11 00 039 Checking compression of all cylinders (N55)

Special tools required:

- 11 0 222
- 11 0 224
- 11 8 731
- 11 8 732

Important!

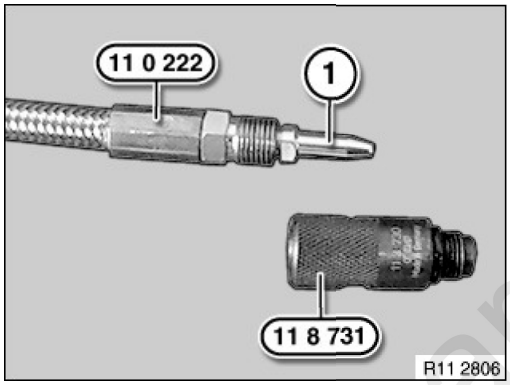
High tension - mortal danger!

Interrupt voltage supply to ignition coils.

Read and comply with notes on compression pressure check.

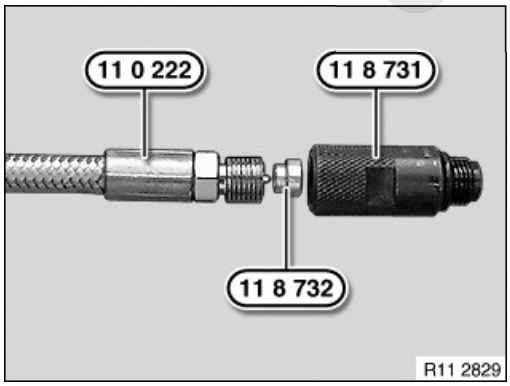
Necessary preliminary tasks:

- Remove spark plugs.



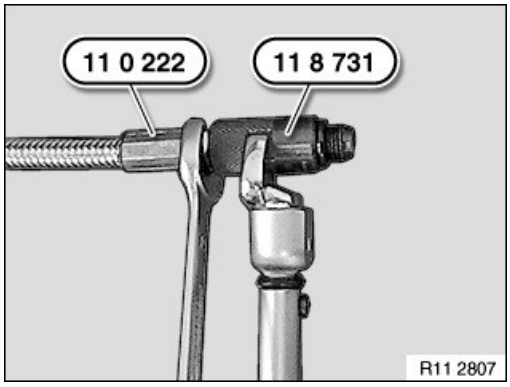
Unscrew tip (1) from special tool 11 0 222 .**Important!**

Then check the Schrader valve that is now visible for secure seating.



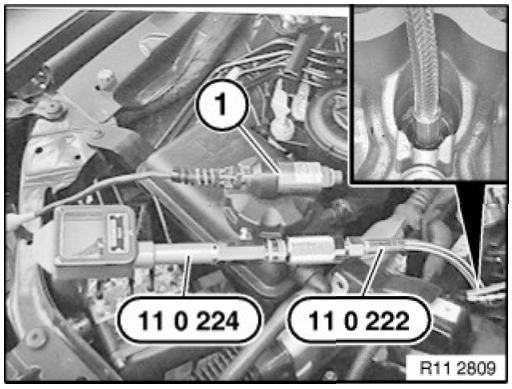
Prepare special tool 11 0 222 in conjunction with 11 8 732 and 11 8 731 .

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Screw special tool 11 0 222 into special tool 11 8 731 to 10 Nm.**Important!**

Oil thread on special tool 11 8 731 .



Screw special tool 11 0 222 by hand into spark plug thread and connect special tool 11 0 224 .

Depress accelerator pedal and actuate starter until compression pressure stops rising.

- Nominal values, compression pressure

Assemble engine.

Delete fault memory.

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31 10 001 Completely removing and installing front axle with engine and transmission (.N55)

Special tools required:

- 17 2 050
- 00 9 030
- 13 5 161
- 13 5 162

Important!

When removing, note that the unit weights approx. 250 to 450 kg.

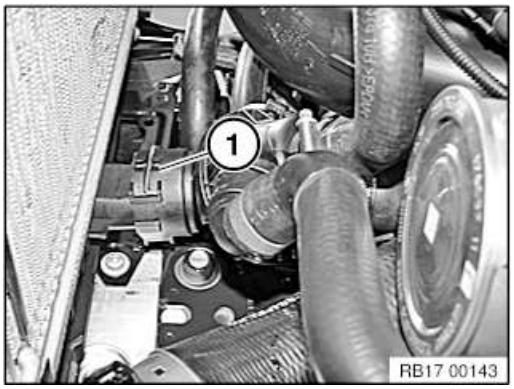
Check the vehicle payload.

Footwell at front is loaded with approx 200 kg.

Note safety information of table lift!

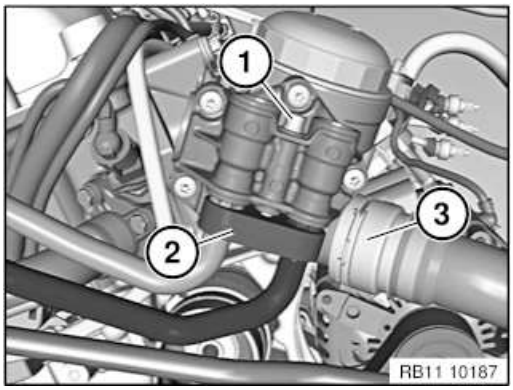
Necessary preliminary tasks:

- Position vehicle on vehicle hoist so its weight is centred.
- Disconnect battery.
- Suction off the air conditioning.
- Remove expansion tank.
- Remove fan cowl with electric fan.
- Drain coolant.
- Remove bulkhead sound insulation.
- Detach vacuum line from brake booster.
- Detach engine wiring harness in electronics box and set aside.
- Remove complete propeller shaft.
- Remove front brake pads.
- Remove both brake calipers at the front and hang them to one side.



Unlock and detach thermostat on radiator (1).

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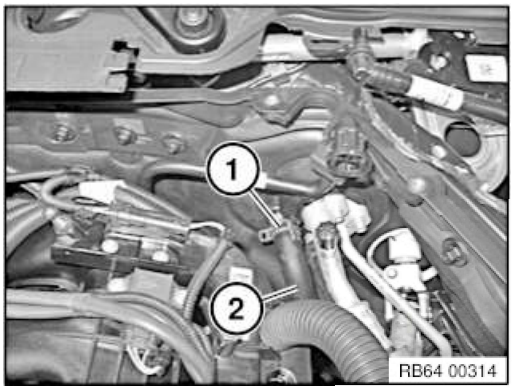


Release screw (1).

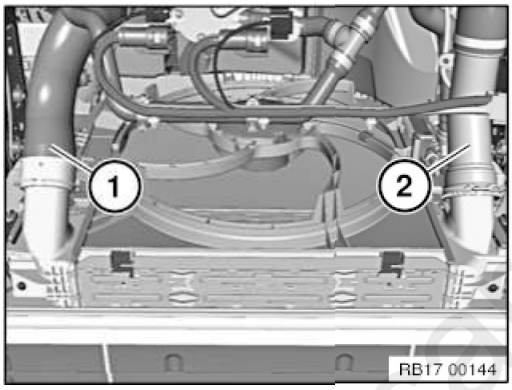
Tightening torque 17 22 4AZ.

Remove engine oil pipe from thermostat (2).

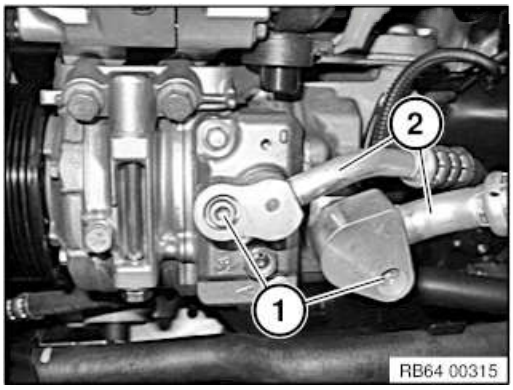
Unlock and detach coolant hose (3).



Release hose clamp (1) with special tool 17 2 050 and detach coolant hose (2).



Unlock and detach charge air line (1) and charge air pipe (2) of charge air cooler and set to one side.



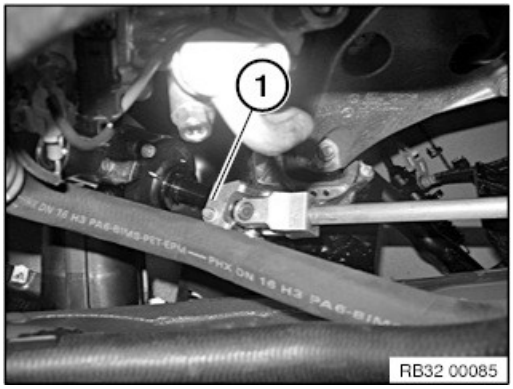
Release screws (1) and remove refrigerant lines (2).

Tightening torque 64 52 1AZ

Installation note:
Replace sealing rings.

Use special tool 00 9 030 to install sealing rings without damaging them.

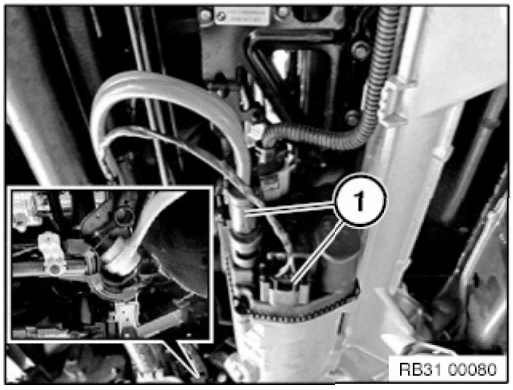
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Release clamping bolts (1) on steering shaft at the bottom of the steering gear and pull off.*Installation note:*
Clean screw threads to remove all remnants of screw locking adhesive.

Replace clamping bolts.

Tightening torque 32 31 2AZ.



Unlock and detach both electrical connectors (1) on steering gear.

Unclip cable routing from front axle support and fold back cable toward engine support.

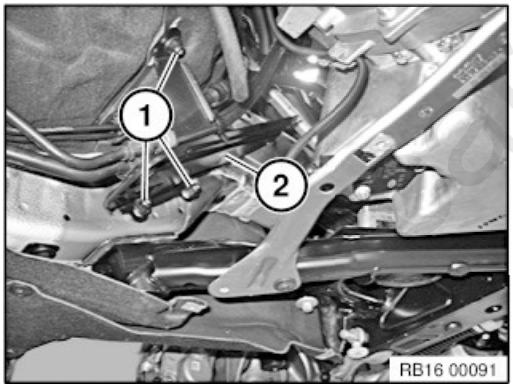
Installation note:
Replace faulty cable clips.



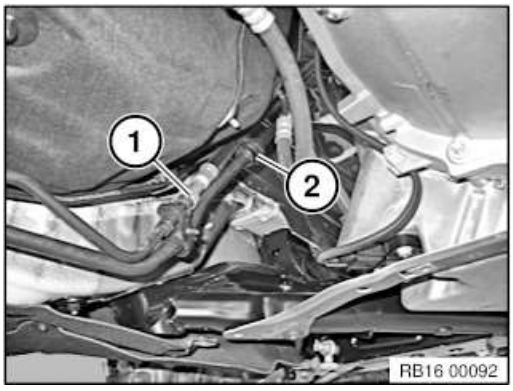
Recycling:

Catch and dispose of escaping fuel with auxiliary materials.

Observe country-specific waste disposal regulations.



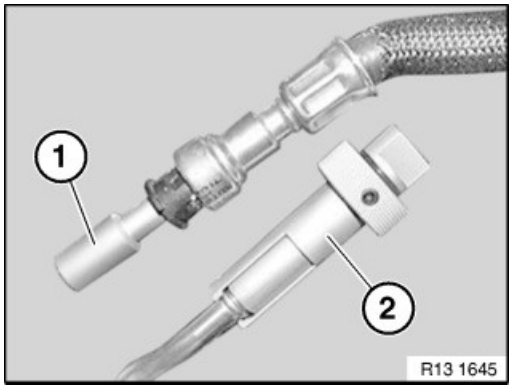
Release screws (1) and remove protective plate (2).



Unfasten fuel line (1) and disconnect.

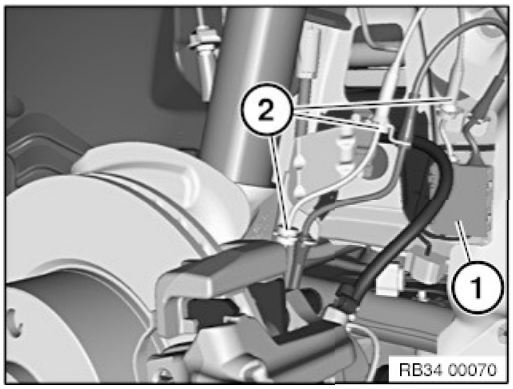
Unlock and detach tank ventilation line of carbon canister (2).

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Close off fuel line (1) with special tool 13 5 161 .

Close off fuel line (2) with special tool 13 5 162 .



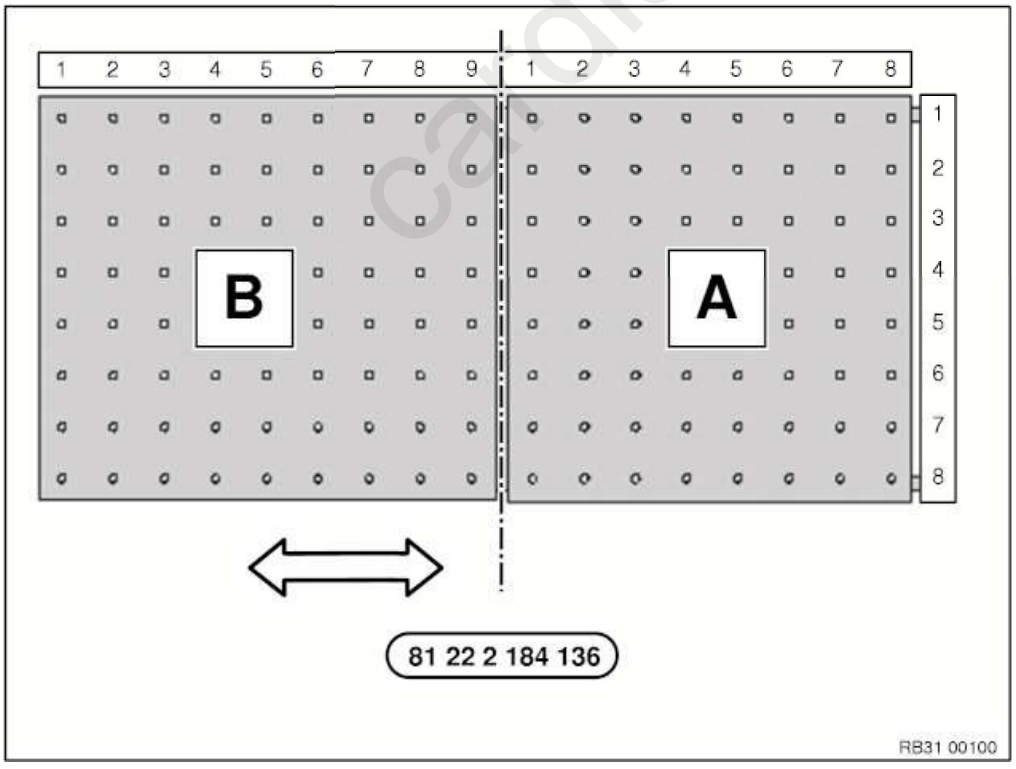
Open connector housing (1), pull electrical connection out of bracket and disconnect.

Disengage cable with rubber grommets from holders (2).

Installation note:
Check that the electrical connectors and rubber grommets are correctly mounted.



Note 31 00 Mobile table lift document.



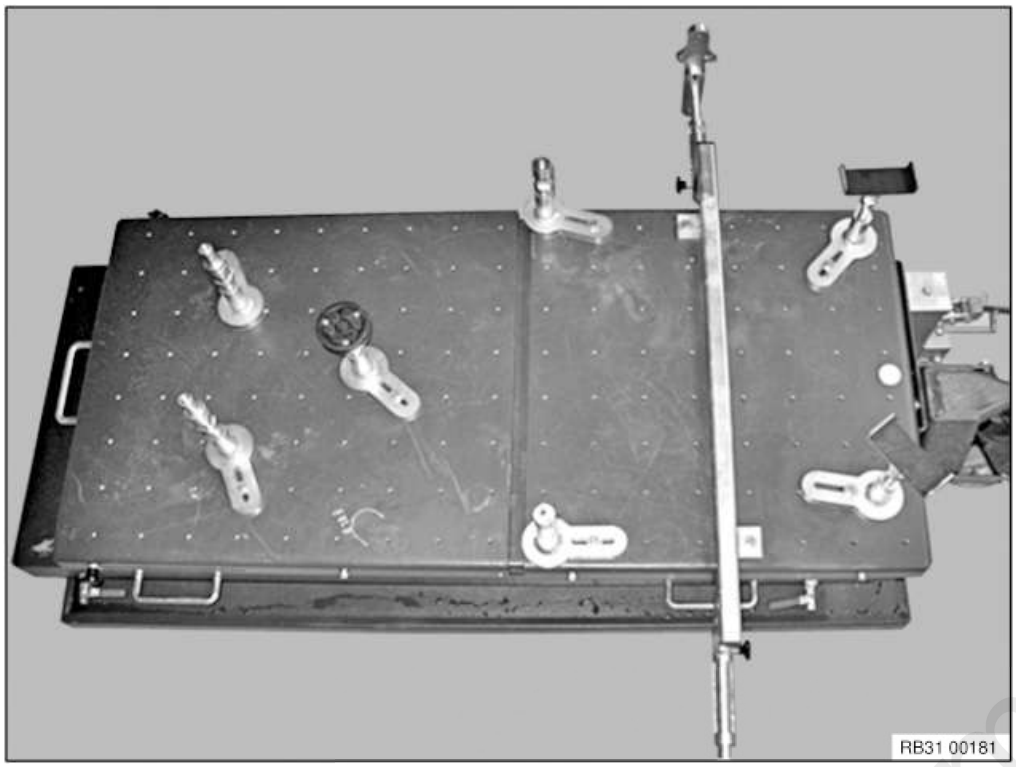
Important!
Coordination of table lift from left to right.

Position engine on working surface of table lift **A**.

Position transmission on working surface of table lift **A**.

Work surface of table lift **B** can be adjusted in length (see arrow).

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Structure of table lift.

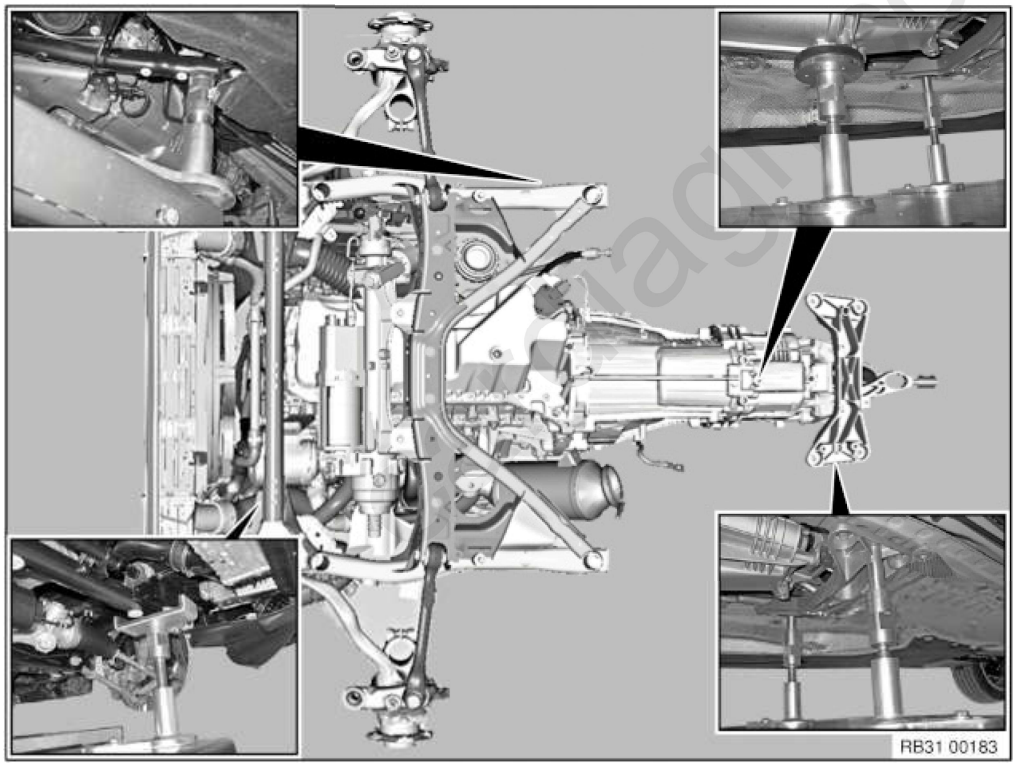
Position adapter (50) on work surface of table lift **B** for transmission cross-member with coordinates 3/2 and 3/7.

Position adapter (80) on work surface of table lift **B** under transmission with coordinates 7/5.

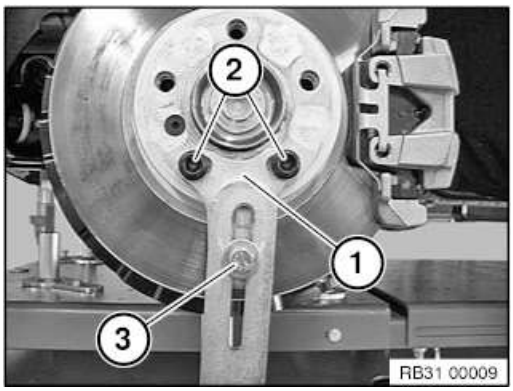
Position adapter (60) on work surface of table lift **A** for front axle support with coordinates 2/1 and 2/8.

Position adapter (10) on work surface of table lift **A** for swivel bearing with coordinates 4/1 and 5/8.

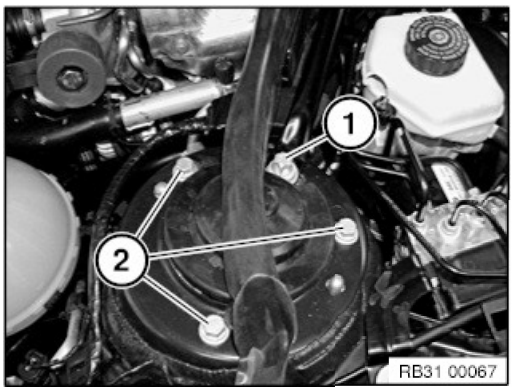
Position adapter (70) on work surface of table lift **A** for front axle support with coordinates 7/2 and 7/7.



Possible attachment points of front axle support (1 and 2) and transmission cross-member (3).



Adapt and secure (3) wheel hub adapter (1) on left and right of wheel hub (2).

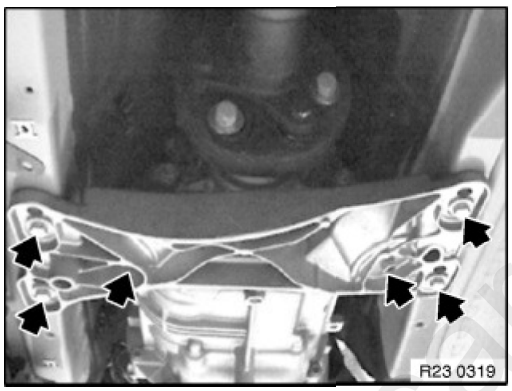


Release left and right spring strut screws (2).

Tightening torque 31 31 1AZ.

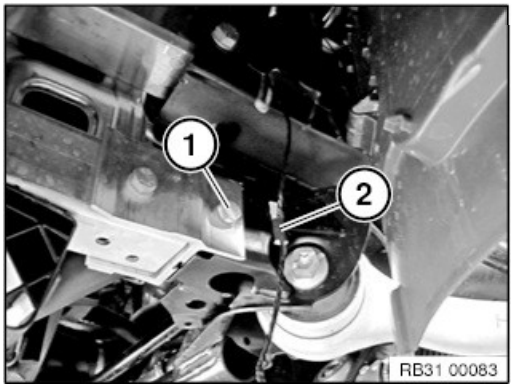
Installation note:
Clean inside contact surface at spring strut dome.

Align spring strut with boreholes on spring strut dome using centring pins and push up.



Release screws of transmission cross-member (manual gearbox).

Tightening torque 23 32 3AZ/4AZ.



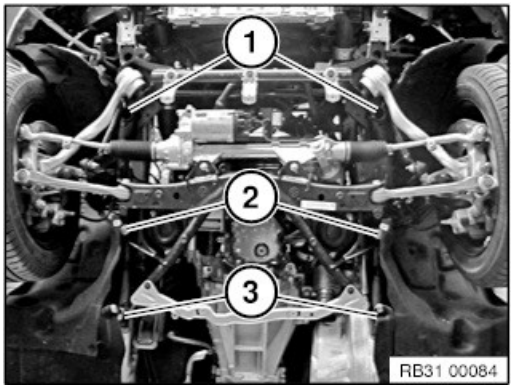
Release screws (1) on left and right.

Tightening torque 51 11 6AZ.

Unclip cable tie (2).

Installation note:
Replace faulty cable clips.

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Release bolts (1-3).

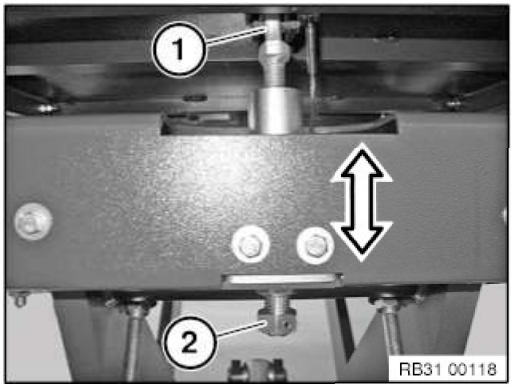
Carefully lower the front axle complete with the motor and transmission.

Installation note:
Note the installation location and tightening sequence of the screws.

Check threads for damage; if necessary, repair with Helicoil thread inserts.

- Bolt (1) M12x45
- Screw (2) M12x165
- Screw (3) M14x60

Tightening torque 31 10 1AZ.



Installation note:
Position the table lift beneath the vehicle.

Adjust the table lift to the vehicle inclination using the adjusting screw (2).

After installation:

- Check and add engine oil.
- Fill and bleed hydraulic system.
- Check line connections for leak tightness
- Check and clear the fault memory

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31 10 001 Completely removing and installing front axle with engine and transmission (N55 automatic transmission)



Special tools required:

- 24 1 110
- 2 222 741
- 24 1 370
- 17 2 050
- 00 9 030
- 13 5 161
- 13 5 162

Important!
When removing, note that the unit weights approx. 250 to 450 kg.
Check the vehicle payload.
Footwell at front is loaded with approx 200 kg.
Note safety information of table lift!



Necessary preliminary tasks:

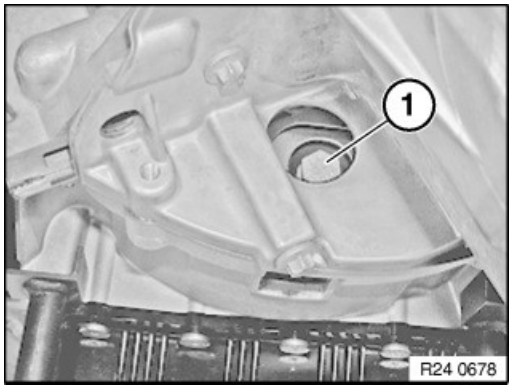
- Position vehicle on vehicle hoist so its weight is centred.
- Disconnect battery.
- Suction off the air conditioning.
- Remove expansion tank.
- Remove fan cowl with electric fan.
- Drain coolant.
- Remove bulkhead sound insulation.
- Detach vacuum line from brake booster.
- Detach engine wiring harness in electronics box and set aside.
- Remove complete propeller shaft.
- Remove front brake pads.
- Remove both brake calipers at the front and hang them to one side.



Necessary preliminary work for engine or transmission replacement
Following repair work must be carried out before removal of the front axle support with a table lift.

- Disconnect torque converter from flywheel.

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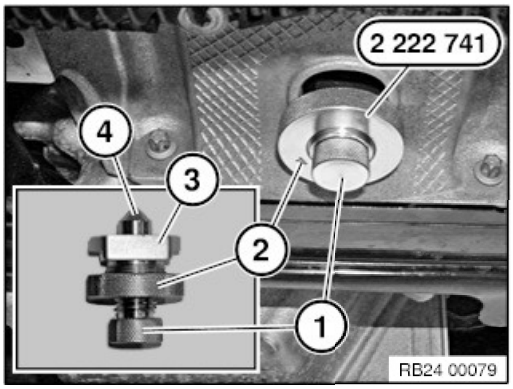


Crank engine at vibration damper in direction of rotation until screw (1) is visible in recess.

Release 6 bolts of torque converter with special tool 24 1 110 .

Tightening torque 24 40 1AZ.

Installation note:
Replace screws (remove any adhesive residues in thread).



Unscrew knurled screw (1) from special tool 2 222 741 (do not remove completely) before inserting in the recess of the transmission housing.

Insert special tool 24 1 370 and shaped element (3) in the recess.

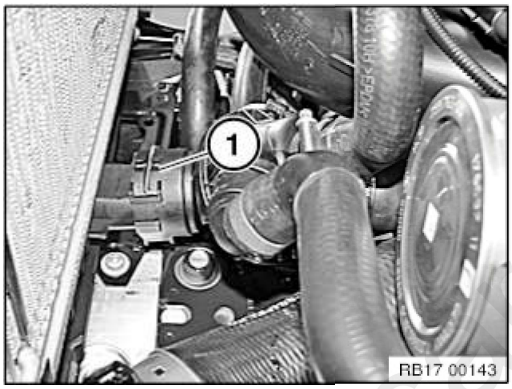
Slightly tighten knurled nut (2).

Screw in knurled screw (1) fully.

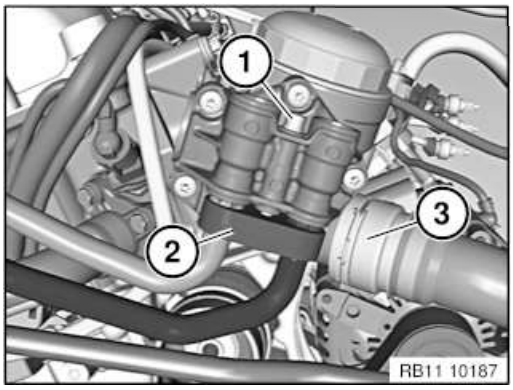
- Locating pin (4) must be located between converter and engine.

Move special tool 2 222 741 in the recess until the locating pin (4) rests against the converter.

Use knurled nut (2) to fix special tool 2 222 741 and converter in position.



Unlock and detach thermostat on radiator (1).



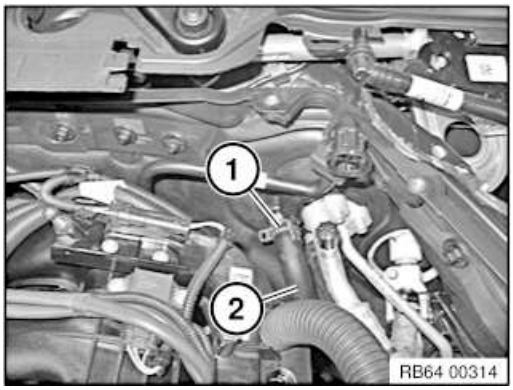
Release screw (1).

Tightening torque 17 22 4AZ.

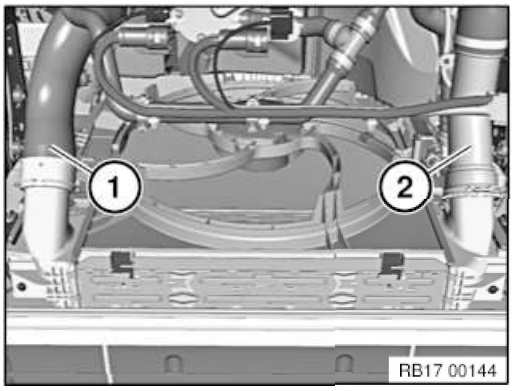
Remove engine oil pipe from thermostat (2).

Unlock and detach coolant hose (3).

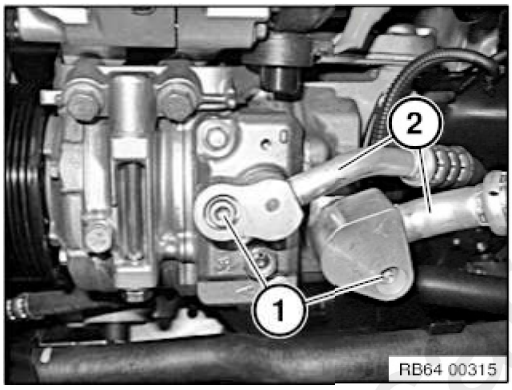
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Release hose clamp (1) with special tool 17 2 050 and detach coolant hose (2).



Unlock and detach charge air line (1) and charge air pipe (2) of charge air cooler and set to one side.

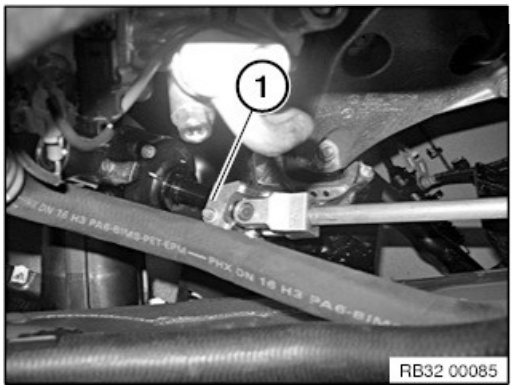


Release screws (1) and remove refrigerant lines (2).

Tightening torque 64 52 1AZ.

Installation note:
Replace sealing rings.

Use special tool 00 9 030 to install sealing rings without damaging them.

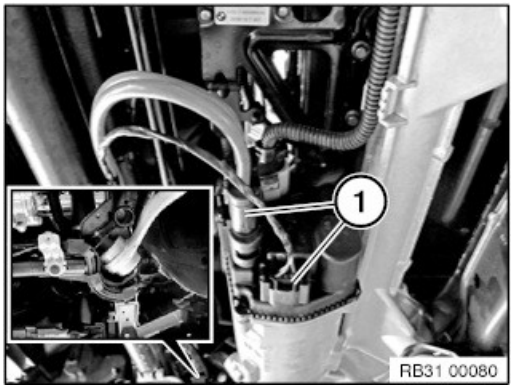


Release clamping bolts (1) on steering shaft at the bottom of the steering gear and pull off.*Installation note:*
Clean screw threads to remove all remnants of screw locking adhesive.

Replace clamping bolts.

Tightening torque 32 31 2AZ.

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Unlock and detach both electrical connectors (1) on steering gear.

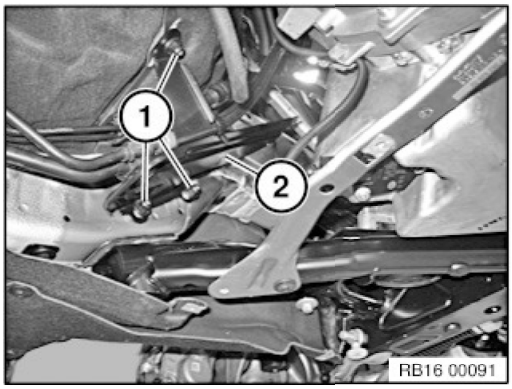
Unclip cable routing from front axle support and fold back cable toward engine support.

Installation note:
Replace faulty cable clips.

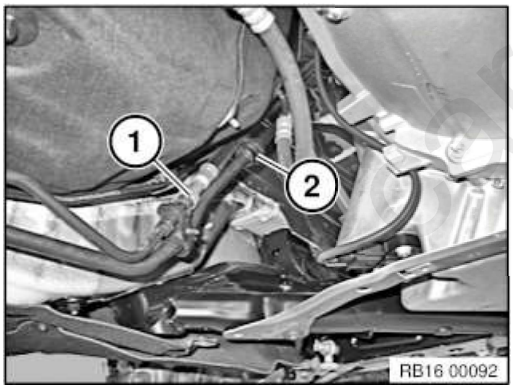
Recycling:

Catch and dispose of escaping fuel with auxiliary materials.

Observe country-specific waste disposal regulations.

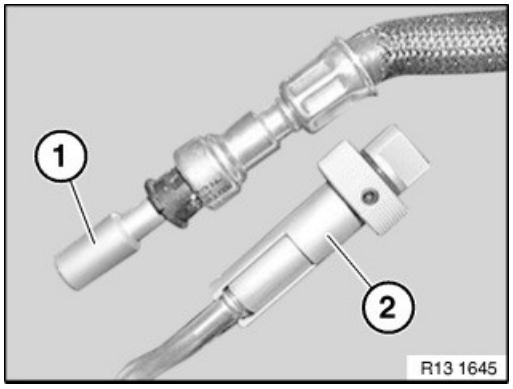


Release screws (1) and remove protective plate (2).



Unfasten fuel line (1) and disconnect.

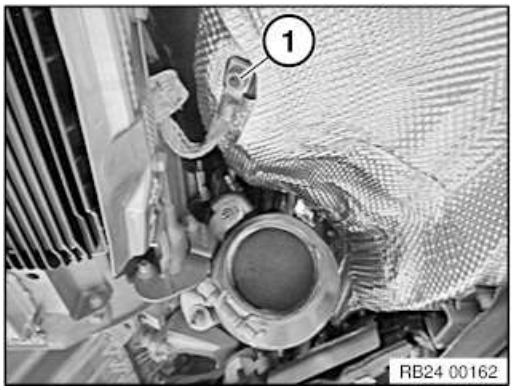
Unlock and detach tank ventilation line of carbon canister (2).



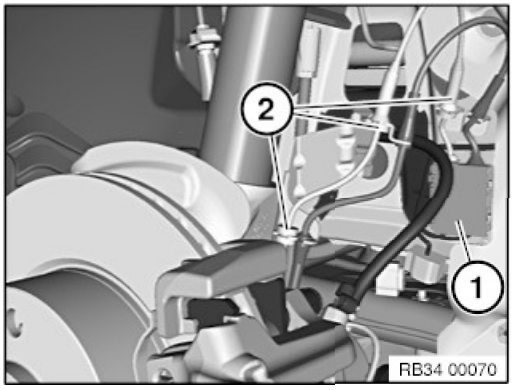
Close off fuel line (1) with special tool 13 5 161 .

Close off fuel line (2) with special tool 13 5 162 .

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Release ground cable at body.



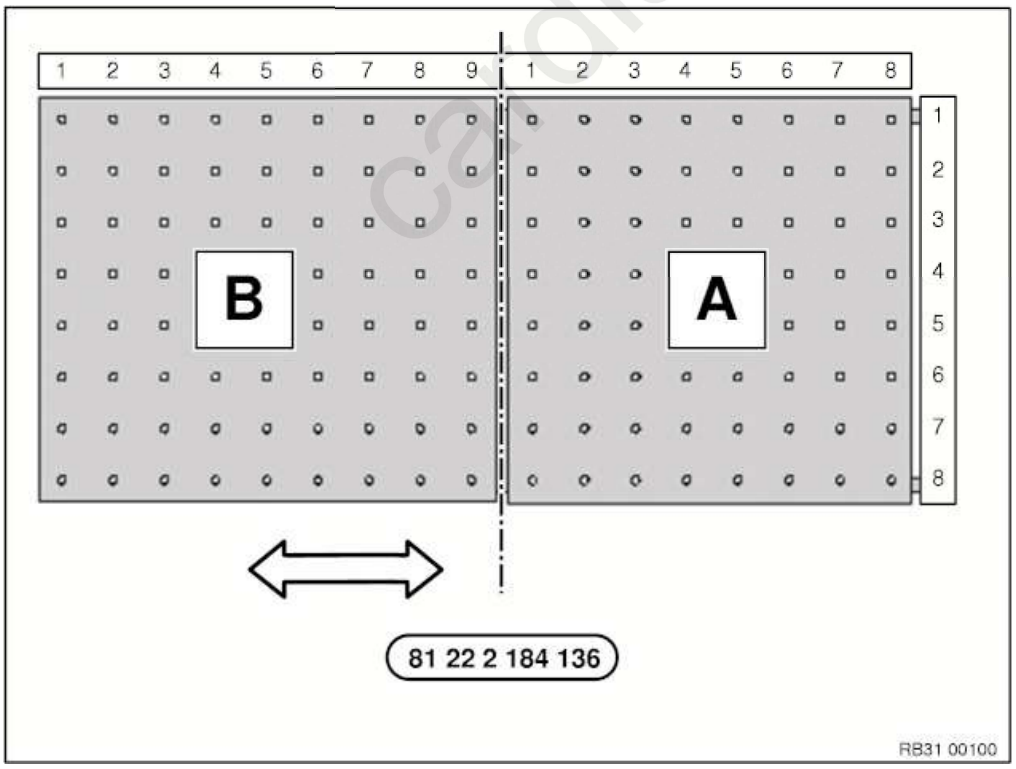
Open connector housing (1), pull electrical connection out of bracket and disconnect.

Disengage cable with rubber grommets from holders (2).

Installation note:
Check that the electrical connectors and rubber grommets are correctly mounted.



Note 31 00 Mobile table lift document.



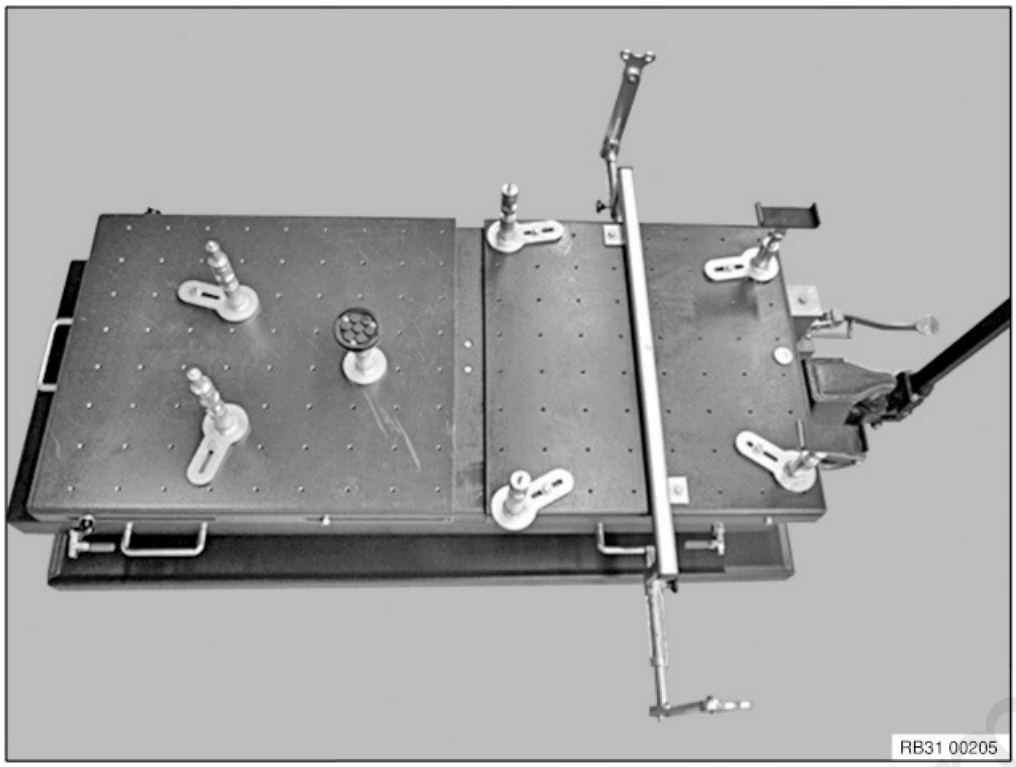
Important!
Coordination of table lift from left to right.

Position engine on working surface of table lift **A**.

Position transmission on working surface of table lift **A**.

Work surface of table lift **B** can be adjusted in length (see arrow).

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Structure of table lift.

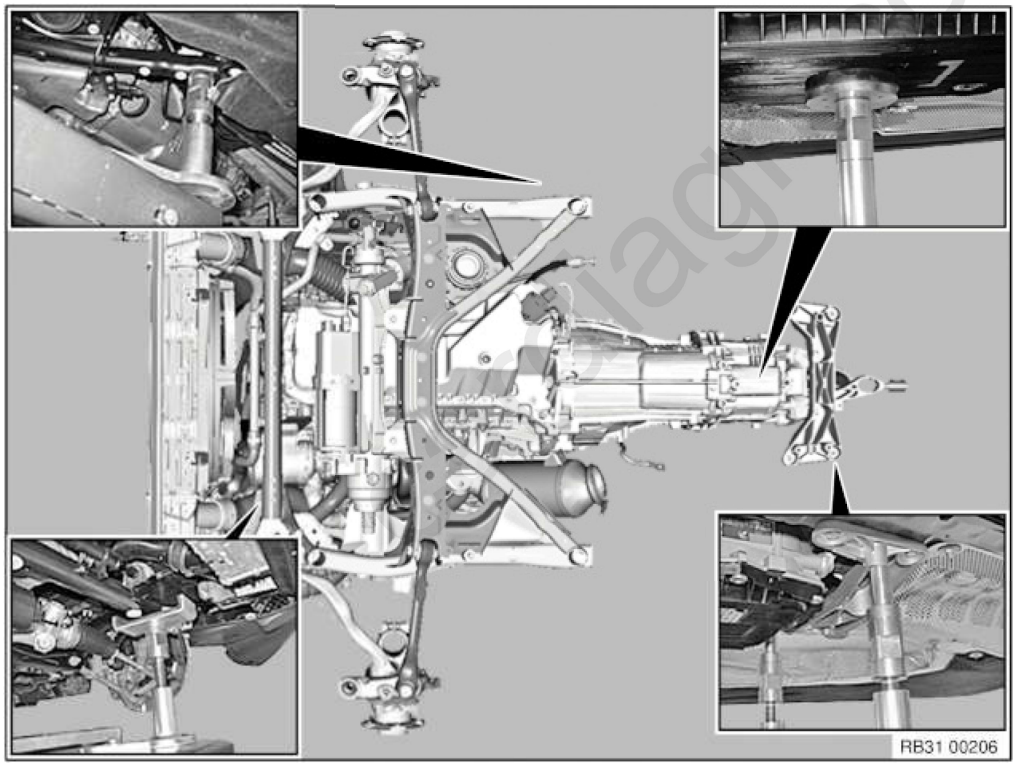
Position adapter (50) on work surface of table lift **B** for transmission cross-member with coordinates 3/3 and 4/7.

Position adapter (80) on work surface of table lift **B** under transmission with coordinates 7/4.

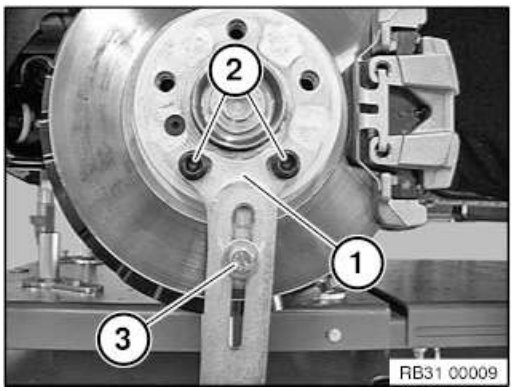
Position adapter (60) on work surface of table lift **A** for front axle support with coordinates 2/1 and 2/8.

Position adapter (10) on work surface of table lift **A** for swivel bearing with coordinates 4/1 and 5/8.

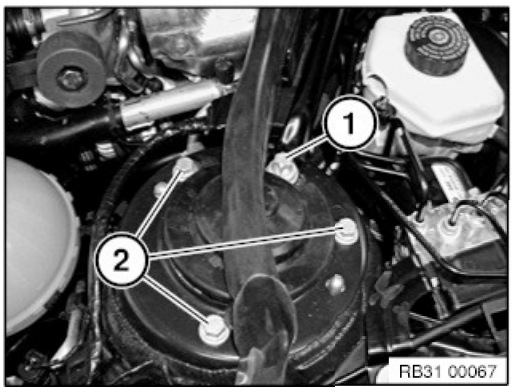
Position adapter (70) on work surface of table lift **A** for front axle support with coordinates 7/2 and 7/7.



Possible attachment points of front axle support (1 and 2) and transmission cross-member (3).



Adapt and secure (3) wheel hub adapter (1) on left and right of wheel hub (2).

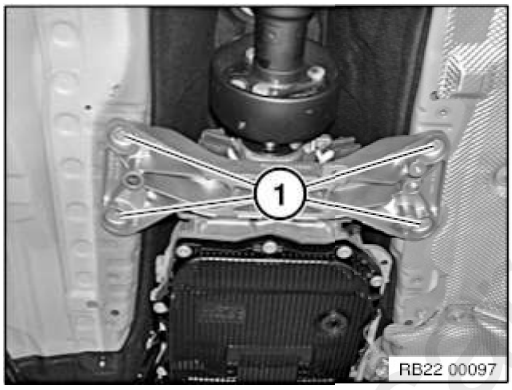


Release left and right spring strut screws (2).

Tightening torque 31 31 1AZ.

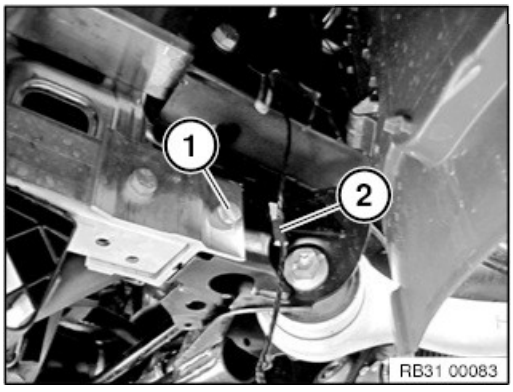
Installation note:
Clean inside contact surface at spring strut dome.

Align spring strut with boreholes on spring strut dome using centring pins and push up.



Release screws (1).

Tightening torque 22 32 3AZ.



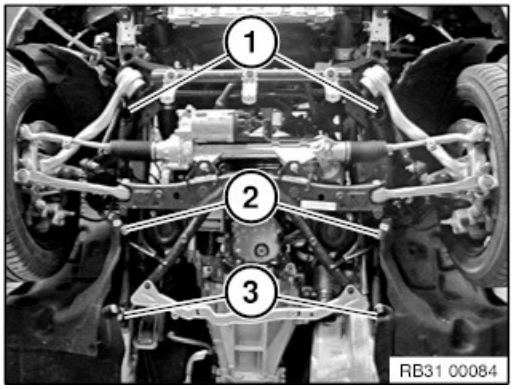
Release screws (1) on left and right.

Tightening torque 51 11 6AZ.

Unclip cable tie (2).

Installation note:
Replace faulty cable clips.

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Release bolts (1-3).

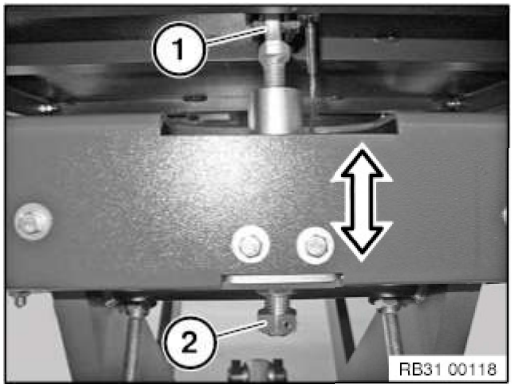
Carefully lower the front axle complete with the motor and transmission.

Installation note:
Note the installation location and tightening sequence of the screws.

Check threads for damage; if necessary, repair with Helicoil thread inserts.

- Bolt (1) M12x45
- Screw (2) M12x165
- Screw (3) M14x60

Tightening torque 31 10 1AZ.



Installation note:
Position the table lift beneath the vehicle.

Adjust the table lift to the vehicle inclination using the adjusting screw (2).

After installation:

- Check and add engine oil.
- Fill and bleed hydraulic system.
- Check line connections for leak tightness
- Check and clear the fault memory

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00 Danger of injury if oil comes into contact with eyes and skin



Danger of injury!

Contact with eyes or skin may result in injury!

Possible symptoms are:

- Impaired sight
- Irritation of the eyes
- Reddening of the skin
- Rough and cracked skin



Protective measures/rules of conduct:

- Wear safety goggles.
- Wear oil-resistant protective gloves.
- Observe country-specific safety regulations.



First aid measures:

- Eye contact: Immediately flush eyes with lots of water for at least 15 minutes. In the case that it is available, use an eye wash bottle. If eye irritation persists, consult a doctor.
- Skin contact: Wash off with soap and water immediately. If irritation persists, consult a doctor.

  Note: Do not use solvents/thinners.

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00 Danger of poisoning if oil is ingested/absorbed through the skin



Danger of poisoning!

Ingesting oil or absorbing through the skin may cause poisoning!

Possible symptoms are:

- Headaches
- Dizziness
- Stomach aches
- Vomiting
- Diarrhoea
- Cramps/fits
- Unconsciousness



Protective measures/rules of conduct:

- Fill oil in appropriately marked containers only.
- Do not fill oil in containers meant for drinking out of. (bottles for beverages, glasses or cups)
- Observe country-specific safety regulations.



First aid measures:

- Do not induce vomiting.

  If the person affected is still conscious, he/she must rinse out their mouth with water, drink plenty of water and consult a doctor immediately.

  Do not administer anything to an unconscious person via their mouth; place them in a stable position on their side. Call the emergency doctor immediately.

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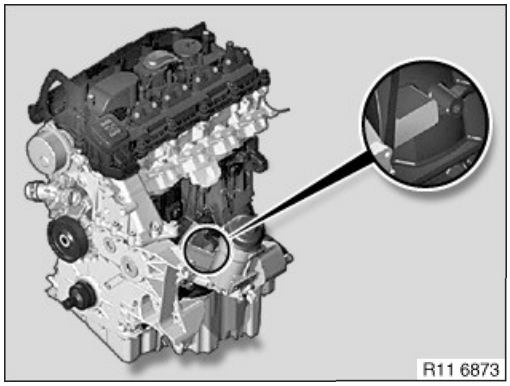
Engine identification

Engine number at the marked surface.

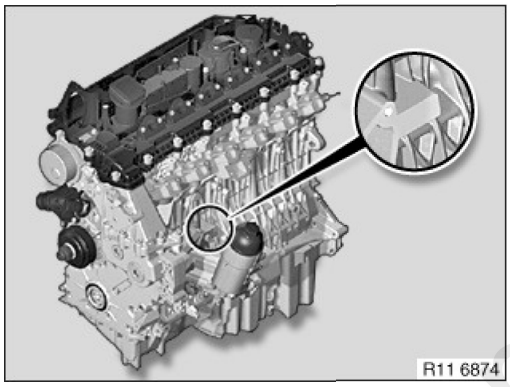
Replacement drives are already assigned a number containing the identification and engine number at the factory.

The old drive number must be imprinted for replacement crankcases.

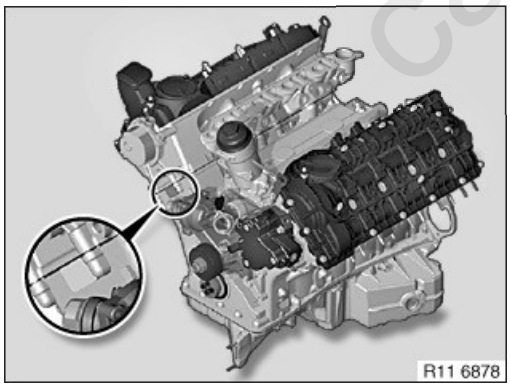
Magnesium crank cases feature a label, the engine number does not need to be embossed.



M47 / M47TU / M47T2

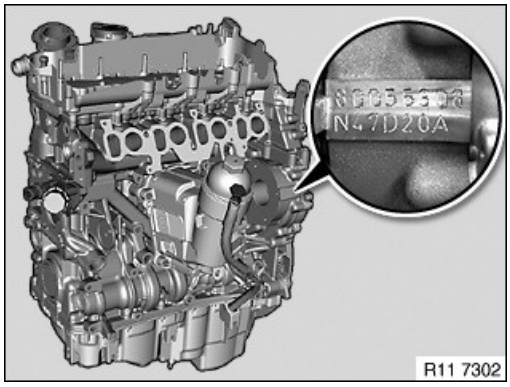


M57 / M57TU / M57T2

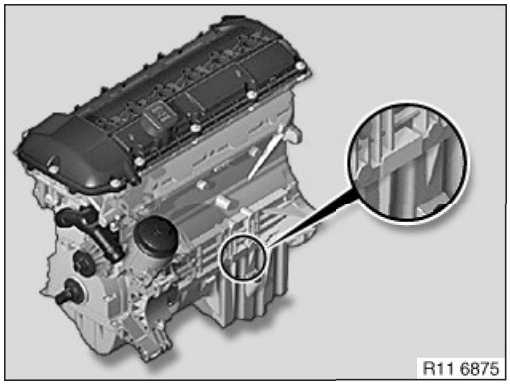


M67 / M67TU

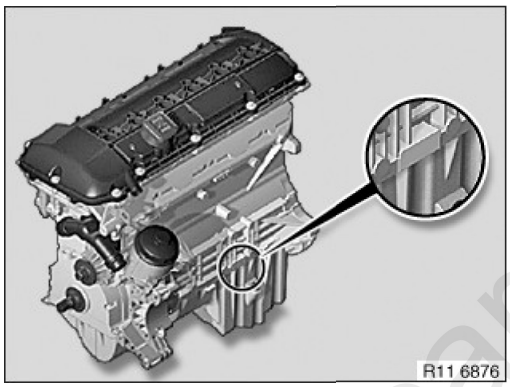
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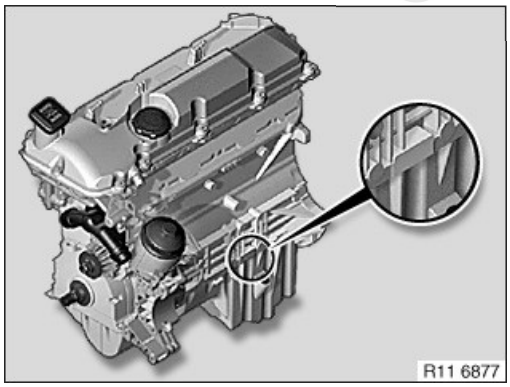
N47 / N47S / N47C / N47T / N57 / N57S / N57T



M52 / M52TU

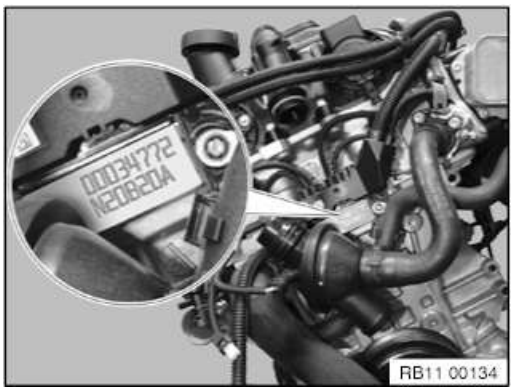


M54

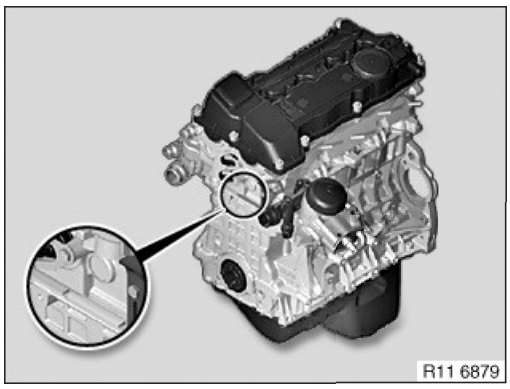


M56

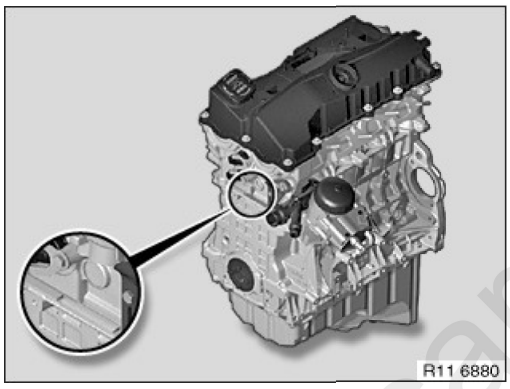
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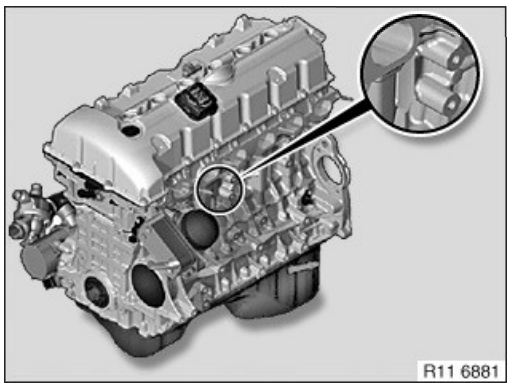
N20 / N26



N40 / N45 / N45T / N43

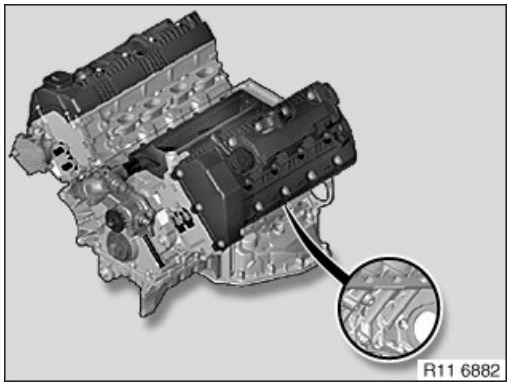


N42 / N46 / N46T

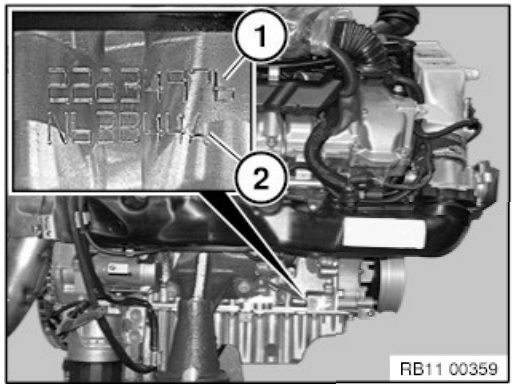


N51 / N52 / N52K / N52T / N53 / N54 / N55

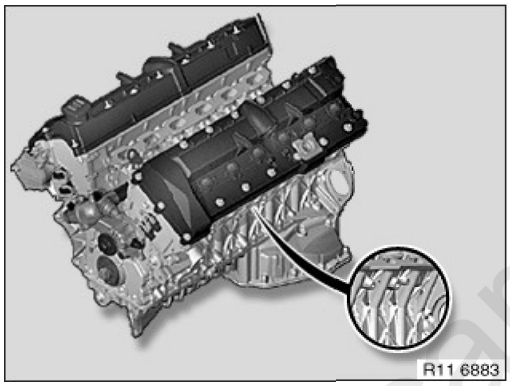
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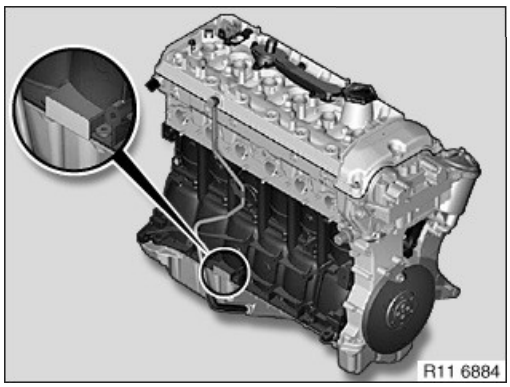
N62 / N62TU



Position (1) engine number.
PositionÂ (2) engine code letters.
N63, N63O1. N63O2
S63
N74, N74O1,
S63T0 to engine number 2001 0052 on right side cyl. 1-4.
S63T0 from engine number 2001 0053 on left side cyl.l 5-8.
E72 Vehicles must be imprinted on the left side cyl. 5-8.

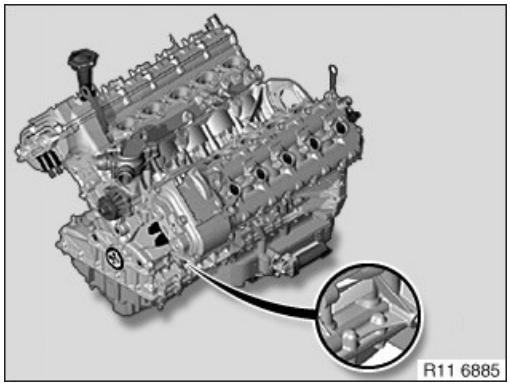


N73



S54

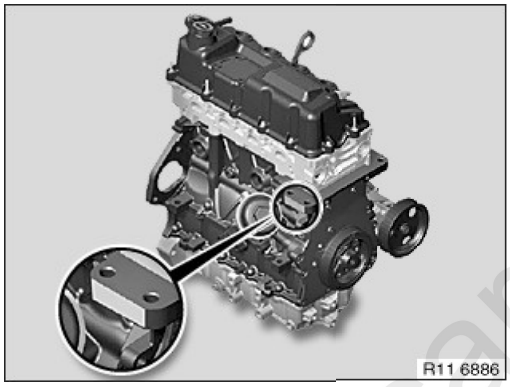
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S85 / S65



S55

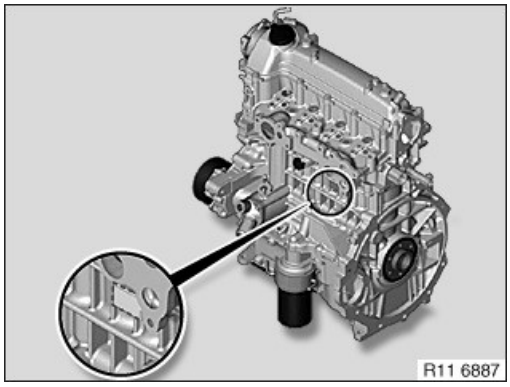


W10 / W11



W16

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W17



W20

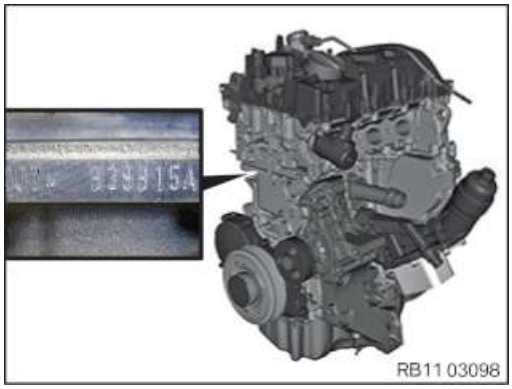


N12 / N13 / N14 / N16 / N18

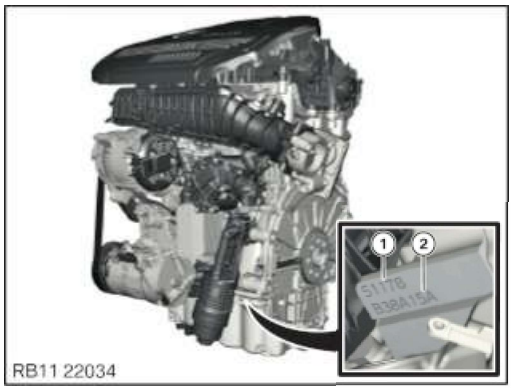


B37 / B38**A** / B47 / B48**A**
in the area of the oil sump

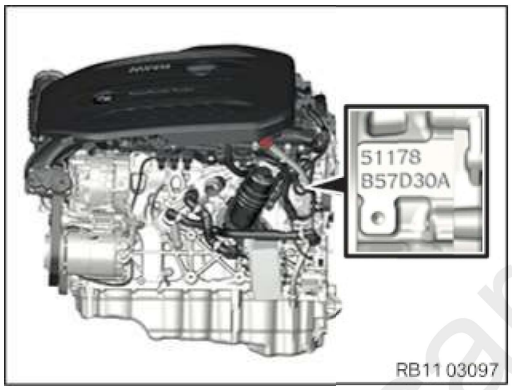
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B38**B** / B48**B**



B38



B57



B58

Assemble engine.

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11 00 300 Engine oil consumption measurement

Attention!

This procedure for measuring oil consumption may not be used for the S 85 due to the oil pan design.

Many complaints about oil consumption are caused by the oil level being measured using the wrong method.

The oil consumption should be measured after a distance of 7,500 km at the earliest, as the process of running in the engine will not have been essentially completed and the engine oil consumption stabilised until this distance has been covered.

Engine oil consumption that may occur in an engine can only be determined by the customer on the basis of the refilled engine oil quantity. As soon as the engine oil level falls below the MAX mark on the dipstick, many customers top up the engine oil without paying attention to a number of basic rules, such as the vehicle must be standing on level ground, a certain period of time must be left to allow the oil to flow back to the sump. In such cases, the available container sizes (e. g. 1-litre can) make it easy to top up above the MAX mark. Too much added engine oil is damaging to the engine and is consumed more quickly due to the splash effect.

It is therefore recommended to allow the engine oil level to the MIN mark and only then to add the required engine oil quantity. The distance between the marks is equivalent to approx. 1.0 to 1.5 litres.

The procedure for checking the oil level is given in the Owner's Handbook for the vehicle concerned.

The service delegates will only deal with claims made under warranty if exact measurements by weighing are available (see below).

Measuring oil consumption by weighing:

To assess a warranty or goodwill claim, only the following oil consumption measurement method by weighing can be accepted (this must have been carried out by a BMW contractual partner):

Note:

The engine must not leak any oil.

Engine oil may only be drained off when the engine is at its normal operating temperature. The engine oil temperature must be at least 90 °C and read off on the diagnosis system.

Preparation:

1. Eliminate any leaks and traces of oil before measuring the engine oil consumption.
2. Allow the engine to run at idling speed for 5 minutes, during which the engine oil temperature must not drop below 90 °C.
3. Unscrew the main flow oil filter cover (the engine oil will flow back into the oil sump from the oil filter housing).
4. Unscrew the oil drain plug.
5. Allow the engine oil to drain off for 15 minutes.
   If necessary, remove the fan/fan cowl.
6. Turn the engine once through 360 degrees by the vibration damper.
7. Allow the engine oil to drain off for 15 minutes.
8. Retighten the primary flow oil filter.
9. Pour in the specified engine oil quantity for the engine type in question (with filter change).
10. Drive the vehicle for a distance of at least 1,000 km/500 miles. Increasing the mileage will produce significantly better measuring results.
    Measurement procedure:
11. Check the engine for leaks; if the engine is not tight, the examination will not be meaningful.
12. Prepare the measuring container to be able to capture the oil quantity.
13. Allow the engine to run at idling speed for 5 minutes, during which the engine oil temperature must not drop below 90 °C.
14. Unscrew the main flow oil filter cover (the engine oil will flow back into the oil sump from the oil filter housing).

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15. Unscrew the oil drain plug.
16. Allow the engine oil to drain off for 15 minutes.
    If necessary, remove the fan/fan cowl.
17. Turn the engine once through 360 degrees by the vibration damper.
18. Allow the engine oil to drain off for 15 minutes.
19. Weight the **amount of drained engine oil**. (Engine oil has a density of about 0.86 g/cm³ at room temperature.)

$$\text{Engine oil consumption} = \frac{\text{Amount of oil added (cm³) - amount of oil drained off (g): 0.86 g/cm³}}{\text{mileage reading when draining - mileage reading when adding engine oil}}$$

Example:

Volume of oil added at mileage reading 44,800: 4.000 cm³

Weight of oil added at mileage reading 45,900: 2.700 g

$$\text{Engine oil consumption} = \frac{\text{4.000 cm3 - 2.700 g : 0.86 g/cm³}}{\text{45,900 km - 44,800 km}} = 0.78 \text{ cm³/km}$$

0.78 cm³/km = 0.78 l/1,000 km

Test certificate for engine oil consumption:

Vehicle data: _____

BMW (type): _____

Chassis number: _____

Added oil quantity (in ccm): _____ ccm at kilometre reading:_____

less drained off oil quantity (in g) : 0.86 (g/ccm) _____ ccm at kilometre reading:_____

=> oil consumption: _____ ccm => mileage: _____ km

Oil consumption [l/1000 km] =

_____ *[ccm] oil consumption* _____ [km] mileage

Oil consumption after balancing out: _____ l/1000 km

Oil grade: _____

Oil grade: _____

Viscosity: _____

Cause of damage: _____

_____ _____

Dealer address Signature

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11 00 ... Engine oil consumption measurement

Procedure for engine oil consumption measurement, see following documents:

- Engine oil consumption measurement (all without S85)
- Engine oil consumption measurement (only S85 with one oil drain plug)
- Engine oil consumption measurement (only S85 with two oil drain plugs)
- Record on oil consumption measurement

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11 . . . . . Equipment recoding special tool number of the transverse member for fixing the engine in the installation location

Equipment recoding from 00 0 200 to 00 6 0 000

Designation	Special tool new	Special tool previous
Cross-member, previous	---	00 0 200
Cross-member, new	00 6 000	---
Mounting bridge	00 6 001	00 0 201
Spindle with hook	00 6 002	00 0 202
Extension	00 6 003	00 0 203
Adapter support	00 6 004	00 0 204
Extension	00 6 005	00 0 205
Chain with hook	00 6 006	00 0 209
Set of supports	00 6 010	00 0 206
Set of supports	00 6 020	00 0 207
Set of supports	00 6 030	00 0 208
Connector	00 6 031	---
Profile strip (2 x)	00 6 032	---
Supports (4 x)	00 6 033	---
Set of supports	00 6 040	---
Profile strip	00 6 041	00 0 451
Supports (2 x)	00 6 042	00 0 452
Supports, short (2 x)	00 6 043	---
Set of supports	00 6 050	---
Profile strip (2 x)	00 6 051	---
Supports, short (2 x)	00 6 052	---
Supports, long (2 x)	00 6 053	---
Support, long	00 6 060	---
Supports (2 x)	00 6 070	---

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11 00 ... Handling components after flood damage

Flood damage can occur if the permissible fording depth of a vehicle is exceeded. Ingress of water can cause damage to the engine (water shock) or components.

Because dirt particles generally enter into the component with the water (e.g. starter motor, wiring harness), the components need to be thoroughly inspected.

Residual moisture in the components leads to corrosion (increased contact resistance in the component), which can lead to a component failure at a later time.

If water ingress into the electrical components cannot be ruled out, it is recommended to replace the component to ensure correct functioning through the vehicle lifetime.

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11 00 Mounting engine on assembly stand (N55)

Special tools required:

- 00 2 300
- 11 8 541
- 11 8 542

Important!

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

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

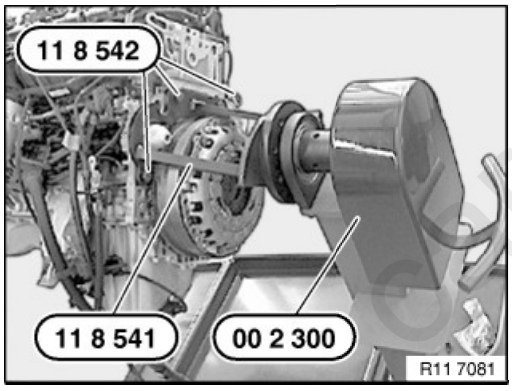
For reliable identification:

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

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

Necessary preliminary tasks:

- Remove engine



Use special tool 11 8 541 to mount engine on special tool 00 2 300 .
Mount engine or engine block with special tool 11 8 542 on 11 8 541 .

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11 00 ... Overview of consumables (Electronic Parts Catalogue)

1.0 Sealing compound for **injection**.

	Repair instructions (engine)	Designation, Electronic Parts Catalogue	Part number, Electronic Parts Catalogue	Application examples
1.1	S55, S65, S85	Loctite 171000 primer	83 19 7 515 683	For hardening Loctite 193140 sealing compound
1.2	S55, S65, S85	Loctite 193140 liquid sealing compound	83 19 0 439 030	Sealing between crankcase upper and lower halves
1.7	W20	Dow Corning liquid sealing compound	07 58 0 397 777	Sealing between crankcase upper and lower halves Sealing of oil sump

2.0 Sealing compound for **application**.

	Designation in repair instructions	Designation, Electronic Parts Catalogue	Part number, Electronic Parts Catalogue	Application examples
2.1	M41, M47, M47TU, M47T2, M50, M51, M52, M52TU, M54, M57, M57TU, M57T2, M60, M62 N12, N14, N16, N18 N20, N26 N40, N42, N45, N45N, N46, N46N, N43, N47, N47top, N47C N47D1 N51, N52, N52N, N53, N54, N55, N57, N57T, N62, N62TU, N63, N63O1 N73, N73H, N74 S14, S38, S50, S52, S54, S62, S65, S85	Drei Bond 1209 liquid sealing compound	07 58 9 062 376	For sealing junction points on crankcase
2.2	N12, N13, N14, N16, N18, N20, N26, N40, N42,N43, N45, N46, N51, N52, N53, N54, N55 W10, W11, W16,	Loctite 5970 liquid sealing compound	83 19 0 404 517	Sealing between crankcase upper and lower sections.
2.2	N47top, N47D1, N47C1 N57D1 N57S1, B32 ,B36 ,B37 ,B38 ,B42 ,B46 ,B47 ,B48 ,B57 ,B58	Loctite 5970 liquid sealing compound	83 19 0 404 517	Timing case cover sealing, oil sump, coolant pump, component carrier.
2.3	N12, N14, N16, N18 W16	Loctite 648 liquid sealing compound	07 58 9 067 732	Sealing between the seal plug and crankcase
2.4	N12, N13, N14, N16, N18 W16	Loctite 121078 liquid sealing compound	83 19 2 223 765	Sealing between cover sleeve and crankcase

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3.0 **Cleaning agent**.

	Designation in repair instructions	Designation, Electronic Parts Catalogue	Part number, Electronic Parts Catalogue	Application examples
3.1	N12, N13, N14, N18, N20, N26, N45, N46, N45T, N46T, N43, N51, N52, N52Kp, N52TU, N53, N55, N63, N63S, N63 Hybrid, N63O1, N63O2 N73, N74 B37, B38 B47, B48, B58	Cold cleaner (chlorine free)	83 19 0 026 956	Cleaning assemblies, washing engine
3.2	M47, M47T1 M47T2, M57 M57T1, M57T2 N47 K/U/O/T 0/1 N47C	Universal cleaner	83 19 2 360 981	Clean intake pipe.
3.3	All	Brake cleaner	83 19 2 365 214	Clean.

4.0 Lubricant for **application**.

	Designation in repair instructions	Designation, Electronic Parts Catalogue	Part number, Electronic Parts Catalogue	Application examples
4.1	N12, N13, N18, N20, N26, N42, N46, N46TU, N51, N52, N52KP, N52TU, N55, N62, N62TU, N63O0, N63O1, N63O2, N73 S55, S63T0 B38, B48, B58	Lubricating grease Longtime PD1	83 19 2 160 340	For greasing the splined shaft on actuator drive/gearing of intermediate shaft.
4.2	M47, M47TU, M47T2, M57, M57TU, M57T2,	High-temperature assembly paste	83 23 0 309 003	For greasing the thread on the exhaust turbocharger.
4.3	N12, N13, N14, N16, N18 N20, N26, N40, N42, N45, N45TU N46, N46TU, N43. N51, N52, N52Kp, N52TU, N53, N54, N55. N62, N62TU, N63O0, N63O1, N63O2 N73, N73H, N74. S63T1, S65, S85. B38, B48, B58	High temperature paste	83 19 2 158 851 83 19 2 158 852	For greasing the threads on the oxygen sensors.

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4.4	N47, N47O1 N47C1, N47T N47D1 N57 N57D1 N63O0, N63O1, N63O2 S63, S63T0	Copper paste	81 22 9 400 794	For greasing the double hex head bolt on the exhaust turbocharger. For greasing the central bolt on the VANOS gear.
4.5	M47, M47TU, M47T2 M57, M57TU, M57T2 N47, N47O1 N47C1, N47T N47D1 N57 N57D1	High-temperature grease (UrethynE2).	83 23 0 441 070	For greasing the injectors or injector shafts. Solenoid valve and piezo injector.
4.6	N47T0, N47T1 N57T0, N57T1, N57S1 B47T0,	Assembly paste	83 29 9 407 778	For lubricating the O-rings of the pressure pipes. Multistage turbocharging assembly.
4.7	W20	Assembly paste, grease	No longer greased.	For greasing the torsion splined shaft.
4.8	N63O1, N63O2	Assembly paste, grease	83 23 9 407 778	For greasing the central bolt on the crankshaft.
4.9	W20	Assembly paste, grease	83 23 9 407 778	Grease O-ring on alternator.

5.0 lubricant for **filling**

	Designation in repair instructions	**Designation, Electronic Parts Catalogue**	**Part number, Electronic Parts Catalogue**	**Application examples**
5.1	M47, M57	Exhaust turbocharger additive	83 19 2 362 168	For filling the exhaust turbocharger after the renewal.
5.2	B32, B36, B37, B38, B42, B46, B47, B48, B58	Exhaust turbocharger additive, petrol MSP	83 19 2 457 276	For filling the exhaust turbocharger after the renewal.

6.0 Lubricants to loosen locked **screw connections.**

	Designation in repair instructions	**Designation, Electronic Parts Catalogue**	**Part number, Electronic Parts Catalogue**	**Application examples**
6.1	M47, M47TU, M47TU2, M57, M57TU, M57TU2. N47, N47C, N47D1, N57, N57D1, N57S1 W16, W17, B37, B47, B57	Brunox lubricating grease	83 23 0 418 567	For releasing the glow elements.
6.2	E89 F10, F11.	Brunox lubricating grease	83 23 0 418 567	For releasing and tightening the screw connection of the rubber mounts.

7.0 **Leak detection spray and contact spray**

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	Designation in repair instructions	Designation, Electronic Parts Catalogue	Part number, Electronic Parts Catalogue	Application examples
7.1	Petrol: N13, N20, N26, N54, N55 B38, B48, B58 Diesel fuel: M47, M47TU, M47TU2, M57, M57TU, M57TU2. N47, N47C, N47D1, N57, N57D1, B37, B47	Leak detection spray	83 19 9 407 861	Check charge air path for tightness. Example: leakage on charge air hose or charge air cooler.
7.2	S55	Contact spray	81 22 9 400 208	For cleaning and protecting of electrical plug connections.

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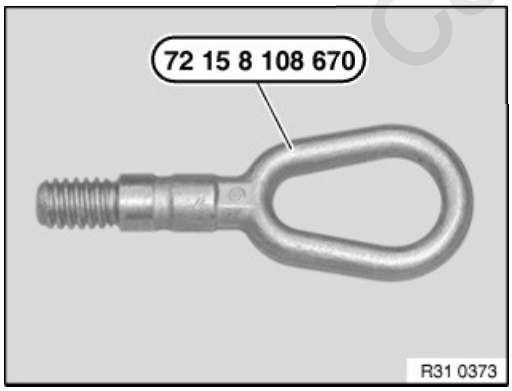
11 00 050 Removing and installing engine (N55)

Special tools required:

- 11 0 000
- 11 7 310
- 11 8 680
- 13 5 281
- 13 5 282

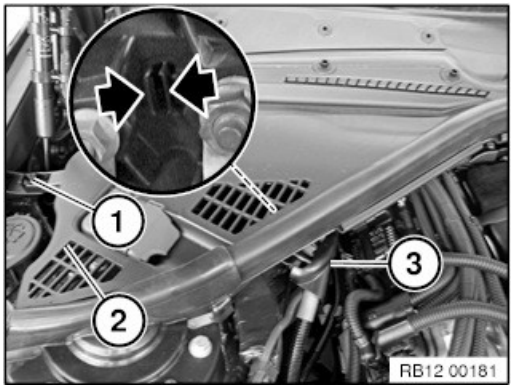
Necessary preliminary tasks:

- Disconnect negative battery lead.
- Move engine compartment lid into service position.
- Remove intake plenum.
- Remove cowl panel cover.
- Remove clean air pipe.
- Remove left charge air duct.
- Remove right charge-air duct.
- Remove expansion tank.
- Remove thermostat.
- Remove rear ignition coil cover.
- Remove air conditioning compressor.
- Remove the catalytic converter.
- Remove transmission.
- Remove front output shaft (all-wheel drive vehicles only).
- Remove radiator.
- Detach all coolant hoses from engine.
- Detach vacuum line from brake booster.



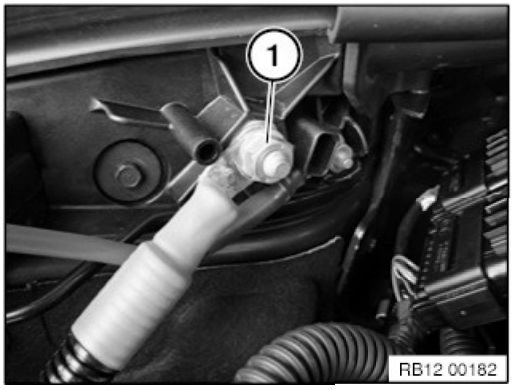
To remove or install the engine, the towing hook 72 15 8 108 670 is required.

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Pull off rubber mount (1) and slightly raise service cover (2) until lock of cover (3) is accessible.

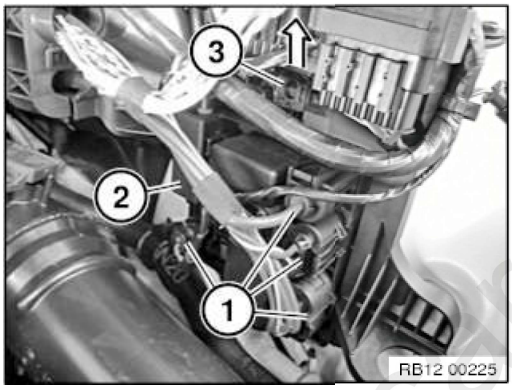
Unlock lock and remove cover (3).



Slacken nut (1).

Tightening torque 12 42 3AZ.

Remove positive battery cable from positive battery connection point.



Unlock and pull off all connectors (1) from power distribution module.

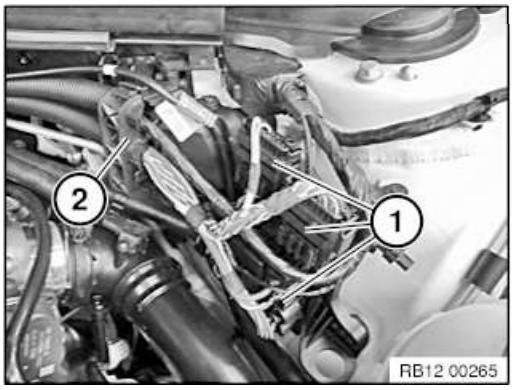
Remove cover (2).

Release nut beneath it and set positive battery cable aside.

Tightening torque 12 52 7AZ.

Release lock (3) in direction of arrow.

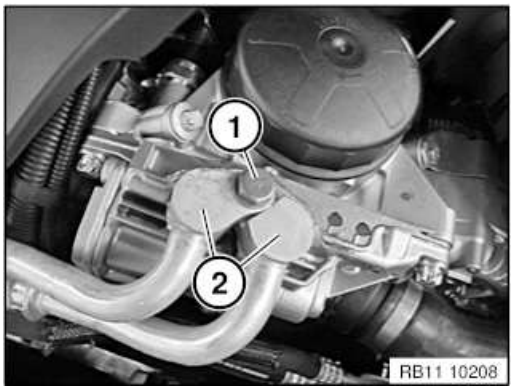
Feed out and remove power distribution module.



Unlock and pull off the connector (1) from the power distribution module and cable holders.

Release the clamp (2) and expose the wiring harnesses.

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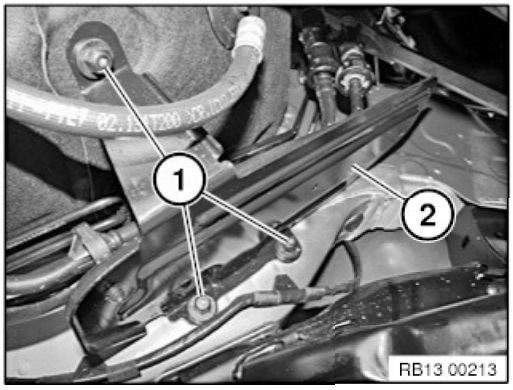


Note:
Hot-climate version

Loosen screw (1).

Remove oil pipes (2) from oil filter unit.

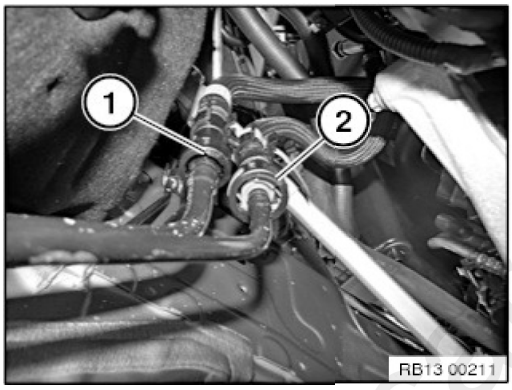
Release oil lines on cylinder head cover.



Unscrew nuts (1).

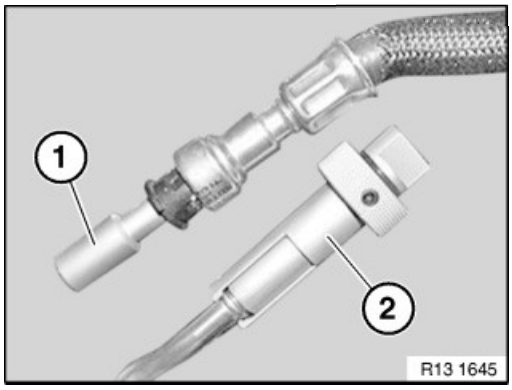
Remove power protective plate (2).

Release fuel lines from protective plate.



Unlock and disconnect fuel tank ventilation line (1).

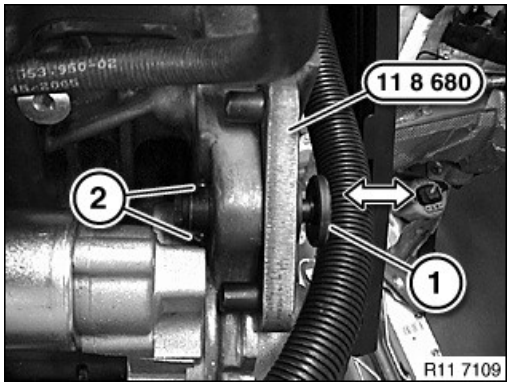
Unlock and disconnect fuel delivery line (2).



Close off fuel line (3) with special tool 13 5 281 .

Close off fuel line (2) with special tool 13 5 282 .

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Installation of special tool 11 8 680 on rear lifting eye (transmission side).

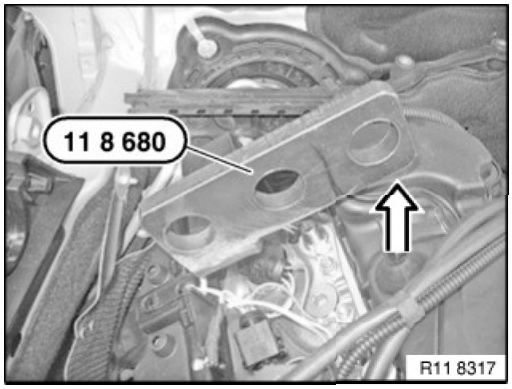
Position special tool 11 8 680 in the lifting eye with ball lock pin (1) pressed.

Pull ball lock pin (1) toward the rear until both balls (2) are pushed outward.

Installation note:
Checking the correct installation of special tool 11 8 680 .

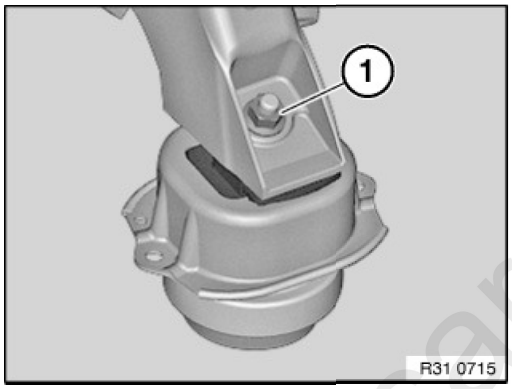
There must be a 6.5 mm gap between ball lock pin (1) and ball lock pin housing.

The gap dimension can be checked using a 6.5 mm drill.



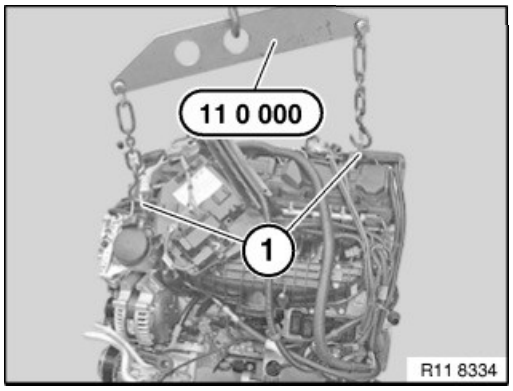
Attach special tool 11 0 000 to engine crane.

Suspend special tool 11 0 000 from the designated mounting eyelets of special tool 11 8 680 only (see arrow).



Release nut (1) on engine mount on left and right.*Installation note:*
Replace self-locking nuts.

Tightening torque 22 11 2AZ.



Screw towing eye into cylinder head.

Tightening torque 11 12 5AZ.

Suspend special tool 11 0 000 from the designated mounting eyelets (1) only.

Lift engine out with engine crane.

Assemble engine.

Check function of DME.

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00 Safety information for working on vehicles with automatic engine start-stop function (MSA)



Warning!

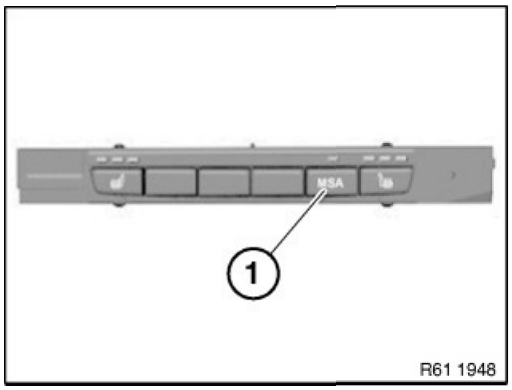
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

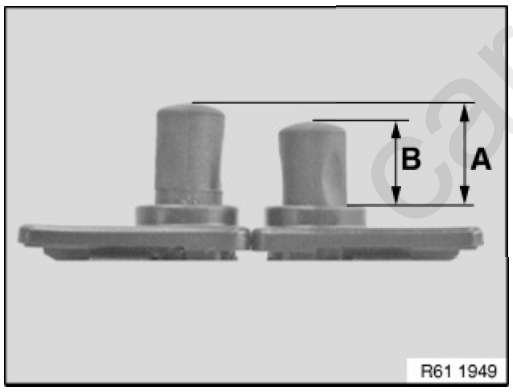
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.



When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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00 Safety instructions for handling oil



Warning!

Danger of poisoning if oil is ingested/absorbed through the skin!

Risk of injury if oil comes into contact with eyes and skin!



Recycling:

Observe country-specific waste disposal regulations.



Measures if oil is unintentionally released:

- Personal precautionary measures: Danger of slipping! Keep non-involved persons away from the work area. Wear personal protective clothing/equipment.
- Environmental protection measures: Prevent oil from draining into drain channels, sewerage systems, pits, cellars, water and the ground.
- Limiting spread: Use oil blocks to prevent the surface spread of oil.
- Cleaning procedure: Bind and dispose of escaped oil with nonflammable absorbents.

  Note: Do not flush oil away with water or aqueous cleaning agents.

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11 00 670 Securing engine in installation position

Special tools required:

- 00 6 100
- 00 6 130
- 00 6 050
- 00 6 053
- 00 6 070
- 00 6 071
- 00 6 072

Warning!

Danger of injury!

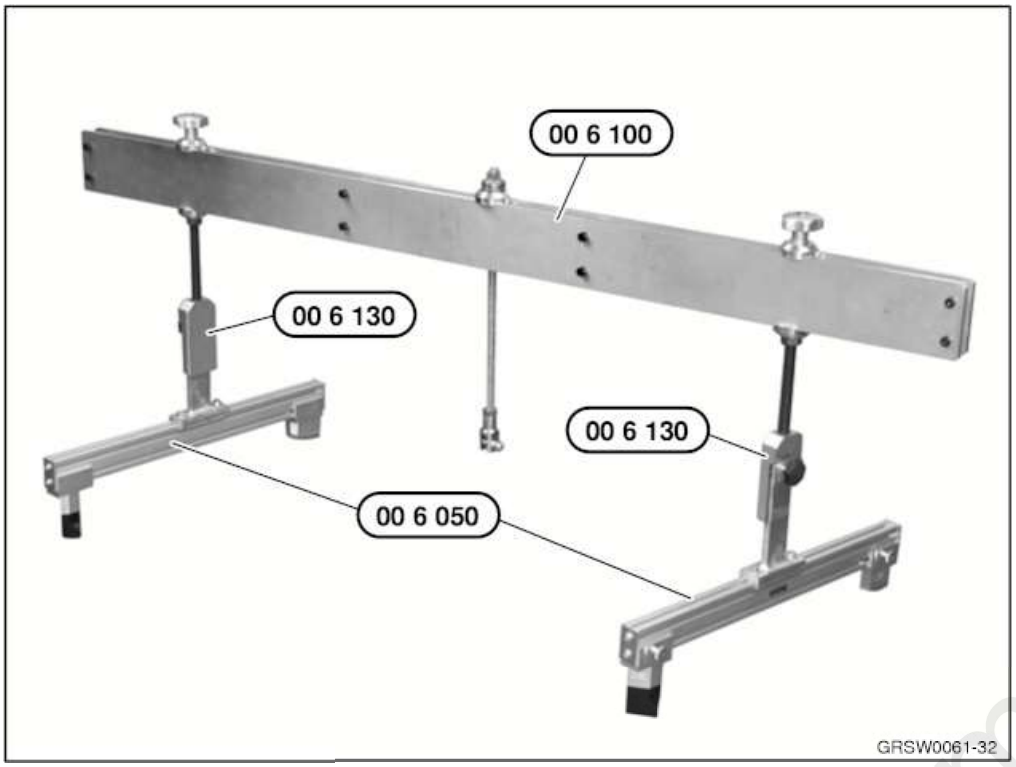
Observe following instructions relating to special tool:

1. Prior to each use, check the special tools for defects, modifications and operational reliability.
2. Damaged/modified special tools must not be used!
3. No changes or modifications may be made to the special tools!
4. Keep special tools dry, clean and free of grease.

Note:

- Numbering system for special tools has been re-encoded.

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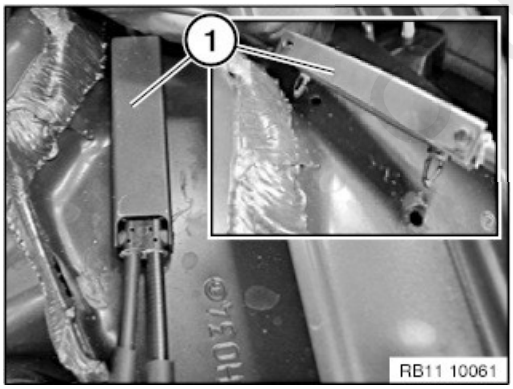


Special tools

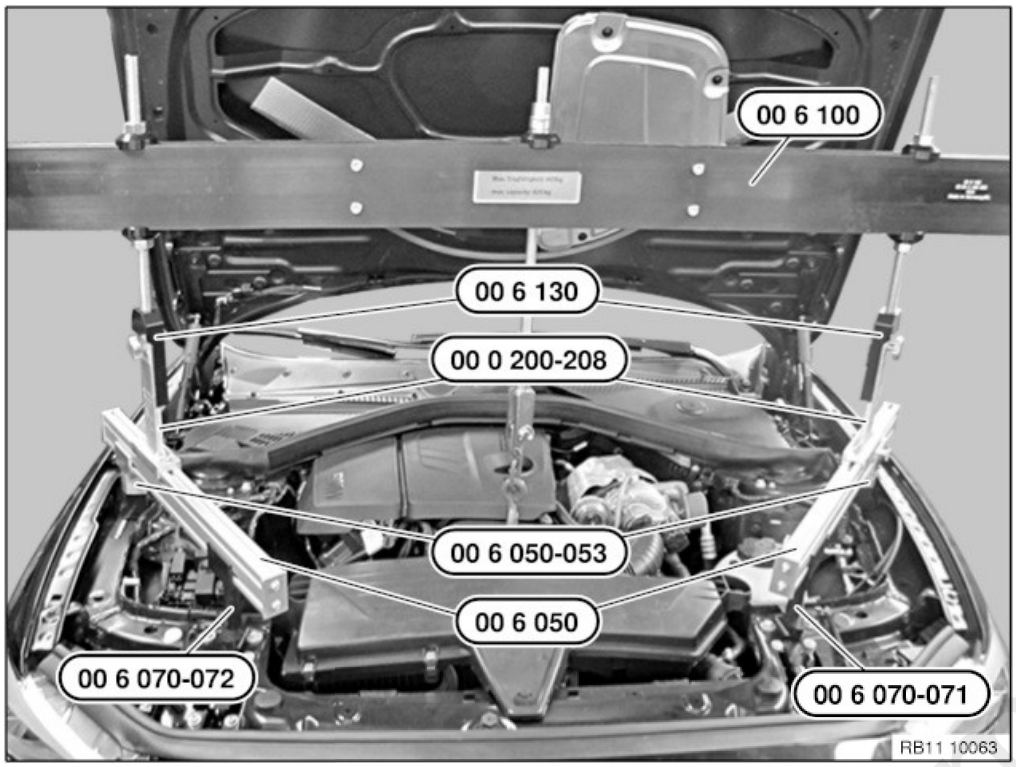
Necessary preliminary work:

- Secure the engine compartment lid in the service position.
- Remove front underbody protection.
- F33 convertible only, remove front-end struts.

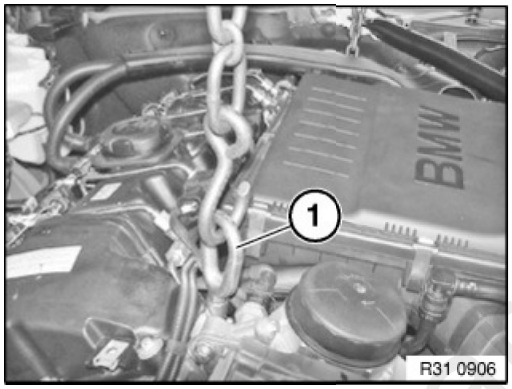
Assemble cross-member 00 6 100 with special tools, 00 6 130 , 00 6 050 , 00 6 053 , 00 6 070 , 00 6 071 , 00 6 072 .



Unclip Bowden cable (1) for hood opening.



Fit cross-member 00 6 100 with a 2nd person helping.



Screw towing hook (1) into engine block.

Attach chain to towing eye.

Warning!

Danger of injury!

Tighten down all screws and nuts on cross-member 00 6 100 .

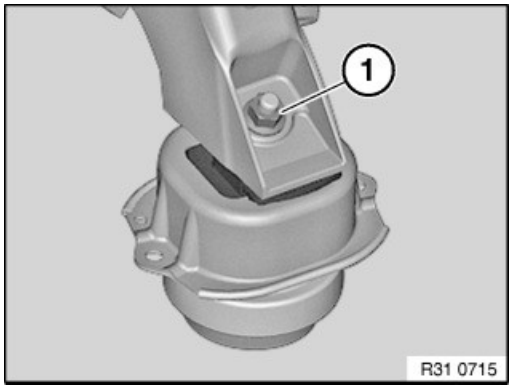
Caution!

Before lifting the engine, check the lifting lugs for damage (cracks) and to ensure they are seated securely.

Avoid a change of engine position in the transverse or longitudinal direction!

Always make sure there is sufficient clearance between the engine (or its add-on parts) and the body.

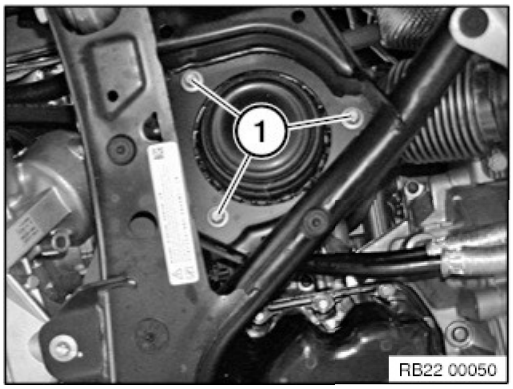
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Note:
4WD

Release bolts (1) on engine mount.

Tightening torque 22 11 2AZ.



Note:
Rear-wheel drive

Release screws (1) from both engine mounts.

Raise engine approx. 10 mm with cross member.

Tightening torque 22 11 1AZ.

Caution!

Observe installation note!

To ensure play between engine mount and front axle support, lower the engine completely before tightening the screw connection (engine mount/front axle support).

Tightening torque 22 11 1AZ.

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11 00 ... Service - engine oil (N55)

Special tools required:

- 11 9 240

Warning!

Risk of scalding!

Carry out work on the vehicle only when wearing oil- and heat-resistant protective gloves incl. forearm protection, face guard and protective apron.

Attention!

Carry out engine oil service only when the engine is at operating temperature.

Observe the exact engine oil filling capacity.

Overfilling the engine with engine oil will result in **engine damage**.

Attention!

Risk of damage!

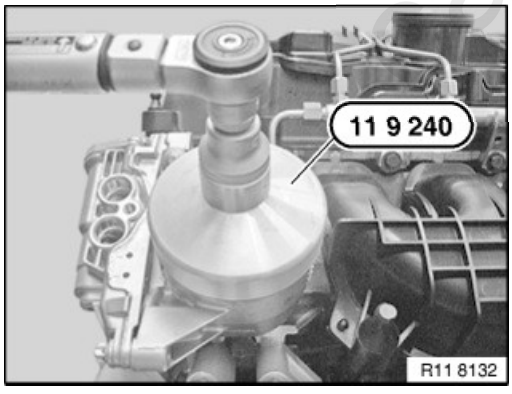
Protect belt drive against dirt.

Cover with suitable materials.

Recycling:

Catch and dispose of drained engine oil in a suitable collecting vessel.

Observe country-specific waste disposal regulations.

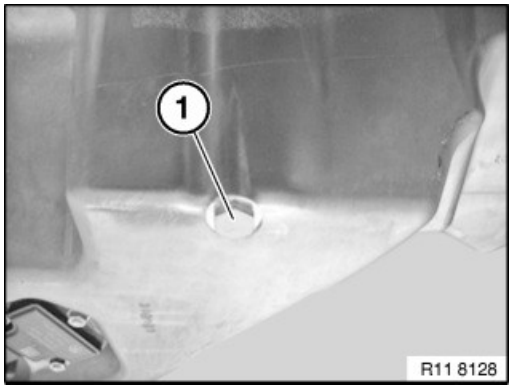


Release oil filter cover with special tool 11 9 240 .

Tightening torque 11 42 1AZ.

Note:
Engine oil flows out of the oil filter housing and back into the oil sump.

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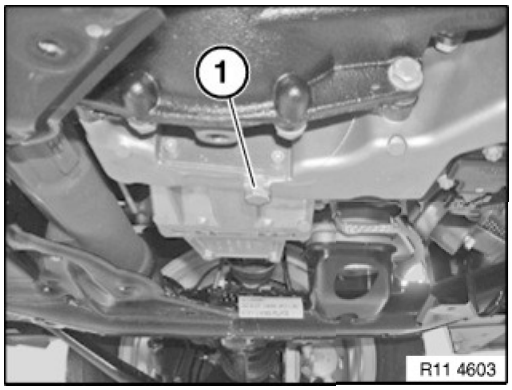
Rear wheel drive:

Open oil drain plug (1) on oil sump.

Drain engine oil.

Installation note:
Replace sealing ring.

Tightening torque 11 13 1AZ.

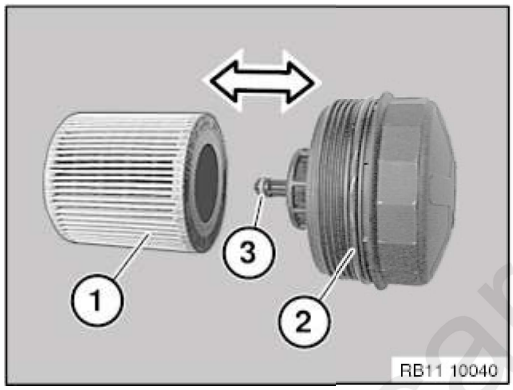


Four-wheel drive:

Open oil drain plug (1) of oil sump and drain engine oil.

Installation note:
Replace sealing ring.

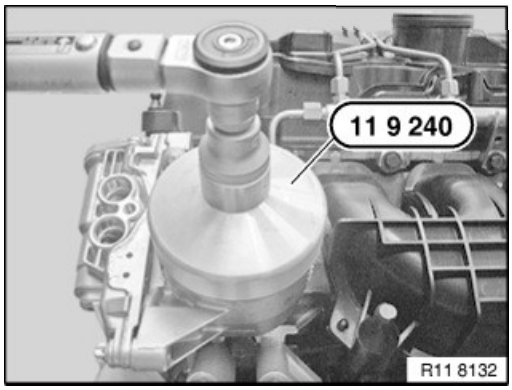
Tightening torque 11 13 1AZ.



Remove and insert oil filter element (1) in direction of arrow.*Installation note:*
Replace oil filter element (1) and sealing ring (2).

Replace gasket (3) and renew if necessary.

Note:
Coat sealing rings (2,3) with engine oil.



Secure oil filter cover with special tool 11 9 240 .

Tightening torque 11 42 1AZ.

Note:
Pour in engine oil.

Start engine and run at idle until oil pressure indicator light goes out.

Switch off engine.

Check oil filter cover and oil drain plug of oil sump for tightness.

Assemble engine.

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Recommendation: Check engine oil level:

- Park vehicle on a horizontal surface
- Allow engine to run at operating temperature for three minutes with increased engine speed (about 1100 rpm)
- Read off engine oil level in instrument cluster or on control display
- Top up engine oil if necessary

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11 12 729 Checking cylinder head for water leaks (N55)

Special tools required:

- 11 4 342
- 11 4 344
- 11 7 190

Important!

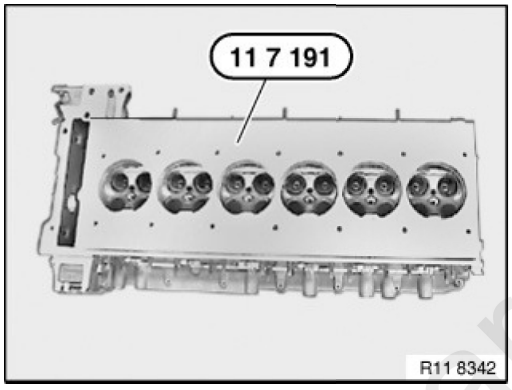
Pressure-test cylinder head to max. **3** bar.

Heat cylinder head to 60 °.

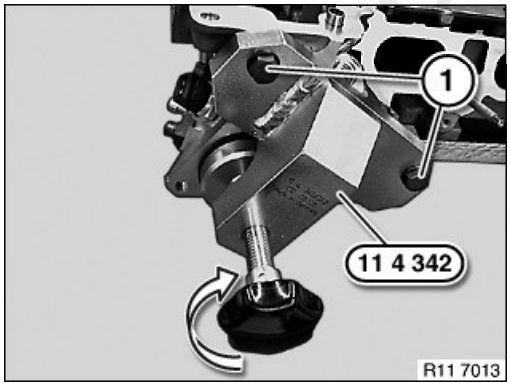
Check for bubble formation in a water bath.

Necessary preliminary tasks:

- Remove cylinder head.
- Disassemble cylinder head.



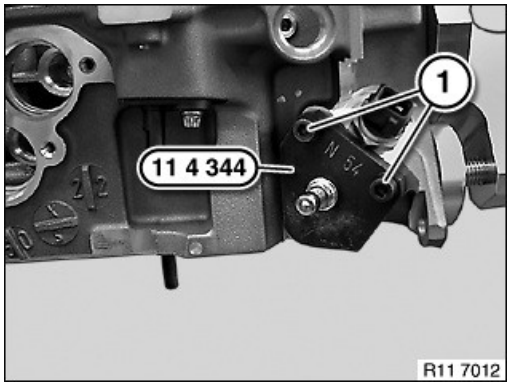
Fit special tool 11 7 190 .*Installation note:*
Secure special tool to 15 Newton metres.



Fit special tool 11 4 342 with screws (1). Screw in knurled screw in direction of arrow.

Sealing flange must rest flat.

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Secure special tool 11 4 344 with bolts (1).*Note:* Compressed air at valve max. **3 bar**.

Heat cylinder head to 60 °.

Check for bubble formation in a water bath.

Assemble engine.

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11 12 670 Cleaning intake port with walnut shell granulate (N55)

Special tools required:

- 81 29 2 208 037
- 81 29 2 208 033

Attention!

Wear personal protective clothing/equipment!

Wear safety goggles and protective gloves.

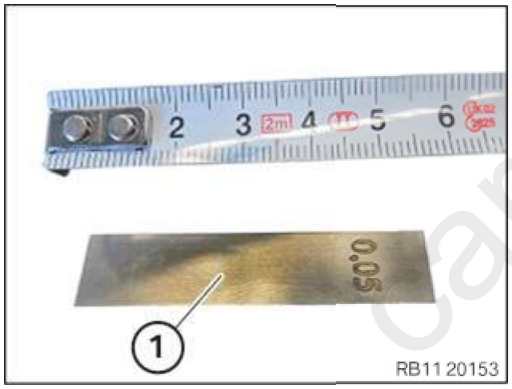
Attention!

Make sure all parts are absolutely clean.

Protect or seal all removed components as well as all exposed openings/connections against the entry of any foreign bodies/contamination!

Necessary preliminary work:

- Remove intake plenum.



Attention!

The blow-by ducts must be covered up.

Granular material may not enter the cylinder head cover. If granular material enters the blow-by ducting areas of the cylinder head cover, it must be replaced.

Cover up blow-by ducts:

Use commercially-available feeler gauge tape 0.05 mm, cut 6 pieces to a length of approx. 5-6 mm.

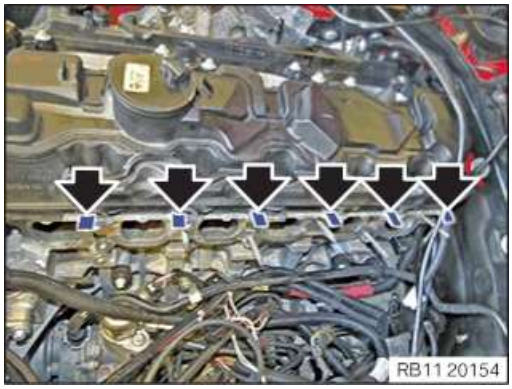
Attention!

Risk of damage!

Deburr the cutting edges and round off using fine-grained sandpaper.

If this is not observed the seal and sealing surfaces will be damaged!

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Remove cylinder head cover.

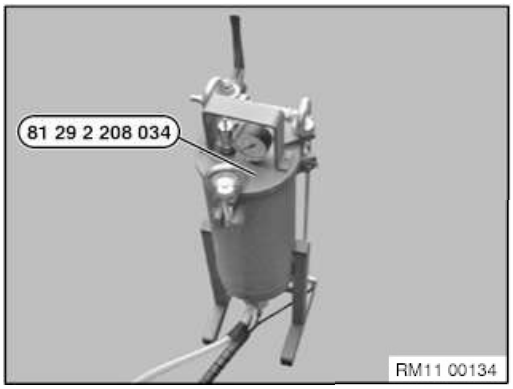
Position with the aid of a second person or by applying a drop of grease to the blow-by bore hole (see graphic).

Mount cylinder head cover with new seal.

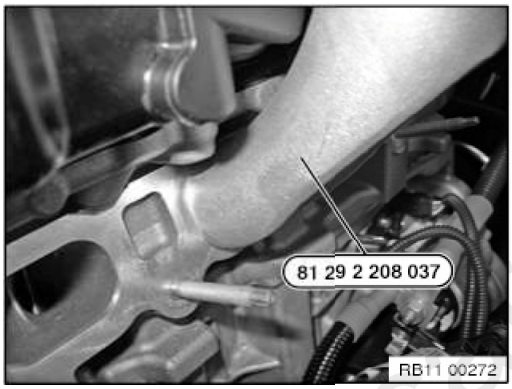
The injection valves are open 3-4 mm too far (piston close to BDC).

Slowly turn the crankshaft at the central bolt in the direction of rotation until the intake valves start to close.

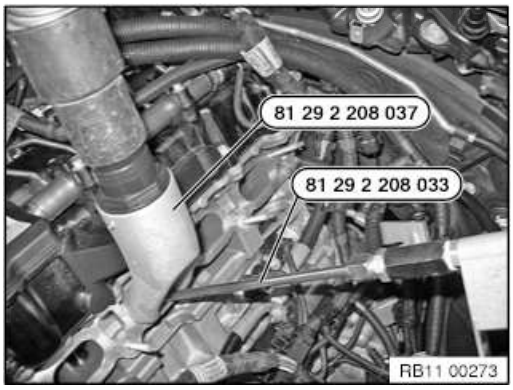
Stop turning when the opening gap is 3-4 mm.



Prepare blasting device (81 29 2 208 034) with walnut shell granulate.



Position vacuum adapter 81 29 2 208 037 on intake port of the cylinder to be cleaned.



Connect vacuum cleaner to vacuum adapter 81 29 2 208 037 and switch on (check function).

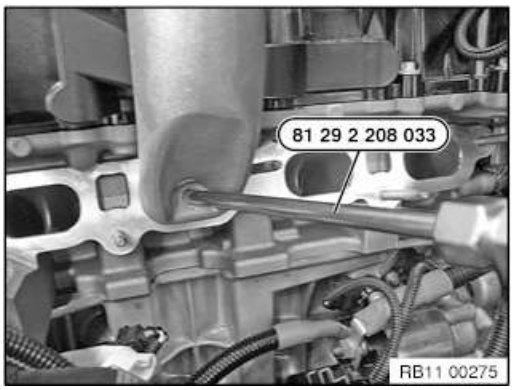
Connect compressed air connection.

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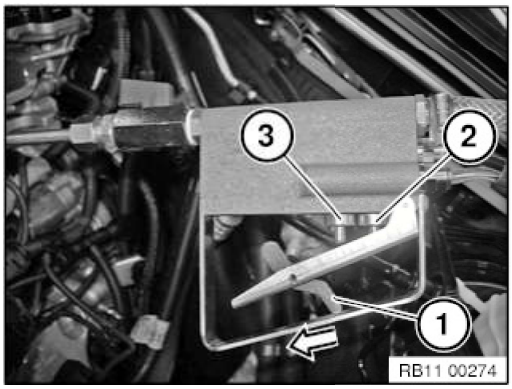
Attention!

Make sure that the extractor functions correctly and that it is activated.

An extractor that does not function properly can cause severe damage to the engine components.



Insert probe 81 29 2 208 033 at extraction adapter 81 29 2 208 037 .



Attention!

The extractor must be switched on.

Slide locking lever (1) to the front in direction of arrow.

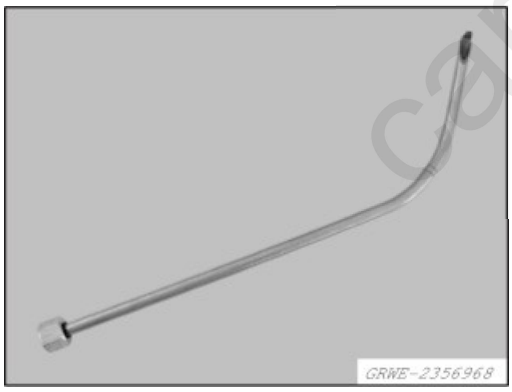
Actuate compressed air valve (2). Compressed air can now stream in.

Actuate valve (3). Walnut shell granulate is injected.

Cleaning:

Cleaning time approx. 30 seconds.

Clean both intake valves and the intake port by swivelling the blasting wand to and fro.



To achieve a better cleaning result, the 2 208 034 blasting wand may be used.

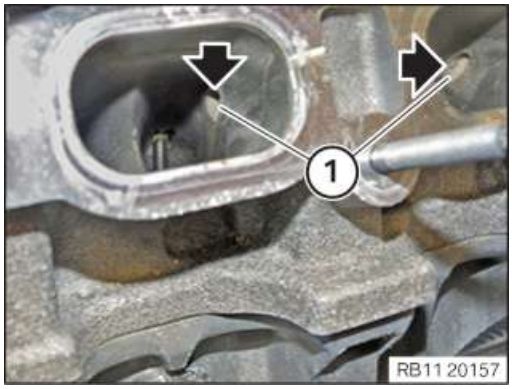
After this, remove the spark plug on cylinder 1.

Use compressed air over the spark-plug hole to blow for approx. 10 to 15 seconds into the combustion chamber to whirl up the granular material in the combustion chamber to then draw it off through the intake port. If necessary, position the vacuum cleaner hose alternately at the spark plug shaft and the intake port to blow compressed air into the intake port or the spark-plug hole.

Using an endoscope, check the level of cleanliness in the combustion chamber / spark plug shaft/intake port/valves/etc., if necessary, repeat the procedure until all the granular material has been removed.

Note:
To blow out the combustion chamber etc., use a blow out/air gun with a sufficiently long lance.

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Clean all blow-by ducts (1) using compressed air (granular material sticks to oily/greasy surface).

Using the BMW brake cleaner (BMW part number 83 19 2 365 214) carefully flush the granular material residue out of the blow-by bore holes then carefully blow them out using compressed air. (Cover up with rags at same time)!

Finally, thoroughly wash down the intake port/intake valves using the BMW brake cleaner (BMW part number 83 19 2 365 214) then blow dry with compressed air.

Using an endoscope, check the level of cleanliness in the combustion chamber / spark plug shaft/intake port/valves/etc., if necessary, repeat the procedure until all the granular material has been removed!

Attention!

All the granular material grains must be completely removed from the combustion chamber/intake port!

If any residue remains on the piston crown/intake port and the crankshaft is then turned, the pistons/valves/valve gear will be damaged!

Danger of explosion!

Flash off brake cleaner.

Do not suck up any highly inflammable substances, e.g. brake cleaner using the vacuum cleaner!

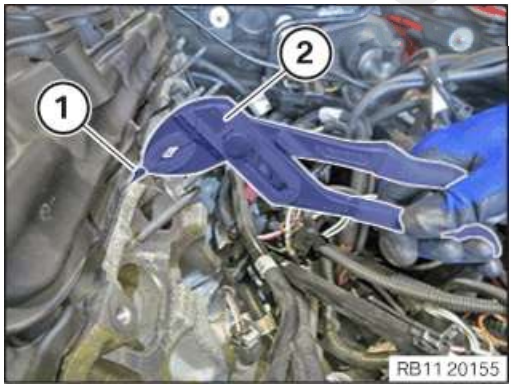
Observe brake cleaner user information!

Note:
Check that no walnut shell granulate remains in the intake port.

Continue to turn the crankshaft at the central bolt in each case through 120° so that each of the intake valves start to close again.

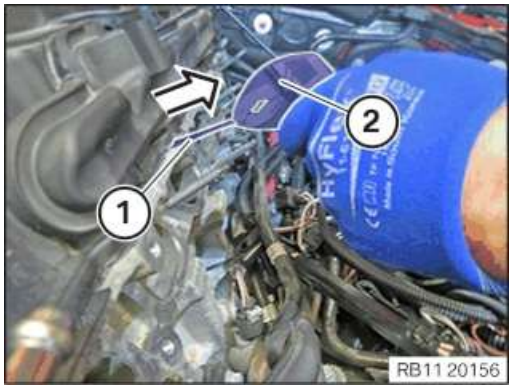
Stop turning when the opening gap is 3-4 mm.

Clean the individual intake ports according to the firing order (1 5 3 6 2 4).



Prepare suitable pair of pliers (2) at the feeler gauge (1).

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Use suitable pair of pliers (2) to pull all feeler gauges (1) in direction of arrow.

Assemble engine.

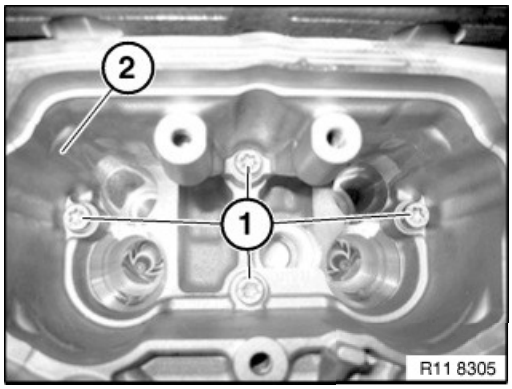
Carry out "Start-up after walnut-shell blasting" service function.

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11 12 040 Removing and installing all ignition coils and injector wells (N55)

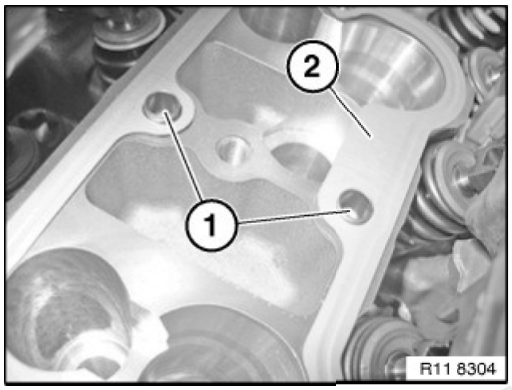
Necessary preliminary work:

- Remove cylinder head cover.
- Remove all injectors.



Release screws (1).

Tightening torque: 11 12 8AZ.



Check fitting bushes (1) for damage.*Installation note:*
Replace gasket (2).

Assemble engine.

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11 12 100 Removing and installing cylinder head (N55)

Special tools required:

- 11 0 320
- 11 4 420
- 11 4 430
- 11 4 471
- 11 4 472
- 11 8 580

Attention!

Fit new cylinder head bolts.

Do not wash off bolt coating.

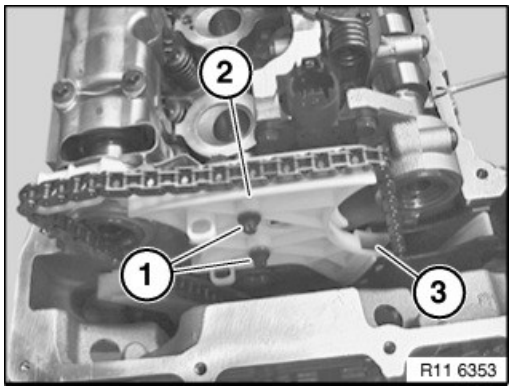
Lightly oil washer on the contact surfaces (both sides).

There must be no coolant, water or engine oil in the blind holes.

Risk of cracking and corrosion!

Necessary preliminary work:

- Remove exhaust system.
- Drain coolant.
- Drain engine oil.
- Remove engine.
- Mount engine on assembly stand.
- Remove all injectors.
- Remove intake plenum.
- Remove exhaust turbocharger with integrated exhaust manifold.
- Detach coolant hoses from cylinder head.
- Remove intake and exhaust camshaft adjusters.



Attention!

If the timing chain is stowed in the gear case, the crankshaft must no longer be rotated.

Release screws (1).

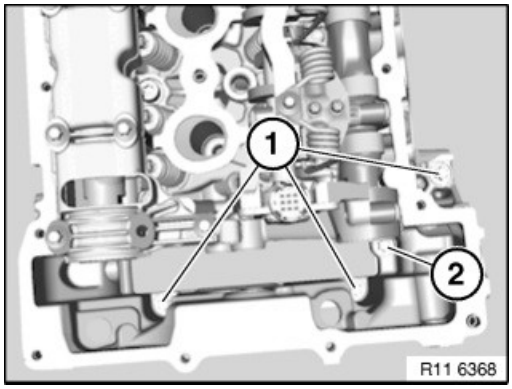
Tightening torque: 11 31 4AZ.

Unclip timing chain module (2) at separation point (3) and remove towards top.

Set down timing chain.

Note:
Graphic shows N52.

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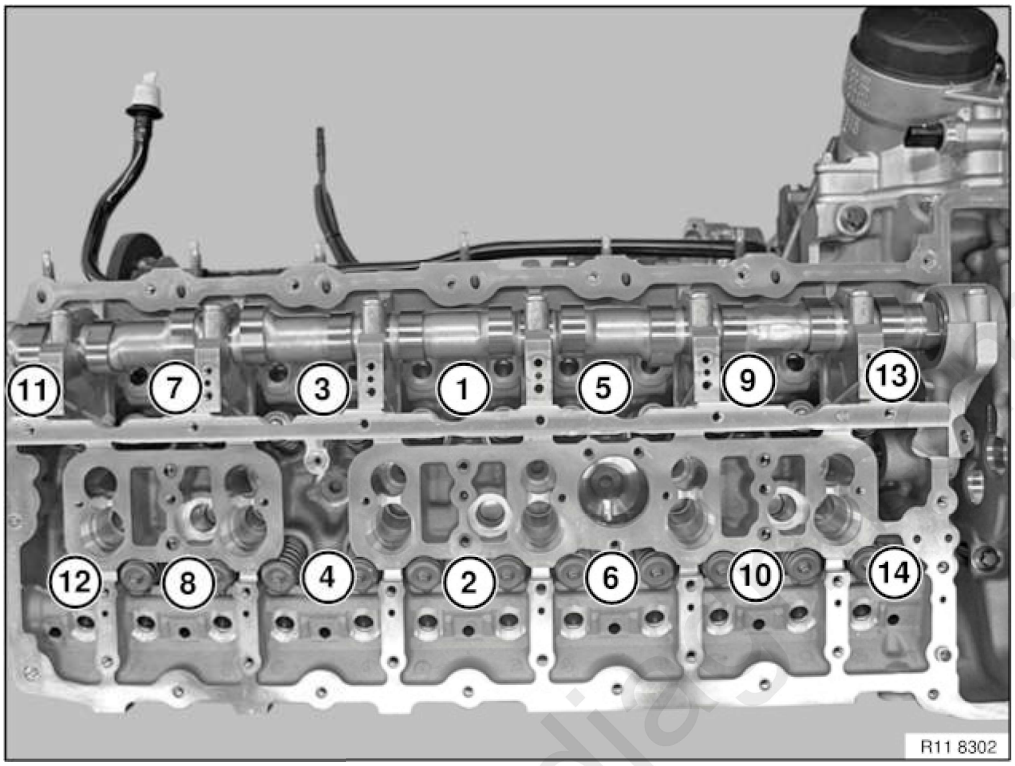
Note:
Bolt (2) can only be released when the timing chain module is pressed forward slightly.

Release screws (1).

Tightening torque 11 12 3AZ.

Release screw (2).

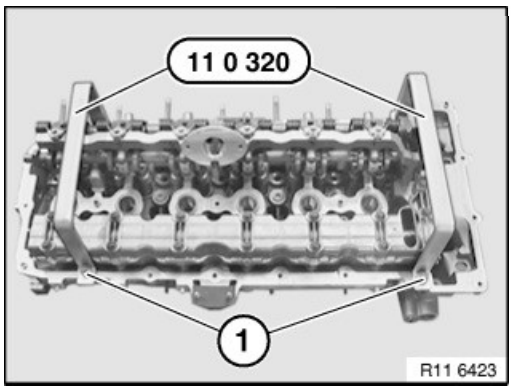
Tightening torque 11 12 3AZ.



Release cylinder head bolts in sequence 14 to 11 with special tool 11 4 420 .

Release cylinder head bolts in sequence 10 to 1 with special tool 11 8 580 .

Note:
Picture shows intermediate lever and exhaust camshaft removed.



Secure special tool 11 0 320 with bolts (1).

Tightening torque 11 12 4AZ.

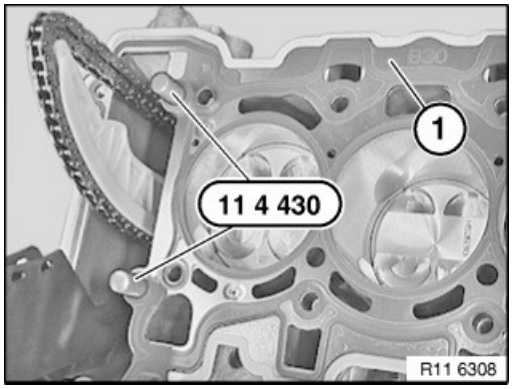
Attention!

Removing and install cylinder head with a second person helping.

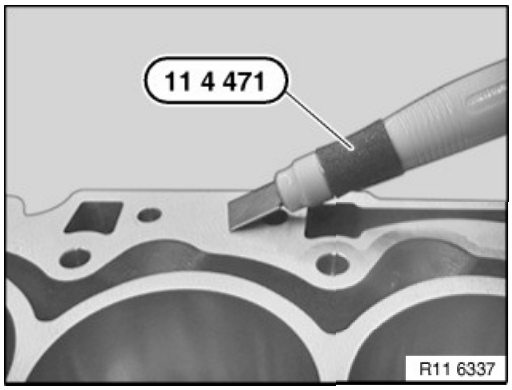
Weight of cylinder head with add-on parts is approx. 40 kg.

Do not rest cylinder head on sealing surface. **Risk of damage to valves!**

Note:
Graphic shows N52.

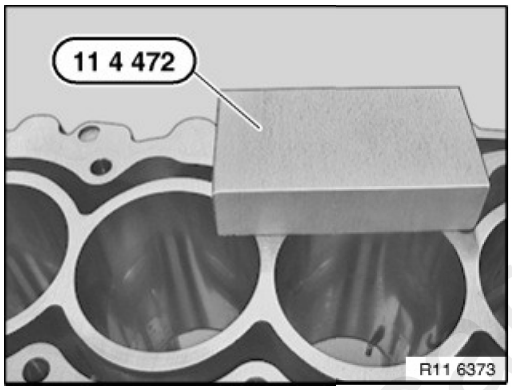


Insert 11 4 430 special tool into bore holes.



Remove coarse residues on sealing surfaces with special tool 11 4 471 from cylinder head and crankcase.**Attention!**

Do not use any metal-cutting tools.



Remove fine residues on sealing surfaces with special tool 11 4 472 from cylinder head and crankcase.

Attention!

Do not use any metal-cutting tools.

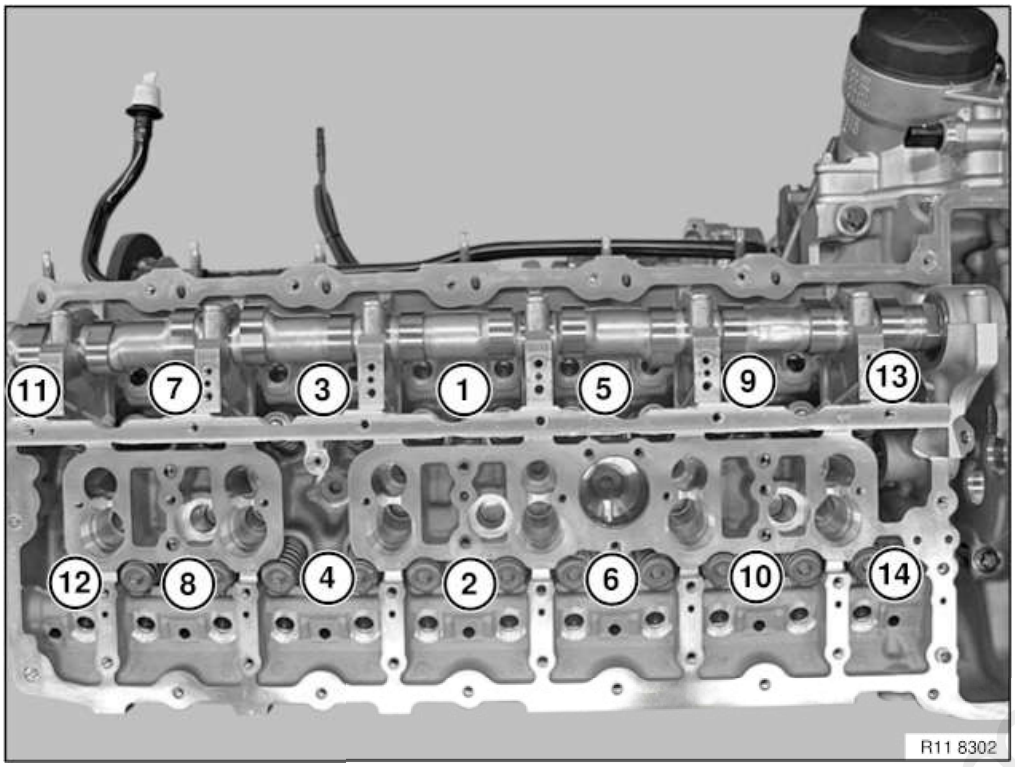
There must be no coolant, water or engine oil in the pocket holes.

Risk of cracking and corrosion!

Clean all blind holes.

Replace cylinder head gasket.

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Fit new cylinder head bolts.

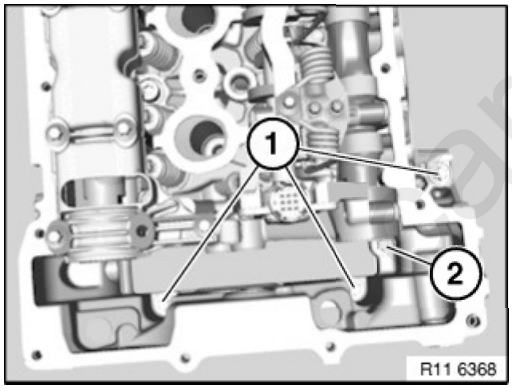
Insert cylinder head bolts (1 to 10) with special tool 11 8 580 .

Tightening torque 11 12 1AZ.

Insert cylinder head bolts (11 to 14) with special tool 11 4 420 .

Tightening torque 11 12 2AZ.

Note:
Picture shows intermediate lever and exhaust camshaft removed.



Insert bolts (1).

Tightening torque 11 12 3AZ.

Insert bolt (2).

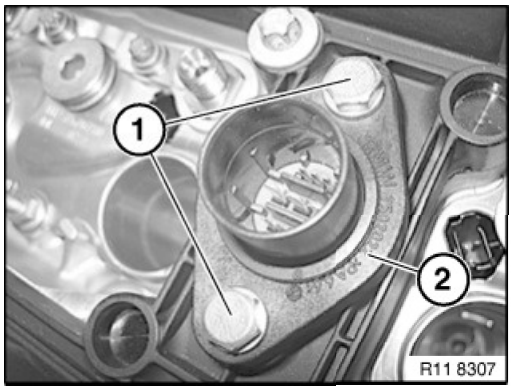
Tightening torque 11 12 3AZ.

Assemble engine.

11 12 000 Removing and installing/sealing cylinder head cover (N55)

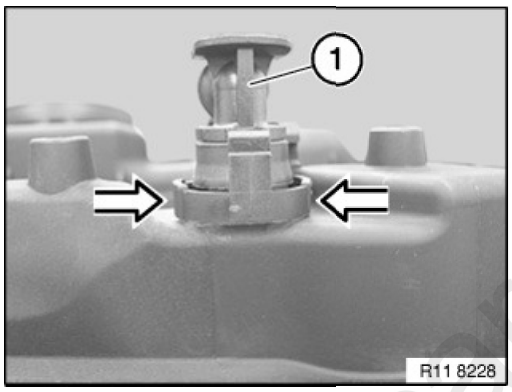
Necessary preliminary work:

- Detach the positive battery cables from the positive battery connection point
- Remove pressure lines
- Remove air duct
- Detach engine wiring harness in **area** of cylinder head cover.



Release screws (1).

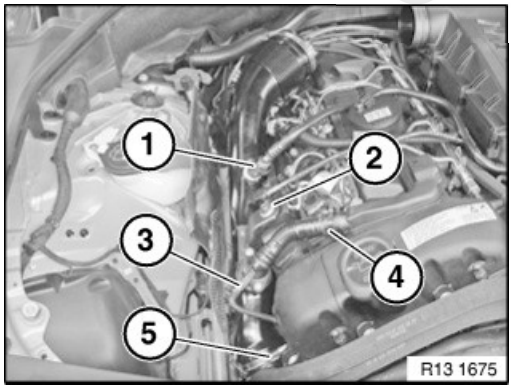
Remove flange (2).



If fitted:

Press and hold down the unlocking device on the vacuum line (1) on the vacuum reservoir (cylinder head cover) in the direction of the arrow.

Detach vacuum line (1) in upward direction.

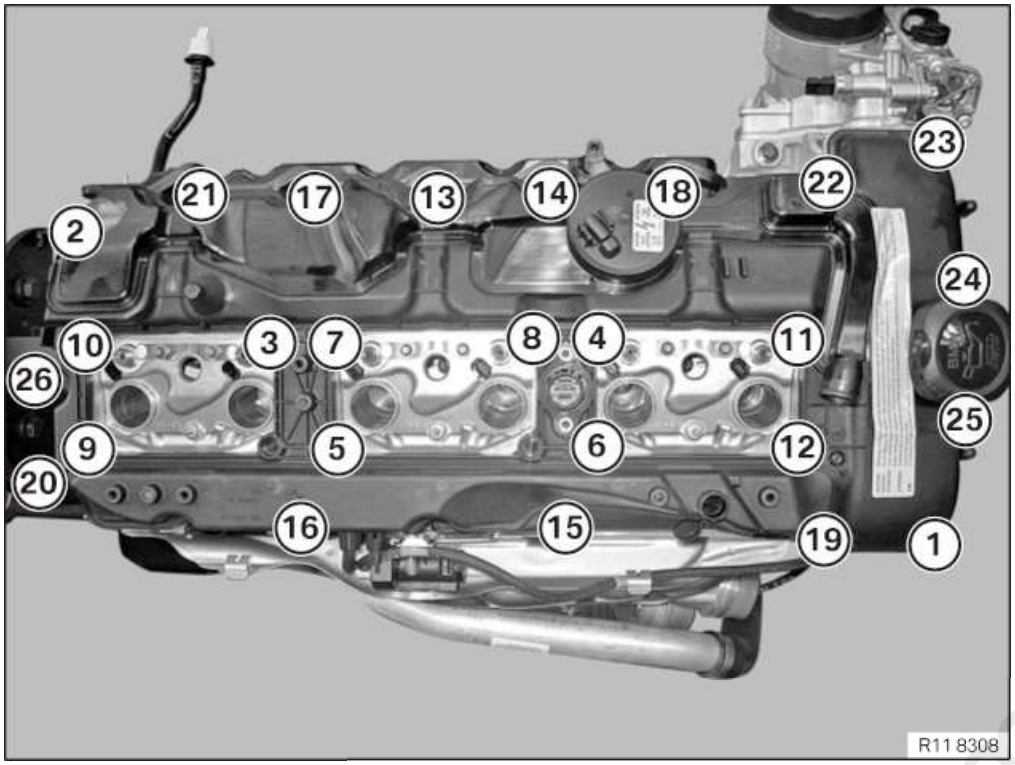


Caution!

Do not loosen the engine vent line (4) on the cylinder head cover.

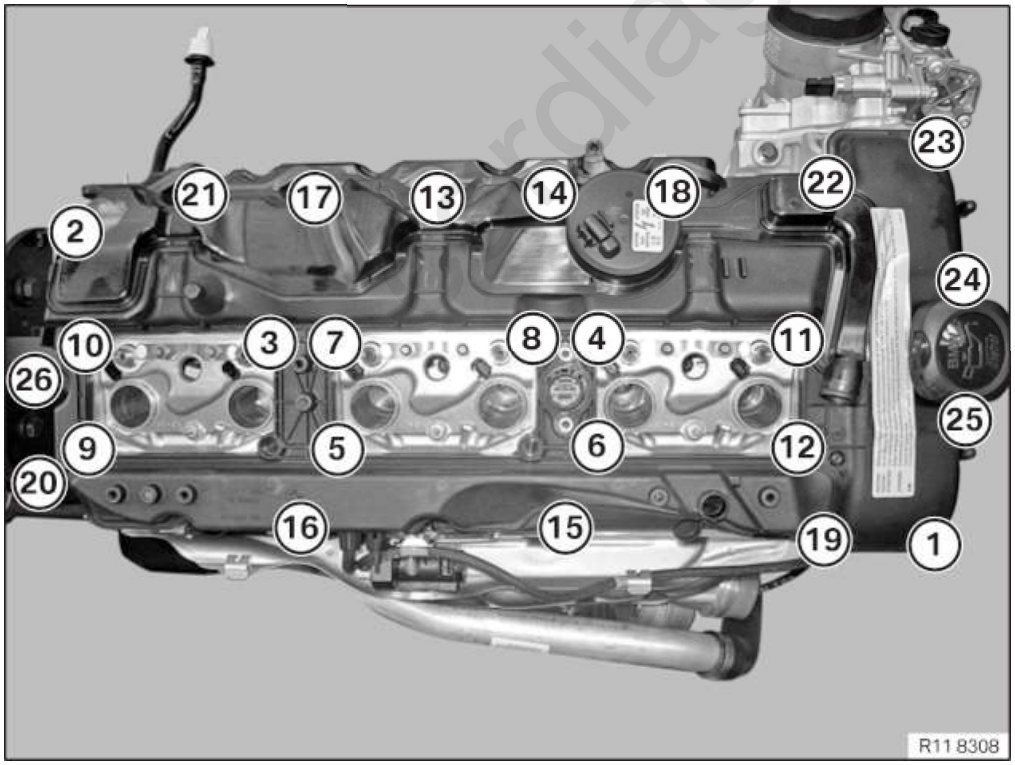
To dismantle the engine vent line, loosen the screws on the air intake system (3).*Note:*
When changing a faulty engine vent line, the clutch on the coupling on the cylinder head cover may be broken open.

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Release screws of cylinder head cover from outside inwards in 1/2 turns.
Remove cylinder head cover.

Replace all gaskets.



Fit cylinder head cover.
Insert screws of the cylinder head cover by 1/2 turn.
Tighten fit screws (1) using 8.5 Nm.
Tighten positional screw (2) using 8.5 Nm.
Tighten remaining screws of cylinder head cover in sequence 3 to 26.

Tightening torque: 11 12 4AZ.

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11 12 101 Replacing cylinder head gasket (N55)

Special tools required:

- 11 4 430
- 11 4 470

Important!

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

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

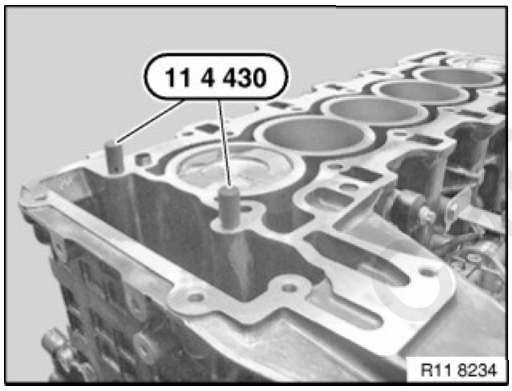
For reliable identification:

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

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

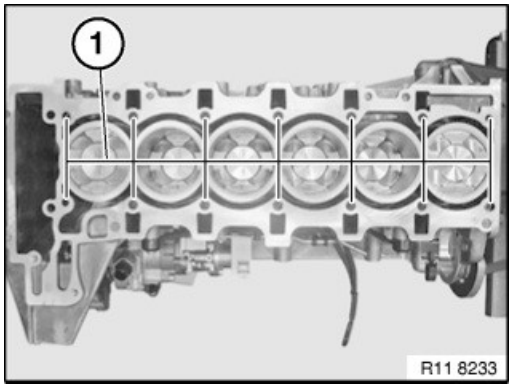
Necessary preliminary tasks:

- Remove cylinder head.
- Check cylinder head for deviation from flatness.
- Check cylinder head for watertightness.



Remove the cylinder head gasket.

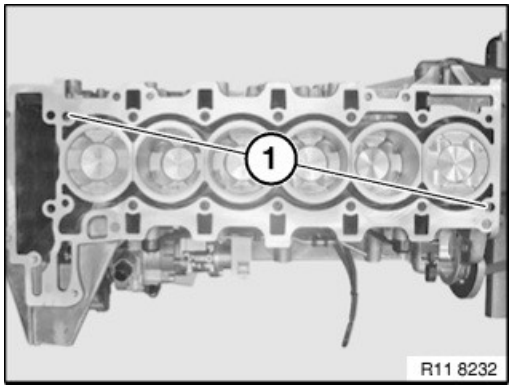
Insert special tool 11 4 430 into feed pipe of oil pump.



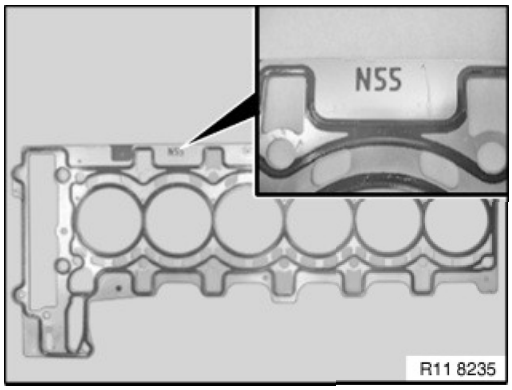
Remove remnants of oil and dirt from blind holes (1).**Important!**

Work on sealing surface on engine block and on cylinder head with special tool 11 4 470 only.

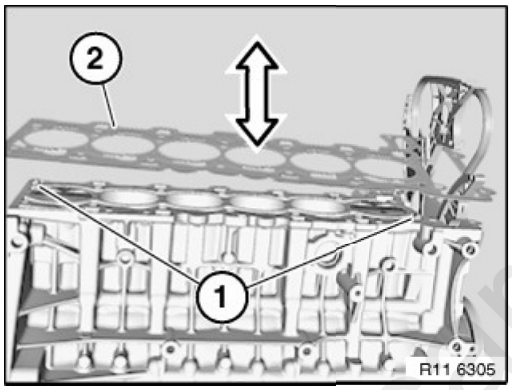
Do not use any metal-cutting tools.



Check adapter sleeves (1) for damage and firm seating.



The cylinder head gasket on the N55 is a beaded metal gasket.



Place cylinder head gasket (2) in direction of arrow on engine block.
Fix new cylinder head gasket with fitting sleeves (1).

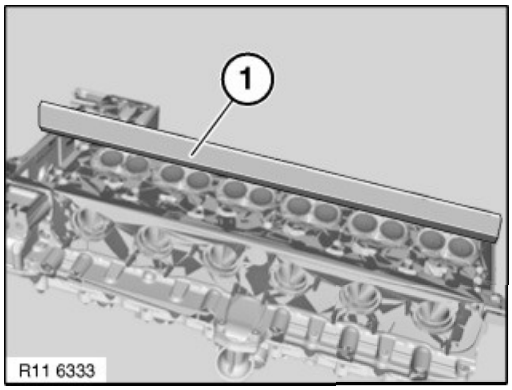
Assemble engine.

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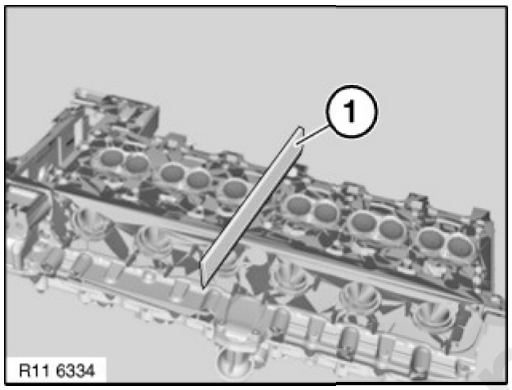
11 12 719 Resurfacing cylinder head lower face (N55)

Necessary preliminary tasks:

- Remove cylinder head.
- Remove exhaust camshaft.
- Remove intermediate lever on inlet side.



Check evenness of cylinder head sealing faces with a standard straightedge (1).*Note:*
Max. deviation from flatness (longitudinal) 0.10 mm



Check evenness of cylinder head sealing faces with a standard straightedge (1).*Note:*
Max. deviation from flatness (transverse) 0.05 mm

Check cylinder head for watertightness.

Assemble engine.

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