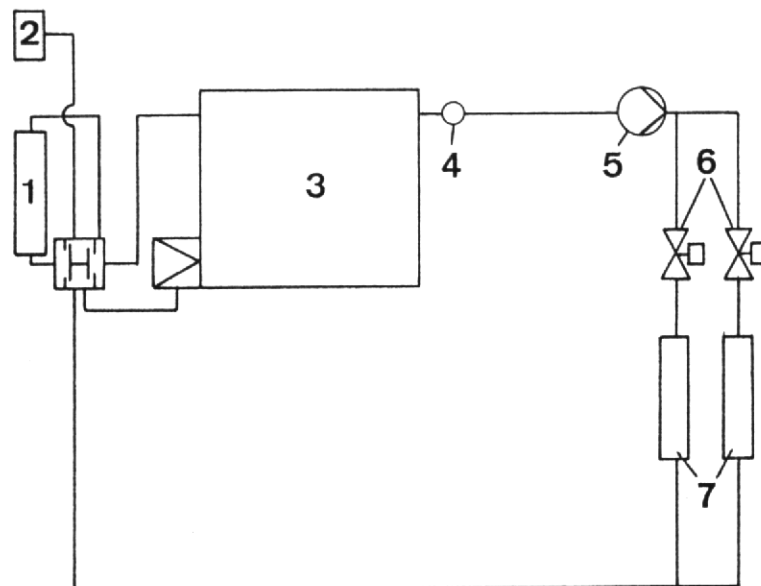


17 Radiator

17 00 005	Coolant circuit of 12 cylinder M 70 engine	17-00/1
009	Coolant - drain and fill (part of 17 11 000)	
039	Cooling system - check for leaks	17-00/2
17 11 000	Cooling system - bleed and check for leaks	17-00/3
100	Radiator - remove and install	17-11/1
130	Coolant expansion tank - remove and install	17-11/3
509	Bleeder pipe betw. radiator and expansion tank (part of 17 11 000)	
17 40 000	Radiator - flush	17-11/4
	Additional fan - remove and install	17-40/1

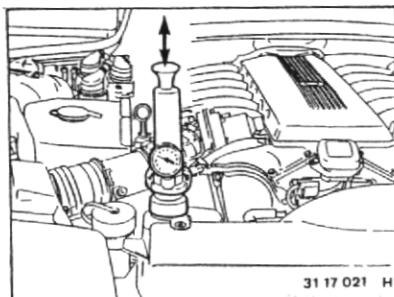
COOLANT CIRCUIT OF TWELVE CYLINDER M 70 ENGINE



- 1 Radiator
- 2 Expansion tank
- 3 Engine block/cyl. head circuit
- 4 Temperature sensor
- 5 Additional water pump
- 6 Heater valves
- 7 Heat exchanger

31 17 002 H

17-00/2

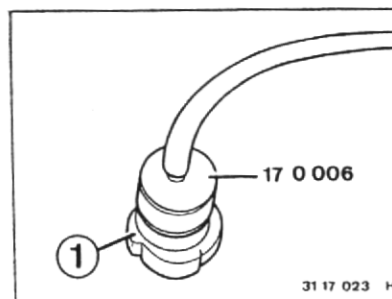


17 00 009 CHECKING COOLING SYSTEM FOR LEAKS

Caution!

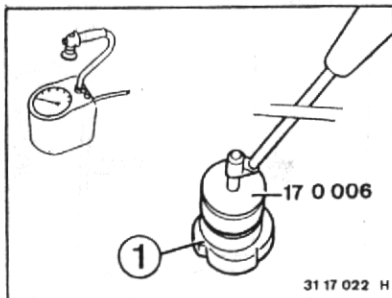
Take off expansion tank cap only when engine has cooled off.

Set up Special Tools 17 0 002 and 17 0 005 on the expansion tank and produce 1 bar (14 psi) pressure. The cooling system does not leak, if there is no considerable pressure drop (max. 0.1 bar / 1.4 psi) after about 2 minutes.



B: Checking Vacuum Valve

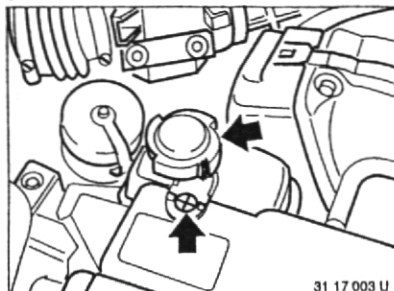
Screw cap (1) on Special Tool 17 0 006 and connect with vacuum hose on a BMW SERVICE TESTER or Special Tool 61 6 030. Supply vacuum to cap slowly. Vacuum valve must open with about 0.9 bar (13 psi) vacuum.



Checking Cap

A: Checking High Pressure Valve

Screw cap (1) on Special Tool 17 0 006 and supply air pressure slowly. High pressure valve must open with about 2 bar (28 psi) pressure.



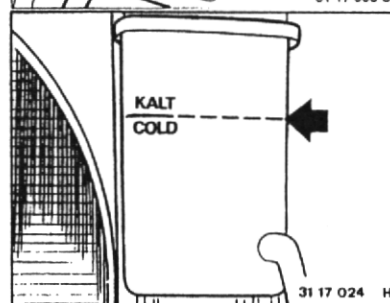
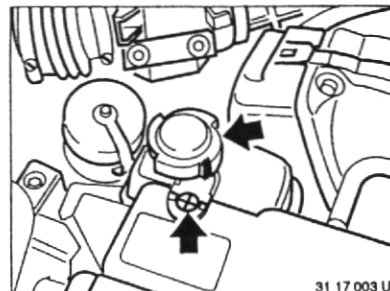
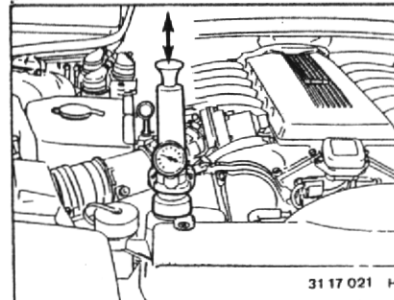
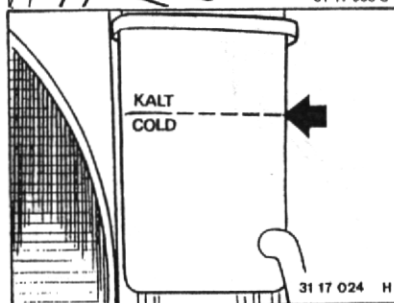
17 00 039 BLEEDING AND CHECKING COOLING SYSTEM FOR LEAKS:

Refilling with Cold Engine:
Set heater valve to "WARM".
Loosen bleeder screw 2 to 3 turns.
Fill expansion tank until full (approx. 11...12 liters / 10...12 quarts).
Only use approved coolant**.

Start engine briefly (fluid level in expansion tank drops).
Pour coolant in expansion tank until level reaches the filler neck.
Total coolant volume*.
Install cap on expansion tank.
Tighten bleeder screw.

Coolant level should be at the "COLD" mark after running the engine warm and then letting it cool off to about 20° C (68° F).

Check cooling system for leaks – see 17 00 009.



Correcting Coolant Level:
Set heater valve to "WARM".

Caution!
Take off expansion tank cap only after engine has cooled off.

Loosen bleeder screw 2 to 3 turns and wait for coolant without air bubbles to run out.
Start engine briefly.
Keep adding coolant to the expansion tank during bleeding procedures.
Install expansion tank cap.
Tighten bleeder screw.

Check coolant level after engine was run warm.

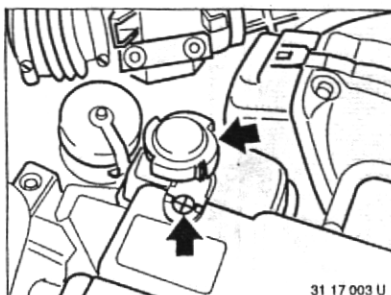
Cold coolant level mark on the expansion tank is the coolant level at approx. 20° C (68° F).
Only use approved coolant**.

Caution!
Never fill the cooling system of a hot engine.

* See Specifications
** See Operating Fluids

** See Operating Fluids

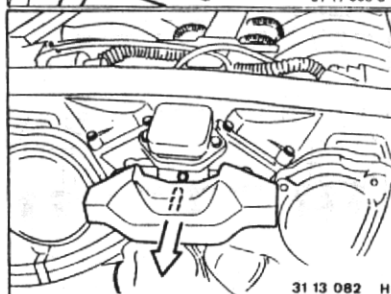
17-11/1



31 17 003 U

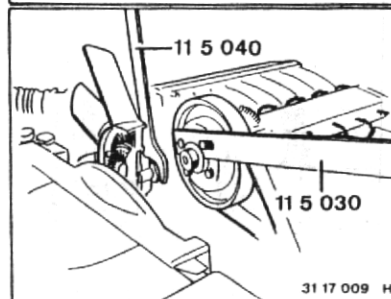
17 11 000 REMOVING AND INSTALLING RADIATOR

Caution!
Unscrew expansion tank cap only after engine has cooled off.
Loosen bleeder screw.



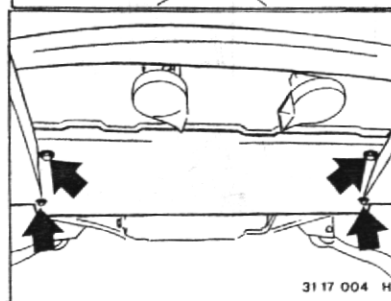
31 13 082 H

Pull off oil catch tray.



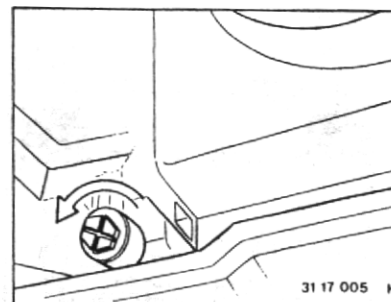
31 17 009 H

Remove fan.



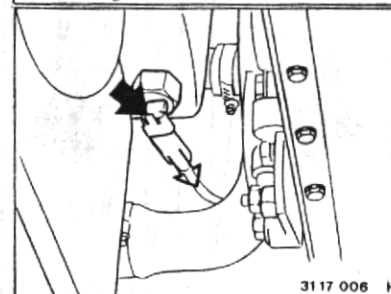
31 17 004 H

Unscrew engine splash guard.



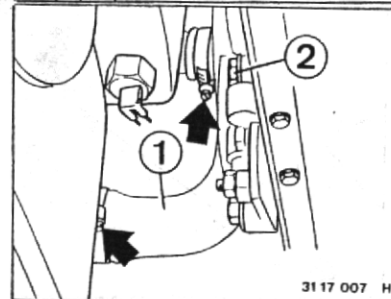
31 17 005 H

Unscrew drain plug and drain, catch and dispose coolant.



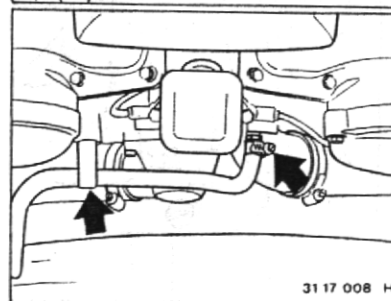
31 17 006 H

Pull off plug on level sender.



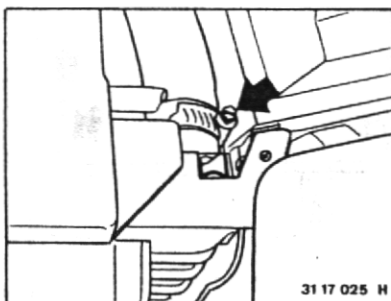
31 17 007 H

Disconnect bottom coolant hose (1) and expansion hose (2).
Catch and dispose coolant.

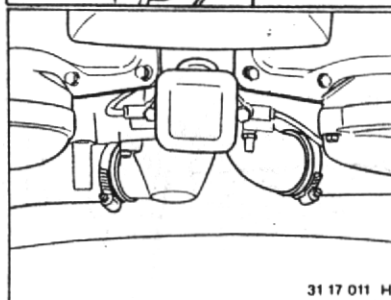


31 17 008 H

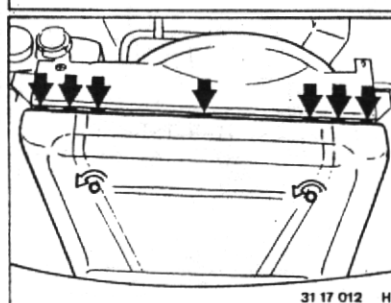
Disconnect bleeding hose.



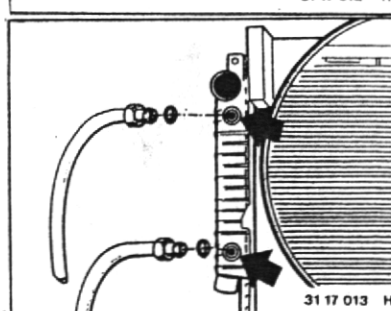
Disconnect top coolant hose.



Disconnect coolant hoses on engine.

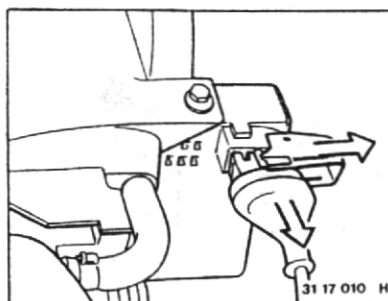


Unscrew upper air duct section and unclip at shown points (arrows) with a screwdriver.

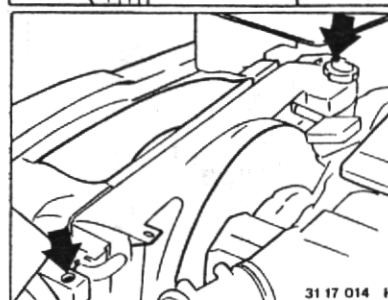


Cars with Automatic Transmission:

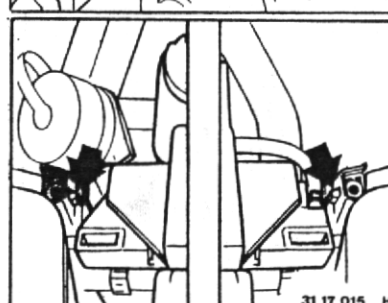
Disconnect transmission oil cooler pipes.
Catch and dispose escaping ATF.



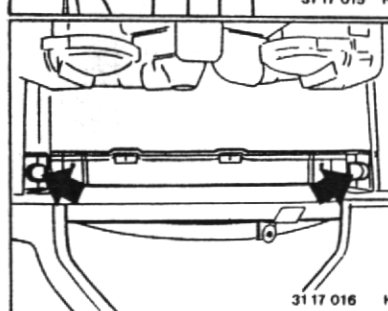
Unlock retainer and pull plug off of temperature switch.
If applicable, run out concealed headlights.



Unscrew radiator on left and right sides.
Run out concealed headlights for removal.



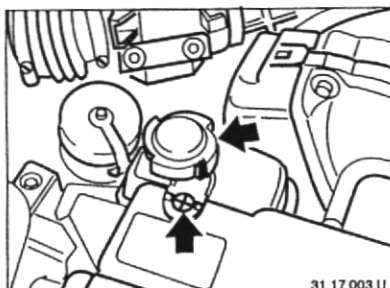
Installation:
Check for correct seating of mounts.



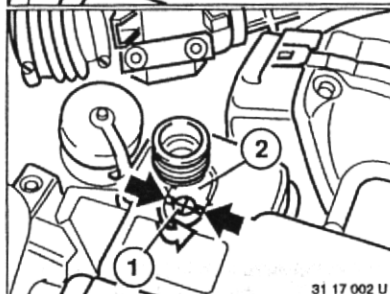
Lift out radiator.

Installation:
Place radiator on liners.

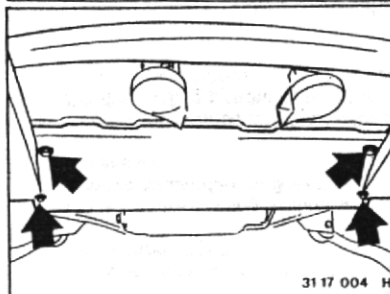
17-11/3



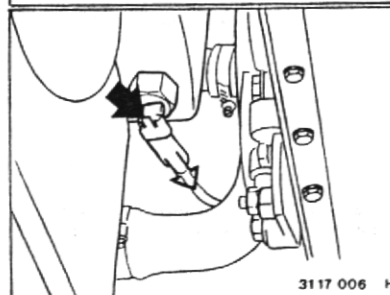
31 17 003 U



31 17 002 U



31 17 004 H



31 17 006 H

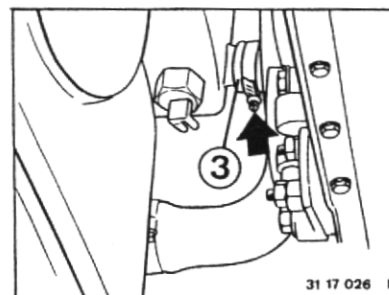
17 11 100 REMOVING AND INSTALLING COOLANT EXPANSION TANK

Caution!
Unscrew expansion tank cap only after engine has cooled off.

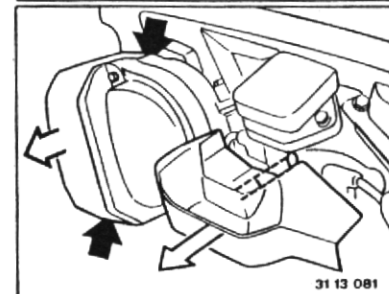
Unscrew and remove bleeder screw (1).
Unscrew and remove mounting part (2).

Unscrew engine splash guard.

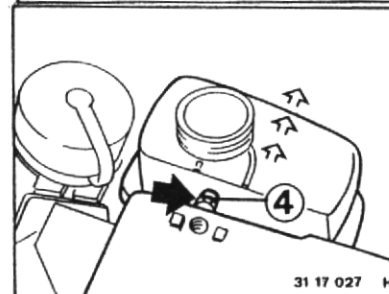
Pull off plug on level sender.



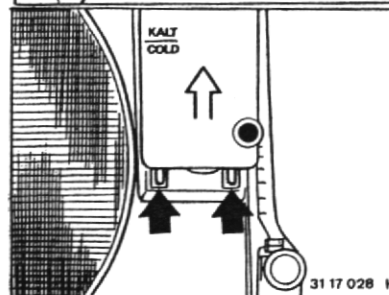
31 17 026 H



31 13 081 H



31 17 027 H



31 17 026 H

Disconnect expansion hose (3).
Drain, catch and dispose coolant.

Pull off branch wire guard.

Pull back expansion tank and disconnect bleeding hose (4).

Pull out expansion tank from above.

Installation:
Expansion tank tabs must engage on the radiator.
Fill cooling system with specified coolant and bleed – see 17 00 039.

17-11/4

17 11 509 FLUSHING RADIATOR

If there is oil in the cooling circuit, the radiator and expansion tank must be flushed and cleaned with Solvethane**.

Procedures:

1. Remove radiator and expansion tank – see 17 10 000/100.
2. Pour in 2 liters (4 pints) of Solvethane.
3. Shake radiator and expansion tank thoroughly and drain Solvethane after oil has been dissolved.
4. Install the cleaned radiator and expansion tank again, and connect them on the cooling circuit.
5. Fill the entire cooling system with hot water and flush thoroughly to safely remove remainders of Solvethane, repeating this step several times as necessary.
6. Inspect the drained water for traces of oil and, if necessary, repeat step 5. Fill the cooling system with coolant* and bleed after completion of the cleaning procedures – see 17 00 039.

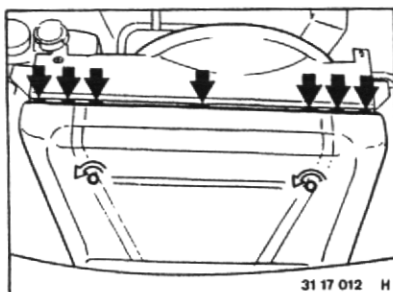
Note:

Solvethane attacks rubber seals, rubber hoses, etc.. Consequently it must not get into or remain in the cooling circuit. Always conform with safety precautions for working with Solvethane (printed on containers).

* See Operating Fluids

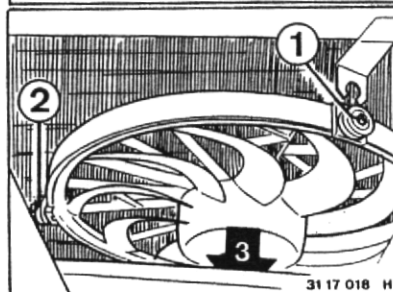
** Source of Supply: HWB

17-40/1

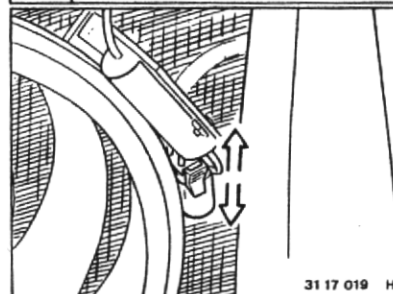


17 40 000 REMOVING AND INSTALLING
ADDITIONAL FAN ASSY.

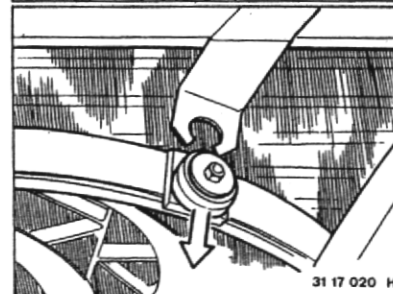
Unscrew upper air duct section and un-
clip on the radiator with a screwdriver.



Unscrew fan console bolts (1...3).



Disconnect plug.



Pull fan console with fan out of the re-
tainer and lift out.