

Engine Mechanical

Engine Lubrication

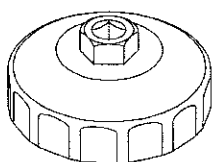
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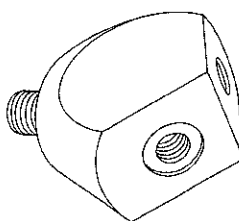
Engine Lubrication

Special Tools

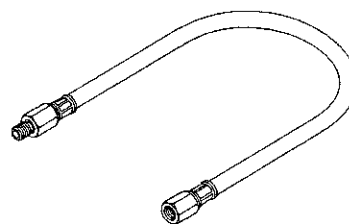
Ref. No.	Tool Number	Description	Qty
①	07AAA-PLCA100	Oil Filter Wrench	1
②	07NAJ-P07010A	Pressure Gauge Adapter	1
③	07ZAJ-S5AA200	Oil Pressure Hose	1
④-1	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	1
④-2	07MAJ-PY40120	A/T Pressure Hose, Adapter	1
④-3	07406-0020201	A/T Pressure Hose	1
④-4	07406-0070301	A/T Low Pressure Gauge W/Panel	1
⑤	070AD-RCAA100	Oil Seal Driver, 64 mm	1



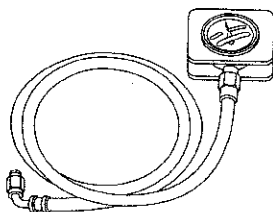
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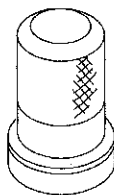
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③



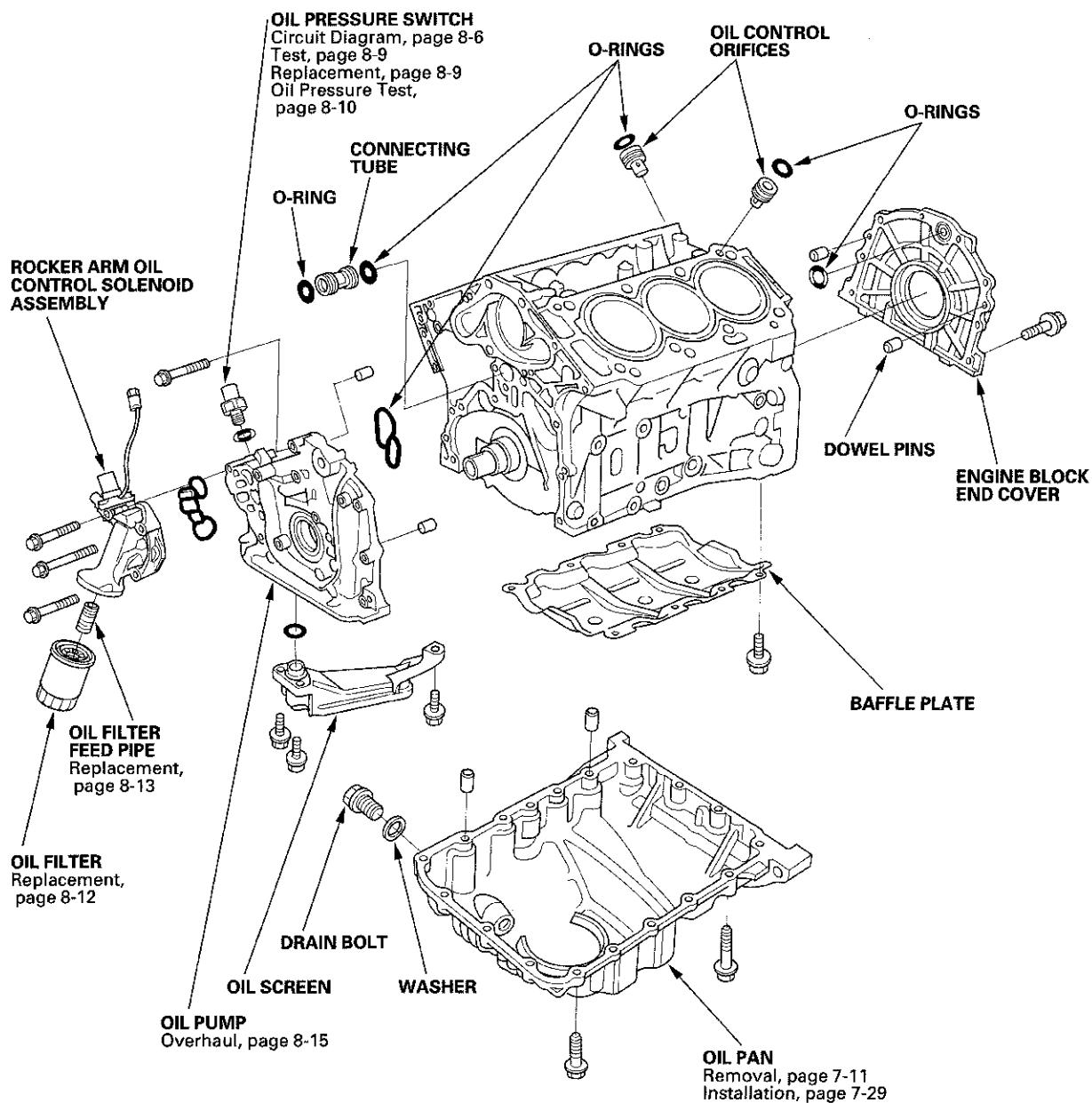
④-1, ④-2, ④-3, ④-4



⑤



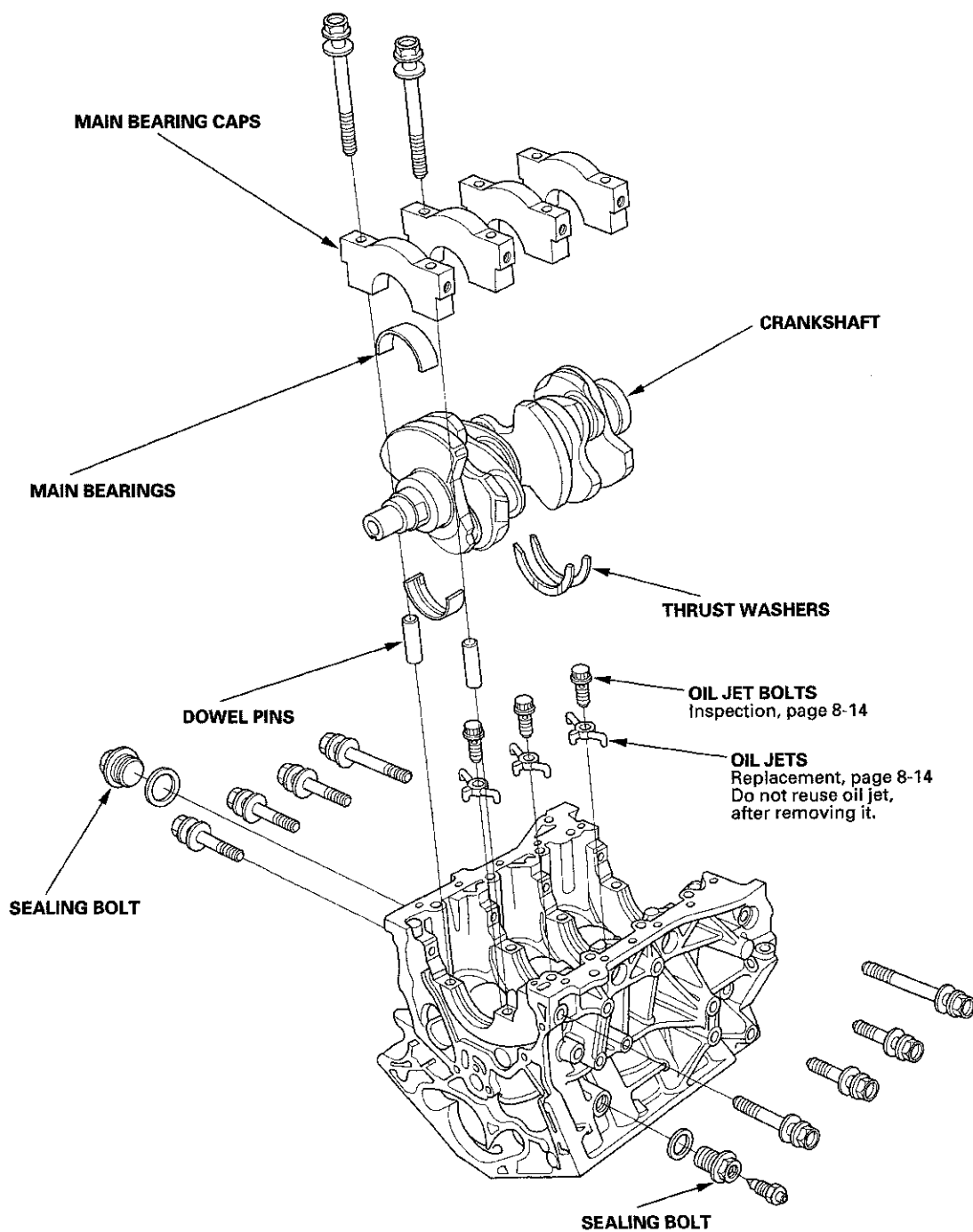
Component Location Index



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Engine Lubrication

Component Location Index (cont'd)



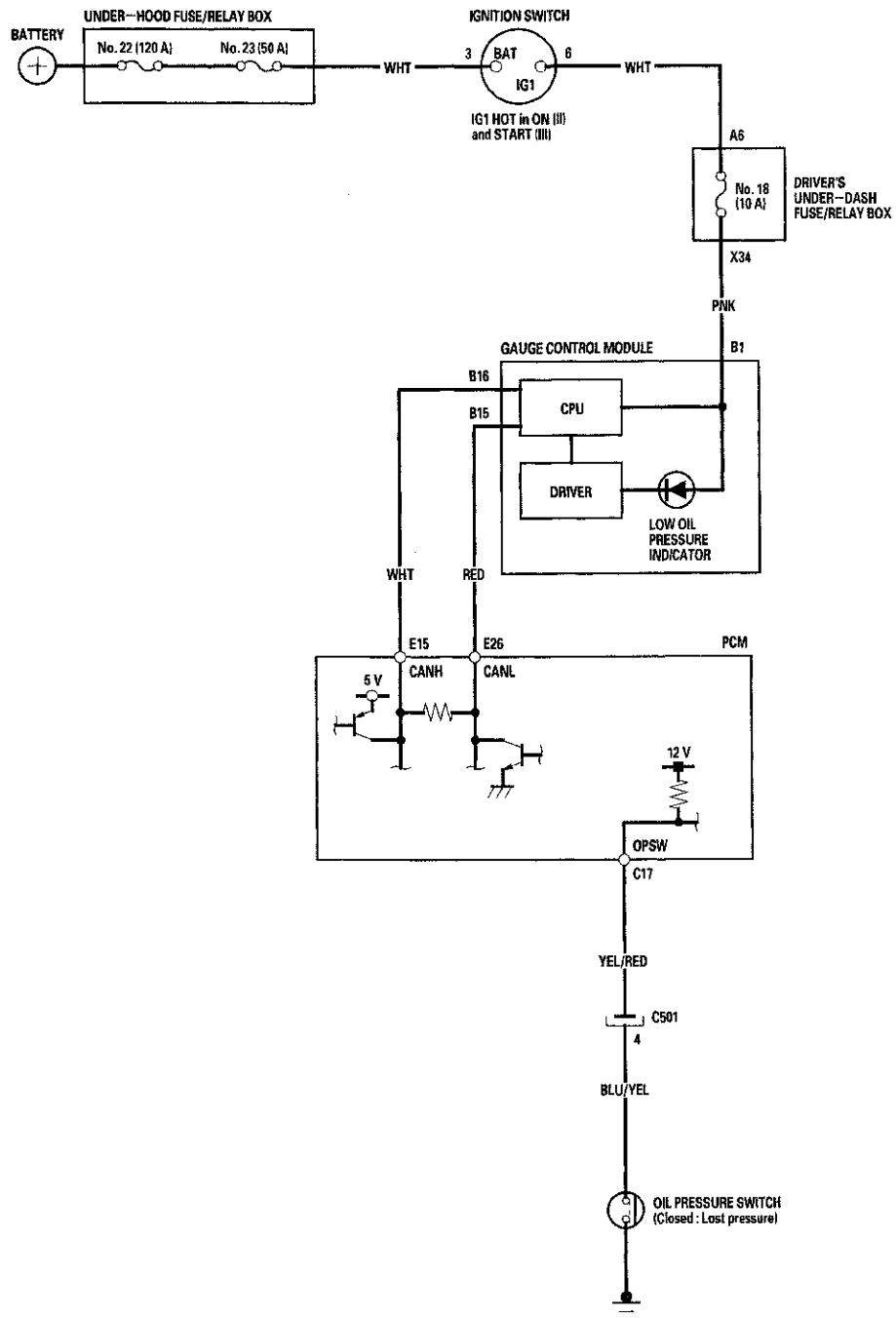


Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Excessive engine oil consumption	1. Verify the engine oil filler cap, the oil drain bolt, and the oil filter are tight. 2. Check for oil leaks. 3. Check for worn valve guide(s) (see page 6-49) or worn valve stem seal(s) (see page 6-48). 4. Check for damaged or worn piston ring(s) (see page 7-21). 5. Check for damaged or worn engine internal parts (cylinder wall, pistons, etc.) (see page 7-15).	
Low oil pressure indicator does not come on with the ignition switch in ON (II)	1. Do the low oil pressure indicator circuit troubleshooting procedure (Open) (see page 8-7). 2. Test the oil pressure switch (see page 8-9).	An open in the wire between the powertrain control module (PCM) and the oil pressure switch
Low oil pressure indicator stays on	1. Check the engine oil level. 2. Do the low oil pressure indicator circuit troubleshooting procedure (Short) (see page 8-8). 3. Test the oil pressure switch (see page 8-9). 4. Check the engine oil pressure (see page 8-10). 5. Check the oil filter for clogging. 6. Check the oil screen for clogging. 7. Check the relief valve (see page 8-15). 8. Test the oil pump (see page 8-17).	A wire shorted to ground between the powertrain control module (PCM) and the oil pressure switch

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Low Oil Pressure Indicator Circuit Diagram



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Low Oil Pressure Indicator Circuit Troubleshooting (Open)

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3).
2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the powertrain control module (PCM). If it doesn't, troubleshoot the DLC circuit (see page 11-211).
4. Check for DTCs (see page 11-3). If a DTC is present, diagnose and repair the cause before continuing with this test.
5. With the ignition switch in ON (II), select PGM-FI, and check the OIL PRESSURE SWITCH in the DATA LIST with the HDS.

Is ON indicated?

YES—Replace the gauge control module (see page 22-419). ■

NO—Go to step 6.

6. Check the oil pressure switch (see page 8-9).

Is the oil pressure switch OK?

YES—Go to step 7.

NO—Replace the oil pressure switch (see page 8-9). ■

7. With the ignition switch in ON (II), jump the SCS line with the HDS, then turn the ignition switch to LOCK (0).

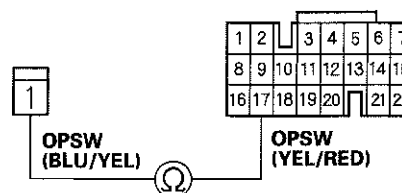
NOTE: This step must be done to protect the PCM from damage.

8. Disconnect PCM connector C (22P) and the oil pressure switch connector.

9. Check for continuity between PCM connector terminal C17 and the oil pressure switch connector.

OIL PRESSURE SWITCH CONNECTOR

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software (see page 11-230), or substitute a known-good PCM (see page 11-7), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-232). ■

NO—Repair an open in the wire between the oil pressure switch and the PCM. ■

Engine Lubrication

Low Oil Pressure Indicator Circuit Troubleshooting (Short)

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3).
2. Turn the ignition switch to ON (II).
3. Make sure the HDS communicates with the vehicle and the powertrain control module (PCM). If it doesn't, troubleshoot the DLC circuit (see page 11-211).
4. Check for DTCs (see page 11-3). If a DTC is present, diagnose and repair the cause before continuing with this test.
5. Start the engine, select PGM-FI, and check the OIL PRESSURE SWITCH in the DATA LIST with the HDS.

Is OFF indicated?

YES—Replace the gauge control module (see page 22-419). ■

NO—Go to step 6.

6. Turn the ignition switch to LOCK (0).
7. Disconnect the oil pressure switch connector.
8. Start the engine and check the OIL PRESSURE SWITCH in the DATA LIST with the HDS.

Is OFF indicated?

YES—Go to step 9.

NO—Go to step 10.

9. Check the oil pressure switch (see page 8-9).

Is the oil pressure switch OK?

YES—Do the oil pressure test (see page 8-10).

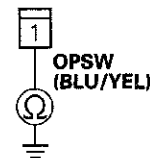
NO—Replace the oil pressure switch (see page 8-9). ■

10. Turn the ignition switch to ON (II), and jump the SCS line with the HDS, then turn the ignition switch to LOCK (0).

NOTE: This step must be done to protect the PCM from damage.

11. Disconnect PCM connector C (22P) and the oil pressure switch connector.
12. Check for continuity between the oil pressure switch connector and body ground.

OIL PRESSURE SWITCH CONNECTOR



Terminal side of female terminal

Is there continuity?

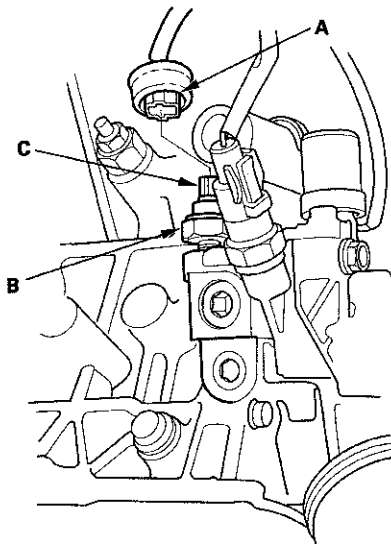
YES—Repair a short in the wire between the oil pressure switch and the PCM. ■

NO—Update the PCM if it does not have the latest software (see page 11-230) or substitute a known-good PCM (see page 11-7), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM (see page 11-232). ■



Oil Pressure Switch Test

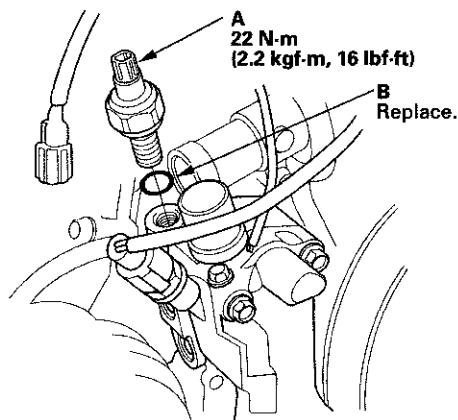
1. Disconnect the oil pressure switch connector (A) from the engine oil pressure switch (B).



2. Check for continuity between the positive terminal (C) and the engine (ground). There should be no continuity with the engine stopped. There should be continuity with the engine running.

Oil Pressure Switch Replacement

1. Disconnect the oil pressure switch connector, then remove the oil pressure switch (A).



2. Remove all of the old liquid gasket from the switch and the switch mounting hole.
3. Apply a very small amount of liquid gasket to the oil pressure switch threads, then install the oil pressure switch with a new O-ring (B).

NOTE: Using too much liquid gasket may cause liquid gasket to enter the oil passage or the end of the new oil pressure switch.

4. Connect the oil pressure switch connector.

Engine Lubrication

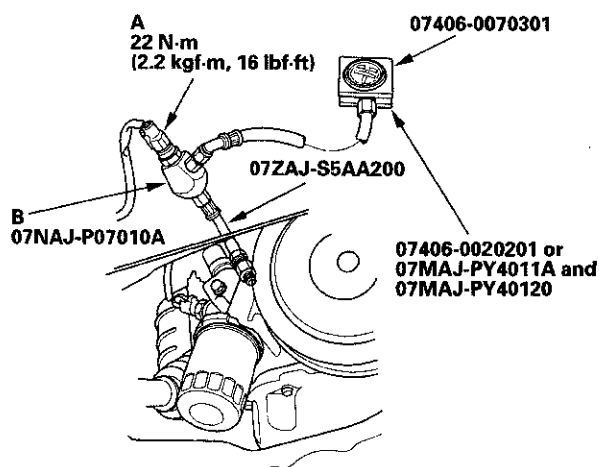
Oil Pressure Test

Special Tools Required

- Pressure gauge adapter 07NAJ-P07010A
- Oil pressure hose 07ZAJ-S5AA200
- A/T pressure hose 07406-0020201
- A/T low pressure gauge w/panel 07406-0070301
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

If the low oil pressure indicator stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Remove the oil pressure switch (A).



2. Install the oil pressure hose, the A/T pressure hose, the A/T low pressure gauge w/panel, the A/T pressure hose, 2,210 mm and the A/T pressure hose adapter.
3. Install the oil pressure switch in the pressure gauge adapter (B).

4. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
5. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

Engine Oil Temperature: 176 °F (80 °C)

Engine Oil Pressure:

At idle: 70 kPa (0.7 kgf/cm², 10 psi) min.

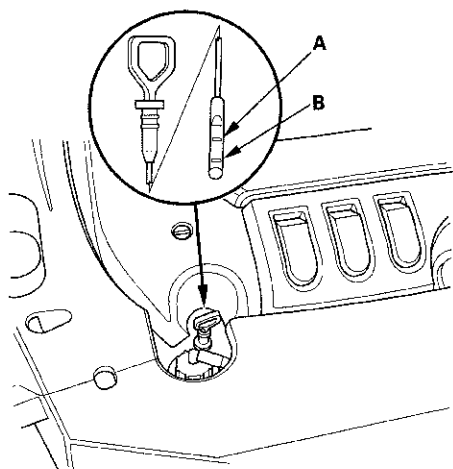
At 3,000 rpm: 490 kPa (5.0 kgf/cm², 71 psi) min.

6. If oil pressure is not within specifications, inspect these items:
 - Inspect the oil pressure relief valve (see page 8-15).
 - Check the oil screen for clogging.
 - Inspect the oil pump (see page 8-17).



Engine Oil Level Check

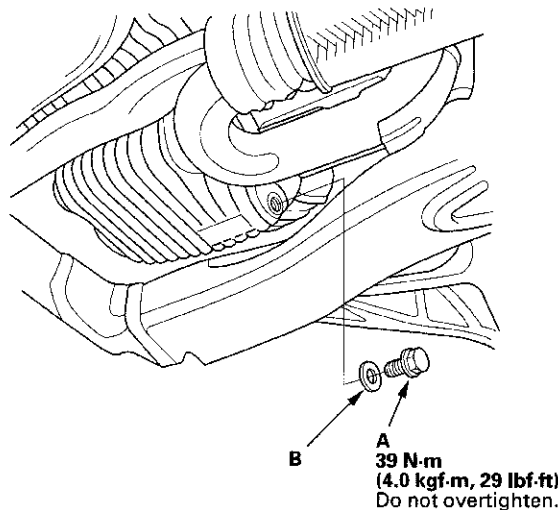
1. Park the vehicle on level ground, and start the engine. Hold the engine speed at 3,000 rpm with no load (in Neutral) until the radiator fan comes on, then turn off the engine, and wait a few minute.
2. Remove the dipstick, and wipe off the dipstick, then reinstall the dipstick.
3. Remove the dipstick, and check the engine oil level. It should be between the upper mark (A) and lower mark (B).



4. If the engine oil level is near or below the lower mark, add the recommended engine oil (see page 3-2) to bring it between the upper and lower marks.

Engine Oil Replacement

1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



3. Reinstall the drain bolt with a new washer (B).
4. Refill with the recommended oil (see page 3-2).

Capacity

At Oil Change:

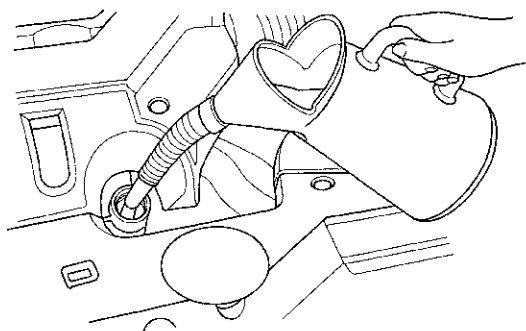
4.0 L (4.2 US qt)

At Oil Change Including Filter:

4.3 L (4.5 US qt)

After Engine Overhaul:

5.0 L (5.3 US qt)



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Engine Lubrication

Engine Oil Replacement (cont'd)

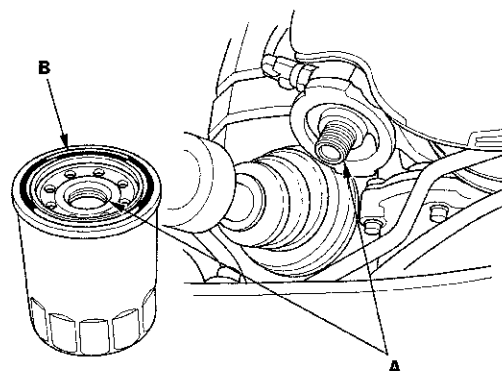
5. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3).
6. Turn the ignition switch to ON (II).
7. Select the BODY ELECTRICAL with the HDS.
8. Select the ADJUSTMENT in GAUGE MENU with the HDS.
9. Select the RESET in the MAINTENANCE MINDER with the HDS.
10. Select the RESET THE ENGINE OIL LIFE with the HDS.
11. Run the engine for more than 3 minutes, then check the oil level and check for oil leakage.

Engine Oil Filter Replacement

Special Tools Required

Oil filter wrench 07AAA-PLCA100

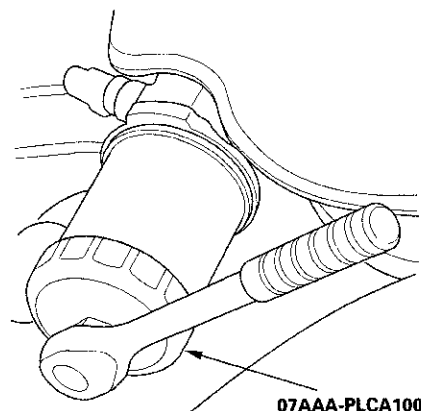
1. Drain the engine oil (see page 8-11).
2. Remove the oil filter with the oil filter wrench.
3. Inspect the filter to make sure the rubber seal is not stuck to the oil filter seating surface of the engine.
4. Inspect the threads (A) and the rubber seal (B) on the new filter. Clean the seat on the engine block, then apply a light coat of new engine oil to the filter rubber seal. Use only filters with a built-in bypass system.



5. Install the oil filter by hand.
6. After the rubber seal seats, tighten the oil filter clockwise with the oil filter wrench.

Tighten: 3/4 Turn Clockwise

Tightening Torque: 12 N·m (1.2 kgf·m, 8.8 lbf·ft)

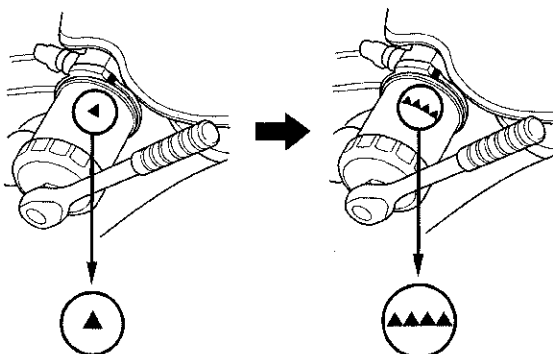




Oil Filter Feed Pipe Replacement

7. If four numbers or marks (1 to 4 or ▼ to ▼▼▼▼) are printed around the outside of the filter, you can use the following procedure to tighten the filter.

- Spin the filter on until its seal lightly seats against the block, and note which number or mark is at the bottom.
- Tighten the filter by turning it clockwise three numbers or marks from the one you noted. For example, if mark ▼ is at the bottom when the seal is lightly seated, tighten the filter until the mark ▼▼▼▼ comes around to the bottom.



Mark when rubber seal is seated.

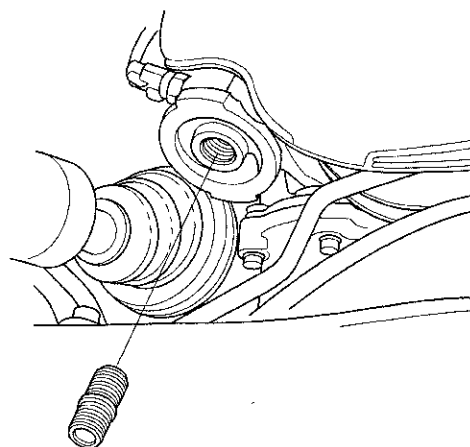
Mark after tightening.

Number or Mark when rubber seal is seated	1 or ▼	2 or ▼▼	3 or ▼▼▼	4 or ▼▼▼▼
Number or Mark after tightening	4 or ▼▼▼▼	1 or ▼	2 or ▼▼	3 or ▼▼▼

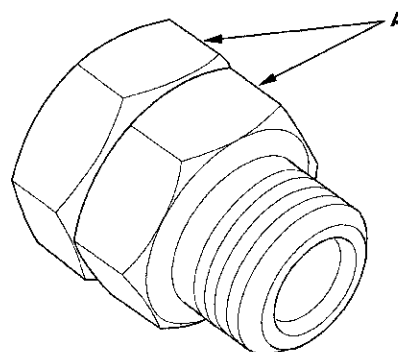
8. Refill with new engine oil (see page 8-11), run the engine for more than 3 minutes, then recheck the oil level and check for oil leakage.

1. Remove the filter (see page 8-12).

2. Remove the oil filter feed pipe.



3. Install two 20 x 1.5 mm nuts (A) onto the new oil filter feed pipe, and hold one nut with a wrench, then tighten the other nut.

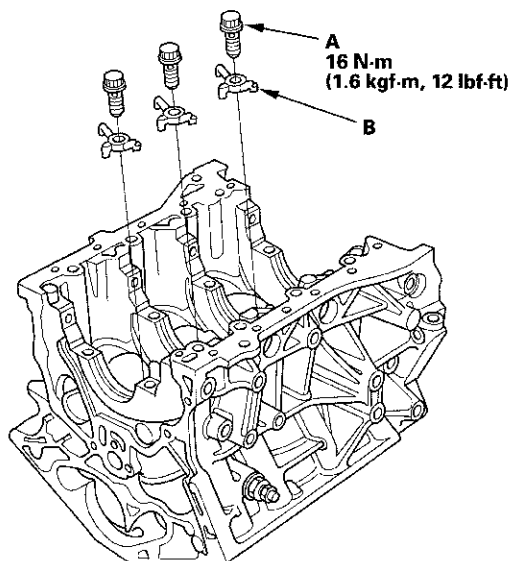


4. Tighten the oil filter feed pipe to 49 N·m (5.0 kgf-m, 36 lbf-ft), then remove the nuts from the oil filter feed pipe.

Engine Lubrication

Oil Jet Replacement

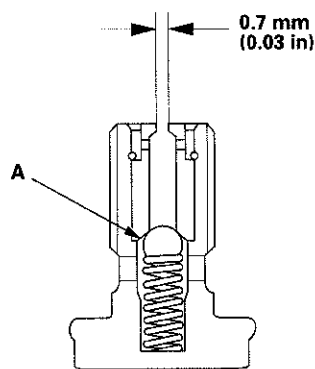
1. Remove the crankshaft from the engine block (see page 7-12).
2. Remove the oil jet bolt (A), then remove and discard the oil jet (B).



3. Carefully install the new oil jet and tighten the oil jet bolt.
4. Install the crankshaft (see page 7-23).

Oil Jet Bolt Inspection

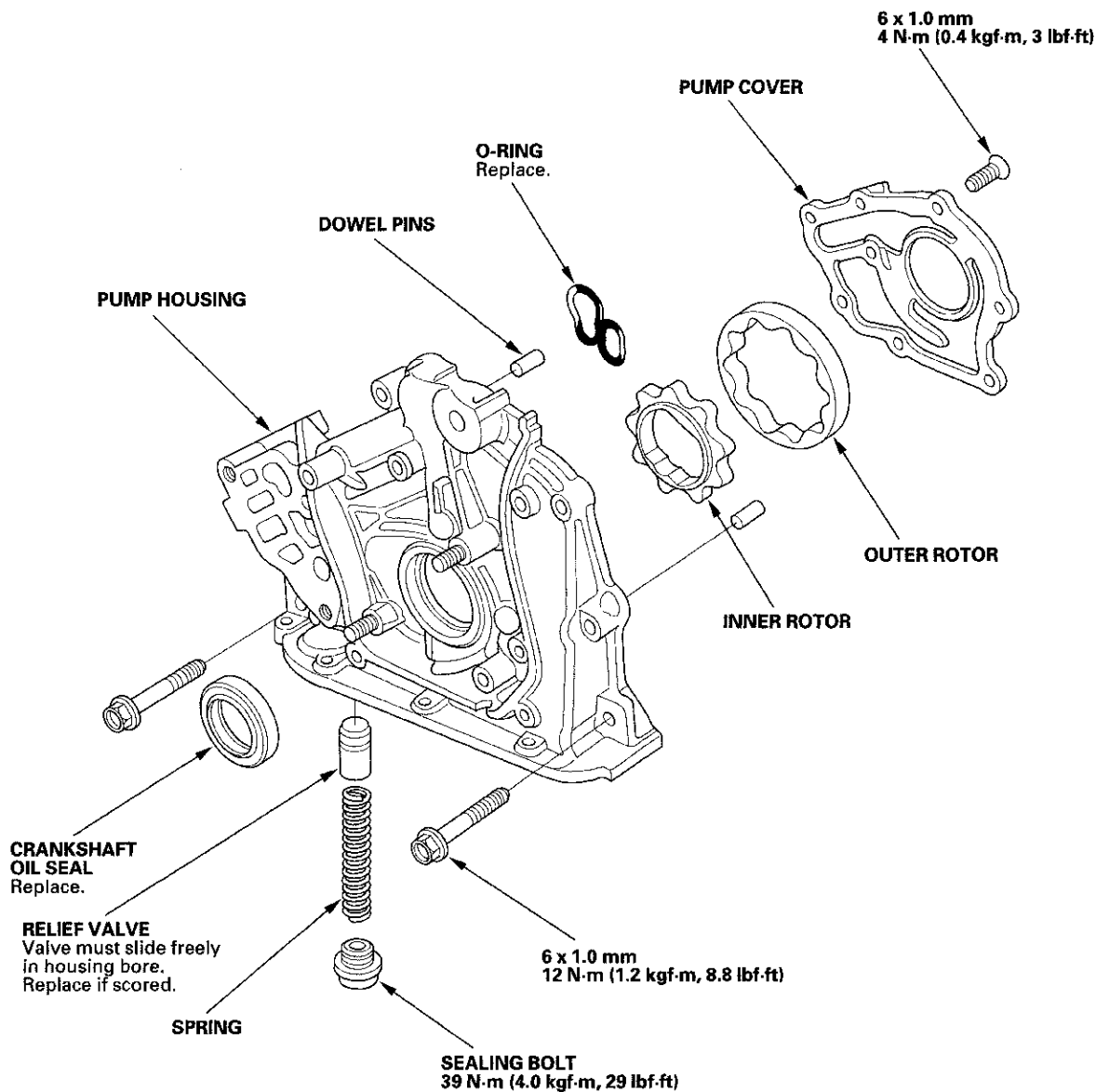
1. Remove the oil jet bolt (see page 8-14).
2. Inspect the oil jet bolt as follows.
 - Make sure that a 0.6 mm (0.02 in) diameter drill will go through the oil intake (0.7 mm (0.03 in) diameter). Make sure the check ball (A) moves smoothly and has a stroke of about 4.0 mm (0.16 in)
 - Check the oil jet bolt operation with an air nozzle. It should take at least 120 kPa (1.2 kgf/cm, 17 psi) to unseat the check ball.





Oil Pump Overhaul

Exploded View



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Engine Lubrication

Oil Pump Overhaul (cont'd)

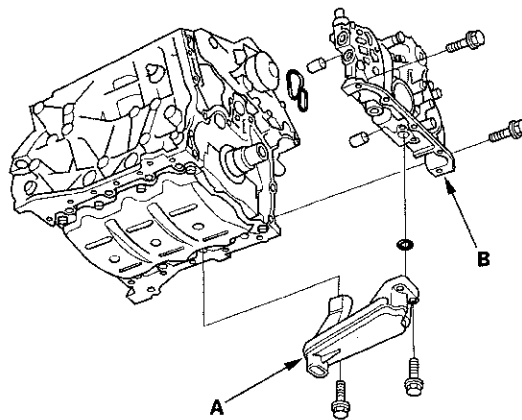
Special Tools Required

- Oil seal driver, 64 mm 070AD-RCAA100
- 2008 V6 Attachment arm SIL02C000033 *
- Engine support hanger, A and Reds AAR-T1256 *
- Engine hanger balance bar VSB02C000019 *
- * : Available through the Acura Tool and Equipment program, 888-424-6857.

Removal

1. Remove the right upper fender trim, the battery trim, the left upper fender trim, the upper grille cover (see page 20-163), and the cowl cover (see page 20-164).
2. Remove the under-hood fuse/relay box, the connector, and the transfer breather hose from the strut brace, then remove the strut brace (see step 16 on page 5-5).
3. Remove the connector bracket from the front cylinder head; use the bracket bolt hole to attach the engine balance bar front arm (see step 53 on page 5-9).
4. Remove the engine mount control solenoid valve bracket from the rear cylinder head; use the bracket bolt hole to attach the 2008 V6 attachment arm (see step 54 on page 5-9).
5. Lift and support the engine with the engine support hanger and engine balance bar. Attach the front arm to the front cylinder head with a spacer and the 10 x 1.25 mm bolt. Remove the rear arm from the balance bar, and install the 2008 V6 attachment arm, then attach the 2008 V6 attachment arm to the rear cylinder head with the 8 x 1.25 mm bolt (see step 55 on page 5-10).
6. Remove the timing belt (see page 6-16).
7. Remove the crankshaft position (CKP) sensor (see page 11-229).
8. Remove the rocker arm oil control solenoid/oil filter assembly (see step 9 on page 7-12).
9. Remove the oil pan (see page 7-11).

10. Remove the oil screen (A), then remove the oil pump (B).





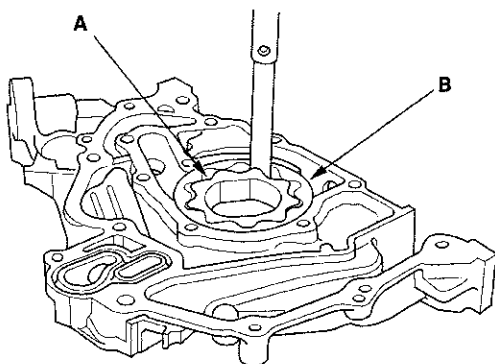
Inspection

1. Remove the screws from the pump housing, then separate the housing and cover.
2. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and the outer rotor (B). If the inner-to-outer rotor clearance exceeds the service limit, replace the oil pump assembly.

Inner Rotor-to-Outer Rotor Radial Clearance

Standard (New): 0.04—0.14 mm
(0.002—0.005 in)

Service Limit: 0.20 mm (0.008 in)

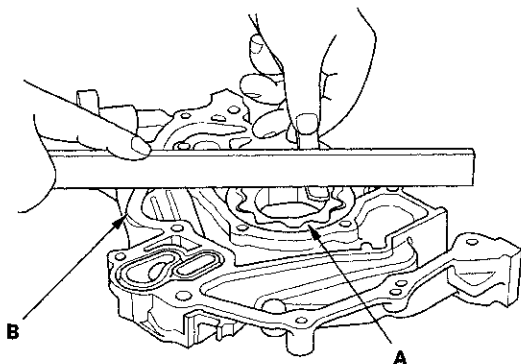


3. Check the housing-to-rotor axial clearance between the rotors (A) and the pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil pump assembly.

Housing-to-Rotor Axial Clearance

Standard (New): 0.02—0.07 mm
(0.001—0.003 in)

Service Limit: 0.12 mm (0.005 in)

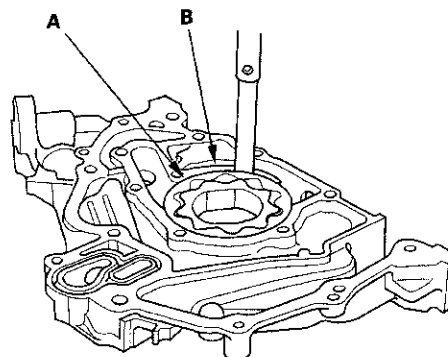


4. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and the pump housing (B). If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump assembly.

Housing-to-Outer Rotor Radial Clearance

Standard (New): 0.10—0.19 mm
(0.004—0.007 in)

Service Limit: 0.20 mm (0.008 in)



5. Inspect both rotors and the pump housing for scoring or other damage. Replace the parts, if necessary.
6. Apply liquid thread lock to the pump housing screws, then install the oil pump cover.
7. Make sure the oil pump turns freely.

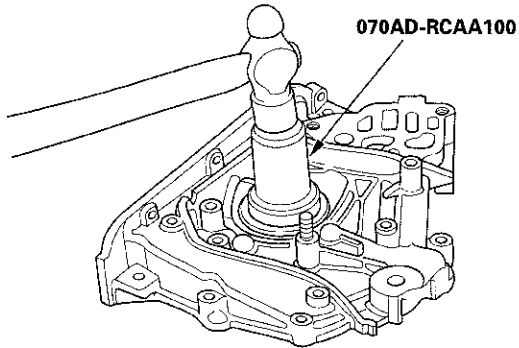
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Engine Lubrication

Oil Pump Overhaul (cont'd)

Installation

1. Remove the old oil seal from the oil pump.
2. Gently tap in the new oil seal until the oil seal driver bottoms on the pump.

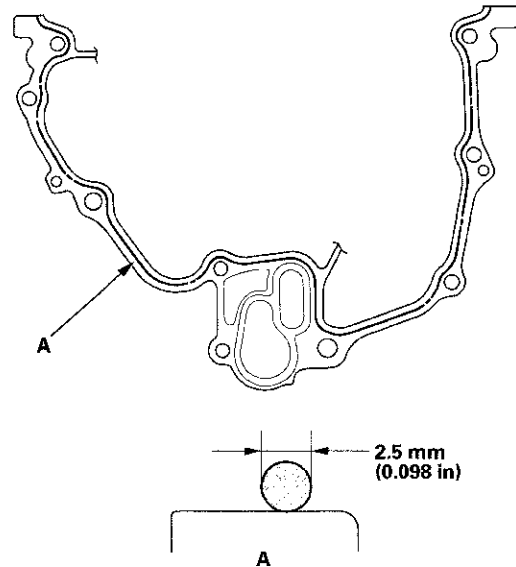


3. Remove all of the old liquid gasket from the oil pump mating surfaces, the bolts, and the bolt holes.
4. Clean and dry the oil pump mating surfaces.

5. Apply liquid gasket, (P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009) to the engine block mating surface of the oil pump and to the inside edge of the threaded bolt holes. Install the component within 5 minutes of applying the liquid gasket.

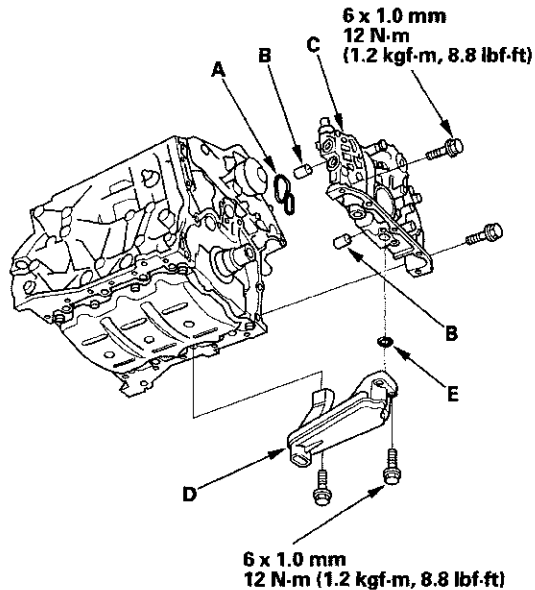
NOTE:

- Apply liquid gasket about 2.5 mm (0.098 in) diameter bead along the broken line (A).
- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.





6. Grease the lip of the oil seal, and apply oil to the new O-ring (A).



7. Install the dowel pins (B), then align the inner rotor with the crankshaft, and install the oil pump (C).
8. Clean the excess grease off the crankshaft, and check the seal for distortion.
9. Install the oil screen (D) with a new O-ring (E).
10. Install the rocker arm oil control solenoid/oil filter assembly, with a new rocker arm oil control solenoid filter (see step 38 on page 7-28).
11. Install the oil pan (see page 7-29).
12. Install the CKP sensor (see page 11-229).
13. Install the timing belt (see page 6-18).
14. Remove the engine balance bar and hanger.
15. Install the connector bracket to the front cylinder head (see step 46 on page 5-18).
16. Install the engine mount control solenoid valve bracket to the rear cylinder head (see step 47 on page 5-18).

17. Install the strut brace, then install the under-hood fuse/relay box, the connector, and the transfer breather hose (see step 59 on page 5-20).
18. Install the cowl cover, the upper grille cover, the left upper fender trim, the battery trim, and the right upper fender trim (see page 20-162).