

Removal

1. Fuel Pressure - Relieve

[Relieve the fuel pressure.](#)

2. High Pressure Fuel Pump - Remove

[Remove the high pressure fuel pump.](#)

3. Cylinder Head Cover - Remove

[Remove the cylinder head cover.](#)

4. CMP Sensor A - Remove

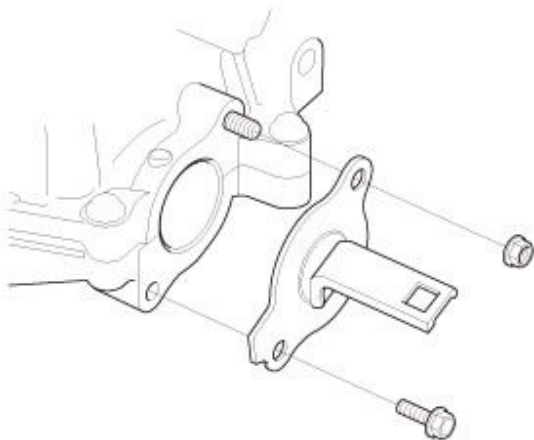
[Remove CMP sensor A.](#)

5. CMP Sensor B Connector - Disconnect

[Disconnect the CMP sensor B connector.](#)

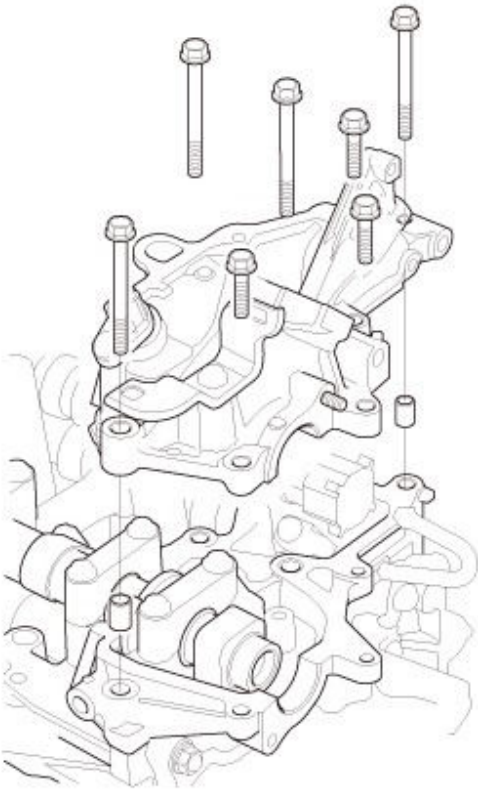
6. Camshaft Holder Cover - Remove

Remove the camshaft holder cover.

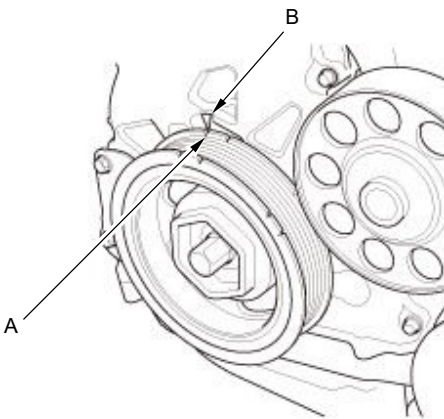


7. High Pressure Fuel Pump Base - Remove

Remove the high pressure fuel pump base.

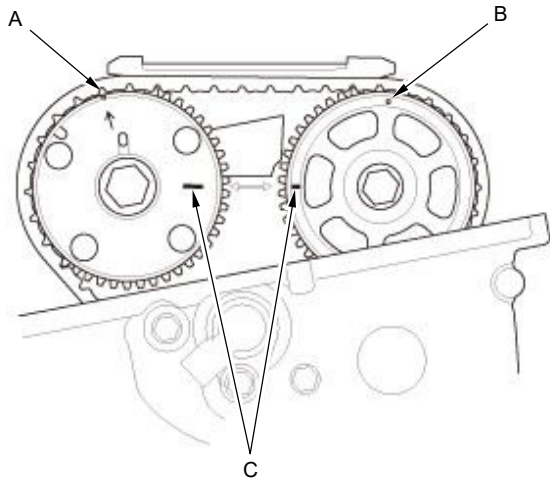


8. No. 1 Piston at Top Dead Center - Set (Crank Side)



Turn the crankshaft so its white mark (A) lines up with the pointer (B).

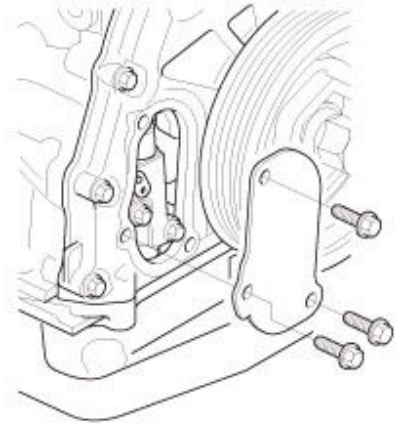
9. No. 1 Piston at Top Dead Center - Set (Cam Side)



Set the No. 1 piston at top dead center (TDC). The punch mark (A) on the VTC actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and the exhaust camshaft sprocket.

10. Chain Case Cover - Remove

Remove the chain case cover.

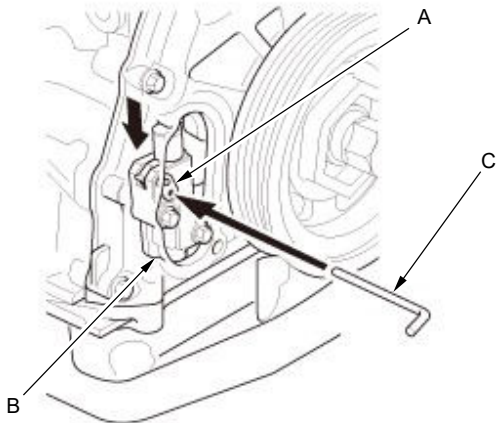


11. Cam Chain Auto-Tensioner - Lock

1. Rotate the crankshaft counterclockwise to align the holes on the lock (A) and the cam chain auto-tensioner (B), then insert a 1.2 mm (3/64 in) diameter pin (C) into the holes.

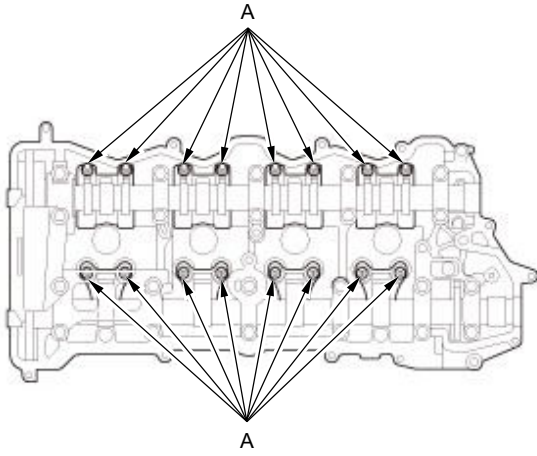
NOTE: If the holes in the lock and the cam chain auto-tensioner do not align, continue to rotating the crankshaft counterclockwise until the holes align, then install the pin.

2. Turn the crankshaft clockwise to secure the pin and the TDC on the No. 1 cylinder.

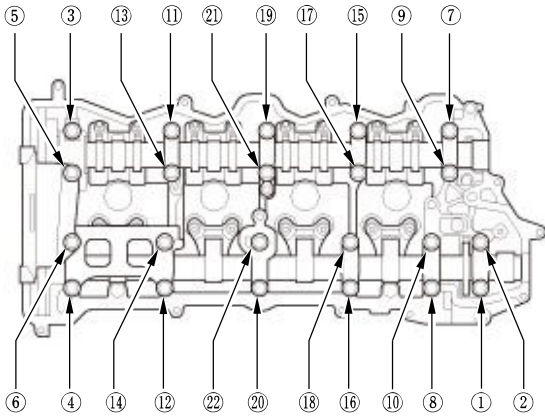


12. Camshaft Holder - Remove

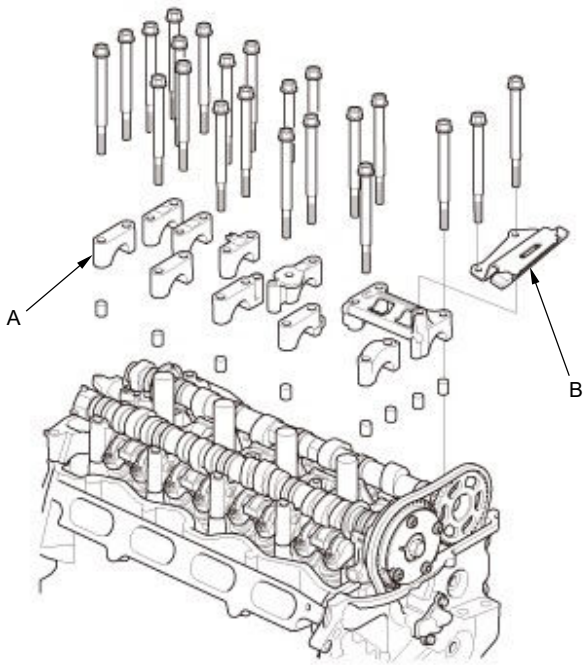
1. Loosen the rocker arm and the adjusting screws (A).



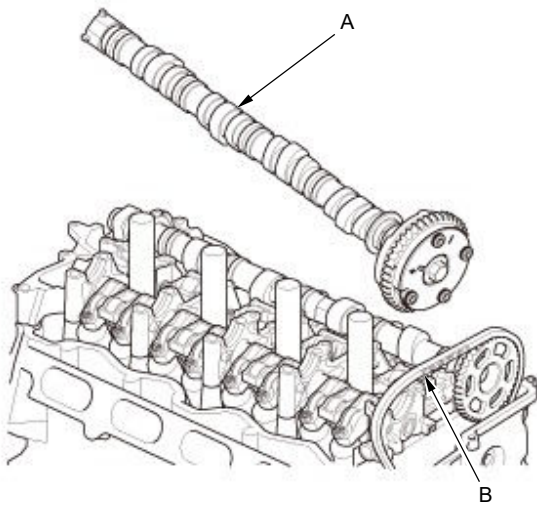
2. Remove the camshaft holder bolts. To prevent damaging the camshafts, loosen the bolts, in sequence, two turns at a time.



3. Remove cam chain guide B and the camshaft holders (A).



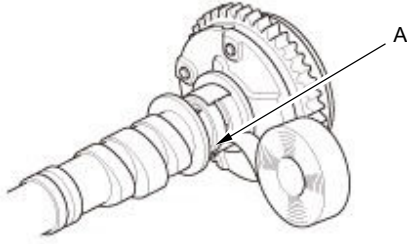
13. Camshaft - Remove



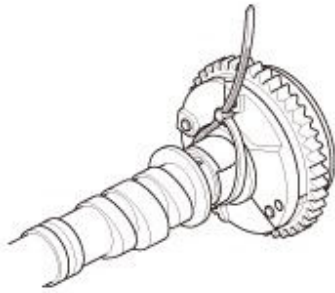
1. Carefully tip up the intake camshaft on the transmission side of the engine until there is enough slack in the chain to lift the chain off of the VTC actuator's teeth.
2. Remove the intake camshaft (A) while keeping some tension on the cam chain.
3. Secure the cam chain (B) to the A/C compressor suction hose with a wire tie to prevent the chain from falling down into the chain case.

14. VTC Actuator Lock Pin - Release

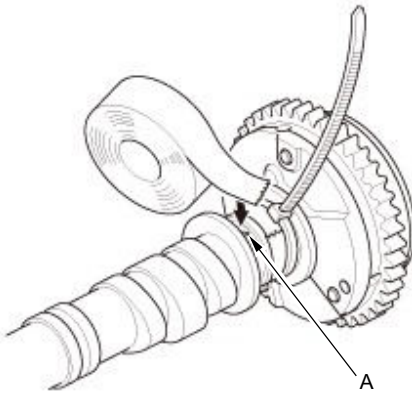
1. Check that the VTC actuator is locked by turning the VTC actuator counterclockwise. If it is not locked, turn the VTC actuator clockwise until it stops, then recheck it. If it is still not locked, replace the VTC actuator.



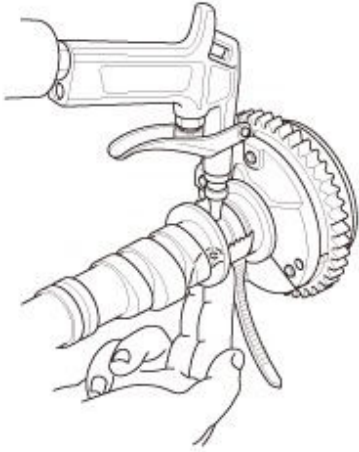
2. Seal the retard holes (A) in the No. 1 camshaft journal with tape and a wire tie.



3. Seal one of the advance holes (A) with tape.

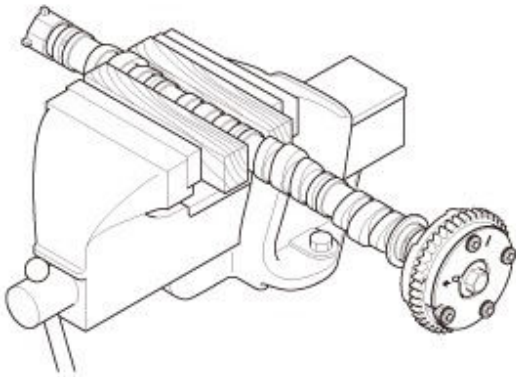


4. Apply air to the unsealed advance hole to release the lock.



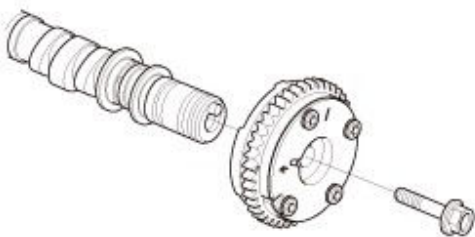
15. VTC Actuator - Remove

1. Secure the intake camshaft in a vise with wood blocks, then loosen the VTC actuator mounting bolt.



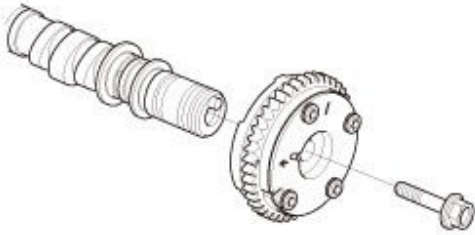
NOTE: After this procedure, remove wood chips that may be stuck to the intake camshaft.

2. Remove the VTC actuator.



Installation

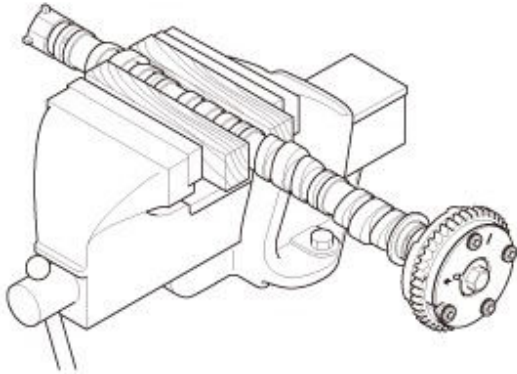
1. VTC Actuator - Install



1. Install the VTC actuator.

NOTE: Install the VTC actuator while in the unlocked position.

2. Apply new engine oil to the threads of the VTC actuator mounting bolts, then loosely install them.



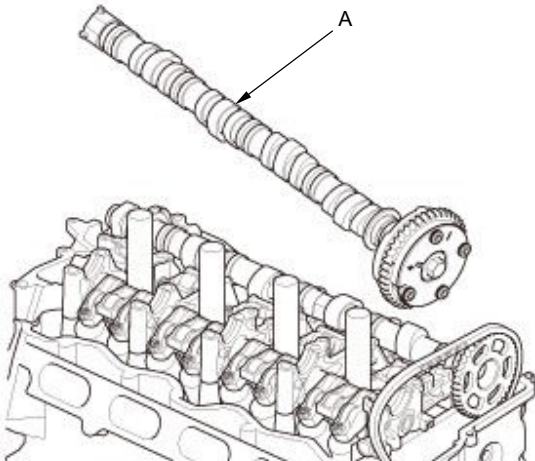
3. Secure the intake camshaft in a vise with wood blocks, then tighten the VTC actuator mounting bolt.

NOTE: After this procedure, remove wood chips that may be stuck to the intake camshaft.

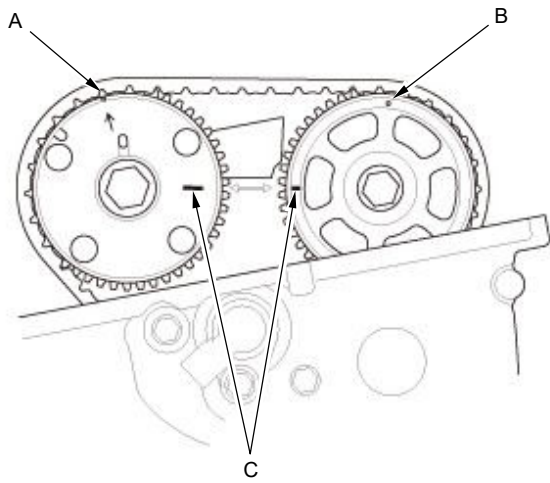
Specified Torque:
115 N·m (11.7 kgf·m, 85 lbf·ft)

4. Turn the VTC actuator clockwise until you hear it click. Make sure to lock the VTC actuator by turning it.

2. Camshaft - Install

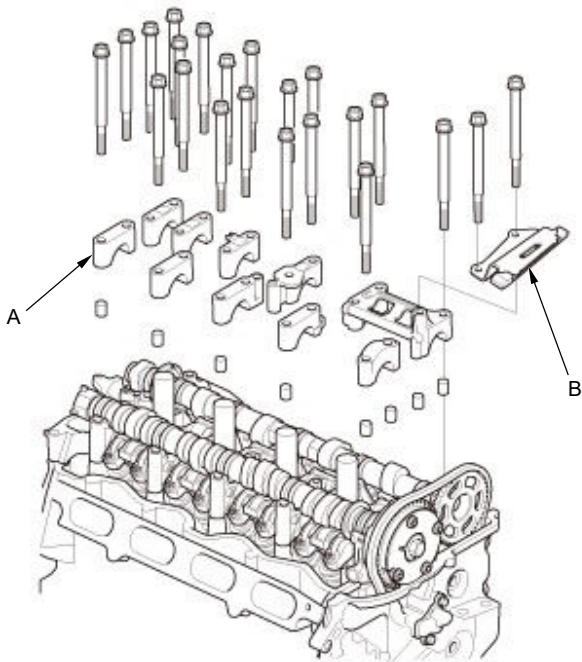


1. Remove the wire tie while keeping light tension on the cam chain.
2. Slide the intake camshaft (A) in at an angle to allow the cam chain to slip over the VTC actuator's teeth.

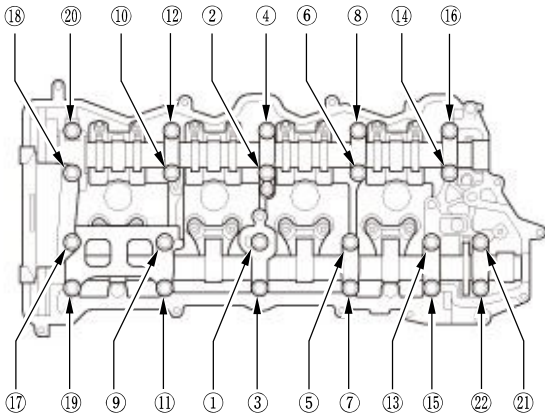


3. Set the No. 1 piston at top dead center (TDC). The punch mark (A) on the VTC actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and the exhaust camshaft sprocket.
4. Apply new engine oil to the camshaft journals and lobes on both cams.

3. Camshaft Holder - Install



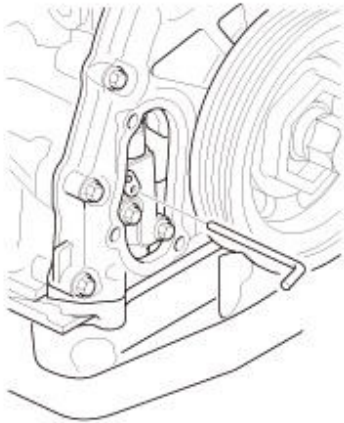
1. Apply new engine oil to the threads of the camshaft holder bolts.
2. Set the camshaft holders (A) and cam chain guide B in place.



3. Tighten the bolts to the specified torque.

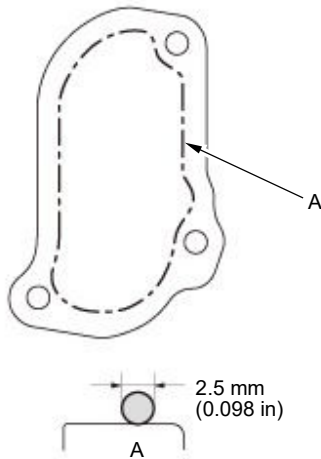
Specified Torque:
13 N·m (1.3 kgf·m, 10 lbf·ft)

4. Cam Chain Auto-Tensioner - Unlock



Remove the pin from the cam chain auto-tensioner.

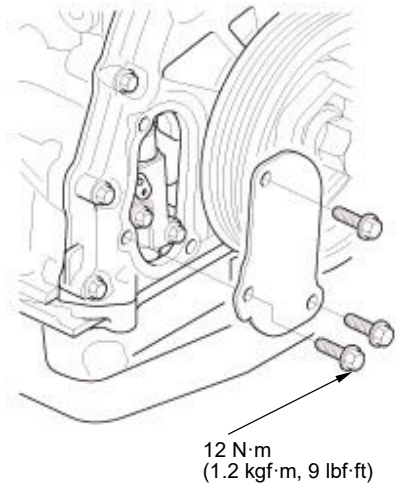
5. Chain Case Cover - Install



1. Remove all of the old liquid gasket from the chain case cover mating surfaces, the bolts, and the bolt holes.
2. Clean and dry the chain case cover mating surfaces.
3. Apply liquid gasket (P/N 08717-0004, 08718-0003, or 08718-0009) to the chain case mating surface of the chain case cover and to the inside edge of the threaded bolt holes. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- Apply a 2.5 mm (0.098 in) diameter bead of liquid gasket along the broken line (A).
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.



4. Install the chain case cover.

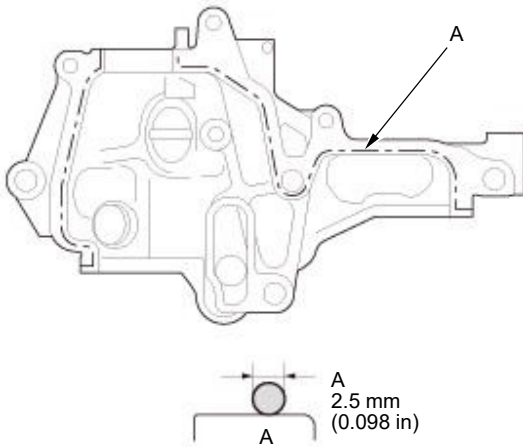
NOTE:

- Wait at least 30 minutes before filling the engine with oil.
- Do not run the engine for at least 3 hours after installing the chain case cover.

6. Valve Clearance - Adjust

[Adjust the valve clearance.](#)

7. High Pressure Fuel Pump Base - Install

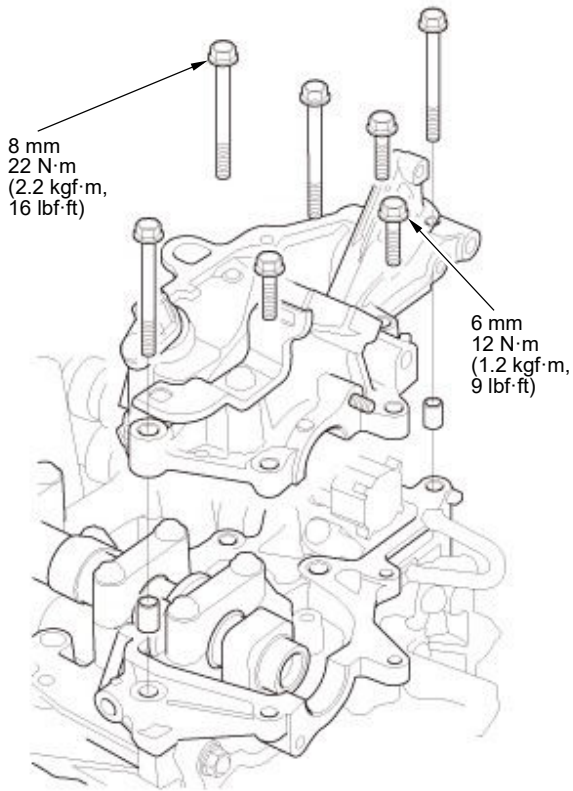


1. Remove all of the old liquid gasket from the high pressure fuel pump base mating surfaces, the bolts, and the bolt holes.
2. Clean and dry the high pressure fuel pump base mating surfaces.
3. Apply liquid gasket (P/N 08717-0004, 08718-0003, or 08718-0009) to the cylinder head mating surface of the high pressure fuel pump base and to the inside edge of the threaded bolt holes. Install the component within 5 minutes of applying the liquid gasket.

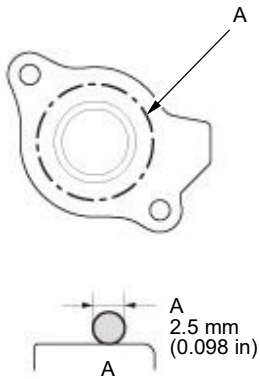
NOTE:

- Apply a 2.5 mm (0.098 in) diameter bead of liquid gasket along the broken line (A).
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

4. Install the high pressure fuel pump base.



8. Camshaft Holder Cover - Install

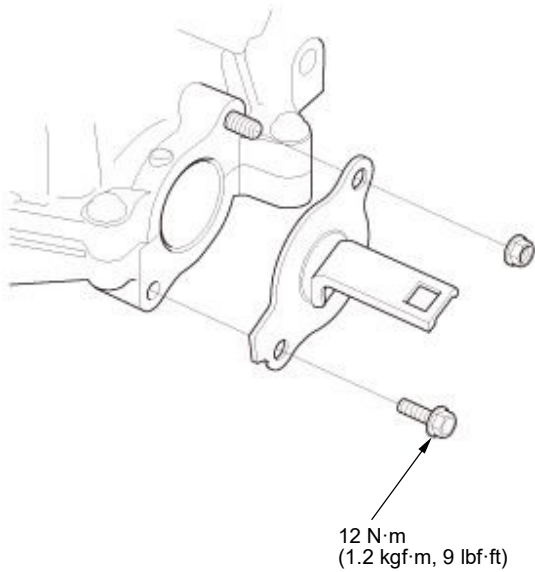


1. Remove all of the old liquid gasket from the camshaft holder cover mating surfaces, the bolts, and the bolt holes.
2. Clean and dry the camshaft holder cover mating surfaces.
3. Apply liquid gasket (P/N 08717-0004, 08718-0003, or 08718-0009) to the cylinder head mating surface of the camshaft holder cover and to the inside edge of the threaded bolt holes. Install the component within 4 minutes of applying the liquid gasket.

NOTE:

- Apply a 2.5 mm (0.098 in) diameter bead of liquid gasket along the broken line (A).
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

4. Install the camshaft holder cover.



9. CMP Sensor B Connector - Connect

[Connect the CMP sensor B connector.](#)

10. CMP Sensor A - Install

[Install CMP sensor A.](#)

11. High Pressure Fuel Pump - Install

[Install the high pressure fuel pump.](#)

12. Cylinder Head Cover - Install

[Install the cylinder head cover.](#)

13. Fuel Leak (Low Pressure) - Check

Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel rail will be pressurized. Repeat this two or three times, then check for fuel leakage.

14. Fuel Leak (High Pressure) - Check

[Do the fuel line inspection, and check the fuel leakage at the high pressure fuel line.](#)