

REP-REP-RAR5311-1112100 REP-REP-RAR5311-1112100 - Removing and installing/sealing cylinder head (MINI COOPER S) - V.2, VIN: TG87060

ISTA system version	4.39.20.24455	Data version	R4.39.20	Programming data	-
VIN	TG87060	Vehicle	MINI/R53/HAT/Cooper S/W11,-/MANUAL/ECE/LL/2006/10		
Int.lev.works	-	Int.lev.(cur.)	-	Int.lev.(tar.)	-
Mileage	-				

11 12 100

Removing and installing/sealing cylinder head (MINI COOPER S)



Special tools required:

- [00 9 120](#)
- [11 5 150](#)
- [11 8 250](#)
- [11 8 370](#)
- [11 8 401](#)
- [11 8 402](#)
- [13 5 280](#)
- [33 2 140](#)



Necessary preliminary tasks:

- [Disconnect battery.](#)
- [Remove charge air cooler.](#)
- Pull off plug connector from EMS/DME.
- [Remove air filter housing.](#)
- [Remove](#) throttle valve
- [Remove cylinder head cover.](#)
- Remove [tank vent valve.](#)
- Remove [intake plenum.](#)
- Remove [charger exhaust pipe.](#)
- Drain [coolant.](#)
- Release [exhaust manifold.](#)
- [Remove spark plugs.](#)
- [Remove wheel housing cover.](#)



Important!

Fuel in fuel line is under pressure (approx. 3 bar).

Fit new cylinder head bolts.

Do not wash off bolt coating.

There must be no oil in the blind holes **(risk of cracking)**.

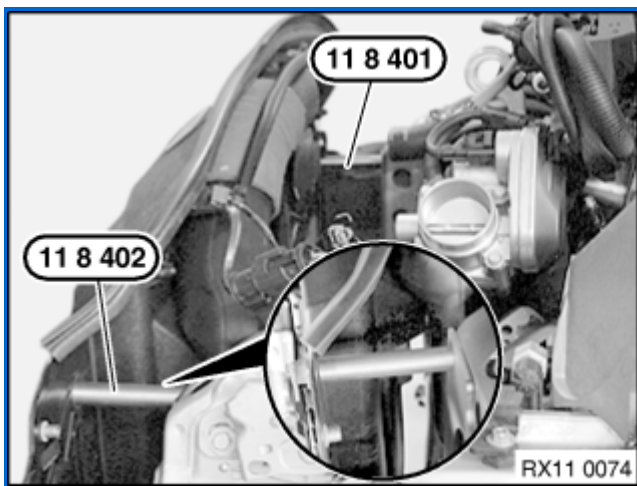


Recycling:

Catch and dispose of escaping fuel.

Catch and dispose of drained coolant.

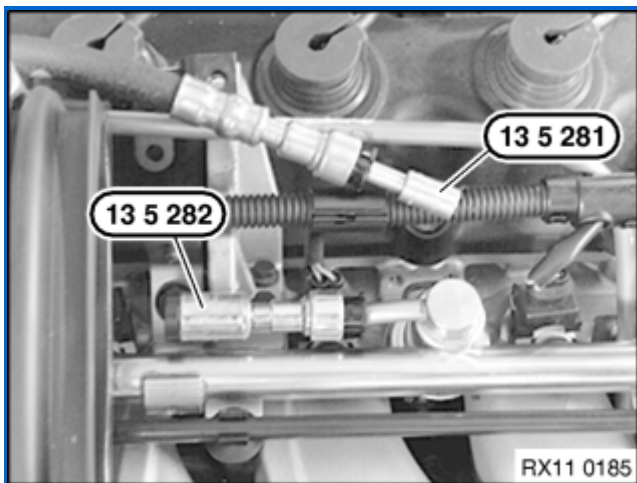
Observe country-specific waste disposal regulations.



Lower front end module.

Mount front end module and extensions:

Special tools [11 8 401](#) and [11 8 402](#).

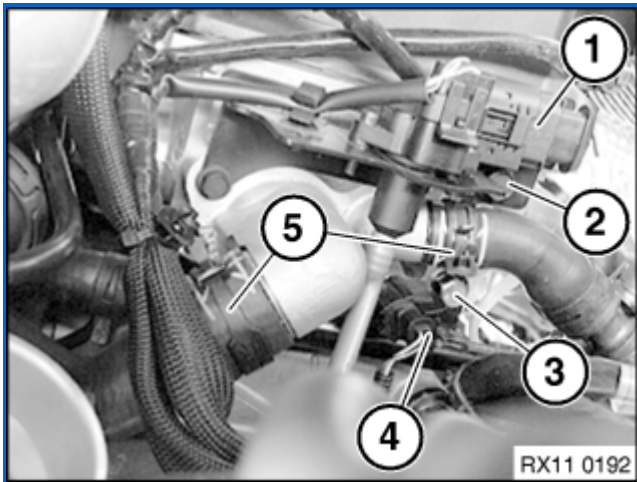
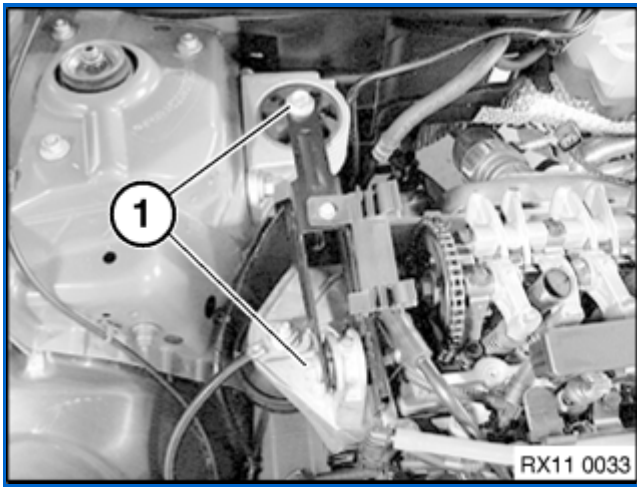


Disconnect fuel line by disconnecting quick-release coupling from fuel injection pipe and mount special tool [13 5 280](#).

Release both lines from anti-roll bar bracket and move to one side.

Unscrew screws (1) for anti-roll bar bracket.

Remove anti-roll bar bracket.



Pull off plug connector (1) of oxygen sensor.

Remove holder for plug connector of oxygen sensor from cylinder head (2).

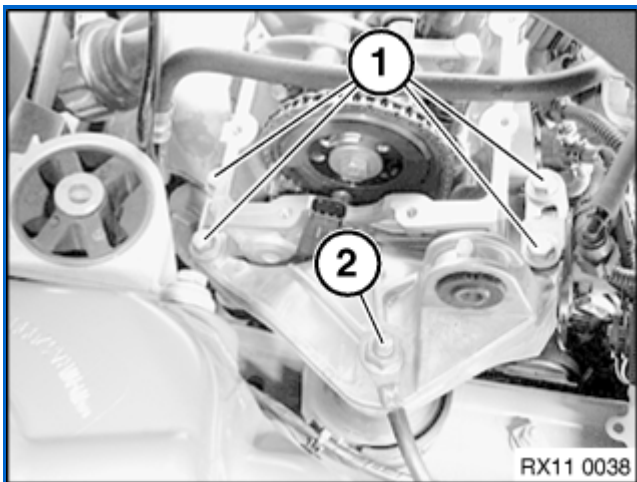
Unscrew mounting bolt (3) of coolant injection pipe.

Pull off plug connector (4) from coolant temperature sensor.

Release coolant lines (5).

Pull off plug connector of camshaft sensor.

Remove dipstick.



Important!

Support engine with hydraulic trolley jack
(**risk of damage**).

Unscrew screws (1) for engine carrier and unscrew retaining nut (2) for engine mount.

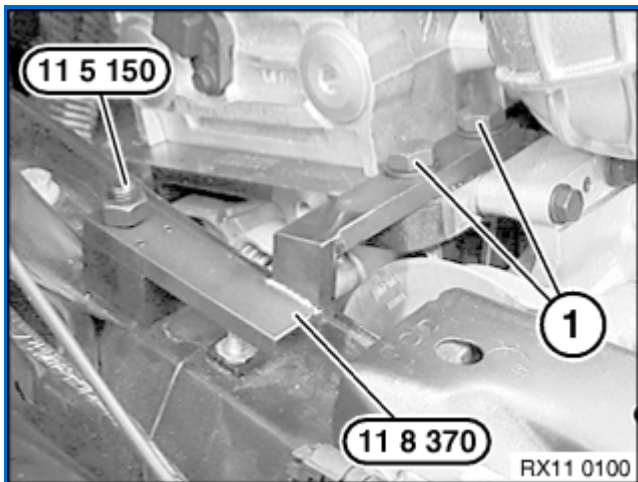
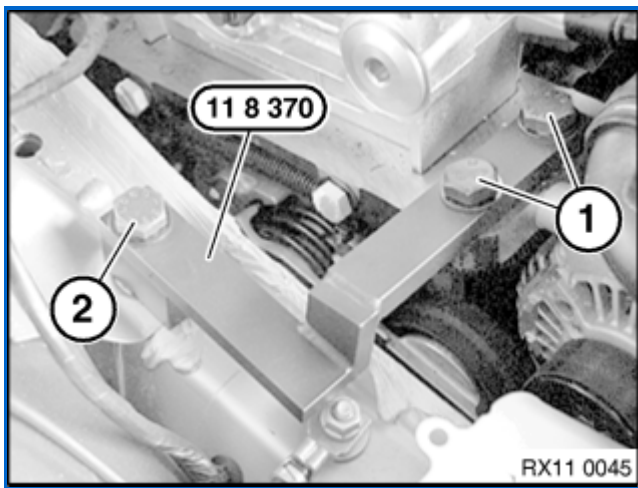
Remove engine carrier.

Old version:

Remove [engine hydro mount](#).

Secure special tool [11 8 370](#) to engine block with bolts (1).

Screw in bolt (2) to position of engine mount.



New version:

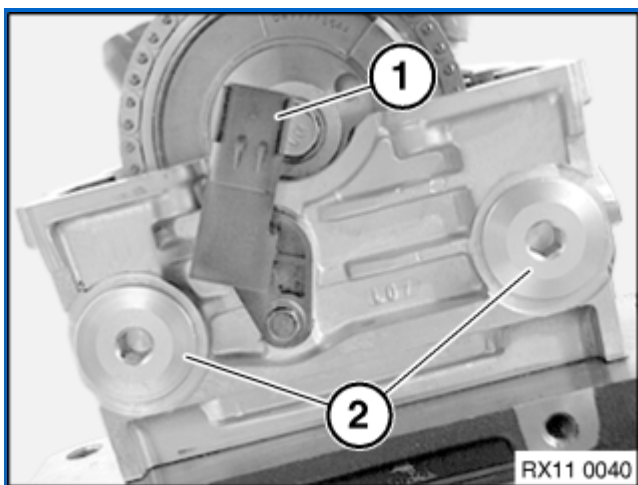
Remove [engine hydro mount](#).

Secure special tool [11 8 370](#) to engine block with bolts (1).

Screw in special tool [11 5 150](#) position of engine mount.

Important!

Unclip ABS sensor cable from bottom engine support.



Remove camshaft sensor (1).

Release screw plugs in cylinder head (2).

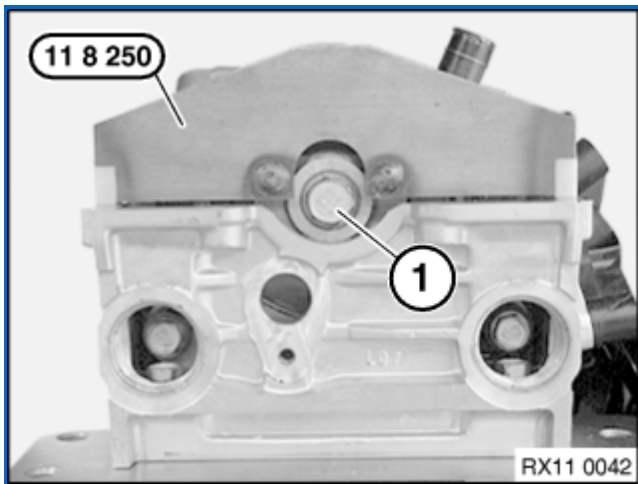
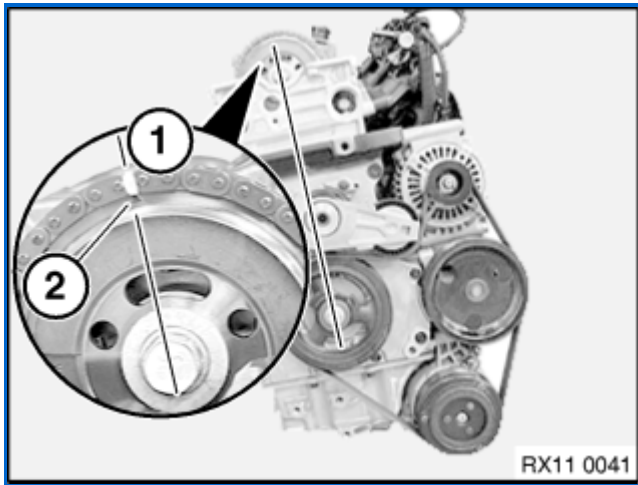
Turn crankshaft until the triangular adjustment mark on camshaft sprocket is at 12 o'clock (1).

For assembly, mark the timing chain on the triangular adjustment mark (2) with coloured paint.

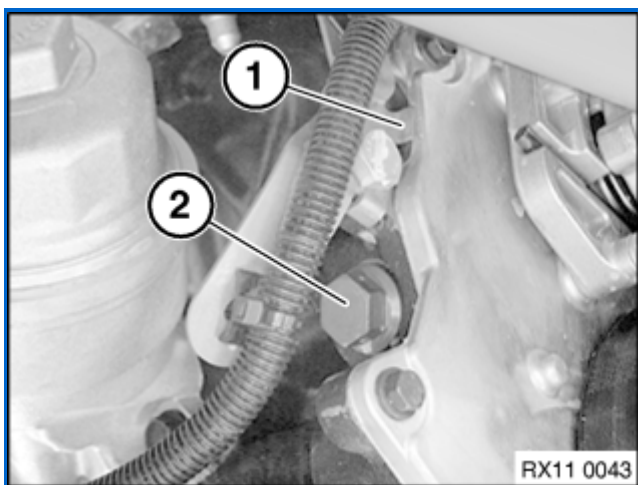
The copper-coloured link may **not** be used for this process.

Important!

Do not twist crankshaft.



Slacken mounting bolt (1) of camshaft and fix the camshaft sprocket in position with special tool [11 8 250](#), but do not remove.



Remove wiring harness mounting (1), unscrew screw plug (2) for chain tensioner and remove tensioning device.

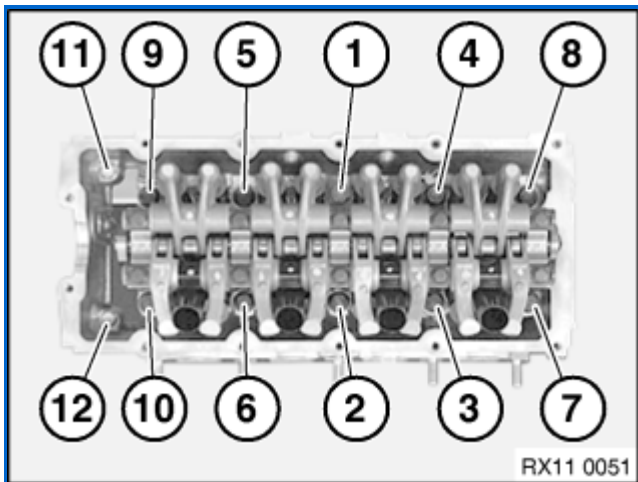
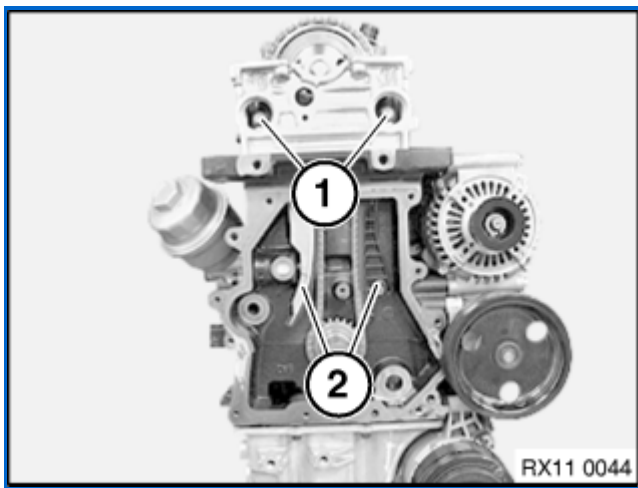
Unscrew mounting bolt for camshaft sprocket, then remove gear and chain.

Take camshaft sprocket from the chain and lower timing chain into crankcase.

Unscrew mounting bolts (1) for chain guides and remove both guides (2).

Note:

The timing chain cover does not have to be removed for this process. This image shows the arrangement of the timing chain guides.



Slacken cylinder head bolts and cylinder head fastenings in sequence (12-1).

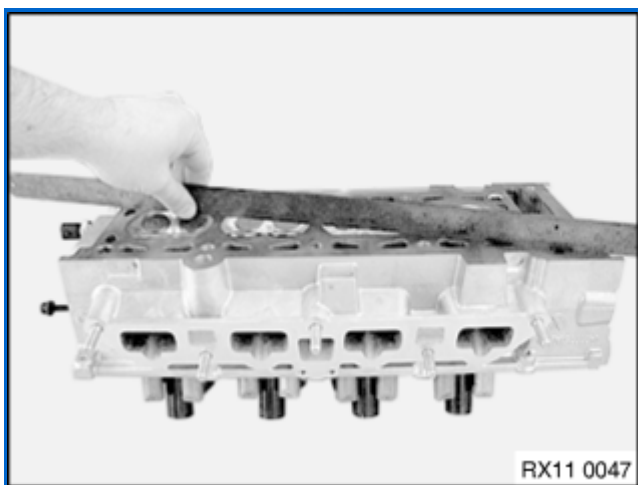
Unscrew cylinder head bolts and remove cylinder head fastenings.

Remove cylinder head and gasket.

Installation note:

Multi-layered steel head gaskets (MLS) require a scratch free sealing surface, therefore caution must be exercised when cleaning engine components made from aluminium.

Clean all engine oil ducts.

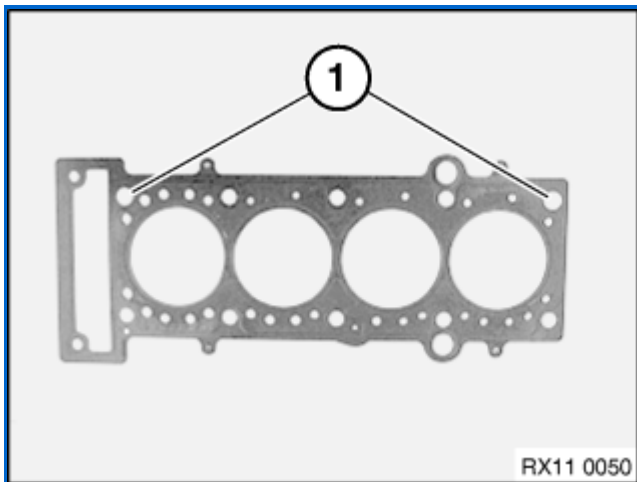
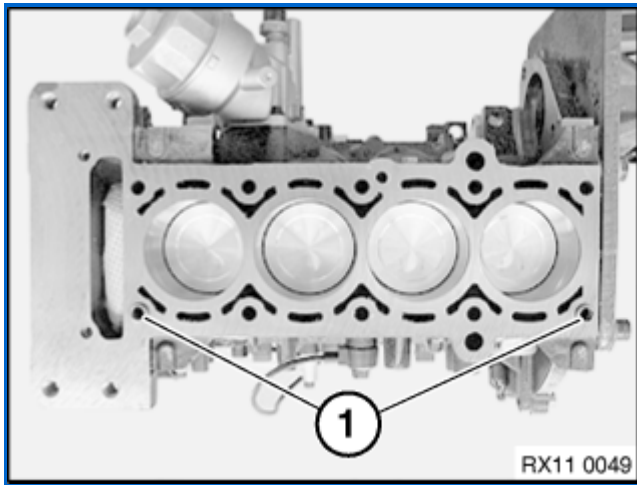


Check diagonal and horizontal flatness of cylinder head with a standard steel ruler.

The maximum permitted cylinder head warpage is 0.1 mm.

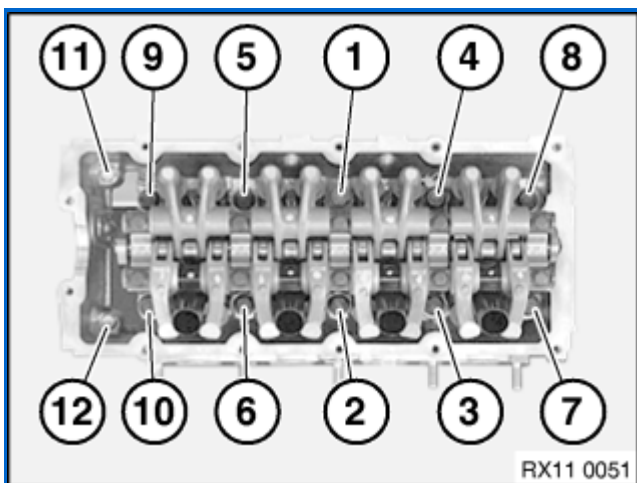
Check whether the fitting bushes (1) are undamaged and are in the right positions.

There must be no oil in the blind holes of the threaded holes, clean bore holes if required (**risk of cracking**).



Replace cylinder head gasket. Large holes (1) are used for aligning the gasket to the engine block guide pins.

Fit cylinder head.



Tighten cylinder head bolts and cylinder head fastenings in sequence (1-10).

[Tightening torque 11 12 3AZ.](#)

Tighten cylinder head bolts in sequence (11-12).

[Tightening torque 11 12 4AZ.](#)

Special tool [00 9 120](#) must be used for the angle of rotation tightening method.

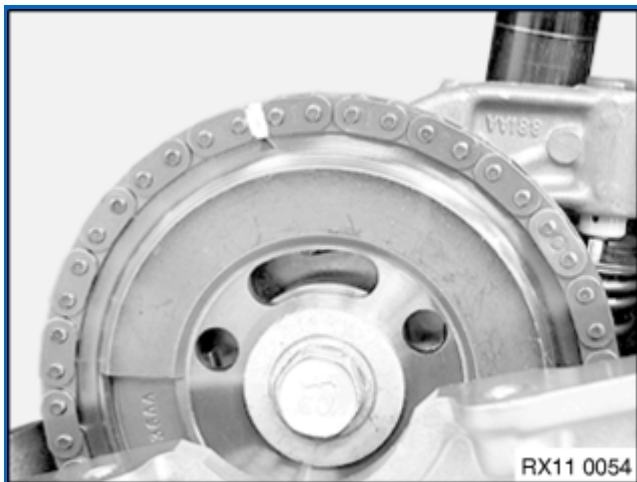
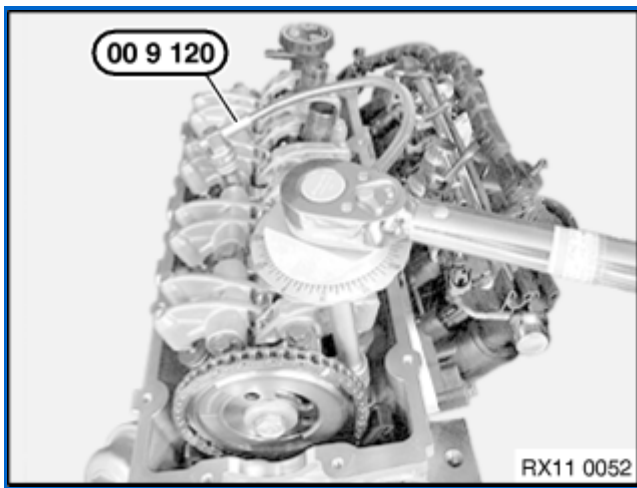
Retrieve timing chain out of crankcase with magnet or manufactured hook.

Place timing chain on camshaft flange.

Install tensioning rails.

Screw in mounting bolts of guides.

[Tightening torque 11 12 12AZ.](#)

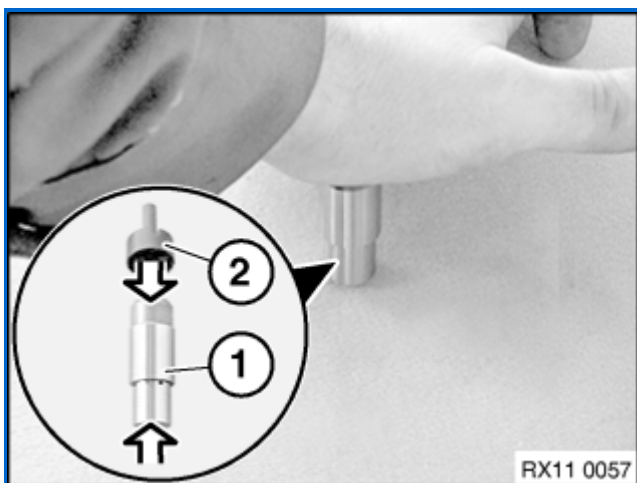


Align the triangular adjustment mark to the camshaft sprocket on the timing chain link that was marked with a colour coding during disassembly.

Lay timing chain on the camshaft sprocket.

Mount camshaft sprocket on camshaft flange and screw in mounting bolt.

[Tightening torque 11 12 5AZ.](#)



Bring back timing chain tensioner to transition position.

Place tensioning device (1) on a level surface.

Remove reservoir cap (2) from tensioning device.

Place palm against tensioning device and apply constant pressure, until the tensioning device is completely pressed together.

Place cap (2) of tensioning device back on after resetting.

Mount chain tensioner (1) in housing and tighten.

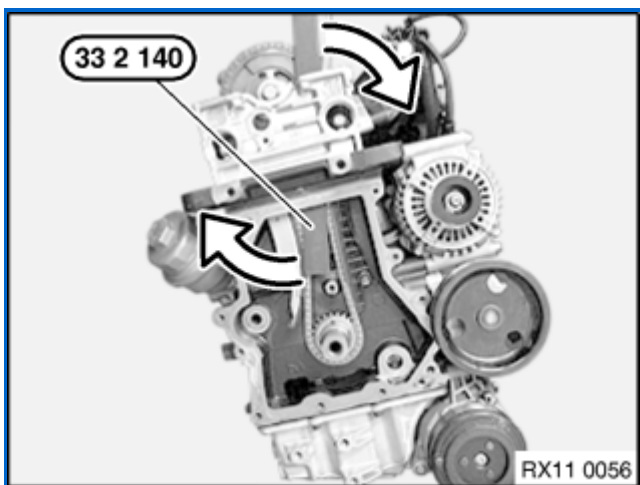
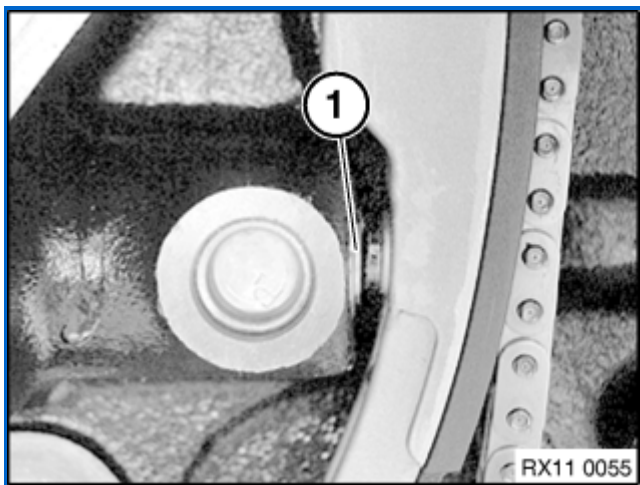
[Tightening torque 11 12 6AZ.](#)

Note: Transition position of tensioning device.

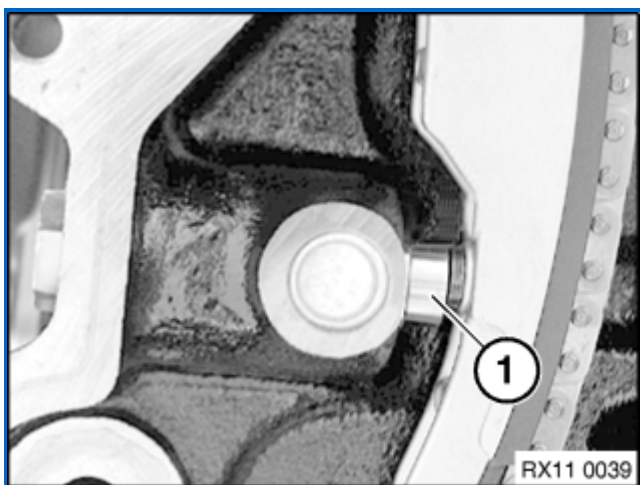
Note:

Make sure that the timing chain is correctly arranged within the channel of the timing chain guide.

Do not lever directly on the chain. This could damage the timing chain.



Use special tool [33 2 140](#) to lever the right (movable) tensioning rail until the chain tensioner tensions the chain.



Pay attention to release position of tensioning device (1).

Installation note:

Fit new sealing rings to screw plugs and screw them back into the cylinder head.

[Tightening torque 13 62 1AZ.](#)

Install camshaft sensor.

[Tightening torque 11 12 7AZ.](#)

Install hydro mount.

[Tightening torque 11 12 11AZ.](#)

Mount engine carrier to cylinder head.

[Tightening torque 11 12 9AZ.](#)

Mount engine carrier to engine mount.

[Tightening torque 11 12 13AZ.](#)

Install anti-roll bar bracket.

[Tightening torque 11 12 14AZ.](#)

[Tightening torque 11 12 15AZ.](#)

Assemble engine.

