

Fuel Injectors (19.60.12)

Special Service Tools



Remover - Fuel Injector
303-1127

Removal



WARNING: Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable vapors are always present and may ignite. Failure to follow these instructions may result in personal injury.



WARNING: Wait at least 30 seconds after the engine stops before commencing any repair to the high-pressure fuel injection system. Failure to follow this instruction may result in personal injury.



WARNING: This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow these instructions may result in personal injury.



WARNING: Do not carry out any repairs to the fuel system with the engine running. The fuel pressure within the system can be as high as 1650 bar (23,931 lb-sq-in). Failure to follow this instruction may result in personal injury.



CAUTION: Make sure the workshop area in which the vehicle is being worked on is as clean and as dust free as possible. Foreign matter from work on clutches, brakes or from machining or welding operations can contaminate the fuel system and may result in later malfunction.



CAUTION: Do not disconnect the fuel injector electrical connectors with the engine running. Failure to follow this instruction may result in serious damage to the engine.



CAUTION: Always carry out the cleaning process before carrying out any repairs to the fuel injection system components. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.



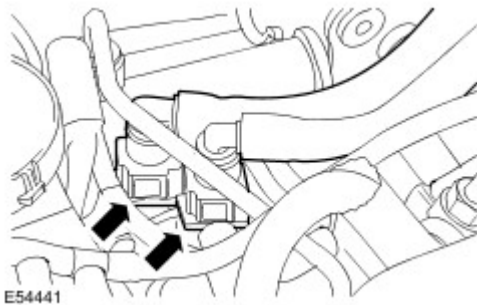
CAUTION: Diesel fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is therefore essential that absolute cleanliness is observed when working with these components.

Always install blanking plugs to any open orifices or lines. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.



CAUTION: Do not disassemble the fuel injectors or clean the nozzles, even with an ultrasonic cleaner. Always install new fuel injectors when required.

1. Disconnect the battery ground cable. For additional information, refer to [Specifications](#) (Section 414-00)
2. Remove the engine cover. For additional information, refer to [Engine Cover - 2.7L Diesel \(12.30.50\)](#) (Section 501-05)
3. Disconnect the low-pressure fuel lines.
▶ Install blanking caps to the exposed ports.



4. Disconnect both exhaust gas recirculation (EGR) coolant cross-over pipe hoses.
▶ Clamp the EGR coolant hoses to minimize coolant loss.

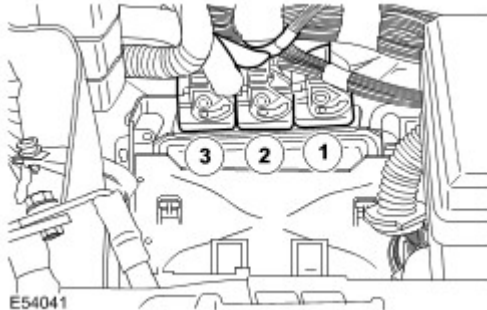


5. Remove the EGR coolant cross-over pipe.
▶ Remove the two retaining bolts.

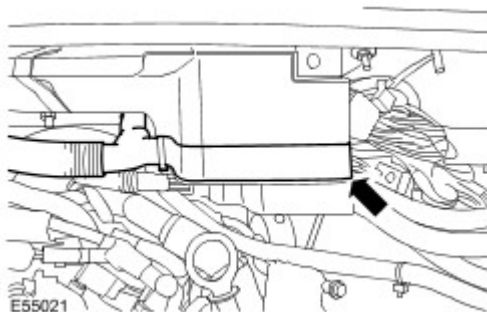


6. Remove the battery. For additional information, refer to [Battery \(86.15.01\)](#) (Section 414-01)

7. **NOTE :**
Right hand drive shown, for Left hand drive reverse the sequence.
Disconnect the three engine harness electrical connectors in the order shown.

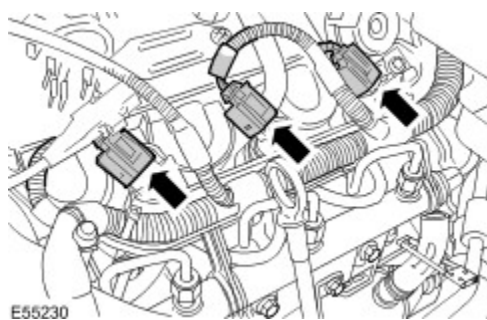


8. Release the engine wiring harness from the bulkhead.



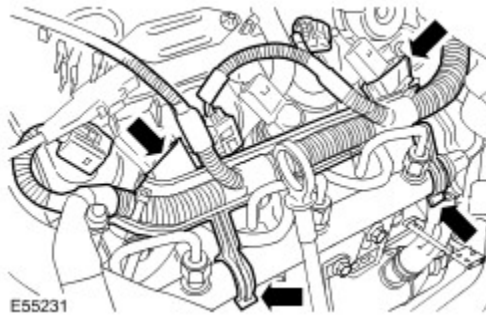
9. Remove the injector sound proofing.

10. Disconnect the fuel injector electrical connectors.



11. Release the engine wiring harness.

➤ Release the 4 clips.



12.



CAUTION: Make sure the high-pressure fuel supply line remains in contact with both the fuel injector and the fuel injection supply manifold until both unions have been detached and cleaned. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.



CAUTION: Make sure that the fuel injector adaptor union does not move when loosening the high-pressure fuel supply lines. Failure to follow this instruction may result in damage to the fuel injector or the fuel injector adaptor union.

Remove and discard the high-pressure fuel supply line.

- Loosen the high-pressure fuel supply line from the fuel injector and the fuel injection supply manifold.
- Install blanking caps to the exposed ports.



13.

Disconnect the fuel return line from the fuel injector.

- Remove the fuel return line retaining clip.



14.


Remove the two fuel injector retaining bolts.

- Remove the fuel injector retaining clamp spacer.

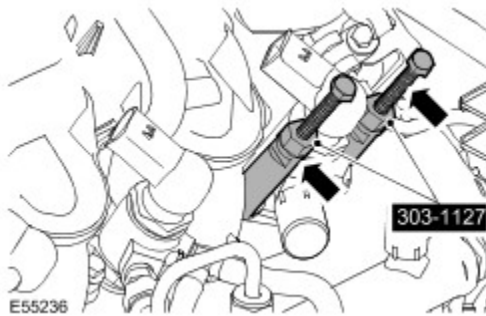


15. Install the special tool studs.



16.  **CAUTION:** Make sure the fuel injector remover legs are correctly engaged to the fuel injector. Failure to follow this instruction may result in damage to the component.


Install the special tool remover legs to the studs.




17. Remove the fuel injector.
- Install the special tool locking plate to the remover legs.
 - Rotate the special tool bolts evenly, in a clockwise direction.
 - Remove the special tool.
 - Remove and discard the fuel injector retaining clamp.
 - Remove and discard the sealing washer.



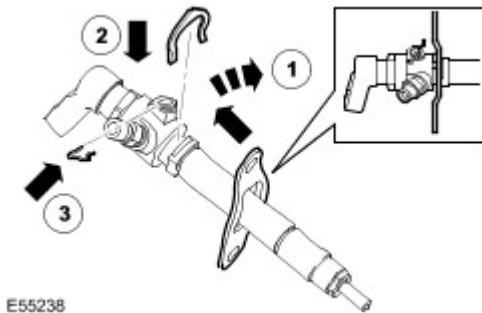
Installation

1.  **CAUTION:** Do not disassemble the fuel injectors or clean the nozzles, even with an ultrasonic cleaner. Always install new fuel injectors when required.


-  **CAUTION:** Do not use tools to install the new fuel return line retaining clip. Failure to follow this instruction will result in damage to the retaining clip.

Install a new fuel injector retaining clamp.

- 1. Install the fuel injector retaining clamp spacer.
- 2. Install a new fuel return line retaining clip.
- 3. Install a new sealing washer.



2. Install the fuel injector.
- Install the two bolts and tighten to 10 Nm (7 lb.ft).

3.  **CAUTION:** Make sure the fuel return line retaining clip is correctly installed to the fuel injector before installing the return line.

Connect the fuel return line to the fuel injector.

- Visually inspect the fuel return line O-ring seals for damage.
- Apply a light coating of petroleum jelly to the fuel return line O-ring seals.

- 4.



CAUTION: Do not allow the unions to hit the olive ends of the high-pressure fuel supply line as this may damage the ends of the line and allow foreign matter to enter the fuel injection system.



CAUTION: Maintain pressure on the high-pressure fuel supply line to keep the olives in contact with the fuel injectors and the fuel injection supply manifold cones while installing unions.

Install the new high-pressure fuel supply line.

- Remove the blanking caps from the ports.
- Stage 1: Tighten the high-pressure fuel supply line union at the injector to 15 Nm (11 lb.ft).
- Stage 2: Tighten the high-pressure fuel supply line union at the fuel injection supply manifold to 15 Nm (11 lb.ft).
- Stage 3: Tighten the high-pressure fuel supply line union at the injector to 30 Nm (22 lb.ft).
- Stage 4: Tighten the high-pressure fuel supply line union at the fuel injection supply manifold to 30 Nm (22 lb.ft).

- 5 . Attach the engine wiring harness.
- 6 . Connect the fuel injector electrical connectors.
- 7 . Install the injector sound proofing.
- 8 . Attach the engine wiring harness to the bulkhead.
- 9 . Connect the three engine harness electrical connectors.
- 10 . Install the battery. For additional information, refer to [Battery \(86.15.01\)](#) (Section 414-01)
- 11 . Install the EGR coolant cross-over pipe.
 - Install the two retaining bolts.
 - Tighten to 13 Nm (10 lb.ft).
- 12 . Connect both EGR coolant cross-over pipe hoses.
 - Remove the EGR coolant hose clamps.
- 13 . Connect the low-pressure fuel lines.
 - Remove the blanking caps from the ports.
- 14 . Install the engine cover. For additional information, refer to [Engine Cover - 2.7L Diesel \(12.30.50\)](#) (Section 501-05)
- 15 . Connect the battery ground cable. For additional information, refer to [Specifications](#) (Section 414-00)
- 16 . Check and top-up the coolant.

- 17 . Bleed the fuel system.