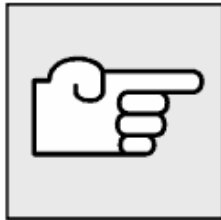
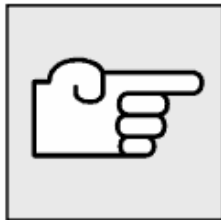
**Special tools required:**

- 11 4 400
- 12 1 120



Remove both exhaust manifolds.

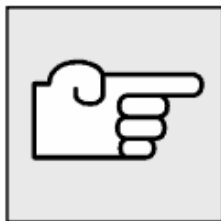


Remove intake filter housing with air-mass flow sensor.

Remove cylinder head cover.

Remove all spark plugs.

Remove intake air manifold.

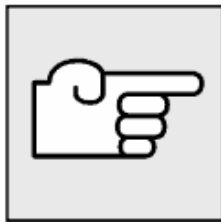


Remove coolant drain plug in engine block. Drain and dispose of coolant.

Installation:

Tightening torque, 11 11 5AZ.

Vent cooling system and check for leaks.



Removal

Removal of cylinder head is described separately from installation.



Remove camshafts.

Caution!

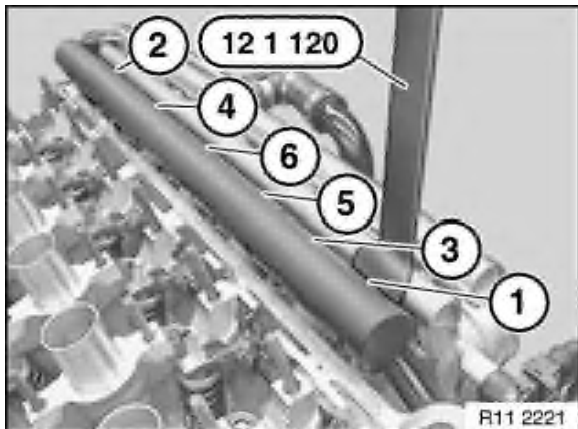
It is very easy for the adjustment plates to fall down.

Raise rocker arm.

Note:

Special tool 11 4 400 is magnetic.

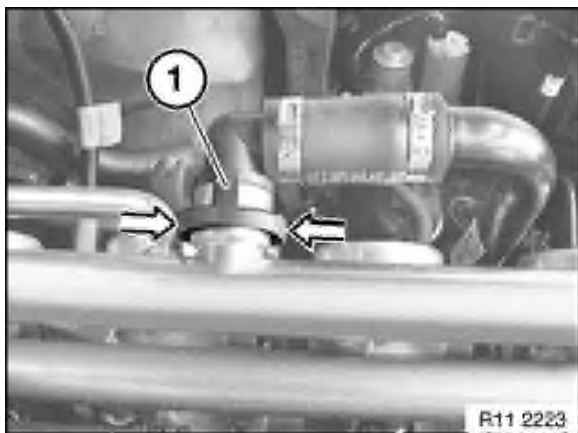
Remove all adjustment plates with special tool 11 4 400 and set to one side in order.



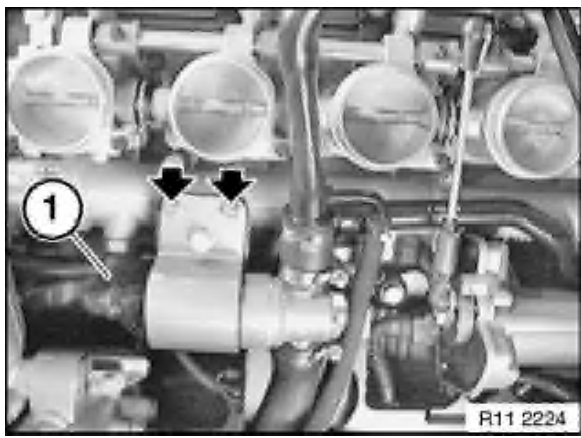
Caution!

The connector strip may break if it is removed without special tool 12 1 120.

Unlock connector strip with special tool 12 1 120 in sequence 1 to 6.

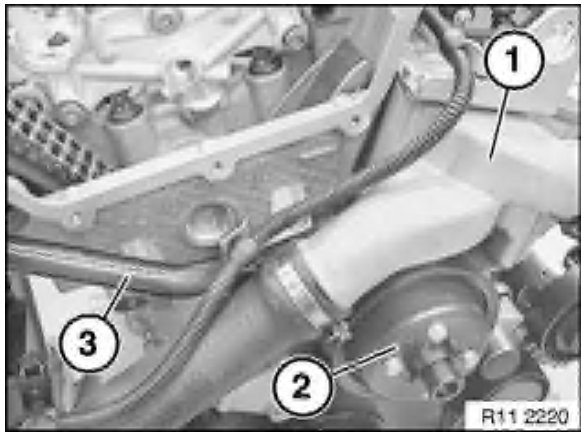


Press lock and detach hose from supplementary air line.



Detach bracket for idle-speed control valve from return line and lay with hoses to one side.

Disconnect plug connection (1) to temperature sensor.



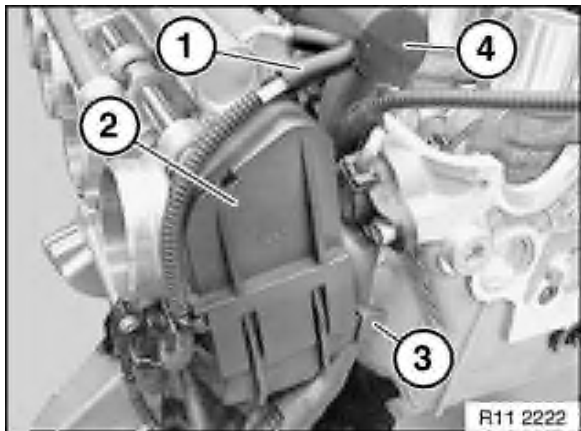
Remove thermostat housing (1).

Installation:

Replace sealing rings.

Remove belt pulley (2).

Remove pipe (3).



Note:

Illustration with engine removed.

Pull off vacuum hose (1).

Feed out upper cover section (2) towards top.

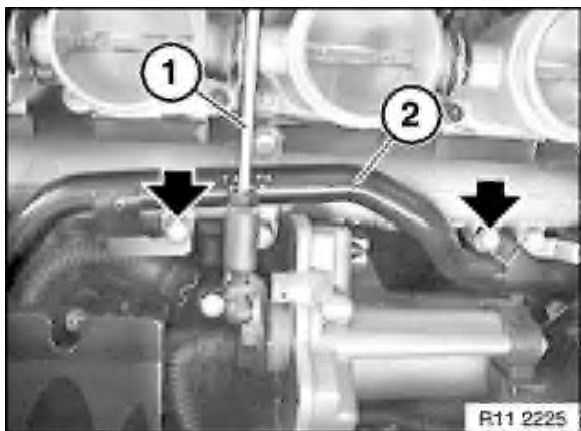
Detach wiring harness from retaining lug (3).

Pull connector strip (4) upwards.

Disconnect plug connection to camshaft sensor of inlet and exhaust camshafts.

Disconnect plug connection to throttle actuator.

Lay connector strip (4) to one side.

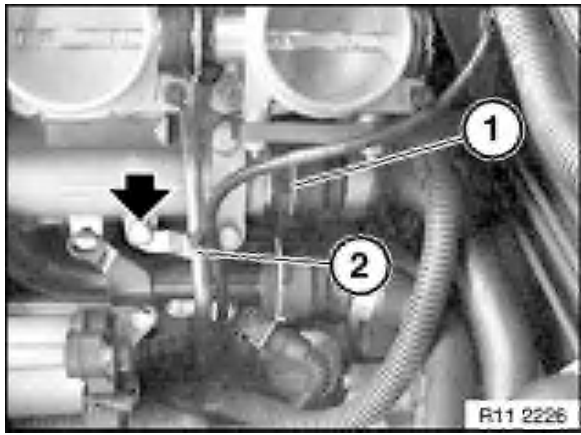


Remove pull rod (1).

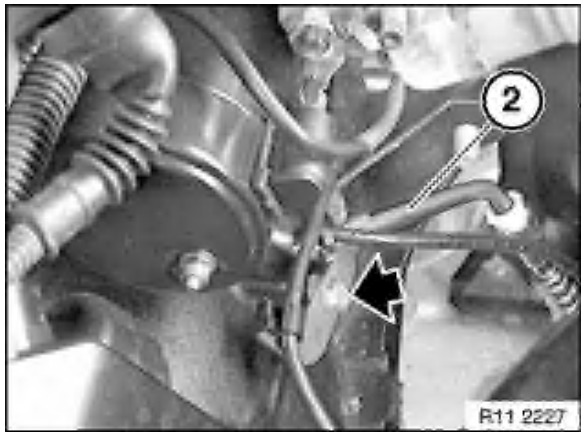
Unfasten screws.

Note:

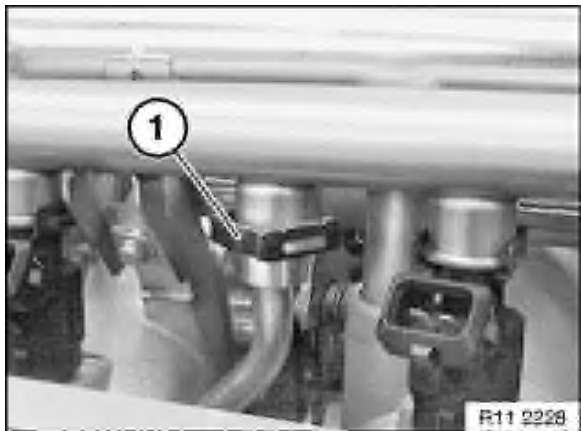
Do not remove pipe (2).



Unlock water hose (1) and detach from return line.
Release upper screw of fuel feed line (2) from return line.



Release lower screw of fuel feed line (2) from engine block.

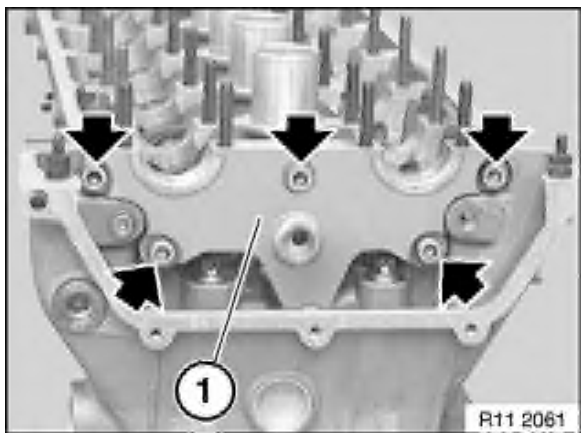


Detach retaining clip (1) of fuel feed line.

Note:

Catch and dispose of escaping fuel.

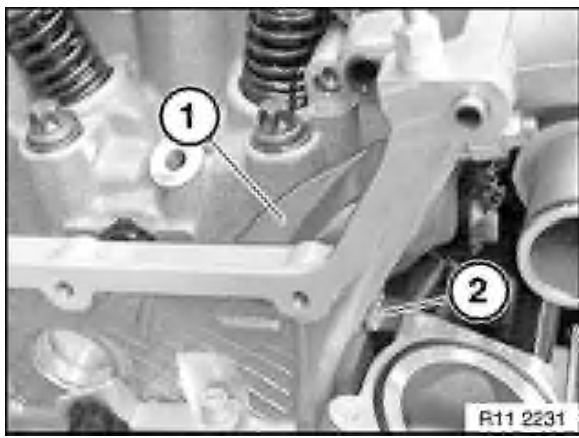
Pull fuel feed line downwards.



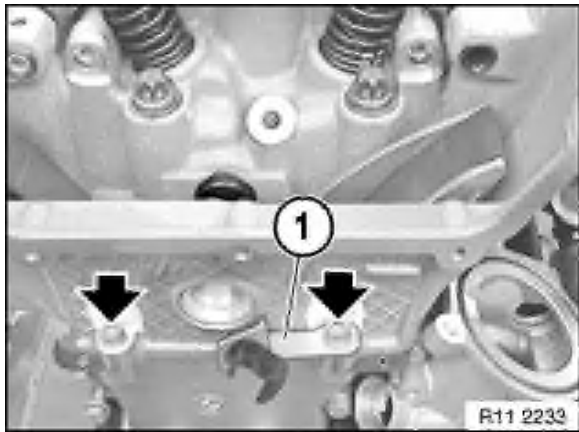
Note:

The thrust bearing flange (1) and the cylinder head are machined as a single unit and must not be replaced individually.

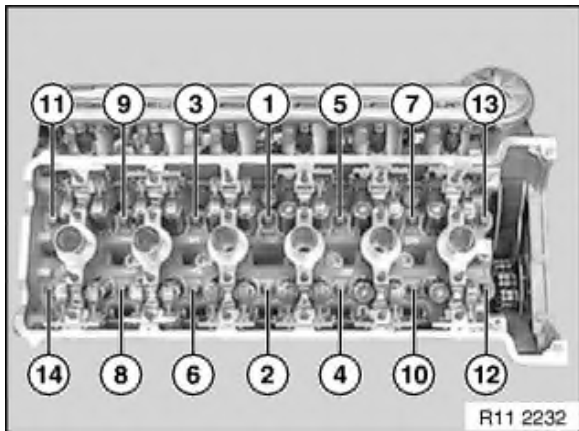
Remove thrust bearing flange (1).



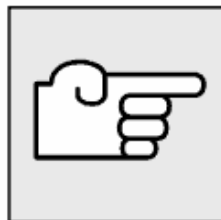
Note:
 Sliding rail (1) is screwed to cylinder head.
 Release screw (2).



Release screws between cylinder head and timing case cover.
 Remove cable holder (1).

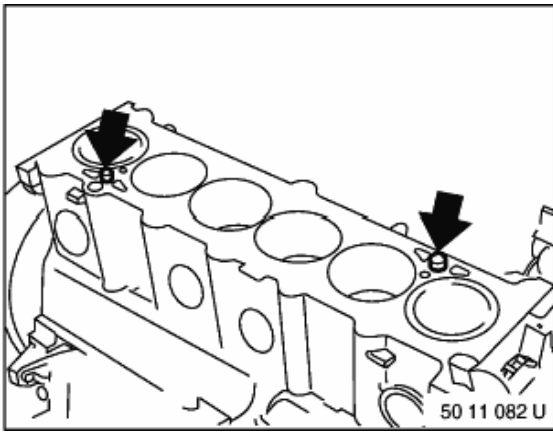


Release cylinder head bolts from outside to inside in sequence 14 to 1.
 Lift off cylinder head.



Installation

Installation of cylinder head is described separately from removal.
 Clean sealing faces of cylinder head and engine block; if necessary, remove traces of gasket with hardwood spatula. Make sure no gasket remnants drop into oil and cooling channels.

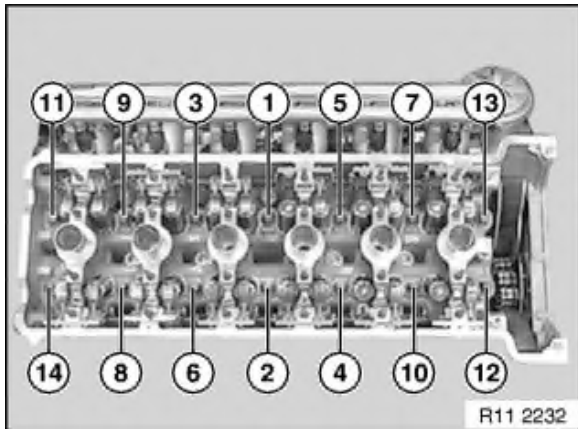


Check dowel sleeves for damage and correct installation position.
 Apply permanently elastic sealing compound Drei Bond 1209 (refer to BMW Parts Service) to joints to timing case cover.
 Replace cylinder head gasket.



Caution!

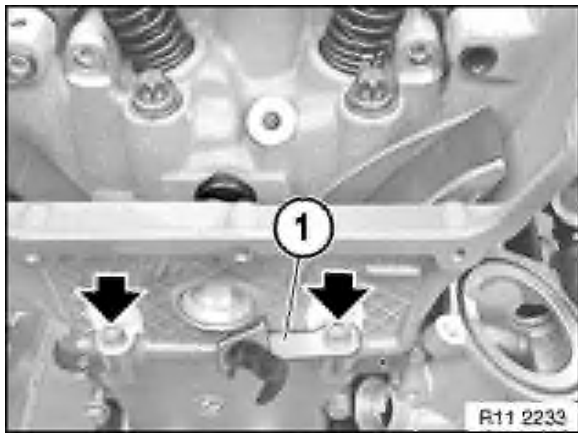
Use cylinder head bolts only once.
 There must be no oil in the tapped holes of the engine block and the timing case cover.
 Risk of cracking and distorted tightening values.



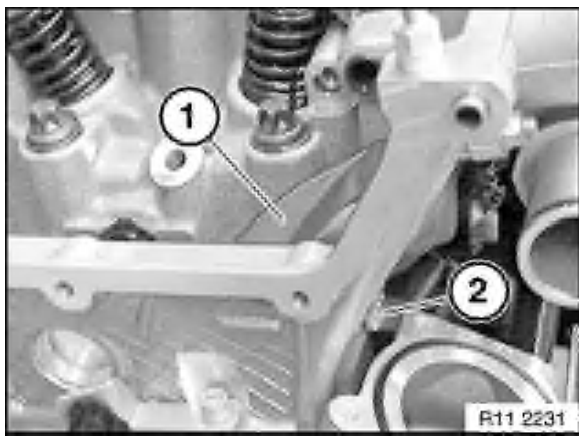
Put the cylinder head on.
 Apply a light coat of oil to washer contact area and thread of new cylinder head bolts.
 Tighten down cylinder head bolts in sequence 1 to 14.
 Tightening torque, 11 12 6AZ.

Note:

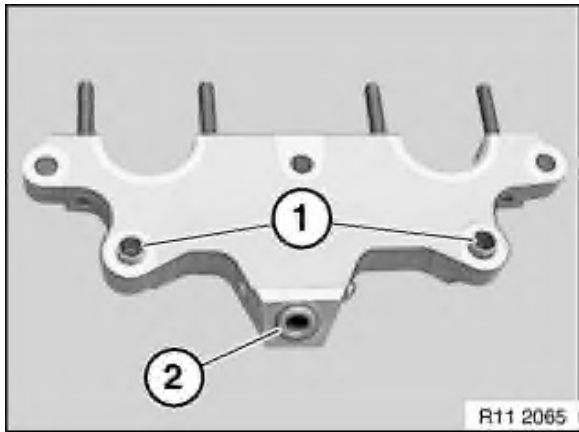
Use special tool 00 9 120 for torsion angle tightening.



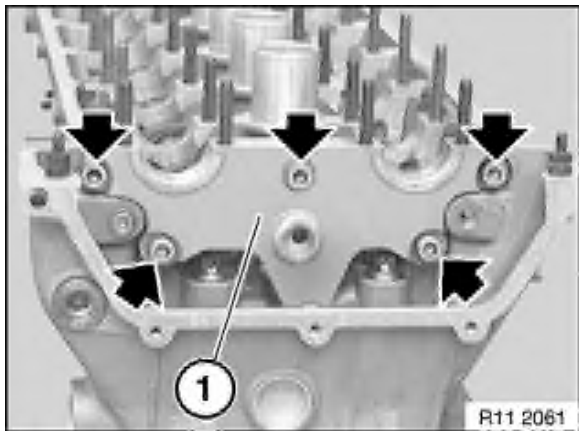
Install cable holder (1) and screws.
 Tighten down screws.



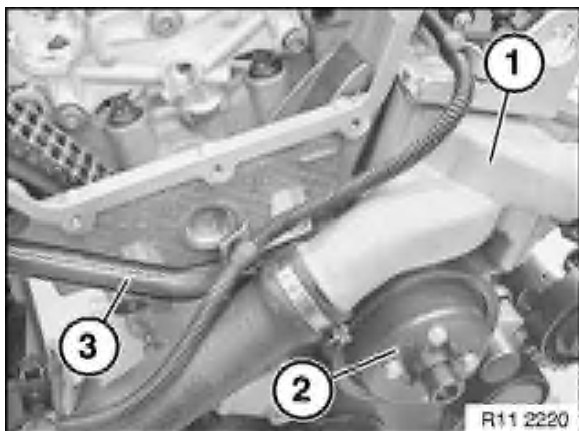
Replace sealing washer for screw (2).
Screw down sliding rail (1) with screw (2).



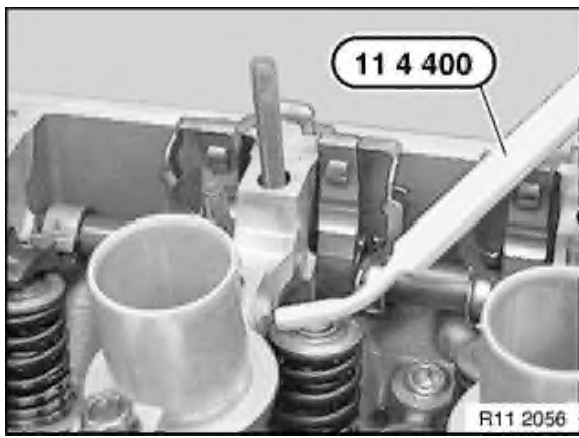
Check dowel sleeves (1) for damage and correct installation position.
Replace sealing ring (2).



Install thrust bearing flange (1).
Install and tighten down screws.



Replace O-ring on pipe (3). Install pipe (3).
Install belt pulley (2).
Replace O-ring between thermostat housing (1) and water pump.
Replace O-ring between thermostat housing (1) and return pipe.
Install thermostat housing (1) with thermostat.



Caution!

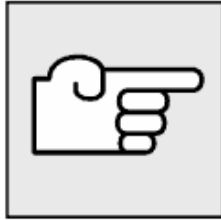
It is very easy for the adjustment plates to fall down.

Raise rocker arm.

Note:

Special tool 11 4 400 is magnetic.

Install all adjustment plates with special tool 11 4 400 .



Install camshafts.

Adjust valve clearance.

Assemble engine.