

## High Pressure Fuel Pump Removal and Installation

### Removal

1. Fuel Pressure - Relieve

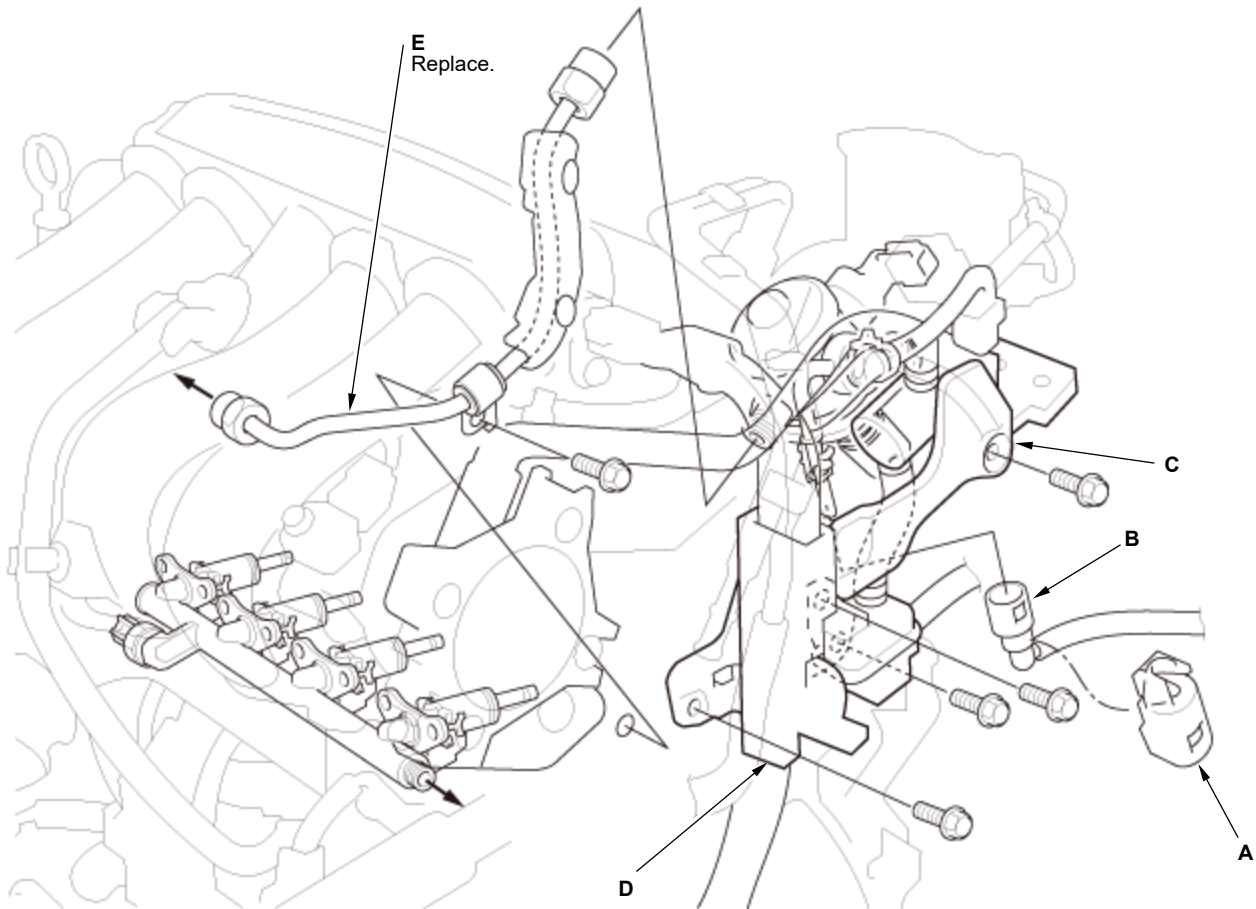
2. Throttle Body - Remove

3. High Pressure Fuel Pump Cover - Remove



4. Fuel Joint Pipe - Remove

1. Remove the quick-connect fitting cover (A).



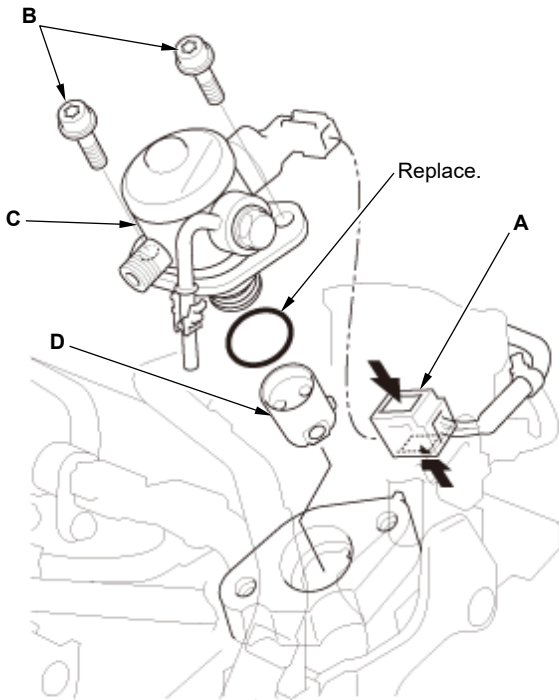
2. [Disconnect the quick-connect fitting](#) (B).

3. Remove the fuel joint pipe bracket (C).

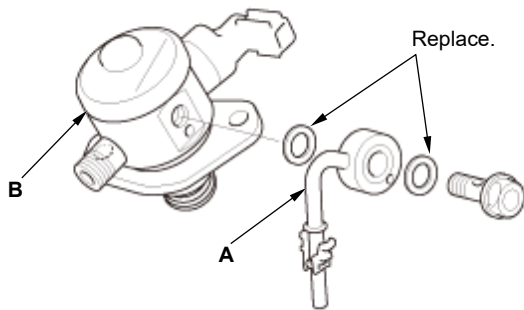
4. Move the harness holder (D), and remove the fuel joint pipe (E).

#### 5. High Pressure Fuel Pump - Remove

1. Disconnect the connector (A).
2. Loosen the bolts (B) alternately, then remove the high pressure fuel pump (C) and the roller (D).

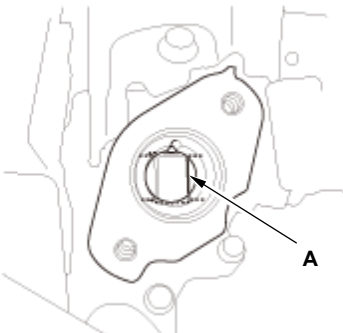


3. Remove the fuel feed pipe (A) from the high pressure fuel pump (B).

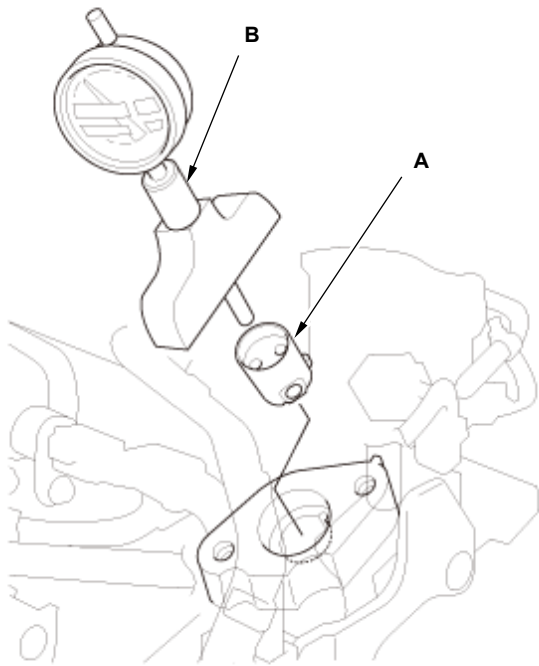


#### 6. High Pressure Fuel Pump Cam - Check

1. Rotate the crankshaft and check the high pressure fuel pump cam (A) for pits, scores, and excessive wear. If needed, [replace the exhaust camshaft](#).







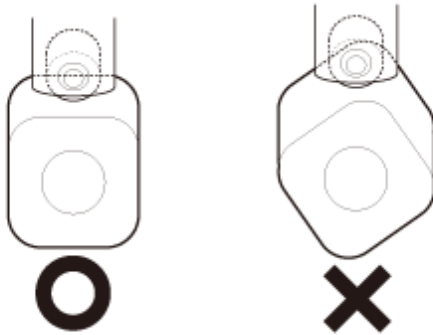
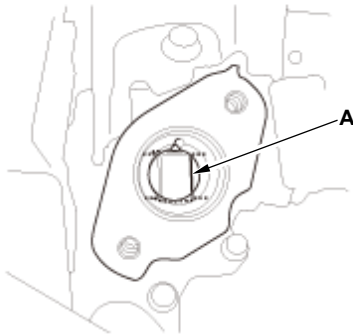
2. Install the roller (A) to the high pressure fuel pump cam.
3. Set the gauge (B) on the roller and hold it.
4. Rotate the crankshaft to 720° and measure the four cam lobes height. If the cam lobes are excessively worn, [replace the exhaust camshaft](#).

NOTE: The high pressure fuel pump cam has four cam lobes.

**Cam Lobe Height Standard (New): 0.118 in (3.0 mm)**

## Installation

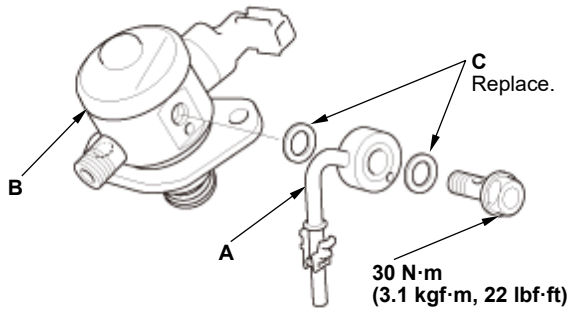
### 1. Camshaft Timing - Set



1. Check the position of the cam (A) that drives high pressure fuel pump as shown. If the position angle is wrong as shown, rotate the crankshaft to set it.

### 2. High Pressure Fuel Pump - Install

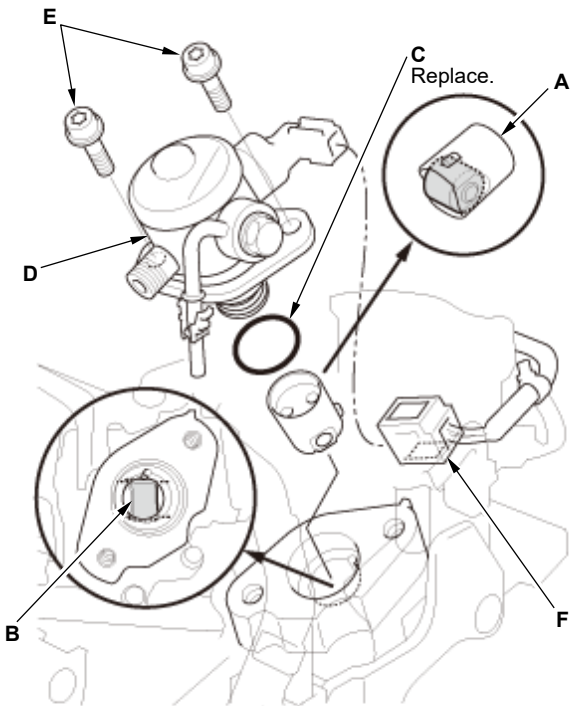
1. Install the fuel feed pipe (A) to the high pressure fuel pump (B) with new washers (C).



2. Coat the roller (A), the cam (B), a new O-ring (C), and around the bore of the roller insert with clean engine oil.
3. Install the roller and the high pressure fuel pump (D) with the O-ring. Temporarily tighten the bolts (E) in an alternate pattern until the high pressure fuel pump is in contact with the cylinder head.

NOTE: To prevent the O-ring from damaging, do not use any power tools (pneumatic or electric).

4. Connect the connector (F).

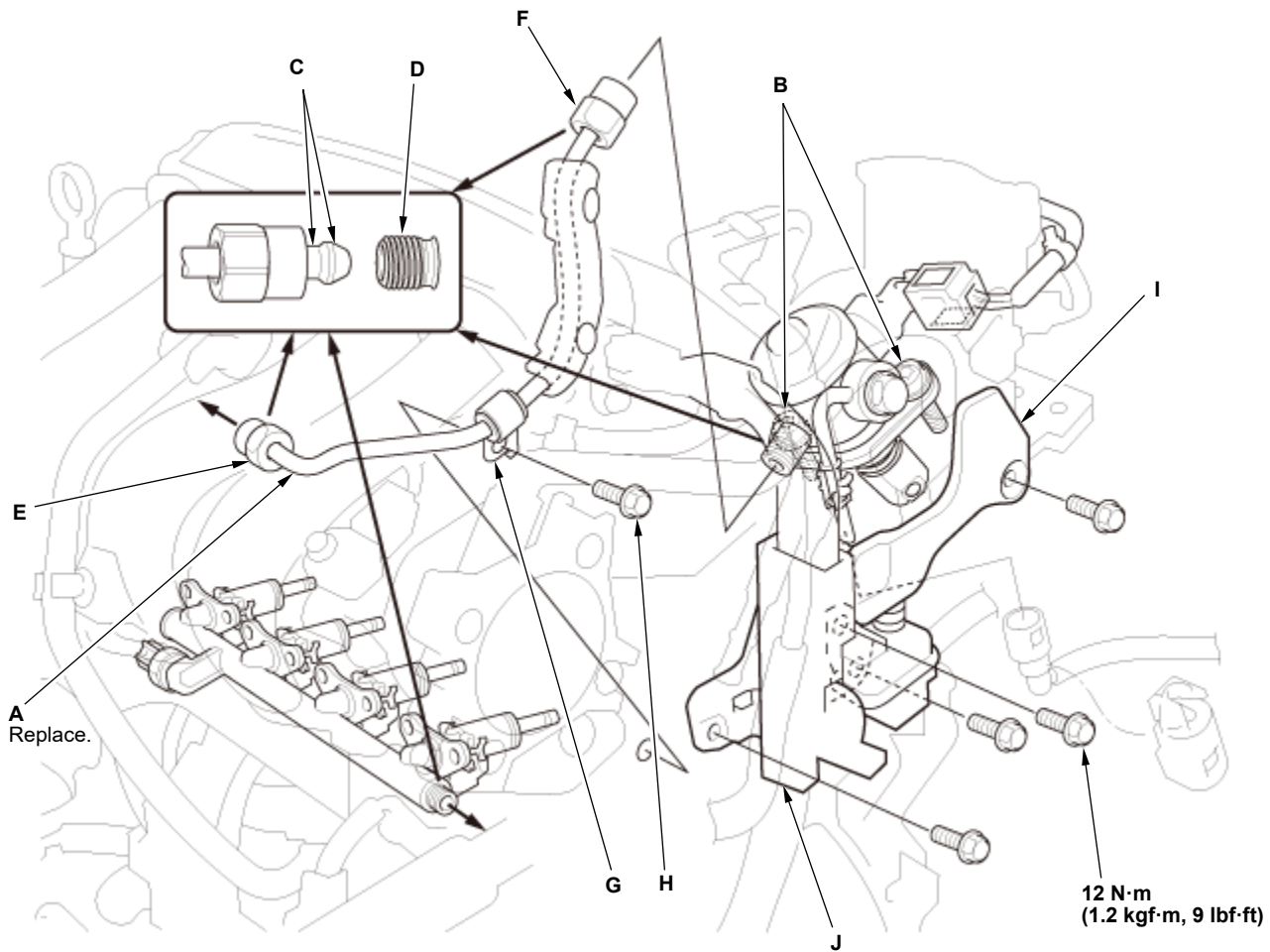


### 3. Fuel Joint Pipe - Install

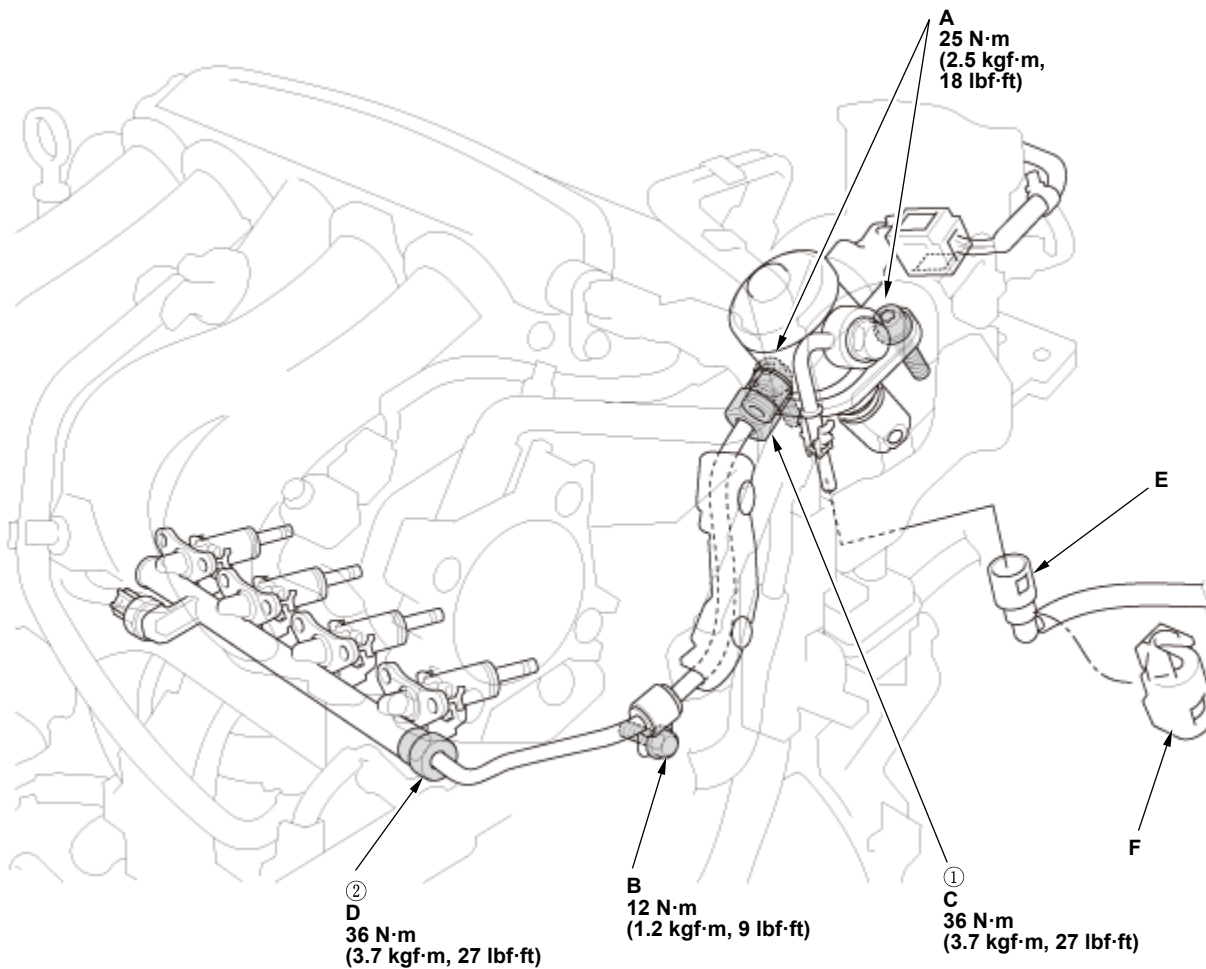
NOTE: Before you install the fuel joint pipe (A), loosen the high pressure fuel pump mounting bolts (B).

1. Lubricate the top of the new fuel joint pipe (C) and the threaded area (D) of the fuel rail and the high pressure fuel pump with polyethylene glycol in a new fuel joint pipe kit.

NOTE: Do not reuse the fuel joint pipe.



2. Tighten the fuel joint pipe nut (E) by hand until the end of the joint pipe is seated on the fuel rail.
  3. Tighten the fuel joint pipe nut (F) by hand until the end of the joint pipe is seated on the high pressure fuel pump.
  4. Set the fuel joint pipe bracket (G) to the cylinder head, and loosely install the bolt (H).
  5. Install the fuel joint pipe bracket (I), and harness holder (J).
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6. Tighten the high pressure fuel pump mounting bolts (A) loosely in an alternate pattern until the high pressure fuel pump and the cylinder head sitting surfaces are contacted.



7. Tighten the high pressure fuel pump mounting bolts to the specified torque.
8. Tighten the fuel joint pipe bracket mounting bolt (B) to the specified torque.
9. Tighten the high pressure fuel pump side of the fuel joint pipe nut (C) and the fuel rail side of the fuel joint pipe nut (D) to the specified torque in the numbered sequence shown.

NOTE: A crowfoot-type special tool increases the torque applied by the torque wrench. [Refer to Torque Specifications for details on how to recalculate the torque wrench setting.](#)

10. [Connect the quick-connect fitting](#) (E) and install the quick-connect fitting cover (F).

#### 4. Fuel Leak (Low Pressure Side) - Check

1. Turn the vehicle to the ON mode, but do not start the engine. After the fuel pump runs for about 2 seconds, the fuel line will be pressurized. Repeat this two or three times, then check for fuel leakage.

#### 5. Fuel Leak (High Pressure Side) - Check

## 6. High Pressure Fuel Pump Cover - Install



## 7. Throttle Body - Install