

Engine Mechanical



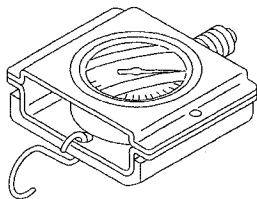
Engine Lubrication

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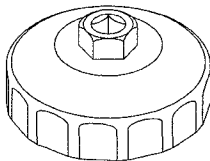
Engine Lubrication

Special Tools

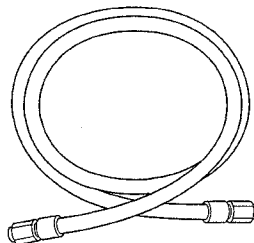
Ref.No.	Tool Number	Description	Qty
①	07406-0070301	A/T Low Pressure Gauge w/Panel	1
②	07AAA-PLCA100	Oil Filter Wrench	1
③	07AAJ-PY4A100	AT Pressure Test Hose	1
④	07MAJ-PY40120	A/T Pressure Adapter	1
⑤	07NAJ-P07010A	Pressure Gauge Adapter	1
⑥	07OAD-RCAA100	Oil Seal Driver, 64 mm	1
⑦	07ZAJ-S5AA200	Oil Pressure Hose	1



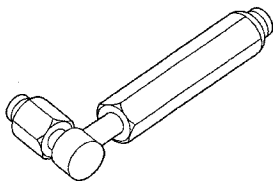
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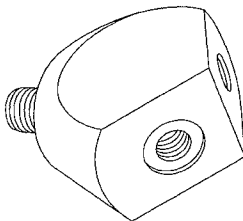
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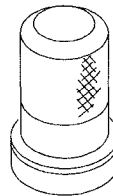
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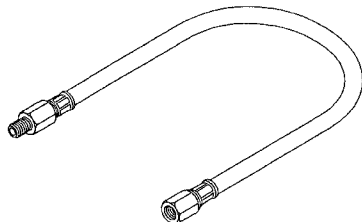
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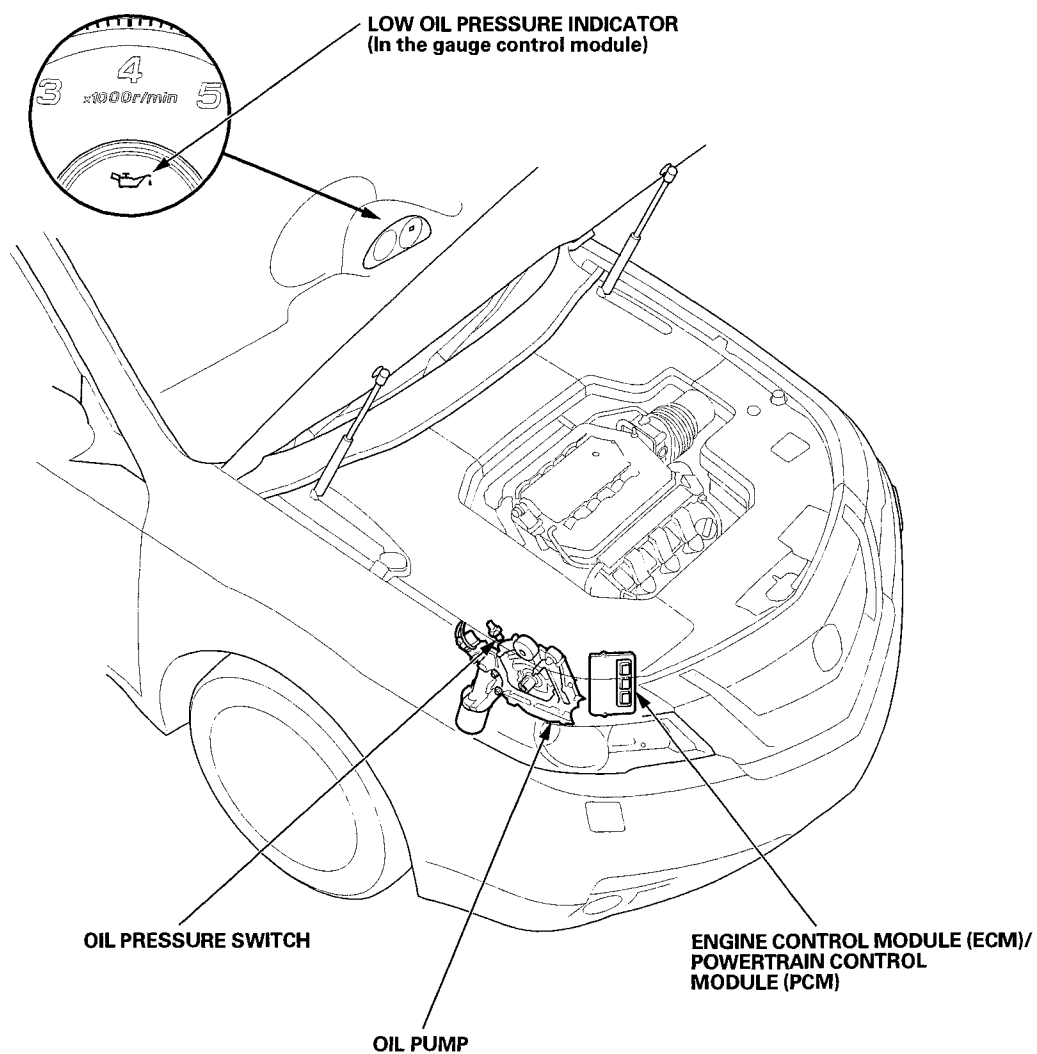
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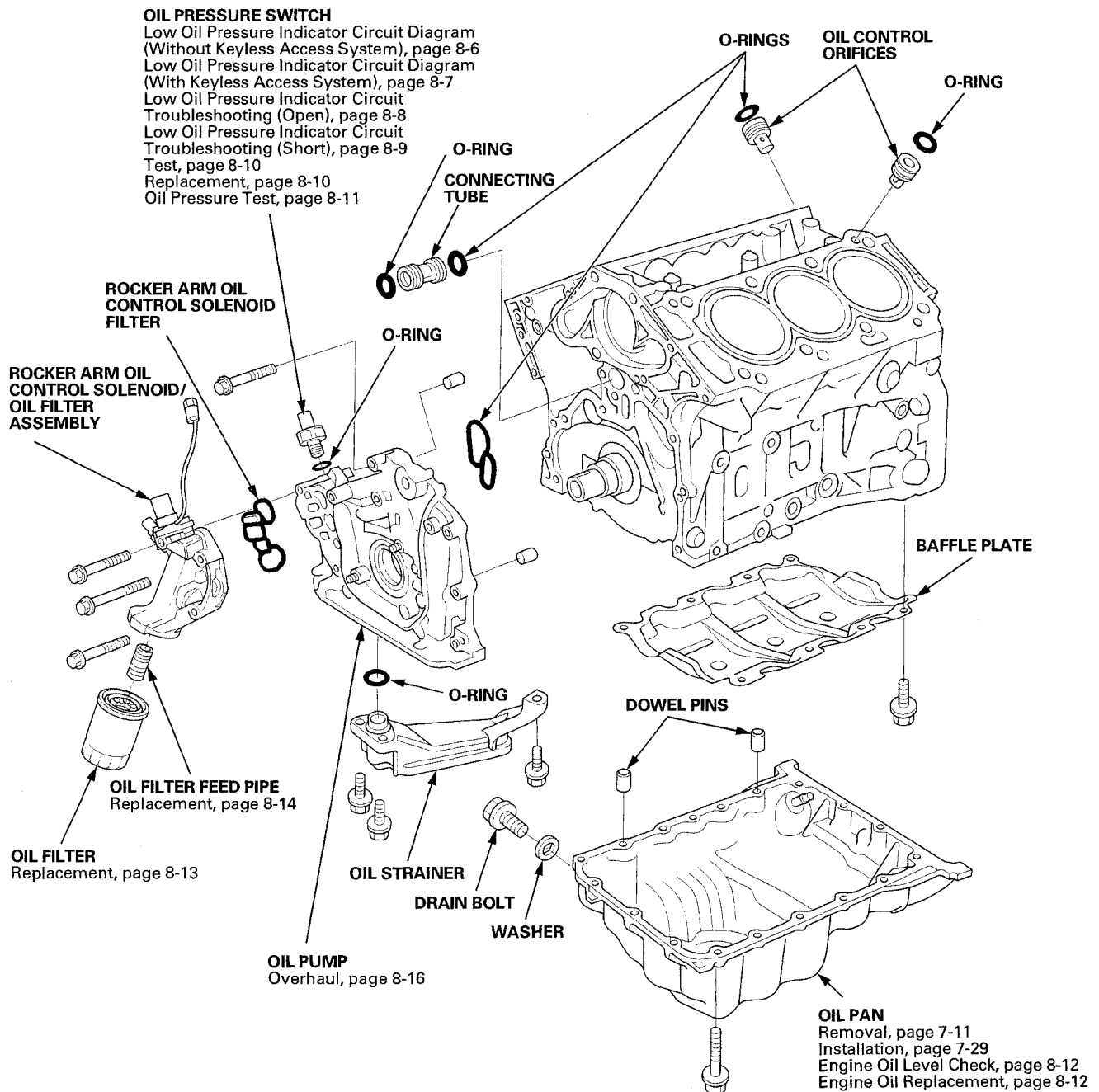
Component Location Index



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Engine Lubrication

Component Location Index (cont'd)





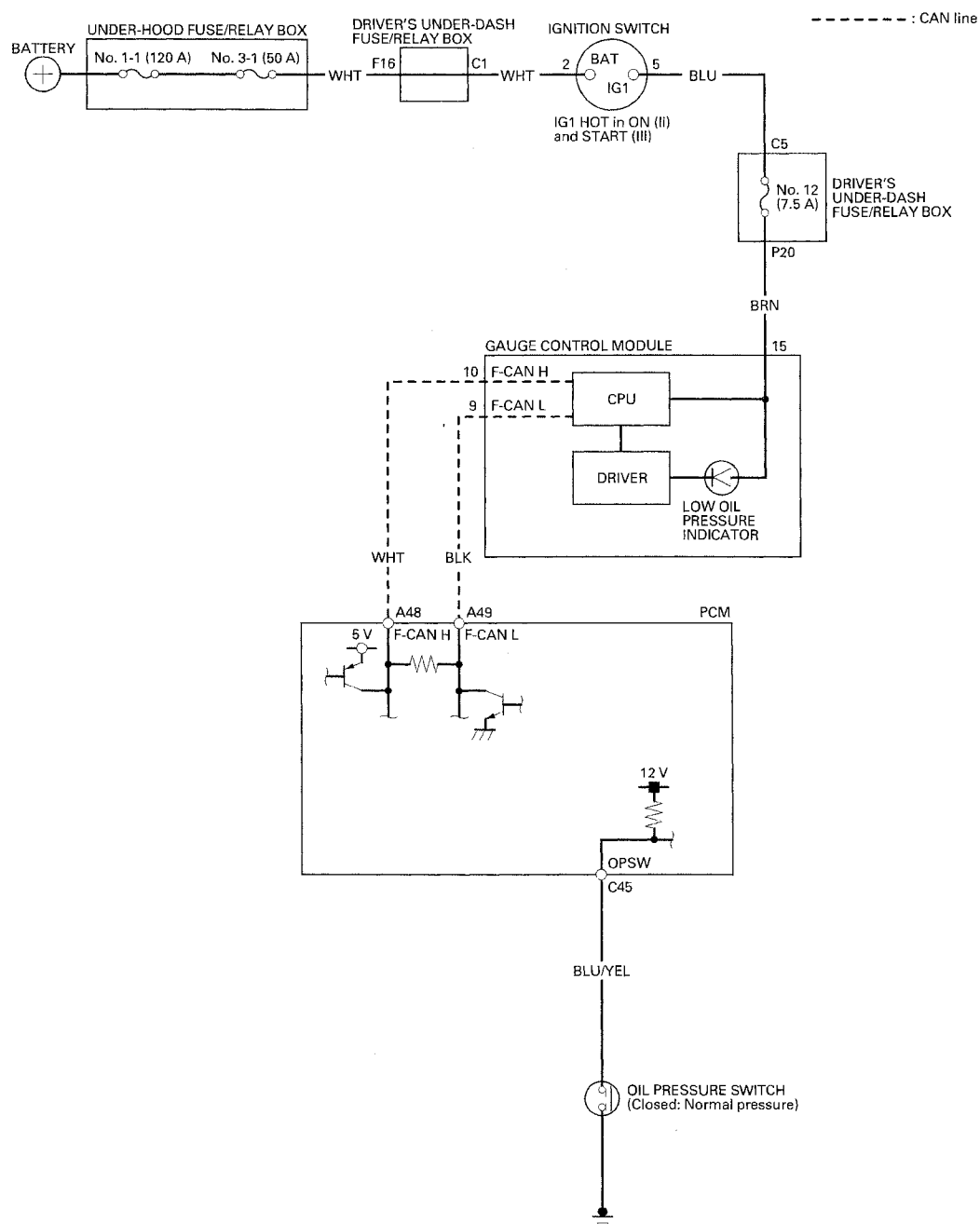
Symptom Troubleshooting Index

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): • J35Z6 engine (see page 6-48) • J37A4 engine (see page 6-111) or worn stem seal(s): • J35Z6 engine (see page 6-47) • J37A4 engine (see page 6-110) 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 7-16).	Check the maintenance records, worn out engine oil will burn off at a higher rate
Low oil pressure indicator does not come on with the ignition switch in ON (II), or the vehicle ignition in the ON mode	1. Do the low oil pressure indicator circuit troubleshooting (Short) (see page 8-8). 2. Test the oil pressure switch (see page 8-10).	A wire shorted to ground between the engine control module (ECM)/powertrain control module (PCM) and the oil pressure switch
Low oil pressure indicator stays on	1. Check the engine oil level (see page 8-12). 2. Do the low oil pressure indicator circuit troubleshooting (Open) (see page 8-9). 3. Test the oil pressure switch (see page 8-10). 4. Check the engine oil pressure (see page 8-11). 5. Check the oil filter for clogging. 6. Check the oil strainer for clogging. 7. Check the relief valve (see page 8-16). 8. Test the oil pump (see page 8-17).	An open in the wire between the ECM/PCM and the oil pressure switch

Engine Lubrication

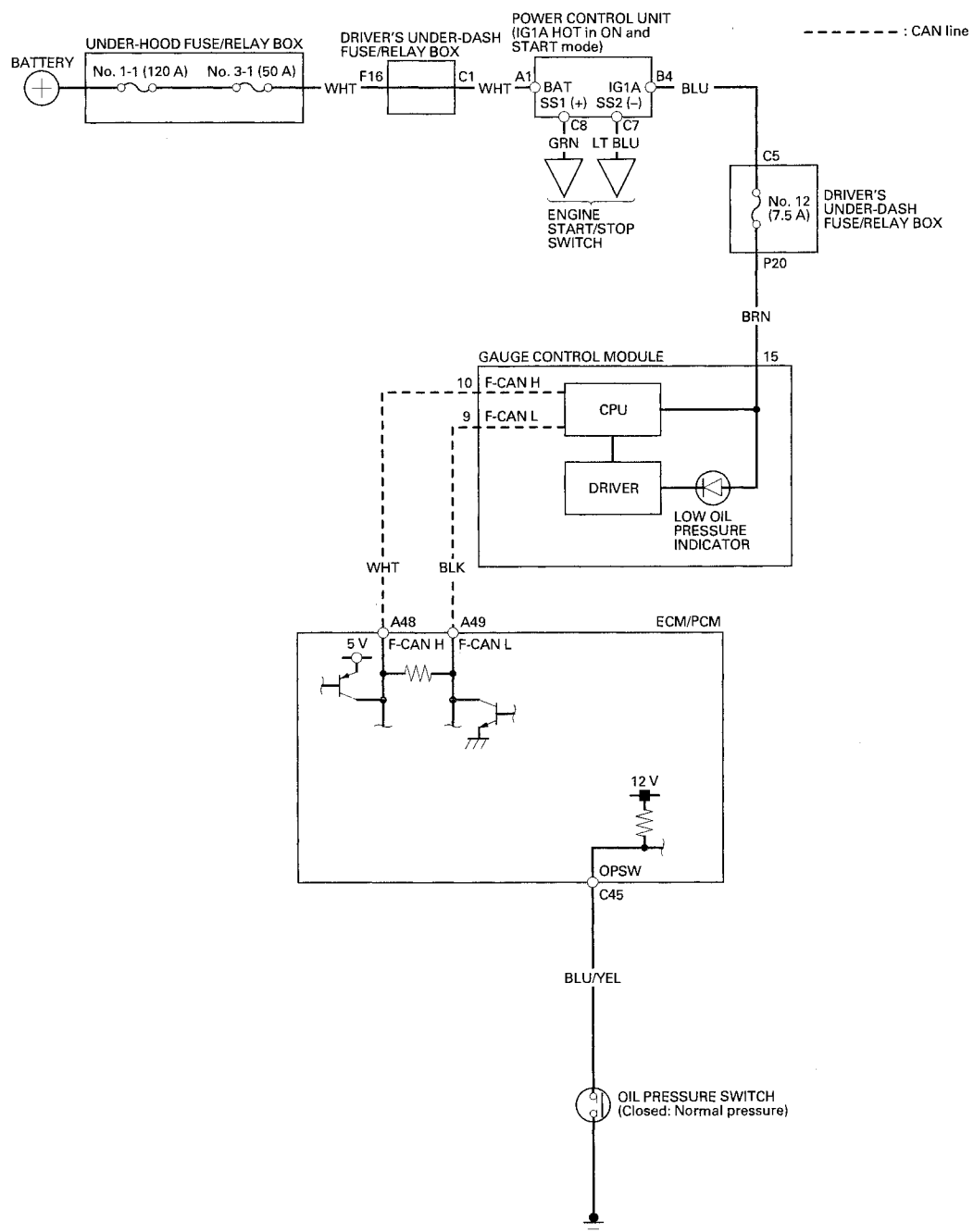
Low Oil Pressure Indicator Circuit Diagram

Without Keyless Access System





With Keyless Access System



Engine Lubrication

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), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the engine control module (ECM)/powertrain control module (PCM). If it does not communicate, troubleshoot the DLC circuit (see page 11-258).
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, and check the OIL PRESSURE SWITCH in the PGM-FI DATA LIST with the HDS.

Is ON indicated?

YES—Replace the gauge control module (see page 22-367). ■

NO—Go to step 6.

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Check the oil pressure switch (see page 8-10).

Is the oil pressure switch OK?

YES—Go to step 8.

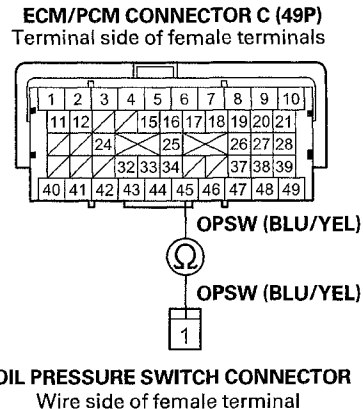
NO—Do the oil pressure test (see page 8-10). If the oil pressure is OK, replace the oil pressure switch (see page 8-10). ■

8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and jump the SCS line with the HDS, then turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

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

9. Disconnect ECM/PCM connector C (49P) and the oil pressure switch connector.

10. Check for continuity between ECM/PCM connector terminal C45 and the oil pressure switch connector.



Is there continuity?

YES—Update the ECM/PCM if it does not have the latest software (see page 11-281), or substitute a known-good ECM/PCM (see page 11-7), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-282). ■

NO—Repair open in the wire between the oil pressure switch and ECM/PCM connector terminal C45. ■



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), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the engine control module (ECM)/powertrain control module (PCM). If it does not communicate, troubleshoot the DLC circuit (see page 11-258).
4. Check for DTCs (see page 11-3). If a DTC is present, diagnose, and repair the cause before continuing with this test.
5. Turn the ignition switch ON (II), or press the engine start/stop button to select the ON mode, and check the OIL PRESSURE SWITCH in the PGM-FI DATA LIST with the HDS.

Is OFF indicated?

YES—Replace the gauge control module (see page 22-367). ■

NO—Go to step 6.

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Check the oil pressure switch (see page 8-10).

Is the oil pressure switch OK?

YES—Go to step 8.

NO—Replace the oil pressure switch (see page 8-10). ■

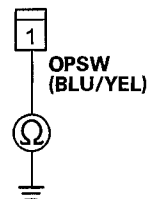
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and jump the SCS line with the HDS, then turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

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

9. Disconnect ECM/PCM connector C (49P).

10. Check for continuity between the oil pressure switch connector and body ground.

OIL PRESSURE SWITCH CONNECTOR



Wire side of female terminal

Is there continuity?

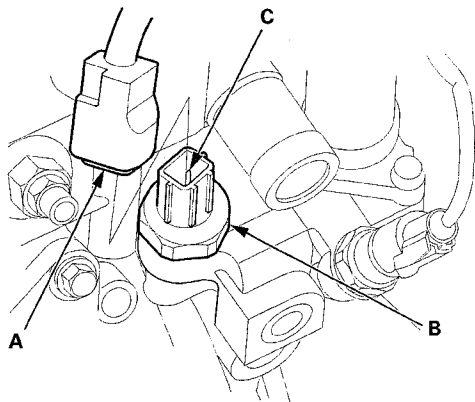
YES—Repair short to ground in the wire between the oil pressure switch and ECM/PCM connector terminal C45. ■

NO—Update the ECM/PCM if it does not have the latest software (see page 11-281), or substitute a known-good ECM/PCM (see page 11-7), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-282). ■

Engine Lubrication

Oil Pressure Switch Test

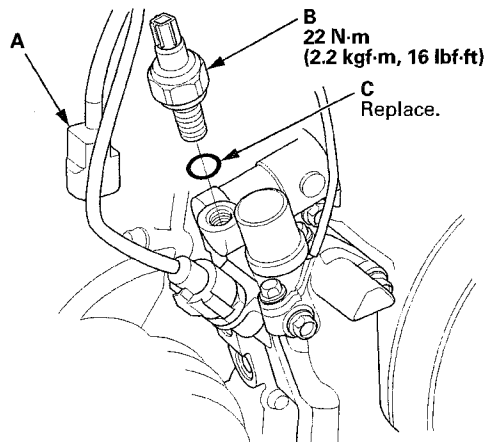
1. Disconnect the connector (A) from the oil pressure switch (B).



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



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 (C).

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. Install the oil pressure switch with a new O-ring.
5. Connect the oil pressure switch connector.



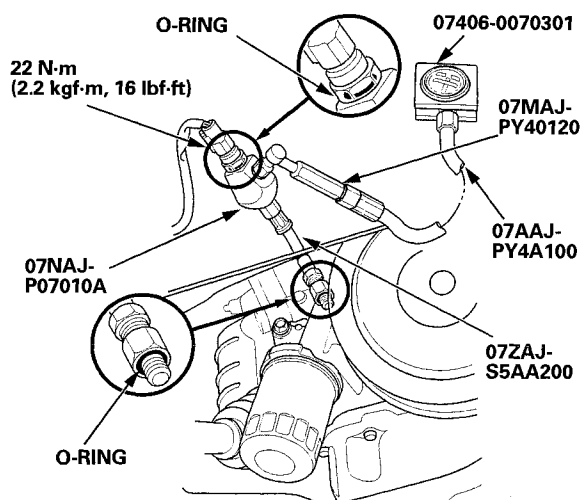
Oil Pressure Test

Special Tools Required

- Oil Pressure Hose 07ZAJ-S5AA200
- A/T Low Pressure Gauge w/Panel 07406-0070301
- A/T Pressure Test Hose 07AAJ-PY4A100
- A/T Pressure Adapter 07MAJ-PY40120
- Pressure Gauge Adapter 07NAJ-P07010A

If the low oil pressure indicator stays on with the engine running, check the engine oil level (see page 8-12). If the oil level is correct:

1. Remove the oil pressure switch (see page 8-10).
2. Install the oil pressure hose, the A/T low pressure gauge w/panel, the A/T pressure test hose, and the A/T pressure adapter as shown, then install the oil pressure switch and/or rocker arm oil pressure sensor to the pressure gauge adapter.



3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.

4. 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: 69 kPa (0.7 kgf/cm², 10.0 psi) min.

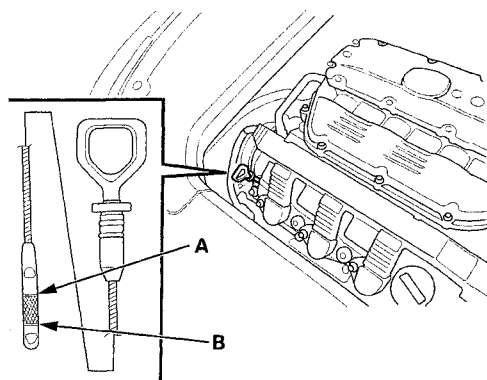
At 3,000 rpm: 490 kPa (5.0 kgf/cm², 71 psi) min.

5. If oil pressure is not within specifications, inspect these items:
 - Blocking of oil filter.
 - Blocking of oil strainer.
 - Inspect the oil pressure relief valve (see page 8-16).
 - Inspect the oil pump (see page 8-17).

Engine Lubrication

Engine Oil Level Check

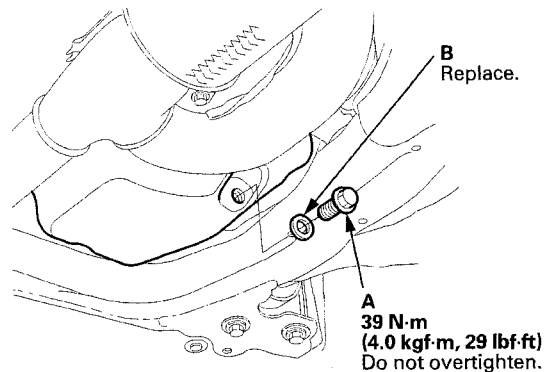
1. Park the vehicle on level ground, and start the engine. Hold the engine speed at 3,000 rpm with no load (in N or P (A/T model) or neutral (M/T model)) until the radiator fan comes on, then turn off the engine, and wait a few minute.
2. Remove the dipstick, and wipe off the dipstick, then reinstall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



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

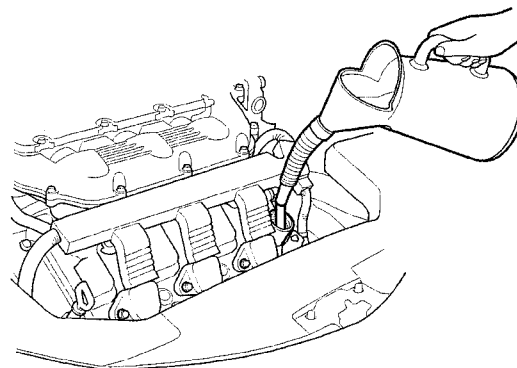
4.0 L (4.2 US qt)

At Oil Change including Filter:

4.3 L (4.5 US qt)

After Engine Overhaul:

5.0 L (5.3 US qt)



5. Run the engine for more than 3 minutes, then check for oil leakage.
6. If the maintenance minder required engine oil replacement, reset the maintenance minder (see page 3-4), and this procedure is complete. If the maintenance minder did not require engine oil replacement, go to step 7.



Engine Oil Filter Replacement

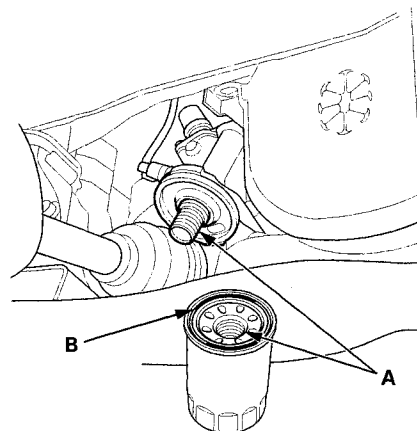
7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3).
9. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
10. Make sure the HDS communicates with the vehicle and the engine control module (ECM)/powertrain control module (PCM). If it does not communicate, troubleshoot the DLC circuit (see page 11-258).
11. Select GAUGES in the BODY ELECTRICAL with the HDS.
12. Select ADJUSTMENT in the GAUGES with the HDS.
13. Select MAINTENANCE MINDER in the ADJUSTMENT with the HDS.
14. Select RESET in the MAINTENANCE MINDER with the HDS.
15. Select RESETTING THE ENGINE OIL LIFE with the HDS.

NOTE: If you changed the ATF at the same time with the engine oil, select RESETTING THE ENGINE OIL LIFE AND ATF with the HDS instead.

Special Tools Required

Oil Filter Wrench 07AAA-PLCA100

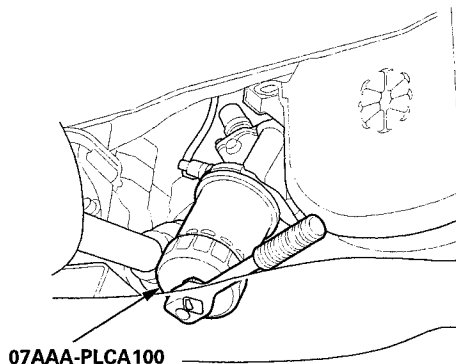
1. Drain the engine oil (see page 8-12).
2. Remove the oil filter with the oil filter wrench.
3. Inspect the filter to make sure the rubber seal is not stuck to the oil filter seating surface of the engine.
4. Inspect the threads (A) and the rubber seal (B) on the new filter. Clean the seat on the oil filter base, 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, 8.7 lbf·ft)

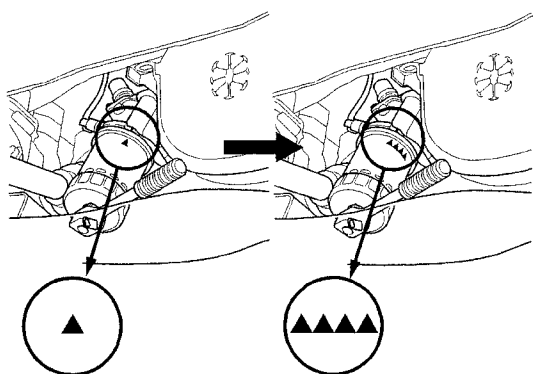


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Engine Lubrication

Engine Oil Filter Replacement (cont'd)

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 oil filter base, 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.

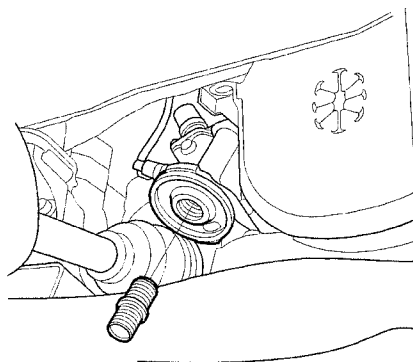
Mark after tightening.

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 ▼▼▼

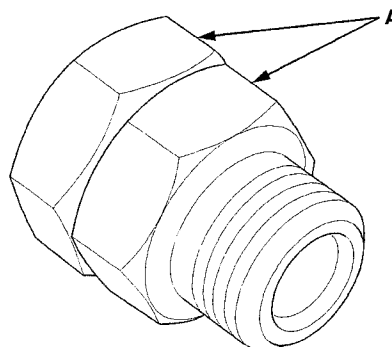
8. Refill with the recommended oil (see step 4 on page 8-12). Run the engine for more than 3 minutes, then check for oil leaks.

Oil Filter Feed Pipe Replacement

1. Remove the oil filter (see page 8-13).
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.

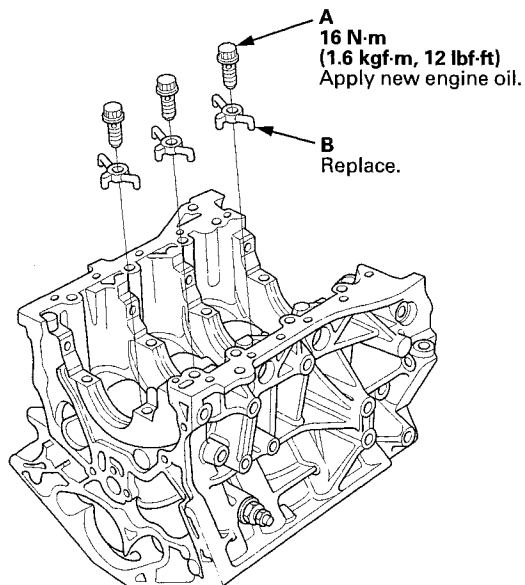


4. Apply new engine oil to the oil filter feed pipe threads, then torque the oil filter feed pipe to 35 N·m (3.6 kgf·m, 26 lbf·ft), then remove the nuts from the oil filter feed pipe.
5. Install the oil filter (see page 8-13).



Oil Jet Replacement

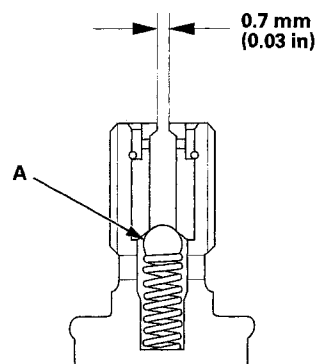
1. Remove the crankshaft from the engine block (see page 7-12).
2. Remove the oil jet bolt (A), then remove the oil jet (B).



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

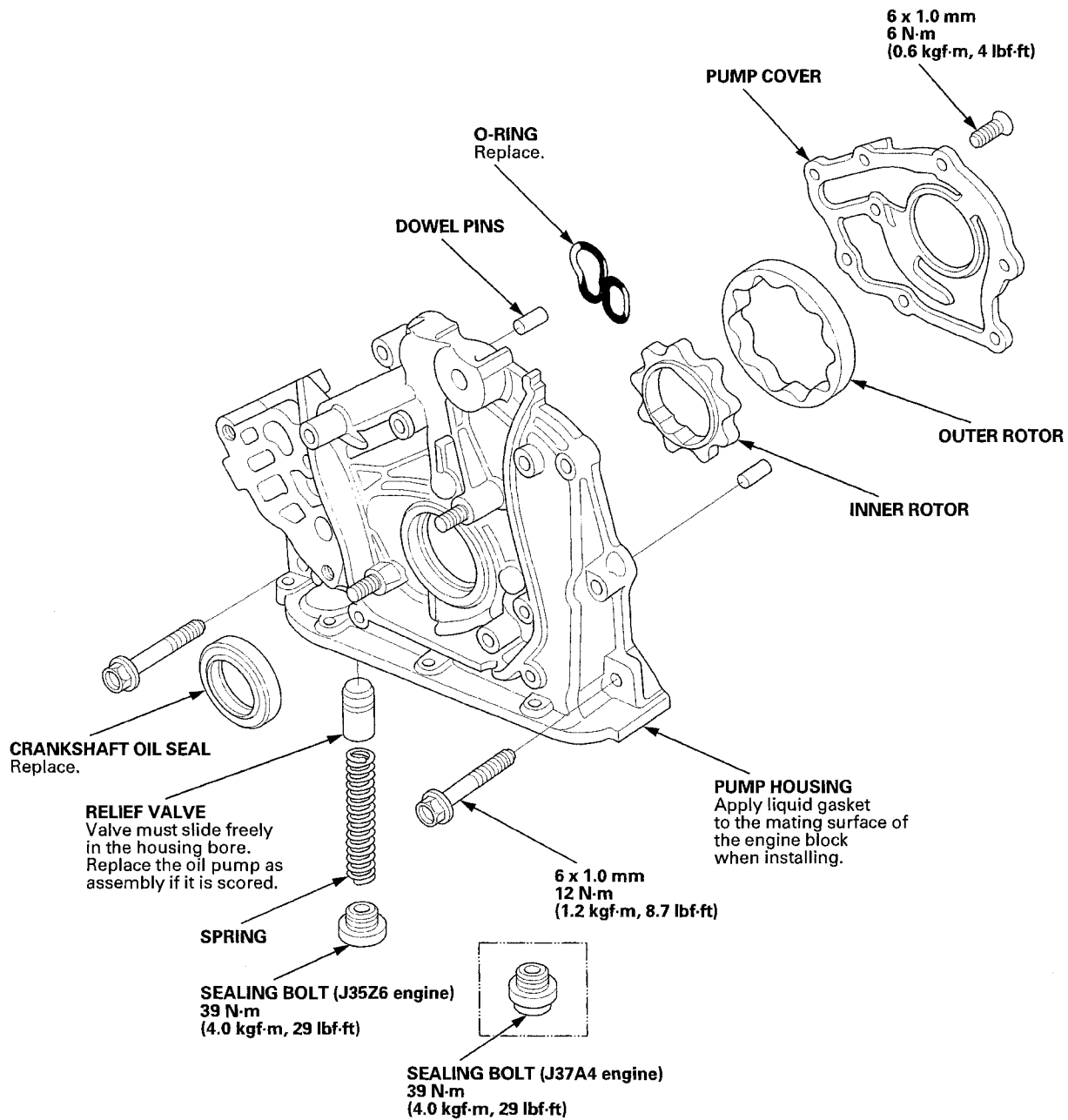
1. Remove the oil jet bolt (see page 8-15).
2. Inspect the oil jet bolt as follows.
 - Make sure that a 0.6 mm (0.02 in) diameter drill will go through the oil intake (0.7 mm (0.03 in) diameter). Make sure the check ball (A) moves smoothly and has a stroke of about 4.0 mm (0.16 in).
 - Check the oil jet bolt operation with an air nozzle. It should take at least 120 kPa (1.2 kgf/cm², 17 psi) to unseat the check ball.



Engine Lubrication

Oil Pump Overhaul

Exploded View



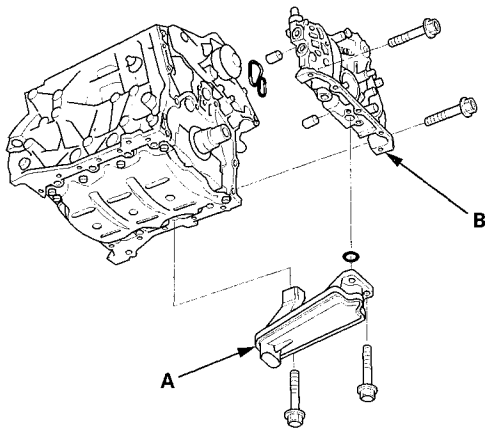


Special Tools Required

Oil Seal Driver, 64 mm 07OAD-RCAA100

Removal

1. Drain the engine oil (see page 8-12).
2. Remove the timing belt:
 - J35Z6 engine (see page 6-15)
 - J37A4 engine (see page 6-78)
3. Remove the timing belt drive pulley from the crankshaft:
 - J35Z6 engine (see page 6-27)
 - J37A4 engine (see page 6-90)
4. Attach the chain hoist to the engine hook on the engine hanger bracket (see step 63 on page 5-10).
5. Remove the rocker arm oil control solenoid/oil filter assembly (see step 9 on page 7-12).
6. Remove the oil pan (see page 7-11).
7. Remove the oil strainer (A).



8. Remove the mounting bolts, then remove the oil pump assembly (B).

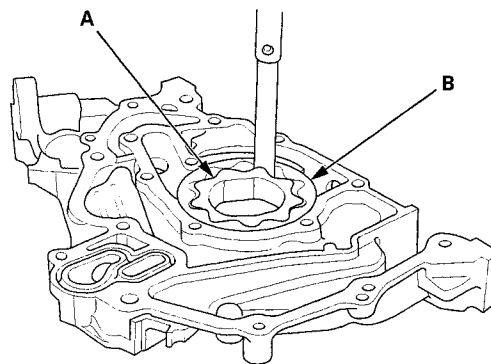
Inspection

1. Remove the screws from the pump housing, then separate the pump housing and the 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 radial clearance exceeds the service limit, replace the oil pump assembly.

Inner Rotor-to-Outer Rotor Radial Clearance

Standard (New): 0.04–0.16 mm (0.002–0.006 in)

Service Limit: 0.20 mm (0.008 in)

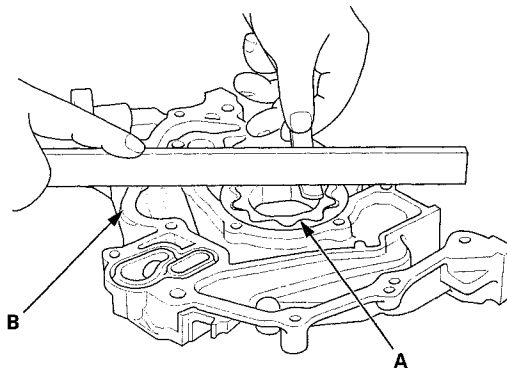


3. Check the pump housing-to-rotor axial clearance between the rotors (A) and the pump housing (B). If the pump housing-to-rotor axial clearance exceeds the service limit, replace the oil pump assembly.

Pump 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)



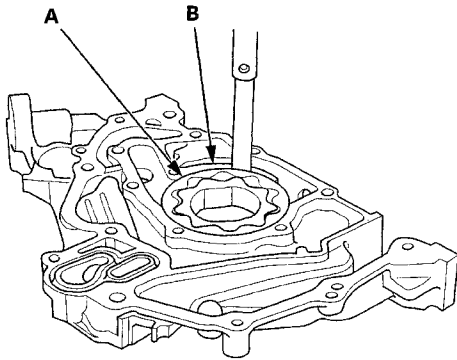
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Engine Lubrication

Oil Pump Overhaul (cont'd)

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

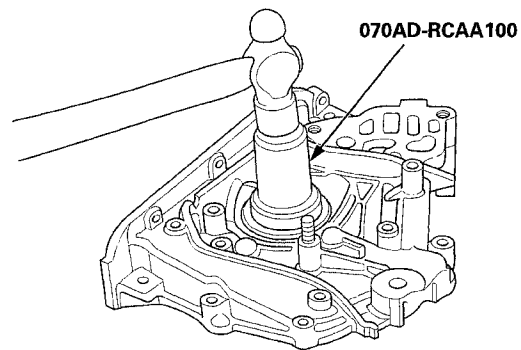
Pump Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.10–0.19 mm (0.004–0.007 in)
Service Limit: 0.20 mm (0.008 in)



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. Check that the oil pump turns freely.

Installation

1. Remove the old oil seal from the oil pump.
2. Clean and dry the crankshaft oil seal housing.
3. Using the oil seal driver, 64 mm, drive in the new crankshaft oil seal until the oil seal driver bottoms on the pump.



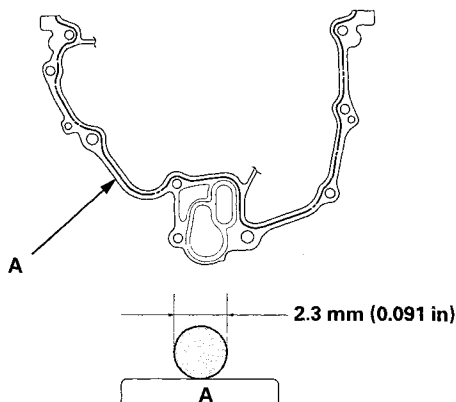
4. Remove all of the old liquid gasket from the oil pump mating surfaces, the bolts, and the bolt holes.
5. Clean and dry the oil pump mating surfaces.



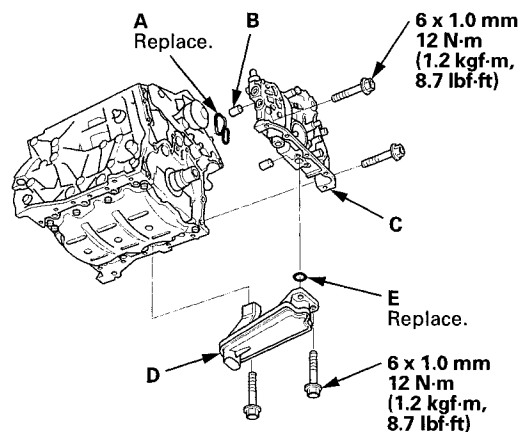
6. Apply liquid gasket, P/N 08717-0004, 08718-0003, or 08718-0009, to the engine block mating surface of the oil pump and to the inside edge of the threaded bolt holes. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- Apply a 2.3 mm (0.091 in) diameter bead of liquid gasket 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 all of the old liquid gasket and residue, then reapply the new liquid gasket.



7. Apply a light coat of new engine oil to the lip of the crankshaft oil seal, and apply new engine oil to the new O-ring (A).



8. Install the dowel pins (B), then align the inner rotor with the crankshaft, and install the oil pump (C).

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 oil pump.

9. Clean the excess grease off the crankshaft, and check the seal for distortion.

10. Install the oil strainer (D) with a new O-ring (E).

11. Install the oil pan (see page 7-29).

12. Install the rocker arm oil control solenoid/oil filter assembly with a new rocker arm oil control solenoid filter (see step 39 on page 7-28).

13. Install the timing belt drive pulley to the crankshaft:

- J35Z6 engine (see page 6-27)
- J37A4 engine (see page 6-90)

14. Install the timing belt:

- J35Z6 engine (see page 6-17)
- J37A4 engine (see page 6-80)

15. Remove the chain hoist.