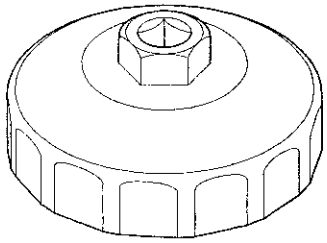
Engine Mechanical

Engine Lubrication

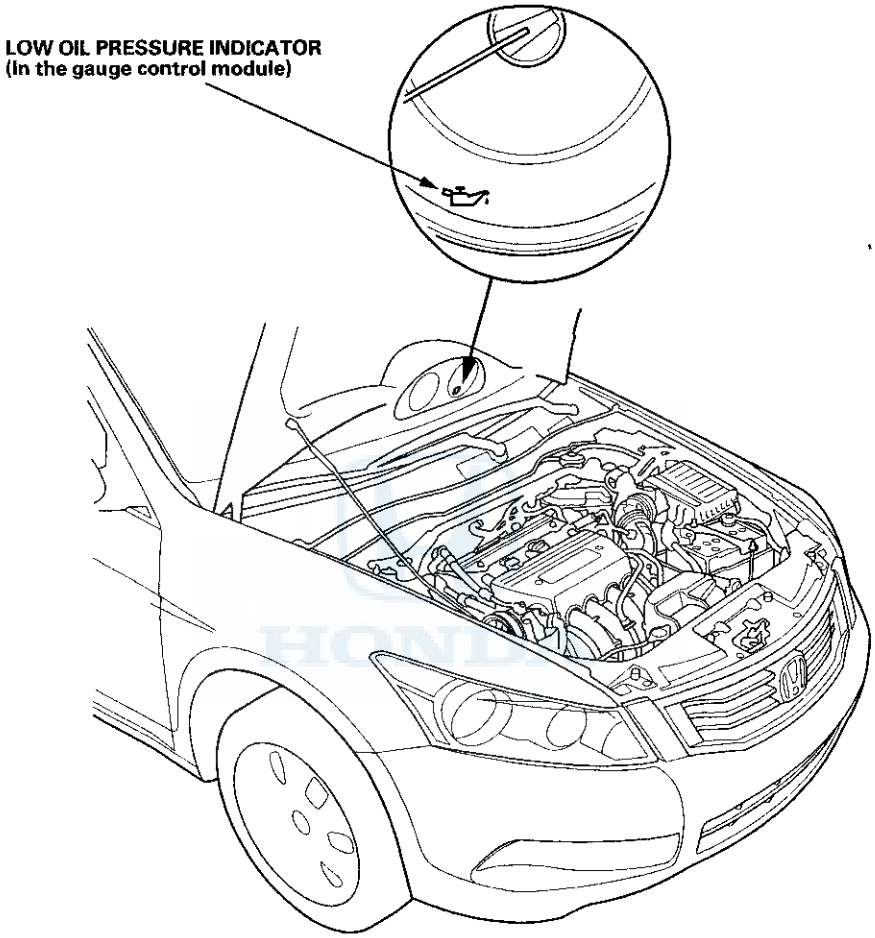
Special Tools

Ref.No.	Tool Number	Description	Qty
①	07AAA-PLCA100	Oil Filter Wrench	1



①

Component Location Index



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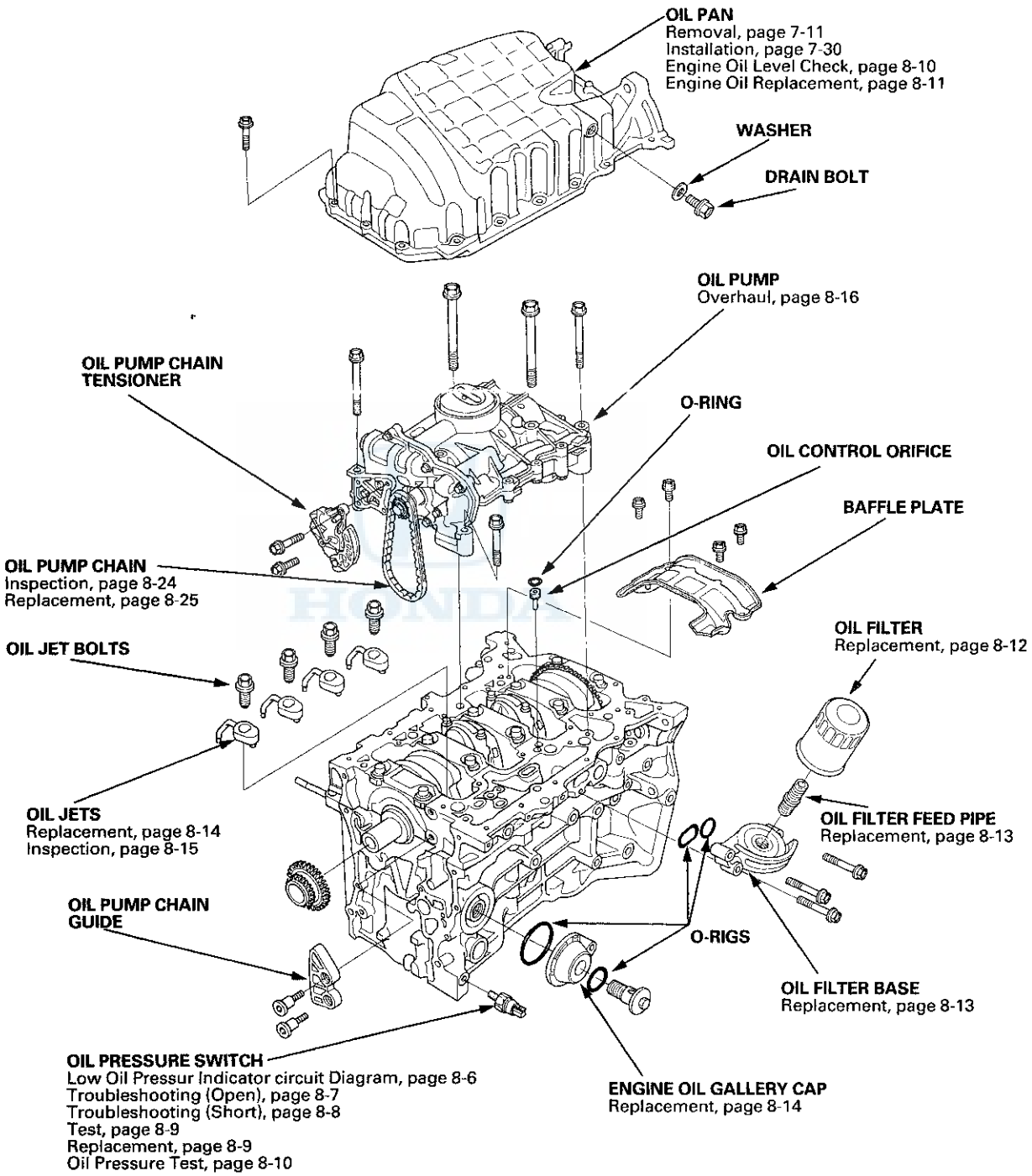
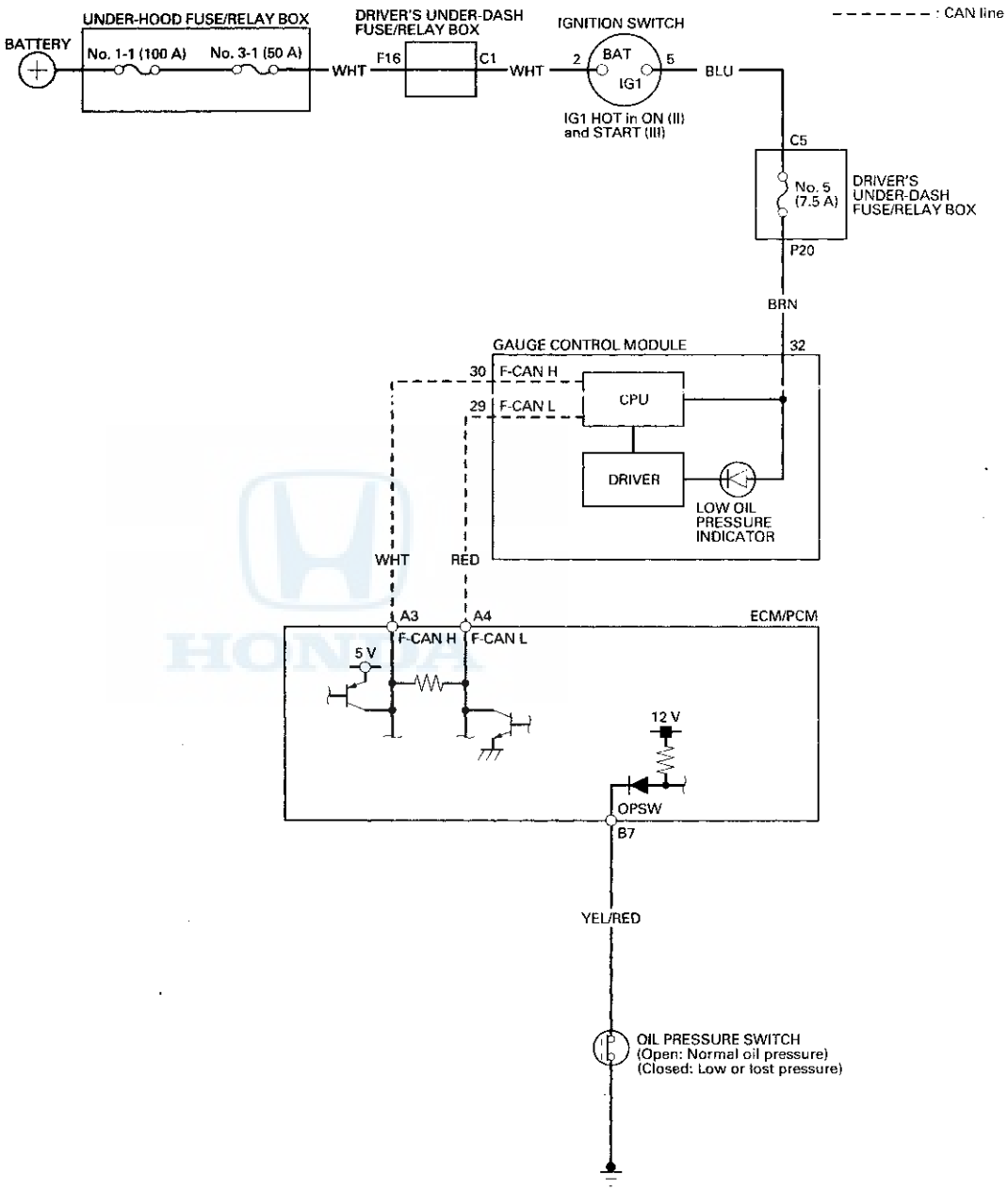
Component Location Index (cont'd)



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. Check for oil leaks. 2. Check for worn valve guide(s): • All models except PZEV (see page 6-38) • PZEV model (see page 6-88) or worn valve seal(s): • All models except PZEV (see page 6-39) • PZEV model (see page 6-88) 3. Check for damaged or worn piston ring(s) (see page 7-22). 4. Check for damaged or worn engine internal parts (cylinder wall, pistons, etc.) (see page 7-17).	
Low oil pressure indicator does not come on with the ignition switch in ON (II)	1. Do the low oil pressure indicator circuit troubleshooting (Open) (see page 8-7). 2. Test the oil pressure switch (see page 8-9).	An open in the wire 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 8-10). 2. Do the low oil pressure indicator circuit troubleshooting (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 8-16). 8. Test the oil pump (see page 8-18).	A wire shorted to ground between the ECM/PCM and the oil pressure switch

Low Oil Pressure Indicator Circuit Diagram



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 engine control module (ECM)/powertrain control module (PCM). If it does not communicate, troubleshoot the DLC circuit (see page 11-181).
4. Check for DTCs (see page 11-3). If a DTC is present, diagnose, and repair the cause before continuing with this test.
5. 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 22-351).■

   NO–Go to step 6.
6. Turn the ignition switch to LOCK (0).
7. Check the oil pressure switch (see page 8-9).

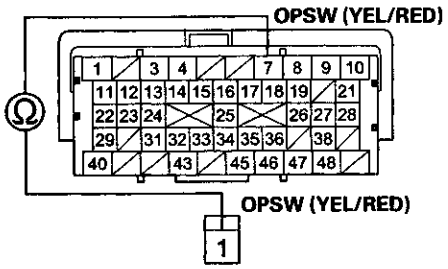
   Is the oil pressure switch OK?

   YES–Go to step 8.

   NO–Replace the oil pressure switch (see page 8-9).■
8. 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 ECM/PCM from damage.
9. Disconnect ECM/PCM connector B (49P) and the oil pressure switch connector.
10. Check for continuity between ECM/PCM connector terminal B7 and the oil pressure switch connector.

ECM/PCM CONNECTOR B (49P)
Terminal side of female terminals



OIL PRESSURE SWITCH CONNECTOR
Wire side of female terminal

Is there continuity?

YES–Update the ECM/PCM if it does not have the latest software (see page 11-203), 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 11-204).■

NO–Repair open in the wire between the oil pressure switch connector and ECM/PCM connector terminal B7.■

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 engine control module (ECM)/powertrain control module (PCM). If it does not communicate, troubleshoot the DLC circuit (see page 11-181).
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 OFF indicated?

   YES–Replace the gauge control module (see page 22-351).■

   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 PGM-FI DATA LIST with the HDS.

   Is OFF indicated?

   YES–Turn the ignition switch to LOCK (0), then go to step 9.

   NO–Turn the ignition switch to LOCK (0), then go to step 10.
9. Check the oil pressure switch (see page 8-9).

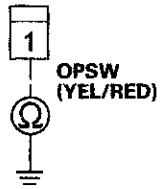
   Is the oil pressure switch OK?

   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 ECM/PCM from damage.
11. Disconnect ECM/PCM connector B (49P).
12. Check for continuity between the oil pressure switch connector and body ground.

OIL PRESSURE SWITCH CONNECTOR



Wire side of female terminal

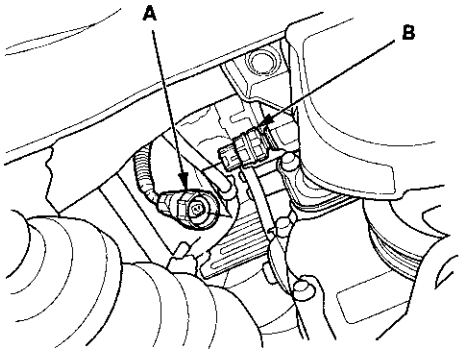
Is there continuity?

YES–Repair short to ground in the wire between the oil pressure switch and ECM/PCM connector terminal B7.■

NO–Update the ECM/PCM if it does not have the latest software (see page 11-203), 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 11-204).■

Oil Pressure Switch Test

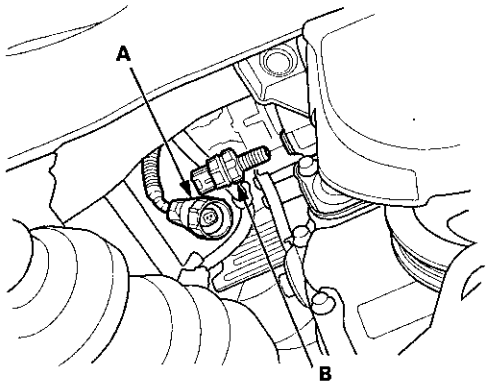
1. Disconnect the oil pressure switch connector (A) from the oil pressure switch (B).



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

Oil Pressure Switch Replacement

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



2. Remove any old liquid gasket from the switch and switch mounting hole.
3. Apply a very small amount of liquid gasket to the oil pressure switch threads, then install the oil pressure switch.

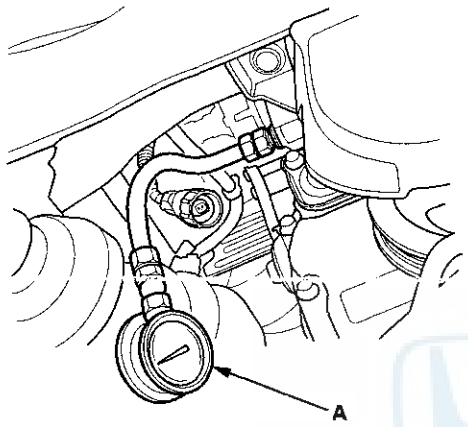
   NOTE: Using too much liquid gasket may cause liquid gasket to enter the oil passage or the end of the new oil pressure switch.

Engine Lubrication

Oil Pressure Test

NOTE: If the low oil pressure warning indicator stays on with the engine running, check the engine oil level. If the oil level is correct, do the following test.

1. With the engine stopped, remove the oil pressure switch (see page 8-9), and install an oil pressure gauge (A).



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

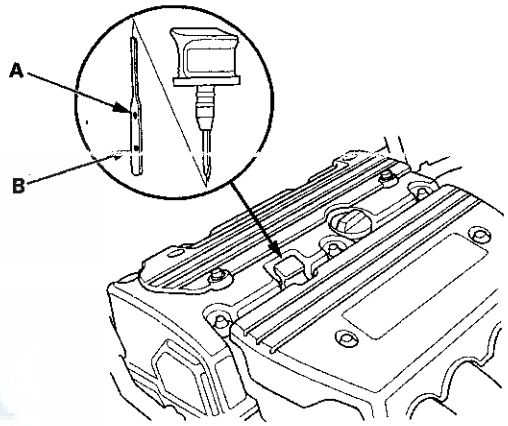
   Engine Oil Temperature: 176 °F (80 °C)
   Engine Oil Pressure:

   At Idle: 69 kPa (0.7 kgf/cm², 10.0 psi) min.
   At 3,000 rpm: 304 kPa (3.1 kgf/cm², 44 psi) min.

4. If the oil pressure is out of specifications, inspect these items:
   - Blocking of oil filter.
   - Blocking of oil screen.
   - Inspect the oil pressure relief valve (see page 8-16).
   - Inspect the oil pump (see page 8-18).

Engine Oil Level Check

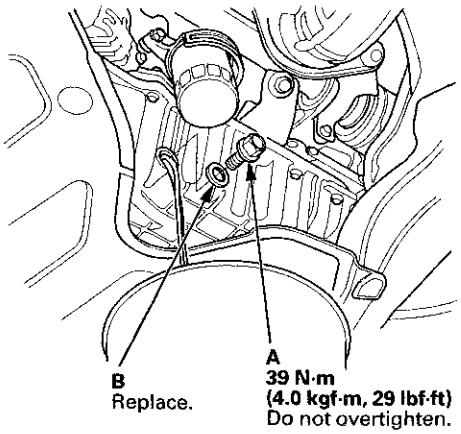
1. Park the vehicle on level ground, and start the engine. Hold the engine speed at 3,000 rpm with no load (in N or P (A/T model) or Neutral (M/T model)) until the radiator fan comes on, then turn off the engine, and wait a few minutes.
2. Remove the dipstick, and wipe off the dipstick, then reinstall 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, add the recommended engine oil to bring it between the upper and lower marks.

Engine Oil Replacement

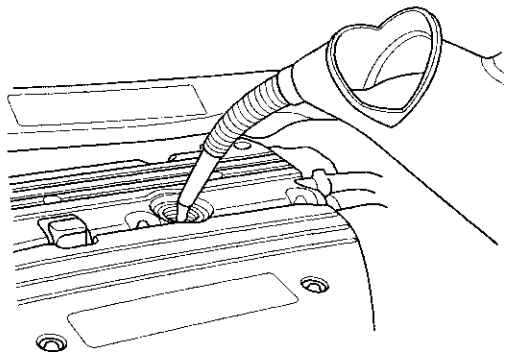
1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



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

Capacity ('08—09 models)
At Oil Change: 4.0 L (4.2 US qt)
At Oil Change Including Filter: 4.2 L (4.4 US qt)
After Engine Overhaul: 5.3 L (5.6 US qt)

Capacity ('10 model)
At Oil Change: 3.8 L (4.0 US qt)
At Oil Change Including Filter: 4.0 L (4.2 US qt)
After Engine Overhaul: 5.1 L (5.4 US qt)



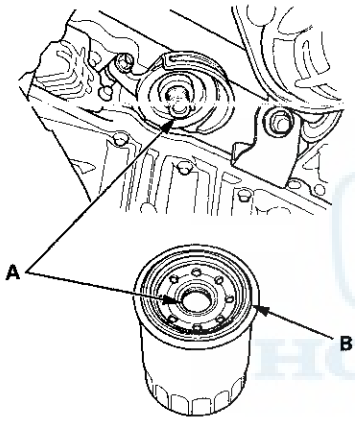
5. Run the engine for more than 3 minutes, then check for oil leakage.
6. If the maintenance minder reguired engine oil replacement, reset the maintenance minder (see page 3-4), and this procedure is complete. If the maintenance minder did not reguire engine oil replacement, go to step 7.
7. Turn the ignition switch to LOCK (0).
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).
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 11-181).
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 automatic transmission fluid (ATF) at the same time with the engine oil, select RESETTING THE ENGINE OIL LIFE AND ATF with the HDS instead.

Engine Oil Filter Replacement

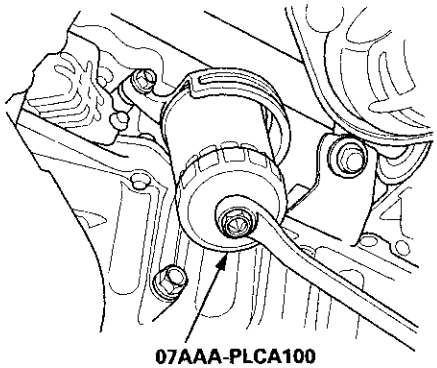
Special Tools Required
Oil Filter Wrench 07AAA-PLCA100

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 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.

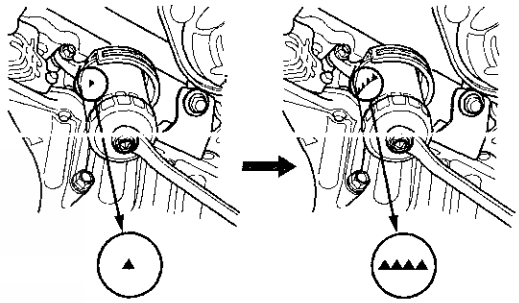


5. Install the oil filter by hand.
6. After the rubber seal seats, tighten the oil filter clockwise with the oil filter wrench.

Tighten: **3/4 Turn Clockwise**
Tightening Torque: **12 N·m (1.2 kgf·m, 8.7 lbf·ft)**



7. If four numbers or marks (1 to 4 or ▼ to ▼▼▼▼) are printed around the outside of the filter, 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 number 2 is at the bottom when the seal is seated, tighten the filter until the number 1 comes around the bottom.



Number when rubber seal is seated.

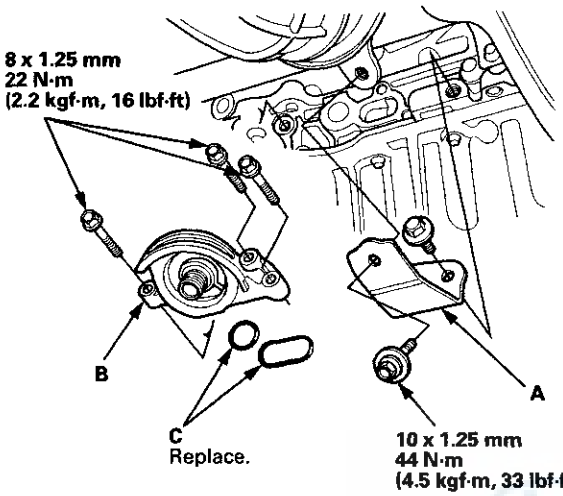
Number after tightening.

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 step 4 on page 8-11) then, run the engine for more than 3 minutes, then check for oil leaks.

Oil Filter Base Replacement

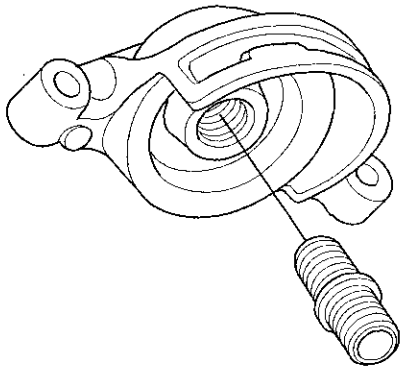
1. Remove the oil filter (see page 8-12).
2. Remove the exhaust pipe bracket (A), then remove the oil filter base (B).



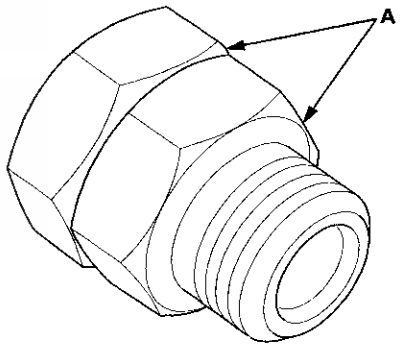
3. Clean the O-ring grooves and the mating surface with the oil filter base.
4. Install the oil filter base with new O-rings (C).
5. Install the oil filter (see page 8-12).

Oil Filter Feed Pipe Replacement

1. Remove the oil filter base (see page 8-13).
2. Remove the oil filter feed pipe.



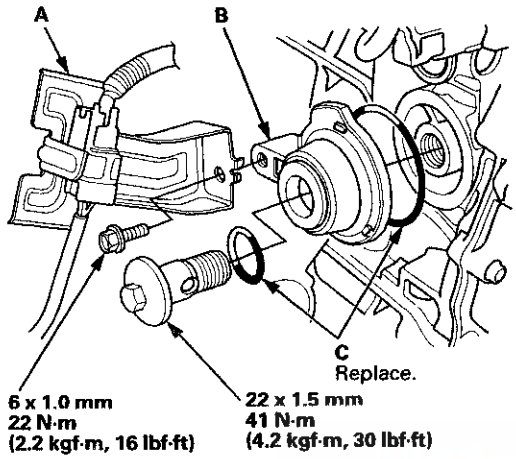
3. Install the two 20 x 1.5 mm nuts (A) onto the new oil filter feed pipe. Hold one nut with a wrench, then use a second wrench to tighten the other nut.



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

Engine Oil Gallery Cap Replacement

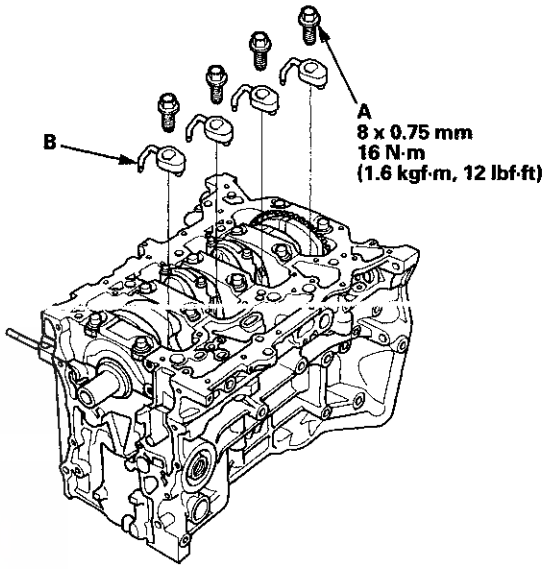
1. Remove the harness bracket (A), then remove the engine oil gallery cap (B).



2. Clean the O-ring groove and mating surface with the engine oil gallery cap.
3. Apply new engine oil to new O-rings (C). Install the engine oil gallery cap with O-rings, then install the harness bracket.

Oil Jet Replacement

1. Remove the oil pump (see page 8-17).
2. Remove the baffle plate (see step 8 on page 7-14).
3. Remove the oil jet bolts (A), then remove the oil jets (B).

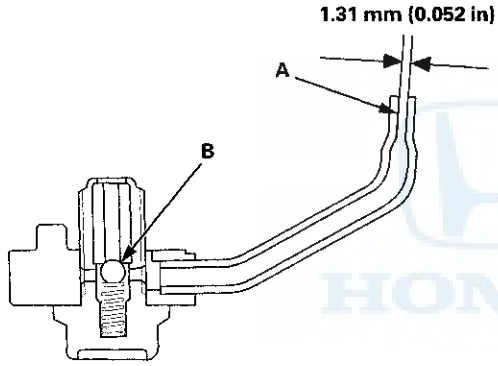


4. Carefully install the oil jets, and tighten the oil jet bolts.
5. Install the baffle plate (see step 25 on page 7-29).
6. Install the oil pump (see page 8-23).

Oil Jet Inspection

1. Remove the oil jet (see page 8-14), and inspect it as follows.
   - Make sure that a 1.2 mm (0.05 in) diameter drill will go through the nozzle hole (A) (1.31 mm (0.052 in) diameter).
   - Insert the other end of a 1.9 mm (0.07 in) drill into the oil intake (2.0 mm (0.079 in) diameter). Make sure the check ball (B) moves smoothly and has a stroke of about 2.0 mm (0.079 in).
   - Check the oil jet operation with an air nozzle. It should take at least 325 kPa (3.9 kgf/cm^2, 47psi) to unseat the check ball.

   NOTE: Replace the oil jet assembly, if the nozzle is damaged or bent.

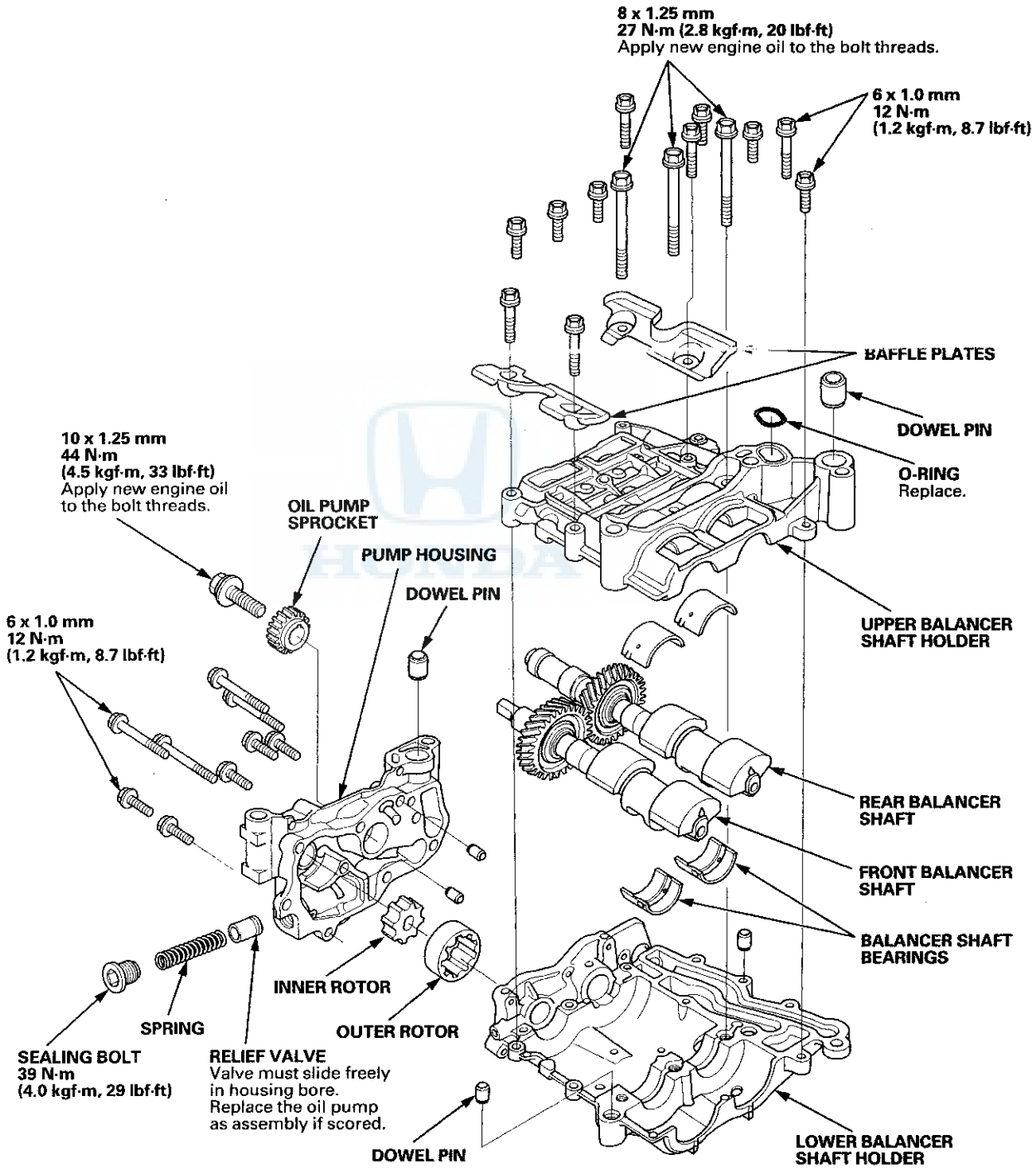


2. Carefully install the oil jet. The mounting torque is critical.

   Specified Torque: 16 N·m (1.6 kgf·m, 12 lbf·ft)

Oil Pump Overhaul

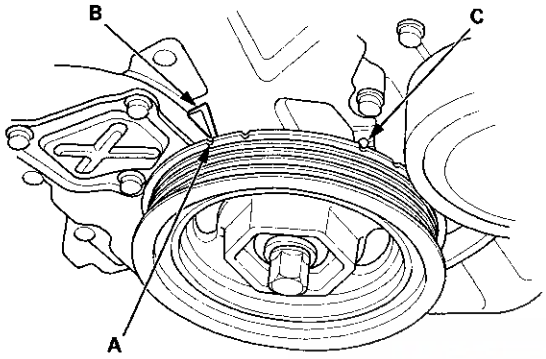
Exploded View



Oil Pump Removal

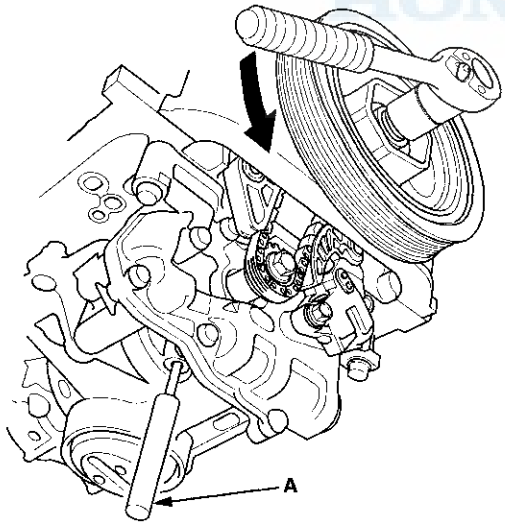
1. Turn the crankshaft pulley so its top dead center (TDC) mark (A) lines up with the pointer (B).

   NOTE: The other pointer (C) is not used.



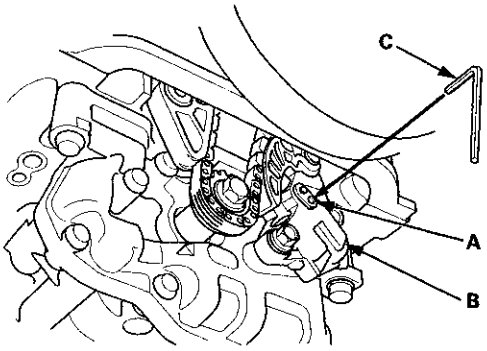
2. Remove the oil pan (see page 7-11).

3. To hold the rear balancer shaft, insert a 6 mm long pin punch (A) (Snap-on PPC108LA or equivalent) into the maintenance hole in the balancer shaft holder and through the rear balancer shaft.

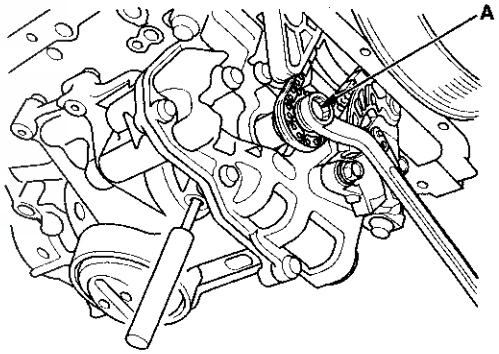


4. Turn the crankshaft counterclockwise to compress the oil pump chain auto-tensioner.

5. Align the holes on the lock (A) and the oil pump chain auto-tensioner (B), then insert a 3.0 mm (0.12 in) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.



6. Loosen the oil pump sprocket mounting bolt (A).



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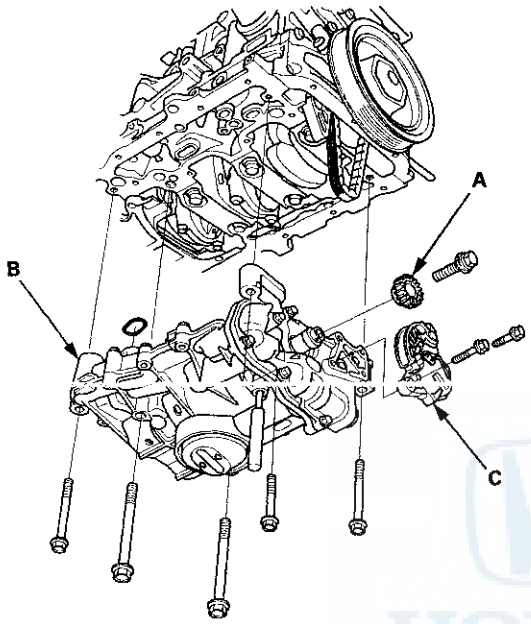
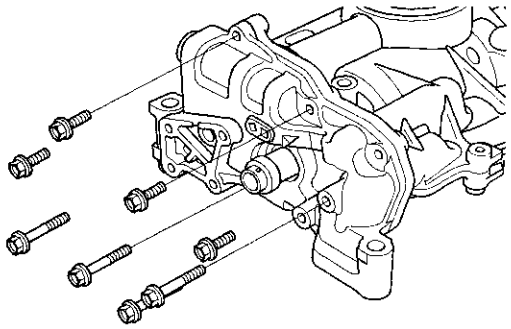
Oil Pump Overhaul (cont'd)

7. Remove the oil pump sprocket (A) and the oil pump (B), then remove the oil pump chain auto-tensioner (C).



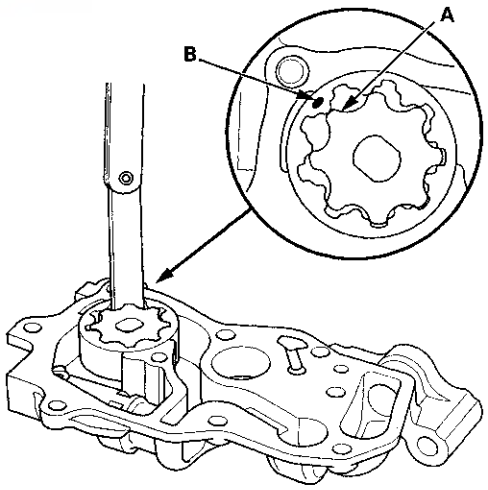
Oil Pump Inspection

1. Remove the pump housing.



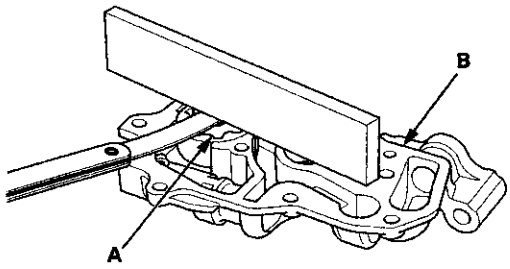
2. Align the inner rotor tooth (A) with the mark (B) on the outer rotor, then check the inner-to-outer rotor radial clearance between the inner rotor and the outer rotor. If the inner-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.050—0.150 mm (0.0020—0.0059 in)
Service Limit: 0.19 mm (0.007 in)



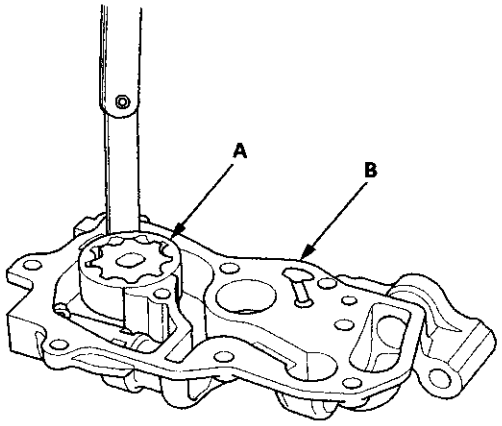
3. Check the pump housing-to-rotor axial clearance between the rotor (A) and the pump housing (B). If the pump housing-to-rotor axial clearance exceeds the service limit, replace the oil pump.

Pump Housing-to-Rotor Axial Clearance
Standard (New): 0.035—0.070 mm (0.0014—0.0028 in)
Service Limit: 0.12 mm (0.005 in)



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.

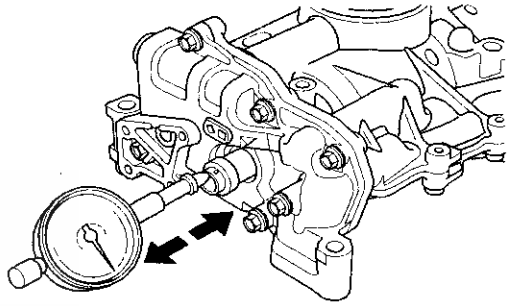
Pump Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.150—0.210 mm (0.0059—0.0083 in)
Service Limit: 0.23 mm (0.009 in)



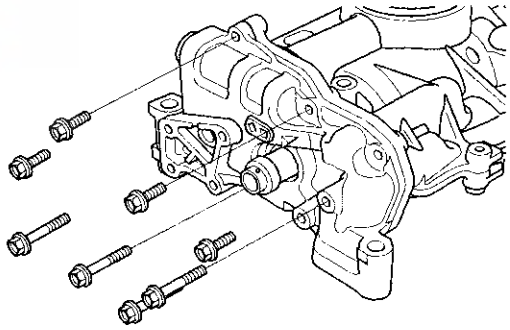
Balancer Shaft Inspection

1. Seat the balancer shaft by pushing it away from the oil pump sprocket end of the oil pump.
2. Zero the dial indicator against the end of the balancer shaft, then push the balancer shaft back and forth and read the end play.

Balancer Shaft End Play
Front Balancer Shaft:
Standard (New): 0.063—0.108 mm (0.0025—0.0043 in)
Service Limit: 0.14 mm (0.006 in)



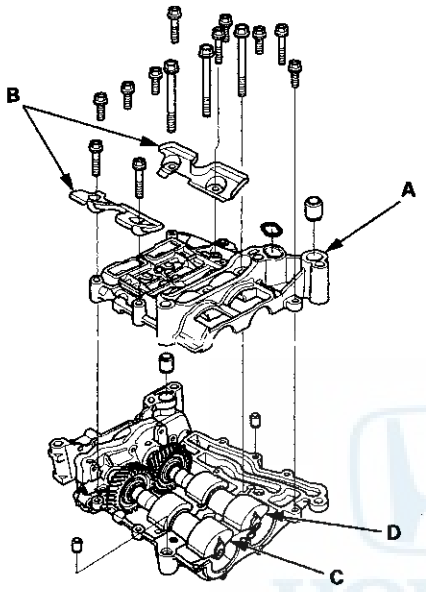
3. Remove the pump housing.



(cont'd)

Oil Pump Overhaul (cont'd)

4. Remove the upper balancer shaft holder (with bearings) (A) and the baffle plates (B), then remove the front balancer shaft (C) and the rear balancer shaft (D).

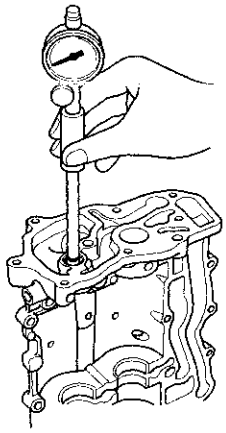


5. Measure the inner diameter of the No. 1 bearing for the front balancer shaft hole and the No. 2 bearing for the rear balancer shaft hole.

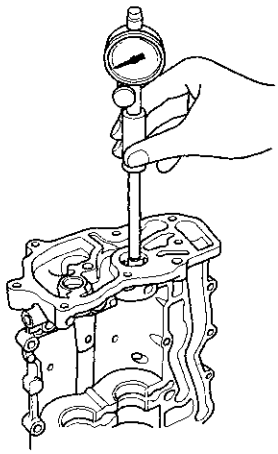
Bearing Inner Diameter

Front:	
Standard (New):	**20.000—20.020 mm (0.7874—0.7882 in)**
Service Limit:	**20.03 mm (0.789 in)**
Rear:	
Standard (New):	**24.000—24.020 mm (0.9449—0.9457 in)**
Service Limit:	**24.03 mm (0.946 in)**

Front



Rear

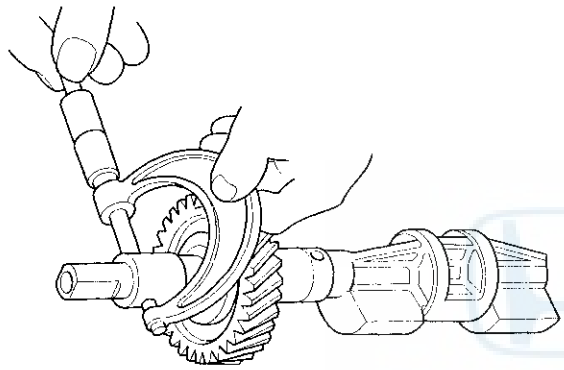


6. Measure the diameters of the No. 1 journal on the front balancer shaft and the No. 2 journal on the rear balancer shaft.

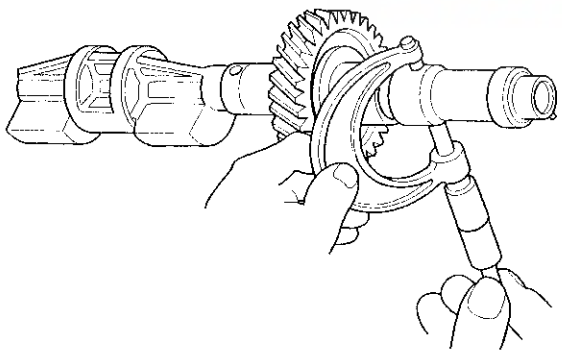
Journal Diameter

Front:	
Standard (New):	**19.938—19.950 mm (0.7850—0.7854 in)**
Service Limit:	**19.92 mm (0.784 in)**
Rear:	
Standard (New):	**23.938—23.950 mm (0.9424—0.9429 in)**
Service Limit:	**23.92 mm (0.942 in)**

Front

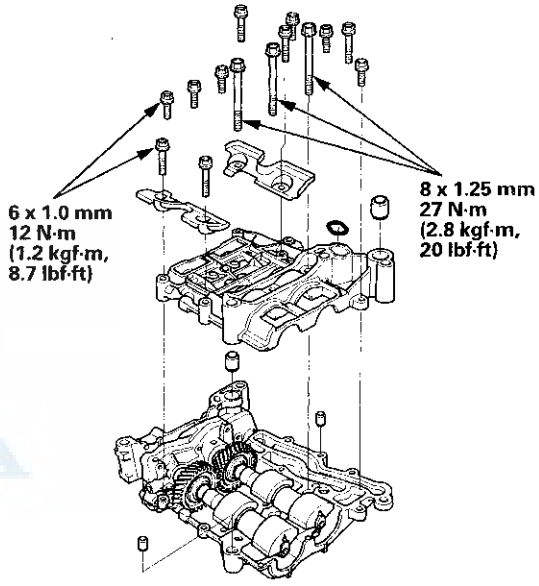


Rear



7. Clean the front balancer shaft No. 2 journal, the rear barancer shaft No. 3 journal and the bearing halves with a clean shop towel, then place both balancer shafts into the balancer holder.
8. Place one strip of plastigage across the No. 2 journal and the No. 3 journals.
9. Reinstall the bearings and the upper balancer shaft holder, then tighten the bolts.

   NOTE: Do not rotate the balancer shafts during inspection.



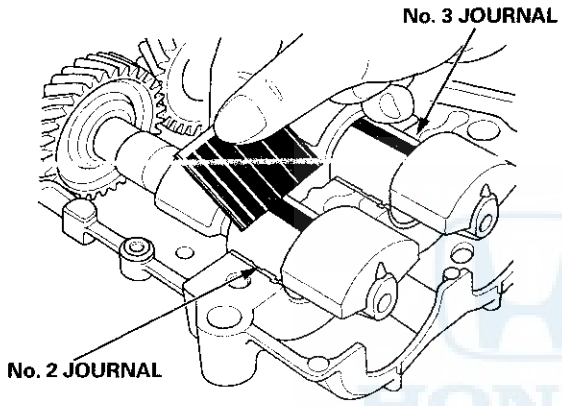
(cont'd)

Oil Pump Overhaul (cont'd)

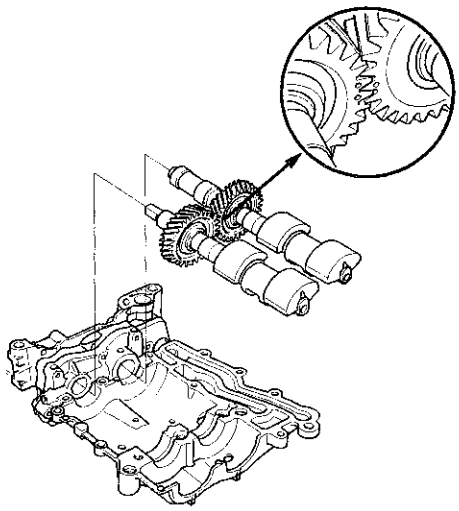
10. Remove the upper balancer shaft holder and the bearings again, and measure the widest part with the plastigage. If the front balancer shaft No. 2 and/or the rear balancer shaft No. 3 journals oil clearance is out-of-tolerance, install new bearings, and recheck. If it is still out-of-tolerance, replace the balancer shafts.

Front No. 2 and Rear No. 3 Journals Oil Clearance

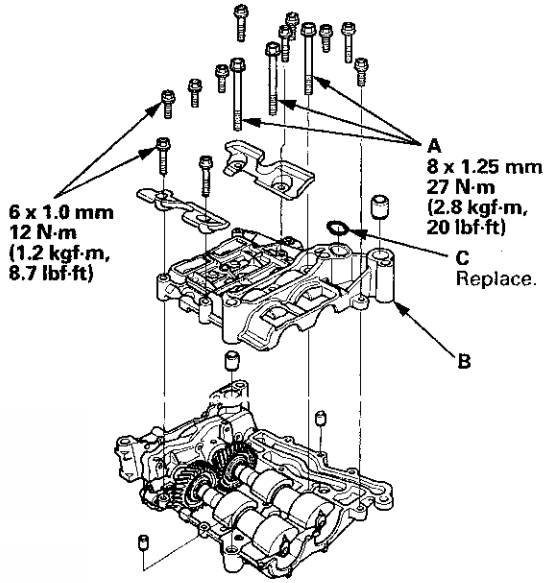
Standard (New):	**0.060—0.120 mm (0.0024—0.0047 in)**
Service Limit:	**0.15 mm (0.006 in)**



11. Align the punch mark on the rear balancer shaft in the center of the two punch marks on the front balancer shaft, then install the balancer shafts on the lower balancer shaft holder.

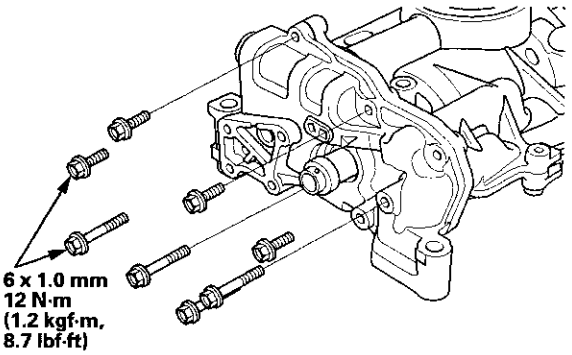


12. Apply new engine oil to the threads of the 8 mm bolts (A).



13. Install the upper balancer shaft holder (B) with a new O-ring (C).

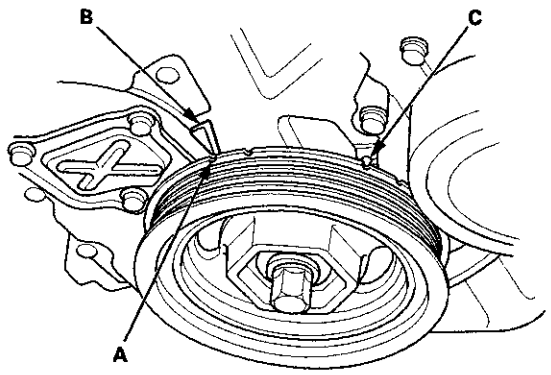
14. Install the pump housing.



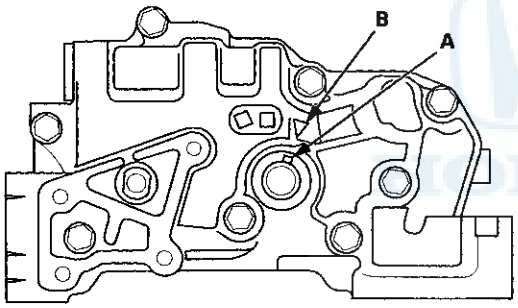
Oil Pump Installation

1. Make sure the No. 1 piston top dead center (TDC) mark (A) lines up with the pointer (B).

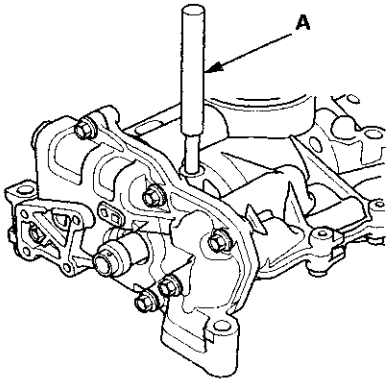
   NOTE: The other pointer (C) is not used.



2. Align the dowel pin (A) on the rear balancer shaft with the mark (B) on the oil pump.

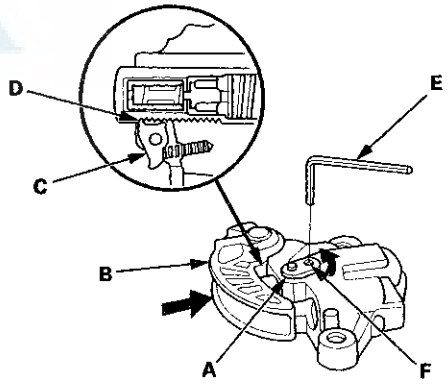


3. To hold the rear balancer shaft, insert a 6 mm long pin punch (A) (Snap-on PPC108LA or equivalent) into the maintenance hole in the balancer shaft holder and through the rear balancer shaft.



4. Turn the plate (A) counterclockwise, to release the lock, then push the oil pump chain auto-tensioner arm (B), and set the first cam (C) to the first edge of the rack (D). Insert a 3.0 mm (0.12 in) diameter pin (E) into the hole (F).

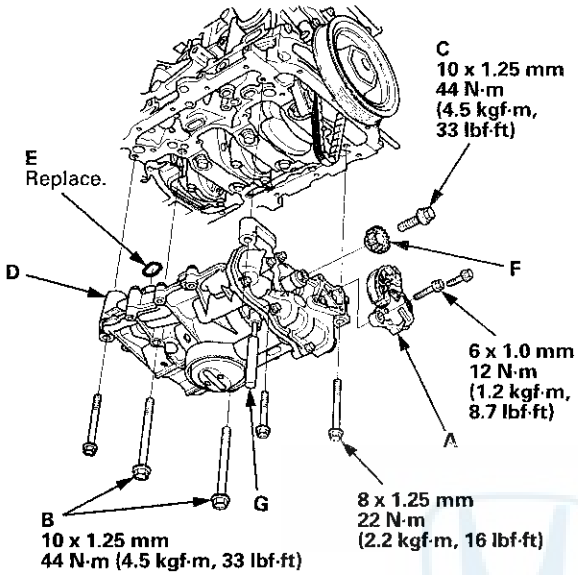
   NOTE: If the chain tensioner is not set up as described, the tensioner will become damaged.



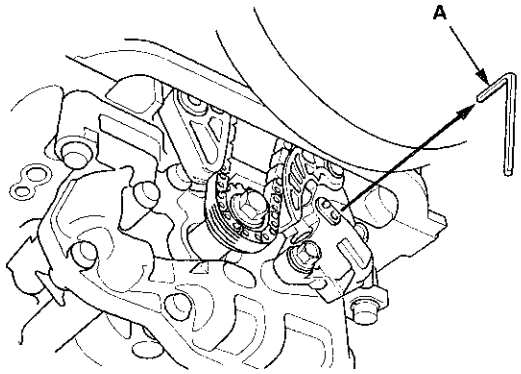
(cont'd)

Oil Pump Overhaul (cont'd)

5. Install the oil pump chain auto-tensioner (A).



6. Apply new engine oil to the threads of the oil pump mounting bolts (B) and the oil pump sprocket mounting bolt (C), then loosely install the oil pump (D) with a new O-ring (E), then install the oil pump sprocket (F).
7. Tighten the oil pump mounting bolts and the oil pump sprocket mounting bolt.
8. Remove the 6 mm pin punch (G).
9. Remove the 3.0 mm (0.12 in) diameter pin (A) from the oil pump chain auto-tensioner.

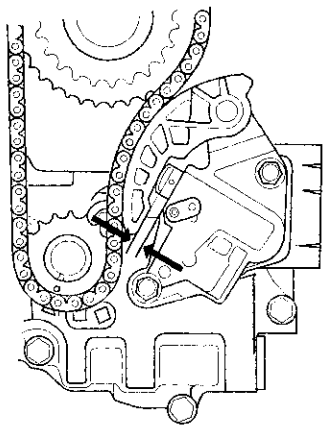


10. Install the oil pan (see page 7-30).

Oil Pump Chain Inspection

1. Remove the oil pan (see page 7-11).
2. Measure the oil pump chain auto-tensioner rod length. If the length is over the service limit, replace the oil pump chain (see page 8-25).

Oil Pump Chain Auto-Tensioner Rod Length
Service Limit: 13 mm (0.51 in)



3. Install the oil pan (see page 7-30).

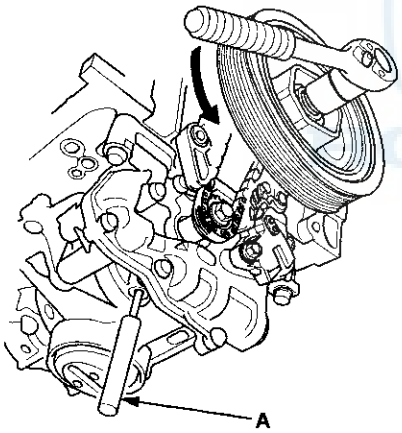
Oil Pump Chain Replacement

NOTE: Keep the oil pump chain away from magnetic fields.

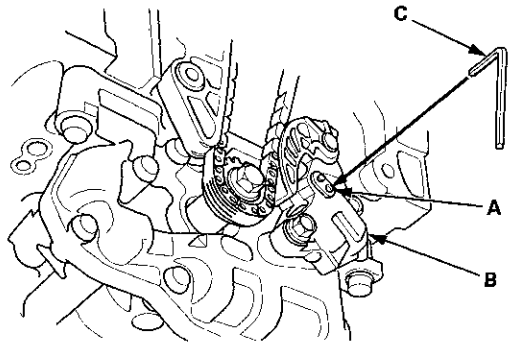
Removal

1. Remove the drive belt (see page 4-30).
2. Remove the oil pan (see page 7-11).
3. Support the engine with a jack and a wood block under the edge of the engine block.

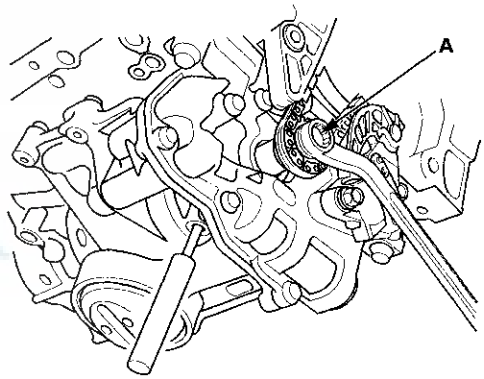
   NOTE: Do not hit the oil pump and baffle plate when placing the jack on the edge of the engine block.
4. Remove the cam chain:
   - All models except PZEV (see page 6-13)
   - PZEV model (see page 6-62)
5. Loosely install the crankshaft pulley.
6. To hold the rear balancer shaft, insert a 6 mm long pin punch (A) (Snap-on PPC108LA or equivalent) into the maintenance hole in the balancer shaft holder and through the rear balancer shaft.



7. Turn the crankshaft counterclockwise to compress the oil pump chain auto-tensioner.
8. Remove the crankshaft pulley.
9. Align the holes on the lock (A) and the oil pump chain auto-tensioner (B), then insert a 3.0 mm (0.12 in) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.



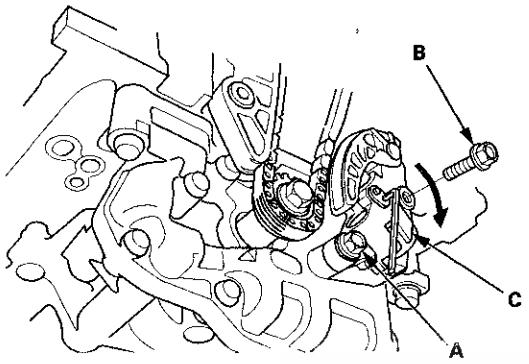
10. Loosen the oil pump sprocket mounting bolt (A).



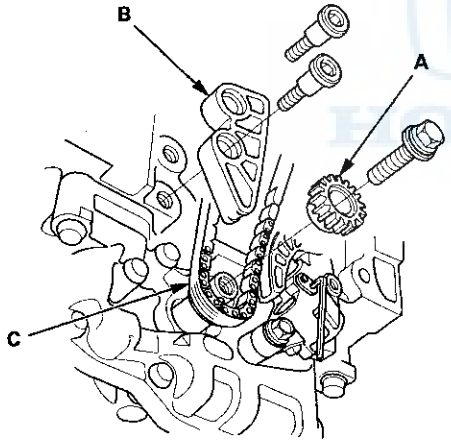
(cont'd)

Oil Pump Chain Replacement (cont'd)

11. Loosen the lower oil pump chain auto-tensioner bolt (A), then remove the upper oil pump chain auto-tensioner bolt (B), then turn the oil pump chain auto-tensioner clockwise (C).



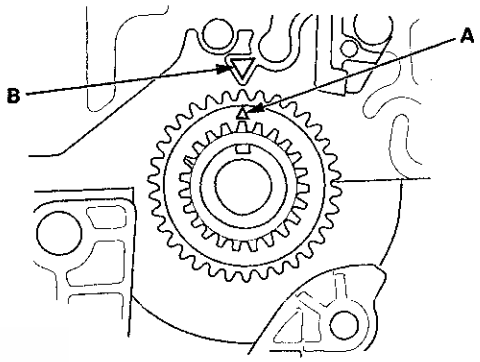
12. Remove the oil pump sprocket (A) and the oil pump chain guide (B).



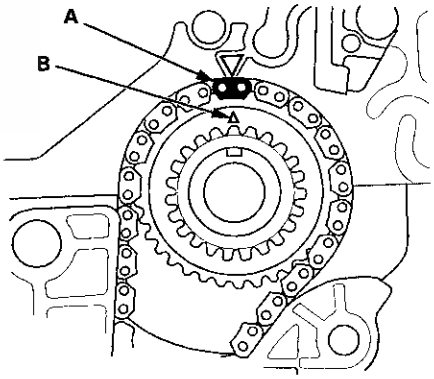
13. Remove the oil pump chain (C).

Installation

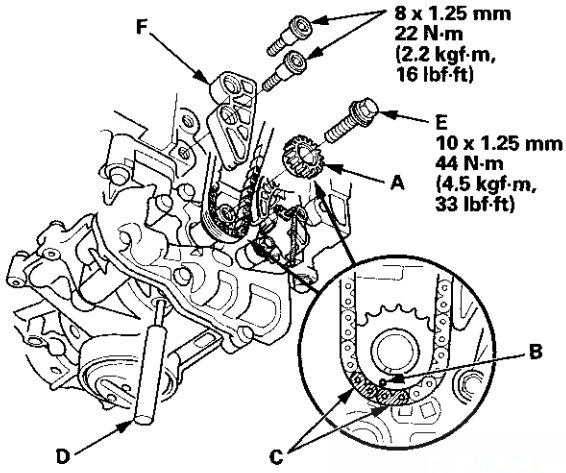
1. Set the crankshaft to top dead center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the engine block.



2. Install the oil pump chain on the crankshaft sprocket with the colored link plate (A) aligned with the TDC mark (B) on the crankshaft sprocket.



3. Set the oil pump chain on the oil pump chain sprocket (A) with the punch mark (B) aligned with the center of the colored link plates (C), then install the oil pump chain sprocket to the oil pump.



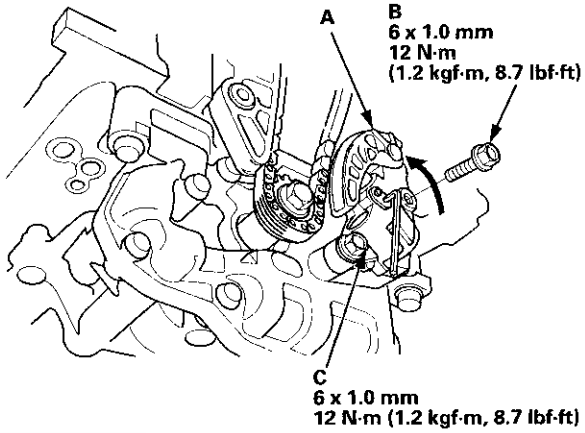
4. To hold the rear balancer shaft, insert a pin driver (D) (Snap-on PPC108LA or equivalent) into the maintenance hole in the balancer shaft holder and through the rear balancer shaft.

5. Apply new engine oil to the threads of the oil pump sprocket mounting bolt (E), then install the oil pump sprocket mounting bolt and the oil pump chain guide (F).

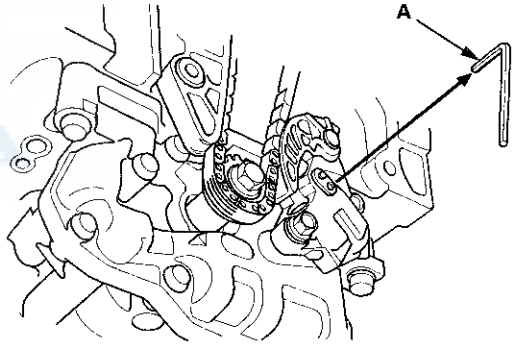
6. Remove the 6 mm long pin punch.

7. Check the auto-tensioner cam position. If the position is not aligned, set the first cam to the first edge of the rack (see step 4 on page 8-23).

8. Turn the oil pump chain auto-tensioner (A) counterclockwise, then install the upper oil pump chain auto-tensioner bolt (B), and tighten the lower oil pump chain auto-tensioner bolt (C).



9. Remove the 3.0 mm (0.12 in) diameter pin (A) from the oil pump chain auto-tensioner.



10. Install the cam chain:
    - All models except PZEV (see page 6-15)
    - PZEV model (see page 6-64)

11. Remove the wood block and the jack.

12. Install the oil pan (see page 7-30).

13. Install the drive belt (see page 4-30).

HONDA