

## Fuel Rail (19.60.04)

### Special Service Tools



Fuel spring lock decoupling tool 310-D005

### Removal

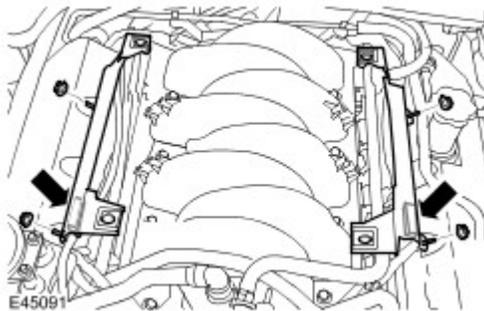


**WARNING:** Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable vapors are always present and may ignite. Failure to follow these instructions may result in personal injury.



**WARNING:** Do not carry or operate cellular phones 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.

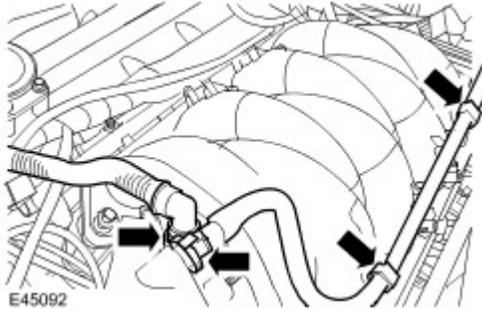
1. Disconnect the battery ground cable. For additional information, refer to [Specifications](#) (Section 414-00)
2. Remove the engine cover. For additional information, refer to [Engine Cover - 4.4L \(12.30.50\)](#) (Section 501-05)
3. Remove the engine cover studs.
  - ▶ Release the electrical connectors from the engine cover brackets.
  - ▶ Remove the 4 nuts.



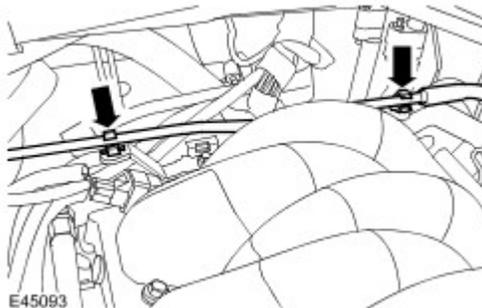
4.  **CAUTION:** Before the disconnection or removal of any components, ensure the area around joint faces and connections are clean. Plug any open connections to prevent contamination.

Disconnect the crankcase vent hoses.

5. Disconnect the evaporative emission hose from the intake manifold assembly.
6. Release the evaporative loss control valve from the intake manifold mounting, move the hose assembly aside for access.



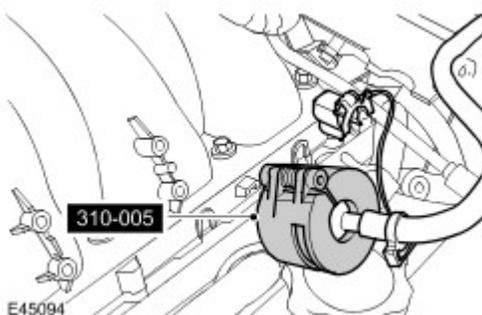
7. Release the fuel pipe from the clips.



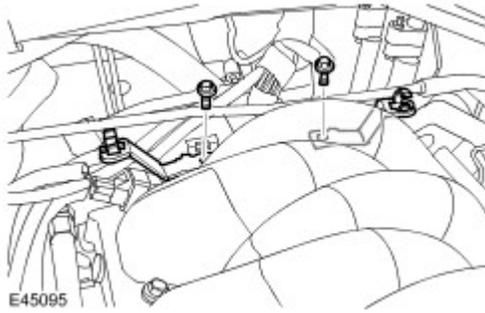
8.  **WARNING: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.**

Using the special tool, disconnect the fuel line.

- ▶ Position an absorbent cloth to collect fluid spillage.

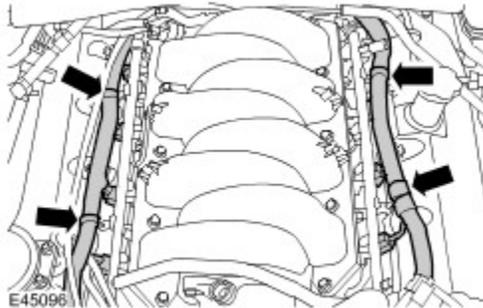


9. Position the wiring harness support bracket aside for access.
  - ▶ Remove the 2 bolts.



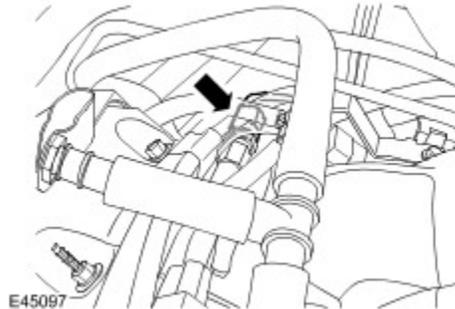
10. Release the engine wiring harness clips from the fuel rail.

11. Disconnect the fuel injector electrical connectors.



12. Disconnect the engine gas recirculation modulator electrical connection.

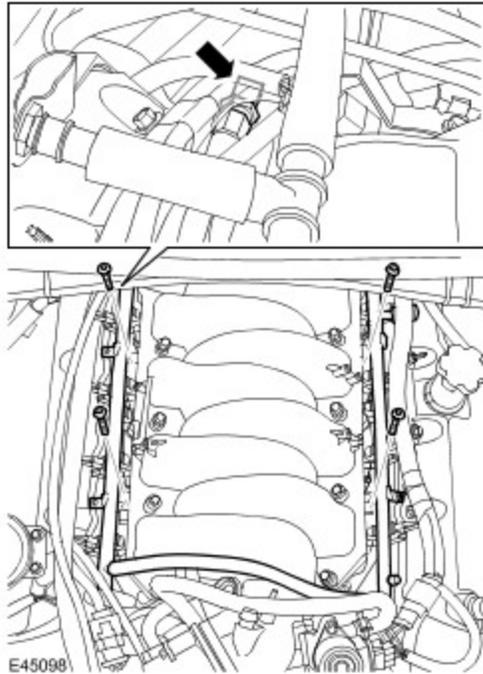
13. Disconnect the fuel temperature sensor electrical connector.



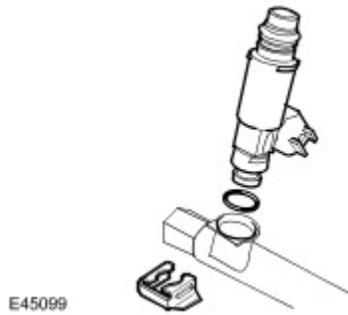
14. **NOTE :**  
Do not disassemble further if the component is removed for access only.  
Remove the fuel rail.

- ▶ Remove the 4 Torx bolts.
- ▶ Remove and discard the fuel injector O-ring seals.

15. Remove the fuel temperature sensor.



16. Remove the fuel injectors.
  - ▶ Remove the retaining clips.
  - ▶ Release the fuel injectors.
  - ▶ Remove and discard the fuel injector O-ring seals.



## Installation

1. Clean the components.
2. Install the fuel injectors to the fuel rail.
  - ▶ Install fuel injector O-ring seals.
  - ▶ Lubricate the O-ring seals with clean engine oil.
  - ▶ Install the fuel injectors.
  - ▶ Secure the fuel injector retaining clips.
3. Clean the components.

- 4 . Install the fuel temperature sensor.
  - ▶ Apply sealant to the sensor thread.
- 5 . Install the fuel rail.
  - ▶ Install fuel injector O-ring seals.
  - ▶ Lubricate the O-ring seals with clean engine oil.
  - ▶ Tighten the Torx bolts to 10 Nm (7 lb.ft).
- 6 . Connect the fuel temperature sensor electrical connector.
- 7 . Connect the fuel injector electrical connectors.
- 8 . Connect the engine wiring harness to the intake manifold.
- 9 . Install the engine wiring harness support bracket.
  - ▶ Tighten the bolts to 10 Nm (7 lb.ft).
- 10 . Connect the fuel line to the fuel rail.
  - ▶ Clean the component mating faces.
  - ▶ Position the fuel pipe into clips.
- 11 . Install the evaporative loss valve assembly to the intake manifold bracket and connect the hose.
  - ▶ Clean the component mating faces.
- 12 . Connect the crankcase vent hoses.
  - ▶ Clean the component mating faces.
- 13 . Install the engine cover mounting brackets.
  - ▶ Tighten the nuts to 6 Nm (4 lb.ft).
  - ▶ Attach the wiring harness connector blocks to the brackets.
- 14 . Install the engine cover. For additional information, refer to [Engine Cover - 4.4L \(12.30.50\)](#) (Section 501-05)
- 15 . Connect the battery ground cable.