

Section 8

Body

Service Procedures

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Specifications

Air Conditioning system

	Metric	US
Refrigerant, type	Freon 12 (dichlorodifluoromethane)	
Compressor, type	York A 209	
number of cylinders	2	
max. speed	100 r/s	6000 rpm
lubricating oil capacity	0,3 liter	0.3 qt
lubricating oil, type	Refrigerant compressor oil e.g.: SUNISO 5, BP ENERGOL LPT 100, SHELL CLAVUS 33, TEXACO CAPPELLA E 500	
Compressor clutch, type	Electro-magnetic	

Compressor drive belt

240 with AIR-pump	HC 50 x 1550
240 without AIR-pump	HC 50 x 1325

Pressures at 30°C = 85°F*)

low side	100–300 kPa	1–3 kp/cm ²	14–40 psi
high side	1000–1500 kPa	10–15 kp/cm ²	140–220 psi

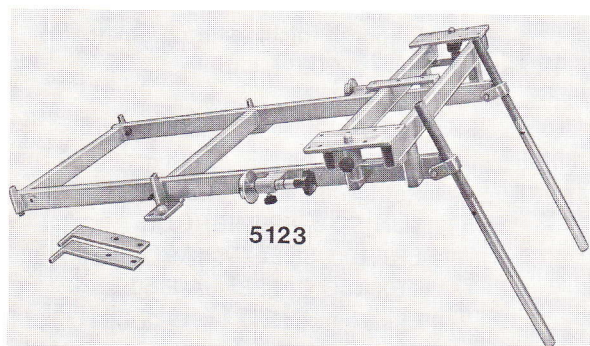
Tightening torques

	Nm	lb. ft.
Engine crankshaft pulley	120–140	87–100
Unions:		
Exp. valve pressure equalizing pipe	18	13
Expansion valve	44	32.5
Expansion valve hose	44	32.5
Evaporator hose	44	32.5
Condenser	17	12.3
Compressor	44	32.5
Receiver-drier	44	32.5
Compressor:		
Head	20–30	15–20
Bottom cover	20–30	15–20
Rear bearing housing	20	15
Conn. rod bolts	20	15
Oil plug	5	4
Clutch center bolts	25–30	18–22

*) These figures are valid only if the vehicle is driven, or if a suitable fan is used to force cooling air through the condenser and the radiator (equal to driving conditions).

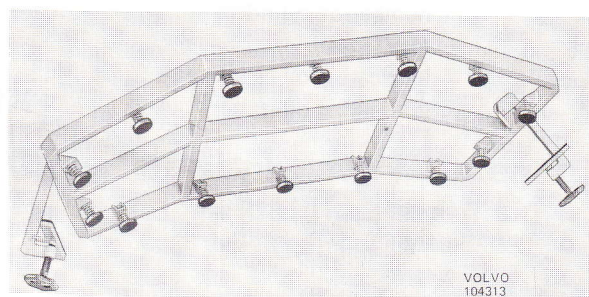
Group 80

Tools

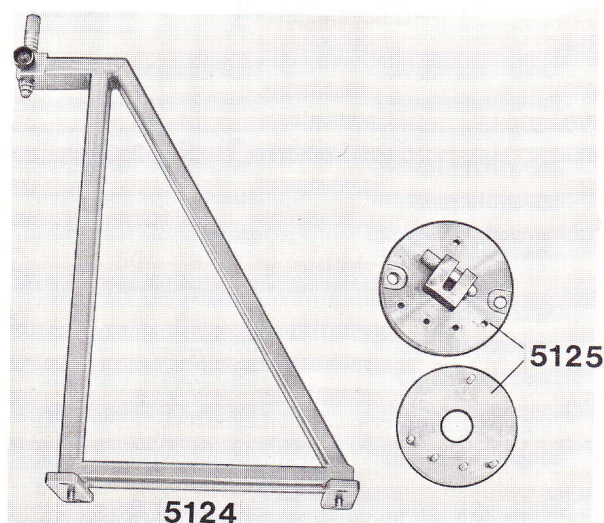


999 (SVO)

5123 Fixture, side members and rear trailing arm attachment

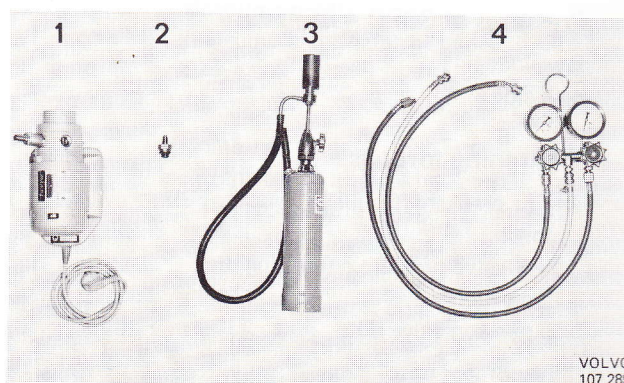


2899 Fixture for windshield installation



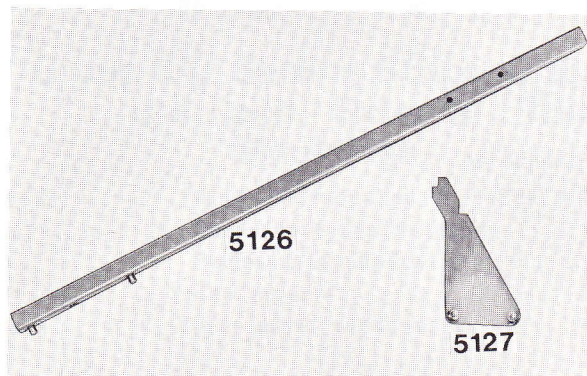
5124 Fixture, wheel housing. Used in conjunction with Fixture 5123 and Abutment Plate 5125

5125 Abutment plate/gauge plate, used in conjunction with Fixture 5124.



Equipment for leak testing and filling

1. Vacuum pump Minni, single-phase
2. Nipple for vacuum pump SK-1229
3. Leak detector LP 631 with LPG bottle
4. Pressure gauge kit with hoses



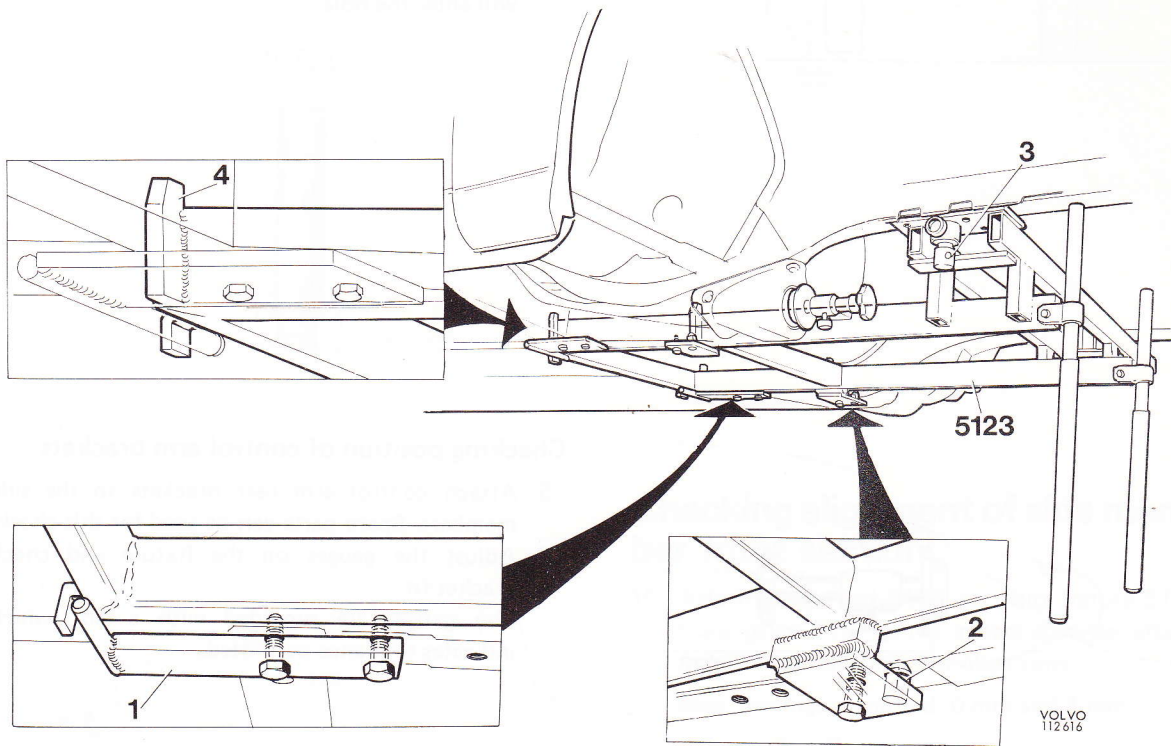
5126 Gauge rod, side members and front cross member. Used with Fixture 5123 and Gauge 5127.

5127 Gauge, side members and front cross member. Used with Gauge Rod 5126

Checking front end with tools 999 5123, -5124, -5125, -5126 and -5127

These tools can be used when replacing or straightening.

Try to obtain zero tolerances.



1. Adaptor
2. Rear guide stud
3. Front guide stud
4. Abutment block

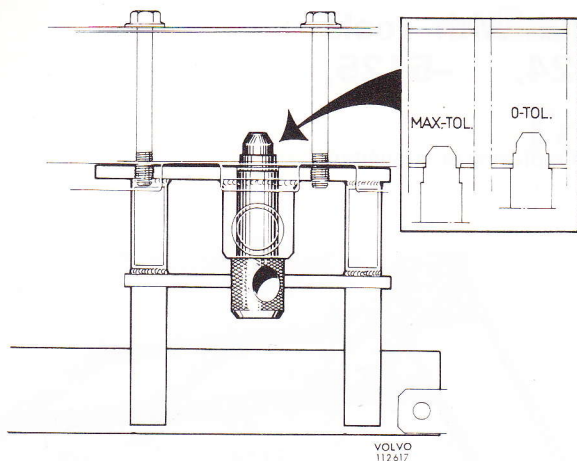
Applying fixture

1. Attach fixture 5123.

NOTE: Do not force the fixture into position. It may be distorted and misalign.

- a. Clean the areas of the side members where the fixture support blocks (4) are supposed to land.
- b. Attach the fixture adaptors (1) to the side member gauge holes. Do not tighten.
- c. Place the fixture under the vehicle. Lift the fixture rear end and hook it on the adaptors.

- d. Lift the fixture front end and attach the rear guide studs (2) to the side member gauge holes. Lower the fixture support legs and adjust height position. The face at the front guide studs (3) should abut the side members. The front guide studs should be down.
- e. Attach retaining screws at the rear guide studs (2).
- f. Tighten the adaptors. The fixture abutment blocks should touch the side member flanges.

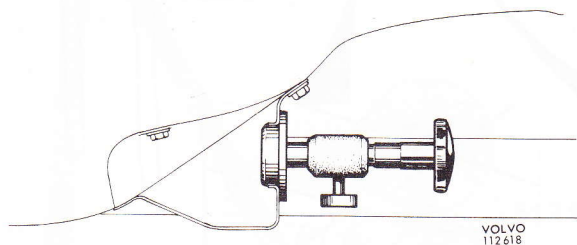


Checking side members

2. Check that the side members align at the front guide studs.
3. Install retaining screws at the front guide studs. Use the front axle member retaining screws.
4. Align the front guide studs in the side member gauge holes.

Max. misalignment permitted: the guide stud small diameter will enter the hole.

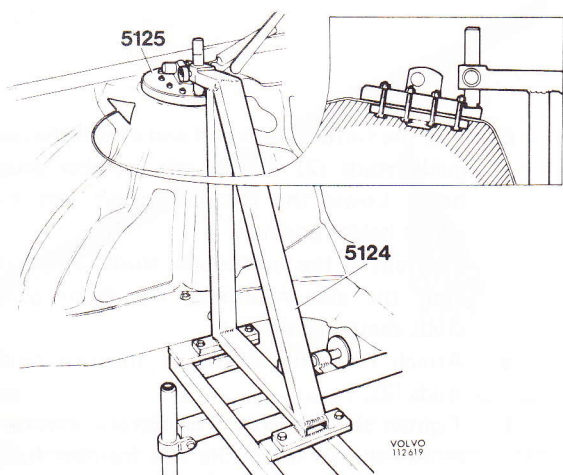
No misalignment: the guide stud large diameter will enter the hole.



Checking position of control arm brackets

5. Attach control arm rear brackets to the side members. Spare parts can be used for this check.
6. Adjust the gauges on the fixture and check bracket fit.

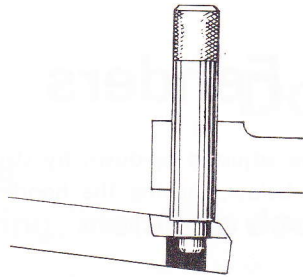
The gauges are provided with a slot which indicates tolerance permitted.



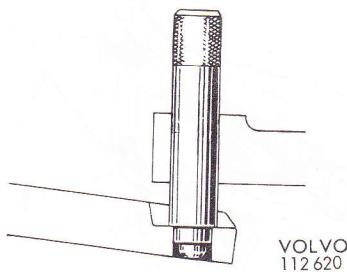
Checking wheel housing height and side alignment

7. Install gauge plate 5125 in one of the wheel housings.
8. Attach fixture 5124 to the previously installed fixture 5123.

MAX-TOL.



0-TOL.



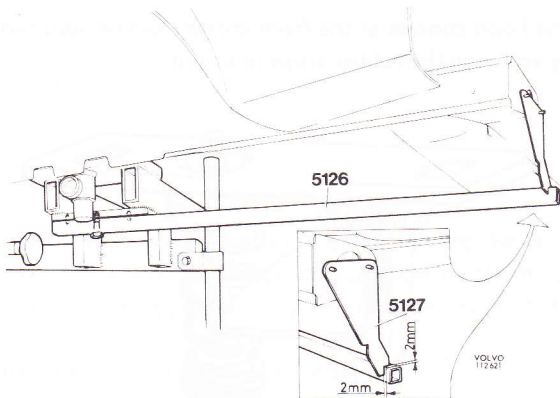
9. Check the wheel housing position, using the gauge of fixture 5124.

Max. tolerance permissible:

Side: the small diameter of the gauge will enter the hole of the gauge plate 5125.

Zero tolerance:

Side: the large diameter of the gauge will enter the hole of gauge plate 5125.

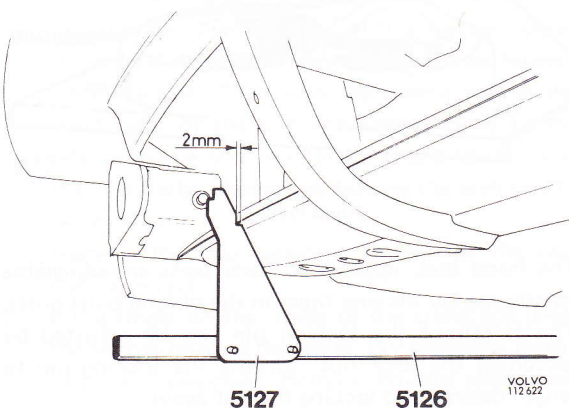


Checking alignment of side member front section

10. Attach gauge rod 5126 to main fixture 5123. Place gauge 5127 in the impact absorber attachment. Check side member alignment.

Max. readings permitted: 0 mm and 4 mm

Zero reading: 2 mm



Checking alignment of front cross member

11. Place gauge 5127 on gauge rod 5126. Check alignment of front member.

Max readings permitted: 0 mm and 4 mm

Zero reading: 2 mm

12. Check other side. Repeat operations 7–11.

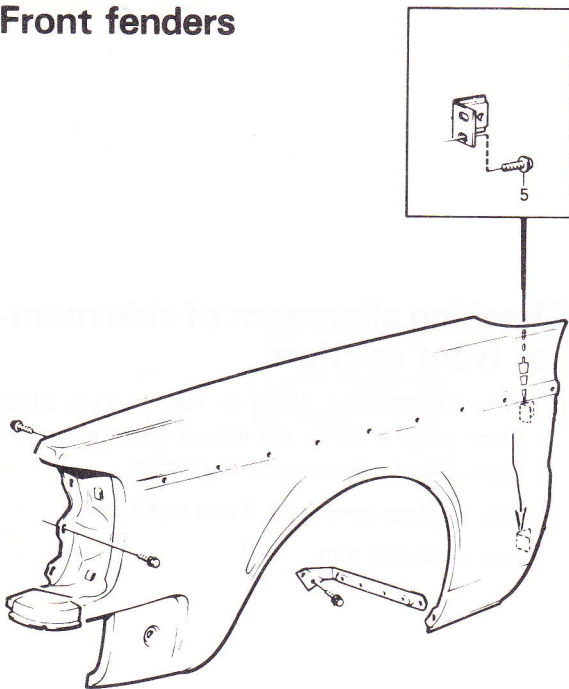
Group 82

Front End, Hood and Fenders

Replacing grille

1. Depress and turn the spring locks 90°. Lift up the spring locks.
2. Pull the grille forwards until free from upper member.
Remove the grille.
3. Transfer springs to the new grille.
4. Position the grille. Position spring locks, depress and turn. Check that the locks are securely locked.

Front fenders



Removing front fenders

Remove:

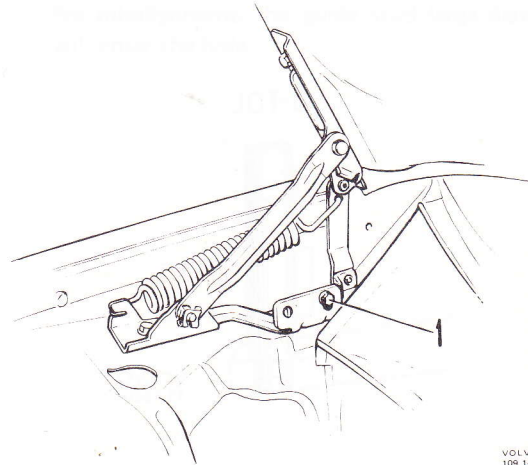
- four bolts to the brace
- four bolts at rear end, accessible when the front door is opened
- three bolts to front section
- eight bolts from the inside of the wheel housing

Hood and hood hinges

To remove the hood, remove the bolts retaining the hood to the hinges.

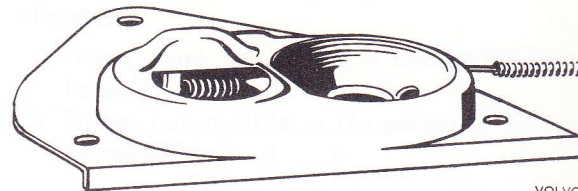
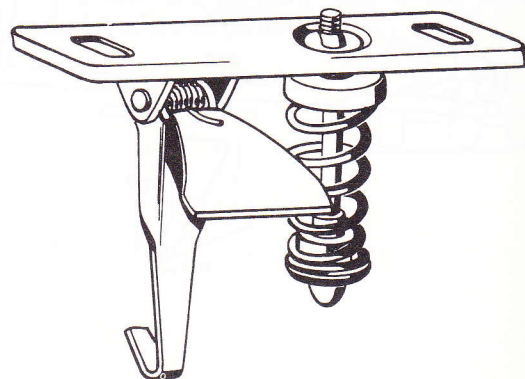
The hinges are attached to the body by two bolts on each side. All bolt holes are oblong to permit hood position adjustment.

The hinges are adjusted up-down by slackening the lock bolts, 1 below, moving the hood to position desired and locking the bolts again.



Adjusting hood hinges

The hood contact at the front corners can be adjusted by screwing the rubber stops in or out.



Hood lock

The hood lock upper and lower parts are adjustable lengthwise by moving them in the oblong bolts holes. The length of the locking pin can be adjusted by loosening the lock nut, turning the locking pin to length desired and locking the nut again.

Group 83

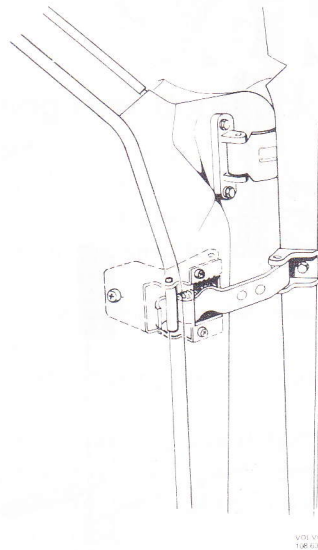
Doors and trunk

Doors

Removing/installing door stops

Replace door stop = Op. No. 83106

Remove door panel according to instructions under "Removing inner handles and upholstery". Then remove the bolt between the door stop and post, and remove the rubber seal.



Door stop

After this, remove the three bolts securing the door stop to the door. The door stop can now be taken out through the upper opening in the inner plate of the door.

Installation is in the reverse order

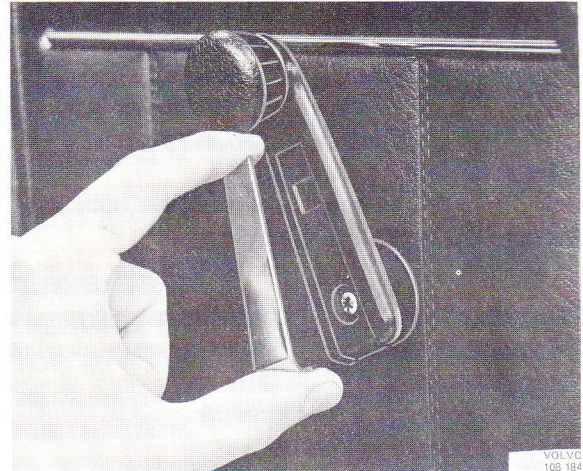
Removing inner handles and upholstery

Replace door window crank = Op. No. 83402

1. To remove the arm rest in the front door, take out the two plastic plugs with a narrow screwdriver and remove the attaching screws located on the inside. Then turn the plastic ring at the front edge of the arm rest several turns to the left, push the arm rest forwards and the hook at the front edge disengages leaving the arm rest to be removed.

Remove the two retaining screws for the rear door arm rest.

2. Put a finger on the inside of the crank and press the latches holding the cover. Pry loose the cover, using a screwdriver. Remove Phillips screw and crank.

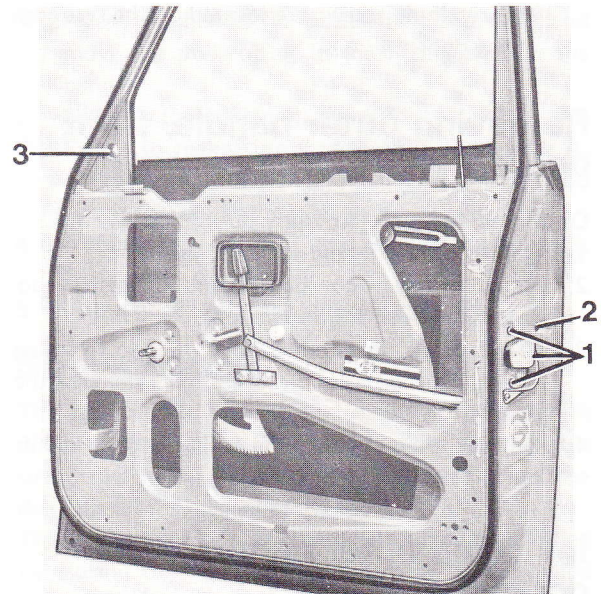


Door window crank

3. Remove lock button and screws at the top edge of the upholstery. Remove the door upholstery by inserting a screwdriver or similar under the upholstery edge and carefully prying outwards so that the upholstery comes loose.

Removing/installing front doors

Remove the bolt between door stop and door pillar. Remove the bolts between hinges and door, accessible when the door is opened. The door can then be removed.



Front door

1. Door lock screws
2. Hole for the lock cylinder attaching screw
3. Hole for rear view mirror installation

In order to remove the hinges, the panel in front of the door has to be removed. When this has been done, the three bolts are removed and now the hinges can be removed.

The door and hinges are installed in the reverse order. Since the holes in the hinges and in the attachment between the door and hinges are oval, the door can be adjusted laterally. The door can be adjusted updown and lengthwise in the attachment between the hinges and door post. This is possible since the holes in the door post are larger than the diameter of the bolts.

Shims to adjust distance between lower door hinge and door are available as spare parts.

Removing and installing rear doors

See the corresponding section above.

Removing front door lock

Op. No. 83406 = replace door lock

1. Follow operations 1—3 under "Removing inner handles and upholstery".
2. Remove the lock cylinder by its attaching screw which is fitted in the rear edge of the door.
3. Remove the locking for the pull rod locking knob and take out the pull rod.
4. Remove the locking for the inner door opener push rod.
5. Remove the locking for the outer handle pull rod.
6. Remove the three retaining screws for the door lock and the lock.

The retaining screws are located on the rear edge of the door.

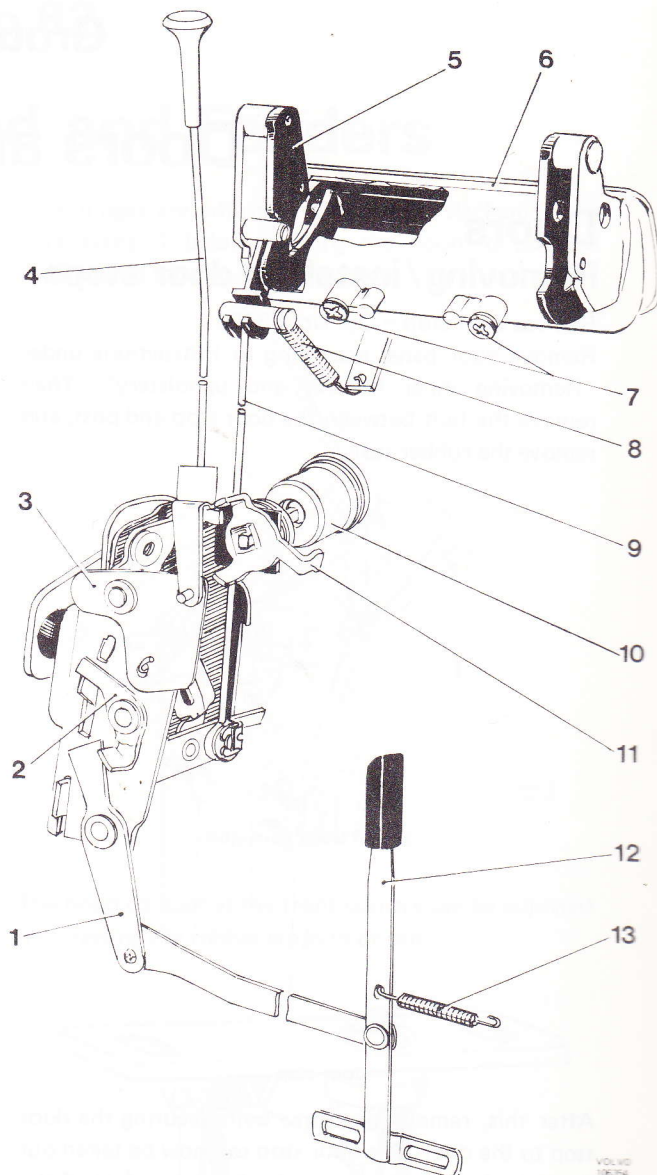
Removing outer handle, front doors

Op. No. 83404 = replace outer door handle

1. Crank up the window to closed position.
2. Remove inner door handle and upholstery according to previous instructions.
3. Crank down the window until the two retaining screws 7, Fig. right are accessible. Remove the screws.
4. Unhook the return spring 8, Fig. right and lift out the handle and cover as a unit.

Installing outer handle, front doors

1. Place the handle in position in the door and move the pull rod 9, below, in the lifting arm for the handle.



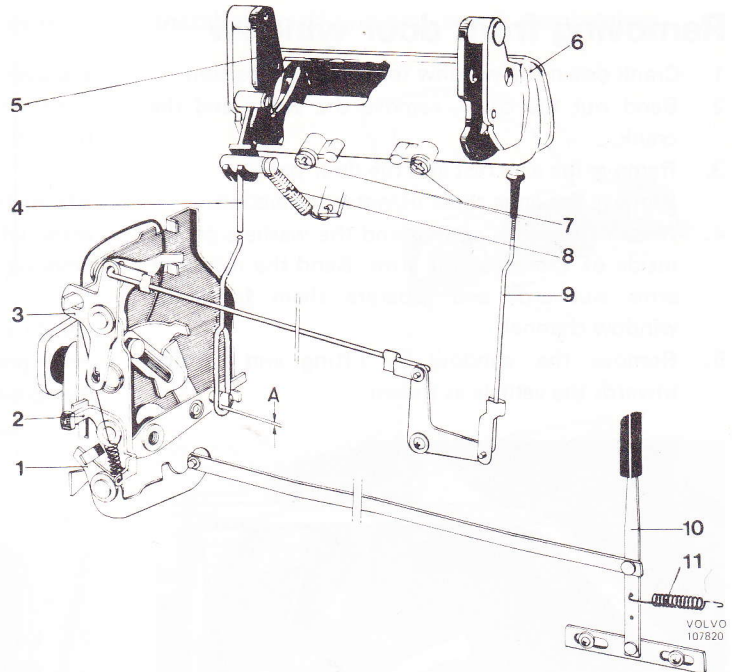
Lock, front doors

1. Lever
2. Lever
3. Lever
4. Pull rod for lock button
5. Outer handle
6. Cover for outer handle
7. Screws for outer handle
8. Return spring for outer handle
9. Pull rod for outer handle
10. Lock cylinder
11. Lock device
12. Inner door opener
13. Return spring for inner door opener

2. Screw in both the attaching screws 7.
3. Check to make sure the lock functions properly. If necessary adjust the length on the pull rod 9.
4. Install the return spring 8.
5. Put back the door upholstery and re-install the inner handle.

Lock, rear doors

1. Lever for remote control
2. Lever for child safety door lock
3. Lever
4. Pull rod for outer handle
5. Outer handle
6. Cover for outer handle
7. Screws for outer handle cover
8. Return spring for outer handle
9. Pull rod for lock button
10. Inner door opener
11. Return spring for inner door opener



Removing rear door lock

Op. No. 83406 = replace door lock

1. Carry out operations 1–3 under "Removing inner handles and upholstery".
2. Remove the locking for the pull rod locking knob.
3. Remove the locking for the inner door opener push rod.
4. Remove the locking for the outer handle pull rod.
5. Remove the retaining screws for the door lock and remove the lock from the door. The attaching screws for the lock are placed on the rear edge of the door.

Removing outer handle, rear doors

1. Wind up the window to the closed position.
2. Remove the inner handle and upholstery according to previous instructions.
3. Unhook the return spring 8.
4. Unscrew the screws 7, and lift out handle and cover as one unit.

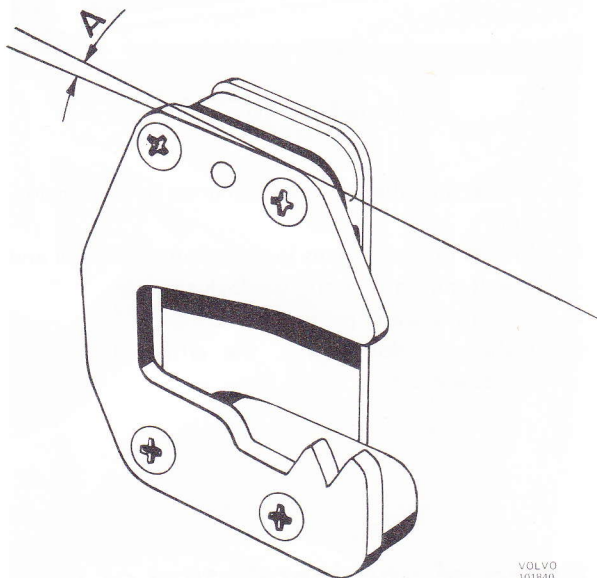
Installing outer handle, rear doors

1. Place the handle in position in the door and move the pull rod 4, in the lifting arm for the handle.
2. Screw in the attaching screws 7.
3. Check to make sure that there is a clearance A, of 1 ± 1 mm ($1/32 \pm 1/32$ ") between the pull rod eyelet and pin in the lock lever.
4. Install return spring 8, and check that the lock is functioning properly.
5. Install door upholstery inner handle.

Striker plates

The striker plate is made of steel and is installed with a floating nut plate. The striker plate is adjustable since the holes in the body are larger than the diameter of the attaching screws.

The vertical position of the striker plate is controlled by closing the door, with the outside handle pulled out, when the door latch should slide correctly into the latch plate. The striker plate should have an inward inclination of 1.5° for the front doors and 2.5° for the rear doors, see Fig. left.

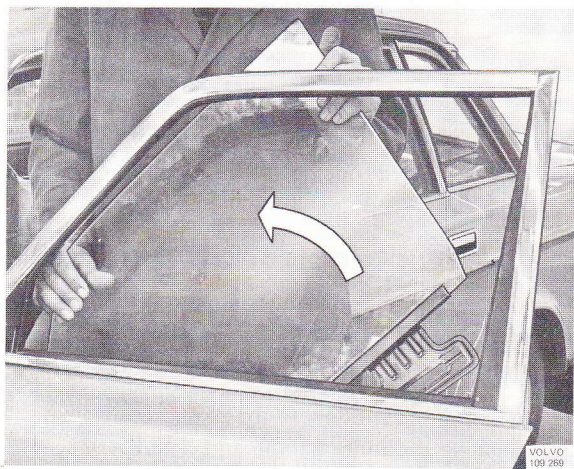


Striker plate

A. Front door 1.5° B. Rear door 2.5°

Removing front door window

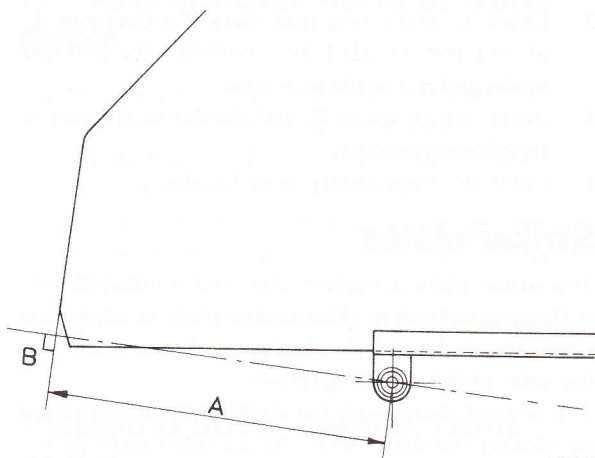
1. Crank down the window to its lowest position.
2. Bend out the cover, remove the screw and the crank.
3. Remove the arm rest and the door panel.
Remove the large sheet of water protection.
4. Remove the lock springs and the washers on the inside of the regulator arms. Bend the regulator arms outwards and separate them from the window channel.
5. Remove the window by lifting and turning towards the vehicle as shown:



Door window removal

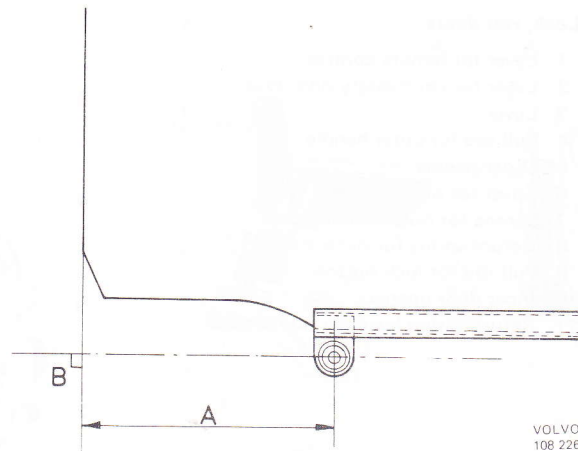
Door window installation

1. Install the window in the window channel according to following two Figs.



Window dimensions, 242 and front door 244, 245

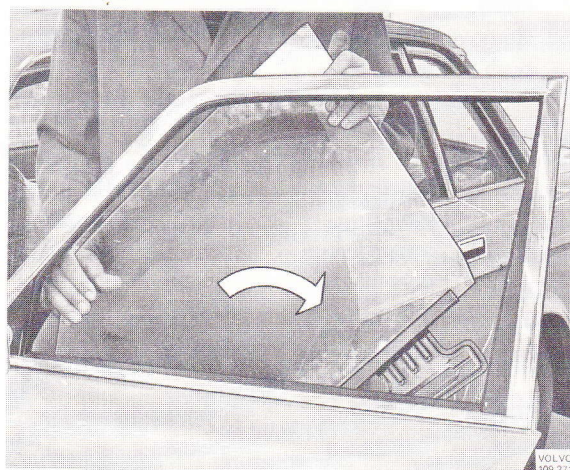
$A = 26 \pm 2 \text{ mm} = 10.275'' - 10.443''$
 $B = 89^\circ \pm 1^\circ$



Window dimension, rear door 244, 245

$A = 169 \pm 2 \text{ mm} = 6.654'' - 6.732''$
 $B = 90^\circ \pm 1^\circ$

2. Lower the window with the acute angled corner first and turn it at the same time as shown:



Window installation

3. Check that the window is aligned in the window runs.
4. Fit the regulator arms in the window channel and install the washers and the lock springs.
5. Install the water protection springs.
6. Install the door panel, the arm rest and the window crank.

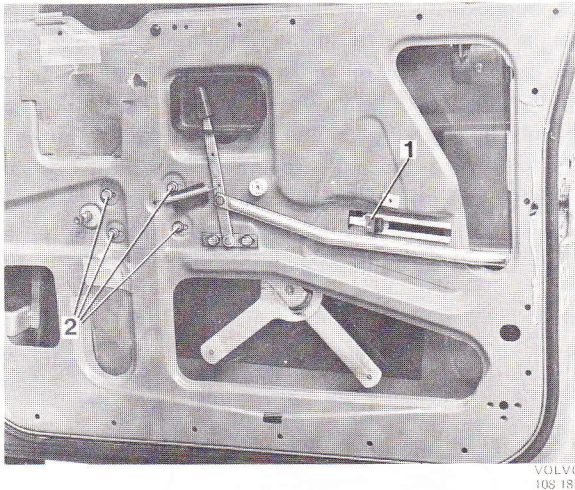
Removal and installation of rear door window

See the corresponding section above.

Removal of door window crank mechanism

Op. No. 83504 = Replace front door window regulator

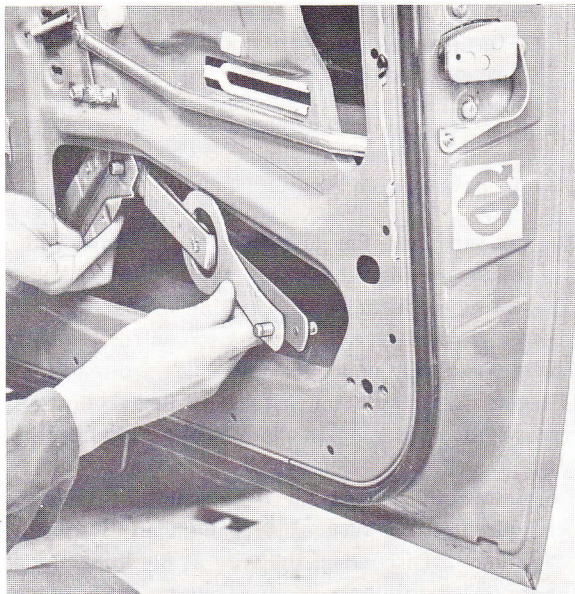
1. Crank down the window to its bottom position.
2. Remove the door panel and the water protection sheet.
3. Remove the lock springs and the washers on the inside of the regulator arms. Bend the arms outwards and remove them from the window channel.
4. Remove the clip 1, Fig. below, at one of the regulator arm's retaining points in the door.
5. Remove the door window crank mechanism retaining screws 2:



Front door interior

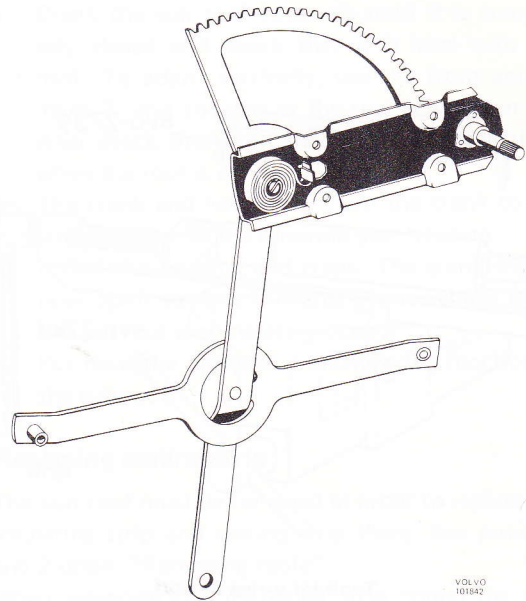
1. Lock
2. Window mechanism retaining screws

6. Remove the crank mechanism as shown:



Window mechanism removal

Installation of window crank mechanism



Window mechanism

1. Install the crank mechanism. Do not tighten the screws.
2. Install the regulator arms first in the door and then in the window channel with the washers and the lock springs.
3. Crank the window to its upper position and tighten the crank mechanism screws.
4. Install the water protection sheet.
5. Install the door panel, the arm rest and the window crank.

Removal and installation of rear door window mechanism

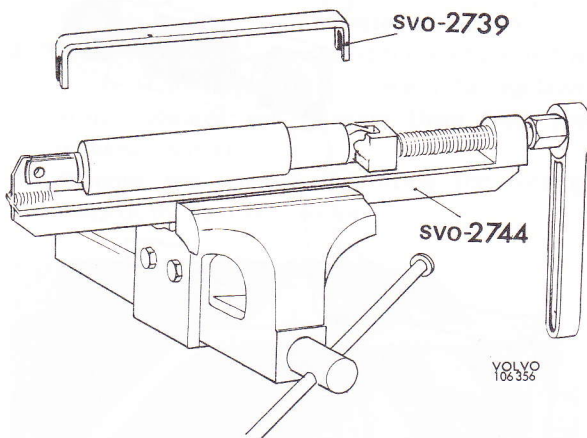
Op. No. 83502 = Replace rear door window regulator
Proceed in the same way as described above.

Trunk lid, 242, 244

The trunk lid is mounted on two hinges, which are attached by two bolts to the inner plate of the lid and with three bolts to the pillar under the rear window. The trunk lid is counterbalanced by a spring support. The trunk lid is removed by removing the two bolts on each hinge and lifting it off.

When replacing, the lid is first opened fully. It is then lowered slightly and clamp 2739 applied and the lid opened fully again, after which the spring support can be removed. When installing a new spring support,

press tool 2744 is used as shown in Fig. below in order to install clamp 2739.

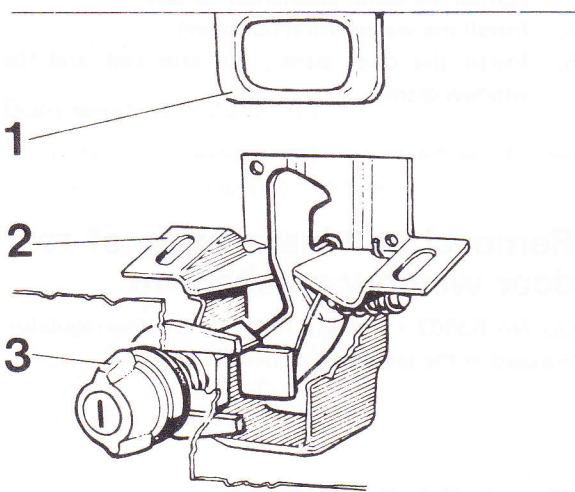


Tools for spring support

Install in the reverse order.

When removing hinges, first remove the spring support as described above. The lid is then removed from the hinges and the hinges from the body.

The holes in the part of the hinges attached to the trunk lid are oval in order to permit longitudinal adjustment. For vertical adjustment the holes in the part of the hinges attached to the body are oval.



Lock for trunk lid

1. Lock catch, fitted in lid
2. Lock mechanism, fitted in rear section
3. Lock knob, fitted in rear section

The lock (Fig. above) is installed in the rear section and is released by turning the lockable knob. The lock catch on the lower edge of the lid is adjustable in order to permit variation of the closing tension of the lid.

The lock knob is removed by taking out the horseshoe clamp with pliers inside the trunk. The lock knob can then be pulled out backwards.

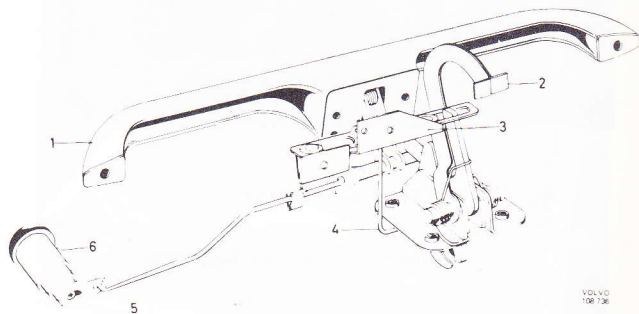
To remove the lock, remove the lock knob and then the two bolts under the upper edge of the rear section.

The lock is adjustable longitudinally since the bolt holes are oval.

Tail gate, 245

The tail gate on the 245 model is suspended by two hinges screwed to the roof. To remove the tail gate, first remove the upholstery panel on the inside. Then remove left license plate light and disconnect wire. Disconnect also the other outgoing wires from their connections inside the tail gate. The gas spring is then taken out at its attachment in the tail gate. Remove the screws for the hinge attachments to the tail gate and lift off the tail gate.

To install the tail gate: Lift up the tail gate and insert the wires. Position tail gate and screw on the hinges. If the gas spring was removed, install it and adjust play where attached to the body. Install license plate light, wire and upholstery panel.



Tail gate lock, 245

1. Outer handle
2. Inside opener
3. Latching device for inner opener
4. Control for latching device
5. Eccentric
6. Lock cylinder

The tail gate lock, Fig. above, must be removed from the inside, so that the panel has first to be taken down. Inside the tail gate, the link rod to the lock plunger is removed and also the screws for the lock. The lock can then be moved to the left, from where it is taken out of the tail gate. The lock cylinder is removed by loosening the lock screw inside the tail gate.

To remove the hinges for replacement, detach the headlining at the rear edge (see under "Replacing headlining"). Disconnect the wire at the joints under the hinges. Remove the screws securing the hinges to the roof and the tail gate. Remove the hinges.

Sun roof

Removing cable

1. Open the sun roof and release the clips securing the roof upholstery at the front end. Then move the upholstery back to leave an opening.
2. Crank the sun roof forwards and slacken the screws at its four attachments 9 and 11. Bend the leaf springs 10 to the one side and remove the reinforcing plates 13 at the rear attachments. Lift off the sun roof.
3. Remove the wind deflector 2.
4. Remove the intermediate pieces 8, covering strip 3 and holders above the drive. Release the front guide rails 6 and pull out the cables 5.

Installing cables

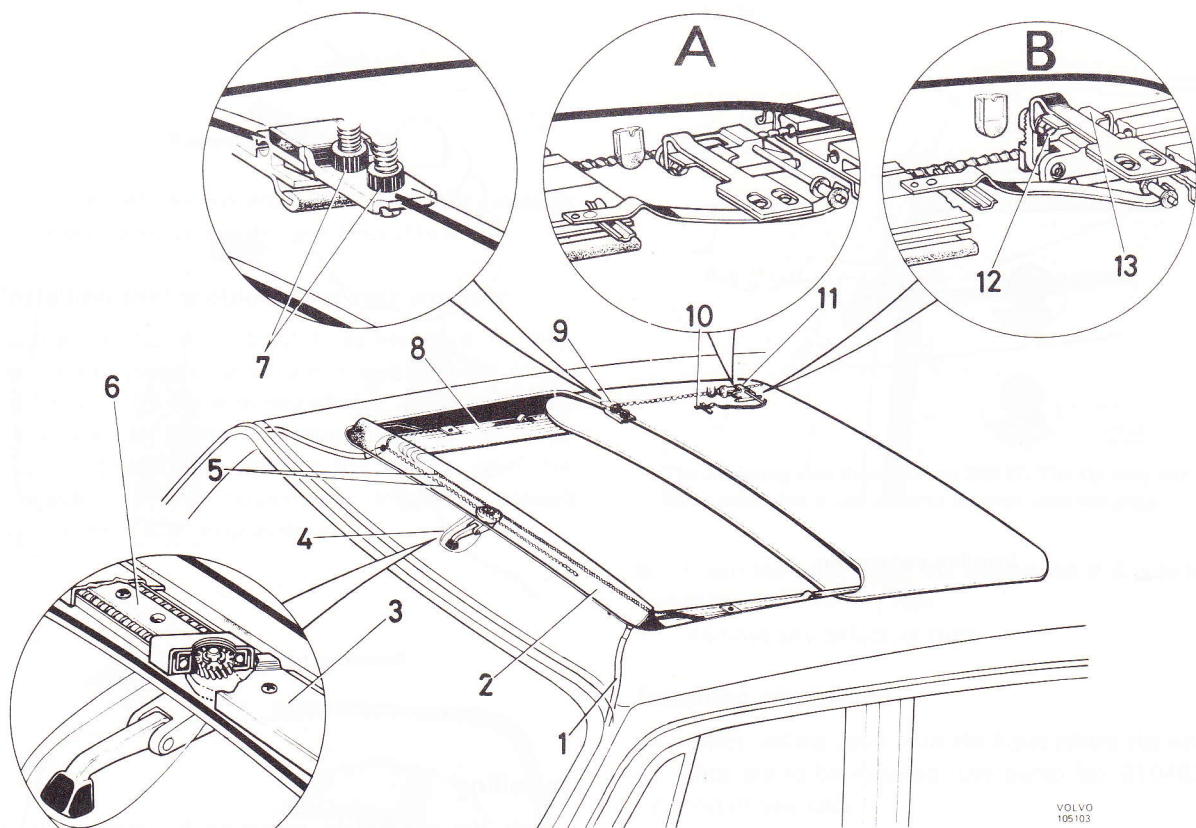
1. Install the cables so that the attachments for the sun roof come opposite each other, and at the rear end of the roof opening. Screw on securely the front guide rails.
2. Install the intermediate pieces, holders and covering plate.
3. Install the wind deflector.

4. Screw on the roof securely and put back the leaf springs.
5. Crank the sun roof forwards until it is completely closed and check that it is level with the roof. To adjust vertically, use the front adjustment 7, and the lifts at the rear adjustment 12. Also check that both the lifts stand straight up when the roof is closed.
6. The crank and housing 4. Turn the crank to the stop position on the removed gear housing.
7. Install the housing and crank. The crank should now point straight forwards in the vehicle when the sun roof is completely closed.
8. Put back the upholstery and test the function of the sun roof.

Replacing sealing strip

The sun roof must be removed in order to replace the insulating strip and sealing strip there. See points 1 and 2 under "Removing cable".

When replacing the insulating strip round the roof opening of the sun roof, all that is required is to crank the roof back to its rearmost position.



Sun roof

- A. Rear attachment when roof is open
B. Rear attachment when roof is closed

1. Drain hose
2. Wind deflector
3. Cover strip
4. Crank housing with crank

5. Cables
6. Front guide rail
7. Front adjustment

8. Intermediate piece
9. Front attachment
10. Leaf spring

11. Rear attachment
12. Rear adjustment
13. Reinforcing plate

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105103

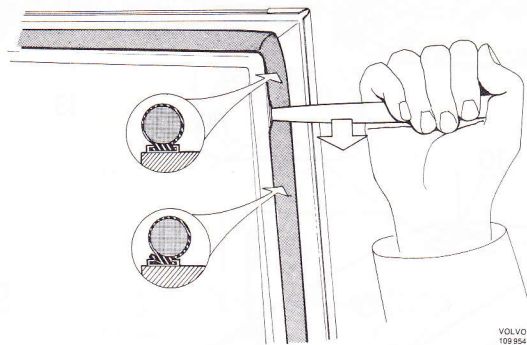
Group 84

Sealing Strips, Glass and External Trim Mouldings

Sealing strips

The sealing strips are secured by spotwelded fastening rails.

The sealing strip is removed by pulling it outwards, when the ridge of the strip releases from the rail. When attaching the sealing strip, one of the ridges is placed in position in the rail, the other ridge is then pressed down into the rail with a wooden putty knife. This is moved along the rail as shown:

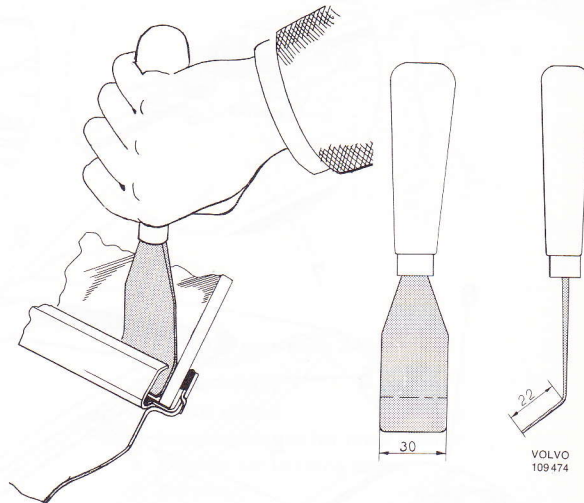


Installing sealing strip

When installing, begin by placing the clips and locking them by pressing in the stud in the middle. The moulding is then pressed onto the clips.

Removing windshield moulding

The windshield moulding is fixed by clips pressed into the slits in the windshield opening in the body. The moulding can, for example, be suitably removed with a steel putty knife. Insert the knife between the windshield and moulding opposite a clip, see Fig. below. Then lever the moulding loose.



Removing trim moulding

Trim mouldings

Waist mouldings

The waist mouldings are attached with plastic clips. The mouldings are removed with a wooden putty knife with which they are carefully levered off. The clips can be removed by carefully pulling them off with pliers.

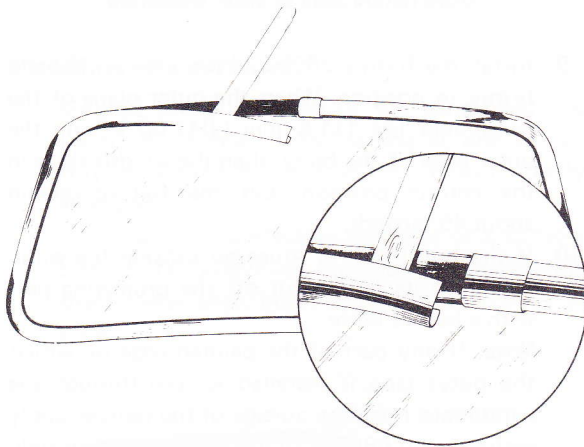
Installing

Install the windshield moulding by pressing it in between the body frame and the clips. To ensure that the moulding coincides with the corner joints, install in the following order.

First, install the lower moulding with a corner joint on. Then install a side moulding also with a corner on. Finally, install the remaining moulding together with corners on to the body frame.

Removing trim moulding for rear window

1. Remove the moulding from the rubber strip by inserting a moistened nylon putty knife and moving it all round between the strips (do not pull off the trim moulding).
2. Push over the joining pieces to one of the halves of the moulding.
3. Remove the trim moulding by levering out the ridge of the rubber strip from the trim moulding with a moistened wooden putty knife. Release the trim moulding in the middle with another putty knife as shown.



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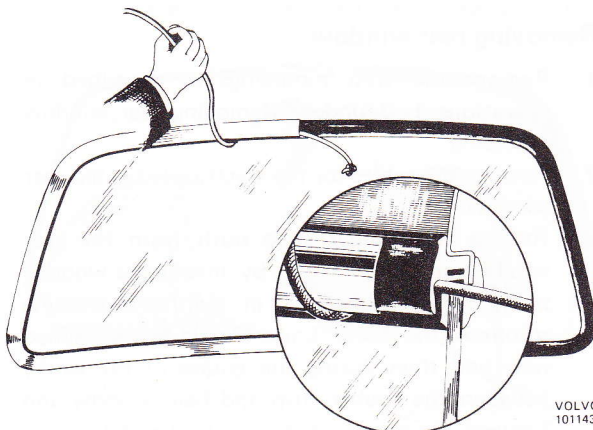
Removing trim moulding

Lever off the moulding carefully while releasing the rubber strip with the other putty knife.

Installing trim moulding for rear window

Moisten a 4.0 mm (5/32") leather cord in soap solution or paraffin and place it in the groove of the rubber strip for the trim moulding.

Place one half of the trim moulding in position and hold it there while pulling the leather cord out upwards over the moulding so that it is pressed against the rubber strip as shown:



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Installing trim moulding

Push over the joining pieces and repeat the procedure with the other half of the moulding. Adjust the position of the joining pieces over the joints.

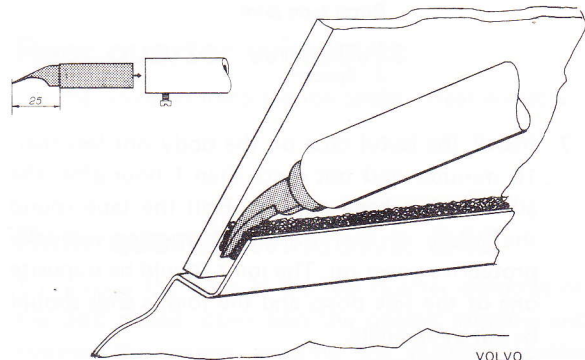
Windshield

Removing windshield

Op. No. 84302 = replace windshield

1. Place protective covering over the hood and front seats.
2. Remove the windshield wiper arms.
3. Remove the external trim moulding. See "Removing windshield moulding".
4. Unscrew the inner covering strips and rear view mirror.
5. Cut the windshield loose with a warm soldering iron.

Insert the point of the iron between the windshield and the body, from the inside of the vehicle. Then draw the soldering iron round the windshield. The windshield can now be pressed out by hand. Cut off any remaining strands with a knife.



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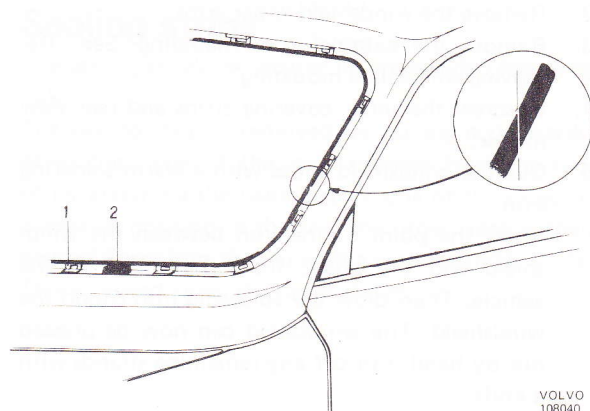
The soldering iron should be on 200 W. The tip may not be so thick that it can come in contact with the glass.

6. Clean the body (also the windshield if it is to be re-installed) of any tape.
7. Remove any defective clips.

Installing windshield

1. Inject sealing agent into the holes where the new clips are to be installed. Use pump No. 210163.
2. Install new clips.
3. Clean the contact surfaces for the tape on body and windshield. Use ethyl or methyl acetate for the cleaning. Be careful not to touch the cleaned surfaces.
4. Coat the clips with sealing agent No. 686275 so that the agent forms a smooth bridge between the clips and body for the butyl tape to seal against.

5. Coat adhesive on the cleaned surfaces on the body and windshield. Coat an edge between 18 and 21 mm (3/4 and 7/8") in width round the windshield, measured from its outer edge. Apply the adhesive twice to ensure total coverage. Any adhesive spill on the body or glass surfaces can be removed with methyl acetate. The adhesive can be applied within 5 minutes after the cleaning.
6. Install both the spacers on the lower edge of the windshield opening. They should lie between the 2nd and 3rd clip from each windshield post.



Butyl tape joint

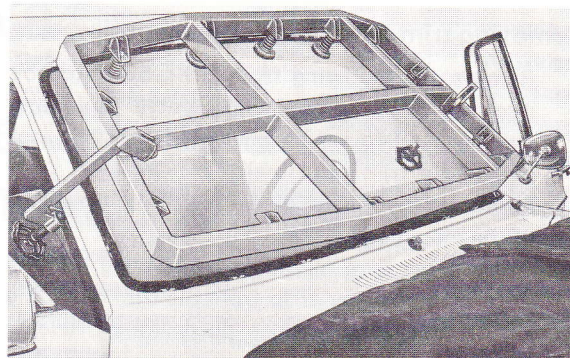
1. Clip
2. Spacer

7. Install the butyl tape on the body not less than 10 minutes and not more than 1 hour after the adhesive has been applied. Roll the tape round the whole of the windshield opening with the protective paper on. The joint should be opposite one of the side posts and the joint's ends should be cut at an angle.

The tape is best cut with a heated knife.

Place the tape edge to edge with the spot weld flange. The tape profile may not be altered by stretching. The protective paper is removed immediately before the windshield is installed. Be careful not to soil or touch the adhesive surface of the tape.

8. Use a glass lifter for installing the windshield. Two men are required to install the windshield. It must be carefully located in the opening before being placed against the tape. Once the windshield has been placed in position, adjusting possibilities are then very small. The windshield must not lie against any clip.



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Using fixture 2899 to install windshield

9. Install the fixture 2899 and press the windshield firmly in position. When the outer plane of the windshield lies 1 ± 1.5 mm ($.04 \pm .06$ ") from the outer edge of the body, then the windshield is in the correct position. Let the fixture remain about 45 seconds.
 10. If the butyl tape is squeezed outside the windshield on its inside, cut off the projecting part with a heated knife.
- Note:** If any part of the painted edge on which the butyl tape is installed is seen through the windshield from the outside of the vehicle, apply sealing agent 686275 to these points. This is only required for light-colored vehicles.
11. Install the outer trim moulding, see "Installing windshield moulding".
 12. Install the inner cover strips and rear view mirror.
 13. Install the windshield wiper arms.

Rear window

Op. No. 84312 = replace rear window

Removing rear window

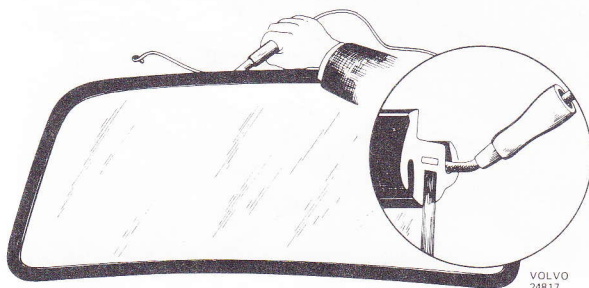
1. Remove the trim mouldings as described in operations 1—3 under "Removing rear window moulding".
2. Remove the cables for the electrically heated rear window.
3. Release the rubber strip both from the rear window and sheet metal by inserting a wooden putty knife moistened in synthetic washing solution (the putty knife should be moistened now and then during the course of the work) between the rubber strip and rear window and between the rubber strip and sheet metal respectively and moving it all round.

4. Start removing the rubber strip in the upper left corner. Lever the rubber strip over the edge of the sheet metal from inside and at the same time carefully pulling out the strip from outside with a pair of wide-nosed grips. Then carefully pull off the strip by hand all round and remove the rear window.

Remove all sealing compound from the sheet metal. If it has dried on, first carefully scrape off the sealing compound and then wash clean with naphtha. Check that the sheet metal edge is not deformed. If the sealing compound has not dried on, clean the rubber strip with naphtha, otherwise replace it.

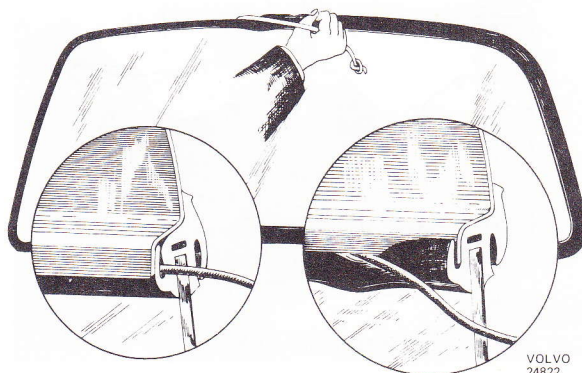
Installing rear window

1. Moisten the outer edge of the windshield and install the rubber strip starting at one of the corners. Adjust the strip so that it lies correctly all round.
2. Install a cord (preferably terylene) of a suitable size in the groove of the rubber strip for the sheet metal edge, beginning at the top center as shown:



Placing cord in rubber strip

3. Place the rear window in position with the rubber strip installed. Wearing working gloves, carefully strike the rear window a few blows with the **palm of the hand** so that it makes good contact all round. Then carefully pull out the cord from inside. This will cause the rubber strip to "creep" over the sheet metal edge as shown:



Installing rear window

It may sometimes be necessary to adjust the position of the rear window with the palm of the hand. If the cord is difficult to pull out, this may damage the strip, in which case the rear window should be struck from inside or outside with the palm of the hand if the rubber strip does not "creep" over the edge of the sheet metal properly.

4. Check that the rubber strip seals well all round. If necessary adjust the position of the rear window both vertically and laterally **by striking with the palm of the hand**.
5. Seal the joints between the rubber strip and rear window and rubber strip and sheet metal with sealing compound using a gun with a flat nylon nozzle. Make sure that the sealing compound fills the joint well. Scrape off surplus sealing compound and wash rear window and sheet metal with kerosene. Clean the rear window and sheet metal around it with polish.
6. Install the trim mouldings as previously described.
7. Install the cables for the electrically heated rear (tail gate) window.

Rear quarter windows

See the corresponding section under "Rear window".

Rear quarter windows, 242

To remove the glass in the rear quarter windows on the 242 model, open first the quarter window and remove the screws securing the quarter window opener to the body.

Remove the window from the front attachments by first opening it 90° and at the same time pulling to the rear.

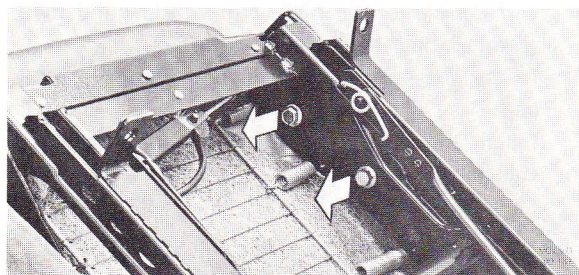
Group 85

Upholstery, Interior, Heating and Air Conditioning

Front seats

Replacing heater device for driver's seat

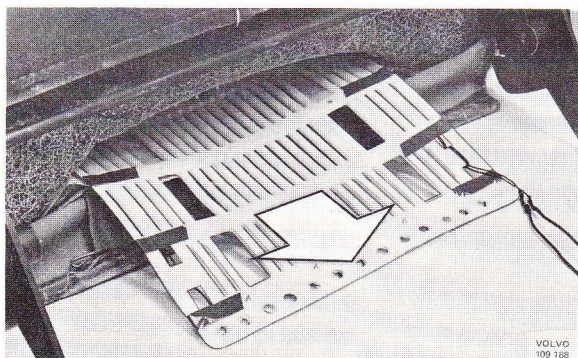
1. Disconnect the seat pad electrical wires at the junction box.
2. Remove the seat, complete with sliding rails, from the vehicle.
3. Remove the screws acc. to Fig. below, and remove the seat cushion.



Retaining bolts

Seat back heater pad

- A. Place the cushion upside down on a table.
- B. Cut and remove the front upholstery retaining clamps.
- C. Unhook the plastic hooks and pull out the heater pad.

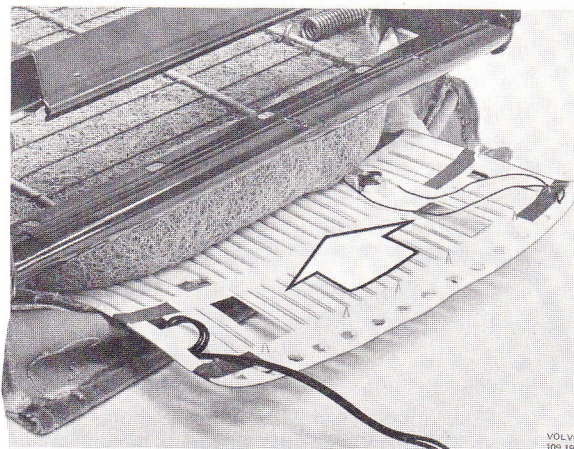


Removing seat back heater pad

- D. Fit the new heater pad in the seat back.
NOTE: the heater element barbs should point towards the padding.
- E. Hook the plastic hooks to the suspension mat lower wire.
- F. The heater pad electric wires should be routed towards the inboard side of the cushion. Fit and attach front upholstery to rear upholstery, using four clamps.

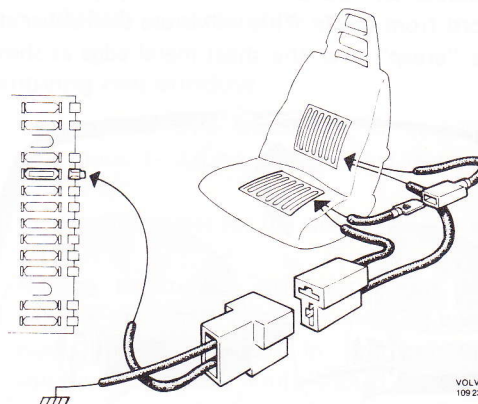
Seat cushion heater pad

- A. Place the seat cushion on a table, upside down.
- B. Remove the cover plate. Cut and remove the clamps at the rear end of the cushion.
- C. Pull out the heater pad.
- D. Fit the new heater pad in the seat cushion.
NOTE: the heater element barbs should point towards the padding.
- E. The heater pad electric wires should be routed towards the inboard side of the cushion, see Fig.



Fitting heater pad

- F. Fold back the upholstery and install five new clamps.
4. Re-install the seat cushion. Connect wires for seat back and seat cushion heater pads:



Wires for heater pads

5. Install the seat in the vehicle and connect the wires at the junction box.

Replacing seat heater thermostat

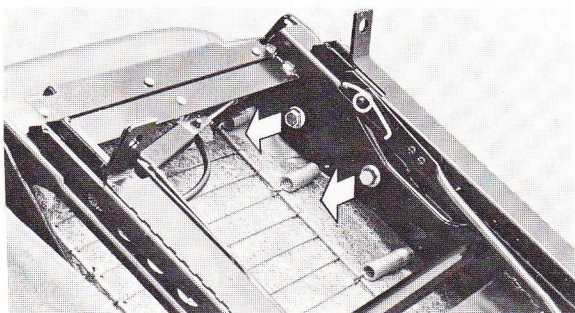
1. Remove the seat heater pad (see separate instructions).
2. Disconnect the thermostat wires. Remove the thermostat.
3. Install the new thermostat in the heater pad and connect the wires.
4. Install the heater pad (see separate instructions).

Replace:

	Seat reclining mechanism
or	Head restraint
or	Seat back upholstery
or	Latch or cable for seat back latch

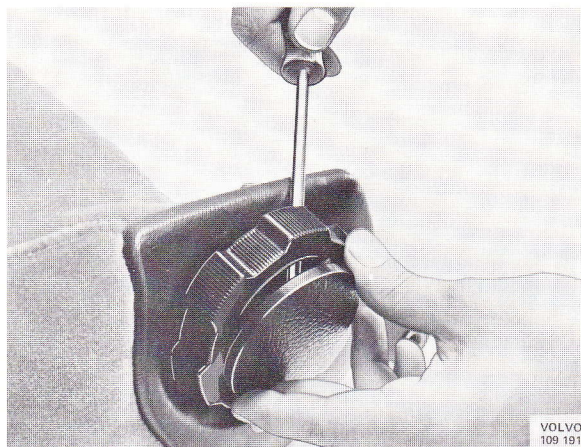
Points in brackets concern cars with seat back latch (2-door models)

1. Disconnect the seat and pad electrical wires at the junction box.
 2. Remove the seat, complete with rails, from the vehicle.
 3. Disconnect wires from seat back and seat cushion heater pads.
- Remove the screws and remove the seat cushion:



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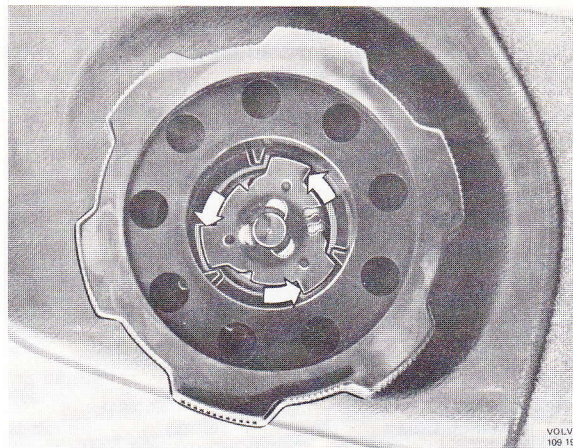
4. Use a screwdriver to press out the hand wheel cover through one of the hand wheel holes:



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109 191

Removing hand wheel cover

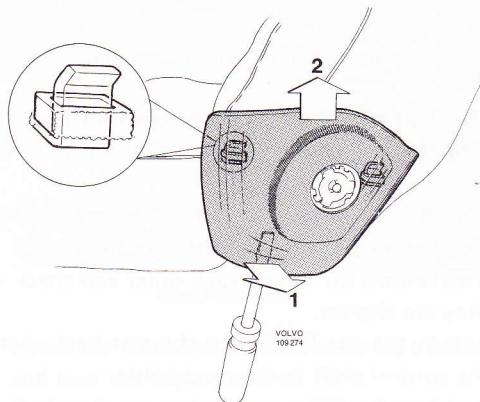
5. Turn the lock in the hand wheel counter-clockwise and remove the wheel:



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109 192

Removing hand wheel

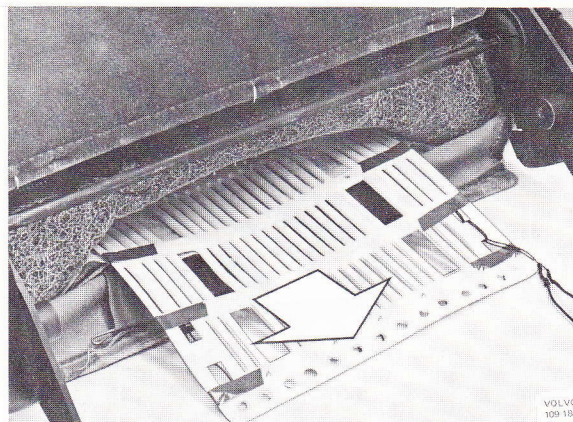
6. Remove the mechanism covers by bending loose the lower edge and then pressing upwards:



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109 274

Removing plastic cover

7. Unhook the upholstery from the seat reclining mechanism. Cut and remove the clamps at the seat back upholstery joint.
8. Unhook the plastic hooks and pull out the heater pad:

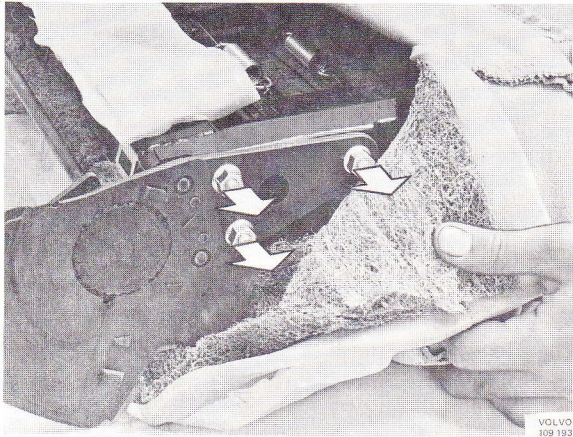


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Heater pad

Replacing seat reclining mechanism

- A. Unfold the upholstery to gain access to the mechanism retaining screws.
- (B). Pull off the cable locks and disconnect the cables from the mechanism.
- C. Fold down the padding, remove the screws and the mechanism:



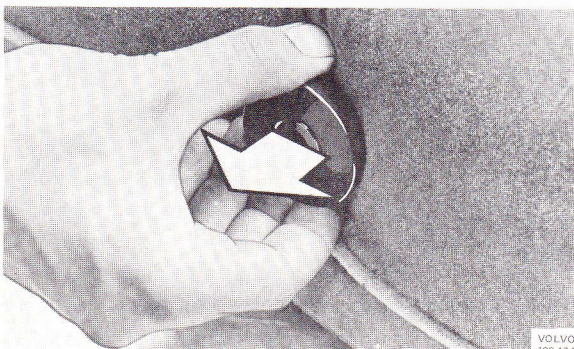
Removing seat reclining mechanism.

NOTE: the seat reclining mechanism cannot be repaired and the whole assembly must be replaced.

- D. Use a screwdriver to turn the new reclining mechanism to the rear stop position. Put the mechanisms on top of each other and check that they are aligned.
- E. Attach the mechanism to the seat back. Attach the control shaft to the mechanism.
- F. Position the other mechanism on the shaft and tighten it to the seat back. Finalize the installation of the seat reclining mechanisms.
- (G). Attach the cables to the mechanisms and fit the cable locks.

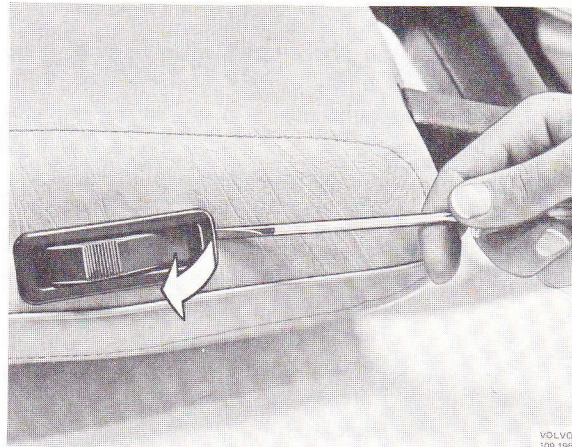
Replacing head restraint or Seat back upholstery

- A. Unscrew the lumbar support hand wheel. Pull loose the plastic bushing in the seat back:



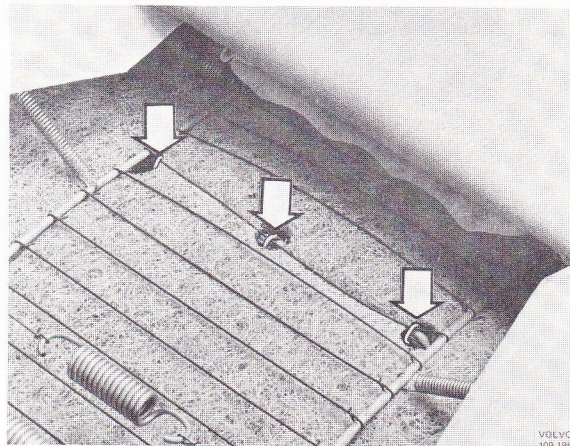
Removing bushing

- (B). Pry loose the frame for the catch release lever:



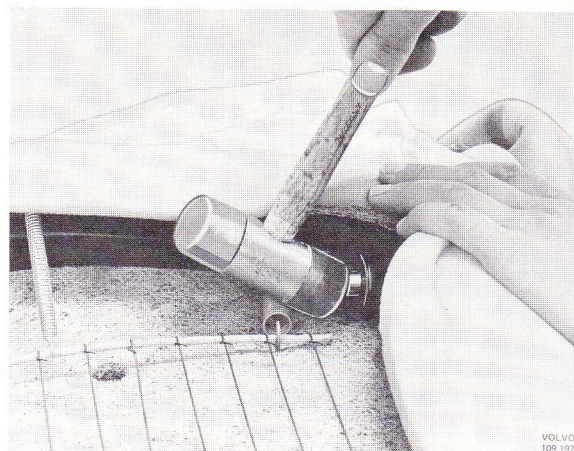
Removing frame

- C. Fold away the upholstery until three clamps are accessible. Cut and remove the clamps:



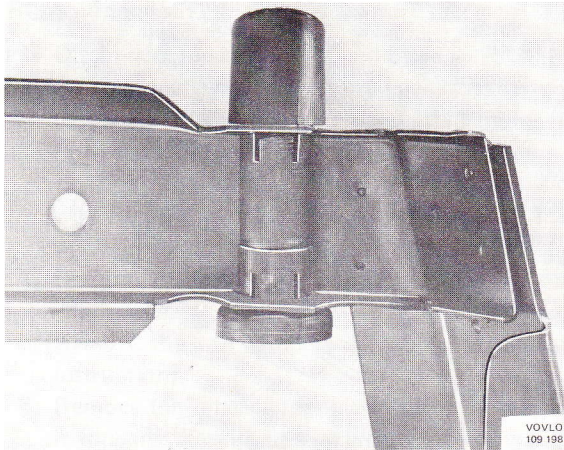
Clamps

- D. Unfold the upholstery completely. Knock loose the head restraint. Remove head restraint and upholstery:



Knocking loose head restraint

- E. Carefully loosen the padding and fold it loose from the seat frame. Remove the head restraint lower bushings (locks).
- F. Install new bushings (locks):



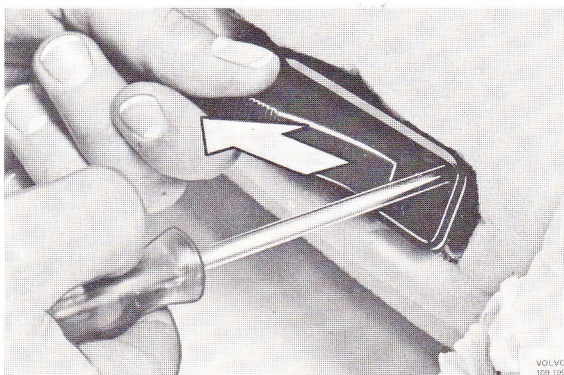
Installing bushings

- G. Apply glue to the seat frame back side and fold on the padding.
- H. Fold on the upholstery slightly. Install the head restraint. Check that the head restraint is securely locked.
- I. Attach the rod to the suspension mat with three clamps.

Replacing control or control cables for seat back latch

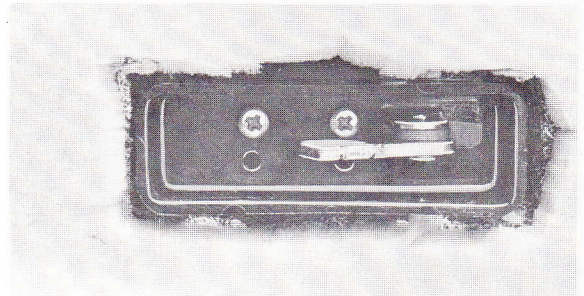
(See also "Replacing head restraint or seat back upholstery", previous page)

- A. Remove the lumbar support hand wheel. Pull loose the plastic bushing in the seat back.
- (B). Pry loose the frame for the catch release lever.
- C. Fold away the upholstery until three clamps are accessible. Cut and remove the clamps.
- D. Unfold the upholstery until the release lever is accessible.
- E. Pull off the cable locks and disconnect the cables from the seat reclining mechanisms.
- F. Pry loose the release lever for the seat back catch:



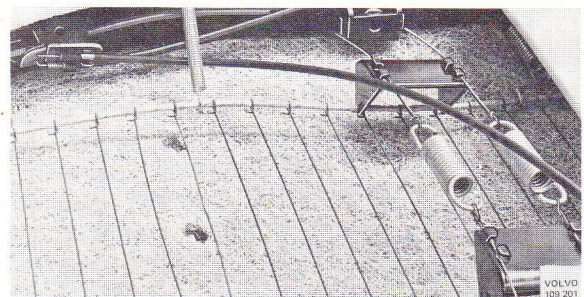
Removing mechanism lever

- G. Remove two retaining screws and the catch release mechanism.
- H. Disconnect cables from the mechanism.
- I. Attach the new mechanism and cover to the seat back frame:



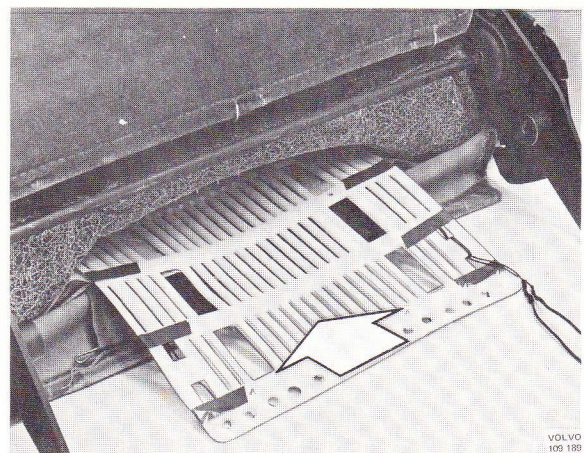
Installing mechanism and cover

- J. Press on the lever.
- K. Attach cables with retainers to the release mechanism:



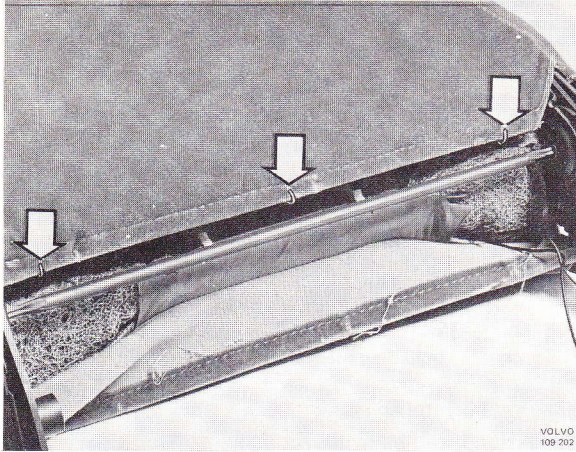
Installing cables

- L. Hook the cables to the seat reclining mechanisms and lock the cable sheaths.
- M. Attach the rod to the suspension mat with three clamps.
- 9. Fold on the upholstery completely. Check for wrinkles.
- 10. Position the heater pad.
NOTE: the heater element barbs should point towards the padding. The wires should be routed towards the inboard side of the cushion:



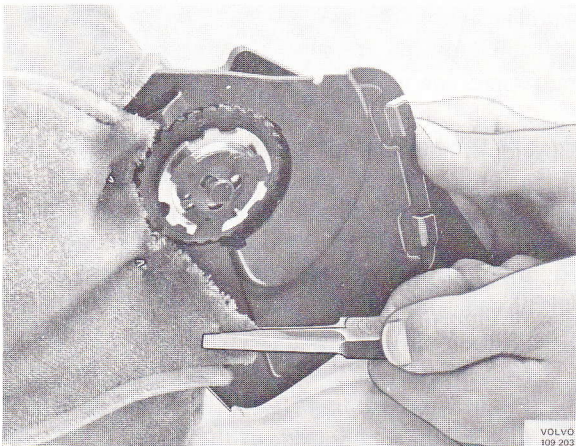
Installing seat back heater pad

11. Attach the upholstery plastic hooks to the suspension mat lower wire.
12. Fit and attach rear upholstery to the seat frame with three clamps.



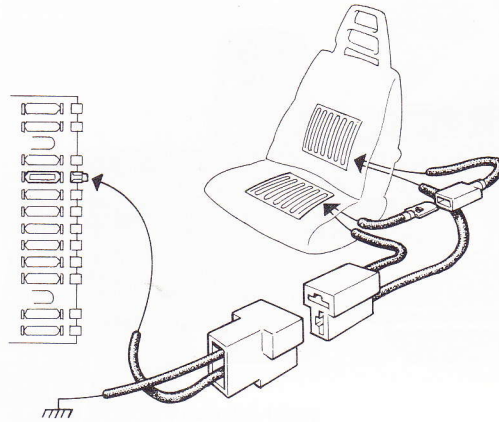
Fitting side upholstery

13. Fit and attach front upholstery to rear upholstery, using four clamps.
14. Bend out the sheet metal tabs of the seat reclining mechanisms. Fit and hook on the side upholstery and then reshape the tabs.



15. Press on the release lever frame. Press on the bushing for the lumbar support hand wheel. Install the hand wheel.
16. Install the plastic covers for the seat reclining mechanisms.
17. Turn the lock clockwise and install the hand wheel for the reclining mechanisms. Press on the hand wheel cover.

18. Attach seat cushion to the seat reclining mechanisms. Connect wires from seat back and seat cushion heater pads.



Wires for heater pads.

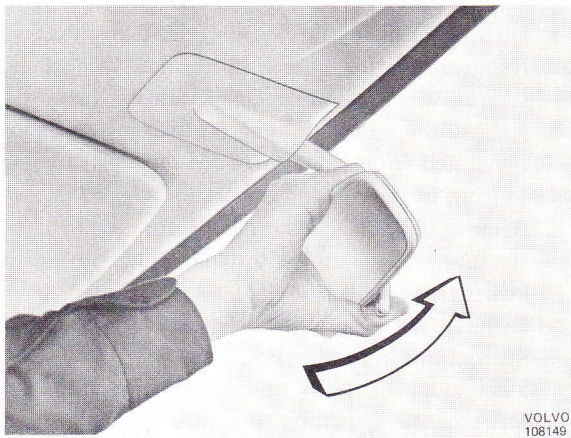
19. Install the seat in the vehicle and connect the wires at the junction box.

Replacing headlining, 242, 244

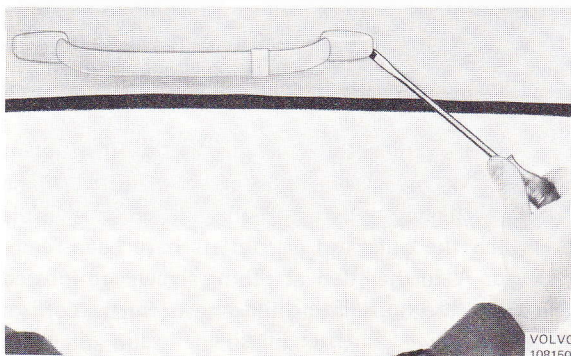
Points in brackets concern cars equipped with sun roof.

Removing

1. Disconnect the battery ground cable.
2. Remove rear seat cushion and back rest. Remove rear shelf with plastic covers and attachments for rear seat belts.
3. Remove side panels located between rear side window and rear window, otherwise they may get stained.
4. Disconnect the electric connections for the rear window heater.
5. Remove the rear window according to separate instructions.
6. Remove the interior rear view mirror by pressing it forwards. Remove the rear view attaching plate from the roof.



7. Remove attachments, incl. support bearings, for sun visors. Remove the sun visors.
8. Pry loose the interior light. Disconnect the wires.
9. Remove crank and gear. Remove the housing for the crank.
10. Remove curve handle and attachments over the door on the driver's side. Bend loose the trim cover to gain access to the screws.



11. Turn the plastic plugs at the rear edge a quarter turn to release the headlining.
12. Lift out the headlining through the rear window opening.
13. Pry loose with a screwdriver to remove panels on front door pillar. Pry loose upper cover strip on the windshield.

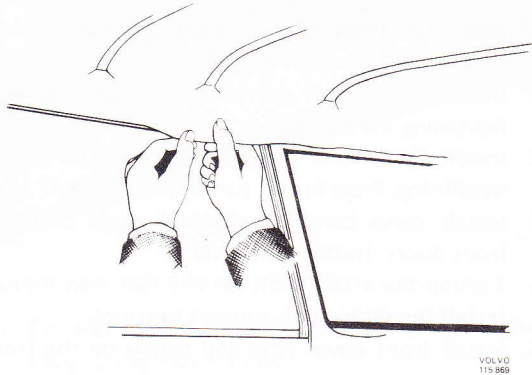
Installing

1. Insert the headlining through the rear window opening and position it on the roof.
2. Install rear view mirror attachment without tightening the screws.
3. Install the plastic plugs at the rear end of the headlining. Press in and turn a quarter turn.
4. Install curve handle and attachments over the front doors. Install trim covers.
5. Tighten the attachment for the rear view mirror. Install sun visors with support bearings.
6. Install front cover strip and panels on the front door pillars.
7. Connect and install the interior light.
8. Install the rear view mirror.
9. Install crank housing, gear and crank.
10. Install rear window. Connect the wires.
11. Install rear side panels. Install caps and attachments for rear seat belts.
12. Install rear shelf. Install rear seat.
13. Reconnect the battery ground cable.

Replacing headlining, 245

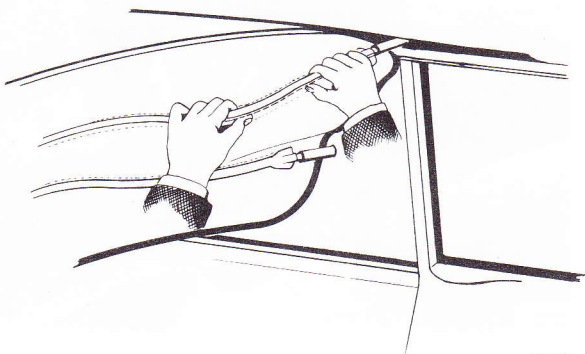
Op. No. 85104

1. Remove the interior light, sun visors, and rear view mirror.
2. Pull down the edge of the headlining with finger and thumb on one side so that the plastic edge can be released from its fastening in the rail.
3. Then pull down the headlining all round.



Removing headlining

4. Take down the stretchers beginning from the back by bending them down in the middle and releasing them from the edge of the roof.



Removing roof stretchers

NOTE: Be careful when removing and installing the stretchers. Careless handling can cause the ends to damage the roof plate.

5. Install the stretchers in the new headlining.
NOTE: the stretchers are different length. Make sure that they are provided with rubber caps at the ends.
6. Install the headlining by first inserting the stretchers beginning with the front one.
7. Stretch the headlining forwards and tuck in the plastic strip at the front edge.

8. Then stretch the headlining backwards by pulling both ends of a stretcher at the same time. Begin at the front and pull on each stretcher working backwards, after which the rear plastic strip can be tucked into its groove.
9. Now pull over the headlining towards one side and tuck in the plastic strip. Then stretch the headlining over towards the other side and tuck in the plastic strip.
10. Install the interior light, sun visors and rear view mirror.
11. Any folds in the fabric can be removed by pulling the headlining in the necessary direction. The headlining then moves in the attaching rails.

Instrument and control panel

Removing instrument panel

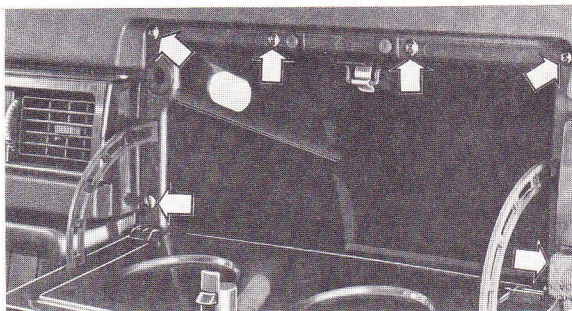
1. Disconnect the battery ground cable.
2. Remove steering wheel (Section 6 "Replacing steering wheel") and steering column covers.
3. Release the screws holding the switches for turn signal and wiper and thereafter the plastic casing in front of the steering wheel.
4. Remove the holder for the horn slip ring.
5. Remove the combined instrument according to instructions in Section 3.
Remove the steering wheel lock according to instructions in Section 6.
Take out the bulb holders in the combined instrument lights and the hub holder in the clock.
Disconnect the electric wire from the clock and the harness from the lower part of the instrument panel. A clamp is situated immediately under the clock and another underneath the combined instrument to the left.
9. Remove the heater side panels. Remove the hoses for the four air outlets on the instrument panel.
10. Remove both lower screws for the control panel and then tip it back as far as the wires permit.
11. Disconnect the electric wires to the glove locker light by opening the locker lid and pulling the entire light inwards. The wires are disconnected in this position.
12. Remove outboard air outlets and the light switch.
13. Remove the screws securing the instrument panel. There are three on each side of the firewall, two underneath and one which is visible when the outboard air outlets have been removed. A further two attaching screws are located above the upper attaching screws for the control panel.

14. Release the instrument panel from its attachment in the dashboard by pulling it backwards and at the same time lifting it over the control panel and the support legs.
15. Lift out the instrument panel.

Installing instrument panel

1. Check to make sure that the rubber bushings in the dashboard are not damaged. Otherwise replace them.
2. Place in the instrument panel with the guide pin in the rubber bushing and screw tight to the cowl sides and support legs.
3. Install light switch and outboard air outlets.
4. Install hoses between car heater and center air outlets in the instrument panel.
5. Install the bulb holder for the clock and hook up the electric cable to the clock.
6. Install the bulb holders to the combined instrument light and fix the cable harness to the instrument panel by the clamp.
7. Install steering wheel lock according to instructions in Section 6.
8. Install combined instrument according to instructions in Section 3.
9. Install the holder for the horn device slip ring onto the steering column.
10. Install the control for turn signal switch and windshield wipers, also hook up the electric cables to them.
11. Install casings over the steering column.
12. Install steering wheel, see Section 6.
13. Hook up the electric cables to the glove locker light.
14. Install the hoses to the outboard air outlets. Install center panels.
15. Install lower attaching screws for the control panel.
16. Connect battery ground cable. Check the function of the instruments and lamps in connection with this installation.

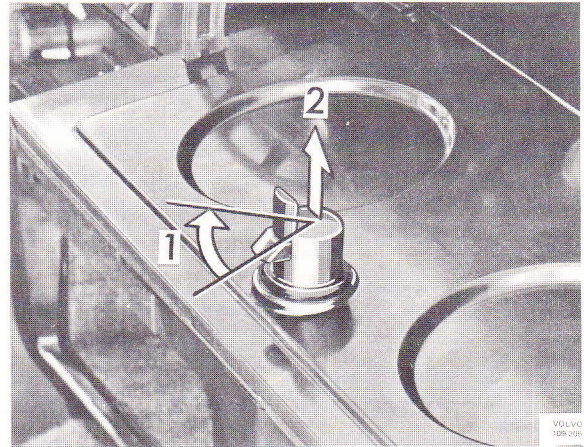
Removing glove box



Removing glove box

1. Remove six retaining screws and pull the glove box out of the dash board.

Replacing glove box lock



Replacing glove box lock

1. Turn the lock 1/4 turn counterclockwise and pull out the lock rearwards.
2. Position a new lock and turn it clockwise to stop.

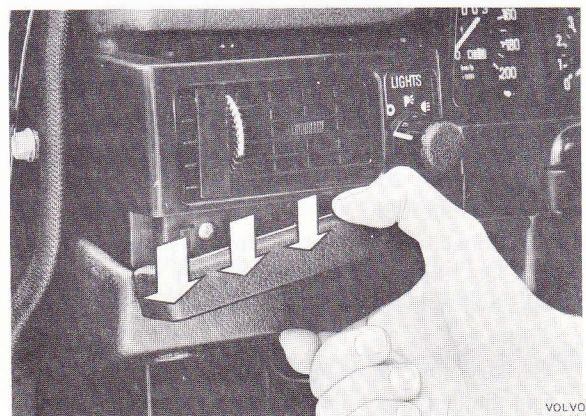
Control panel

Removal of the control panel can be started once the battery ground cable has been disconnected. Thereafter remove the panel attaching screws and lift the panel forwards until the wire connections are accessible. Note that the panel is attached by six screws. Two are underneath the panel. Mark the connections and disconnect them from their terminals. The panel can then be lifted out.

When re-installing, place the panel first in a suitable position, re-connect the wires and then place the panel in position. Thereafter screw tight and re-connect the battery ground cable.

Replacing outboard air outlet

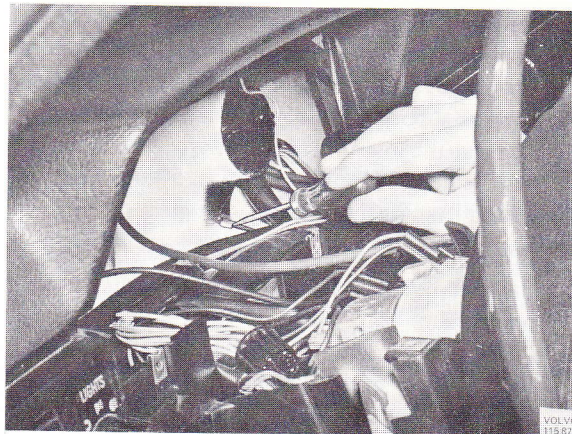
1. Pull off the knob of the main light switch.
2. Press the impact absorber moulding downwards.
3. Remove two retaining screws and the outlet.
4. Installation in opposite order.



Removing impact absorber moulding

Replacing center air outlet

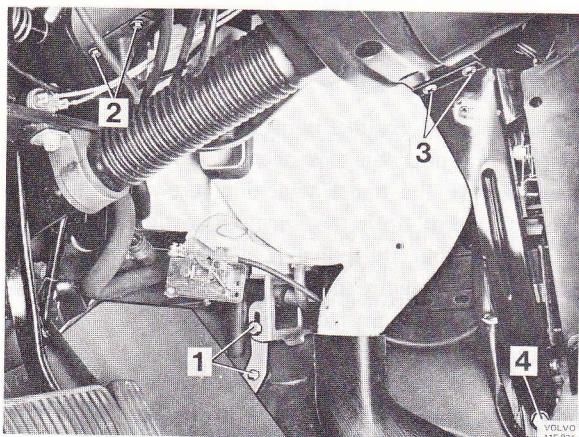
1. Loosen the control panel and pull it out slightly.
2. Press the impact absorber moulding downwards.
3. Remove the retaining screws and the outlets.
4. Remove the clock.
5. Installation in opposite order.



Removing clamps for outer end

Combined unit

Replacing turbine wheel, left side

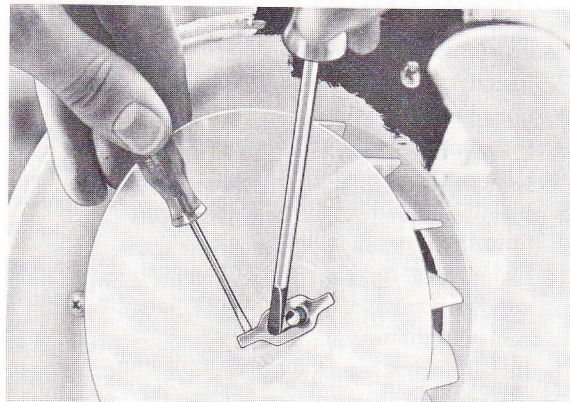


Central unit, left side

- | | |
|------------------------------|----------------------------------|
| 1. Screws for bottom bracket | 3. Upper screws for support legs |
| 2. Screws for upper bracket | 4. Lower screw for support legs |

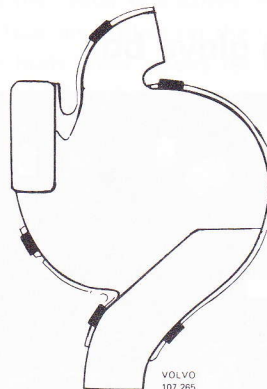
1. Disconnect the battery ground cable.
2. Fold the floor carpet to the one side and remove the side panels from the central unit.
3. Remove screws 4 and 5 for the control plate support legs on both sides, and move the plate as far back on the transmission tunnel as the electric wires permit.
4. Remove the attaching screw for the rear floor air duct so that the duct can be disconnected from the central unit.
5. Remove the combined instrument (see instructions, Section 3).
6. Disconnect vacuum hoses from vacuum motors for left defroster outlet and left floor outlet. Remove defroster nozzle and air duct to left air outlet.
7. Remove the air hose between the central unit and the left, inner air outlet.
8. Remove the clamps on the central unit outer end and remove the end:

9. Remove the turbine wheel locking with help of two screwdrivers.
Remove the turbine.



Removing locking for turbine

10. Place the new turbine wheel on the shaft and install the locking.
11. Install the outer end and check at the same time that the heater control valve capillary tube with rubber grommet is properly installed in the air duct.



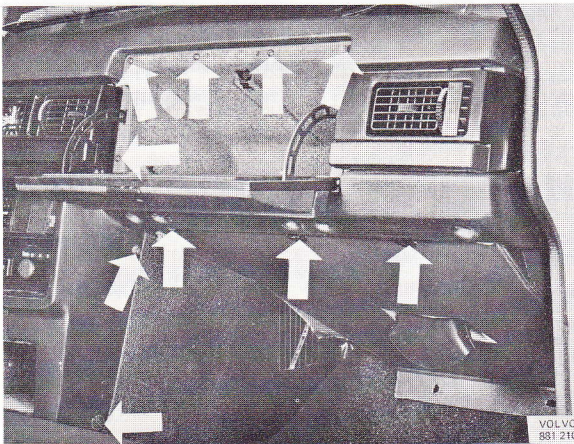
Placing clamps for outer end

12. Connect battery ground cable and make a function test.

13. Disconnect the battery ground cable.
14. Install the air duct between the central unit and the air vent.
15. Install the defroster nozzle and air duct and connect up the vacuum hose.
16. Install combined instrument (see instructions, Section 3).
17. Install the air duct to the rear floor.
18. Place the control plate and support legs in position and screw tight the support legs.
19. Put back the floor mat and install the side panels.
20. Re-connect the battery ground cable.

Replacing turbine wheel, right side

1. Perform points 1 to 4 under "Replacing turbine wheel, left side".
2. Remove right side panel, insulation panel, and glove box:



Removing panels and glove box

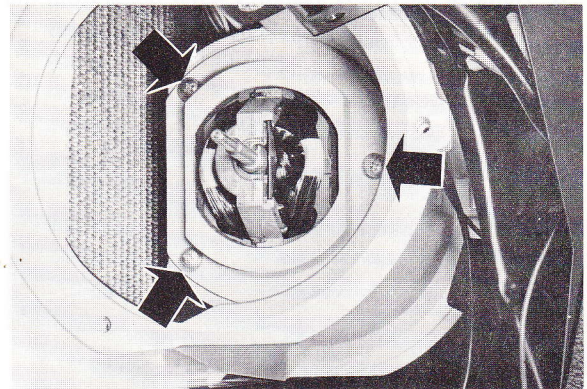
3. Disconnect the vacuum hoses from vacuum motors for right defroster nozzle and right floor outlet. Remove the defroster nozzle and the air duct to the right air outlet.
4. Remove the air duct between the central unit and the right inside air outlet.
5. Remove the clamps on the central unit outer end and remove the end.
6. Remove the turbine wheel locking with help of two screwdrivers and remove the turbine.
7. Place the new turbine wheel on the shaft and install the locking.
8. Install the outer end. Regarding the location of the clamps, see Fig. previous page.
9. Connect battery ground cable and make a function test.
10. Disconnect battery ground cable.
11. Install the hose between central unit and right inner air outlet.

12. Install defroster nozzle and air duct. Connect the vacuum hoses.
13. Install glove box, insulation panel and right side panel.
14. Perform points 17 to 20 under "Replacing turbine wheel, left side".

Replacing blower motor

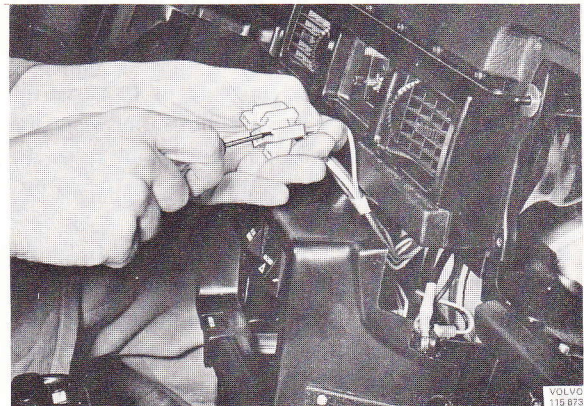
Op. No. 85406

1. Remove the right and left turbines according to previous instructions.
2. Move the heater control valve capillary tube to the one side.
3. Remove the left inner end from the central unit.
4. Remove the blower motor retainer:



Screws for blower motor retainer

5. Disconnect the contact unit from the blower motor control and disconnect the blower motor electric wires from the contact unit and the control plate:



Removing electric cables for contact unit

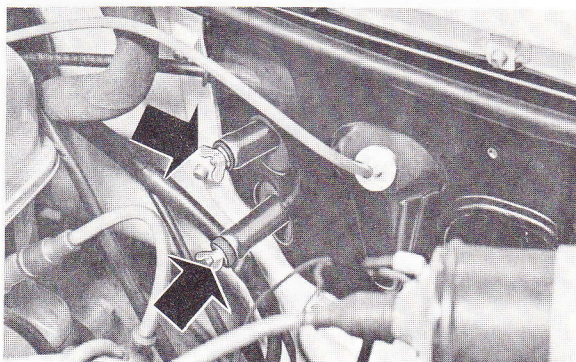
6. Remove the rubber grommet and pull down the electric wires through the right opening in the central unit.
7. Lift out the blower motor through the left opening.
8. Place the blower motor in position in the central unit and screw tight the retainer.

9. Pull through the electric wires and install the rubber grommet.
10. Connect the electric wires to the contact unit and the control plate, also connect the contact unit to the blower motor control.
11. Install the inner left end and adjust in the heater control valve capillary tube.
12. Install the turbine wheels according to previous instructions.

Removing central unit

The points in brackets apply only to vehicles equipped with air conditioning.

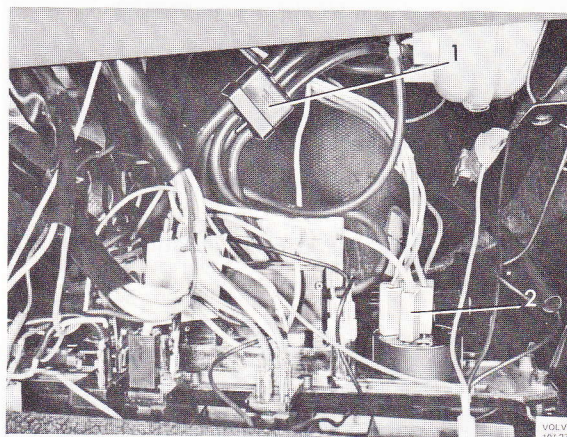
1. Drain the coolant.
2. Disconnect battery ground cable.
3. Remove the heater system's water hoses from the joint pipes in the firewall, and plug the pipes:



Installing plugs in heater system connection pipe

- (4). Remove clamps for the hoses to the evaporator and remove the firewall door without loosening the hoses to the evaporator.
 5. Remove the combined instrument (see instructions, Section 3), the air hose between the central unit and the left inner air vent, also the vacuum hoses from vacuum motors for left defroster nozzle and left floor outlet.
 6. Remove the left side panel for the central unit.
 7. Fold the floor mat out of the way and disconnect the rear floor air duct from the central unit.
 8. Disconnect the joint pipes for the heater system's water hoses from the firewall.
 9. Remove the upper and lower screws for the left support leg, and the screws for the upper and lower brackets, from firewall and transmission tunnel.
- NOTE: The screws for the upper bracket should only be slackened a couple of turns.
10. Remove the right side panel from the central unit.
 11. Remove right insulation panel and glove box.
 12. Remove the right side defroster jet, and the hose from the central unit to right center jet.

13. Fold the floor carpet out of the way and disconnect the rear floor air duct.
14. Remove the upper and lower screws for the right support leg, also the lower screws for the control panel.
15. Disconnect the ground wires from the control plate and the contact unit from the blower motor control 2.

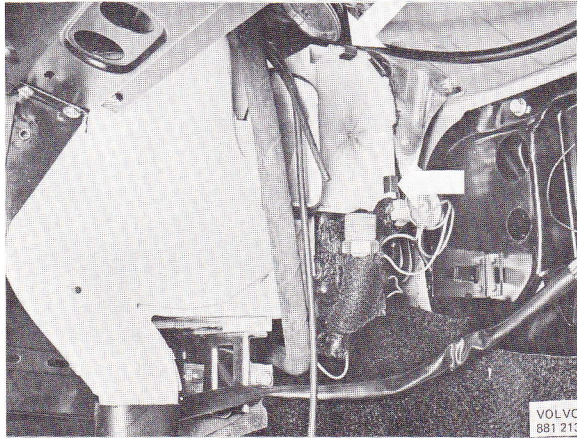


Control panel reverse side

1. Connector for vacuum hoses
2. Contact unit for blower motor control

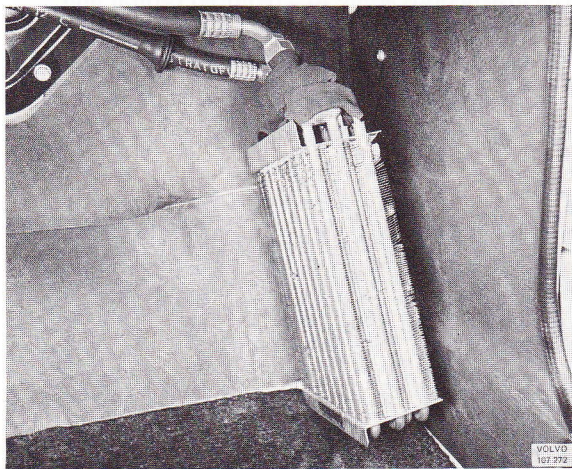
16. Disconnect the hot wire (thick yellow) from the contact.
17. Separate the connector 1 for the vacuum hoses and disconnect the vacuum tank hose from the connector.
18. Move the control plate as far back on the transmission tunnel as the wires permit.
19. Remove the screws, for the upper and lower brackets, from the firewall and the transmission tunnel.

- (20) Disconnect the thermostat attachment Fig. below, from the central unit, and both clamps securing the cover to the evaporator.



Cover for evaporator

- (21) Remove the evaporator from the central unit without disconnecting any of the refrigerant hoses, and place it at the right side of the cowl:



Placing evaporator on floor

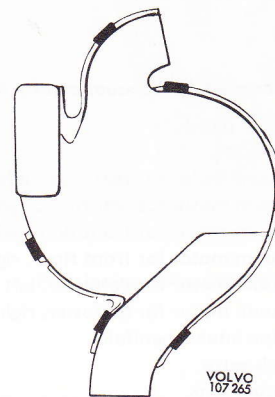
22. Remove the central unit right, outer end, turbine wheel and inner end.
23. Central unit.

Installing central unit

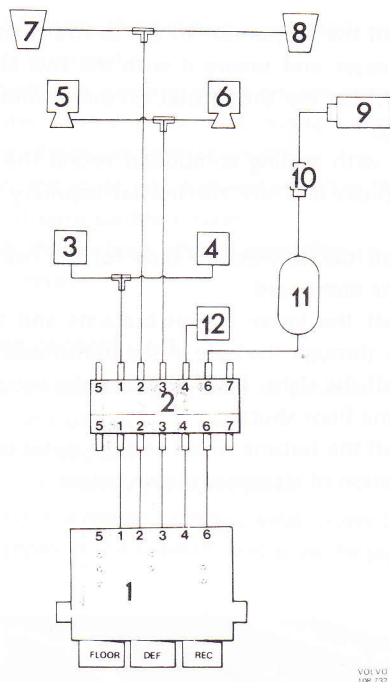
The points in brackets apply only to vehicles equipped with air conditioning.

1. Lift the central unit onto the right floor, and install the rubber seal for the air intake. Lift the central unit into position and insert the left, upper bracket over the screws on the dashboard. Install the right bracket screws and tighten the left ones.

- (3) Install the evaporator in the central unit. Put on the cover and secure it with the two clamps (1, Fig.), also the thermostat on the opening's lower flange.
4. Seal with sealing compound round the evaporator pipes and the thermostat capillary if necessary.
5. Install the connection pipe for the heater hoses to the dashboard.
6. Install the lower tunnel brackets and the drain hose through the hole in the transmission tunnel.
7. Install the right, inner end and the vacuum hose for the floor shutter.
8. Install the turbine wheel and the outer end. Location of clamps is shown below:



9. Install air hose between central unit and right, inner air outlet.
10. Install right defroster nozzle and connect vacuum hose.
11. Install glove box.
12. Install air duct to right air outlet.
13. Install air ducts for rear floor.
14. Install air hose to the left inner air outlet and adjust left defroster nozzle and connect its vacuum hose.
15. Install the combined instrument (see instructions, Section 3).
16. Put the connection piece of the vacuum hoses together and connect the hose from the vacuum tank.
17. Connect the hot wire (thick yellow) to the blower motor control contact unit, and connect the contact unit to the control.
18. Connect ground wires and screw tight instrument plate and support legs.
19. Fold back floor mat. Install control panel, side panels and insulation panels.



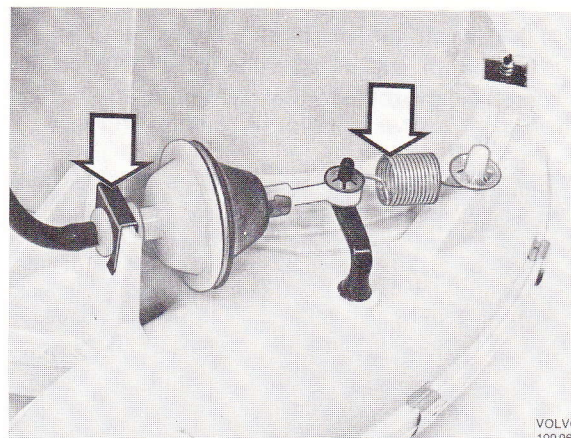
Lay-out diagram for vacuum control system

1. Control panel
2. Connector
3. Vacuum motor for rear floor, left
4. Vacuum motor for rear floor, right
5. Vacuum motor for front floor, left
6. Vacuum motor for front floor, right
7. Vacuum motor for defroster, left
8. Vacuum motor for defroster, right
9. Engine intake manifold
10. Check valve
11. Vacuum tank
12. Vacuum motor for air intake cover

20. Connect the heater system water hoses to the connection pipes on the dashboard.
- (21) Install the firewall door and clamp the refrigeration hoses in the engine compartment.
22. Fill coolant.
23. Re-connect battery ground cable and function test.

Replacing vacuum motor for rear floor air shutter

1. Disconnect the battery ground cable.
2. Remove the side panel for the central unit, right or left depending on the vacuum motor to be replaced.
3. Remove the upper and lower screws for the support legs and lift the control plate to the one side.
4. Disconnect the vacuum motor locking from the shutter shaft and attachment (Fig.), and motor with vacuum hose.



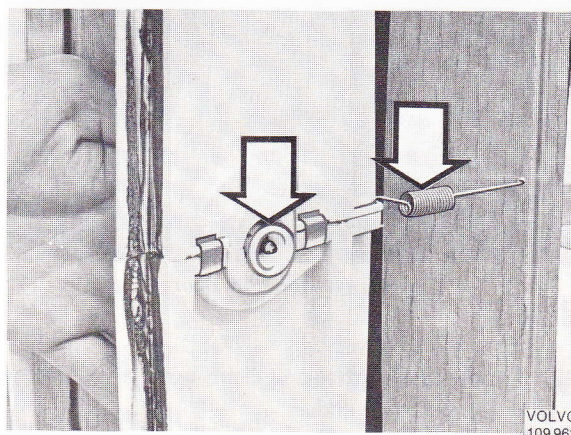
Vacuum motor for air shutter to rear floor

5. Transfer the hose to the new vacuum motor.
6. Place the vacuum motor in position and install the locks.
7. Install the control plate, support legs and side panel.
8. Re-connect battery ground cable and function test.

Replacing vacuum motor for central unit air intake

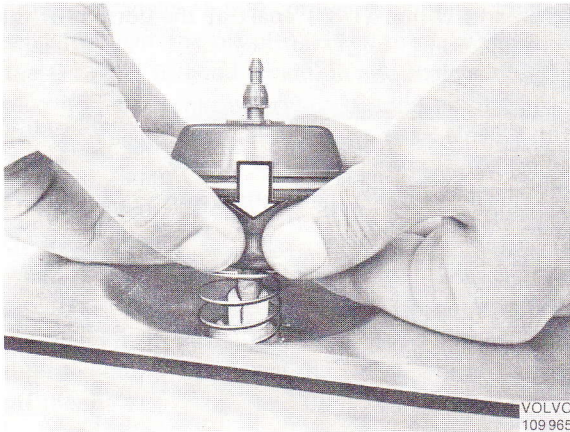
The instructions apply to a removed central unit.

1. Remove hose from vacuum motor.
2. Pry loose the vacuum motor outer plastic lock, see Fig. below. Remove the vacuum motor from the housing and remove the spring.



3. Unhook the return spring from the air shutter.
4. Remove the shutter shaft locks (1, Fig. above). Push the shutter towards one side to free one end of the shaft. Then release the other end. Pull out air shutter with vacuum motor from the housing.
5. Pry loose the vacuum motor inner plastic lock, in the air shutter. Remove vacuum motor and spring.

6. Position the spring and install a new vacuum motor in the air shutter, see below. Use a new plastic lock.



7. Position air shutter with vacuum motor in the housing. Insert the shutter shaft in the housing. Install the shaft locks.
8. Hook on the air shutter return spring.
9. Position the spring and install the vacuum motor in the housing. Use a new plastic lock.
10. Reconnect vacuum hose to the vacuum motor.

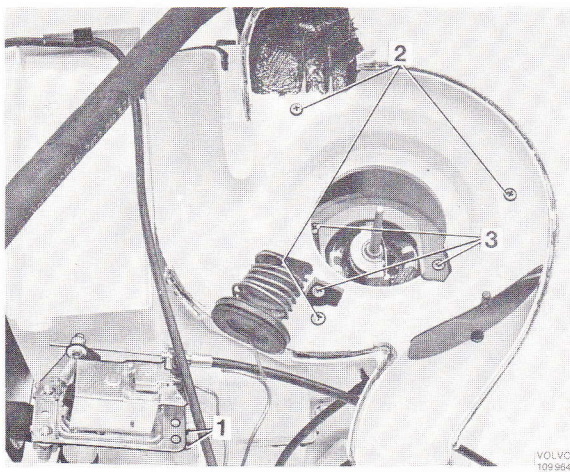
Heating System

Removing cell assembly

Heater Core, replace	Op. No. = 85404
Heater Core, pressure test and repair (solder), heater core removed	= 85479

The instructions apply to a removed central unit.

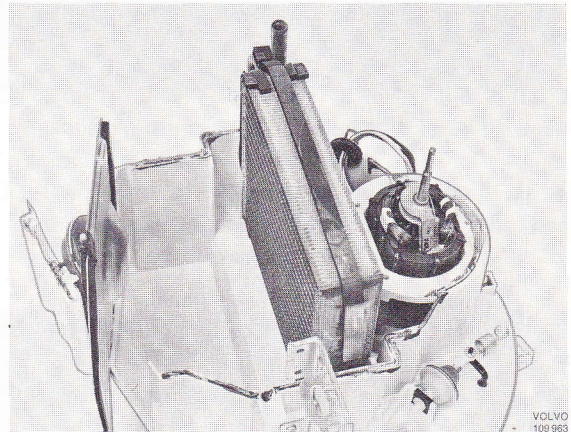
1. Remove the left outer end and turbine wheel (see previous instructions).
2. Unscrew the two left screws for the tunnel bracket 1:



Disassembling central unit

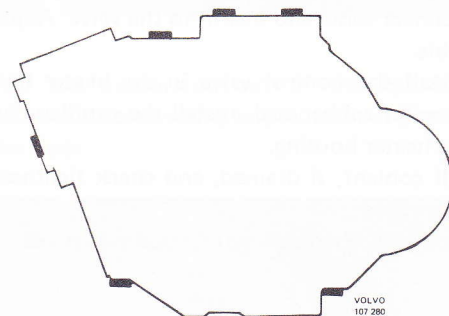
1. Screws for lower bracket
2. Shutter shaft locking
3. Screws for inner end
4. Screws for blower motor holder

3. Remove the air intake left shutter shaft lock.
4. Remove the screws 3 for the inner end and lift off the end.
5. Remove the screws 4 for the blower motor retainer.
6. Disconnect the water hoses from the cell assembly.
7. Remove the clamps for the central unit's middle joint, lift off the left half and remove the cell assembly.
8. Place the new cell assembly with insulation in position in the right half of the central unit.



Positioning cell assembly

9. Install the left half. For location of clamps, see Fig below:

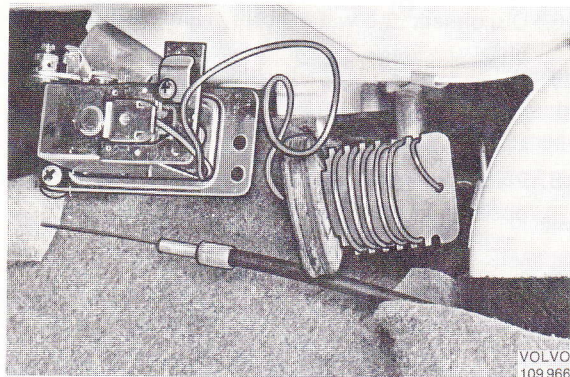


Location of clamps for middle connector

10. Install the retainer for the blower motor.
11. Install the inner end, turbine wheel and outer end.
12. Install the attaching screws for the tunnel bracket.
13. Install the shutter shaft locking for the air intake.

Replace heater control valve

Op. No. 85464



Heater control valve

1. Capillary tube
2. Heater control valve
3. Retaining screws

1. Remove central unit left side panel.
2. Unfold floor mat and put rags under the valve to protect against water spill.
3. Pull loose the control valve from the heater housing. Use tongs to block the water hoses or drain the coolant.
4. Disconnect cable and sheath from the control valve.
5. Disconnect the capillary tube from the heater housing. Disconnect the coolant hoses at the control valve. Remove the valve.
6. Transfer the bracket to the new valve.
7. Connect the coolant hoses to the valve. Remove tongs.
8. Connect cable and sheath to the valve. Adjust the cable.
9. Install the control valve in the heater housing. Transfer rubber seal. Install the capillary tube in the heater housing.
10. Fill coolant, if drained, and check tightness and operation.
11. Fold back the floor mat. Install side panel.

Cooling system

Strict cleanliness must be observed when working on an air conditioning system.

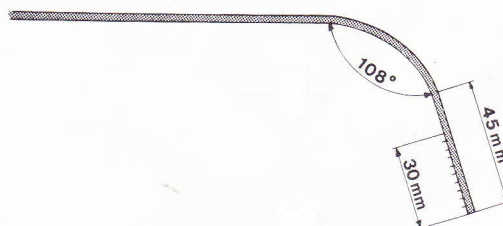
The vacuum pumping is also very important.

Any dirt, moisture or air remaining in the system will impair capacity and operation.

Checking oil level in compressor

For checking the oil level in the compressor use a dipstick with measurements according to Fig.

Suitable material is a 3 mm (1/8") brass wire. Make ten marks 3 mm (1/8") apart at the bottom of the stick.

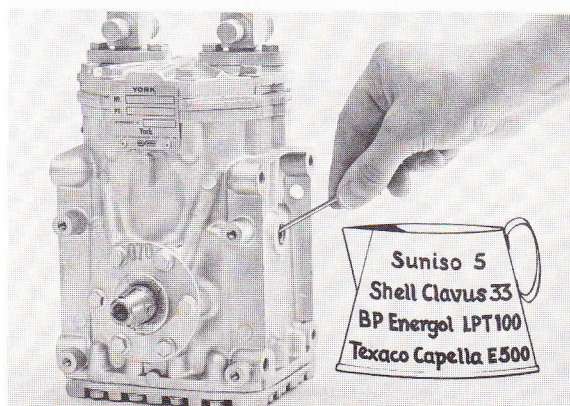


Oil dipstick for compressor

When making an oil check with an installed compressor, it is important that the refrigerant is emptied before the oil plug is screwed out. Due to the fact that the compressor's crankcase is connected to the rest of the system, refrigerant will otherwise spurt out through the filler hole and take with it at the same time any oil left in the compressor. Drain refrigerant by connecting the pressure gauge hoses to the service valves. Before connecting the hoses, check to make sure that the valves on the pressure gauges are closed. NOTE: Use rubber gloves as protection when emptying the refrigerant.

The blue hose is connected to the suction side of the compressor marked "suction" the red hose to the discharge side marked "disch" and the white hose is led into and exhaust suction hose. The valves are then opened slowly otherwise there is risk of the compressor oil accompanying the refrigerant.

When checking the oil level, hold the dipstick so that the graduated part is vertical to the compressor bottom.



Check oil level in compressor

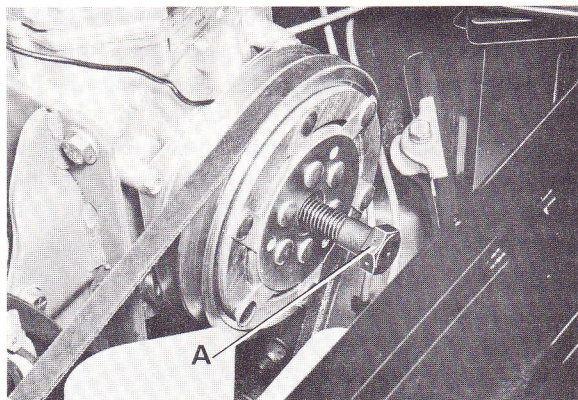
Correct level is 1.10–1.14" = 28–29 mm. 0.3 dm³ = 0.3 qt. When filling, use only refrigerant compressor oil:

Suniso 5, BP Energol LPT 100, Shell Clavus 33, Texaco Capella E 500 or corresponding. Before screwing tight the oil plug, check to make sure that the O-ring is in good condition and that neither the plug nor the crankcase sealing surfaces are damaged. The oil plug is tightened to a torque of 5 Nm 3.5 lbft.

Replacing compressor clutch

Op. No. 85506

When replacing the compressor solenoid clutch, first disconnect the pulley center bolt. Thereafter remove the pulley with the help of a 5/8" UNC bolt, which is threaded into the center of the pulley, which is pulled off the shaft

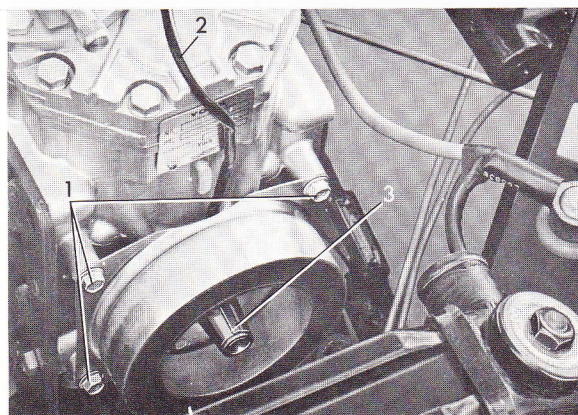


VOLVO
107 285

Removing pulley

A. Bolt 5/8" UNC

The solenoid is retained by four bolts:



VOLVO
107 286

Removing solenoid

1. Attaching screws for solenoid
2. Electric cable
3. Key

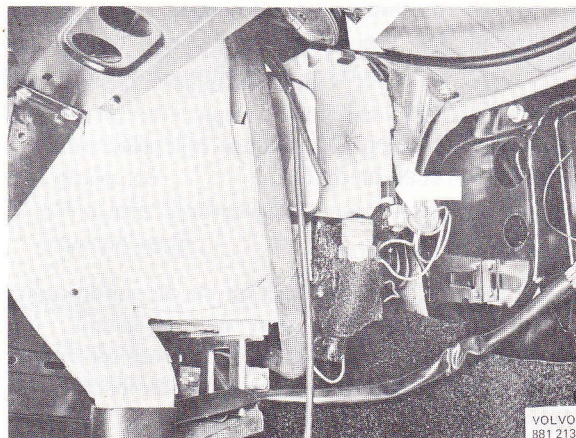
When installing the solenoid, turn it so that the wire 2 is up. Before installing the pulley, check that the key 3 fits properly in the shaft groove. Tighten the pulley center bolt to a torque of 25–30 Nm = 18–22 lbft. When tightening the center bolt, the simplest way to lock the clutch is by switching on the current and holding the pulley with the compressor belt. Then check by rotating the pulley several revolutions that it does not slip in the solenoid.

Replacing thermostat

Op. No. 85512

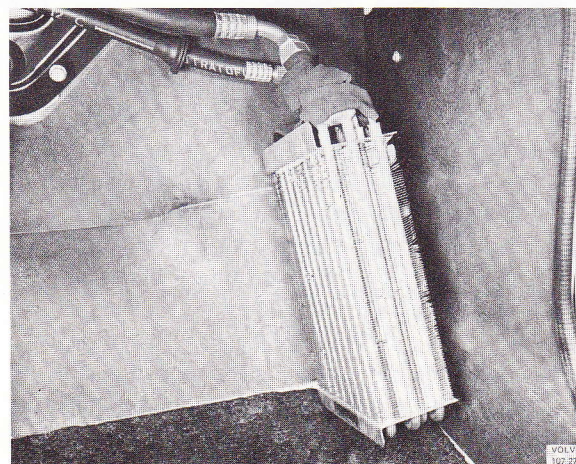
The thermostat can be replaced without emptying the system of refrigerant.

1. Release the clamps for the evaporator hoses in the engine compartment.
2. Remove the receiver-drier from its bracket and place it as near the cowl as the hose between drier and condenser permits.
3. Disconnect the thermostat attachment 1 from the central unit and both the clamps 2 holding the cover on the evaporator.



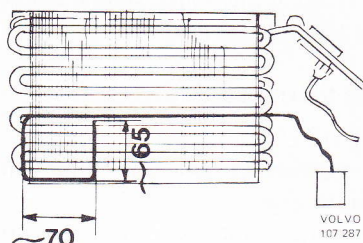
VOLVO
881 213

4. Pull the evaporator out of the central unit without disconnecting any hoses and place it on the floor:



VOLVO
107 272

5. Remove the thermostat with capillary.
6. Insert the new thermostat capillary in the evaporator and bend it according to the measurements shown below. It is important that no sharp bends are made on the capillary.



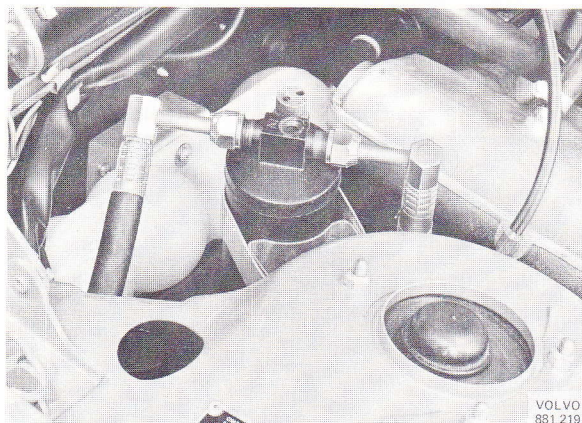
Location of capillary tube in evaporator

7. Install the evaporator in the central unit. Secure the cover with the two clamps and fix the thermostat to the lower flange. With sealing compound seal all round the evaporator pipes and thermostat capillary if necessary.
8. Install the receiver-drier and clamp the refrigerant hoses securely in position in the engine compartment.

Replacing receiver-drier

Op. No. 85510
(excl. leak test and charge)

Each time work is carried out on the air conditioning system involving evacuation of refrigerant, the receiver-drier should be replaced. The receiver-drier is removed by disconnecting the hose connections as well as the two bolts for the bracket.



Receiver-drier

The condensor hose is connected to the connection marked "IN". The hoses should be provided with O-rings.

Filling refrigerant

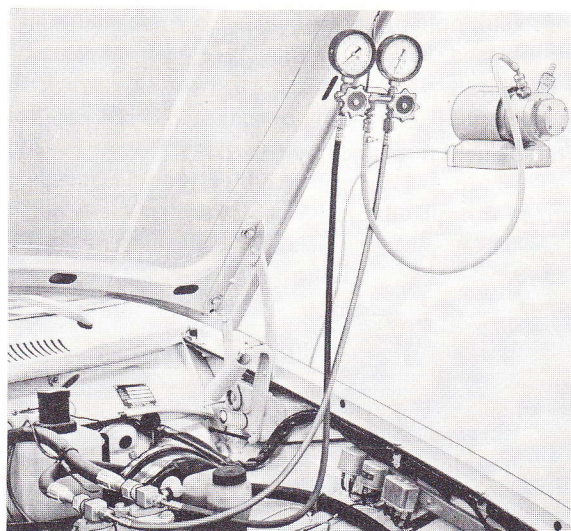
Op. No. 85501 = vacuum pump, leak test and charge
Air Conditioner.

The air conditioning system, may only be filled with refrigerant of type Freon 12 (dichlorodifluorometan). During the filling, which is divided up into the stages – vacuum pumping, leak test and filling – a suitable balance for weighing the refrigerant container is necessary in addition to the equipment shown in front of this Section.

NOTE: Before starting the filling, check that the pressure gauges and hoses are properly tightened in the distributing piece and that the valves are closed. Check also that there are spacers on the end nipples on the hoses that are connected to the compressor and vacuum pump or refrigerant can.

Vacuum pumping

1. Remove the cap nuts from the compressor valves.
2. Connect the low-pressure gauge hose, the blue one, to the suction side of the compressor (marked "suction" on top of the compressor), and the high-pressure gauge hose, the red one, to the discharge side (marked "disch"). The middle white hose is connected to the suction side of the vacuum pump:



Connecting vacuum pump

NOTE: The packings in the nipples must only be tightened with the fingers when they are connected in order not to damage them.

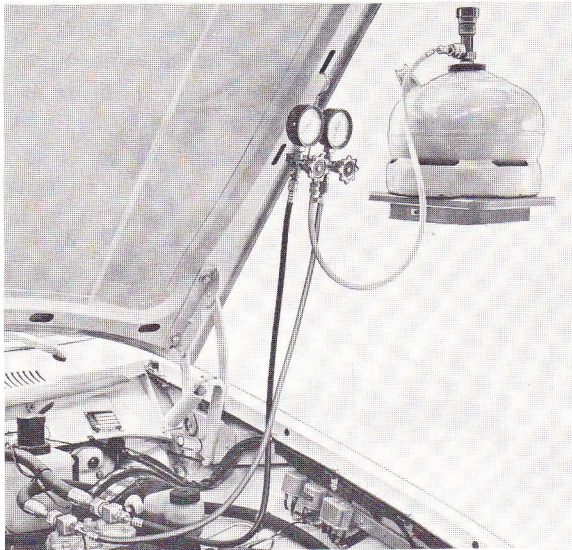
3. Start the vacuum pump and then open both the valves at the pressure gauges slowly and simultaneously.

NOTE: With all pressures balancing in the system, the valves should be opened very slowly otherwise there is risk of the compressor oil being sucked out.

4. Let the vacuum pump run until the low-pressure gauge indicates a vacuum of about 28" below atmospheric pressure. This vacuum is generally obtained quite quickly, but in order to be sure that all moisture has been removed from the system, the pump should be driven for at least 60 minutes at a temperature of below 30°C = 86°F and at least for 30 minutes at temperatures above 30°C = 86°F. Thereafter close the pressure gauge valves and stop the pump.
5. If a vacuum of 28" does not arise or if it drops a lot after the valves have been closed, there must be leak in the system, which is easy to trace. After correcting the leak, repeat points 3 and 4.

Leak test

1. Disconnect the white hose from the vacuum pump and connect it to the refrigerant can:

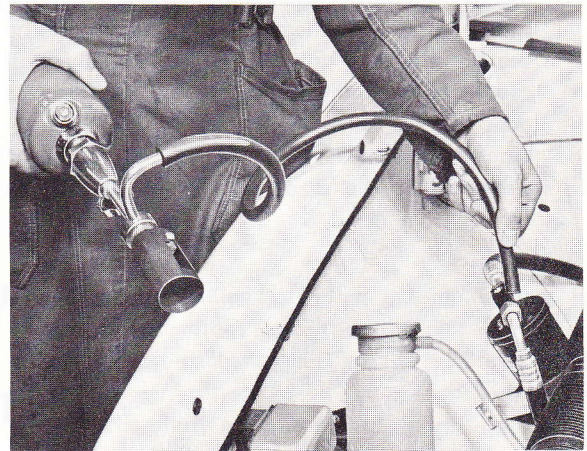


Connecting refrigerant can

NOTE: Under no circumstances whatsoever may the refrigerant can be placed on its side or inverted. It must always be upright while the system is being filled, otherwise fluid will be sucked into the compressor and damage it.

2. Open the valve on the refrigerant can and both the valves at the pressure gauges.
3. When the whistling sound ceases, there is pressure balance in the system, and about 100 grams = 3 1/2 oz refrigerant left in it. By letting all the valves remain open, this situation will remain even if there is a leak in the system.

4. Light the leak detector and check the entire system at all the connections by holding the end of the hose next to the connection (Fig. below). If there is leak, the color of the flame will change to blue-green.



Leak test

Check the entire system even if leaks are discovered at an early stage.

NOTE: in all cases where gas might escape, hands and bare skin should be protected with rubber gloves, etc.

5. If a leak is discovered, seal it and then test the system again.

Filling

1. Shut off the valves on the refrigerant can and the pressure gauges.
2. Disconnect the hose from the refrigerant can and insert it in an exhaust suction hose. Slowly open the valves at the pressure gauges and release the gas in the system. By releasing 100 grams = 3.3 oz of refrigerant, the air in the system accompanies it and this results in an effective drying of the system. Moisture is bad for the air conditioning system since it can easily freeze and plug the TEV valve at the evaporator unit.
3. When the pressure gauges indicate zero, close the valves on the gauges. Connect the white hose to the vacuum pump. Start the pump and open the valves slowly. Allow the pump to go for about two minutes after the low-pressure gauge has shown 28" below atmospheric. Then close the valves and stop the pump.
4. Disconnect the hose from the vacuum pump and connect it to the refrigerant can.
5. Place the can on a balance and read the weight with the hose connected.
6. Open the valves on the refrigerant can and both the pressure gauges. When the whistling sound

ceases, close the valve on the high-pressure gauge.
NOTE: This valve must not be opened while the work is in progress.

7. Connect the tachometer and the exhaust hose. Start the engine and run it at about 33 r/s = 2000 rpm. Set the cooling control to maximum cooling and the blower to maximum speed. Open the car doors and let them stay open otherwise the vehicle will cool down internally and this will cause the solenoid coupling on the compressor to cut out.
8. When the balance shows 1100 grams = 38.8 oz less than at the reading in point 5, and the

bubbling in the receiver-drier sightglass stops, lower the engine speed to idling and close the low-pressure gauge valve. If no bubbles are observed in the sightglass at idling, then the filling is completed. If there are still bubbles in the sightglass proceed as follows: Open the low-pressure gauge valve, raise engine speed and add 50 grams = 2 oz of refrigerant.

9. Close the valves on the low-pressure gauge and the refrigerant can. Stop the engine. Disconnect the hoses and screw tight the compressor cap nuts.

Group 86

Bumpers

Op. No.

86134 =remove and install front bumper

86136 =remove and install rear bumper

86189 =replace front bumper strip, bumper removed

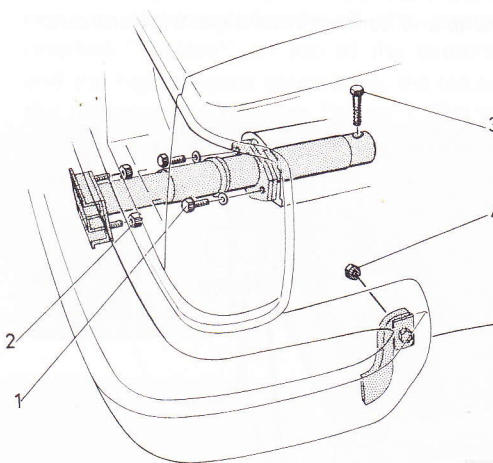
86191 =replace rear bumper strip, bumper removed

86206 =replace front bumper shock absorber, bumper removed

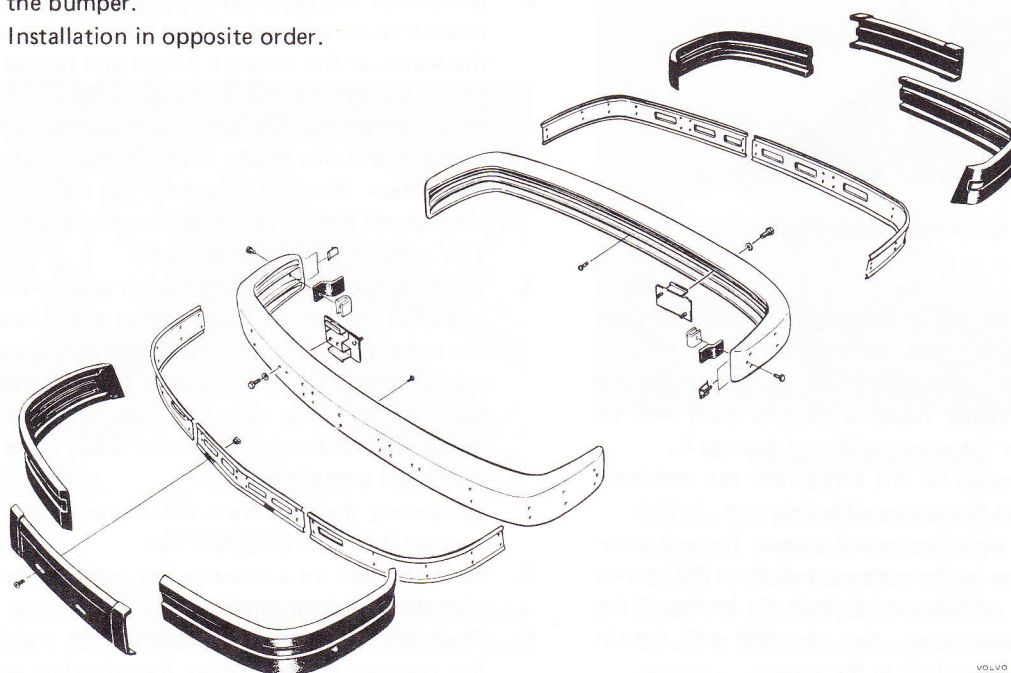
86208 =replace rear bumper shock absorber, bumper removed

Removing/installing bumper

1. Remove the retaining plates (4).
2. Remove the nuts (2) for the bracket and lift off the bumper.
3. Installation in opposite order.



VOLVO
109 145



VOLVO
109 137

Impact absorbers

The impact absorbers are partly gas filled and no welding on or close to them is permitted. Heating may expand the gas to such an extent that the impact absorbers are blown.

If therefore oxy-acetylene cutting must be performed to remove the impact absorbers, the gas pressure should first be released.

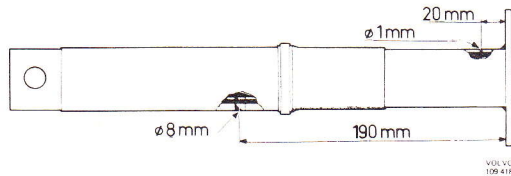
There are two brands of impact absorbers:

Fichtel & Sachs

Boge

To release the gas pressure, proceed as follows:

Fichtel & Sachs

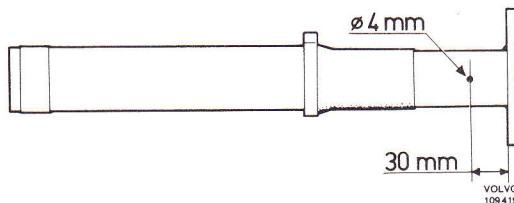


Place the impact absorber horizontally. To release the gas, drill a hole 1/32" (1 mm) diam. approx. 3/4" (20 mm) from the end, as shown above.

Then drill a second hole, 5/16" (8 mm) diam. approx. 7.5" (190 mm) from the end. The holes should be positioned 180° opposite each other.

NOTE: Use safety glasses when drilling.

Boge



Place the impact absorber horizontally. To release the gas, drill a hole 5/32" (4 mm) diam. approx. 1.06" (30 mm) from the end, as shown above.

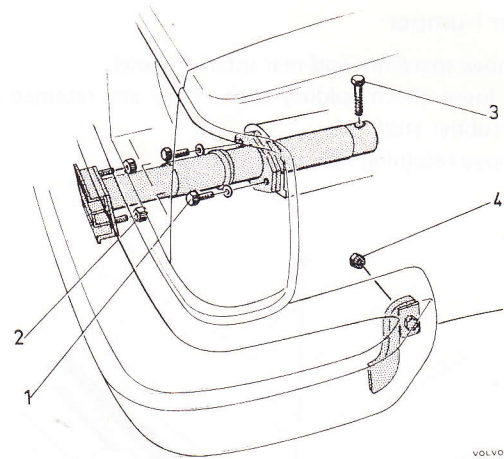
NOTE: use safety glasses when drilling.

After holes have been drilled, cutting can safely be performed.

Before scrapping, a damaged or otherwise replaced impact absorber should be emptied by drilling holes.

Replacing

1. Remove the bumper as previously described.
2. Remove two retaining bolts (1) for the bracket.



3. Remove retaining bolt (3) in the side member. It is accessible from inside the trunk. Remove impact absorber. Pull off the bracket and the spacer.

NOTE: empty gas before scrapping.

4. Attach bracket and spacer to the new impact absorber.
5. Position the impact absorber and fit the bolt from the side member.
6. Install bracket bolts.
7. Install bumper.

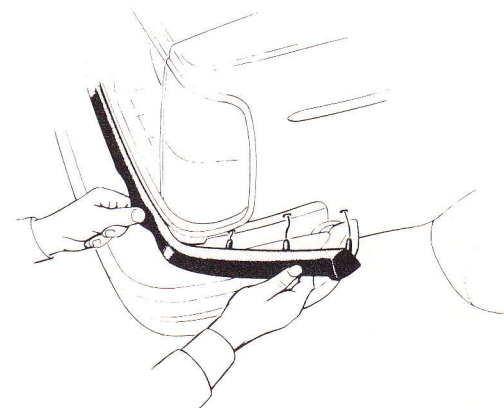
NOTE: do not confuse front and rear impact absorbers. The rear ones have a shorter stroke.

Removing and installing bumper cover moulding

Front bumper

The rubber cover is retained by integral snap-in studs. When removing, pull out the moulding so that the studs come loose.

Be careful not to tear off the studs.



When installing, position the moulding and pull in the studs with pliers.

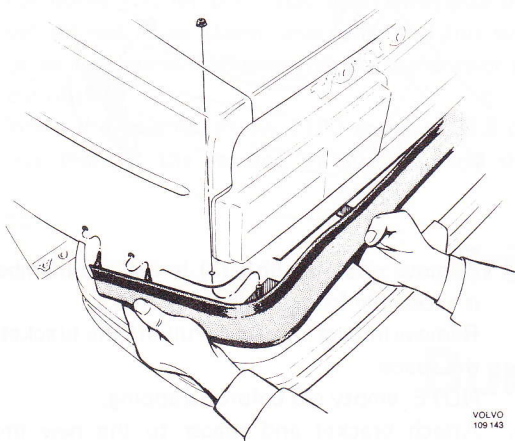
Installation is facilitated if the studs are lubricated with soap solution.

Rear bumper

Remove spare tire and rear interior panel.

Pull loose the moulding ends. They are retained by two rubber studs.

Remove retaining nut, both sides.

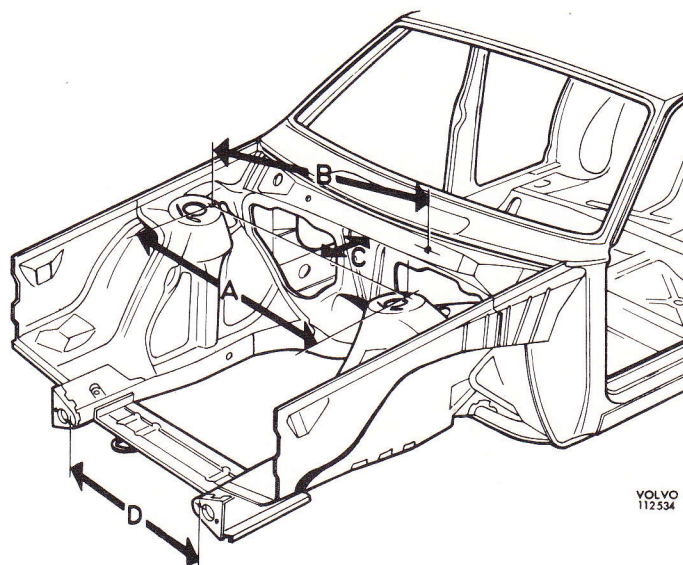


Pull out rubber cover, complete with retaining bars, from rear panel.

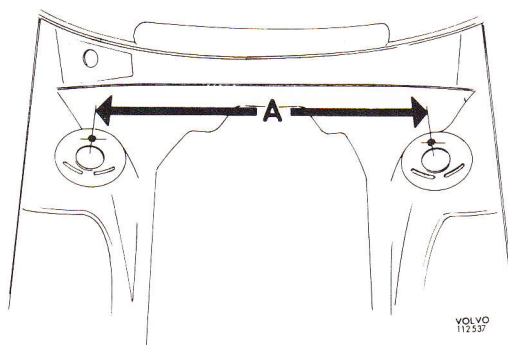
Installation in opposite order. Check that the retaining bar clips lock securely.

Replacing bumper face rubber mouldings

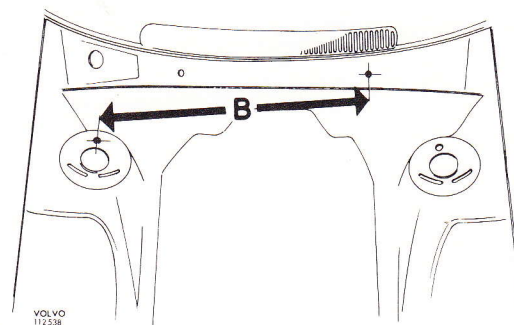
1. Remove the bolts retaining the bumper to the bumper shock absorber.
2. Lift out the bumper.
3. Remove the bars, retaining the rubber mouldings, from the bumper bar.
4. Disengage the rubber mouldings from the bars.
5. Install the new rubber mouldings by folding them over the retaining bars.
6. Install the units (retaining bars and rubber mouldings) to the bumper bar.
Use a small screwdriver to find the bolt holes.
7. Attach the bumper bar to the bumper shock absorber.



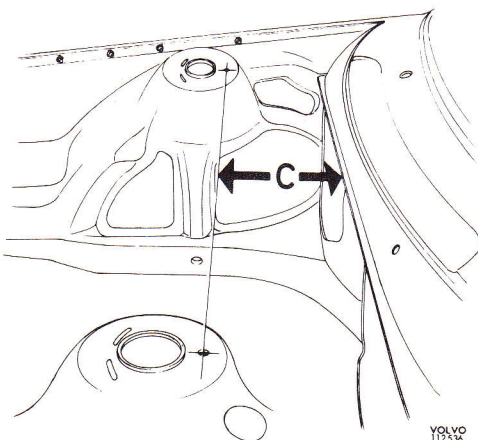
VOLVO
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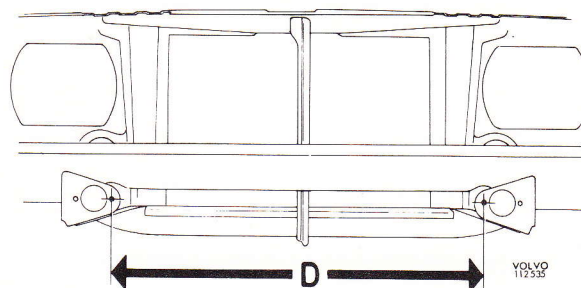
VOLVO
112537



VOLVO
112538



VOLVO
112536



VOLVO
112535

Front end

A = distance between center of holes
(hole diam. 9 mm = 0.354")

A = 1020±2 mm

A = 40.078"—40.236"

B = distance between center of holes
(hole diam. 9 and 16 mm =
0.354" and 0.630")

B = 855.5 mm

B = 33.602"—33.740"

C = distance between center of hole
(diam. 9 mm = 0.354") and flange
face

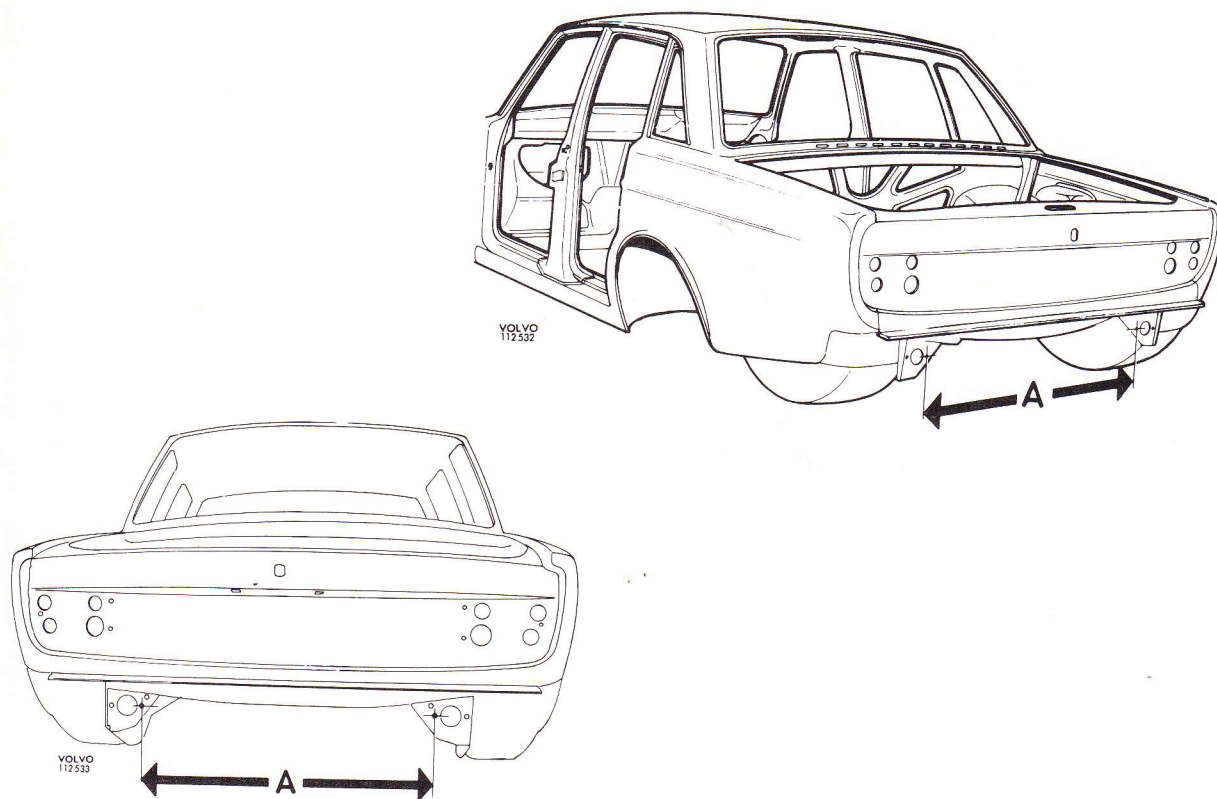
C = 236.2 mm

C = 9.212"—9.370"

D = distance between center of holes
(diam. 10 mm = 0.393")

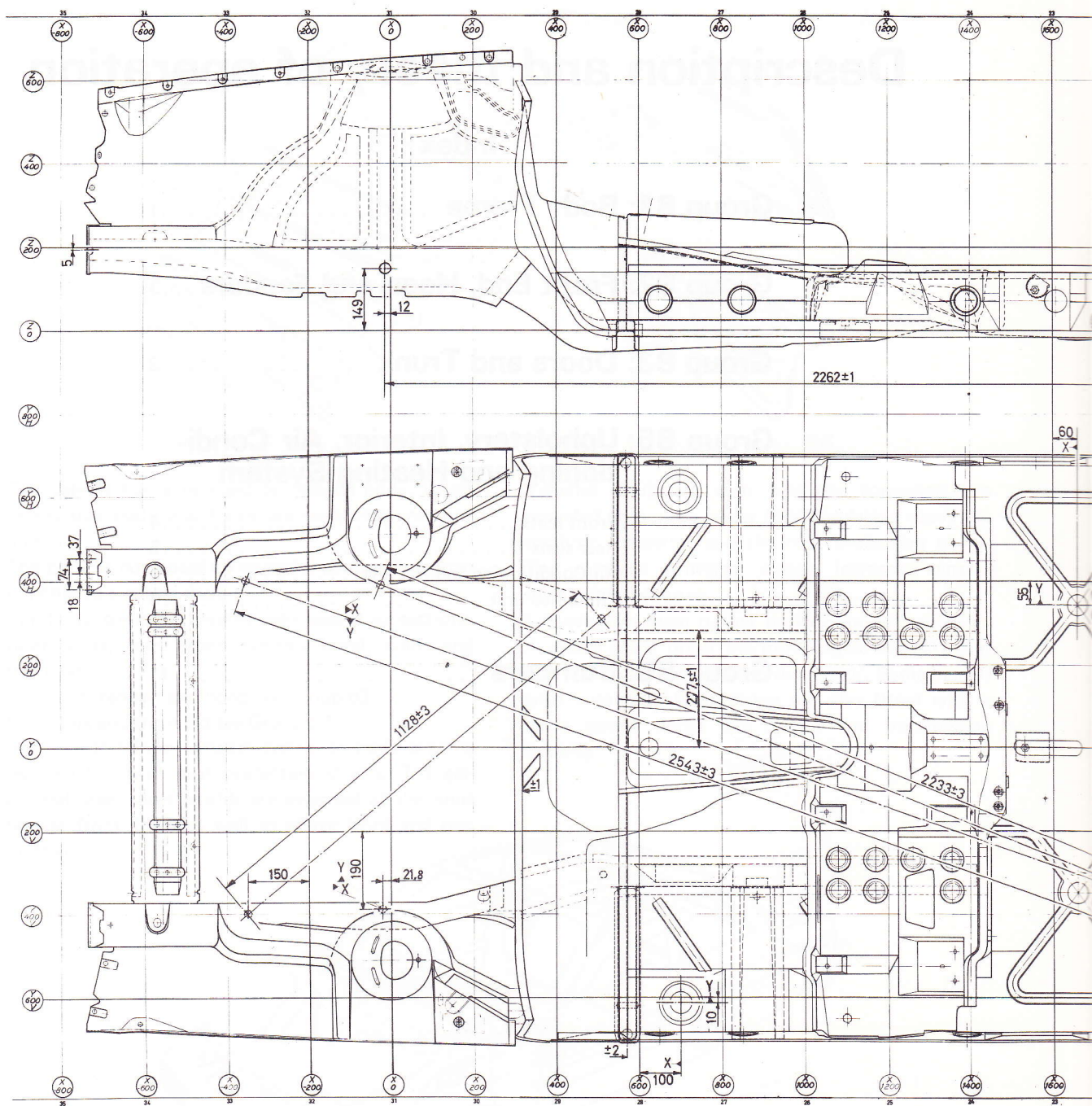
D = 762.2±2 mm

D = 2.992"—3.008"

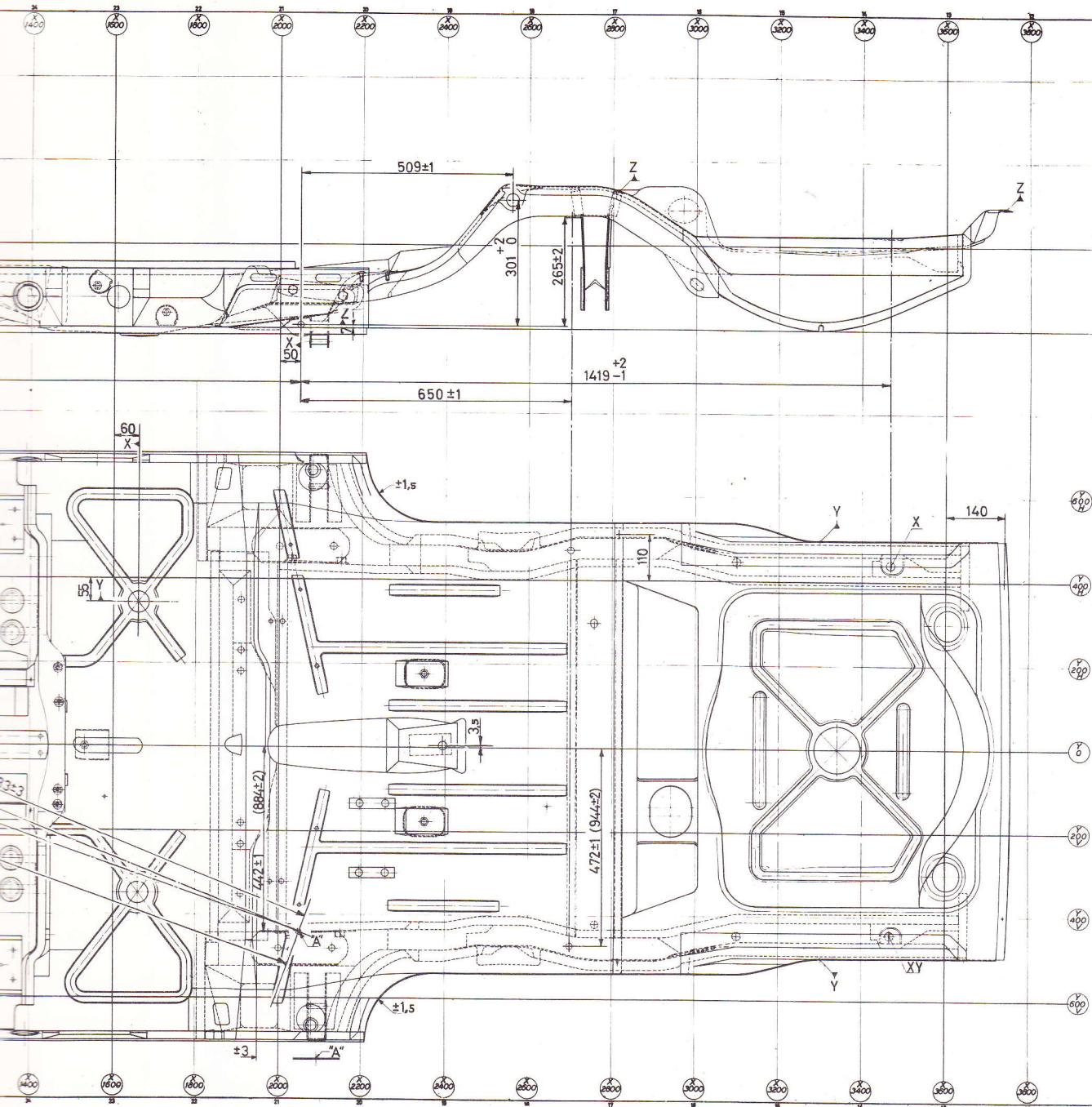


Rear end

A = distance between bumper shock absorber attachments, center of hole
(hole 10 mm = 0.394")
A = 812±2 mm
A = 31.89"—32.05"



**Floor plans
242, 244, 24**



VOLVO
112539

or plans
2, 244, 245

Section 8

Body

Description and theory of operation

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Group 85: Upholstery, Interior, Air Conditioning and Heating System

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Rear seats5

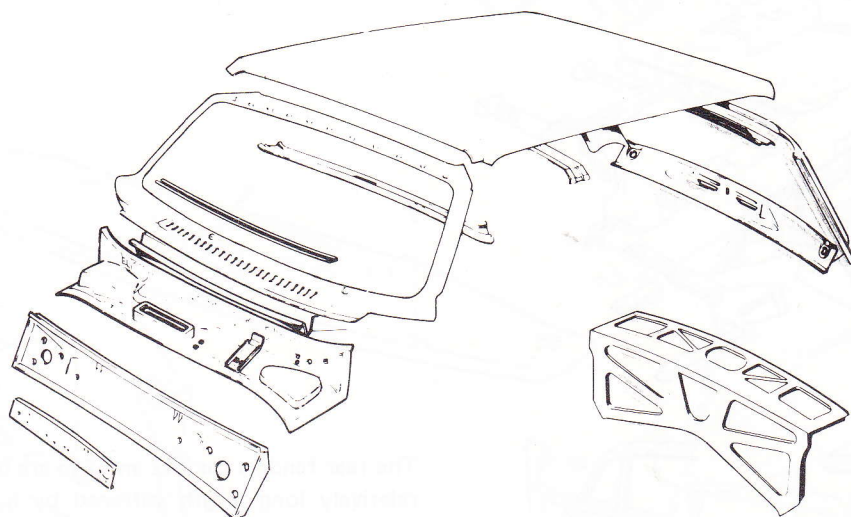
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Group 81

Body Frame



VOLVO
115 874

The vehicle has a unitized or integral body, which means that body and frame are composed into one unit.

The body is composed by several sheet panels welded together to a strong shell.

The body could be divided into several subsections: floor, sides, roof, front, fenders, hood, doors and trunk lid.

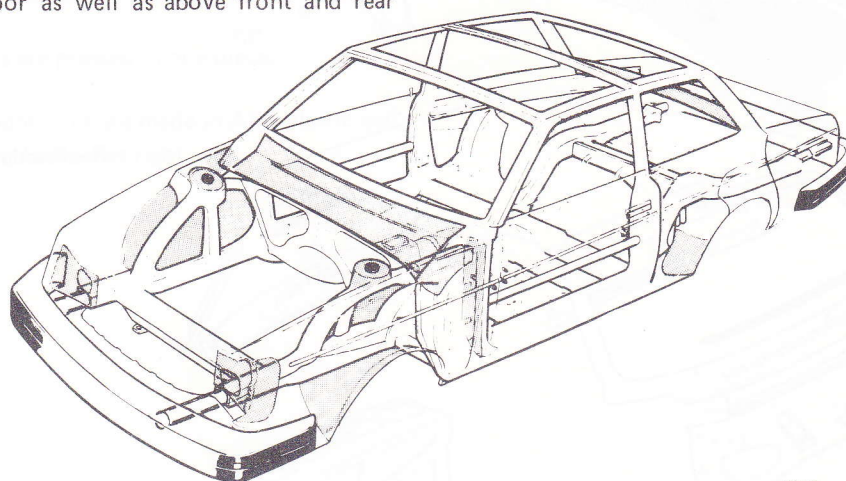
For front, fenders and hood see Group 82.

For doors and trunk lid see Group 83.

Heat transfer from exhaust system to body is being reduced by three heat protection shields. The galvanized steel sheet shields are attached at the joint firewall-front floor as well as above front and rear mufflers.

Vehicles equipped with catalytic converters are provided with extra heavy floor insulation above the catalytic converter and the heat protection plates. The catalytic converter system increases exhaust system temperatures.

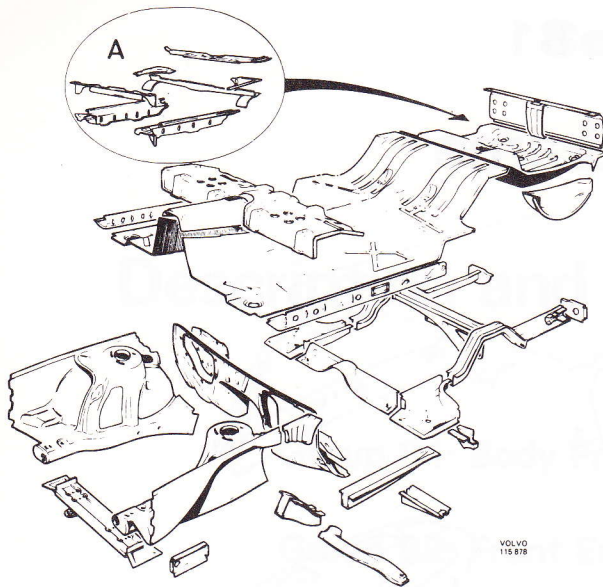
Self-adhesive foam rubber provides noise insulation. A splash guard under the front engine compartment also acts as an engine noise suppressor. Some models with automatic transmission are also fitted with a noise screen under the engine and transmission housing.



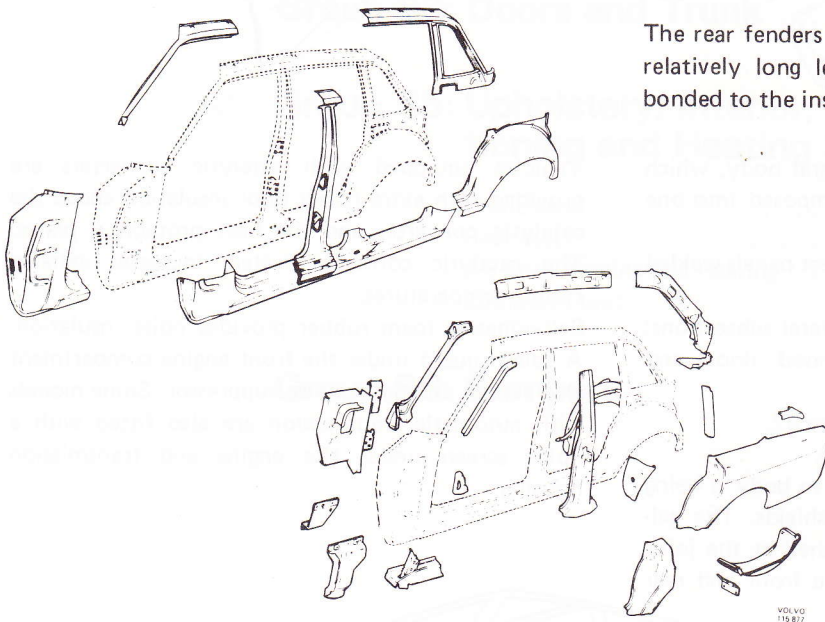
VOLVO
102 259

Hot-dipped galvanized (zinc coated) steel is used for many critical sheet metal components. These components are normally subjected to high weather exposures. There are numerous additions on the front

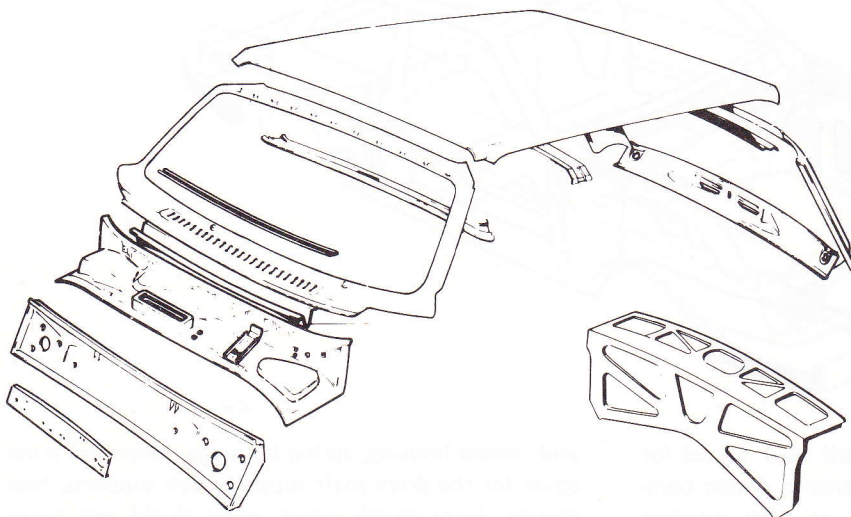
end: wheel housing, spring housings, inner and outer cover for the drive shaft support, jack supports, heat shields, front splash guard, noise shield and lower front panel beneath the grille.



The floor section is the same for 242, 244 and 245. The rear floor panel for the 245 is reinforced with a frame A, above.



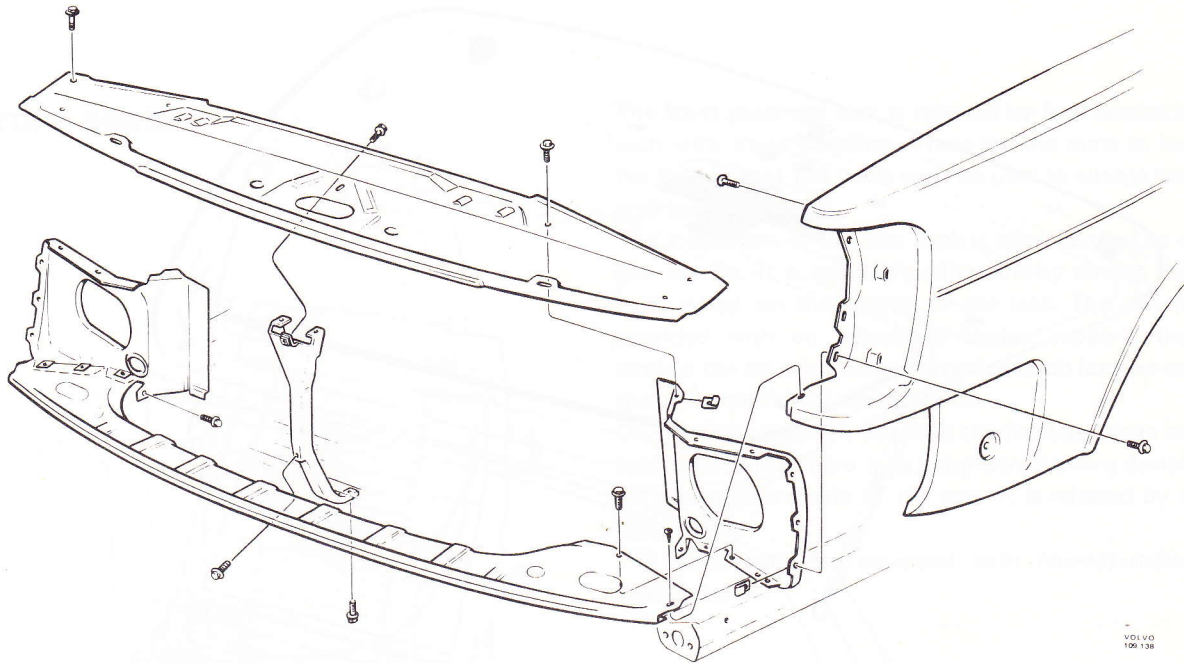
The rear fenders for 242 and 245 are because of their relatively long length stiffened by a reinforcement bonded to the inside.



Roof sections

Group 82

Front End, Hood and Fenders

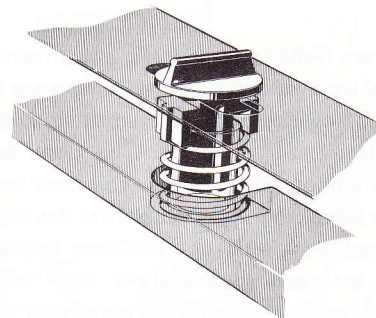


The hood consists of an outer and an inner steel sheet plate, bonded together. The underside of the hood is covered with sound absorbing material.

The hood is hinged at the back on two hinges. In closed position the hood is secured by a lock on the front section. The lever for the hood lock is operated by a control underneath the dashboard.

The front fenders are pressed in one piece.

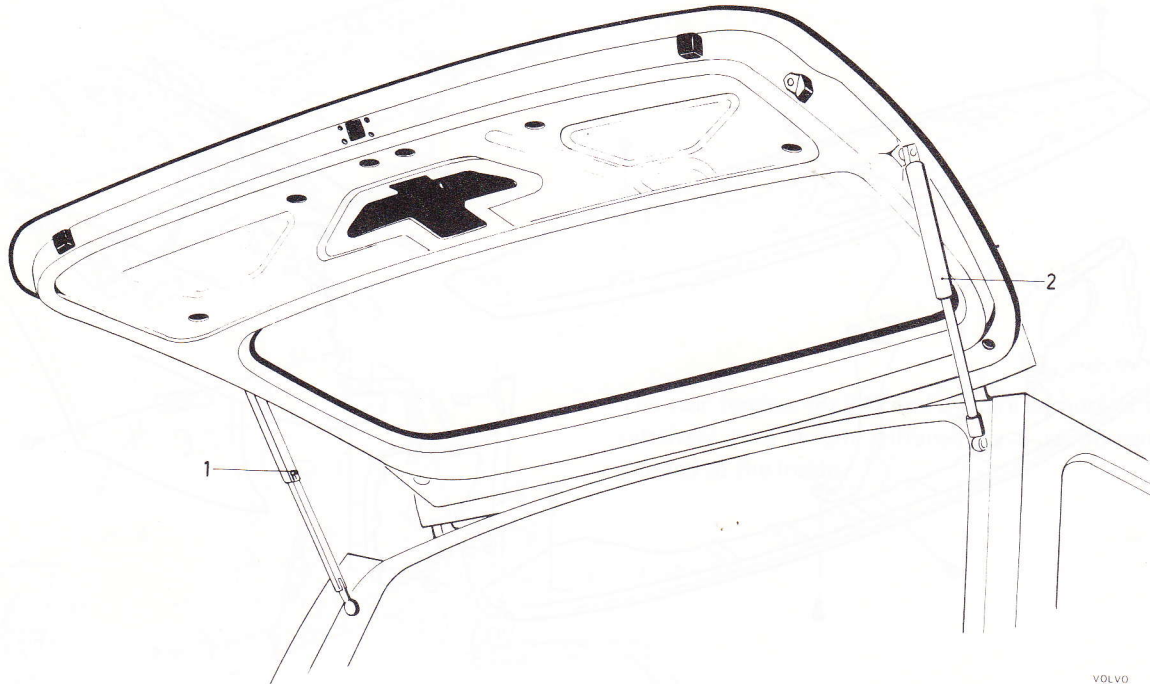
Grille and headlight rims are made in ABS plastic and retained by spring locks. See right.



Spring lock

Group 83

Doors and trunk



VOLVO
104296

The doors are built up of an inner and an outer plate, flanged and spot-welded together. Hinges are fitted to the inner plate. The doors are adjustable longitudinally, vertically and laterally. The door locks are fitted to the doors with screws. The door handle on the outside actuates a lever which lifts the lock pin of the door lock by a pull rod. The door opener inside the car is attached to the inner door plate with screws. The handle transmits the movement to a lever which lifts the locking pin by link rods in the lock. On the front doors the lock mechanism is fitted in a cylinder under the door handle.

The rear doors are equipped with child-safe locks. The locks incorporate a latch which prevents the door from being opened from the inside when the latch is down.

The door arches are steel and welded to the door. The window winders consist of lifting arms with toothed segments. The window runs in sliding grooves in the inner door plate and is set to the desired position by a lifting arm from the toothed segment with the assistance of a helper arm.

The trunk lid on the 242, 244 models is built up of an outer and inner plate bonded together.

The catch for the locking device is attached to rear edge of the trunk lid. The hinges are on the front edge of the lid and bolted to the body. The trunk lid is counter-balanced by a spring support and can be set in any desired position when opening. The locking device is installed on the body below the lid and is of the turning type.

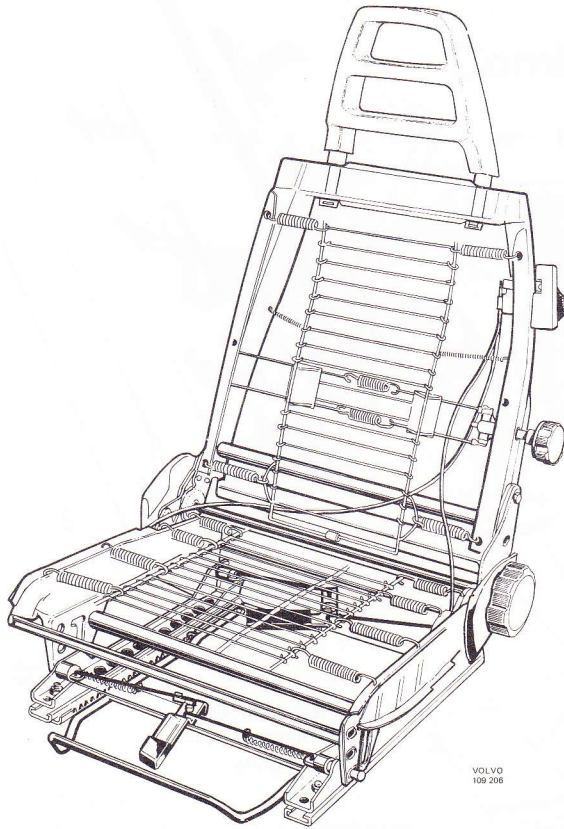
The tail gate on the 245 model is also built up of an outer and inner plate, spot-welded together. The tail gate lock is located at the foot of the tail gate, and the hinges are mounted near the top. The hinges are screwed to the car roof. The tail gate is lifted up by a gas spring at the right-hand side. A mechanical catch locks it in the open position desired.

The 242 and 244 models are also available with a sun roof. The roof is operated by a crank handle, which is folded in the recess in the roof upholstery between the sun visors when not in use. Any water that penetrates the joint between body and sun roof is collected in the inner roof plate and conducted away through four hoses installed through the corner posts of the roof.

Group 85

Upholstery, Interior, Air Conditioning and Heating System

Front seats



Front seat

The front seats are built up on a tubular frame. The padding consists of a soft rubber material and foam plastic.

Seat cover material:

240 De Luxe: vinyl, alt. fabric

240 Grand Luxe: leather

164: leather, alt. plush

The front seat can be slid forwards and backwards to desired position after the loop handle on the seat front has been lifted. The seat rails on both sides have catches.

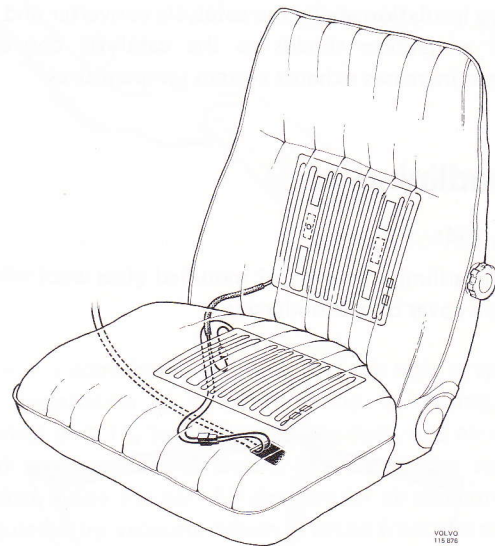
There are two levers, each with three positions, for positioning the driver's seat vertically both in front and rear. This means that also the cushion angle can be changed.

The front passenger seat is retained by four brackets, each with three positions. These are the same as for the driver's seat but tools must be used to change the positions.

The inclination of the seat back is accomplished by a gear system. It is invariably adjustable by turning the hand wheel on the outside of the seat. The seat is provided with an adjustable lumbar support, the tension can be adjusted by a knurled knob located on the outboard side of the back rest.

On the 2-door model, the 242, the front seats can be folded forward. There is an automatic latching device on the outboard side of the seat. It is released by a lever.

The front seats are equipped with non-adjustable head restraints.



Electrically heated driver's seat

Some models have an electrically heated driver's seat controlled by a thermostat.

The total current draw is 60 W. The thermostat cuts out at 26°C (78°F) and cuts in at 14°C (57°F).

Rear seats

242, 244:

Rear seat cushion and rear seat back are made in polyuretan foam, moulded on a frame of wires which stabilize the foam and retain the upholstery.

245:

Rear seat cushion and rear seat back are designed as the front seats, but the frame is wood.

The rear seat cushion can be folded forward and the back rest down to provide increased cargo space.

Door upholstery

The door upholstery consists of wood-fiber sheeting lined with non-woven padding and covered with upholstery material. It is secured to the door by clips. The arm rests are made of moulded plastic and are screwed to the inner plate of the door.

Covering for firewall and floor

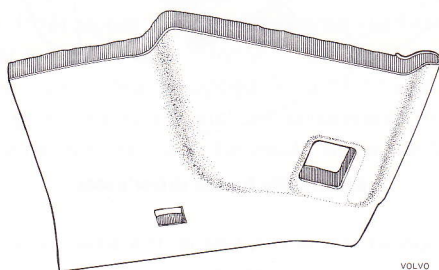
The sides of the bulkhead are lined with millboard. The firewall is covered with self-adhesive insulating material. The floor is covered with textile mats.

Vehicles equipped with catalytic converter have extra heavy insulation above the catalytic converter and the heat protection shields as the catalytic converter system increases exhaust system temperatures.

Headlining

242, 244:

The headlining consists of moulded glass wool with a plastic cover on the underside.



Glass wool headlining 242, and 244.

It is made in one piece and cannot be folded. It is held in position by the sun visors, rear view mirror, curve handle and three plugs at the rear end of the headlining.

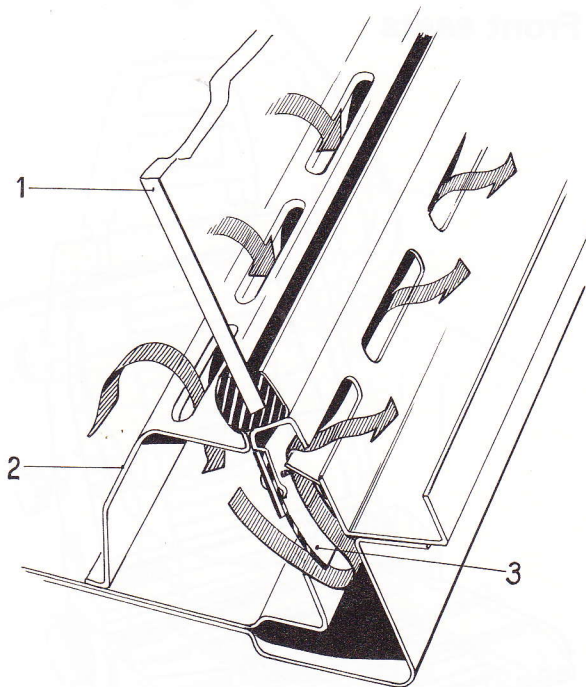
245:

The headlining consists of plastic fabric stretched on roof ribs. It is secured in retainers fitted on the upper limit of the body sides.

Air Conditioning and Heating

242, 244:

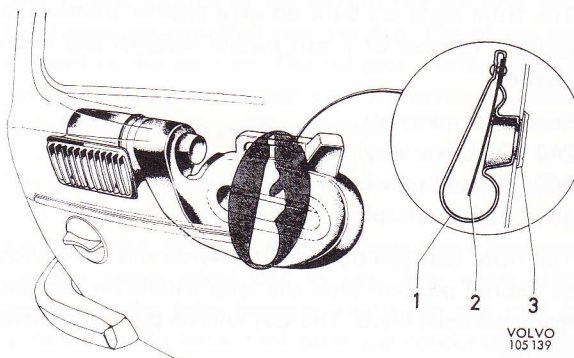
The air vents are located under the rear window:



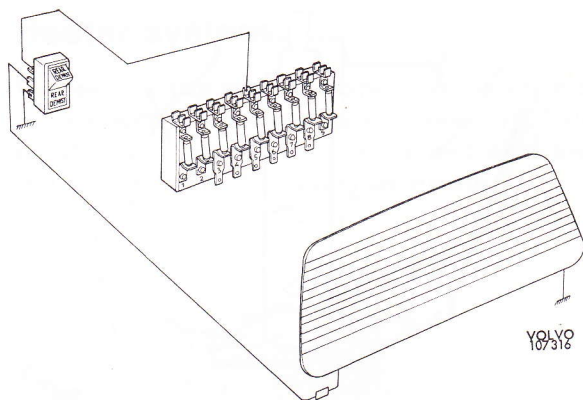
1. Rear window
2. Non-return valve
3. Inner grille

245:

The air vents are located under the rear right side window:



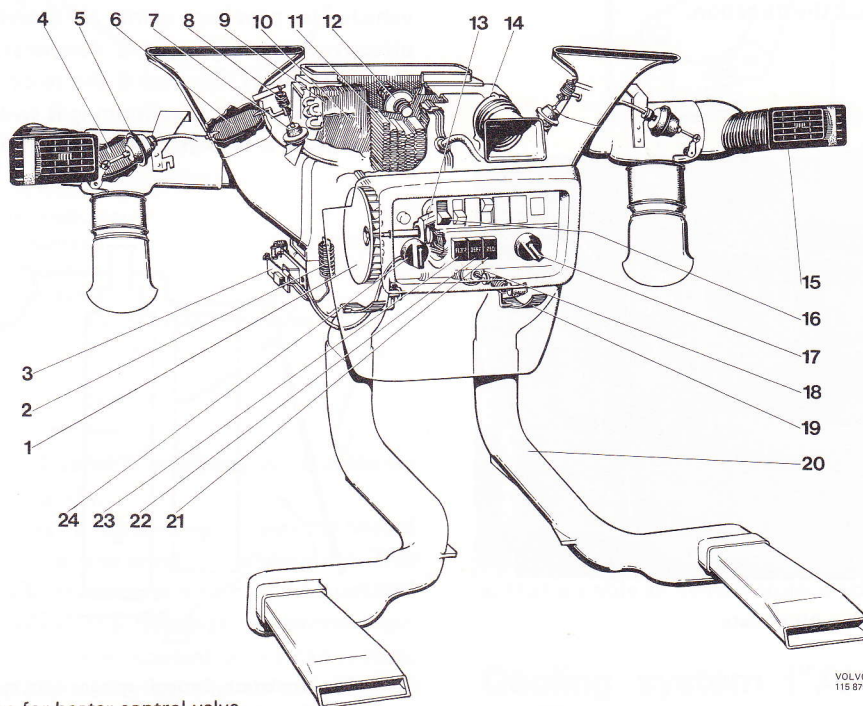
1. Air duct
2. Non-return valve
3. Inner grille



A fresh air vent is located in the left firewall panel. The air vent has a grille which can be regulated to control the fresh air supplied to the compartment. The electrically heated rear window has an output of 200 W. It is controlled by a switch on the control panel.

Wiring diagram for electrically heated rear window.

Combined unit



1. Turbine
2. Capillary tube for heater control valve
3. Heater control valve
4. Shutter, air vent left floor
5. Vacuum motor
6. Shutter, left defroster nozzle
7. Vacuum motor
8. Return spring for vacuum motor
9. Evaporator (only on vehicles with air conditioning)
10. Air intake cover
11. Heater cell assembly
12. Vacuum motor for air intake cover
13. Fan motor
14. Central unit
15. Blow-in valve
16. Air conditioning switch
17. Fan motor switch
18. Vacuum motor
19. Shutter, right air duct, rear floor
20. Air duct to rear floor
21. Knob, air intake cover
22. Knob, defroster shutter
23. Knob, floor shutter
24. Temperature controls

This is a combined heater and fresh-air unit, prepared for installation of air conditioning. It consists of a central unit 14, located under the dash, and air ducts and nozzles for distributing the air to the various points inside the car. All shutters for air directing are regulated by vacuum, which is taken from the engine intake manifold via a vacuum tank located on the firewall in the engine compartment.

An electric motor (13) located in the central unit takes care of the air circulation. This motor is provided with a through shaft and two turbine wheels 3. The cellular assembly 12 of the heater system is placed in front of the electric motor. Vehicles with air conditioning have the evaporator 9 installed in front of the heater system cellular assembly.

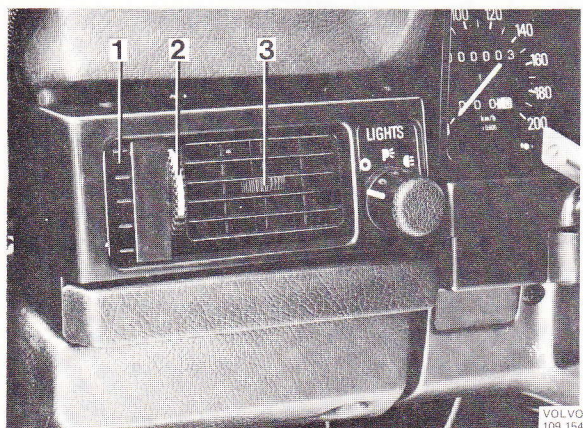
The combined unit is operated by two knobs and three push buttons placed on the control panel. The

right knob "FAN" (18) is the switch and speed control for the blower, and it has three speed positions.

The left control "TEMP" (25) regulates by a cable the heat control valve (1) so desired air temperature is achieved.

The air shutter and the air intake cover are turned with the help of vacuum. At each shutter there is a vacuum motor (8) which opens the shutter when actuated by vacuum. Vacuum is transmitted to the vacuum motors by pushing in the appropriate buttons on the control panel. When the buttons are pushed out again, the shutters return to the closed position with the help of return springs (7).

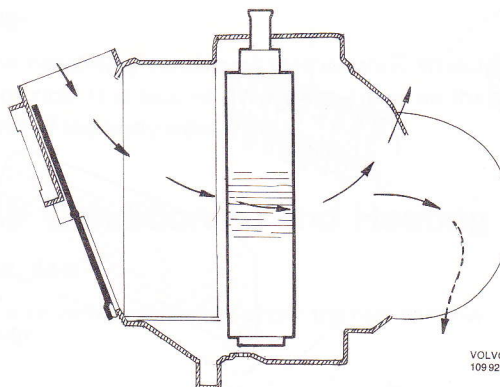
The dash board air outlets can be adjusted independently. A hand wheel 2 controls the force of the air stream and a lever 3 the direction:



Air outlets

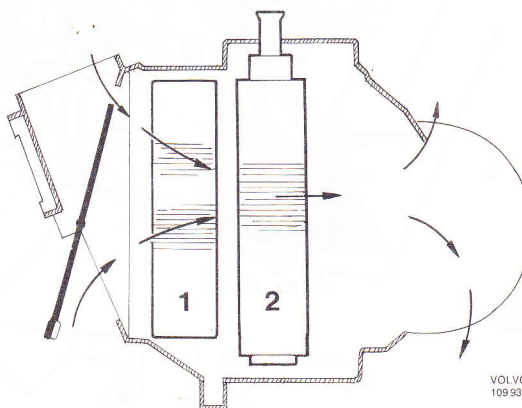
Adjacent to the outer air outlets there are separate outlets, 1, directing air towards the door window and the side window. This air stream removes and counteracts fogging of the windows.

The air flow through the vents on the dash are only regulated by the vent shutter and is not influenced by the push buttons. When all buttons are out, only fresh air is drawn into the unit, all flow ducts are closed and the defroster effect is weak. When the button marked "FLOOR" is pushed in, full air flow is supplied to the front and rear floor together with weak defroster effect. When the middle button "DEF" is pushed in, full defroster effect is obtained while the floor ducts on the other hand are fully closed. When the right button marked "REC" is pushed in, the air intake cover is adjusted to re-circulation of the compartment air. With the cover in this position, only a small portion of fresh air is sucked in and mixed with the compartment air. If the



Air circulation through system

vehicle is provided with air conditioning, more effective lowering of the temperature inside the compartment is obtained if the re-circulation is used. Even when the air conditioning is switched on the air temperature is regulated by the "TEMP" control.



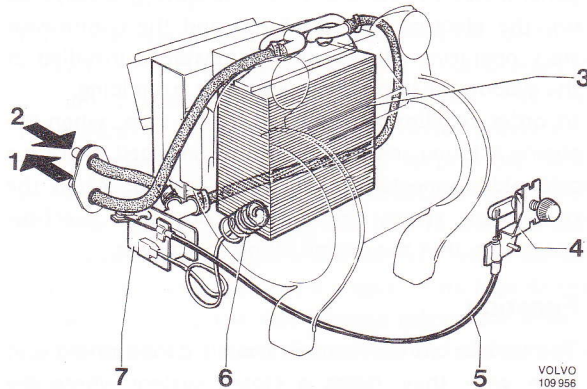
Air circulation through system with re-circulation

1. Evaporator
2. Heater cell assembly
3. Drain hose

Above is shown how the sucked-in air is first cooled when it passes the evaporator (1) and how it is heated, when it passes the heater cell assembly (2), up to the temperature adjusted by the "TEMP" control. When the air passes the evaporator, it liquifies as it cools. The moisture which condenses on the evaporator during the cooling, is drained through a hose which runs through the transmission tunnel.

Heater system

The heater system in the combined unit consists of a cell assembly and a heater control valve. The cell assembly 4 is located in the central unit while the heater control valve (1) is placed underneath.

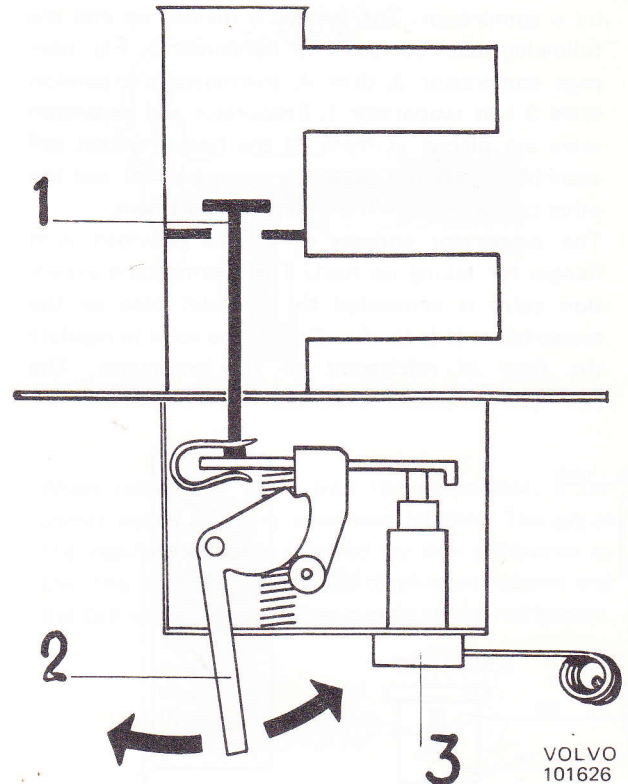


Heating system

1. Water hose, output
2. Water hose, input
3. Cell assembly
4. TEMP control
5. Control cable
6. Capillary tube for heater control valve
7. Heater control valve

The heater control valve is regulated via a cable by the "TEMP" control (6).

The heat control valve is intended to keep the heated air at a predetermined and constant temperature. This is achieved by the thermostat which is incorporated in the control valve. The temperature control regulates the supply of heated coolant to the cell system. The heater coolant warms up the air which is fed through the heater unit by the blower or the slipstream. If the coolant temperature increases, the thermostat capillary expands thus acting on the valve in the control system and resulting in less flow of coolant.



Principle of heat control valve

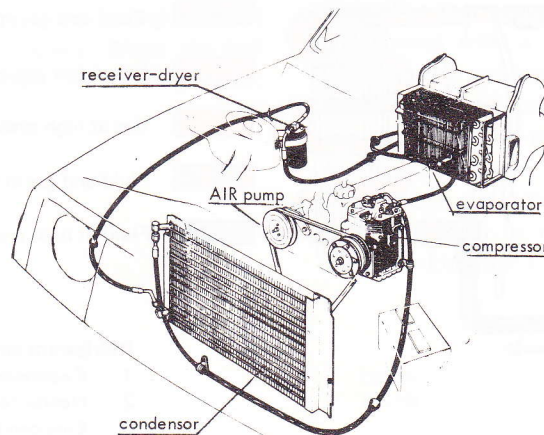
1. Valve
2. Lever for heating controls
3. Thermostat

This means that the temperature of the air flowing through the unit will be lower and this will cause the capillary to shrink. The result will be an increased flow of coolant. This cycle is repeated continuously so that a stable air temperature is achieved.

Cooling system ("Air Conditioner")

Design

The cooling system in the unit is of the compressor type, which means that the refrigerant is circulated



by a compressor. The system is divided up into the following main components: condenser 5, Fig. next page compressor 3, drier 4, thermostatic expansion valve 2 and evaporator 1. Evaporator and expansion valve are placed in front of the heater system cell assembly inside the passenger compartment and the other components in the engine compartment.

The evaporator consists of a tube provided with flanges for taking up heat. The thermostatic expansion valve is connected to the inlet pipe on the evaporator. It is the function of the valve to regulate the flow of refrigerant to the evaporator. The two cylinder piston compressor is provided with an

absorb the moisture which can remain in the system and to store the refrigerant for the evaporator. Refrigerant hoses are used for conveying the refrigerant between the various components. They are provided with tapered pipes and unions at the ends.

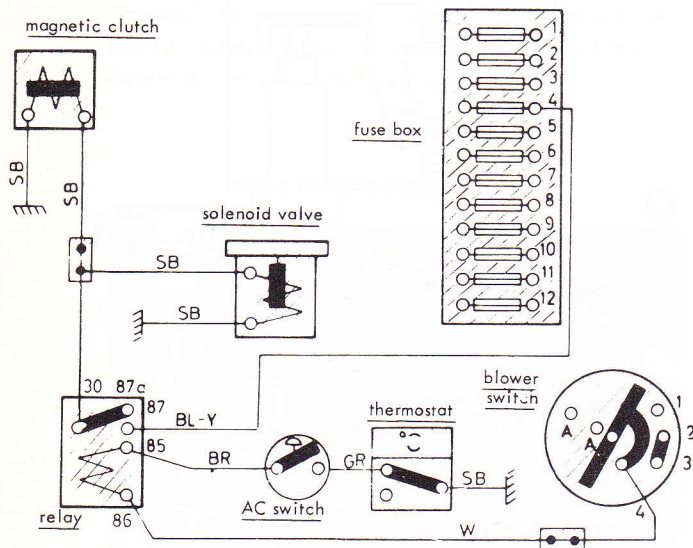
The unit is started by the switch 4, on the instrument panel inside the vehicle. When the current is switched on, the electromagnetic clutch and the compressor start operating. A cut-out thermostat is installed at the evaporator in order to prevent it from icing.

In order to eliminate risk of engine stop, when the engine is idling and the compressor engaged, there is a solenoid connected to the fuel system. When the compressor starts, the solenoid opens an overflow channel so that the engine idling speed rises.

Function

The various components in the air conditioning unit form with their hoses a closed system where the refrigerant is kept in circulation by the compressor. The actual cooling process has no direct beginning or end in the unit but works continuously with the refrigerant changing between gas and fluid due to the changes in temperature and pressure in the system.

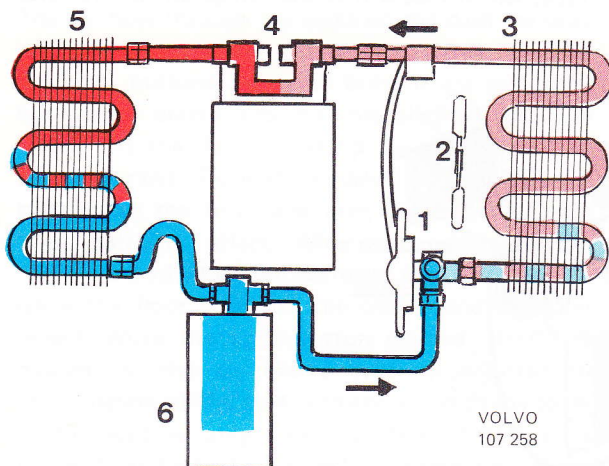
In order to explain the cooling process that takes place, it is suitable to start with the thermostatic expansion valve, usually called the TEV 1, Fig. Before the TEV, the refrigerant is in liquid form and at high pressure. When it flows into the inlet pipe of the evaporator, where there is lower pressure (created by the suction effect of the compressor), the temperature of the refrigerant immediately drops and it is converted to partly vapour, partly fluid. Since the boiling point of the refrigerant is at $-32^{\circ}\text{C} = -26^{\circ}\text{F}$ at normal air pressure, it starts to boil and changes to vapor in the evaporator coil 3, while it absorbs heat from the warm air which the heater blower 2 blows round the pipeline. Due to the fact that heat is absorbed from the air, it becomes colder. It is this cold air which is blown out through the air ducts into



Wiring diagram for air conditioning

Color code:
 BR — brown
 SB — black GR — gray
 BL-Y — blue-yellow W — white

electromagnetic clutch and driven by a belt from the engine. The condenser consists of tubes with cooling flanges and it is placed in front of the car's standard radiator. The function of the receiver-drier is to



- Fluid and gas at low pressure
- Gas at low pressure
- Gas at high pressure
- Fluid and gas at high pressure
- Fluid at high pressure

Refrigerant circulation in air conditioning system

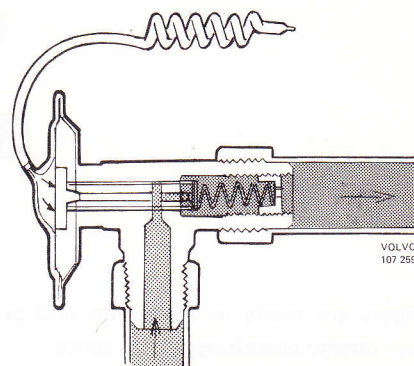
- | | |
|--------------------|-------------------|
| 1. Expansion valve | 4. Compressor |
| 2. Heater fan | 5. Condenser |
| 3. Evaporator | 6. Receiver-drier |

the compartment. In the evaporator coil, the latent heat has caused the refrigerant to convert to a gaseous form, without any change in temperature. Before the refrigerant reaches the end of the coil, it absorbs, however, more heat and the gas temperature rises. This heat is called superheat, and it is that which regulates the function of the TEV, which will be described later on.

From the evaporating unit, the gaseous refrigerant is sucked to the compressor 4 where it is compressed to a high pressure and high temperature. The hot refrigerant is thereafter conveyed under pressure to the condenser coil 5. The coil is provided with cooling flanges around which it is cooled by air with the help of the car cooling fan. Due to the fact that heat always moves from a warmer to a colder object, the hot refrigerant will emit a part of its heat to the colder air. Since the hot gaseous refrigerant loses a part of its heat, it starts condensing and changes to a fluid.

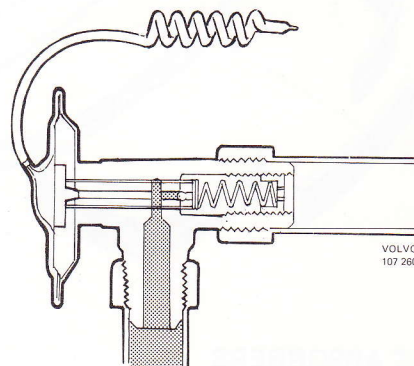
The condensed refrigerant which has changed to a fluid, is conveyed at high pressure and high temperature further to the receiver-drier 6. The receiver-drier contains a desiccant which not only absorbs moisture from the refrigerant but also stores the refrigerant. From the receiver-drier the refrigerant is conveyed further via the TEV to the evaporator, so the cycle is complete.

In order to clarify the function of the TEV, whose purpose is to regulate the amount of refrigerant which is to be supplied to the evaporator, a more detailed description is required. A spring-loaded ball valve is located in the valve body and this valve is actuated by a diaphragm via push rods. In its turn, the diaphragm is influenced by a gas-filled capillary tube, which is fixed to the outlet pipe of the evaporator. At a certain point, the gas in the evaporator, due to the latent heat, reaches the same temperature as the refrigerant as when it enters the evaporator. If more heat is absorbed by the gas it is called, as mentioned previously, superheat. It is this superheat which the gas in the capillary tube feels and absorbs a part of. When the gas absorbs heat, it expands and presses against the diaphragm. This causes the diaphragm to actuate the push rods so that the spring force is overcome and the ball valve opens. When the ball valve opens, the refrigerant flows into the evaporator:



Expansion valve in open position

When refrigerant flows into the evaporator, it becomes colder and the superheat reduces. The gas in the capillary tube is affected by this difference so that the pressure against the diaphragm reduces and the ball valve closes further supply of the refrigerant.



Expansion valve in closed position

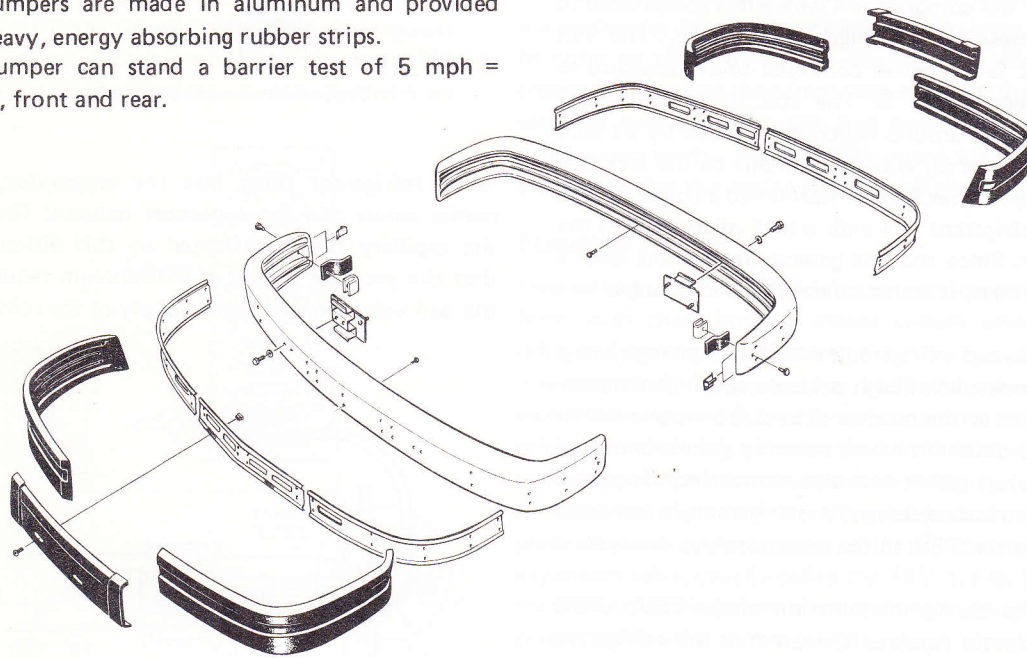
By the TEV regulating in this way the right amount of refrigerant to the evaporator, it is possible for the evaporator to cope with the various heat loads and produce an even temperature for the cooled air.

Belonging to the unit control system is the cutout thermostat, whose function is to prevent evaporator icing. The thermostat is placed at the evaporator and is provided with a capillary tube which is inserted between the evaporator fins. When the vapor temperature has dropped to $+3^{\circ}\text{C} = 37^{\circ}\text{F}$, this actuates the capillary tube thermostat so that current to the compressor clutch is cut off and the compressor stops. When the temperature of the evaporator again rises, this cuts in the current and the compressor starts working again.

Group 86

Bumpers

The bumpers are made in aluminum and provided with heavy, energy absorbing rubber strips. This bumper can stand a barrier test of 5 mph = 8 km/h, front and rear.



VOLVO
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IMPACT ABSORBERS

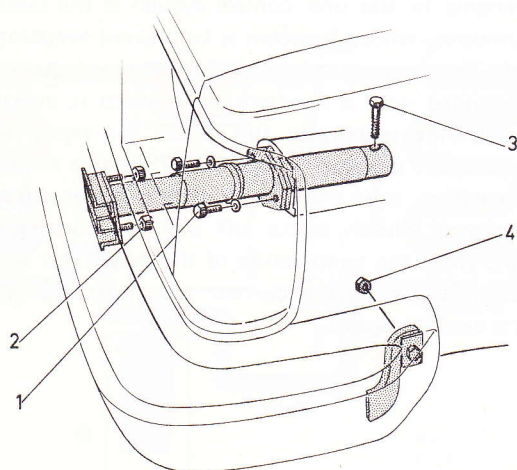
The impact absorbers contain gas and fluid and are speed-related. That means that the resistance increases with the speed.

Thereby the whole impact absorbing stroke can be used also for low speed impacts.

The function is very much the same as for a combination of a spring and a shock absorber.

When compressed, gas and fluid are forced through narrow channels. The compress is damped and at the same time the fluid compresses the gas. When the outside force is released, the gas expands again and presses the fluid back and the bumper retains the original position. The fluid this way acts as a shock absorber and the gas as a spring.

As the impact absorbers are partly gas-filled, no welding on or close to them is allowed. Heating may expand the gases to such an extent that the impact absorbers are blown.



VOLVO
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LOCATION 4028B		PART NUMBER 7776034-6		DESCRIPTION S M 240 1975		QUANTITY 1		UNIT ACCESSORIES		QUANT PK	
ORIGINAL PARTS		CUSTOMER NO. 5476		ORDER NO. 80905		STOCK		ORDER CLASS		REMARKS	
BATCH											

VOLVO

TP 11050/1
12000 4.75
USA, Canada