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[BMW 3-Series 320i & 320xi \(12-14\), 325i, 325xi, 330i & 330xi \(06\) & 328i & 328xi \(07-14\) Haynes Online Manual](#)

10 Fuel rail and injectors - removal and installation

1 Disconnect the negative battery cable (see [Chapter 5, Section 3](#)).

2.0L engine

Removal

2 Relieve the fuel system pressure (see [Section 3](#)).

3 Disconnect the cable from the negative terminal of the battery (see [Chapter 5](#)).

4 Remove the engine cover, by lifting the front of the cover up and pulling it forwards. Remove the strut tower crossbrace plastic push-pins and bolts then remove the brace. Remove the sound insulator plastic retainers and lift the insulator off of the engine.

5 Remove the ignition coils (see [Chapter 5](#)).

6 Remove and replace the high pressure fuel line to the high pressure pump (see [Section 12](#)).

7 Disconnect the electrical connector to the high pressure sensor at the end of the fuel rail.

8 Place clean rags to collect any fuel, then, starting with the unions on the fuel rail, loosen and pull up the high-pressure fuel pipe unions from the fuel rail to the injectors.

9 Loosen the fuel rail bolts, slowly and evenly, a 1/4-turn at a time until the rail is loose in the brackets.

10 Carefully rotate the fuel rail up, counterclockwise, until the fuel line unions to the injectors are clear of the injectors.

Caution:

Do not bend or distort the fuel lines at the injectors or at the fuel rail.

11 Disconnect the electrical connectors from the injectors.

12 Loosen the ground wire retaining bolt just enough to remove the ground wire, then move the harness out of the way.

Caution:

The ground wire is held in place by one of the injector hold-down element bolts; if the bolts are not loosened and removed evenly, the hold-down element can tilt and damage the injector or injector threads.

13 The hold-down elements are shaped like a “T;” loosen the bolt at the end of the T, first a little at a time, then the middle bolt, alternating between the bolts evenly until the hold-down element can be removed.

14 If necessary, use a vacuum cleaner to remove all dirt and debris from the area adjacent to the high-pressure pipes, injectors, etc. It's essential that these areas be completely clean.

Caution:

Do not allow fuel to contact the ignition coils, as the resistance of the silicone material used in the coils is significantly reduced by contact with fuel.

15 Pull the injectors from the bores in the cylinder head. Place plastic caps over each injector fuel intake port and injection nozzle. Caps of various sizes are available from BMW dealers or automotive parts store.

Caution:

If the injectors are twisted with 53 in-lbs (6 Nm) of force or more while being removed, the injector(s) must be replaced.

Note:

If the injector(s) are stuck, use BMW special tool No. 13 0 320 (or equivalent) to remove them.

Note:

If the injectors are to be re-used, mark their positions. It's essential they be reinstalled to their original positions.

Installation

16 Use a small screwdriver to remove the coupling element from each injector. New ones must be installed.

17 Using a sharp razor knife (or the tools supplied in the BMW special tool kit) carefully cut the Teflon ring from the ends of the injectors. Take great care not to mark the metal of the injector nozzle (see illustrations) .

10.17a Remove the Teflon seal from the injector using a sharp knife...



10.17b... or the tools provided in the BMW kit



18 Clean the cylindrical part of each injector nozzle using clean, fluff-free rags – don't use any other cleaning agents/tools. Do not attempt to clean the nozzle tip.

19 New injectors are supplied with the Teflon ring already installed, and secured with plastic caps.

20 To replace the Teflon ring when reusing the original injectors, BMW technicians use a number of special tools (No. 13 0 190, 13 0 281, 13 0 282 and 13 0 283) which spreads the seal, pushes it into place, and compresses it into place afterwards (see illustrations). Equivalent tools may also be available from specialist automotive tool manufacturers. If these tools are unavailable, the job should be left to a BMW dealer or specialist. Note that the seal must not be lubricated.

10.20a Slide the new seal over the tapered installation tool . . .



10.20b . . . and into the groove on the injector



21 When reusing the injectors, the coupling element must be replaced on each injector.

22 Use a nylon brush and a vacuum cleaner to thoroughly clean out the injector holes in the cylinder head. Take care not to let any debris fall into the combustion chamber.

23 If new injectors are being installed, their adjustment values must be programmed into the engine management ECM (DME) using dedicated diagnostic equipment/scanner. Make a note of the values on each injector before installing. They are printed on the injector body in a row; use the last 3-digits. If this equipment is not available, this should be done by a BMW dealer or BMW specialist.

Note:

It may be possible to drive the vehicle, with considerable reduced performance/increased emissions, to a dealer or BMW specialist for the numbers to be programmed, but the engine may run poorly or fail to start.

24 Remove the plastic caps/compressing tool, and install each injector into its original position.

Warning:

The injectors must not be twisted with more than 53 in-lbs (6 Nm) of force while being installed or the injector(s) Teflon ring must be replaced .

25 Place special tool No. 13 0 320 (or equivalent) over the injectors and install the coupling element bolts with a few turns. Screw the union sleeves of the tool onto the injectors. Tighten the knurled knobs on top of the union sleeves until all the play is gone.

26 Tighten the coupling element bolts to the torque listed in [this Chapter's Specifications](#) .

27 Using a [torque wrench](#) with a crows-foot adapter, turn the union sleeves counterclockwise until 9 in-lbs (2 Nm) is reached on the torque wrench.

28 Remove the special tool and install the coupling element between the injectors, with the curvatures facing downwards.

29 Install the bolts a little at a time to prevent the T-shaped coupling from binding until the bolts are hand tight.

30 Rotate the fuel [injector](#) pipes to the injectors, then reconnect the high-pressure pipe unions to their original locations on the injectors. It's essential that the pipes are installed without tension – it must be possible to screw on the union nuts easily by hand.

31 With each high-pressure pipe union tightened down by hand, tighten the [injector](#) clamp bolts to the torque listed in [this Chapter's Specifications](#) .

32 Tighten the T-shaped coupling element mounting bolts to the torque listed in [this Chapter's Specifications](#) .

33 Tighten the high-pressure fuel pipe unions to the torque listed in [this Chapter's Specifications](#) , using a crows-foot wrench.

34 Reconnect each [injector](#) electrical connector.

35 Install the high-pressure fuel pump lines (see [Section 12](#)).

36 Reinstall the ignition coils as described in [Chapter 5](#) .

37 The remaining installation is the reverse of removal.

38 If new injectors have been installed, have their adjustment values entered into the PCM (DME) using BMW diagnostic equipment.

3.0L engine

Removal

39 Pull up and remove the plastic cover from the top of the engine (see [illustration](#)) .

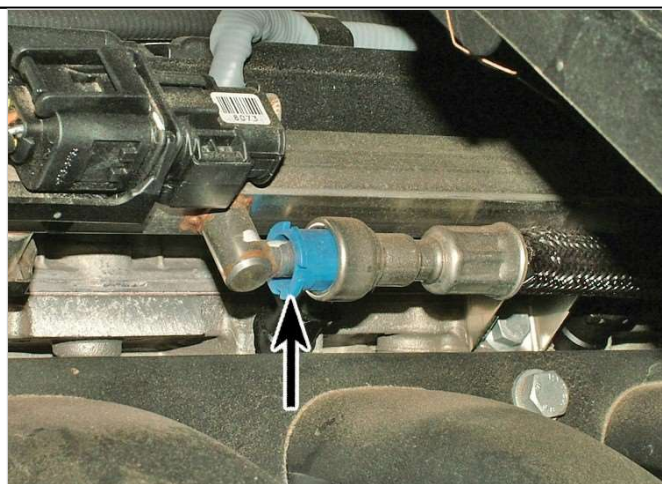
10.39 Pull the plastic engine cover upwards - the bolt heads are fake



40 Relieve the fuel system pressure (see [Section 3](#)).

41 Depress the locking collar, and disconnect the fuel feed pipe from the rail (see illustration) .

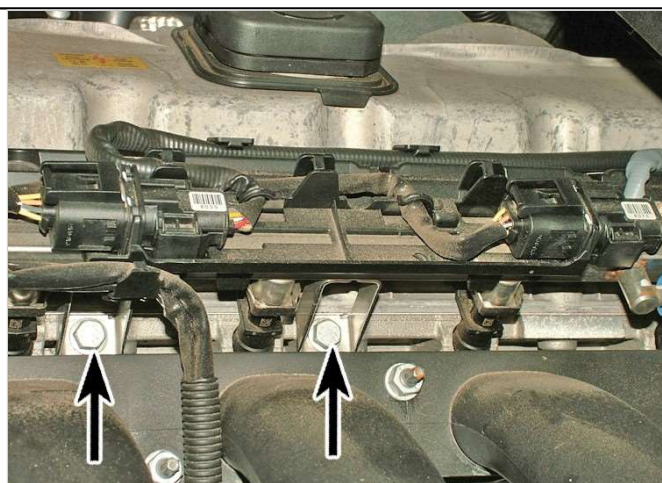
10.41 Press in the collar and disconnect the fuel feed pipe



42 Unclip and remove the electrical connector strip from the injectors/ fuel rail.

43 Remove the mounting bolts and pull out the fuel rail and injectors as an assembly (see illustration) .

10.43 Fuel rail mounting bolts (two of four shown)



44 To remove a fuel injector from the fuel rail, proceed as follows:

A. Pry off the metal securing clip, using a screwdriver (see illustration).

B. Pull the fuel injector from the fuel rail.

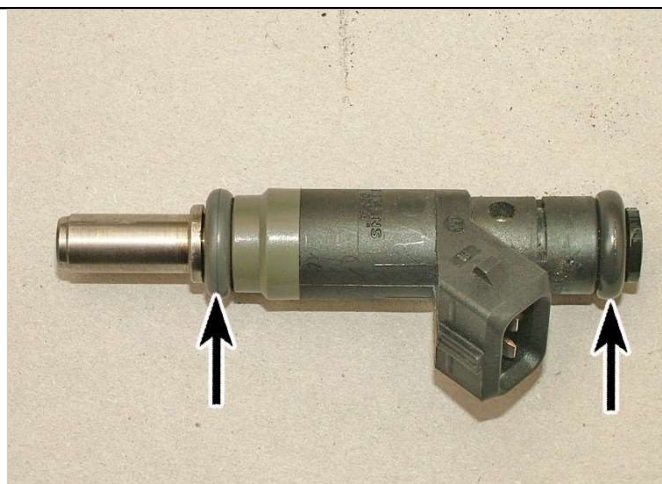
10.44 Pry out the injector retaining clips



Installation

45 Lightly lubricate the fuel injector O-rings with petroleum jelly or clean engine oil (see illustration) .

10.45 Check the condition of the injector O-ring seals



46 Install the injectors to the fuel rail, and hold them in place with the clips pushed into the grooves.

47 The remainder of installation is the reverse of removal.