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COOLING SYSTEM Assy group 031

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1 Cooling system pressure test

Tools:

Testing device for
cooling system

124 589 15 21 00

- 1 Push lever (1) for heating control valve fully to the left.

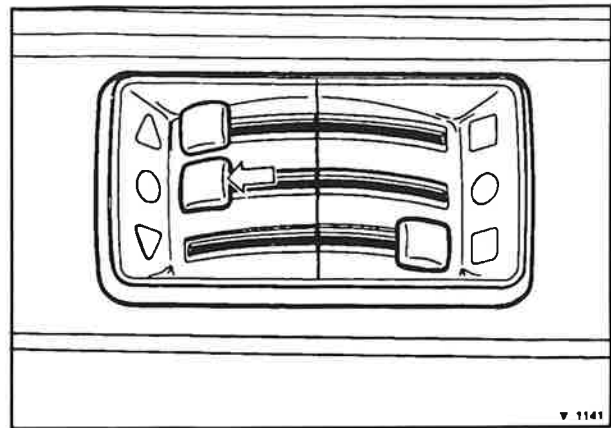


Fig. 1

- 2 Open covering grid (2/2).
- 3 Turn filler cap (2/1) on the filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding if engine is hot!

- 4 Continue turning and remove filler cap.
- 5 Adjust coolant to correct level.

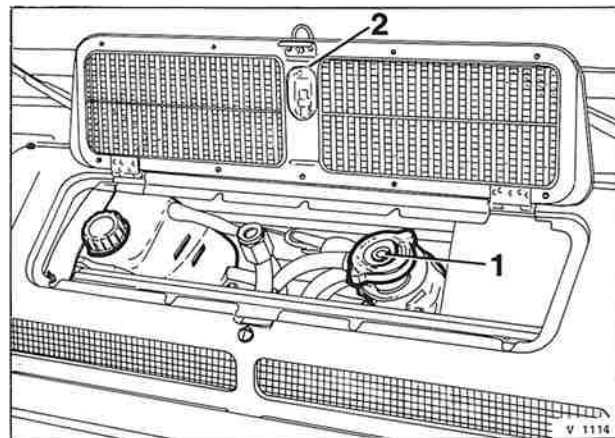


Fig. 2

- 6 Set up testing device for cooling system (3).
- 7 Using the testing device hand pump, create an excess pressure of 1 bar in the radiator.
- 8 Check radiator, coolant pump, thermostat housing, core hole cover of the engine and heating system for leakage.
- 9 Check tubes and hoses for leakage. Replace hardened and swollen hoses.
- 10 Remove testing device, set filler cap and close covering grid (2/2).



Fig. 3

2 Change water pump

Includes:

Removing driver's seat, front passenger seat and left- and right-side engine covers with maintenance covers, see group 171

Removing and mounting front toothed belt, see group 010

Tools:

Extractor	905.3.14.104.0
Testing device for toothed belts	905.3.12.102.0
Testing device for V-belts	001 589 69 21 00
Box spanner	905.3.15.103.1
Position locking tool	905.3.31.112.0

Removing:

- 1 Removing driver's seat, front passenger seat and left- and right-side engine cover with maintenance cover, see group 171
- 2 Remove front toothed belt, see group 010
- 3 Loosen retaining screw (1) of belt tension roller.
- 4 Fit puller for tension roller with special tool item no.. 905.3.14.104.0 (2) and remove tension roller.

- 5 Open covering grid (3/2).

- 6 Turn filler cap (3/1) on filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot!

- 7 Continue turning and remove filler cap.

- 8 Remove screws (4/1 and 4/2) and collect coolant in suitable basin.

NOTE: Replace seal rings of screws (4/1 and 4/2).

- 9 Tighten screws (4/1 and 4/2).

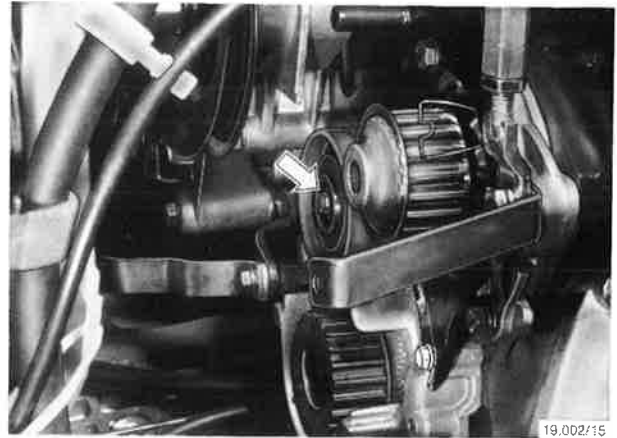


Fig. 1

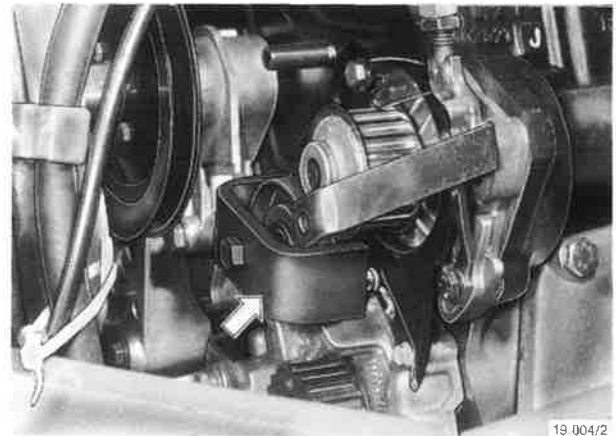


Fig. 2

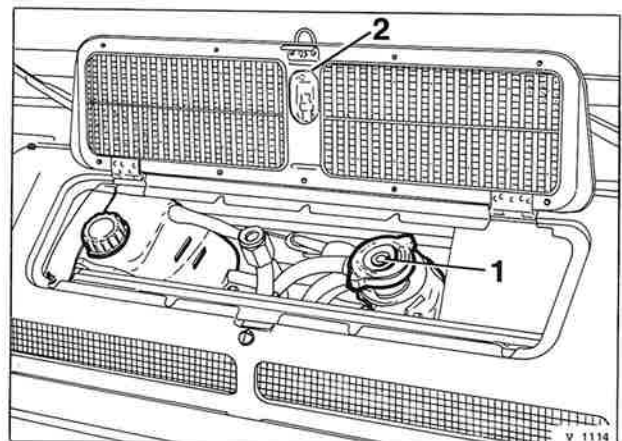


Fig. 3

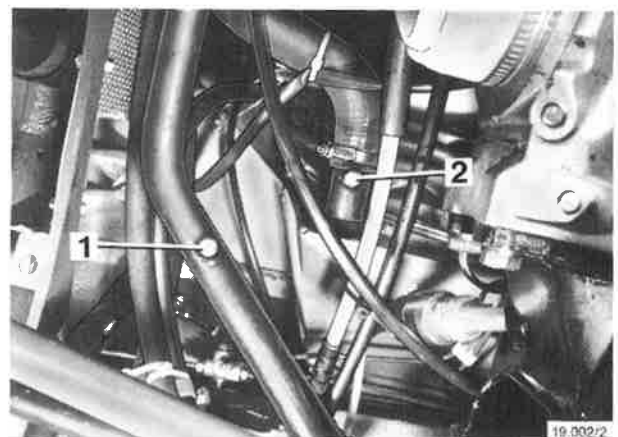


Fig. 4

- 10 Unscrew retaining screws (5).

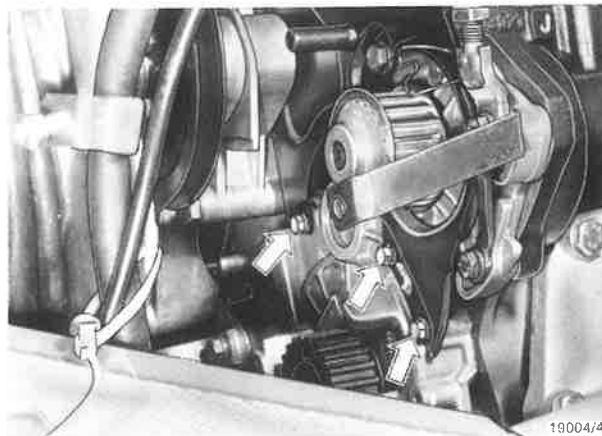


Fig. 5

- 11 Unscrew retaining screws (6/1 and 6/2) from the cover sheet.

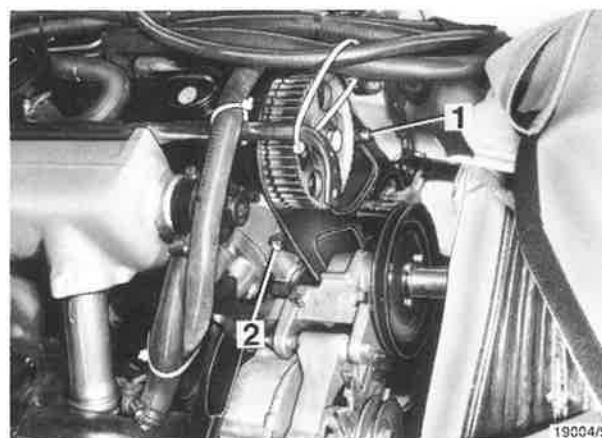


Fig. 6

- 12 Unscrew retaining screws (7/1, 7/2 and 7/3) and remove support (7/4).
- 13 Swivel bracket (7/5) for servo steering pump upwards.

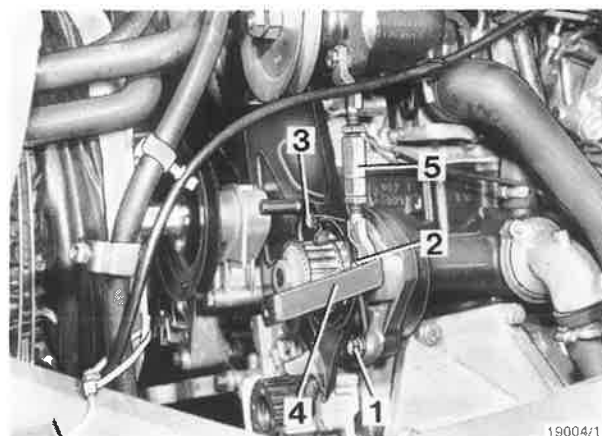


Fig. 7

- 14 Press covering sheet (8/1) forwards and remove water pump (8/2).

NOTE: Clean contact surface of water pump at engine block.

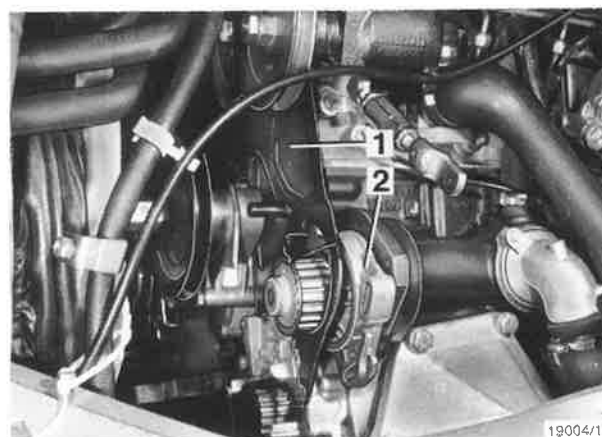


Fig. 8

Fitting:

- 15 Insert seal ring into the groove of the water pump housing (9).

NOTE: Apply rubber lubricant to the seal ring at the contact surface to the engine block.

- 16 Fit water pump.

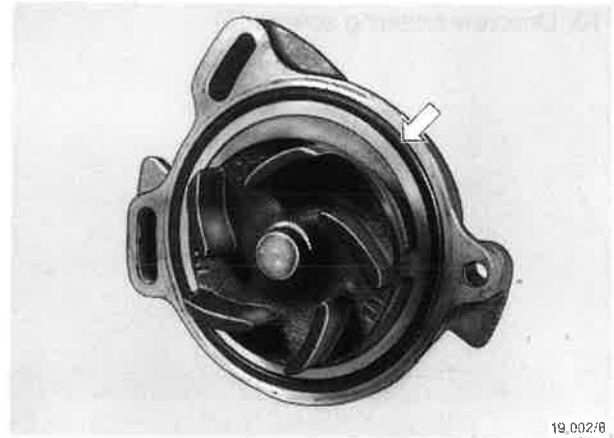


Fig. 9

- 17 Position support(10/4) and bracket of servo steering pump with their screws (10/1, 10/2 and 10/3), but do not tighten the screws.

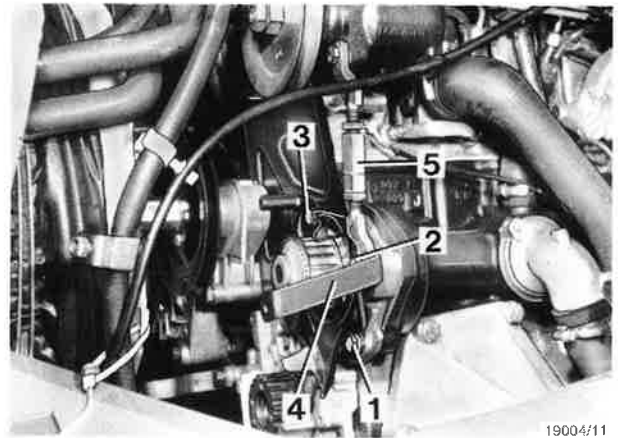


Fig. 10

- 18 Tighten the retaining screws (11/1 and 11/2) of the cover sheet.

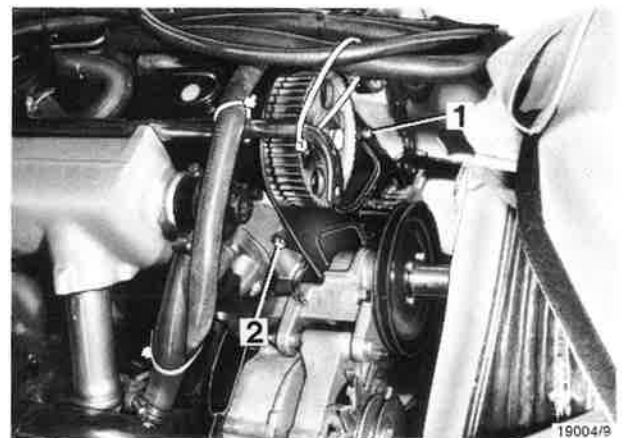


Fig. 11

- 19 Tighten screws (12).

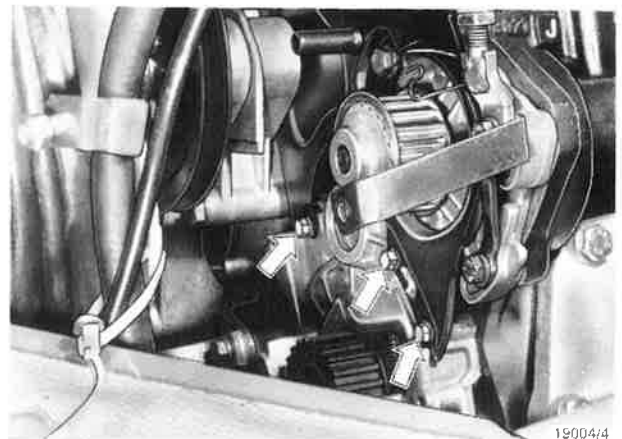


Fig. 12

- 20 Attach tension roller and tighten with retaining screw (13).
- 21 Fit front toothed belt, see group 010

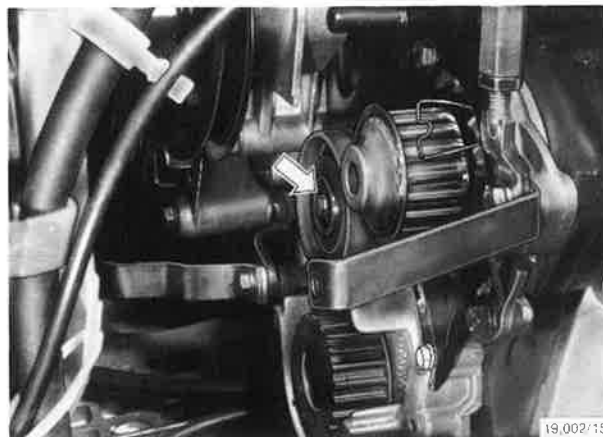


Fig. 13

- 22 Undo screws (14/1), fill in coolant until overflow level is reached.
- 23 Tighten screw (14/1).
- 24 Top up coolant, see section 30.

NOTE: Use only pre-mixed coolant (anti-corrosive/anti-freeze agents and clean water at 50% by vol. each).

- 25 Tension toothed belt and V-belt, see group 010

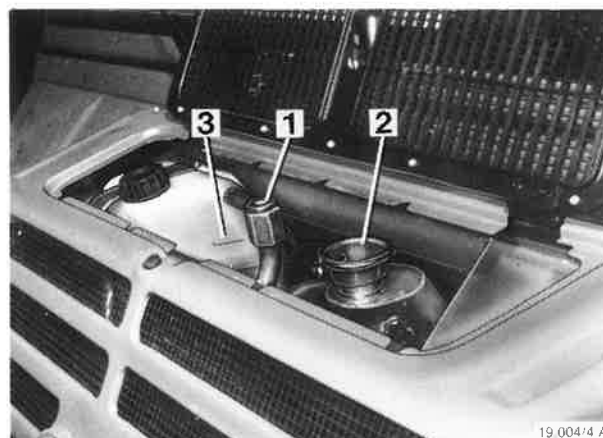


Fig. 14

3 Check and replace thermostat

Includes: Removing driver's seat and engine cover, see group 171

Removing:

- 1 Remove driver's seat and engine cover, see group 171
- 2 Drain coolant, see section 2.
- 3 Unscrew both screws (1/1) with washers (1/2), take off cap (1/3) and remove thermostat with seal ring.
- 4 Check thermostat, warm up controller in water bath.

Note: The thermostat opens at different temperatures, i.e. 71°C, 80°C or 87°C depending on the country of use.

Opening stroke at least 8 mm

Fitting:

- 5 Fit thermostat (2/1) with new seal ring (2/2). Attach cap and screw on tightly.
- 6 Fill up coolant, see section 30.
- 7 Further fitting is made in reverse sequence of item 1.

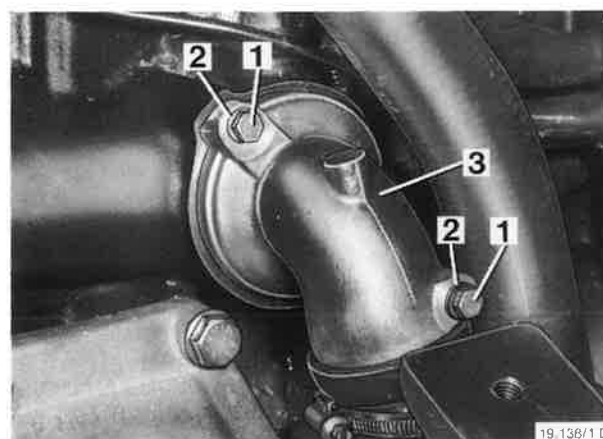


Fig. 1

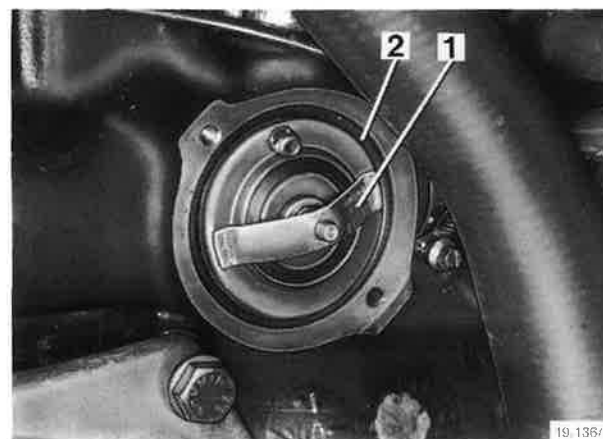


Fig. 2

4 Change transmitter for coolant remote thermometer

Includes:

Removing driver's seat, see group 171

Removing:

- 1 Remove driver's seat, see group 171
- 2 Loosen left-side maintenance cover by turning the turn-lock fasteners (1) to the left and remove.
- 3 Pull off electrical lead connection (2/1) from coolant remote thermometer transmitter(2/2).

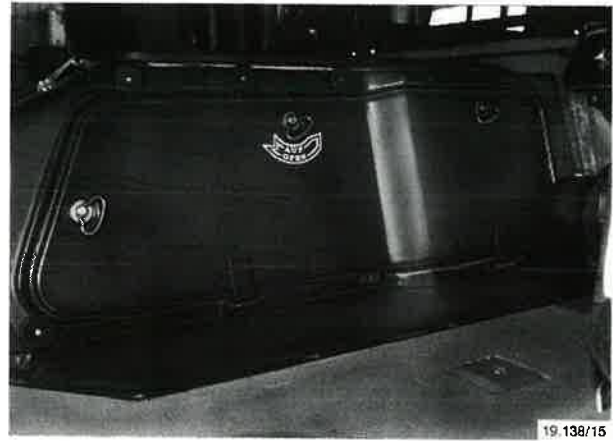


Fig. 1

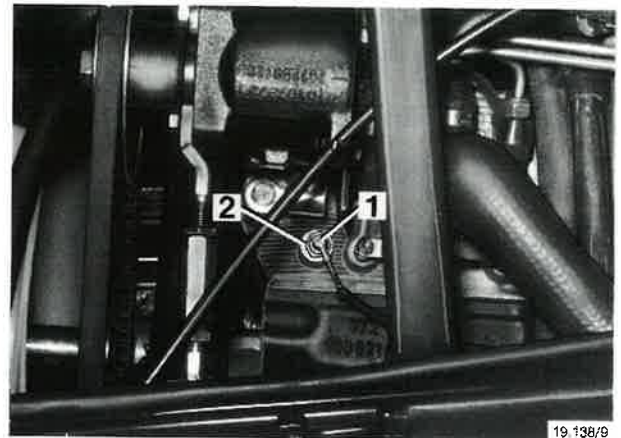


Fig. 2

- 4 Open the covering grid (3/2).
- 5 Turn filler cap (3/1) of filler neck as far as the 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot!

- 6 Unscrew transmitter for coolant remote thermometer (2/2) with seal ring.

NOTE: The transmitter for the coolant remote thermometer juts into the coolant canal of the cylinder head. Danger of scalding when engine is hot. Observe transmitter version (various)!

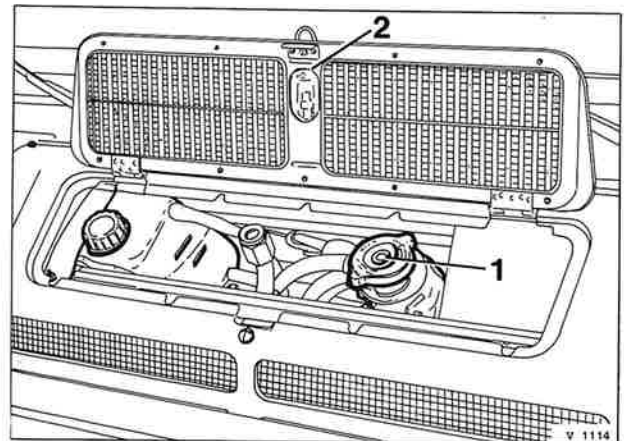


Fig. 3

Fitting:

- 7 Screw in transmitter for coolant remote thermometer with seal ring.
- 8 Plug in electrical lead connection.
- 9 Further fitting is made in reverse sequence 2-1.
- 10 Check coolant level and, if necessary, top up.

5 Change radiator support

Removing:

- 1 Loosen retaining screws (1/1) of radiator cover (1/2), remove screws (1/1).



Fig. 1

- 2 Open covering grid.
- 3 Tip radiator cover forwards and pull out hose of windscreen washer nozzle. For that compress hose clamp.
- 4 Remove radiator cover (1/2).

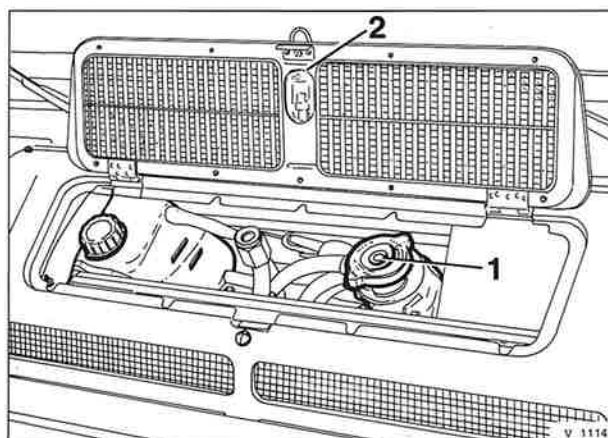


Fig. 2

- 5 Unscrew retaining nuts (3/1) of brackets (3/2 and 3/3), remove washers (3/4).
- 6 Pull off brackets (3/2 and 3/3) upwards.

Fitting:

- 7 Fitting is made in reverse sequence 6-1.

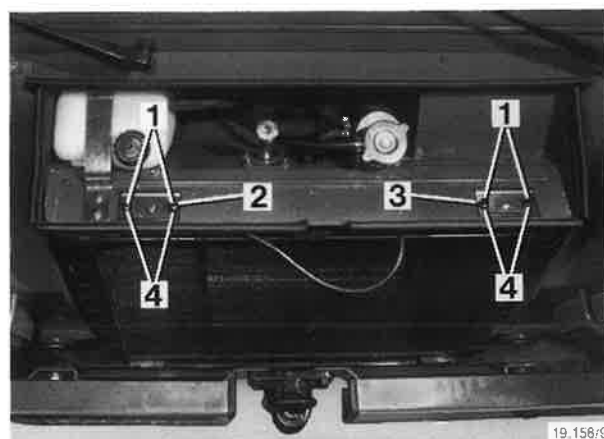


Fig. 3

6 Change radiator

Removing:

- 1 Loosen retaining screws (1/1) of radiator cover (1/2) and remove screws (1/1).

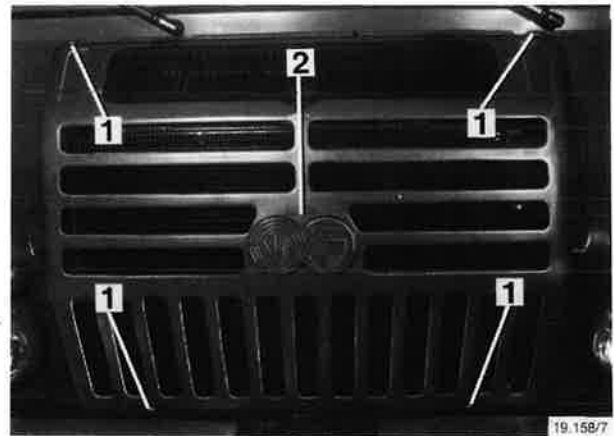


Fig. 1

- 2 Open covering grid (2/2).
- 3 Turn filler cap (2/1) of filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot !

- 4 Continue turning and remove filler cap.
- 5 Tip radiator cover forwards and pull out hose of windscreen washer nozzle. For that compress hose clamp.
- 6 Remove radiator cover (1/2).

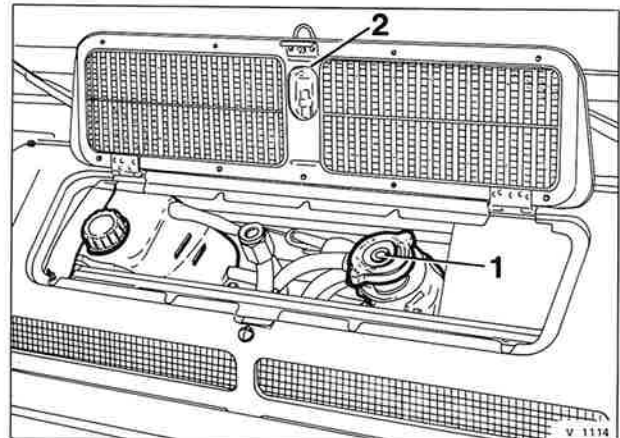


Fig. 2

- 7 Unscrew screws (3/1 and 3/2) and collect coolant in suitable basin.

NOTE: Replace seal rings of screws (3/1 and 3/2).

- 8 Tighten screws (3/1 and 3/2).

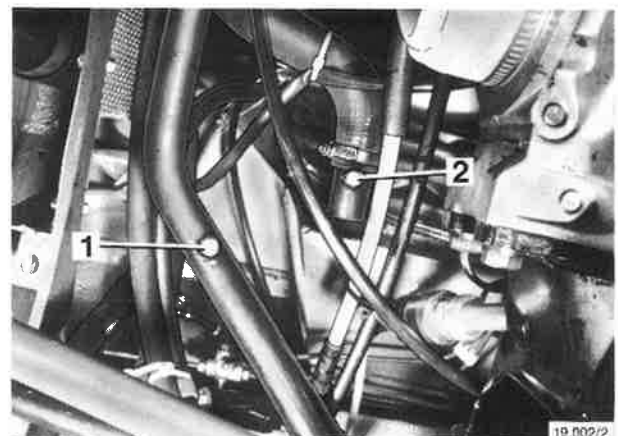


Fig. 3

- 9 Unscrew retaining nuts (4/1) of supports (4/2 and 4/3). Remove washers (4/4).
- 10 Pull off supports (4/2 and 4/3) upwards.

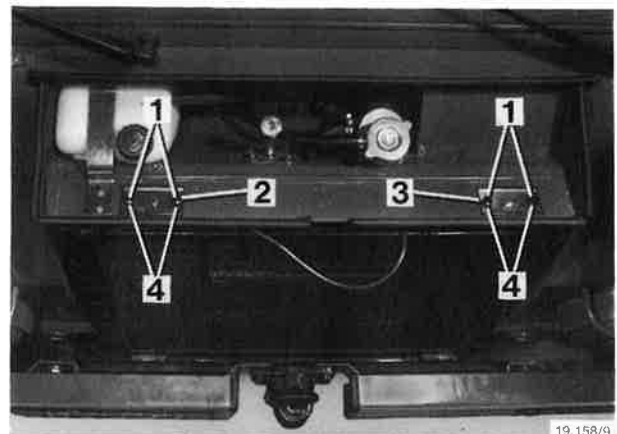


Fig. 4

- 11 Using a screwdriver, press the radiator gently downwards (5) and then pull forwards.



Fig. 5

- 12 Loosen hose clip (6/1) and pull off hose (6/2) from radiator filler tube at radiator.
- 13 Loosen hose clip (6/3) and pull off coolant flow hose (6/4) from radiator.
- 14 Loosen hose clip (6/5) and pull off coolant return hose (6/6) from radiator.

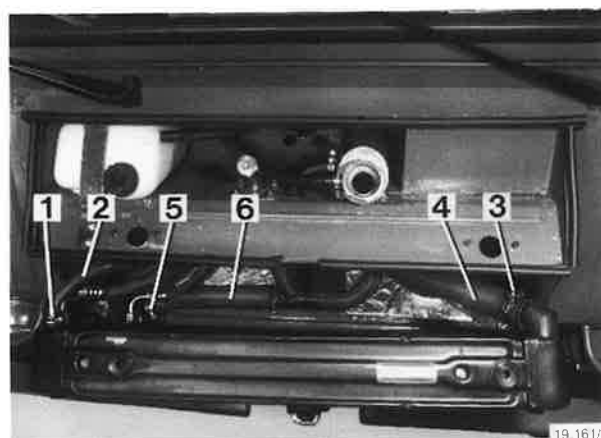


Fig. 6

- 15 Only for automatic gearbox models: loosen hose (7/1) and hose (7/2) for automatic gear oil at radiator.

NOTE: Oil cooler and radiator form one unit.

- 16 Remove radiator.

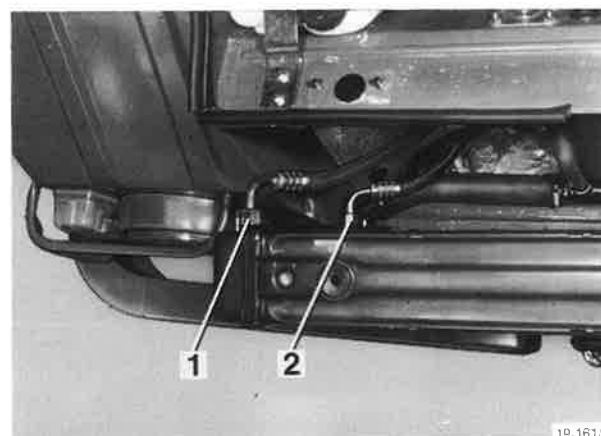


Fig. 7

- 17 Remove rubber grommets (8/1 and 8/2) from the top and bottom of the radiator..

NOTE: Replace spongy, swollen, cracked or porous rubber grommets.

Fitting:

- 18 Fitting is made in reverse sequence 17-5.
- 19 Fill up coolant, see section 30.
- 20 Fasten radiator cover and close covering grid.
- 21 Correct automatic gear oil level, see group 074

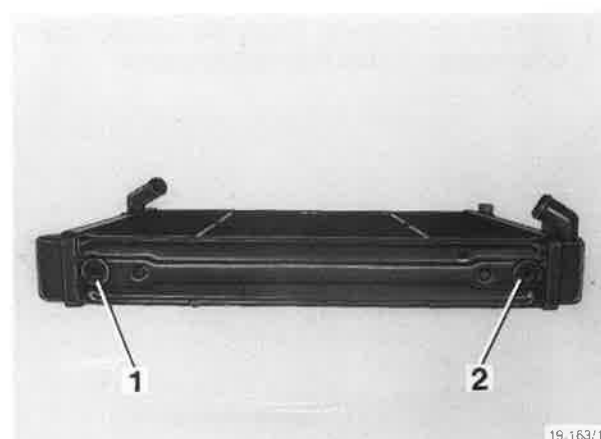


Fig. 8

7 Change filler tube

Removing:

- 1 Loosen retaining screws (1/1) of radiator cover (1/2), remove screws and washers.



Fig. 1

- 2 Open covering grid (2/2).

- 3 Turn filler cap (2/1) on the filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot !

- 4 Continue turning and remove filler cap.

- 5 Tip radiator cover forwards and pull off hose of windscreen washer nozzle. Compress hose clamp to release.

- 6 Remove radiator cover (1/2).

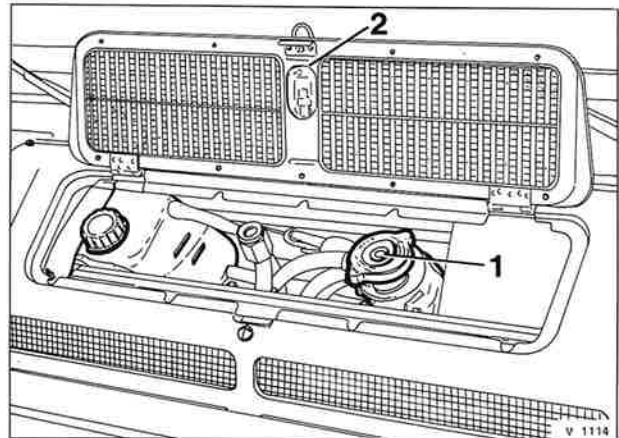


Fig. 2

- 7 Unscrew retaining nuts (3/1) of brackets (3/2 and 3/3), remove washers (3/4).

- 8 Pull off brackets (3/2 and 3/3) upwards.

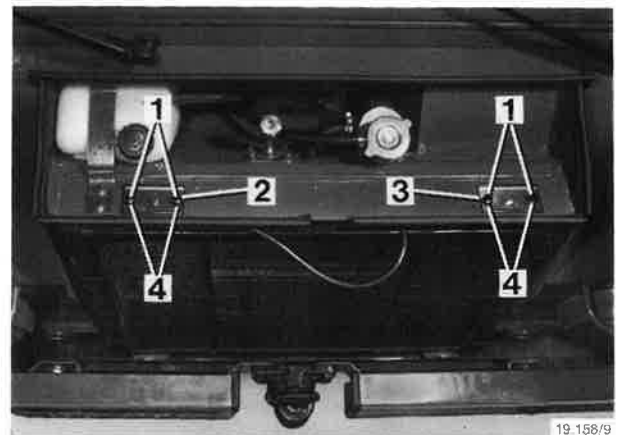


Fig. 3

- 9 Using a screwdriver, press the radiator gently downwards (4) and then pull forwards.



Fig. 4

10 Loosen hose clip (5/1) and pull off hose (5/2).

NOTE: Seal hose (5/2) with suitable plug.

11 Unscrew four retaining screws (5/3) and remove with washers.

12 Remove filler tube.

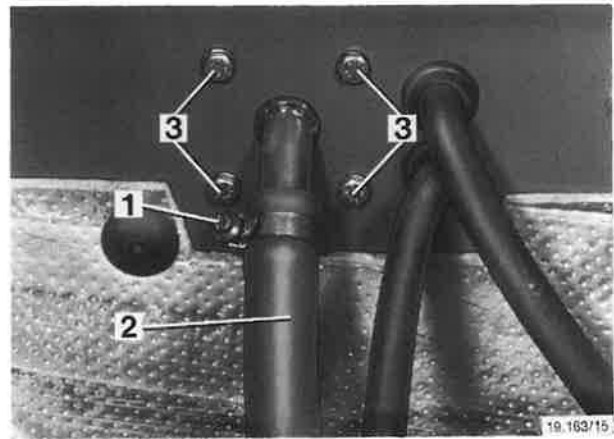


Fig. 5

13 Unscrew screw plug (6/2) of filler tube (6/1), remove seal ring (6/3).

Fitting:

14 Fasten filler tube (6/1) with screws (5/3) and washers.

15 Remove plug from hose (5/2).

16 Push hose (5/2) onto filler tube and tighten hose clip (5/1).

17 Further fitting is made in reverse sequence 9-5.

18 Top up coolant.

19 Fill in coolant into the filler tube until overflow level is reached.

20 Tighten screw (7/1) (use new seal ring).

21 Fill up coolant up to neck of filler neck (7/2).

22 Fill up coolant in expansion tank up to maximum level.

NOTE: Use only pre-mixed coolant (anti-corrosion/anti-freeze agents and clean water at 50% by vol. each).

23 Screw filler caps onto filler neck and expansion tank.

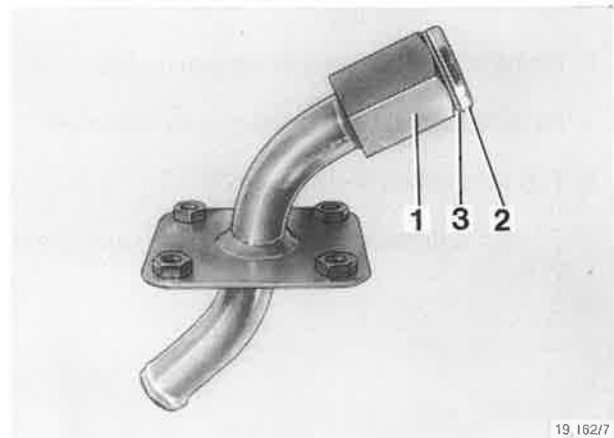


Fig. 6



Fig. 7

8 Change filler neck

Removing:

- 1 Remove radiator and drain coolant, see section 6.
- 2 Loosen hose clips (1/1, 1/2 and 1/3), remove hoses (1/4, 1/5 and 1/6).
- 3 Loosen hose clip (2/1), pull off hose (2/2).
- 4 Loosen retaining screws (2/3), remove washers.
- 5 Remove filler neck (1/7).

Fitting:

- 6 Fitting is made in reverse sequence 5-2.
- 7 Fit radiator and fill up coolant, see section 6.
- 8 Top up coolant, see section 30.
- 9 Correct automatic gearbox oil level, see group 074

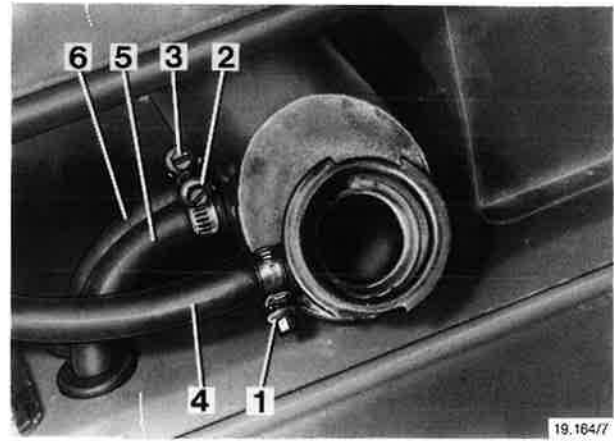


Fig. 1

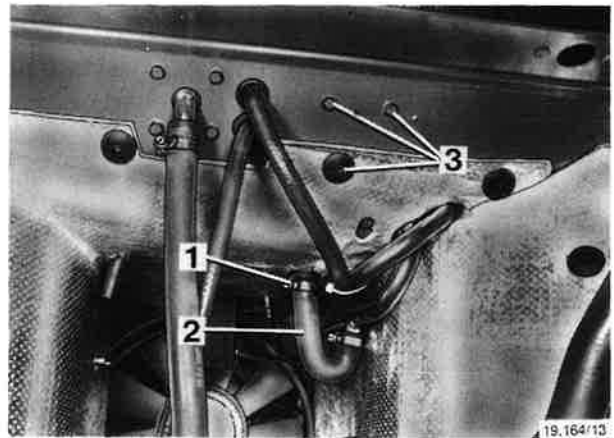


Fig. 2

9 Check radiator filler cap

- 1 Open covering grid (1/2).
- 2 Turn filler cap (1/1) on filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot !

- 3 Continue turning and remove filler cap.

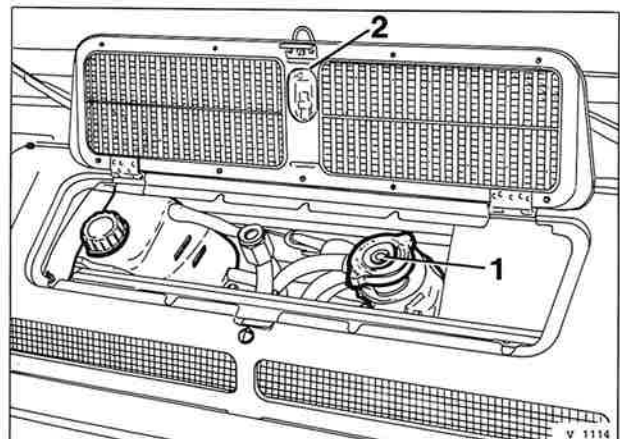


Fig. 1

- 4 Check condition of rubber seals (2/1 and 2/2). If the seals are swollen or damaged, a new cap should be fitted.
- 5 Check smooth running and correct functioning of breather valve by pulling against the closing resistance. If the valve is stiff, fit a new filler cap.

NOTE: When replacing filler cap, observe version, 1 bar or 1.3 bar.

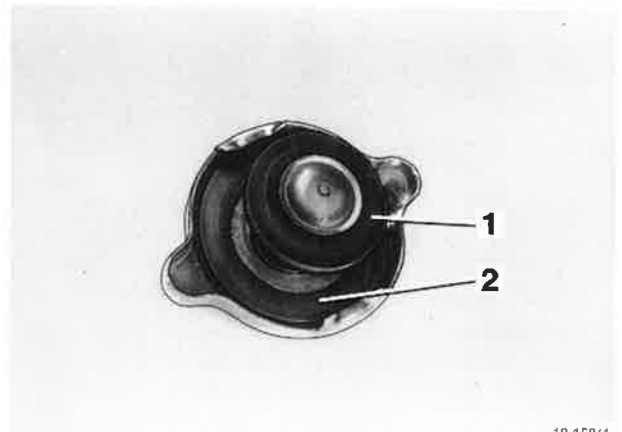


Fig. 2

- 6 Check smooth functioning of breather valve by compressing the rubber seal (3/1) as far as possible and then releasing it. If the valve is stiff replace filler cap.



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Fig. 3

10 Change expansion tank

Removing:

- 1 Loosen retaining screws (1/1) of radiator cover (1/2). Remove washers and screws.
- 2 Open covering grid (2/2).
- 3 Turn filler cap (2/1) of filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot !

- 4 Continue turning and remove filler cap.
- 5 Tip radiator cover forwards and pull off hose of windscreen washer nozzle. Compress hose clamp to release.
- 6 Remove radiator cover (1/2).
- 7 Loosen hose clip (3/1) and pull out hose (3/2).
- 8 Pull out hose (3/3) of expansion tank (3/4).
- 9 Remove nuts (3/5) and washers.
- 10 Remove clip (3/6).
- 11 Remove expansion tank (3/4).
- 12 Empty expansion tank.
- 13 Pull off hose from expansion tank.

Fitting:

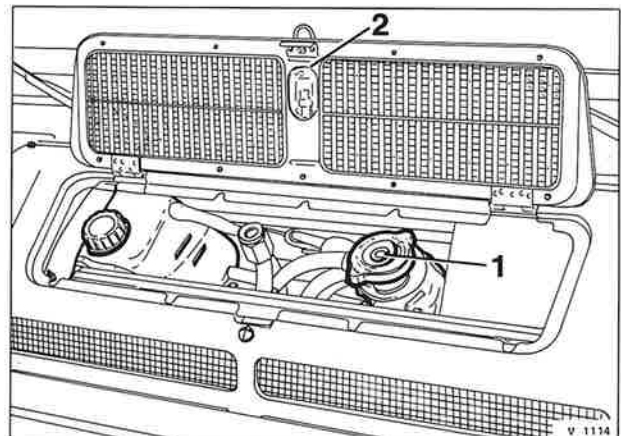
- 14 Fitting is made in reverse sequence 13-1.
- 15 Fill up coolant in expansion tank until maximum level is reached.
- 16 Fill up coolant up to neck of filler neck.

NOTE: Use only pre-mixed coolant (anti-corrosion/anti-freeze agents and clean water at 50% by vol. each).



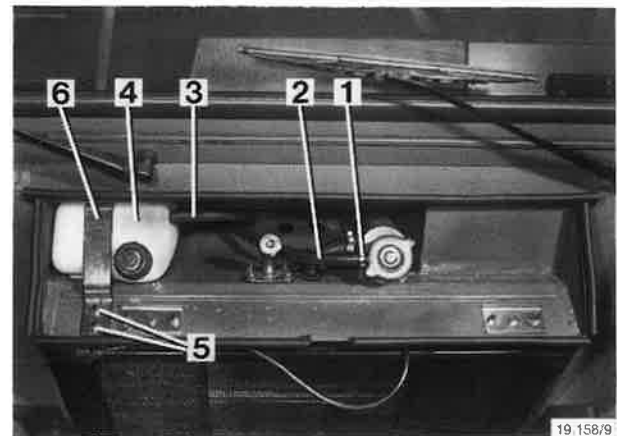
19.158/7

Fig. 1



V 1114

Fig. 2



19.158/9

Fig. 3

11 Change coolant return tube

Removing:

- 1 Remove radiator and drain coolant, see section 6.
- 2 Loosen hose clips (1/1 and 1/2) and pull off hoses (1/3 and 1/4).
- 3 Loosen nut (1/5), remove washer.
- 4 Loosen hose clip (2/1), pull off hose (2/2).
- 5 Unscrew and remove screw (2/3).
- 6 Remove coolant return tube.

Fitting:

- 7 Fitting is made in reverse sequence 6-2.

NOTE: When inserting return pipe, take care not to damage rubber grommet in air duct.

- 8 Fit radiator, see section 6.
- 9 Fill up coolant, see section 30.

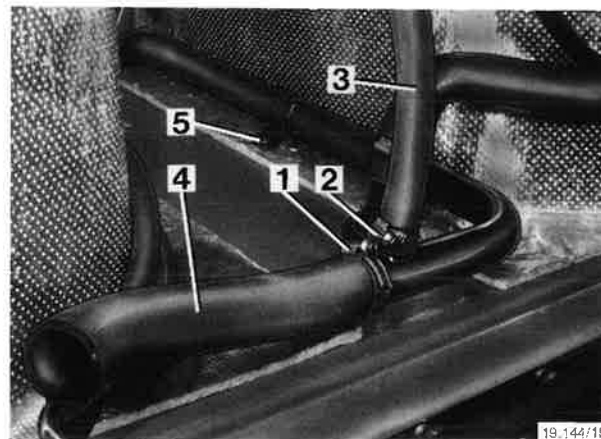


Fig. 1

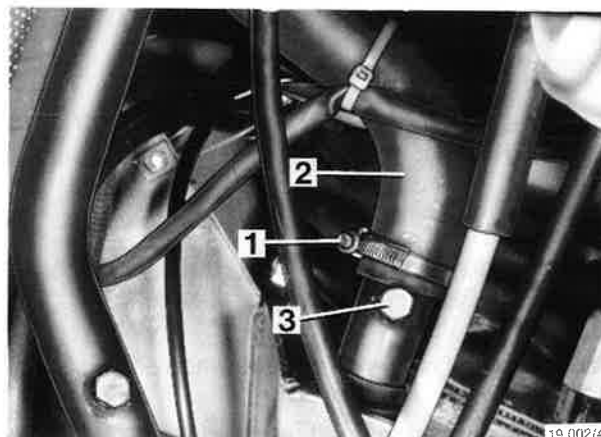


Fig. 2

12 Change coolant flow tube

Tool:

Track rod end ejector 905.3.33.502.0

Removing:

- 1 Remove radiator and drain coolant, see section 6.
- 2 Loosen hose clip (1/1) and pull off hose (1/2), remove rubber grommet (1/3).

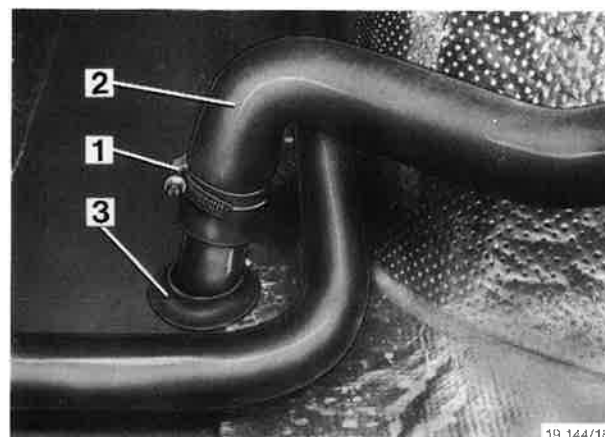


Fig. 1

- 3 Loosen hose clip (2/1) and pull off hose (2/2).

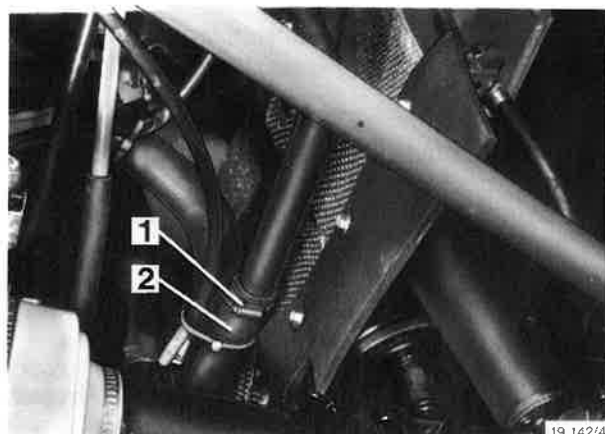


Fig. 2

4 Unscrew nut (3/1) and remove washer (3/2).

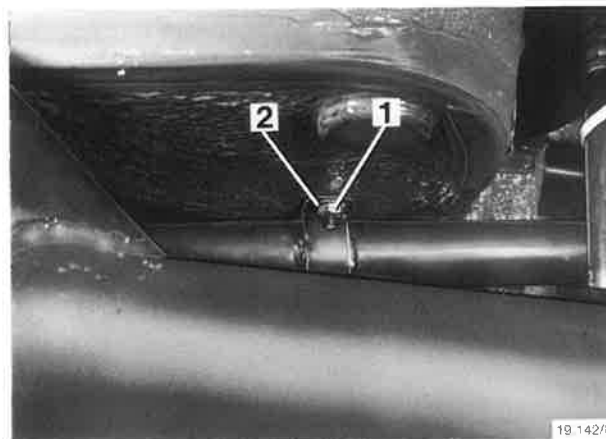


Fig. 3

5 Remove split-pin (4/1) and unscrew nut (4/2).

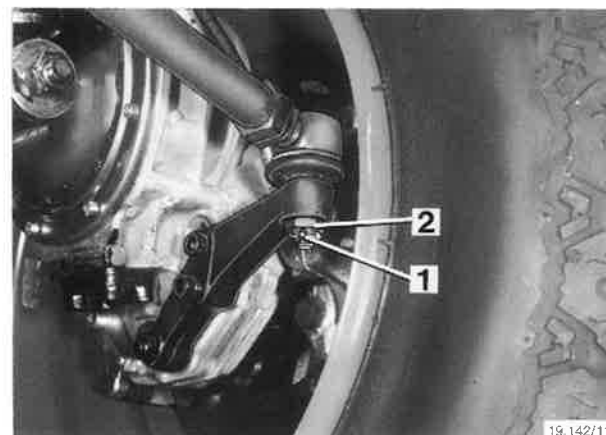


Fig. 4

6 Apply track rod end ejector special tool item no. 905.3.33.502.0 to the ball and socket joint of the track rod and separate it (5).



Fig. 5

7 Remove split-pin (6/1), unscrew nut (6/2).

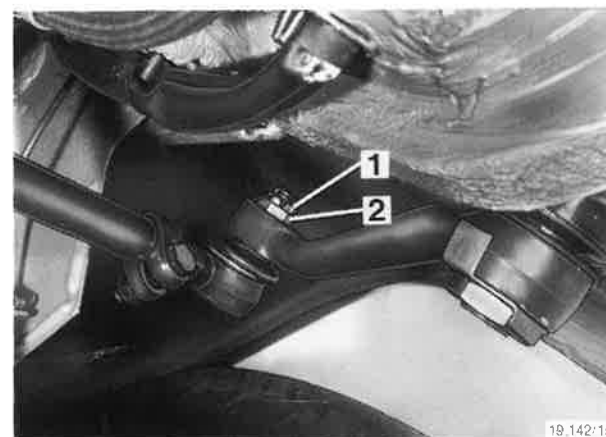


Fig. 6

- 8 Apply track rod end ejector special tool item no. 905.3.33.502.0 to the ball and socket joint and separate steering rod (7).



Fig. 7

- 9 Unscrew union nuts (8/1 and 8/2) from bulkhead stuffing boxes (8/3 and 8/4) of servo-steering.

NOTE: When loosening the union nuts, back-up the bulkhead stuffing boxes. Collect the oil in a suitable basin.

- 10 Pull out the radiator feed tube downwards.

Fitting:

- 11 Insert radiator feed tube from the bottom.
- 12 Fasten radiator feed tube and washer to floor pan.
- 13 Screw union nuts (8/1 and 8/2) to bulkhead stuffing boxes (8/3 and 8/4).
- 14 Tighten the retaining nuts on the track rod and the steering rod to 80 Nm and secure with split-pin.
- 15 Push hose (9/2) onto radiator feed tube, fasten hose clip (9/1).

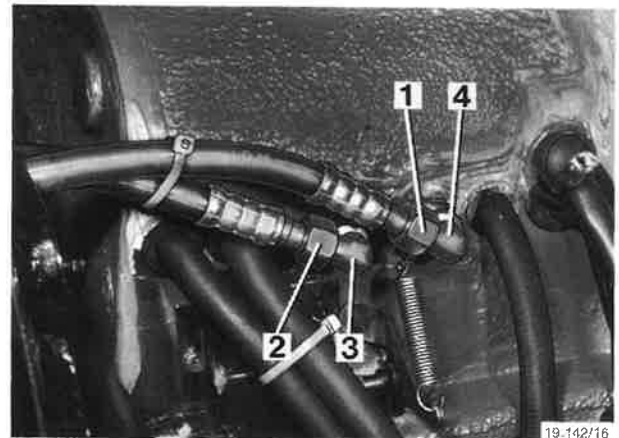


Fig. 8

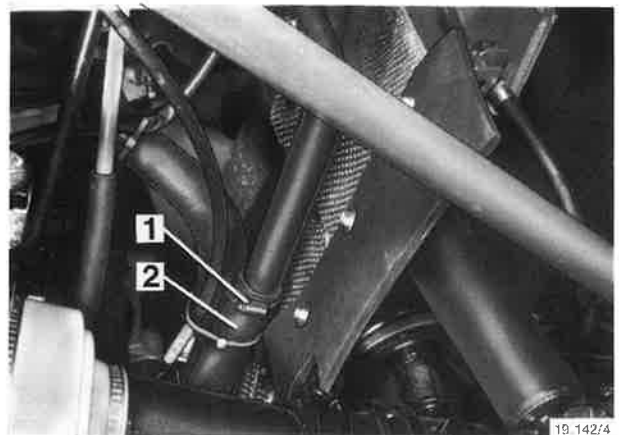


Fig. 9

- 16 Insert rubber grommet (10/3). Push hose (9/2) onto radiator return tube and tighten hose clip (10/1).
- 17 Fit radiator and fill coolant, see section 6.
- 18 Fill coolant, see section 30.

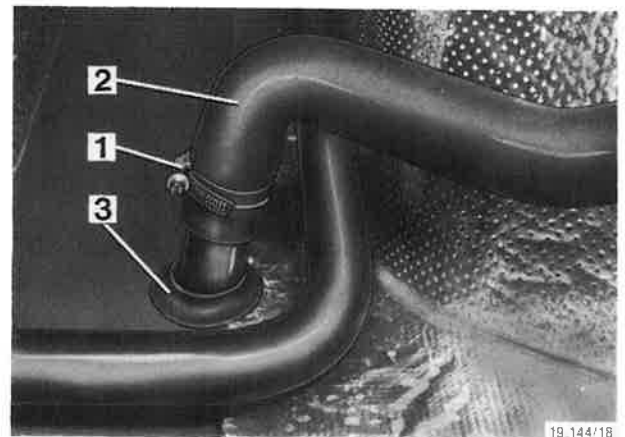


Fig. 10

- 19 Remove cover.
- 20 Open catch (11) and remove engine cover.
- 21 Unscrew cap (12/1) from tank (12/2).
- 22 Fill tank up to maximum level with oil.
- 23 Jack up vehicle on front axle until wheels are off the ground.
- 24 Start engine and turn steering wheel from stop to stop a few times.

NOTE: Whilst bleeding, always care for sufficient oil in the tank (12/2).

- 25 Turn off engine and lower front axle.
- 26 Top up oil to maximum marking.
- 27 Screw cap (12/1) onto tank (12/2).
- 28 Fit engine cover and covering.



Fig. 11



Fig. 12

13 Change coolant return hose from thermostat to coolant return tube

Includes: Removing driver's seat and engine cover, see group 171

Removing:

- 1 Remove driver's seat and engine cover, see group 171
- 2 Drain coolant, see section 2.
- 3 Loosen hose clips (1/1 and 1/2) and pull off coolant hose (1/3).
- 4 Loosen cable clips and remove coolant hose.

Fitting:

- 5 Push coolant hose onto thermostat housing and coolant return tube.
- 6 Tighten hose clips (1/1) and attach cable clips.
- 7 Fill coolant, see section 30.
- 8 Further fitting is made in reverse sequence of item 1.

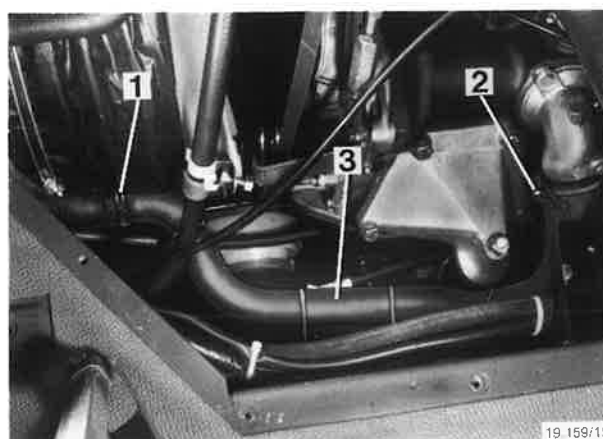


Fig. 1

14 Change coolant flow hose from cylinder head connection to coolant flow tube

Includes:

Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Remove driver's seat and left-side engine cover, see group 171
- 2 Drain coolant, see section 2.
- 3 Loosen hose clip (1/1) and pull off coolant flow hose (1/2) from union pipe at cylinder head.
- 4 Loosen hose clip (2/1) and pull off coolant hose (2/2).
- 5 Loosen cable clips and remove coolant flow hose (1/2).
- 6 Fitting is made in reverse sequence of item 4..
- 7 Fill coolant, see section 30.
- 8 Further fitting is made in reverse sequence of item 1.

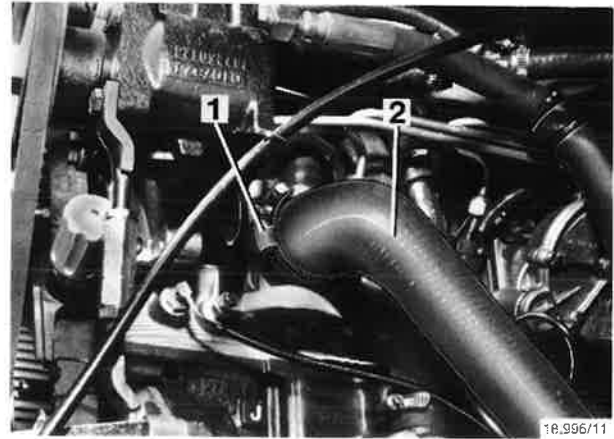


Fig. 1

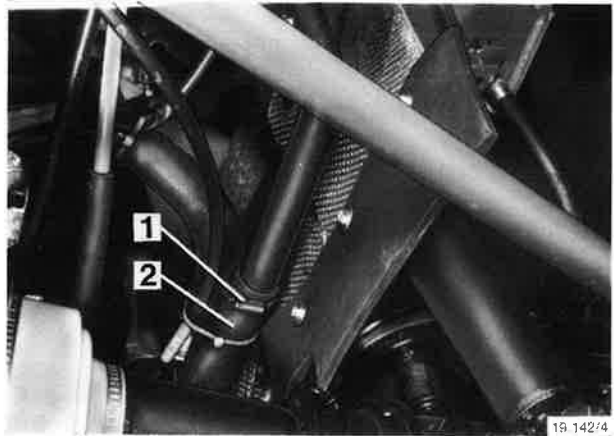


Fig. 2

15 Change water connection tube for cylinder head

Includes:

Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Remove driver's seat and left-side engine cover, see group 171
- 2 Drain coolant, see section 2.
- 3 Loosen hose clips (1/1 and 1/2).
- 4 Unscrew screw (1/3) and remove with spring washer.
- 5 Pull out tube (1/4) from hose (1/5).
- 6 Remove water connecting tube (1/6) with seal ring from cylinder head.
- 7 Loosen hose clip (2/1) and pull off hose (2/2).

Fitting:

- 8 Push hose (2/2) onto water connecting tube (1/6) and tighten hose clip (2/1).
- 9 Place new O-ring on the water connecting tube.
- 10 Push water connecting tube onto the hose of flow tube and insert into the bore of cylinder head.
- 11 Screw in retaining screw (1/3) with spring washer.
- 12 Push tube (1/4) into hose (1/5).
- 13 Tighten hose clips (1/1 and 1/2).
- 14 Fill up coolant, see section 30.
- 15 Further fitting is made in reverse sequence of item 1.

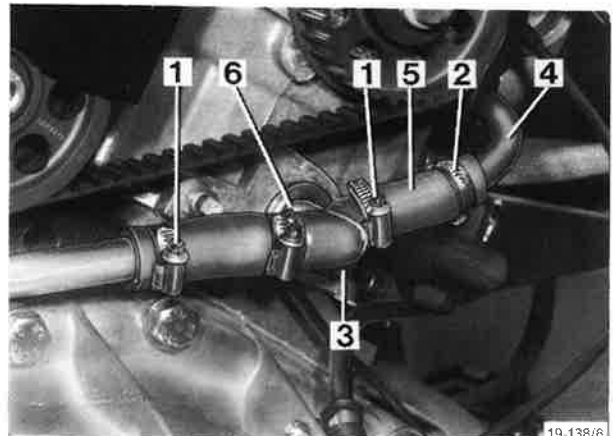


Fig. 1

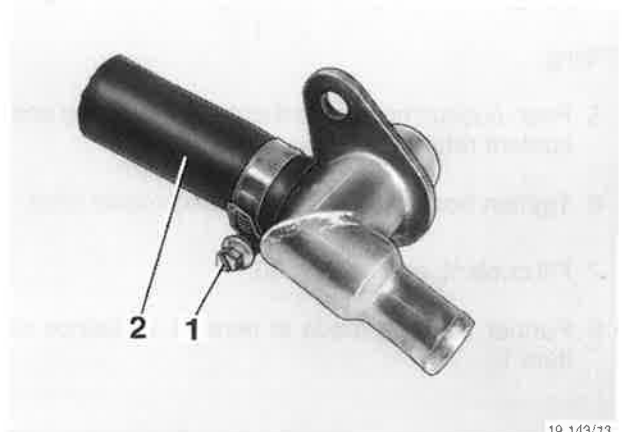


Fig. 2

16 Change hose between cylinder head connection and tube

- 1 See section 14.

17 Change tube with rubber ring

Includes: Removing front passenger seat and right-side engine cover, see group 171

Removing intake manifold, see group 041

Fitting intake manifold, see group 041

Removing:

- 1 Remove front passenger seat and right-side engine cover, see group 171
- 2 Remove intake manifold, see group 041
- 3 Drain coolant, see section 2.
- 4 Loosen hose clip (1/1) and pull off tube with rubber ring (1/2)..
- 5 Loosen hose clip (2/1) and remove tube with rubber ring (2/2).

Fitting:

- 6 Push tube with rubber ring (2/2) into hose (2/3) and fasten hose clip (2/1).
- 7 Insert tube with rubber ring (1/2) into hose (1/3) and fasten hose clip (1/3).
- 8 Fit intake manifold, see group 041
- 9 Fill coolant, see section 30.

18 Change oil cooler coolant flow hose

Includes: Removing front passenger seat and right-side engine cover, see group 171

Removing:

- 1 Remove front passenger seat and right-side engine cover, see group 171
- 2 Drain coolant, see section 2.+98
- 3 Unscrew retaining screws (1/1 and 1/2), remove nut and washer.
- 4 Remove retaining screw (2/1), remove nut and washer.

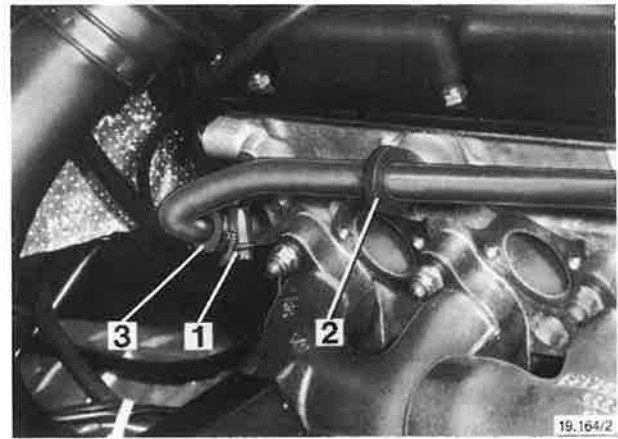


Fig. 1

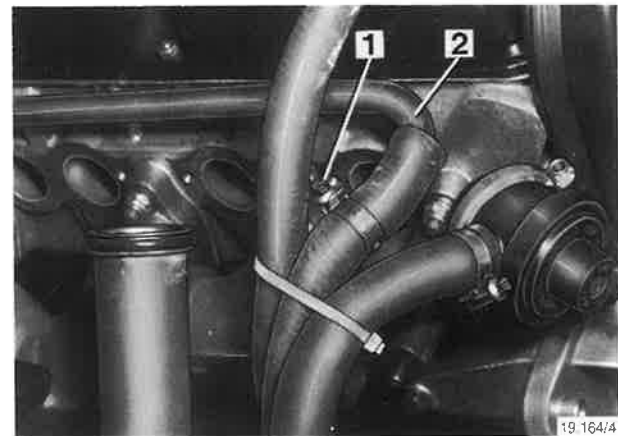


Fig. 2

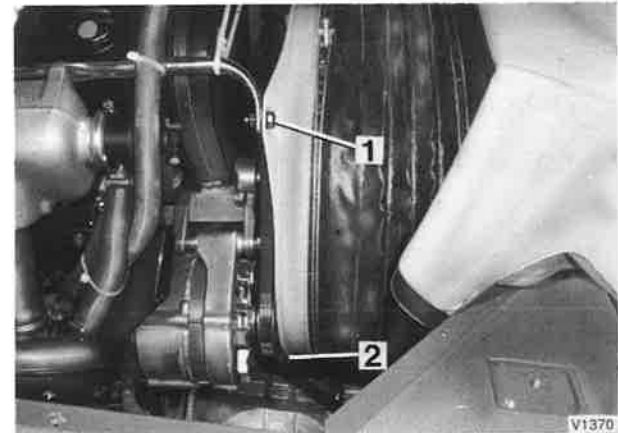


Fig. 1

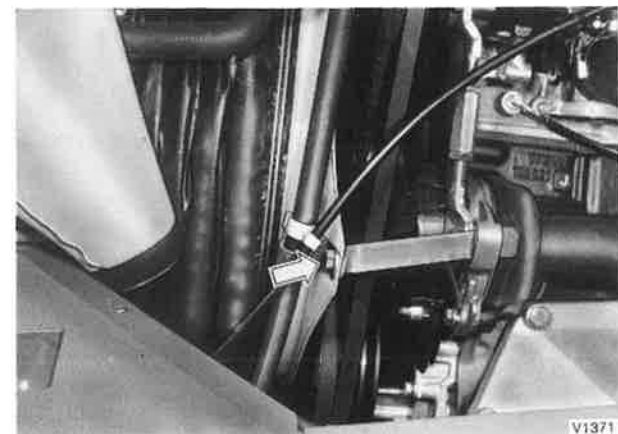


Fig. 2

5 Using wire hooks (3/2), stretch fan ring (3/1) forwards.

6 Switch off battery main switch.

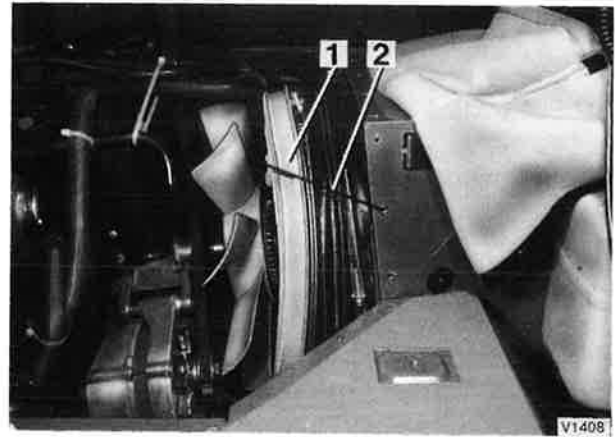


Fig.3

7 Unscrew top retaining screw (4/1) of alternator, remove nut (4/2) with washer (4/3) and pull out retaining screw.

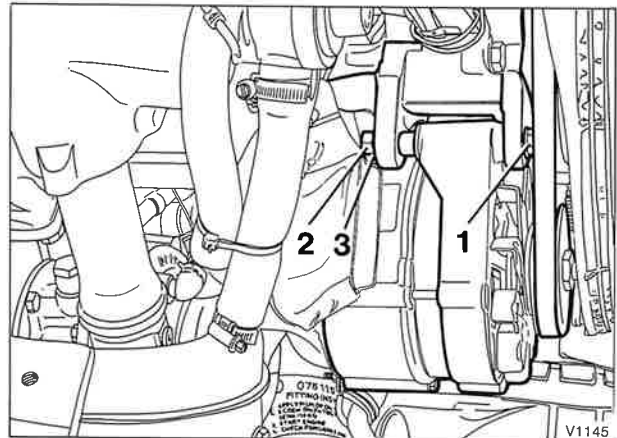


Fig. 4

8 Loosen belt tension roller (5/2).

9 Unscrew bottom retaining screw (5/1) of the alternator and remove screw with washer.

10 Take off V-belt and put alternator aside.

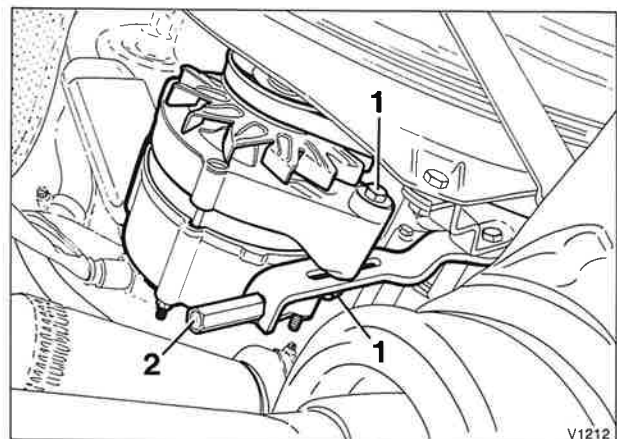


Fig. 5

11 Loosen cable clip (6/1).

12 Loosen hose clips (6/2).

13 Pull off and remove coolant hose for oil cooler flow (6/3).

Fitting:

14 Fitting is made in reverse sequence 13-1.

15 Top up coolant, see section 30.

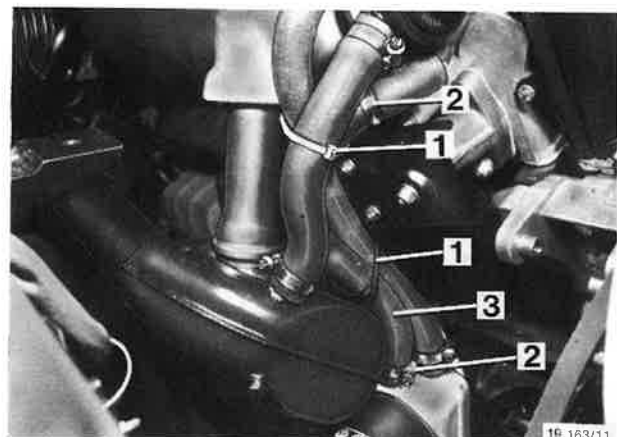


Fig.6

19 Change oil cooler return hose

Includes: Removing driver's seat, front passenger seat and engine covers with maintenance cover left- and right-side, see group 171

Removing:

- 1 Remove driver's seat, front passenger seat and engine covers with maintenance cover left- and right-side, see group 171
- 2 See section 18.
- 3 Loosen cable clips (1/1, 1/2 and 1/3).
- 4 Loosen hose clip (1/4) and pull off hose (1/5).
- 5 Loosen hose clip (2/1) and pull off hose (2/2).
- 6 Undo hose (2/2) from hose guide (2/3) and remove.

Fitting:

- 7 Fitting is made in reverse sequence 6-1.
- 8 Fill coolant, see section 30.

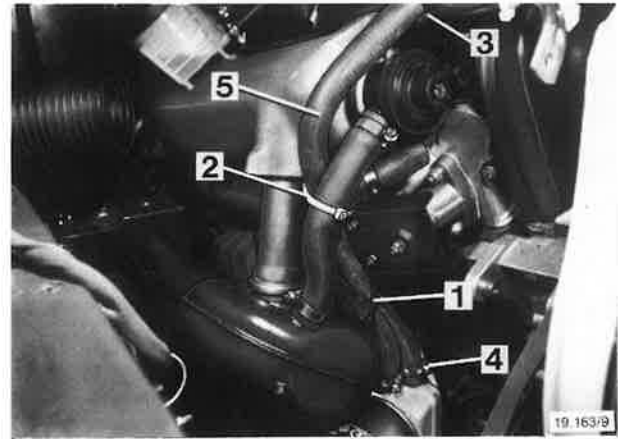


Fig. 1

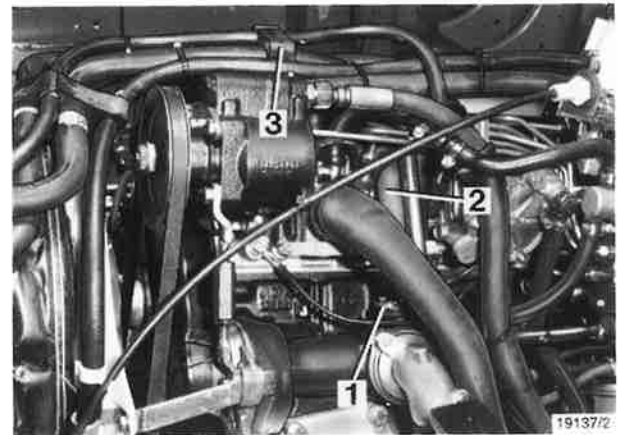


Fig. 2

20 Change hose between cold starter and branch tube

Includes: Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Remove driver's seat and left-side engine cover, see group 171
- 2 Loosen hose clip (1/1 and 1/2).
- 3 Pull off hose (1/3) from branch pipe (1/4) and from cold starter (1/5).

NOTE: Close the two openings - on the cold starter (1/5) and on the branch pipe (1/4) - to prevent the coolant from flowing out.

Fitting:

- 4 Fitting is made in reverse sequence 3-1.
- 5 Top up coolant, see section 30.

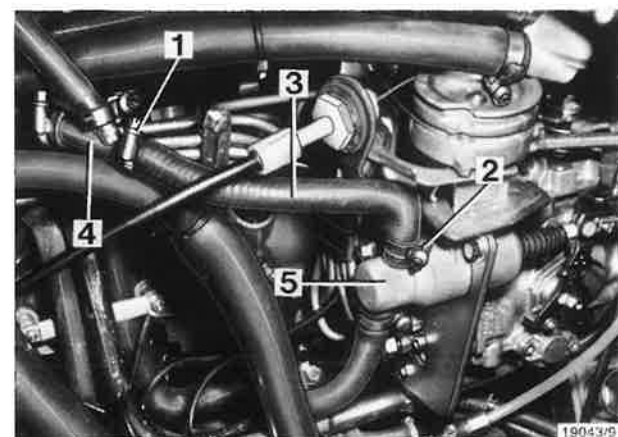


Fig. 1

21 Change branch tube

Includes: Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Remove driver's seat and left-side engine cover, see group 171
- 2 Loosen hose clips (1/1, 1/2 and 1/3) and pull off hoses (1/4, 1/5 and 1/6) from branch tube (1/7).
- 3 Loosen cable clip (1/8) and remove branch tube (1/7).

NOTE: Close openings on hoses (1/4, 1/5 and 1/6) to prevent the coolant from flowing out.

Fitting:

- 4 Fitting is made in reverse sequence 3-1.
- 5 Top up coolant, see section 30.

NOTE: Fit Y-piece (2/1) according to drawing. Observe mounting position (branch pointing to cold starter).

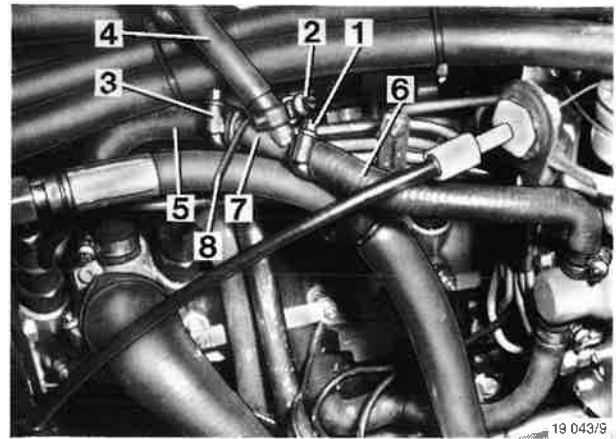


Fig. 1

22 Change hose between branch tube and tube connection at cylinder head

Includes: Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Remove driver's seat and left-side engine cover, see group 171
- 2 Loosen hose clips (1/1 and 1/2) on branch tube (1/3) and on tube connection (1/4).
- 3 Remove hose (1/5).

NOTE: Close openings at branch tube (1/3) and at tube connection (1/4) to prevent coolant from flowing out.

Fitting:

- 4 Fitting is made in reverse sequence 3-1.
- 5 Top up coolant, see section 30.

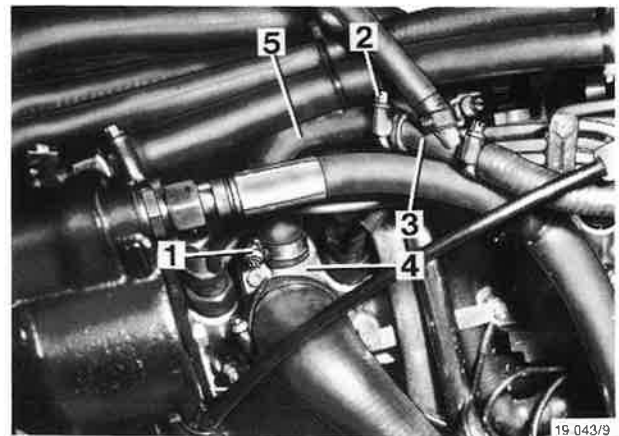


Fig. 1

23 Change vent hose

Includes: Removing driver's seat and left-side engine cover, see group 171

Removing:

- 1 Loosen retaining screws (1/1) of radiator cover (1/2), remove screws (1/1).

- 2 Open covering grid (2/2).
- 3 Turn filler cap (2/1) on filler neck as far as 1st notch. Release excess pressure !

WARNING: Danger of scalding when engine is hot !

- 4 Continue unscrewing and remove filler cap.
- 5 Tip radiator cover forwards and pull off hose to windscreen washer nozzle. Compress hose clamp to release.
- 6 Remove radiator cover (1/2).
- 7 Drain coolant, see section 2.
- 8 Unscrew retaining nuts (3/1) of brackets (3/2 and 3/3). Remove washers (3/4).
- 9 Lift off brackets (3/2 and 3/3) upwards.
- 10 Using a screwdriver, press the radiator gently downwards (4) and pull out forwards.



Fig. 1

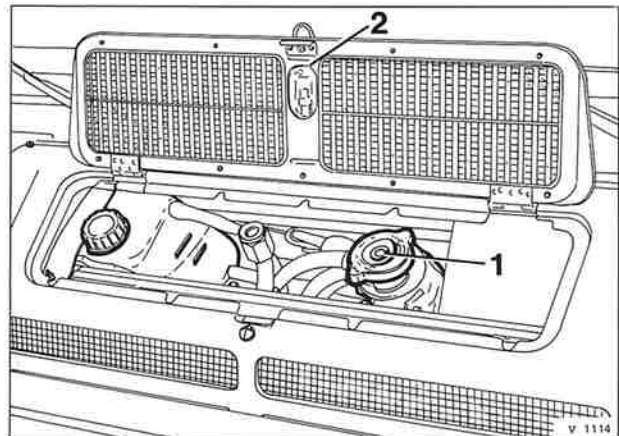


Fig. 2

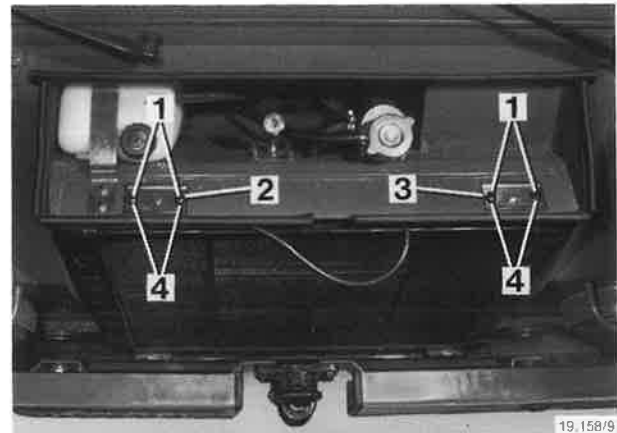


Fig. 3



Fig. 4

- 11 Loosen hose clip (5/1) and pull off hose (5/2) from filler neck to radiator.
- 12 Loosen hose clip (5/3) and pull off coolant feed hose (5/4) from radiator.
- 13 Loosen hose (5/5) and pull off coolant return hose (5/6) from radiator.

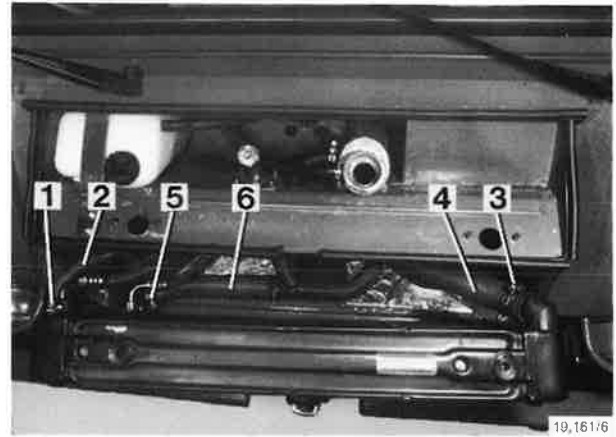


Fig. 5

- 14 Only for automatic gearbox model: loosen hose (6/1) and hose (6/2) for automatic drive oil from the radiator.

NOTE: Oil cooler and radiator form one unit.

- 15 Remove radiator.

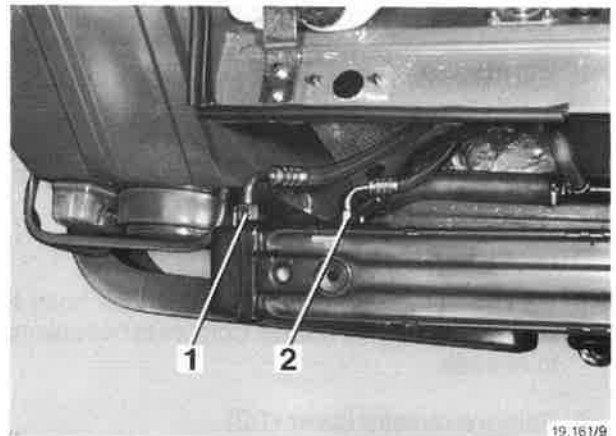


Fig. 6

- 16 Loosen cable clips (7/1 and 7/2).

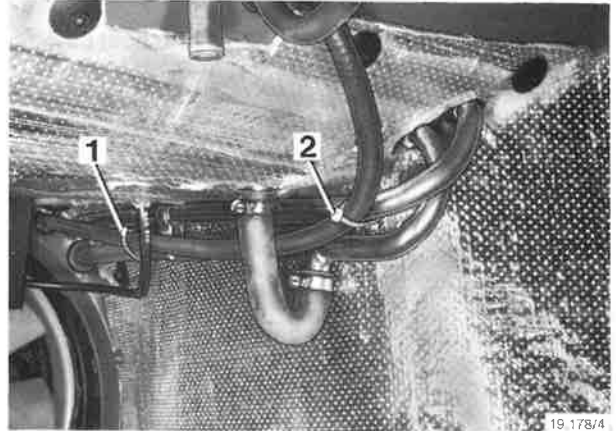


Fig. 7

- 17 Loosen hose clip (8/1) and pull off hose (8/2).
- 18 Pull out hose (8/2) from the grommet (8/3).
- 19 Remove driver's seat and left-side engine cover, see group 171

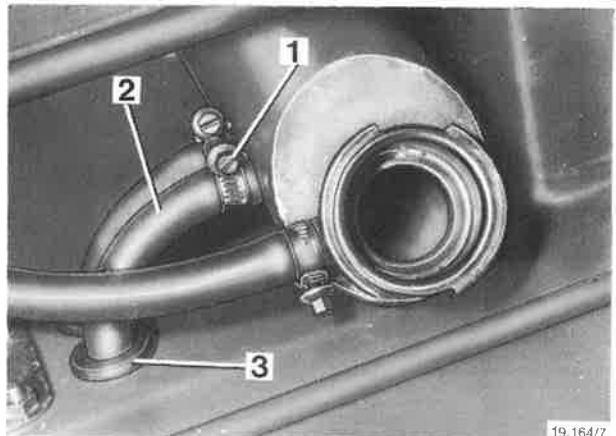


Fig. 8

- 20 Loosen hose clip (9/1) and pull off hose (9/2) from branch tube (9/3).
- 21 Undo hose (9/2) from hose guide (9/4).
- 22 Loosen cable clip (9/5)
- 23 Pull out hose (9/2) from the grommet (9/6).

Fitting:

- 24 Fitting is made in reverse sequence 23-8 and 6-1.
- 25 Fill coolant, see section 30.
- 26 Correct oil level in automatic gearbox, see group 074

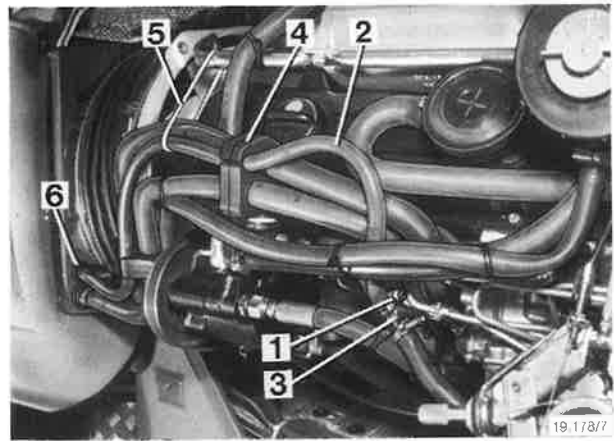


Fig. 9

24 Change visco-hub

Includes: Removing driver's seat, front passenger seat and engine covers with maintenance cover left- and right-side, see group 171

Removing:

- 1 Remove driver's seat, front passenger seat and engine cover with maintenance cover left- and right-side, see group 171
- 2 Unscrew retaining screws (1/1 and 1/2), remove nuts and washers.
- 3 Unscrew retaining screw (2/1), remove nut and washer.

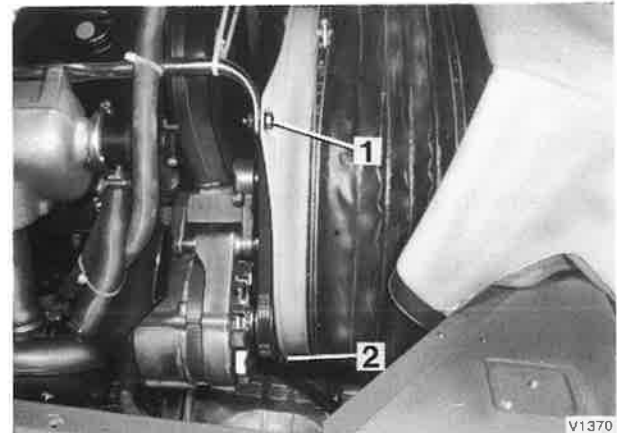


Fig. 1

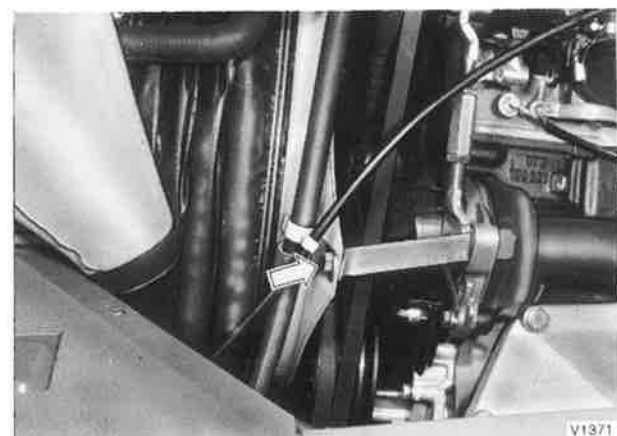


Fig. 2

- 4 Stretch fan cowl (3/1) forwards with wire hook (3/2).

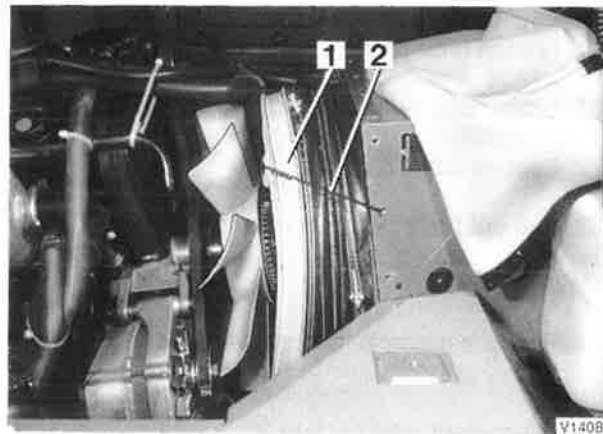


Fig. 3

- 5 Unscrew retaining screw of visco-hub (4/1) with Allan key 8mm and lift off visco-hub with fan wheel.

WARNING: Secure screw with Loctite 573 ! Torque 45 Nm.



Fig. 4

- 6 Loosen retaining screws (5/1) and remove fan (5/2) from visco-hub (5/3).

Fitting:

- 7 Fasten fan (5/2) onto visco-hub (5/3) with retaining screws (5/1) to 22 Nm.

NOTE: Secure screws (5/1) with Loctite 222.

- 8 Further fitting is made in reverse sequence 4-1.

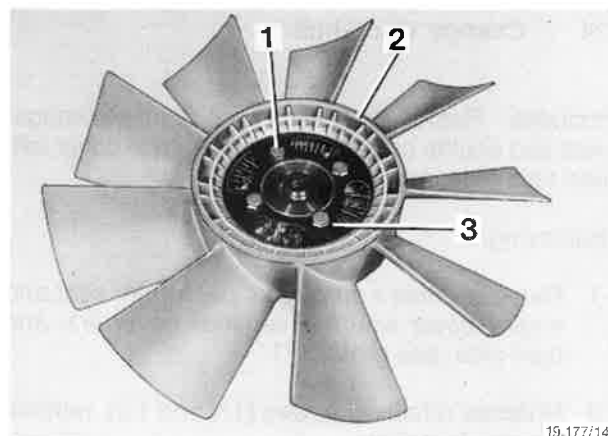


Fig. 5

25 Check fan

Removing:

- 1 Remove fan, see section 24.
- 2 Check fan for damage or cracks at the blades (1/1).
- 3 Check condition of seating (1/2).

Fitting:

- 4 Fit fan, see section 24.

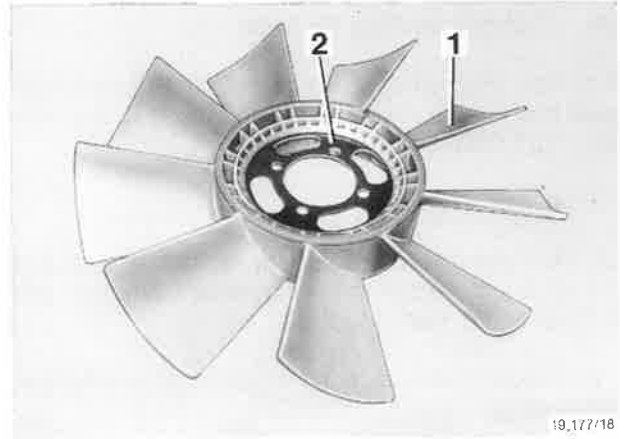


Fig. 1

26 Change fan

- 1 See section 24.

27 Change pulley

Includes: Tensioning V-belt, see group 010

Removing:

- 1 Remove fan, see section 24.
- 2 Loosen retaining screw to alternator (1/1) and turn tensioning screw (1/2) to the left until V-belt can be taken off.
- 3 Loosen retaining screws (2/1) of pulley (2/2) and remove pulley.

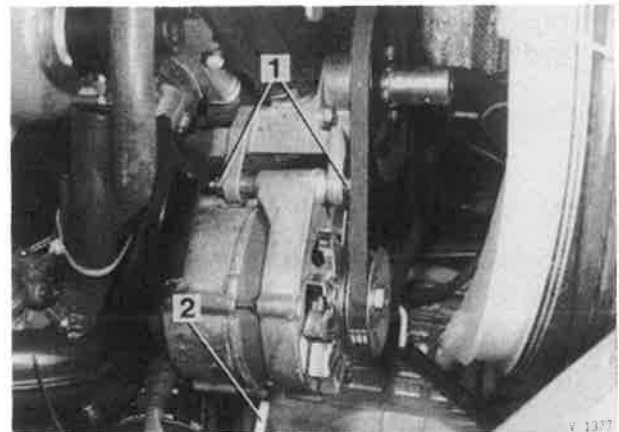


Fig. 1

Fitting:

- 4 Fitting is made in reverse sequence 3-1.
- 5 Tension V-belt, see group 010

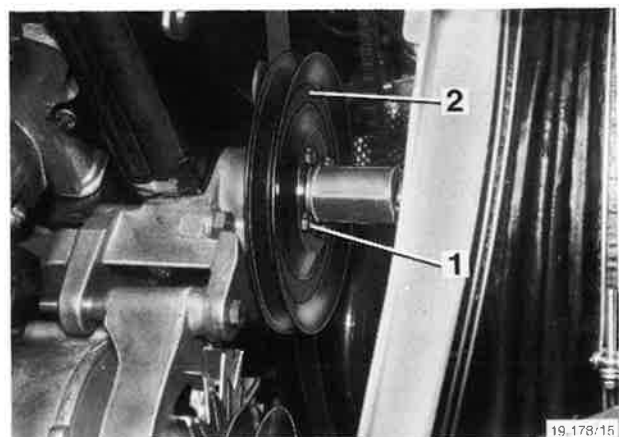


Fig. 2

28 Check cooling air hose

Includes: Removing driver's seat, front passenger seat and engine covers with maintenance cover left- and right-side, see group 171

Removing:

- 1 Remove driver's seat, front passenger seat and engine covers with maintenance cover left- and right-side, see group 171
- 2 Check cooling air hose for damage, cracks and tightness (visual inspection).

Fitting:

- 3 Fitting is made in reverse sequence.

29 Change cooling air hose

Removing:

- 1 See section 24.
- 2 Loosen screws (1/1 and 1/2) of hose clamps. Remove both hose clamps (1/3 and 1/4).
- 3 Pull off cooling air hose (1/5) from air duct (1/6) and remove fan cowl (1/7).
- 4 Separate cooling air hose from fan cowl.

Fitting:

- 5 Clean all traces of contact adhesive from air duct and fan cowl.
- 6 Apply contact adhesive to fan cowl and push on cooling air hose.
- 7 Fasten cooling air hose at fan cowl with hose clamp.
- 8 Fasten fan cowl with the retaining screws.
- 9 Apply contact adhesive to air duct and mount cooling air hose.
- 10 Fasten cooling air hose at air duct with hose clamp.
- 11 Further fitting is made in reverse sequence according to section 24.

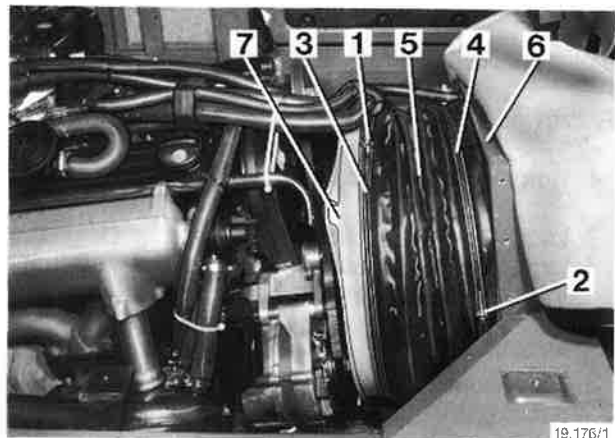


Fig.1

30 Fill coolant

NOTE: Use only pre-mixed coolant (anti-corrosion/anti-freeze agents and clean water at 50 % by volume each). The coolant agents are preventing freeze and corrosion damages and raise the boiling-point of the water. Therefore the cooling system must be filled with pre-mixed coolant the whole year round.

The coolant has to be filled according to the versions A, B, C or D observing the following instructions. In case of new filling of the cooling system some changes in the coolant circulation have to be made. Works therefore are divided into two parts: changes and fillings.

Distinctive features of versions A, B, C, and D

Version A:

up to chassis end number 0264
radiator cover, short (1/arrow)

filler neck (2/1)
expansion tank (2/2)

Version B:

from chassis end number 0265
up to chassis end number 1790

radiator cover, short (3/arrow)

filler neck (4/1)
compensation tank (4/2)
filler tube (4/3)

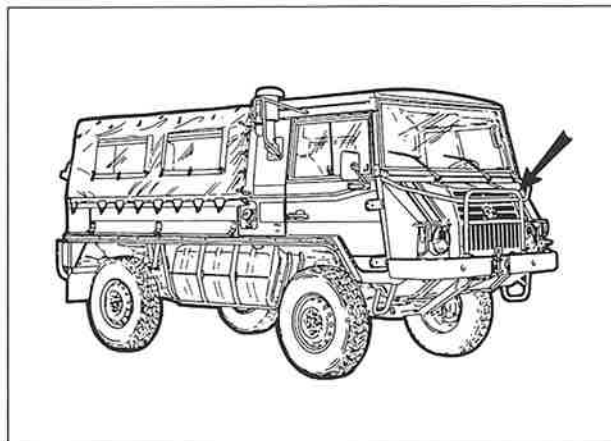


Fig. 1

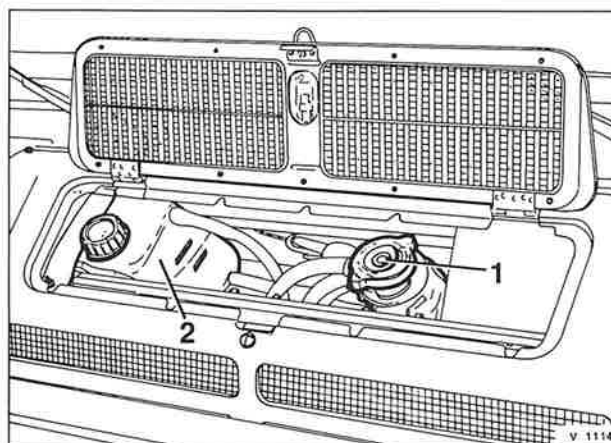


Fig. 2

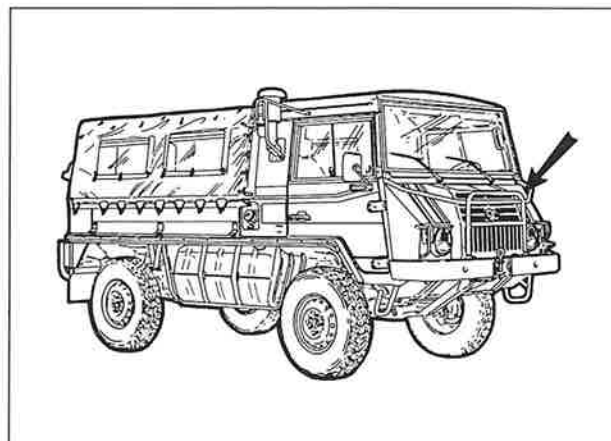


Fig. 3

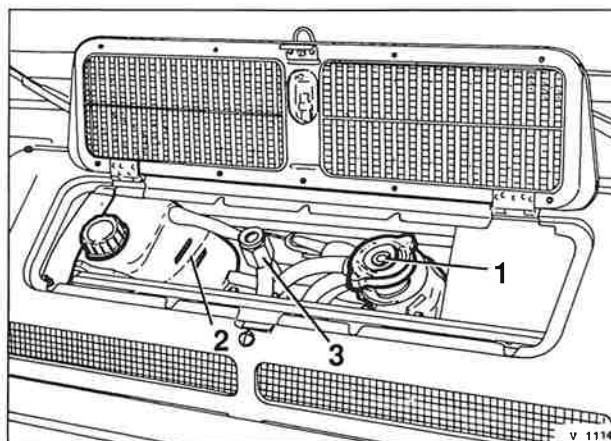


Fig. 4

Version C:

from chassis end number 1791
up to chassis end number 1936

radiator grille advanced (5/arrow)

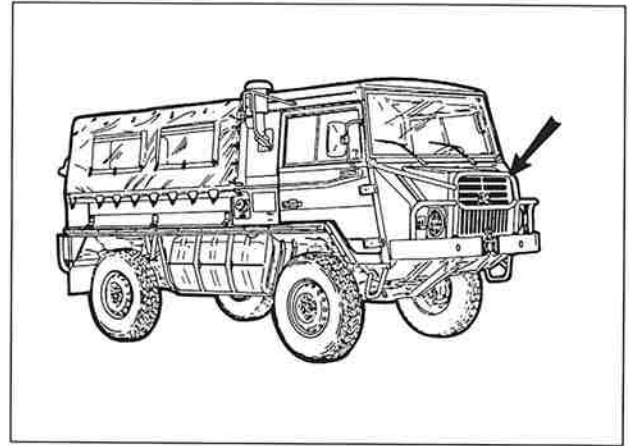


Fig. 5

without coolant filling auxiliary valve (6/arrow)

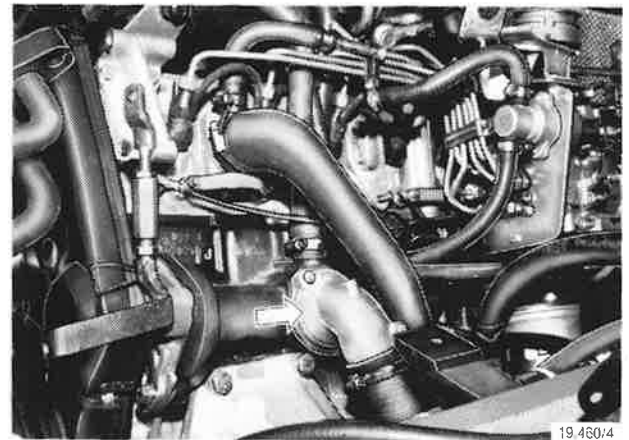


Fig. 6

Version D:

from chassis end number 1937
radiator grille advanced (7/arrow)

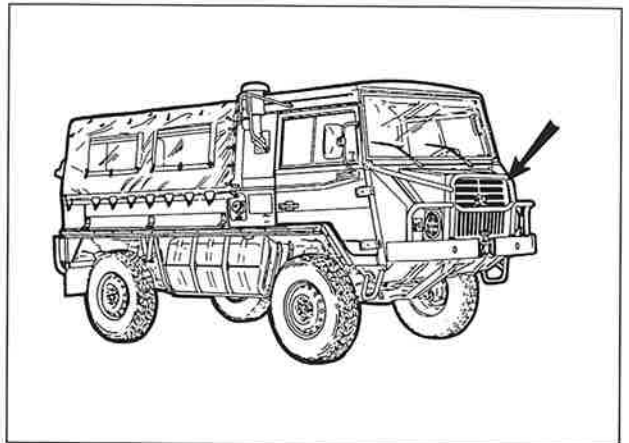


Fig. 7

with coolant filling auxiliary valve

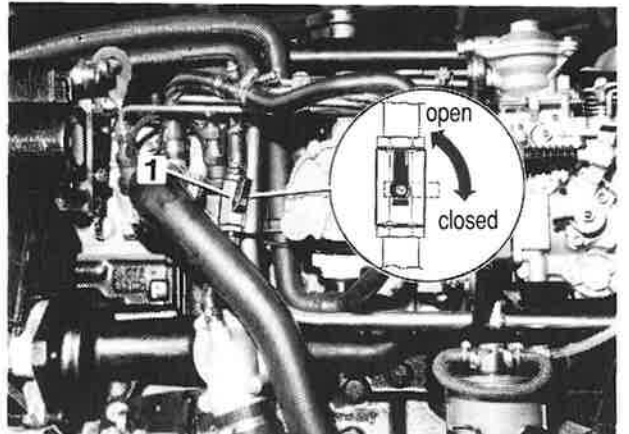


Fig. 8

Filling of coolant circulation

Version A

Change:

- 1 Mount Y-piece (9/1) according to drawing. Observe mounting position (branch pointing to cold starter).
- 2 Place throttle (9/2), pos. no. 758.1.17.016.1, into hose to cold starter (9/3) and insert with Y-piece (9/1).

Filling:

- 1 Push heating control lever on instrument panel to the left (red point being "open" position).
- 2 Top up coolant in expansion tank (10/2) between min. and max. marks.
- 3 Open filler cap (10/1) on filler neck.
- 4 Top up coolant to neck of filler neck.
- 5 Start engine and let idle for about 10 minutes at 2000 revs. (filler neck open).
- 6 Stop engine. Top up coolant to neck of filler neck.
- 7 Start engine again and let idle for about 6 minutes at 2000 revs. (filler neck open).
- 8 Stop engine and top up coolant to neck of filler neck.
- 9 Attach filler cap (10/1) and tighten.
- 10 Make a roadtest for about 20 minutes.

WARNING: Open filler cap on filler neck only when engine is cold (danger of scalding)!

- 11 Turn filler cap (10/1) as far as first notch. Release excess pressure. Continue turning to second notch and remove.
- 12 Top up coolant to neck of filler neck.
- 13 Place and tighten filler cap (10/1).
- 14 After cooling down of the engine, coolant level in expansion tank (10/2) must be between maximum and minimum marks.

Filling capacity: approx. 12 liters.

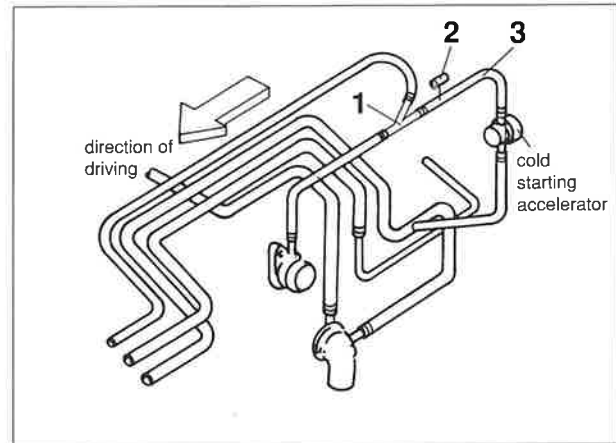


Fig. 9

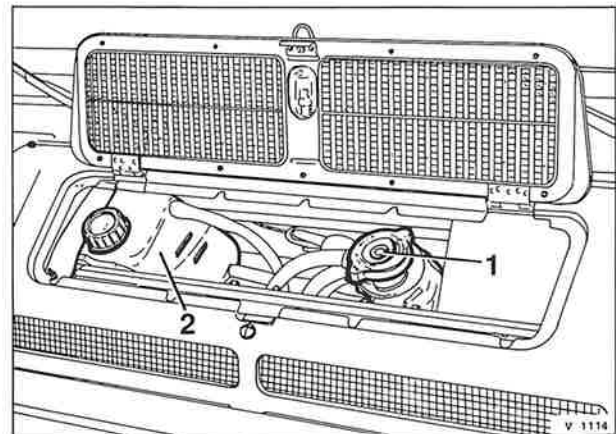


Fig. 10

Version B

Change:

- 1 Mount Y-piece (11/1) according to drawing. Observe mounting position (branch pointing to cold starter).
- 2 Place throttle (9/2), pos. no. 758.1.17.016.1, into hose to cold starter (11/3) and insert with Y-piece (11/1).

Filling:

- 1 Push heating control lever on instrument panel to the left (red point being "open" position).
- 2 Top up coolant in expansion tank (12/2) between min. and max. marks.
- 3 Open filler cap (12/1) of filler neck.
- 4 Open screw plug of filler tube (12/3).
- 5 Fill coolant to top of filler tube.
- 6 Tighten screw plug (12/3) of filler tube.
- 7 Top up coolant to neck of filler neck.
- 8 Start engine and let idle for about 10 minutes at 2000 revs. (filler neck open).
- 9 Stop engine. Top up coolant to neck of filler neck.
- 10 Start engine again and let idle for about 6 minutes at 2000 revs. (filler neck open).
- 11 Stop engine and top up coolant to neck of filler neck.
- 12 Attach filler cap (12/1) and tighten.
- 13 Make a roadtest for about 20 minutes.

WARNING: Open filler cap on filler neck only when engine is cold (danger of scalding)!

- 14 Turn filler cap (12/1) as far as first notch. Release excess pressure. Continue turning to second notch and remove.
- 15 Top up coolant to neck of filler neck.
- 16 Place and tighten filler cap (12/1).
- 17 After cooling down of the engine, coolant level in expansion tank (12/2) must be between maximum and minimum marks.

Filling capacity: approx. 12 liters.

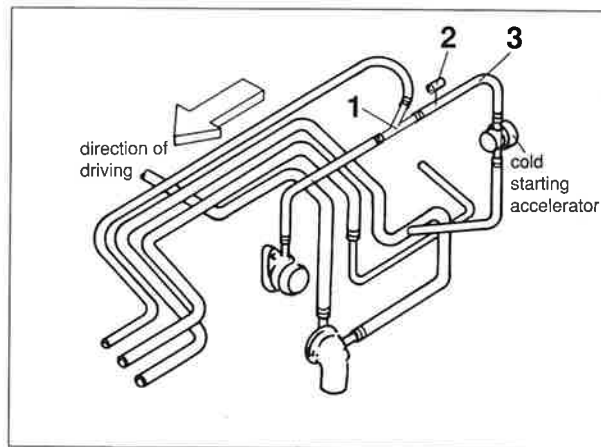


Fig. 11

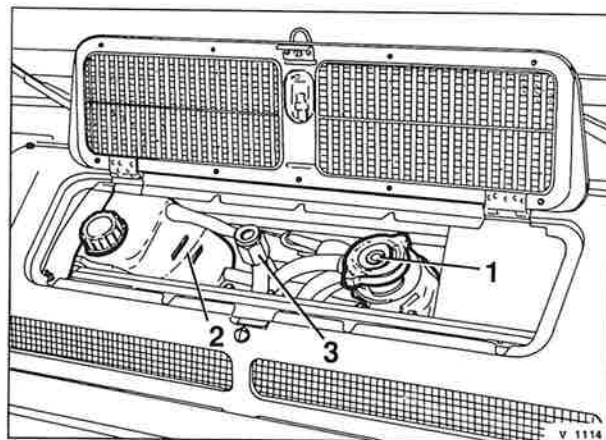


Fig. 12

Version C

Change:

- 1 Mount Y-piece (11/1) according to drawing. Observe mounting position (branch pointing to cold starter).
- 2 Place throttle (9/2), pos. no. 758.1.17.016.1, into hose to cold starter (11/3) and insert with Y-piece (11/1).

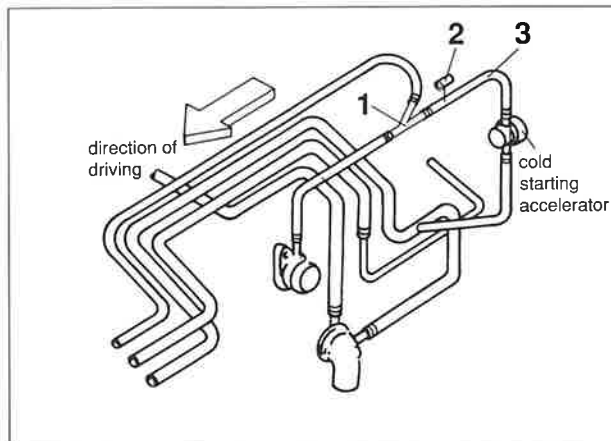


Fig. 13

- 3 Pull off hose (14/1) from filler neck (14/2). Make visual check that throttle (14/3) is mounted in hose (14/1). Pull throttle (14/3) out of hose (14/1) using counter-clockwise driver. Shorten hose (14/1) as far as it can be mounted without sagging on the filler neck (14/2).
- 4 Check engraved degree number (71°, 80° or 87°) on thermostat.

WARNING: There are thermostats with differing opening temperatures depending on countries.

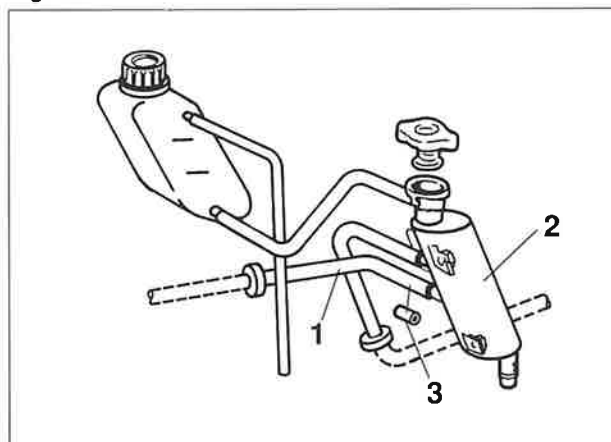


Fig. 14

Near East countries:

Thermostat (15), pos. no. 716.1.17.100.0, 71°C and bore 2.5 mm.

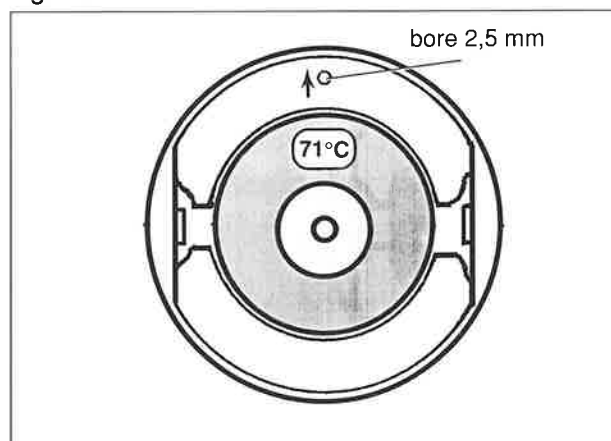


Fig. 15

African and Asian countries:

Thermostat (16), pos.no. 076.121.113 or 076.121.113B 80°C.

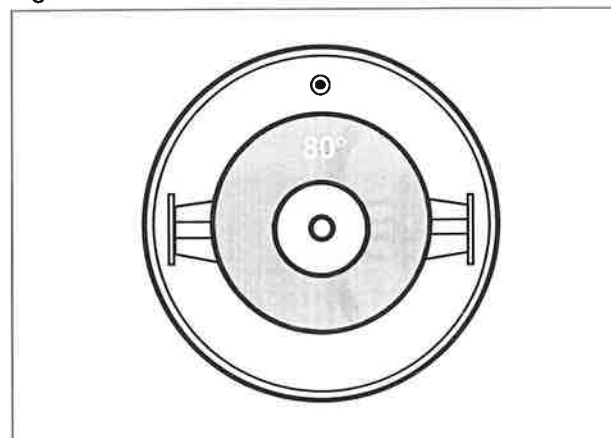


Fig. 16

European countries:

Thermostat (17), pos. no. 075.121.113 A, 87°C.

When fitting the thermostat the bore of the valve must point upwards.

- 5 Check filler cap of filler neck.

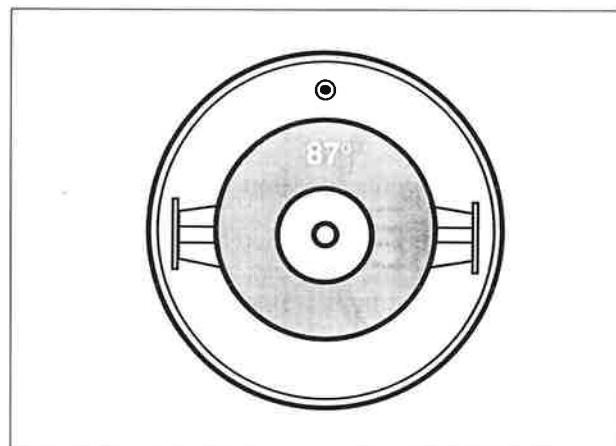


Fig. 17

WARNING: Use filler cap (18/arrow), pos. no. 716.1.17.031.2, opening pressure 1.3 bar only in case of versions A and B.



Fig. 18

Use filler cap (19), pos. no. 716.2.17.031.2, opening pressure 1 bar only in case of versions C and D.



Fig. 19

Filling:

- 1 Pull off heating return hose (20/1) from connecting tube (20/2) at air duct.
- 2 Place funnel on heating return hose (20/1) and fill in coolant until it flows out of the hose.
- 3 Fit heating return hose (20/1).

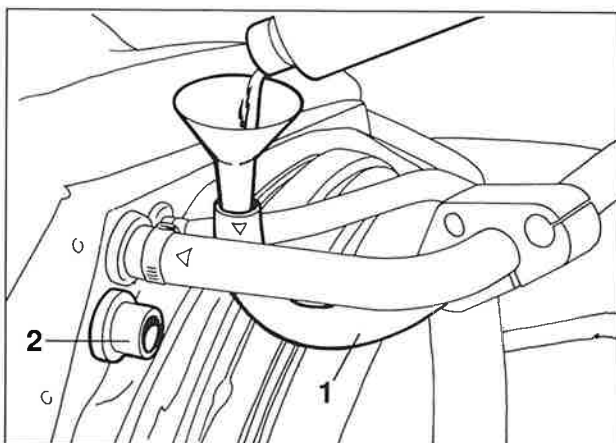


Fig. 20

- 4 Push heating control lever on instrument panel to the left (red point being "open" position).
- 5 Top up coolant in expansion tank (21/2) between min. and max. marks.
- 6 Open filler cap (21/1) on filler neck.
- 7 Top up coolant to neck of filler neck.
- 8 Start engine and let idle for about 10 minutes at 2000 revs. (filler neck open).
- 9 Stop engine. Top up coolant to neck of filler neck.
- 10 Start engine again and let idle for about 6 minutes at 2000 revs. (filler neck open).
- 11 Stop engine and top up coolant to neck of filler neck.
- 12 Attach filler cap (21/1) and tighten.
- 13 Make a roadtest for about 20 minutes.

WARNING: Open filler cap on filler neck only when engine is cold (danger of scalding)!

- 14 Turn filler cap (21/1) as far as first notch. Release excess pressure. Continue turning to second notch and remove.
- 15 Top up coolant to neck of filler neck.
- 16 Place and tighten filler cap (21/1).
- 17 After cooling down of the engine, coolant level in expansion tank (21/2) must be between maximum and minimum marks.

Filling capacity: approx. 15 liters.

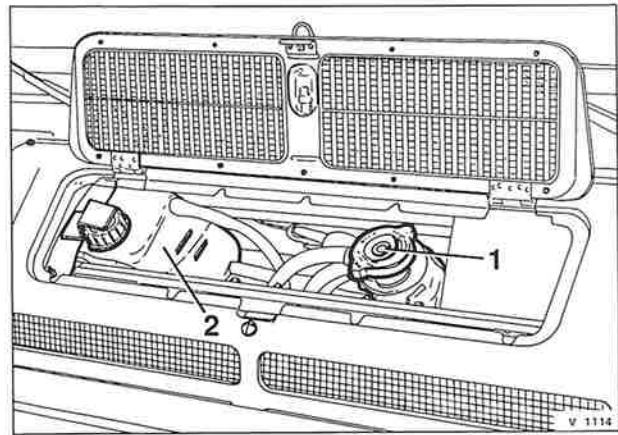


Fig. 21

Version D:

Filling:

- 1 Open coolant filling auxiliary valve (22/1) (vertical position).
 - 2 Push heating control lever on instrument panel to the left (red point being "open" position).
 - 3 Top up coolant in expansion tank (23/2) between min. and max. marks.
 - 4 Open filler cap (23/1) on filler neck.
 - 5 Top up coolant to neck of filler neck.
 - 6 Start engine and let idle for about 10 minutes at 2000 revs. (filler neck open).
 - 7 Stop engine. Top up coolant to neck of filler neck.
 - 8 Start engine again and let idle for about 6 minutes at 2000 revs. (filler neck open).
 - 9 Stop engine and top up coolant to neck of filler neck.
 - 10 Attach filler cap (23/1) and tighten.
 - 11 Close coolant filling auxiliary valve (24/1) (horizontal position).
 - 12 Make a roadtest for about 20 minutes.
- WARNING:** Open filler cap on filler neck only when engine is cold (danger of scalding)!
- 13 Turn filler cap (23/1) as far as first notch. Release excess pressure. Continue turning to second notch and remove.
 - 14 Top up coolant to neck of filler neck.
 - 15 Place and tighten filler cap (23/1).
 - 16 After cooling down of the engine, coolant level in expansion tank (23/2) must be between maximum and minimum marks.

Filling capacity: approx. 15 liters.

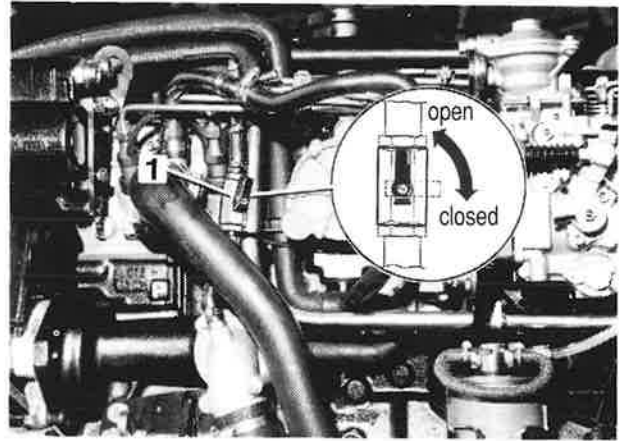


Fig. 22

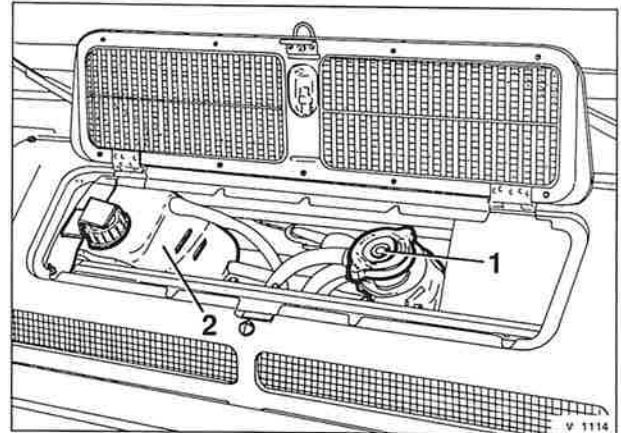


Fig. 23

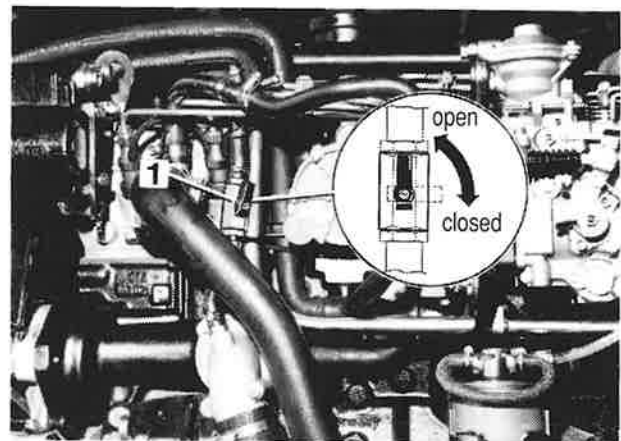


Fig. 24