2003-06 ENGINE

Cylinder Head - MDX

SPECIAL TOOLS

Ref. No.	Tool Number	Description	Qty
①	07AAJ-PNAA100	Air Pressure Regulator	1
②	07HAH-PJ7A100	Valve Guide Reamer, 5.5 mm	1
③	07JAA-001020A	Socket, 19 mm	1
④	07JAB-001020A	Holder Handle	1
⑤	07MAB-PY3010A	Holder Attachment, 50 mm, Offset	1
⑥	07PAD-0010000	Stem Seal Driver	1
⑦	07PAF-0030100	Camshaft Oil Seal Driver	1
⑧	07VAJ-P8A010A	VTEC Air Adapter	1
⑨	070AJ-0030100	VTEC Air Stopper	1
⑩	07742-0010100	Valve Guide Driver, 5.5 mm	1
⑪	07757-PJ1010A	Valve Spring Compressor Attachment	1

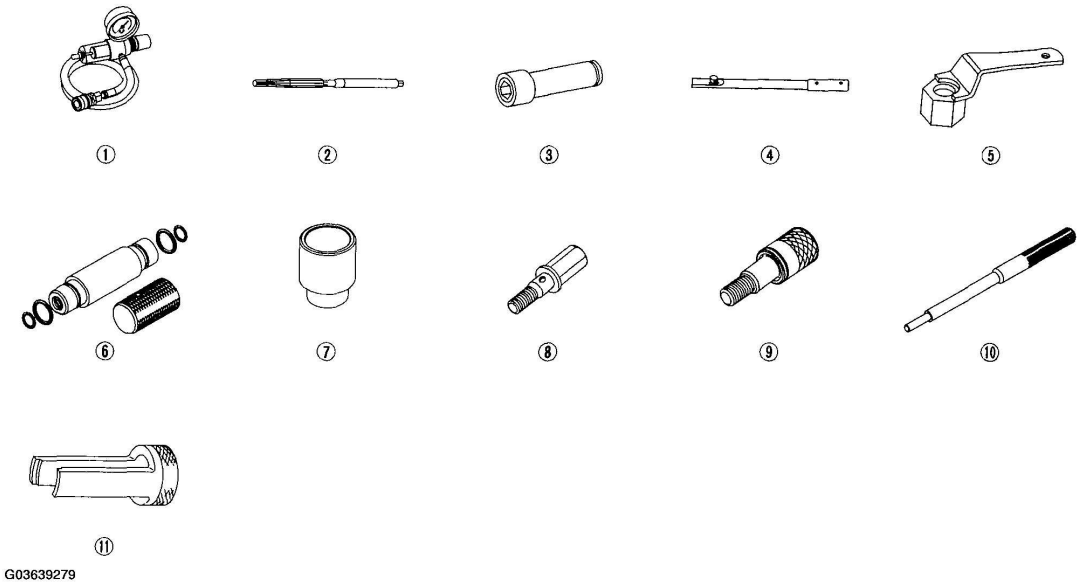

Fig. 1: Identifying Special Tool
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT LOCATION INDEX

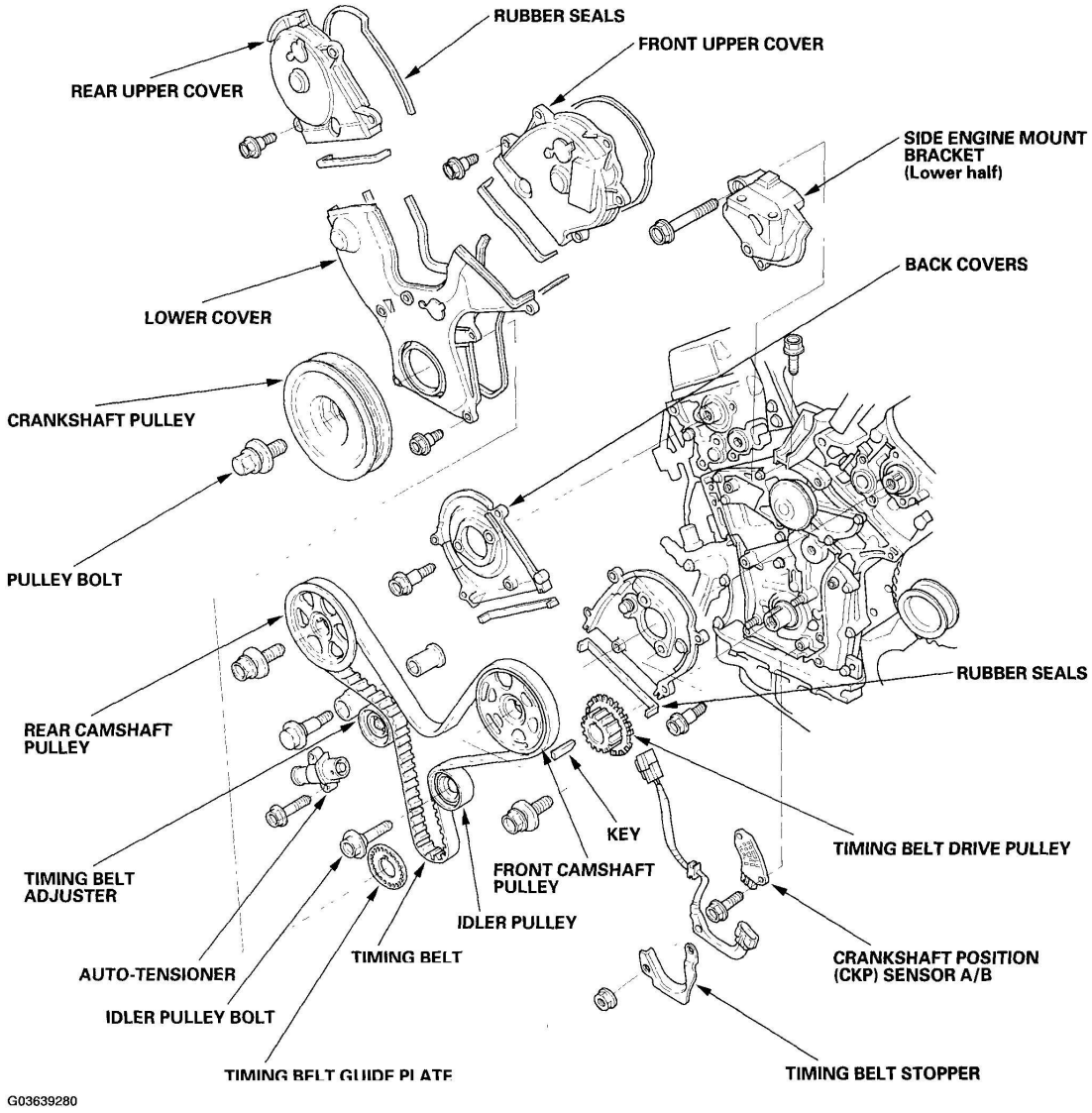

Fig. 2: Identifying Cylinder Head Components (1 Of 3)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

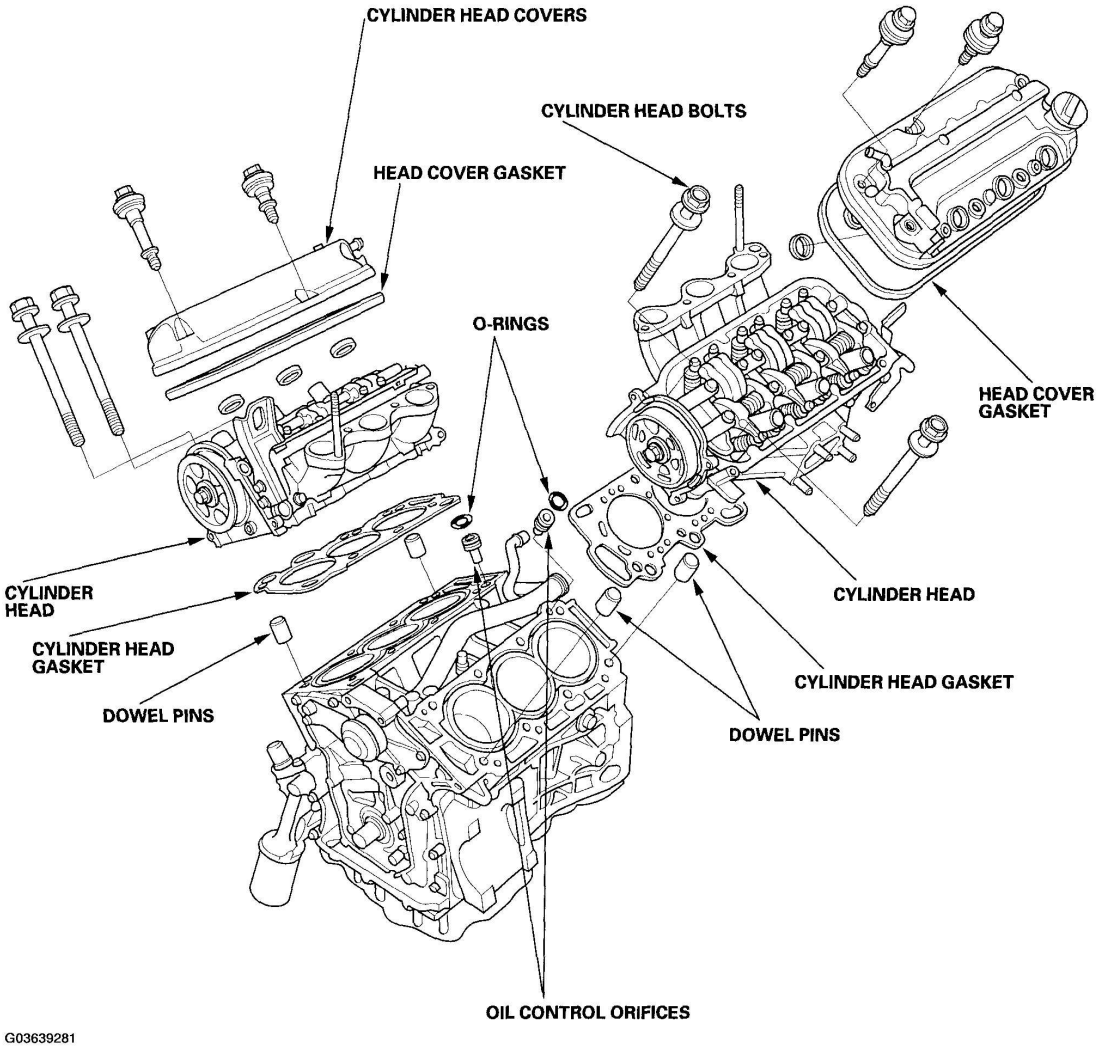

Fig. 3: Identifying Cylinder Head Components (2 Of 3)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

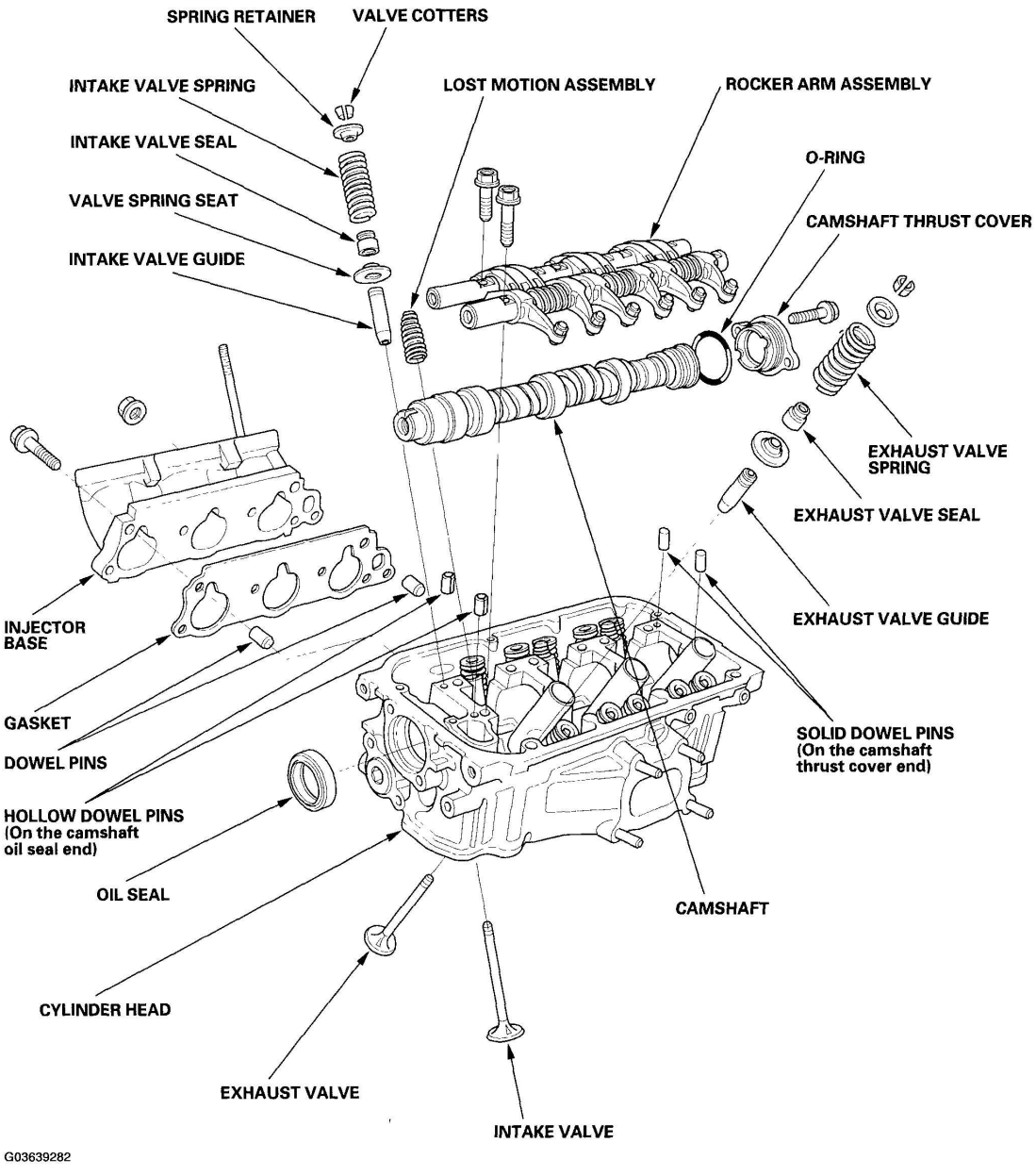

Fig. 4: Identifying Cylinder Head Components (3 Of 3)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ENGINE COMPRESSION INSPECTION

NOTE: After this inspection, you must reset the powertrain control module (PCM), otherwise the PCM will continue to stop the injectors from functioning. Select PCM reset using the Honda Diagnostic System (HDS) (see PCM RESET).

1. Warm up the engine to normal operating temperature (cooling fan comes on).

2. Turn the ignition switch OFF.
3. Connect the HDS to the data link connector (DLC) (see step 2 in **GENERAL TROUBLESHOOTING INFORMATION**).
4. Turn the ignition switch ON (II), and select PGM-FI, INSPECTION, then ALL INJECTORS OFF function on the HDS
5. Remove the six ignition coils (see **IGNITION COIL REMOVAL/INSTALLATION**).
6. Remove the six spark plugs.
7. Attach the compression gauge to a spark plug hole.

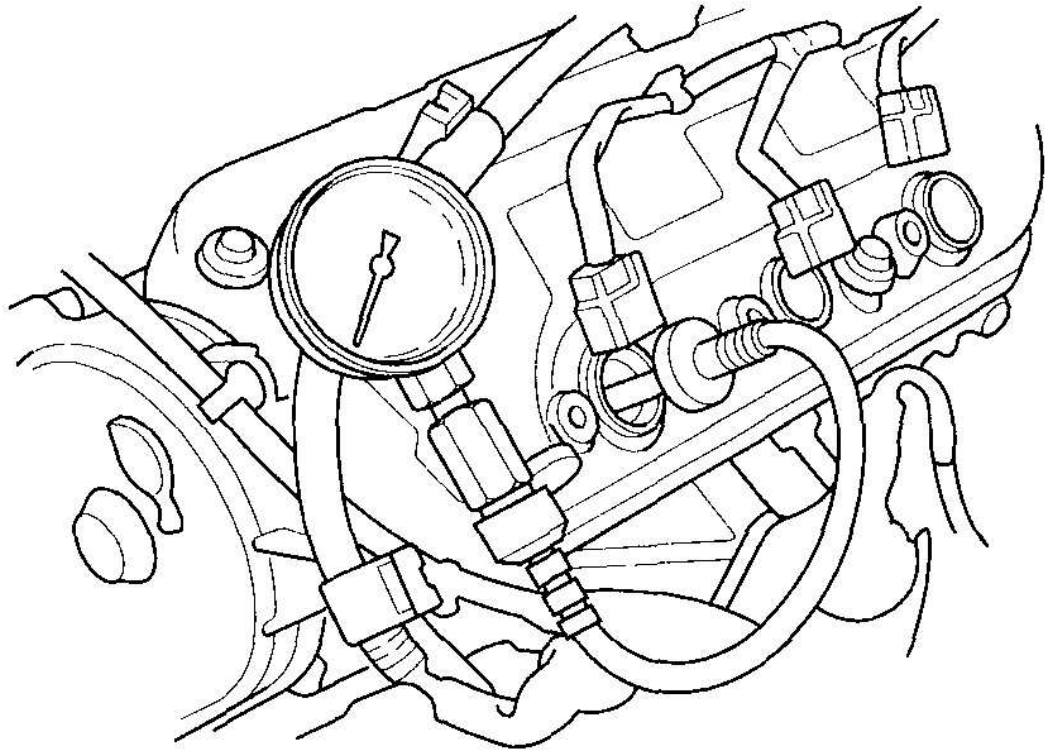

Fig. 5: Attaching Compression Gauge To Spark Plug Hole
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Crank the engine with the starter motor and measure the compression.

   Compression Pressure: Above 930 kPa (9.5 kgf/cm^2 , 135 psi)

9. Measure the compression on the remaining cylinders.

Maximum Variation: Within 200 kPa (2.0 kgf/cm^2 , 28 psi)

10. If the compression is not within specification, check the following items, then remeasure the compression.
    - Damaged or worn valves and seats
    - Damaged cylinder head gaskets
    - Damaged or worn piston rings
    - Damaged or worn piston and cylinder bore
11. Select PCM reset (see **PCM RESET**) to cancel ALL INJECTORS OFF function on the HDS.

VTEC ROCKER ARM TEST

Special Tools Required

- VTEC air adapter 07VAJ-P8A010A
- VTEC air stopper 070AJ-0030100
- Air pressure regulator 07AAJ-PNAA100

1. Start the engine and let it run for 5 minutes, then turn the ignition switch OFF.
2. Remove the intake manifold (see **REMOVAL**).
3. Remove the cylinder head covers (see **CYLINDER HEAD COVER REMOVAL**).
4. Set the No. 1 piston at top dead center (TDC) (see step 3 in **VALVE CLEARANCE ADJUSTMENT**)
5. Push on the intake mid rocker arm (A) for the No. 1 cylinder. The mid rocker arm should move independently of the primary rocker arm (B) and secondary rocker arm (C).
    - If the mid rocker arm moves freely, go to step 6.
    - If the intake mid rocker arm does not move, remove the mid, primary, and secondary intake rocker arms as an assembly, then check that the pistons in the mid and primary rocker arms move smoothly. If any rocker arm needs replacing, replace the mid, primary, and secondary rocker arms as an assembly, and retest.

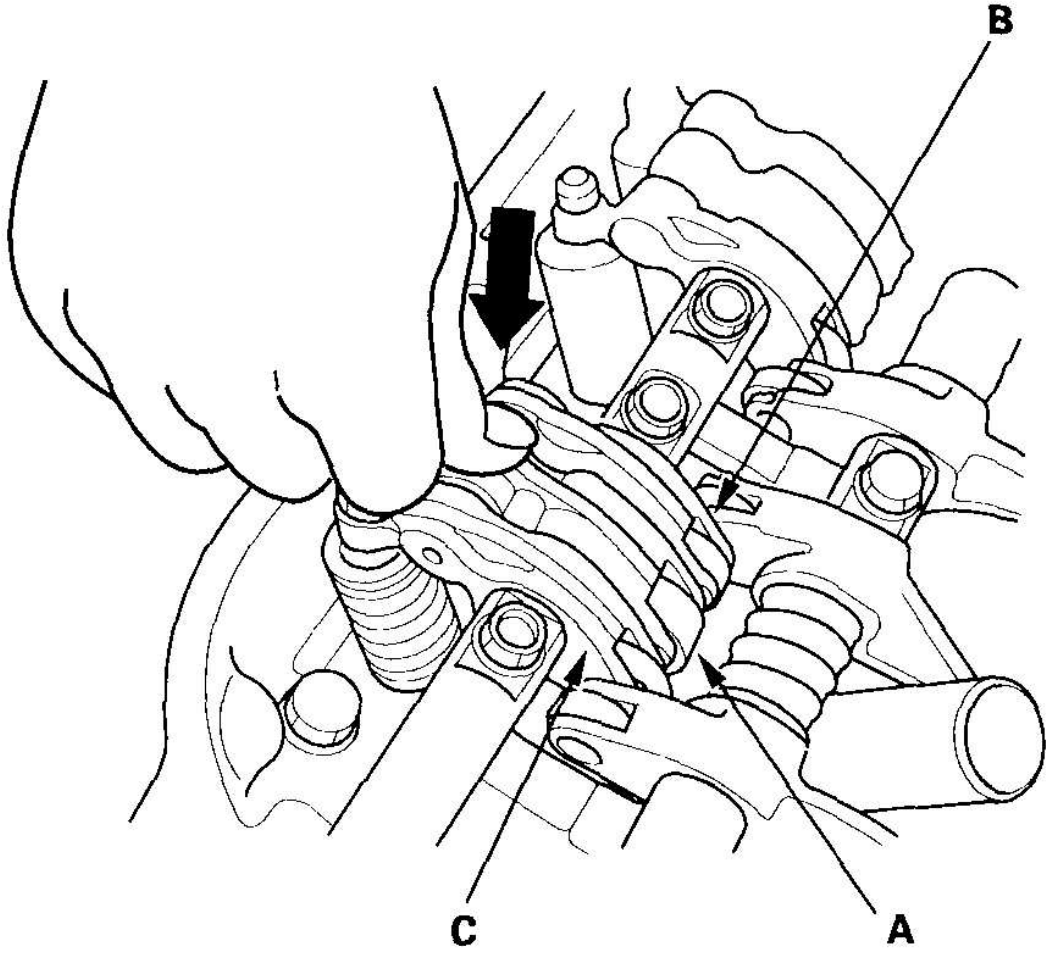

Fig. 6: Pushing On Intake Mid Rocker Arm For No. 1 Cylinder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Repeat step 5 on the remaining intake mid rocker arms with each piston at TDC. When all the mid rocker arms pass the test, go to step 7.
7. Check that the air pressure on the shop air compressor gauge indicates over 690 kPa (7.0kgf/cm^2 100 psi).
8. Inspect the valve clearance (see **VALVE CLEARANCE ADJUSTMENT**).
9. Remove the No. 1 and No. 6 intake rocker shaft mounting bolts, then install and connect the special tools as shown in **Fig. 7** or **Fig. 8** .

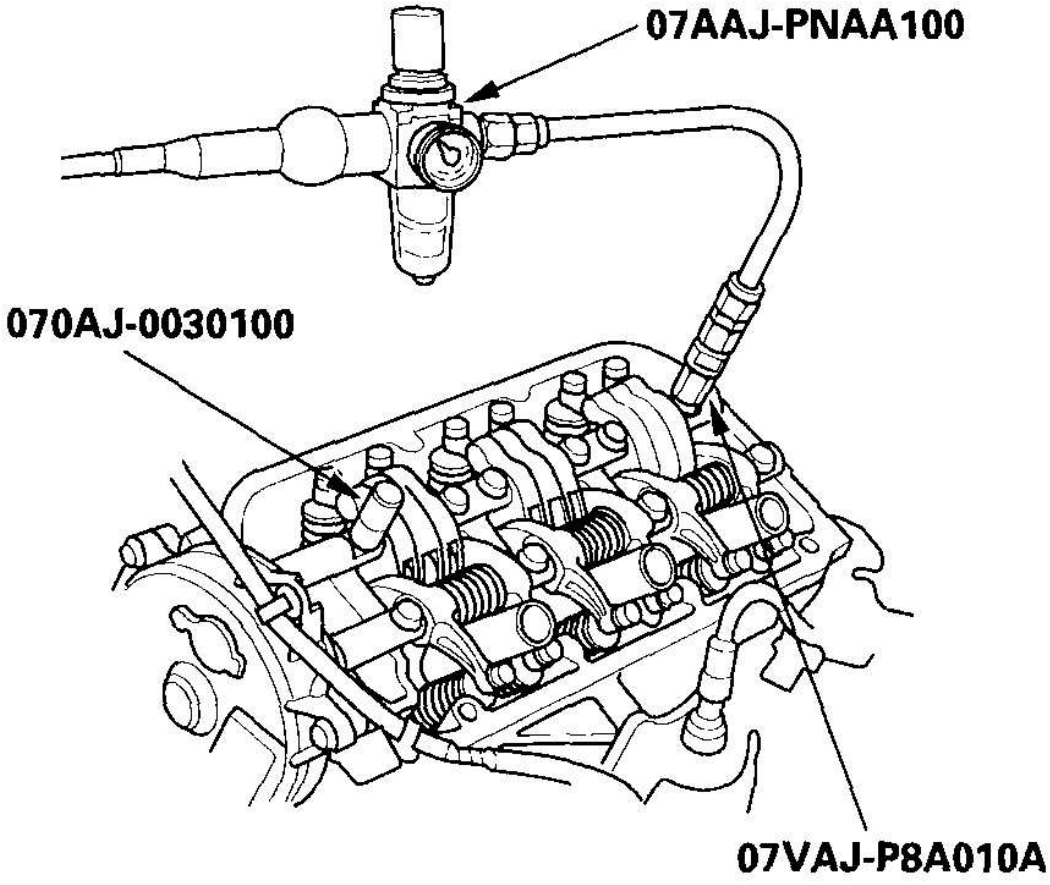

Fig. 7: Installing And Connecting Special Tools (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

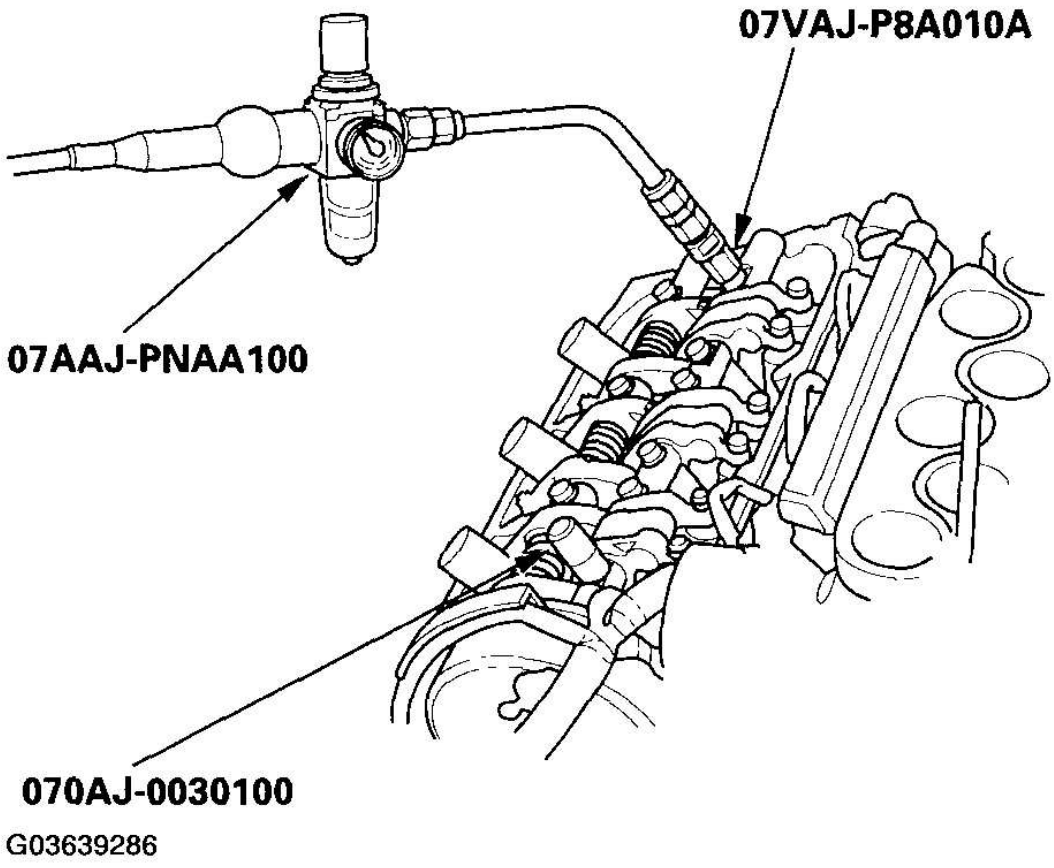

Fig. 8: Installing And Connecting Special Tools (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Loosen the valve on the regulator, and apply the specified air pressure.

Specified Air Pressure: 440-540 kPa (4.5-5.5 kgf/cm^2 , 64-78 psi)

NOTE: If the synchronizing pistons do not move after applying air pressure, move the primary or secondary rocker arm up and down manually.

11. Make sure that the intake primary rocker arm (A) and intake secondary rocker arm (B) are mechanically connected by the piston and that the mid rocker arm (C) does not move when pushed manually. If any intake mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.

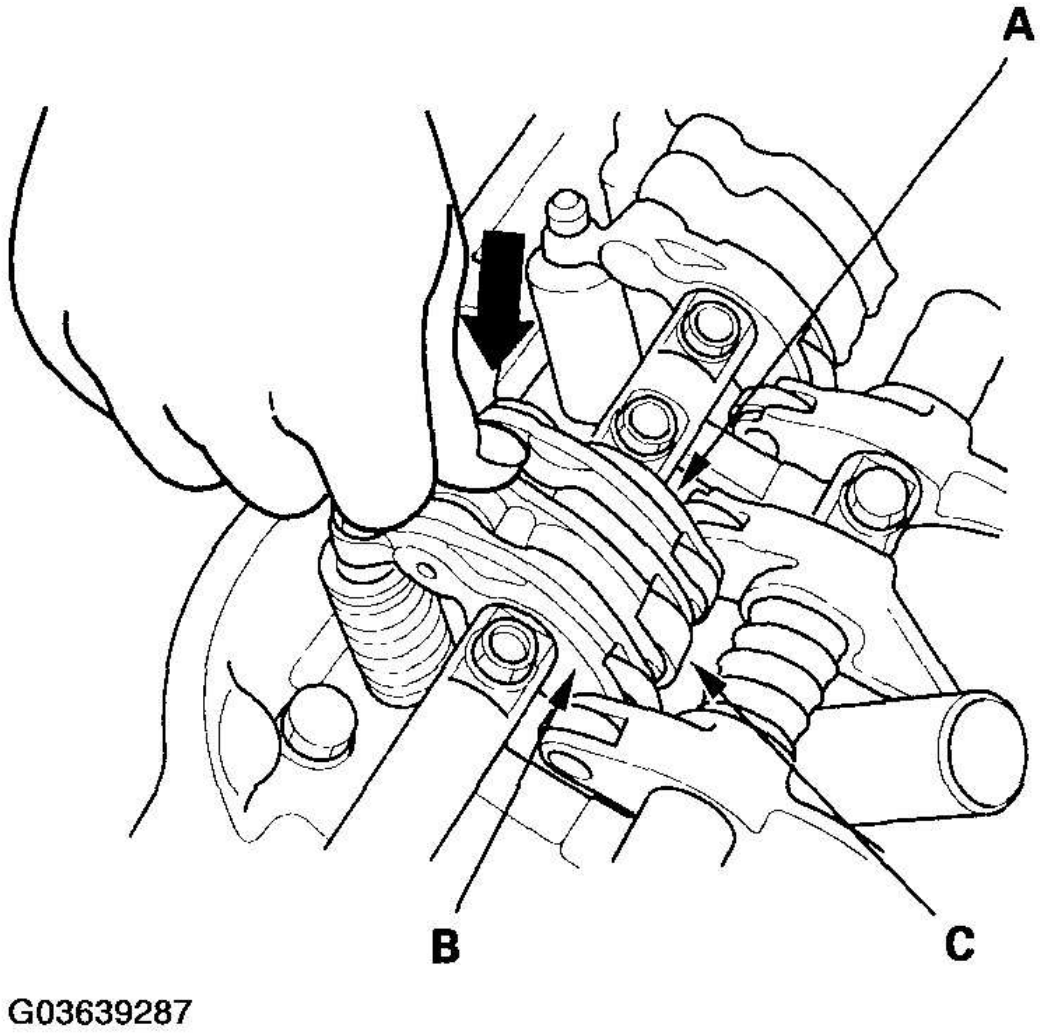

Fig. 9: Making Sure Intake Primary Rocker Arm And Intake Secondary Rocker Arm Are Mechanically Connected By Piston
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Remove the special tools.
13. Tighten the rocker shaft bolts to 24 N.m (2.4 kgf.m, 17 lbf.ft)
14. Install the cylinder head covers (see **CYLINDER HEAD COVER INSTALLATION**).
15. Install the intake manifold (see **INSTALLATION**).

VALVE CLEARANCE ADJUSTMENT

NOTE: Adjust the valves only when the cylinder head temperature is less than 100°F (38°C).

1. Remove the intake manifold (see **REMOVAL**).
2. Remove the cylinder head covers (see **CYLINDER HEAD COVER REMOVAL**).
3. Set the No. 1 piston at top dead center (TDC). Align the pointer (A) on the front upper cover with the No. 1 piston TDC mark (B) on the front camshaft pulley.

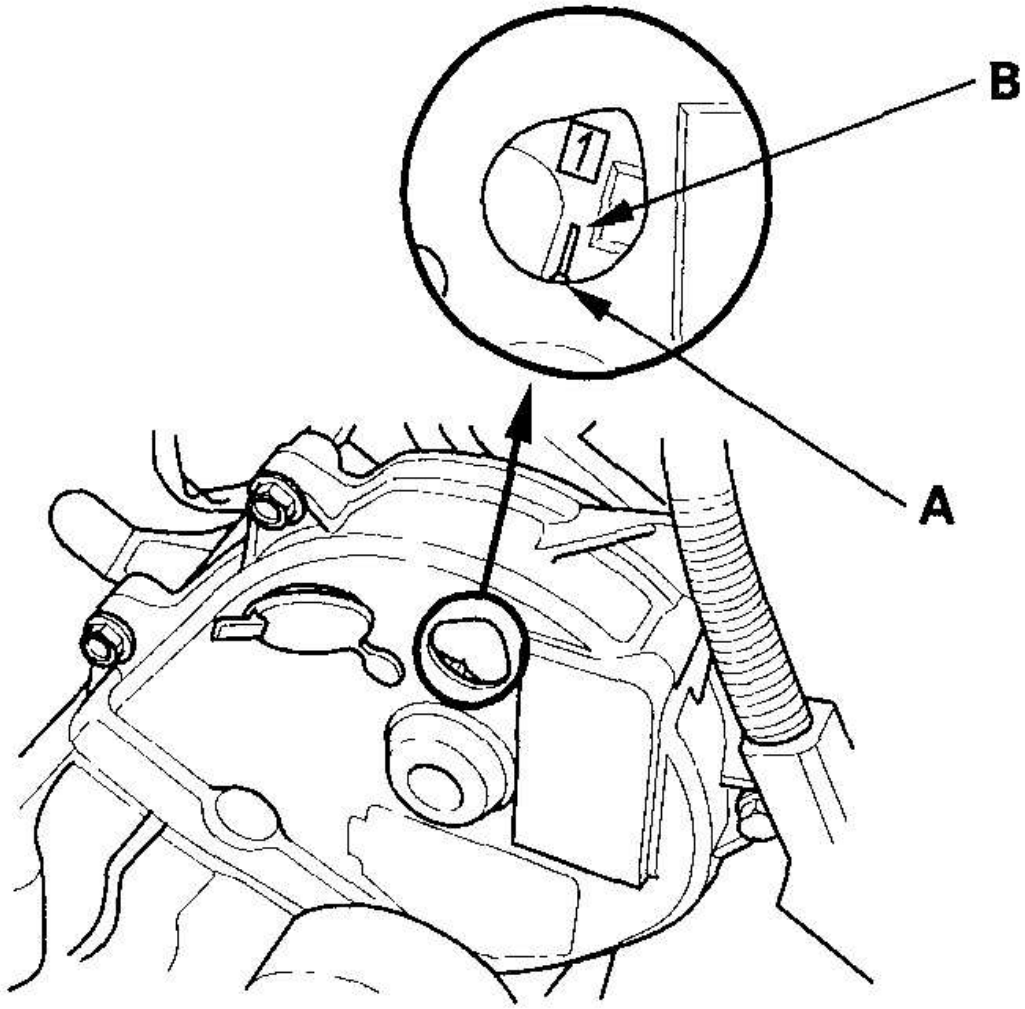

Fig. 10: Aligning Pointer On Front Upper Cover With No. 1 Piston TDC Mark
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Select the correct thickness feeler gauge for the valves you're going to check.

Valve Clearance

Intake: 0.20-0.24 mm (0.008-0.009 in.)
Exhaust: 0.28-0.32 mm (0.011-0.013 in.)

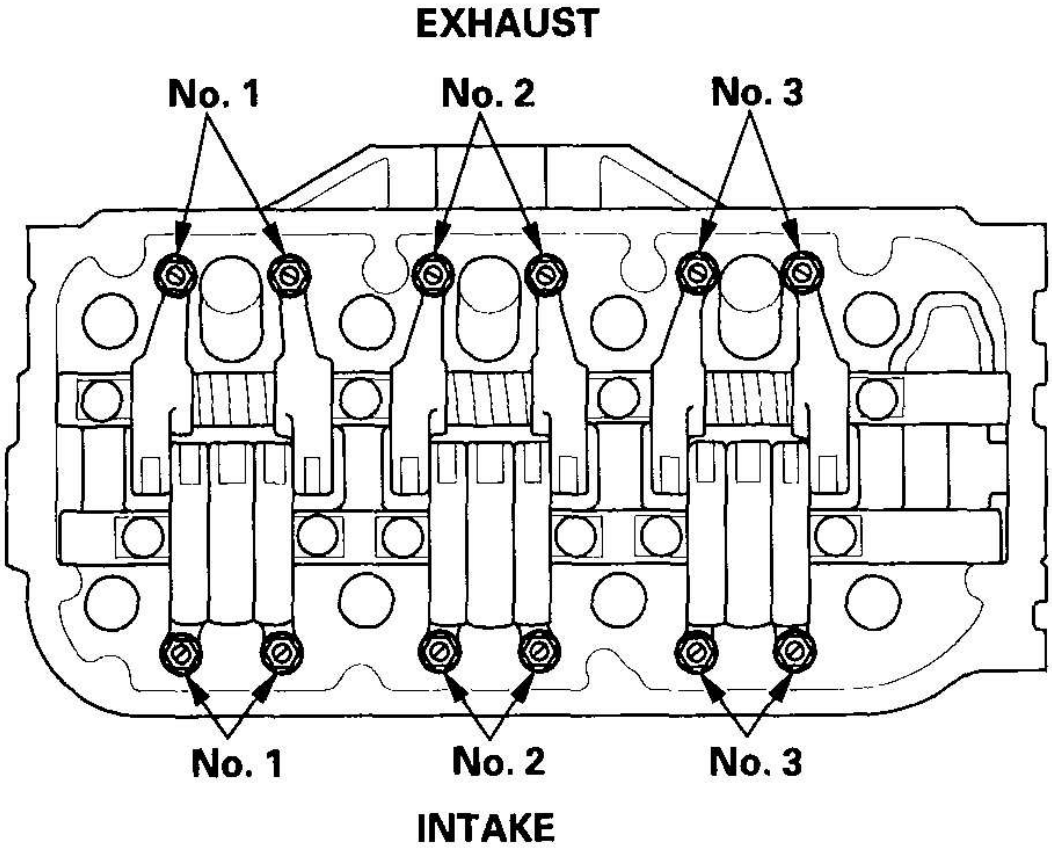

Fig. 11: Selecting Correct Thickness Feeler Gauge (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

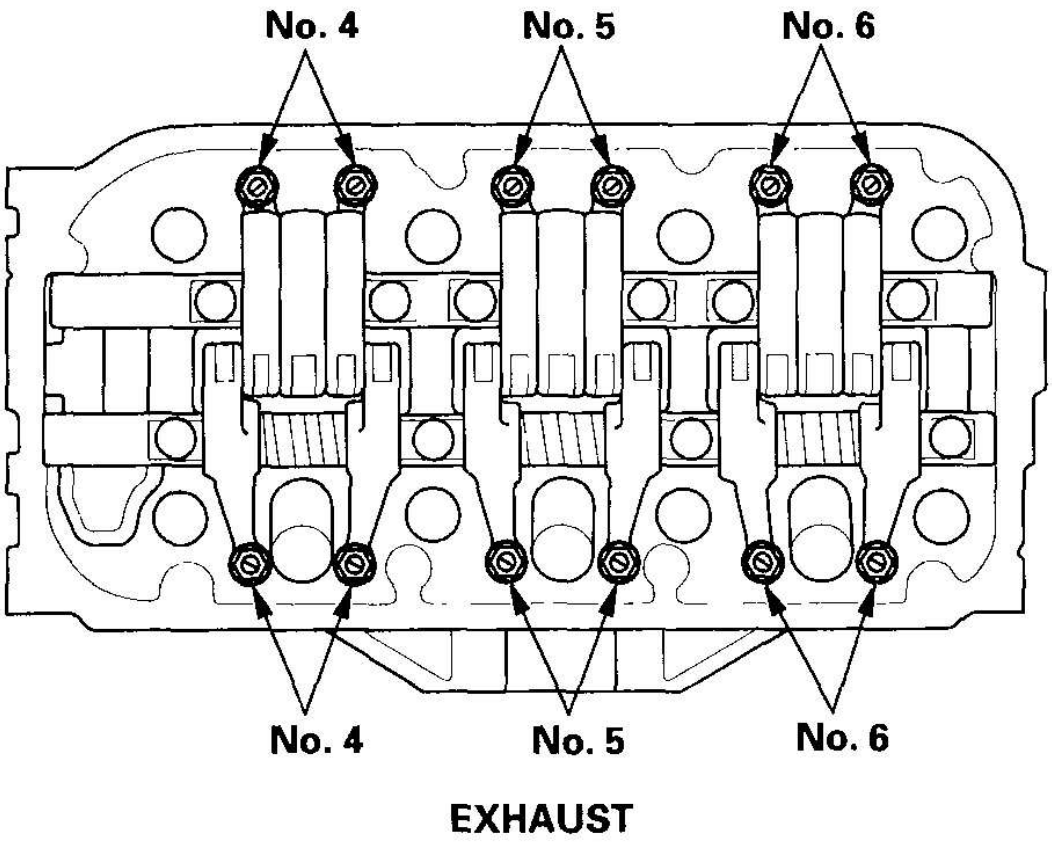

Fig. 12: Selecting Correct Thickness Feeler Gauge (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Insert the feeler gauge (A) between the adjusting screw and the end of the valve stem on No. 1 cylinder, and slide it back and forth; you should feel a slight amount of drag.

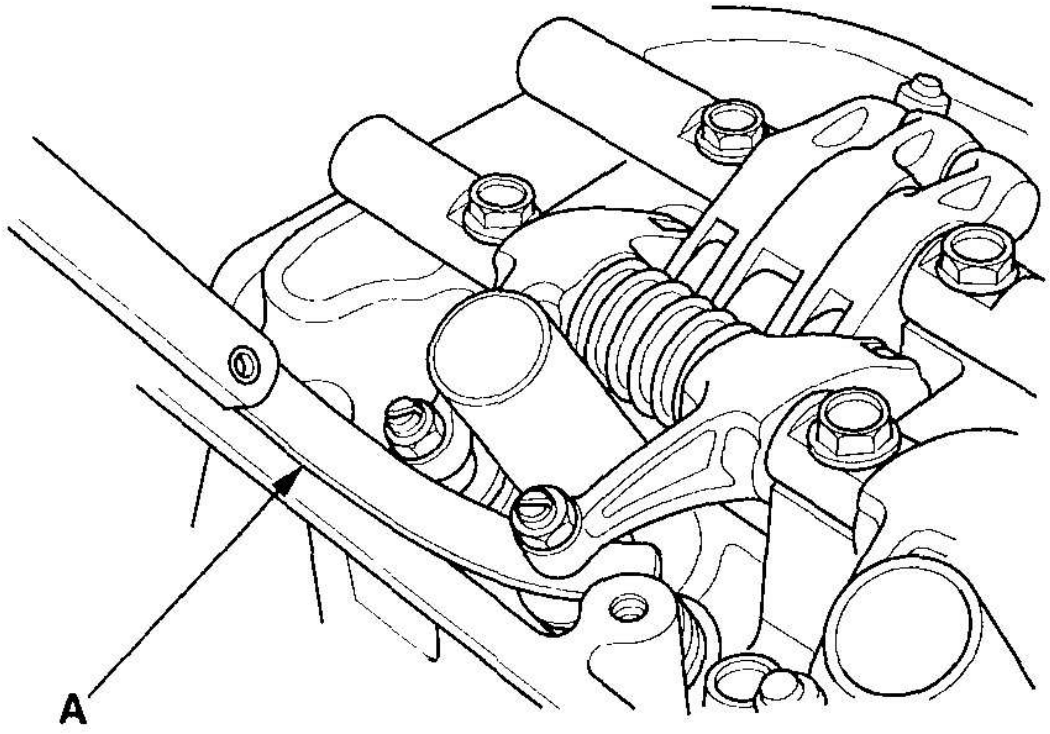

Fig. 13: Inserting Feeler Gauge Between Adjusting Screw And End Of Valve Stem On No. 1 Cylinder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. If you feel too much or too little drag, loosen the locknut (A), and turn the adjusting screw (B) until the drag on the feeler gauge is correct.

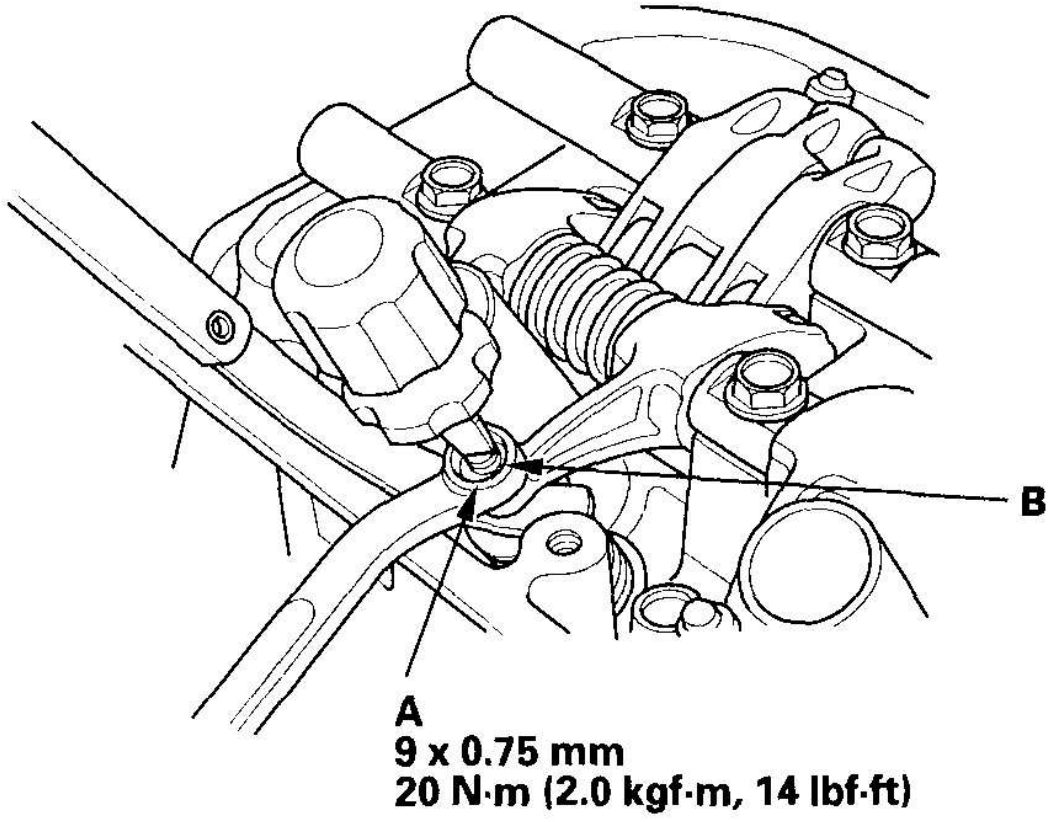

Fig. 14: Loosening Locknut And Turning Adjusting Screw
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Tighten the locknut and recheck the clearance. Repeat the adjustment, if necessary.
8. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 4 piston TDC mark (B) on the front camshaft pulley.

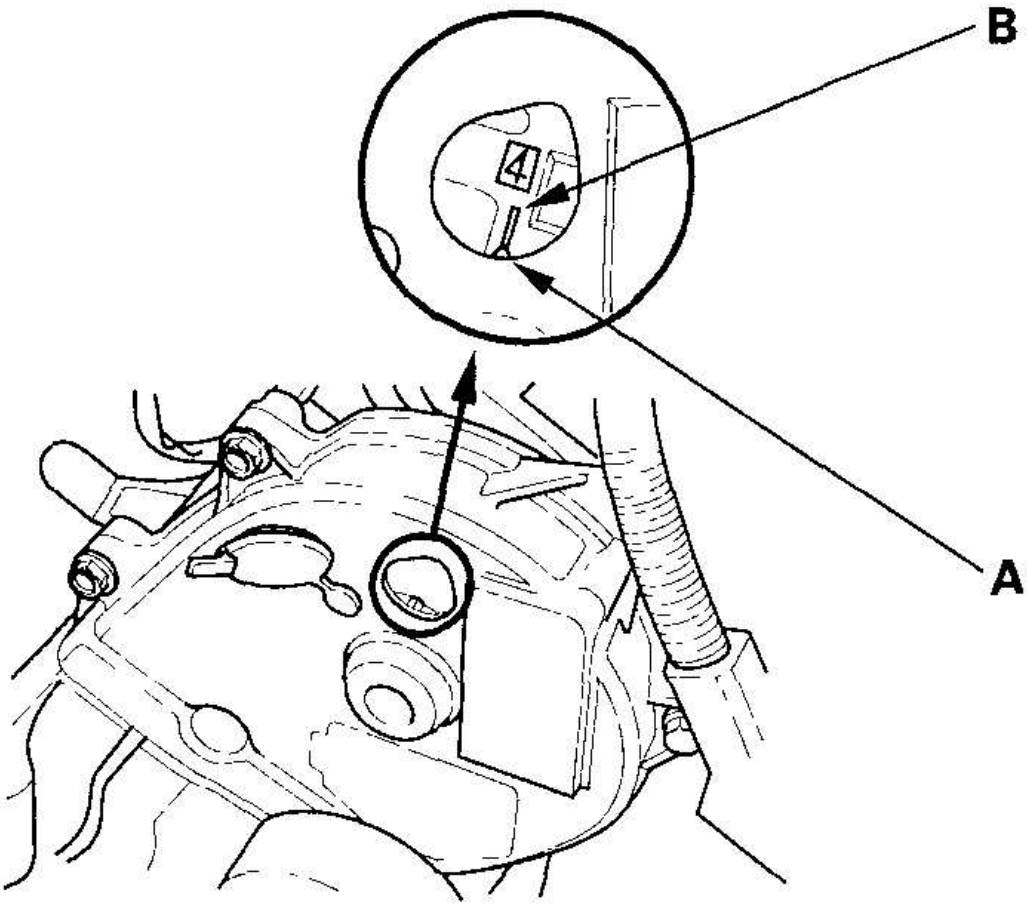

Fig. 15: Aligning Pointer On Front Upper Cover With No. 4 Piston TDC Mark On Front Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Check and, if necessary, adjust the valve clearance on No. 4 cylinder.
10. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 2 piston TDC mark (B) on the front camshaft pulley.

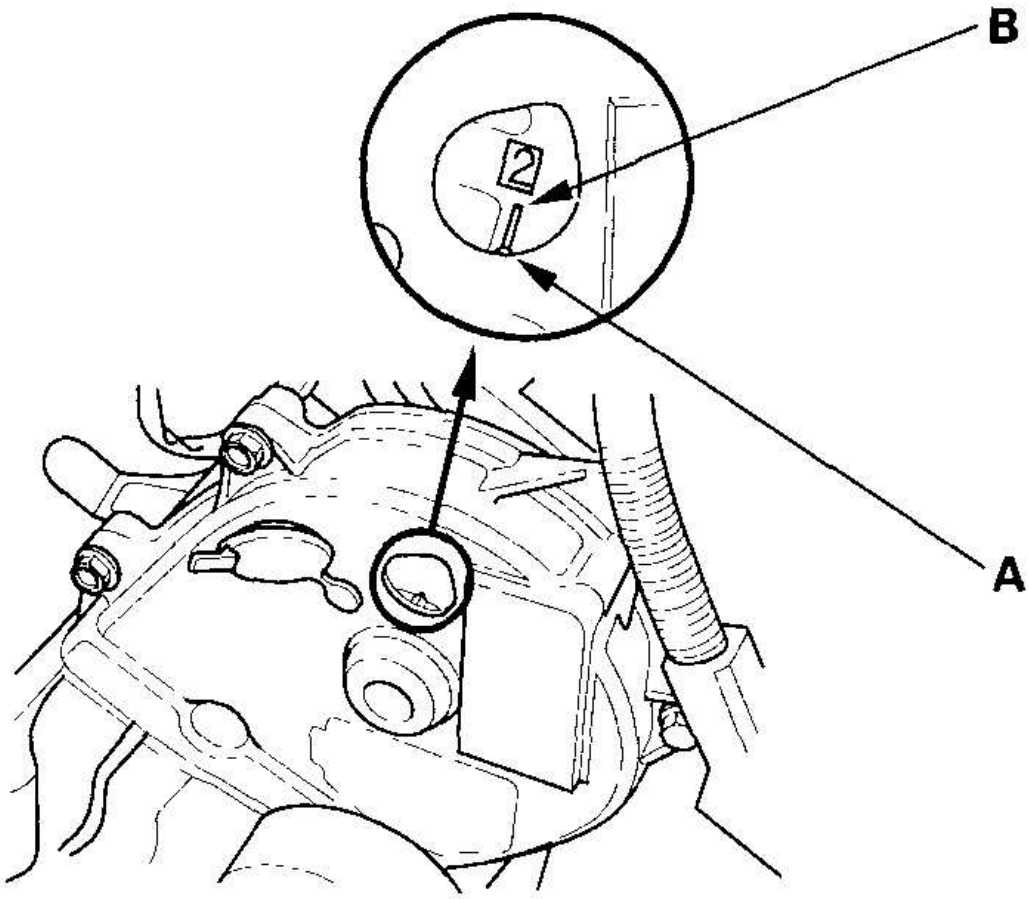

Fig. 16: Aligning Pointer On Front Upper Cover With No. 2 Piston TDC Mark On Front Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Check and, if necessary, adjust the valve clearance on No. 2 cylinder.
12. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 5 piston TDC mark (B) on the front camshaft pulley.

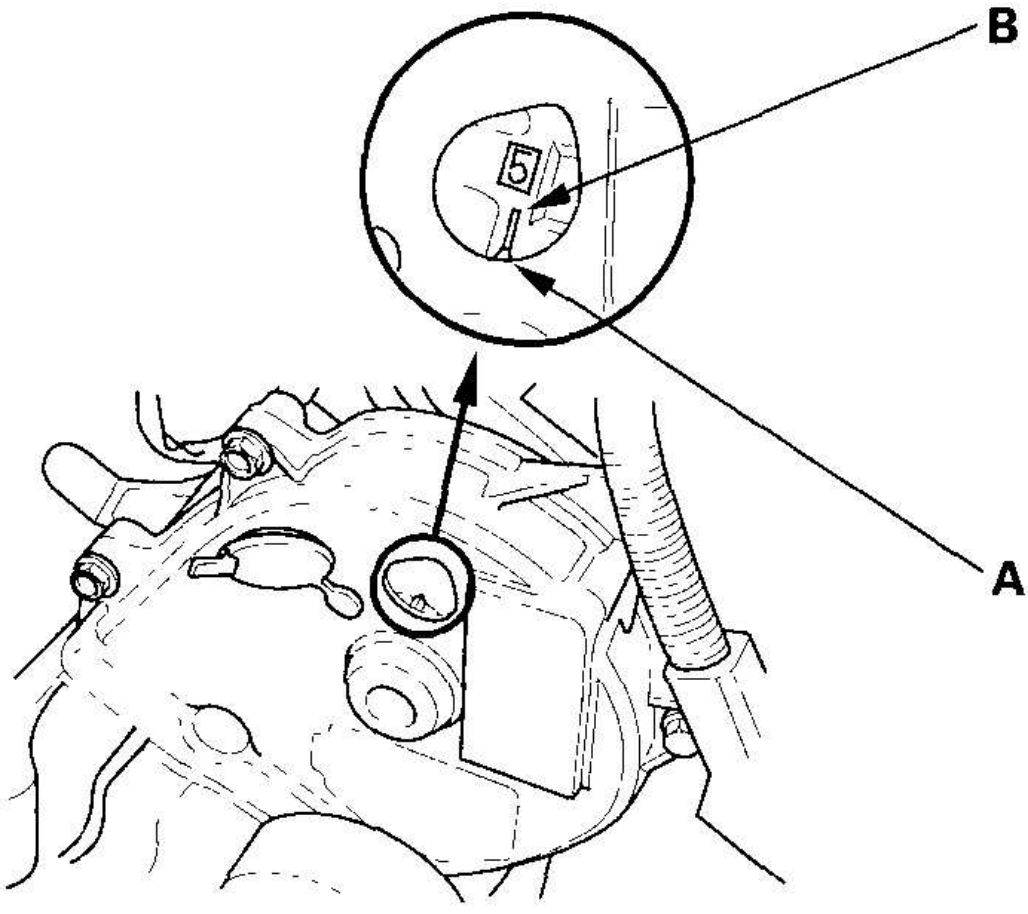

Fig. 17: Aligning Pointer On Front Upper Cover With No. 5 Piston TDC Mark On Front Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Check and, if necessary, adjust the valve clearance on No. 5 cylinder.
14. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. 3 piston TDC mark (B) on the front camshaft pulley.

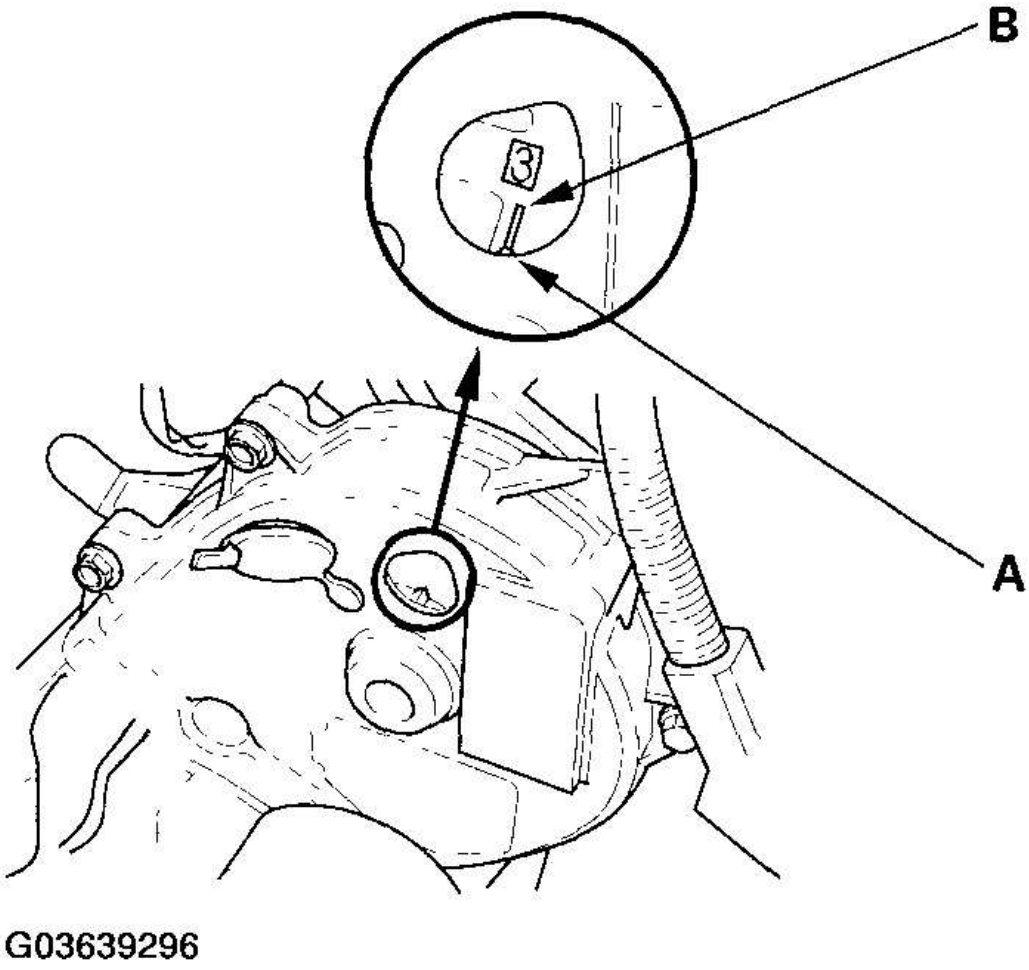

Fig. 18: Aligning Pointer On Front Upper Cover With No. 3 Piston TDC Mark On Front Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Check and, if necessary, adjust the valve clearance on No. 3 cylinder.
16. Rotate the crankshaft clockwise. Align the pointer (A) on the front upper cover with the No. piston TDC mark (B) on the front camshaft pulley.

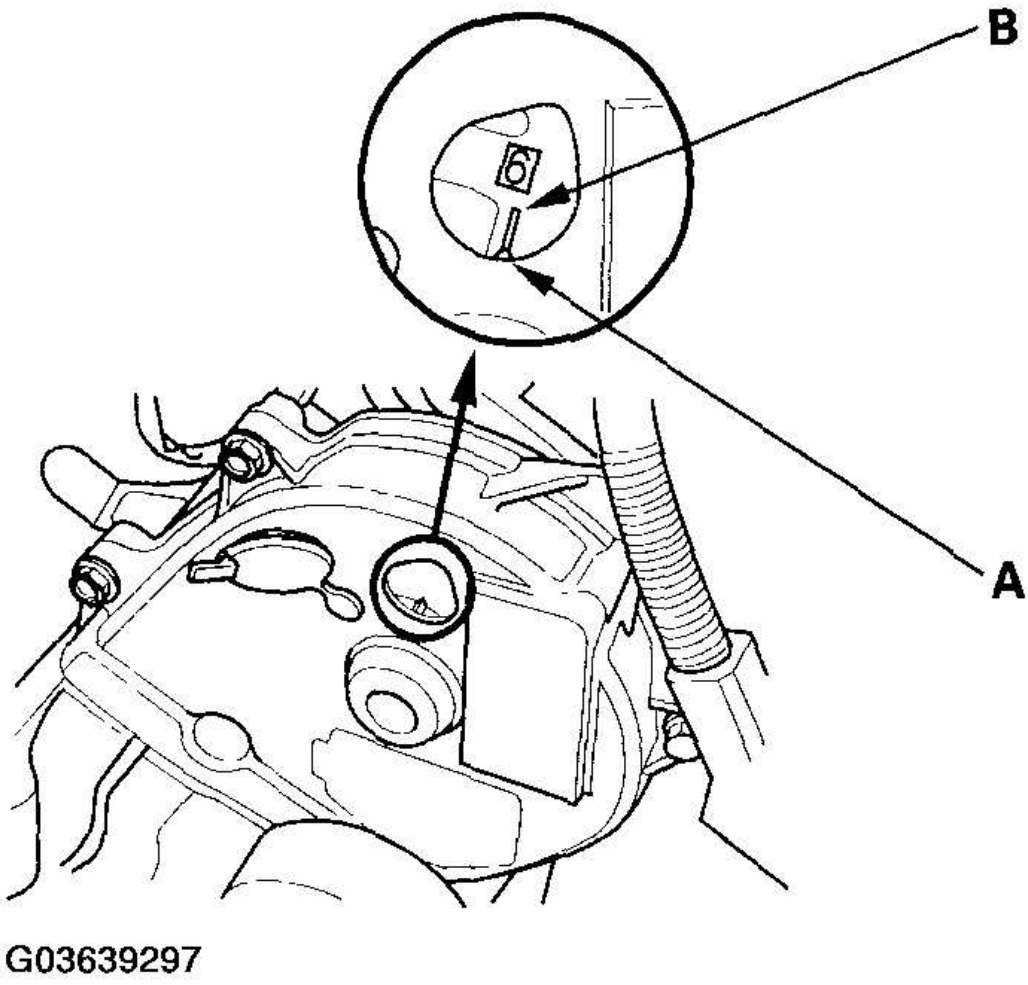

Fig. 19: Aligning Pointer On Front Upper Cover With No. 6 Piston TDC Mark On Front Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Check and, if necessary, adjust the valve clearance on No. 6 cylinder.
18. Install the cylinder head covers (see **CYLINDER HEAD COVER INSTALLATION**).
19. Install the intake manifold (see **INSTALLATION**).

CRANKSHAFT PULLEY REMOVAL AND INSTALLATION

Special Tools Required

- Holder handle 07JAB-001020A

- Holder attachment, 50 mm, offset 07MAB-PY3010A
- Socket, 19 mm 07JAA-001020A, or a commercially available 19 mm socket

REMOVAL

1. Remove the right front wheel.
2. Remove the splash shield.

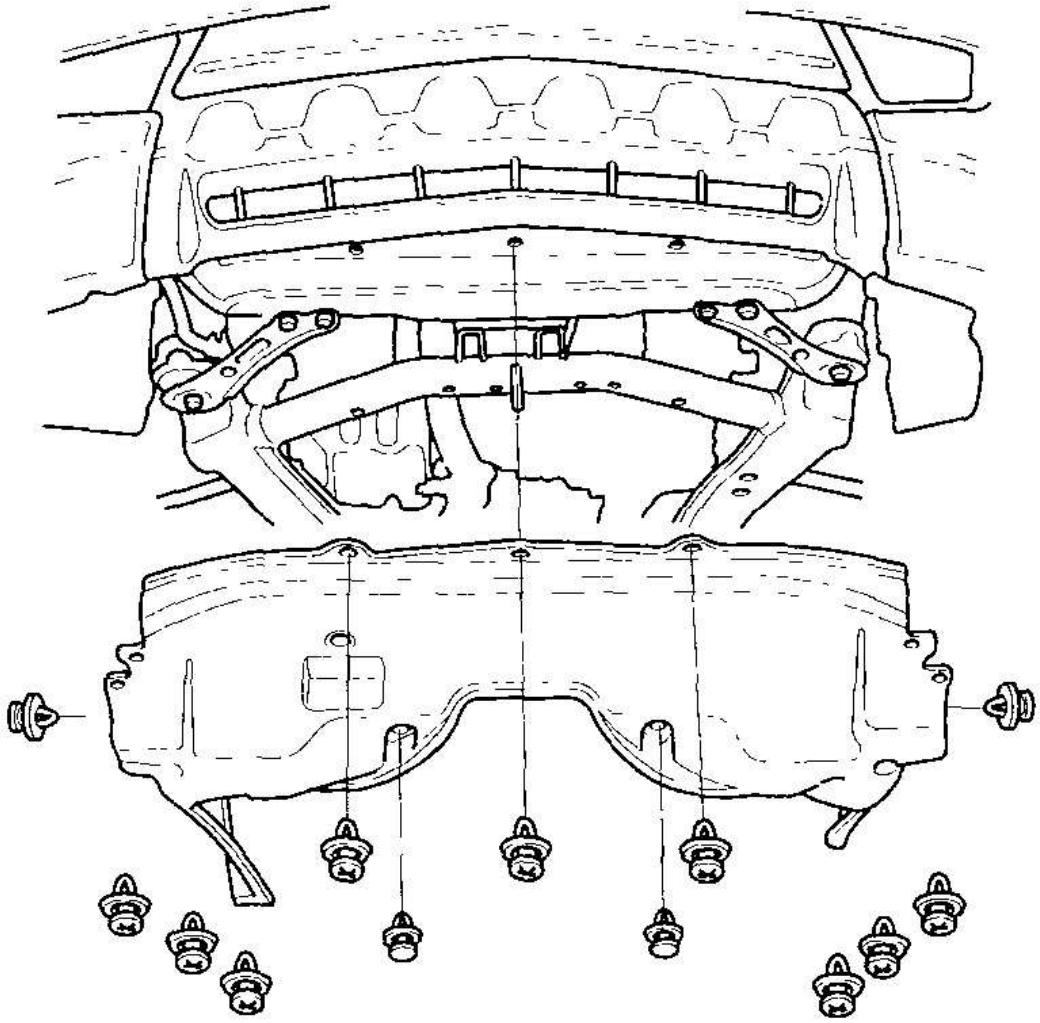

Fig. 20: Removing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
4. Hold the pulley with the holder handle (A) and holder attachment (B).

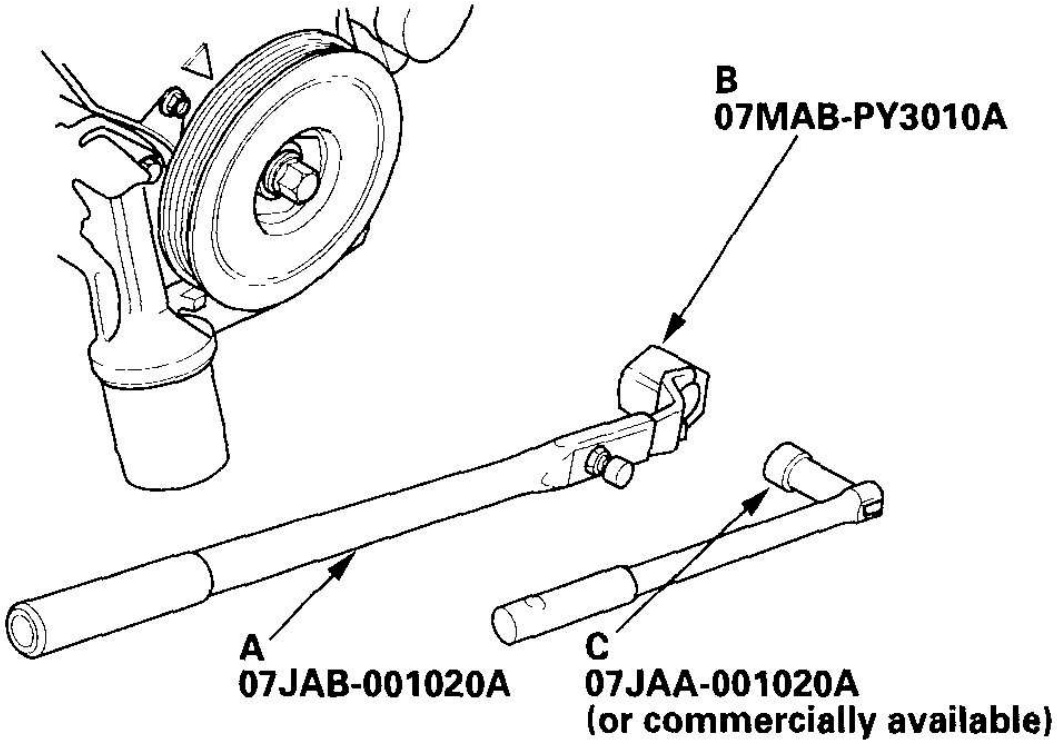

Fig. 21: Holding Pulley With Holder Handle And Holder Attachment
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the bolt with a heavy duty 19 mm socket (C) and breaker bar, then remove the crankshaft pulley.

INSTALLATION

1. Remove any oil or clean the pulleys (A), crankshaft (B), bolt (C), and washer (D). Lubricate new engine oil as shown in **Fig. 22** .

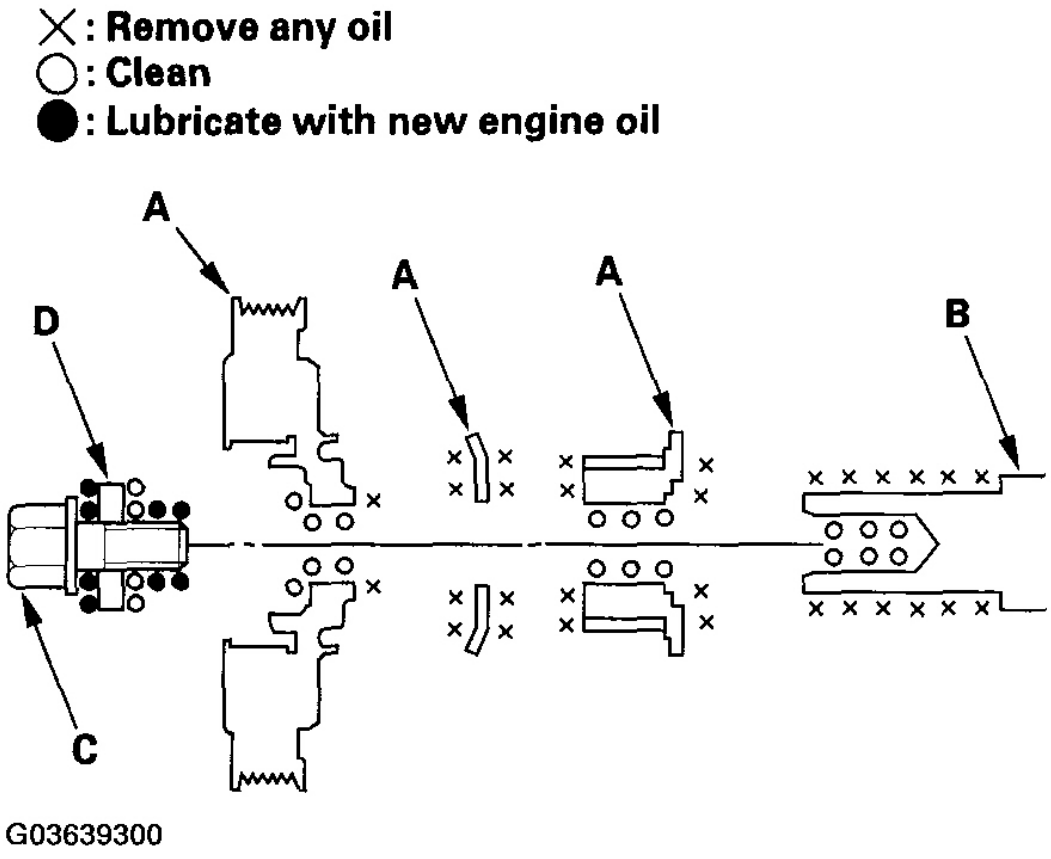

Fig. 22: Removing Oil Or Cleaning Crankshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the crankshaft pulley, and tighten the bolt. Do not use an impact wrench.

   -1 Hold the pulley with the handle (A) and holder attachment (B), then tighten the bolt to 64 N.m (6.5 kgf.m, 47 lbf.ft) with a torque wrench and 19 mm socket (C).

   -2 Mark (D) the bolt head and crankshaft pulley as shown in **Fig. 24** , then tighten the bolt an additional 60° (The mark on the bolt head line up with the mark on the crankshaft pulley).

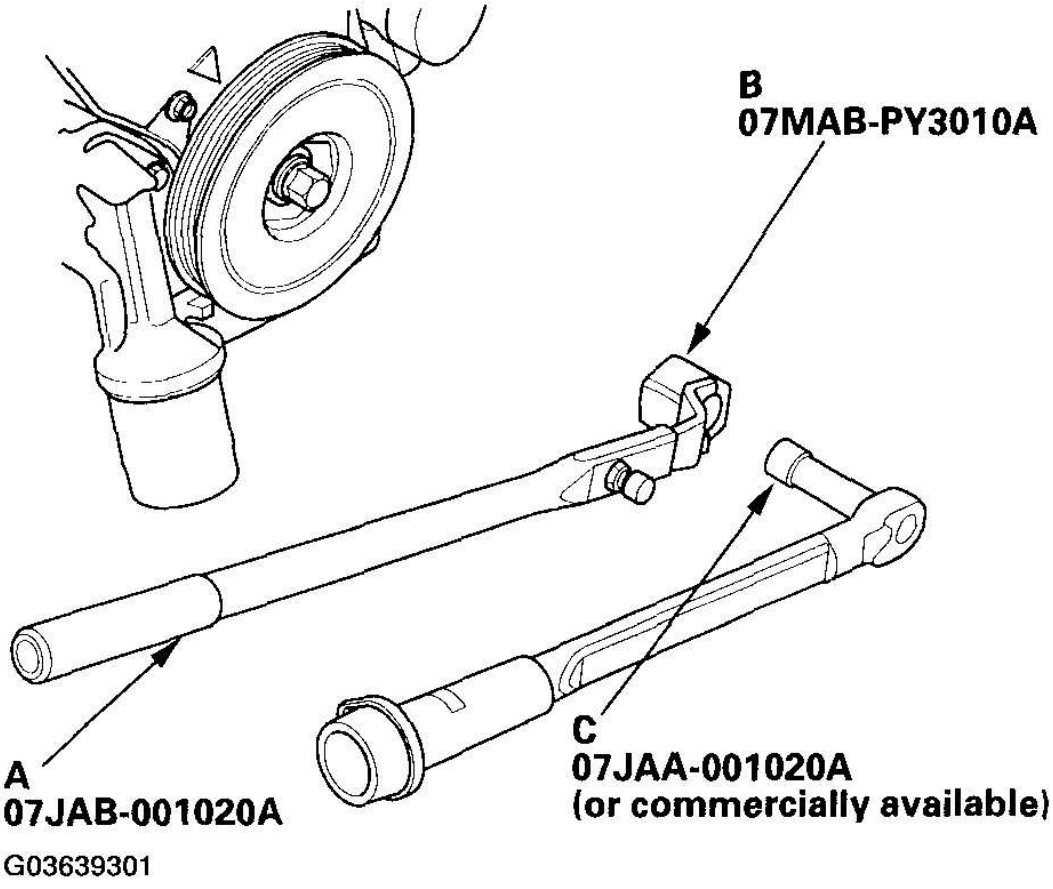

Fig. 23: Holding Pulley With Handle And Holder Attachment
Courtesy of AMERICAN HONDA MOTOR CO., INC.

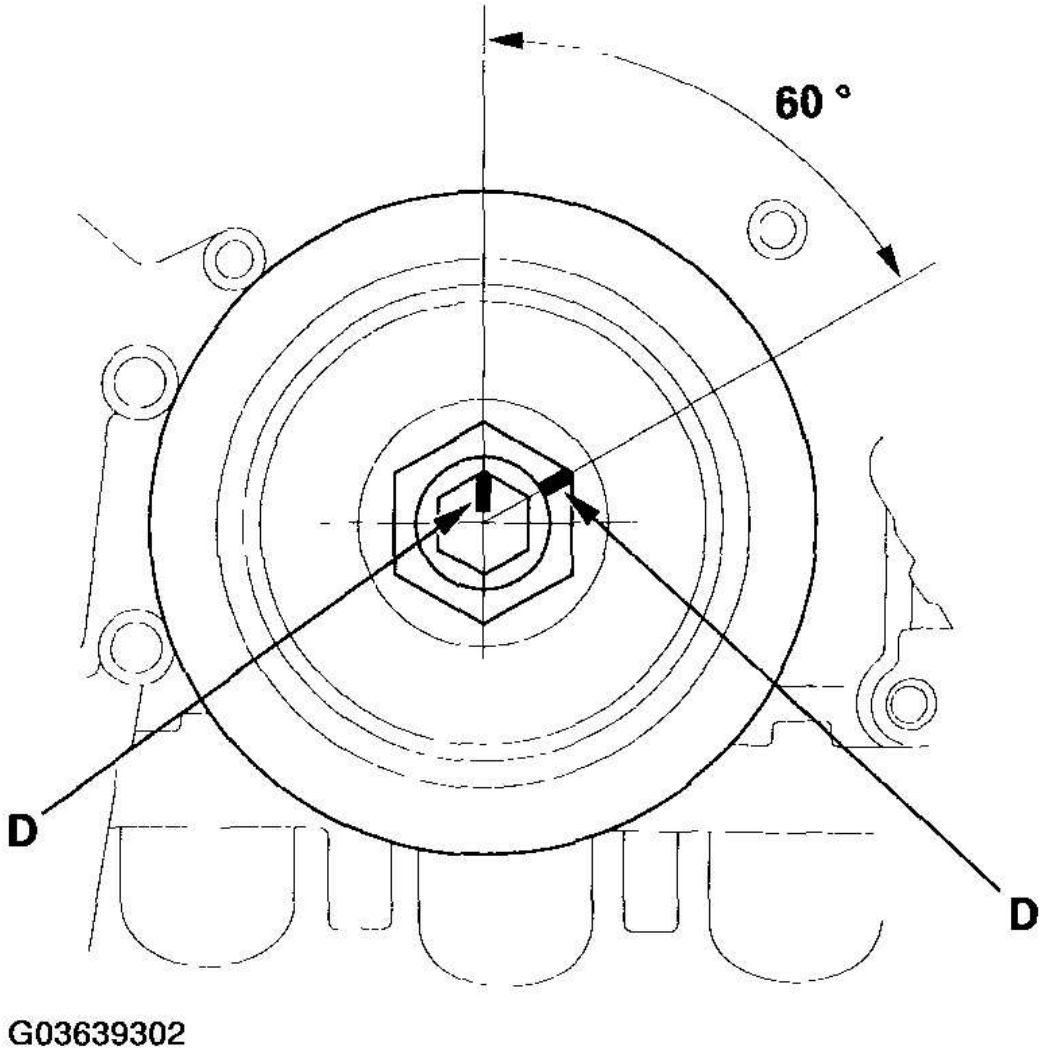

Fig. 24: Marking Bolt Head And Crankshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the drive belt (see **DRIVE BELT REPLACEMENT**).
4. Install the splash shield.
5. Install the right front wheel.

TIMING BELT INSPECTION

1. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
2. Remove the front upper cover.

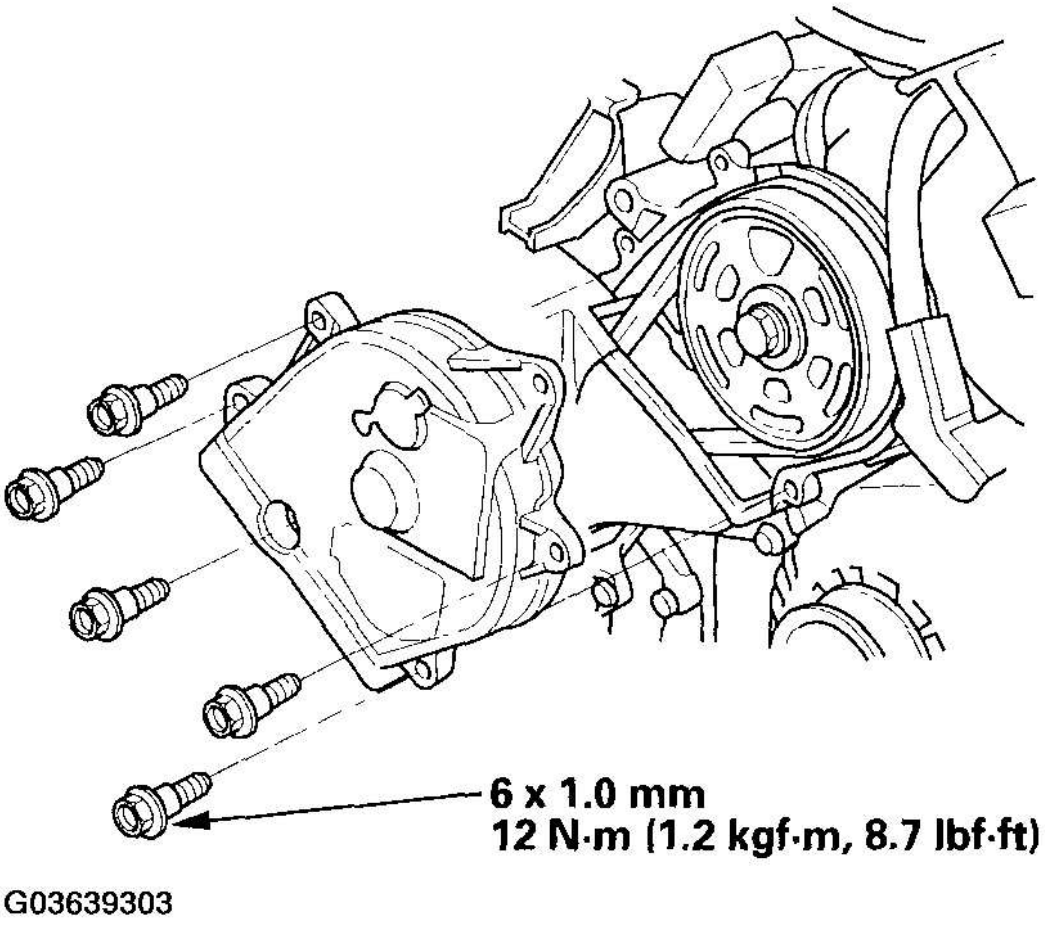

Fig. 25: Removing Front Upper Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Inspect the timing belt for cracks and oil or coolant contamination. Replace the belt if it is cracked, or is contaminated with oil or coolant. Wipe off any oil or solvent that gets on the belt.

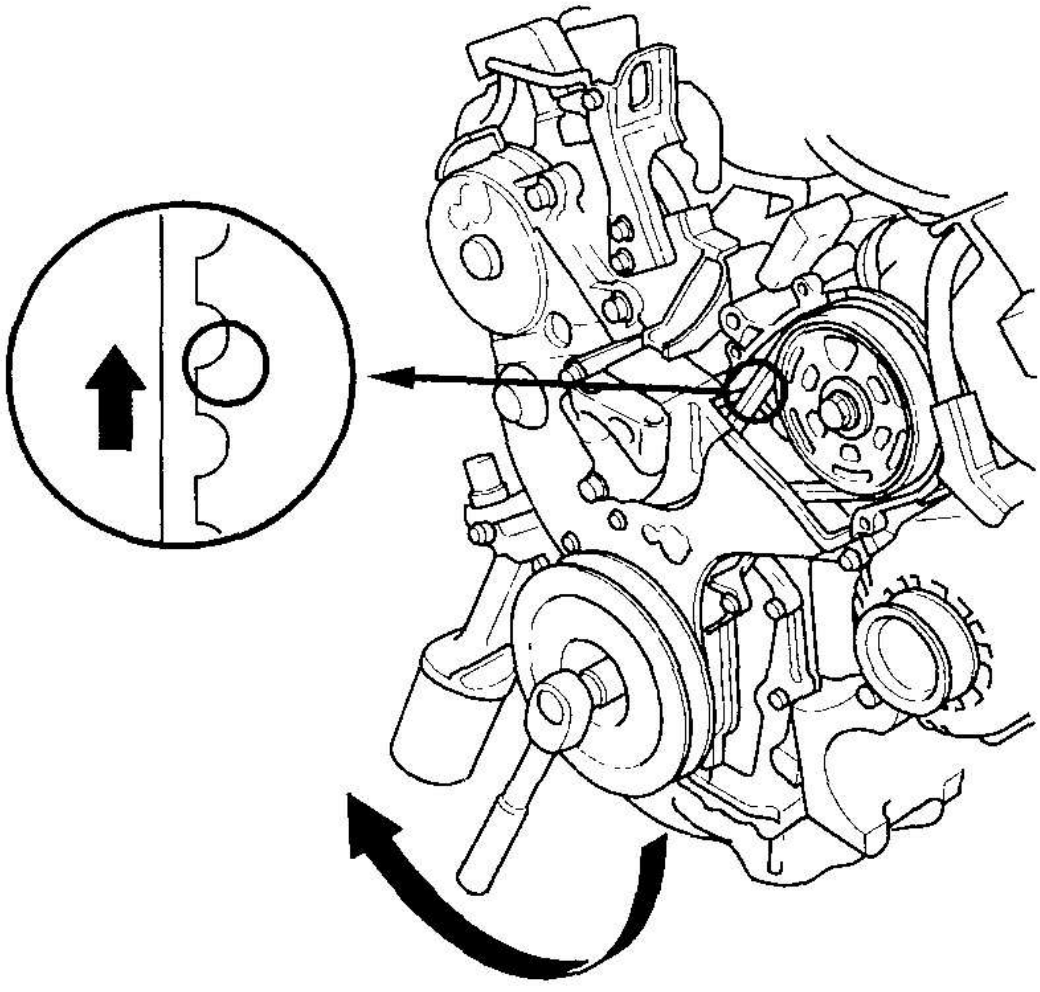

Fig. 26: Inspecting Timing Belt For Cracks, Oil Or Coolant Contamination
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TIMING BELT REMOVAL

1. Turn the crankshaft so its white mark (A) lines up with the pointer (B).

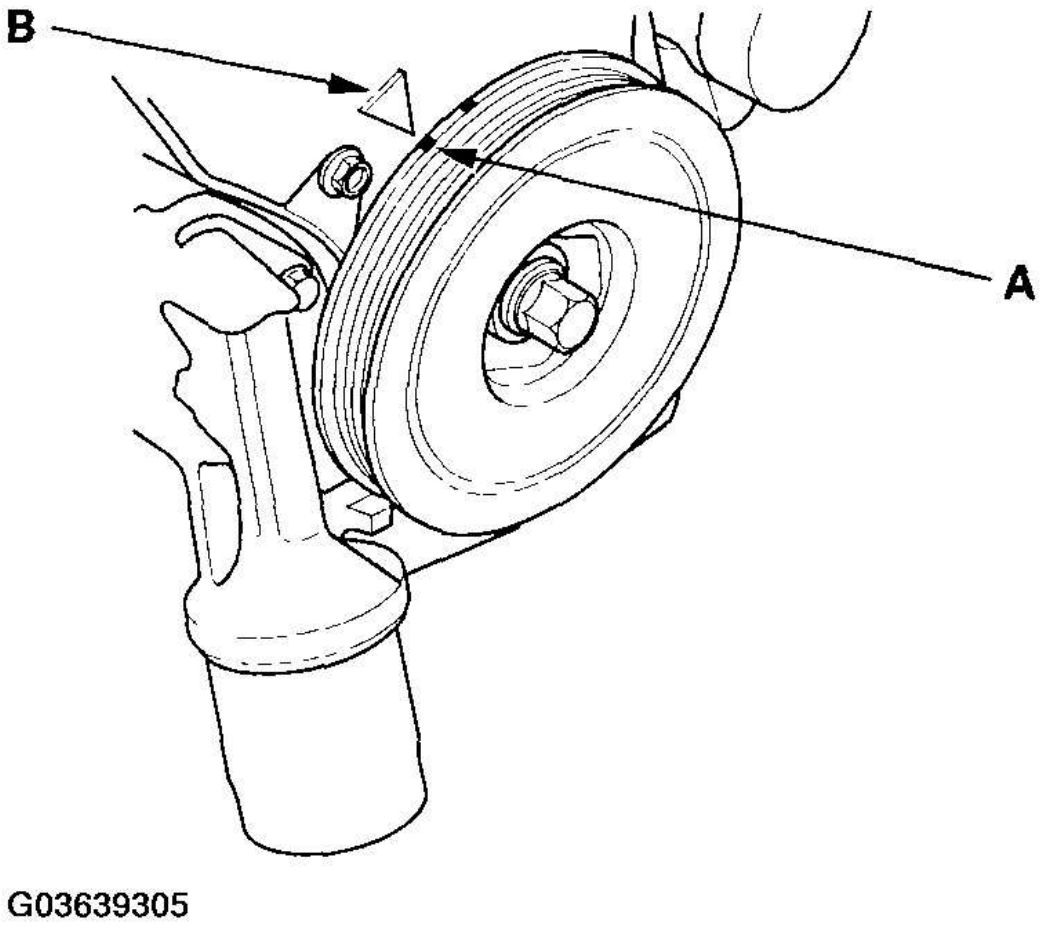

Fig. 27: Lining Up White Mark With Pointer Turning Crankshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check that the No. 1 piston top dead center (TDC) mark (A) on the front camshaft pulley and the pointer (B) on the front upper cover are aligned.

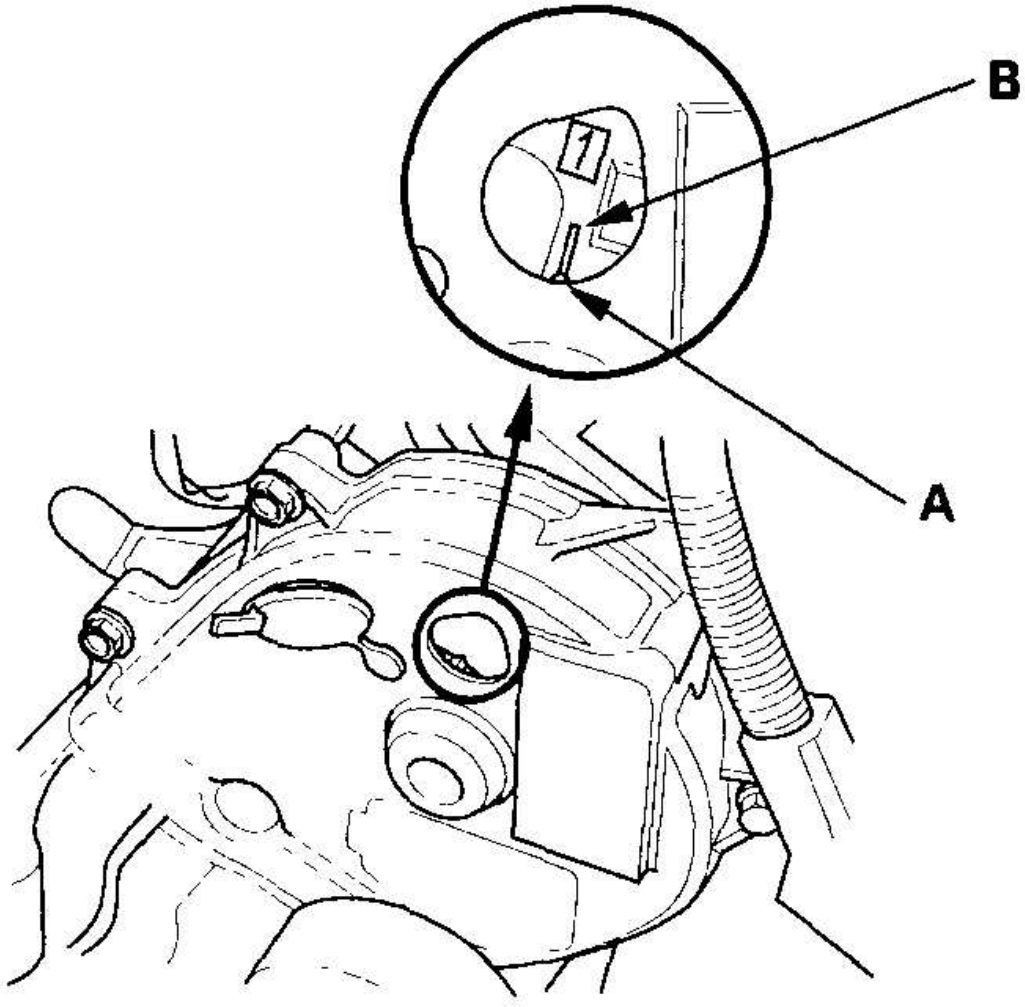

Fig. 28: Checking No. 1 Piston TDC Mark On Front Camshaft Pulley And Pointer Are Aligned
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the right front wheel.
4. Remove the splash shield.

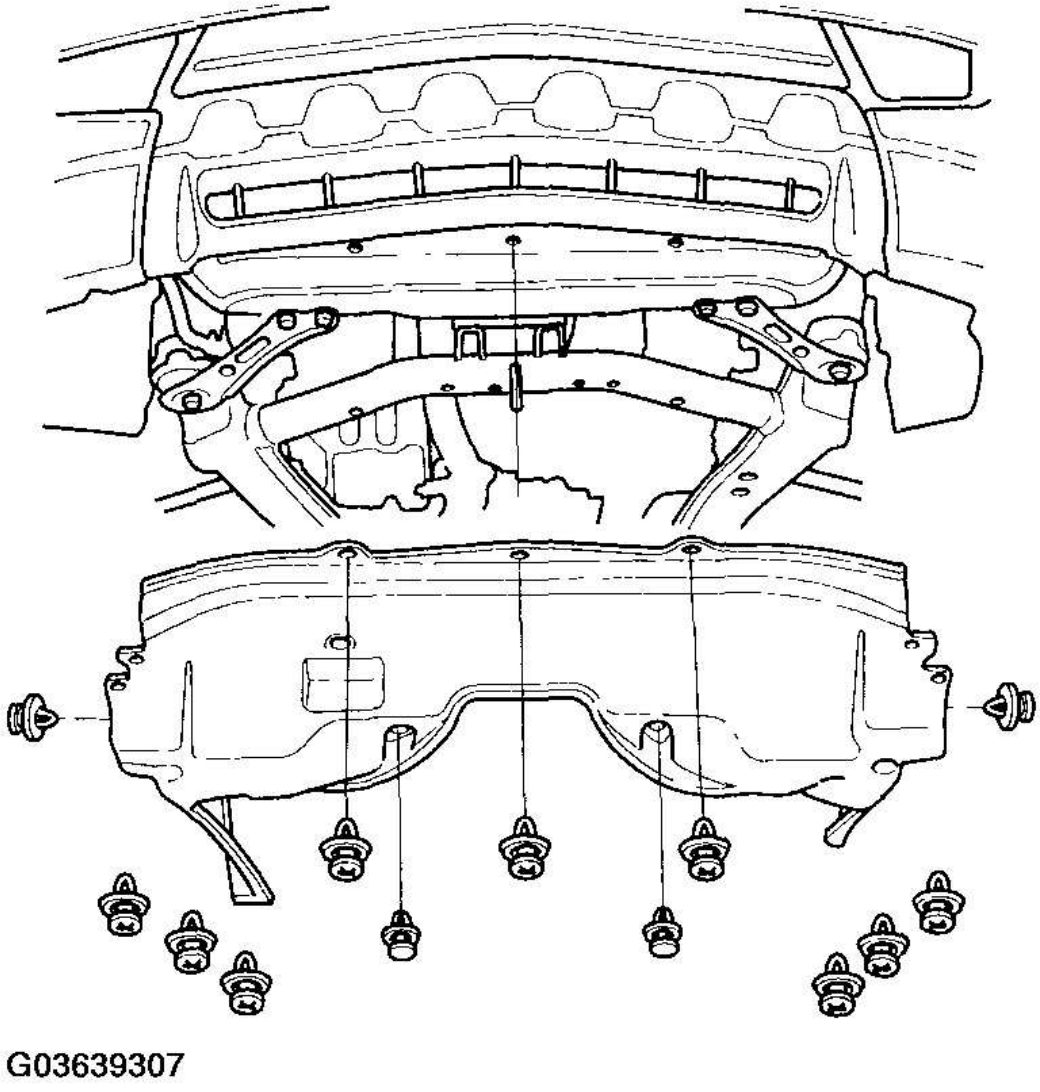

Fig. 29: Removing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
6. Support the engine with a jack and wood block under the oil pan.
7. Remove the upper half of the side engine mount bracket.

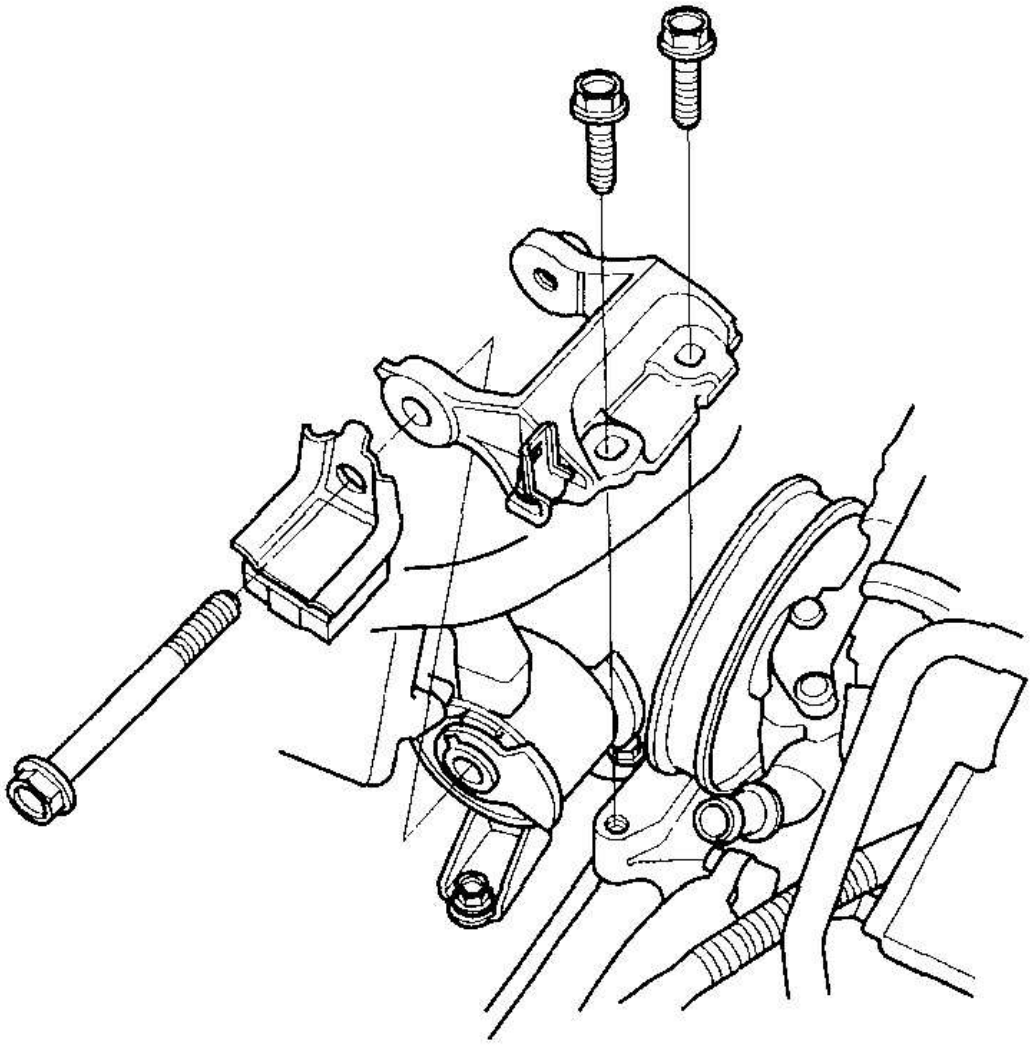

Fig. 30: Removing Upper Half Of Side Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove the crankshaft pulley (see **CRANKSHAFT PULLEY REMOVAL AND INSTALLATION**).
9. Remove the front upper cover (A) and rear upper cover (B).

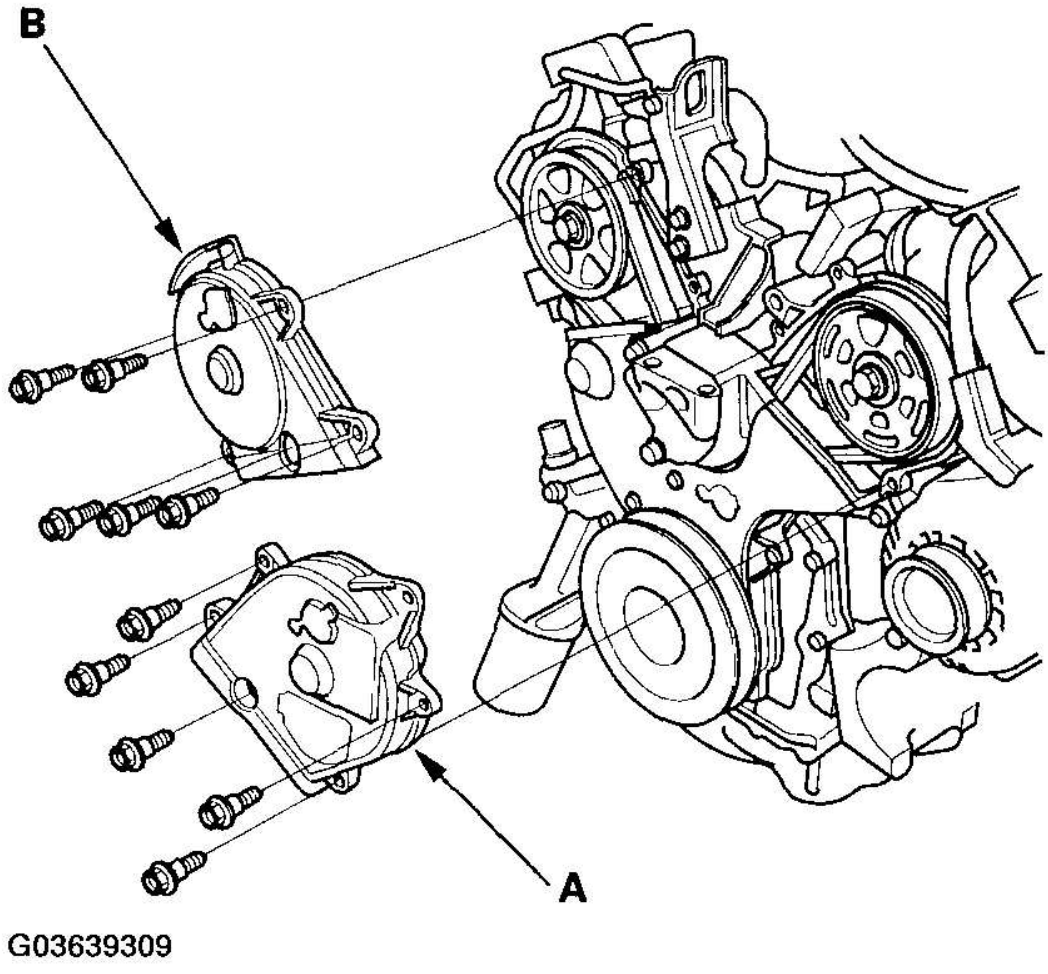

Fig. 31: Removing Front And Rear Upper Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the lower cover.

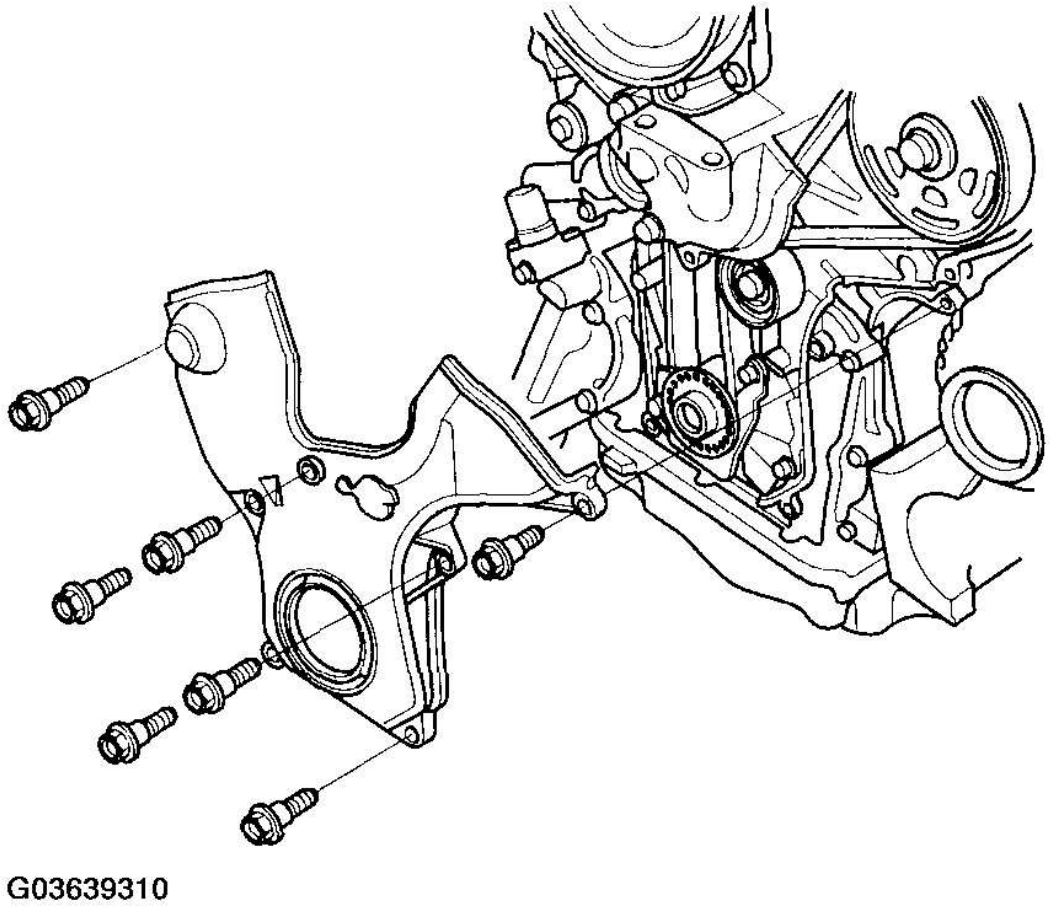

Fig. 32: Removing Lower Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Remove one of the battery clamp bolts from the battery tray, and grind the end of it as shown in **Fig. 33** .

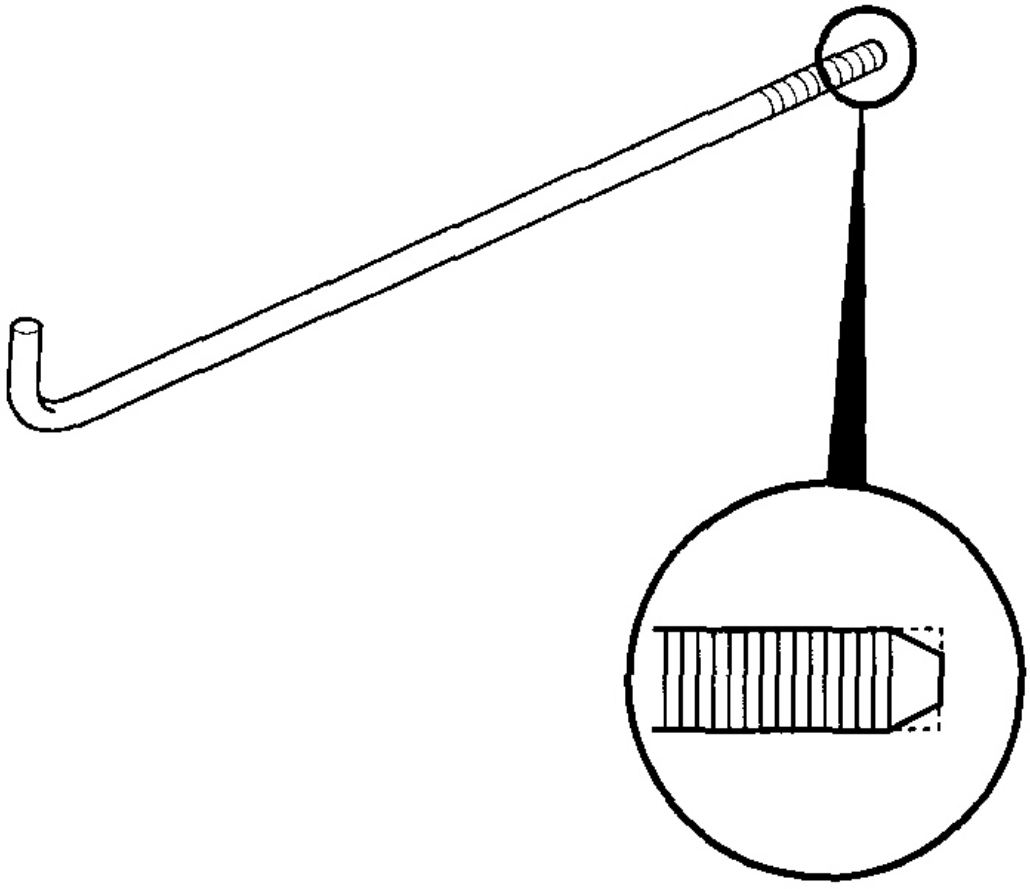

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Fig. 33: Grinding End Of Battery Clamp Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Screw the battery clamp bolt in as shown in **Fig. 34** to hold the timing belt adjuster in its current position.

    Tighten it by hand; do not use a wrench.

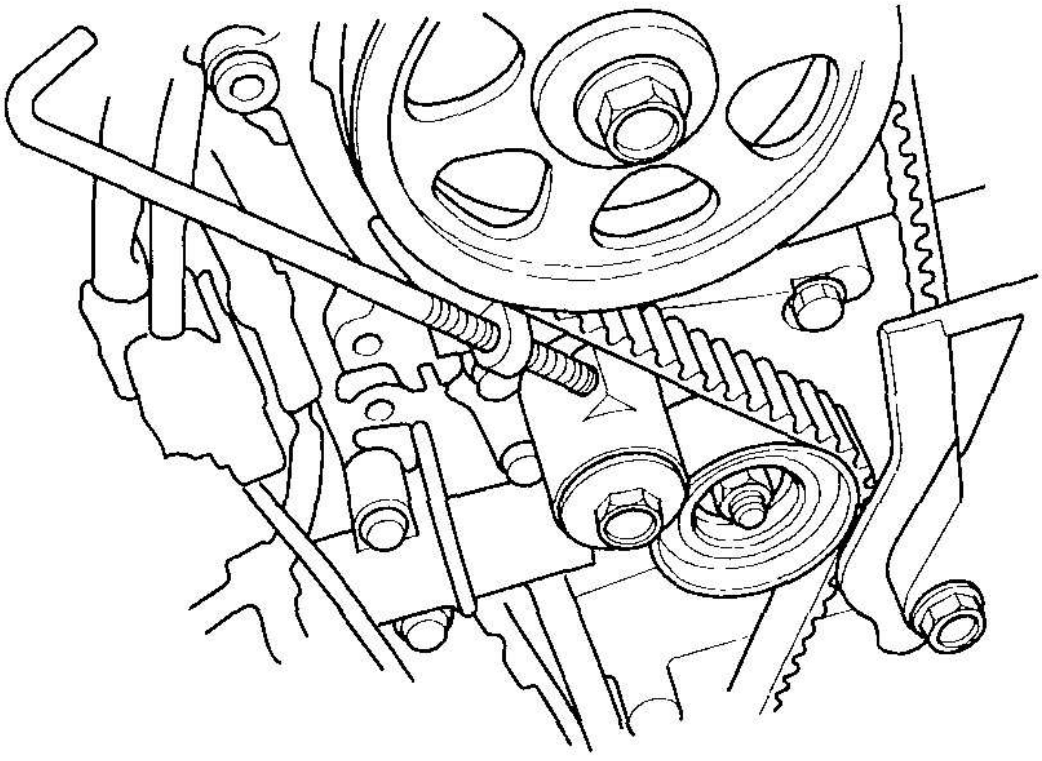

Fig. 34: Installing Battery Clamp Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the timing belt guide plate (A).

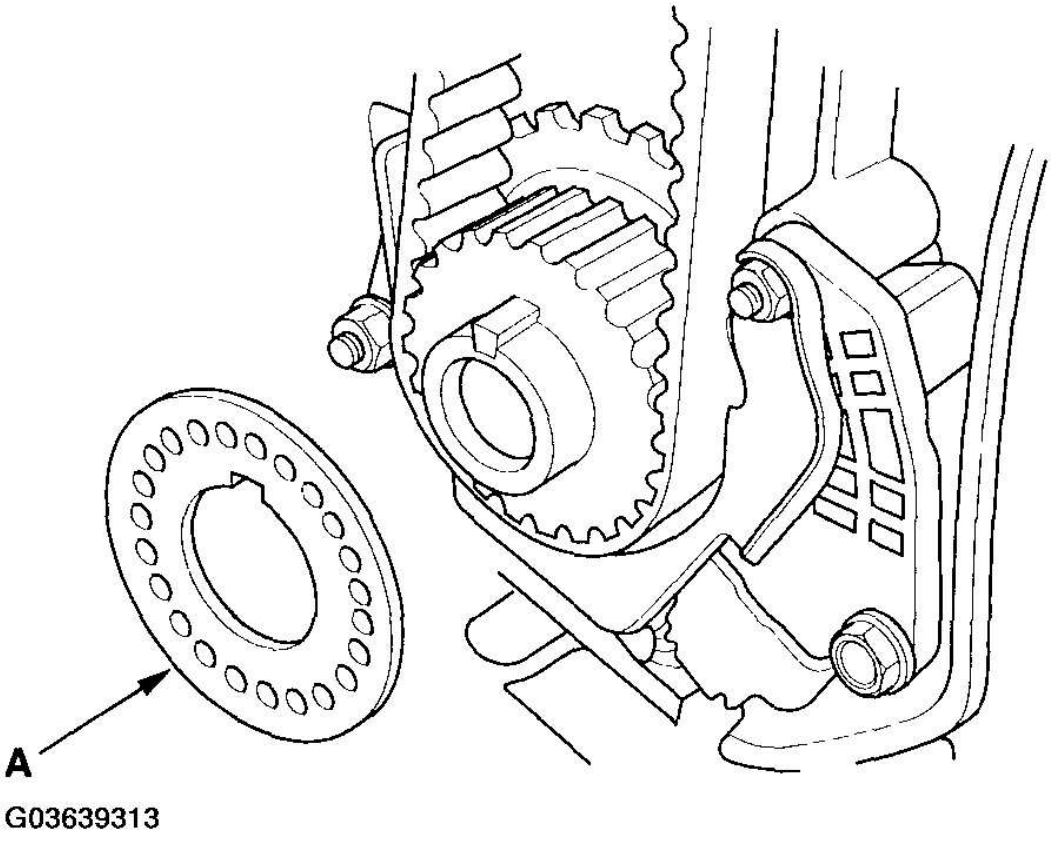

Fig. 35: Removing Timing Belt Guide Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the lower side engine mount bracket.

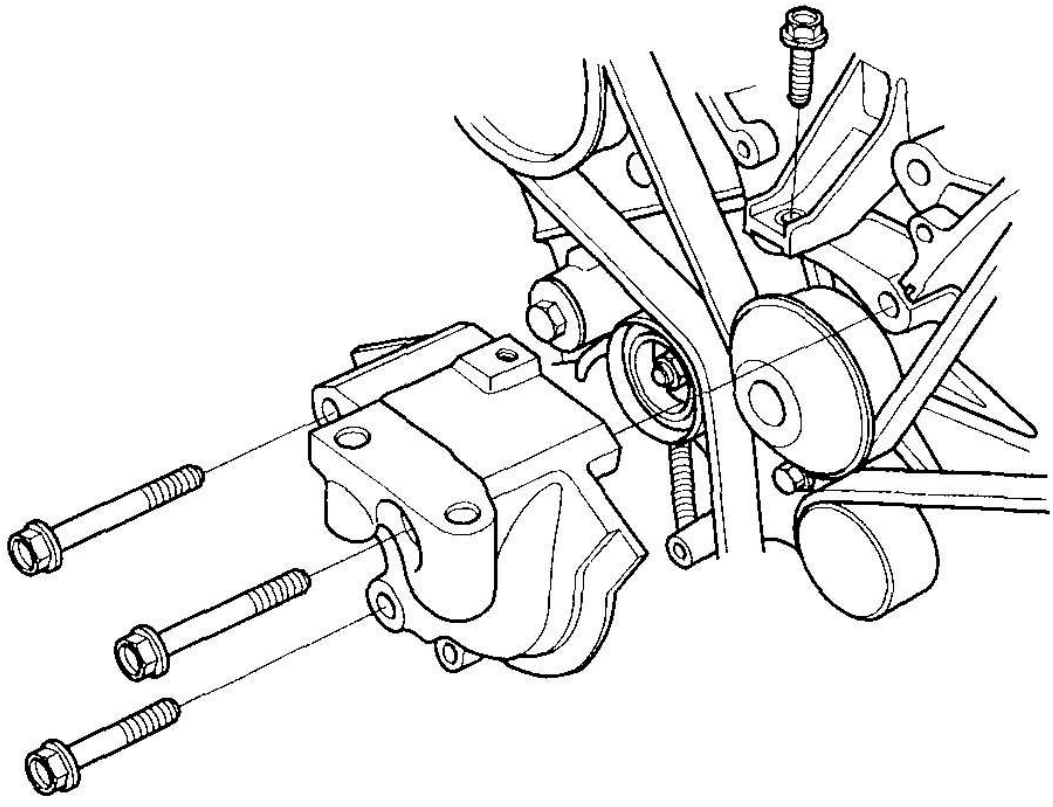

Fig. 36: Removing Lower Side Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Remove the idler pulley bolt (A) and idler pulley (B), then remove the timing belt. Discard the idler pulley bolt.

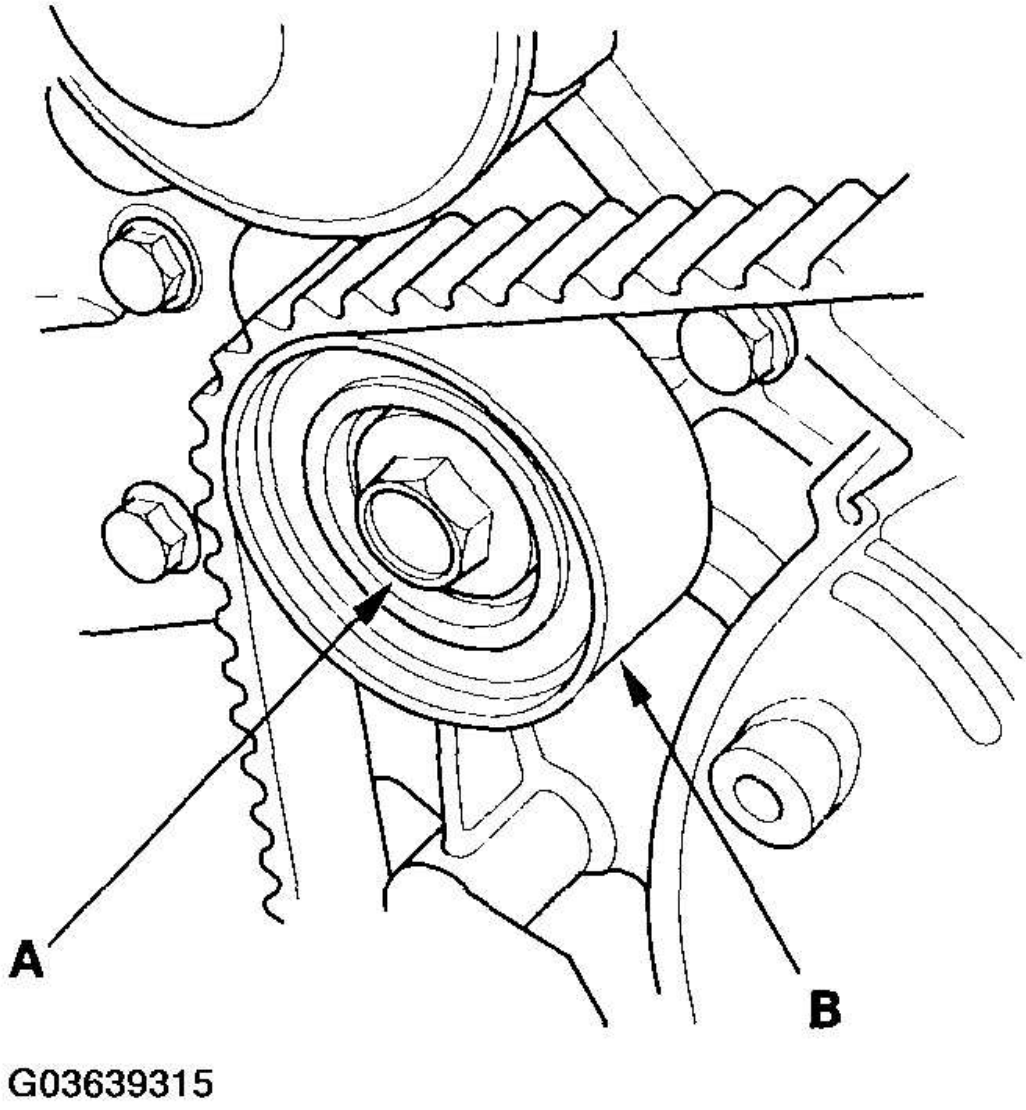

Fig. 37: Removing Idler Pulley Bolt And Idler Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TIMING BELT INSTALLATION

NOTE: **The following procedure is for installing a used belt. If you are installing a new belt, refer to the timing belt replacement procedures (see TIMING BELT REPLACEMENT).**

1. Clean the timing belt pulleys, timing belt guide plate, and the upper and lower covers.
2. Set the timing belt drive pulley to top dead center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

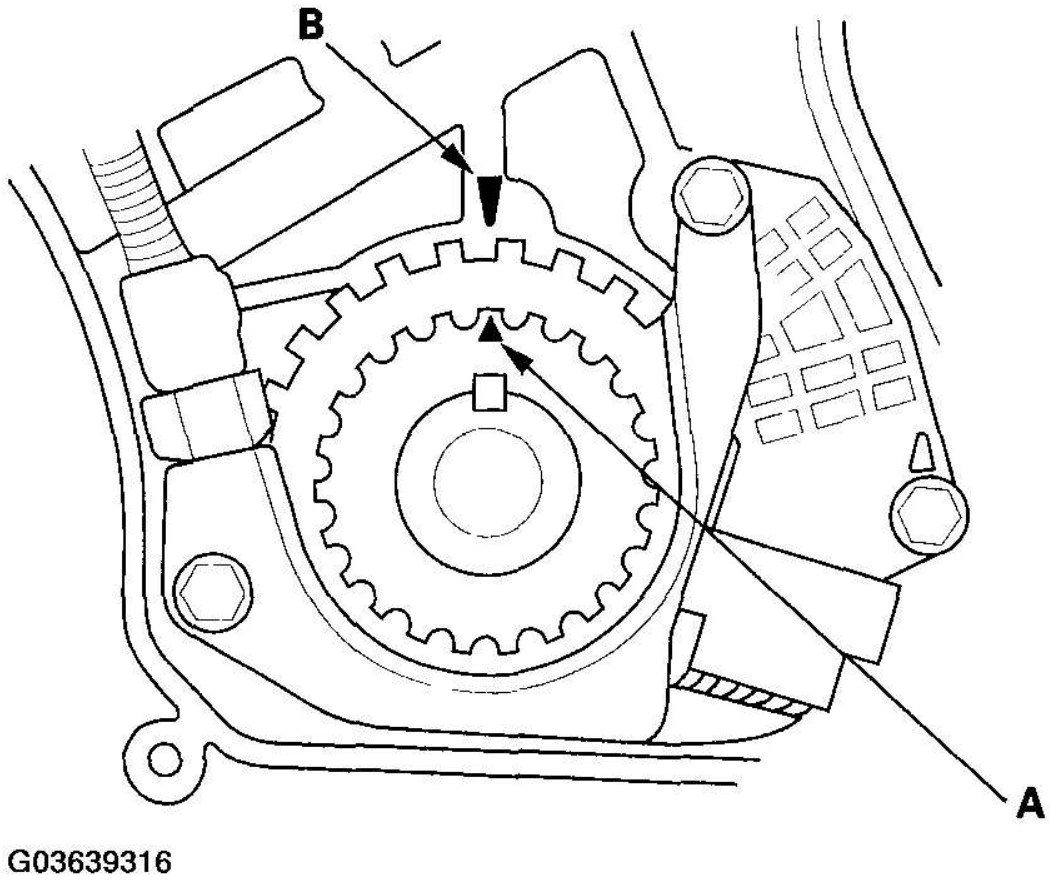

Fig. 38: Alining TDC Mark On Tooth Of Timing Belt Drive Pulley With Pointer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

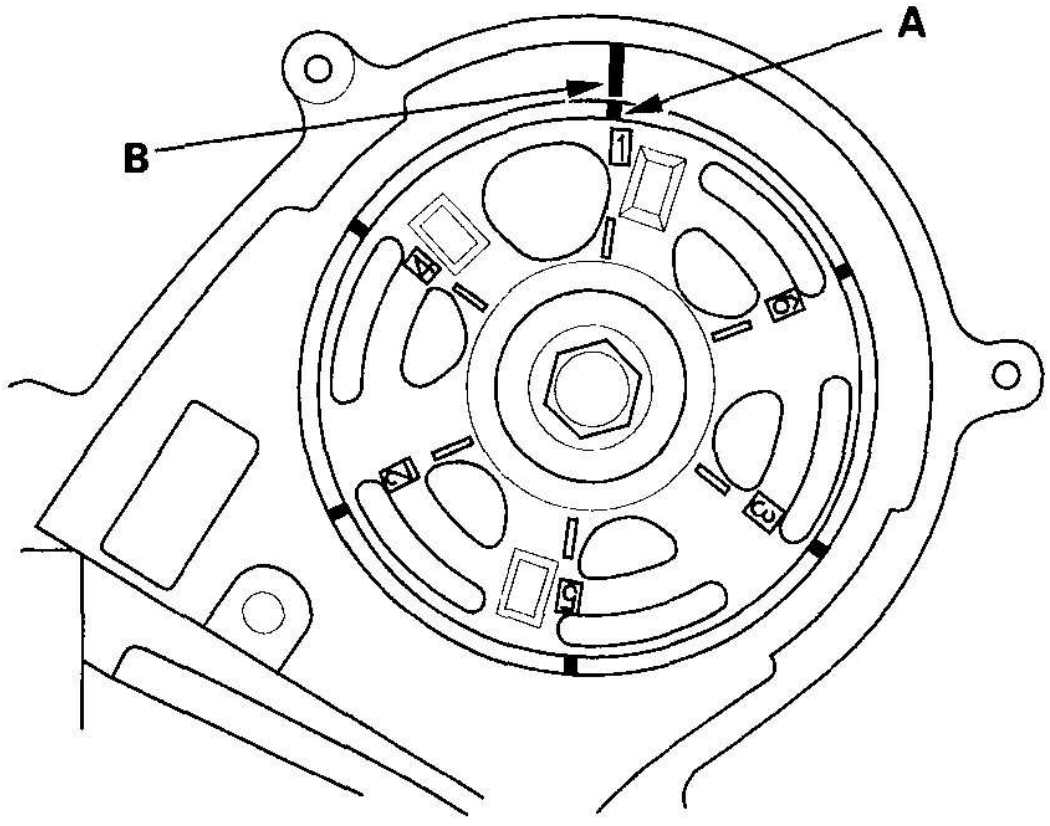

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Fig. 39: Aligning TDC Marks On Camshaft Pulley With Pointers (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

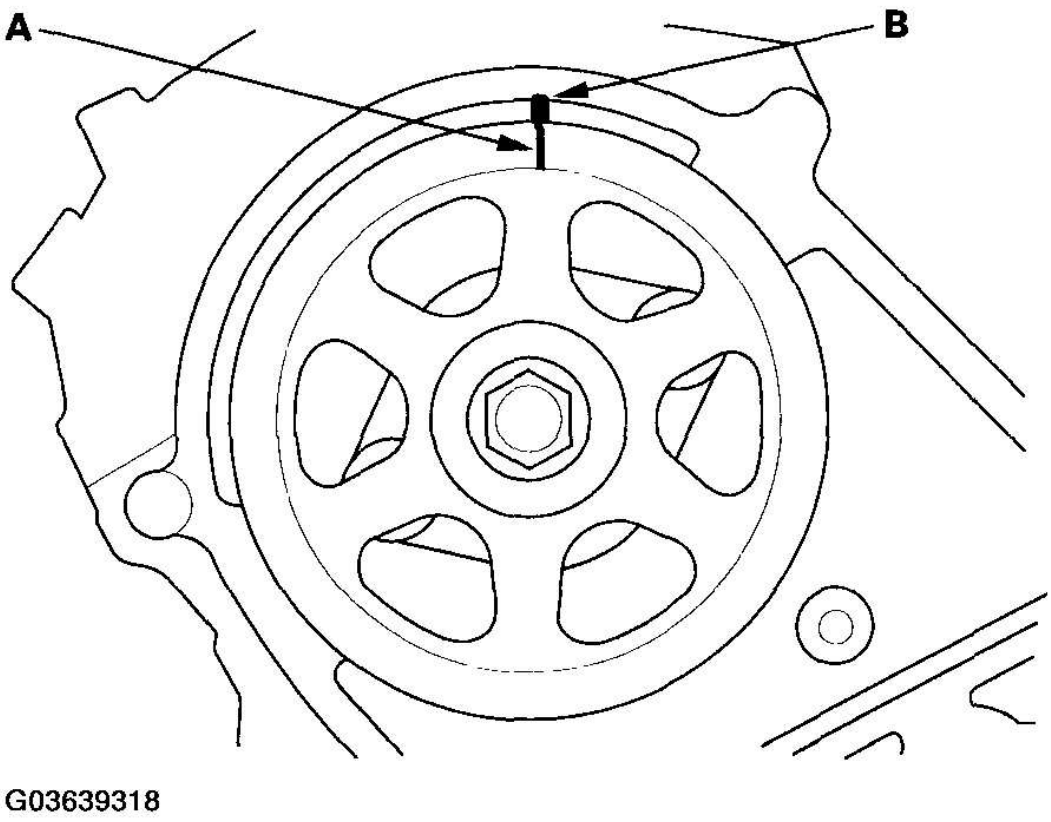

Fig. 40: Alining TDC Marks On Camshaft Pulley With Pointer (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Loosely install the idler pulley with a new idler pulley bolt so the pulley can move but does not come off.
5. If the auto-tensioner has extended and the timing belt cannot be installed, do the timing belt replacement procedure (see **TIMING BELT REPLACEMENT**).
6. Install the timing belt in a counterclockwise sequence starting with the drive pulley. Take care not to damage the timing belt when installing it.

–1 Drive pulley (A)
–2 Idler pulley (B)
–3 Front camshaft pulley (C)
–4 Water pump pulley (D)
–5 Rear camshaft pulley (E)
–6 Adjusting pulley (F)

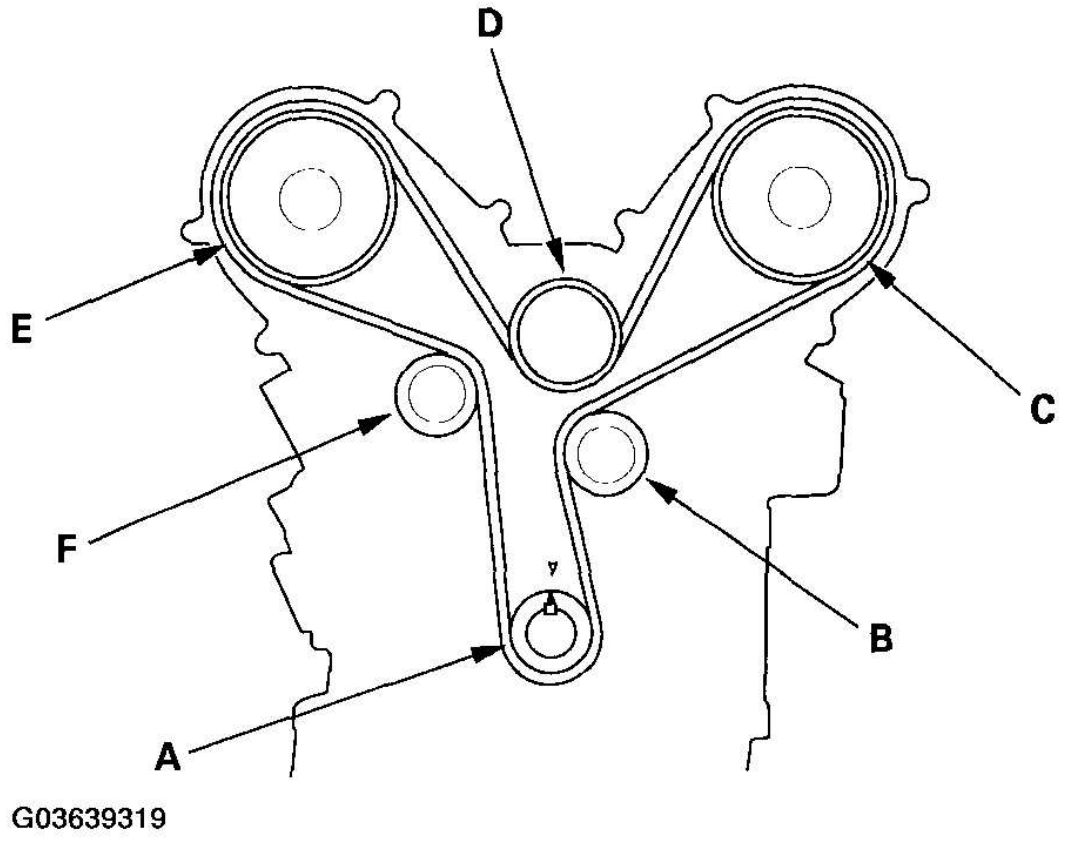

Fig. 41: Installing Timing Belt In Counterclockwise Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Tighten the idler pulley bolt.

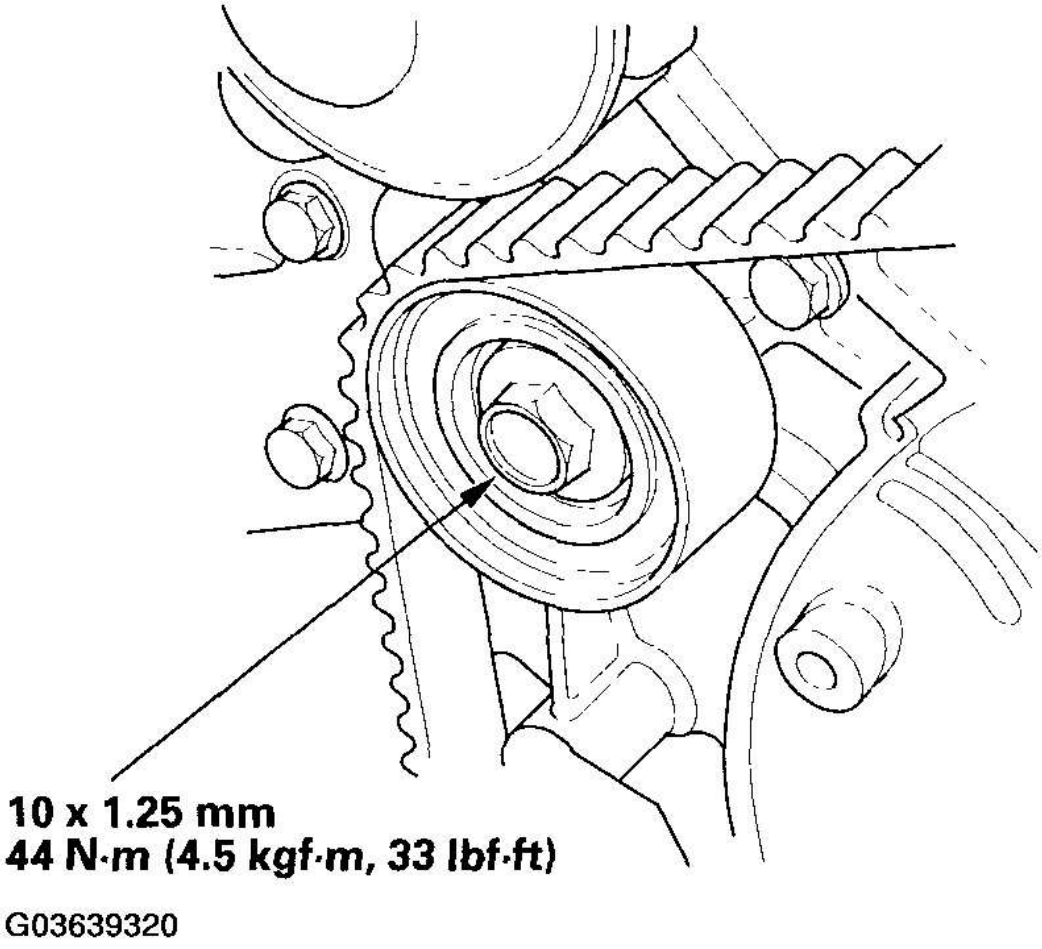

Fig. 42: Tightening Idler Pulley Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove the battery clamp bolt from the back cover.
9. Install the lower half of the side engine mount bracket.

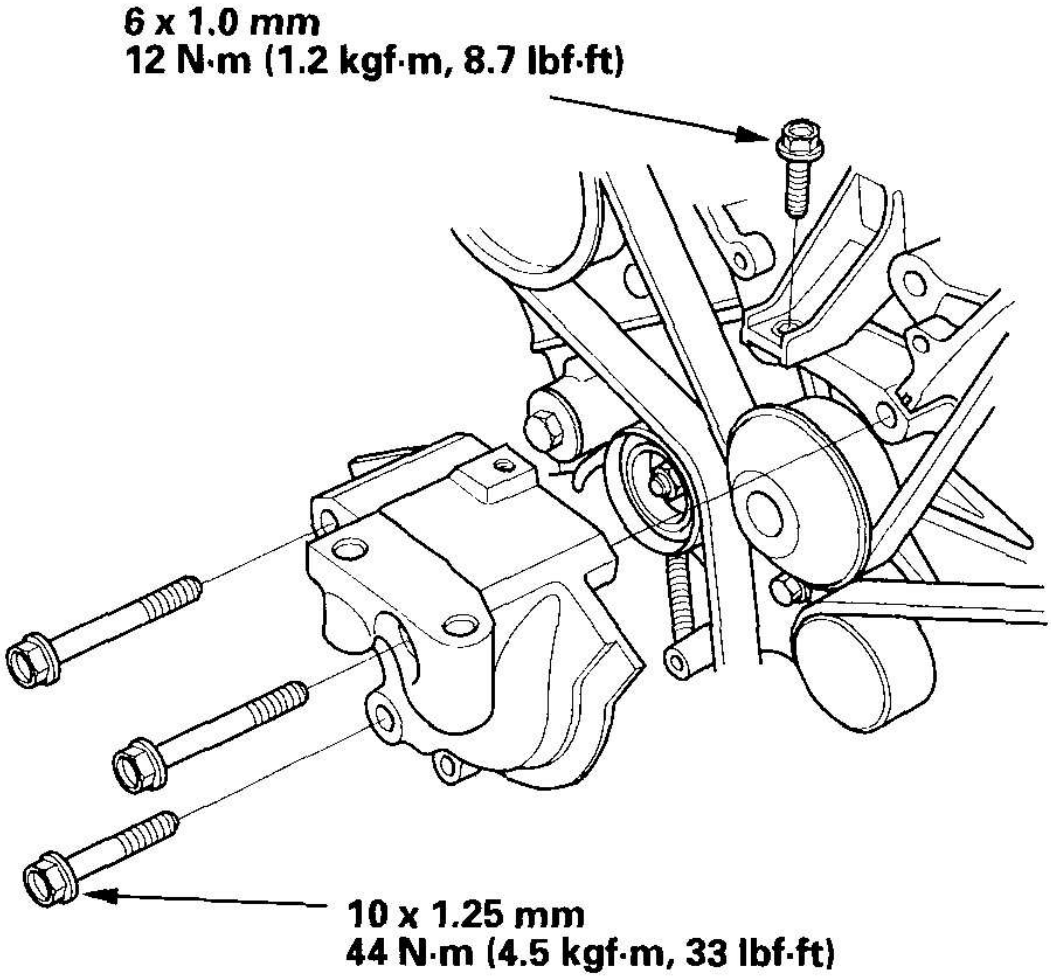

Fig. 43: Installing Lower Half Of Side Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the timing belt guide plate as shown in **Fig. 44** .

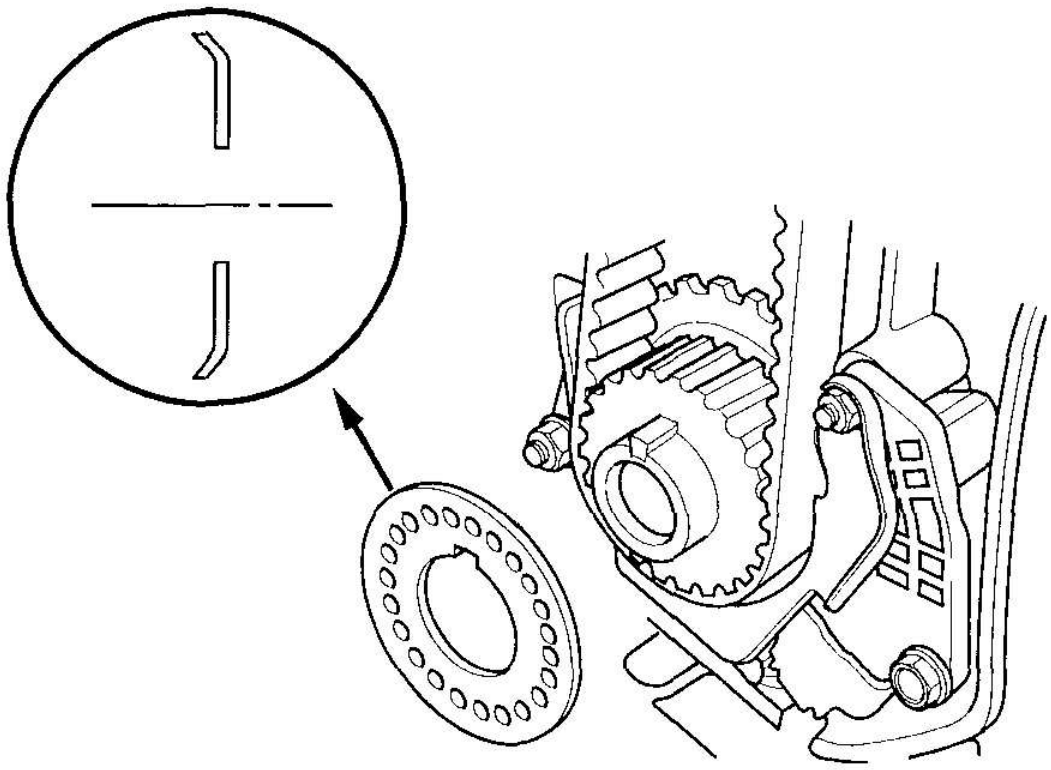

Fig. 44: Installing Timing Belt Guide Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the lower cover.

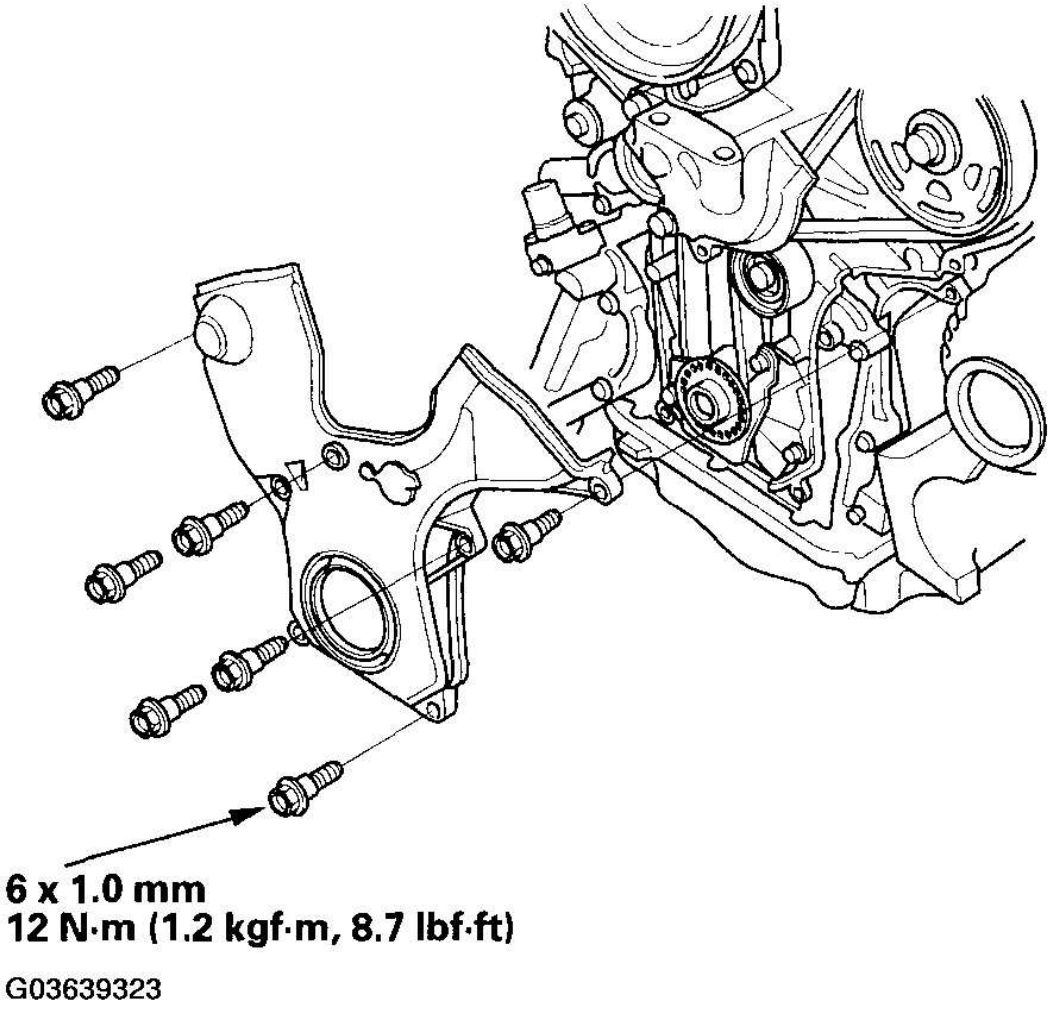

Fig. 45: Installing Lower Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install the crankshaft pulley (see **INSTALLATION**).
13. Install the front upper cover (A) and rear upper cover (B).

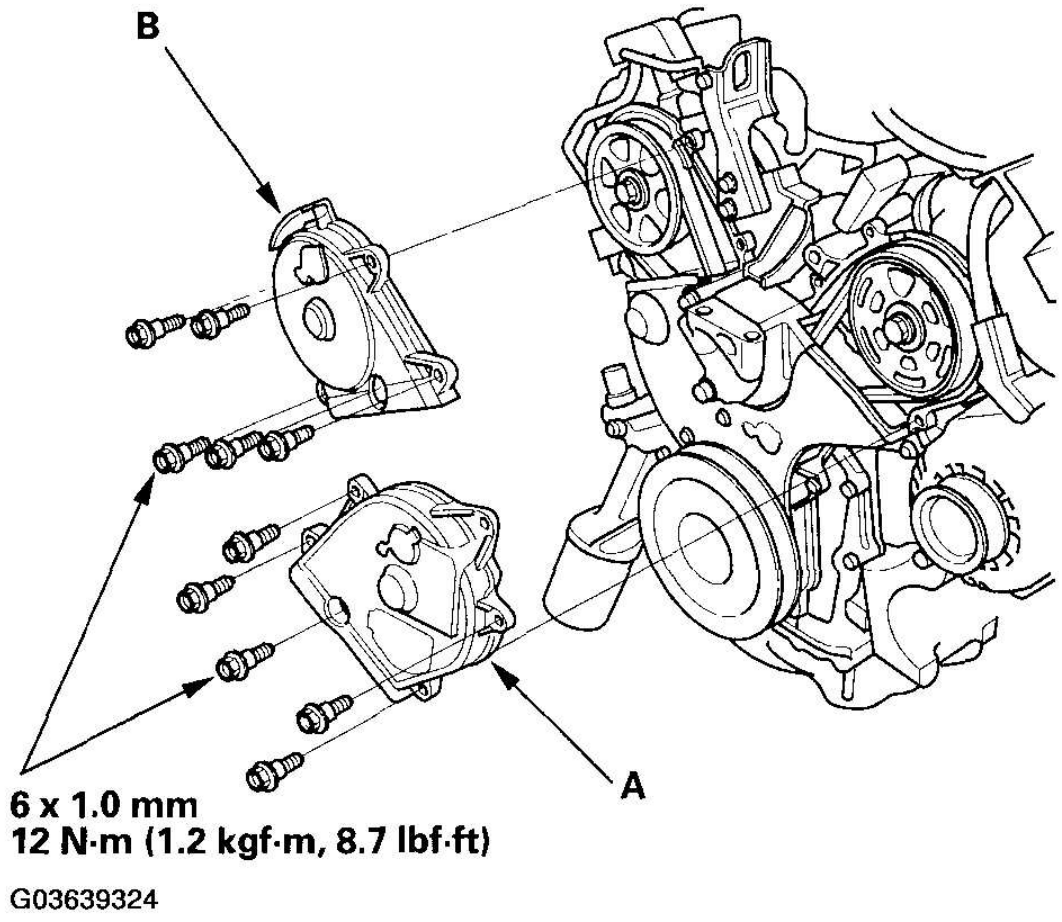

Fig. 46: Installing Front And Rear Upper Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions itself on the pulleys.
15. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).

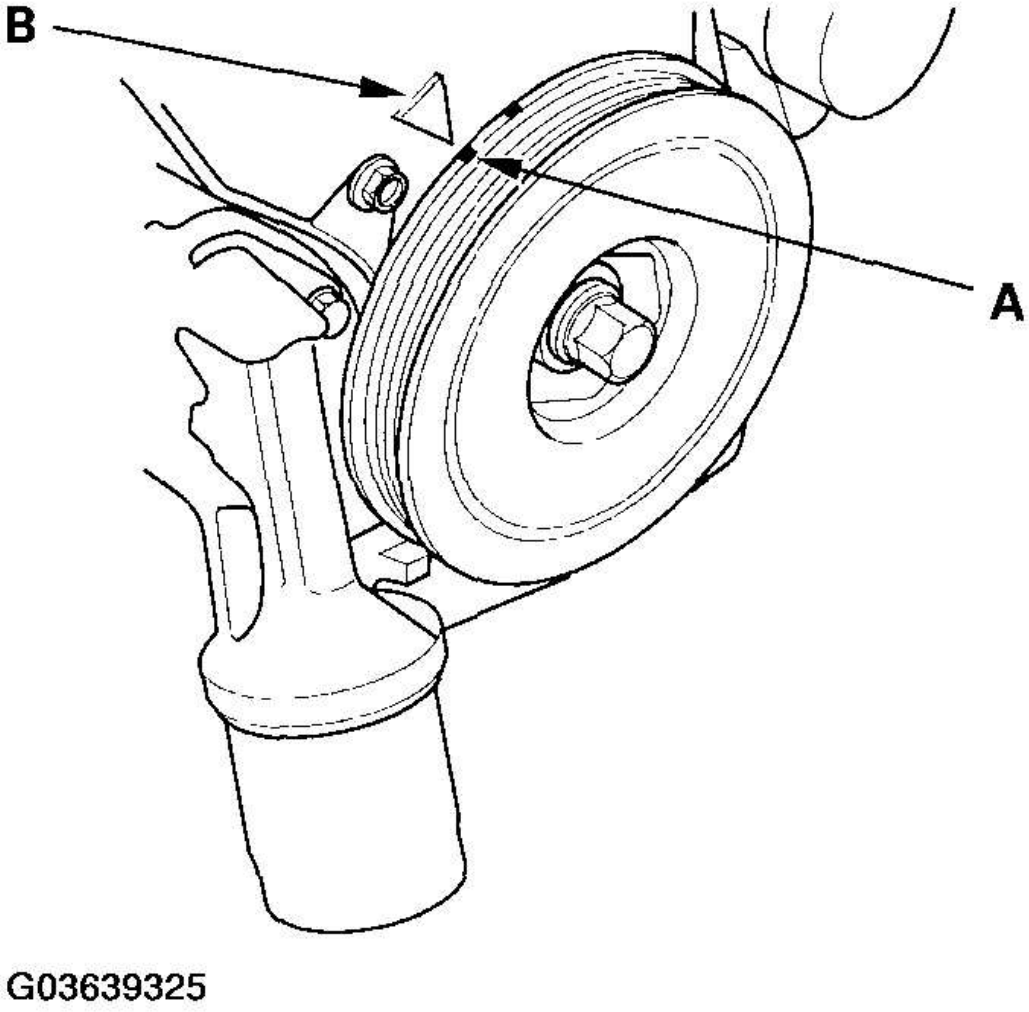

Fig. 47: Alining White Mark With Pointer By Turning Crankshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Check the camshaft pulley marks.
    - If the camshaft pulley marks are at TDC, go to step 17.
    - If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 16.

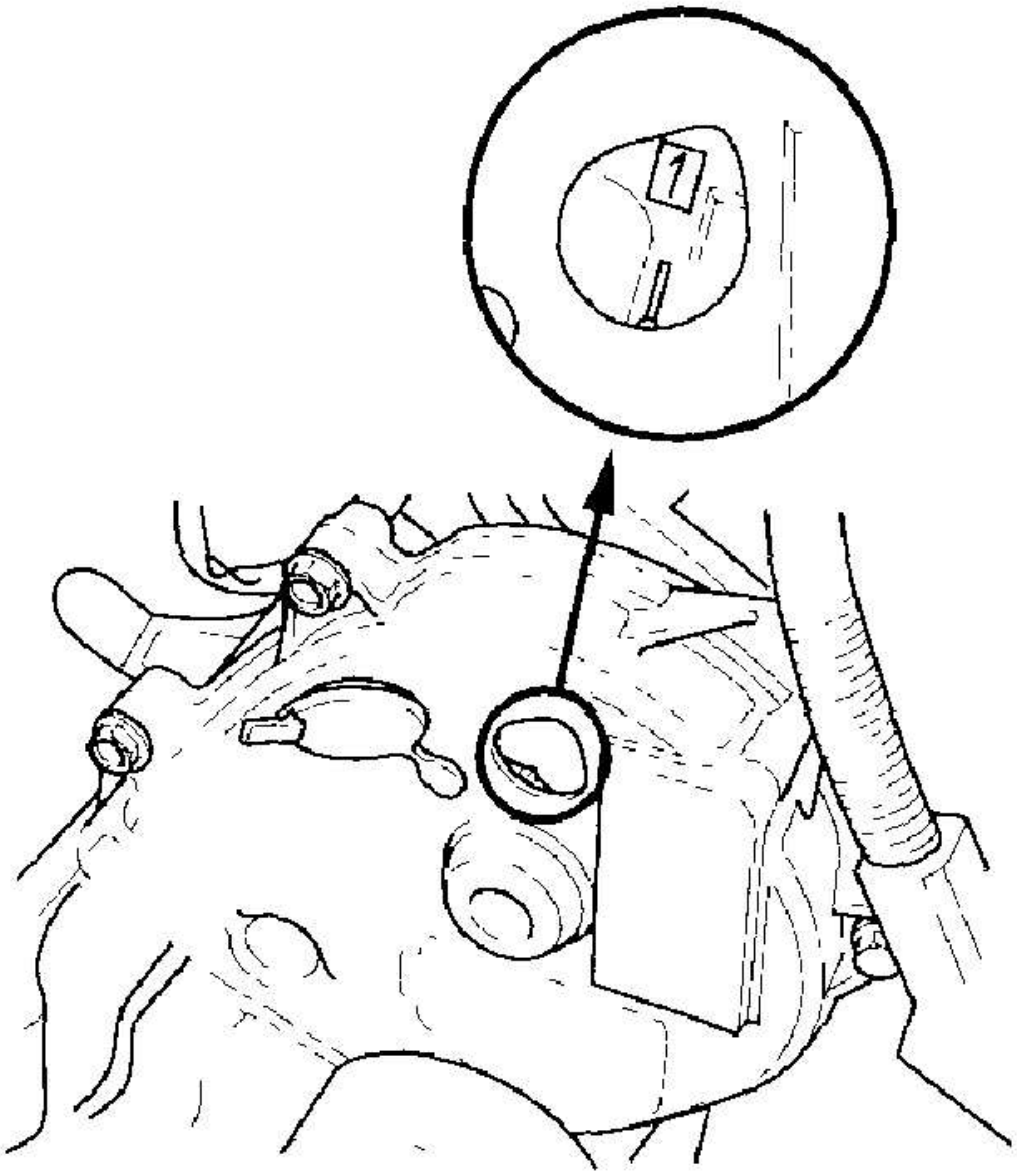

Fig. 48: Checking Camshaft Pulley Marks (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

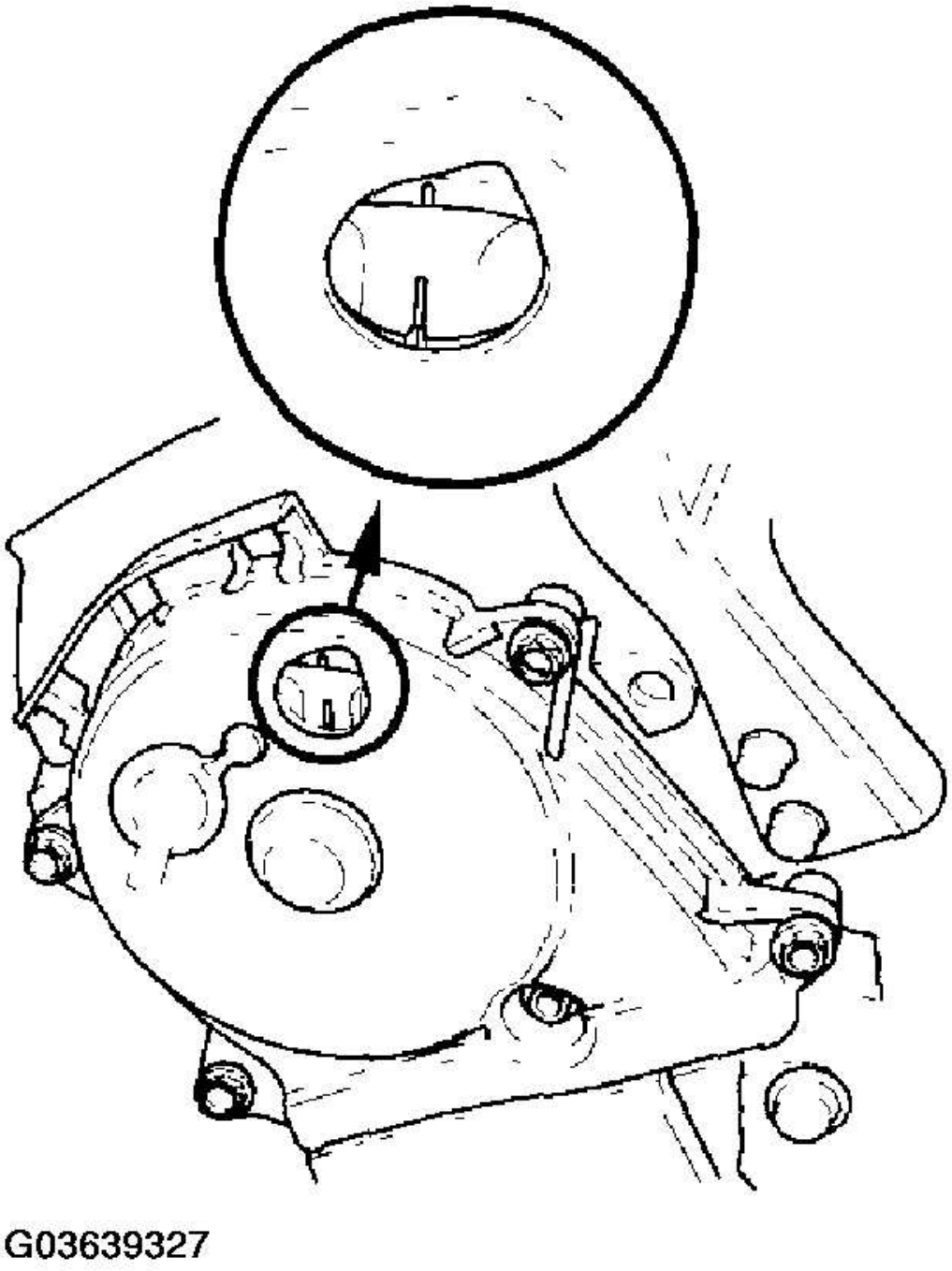

Fig. 49: Checking Camshaft Pulley Marks (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Install the drive belt (see **DRIVE BELT REPLACEMENT**).
18. Install the upper half of the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown in **Fig. 50** .

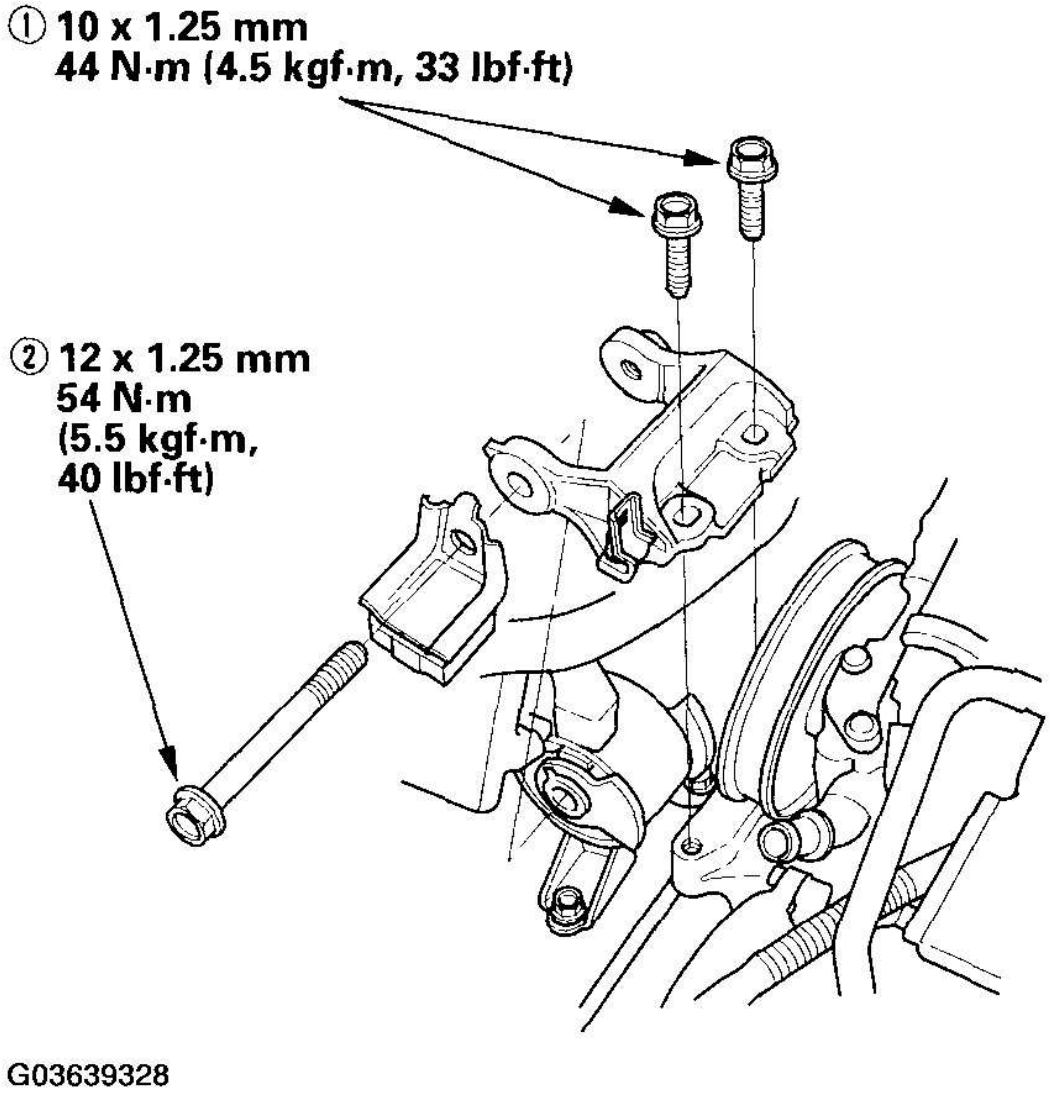

Fig. 50: Tightening Mounting Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Install the splash shield.

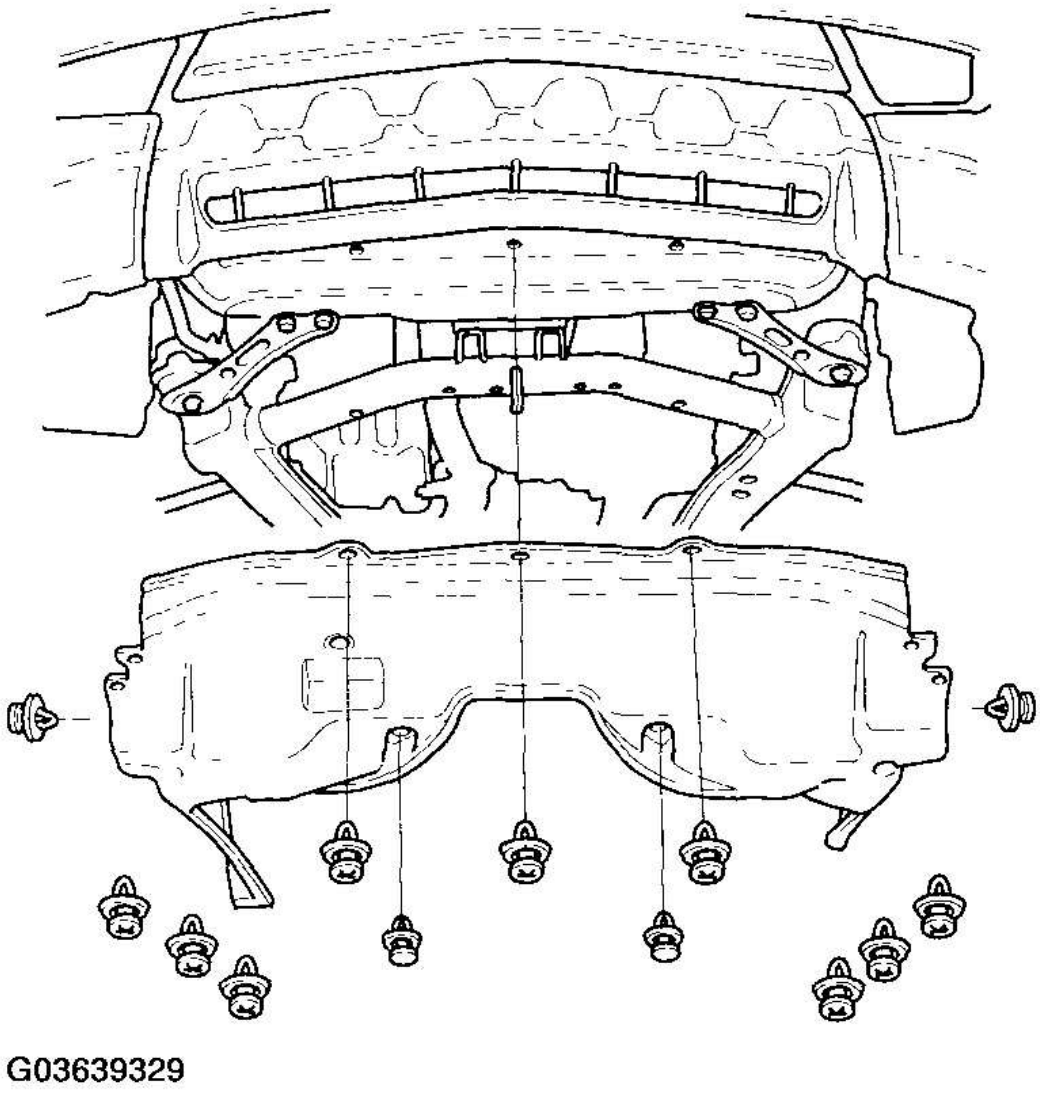

Fig. 51: Installing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Install the right front wheel.
21. Do the crankshaft position (CKP) pattern clear/CKP pattern learn procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).

TIMING BELT REPLACEMENT

1. Remove the timing belt (see **TIMING BELT REMOVAL**).
2. Clean the timing belt pulleys, timing belt guide plate, and the upper and lower covers.

3. Set the timing belt drive pulley to top dead center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

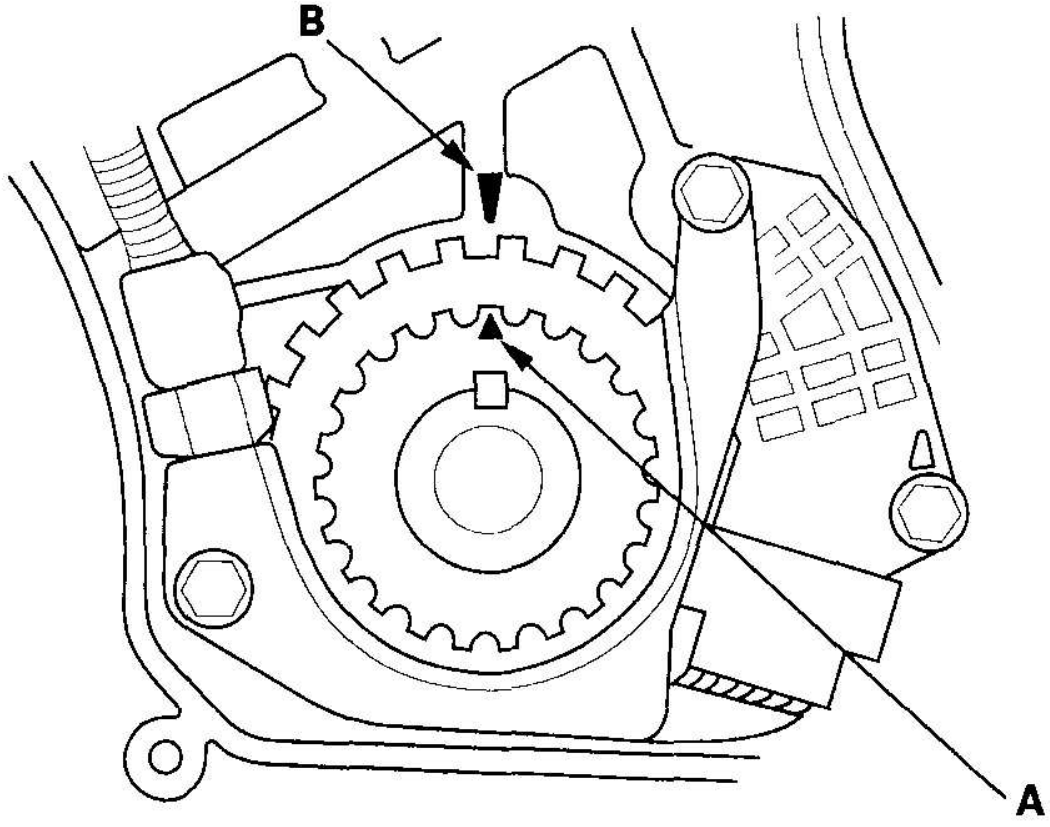

Fig. 52: Aligning TDC Mark On Tooth Of Timing Belt Drive Pulley With Pointer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

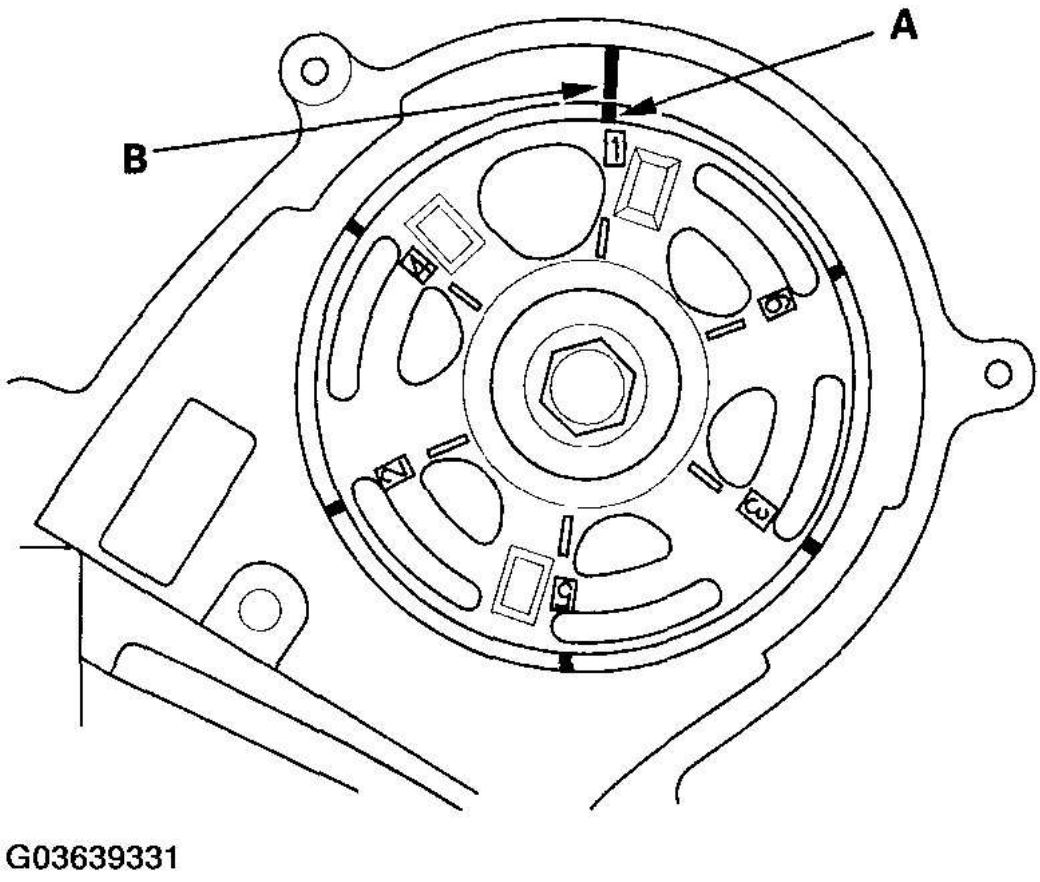

Fig. 53: Aligning TDC Marks On Camshaft Pulleys With Pointers (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

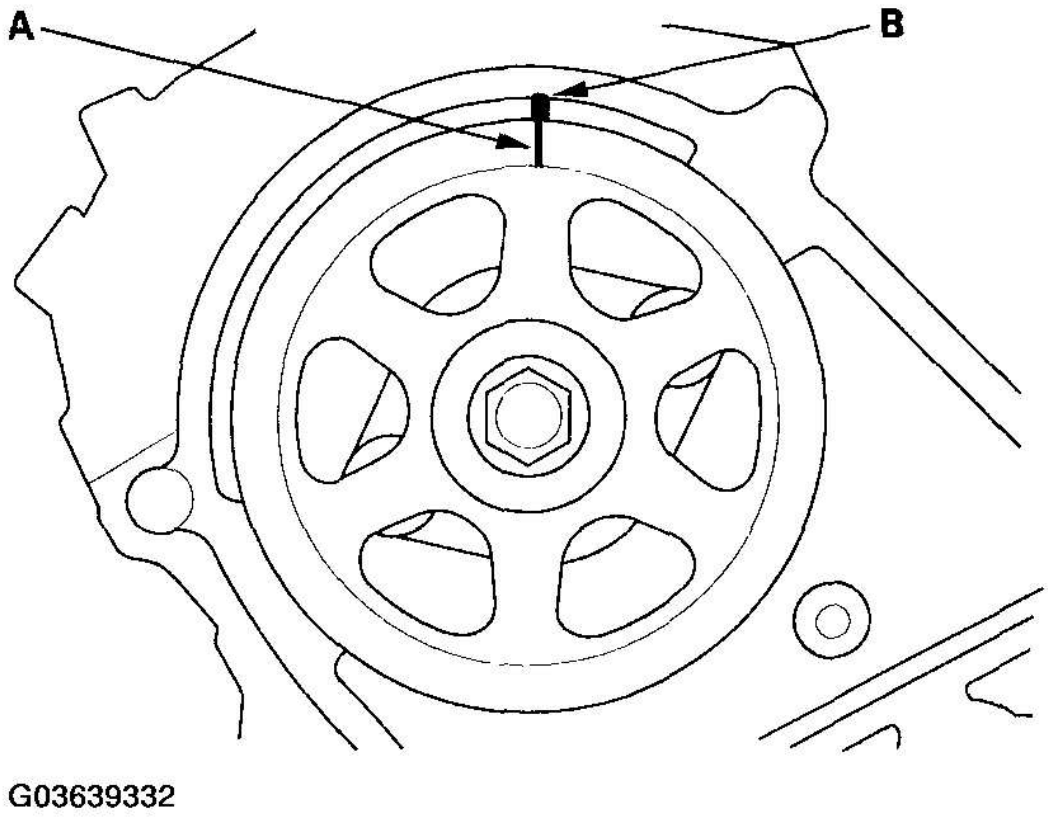

Fig. 54: Aligning TDC Marks On Camshaft Pulleys With Pointers (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the battery clamp bolt from the back cover.
6. Remove the auto-tensioner.

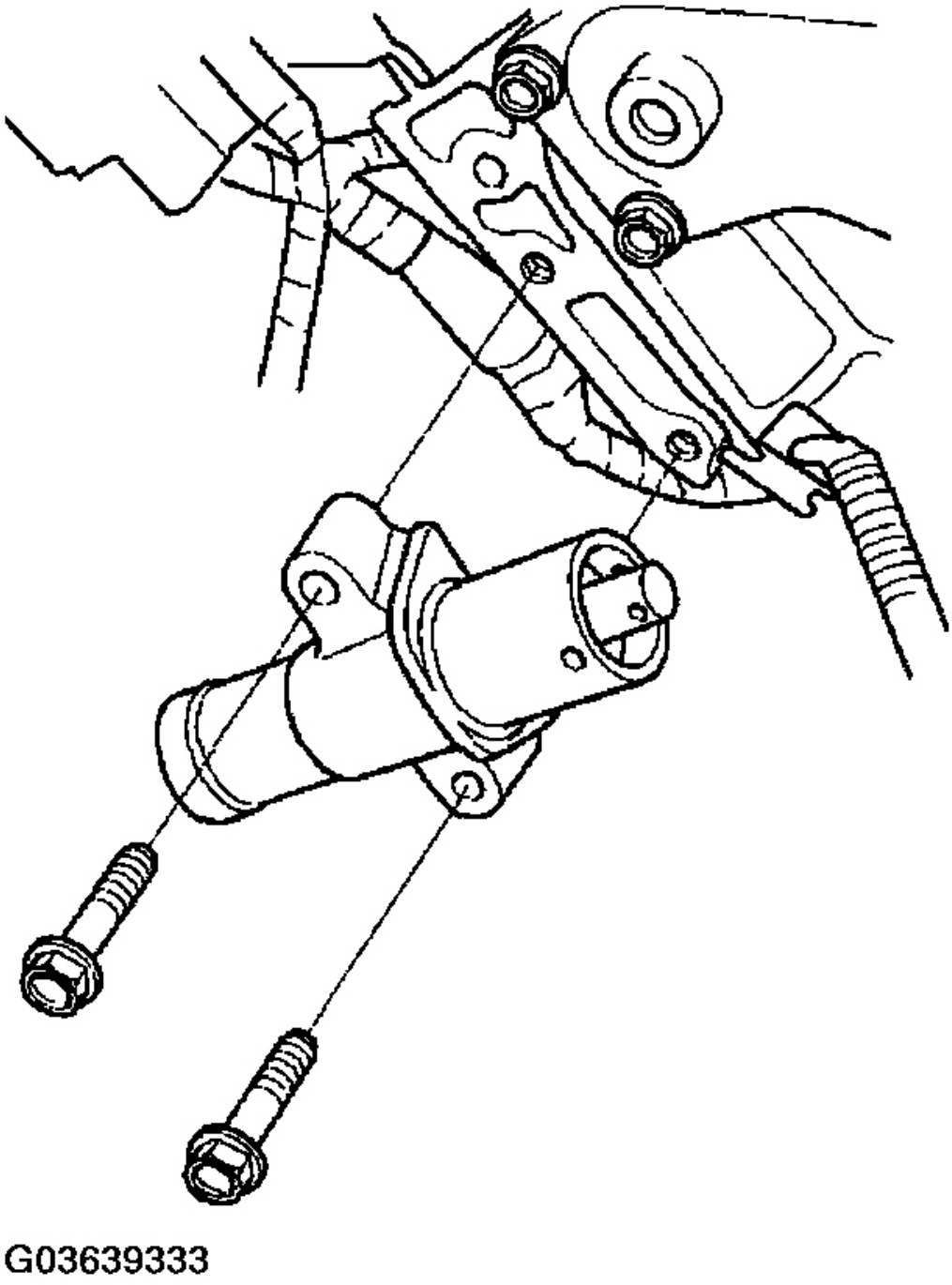

Fig. 55: Removing Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Align the holes on the rod and housing of the auto-tensioner.

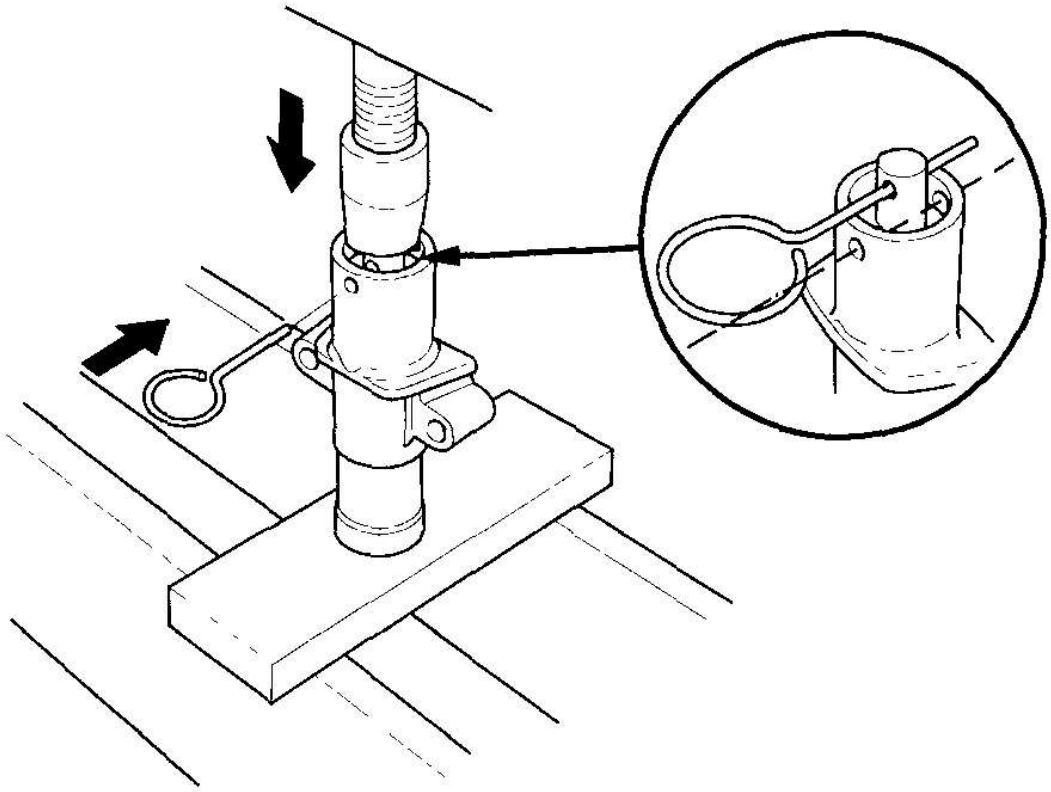

Fig. 56: Aligning Holes On Rod And Housing Of Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Use a hydraulic press to slowly compress the auto-tensioner. Insert a 2.0 mm (0.08 in.) pin through the housing and the rod. Make sure the pin can be removed once the auto-tensioner is installed.

NOTE: The compression pressure should not exceed 9,800 N (1,000 kgf, 2,200 lbf).

9. Install the auto-tensioner.

NOTE: Make sure the pin stays in place.

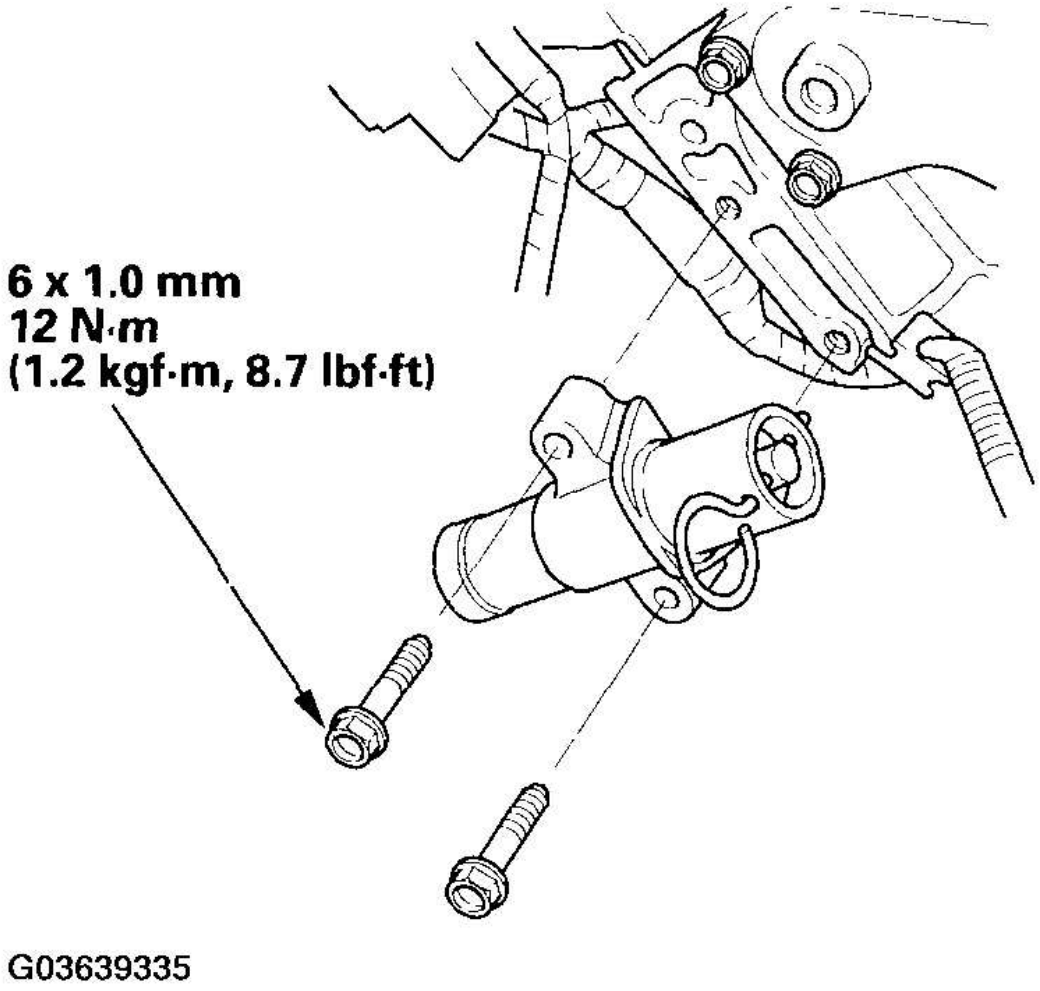

Fig. 57: Installing Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Screw the battery clamp bolt in as shown in **Fig. 58** to hold the timing belt adjuster. Tighten it by hand; do not use a wrench.

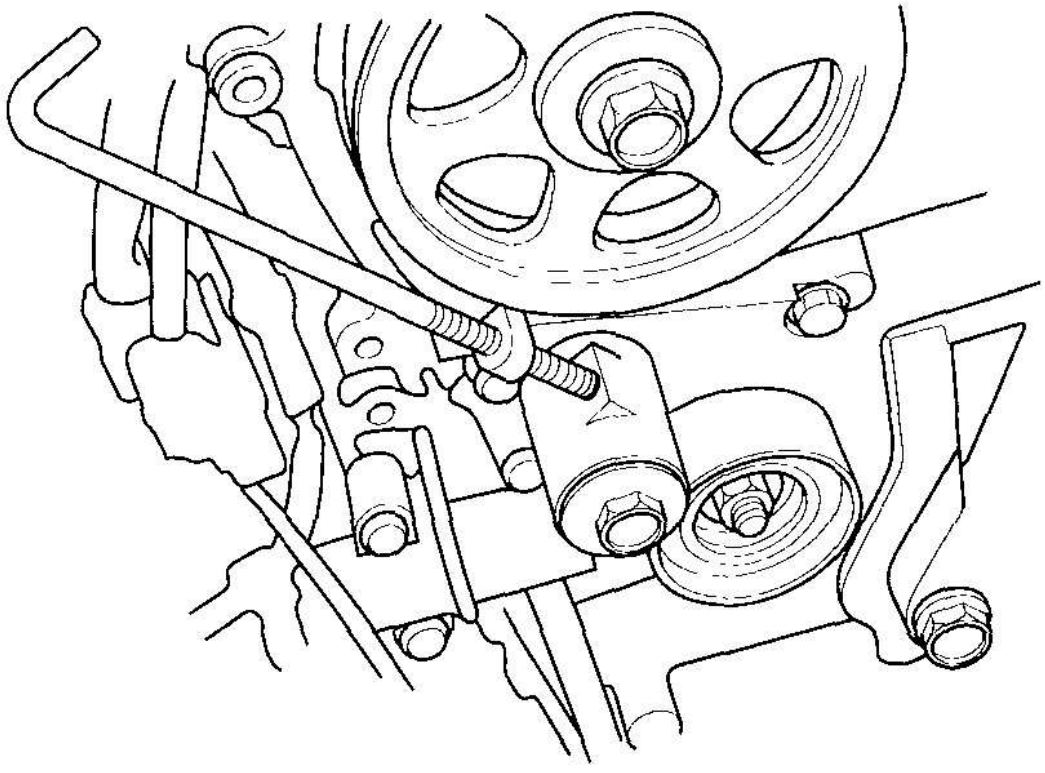

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Fig. 58: Installing Battery Clamp Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Loosely install the idler pulley with a new idler pulley bolt so the pulley can move but does not come off.
12. Install the timing belt in a counterclockwise sequence starting with the drive pulley.

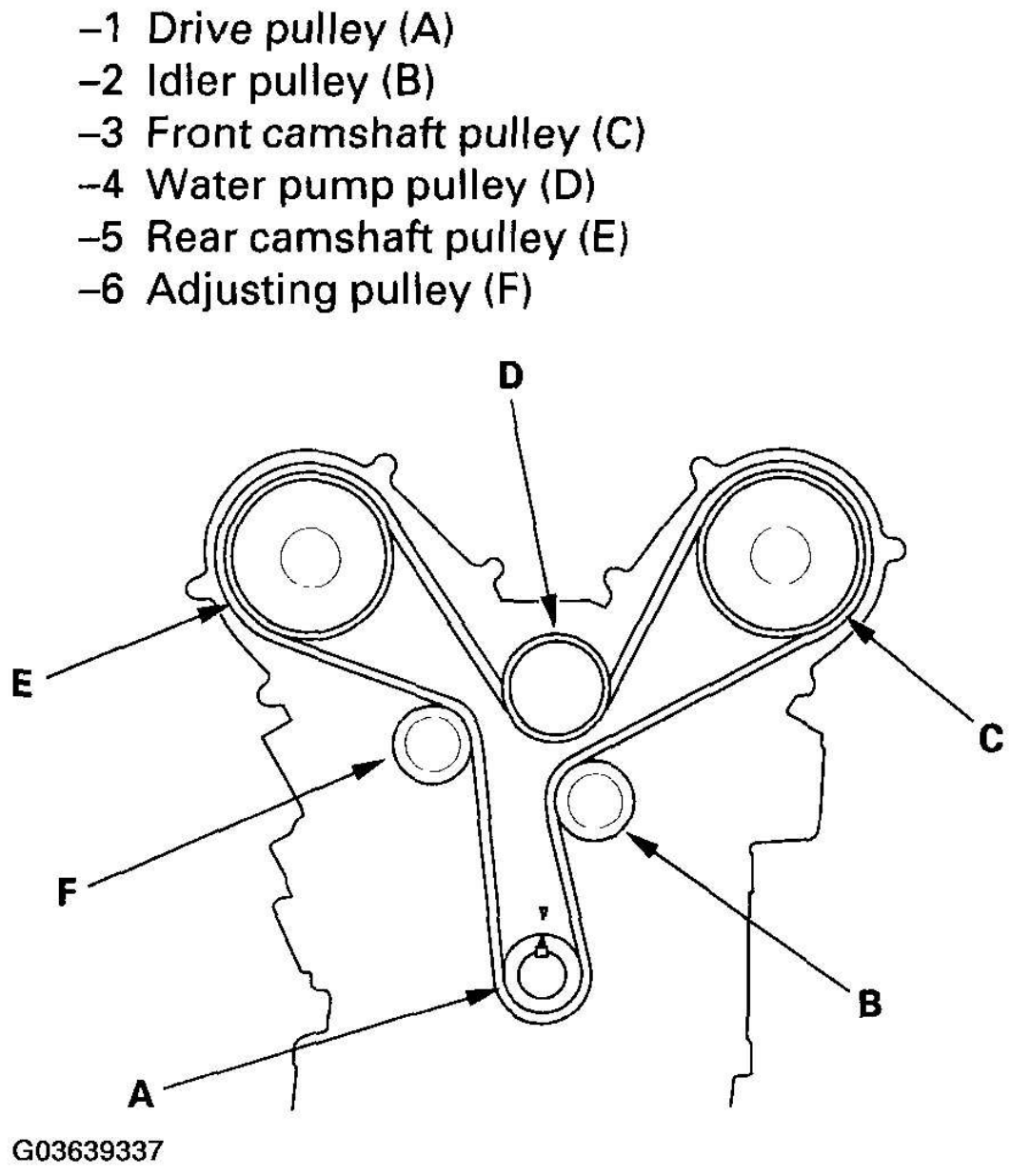

Fig. 59: Installing Timing Belt In Counterclockwise Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Tighten the idler pulley bolt.

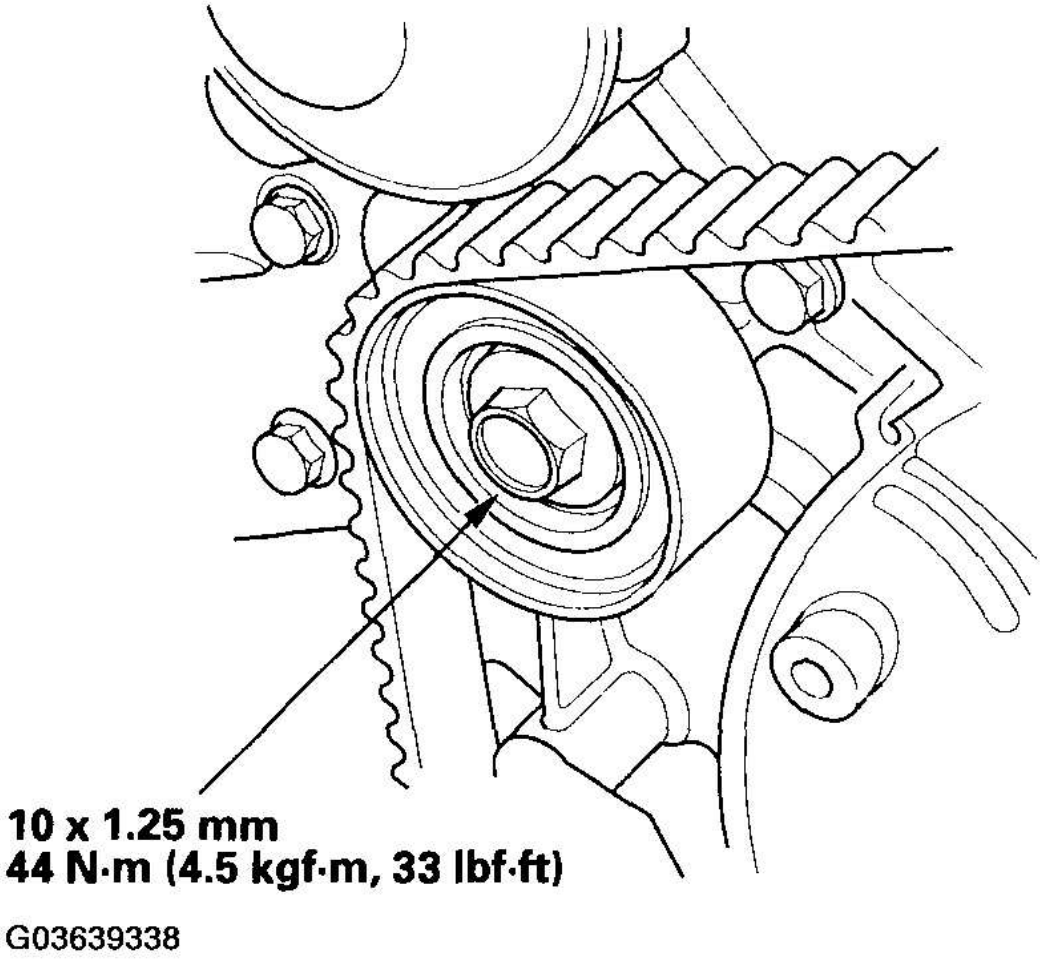

Fig. 60: Tightening Idler Pulley Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the pin from the auto-tensioner.

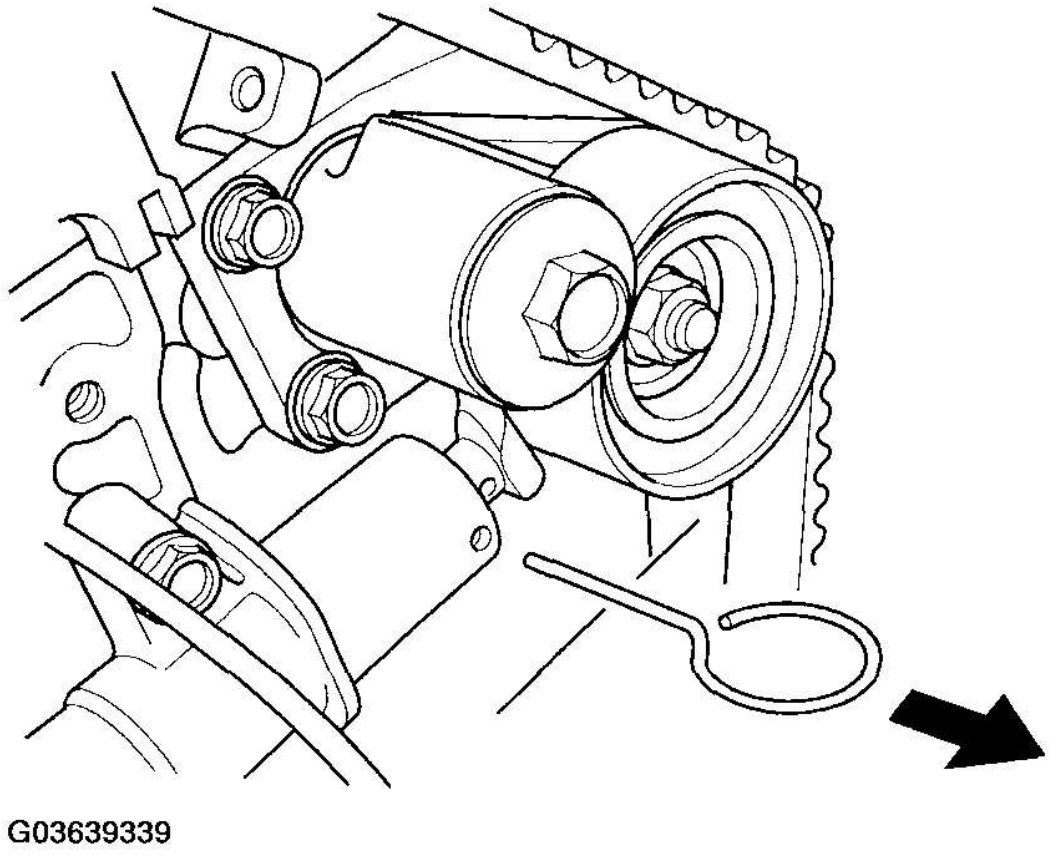

Fig. 61: Removing Pin From Auto-Tensioner
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Remove the battery clamp bolt from the back cover.
16. Install the lower half of the side engine mount bracket.

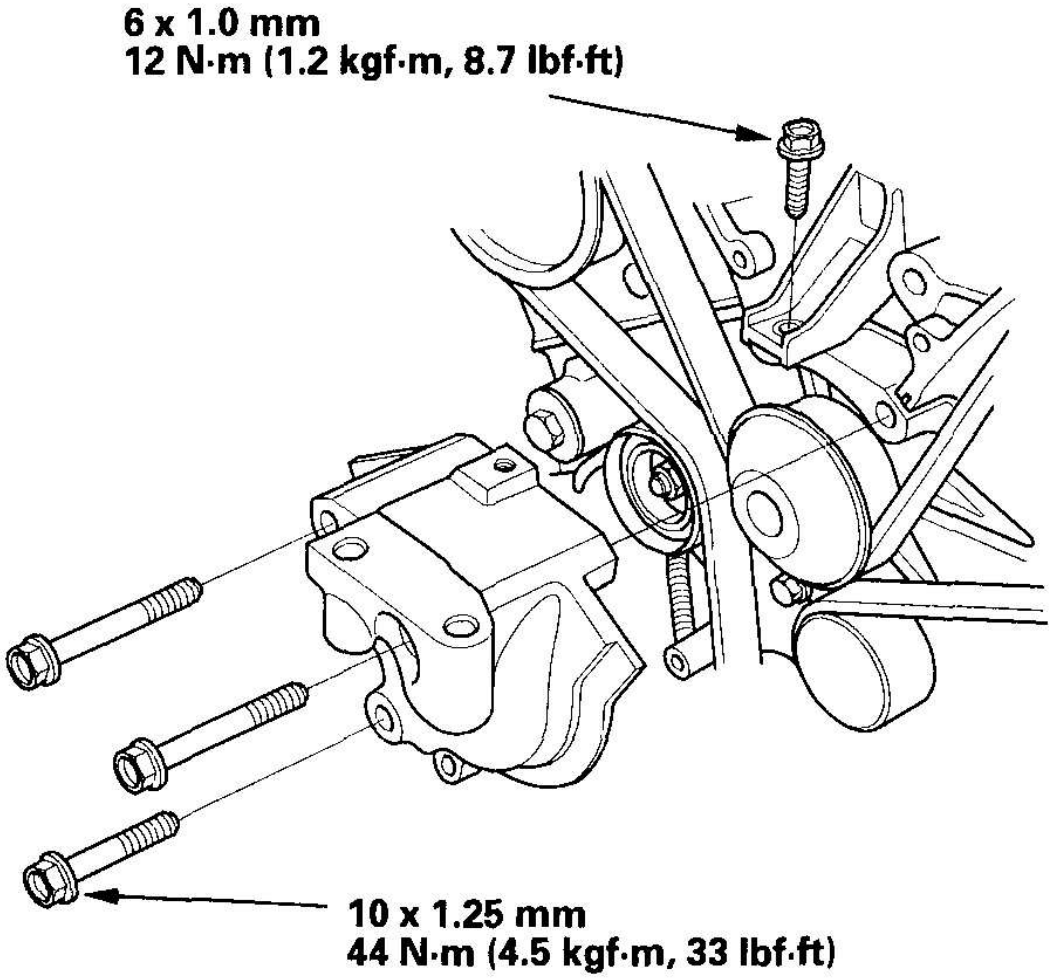

Fig. 62: Installing Lower Half Of Side Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Install the timing belt guide plate as shown in **Fig. 63** .

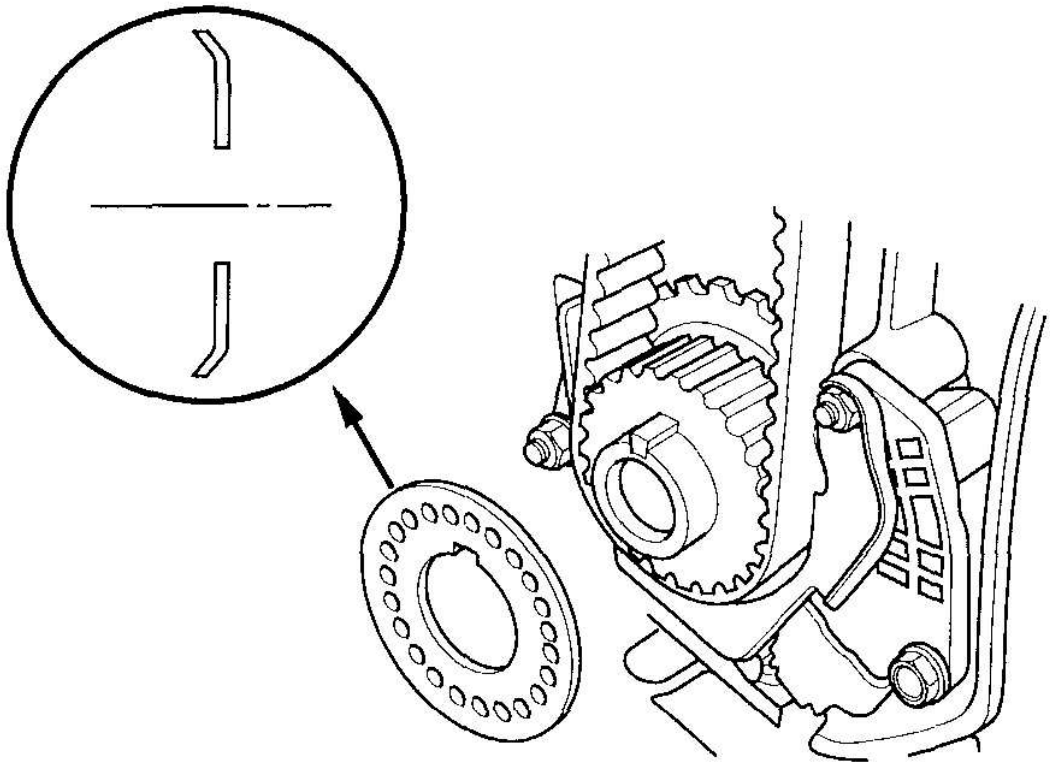

Fig. 63: Installing Timing Belt Guide Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Install the lower cover.

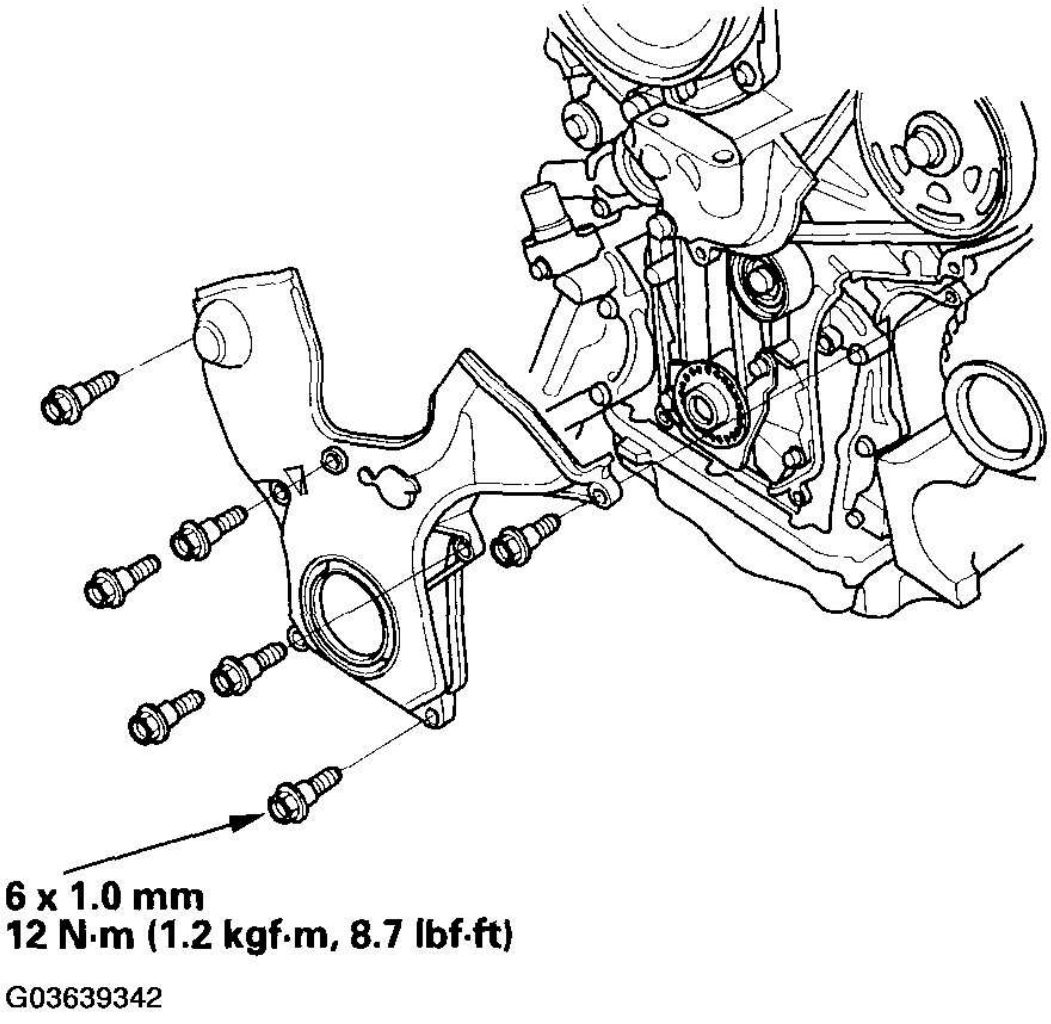

Fig. 64: Installing Lower Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Install the crankshaft pulley (see **INSTALLATION**).
20. Install the front upper cover (A) and rear upper cover (B).

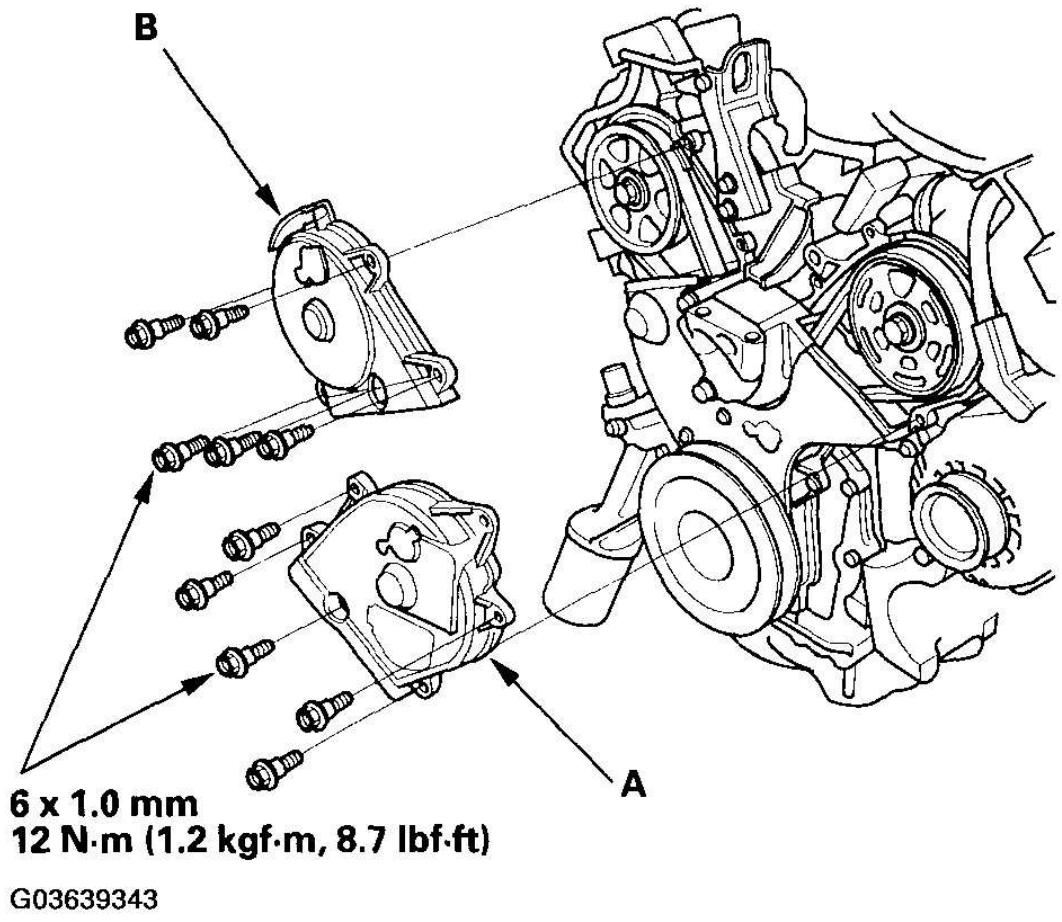

Fig. 65: Installing Front And Rear Upper Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions itself on the pulleys.
22. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).

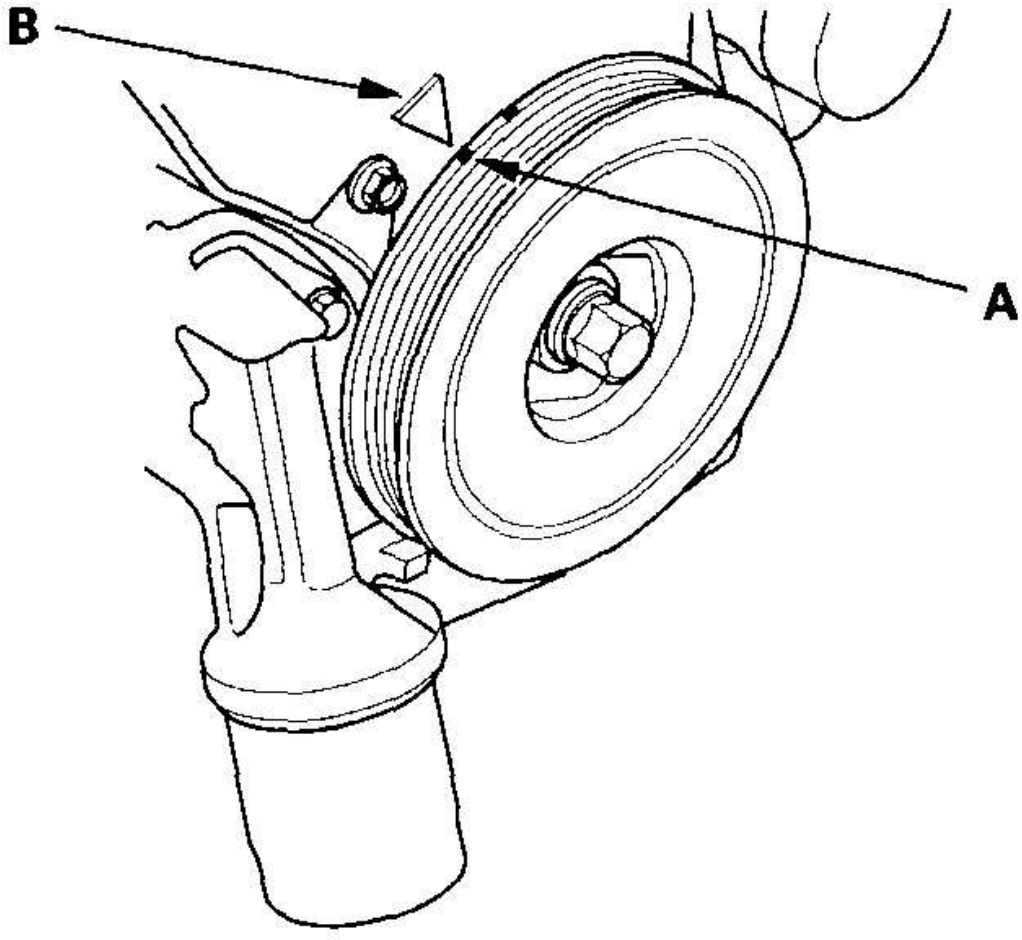

Fig. 66: Aligning White Mark With Pointer Turning Crankshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Check the camshaft pulley marks.
    - If the camshaft pulley marks are at TDC, go to step 24.
    - If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 23.

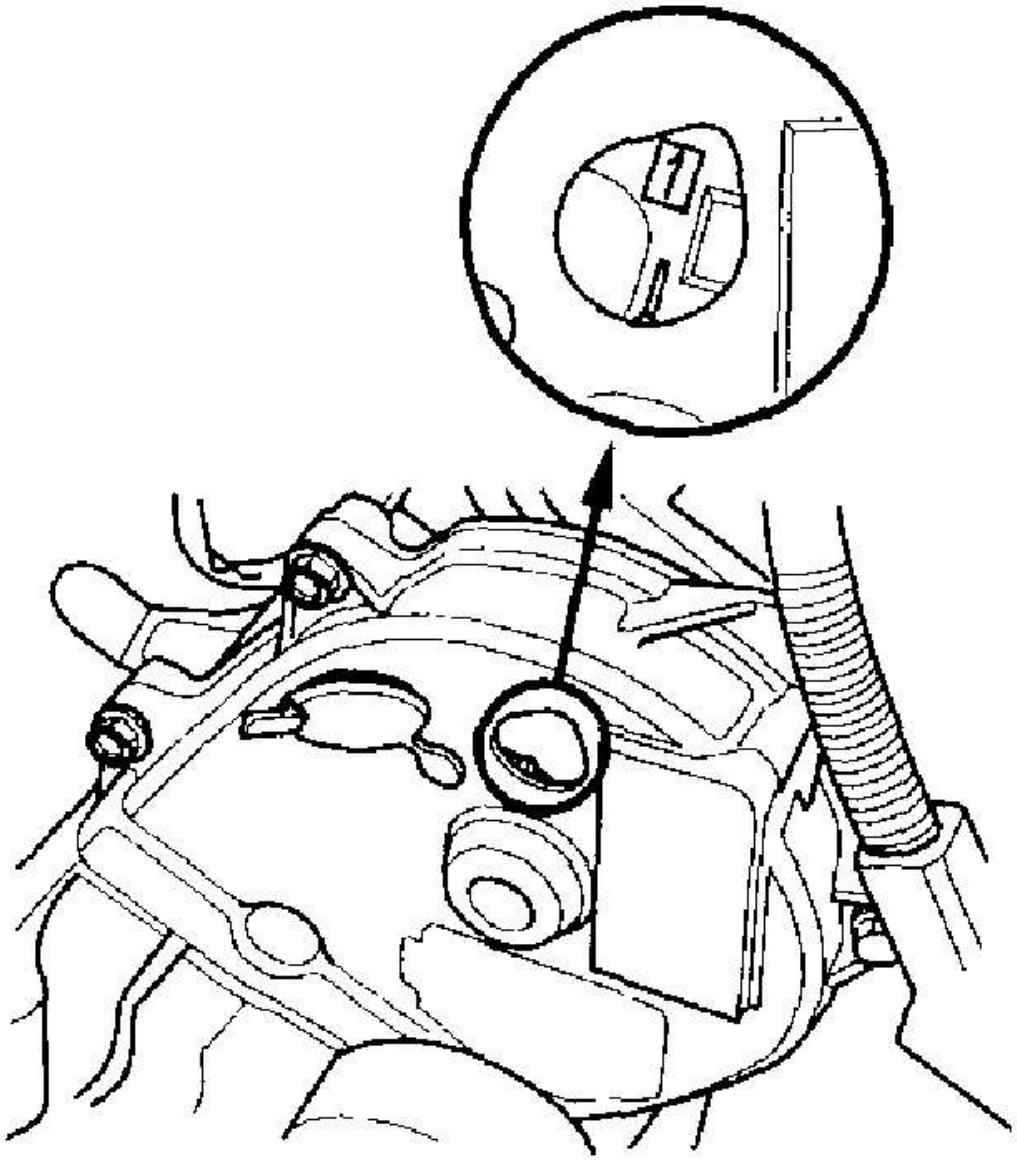

Fig. 67: Checking Camshaft Pulley Marks (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

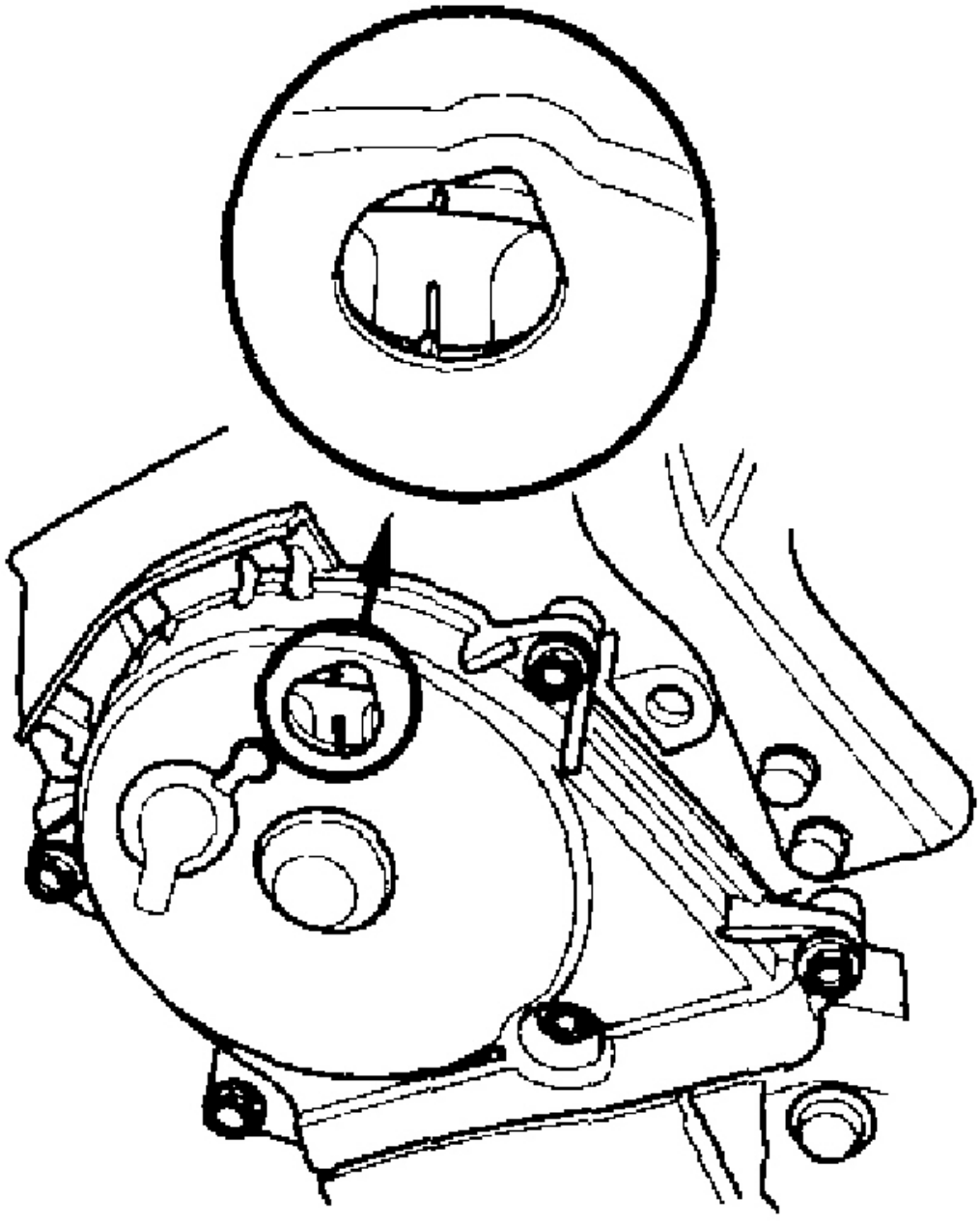

Fig. 68: Check Camshaft Pulley Marks (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

24. Install the upper half of the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown in **Fig. 69** .

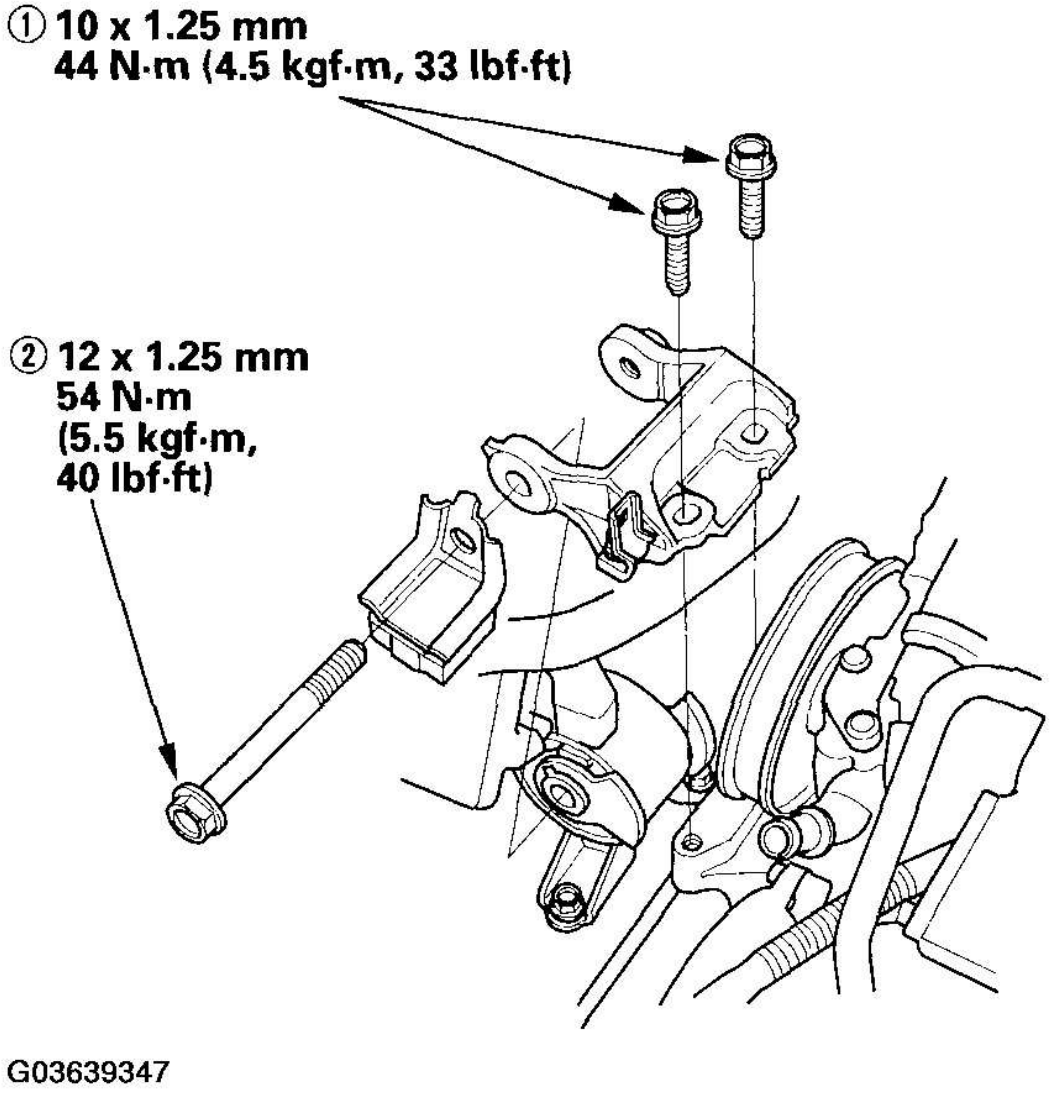

Fig. 69: Tightening Mounting Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Install the drive belt (see **DRIVE BELT REPLACEMENT**).
26. Install the splash shield.

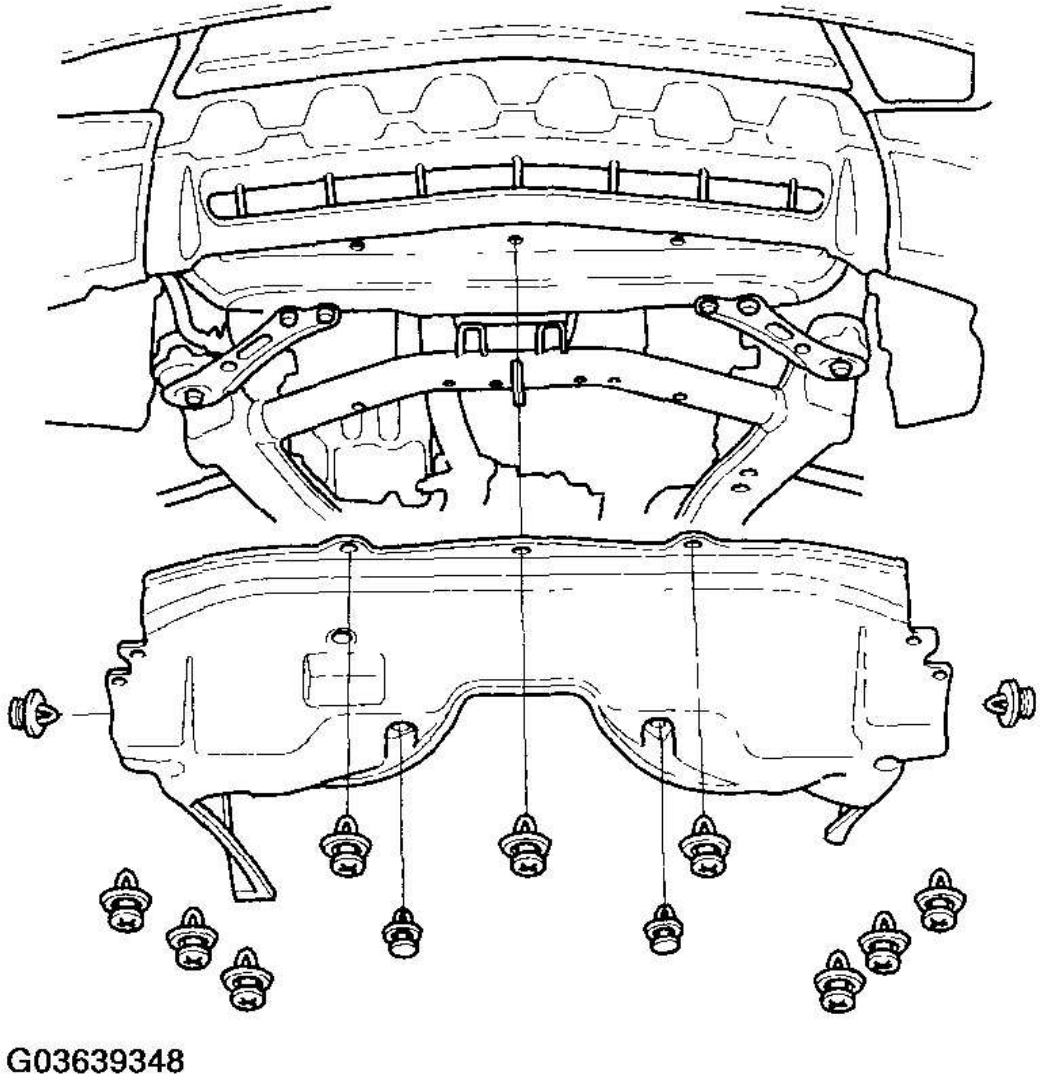

Fig. 70: Installing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Install the right front wheel.
28. Do the crankshaft position (CKP) pattern clear/CKP pattern learn procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).

TIMING BELT ADJUSTER REPLACEMENT

1. Remove the timing belt (see **TIMING BELT REMOVAL**).
2. Remove the auto-tensioner (see step 6 in **TIMING BELT REPLACEMENT**).

3. Remove the bolt (A), then remove the timing belt adjuster (B) and collar (C).

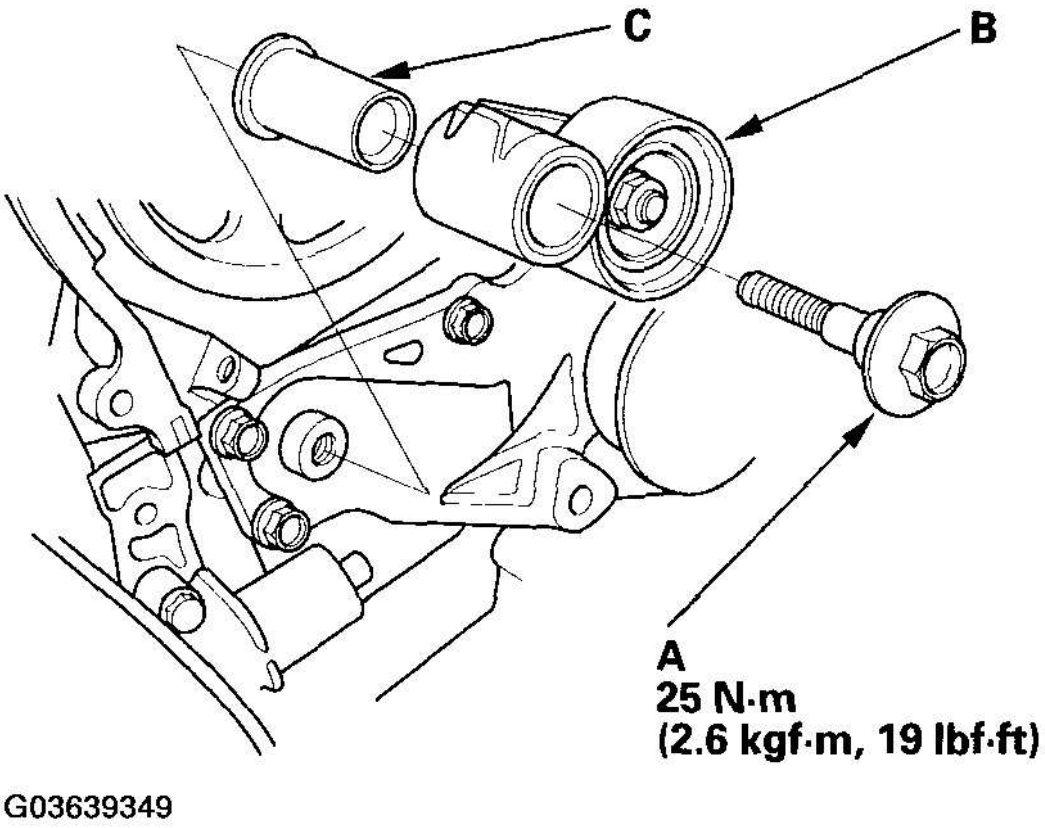

Fig. 71: Removing Timing Belt Adjuster And Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install in the reverse order of removal.
5. Install the timing belt (see **TIMING BELT INSTALLATION**).

TIMING BELT DRIVE PULLEY REPLACEMENT

1. Remove the timing belt (see **TIMING BELT REMOVAL**).
2. Remove the crankshaft position (CKP) sensor A/B (see **CKP SENSOR REPLACEMENT**).
3. Remove the timing belt drive pulley (A) and key (B).

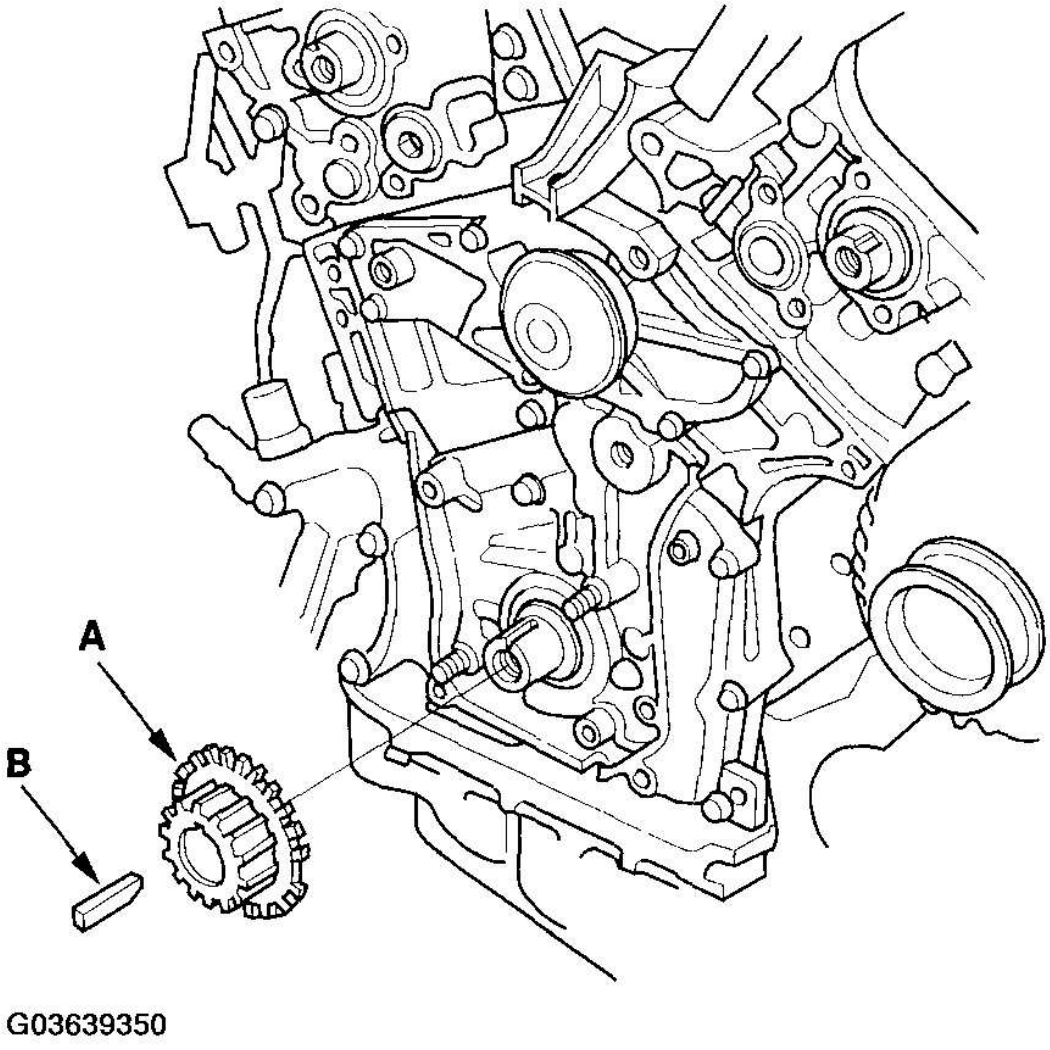

Fig. 72: Removing Timing Belt Drive Pulley And Key
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Inspect the timing belt pulley and key for damage. If it is cracked or damaged, replace the timing belt drive pulley.
5. Install the new timing belt drive pulley.
6. Install the CKP sensor A/B (see **CKP SENSOR REPLACEMENT**).
7. Install the timing belt (see **TIMING BELT INSTALLATION**).
8. Do the CKP pattern clear/CKP pattern learn procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).

CYLINDER HEAD COVER REMOVAL

1. Remove the intake manifold (see **REMOVAL**).
2. Remove the six ignition coils (see **IGNITION COIL REMOVAL/INSTALLATION**).
3. Remove the dipstick.
4. Remove the two bolts (A) securing the harness holder, and remove the positive crankcase ventilation (PCV) hose (B).

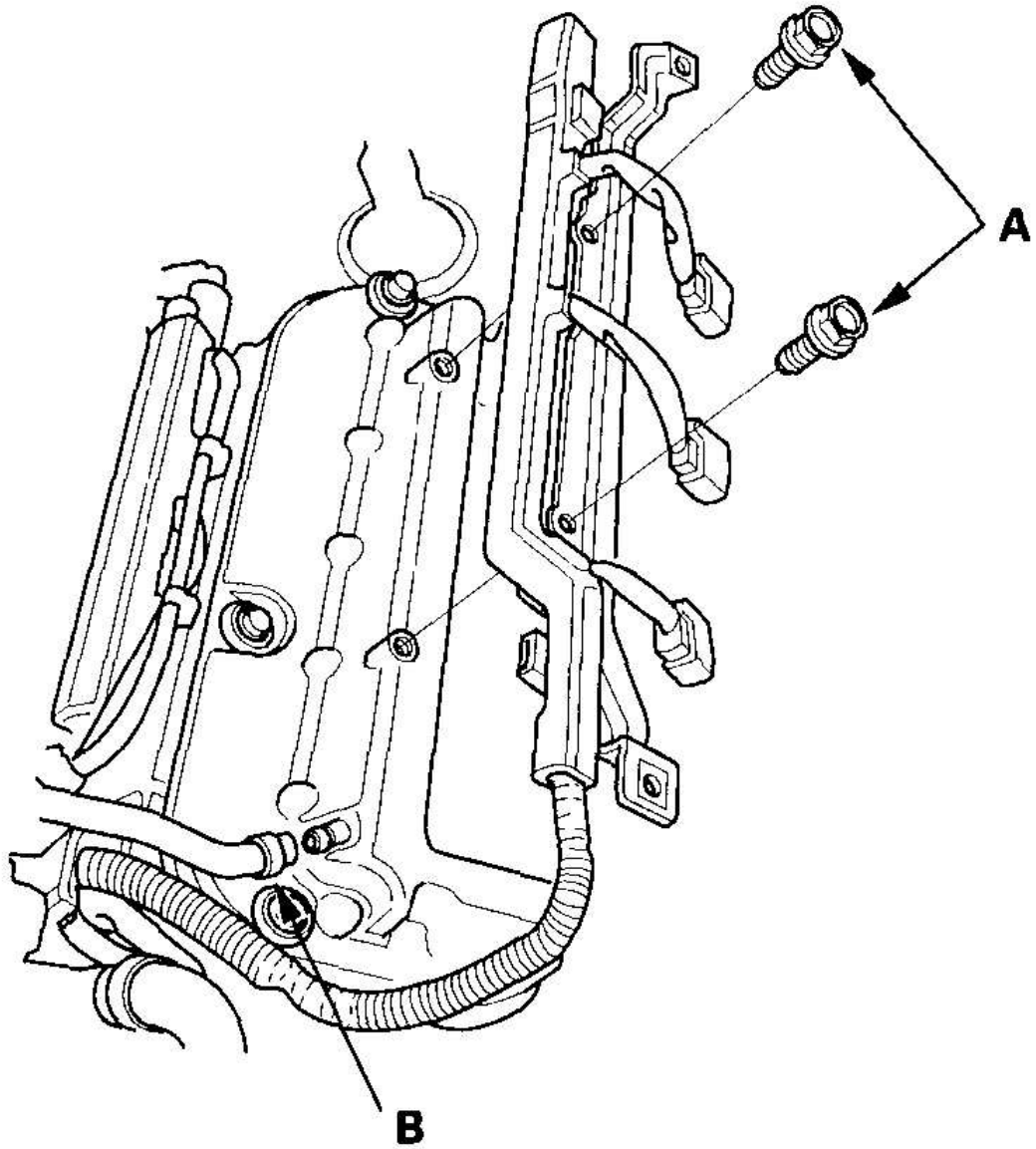

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Fig. 73: Removing Harness Holder Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Disconnect the three injector connectors from the injectors on the cylinder head (see **INJECTOR REPLACEMENT**).
6. Remove the power steering hose bracket mounting bolt (A) and the harness holder mounting bolts (B).

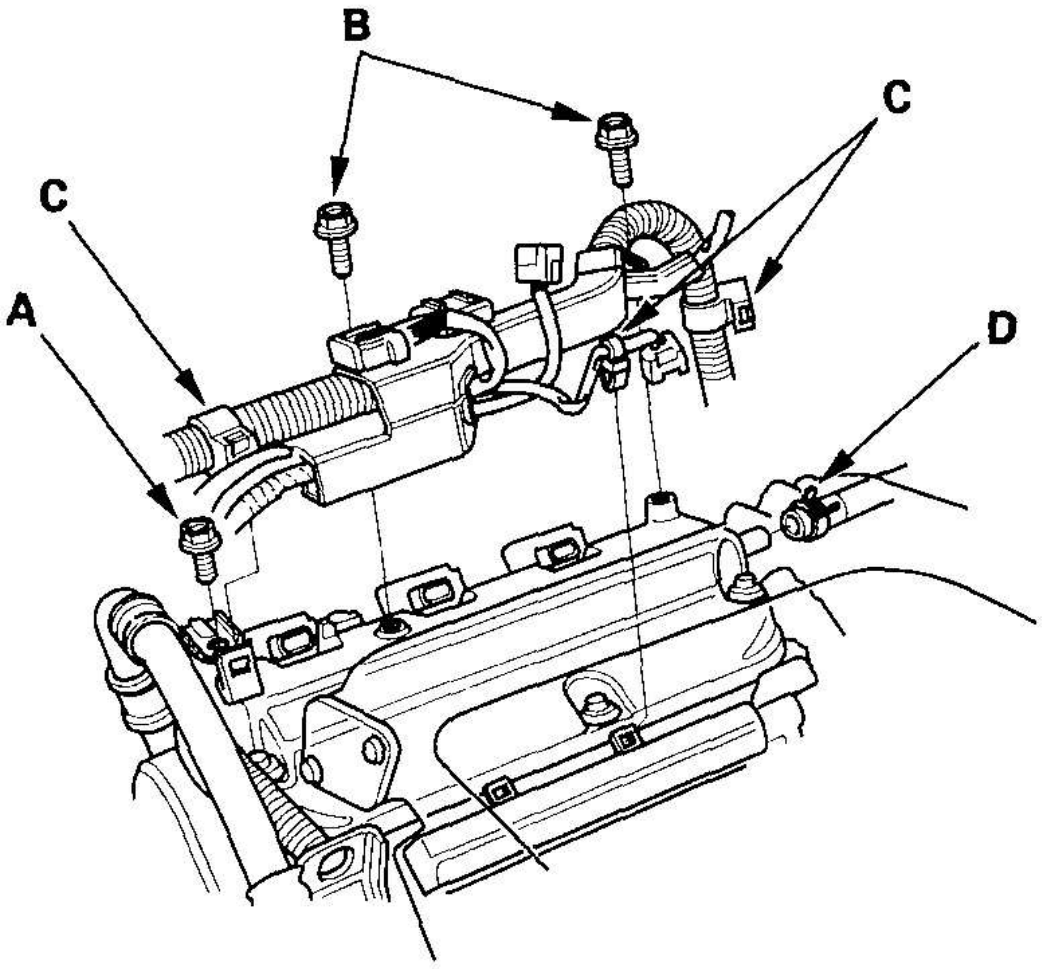

Fig. 74: Removing Power Steering Hose Bracket Mounting Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the harness clamps (C) and breather hose (D).
8. Remove the cylinder head cover.

FRONT

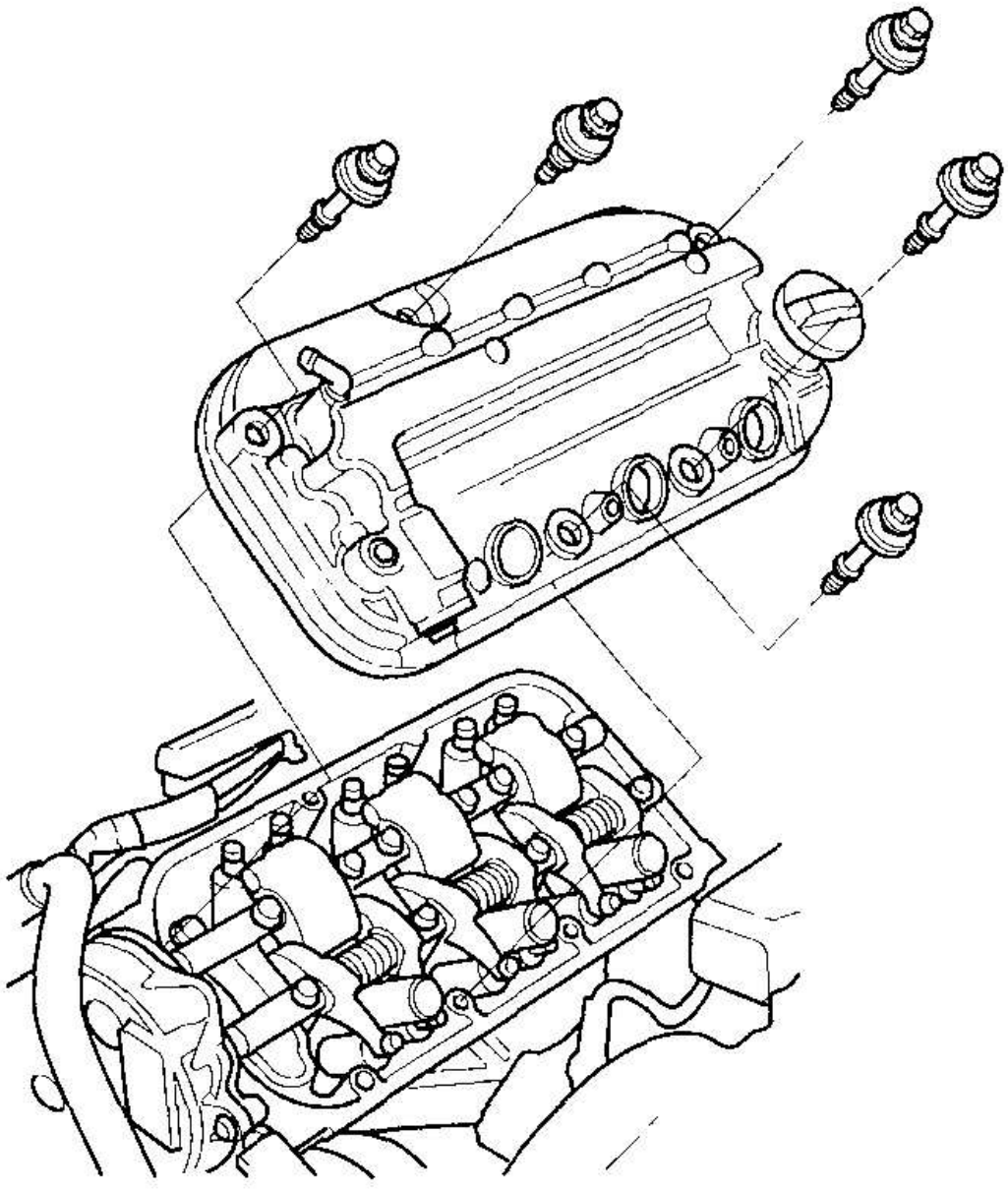

Fig. 75: Removing Cylinder Head Cover (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REAR

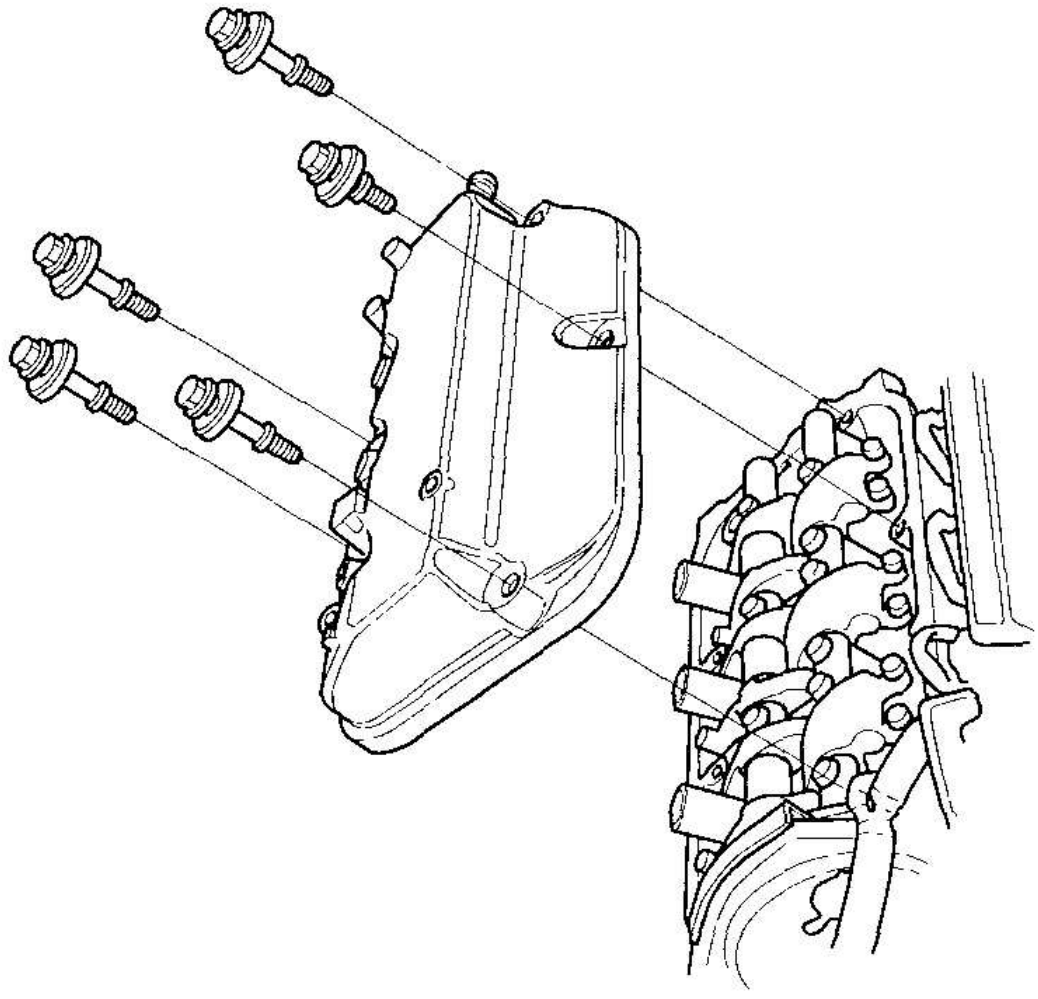

Fig. 76: Removing Cylinder Head Cover (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CYLINDER HEAD COVER INSTALLATION

1. Clean the head cover contacting surfaces with a shop towel.
2. Visually check the spark plug seals for damage. Replace if necessary.
3. Set the spark plug seals (A) on the spark plug tubes, and install the cylinder head cover (B).

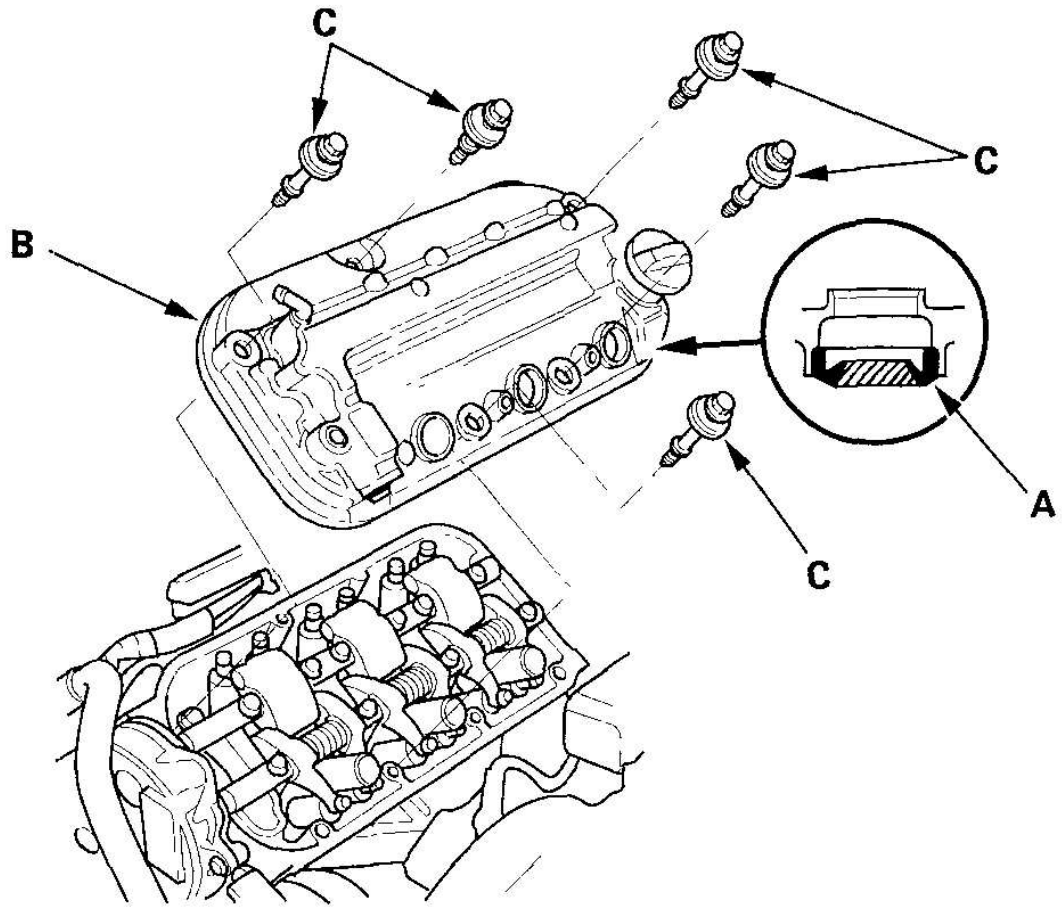

Fig. 77: Installing Cylinder Head Cover (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

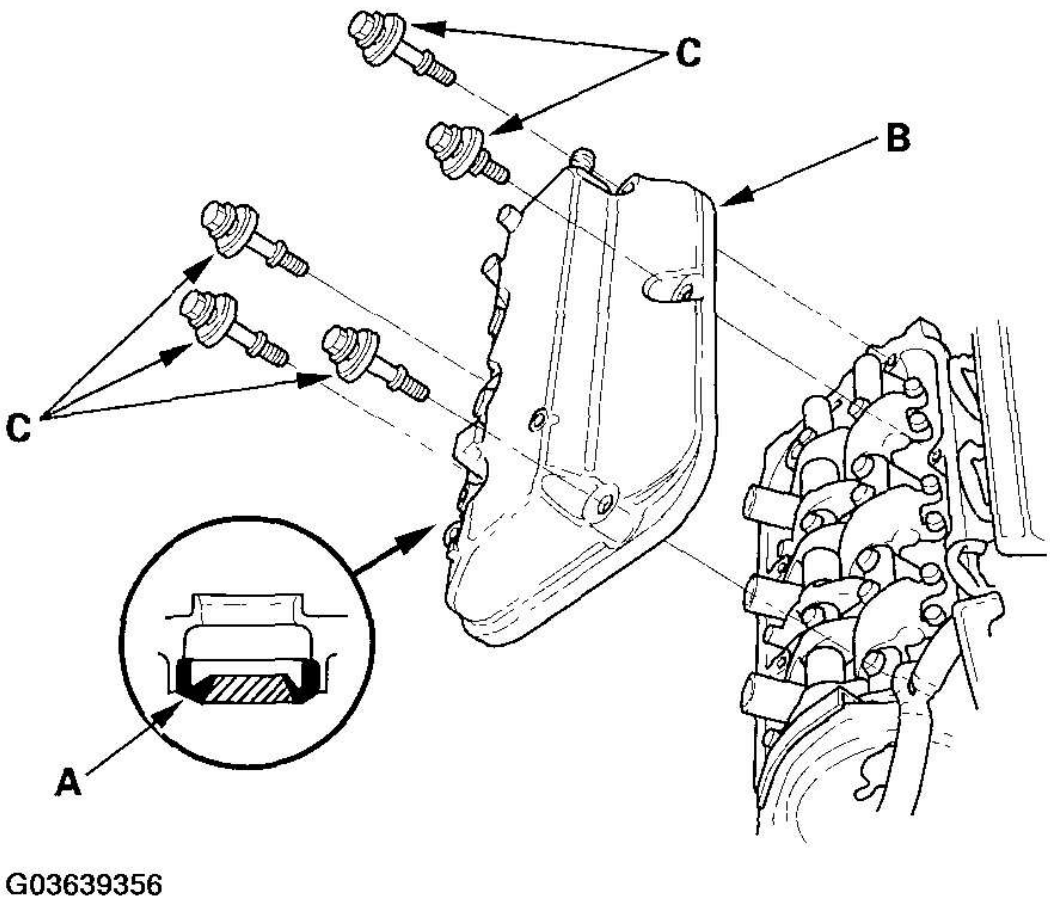

Fig. 78: Install Cylinder Head Cover (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Inspect the cover washer (C). Replace any washer that is damaged or deteriorated.
5. Tighten the bolts in two or three steps. In the final step tighten all bolts, in sequence, 12 N.m (1.2 kgf.m, 8.7 lbf.ft).

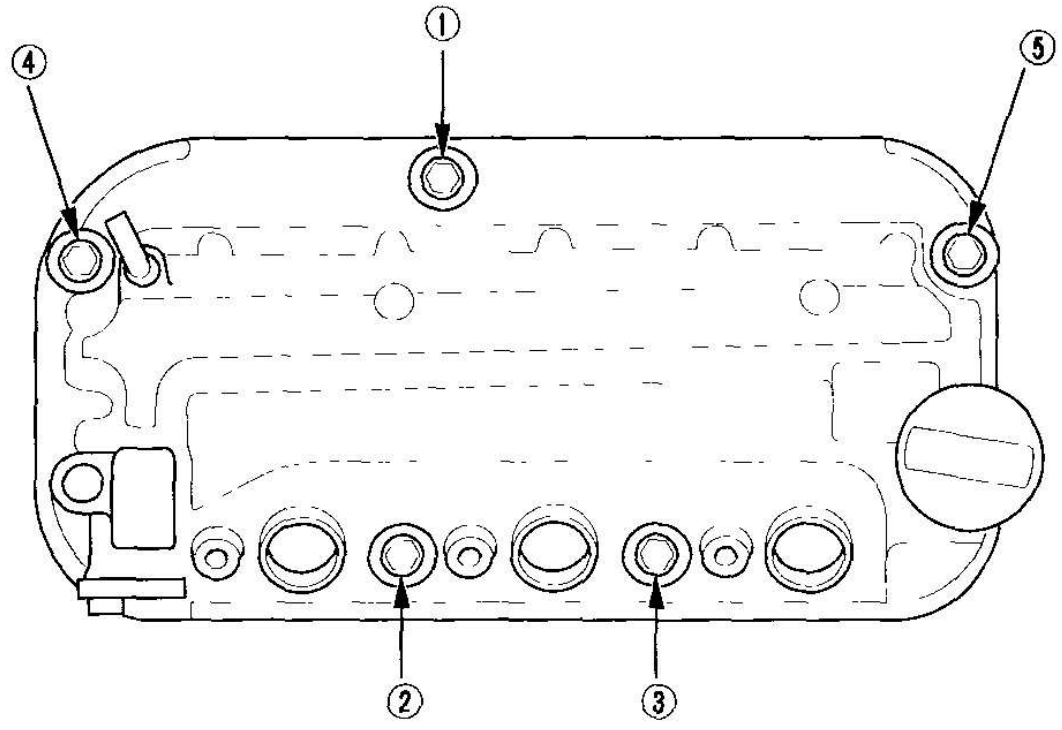

Fig. 79: Tightening Cylinder Head Cover Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Tighten the harness holder mounting bolts (A) and the power steering hose bracket mounting bolt (B).

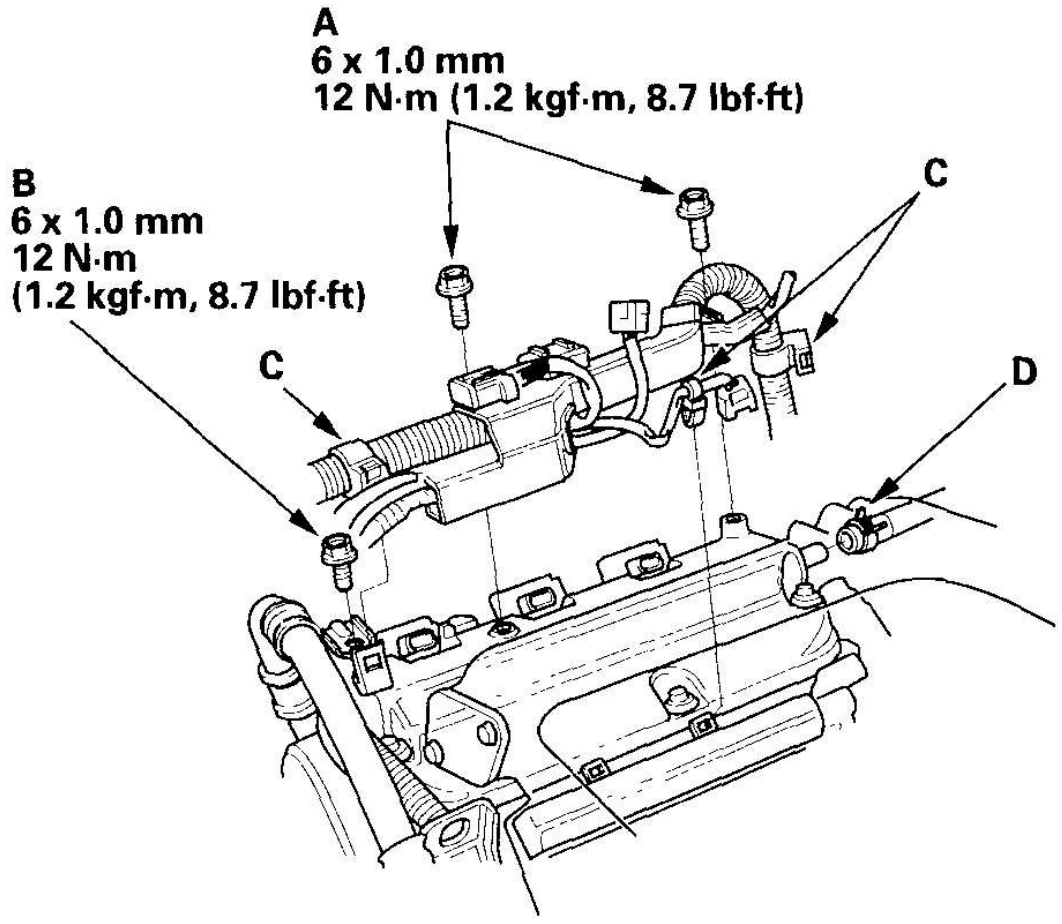

Fig. 80: Tightening Harness Holder Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the harness clamps (C) and breather hose (D).
8. Connect the three injector connectors to the injectors on the cylinder head.
9. Tighten the two bolts (A) securing the harness holder, and install the positive crankcase ventilation (PCV) hose (B).

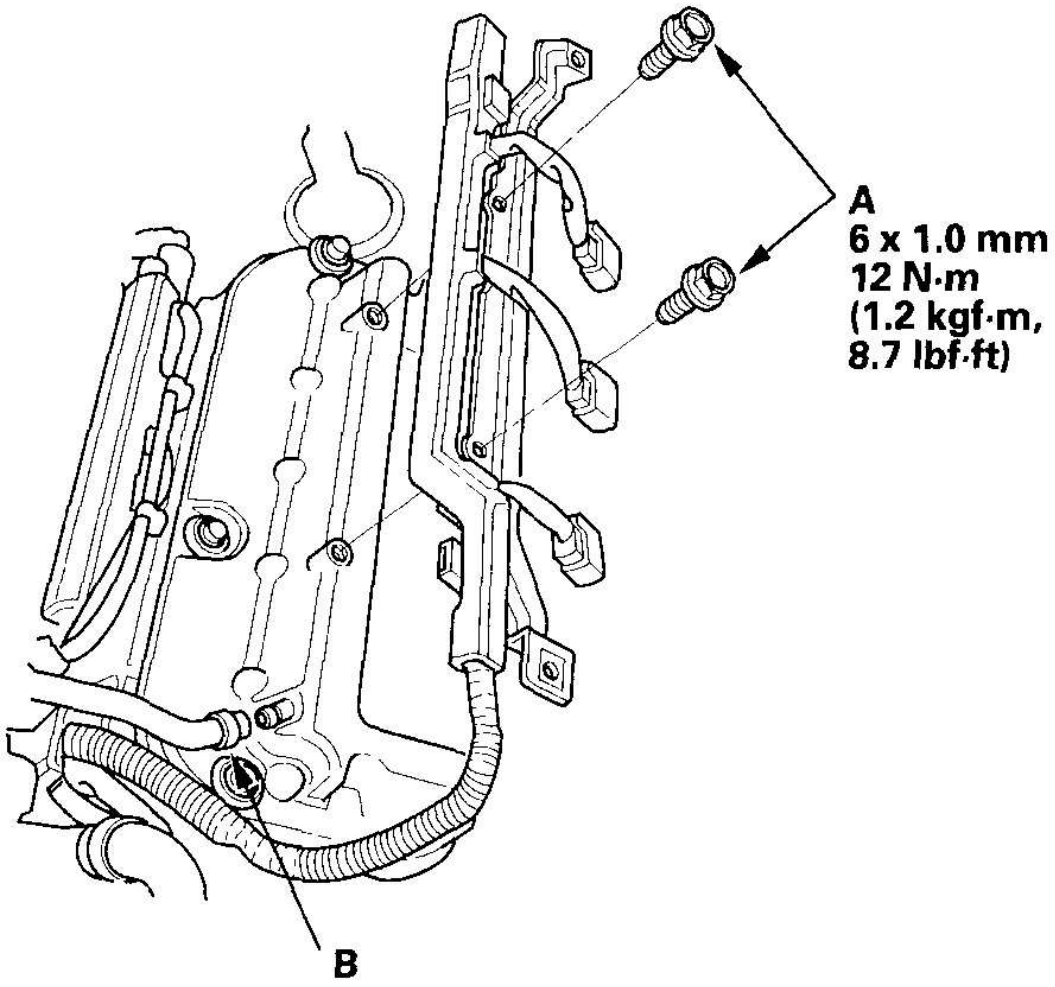

Fig. 81: Tightening Harness Holder Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the dipstick
11. Install the six ignition coils (see **IGNITION COIL REMOVAL/INSTALLATION**).
12. Install the intake manifold (see **INSTALLATION**).

CYLINDER HEAD REMOVAL

NOTE:

- **Use fender covers to avoid damaging painted surfaces.**
- **To avoid damage, 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 ℉ (38 ℃) before loose ning the cylinder head bolts.**
- **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 you have the anti-theft codes for the radio and the navigation system, then write down the customer's audio presets. Make sure the ignition switch is OFF.
2. Relieve the fuel pressure (see **FUEL PRESSURE RELIEVING**).
3. Disconnect the negative cable from the battery.
4. Drain the engine coolant (see **COOLANT REPLACEMENT**).
5. Remove the drive belt (see **DRIVE BELT REPLACEMENT**).
6. Remove the power steering (P/S) pump (A) and the bolt (B) securing the P/S hose bracket.

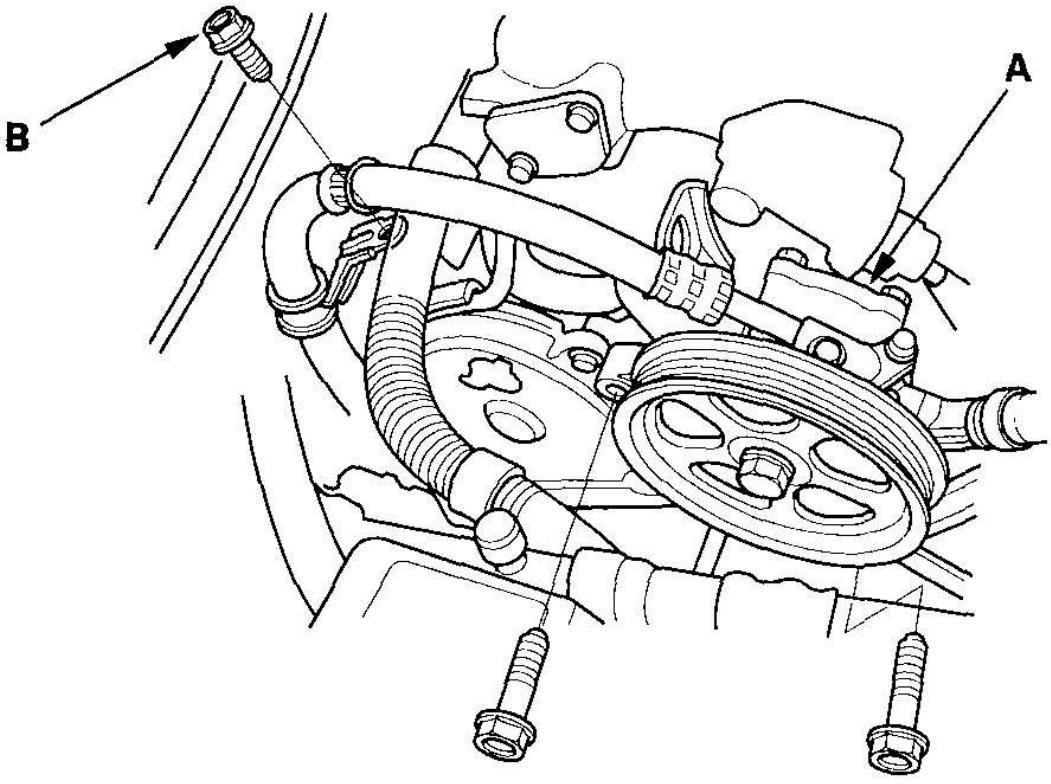

Fig. 82: Removing P/S Pump
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the alternator (see **ALTERNATOR REMOVAL AND INSTALLATION**).
8. Remove the intake manifold (see **REMOVAL**).
9. Remove the six ignition coils (see **IGNITION COIL REMOVAL/INSTALLATION**).
10. Remove the timing belt (see **TIMING BELT REMOVAL**).
11. Remove these engine wire harness connectors and wire harness clamps from the cylinder head:
    - Six injector connectors
    - Engine coolant temperature (ECT) sensor connector
    - Camshaft position (CMP) sensor connector
    - Crankshaft position (CKP) sensor A/B connector
    - Exhaust gas recirculation (EGR) valve connector
    - Rocker arm oil control solenoid (VTEC solenoid valve) connector
    - Rocker arm oil pressure switch (VTEC oil pressure switch) connector
    - Oil pressure switch connector
    - Two air fuel ratio (A/F) sensor connectors
    - Two secondary heated oxygen sensor (secondary HO2S) connectors
12. Remove the upper radiator hose (A) and lower radiator hose (B).

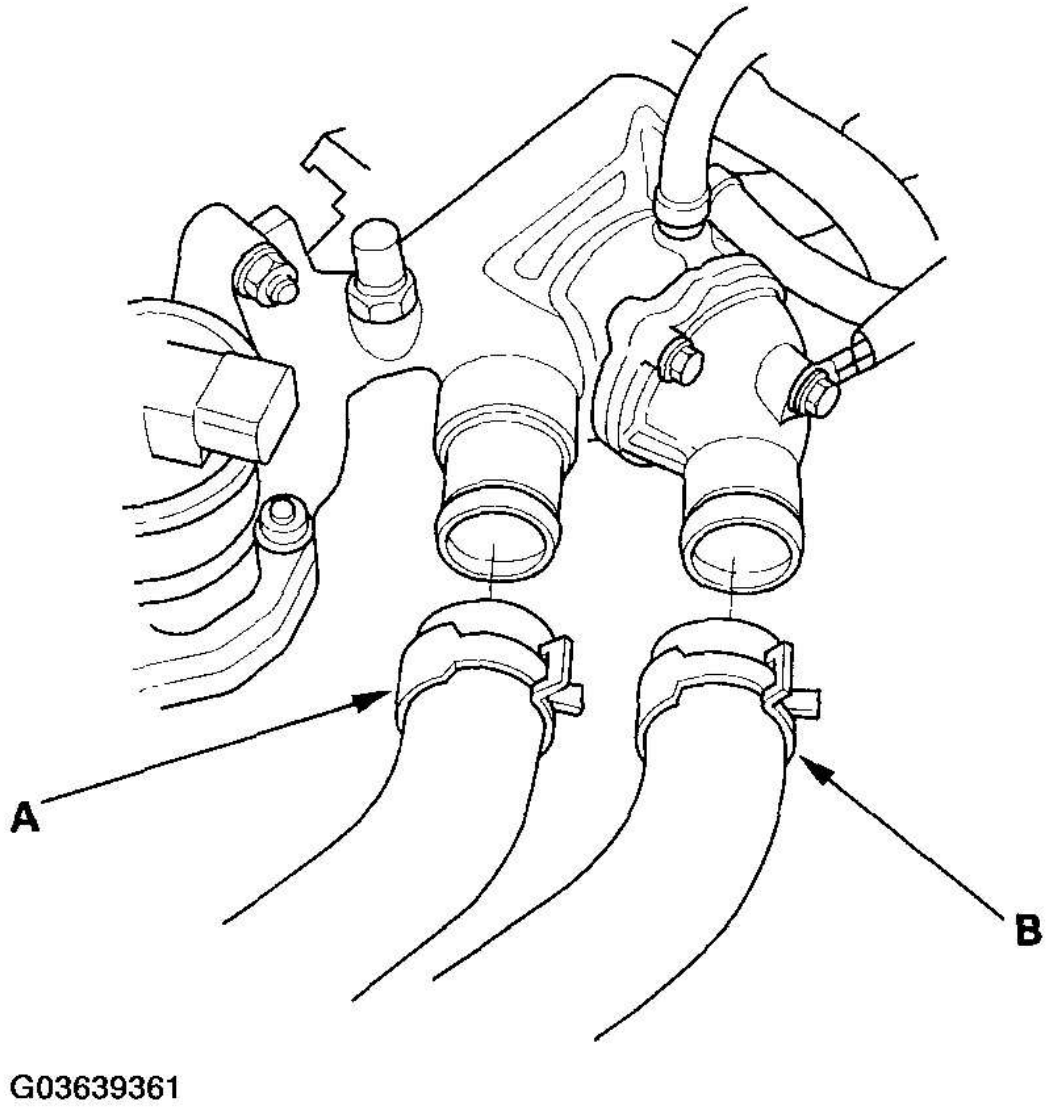

Fig. 83: Removing Upper And Lower Radiator Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the heater hose (A) and water bypass hose (B).

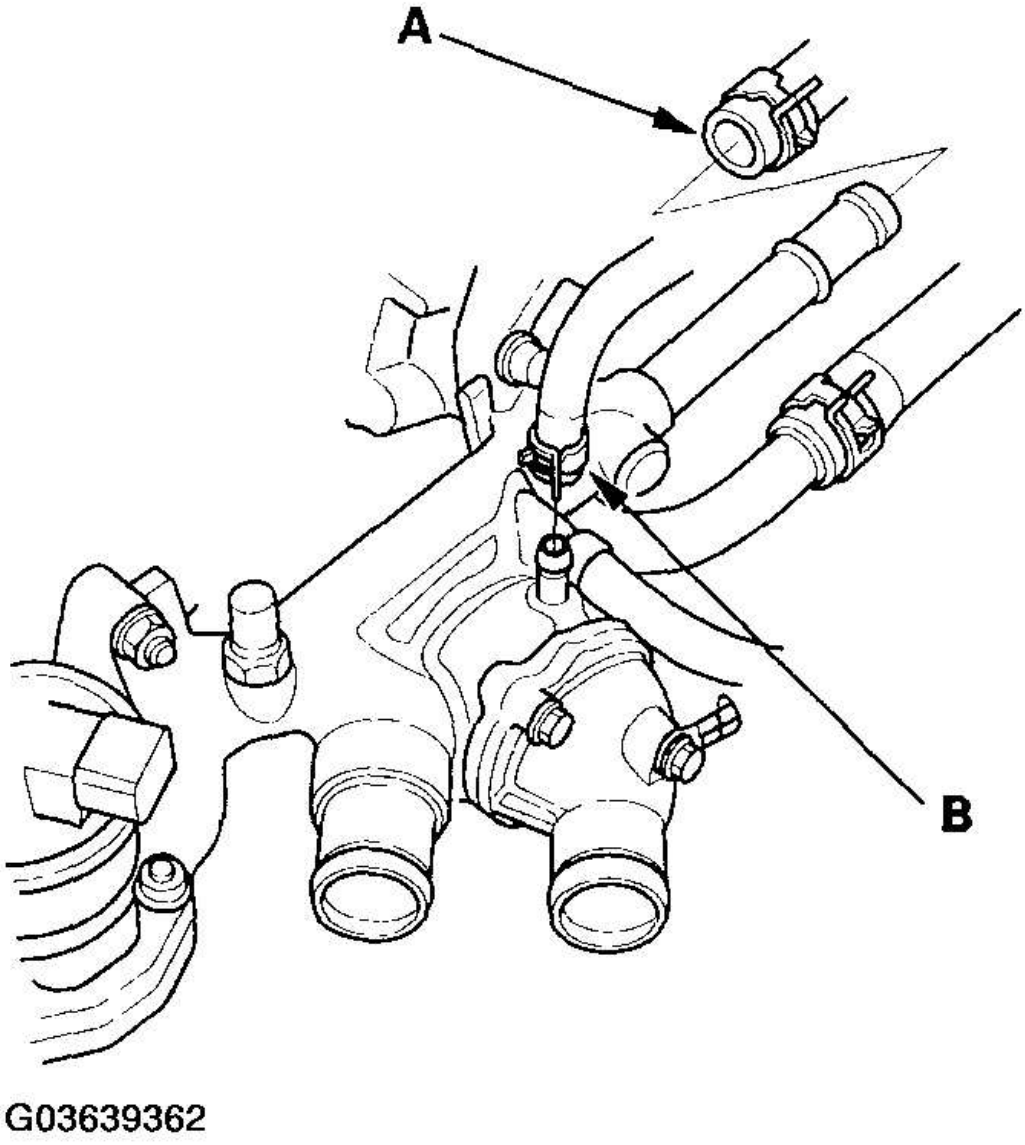

Fig. 84: Removing Heater Hose And Water Bypass Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the bolt securing the harness bracket.

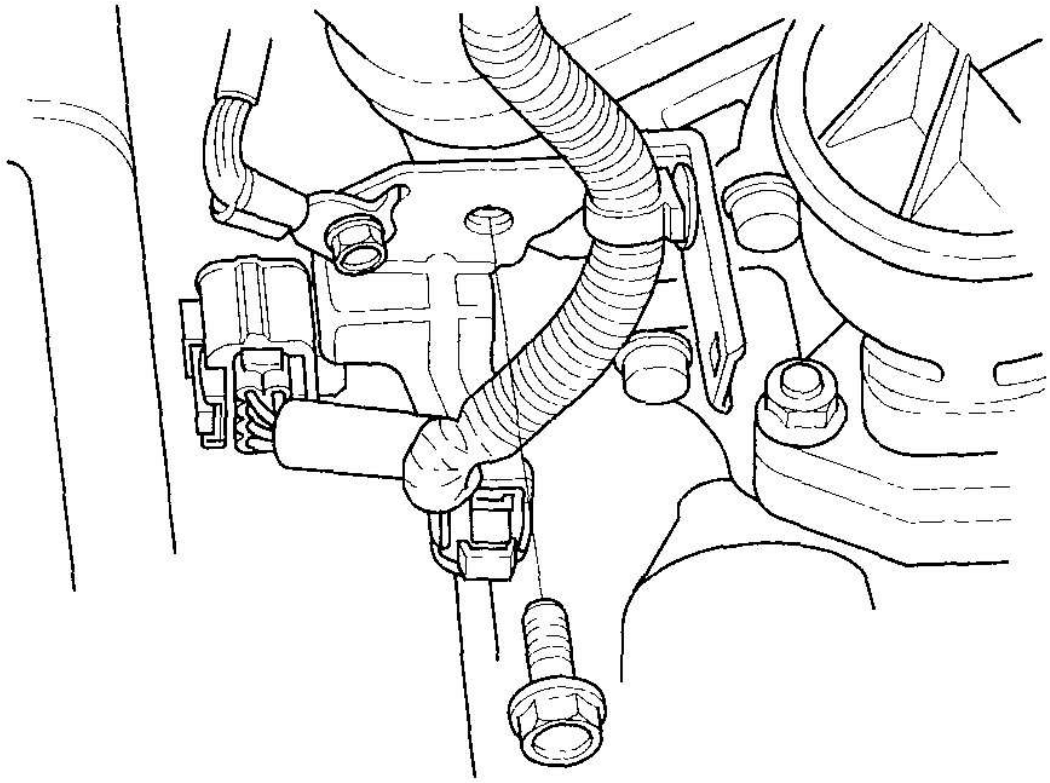

Fig. 85: Removing Harness Bracket Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Remove the bolt securing the harness bracket.

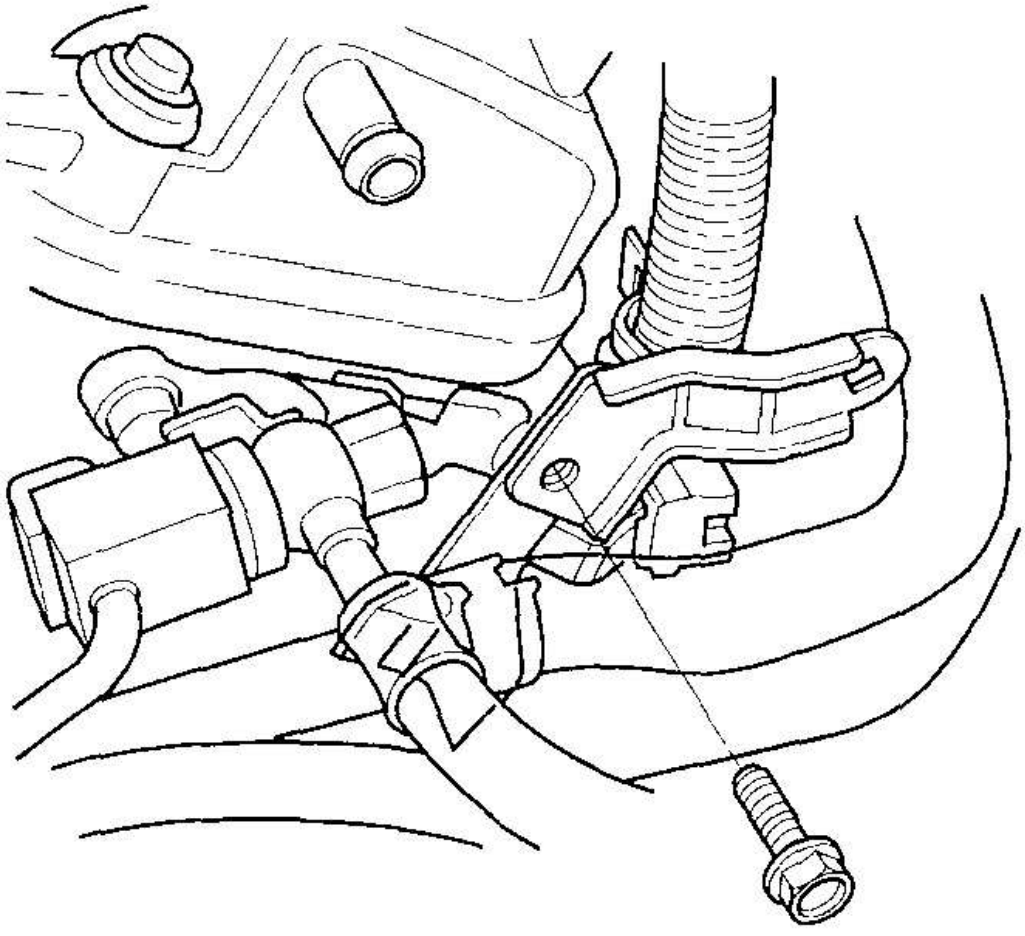

Fig. 86: Removing Harness Bracket Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. 2003-2004 models: Remove the fuel feed hose.

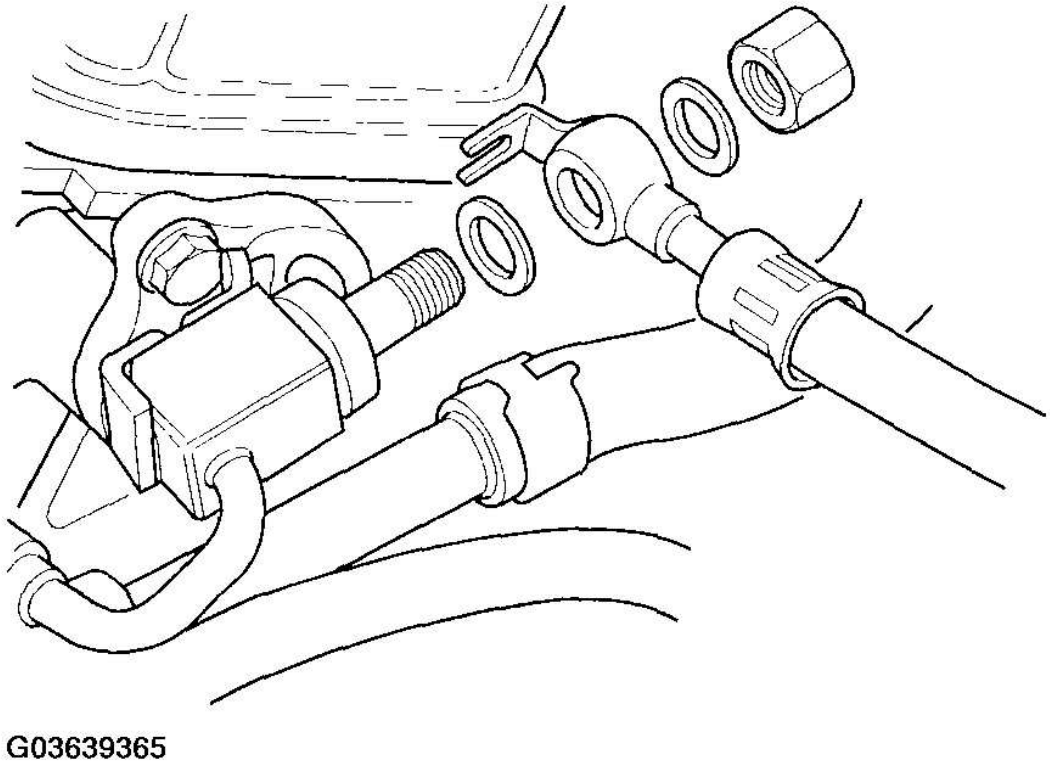

Fig. 87: Removing Fuel Feed Hose (2003-04 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. 2005-2006 models: Remove the quick-connect fitting cover (A), then disconnect the fuel feed hose (see **FUEL LINE/QUICK-CONNECT FITTING REMOVAL**).

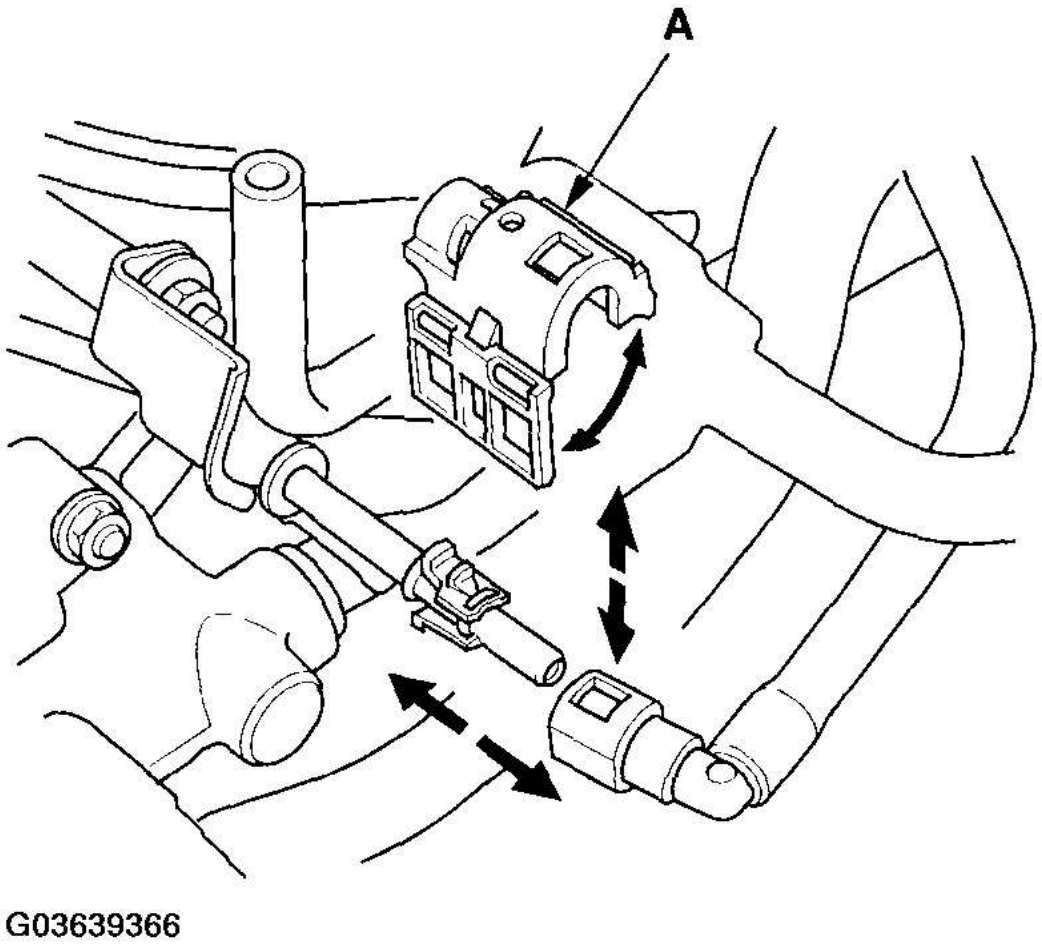

Fig. 88: Removing Quick-Connect Fitting Cover (2005-06 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. 2005-2006 models: Remove the two nuts securing the purge joint.

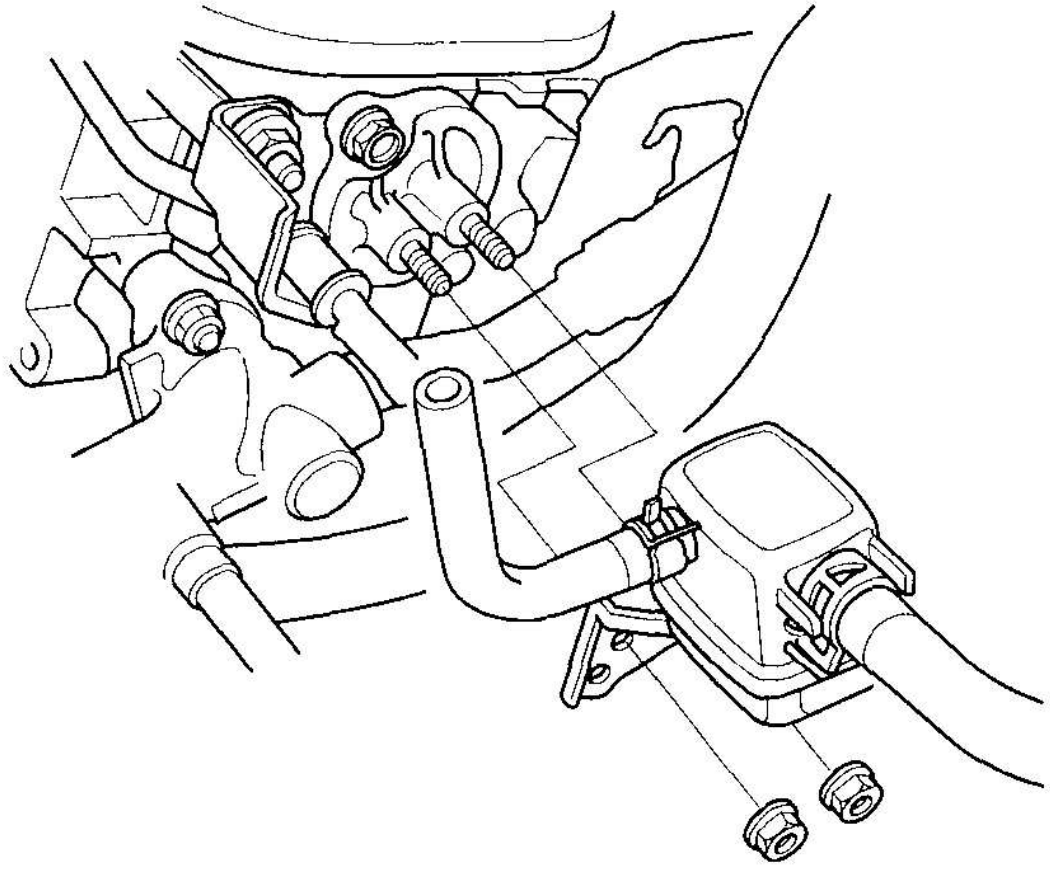

Fig. 89: Removing Purge Joint Nuts (2005-06 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Remove the fuel rails (see **COMPONENT LOCATION INDEX**).
20. Remove the front and rear warm up three way catalytic converter (WU-TWC) (see **WARM UP TWC REMOVAL/INSTALLATION**).
21. Remove the water passage.

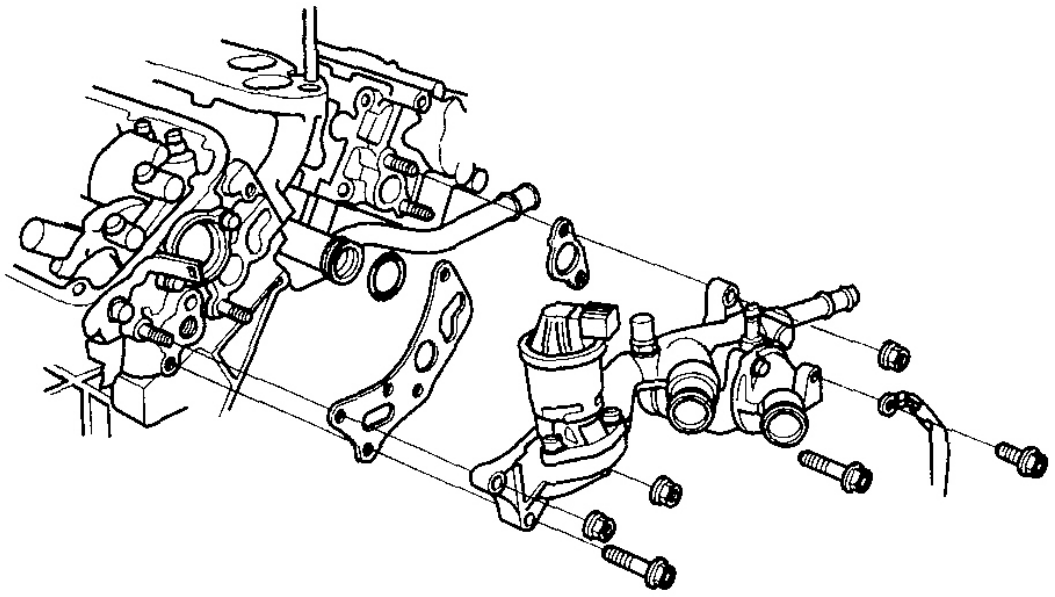

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Fig. 90: Removing Water Passage
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Remove the front and rear camshaft pulleys (A) and front and rear back covers (B).

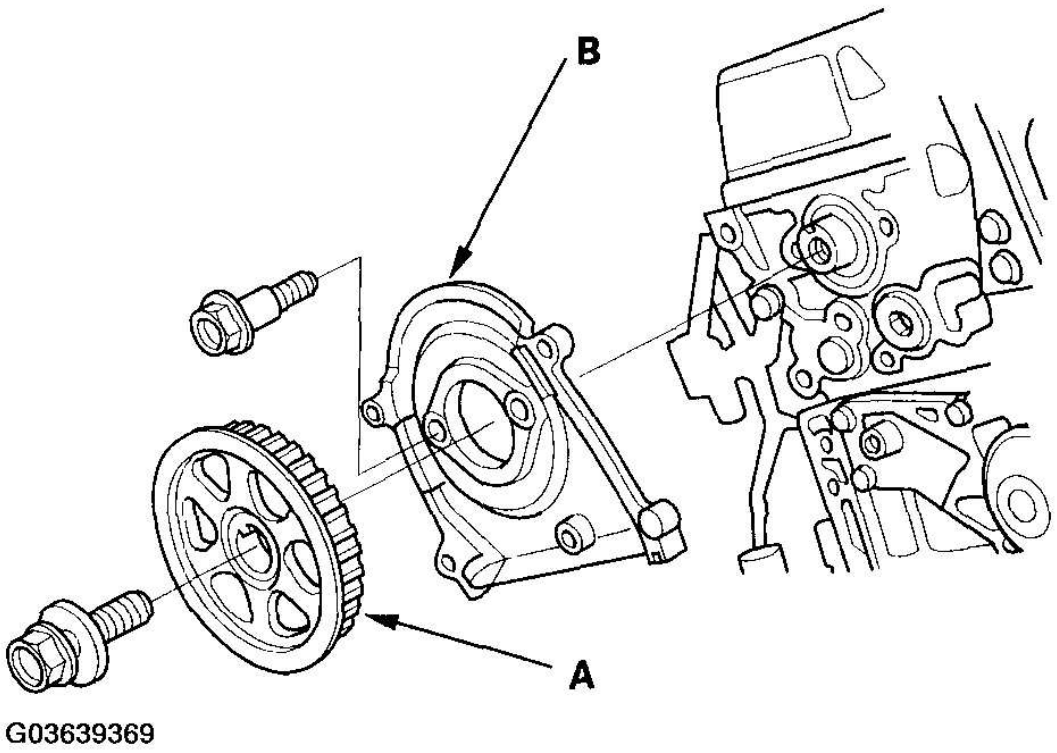

Fig. 91: Removing Front And Rear Camshaft Pulleys
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Remove the cylinder head cover (see **CYLINDER HEAD COVER REMOVAL**).
24. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

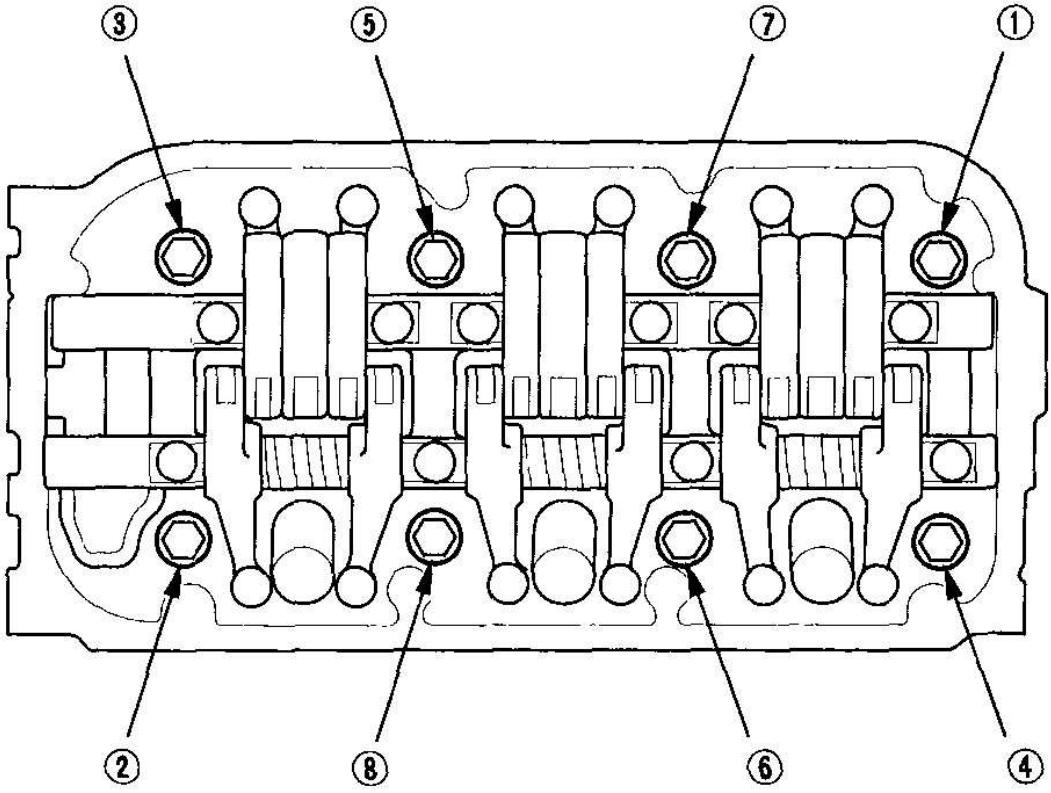

Fig. 92: Removing Cylinder Head Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Remove the cylinder head.

CAMSHAFT REPLACEMENT

FRONT

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the customer's radio station and XM radio channel presets. Make sure the ignition switch is OFF.
2. Disconnect the negative cable from the battery first, then the positive cable. Remove the battery.
3. Drain the engine coolant (see **COOLANT REPLACEMENT**).
4. Remove the upper radiator hose.

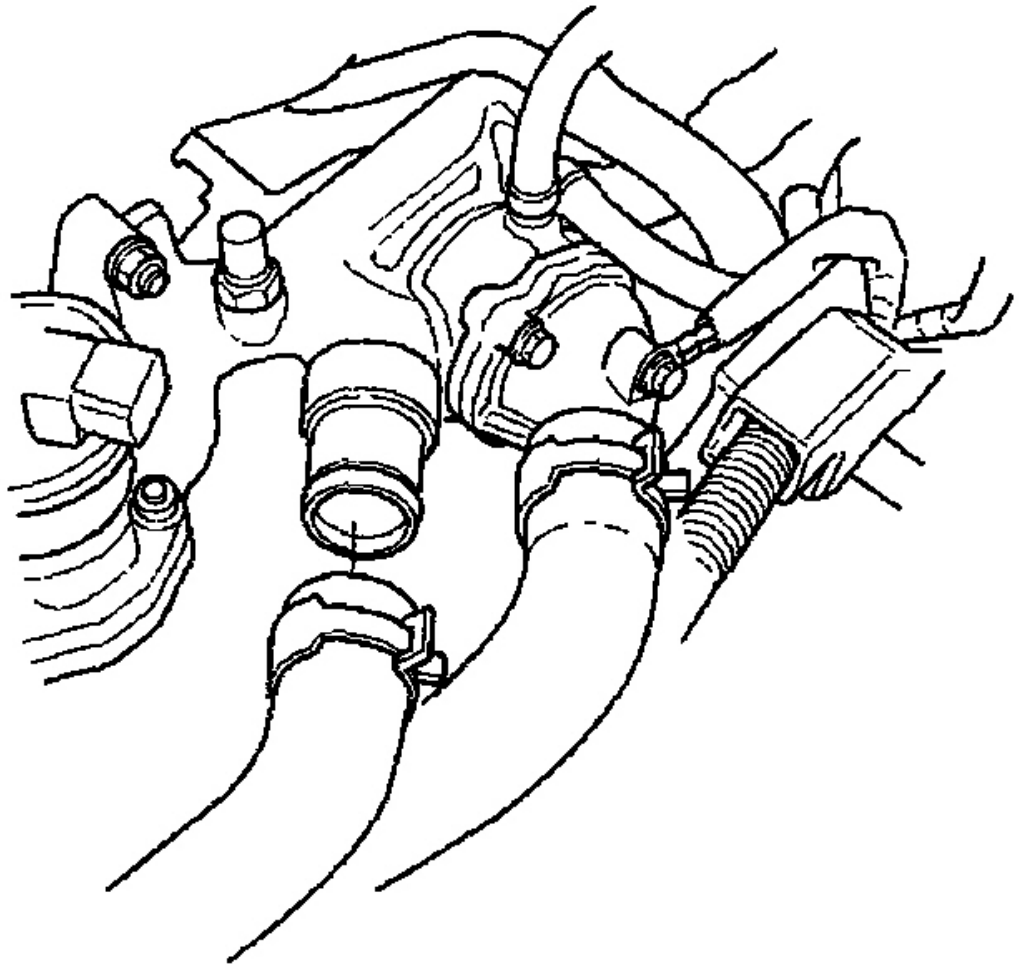

Fig. 93: Removing Upper Radiator Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the exhaust gas recirculation (EGR) valve (see **EGR VALVE REPLACEMENT**).
6. Remove the timing belt (see **TIMING BELT REMOVAL**).
7. Remove the rocker arm assembly (see **ROCKER ARM ASSEMBLY REMOVAL**).
8. Remove the front camshaft pulley.
9. Remove the thrust cover (A), then remove the camshaft (B).

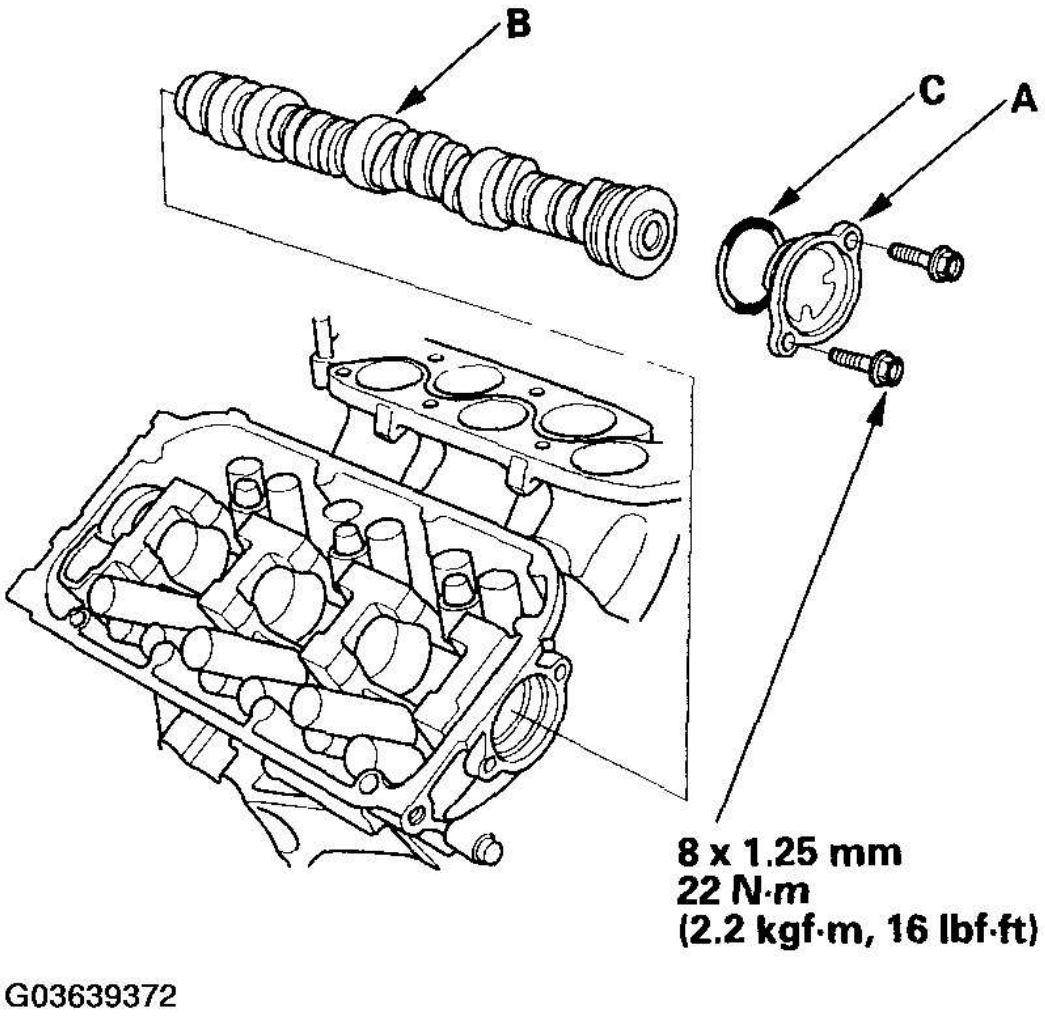

Fig. 94: Removing Thrust Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the camshaft in the reverse order of removal. Always use a new O-ring (C). Apply new engine oil to the camshaft lobes and journals.
11. Apply new engine oil to the threads of the camshaft pulley mounting bolt, then install the front camshaft pulley (see step 11 in **CAMSHAFT, ROCKER ARM, CAMSHAFT SEAL, AND PULLEY INSTALLATION**).
12. Install the rocker arm assembly, then tighten the mounting bolts (see step 9 in **CAMSHAFT, ROCKER ARM, CAMSHAFT SEAL, AND PULLEY INSTALLATION**).
13. Install the timing belt (see **TIMING BELT INSTALLATION**).
14. Adjust the valve clearance (see **VALVE CLEARANCE ADJUSTMENT**).

15. Install the upper radiator hose.
16. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
17. Fill the radiator with engine coolant and bleed the air out from the system (see step 8 in **COOLANT REPLACEMENT**).
18. Do the powertrain control module (PCM) reset procedure (see **PCM RESET**).
19. Do the crankshaft position (CKP) pattern clear/CKP pattern lean procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).
20. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT**).
21. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station and XM radio channel presets.
22. Set the clock.

REAR

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the customer's radio station and XM radio channel presets. Make sure the ignition switch is OFF.
2. Relieve the fuel pressure (see **FUEL PRESSURE RELIEVING**).
3. Disconnect the negative cable from the battery first, then disconnect the positive cable.
4. Remove the under-hood fuse/relay box.
5. Drain the engine coolant (see **COOLANT REPLACEMENT**).
6. 2003-2004 models: Remove the fuel feed hose (see step 16 in **CYLINDER HEAD REMOVAL**).
7. 2003-2004 models: Remove the nuts (A) securing the fuel line.

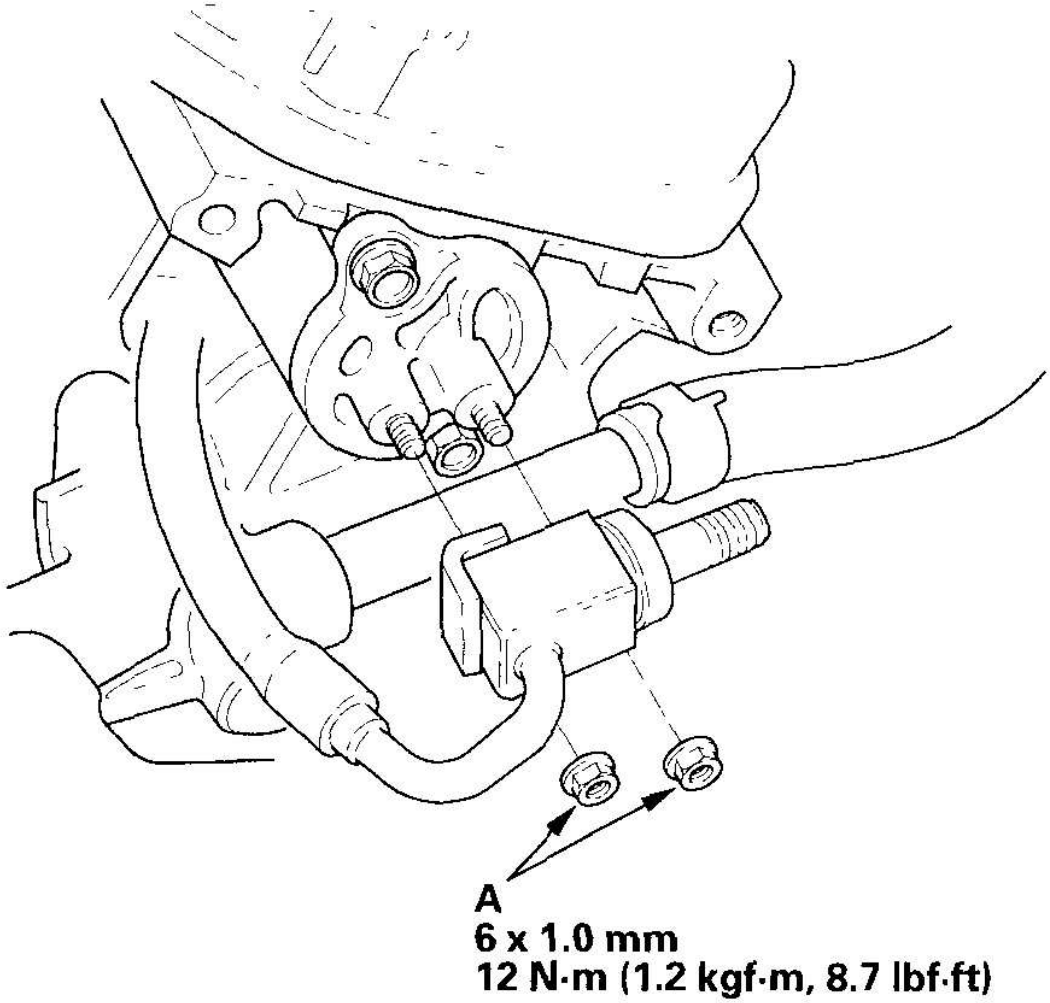

Fig. 95: Removing Fuel Line Nuts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove the brake lines from the master cylinder (see **MASTER CYLINDER REPLACEMENT**).
9. Remove the timing belt (see **TIMING BELT REMOVAL**).
10. Remove the rocker arm assembly (see **ROCKER ARM ASSEMBLY REMOVAL**).
11. Remove the rear camshaft pulley.
12. 2005-2006 models: Remove the two nuts securing the purge joint.

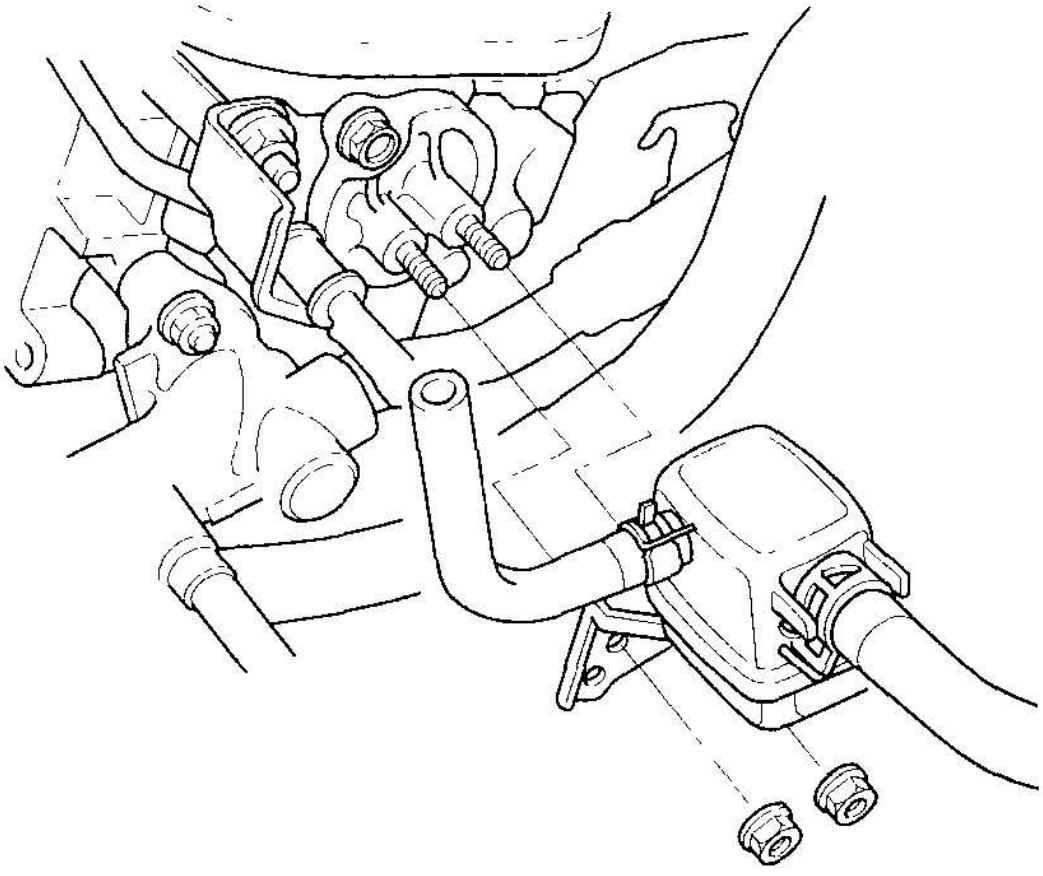

Fig. 96: Removing Purge Joint Nuts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the thrust cover (A), then remove the camshaft (B).

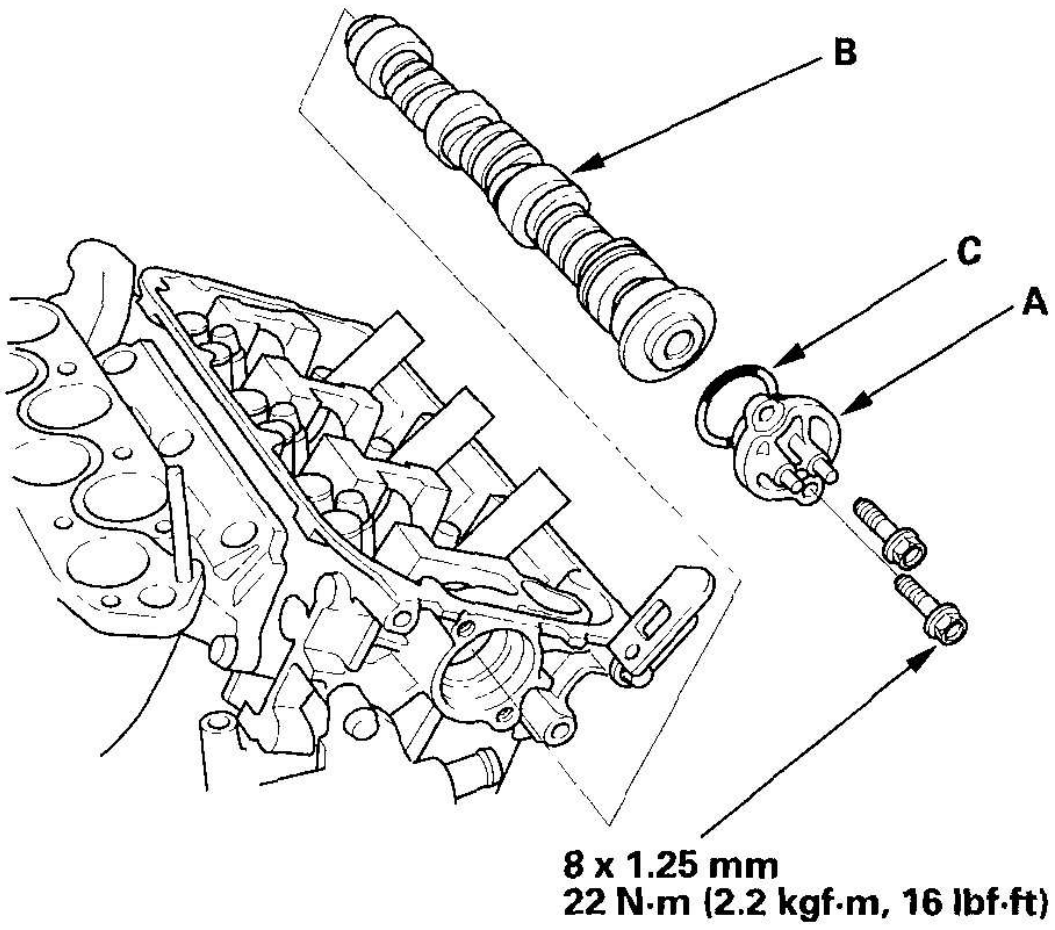

Fig. 97: Removing Thrust Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install the camshaft in the reverse order of removal. Always use a new O-ring (C). Apply new engine oil on the camshaft lobes and journals.
15. Apply new engine oil to the threads of the camshaft pulley mounting bolt, then install the rear camshaft pulley (see step 11 in **CAMSHAFT, ROCKER ARM, CAMSHAFT SEAL, AND PULLEY INSTALLATION**).
16. Install the rocker arm assembly, then tighten the mounting bolts (see step 9 in **CAMSHAFT, ROCKER ARM, CAMSHAFT SEAL, AND PULLEY INSTALLATION**).
17. Install the timing belt (see **TIMING BELT INSTALLATION**).
18. Adjust the valve clearance (see **VALVE CLEARANCE ADJUSTMENT**).
19. Install the under-hood fuse/relay box.
20. Connect the negative cable to the battery.

21. 2003-2004 models: Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.
22. Fill the radiator with engine coolant and bleed the air out from the system (see step 8 in **COOLANT REPLACEMENT**).
23. Do the PCM reset procedure (see **PCM RESET**).
24. Do the CKP pattern clear/CKP pattern learn procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).
25. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT**).
26. Enter the anti-theft codes for the radio and navigation system, then enter the customer's radio station and XM radio channel presets.
27. Set the clock.

CYLINDER HEAD INSPECTION FOR WARPAGE

1. Remove the cylinder head (see **CYLINDER HEAD REMOVAL**).
2. Inspect the camshaft (see **CAMSHAFT INSPECTION**).
3. Check the cylinder head for warpage. Measure along the edges, and three ways across the center.
    - If warpage is less than 0.05 mm (0.002 in.), cylinder head resurfacing is not required.
    - If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface the cylinder head.
    - Maximum resurface limit is 0.2 mm (0.008 in.) based on a height of 121 mm (4.76 in.).

    Cylinder Head Height

    Standard (New): 120.95-121.05 mm (4.762-4.766 in.)

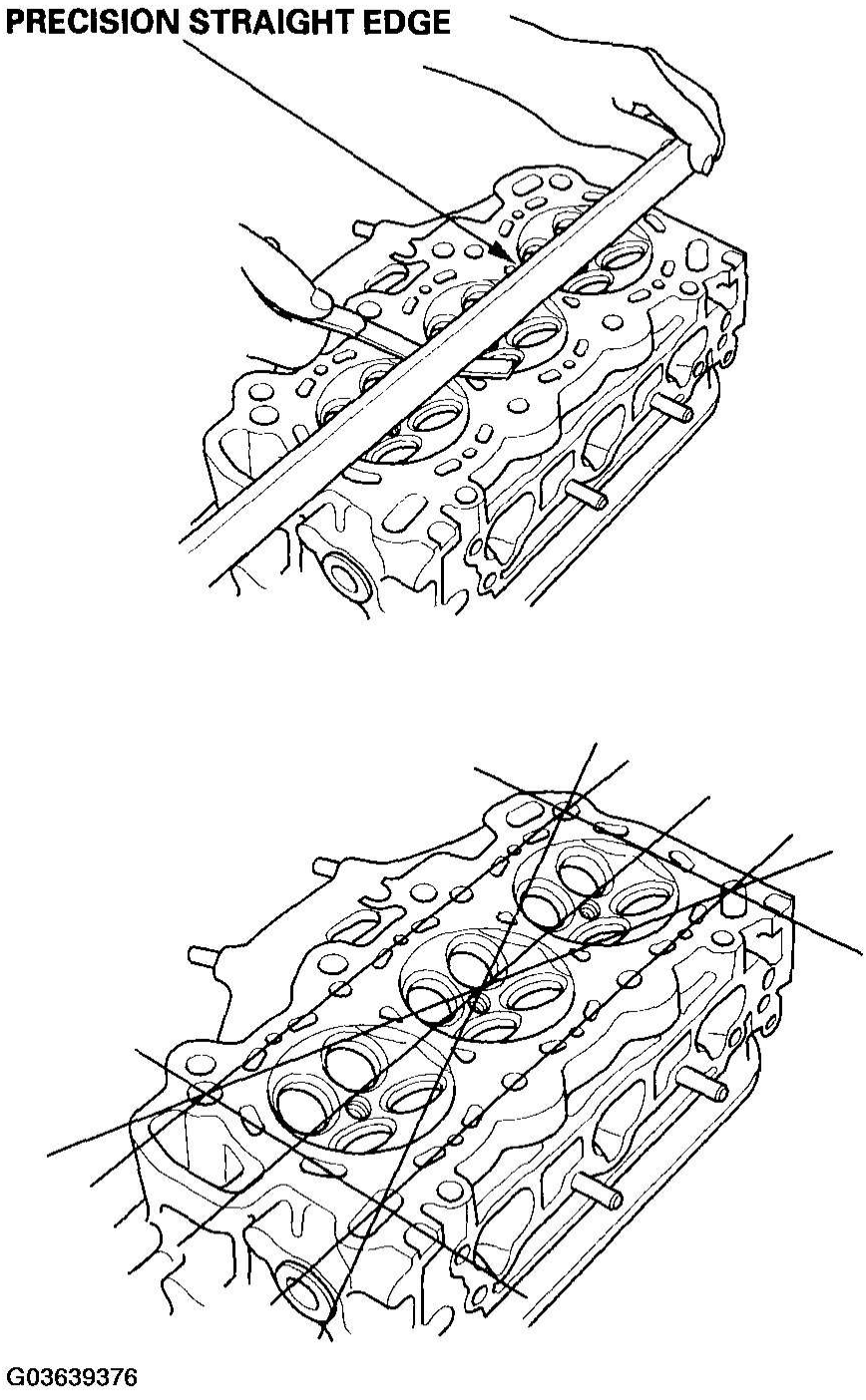

Fig. 98: Checking Cylinder Head For Warpage
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ROCKER ARM ASSEMBLY REMOVAL

1. Remove the cylinder head cover (see **CYLINDER HEAD COVER REMOVAL**).
2. Loosen the adjusting screws (A).

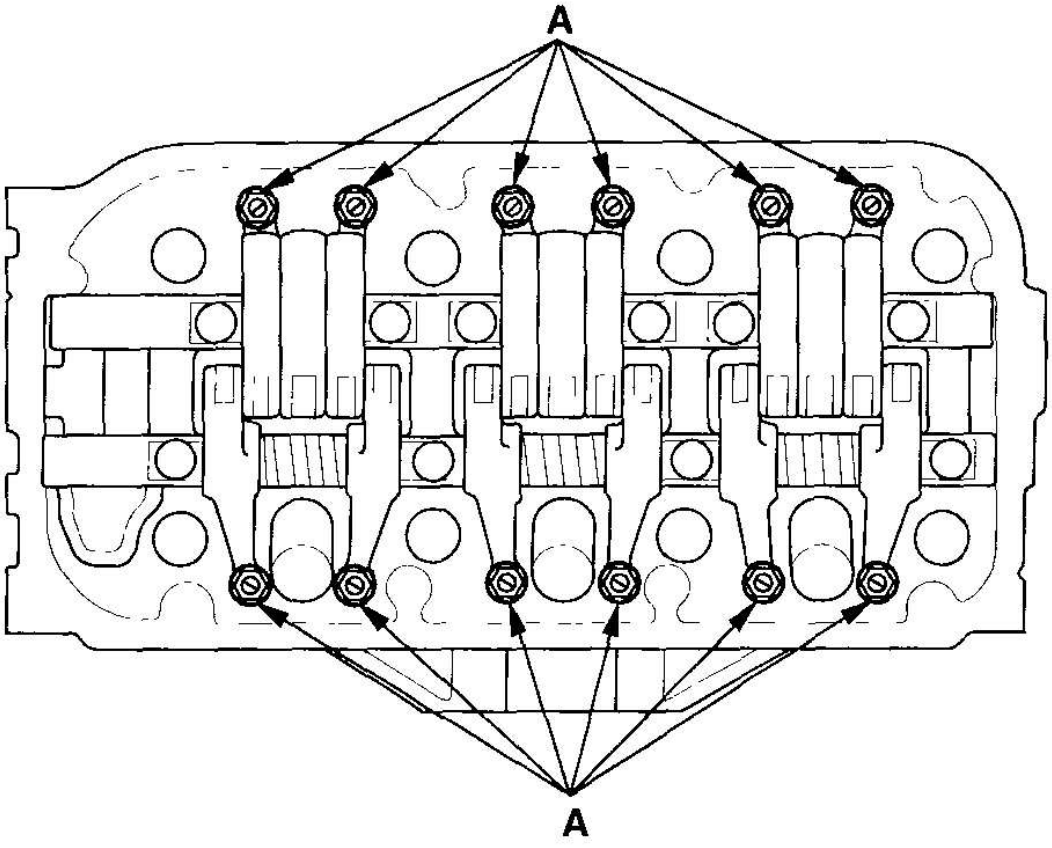

Fig. 99: Loosening Adjusting Screws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the bolts and the rocker arm assembly.

   -1 Unscrew the rocker shaft mounting bolts at two turns at a time, to prevent damaging the valves or rocker arm assembly.

   -2 When removing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and the rocker arms on the shafts.

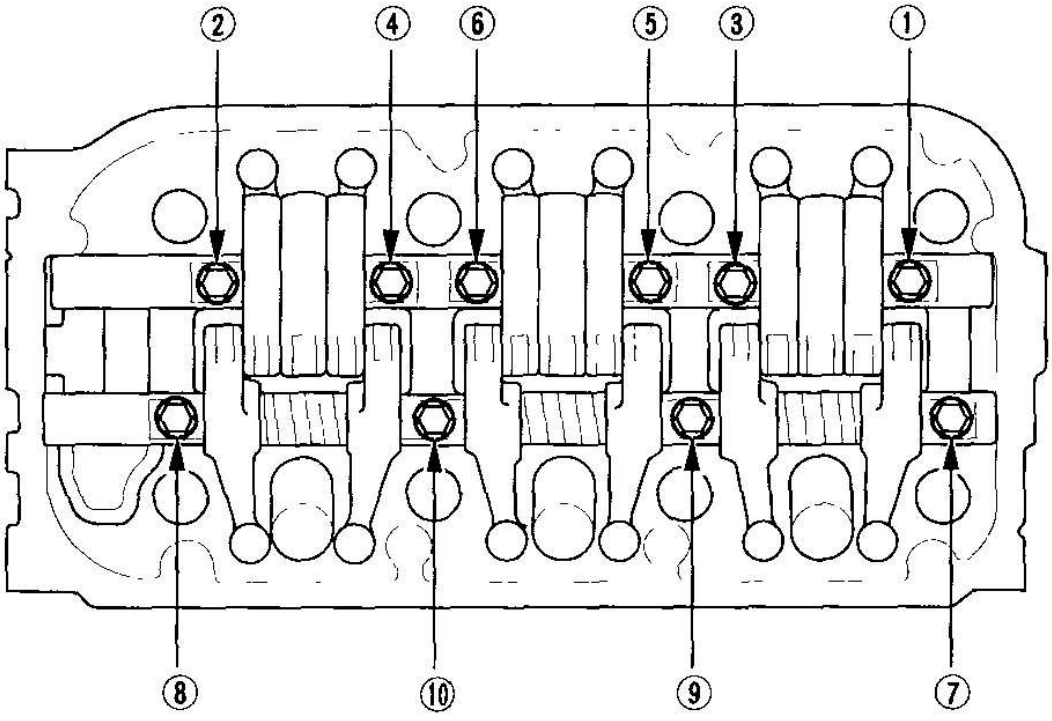

Fig. 100: Removing Rocker Arm Assembly In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ROCKER ARM AND SHAFT DISASSEMBLY/REASSEMBLY

NOTE:

- **Identify parts as they are removed so they can be reinstalled in their original locations.**
- **Inspect the rocker shafts and rocker arms (see ROCKER ARM AND SHAFT INSPECTION).**
- **Rocker arms must be installed in the same positions if reused.**
- **When removing or installing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and rocker arms on the shaft.**
- **Bundle the intake rocker arms with rubber bands to keep them together as a set.**
- **Prior to reassembling, clean all the parts in solvent, dry them and apply new engine oil to any contact points.**
- **When replacing the intake rocker arm assembly, remove the fastening**

hardware from the new intake rocker arm assembly.

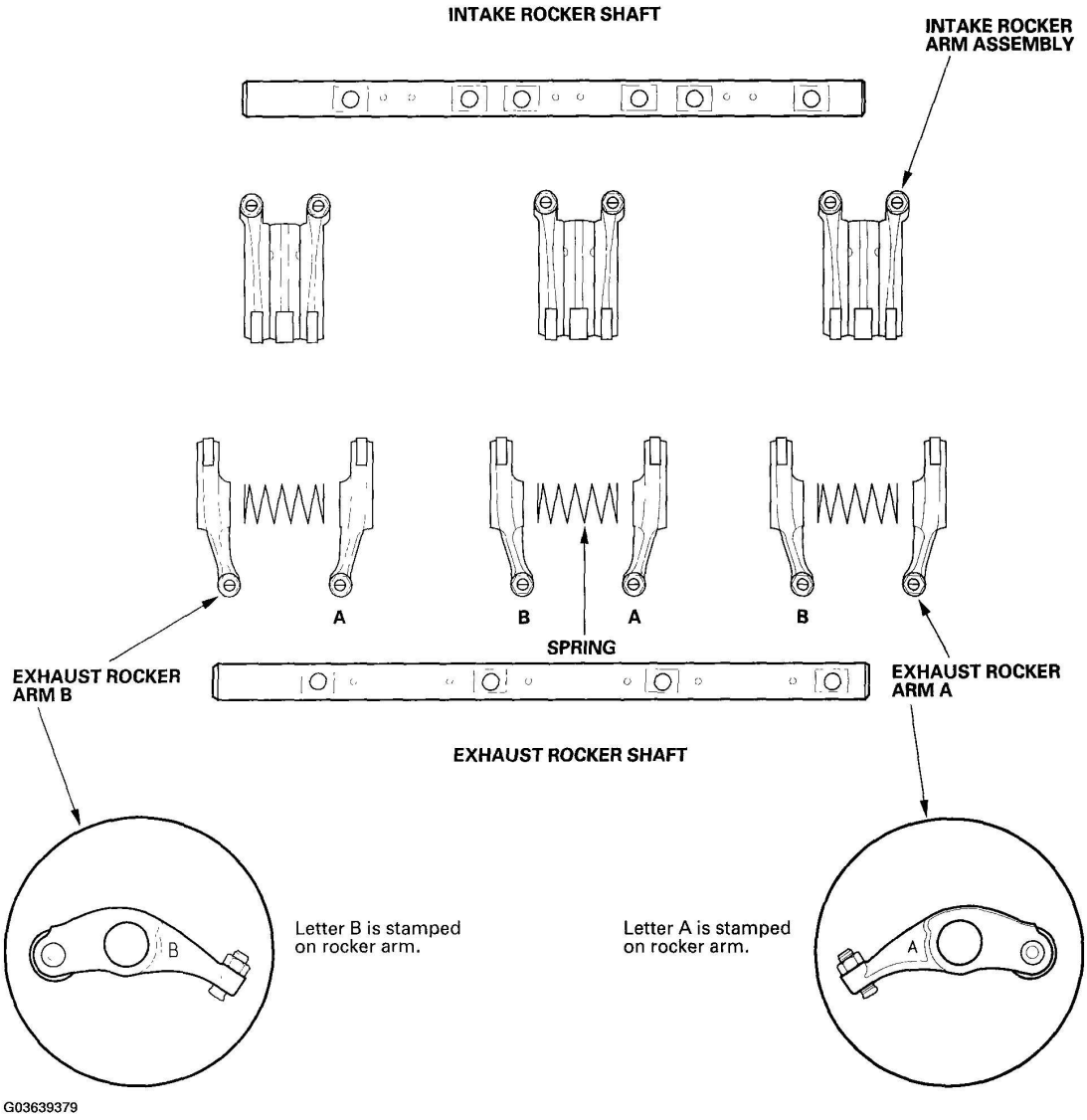

Fig. 101: Disassembly/Reassembly Of Rocker Arm And Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ROCKER ARM AND SHAFT INSPECTION

1. Remove the rocker arm assembly (see **ROCKER ARM ASSEMBLY REMOVAL**).
2. Disassemble the rocker arm assembly (see **ROCKER ARM AND SHAFT DISASSEMBLY/REASSEMBLY**).
3. Measure the diameter of the shaft at the first rocker location.

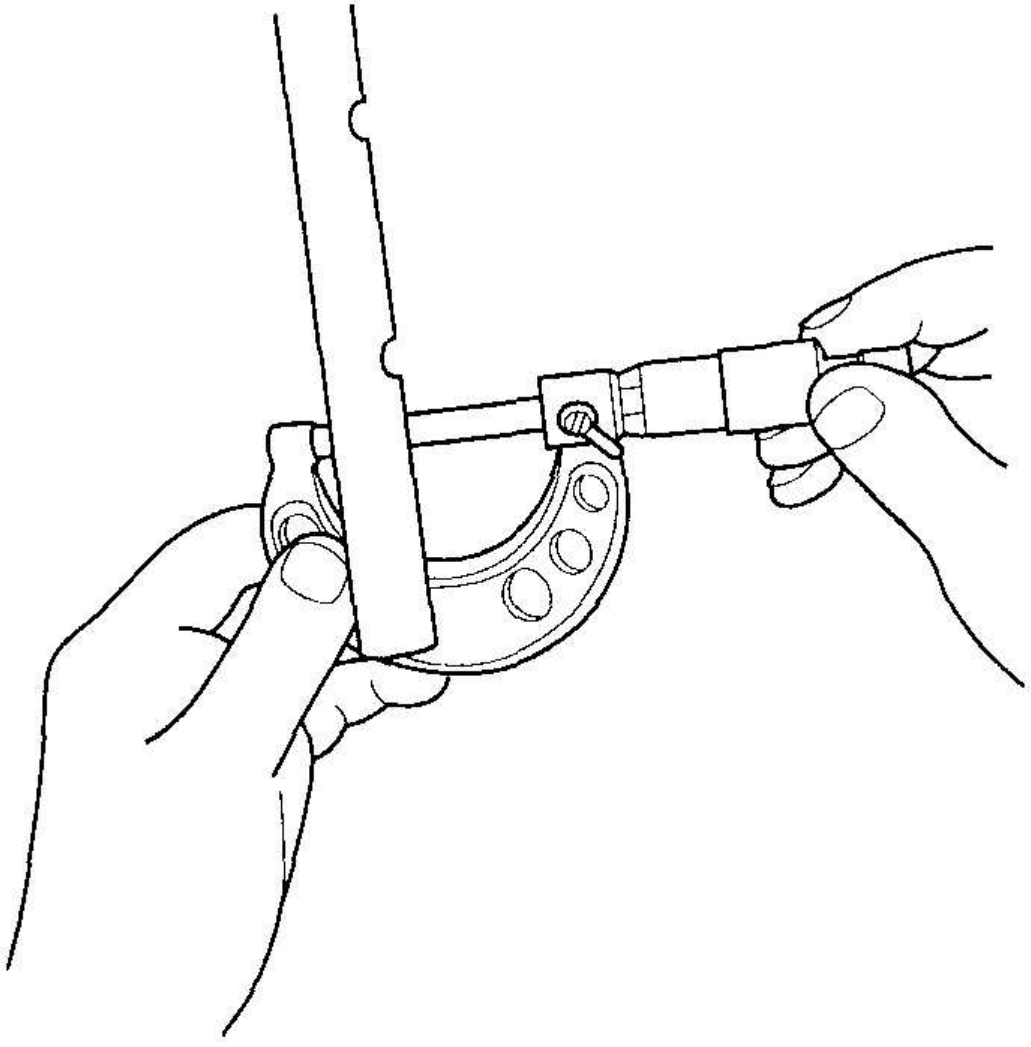

Fig. 102: Measuring Diameter Of Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Zero the gauge (A) to the shaft diameter.

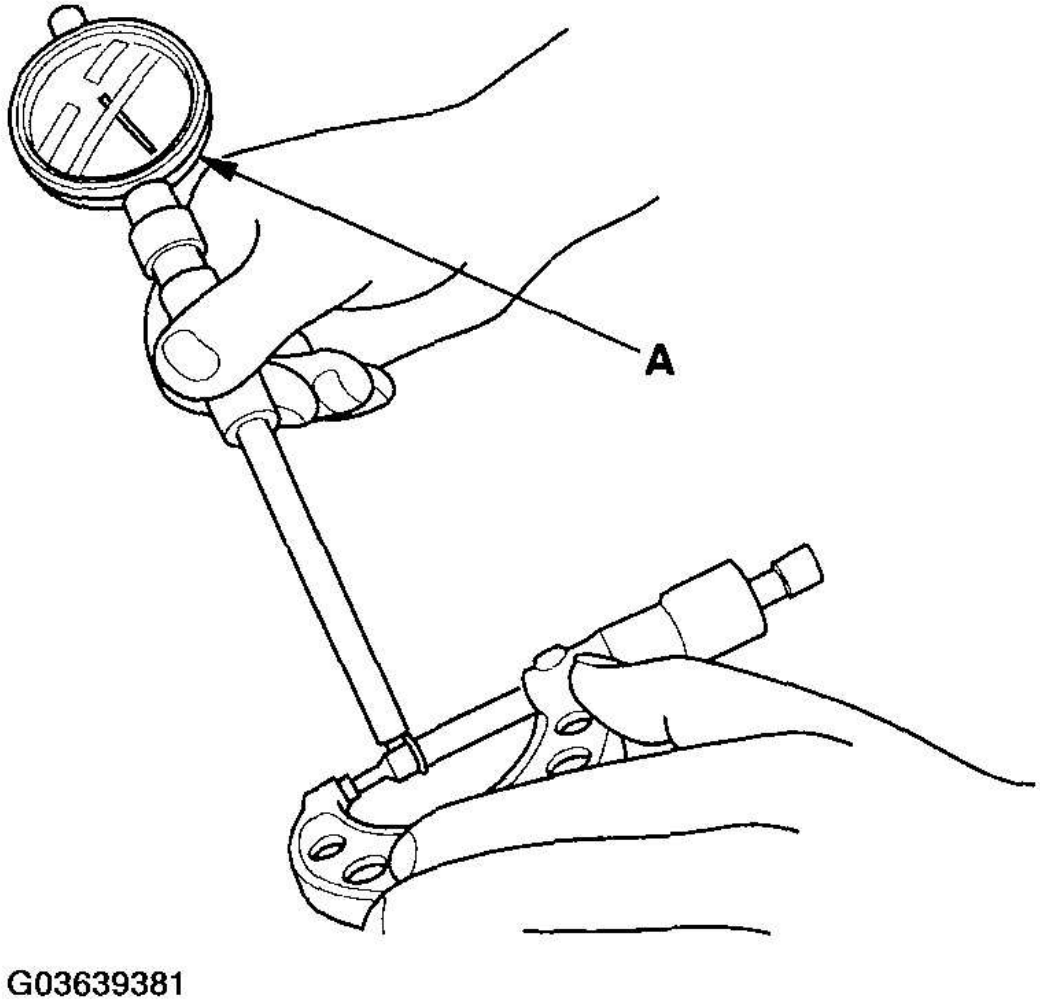

Fig. 103: Zeroing Gauge To Shaft Diameter
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

Intake Rocker Arm-to-Shaft Clearance

Standard (New): 0.026-0.067 mm (0.0010-0.0026 in.)
Service Limit: 0.067 mm (0.0026 in.)

Exhaust Rocker Arm-to-Shaft Clearance

Standard (New): 0.026-0.077 mm (0.0010-0.0030 in.)

Service Limit: 0.077 mm (0.0030 in.)

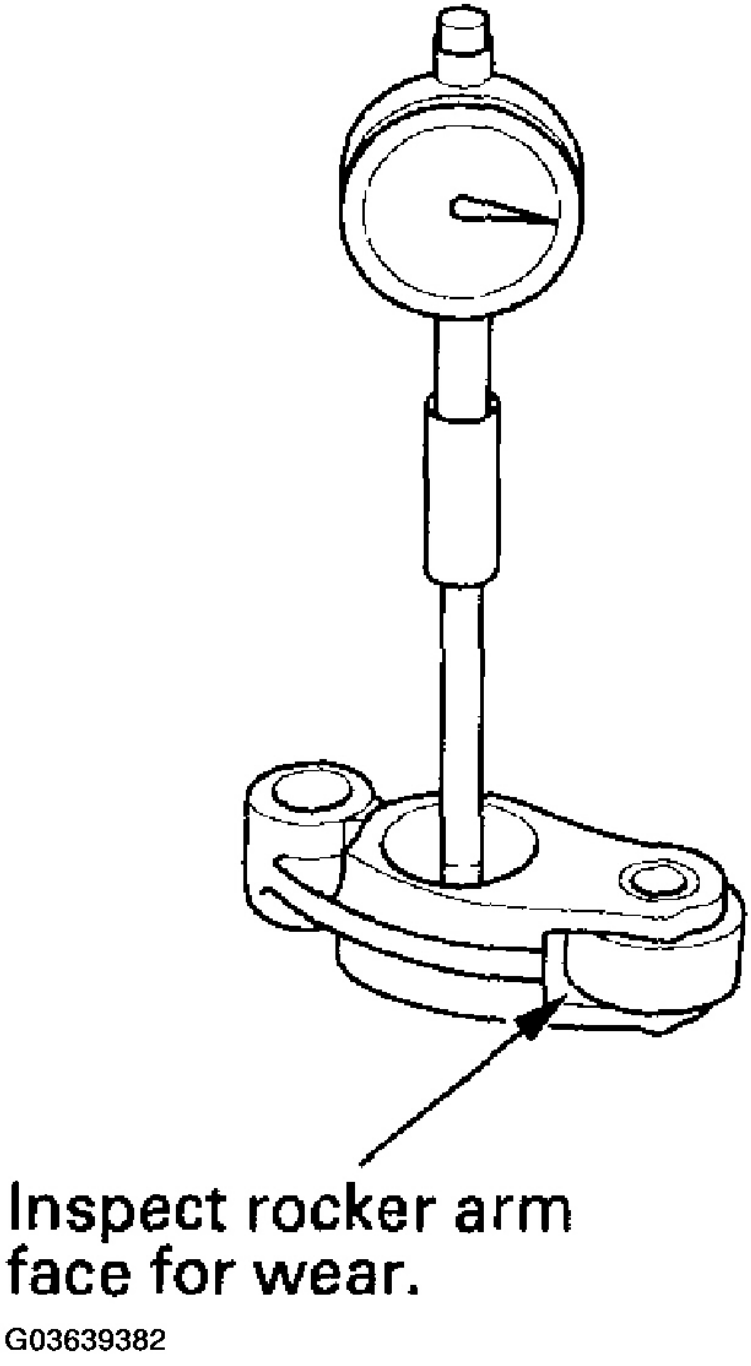

Fig. 104: Inspecting Diameter Of Rocker Arm
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Repeat for all rockers and both shafts. If the clearance is over the limit, replace the rocker shaft and all over-tolerance rocker arms. If any intake rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

VTEC Rocker Arms

7. Inspect the rocker arm synchronizing pistons (A). Slide them into the rocker arms, if they do not move smoothly, replace the rocker arm set.

NOTE:

- **Apply new engine oil to the pistons when reassembling.**
- **When reassembling the primary rocker arm (B), carefully apply air pressure to the oil passage of the rocker arm.**

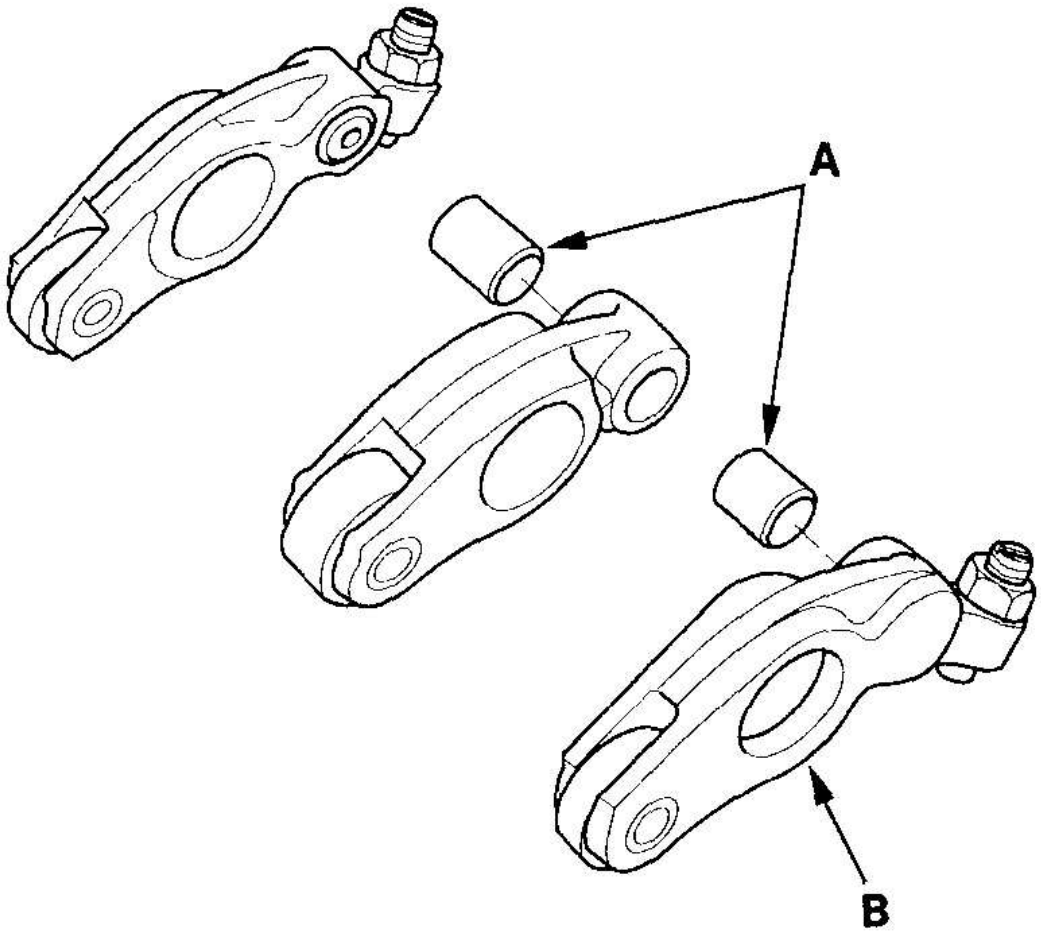

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Fig. 105: Inspecting Rocker Arm Synchronizing Pistons
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Reassemble the rocker arm assembly (see **ROCKER ARM AND SHAFT DISASSEMBLY/REASSEMBLY**).

CAMSHAFT INSPECTION

1. Remove the cylinder head (see **CYLINDER HEAD REMOVAL**).
2. Remove the rocker arms (see **ROCKER ARM ASSEMBLY REMOVAL**).
3. Put the rocker shafts on the cylinder head, then tighten the bolts to the specified torque.

NOTE: Apply new engine oil to the threads and flange of the exhaust rocker shaft mounting bolts.

Specified Torque

8 x 1.25 mm: 24 N.m (2.4 kgf.m, 17 lbf.ft)

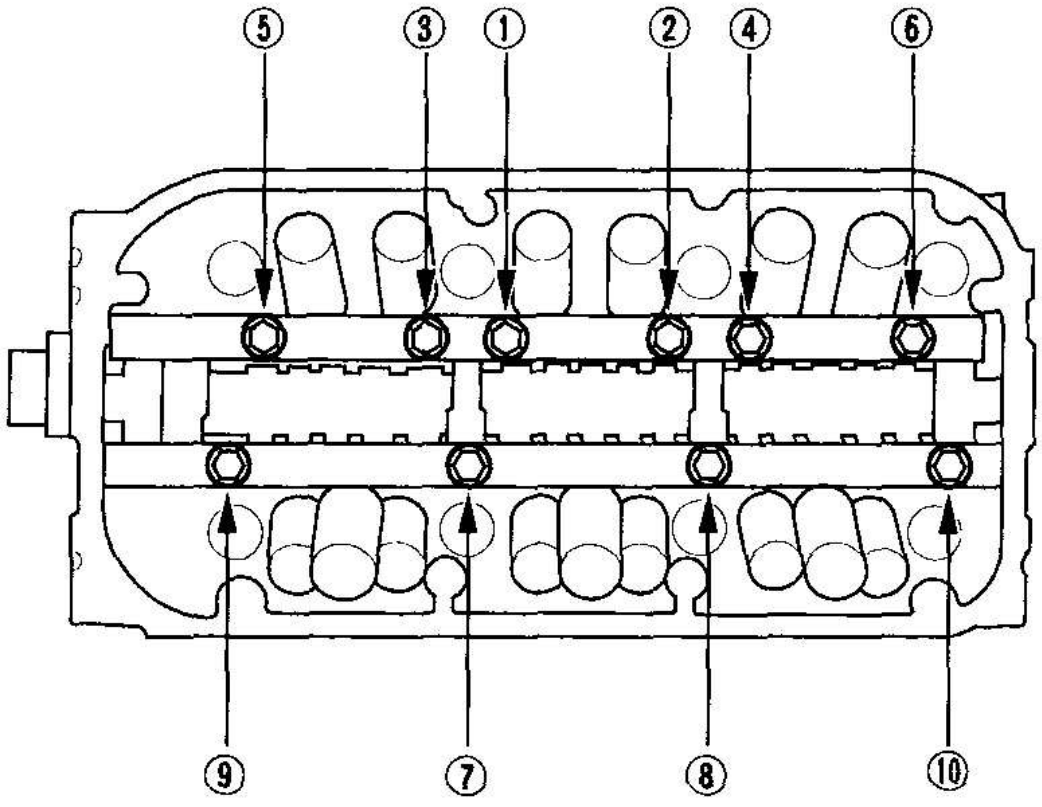

Fig. 106: Tightening Cylinder Head Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Seat the camshaft by pushing it toward the rear of the cylinder head.
5. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth and read the end play. If the end play is beyond the service limit, replace the thrust cover and recheck. If it is still beyond the service limit, replace the camshaft.

Camshaft End Play

Standard (New): 0.05-0.20 mm (0.002-0.008 in.)
Service Limit: 0.20 mm (0.008 in.)

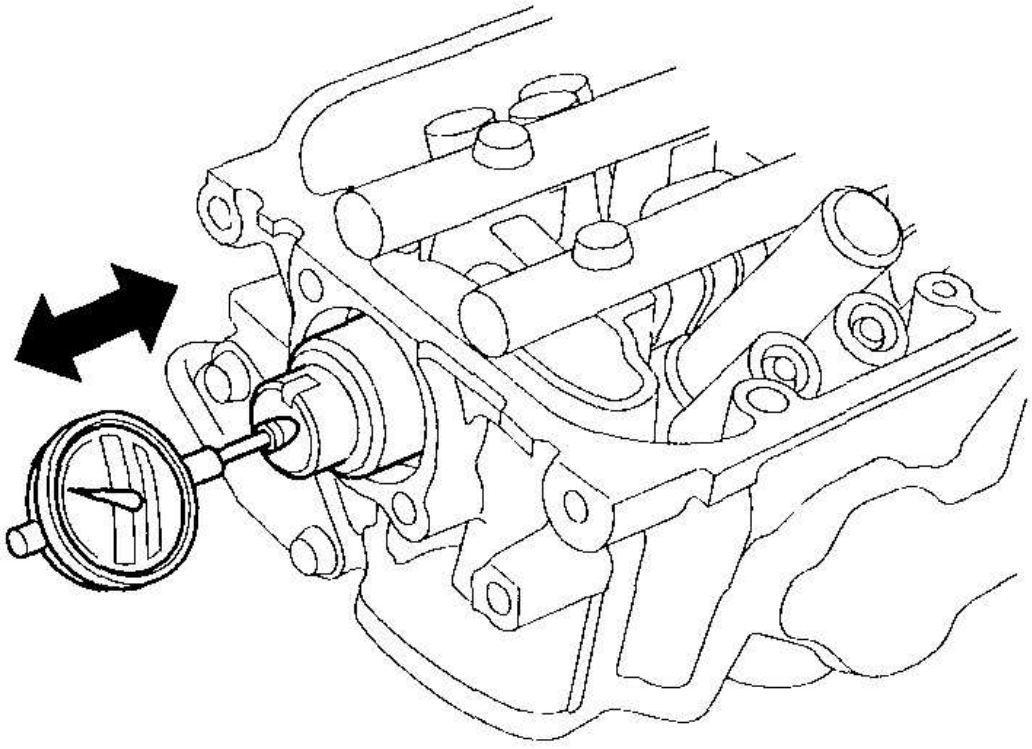

Fig. 107: Zeroing Dial Indicator Against End Of Camshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the camshaft thrust cover (A), then pull out the camshaft (B).

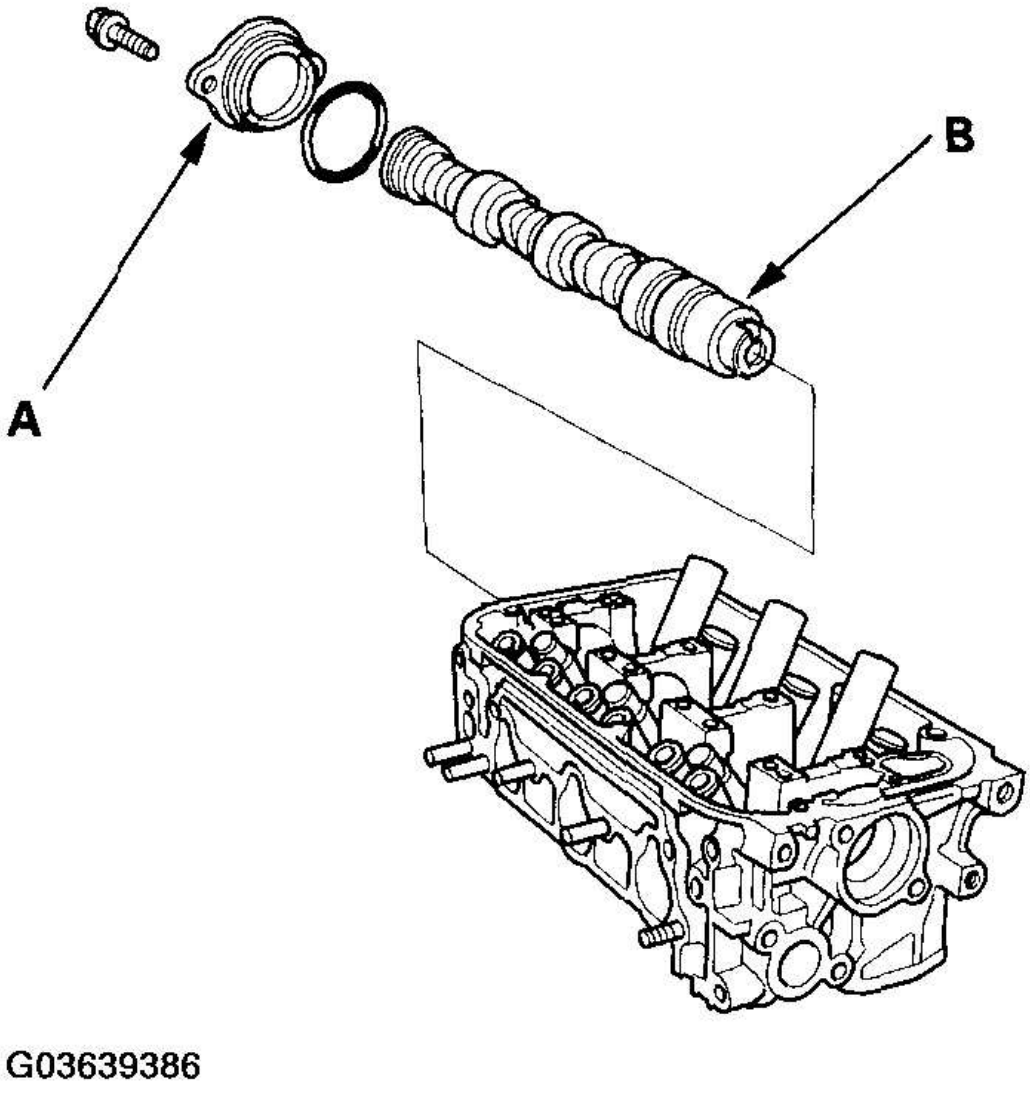

Fig. 108: Removing Camshaft Thrust Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Wipe the camshaft clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
8. Measure the diameter of each camshaft journal.

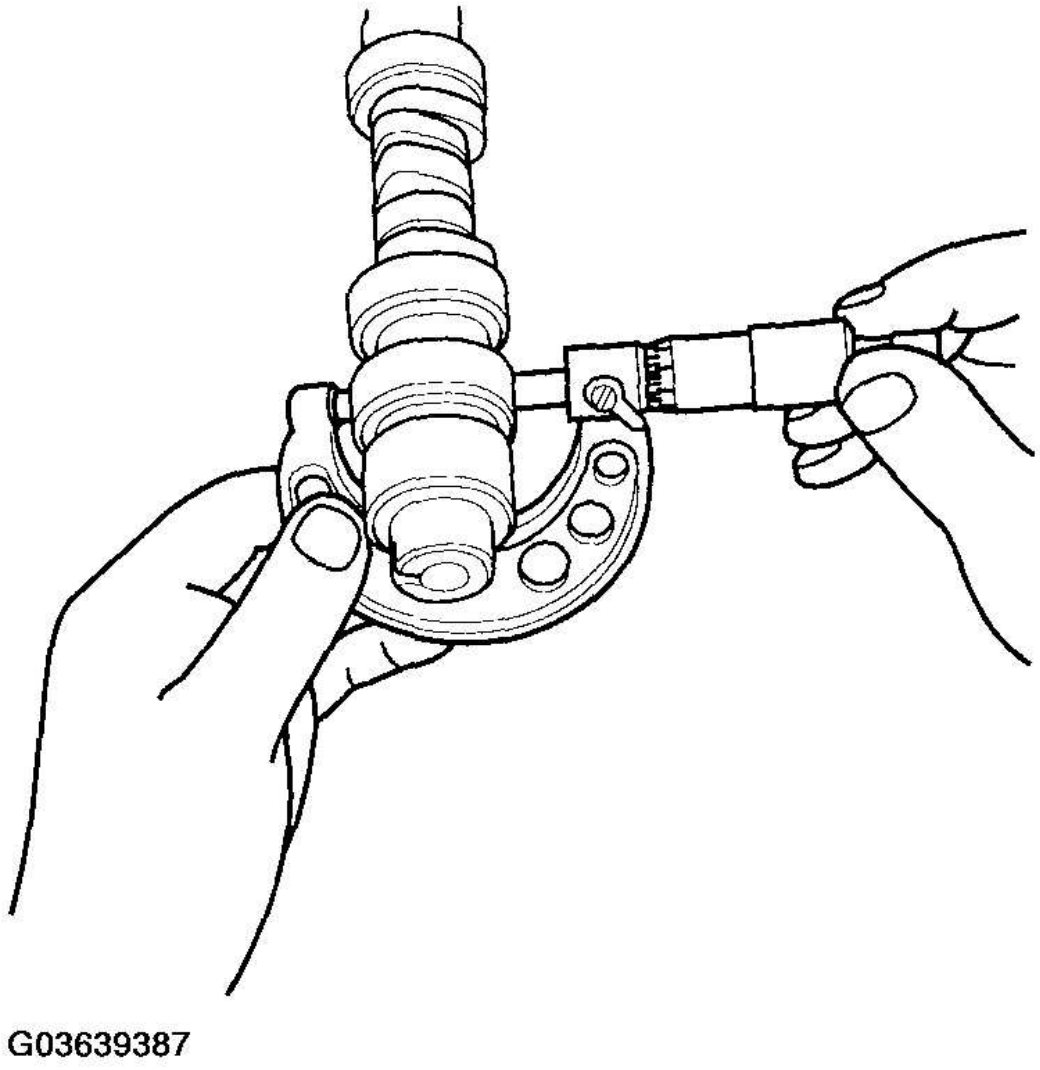

Fig. 109: Measuring Diameter Of Each Camshaft Journal
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Zero the gauge to the journal diameter.

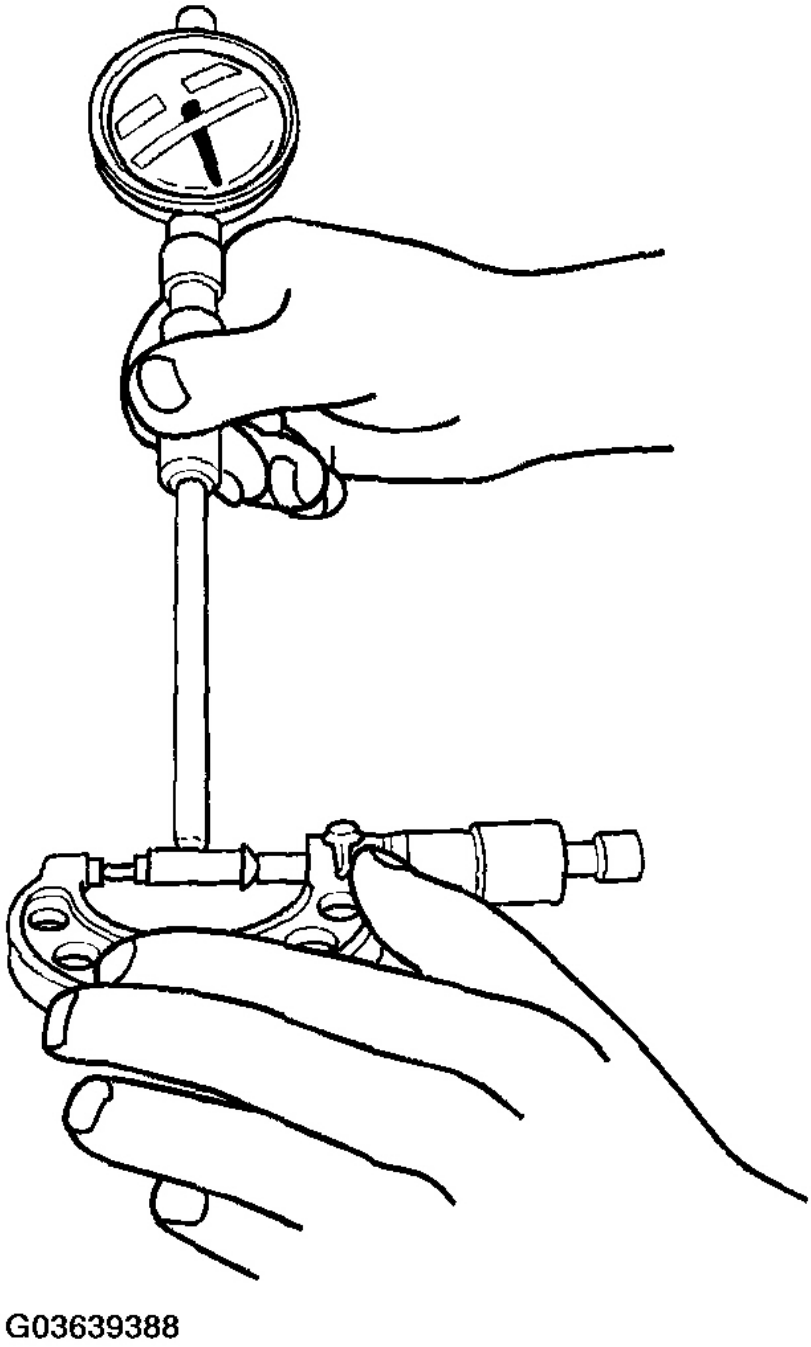

Fig. 110: Zeroing Gauge To Journal Diameter
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Clean the camshaft bearing surfaces in the cylinder head. Measure the inside diameter of each camshaft

bearing surface, and check for an out-of-round condition.

- If the camshaft-to-holder clearance is within limits, go to step 12 .
- If the camshaft-to-holder clearance is beyond the service limit and the camshaft has been replaced, replace the cylinder head.
- If the camshaft-to-holder clearance is beyond the service limit and the camshaft has not been replaced, go to step 11.

Camshaft-to-Holder Oil Clearance

Standard (New): 0.050-0.089 mm (0.0020-0.0035 in.)
Service Limit: 0.15 mm (0.006 in.)

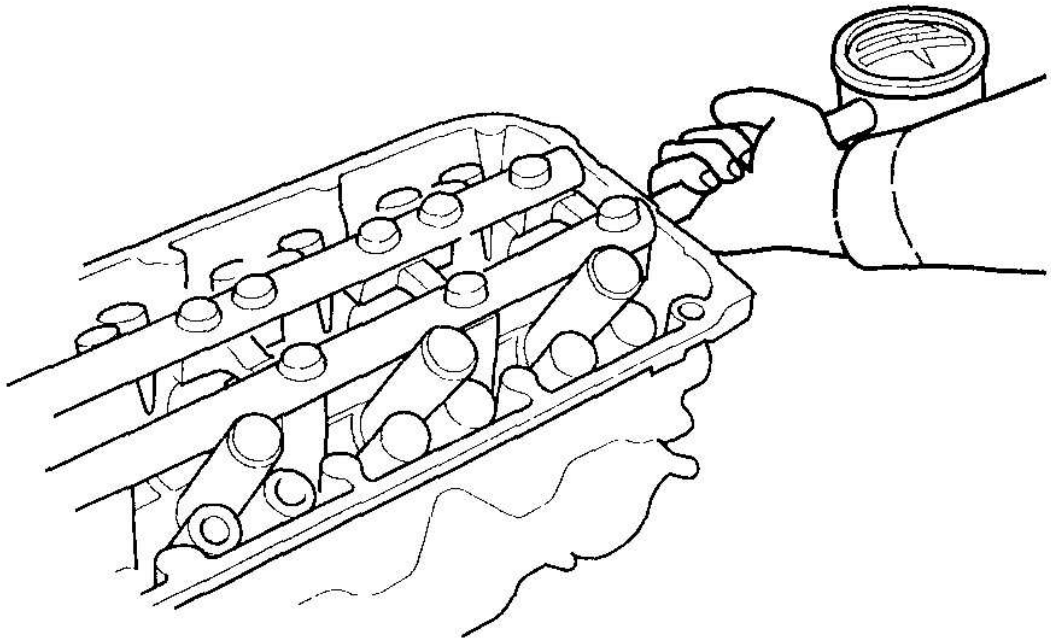

Fig. 111: Measuring Diameter Of Each Camshaft Bearing Surface
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Check total runout with the camshaft supported on V-blocks.
    - If the total runout of the camshaft is within the service limit, replace the cylinder head.
    - If the total runout is beyond the service limit, replace the camshaft and recheck the oil clearance. If the oil clearance is still out of tolerance, replace the cylinder head.

Camshaft Total Runout

Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.04 mm (0.002 in.)

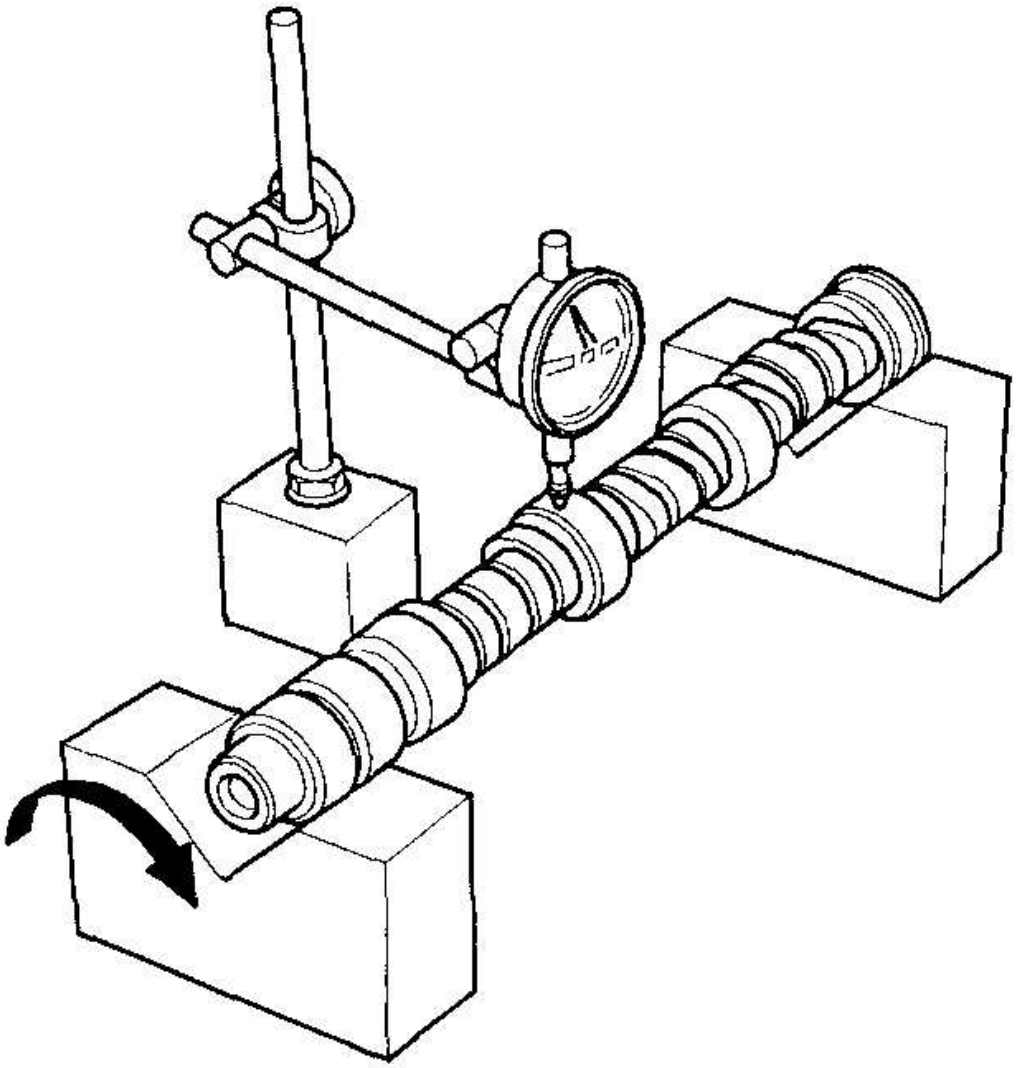

Fig. 112: Checking Total Runout With Camshaft On V-Blocks
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Measure cam lobe height.

	INTAKE	EXHAUST
PRI	35.041 mm (1.3796 in.)	36.326 mm (1.4302 in.)
MID	36.445 mm (1.4348 in.)	
SEC	35.284 mm (1.3891 in.)	

PRI: Primary MID: Mid SEC: Secondary
IN: Intake EX: Exhaust T/B: Timing belt

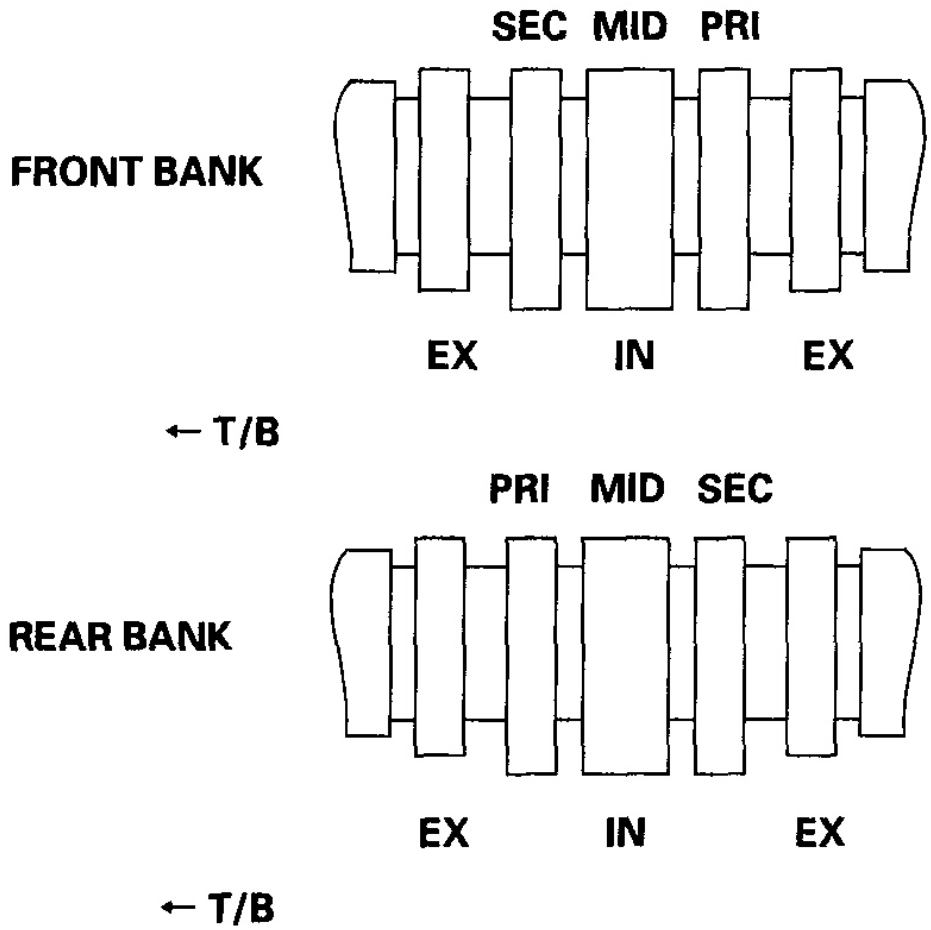

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Fig. 113: Cam Lobe Height Standard (New) Chart
Courtesy of AMERICAN HONDA MOTOR CO., INC.

VALVE, SPRING, AND VALVE SEAL REMOVAL

Special Tools Required

Valve spring compressor attachment 07757-PJ1010A

Identify the valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Remove the cylinder head (see **CYLINDER HEAD REMOVAL**).
2. Using an appropriate-sized socket (A) and plastic mallet (B), lightly tap the valve retainer to loosen the valve cotters.

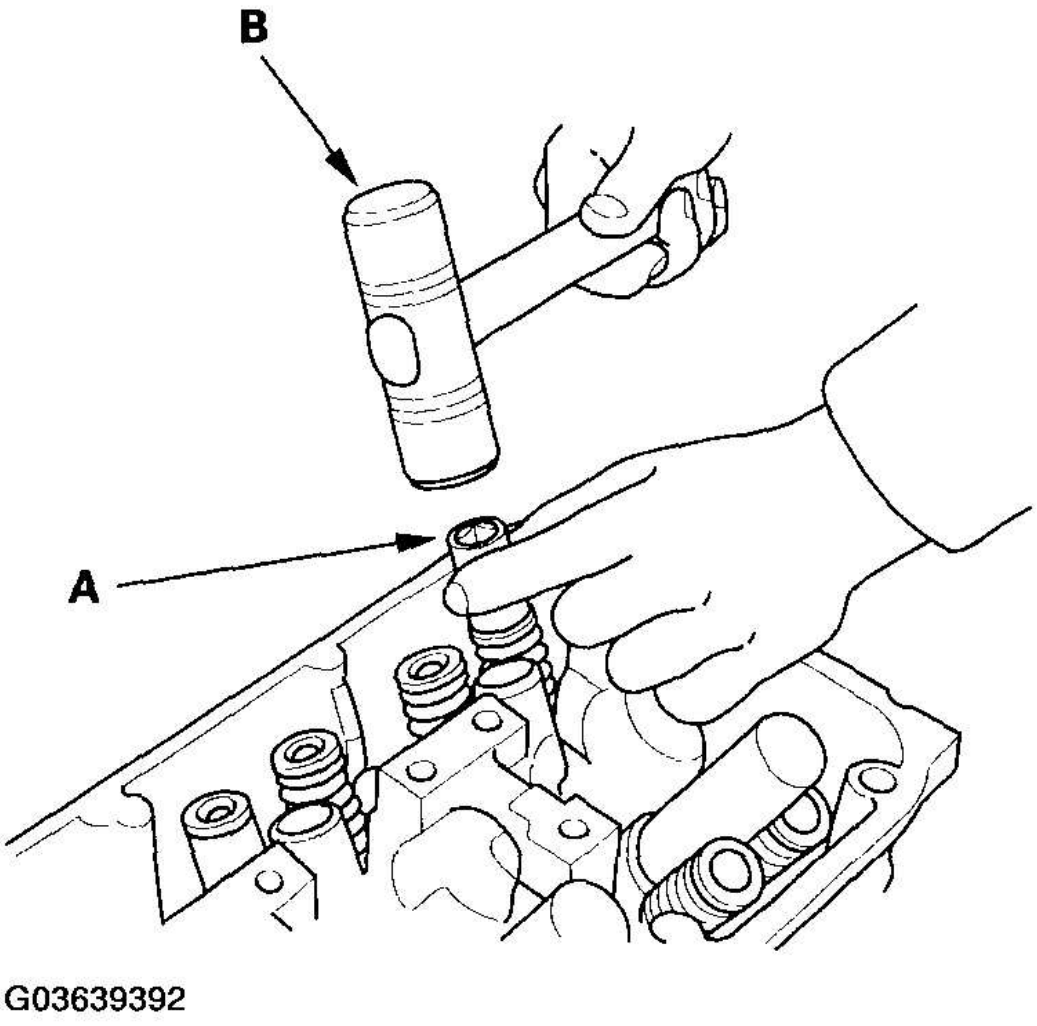

Fig. 114: Tapping Valve Retainer To Loosening Valve Cotters
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the valve spring compressor. Compress the spring and remove the valve cotters.

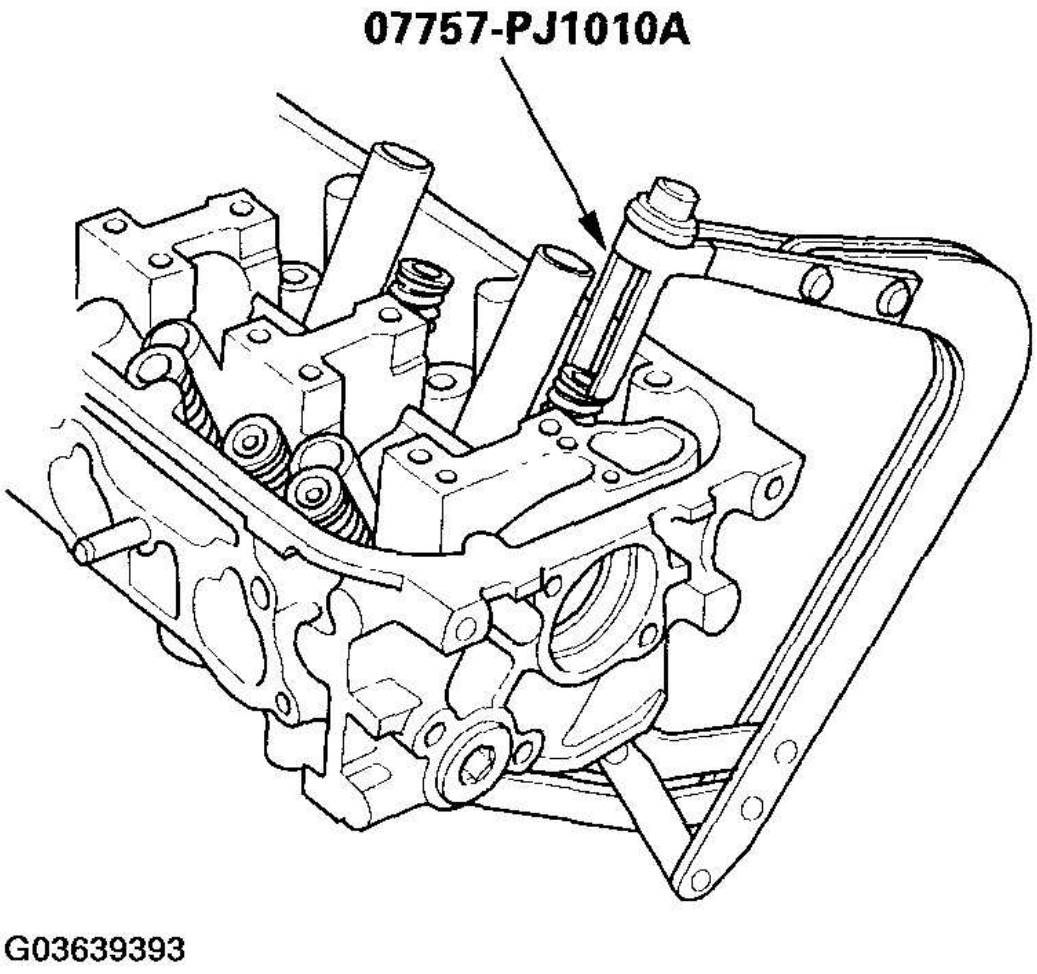

Fig. 115: Installing Valve Spring Compressor
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the valve spring compressor, then remove the valve retainer and valve spring.
5. Install the valve guide seal remover (A).

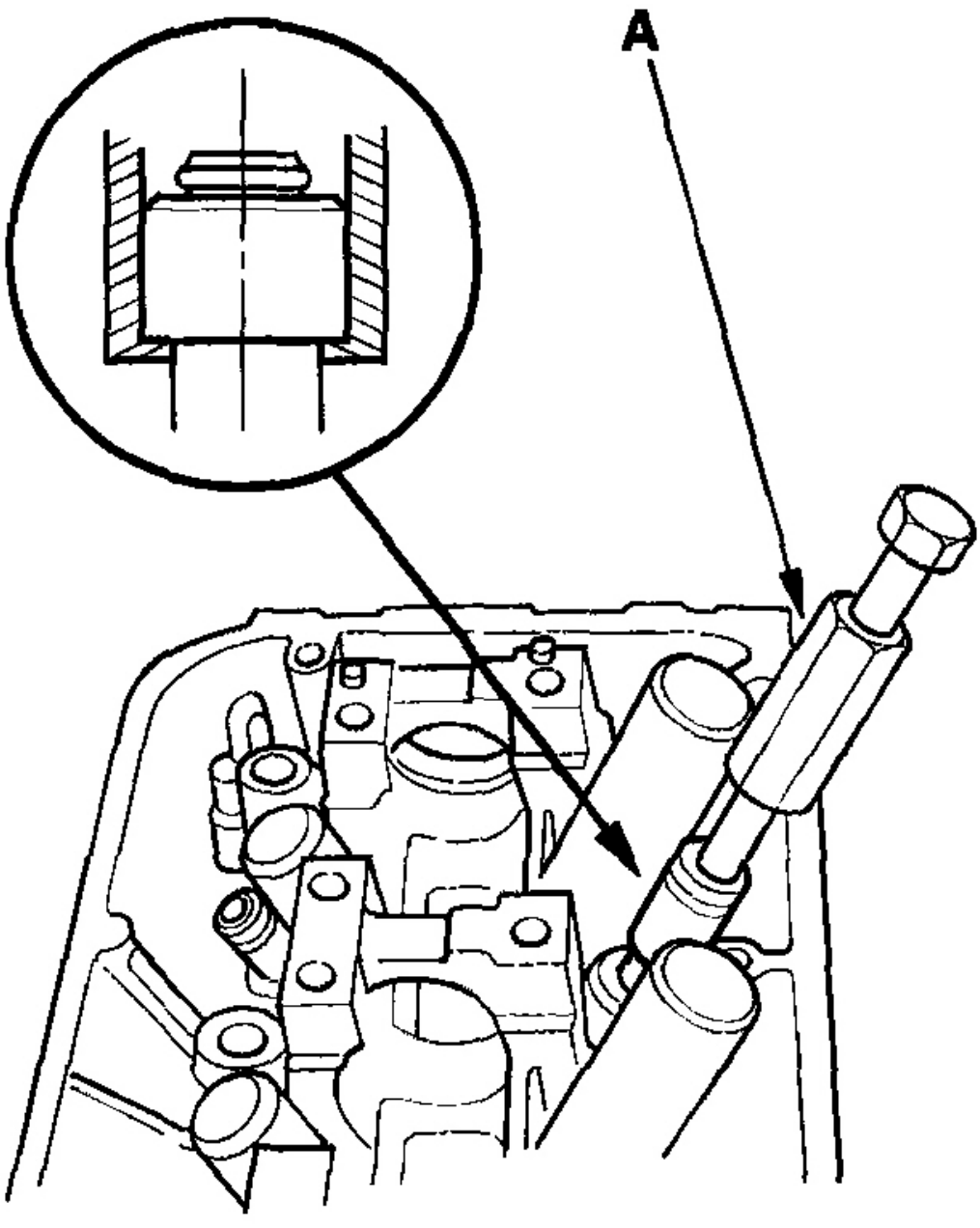

Fig. 116: Installing Valve Guide Seal Remover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the valve seal.

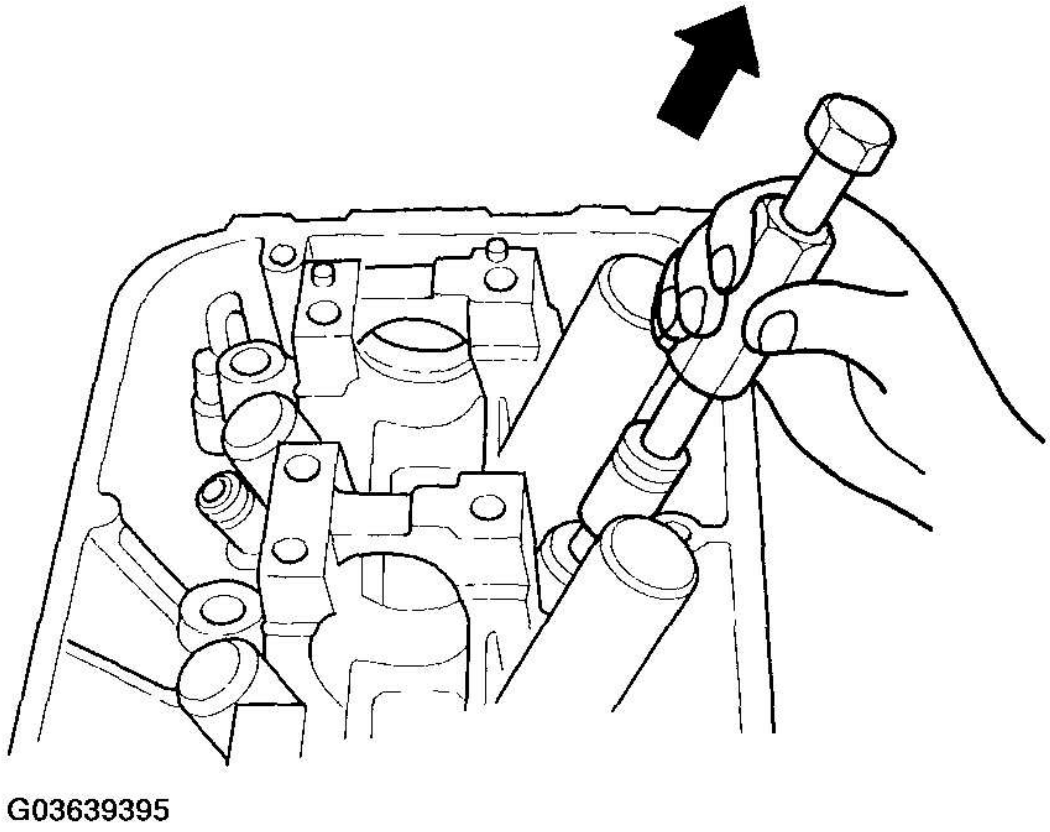

Fig. 117: Removing Valve Seal
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the valve spring seat, valve guide, and valve.

VALVE INSPECTION

1. Remove the valves (see **VALVE, SPRING, AND VALVE SEAL REMOVAL**).
2. Measure the valve in these areas.

Intake Valve Dimensions

A Standard (New): 34.90-35.10 mm (1.374-1.382 in.)
B Standard (New): 115.70-116.30 mm (4.555-4.579 in.)
C Standard (New): 5.485-5.495 mm (0.2159-0.2163 in.)

C Service Limit: 5.455 mm (0.2148 in.)

Exhaust Valve Dimensions

A Standard (New): 29.90-30.10 mm (1.177-1.185 in.)
B Standard (New): 113.90-114.50 mm (4.484-4.508 in.)
C Standard (New): 5.450-5.460 mm (0.2146-0.2150 in.)
C Service Limit: 5.420 mm (0.2134 in.)

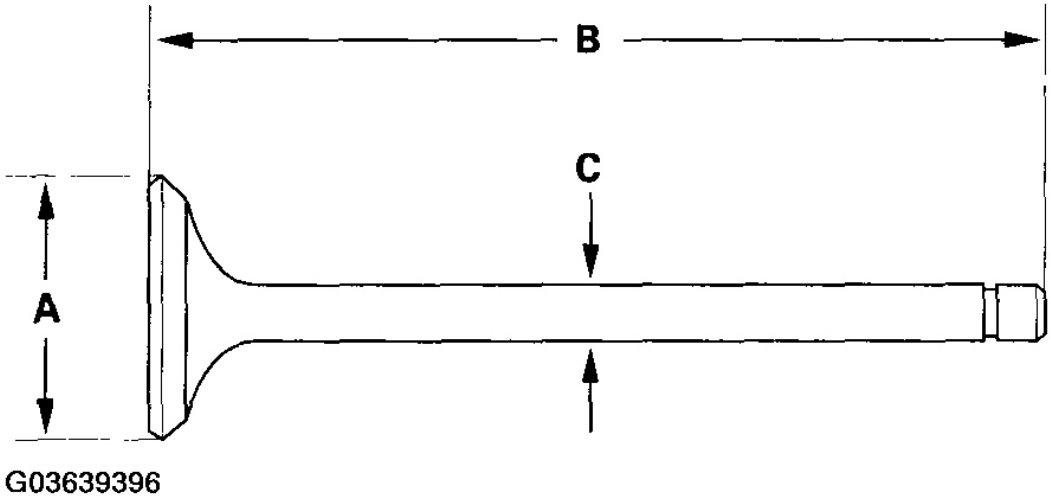

Fig. 118: Measuring Valve Dimension
Courtesy of AMERICAN HONDA MOTOR CO., INC.

VALVE STEM-TO-GUIDE CLEARANCE INSPECTION

1. Remove the valves (see **VALVE, SPRING, AND VALVE SEAL REMOVAL**).
2. Slide the valve out of its guide about 10 mm (0.39 in.), then measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).
   - If the measurement exceeds the service limit, recheck it using a new valve.
   - If the measurement is now within the service limit, reassemble using a new valve.
   - If the measurement with a new valve still exceeds the service limit, go to step 3.

Intake Valve Stem-to-Guide Clearance

Standard (New): 0.04-0.09 mm (0.002-0.004 in.)
Service Limit: 0.16 mm (0.006 in.)

Exhaust Valve Stem-to-Guide Clearance

Standard (New): 0.11-0.16 mm (0.004-0.006 in.)
Service Limit: 0.22 mm (0.009 in.)

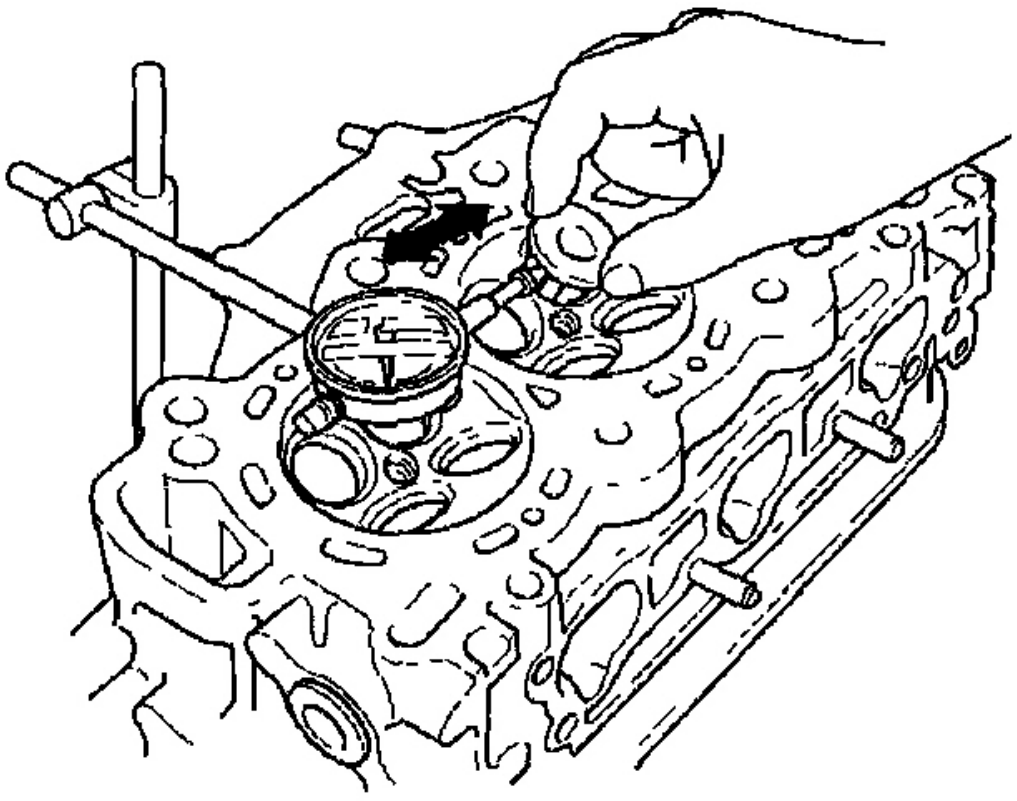

Fig. 119: Measuring Guide-To-Stem Clearance With Dial Indicator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance

Standard (New): 0.020-0.045 mm (0.0008-0.0018 in.)

Service Limit: 0.08 mm (0.003 in.)

Exhaust Valve Stem-to-Guide Clearance

Standard (New): 0.055-0.080 mm (0.0022-0.0031 in.)
Service Limit: 0.11 mm (0.004 in.)

VALVE GUIDE REPLACEMENT

Special Tools Required

- Valve guide driver, 5.5 mm 07742-0010100
- Valve guide reamer, 5.5 mm 07HAH-PJ7A100

1. Inspect valve stem-to-guide clearance (see **VALVE STEM-TO-GUIDE CLEARANCE INSPECTION**).
2. Use a commercially available air-impact valve guide driver (A) modified to fit the diameter of the valve guides as shown in **Fig. 120** . In most cases, the same procedure can be done using the special tool and a conventional hammer.

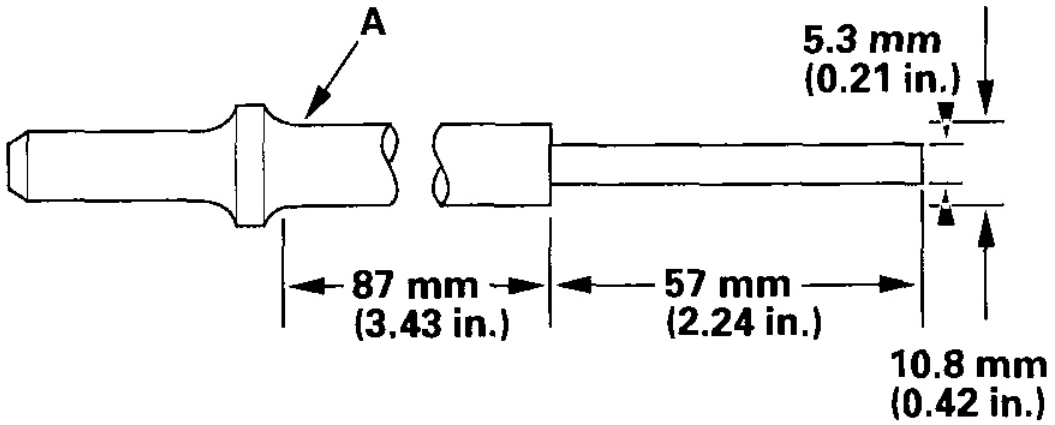

Fig. 120: Using Commercially Available Air-Impact Valve Guide Driver Modified To Fit Diameter Of Valve Guides
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Select the proper replacement guides, and chill them in the freezer section of a refrigerator for about an hour.
4. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a

cooking thermometer. Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.

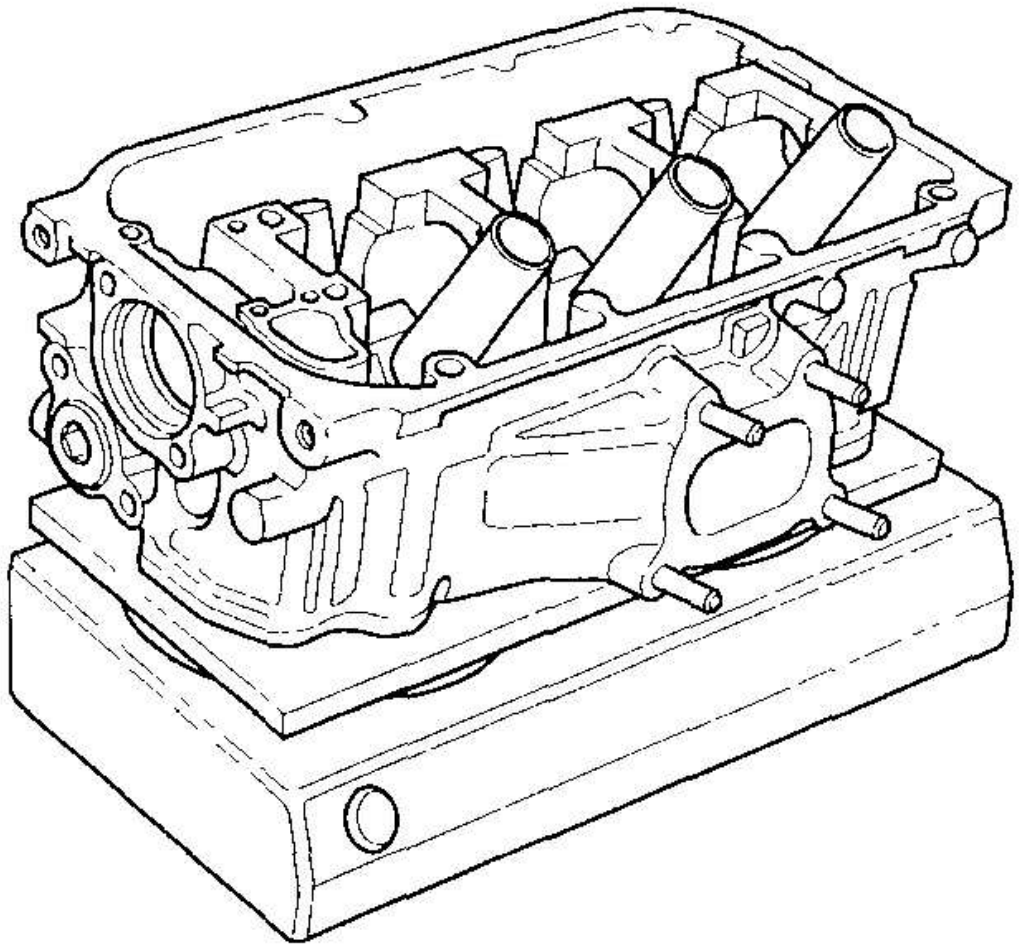

Fig. 121: Heating Cylinder Head
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in.) towards the combustion chamber. This will knock off some of the carbon and make removal easier. Hold the air hammer directly in line with the valve guide to prevent damaging the driver. Wear safety goggles or a face shield.
6. Turn the head over, and drive the guide out toward the camshaft side of the head.

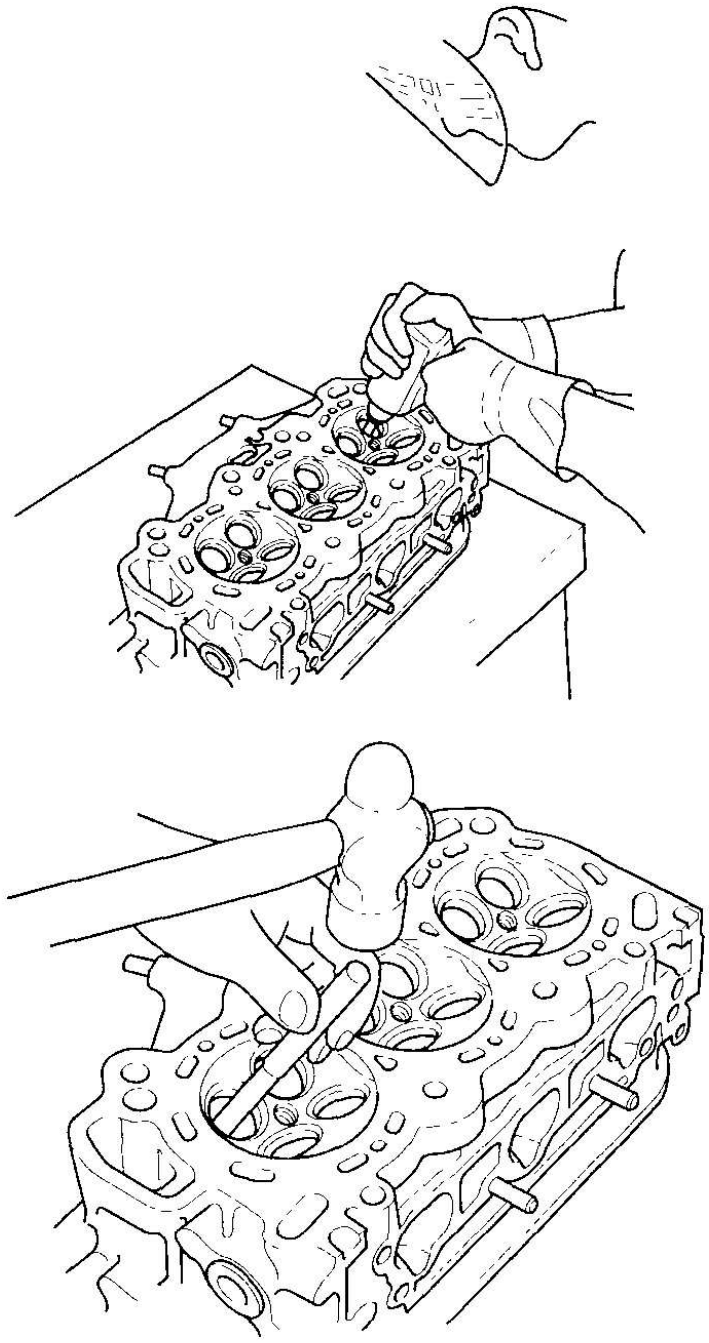

Fig. 122: Driving Guide Out Towards Camshaft Side
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. If a valve guide still won't move, drill it out with a 8 mm (5/16 in.) bit, then try again.

NOTE: Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.

8. Take out the new guide(s) from the freezer, one at a time, as you need them.
9. Apply a thin coat of new engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide to the specified installed height (A) of the guide (B). If you have all 12 guides to do, you may have to reheat the head.

Valve Guide Installed Height

Intake: 21.20-22.20 mm (0.835-0.874 in.)
Exhaust: 20.63-21.63 mm (0.812-0.852 in.)

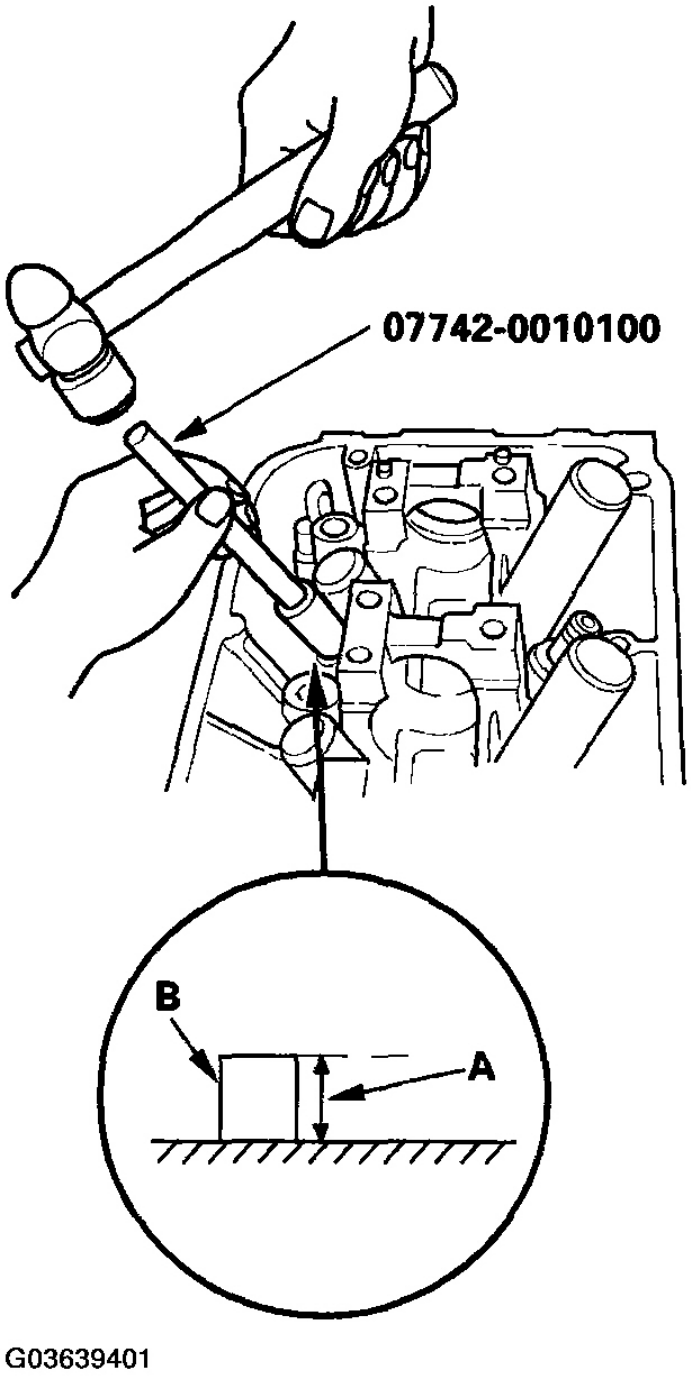

Fig. 123: Driving Guide Using Special Tool
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Coat both the reamer and the valve guide with cutting oil.

11. Rotate the reamer clockwise the full length of the valve guide bore.

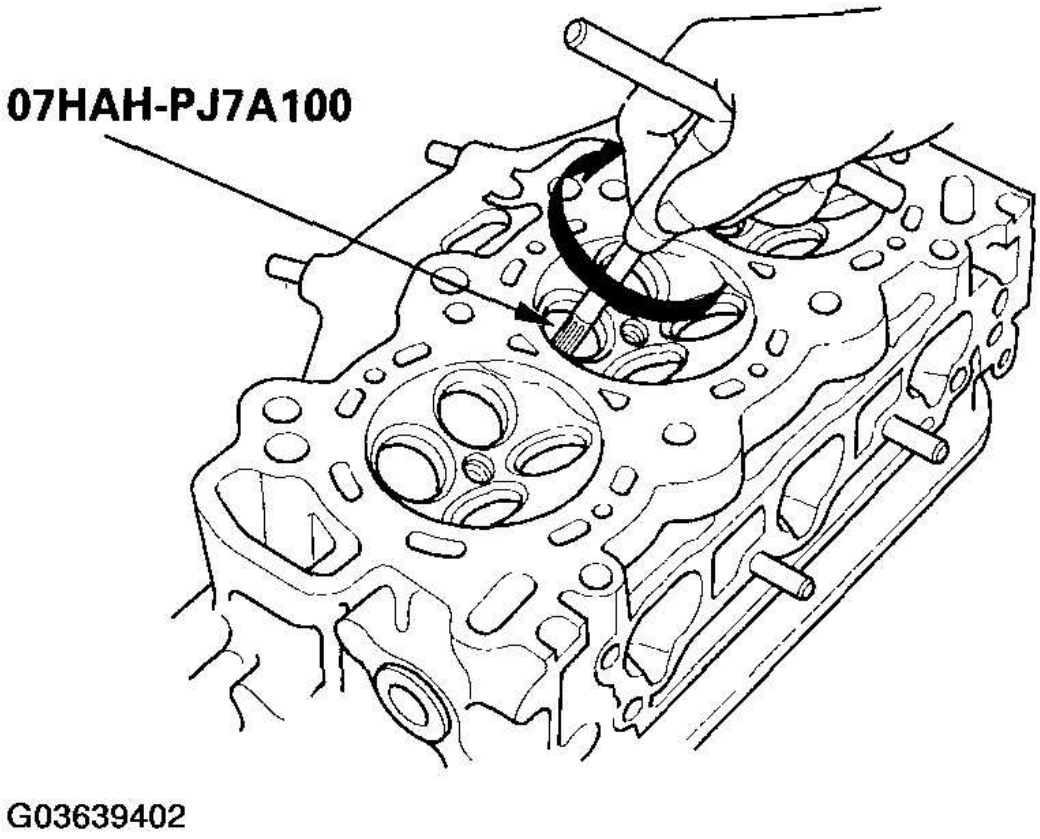

Fig. 124: Rotating Reamer Clockwise
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Continue to rotate the reamer clockwise while drawing it from the bore.
13. Thoroughly wash the guide in detergent and water to remove any cutting residue.
14. Check the clearance with a valve (see **VALVE STEM-TO-GUIDE CLEARANCE INSPECTION**). Verify that a valve slides in the intake and exhaust valve guides without resistance or getting stuck.
15. Inspect the valve spring, if necessary renew the valve seat using a valve cutter (see **VALVE SEAT RECONDITIONING**).

VALVE SEAT RECONDITIONING

1. Inspect valve stem-to-guide clearance (see **VALVE STEM-TO-GUIDE CLEARANCE INSPECTION**). If the valve guides are worn, replace them (see **VALVE GUIDE REPLACEMENT**) before cutting the valve seats.

2. Renew the valve seats in the cylinder head using a valve seat cutter.

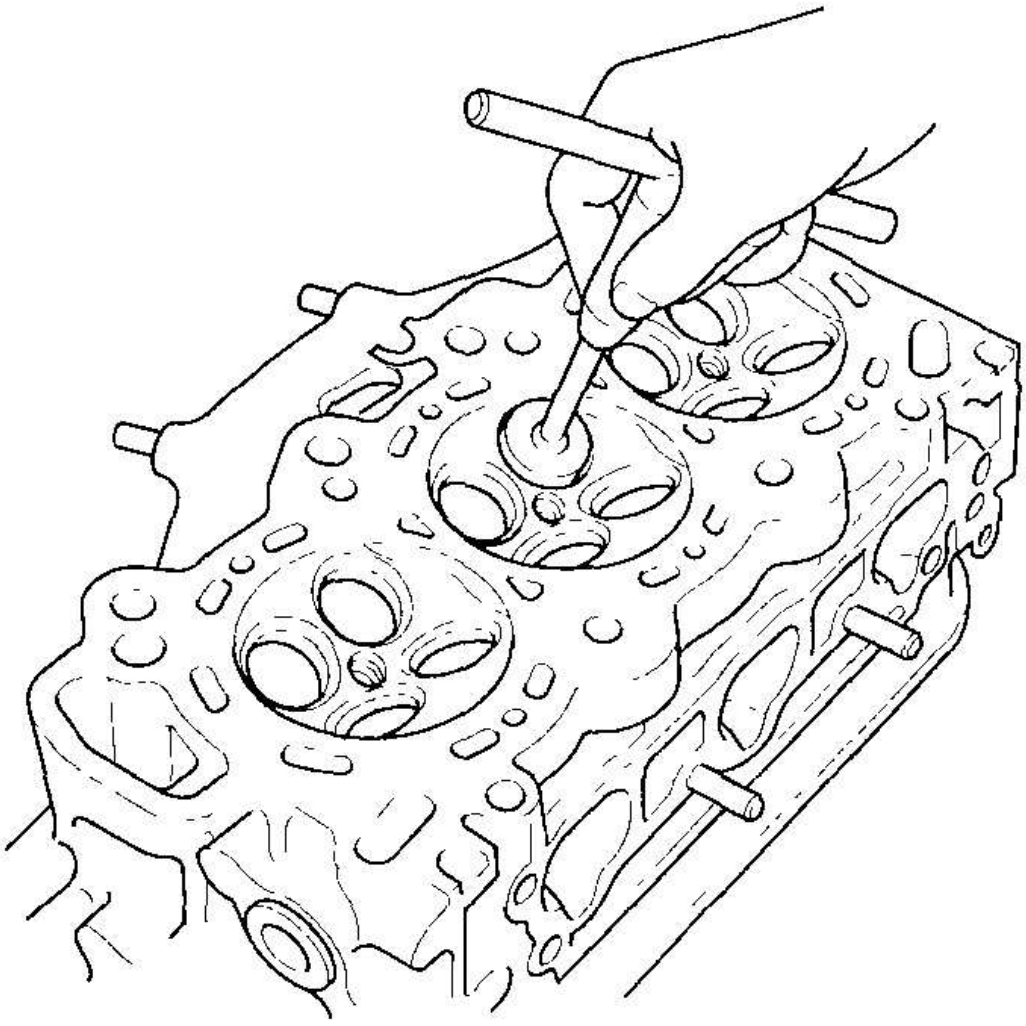

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Fig. 125: Renewing Valve Seats In Cylinder Head Using Valve Seat Cutter
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
4. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 67.5° cutter (intake seat) or the 60° cutter (exhaust seat). Check the width of the seat and adjust accordingly.

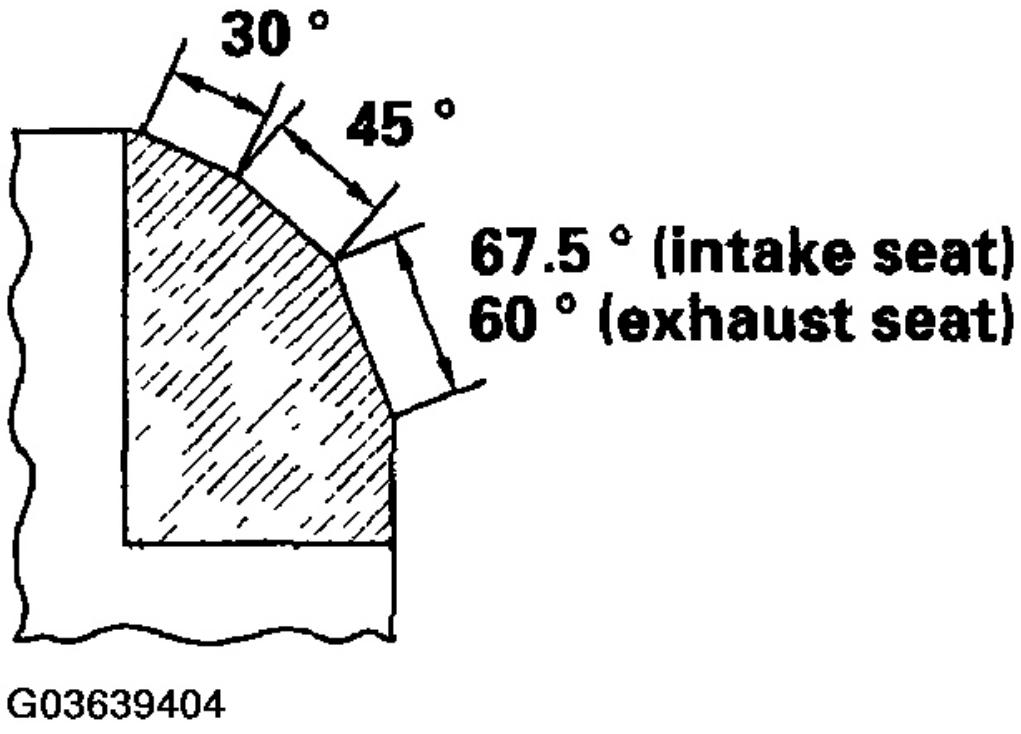

Fig. 126: Checking And Adjusting Width Of Seat
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width

   Standard (New): 1.25-1.55 mm (0.049-0.061 in.)
   Service Limit: 2.00 mm (0.079 in.)

6. After resurfacing the seat, inspect it for even valve seating. Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.

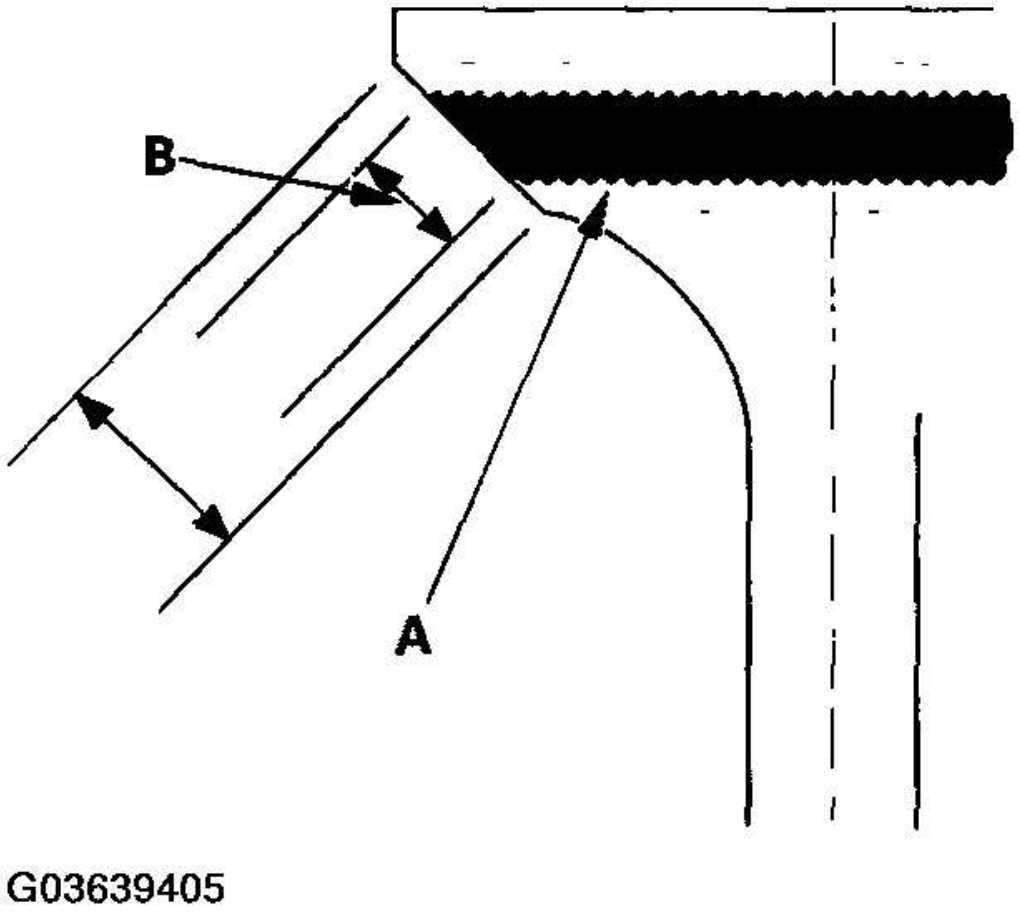

Fig. 127: Applying Prussian Blue Compound to Valve Face
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. The actual valve seating surface (B), as shown in **Fig. 127** by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 67.5° cutter (intake seat) or the 60° cutter (exhaust seat) to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

8. Insert the intake and exhaust valves in the head, and measure the valve stem installed height (A).

Intake Valve Stem Installed Height

Standard (New): 46.75-47.55 mm (1.841-1.872 in.)
Service Limit: 47.80 mm (1.882 in.)

Exhaust Valve Stem Installed Height

Standard (New): 46.68-47.48 mm (1.838-1.869 in.)
Service Limit: 47.73 mm (1.879 in.)

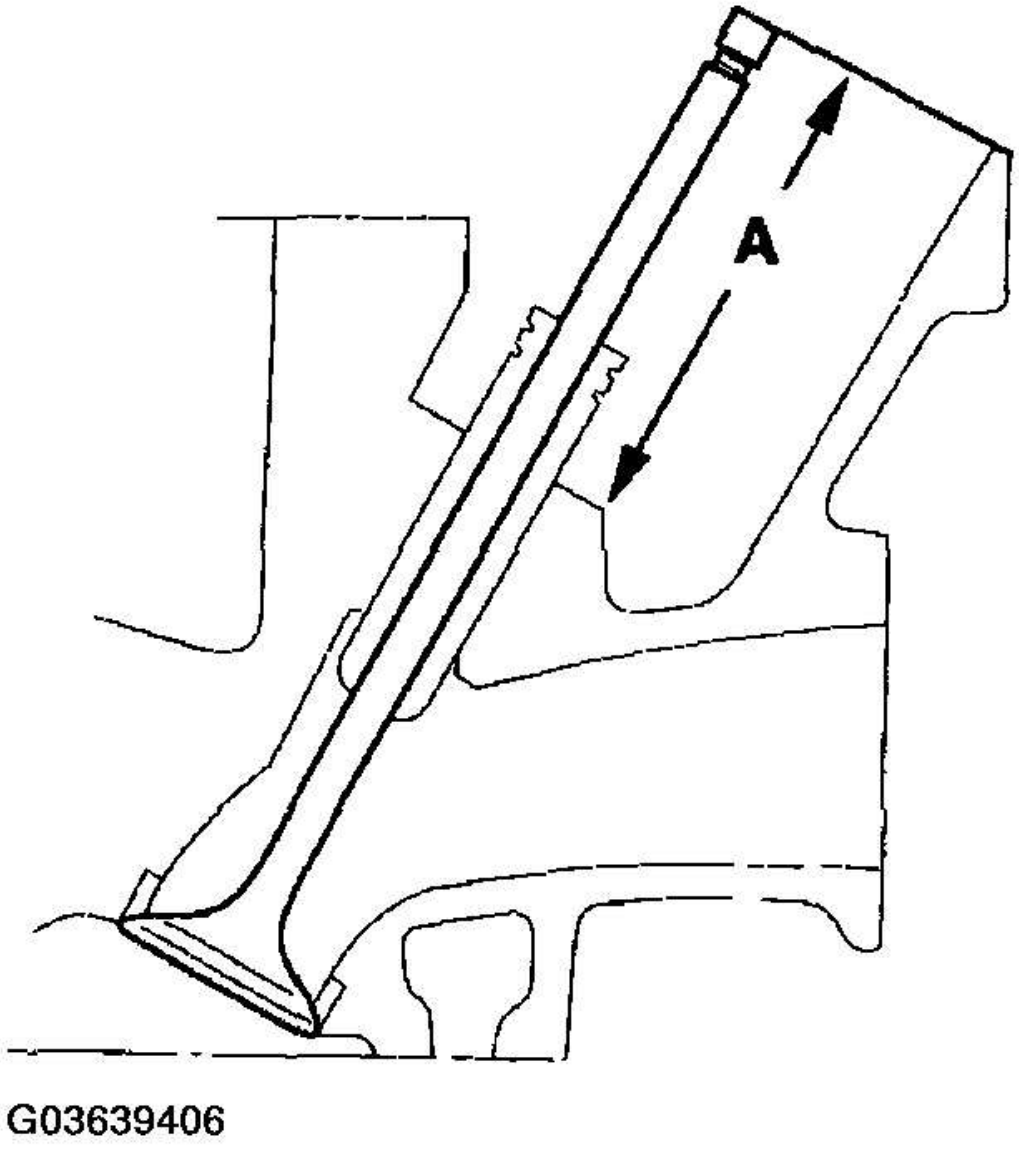

Fig. 128: Measuring Valve Stem Installed Height
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. If the valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

VALVE, SPRING, AND VALVE SEAL INSTALLATION

Special Tools Required

- Stem seal driver 07PAD-0010000
- Valve spring compressor attachment 07757-PJ1010A

1. Coat the valve stems with new engine oil. Install the valves in the valve guides.
2. Check that the valves move up and down smoothly.
3. Install the spring seats on the cylinder head.
4. Install the new valve seals (A) using the valve guide seal installer (B).

NOTE: Exhaust valve seals (C) have a black spring (D) and intake valve seals (E) have a white spring (F); they are not interchangeable.

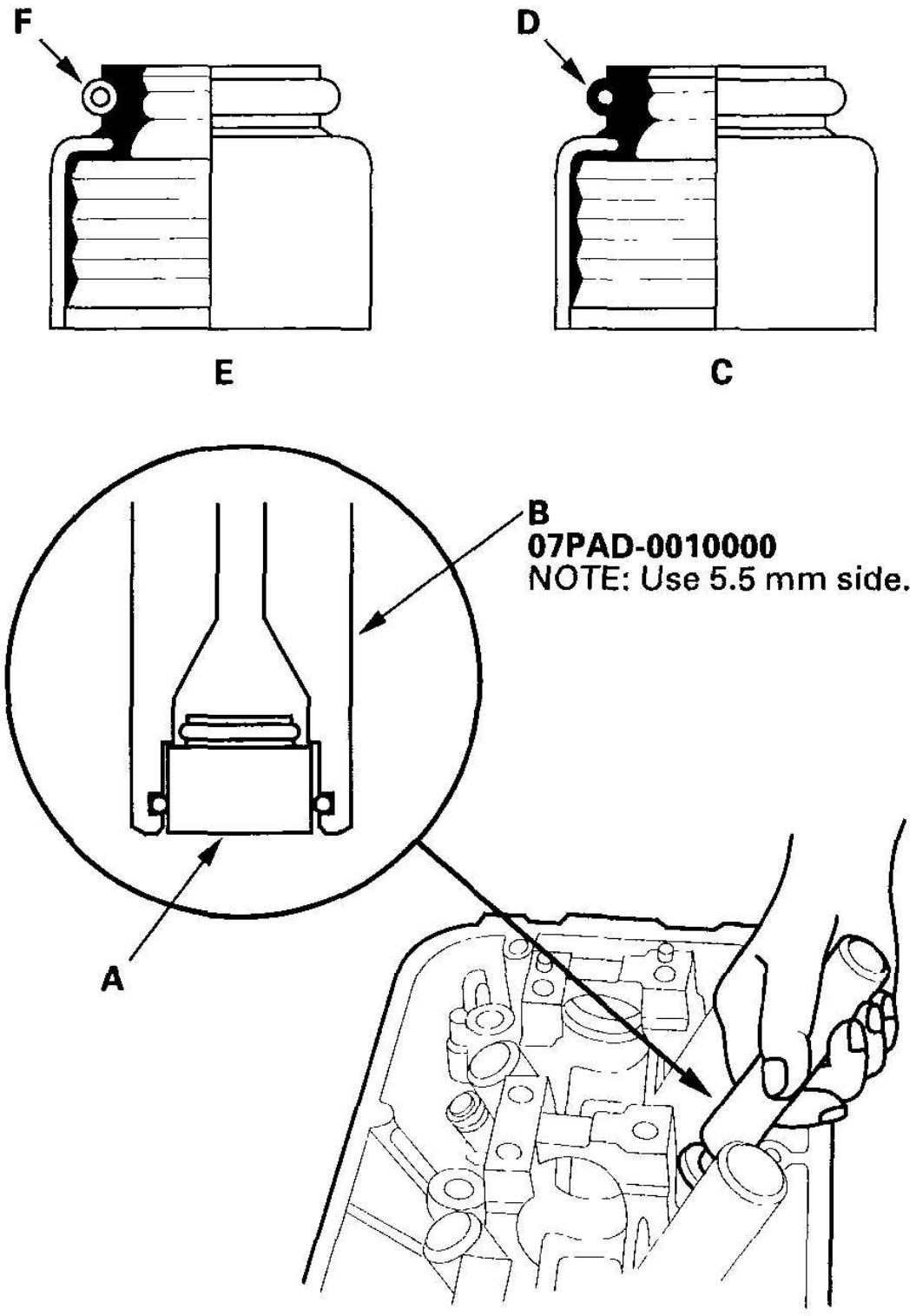
F
D
E
C
B
07PAD-0010000
NOTE: Use 5.5 mm side.
A
G03639407

Fig. 129: Installing New Valve Seals
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the valve spring and valve retainer. Place the end of the valve spring with the closely wound coils positioned towards the cylinder head.
6. Install the valve spring compressor. Compress the spring and install the valve cotters.

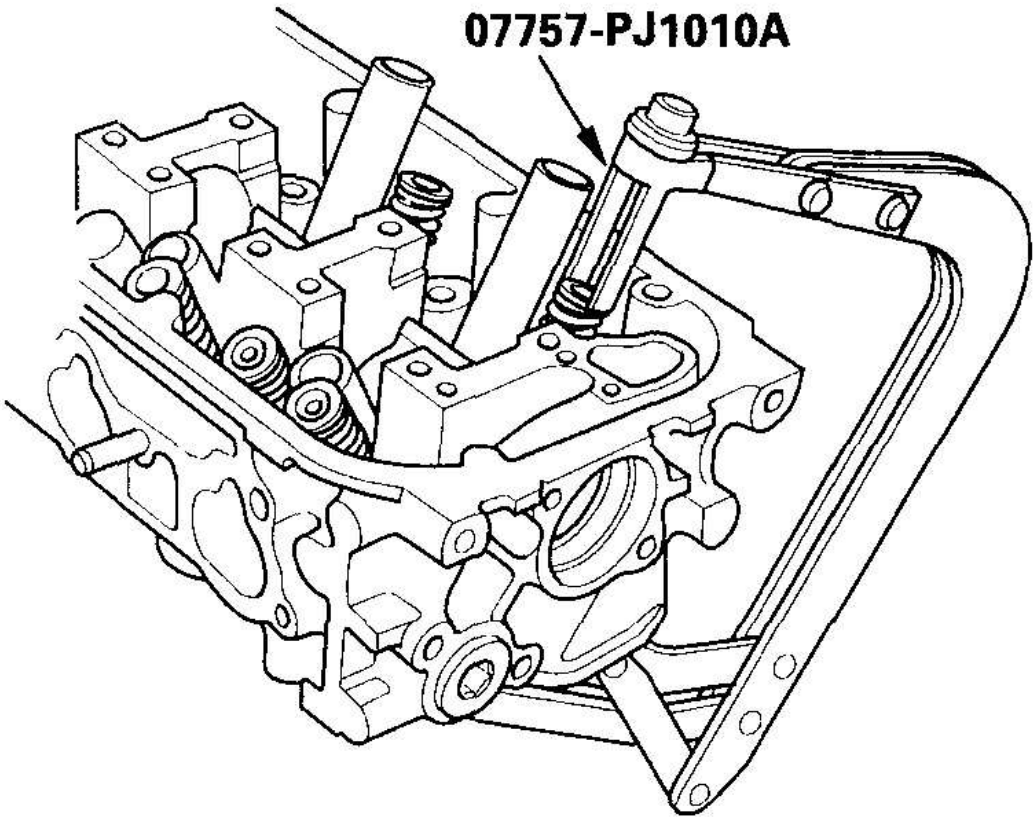

Fig. 130: Installing Valve Spring Compressor
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the valve spring compressor.
8. Lightly tap the end of each valve stem two or three times with a plastic mallet (A) to ensure proper seating of the valve and valve cotters. Tap the valve stem only along its axis so you do not bend the stem.

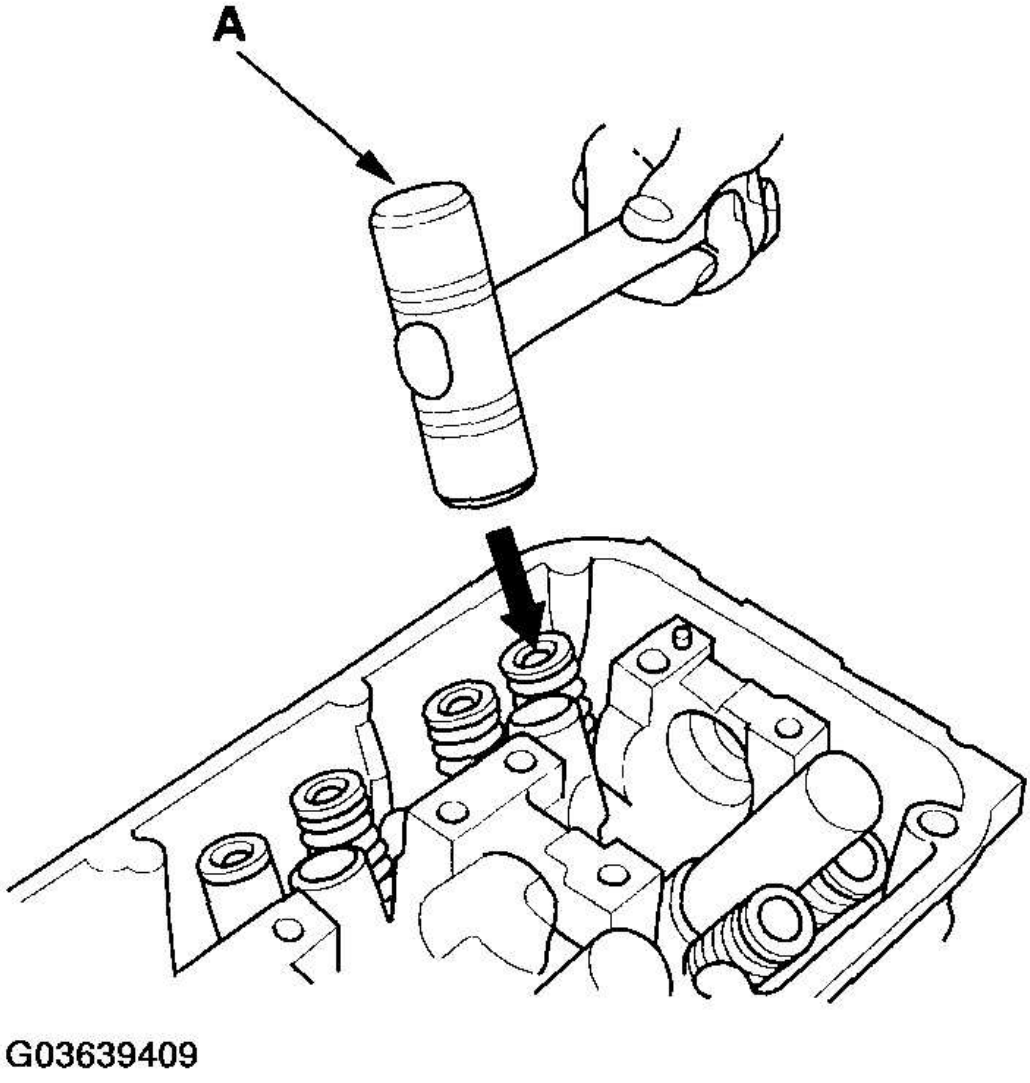

Fig. 131: Tapping End Of Valve Stem To Ensure Proper Seating
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CAMSHAFT, ROCKER ARM, CAMSHAFT SEAL, AND PULLEY INSTALLATION

1. Apply a light coat of new engine oil around the camshaft oil seal.
2. Gently tap the new camshaft oil seal (A) into the cylinder head.
   -1 Tap the camshaft oil seal in squarely.
   -2 Install the oil seal about 0.5-1.5 mm (0.02-0.06 in.) below the surface of the cylinder head.

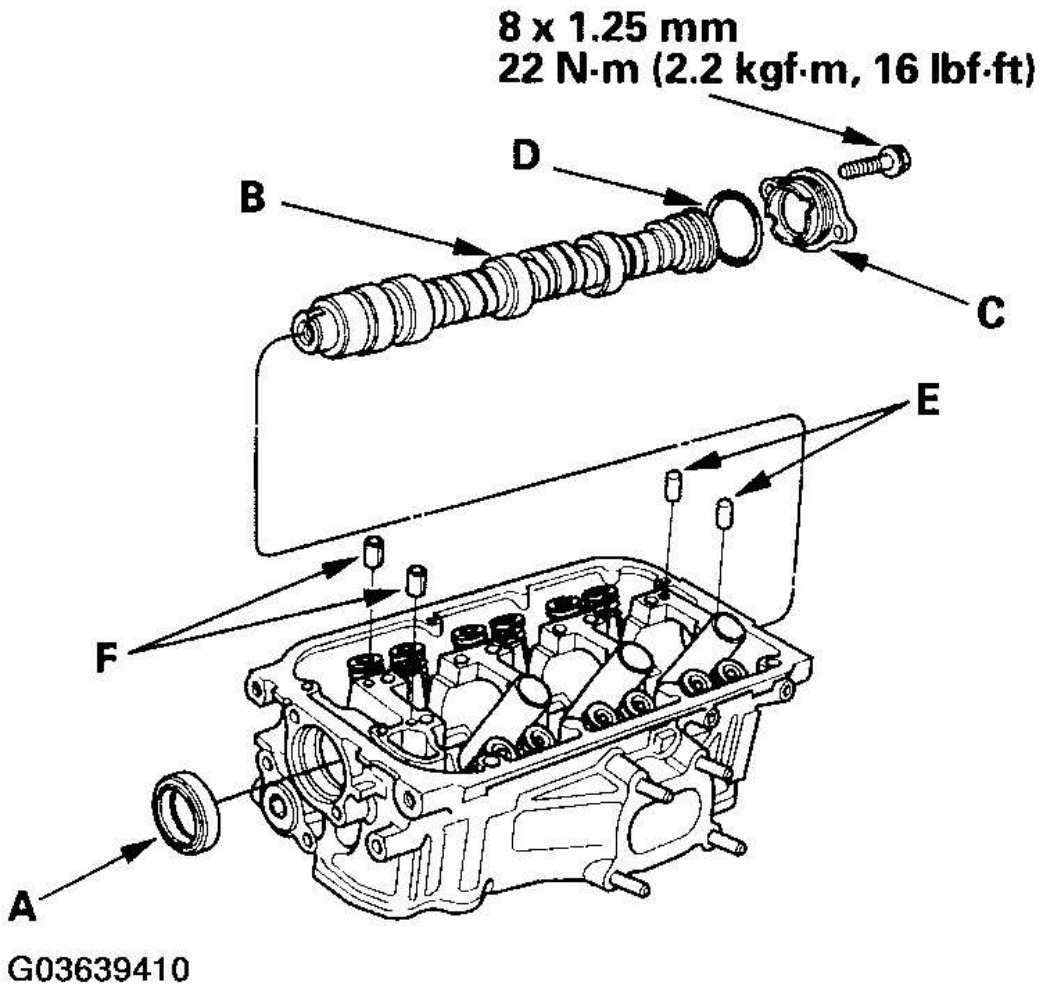

Fig. 132: Tapping Oil Seal (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

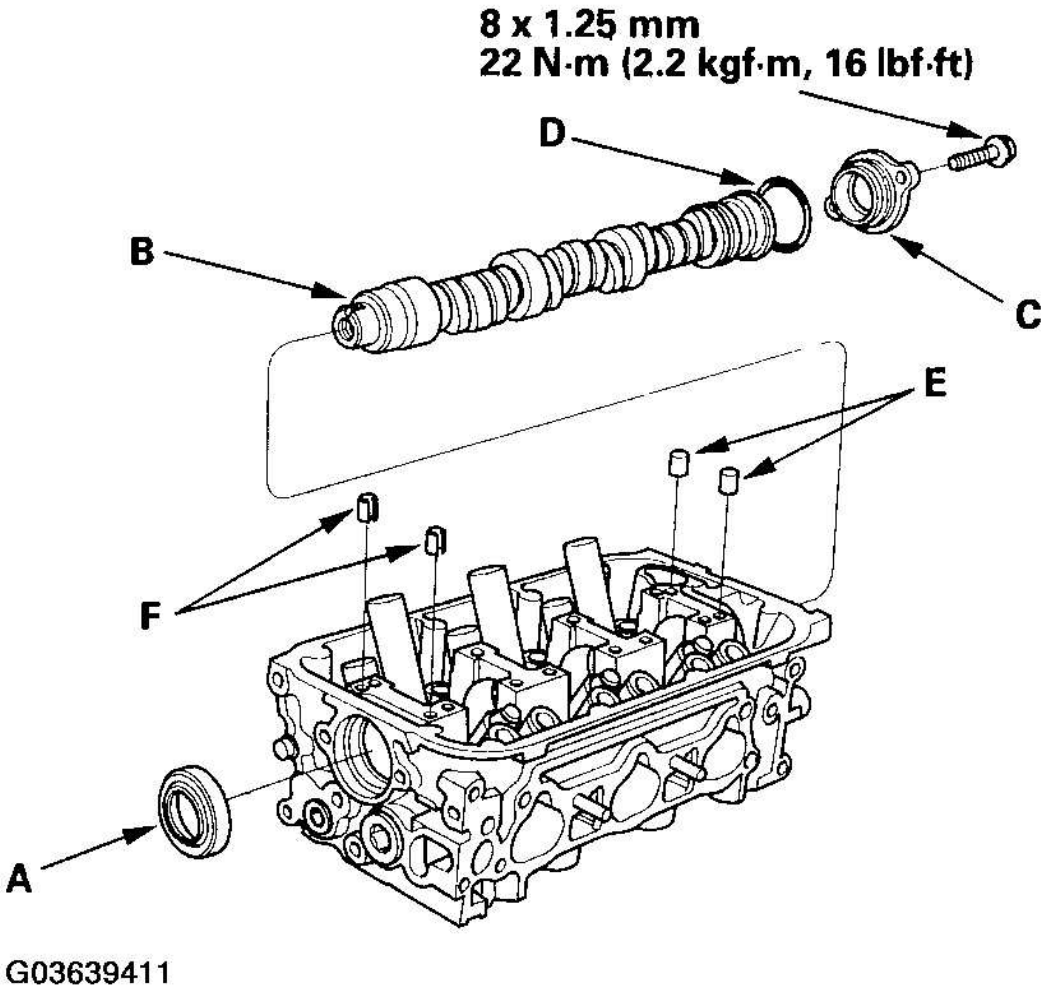

Fig. 133: Tapping Oil Seal (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Insert the camshaft (B) into the cylinder head, then install the camshaft thrust cover (C). Always use a new O-ring (D).
4. Check that the oil seal lips are not distorted.
5. Install the solid dowel pins (E) and the hollow dowel pins (F).
6. Loosen the valve adjusting screws.
7. If necessary, reassemble the rocker arm assembly (see **ROCKER ARM AND SHAFT DISASSEMBLY/REASSEMBLY**).
8. Set the rocker arm assembly in place, and loosely install the bolts. Make sure that the rocker arms are properly positioned on the valve stems.
9. Tighten each bolt two turns at a time in the sequence as shown in **Fig. 134** to ensure that the rockers do

not bind on the valves.

NOTE: Apply new engine oil to the threads and flange of the exhaust rocker shaft mounting bolts.

Specified Torque

8 x 1.25 mm: 24 N.m (2.4 kgf.m, 17 lbf.ft)

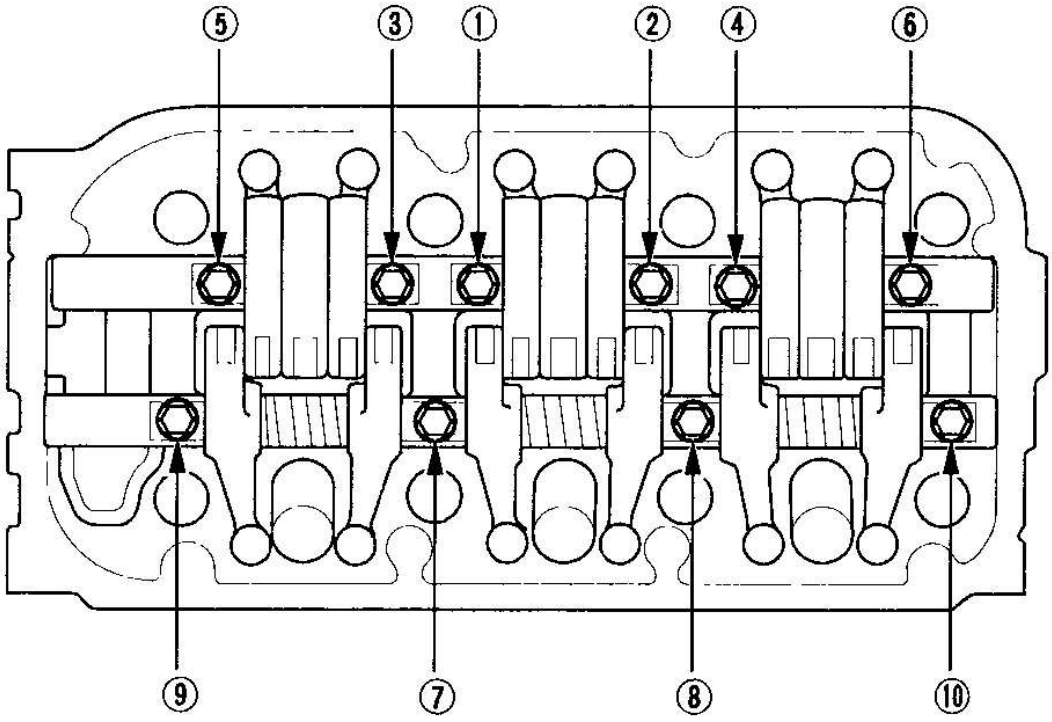

Fig. 134: Tightening Rocker Arm In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the injector base (A). Always use a new gasket (B).

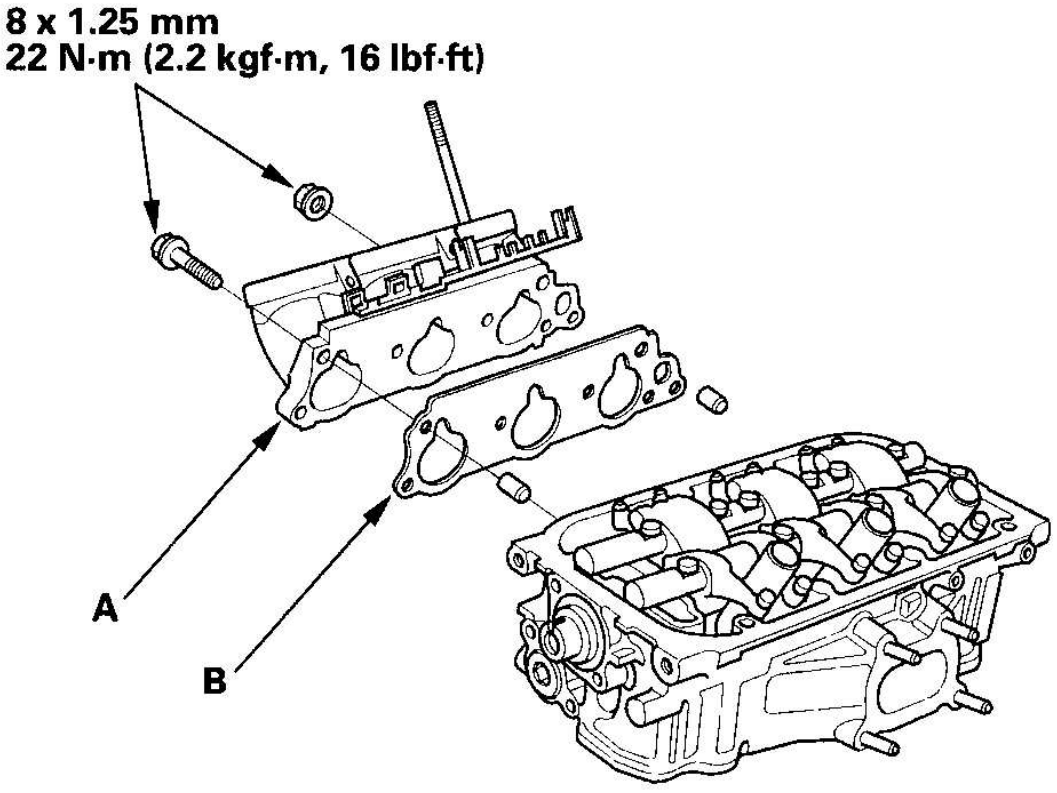

Fig. 135: Installing Injector Base
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Apply new engine oil to the threads of the camshaft pulley mounting bolt (A). Install the back cover (B), then install the camshaft pulley (C).

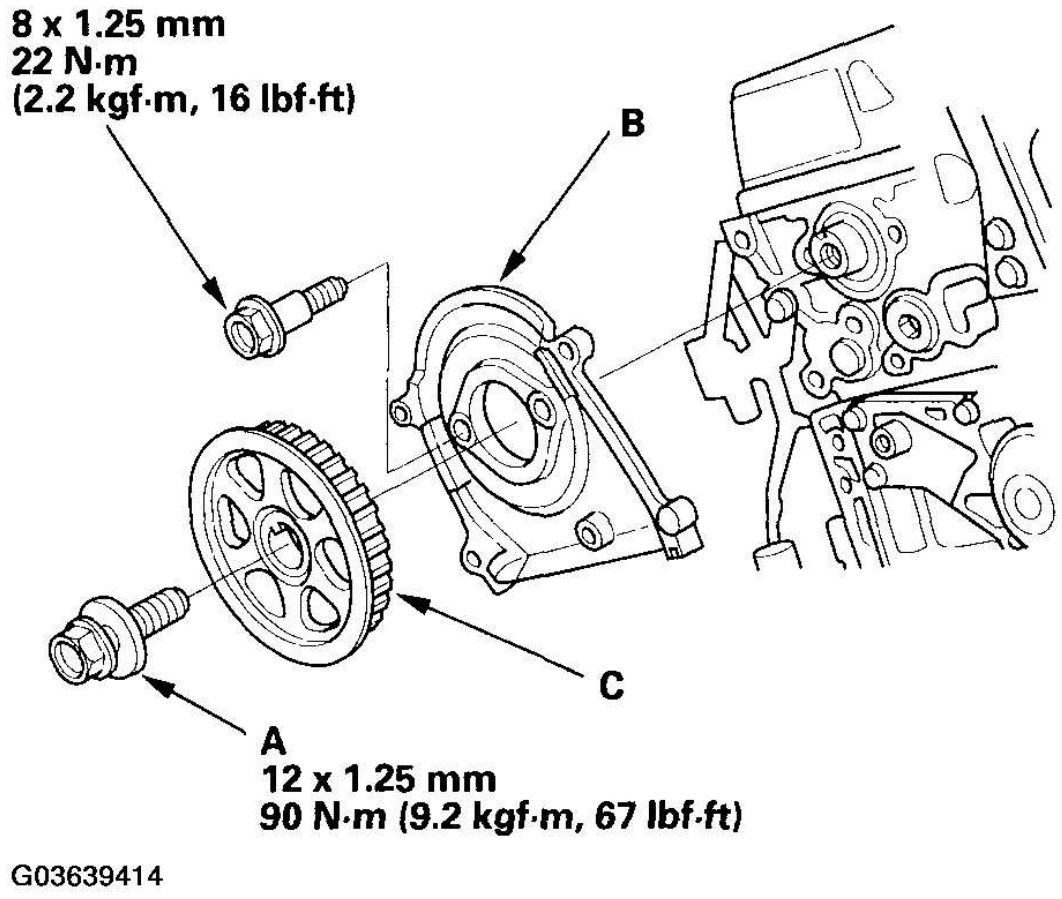

Fig. 136: Installing Camshaft Pulley
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CYLINDER HEAD INSTALLATION

Install the cylinder head in the reverse order of removal:

1. Clean the cylinder head and engine block surface.
2. Clean and install the oil control orifices (A) with new O-rings (B).

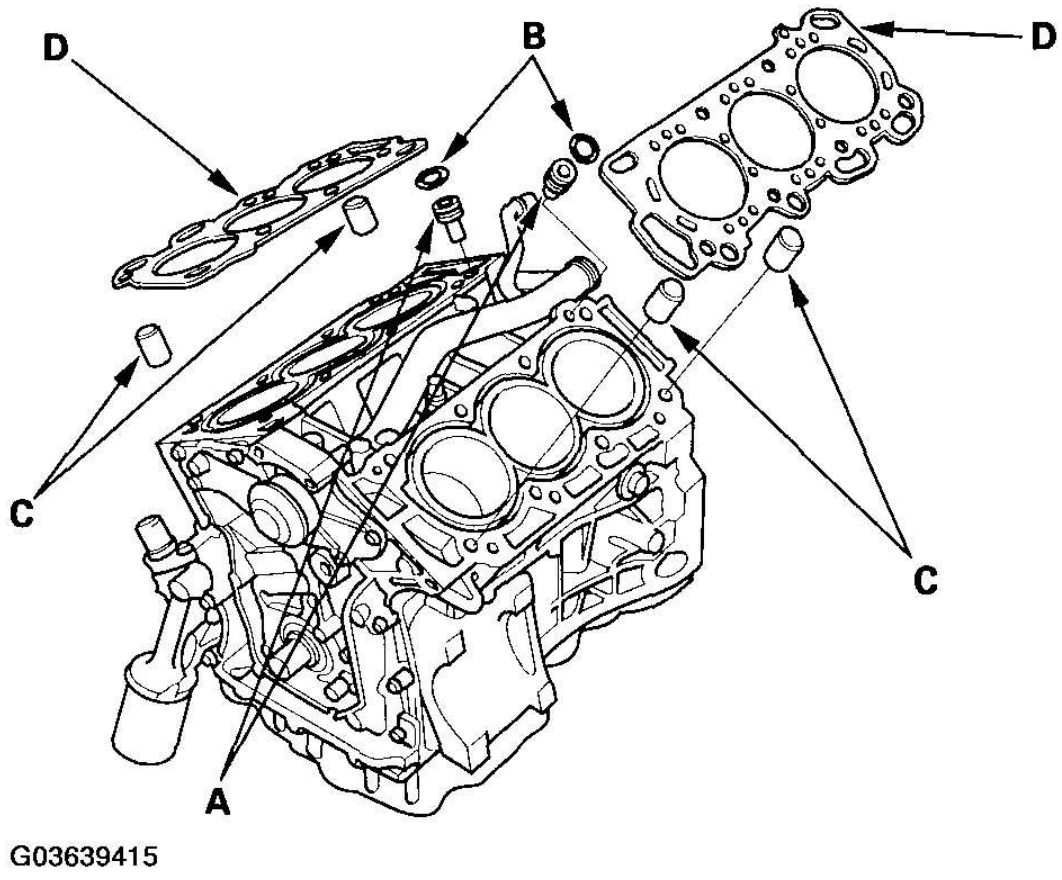

Fig. 137: Installing Oil Control Orifices
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the dowel pins (C) and new cylinder head gaskets (D).
4. Clean the timing belt pulleys, timing belt guide plate, and the upper and lower covers.
5. Set the timing belt drive pulley to top dead center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

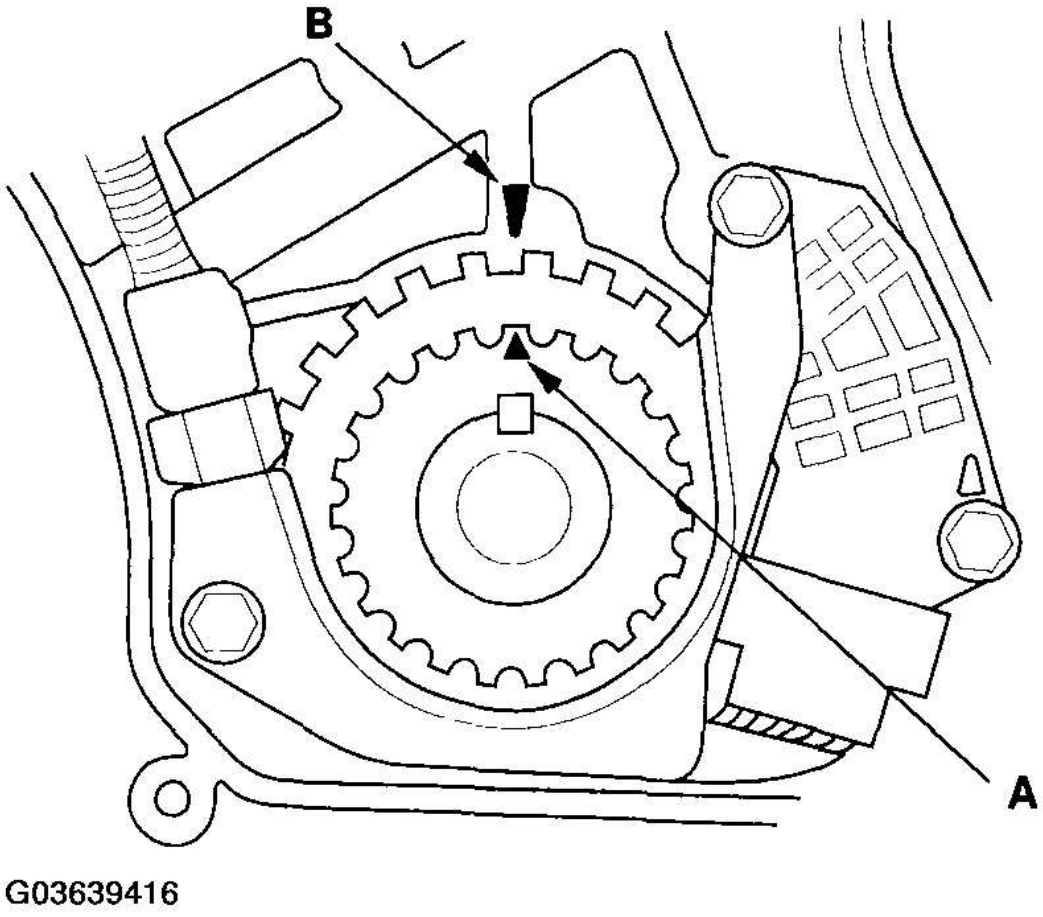

Fig. 138: Setting Timing Belt Drive Pulley To DTC Aligning TDC With Pointer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

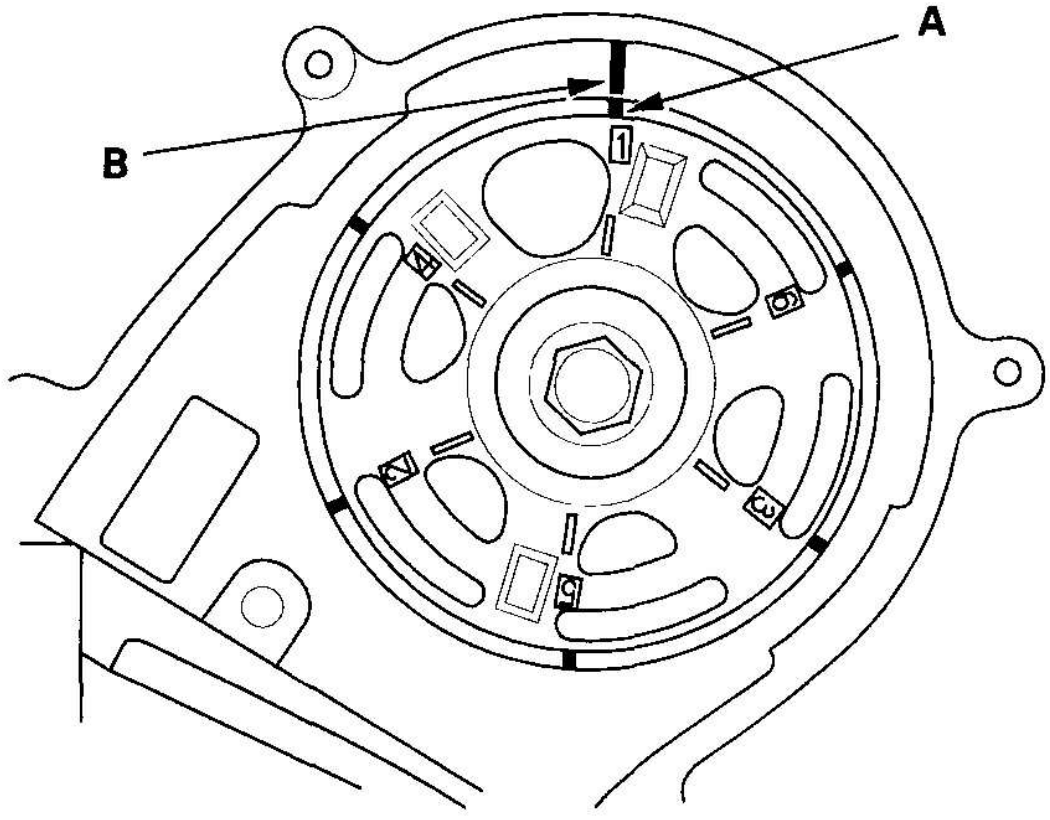

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Fig. 139: Setting Camshaft Pulleys To TDC Aligning TDC Marks With Pointers (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

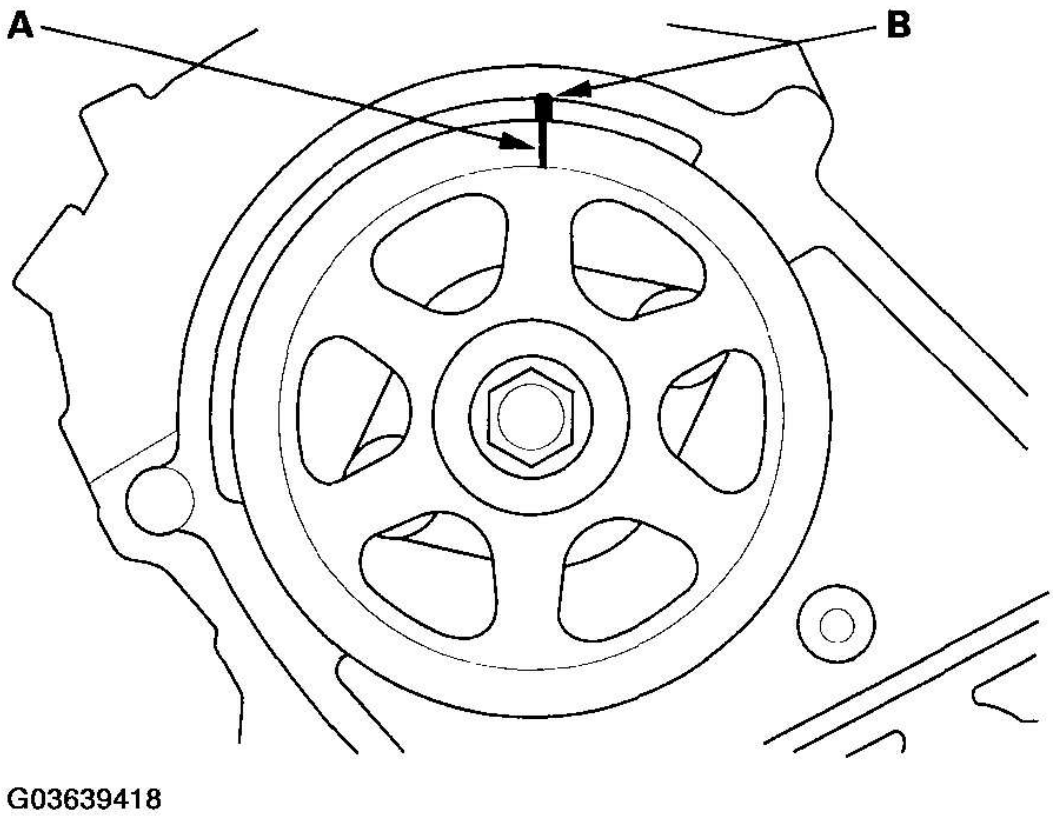

Fig. 140: Setting Camshaft Pulleys To TDC Aligning TDC Marks With Pointers (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the cylinder head onto the engine block.
8. Install the cylinder head bolts:
   - 6 point bolt: Go to step 9.
   - 12 point bolt: Go to step 11 .

Tightening sequence for 6 point bolts

NOTE: Do not intermix cylinder head bolt types on the cylinder head. Make sure the cylinder head bolts are all the same type (6 point).

9. Apply new engine oil to the threads and flanges of the cylinder head bolts.
10. Tighten the cylinder head bolts sequentially in three steps. Then go to step 16 .

NOTE: Perform each step twice.

1st Step Torque: 39 N.m (4.0 kgf.m, 29 lbf.ft)
2nd Step Torque: 69 N.m (7.0 kgf.m, 51 lbf.ft)
3rd Step Torque: 98.1 N.m (10.0 kgf.m, 72.3 lbf.ft)

Use a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten. If a bolt makes any noise while you are torquing it, loosen the bolt, and retighten it from the 1st step.

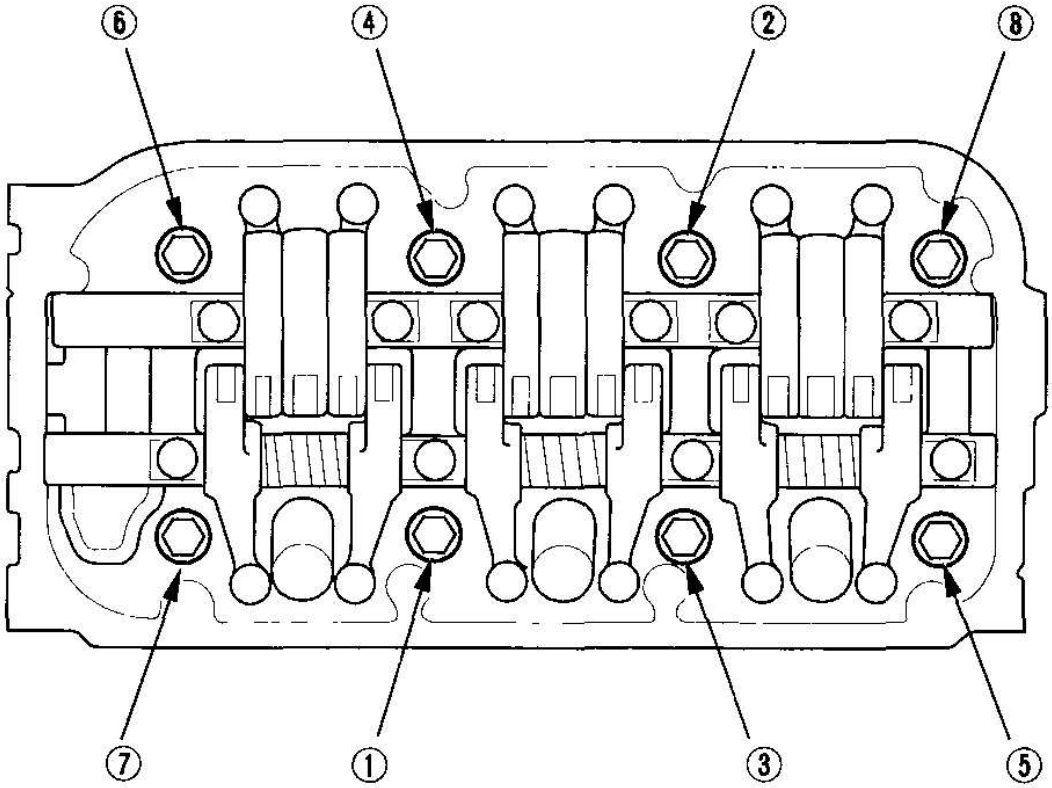

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Fig. 141: Tightening Cylinder Head Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Tightening sequence for 12 point bolts

NOTE: Do not mix cylinder bolt types on the cylinder head. Make sure the cylinder head bolts are all the same type (12 point).

11. Measure the diameter of each cylinder head bolt at point A and point B.

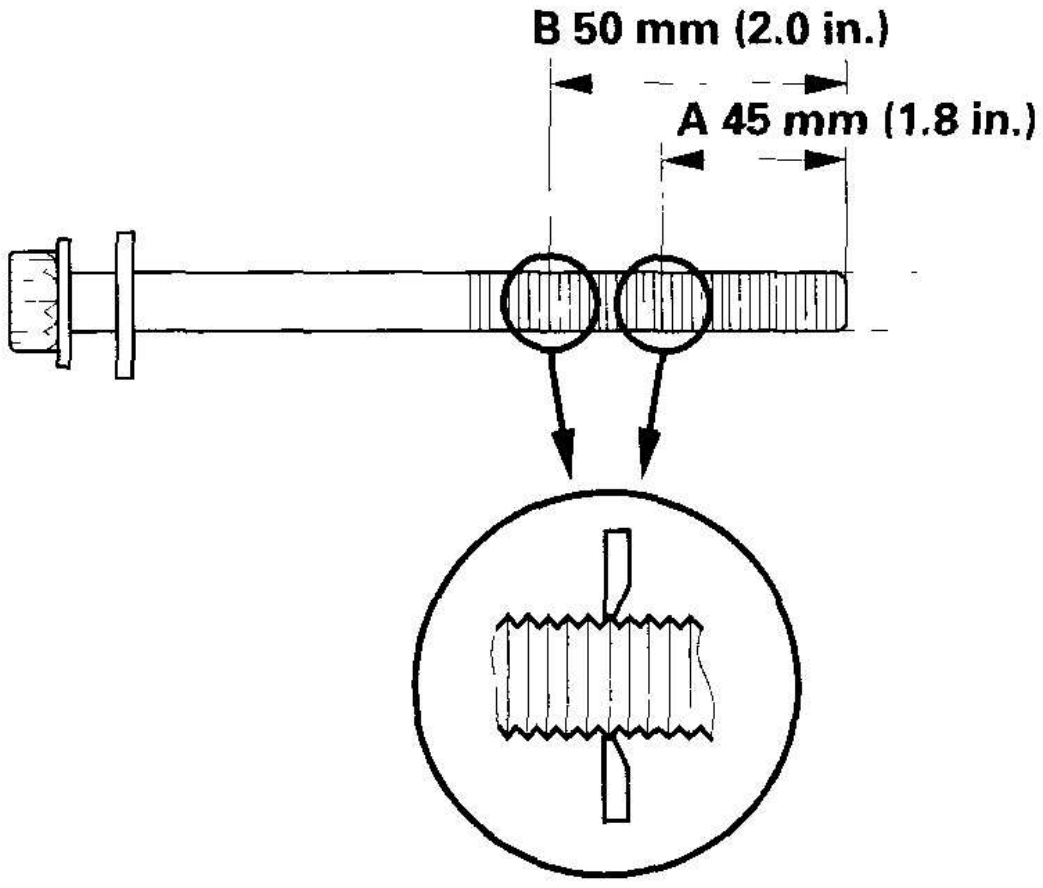

Fig. 142: Measuring Diameter Of Cylinder Head Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. If either diameter is less than 10.6 mm (0.42 in.), replace the cylinder head bolt.
13. Apply new engine oil to the threads and under the bolt heads of all cylinder head bolts.
14. Tighten the cylinder head bolts in sequence to 29 N.m (30 kgf.m, 22 lbf.ft). Use a beam-type torque wrench. When using a preset-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.

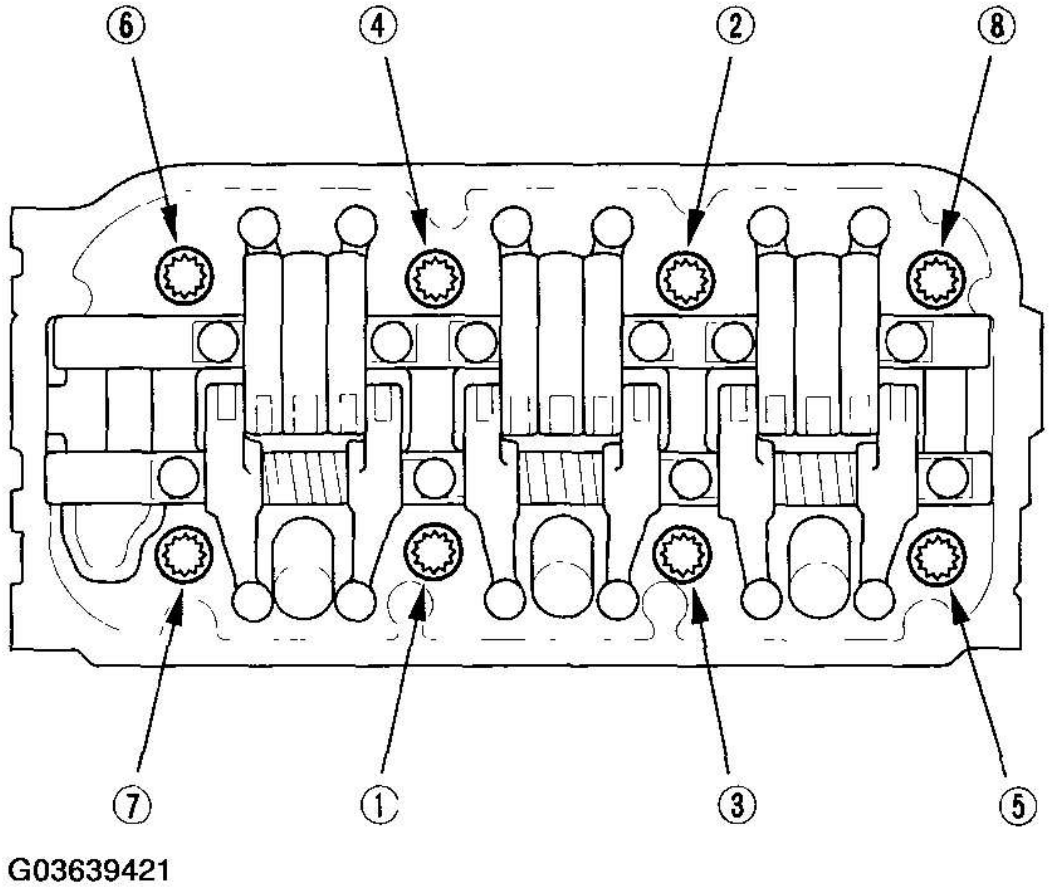

Fig. 143: Tightening Cylinder Head Bolts In Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. After torquing, tighten all cylinder head bolts in two steps (90° per step). 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 step 11 of the procedure. Do not loosen it back to the specified angle.

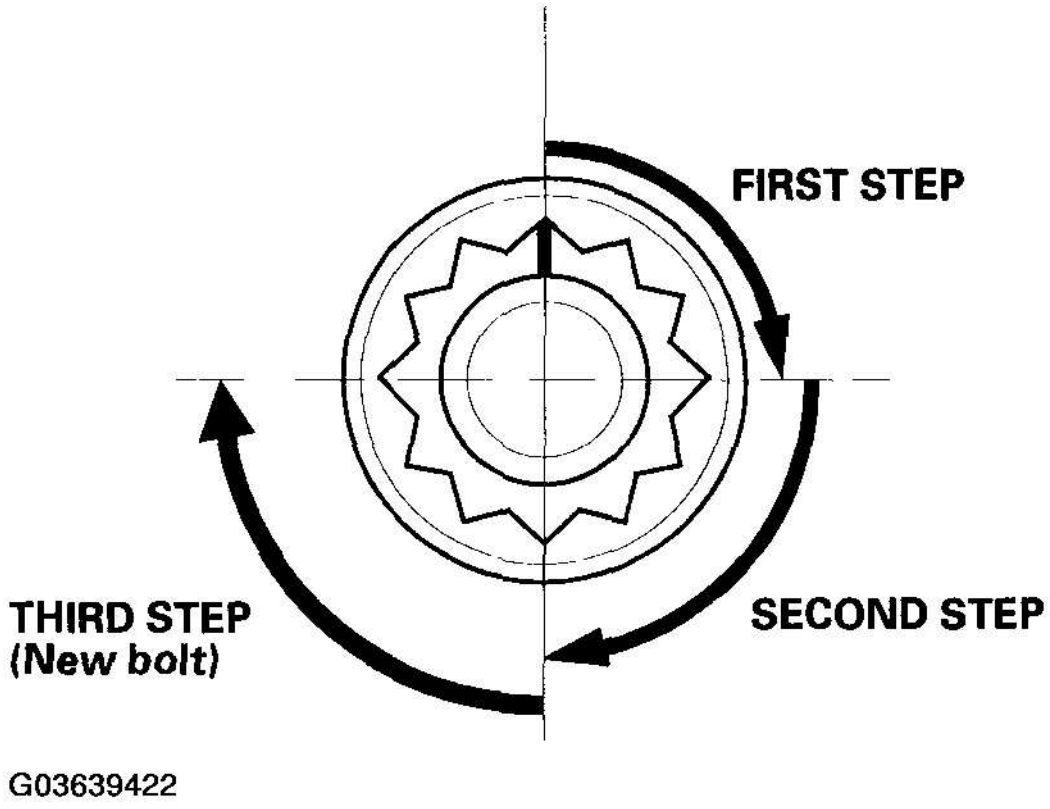

Fig. 144: Tightening All Cylinder Head Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Install the timing belt (see **TIMING BELT INSTALLATION**).
17. Adjust the valve clearance (see **VALVE CLEARANCE ADJUSTMENT**).
18. Install the cylinder head cover (see **CYLINDER HEAD COVER INSTALLATION**).
19. Install the front and rear warm up three way catalytic converter (WU-TWC) (see **WARM UP TWC REMOVAL/INSTALLATION**).
20. Install the water passage (A). Always use a new O-ring (B) and new gaskets (C).

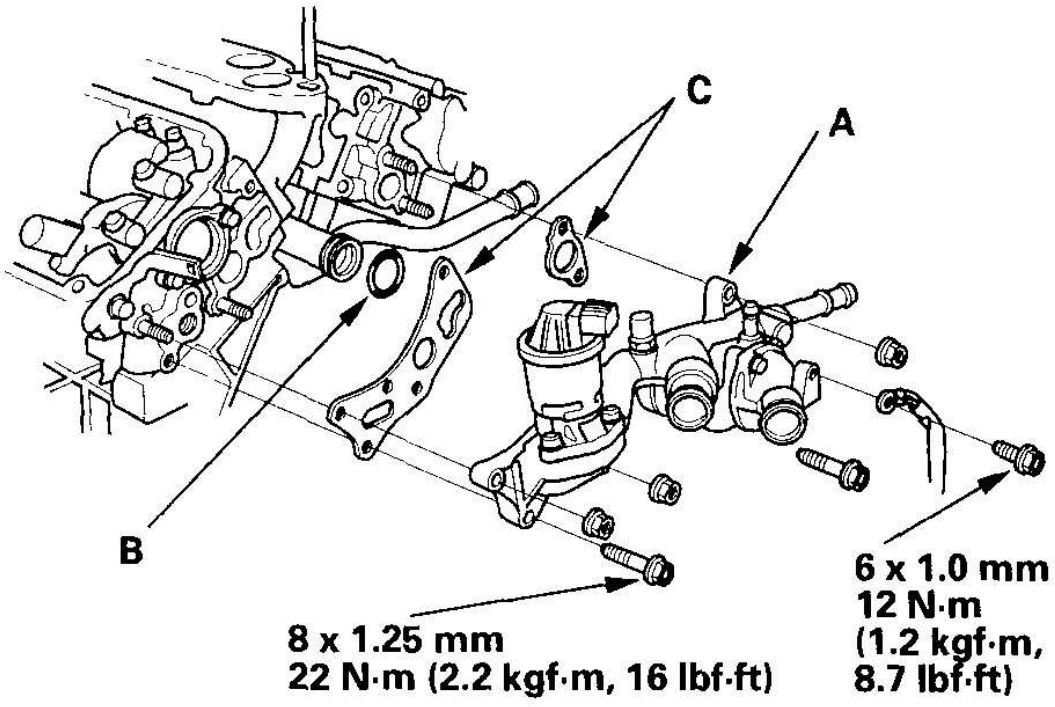

Fig. 145: Installing Water Passage
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Set the new O-rings to the injectors, then install the fuel rails (see **COMPONENT LOCATION INDEX**).
22. 2005-2006 models: Install the purge joint.

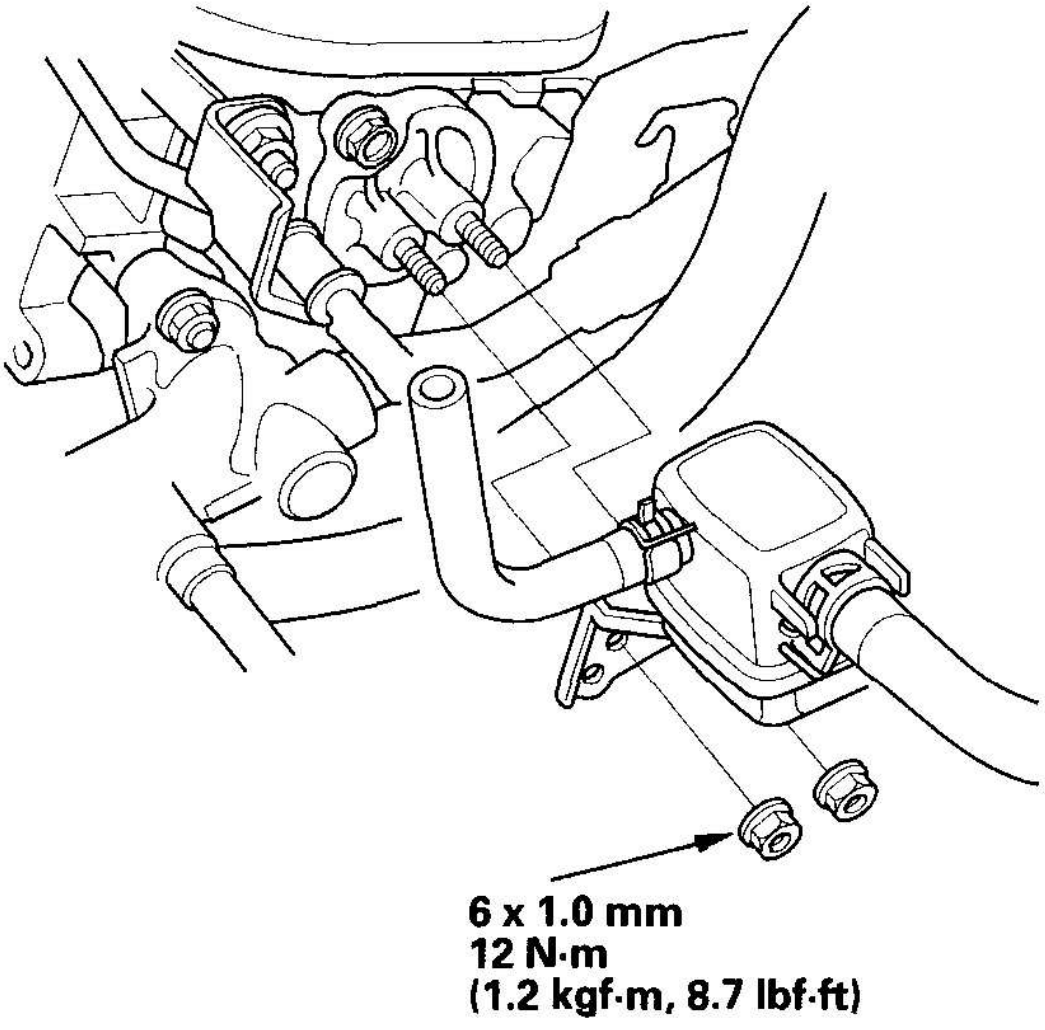

Fig. 146: Installing Purge Joint (2005-06 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. 2003-2004 models: Install the fuel feed hose (A) with new washers (B).

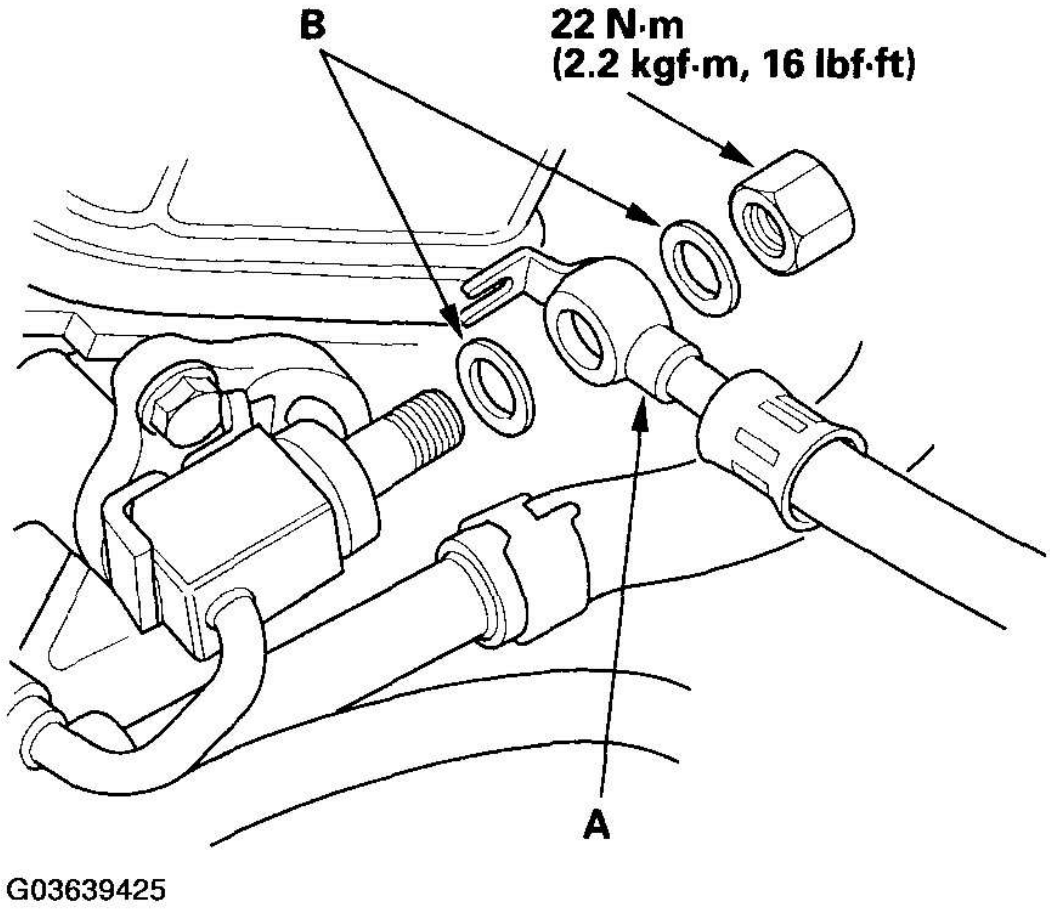

Fig. 147: Installing Fuel Feed Hose (2003-04 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

24. 2005-2006 models: Connect the fuel feed hose (see **FUEL LINE/QUICK-CONNECT FITTING INSTALLATION**), then install the quick-connect fitting cover (A).

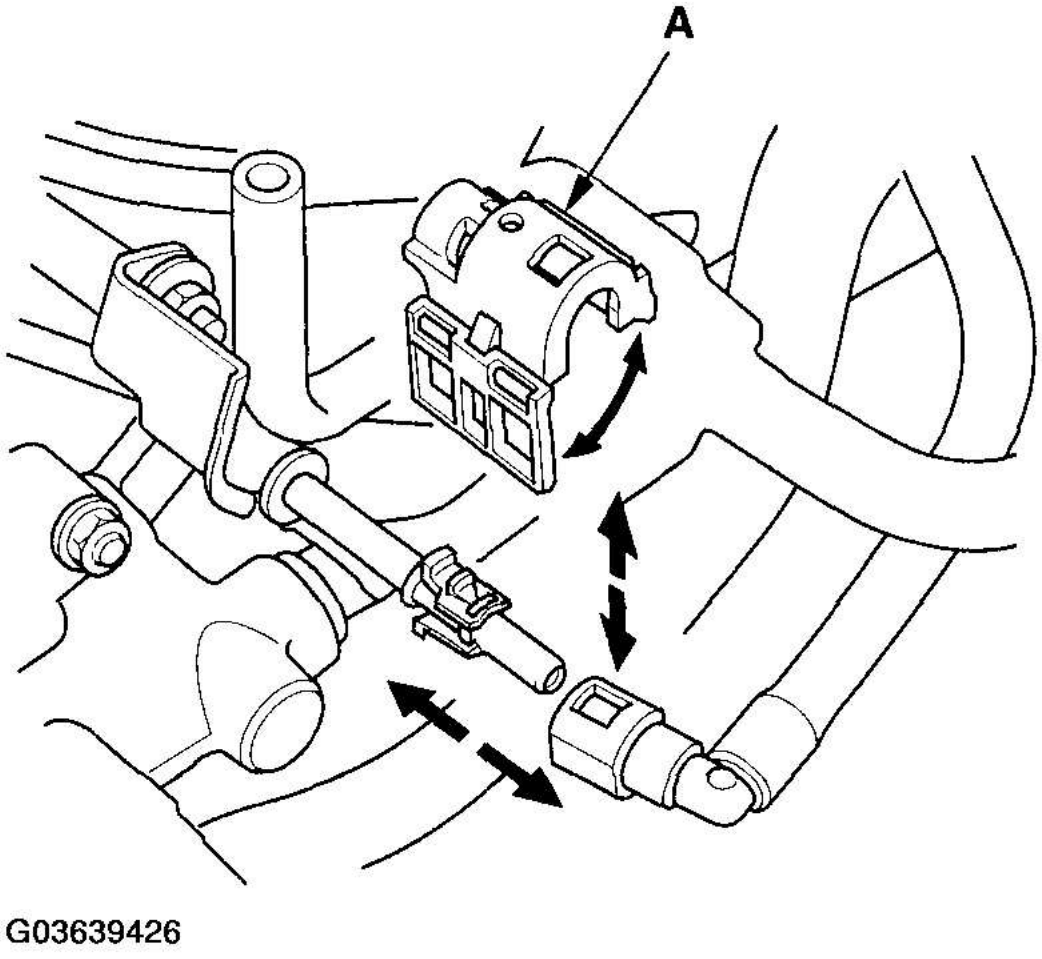

Fig. 148: Connecting Fuel Feed Hose (2005-06 Models)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Tighten the bolt securing the harness bracket.

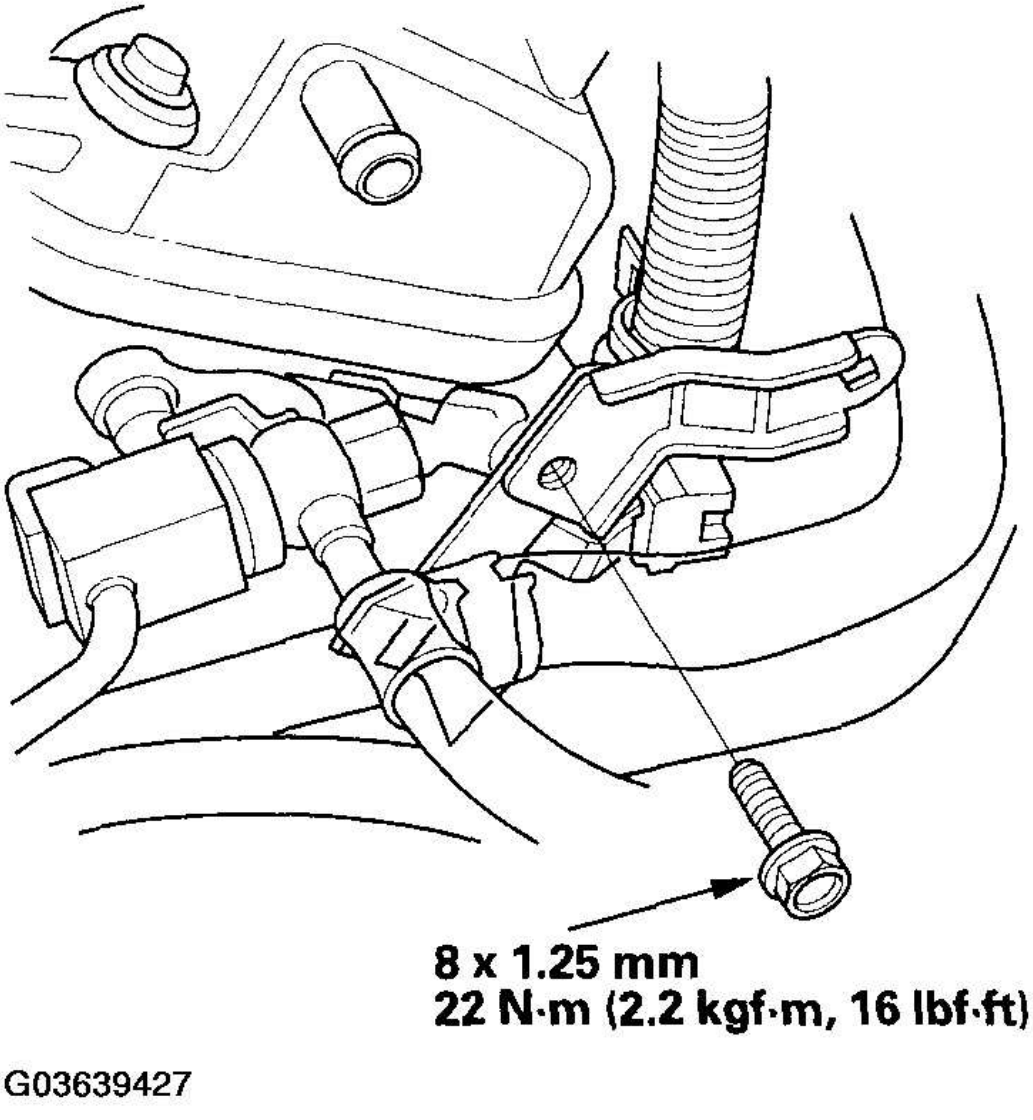

Fig. 149: Tightening Harness Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. Tighten the bolt securing the harness bracket.

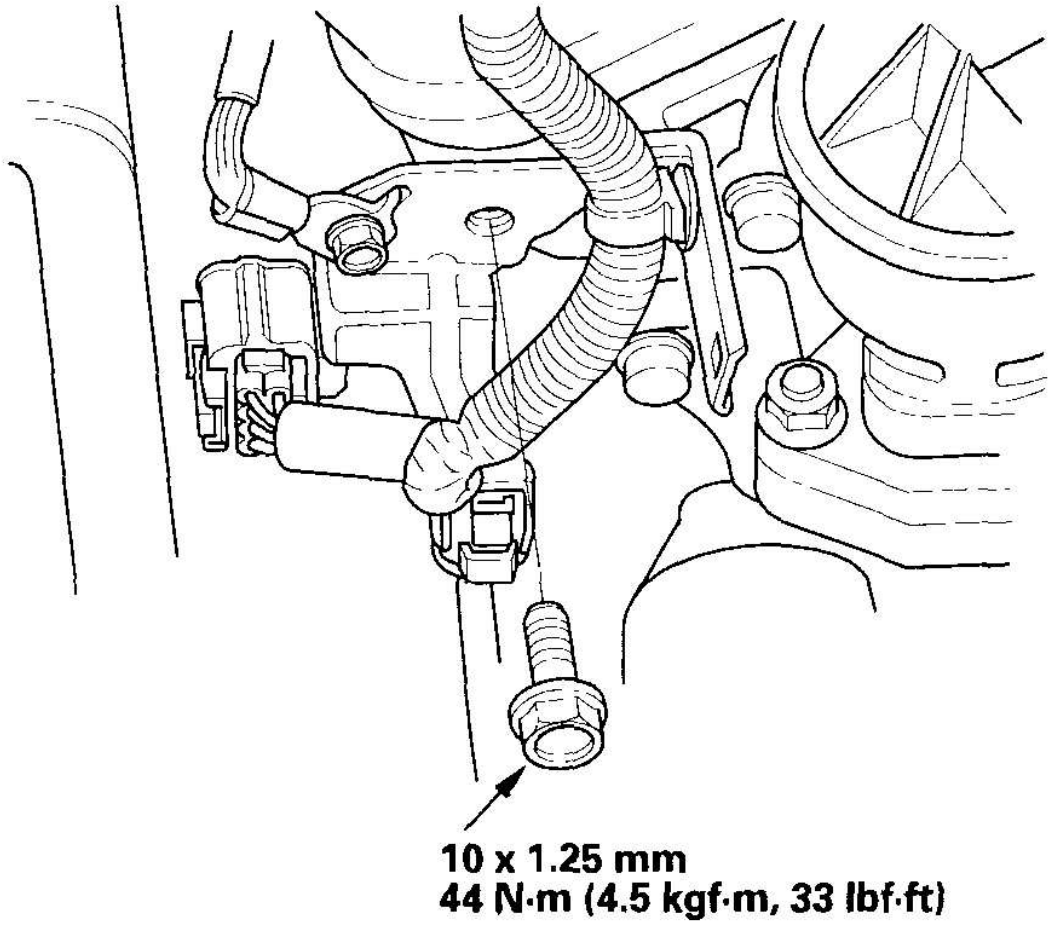

Fig. 150: Tightening Harness Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Install the heater hose (A) and water bypass hose (B).

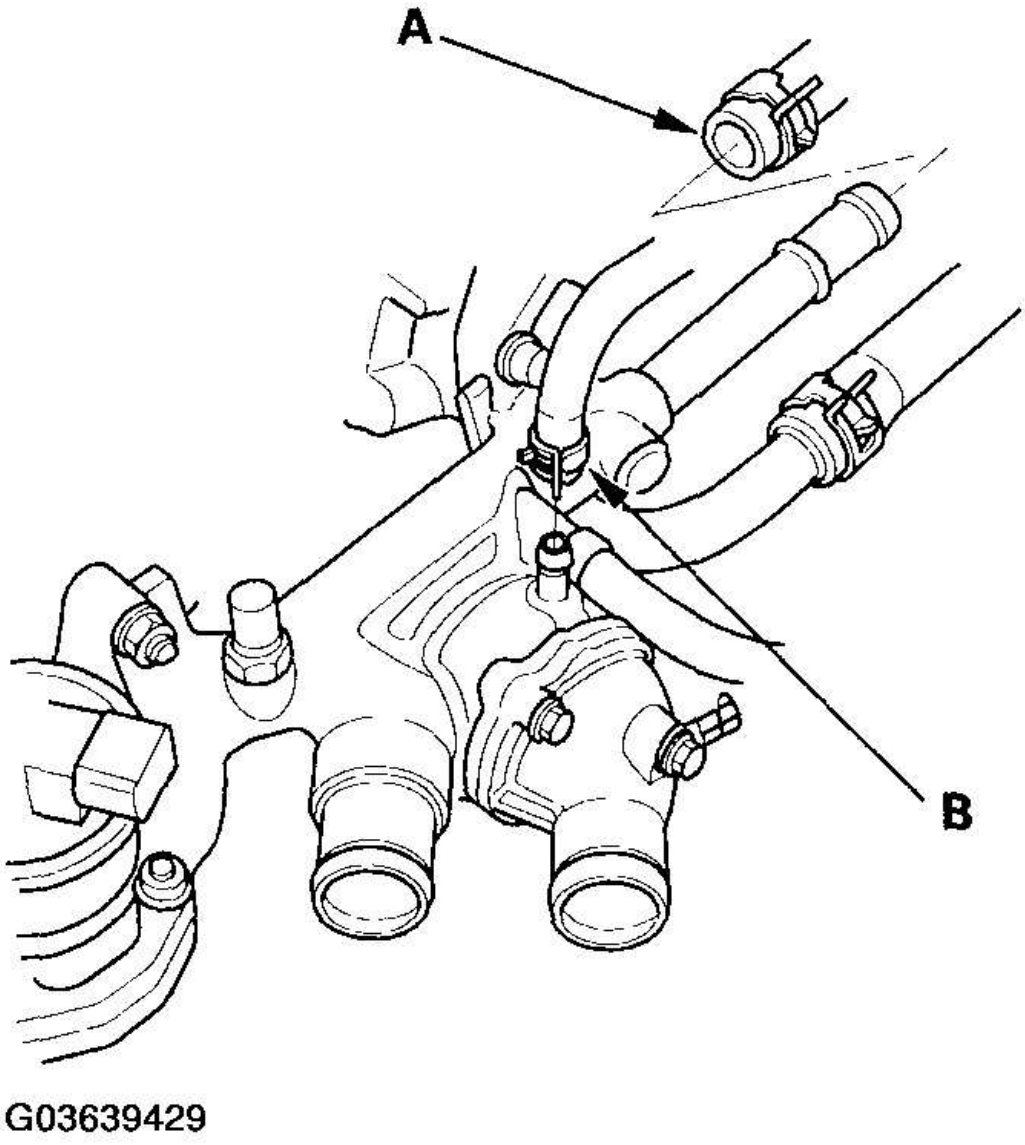

Fig. 151: Installing Heater Hose And Water Bypass Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

28. Install the upper radiator hose (A) and lower radiator hose (B).

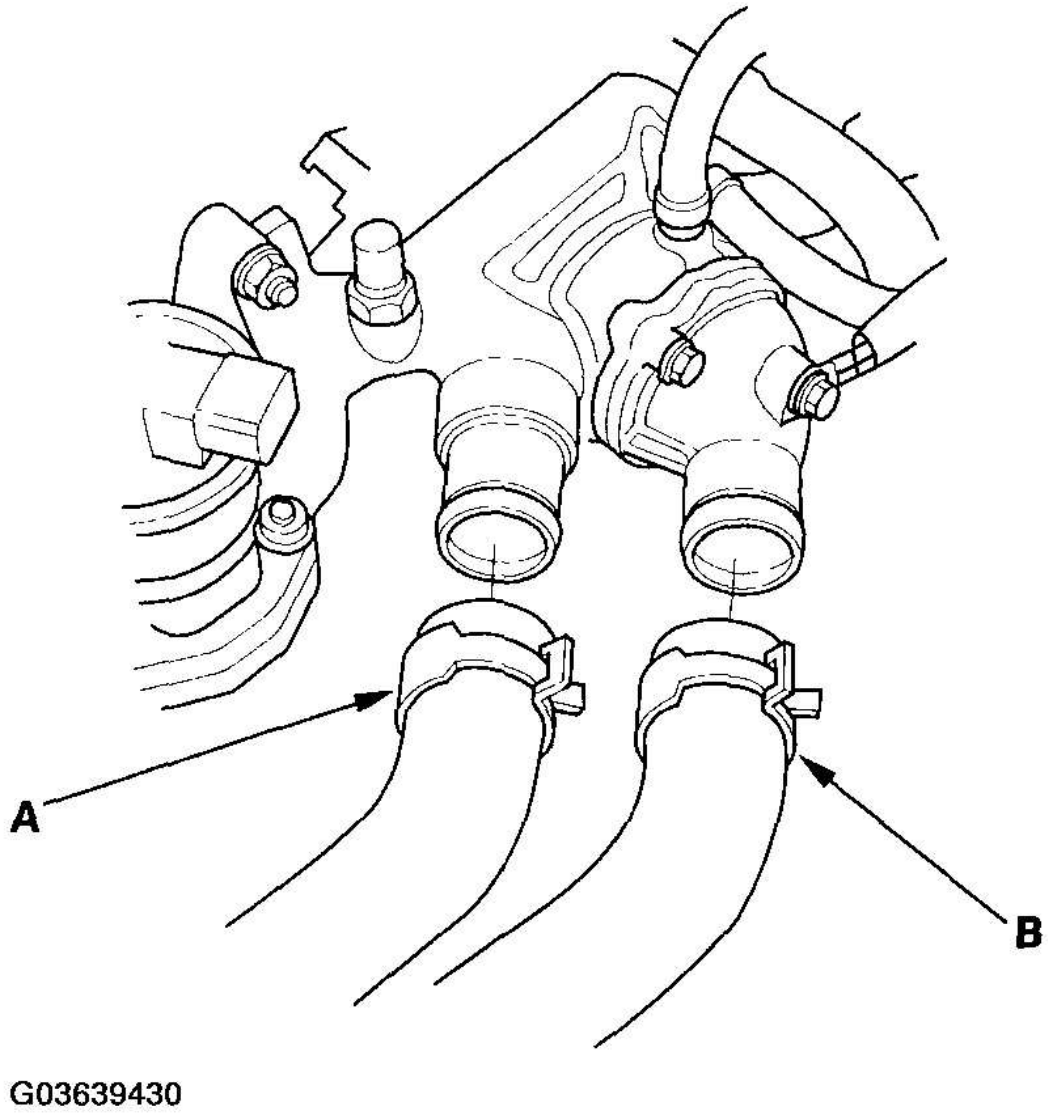

Fig. 152: Installing Upper Lower Radiator Hose
Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Install the intake manifold (see **INSTALLATION**).
30. Install the engine wire harness connectors and wire harness clamps to the cylinder head:
    - Six injector connectors
    - Engine coolant temperature (ECT) sensor connector
    - Camshaft position (CMP) sensor connector
    - Crankshaft position (CKP) sensor A/B connector

- Exhaust gas recirculation (EGR) valve connector
- Rocker arm oil control solenoid (VTEC solenoid valve) connector
- Rocker arm oil pressure switch (VTEC oil pressure switch) connector
- Oil pressure switch connector
- Two air fuel ratio (A/F) sensor connectors
- Two secondary heated oxygen sensor (secondary HO2S) connectors

31. Install the power steering (P/S) pump (A), and tighten the bolt (B) securing the P/S hose bracket.

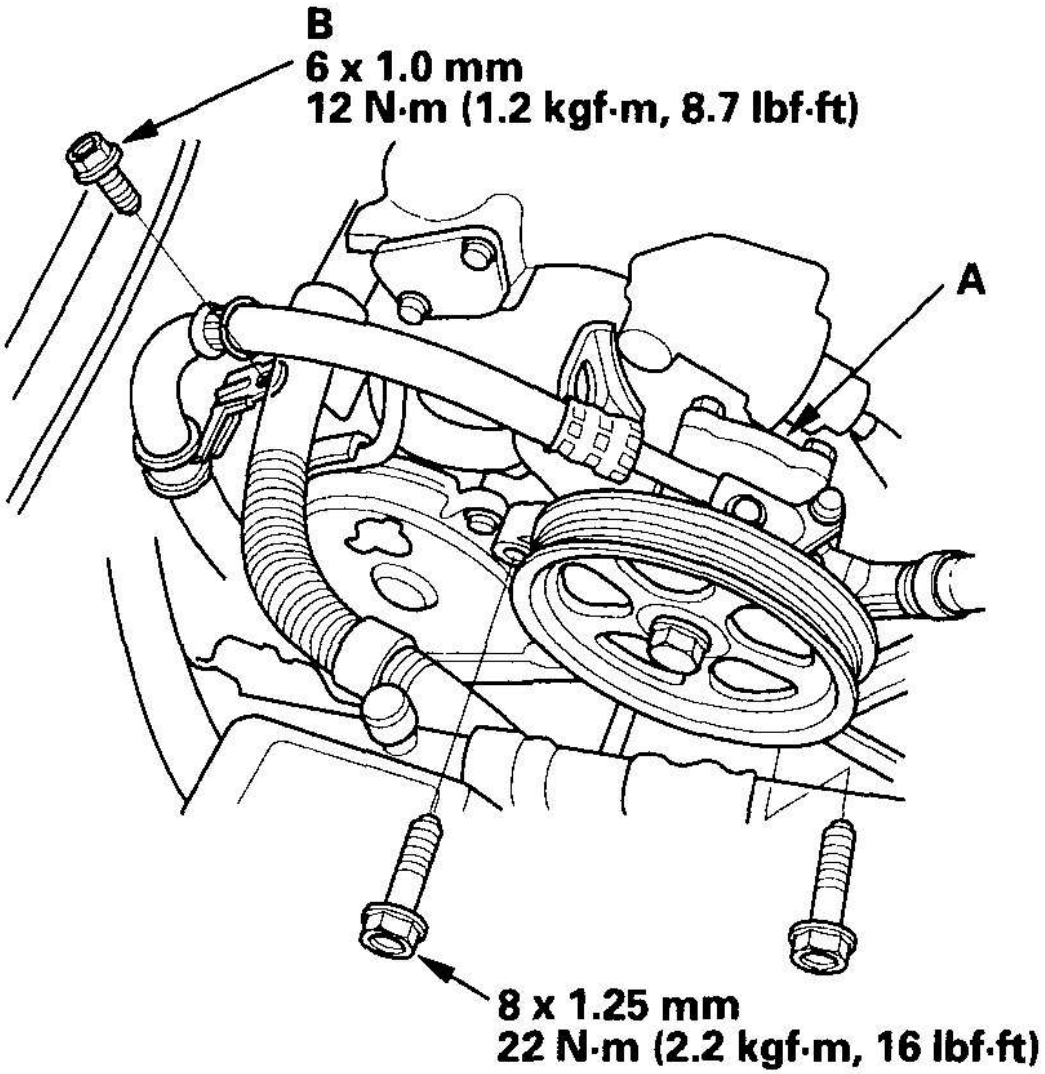

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Fig. 153: Installing P/S Pump
Courtesy of AMERICAN HONDA MOTOR CO., INC.

32. Install the alternator (see **INSTALLATION**).
33. Install the six ignition coils (see **IGNITION COIL REMOVAL/INSTALLATION**).
34. Install the drive belt (see **DRIVE BELT REPLACEMENT**).
35. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
36. After installation, check that all tubes, hoses, and connectors are installed correctly.
37. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.
38. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 8 in **COOLANT REPLACEMENT**).
39. Do the crankshaft position (CKP) pattern clear/CKP pattern learn procedure (see **CKP PATTERN CLEAR/CKP PATTERN LEARN**).
40. Reset the power window control unit (see **RESETTING THE POWER WINDOW CONTROL UNIT**).
41. Inspect the idle speed (see **IDLE SPEED INSPECTION**).
42. Inspect the ignition timing (see **IGNITION TIMING INSPECTION**).
43. Install the intake manifold cover (see **INSTALLATION**).
44. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's audio presets.
45. Set the clock.

CAMSHAFT OIL SEAL INSTALLATION - IN CAR

Special Tools Required

Camshaft oil seal driver 07PAF-0030100

1. Dry the camshaft oil seal housing.
2. Apply a light coat of multipurpose grease to the lip of the camshaft oil seal.
3. Using the special tool (A), washer (B), and a 12 x 75 x 1.25 mm bolt (C), press in the camshaft oil seal (D) about 0.5-1.5 mm (0.02-0.06 in.) below the surface of the cylinder head.

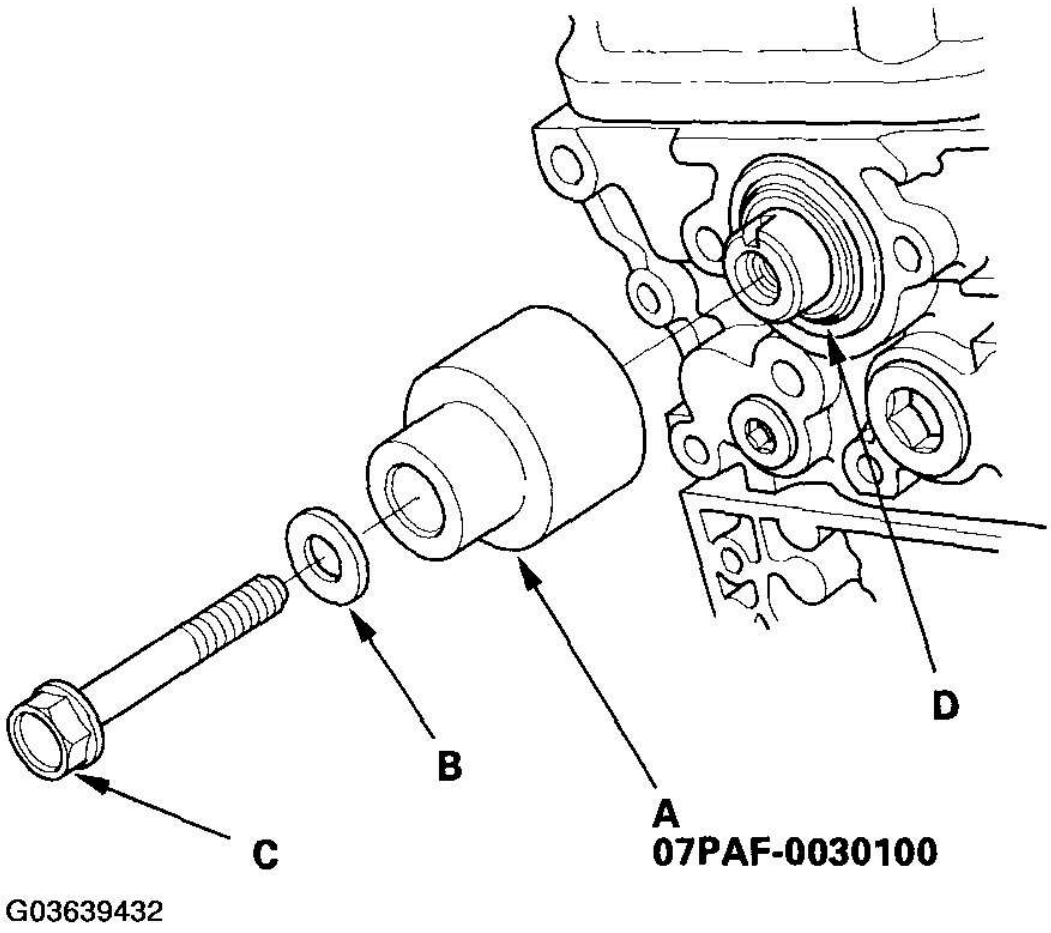

Fig. 154: Installing Camshaft Oil Seal
Courtesy of AMERICAN HONDA MOTOR CO., INC.