

ENGINE PERFORMANCE

Fuel System - Repair Instructions - X6

FUEL PUMP WITH DRIVE AND LINE

13 31... NOTES ON FUEL PRESSURE CHECK (REFERENCE PRESSURE: ENVIRONMENT)

Feature of this version with ambient pressure

The connection for the vacuum hose of the fuel pressure regulator is located between the throttle and the air cleaner or on the air cleaner.

Test precondition

The correct fuel pressure regulator is fitted.

- Using the EPC, check whether the fuel pressure regulator suitable for the car is fitted:

Connect test adapter .

Description of operation

The control function of the fuel pressure regulator must be guaranteed under all operating conditions. The fuel pump must always be able to generate a higher fuel pressure than the pressure regulated by the pressure regulator.

The injection rate is adjusted by means of the injection time; the injection time is controlled by the DME.

Description of operation: fuel return line

When the engine is at a standstill and the ignition key is in position 0, the fuel return line after the pressure regulator is at zero pressure.

Description of operation: pressure retaining function

The pressure regulator closes when the engine is at a standstill and the ignition key is in position 0. The fuel pressure in the delivery line is retained over an extended period. A non-return valve closes in the fuel pump. These measures help to retain the fuel pressure in the fuel system. Extended starting times are thus avoided.

Complaint: drive characteristic faults, lack of power

- Run engine at idle speed and measure fuel pressure.

If the measured value is less than the nominal value - 0.2 bar:

- Line cross-sections in fuel feed are constricted or fuel filter is clogged, or
- Fuel pump voltage supply is not O.K.: e.g. as a result of high contact resistance (corrosion) in plug

connection between wiring harness and fuel pump.

If the measured value is greater than the nominal value + 0.2 bar:

- Turn off engine stop and then observe measured value.
- If measured value drops to nominal value, then line cross-sections in fuel return are constricted or clogged.
- Check the fuel lines for kinks.

If no kinks are visible:

- Replace return lines

If measured value remains too high, then pressure regulator is in all probability faulty.

IMPORTANT: With less likelihood, the return line may be completely blocked. When the pressure regulator is removed, fuel could escape under pressure!

- **Have a cleaning cloth ready and catch and dispose of escaping fuel.**
- **Replace the return line but not the pressure regulator.**

Complaint: Starting Problems

- Run engine briefly at idle speed and switch off.
- Note down measured value while engine is stopped.
- Read off measured value again after approx. 20 to 30 minutes while engine is stopped.

Special tool 13 3 010 (hose clamp) is required for the following test.

If the measured value has dropped by more than 0.5 bar:

- Start engine and wait briefly for a stable pressure increase.
- Switch off the engine and immediately pinch off the delivery line just before the pressure gauge with the special tool 13 3 010.
- Note down measured value
- Read off measured value again after approx. 20 to 30 minutes while engine is stopped

If the measured value has now dropped by less than 0.5 bar, the following faults can be present:

- Fault in delivery lines
- Fault in in-tank delivery hose
- Faulty pressure-holding non-return valve in fuel pump

Check components. Replace faulty components.

If the measured value has dropped by more than 0.5 bar again:

- Replace pressure regulator

NOTE:

- All the fuel hoses and hose clips which were detached within the framework of the checks must be replaced.
- Interrogate fault memory of DME control unit. Check stored fault messages. Rectify faults. Now clear the fault memory.

INJECTION PUMP, REGULATOR, MIXTURE REGULATOR

13 51 065 REMOVING AND INSTALLING/REPLACING LEFT HIGH-PRESSURE FUEL PUMP (N63)

WARNING: Observe warning on cylinder head cover.

Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

Electric fuel pump starts up automatically when door is opened!

Carry out installation work on fuel system only with coolant temperature below 40°C.

IMPORTANT: Wear full face guard and protective gloves.

Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system.

Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

IMPORTANT: Ignition coils must not be fouled by fuel.

The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail!

Cover ignition coil with suitable means.

Necessary preliminary tasks:

- Remove **fuel feed line** .
- Remove **high-pressure line** from left high-pressure pump to rail.

Recycling:

Fuel escapes when fuel lines are detached.

Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

IMPORTANT: High-pressure pump can be pretensioned by camshaft cams!

Gently release screws (1) of high-pressure pump (2). If the high-pressure pump is pressed out, the engine must be rotated.

Otherwise it will not be possible to install the high-pressure pump!

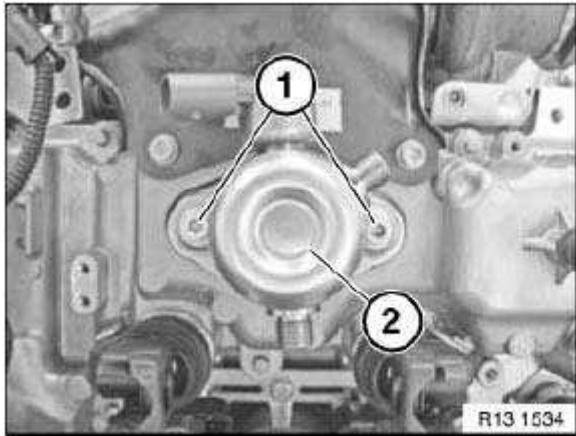


Fig. 1: Identifying High-Pressure Pump & Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Rotate engine at central bolt through 90° in direction of engine rotation.

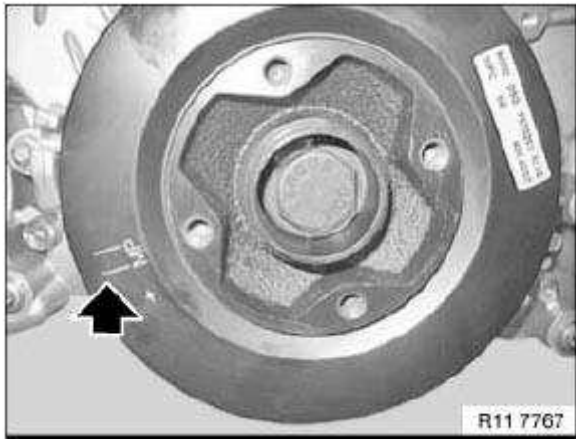


Fig. 2: Rotating Central Bolt
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Replace screws (1). Screws (1) are coated with sealant.

IMPORTANT: Pump plunger can fall out when high-pressure pump (2) is pulled out!

Detach high-pressure pump (2) and remove.

Engine oil can escape when pump is detached; have a cleaning cloth ready.

Installation:

Provisionally fasten screws (1) and tighten uniformly in 180° increments until final tightening.

Tightening torque, see 13 51 1AZ in **INJECTION PUMP, REGULATOR, MIXTURE REGULATOR** .

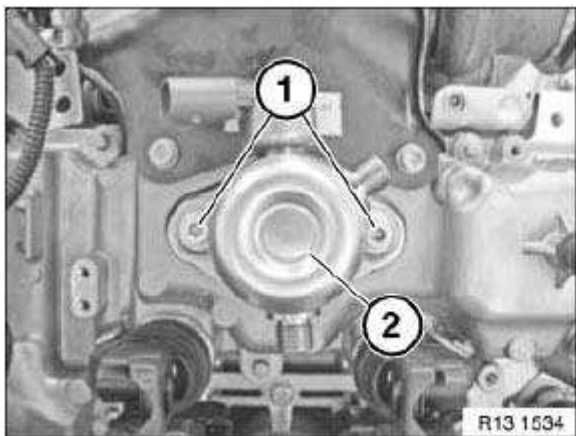


Fig. 3: Detaching High-Pressure Pump

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring (1).

Clean contact faces.



Fig. 4: Replacing Sealing Ring

Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

13 51 070 REMOVING AND INSTALLING/REPLACING RIGHT HIGH-PRESSURE FUEL PUMP (N63)

WARNING: Observe warning on cylinder head cover.

Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

Electric fuel pump starts up automatically when door is opened!

Carry out installation work on fuel system only with coolant temperature below 40°C.

IMPORTANT: Wear full face guard and protective gloves.

Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system.

Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

IMPORTANT: Ignition coils must not be fouled by fuel.

The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail!

Cover ignition coil with suitable means.

Necessary preliminary tasks:

- Remove **fuel feed line** .
- Remove **high-pressure line** from right high-pressure pump to rail.

Recycling:

Fuel escapes when fuel lines are detached.

Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

IMPORTANT: High-pressure pump can be pretensioned by camshaft cams!

Gently release screws (1) of high-pressure pump (2). If the high-pressure pump is pressed out, the engine must be rotated.

Otherwise it will not be possible to install the high-pressure pump!

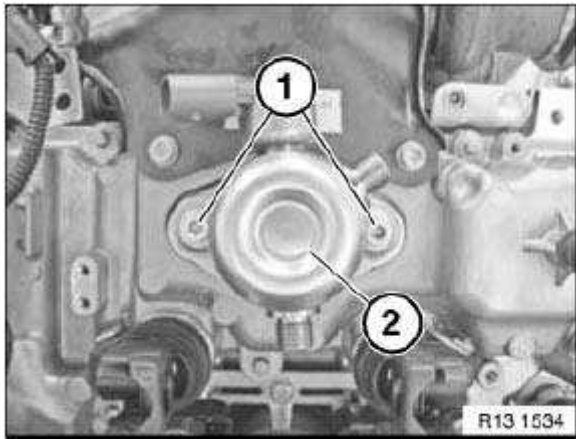


Fig. 5: Identifying High-Pressure Pump & Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Rotate engine at central bolt through 90° in direction of engine rotation.

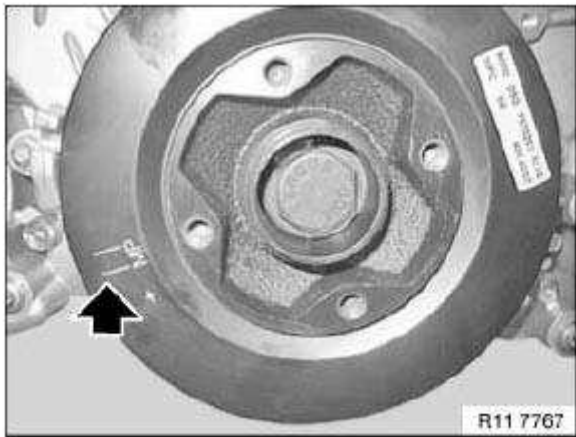


Fig. 6: Identifying Central Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Replace screws (1). Screws (1) are coated with sealant.

IMPORTANT: Pump plunger can fall out when high-pressure pump (2) is pulled out!

Detach high-pressure pump (2) and remove.

Engine oil can escape when pump is detached; have a cleaning cloth ready.

Installation:

Provisionally fasten screws (1) and tighten uniformly in 180° increments until final tightening.

Tightening torque, see 13 51 1AZ in **INJECTION PUMP, REGULATOR, MIXTURE REGULATOR** .

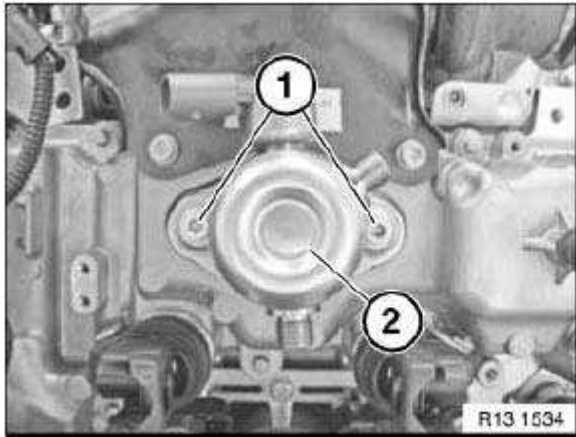


Fig. 7: Detach High-Pressure Pump (2) And Remove
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring (1).

Clean contact faces.



Fig. 8: Identifying Sealing Ring
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

INJECTION NOZZLE AND LINES

13 53 170 REMOVING AND INSTALLING/REPLACING ALL PRESSURE LINES (N63)

Special Tools Required

- 00 1 440
- 13 0 140
- 13 0 160
- 13 0 161
- 13 0 162
- 32 1 270

See MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS .

See FUEL SYSTEM - SPECIAL TOOLS .

See STEERING AND WHEEL ALIGNMENT - SPECIAL TOOLS .

WARNING: Electric fuel pump starts up automatically when door is opened! Observe warning on cylinder head cover. Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

WARNING: Carry out installation work on fuel system only with coolant temperature below 40°C. Wear full face guard and protective gloves. Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs 32 1 270 .
- High-pressure lines may be rescrewed a maximum of 10 times.

Recycling:

Fuel escapes when fuel lines are detached.

Catch and dispose of escaping fuel in a suitable container.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Partially remove **wiring harness** for engine.
- Partially remove **wiring harness** for injectors.
- Detach battery positive lead from battery positive support point.
- Remove coolant **expansion tank** . See **17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N63)** .
- Remove **water valve** for heater/air conditioner. See **64 11 273 REPLACING WATER VALVE FOR HEATER** .
- Detach tank vent line from tank venting valve and point of separation.
- Remove lower section of **steering spindle** . See **32 31 070 REMOVING AND INSTALLING/REPLACING STEERING SPINDLE LOWER SECTION (N63)** .
- Clamp off and fuel feed line and remove plug.
- Remove **ignition coils** . See **12 13 511 REPLACING IGNITION COILS (N63)** .

NOTE:

- Ignition coils must not be fouled by fuel!

The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail! Cloths/rags must therefore be used to prevent fuel from getting into the spark plug slots!

- Before installing ignition coils, clean spark plug slots with compressed air.
- Make sure the spark plug slot is absolutely clean.

Disconnect pressure line from injector to rail

NOTE:

The following description applies to all pressure lines.

Secure injector against twisting with wrench (2).

Release union nut (1).

IMPORTANT: If several pressure lines are removed, ensure that each pressure line is reinstalled in its original location (cylinder). Mark pressure lines.

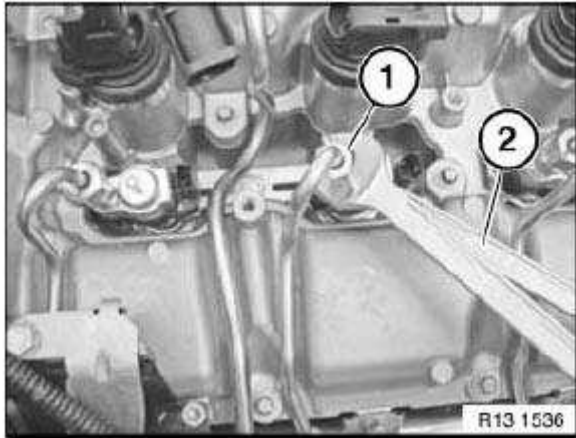


Fig. 9: Releasing Union Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Release union nuts (1).

Disconnect pressure line (2).

Set down pressure lines in order.

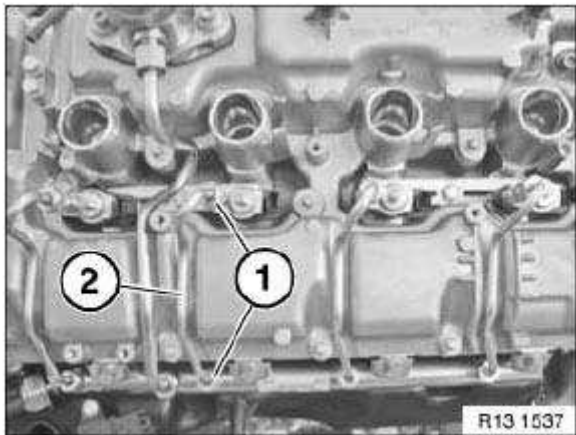


Fig. 10: Disconnecting Pressure Line
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Only if injector has to be turned into installation position:

- Release bolt a few turns until holding-down element (3) is slackened.
- Turn injector (1) in direction of arrow until nuts (2) on pressure line can be easily screwed on by hand.
- To do so, engage wrench on hexagon head of injector if necessary.
- Tighten union nuts on pressure line hand-tight.

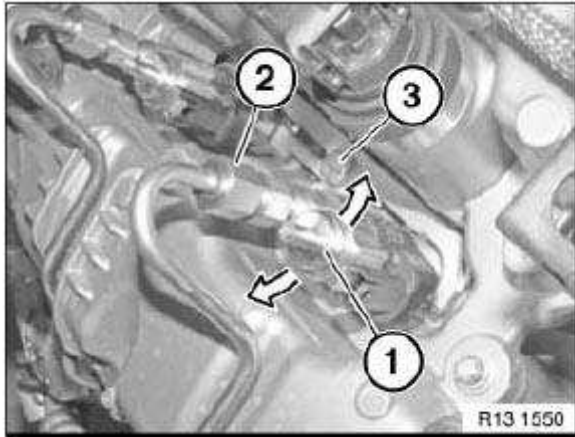


Fig. 11: Identifying Holding-Down Element
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not under any circumstances pull injector out of bore!

If the injector is pulled out of the bore hole, the PTFE sealing ring must be replaced! Replacing PTFE sealing ring, refer to 13 53 310.

Adhere to tightening sequence:

- First tighten down union nut on injector.
- Then tighten down union nut on rail.

Tighten down special tool **13 0 160** for pressure lines.

Tighten down pressure line on injector with torque wrench (2) and special tool (1) **13 0 161** . In so doing, grip hexagon head of injector with wrench (3).

Tighten down nuts with special tool (1) **13 0 161** .

Tightening torque, see 13 53 2AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

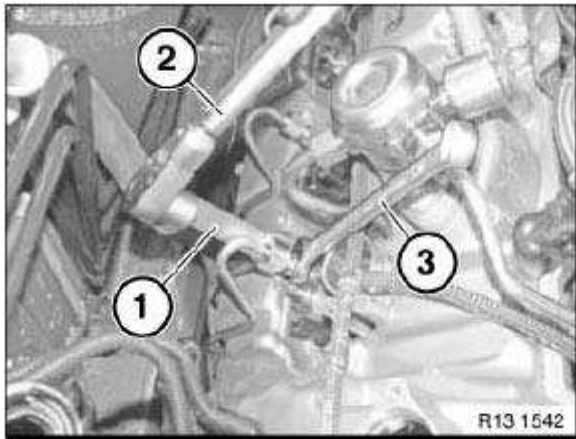


Fig. 12: Tightening Down Pressure Line On Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Tighten down pressure line on rail with torque wrench (1) and special tools (2) **00 1 440** (3) **13 0 162** and (4) **13 0 161** .

Tightening torque, see 13 53 2AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

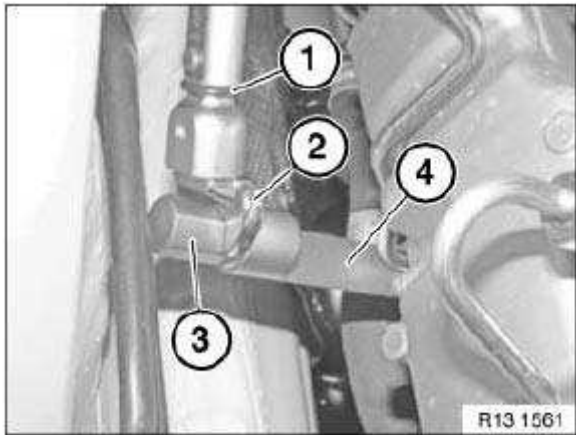


Fig. 13: Tightening Down Pressure Line On Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

When tightening down pressure line on rail, make sure that angle of rotation of special tool **13 0 161** is limited.
Re-engage special tool if necessary.

Distortion of torque possible!

Disconnect pressure line from high-pressure pump to rail .

Picture describes the left side, the procedure for the right side is identical.

Release union nuts (1).

Disconnect pressure line (2).

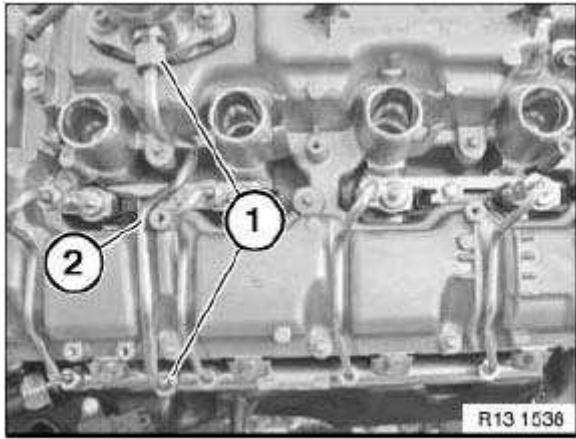


Fig. 14: Identifying Union Nuts & Pressure Line
Courtesy of BMW OF NORTH AMERICA, INC.

Connect pressure line from high-pressure pump to rail .

Tighten down pressure line (1) hand-tight on rail and injector.

First tighten down pressure line (1) on high-pressure pump to torque (2) and with crowfoot wrench (3).

Tightening torque, see 13 53 3AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

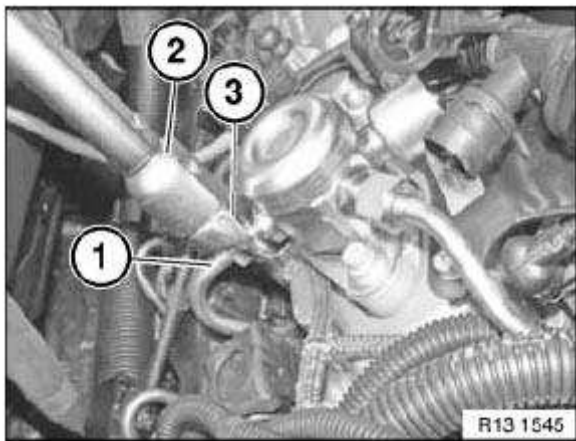


Fig. 15: Tightening Down Pressure Line On Rail
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

When tightening down pressure line on rail, make sure that angle of rotation of special tool **13 0 140** is limited.

Re-engage special tool if necessary.

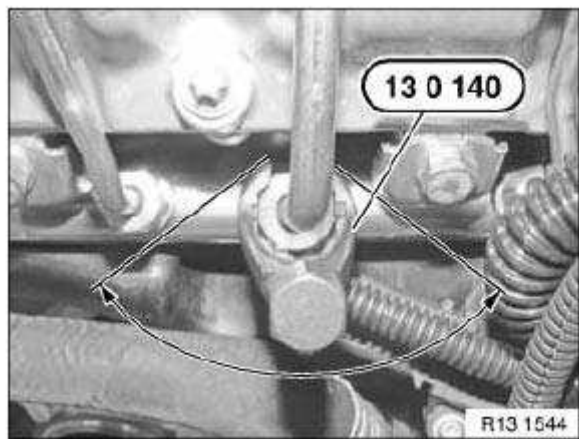


Fig. 16: Tightening Down Pressure Line On Rail
Courtesy of BMW OF NORTH AMERICA, INC.

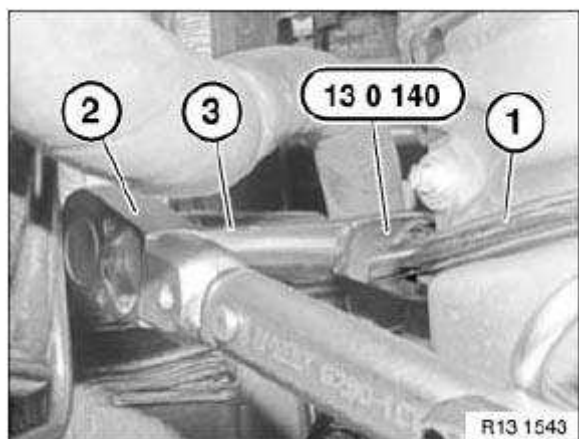


Fig. 17: Tightening Down Pressure Line Using Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

13 53 205 REMOVING AND INSTALLING/REPLACING LEFT RAIL (N63)

WARNING: Electric fuel pump starts up automatically when door is opened! Observe warning on cylinder head cover. Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). Carry out installation work on fuel system only with coolant temperature below 40°C. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

IMPORTANT: Wear full face guard and protective gloves. Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-

pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- **Do not allow any dirt particles or foreign bodies to get into the system.**
- **Remove all traces of dirt before removing pipes or individual components.**
- **Use only fluff-free cloths.**
- **Seal all fuel system openings with protective caps or plugs.**

Recycling

Fuel escapes when fuel line is detached. Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Read out fault memory of DME control unit. If necessary, work through test schedules.
- Switch off ignition.
- Remove fuel **feed line** .
- Disconnect all **pressure lines on left side** .

Unlock plug (1) on high-pressure sensor and disconnect.

Release screws (2).

Tightening torque, see 13 53 1AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Remove rail (3).

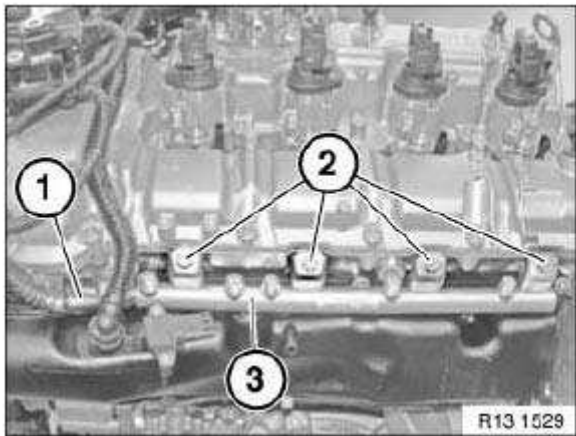


Fig. 18: Identifying Unlock Plug On High-Pressure Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Assemble engine. Check fuel system for leaks. Now clear the fault memory.

13 53 208 REMOVING AND INSTALLING/REPLACING RIGHT RAIL (N63)

WARNING: Electric fuel pump starts up automatically when door is opened! Observe warning on cylinder head cover. Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). Carry out installation work on fuel system only with coolant temperature below 40°C. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

IMPORTANT: Wear full face guard and protective gloves. Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

Recycling

Fuel escapes when fuel line is detached. Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Read out fault memory of DME control unit. If necessary, work through test schedules.
- Switch off ignition.
- Remove fuel **feed line** .
- Disconnect all **pressure lines** on right.
- Remove front right **wheel arch trim** .

Unlock plug (1) on high-pressure sensor and disconnect.

Release screws (2).

Tightening torque, see 13 53 1AZ in 13 53 FUEL INJECTION NOZZLES AND PIPES .

Remove rail (3).

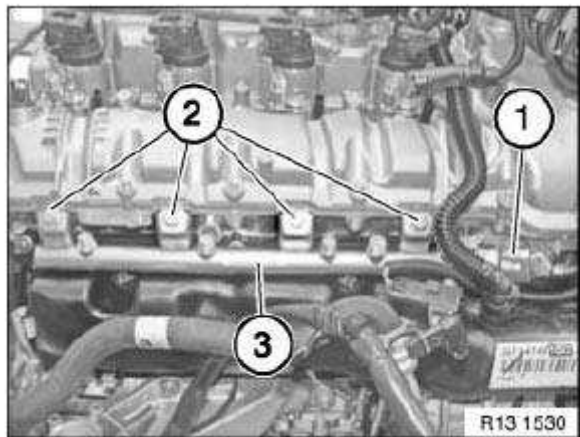


Fig. 19: Identifying Unlock Plug & Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Assemble engine. Check fuel system for leaks. Now clear the fault memory.

13 53 310 REMOVING AND INSTALLING/REPLACING AN INJECTOR (N63)

Special Tools Required

- 00 1 440
- 13 0 161
- 13 0 162
- 13 0 191
- 13 0 192
- 13 0 193
- 13 0 194
- 13 0 195

See MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS .

See FUEL SYSTEM - SPECIAL TOOLS .

WARNING: Electric fuel pump starts up automatically when door is opened!

Observe warning on cylinder head cover.

Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

WARNING: Carry out installation work on fuel system only with coolant temperature

below 40°C.

Wear full face guard and protective gloves.

Fuel can emerge spontaneously at high velocity from the fuel injectors!

To reduce the fuel pressure, place rag over fuel injector and carefully tap against the fuel injector with a spanner.

There is a risk of injury if the fuel pressure is not reduced!

IMPORTANT: Observe without fail the tightening sequences and tightening torques when reassembling. Failure to comply with this requirement may result in leaks!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system.
Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.
- High-pressure lines may be rescrewed a maximum of 10 times.

IMPORTANT: Injectors are not waterproof!

Carry out engine cleaning/washing only with ignition coil cover fitted.

Necessary preliminary tasks:

- Remove **ignition coils** . See 12 13 511 REPLACING IGNITION COILS (N63) .

NOTE:

- Ignition coils must not be fouled by fuel!

The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail! Cloths/rags must therefore be used to prevent fuel from getting into the spark plug slots!

- Before installing ignition coils, clean spark plug slots with compressed air.
- Make sure the spark plug slot is absolutely clean.
- Remove pressure lines on injectors.

NOTE: The following description applies to all injectors.

Release bolt (1) and remove holding-down element (2).

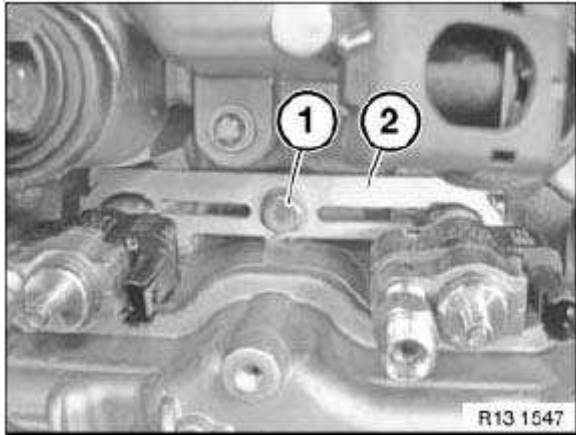


Fig. 20: Identifying Holding-Down Element & Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

Remove injector (1).

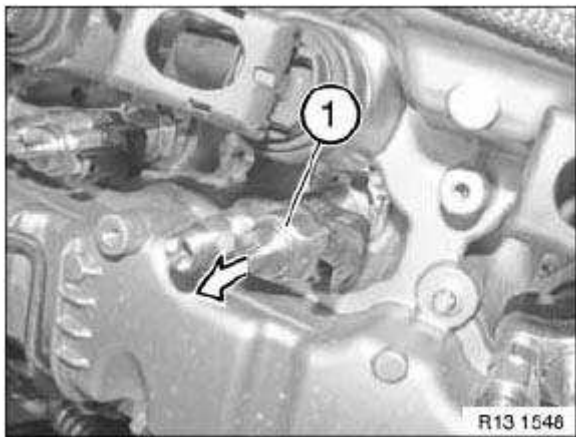


Fig. 21: Removing Injector
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: If several injectors are removed, ensure that each injector is reinstalled in its original location (cylinder). Mark injectors.

After removing, fit protective caps (1 and 3) to injector tip and fuel line connection.

Protective caps are available from BMW Parts Service.

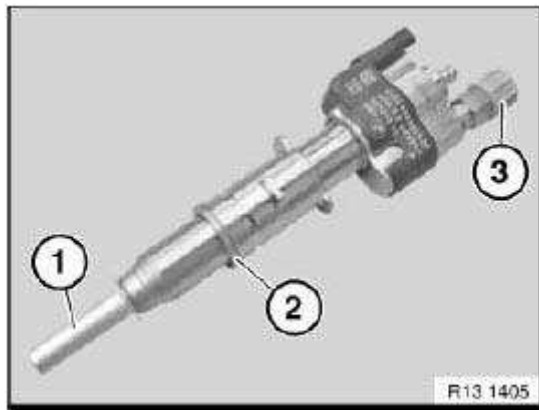


Fig. 22: Identifying Protective Caps
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

When installing a new injector:

- Use a new uncoupling element (2).
- Remove protective cap (1) from injector tip max. 10 min. before installation (PTFE sealing ring swells up).

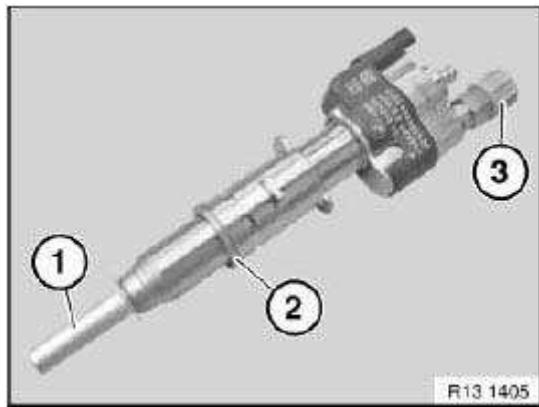


Fig. 23: Identifying Uncoupling Element (2)
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

When reusing fuel injector:

- Replace uncoupling element (2).
- Replace PTFE sealing ring (1).

A PTFE seal which has been heated once by engine operation must be replaced before the fuel injector is

reinstalled.

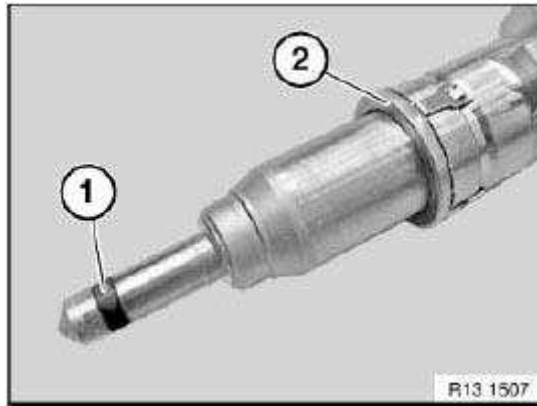


Fig. 24: Identifying PTFE Sealing Ring And Uncoupling Element
Courtesy of BMW OF NORTH AMERICA, INC.

Replacing PTFE sealing ring

Before replacing PTFE sealing ring (1), make sure hands and work surface are clean and free of oil.

Avoid mechanical contact with injector tip (2).

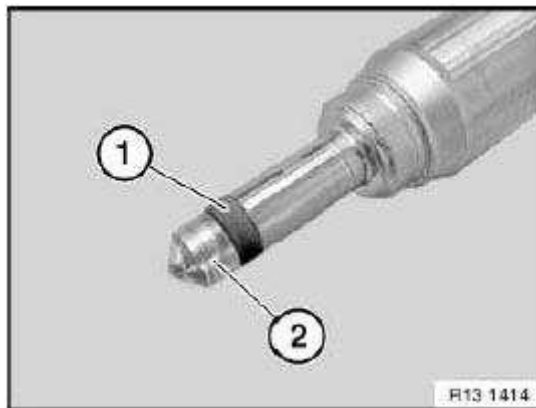


Fig. 25: Identifying PTFE Sealing Ring And Injector Tip
Courtesy of BMW OF NORTH AMERICA, INC.

Remove PTFE sealing ring (1) with special tool **13 0 191** from injector (2).

Use a fluff-free cloth only to remove combustion residues from cylindrical part of injector tip (do not use ultrasound or other tools/agents).

Do not clean injector tip.

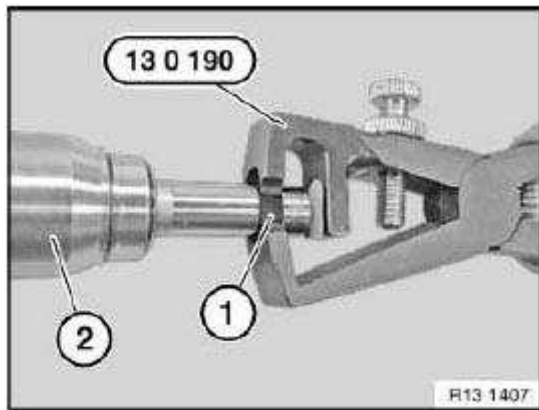


Fig. 26: Identifying PTFE Sealing Ring And Injector
 Courtesy of BMW OF NORTH AMERICA, INC.

Slide new PTFE sealing ring (1) onto mounting taper 13 0 195 .

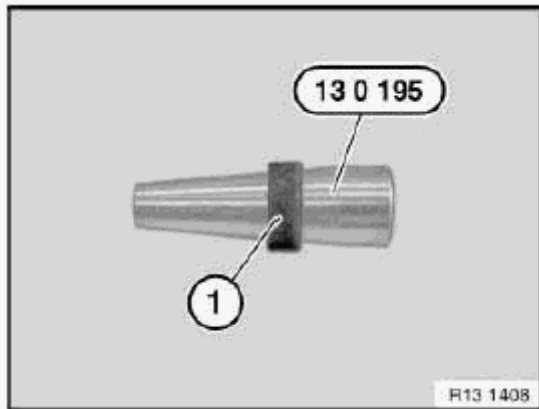


Fig. 27: Identifying PTFE Sealing Ring And Injector
 Courtesy of BMW OF NORTH AMERICA, INC.

Use fingers and mounting taper 13 0 195 to slide PTFE sealing ring (1) onto injector (2).

NOTE:

- Do not use fingernails to slide PTFE sealing ring on.
- Do not use any lubricating agents.
- The sealing ring is expanded when slid on.

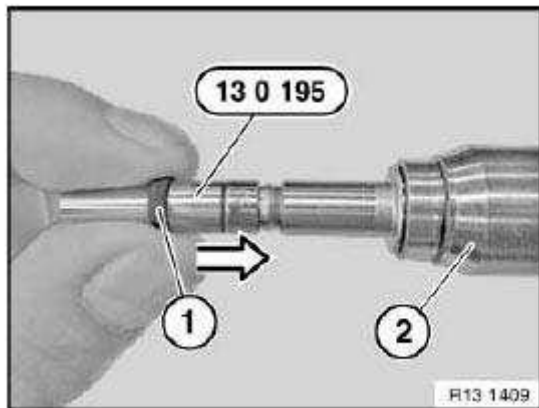


Fig. 28: Sliding PTFE Sealing Ring
 Courtesy of BMW OF NORTH AMERICA, INC.

To bring the expanded PTFE sealing ring to its installation dimension, slide three mounting sleeves with decreasing diameters onto the injector.

Slide mounting sleeve (1) with large opening first onto injector (1).

Do not use any lubricating agents.

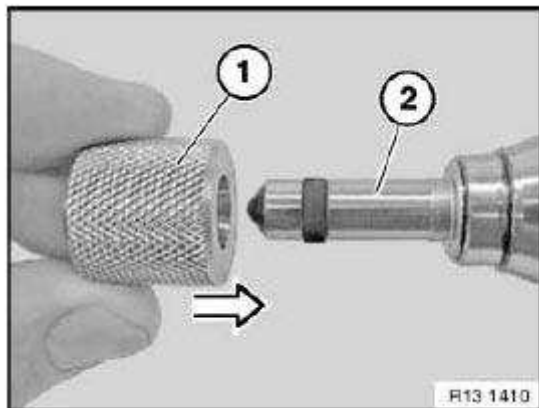


Fig. 29: Sliding Mounting Sleeve
 Courtesy of BMW OF NORTH AMERICA, INC.

First slide mounting sleeve **13 0 192** (large diameter) onto injector (1).

Then slide mounting sleeve **13 0 193** (medium diameter) onto injector (1).

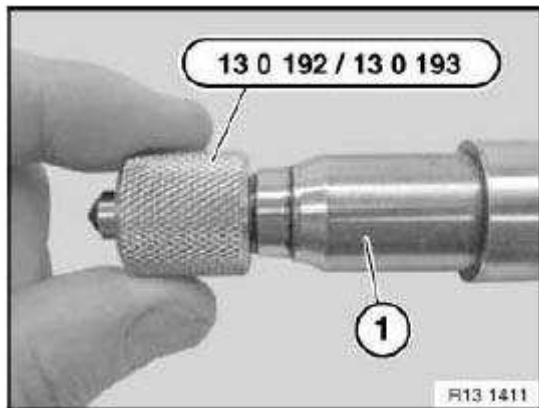


Fig. 30: Sliding Mounting Sleeve
 Courtesy of BMW OF NORTH AMERICA, INC.

Finally, press injector (1) into mounting sleeve **13 0 194** (small diameter).

Installation:

Install injector within 10 minutes or slide on protective cap (Fig. **Fig. 31**) (PTFE sealing ring swells up).

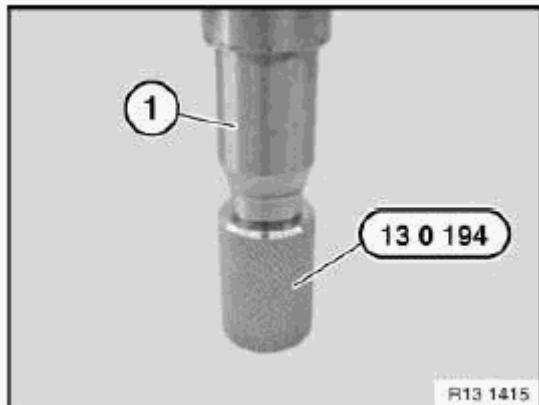


Fig. 31: Pressing Injector Into Mounting Sleeve
 Courtesy of BMW OF NORTH AMERICA, INC.

Installing injector

Installation of injector is described separately from removal.

Before installing injector in engines that have been run:

- Check injector bore for dirt.

Clean **only dirty** injector bores.

Important - do not damage injector!

- Clean injector bore: To do so, preferably slide injector without uncoupling element (2) but with new PTFE sealing ring (1) in and out of injector bores several times.

The PTFE sealing ring must then be replaced.

- Clean contact surfaces of uncoupling elements (2) in cylinder head.
- Replace uncoupling element (2).

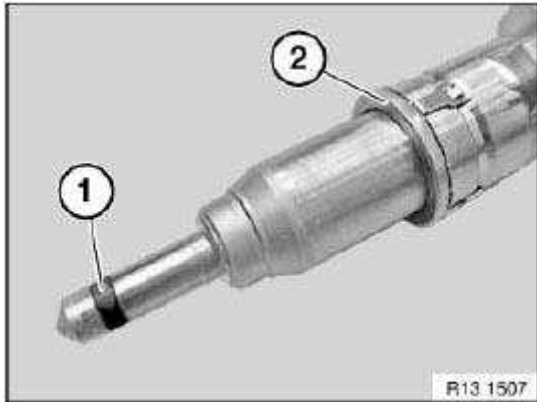


Fig. 32: Replacing Uncoupling Element
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Injector adjustment!

An injector adjustment must be carried out if an injector is replaced or changed on the cylinder side.

Injector adjustment is carried out with the aid of a so-called adjustment value.

The adjustment value is printed in two blocks of three digits on the injector.

The adjustment value must be read off **before** installation!

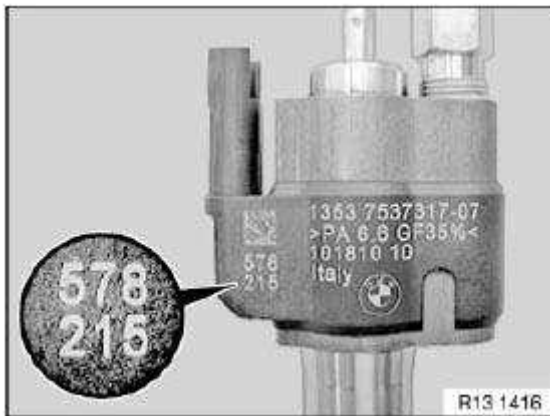


Fig. 33: Identifying Printed Mark On Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Enter the adjustment value according to the installation position (cylinder) of the injector.

If injector adjustment is not carried out, the engine may run roughly or fail to start.

Description of injector adjustment at end of instruction.



Fig. 34: Locating Printed Mark On Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Installing injector:

Install injector (1).

Install holding-down element (2).

NOTE: Make sure holding-down element (2) is correctly seated.

IMPORTANT: Tighten bolt (3) hand-tight only so that holding-down element (2) is slack and if necessary injector (1) can still be turned.

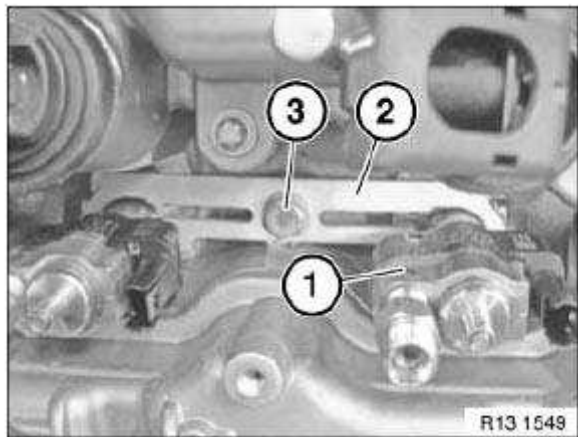


Fig. 35: Identifying Holding-Down Element & Injector
 Courtesy of BMW OF NORTH AMERICA, INC.

Connect pressure line (2), tightening nuts (1) hand-tight only in the process.

IMPORTANT: Connect pressure line (2) without tension only. To ensure distortion-free installation of the pressure line and to avoid damaging the thread, it must be possible for both nuts to be screwed on easily by hand! If the nuts cannot be screwed on easily by hand, the injector must if necessary be turned a little.

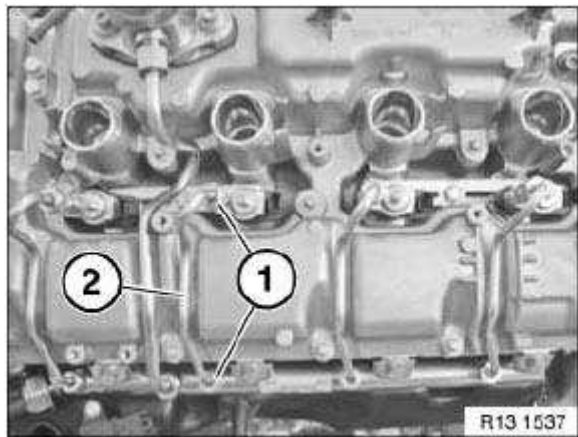


Fig. 36: Connecting Pressure Line
 Courtesy of BMW OF NORTH AMERICA, INC.

Turn injector (1) if necessary in direction of arrow until nuts on pressure line can be easily screwed on by hand.

Tighten nut (2) of pressure line hand-tight.

Then tighten down bolt for holding-down element (3).

Tightening torque, see 13 53 5AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

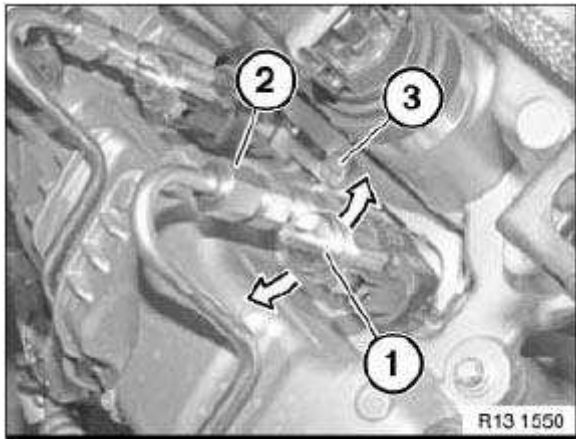


Fig. 37: Identifying Holding-Down Element & Injector
 Courtesy of BMW OF NORTH AMERICA, INC.

Adhere to tightening sequence:

- First tighten down pressure line on injector.

Tighten down nut on injector with special tool (1) **13 0 161** and to torque (2). In so doing, grip hexagon head of injector with wrench (3).

Tightening torque, see 13 53 2AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

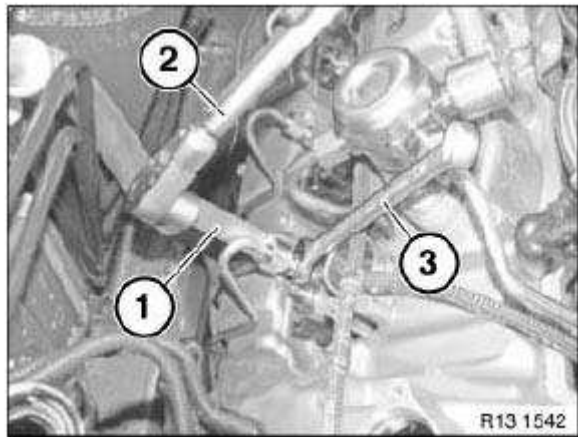


Fig. 38: Tightening Nut On Injector
 Courtesy of BMW OF NORTH AMERICA, INC.

- Then tighten down pressure line on rail.

Tighten down pressure line on rail with torque wrench (1) and special tools (2) **00 1 440** , (3) **13 0 162** and (4) **13 0 161** .

Tightening torque, see 13 53 2AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

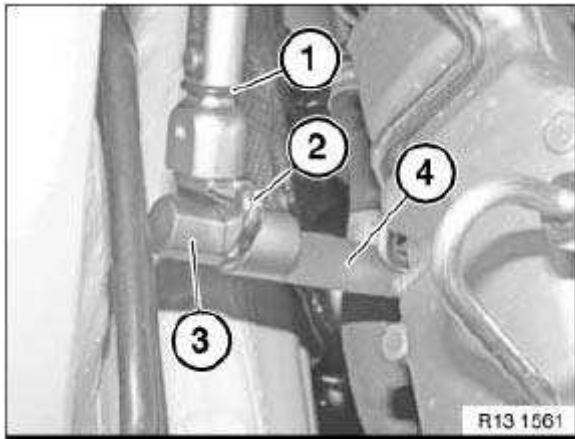


Fig. 39: Tightening Down Pressure Line On Rail
Courtesy of BMW OF NORTH AMERICA, INC.

Carrying out injector adjustment

- Connect DIS Tester
- Identify car
- Select "Function selection"
- Select "Service functions"
- Select "Engine electronics"
- Select "Adjustment programs"
- Select "Adjust injectors"
- Change "Test schedule"
- For each replaced injector, the adjustment value must be entered according to the installation position (cylinder).

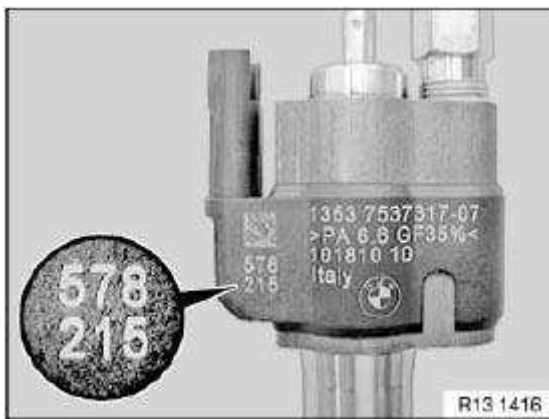


Fig. 40: Identifying Mark On Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Vent fuel system with BMW diagnosis system.

Check fuel system for leaks.

Check function of DME.

13 53 332 REMOVING AND INSTALLING/REPLACING FEED LINE (N63)

Special Tools Required

- **13 5 160**
- **13 5 162**

See **FUEL SYSTEM - SPECIAL TOOLS** .

WARNING: Clamp off battery negative terminal (risk of fire due to short-circuiting on removal). Electric fuel pump starts up automatically when door is opened! Carry out installation work on fuel system only with coolant temperature below 40°C. See **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .

Wear protective goggles.

Wear protective gloves.

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

IMPORTANT: Ignition coils must not be fouled by fuel. The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail! Cover ignition coil with suitable means.

Necessary preliminary tasks:

- Remove **left and right intake filter housings**

Recycling:

Fuel escapes when fuel lines are detached.

Catch and dispose of escaping fuel in a suitable container.

Observe country-specific waste-disposal regulations.

Release clamps (1) and (2).

Replace clamps (2).

Detach both charge-air ducts (3) and remove.

Check gaskets on turbocharger, replacing if necessary.

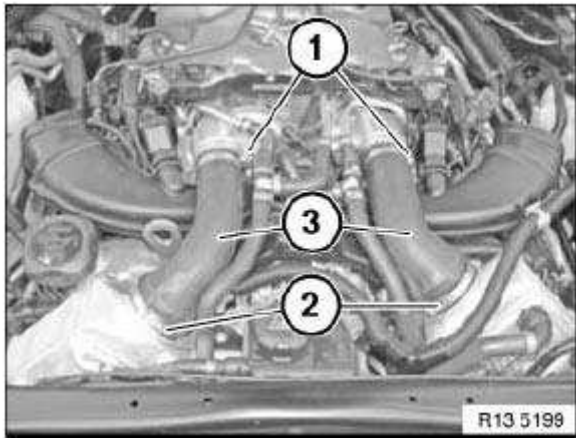


Fig. 41: Identifying Charge-Air Ducts & Clamps
Courtesy of BMW OF NORTH AMERICA, INC.

Picture shows the left side, the procedure for the right side is identical.

Detach hoses (1) from clean-air pipe.

Release screw (2).

Tightening torque, see 13 71 1AZ in **13 71 AIR INTAKE DUCT** .

Detach clean-air pipe (3) in direction of travel from turbocharger.

Check seal on clean-air pipe, replacing if necessary.

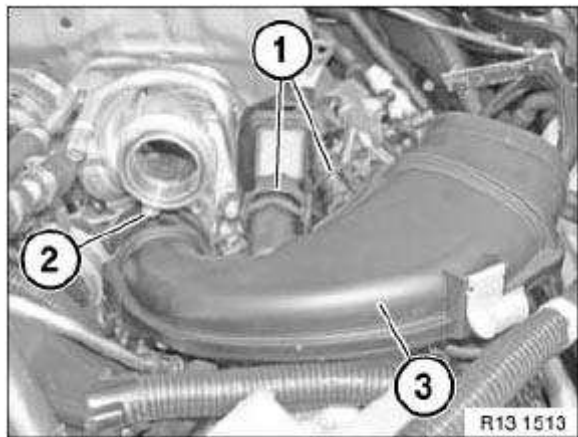


Fig. 42: Checking Seal On Clean-Air Pipe
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock and disconnect fuel feed line (1).

Seal fuel lines with special tools **13 5 160** and **13 5 162** .

Unlock and disconnect plug (2) on fuel low-pressure sensor.

Release fuel feed line (3) on high-pressure pump.

Tightening torque, see 13 53 4AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Release bolts (4).

Tightening torque, see 13 53 6AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Catch and dispose of escaping fuel.

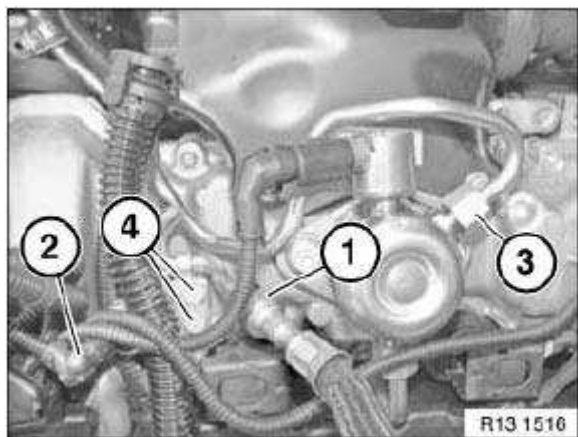


Fig. 43: Releasing Fuel Feed Line On High-Pressure Pump
 Courtesy of BMW OF NORTH AMERICA, INC.

Seal fuel lines with special tools (1) 13 5 160 and (2) 13 5 162 .

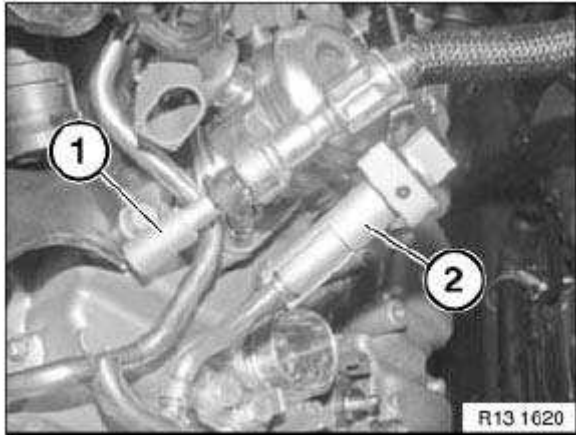


Fig. 44: Sealing Fuel Lines With Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

Release fuel feed line (1) on high-pressure pump.

Tightening torque, see 13 53 4AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Catch and dispose of escaping fuel.

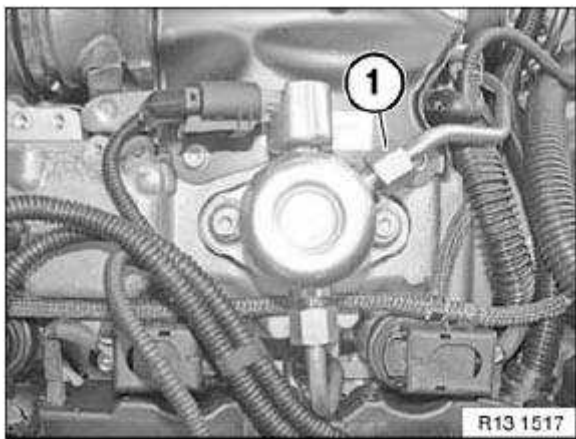


Fig. 45: Releasing Fuel Feed Line On High-Pressure Pump
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) on retaining clips.

Tightening torque, see 13 53 7AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Feed out and remove fuel feed line (2).

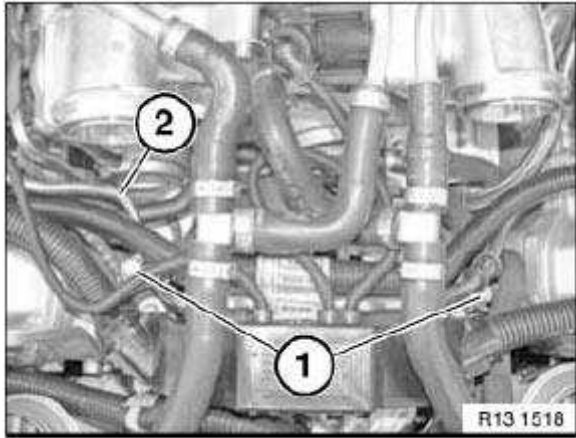


Fig. 46: Releasing Screws On Retaining Clips
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Observe tightening sequence .

1. Fit fuel feed line.

In so doing, tighten screw connections **hand-tight only** .

2. Tighten down fuel feed line (1) on high-pressure pumps to torque (2) and with crowfoot wrench (3).

Tightening torque, see 13 53 4AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

3. Tighten down lugs on fuel low-pressure sensor.

Tightening torque, see 13 53 6AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

4. Tighten down retaining clips.

Tightening torque, see 13 53 7AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

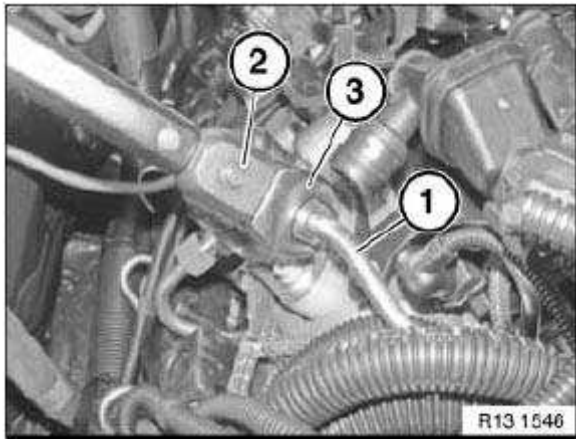


Fig. 47: Tightening Down Fuel Feed Line On High-Pressure Pumps
 Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

13 53 594 REPLACING LOW-PRESSURE FUEL SENSOR (N63)

WARNING: Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). Electric fuel pump starts up automatically when door is opened! Carry out installation work on fuel system only with coolant temperature below 40°C. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

Wear protective goggles.

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

IMPORTANT: Ignition coils must not be fouled by fuel. The resistance of the silicone material is reduced significantly by contact with fuel, which may cause the ignition coil to fail! Cover ignition coil with suitable means.

Necessary preliminary tasks:

- Remove left **air intake hose**

Recycling:

Catch and dispose of escaping fuel in a suitable container.

Observe country-specific waste-disposal regulations.

Unlock plug (1) and remove.

Release low-pressure fuel sensor (2).

Tightening torque, see 13 53 9AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

Installation:

Replace sealing ring on low-pressure fuel sensor.

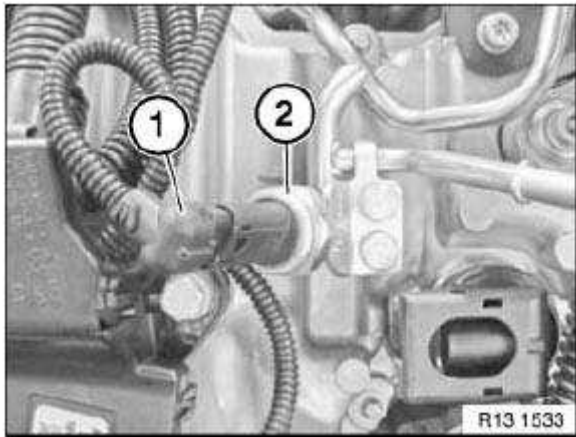


Fig. 48: Releasing Low-Pressure Fuel Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

13 53 602 REPLACING LEFT HIGH-PRESSURE FUEL SENSOR (N63)

WARNING: Observe warning on cylinder head cover. Disconnect battery negative terminal (risk of fire due to short-circuiting on removal). Electric fuel pump starts up automatically when door is opened! Carry out installation

work on fuel system only with coolant temperature below 40°C. See **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .

IMPORTANT: Wear full face guard and protective gloves. Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

Necessary preliminary tasks:

- Remove left **rail** .

Recycling:

Catch and dispose of escaping fuel in a suitable container.

Observe country-specific waste-disposal regulations.

Release high-pressure sensor (1) and remove.

Tightening torque, see 13 53 8AZ in **13 53 FUEL INJECTION NOZZLES AND PIPES** .

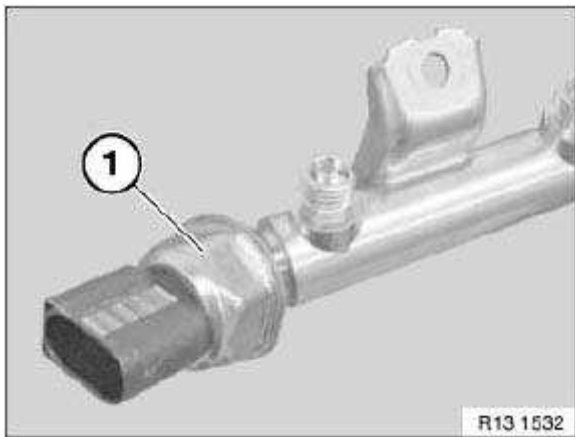


Fig. 49: Releasing High-Pressure Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

13 53 602 REPLACING RIGHT HIGH-PRESSURE FUEL SENSOR (N63)

WARNING: Observe warning on cylinder head cover. Clamp off battery negative terminal (risk of fire due to short-circuiting on removal). Electric fuel pump starts up automatically when door is opened! Carry out installation work on fuel system only with coolant temperature below 40°C. See 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

IMPORTANT: Wear full face guard and protective gloves. Fuel can emerge spontaneously at high velocity when the high-pressure line is released!

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the high-pressure fuel system. Introduced contaminants can cause malfunctions in the system!

- Do not allow any dirt particles or foreign bodies to get into the system.
- Remove all traces of dirt before removing pipes or individual components.
- Use only fluff-free cloths.
- Seal all fuel system openings with protective caps or plugs.

Necessary preliminary tasks:

- Remove right rail .

Recycling:

Catch and dispose of escaping fuel in a suitable container.

Observe country-specific waste-disposal regulations.

Release high-pressure sensor (1) and remove.

Tightening torque, see 13 53 8AZ in 13 53 FUEL INJECTION NOZZLES AND PIPES .

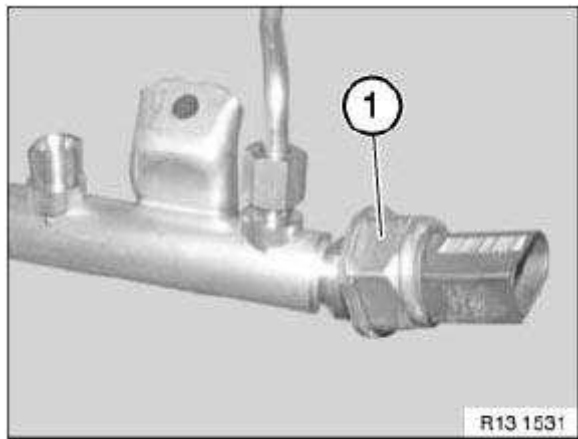


Fig. 50: Releasing High-Pressure Sensor
 Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

Check fuel system for leaks.

Check function of DME.

THROTTLE AND OPERATION

13 54 015 REMOVING AND INSTALLING/SEALING LEFT THROTTLE VALVE ASSEMBLY (N63)

Necessary preliminary tasks:

- Switch off ignition.
- Remove left **intercooler** . See **17 51 001 REMOVING AND INSTALLING/REPLACING LEFT INTERCOOLER (N63)** .

Unlock plug (1) and remove.

Unfasten screws (2).

Tightening torque, see 13 54 1AZ in **13 54 THROTTLE AND ACTUATOR** .

Remove throttle valve assembly (3).

Installation:

Check plug connection (1) for coolant remnants. If necessary, clean plug connection (1) with compressed air.

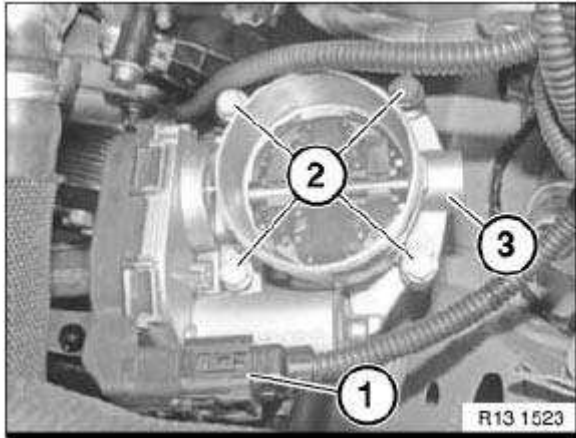


Fig. 51: Checking Plug Connection For Coolant Remnants
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Replace sealing ring (1) of throttle assembly (2).

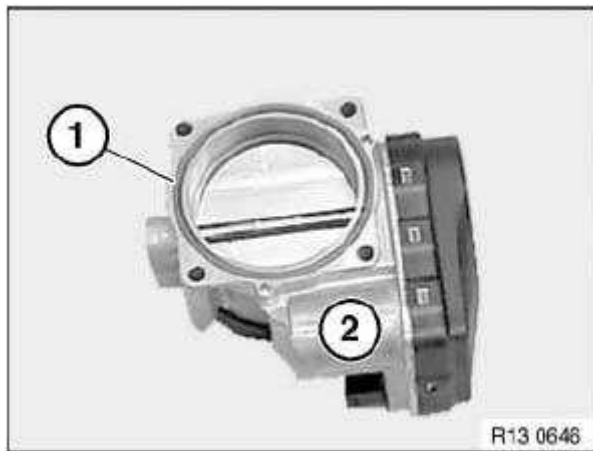


Fig. 52: Replacing Sealing Ring Of Throttle Assembly
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check stored fault message.

Now clear the fault memory.

13 54 020 REMOVING AND INSTALLING/SEALING RIGHT THROTTLE VALVE ASSEMBLY (N63)

Necessary preliminary tasks:

- Switch off ignition.
- Remove right intercooler.

NOTE: **Picture shows the left throttle valve assembly, the procedure for the right side is identical.**

Unlock plug (1) and remove.

Unfasten screws (2).

Tightening torque, see **13 54 THROTTLE AND ACTUATOR** .

Remove throttle valve assembly (3).

Installation:

Check plug connection (1) for coolant remnants. If necessary, clean plug connection (1) with compressed air.

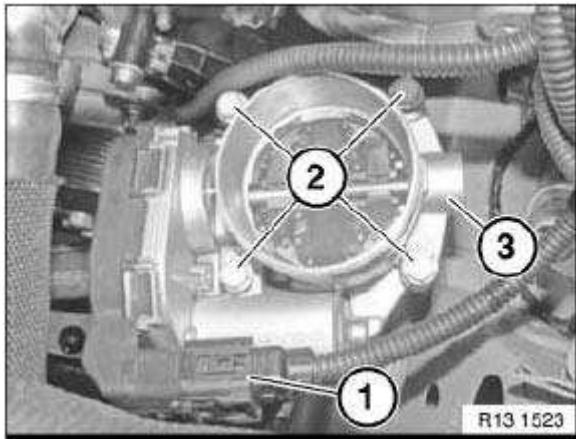


Fig. 53: Checking Plug Connection For Coolant Remnants
Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Replace sealing ring (1) of throttle assembly (2).

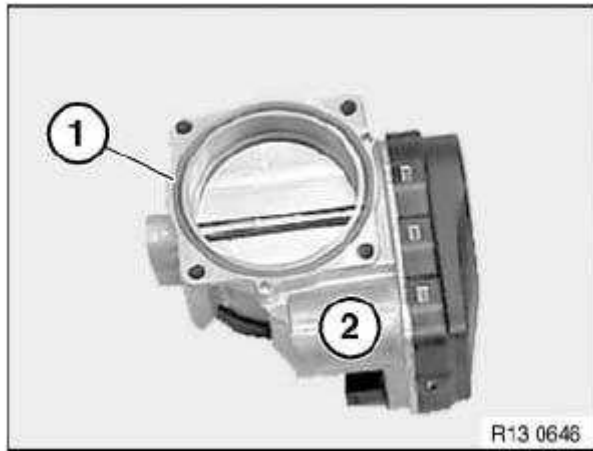


Fig. 54: Replacing Sealing Ring Of Throttle Assembly
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check stored fault message.

Now clear the fault memory.

SENSOR FOR CONTROL UNIT

13 62 531 REPLACING COOLANT TEMPERATURE SENSOR (N63)

WARNING: Danger of scalding! Only perform this work after engine has cooled down.

IMPORTANT: Protect alternator against coolant. Cover alternator with suitable apparatus (risk of damage) .

Necessary preliminary tasks:

- Read out fault memory of DDE control unit; if necessary, work through test schedules
- Switch off ignition
- Remove **supplementary coolant pump** for turbocharger. See **17 51 020 REMOVING AND INSTALLING OR REPLACING SUPPLEMENTARY COOLANT PUMP FOR INTERCOOLER (N63)** .

Unlock plug (1) and remove.

Unfasten coolant temperature sensor (2).

Installation:

Tightening torque, see 13 62 1AZ in **SENSOR FOR CONTROL UNIT** .

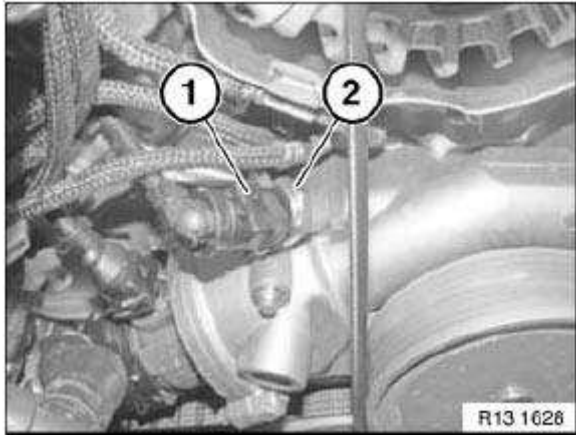


Fig. 55: Identifying Unlock Plug & Unfasten Coolant Temperature Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Now clear the fault memory.

13 62 560 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT AIR-MASS FLOW SENSOR (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit
- Switch off ignition
- Remove **acoustic cover** . See **REMOVING ENGINE COVER (N63)** .

Picture shows the left side, the procedure for the right side is identical.

Unlock plug (1) and remove.

Release screws (2).

Tightening torque, see 13 62 6AZ in **SENSOR FOR CONTROL UNIT** .

Pull air-mass flow sensor (3) out of upper section of intake filter housing.

Installation:

Replace gasket on air-mass flow sensor.

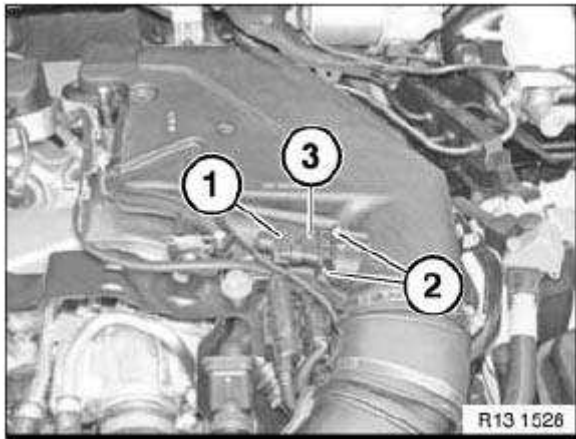


Fig. 56: Identifying Air-Mass Flow Sensor And Unlock Plug
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Check stored fault message. Now clear the fault memory.

13 62 591 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON LEFT INTERCOOLER (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit.
- Switch off ignition
- Remove **intake duct** .

Unclip Bowden cable for engine bonnet/hood actuator from transverse reinforcement (1).

Detach A/C line from holder.

Release screws on left and right.

Tightening torque, see 51 71 4AZ in **51 71 SEALS AND LOOSE BODY PARTS** .

Remove cross-brace (1).

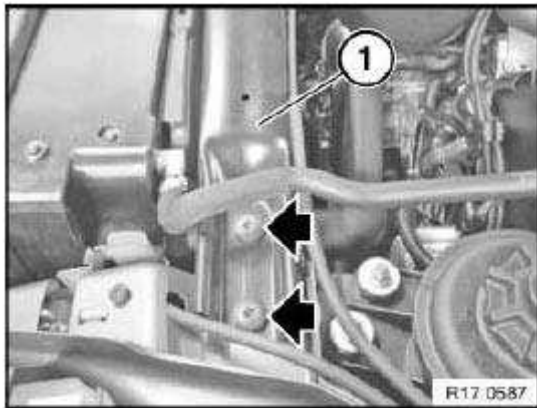


Fig. 57: Removing Cross-Brace
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Release screws (2).

Tightening torque, see 13 62 7AZ in **SENSOR FOR CONTROL UNIT** .

Pull pressure sensor (3) out of left intercooler.

Installation:

Replace sealing ring on pressure sensor.

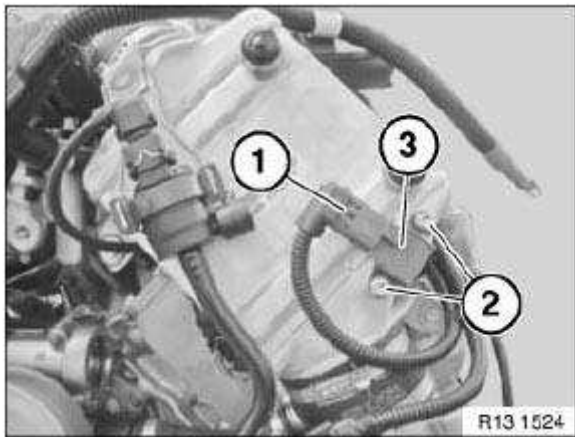


Fig. 58: Pulling Pressure Sensor Out Of Left Intercooler
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Now clear the fault memory.

13 62 592 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON RIGHT INTERCOOLER (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit.
- Switch off ignition
- Remove **intake duct** .

Unclip Bowden cable for engine bonnet/hood actuator from transverse reinforcement (1).

Detach A/C line from holder.

Unscrew left and right bolts.

Tightening torque, see 51 71 4AZ in **51 71 SEALS AND LOOSE BODY PARTS** .

Remove cross-brace (1).

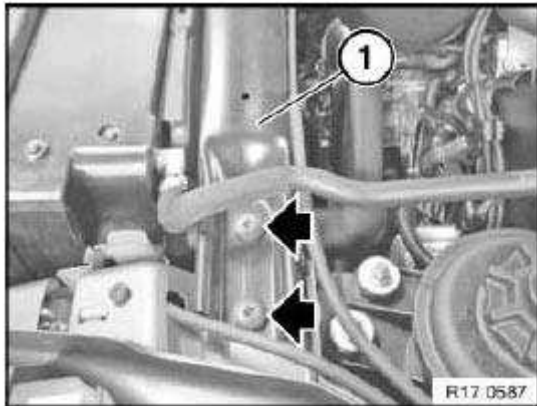


Fig. 59: Removing Cross-Brace
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Release screws (2).

Tightening torque, see 13 62 7AZ in **SENSOR FOR CONTROL UNIT** .

Pull pressure sensor (3) out of right intercooler.

Installation:

Replace sealing ring on pressure sensor.

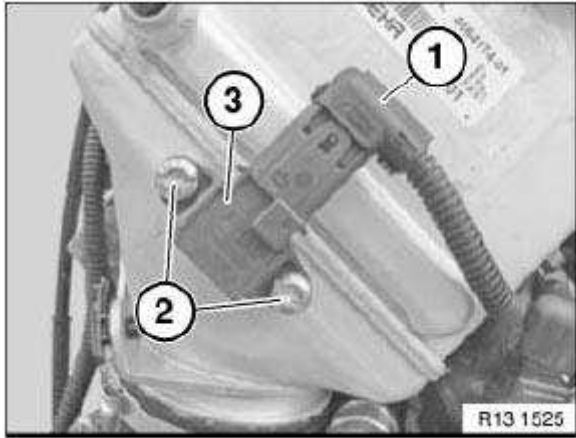


Fig. 60: Pulling Pressure Sensor Out Of Right Intercooler
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Now clear the fault memory.

13 62 593 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON LEFT INTAKE MANIFOLD (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit.
- Switch off ignition
- Remove coolant **expansion tank** . See **17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N63)** .

Unlock plug (1) and remove.

Release screws (2).

Tightening torque, see 13 62 2AZ in **SENSOR FOR CONTROL UNIT** .

Pull pressure sensor (3) out of left intake manifold.

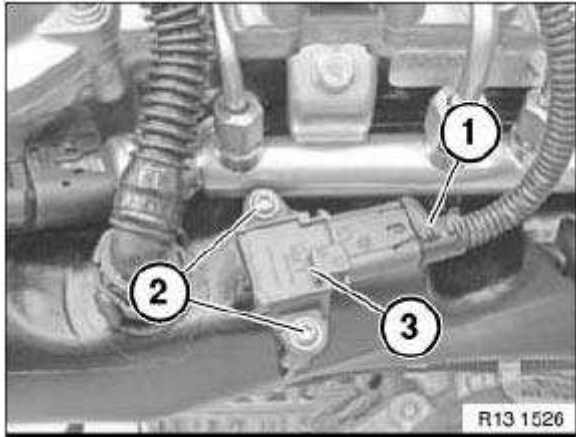


Fig. 61: Pulling Pressure Sensor From Left Intake Manifold
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Now clear the fault memory.

13 62 594 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON RIGHT INTAKE MANIFOLD (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit.
- Switch off ignition
- Remove front right **wheel arch trim** .

Unlock plug (1) and remove.

Release screws (2).

Tightening torque, see 13 62 2AZ in **SENSOR FOR CONTROL UNIT** .

Pull pressure sensor (3) out of left intake manifold.

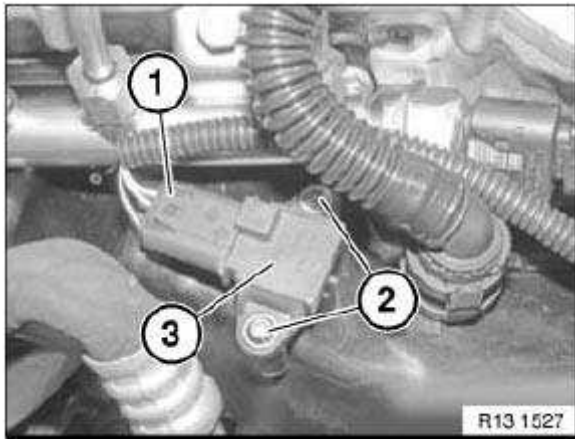


Fig. 62: Pulling Pressure Sensor From Left Intake Manifold
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Now clear the fault memory.

INTAKE SILENCER

13 REMOVING INTAKE DUCT (N63)

Release expansion rivet (1). Pull off air intake hose (2) upwards.

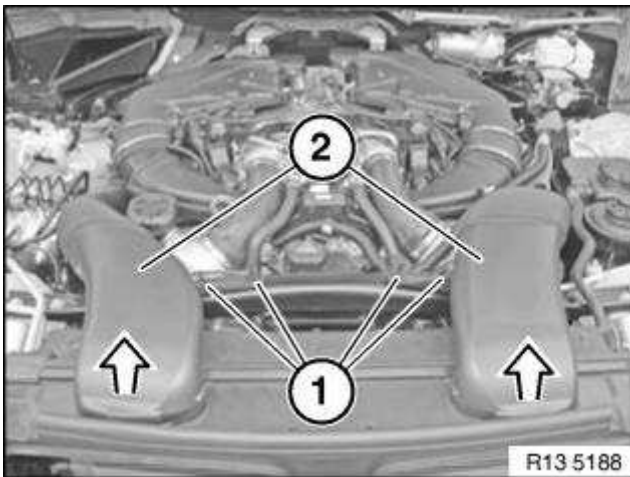


Fig. 63: Release Expansion Rivet (1) And Pull Off Air Intake Hose (2) Upwards
 Courtesy of BMW OF NORTH AMERICA, INC.

Press in catch (1). Pull off air intake hose (2) in direction of travel.

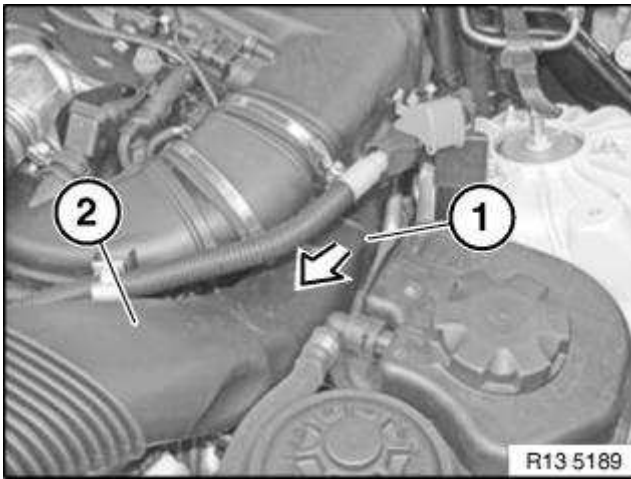


Fig. 64: Press In Catch (1) And Pull Off Air Intake Hose (2) In Direction Of Travel
Courtesy of BMW OF NORTH AMERICA, INC.

13 71 030 REMOVING AND INSTALLING BOTH INTAKE FILTER HOUSINGS (N63)

Necessary preliminary tasks:

- Switch off ignition
- Remove **tension struts** on left and right.
- Remove **acoustic cover** . See **REMOVING ENGINE COVER (N63)** .
- Remove **intake pipe** .

NOTE: **Description relates to the left intake filter housing. Procedure for the right side is identical.**

Release clamps (1).

Disconnect plug (2) on air-mass sensor.

Release clip (3).

Remove intake filter housing by pulling upwards.

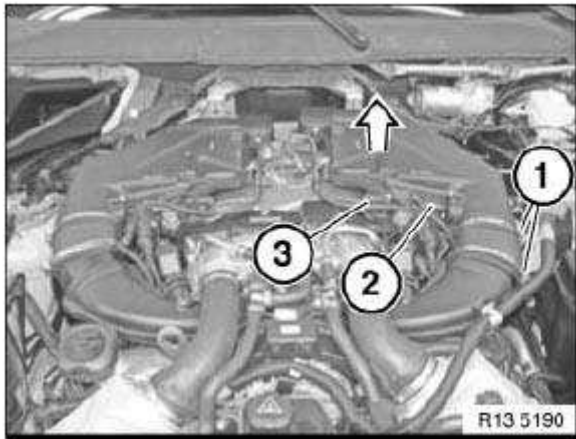


Fig. 65: Identifying Plug On Air-Mass Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

13 71 030 REMOVING AND INSTALLING/REPLACING BOTH INTAKE FILTER HOUSINGS (N63)

Necessary preliminary tasks:

- Switch off ignition
- Remove **tension struts** on left and right
- Remove **acoustic cover** . See **REMOVING ENGINE COVER (N63)** .
- Remove **intake manifold** . See **INTAKE MANIFOLD** .

NOTE: **Description relates to the left intake filter housing. Procedure for the right side is identical.**

Release clamps (1).

Disconnect plug (2) on air-mass sensor.

Release clip (3).

Remove intake filter housing by pulling upwards.

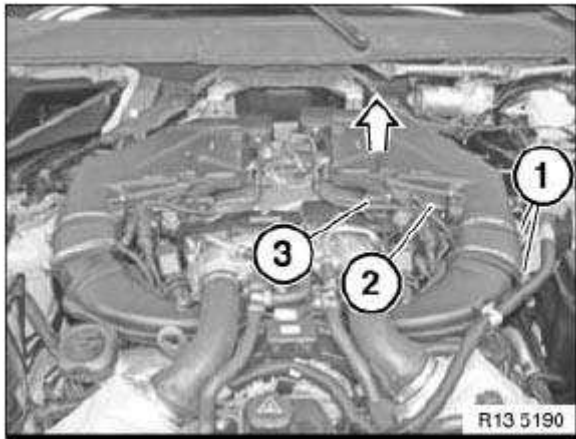


Fig. 66: Identifying Plug On Air-Mass Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

13 72 002 REPLACING BOTH AIR FILTER ELEMENTS (N63)

Necessary preliminary tasks:

- Switch off ignition
- Remove **tension struts** on left and right
- Remove **acoustic cover** . See **REMOVING ENGINE COVER (N63)** .

NOTE: **Description relates to the left intake filter housing. Procedure for the right side is identical.**

Release clamp (1).

Disconnect plug (2) on air-mass sensor.

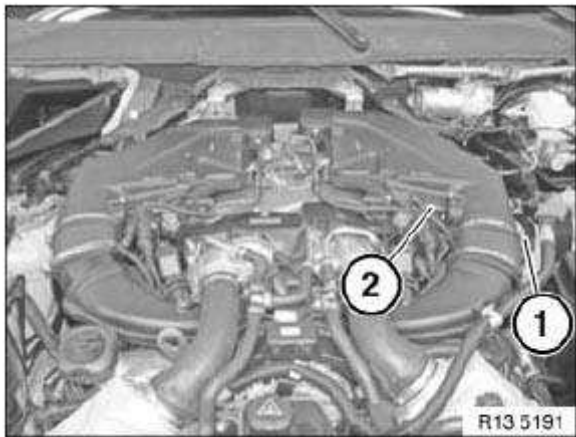


Fig. 67: Disconnecting Plug On Air-Mass Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws along line (1).

Remove air filter cover (2).

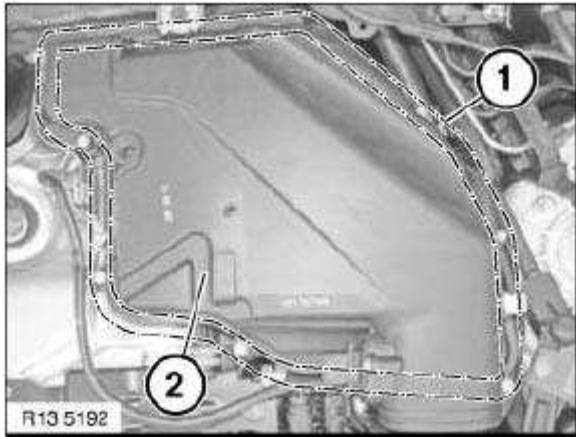


Fig. 68: Removing Air Filter Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Remove air filter insert.

Installation:

Clean upper and lower sections of intake filter housing from inside.

Replace air filter elements.

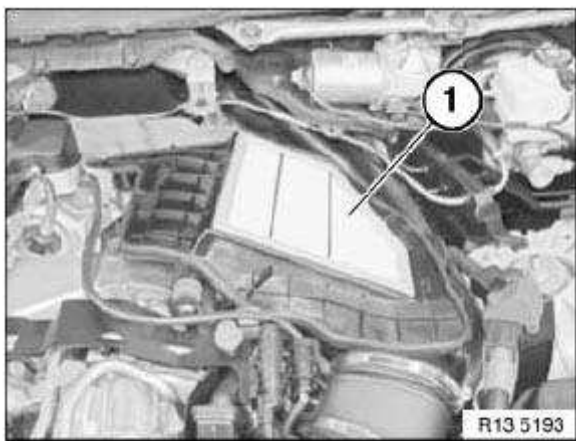


Fig. 69: Replacing Air Filter Elements

Courtesy of BMW OF NORTH AMERICA, INC.

AIR CLEANER

13 72 002 REPLACING BOTH AIR FILTER ELEMENTS (N63)

Necessary preliminary tasks:

- Switch off ignition
- Remove **tension struts** on left and right
- Remove **acoustic cover** . See **REMOVING ENGINE COVER (N63)** .

NOTE: **Description relates to the left intake filter housing. Procedure for the right side is identical.**

Release clamp (1).

Disconnect plug (2) on air-mass sensor.

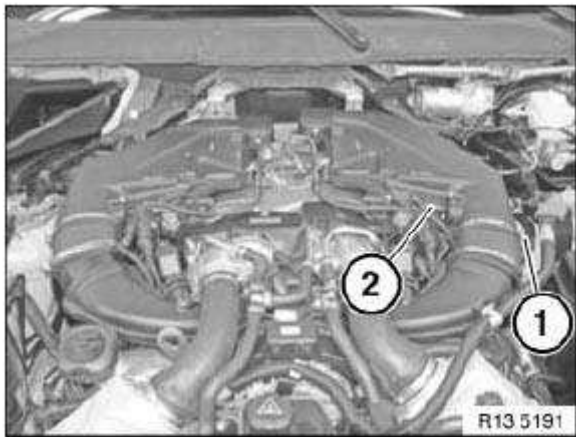


Fig. 70: Disconnecting Plug On Air-Mass Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws along line (1).

Remove air filter cover (2).

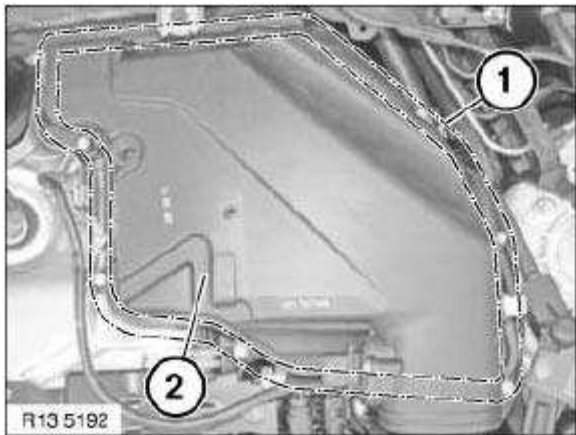


Fig. 71: Removing Air Filter Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Remove air filter insert.

Installation:

Clean upper and lower sections of intake filter housing from inside.

Replace air filter elements.

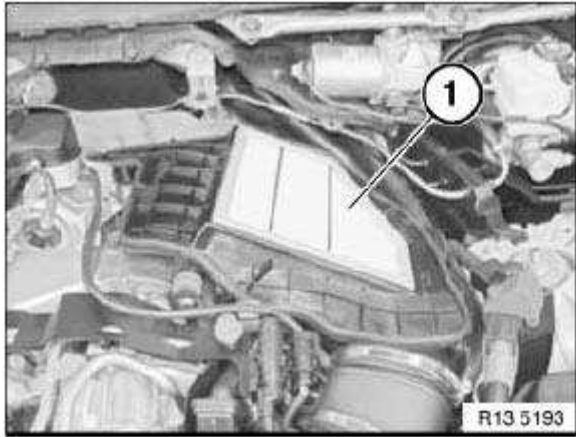


Fig. 72: Replacing Air Filter Elements
Courtesy of BMW OF NORTH AMERICA, INC.

CARBON CANISTER VENTILATION

13 90 500 REPLACING TANK VENTING VALVE (N63)

Necessary preliminary tasks:

- Check stored fault message.
- Switch off ignition.
- Remove **fan cowl** . See **17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N63)** .

Unlock plug (1) and remove.

Unlock hose (2) and detach.

Unlock hose (3) further below on intake manifold and detach.

Detach tank vent valve (4) from holder and remove.

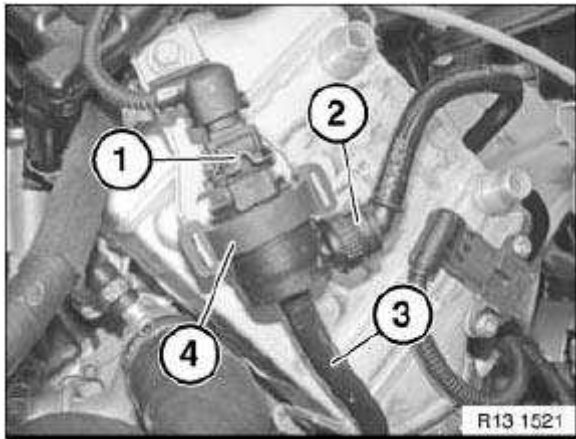


Fig. 73: Detaching Tank Vent Valve
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock hose (1) on intake manifold and detach.

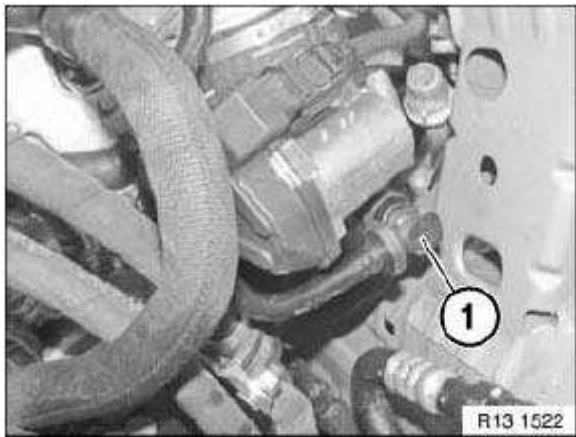


Fig. 74: Unlock Hose On Intake Vent Valve
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Read out fault memory of DME control unit. Now clear the fault memory.