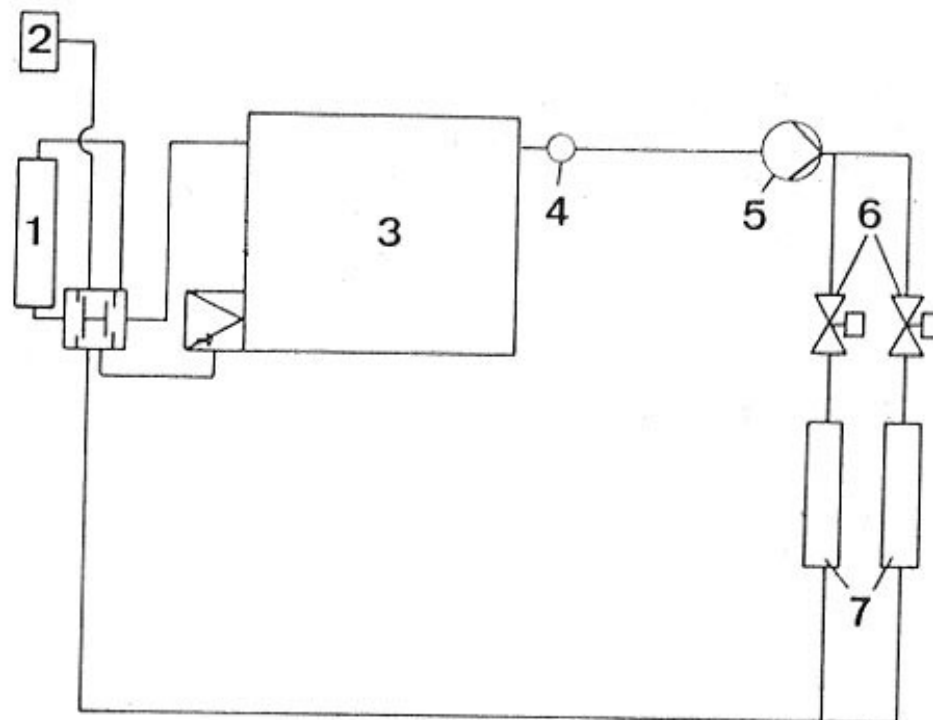


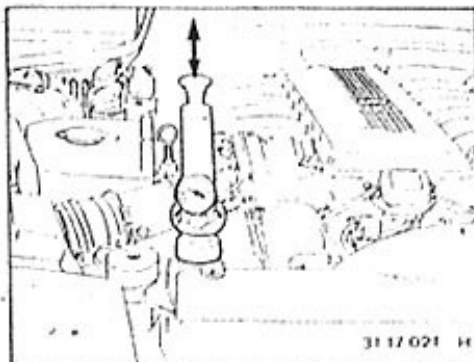
17 Radiator

	Coolant circuit, 12-cylinder M70	17- 0/1
17 00 009	Cooling system – check for water leaks	17- 0/2
039	Cooling system – vent and check for water leaks	17- 0/3
17 11 000	Radiator – remove and install	17-11/1
100	Coolant expansion tank – remove and install	17-11/3
509	Water cooler – flush	17-11/4
17 40 000	Auxiliary fan, complete – remove and install or replace	17-40/1

COOLANT CIRCUIT OF TWELVE CYLINDER M 70 ENGINE



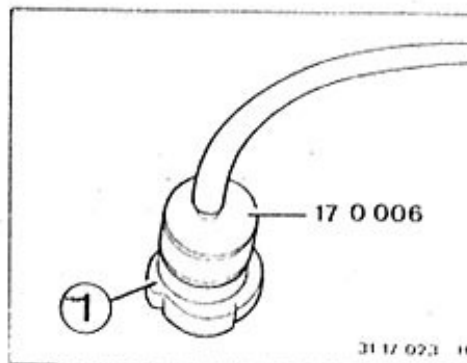
- 1 Radiator
- 2 Expansion tank
- 3 Engine block/cyl. head circuit
- 4 Temperature sensor
- 5 Additional water pump
- 6 Heater valves
- 7 Heat exchanger



17-00 009 Checking cooling system for leaks

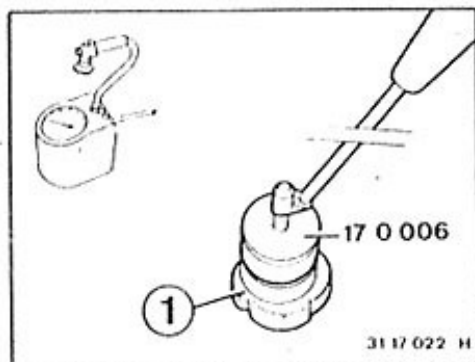
Caution: only unscrew expansion tank when engine is cold.

Attach tester 17 0 002 and adapter 17 0 005 to expansion tank and generate a pressure of 1 bar.
The cooling system does not leak if there is no significant drop in pressure (max. 0.1 bar) after about 2 minutes.



B: Check vacuum valve.

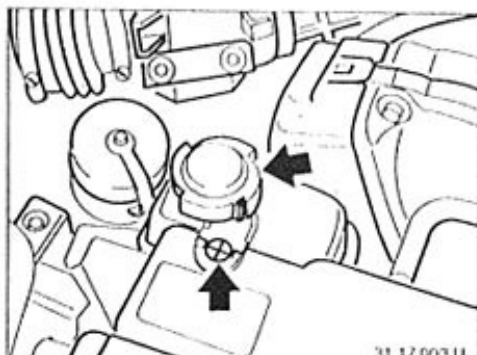
Screw cap (1) on tester 17 0 006 and connect vacuum hose to BMW Service Tester or to tool 61 6 030. Slowly build up a vacuum at the cap. Vacuum valve opens at about 0.9 bar (0.1 bar vacuum).



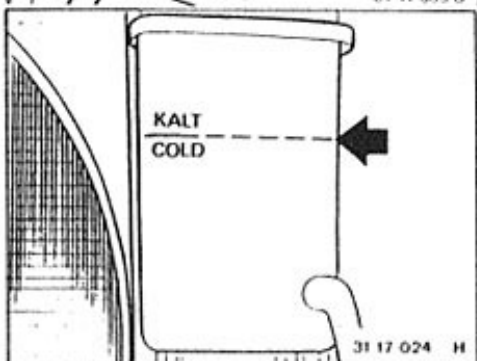
Check screw connection.

A: Check pressure valve.

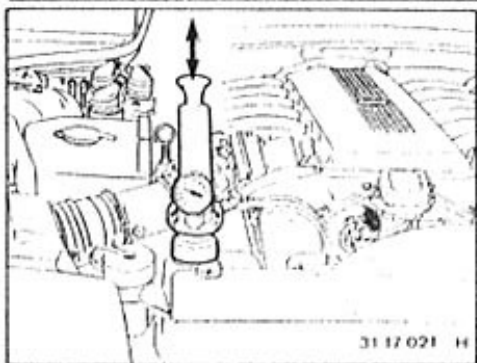
Screw connection (1) to tester 17 0 006 and build up air pressure slowly. Pressure relief valve should open at about 2 bar.



31 17 003 U



31 17 024 H



31 17 021 H

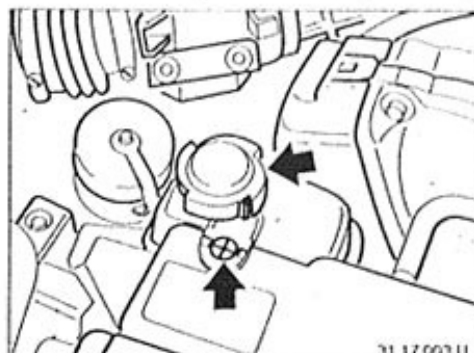
17-00 039 Bleeding cooling system and checking for leaks

When completely refilling (engine cold): set heating valve to "WARM", open venting screw 2-3 turns and completely fill expansion tank (approx. 11...12 l). Only use approved grade of coolant**.

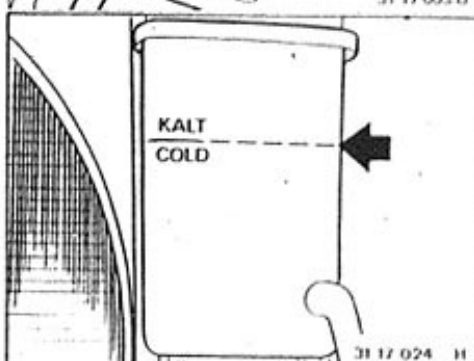
Run engine for a brief period (fluid level in expansion tank falls). Top up expansion tank as far as filler neck; total fill quantity*. Close expansion tank. Close venting screw.

After engine has run up to temperature then been allowed to cool down (to approx. 20° C), the coolant level should reach the mark "KALT/COLD".

Check cooling system for leaks
17 00 009.



31 17 003 U



31 17 024 H

Correct coolant level:

Set heating valve to "WARM".

Caution!

Only open expansion tank cap once engine has cooled down.

Open venting screw 2...3 turns and wait until coolant emerges without air bubbles.

Run engine for a brief period.

Top up level in expansion tank during this process.

Replace cap on expansion tank.

Close venting screw.

Once the engine has come up to temperature, check the coolant level.

The coolant level mark on the expansion tank indicates the coolant level at approx. 20° C.

Only use approved grade of coolant**.

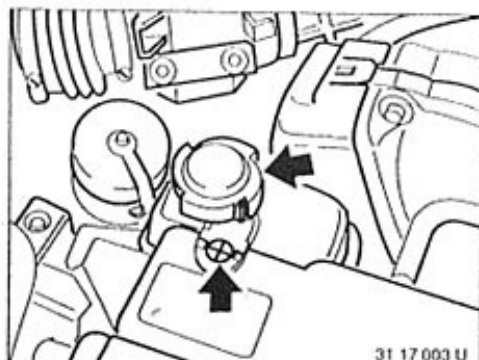
Caution!

Never top up cooling system while engine is hot.

* Refer to Technical Data

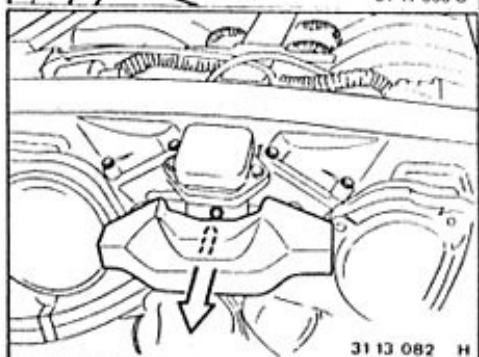
** Refer to Operating Fluids Specifications

* Refer to Operating Fluids Specifications

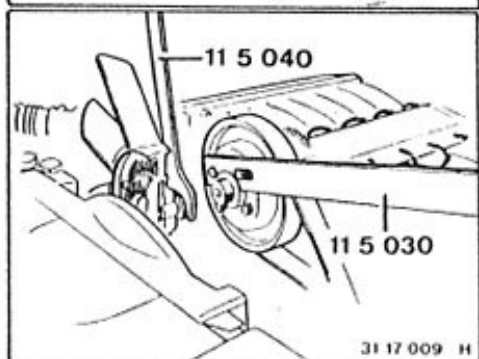


17 11 000 REMOVING AND INSTALLING RADIATOR

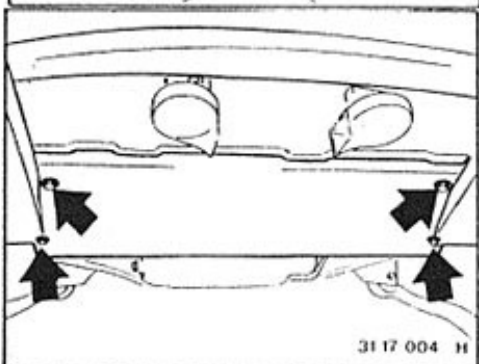
Caution!
Unscrew expansion tank cap only after engine has cooled off.
Loosen bleeder screw.



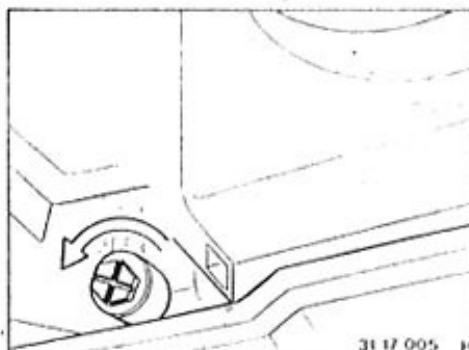
Pull off oil catch tray.



Remove fan.



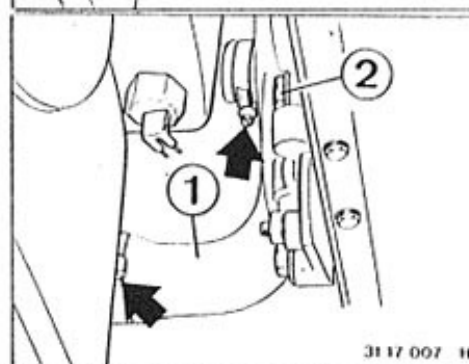
Unscrew engine splash guard.



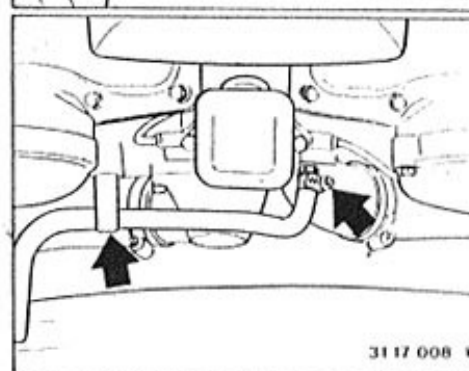
Unscrew drain plug and drain, catch and dispose coolant.



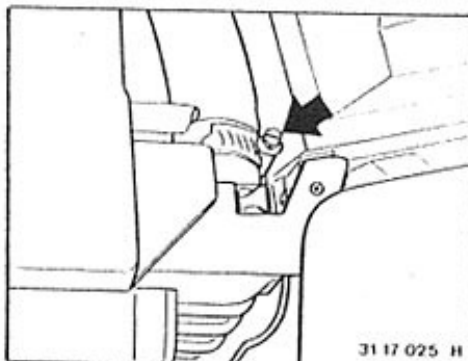
Pull off plug on level sender.



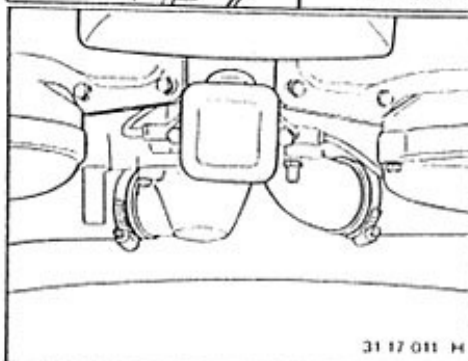
Disconnect bottom coolant hose (1) and expansion hose (2).
Catch and dispose coolant.



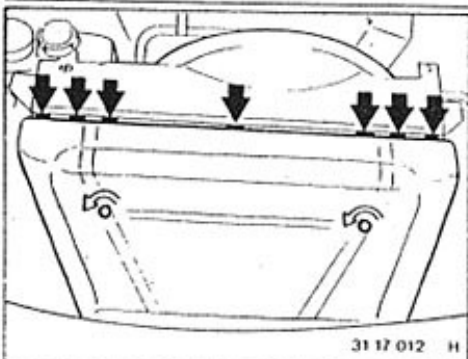
Disconnect bleeding hose.



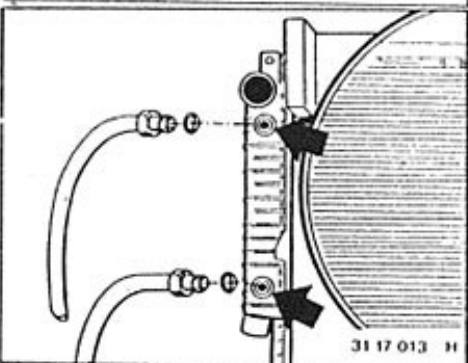
Remove upper water hose.



Remove water hoses from engine.

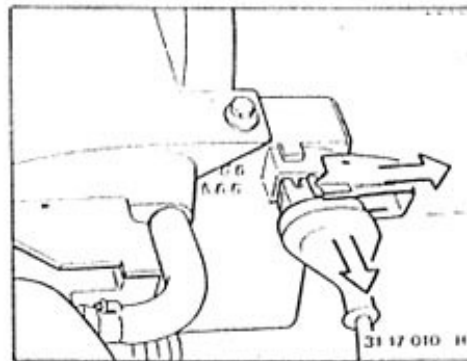


Unfasten upper section of air duct and unclip with screwdriver at specified points (arrows).

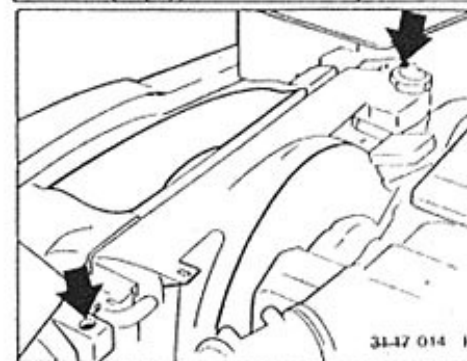


Version with integrated transmission oil cooler:

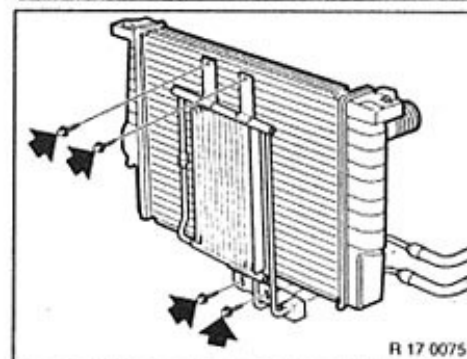
Remove transmission oil cooler lines. Catch escaping transmission fluid and dispose of it correctly.



Open clips and remove connector from temperature switch.
If necessary, raise the headlight pods.



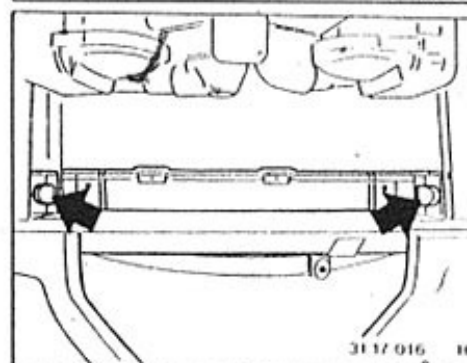
Unfasten left and right cooler brackets.
For removal, raise headlight pods.



Version with separate transmission oil cooler:

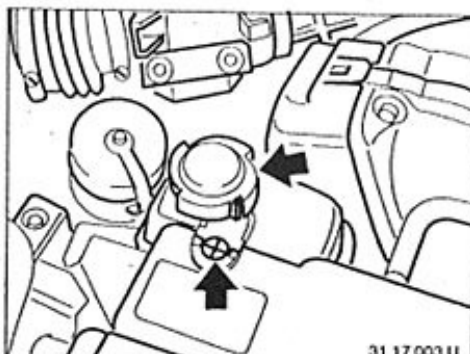
Lift radiator and press backwards.
Unfasten screws at top and bottom.

Note:
Transmission oil cooler remains in vehicle.



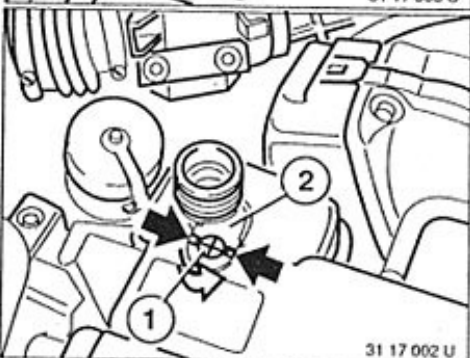
Lift out radiator.

Installation:
Ensure that mounting blocks are correctly located.
Place radiator on supports.

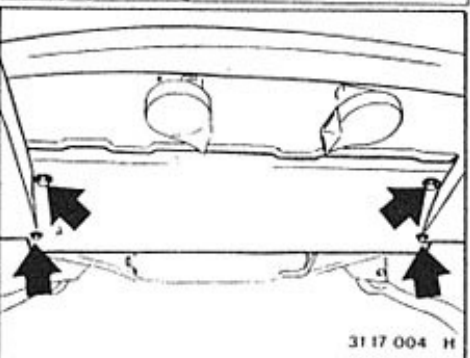


17 11 100 Removing and installing coolant expansion tank

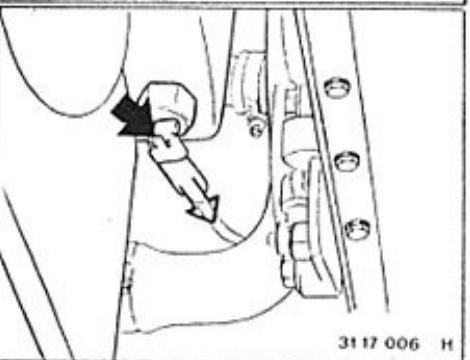
Caution!
Only unscrew sealing cap once engine has cooled down.



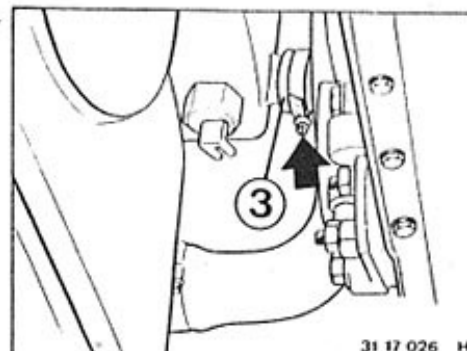
Completely unscrew venting screw (1), unfasten retainer (2) and remove.



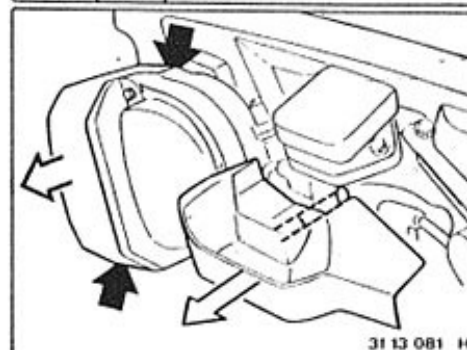
Remove underbody protection from engine.



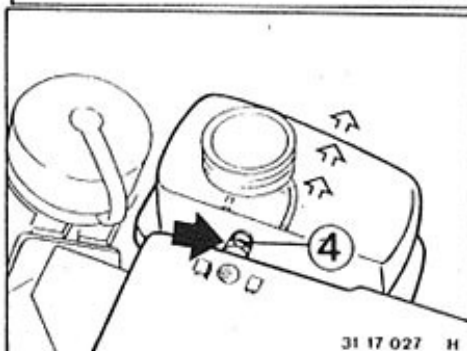
Remove connector from level sensor.



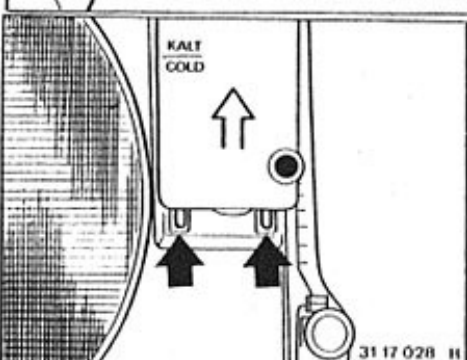
Remove expansion hose (3).
Drain off coolant, catch and dispose of correctly.



Remove distributor cable sheath.



Pull expansion tank backwards and remove venting hose (4).



Lift expansion tank up to remove.

Installation:
Expansion tank lugs must locate on radiator.

Top up with specified coolant, bleed cooling system and check for leakage 17 00 039.

17-11/4

17 11 509 Flushing radiator

If oil has entered the coolant circuit, the radiator and expansion tank must be flushed and cleaned with Solvethane** cleaning agent.

Follow the procedure described below:

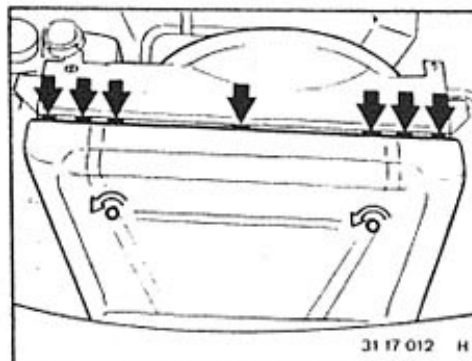
1. Removing and installing the radiator, see 17 11 000.
Removing and installing or replacing coolant expansion tank, see 17 11 100.
2. Fill with approx. 2 liters of Solvethane.
3. Shake radiator and tank well, then empty once the oil has separated.
4. Reinstall the cleaned radiator and expansion tank and connect to the cooling circuit.
5. Fill the entire cooling circuit with hot water and flush, if necessary several times, to be sure of clearing the system of any cleaning residue.
6. Check drained coolant for oil residue and, if necessary, repeat process 5.
After the cleaning operation, fill the cooling system*.
Bleed the cooling system and check for leakage, see 17 00 039.

Comment:

Solvethane attacks rubber seals, hoses etc. and must therefore not be allowed to enter the cooling circuit, or to remain there. For this reason, always follow the safety regulations governing the use of Solvethane (printed on the containers).

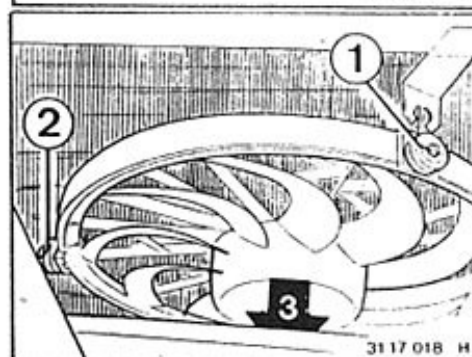
* Refer to Operating Fluids Specifications folder

** Source of Supply: BMW Parts Service

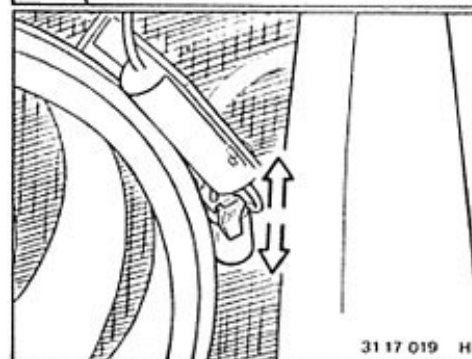


17 40 000 Removing and installing or replacing complete additional fan

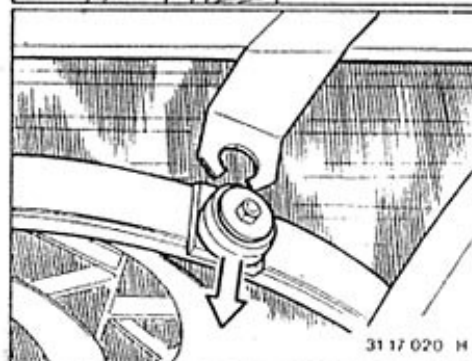
Unfasten upper section of air guide duct and unclip radiator with screwdriver



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



Disconnect plug



Pull fan console with fan out of retainers and lift out.