

December 19, 2018

Version 9

## Warranty Extension: Sticking Rings Resulting in High Engine Oil Consumption

Supersedes 13-006, *Sticking Rings Resulting in Unusually High Engine Oil Consumption*, dated January 31, 2018; see Revision Summary

### AFFECTED VEHICLES

Year	Model	Trim	VIN Range
2008-11	TSX	ALL	Check the iN VIN status for eligibility.
2011	TSX Sport Wagon	ALL	Check the iN VIN status for eligibility.

### REVISION SUMMARY

The cylinder bore inspection procedure included in the REPAIR PROCEDURE was updated because there is now a special tool available to check for scratches.

### BACKGROUND

American Honda is extending the warranty coverage on the Piston Rings and Pistons for 2009-11 TSX L4 to 8 years from the original date of purchase or 125,000 miles, whichever comes first.

The warranty extension does not apply to any vehicle that has ever been declared a total loss or sold for salvage by a financial institution or insurer, or has a branded, or similar title under any state's law. **To check for vehicle eligibility, you must do a VIN status inquiry.**

Some vehicles may be affected by S/B 11-021, *Product Update: Software Update to Improve Fuel Injector and VTC Timing*. Do an iN VIN status inquiry, and if the product update applies, make sure you update the vehicle before continuing with this warranty extension.

Additionally, there are three Tech2Tech videos for reference:

- [Tips When Working with Fracture Rods](#)
- Using Cylinder Wall Inspection Tool (To be released in January 2019)
- [Let's Talk Ring Compressors!](#)

### CLIENT NOTIFICATION

Owners of affected vehicles will be sent a notification of this campaign.

Do an iN VIN status inquiry to make sure the vehicle is shown as eligible.

**CLIENT INFORMATION:** The information in this bulletin is intended for use only by skilled technicians who have the proper tools, equipment, and training to correctly and safely maintain your vehicle. These procedures should not be attempted by "do-it-yourselfers," and you should not assume this bulletin applies to your vehicle, or that your vehicle has the condition described. To determine whether this information applies, contact an authorized Acura automobile dealer.

## SYMPTOM

The engine oil level is low on the dipstick, and the oil warning light may come on in rare high oil consumption situations.

## POSSIBLE CAUSES

Under certain specific circumstances the engine may create deposits on the oil control rings, which may lead to increased oil consumption when all of the following conditions occur simultaneously on a regular and prolonged basis:

- The engine is cold (not warmed up to operating temperature)
- Hard acceleration while the engine is cold
- The fuel used has an unusually high concentration of particles - Honda recommends using Top Tier gas that contains detergents to prevent deposits. For more information about Top Tier gas, go to [www.toptiergas.com](http://www.toptiergas.com).

All these conditions happening at the same time is rare, but if they do, deposits may form over years of driving. If the oil control rings begin to stick because of the deposits, the customer may subsequently complain about excessive oil consumption.

## CORRECTIVE ACTION

Do the procedure under DIAGNOSIS and based on your results, replace all of the engine pistons and piston rings if necessary.

**Service Advisor:** Talk to the customer about the many factors contributing to oil consumption. Remind him or her that with less frequent service intervals for modern engines, it's not uncommon to add oil between services. Therefore, it's a good idea to check the engine oil regularly (as recommended in the owner's manual) and add oil as necessary.

## SOFTWARE INFORMATION

### NOTE

Unnecessary or incorrect repairs resulting from a failure to update the i-HDS are not covered under warranty.

i-HDS Software Version: **3.015.023 or later**

J2534 Software Information:

- PC Application Version **12-Nov-2014 or later**
- Database update **12-Nov-2014 or later**

**Before beginning the repair, make sure that both the i-HDS and J2534 software are updated as listed above.**

**Do only the update listed in this service bulletin.**

**You cannot apply the updates with the MVCI as a standalone tool.** To update the software you must use the MVCI or the DST-i interface in conjunction with the J2534 Rewrite PC application on the i-HDS.

For more information about updating the i-HDS, the MVCI, and vehicle systems, refer to Service Bulletin 01-026, *Updating Control Units/Modules*.

Year/Model	Program ID (or later)	Program P/N (or later)
2009 Sedan L4	RL5-A710	RL5-A710
2010 Sedan L4	RL5-A710	RL5-A710
2011 Sedan L4	RL5-A550	RL5-A550
2011 Wagon L4	RL5-A550	RL5-A550

**PARTS INFORMATION**

<b>Part Name</b>	<b>Part Number</b>	<b>Quantity</b>
BOLT, CONNECTING ROD (Up to 8 as required after measurements)	13204-RBB-004	8
BOLT, WASHER, 11 x 176 mm (Up to 10 as required after measurements)	90005-RNA-A01	10
BOLT, FLANGE, 12 x 45 mm (Side engine mount 1 required)	90165-SDA-A00	2
BOLT, FLANGE, 12 x 65 mm (Side engine mount 1 required)	90168-TA0-A00	1
Drain Plug Washer	94109-14000	1
GASKET, Cylinder Head	12251-R40-A01	1
GASKET, SET	12030-R44-A00	1
GASKET, Exhaust Flexible	18229-SEA-013	1
HondaBond HT ( 1 tube repairs 5 vehicles )	08718-0004	1
Honda Coolant Type 2 ( 1 gallon will be used to top off 2 vehicles)	OL999-9011	1
Honda Motor Oil, Full Synthetic 0W20 ( 6 quarts of oil to be used)	08798-9073	6
Oil Filter	15400-PLM-A02	1
O-Ring ( At oil pump )	91301-R40-A01	1
O-Ring, Chain Case	91302-PNA-004	1
Oil Seal, Control Valve ( O-ring at VTC Valve assembly )	15832-PNA-023	1
Packing A, Intake Manifold	17115-R40-A01	4
Piston SET A (STD) (Dealer must determine how many to order)	13010-RL5-A00	4
Piston SET B (STD) (Dealer must determine how many to order)	13020-RL5-A00	4
Ring Set (STD)	13011-RL5-A01	4

**TOOL INFORMATION**

<b>Part Name</b>	<b>Part Number</b>	<b>Quantity</b>
Camshaft Lock Pin Set	07AAB-RWCA120	1
Crank Pulley Holder	07AAB-RJAA100	1
Handle 6-25-660L	07JAB-001020B	1
Engine Hanger	AART1256	1

Part Name	Part Number	Quantity
Gasket Remover/Pan Separator	LIL50190	1
Piston Ring Expander	Snap-On PRS8 or equivalent	1
Piston Ring Compressor	SCP1287 or equivalent	1
1/2 in. Drive Torque Angle Gauge	BLMBLDAG001 or TA360	1
Cylinder Wall Inspection Tool	07AAJR70A300	1

#### NOTES

- Each dealer was sent one cylinder wall inspection tool. If you need more, it is available for dealer ordering.
- The other items can be purchased through the Honda Tool & Equipment Program 888-424-6857.

#### WARRANTY CLAIM INFORMATION

Operation Number	Description	Flat Rate Time	Defect Code	Symptom Code	Template ID	Failed Part Number
1111BF	Replacing all pistons and piston rings	10.0 hrs	5X100	JP100		13011-RL5-A01
A	A/T Software update	0.2 hr	5X100	JP100		13011-RL5-A01

Skill Level: Repair Technician

## DIAGNOSIS

1. Do an engine oil consumption test. Refer to the Job Aid Engine Oil Consumption Test.
2. Review the results of the engine oil consumption test.
  - Based on the test results, if the engine is consuming an unusually high amount of oil, contact your DPSM for approval, then go to REPAIR PROCEDURE.
  - Based on the test results, if the engine is consuming a normal amount of engine oil, the vehicle is OK. Explain to the customer that the vehicle is OK, and that the consumption of oil is within a normal range.

### NOTE

Remind the customer to regularly check the engine oil level every time they fill the fuel tank. Modern engines require less frequent oil changes, which may impact the amount of oil used between oil changes.

## REPAIR PROCEDURE

This procedure is an outline form that you can also use as a checklist for the repair. For details on the procedures noted, refer to the appropriate service manual, or view them online.

- Engine Oil Replacement
- Battery Terminal Disconnection and Reconnection
- Fuel Pressure Relieving
- Coolant Replacement
- Drive Belt Removal/Installation
- Intake Manifold Removal and Installation
- Warm Up TWC Removal/Installation

### NOTE

Disconnect TWC at the A-pipe at TWC.

- Fuel Line/Quick-Connect Fitting Removal
- Cylinder Head Removal
- Cam Chain Removal
- Rocker Arm Assembly Removal
- Valve Adjustment
- Oil Pan Installation
- ECM Idle Learn Procedure

### NOTES

- **Before starting work**, make sure to order the correct number of “A” and “B” pistons. Refer to ORDERING PISTONS at the end of this bulletin.
- Use fender covers to avoid damaging painted surfaces.
- To avoid damaging the wires and terminals, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below **100°F (38°C)** before loosening the cylinder head bolts. If needed, connect the HDS to the DLC, and monitor ECT SENSOR 1.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact any other wiring or hoses, or interfere with any other parts.

1. Make sure that Service Bulletin 11-021, *Product Update: Software Update to Improve Fuel Injector and VTC Timing* is complete by checking the iN VIN status.

**NOTE**

If you do not confirm software update has been completed, your warranty claim could be debited.

2. Put the vehicle on a lift.
3. Relieve the fuel pressure.
4. Do the battery terminal disconnection procedure.
5. Drain the engine oil.
6. Remove the strut brace (if equipped).
7. Drain the engine coolant.

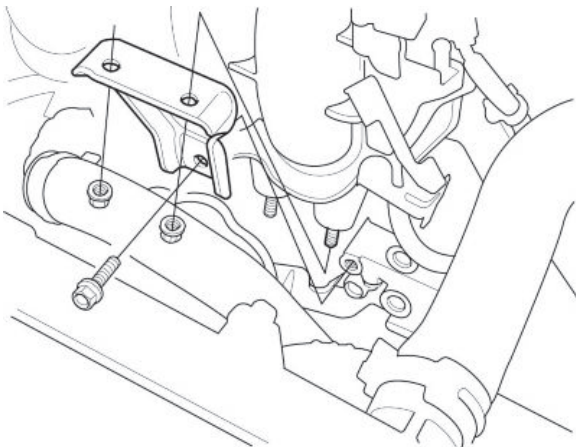
**NOTE**

Use a clean container to recover coolant for re-use.

8. Remove the drive belt.
9. Remove the intake manifold. Remove the intake manifold bracket lower bolt.

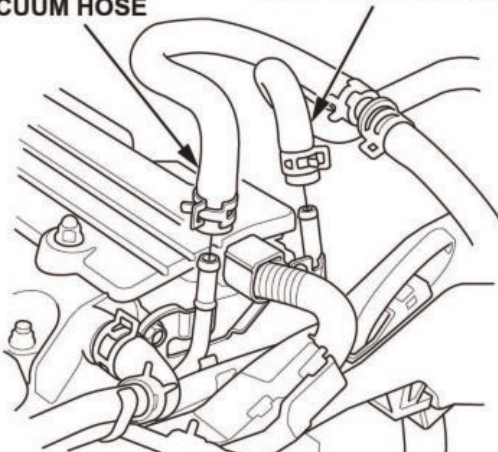
**NOTE**

It is not necessary to remove the two nuts or the bracket from the intake manifold.

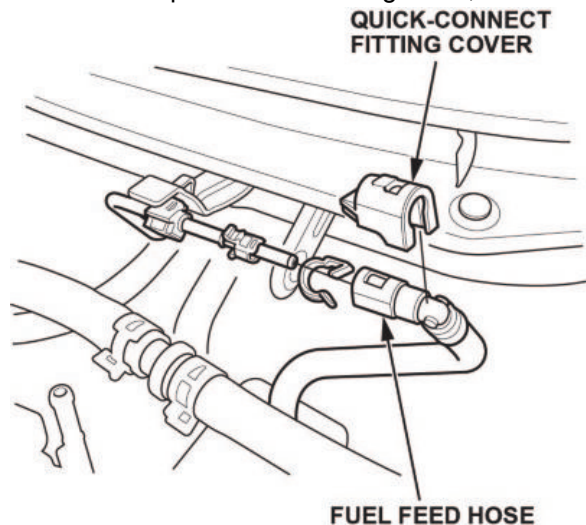


10. Unbolt TWC at the A-Pipe, leaving the TWC mounted to the cylinder head assembly.
11. Disconnect the brake booster vacuum and EVAP canister hoses.

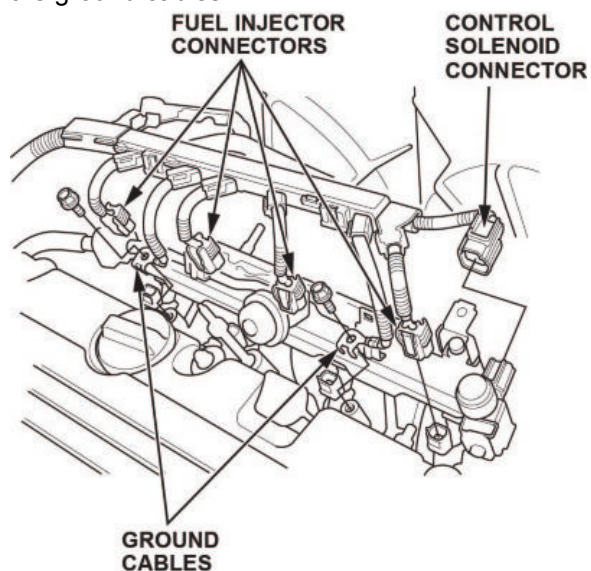
**BRAKE BOOSTER VACUUM HOSE**      **EVAP CANISTER HOSE**



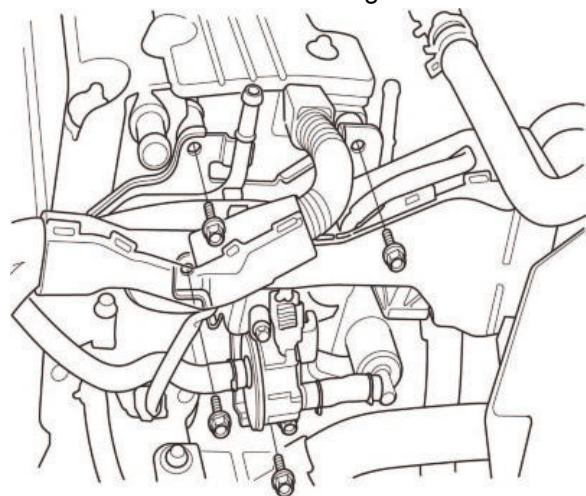
12. Remove the quick-connect fitting cover, then disconnect the fuel feed hose.



13. Disconnect the four fuel injector connectors, the engine mount control solenoid valve connectors, and disconnect the ground cables.



14. Remove the four bolts securing the EVAP canister purge valve bracket.

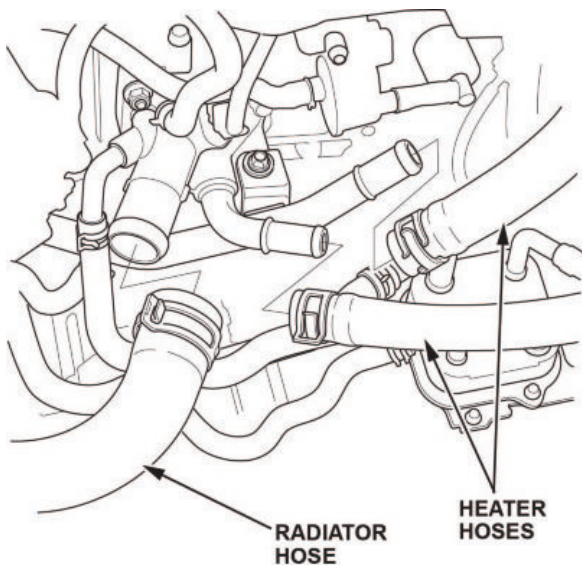




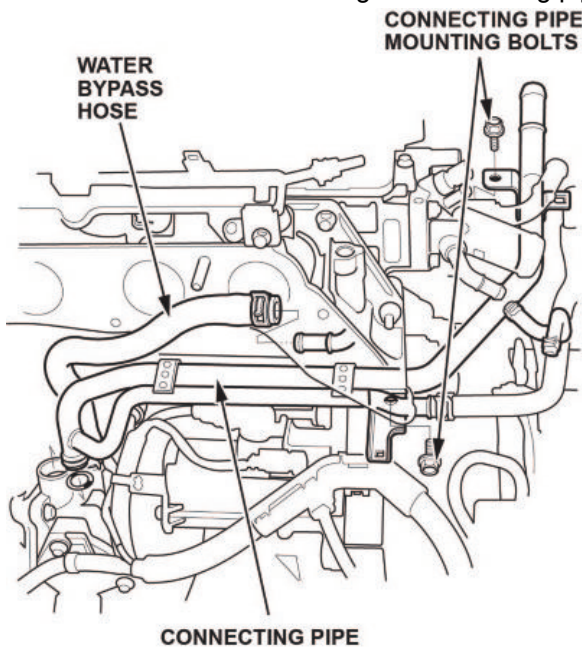
15. Disconnect the radiator hoses and the heater hoses. Disconnect the ATF warmer bypass hose (if equipped).

**NOTE**

The second radiator hose is connected to the thermostat and is not shown.

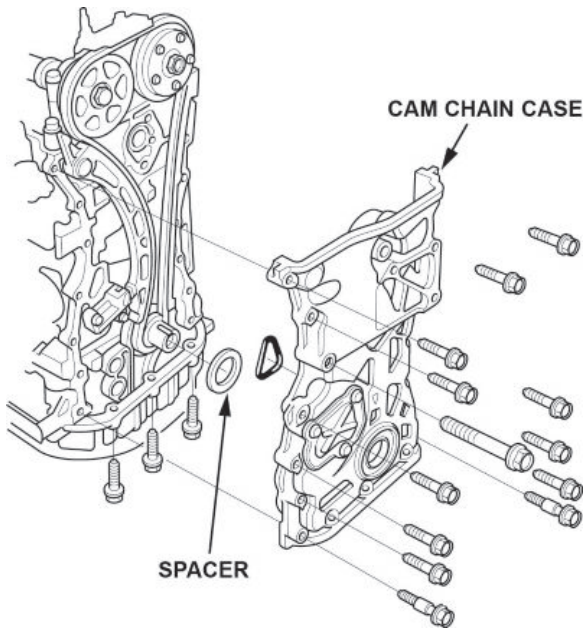


16. Remove the two bolts securing the connecting pipe. Disconnect the water bypass hose.

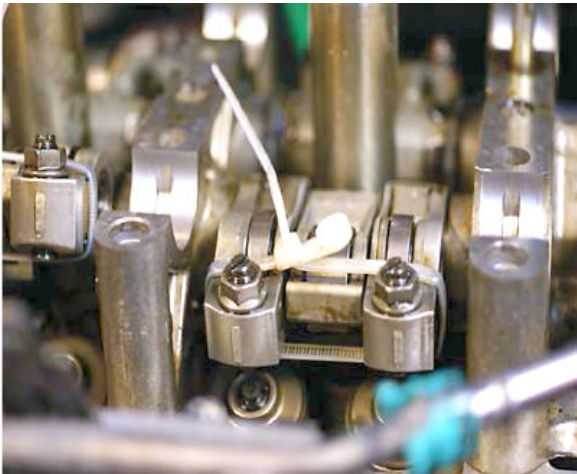




17. Remove the front cam chain cover and the cam chain.



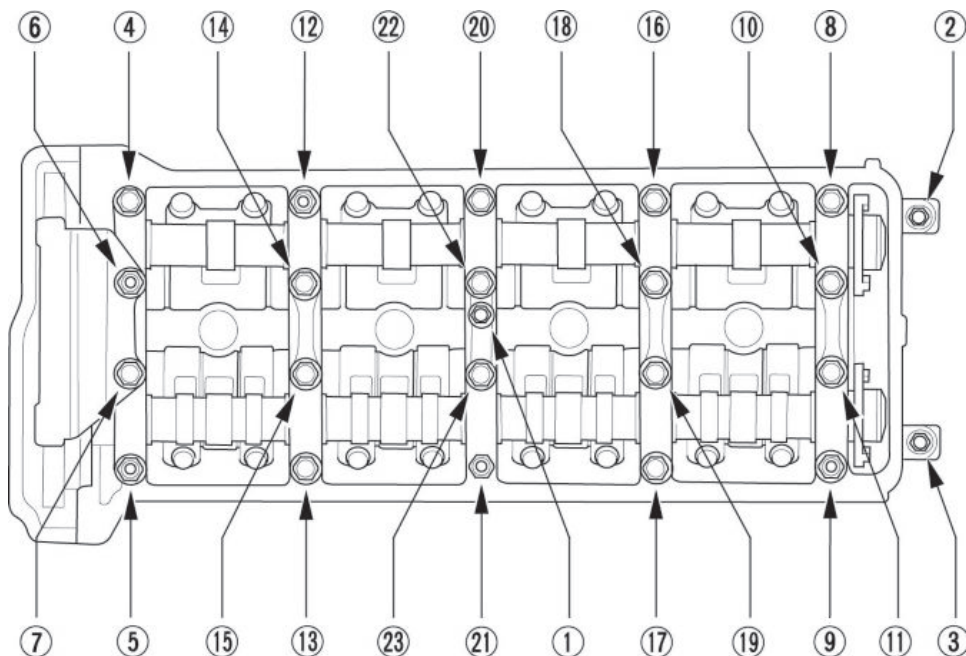
18. Use zip ties to hold the intake rocker assemblies together to ease re-installation.



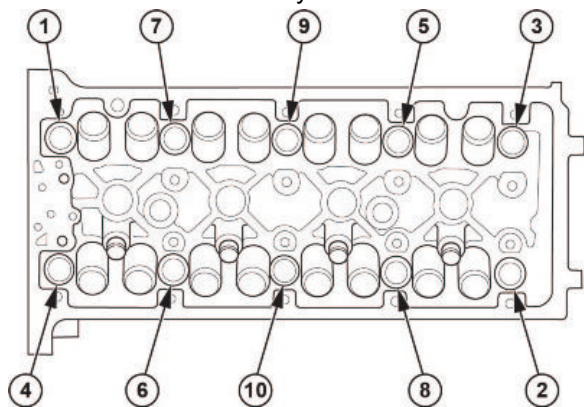
19. To prevent damage to the camshafts, loosen the bolts, in sequence, two turns at a time. Remove the camshaft holder bolts, Remove the rocker arm assembly and both cam shafts.

**NOTE**

Bolt #1 is not on all engines.



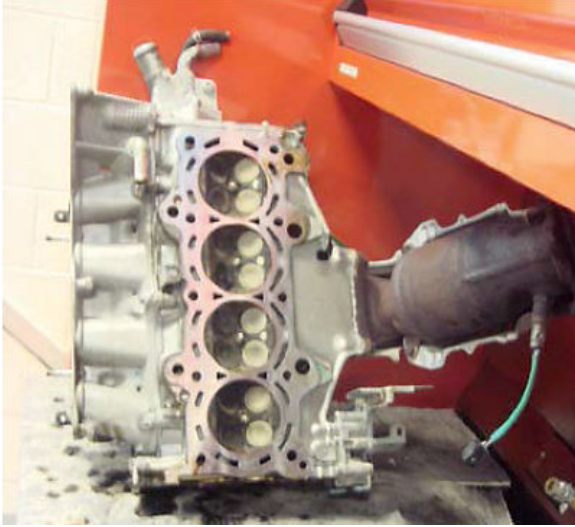
20. To prevent warpage, loosen the bolts in sequence 1/3 turn at a time, repeat the sequence until all the bolts are loosened. Remove the cylinder head bolts.



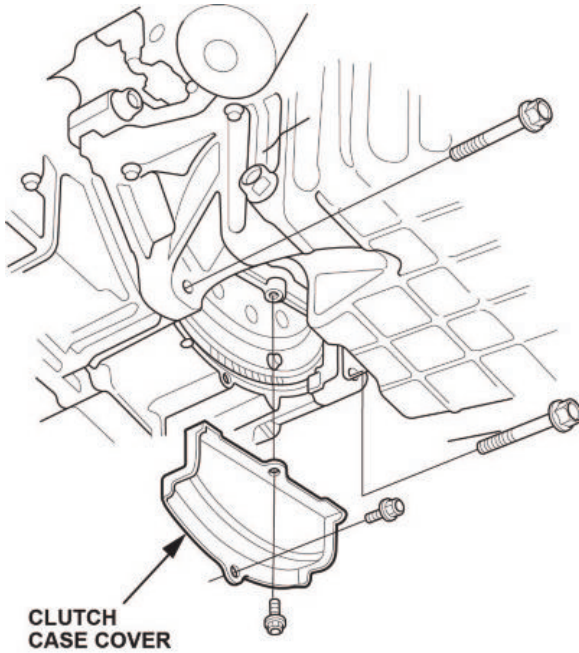
21. Remove the cylinder head with the catalytic converter attached.

**NOTE**

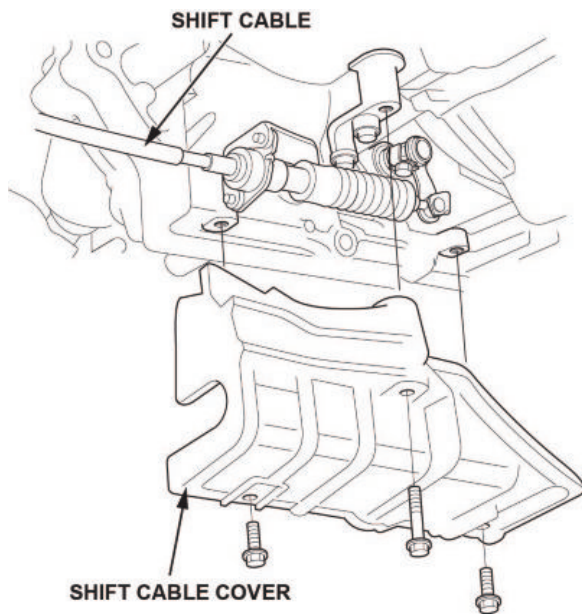
Be careful not to lose the lost-motion springs.



22. Raise the vehicle on the lift.
23. Remove the clutch case cover (M/T) or the torque converter cover (A/T), and remove the two bolts securing the oil pan to the transmission.

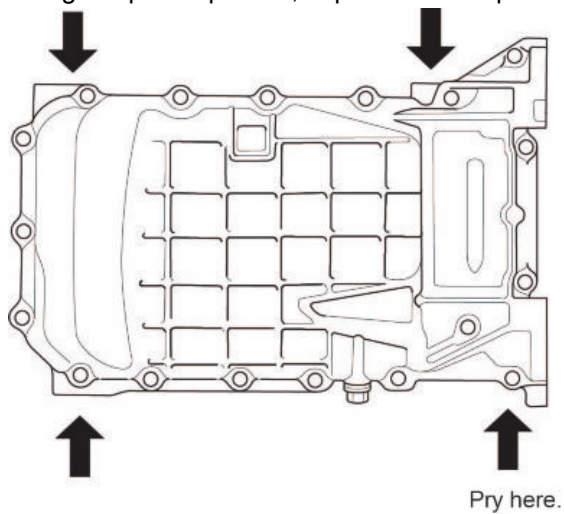


24. With A/T: Remove the shift cable cover.

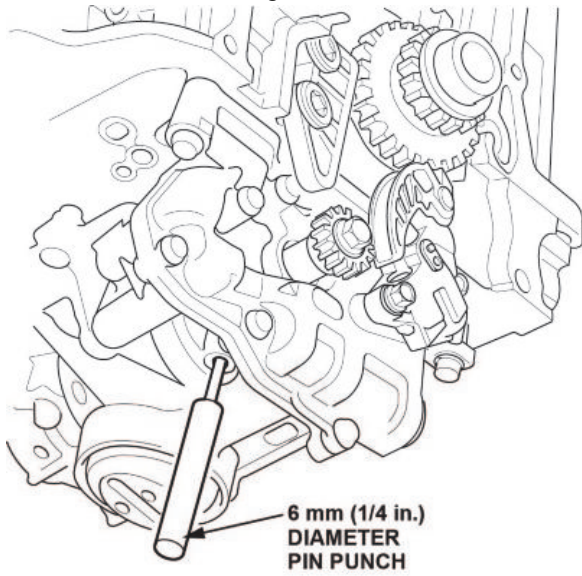


25. Remove the bolts securing the oil pan.

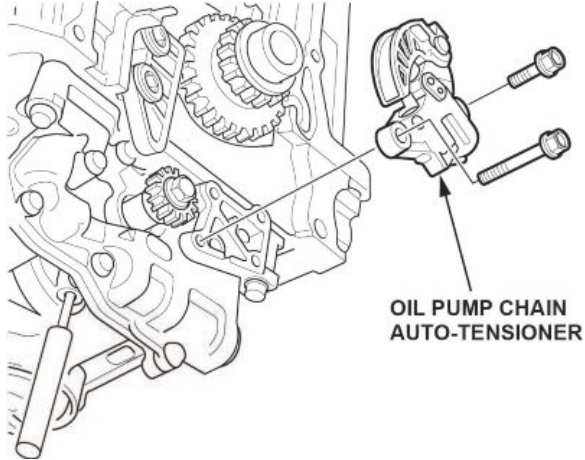
26. Using the pan separator, separate the oil pan from the engine block in the indicated areas, and remove the oil pan.



27. To hold the balance shaft, insert a 6 mm (1/4in.) diameter long pin punch into the maintenance hole in the balance shaft holder and through the rear balancer shaft.

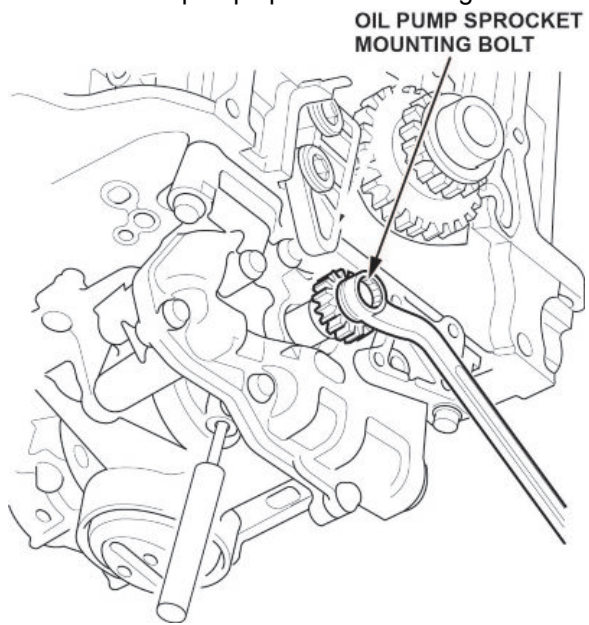


28. Remove the cam chain and oil pump chain auto-tensioner.

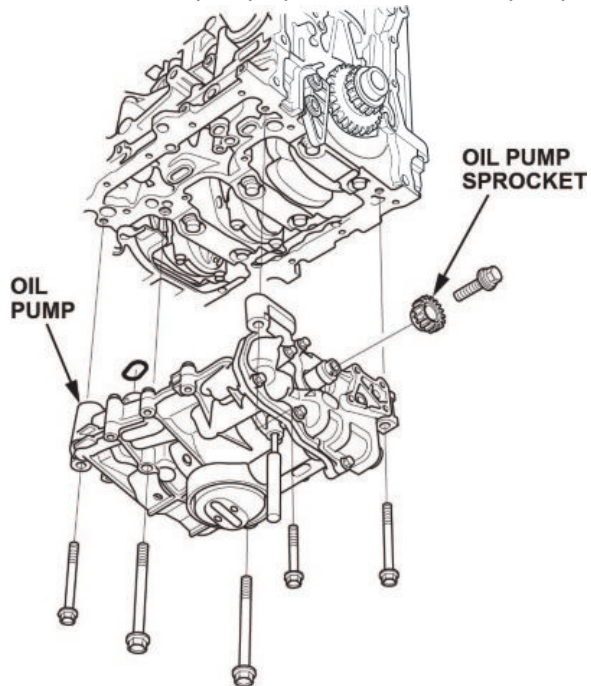




29. Loosen the oil pump sprocket mounting bolt.

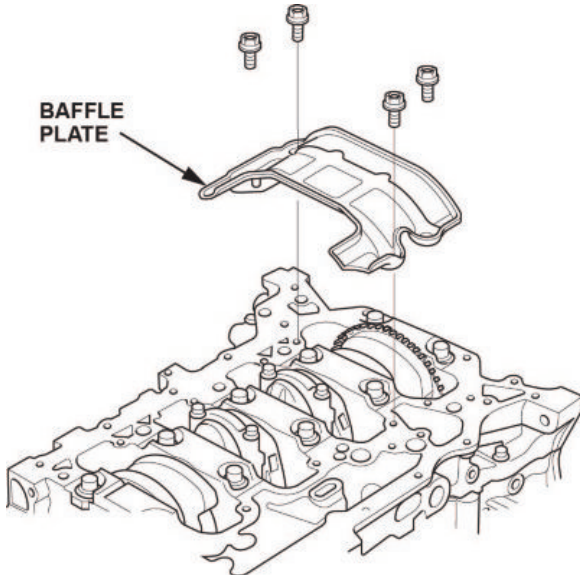


30. Remove the oil pump sprocket and the oil pump.





31. Remove the baffle plate.



32. Lower the vehicle to a comfortable working height, and place a clean shop towel around the cylinder wall to prevent debris from entering the coolant passage.
33. Cylinder Wall Inspection. If vertical scratches are noted in the cylinder wall, refer to Job Aid Using Cylinder Wall Inspection Tool and or Tech2Tech "Using Cylinder Wall Inspection Tool".

**NOTE**

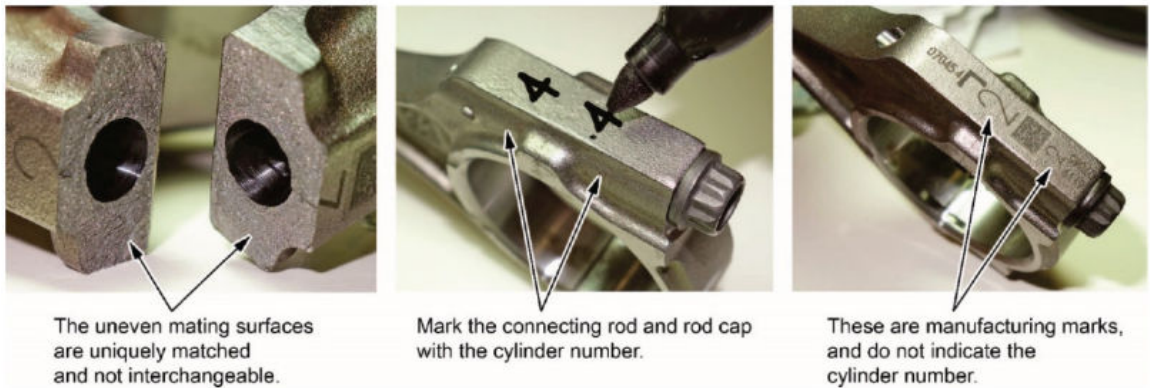
Do not use finger nail or pencil lead to determine if engine block is usable. Always use the cylinder wall inspection tool to inspect any scratches. Light to moderate scratches that may be detected with your finger nail, but do not affect the engine, will pass when using the cylinder wall inspection tool.

- If the engine block is **good**, go to the next step.
- If the engine block is **no good**, replace the engine block. The pistons and rings in the new engine block do not need to be replaced. This bulletin no longer applies. You must obtain DPSM authorization and refer online to **Engine Removal and Installation** to reinstall the engine.

34. Remove the rod caps and the bearings.

**NOTES**

- Before removing the rod caps, use a grease pencil or suitable marking pen to mark each cap and its corresponding connecting rod with the cylinder number it came from.
- Do not confuse the existing marking on the side of the connecting rod and rod cap with a cylinder number. They are just manufacturing marks referring to the size of the big end of the rod.
- Installing a rod cap incorrectly will result in engine knock and/or engine failure. Remove and mark one rod assembly at a time to make sure it is assembled correctly.
- When torqueing the rod cap bolts, refer to the service information for details.
- Click [HERE](#) to go to the Tech2Tech® video “Tips When Working with Fracture Rods”.



35. Use a wooden hammer handle to drive out each of the piston and connecting rod assemblies.

**NOTE**

Be careful not to damage the cylinder walls or the crankshaft when pushing out the pistons and the connecting rod assemblies.

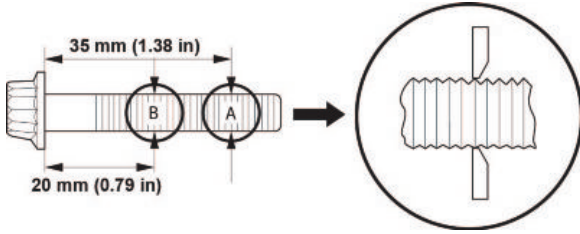
36. Visually inspect all the connecting rod bearing for signs of damage.

**NOTES**

- If your fingernail catches on a scratch or groove in the bearing, replace it. Pictured are normal reusable rod bearings after about 35,000 miles. Some discoloration is normal and does not require replacement.
- If the bearings look like they must be replaced, contact your DPSM for authorization.



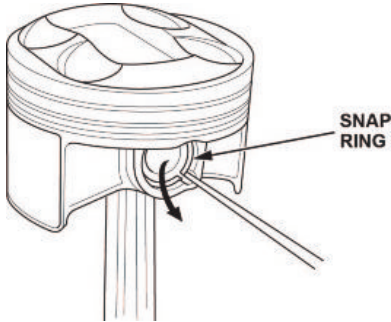
37. Measure the diameter of each connecting rod bolt at points A and B.



37.1. Calculate the difference in diameter between points A and B:

- Point A – Point B = Difference in Diameter
- Difference in Diameter Specification: 0 - 0.1 mm (0.004 in.)
- If the difference in diameter is out of specification, replace the connecting rod bolt.

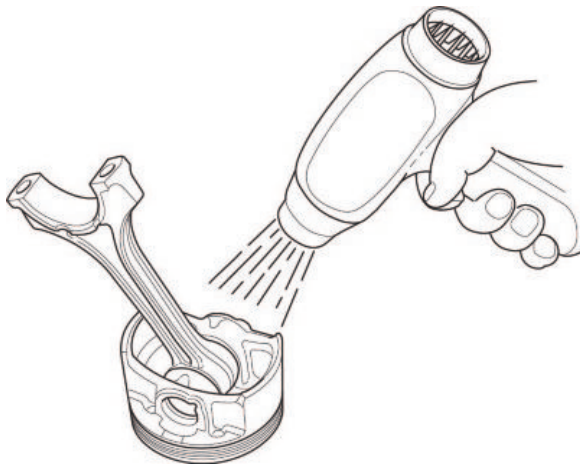
38. Put on eye protection, then remove the snap rings from both sides of each piston. Start at the cutout in the piston pin bore. Remove the snap rings carefully so they don't go flying or get lost.



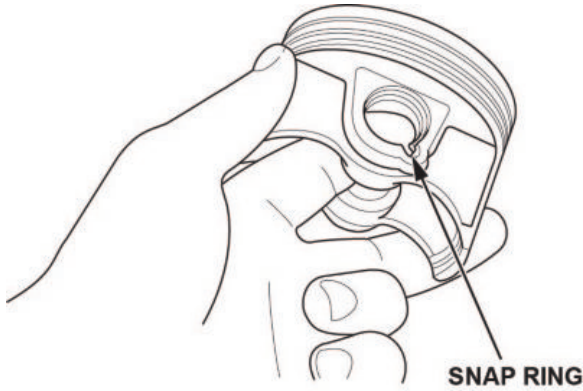
39. Put on gloves, heat the piston and the small end of the connecting rod to about 158°F (70°C), then remove the piston pin.

**NOTE**

The old piston, the pin, and the snap rings won't be reused.

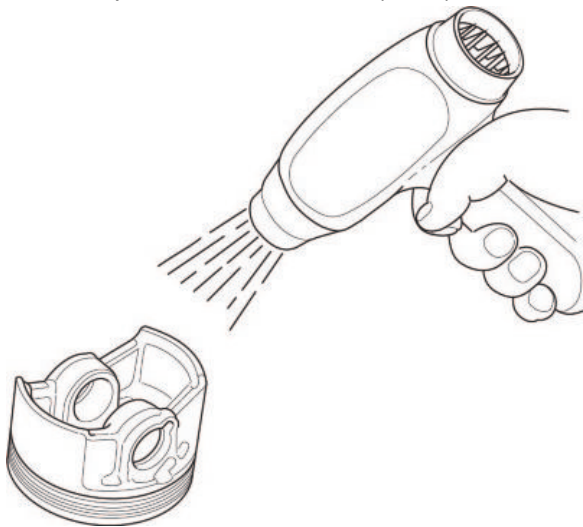


40. Install a new piston pin snap ring on one side of a new piston.



41. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with new engine oil.

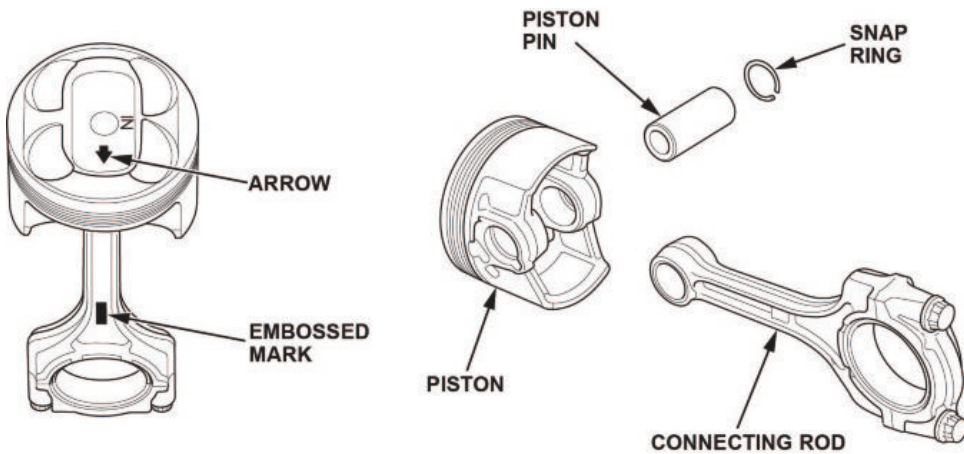
42. Heat the piston to about 158°F (70°C).



43. Assemble the piston and the connecting rod with the arrow and the embossed mark on the same side. Install the piston pin.

**NOTE**

When the piston and the rod end are heated properly, the piston pin should slide into position relatively easily. You will damage the piston if you try to use a hammer or a press to force the piston pin in.

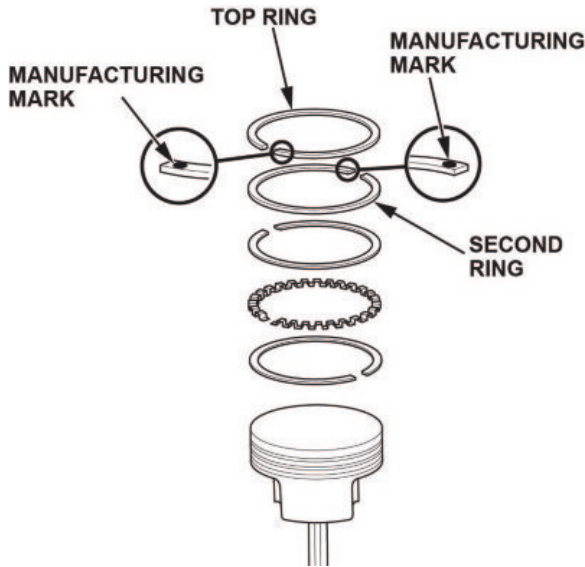


44. Install the remaining snap ring.

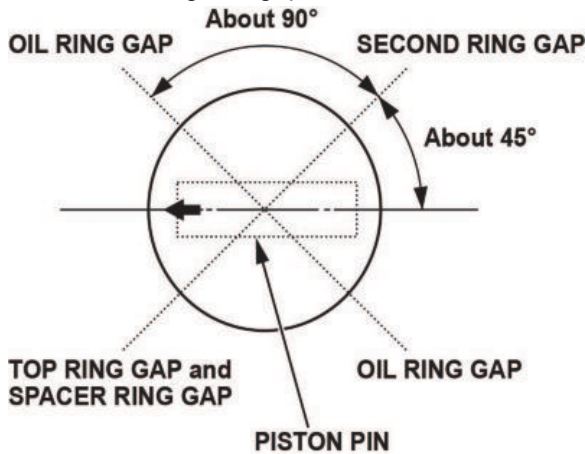
45. Turn the snap ring in the ring grooves until the end gaps are positioned at the bottom of the piston.
46. Repeat steps 38 through 45 for the remaining pistons.
47. Using a piston ring expander, install the spacer and two oil rings. Then install the second ring and top ring with the manufacturing marks facing up. The second ring has a "2" followed by a letter or letters. The top ring has a "1" followed by a letter or letters.

**NOTE**

The new rings may not have the same manufacturing marks as the originals.



48. Rotate the rings in their grooves to make sure they do not bind.
49. Position the ring end gaps as shown.



50. Rotate the crankshaft so that cylinders 1 and 4 are at bottom dead center (BDC).
51. Remove the connecting rod cap to piston 1, and check that the bearing is securely in place.

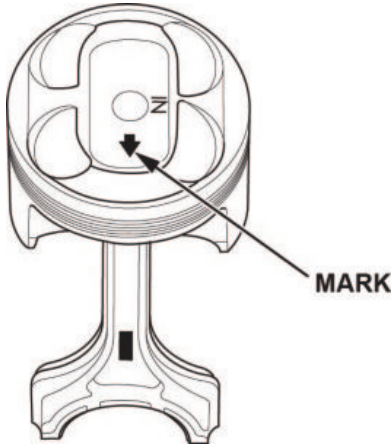


52. Apply new engine oil to the piston, the inside of the ring compressor, the cylinder bore, and the rod bearings.

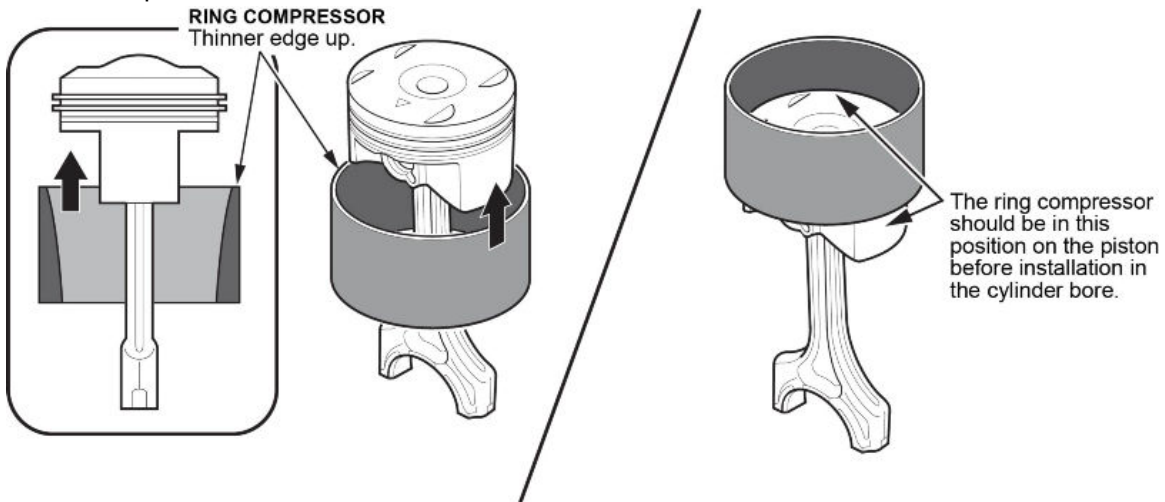
**NOTE**

**Cylinder wall honing is NOT required for this repair.**

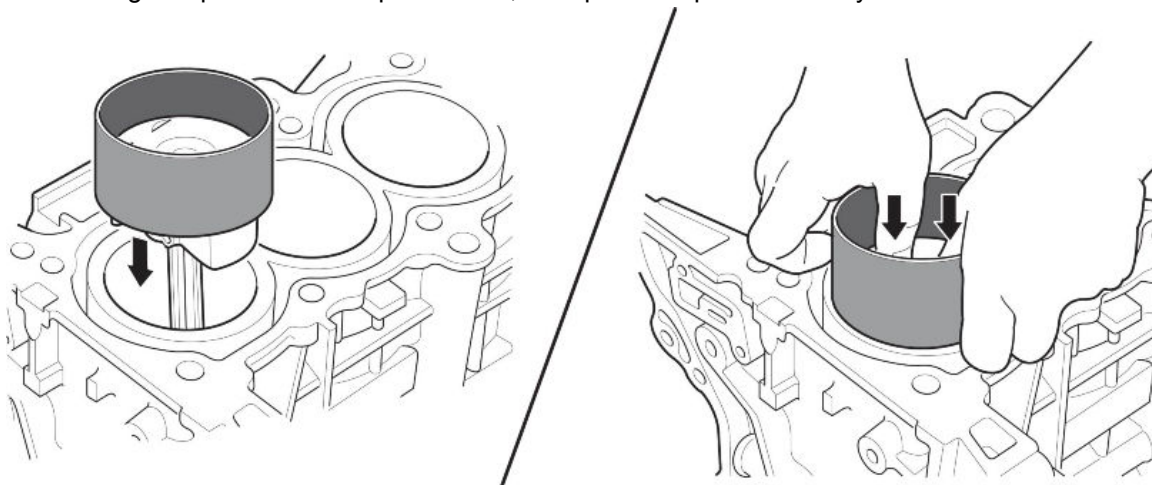
53. Position the mark to face the cam chain end of the engine block.



54. Set the piston in the ring compressor, and position the piston in the cylinder based on the rod/cap marks that you made in step 34.



55. Set the ring compressor on the piston bore, then push the piston in with your hands.

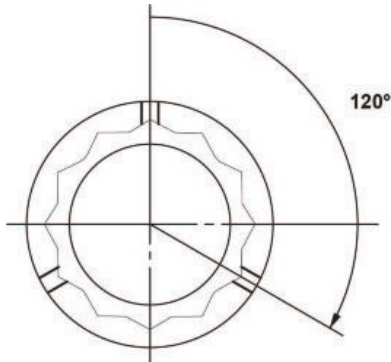




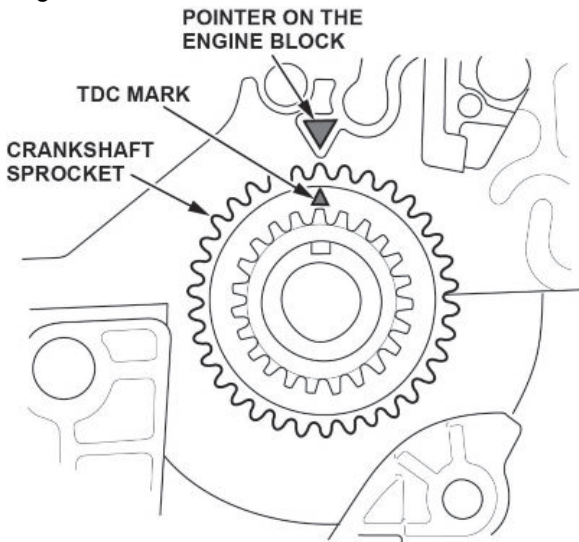
56. Stop after the ring compressor pops free, and check the connecting rod-to-rod journal alignment before pushing the piston into place.
57. Apply new engine oil to the bolt threads, then install the connecting rod cap with the bearing. Torque the bolts to **41 N·m (30 lb-ft)**.
58. Tighten the connecting rod bolts an additional 120°.

**NOTE**

If you tighten a rod bolt beyond the specified angle, remove it and repeat steps 57 and 58. Do not loosen the bolt back to the specified angle.

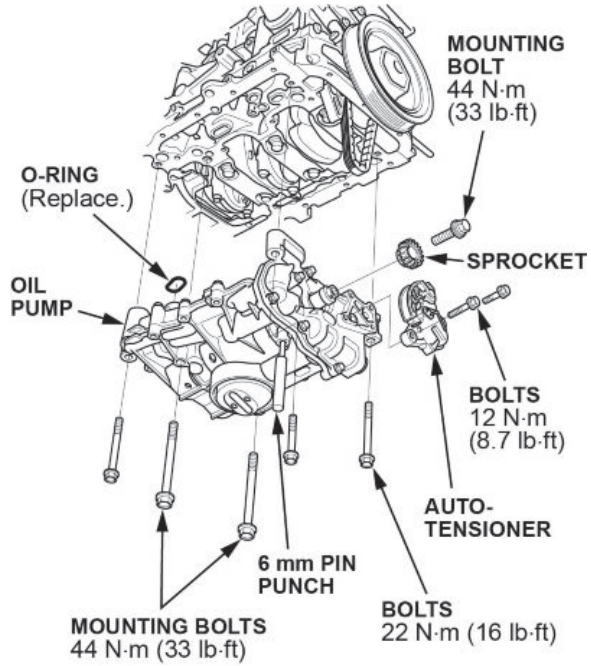


59. Repeat steps 47 through 58 for piston number 4.
60. Rotate the crankshaft so that cylinders 2 and 3 are at bottom dead center (BDC).
61. Repeat steps 47 through 58 for piston number 2 and 3.
62. Rotate the crankshaft several times after all connecting rods have been installed to ensure that nothing is binding.
63. Install the baffle plate, and torque the bolts to **12 N·m (8.7 lb-ft)**.
64. Set the crankshaft to top dead center (TDC). Align the TDC mark on the crankshaft sprocket with the pointer on the engine block.

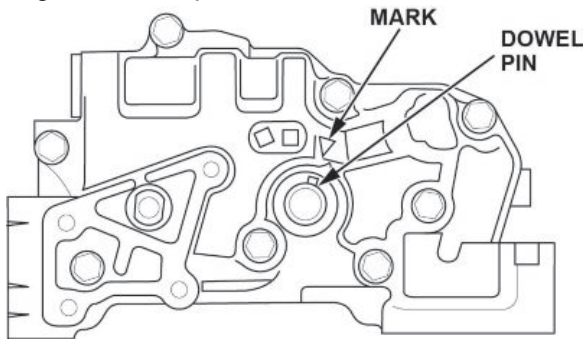


65. Apply new engine oil to the threads of the oil pump mounting bolts and the oil pump sprocket mounting bolt, then loosely install the oil pump with a new O-ring.

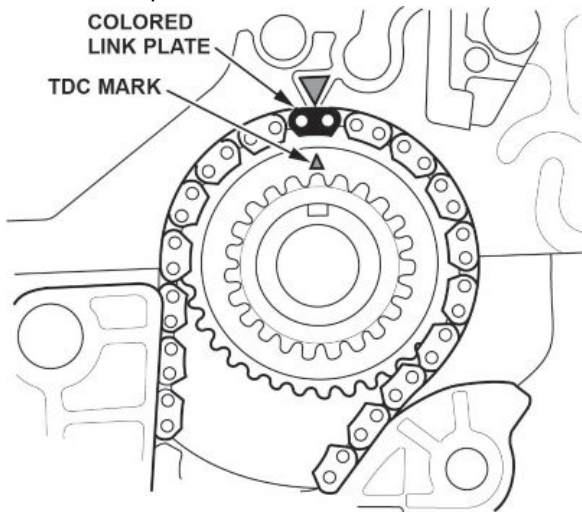
66. Torque the oil pump mounting bolts and the oil pump sprocket mounting bolt according to figure shown.



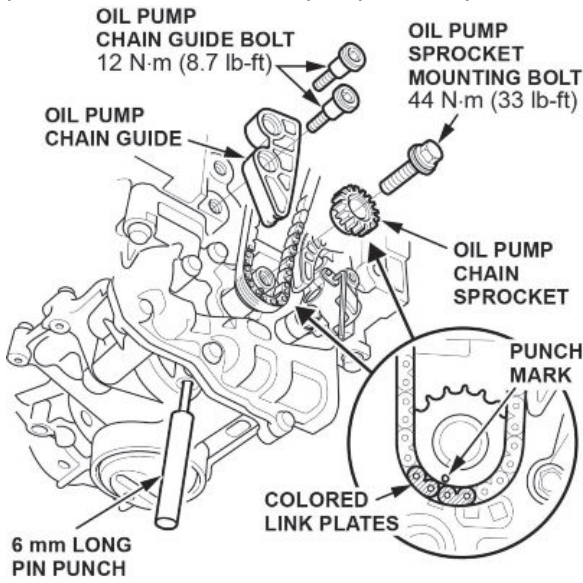
67. Align the dowel pin on the rear balancer shaft with the mark on the oil pump.



68. Install the oil pump chain on the crankshaft sprocket with the colored link plate aligned with the TDC mark on the crankshaft sprocket.

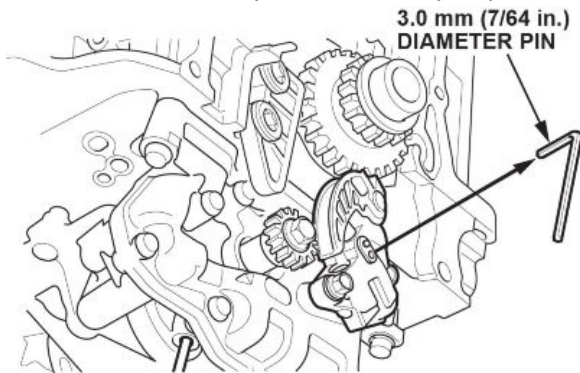


69. Set the oil pump sprocket on the oil pump chain with the punch mark aligned with the center of the colored link plates, then install the oil pump chain sprocket to the oil pump.



Apply new engine oil to the threads of the oil pump sprocket mounting bolt, then install it and torque it to **44 N·m (33 lb-ft)**.

70. Install the oil pump chain auto-tensioner, and torque the bolts to **12 N·m (8.7 lb-ft)**.  
71. Remove the 6 mm (1/4 in.) diameter long pin punch.  
72. Remove the 3.0 mm (7/64 in.) diameter pin from the oil pump chain auto-tensioner.

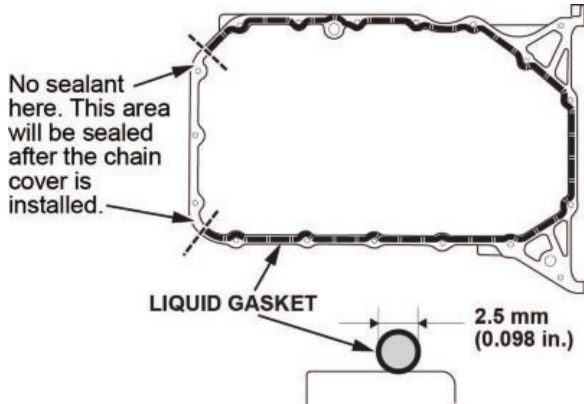


73. Remove all of the old liquid gasket from the oil pan mating surfaces, the bolts, and the bolt holes.  
74. Clean and dry the oil pan mating surfaces.

75. Apply liquid gasket, P/N 08718-0004 to the engine block mating surface of the oil pan and to the inside edge of the threaded bolt holes. Install the component within 5 minutes of applying the liquid gasket.

**NOTES**

- Apply a 2.5 mm (0.098 in) diameter bead of liquid gasket along the broken line.
- If more than 5 minutes have passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.
- Do not apply any sealant where the cam chain case is installed because the sealant will dry before you can reinstall the case.

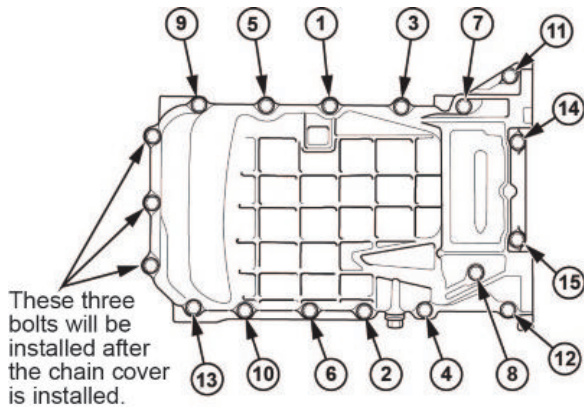


76. Install the oil pan to the engine block.

77. Tighten the bolts in three steps. In the final step, torque all bolts, in sequence, to **12 N·m (9 lb-ft)**.

**NOTES**

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



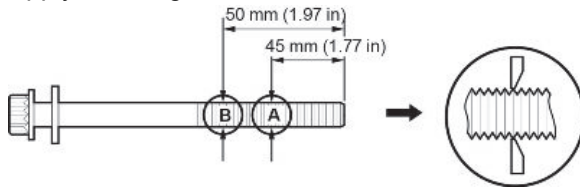
78. Install a new oil filter.

79. Reinstall the clutch case cover and torque the bolts to **12 N·m (8.7 lb-ft)**. Reinstall the two bolts securing the oil pan to the transmission and torque them to **64 N·m (47 lb-ft)**.

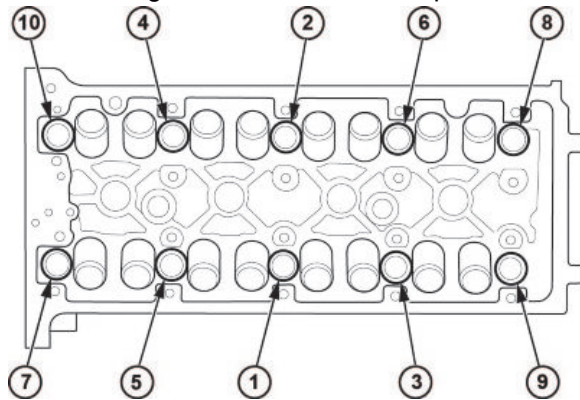
80. With A/T: Reinstall the shift cable cover, and torque the bolts to **12 N·m (9.0 lb-ft)**.

81. Reinstall the cylinder head with a new gasket.

- Measure the diameter of each cylinder head bolt at point A and point B.
- If either diameter is less than 10.8 mm (0.417 in), replace the cylinder head bolt.
- Apply new engine oil to the threads and under the bolt heads of all cylinder head bolts.



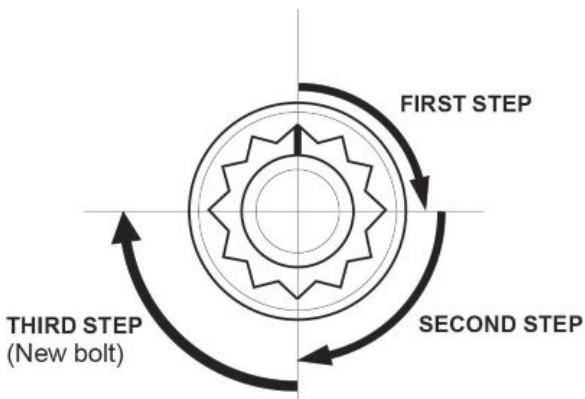
- Torque the cylinder head bolts in sequence to **39 N·m (29 lb-ft)**. When using a preset click-type torque wrench, be sure to tighten slowly and do not overtighten. If a bolt makes any noise while you are torquing it, loosen the bolt and retighten it from the first step.



- After torquing, tighten all cylinder head bolts in two steps (90° per step) using the sequence shown above. If you are using a new cylinder head bolt, tighten the bolt an extra 90°.

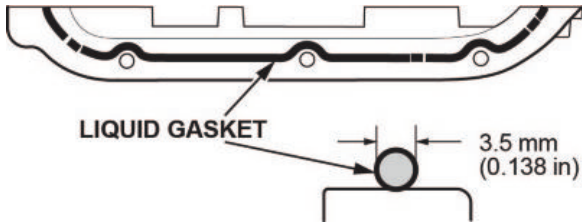
**NOTE**

Remove the cylinder head bolt if you tightened it beyond the specified angle, and go back to the second bullet to re-measure the bolt. Do not loosen it back to the specified angle.

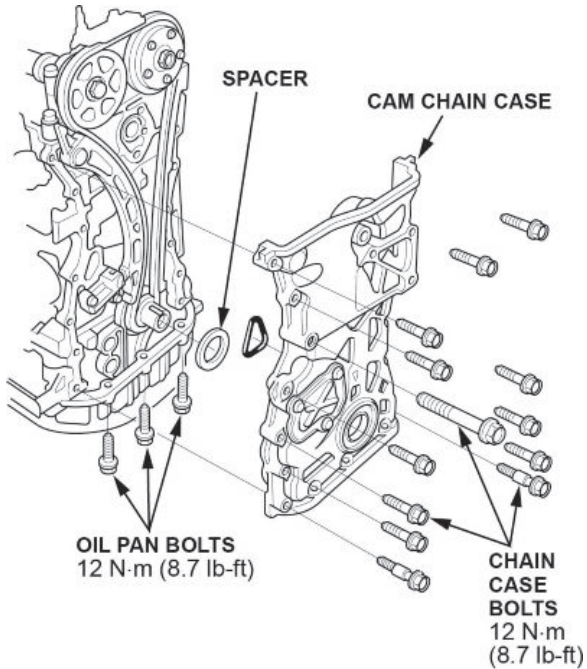




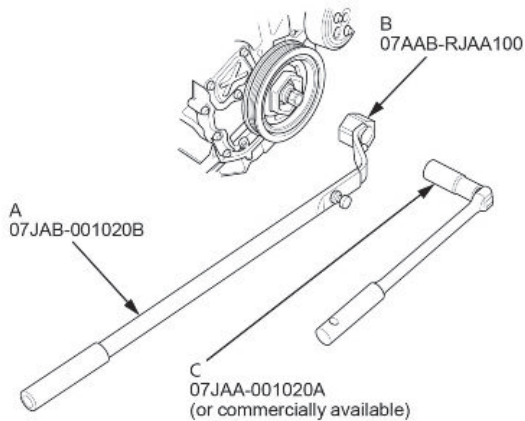
- 82. Reinstall the rocker arm assembly and the camshafts.
- 83. Reinstall the cam chain.
- 84. Apply liquid gasket to the oil pan where it meets the cam chain case and to the inside edge of the threaded bolt holes. Install the cam chain case within 5 minutes of applying the liquid gasket.



- 85. Install the cam chain cover.



- 86. Reinstall crank pulley and torque the bolt to **49 N·m (36 ft-lb)**.





87. Adjust the valve clearance. Refer to the service manual for Valve Clearance Adjustment.

**Valve Clearance:**

Intake: 0.21 – 0.25 mm (0.0083 – 0.0098 in)

Exhaust: 0.25 – 0.29 mm (0.0098 – 0.0114 in)

**Specified Torque (Intake & Exhaust)**

7 x 0.75 mm: **14 N·m (1.4 kgf·m, 10 lbf·ft)**

Apply new engine oil to the nut threads.

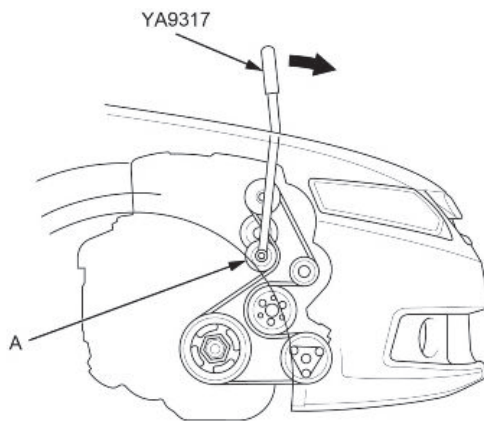
88. Reinstall or reconnect the following components:

- Reinstall the cylinder head cover.
- Reinstall the coolant connecting pipe.
- Reinstall the EVAP canister purge valve bracket.
- Reconnect the four fuel injectors, the engine mount control solenoid connector, and the ground cables.
- Reconnect the fuel feed hose and the quick connect fitting cover.
- Reconnect the EVAP canister hose.

89. Install a new gasket from TWC to A-pipe.

90. Install the intake manifold using new gaskets.

91. Reinstall the drive belt.

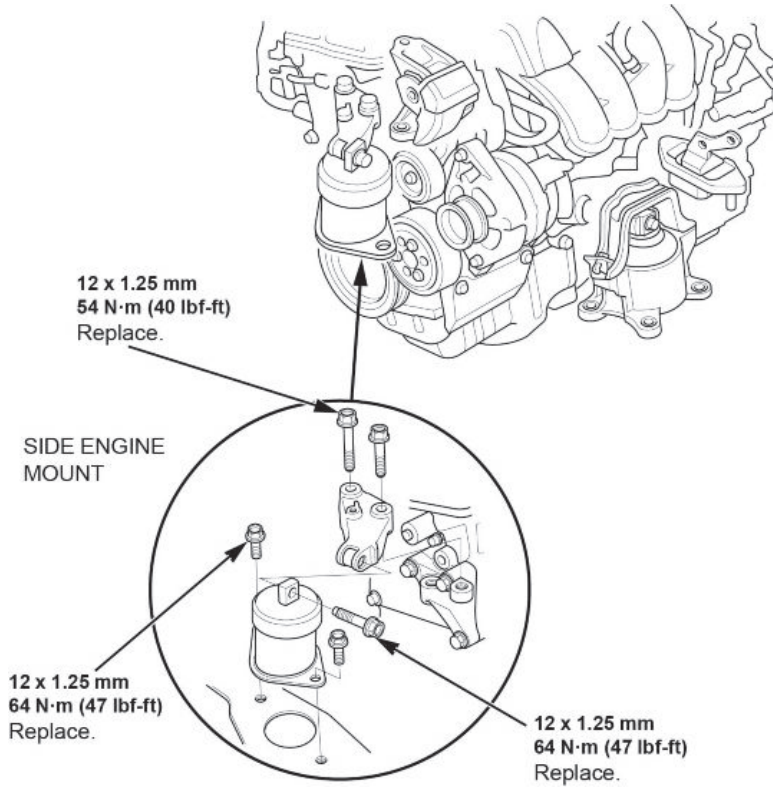


92. Fill the engine with coolant using recovered coolant. Add new as needed.

93. Reinstall the strut brace (if equipped), and torque the bolts to **22 N·m (16 lb-ft)**.

94. Fill the engine with oil.

95. Reinstall right side engine mount.



96. Do the battery terminal reconnection procedure.

97. Crank the engine for about 5 seconds to prime the engine with oil pressure before plugging in the ignition coils.

98. Reconnect the four ignition coils.

99. Do the idle learn procedure.

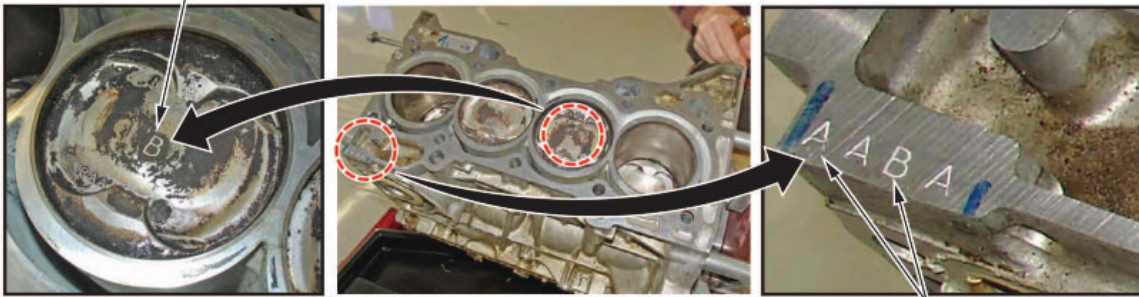
## ORDERING PISTONS

Every engine has some combination of A- and B-sized pistons. You can determine the sizes and their locations in the block by inspecting the markings on the timing chain end of the engine block or by looking at the pistons. If you look at the piston, the pistons have identifiers; "A" pistons are unmarked; "B" pistons are marked with a "B". Make sure you order the appropriate number of each piston size before starting work.

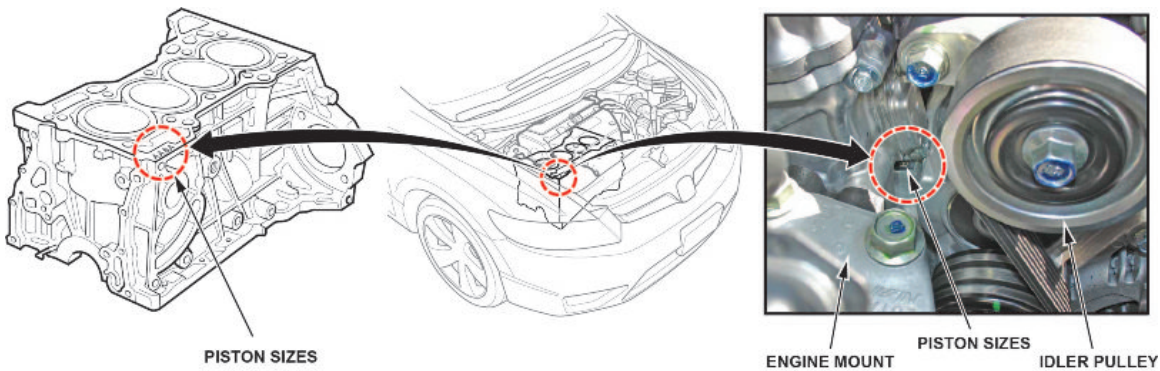
"A" pistons are not marked on the top of the piston.

"B" pistons are always marked with a "B" stamp.

The "A" or "B" indicates the piston size.



The "A" and "B" represents piston size. Piston sizes can be mixed in an engine block assembly.



END