

**Special tools required:**

- 11 6 410
- 11 9 240
- 11 9 250
- 13 6 051
- 2 212 823
- 11 4 310

**Important!**

The regulated oil pump can only be checked and measured with the diagnosis system.

Vehicles with a regulated oil pump have a hydraulic valve fitted.

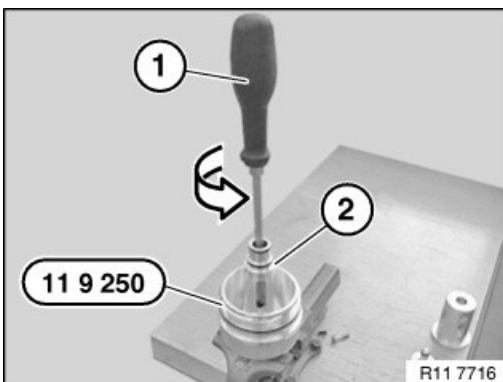
Diagnosis path:

- DME Digital Motor Electronics
- Complete vehicle
- Power train
- Engine electronics
- Engine oil
- Oil-pressure control

Special tool 11 9 250 must be converted for N55

**Necessary preliminary tasks:**

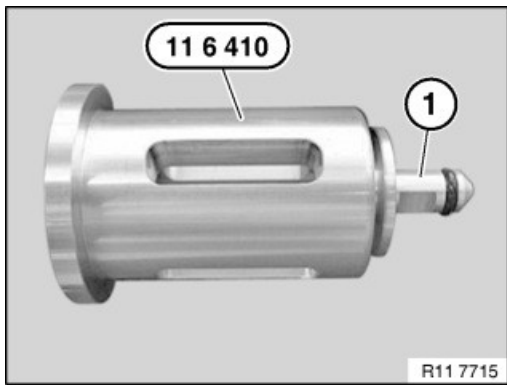
- Connect BMW diagnosis system to vehicle.
- Observe diagnosis instructions.
- Protect drive belt against dirt
- Have a cleaning cloth ready to catch escaping oil



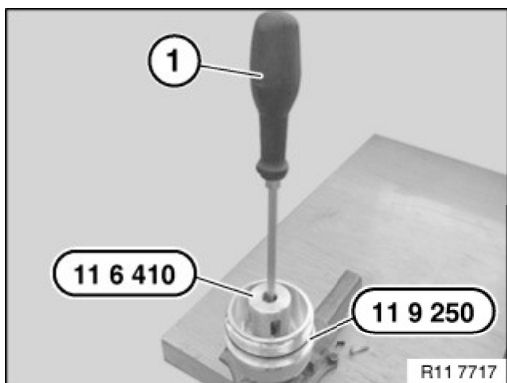
Secure special tool 11 9 250 at hexagon head in a vice.

Release insert (2) using a slotted screwdriver (1) in direction of arrow.

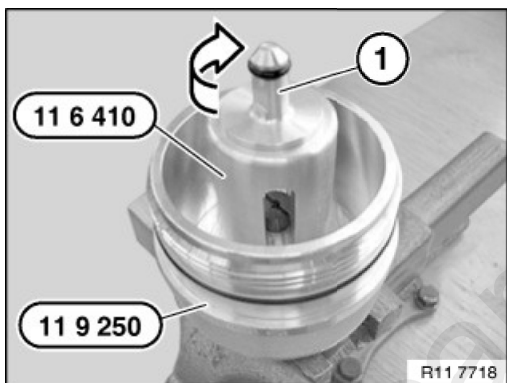




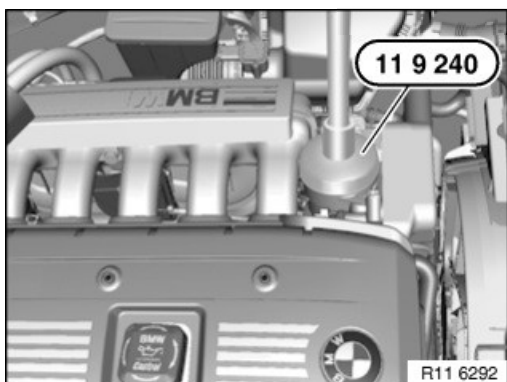
Release screw piece (1) on special tool 11 6 410 .



Install special tool 11 6 410 in special tool 11 9 250 .
Insert central bolt with a slotted screwdriver (1) hand-tight.

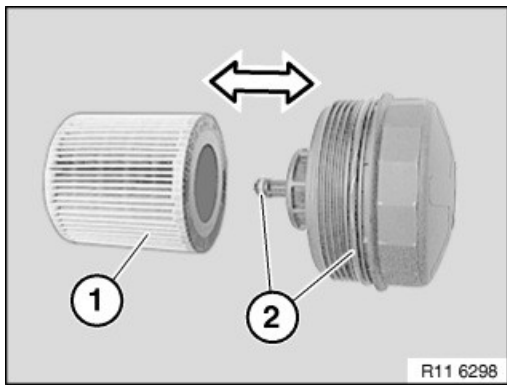


Insert screw piece (1) hand-tight in direction of arrow on special tool 11 6 410 .

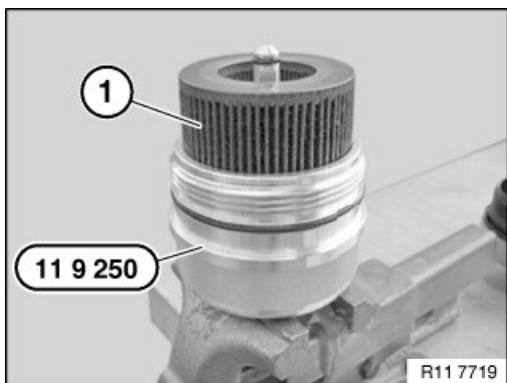


Release oil filter cover with special tool 11 9 240 .
Tightening torque: 11 42 1 AZ.

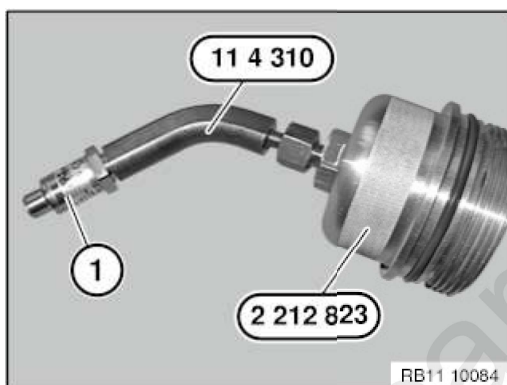




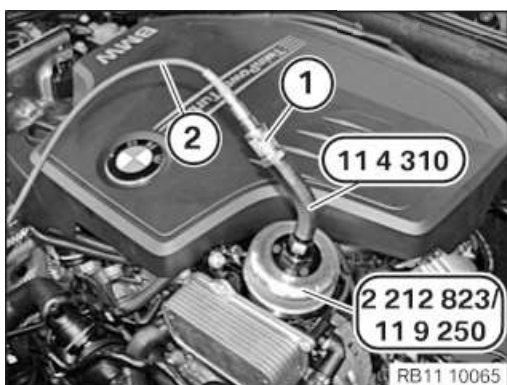
Carefully detach filter element. *Installation note:*
Check all O-rings for damage, replace if necessary.



Install filter element (1) in special tool 11 9 250. *Installation note:*
Coat O-ring with engine oil.



Order number for special tool: Bolt 2 212 823 with 11 4 310 .
Screw the pressure sensor (1) hand tight.
Apply light coating of oil to sealing ring at pressure sensor (1) 100 bar.



Measure the engine oil pressure with diagnosis system.

Order number for special tool: Screw 2 212 823 to oil filter housing.
Special tool 11 4 310 on special tool, order number: 2 212 823 .
Screw in pressure sensor (1) 100 bar at special tool 11 4 310 (finger-tight).
Connect cable (2) of IMIB (Integrated Measurement Interface Box) to pressure sensor (1) 100 bar.
Graphic N20.



Start engine and check engine oil pressure by means of diagnosis.



11 41 010 Removing and installing or replacing chain module for oil pump/vacuum pump (N55)



Special tools required:

- 00 9 140
- 11 0 290
- 11 0 300
- 11 4 120
- 11 4 280
- 11 8 640
- 11 8 650
- 11 9 260
- 2 303 793



Important!

Aluminium screws/bolts must be replaced each time they are **released**.

Aluminium screws/bolts are permitted with and without colour coding (blue).

For reliable identification:

Aluminium screws/bolts are **not magnetic**.

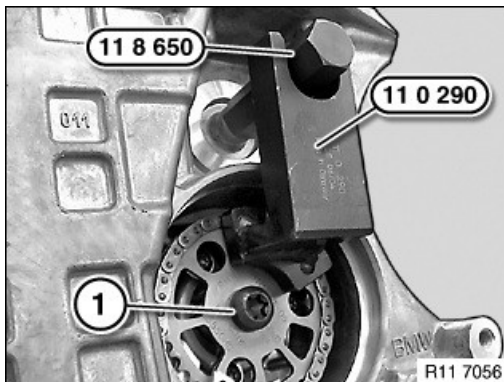
Jointing torque and angle of rotation must be observed without fail (**risk of damage**).



Necessary preliminary tasks:

- Remove cylinder head cover
- Remove all spark plugs.
- Remove oil sump
- Remove drive belt
- Remove drive belt tensioning device
- Remove vibration damper
- Remove sealing cap for vacuum pump
- Remove sealing cap of chain tensioner for oil pump.
- Remove chain tensioner.





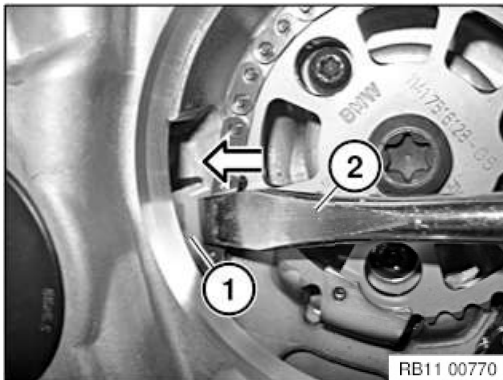
Screw in special tool 11 8 650 on belt tensioner screw connection on crankcase.

Turn camshaft sprocket with central bolt at crankshaft into position until special tool 11 0 290 can be secured.

Simultaneously secure special tool 11 0 290 to camshaft sprocket and special tool 11 8 650.

Release screw (1) for camshaft sprocket.

Tightening torque 11 66 2AZ.

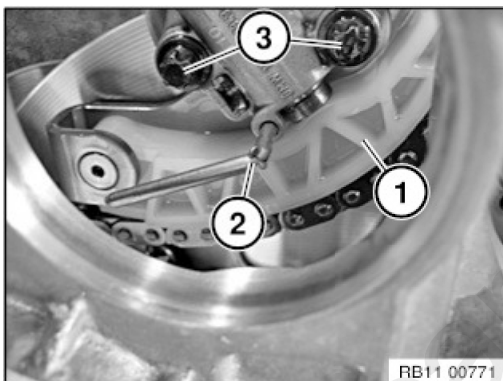


Important!

Before releasing the central bolt on the oil pump, the hydraulic chain tensioner must be drained.

Carefully press tensioning rail (1) with a suitable screwdriver (2) in direction of arrow.

As the oil pressure in the chain tensioner can only be drained pulsating, the tensioning rail (1) must be pressed several times.

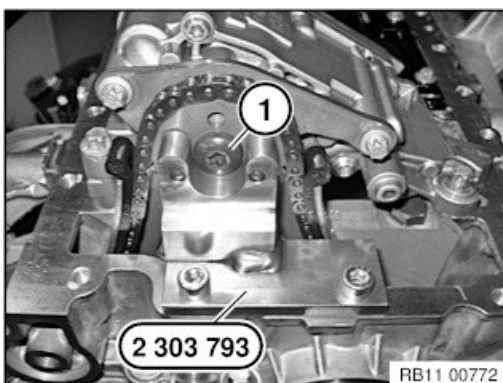


Press the tensioning rail (1) and hold down.

Fix chain tensioner piston in position with a suitable lock pin (2).

Release screws (3).

Tightening torque: 11 41 7AZ.



Note:

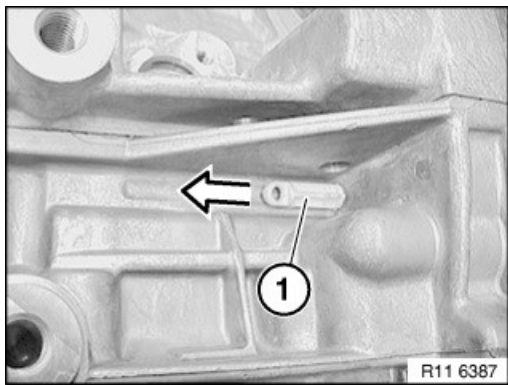
Sprocket must be blocked in order to release central bolt (1).

Secure special tool 2 303 793 to crankcase.

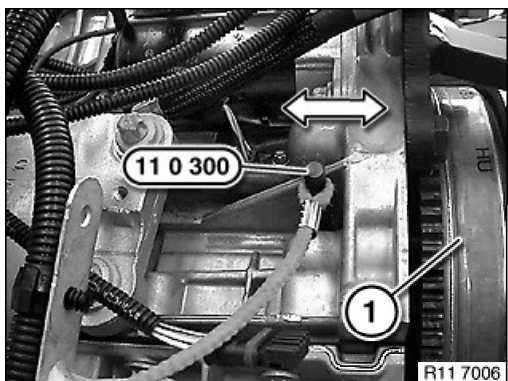
Release oil pump central bolt (1).

Tightening torque 11 41 5AZ.

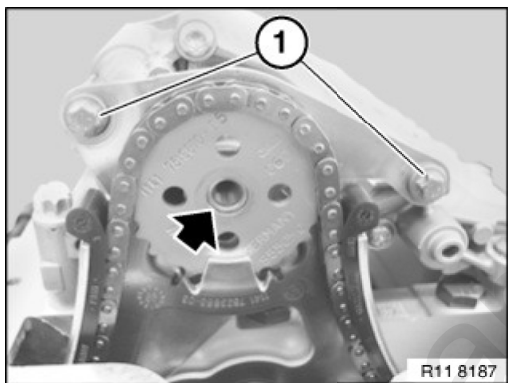




Remove fastener (1) in direction of arrow.

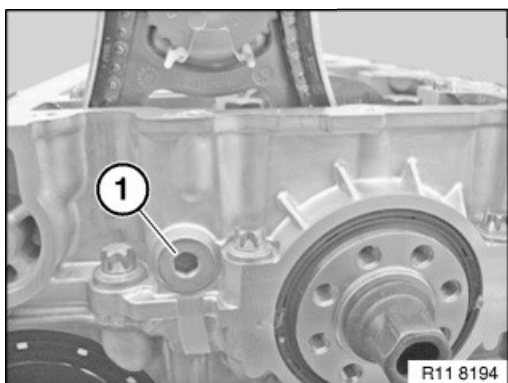


Position flywheel (1) with special tool 11 0 300 in TDC setting.



Release aluminium screws (1).

Remove oil pump drive gear from the drive shaft.



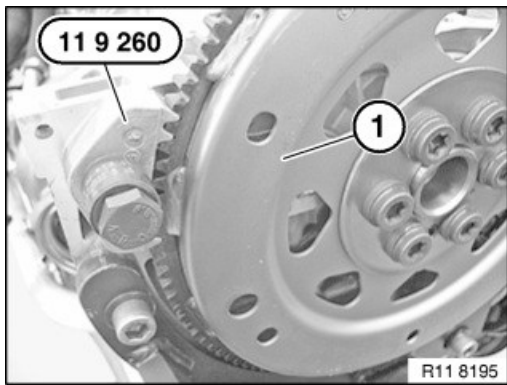
Open screw plug (1).

Tightening torque: 11 11 9AZ.

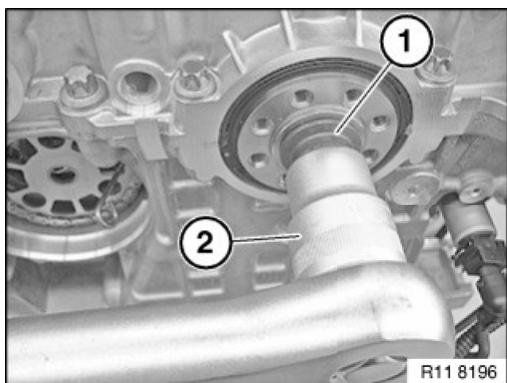
Installation note:

Replace sealing ring.





Lock flywheel (1) with special tool 11 9 260 .

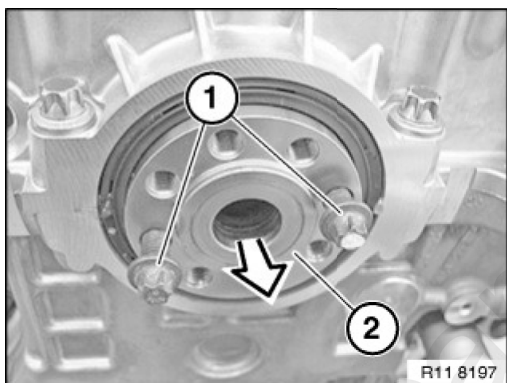


Important!

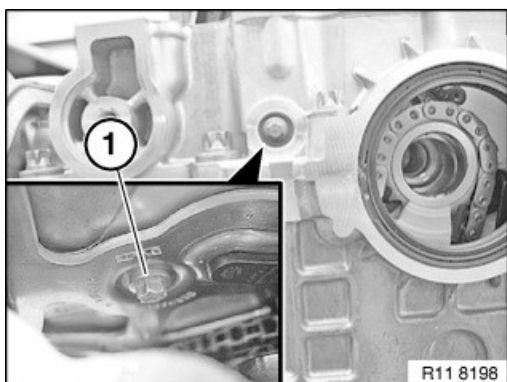
Do not remove special tools 11 0 300 and 11 4 280 to release central bolt (1).

Release central bolt (1). *Installation note:*
Release central bolt (1) with 3/4 tool (2).

Breakaway torque approx. 500 Nm.

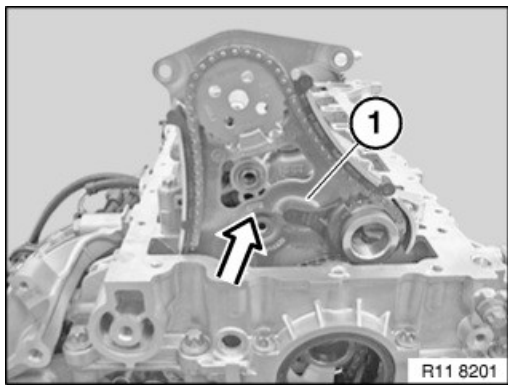


Screw in two screws (1) and remove hub (2) in direction of arrow. *Installation note:*
Replace front crankshaft seal.



Release aluminium screw (1) with special tool 11 8 640 .





Remove chain module (1) in direction of arrow.

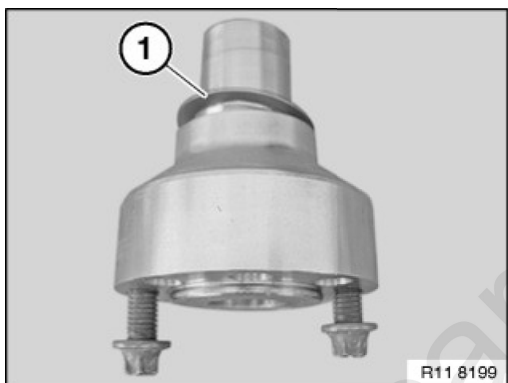


Installation note:

Both grip discs must be attached to drive gear for oil pump with welding spots.

Grip discs are not individually available.

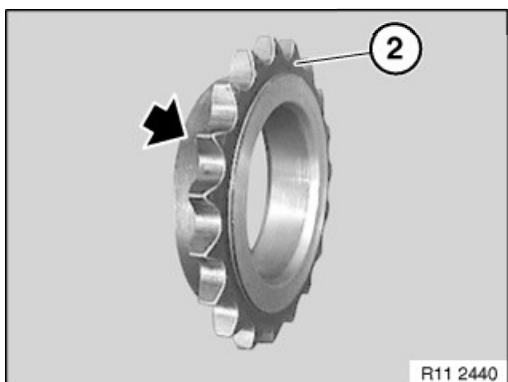
If grip discs are damaged, the drive gear for oil pump with grip discs must be replaced.



Installation note:

Grip disc (1) must be mounted.

If grip disc (1) is not mounted, central bolt can come loose (engine damage).



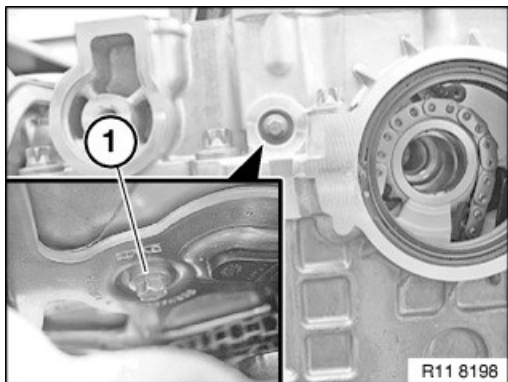
Important!

Note direction of installation of camshaft sprocket (2).

Collar (see arrow) on camshaft sprocket (2) points to **engine**.

Incorrect assembly will result in **engine damage**.

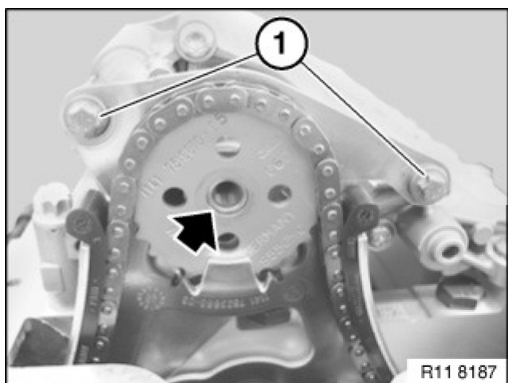




Insert chain module.

Secure aluminium screw (1) with special tool 11 8 640 .

Tightening torque: 11 41 3AZ.



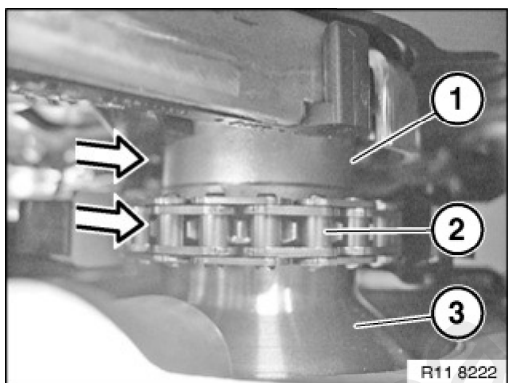
Insert aluminium screws (1) for chain module.

Tightening torque 11 41 6AZ.

Installation note:

Replace aluminium screws.

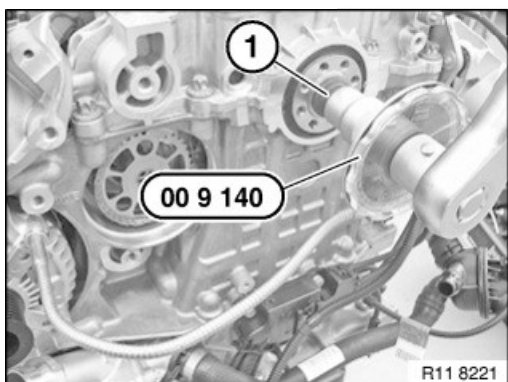
Pay attention to mounting flats on oil pump drive.



Position module (1) for oil pump drive.

Position module (2) for camshaft drive.

Insert hub (3) for vibration absorber with grip disc.



Insert central bolt (1).

Secure central bolt with special tool 100 9 140 .

Tightening torque 11 21 1AZ.

Installation note:

Replace front crankshaft seal.

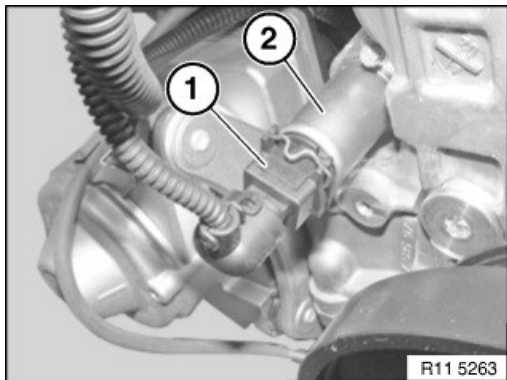


Assemble engine.

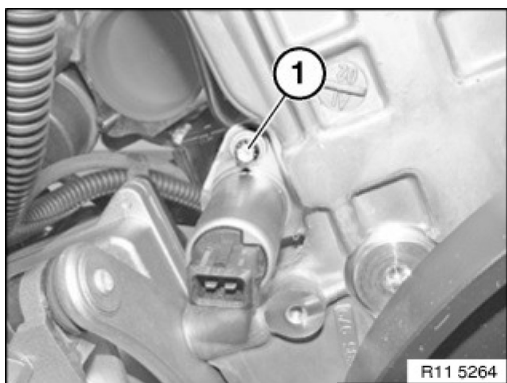


*Necessary preliminary tasks:*

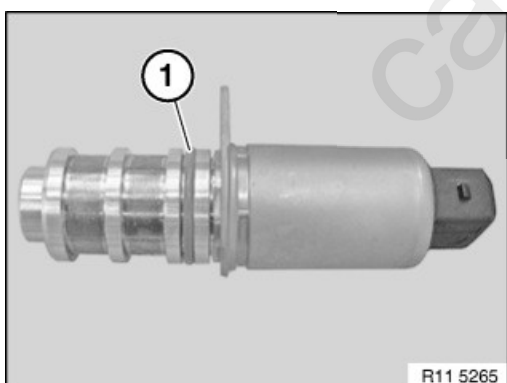
- Remove fan cowl with electric fan.
- Have a cleaning cloth ready to catch escaping oil



Detach connector (1) from hydraulic valve (2).



Release screw (1) and remove hydraulic valve.
Tightening torque: 11 41 4AZ.



Replace O-ring (1).





Assemble engine.

Check function of Digital Engine Electronics.

Check oil pressure.

Diagnosis path:

- Digital Motor Electronics
- Complete vehicle
- Power train
- Engine electronics
- Engine oil
- Oil-pressure control

cardiagn.com



**Special tools required:**

- 2 303 793

**Attention!**

Aluminium screws/bolts must be replaced each time they are **released**.

Aluminium screws/bolts are permitted with and without colour coding (blue).

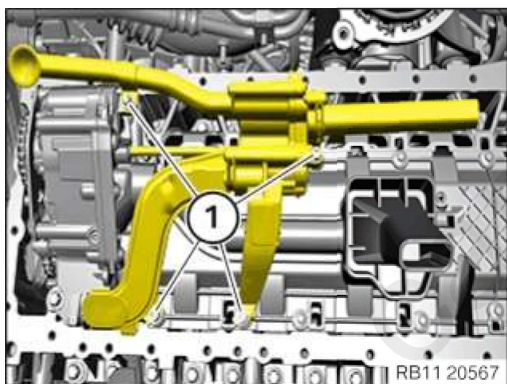
For reliable identification:

Aluminium screws/bolts are **not magnetic**.

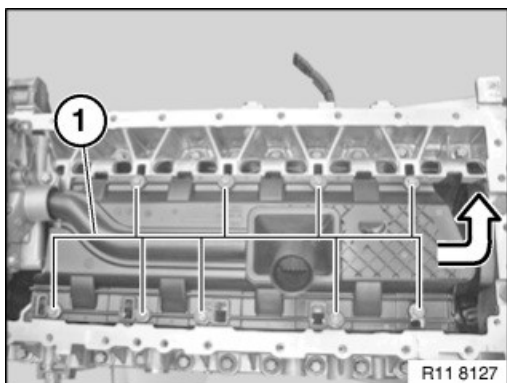
Joining torque and angle of rotation must be observed without fail (**risk of damage**).

**Necessary preliminary work:**

- Removing oil sump.
- Remove sealing cap of vacuum pump.
- Remove sealing cap of chain tensioner for the oil pump.

**Note: Only F87**

Release screw 1 and remove entire suction pump.



Undo all the aluminium screws (1) along the line.

Installation note:

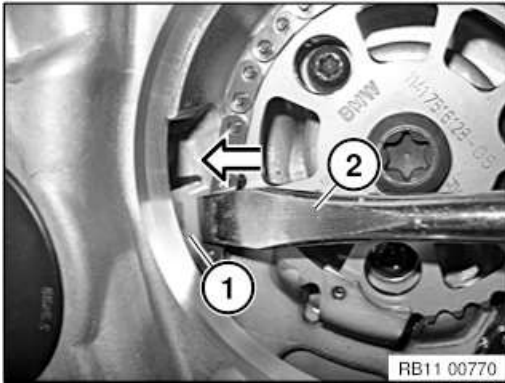
Replace aluminium screws.

Remove intake pipe with oil deflector.

Installation note:

Replace O-ring.



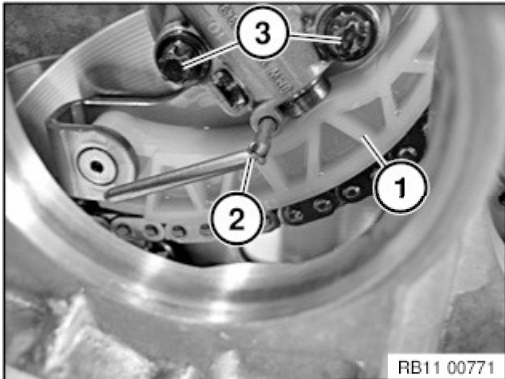


Attention!

Before releasing the central bolt on the oil pump, the hydraulic chain tensioner must be drained.

Carefully press tensioning rail (1) with a suitable screwdriver (2) in direction of arrow.

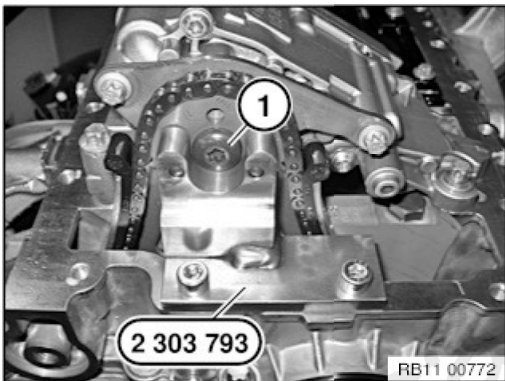
As the oil pressure in the chain tensioner can only be drained pulsating, the tensioning rail (1) must be pressed several times.



Press the tensioning rail (1) and hold down.

Fix chain tensioner piston in position with a suitable lock pin (2).

Tightening torque: 11 41 7AZ.



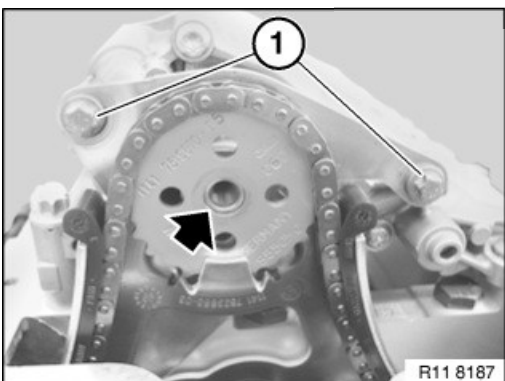
Note:

Sprocket must be blocked in order to release central bolt (1).

Secure special tool 2 303 793 to crankcase.

Release oil pump central bolt (1).

Tightening torque 11 41 5AZ.



Release aluminium screws (1).

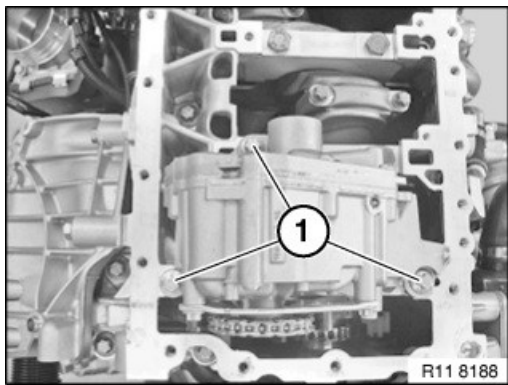
Tightening torque 11 41 6AZ.

Installation note:

Replace aluminium screws.

Watch mounting flats on oil pump sprocket.





Attention!

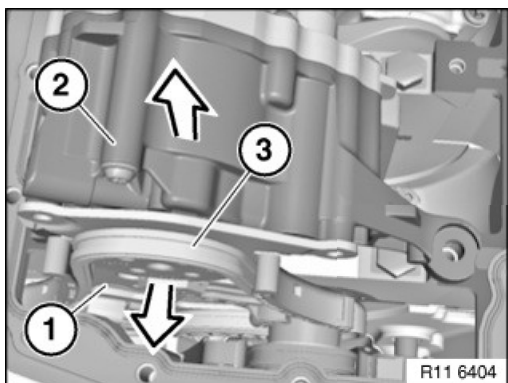
Observe different screw lengths.

Release aluminium screws (1).

Tightening torque 11 41 2AZ.

Installation note:

Replace aluminium screws.



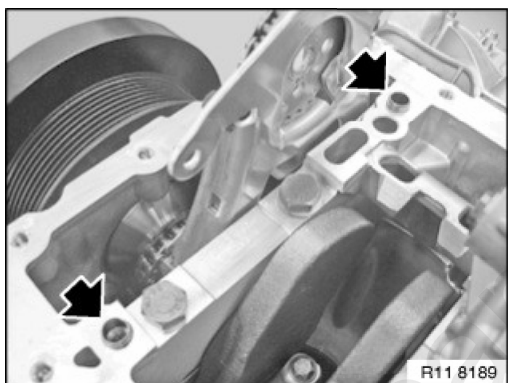
Detach sprocket (1) in direction of arrow.

Note:

Chain tensioner presses timing chain (3) upwards.

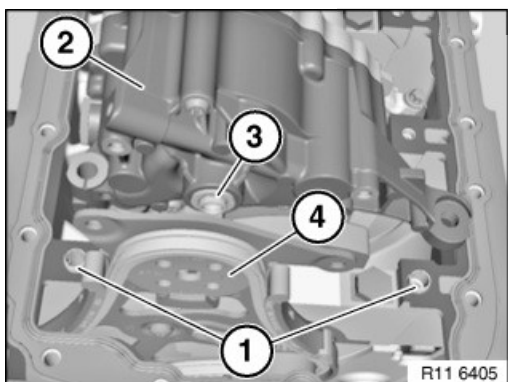
Do not remove sprocket (1).

Remove oil pump (2) in direction of arrow.



Installation note:

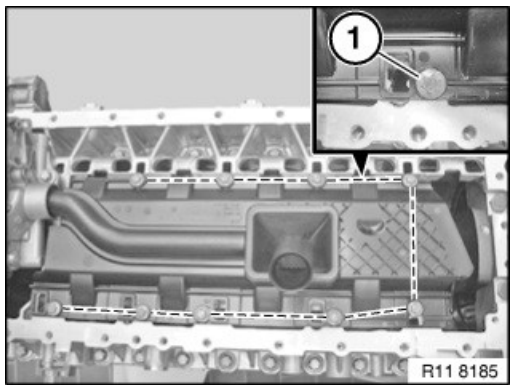
Check spacer bushes for secure seating and damage; replace if necessary.



Install oil pump (2).

Align mounting flats (3) on oil pump (2) to sprocket (4).





Install intake pipe with oil deflector.

Installation note:

Replace O-ring.

Insert all the aluminium screws (1) along the line.

Installation note:

Replace aluminium screws.

Tightening torque 11 41 1AZ.



Assemble engine.

cardiagn.com



**Warning!**

Risk of scalding!

Only perform this repair work on an engine that has cooled down.

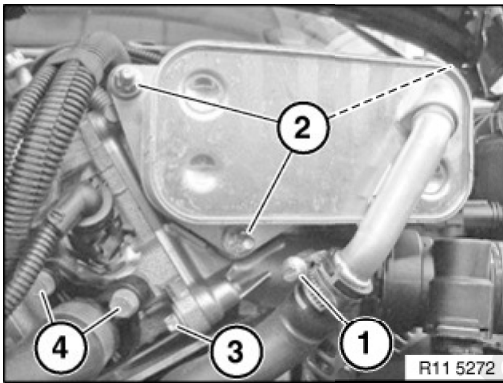
**Recycling:**

Catch and dispose of drained coolant.

Observe country-specific waste disposal regulations.

*Necessary preliminary tasks:*

- Drain coolant.
- Remove intake plenum.
- Unfasten oil filter cover.
- Protect drive belt against dirt contamination.



Unfasten hose clamp (1).

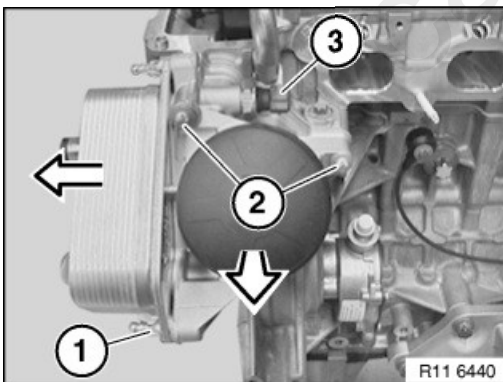
Tightening torque 11 53 6AZ.

Release screws (4) from coolant hose on cylinder head.

Tightening torque: 11 53 7AZ.

Release screw (3).

Tightening torque: 11 42 2AZ.



Unfasten screws (2).

Tightening torque: 11 42 2AZ.

Detach connector from oil pressure switch (3).

Note:

Have cleaning cloth ready to catch residual oil.

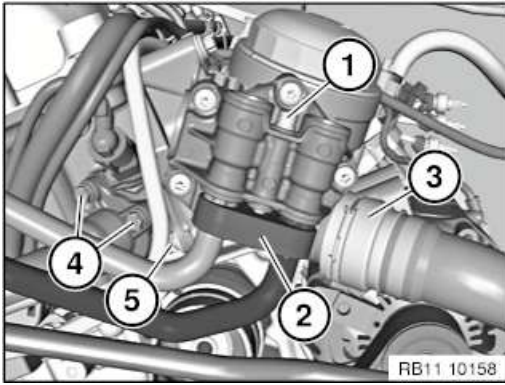
Installation note:

Replace all gaskets.

If necessary, replace filter element.

When replacing, remount oil-to-water heat exchanger and oil pressure switch (3).





Note:

Hot-climate version

Release screw (1).

Tightening torque 17 22 4AZ.

Remove engine oil pipes (2).

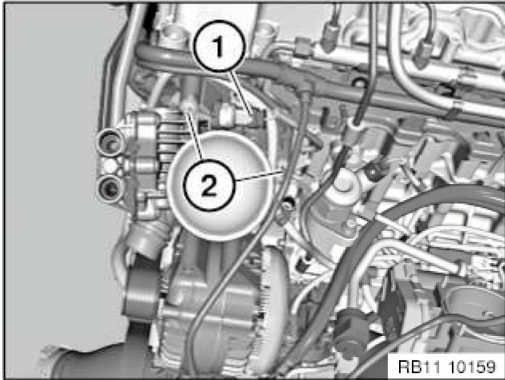
Unlock and detach coolant hose (3).

Release screws (4) from coolant hose on cylinder head.

Tightening torque: 11 53 7AZ.

Release screw (5) from oil filter.

Tightening torque 11 42 2AZ.



Pull off connector (1) from oil pressure switch.

Release screw (2) from oil filter.

Tightening torque: 11 42 2AZ.

Note:

Have cleaning cloth ready to catch residual oil.

Installation note:

Replace all gaskets.

If necessary, replace filter element.

If replacing, modify thermostat housing and oil pressure switch.



Assemble engine. *Note:*

Protect drive belt against dirt contamination.

Installation note:

Bleeding instruction must be observed without fail.

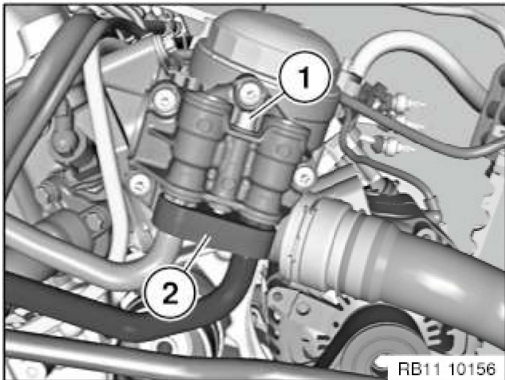


**Special tools required:**

- 11 9 240

**Necessary preliminary tasks:**

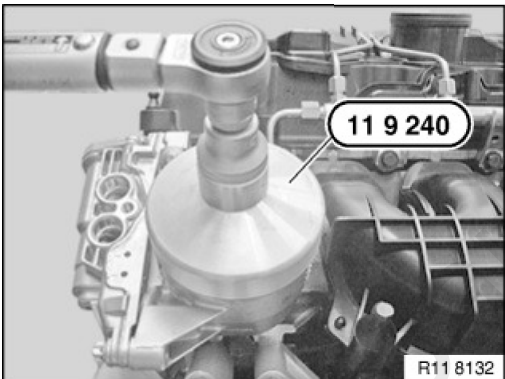
- Remove intake silencer housing.



Release screw (1).

Tightening torque 17 22 4AZ.

Remove engine oil pipe (2).

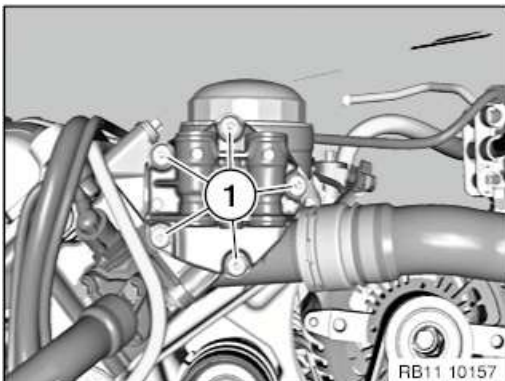


Release oil filter cover with special tool 11 9 240 .

Tightening torque 11 42 1AZ.

Note:

The remaining engine oil can flow back into the oil sump.



Release screws (1).

Tightening torque 11 42 3AZ.

Note:

Catch escaping engine oil with suitable auxiliary materials.

Remove thermostat housing.

Installation note:

Replace gasket.





Assemble engine.

Checking engine oil level:

- Park vehicle on a horizontal surface.
- Allow engine at normal operating temperature to run for three minutes with increased engine speed (approx. 1100 rpm)
- Read off engine oil level in instrument panel or on Control Display
- Top up engine oil if necessary.

cardiagn.com

