

[11 31 051](#) Replacing the timing chain \PREMIUM

PRELIMINARY WORK

1 – Disconnecting the battery earth lead

Prerequisite

Ignition is switched off.



Damage to battery terminal, the safety battery terminal or the intelligent battery sensor (IBS). Damaged battery terminals can lead to malfunctions or vehicle electrical system faults.

- Pull off battery terminal from battery pole by carefully moving to and fro. Do not pry off using a tool.



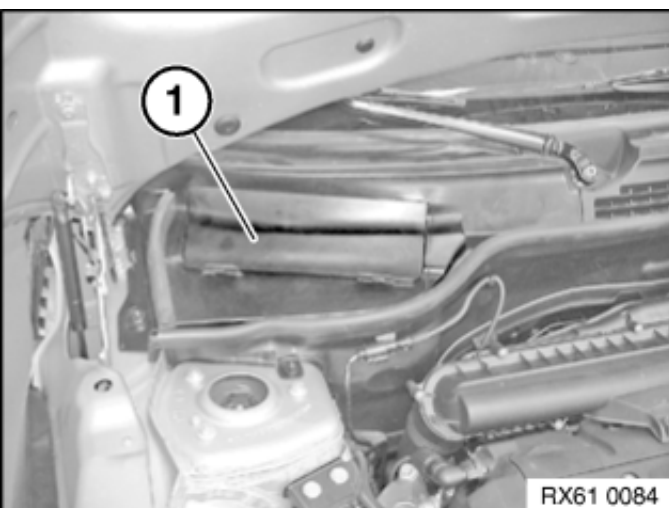
Observe the notes on handling the vehicle battery.

For additional information see:

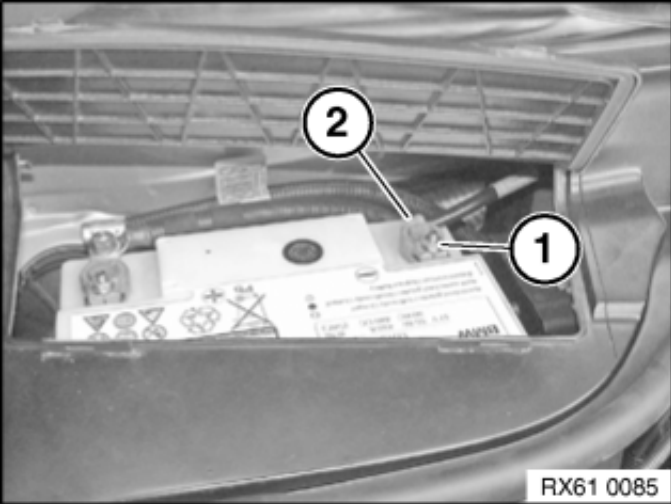
61 00 ... Safety information on handling the vehicle battery

[61 00 / 12 00](#) ... Notes on disconnecting and connecting the vehicle battery

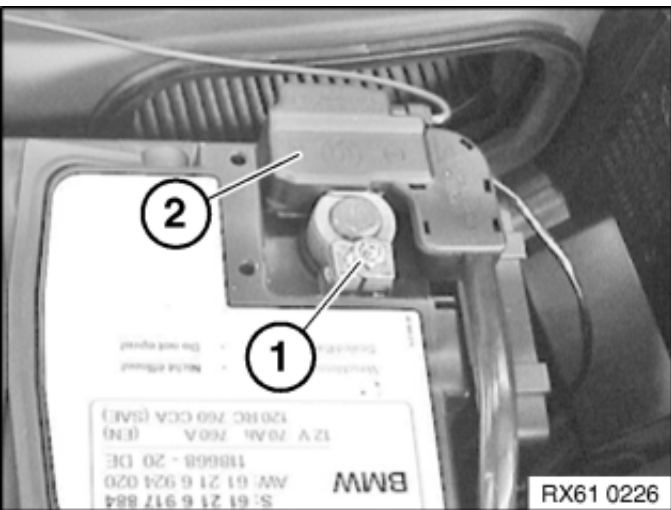
61 12 ... Notes on the intelligent battery sensor (IBS)



- Open the cover (1).

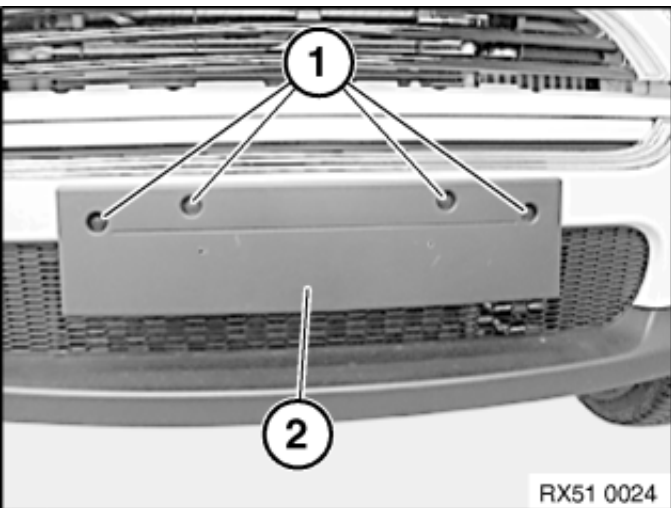


- Equipment specification without intelligent battery sensor (IBS):
- Slacken nut (1).
- Remove the battery earth lead (2) and secure to one side.



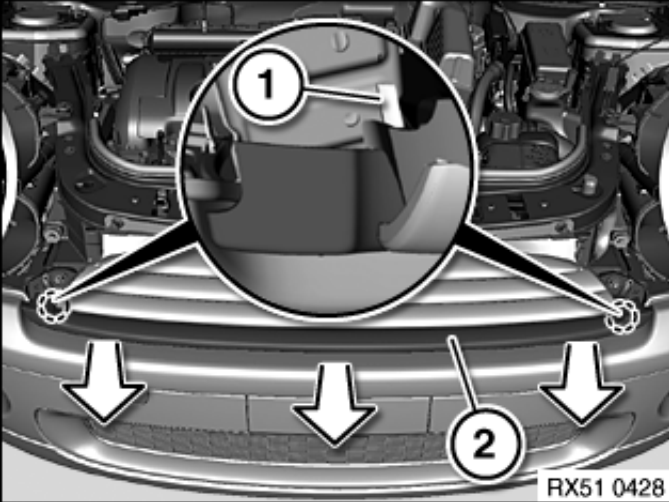
- Equipment specification with intelligent battery sensor (IBS):
- Slacken nut (1).
- Remove the battery earth lead (2) and secure to one side.

2 – Remove the number plate baseplate for the number plate



- Loosen screws (1).
- Remove the number plate baseplate (2).

3 – Removing trim on front ornamental grille



- Press down the latch mechanism (1) from inside behind the trim (2).
- Unclip the trim (2) forwards.

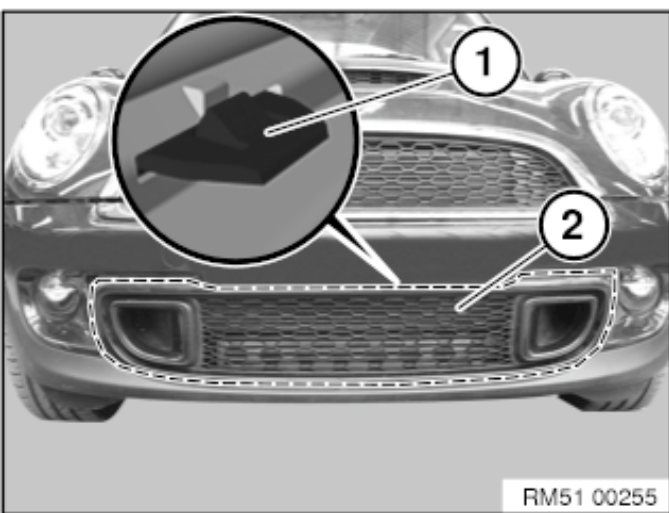
4 – Removing the ornamental grille in the front bumper



Paint damage.

Mechanical action can lead to paint damage.

- Mask those working areas at risk with yellow plastic adhesive tape.
- Remove and install heavy or bulky components with the aid of another person/other persons.

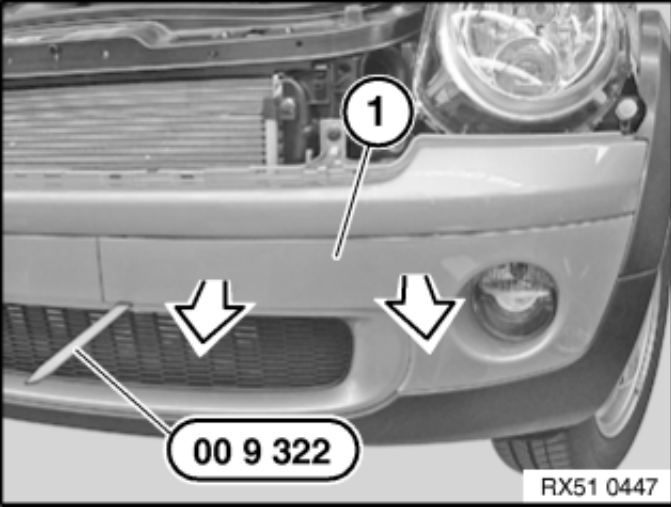


- Release the ornamental grille (2) by the latch mechanism (1) in the lower area with the special tool **0 496 569 (00 9 325)**.
- Pull the ornamental grille (2) forward slightly from below.
- Release the upper latch mechanism (1) by hand.
- Remove the ornamental grille (2).

5 – Removing left and right bumper trim



Description is for left component only. Procedure on the right side is identical.

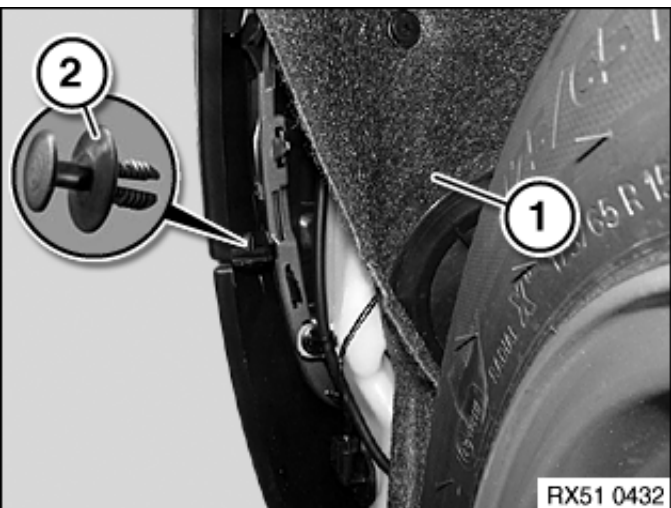


- Unclip bumper trim (1) with special tool 0 490 539 (00 9 322).

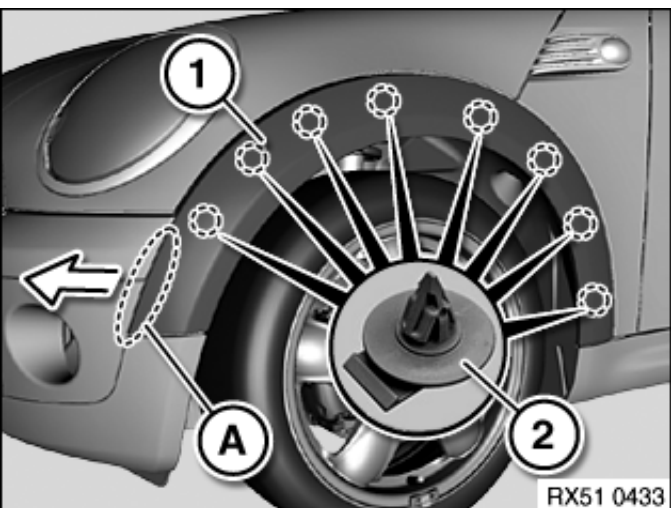
6 – Remove remove the wheel arch trim on the front left and right



Description is for left component only. Procedure on the right side is identical.



- If necessary, release the clip on the front wheel arch cover (1).
- Bend the wheel arch cover (1) slightly inward and release the clip (2).



- Feed out the wheel arch trim (1) in area (A) from the bumper toward the front.
- Detach the wheel arch trim (1) at the clips (2) and disconnect and remove the associated plug connection where required.

7 – Removing both headlights



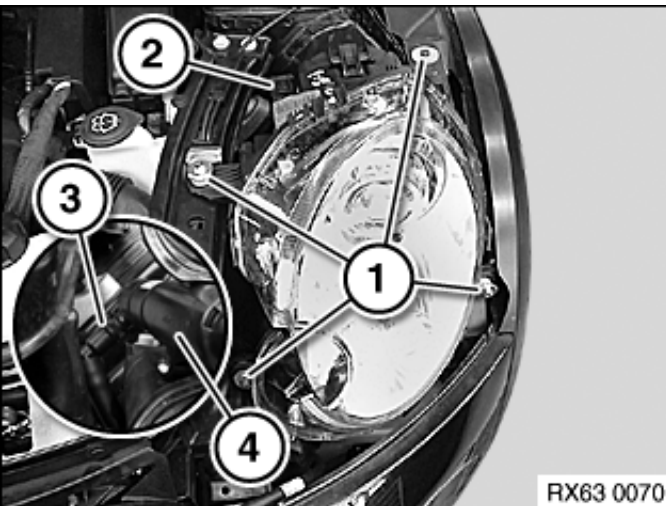
Danger through light source.

Danger of injury! Risk of short circuits!

- Disconnect light source from voltage supply before replacing: Switch off lighting system and ignition.
- For additional information see: 63 99 Information on handling bulbs / light sources (exterior lights)

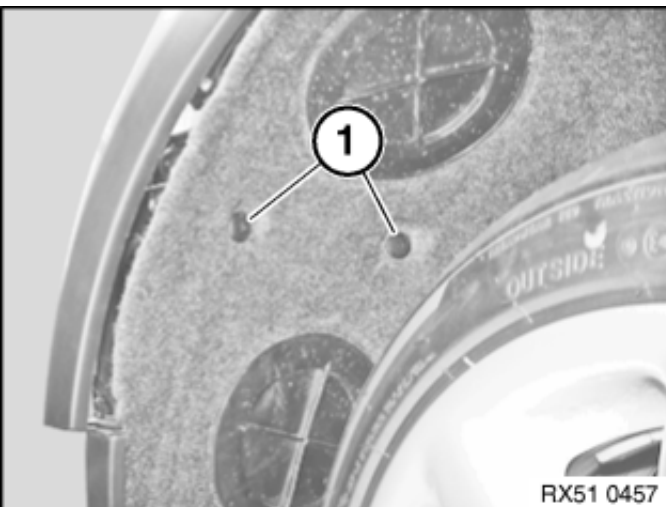


Description is for left component only. Procedure on the right side is identical.

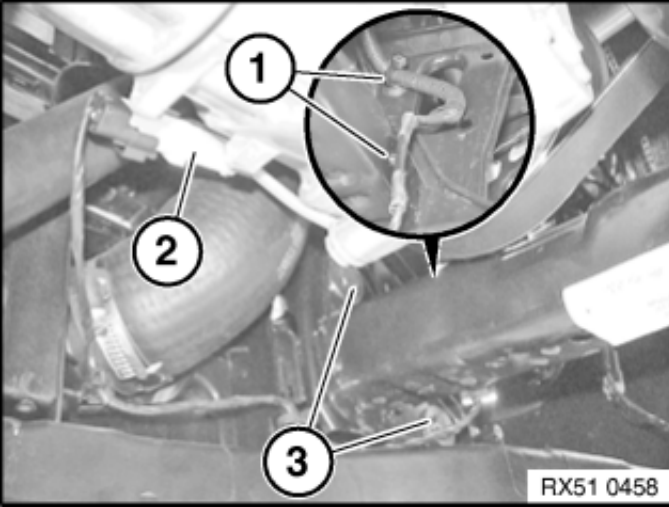


- Loosen screws (1).
- Disconnect plug connection (2).
- **In versions with a headlight cleaning system:** Pull the headlight slightly to the front and disconnect hose connection (3) from high-pressure nozzle (4).
- Remove headlight.

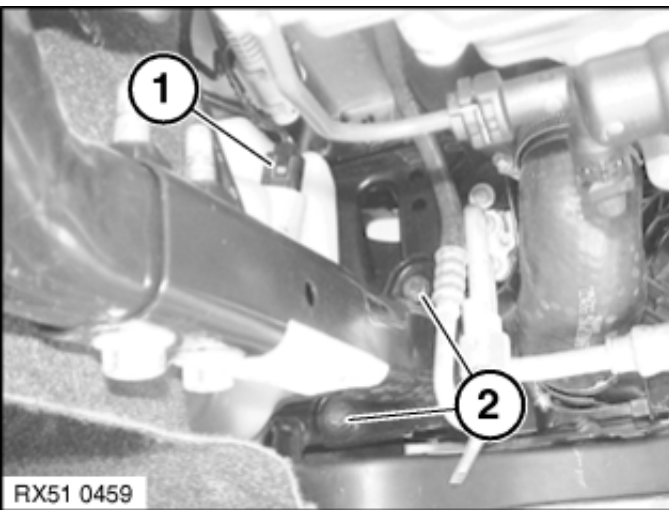
8 – Moving front panel into service position



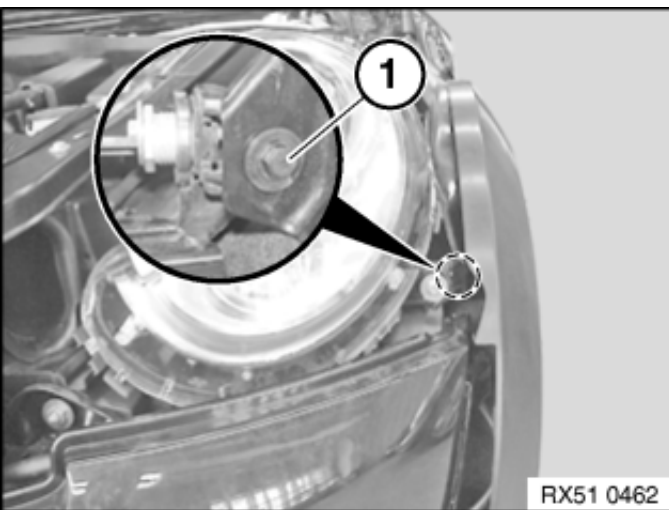
- Loosen clips (1) on the left and right.



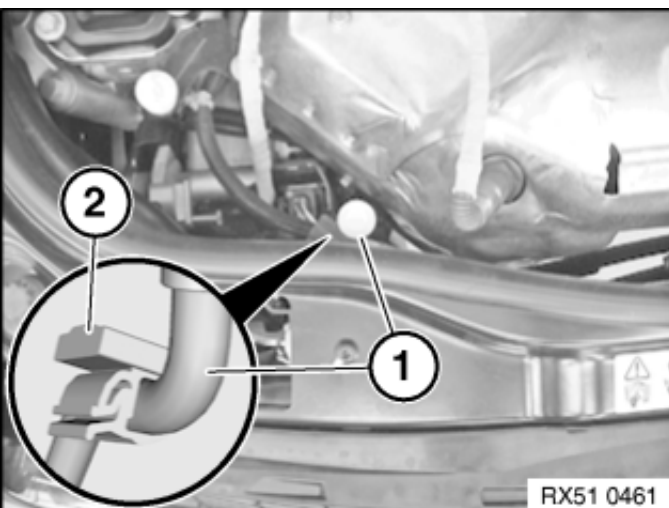
- Loosen the cable clip (1).
- Disconnect plug connections (2) at the air conditioning compressor.
- Loosen screws (3).



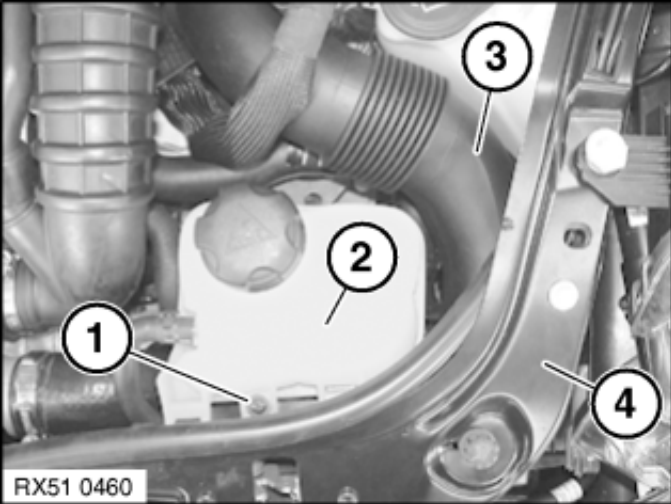
- Loosen screws (2).
- **Version with headlight cleaning system:**
Release the plug connection (1) at the washer pump for headlight cleaning system.



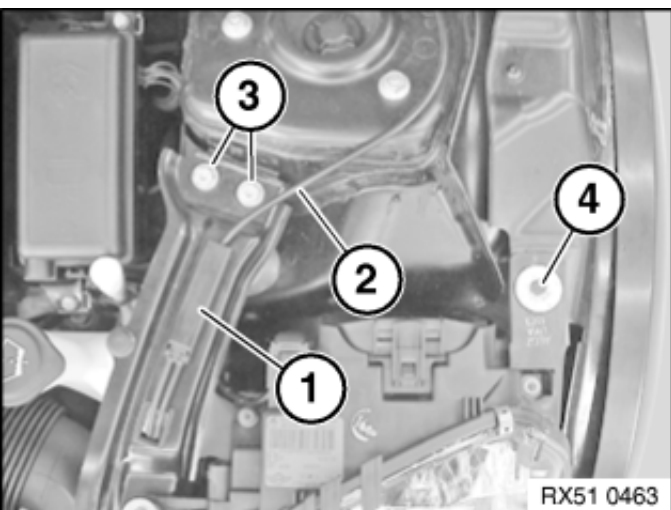
- Release the screws (1) at the side panel on the left and right.



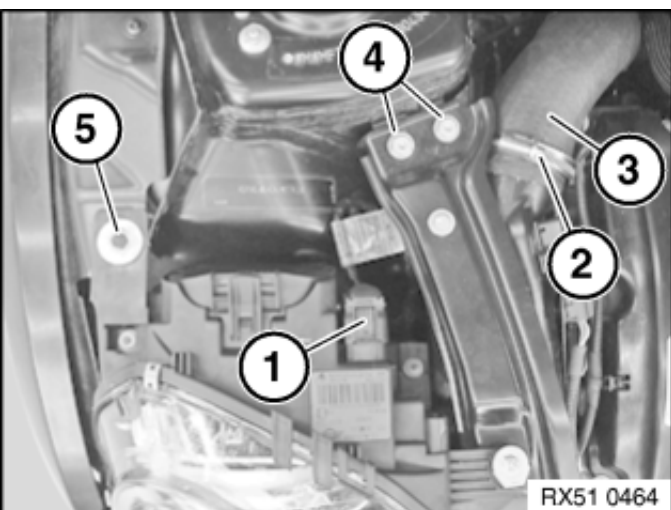
- **For equipment specification with air conditioning:**
Unclip refrigerant line (1) from the holder (2).



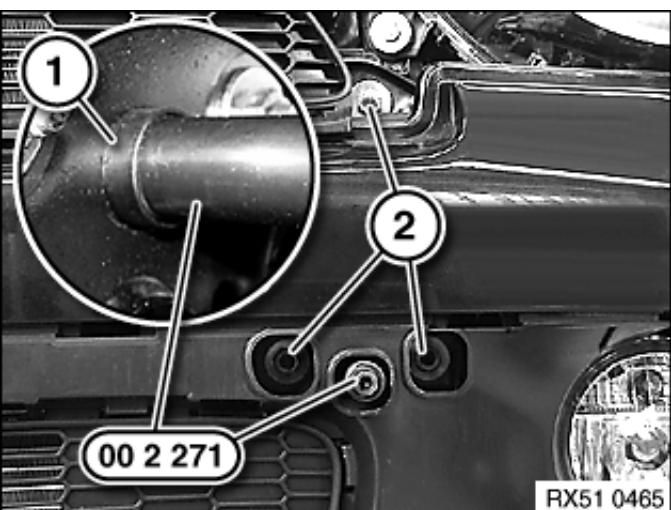
- Loosen screw (1).
- Set the coolant expansion tank (2) aside.
- Detach gaiter (3) from the bridge (4).



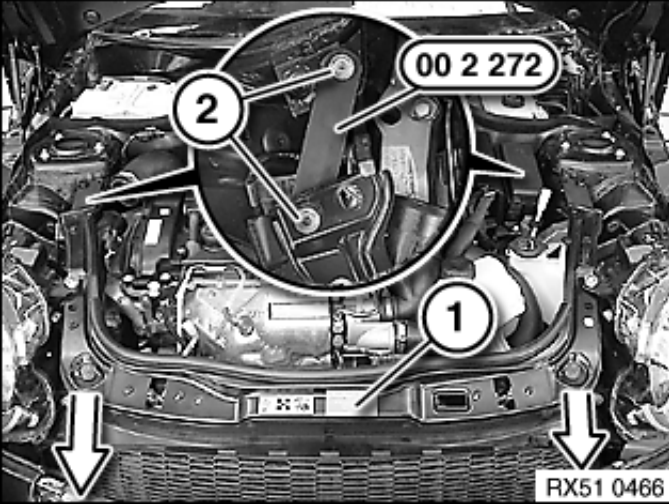
- Open Bowden cable bracket (1).
- Detach the Bowden cable (2).
- Loosen screws (3) and (4).



- Disconnect plug connection (1).
- Loosen screws (4) and (5).
- **Only for MINI Cooper S:**
Unfasten clamp (2).
- Pull off air duct (3).

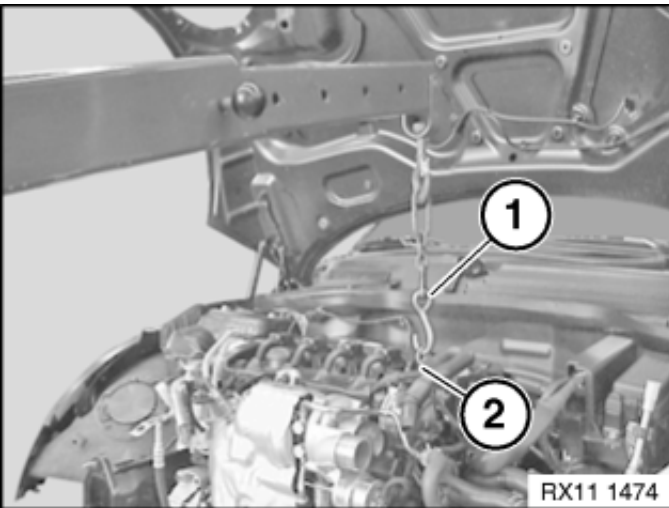


- Insert special tool **0 495 894 (00 2 271)** on the left and right in the sleeve (1).
- If necessary, twist the special tool **0 495 894 (00 2 271)**, until the screw can be inserted and tighten.
- Have the special tool be mounted **0 495 894 (00 2 271)**, until the front panel is mounted.
- Loosen nuts (2).



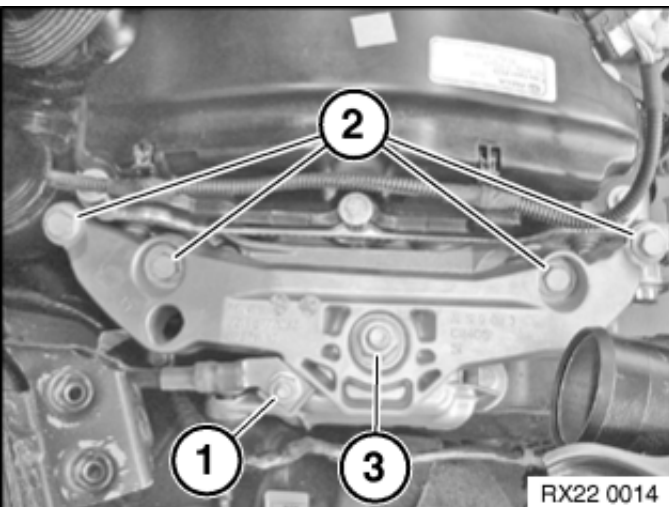
- Pull the front panel forward by (1) approx. 10 cm.
- Pay attention to other cable clips.
- Insert special tool **0 495 895 (00 2 272)** on the left and right and secure with screws (2).

9 – Attach the engine to the workshop crane



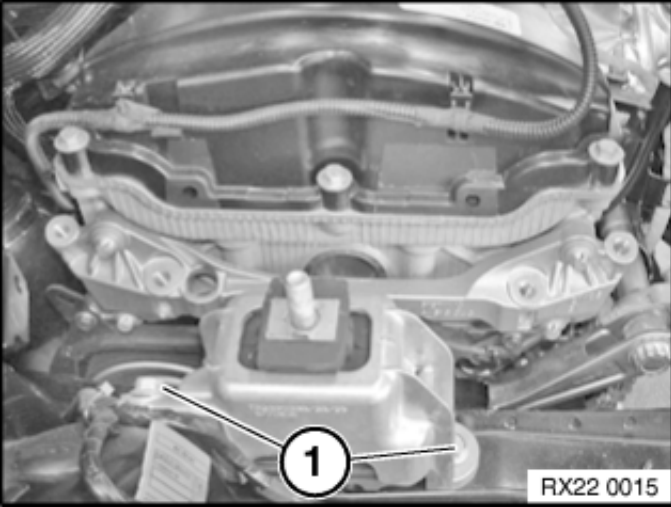
- Attach the engine with the workshop crane (1) on the engine mounting bracket (2).

10 – Removing engine mounting bracket



- Loosen the nut (1) and remove the ground strap.
- Loosen screws (2).
- Loosen nut (3).
- Remove engine mounting bracket.

11 – Removing the right engine mount



- Loosen screws (1).
- Remove engine mount.

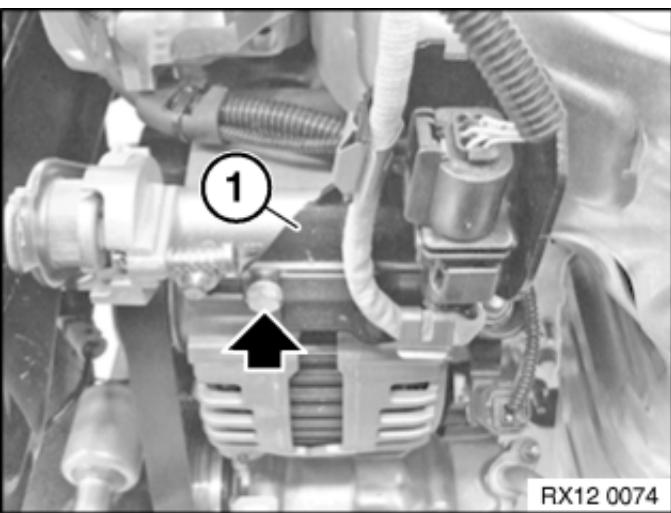
12 – Removing top screw connection on alternator



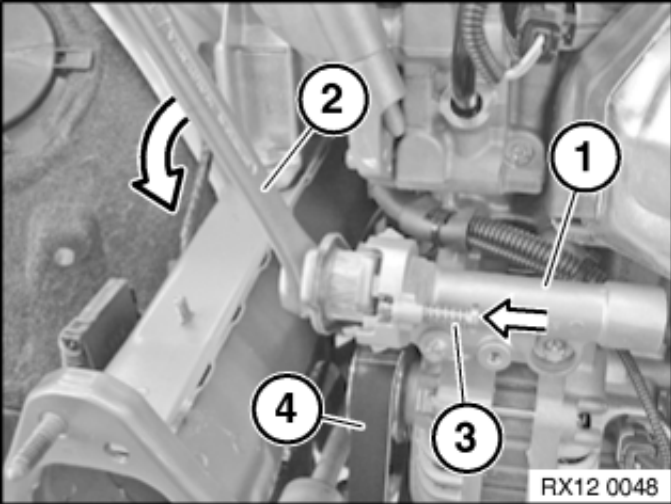
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.



- Unscrew the bolt and remove the holder (1).
- Lay holder (1) to one side.



- Bring and hold belt tensioner (1) in service position with the spanner (2).
- Secure installation position of belt tensioner (1) by sliding locating pin (3) in direction of arrow.

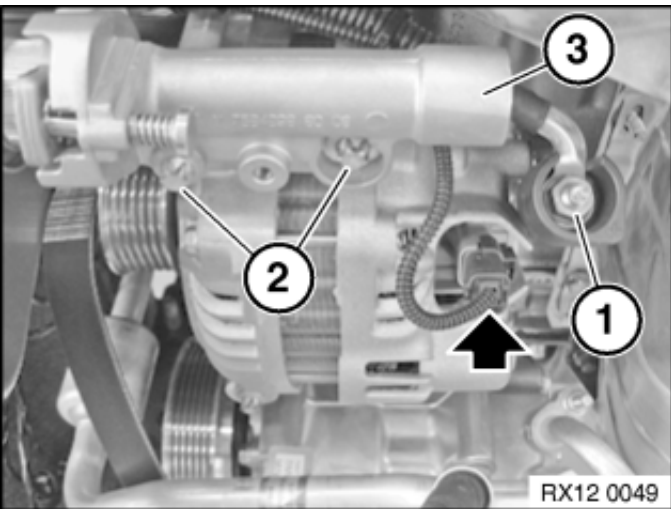


Abrupt snap back of the belt pulley.

Danger of injury!

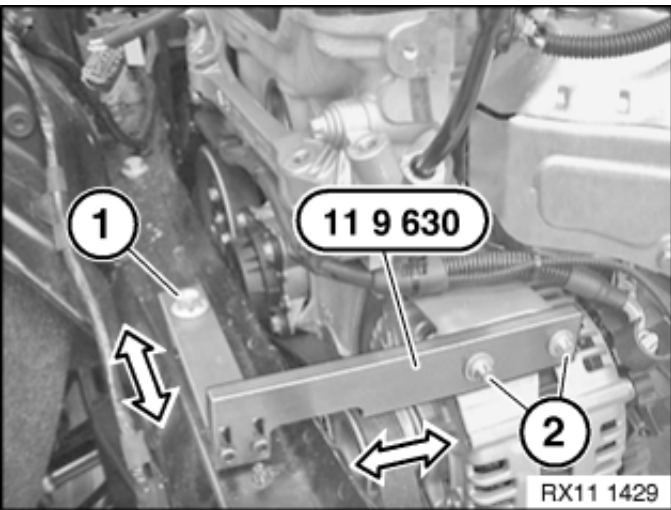


- Wear protective gloves.



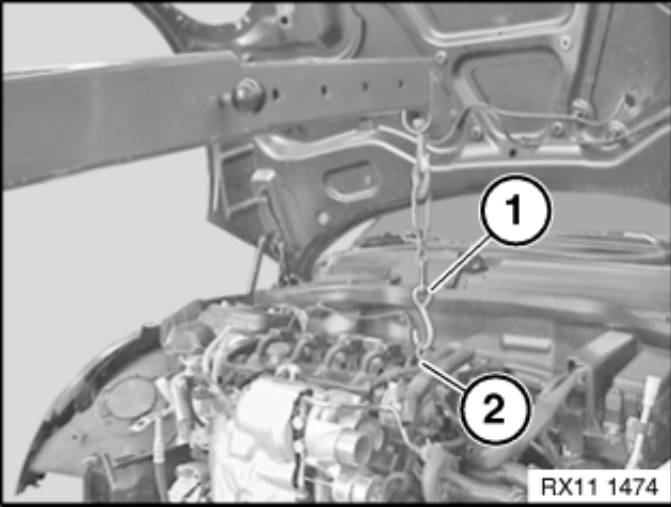
- Remove the drive belt (4) from the generator.
- Unlock and disconnect connector .
- Loosen the nut (1) and remove the positive battery cable.
- Loosen the screws (2) and remove the belt tensioner (3).

13 – Secure the engine with the special tool



- Do **not** remove the alternator.
- Secure special tool **0 496 016 (11 9 630)** with the screw connections (1) and (2) analog to the series.

14 – Detaching engine from workshop crane

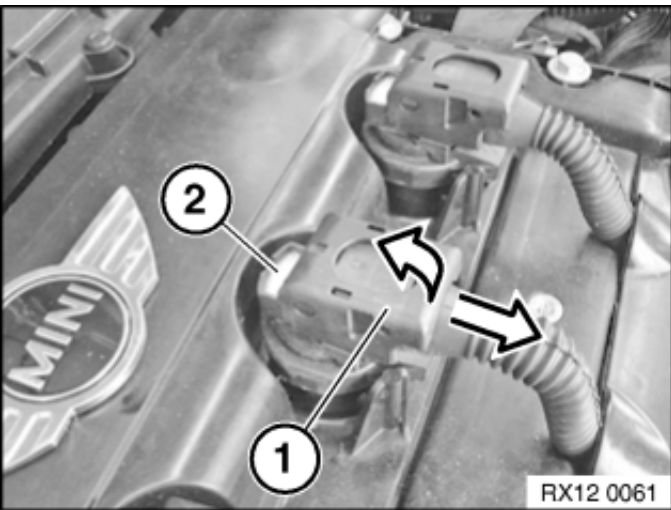


- Loosen and remove workshop crane (1) from the engine mounting bracket (2).

15 – Removing ignition coils (N14)

Prerequisite

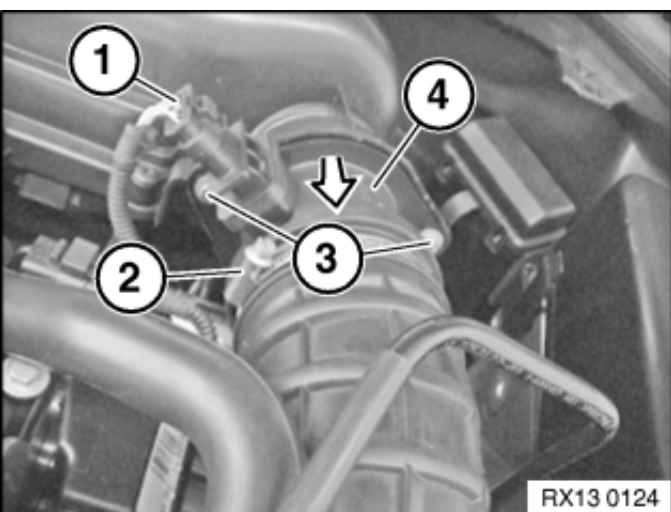
Switch off ignition.



- Unlock the connector fastener (1) of the ignition coil (2) and pull off the connector.
- Pull the ignition coil (2) out toward the top slowly and carefully.

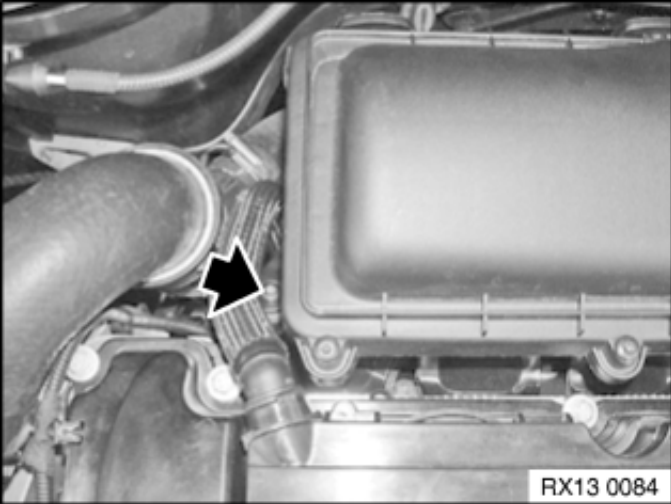
Pulling out the ignition coil with jerks may cause silicone hose to tear.

16 – Removing hot film air mass meter

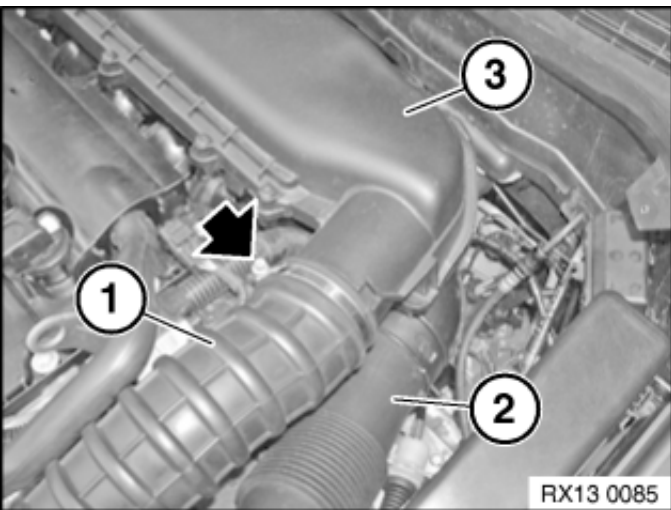


- Disconnect plug connection (1).
- Unfasten clamp (2).
- Loosen screws (3).
- Pull the gaiter off the hot film air mass meter.
- Remove the hot film air mass metre (4) in the direction of arrow.

17 – Removing the intake silencer housing (N14)

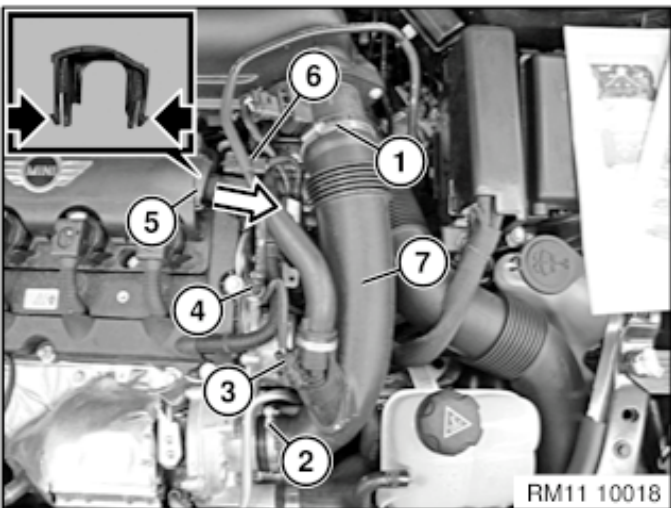


- Release screw (arrow).

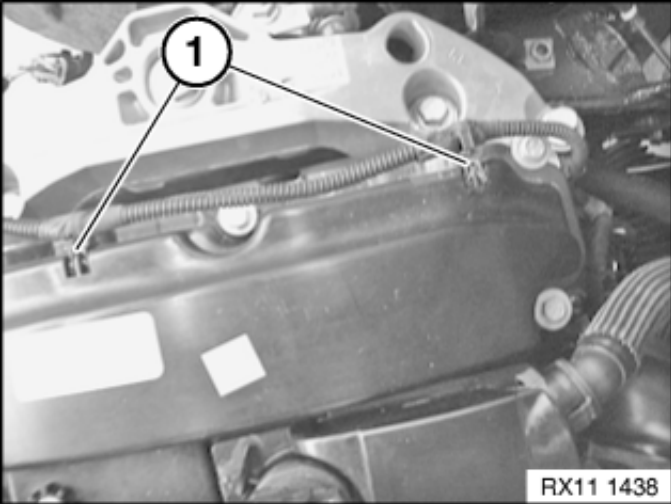


- Release clamp (arrow) and pull off the gaiter (1) from the intake filter housing (3).
- Slightly press in the intake pipe (2) at the latch mechanisms and pull it off from the intake silencer housing (3).
- Remove the intake silencer housing (3) together with the intake pipe.
- **For vehicles that have a hot film air mass meter:**
Disconnect plug connection.

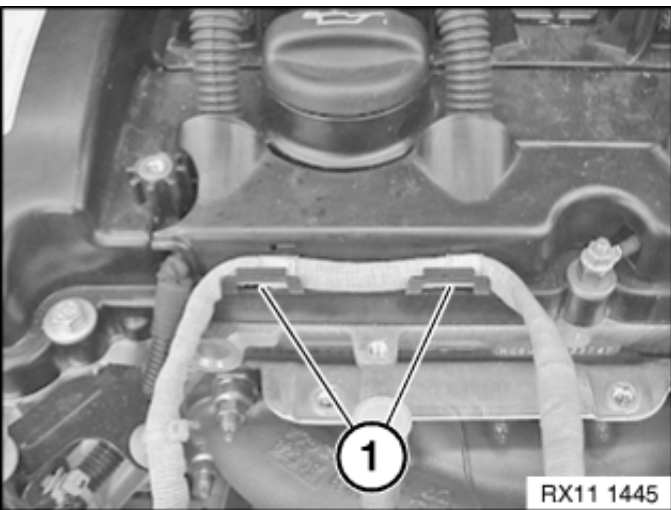
18 – Removing cylinder head cover (N14)



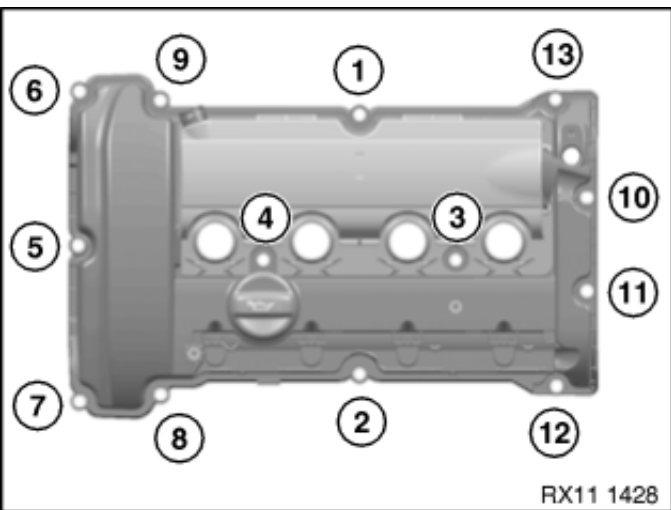
- Loosen clamps (1) and (2).
- Unlock connector (3) and remove.
- Unlock and pull off the vacuum line (4).
- Press lock (5) of the vent hose together at the side and pull off upwards.
- Pull the vent hose off the cylinder head cover in direction of arrow.



- Unclip engine wiring harness with the brackets (1).



- Release oxygen sensors on cylinder head (1).

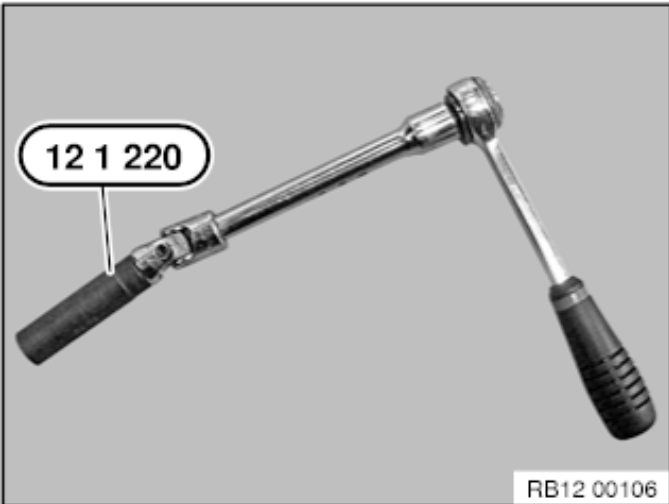


- Loosen ground cable at the screw connection (2).
- Unscrew the bolts of the cylinder head cover in sequence (13) to (1).

19 – Removing all spark plugs



Exclusively swivelling extensions may be used for the reversible ratchet. Rigid mounting tool and variable plug connections with rigid option may not be used; there is a risk that the insulator breaks.



- Unscrew the spark plugs with the special tool **0 495 560 (12 1 220)** and an extension with joint.

20 – Remove front right wheel

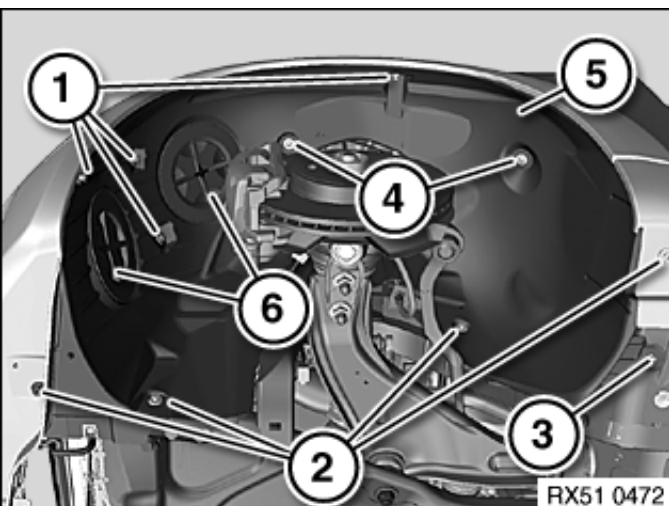


Description is for left component only. Procedure on the right side is identical.



Schematic diagram is for example purposes. Some parts may differ in certain details.

21 – Removing the front right wheel arch cover

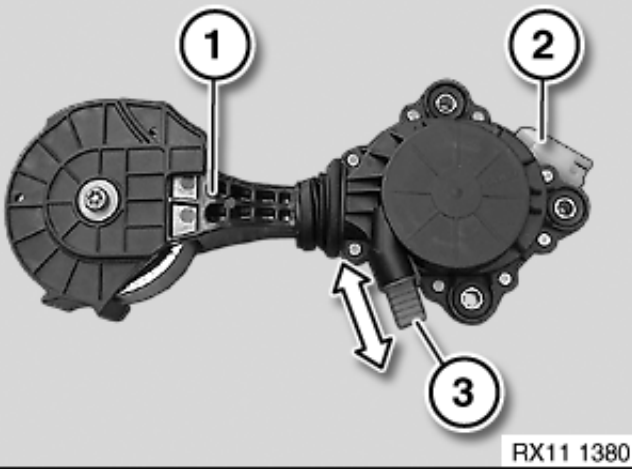


- Release screw-in rivets (1) and (2).
- Loosen nut (3).
- Loosen screws (4).
- Guide the wheel arch cover (5) out.

22 – Removing friction wheel



To provide a better overview: Shown on removed friction wheel.



RX11 1380

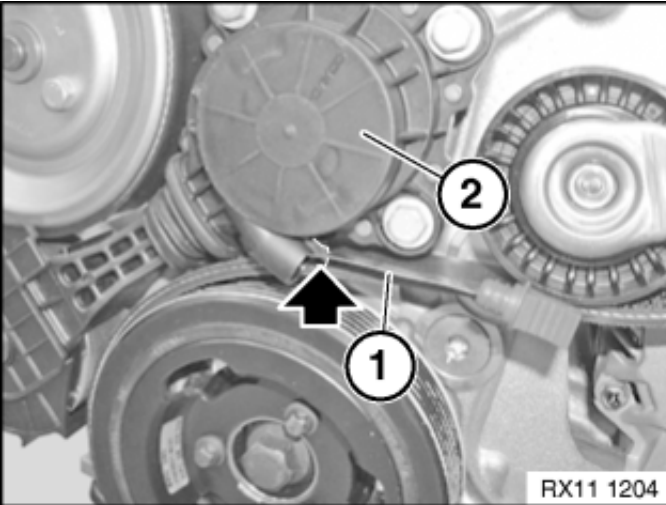
- Pull out the friction wheel with mechanical unlocking (3) in the direction of the arrow and lock it at the locking hook.

The friction wheel (1) lifts up from the belt drive mechanically.

- Disconnect the plug connection (2) on the friction wheel.

- Move the friction wheel (2) into the service position with a **maximum** of 50 N.

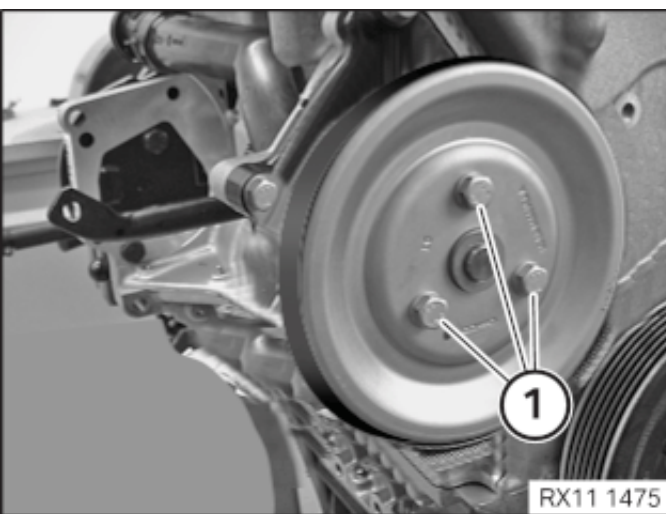
- Fix the service position of the friction wheel: Attach the tensioning strap (1) on the housing (2).



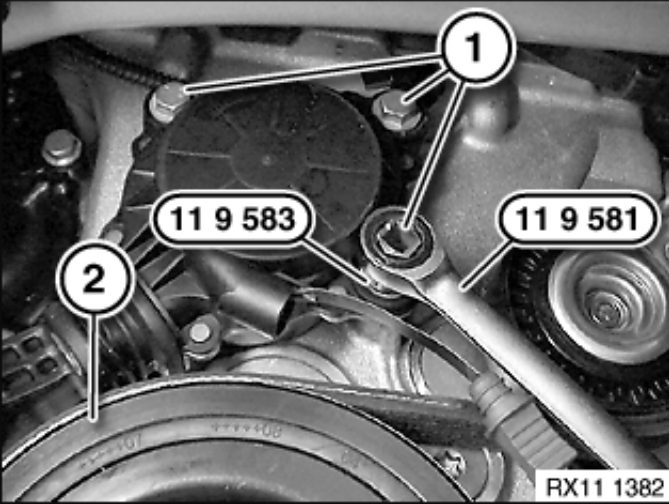
RX11 1204

- Secure the belt pulley of the coolant pump with an oil filter strap.

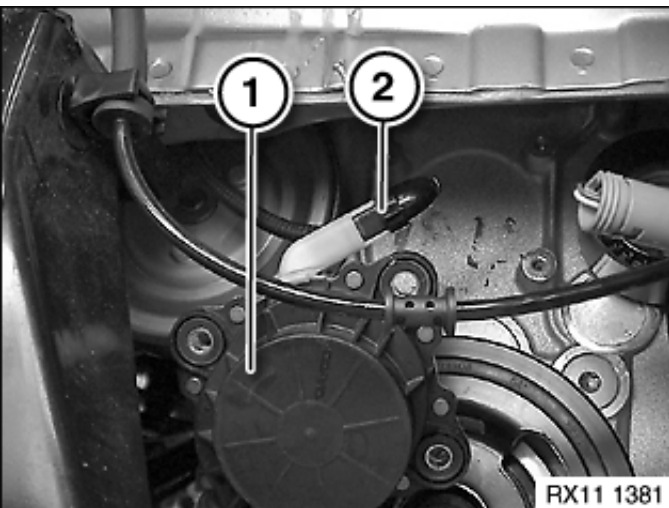
- Slightly loosen the bolts (1) with the special tools 0 495 933 (11 9 581) and 0 495 935 (11 9 583).



RX11 1475

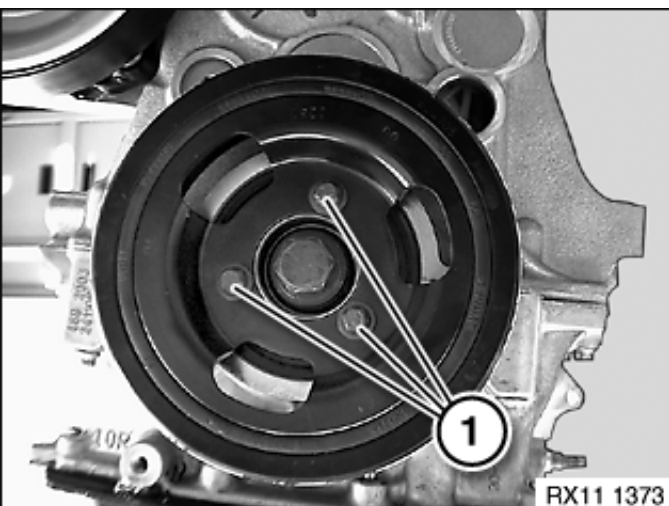


- Loosen the bolts (1) with the special tools **0 495 933 (11 9 581)** and **0 495 935 (11 9 583)**.
- Do (2) **not** disassemble the drive belt for the alternator.
It is not necessary to disassemble the drive belt for the alternator.



- Remove the friction wheel (1) toward the bottom.
- Disconnect plug connection (2).

23 – Removing the vibration damper



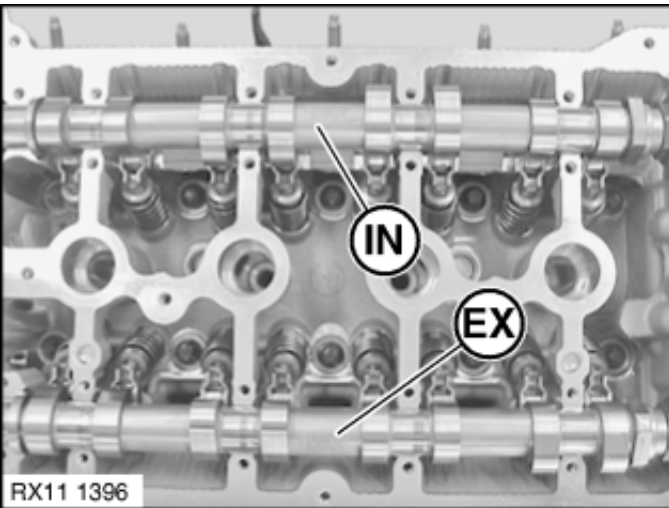
- Loosen screws (1).
- Remove vibration damper.

24 – Removing intake adjuster

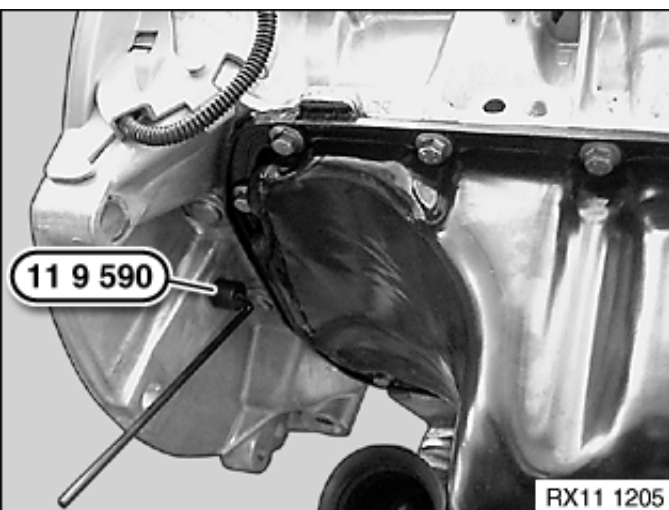


The timing is not determined in the TDC firing position of the 1st cylinder. Set a modified procedure for timing. All pistons are in the 90° position. Check the VANOS adjuster lock.

Checking the VANOS adjuster lock: turn the intake camshaft in the direction of rotation at the hexagon head. The VANOS adjuster has been locked in initial setting once the camshaft has established a frictional connection with the VANOS adjuster. If it is not possible to establish a permanent connection to the camshaft, the VANOS adjuster is faulty and must be renewed.

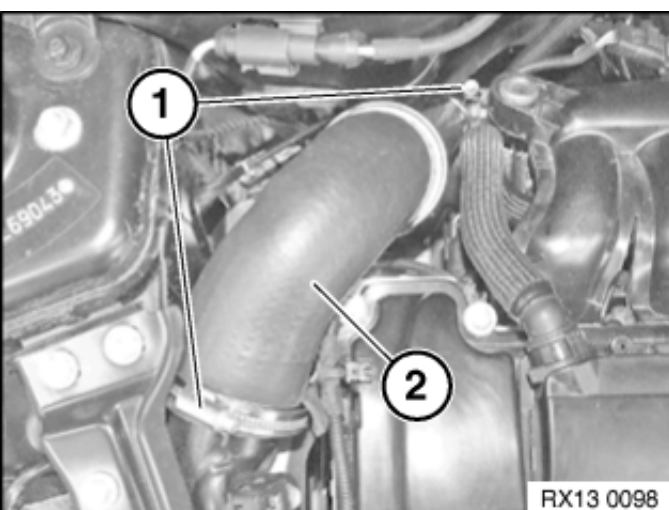


- Mount special tool **0 495 926 (11 9 550)** to open the central bolts on the intake adjuster and the camshaft.
- Turn the engine at the central bolt in direction of rotation, until the designations **IN** and **EX** can be read from above.

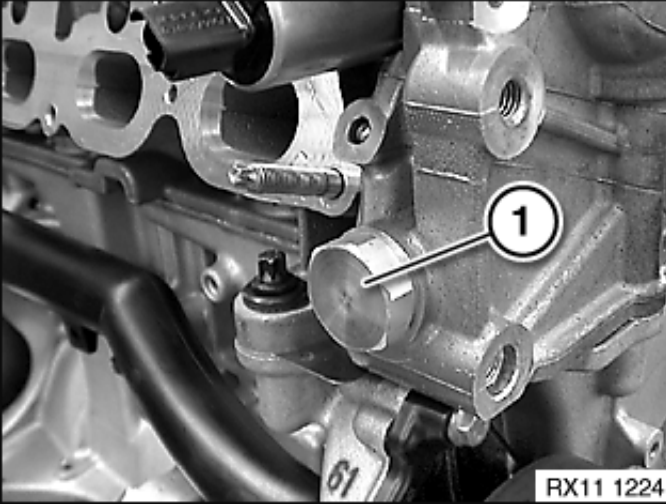


- Insert special tool **0 495 939 (11 9 590)**.
- Turn the flywheel (1) at the central bolt, until the TDC firing position of the 1st cylinder is reached.

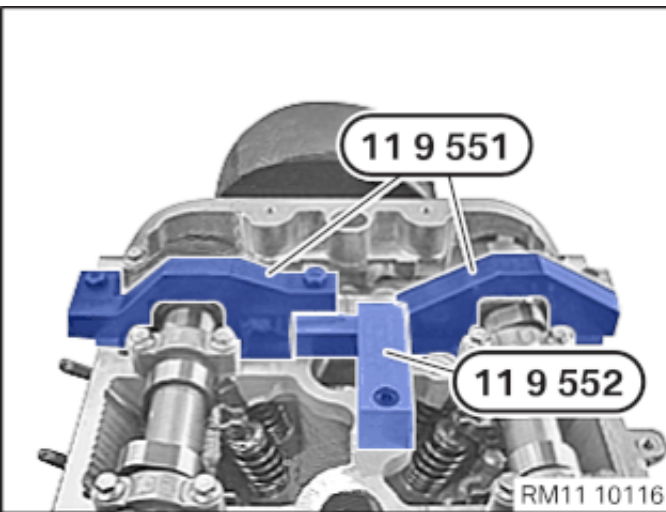
Note: The dowel hole may be mixed up in the automatic transmission.



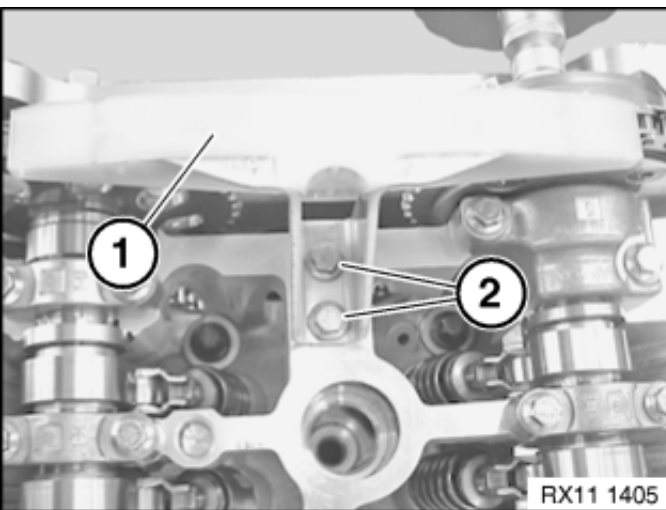
- Release the hose clamp (1) and remove the charge air hose (2).



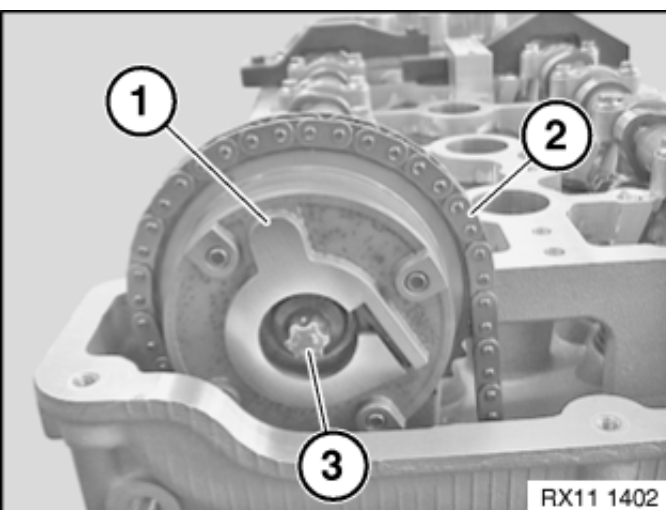
- Collect escaping engine oil. Ensure that no oil is running onto the belt drive.
- A small quantity of engine oil will escape after the screw connection has been released.
- Release the chain tensioner (1).



- Before positioning the special tool: check the lock of the intake adjuster.
- The camshaft must be firmly connected to the VANOS adjuster.
- Position the special tool **0 495 936 (11 9 551)** on the exhaust camshaft and fix with the special tool **0 495 937 (11 9 552)**.
 - Position special tool **0 495 936 (11 9 551)** on intake camshaft and secure with both screws.

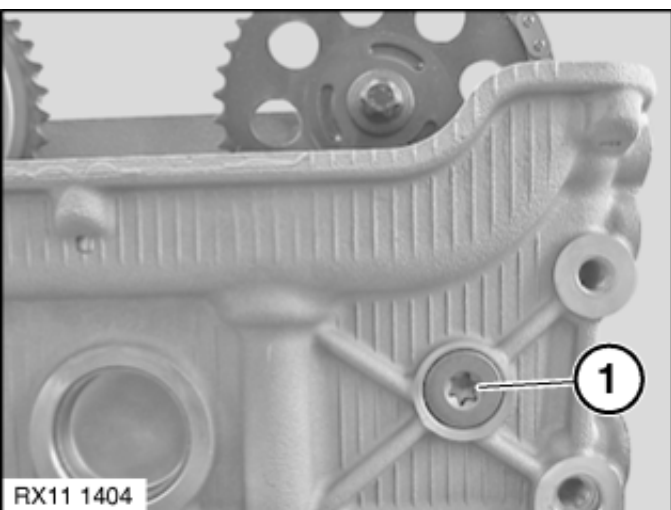


- Loosen screws (2).
- Remove the slide rail (1).

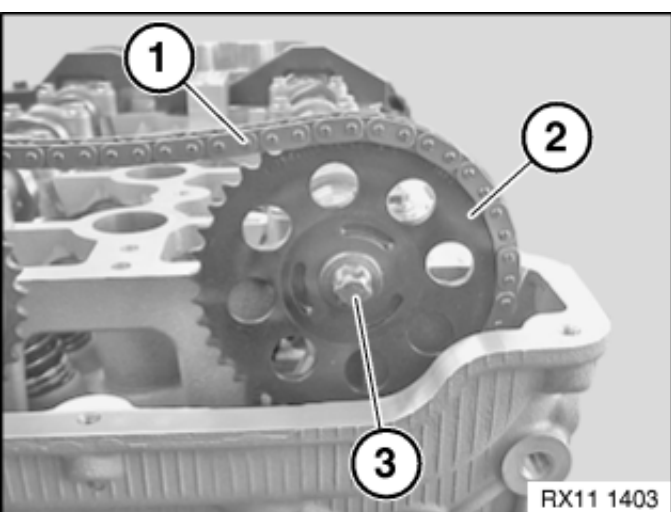


- Unscrew the central bolt (3).
 - Remove the VANOS adjuster (1) from the timing chain (2).
- Note:** The VANOS adjuster of the intake camshaft is designated with the letters **IN**.

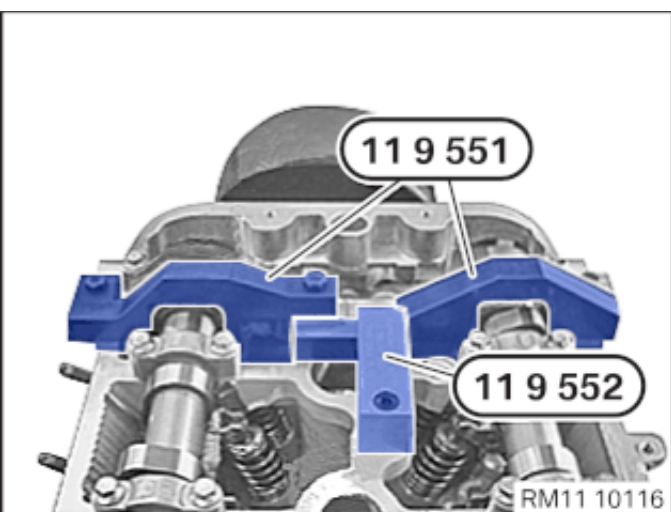
25 – Removing timing chain



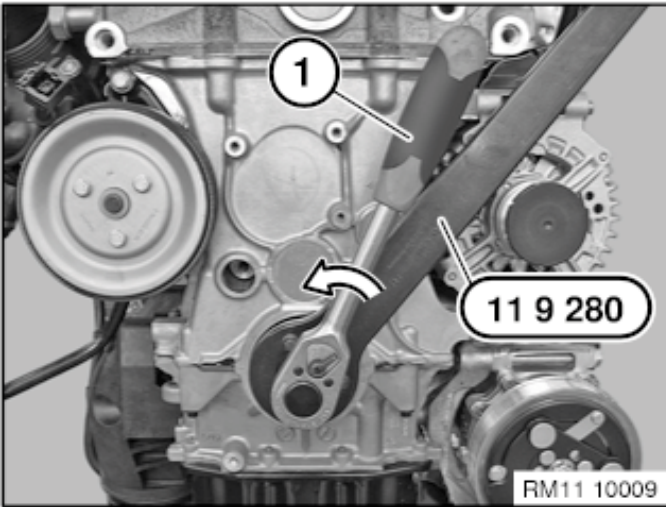
- Loosen screw (1).



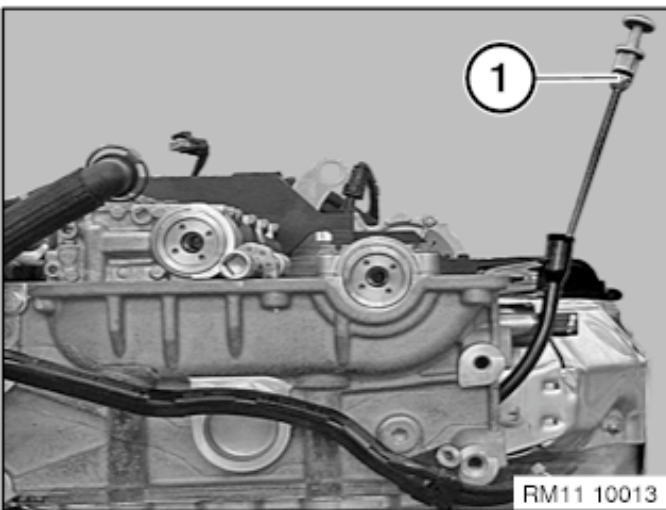
- Unscrew the central bolt (3).
- Feed out camshaft sprocket (2) forward from the timing chain (1).



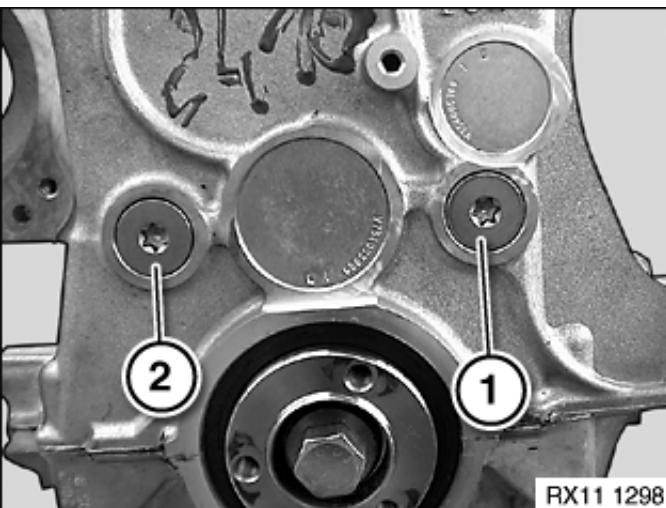
- Do not remove special tool 0 495 926 (11 9 550).



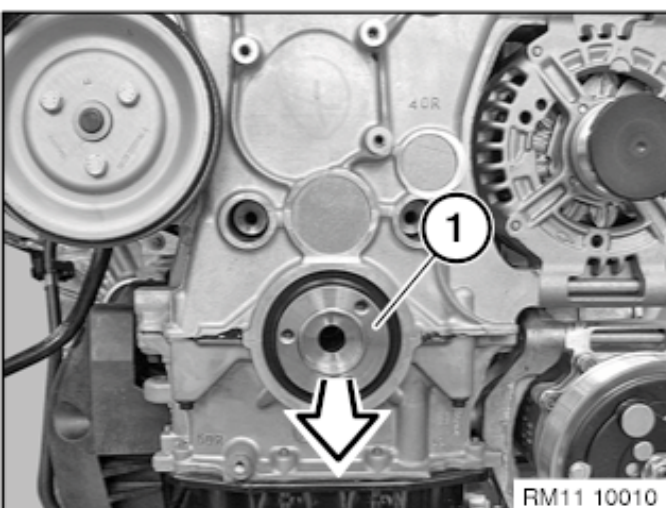
- Install the special tool **0 493 940 (11 9 280)** on the hub for the vibration absorber with screws.
- Involve a second person for counter support to release the central bolt.
- Release the central bolt with the tool (1) in the direction of arrow.



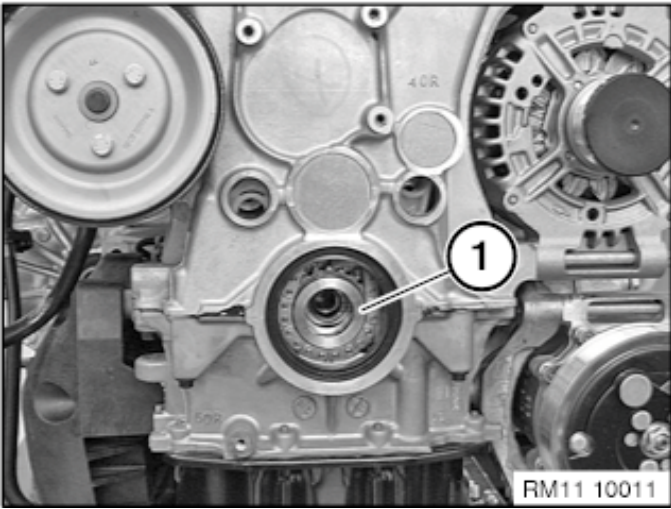
- Pull out the oil dipstick (1).



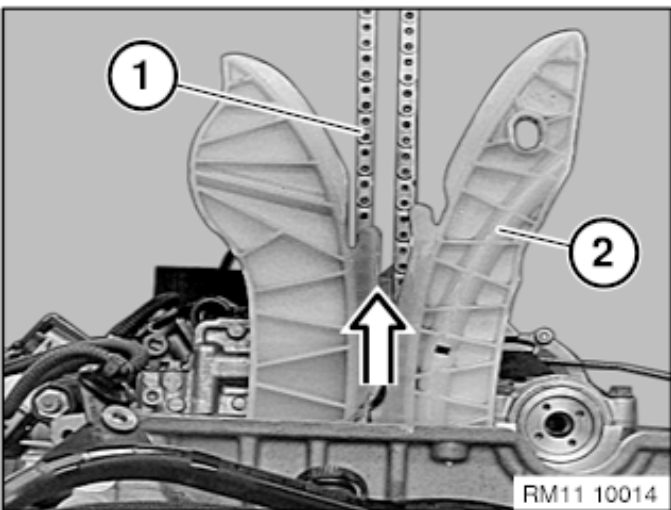
- Release the bearing journal (1) and (2) at the chain module.



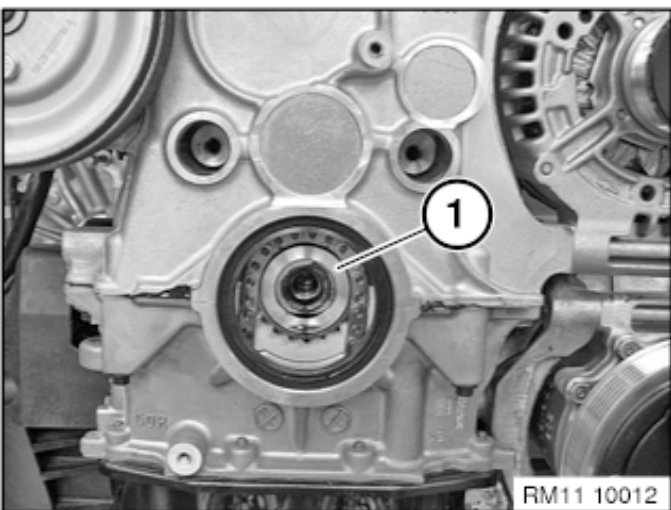
- (1) Remove hub towards front.



- Remove timing chain from the camshaft sprocket (1) and pay attention that the camshaft sprocket (1) does not slip off the crankshaft.

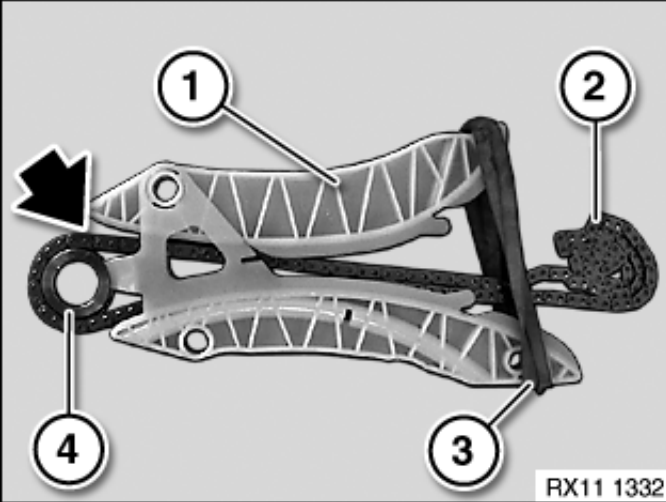


- Remove the chain module (2) upwards with the timing chain (1).

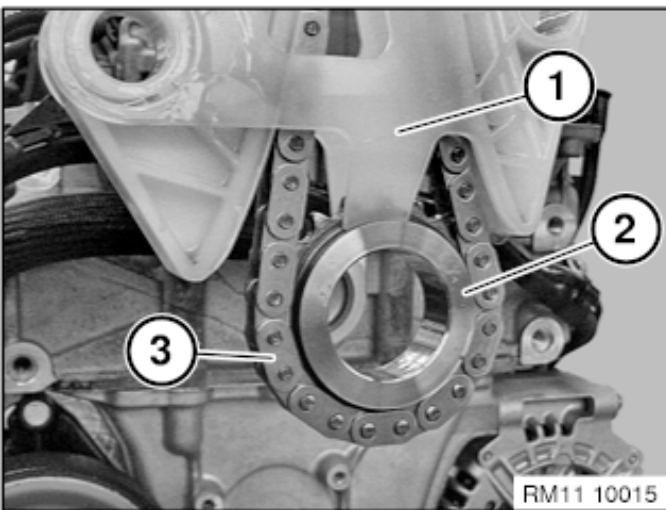


- Check the camshaft sprocket (1) of the oil pump for correct fit.

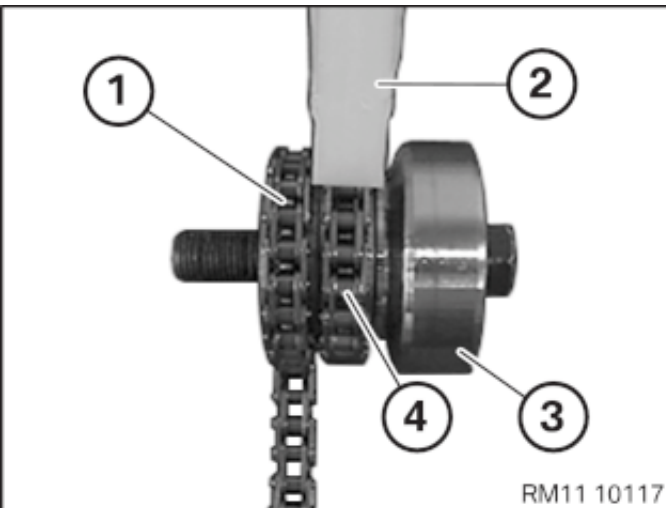
26 – Installing timing chain



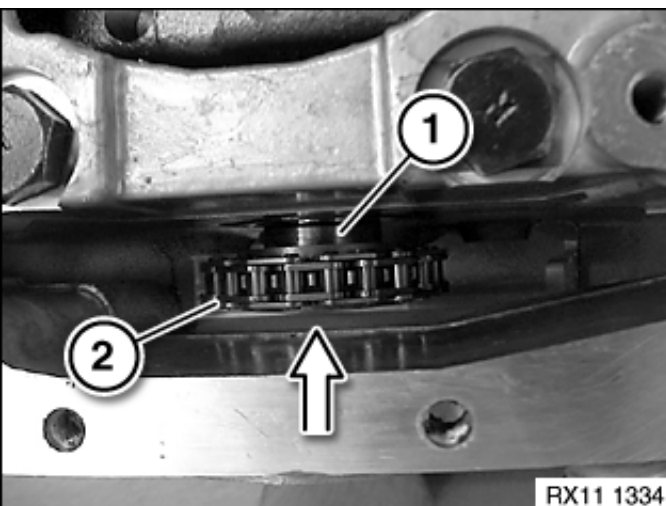
- Fasten chain module (1) with a rubber part (3).
This makes installation easier.
- Pull timing chain (2) upwards until the camshaft sprocket (4) lies on the chain guide (1).
- Install the timing chain (2) and camshaft sprocket (4) in this position.



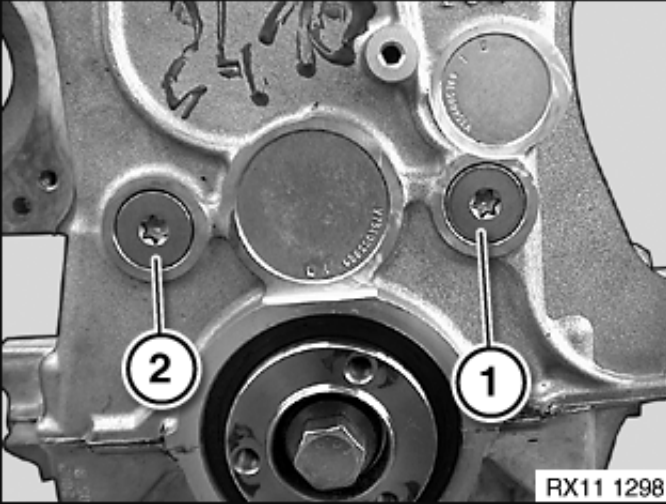
- Make sure the mounting orientation of the chain module (1), camshaft sprocket (2) and timing chain (3) are correct.



- Check if the mounting orientation of both camshaft sprockets is correct:
» The camshaft sprocket (1) of the oil pump, the guide rail (2) of the timing chain, the hub (3) on the crankshaft and the camshaft sprocket (4) of the timing chain are present as pictured.



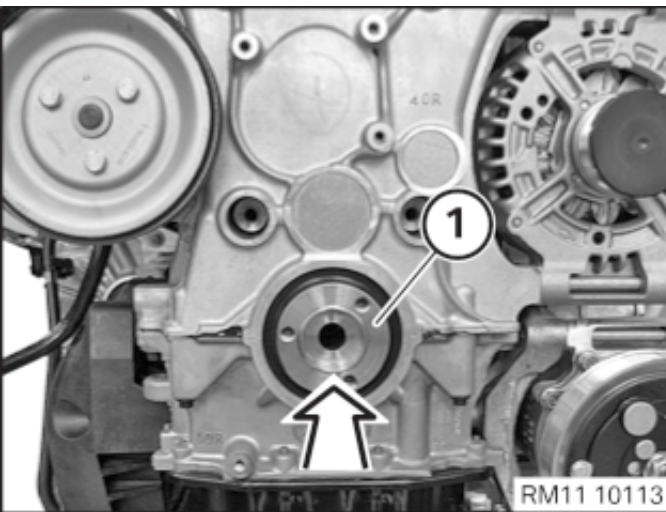
- Attach oil pump camshaft sprocket (2) to crankshaft (1) in direction of arrow.
- Insert chain module with timing chain.



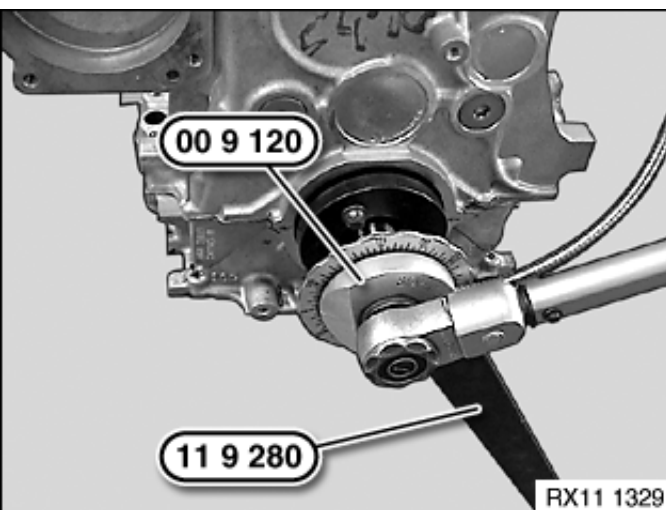
- Fasten the chain module with bearing journals (1) and (2).

Bearing journal

M8x1.25	Replace O-ring		24 Nm
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- Attach crankshaft hub (1).

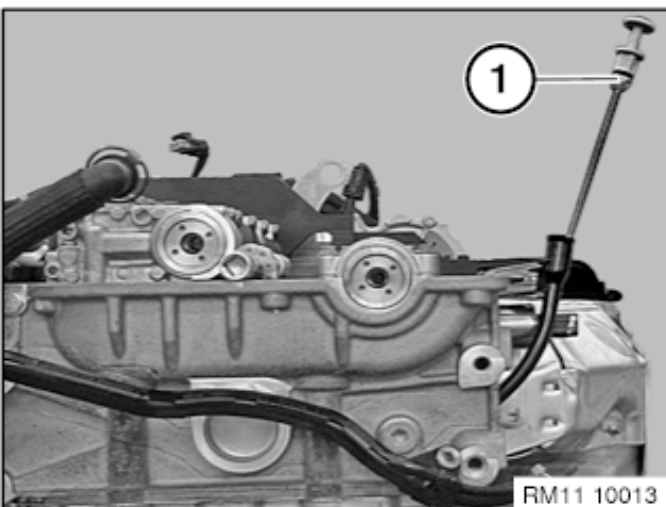


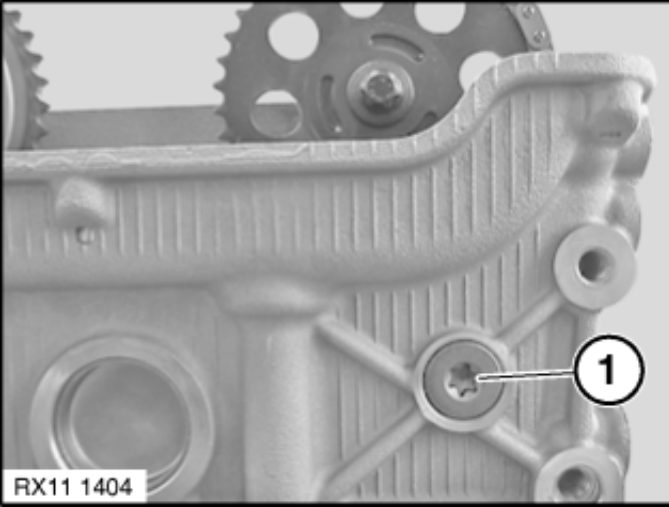
- Install central bolt.
- Secure central bolt with the special tool **0 490 504 (00 9 120)**.

Torsional vibration damper (hub) to crankshaft

M14 x1.5 x74	12.9	Tightening torque	50 Nm
		Angle of rotation	180 °

- Remove special tool **0 493 940 (11 9 280)** from hub.
- Insert oil dipstick (1).

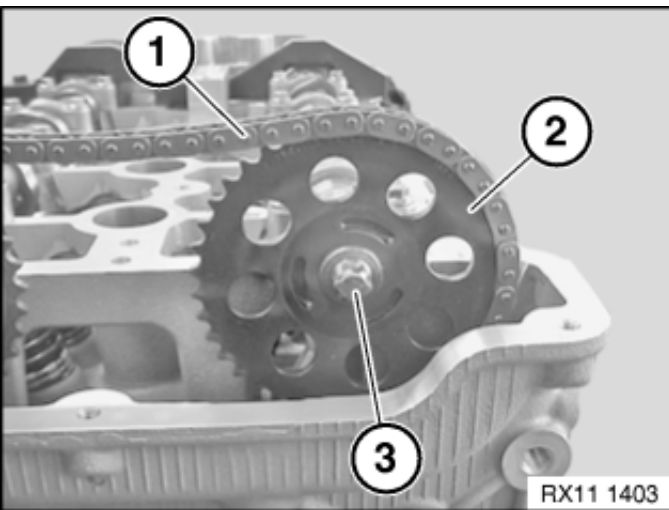




- Position and tighten the screw (1).

Screw plug, timing case upper section

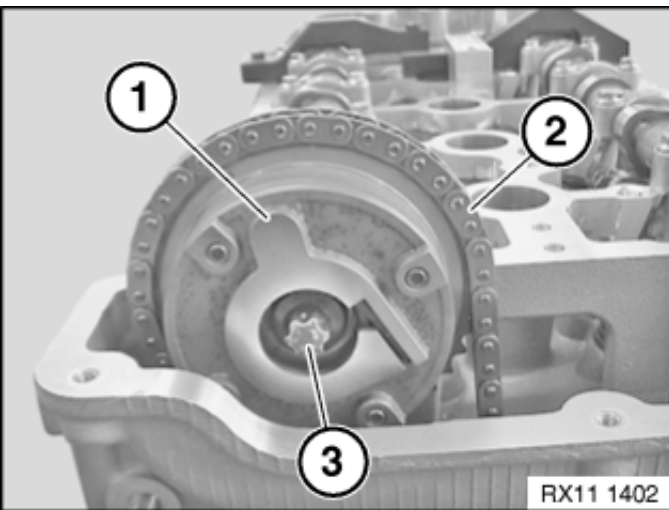
M22x1.5	Replace sealing ring		35 Nm
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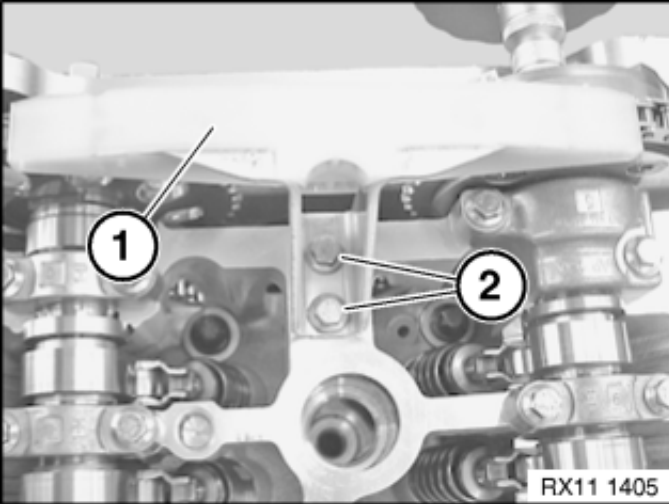
- Install camshaft sprocket (2) for the exhaust camshaft with mounted timing chain (1).
- Position the screw (3) and hand-tighten.

POSTPROCESSES

27 – Installing the intake adjuster



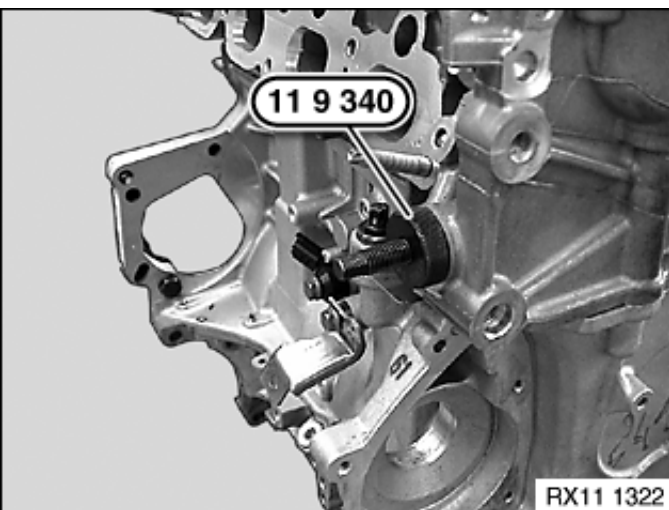
- (1) Install the VANOS adjuster.
The VANOS adjuster of the intake camshaft is designated with the letters **IN**.
- Position the timing chain (2).
- Apply the central bolt(3) and hand-tighten.



- Mount the slide rail (1).
- Insert screws (2).

Slide rail to crankcase

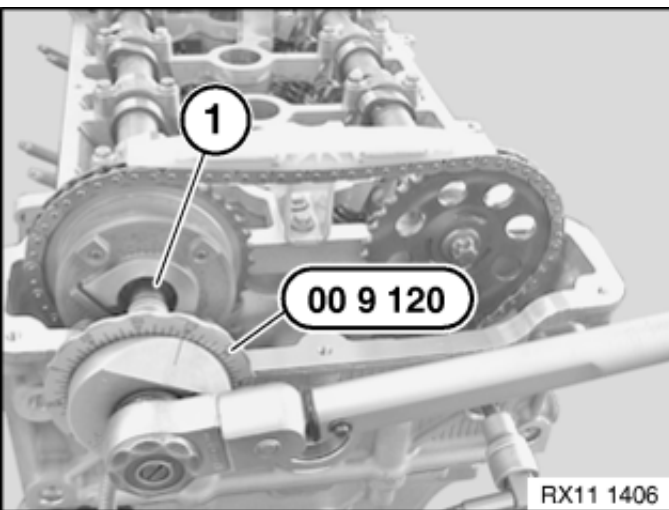
M6			8 Nm
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- Screw special tool **0 493 971 (11 9 340)** into the cylinder head.
- Pretension the timing chain with the special tool **0 496 778 (00 9 460)**.

Preload timing chain

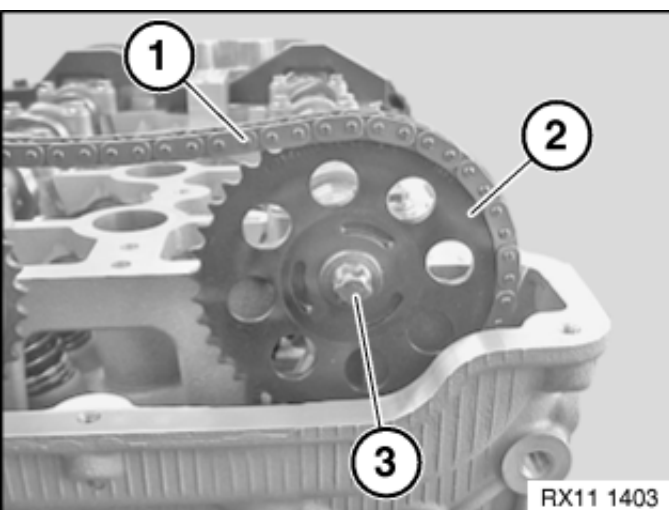
			0,6 Nm
--	--	--	--------



- Secure central bolt (1) with the special tool **0 490 504 (00 9 120)**.

VANOS to intake shafts

M10x52	Renew screw.	Jointing torque	20 Nm
		Angle of rotation	180 °



- Tighten down screw (3).

Camshaft sprocket to exhaust camshafts

M10x30		Tightening torque	20 Nm
		Angle of rotation	90 °



Damage to the engine.

The engine may be damaged if it is manually rotated in the wrong direction.

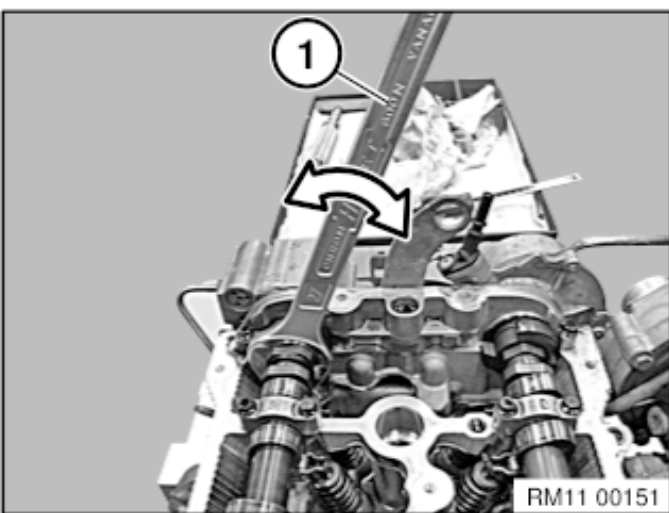
- Always rotate the engine in the correct direction of rotation by hand: a) Clockwise, facing the vibration damper or b) Counter-clockwise, facing the chain drive. (b) only applies when the rear timing chain is installed.



The timing is not determined in the TDC firing position of the 1st cylinder. Set a modified procedure for timing. All pistons are in the 90° position. Check the VANOS adjuster lock.

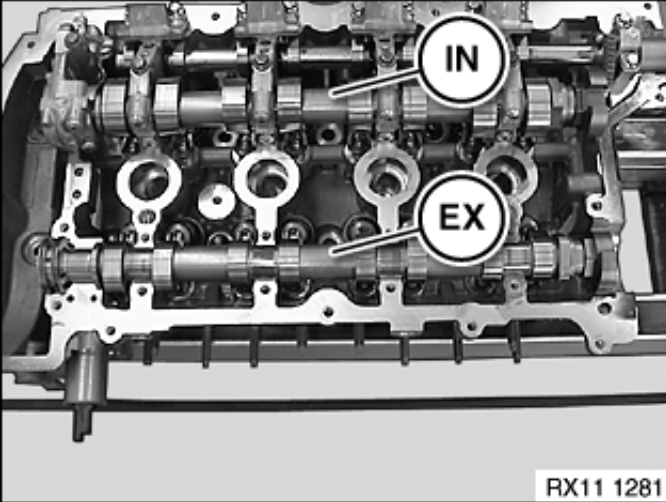


Checking the VANOS adjuster lock: turn the intake camshaft in the direction of rotation at the hexagon head. The VANOS adjuster has been locked in initial setting once the camshaft has established a frictional connection with the VANOS adjuster. If it is not possible to establish a permanent connection to the camshaft, the VANOS adjuster is faulty and must be renewed.



- To check the lock of VANOS adjuster: turn intake camshaft in direction of arrow using an open-end spanner (1). The maximum permissible force is 10 Nm to 15 Nm.

If play of VANOS adjuster is less than 10 degrees, the VANOS adjuster is OK.

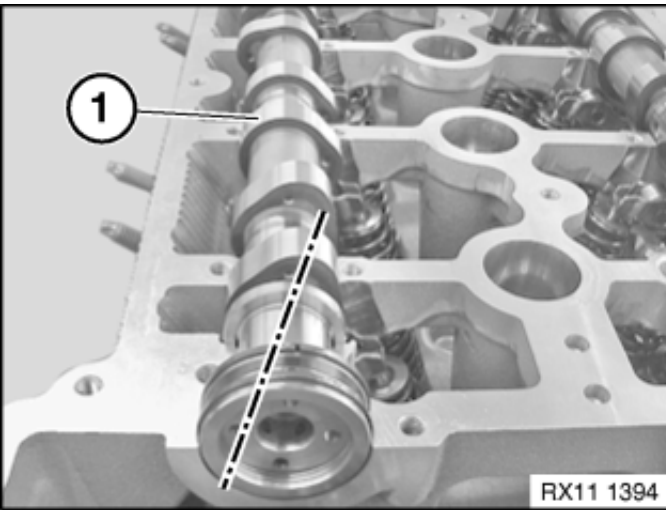


RX11 1281

- Check the mounting orientation of the camshaft.

The designation **IN** must show upwards for the intake camshaft.

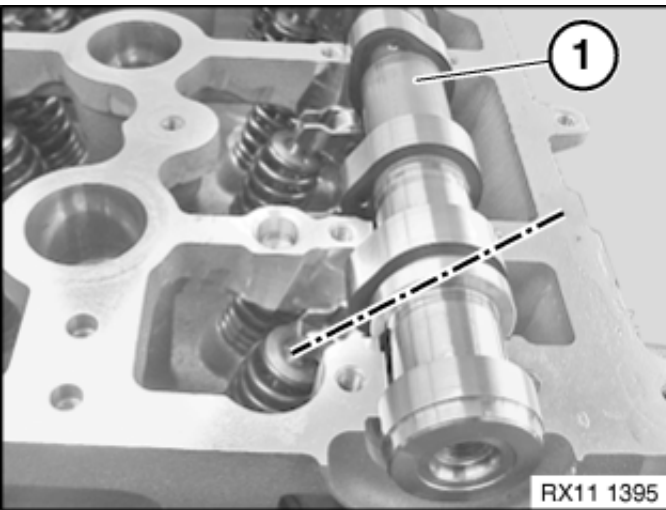
The designation **EX** must show upwards for the exhaust camshaft.



RX11 1394

- Check, whether the position of the intake camshaft (1) is correct.

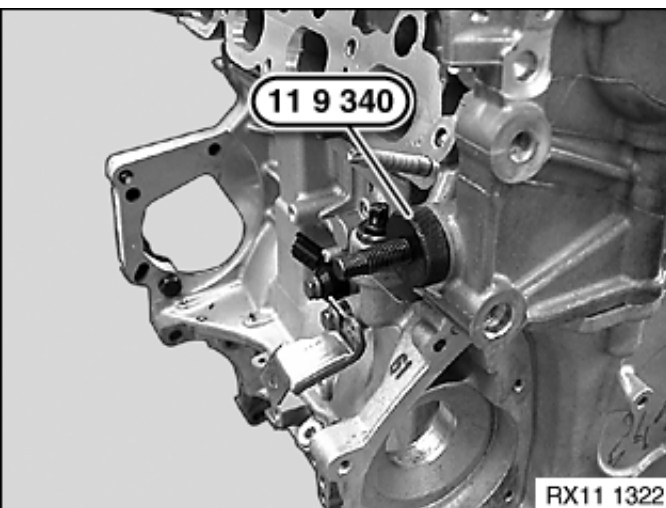
The intake camshaft must show diagonally **up** to the inner right.



RX11 1395

- Check, whether the position of the exhaust camshaft (1) is correct.

The exhaust camshaft must show diagonally **down** to the inner right.

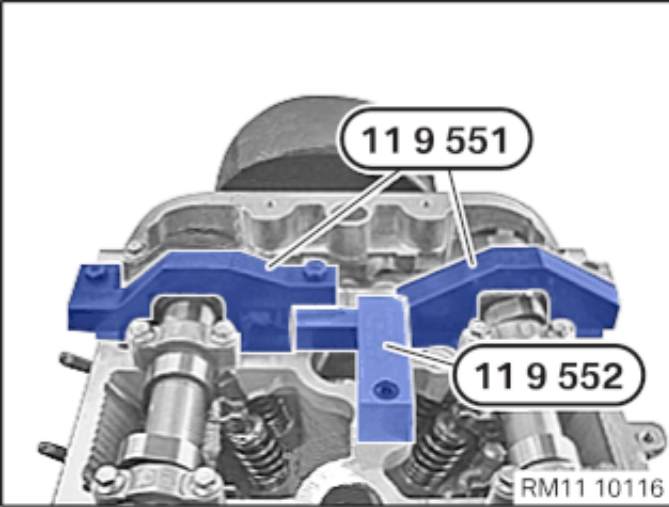


RX11 1322

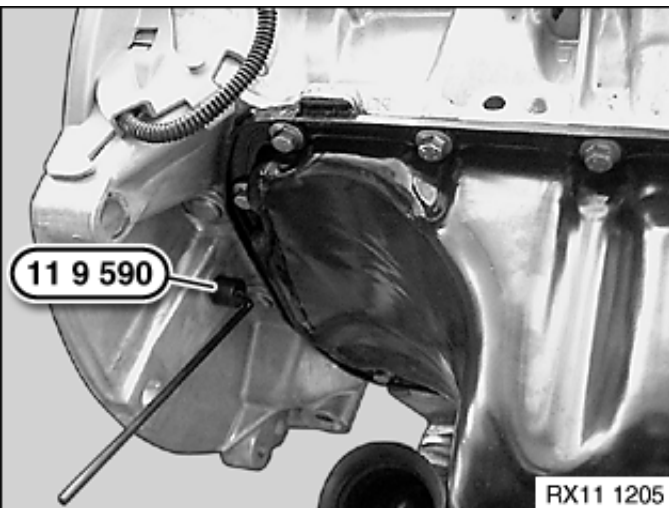
- Screw special tool **0 493 971 (11 9 340)** into the cylinder head.
- Pretension the timing chain with the special tool **0 496 778 (00 9 460)**.

Preload timing chain

			0,6 Nm
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- Special tool: remove **0 495 936 (11 9 551)**.
- Special tool: **0 495 937 (11 9 552)** Remove.



Damage to the engine.

The engine may be damaged if it is manually rotated in the wrong direction.

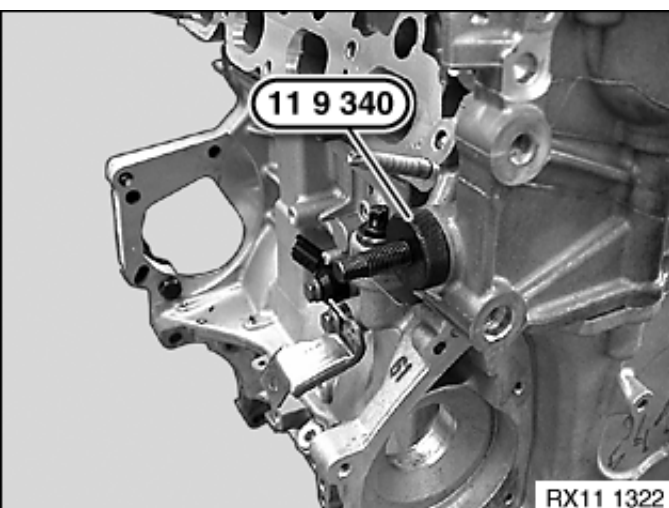
- Always rotate the engine in the correct direction of rotation by hand: a) Clockwise, facing the vibration damper or b) Counter-clockwise, facing the chain drive. (b) only applies when the rear timing chain is installed.

- Further turn the crankshaft at the central bolt by 720°.



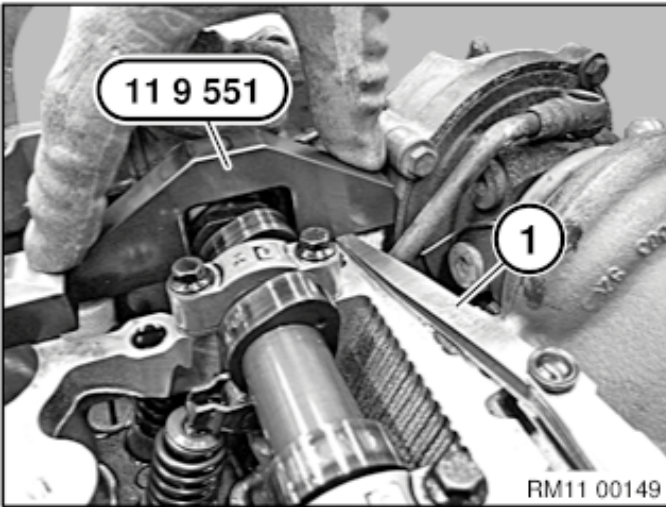
Do not confuse the dowel hole with other bore holes. All pistons must be in the 90° position. If necessary, identify the dowel hole using the spark plug bore hole.

- Position the crankshaft with the special tool **0 495 939 (11 9 590)** in the dowel hole.
- Check the preload of the timing chain again. Retighten special tool **0 493 971 (11 9 340)**.



Preload timing chain

			0,6 Nm
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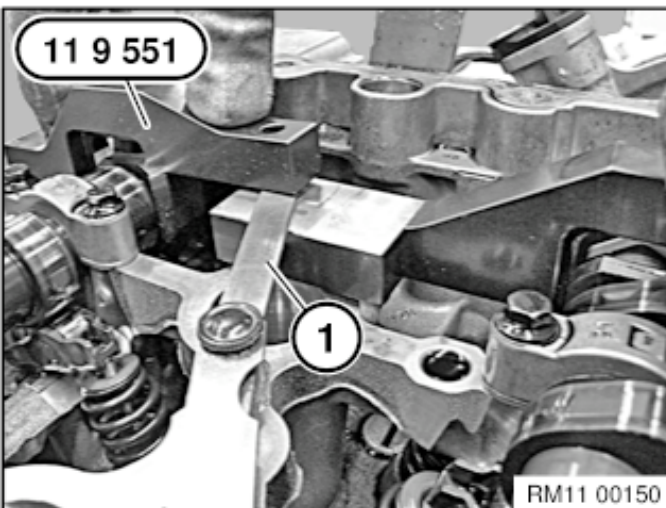


- Position special tool **0 495 936 (11 9 551)** on mounting flats of exhaust camshaft.
- Check the air gap using a feeler gauge (1).

Measured value on exhaust camshaft

If the measured value is below 1.9 mm, the timing is OK

max. 1,9 mm

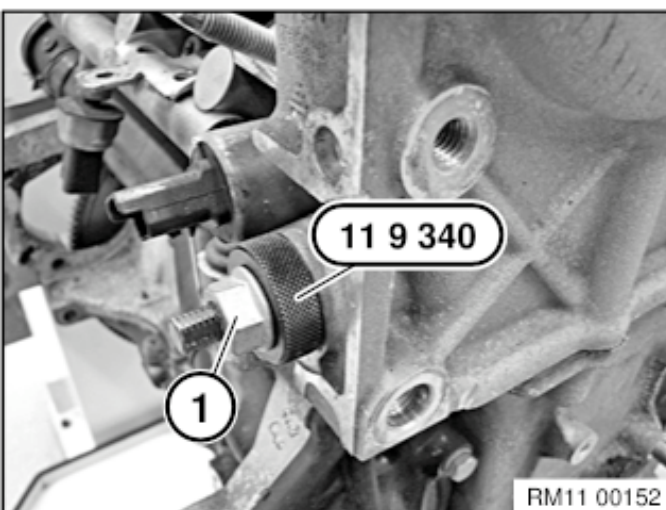


- Position the special tool **0 495 936 (11 9 551)** at the mounting flats of the intake camshaft.
- Check the air gap using a feeler gauge (1).

Measured value on intake camshaft

If the measured value is below 2.5 mm, the timing is OK

max. 2,5 mm

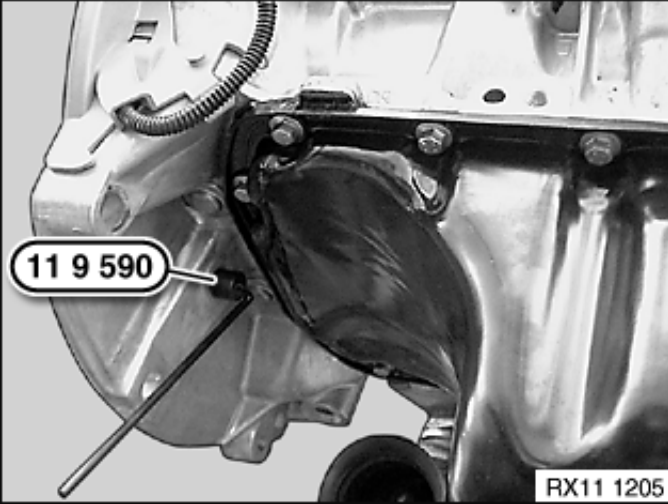


Damage to timing chain or timing chain drive.
The timing chain or timing chain drive may be damaged if the engine is cranked without using a chain tensioner or without using the special tool.

- Crank the engine using the chain tensioner or special tool only.
- Screw on the lock nut (1) at the special tool **0 493 971 (11 9 340)** and hand-tighten.
- Remove special tool **0 493 971 (11 9 340)**.

29 – Disassemble the alignment pin

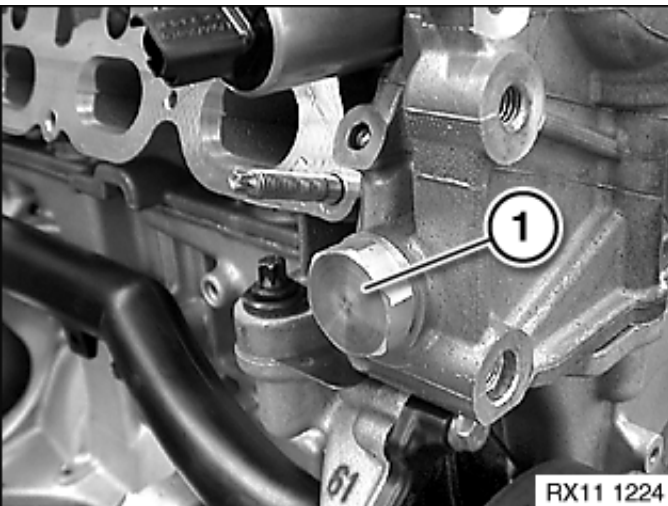
- Remove special tool **0 495 939 (11 9 590)**.



30 – Installing the chain tensioner piston



A sealing ring must be fitted by service personnel when the chain tensioner is fitted.

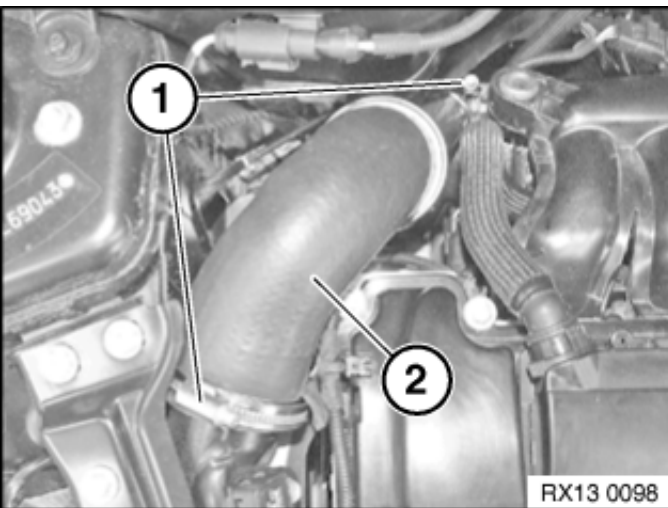


- Install and tighten the chain tensioner (1).

Chain tensioner to cylinder head

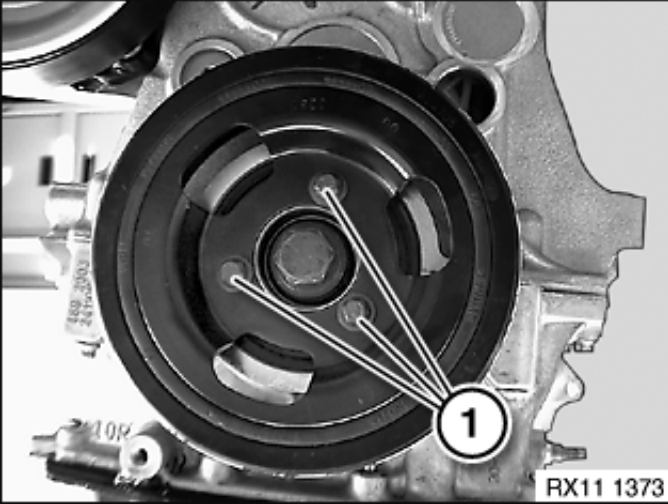
M22x1.5

80 Nm



- Mount the charge air hose (2) on the connecting branch of the throttle valve.
The connecting branch must be dry and free from grease.
- Position the hose clamps (1) correctly and ensure sufficient spacing to the adjacent components.
The distance between the hose clamp and the brake line must be 15 mm.

31 – Installing the vibration damper



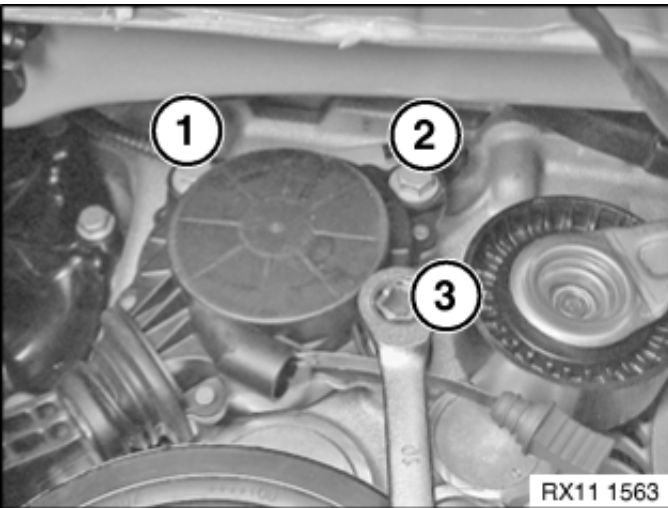
- Install vibration damper.
- Insert screws (1) and tighten them.

Vibration damper to crankshaft (hub)

M8x16

28 Nm

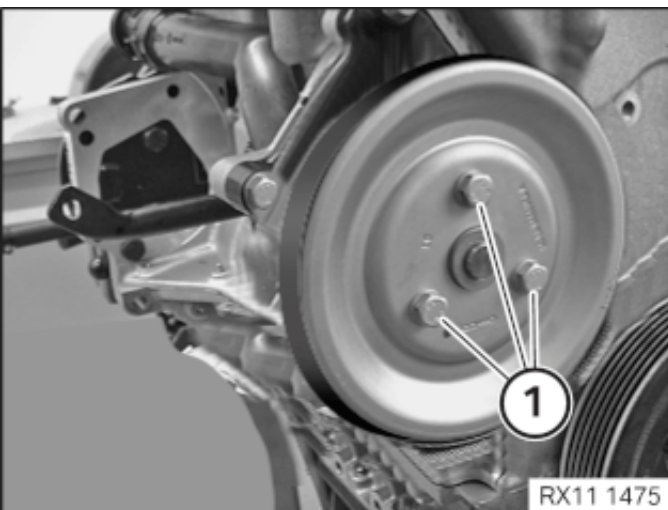
32 – Installing friction wheel



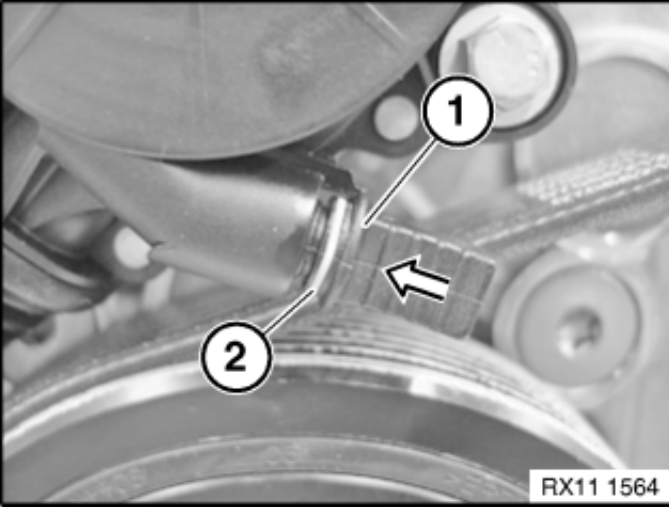
- Install friction wheel.
- Screw in the friction wheel in sequence (1) to (3).

Friction wheel to engine

9 Nm



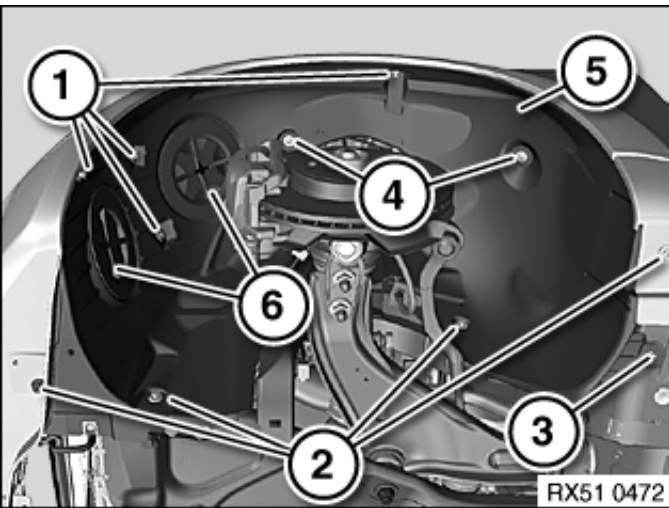
- Install the belt pulley.
- Tighten the bolts (1) with the special tools **0 495 933 (11 9 581)** and **0 495 935 (11 9 583)**.
- Loosen the oil filter strap.



- Slowly retract the tensioning strap (1) in the direction of the arrow.

The plastic ring (2) must lock in the housing of the friction wheel.

33 – Installing the front right wheel arch cover



- Guide the wheel arch cover (5) in.
- Insert screws (4) and tighten them.
- Fit nut (3) and tighten.
- Fasten screw rivets (1) and (2).

34 – Installing the front right wheel

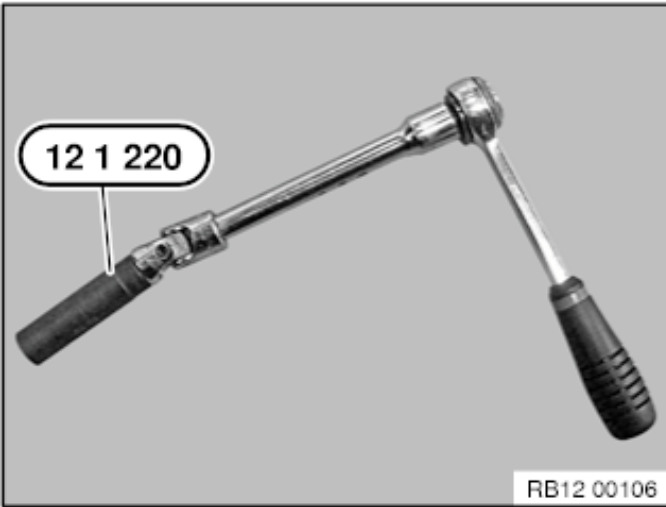


Description is for left component only. Procedure on the right side is identical.



Schematic diagram is for example purposes. Some parts may differ in certain details.

35 – Installing all spark plugs



Do not drop spark plug into spark plug shaft! This can lead to a reduction of the electrode gap and can thus impair smooth running of the engine, especially in idle position.

- First, hand-tighten the spark plugs with the special tool **0 495 560 (12 1 220)** and with an extension with a joint into the engine.
- Tighten spark plugs with torque wrench, special tool **0 495 560 (12 1 220)** and extension with joint.

Spark plugs (unlubricated)

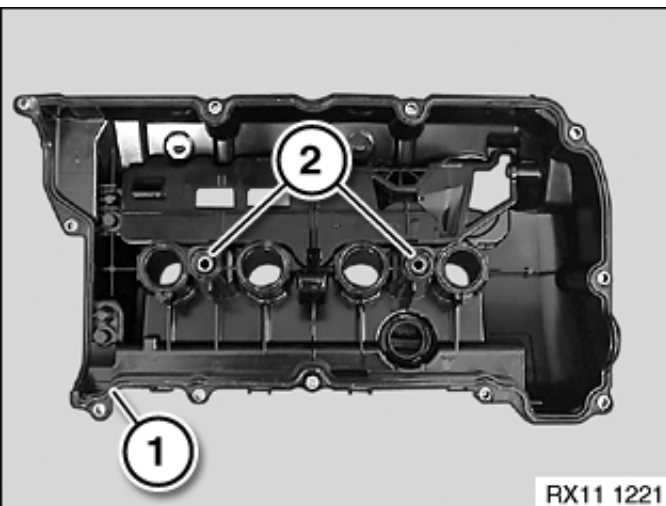
M12 x 1.25

23±3
Nm

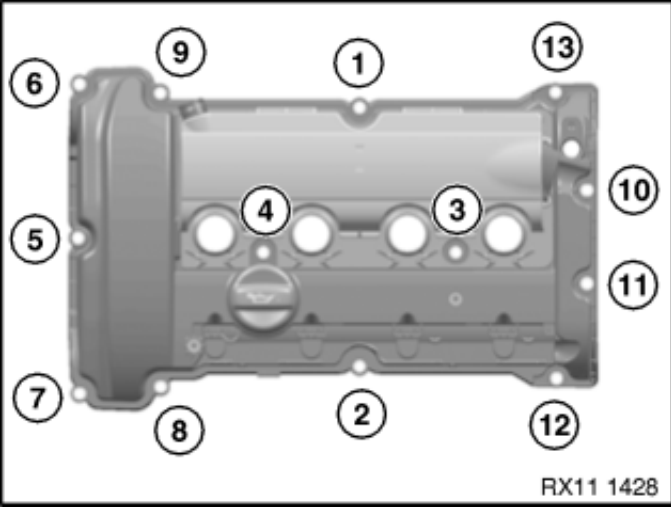
36 – Installing cylinder head cover (N14)



The figure shows the engine N12. The procedure for the engine N14 is identical.



- Renew gasket (1).
- Renew all seals (2).
- Clean all sealing surfaces.
- Seal all edges and contact points on the cylinder head with sealing compound Drei Bond 1209.

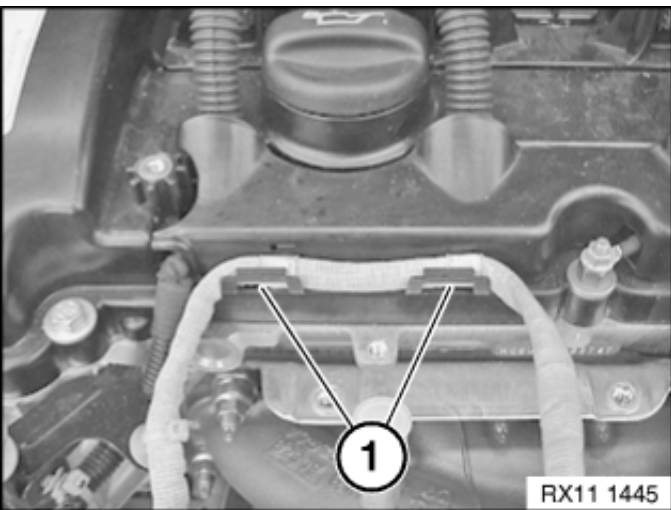


- Screw in the bolts for the cylinder head cover in sequence (1) to (13).

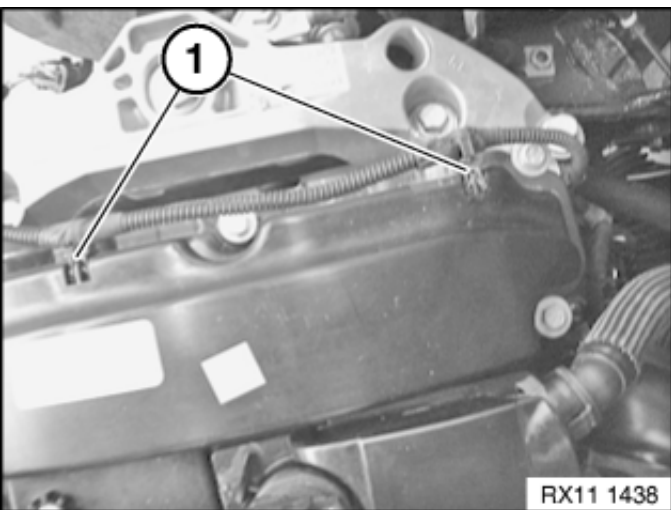
Cylinder head cover to cylinder head

M6x30

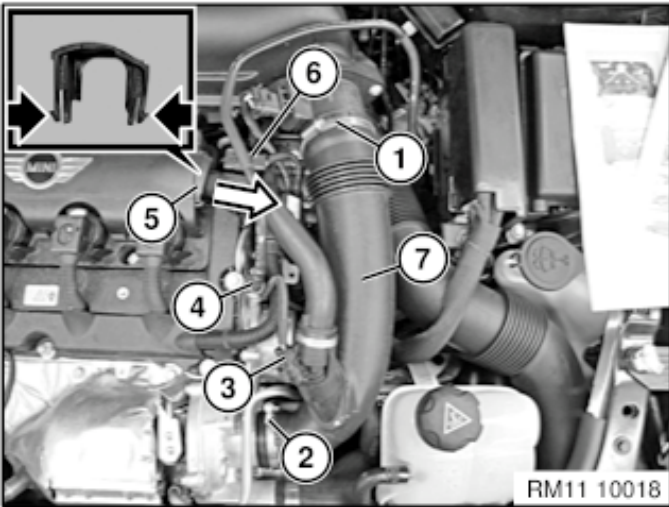
10 Nm



- Install the oxygen sensors on the cylinder head (1).



- Connect the engine wiring harness with the brackets (1).

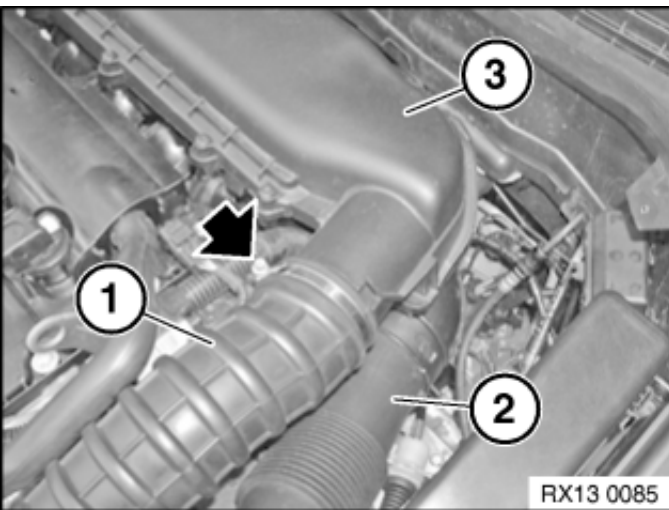


- Install the gaiter (7) dry and grease-free.
- Fit and lock the connector (6).
- Install the vent hose with the gaiter (7).
- Connect the vent hose to the cylinder head cover in the opposite direction of the arrow.
- Connect the lock (5) of the vent hose toward the bottom and lock.
- Connect and lock the vacuum line (4).
- Fit and lock the connector (3).
- Tighten the clamps (1) and (2).

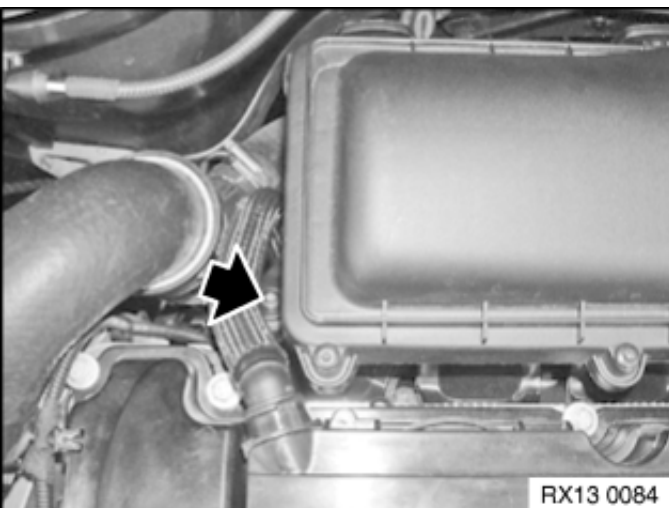
37 – Installing intake silencer housing (N14)



The gaiter and charge air hoses that are secured with clamps must be installed dry and free from grease. The exhaust turbocharger can otherwise fail.



- Ensure that the connecting branch at the intake filter housing is free of grease and dry.
- Install the intake silencer housing (3) together with the intake pipe.
- Connect the intake pipe (2) to the intake pipe on the intake silencer housing (3).
- Connect the gaiter (1) to the intake silencer housing (3).
- Fasten the clamp (arrow).



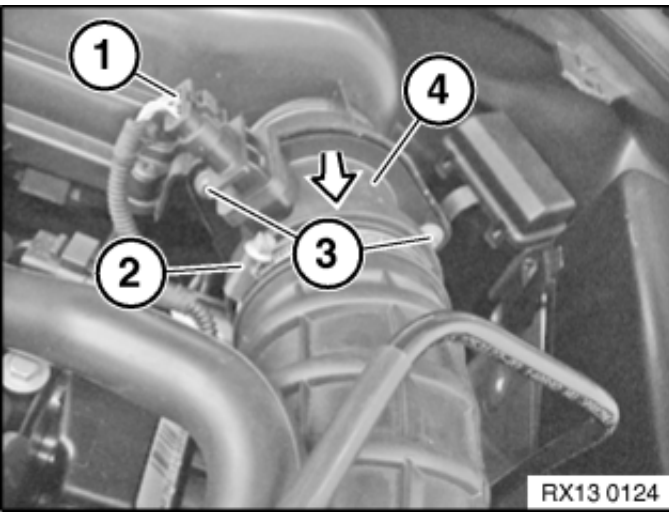
- Join and tighten the screw (arrow).

Intake filter housing to intake manifold

				6 ± 0,5 Nm
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38 – Installing hot film air mass meter

The gaiter and charge air hoses that are secured with clamps must be installed dry and free from grease. The exhaust turbocharger can otherwise fail.



- Install the hot film air mass metre (4) in the direction of arrow.
- Connect the gaiter to the hot film air mass metre.
- Insert screws (3) and tighten them.
- Tighten clamp (2).
- Connect the plug connection (1).

Hot film air-mass meter to intake filter housing

4,6 Nm

39 – Installing ignition coils (N14)



Damage to the ignition coil.

The silicone hose of the ignition coil must not be contaminated by fuel as this can lead to failure of the ignition coil.

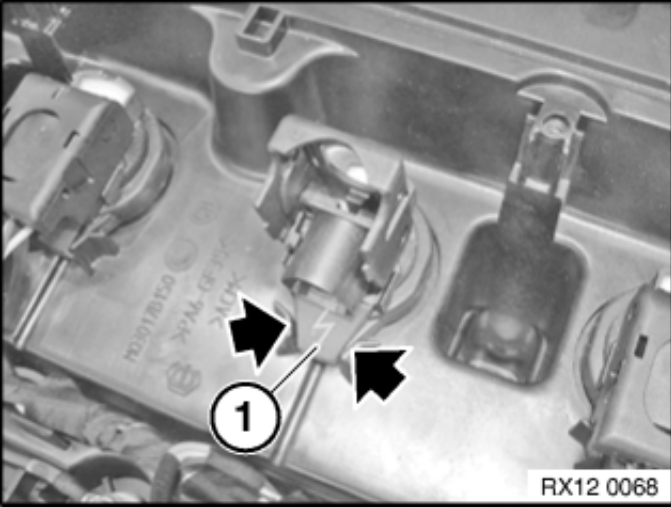
- Cover ignition coils using suitable covers when working on the fuel system, if necessary remove them.
- Do not oil or grease the silicone tube of the spark plug connector. The silicone tube is coated with talc to reduce the pulling forces.



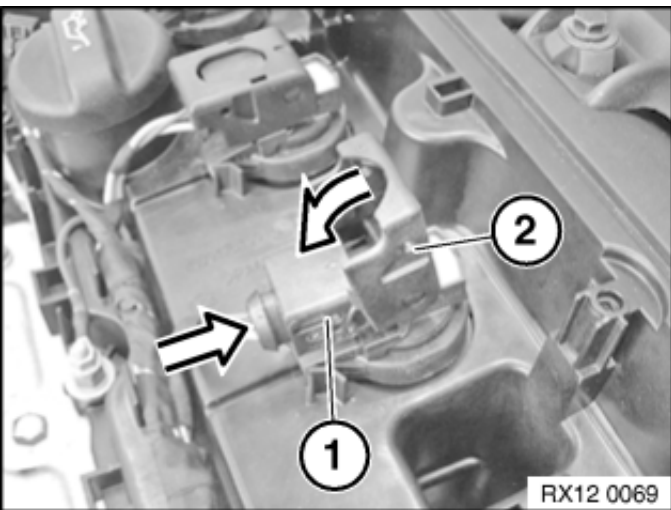
The description is for one component only. The procedure is identical for all further components.



The figure shows the engine N12. The procedure for the engine N14 is identical.



- Position the ignition coil (1) and gently push it to the limit position, if necessary by twisting it back and forth slightly.
- Check anti-twist lock.
- Make sure that the rubber seal of the ignition coil completely encloses the opening for the spark plug on the cylinder head cover.

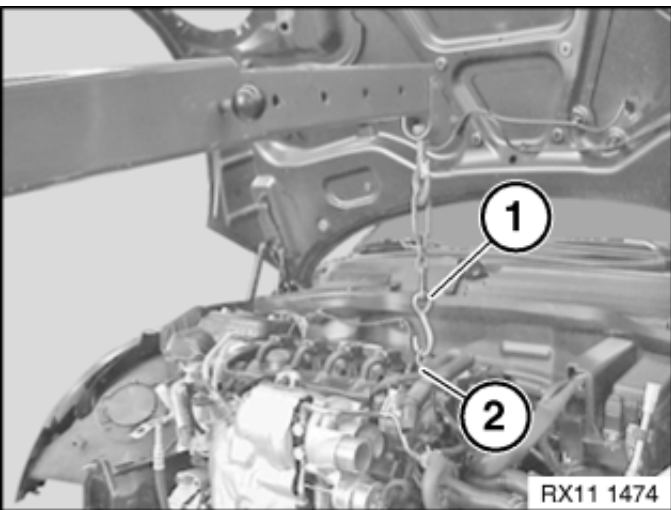


- Push connector (1) onto the ignition coil with the connector fastener (2) open.
- Carefully close the connector fastener (2) in the direction of the arrow.

When closing the locking lever, the connector (1) must rest against the counter-piece nearly gap-free. In the process, the crank webs of the locking lever are positioned inside of the counter piece.

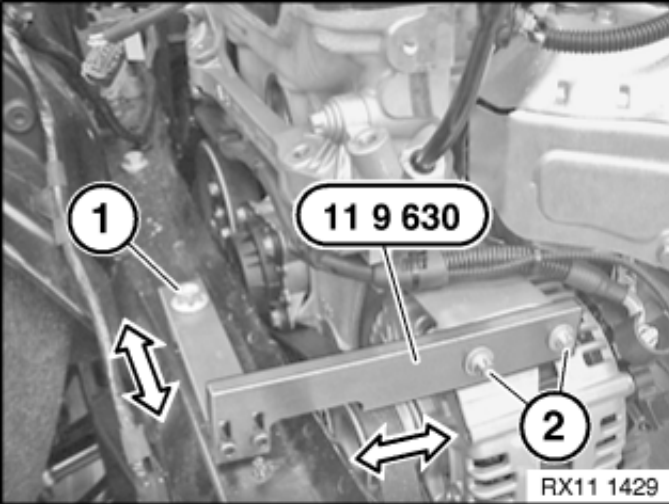
- Ensure that cables are not crushed or damaged.
- The connector fastener must snap into place without great effort.
- Repair damaged cables.

40 – Attach the engine to the workshop crane



- Attach the engine with the workshop crane (1) on the engine mounting bracket (2).

41 – Removing special tool to fasten the engine



- Release the screw connections (1) and (2) of the series.
- Remove special tool 0 496 016 (11 9 630).

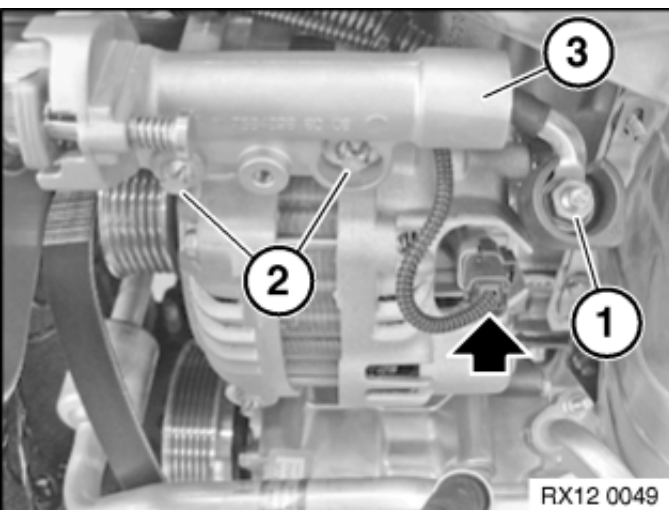
42 – Removing top screw connection on alternator



Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.



- Install belt tensioner (3).
- Insert screws (2) and tighten.

Belt tensioner to alternator

M8x110			
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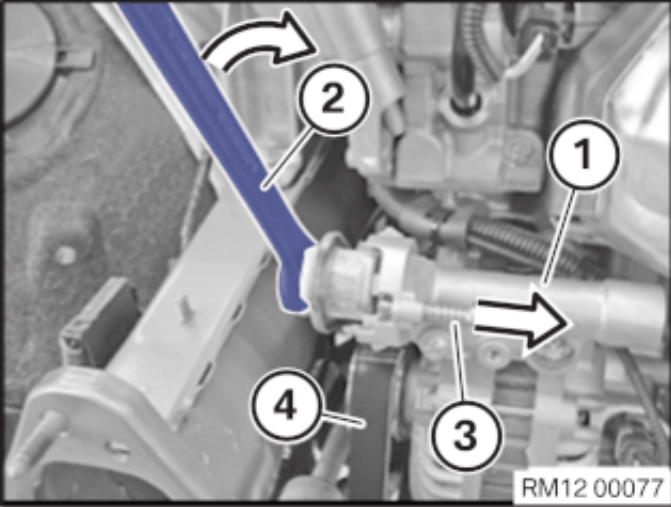
			20 Nm
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- Mount positive battery cable.
- Fit nut (1) and tighten.

Positive battery cable to alternator

			13,5 Nm
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- Connect connectors and lock.



- Put drive belt (4) onto the belt pulley of the alternator.
- Hold belt tensioner (1) in service position with the spanner (2).



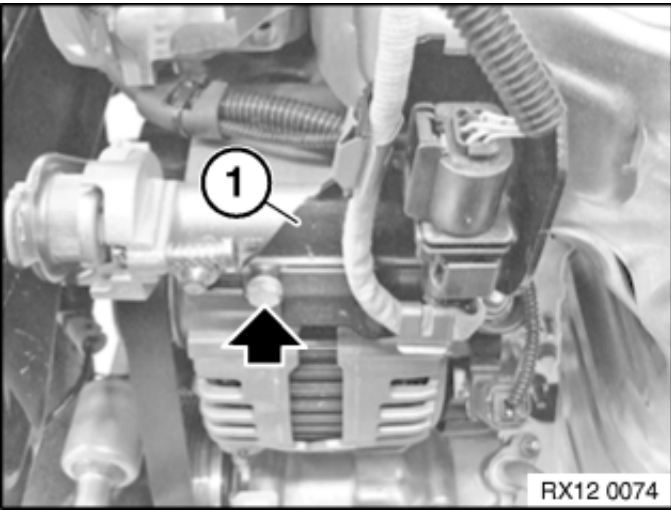
Abrupt snap back of the belt pulley.

Danger of injury!

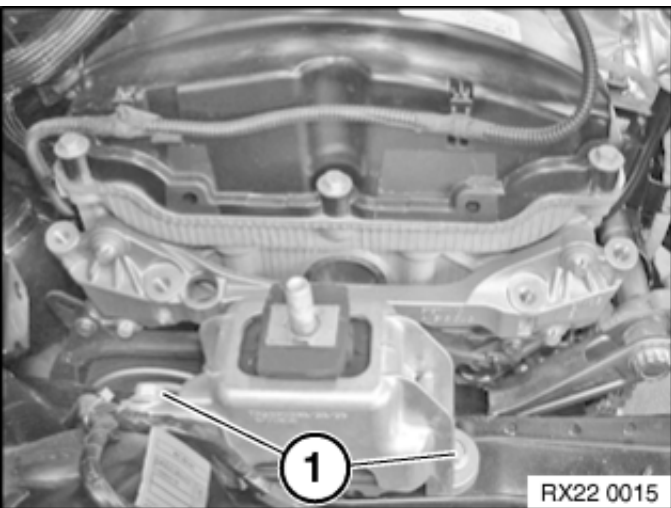


- Wear protective gloves.

- Remove locating pin (3) in direction of arrow.
- Slowly relieve the belt tensioner (1) in direction of arrow.
- Install holder (1).
- Mount screw and tighten.



43 – Installing the right engine mount



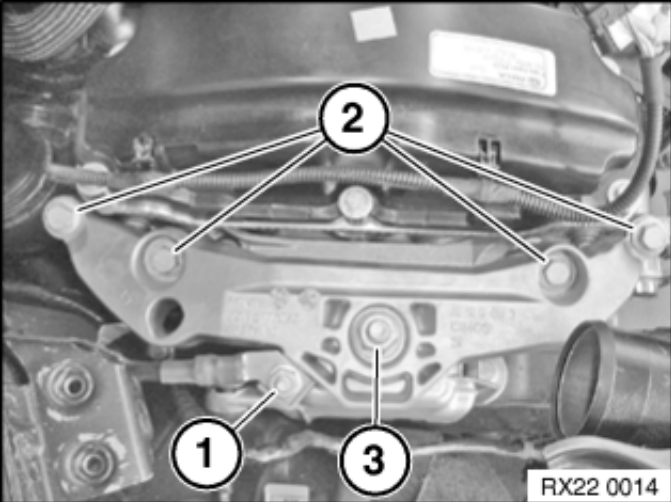
- Install engine mount.
- Insert screws (1) and tighten them.

Engine mount to body

M12 8.8
screw

68 Nm

44 – Installing engine mounting bracket



- Install engine mounting bracket.
- Fit nut (3) and tighten.

Engine support bracket to engine mount

M12x1.5 -10.9 nut			100 Nm
----------------------	--	--	--------

- Insert screws (2) and tighten.

Engine mounting bracket to adapter plate

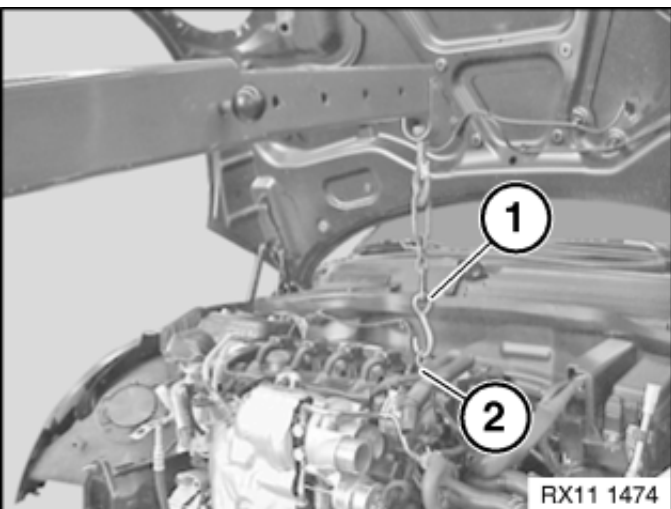
M10 10.9 screw			56 Nm
-------------------	--	--	-------

- Install ground strap, mount nut (1) and tighten.

Ground cable to engine support bracket

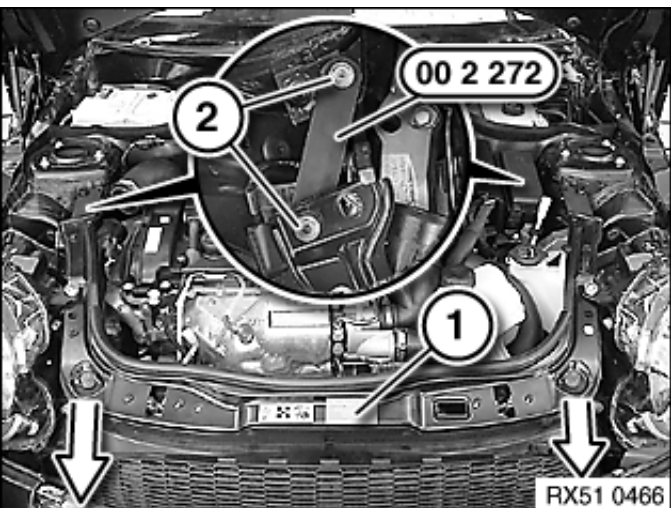
Nut M8			15 Nm
--------	--	--	-------

45 – Detaching engine from workshop crane

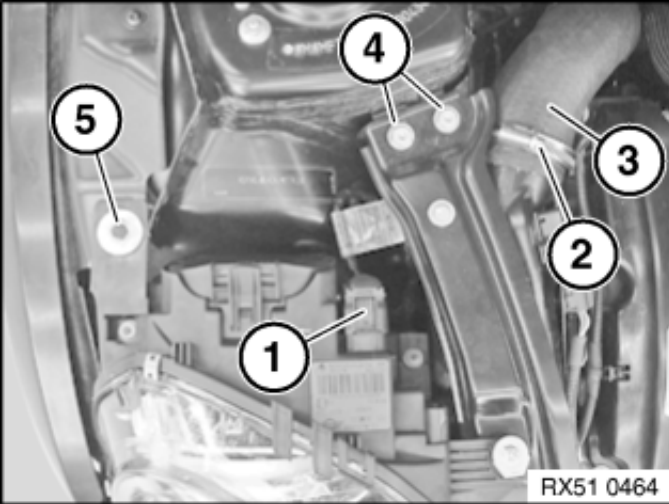


- Loosen and remove workshop crane (1) from the engine mounting bracket (2).

46 – Mounting the front panel from the service position



- Loosen screws (2).
- Remove the special tool **0 495 895 (00 2 272)** from the left and right.
- Slide the front panel (1) carefully in position with a second person and secure. Slide the front panel to the rear equally on the left and right and pay attention to the retaining tab on the headlight.

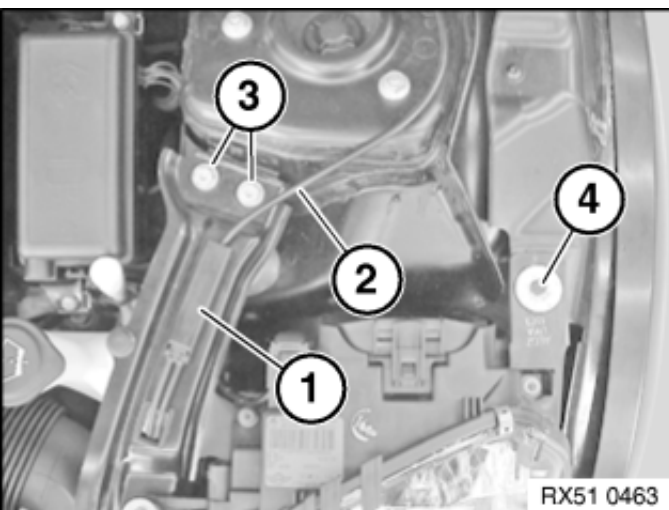


- Join and tighten the bolts (4) and (5).

Lock bridge to body

			22 Nm
--	--	--	-------

- Connect the plug connection (1).
- **Only for MINI Cooper S:**
- Connect the air duct (3).
- Fasten clamp (2).

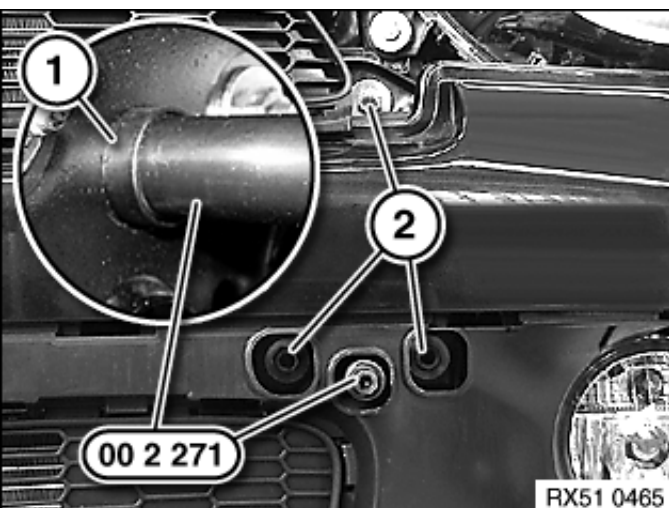


- Join and tighten the bolts (3) and (4).

Lock bridge to body

			22 Nm
--	--	--	-------

- Attach the Bowden cable (2).
- Close the Bowden cable bracket (1).



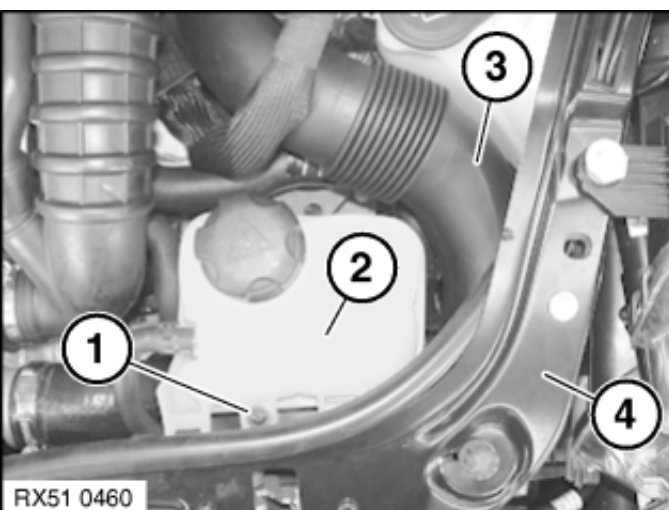
- Place and tighten nuts (2).

Support to body

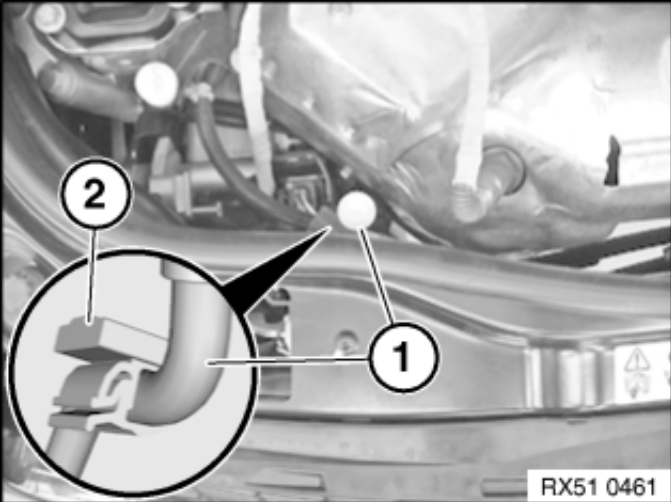
M8			
----	--	--	--

			22 Nm
--	--	--	-------

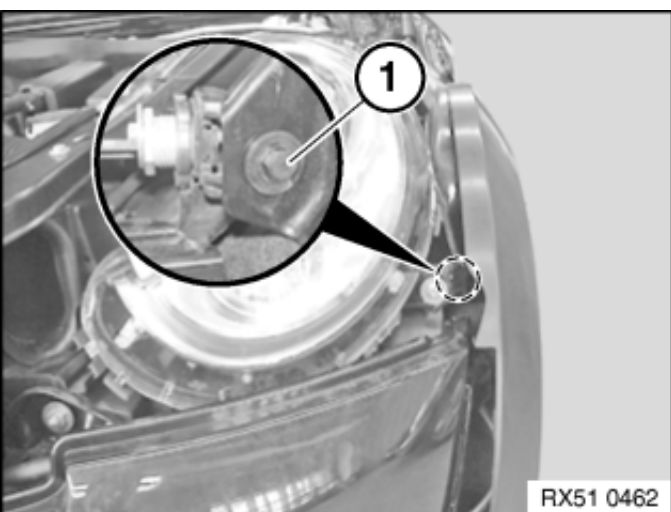
- Loosen screw from special tool **0 495 894 (00 2 271)**.
- Remove special tool **0 495 894 (00 2 271)**.



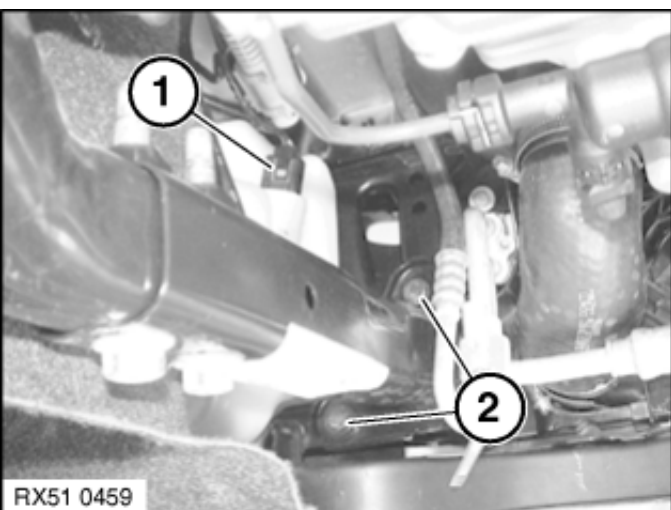
- Insert gaiter (3) into the bridge (4).
- Install the coolant expansion tank (2).
- Position and tighten the screw (1).



- For equipment specification with air conditioning:
Clip in the refrigerant line (1) in the holder (2).



- Mount and tighten screw (1) on side panel on the left and right and tighten.



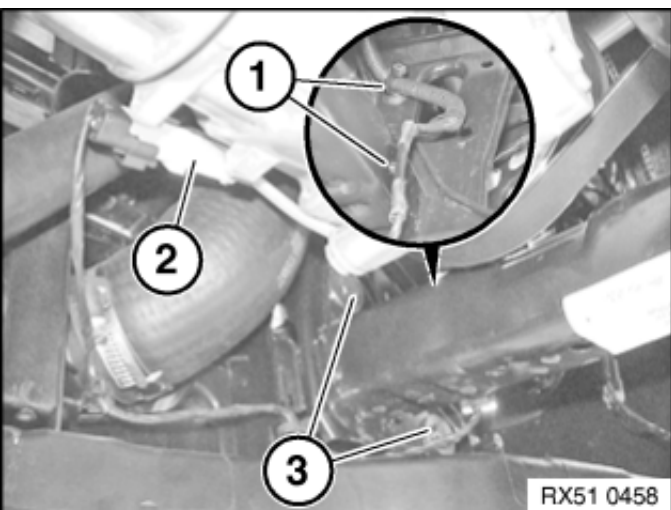
- Insert screws (2) and tighten.

Support to holder, bumper, front

M8			18,5 Nm
----	--	--	------------

- Version with headlight cleaning system:

- Connect the plug connection (1) for the washer pump for headlight cleaning system.



- Insert screws (3) and tighten them.

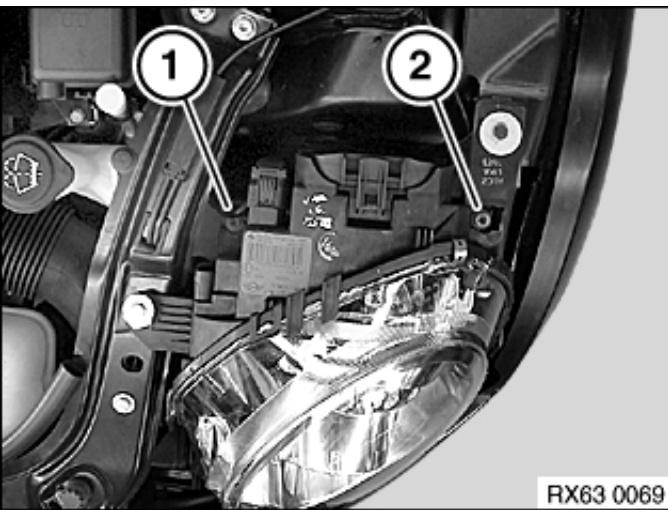
Support to holder, bumper, front

M8			18,5 Nm
----	--	--	------------

- Connect plug connections (2) for the air conditioning compressor.
- Secure the cable clips (1).

Notes on headlight adjustment are a fundamental requirement for these repair instructions and must be complied with at all times.

For additional information see: 6310 ... Test prerequisite for adjusting headlights



- Perform the headlight adjustment with the adjusting screws (1) and (2).

Adjusting screw (1) is primarily used for the height adjustment.

Adjusting screw (2) is primarily used for the lateral adjustment.

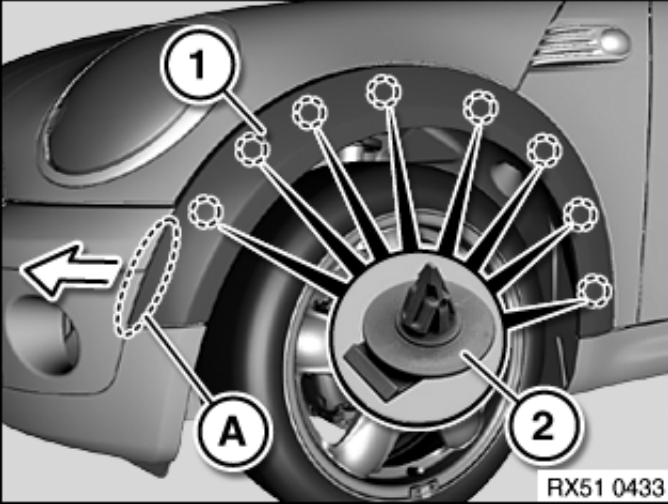
A definite allocation of adjusting screws is not possible.

- Adjust the height at the adjusting screw (1).
- **US version:** Only make a lateral adjustment if the plug on the adjusting screw for lateral adjustment is missing or damaged (see further information).
- Make the lateral adjustment at the adjusting screw (2).
- Perform reference run. Switch the headlights off and on again.
- Check the headlight and adjust if necessary.
- **US version only:** If the lateral adjustment has been corrected, press new plug into the adjusting screw for the lateral adjustment **without damaging it** (see further information).

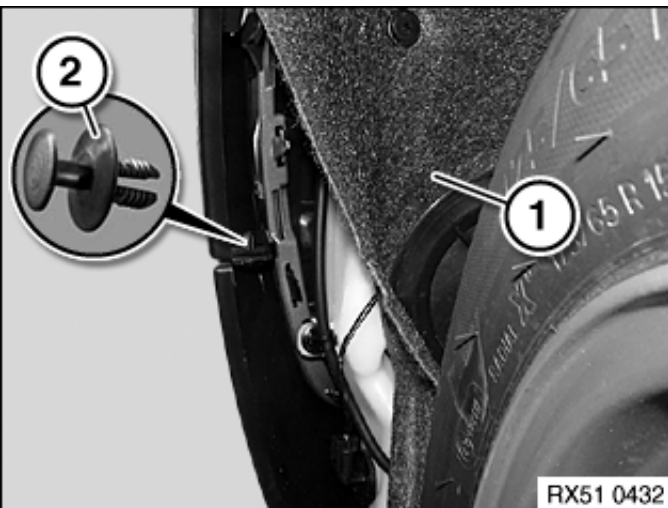
49 – Install the wheel arch trim on the left and right



Description is for left component only. Procedure on the right side is identical.



- Feed the wheel arch trim (1) in area (A) into the bumper.
- If necessary, connect the associated plug connection and engage the wheel arch trim (1) evenly.

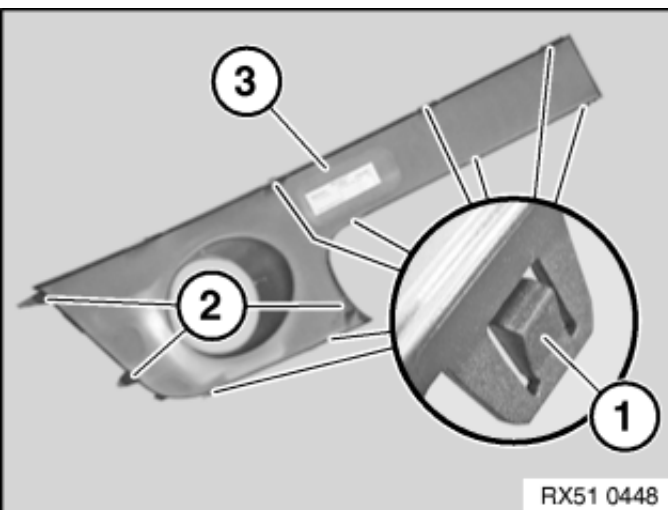


- Bend the wheel arch trim panel (1) slightly inward and fasten the clip (2).
- Install the front wheel arch cover (1).

50 – Installing bumper trim on left and right



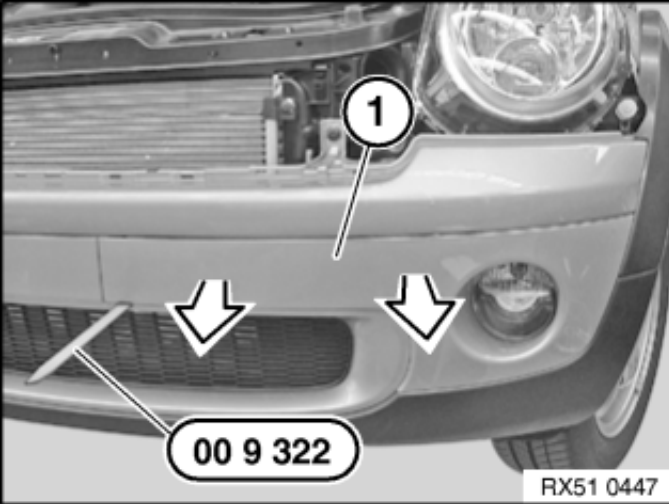
Description is for left component only. Procedure on the right side is identical.



- Check the latch mechanisms (1) and guides (2) on the bumper trim (3) for damage, renew bumper trim as needed.

Latch mechanisms (1) and guides (2) must not be damaged.

- Mount bumper trim (1).



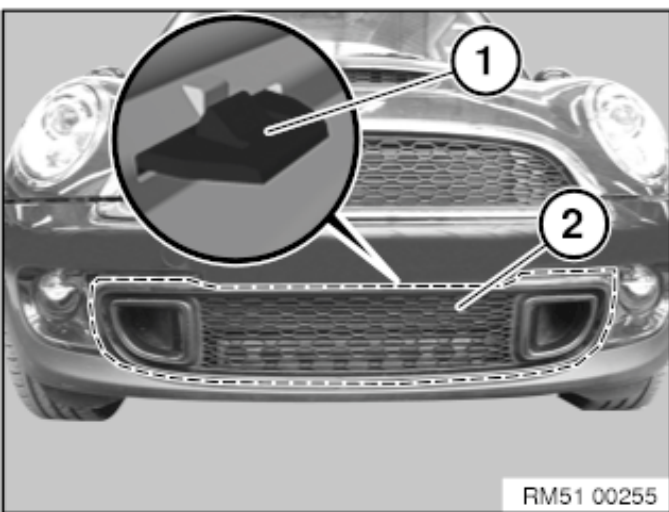
51 – Installing the ornamental grille in the front bumper



Paint damage.

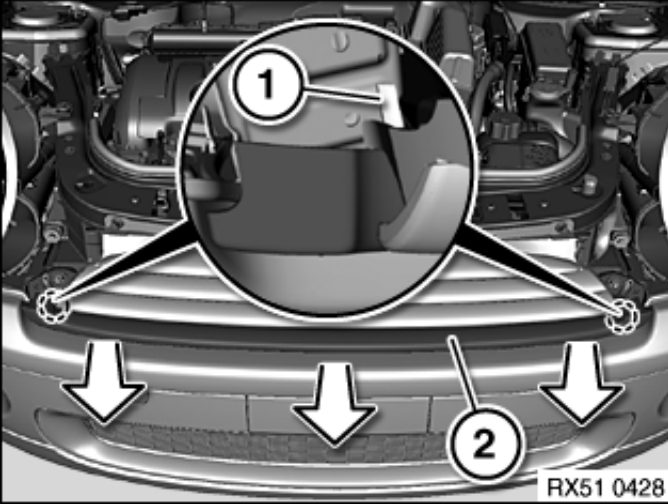
Mechanical action can lead to paint damage.

- Mask those working areas at risk with yellow plastic adhesive tape.
- Remove and install heavy or bulky components with the aid of another person/other persons.



- Check latch mechanism (1) of the ornamental grille (2) for damage, replace if required.
- Insert the ornamental grille sideways.
- Lock the ornamental grille (2) evenly.

52 – Installing trim on front ornamental grille



- Feed in trim (2) from front and engage.

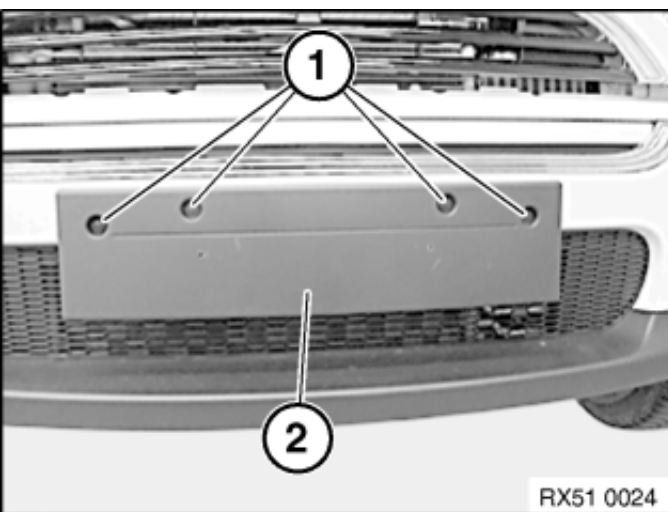
53 – Install number plate baseplate for the police number plate



Malfunction of the sensors of the driver assistance systems.

Incorrect assembly of the number plate leads to a malfunction of the sensors of the driver assistance systems.

- Fix number plate and number plate baseplate only according to the dimensions specified in the repair instructions.
- Secure number plate and number plate baseplate on the bumper panel **without pre-drilling** , otherwise there is a risk of damage to the underlying cables.
- Only use number plate baseplates that have been approved for the vehicle type.



- Secure number plate baseplate (2) with screws (1).

54 – Connecting the battery earth lead

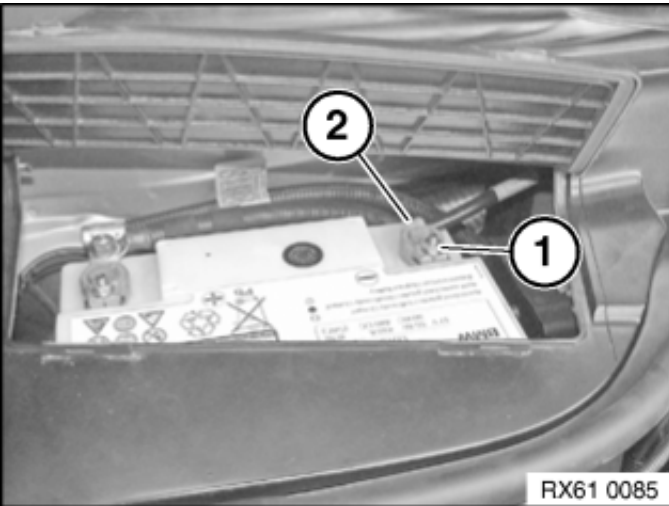
Observe the notes on handling the vehicle battery.

For additional information see:

61 00 ... Safety information on handling the vehicle battery

[61 00 / 12 00](#) ... Notes on disconnecting and connecting the vehicle battery

61 12 ... Notes on the intelligent battery sensor (IBS)

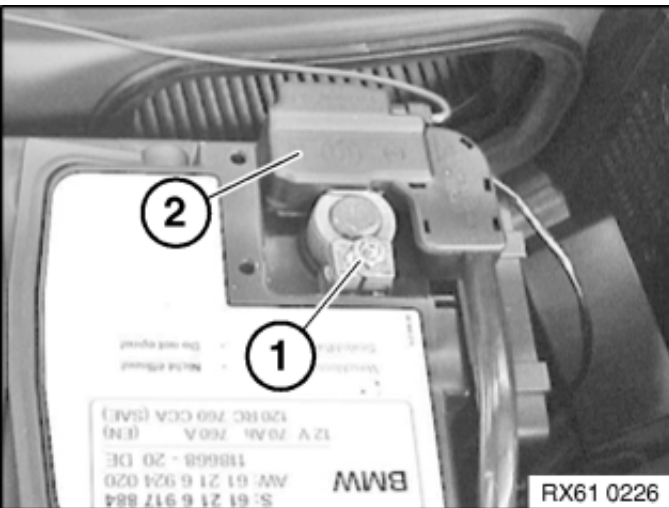


- **Version without intelligent battery sensor (IBS):**
- Position the battery earth lead (2) on the battery terminal.
- Tighten nut (1).

Battery earth lead

M6

5 Nm

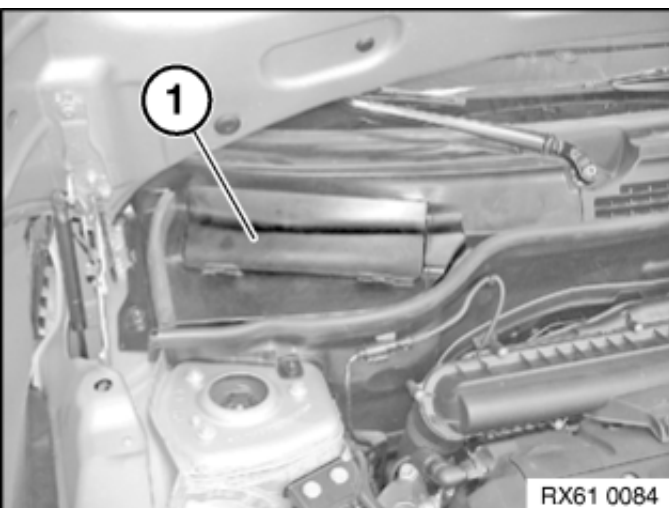


- **Version with intelligent battery sensor (IBS):**
- Position the battery earth lead (2) on the battery terminal.
- Tighten nut (1).

Battery earth lead

M6

5 Nm



- Close the cover (1).

Additional Information

Overview of Tightening Torques

Bearing journal

Used in step [26](#)

M8x1.25	Replace O-ring		24 Nm
---------	----------------	--	-------

Torsional vibration damper (hub) to crankshaft

Used in step [26](#)

M14 x1.5 x74	12.9	Tightening torque	50 Nm
		Angle of rotation	180 °

Screw plug, timing case upper section

Used in step [26](#)

M22x1.5	Replace sealing ring		35 Nm
---------	----------------------	--	-------

Slide rail to crankcase

Used in step [27](#)

M6			8 Nm
----	--	--	------

Preload timing chain

Used in step [27](#) [28](#)

			0,6 Nm
--	--	--	--------

VANOS to intake shafts

Used in step [27](#)

M10x52	Renew screw.	Jointing torque	20 Nm
		Angle of rotation	180 °

Camshaft sprocket to exhaust camshafts

Used in step [27](#)

M10x30		Tightening torque	20 Nm
		Angle of rotation	90 °

Chain tensioner to cylinder head

Used in step [30](#)

M22x1.5			80 Nm
---------	--	--	-------

Vibration damper to crankshaft (hub)

Used in step [31](#)

M8x16			28 Nm
-------	--	--	-------

Friction wheel to engine

Used in step [32](#)

			9 Nm
--	--	--	------

Spark plugs (unlubricated)			Used in step 35
M12 x 1.25			23±3 Nm
Cylinder head cover to cylinder head			Used in step 36
M6x30			10 Nm
Intake filter housing to intake manifold			Used in step 37
			6 ± 0,5 Nm
Hot film air-mass meter to intake filter housing			Used in step 38
			4,6 Nm
Belt tensioner to alternator			Used in step 42
M8x110			20 Nm
Positive battery cable to alternator			Used in step 42
			13,5 Nm
Engine mount to body			Used in step 43
M12 8.8 screw			68 Nm
Engine support bracket to engine mount			Used in step 44
M12x1.5 -10.9 nut			100 Nm
Engine mounting bracket to adapter plate			Used in step 44
M10 10.9 screw			56 Nm
Ground cable to engine support bracket			Used in step 44
Nut M8			15 Nm
Lock bridge to body			Used in step 46
			22 Nm
Support to body			Used in step 46
M8			22 Nm
Support to holder, bumper, front			Used in step 46
M8			18,5 Nm

Headlight to front panel

Used in step 47

3,5 Nm

Battery earth lead

Used in step 54

M6

5 Nm

Overview of Special Tools

0 496 569 (00 9 325) Wedge



Common

Used in step 4

Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
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Included in the tool or work	0 490 527
------------------------------	-----------

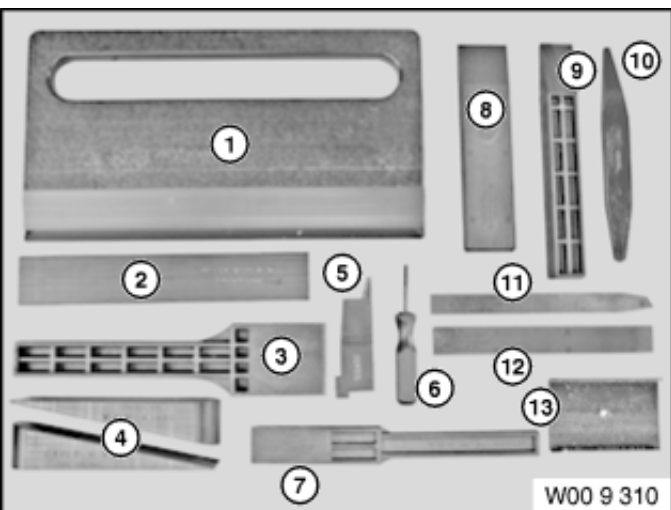
Storage location	Individual
------------------	------------

Replaced by

In connection with

SI-Number	41 01 09 (507)
-----------	----------------

0 490 539 (00 9 322) Wedge



Common

Used in step 5

Usage	(Panel wedge)
-------	---------------

Included in the tool or work	0 490 527
------------------------------	-----------

Storage location	Individual
------------------	------------

Replaced by

In connection with

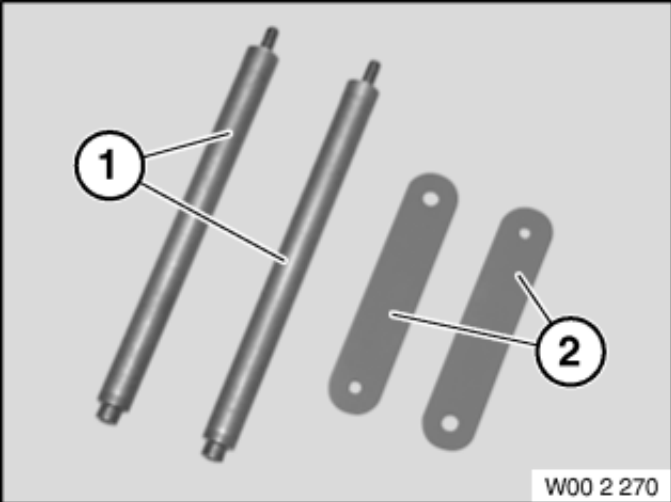
SI-Number	01 07 09 (530)
-----------	----------------

0 495 894 (00 2 271) Holding sleeve

Common

Used in step 8 46

	(Sleeves with screws (2 units)) sale of existing inventories then discontinued and
--	--



Usage available as part of set of special tools 00 2 270 = [83 30 0 495 888](#) only - as of 30.11.2011

Included in the tool or work 0 495 888

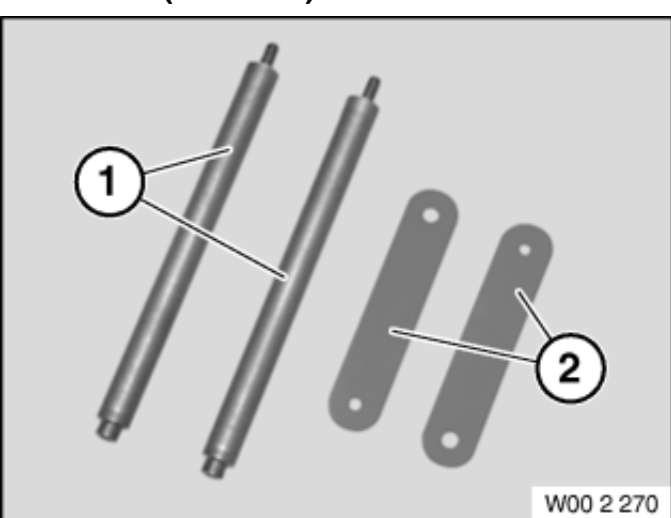
Storage location A85

Replaced by

In connection with

SI-Number 01 23 06 (308)

0 495 895 (00 2 272) Holder



Common Used in step [8](#) [46](#)

Usage (Holder (2 units)) sale of existing inventory and then available as part of set of special tools 00 2 270 = [83 30 0 495 888](#) only - as of 30.11.2011

Included in the tool or work 0 495 888

Storage location A85

Replaced by

In connection with

SI-Number 01 23 06 (308)

0 496 016 (11 9 630) Angle



Common Used in step [13](#) [41](#)

Usage (Support angle) For supporting the engine when dismantling the cylinder head.

Included in the tool or work

Storage location A87

Replaced by

In connection with

SI-Number 01 14 07 (389)

0 495 560 (12 1 220) Socket



Common

Used in step [19](#) [35](#)

Usage For removing and installing the spark plugs (WAF 14 bihexal).

Included in the tool or work

Storage location C18

Replaced by

In connection with

SI-Number 01 20 06 (299)

0 495 933 (11 9 581) Ring spanner



Common

Used in step [22](#)

Usage

Included in the tool or work 0 495 932

Storage location A85

Replaced by

In connection with

SI-Number 01 26 06 (321)

0 495 935 (11 9 583) Socket



Common

Used in step [22](#)

Usage (socket, width across flats 10)

Included in the tool or work 0 495 932

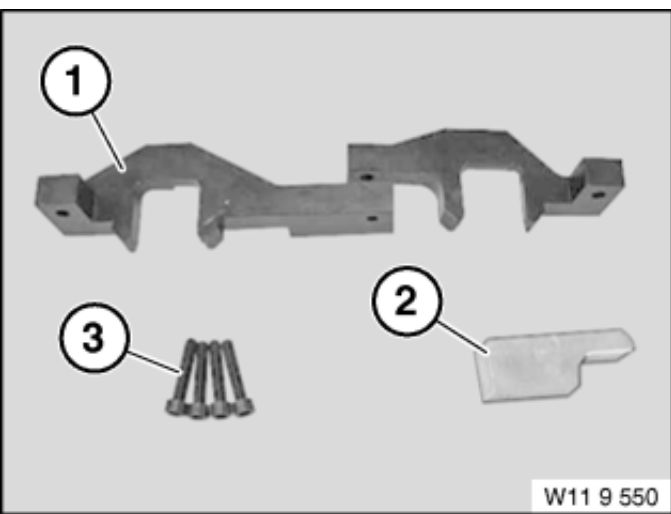
Storage location A85

Replaced by

In connection with

SI-Number 01 26 06 (321)

0 495 926 (11 9 550) Gauge



Common

Used in step [24](#) [25](#)

Usage For fixing camshaft in TDC setting.

Included in the tool or work

Storage location B86

Replaced by

In connection with

SI-Number 01 26 06 (321)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 495 936 (11 9 551)		Gauge Available only as a complete tool set 11 9 550 = 83 30 0 495 926 - as of 29.11.2011	
2	0 495 937 (11 9 552)		Holder (Countersupport) 0496208 =119850	
3	0 495 938 (11 9 553)		Screw (Set of screws) Can only be ordered as part of complete tool 11 9 660 = 0495955	

0 495 939 (11 9 590) Mandrel

Common

Used in step [24](#)

Usage (Alignment pin) For locating crankshaft in TDC setting.

Included in the tool or work

Storage location B85

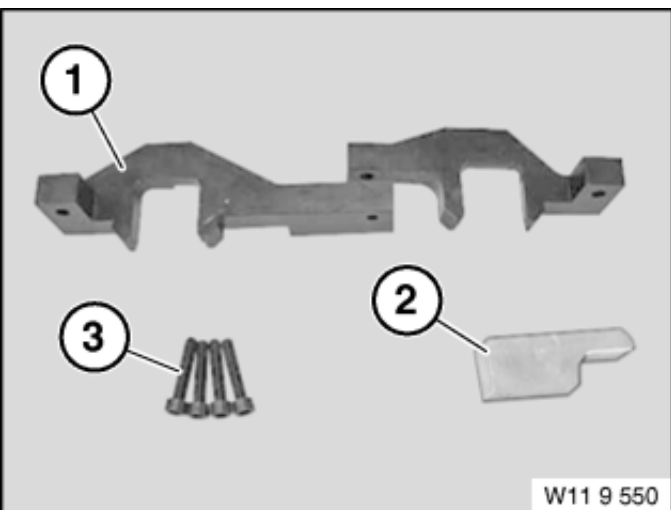
Replaced by



In connection with

SI-Number 01 26 06 (321)

0 495 936 (11 9 551) Gauge



Common

Used in step [24](#) [28](#)

Usage Available only as a complete tool set 11 9 550 = [83 30 0 495 926](#) - as of 29.11.2011

Included in the tool or work 0 495 926

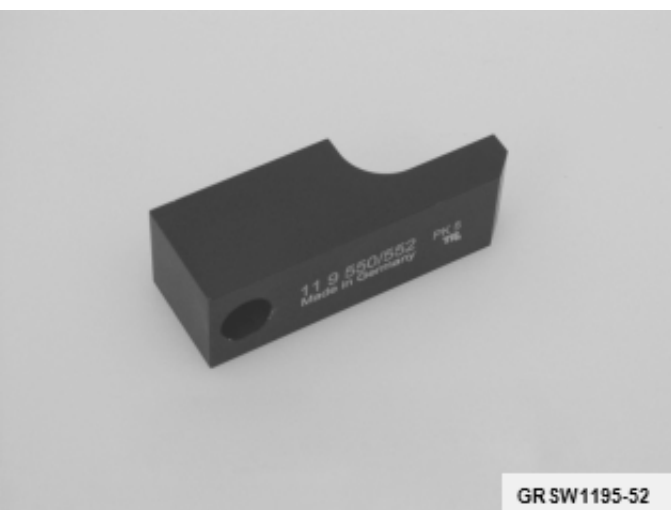
Storage location B86

Replaced by

In connection with

SI-Number 01 26 06 (321)

0 495 937 (11 9 552) Holder



Common

Used in step [24](#) [28](#)

Usage (Countersupport) 0496208 =119850

Included in the tool or work 0 495 926

Storage location B86

Replaced by

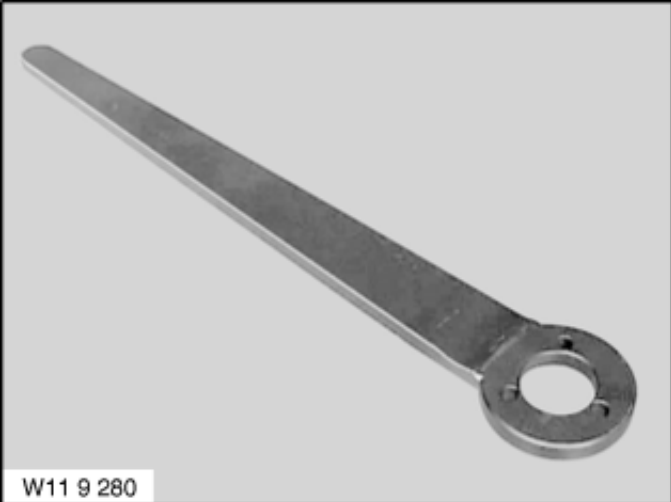
In connection with

SI-Number 01 26 06 (321)

0 493 940 (11 9 280) Holder

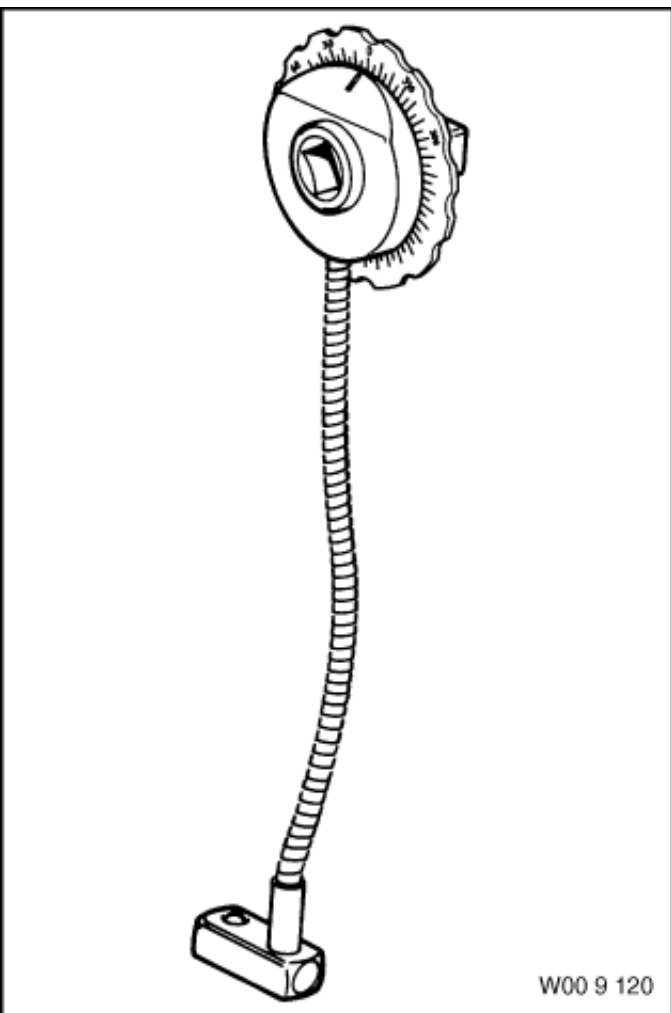
Common

Used in step [25](#) [26](#)



Usage	(Counter support) For the crankshaft when releasing/tightening the central bolt
Included in the tool or work	
Storage location	A43
Replaced by	
In connection with	
SI-Number	01 01 01 (662)

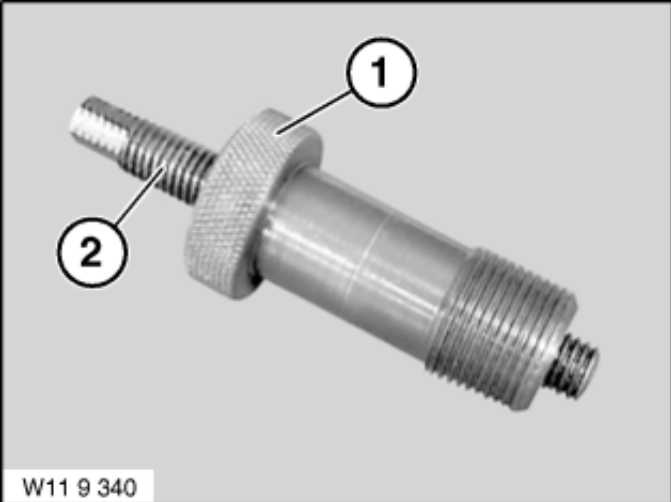
0 490 504 (00 9 120) Torque angle measuring dial



Common	Used in step 26 27
Usage	For torsion angle adjustment of cylinder head bolts (all engines) And reinforcement plate front axle support E46
Included in the tool or work	
Storage location	A4
Replaced by	
In connection with	
SI-Number	

0 493 971 (11 9 340) Device

Common	Used in step 27
Usage	(Device) For tensioning timing chain when adjusting timing
Included in the tool or work	
Storage	



location C42

Replaced by

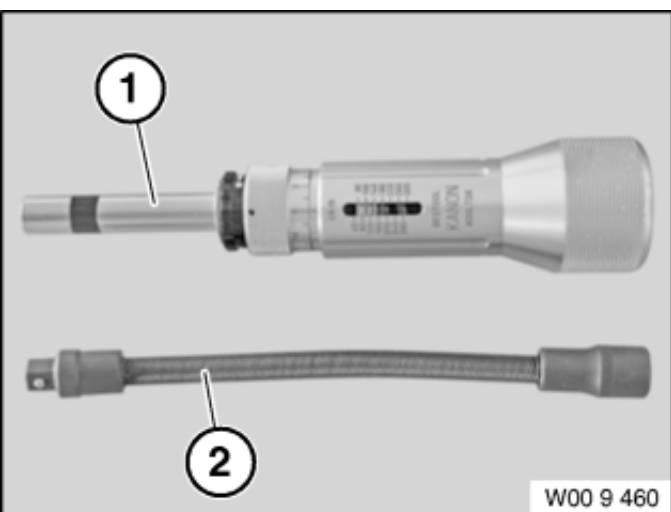
In connection with

SI-Number 01 01 01 (662)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 494 032 (11 9 341)		Screw Available only as a complete tool set 11 9 340 = 83 30 0 493 971 - as of 29.11.2011	
2	0 494 033 (11 9 342)		Spindle Available only as a complete tool set 11 9 340 = 83 30 0 493 971 - as of 29.11.2011	

0 496 778 (00 9 460) Torque wrench



Common

Used in step [27](#)

Usage

Measuring range 0.40 to 3.00 Nm (accuracy +/-3%). Set 00 9 460 consists of 00 9 461 = torque wrench and 00 9 462 extension. Replaces special tool 00 9 250 from KW41/2009.

Included in the tool or work

Storage location A27

Replaced by

In connection with

SI-Number 01 02 10 (618)

Consisting of

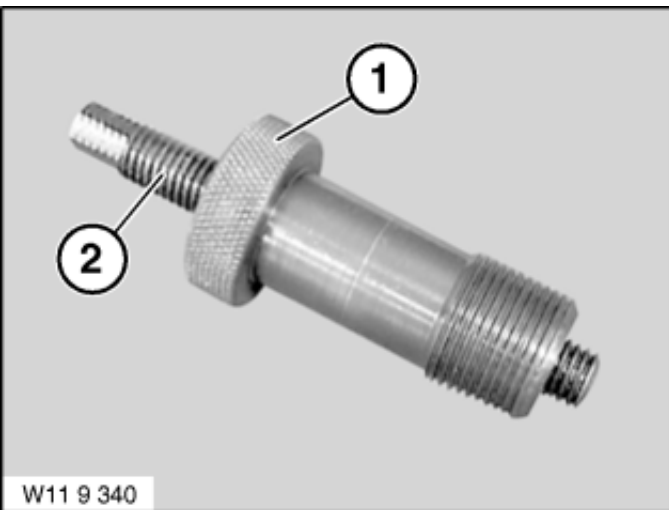
BMW

In

Pos	Order number	Replaced by	Designation	Connection with
1	0 496 781 (00 9 461)		Torque wrench N30LTDK (0.4 - 3.0 Nm accuracy 3%) (replaces special tool 00 9 251 from KW41/2009) Sale of existing inventory and then available only as part of complete tool set 00 9 460 (83 30 0 496 778) - as of 04/04/2012.	

2	0 496 782 (00 9 462)		Extension Flexible shaft (Replaces special tool 00 9 552 from KW41/2009)	
---	---	--	---	--

0 493 971 (11 9 340) Device



Common

Used in step [28](#)

Usage (Device) For tensioning timing chain when adjusting timing

Included in the tool or work

Storage location C42

Replaced by

In connection with

SI-Number 01 01 01 (662)

Consisting of

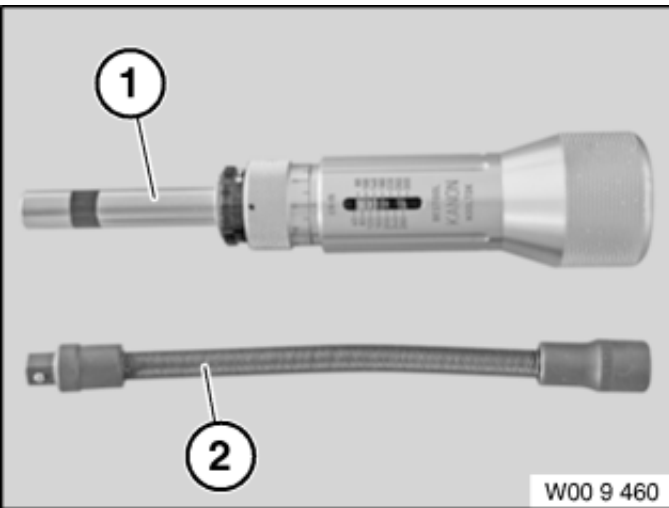
Pos	BMW Order number	Replaced by	Designation	In Connection with
-----	------------------	-------------	-------------	--------------------

			Screw	
--	--	--	--------------	--

1	0 494 032 (11 9 341)	Available only as a complete tool set 11 9 340 = 83 30 0 493 971 - as of 29.11.2011
---	---	---

2	0 494 033 (11 9 342)	Spindle Available only as a complete tool set 11 9 340 = 83 30 0 493 971 - as of 29.11.2011
---	---	---

0 496 778 (00 9 460) Torque wrench



Common Used in step [28](#)

Usage	Measuring range 0.40 to 3.00 Nm (accuracy +/-3%). Set 00 9 460 consists of 00 9 461 = torque wrench and 00 9 462 extension. Replaces special tool 00 9 250 from KW41/2009.
-------	--

Included in the tool or work

Storage location	A27
------------------	-----

Replaced by

In connection with

SI-Number	01 02 10 (618)
-----------	----------------

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 781 (00 9 461)		Torque wrench N30LTDK (0.4 - 3.0 Nm accuracy 3%) (replaces special tool 00 9 251 from KW41/2009) Sale of existing inventory and then available only as part of complete tool set	

00 9 460 ([83 30 0 496 778](#)) - as of 04/04/2012.

2 [0 496 782 \(00 9 462\)](#)

Extension
Flexible shaft
(Replaces special tool 00 9 552 from KW41/2009)

0 495 939 (11 9 590) Mandrel



Common

Used in step [28](#) [29](#)

Usage (Alignment pin) For locating crankshaft in TDC setting.

Included in the tool or work

Storage location B85

Replaced by

In connection with

SI-Number 01 26 06 (321)

0 495 933 (11 9 581) Ring spanner



Common

Used in step [32](#)

Usage

Included in the tool or work 0 495 932

Storage location A85

Replaced by

In connection with

SI-Number 01 26 06 (321)

0 495 935 (11 9 583) Socket

Common

Used in step [32](#)

Usage (socket, width across flats 10)

Included in the 0 495 932



tool or work

Storage location A85

Replaced by

In connection with

SI-Number 01 26 06 (321)

2 344 011 Tool



Common

Used in step [34](#)

Usage

Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.

Included in the tool or work

Storage location

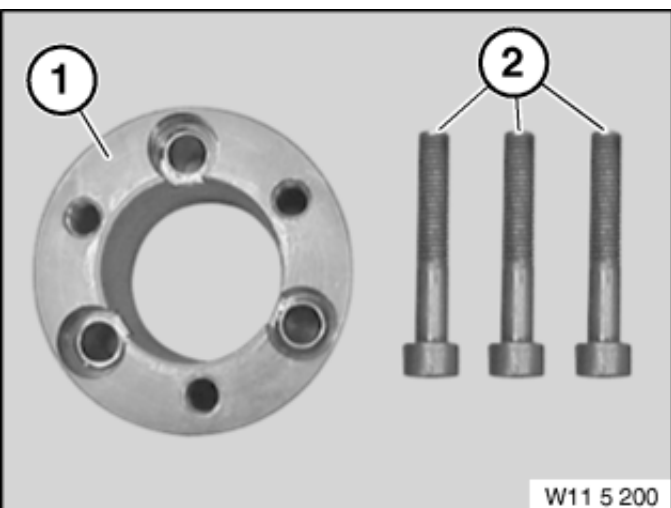
Replaced by

In connection with

SI-Number 08 08 12 (872)

Replacement tools:

0 495 211 (11 5 202) Screw



Common

Used in step [20](#)

Usage

(Screws M8x40mm (3 each)) Remaining inventories will be sold off, followed by discontinuation and then available as complete special tool 11 5 200 = [83 30 0 495 111](#) - as of 29.11.2011

Included in the tool or work 0 495 111

Storage location A52

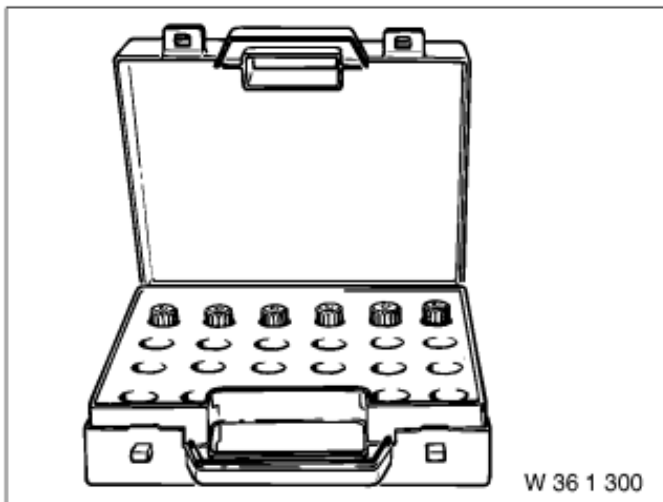
Replaced by

In connection

with

SI-Number

0 495 222 (36 1 324) Wheel stud



Common

Used in step [20](#)

Usage

(Code 31) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

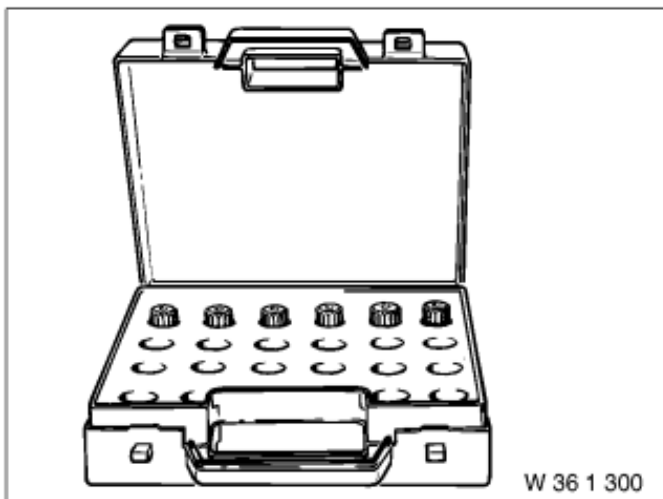
Storage location

Replaced by

In connection with

SI-Number

0 495 223 (36 1 325) Wheel stud



Common

Used in step [20](#)

Usage

(Code 32) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

Storage location

Replaced by

In connection with

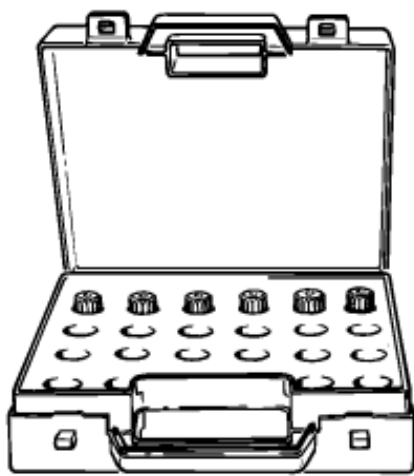
SI-Number

0 495 224 (36 1 326) Wheel stud

Common

Used in step [20](#)

(Code 33) With centring bore. Not available individually. Can only be ordered



W 36 1 300

Usage

as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

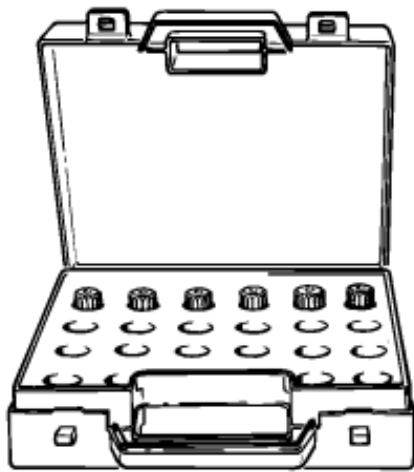
Storage location

Replaced by

In connection with

SI-Number

0 495 225 (36 1 327) Wheel stud



W 36 1 300

Common

Used in step [20](#)

Usage

(Code 34) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

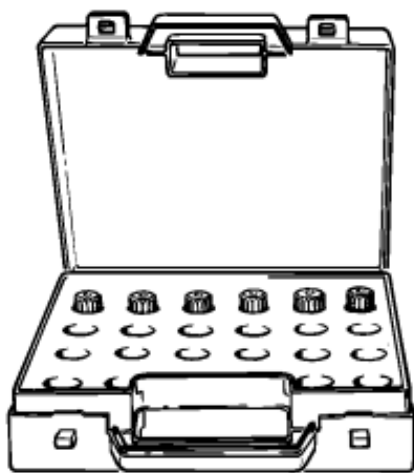
Storage location

Replaced by

In connection with

SI-Number

0 495 226 (36 1 328) Wheel stud



W 36 1 300

Common

Used in step [20](#)

Usage

(Code 35) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

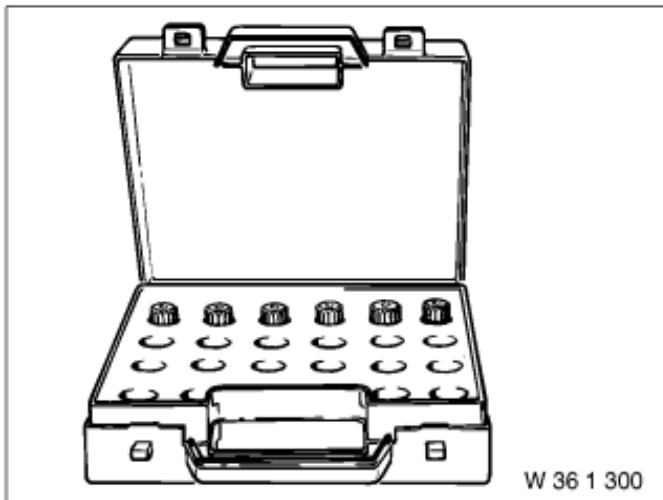
Storage location

Replaced by

In connection with

SI-Number

0 495 227 (36 1 329) Wheel stud



Common

Used in step [20](#)

Usage

(Code 36) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

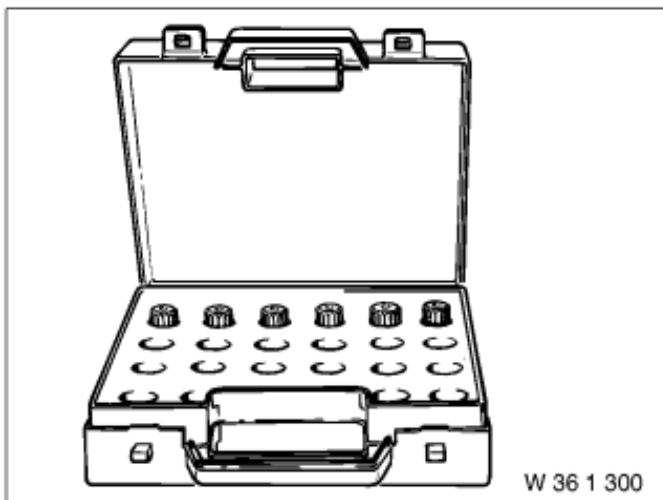
Storage location

Replaced by

In connection with

SI-Number

0 495 228 (36 1 331) Wheel stud



Common

Used in step [20](#)

Usage

(Code 37) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

Storage location

Replaced by

In connection with

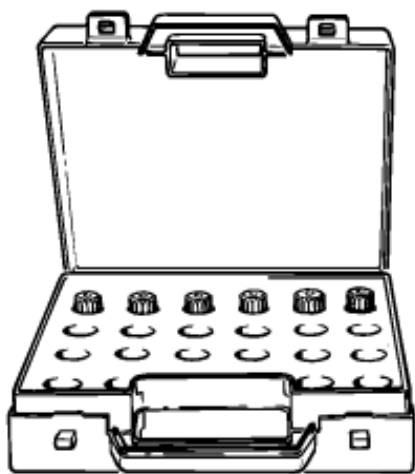
SI-Number

0 495 229 (36 1 332) Wheel stud

Common

Used in step [20](#)

(Code 38) With centring bore. Not



W 36 1 300

Usage

available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

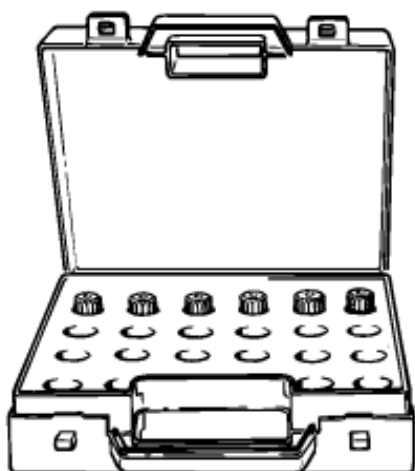
Storage location

Replaced by

In connection with

SI-Number

0 495 230 (36 1 333) Wheel stud



W 36 1 300

Common

Used in step [20](#)

Usage

(Code 40) With centring bore. Not available individually. Can only be ordered as part of the complete special tool set [83 30 0 492 518](#) (special tool number 36 1 300) or via the Electronic Parts Catalogue.

Included in the tool or work

0 492 518

Storage location

Replaced by

In connection with

SI-Number

Overview Technical Data

Measured value on exhaust camshaft

Used in step [28](#)

If the measured value is below 1.9 mm, the timing is OK

max. 1,9 mm

Measured value on intake camshaft

Used in step [28](#)

If the measured value is below 2.5 mm, the timing is OK

max. 2,5 mm

Links

General repair instructions	Used in step
12 00 ... Notes for disconnecting and connecting battery	1
61 12 ... Notes on intelligent battery sensor (IBS)	1
61 00 ... Safety information for handling vehicle battery	1
63 12 ... US version: Setting the horizontal blocking when headlamp is set	48
63 12 ... US version: Remove the horizontal blocking before adjusting the headlamp	48
Repair instructions	Used in step
63 99 ... Safety information for handling bulbs / light sources (exterior lights)	7 47
63 10 ... Test requirements for headlights vertical aim adjustment	48

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