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2020.0 DEFENDER (LE), 303-04E

FUEL CHARGING AND CONTROLS - INGENIUM I6 3.0L PETROL

FUEL INJECTORS (G2344597)

mcx30.com

SPECIAL TOOL(S)



E54135

100-012

Slide Hammer



E193517

100-012-01

Slide Hammer Adapter



E107680

310-198

Installer, Teflon Seal



E200616

JLR-310-254

Injector Remover



E204101

JLR-310-255

Guide pins threaded



JLR-310-256

Guide pins unthreaded



E203540

JLR-310-257

Teflon Seal Resize Tool

PART(S)

STEP	PART NAME	QUANTITY
Installation Step 1	Fuel injector refit kit	6
Installation Step 12	Fuel rail bolt(s)	4
Installation Step 14	Fuel rail bolt(s)	2

REMOVAL

WARNINGS:

- Residual pressure may still be present in the fuel system when disconnecting a fuel line. Make sure to cover the fuel line connection with a lint free cloth to capture any escaping fuel.
- Be prepared to collect escaping fuel.

CAUTIONS:

- Before disconnecting any components, make sure the area is clean and free from foreign material. When disconnected all openings must be sealed.
- Extreme cleanliness must be exercised when handling these components. Make sure that all tools and the surrounding area is clean before commencing work.
- While installing seals / Gaskets, make sure all the mating faces are clean and free from foreign material.

NOTES:

- This procedure contains some variation in the illustrations depending on the vehicle specification, but the essential information is always correct.
- This procedure contains illustrations showing certain components removed to provide extra clarity.

1. Before working on the fuel system make sure to study the fuel system health and safety section of this manual.

Refer to: [Petrol and Petrol-Ethanol Fuel Systems Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

2. Release the fuel pressure.

Refer to: [Fuel System Pressure Release](#) (310-00 Fuel System - General Information, General Procedures).

3. Disconnect the startup battery ground cable.

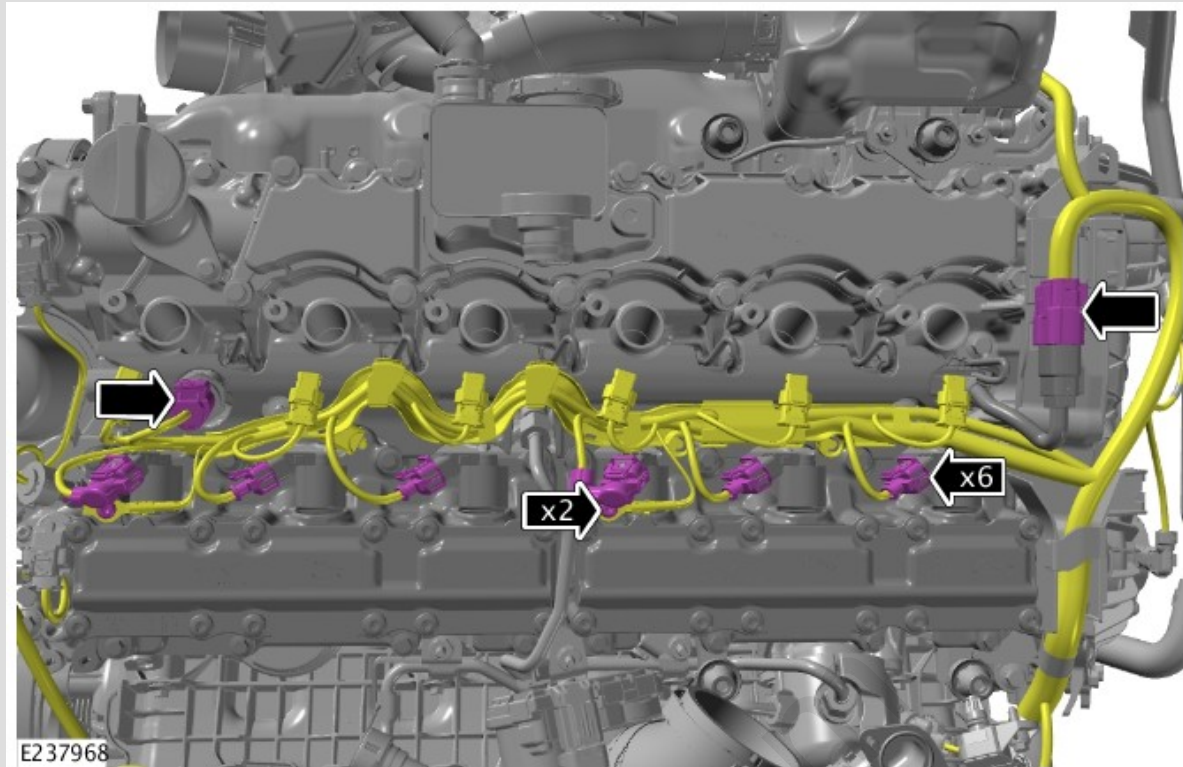
Refer to: [Startup Battery Disconnect and Connect](#) (414-00 Battery and Charging System - General Information, General Procedures).

4. Remove the engine cover.

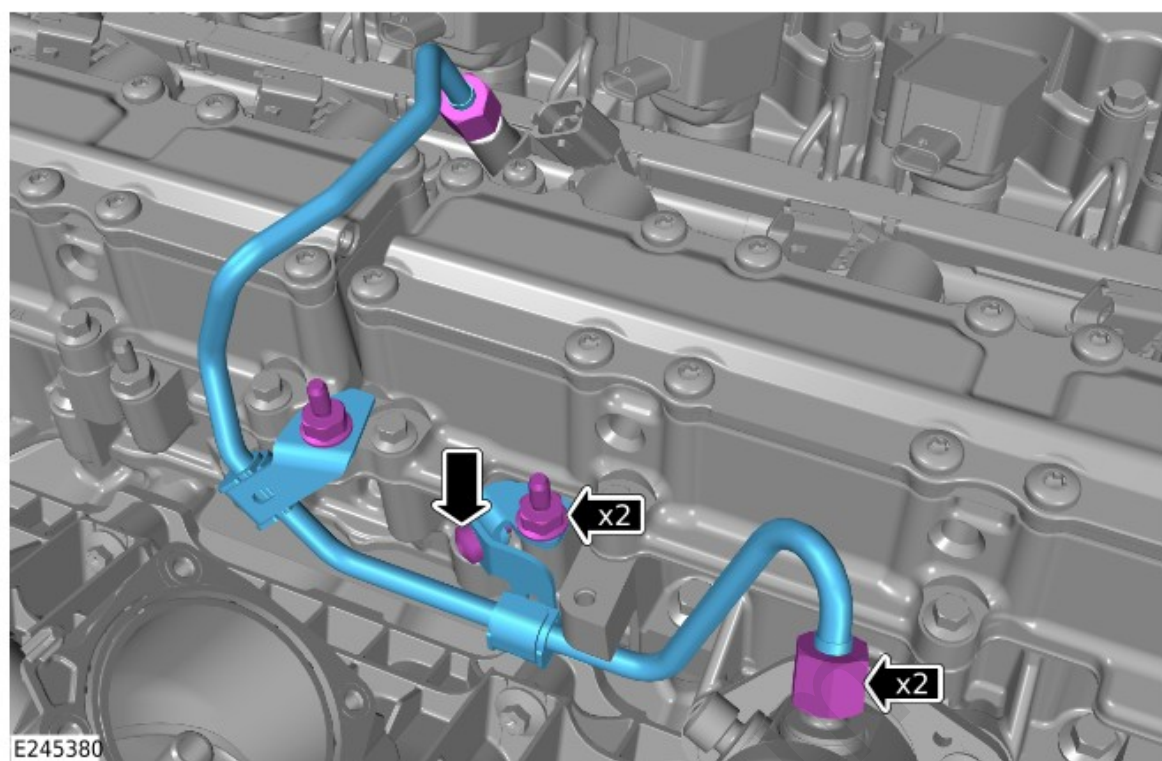
Refer to: [Engine Cover - INGENIUM I6 3.0L Petrol](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

5. Remove the ignition coil on-plugs.

Refer to: [Ignition Coil-On-Plug](#) (303-07C Engine Ignition - INGENIUM I6 3.0L Petrol, Removal and Installation).

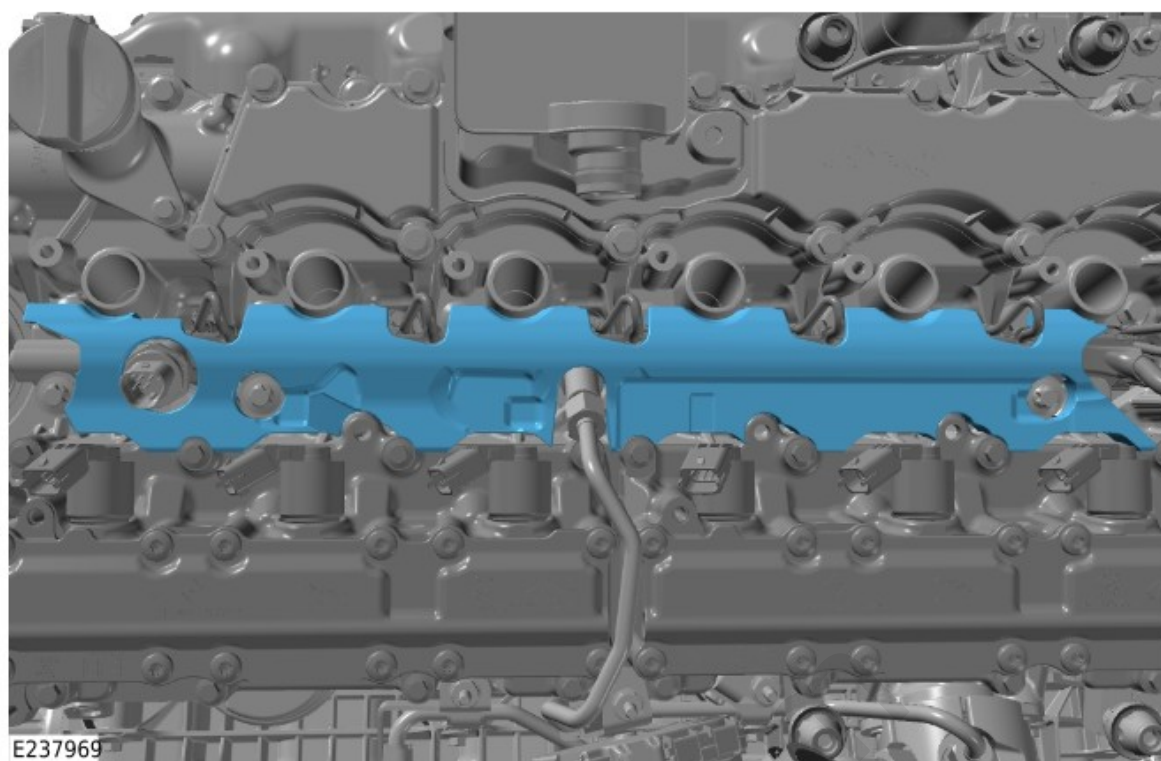


- Remove the 2 bolts.
- Disconnect the 10 electrical connectors.
- Reposition the wiring harness away from the fuel injectors.



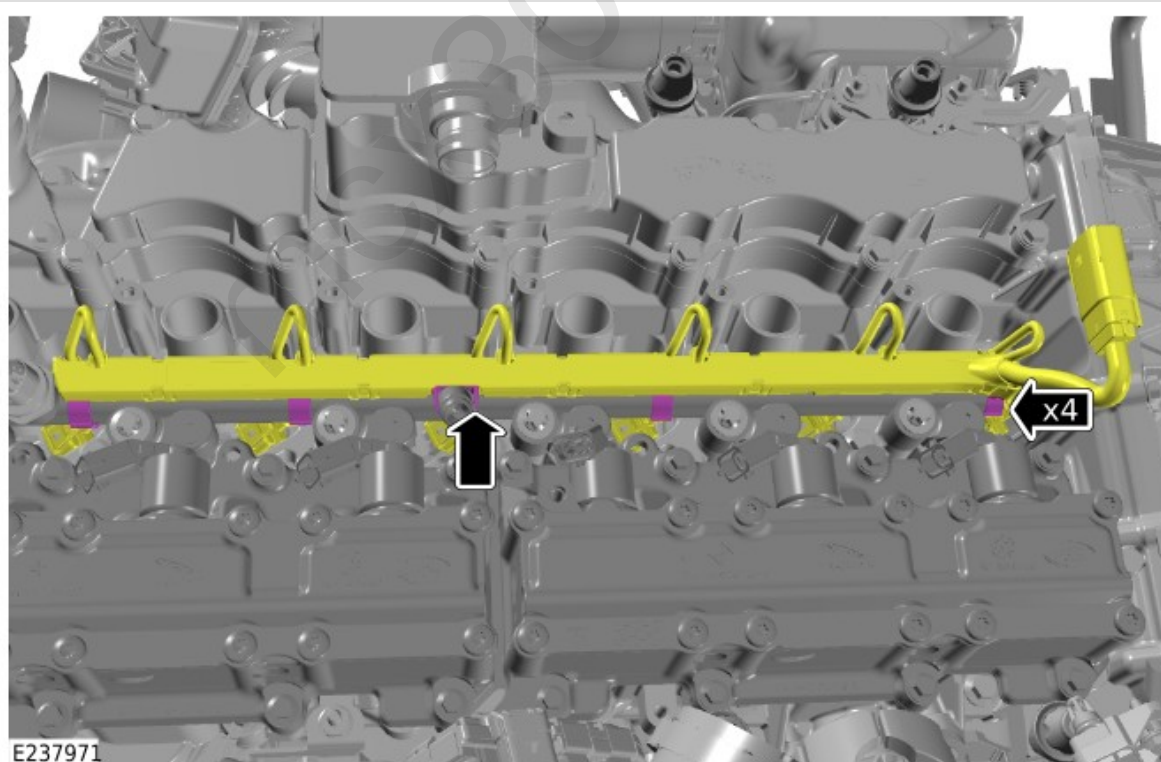
- Loosen the 2 fuel line unions.
- Remove the 2 studs.
- Remove the High Pressure (HP) fuel line assembly.
- Loosen the M6 Torx bolt.

8.



Remove the Noise, Vibration and Harshness (NVH) material.

9.



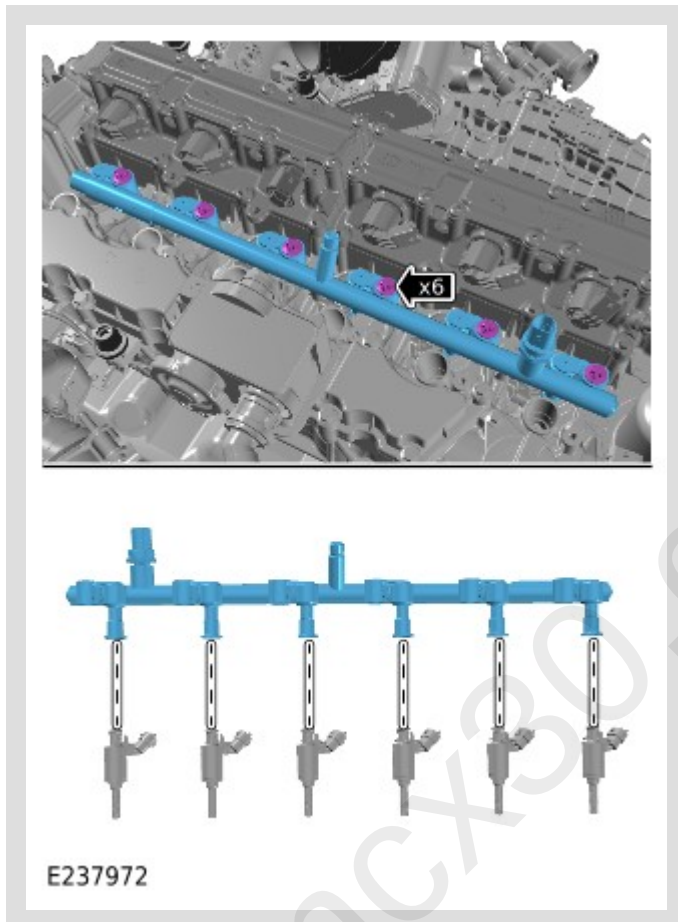
- Release the 4 clips.
- Reposition the wiring harness away from the fuel injectors.

⚠ WARNING:

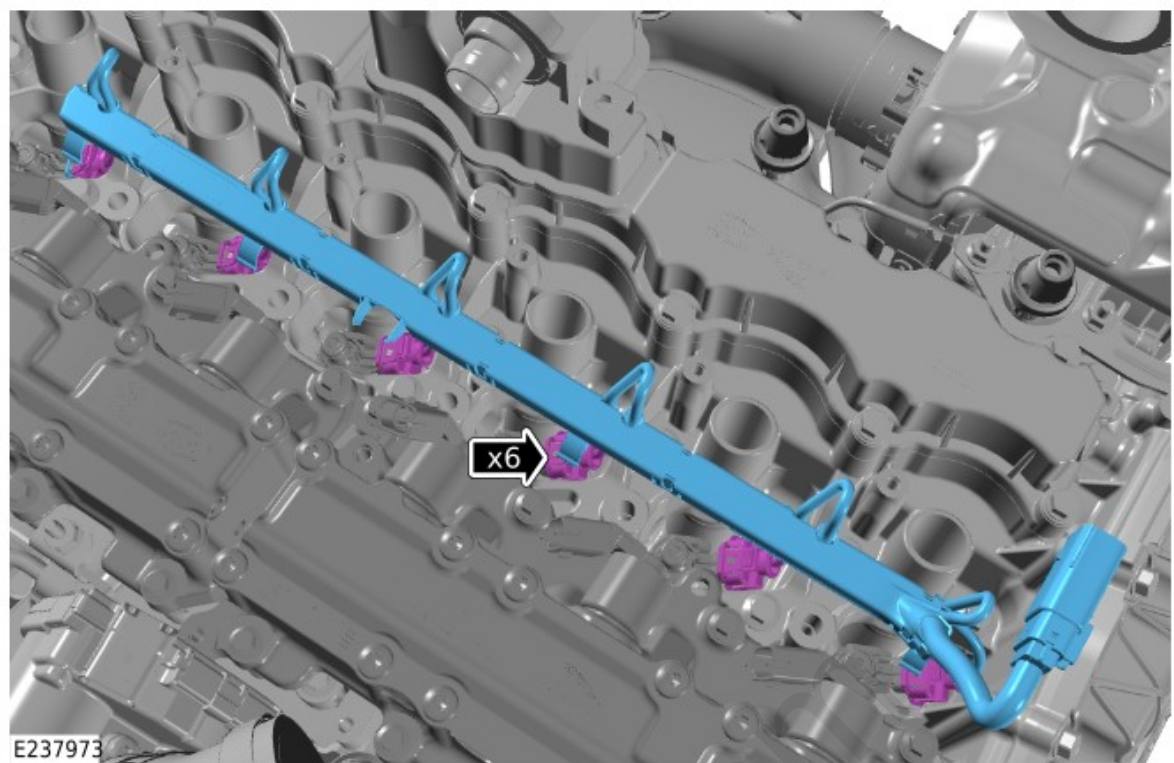
Be prepared to collect escaping fuel.

ⓘ CAUTION:

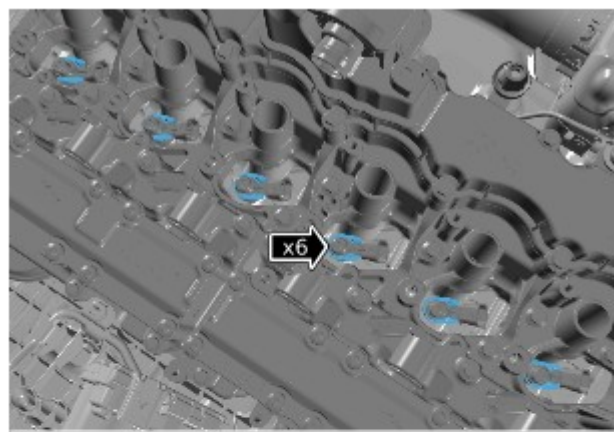
Loosen each of the bolts 1 turn at a time until the tension is fully released.



- Remove and discard the 6 bolts.
- Remove the fuel rail.



- Disconnect the 6 electrical connectors.
- Remove the fuel injector wiring harness.

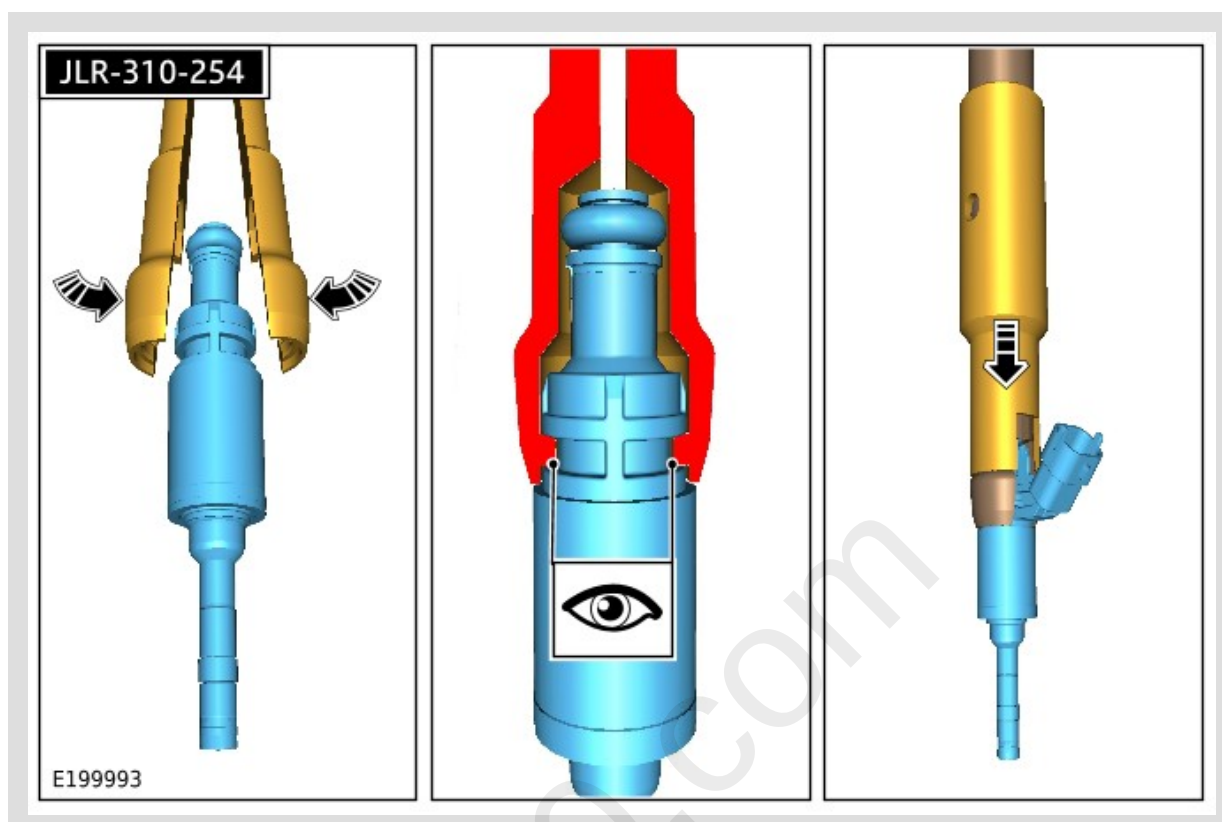


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Remove and discard the 6 fuel injector retainers.

⚠ CAUTION:

Make sure that the special tool is correctly installed.



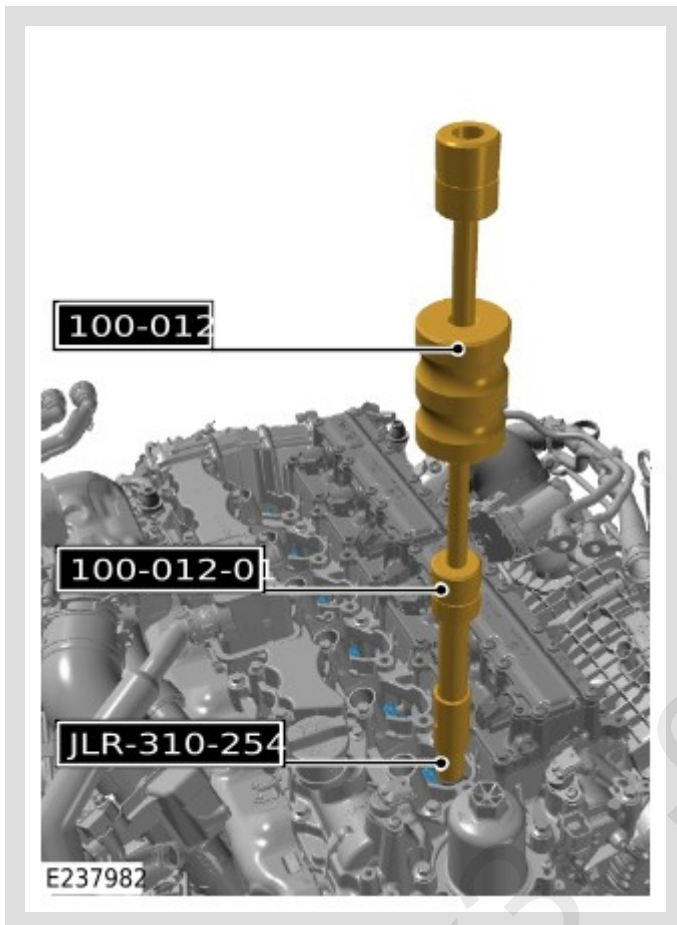
Install the special tool to the fuel injector.

Special Tool(s): [JLR-310-254](#)

14.

 NOTE:

Make sure that the fuel injector is removed smoothly.



Use the special tool to remove the fuel injector.

Special Tool(s): [100-012](#), [100-012-01](#), [JLR-310-254](#)

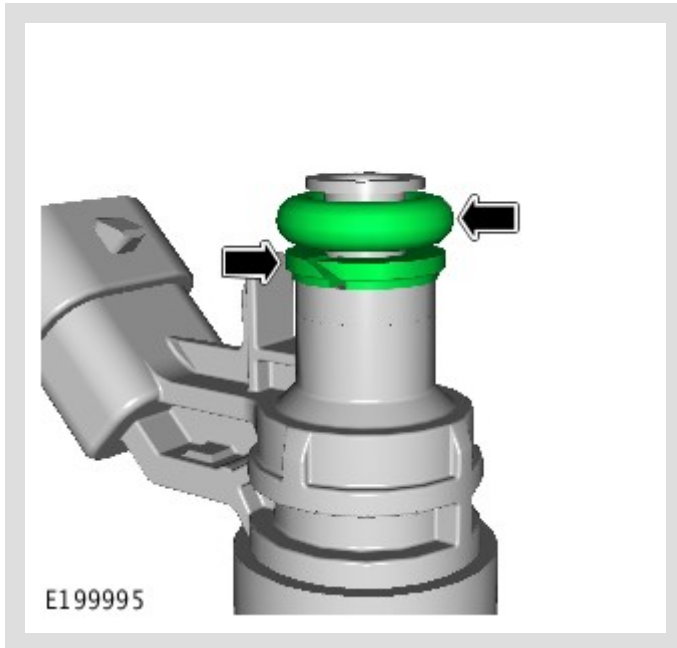
15.

Remove the special tools from the fuel injector.

Special Tool(s): [100-012](#), [100-012-01](#), [JLR-310-254](#)

⚠ CAUTION:

Do not use any sharp tools to remove the O-ring seal as damage could occur to the fuel injector.

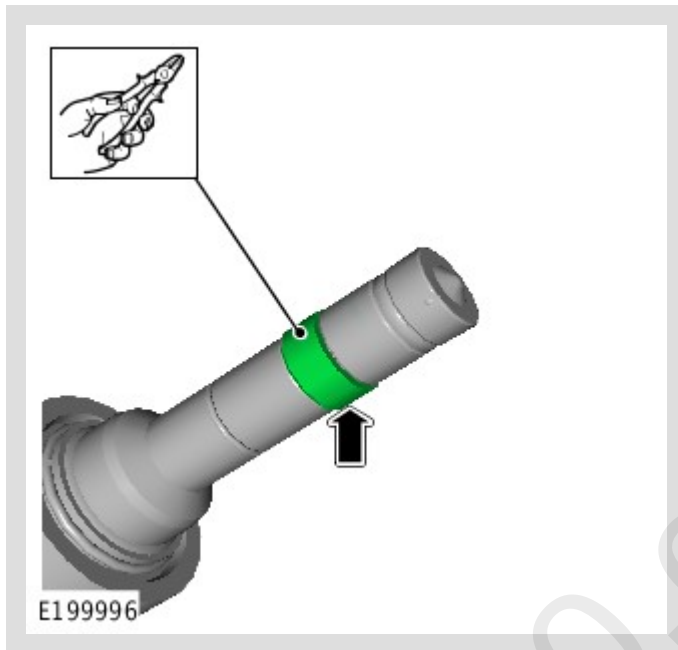


Remove and discard the fuel injector O-ring seal and washer.

17.

⚠ CAUTION:

- Do not use a knife to remove the Teflon seal as damage could occur to the fuel injector.
- Pinch the Teflon seal to allow the tool to cut the Teflon seal without damaging the fuel injector.
- Do not cut the Teflon seal too deep as damage could occur to the fuel injector.



Remove and discard the Teflon seal.

18. Repeat steps 15 to 19 for the remaining fuel injectors.

INSTALLATION

1.

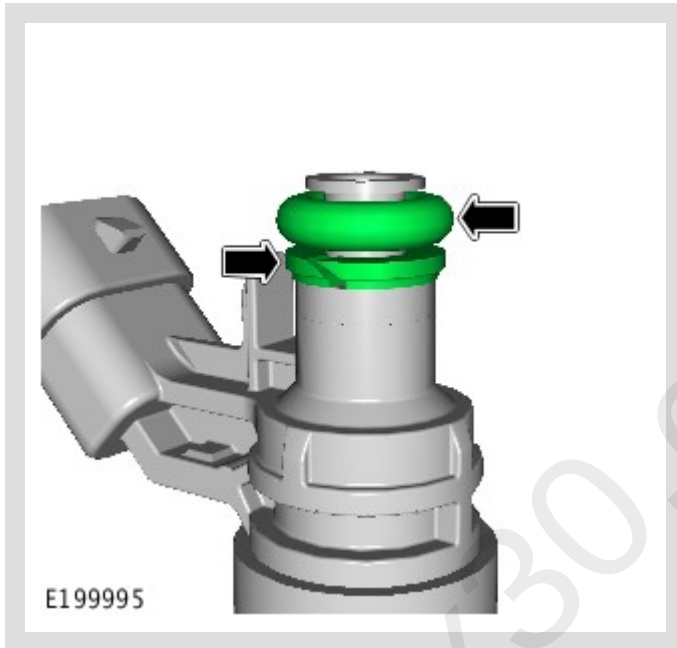
⚠ CAUTION:

New fuel injector replacement kits must be installed.

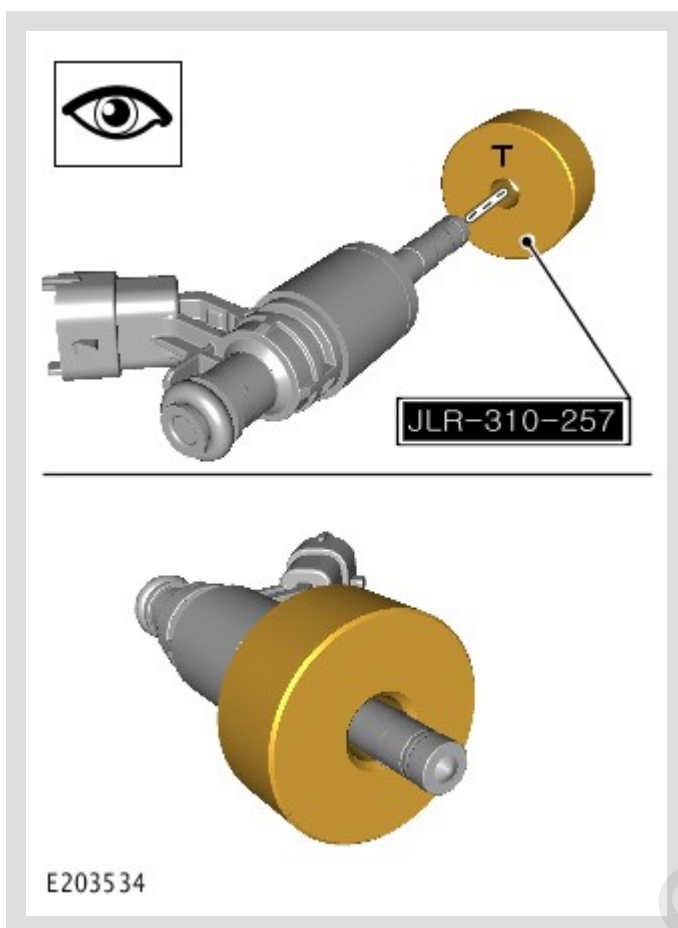
Installation steps 2 to 6 must be completed for each of the fuel injectors.

Renew Part: [Fuel injector refit kit](#) Quantity: [6](#).

2.



Install the new fuel injector O-ring seal and washer.

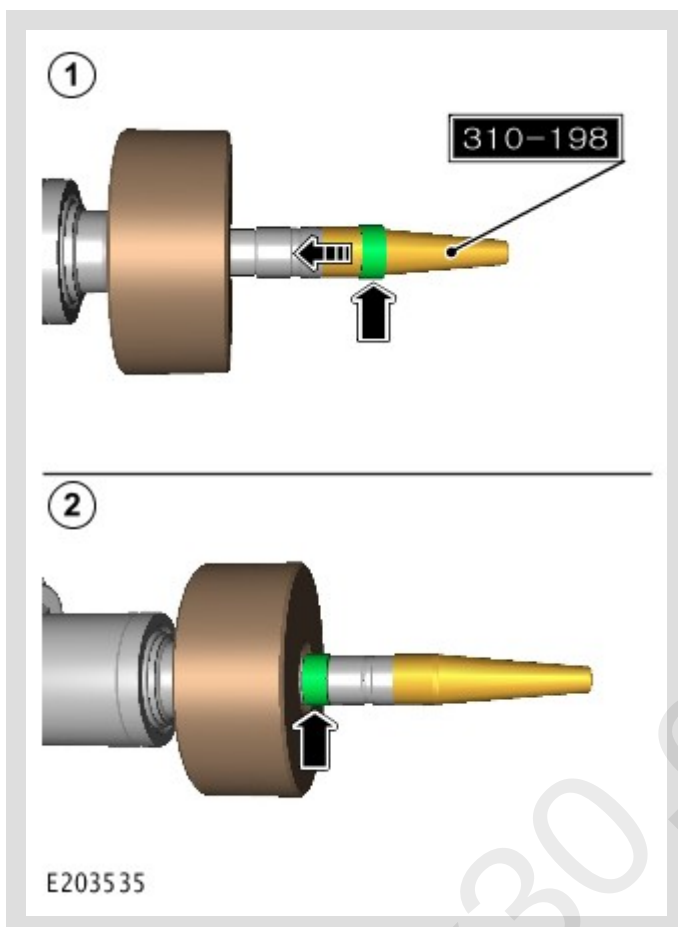


Install the special tool JLR-310-257 to the fuel injector with the 'T' symbol towards the top of the fuel injector as shown.

Special Tool(s): [JLR-310-257](#)

ⓘ CAUTION:

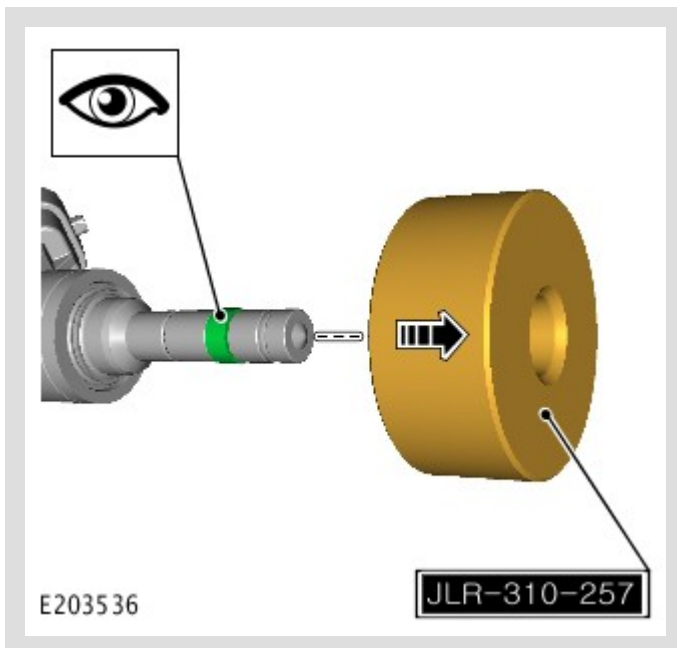
Wait 2 minutes to allow the Teflon seal to recover its shape.



Use the special tool 310-198 to install the new Teflon seal to the fuel injector.

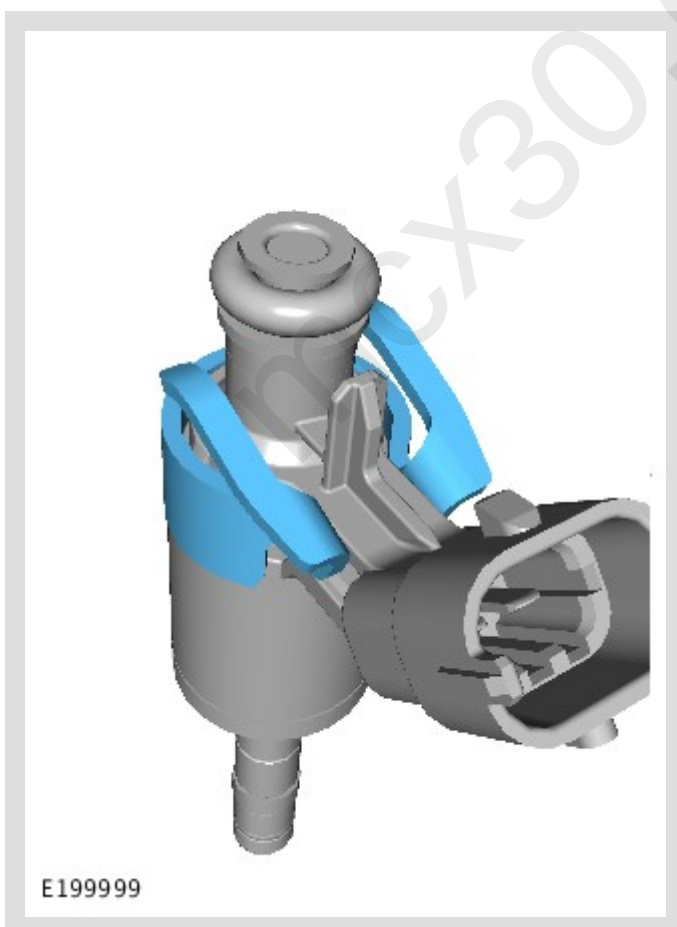
Special Tool(s): [310-198](#)

5.



- Remove the special tool.
Special Tool(s): [JLR-310-257](#)
- Check the Teflon seal.

6.



Install the new fuel injector retainer.

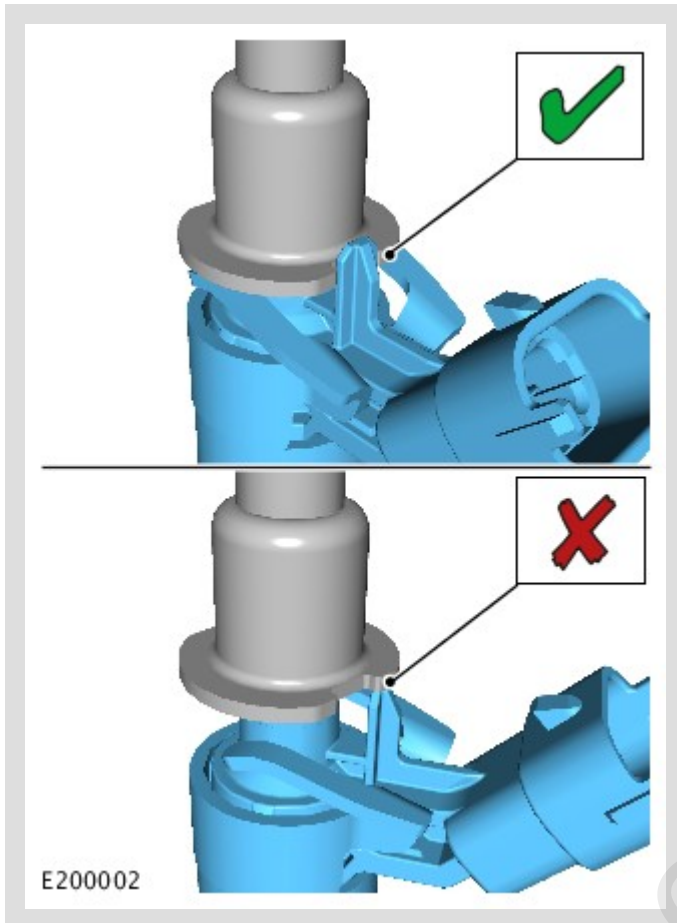
7.

 NOTE:

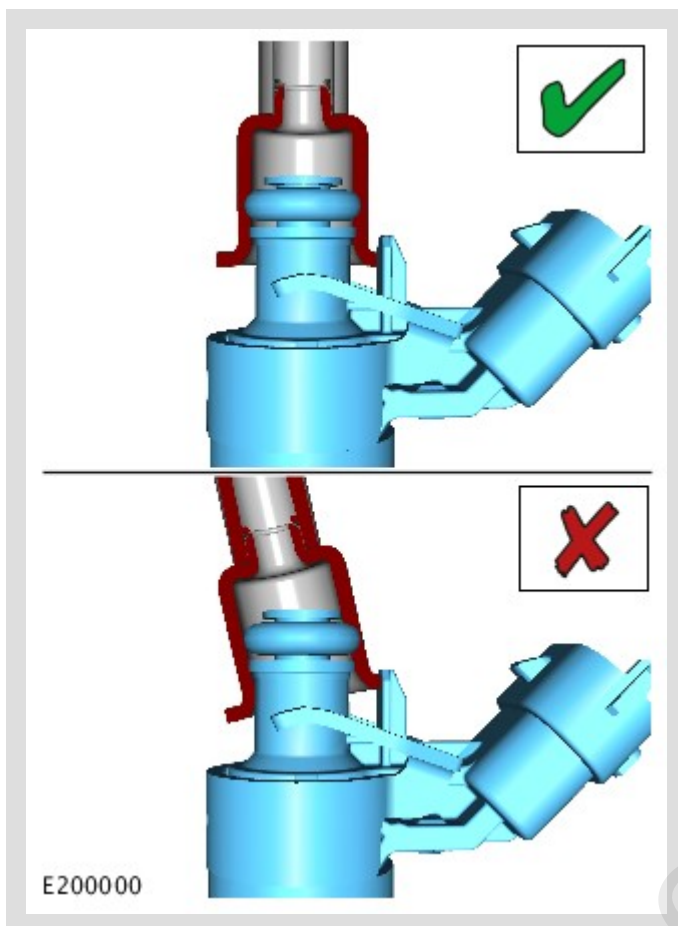
Lubricate the fuel injector O-ring seals with clean engine oil.



Install all the fuel injectors into the fuel rail.

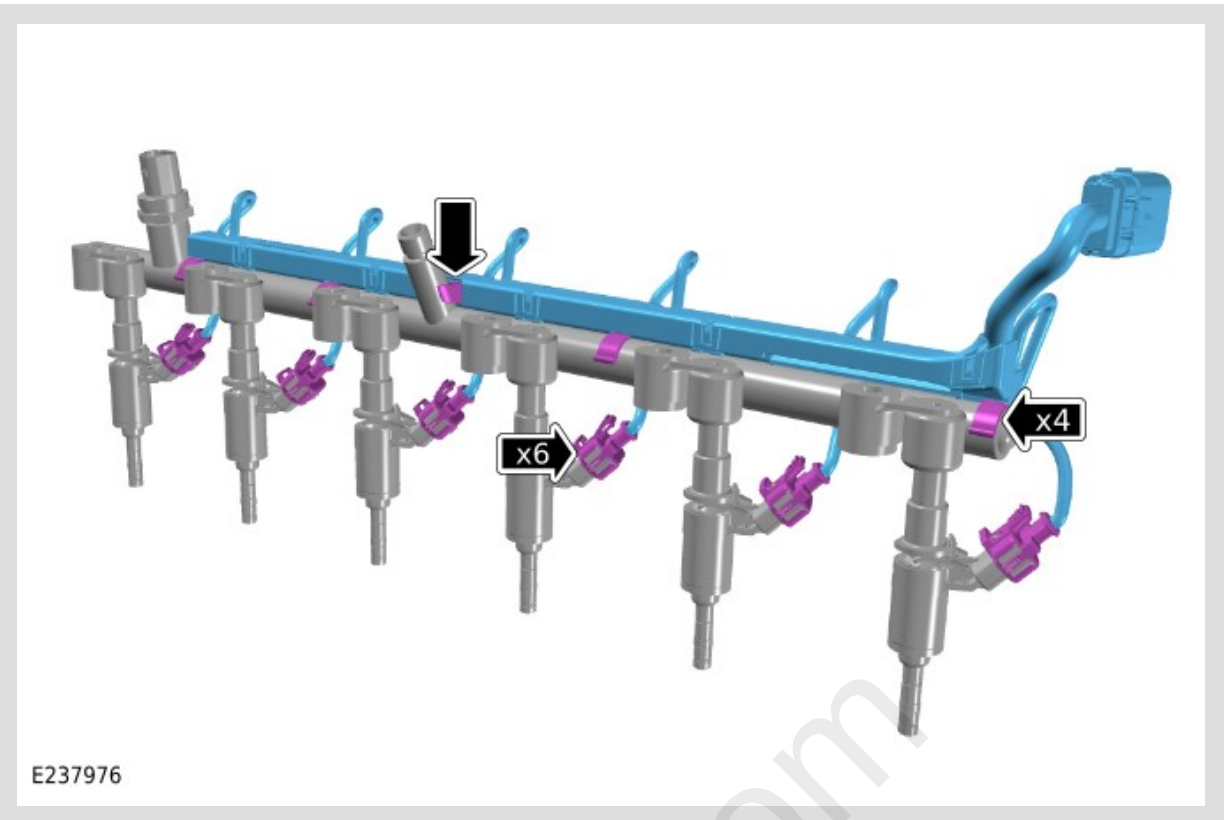


Make sure the fuel injectors are correctly aligned.



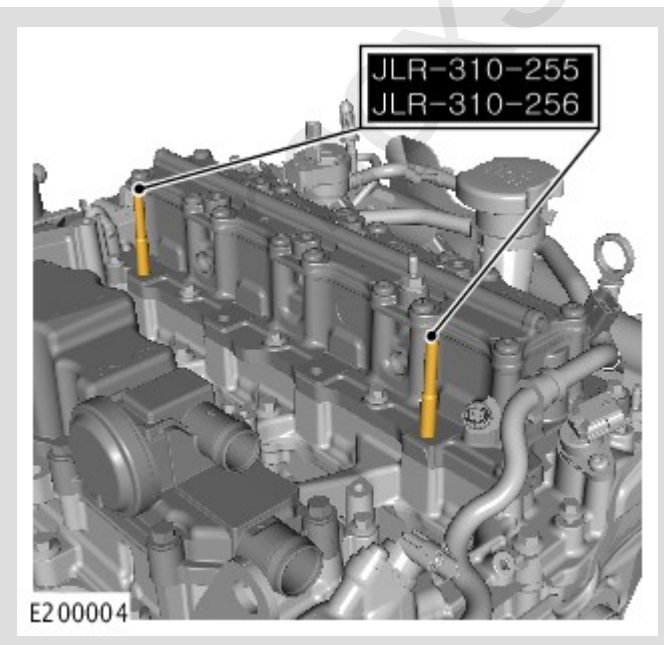
Make sure the fuel injectors are correctly aligned.

10.



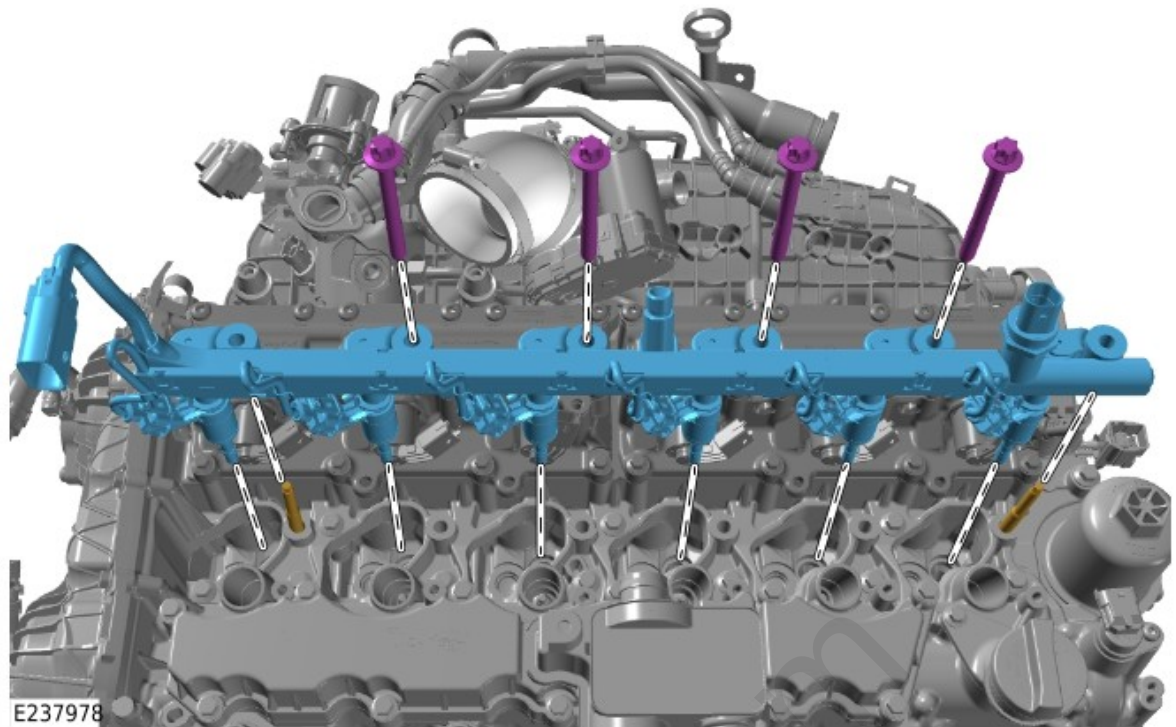
- Install the fuel injector wiring harness.
- Install the 4 clips.
- Connect the 6 electrical connectors.

11.



Install the appropriate special tools. If a new cylinder head **has not** been installed then the special tool JLR-310-255 with the threaded section must be used. If a new cylinder head **has** been installed then the special tool JLR-310-256 without the threaded section must be used.

Special Tool(s): [JLR-310-255](#), [JLR-310-256](#)



- Install, but do not fully tighten the 4 fuel injector bolts.

Renew Part: [Fuel rail bolt\(s\)](#) *Quantity:* [4](#).

- Tighten the bolts 1 turn at a time.

Torque: **20Nm**

-
13. Remove the special tools.

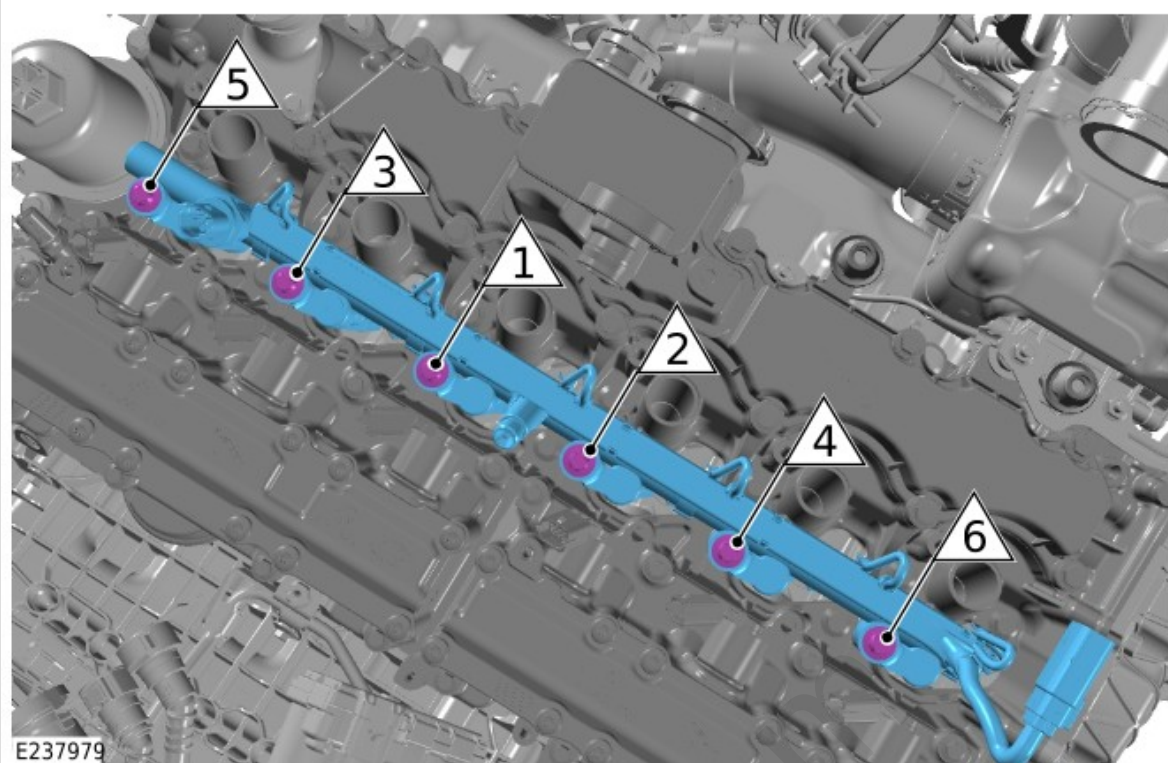
Special Tool(s): [JLR-310-255](#), [JLR-310-256](#)

-
14. Install and tighten the remaining 2 fuel rail bolts.

Renew Part: [Fuel rail bolt\(s\)](#) *Quantity:* [2](#).

Torque: **20Nm**

15.



Tighten the 6 bolts in the sequence illustrated.

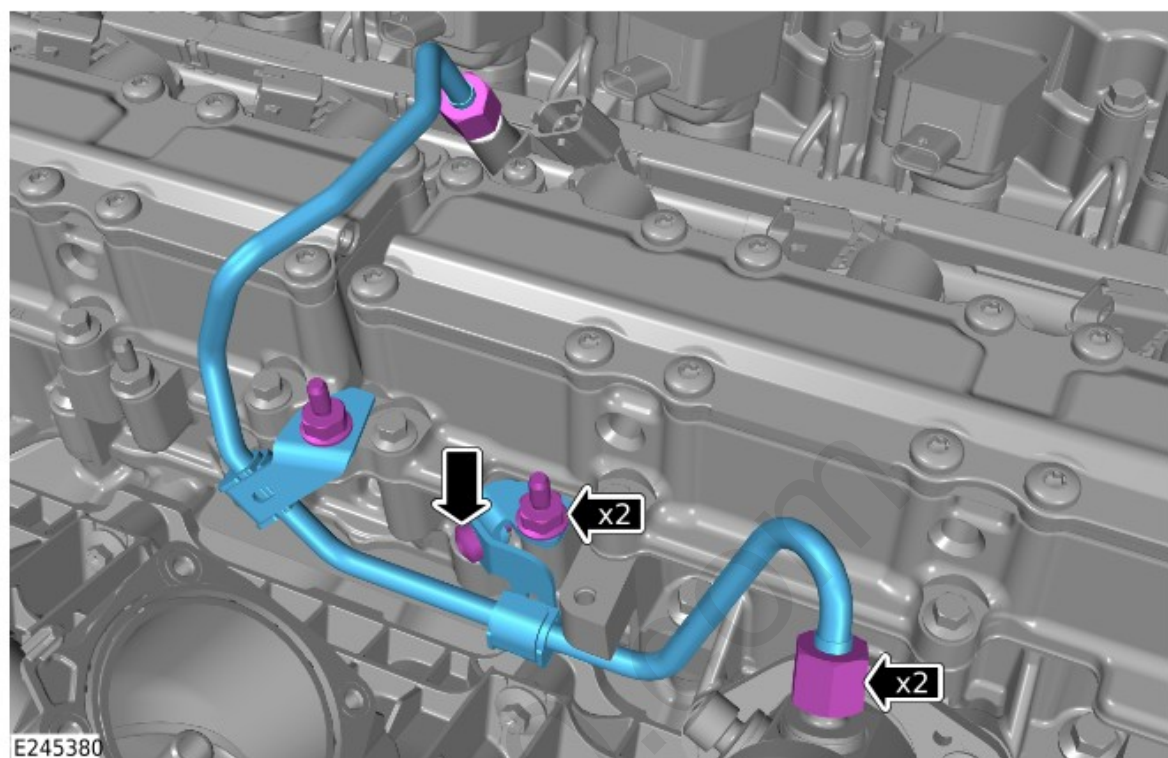
Torque: 30Nm

16.

Install the NVH material.

⚠ CAUTION:

Fuel lines may only be reused one time. After final tightening, clean the fuel line and apply a paint mark to identify reuse. If the fuel line is already paint marked, a new fuel line must be installed.



- Install the HP fuel line.
- Finger tighten the 2 unions.
- Tighten the 2 unions.
Torque: 20Nm
- Install and tighten the 2 M6 Hex stud bolts.
Torque: 11.5Nm
- Fully loosen the 2 fuel line unions.
- Finger tighten the 2 unions.
- Tighten the 2 fuel line unions.
Torque: 20Nm
- Wait for 30 seconds and recheck the final torque.
- Install and tighten the M6 Torx bolt.
Torque: 11.5Nm

18.

- Position the wiring harness to the fuel injectors
- Connect the 10 electrical connectors.
- Install and tighten the 2 bolts.

Torque: 7Nm

19.

Install the ignition coil-on-plugs.

Refer to: [Ignition Coil-On-Plug](#) (303-07C Engine Ignition - INGENIUM I6 3.0L Petrol, Removal and Installation).

20.

Install the engine cover.

Refer to: [Engine Cover - INGENIUM I6 3.0L Petrol](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

21.

Connect the startup battery ground cable.

Refer to: [Startup Battery Disconnect and Connect](#) (414-00 Battery and Charging System - General Information, General Procedures).

22.

Bleed the low pressure fuel system.

Refer to: [Low-Pressure Fuel System Bleeding](#) (310-00 Fuel System - General Information, General Procedures).