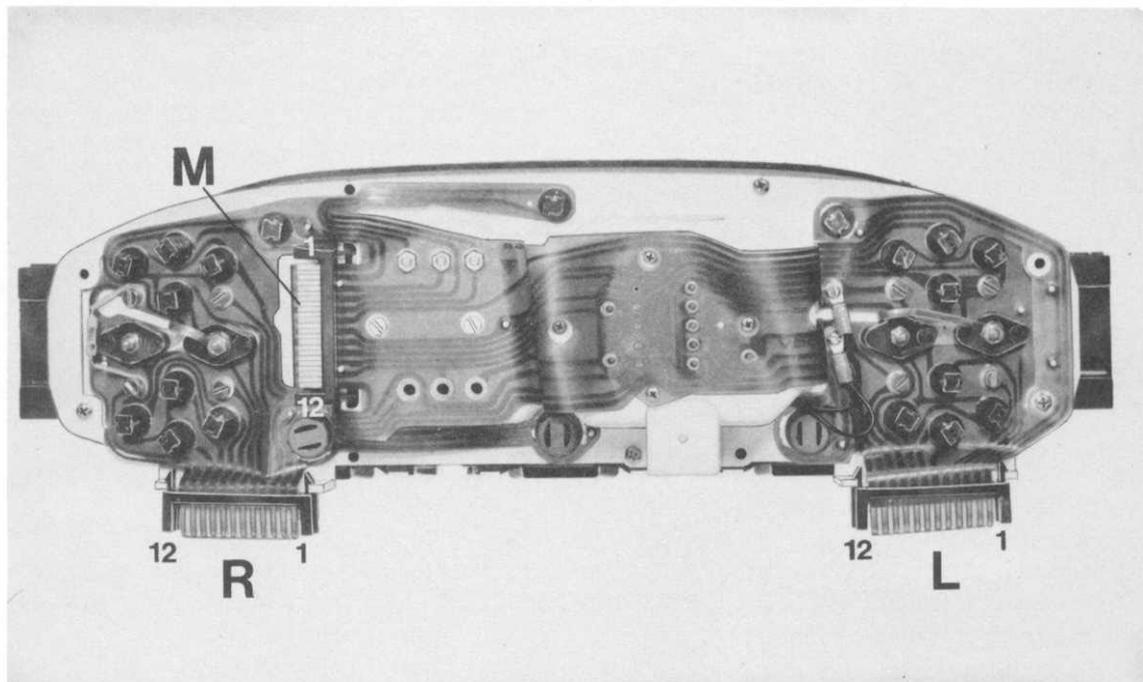


2. Pull off cover frame, starting at top.



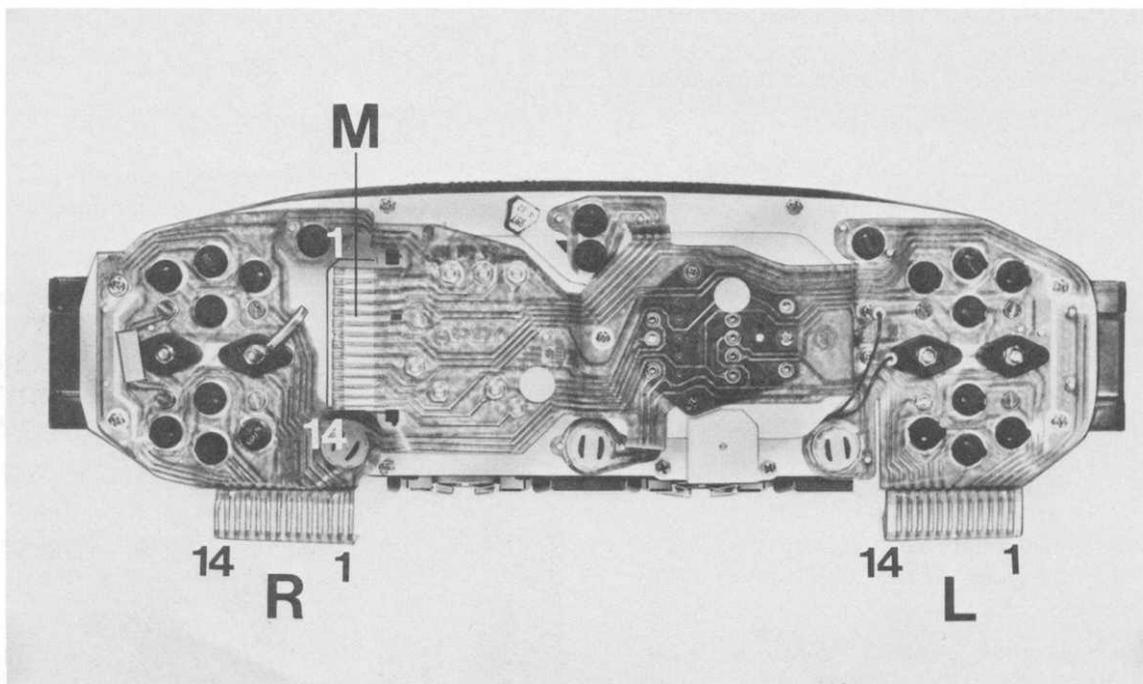
3. Disconnect and remove keyboard.

INSTRUMENT CLUSTER AS FROM 1979 MODELS



To operate the indicator lamps incorporated in the instrument cluster as from 1979 models, it was necessary to increase the number of wire connections. The three wire connection strips on the back of the instrument are designated R, M and L on the current flow diagrams.

INSTRUMENT CLUSTER AS FROM 1982 MODELS



Because of economy control (EC) the number of wire connections on the connection strips has been increased to 14 and plug connections are different.

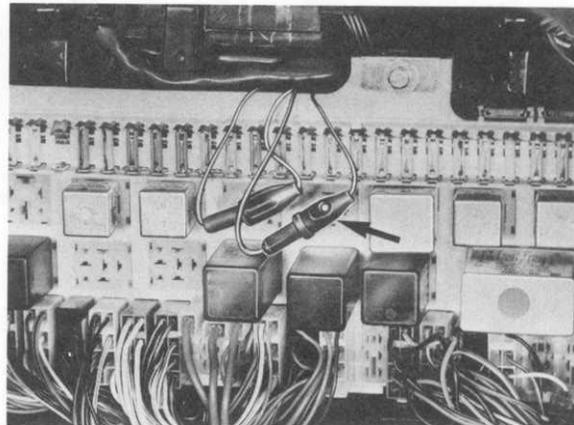
LOCATION OF FUSES AND RELAYS IN CAR - 1980 MODEL

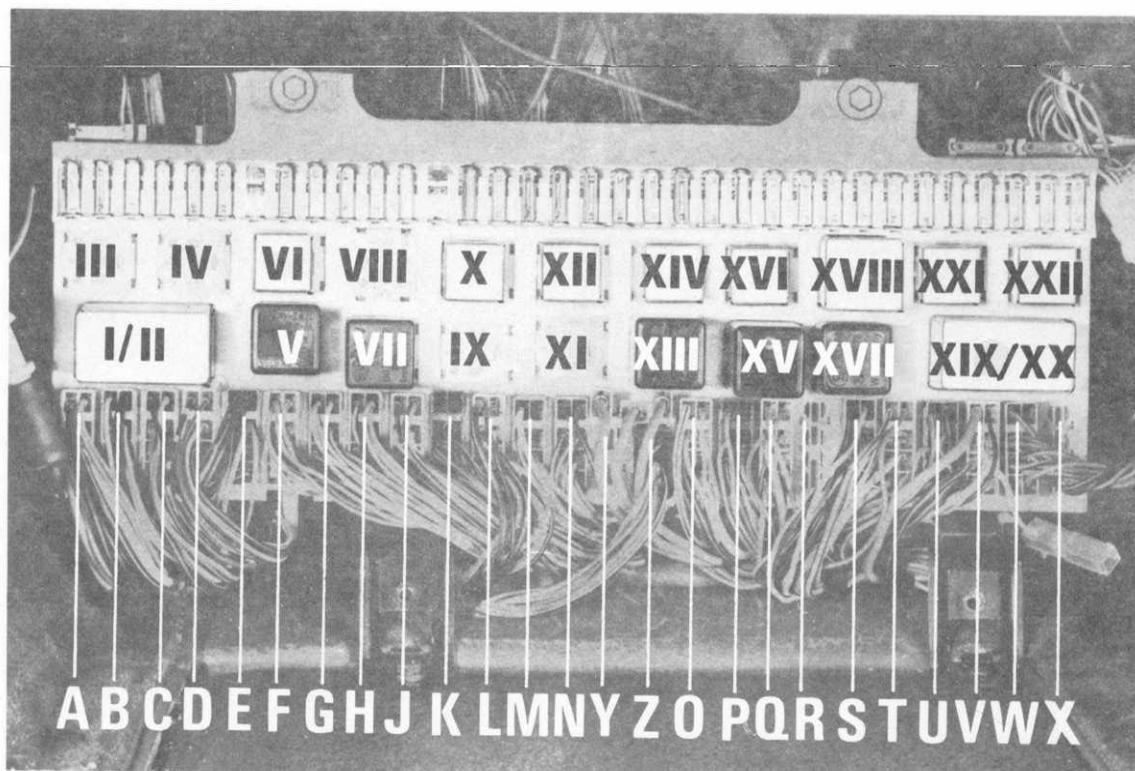
Fuses are numbered in order from left to right and appear on current flow diagrams as S 1 through S 34.

- | | |
|---|---|
| S 1 - Front fog lights | S 23 - Clock, glove box light, inside lights, vanity mirror light |
| S 2 - Not used | S 24 - High beam left, high beam indicator |
| S 3 - License plate lights, engine compartment light | S 25 - High beam right |
| S 4 - Switch lights (front fog lights, tail fog light, hazard lights, rear window wiper, rear window defogger), light for cigarette lighter | S 26 - Low beam left |
| S 5 - Cigarette lighter | S 27 - Low beam right |
| S 6 - Windshield wipers, pump for cleaning solution | S 28 - Side marker lights left |
| S 7 - Not used | S 29 - Side marker lights right |
| S 8 - Sunroof | S 30 - Turn signals front left |
| S 9 - Backup lights, mirror control, rear window wiper, automatic air conditioner | S 31 - Turn signals rear left |
| S 10 - Stop lights, cruise control | S 32 - Turn signals front right |
| S 11 - Instrument lights, light switch light, reset button light, selector lever light, clock light | S 33 - Turn signals rear right |
| S 12 - Instruments and indicator lamps in instrument cluster | S 34 - Not used |
| S 13 - Not used | |
| S 14 - Power seats | |
| S 15 - Two-tone horns, power antenna, rear window wiper return action | |
| S 16 - Condenser fan for A/C | |
| S 17 - Fresh air blower, A/C | |
| S 18 - Rear window defogger, outside mirror heating | |
| S 19 - Retractable headlight motor | |
| S 20 - Pump for headlight washer | |
| S 21 - Window controls, central locking system | |
| S 22 - Fuel pump, control pressure regulator, auxiliary air regulator | |

Note

There are two 0.4 A fuses in inline fuse holders behind the central fuse/relay board for the central locking system.

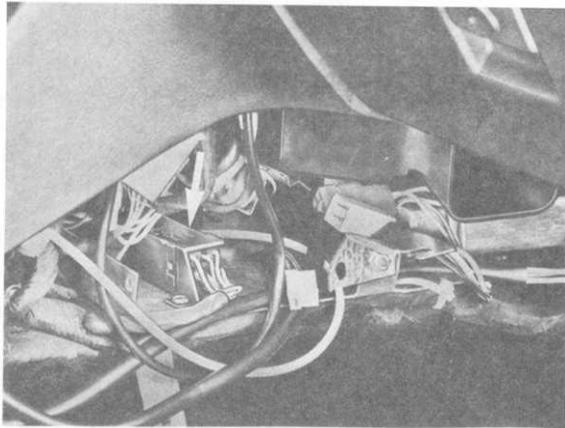




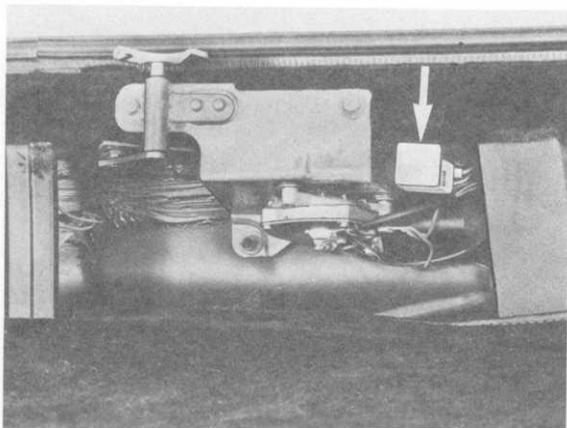
I + II	- Rear window defogger	XV	- Bridge (extra cleaning pump)
III	- Not connected	XVI	- AFC fuel injection
IV	- Not connected	XVII	- Fuel pump
V	- Hazard light/flasher	XVIII	- A/C condenser fan
VI	- Window control	XIX + XX-	Headlight combination
VII	- Headlight cleaner pump	XXI	- Fresh air blower
VIII	- Not connected	XXII	- Defroster
IX	- Not connected		
X	- Horn		
XI	- Not connected		
XII	- Front fog light		
XIII	- Wiper intermittent action		
XIV	- Bridge (start relay for automatic transmission)		

Note

Time action relay for seat belt warning system is located in center console in front of radio.

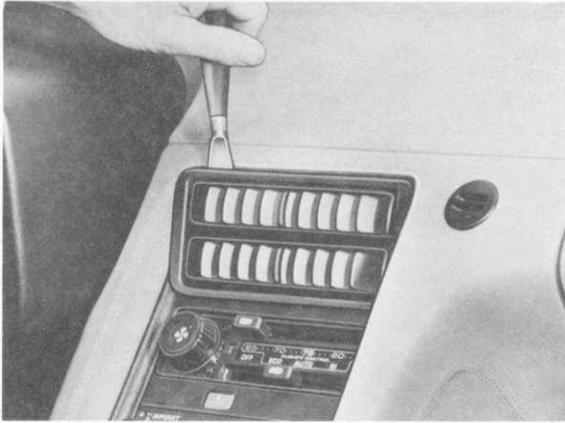


Rear window wiper relay is located on left side behind the tool plate at rear.



REMOVING AND INSTALLING RADIO (DIGITAL RADIO BAMBERG QTS)

1. Press out center vent with a putty knife.



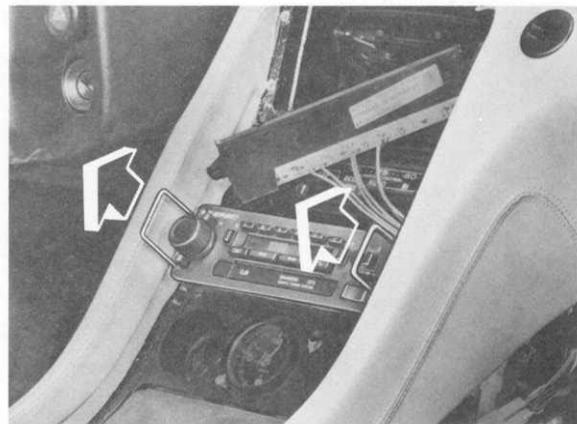
2. Pull off cover beginning at top.



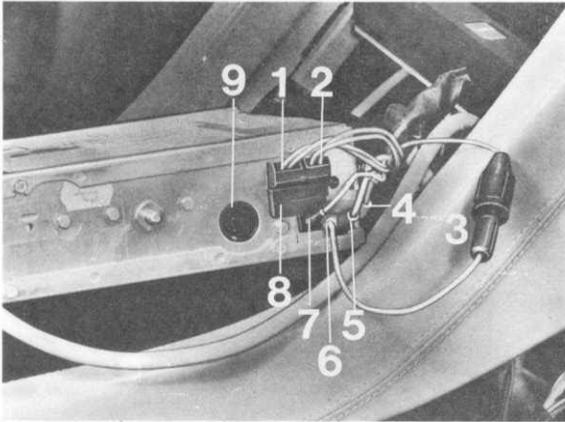
4. Unscrew tray underneath glove box and trim on side of center console.

5. Push assembly bar into openings of radio mask until it engages.
Pull radio out of center console.

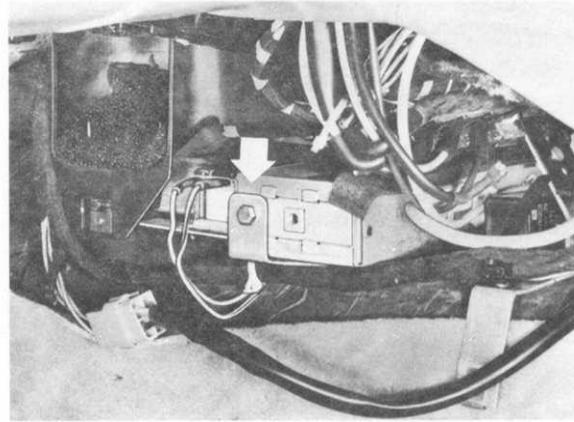
3. Unscrew and remove push button plate.



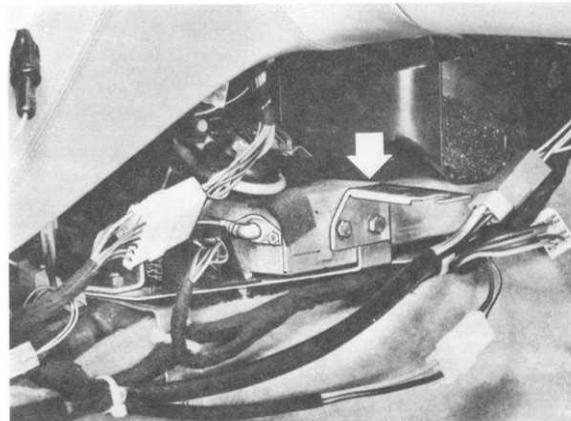
6. Pull off plugs on radio.



- 1 – Speaker connection, right
- 2 – Speaker connection, left
- 3 – Fuse holder (2.5 A fuse)
- 4 – Ground connection
- 5 – Plus connection wired via fuse and ignition lock
- 6 – Plus connection term. 30 (digital clock and station memory)
- 7 – Automatic antenna conn.
- 8 – Fuse 3.15 A (remove cap)
- 9 – Remote control connection



Unscrew radio mounting on right side and remove radio from left side.



7. Unscrew radio mounting on left side.

CHECKING FUEL CONSUMPTION INDICATOR

A F C

1. Check connecting wires and plug connections between AFC control unit and instrument cluster for good contact and breaks.
 2. The sensor signal (duration of injection) can be checked with an oscilloscope on the central electric plug L, term. 5, or on the instrument cluster (center multiple-pin plug, term. 11). The square wave signal changes frequency when the engine speed changes.
 3. If the instrument cluster receives the sensor signal, check the printed circuit and, if necessary, replace the instrument.
 4. If there is excessive deviation in the upper range between displayed and actual consumption, check the speedometer signals on left multiple-pin plug term. 2 by turning the driven wheels.
 5. If the fuel consumption indicator does not return to zero after switching off the ignition, check whether center multiple-pin plug term. 14 of instrument cluster has + 12 volts (check fuse no. 23).
-

TROUBLESHOOTING CENTRAL WARNING SYSTEM

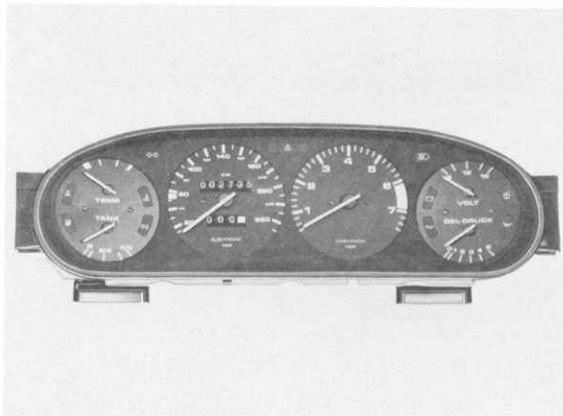
Function:

The central warning system monitors the following functions in the car.

- 1 – Oil pressure
- 2 – Oil level
- 3 – Brake circuit failure
- 4 – Brake fluid level
- 5 – Parking brake
- 6 – Coolant level
- 7 – Coolant temperature
- 8 – Fuel reserve
- 9 – Washer fluid level
- 10 – Brake pad wear
- 11 – Stop lights
- 12 – Tail lights

Any deviation from specified condition or a defect will be displayed by the central warning lamp flashing or coming on, depending on priority, the acknowledgement button and the pertinent indicator lamp. Beginning with 1979 models the acknowledgement button comes on together with the central warning lamp.

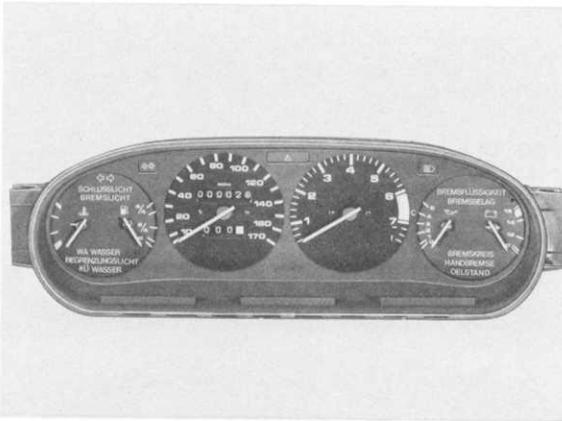
1978 Models



Indicator Panel for 1978 Models



Beginning with 1979 models



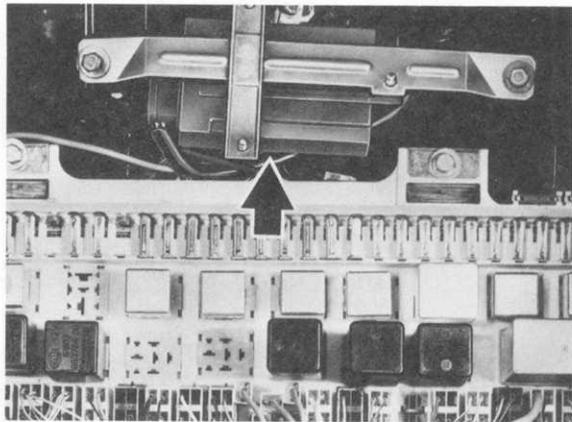
Acknowledgement button beginning with 1979 models



The central warning unit contains a "bulb check" function to check the light bulbs. All indicator lamps, the central warning lamp and the acknowledgement button lamp must come on after turning on the ignition.

Voltage is supplied to the central warning unit via term. 50 while starting the engine and cancels the "bulb check" function. All indicator lamps go out except for the stop light indicator (goes out when operating brake pedal first time) and parking brake indicator (when parking brake is applied).

Monitoring the tail lights and stop lights is accomplished with a bulb check control unit, which together with the central warning unit will activate the pertinent indicator lamp when a bulb is defective or a wire has a break.



Types of Defects

The following defects could occur in the central warning system.

1. Check lamp(s) do not come on when checking light bulbs.
2. Indicator lamp on continuously, instead of flashing (for functions 1 – 4).
3. Indicator lamp not on, even though monitored function is not okay.
4. Indicator lamp on, even though monitored function is okay.



CWL = Central Warning Lamp

ABL = Acknowledgement Button Lamp

IL = Indicator Lamp (or Sign Light)

FUNCTION TEST ON CENTRAL WARNING UNIT

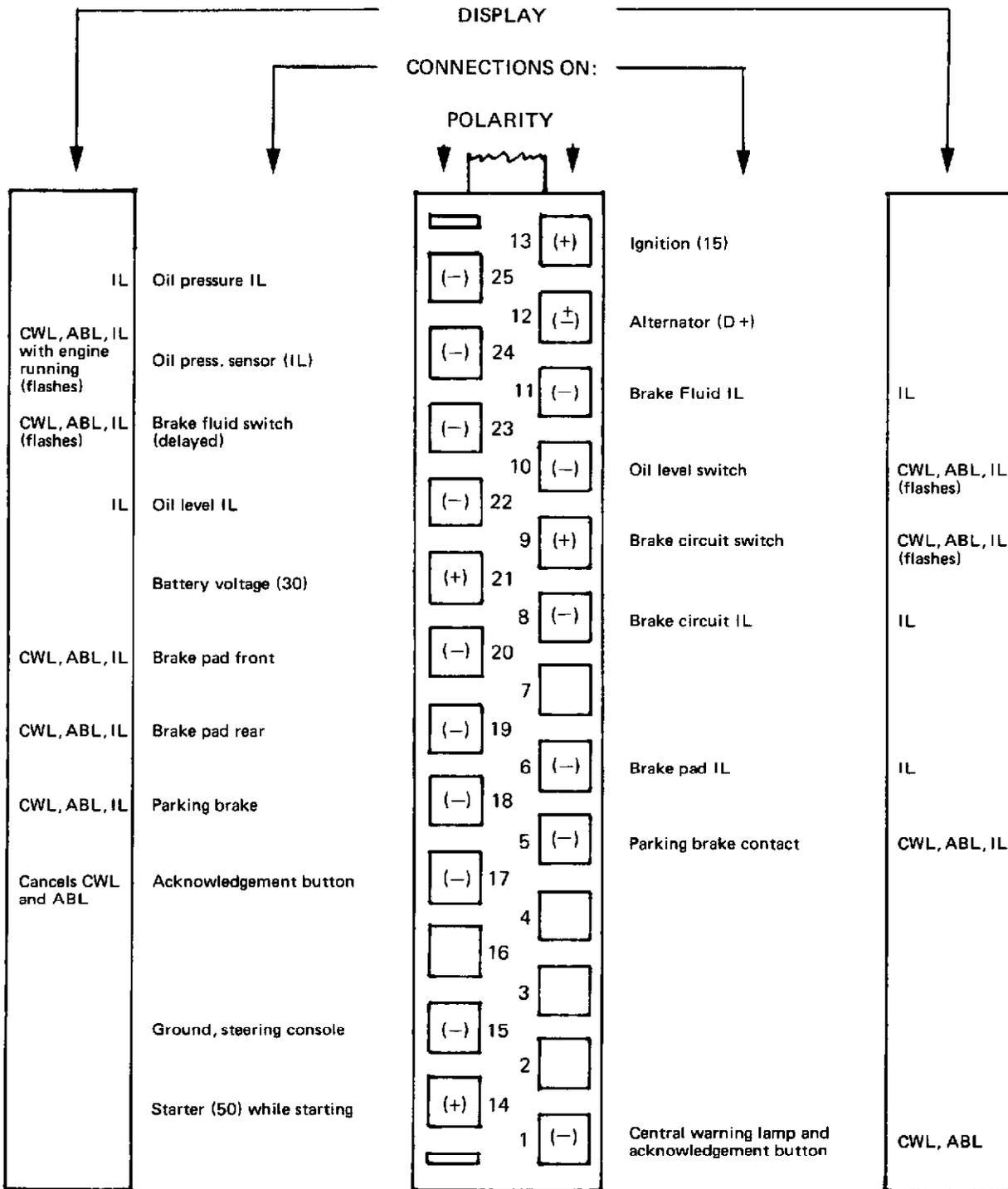
This test is applied to find a defect in the central warning unit itself.

Use a piece of wire to make connection between the connected multiple-pin plugs of the central warning unit and the pertinent polarity of the point being tested.

Refer to the central warning unit connection plan for designations and polarity.

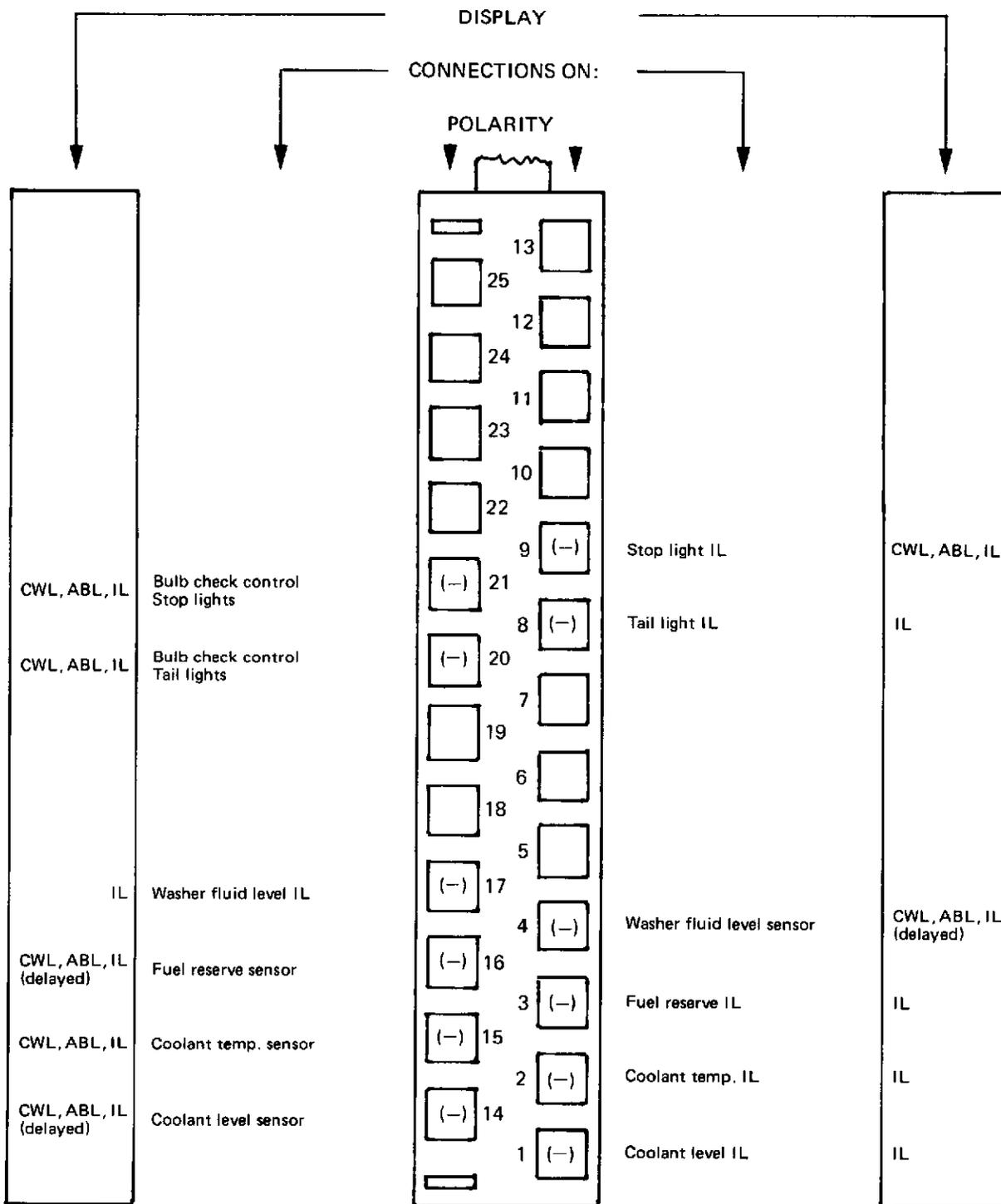
CENTRAL WARNING UNIT CONNECTION PLAN

BLACK PLUG



CENTRAL WARNING UNIT CONNECTION PLAN

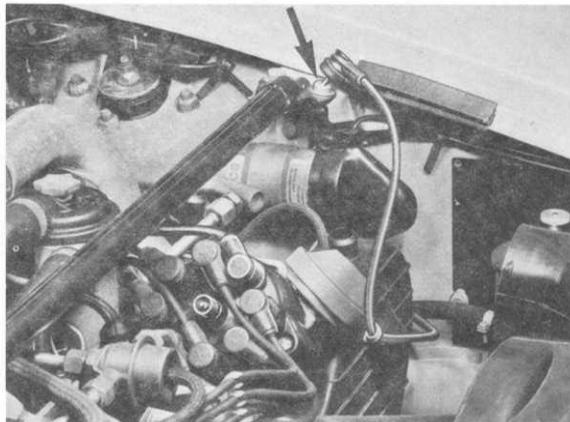
YELLOW PLUG



Single Component Function Test

Observe the following points when checking the wiring.

- Plugs must be connected correctly.
- Plug contacts must not be deformed or pushed back.
- Wires must be checked for breaks or shorts.
- Ground connections must not be loose or corroded.



Turn ignition on and operate starter briefly. All indicator lamps should go out with exception of stop light and battery charge indicator lamps. Operate brake pedal to cancel the stop light indicator lamp.

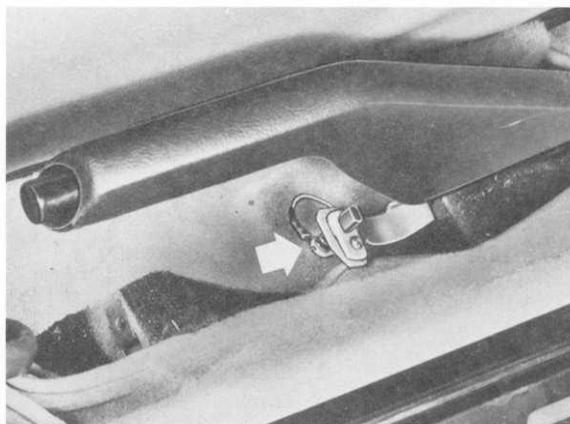
Note

To be able to test the single components on a stopped engine, voltage must be supplied from term. 50 to the central warning unit without having the engine start.

This is accomplished by pulling off term. 4 ignition wire on the distributor and connecting it on ground (engine cross member mounting bolt).

1. Parking Brake:

Pull up parking brake lever or connect parking brake contact with ground.



CWL, ABL and parking brake IL should come on. Lamps must go out when releasing the parking brake or disconnecting ground.

Switch Function:

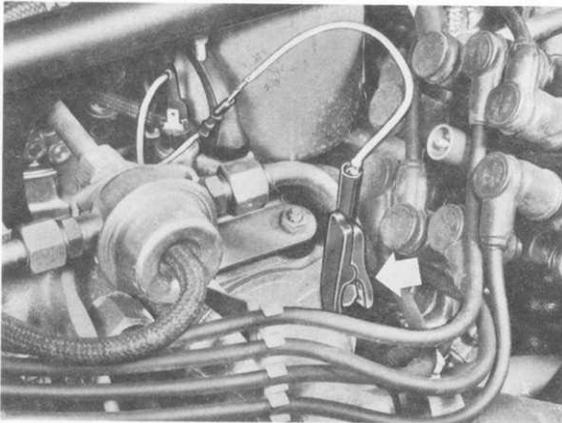
Parking brake released = contact open
 Parking brake applied = contact made

CWL, ABL and coolant temperature IL should come on. Press acknowledgement button, CWL and ABL should go out, while IL remains on.

2. Coolant Temperature:

Pull off flat female plug on sensor term. W (narrow female plug) and connect with ground.

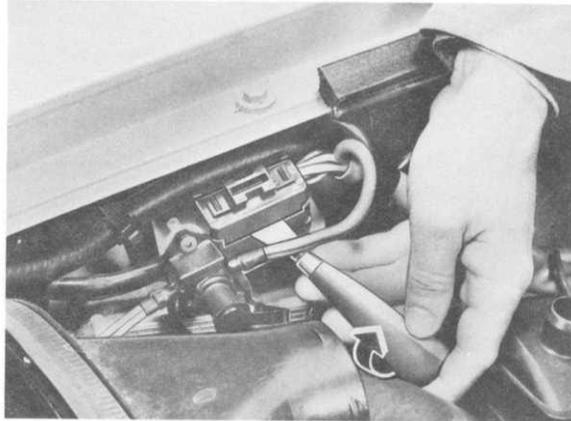
IL should go out when disconnecting ground.

**Switch Function:**

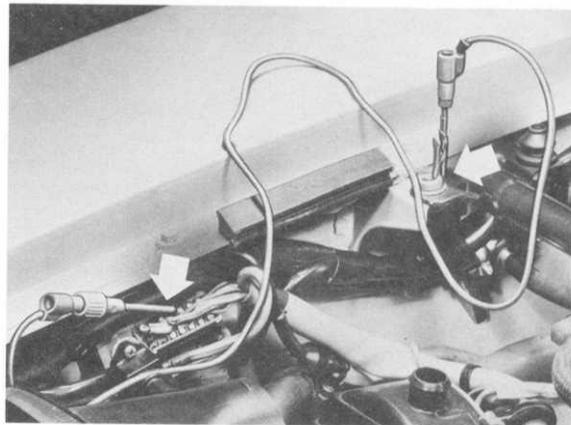
Temperature too high = contact made
 Temperature normal = contact open

3. Oil Level:

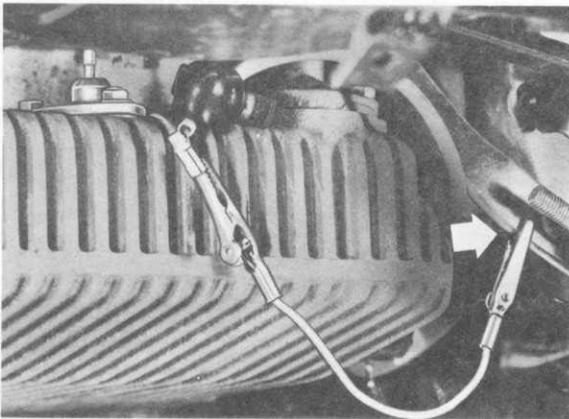
Remove cap on multiple-pin plug in engine compartment at front right side (do not disconnect plug).



Connect term. 6 with ground.



This test could also take place direct on the sensor.
Pull off plug on sensor and connect with ground.

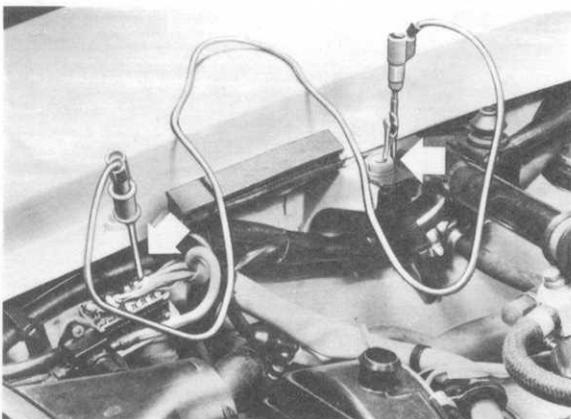


Switch Function:

Oil level too low = contact made
Oil level normal = contact open

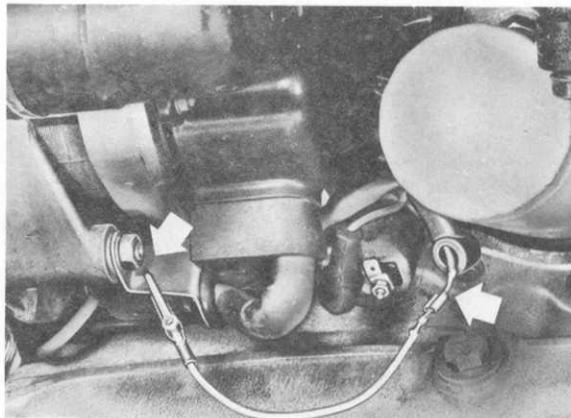
4. Oil Pressure:

Connect term. 2 of multiple-pin plug in engine compartment with ground.



CWL, ABL and oil pressure IL should start to flash after about 2 seconds. Press acknowledgement button, lamps should continue flashing. Disconnect ground on term. 2, lamps should go out.

Test on Oil Pressure Switch

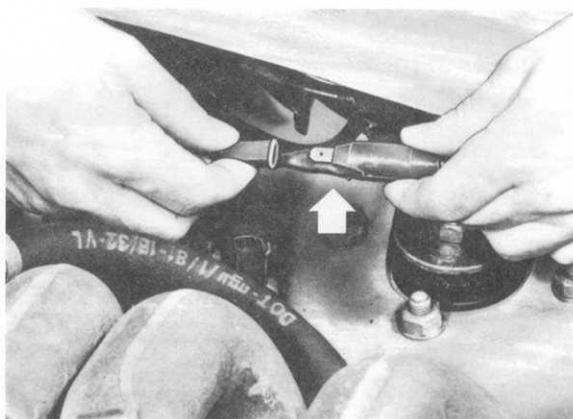


Switch Function:

No oil pressure = contact made
Oil pressure = contact open

5. Brake Pad Wear:

Disconnect one plug of pad wear control (e. g. in engine compartment at front left next to brake master cylinder).



CWL, ABL and brake pad IL should come on. Press acknowledgement button. CWL and ABL should go out, while IL remains on.

Function:

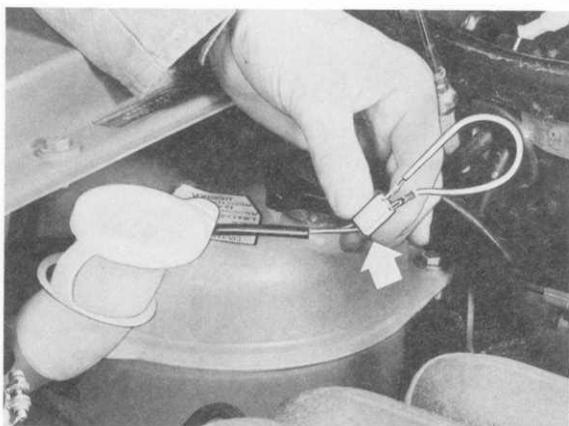
The wire connection will be broken and pad wear reported when the warning contact in one of the brake pads has been ground off.

The display can be cancelled by turning the ignition off.

The procedures described at the beginning of the function test will then be necessary for the following tests.

6. Coolant Level:

Pull off and bridge plugs on float switch.



CWL, ABL and coolant level IL must come on after approx. 20 seconds.

Press acknowledgement button. CWL and ABL should go out and IL must remain on.

Disconnect bridged plugs, IL should remain on.

Switch Function:

Coolant level too low = contact made

Coolant level normal = contact open

Indicator lamp goes out when turning ignition off.

7. Washing Fluid Level:

Open cover for central electric board in passenger's footwell.

Connect plug Q, term. 6 (green/blue) on ground with a piece of wire.

CWL, ABL and washing fluid IL should come on after approx. 20 seconds.

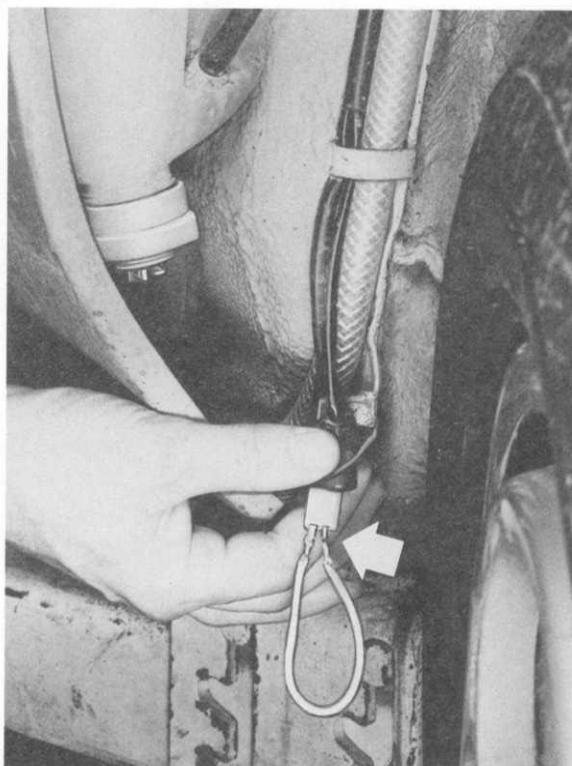
Press acknowledgement button. CWL and ABL should go out and IL must remain on.

Indicator lamp goes out when turning ignition off.

Switch Function:

Level too low = contact made

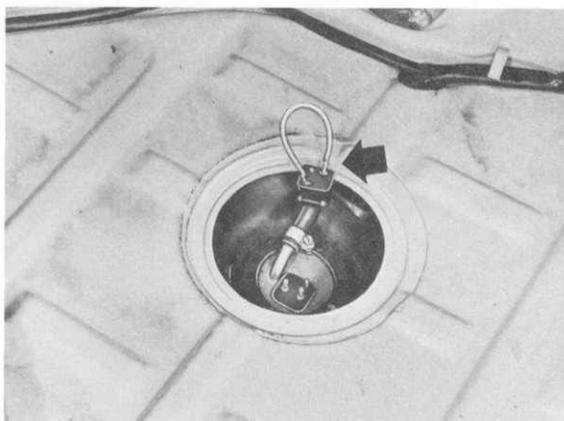
Level normal = contact open

Testing on Float Switch

The float switch is located in the right wheel house behind the rear cover.

8. Fuel Tank Reserve:

Remove cover in trunk on right side. Pull off plug on transmitter and bridge term. W and T with a piece of wire.



CWL, ABL and brake circuit IL must flash. Press acknowledgement button. All lamps should continue to flash. Disconnect bridge and connect plug on stop light switch. Lamps should continue to flash.

CWL, ABL and tank reserve IL should come on after approx. 10 seconds.

Press acknowledgement button. CWL and ABL should go out, while IL must remain on.

Indicator lamp will go out when turning ignition off.

Note

Brake circuit failure indicators can only be cancelled by disconnecting battery briefly.

Switch Function:

Reserve fuel level = contact made

Greater fuel level = contact open

Switch Function:

No brake pressure = Term. 81 and 81 a made
Term. 81 and 82 a open

Brake pressure = Term. 81 and 81 a open
Term. 81 and 82 a made

9. Brake Circuit Failure:

Pull off plug on one stop light switch below brake master cylinder and bridge opposite female plugs (term. 81 and 82 a) with a piece of wire.

10. Brake Fluid Level:

Press down and hold float switch above brake fluid tank at least 20 seconds or bridge plug.



CWL, ABL and brake fluid IL should start to flash after approx. 20 seconds.
Press acknowledgement button. Lamps should continue flashing.
Lamps will go out after switching ignition off.

Switch Function:

Fluid level too low = contact made
Fluid level normal = contact open

11. Tail Lights:

Turn parking lights on. Remove tail light bulb from one tail light assembly.

CWL, ABL and tail light IL should come on after approx. 4 seconds.
Press acknowledgement button.
CWL and ABL should go out. IL must remain on.
Tail light IL should go out after installation of light bulb.

12. Stop Lights:

Remove stop light bulb from one tail light assembly. Operate brake pedal.

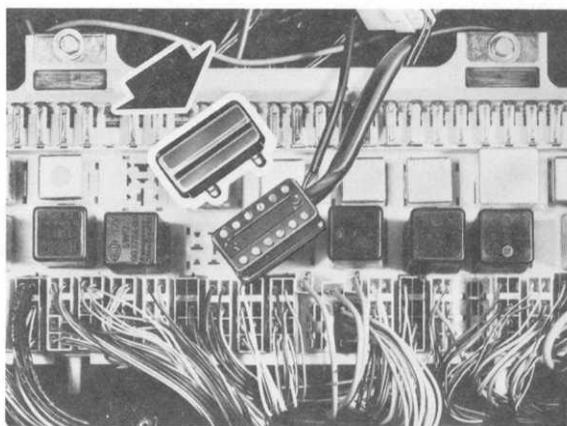
CWL, ABL and stop light IL should come on. Press acknowledgement button. CWL and ABL should go out. IL must remain on. Install light bulb again. IL should go out only after operating the brake pedal again.

Note

Light bulbs of same wattage must be installed on both sides. If not, the indicator will be activated even when both bulbs are functioning. Should the tail light or stop light indicator lamps come on in spite of perfect condition tail light assemblies, the defect could be in the central warning unit or bulb check control.

When the bulb check control is defective, both tail lights and/or both stop lights could be malfunctioning.

An adapter, Part No. 928.641.610.00, could be installed in place of the bulb check control as an emergency solution. The adapter will bridge the concerned connections.



In this case no warning lamps would be activated for failure of a stop or tail light.

Note

The central warning system is only available as optional extra (M) equipment in Type 928 cars beginning with 1980 model.

An adapter is installed standard in the same housing instead of the central warning system.

The monitored functions are limited to:

- 1 – Oil pressure
- 2 – Brake circuit failure
- 3 – Brake fluid level
- 4 – Brake pad wear
- 5 – Parking brake
- 6 – Coolant temperature
- 7 – Fuel tank reserve

There is not a red acknowledgement button in the center console then.

ALARM SYSTEM 928

Description:

The alarm system is switched on and off when locking and unlocking the doors with the S key (long key).

Beginning with 1981 models the alarm system is also switched off by unlocking the tailgate and switched on by locking the tailgate by way of an additional locking movement with the S key.

Using the auxiliary key will mean only mechanical locking and unlocking of both doors and the tailgate.

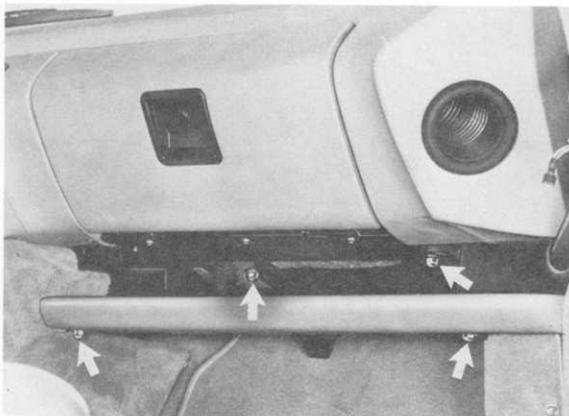
The alarm is set off by opening the doors, tailgate or engine hood.

After activation of the alarm system a separate alarm horn will sound off intermittently for about 30 seconds (uninterrupted sound for Swiss version) and can be reactivated by repeating the described actions.

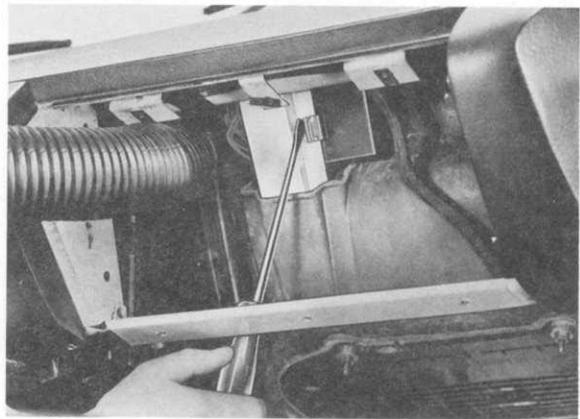
The engine can also not be started.

Removing and Installing Alarm Control Unit

1. Unscrew tray underneath the glove box.



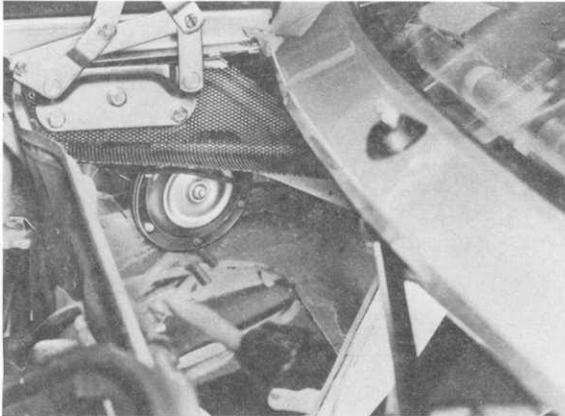
2. Disconnect two-pin plug underneath glove box on right side and remove glove box.
3. Pull off heating hose on right side.
4. Press alarm control unit off of brace at the retainer clamp with a screwdriver.



5. Pull off both plugs on alarm control unit.

Removing and Installing Alarm Horn

1. Remove blower (see page 87 - 16 of this repair manual).
2. Unscrew right engine hood hinge and remove grill.



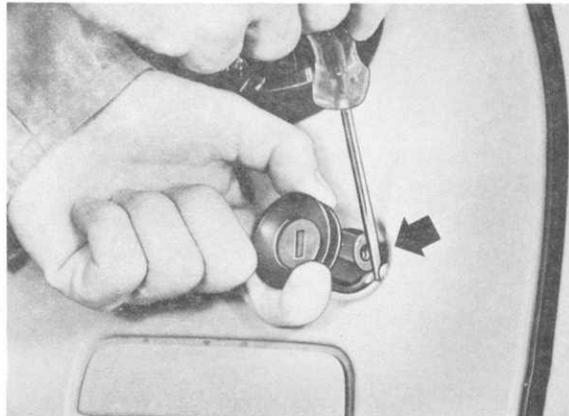
3. Unscrew alarm horn (M 10 hexagon nut, 17 mm wrench) and pull off wires.

Removing and Installing Lock Cylinder

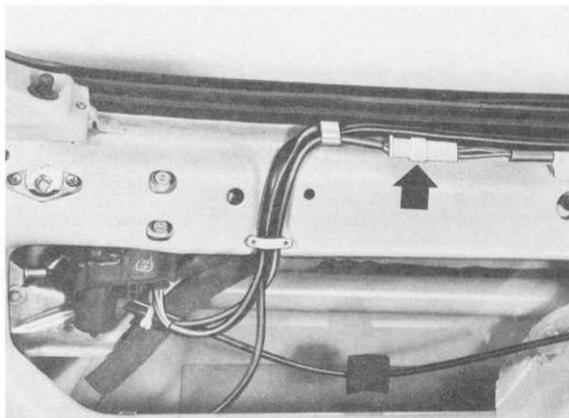
1. Remove door panel.
2. Unscrew mounting bolt.



3. Detach connecting rod.

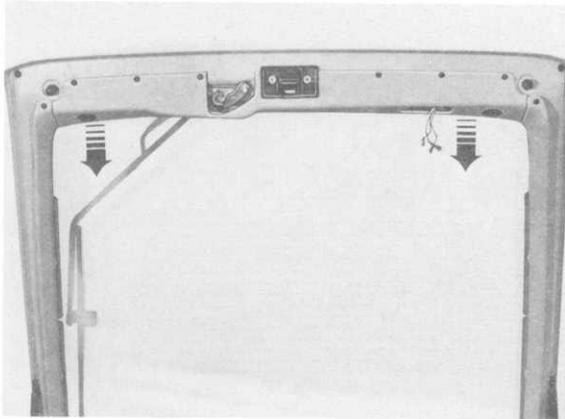


4. Disconnect plug and remove lock cylinder.

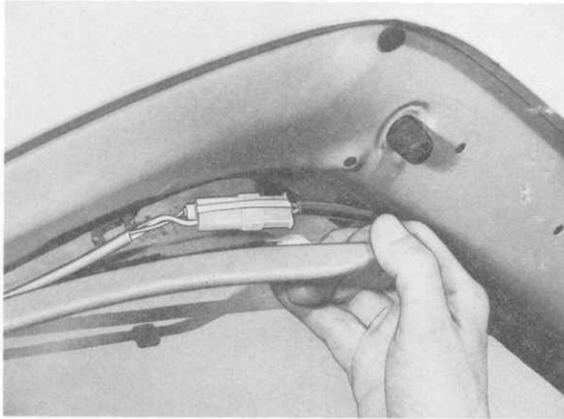


Removing and Installing Tailgate Lock Upper Section

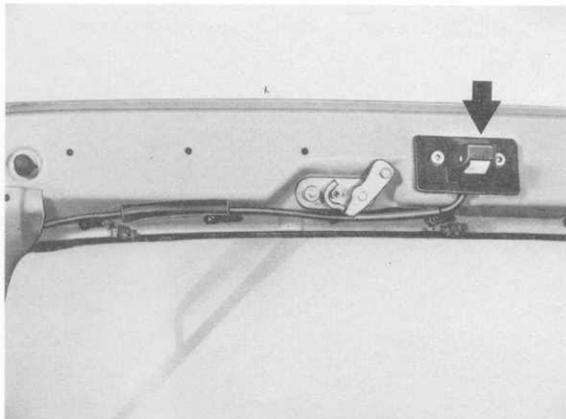
1. Remove trim panel on bottom of tailgate by pulling out spreader rivets and pressing trim panel forward out of retaining clips. Disconnect trunk light.



2. Disconnect trim panel on left side and remove plug of alarm switch.

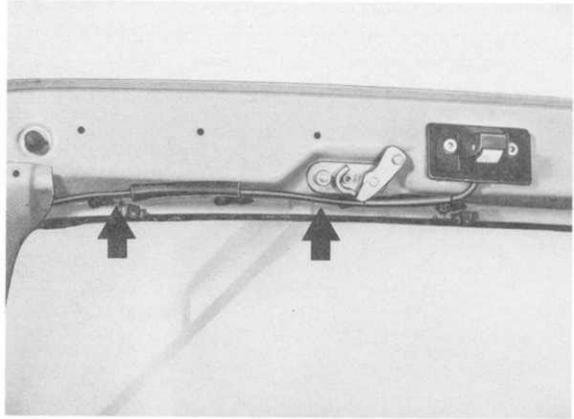


3. Unscrew and remove lock upper section.

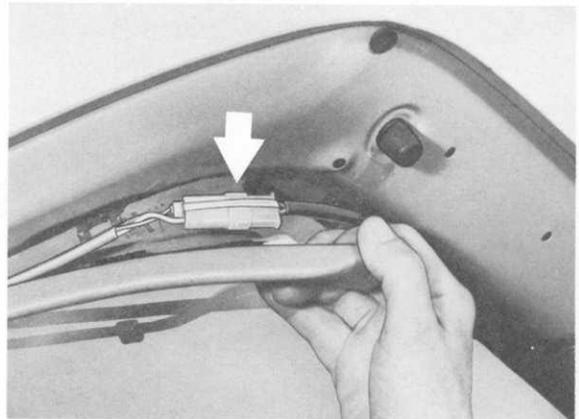


Note

Secure wires with adhesive tape in area of rear window wiper drive when installing.



Secure plug connection with adhesive tape to prevent unintentional disconnection.

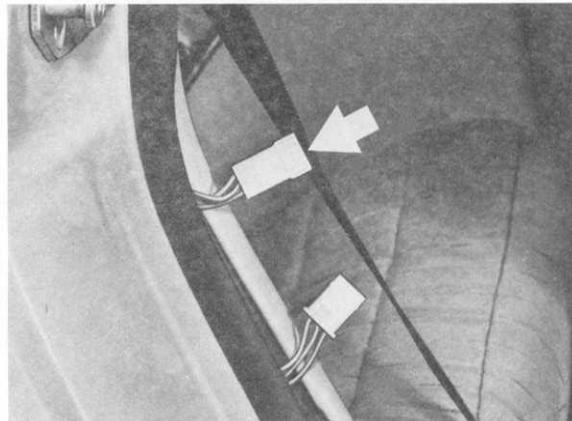


Troubleshooting Alarm System:

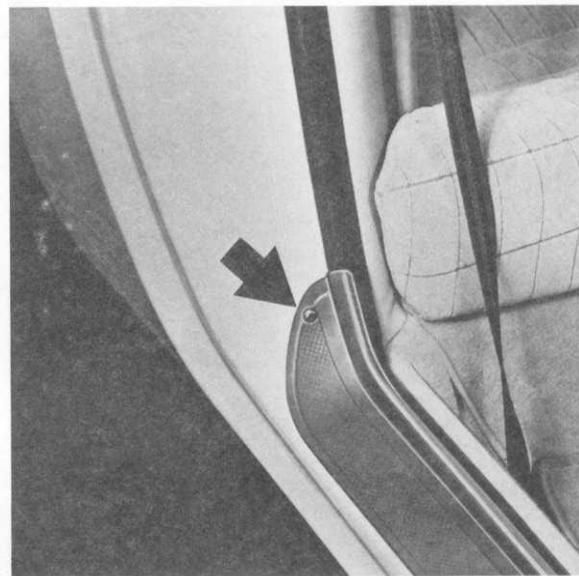
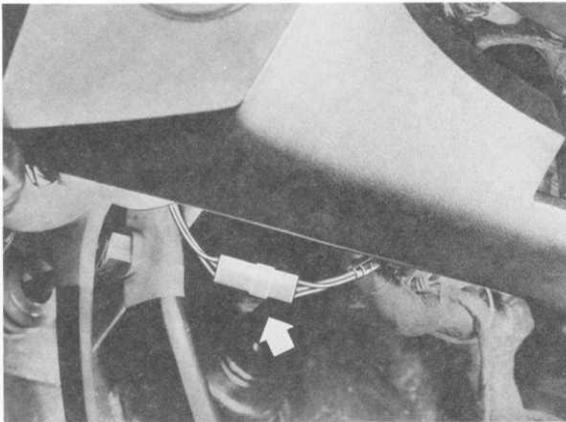
Check contact switch on lock cylinder.

1. Disconnect plug of lock cylinder contact switch being checked outside of door or tailgate.

- Plug for driver's door underneath instrument panel on left side.

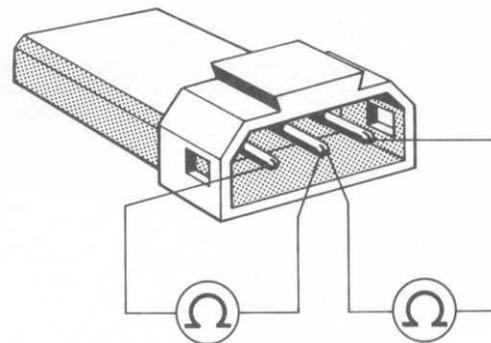
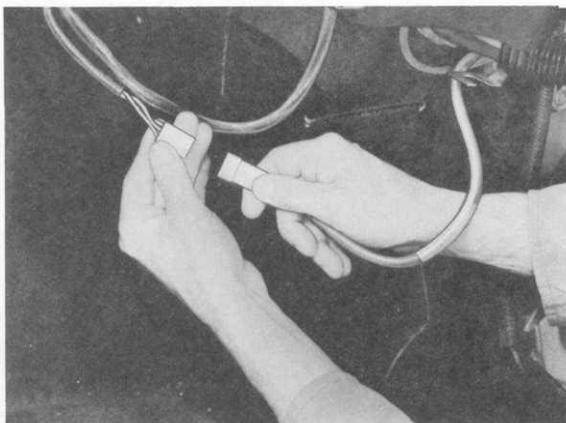


Disconnect door sill molding and side trim panel and press off carefully. Do not bend trim panel.



- Plug for passenger's door underneath instrument panel on right side.

2. Connect ohmmeter on plug of wire leading to door.



- Plug for tailgate behind side panel trim on right side.

- Activating alarm system = connection of meter on brown and brown/red wires.
- Deactivating alarm system = connection on brown and brown/green wires.

3. Lock or unlock pertinent lock cylinder with the S key.

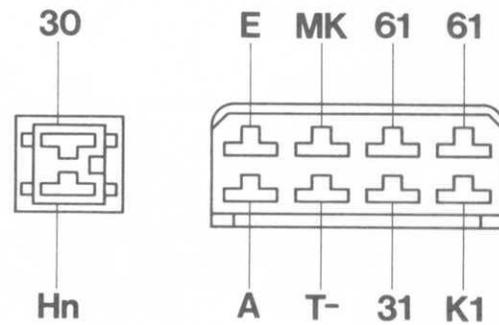
Meter should not display resistance when switching the contact switch.

Note

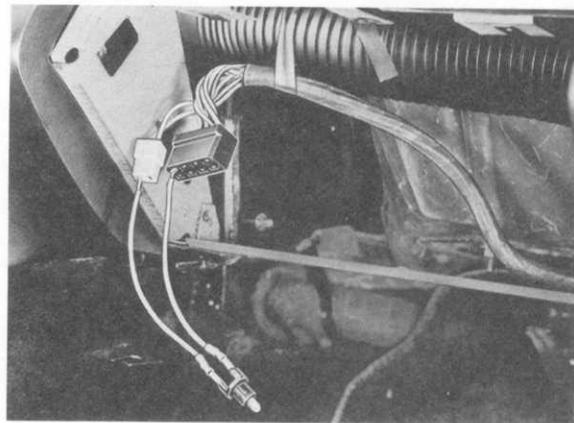
Contact switch can only be replaced together with the lock cylinder.

Checking Wires and Connections

1. Remove alarm control unit.
Pull off both plugs on alarm control unit.
2. Connect test lamp (max. 3 W) on term. 30 and Hn of two-pin plug.
When lamp comes on, there is battery voltage and wire to alarm horn and term. 31 on disconnected eight pin plug is okay.



3. Leave test lamp connected on term. 30 and make other connection on term. E.



Activate the alarm system with S key on both doors and the tailgate.
Lamp must come on briefly.

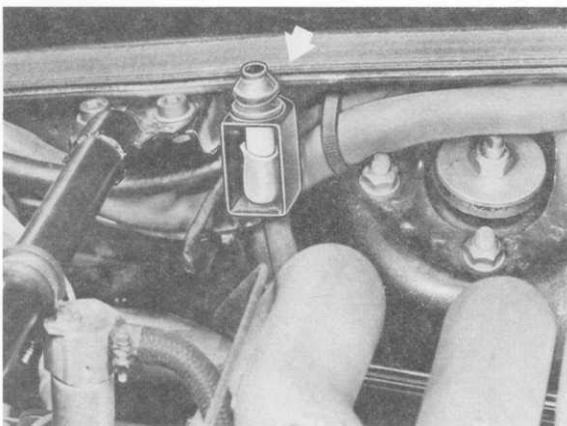
4. Connect test lamp on term. 30 and A.
Deactivate alarm system on both doors and tailgate.
Lamp should come on briefly.

5. Connect test lamp on term. 30 and T.
Open and close both doors and tailgate separately. Lamp should come on while opening.
6. Connect test lamp on term. 30 and MK.
Open engine hood — lamp should come on.

Note

The switching point of the engine hood contact switch must be checked to prevent unintentional activation of the alarm system when car is shaken while alarm system is set.

Open engine hood slowly. Lamp should go out immediately before engagement in lock. Adjust switch if necessary.



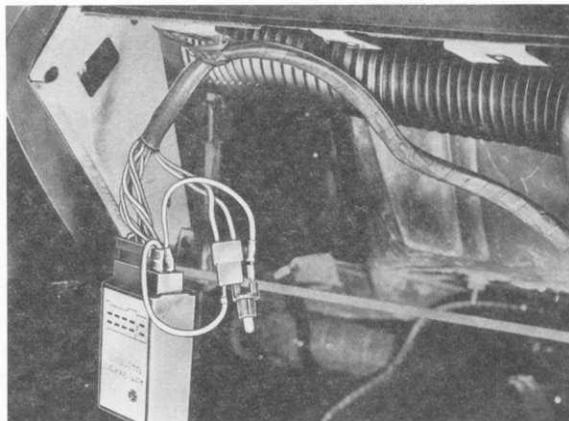
7. Connect test lamp on term. 30 and 61 (connect on both term. 61 separately).
 - Lamp comes on and goes out when turning ignition on (connection via central electric board Z 6).
 - Lamp comes on and goes out after starting engine at high speed (connection via central electric board Z 1).

8. Connect test lamp on term. 30 and K 1.
Lamp should come on.

Checking Function of Control Unit

The use of a test lamp instead of the alarm horn is recommended (noiseless).

1. Connect eight-pin plug on alarm control unit.
Two-pin plug remains disconnected.
2. Connect term. 30 (red wire) on control unit with a piece of wire. Connect test lamp on term. Hn of control unit and red/white wire of two-pin plug.



3. Lock door with S key (set alarm system) and unlock door with the auxiliary key. Lamp should flash, i. e. alarm should be activated. Deactivate system — lamp goes out. Make test on both doors and tailgate.
4. Activate alarm on driver's door and do not deactivate. Lamp flashes about 30 seconds. Open engine hood. Alarm should be activated again.

5. Start engine when system has been activated.
Engine should not start.

6. Disconnect test lamp and connect two-pin plug on control unit. Check function of alarm horn by activating alarm again.

If functions are not fulfilled, replace alarm control unit.

Note

A defect in the control unit could cause failure of the ignition or fuel pump under certain circumstances, even when the alarm system is not activated.

If a new control unit were not immediately available in this case, the following measure will provide help.

Pull off plug Z on central electric board and bridge terminals 1 and 6 on central electric plug.

This will stop function of the alarm system.

SERVICE INSTALLING BLAUPUNKT RADIO SQR 22 (COLOGNE, ATLANTA OR MONTEREY)

Applicable for cars up to and including 1982 models.

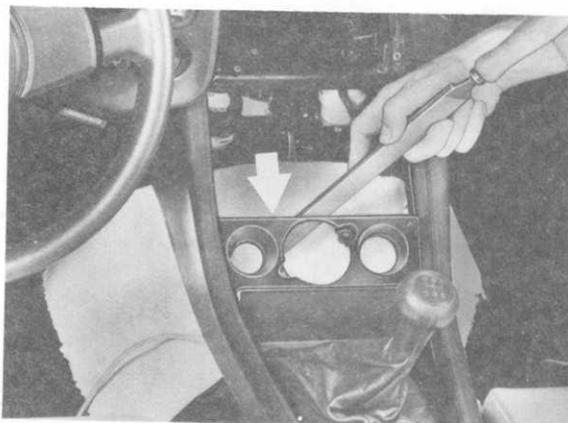
Parts of 1983 model required for installation:

- Mask, upper
- Mask, lower
- Digital clock

Additional Part Requirements:

- Two M 5 x 10 hexagon bolts with nuts and washers (for installation of solenoid valve plate)
- Six M 3.5 x 16 Allan screws

4. File back radio opening at bottom to edge (approx. 2 mm), catching burrs with a rag.

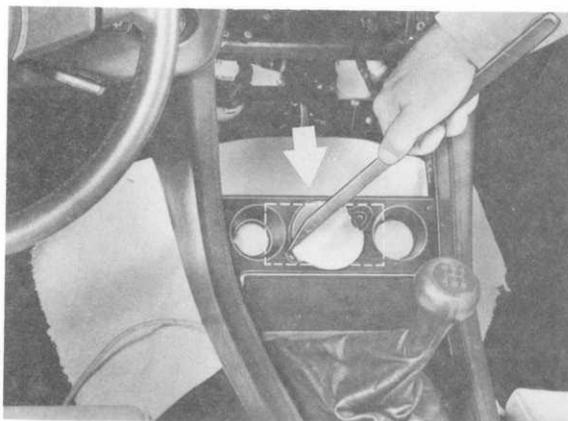


5. Mark location of opening for new digital clock and cut out opening with a suitable saw. Deburr edges.

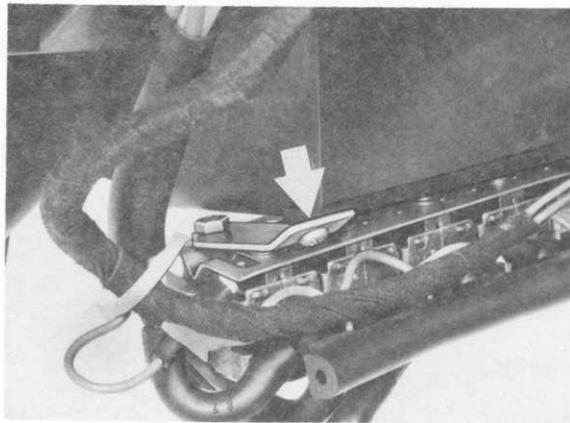
1. Remove shelf and trim on sides of center console.

2. Remove center vent and cover frame.

3. Remove control switches, display panel and clock.

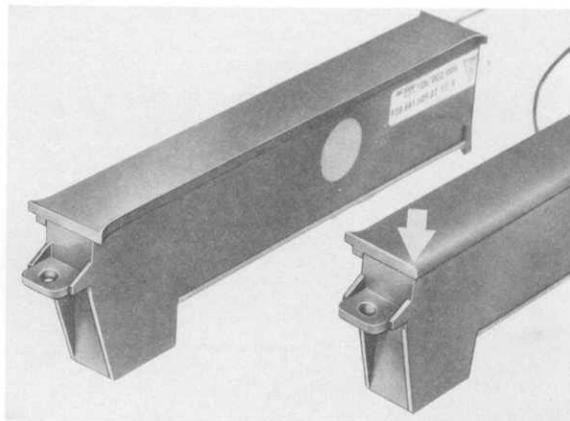
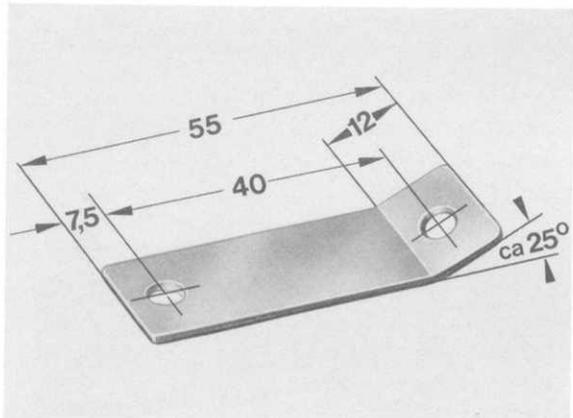


6. Control switch and display panel must be brought to same height as radio opening by using suitable material on bearing surfaces (e. g. plastic or modelling wood).



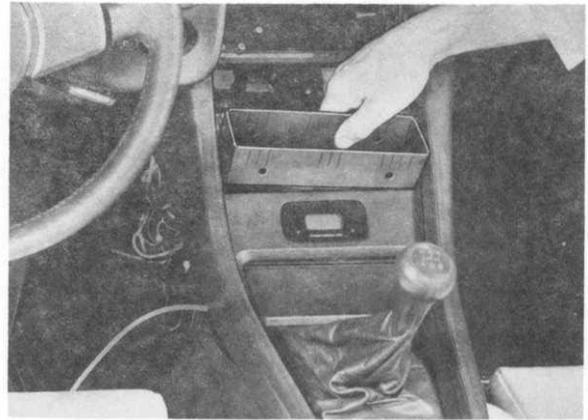
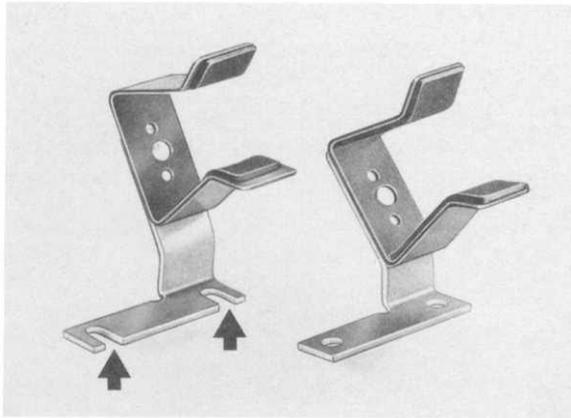
9. Make a radius on lower edge of display panel with a fine file.

7. Solenoid valve plate has to be moved down because of greater installed depth of new radio. Make up two sheet metal holders for this purpose.



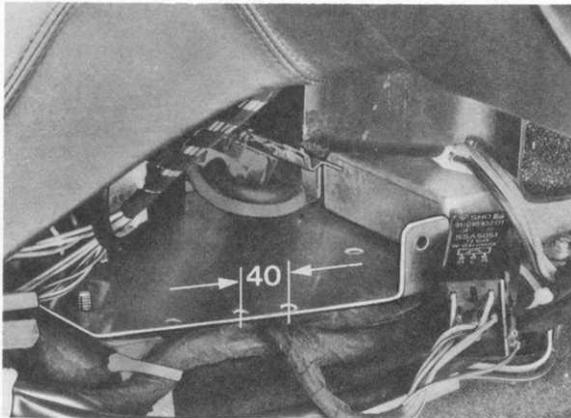
10. Saw slots in front radio holder and push holder forward as far as possible when tightening screws.

8. Unscrew solenoid valve plate and screw it on tight underneath the flap box with sheet metal holders.



11. Move relay for seat belt fasten sign forward by approx. 40 mm.
Drill new hole with an angled drill.

14. Connect antenna, speaker, ground and feed wires on radio. Slide radio into opening until tabs on sides engage in holding frame.



15. Install upper mask frame and reinstall all removed parts.



12. Insert lower mask frame with digital clock and connect digital clock.

13. Install holding frame for radio in opening and secure by bending tabs provided on holding frame.

16. Ashtray can be brought to correct height by using suitable washers on ashtray mounting points.

UPSHIFT INDICATOR (Only USA in Cars with Manual Transmission)

Description and Information on Troubleshooting

The upshift indicator is an illuminated arrow integrated in the tachometer.



The upshift indicator will light up when it is practical and economical to shift up into the next higher gear. It works in gears 1 through 4 and remains illuminated until the next higher gear is engaged or the operating condition causing illumination of the indicator is changed (e.g. coasting, full throttle, etc.).

The indicator lamp is designed to be very bright for clear visibility in daylight driving and less bright for night driving when main lights are switched on.

The electronic control is integrated in the tachometer and cannot be replaced separately, as also the indicator lamp.

Signals already available in the car are used to activate the indicator. Consequently there are no additional transmitters or sensors.

The Signals are:

- engine speed,
- engine temperature,
- road speed and
- injection time.

If the upshift indicator malfunctions, first check the following points.

1. Engine must be operating correctly and engine speed displayed on the tachometer.
2. Coolant (engine) temperature must be displayed correctly on the instrument.
3. Speedometer must display the road speed correctly.

If these points can be confirmed, the instrument cluster will be receiving signals on

- engine speed
- engine temperature and
- road speed

The injection time (ti) signal will be in the L-Jetronic control unit while the engine is running, but there could be a break or loose connection in the wiring between the control unit and instrument cluster.

The ti signal can be checked with help of an oscilloscope on central electric plugs L 5 and X 1 (plugs remain connected).

Ti signals have a rectangular pulse shape. The instrument cluster must be removed to check the ti signal wire for breaks.

This wire break test is made from instrument cluster term. 11 M to L-Jetronic control unit term. 11.

If signals are okay up to the instrument cluster, it will be necessary to check pertinent conducting paths on the printed circuit of the instrument cluster for breaks and good contact of connections.

If necessary, the tachometer must be replaced.

Checking burglar alarm

Note

The alarm control unit is located behind the glove compartment.

The following signals must be present at the alarm control unit terminals:

Input signals

1. Terminal 31: Ground
2. Terminal 30: Battery voltage
3. Terminal 15: Battery voltage with ignition switched on
4. Terminal 61: Battery voltage with engine running
5. Terminal T: Ground with doors open or rear hood open.
6. Terminal MK: Ground with engine hood open or radio removed.
7. Terminal A : Ground with key in lock cylinder (doors or rear hood) turned in "open" direction.
8. Terminal E ; Ground when lock cylinder turned towards "closed".

Output signals

1. Terminal 87a: Battery voltage with ignition switched on.
2. Terminal Hn: Battery voltage with burglar alarm primed and triggered (permanently in Swiss vehicles).

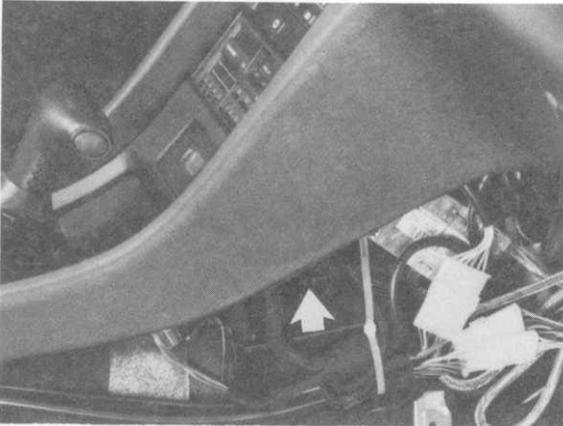
Note

There is a relay in the central console of USA vehicles which operates fog lamps and brake lamps as an visual warning in addition to the alarm horn.

Check auxiliary control unit - burglar alarm

Note

The auxiliary control unit is accommodated in the central console.



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Output signals

The output signals may only be checked with the relay fitted.

1. Terminal 2: Ground if

a) ground at terminal 8

b) burglar alarm primed after closing the rear hood approx. 25 seconds after the internal lighting has gone out (short pulse of approx. 0.5 seconds only).

2. Terminal 6: Ground if ground at terminal 9.

Input signals

Remove the relay and check the input signals at the base.

1. Terminal 1: Ground with rear hood open or for as long as the internal lighting is switched on by means of the time-lag relay.
2. Terminal 3: Ground
3. Terminal 4: Battery voltage (terminal 30).
4. Terminal 8: Ground with the key in the lock cylinder (doors or rear hood) turned towards "closed" (only for as long as the lock cylinder is held in this position).
5. Terminal 9: Ground when the lock cylinder is turned towards "open".

Backlit instrument cluster, removing and installing

From Model 89 onwards

1. Disconnect battery.
2. Remove steering wheel.
3. Remove cover under the instrument cowling (2 screws).
4. Undo fastening screws (2) for instrument cowling.
5. Remove steering-column switch.
6. Remove ignition-lock cover.
(Procedure is described on page 94 - 4).
7. Disconnect plugs (4) from instrument cluster, turn both locking levers outwards for this.

Note

The plugs are coded and cannot be confused.

8. Lift instrument cowling carefully and tip to the rear.
9. Pull instrument cluster from bracket.

Advancing the odometer reading of the backlight instrument cluster

Note

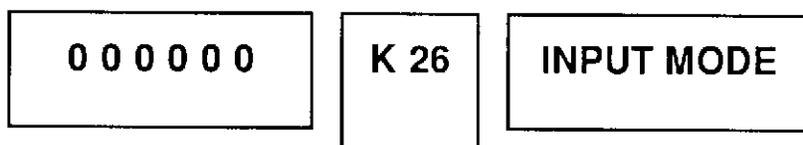
Advancing the odometer reading is performed within the the scope of the instrument cluster diagnosis under menu item "Specific functions" and is required to adjust the odometer reading after replacement of the instrument cluster. This function is only available as of software level K 26.

1. Select Specific Functions (SF)
(refer to Service Information: Diagnosing the instrument cluster).
2. Select "Preset tot. Counter"
3. Pulling the operating lever selects input mode.

Note

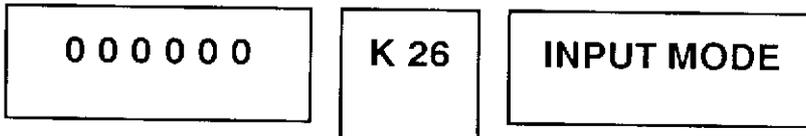
The input mode is only accessed at a mileage below 256 kms or 256 miles, respectively.

Upon start of the input mode, the following display appears

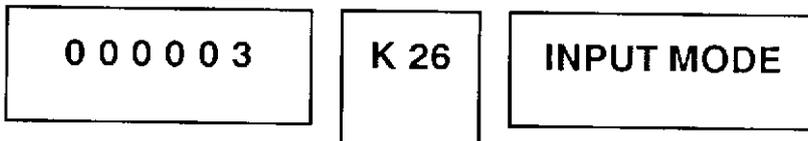


4. Use the operating lever to enter the rightmost position
 - up: + 1
 - down: – 1
 - press: entered position moves 1 position to the left
 - pull: entered position moves 1 position to the right
(only required for fault correction).

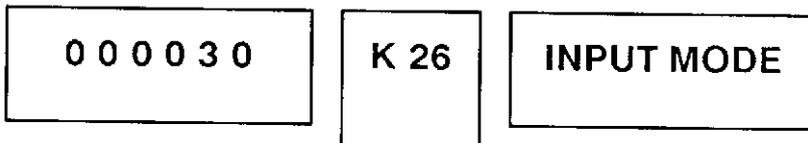
Example: input 3840 km



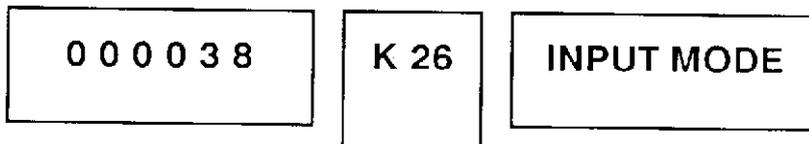
Operating lever is moved up three times



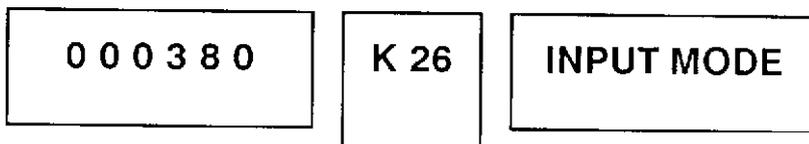
Press operating lever



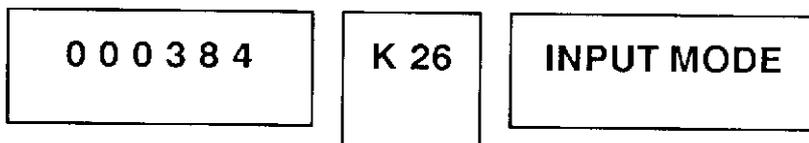
Operating lever is moved down twice



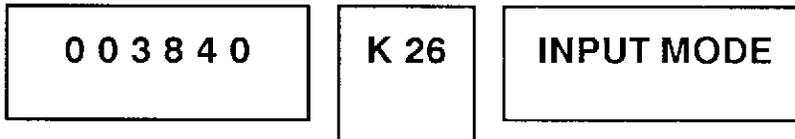
Press operating lever



Operating lever is moved up four times



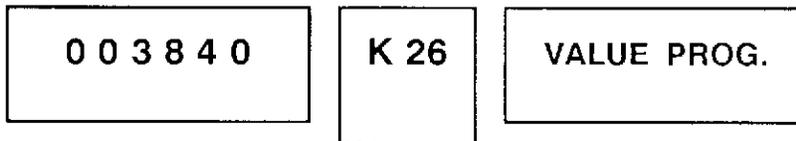
Press operating lever



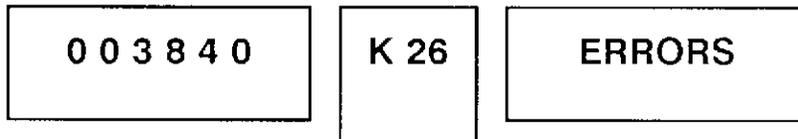
To store the new value, the trip mileage reset button must be pressed without interruption for more than 14 seconds.

If the button is released prematurely, the function is aborted without the new odometer reading being stored

After 14 seconds have elapsed, the following display appears:



If storing is not possible (e.g. due to low battery voltage), the following fault message is displayed:



In this case, abort the function and repeat advancing the odometer reading after having corrected the fault (charge battery). To access the selection mode of the instrument cluster again, the operating lever must be moved up again.

Note

If a value above 256 kms is entered, repeated access to the enter mode is denied and the odometer cannot be advanced again.

After terminal 30 has been disconnected, the total mileage indicated may deviate by +/- 8 kms.

Facilities for subsequent telephone installation

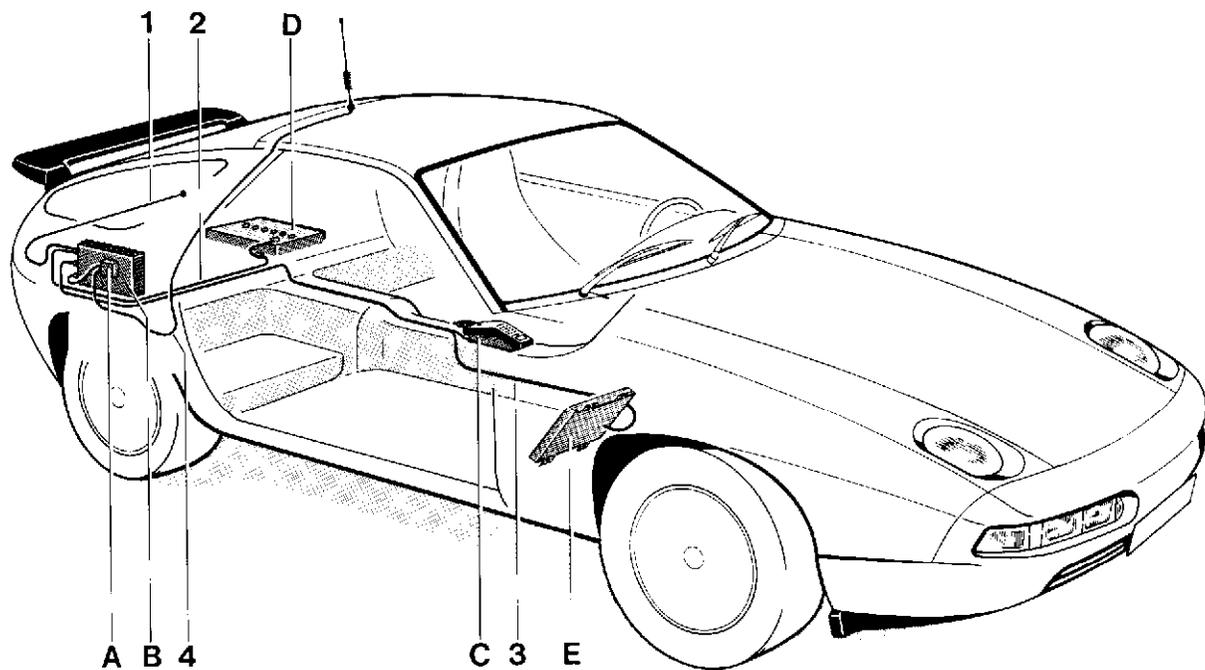
M 195 Cellular telephone system

M 496 C-Net telephone system

As from Model 88, all 928 vehicles may be fitted with facilities for subsequent telephone installation.

This preliminary equipment embraces all cable harnesses required, the brackets for the radio and operating unit as well as the telephone antenna.

Laying the cable harnesses in the vehicle



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A - Antenna separation filter

B - Transceiver unit

C - Operating unit

D - Battery

E - Central electric system

1 - Terminal 31

2 - Terminal 30

3 - Terminal 15

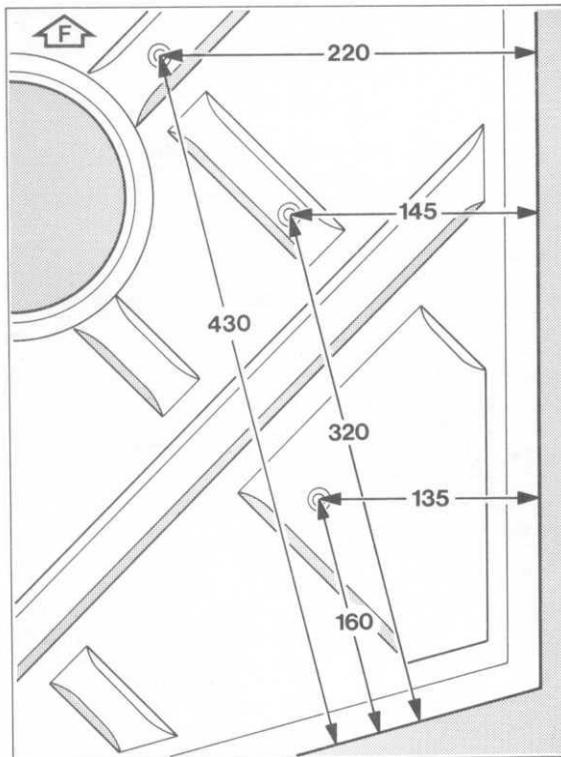
4 - Antenna cable

Installing the transceiver unit

The transceiver unit is installed under a cover panel on the right-hand side of the trunk.



1.1 Fastening points for the C-Net baseplate

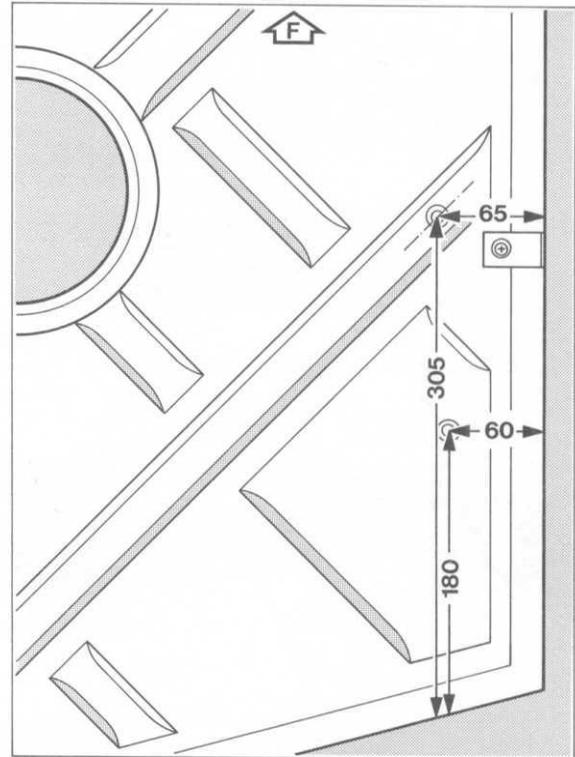


F = Direction of travel

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The baseplate can be fitted with longitudinal slots to compensate for any irregularities.

1.2 Fastening points for the Cellular baseplate.

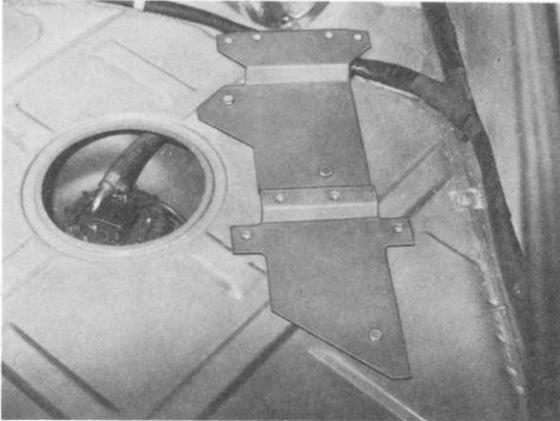


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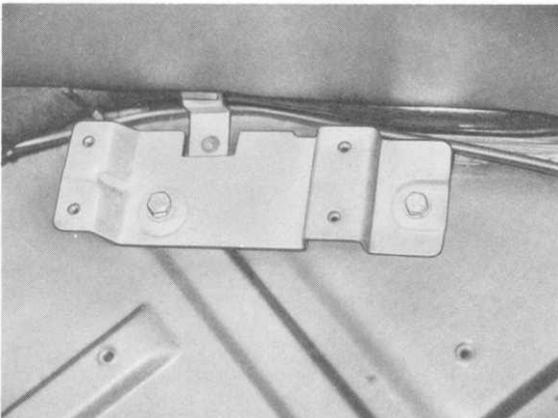
Note

The riveted blind nuts are all situated in molded beads. When drilling, bear in mind that the fuel tank is directly below.

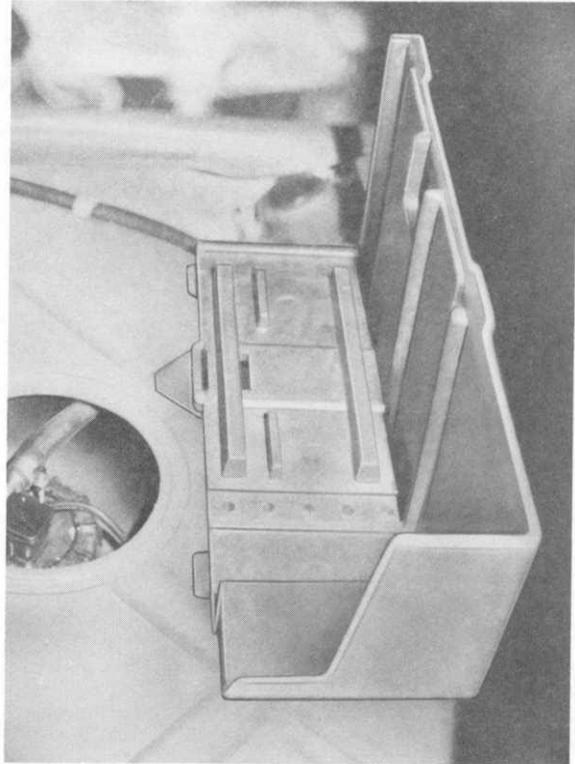
2.1 Installation of the C-Net baseplate



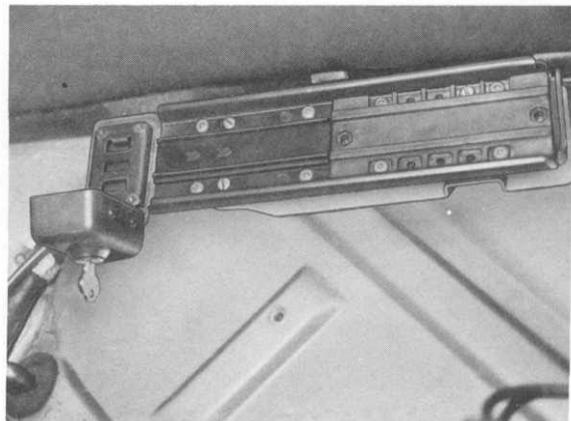
2.2 Installation of the Cellular baseplate



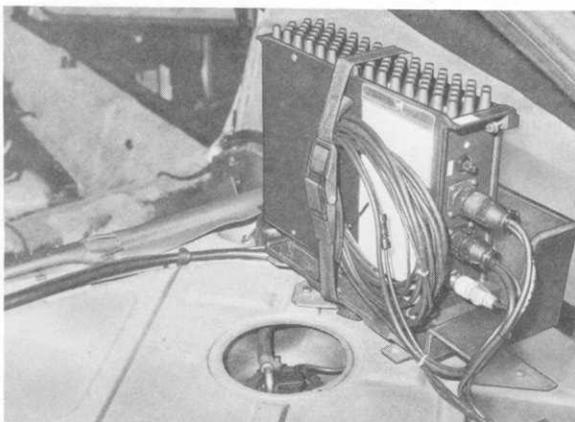
3.1 Bracket for the C-Net transceiver unit.



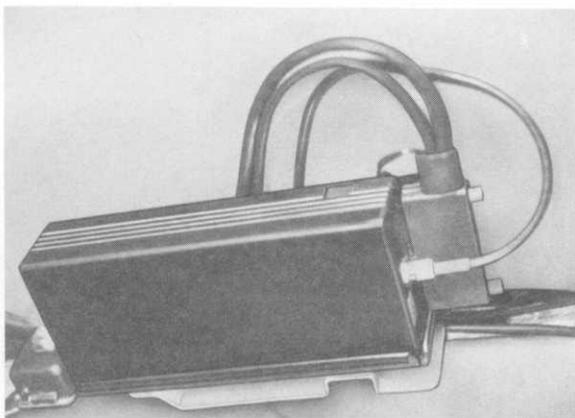
3.2 Bracket for the Cellular transceiver unit.



- 4.1 Installation of the C-Net transceiver unit
with accommodation of the excess length
of the cable harness.

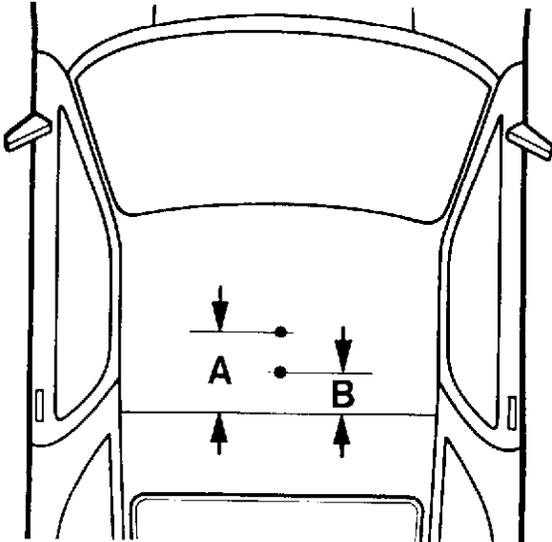


- 4.2 Installation of the Cellular transceiver unit



Installation of the antenna

The telephone antenna is mounted on the roof.



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Dimension A: Without sun roof

- 105 mm from the rear edge

Dimension B: With sun roof

- 40 mm from the rear edge

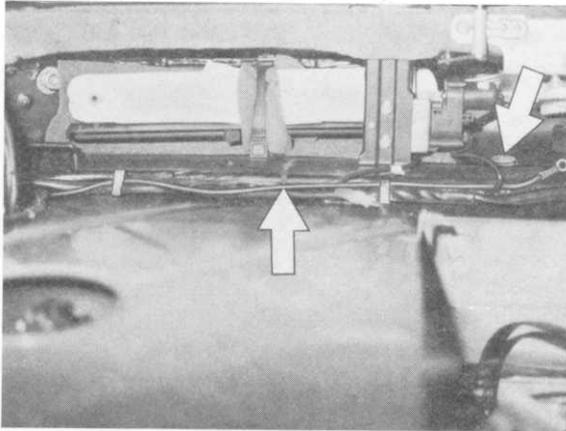
Installation of the antenna separation filter

The antenna separation filter is only installed for C-Net telephone systems.

The separation filter is mounted on the right-hand side of the transceiver unit.

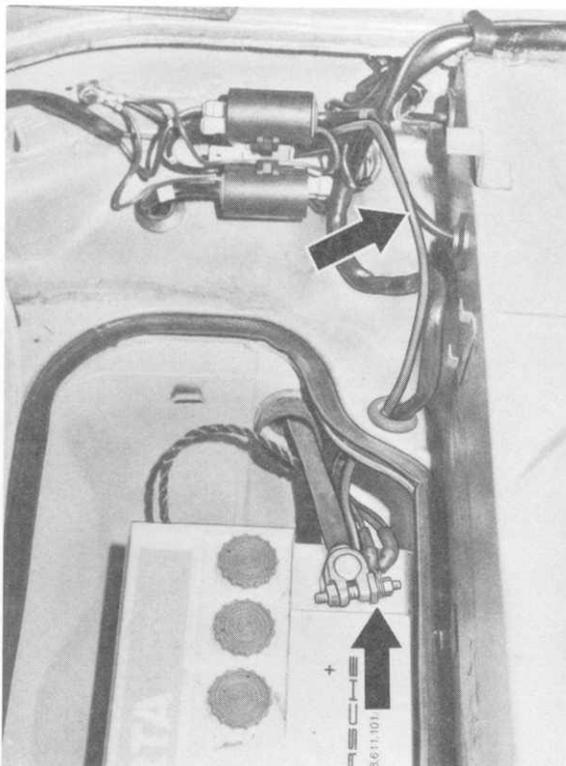
Installing power supply lines

1. Ground wire

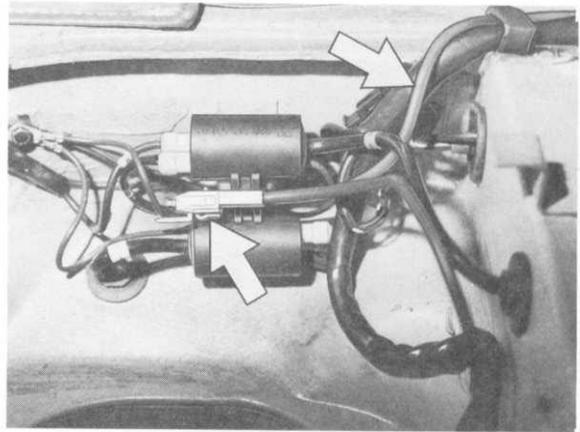


The ground wire is run along the rear wiring harness to the ground point.

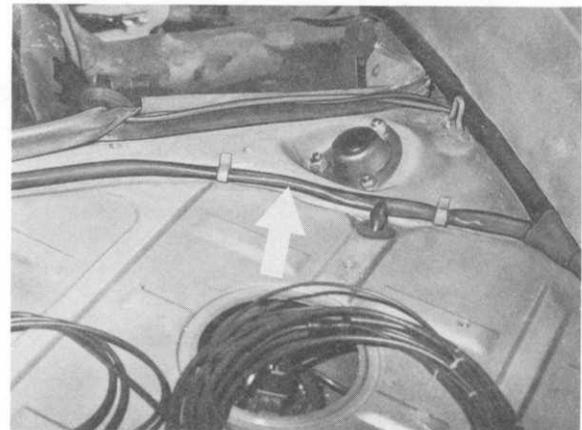
2. Positive supply, terminal 30



The positive terminal 30 line is run from the positive pole of the battery to the fuse in the spare wheel well.

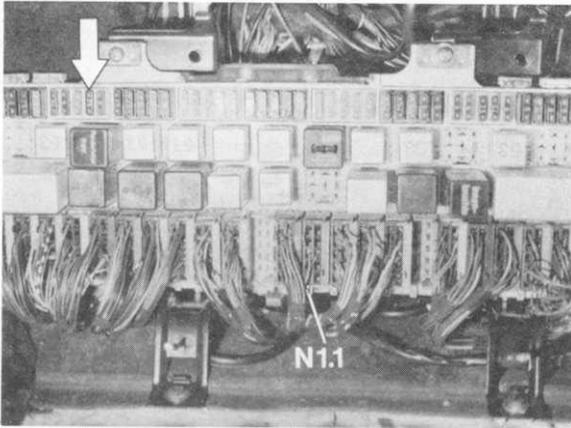


From the fuse, the line continues along the trunk floor to the transmitter-receiver stage.

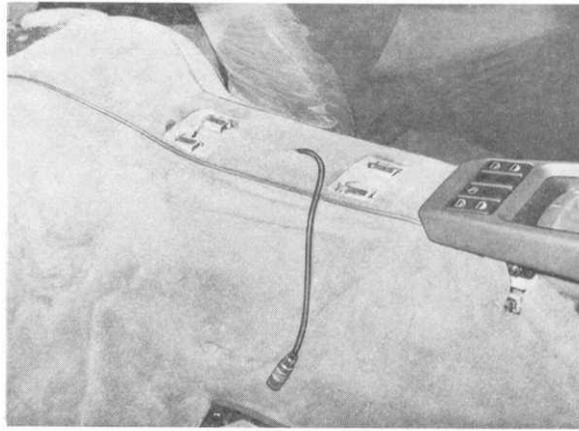


3. Positive supply, terminal 15

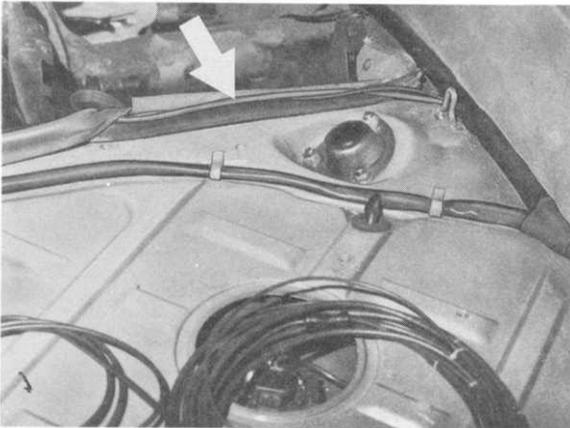
The positive terminal 15 line is run from fuse No. 9 to plug N 1.1. From 1990 models on it runs from fuse 43 to plug N 2.4 (already wired).



From plug N 1.1 (N 2.4 from 1990 models on) along the tunnel between the rear seats and to the transmitter-receiver stage in the trunk.

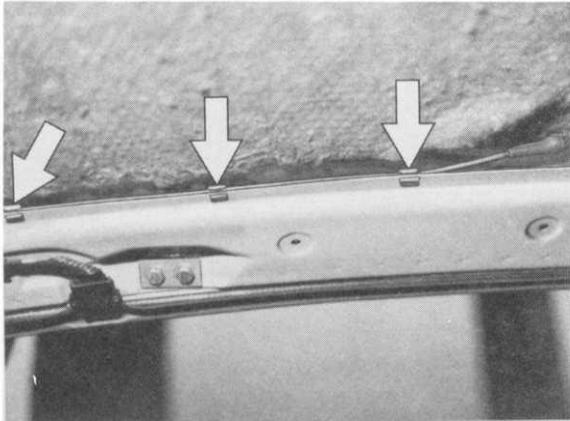


This line is run from the transmitter-receiver stage parallel to the terminal 15 power supply line as far as the control stage.

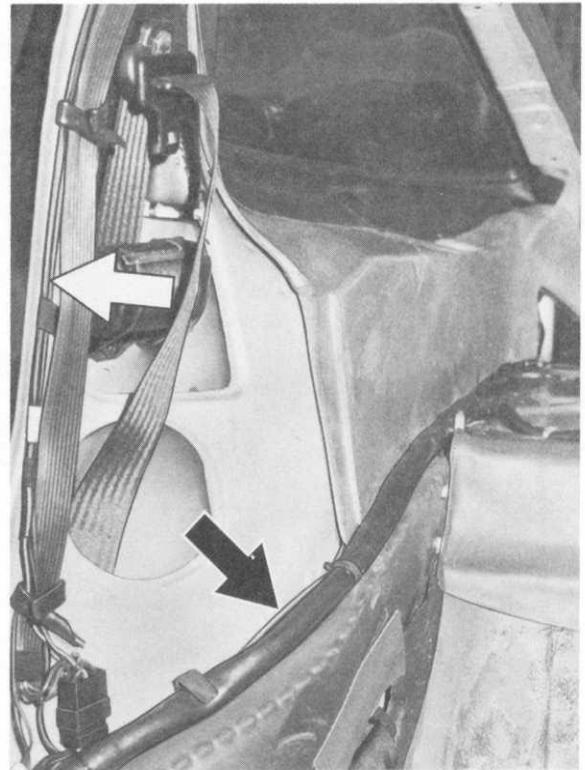


4. Line from transmitter-receiver stage to control stage.

5. Antenna cable



The antenna cable is fastened in the area of the roof support with 3 clips. It is laid from the antenna along the roof support to the B column on the right, down to the door seal and along the rear harness to the antenna separation filter.



Retrofitting CD player from Model 89 onwards

Vehicles with radio equipment or sound packet

Loudspeakers, amplifier and cables are installed into these vehicles.

1. Install retaining frame for radio.
2. Connect CD player.

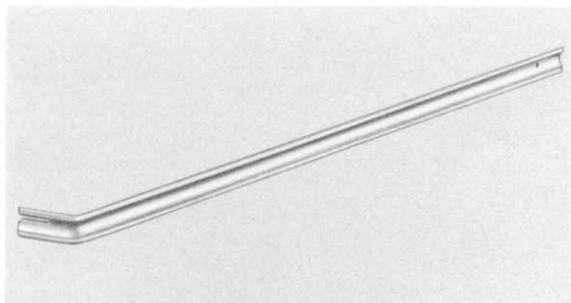
Note

The connector assignment is specified on the CD player.

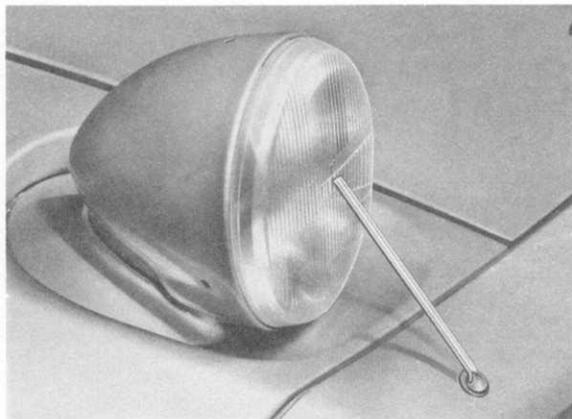
3. Slide in CD player and latch.

ADJUSTING HEADLIGHT CLEANER JETS

Special Tool 9135

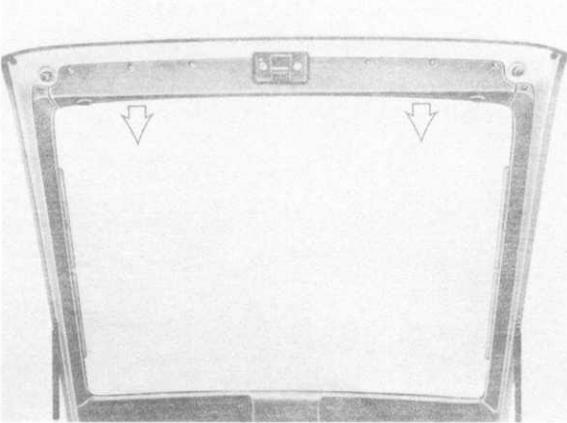


Insert tool into spray jet and turn jet insert so that long arm of tool points to center of lens.

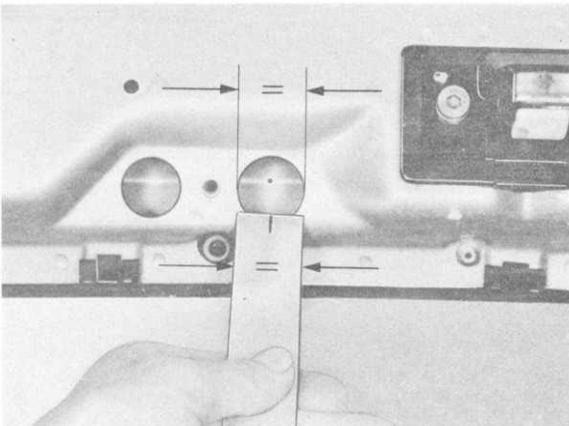


SERVICE INSTALLING REAR WINDOW WIPER

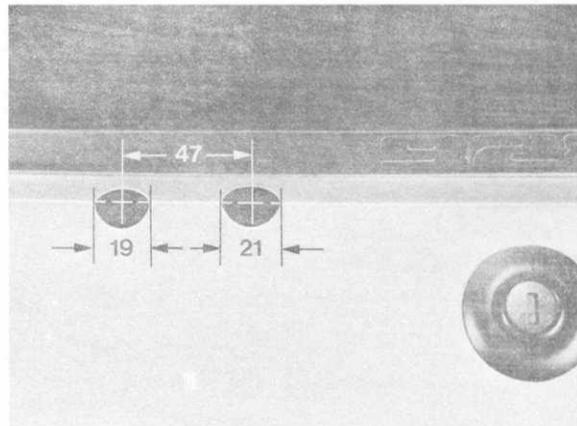
1. Remove trim from rear lid at bottom, pulling out spreader rivets and pushing trim forward out of holding clips.



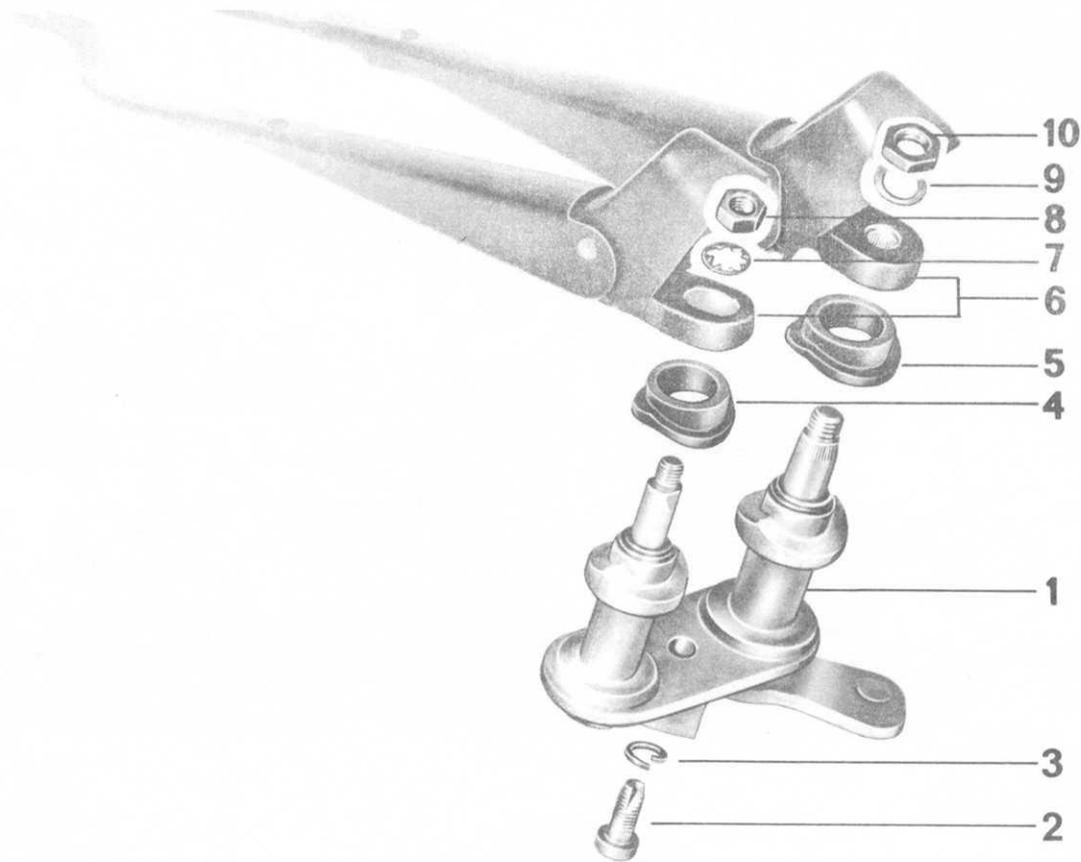
2. Mark hole for wiper mount on inside of panel seam with a scribe and suitable template, e. g. a cardboard strip, whose width equals the hole's inside diameter.



3. Drill hole from inside.
4. Mark second hole outside (distance 47 mm) and also drill. To prevent damage, the surface being drilled should be covered with tape.
5. Open up both holes with a hole saw. Make sure that holes don't have runout. Remove burrs.



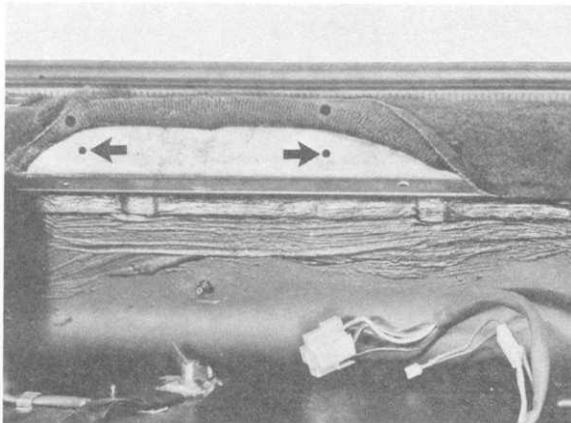
6. Touch up edges of holes with rust protection paint and body paint. Insert rubber seal for wiper mount with a sealing compound and bolt wiper mount on rear lid.



No.	Description	Qty.	Note When		Special Instructions
			Removing	Installing	
1	Wiper mount, upper	1			
2	Bolt M 6 x 15	1			
3	Lockwasher	1			
4	Rubber bushing	1		Install with body sealing compound	
5	Rubber bushing	1			
6	Wiper arm	1			
7	Lockwasher	1			
8	Nut M 6	1			
9	Washer	1			
10	Nut M 8	1			

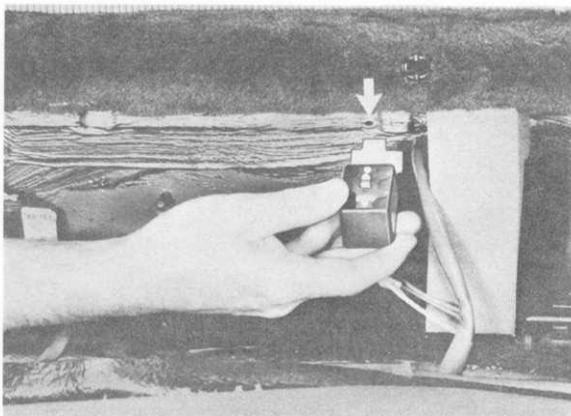
7. Remove access plate.

Detach carpet on lock cross member. Cut out small holes in carpet for mounting bores of motor console. Glue carpet down again.

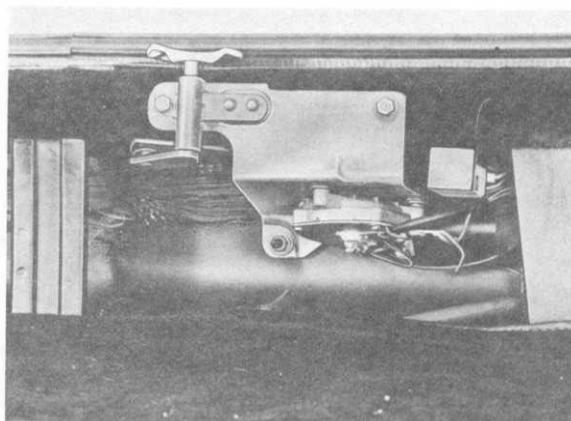


8. Remove foam rubber part behind the access plate. Install (glue) new foam rubber part with opening.

9. Connect relay with four-pin plug and insert in hole below the lock cross member.



10. Connect two-pin plug and ground on wiper motor and bolt motor console at the provided points. Adjust motor console in the slots until output shaft of console is aligned with shaft of cover bearing.

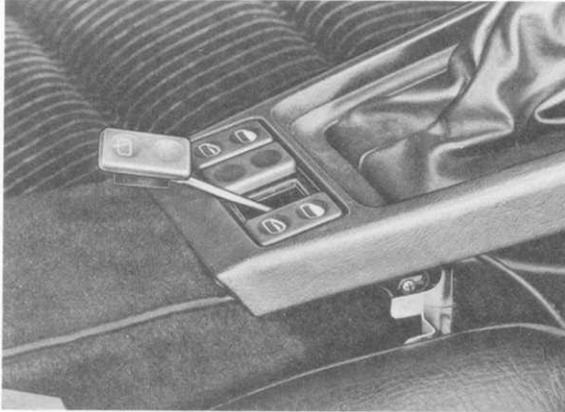


11. Turn lever on upper wiper mount clockwise against the stop. Bolt wiper arm so that distance to left frame of rear lid is approx. 2 to 3 cm.

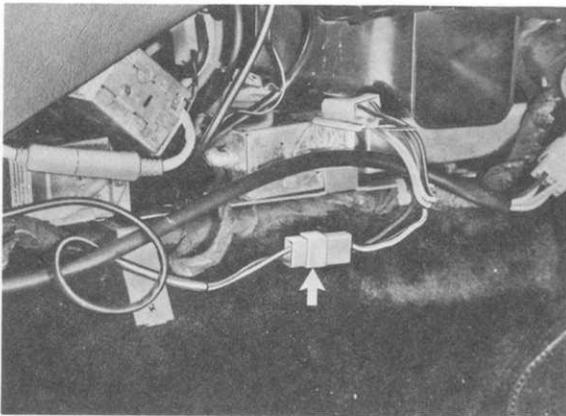
Torque for nut M 8 = 12 Nm (8 ft lb) and for M 6 = 10 Nm (7 ft lb).

12. Remove right side trim panel from center console.

Remove switch plate in center console. Unscrew right rear center console mounting screw and lift center console enough that two-pin plug for switch can be pushed through forward.



13. Connect two-pin plug of switch with standard plug.



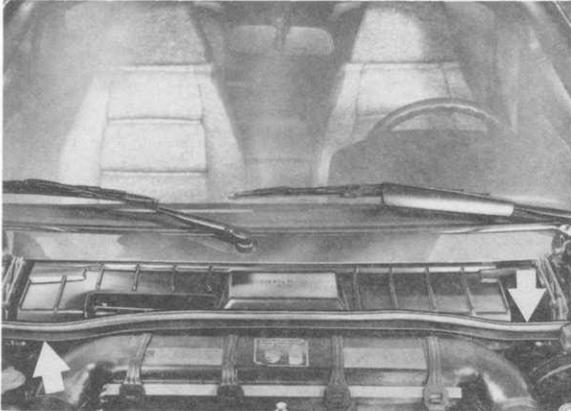
14. Close rear lid and wet down rear window. Turn on ignition and operate rear window wiper. Rear window wiper should wipe four times and then return automatically to OFF position. Check wiped area, correcting if necessary by changing wiper arm on shaft.

15. Mount trim panel on center console and rear lid. Replace access plate by a new one.

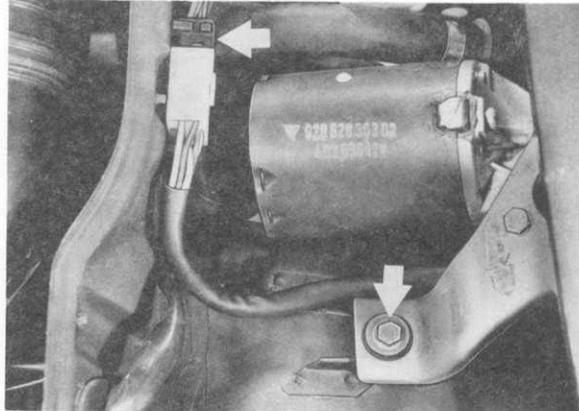
No.	Description	Qty.	Note When:		Special Instructions
			Removing	Installing	
1	Screw M 6 x 18	1			
2	Washer	1			
3	Grommet	1			
4	Nut	1			
5	Lock nut	1		Torque: 25 Nm (18 ftlb)	
6	Crank	1			
7	Screw M 6 x 12	3		Torque: 11 Nm (8 ftlb)	
8	Lock washer	3			
9	Wiper motor	1			
10	Cap	2			
11	Nut	2		Torque: 14 Nm (10 ftlb)	
12	Wiper arm, driver's side	1			
13	Wiper arm, passenger's side	1			
14	Cap, right	1			
15	Cap, left	1			
16	Nut	2			
17	Washer	2			
18	Rubber bushing	2			
19	Rubber bushing	2			
20	Crank drive	1			
21	Connecting rod, left	1			
22	Connecting rod, right	1			

REMOVING AND INSTALLING WINDSHIELD WIPERS BEGINNING
WITH 1983 MODELS

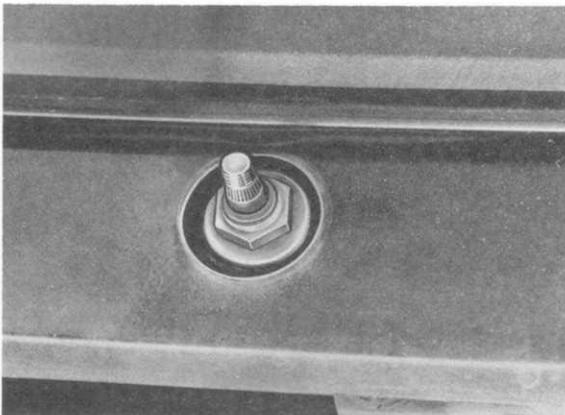
1. Pull off seal for fresh air chamber and pull cover out forward.



3. Remove connection in fresh air chamber.
Disconnect plug and disengage plug socket for
easier installation on wall.



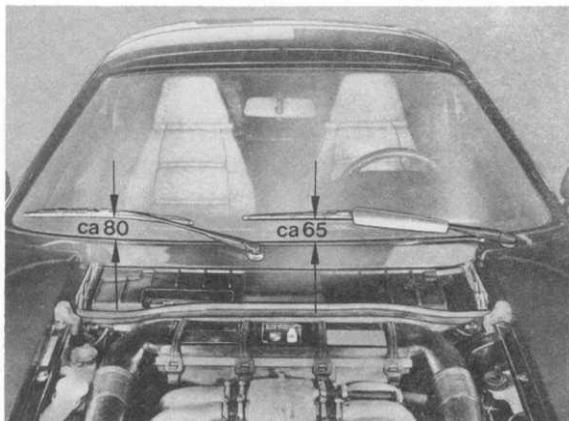
2. Remove wiper arms and wiper arm bases. Hexagon
nut of left base can be removed with a flat, straight
closed wrench.



4. Remove wiper assembly to the right, while
swinging up wiper motor at same time.



5. Check installed position of wiper arms.



BULB CHART

Location	Watts	Shape	Base	Remarks
Fog light H 3	55 W	YC	PK 22 s	
Main headlight Sealed beam (7 inch)	60/50 W			
Turn signals, front + rear Stop light Backup light	32 cp	SAE	1073	
Parking light, front Side marker lights, front + rear	5 W	R 19-5	BA 15 s	
Tail light, rear	6 cp	SAE	89	
License plate light	5 W	L	SV 8,5 - 8	

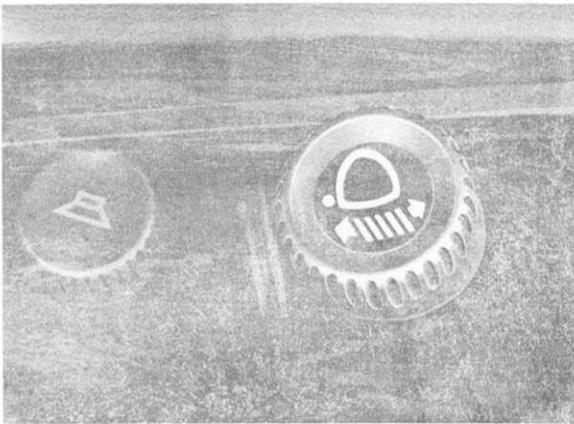
AIMING HEADLIGHTS

Requirement:

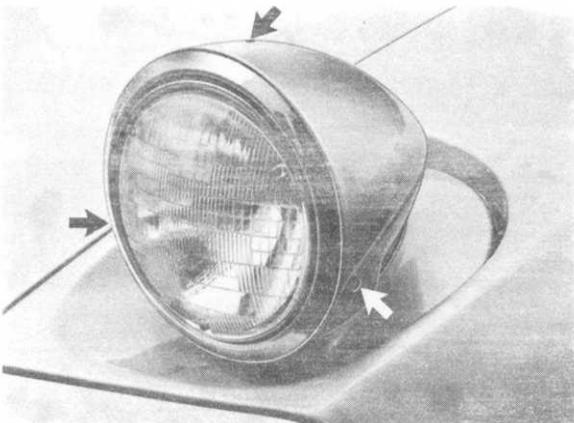
Tire pressure correct, fuel tank full, driver's seat occupied by a person or weight of approx. 70 kg (155 lb).

Note

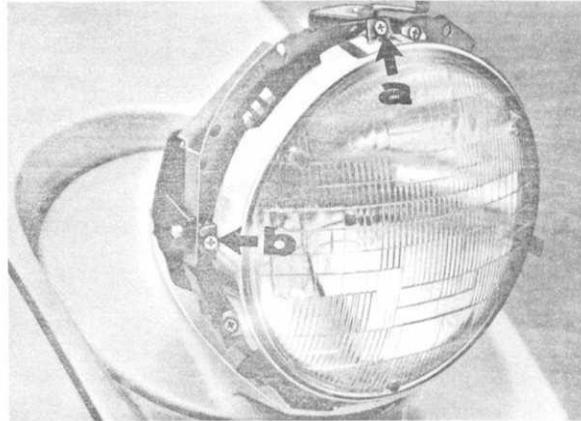
If equipped with headlight beam adjuster, turn adjuster knob so that white dot on knob faces forward (audible click).



1. Turn on ignition.
2. Turn on headlights (low beams). Clean lenses.
3. Remove 3 Phillips screws (arrows) and take off headlight cover and trim ring.



4. Aim headlights with optical aiming equipment.



Adjusting screw A = vertical adjustment
 adjusting screw B = lateral adjustment

5. Reinstall trim ring and headlight cover.

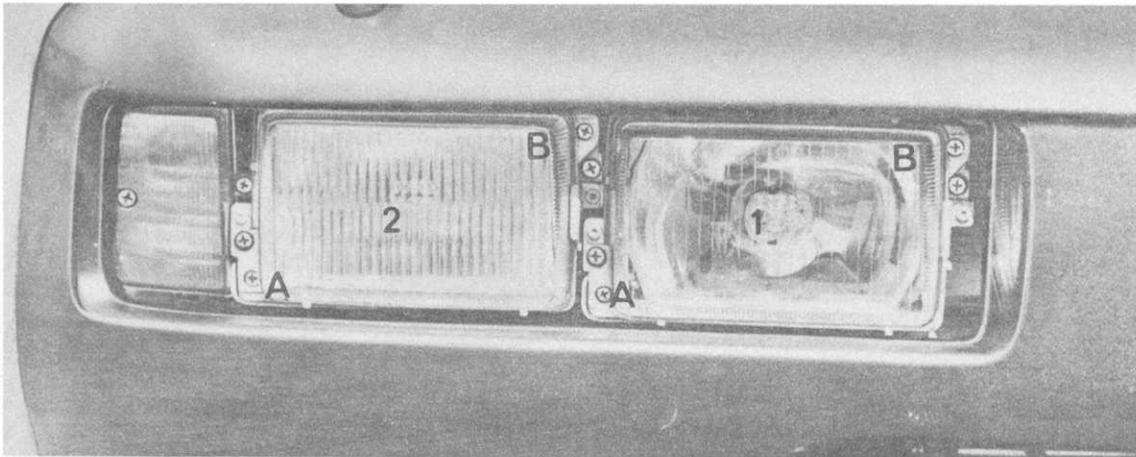
ADJUSTING FOG LIGHTS

Requirements:

Correct tire pressures, full fuel tank, one person
or 70 kg/154 lb weight on driver's seat.

Pull trim off of lights.

- 1 - Fog light
- 2 - Parking light



Adjust fog lights with an optical headlight aimer.

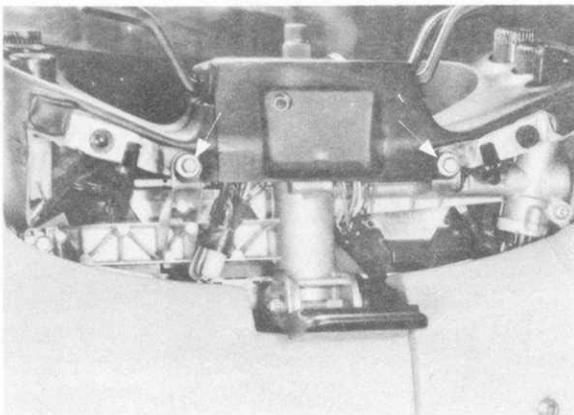
- A - Vertical adjustment
- B - Lateral adjustment

REMOVING AND INSTALLING STEERING COLUMN SWITCH

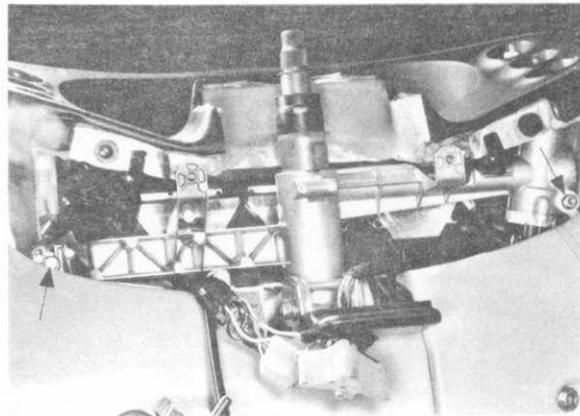
1. Disconnect battery ground lead.

2. Remove steering wheel.

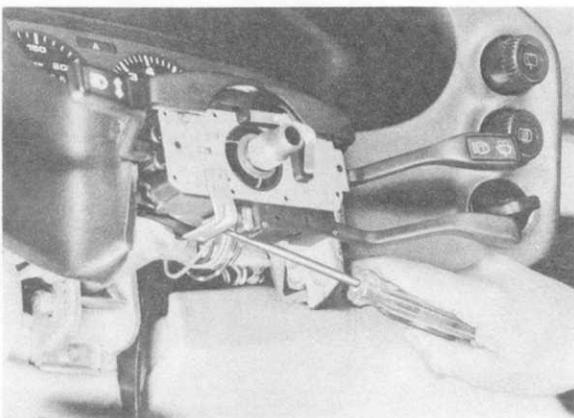
3. Unscrew cover underneath steering column switch.



5. Loosen instrument cover mounting screws.



4. Loosen steering column switch mounting screw.

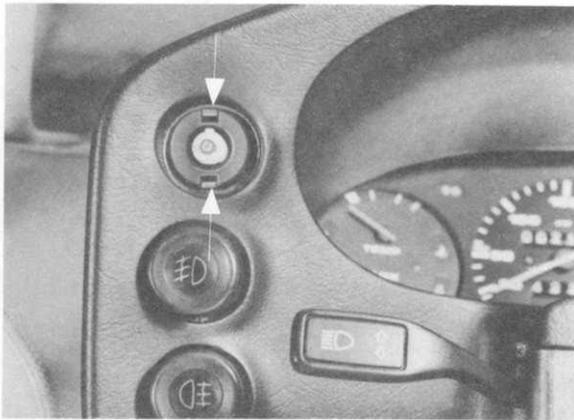


6. Lift instrument cover, pull off plugs and remove steering column switch.

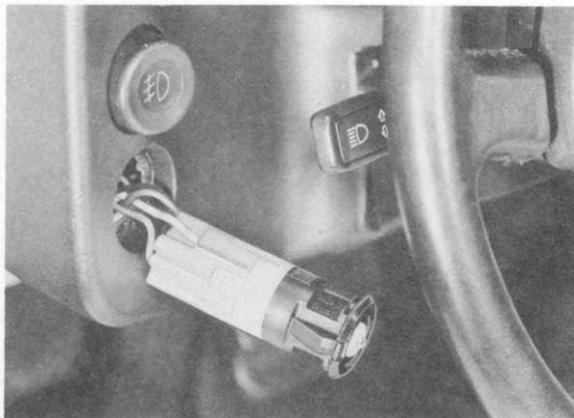


REMOVING AND INSTALLING SWITCH IN INSTRUMENT COVER

1. Pull off switch knob.
2. Compress both retaining springs.

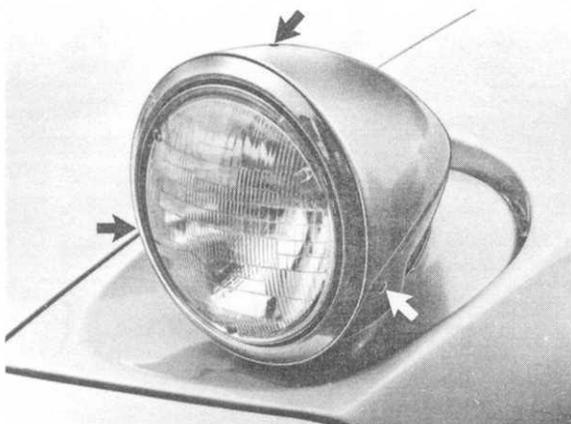


3. Pull out switch and detach plugs.

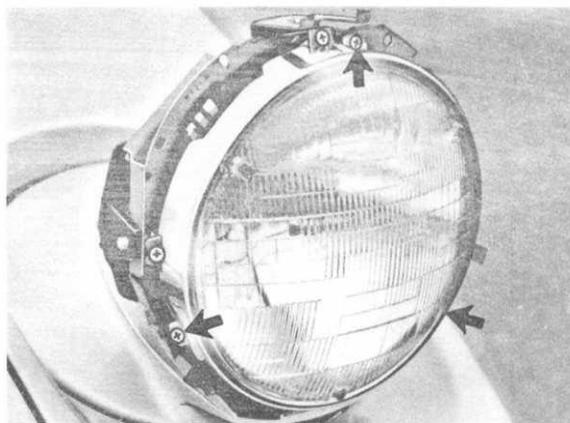


REMOVING AND INSTALLING SEALED BEAM HEADLIGHT UNITS

1. Turn on ignition.
2. Turn light switch to position 2 (headlights raised).
3. Turn ignition off.
4. Remove 3 Phillips screws (arrows) and take off headlight cover and trim ring.



5. Remove 3 small Phillips screws (arrows) from sealed beam securing ring and remove ring.



6. Unplug connector, replace sealed beam unit and plug in connector.
7. Reinstall sealed beam securing ring.
8. Check lights.
9. Reinstall trim ring and headlight cover.

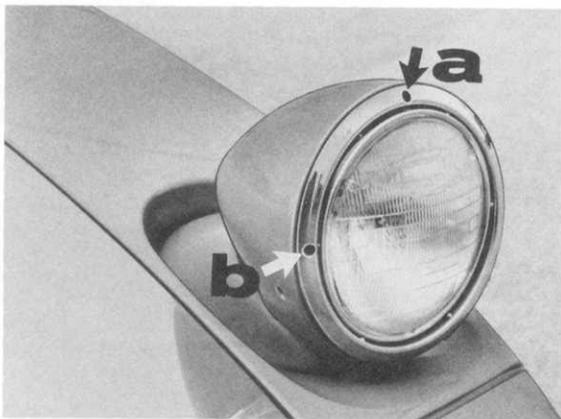
AIMING MAIN HEADLIGHTS – USA (since 1980 Models)

Headlights must be aimed with an optical headlight aimer.

Requirements:

Tire pressure correct, fuel tank full, driver's seat occupied by a person or weight of approx. 70 kg (155 lbs.).

Adjusting screws



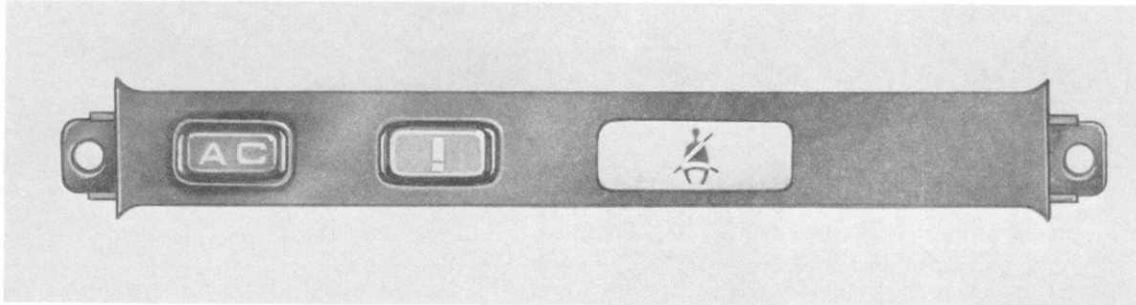
Screw "a" – vertical adjustment

Screw "b" – lateral adjustment

BULB CHART

Location	Watts	Shape	Base	Remarks
Engine compartment light	10 W	F	BA 15 s	
Inside light Luggage compartment light	10 W	K	SV 8.5 - 8	
Glove box light	3 W	M	SV 7 - 8	
Vanity mirror light	5 W	L	SV 8.5 - 8	
Battery charge indicator Instrument cluster light	3 W	WT 10 - 3 (VA)	W 2.1x9.5 d	
Ashtray light Heater/ventilation switch light	2 W	J	BA 7 s	
All other bulbs (instrument light, indicator lamps etc.)	1.2 W	WT 5 - 1.2 (W)	W 2x4.6 d	

CONTROL PANEL VARIATIONS - 1980 Models



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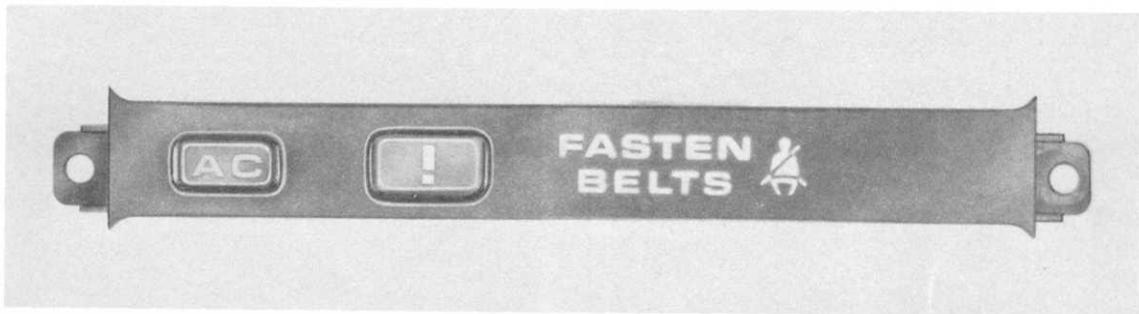
With manual air conditioner and central warning light

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With automatic air conditioner and central warning light

CONTROL PANEL VARIATIONS - early 1980 Models



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Standard
(manual air conditioner and central
warning light)

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With automatic air conditioner and
central warning light

Note

Control panels will be replaced by different
versions during course of model year 1980 (see
page 96 - 2).