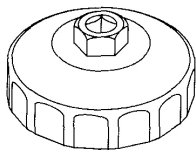


2000-06 ENGINE

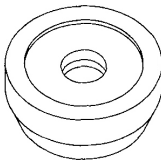
Engine Lubrication - Insight

SPECIAL TOOLS

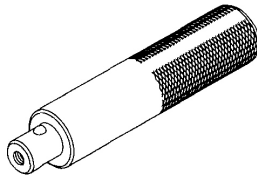
Ref. No.	Tool Number	Description	Qty
①	07HAA-PJ70100	Oil Filter Wrench	1
②	07746-0010400	Attachment, 52 x 55 mm	1
③	07749-0010000	Driver	1



①



②



③

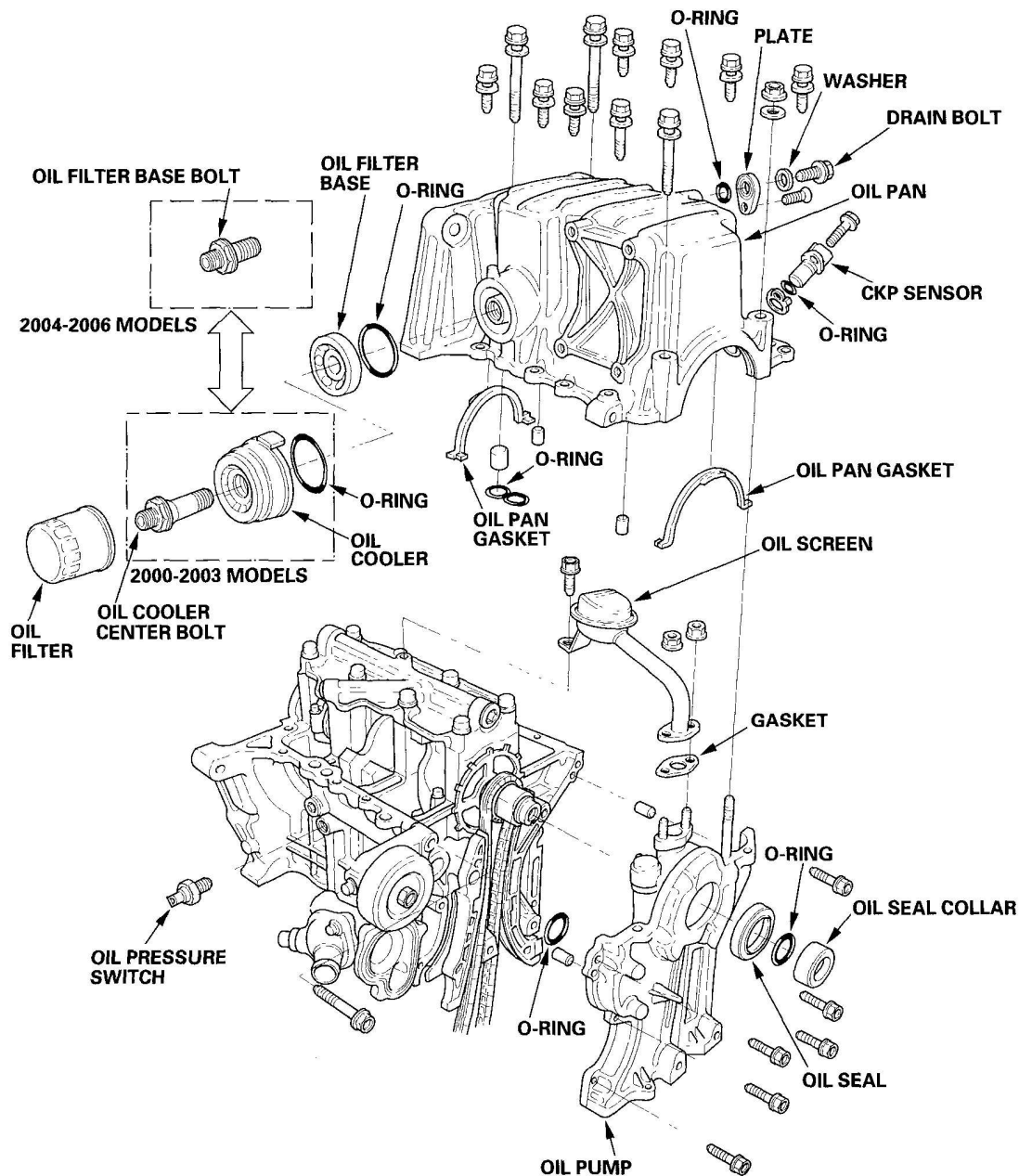
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Fig. 1: Identifying Special Tools
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT LOCATION INDEX

2006 Honda Insight

2000-06 ENGINE Engine Lubrication - Insight



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Fig. 2: Identifying Engine Lubrication Component Location
Courtesy of AMERICAN HONDA MOTOR CO., INC.

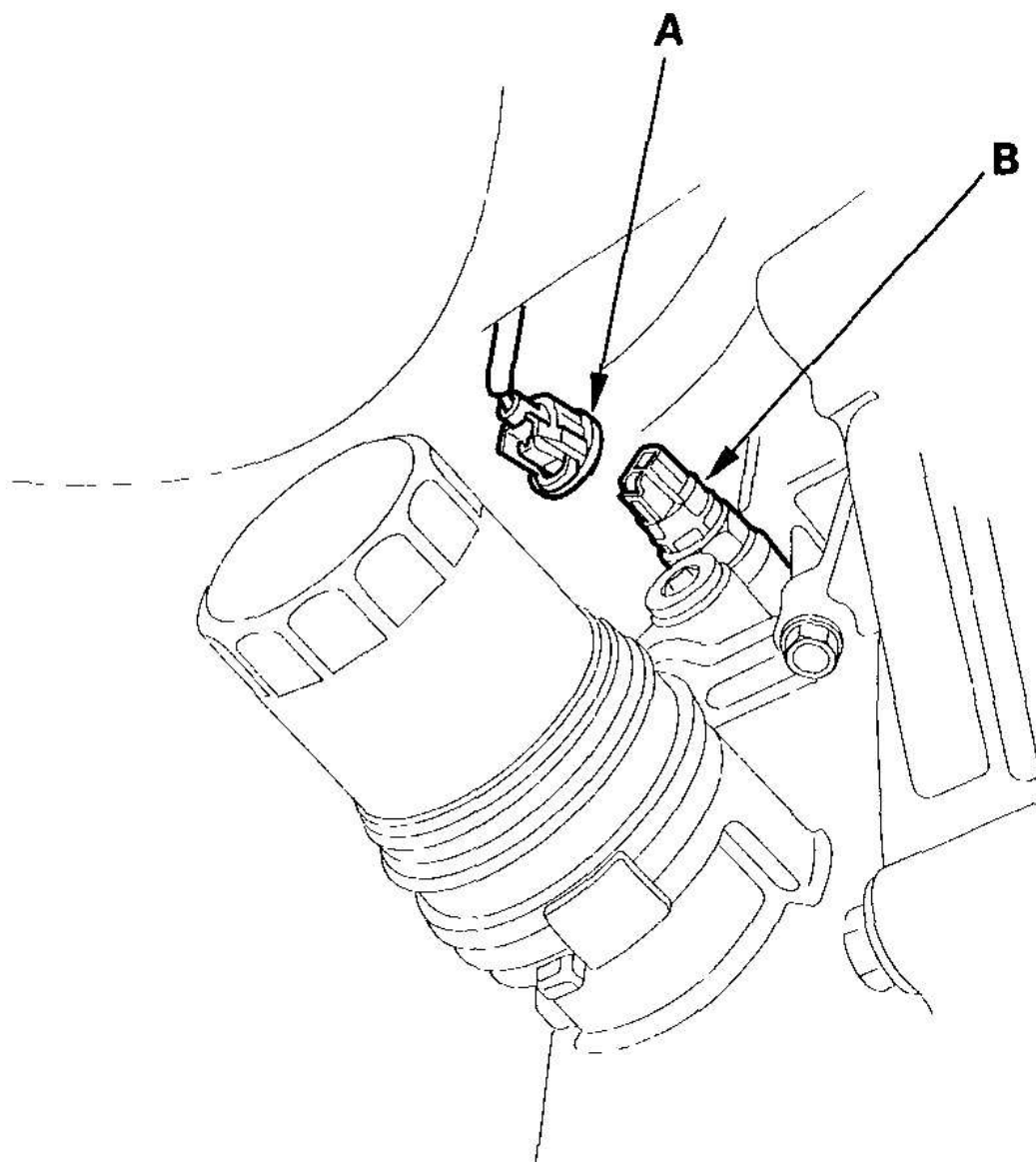
SYMPTOM TROUBLESHOOTING INDEX

TROUBLESHOOTING CHART

Symptom	Diagnostic procedure	Also check for
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Excessive engine oil consumption	<ol style="list-style-type: none"> 1. Check the loose of the engine oil fill cap, oil drain bolt, and oil filter. 2. Check for oil leaks. 3. Check for worn valve guide(s) (see VALVE INSPECTION) or worn valve stem seal(s) (see VALVE INSPECTION). 4. Check for damaged or worn piston ring(s) (see PISTON RING REPLACEMENT). 5. Check for damaged or worn engine internal parts (cylinder wall, pistons, etc.) (see BLOCK AND PISTON INSPECTION). 	
Low oil pressure indicator does not come on with the ignition switch ON (II)	Test the oil pressure switch (see OIL PRESSURE SWITCH TEST).	An open in the wire between the gauge assembly and the oil pressure switch
Low oil pressure indicator stays on	<ol style="list-style-type: none"> 1. Check the engine oil level. 2. Test the oil pressure switch (see OIL PRESSURE SWITCH TEST). 3. Check the engine oil pressure (see OIL PRESSURE TEST). 4. Check the oil filter for clogging. 5. Check the oil screen for clogging. 6. Check the relief valve. 7. Test the oil pump (see REMOVAL). 	A wire shorted to ground between the gauge assembly and the oil pressure switch

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



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Fig. 3: Removing Oil Pressure Switch Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

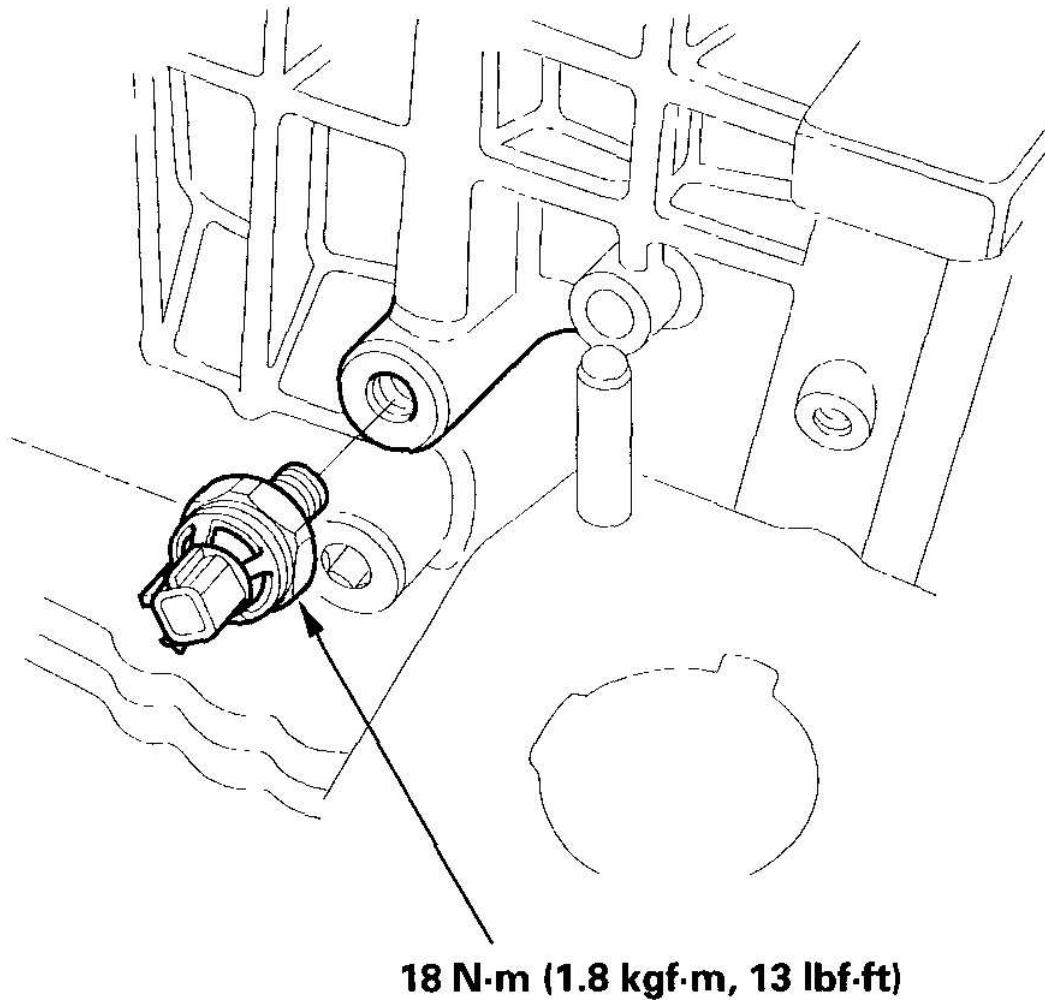
2. Check for continuity between the engine oil pressure switch and the engine (ground). There should be continuity with the engine stopped.

There should be no continuity with the engine running.

3. If the switch fails to operate, check the engine oil level. If the engine oil level is OK, check the engine oil pressure.

OIL PRESSURE SWITCH REPLACEMENT

1. Remove the throttle body (see **THROTTLE BODY REMOVAL/INSTALLATION**).
2. Disconnect the oil pressure switch connector, then remove the oil pressure switch.



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Fig. 4: Removing Oil Pressure Switch

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove any old liquid gasket from the switch and switch mounting hole.
4. Apply a very small amount of liquid gasket to the new 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

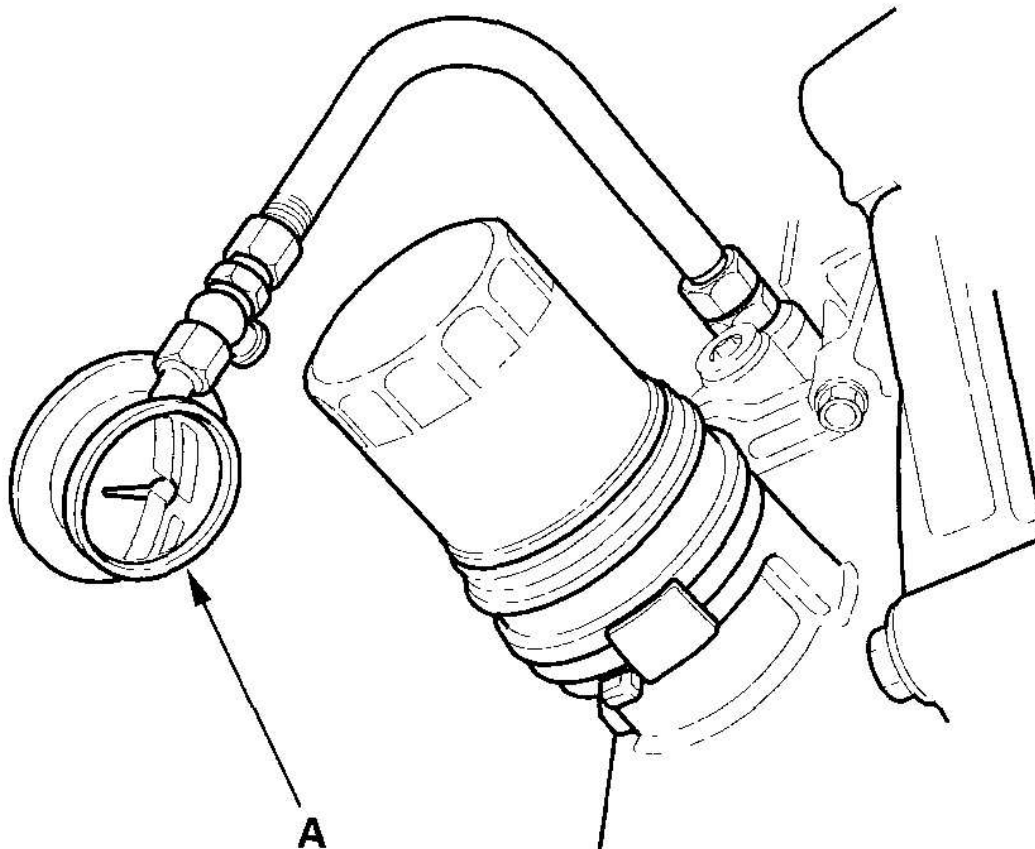
pressure switch.

5. Install the throttle body (see **THROTTLE BODY REMOVAL/INSTALLATION**).

OIL PRESSURE TEST

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

1. Connect a tachometer or Honda Diagnostic System (HDS) (see **IDLE SPEED ADJUSTMENT**).
2. Remove the oil pressure switch (see **OIL PRESSURE SWITCH REPLACEMENT**), then install an oil pressure gauge (A).



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Fig. 5: Installing Oil Pressure Gauge
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the throttle body (see **THROTTLE BODY REMOVAL/INSTALLATION**).
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:

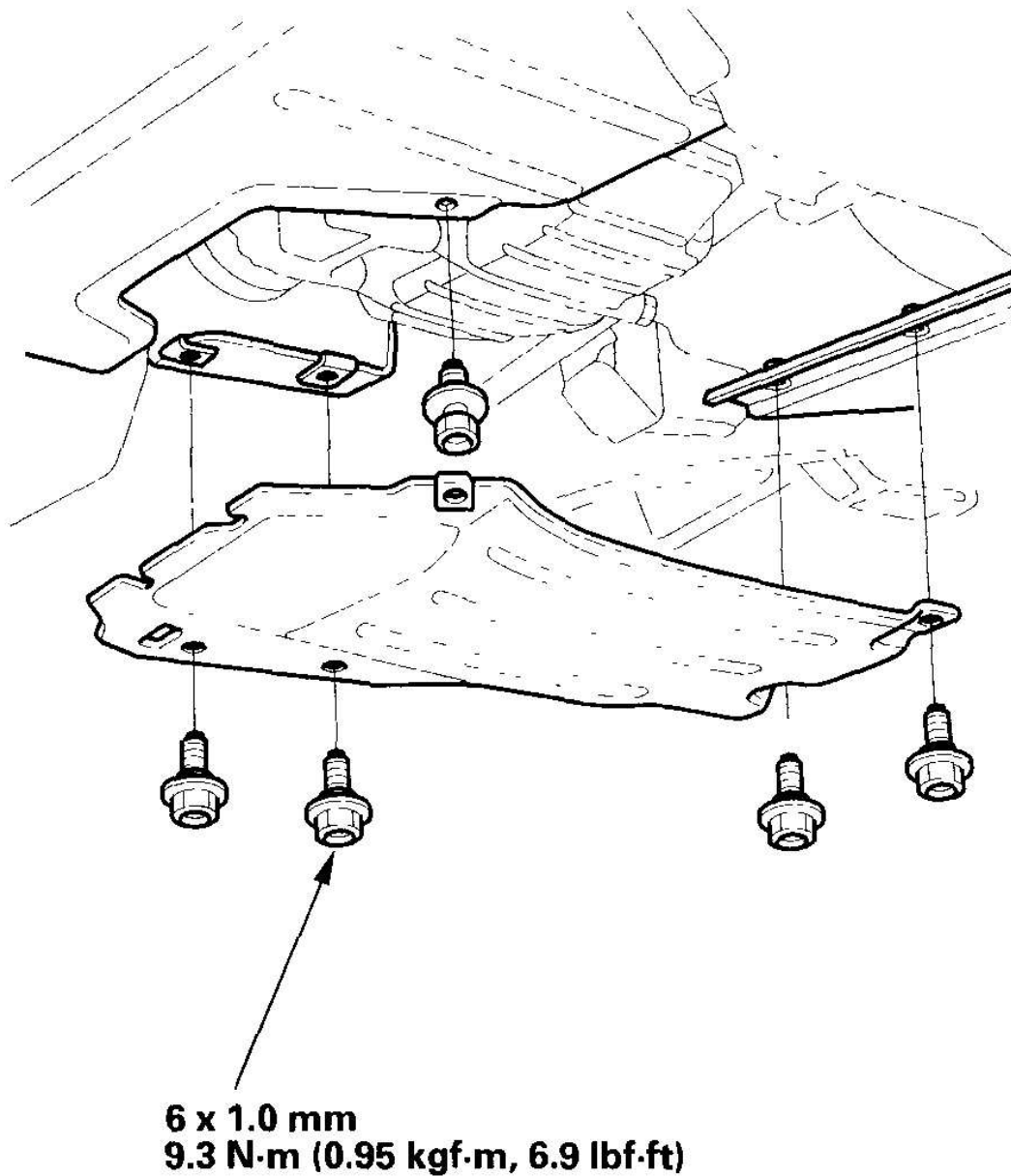
At Idle: 70 kPa (0.7 kgf/cm² , 10 psi) min.

At 3,000 rpm: 340 kPa (3.5 kgf/cm² , 50 psi) min.

6. If oil pressure is not within specifications, inspect the oil pump (see step 2).
7. After inspection, install the oil pressure switch (see **OIL PRESSURE SWITCH REPLACEMENT**).

ENGINE OIL REPLACEMENT

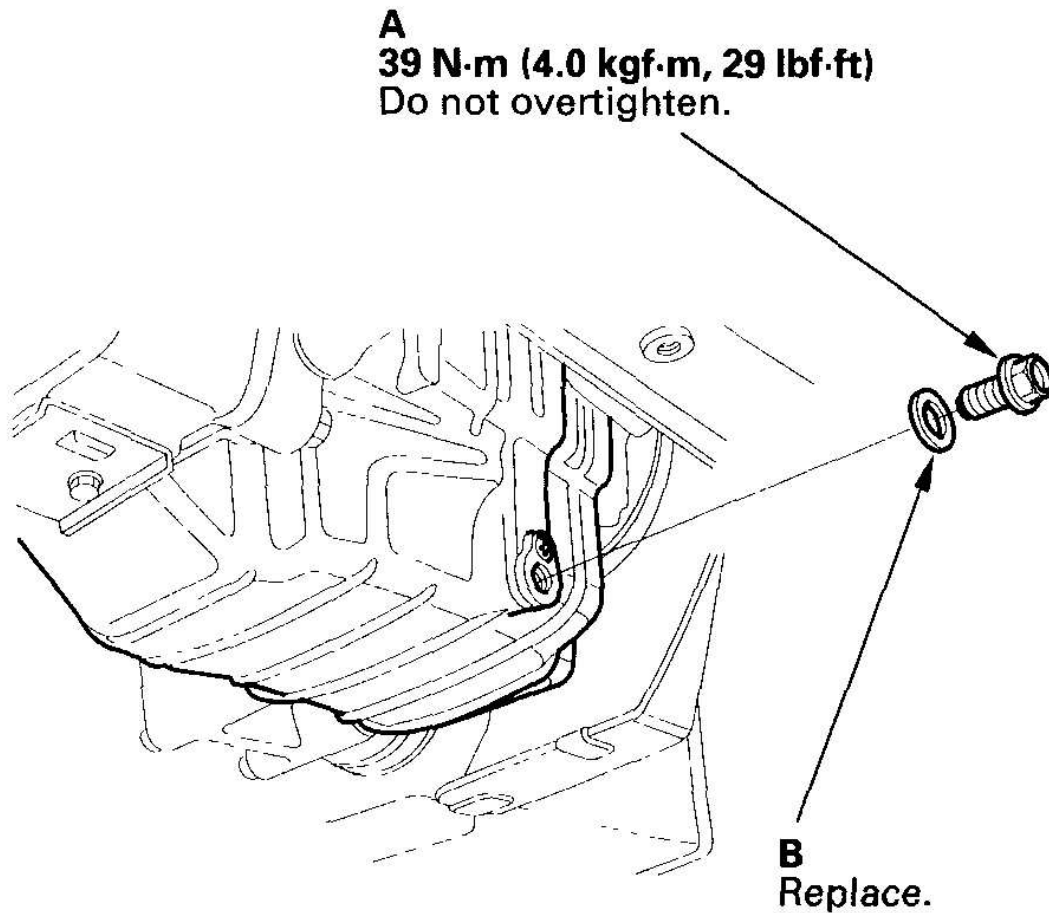
1. Warm up the engine.
2. Remove the right rear splash shield.



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Fig. 6: Removing Right Rear Splash Shield And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the drain bolt (A), and drain the engine oil.



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Fig. 7: Removing Drain Bolt And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Reinstall the drain bolt with a new washer (B).
5. Refill with the recommended oil .

Capacity

At Oil Change:

2.3 L (2.4 US qt)

At Oil Change including Filter:

2.5 L (2.6 US qt)

After Engine Overhaul:

3.0 L (3.2 US qt)

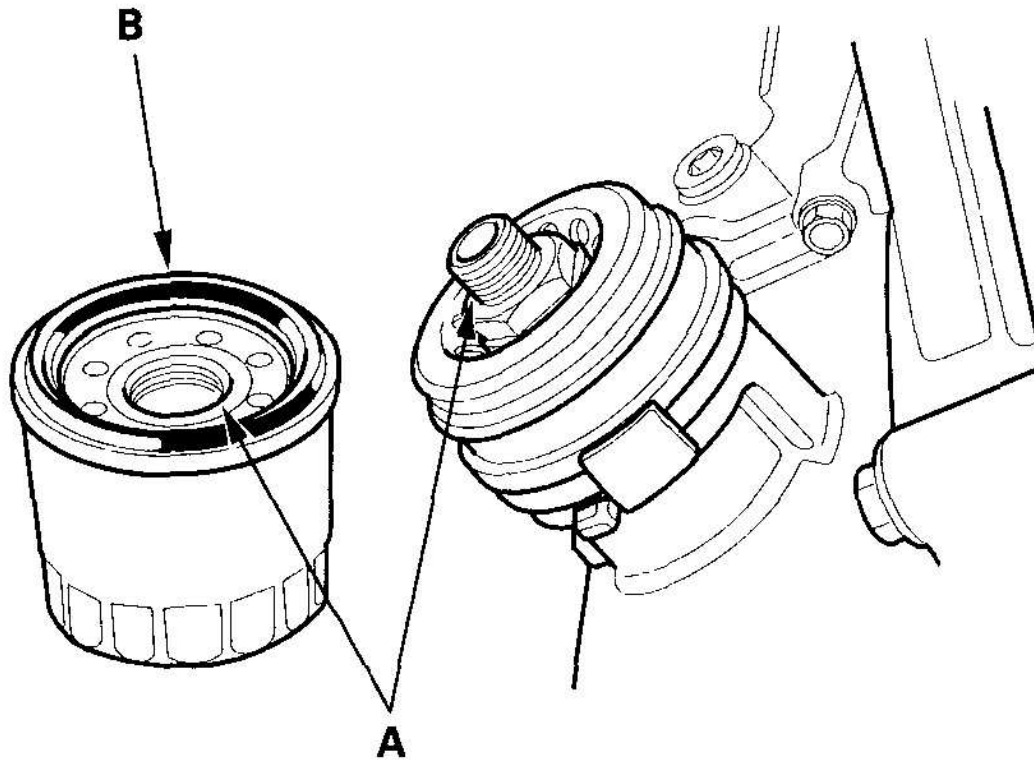
6. Run the engine for more than 3 minutes, then check for oil leakage.

ENGINE OIL FILTER REPLACEMENT

Special Tools Required

Oil filter wrench 07HAA-PJ70100

1. Remove the splash shields (see step 24 on **ENGINE ASSEMBLY**).
2. Remove the oil filter with the special tool.
3. Inspect the threads (A) and 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.



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Fig. 8: Inspecting Threads And Rubber Seal On New Filter
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the oil filter by hand.
5. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: 3/4 Turn Clockwise

Tightening Torque: 12 N.m (1.2 kgf.m, 8.7 lbf.ft)

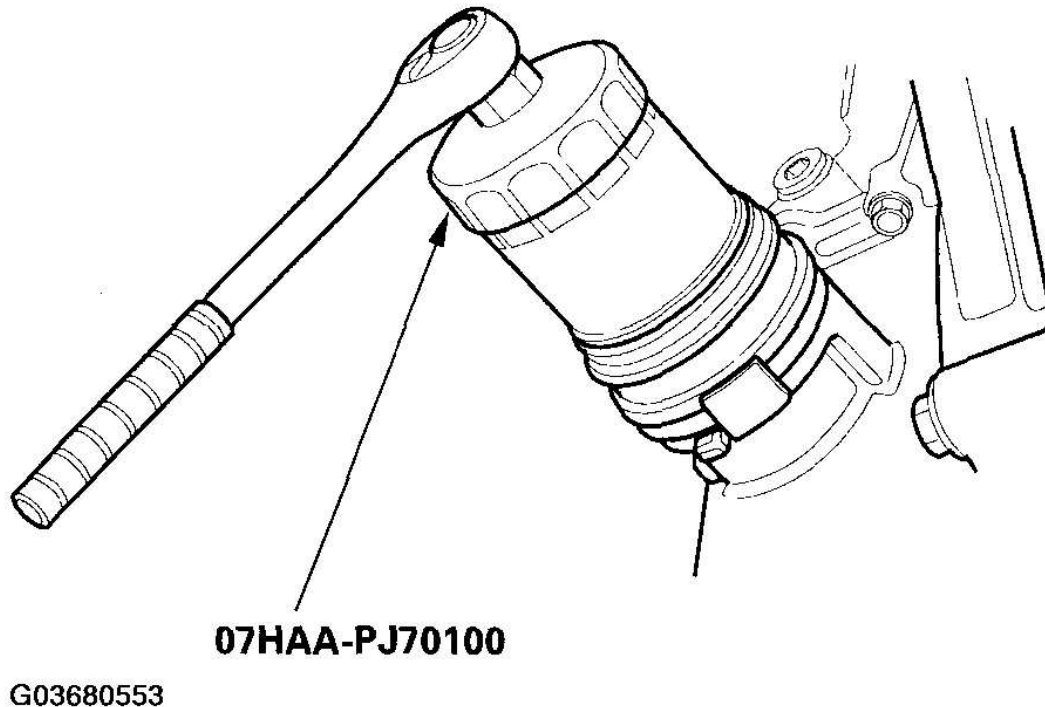
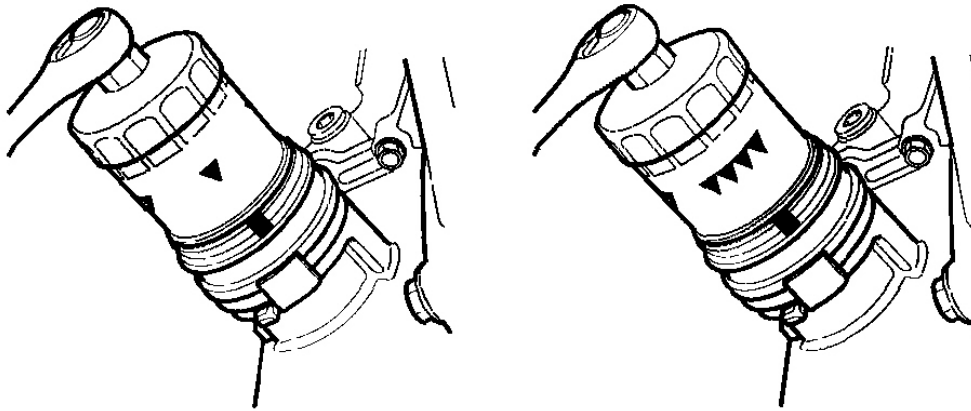


Fig. 9: Tightening Oil Filter Clockwise With Special Tool
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. If four marks (ARROW) 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 engine oil cooler, and note which number is at the bottom.
 - Tighten the filter by turning it clockwise three marks from the one you noted. For example, if the ARROW mark is at the bottom when the seal is seated, tighten the filter until the center of the ARROW mark comes around to the bottom.



Mark when rubber seal is seated.

Mark after tightening.

Mark when rubber seal is seated	▼	▼▼	▼▼▼	▼▼▼▼
Mark after tightening	▼▼▼▼	▼	▼▼	▼▼▼

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Fig. 10: Identifying Mark On Oil Filter

Courtesy of AMERICAN HONDA MOTOR CO., INC.

- After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

OIL COOLER CENTER BOLT/OIL COOLER REPLACEMENT

2000-2003 MODELS

- Remove the oil filter (see **ENGINE OIL FILTER REPLACEMENT**).
- Remove the oil cooler center bolt (A), oil cooler (B), and oil filter base (C).

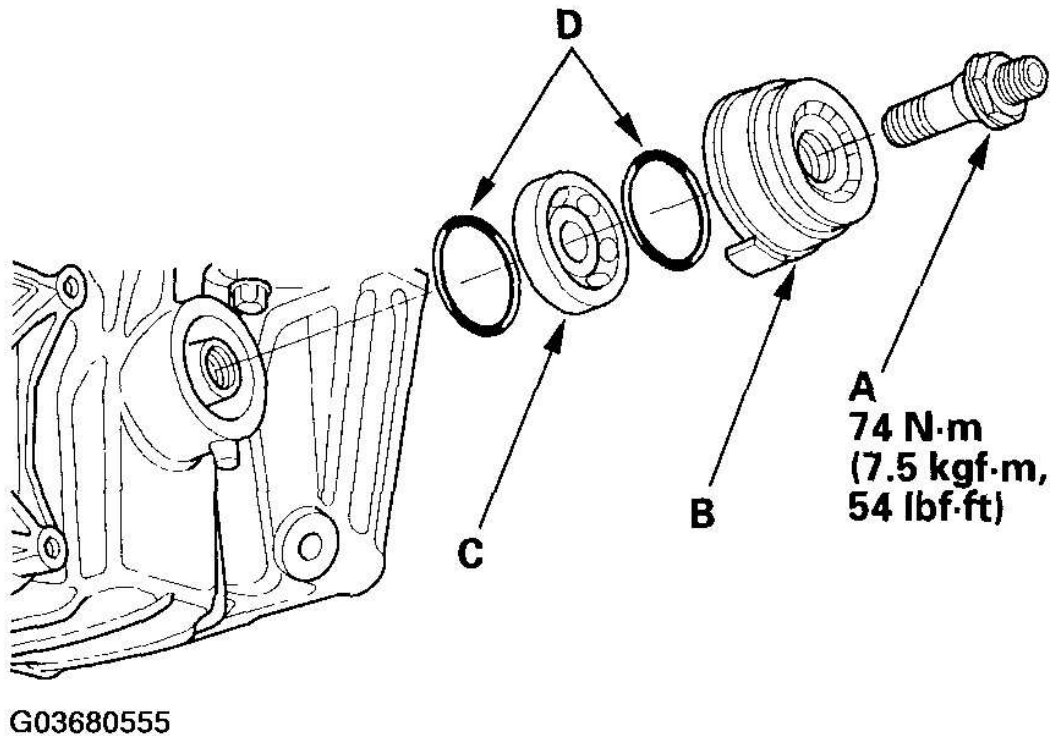


Fig. 11: Removing Oil Cooler Center Bolt, Oil Cooler, And Oil Filter Base (2000-2003 Models)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Apply new engine oil to new O-rings (D).
4. Install the oil filter base and oil cooler using the O-rings. Tighten the oil cooler center bolt to the engine block.
5. Install the new oil filter (see **ENGINE OIL FILTER REPLACEMENT**).

OIL FILTER BASE BOLT REPLACEMENT

2004-06 MODELS

1. Remove the oil filter (see **ENGINE OIL FILTER REPLACEMENT**).
2. Remove the oil filter base bolt (A) and oil filter base (B).

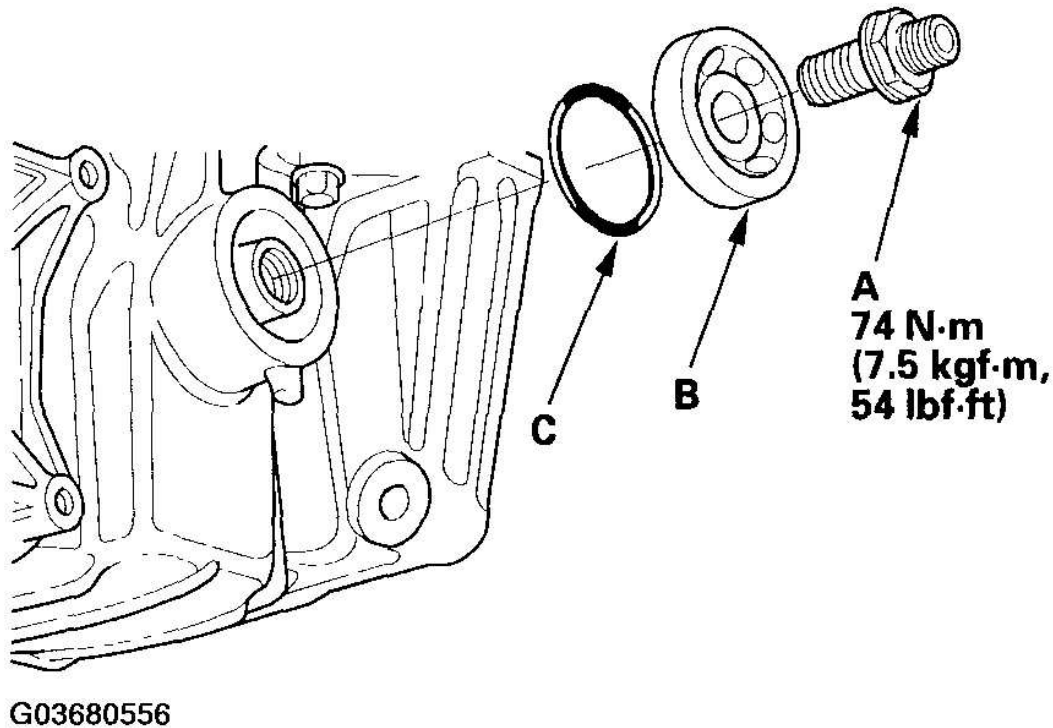


Fig. 12: Removing Oil Filter Base Bolt And Oil Filter Base (2004-06 Models)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

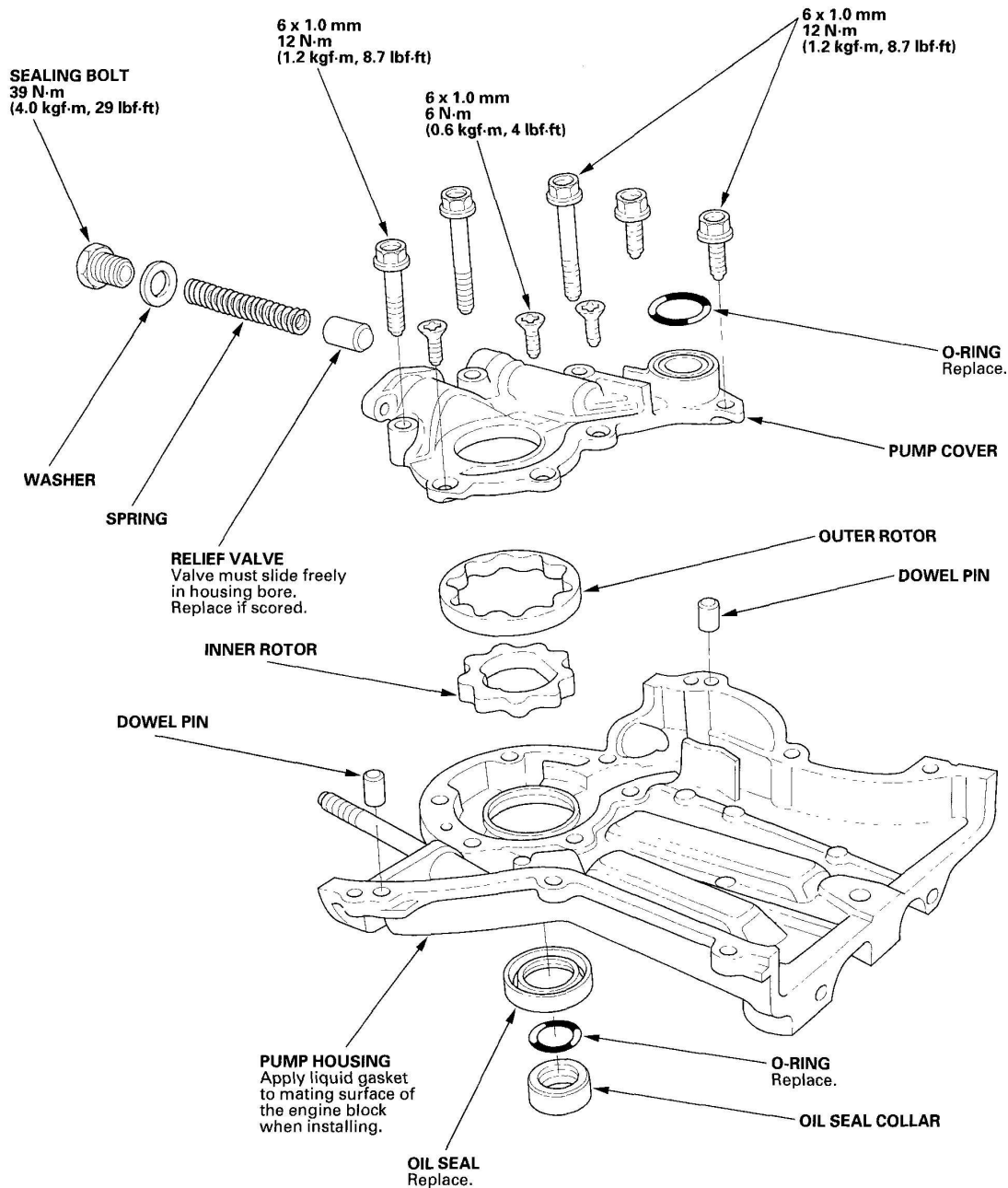
3. Apply new engine oil to a new O-ring (C).
4. Install the oil filter base using the O-ring. Tighten the oil filter base bolt to the engine block.
5. Install the new oil filter (see **ENGINE OIL FILTER REPLACEMENT**).

OIL PUMP OVERHAUL

EXPLODED VIEW

2006 Honda Insight

2000-06 ENGINE Engine Lubrication - Insight



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Fig. 13: Exploded View Of Oil Pump
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver 07749-0010000

- Attachment, 52 x 55 mm 07746-0010400

Removal

1. Remove the cam chain (see **CAM CHAIN REMOVAL**).

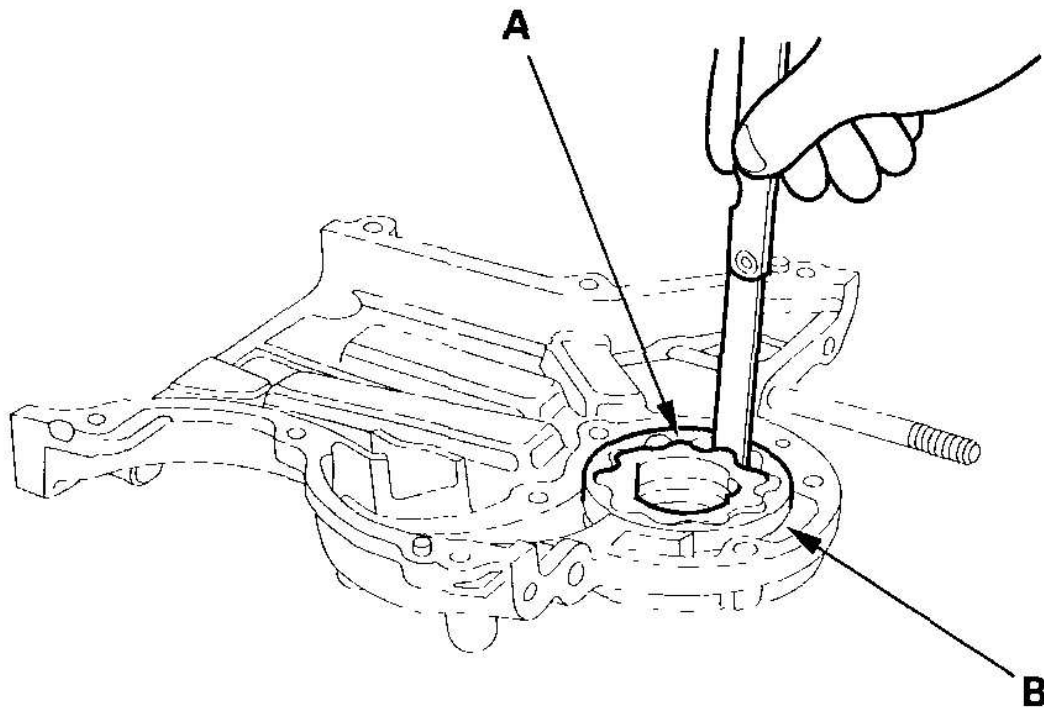
Inspection

2. Remove the pump cover.
3. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and outer rotor (B). 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): 0.02-0.14 mm (0.001-0.006 in.)

Service Limit: 0.18 mm (0.007 in.)



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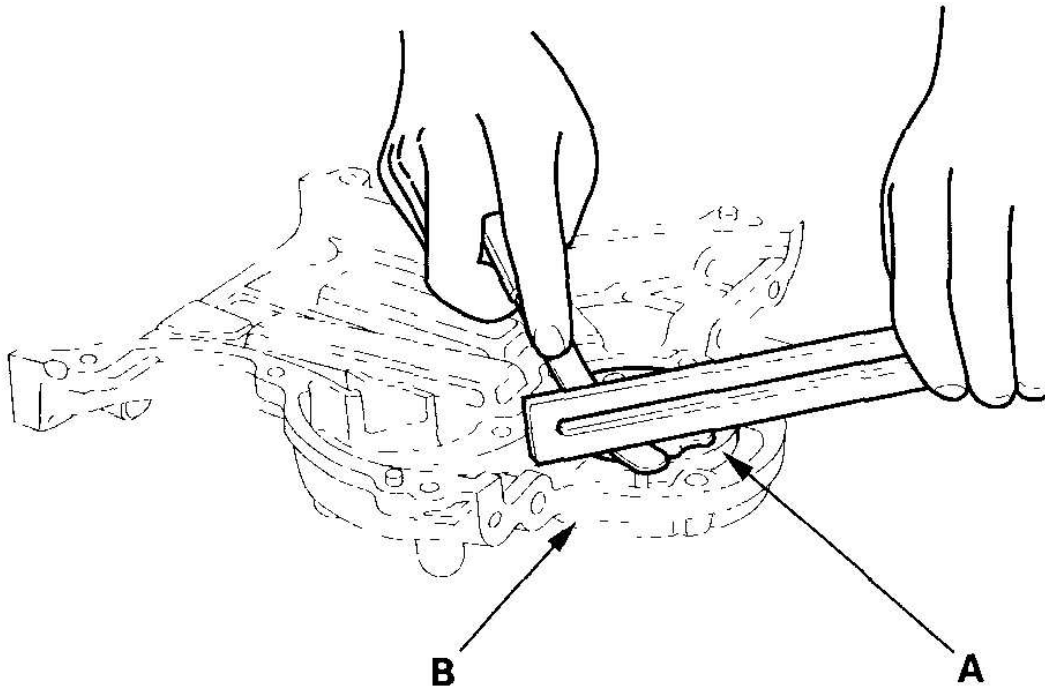
Fig. 14: Checking Clearance Between Inner Rotor And Outer Rotor
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Check the housing-to-rotor axial clearance between the rotor (A) and pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil 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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Fig. 15: Checking Clearance Between Rotor And Pump Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

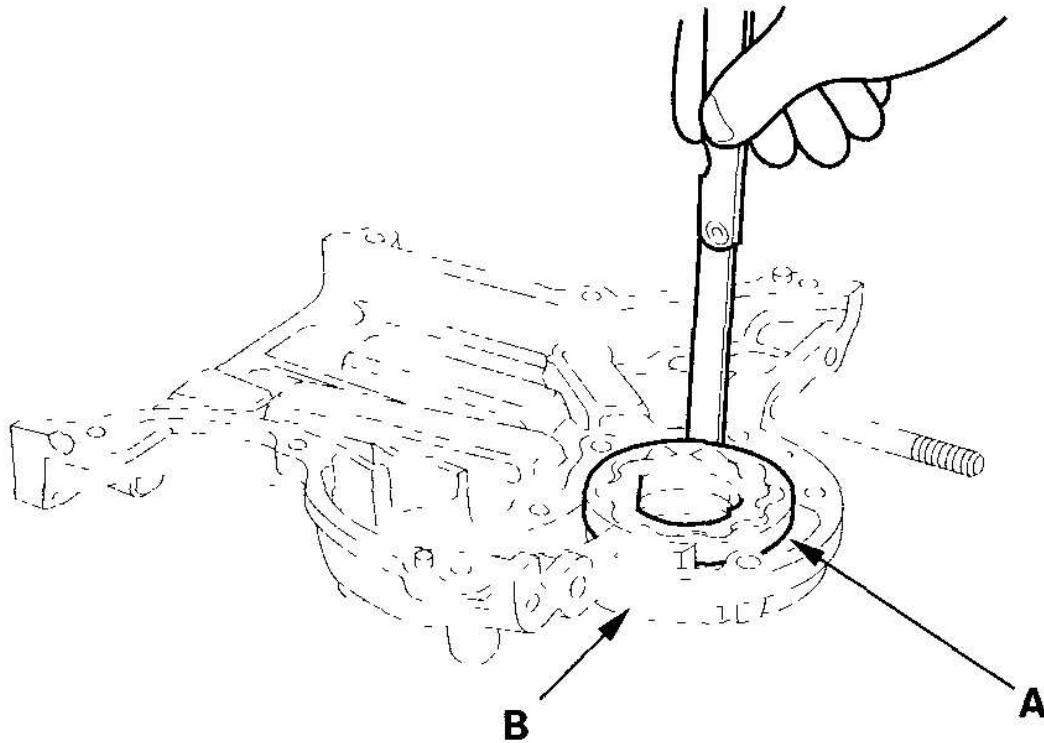
5. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and pump housing (B).

If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Housing-to-Outer Rotor Radial Clearance

Standard (New): 0.100-0.175 mm (0.0039-0.0069 in.)

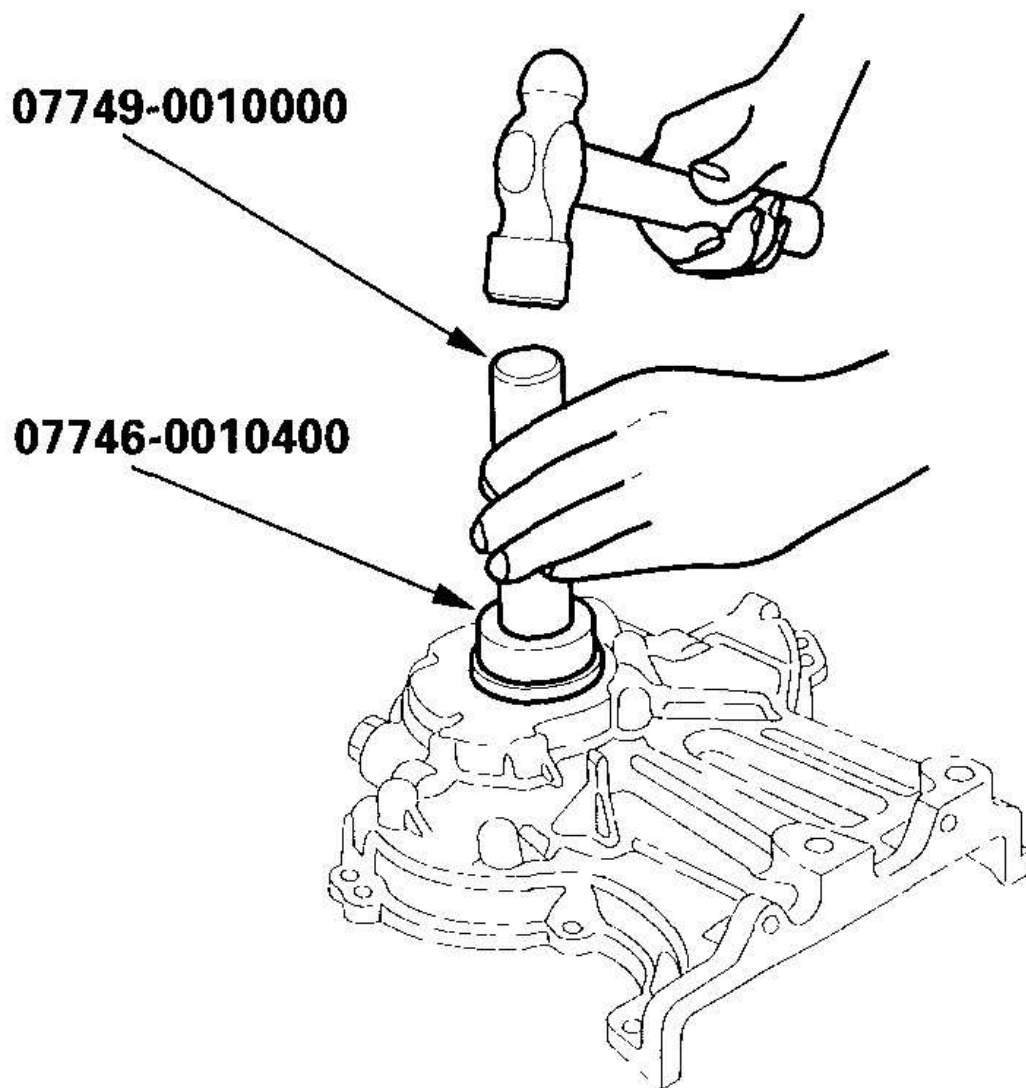
Service Limit: 0.20 mm (0.008 in.)



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Fig. 16: Checking Clearance Between Outer Rotor And Pump Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Inspect both rotors and the pump housing for scoring or other damage. Replace the damaged parts if necessary.
7. Remove the old oil seal from the oil pump.
8. Use the special tools to install a new oil seal. Drive the seal until the special tool bottoms on the oil pump.



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Fig. 17: Installing Oil Seal With Special Tools
Courtesy of AMERICAN HONDA MOTOR CO., INC.

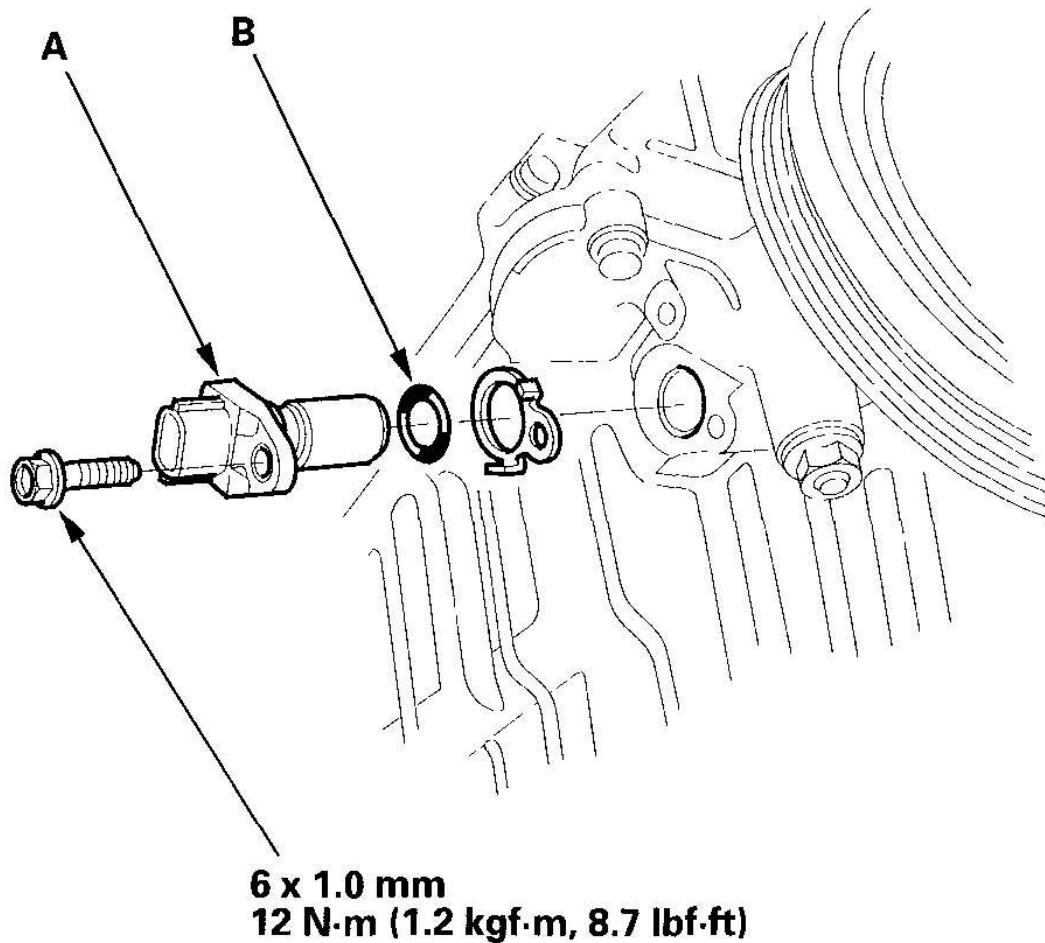
9. Install the oil pump cover.

Installation

10. Install the cam chain (see **CAM CHAIN INSTALLATION**).

CKP SENSOR REPLACEMENT

1. Disconnect the CKP sensor connector, then remove the CKP sensor (A).



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Fig. 18: Removing CKP Sensor And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the new CKP sensor with a new O-ring (B).