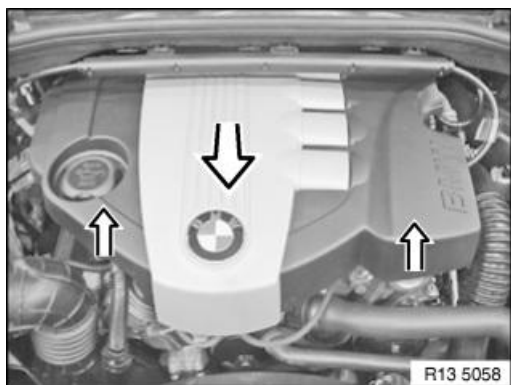
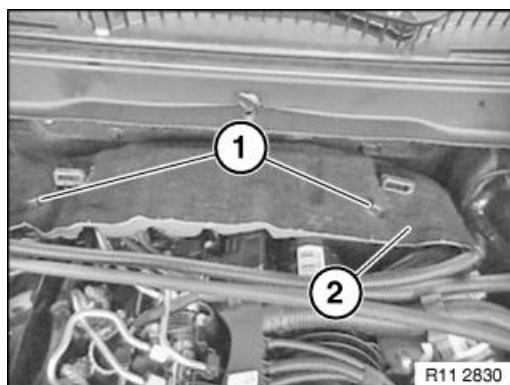




Raise acoustic cover at front and pull out in direction of travel.

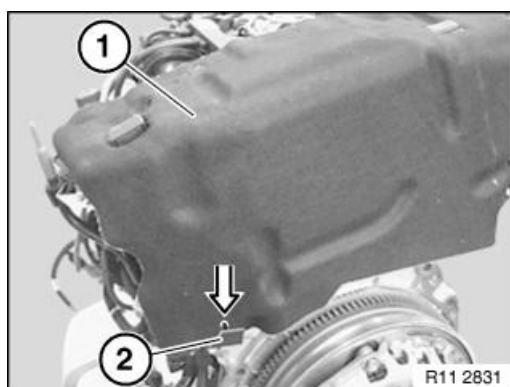
**Necessary preliminary tasks:**

- Remove acoustic cover at front.
- Remove lower section of microfilter housing



Remove expander rivets (1).

Lift off acoustic cover (2)

**Installation note:**

When installing the acoustic cover (1), make sure it is correctly seated in the holder (2).

Note:

Illustration with engine removed.

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



Warning!

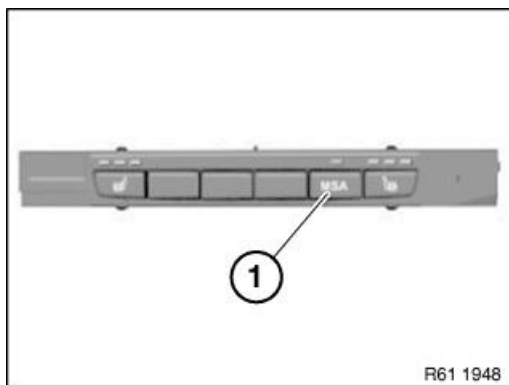
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

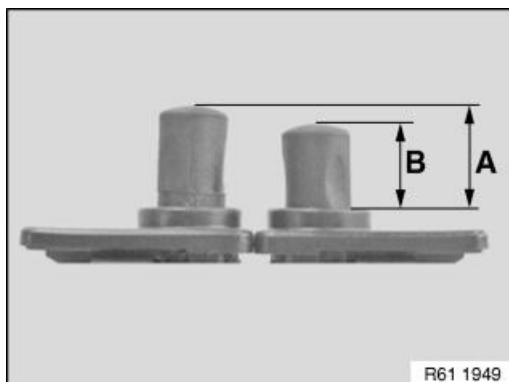
Observe safety precautions when working on MSA vehicles.

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
 $A = 10 \text{ mm}$
 - Basic setting (engine hood/bonnet open)
 $B = 7 \text{ mm}$

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



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](#)

**Special tools required:**

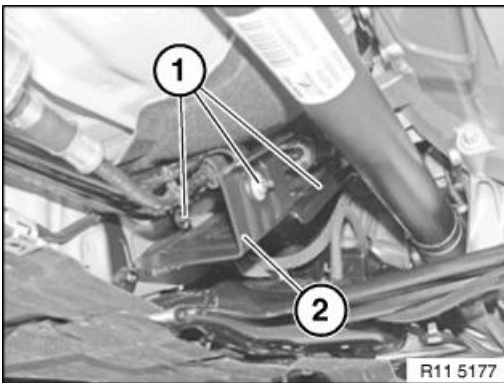
- [13 6 030](#)
- [13 5 222](#)
- [11 4 310](#)
- [11 5 364](#)
- [13 3 060](#)

**Necessary preliminary tasks:**

- [Remove](#) rear underbody protection.
- Connect BMW diagnosis system.

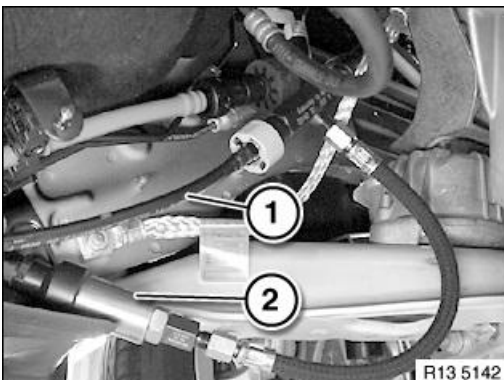
**Recycling:**

Catch and dispose of escaping fuel in a suitable container.
Observe country-specific waste disposal regulations.



Unscrew nuts (1).

Remove guard plate (2).

**Procedure with the 25 bar pressure sensor:**

Unclip fuel lines from bracket.

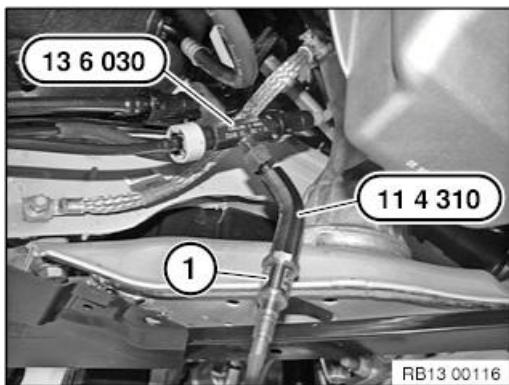
Unlock and disconnect snap fastener of feed line (1).

Fit special tools [13 6 030](#) and [13 5 222](#).

Connect pressure sensor (2) 25 bar to IMIB or DIS Tester.

Insert special tool [13 6 030](#) between lines.

Establish fuel delivery pressure. Read off fuel delivery pressure on IMIB or DIS Tester and compare with values in BMW diagnosis system.



Procedure with the 100 bar pressure sensor:

Disconnect snap fastener from feed line.

Insert special tool [13 6 030](#) into the disconnected return line.

Screw onto special tool [13 6 030](#) , the special tool [11 4 310](#) .

Screw IMIB 100 bar pressure sensor (1) on the special tool [11 4 310](#) .

Note:

As an alternative to the 100 bar IMIB pressure sensor (1), the 25 bar pressure sensor can also be used. For this, screw on special tool [11 5 364](#) instead of special tool [11 4 310](#) into special tool [13 6 030](#) . Or directly screw the pressure manometer from the set of special tools [13 3 060](#) onto the special tool [13 6 030](#) .

Establish fuel delivery pressure. Read off fuel delivery pressure on IMIB and compare with values in diagnosis system.



Check fuel system for tightness.

Reassemble the vehicle.

**Special tools required:**

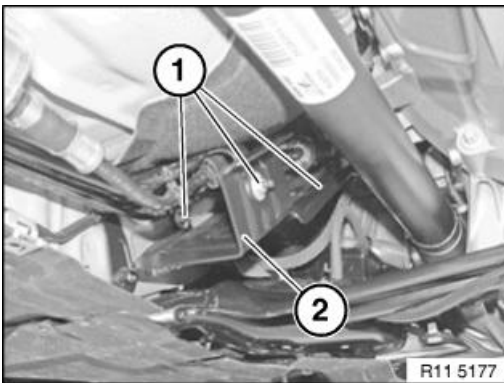
- [13 6 030](#)
- [13 5 222](#)
- [11 4 310](#)
- [11 5 364](#)
- [13 3 060](#)

**Necessary preliminary tasks:**

- [Remove](#) rear underbody protection.
- Connect BMW diagnosis system.

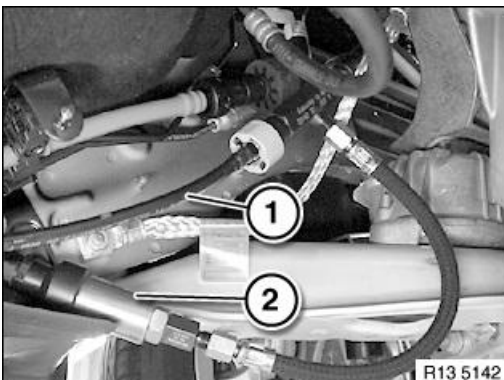
**Recycling:**

Catch and dispose of escaping fuel in a suitable container.
Observe country-specific waste disposal regulations.



Unscrew nuts (1).

Remove guard plate (2).

**Procedure with the 25 bar pressure sensor:**

Unclip fuel lines from bracket.

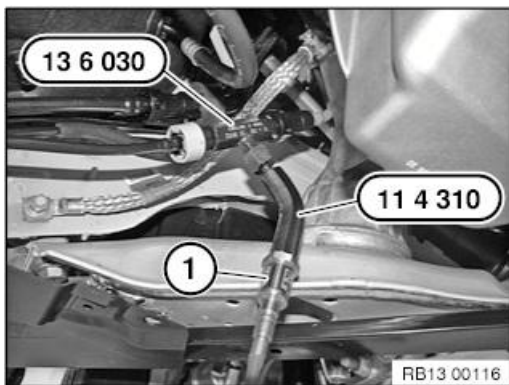
Unlock and disconnect snap fastener of feed line (1).

Fit special tools [13 6 030](#) and [13 5 222](#).

Connect pressure sensor (2) 25 bar to IMIB or DIS Tester.

Insert special tool [13 6 030](#) between lines.

Establish fuel delivery pressure. Read off fuel delivery pressure on IMIB or DIS Tester and compare with values in BMW diagnosis system.



Procedure with the 100 bar pressure sensor:

Disconnect snap fastener from feed line.

Insert special tool [13 6 030](#) into the disconnected return line.

Screw onto special tool [13 6 030](#) , the special tool [11 4 310](#) .

Screw IMIB 100 bar pressure sensor (1) on the special tool [11 4 310](#) .

Note:

As an alternative to the 100 bar IMIB pressure sensor (1), the 25 bar pressure sensor can also be used. For this, screw on special tool [11 5 364](#) instead of special tool [11 4 310](#) into special tool [13 6 030](#) . Or directly screw the pressure manometer from the set of special tools [13 3 060](#) onto the special tool [13 3 060](#) .

Establish fuel delivery pressure. Read off fuel delivery pressure on IMIB and compare with values in diagnosis system.



Check fuel system for tightness.

Reassemble the vehicle.

**Special tools required:**

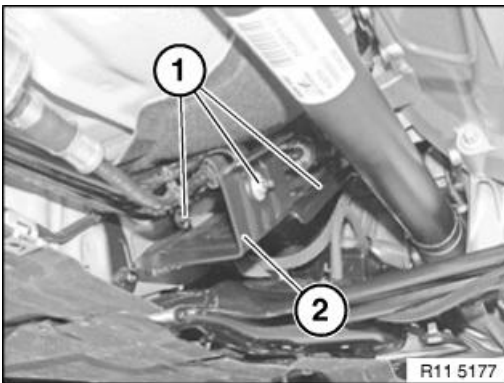
- [13 5 222](#)
- [13 6 030](#)
- [11 4 310](#)
- [11 5 364](#)
- [13 3 060](#)

**Note:**

- [Remove](#) rear underbody protection.
- Connect BMW diagnosis system.

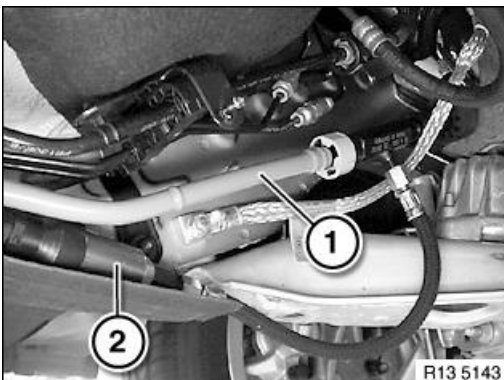
**Recycling:**

Catch and dispose of escaping fuel in a suitable container.
Observe country-specific waste disposal regulations.



Unscrew nuts (1).

Remove guard plate (2).

**Procedure with the 25 bar pressure sensor:**

Unclip fuel lines from bracket.

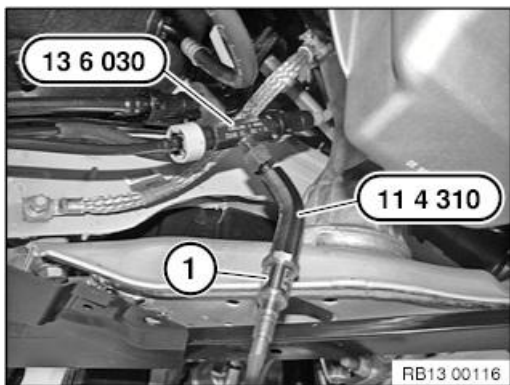
Disconnect snap fastener from return line (1).

Fit special tools [13 6 030](#) and [13 5 222](#).

Connect pressure sensor (2) 25 bar to IMIB or DIS Tester.

Insert special tool [13 6 030](#) between lines.

Build up fuel return pressure. Read off fuel return pressure on IMIB or DIS Tester and compare with values in BMW diagnosis system.



Procedure with the 100 bar pressure sensor:

Disconnect snap fastener from return line.

Insert special tool [13 6 030](#) into the disconnected return line.

Screw onto special tool [13 6 030](#) , the special tool [11 4 310](#) .

Screw IMIB 100 bar pressure sensor (1) on the special tool [11 4 310](#) .

Note:

As an alternative to the 100 bar IMIB pressure sensor (1), the 25 bar pressure sensor can also be used. For this, screw on special tool [11 5 364](#) instead of special tool [11 4 310](#) into special tool [13 6 030](#) . Or directly screw the pressure manometer from the set of special tools [13 3 060](#) onto the special tool [13 6 030](#) .

Build up fuel return pressure. Read off fuel return pressure on IMIB and compare with values in diagnosis system.



Check fuel system for tightness.

Reassemble the vehicle.

**Special tools required:**

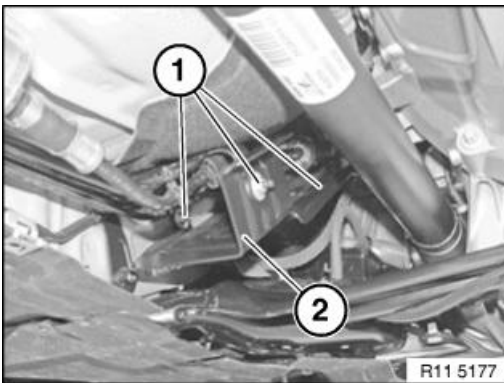
- [13 5 222](#)
- [13 6 030](#)
- [11 4 310](#)
- [11 5 364](#)
- [13 3 060](#)

**Note:**

- [Remove](#) rear underbody protection.
- Connect BMW diagnosis system.

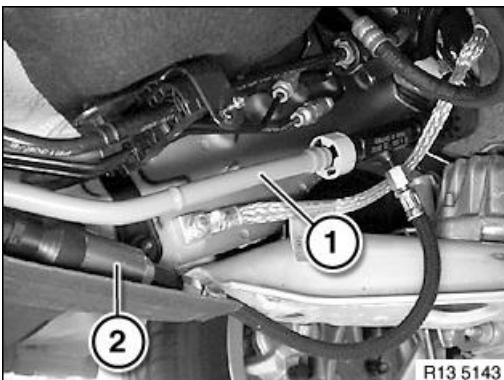
**Recycling:**

Catch and dispose of escaping fuel in a suitable container.
Observe country-specific waste disposal regulations.



Unscrew nuts (1).

Remove guard plate (2).

**Procedure with the 25 bar pressure sensor:**

Unclip fuel lines from bracket.

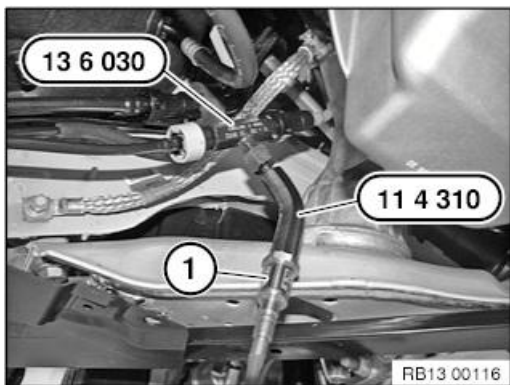
Disconnect snap fastener from return line (1).

Fit special tools [13 6 030](#) and [13 5 222](#).

Connect pressure sensor (2) 25 bar to IMIB or DIS Tester.

Insert special tool [13 6 030](#) between lines.

Build up fuel return pressure. Read off fuel return pressure on IMIB or DIS Tester and compare with values in BMW diagnosis system.



Procedure with the 100 bar pressure sensor:

Disconnect snap fastener from return line.

Insert special tool [13 6 030](#) into the disconnected return line.

Screw onto special tool [13 6 030](#) , the special tool [11 4 310](#) .

Screw IMIB 100 bar pressure sensor (1) on the special tool [11 4 310](#) .

Note:

As an alternative to the 100 bar IMIB pressure sensor (1), the 25 bar pressure sensor can also be used. For this, screw on special tool [11 5 364](#) instead of special tool [11 4 310](#) into special tool [13 6 030](#) . Or directly screw the pressure manometer from the set of special tools [13 3 060](#) onto the special tool [13 6 030](#) .

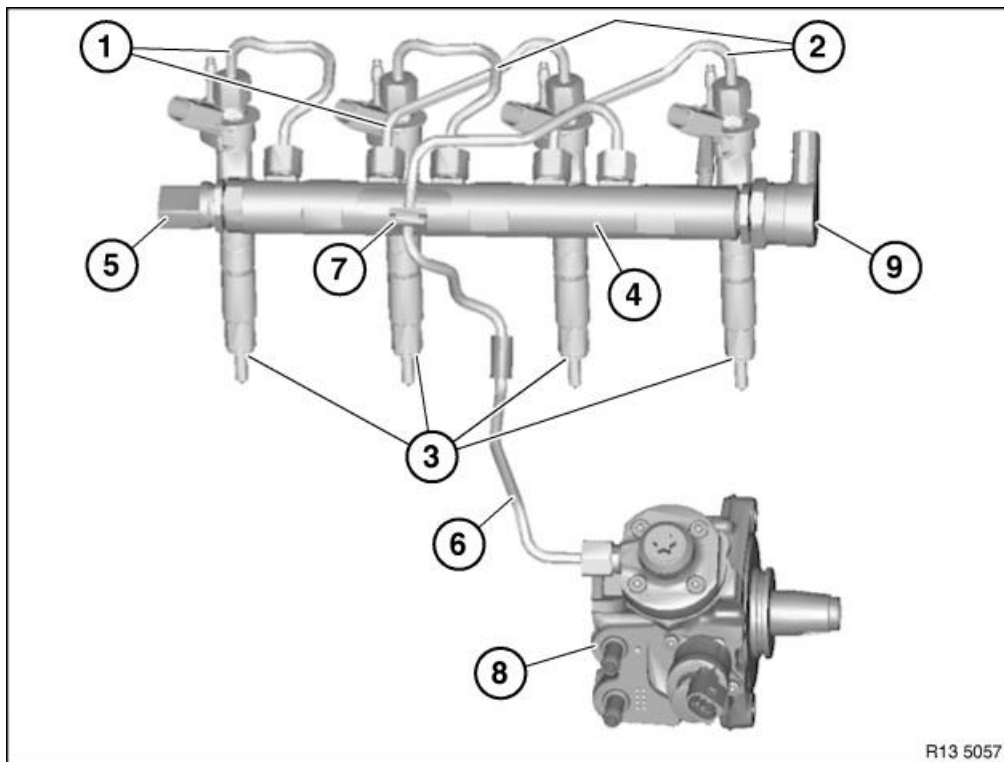
Build up fuel return pressure. Read off fuel return pressure on IMIB and compare with values in diagnosis system.



Check fuel system for tightness.

Reassemble the vehicle.

S13 53 ... Layout of the common rail system (N47, N47S)



- | | |
|------------------------------------|----------------------|
| 1 Pressure line, cylinders 1 and 3 | 5 Pressure sensor |
| 2 Pressure line, cylinders 2 and 4 | 6 Pump line |
| 3 Injectors | 7 Rubber mount |
| 4 High-pressure accumulator | 8 High pressure pump |
| | 9 Pressure regulator |

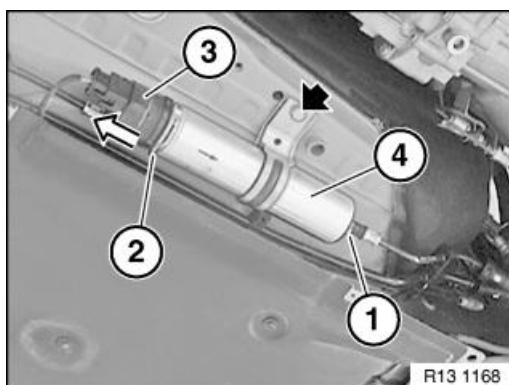
**Necessary preliminary tasks:**

- Switch off ignition.
- Remove [rear underbody protection](#).

**Recycling:**

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.



Release clamp (1).

Installation note:

Check clamp, replacing if necessary.

Pull off hose.

Pull out retainer (2).

Detach fuel preheating (3) in direction of arrow.

Release screw.

Remove fuel filter (4).

Installation note:

Modify retaining clip.



Reassemble the vehicle.

Check fuel system for tightness.



Removal of the filter unit is described in
[Changing fuel filter.](#)



Installation note N47:

Venting fuel system:

Bleed fuel system using BMW diagnosis system.

**Special tools required:**

- [00 2 030](#)
- [32 1 270](#)

**Important!**

Wear safety goggles and protective gloves.

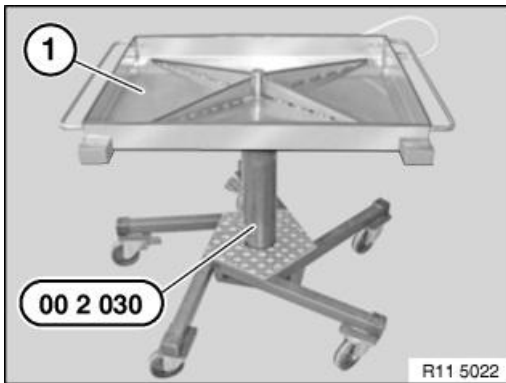
**Necessary preliminary tasks:**

- Switch off ignition.
- [Remove](#) rear underbody protection.

**Recycling:**

Catch and dispose of escaping fuel.

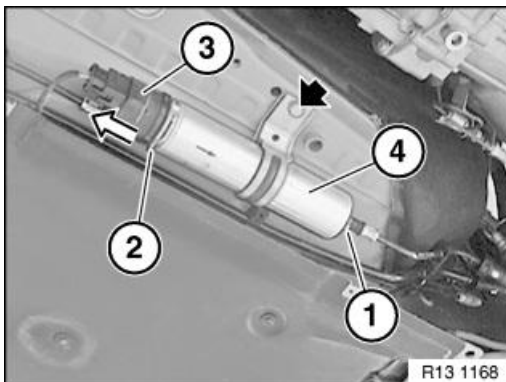
Observe country-specific waste disposal regulations.

**Note:**

Catch and dispose of escaping fuel with drip tray (1) and if necessary special tool [00 2 030](#) (universal hydraulic lifting equipment).

Recycling:

Observe country-specific waste disposal regulations.



Release clamp (1).

Installation note:

Check clamp, Replace faulty clamp.

Disconnect fuel line on fuel filter and close off with suitable plugs from set of special tools [32 1 270](#) !

Pull out retainer (2).

Detach fuel preheating (3) in direction of arrow.

Release screw and remove fuel filter (4).

Installation note:

Modify retaining clip.



Check fuel system for tightness.
Reassemble the vehicle.



Special tools required:

- [11 8 740](#)
- [11 8 741](#)
- [11 8 742](#)
- [32 1 270](#)
- [37 1 152](#)



Caution!

Special tool [11 8 741](#) must - after it has been installed - without fail remain bolted in the sprocket wheel until all repair work has been completed.

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials. Failure to comply with this procedure may result in an alternator malfunction.



Note:

After disconnecting the high pressure line, it is absolutely essential to seal the high pressure pump and the high-pressure accumulator with protective caps. [32 1 270](#)

The position of the high-pressure pump in relation to the valve gear has no effect on the function, but must be observed during removal and installation.

For purposes of clarity, all images have been created to show the engine removed.



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

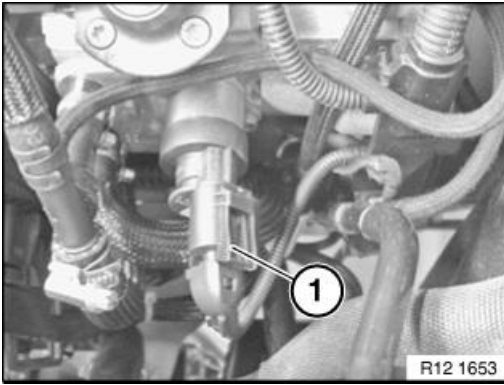


Necessary preliminary work:

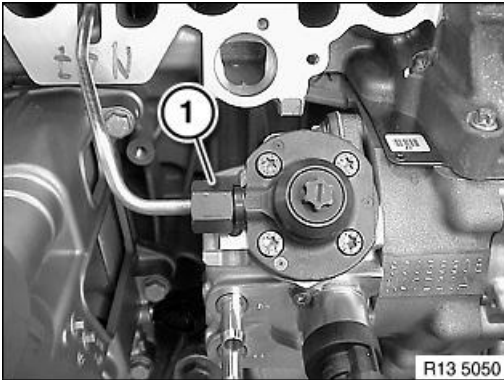
- Switch off the ignition
- [Layout of common rail system](#)
- [Removing the acoustic cover](#)
- Remove [intake plenum](#)
- Remove [preheating control unit](#)
- Secure crankshaft position; for more information, refer to [Checking timing](#)

(Do not remove cylinder head screen. Only secure crankshaft position to firing)

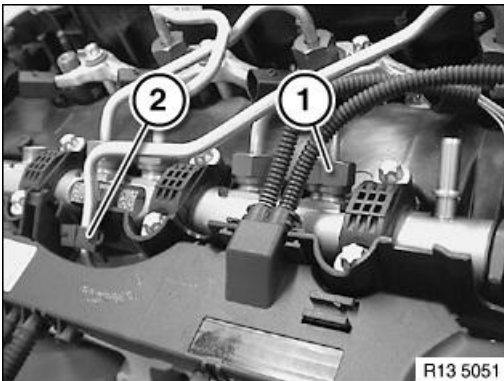
- E60/E61: Remove cover plate from high pressure pump



Unlock connector (1) on metering unit and detach. Detach fuel feed and return lines of high pressure pump. *Installation note:*
Replace clamps. Tightening torque [13 51 1AZ](#).



Release union nut (1) from high pressure pump with special tool [37 1 152](#). *Installation note:*
Tightening torque [13 53 2AZ](#)



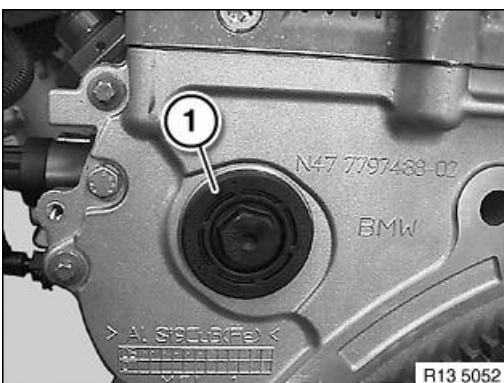
Release union nut from pressure accumulator (1) with special tool [37 1 152](#).

Remove [high pressure line](#).

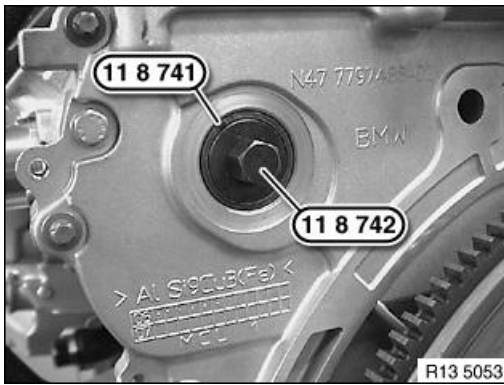
Installation note:

Tightening torque [13 53 2AZ](#)

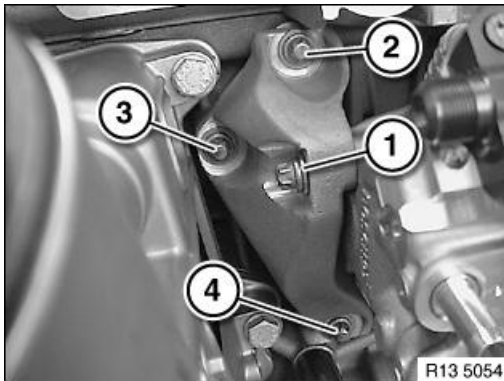
Pay attention to installation position of rubber mount (2) and abrasion protection on high-pressure line.



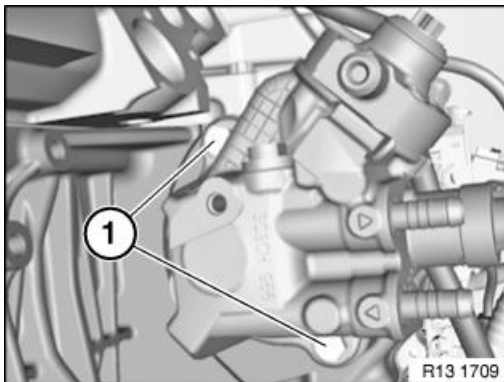
Release sealing cap in gear case. The image shows the sealing cap on the removed engine. Replace sealing cap with O-ring. *Installation note:*
Tightening torque [11 14 1AZ](#)



Screw in special tool [11 8 741](#) for positioning camshaft sprocket of high pressure pump. Afterwards remove special tool [11 8 742](#). Special tool 11 8 741 remains in gear case until end of repair work.

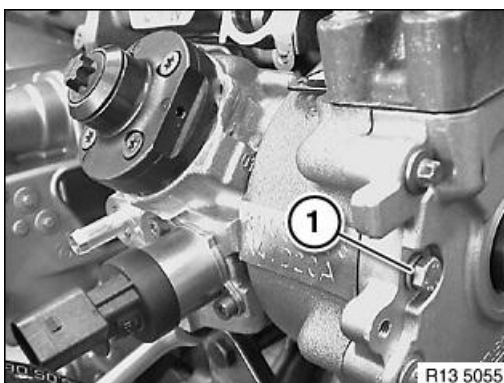


Remove high pressure pump support.



Release screws (1).

Tightening torque [13 51 4AZ](#).



If fitted:

Release mounting bolt (1) on side of gear case and remove.

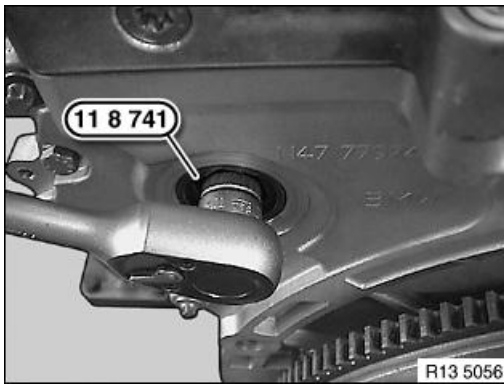
Note:

Bolt (1) is no longer needed and **must** be removed.

Caution!

Risk of damage!

Do not reinstall screw (1), as the new high pressure pumps do not have a thread at this position! Screwing in screw (1) forcefully can damage the high pressure pump!



Caution!

Special tool [11 8 741](#) remains in gear case housing.

Central screw remains in sprocket wheel.

Release screw connection between high pressure pump and sprocket wheel.

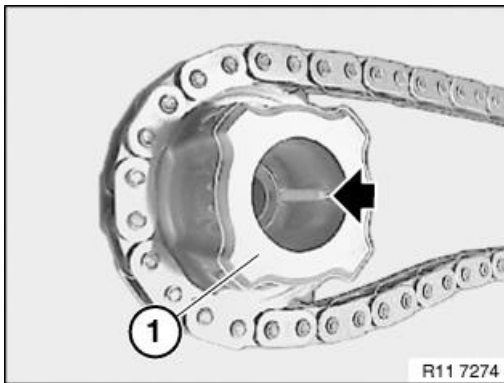
Note:

Central bolt is supported on special tool [11 8 740](#) until high pressure pump is pressed out.

Remove high pressure pump.

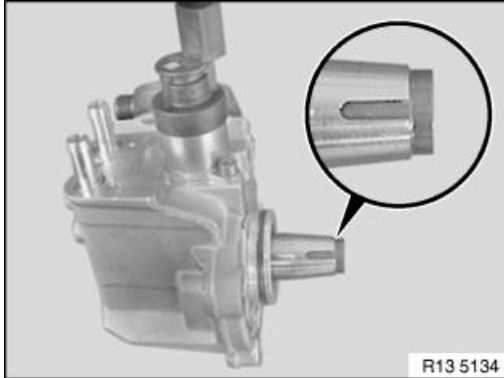
Installation note:

Tightening torque [13 52 2AZ](#)



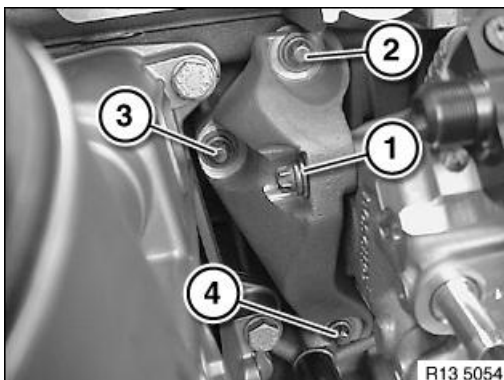
Picture shows the high-pressure pump sprocket wheel (1) when removed.

To insert the high-pressure pump shaft in the secondary sprocket wheel, it may be necessary to swing the high pressure pump through several degrees (spline groove lug-fit [arrow]). Then rotate high pressure pump back into screwing position.



Replacing high pressure pump:

When installing a **new** high-pressure pump, adapt the high-pressure pump/camshaft sprocket assignment. To do so, turn back high pressure pump at **set-back** part of shaft 45° clockwise (top view). Do not damage the shaft, especially the taper.



When installing the high-pressure pump support, the screwing sequence must be observed! *Installation note:*

1. Tighten down to head (gap-free) hand-tight, sequence 1--2--3--4

2. Tighten to final torque [13 51 2AZ](#)

Tightening sequence 2--3--4--1



Installation note:

Assemble engine.

To vent fuel system:

Bleed fuel system using BMW diagnosis system.

Check fuel system for tightness.

Reset adaptation of electric fuel pump with BMW diagnosis system



Special tools required:

- [11 8 740](#)
- [11 8 741](#)
- [11 8 742](#)
- [32 1 270](#)



Caution!

Special tool [11 8 741](#) must - after it has been installed - without fail remain bolted in the sprocket wheel until all repair work has been completed.

When working on the fuel circuit, you must protect the alternator against dirt contamination.

Cover alternator with suitable materials. Failure to comply with this procedure may result in an alternator malfunction.



Note:

After disconnecting the fuel injection line, it is absolutely essential to seal the high pressure pump and the high-pressure accumulator with protective caps [32 1 270](#).

The position of the high pressure pump in relation to the valve gear does not affect its function. However, it must be taken into account on removal and installation.

For purposes of clarity, all images have been created to show the engine removed.



Recycling:

Catch and dispose of escaping fuel.

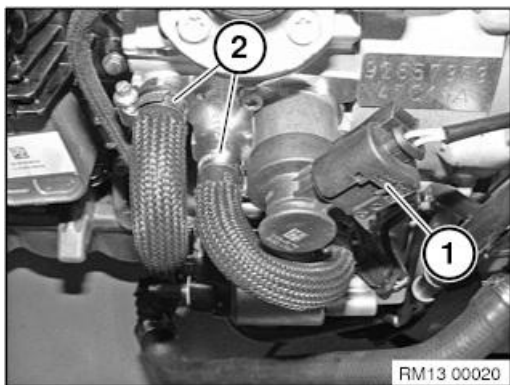
Observe country-specific waste disposal regulations.



Necessary preliminary work:

- Switch off ignition.
- Remove [air intake plenum](#).
- Remove [pressure line](#) between high pressure pump and pressure accumulator.
- Secure crankshaft position at firing TDC; for more information, refer to document Checking [timing](#)

(Do not install cylinder head hood; only fix crankshaft position in firing TDC)

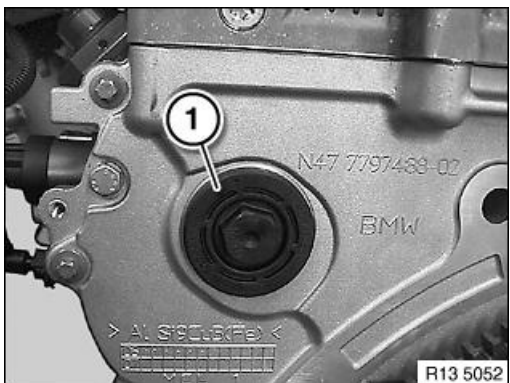


Unlock connector (1) on metering unit and detach.

Detach fuel feed and return lines (2) of high pressure pump.

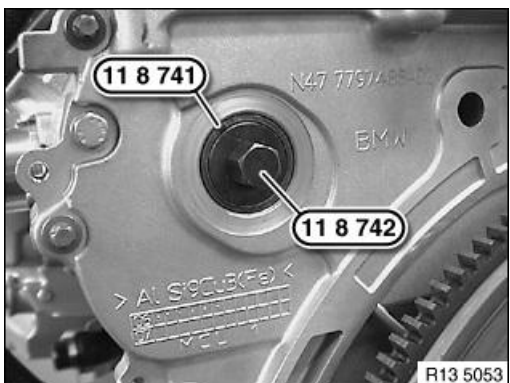
Installation note:

Replace clamps. Tightening torque [13 51 3AZ](#).

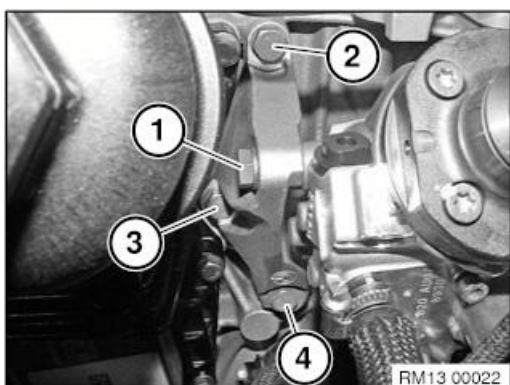


Release sealing cap in the timing case housing. Picture shows the sealing cap on the removed engine. Replace sealing cap with O-ring. *Installation note:*

Tightening torque [11 14 1AZ](#).

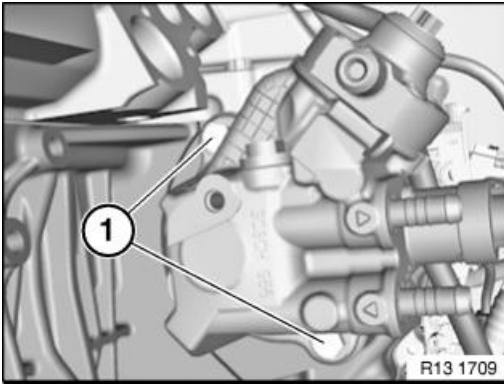


Screw in special tool [11 8 741](#) for positioning the camshaft sprocket of the high pressure pump. Then remove special tool [11 8 742](#). Special tool [11 8 741](#) remains in the timing case housing until the end of the repair work.



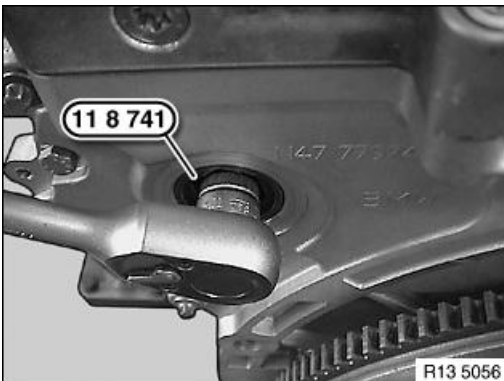
Release screws (1), (2), (3) and (4).

Remove high pressure pump support.



Release screws (1).

Tightening torque [13 51 4AZ](#).



Caution!

Special tool [11 8 741](#) remains in timing case housing.

Central screw remains in sprocket wheel.

Release screw connection between high pressure pump and camshaft sprocket.

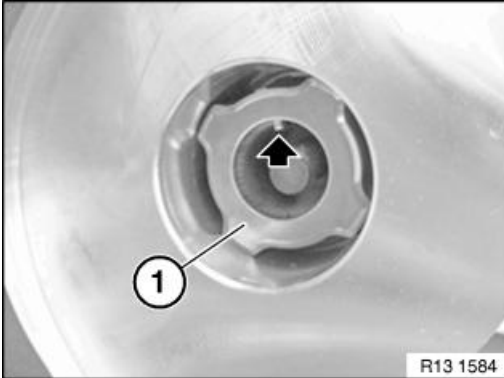
Note:

Central bolt is supported on special tool [11 8 740](#) until high pressure pump is pressed out.

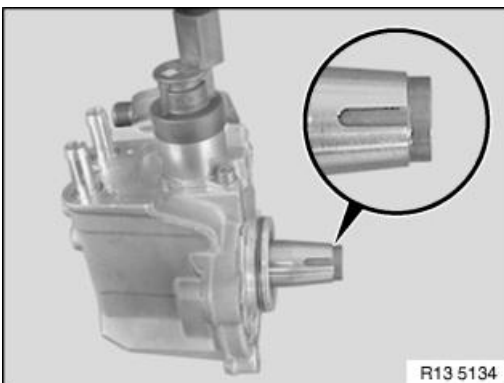
Remove high pressure pump.

Installation note:

Tightening torque [13 52 2AZ](#).

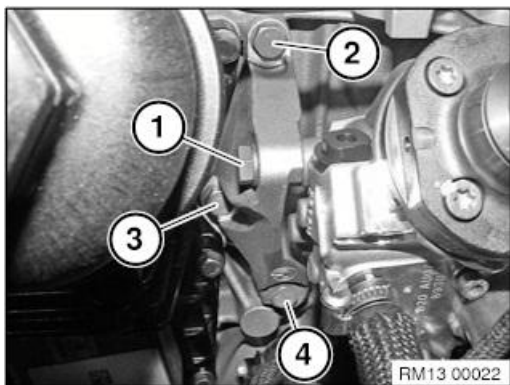


To insert the high pressure pump shaft in the sprocket wheel (1), it may be necessary to swing the high pressure pump through several degrees (spline groove-lug fit, see arrow). Then rotate high pressure pump back into screwing position.



Replacing high pressure pump:

When installing a **new** high pressure pump, adapt the high pressure pump-sprocket wheel assignment. To do so, turn back high pressure pump at **set-back** part of shaft 45° clockwise (top view). Do not damage the shaft, especially the taper.



When installing the high pressure pump support, adhere to the screwing sequence. *Installation note:*

1. Tighten down to head (gap-free) hand-tight, sequence 1--2--3--4
2. Tighten to final torque

Tightening sequence 2--3--4--1

Tightening torque [13 51 2AZ](#).



Installation note:

Assemble engine.

Bleed fuel system using BMW diagnosis system.

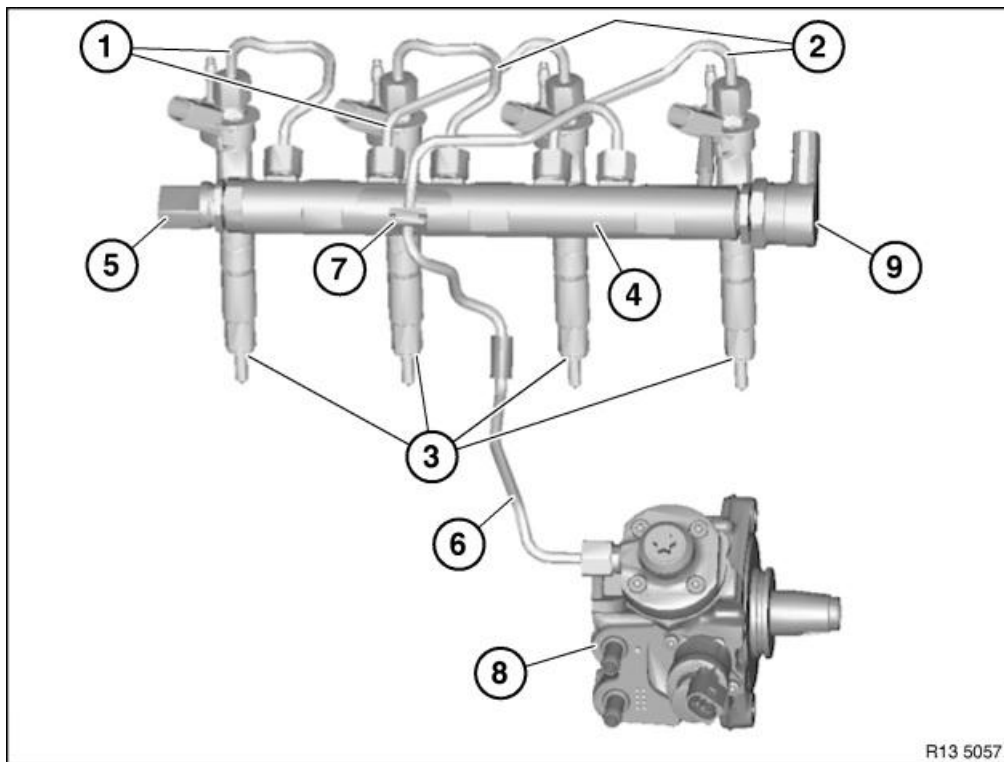
Check fuel system for tightness.

Reset adaptation of electric fuel pump with BMW diagnosis system.

13 51 320 Venting fuel system (N47, N47S)

Note: The fuel system is vented by means of the BMW diagnosis system.

S13 53 ... Layout of the common rail system (N47, N47S)



- | | |
|------------------------------------|----------------------|
| 1 Pressure line, cylinders 1 and 3 | 5 Pressure sensor |
| 2 Pressure line, cylinders 2 and 4 | 6 Pump line |
| 3 Injectors | 7 Rubber mount |
| 4 High-pressure accumulator | 8 High pressure pump |
| | 9 Pressure regulator |

13 53 560 Remove and install/replace the pressure sensor at the pressure accumulator of the injection system (N47 D20 U/O/K/T 1)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Necessary preliminary tasks:

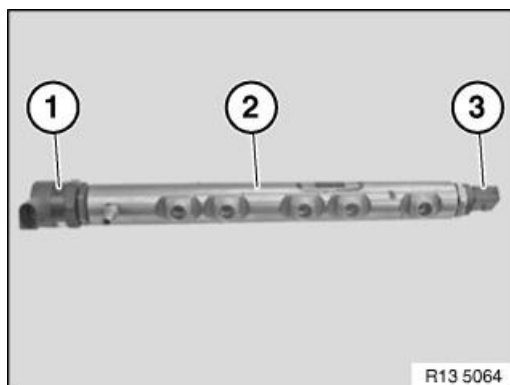
- Read fault memory.
- Read out ignition.
- Remove [pressure accumulator](#).



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

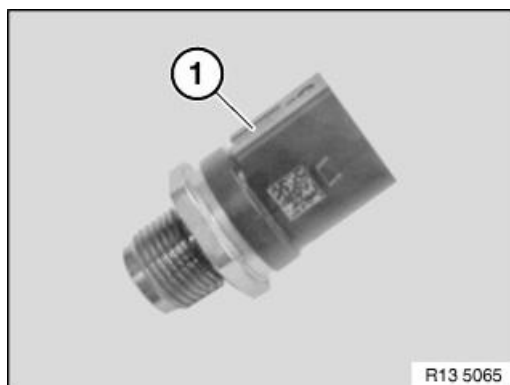


Grip removed rail (2) at flattened area.

Cover plug-in contacts on pressure sensor and remove thread-locking sealant from thread with a suitable cleaning agent. Remove any adapters that may be connected to the pressure sensor. Clean threads and sealing surface on the pressure accumulator and seal with a protective cap.

Note:

Grip at pressure accumulator when removing pressure sensor (3).



Check threads and sealing surfaces for damages prior to installing the pressure sensor. Ensure conditions of cleanliness when installing pressure sensor (1). Lightly grease thread on pressure sensor. Screw in pressure sensor by hand and then tighten.

Tightening torque [13 53 3AZ](#).



Assemble engine.

Check fuel system for tightness.

Reset quantity mean quantity adaptation with BMW diagnosis system.

13 53 315 Removing and installing/replacing all injectors in fuel injection system (N47, N47S)



Special tools required:

- [13 5 210](#)
- [13 5 214](#)
- [13 5 215](#)
- [13 6 100](#)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

- Use only fluff-free cloths.
- Remove all traces of dirt contamination before removing lines or separate components.



Recycling:

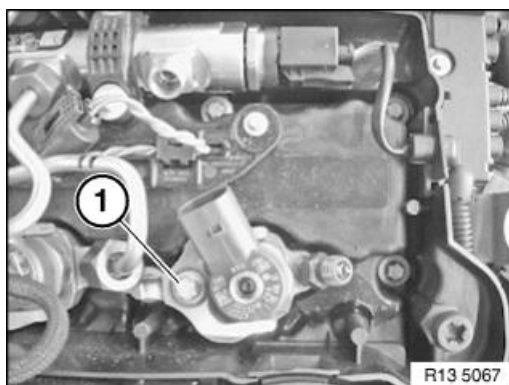
Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.



Necessary preliminary tasks:

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Pay attention to [layout of common rail system](#).
- Release [leakage oil lines](#) and lay to one side.
- Remove [all pressure lines](#) to injectors.
- Seal all fuel system openings with protective caps.



Picture shows version N47uL:

Release screw (1) of clamping claw.

Remove clamping claw, screw and centering ring.

Pull out injector with light rotational movements.

Copper sealing ring must be replaced after clamping jaw is released.

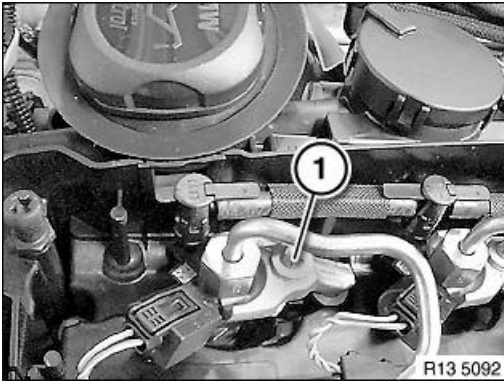
Installation note:

Retighten clamping claw rest (cylinder head cover mounting).

Tightening torque [13 53 5AZ](#).

During assembly, make sure washer is correctly positioned in relation to screw centering in order to align clamping claw. Secure clamping claw in installation position to jointing torque.

Tightening torque [13 53 1AZ](#).



Picture shows versions N47oL and N47TOP (injection systems):

Release screw (1) of clamping claw.

Remove clamping claw, screw and centering ring.

Pull out injector with light rotational movements.

Copper sealing ring must be replaced after clamping jaw is released.

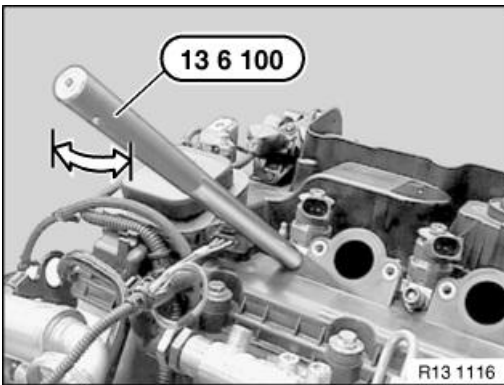
Installation note:

Retighten clamping claw rest (cylinder head cover mounting).

Tightening torque, [13 53 5AZ](#).

During assembly, make sure washer is correctly positioned in relation to screw centering in order to align clamping claw. Secure clamping claw in installation position to jointing torque.

Tightening torque [13 53 1AZ](#).

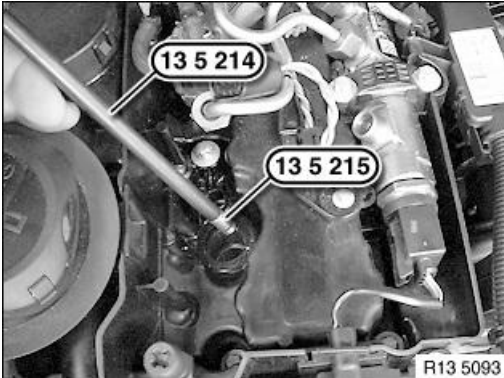


If injectors are stuck tight (N47uL), mount special tool [13 6 100](#) to pressure line connection.

Pull out injector by means of short back and forth movements.

Important!

Move injector with removal rod only by a few degrees only.

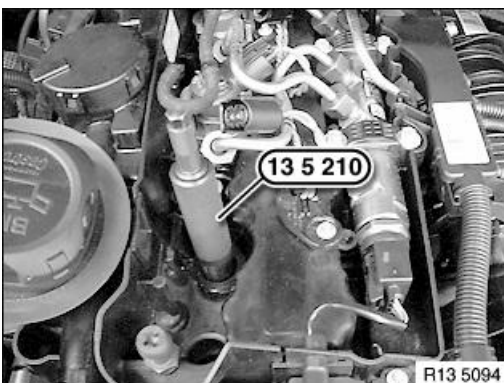


Cleaning injector slots:

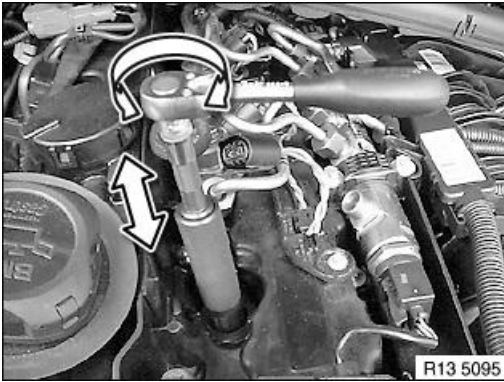
Copper sealing ring must not remain in injector slot.

Place sealing cap [13 5 215](#) with mounting rod [13 5 214](#) into injector slot.

Remove fitting rod.



Place the cleaning tool with brush head [13 5 210](#) into injector slot.

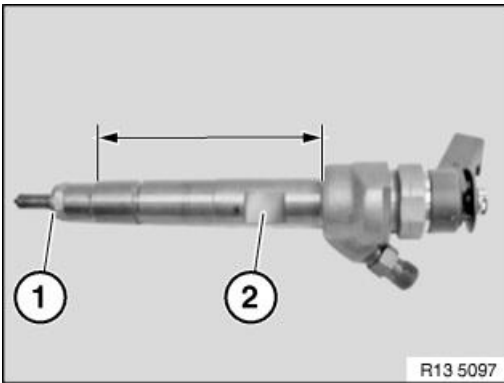


Using a suitable tool (SW8) move brush head up and down in the injector slot in rotating movements. After removing the cleaning tool, blow out the injector slot with compressed air.

Important!

Wear safety goggles and cover injector slot with cleaning cloth or similar.

Remove seal plugs [13 5 215](#) again with mounting rod [13 5 214](#).



Note:

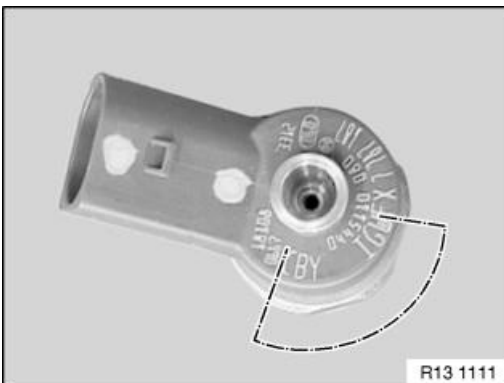
Replace copper sealing ring (1) on injector (2) without fail.

Installation note:

Lightly lubricate injectors with highly heat-resistant grease before installing in injector slot (above copper sealing ring up to injector slot end (refer to [Consumables 4.5](#)).

(BMW part number 83 23 0 441 070)

Observe installation position of high-pressure connection.



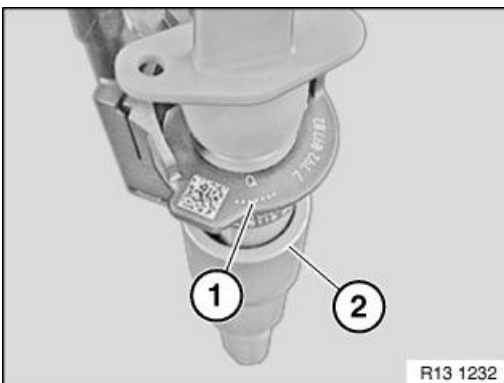
The IMA codes must be read off in each case when new injectors are installed.

The adjustment value (7-position letter/number code) is engraved on each injector.

The digits / letters correspond to the installation location (cylinder) of the new injectors.

- Select "Digital Diesel Electronics"
- Select "Adjustment, injection quantity compensation"
- Select "Test schedule"
- The adjustment must be entered for each cylinder on which an injector has been replaced.

It is necessary to adjust the new injectors to ensure their full operability.



Position of IMA code (1) on piezo-injector (2).



Note:

Assemble engine.

Check stored fault messages.

Delete fault memory.

Check fuel system for tightness.

13 53 315 Removing and installing/replacing all injectors of injection system (N47 D20 U/O/K/T 1)



Special tools required:

- [13 5 210](#)
- [13 6 100](#)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

- Use only fluff-free cloths
- Remove all traces of dirt contamination before dismantling lines or separate components



Recycling:

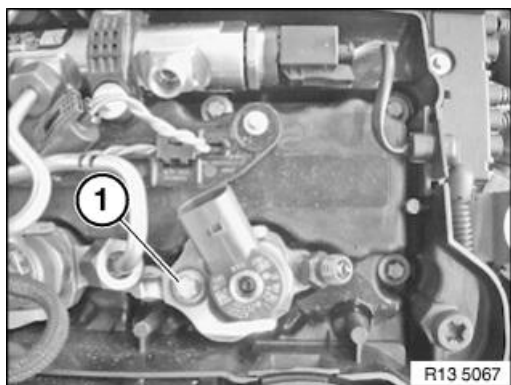
Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.



Necessary preliminary tasks:

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Detach [all leakage oil lines](#) from the injectors.
- Remove [all pressure lines](#) to injectors.
- Seal all fuel system openings with protective caps.



Release screw (1) of clamping claw.

Remove clamping claw, screw and centering ring.

Pull out injector with light rotational movements.

Copper sealing ring must be replaced after clamping jaw is released.

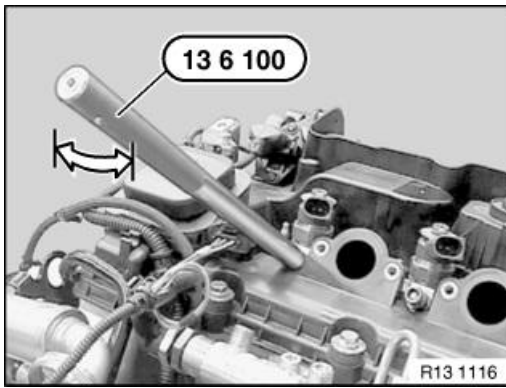
Installation note:

Retighten clamping claw rest (cylinder head cover mounting).

Tightening torque [13 53 5AZ](#).

During assembly, make sure washer is correctly positioned in relation to screw centering in order to align clamping claw. Secure clamping claw in installation position to jointing torque.

Tightening torque [13 53 1AZ](#).



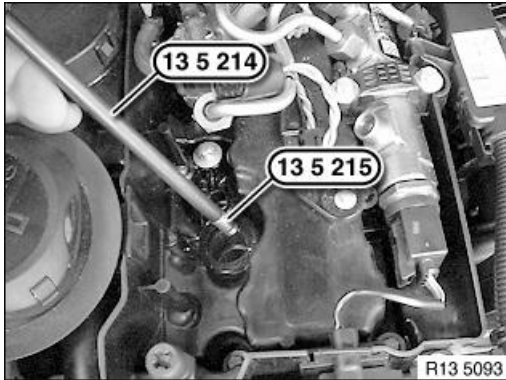
Only N47 D20 K/U 1 engine:

For tight injectors, mount the special tool [13 6 100](#) on the pressure line connection (application example and graphic on a M47T2 engine).

Pull out injector by means of short back and forth movements.

Important!

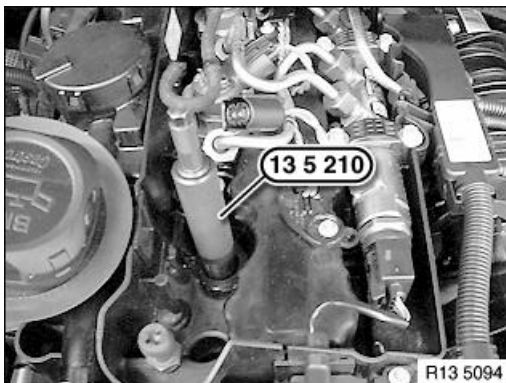
Move injector with removal rod only by a few degrees only.



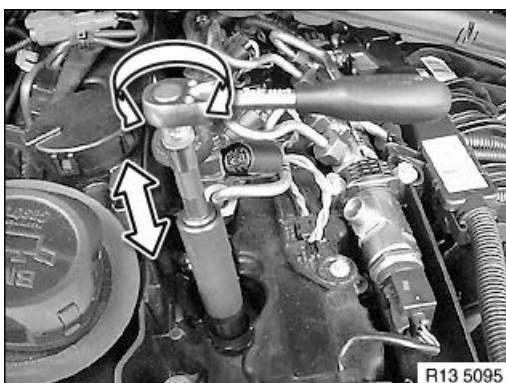
Cleaning injector slots:

Copper sealing ring must not remain in injector slot.

Insert sealing cap 13 5 215 into the injector chamber using the mounting rod 13 5 214 from the set of special tools [13 5 210](#). Remove fitting rod.



Place the cleaning tool with brush head [13 5 210](#) into injector slot.

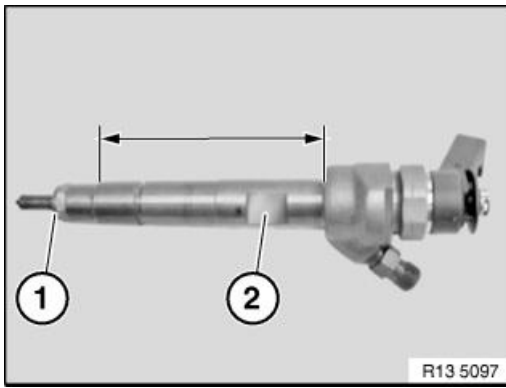


Using a suitable tool (SW8) move brush head up and down in the injector slot in rotating movements. After removing the cleaning tool, blow out the injector slot with compressed air.

Important!

Wear safety goggles and cover injector slot with cleaning cloth or similar.

Remove seal plug 13 5 215 with mounting rod 13 5 214.



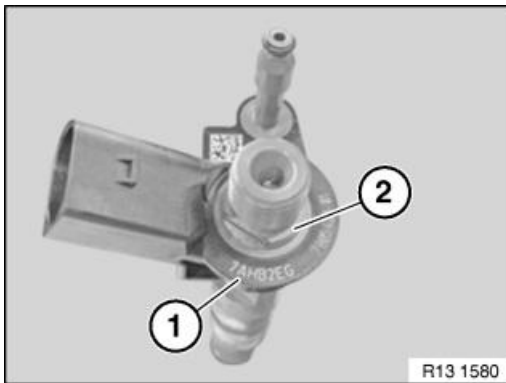
Note:

Replace copper sealing ring (1) on injector (2) without fail.

Installation note:

Lightly lubricate injectors with highly heat-resistant grease before installing in injector slot (above copper sealing ring up to injector slot end (refer to [Consumables 4.5](#)).

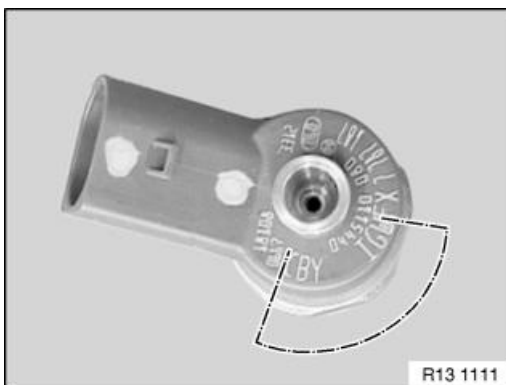
Observe installation position of high-pressure connection.



Injection quantity compensation:

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out the injection quantity compensation (graphic shows N47 D20 O/T 1).

The adjustment value (1) (7-position letter code / number code) is engraved on each injector (2).



When installing new injectors, the compensation values in each case must be read off (graphic shows N47 D20 U/K 1).

The adjustment value (7-position letter/number code) is engraved on each injector.

The digits / letters correspond to the installation location (cylinder) of the new injectors.

- Select "DDE".
- Select "Adjustment, injection quantity compensation"
- Select "Test plan"
- The adjustment must be entered for each cylinder on which an injector has been replaced.

It is necessary to adjust the new injectors to ensure their full operability.



Note:

Assemble engine.

Check stored fault messages.

Clear diagnostic fault entries from fault memory.

Check fuel system for tightness.

13 53 158 Removing and installing/replacing pressure accumulator of fuel injection system (N47, N47S)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Necessary preliminary tasks:

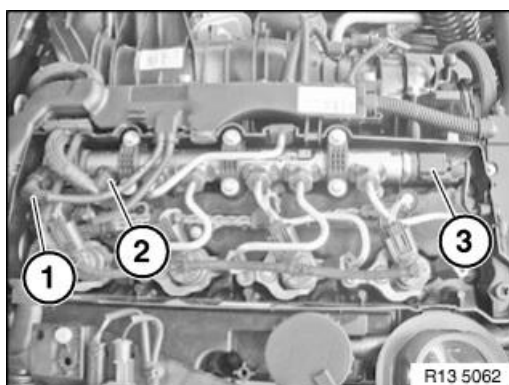
- Remove [acoustic cover](#)
- Remove rear acoustic cover.
- Remove [pressure lines](#) to injectors.
- Remove [pressure line](#) to high pressure pump.



Recycling:

Catch and dispose of escaping fuel.

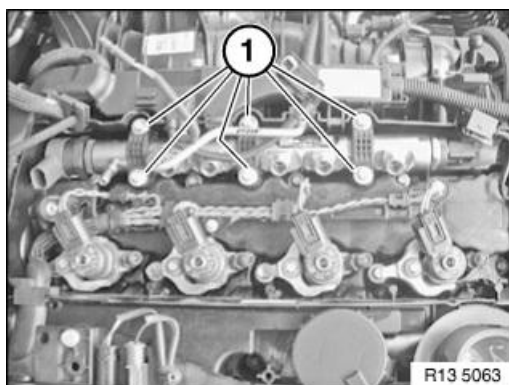
Observe country-specific waste disposal regulations.



Unlock plug (1) from pressure regulator and detach.

Unlock return line (2) from pressure accumulator and disconnect.

Unlock connector from pressure sensor (3) and detach.



Release screws (1).

Remove pressure accumulator.



Assembly sequence for high-pressure fuel system:

1. Insert pressure accumulator.
2. Provisionally fasten all high pressure lines.
3. Clip pressure accumulator mountings and screw down.
4. Tighten down high pressure lines on injectors.
Tightening torque [13 53 2AZ](#).
5. Tighten down high pressure lines on pressure accumulator.
Tightening torque [13 53 2AZ](#).
6. Tighten down high pressure line on high pressure pump.
Tightening torque [13 53 2AZ](#).



Assemble engine.

Vent fuel system via BMW diagnosis system.

Check fuel system for tightness.



Special tools required:

- [37 1 152](#)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Important!

After engine shutdown, wait at least 1 minute before releasing the high-pressure lines.

After disconnecting the pressure lines, it is absolutely essential to seal the injectors and the high-pressure accumulator with protective caps.

Do not mix up new pressure lines.



Necessary preliminary tasks:

- Read fault memory.
- Switch off ignition.
- Remove and install [acoustic cover](#).
- **only E81, E82, E84, E87, E88, E90, E91, E92, E93:**
Remove [lower section of microfilter housing](#).

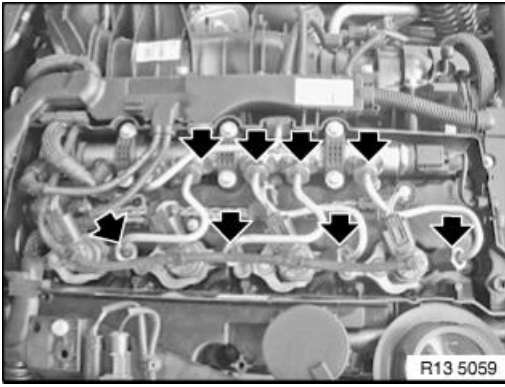
Note: Pay attention to [layout of common rail system](#).



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

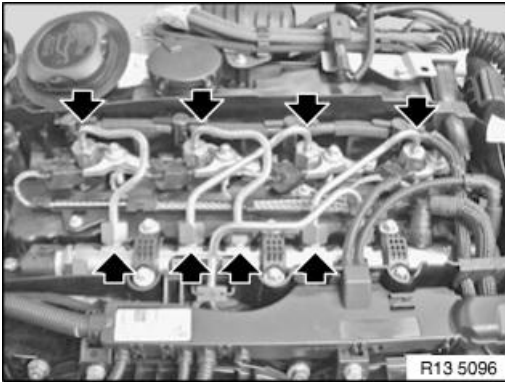


View of N47uL (magnet injectors)

Release all union nuts of the pressure lines with special tool [37 1 152](#).

Note:

Reset special tool in good time to prevent bending of pressure lines.



View N47oL (piezo injectors)

Release all union nuts of the pressure lines with special tool [37 1 152](#).

Note:

Reset special tool in good time to prevent bending of pressure lines.



Important!

Risk of damage to injection system and pressure accumulator!

Observe tightening torque [13 52 2AZ](#) without fail. If the pressure lines are leaking after installation, they must be replaced. Do not retighten pressure lines with a higher tightening torque!

Risk of damage to injection system and pressure accumulator!



Installing pressure lines. Important!

Risk of injector breakage! Observe tightening torque [13 53 2AZ](#) without fail.

All pressure lines may only be reused 3 times; after the 3rd time, they must be replaced.

1. Insert pressure lines.
2. Hand-tighten all union nuts on pressure lines.
3. Tighten down union nuts on injectors to specified torque.
Tightening torque [13 53 2AZ](#).
4. Tighten down union nuts on pressure accumulator to specified torque.
Tightening torque [13 53 2AZ](#).
5. Check all components of common rail system for tightness.



Reassemble the vehicle.

Vent fuel system via BMW diagnosis system.

Check fuel system for tightness.

13 53 170 Removing and installing/replacing pressure lines to the injectors (N47 D20 U/O/K/T 1)



Special tools required:

- [37 1 152](#)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Important!

After the engine has stopped, wait at least 1 minute before releasing the high pressure lines.

After disconnecting the pressure lines, it is absolutely essential to seal the injectors and the high-pressure accumulator with protective caps.

Do not mix up new pressure lines.



Necessary preliminary tasks:

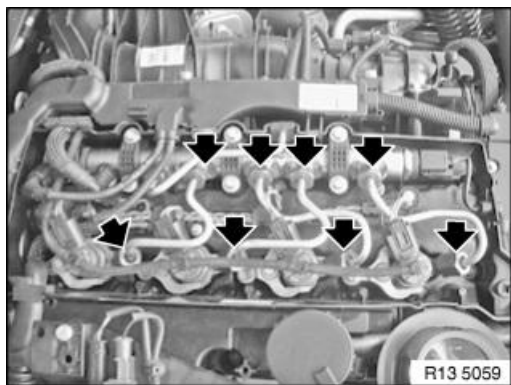
- Read fault memory.
- Switch off ignition.
- Remove [acoustic cover](#)
- Remove [microfilter housing](#) lower section.
- Remove sound insulation on injectors.



Recycling:

Catch and dispose of escaping fuel.

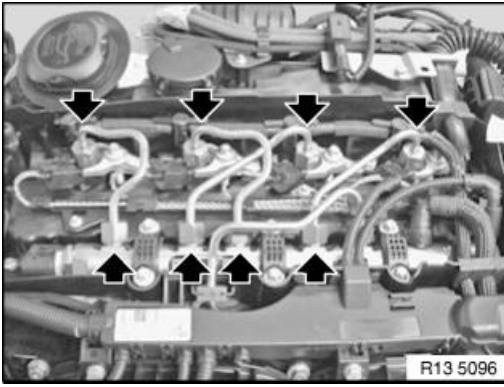
Observe country-specific waste disposal regulations.



Release all union nuts of the pressure lines with special tool [37 1 152](#)

.Note:

Reset special tool in good time to prevent bending of pressure lines.



Release all union nuts of the pressure lines with special tool [37 1 152](#)

.Note:

Reset special tool in good time to prevent bending of pressure lines.



Important!

Risk of damage to injection system and pressure accumulator!

Observe tightening torque [13 53 2AZ](#) without fail. If the pressure lines are leaking after installation, they must be replaced. Do not retighten pressure lines with a higher tightening torque!

Risk of damage to injection system and pressure accumulator!



Installing pressure lines Important!

Risk of injector breakage! Observe tightening torque [13 53 2AZ](#) without fail.

All pressure lines may only be reused 3 times; after the 3rd time, they must be replaced.

1. Insert pressure lines.
2. Hand-tighten all union nuts on pressure lines.
3. Tighten down union nuts on injectors to specified torque.
Tightening torque [13 53 2AZ](#).
4. Tighten down union nuts on pressure accumulator to specified torque.
Tightening torque [13 53 2AZ](#).
5. Check all components of common rail system for tightness.



Reassemble the vehicle.

Vent fuel system via BMW diagnosis system.

Check fuel system for tightness.

13 53 560 Removing and installing/replacing pressure sensor on pressure accumulator of fuel injection system (N47, N47S)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Necessary preliminary tasks:

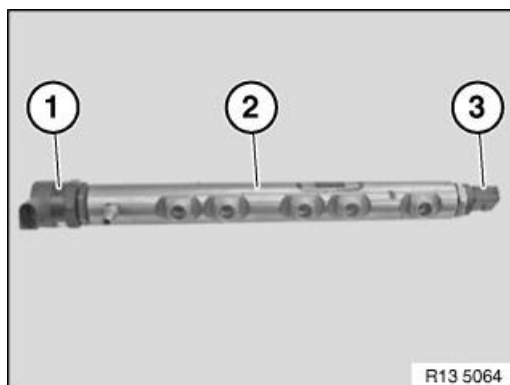
- Read fault memory.
- Read out ignition.
- Remove [pressure accumulator](#).



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

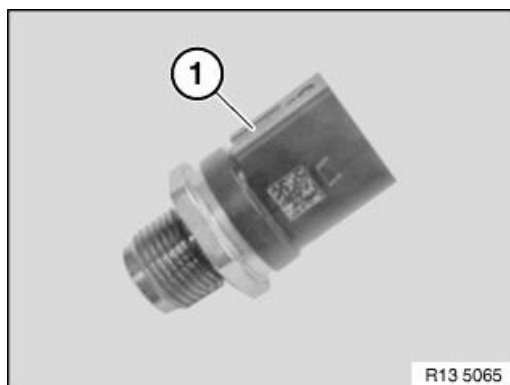


Grip removed rail (2) at flattened area.

Cover plug-in contacts on pressure sensor and remove locking paint from thread with a suitable cleaning agent. Remove any adapters that may be connected to the pressure sensor. Clean threads and sealing surface on the pressure accumulator and seal with a protective cap.

Note:

Grip at pressure accumulator when removing pressure sensor (3).



Check threads and sealing surfaces for damages prior to installing the pressure sensor. Ensure conditions of cleanliness when installing pressure sensor (1). Lightly grease thread on pressure sensor. Screw in pressure sensor by hand and then tighten.

Tightening torque [13 53 3AZ](#).



Assemble engine.

Check fuel system for tightness.

Reset quantity mean quantity adaptation with BMW diagnosis system.

13 53 158 Removing and installing/replacing the pressure accumulator of the injection system (N47 D20 U/O/K/T 1)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Necessary preliminary tasks:

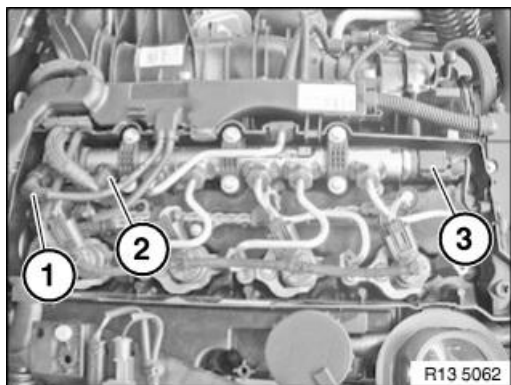
- Remove rear acoustic cover.
- Remove [pressure lines](#) to injectors.
- Remove [pressure line](#) to high pressure pump.



Recycling:

Catch and dispose of escaping fuel.

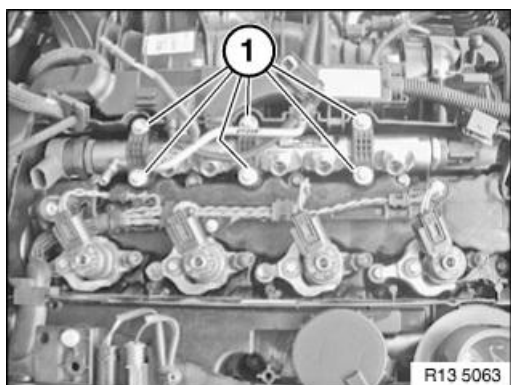
Observe country-specific waste disposal regulations.



Unlock plug (1) from pressure regulator and detach.

Unlock return line (2) from pressure accumulator and disconnect.

Unlock connector from pressure sensor (3) and detach.



Release screws (1).

Remove pressure accumulator.



Assembly sequence for high-pressure fuel system:

1. Insert pressure accumulator.
2. Provisionally fasten all high pressure lines.
3. Clip pressure accumulator mountings and screw down.
4. Tighten down high pressure lines on injectors.
Tightening torque [13 53 2AZ](#).
5. Tighten down high pressure lines on pressure accumulator.
Tightening torque [13 53 2AZ](#).
6. Tighten down high pressure line on high pressure pump.
Tightening torque [13 53 2AZ](#).



Assemble engine.

Vent fuel system via BMW diagnosis system.

Check fuel system for tightness.

**Special tools required:**

- [13 0 170](#)

**Necessary preliminary tasks:**

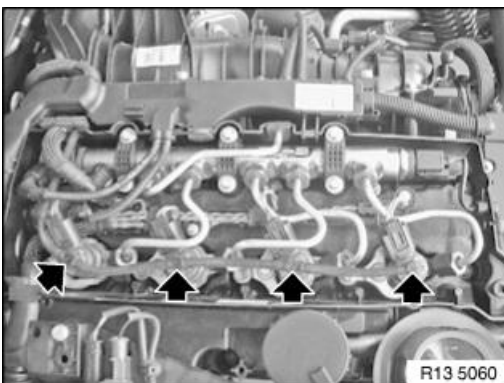
- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Layout of the [common rail system](#).
- Remove [acoustic cover](#)
- [Remove](#) intake plenum.

**Important!**

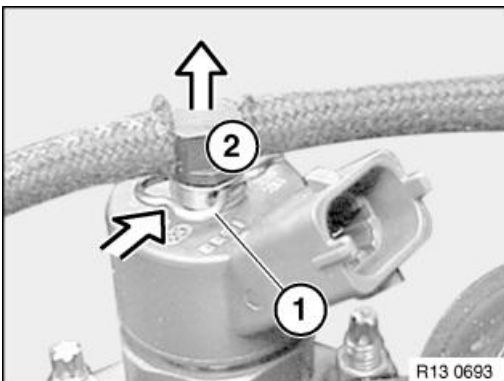
When working on the oil, coolant or fuel circuit, you must protect the alternator against dirt contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

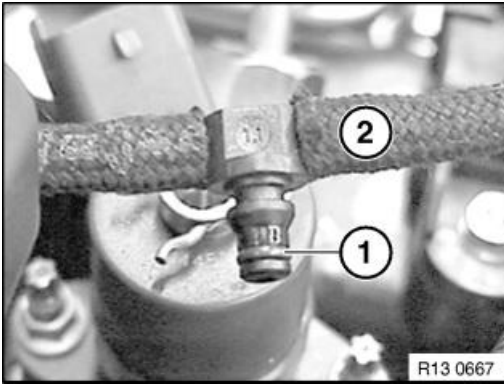


Unlock clamps on injectors and disconnect.

**Figures show variant N47uL:**

Press in clamp (1).

Detach connection of leakage oil line (2) upwards.

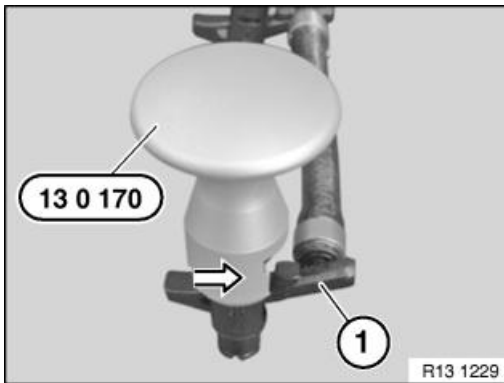


Important!

Coat sealing ring (1) with lubricant before connecting to leakage oil line (2) at the injector.

Check sealing ring for damage, damaged sealing rings may cause malfunction during fuel pressure build-up.

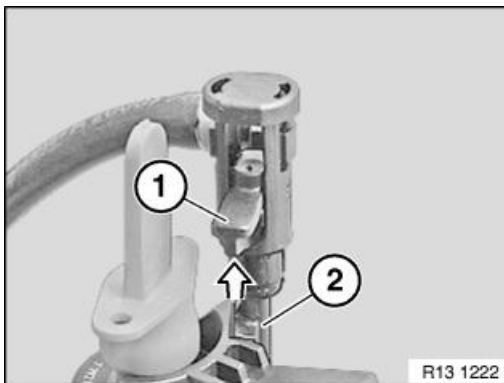
If sealing ring (1) is damaged, entire leakage oil line (2) of a cylinder group must be replaced.



Figures show variant N47oL (piezo injectors):

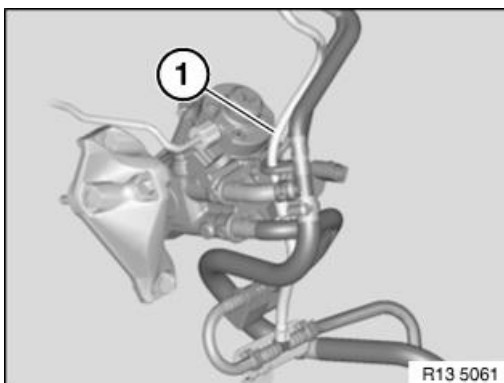
Unlock leakage oil line with special tool [13 0 170](#).

Grip line when unlocking.



Pull off unlocked leakage oil lines in upward direction.

Check sealing rings on injectors, replace if damaged.



Detach leakage oil line from T-piece of fuel line (close to high pressure pump).



Reassemble the vehicle.

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#) at rear.
- Remove sound insulation on injectors.

**Important!**

It is essential to adhere to conditions of absolute cleanliness when carrying out repair work on the fuel system.

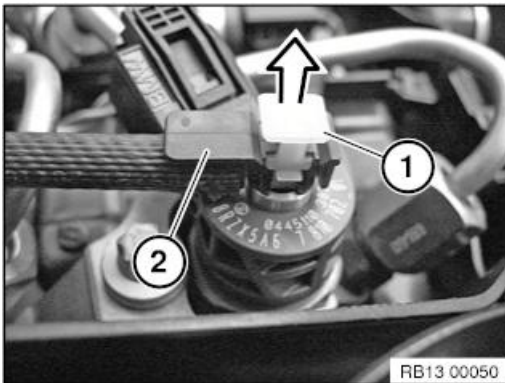
- Do not allow any dirt particles or foreign bodies to get into the system.
- Use only lint-free cloths.
- Remove all traces of dirt contamination before removing pipes or individual components.

**Important!**

You must protect the alternator against dirt contamination before carrying out any repair work on the fuel circuit.

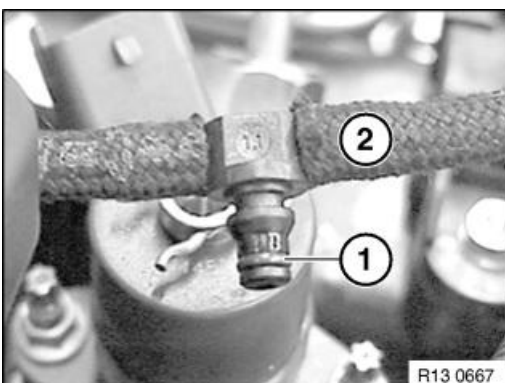
Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Pull out retainer (1) upwards.

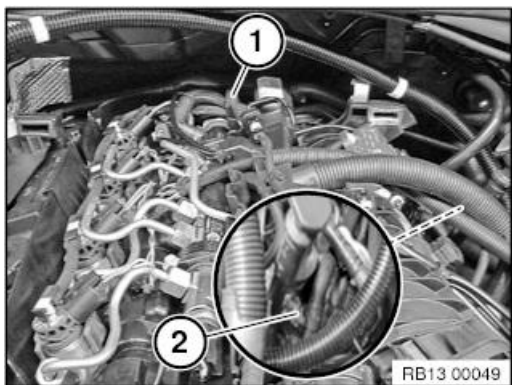
Detach connection of leakage oil line (2) upwards.

**Important!**

Brush sealing ring (1) with lubricant before connecting the leakage oil line (2) to the injector.

Check sealing ring for damage; damaged sealing rings can cause a malfunction when building up the fuel pressure.

If sealing ring (1) is damaged, entire leakage oil line (2) of a cylinder group must be replaced.



Detach leakage oil lines from the injectors. Release leakage oil line from rubber grommet (1).

Detach leakage oil line from T-piece (2) of fuel line (close to high pressure pump).



Reassemble the vehicle.

Check fuel system for tightness.

13 53 570 Replacing pressure regulator on pressure accumulator of injection system (N47, N47S)



Necessary preliminary tasks:

- Read fault memory.
- Switch off ignition.
- Remove [pressure accumulator](#).



Recycling:

Catch and dispose of escaping fuel.
Observe country-specific waste disposal regulations.

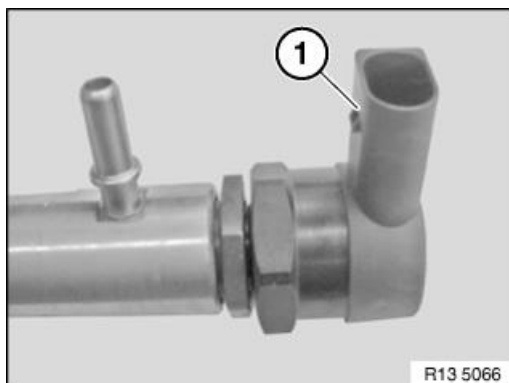


Installation note:

Pressure regulator may only be used once!

Pressure regulator must be replaced (cutting seat seal) after screw connection has been released.

Positioning before final tightening!



Grip at hexagon head (1) when removing pressure regulator.
Release hexagon screw connection on pressure accumulator.

Installation note:

Secure position of pressure regulator and grip at hexagon head (2).

Tightening torque [13 53 4AZ](#).



Assemble engine.

Check fuel system for tightness.

Check stored fault messages.

Delete fault memory.

Reset rail pressure regulator adaptation with BMW diagnosis system.

13 53 180 Replacing the pressure line between the high pressure pump and pressure accumulator (N47 D20 U/O/K/T 1)



Special tools required:

- [37 1 152](#)



Necessary preliminary tasks:

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Disconnect and connect [intake air manifold](#).



Attention!

When working on the fuel circuit, you must protect the alternator against dirt contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Attention!

After the engine has stopped, wait at least 1 minute before releasing the high pressure lines.

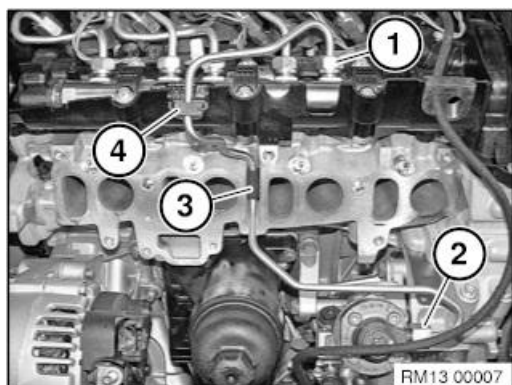
After disconnecting the pressure line, it is absolutely essential to seal the openings in the high-pressure pump and the high-pressure accumulator with protective caps.



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.



Release union nuts (1) and (2) on pressure line with special tool [37 1 152](#)

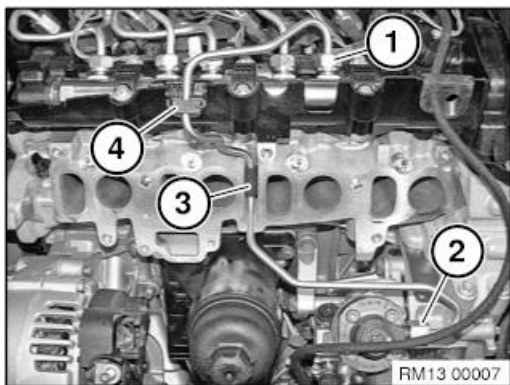
Reset special tool in good time in order to avoid bending high pressure line.

Feed out pressure lines and remove.

Installation note:

Pay attention to installation position of rubber mounts (3) and rubber grommets (4).

Observe tightening sequence.



Installation note:

- Install pressure lines and tighten hand-tight on both sides.
- First tighten pressure line at rail (1).
Tightening torque [13 53 2AZ](#).
- Then apply pressure line to high pressure pump (2).
Tightening torque [13 53 2AZ](#).

Installation note:

Pay attention to installation position of rubber mount (4) and abrasion protection (3) on pressure line.



Assemble engine.

Check fuel system for leak tightness.

13 53 180 Replacing the pressure line between the high-pressure pump and pressure accumulator (N47, N47S)



Special tools required:

- [37 1 152](#)



Important!

When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Important!

After the engine has stopped, wait at least 1 minute before releasing the high-pressure lines.

After disconnecting the pressure line, it is absolutely essential to seal the openings in the high-pressure pump and the high-pressure accumulator with protective caps.



Necessary preliminary tasks:

- Read fault memory.
- Switch off ignition.
- [Remove acoustic cover](#)
- Disconnect and connect [intake plenum](#).
- Cover intake ports.

Note:

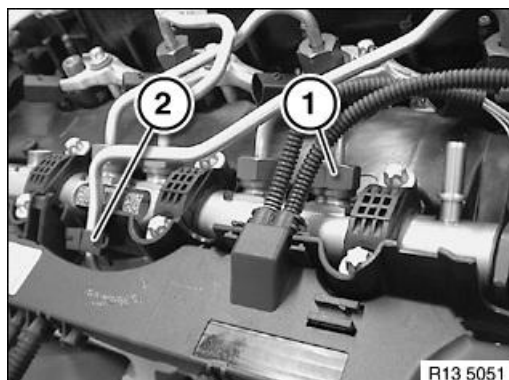
Observe [layout of common rail system](#).



Recycling:

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

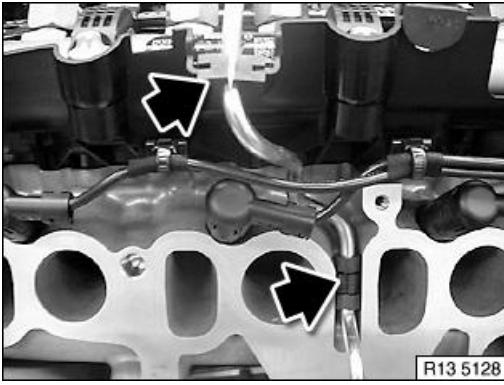


Release union nuts (1) [37 1 152](#) on pressure line with special tool .

Reset special tool in good time in order to avoid bending high-pressure lines.

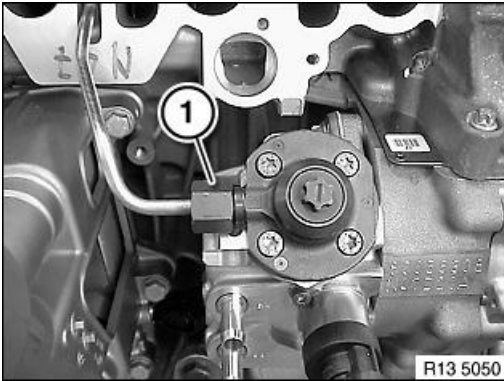
Tightening torque [13 53 2AZ](#).

Remove rubber mount (2).



Installation note:

Pay attention to installation position of rubber mount and abrasion protection on pressure line.



Release union nut (1) on high-pressure pump.

Remove H.P. line.

Installation note:

Install pressure line and apply hand-tight on both sides. Screw pressure line to pressure accumulator first then to high pressure pump.

Tightening torque [13 53 2AZ](#).



Assemble engine.

Vent fuel system via BMW diagnosis system.

Check fuel system for tightness.

13 53 570 Replacing the pressure regulator on the pressure accumulator of the injection system (N47 D20 U/O/K/T 1)



Necessary preliminary tasks:

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [pressure accumulator](#).



Recycling:

Catch and dispose of escaping fuel.
Observe country-specific waste disposal regulations.

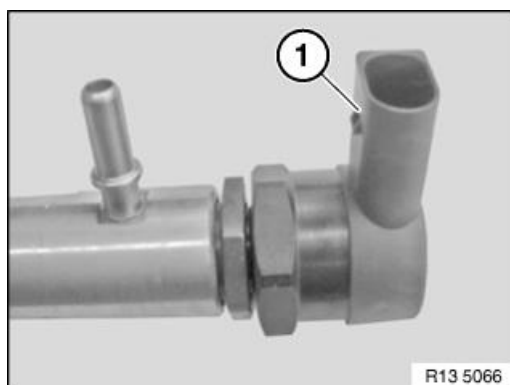


Installation note:

Pressure regulator may only be used once!

Pressure regulator must be replaced (seat seal) after screw connection has been released.

Positioning before final tightening!



Grip at hexagon head (1) when removing pressure regulator.

Release hexagon screw connection on pressure accumulator.

Installation note:

Secure position of pressure regulator and grip at hexagon head (2).

Tightening torque [13 53 4AZ](#).



Note:

Assemble engine.

Check fuel system for tightness.

Reset adaptation of pressure regulator with BMW diagnosis system.

Check stored fault message.

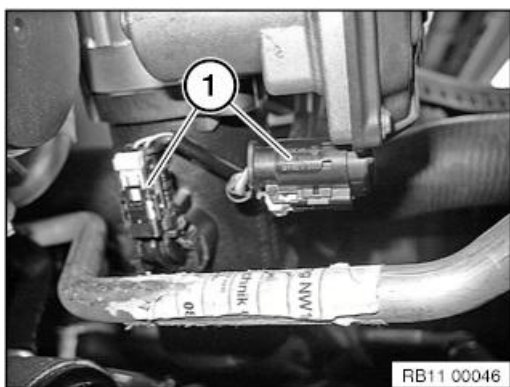
Delete fault memory.

**Important!**

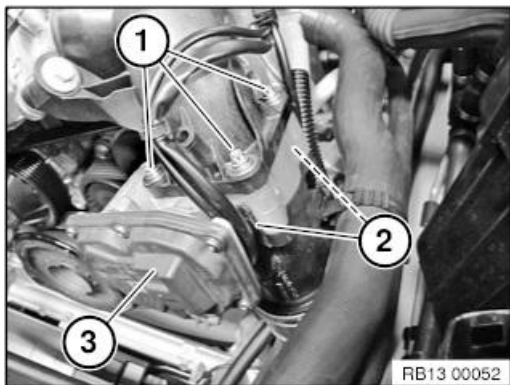
[Read](#) and comply with notes on protection against electrostatic damage (ESD protection).

**Necessary preliminary tasks:**

- Switch off ignition.
- Remove [acoustic cover](#)
- Remove [intake port](#).



Release and detach plug connections (1) at throttle body and intake air temperature sensor.



Release screws (1) on throttle valve assembly.

Tightening torque [13 54 1AZ](#).

Loosen clamps (2).

Feed out and remove throttle body (3).

Installation note:

Replace seals on throttle body and intake air mixing tube.

*Installation note:*

Check stored fault message.

Delete fault memory.



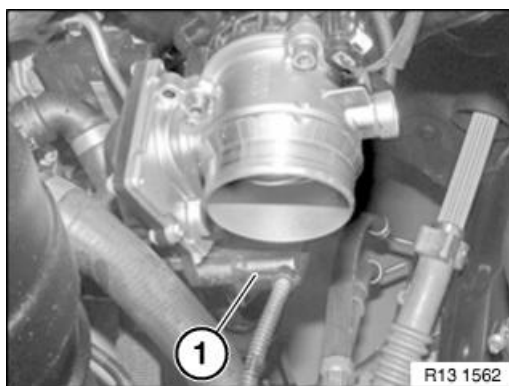
Important!

Read and comply with notes on protection against damage from electrostatic discharge (ESD protection).

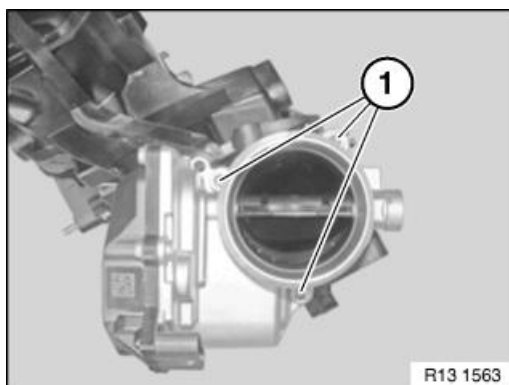


Necessary preliminary tasks:

- Switch off ignition.
- Remove [pressure pipe](#).



Unlock and disconnect plug (1) on throttle valve assembly.



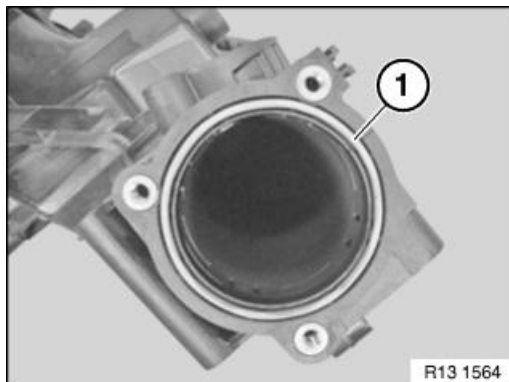
Note:

For purposes of clarity, the intake plenum is shown removed.

Release screws (1) on throttle valve assembly.

Tightening torque [13 54 1AZ](#).

Remove throttle valve assembly.



Installation note:

Release sealing ring (1) on intake plenum.



Installation note:
Check stored fault message.
Delete fault memory.

**Important!**

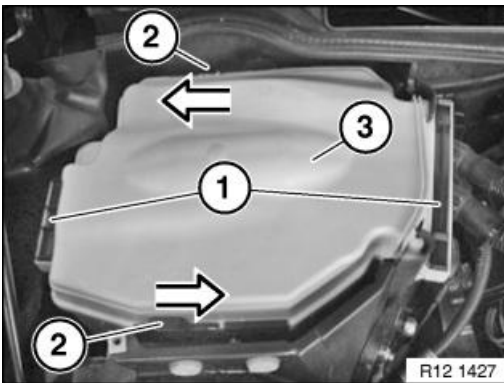
Read and comply with notes on [protection against electrostatic discharge \(ESD protection\)](#).

*Necessary preliminary tasks:*

- Read fault memory.
- Switch off ignition.
- Disconnect [negative battery cable](#).
- Remove [lower section of microfilter housing](#).
- [Follow instructions for removing and installing control units](#).

Replacement:

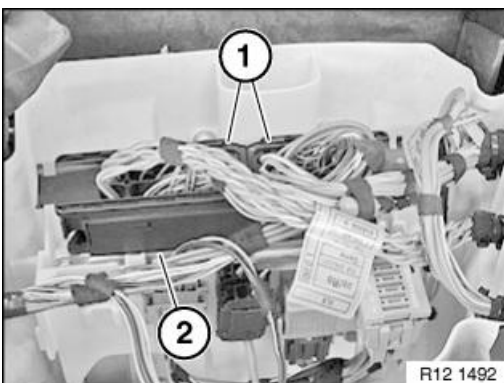
- Carry out programming/encoding.
- If no data can be read out from the previous control unit, carry out injection quantity compensation (description at end of instructions).



Unlock fasteners (1) from below and slide upwards approx. 10 mm.

Unlock locks (2) in direction of arrow.

Remove cover (3).

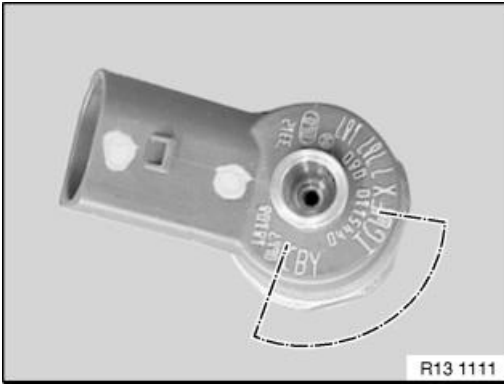


Unlock connector (1) and remove.

Unlock control unit (2) and remove towards top.

*Installation note:*Replacement:

Note the identification number and encoding.



Injection quantity compensation:

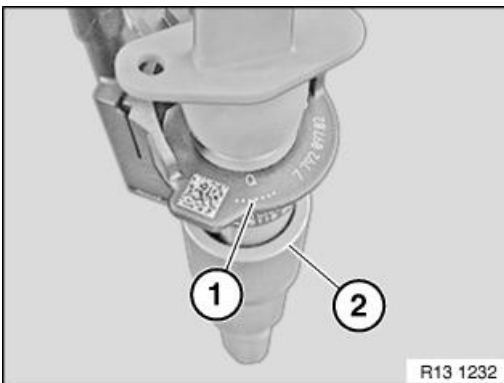
If the DDE control unit has been replaced, it will also be necessary to carry out adjustment of the injectors!

The adjustment value (7-position letter/number code) is engraved on each injector.

Enter the numbers/letters according to the installation location (cylinder) of the injectors.

- Select "DDE".
- Select "Adjustment, injection quantity compensation"
- Select "Test plan"
- The adjustment must be entered for each cylinder on which an injector has been replaced.

It is necessary to adjust the new injectors to ensure their full operability.



Position of the adjustment value (1) at the injector (2).



Note:

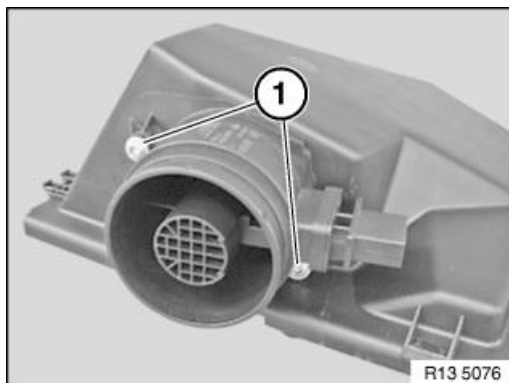
Check stored fault messages.

Delete fault memory.



Necessary preliminary tasks:

- Read fault memory.
- Switch off ignition.
- Remove [air filter housing upper section](#).



Release screws (1) and remove hot film air mass meter.

Tightening torque [13 71 3AZ](#).



Note:

Check stored fault messages.

Delete fault memory.

Reset hot film air mass meter adaptation with BMW diagnosis system.



Necessary preliminary tasks:

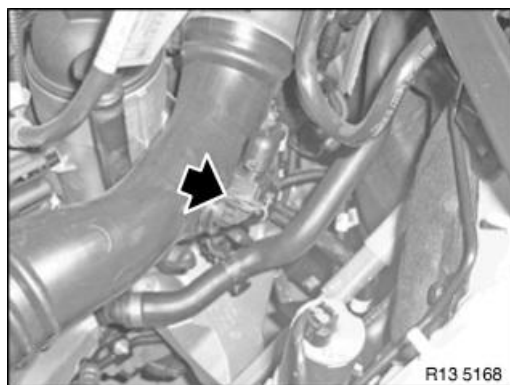
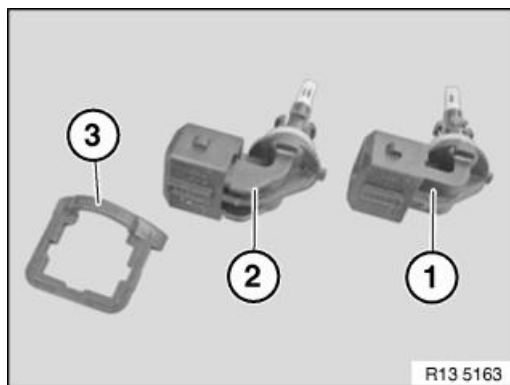
- Read out fault memory of the DME control unit, work through test schedules if necessary
- Switch off ignition

Important!

There are different versions of charge-air temperature sensors!

Intake air charge-air temperature sensor (1) without retaining clip.

Intake air charge-air temperature sensor (2) with large ribs for retaining clip (3).



Unlock connector and remove.

Turn charge-air temperature sensor by 45° and remove.



Note:

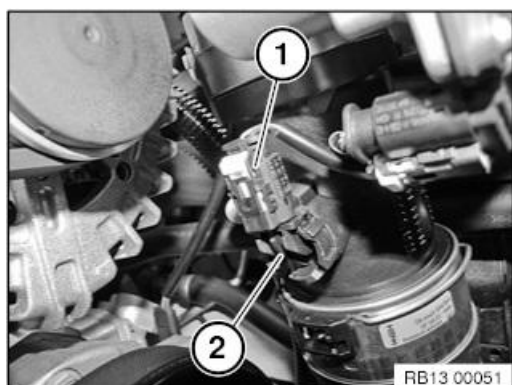
- Clear diagnostic fault entries from fault memory.
- Reassemble the vehicle.

13 62 538 Removing and installing/replacing charge-air temperature sensor (N47 D20 K/U/O/T 1)

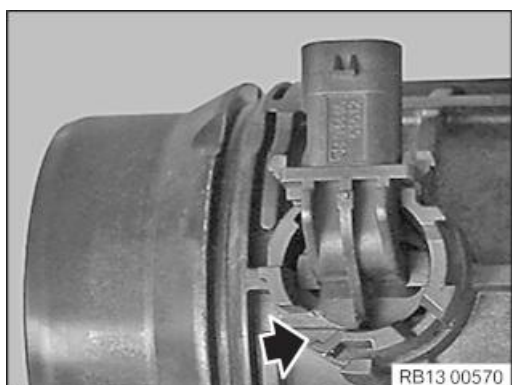


Necessary preliminary tasks:

- Read out fault memory of the DME control unit, work through test plans if necessary.
- Switch off ignition.
- Remove [intake port](#).



Unlock connector (1) from charge-air temperature sensor (2) and pull off.

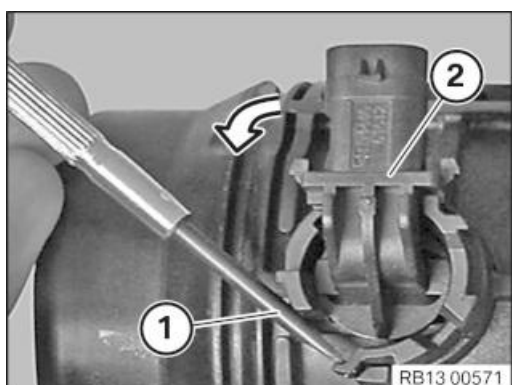


Important!

The lock must be unlocked for removal of charge-air temperature sensor!

If the lock is not unlocked, the retaining lug on charge-air temperature sensor wears.

If the retaining lug is damaged, the charge-air temperature sensor can fall out of the pressure pipe.



Open the lock with a suitable tool (1).

Rotate charge-air temperature sensor (2) anticlockwise by 90° and pull out sensor straight.

Installation note:

Check sealing ring.

Replace damaged sealing ring.



Note:

Clear diagnostic fault entries from fault memory.

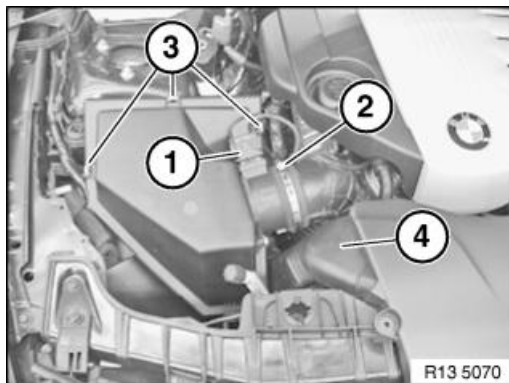
Reassemble the vehicle.

13 62 560 Removing and installing/replacing hot film air mass meter (N47 D20 U/O/K/T 1)



Necessary preliminary tasks:

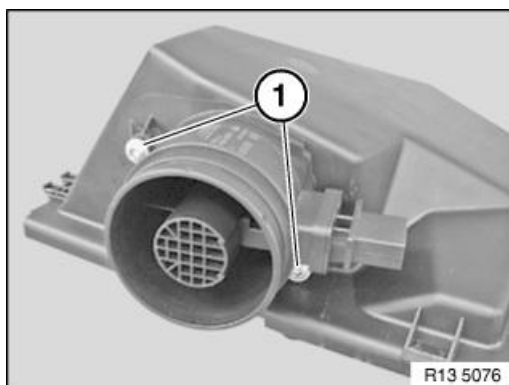
- Read fault memory.
- Switch off ignition.



Pull off connector (1) from hot film air mass meter.

Release clamp (2) on air intake hose.

Release retainers (3) on intake filter housing and remove upper section of intake filter housing.



Release screws (1) and remove hot film air mass meter.

Tightening torque [13 71 2AZ](#).



Replacement only:

Reset the adaptation values for the air mass system via the BMW diagnosis system.



Note:

Check stored fault messages.

Delete fault memory.

**Special tools required:**

- [11 7 020](#)

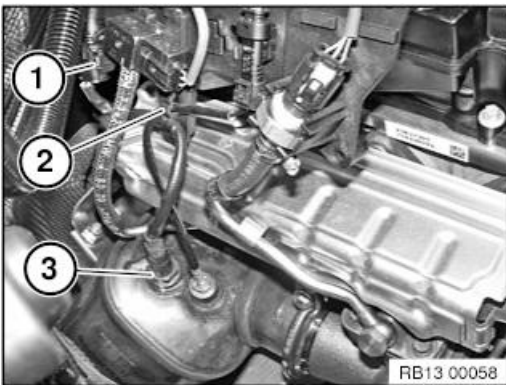
**Warning!**

Risk of burning!

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

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)



Disconnect connector (1) and release from bracket.

Release oxygen sensor cable from clamp (2).

Remove oxygen sensor (3) with special tool [11 7 020](#).

Tightening torque [13 62 3AZ](#).

**Installation note:**

Threads of new oxygen sensors are already coated with NEVER-SEEZ compound.

If an oxygen sensor is reused, only apply a thin and uniform coat of Never Seez Compound (refer to BMW Parts Department) to thread.

Oxygen sensor section projecting into exhaust branch must not be cleaned or come into contact with lubricant.

Pay attention to cable routing of oxygen sensors.

[11 7 020](#) Use special tool to tighten down oxygen sensor.

Tightening torque [13 62 3AZ](#).

Cover oxygen sensors when applying underbody protection.

*Installation note:*

Check stored error/fault messages.

Delete fault memory.

**Special tools required:**

- [11 8 850](#)

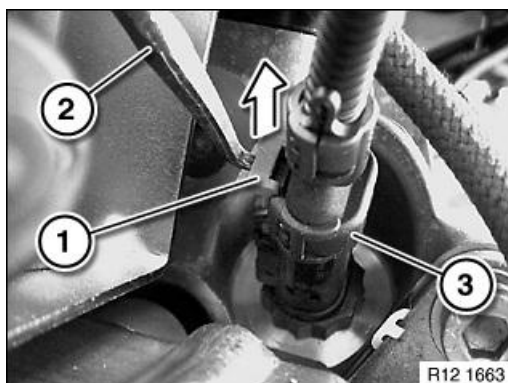
**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)

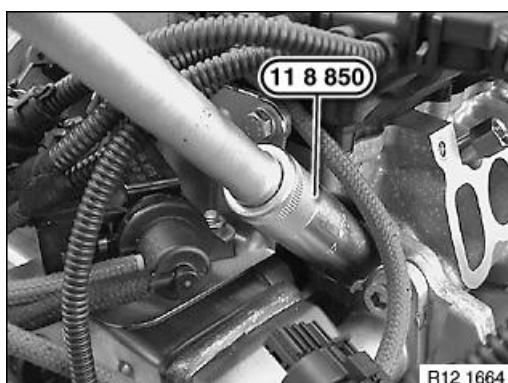
**Recycling:**

Catch and dispose of escaping coolant.

Observe country-specific waste disposal regulations.



Release lock (1) with hook (2) and detach connector (3).



Loosen and remove coolant temperature sensor (3) with [11 8 850](#).

Tightening torque [13 62 2AZ](#).

If necessary, top up coolant.

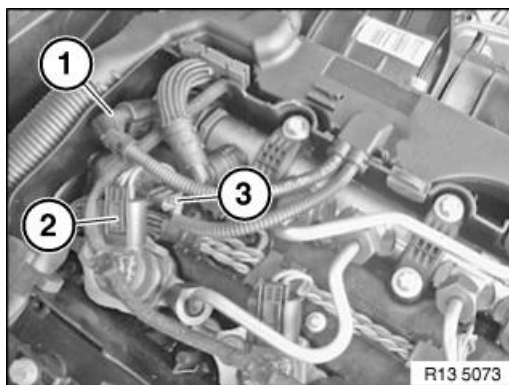
**Note:**

Check stored fault messages.

Delete fault memory.

**Necessary preliminary tasks:**

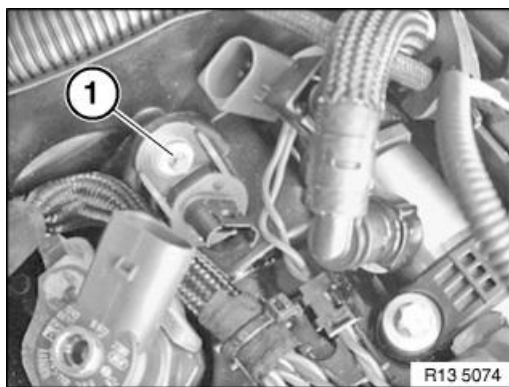
- Read fault memory.
- Switch off ignition.
- Remove acoustic cover at front.
- Raise acoustic cover, rear.
- **Only E90, E91, E92, E93, E81, E82, E84, E87, E88:**
Remove [microfilter housing](#) lower section.



Detach plug from pressure regulator (1).

Detach plug (2), injector, cyl. 4.

Unlock plug (3) from pulse generator and detach.



Release screw (1).

Remove pulse sensor.

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

**Installation note:**

Apply a thin coat of lubricant to sealing ring (1) for installation.



Installation note:
Reassemble the vehicle.
Delete fault memory.
Check function of DDE.

13 62 585 Replace the exhaust backpressure sensor on the exhaust turbocharger (N47 D20 U/O/K1)



Warning!

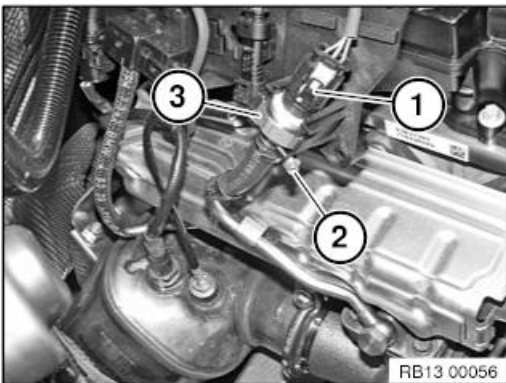
Risk of burning!

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



Necessary preliminary tasks:

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)



Unlock connector (1) and remove.

Release clamp (2).

Unclip the exhaust-gas temperature sensor (3) and remove from the pressure hose.

Installation note:

Immediately secure pressure hose back to the hose clamp on the exhaust back pressure sensor.



Installation note:

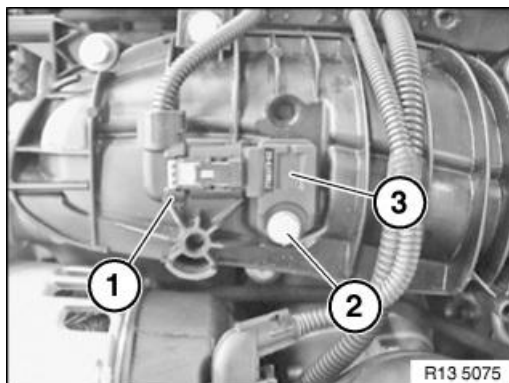
After replacing the exhaust back pressure sensor, carry out an adaptation using the „Exhaust back pressure sensor upstream of exhaust turbocharger“ diagnosis system.

Check stored error/fault messages.

Delete fault memory.

**Necessary preliminary tasks:**

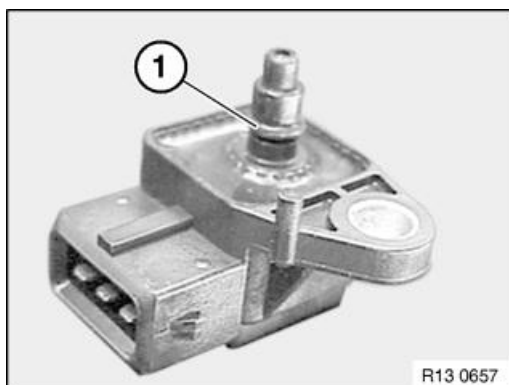
- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove acoustic cover at front.



Unlock connector (1) and remove.

Release screw (2).

Remove charge-air pressure sensor (3).

**Installation note:**

Check sealing ring (1) of charge-air pressure sensor and replace if damaged.

Prior to installation, apply a thin coat of anti-friction agent to sealing ring (1) of charge-air pressure sensor.

**Note:**

Check stored fault messages.

Delete fault memory.

**Special tools required:**

- [11 8 850](#)

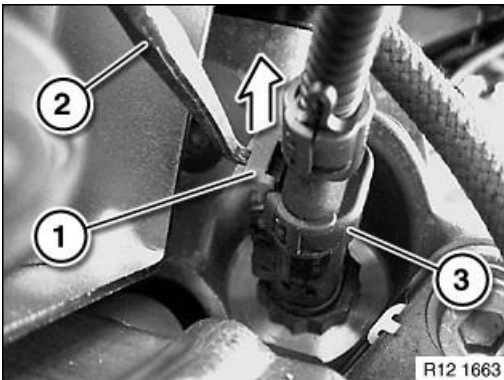
**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)

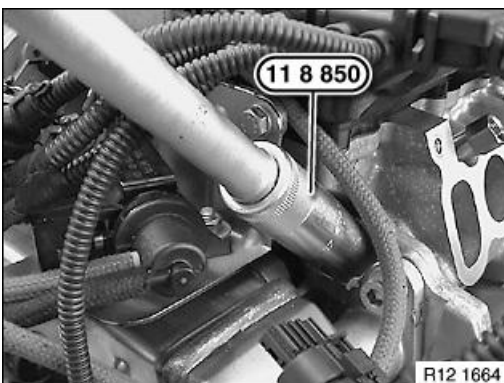
**Recycling:**

Catch and dispose of escaping coolant.

Observe country-specific waste disposal regulations.



Release lock (1) with hook (2) and detach connector (3).



Loosen and remove coolant temperature sensor (3) with [11 8 850](#).

Tightening torque [13 62 2AZ](#).

If necessary, top up coolant.

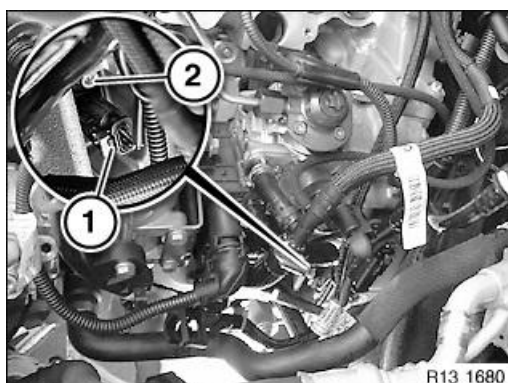
**Note:**

Check stored fault messages.

Delete fault memory.

**Necessary preliminary tasks:**

- Read fault memory.
- Switch off ignition.
- **E81, E82, E87, E88, E90, E91, E92, E93 only:**
Remove front [underbody protection](#).
Remove rear [underbody protection](#).
- **E60, E61 only:**
Remove [reinforcement plate](#).
- **E83, E84 only:**
Remove rear [underbody protection](#).



Pull connector (1) off pulse sensor.

Release screw (2).

Remove pulse sensor.



Reassemble the vehicle.

Delete fault memory.

Check function of DDE.

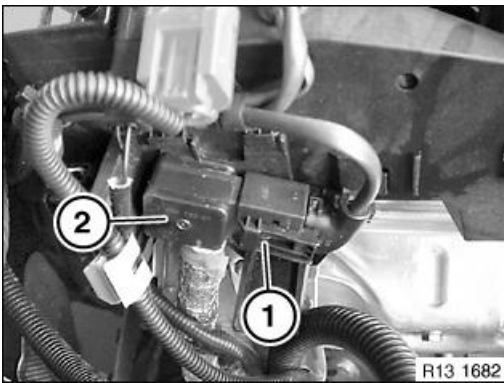
**Warning!**

Risk of burning!

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

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)



Unlock connector (1) and remove.

Unlock exhaust-gas pressure sensor (2) at holder.

Remove exhaust backpressure sensor.

Remove hose retainer.

Disconnect pressure hose.

Installation note:

Check pressure hose. Replace hardened pressure hose.

Check connection on pressure pipe and pressure sensor for tightness.

A pressure hose which has been pulled off once must be secured with a 15 mm - 19 mm diameter screw clamp.

Tightening torque [18 32 1AZ](#).

**Installation note:**

Check stored error/fault messages.

Delete fault memory.

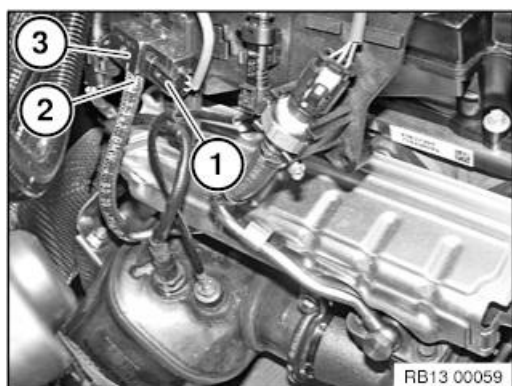
**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)

**Warning!**

Risk of burning!

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



Unlock connector (1) and remove.

Unlock exhaust backpressure sensor (2) at holder.

Remove exhaust backpressure sensor (2).

Detach pressure hose (3). Renew pressure hose.

**Installation note:**

Check stored error/fault messages.

Clear diagnostic fault entries from fault memory.

13 62 662 Replacing exhaust temperature sensor for exhaust-gas recirculation

PRELIMINARY WORK

1 – Remove acoustic cover at top.

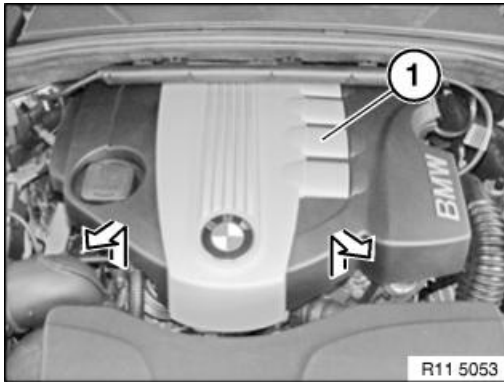


RISK OF DAMAGE

Damage to the acoustic cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.

- Disassemble or mount the acoustic cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover only at temperatures $>20^{\circ}\text{C}$.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Detach the acoustic cover top (1) upwards from rubber mounts and remove it in the direction of travel.

MAIN WORK

2 – Remove the exhaust temperature sensor for the exhaust-gas recirculation



WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.



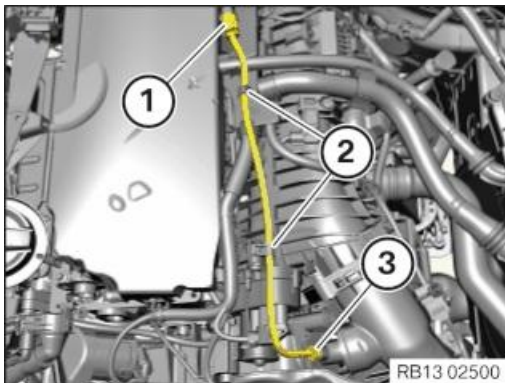
RISK OF DAMAGE



Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 Information on electrostatic discharge (ESD) protection.



- If necessary, partially detach rear acoustic cover.
- Unlock and loosen connector (1).
- Loosen the cables from the clamps (2).
- Loosen and remove the exhaust temperature sensor for the exhaust-gas circulation (3).

3 – Install the exhaust temperature sensor for the exhaust-gas recirculation



RISK OF DAMAGE

Damage of exhaust temperature sensor.

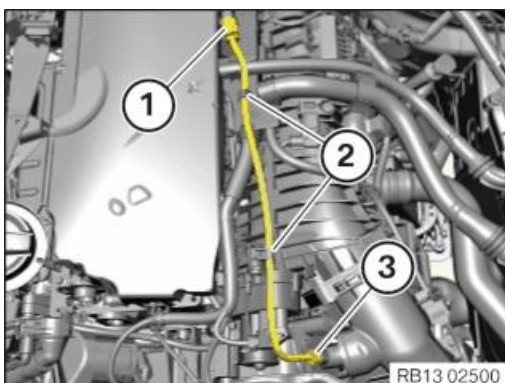
Damage to exhaust temperature sensors leads to malfunctions.

- Make sure that the gauge tip (1) is not damaged.
- Check the gauge tip (1) for damage and renew the exhaust temperature sensor as needed.
- Install and tighten exhaust temperature sensor for the exhaust-gas recirculation (3).

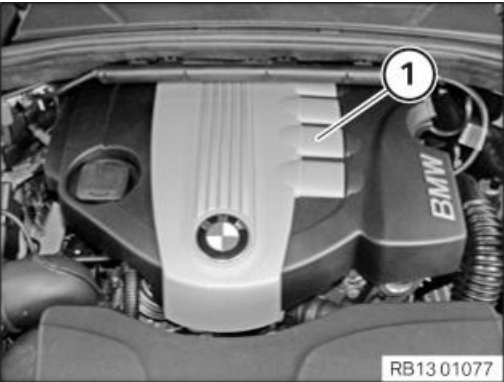
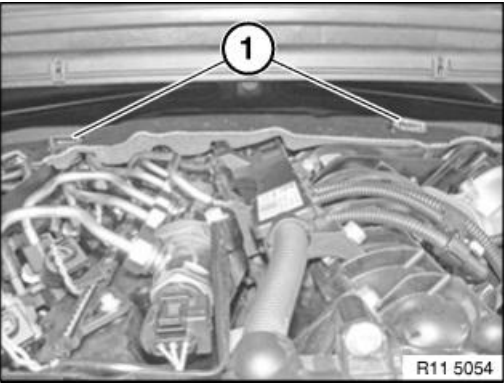
Exhaust temperature sensor for EGR

Exhaust-gas temperature sensor	Tightening torque	21,7 Nm
--------------------------------	-------------------	---------

- Secure the cable with the clamps (2).
 - Connect and lock the connector (1).
- The connector (1) must engage audibly.



4 – Installing the top acoustic cover



- Push the top acoustic cover into both guides (1).



RISK OF DAMAGE

Damage to the acoustic cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover.

- Disassemble or mount the acoustic cover carefully.
 - Disassemble or mount snap-lock couplings of the ball pivots one after the other.
 - Disassemble or mount acoustic cover only at temperatures >20 °C.
 - Use only distilled water as an auxiliary material during installation, no lubricants.
- Secure the top acoustic cover (1) to the rubber mounts.

Additional Information

Overview of Tightening Torques

Exhaust temperature sensor for EGR			Used in step
Exhaust-gas temperature sensor		Tightening torque	21,7 Nm

Links

Repair instructions	Used in step
61 35 ... Notes on ESD protection (Electro Static Discharge)	2

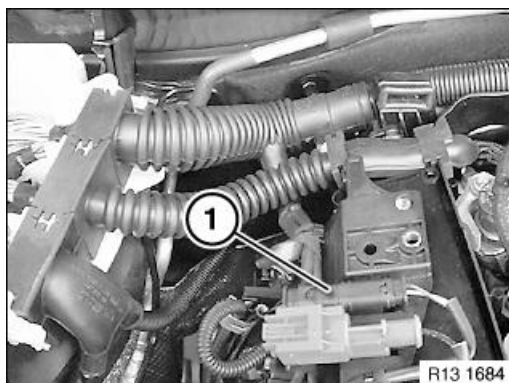
**Warning!**

Risk of burning!

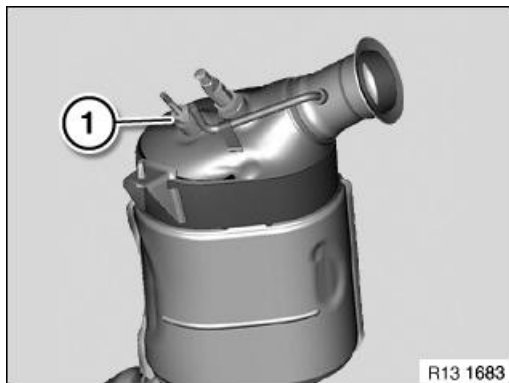
Only perform this repair work on an engine that has cooled down.

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit
- Switch off ignition
- Remove [acoustic cover](#)

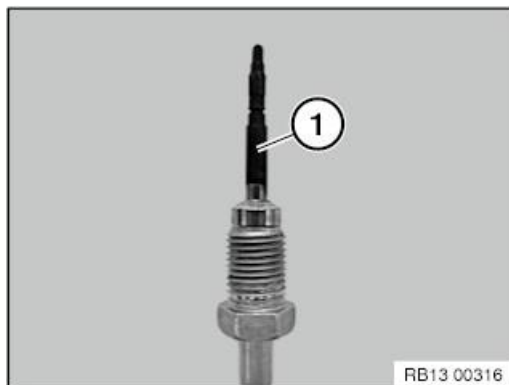


Disconnect plug (1) from the exhaust backpressure sensor.



Release exhaust-gas temperature sensor and remove.

Tightening torque [13 62 4AZ](#).

**Important!**

Make sure when installing the exhaust-gas temperature sensor that the gauge tip (1) is not damaged.



Installation note:
Check stored fault messages.
Delete fault memory.

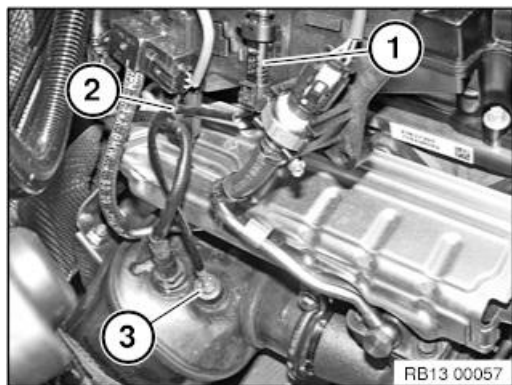
**Warning!**

Risk of burning!

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

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit.
- Switch off ignition.
- Remove [acoustic cover](#)

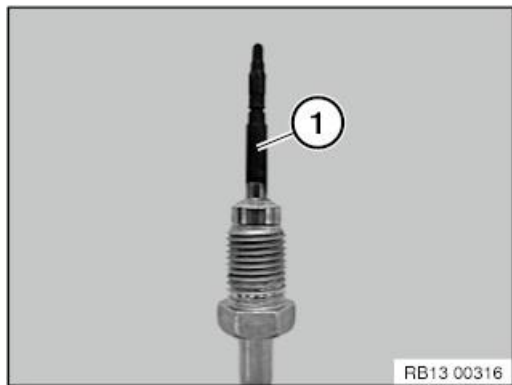


Unlock connector (1) and remove.

Detach cable from clamp (2).

Release exhaust-gas temperature sensor (3) and remove.

Tightening torque [13 62 4AZ](#).

**Important!**

Make sure when installing the exhaust-gas temperature sensor that the gauge tip (1) is not damaged.

**Installation note:**

Check stored error/fault messages.

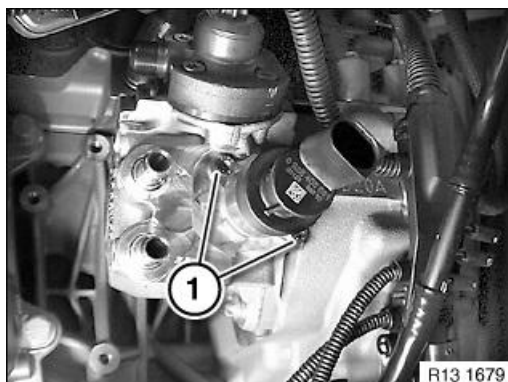
Delete fault memory.

**Necessary preliminary tasks:**

- Read fault memory of DDE control unit
- Switch off ignition
- Remove [acoustic cover at front](#)

Note:

Installation location: under intake air manifold.



Unlock and disconnect plug.

Release screws (1).

Remove metering unit.

[Tightening torque 13 51 1AZ.](#)



Clean sealing faces of metering unit.

*Note:*

Check stored fault messages.

Now clear the fault memory.

**Special tools required:**

- [11 7 020](#)

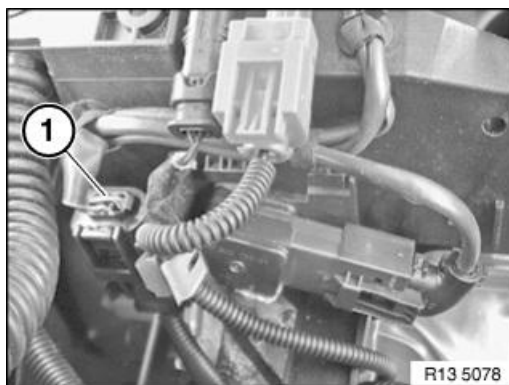
**Warning!**

Risk of burning!

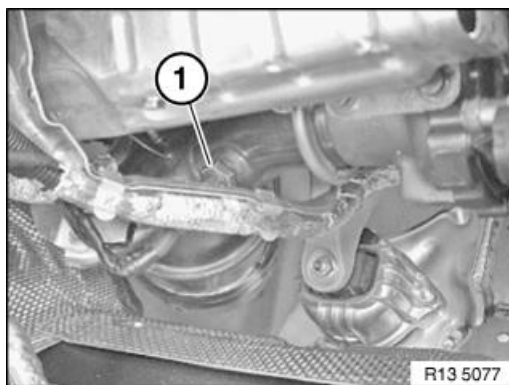
Only perform this repair work on an engine that has cooled down.

**Necessary preliminary tasks:**

- Read out the fault memory of the DDE control unit
- Switch off ignition



Disconnect plug (1).



Release control sensor (1) with special tool [11 7 020](#).

**Installation note:**

Threads of new oxygen sensors are already coated with NEVER-SEEZ compound.

If an oxygen sensor is reused, only apply a thin and uniform coat of NEVER-SEEZ compound (refer to BMW Parts Department) to thread.

Oxygen sensor section projecting into exhaust branch must not be cleaned or come into contact with lubricant.

Pay attention to cable routing of oxygen sensors.

[11 7 020](#) Use special tool to tighten down oxygen sensor.

Tightening torque [13 62 3AZ](#).

Cover oxygen sensors when applying underbody protection.

*Installation note:*

Check stored fault messages.

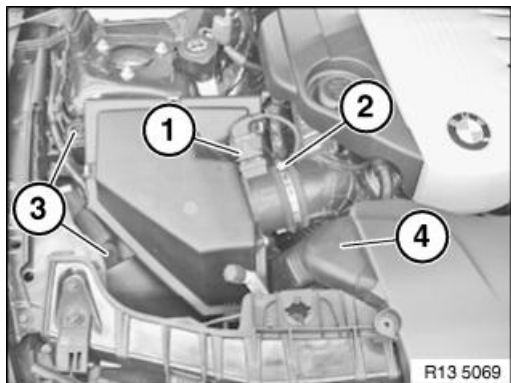
Delete fault memory.

13 71 000 Removing and installing an intake silencer housing (N47, N47S, N47 D16/20 U/O/K/T 1)



Necessary preliminary work:

- Switching off the ignition



Pull off connector from hot film air mass meter (1).

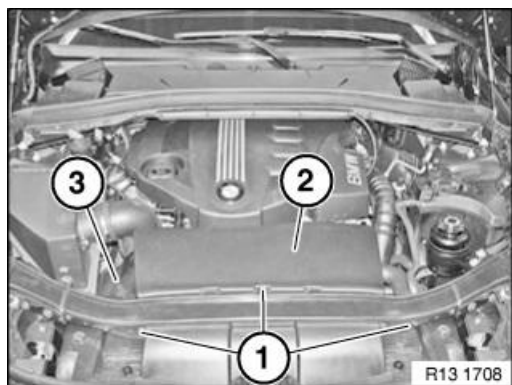
Release clamp on air intake hose and disconnect hose.

Release screws (3).

Release unfiltered-air snorkel (4).

Remove intake silencer housing.

13 71 ... Removing the intake port (N47 D20 U/O/K/T 1)



Release screws (1).

Detach hose (3) on intake silencer housing.

Lift off intake port (2) and remove.

13 71 140 Replacing intake pipe between hot film air mass meter and exhaust turbocharger (N47, N47S)



Necessary preliminary tasks:

- Remove acoustic cover at front.
- Remove [underbody protection](#)



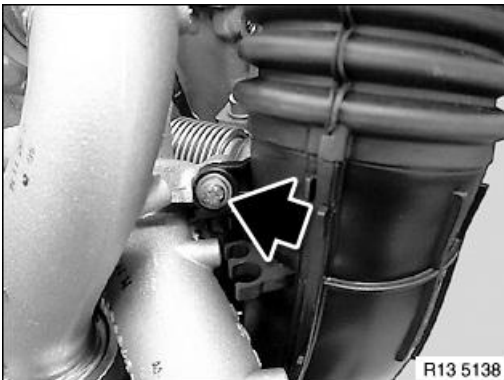
Unfasten clamp.

Unclamp lines from intake pipe.

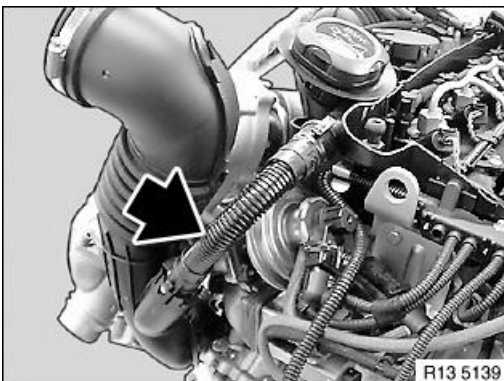
Pull the intake pipe off the hot film air mass meter.

Installation note:

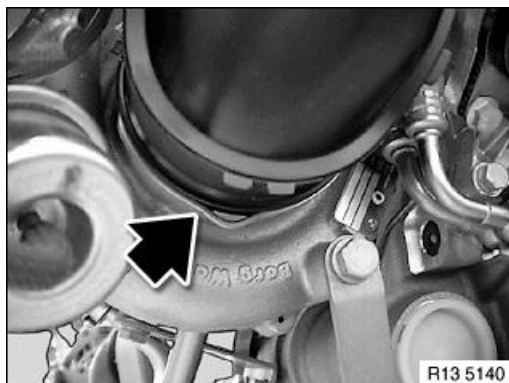
Make sure intake pipe (2) is correctly seated on hot film air mass meter.



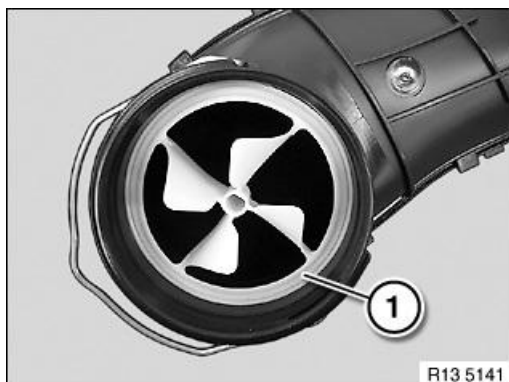
Release screw.



Detach line for oil venting.



Unlock clasp and remove air pipe. *Installation note:*
Clasp must be clearly heard to snap into place.



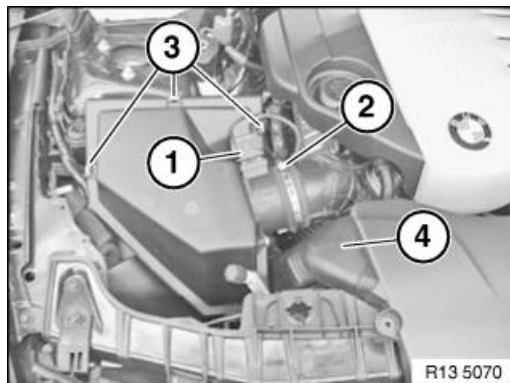
N47S only:

Note installation position and condition of swirl generator (1).
Reassemble the vehicle.



Necessary preliminary tasks:

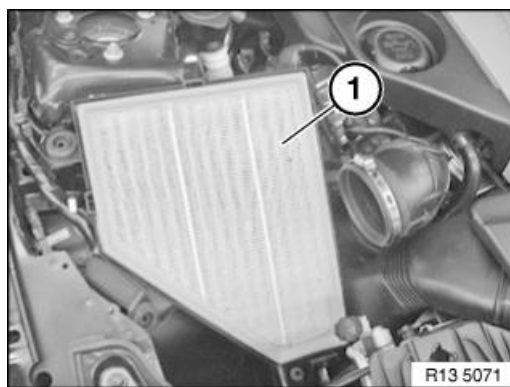
- Switch off ignition.



Pull off connector (1) from hot film air mass meter.

Release clamp (2) on air intake hose.

Release retainers (3) on intake filter housing and remove cover.

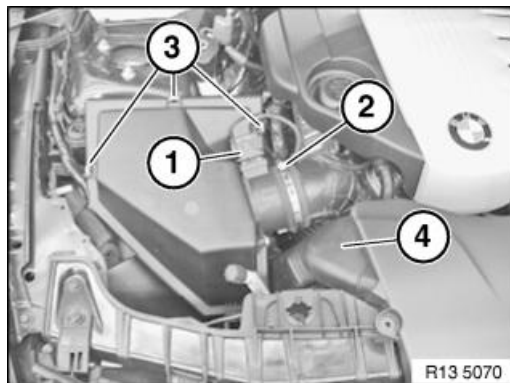


Remove air filter element (1).



Necessary preliminary tasks:

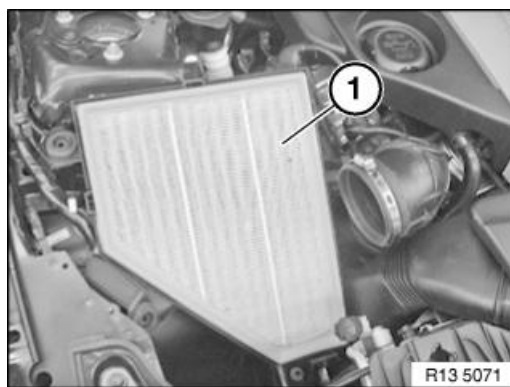
- Switch off ignition



Pull off connector (1) from hot film air mass meter.

Release clamp (2) on air intake hose.

Release retainers (3) on intake filter housing and remove cover.



Remove air filter element (1) and replace. *Installation note:*

Clean inside of intake silencer housing.

13 71 140 Replacing intake pipe between hot film air mass meter and exhaust turbocharger (N47, N47S)



Necessary preliminary tasks:

- Remove acoustic cover at front.
- Remove [underbody protection](#)



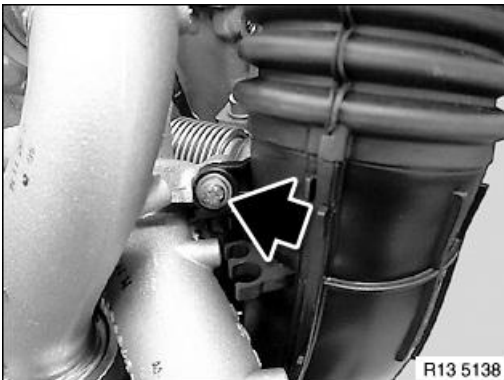
Unfasten clamp.

Unclamp lines from intake pipe.

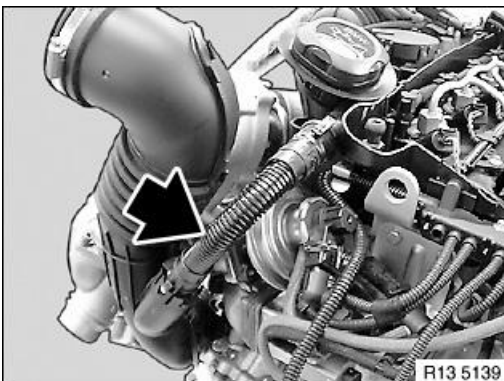
Pull the intake pipe off the hot film air mass meter.

Installation note:

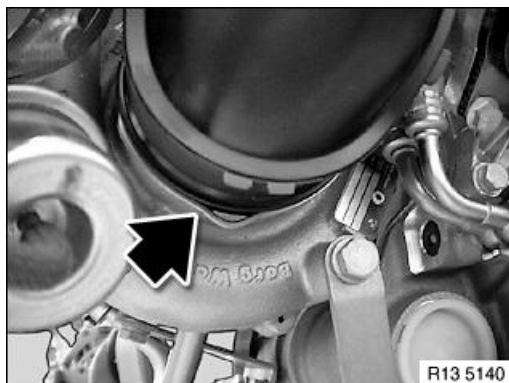
Make sure intake pipe (2) is correctly seated on hot film air mass meter.



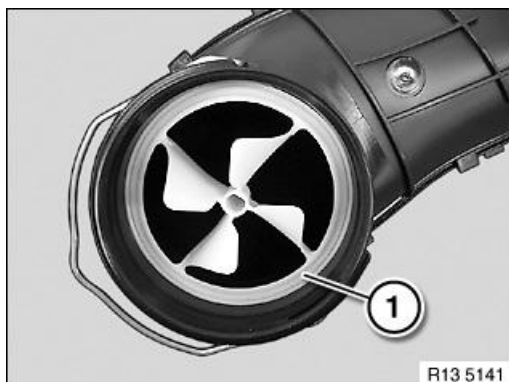
Release screw.



Detach line for oil venting.



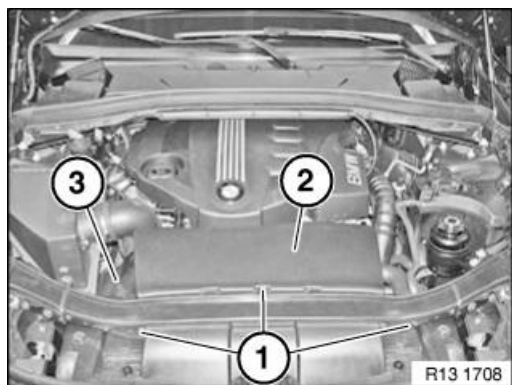
Unlock clasp and remove air pipe. *Installation note:*
Clasp must be clearly heard to snap into place.



N47S only:

Note installation position and condition of swirl generator (1).
Reassemble the vehicle.

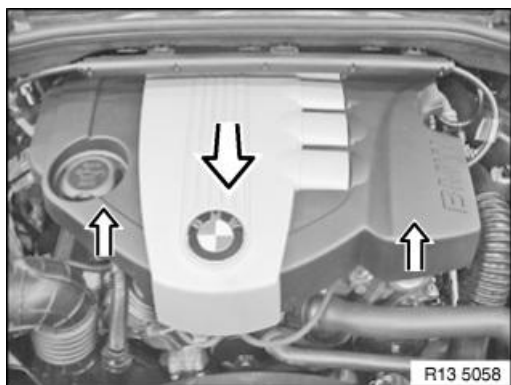
13 Removing intake duct (N47, N47S)



Release screws (1).

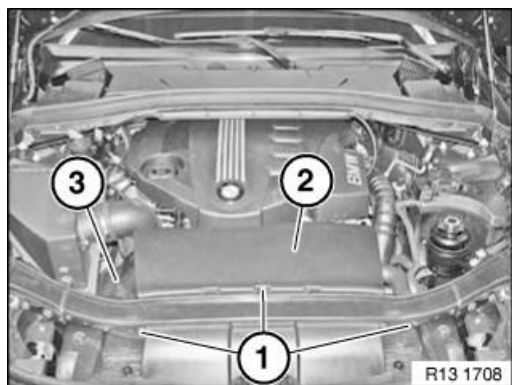
Detach hose (3) on intake filter housing.

Lift off intake duct (2) and remove.



Raise acoustic cover at front and pull out in direction of travel.

13 71 ... Removing the intake port (N47 D20 U/O/K/T 1)



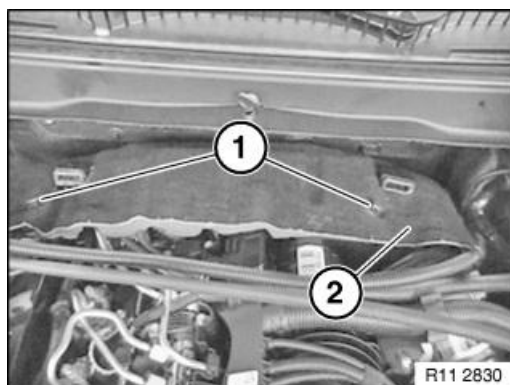
Release screws (1).

Detach hose (3) on intake silencer housing.

Lift off intake port (2) and remove.

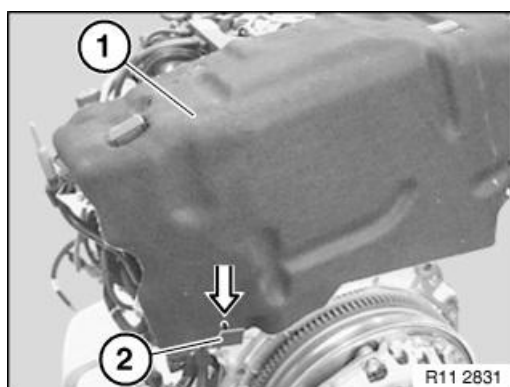
**Necessary preliminary tasks:**

- Remove acoustic cover at front.
- Remove lower section of microfilter housing



Remove expander rivets (1).

Lift off acoustic cover (2)

**Installation note:**

When installing the acoustic cover (1), make sure it is correctly seated in the holder (2).

Note:

Illustration with engine removed.