

**Special tools required:**

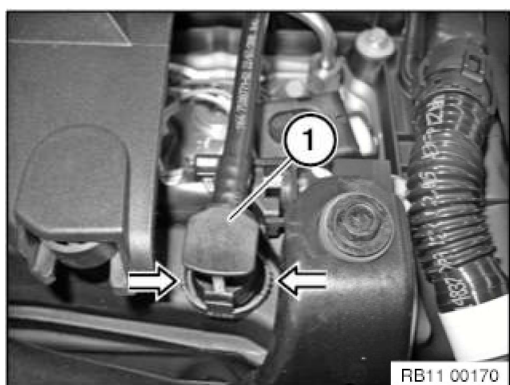
- 81 31 2 357 800

**Caution!**

Note the sequence of the diagnosis instructions in the **ISID**:

Depending on the fault pattern, the order of operations in the repair instructions may be different from the order of operations in the **ISID**.

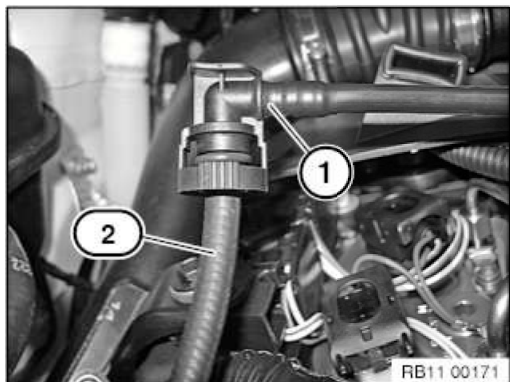
Carry out procedure to check the vacuum system.

**Check the function of the vacuum pump:**

Press and pull off the lock of the vacuum line (1) (see arrows).

Note:

This empties the vacuum reservoir, this will always be accompanied by a sucking noise.

**Check suction effect of vacuum pump.**

Connect vacuum line (1) and IMIB with special tool (2) 81 31 2 357 800 (previously: 81 38 2 201 924).

Start engine.

Run engine at idle speed.

Follow diagnosis instruction.

**Check vacuum reservoir.**

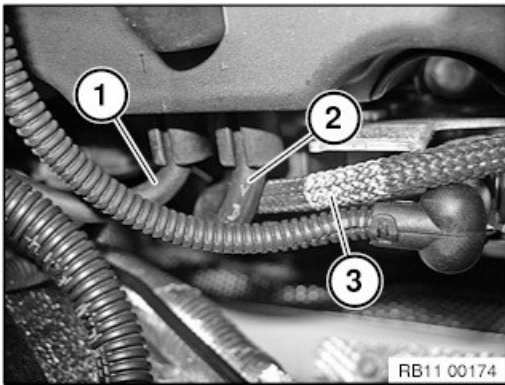
Reconnect vacuum line from vacuum pump to the vacuum reservoir.

Note:

When the **IMIB (1)** is used the absolute pressure is displayed.

Follow diagnosis instruction.





Pull off connection (1) at the vacuum reservoir to the exhaust flap.
Pull off connection (2) at the vacuum reservoir to the EPDW (pressure converter).

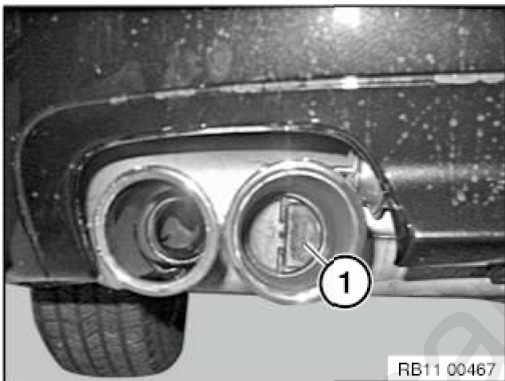


Check vacuum reservoir.

Seal connection on vacuum reservoir with sealing cap (1).

Connect vacuum reservoir and IMIB using special tool 81 31 2 357 800 (previously: 81 38 2 201 924).

Follow diagnosis instruction.

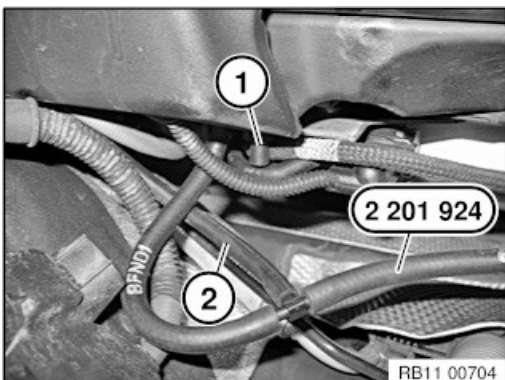


Functional check of exhaust flaps (if installed).

Checking function of exhaust flap (1).

Follow diagnosis instruction.

Illustration: E81.



Check suction operation on the exhaust flap.

Pull off the vacuum line to the EPDW at the vacuum reservoir and seal the connection at the vacuum reservoir with sealing cap (1).

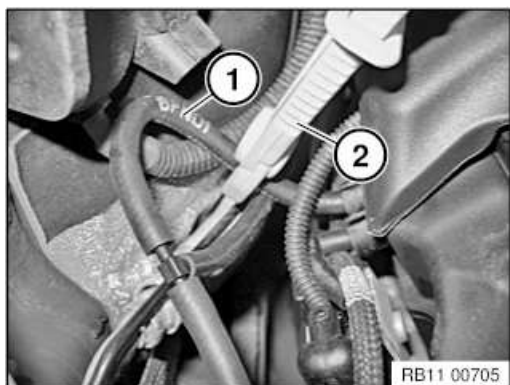
Pull off the vacuum line (2) to the exhaust flap and use special tool 81 31 2 357 800 (previously: 81 38 2 201 924) to connect it with the vacuum reservoir via the T-piece.

Note:

When the **IMIB** is used the absolute pressure is displayed.

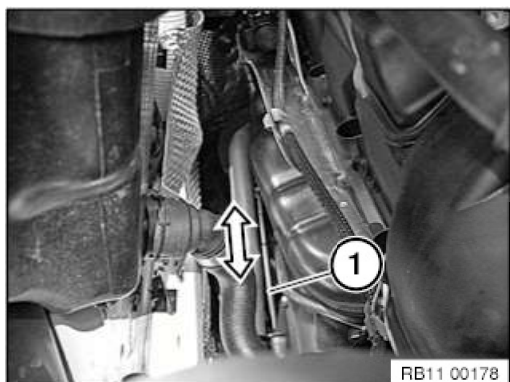
Follow diagnosis instruction.





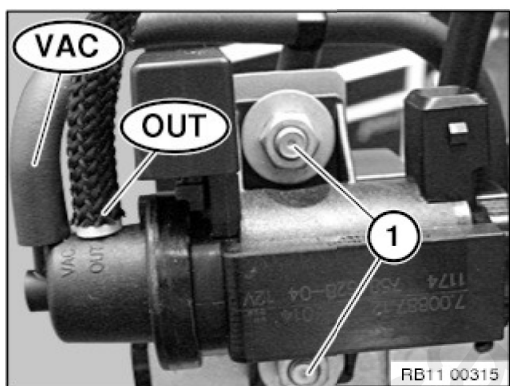
Leakage test of vacuum line to exhaust flap.

Disconnect vacuum line (1) with pliers (2) as shown in the graphic.
Follow diagnosis instruction.



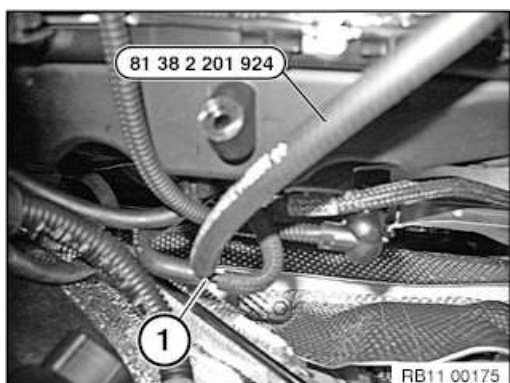
Check function of wastegate valve.

Initial setting of wastegate linkage (1).
Observe wastegate linkage (1); it must close following activation (arrowed).
Follow diagnosis instruction.



Pressure converter connections

Disconnect vacuum hose at connection (VAC = vacuum reservoir).
Disconnect vacuum hose at connection (OUT= turbocharger vacuum unit).



Leakage test of hoses to wastegate valve.

Pull vacuum line off pressure converter plug connection (OUT).
Pull vacuum line off pressure converter plug connection (VAC).
Connect both vacuum lines and special tool 81 31 2 357 800 (previously: 81 38 2 201 924) with one T-piece (1).
Follow diagnosis instruction.



Note:
Remove all special tools.
Reassemble the vehicle.

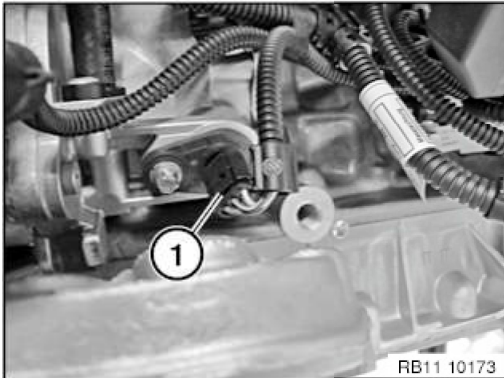


**Special tools required:**

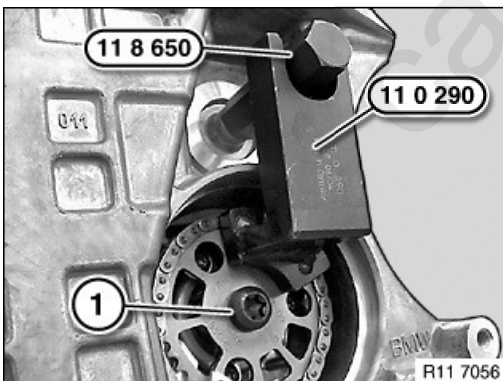
- 11 0 290
- 11 4 120
- 11 8 650

**Necessary preliminary tasks:**

- Remove drive belt.
- Remove tensioner for drive belt.
- Remove sealing cover for vacuum pump.
- Remove sealing cap of chain tensioner for oil pump.
- Remove high pressure pump.
- Disconnect vacuum line from vacuum pump.



Unlock connector (1) on vacuum pump and disconnect.



Rotate crankshaft at central bolt.

Turn sprocket wheel until drilled holes and screws of vacuum pump match up.

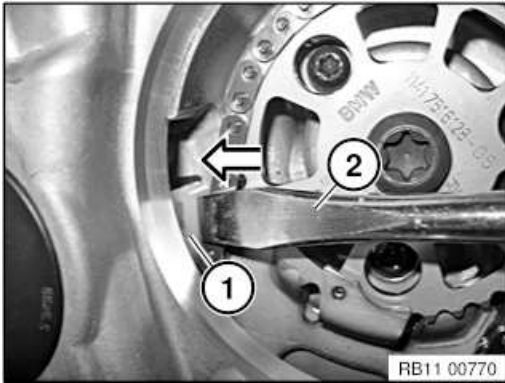
Screw in special tool 11 8 650 .

Secure special tool 11 0 290 in sprocket and to special tool 11 8 650 .

Release screw (1).

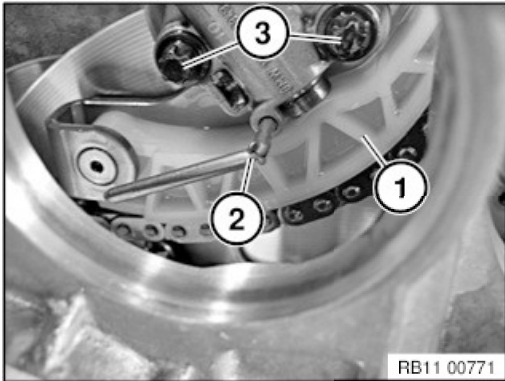
Tightening torque 11 66 2AZ.





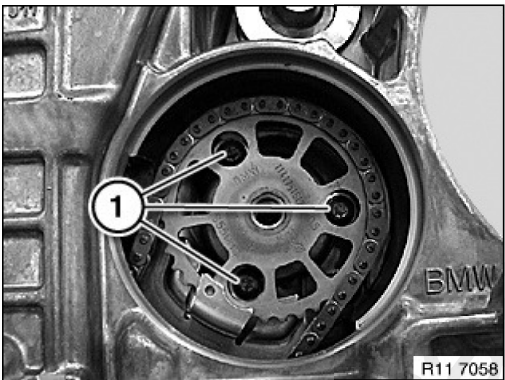
Carefully press tensioning rail (1) with a suitable screwdriver (2) in direction of arrow.

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



Press the tensioning rail (1) and hold down.

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

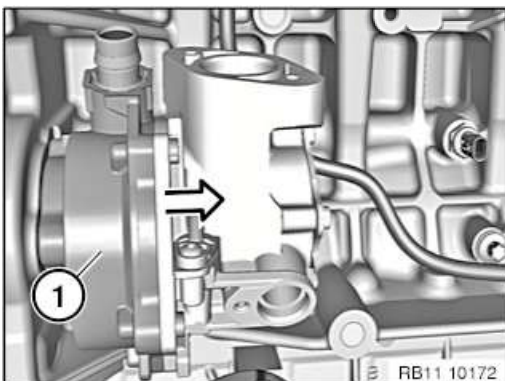


Release screws (1).

Tightening torque 11 66 1AZ.

Release screws (1).

Secure screws (1) against falling out.



Remove vacuum pump (1) in direction of arrow. *Installation note:*

Replace seal.



Assemble engine.



**Special tools required:**

- 11 7 030
- 11 9 150

**Warning!****Risk of burning!**

Work should only be carried out on an exhaust system that has cooled down.

*Necessary preliminary tasks:*

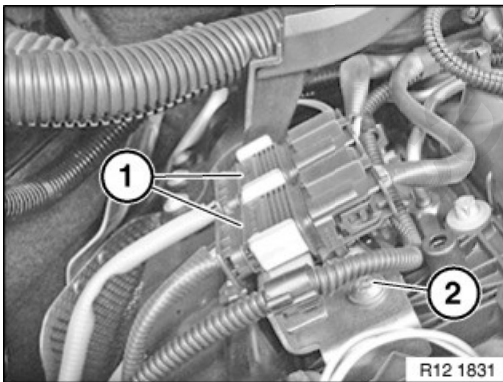
- Remove rear ignition coil cover.
- Remove the catalytic converter.

*Installation note:*

The threads of new monitoring sensors are already coated with NEVER-SEEZ compound (refer to BMW Parts Service).

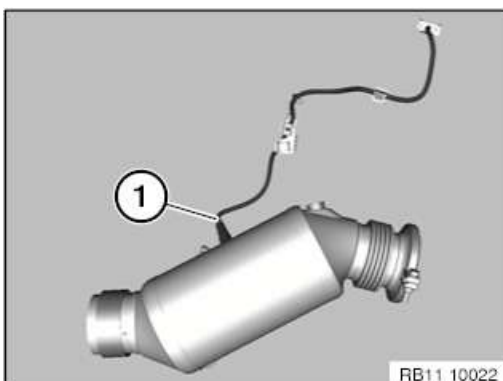
If a monitoring sensor is to be reused, apply a thin and even coating of NEVER-SEEZ compound to the thread only.

The part of the monitoring sensor which projects into the exhaust branch (sensor ceramics) must not be cleaned and not coated with lubricant.



Disconnect plug connection of monitoring sensor (1). *Installation note:* Cable colour of control sensor = black.

Cable colour of monitoring sensor = grey.



Remove monitoring sensor.

Tightening torque 11 78 2AZ.





Reassemble the vehicle.
Check function of DME.

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**Special tools required:**

- 11 7 030
- 11 9 150
- 11 4 260

**Warning!****Risk of burning!**

Work should only be carried out on an exhaust system that has cooled down.

**Installation note:**

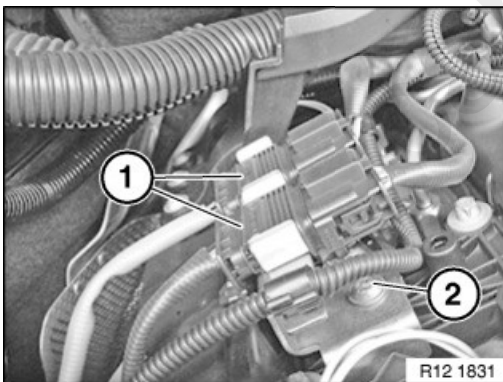
The threads of new oxygen control sensors are already coated with Never Seez Compound (refer to BMW Parts Department).

If a oxygen control sensor is to be reused, apply a thin and even coating of Never Seez compound to the thread only.

The part of the lambda control sensor which projects into the exhaust system branch (sensor ceramics) must not be cleaned and not coated with lubricant.

**Necessary preliminary tasks:**

- Remove rear ignition coil cover.

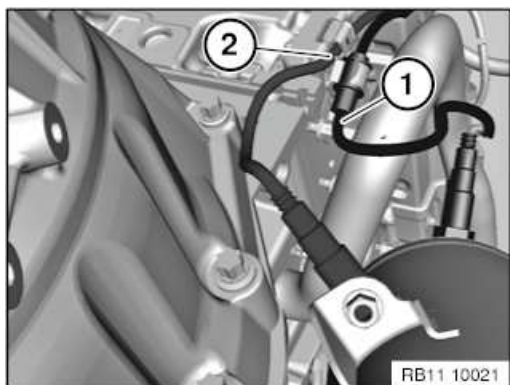


Disconnect plug connection on oxygen control sensor (1). *Installation note:*

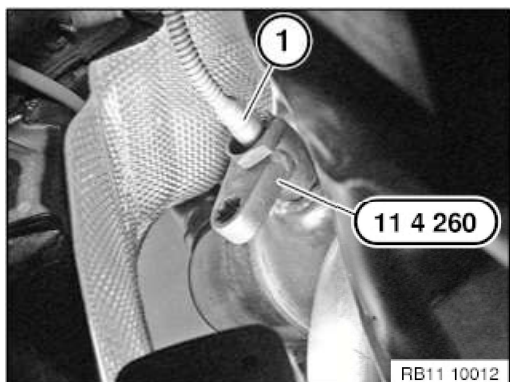
Cable colour of oxygen control sensor = black.

Cable colour of oxygen monitoring sensor = grey.





Unclip cable (1) of control sensor out of holder.



Release oxygen sensor (1) from above with special tool 11 4 260 .
Tightening torque 11 78 1AZ.



Reassemble the vehicle.
Check function of DME.



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

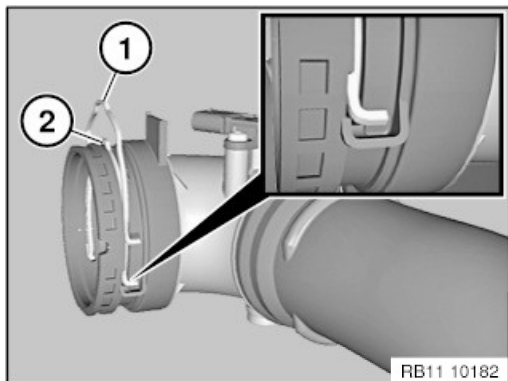
Equipment recoding from 00 0 200 to 00 6 0 000

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	---



**Necessary preliminary tasks:**

- Remove front underbody protection.
- Release air conditioning compressor (do not draw off and remove).



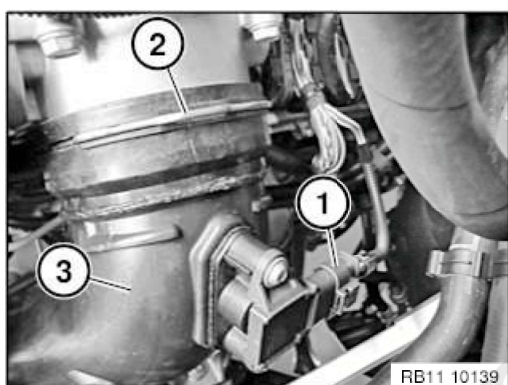
(1) Unlocked

(2) Locked

Installation note:

Ensure locking clamps are correctly fitted.

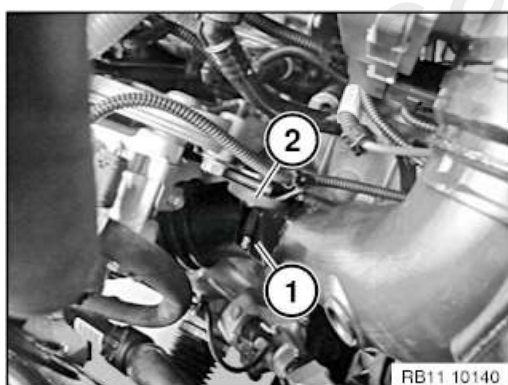
Lock must engage.



Unlock and pull off cable connector (1).

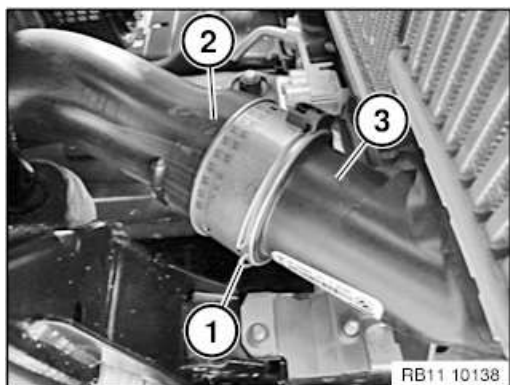
Unlock snap fastener (2).

Pull off charge air duct (3) from throttle body.



Unclip charge air duct (1) from rubber grommet (2).





Unlock snap fastener (1).

Pull off charge air duct (2) from charge air cooler (3).

Installation note:

The seal inside the snap fastener must be coated with anti-friction agent.

Charge air duct (2) must snap audibly into place!



Assemble engine.

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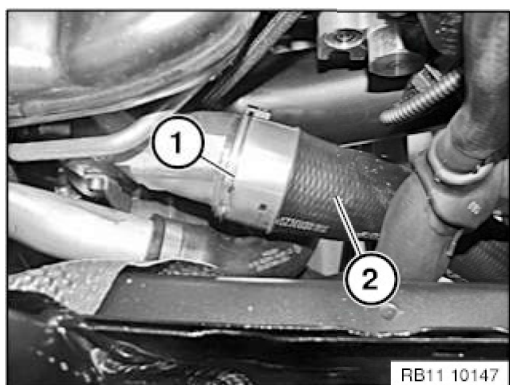


**Necessary preliminary tasks:**

- Remove front underbody protection

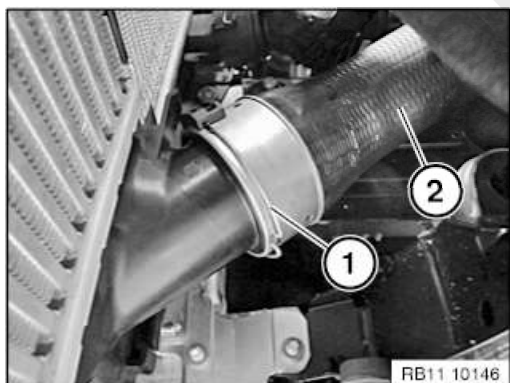


Unscrew screw (1) and set expansion tank aside.



Release lock (1) of charge air duct.

Pull charge air duct (2) off of exhaust turbocharger.



Release lock (1) of charge air duct.

Detach charge air duct (2) from charge air cooler.

Feed out charge air duct (2).



Assemble engine.

Check DME control unit (exhaust turbocharger) for correct operation.



**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!

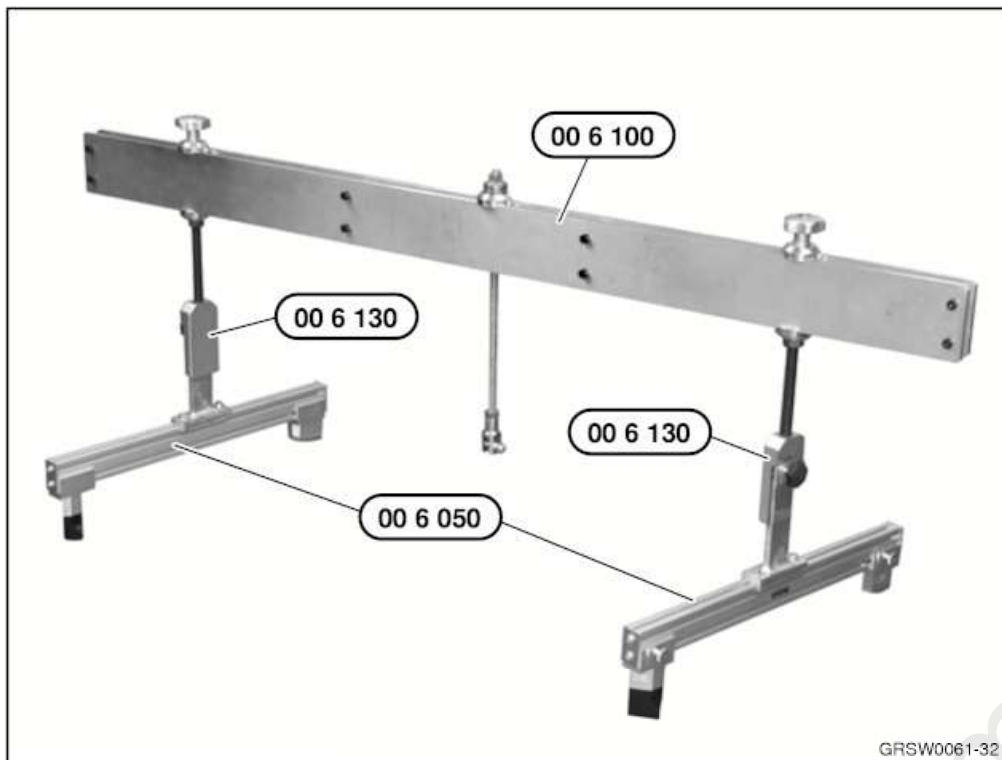
Observe following instructions relating to special tool:

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.





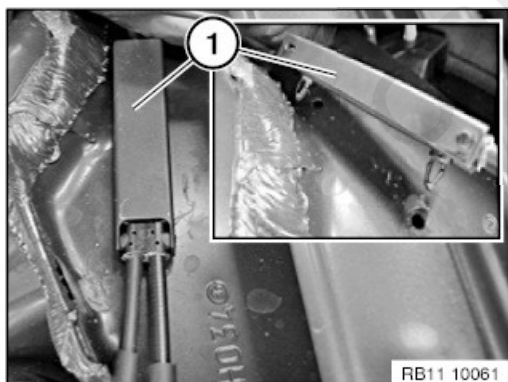
Special tools



Necessary preliminary work:

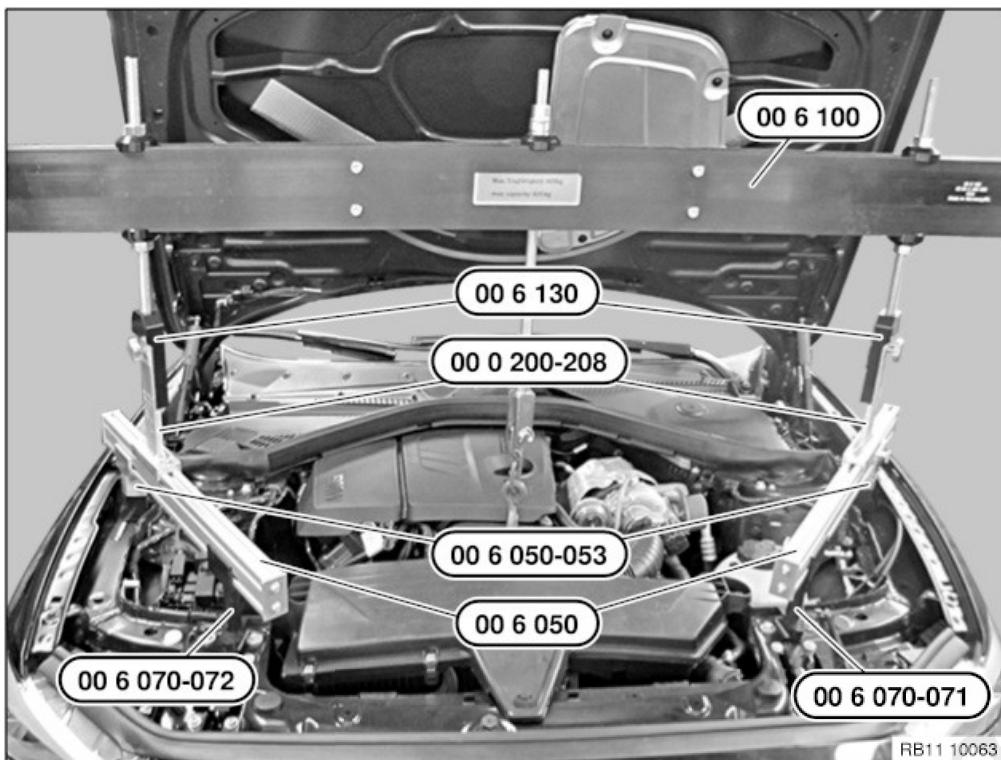
- Secure the engine compartment lid in the service position.
- Remove front underbody protection.
- F33 convertible only, remove front-end struts.

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 .

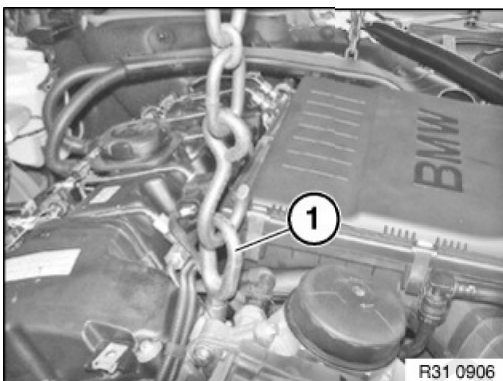


Unclip Bowden cable (1) for hood opening.





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 .

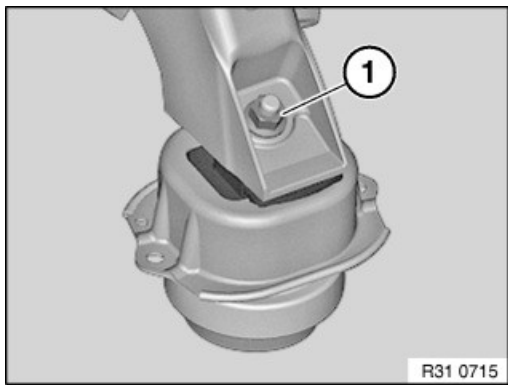
Caution!

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.



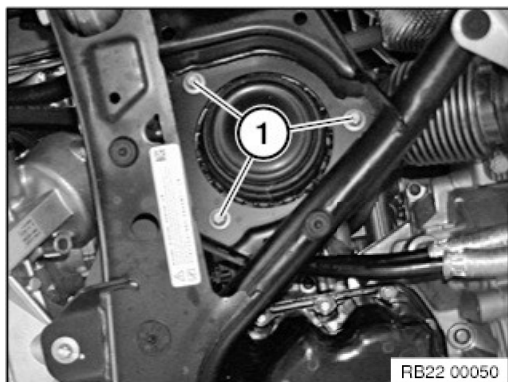


Note:

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.

