



Valve Cover LH (12.29.43)

Removal



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: 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.



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: 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: 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.

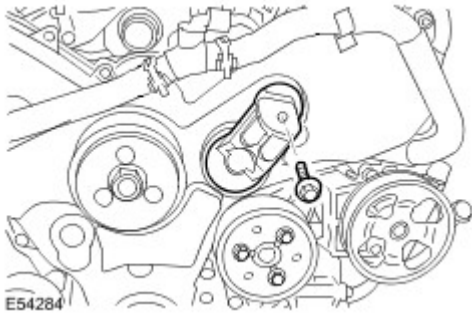


CAUTION: Diesel fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is therefore essential that absolute cleanliness is observed when working with these components. Always install blanking plugs to any open orifices or lines. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.

1. Disconnect the battery ground cable. For additional information, refer to [Specifications](#) (Section 414-00)
2. Remove the intake air shutoff throttle. For additional information, refer to [Intake Air Shutoff Throttle \(19.70.32\)](#) (Section 303-04)
3. Remove the accessory drive belt. For additional information, refer to [Accessory Drive Belt \(86.10.03\)](#) (Section 303-05)

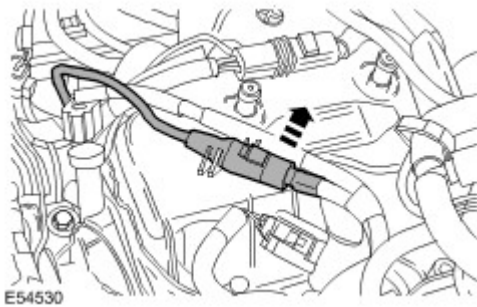
4. Remove the accessory drive belt idler pulley.

➤ Remove the retaining bolt.



5. Release the knock sensor (KS) harness from the valve cover.

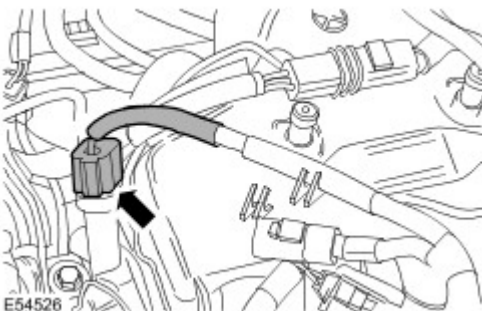
6. Disconnect the KS electrical connector.



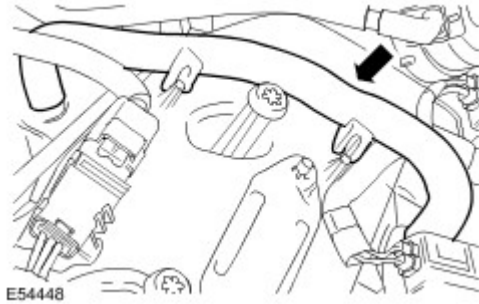
7. Release the glow plug harness from the valve cover.



8. Disconnect the engine oil pressure (EOP) sensor electrical connector.




9. Disconnect the valve cover breather hose.



10. Remove the fuel injector. For additional information, refer to [Fuel Injector \(19.60.10\)](#) (Section 303-04)
11. Remove the 2 remaining fuel injectors.
12. Release the high-pressure fuel supply line.

▶ Remove the retaining bolt.

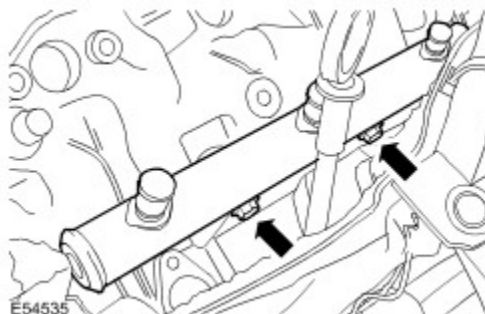
13.  **CAUTION:** Make sure that the high-pressure fuel supply line remains in contact with the fuel injection supply manifold and the fuel injection diverter rail until both unions have been detached and cleaned. Failure to follow this instruction may result in foreign matter ingress to the fuel injection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

Remove and discard the high-pressure fuel supply line.

▶ Install blanking caps to the exposed ports.



14. Remove the fuel injection supply manifold.
- ▶ Remove the two retaining bolts.

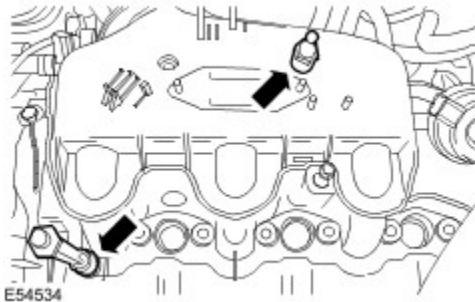


15. Remove the fuel injection supply manifold securing bracket.

- ▶ Release the dipstick tube.
- ▶ Remove the three retaining bolts.

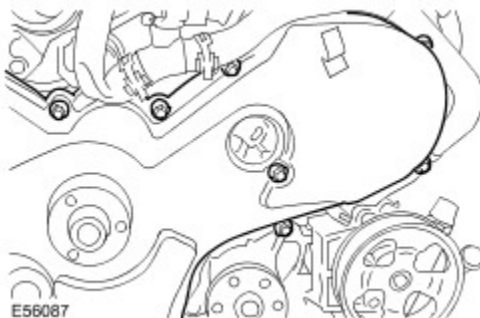


16. Remove the engine cover locating studs.



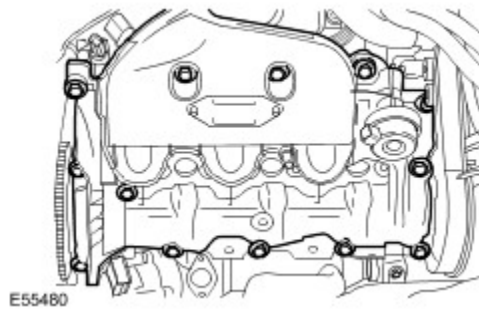
17. Release the timing belt cover.

- ▶ Reposition the timing cover to access the two front valve cover retaining bolts.
- ▶ Fully loosen the seven timing belt cover retaining bolts shown.



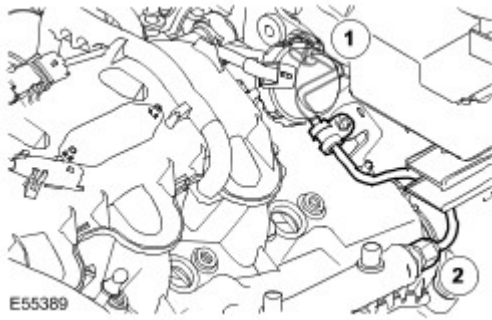
18. Remove the LH valve cover.

- ▶ Loosen the 13 valve cover retaining bolts.



Installation

- 1 . Install the LH valve cover.
 - Tighten the 13 retaining bolts to 10 Nm (7 lb.ft).
- 2 . Attach the timing belt cover.
 - Tighten the seven retaining bolts to 10 Nm (7 lb.ft).
- 3 . Install the engine cover locating studs.
- 4 . Install the fuel injection supply manifold securing bracket.
 - Install the two retaining bolts.
 - Tighten the bolts to 23 Nm (17 lb.ft).
 - Secure the dipstick tube.
- 5 . Install the fuel injection supply manifold.
 - Install the two bolts, but do not fully tighten at this stage.
- 6 . Install a new high-pressure fuel supply line.
 - Remove the blanking caps from the ports.
 - Install the new high-pressure fuel supply line, but do not tighten unions at this stage.
 - Tighten the fuel injection supply manifold retaining bolts to 23 Nm (17 lb.ft).
 - Tighten the fuel injection supply line unions in the sequence shown in four stages:
 - Stage 1: Tighten the high-pressure fuel supply line union at the fuel injection diverter rail 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 fuel injection diverter rail 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).



- 7 . Secure the high-pressure fuel supply line.
 ▶ Tighten the retaining bolt to 10 Nm (7 lb.ft).
- 8 . Install the fuel injector. For additional information, refer to [Fuel Injector \(19.60.10\)](#) (Section 303-04)
- 9 . Install the 2 remaining fuel injectors.
- 10 . Connect the valve cover breather hose.
- 11 . Connect the EOP sensor electrical connector.
- 12 . Connect the KS electrical connector.
- 13 . Attach the glow plug harness and KS harness to the valve cover.
- 14 . Install the accessory drive belt idler pulley.
 ▶ Install the retaining bolt and tighten to 47 Nm (35 lb.ft).
- 15 . Install the accessory drive belt. For additional information, refer to [Accessory Drive Belt \(86.10.03\)](#) (Section 303-05)
- 16 . Install the intake air shutoff throttle. For additional information, refer to [Intake Air Shutoff Throttle \(19.70.32\)](#) (Section 303-04)
- 17 . Connect the battery ground cable. For additional information, refer to [Specifications](#) (Section 414-00)