

PE12-019

MADZA

9/6/2012

APPENDIX 18

18a Copy of Repair Procedures

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APPENDIX 18

18a Copy of Repair Procedures

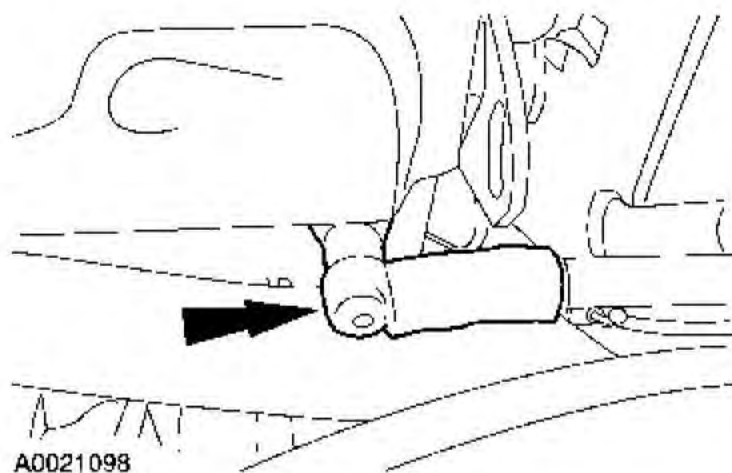
2001 Tribute

VIN or Model Year 2001 Model TRIBUTE accelerator cable bracket☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

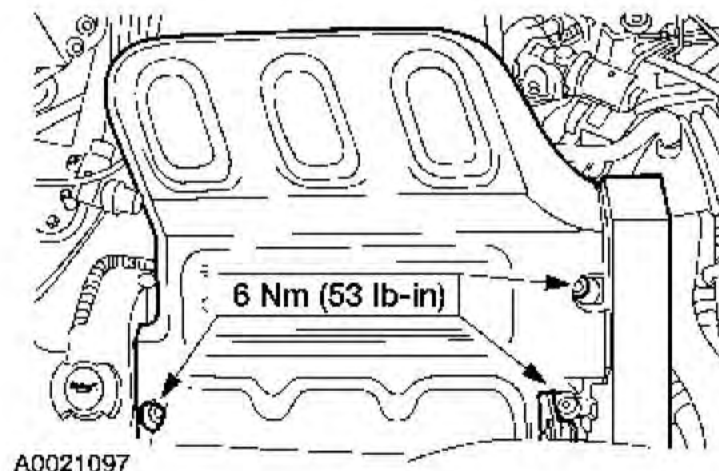
2001 - Tribute - Workshop Manual - Engine

ACCELERATOR CABLE BRACKET

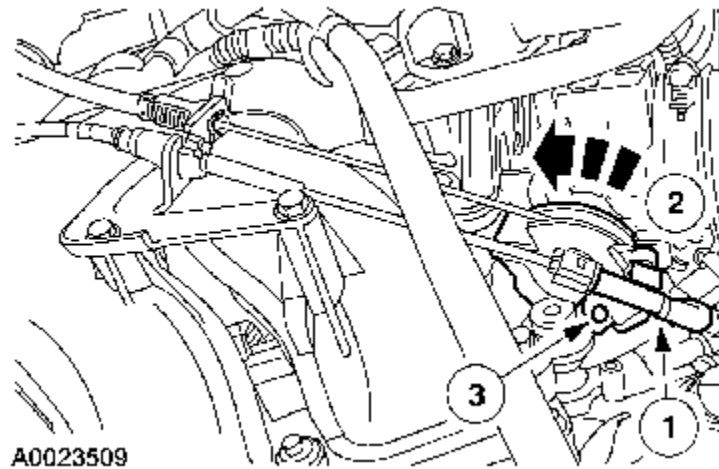
Removal and Installation



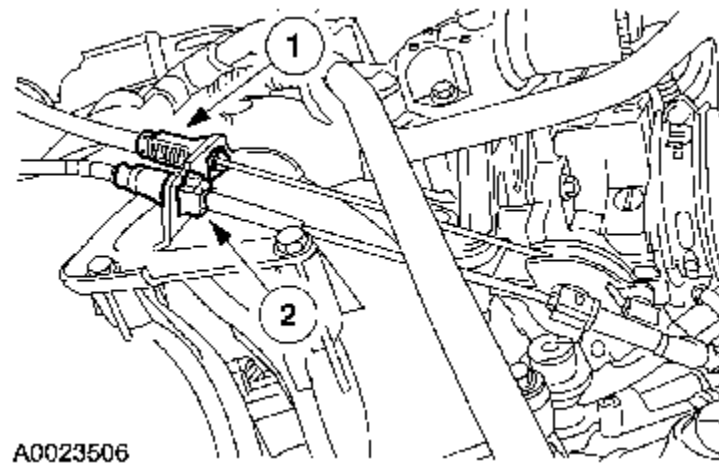
1. Disconnect the crankcase ventilation hose.



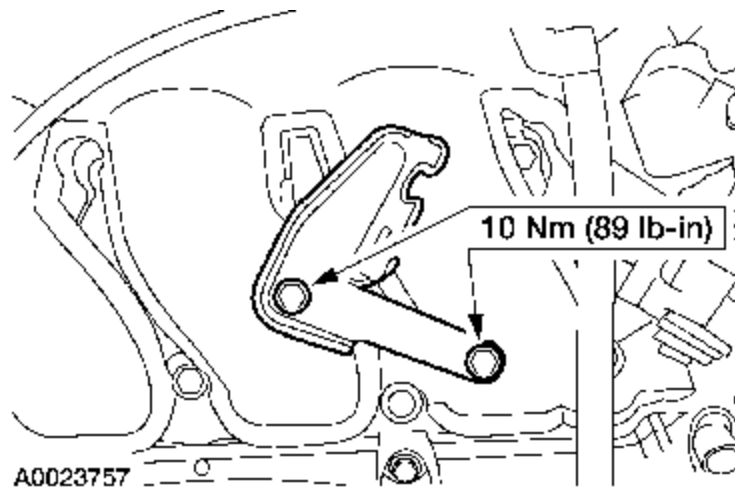
1. Remove the bolt, nuts and the engine appearance cover.



1. Disconnect the throttle control linkage from the throttle lever.
 - a. If equipped, disconnect the cruise control cable from the throttle lever.
 - b. Rotate the throttle lever.
 - c. Slide the accelerator cable end out of the throttle lever.



1. Disconnect the throttle control linkage from the accelerator cable bracket.
 - a. Disconnect the accelerator cable from the bracket.
 - b. If equipped, squeeze the tabs and disconnect the cruise control cable from the accelerator cable bracket.



1. Remove the bolts and the accelerator cable bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE camshafts

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

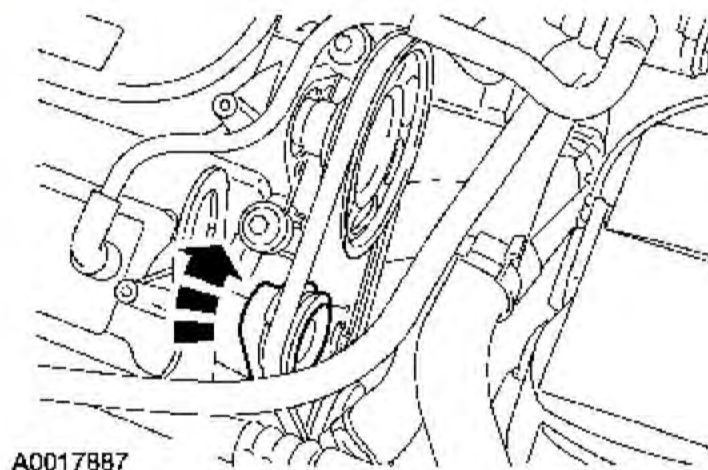
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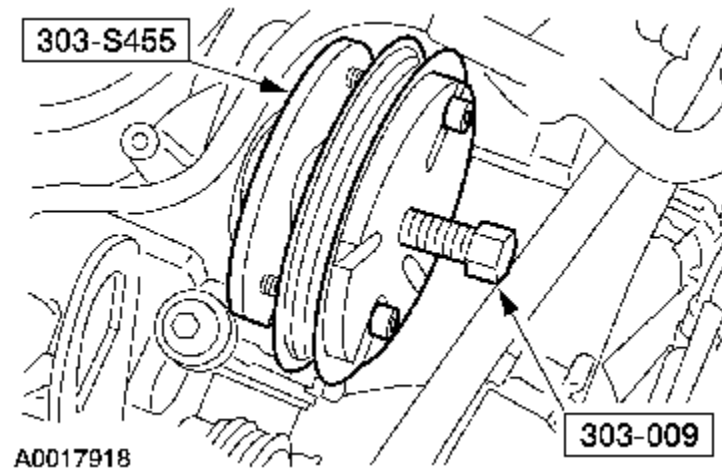
CAMSHAFTS -- LH

Removal

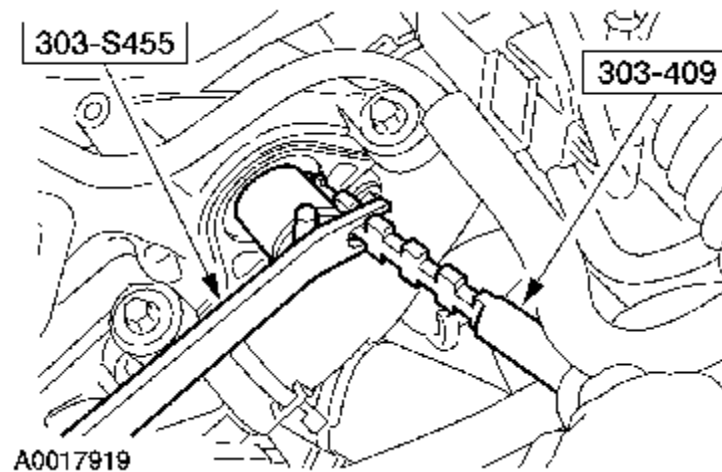
1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).



1. Rotate the belt tensioner clockwise, towards the camshaft drive pulley to release the drive belt tension and remove the belt.



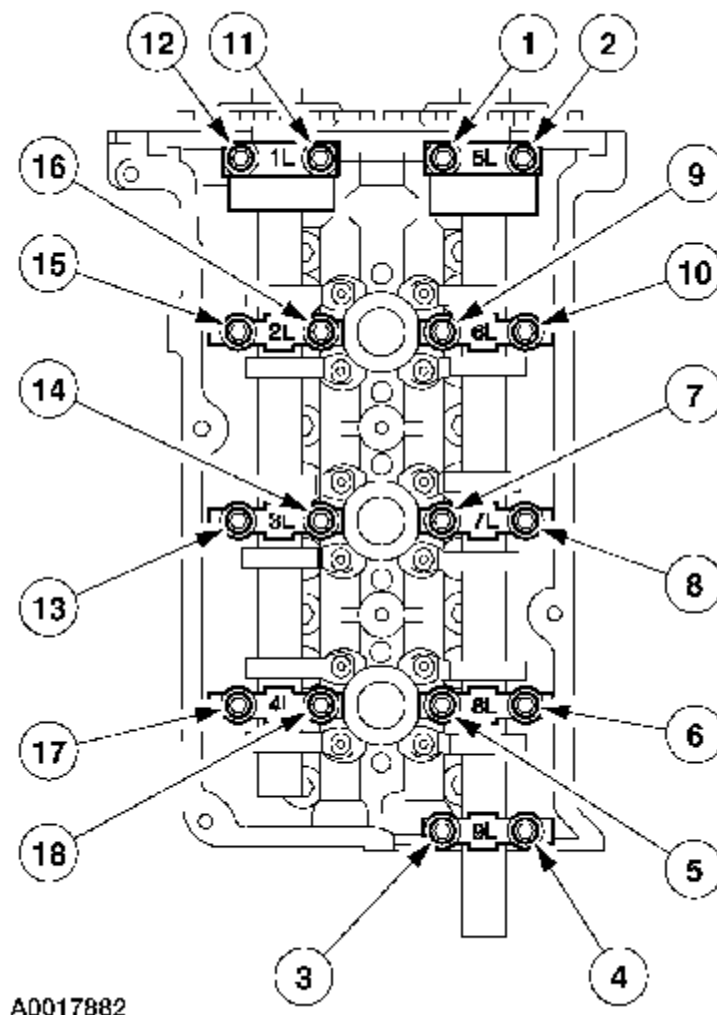
1. Using the special tools remove the water pump drive pulley.



- 1.

NOTE:

In order to assure correct sealing do not scratch the camshaft. Using the special tools, remove the camshaft oil seal.

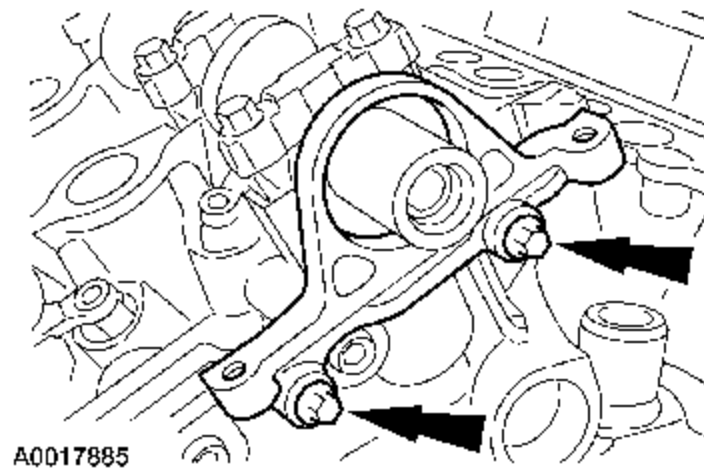


A0017882

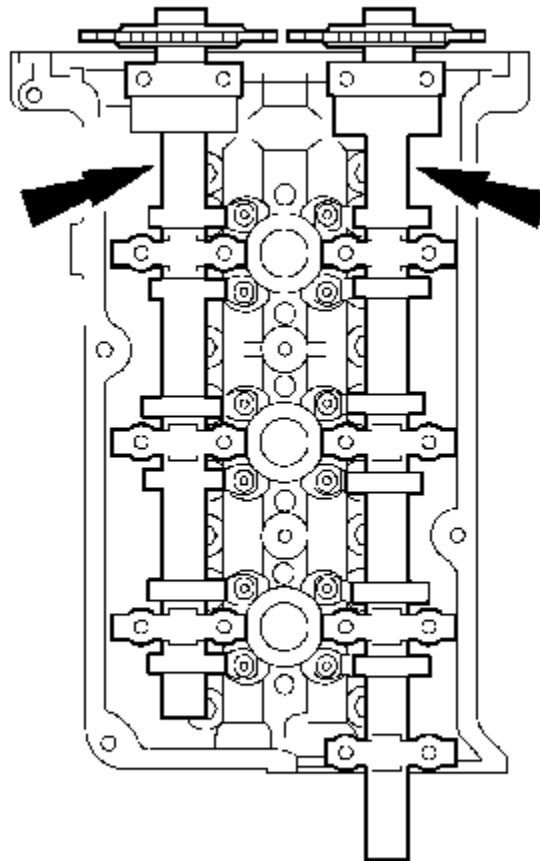
1.

CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the LH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.

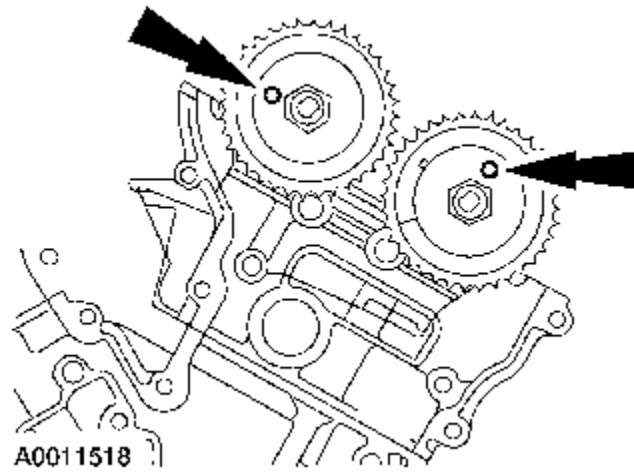


1. Remove the intake camshaft oil seal retainer.



1. Remove the camshafts.

Installation

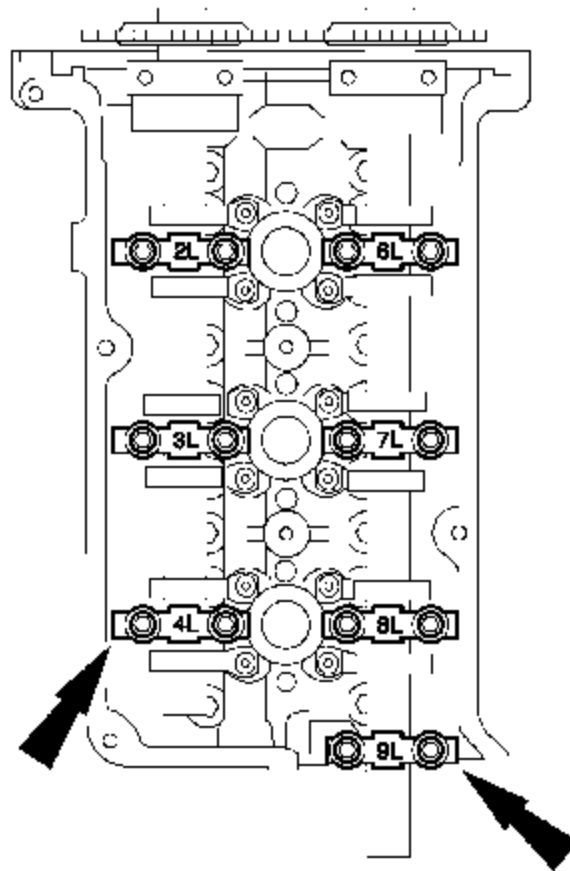


1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

- a. Align the camshafts as shown.

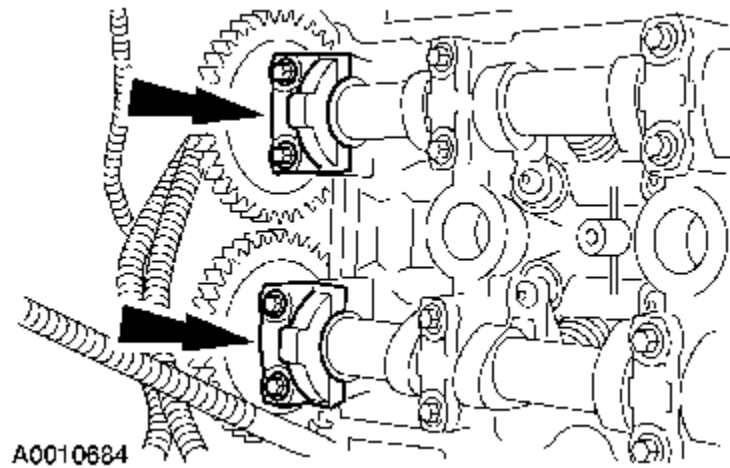


A0017886

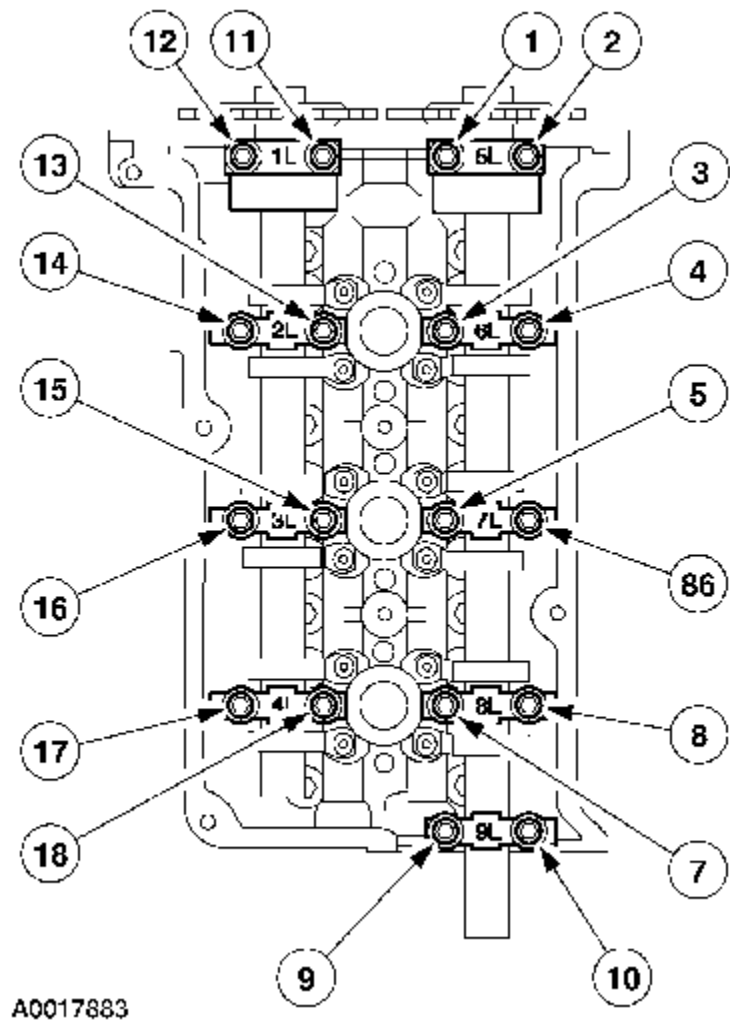
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil. Install the bearing caps and loosely install the bolts.

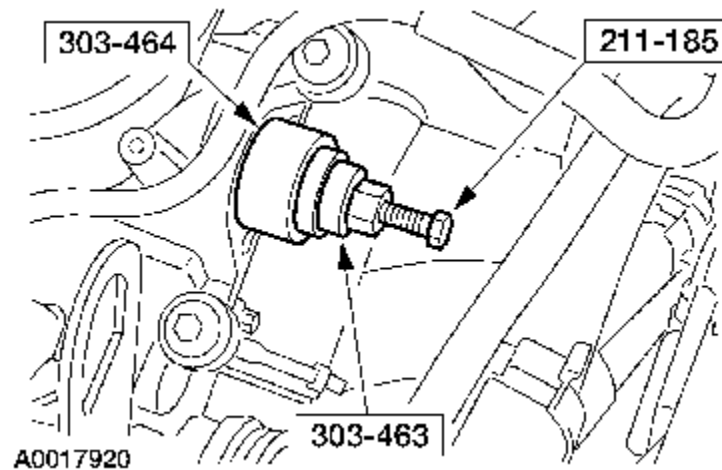


1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil. Install the bearing thrust caps and loosely install the bolts.



1. Tighten the bolts in the sequence shown.

2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

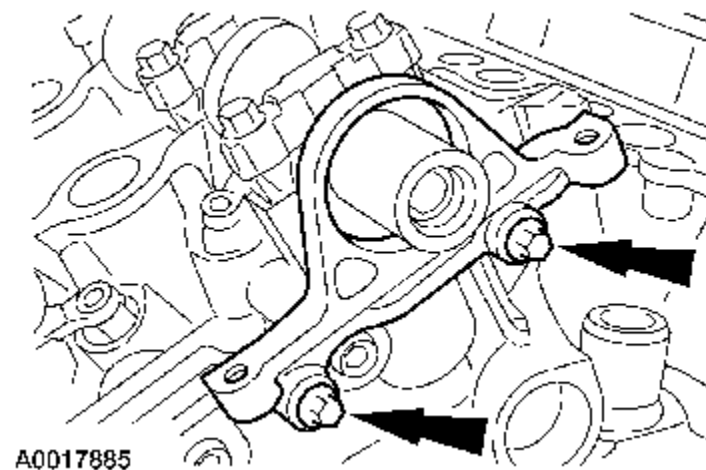


1. Install the new camshaft oil seal.

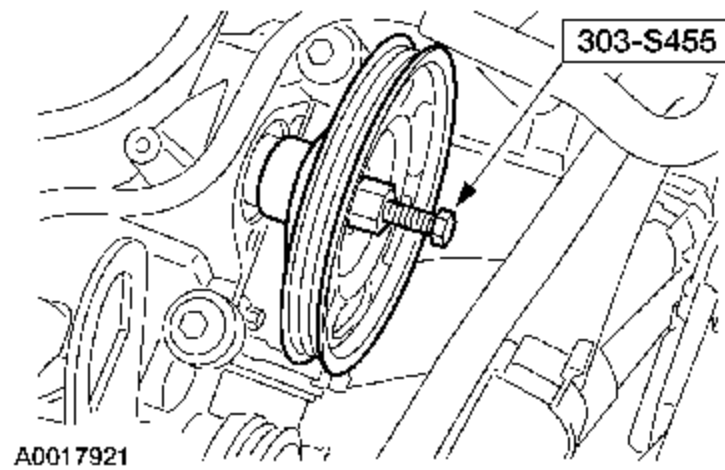
NOTE:

Lubricate the camshaft oil seal with SAE 5W-30 motor oil.

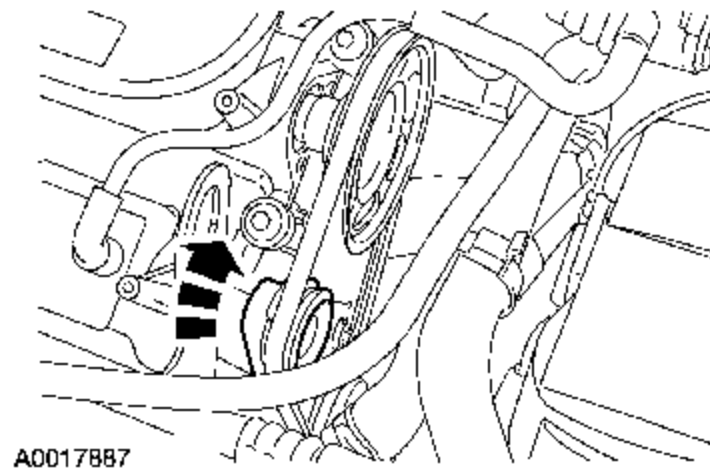
Using special tools positioned over the oil seal, turn to install to the seal.



1. Install camshaft oil seal retainer.



1. Using special tool, install the water pump drive pulley.



1. Rotate the belt tensioner clockwise, towards the camshaft drive pulley to release the drive belt tension and install the belt.

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☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

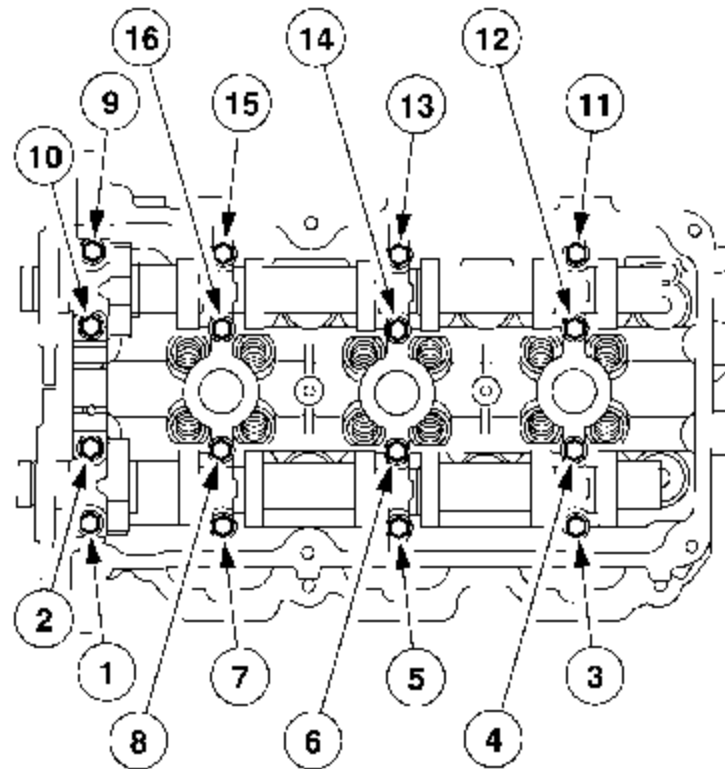
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2001 - Tribute - Workshop Manual - Engine

CAMSHAFTS -- RH

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

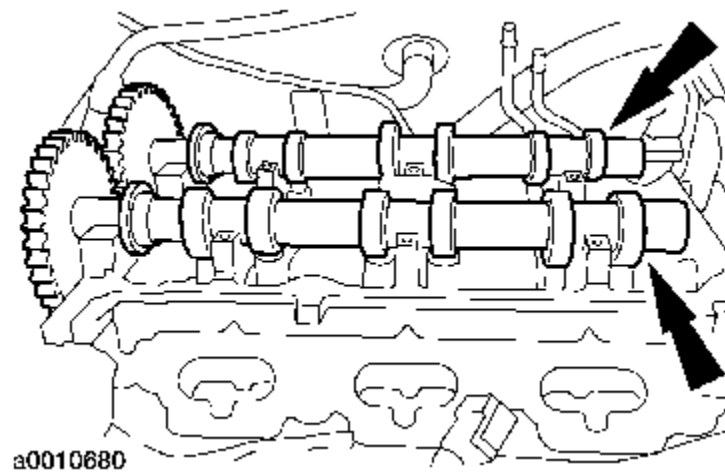


A0010679

1.

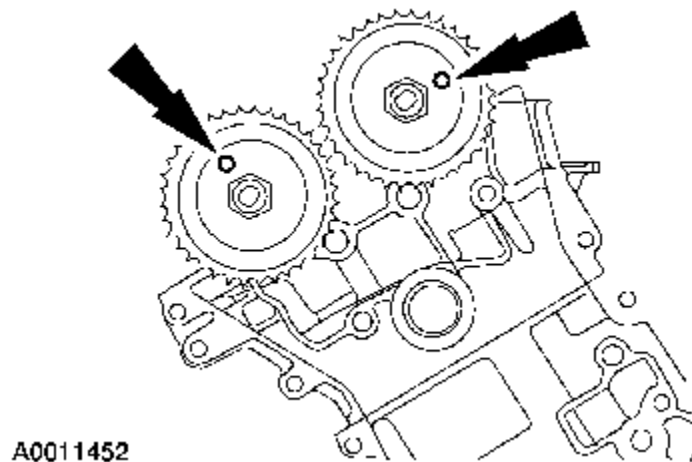
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the RH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



1. Remove the camshafts.

Installation

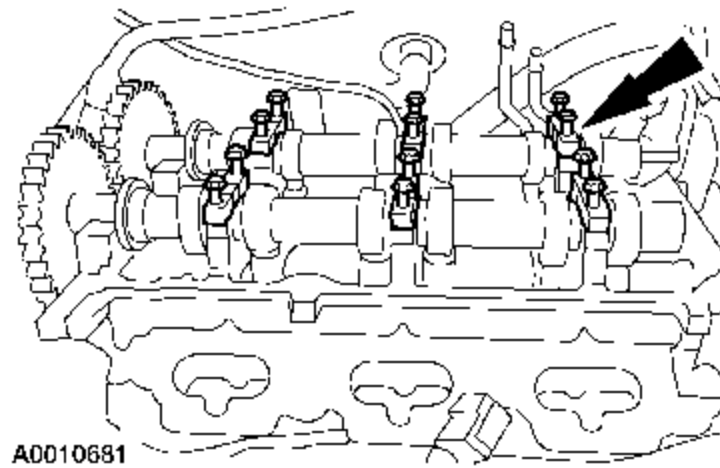


- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

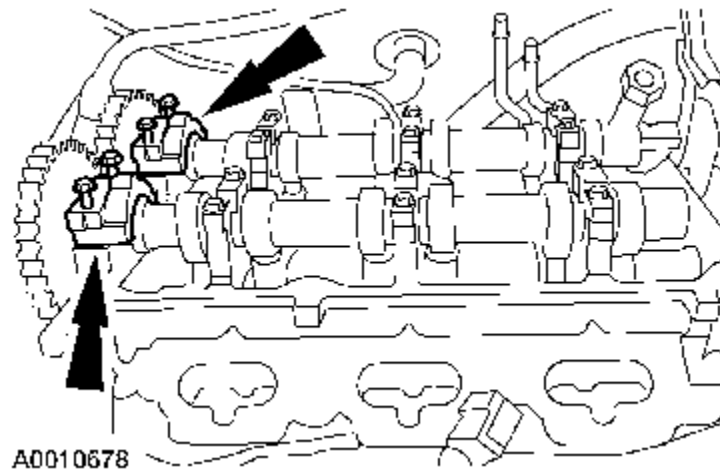
- a. Align the camshafts as shown.



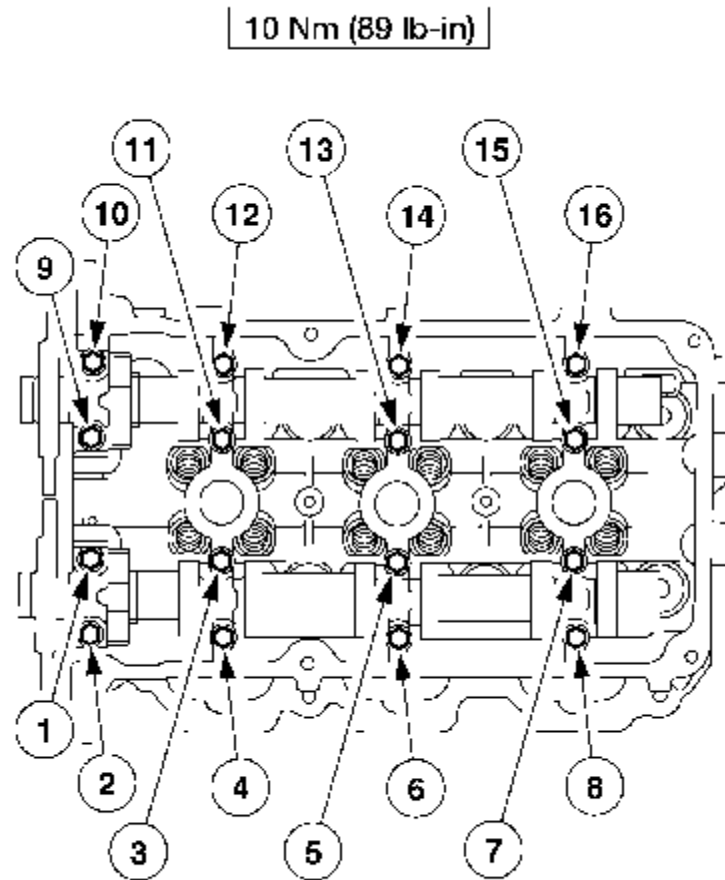
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil and install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil . Install the bearing thrust caps and loosely install the bolts.



A0010682

1. Tighten the bolts in the sequence shown.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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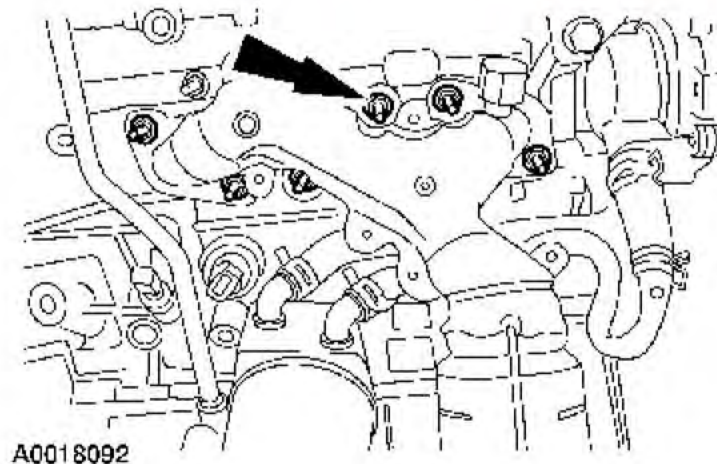
VIN or Model Year 2001 Model TRIBUTE Hydraulic Lash Adjuster☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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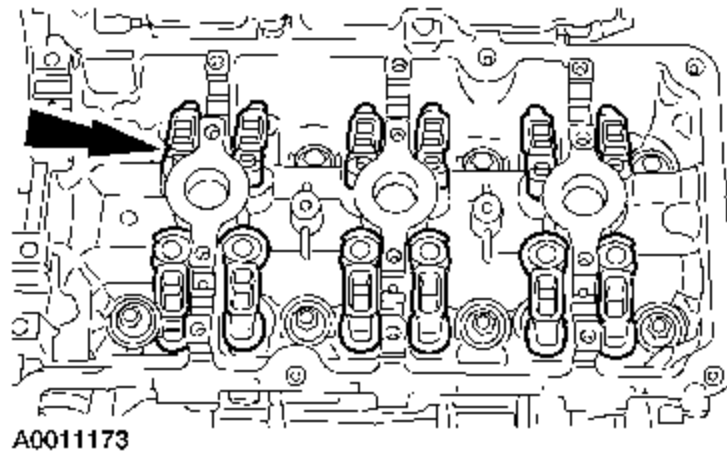
CYLINDER HEAD -- LH

Removal

1. Remove the LH camshafts. Refer to [01-10C CAMSHAFTS -- LH](#).
2. Remove the coolant bypass tube. Refer to [01-12B BYPASS TUBE -- 3.0L \(4V\)](#).



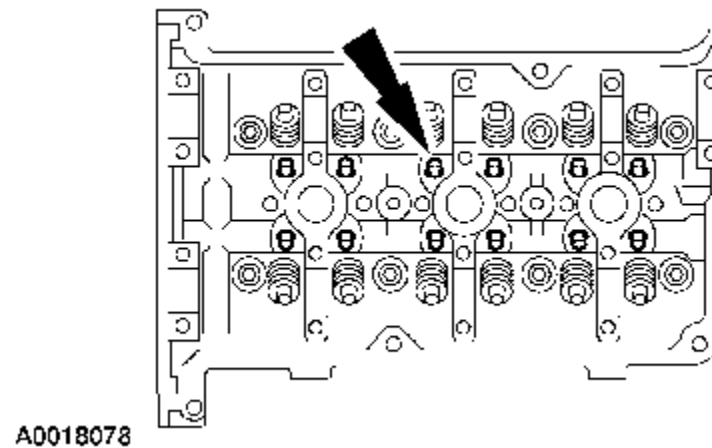
1. Remove the LH exhaust manifold nuts.



1.

CAUTION:

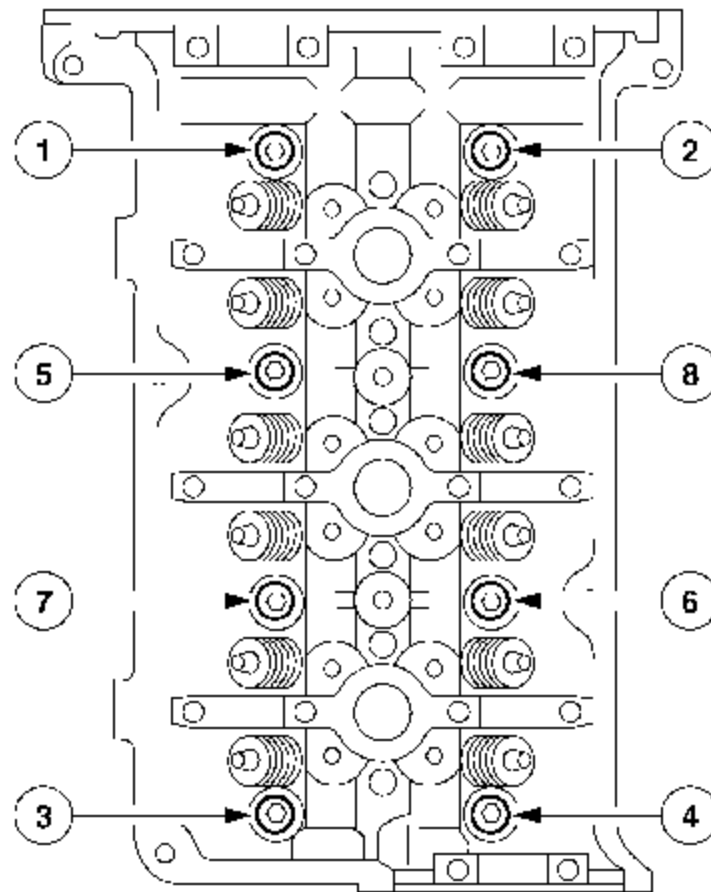
The camshaft followers must be installed in their original position. Remove the camshaft followers.



1.

CAUTION:

The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.



A0017922

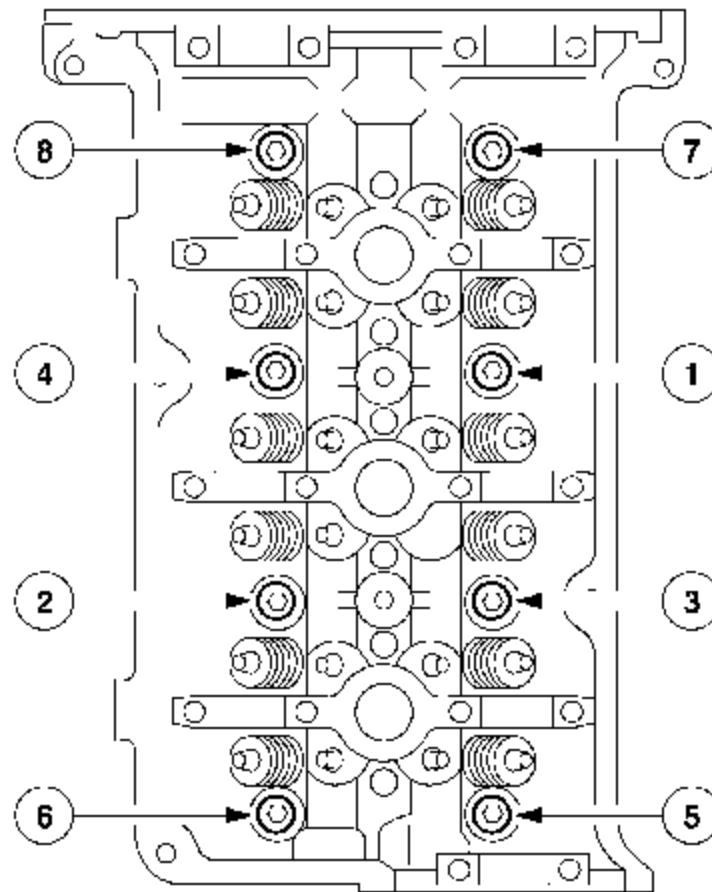
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- a. Discard the gasket and the bolts.

Installation



A0017924

1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

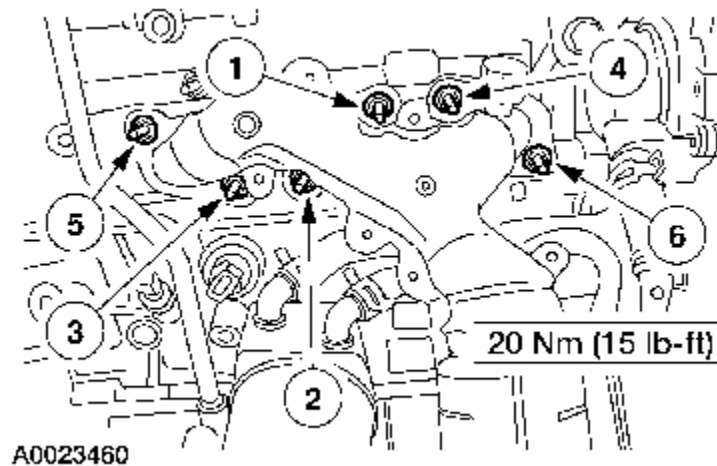
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

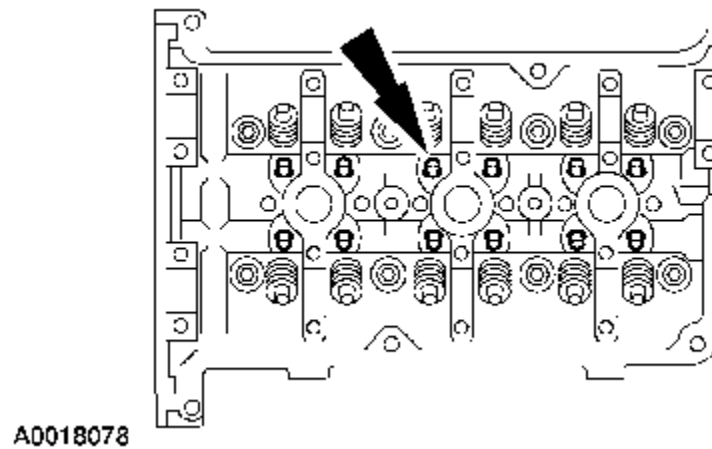
Position the LH cylinder head, gasket and install the bolts in the sequence shown.

- a. Tighten the bolts in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).

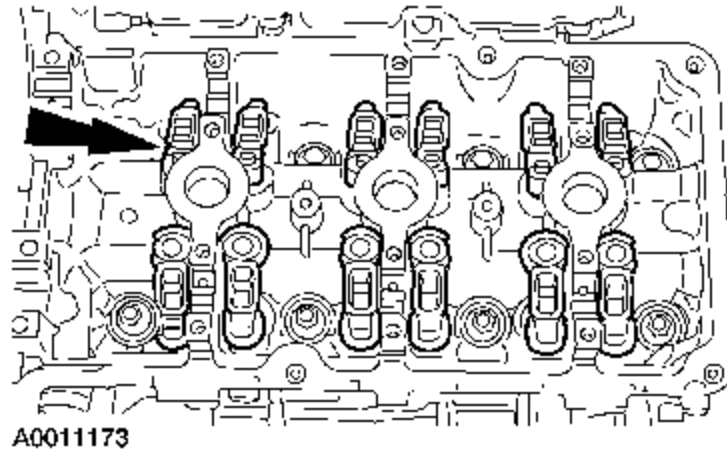
- c. Stage 2: Tighten bolts 90 degrees.
- d. Stage 3: Loosen one full turn.
- e. Stage 4: Tighten to 40 Nm (30 lb-ft).
- f. Stage 5: Tighten 90 degrees.
- g. Stage 6: Tighten 90 degrees.



- 1. Install the LH exhaust manifold nuts in the sequence shown.



- 1. Install the hydraulic lash adjusters.
 - a. Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.
 - a. Lubricate the camshaft followers with SAE 5W-20 motor oil.
2. Install the LH camshafts. Refer to [01-10C CAMSHAFTS -- LH](#).
3. Install the coolant bypass tube. Refer to [01-12B BYPASS TUBE -- 3.0L \(4V\)](#).

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VIN or Model Year 2001 Model TRIBUTE Hydraulic Lash Adjuster

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

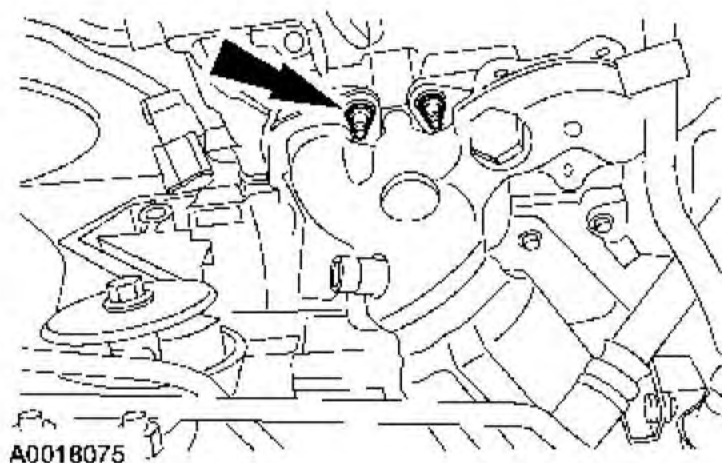
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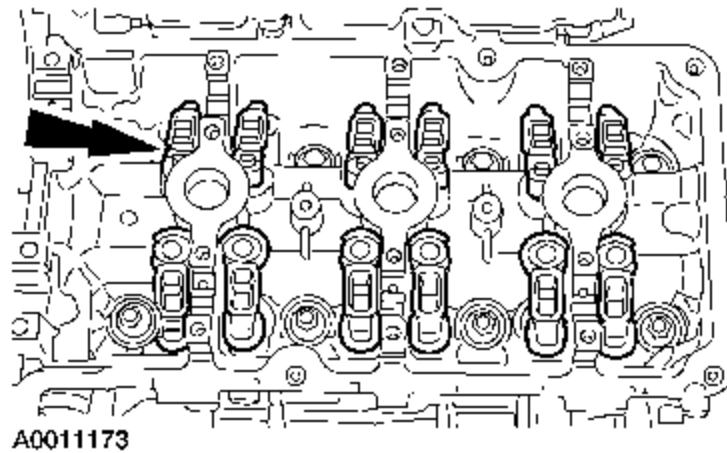
CYLINDER HEAD -- RH

Removal

1. Remove the coolant bypass tube. Refer to [01-12B BYPASS TUBE -- 3.0L \(4V\)](#).
2. Remove the exhaust gas recirculation (EGR) tube. Refer to [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE -- 3.0L \(4V\)](#).



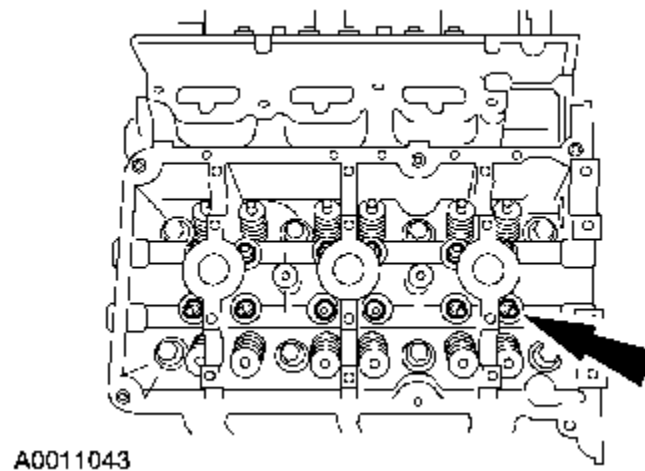
1. Remove the six nuts from the RH exhaust manifold.
2. Remove the RH camshafts. Refer to [01-10C CAMSHAFTS -- RH](#).



1.

CAUTION:

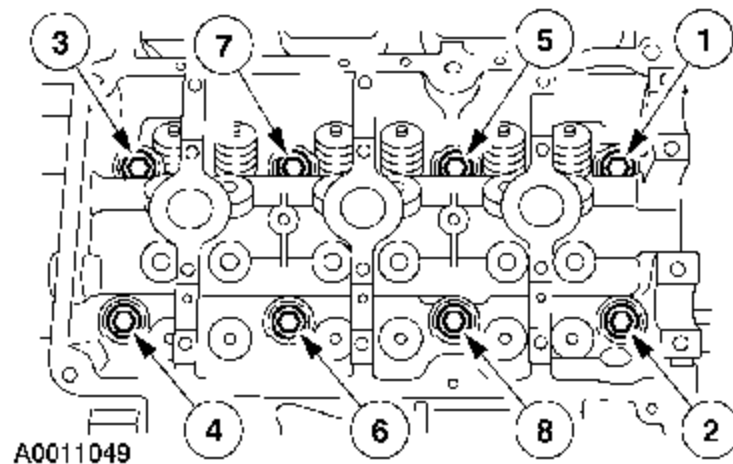
The camshaft followers must be installed in their original positions. Remove the camshaft followers.



1.

CAUTION:

The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.



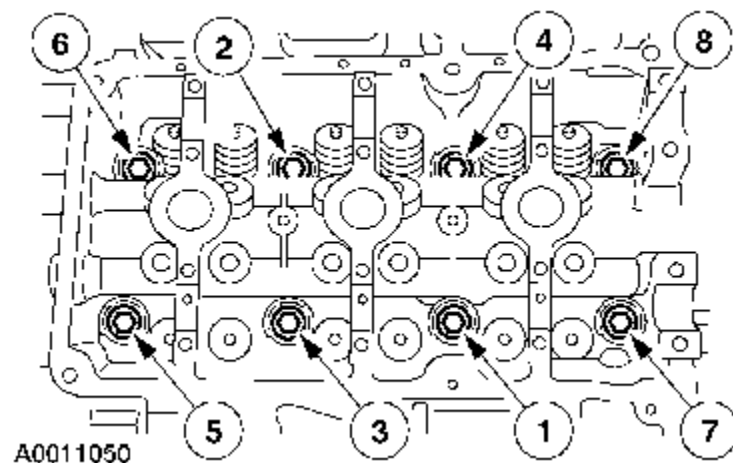
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- a. Discard the gasket and the bolts.

Installation



1.

CAUTION:

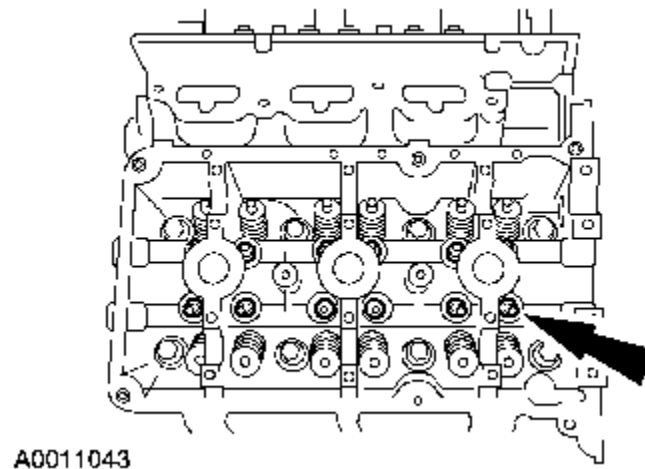
Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

NOTE:

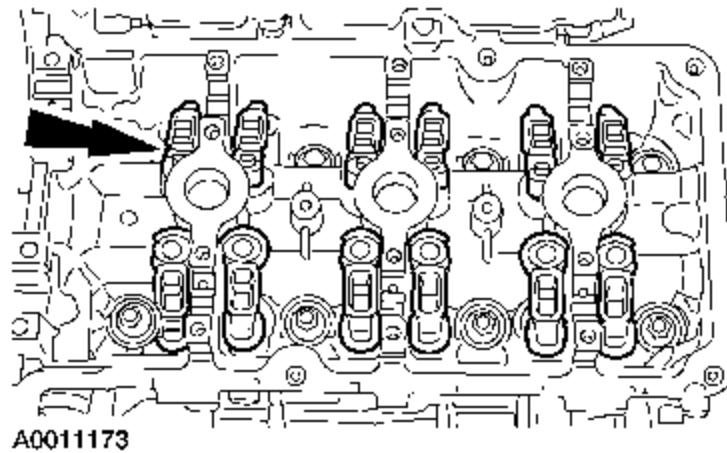
The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

Position the RH cylinder head, gasket and install the bolts in the sequence shown.

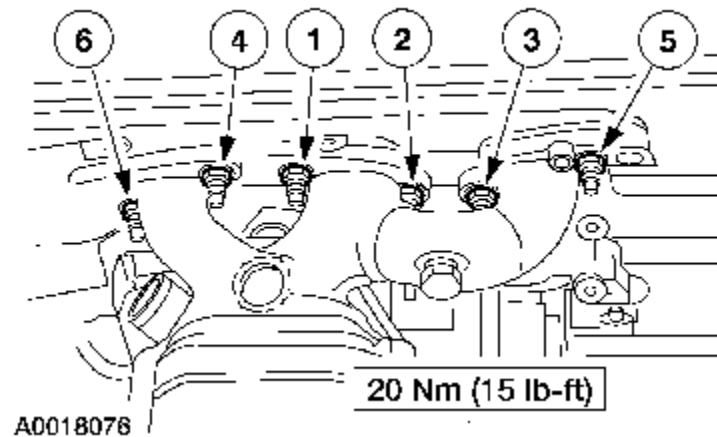
- a. Tighten the bolts in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).
- c. Stage 2: Tighten bolts 90 degrees.
- d. Stage 3: Loosen one full turn.
- e. Stage 4: Tighten to 40 Nm (30 lb-ft).
- f. Stage 5: Tighten 90 degrees.
- g. Stage 6: Tighten 90 degrees.



1. Install the hydraulic lash adjusters.
 - a. Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.
 - a. Lubricate the camshaft followers with SAE 5W-20 motor oil.
2. Install the RH camshafts. Refer to [01-10C CAMSHAFTS -- RH](#).
3. Install the coolant bypass tube. Refer to [01-12B BYPASS TUBE -- 3.0L \(4V\)](#).



1. Install RH exhaust manifold nuts in the sequence shown.
2. Install the exhaust gas recirculation (EGR) tube. Refer to [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE -- 3.0L \(4V\)](#).

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VIN or Model Year 2001 Model TRIBUTE engine assemblyGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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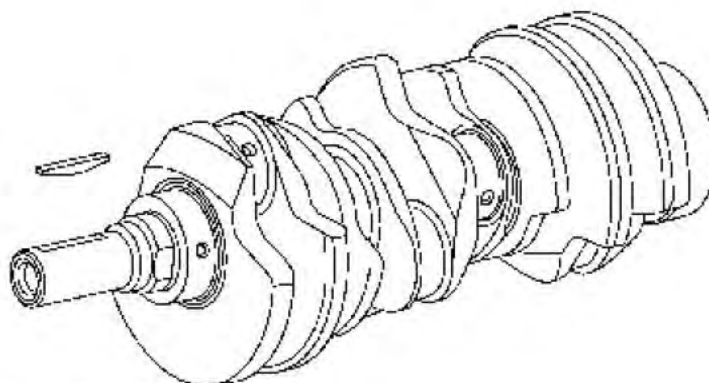
ENGINE

Assembly

1.

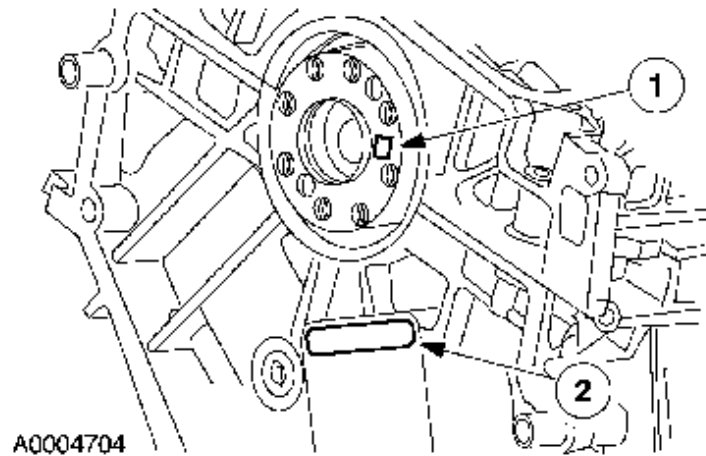
WARNING:

Eye protection is required to be worn during the use of compressed air. Failure to wear eye protection could result in possible personal injury. Clean gasket material, dirt and foreign material from the cylinder block. Wash the cylinder block with a suitable soap and water solution, and dry with compressed air.



A0004226

1. If removed, install the crankshaft key into the keyway on the crankshaft.



1.

NOTE:

This procedure is for selecting bearings using a new crankshaft. Select the crankshaft main bearings for each crankshaft journal.

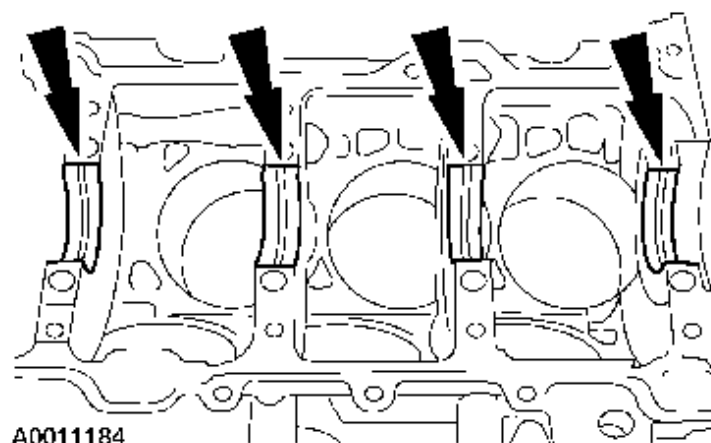
- a. Read the code on the crankshaft flange.
- b. Read the code on the cylinder block rear face.
- c. The first two numbers after the asterisk make up the code for main No. 1 and the next two numbers for main No. 2.
- d. The first two numbers after the second asterisk make up the code for main No. 3 and the last two numbers for main No. 4.

CRANKSHAFT CODE	BLOCK CODE																							
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
88	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
87	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
86	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
85	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
84	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
83	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
82	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
81	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
79	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
78	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
77	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
76	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
75	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
74	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
73	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
72	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
71	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
70	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
69	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
68	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3

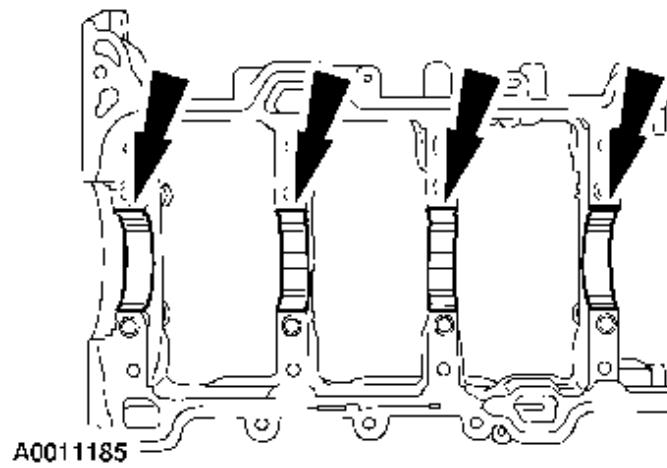
A0004705

1. Using the chart, choose a bearing for each main. Match the block and crankshaft code with its corresponding column or row, by reading across the "crankshaft" row and down the "block" column.

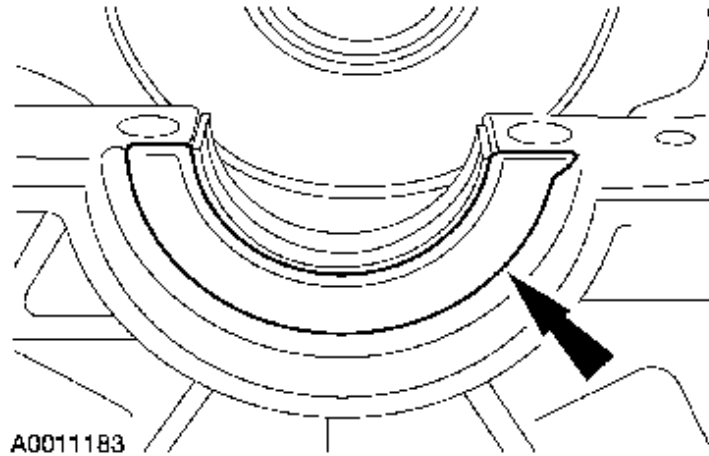
a. For example: If the block code is *0609*0711* and the crankshaft code is *8480*8082*, main No. 1 should use grade 1 bearings, as determined by the intersection of the 06 block column and the 84 crankshaft row. Mains 2,3 and 4 should all be grade 2.



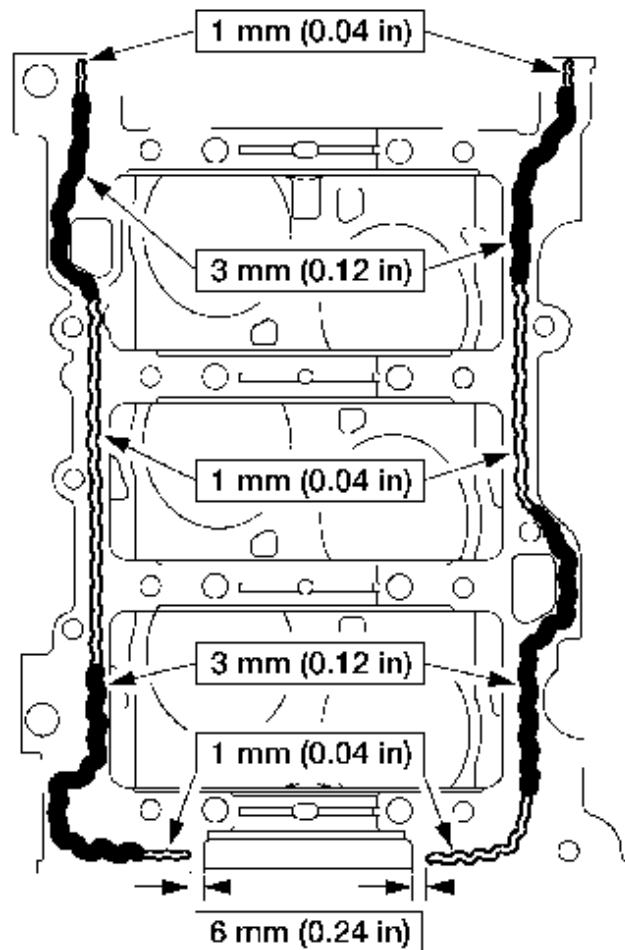
1. Install the main bearings into the cylinder block.



1. Install the main bearings into the lower cylinder block.



1. Install the crankshaft thrust bearing.



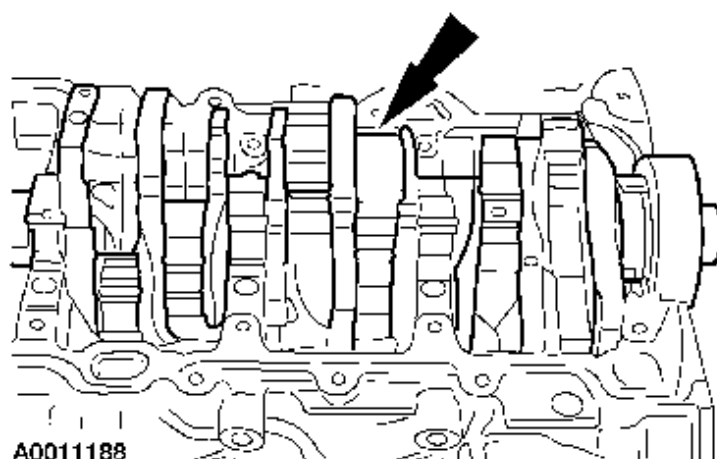
A0011187

1.

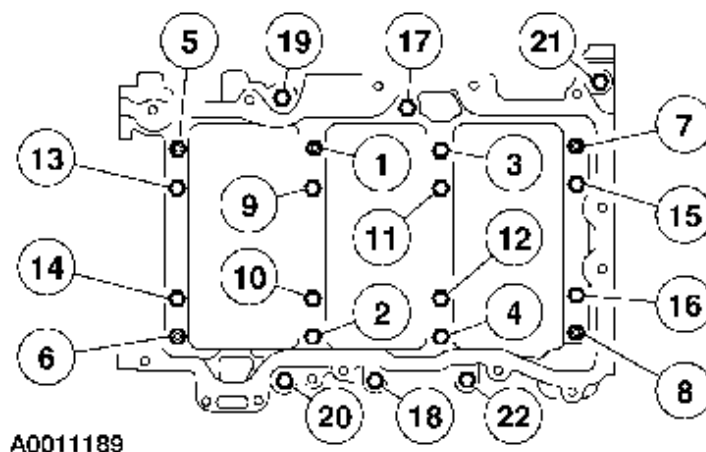
CAUTION:

The lower cylinder block must be installed and the bolts tightened within four minutes of applying the sealant. Apply Silicone Gasket and Sealant to the cylinder block as shown.

2. Apply SAE 5W-20 motor oil to the crankshaft main and rod bearing journals.



1. Position the crankshaft in the cylinder block.

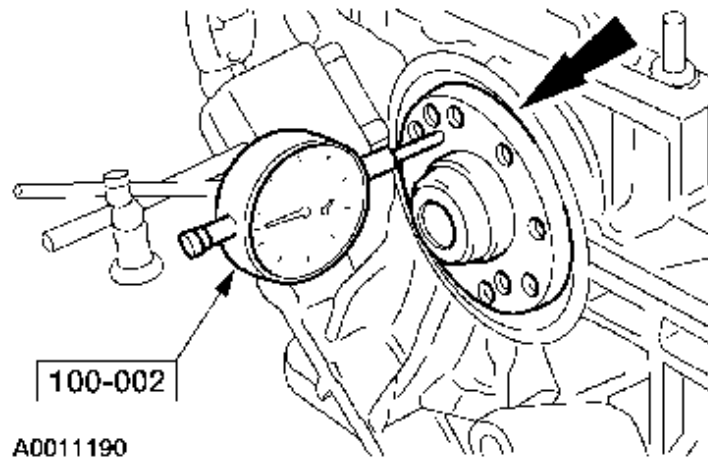


- 1.

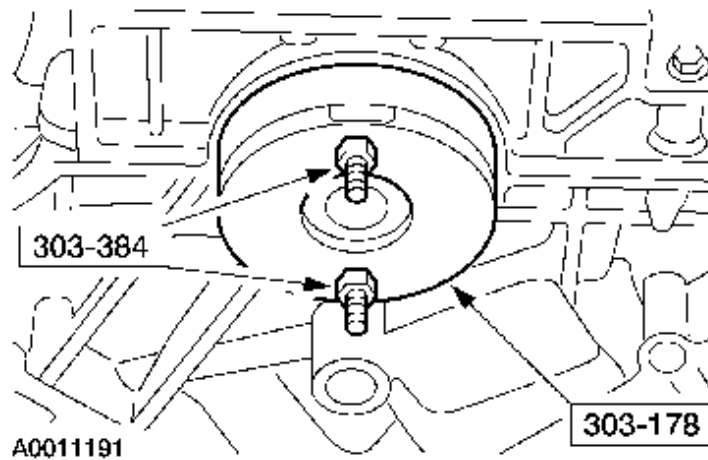
CAUTION:

Fasteners No. 1, 5, 6, 7, 8 are studs. Fasteners No. 18–22 are M8 x 1.25 mm x 79.3 mm (0.05 in x 3.12 in) bolts. Fasteners No. 2–4, 17 are M8 x 1.25 mm x 95.3 mm (0.05 in x 3.75 in) bolts. Fasteners 9–16 are M10 x 1.5 mm x 106 mm (0.06 in x 4.17 in) bolts. The bolts and studs must be installed in the correct position or engine damage may result. Position the lower cylinder block and install the bolts and studs.

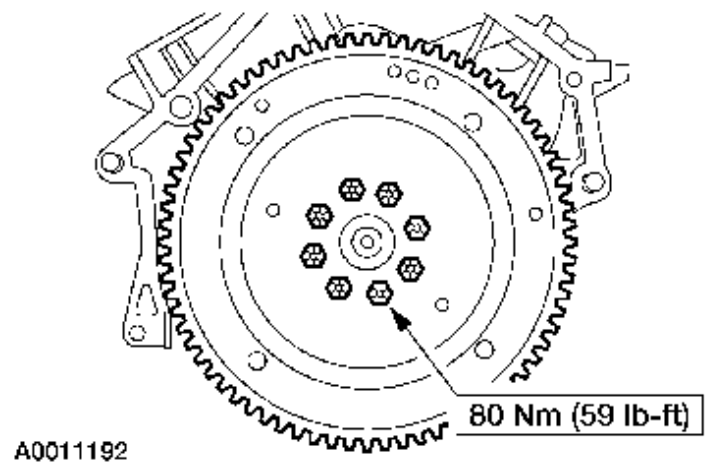
- a. Tighten the bolts and studs in the sequence shown in four stages.
- b. Stage 1: Tighten fasteners 1–8 to 25 Nm (18 lb-ft).
- c. Stage 2: Tighten fasteners 9–19 to 40 Nm (30 lb-ft).
- d. Stage 3: Tighten fasteners 1–16 90 degrees.
- e. Stage 4: Tighten fasteners 17–22 to 25 Nm (18 lb-ft).



1. Using the special tool, measure the crankshaft end play. Refer to [01-10A CRANKSHAFT - END PLAY](#).

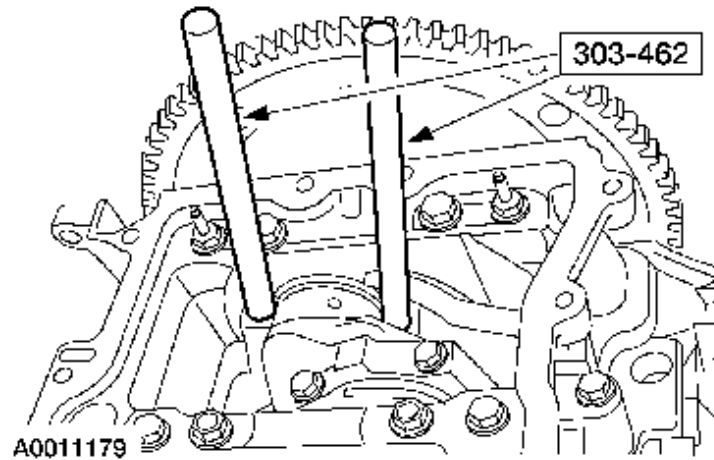


1. Using the special tool, install the crankshaft rear oil seal.

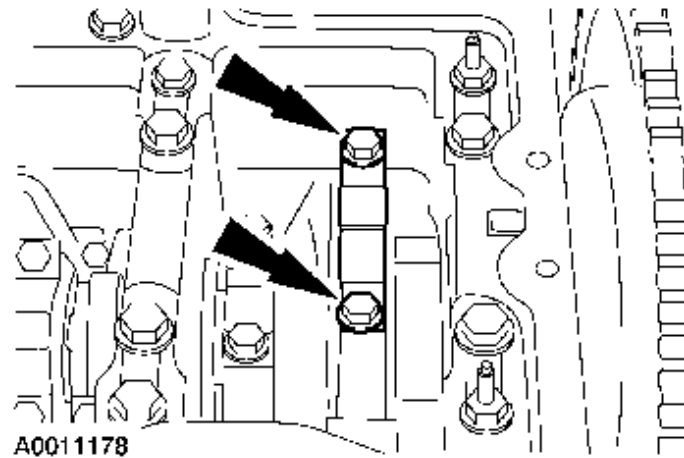


1. Position the flexplate and install the bolts.

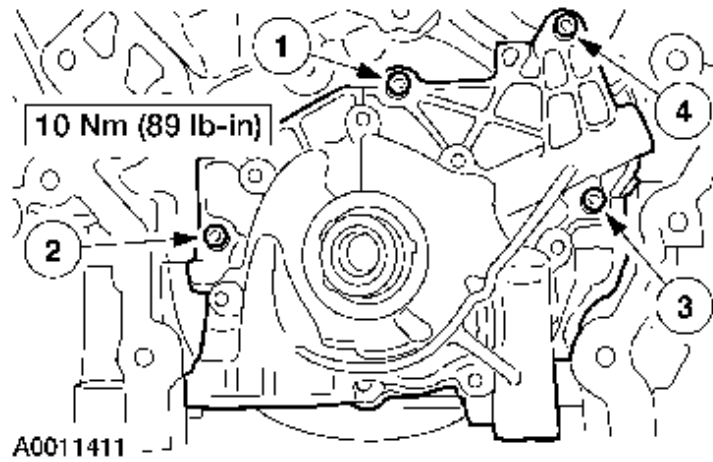
2. Mount the engine on an engine stand.
3. Apply SAE 5W-20 motor oil to the cylinder bores.



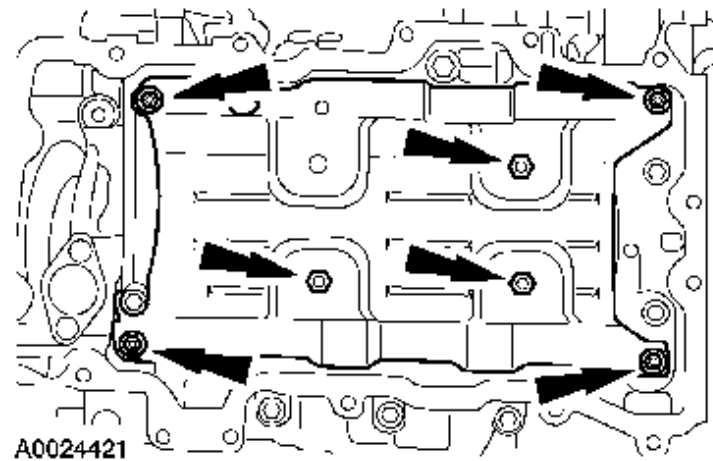
1. Using the special tools, install the piston and connecting rod assemblies.



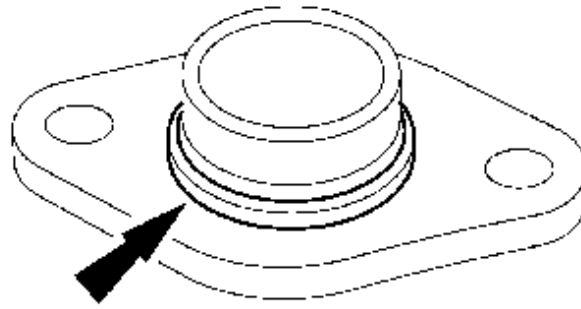
1. Install the connecting rod caps and bolts.
 - a. Tighten the bolts in two stages.
 - b. Stage 1: Tighten to 23 Nm (17 lb-ft).
 - c. Stage 2: Tighten to 43 Nm (32 lb-ft).



1. Position the oil pump and install the bolts in the indicated sequence.

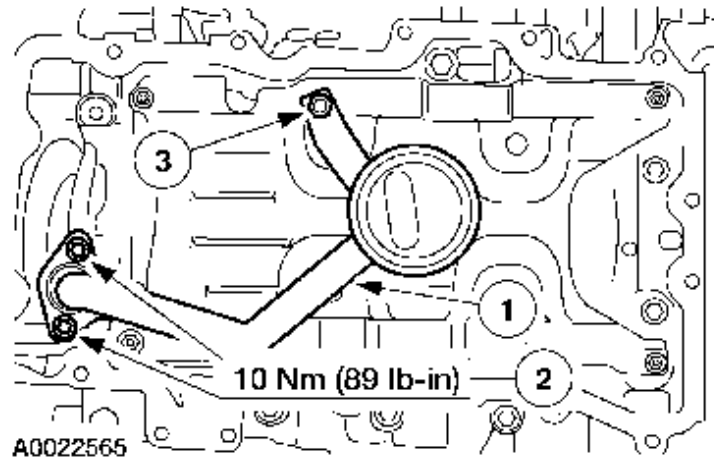


1. Position the oil pan baffle and install the nuts.
 - a. Tighten the nuts in two stages.
 - b. Stage 1: Tighten to 5 Nm (44 lb-in).
 - c. Stage 2: Tighten 45 degrees.

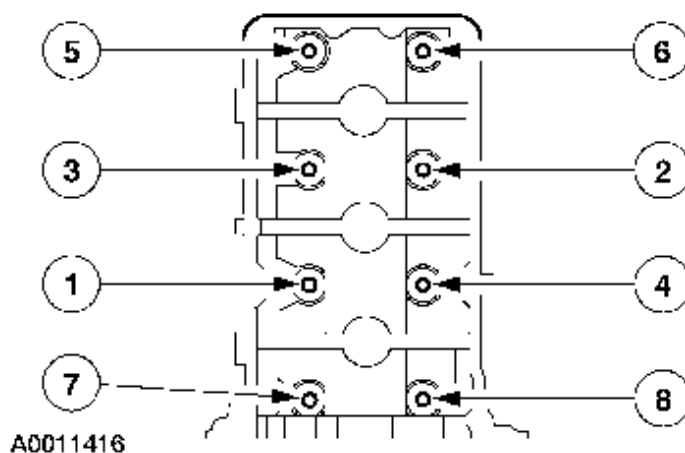


A0011413

1. Install a new O-ring seal on the oil pump screen and pick-up tube.



1. Install the oil pump screen and pick up tube.
 - a. Position the oil pump screen and pick up tube.
 - b. Install the bolts.
 - c. Install the nut.
 - i. Tighten the nut in two stages.
 - ii. Stage 1: Tighten to 5 Nm (44 lb-in).
 - iii. Stage 2: Tighten 45 degrees.

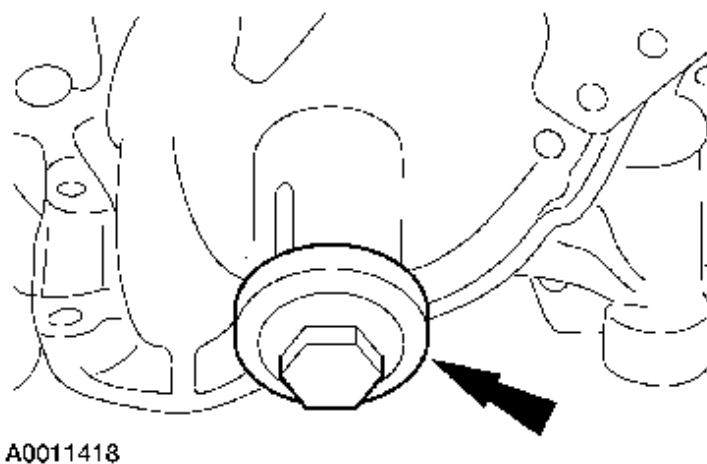


1.

NOTE:

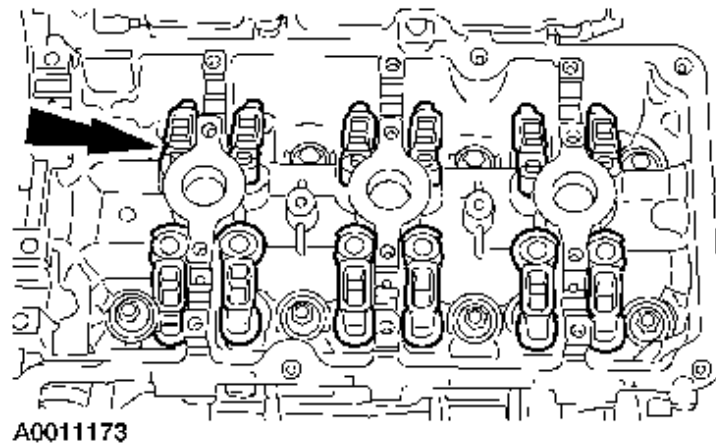
LH shown, RH similar. Position the LH and RH cylinder heads, gaskets, and install the bolts.

- a. Tighten the bolts in the sequence shown in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).
- c. Stage 2: Tighten to 90 Nm (66 lb-ft).
- d. Stage 3: Loosen one full turn.
- e. Stage 4: Tighten to 40 Nm (30 lb-ft).
- f. Stage 5: Tighten 90 degrees.
- g. Stage 6: Tighten 90 degrees.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position to locate top dead center (TDC).

2. Apply SAE 5W-20 motor oil to the LH and RH camshaft followers.



- 1.

CAUTION:

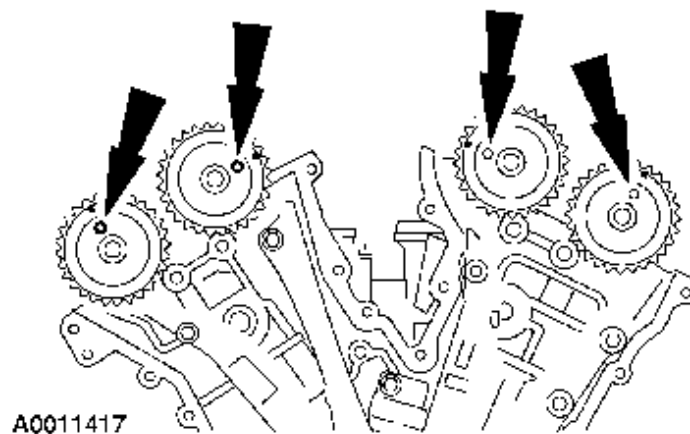
The camshaft followers must be installed in the original position.

NOTE:

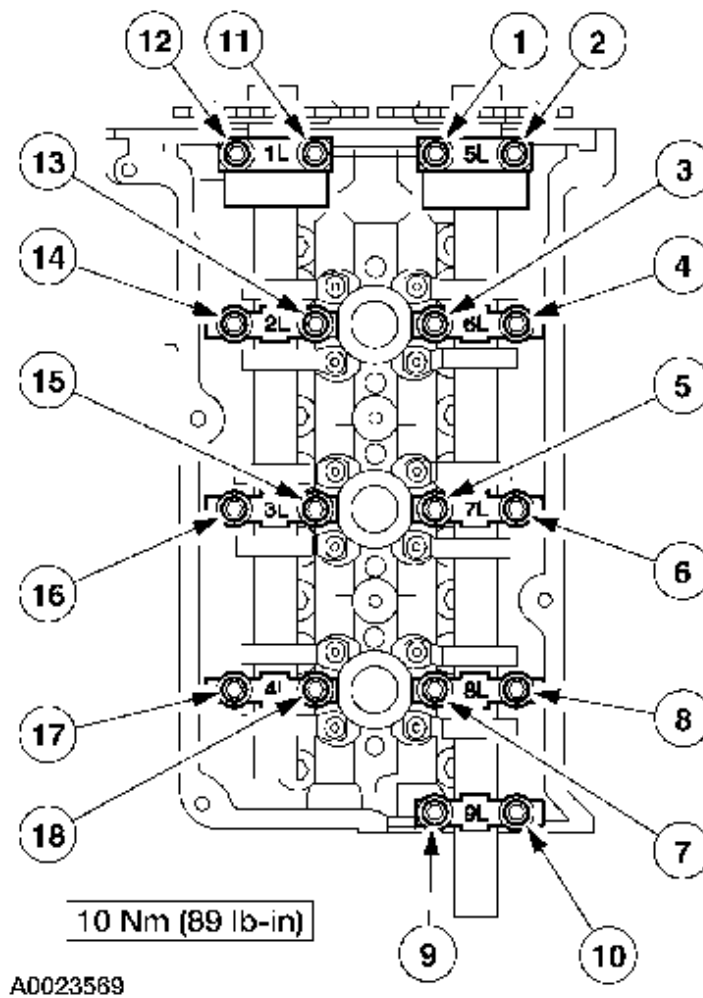
RH shown, LH similar.

Install the LH and RH camshaft followers.

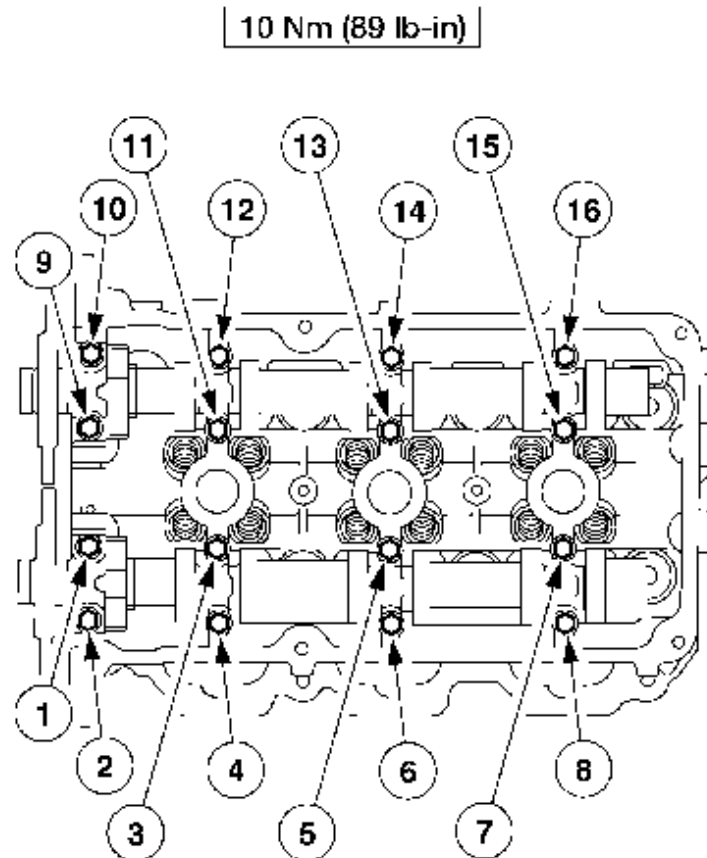
2. Apply SAE 5W-20 motor oil to the LH and RH camshafts.



1. Install the LH and RH camshafts.
 - a. Locate the camshafts as shown.



1. Position the LH camshaft caps and install the bolts in the sequence shown.

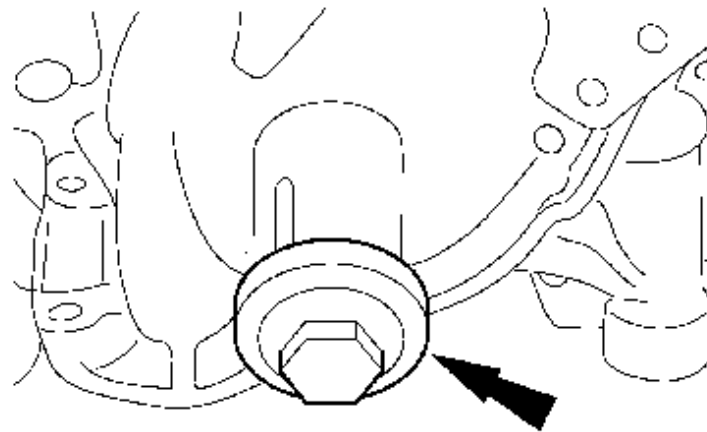


A0010682

1.

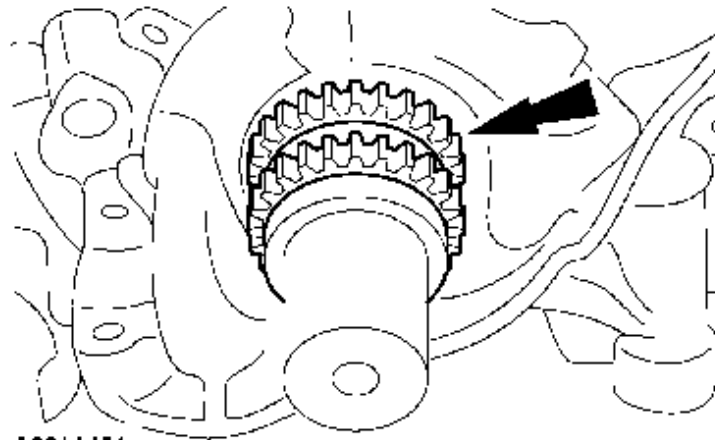
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Position the RH camshaft caps and install the bolts in the sequence shown.



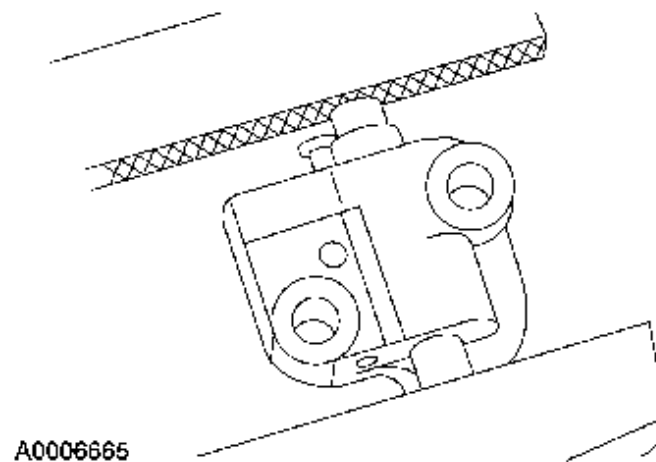
A0011418

1. Remove the crankshaft damper bolt.



A0011451

1. Install the crankshaft sprockets.

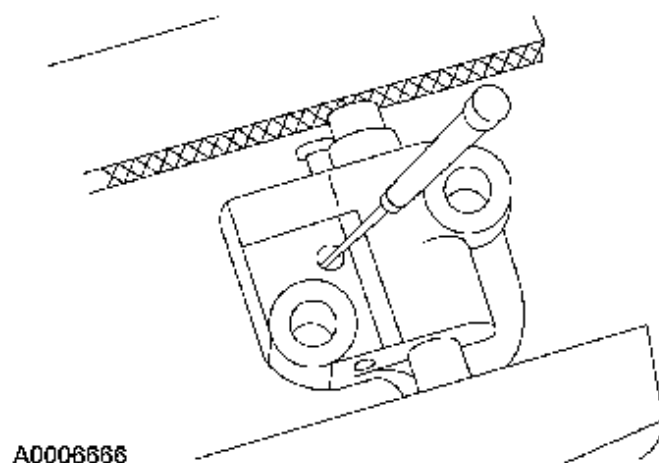


A0006665

- 1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

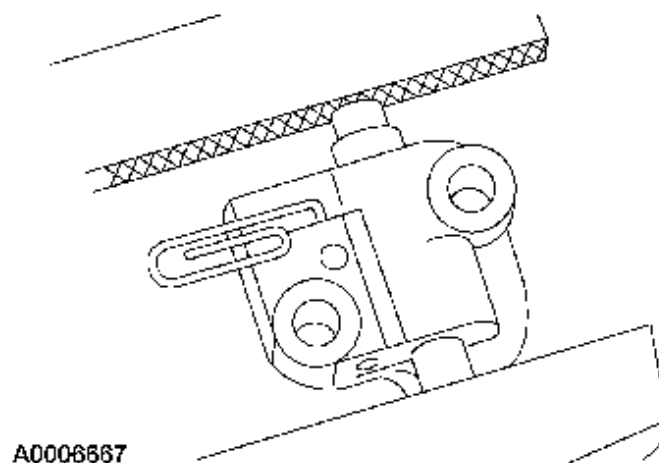
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

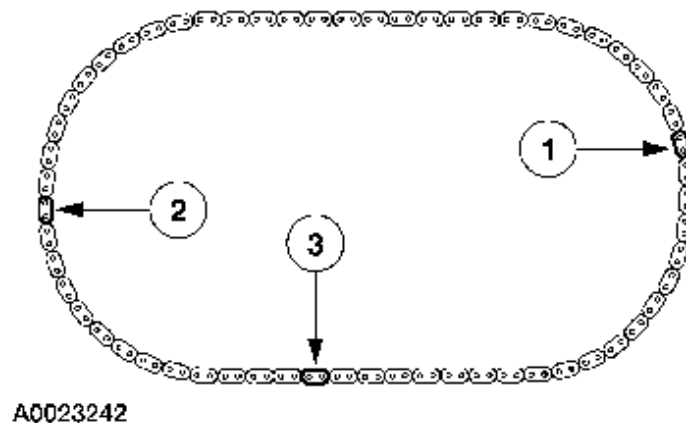
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.

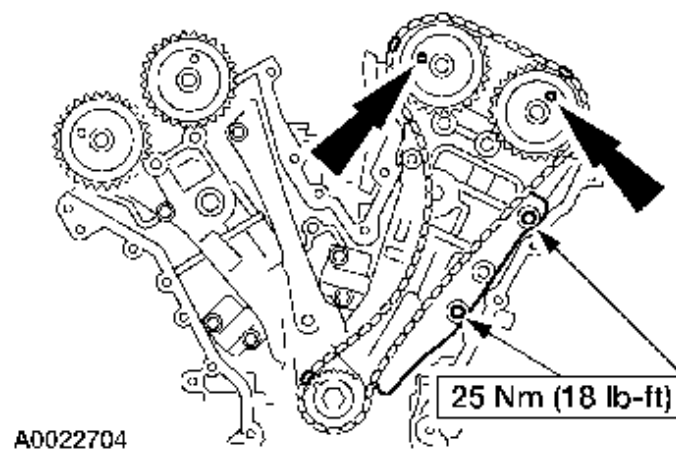


1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.



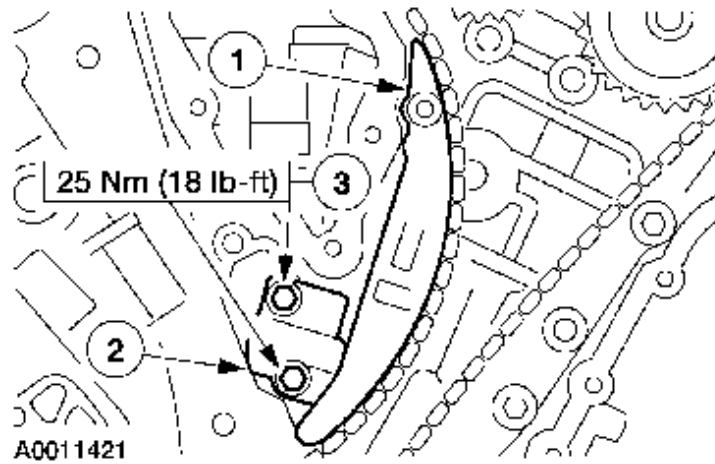
1. If timing marks in the timing chains are not evident, use a permanent-type marker to mark the crankshaft and camshaft timing marks on the LH and RH timing chains.

- a. Mark any link to use as the crankshaft timing mark.
- b. Count 29 links from the crankshaft timing mark and mark as the exhaust cam sprocket timing mark.
- c. Continue counting to 42 mark the link as the intake sprocket timing mark.

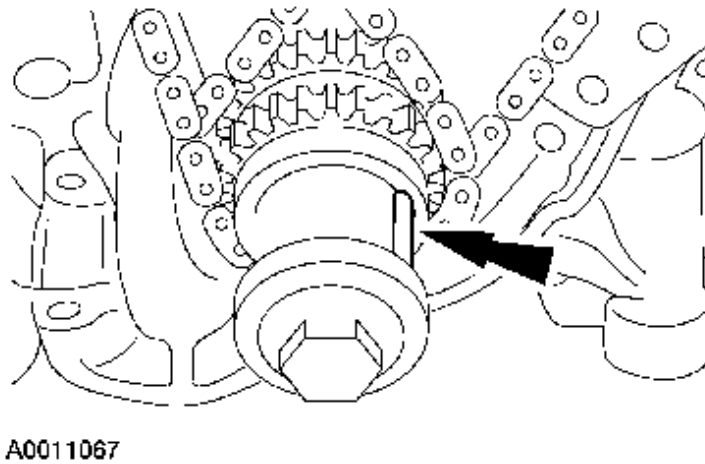


1. Position the LH timing chain and guide and install the bolts.

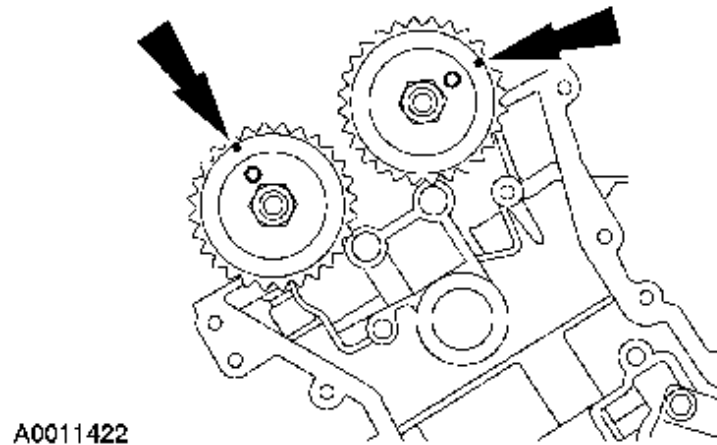
- a. Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



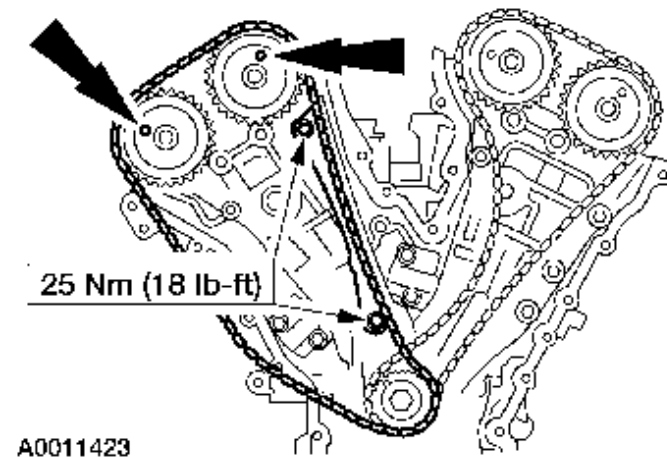
1. Install the LH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.



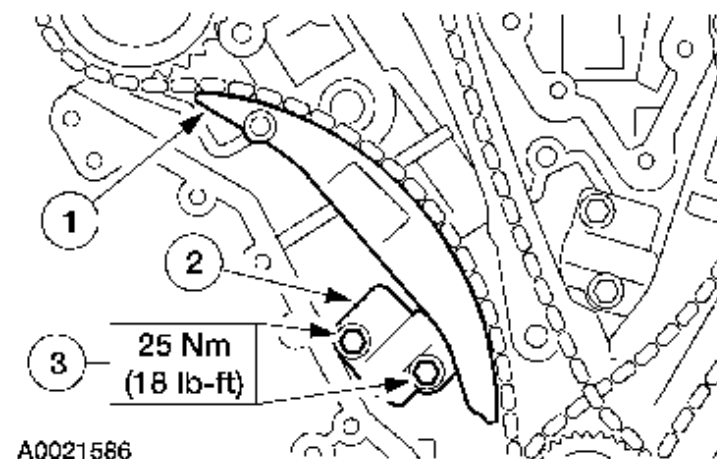
1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



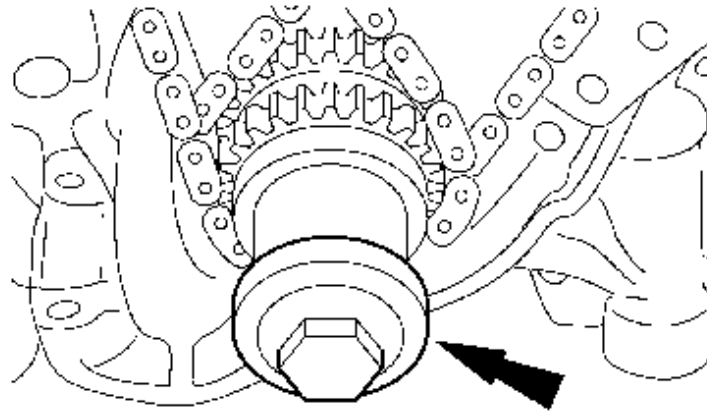
1. Verify that the RH camshafts are correctly positioned.



1. Position the RH timing chain and chain guide and install the bolts.
 - a. Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.

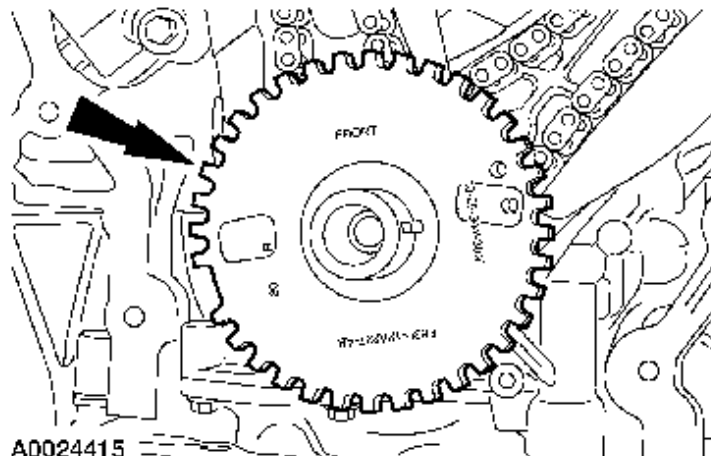


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

1. Remove the crankshaft damper bolt.

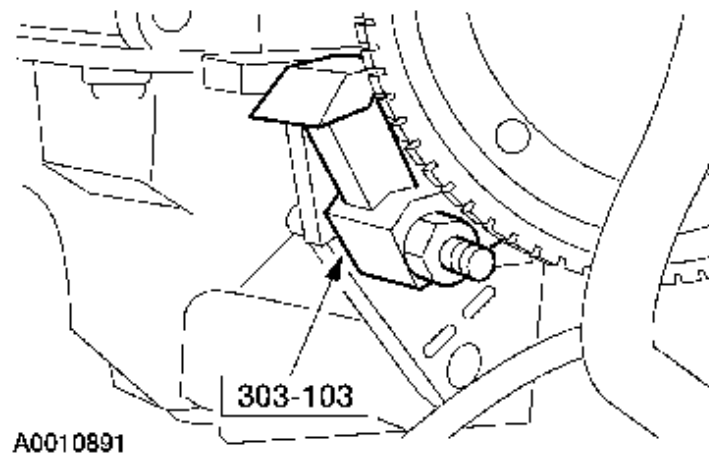


A0024415

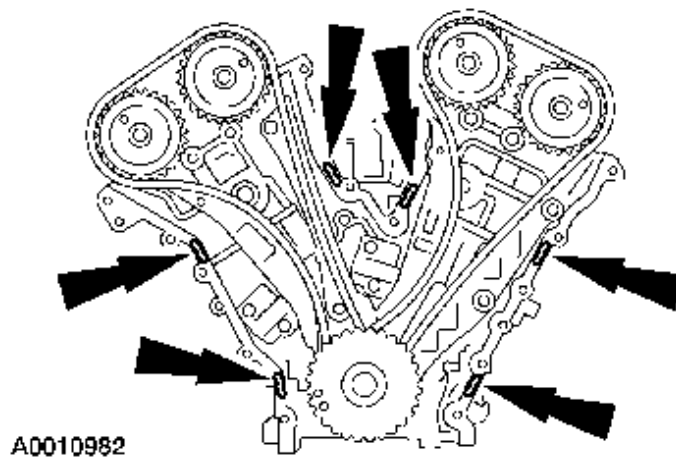
- 1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



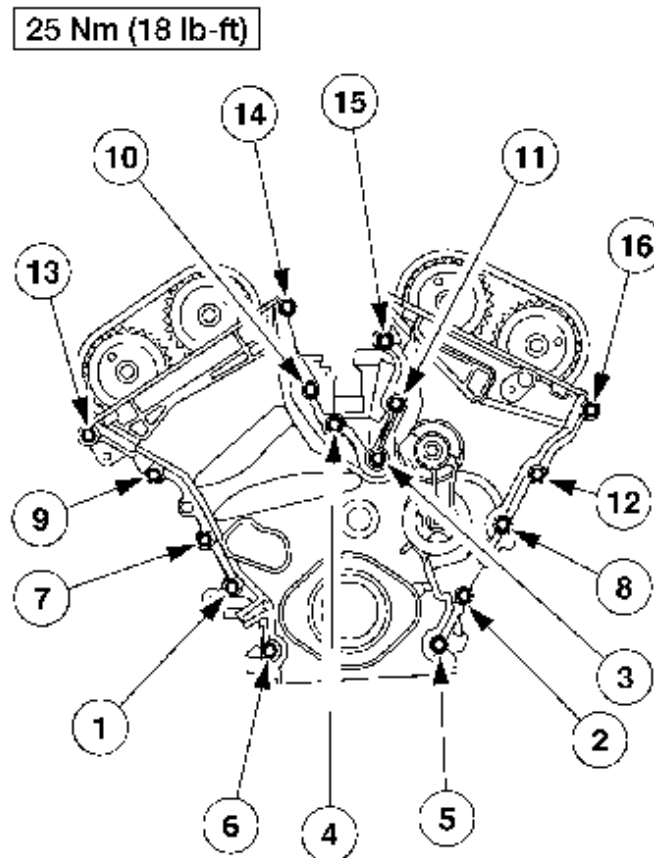
1. Install the special tool to hold the flexplate.
2. Install three gaskets in the front cover.



- 1.

NOTE:

The front cover must be installed and the bolts tightened within six minutes of sealant application. Apply a 6 mm (0.24 in) dot of silicone gasket and sealant to the cylinder block to lower cylinder block and cylinder head mating surfaces.

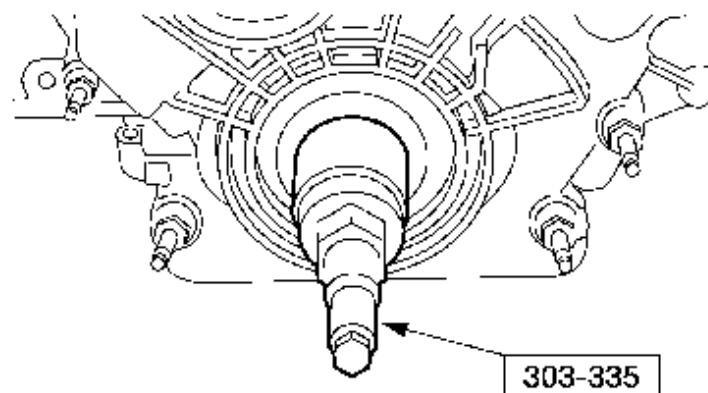


A0022269

1.

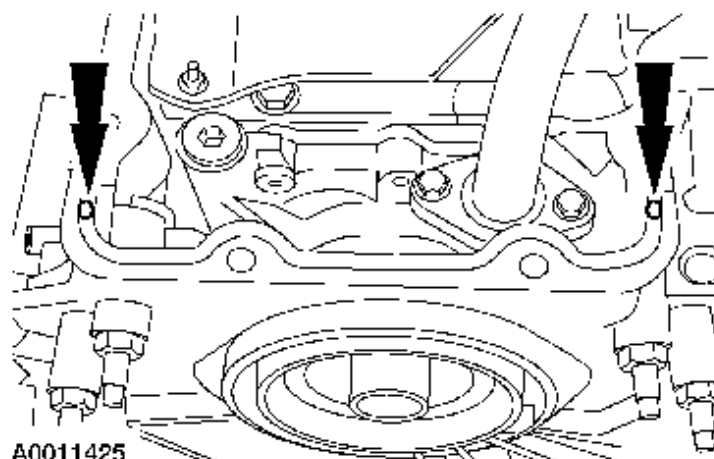
NOTE:

Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the front cover and install the bolts and studs in the sequence shown.



A0011428

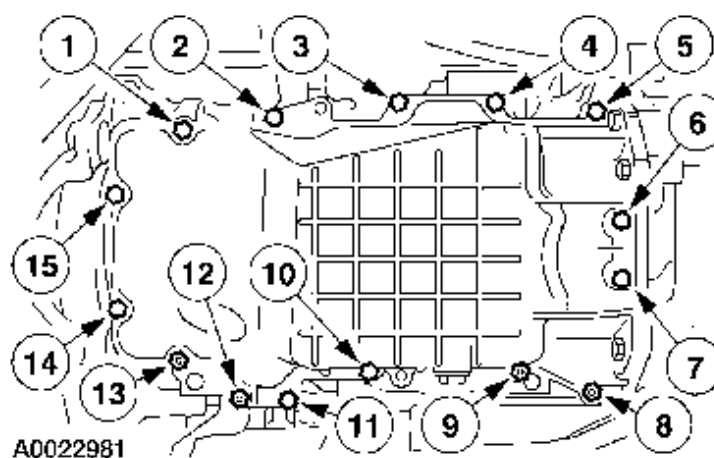
1. Using the special tool, install the crankshaft front oil seal.



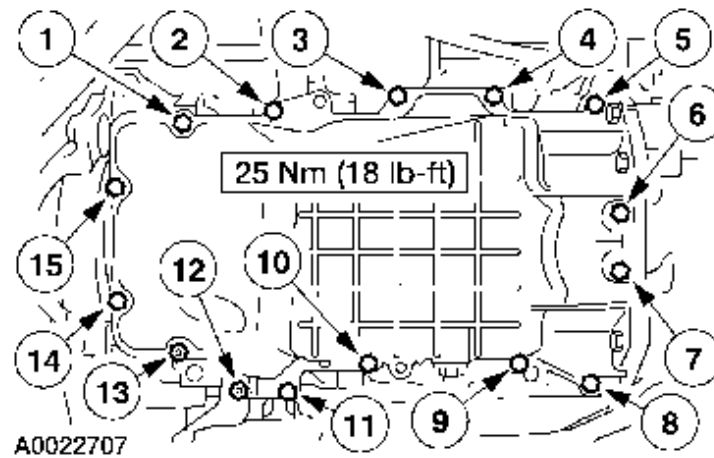
- 1.

NOTE:

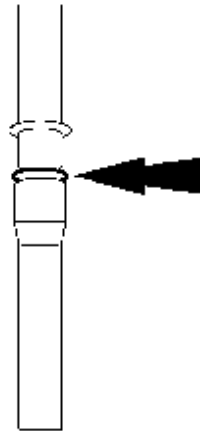
The oil pan must be installed and the bolts tightened within six minutes of sealant application. Apply a 10 mm (0.24 in) dot of silicone gasket and sealant to the front cover to cylinder block mating surface.



1. Position the oil pan and gasket and loosely install the bolts and studs in the indicated sequence.
2. Align the transaxle face of the oil pan with the rear of the cylinder block. The pan should be 0.00 mm (0.0 in)–0.25 mm (0.009 in) under flush. Assemblies that are between 0.26 (0.01 in) –0.50 mm (0.019 in) should be shimmed using either one or two 0.25 mm (0.009 in) gold shims. Assemblies that are between 0.51 mm (0.020 in) –0.75 mm (0.029 in) should be shimmed using either one or two 0.50 mm (0.019 in) silver shims. If the pan measures greater than 0.75 mm (0.029 in) or the pan is over flush of the cylinder block, the entire pan assembly must be removed and a new one installed.

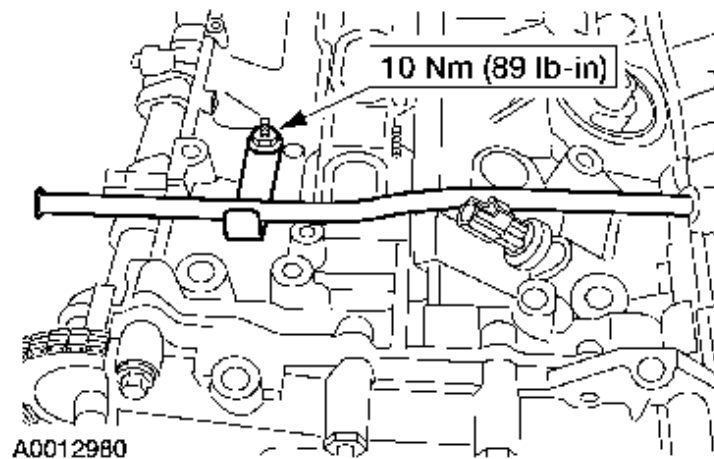


1. Tighten the oil pan bolts and studs in the sequence shown.

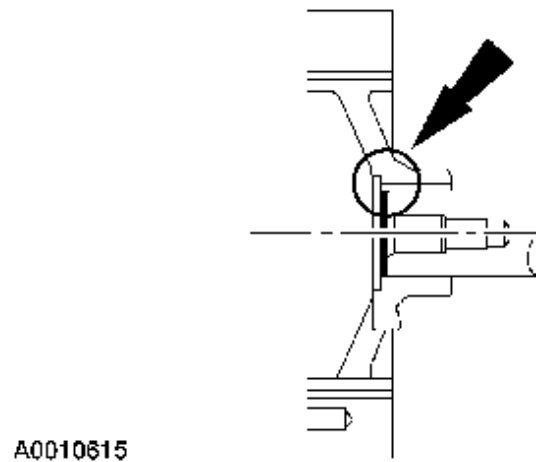


A0011038

1. Install a new seal on the oil level indicator tube.



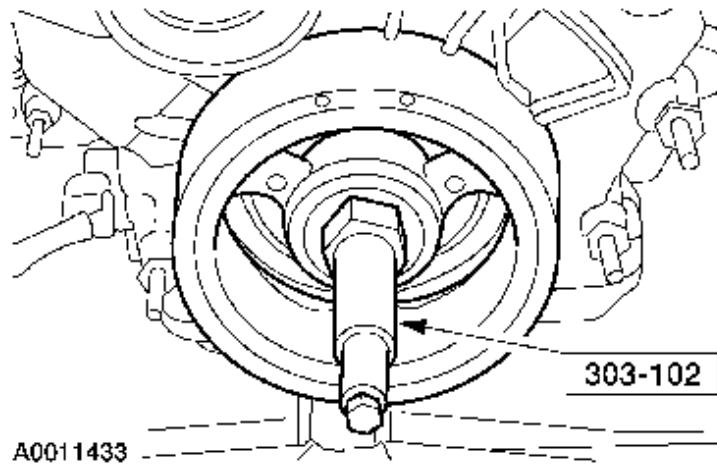
1. Install the oil level indicator tube and install the bolt.



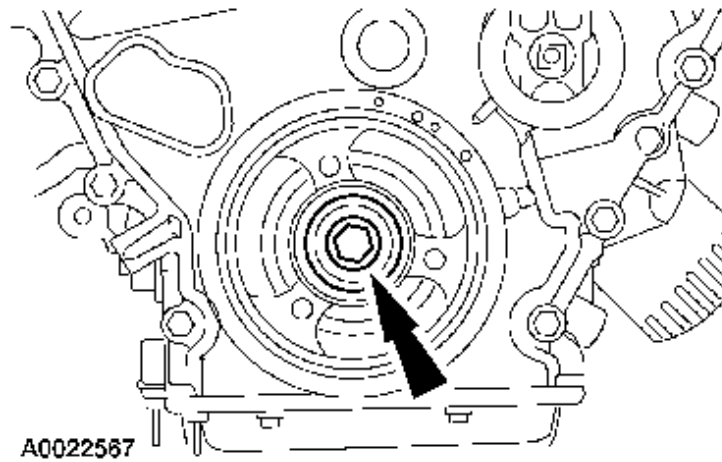
1.

NOTE:

The crankshaft damper must be installed and the bolt tightened within six minutes of sealant application. Apply silicone gasket and sealant to the end of the crankshaft damper keyway slot.



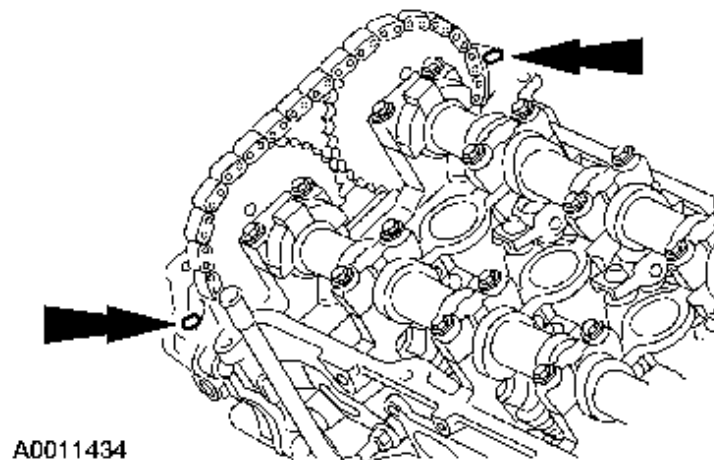
1. Using the special tool, install the crankshaft vibration damper.



1. Install the crankshaft vibration damper washer and bolt.

- a. Tighten the bolt in four stages.
- b. Stage 1: Tighten to 120 Nm (89 lb-ft).
- c. Stage 2: Loosen one full turn (360 degrees).
- d. Stage 3: Tighten to 50 Nm (37 lb-ft).
- e. Stage 4: Tighten to 90 Nm (66 lb-ft).

2. Install new gaskets in the valve covers.



1.

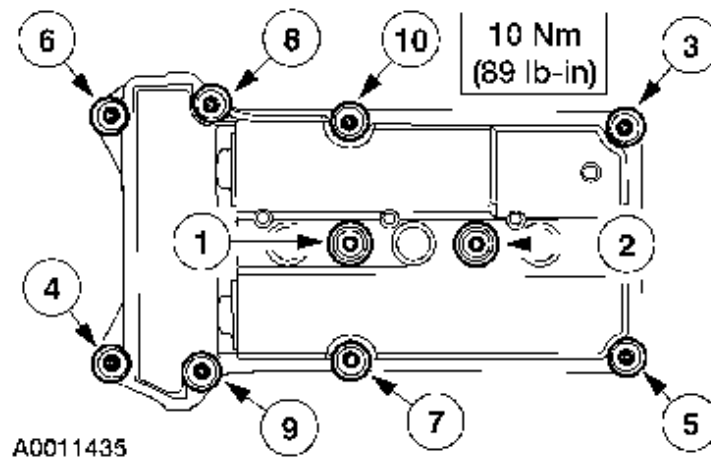
NOTE:

The valve cover must be installed and the bolts and studs tightened within six minutes of sealant application.

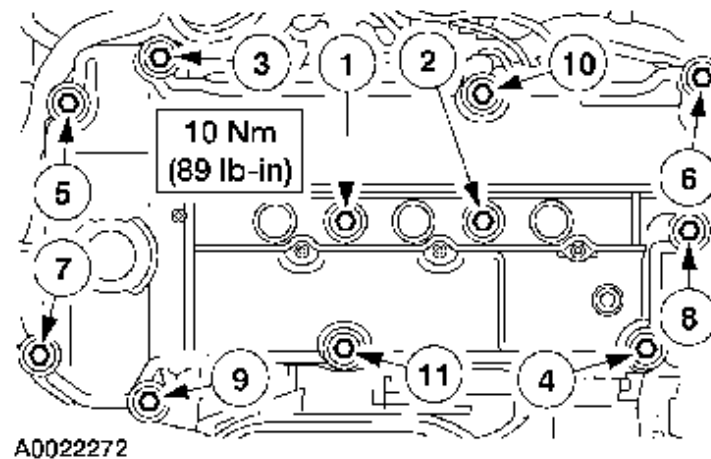
NOTE:

LH shown, RH similar.

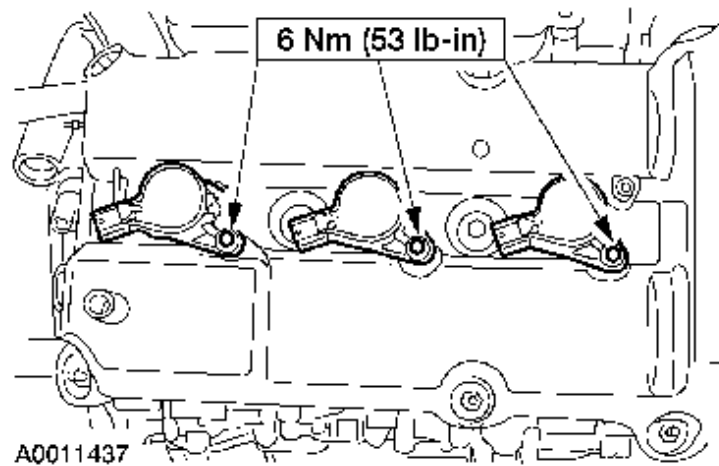
Apply a 8 mm (0.31 in) dot of silicone gasket and sealant at the cylinder block to front cover mating surface of the LH and RH valve covers.



1. Position the RH valve cover and install the bolts and studs in the sequence shown.



1. Position the LH valve cover and install the bolts and studs in the sequence shown.

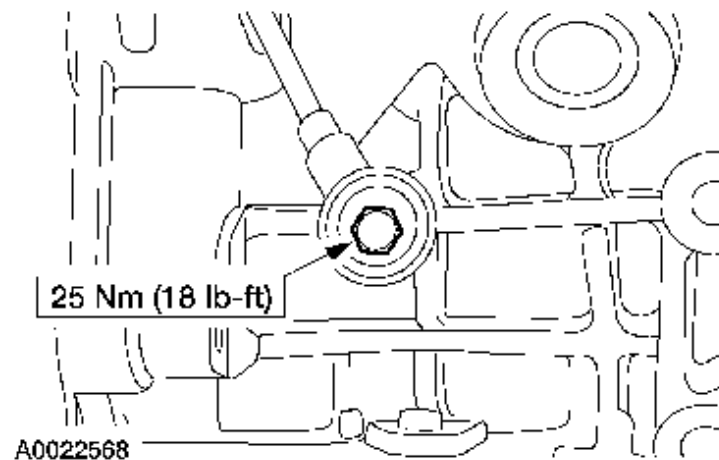


1.

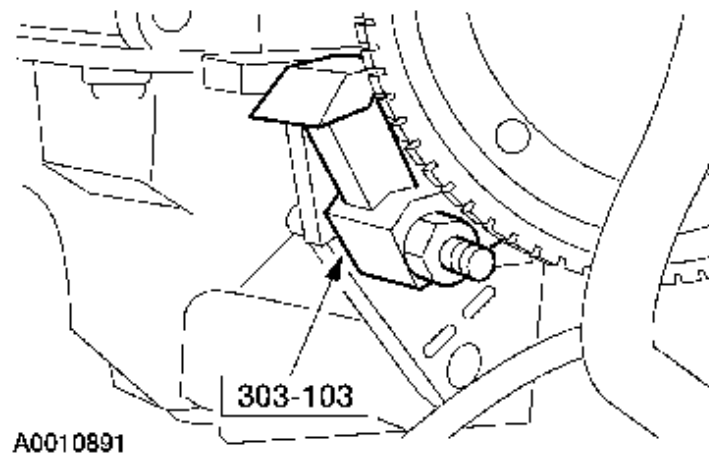
NOTE:

RH shown, LH similar. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation. Install the six coil-on-plugs and install the bolts.

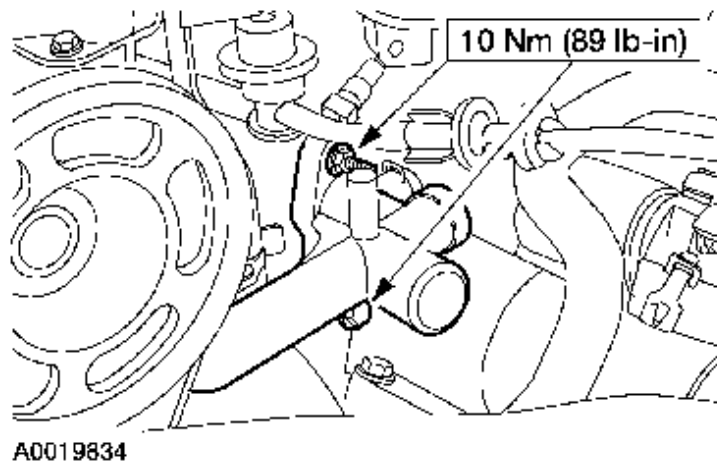
2. Install new gaskets in the lower intake manifold.



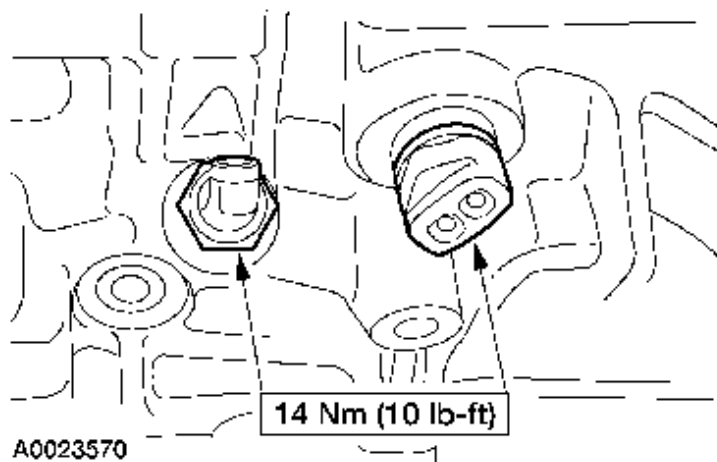
1. Position the knock sensor and install the bolt.



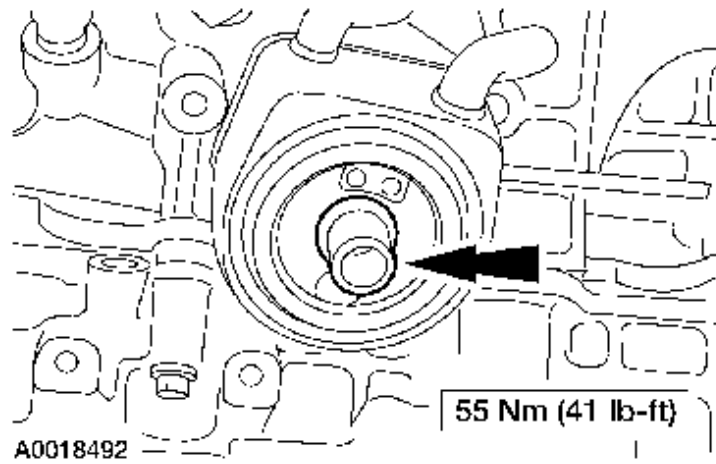
1. Remove the special tool.



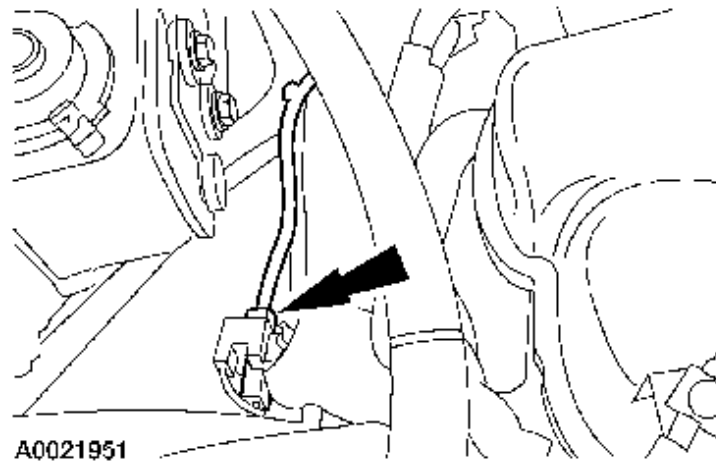
1. Position the coolant bypass tube and connect the hoses.



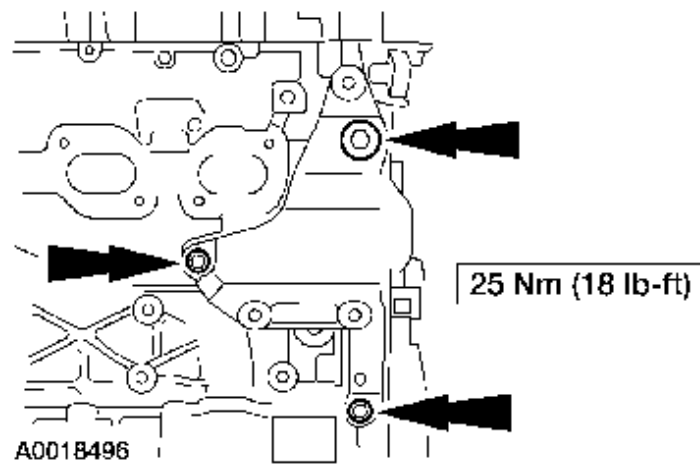
1. Install the oil pressure sender and the block heater.



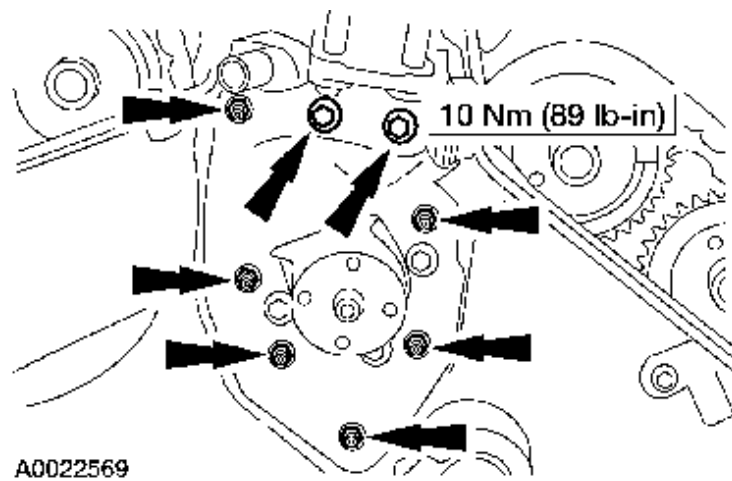
1. Install the oil cooler.



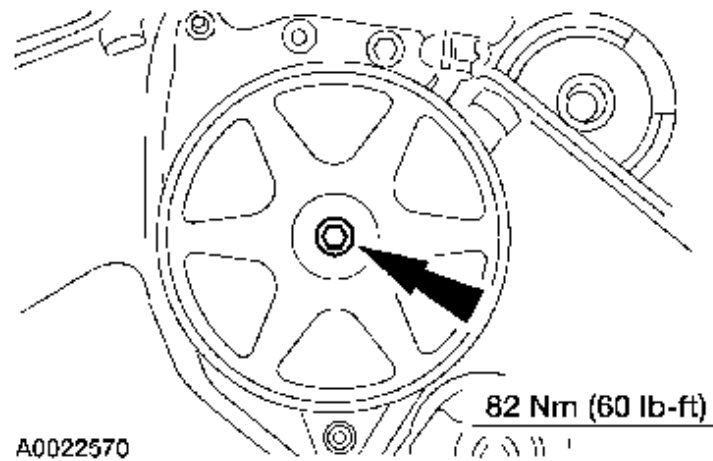
1. Install the radio ignition noise suppressor electrical connector.



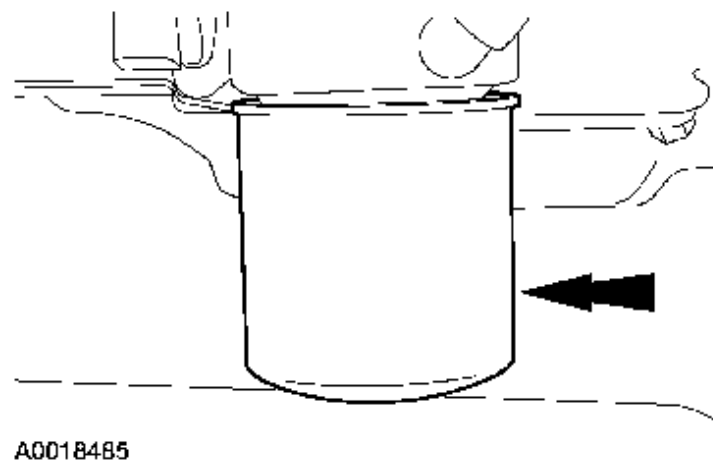
1. Install the generator support bracket.



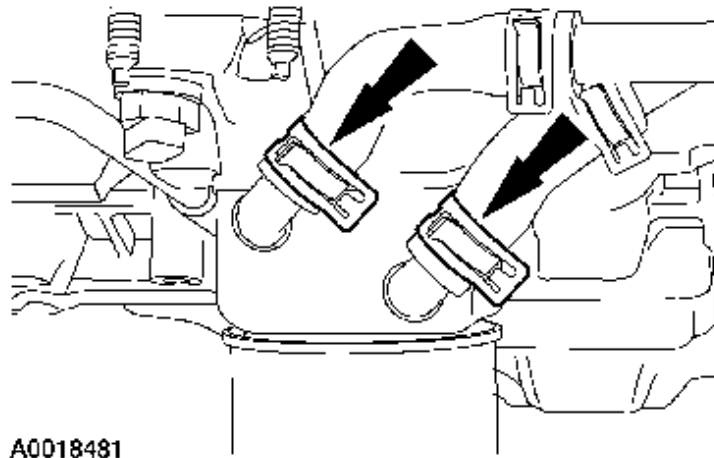
1. Install the power steering pump.



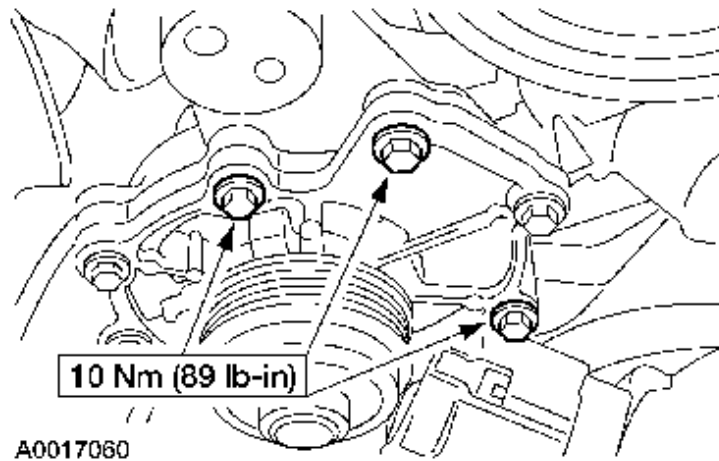
1. Install the power steering pump pulley.



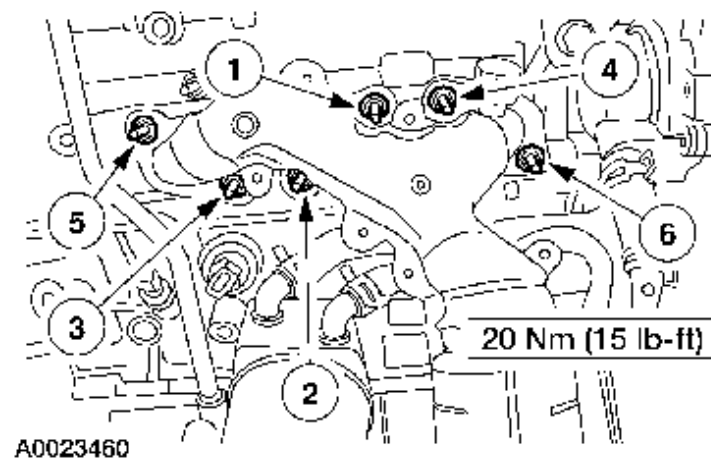
1. Install the oil filter.



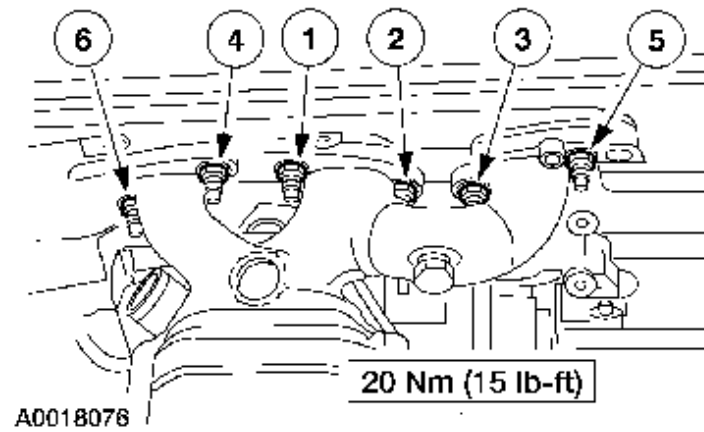
1. Connect the coolant hoses at the oil cooler.



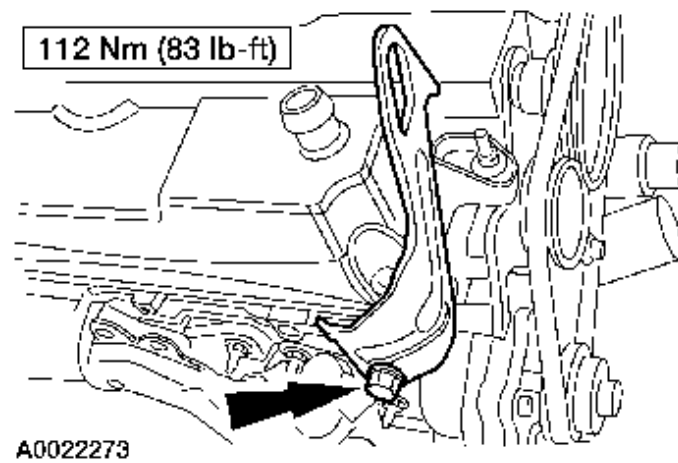
1. Install the water pump assembly.



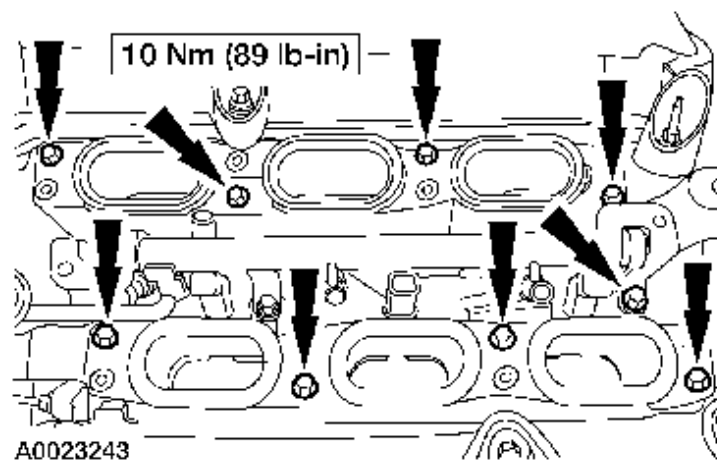
1. Position a new gasket and tighten the exhaust manifold nuts in the sequence shown.



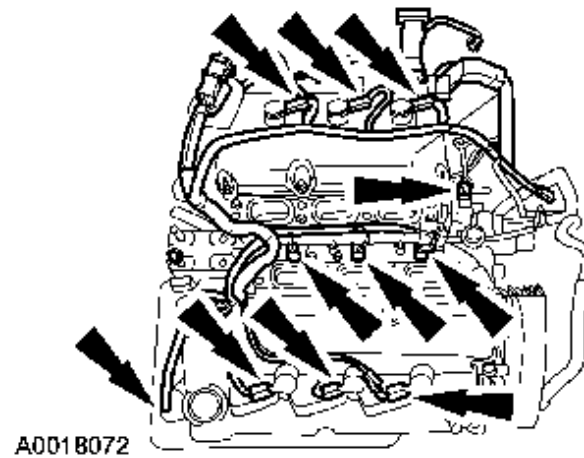
1. Position a new gasket and tighten the exhaust manifold nuts in the sequence shown.



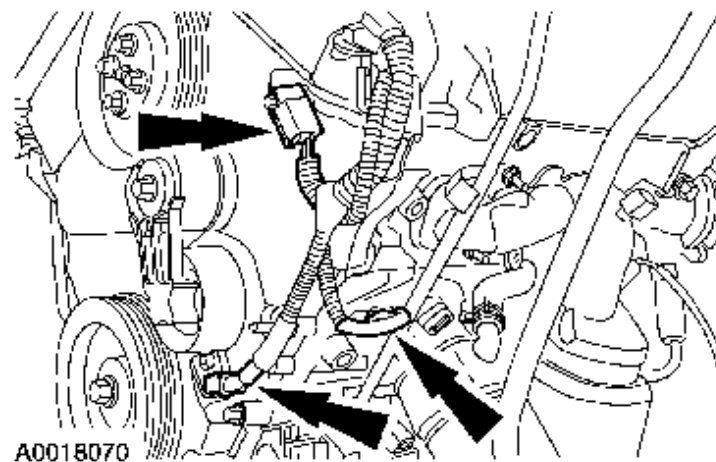
1. Install the engine lift bracket.



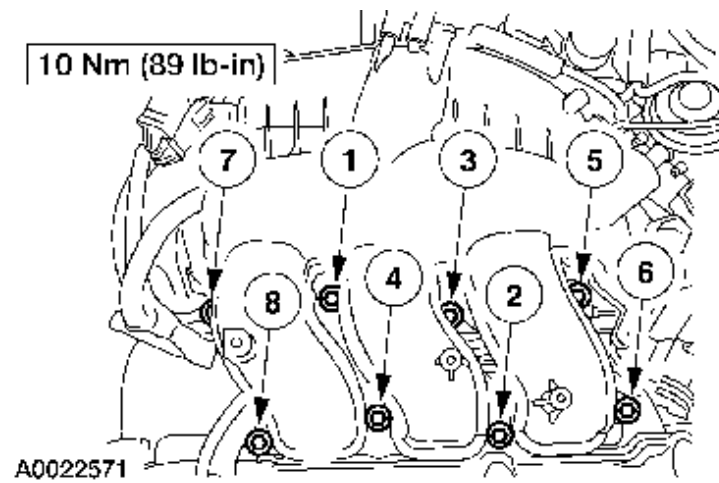
1. Position the gasket and install the lower intake manifold.



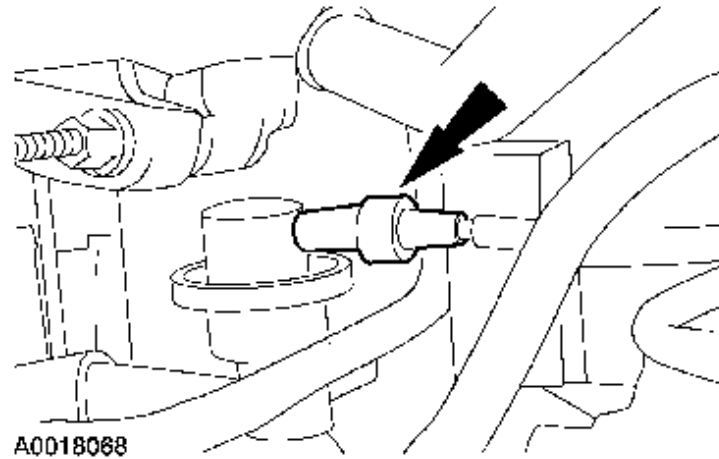
1. Position and connect the engine control sensor wiring in the locations shown.
 - a. coils on plugs
 - b. fuel injectors
 - c. idle air control
 - d. crankshaft position sensor



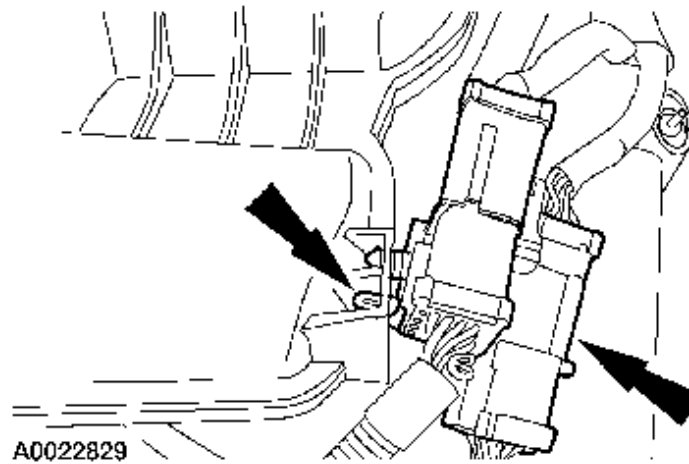
1. Connect the crankshaft and camshaft position sensor electrical connectors.
2. Install new gaskets in the upper intake manifold.



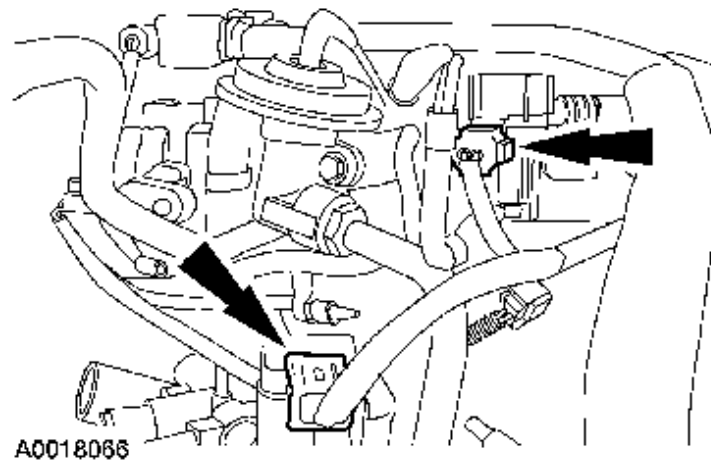
1. Install the upper intake manifold.



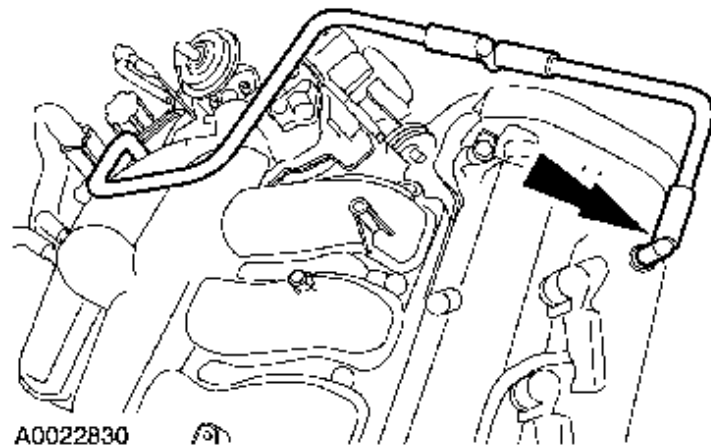
1. Connect the vacuum line from the fuel pressure damper.



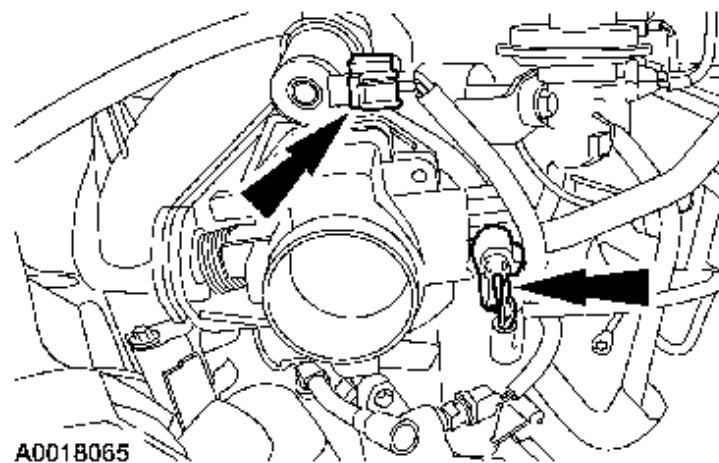
1. Connect the engine control sensor wiring to the upper intake manifold.



1. Connect the EGR vacuum regulator and the differential pressure feedback EGR electrical connectors.



1. Install the PCV tube.



1. Connect the idle air control (IAC) valve and the throttle position (TP) sensor electrical connectors.

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VIN or Model Year 2001 Model TRIBUTE engine front cover

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

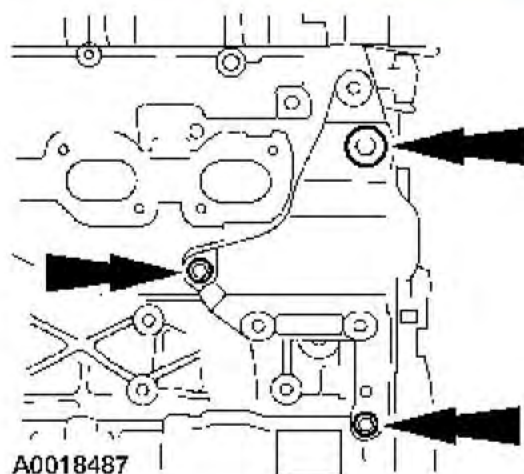
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2001 - Tribute - Workshop Manual - Engine

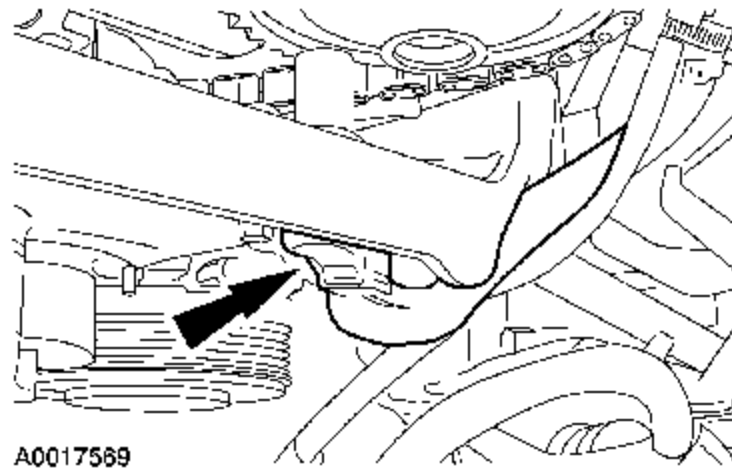
ENGINE FRONT COVER

Removal

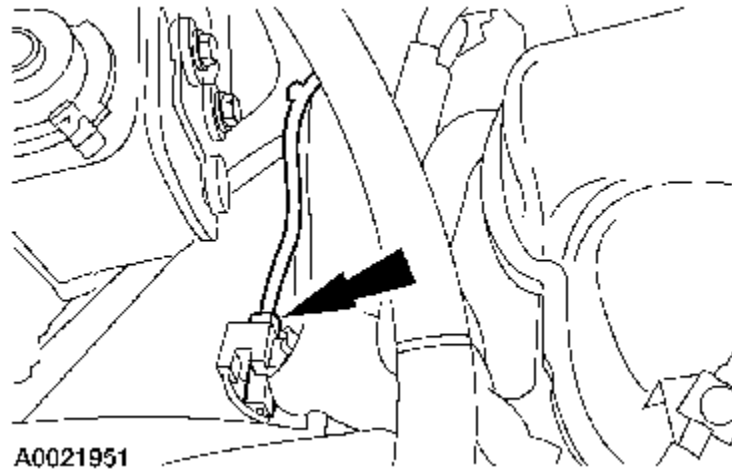
1. Remove the RH and LH valve covers. Refer to [01-10C VALVE COVER -- LH](#) and [01-10C VALVE COVER -- RH](#).
2. Remove the oil pan. Refer to [01-11B OIL PAN](#).
3. Remove the generator. Refer to [01-17 GENERATOR -- 3.0L](#).



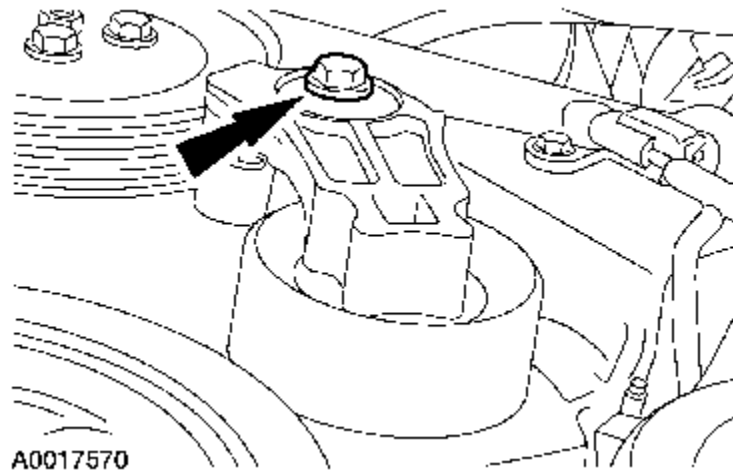
1. Remove the bolts and the generator bracket.



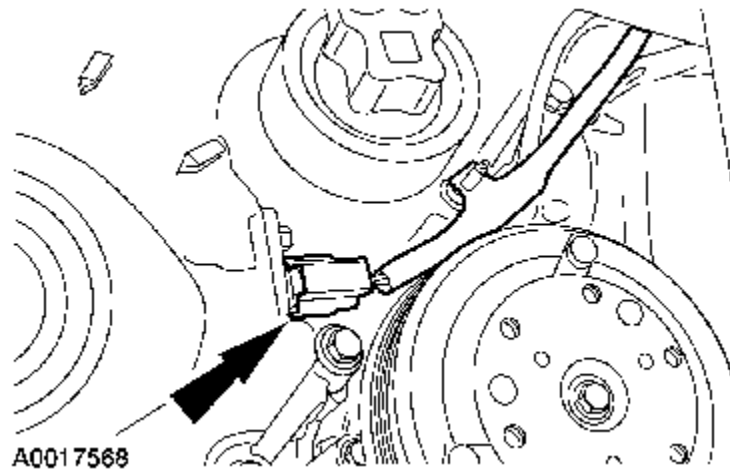
1. Remove the bolt and the camshaft position (CMP) sensor.
2. Lower the vehicle.



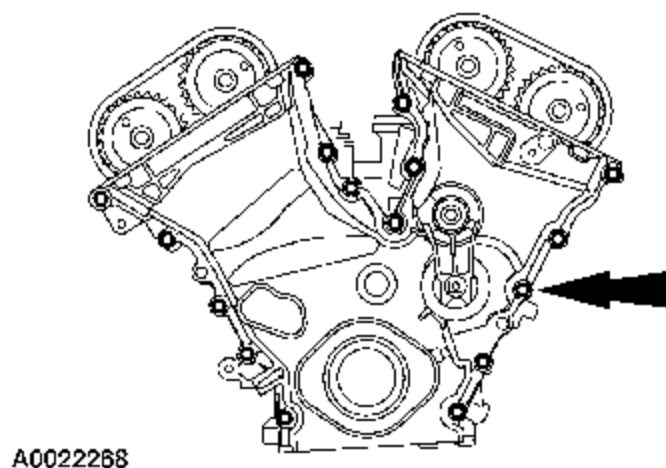
1. Remove the nut and the radio ignition interference capacitor.
2. Remove the power steering pump. Refer to [06-12 POWER STEERING PUMP -- 3.0L \(4V\)](#).
3. Remove front engine support insulator. Refer to [01-10C ENGINE SUPPORT INSULATORS -- FRONT, RH](#).
4. Raise and support the vehicle. Refer to [00-00 LIFTING](#).



1. Remove the bolt and remove the belt tensioner.
2. Remove the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Remove the crankshaft position (CKP) sensor.
 - a. Disconnect the electrical connector.
 - b. Remove the bolt and the sensor.



1.

NOTE:

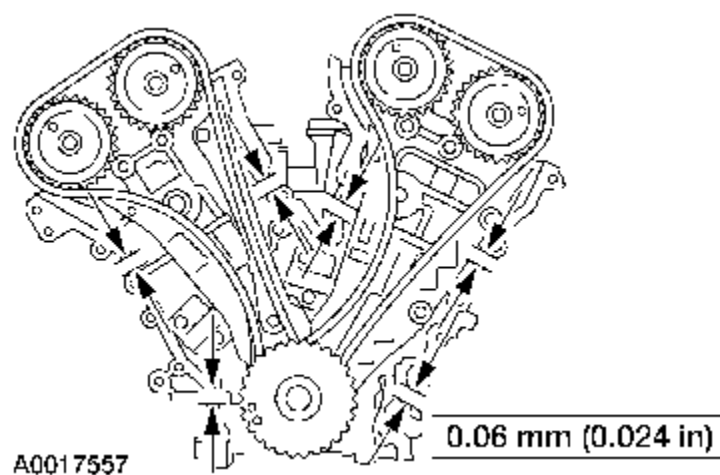
Remove the engine front cover with the vehicle raised in the air. Remove the bolts, studs and the engine front cover.

Installation

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surface. These tools cause scratches and gouges, which make leak paths. Use a plastic scraping tool to remove all traces of sealant.

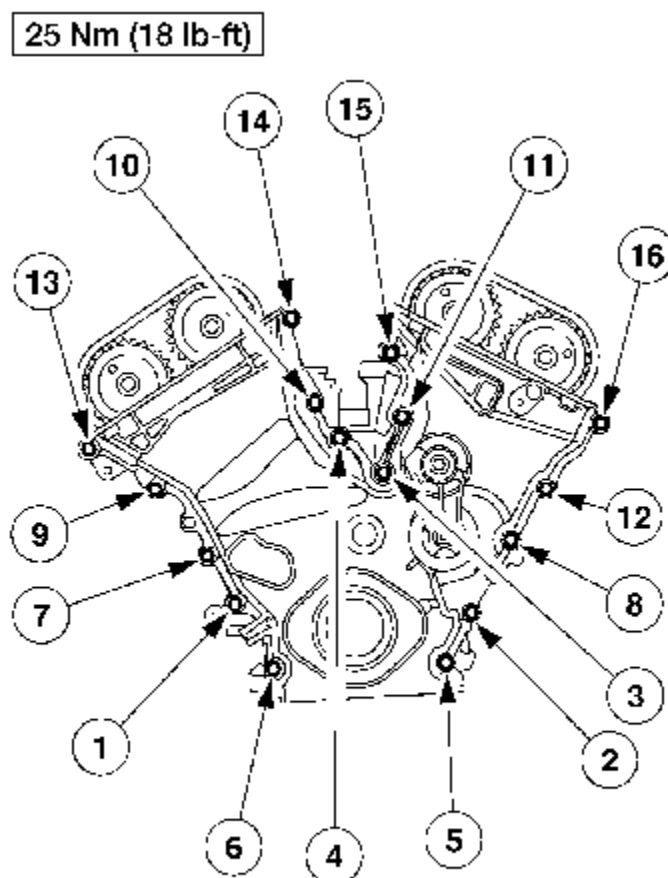
1. Clean all sealing surfaces with Metal Surface Cleaner.
2. Install three new gaskets in the front cover.



1.

NOTE:

The engine front cover must be installed and the bolts tightened within six minutes of applying the sealant. Apply a 6 mm (0.24 in) diameter dot of silicone gasket and sealer to the cylinder block, lower cylinder block, and cylinder head mating surfaces.

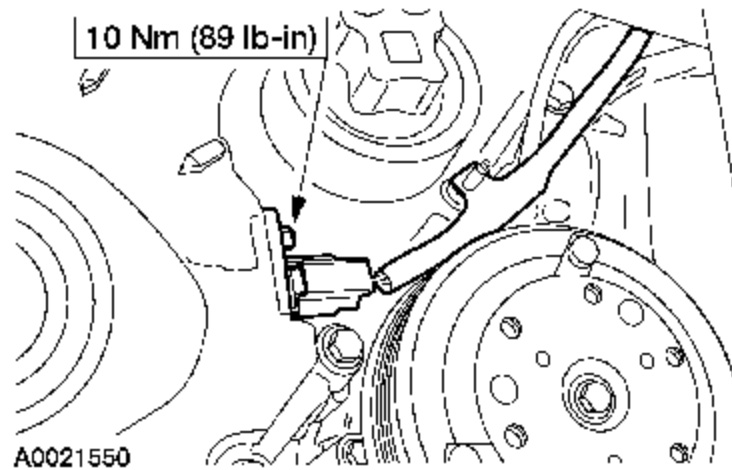


A0022269

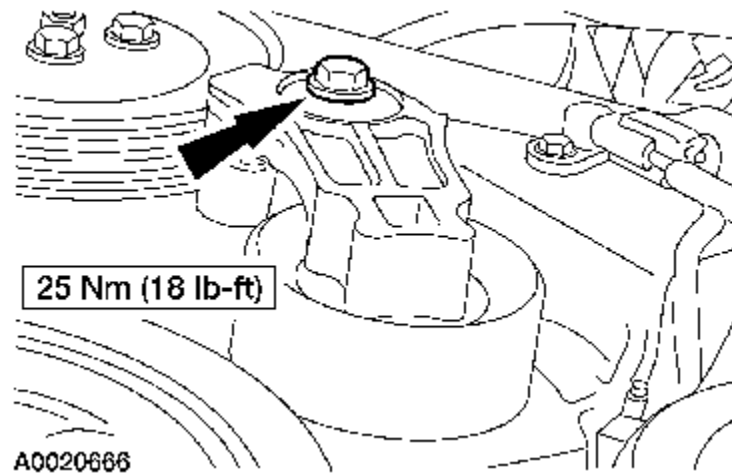
1.

NOTE:

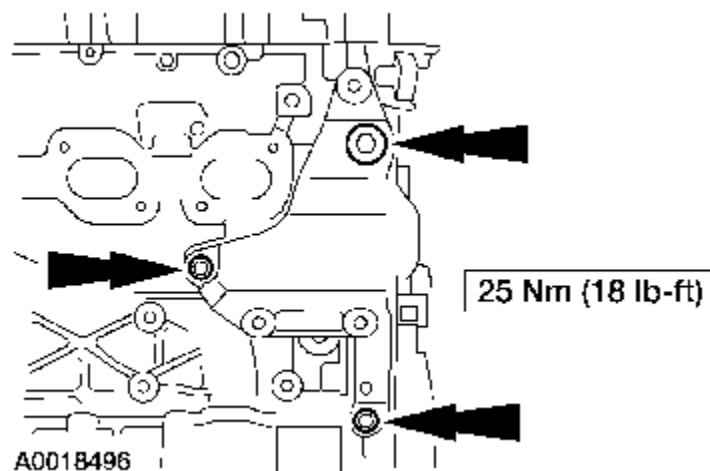
Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the cover and install the studs and bolts in the sequence shown.



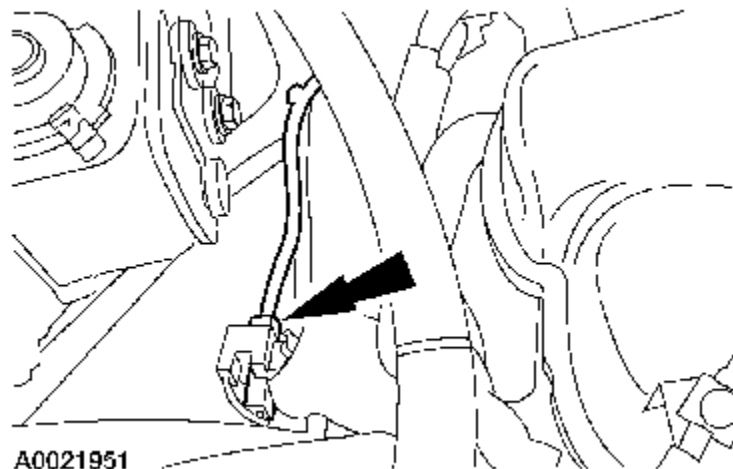
1. Install the (CKP) sensor and connect the electrical connector.
2. Install the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Install the tensioner and bolt.



1. Install the generator bracket.
2. Install the generator. Refer to [01-17 GENERATOR -- 3.0L](#).
3. Install the oil pan. Refer to [01-11B OIL PAN](#).
4. Lower the vehicle.
5. Install the front engine support insulator. Refer to [01-10C ENGINE SUPPORT INSULATORS -- FRONT, RH](#).



1. Install the radio ignition interference capacitor.
2. Install the power steering pump. Refer to [06-12 POWER STEERING PUMP -- 3.0L \(4V\)](#).
3. Install the RH and LH Valve cover. Refer to [01-10C VALVE COVER -- LH](#) and [01-10C VALVE COVER -- RH](#).

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☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

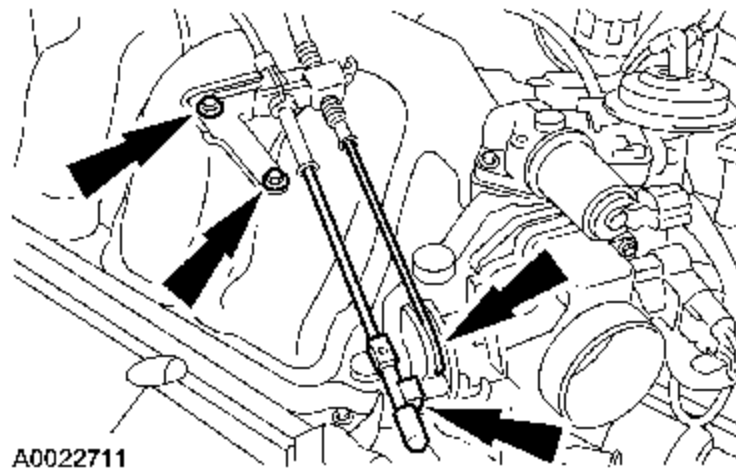
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2001 - Tribute - Workshop Manual - Engine

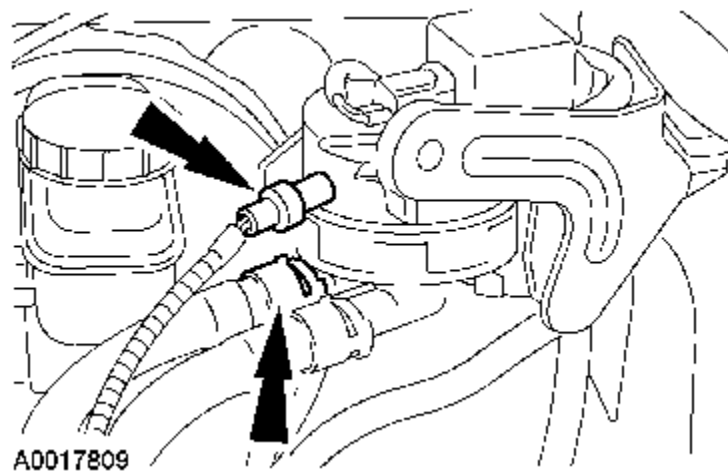
ENGINE

Removal

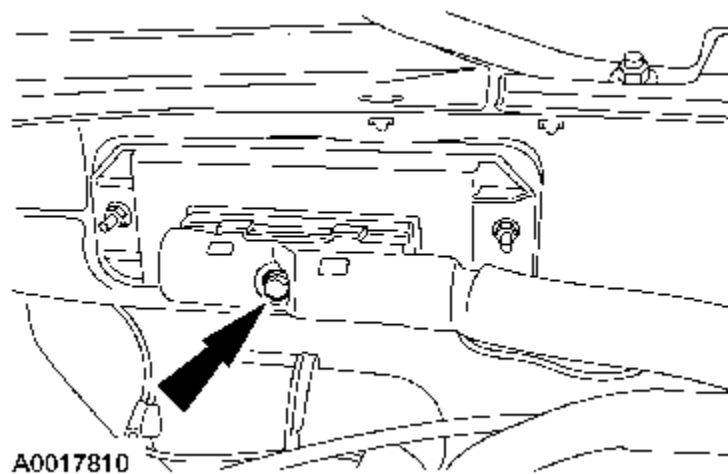
1. Remove the battery tray. Refer to [01-17 BATTERY TRAY](#).
2. Remove the air cleaner outlet tube and air cleaner. Refer to —[01-13B AIR CLEANER OUTLET PIPE 3.0L \(4V\)](#).
3. Raise and support the vehicle. Refer to [00-00 LIFTING](#).
4. Remove the lower radiator air deflectors.
5. Drain the engine cooling system. Refer to [01-12B COOLING SYSTEM DRAINING, FILLING AND BLEEDING](#).
6. Lower the vehicle.
7. Disconnect the fuel line. Refer to —[01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L \(4V\)](#).
8. Remove the water pump drive belt.



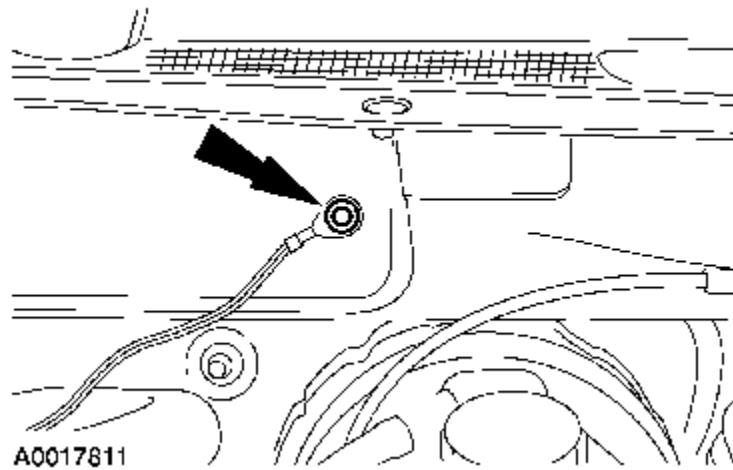
1. Disconnect the accelerator cable and if equipped cruise control actuator cable.



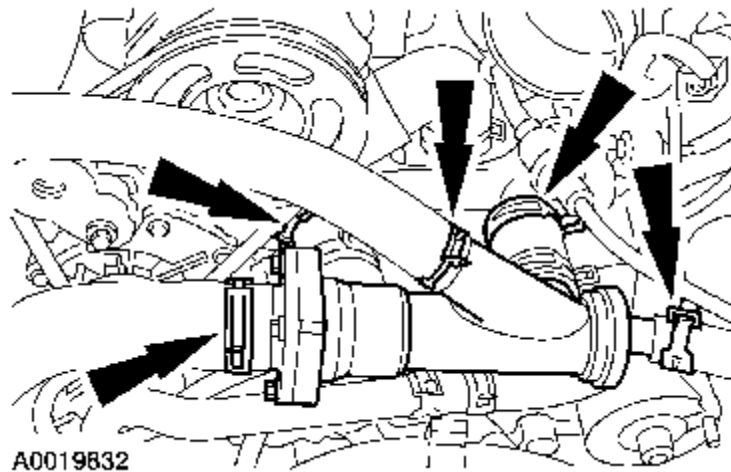
1. Disconnect the vapor management valve (VMV).



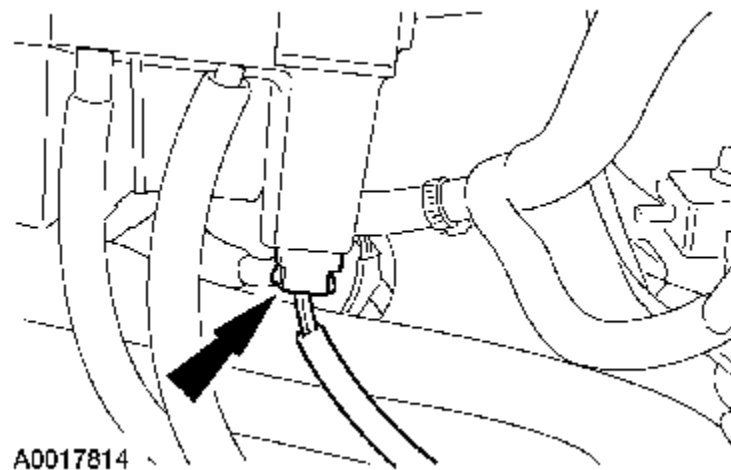
1. Disconnect the powertrain control module.



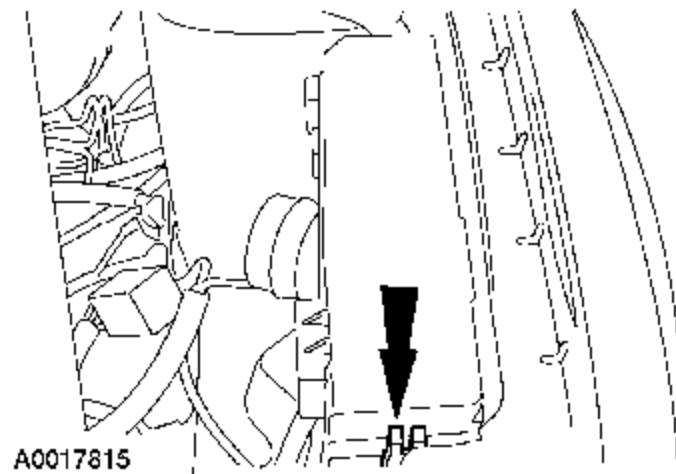
1. Disconnect the ground wire.



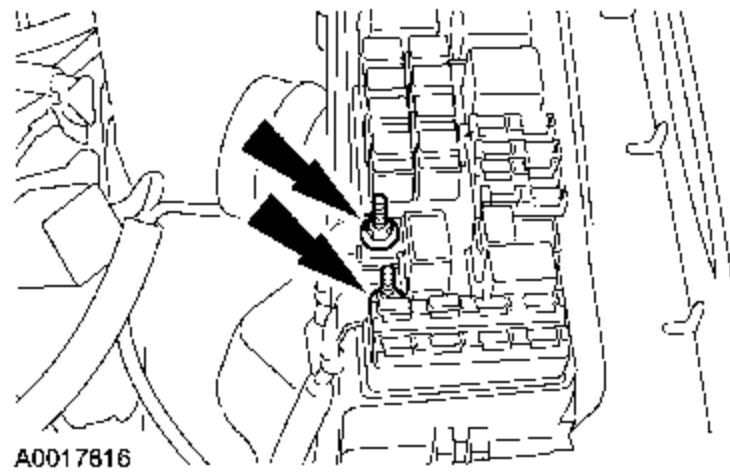
1. Disconnect the hoses and position the thermostat housing and hose assembly out of the way.



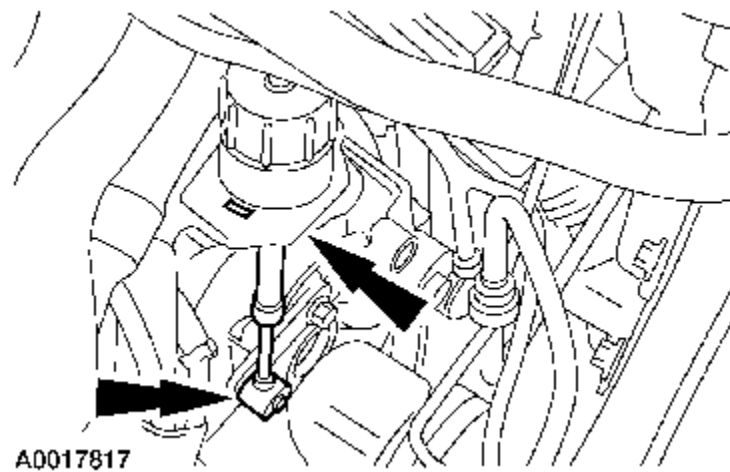
1. Disconnect the connector from the power distribution box.



1. Remove the power distribution box cover.

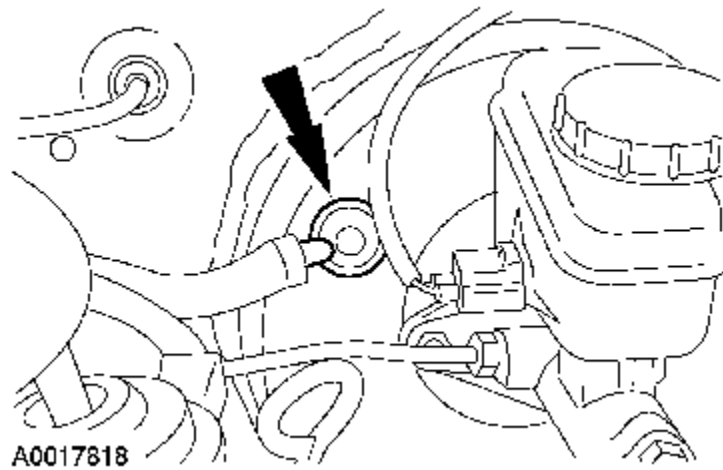


1. Remove the nuts and the cables.

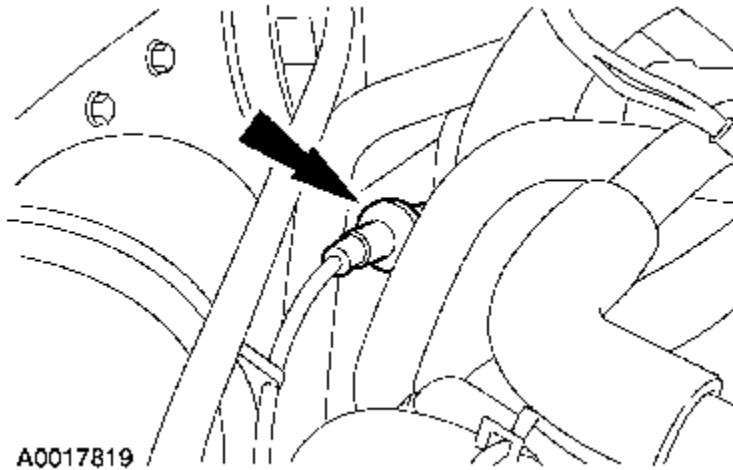


1. Disconnect connector X-134 and ground wire.

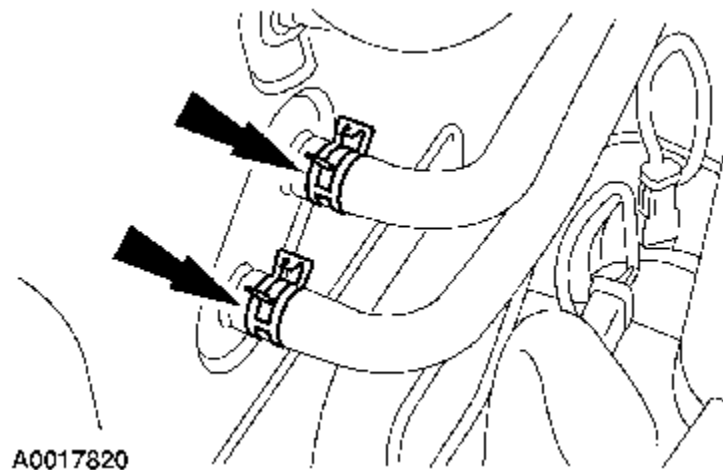
2. Disconnect the transaxle linkage.



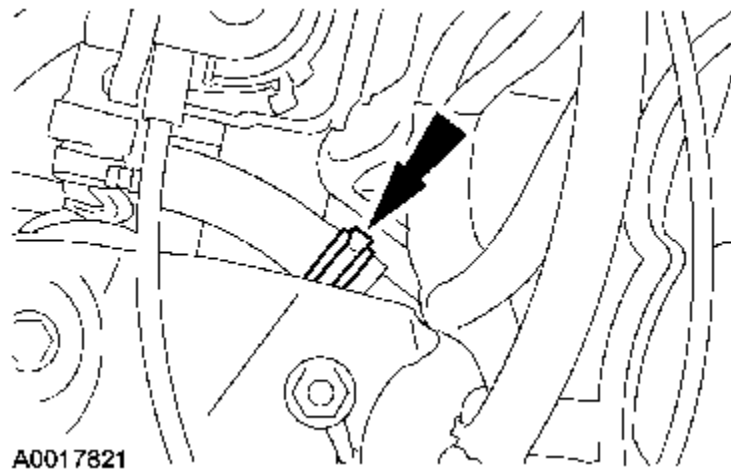
1. Disconnect the brake booster vacuum hose.



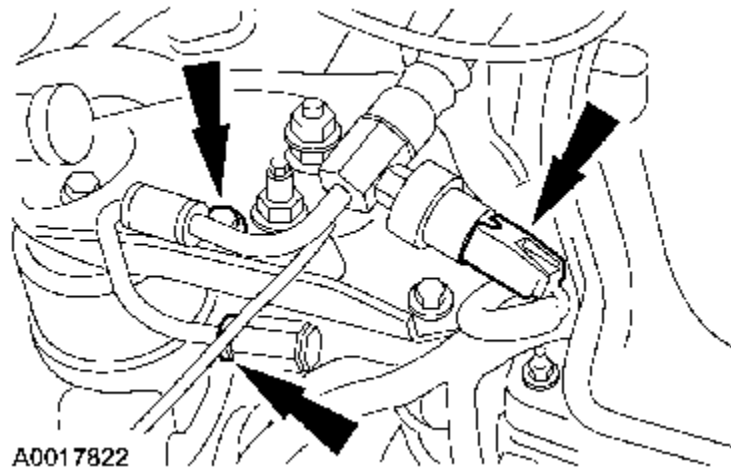
1. Disconnect the vacuum line.



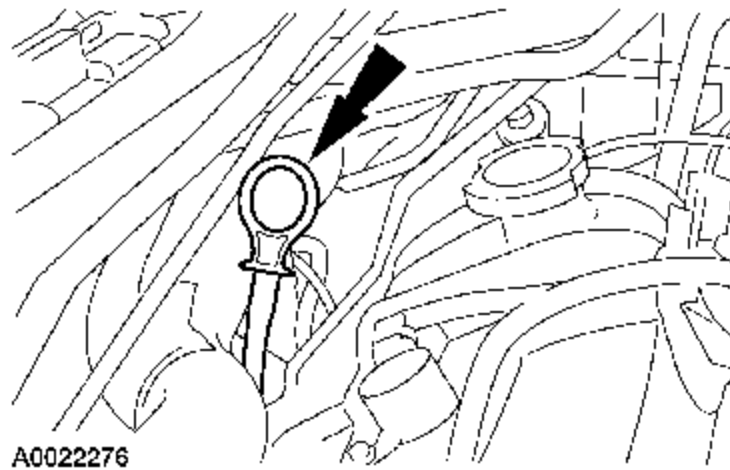
1. Disconnect the heater hoses.



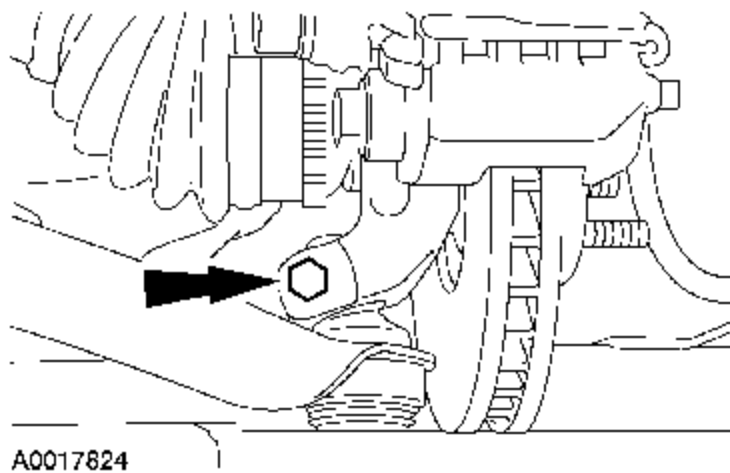
1. Disconnect the power steering return line.



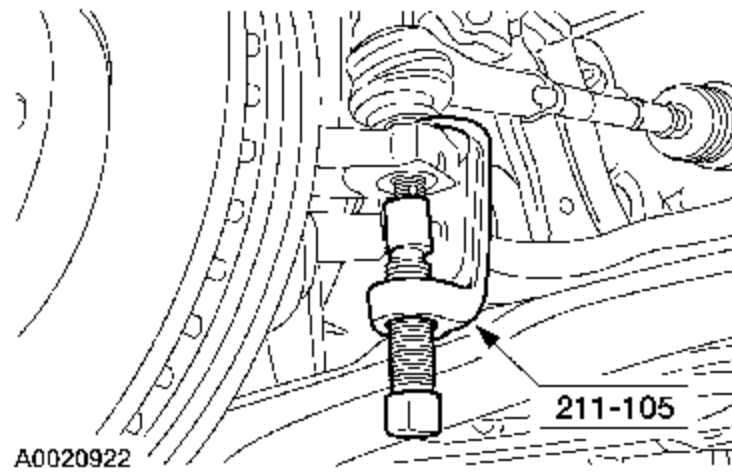
1. Disconnect the power steering line.
 - a. Disconnect the power steering pressure (PSP) switch electrical connector.
 - b. Remove the bracket bolt.
 - c. Disconnect the power steering line.



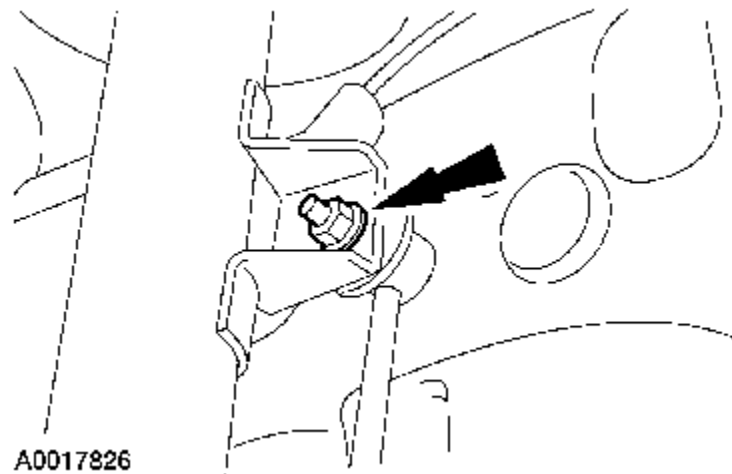
1. Remove the oil level indicator.
2. Remove the three way catalytic converter. Refer to —[01-15B CATALYTIC CONVERTER 3.0L \(4V\)](#).
3. Remove the A/C compressor. Refer to —[07-11 AIR CONDITIONING \(A/C\) COMPRESSOR 3.0L \(4V\)](#).
4. Remove both front wheel and tire assemblies.
5. If equipped, remove the drive shaft (4WD vehicles). Refer to [DRIVESHAFT](#).



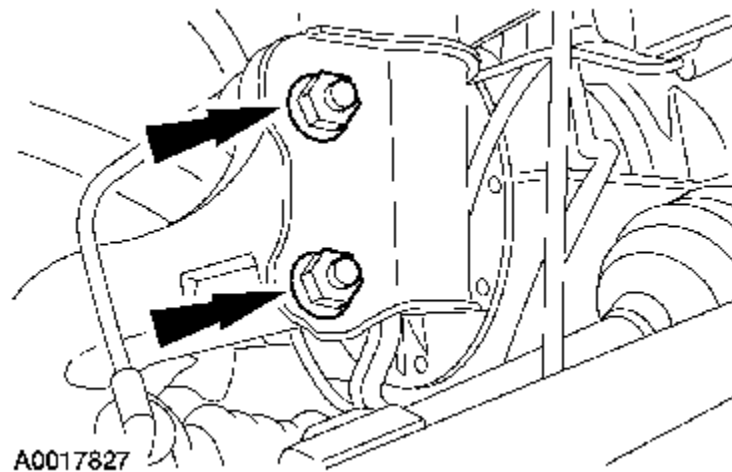
1. Separate the LH and RH ball joints.



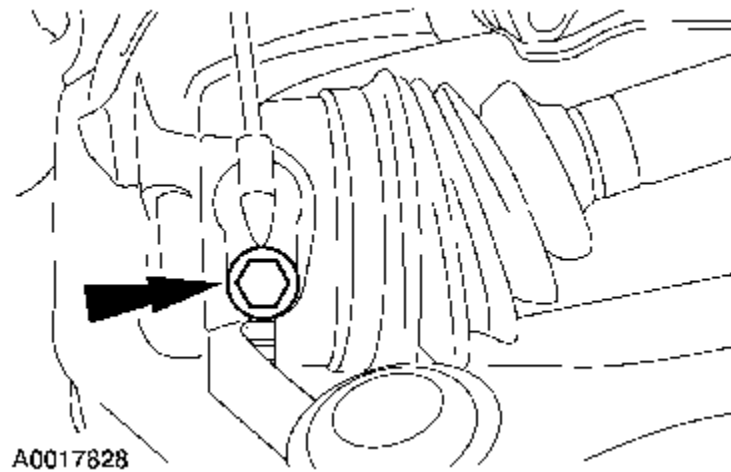
1. Separate the LH and RH tie rods from the steering knuckle.



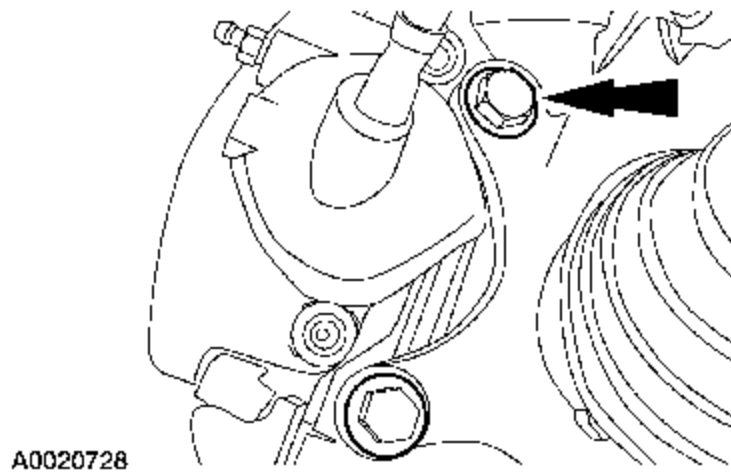
1. Separate the LH and RH sway bar links from the strut mount.



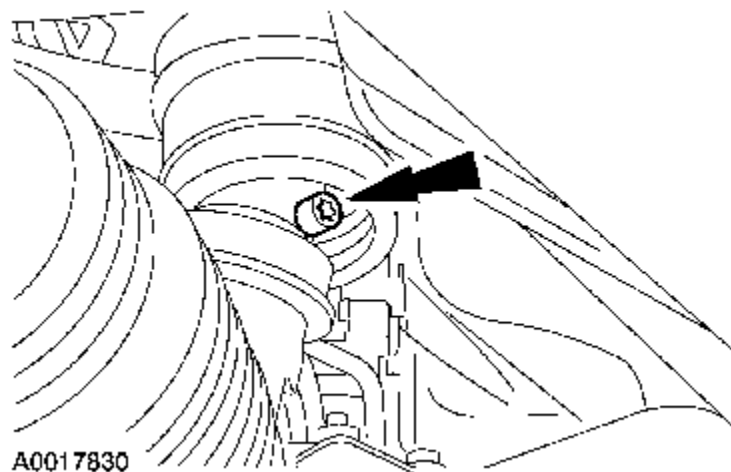
1. Remove the bolt and separate the struts from the LH and RH steering knuckles.



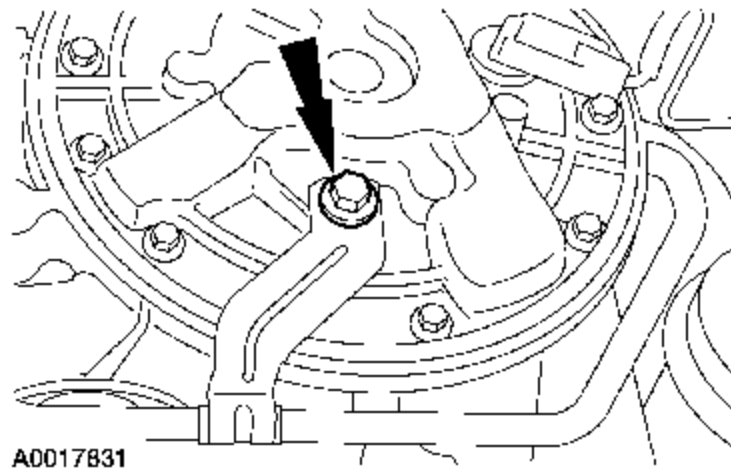
1. Remove the bolt and position aside the LH and RH wheel speed sensors if equipped.



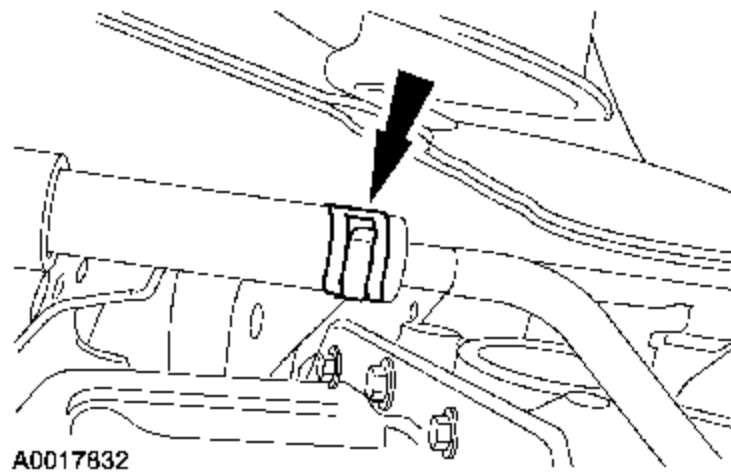
1. Remove the LH and RH brake calipers from the steering knuckles and support the struts.



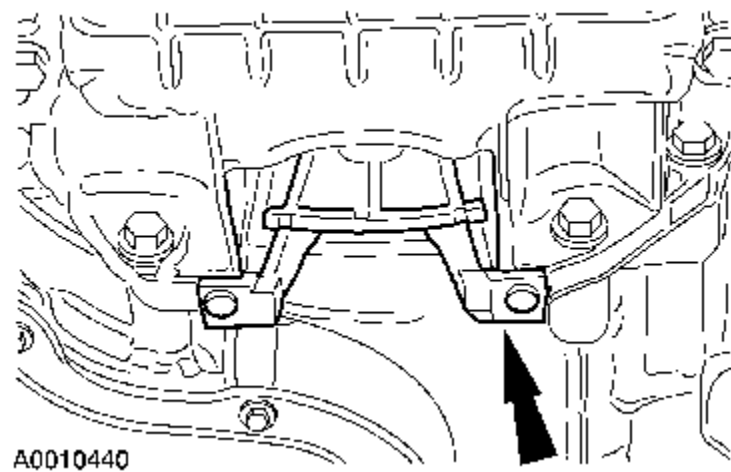
1. Remove the bolt and separate the steering shaft from the rack.



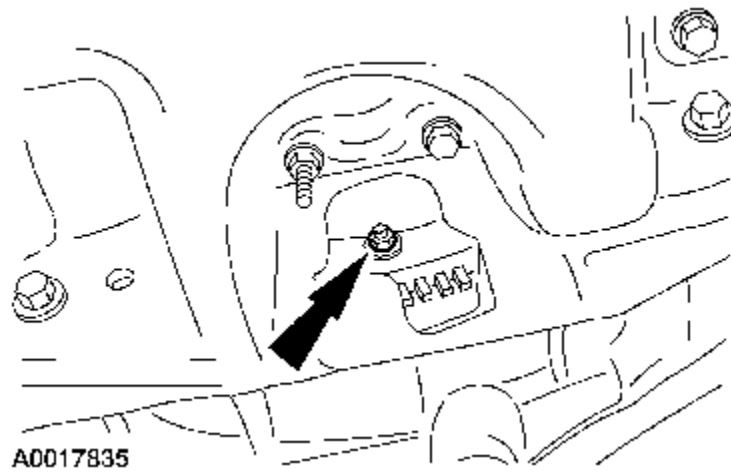
1. Remove the transaxle line bracket bolt.



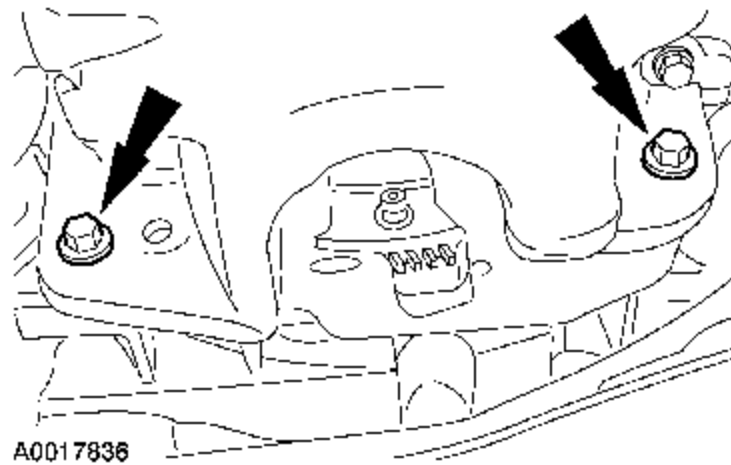
1. Disconnect the two transaxle cooler lines.



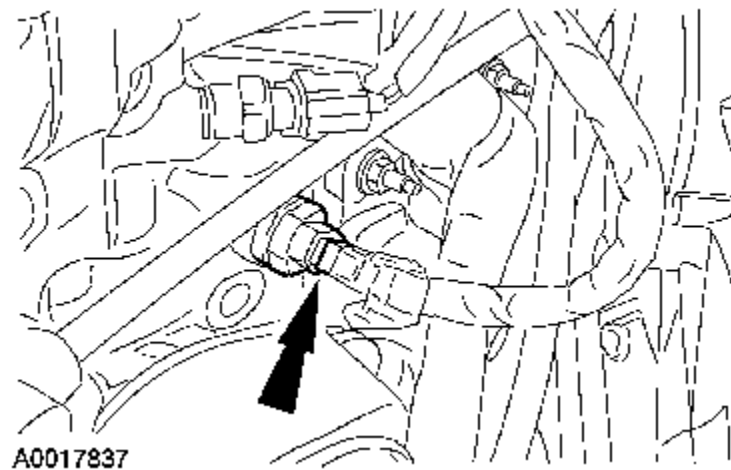
1. Remove the torque converter inspection cover.



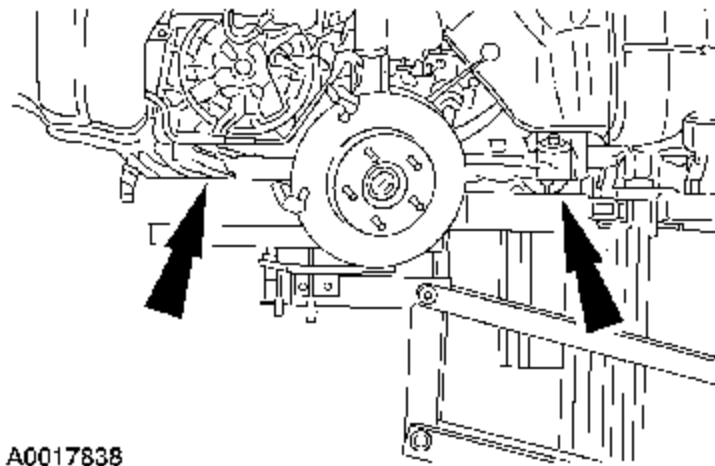
1. Remove the four torque converter nuts.



1. Remove the four bolts.



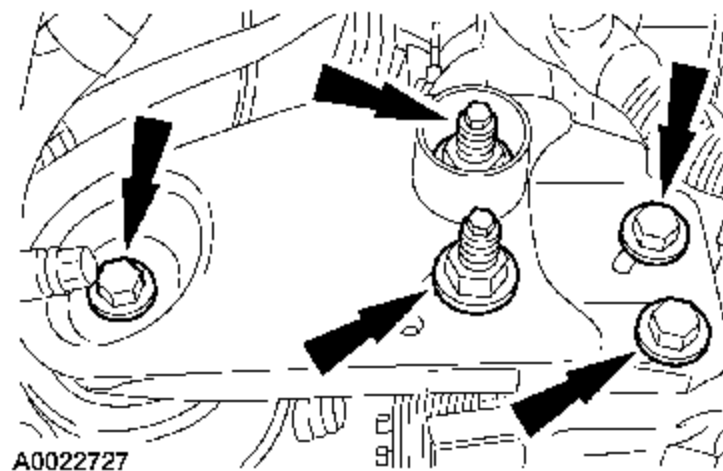
1. If equipped disconnect the block heater wiring.



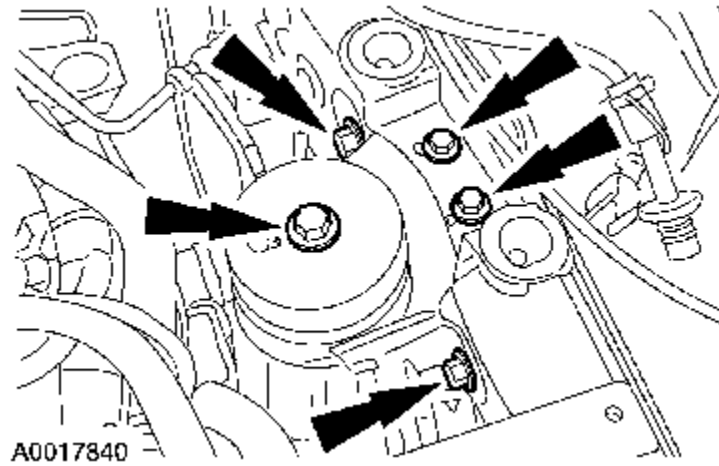
1. Position the universal powertrain lift.

NOTE:

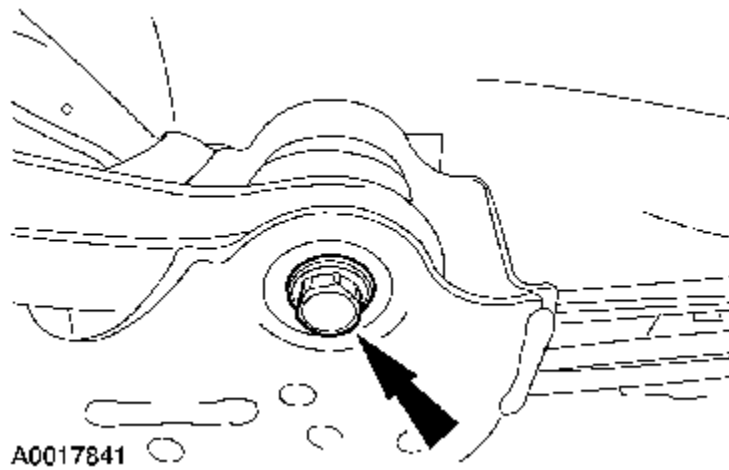
The next six steps must be carried out with the vehicle raised and the universal powertrain lift in position.



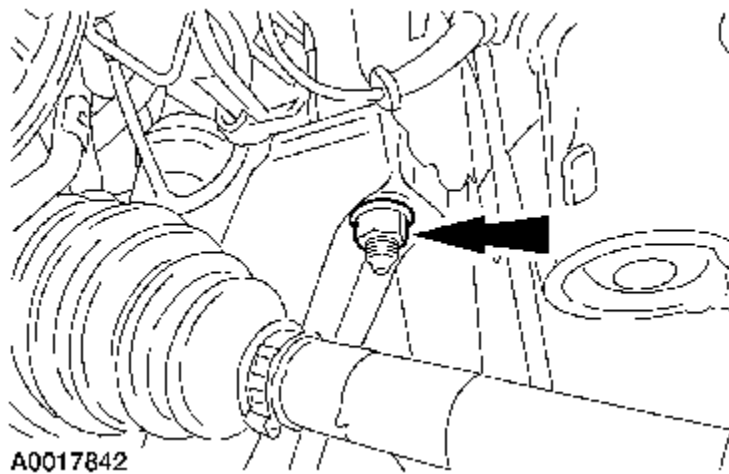
1. Remove the bolts and the nuts, remove the engine support bracket.



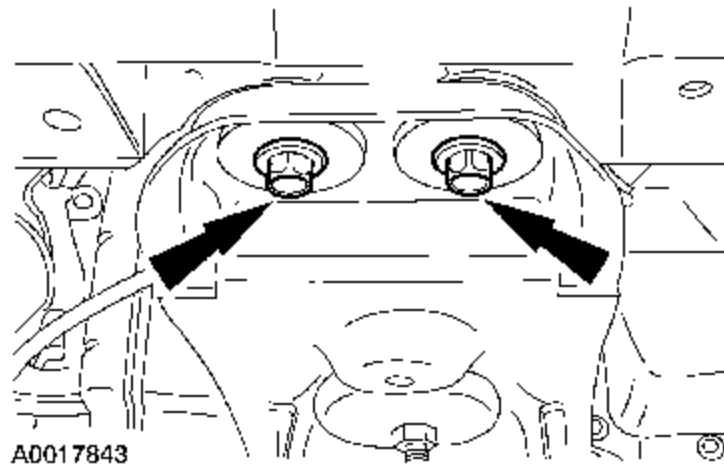
1. Remove the bolts and the transaxle support.



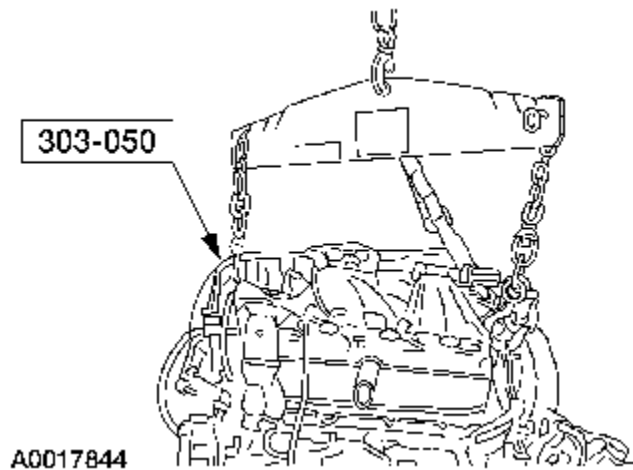
1. Remove two rear subframe bolts.



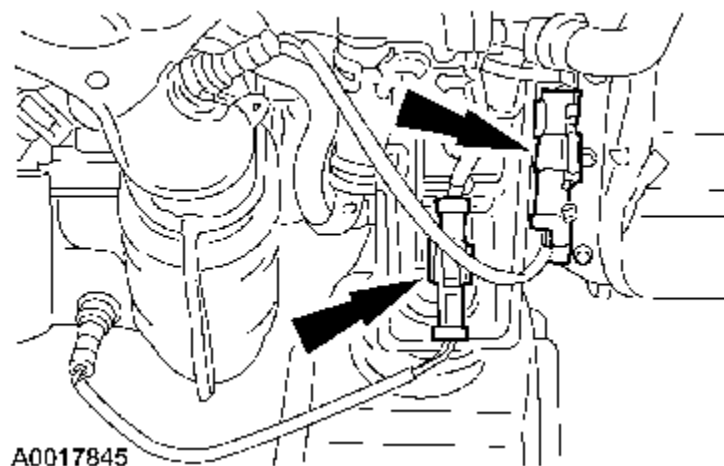
1. Remove the two subframe side nuts.



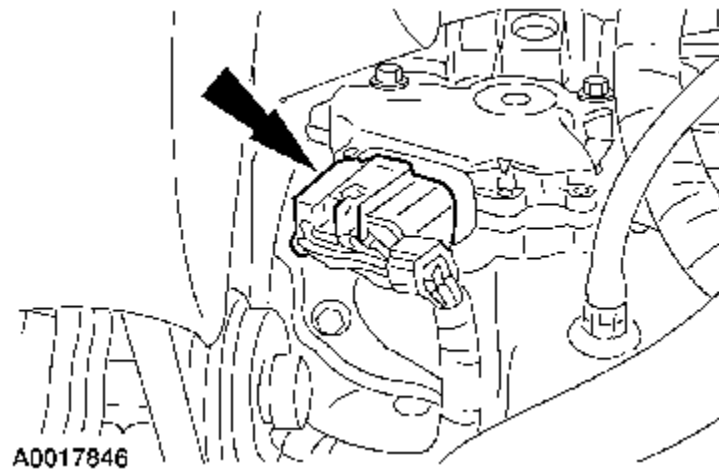
1. Remove the four bolts from the motor mount support.
2. Remove the powertrain from the vehicle.



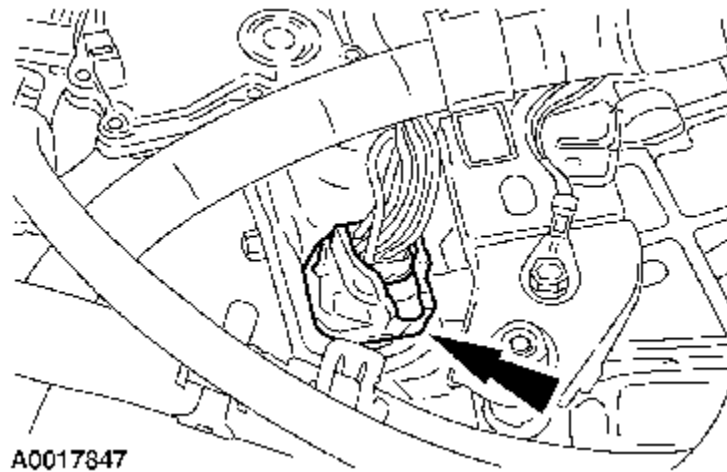
1. Using the special tools remove the powertrain from the universal powertrain lift and set it down on the floor or a suitable table.



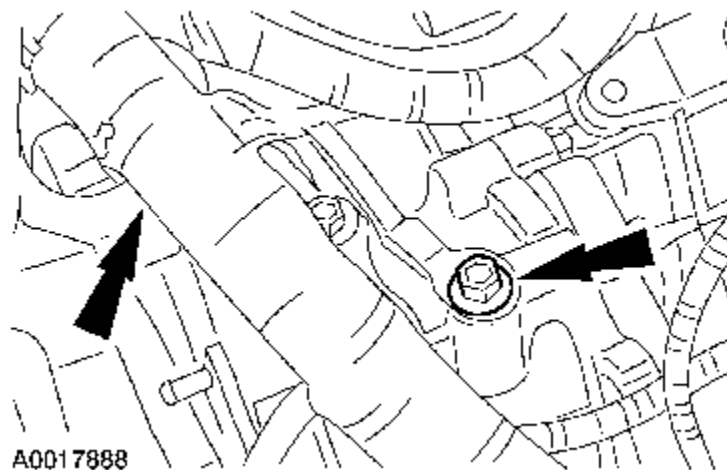
1. Disconnect the heated oxygen sensors.



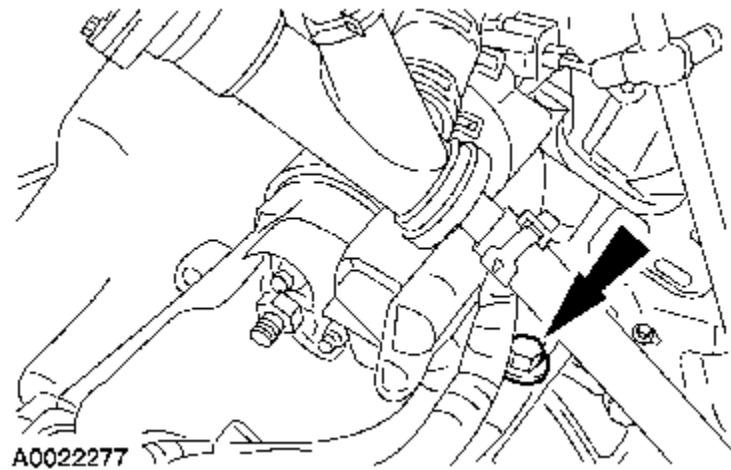
1. Disconnect the TR sensor.



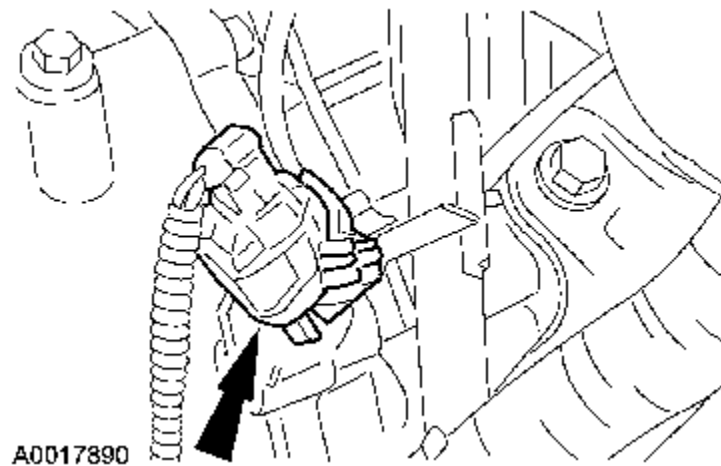
1. Disconnect the transaxle harness electronic control switch.



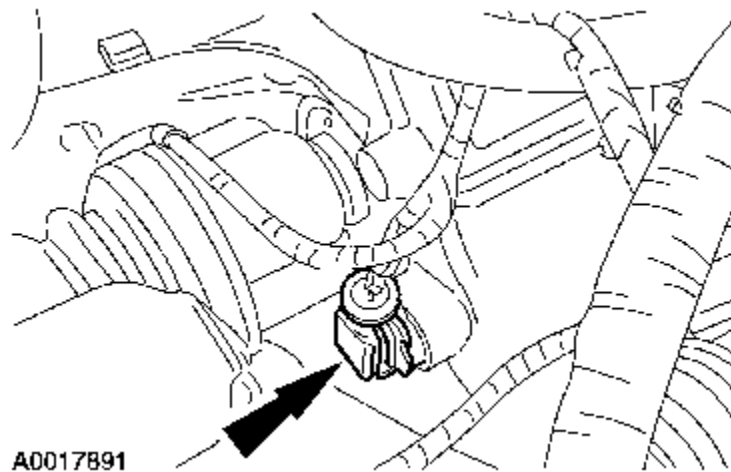
1. Remove the bolt and separate the transaxle control harness from the bracket.



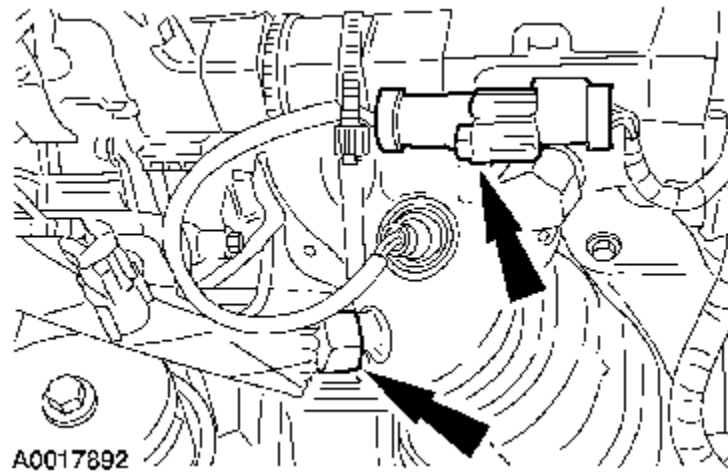
1. Remove the two bolts, the starter and harness as an assembly.



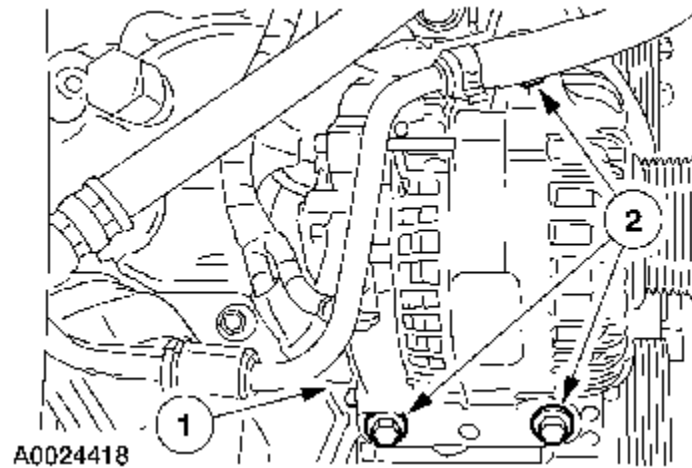
1. Disconnect the knock sensor jumper electrical connector.



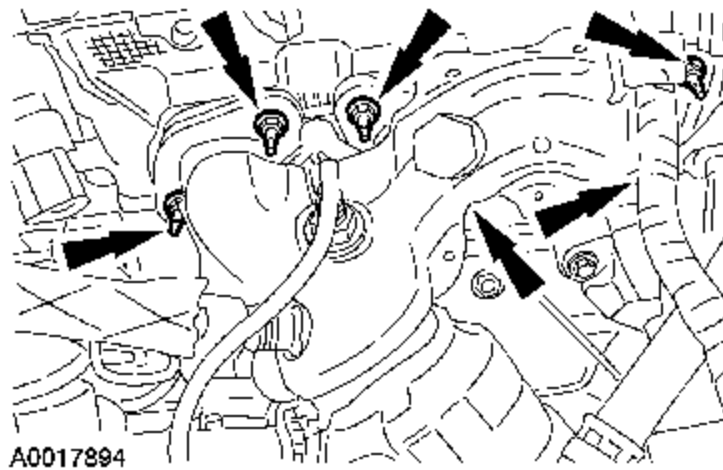
1. Disconnect the output shaft speed sensor electrical connector.



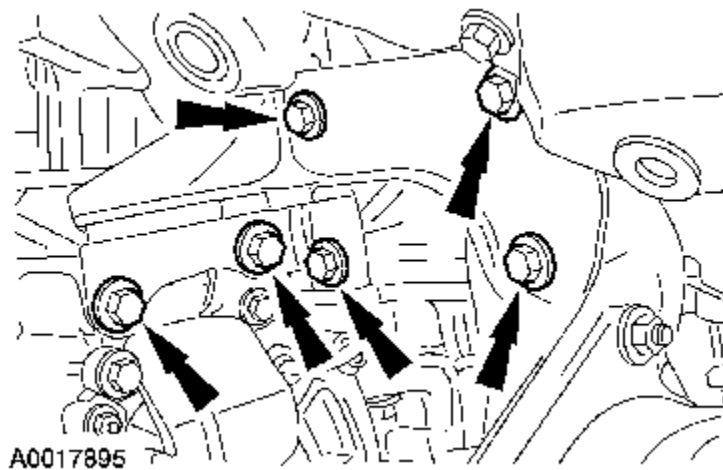
1. Disconnect the HO2S and the EGR tube from the exhaust manifold.



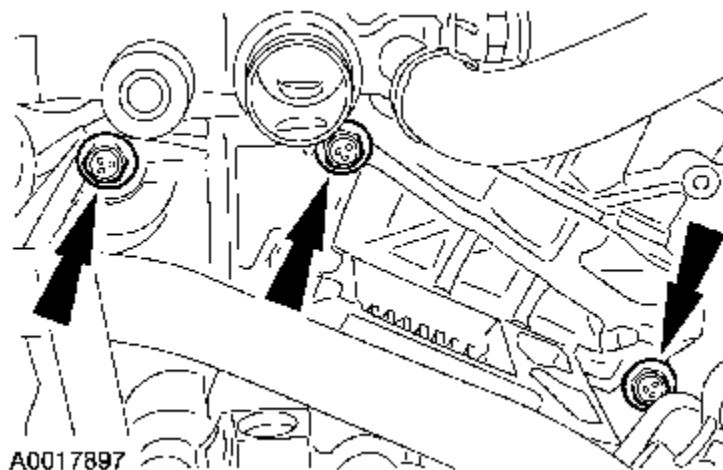
1. Remove the generator.
 - a. Disconnect the electrical connector.
 - b. Remove the bolts.



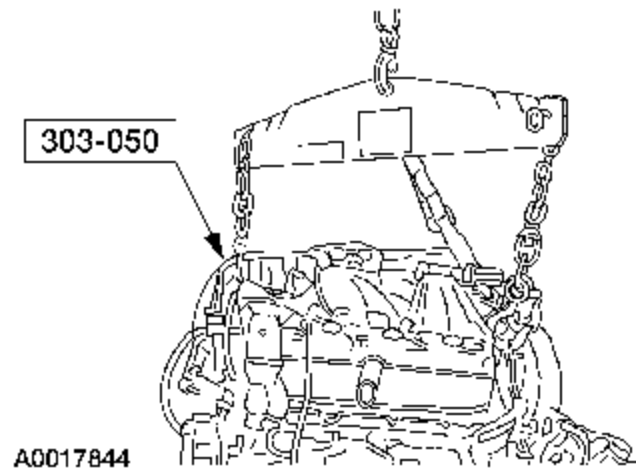
1. Remove the six RH exhaust manifold nuts and gasket.



1. Remove the bolts and position the halfshaft support bracket out of the way.



1. Remove the five trans axle bolts.



1. Using the special tools, remove the engine from the transaxle and mount on a suitable engine stand.

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VIN or Model Year 2001 Model TRIBUTE fuel charging wire harness

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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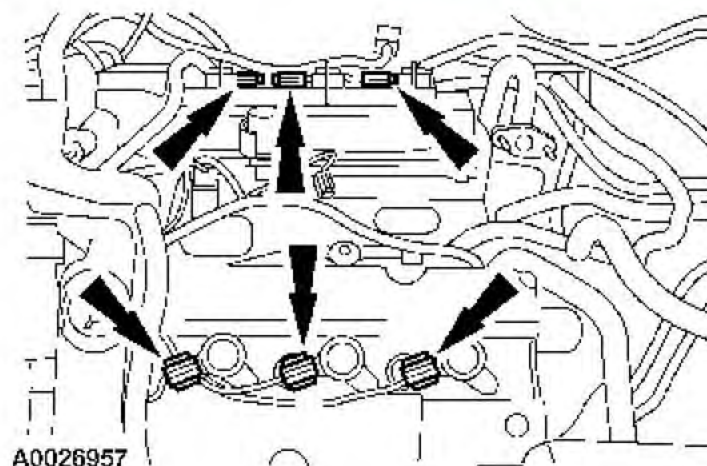
FUEL CHARGING WIRING HARNESS

Removal and Installation

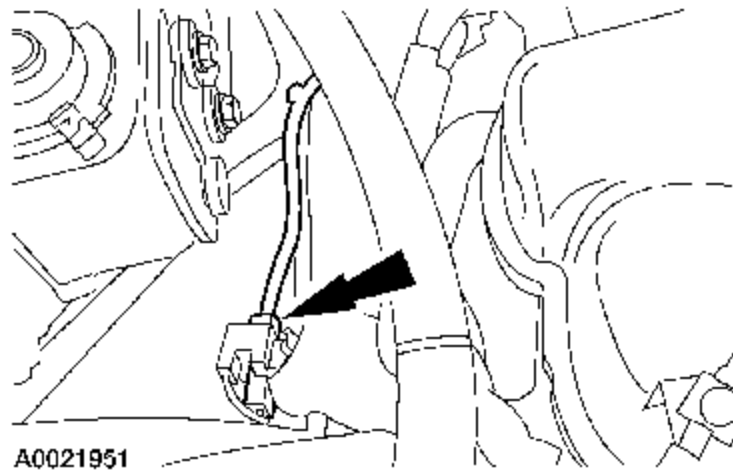
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

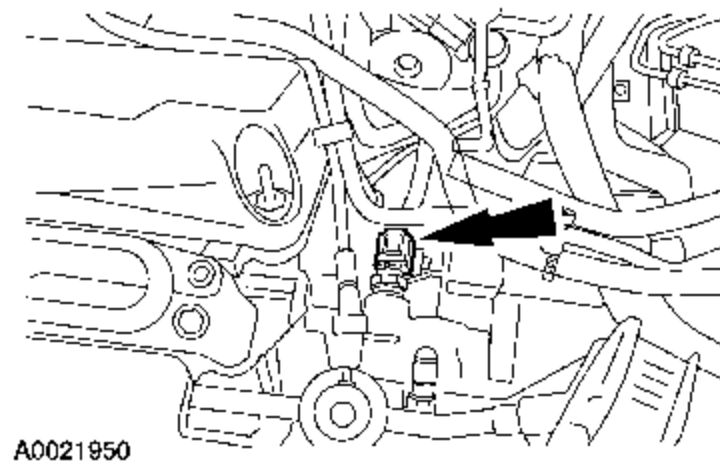
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



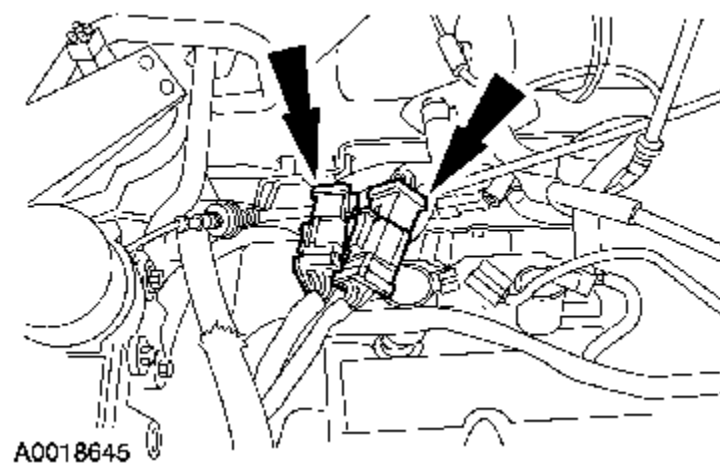
1. Disconnect the coil-on-plug electrical connectors.



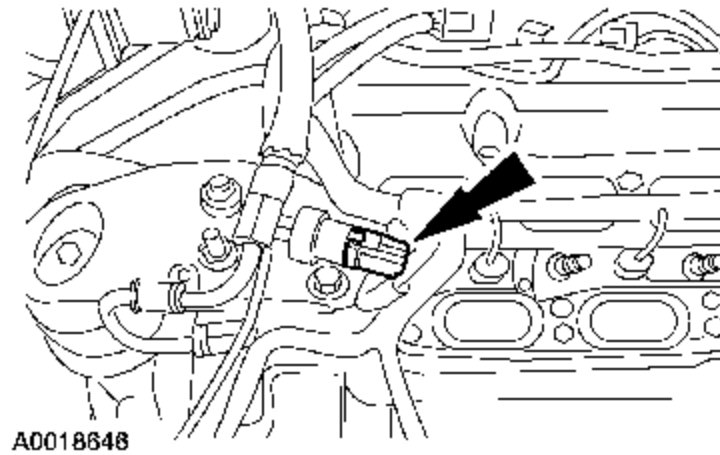
1. Disconnect the radio ignition noise suppressor electrical connector.



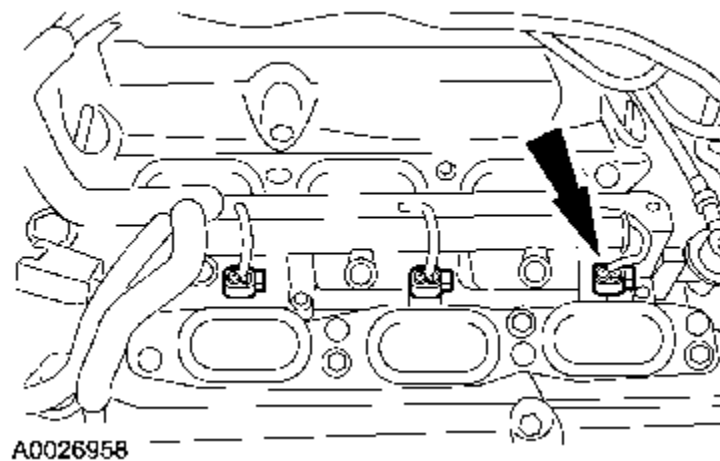
1. Remove the engine coolant temperature (ECT) sensor electrical connector.



1. Disconnect the 16-pin electrical connectors.



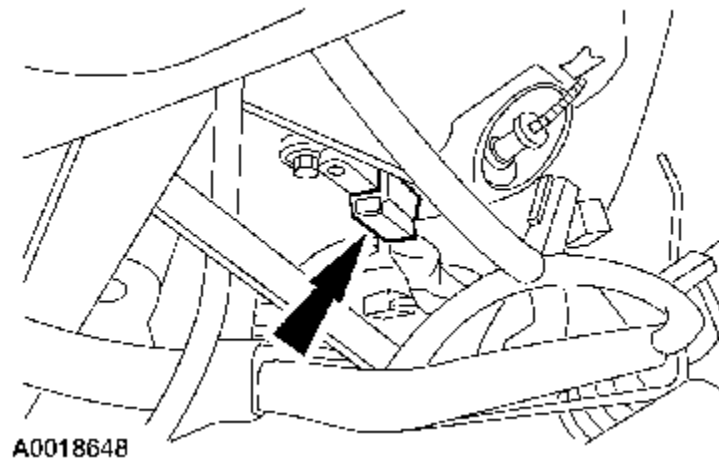
1. Disconnect power steering pressure (PSP) switch electrical connector.



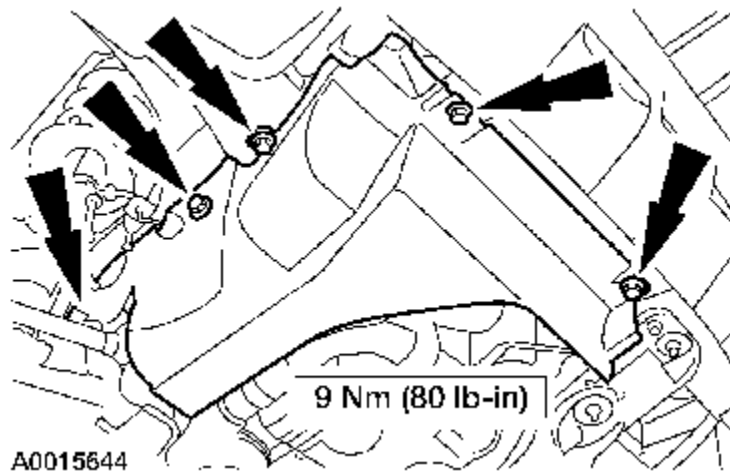
- 1.

NOTE:

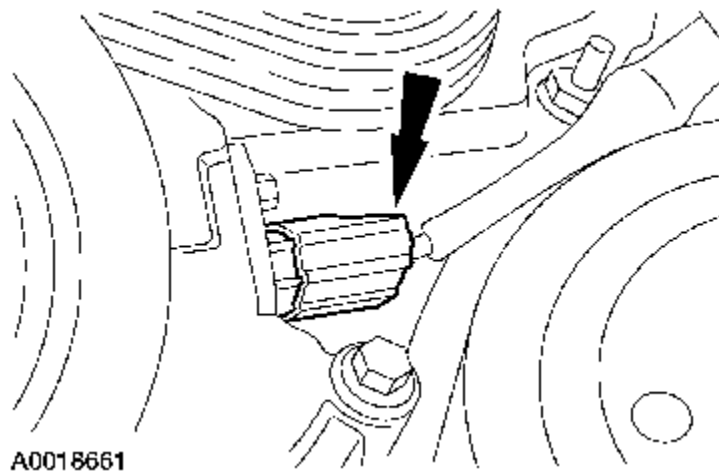
One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



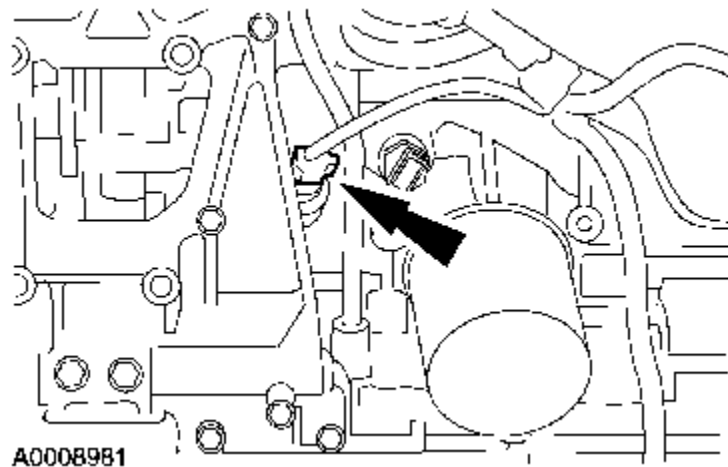
1. Disconnect the camshaft position (CMP) sensor electrical connector.
2. Remove the RH wheel and tire assembly.



1. Remove the RH lower splash shield.



1. Disconnect the crankshaft position (CKP) sensor electrical connector.



- 1.

NOTE:

The oil pressure sensor is located behind the rear of the A/C compressor. The A/C compressor has been removed for clarity. Disconnect the oil pressure sensor electrical connector.

2. Lower the vehicle.
3. Remove the fuel charging wiring harness from the vehicle.
4. To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE fuel Injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

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FUEL INJECTION SUPPLY MANIFOLD

Removal and Installation

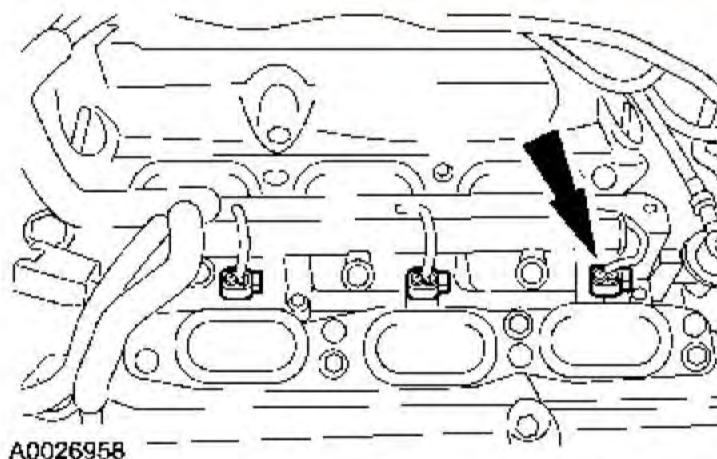
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#)
2. Disconnect the fuel line. Refer to [01-14 SPRING LOCK COUPLINGS](#).

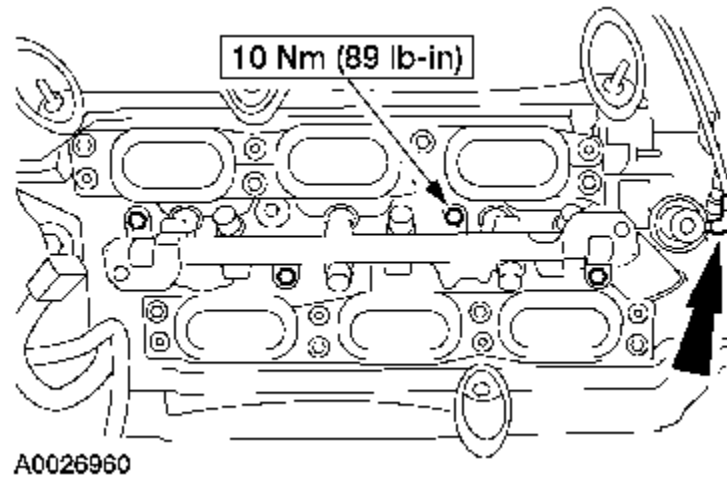


A0026958

1.

NOTE:

One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



1. Remove the fuel injection supply manifold.

- a. Remove the vacuum hose.
- b. Remove the bolts and the manifold.

2.

NOTE:

Lubricate the fuel injector O-ring seals with clean engine oil to aid installation. To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE fuel Injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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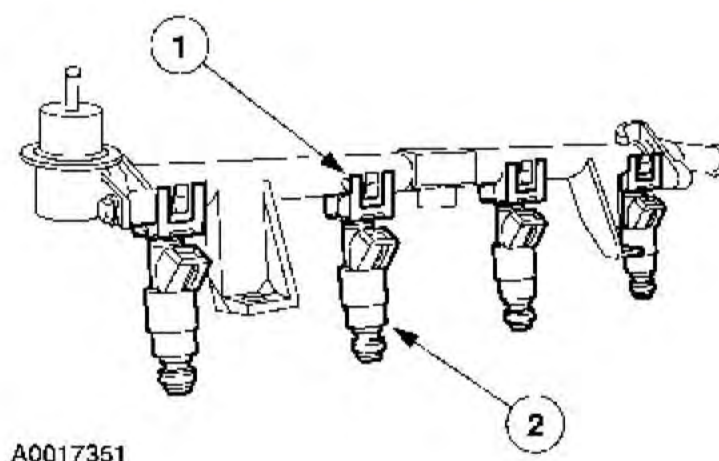
FUEL INJECTORS

Removal and Installation

WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

1. Remove the fuel injection supply manifold. Refer to [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 2.0L Zetec, or [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 3.0L (4V).

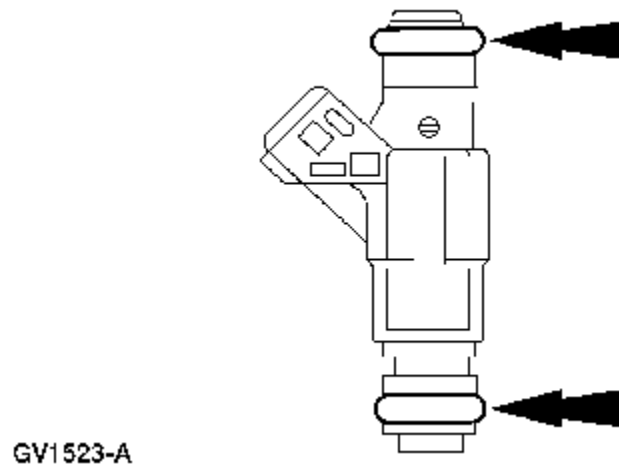


- 1.

NOTE:

A gentle twisting motion may be used while removing the fuel injectors from the fuel supply manifold. Remove the fuel injectors from the supply manifold.

- a. Release the retaining clips.
- b. Remove the fuel injectors.



1. Inspect the O-ring seals. Discard if damaged.
- 2.

CAUTION:

Use O-ring seals made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog fuel injectors.

NOTE:

Lubricate the O-ring seals with clean SAE 5W-30 motor oil to aid installation.

NOTE:

Install the fuel injector retaining clips onto the fuel injectors before installing the injectors onto the supply manifold.

To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE fuel pulse damper

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

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FUEL PULSE DAMPER

Removal and Installation

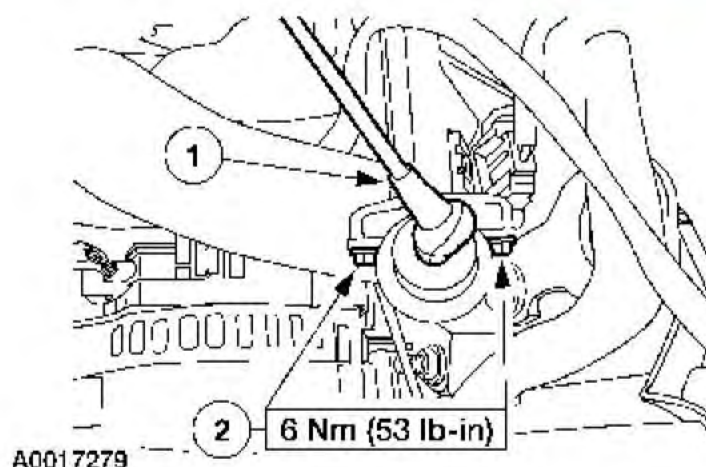
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Relieve the fuel system pressure. Refer to [01-14 FUEL SYSTEM PRESSURE RELEASE -- 2.0L ZETEC](#) or [01-14 FUEL SYSTEM PRESSURE RELEASE -- 3.0L \(4V\)](#).
2. For 3.0L (4V) engine, remove the throttle body. Refer to [01-13B THROTTLE BODY](#).



1. Remove the fuel pulse damper.
 - a. Disconnect the vacuum line.
 - b. Remove the bolts and the damper.
2. Inspect the O-ring seal and install a new seal if damaged.
- 3.

CAUTION:

Use an O-ring seal made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog the fuel injectors.

NOTE:

Lubricate the O-ring seal with clean SAE 5W-30 motor oil to aid installation.

To install, reverse the removal procedure.

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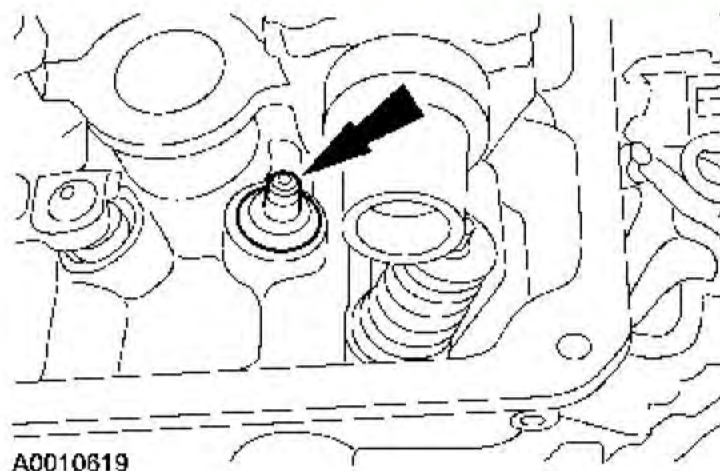
VIN or Model Year 2001 Model TRIBUTE Hydraulic Lash Adjuster☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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HYDRAULIC LASH ADJUSTERS

Removal and Installation

1. Remove the camshaft followers. Refer to [01-10C ROLLER FOLLOWERS](#).



- 1.

NOTE:

Mark the positions of the hydraulic lash adjusters to make sure they are assembled in their original position. Remove the hydraulic lash adjusters.

- 2.

NOTE:

Inspect the hydraulic lash adjusters for scoring marks and uneven wear in the bore. Install new lash adjusters if necessary. To install, reverse the removal procedure.

- a. Lubricate the hydraulic lash adjusters with SAE 5W-20 Motor Oil.

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VIN or Model Year 2001 Model TRIBUTE ignition coil on plug RH 1
 General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐ V
 Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐ Bo

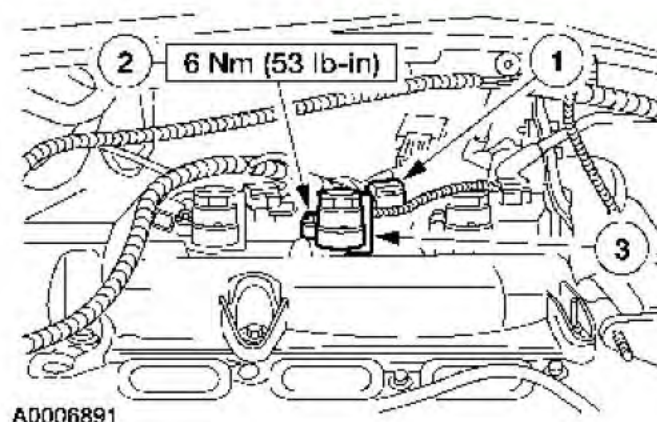
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IGNITION COIL-ON-PLUG -- RH

Removal and Installation

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Remove the ignition coil-on-plug.
 - a. Disconnect the electrical connector.
 - b. Remove the bolt.
 - c. Remove the coil-on-plug.
2. To install, reverse the removal procedure.
 - a. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

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VIN or Model Year 2001 Model TRIBUTE upper intake

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

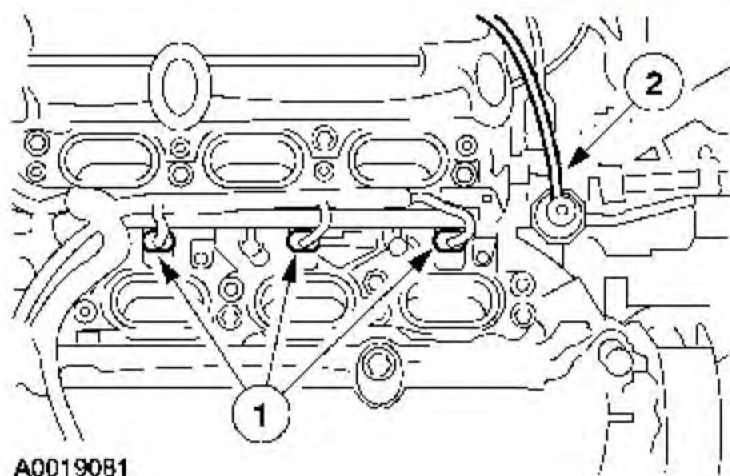
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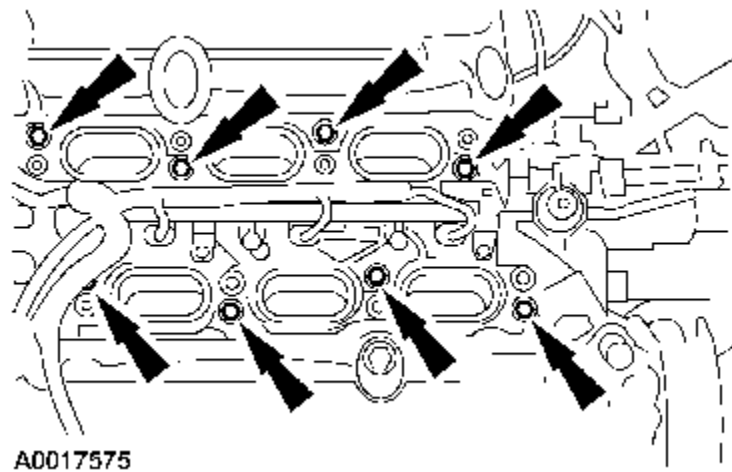
LOWER INTAKE MANIFOLD

Removal

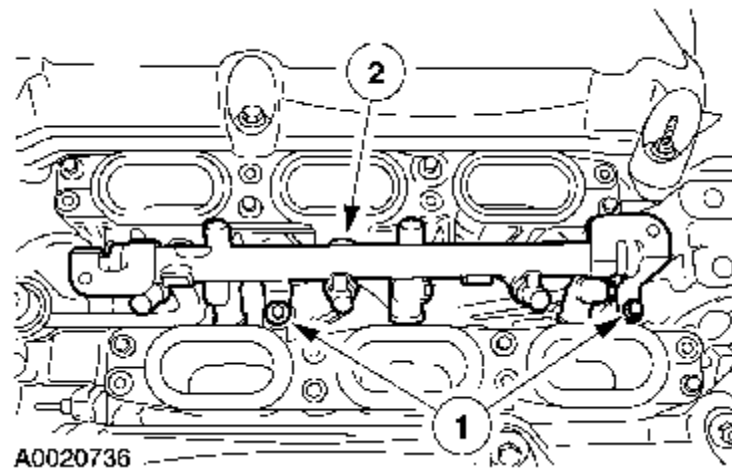
1. Disconnect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).
2. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Disconnect the fuel rail.
 - a. Disconnect the six fuel injector electrical connectors (1).
 - b. Disconnect the fuel pressure damper vacuum line (2).



1. Remove the bolts and the lower intake manifold.



1. Remove the fuel rail.
 - a. Remove the bolts (1).
 - b. Carefully separate the lower intake manifold from the fuel rail (2).
2. Remove the six fuel injectors from the lower intake manifold.
3. Remove and discard the gaskets if damaged.

Installation

1. Install the gaskets in the lower intake manifold.
- 2.

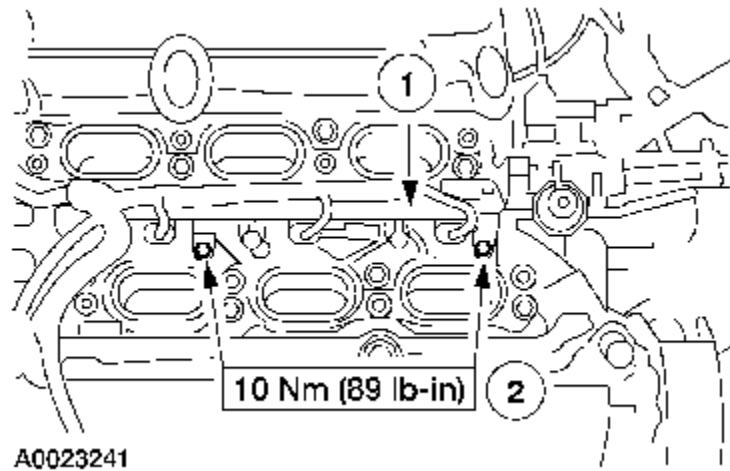
CAUTION:

Never use silicone grease. It will clog the fuel injectors.

NOTE:

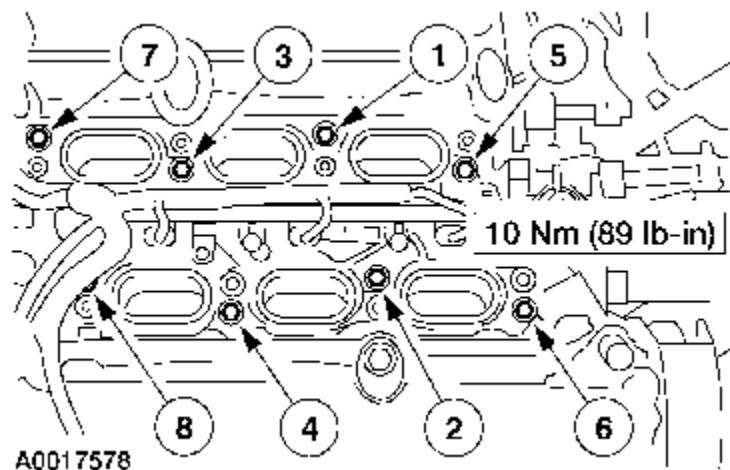
Inspect the fuel injector O-ring seals and install O-ring seals if necessary.

Lubricate the O-ring seals lightly with SAE 5W-20 Motor Oil and install the fuel injectors into the lower intake manifold.

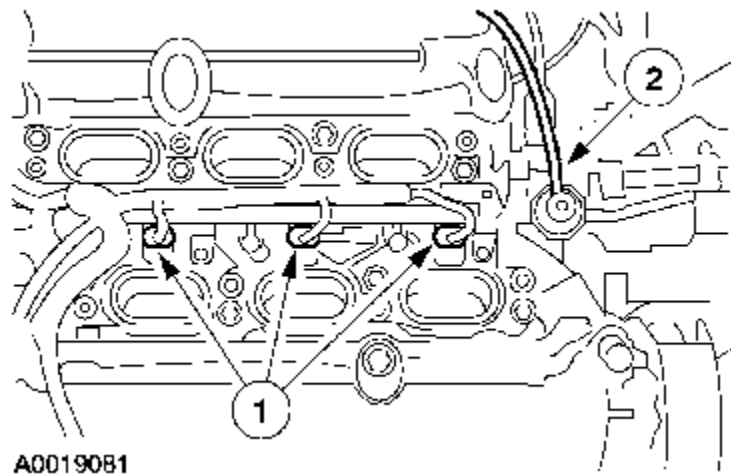


1. Install the fuel rail.

- a. Position the fuel rail (1).
- b. Install the four bolts (2).



1. Install the lower intake manifold assembly and tighten the bolts in the sequence shown.



1. Connect the fuel rail.
 - a. Connect the six fuel injectors (1).
 - b. Connect the fuel pressure damper vacuum line (2).
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).
3. Connect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).

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VIN or Model Year 2001 Model TRIBUTE oil pump

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

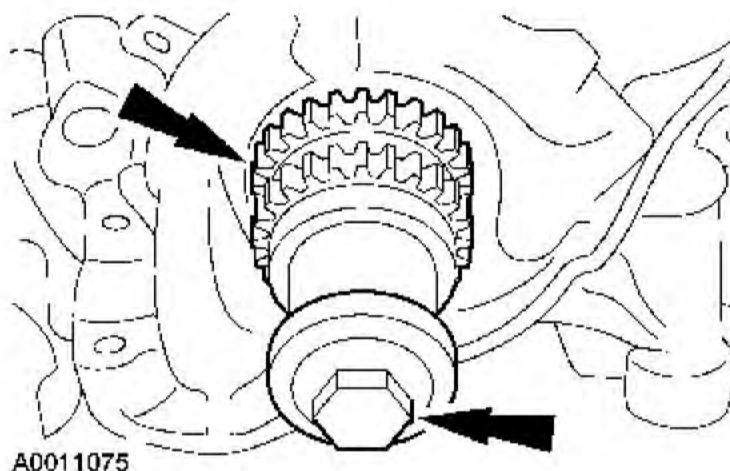
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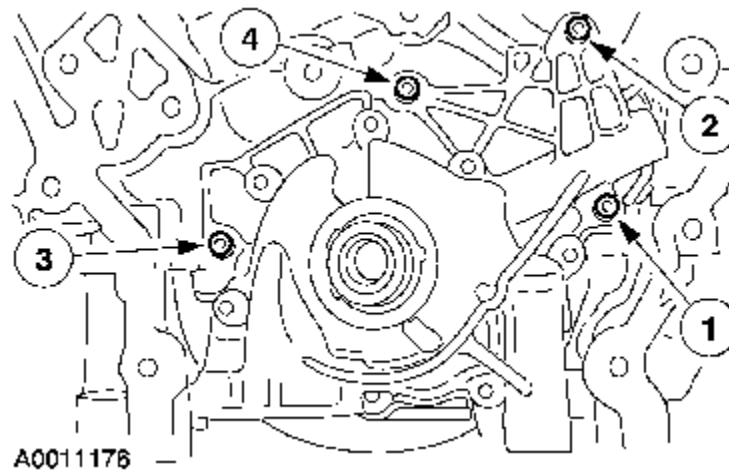
OIL PUMP

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).
2. Remove the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).

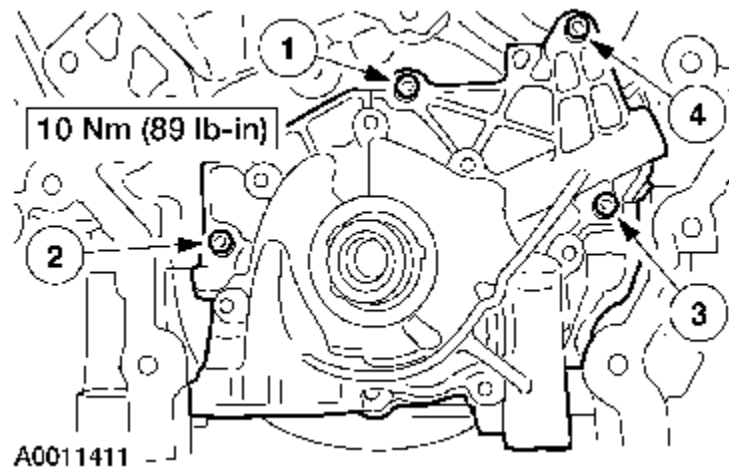


1. Remove the damper bolt and the crankshaft sprockets.

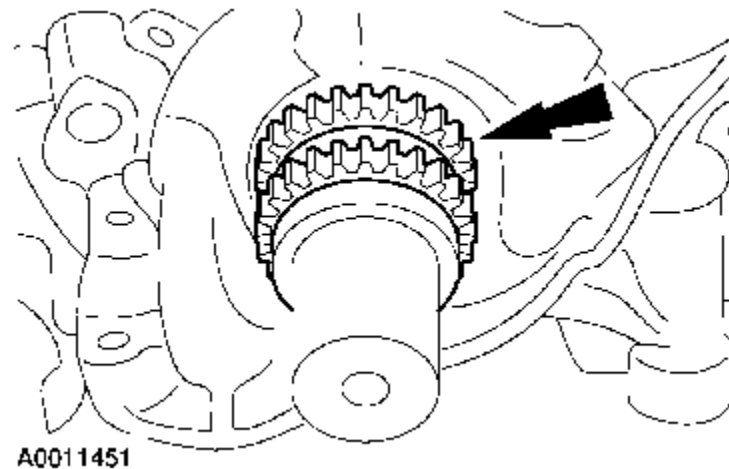


1. Remove the bolts in the indicated sequence and remove the oil pump.

Installation



1. Position the oil pump and install the bolts in the sequence shown.



1. Install the crankshaft sprockets.
2. Install the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).
3. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2001 Model TRIBUTE valve cover RH

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

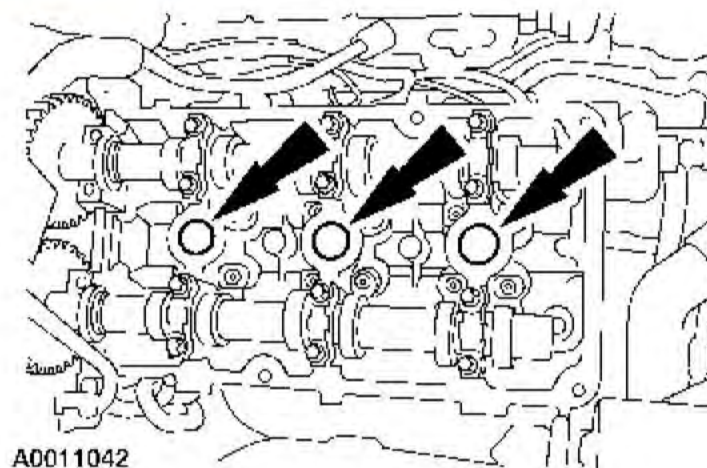
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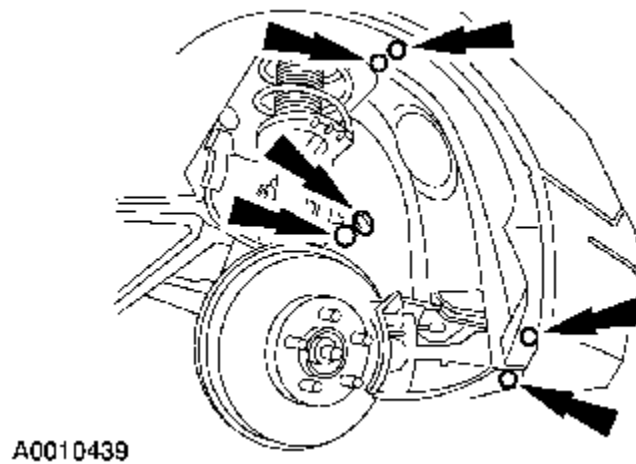
ROLLER FOLLOWERS

Removal and Installation

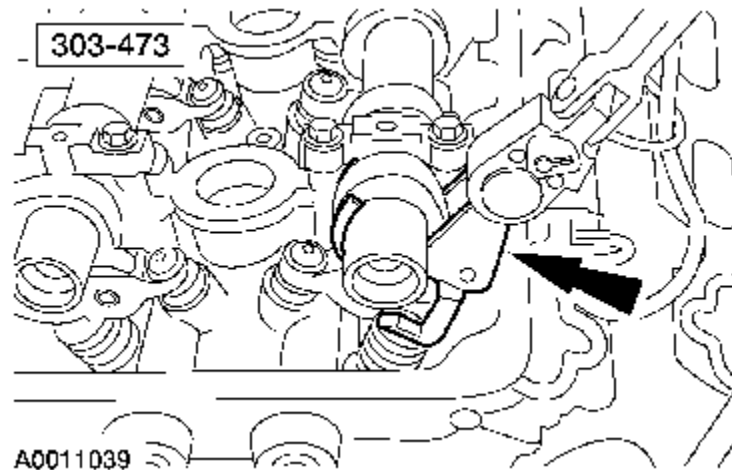
1. Remove the LH and RH valve covers. Refer to [01-10C VALVE COVER -- RH](#) and [01-10C VALVE COVER -- LH](#).



1. Remove the LH and RH spark plugs.
2. Remove the RH front wheel.



1. Remove the screws, the pin-type retainers, and the RH front inner fender splash shield.
2. Rotate the crankshaft until the camshaft lobe is pointing directly away from the follower.



1. Using the special tool, remove the followers.
2. To install, reverse the removal procedure.
 - a. Lubricate the camshaft followers with SAE 5W-20 Motor Oil .

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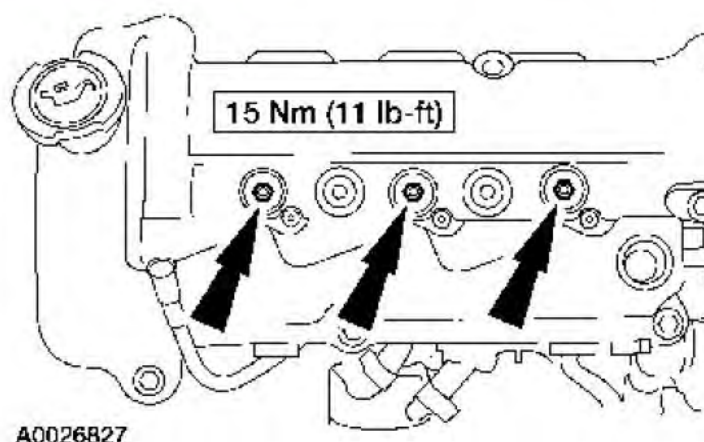
VIN or Model Year 2001 Model TRIBUTE ignition coil on plug RHGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐[< Previous](#) [Next >](#)

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SPARK PLUGS -- 3.0L

Removal

1. Remove the ignition coil-on-plugs. Refer to [01-18 IGNITION COIL-ON-PLUG -- LH](#) and [01-18 IGNITION COIL-ON-PLUG -- RH](#).



- 1.

NOTE:

LH shown, RH similar. Remove the LH and RH spark plugs.

2. Inspect the spark plugs. Refer to [01-18 SPARK PLUG -- INSPECTION](#).
3. To install, reverse the removal procedure.

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VIN or Model Year 2001 - Model TRIBUTE - speed control actuator

General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

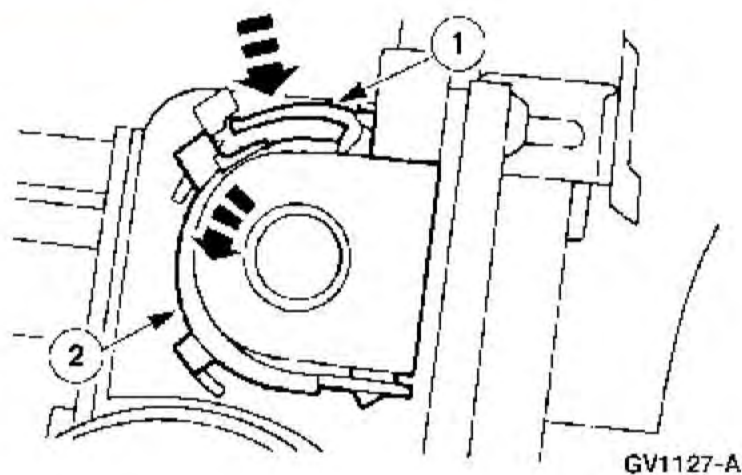
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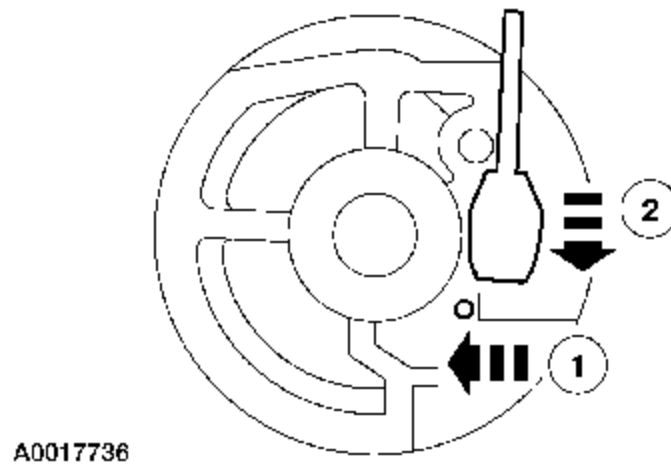
SPEED CONTROL ACTUATOR

Removal and Installation

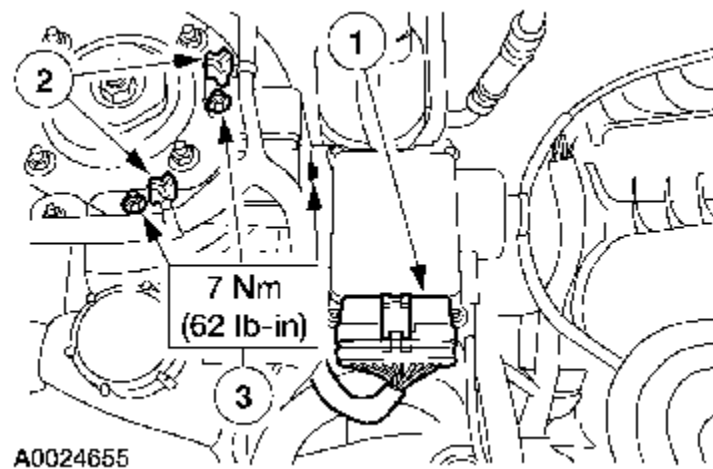
1. Disconnect the battery ground cable. For additional information, refer to [01-17 BATTERY DISCONNECT](#).



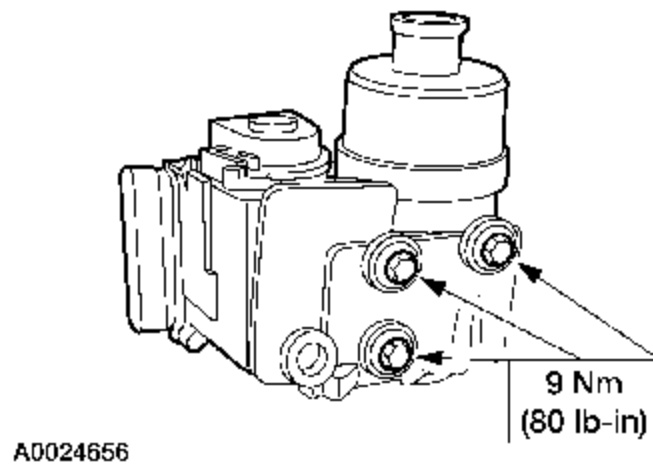
1. Release the cruise control cable cap.
 - a. Squeeze the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.



1. Remove the cruise control actuator assembly.
 - a. Disconnect the electrical connector.
 - b. Separate the wire harness from the bracket.
 - c. Remove the nuts.



1. Remove the bolts and separate the cruise control actuator from the bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE accelerator cable brack☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain[< Previous](#) [Next >](#)

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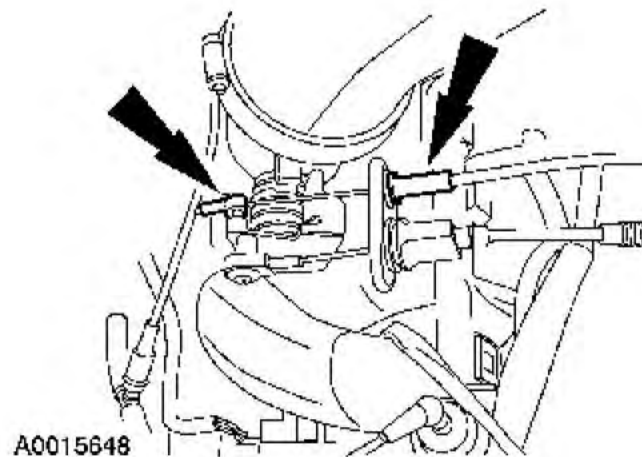
SPEED CONTROL CABLE

Removal and Installation

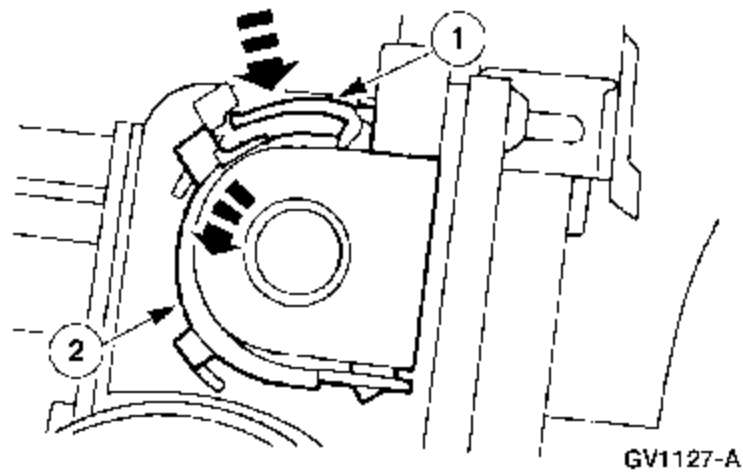
NOTE:

The cruise control actuator cable is not adjustable.

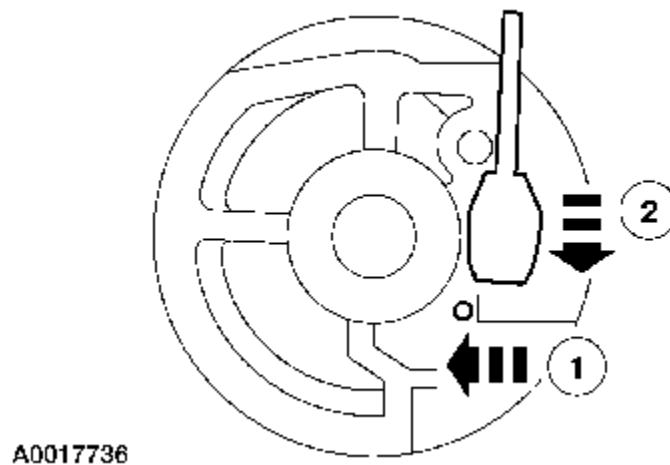
Vehicles equipped with 2.0L Zetec engine



1. Disconnect the cruise control cable from the throttle control linkage and bracket.

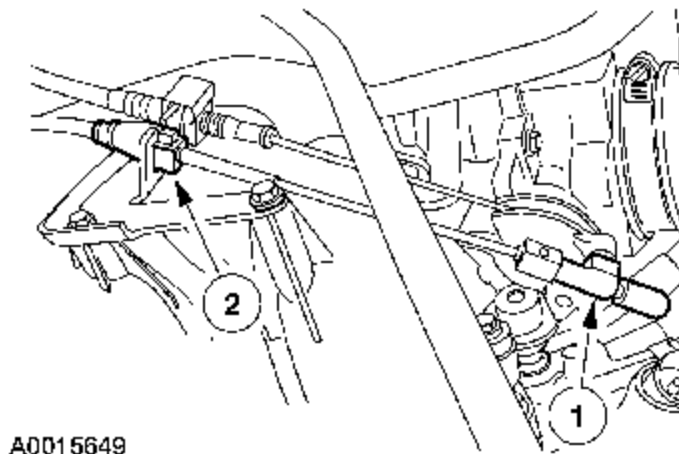


1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



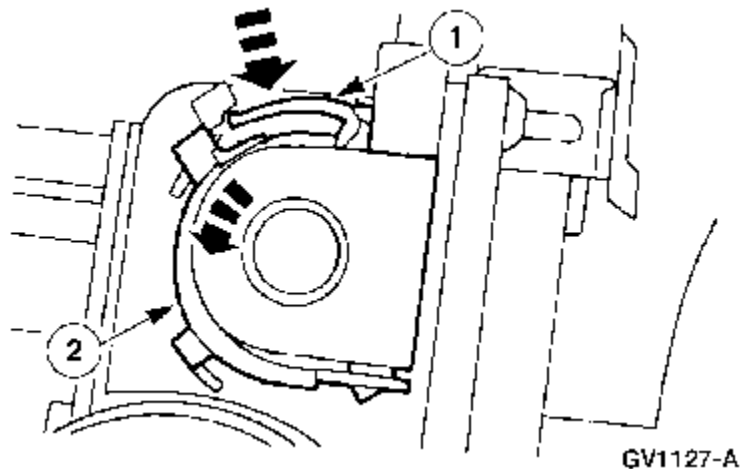
1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

Vehicles equipped with 3.0L (4V) engine



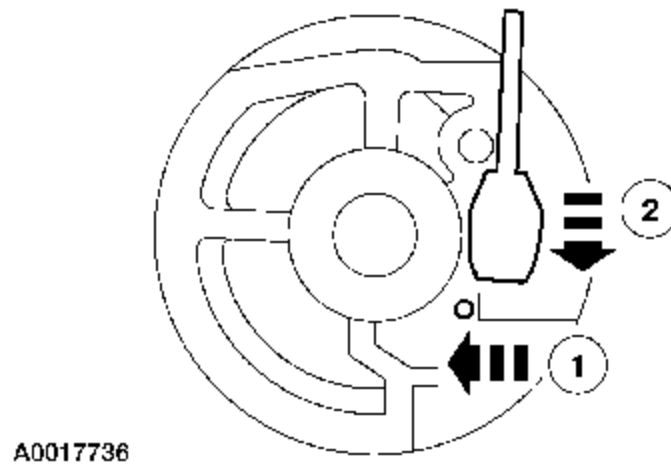
A0015649

1. Disconnect the cruise control cable from the throttle control linkage and bracket.
 - a. Disconnect the cable from the throttle control linkage.
 - b. Squeeze the tabs and disconnect the cruise control cable from the bracket



GV1127-A

1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

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VIN or Model Year 2001 Model TRIBUTE throttle body

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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THROTTLE BODY

Removal and Installation

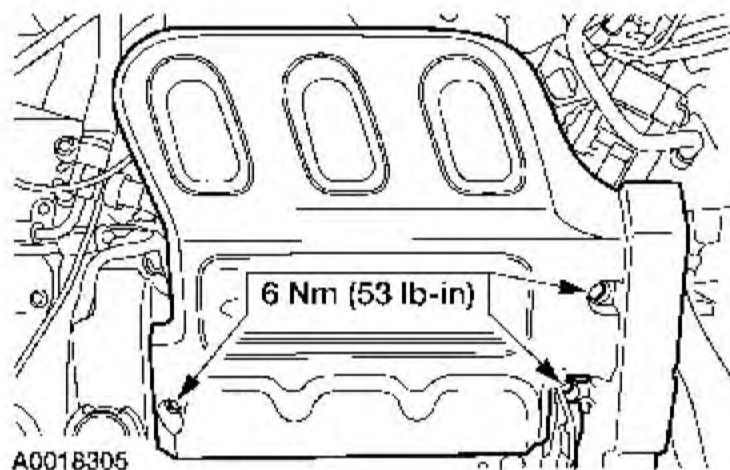
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

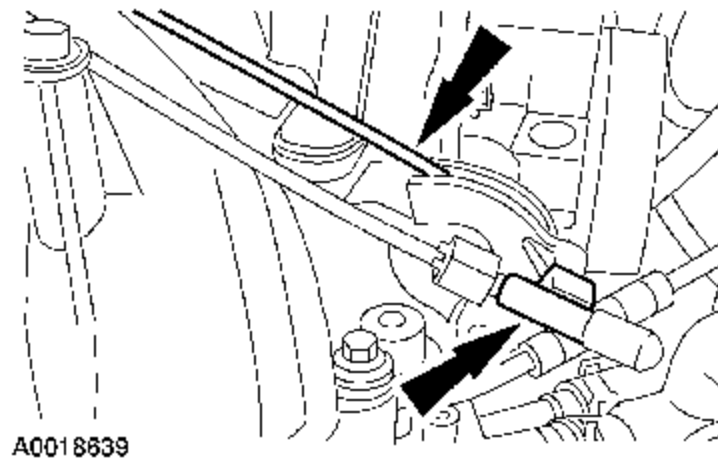
CAUTION:

Throttle body bore and plate area have a special coating and should not be cleaned.

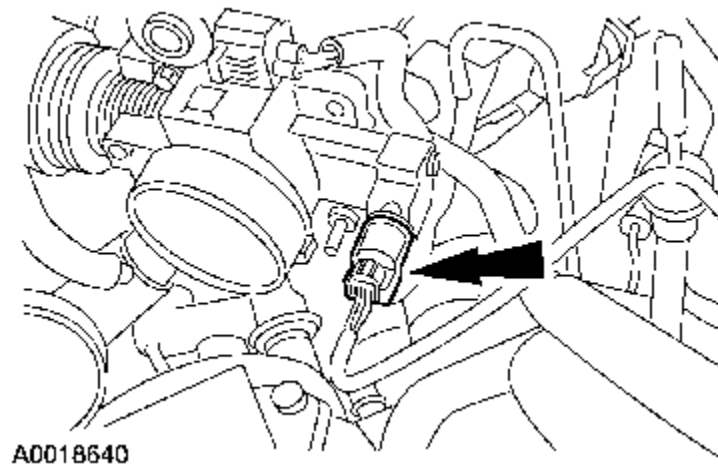
1. Remove the air cleaner outlet tube. Refer to [01-13B AIR CLEANER OUTLET PIPE -- 3.0L \(4V\)](#).



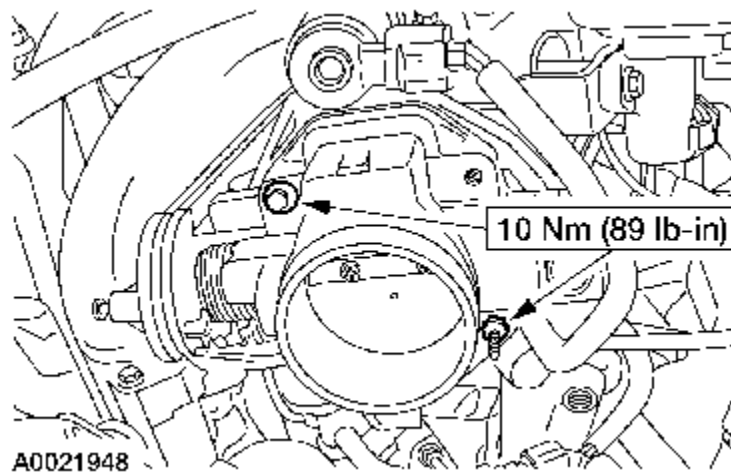
1. Remove the nuts and the engine appearance cover.



1. Disconnect the accelerator cable and the cruise control cable (if equipped) from the throttle body lever.



1. Disconnect the throttle position (TP) sensor electrical connector.



1. Remove the bolt, the stud bolt and the throttle body.

- a. Discard the gasket.
2. To install, reverse the removal procedure.
 - a. Install a new gasket.

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VIN or Model Year 2001 Model TRIBUTE timing drive component

 General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
 Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

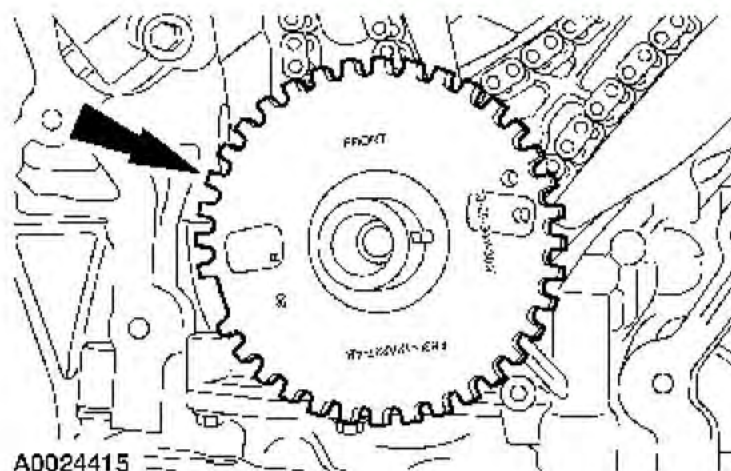
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TIMING DRIVE COMPONENTS

Removal

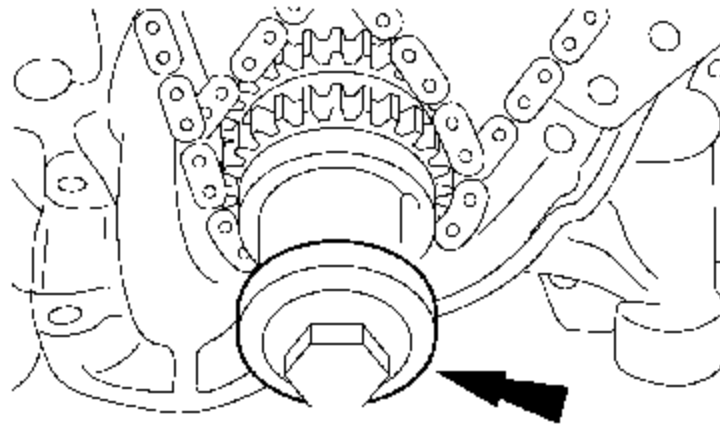
1. Remove the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).



- 1.

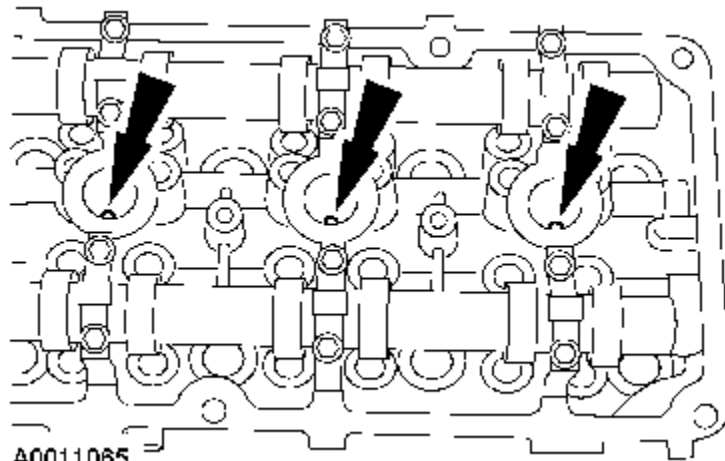
CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Remove the ignition pulse wheel.



A0022699

1. Install the damper bolt.

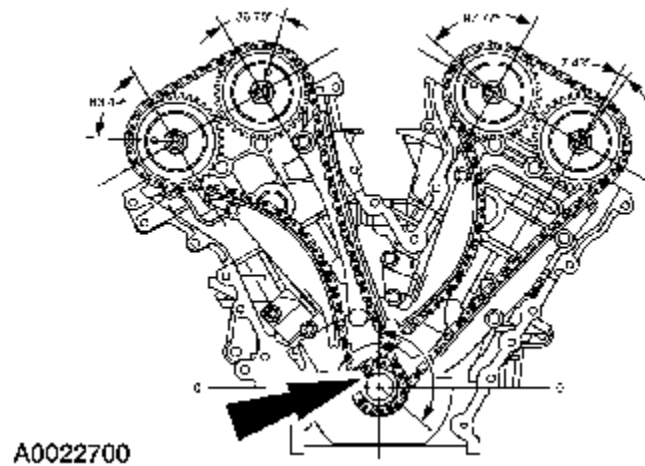


A0011065

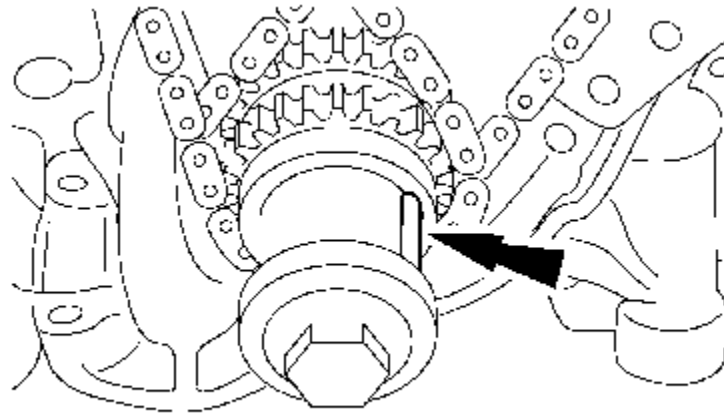
- 1.

NOTE:

RH shown, LH similar. Remove the LH and RH spark plugs.

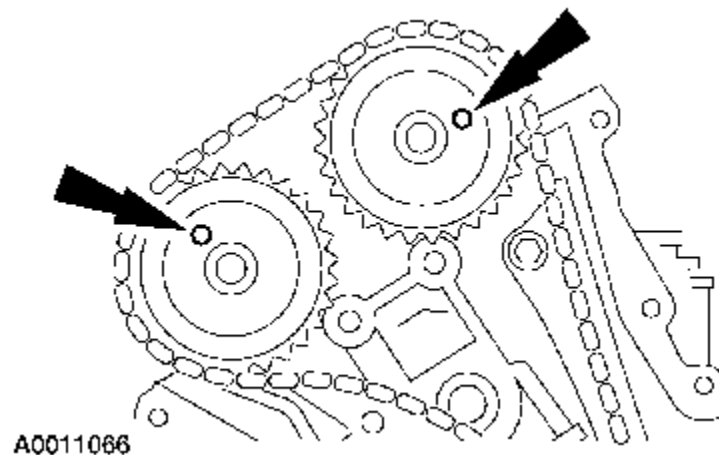


1. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at top dead center (TDC).



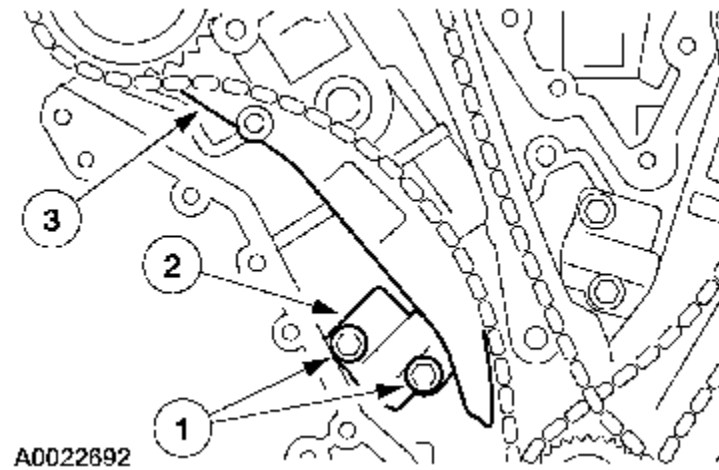
A0011067

1. Rotate the crankshaft clockwise 120 degrees to the 3 o'clock position to locate the RH camshafts in the neutral position.

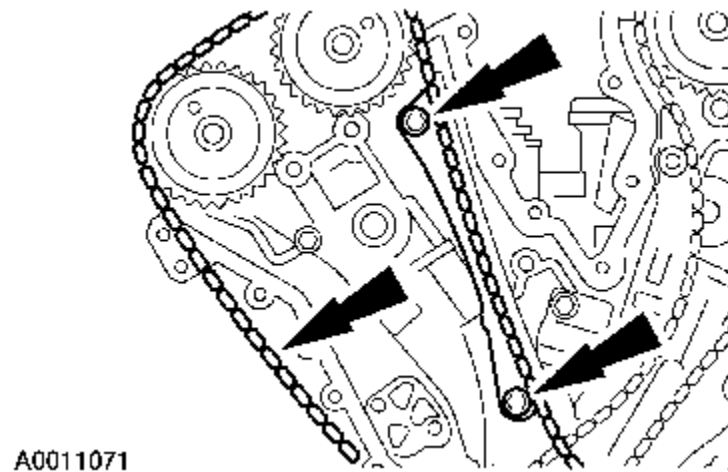


A0011066

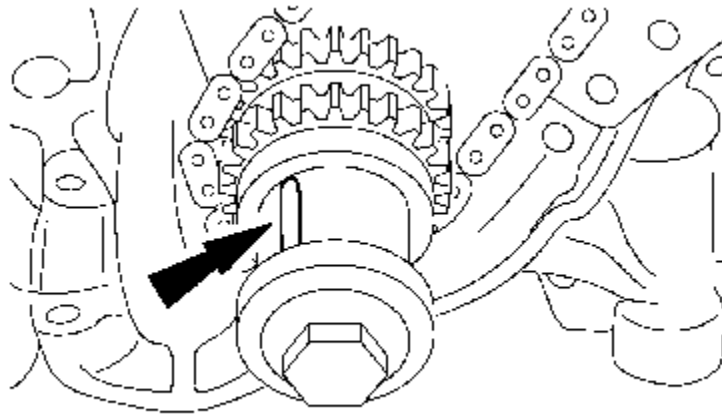
1. Verify that the RH camshafts are in the neutral position.



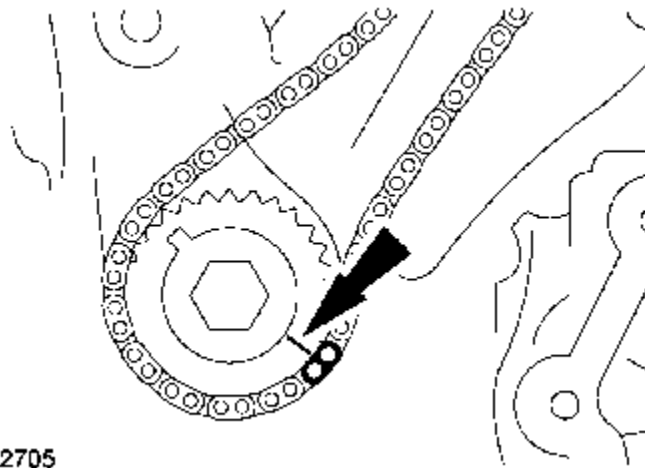
1. Remove the RH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.



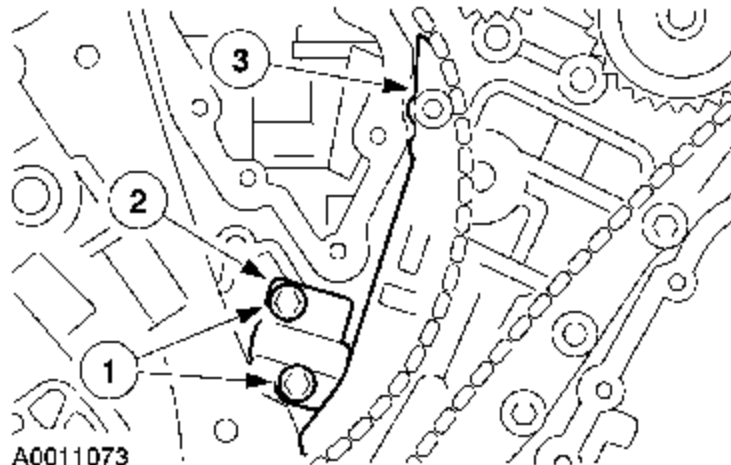
1. Remove the bolts, RH timing chain guide and the timing chain.

**A0011072**

1. Rotate the crankshaft clockwise two times to position the crankshaft keyway in the 11 o'clock position. This will position the LH camshafts in the neutral position.

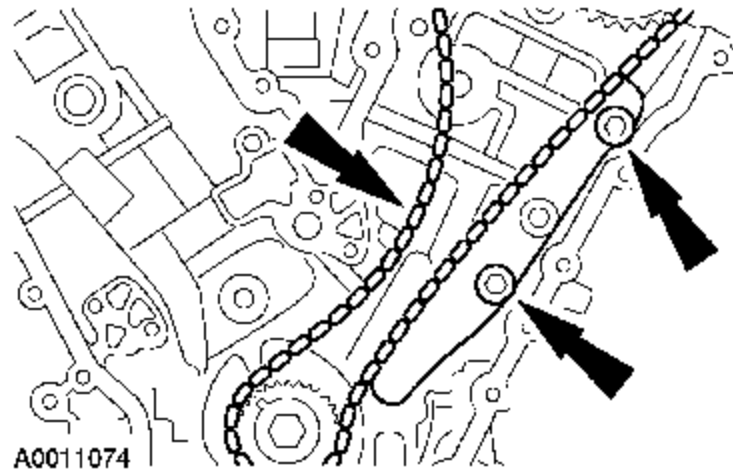
**A0022705**

1. Verify that the LH camshafts are in the neutral position. Mark the link position if visible on the crankshaft sprocket.

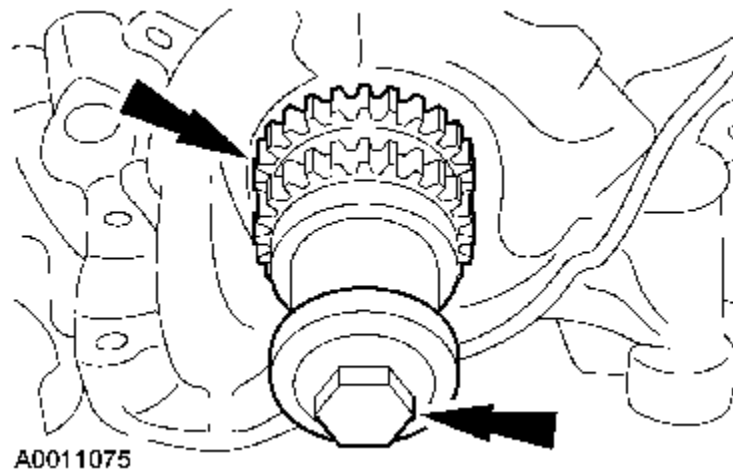
**A0011073**

1. Remove the LH timing chain and tensioner arm.

- a. Remove the bolts.
- b. Remove the tensioner.
- c. Remove the tensioner arm.

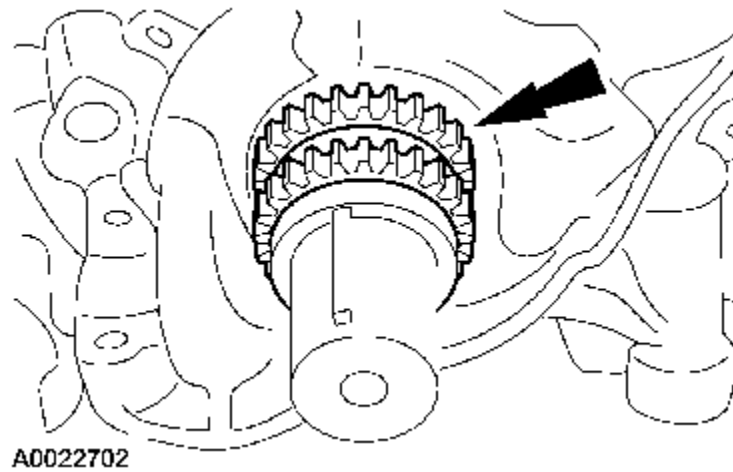


1. Remove the LH timing chain and timing chain guide.

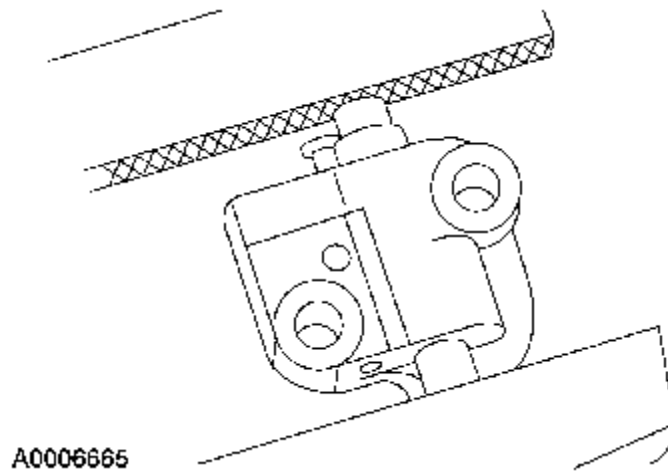


1. Remove the damper bolt and the crankshaft sprockets.

Installation



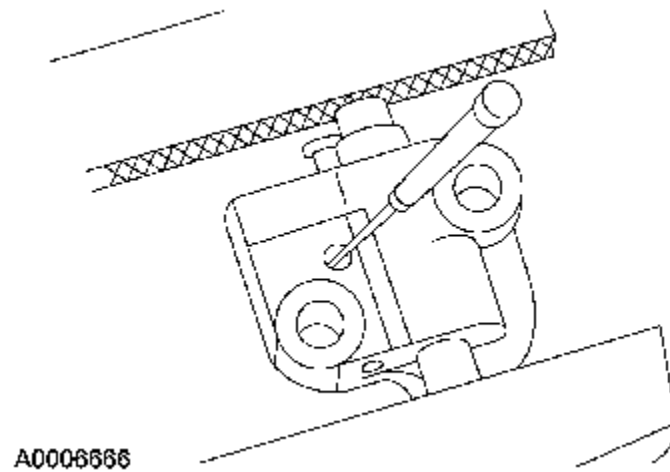
1. Install the crankshaft sprockets.



- 1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

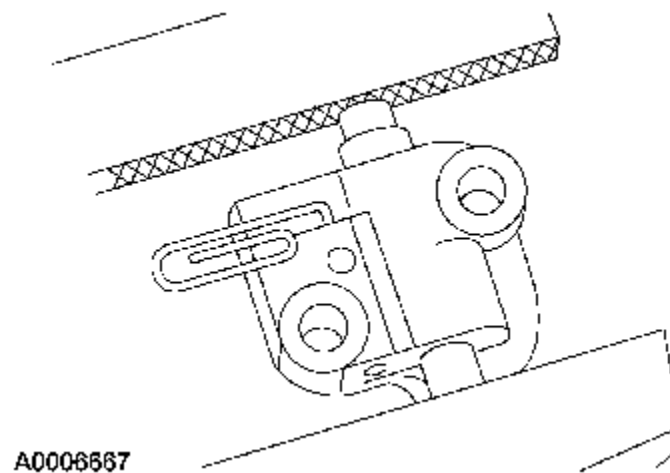
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

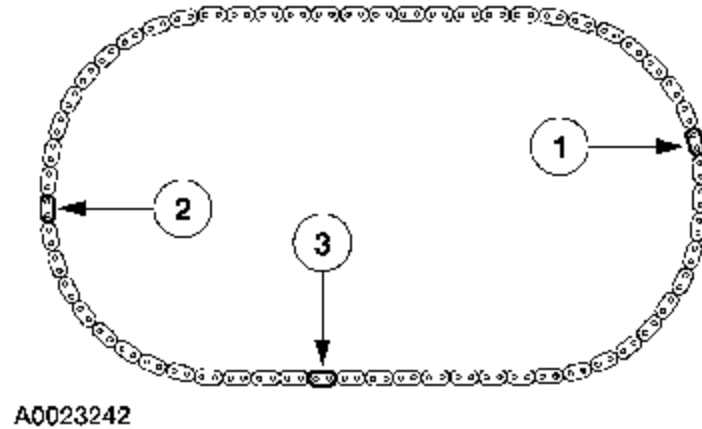
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.

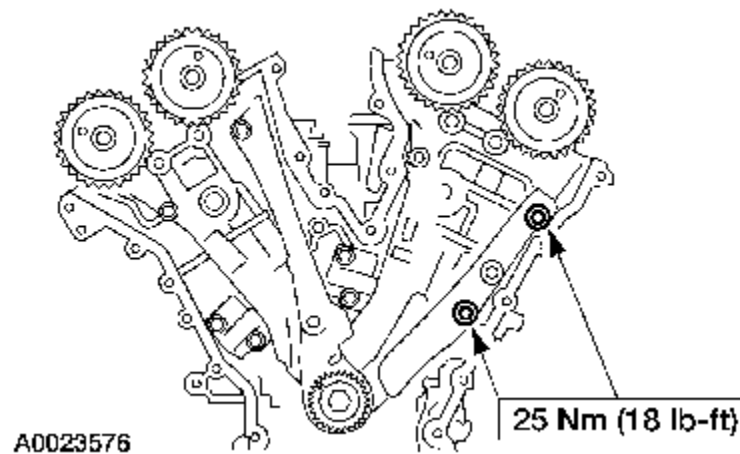


1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.

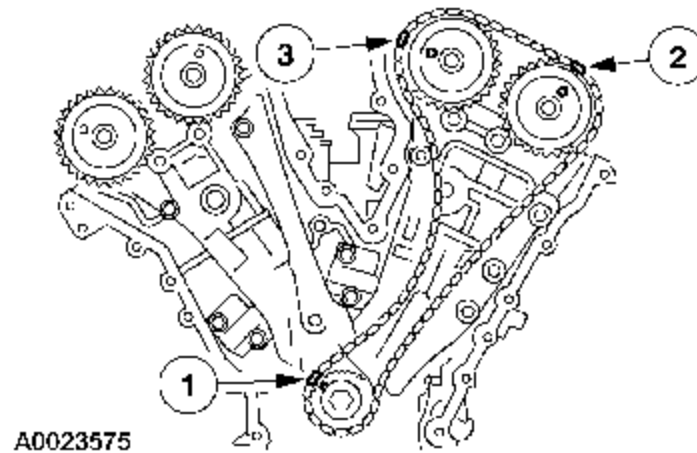


1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

- a. Mark any link to use as the crankshaft timing mark.
- b. Count 29 links from the crankshaft timing mark and mark as the exhaust cam sprocket timing mark.
- c. Continue counting to 42 and mark the link as the intake sprocket timing mark

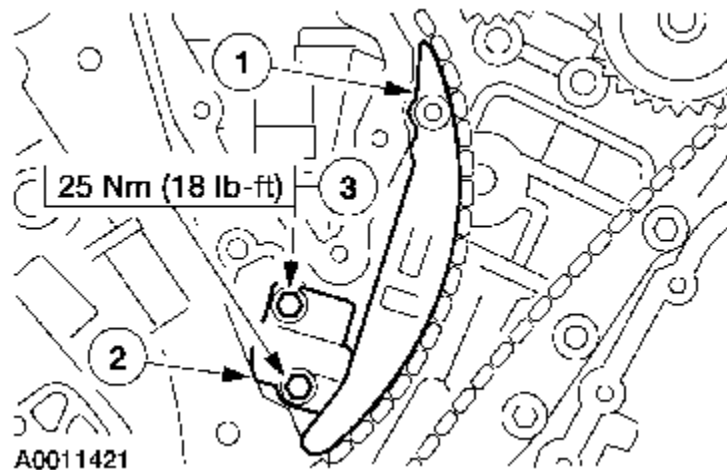


1. Position the guide and install the bolts.



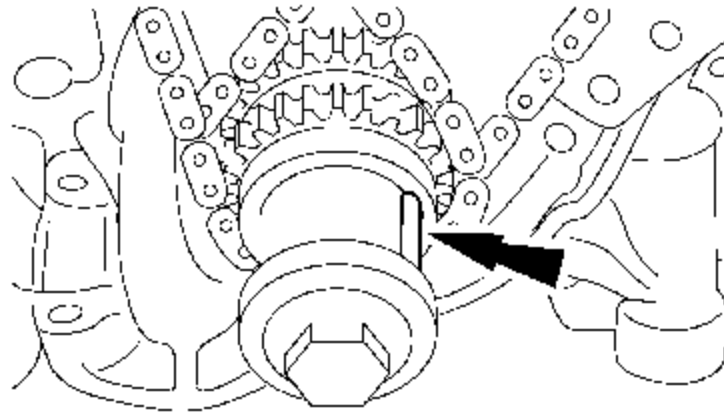
1. Install the LH timing chain.

- a. Position number one on the crankshaft.
- b. Count twenty-nine links from the number one link. Position on the exhaust cam sprocket.
- c. Continue counting to forty-two and position link on intake sprocket timing mark.

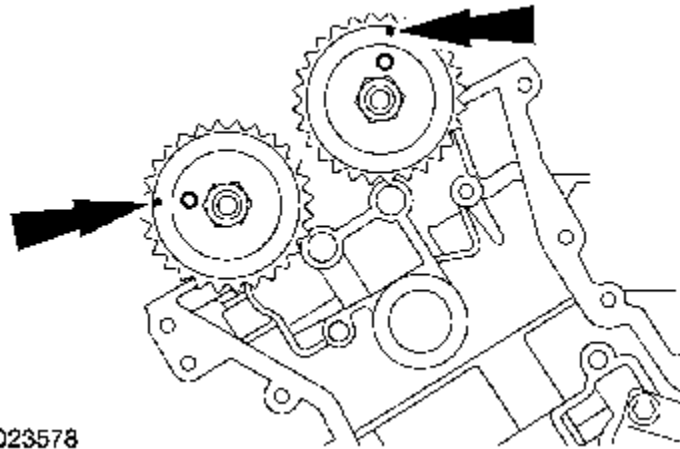


1. Install the LH timing chain and tensioner arm.

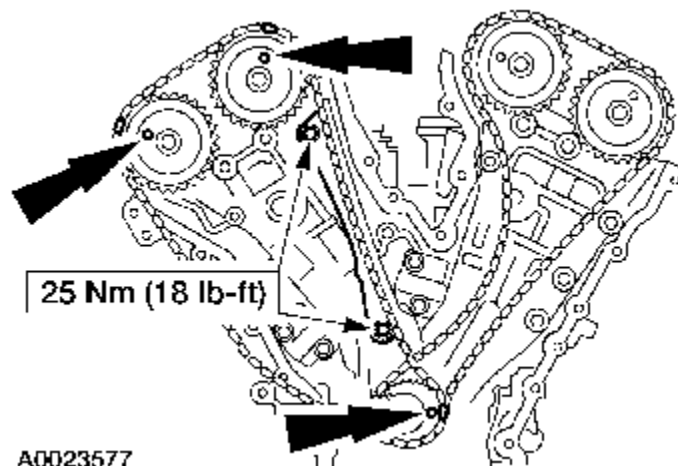
- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolt.

**A0011067**

1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.

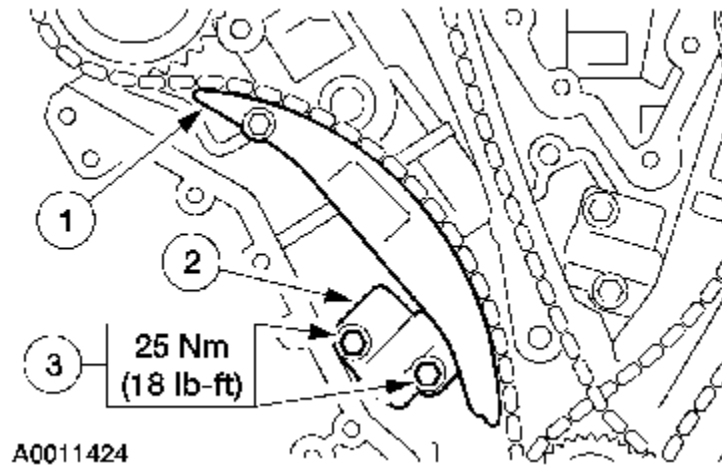
**A0023578**

1. Verify that the RH camshafts are correctly positioned.

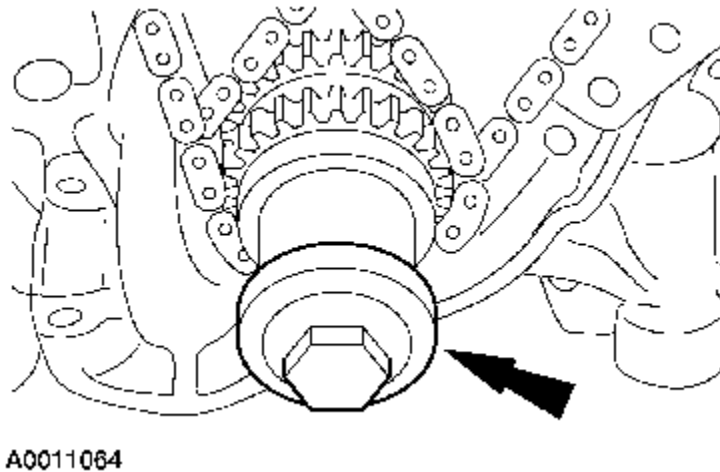
**A0023577**

1. Position the RH timing chain and chain guide and install the bolts.

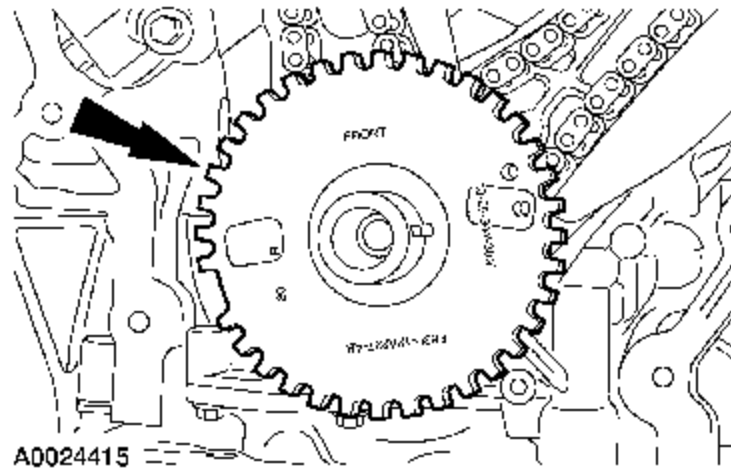
- a. Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



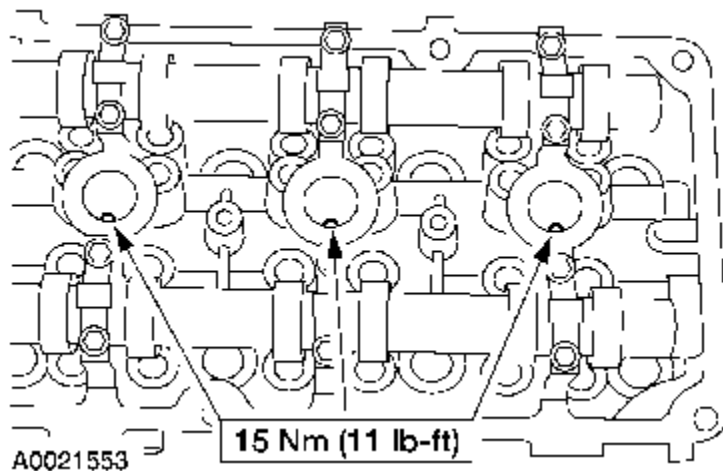
1. Remove the crankshaft damper bolt.



1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the key way in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the LH and RH spark plugs. (RH shown, LH similar.)
2. Install the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).

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VIN or Model Year 2001 Model TRIBUTE upper intake

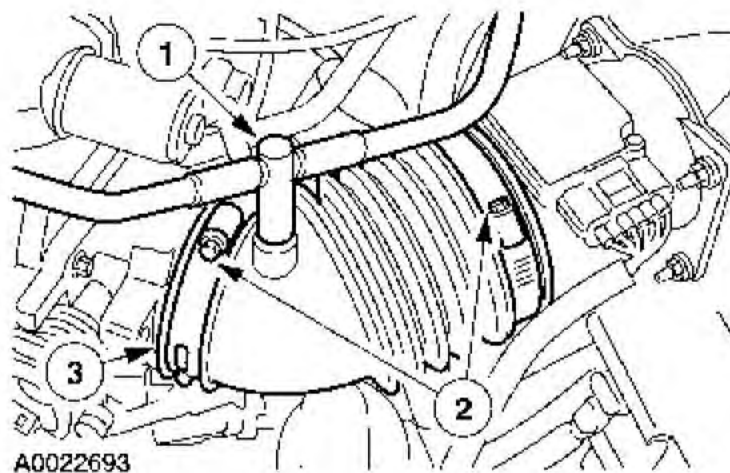
☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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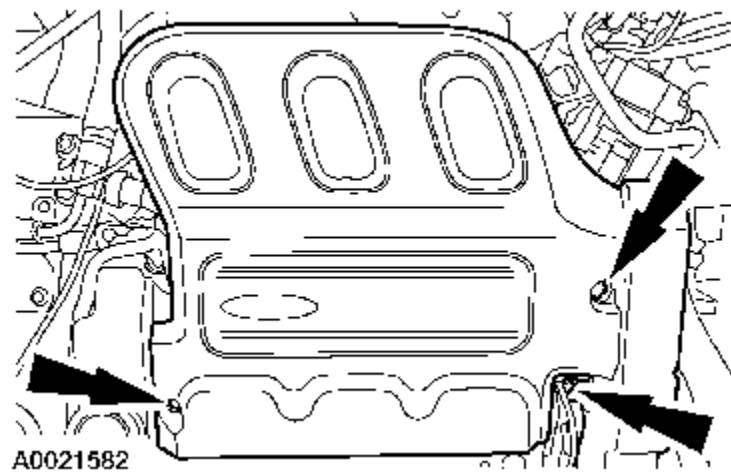
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UPPER INTAKE MANIFOLD

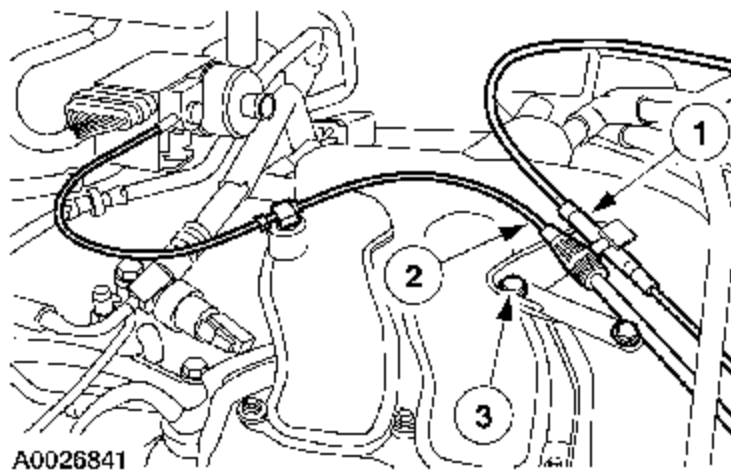
Removal



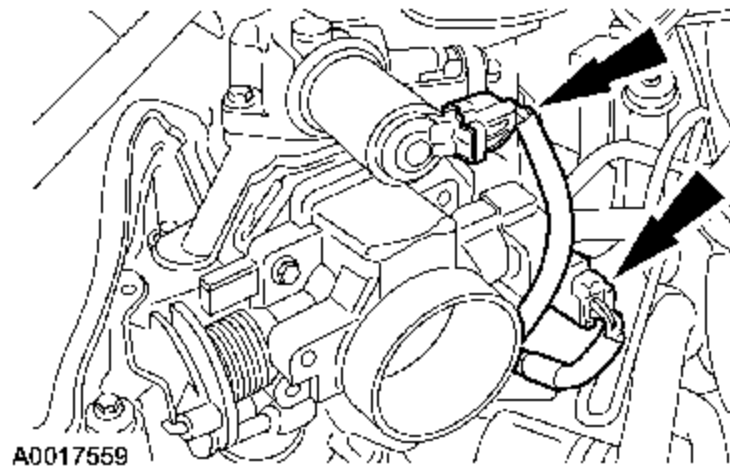
1. Remove the air cleaner outlet tube.
 - a. Remove the vacuum hose.
 - b. Loosen the clamps.
 - c. Remove the air cleaner outlet tube.



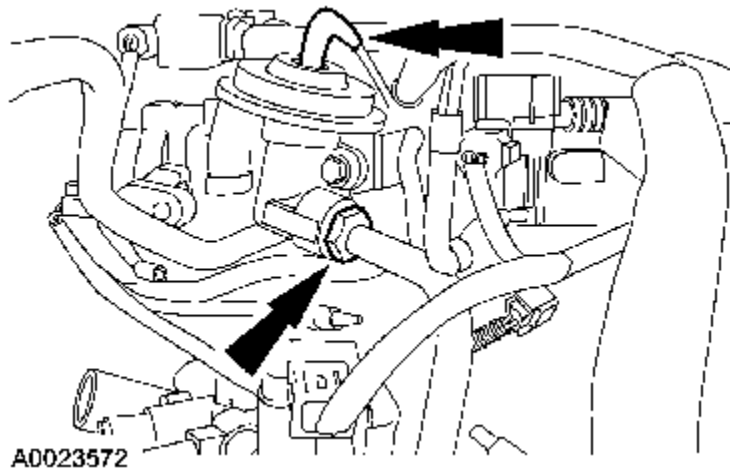
1. Remove the three nuts and the engine appearance cover.



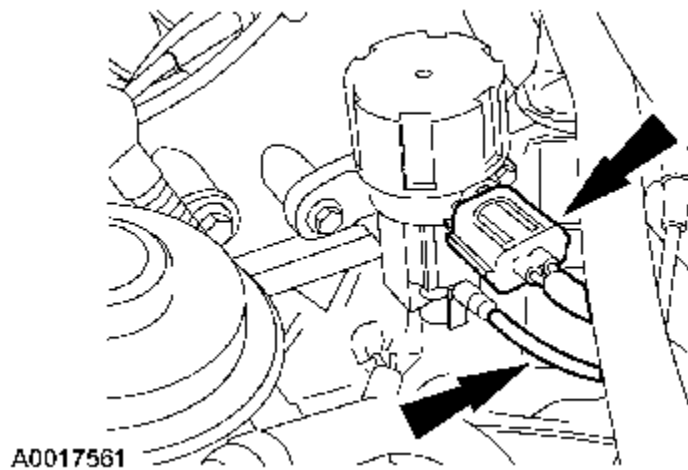
1. Disconnect the cables.
 - a. Disconnect the throttle cable.
 - b. If equipped, disconnect the cruise control cable.
 - c. Remove the throttle cable bracket bolts.



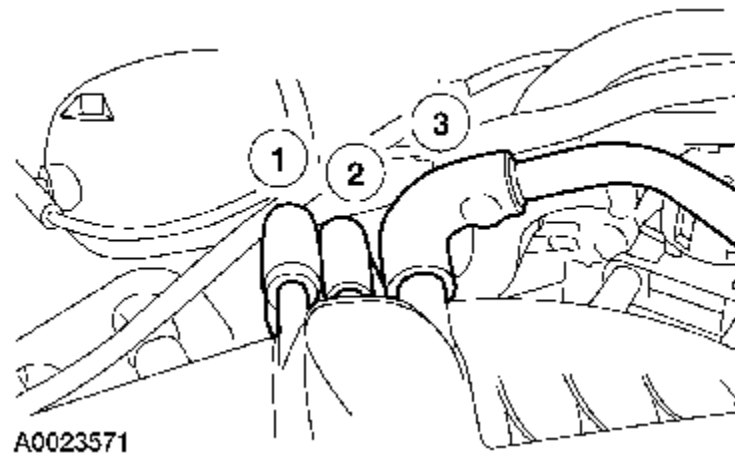
1. Disconnect the throttle position (TP) sensor and idle air control (IAC) electrical connectors.



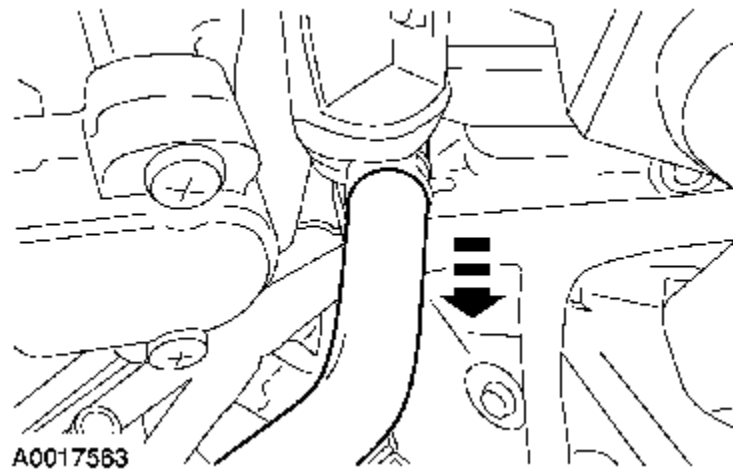
1. Disconnect the exhaust gas recirculation (EGR) valve vacuum hose and EGR tube nut.



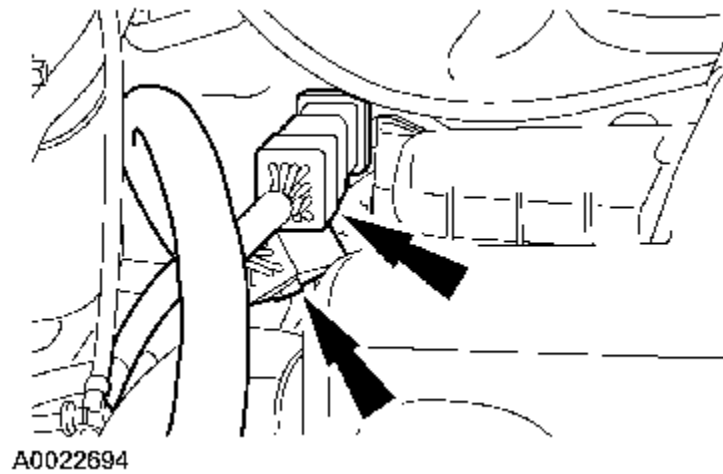
1. Disconnect the EGR vacuum regulator valve electrical connector and vacuum hose.



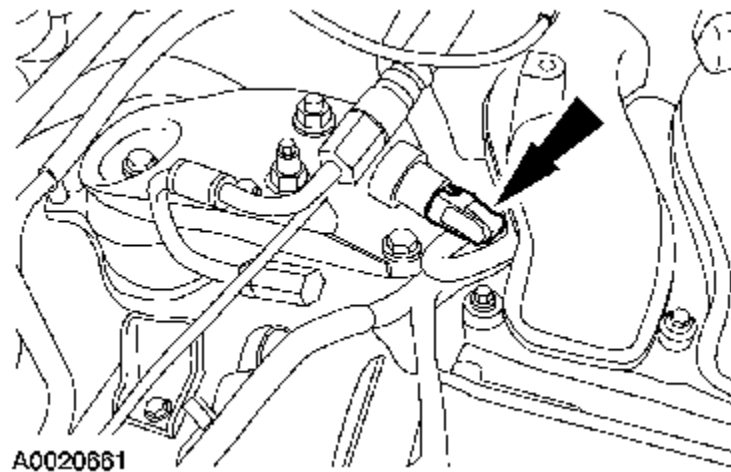
1. Disconnect the three vacuum hoses on the back of the intake manifold.
 - a. Connect the chassis vacuum hose.
 - b. Connect the engine vacuum hose.
 - c. Connect the positive crankcase ventilation (PCV) hose.



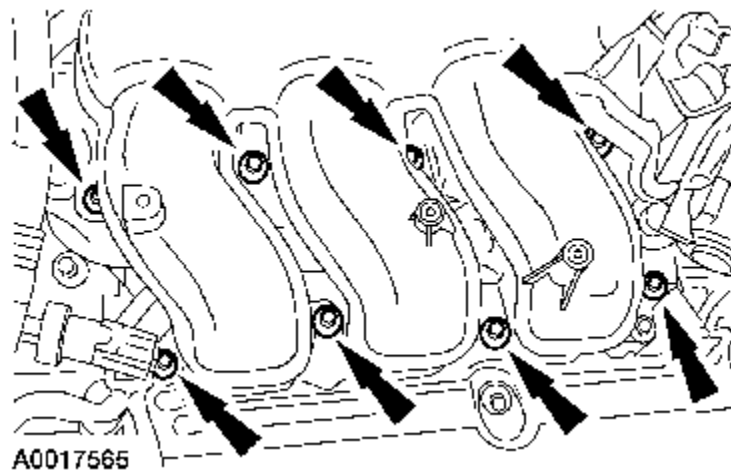
1. Disconnect the vapor management valve (VMV) vacuum hose.



1. Disconnect the two electrical connectors attached to the left side of the upper intake manifold.



1. Disconnect the power steering pressure (PSP) sensor electrical connector.

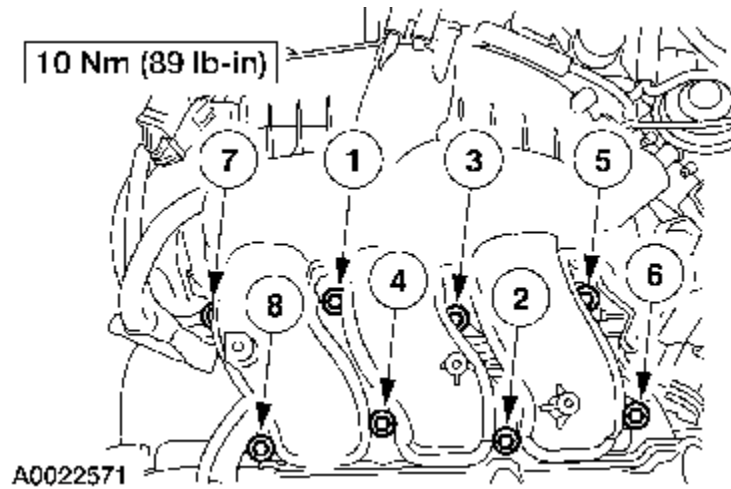


1. Remove the eight bolts and the upper intake manifold.

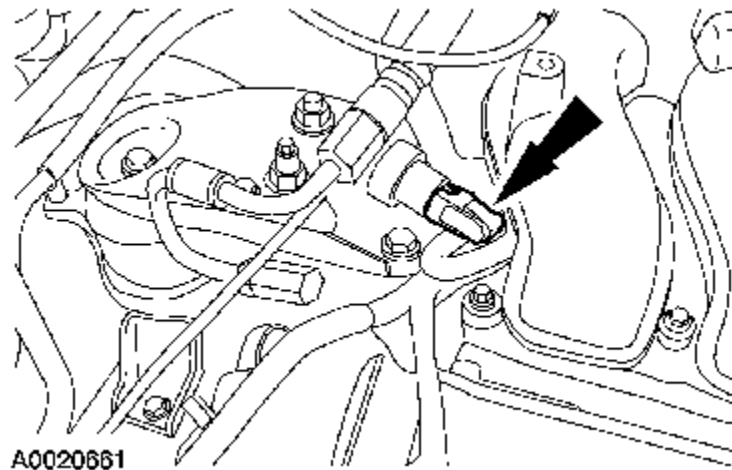
- a. Remove and inspect the gaskets. Discard if damaged.
- b. Clean all sealing surfaces.

Installation

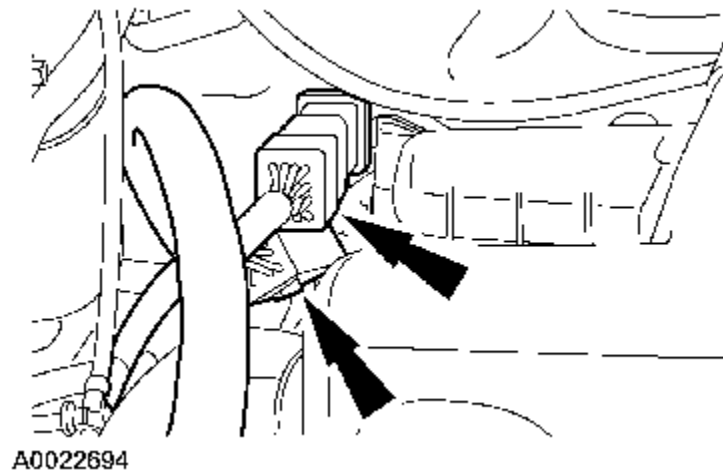
1. Position the gaskets in the upper intake manifold.



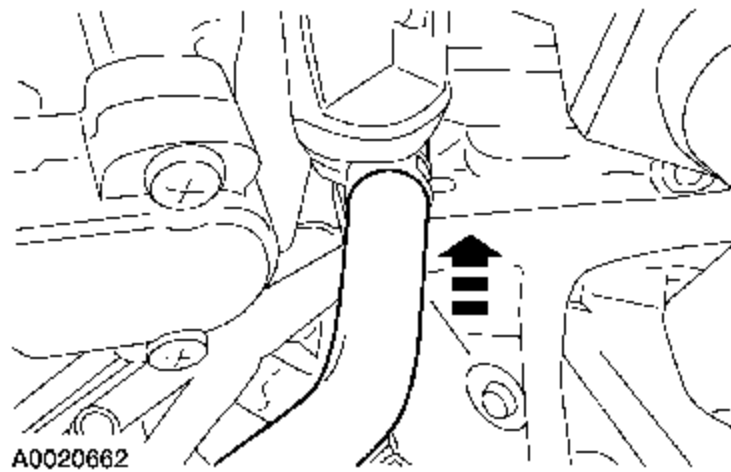
1. Position the upper intake manifold and tighten the bolts in the sequence shown.



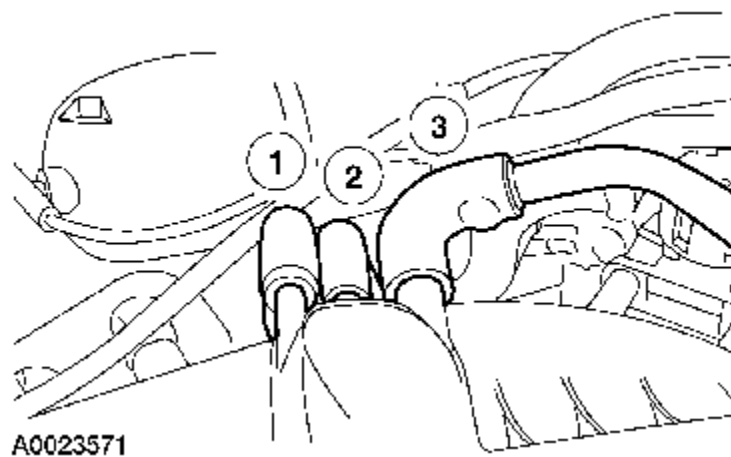
1. Connect the PSP electrical connector.



1. Install the two electrical connectors on the left side of the intake manifold.

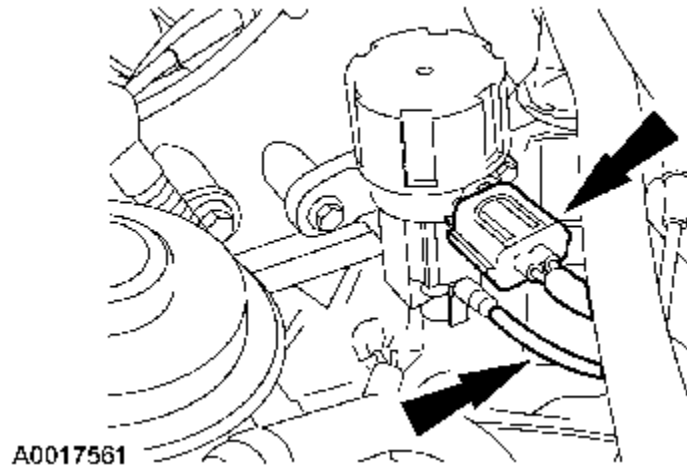


1. Install the vapor management valve (VMV) vacuum hose.

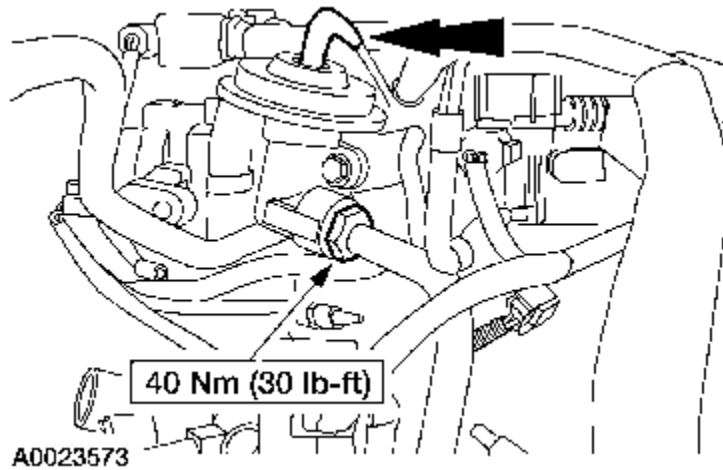


1. Connect the three vacuum hoses on the back of the upper intake manifold.

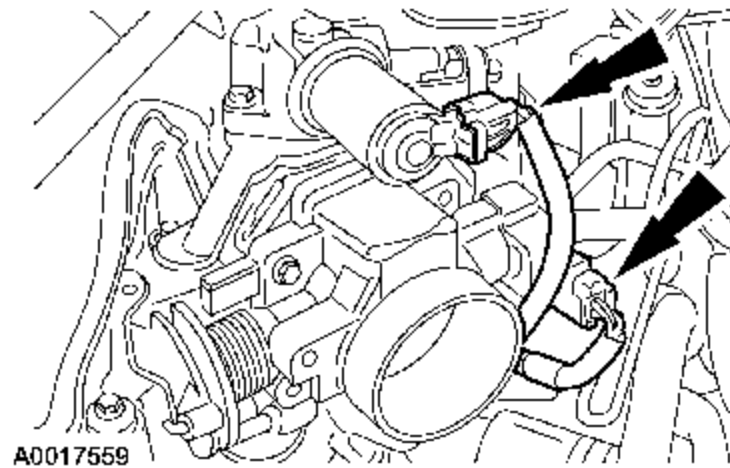
- a. Connect the chassis vacuum hose.
- b. Connect the engine vacuum hose.
- c. Connect the PCV hose.



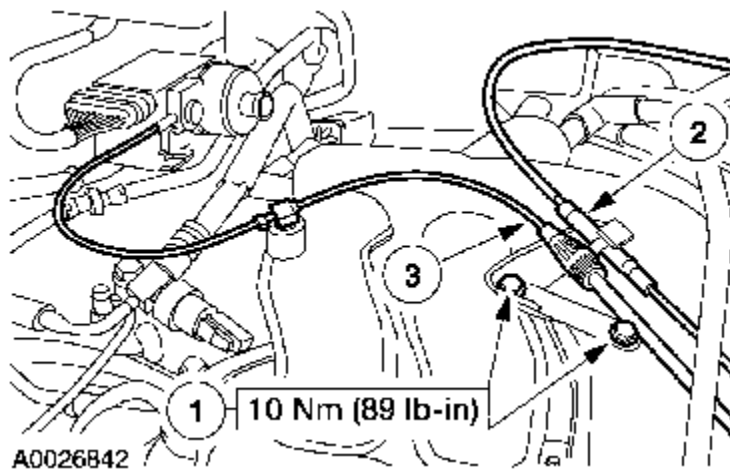
1. Connect the E.G.R. Vacuum regulator electrical connector.



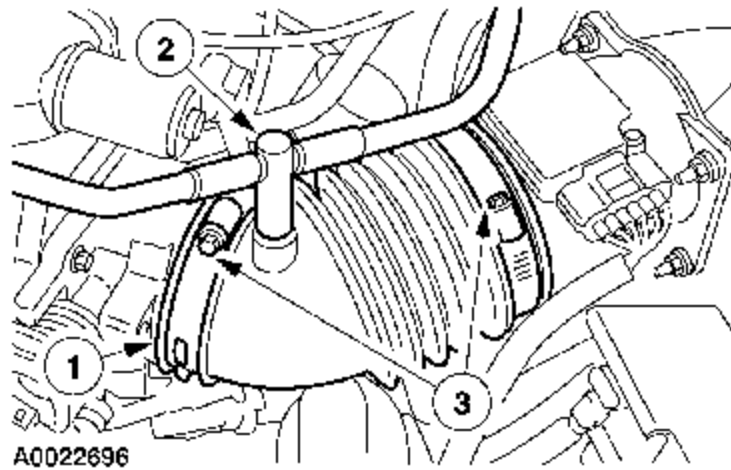
1. Install the EGR valve vacuum hose and EGR tube nut.



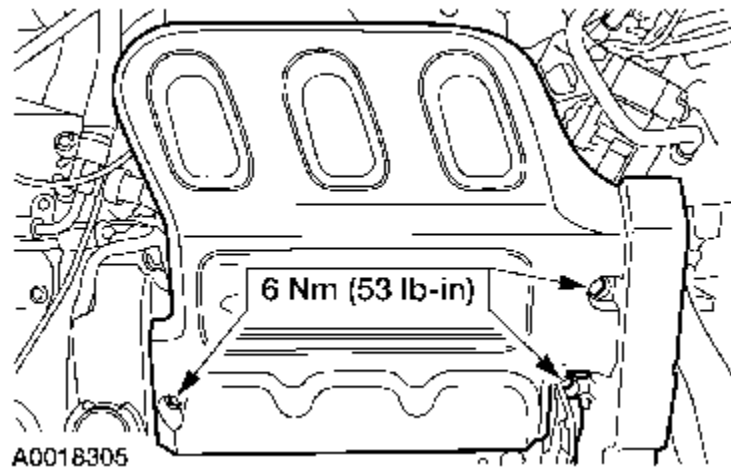
1. Connect the TP sensor and IAC electrical connectors.



1. Connect the throttle cables.
 - a. Install the throttle cable bracket bolts.
 - b. Connect the throttle cable.
 - c. If equipped, connect the cruise control cable.



1. Install the air cleaner outlet tube.
 - a. Position the air cleaner outlet tube.
 - b. Install the hoses.
 - c. Install the clamps.



1. Install the splash shield.

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VIN or Model Year 2001 Model TRIBUTE valve cover RH

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

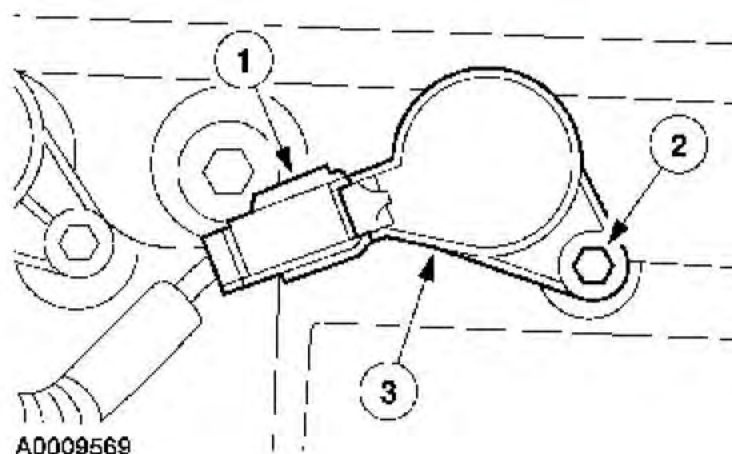
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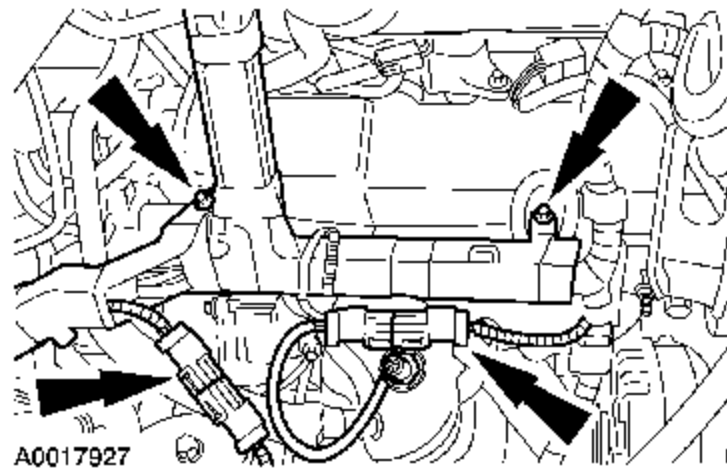
VALVE COVER -- RH

Removal

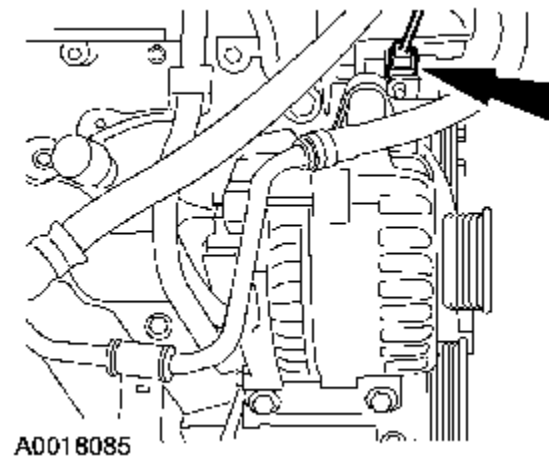
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



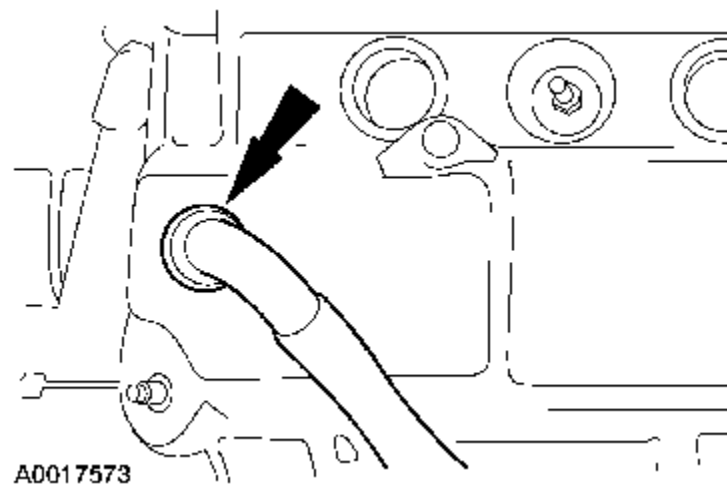
1. Remove the RH coil on plugs.
 - a. Disconnect the three electrical connectors.
 - b. Remove the three bolts.
 - c. Remove the RH coil packs.



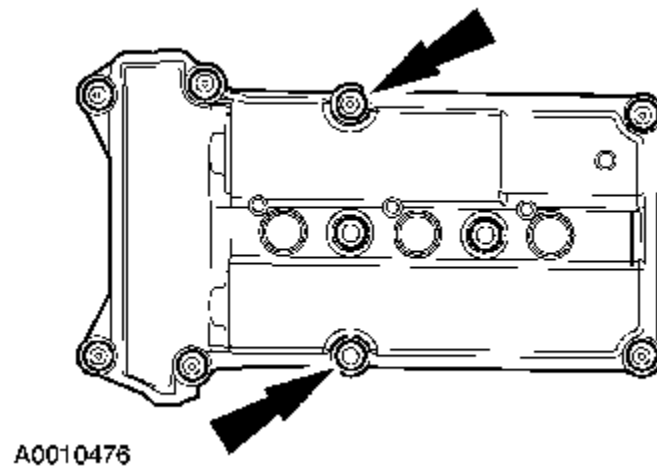
1. Remove the wiring harness nuts and disconnect the (O2) sensor electrical connectors.



1. Disconnect the radio ignition interference capacitor.



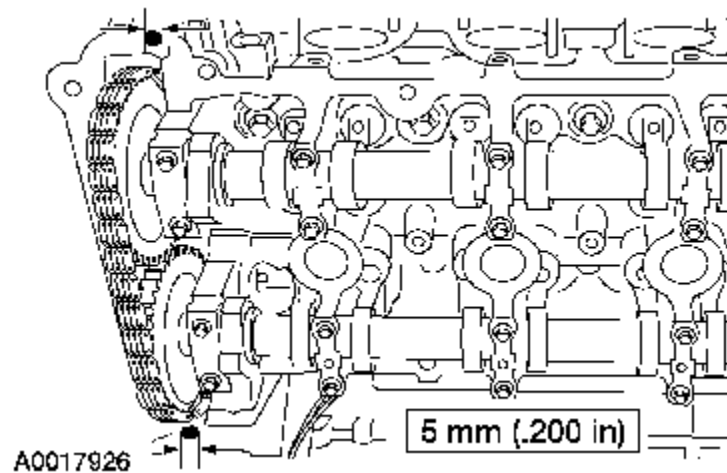
1. Disconnect the crankcase ventilation tube from the valve cover.



1. Remove the bolts, studs and the RH valve cover.

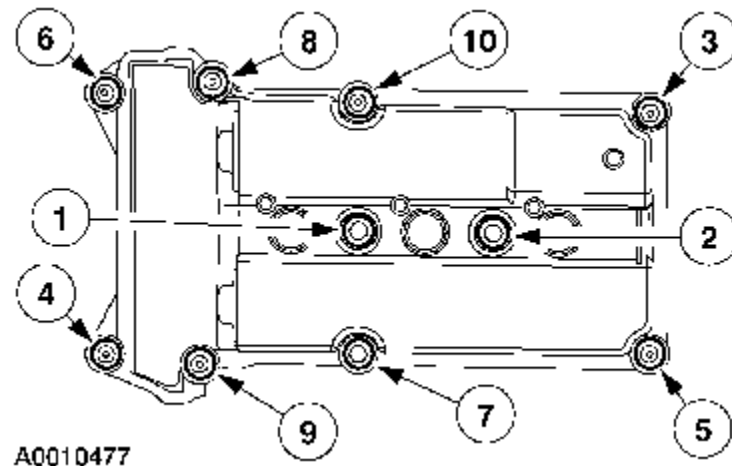
a. Remove and discard the gasket.

Installation

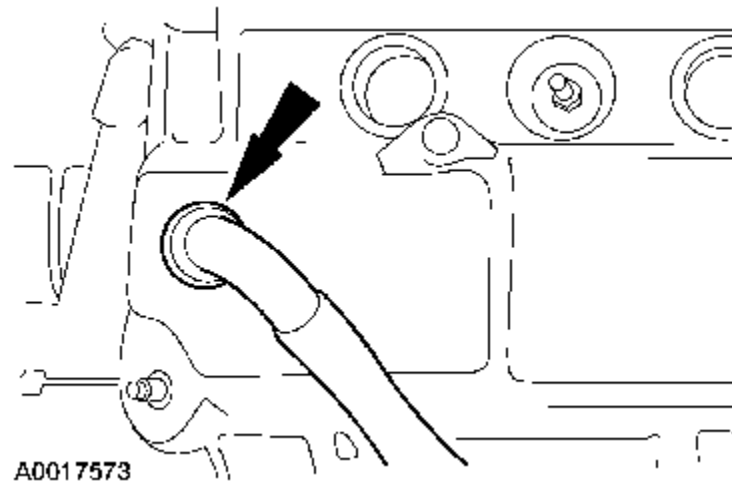


1. Apply a 5 mm dot of silicone gasket sealant to the front cover to cylinder head joints.

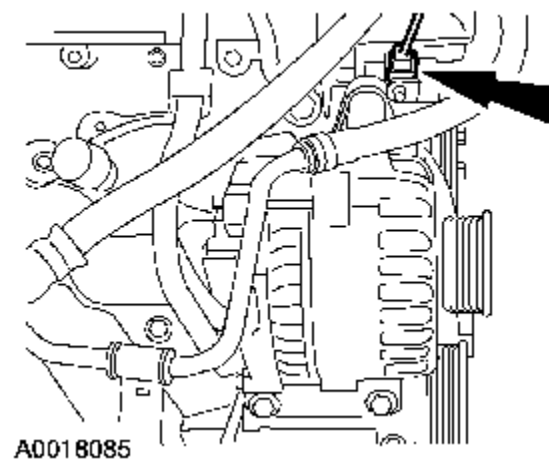
2. Install a new valve cover gasket on the valve cover.



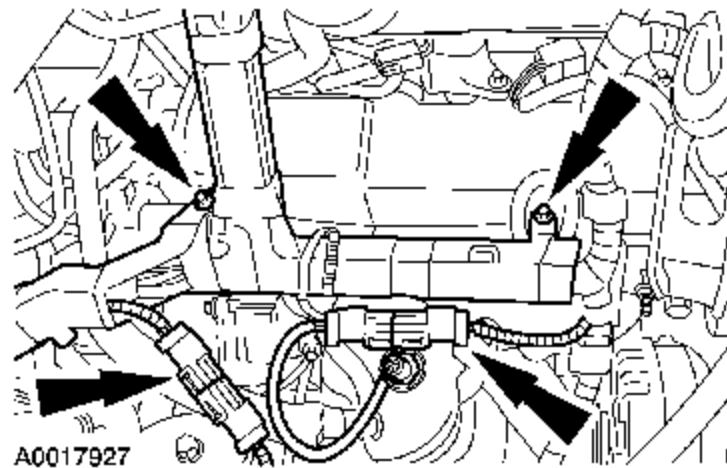
1. Position the valve cover and install the bolt and the studs in the sequence shown.



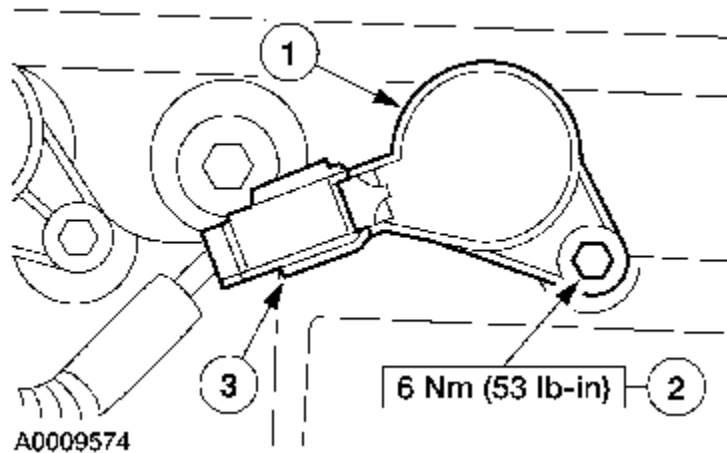
1. Connect the crankcase ventilation tube to the valve cover.



1. Reconnect the radio ignition interference capacitor.



1. Reconnect the (O2) sensor electrical connectors and wiring harness to the the RH valve cover stud.



1. Install the RH coil packs.
 - a. Position the RH coil packs.
 - b. Install the three bolts.
 - c. Connect the three electrical connectors.
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

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VIN or Model Year 2001 Model TRIBUTE valve spring

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

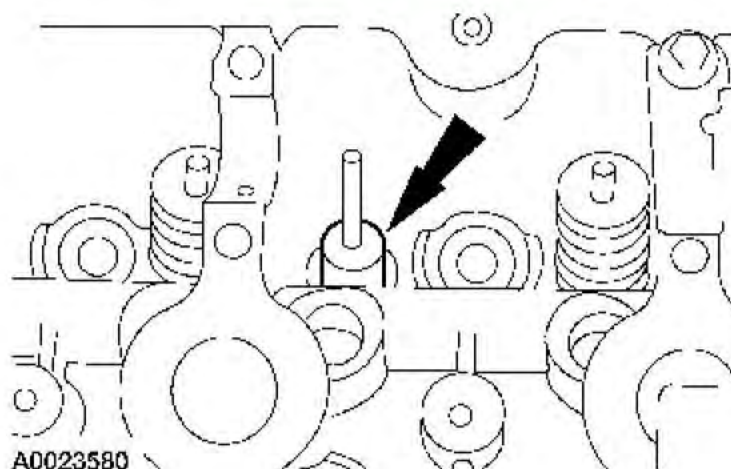
[< Previous](#) [Next >](#)

2001 - Tribute - Workshop Manual - Engine

VALVE SEALS

Removal

1. Remove the valve spring. Refer to [01-10C VALVE SPRING](#).



- 1.

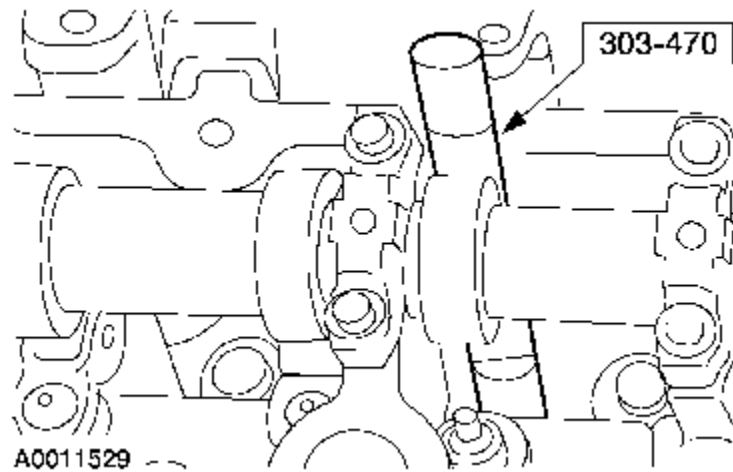
NOTE:

Camshaft removed for clarity. Remove the valve seal.

Installation

NOTE:

Lubricate the valve guide with SAE 5W-20 motor oil.



1. Using the special tool, install the valve seal.
2. Install the valve spring. Refer to [01-10C VALVE SPRING](#).

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VIN or Model Year 2001 Model TRIBUTE valve spring 1General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐ \ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐ Bo[< Previous](#) [Next >](#)

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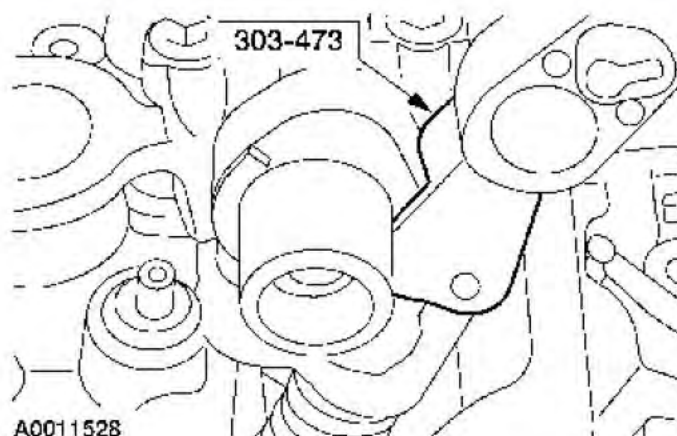
VALVE SPRING

Removal and Installation

1. Remove the roller followers. Refer to [01-10C ROLLER FOLLOWERS](#).
- 2.

NOTE:

If air pressure has forced the piston to the bottom of the cylinder, any loss of air pressure will allow the valve(s) to fall into the cylinder. A rubber band, tape or string wrapped around the end of the valve stem will prevent this from happening. Pressurize the cylinder using compressed air.



1. Using the special tool, remove the key, retainer, and valve spring.
2. To install, reverse the removal procedure.

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APPENDIX 18

18a Copy of Repair Procedures

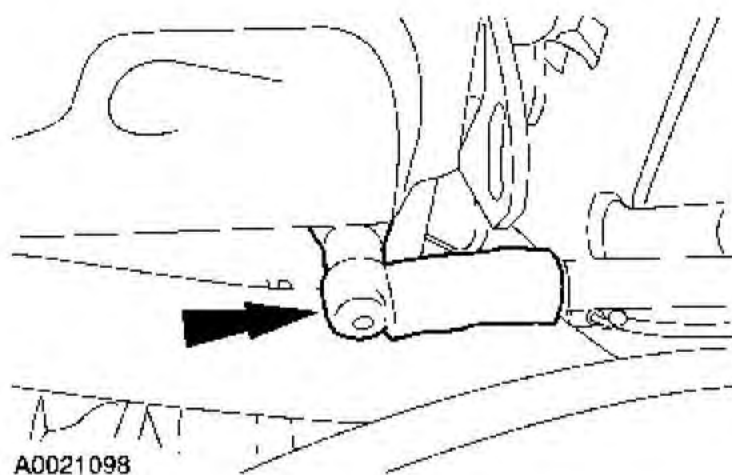
2002 Tribute

VIN or Model Year 2002 Model TRIBUTE accelerator cable bracket☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

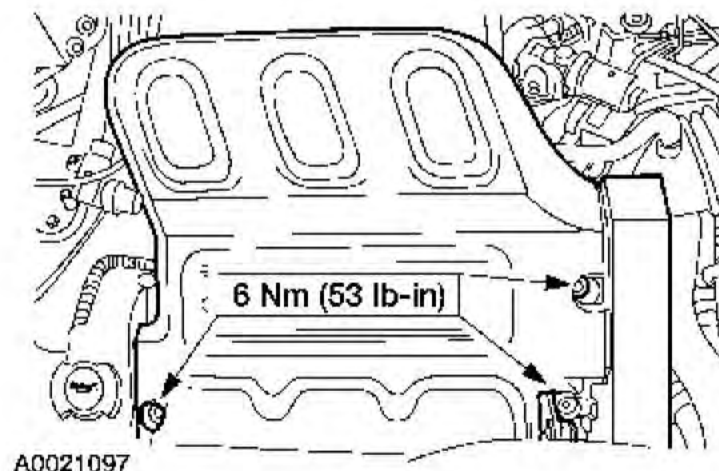
2002 - Tribute - Workshop Manual - Engine

ACCELERATOR CABLE BRACKET

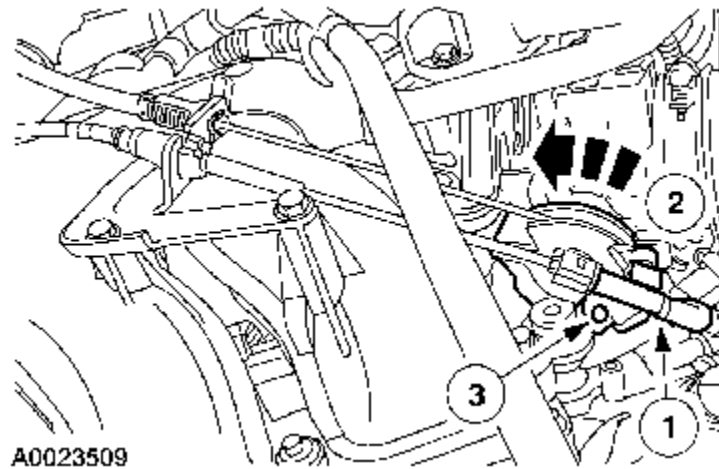
Removal and Installation



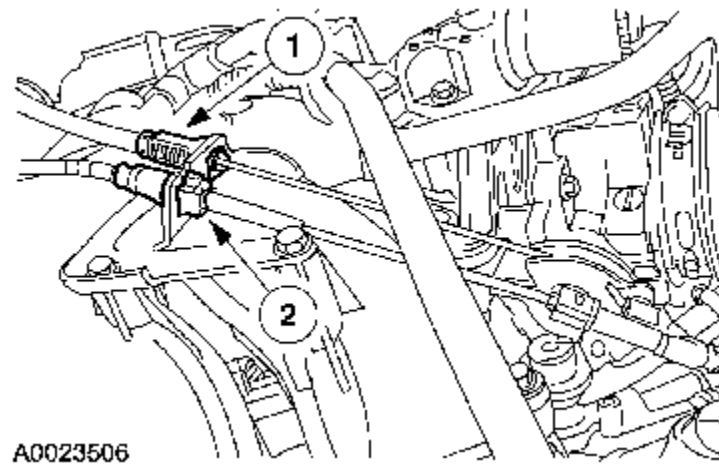
1. Disconnect the crankcase ventilation hose.



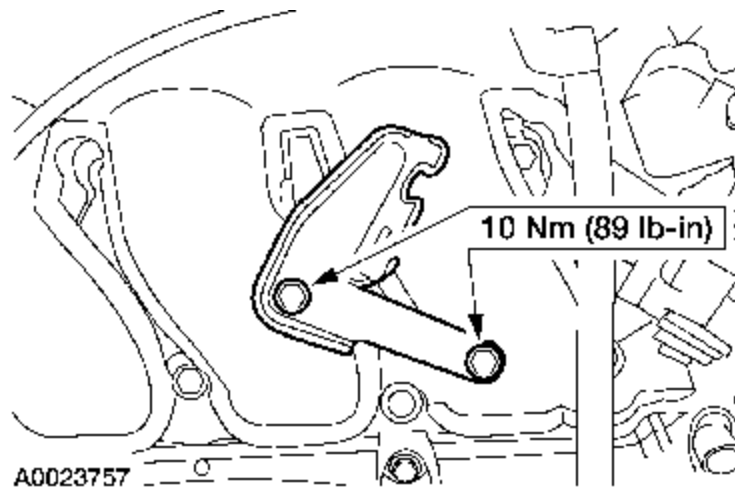
1. Remove the bolt, nuts and the engine appearance cover.



1. Disconnect the throttle control linkage from the throttle lever.
 - a. If equipped, disconnect the cruise control cable from the throttle lever.
 - b. Rotate the throttle lever.
 - c. Slide the accelerator cable end out of the throttle lever.



1. Disconnect the throttle control linkage from the accelerator cable bracket.
 - a. Disconnect the accelerator cable from the bracket.
 - b. If equipped, squeeze the tabs and disconnect the cruise control cable from the accelerator cable bracket.



1. Remove the bolts and the accelerator cable bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2002 Model TRIBUTE camshafts LH

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

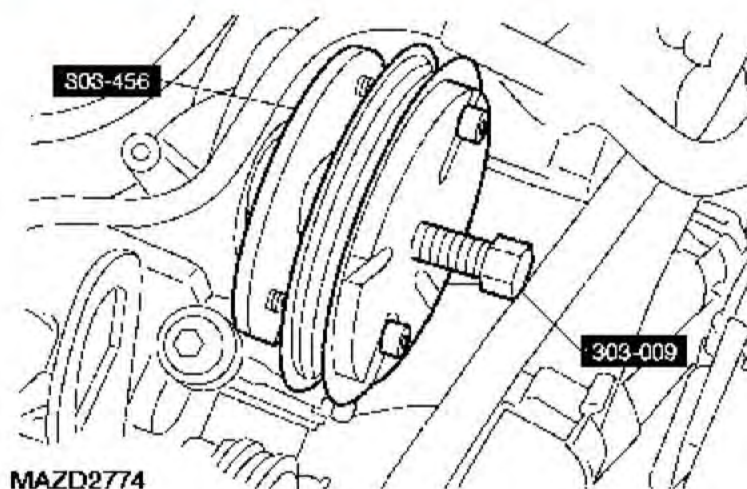
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2002 - Tribute - Workshop Manual - Engine

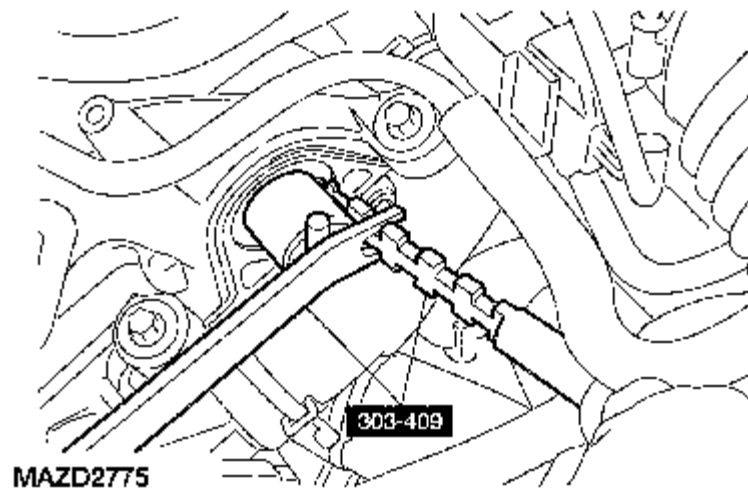
CAMSHAFTS — LH

Removal

1. Remove the water pump belt. Refer to — [01-10C WATER PUMP BELT 3.0L DURATEC \(4V\) WITHOUT TENSIONER](#).



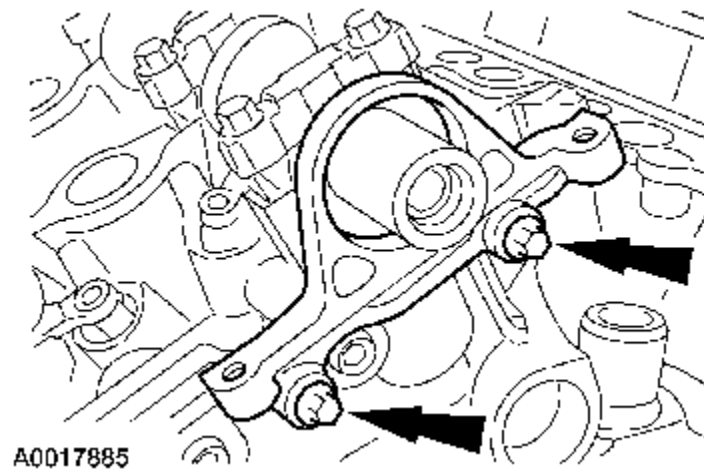
1. Using the special tools remove the water pump drive pulley.
2. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).



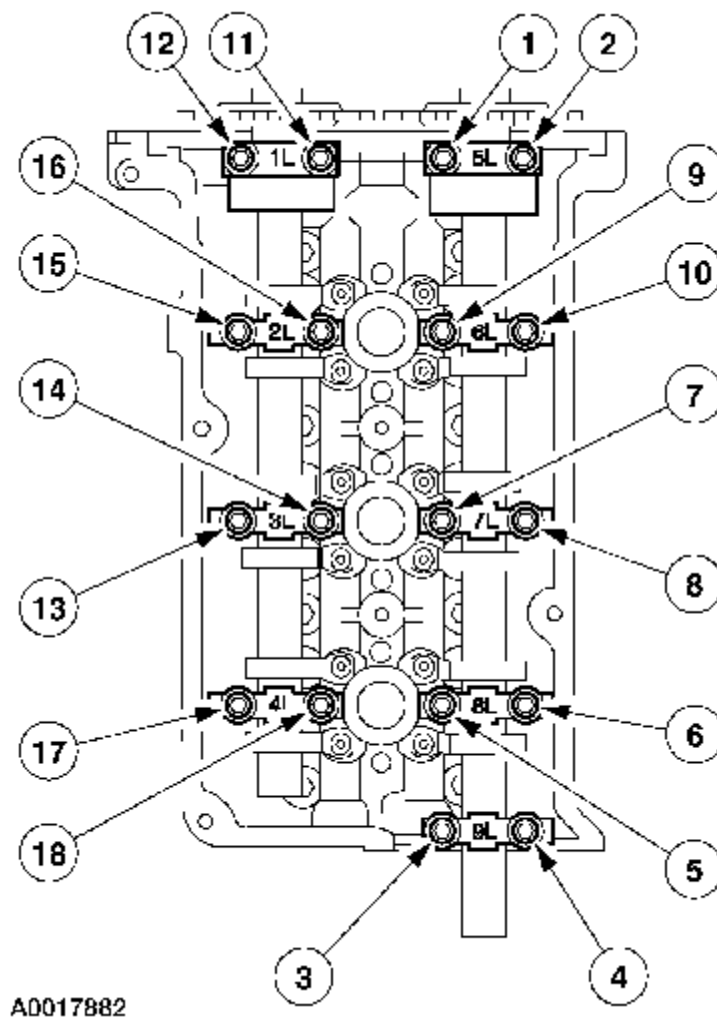
1.

NOTE:

In order to assure correct sealing do not scratch the camshaft. Using the special tools, remove the camshaft oil seal.



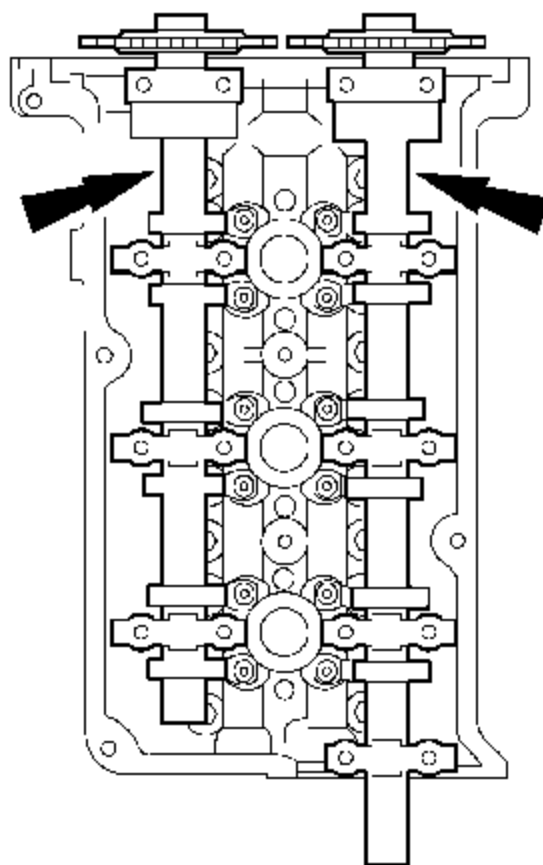
1. Remove the intake camshaft oil seal retainer.



1.

CAUTION:

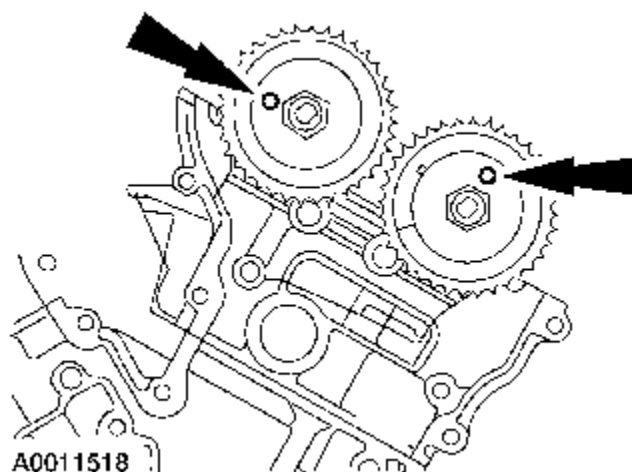
Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the LH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



A0017884

1. Remove the camshafts.

Installation



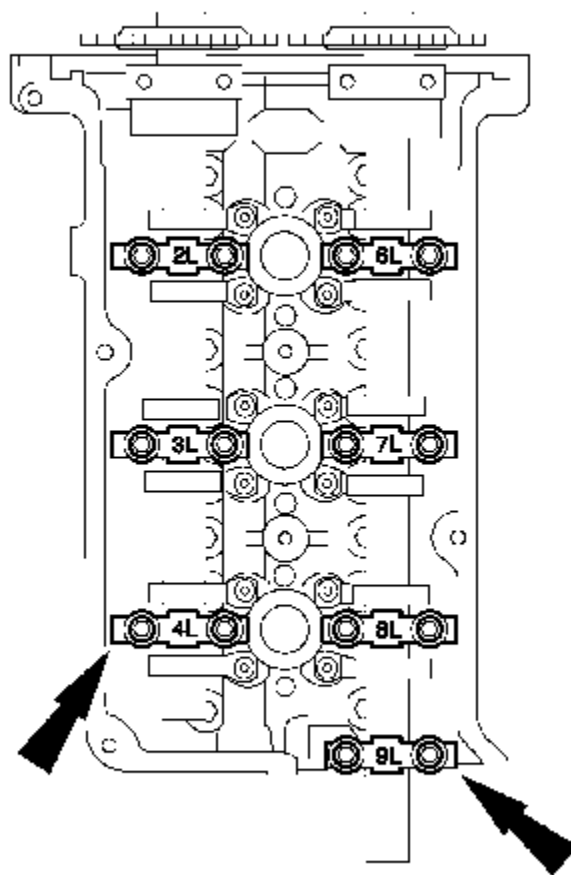
A0011518

- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

- Align the camshafts as shown.

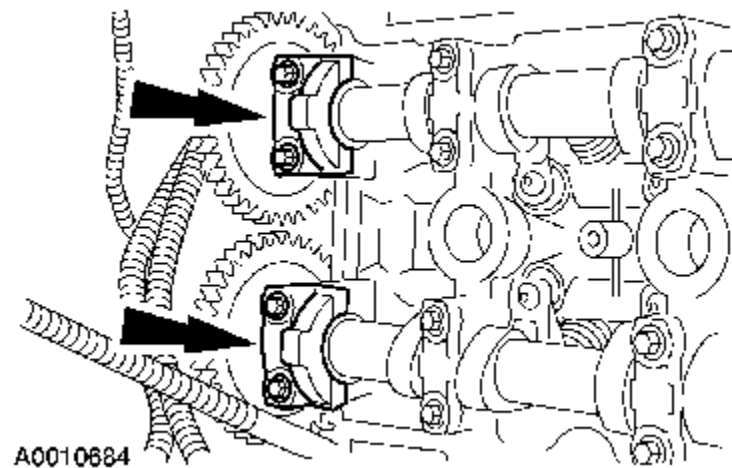


A0017886

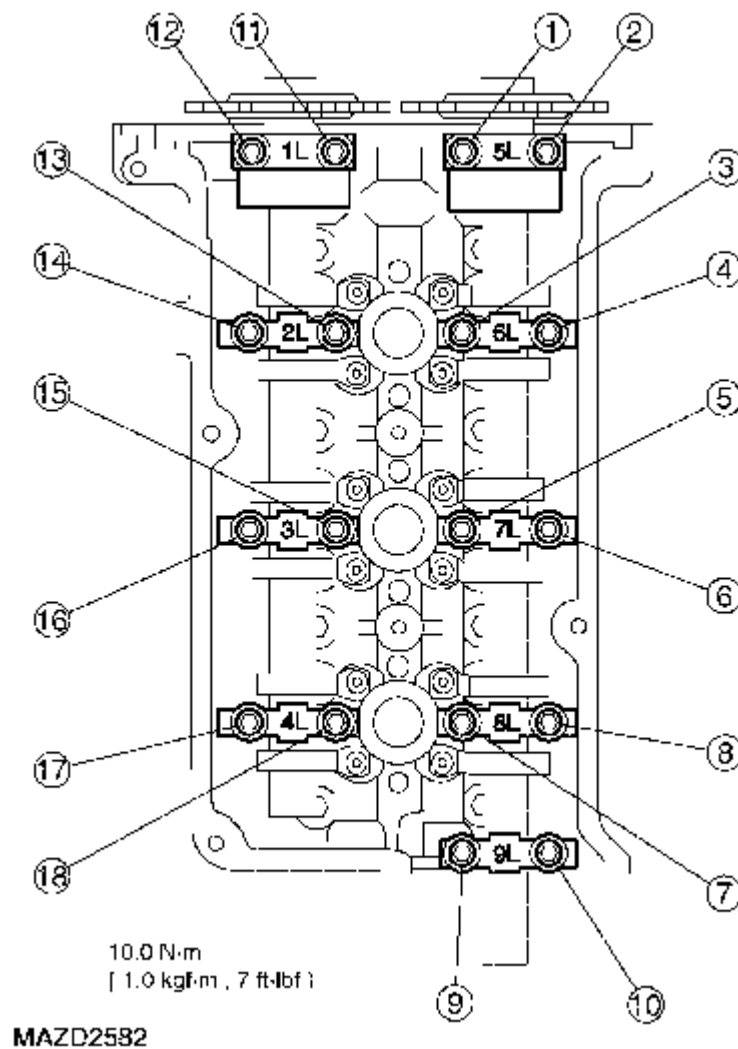
1.

CAUTION:

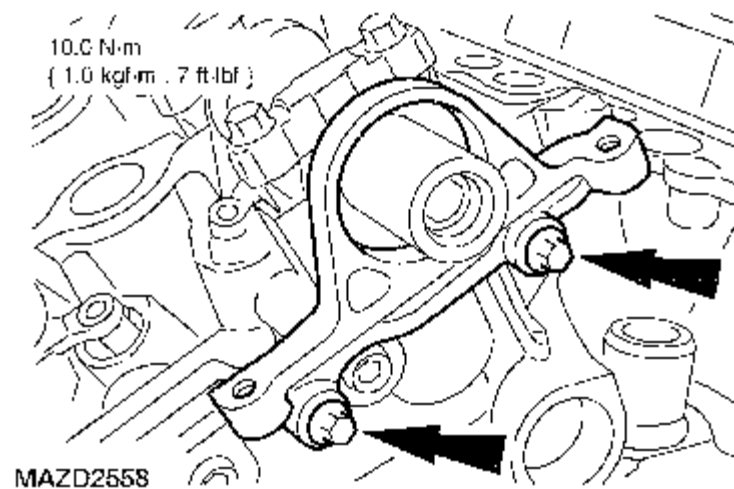
Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil. Install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil. Install the bearing thrust caps and loosely install the bolts.



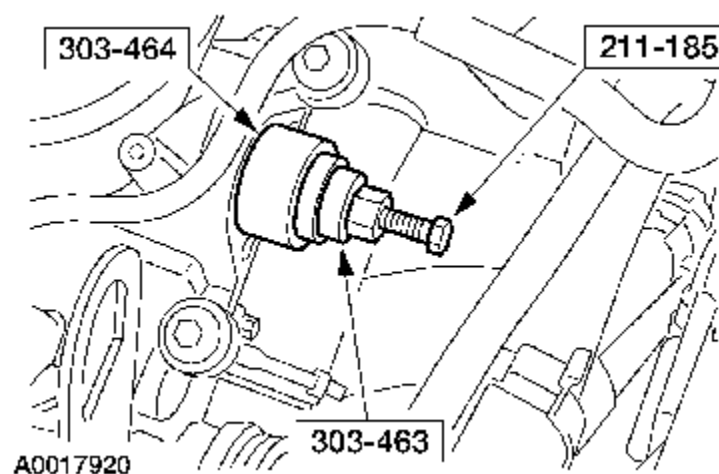
1. Tighten the bolts in the sequence shown.



1. Install camshaft oil seal retainer.

- Install a new gasket.

2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

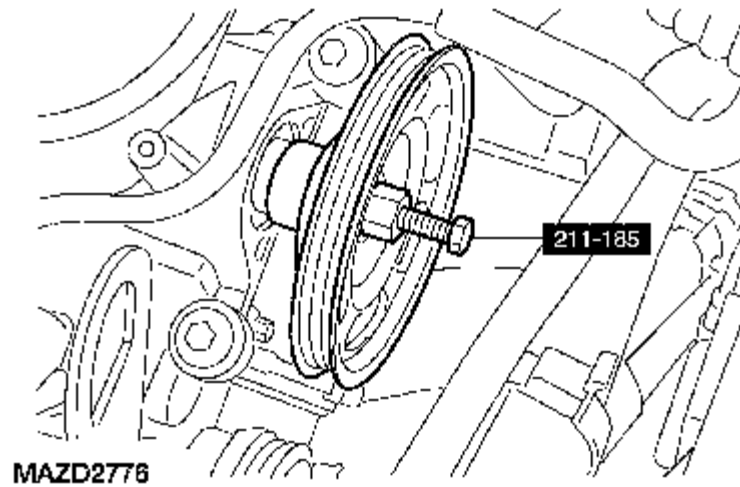


1. Install the new camshaft oil seal.

NOTE:

Lubricate the camshaft oil seal with SAE 5W-30 motor oil.

Using special tools positioned over the oil seal, turn to install to the seal.



1. Using special tool, install the water pump drive pulley.
2. Install the water pump belt. Refer to — [01-10C WATER PUMP BELT 3.0L DURATEC \(4V\) WITHOUT TENSIONER](#).

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**Mazda Service**[Home](#) [View Content](#) [Other Applications](#) [As Built Data](#) [MyMazda](#) [IDS](#) [Training](#) [Return To Search Results](#)VIN or Model Year 2002 Model TRIBUTE camshafts RH

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

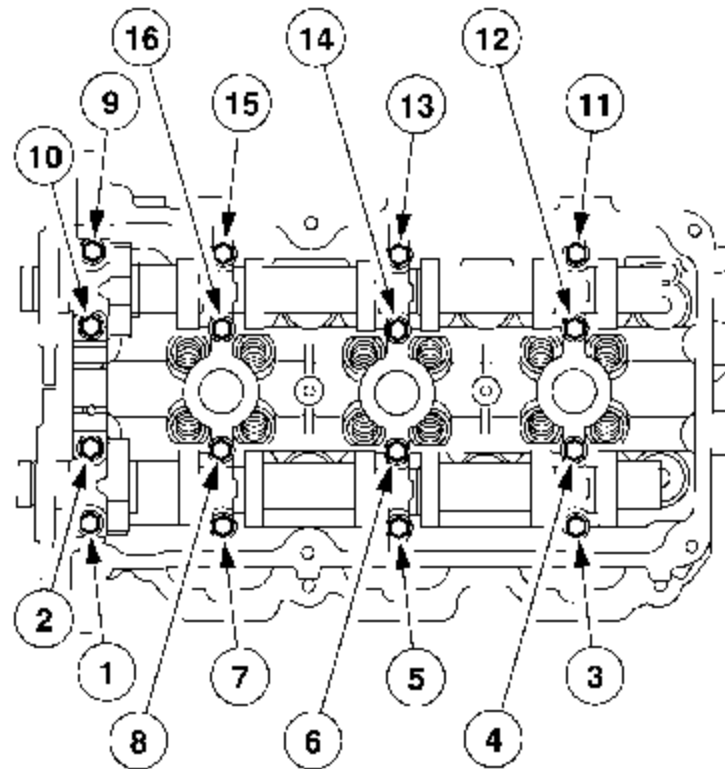
[< Previous](#) [Next >](#)

2002 - Tribute - Workshop Manual - Engine

CAMSHAFTS — RH

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

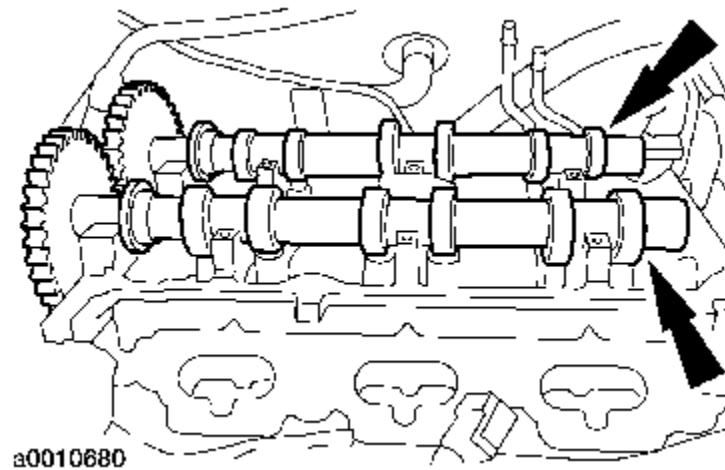


A0010679

1.

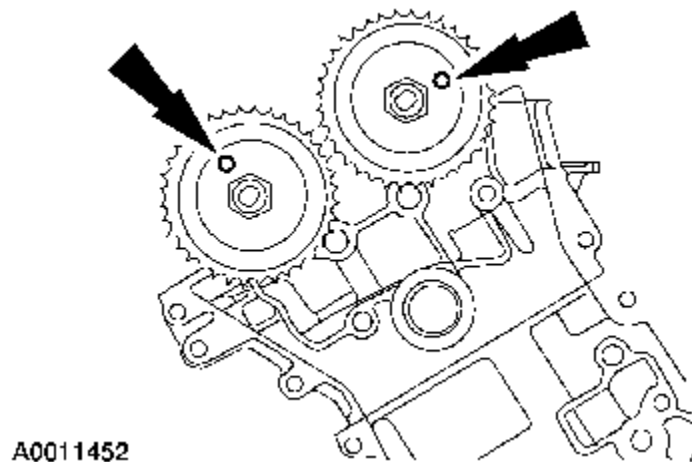
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the RH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



1. Remove the camshafts.

Installation

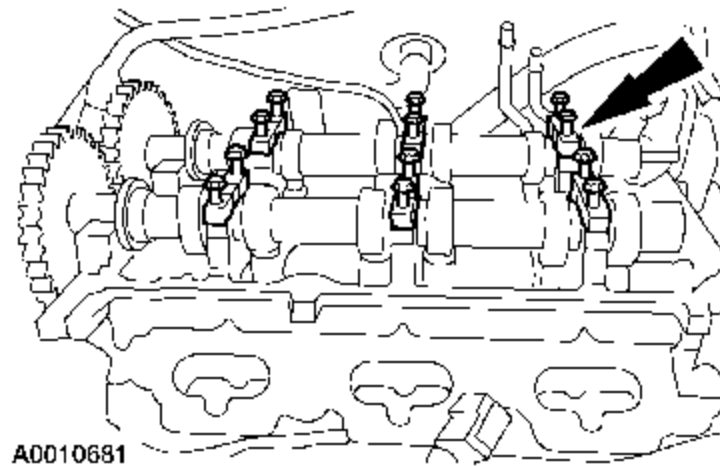


- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

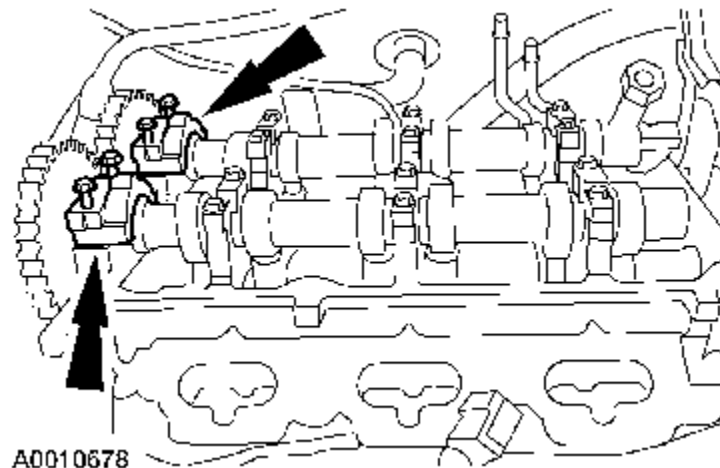
- a. Align the camshafts as shown.



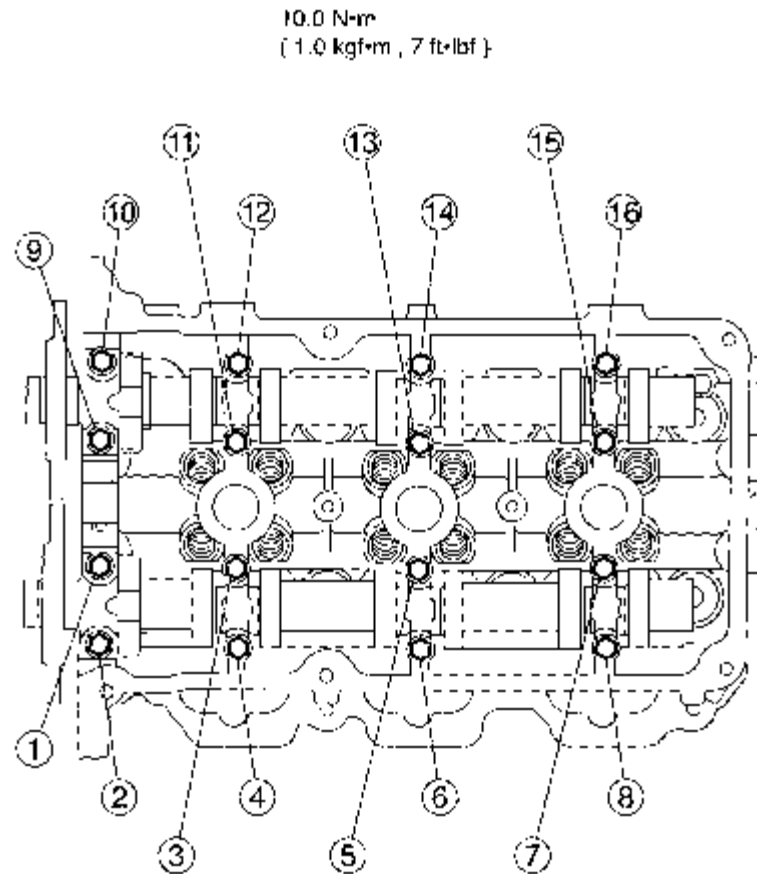
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil and install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil . Install the bearing thrust caps and loosely install the bolts.

**MAZD2356**

1. Tighten the bolts in the sequence shown.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2002 Model TRIBUTE Lower Intake Manifold
 General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
 Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

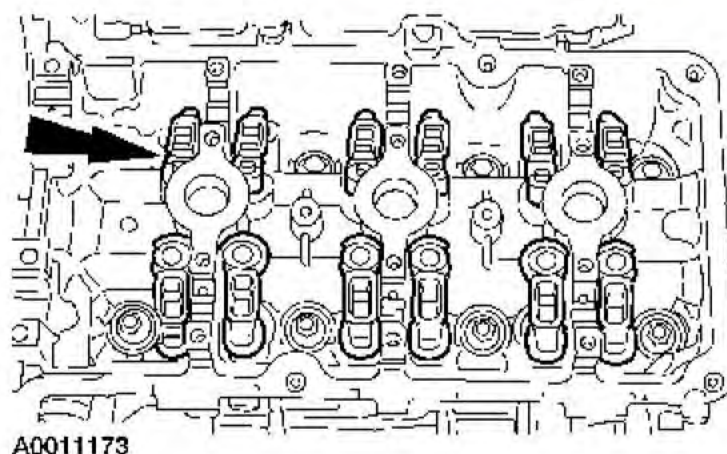
[< Previous](#) [Next >](#)

2002 - Tribute - Workshop Manual - Engine

CYLINDER HEAD — LH

Removal

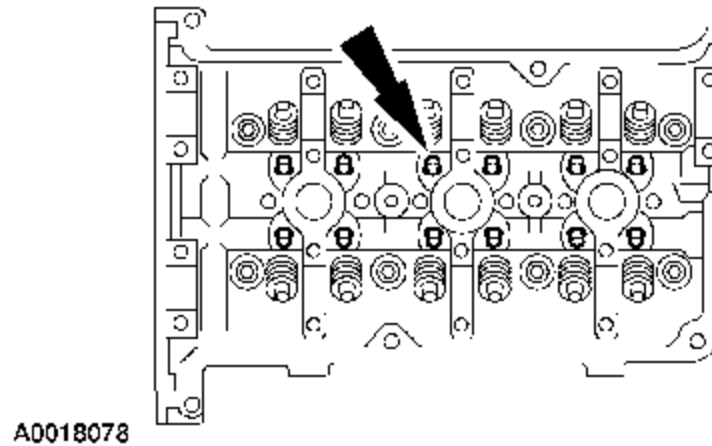
1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).



1.

CAUTION:

The camshaft followers must be installed in their original position. Remove the camshaft followers.



1.

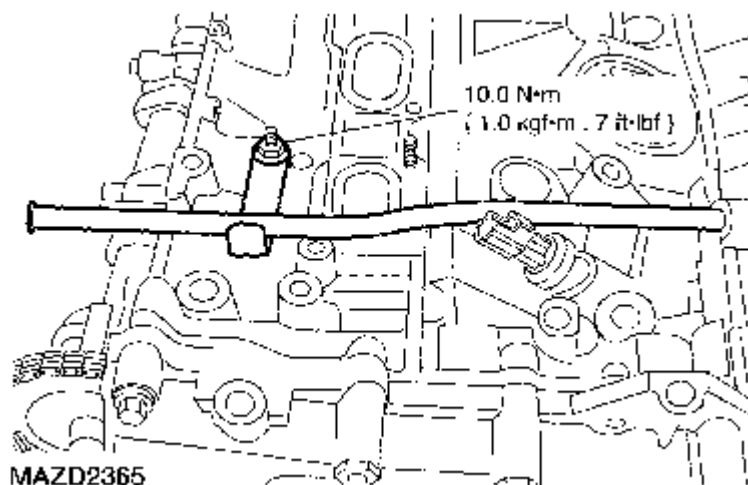
CAUTION:

The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Position the water pump and housing aside. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)

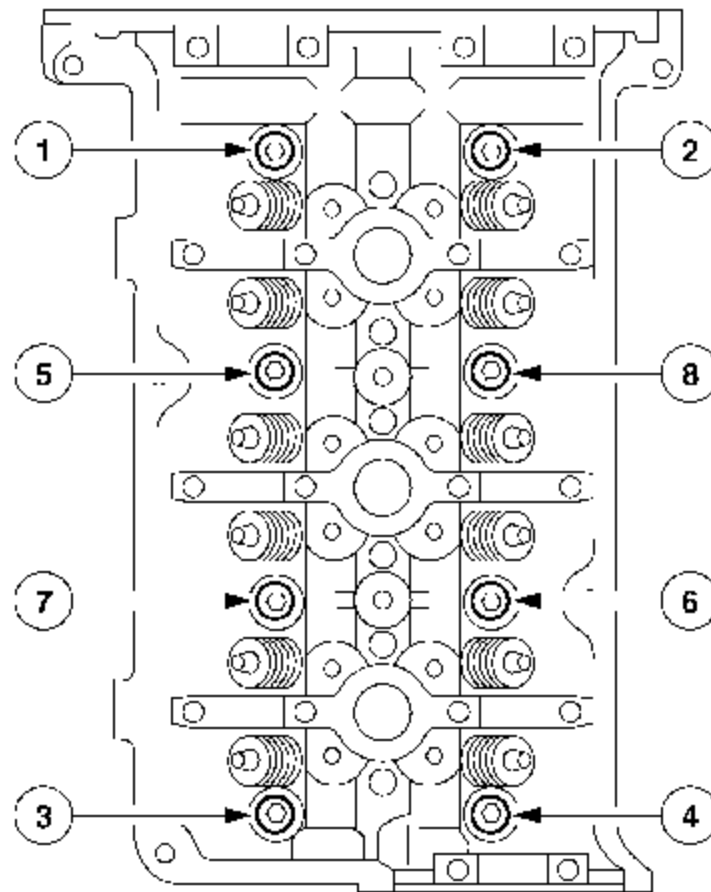
3. Raise the vehicle.

4. Remove the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



1. Remove the oil level indicator tube nut.

2. Lower the vehicle.



A0017922

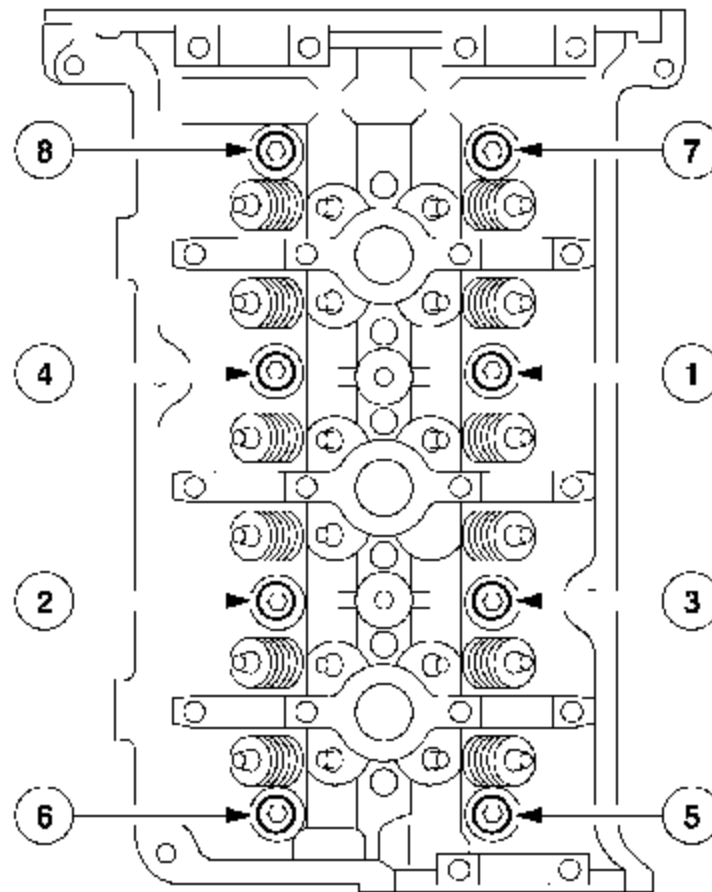
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- a. Discard the gasket and the bolts.

Installation



A0017924

1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

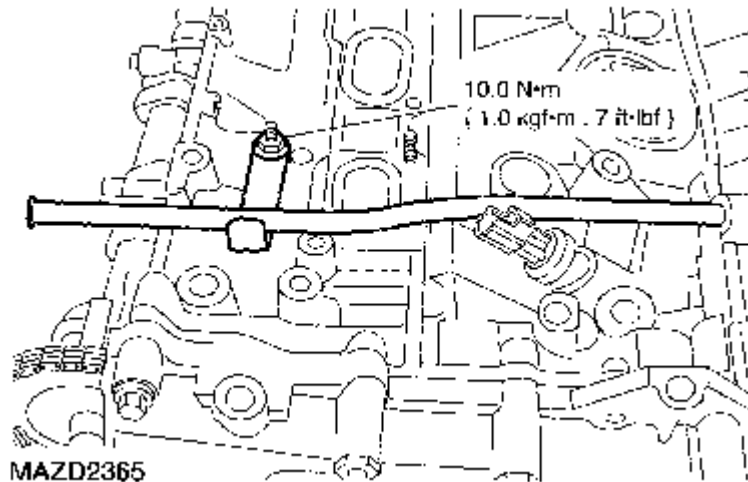
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

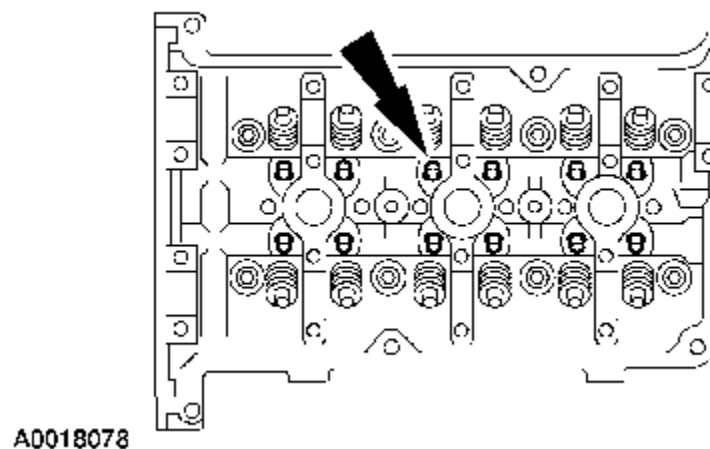
Position the LH cylinder head, gasket and install the bolts in the sequence shown.

- a. Tighten the bolts in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).

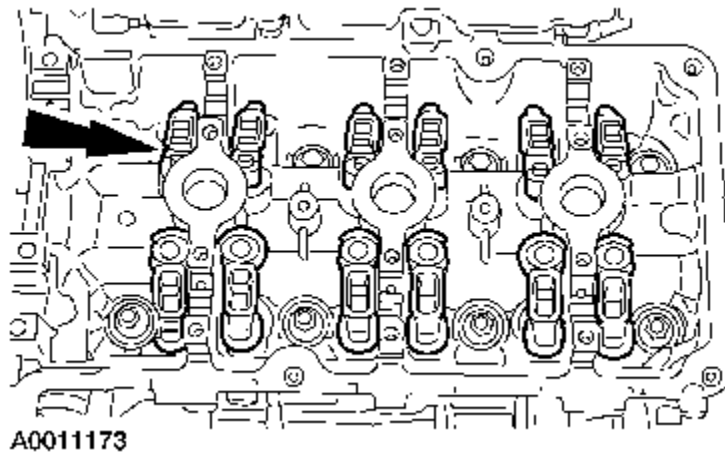
- c. Stage 2: Tighten bolts 90 degrees.
 - d. Stage 3: Loosen one full turn.
 - e. Stage 4: Tighten to 40 Nm (30 lb-ft).
 - f. Stage 5: Tighten 90 degrees.
 - g. Stage 6: Tighten 90 degrees.
- 2. Install the water pump. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)
 - 3. Raise the vehicle.
 - 4. Install the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



- 1. Install the oil level indicator tube nut.
- 2. Lower the vehicle.



1. Install the hydraulic lash adjusters.
 - a. Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.
 - a. Lubricate the camshaft followers with SAE 5W-20 motor oil.
2. Install the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).
3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
4. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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VIN or Model Year 2002 Model TRIBUTE Lower Intake Manifold
 General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
 Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

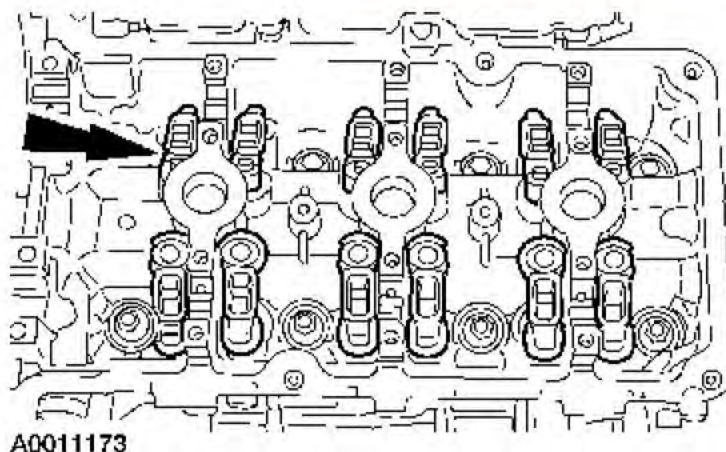
[< Previous](#) [Next >](#)

2002 - Tribute - Workshop Manual - Engine

CYLINDER HEAD — RH

Removal

1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).
4. Remove the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

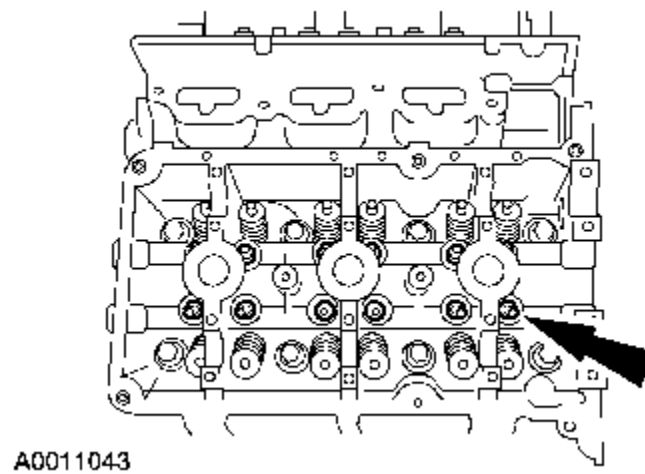


1.

CAUTION:

The camshaft followers must be installed in their original positions. Remove the camshaft

followers.

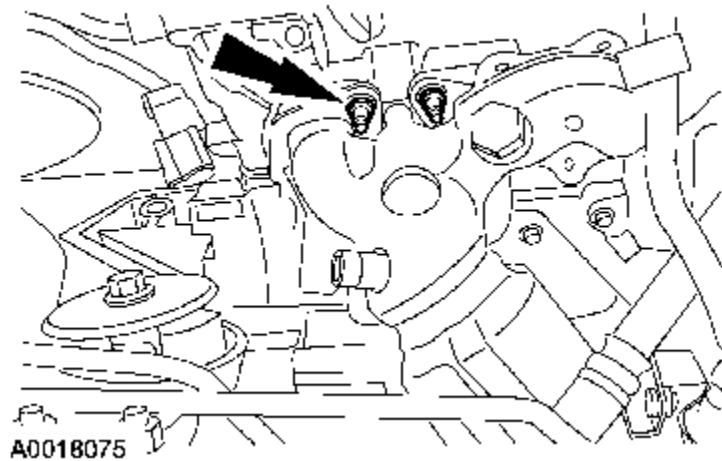


1.

CAUTION:

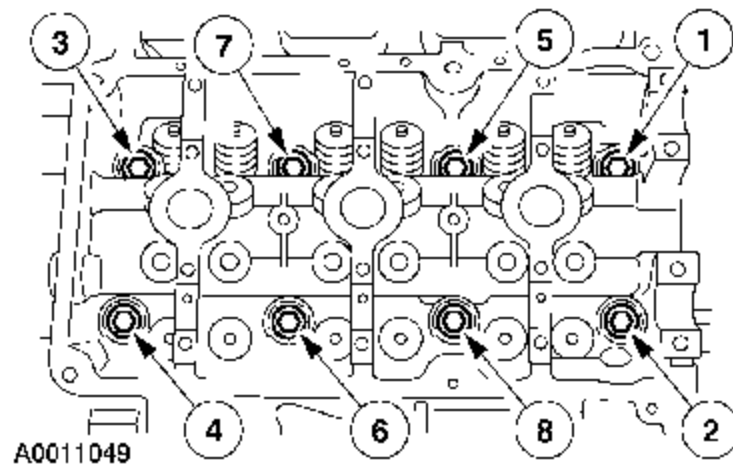
The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Raise the vehicle.



1. Remove the six nuts from the RH exhaust manifold.

2. Lower the vehicle.



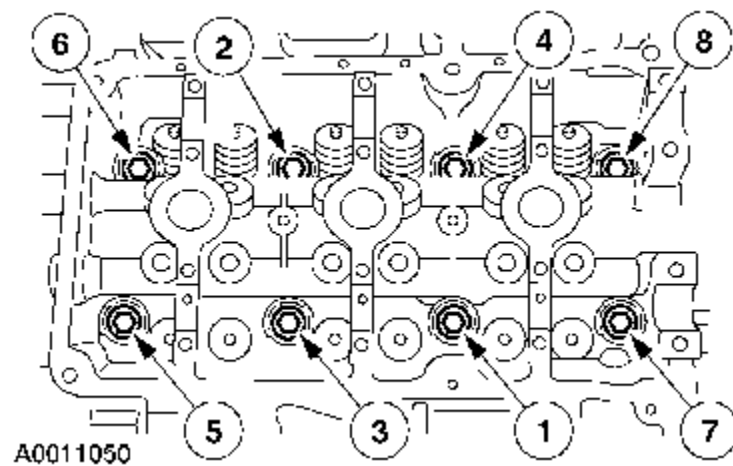
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- Discard the gasket and the bolts.

Installation



1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

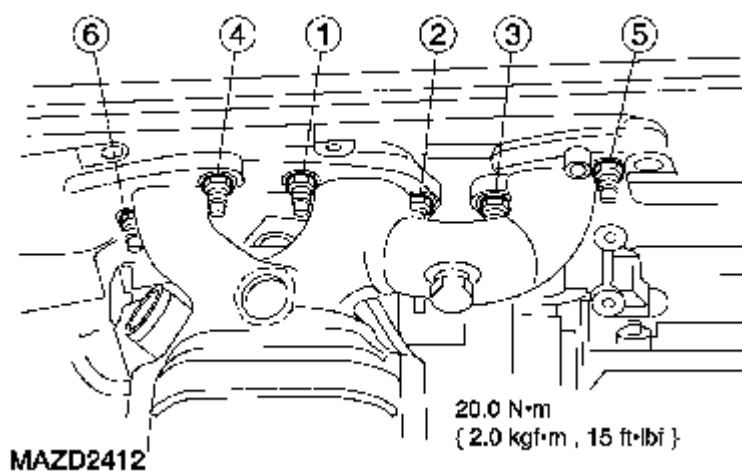
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

Position the RH cylinder head, gasket and install the bolts in the sequence shown.

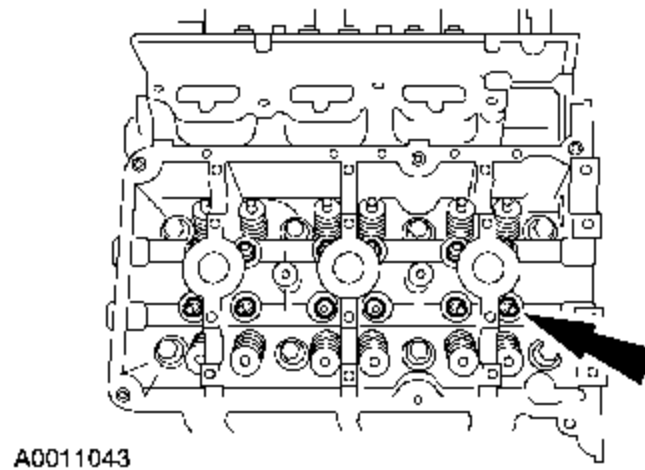
- Tighten the bolts in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten bolts 90 degrees.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.

2. Raise the vehicle.



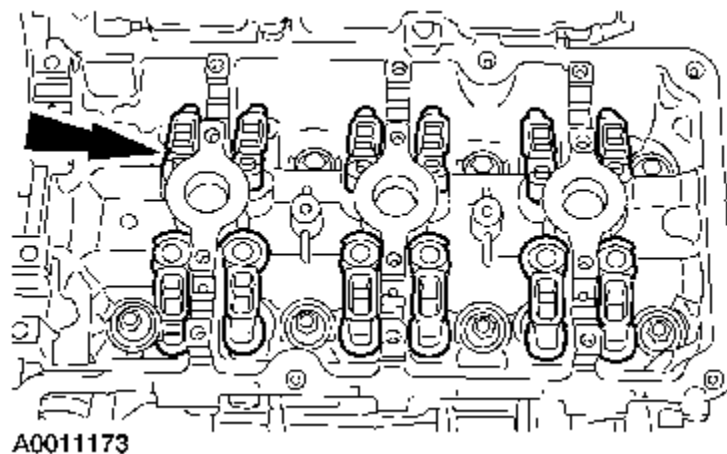
1. Install RH exhaust manifold nuts in the sequence shown.

2. Lower the vehicle.



1. Install the hydraulic lash adjusters.

- Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.

- Lubricate the camshaft followers with SAE 5W-20 motor oil.

2. Install the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).

4. Install the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).

5. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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VIN or Model Year 2002 Model TRIBUTE engine assemblyGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

2002 - Tribute - Workshop Manual - Engine

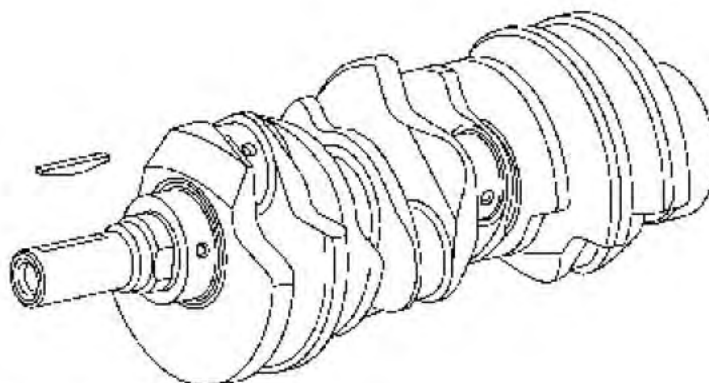
ENGINE

Assembly

1.

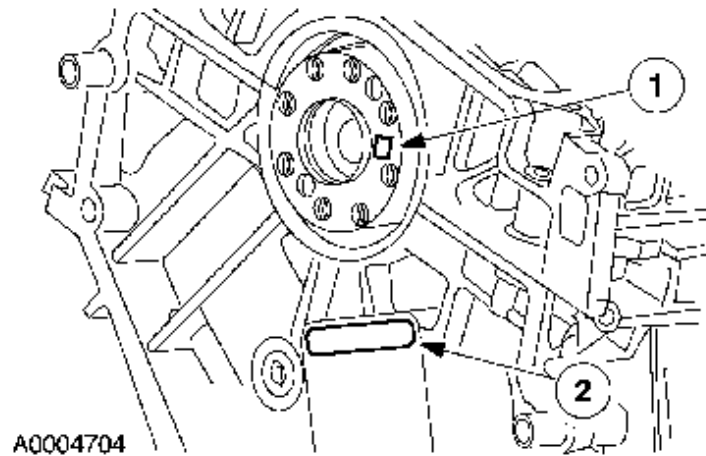
WARNING:

Eye protection is required to be worn during the use of compressed air. Failure to wear eye protection could result in possible personal injury. Clean gasket material, dirt and foreign material from the cylinder block. Wash the cylinder block with a suitable soap and water solution, and dry with compressed air.



A0004226

1. If removed, install the crankshaft key into the keyway on the crankshaft.



1.

NOTE:

This procedure is for selecting bearings using a new crankshaft. Select the crankshaft main bearings for each crankshaft journal.

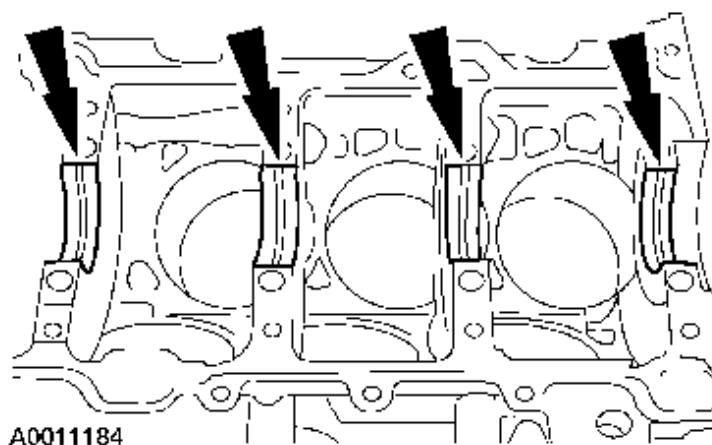
- a. Read the code on the crankshaft flange.
- b. Read the code on the cylinder block rear face.
 - The first two numbers after the asterisk make up the code for main No. 1 and the next two numbers for main No. 2.
 - The first two numbers after the second asterisk make up the code for main No. 3 and the last two numbers for main No. 4.

	BLOCK CODE																							
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
CRANKSHAFT CODE	91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
	88	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	87	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
	86	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
	85	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
	84	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3
	83	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
	82	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	81	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
	80	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
	79	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
	78	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	77	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
	76	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
	75	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
	74	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
	73	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
	72	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	71	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	70	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	69	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	68	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

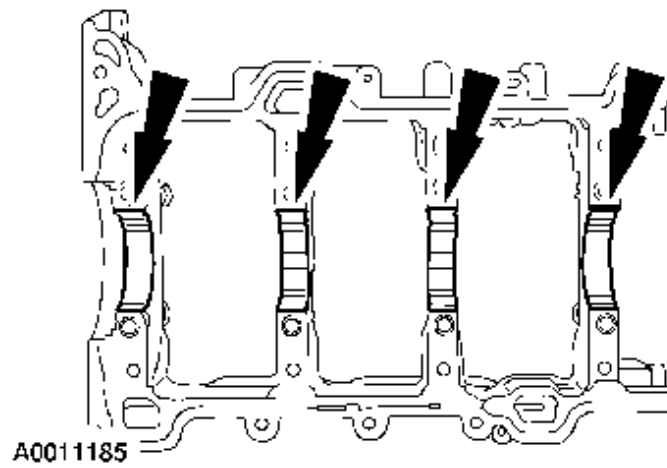
A0004705

1. Using the chart, choose a bearing for each main. Match the block and crankshaft code with its corresponding column or row, by reading across the "crankshaft" row and down the "block" column.

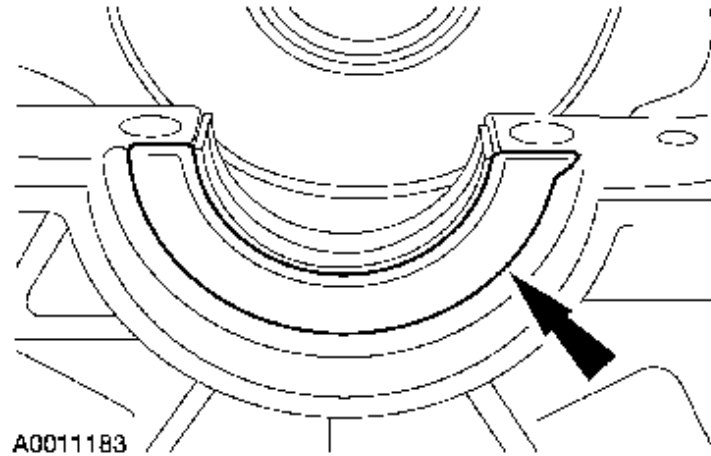
- For example: If the block code is *0609*0711* and the crankshaft code is *8480*8082*, main No. 1 should use grade 1 bearings, as determined by the intersection of the 06 block column and the 84 crankshaft row. Mains 2,3 and 4 should all be grade 2.



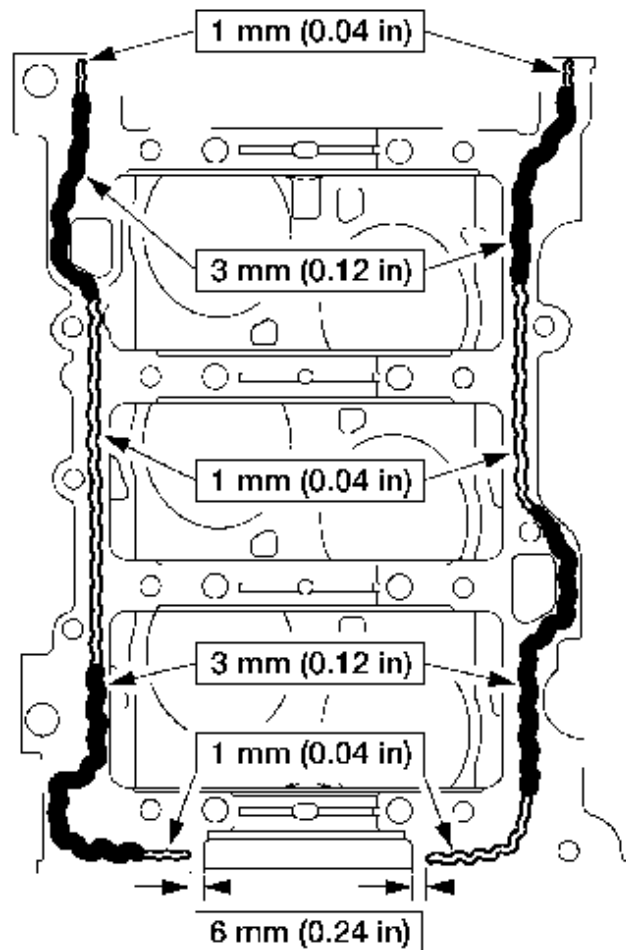
1. Install the main bearings into the cylinder block.



1. Install the main bearings into the lower cylinder block.

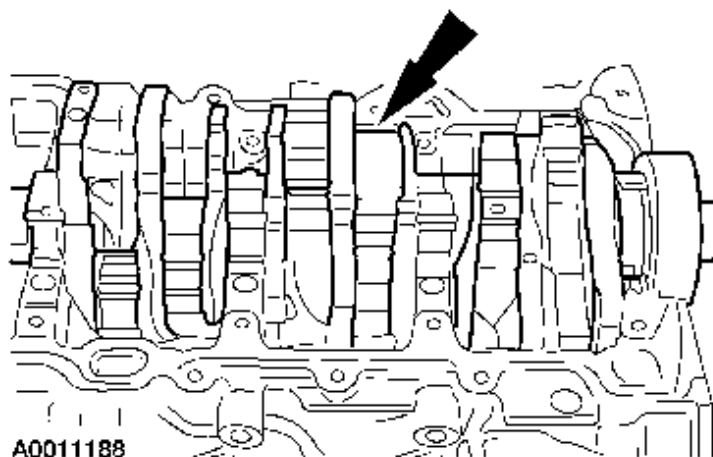


1. Install the crankshaft thrust bearing.



A0011187

1. Apply SAE 5W-20 motor oil to the crankshaft main and rod bearing journals.

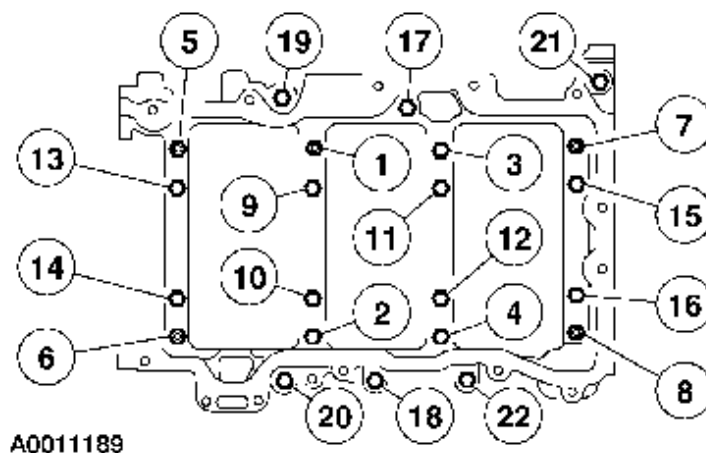


A0011188

1. Position the crankshaft in the cylinder block.
- 2.

CAUTION:

The lower cylinder block must be installed and the bolts tightened within four minutes of applying the sealant. Apply Silicone Gasket and Sealant to the cylinder block as shown.

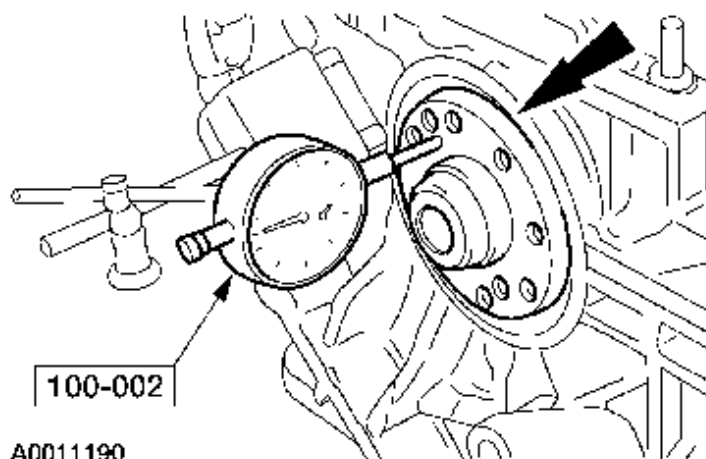


1.

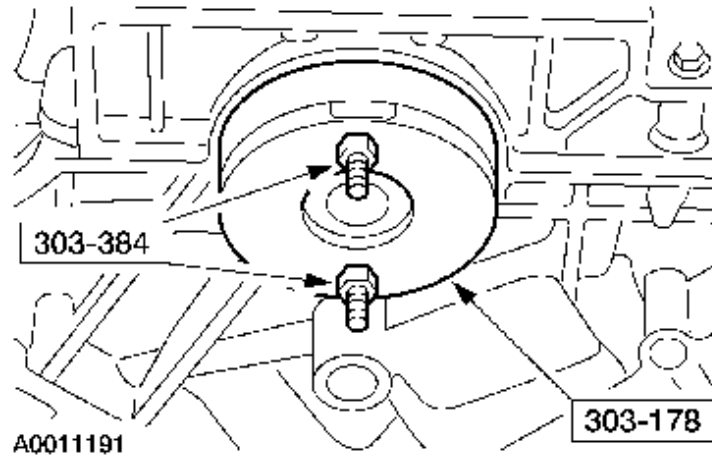
CAUTION:

Fasteners No. 1, 5, 6, 7, 8 are studs. Fasteners No. 18–22 are M8 x 1.25 mm x 79.3 mm (0.05 in x 3.12 in) bolts. Fasteners No. 2–4, 17 are M8 x 1.25 mm x 95.3 mm (0.05 in x 3.75 in) bolts. Fasteners 9–16 are M10 x 1.5 mm x 106 mm (0.06 in x 4.17 in) bolts. The bolts and studs must be installed in the correct position or engine damage may result. Position the lower cylinder block and install the bolts and studs.

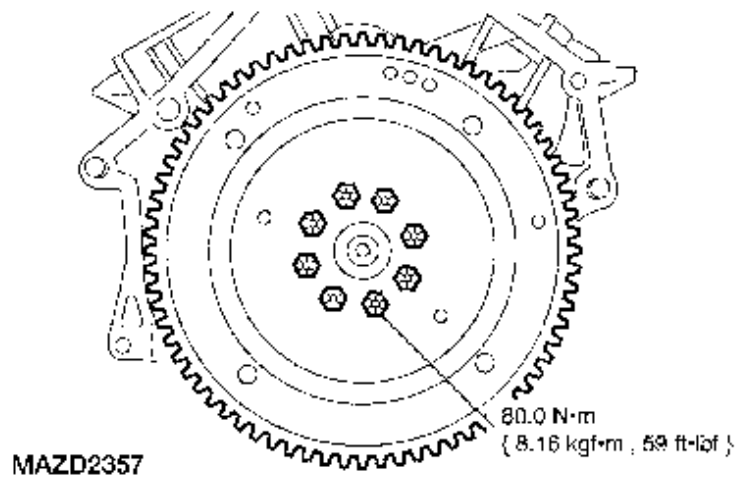
- Tighten the bolts and studs in the sequence shown in four stages.
- Stage 1: Tighten fasteners 1–8 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.
- Stage 2: Tighten fasteners 9–19 to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 3: Tighten fasteners 1–16 90 degrees.
- Stage 4: Tighten fasteners 17–22 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.



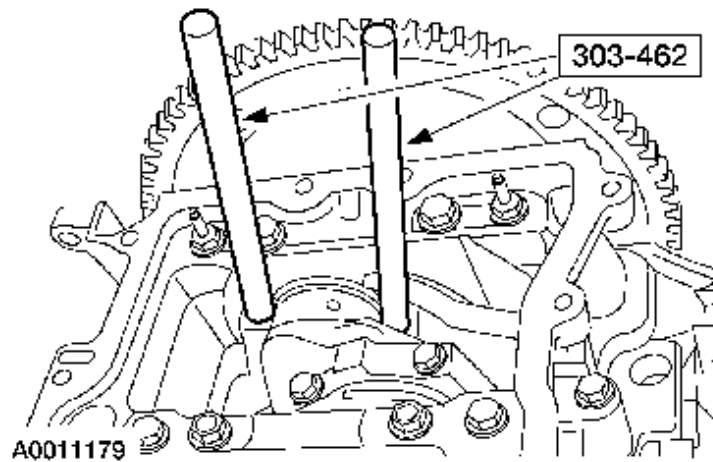
1. Using the special tool, measure the crankshaft end play. Refer to — [01-10A CRANKSHAFT END PLAY](#).



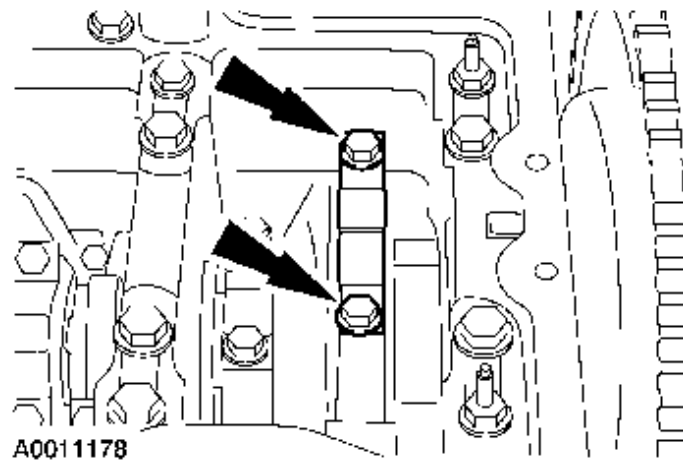
1. Using the special tool, install the crankshaft rear oil seal.



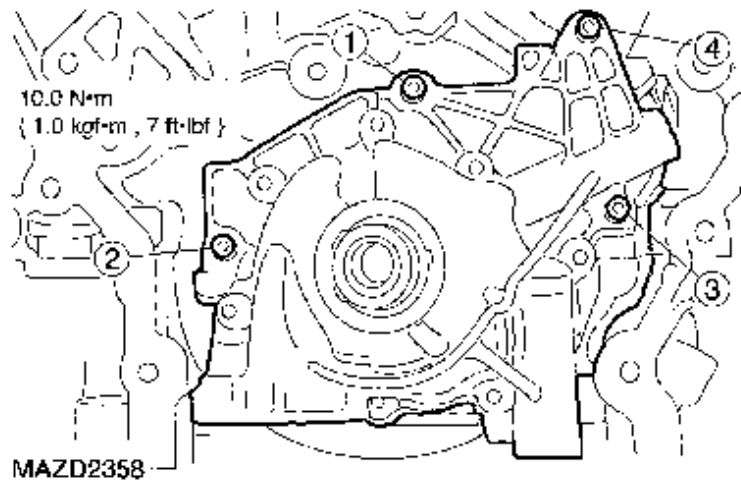
1. Position the flexplate and install the bolts.
2. Mount the engine on an engine stand.
3. Apply SAE 5W-20 motor oil to the cylinder bores.



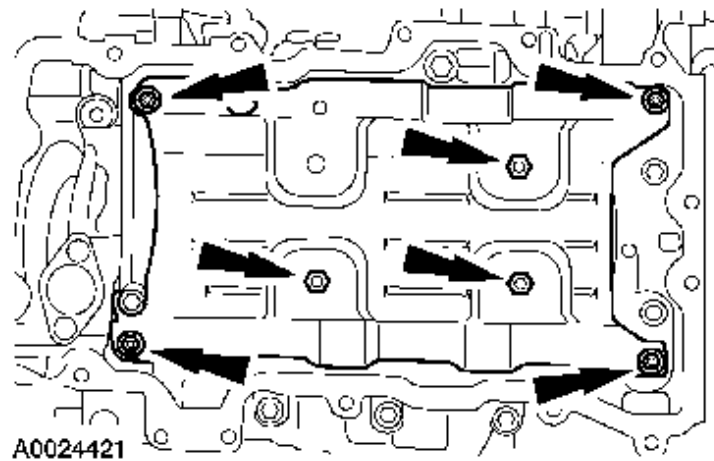
1. Using the special tools, install the piston and connecting rod assemblies.
2. Check connecting rod bearing clearance. Refer to — [01-10A CONNECTING ROD BEARING JOURNAL CLEARANCE](#)



1. Install the connecting rod caps and bolts.
 - Tighten the bolts in two stages.
 - Stage 1: Tighten to 23 N•m {2.3 kgf•m , 17 ft•lbf}.
 - Stage 2: Tighten to 43 N•m {4.4 kgf•m , 32 ft•lbf}.

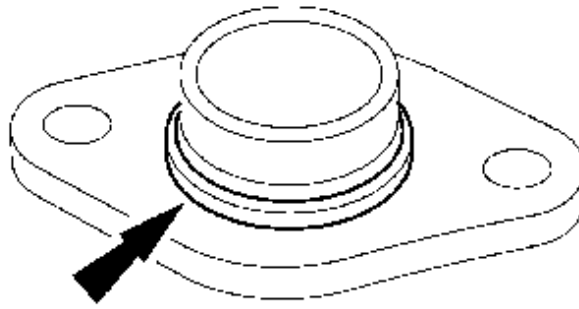


1. Position the oil pump and install the bolts in the indicated sequence.



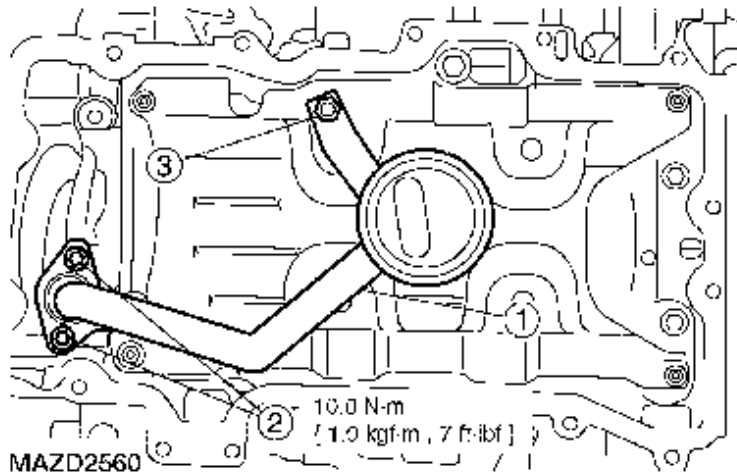
1. Position the oil pan baffle and install the nuts.

- Tighten the nuts in two stages.
- Stage 1: Tighten to 5 N·m { 0.5 kgf·m , 44 in·lbf }.
- Stage 2: Tighten 45 degrees.

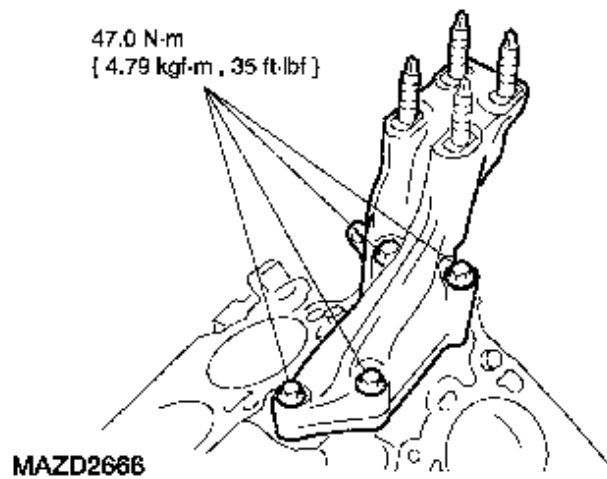


A0011413

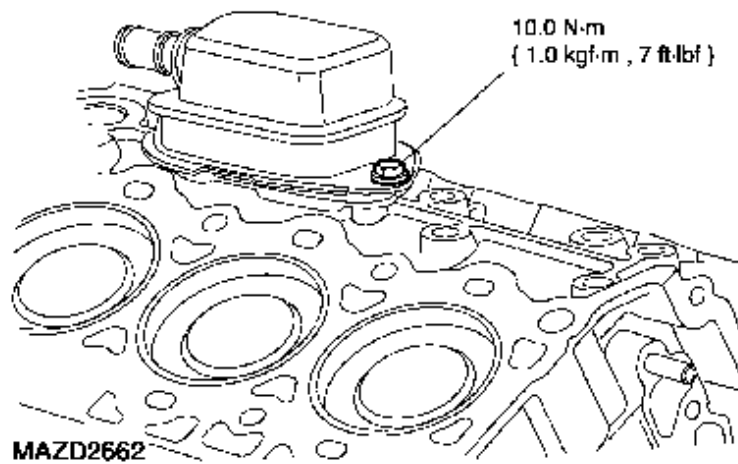
1. Install a new O-ring seal on the oil pump screen and pick-up tube.



1. Install the oil pump screen and pick up tube.
 - a. Position the oil pump screen and pick up tube.
 - b. Install the bolts.
 - c. Install the nut.
 - Tighten the nut in two stages.
 - Stage 1: Tighten to 5 N·m {0.5 kgf·m , 44 in·lbf}.
 - Stage 2: Tighten 45 degrees.

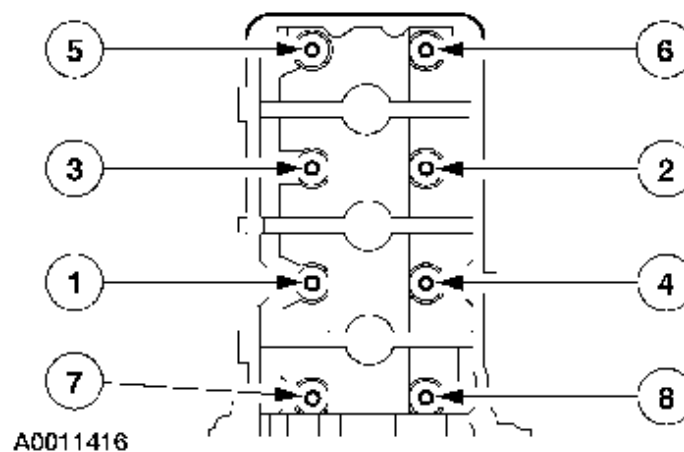


1. Install the power steering/engine support bracket.



1. Install the oil separator.

- Install the two bolts.

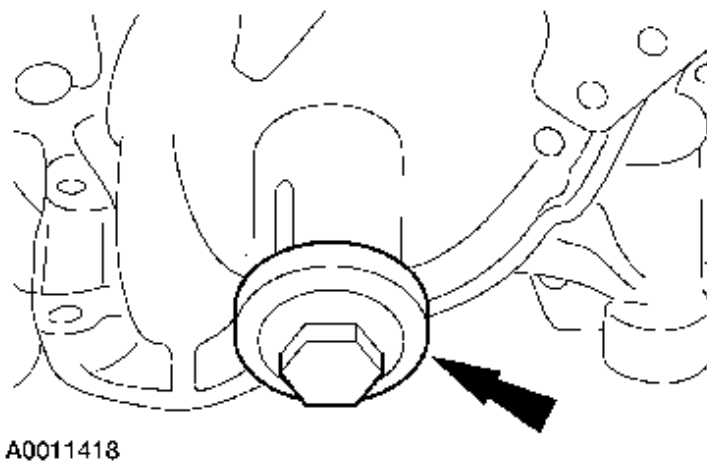


1.

NOTE:

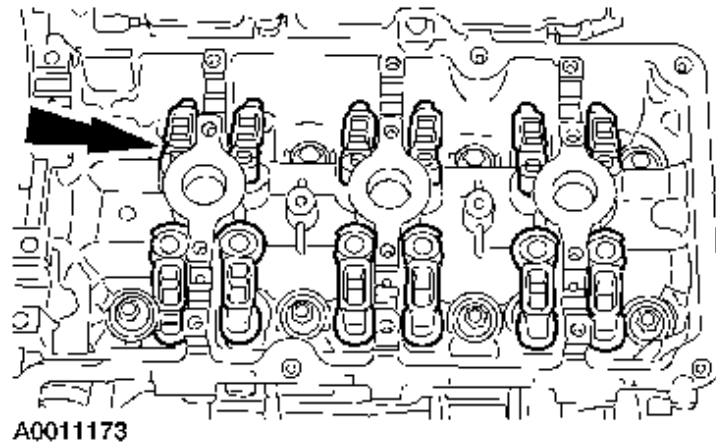
LH shown, RH similar. Position the LH and RH cylinder heads, gaskets, and install the bolts.

- Tighten the bolts in the sequence shown in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position to locate top dead center (TDC).

2. Apply SAE 5W-20 motor oil to the LH and RH camshaft followers.



1.

CAUTION:

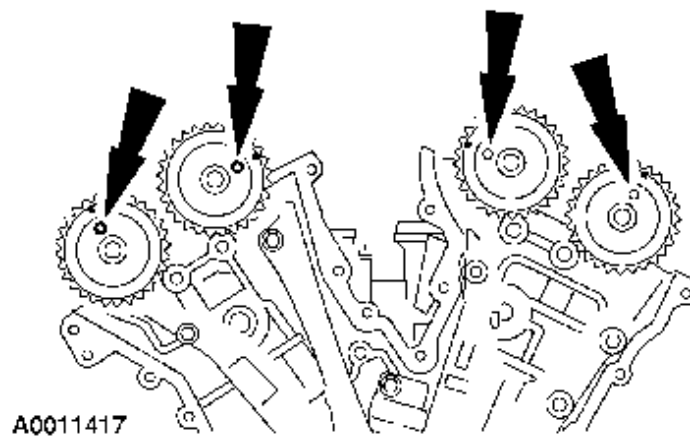
The camshaft followers must be installed in the original position.

NOTE:

RH shown, LH similar.

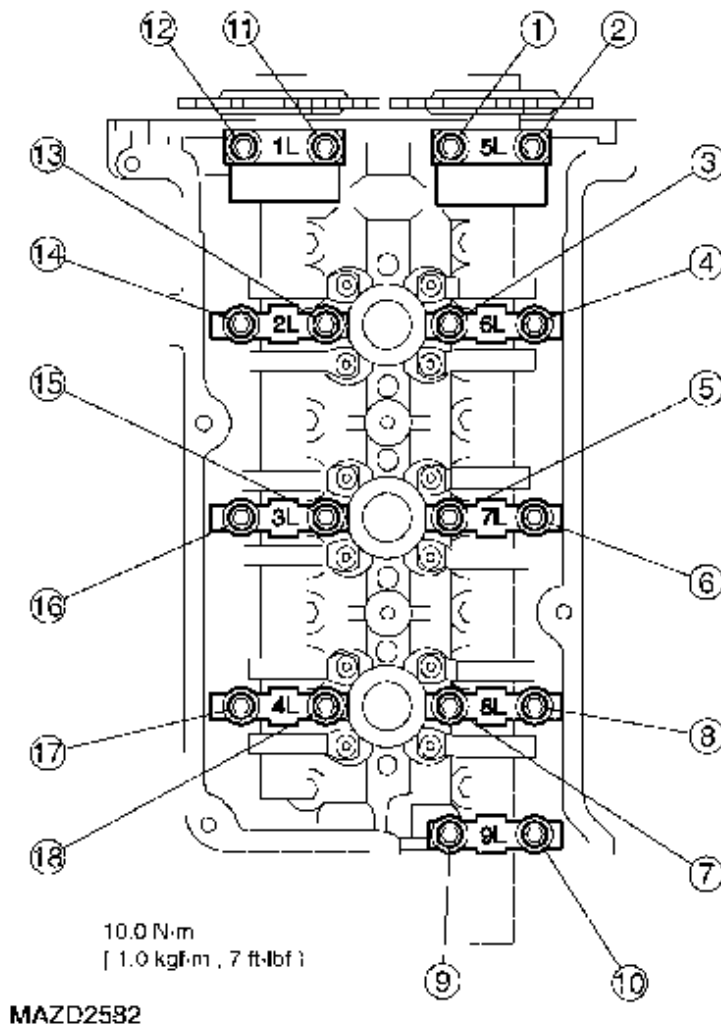
Install the LH and RH camshaft followers.

2. Apply SAE 5W-20 motor oil to the LH and RH camshafts.



1. Install the LH and RH camshafts.

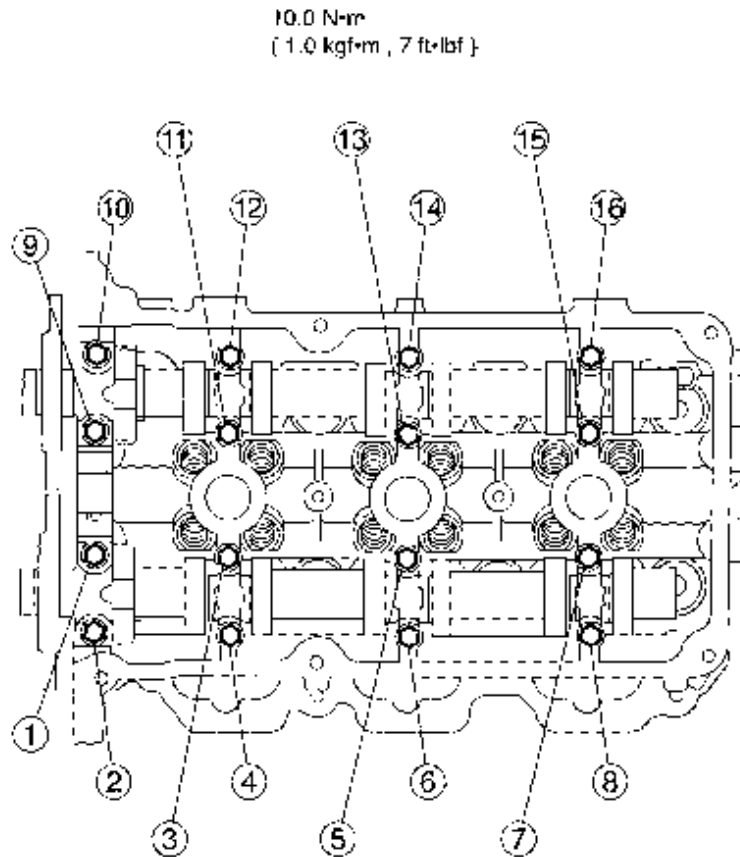
- Locate the camshafts as shown.



1.

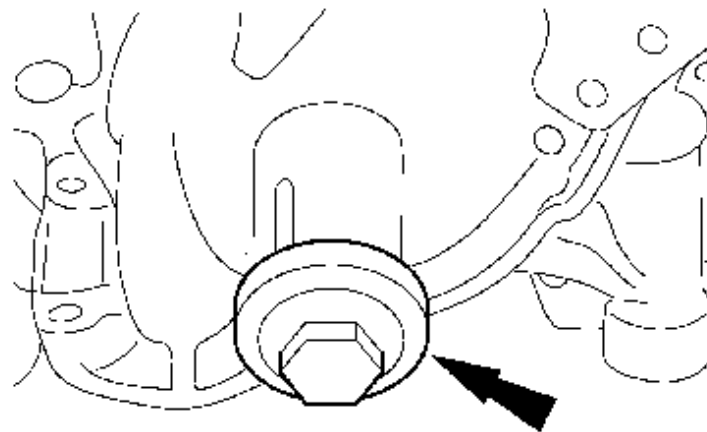
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Position the LH camshaft caps and install the bolts in the sequence shown.



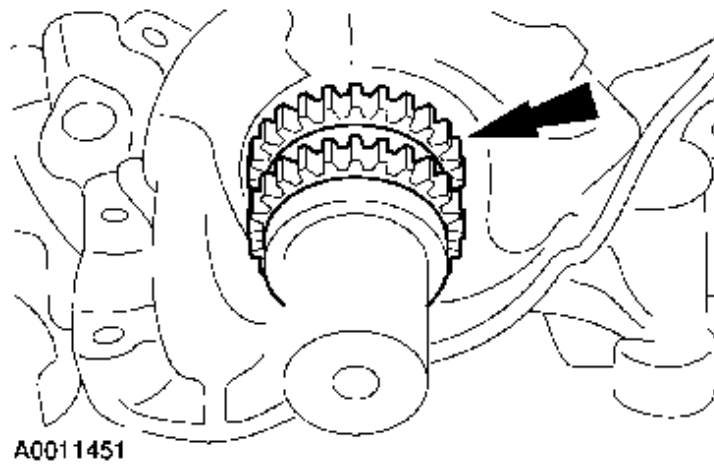
MAZD2356

1. Position the RH camshaft caps and install the bolts in the sequence shown.

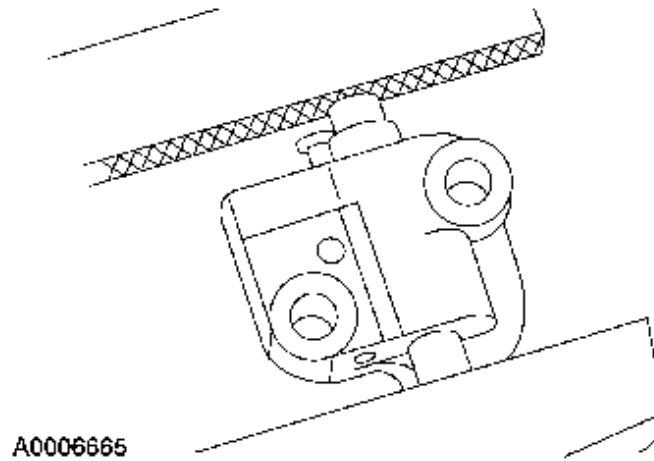


A0011418

1. Remove the crankshaft damper bolt.



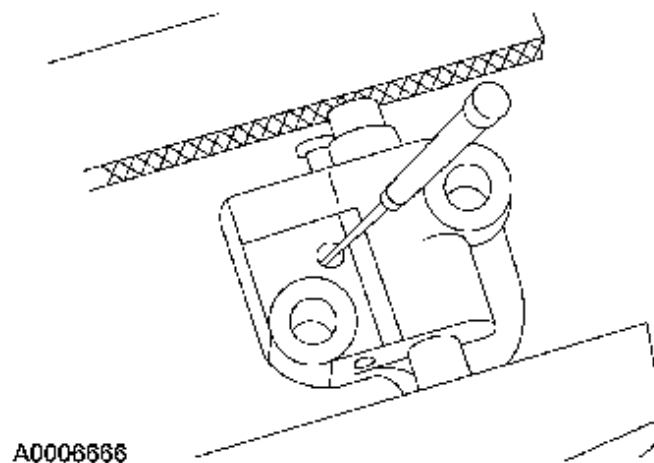
1. Install the crankshaft sprockets.



- 1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

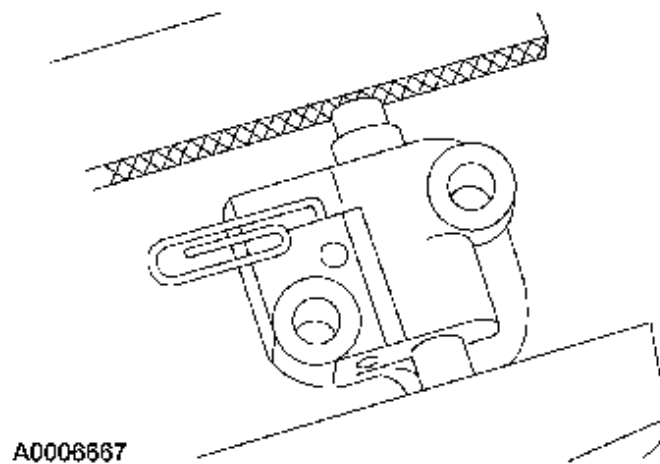
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

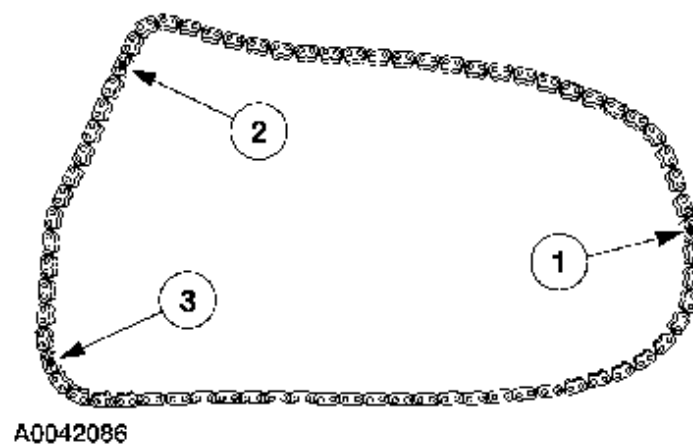
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.



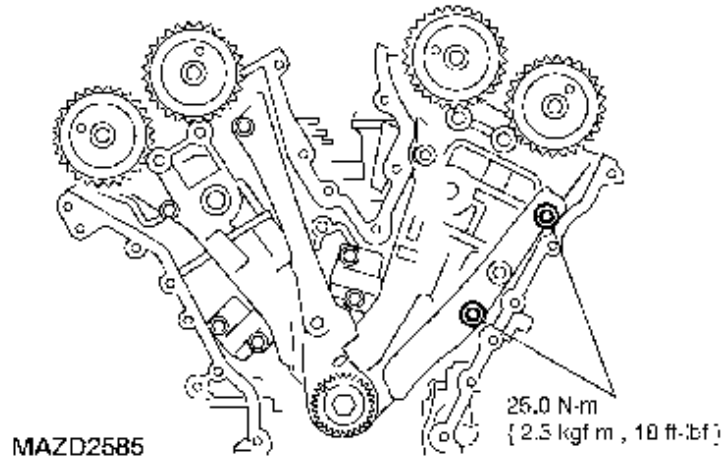
1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.



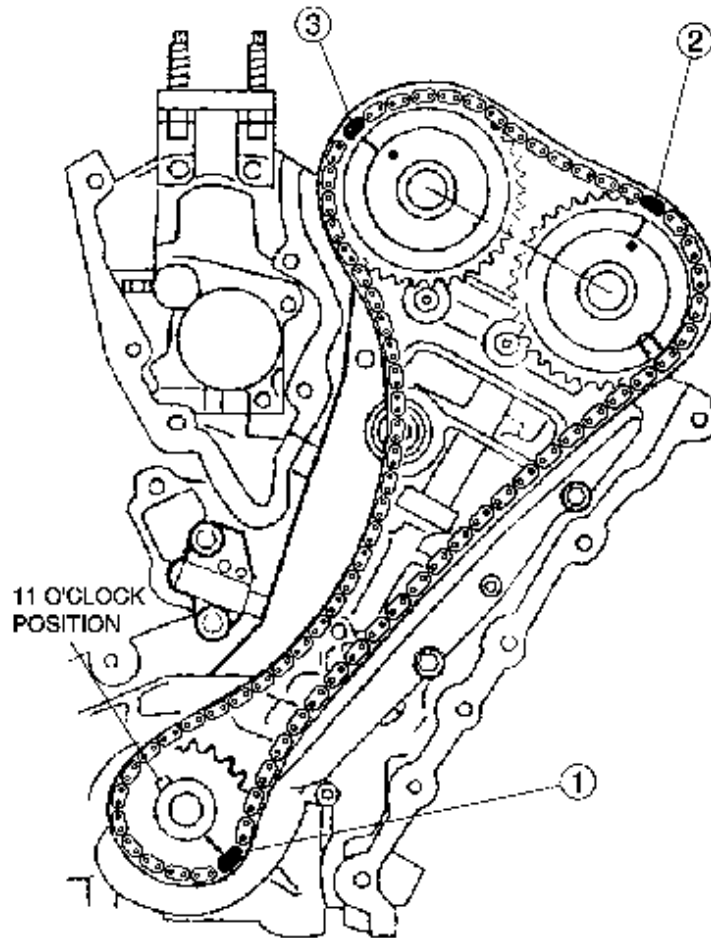
1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

a. Mark any link to use as the crankshaft timing mark.

- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark

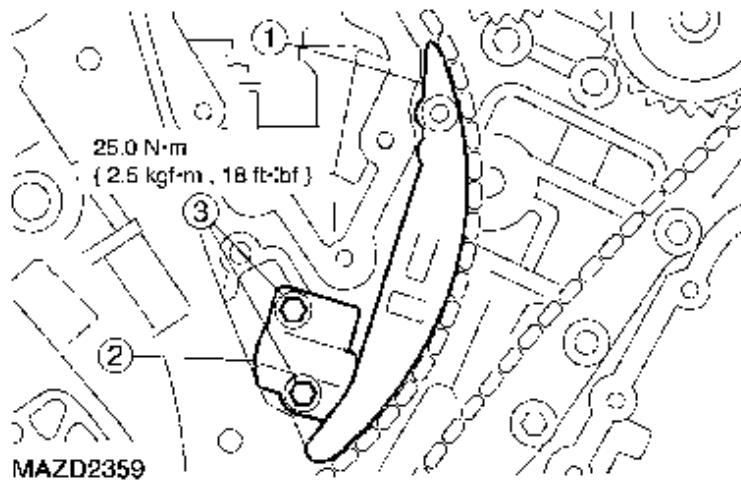


1. Position the guide and install the bolts.



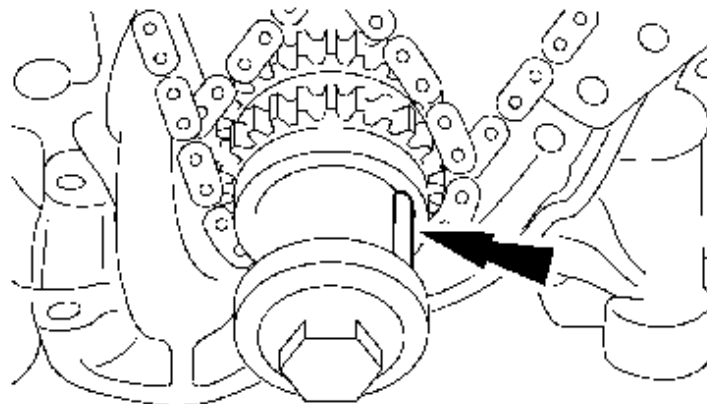
MAZD2331

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.



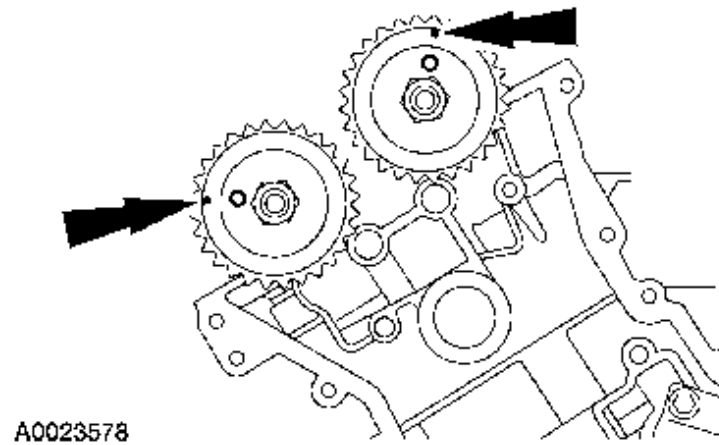
1. Install the LH timing chain tensioner and tensioner arm.

- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolts.

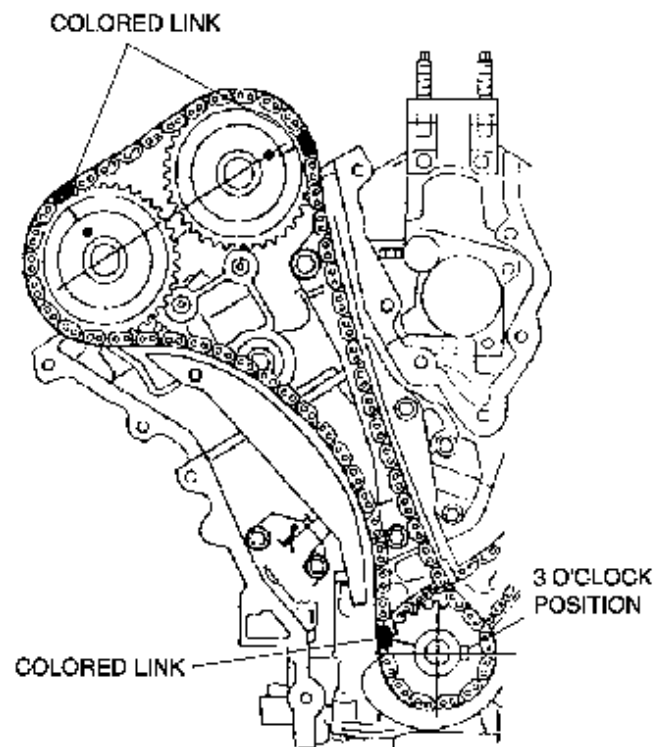


A0011067

1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



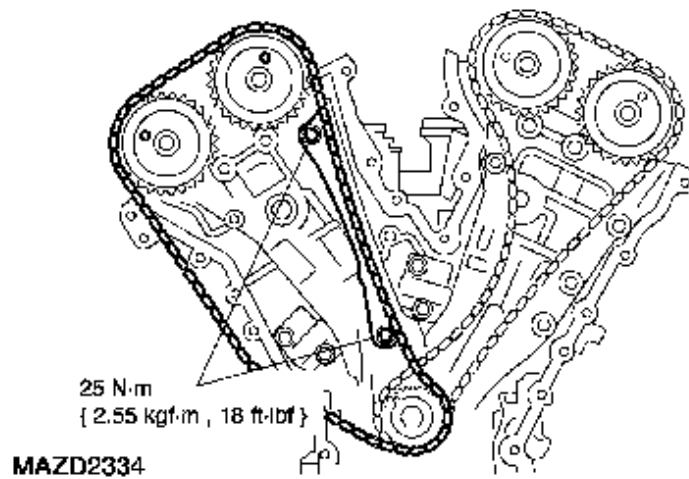
1. Verify that the RH camshafts are correctly positioned.



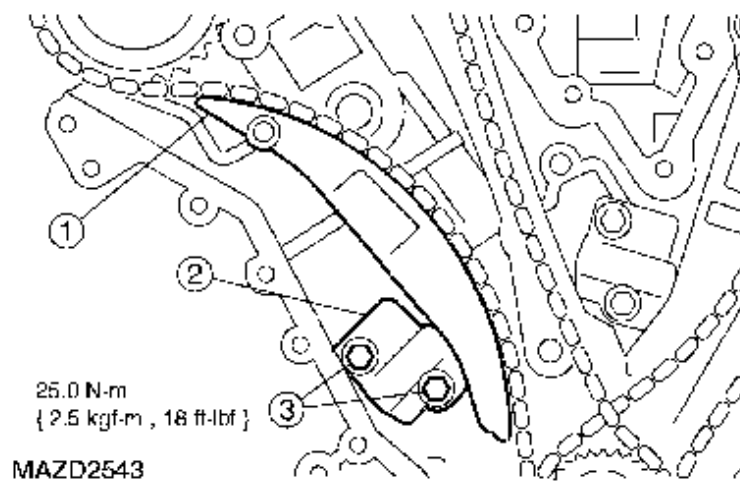
1. Install the RH timing chain.

- Align the marks on the timing chain with the marks on the camshaft and

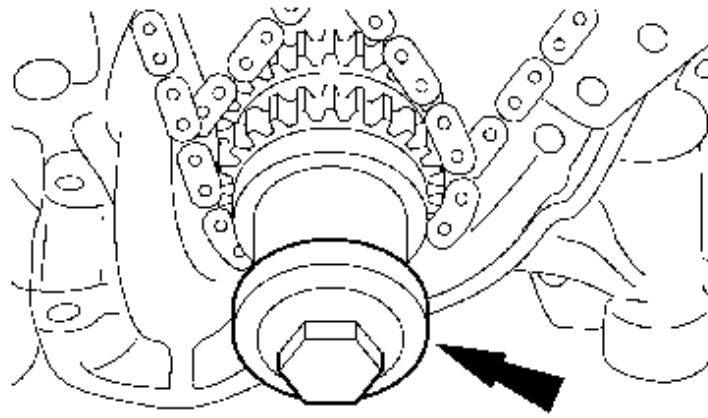
crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

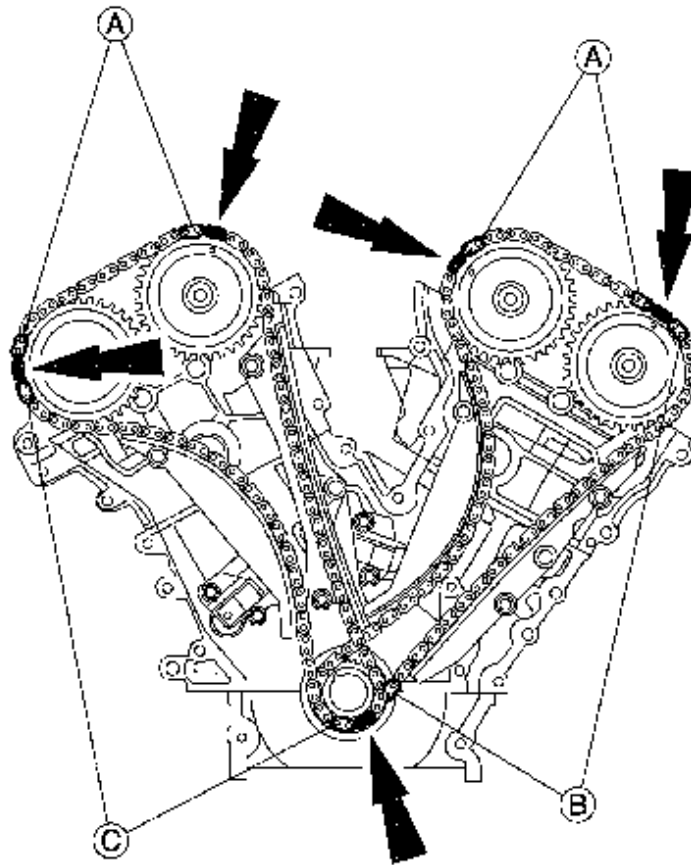


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

1. Remove the crankshaft damper bolt.

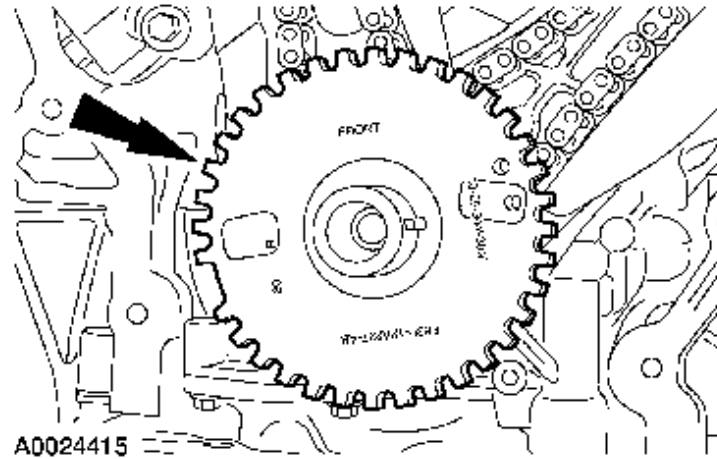


MAZD2333

1. Verify the timing with the following steps.

1. There should be 12 chain links between the front camshaft timing marks.

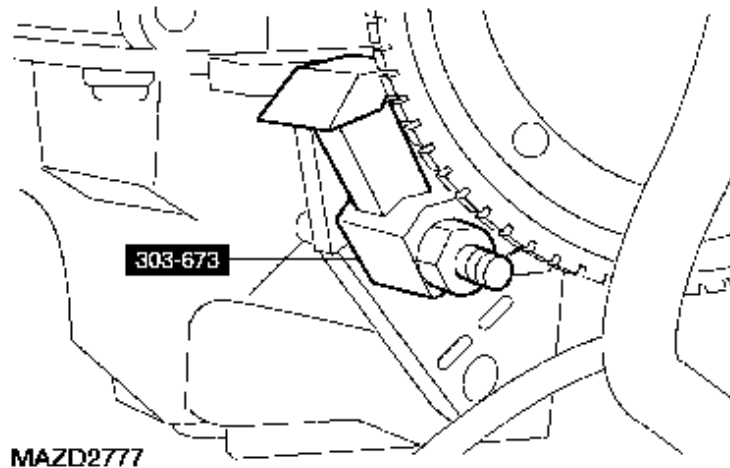
2. There should be 27 chain links between the camshaft and crankshaft timing marks.
3. There should be 30 chain links between the camshaft and crankshaft timing marks.



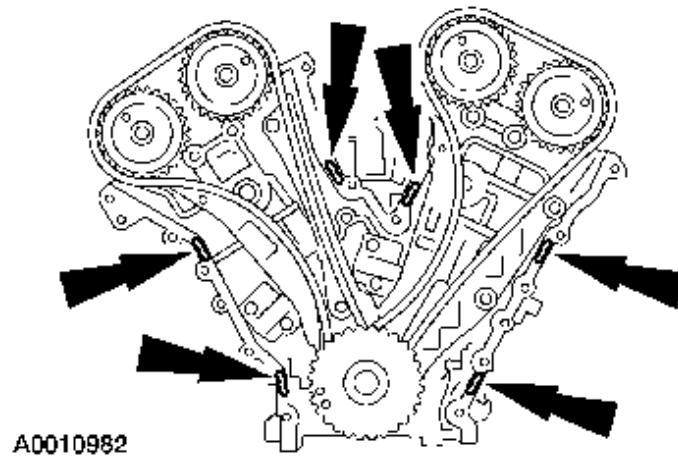
1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the special tool to hold the flexplate.
2. Install three gaskets in the front cover.

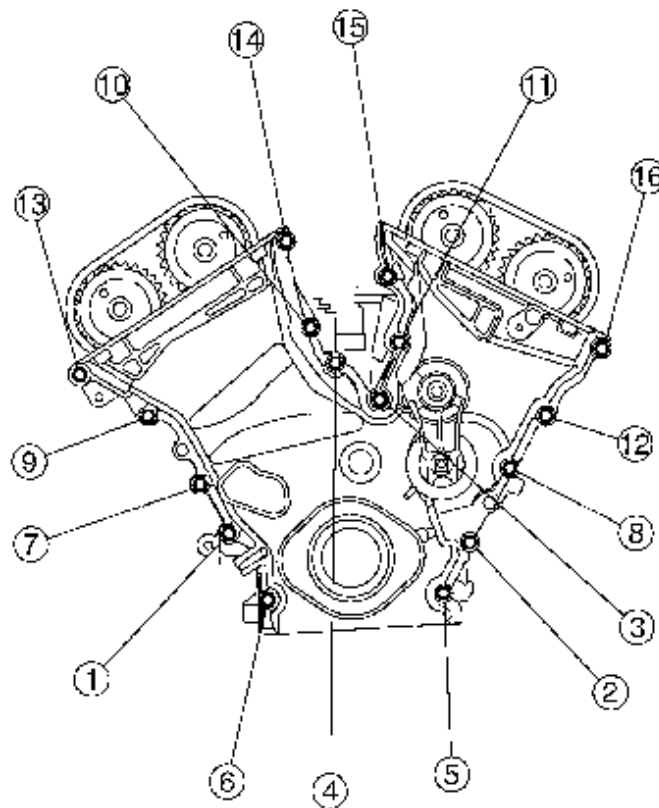


1.

NOTE:

The front cover must be installed and the bolts tightened within six minutes of sealant application. Apply a 6 mm (0.24 in) dot of silicone gasket and sealant to the cylinder block to lower cylinder block and cylinder head mating surfaces.

25.0 N·m
{ 2.5 kgf-m , 18 ft·lbf }

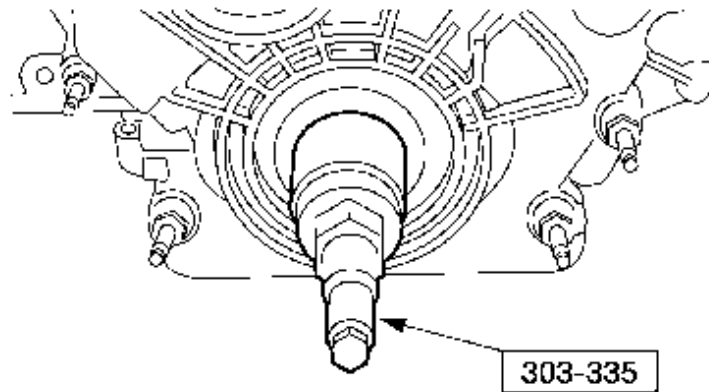


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1.

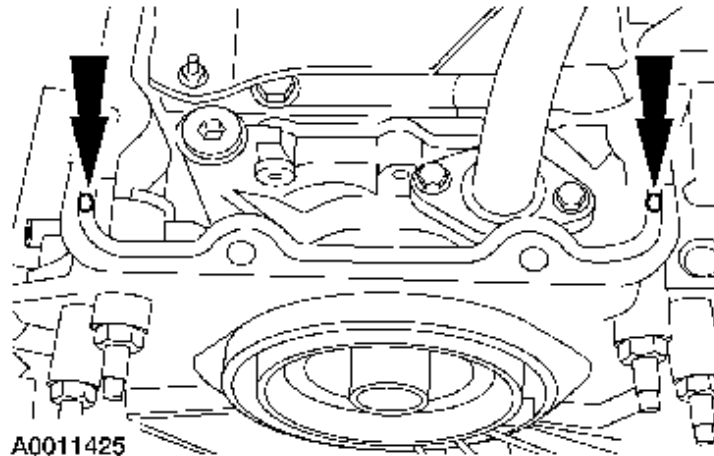
NOTE:

Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the front cover and install the bolts and studs in the sequence shown.



A0011428

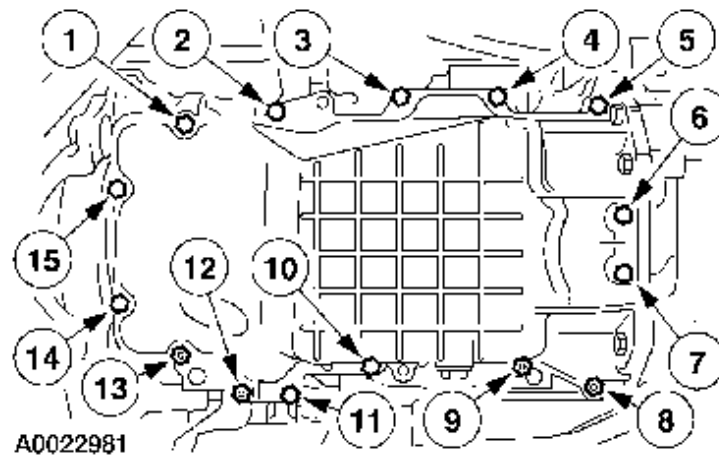
1. Using the special tool, install the crankshaft front oil seal.



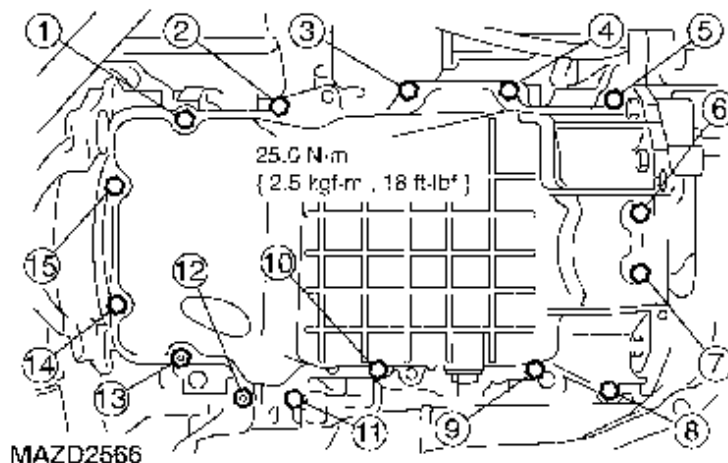
- 1.

NOTE:

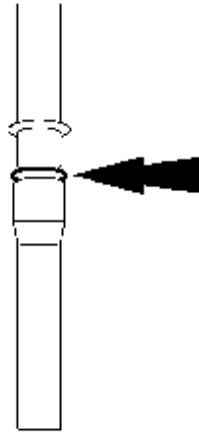
The oil pan must be installed and the bolts tightened within six minutes of sealant application. Apply a 10 mm (0.39 in) dot of silicone gasket and sealant to the front cover to cylinder block mating surface.



1. Position the oil pan and gasket and loosely install the bolts and studs in the indicated sequence.
2. Align the transaxle face of the oil pan with the rear of the cylinder block. The pan should be 0.00 mm (0.0 in)–0.25 mm (0.009 in) under flush. Assemblies that are between 0.26 (0.01 in) –0.50 mm (0.019 in) should be shimmed using either one or two 0.25 mm (0.009 in) gold shims. Assemblies that are between 0.51 mm (0.020 in) –0.75 mm (0.029 in) should be shimmed using either one or two 0.50 mm (0.019 in) silver shims. If the pan measures greater than 0.75 mm (0.029 in) or the pan is over flush of the cylinder block, the entire pan assembly must be removed and a new one installed.

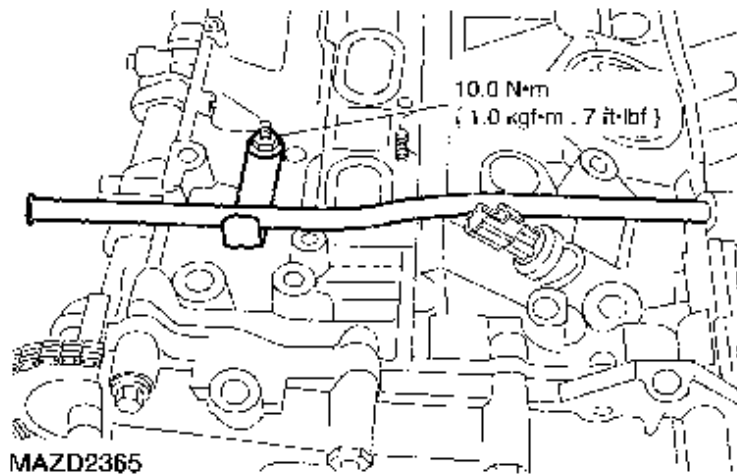


1. Tighten the oil pan bolts and studs in the sequence shown.

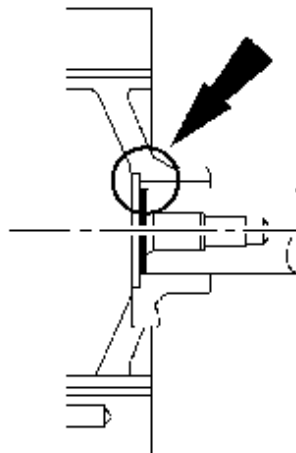


A0011038

1. Install a new seal on the oil level indicator tube.



1. Install the oil level indicator tube and install the bolt.

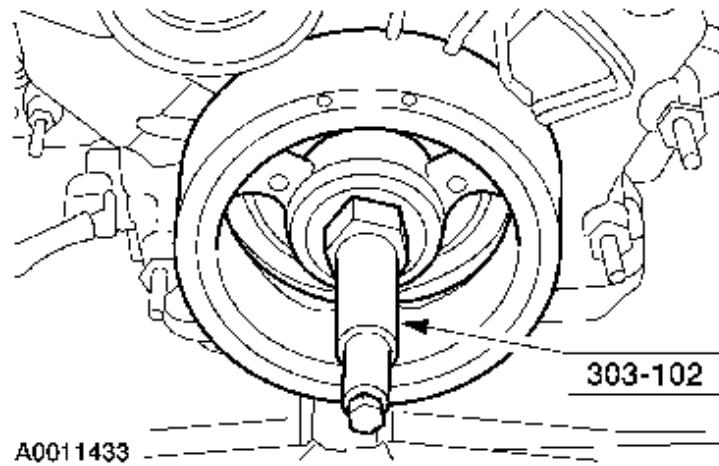


A0010615

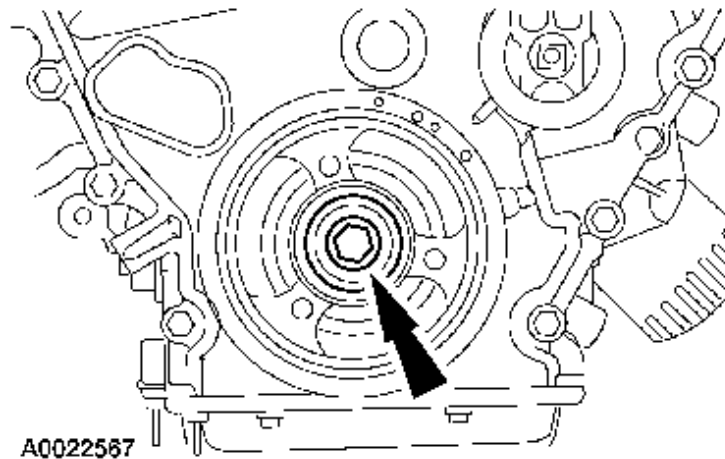
- 1.

NOTE:

The crankshaft damper must be installed and the bolt tightened within six minutes of sealant application. Apply silicone gasket and sealant to the end of the crankshaft damper keyway slot.



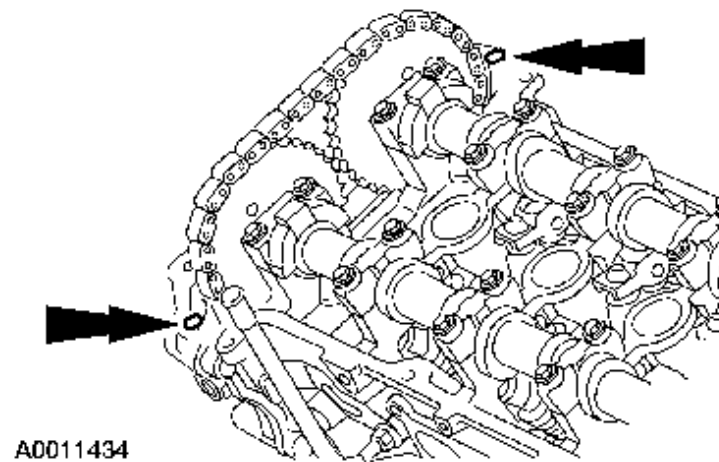
1. Using the special tool, install the crankshaft vibration damper.



1. Install the crankshaft vibration damper washer and bolt.

- Tighten the bolt in four stages.
- Stage 1: Tighten to 120 N•m {1.22 kgf•m , 89 ft•lbf}.
- Stage 2: Loosen one full turn (360 degrees).
- Stage 3: Tighten to 50 N•m {5.1 kgf•m , 37 ft•lbf}.
- Stage 4: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.

2. Install new gaskets in the valve covers.



1.

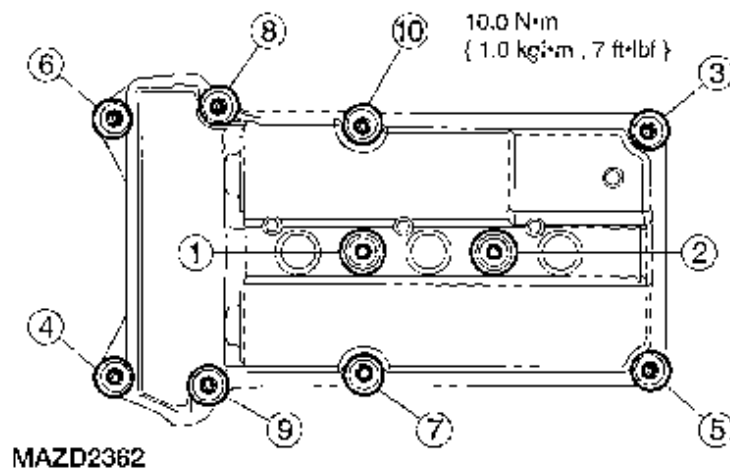
NOTE:

The valve cover must be installed and the bolts and studs tightened within six minutes of sealant application.

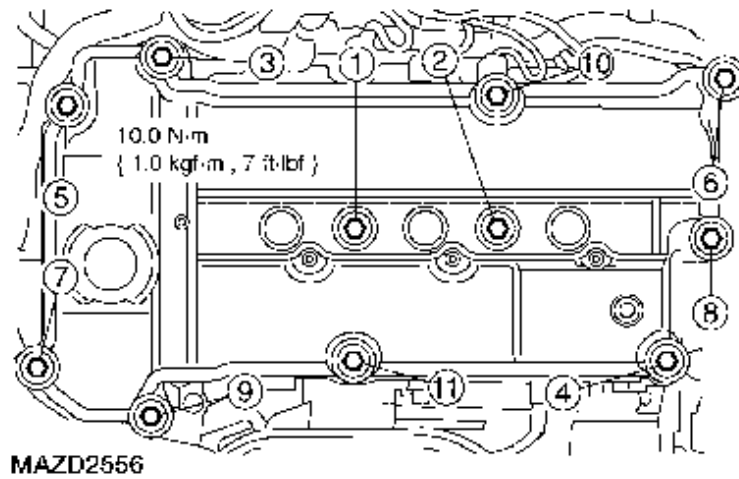
NOTE:

LH shown, RH similar.

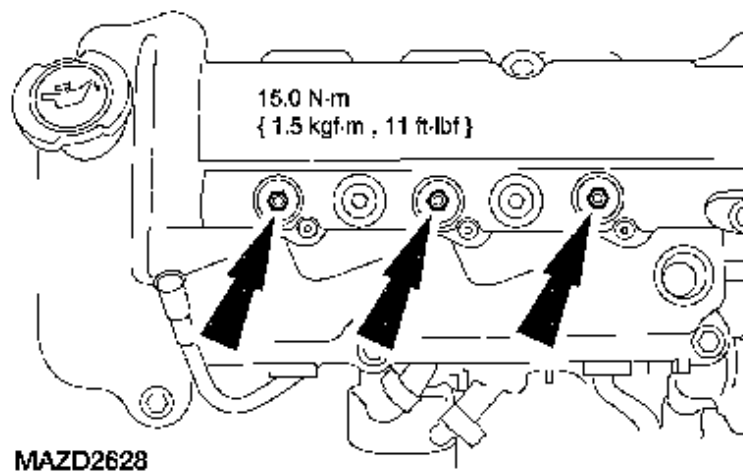
Apply a 8 mm (0.31 in) dot of silicone gasket and sealant at the cylinder block to front cover mating surface of the LH and RH valve covers.



1. Position the RH valve cover and install the bolts and studs in the sequence shown.



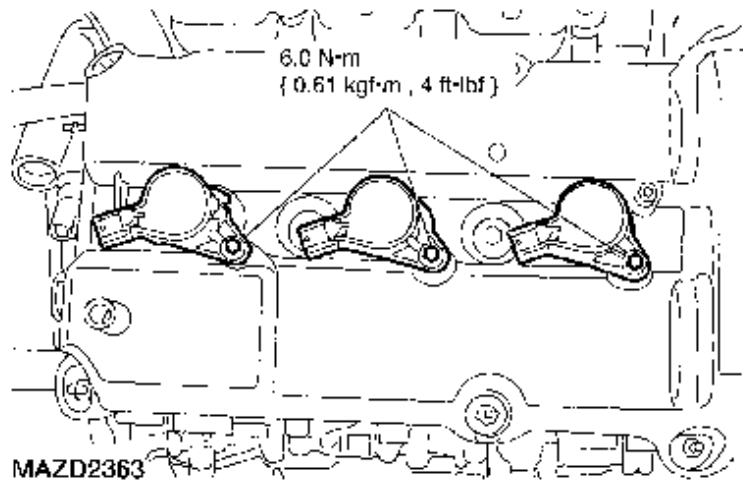
1. Position the LH valve cover and install the bolts and studs in the sequence shown.



- 1.

NOTE:

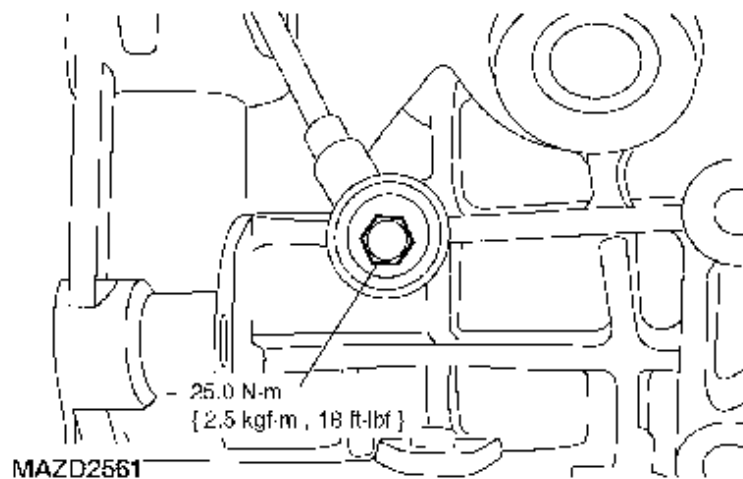
RH shown, LH similar. Install the spark plugs.



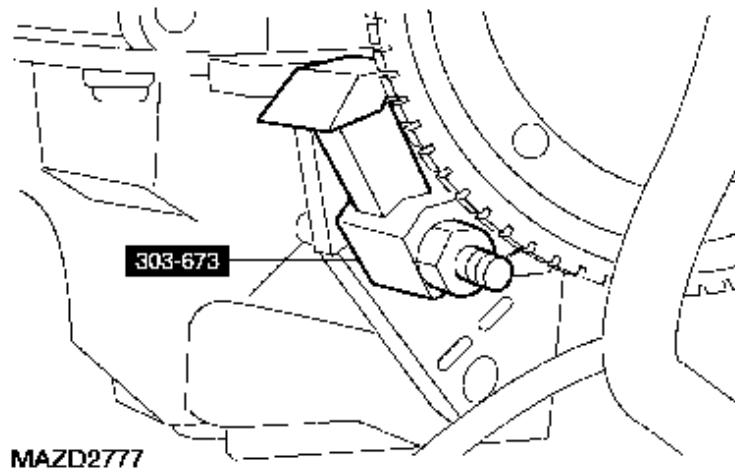
1.

NOTE:

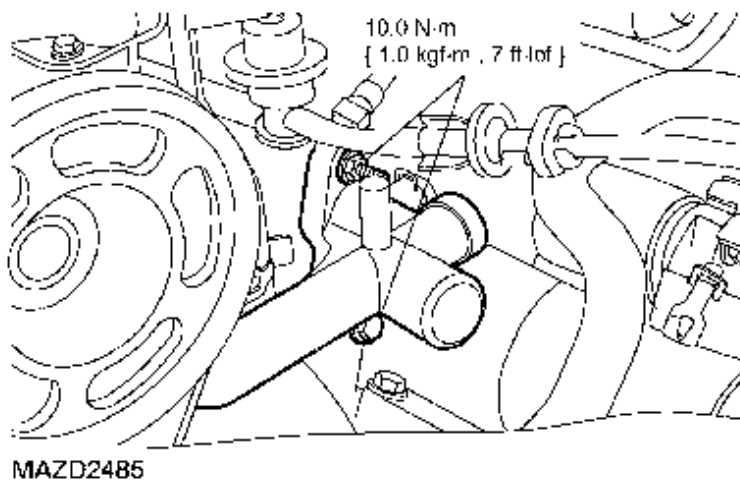
RH shown, LH similar. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation. Install the six coil-on-plugs and install the bolts.



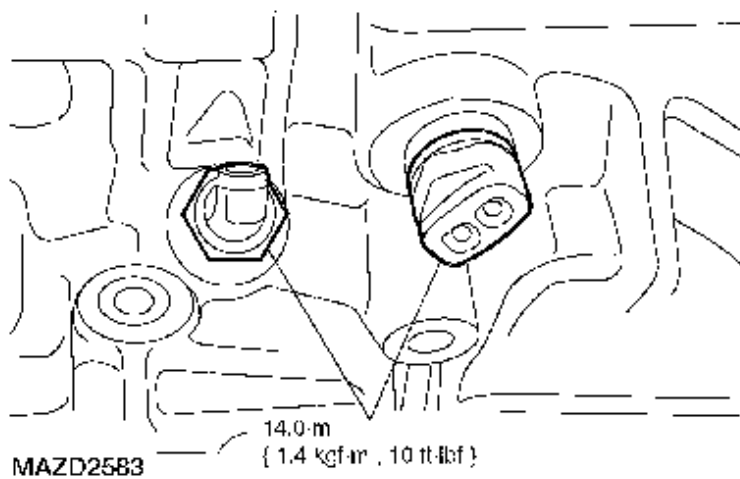
1. Position the knock sensor and install the bolt.



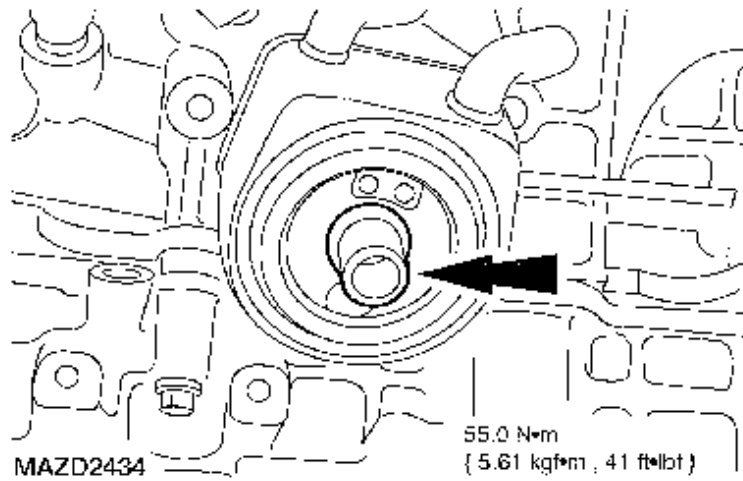
1. Remove the special tool.



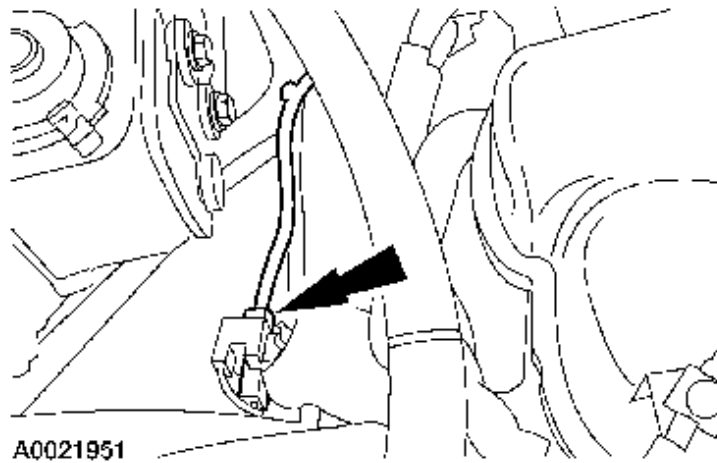
1. Position the coolant bypass tube and connect the hoses.



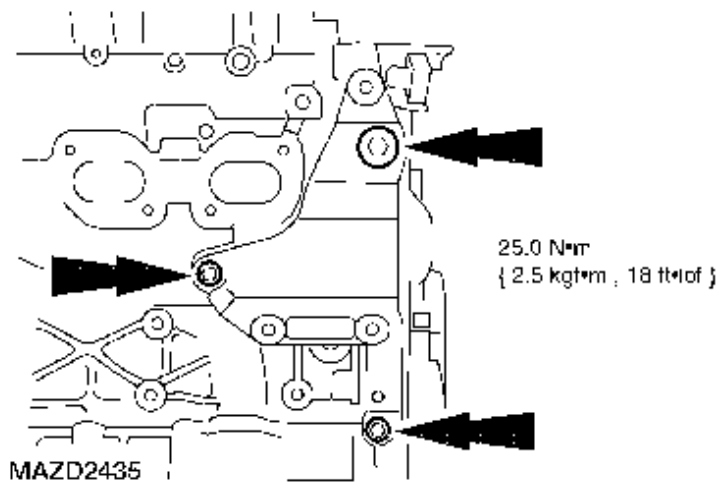
1. Install the oil pressure sender and the block heater.



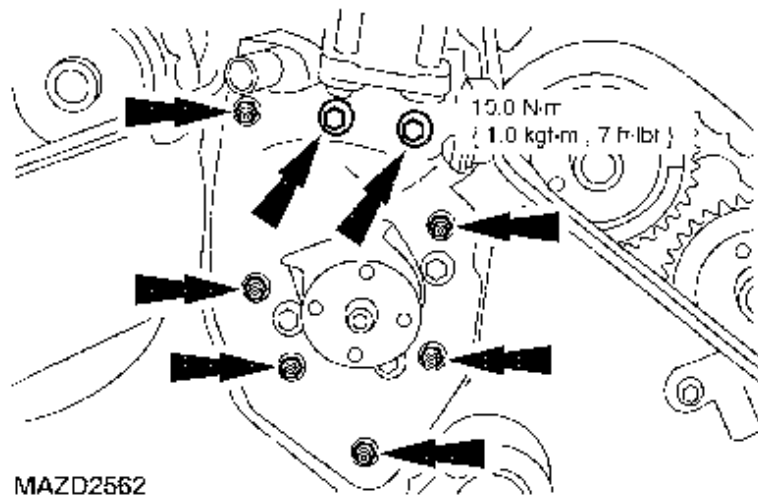
1. Install the oil cooler.



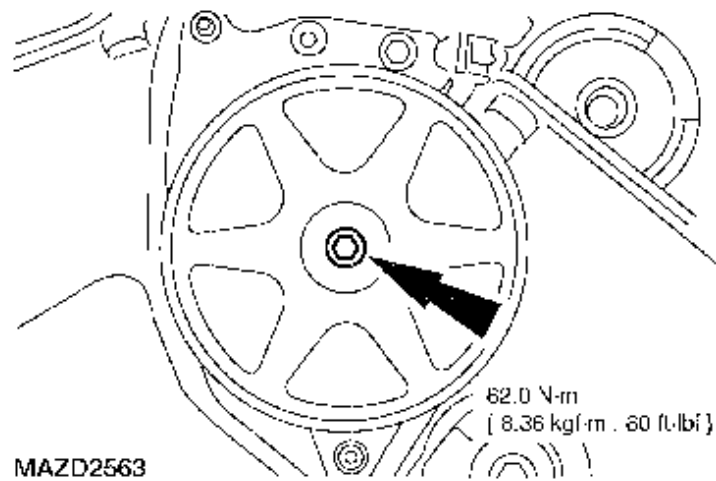
1. Install the radio ignition noise suppressor electrical connector.



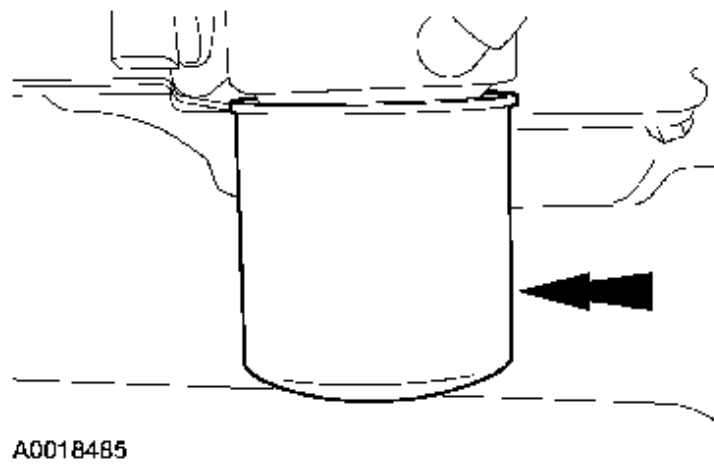
1. Install the generator support bracket.



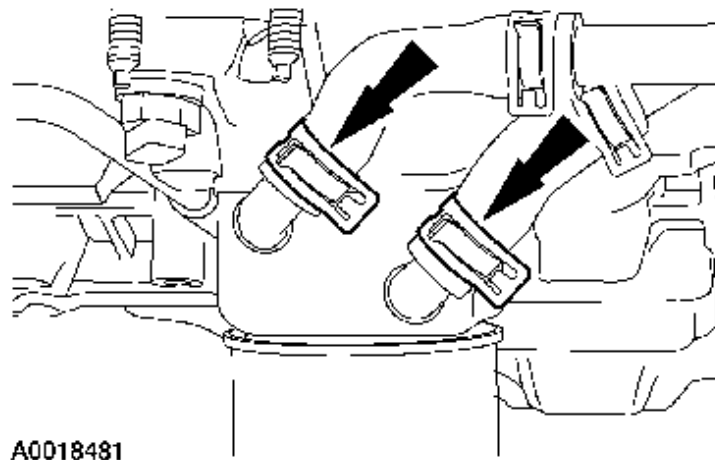
1. Install the power steering pump.



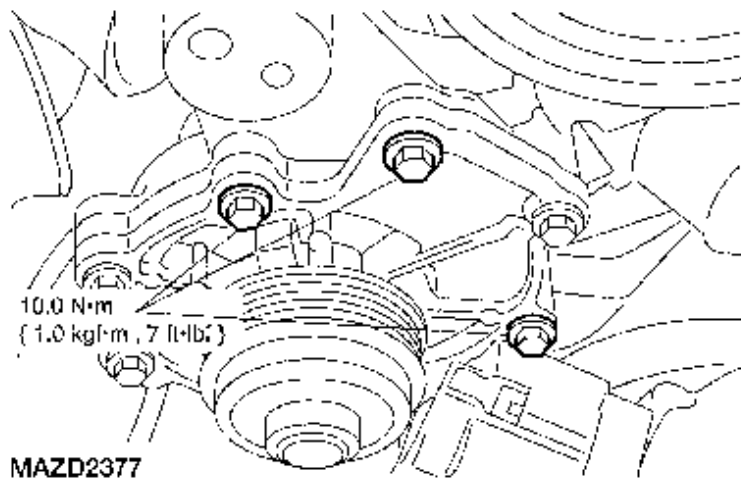
1. Install the power steering pump pulley.



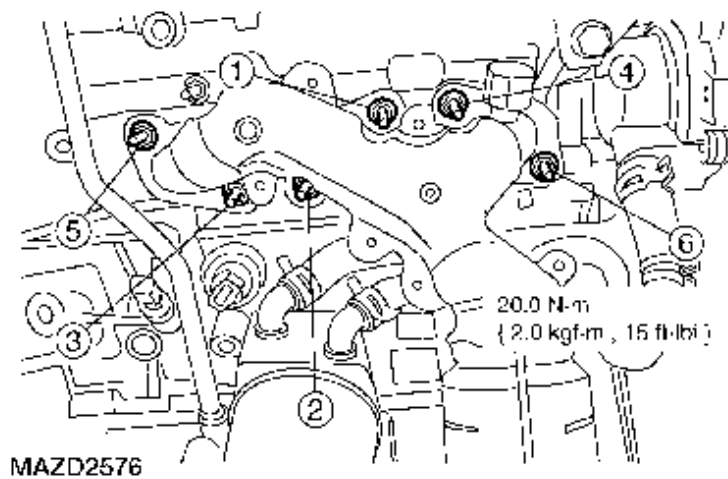
1. Install the oil filter.



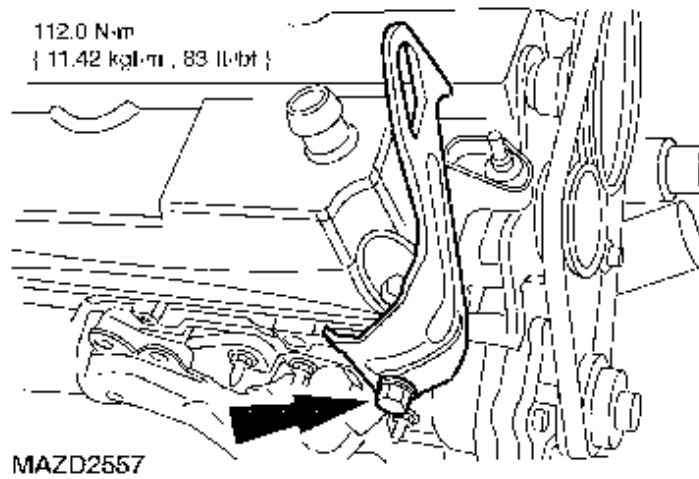
1. Connect the coolant hoses at the oil cooler.



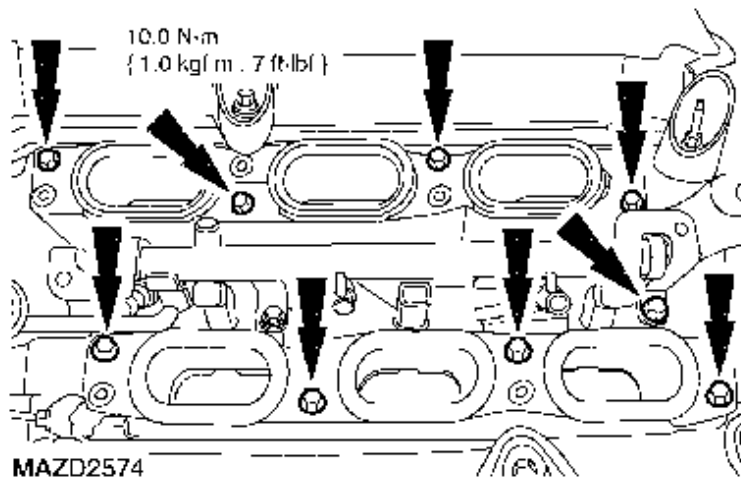
1. Install the water pump assembly.



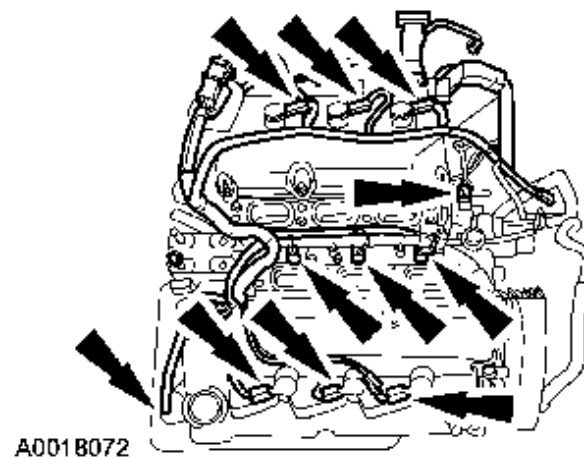
1. Position a new gasket and tighten the LH exhaust manifold nuts in the sequence shown.



1. Install the engine lift bracket.

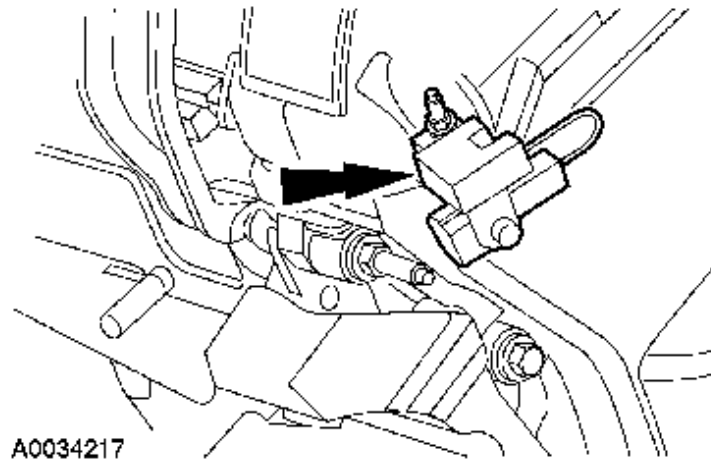


1. Position the gasket and install the lower intake manifold.

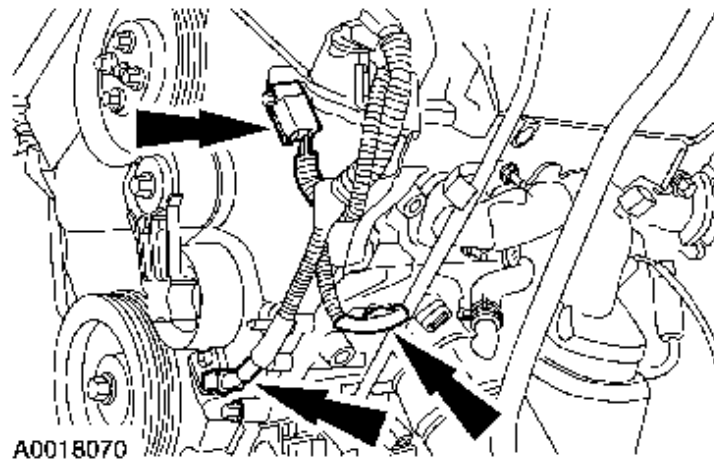


1. Position and connect the engine control sensor wiring to the following components:

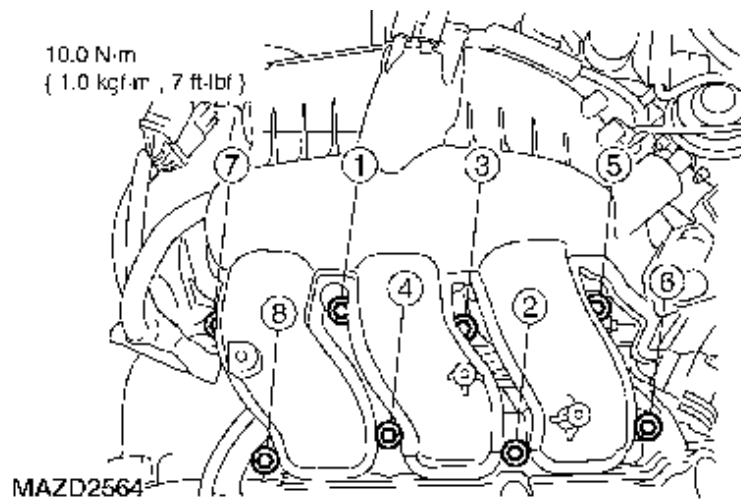
- coils on plugs
- fuel injectors



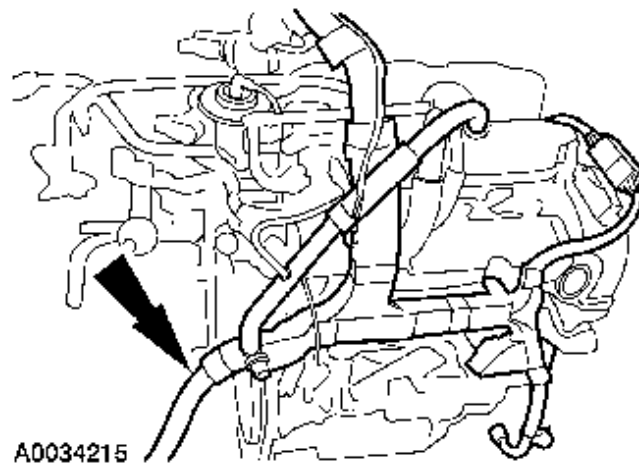
1. Connect the radio interference capacitor.



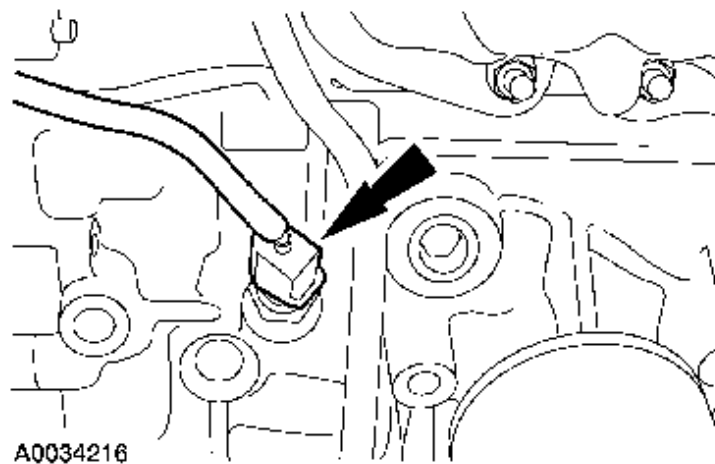
1. Connect the crankshaft and camshaft position sensor electrical connectors.
2. Install new gaskets in the upper intake manifold.



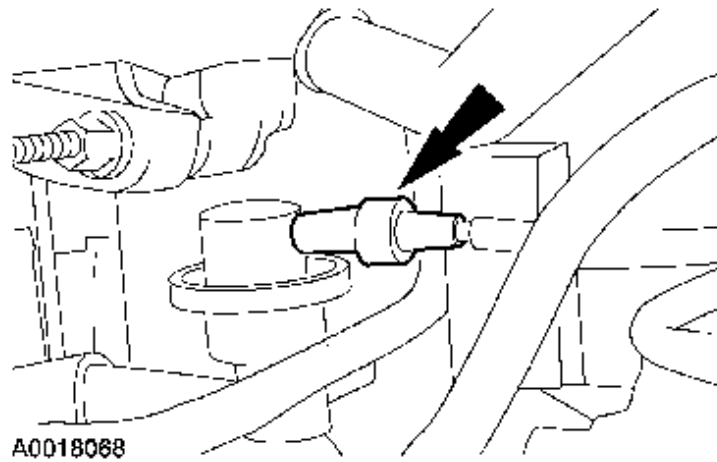
1. Install the upper intake manifold.



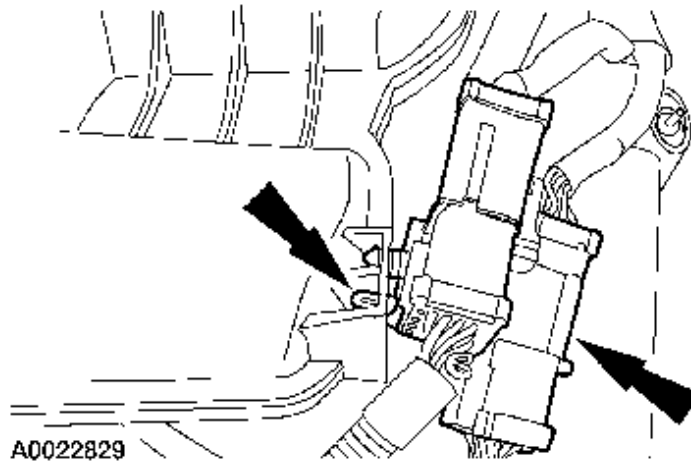
1. Install and connect the engine control wire harness.



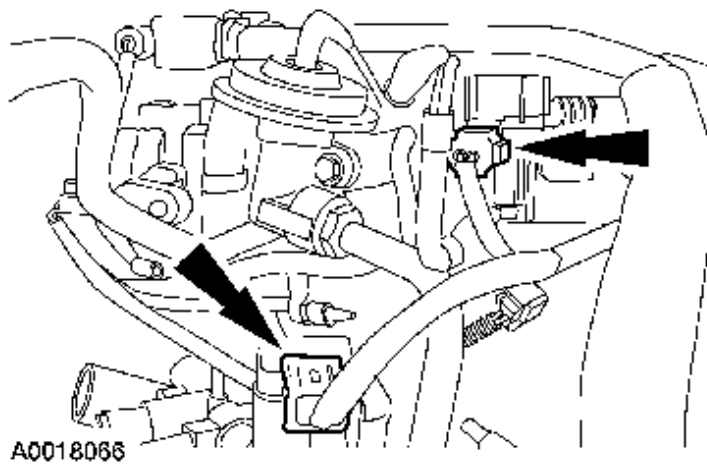
1. Connect the coolant temperature sender and the oil pressure switch.



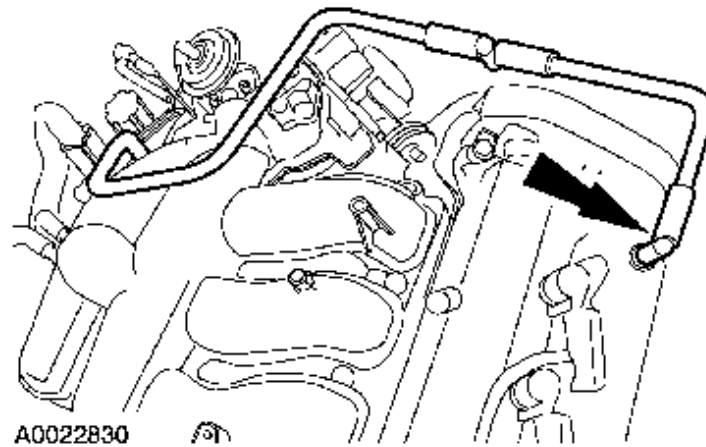
1. Connect the vacuum line to the fuel pressure damper.



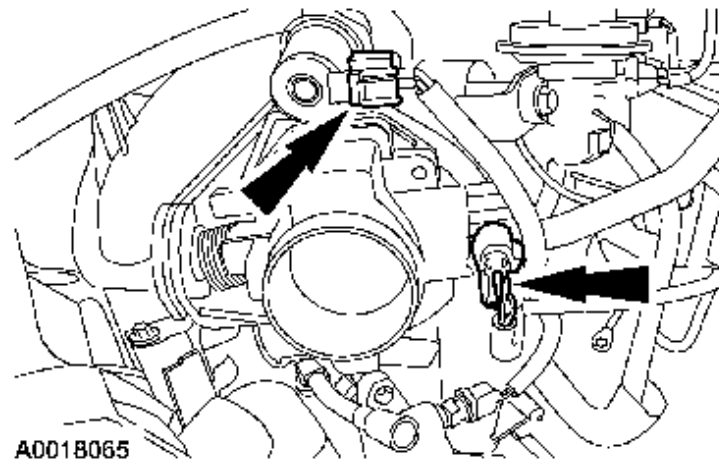
1. Connect the engine control sensor wiring to the upper intake manifold.



1. Connect the EGR vacuum regulator and the differential pressure feedback EGR electrical connectors.



1. Install the PCV tube.



1. Connect the idle air control (IAC) valve and the throttle position (TP) sensor electrical connectors.

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VIN or Model Year 2002 - Model TRIBUTE - engine front cover

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

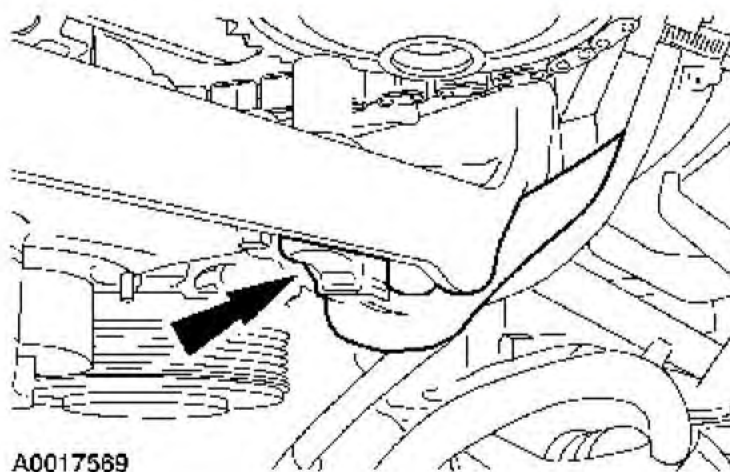
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2002 - Tribute - Workshop Manual - Engine

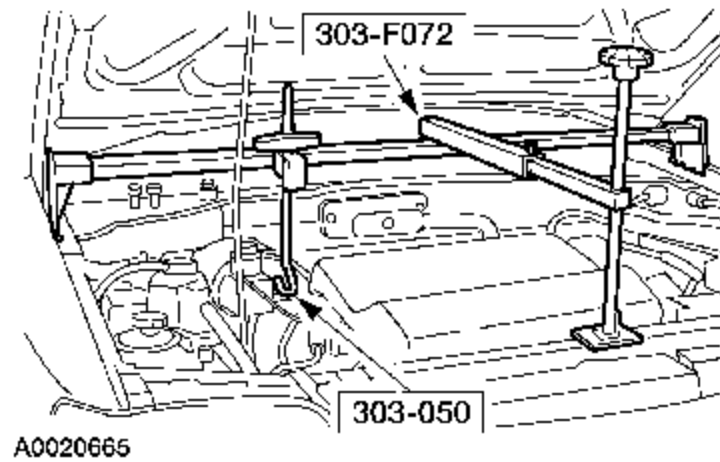
ENGINE FRONT COVER

Removal

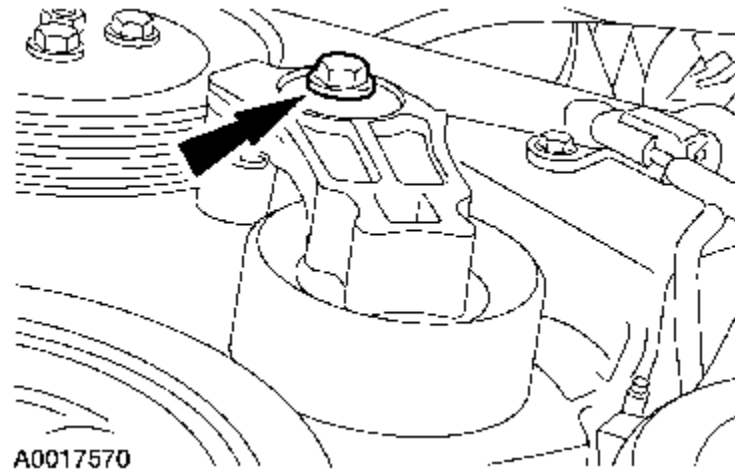
1. Remove the RH and LH valve covers. Refer to — [01-10C VALVE COVER LH](#) and — [01-10C VALVE COVER RH](#).
2. Remove the oil pan. Refer to [01-11B OIL PAN](#).
3. Remove the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).



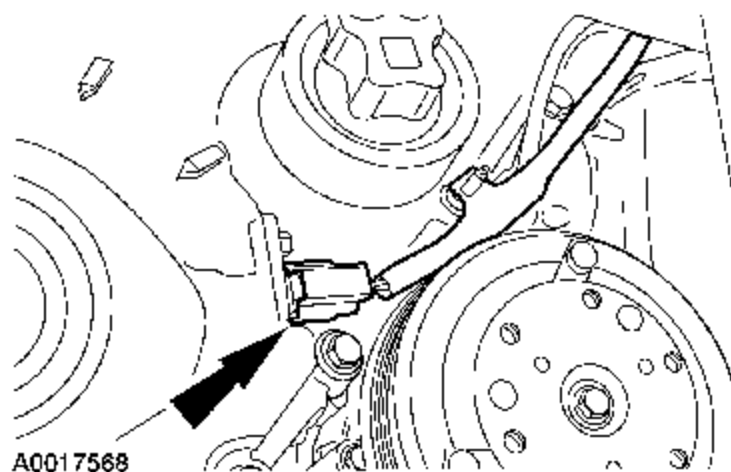
1. Remove the bolt and the camshaft position (CMP) sensor.
2. Lower the vehicle.
3. Remove the power steering pump. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#)



1. Remove the special tool.
2. Raise the vehicle.

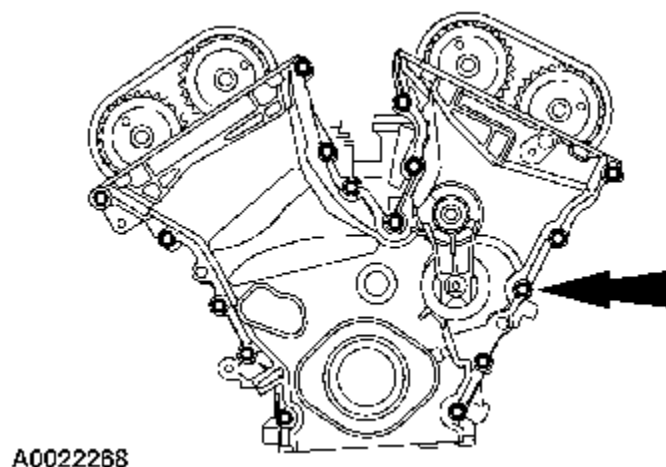


1. Remove the bolt and remove the belt tensioner.
2. Remove the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Remove the crankshaft position (CKP) sensor.

- Disconnect the electrical connector.
- Remove the bolt and the sensor.



1.

NOTE:

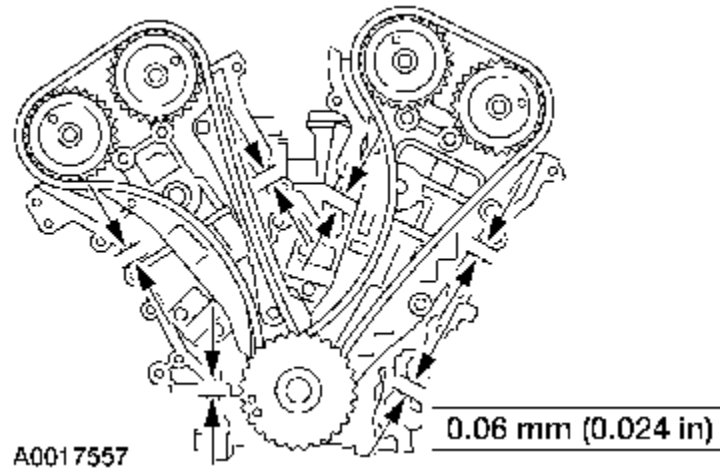
Remove the engine front cover with the vehicle raised in the air. Remove the bolts, studs and the engine front cover.

Installation

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surface. These tools cause scratches and gouges, which make leak paths. Use a plastic scraping tool to remove all traces of sealant.

1. Clean all sealing surfaces with Metal Surface Cleaner.
2. Install three new gaskets in the front cover.

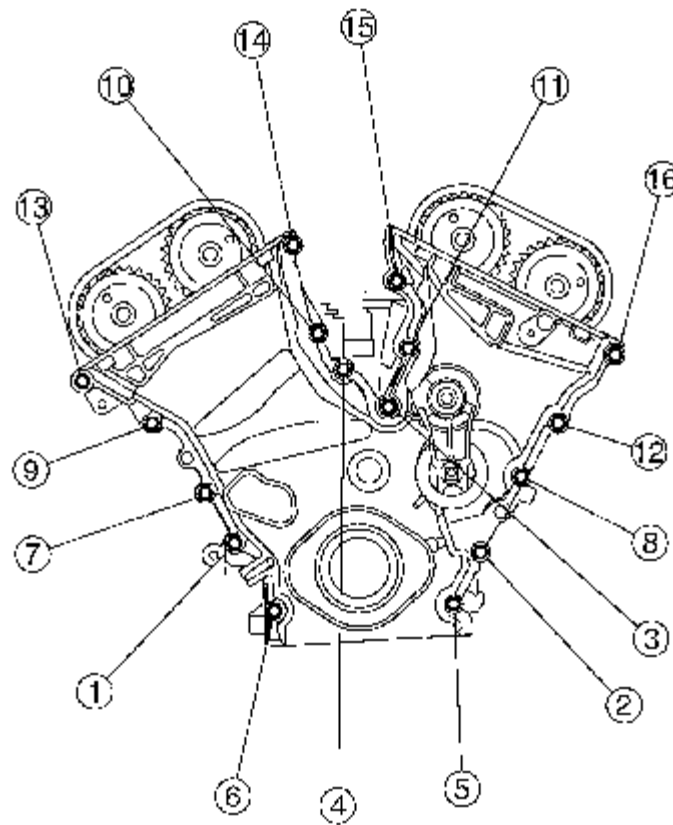


1.

NOTE:

The engine front cover must be installed and the bolts tightened within six minutes of applying the sealant. Apply a 6 mm (0.24 in) diameter dot of silicone gasket and sealer to the cylinder block, lower cylinder block, and cylinder head mating surfaces.

25.0 N·m
{ 2.5 kgf-m , 18 ft-lbf }

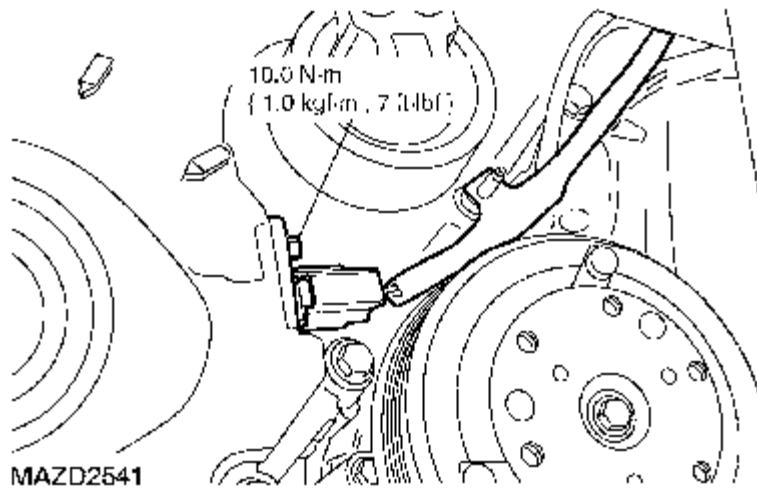


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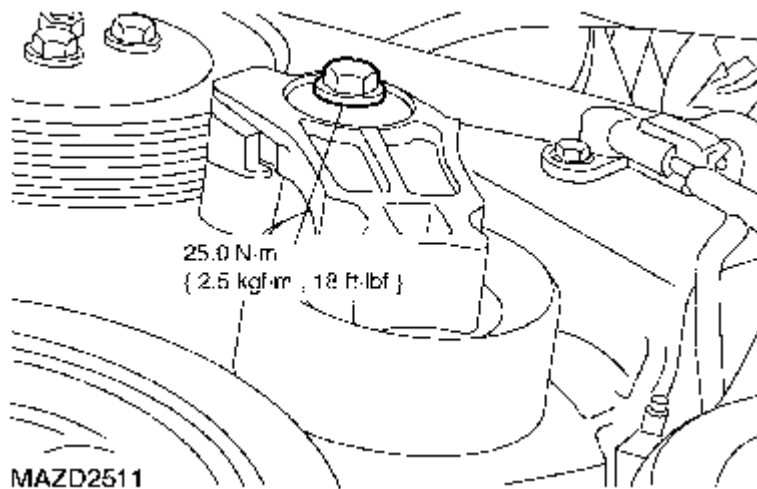
1.

NOTE:

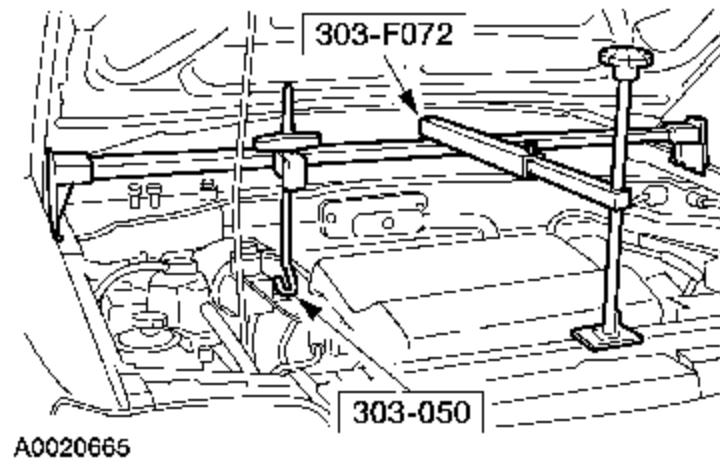
Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the cover and install the studs and bolts in the sequence shown.



1. Install the (CKP) sensor and connect the electrical connector.
2. Install the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Install the tensioner and bolt.
2. Install the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).
3. Install the oil pan. Refer to [01-11B OIL PAN](#).
4. Lower the vehicle.



1. Install the special tool.
2. Remove the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#).
3. Install the power steering pump. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the RH and LH Valve cover. Refer to — [01-10C VALVE COVER LH](#) and — [01-10C VALVE COVER RH](#).

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VIN or Model Year 2002 - Model TRIBUTE - engine removal

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

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2002 - Tribute - Workshop Manual - Engine

ENGINE

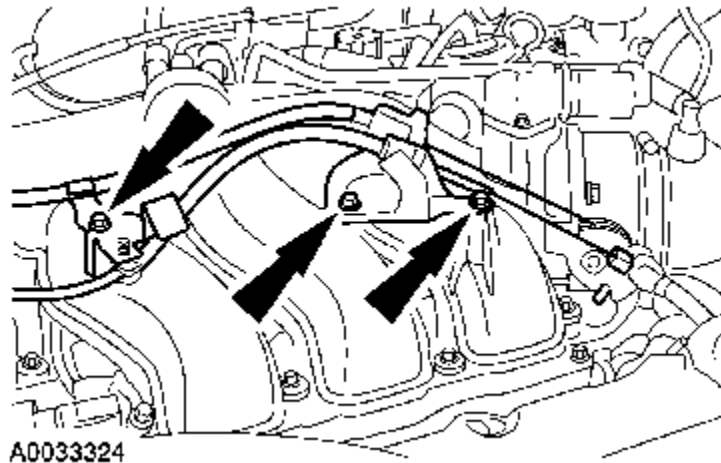
Removal

1. Remove the battery tray. Refer to [01-17 BATTERY TRAY](#).
2. Remove the air cleaner outlet tube and air cleaner. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).
3. Discharge and recover the refrigerant. For additional information, refer to [07-10 DISCHARGING AND RECOVERY](#).
4. Raise and support the vehicle. Refer to [00-00 LIFTING](#).
5. Remove the lower radiator air deflectors.
6. Drain the engine cooling system. Refer to [01-12B COOLING SYSTEM DRAINING, FILLING AND BLEEDING](#).

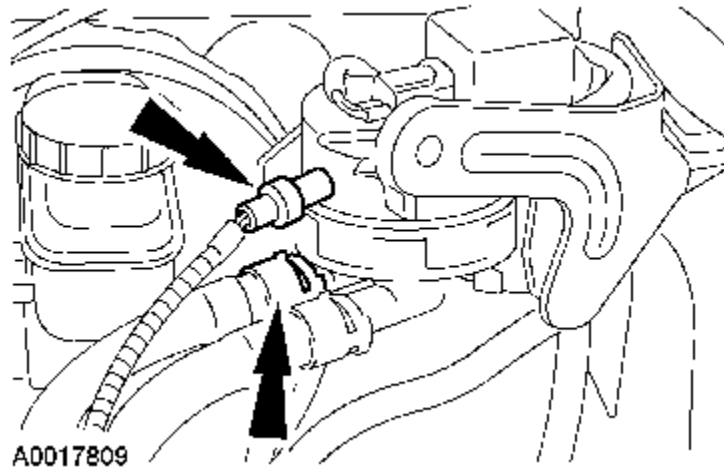


1. Drain the engine oil.

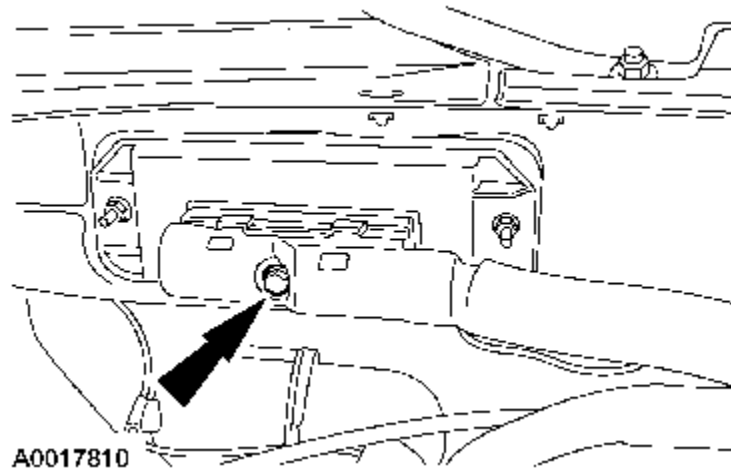
- Install a new drain plug gasket and tighten the drain plug.
2. Lower the vehicle.
 3. Disconnect the fuel line. Refer to — [01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC \(4V\)](#).
 4. Remove the water pump drive belt.



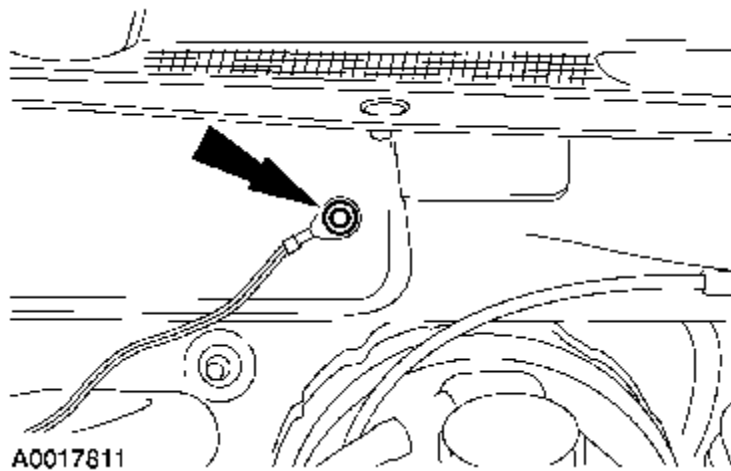
1. Disconnect the accelerator cable and if equipped cruise control actuator cable.



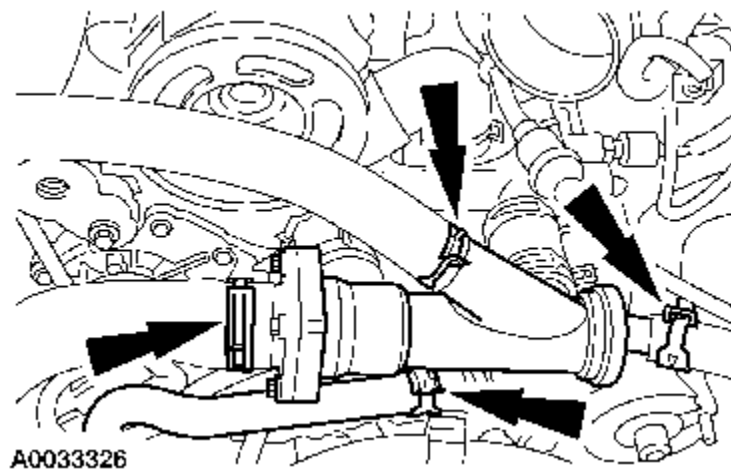
1. Disconnect the vapor management valve (VMV).



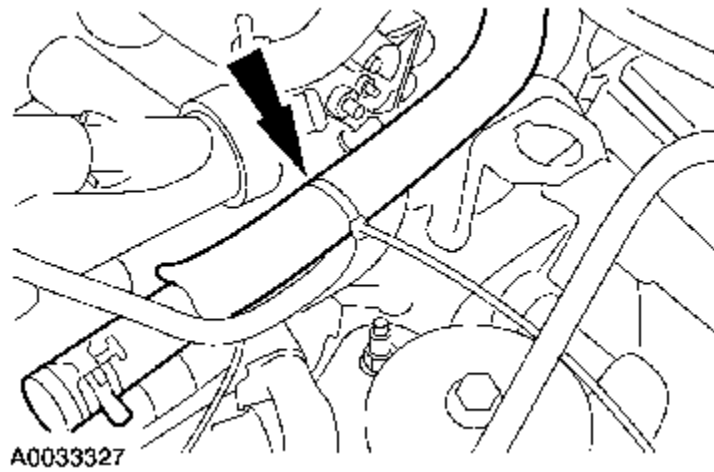
1. Disconnect the powertrain control module.



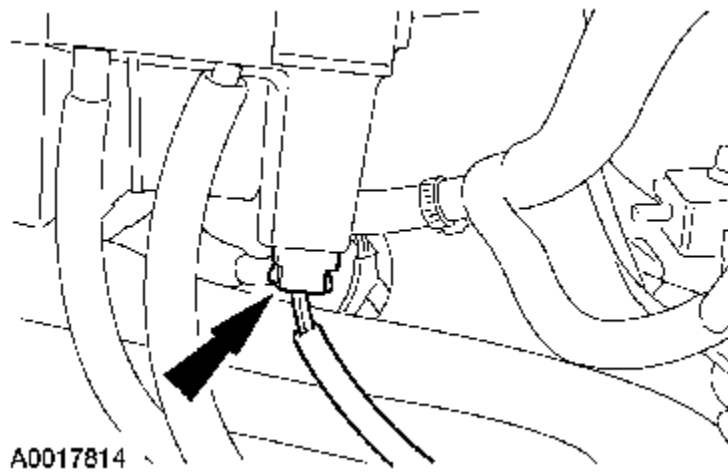
1. Disconnect the ground wire.



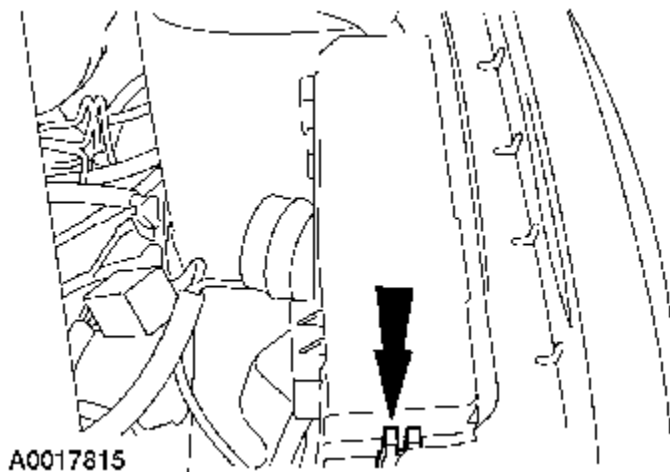
1. Disconnect the hoses.



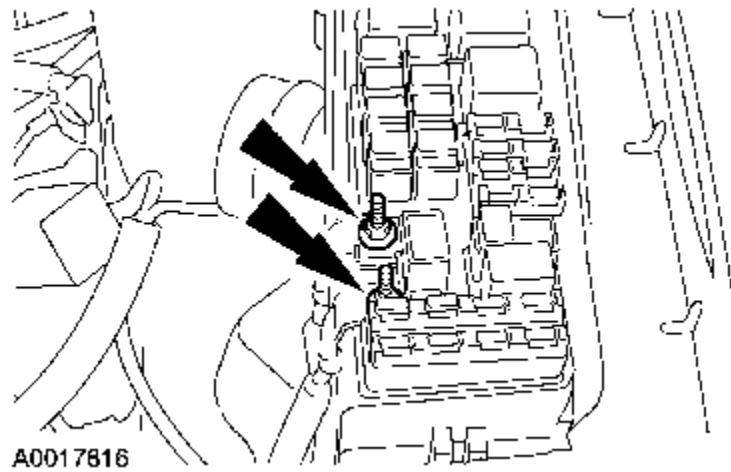
1. Remove the tie-strap and position the hose out of the way.



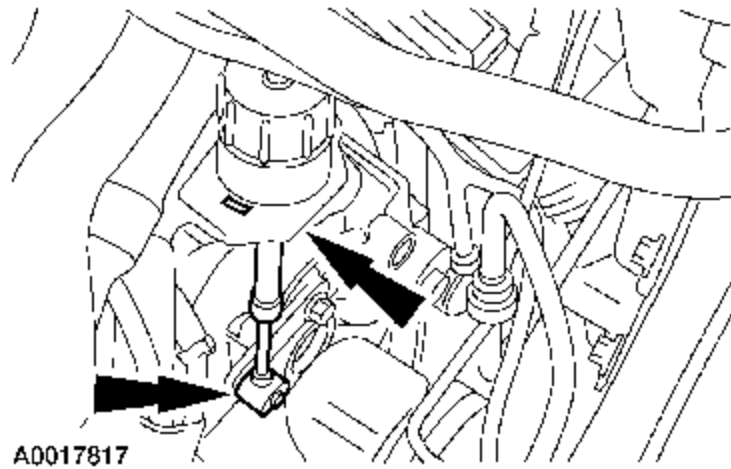
1. Disconnect the connector from the power distribution box.



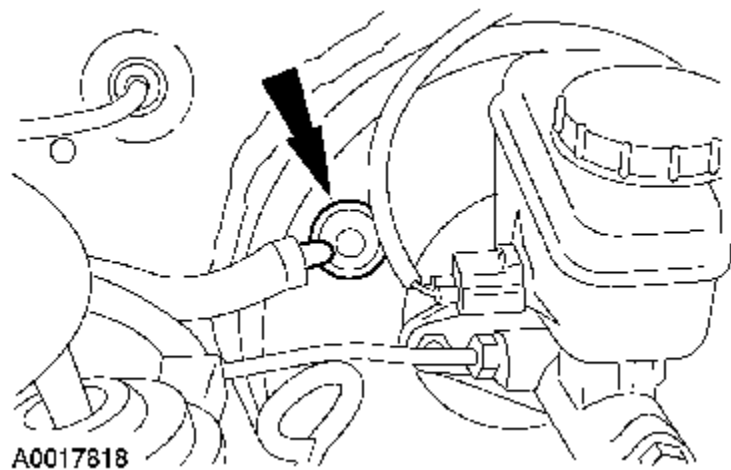
1. Remove the power distribution box cover.



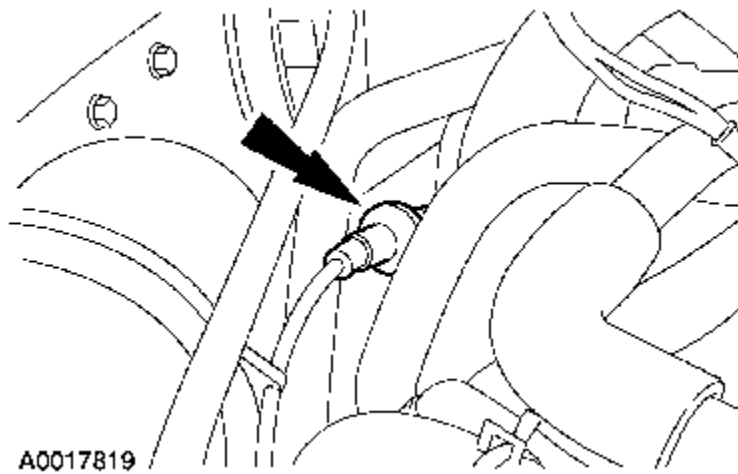
1. Remove the nuts and the cables.



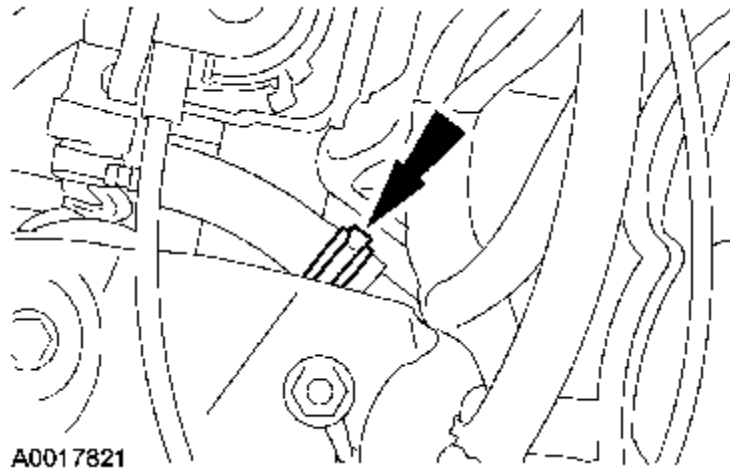
1. Disconnect the transaxle linkage.



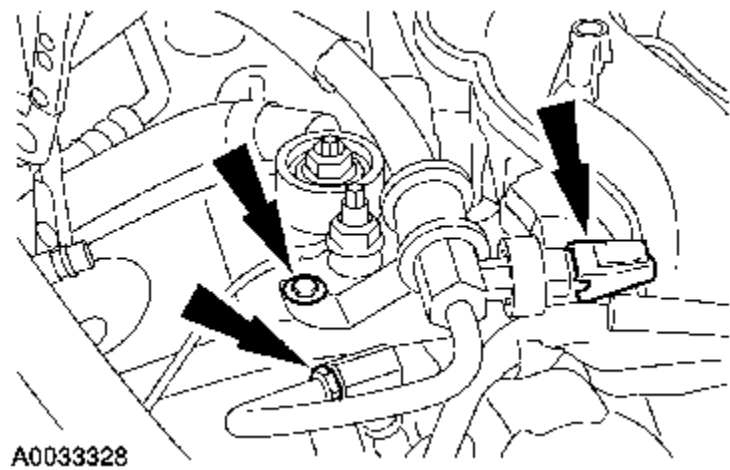
1. Disconnect the brake booster vacuum hose.



1. Disconnect the vacuum line.

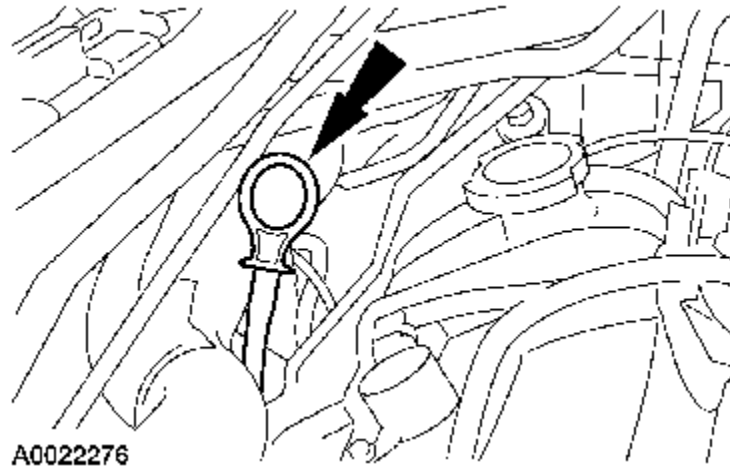


1. Disconnect the power steering return line.

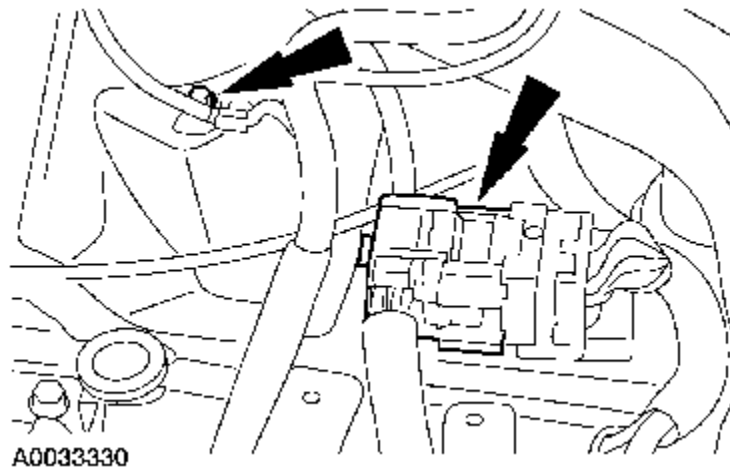


1. Disconnect the power steering line.

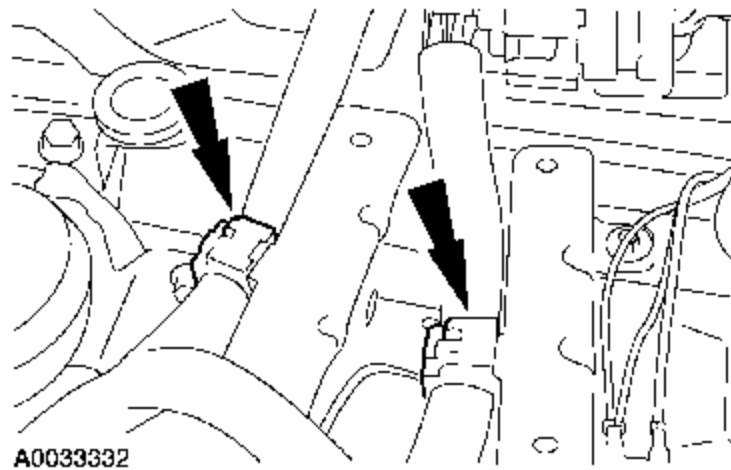
- Disconnect the power steering pressure (PSP) switch electrical connector.
- Remove the bracket bolt.
- Disconnect the power steering line.



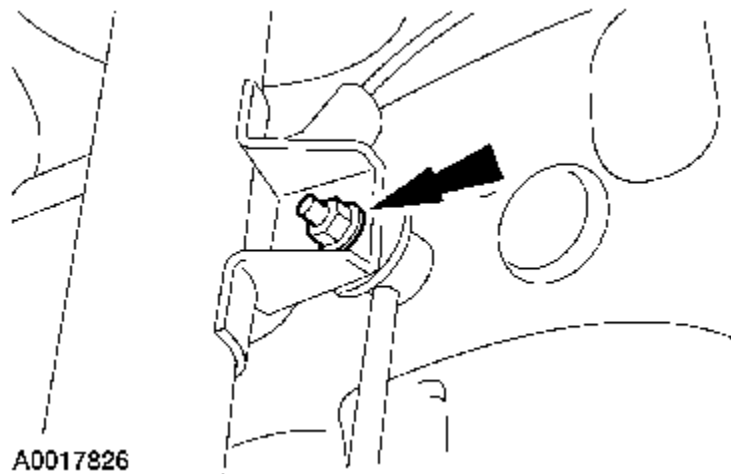
1. Remove the oil level indicator.



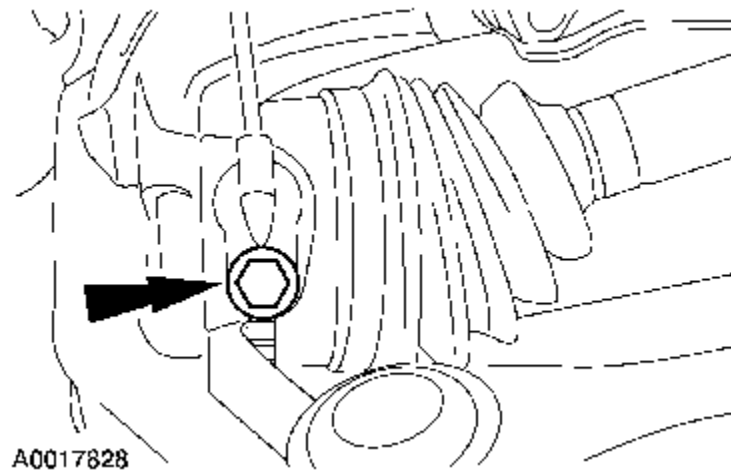
1. Disconnect the ground strap and the connector.



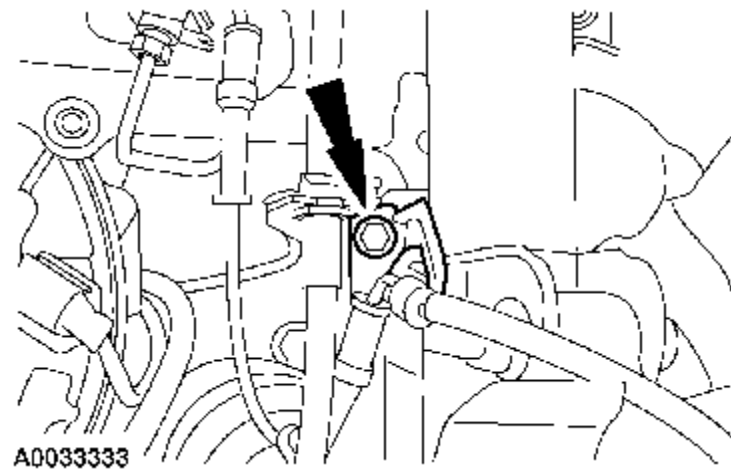
1. Remove the harness retainers and position the harness out of the way.
2. Remove the exhaust flexible pipe. Refer to — [01-15B EXHAUST FLEXIBLE PIPE 3.0L DURATEC \(4V\)](#).
3. Remove the A/C compressor. Refer to — [07-11 AIR CONDITIONING \(A/C\) COMPRESSOR 3.0L DURATEC \(4V\)](#).
4. Remove both front wheel and tire assemblies.
5. If equipped, remove the intermediate drive shaft. Refer to [03-13 INTERMEDIATE SHAFT](#).



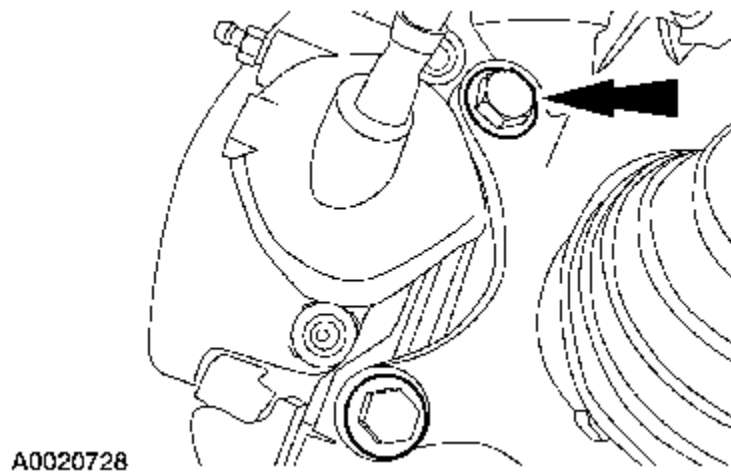
1. Separate the LH and RH sway bar links from the strut mount.



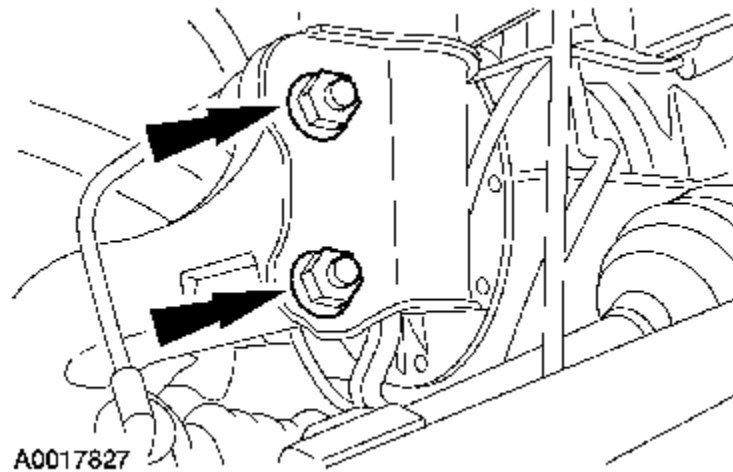
1. Remove the bolt and position aside the LH and RH wheel speed sensors if equipped.



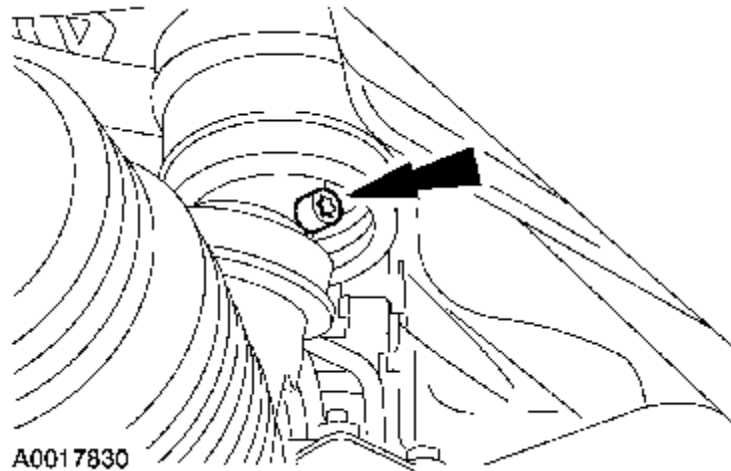
1. If equipped, remove the LH and RH wheel speed sensor brackets.



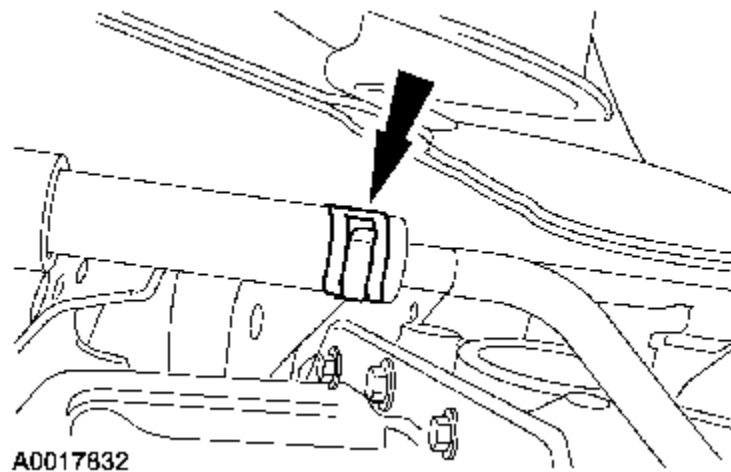
1. Remove the LH and RH brake calipers from the steering knuckles and support them to the struts.



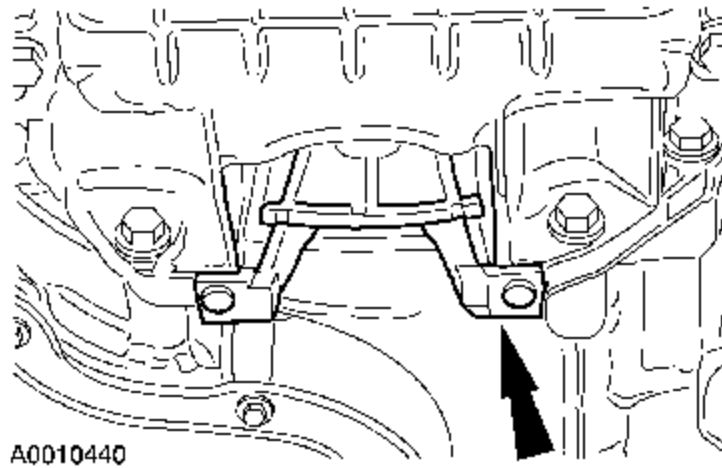
1. Remove the bolt and separate the struts from the LH and RH steering knuckles.



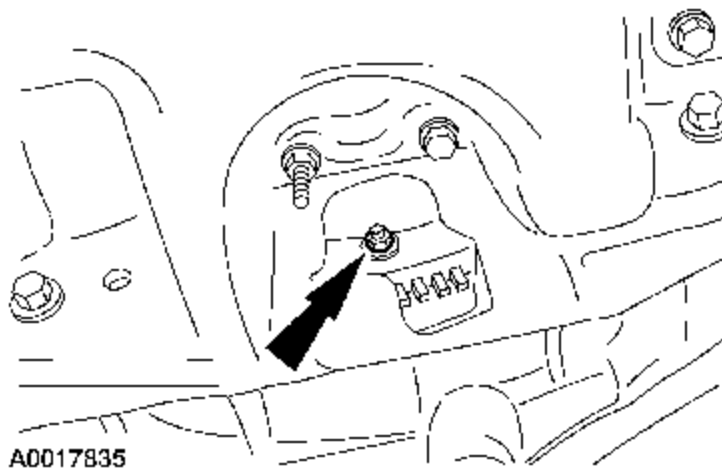
1. Remove the bolt and separate the steering shaft from the rack.



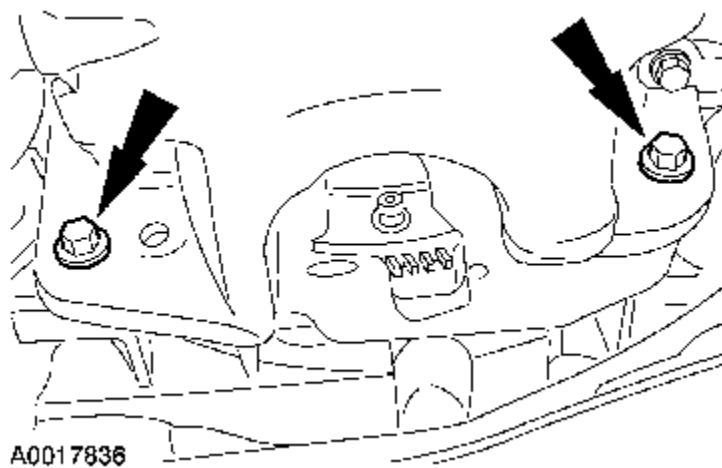
1. Disconnect the two transaxle cooler lines.



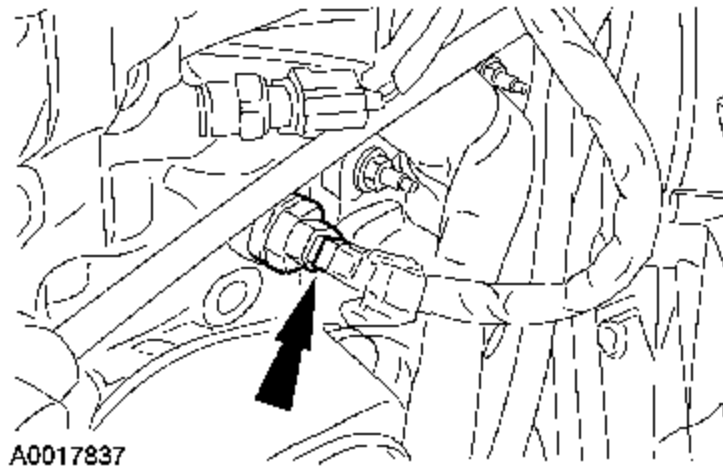
1. Remove the torque converter inspection cover.



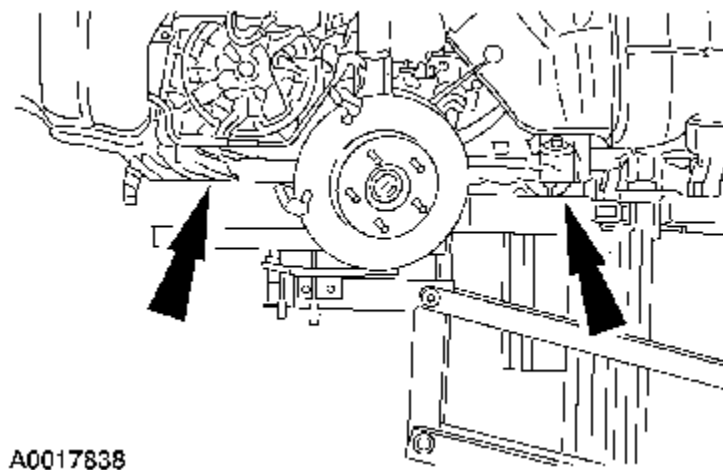
1. Remove the four torque converter nuts.



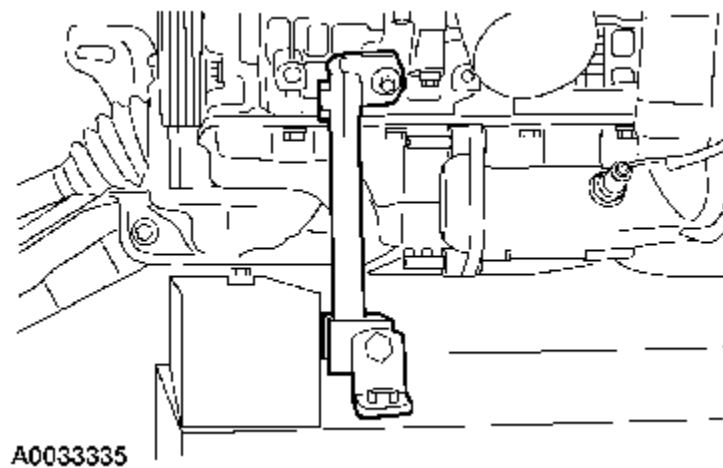
1. Remove the four bolts.



1. If equipped disconnect the block heater wiring.



1. Position the universal powertrain lift.



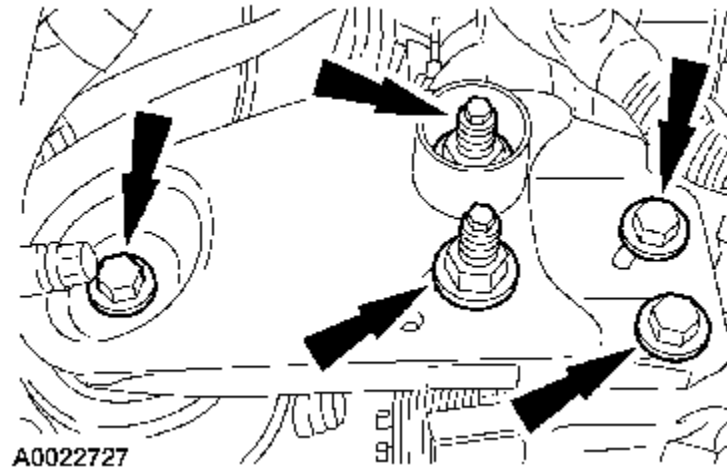
- 1.

CAUTION:

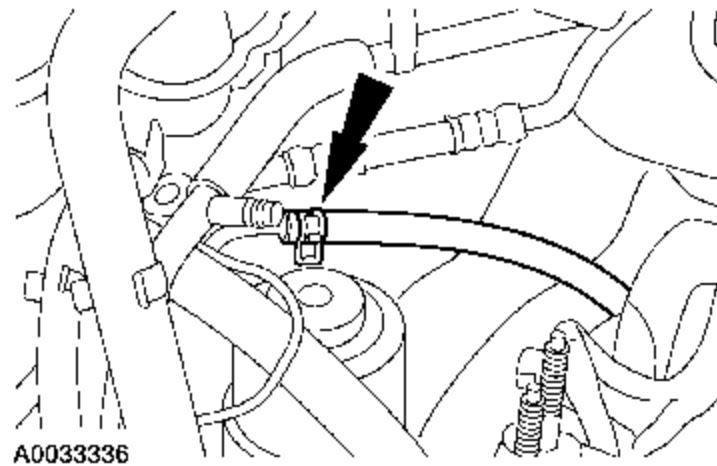
Do not allow the engine oil pan to rest on the powertrain lift. Using a bracket from the heavy duty engine stand, support the front of the engine.

NOTE:

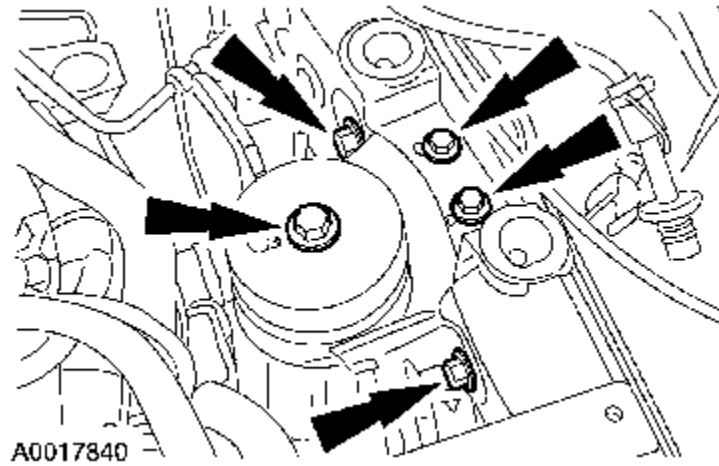
The next seven steps must be carried out with the vehicle raised and the universal powertrain lift in position.



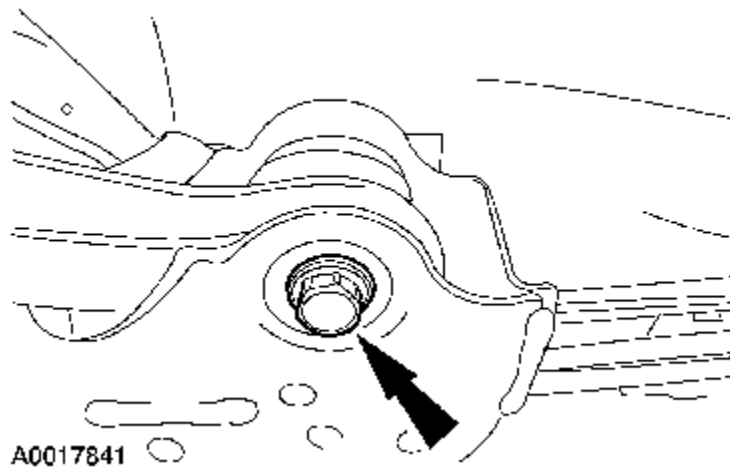
1. Remove the bolts and the nuts, remove the engine support bracket.



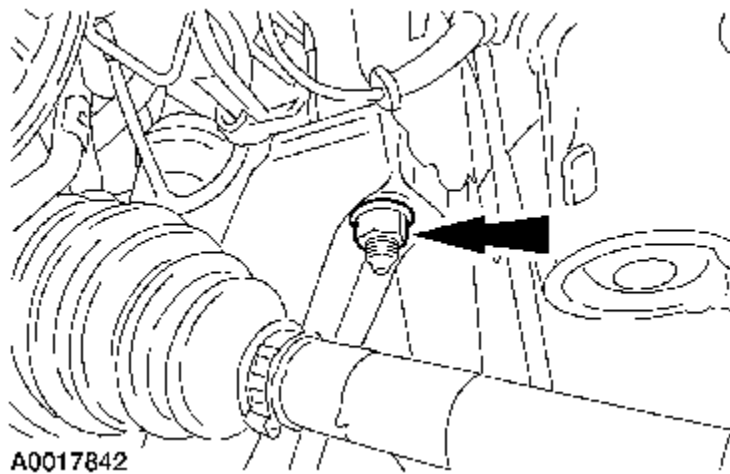
1. Disconnect the power steering return hose.



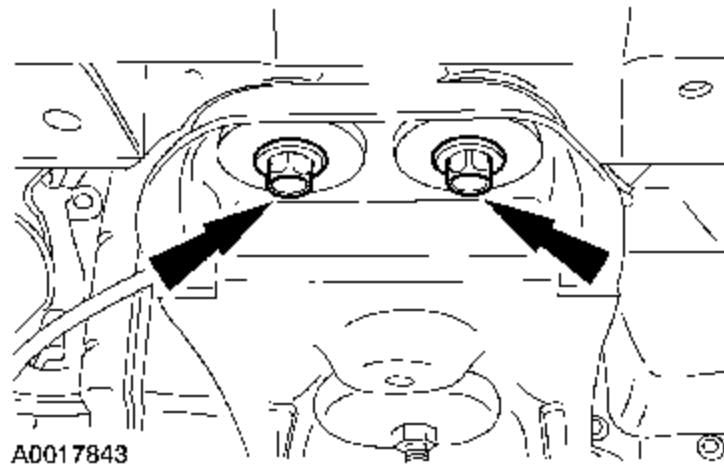
1. Remove the bolts and the transaxle support.



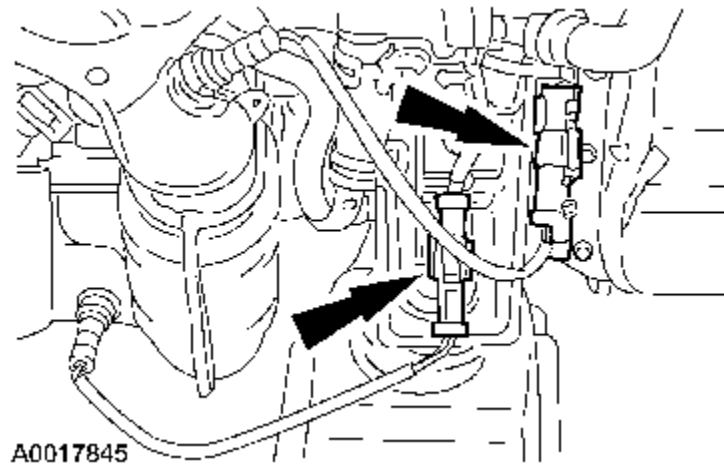
1. Remove two rear subframe bolts.



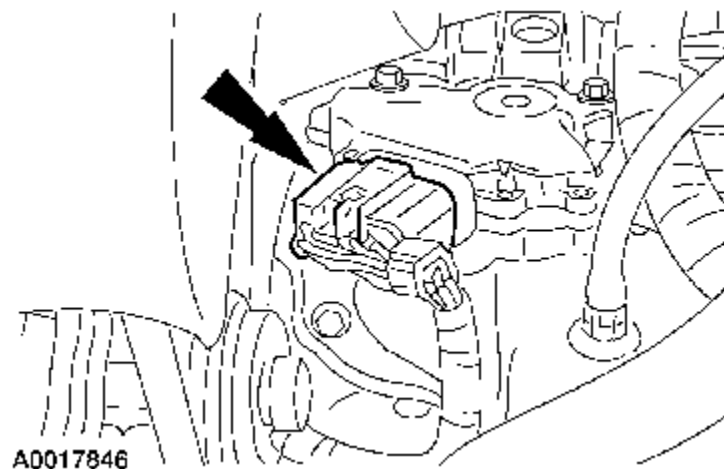
1. Remove the two subframe side nuts.



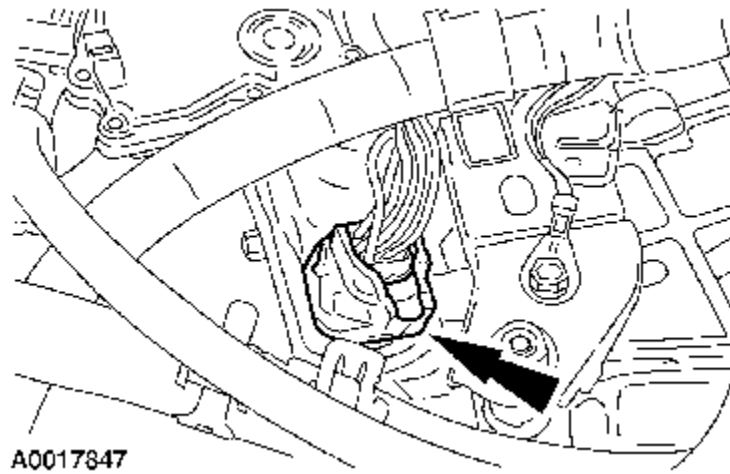
1. Remove the two bolts from the motor mount support.
2. Remove the powertrain from the vehicle.



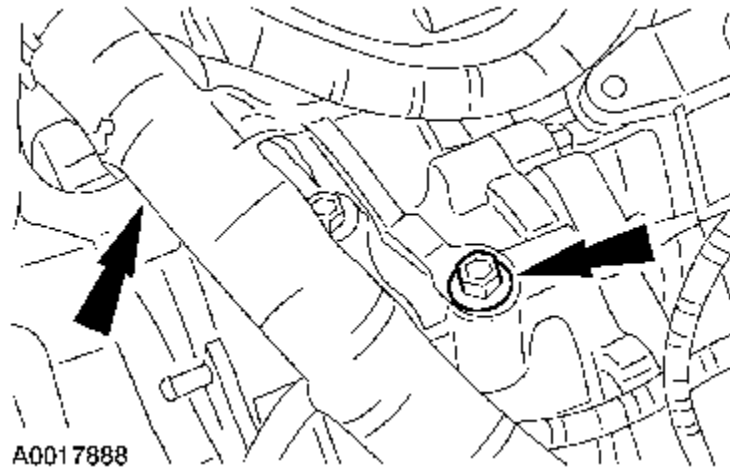
1. Disconnect the heated oxygen sensors.



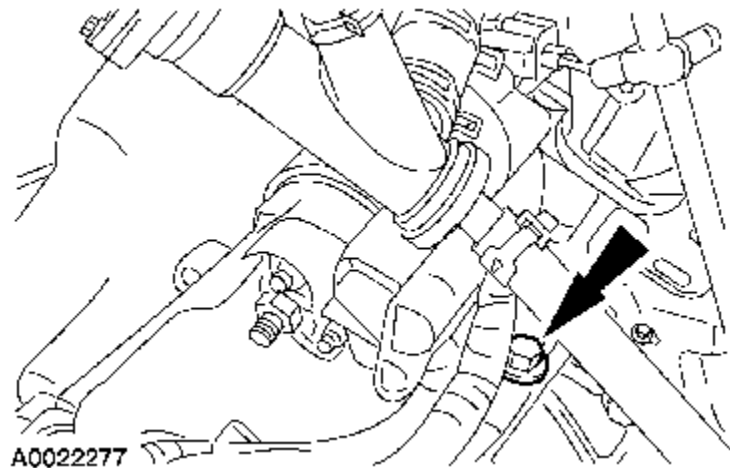
1. Disconnect the TR sensor.



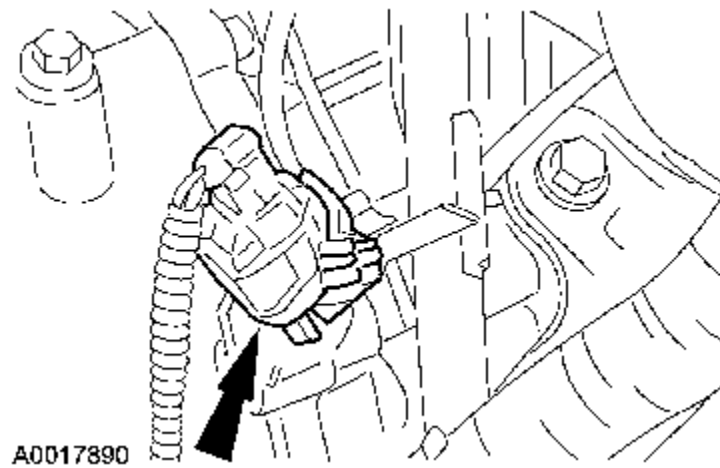
1. Disconnect the transaxle harness electronic control switch.



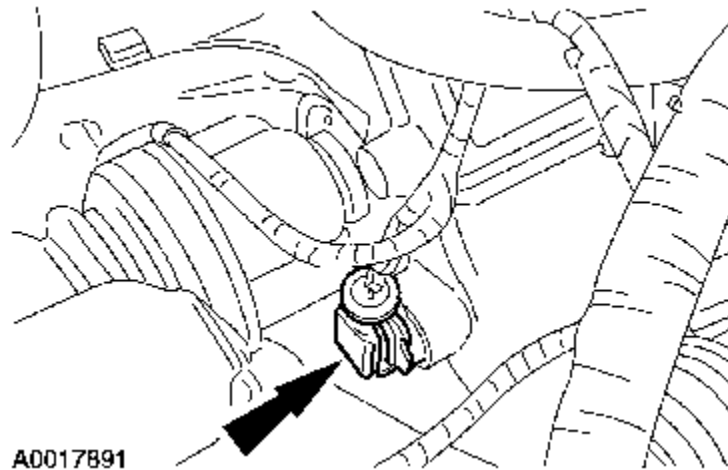
1. Remove the bolt and separate the transaxle control harness from the bracket.



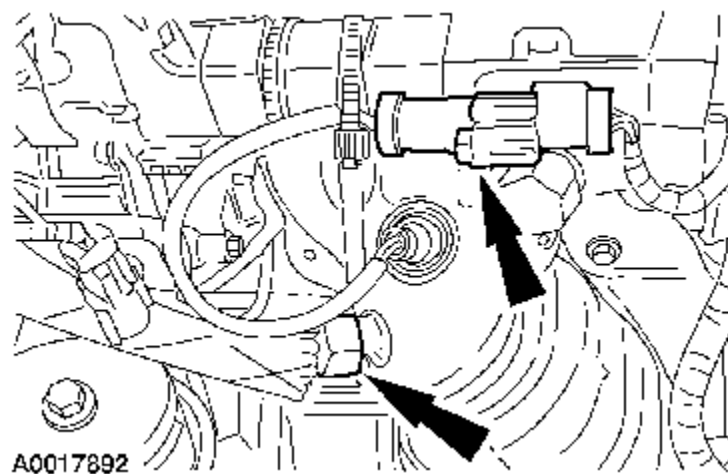
1. Remove the two bolts, the starter and harness as an assembly.



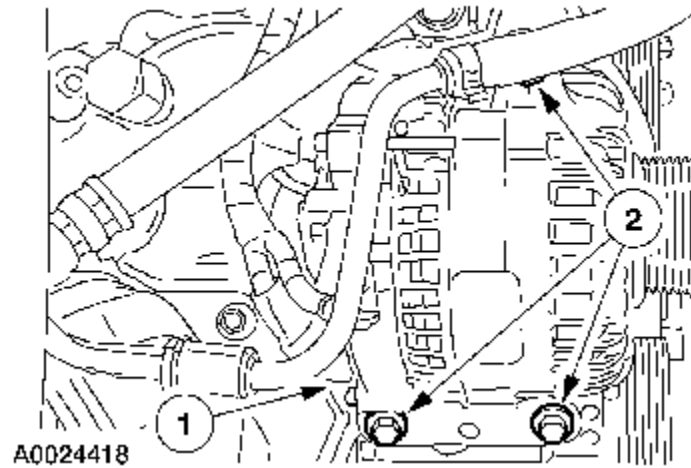
1. Disconnect the knock sensor jumper electrical connector.



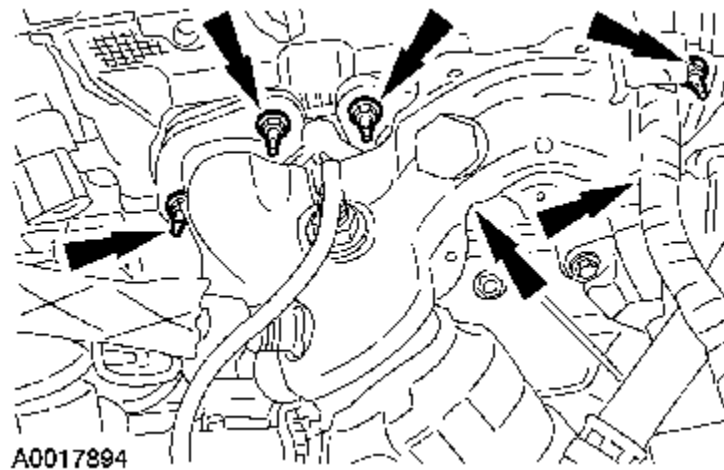
1. Disconnect the output shaft speed (OSS) sensor and the turbine shaft speed (TSS) sensor electrical connectors.



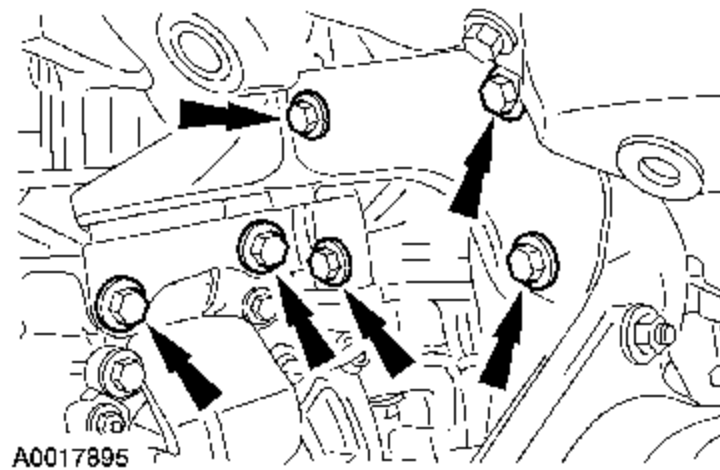
1. Disconnect the HO2S and the EGR tube from the exhaust manifold.
2. Disconnect the DPFE hoses and remove the EGR tube from the EGR valve.



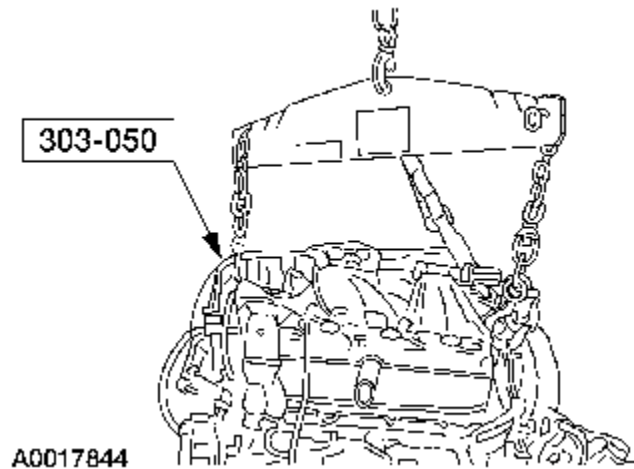
1. Remove the generator.
 - a. Disconnect the electrical connector.
 - b. Remove the bolts.



1. Remove the six RH exhaust manifold nuts and gasket.



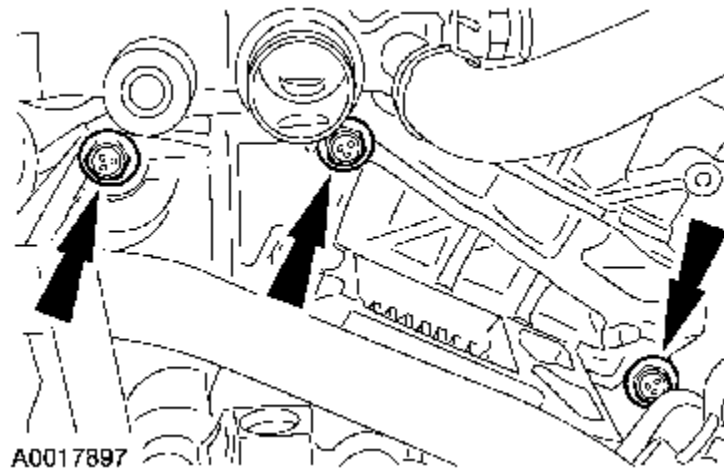
1. Remove the bolts and position the halfshaft support bracket out of the way.



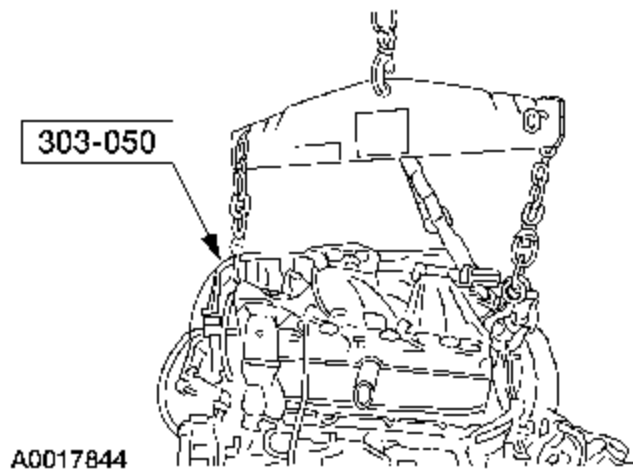
- 1.

NOTE:

Once the engine is supported by the engine crane, remove the bracket supporting the front of the engine. Using the special tools, remove the powertrain from the universal powertrain lift.



1. Remove the six transaxle bolts.



1. Using the special tools, remove the engine from the transaxle and mount on a suitable engine stand.

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VIN or Model Year 2002 Model TRIBUTE fuel charging wire

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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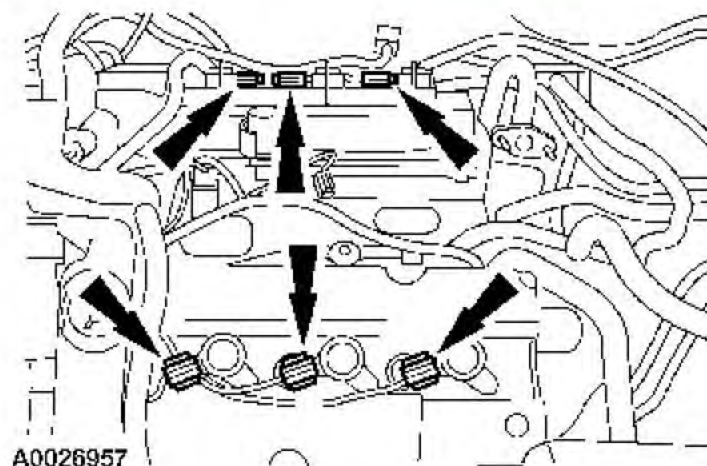
FUEL CHARGING WIRING HARNESS

Removal and Installation

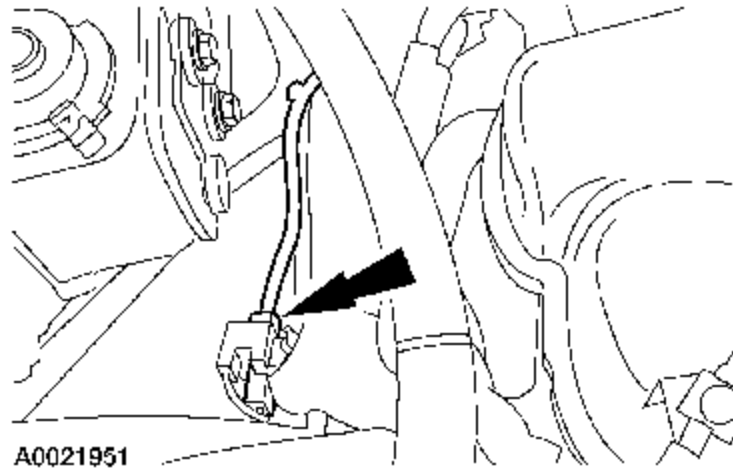
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

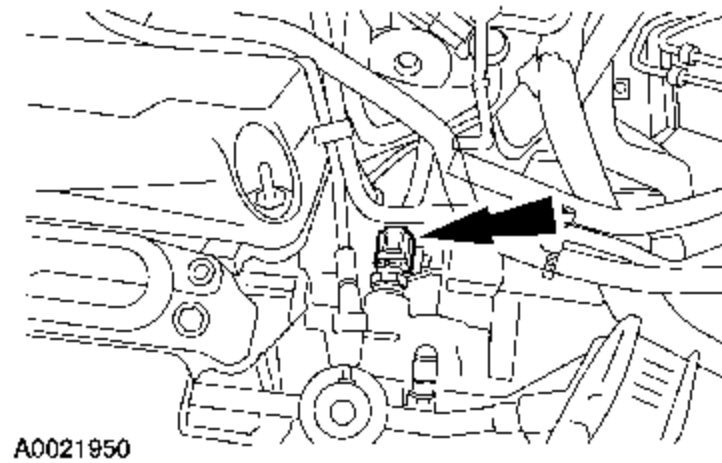
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



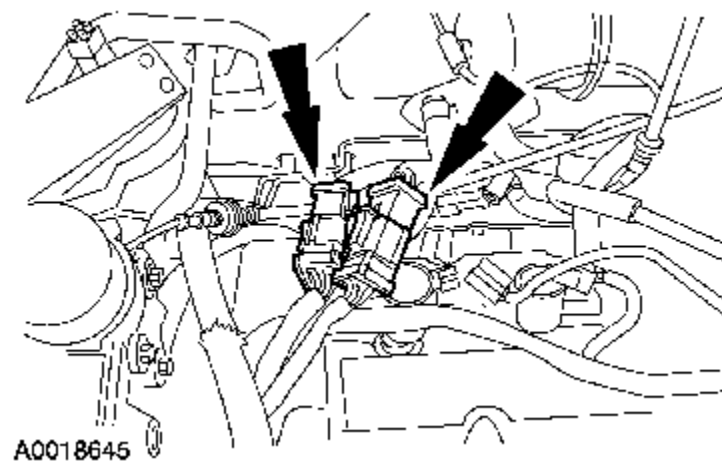
1. Disconnect the coil-on-plug electrical connectors.



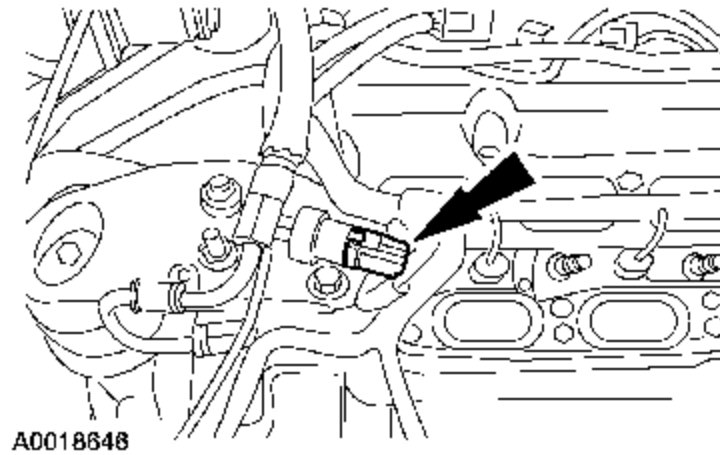
1. Disconnect the radio ignition noise suppressor electrical connector.



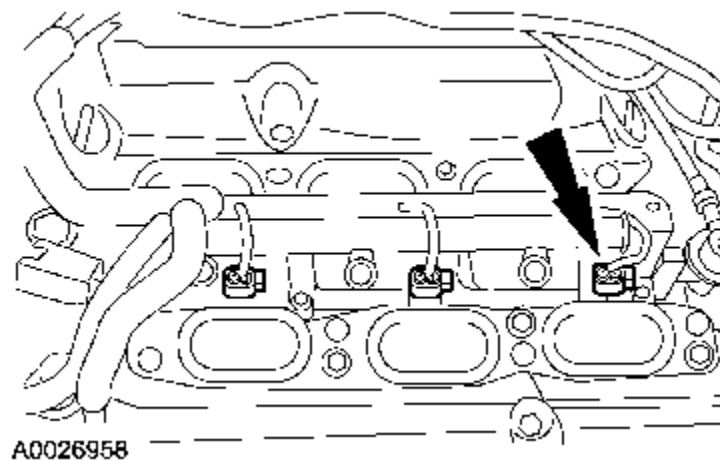
1. Remove the engine coolant temperature (ECT) sensor electrical connector.



1. Disconnect the 16-pin electrical connectors.



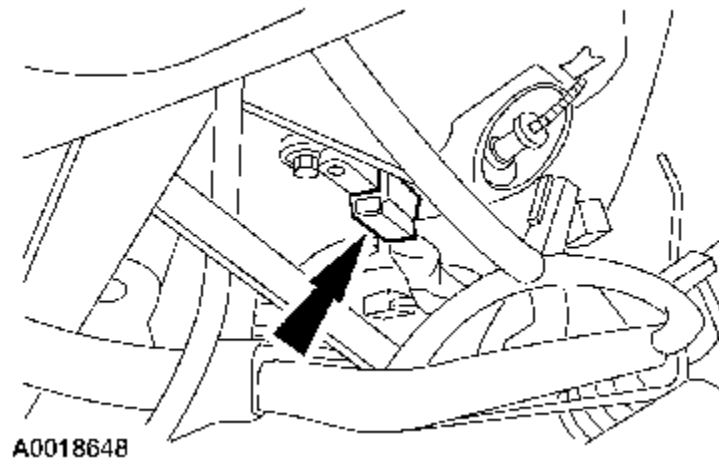
1. Disconnect power steering pressure (PSP) switch electrical connector.



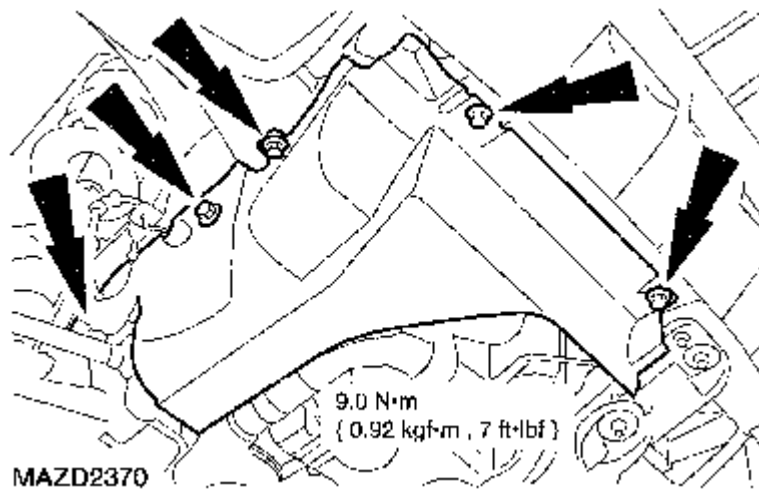
- 1.

NOTE:

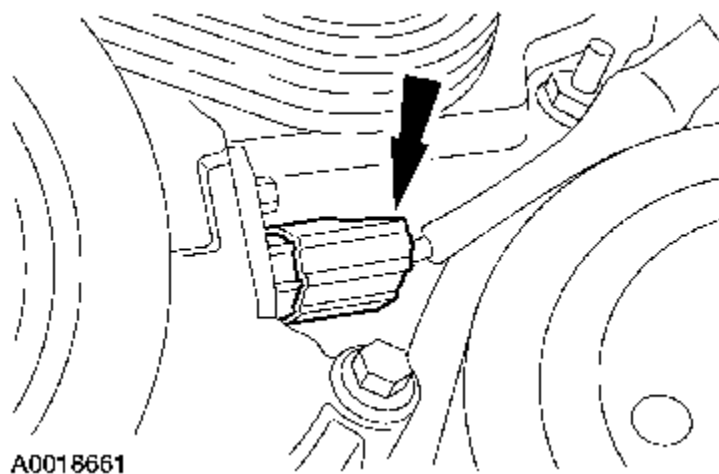
One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



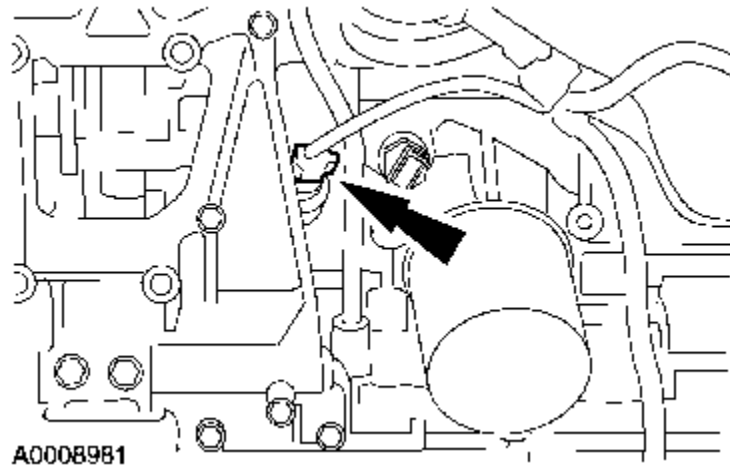
1. Disconnect the camshaft position (CMP) sensor electrical connector.
2. Remove the RH wheel and tire assembly.



1. Remove the RH lower splash shield.



1. Disconnect the crankshaft position (CKP) sensor electrical connector.



- 1.

NOTE:

The oil pressure sensor is located behind the rear of the A/C compressor. The A/C compressor has been removed for clarity. Disconnect the oil pressure sensor electrical connector.

2. Lower the vehicle.
3. Remove the fuel charging wiring harness from the vehicle.
4. To install, reverse the removal procedure.

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VIN or Model Year 2002 Model TRIBUTE fuel injector supply man☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain[< Previous](#) [Next >](#)

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FUEL INJECTION SUPPLY MANIFOLD

Removal and Installation

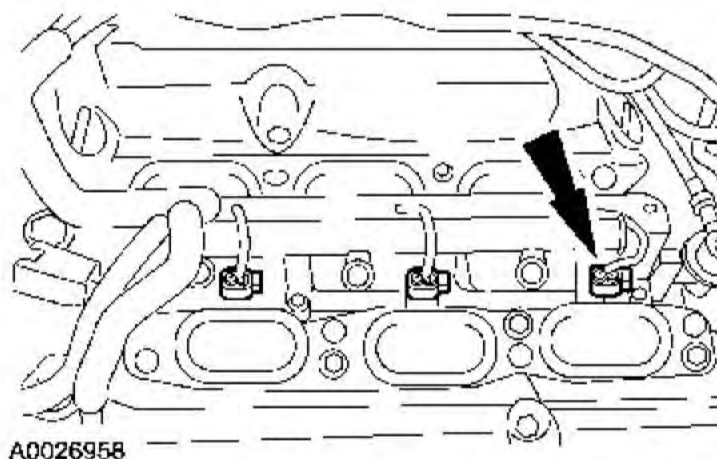
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

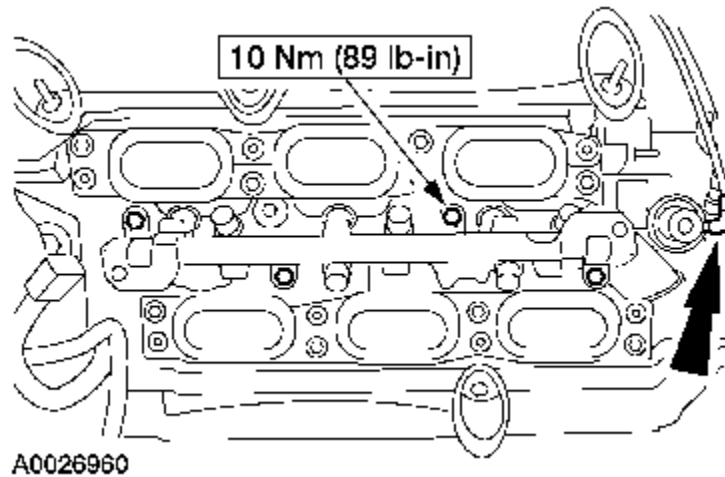
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#)
2. Disconnect the fuel line. Refer to [01-14 SPRING LOCK COUPLINGS](#).



1.

NOTE:

One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



1. Remove the fuel injection supply manifold.

- a. Remove the vacuum hose.
- b. Remove the bolts and the manifold.

2.

NOTE:

Lubricate the fuel injector O-ring seals with clean engine oil to aid installation. To install, reverse the removal procedure.

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VIN or Model Year 2002 - Model TRIBUTE - fuel injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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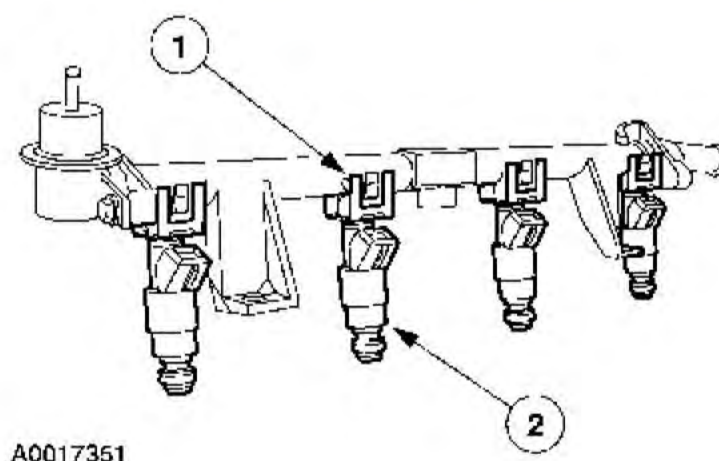
FUEL INJECTORS

Removal and Installation

WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

1. Remove the fuel injection supply manifold. Refer to [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 2.0L Zetec, or [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 3.0L (4V).

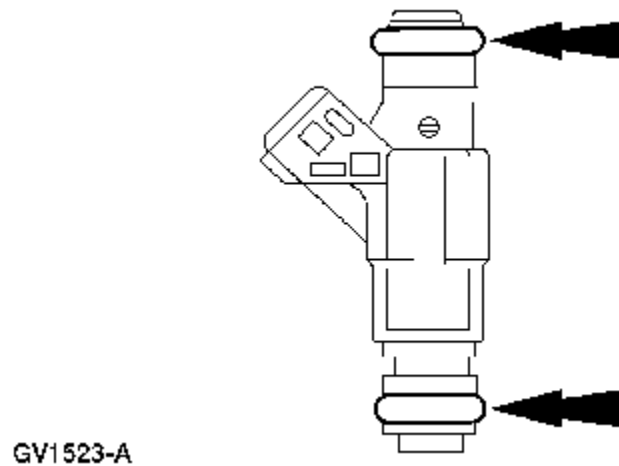


- 1.

NOTE:

A gentle twisting motion may be used while removing the fuel injectors from the fuel supply manifold. Remove the fuel injectors from the supply manifold.

- a. Release the retaining clips.
- b. Remove the fuel injectors.



1. Inspect the O-ring seals. Discard if damaged.
- 2.

CAUTION:

Use O-ring seals made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog fuel injectors.

NOTE:

Lubricate the O-ring seals with clean SAE 5W-30 motor oil to aid installation.

NOTE:

Install the fuel injector retaining clips onto the fuel injectors before installing the injectors onto the supply manifold.

To install, reverse the removal procedure.

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**Mazda Service**[Home](#) [View Content](#) [Other Applications](#) [As Built Data](#) [MyMazda](#) [IDS](#) [Training](#) [Return To Search Results](#)VIN or Model Year 2002 Model TRIBUTE fuel pulse dampener☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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FUEL PULSE DAMPER

Removal and Installation

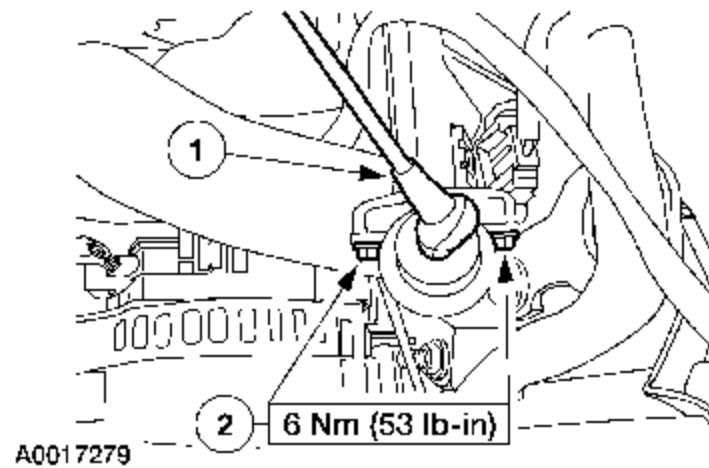
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Relieve the fuel system pressure. Refer to — [01-14 FUEL SYSTEM PRESSURE RELEASE 2.0L ZETEC](#) or — [01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC \(4V\)](#).
2. For 3.0L (4V) engine, remove the throttle body. Refer to [01-13B THROTTLE BODY](#).



1. Remove the fuel pulse damper.
 - a. Disconnect the vacuum line.
 - b. Remove the bolts and the damper.
2. Inspect the O-ring seal and install a new seal if damaged.
- 3.

CAUTION:

Use an O-ring seal made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog the fuel injectors.

NOTE:

Lubricate the O-ring seal with clean SAE 5W-30 motor oil to aid installation.

To install, reverse the removal procedure.

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VIN or Model Year 2002 Model TRIBUTE hydraulic lash

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☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

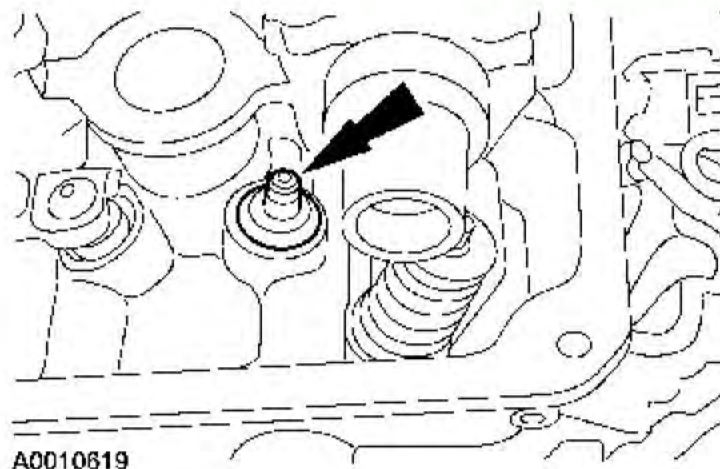
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HYDRAULIC LASH ADJUSTERS

Removal and Installation

1. Remove the camshaft followers. Refer to [01-10C ROLLER FOLLOWERS](#).



- 1.

NOTE:

Mark the positions of the hydraulic lash adjusters to make sure they are assembled in their original position. Remove the hydraulic lash adjusters.

- 2.

NOTE:

Inspect the hydraulic lash adjusters for scoring marks and uneven wear in the bore. Install new lash adjusters if necessary. To install, reverse the removal procedure.

- a. Lubricate the hydraulic lash adjusters with SAE 5W-20 Motor Oil.

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VIN or Model Year 2002 Model TRIBUTE ignition coil 1
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Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐ Bo

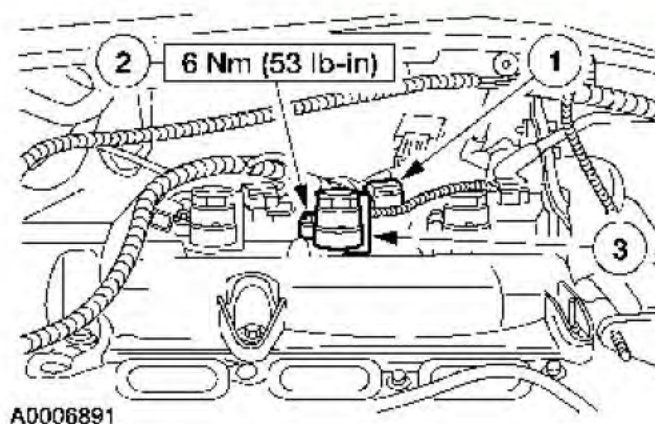
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IGNITION COIL-ON-PLUG — RH

Removal and Installation

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Remove the ignition coil-on-plug.
 - a. Disconnect the electrical connector.
 - b. Remove the bolt.
 - c. Remove the coil-on-plug.
2. To install, reverse the removal procedure.
 - a. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

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VIN or Model Year 2002 Model TRIBUTE Lower Intake Manifold

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[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restrain](#)

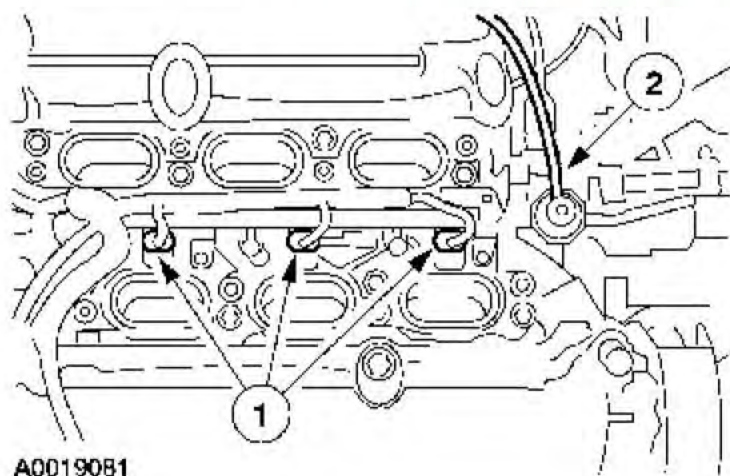
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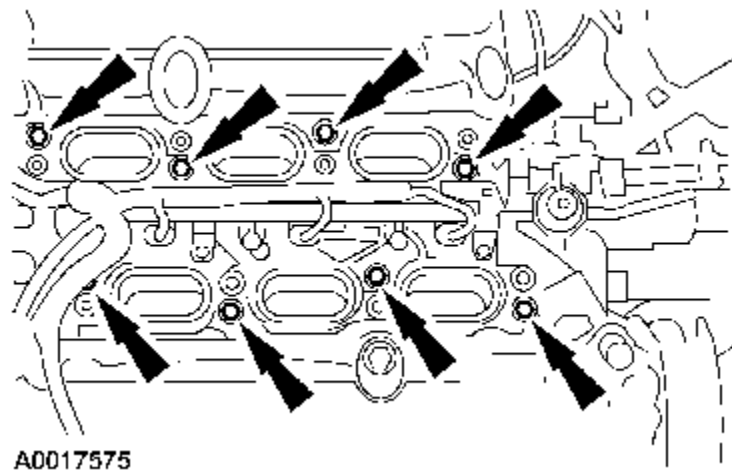
LOWER INTAKE MANIFOLD

Removal

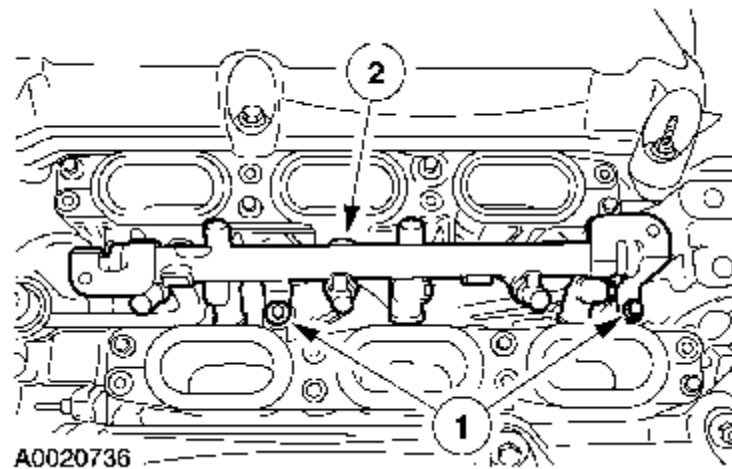
1. Disconnect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).
2. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Disconnect the fuel rail.
 - a. Disconnect the six fuel injector electrical connectors (1).
 - b. Disconnect the fuel pressure damper vacuum line (2).



1. Remove the bolts and the lower intake manifold.



1. Remove the fuel rail.
 - a. Remove the bolts (1).
 - b. Carefully separate the lower intake manifold from the fuel rail (2).
2. Remove the six fuel injectors from the lower intake manifold.
3. Remove and discard the gaskets if damaged.

Installation

1. Install the gaskets in the lower intake manifold.
- 2.

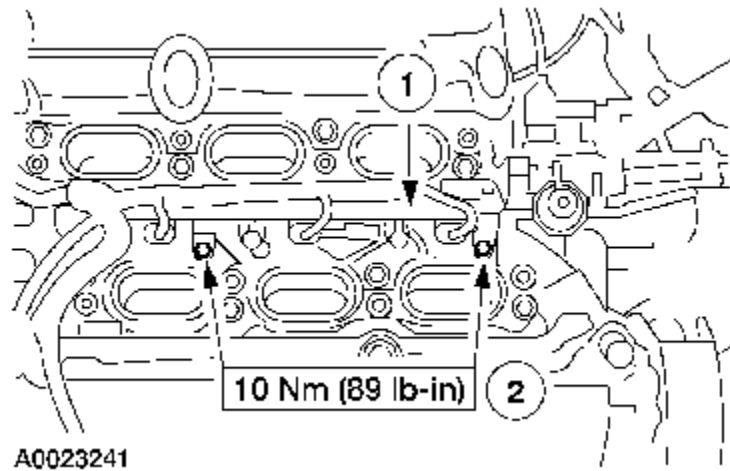
CAUTION:

Never use silicone grease. It will clog the fuel injectors.

NOTE:

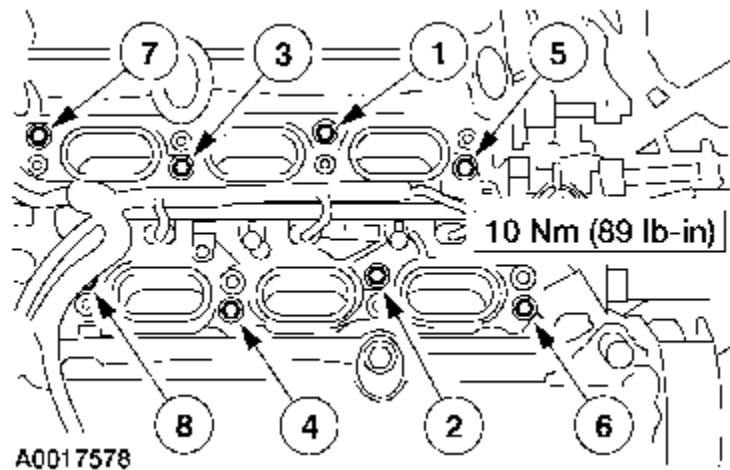
Inspect the fuel injector O-ring seals and install O-ring seals if necessary.

Lubricate the O-ring seals lightly with SAE 5W-20 Motor Oil and install the fuel injectors into the lower intake manifold.

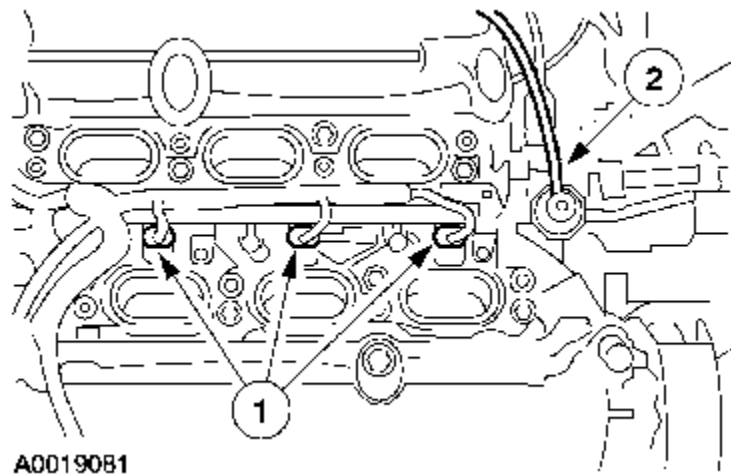


1. Install the fuel rail.

- a. Position the fuel rail (1).
- b. Install the four bolts (2).



1. Install the lower intake manifold assembly and tighten the bolts in the sequence shown.



1. Connect the fuel rail.
 - a. Connect the six fuel injectors (1).
 - b. Connect the fuel pressure damper vacuum line (2).
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).
3. Connect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).

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VIN or Model Year 2002 Model TRIBUTE oil pump

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

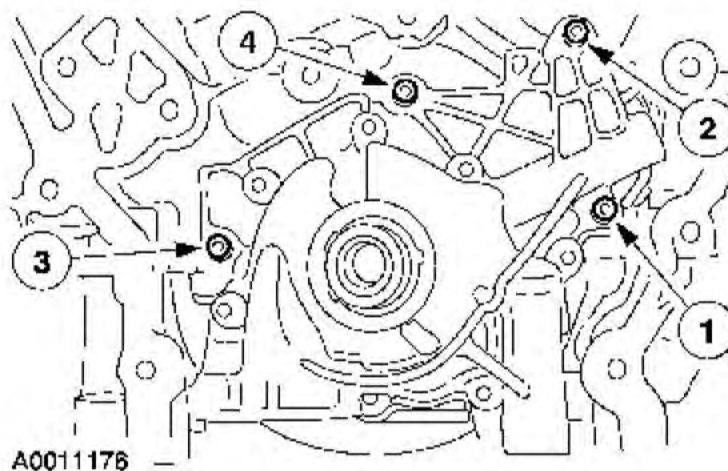
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OIL PUMP

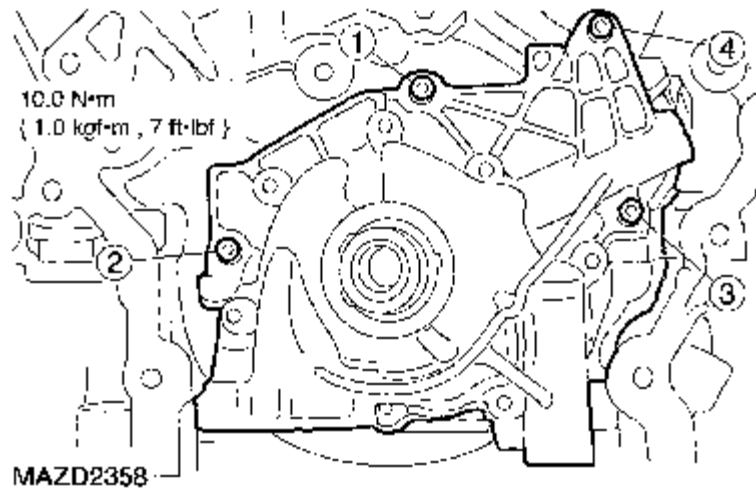
Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).
2. Remove the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).



1. Remove the bolts in the indicated sequence and remove the oil pump.

Installation



1. Position the oil pump and install the bolts in the sequence shown.
2. Install the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).
3. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2002 Model TRIBUTE roller followers

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

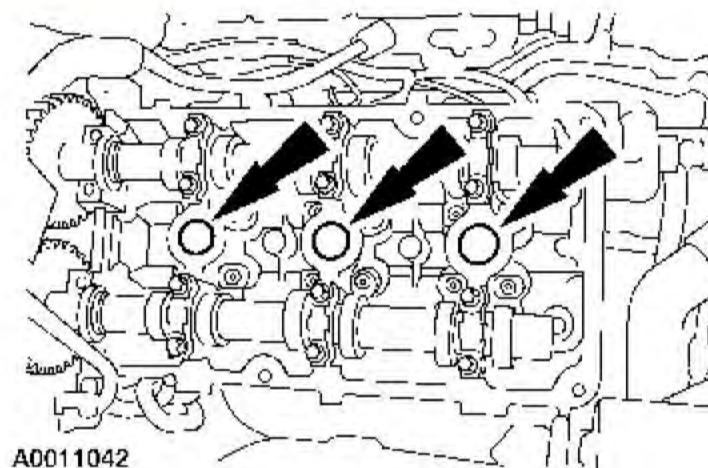
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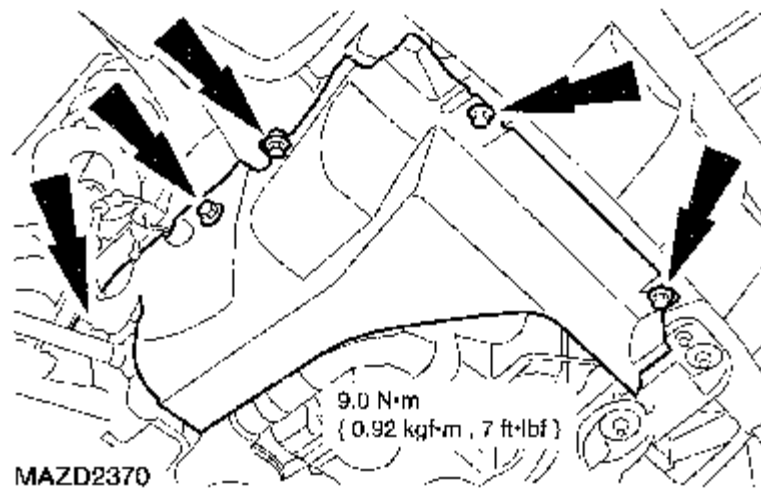
ROLLER FOLLOWERS

Removal and Installation

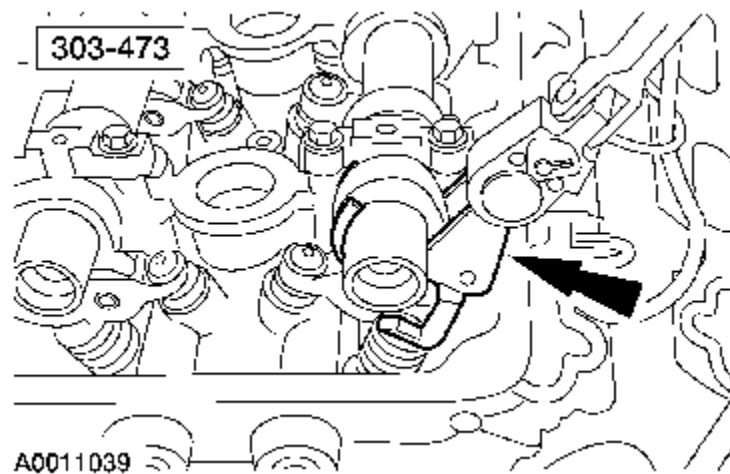
1. Remove the LH and RH valve covers. Refer to — [01-10C VALVE COVER RH](#) and — [01-10C VALVE COVER LH](#).



1. Remove the LH and RH spark plugs.
2. Remove the RH front wheel. Refer to [02-12 WHEEL AND TIRE](#).



1. Remove the splash shield.
2. Rotate the crankshaft until the camshaft lobe is pointing directly away from the follower.



1. Using the special tool, remove the followers.
 2. To install, reverse the removal procedure.
- Lubricate the camshaft followers with SAE 5W-20 Motor Oil .

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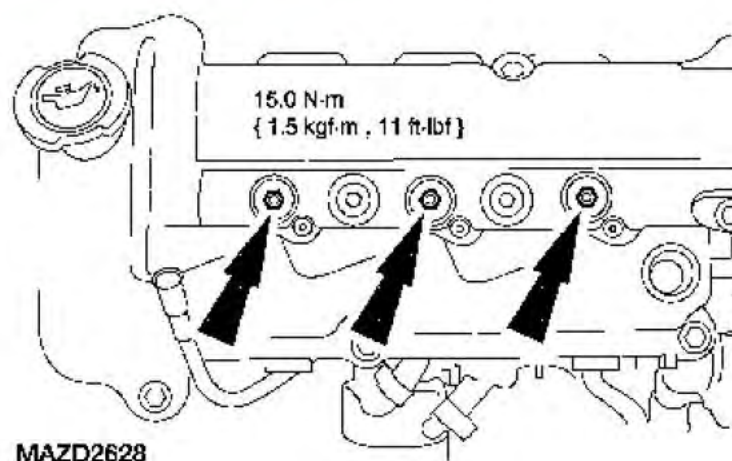
**Mazda Service Site**[Home](#) [View Content](#) [Other Applications](#) [As Built Data](#) [MyMazda](#) [IDS](#) [Training](#) [Return To Search Result](#)VIN or Model Year 2002 Model TRIBUTE spark plugGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐[< Previous](#) [Next >](#)

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SPARK PLUGS — 3.0L DURATEC (4V)

Removal

1. Remove the ignition coil-on-plugs. Refer to — [01-18 IGNITION COIL-ON-PLUG LH](#) and — [01-18 IGNITION COIL-ON-PLUG RH](#).



- 1.

NOTE:

LH shown, RH similar. Remove the LH and RH spark plugs.

2. Inspect the spark plugs. Refer to — [01-18 SPARK PLUG INSPECTION](#).
3. To install, reverse the removal procedure.

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VIN or Model Year 2002 - Model TRIBUTE - speed control actuator

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

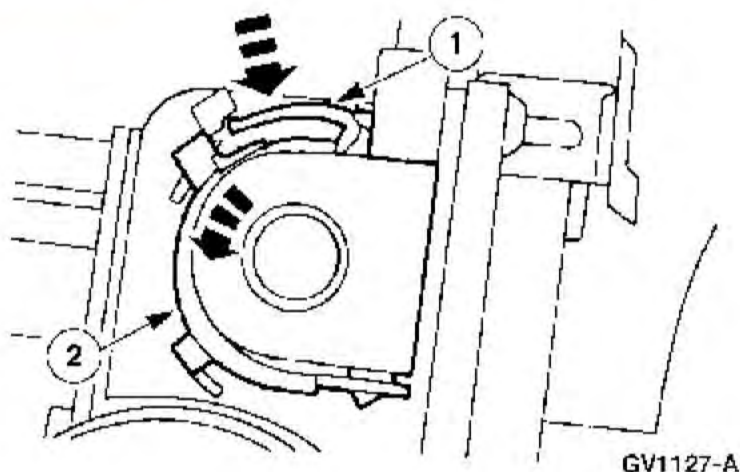
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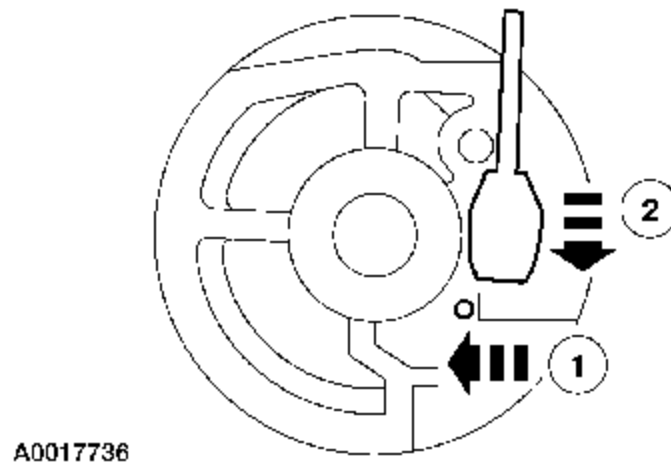
SPEED CONTROL ACTUATOR

Removal and Installation

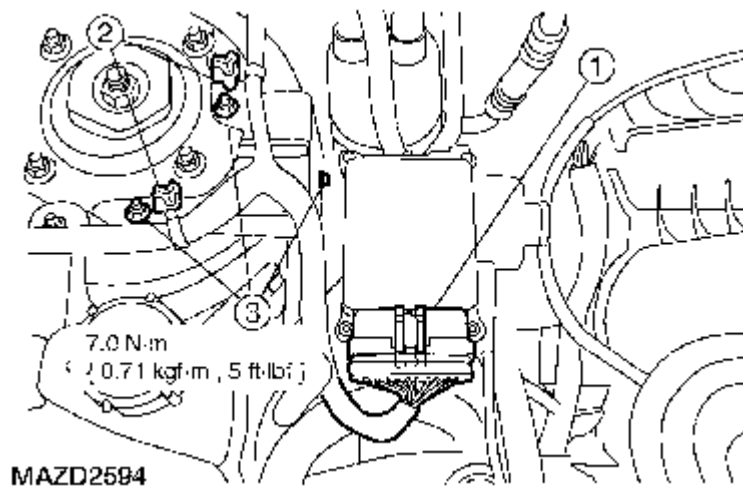
1. Disconnect the battery ground cable. For additional information, refer to [01-17 BATTERY DISCONNECT](#).



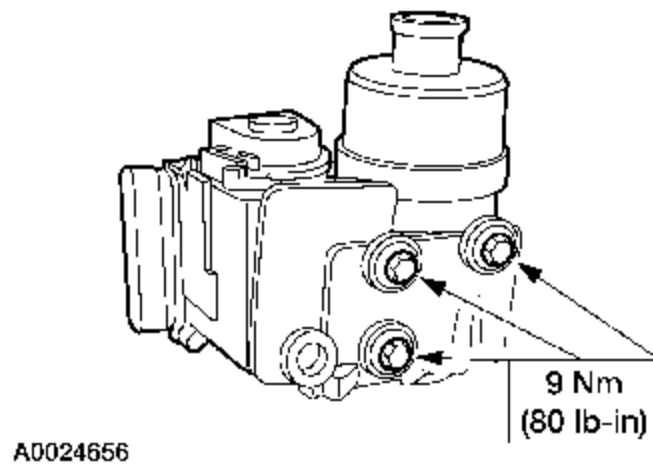
1. Release the cruise control cable cap.
 - a. Squeeze the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.



1. Remove the cruise control actuator assembly.
 - a. Disconnect the electrical connector.
 - b. Separate the wire harness from the bracket.
 - c. Remove the nuts.



1. Remove the bolts and separate the cruise control actuator from the bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2002 - Model TRIBUTE - speed control cable

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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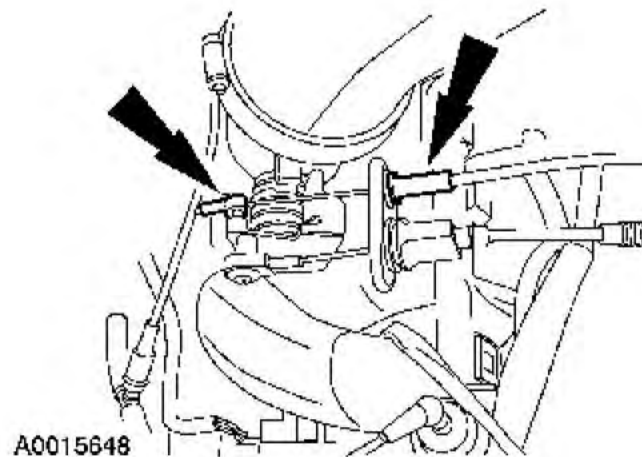
SPEED CONTROL CABLE

Removal and Installation

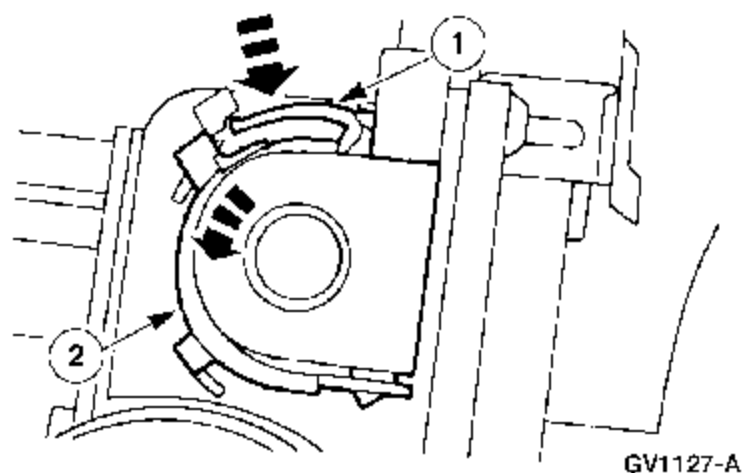
NOTE:

The cruise control actuator cable is not adjustable.

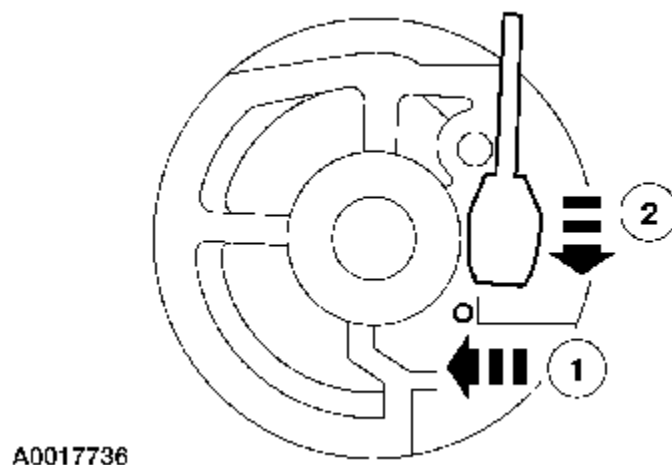
Vehicles equipped with 2.0L Zetec engine



1. Disconnect the cruise control cable from the throttle control linkage and bracket.



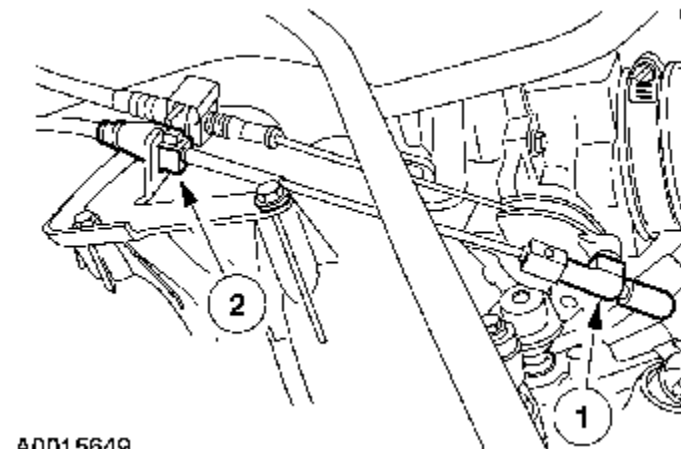
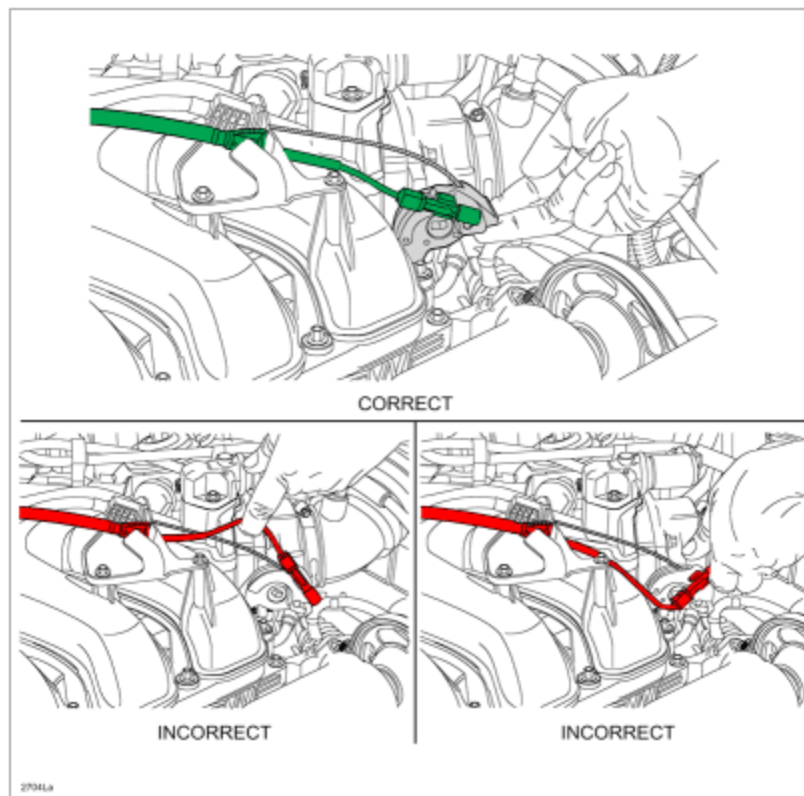
1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



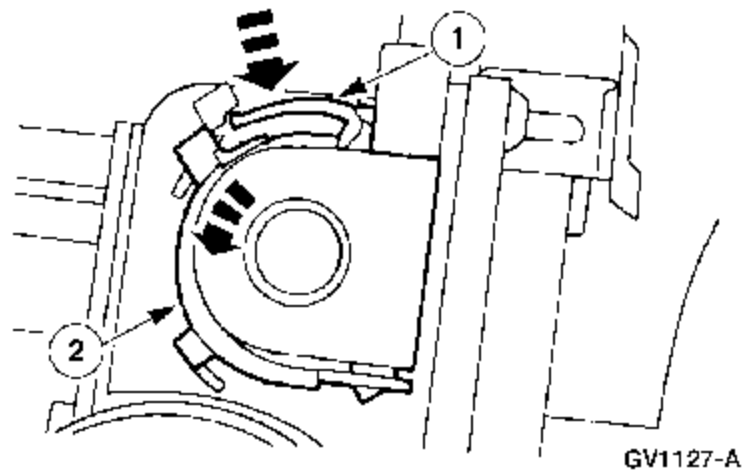
1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

Vehicles equipped with 3.0L (4V) engine

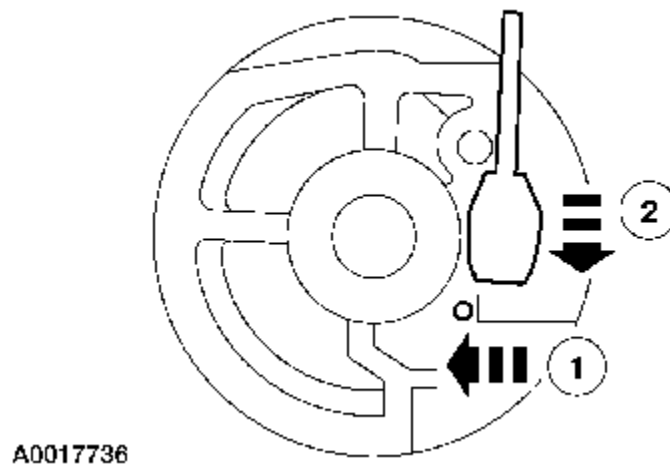
CAUTION: Damage to the speed control cable may result if the throttle body cam is rotated by lifting up on the speed control cable or the speed control cable connector end. When disconnecting the accelerator cable from the throttle body, rotate the throttle body cam only by lifting up on the cam itself. See Figure below.



1. Disconnect the cruise control cable from the throttle control linkage and bracket.
 - a. Disconnect the cable from the throttle control linkage.
 - b. Squeeze the tabs and disconnect the cruise control cable from the bracket



1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

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VIN or Model Year 2002 Model TRIBUTE throttle body☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain[< Previous](#) [Next >](#)

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THROTTLE BODY

Removal and Installation

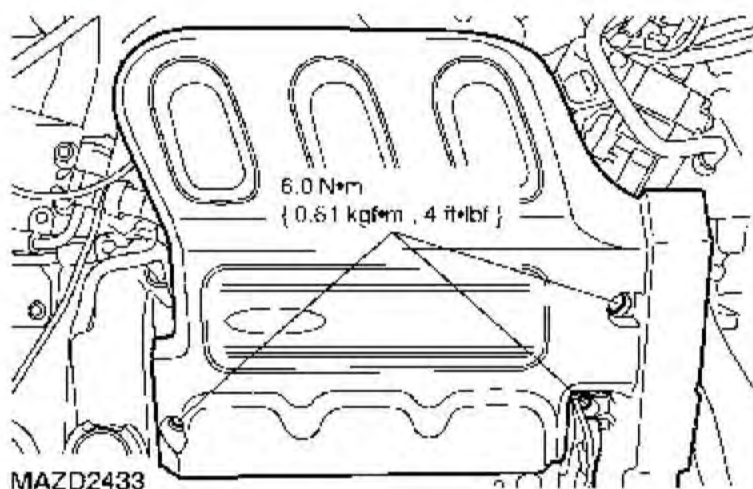
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

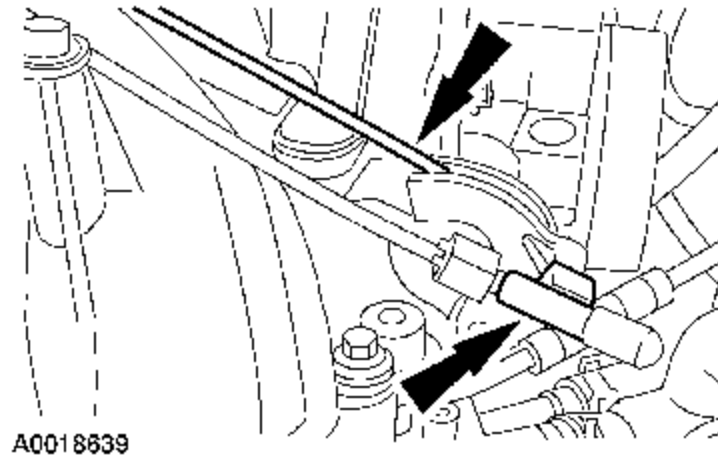
CAUTION:

Throttle body bore and plate area have a special coating and should not be cleaned.

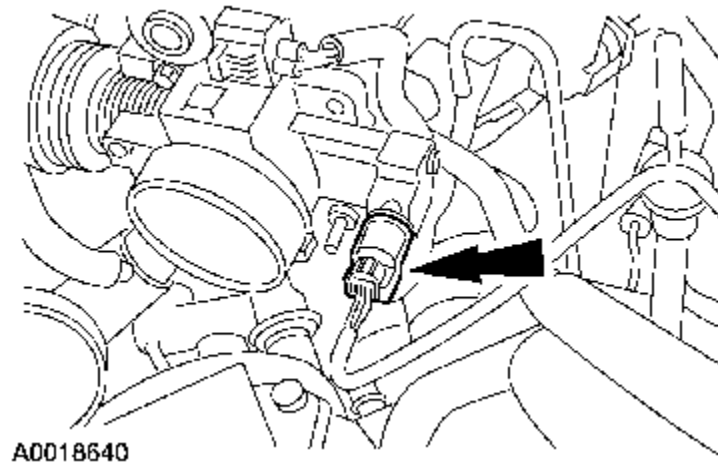
1. Remove the air cleaner outlet tube. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).



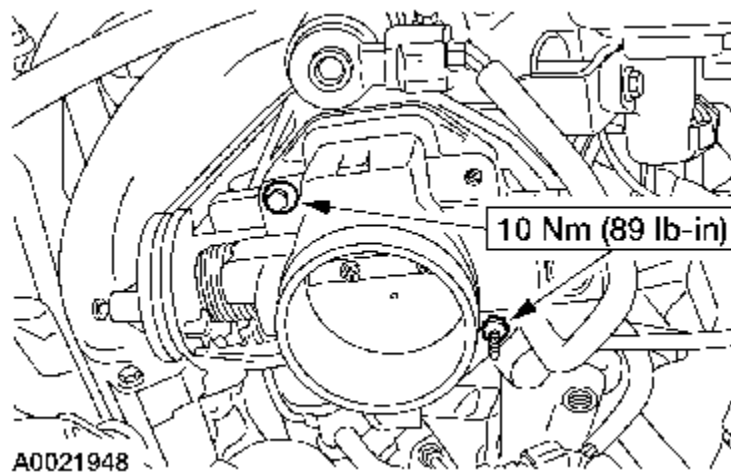
1. Remove the nuts and the engine appearance cover.



1. Disconnect the accelerator cable and the cruise control cable (if equipped) from the throttle body lever.



1. Disconnect the throttle position (TP) sensor electrical connector.



1. Remove the bolt, the stud bolt and the throttle body.

- a. Discard the gasket.
2. To install, reverse the removal procedure.
 - a. Install a new gasket.

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VIN or Model Year 2002 Model TRIBUTE timing drive

[General Information](#) ☐ [Engine](#) ☐ [Suspension](#) ☐ [Transmission/Transaxle](#) ☐ [HVAC](#)
[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restraints](#)

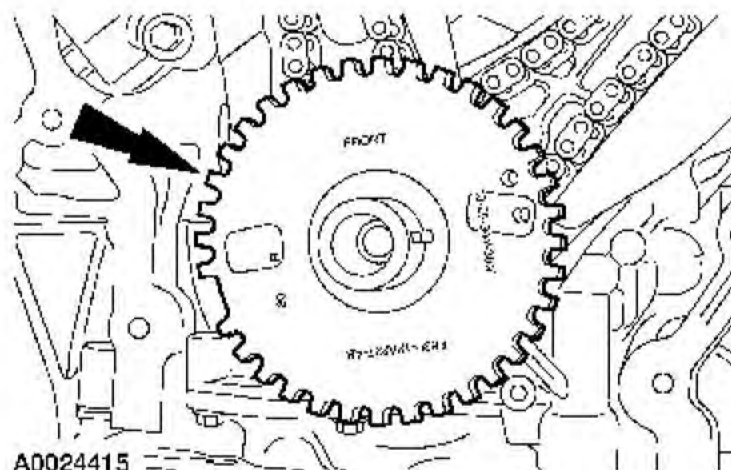
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TIMING DRIVE COMPONENTS

Removal

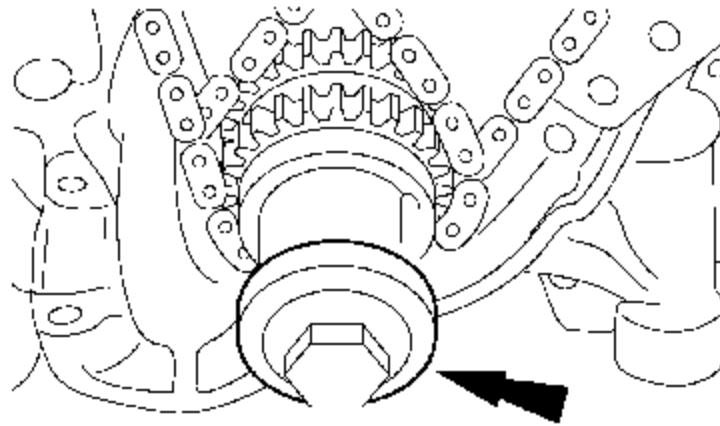
1. Remove the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).
2. Lower the vehicle.



- 1.

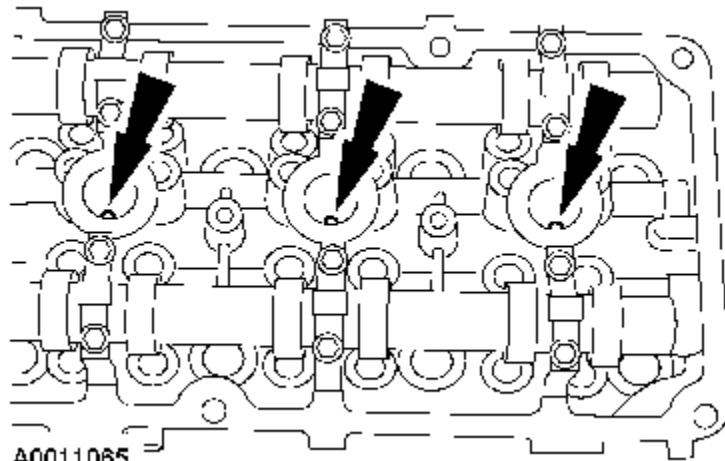
CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Remove the ignition pulse wheel.



A0022699

1. Install the damper bolt.

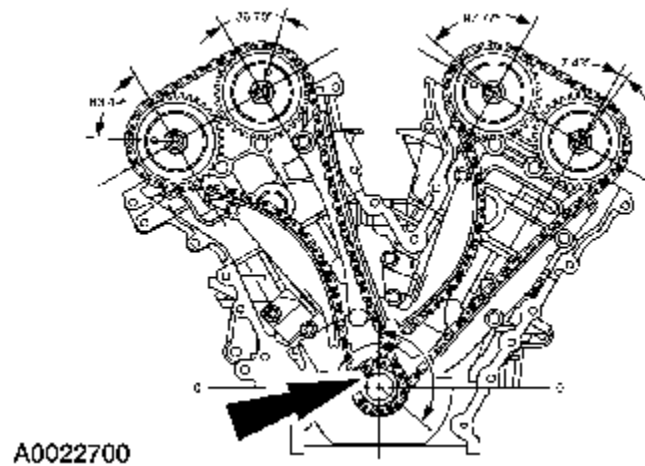


A0011065

- 1.

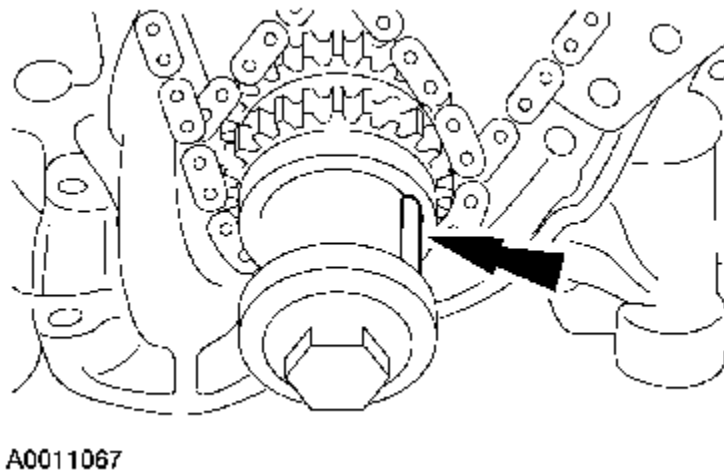
NOTE:

RH shown, LH similar. Remove the LH and RH spark plugs.

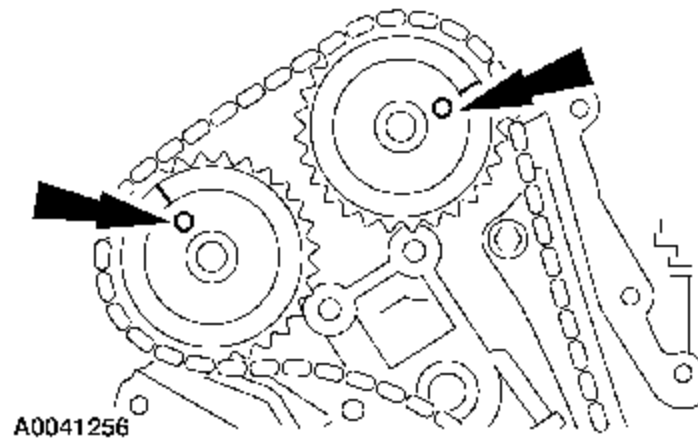


1. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at top dead center (TDC).

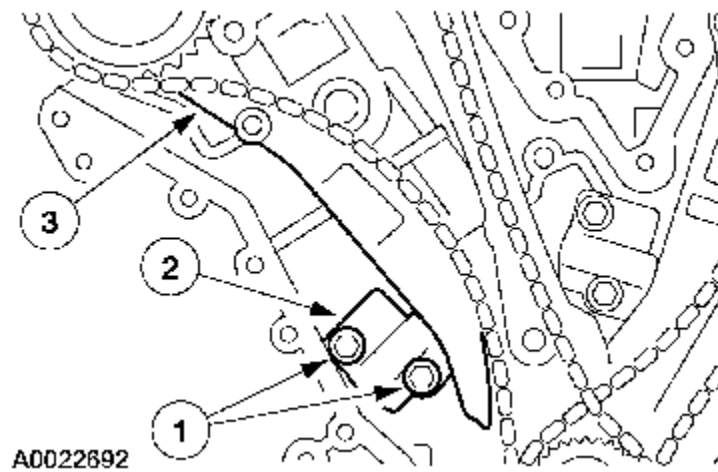
- Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and re-check.



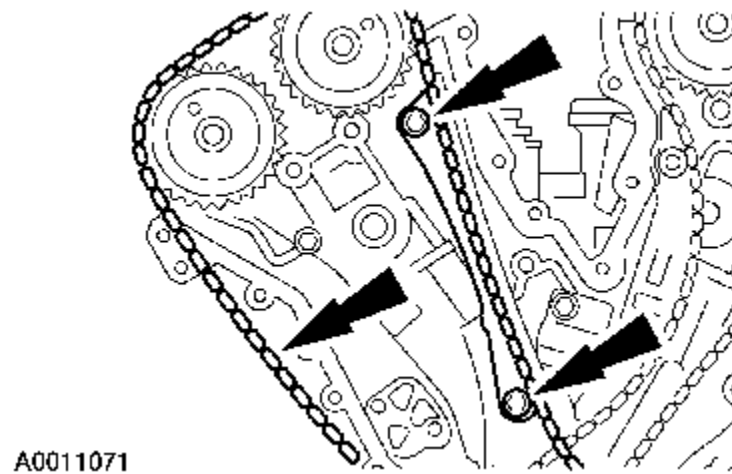
1. Rotate the crankshaft clockwise 120 degrees to the 3 o'clock position to locate the RH camshafts in the neutral position.



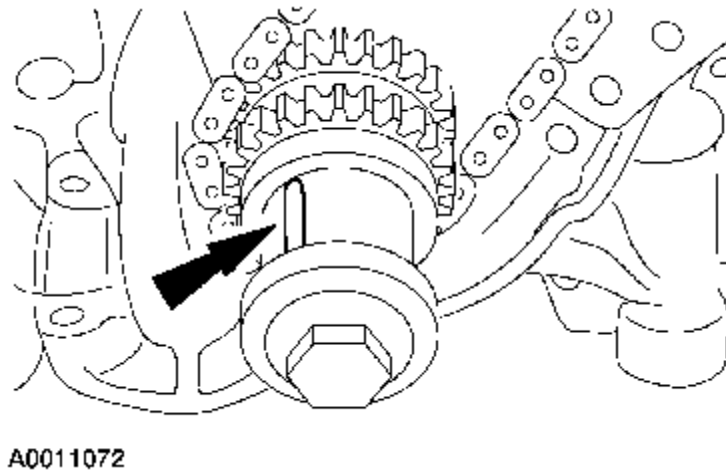
1. Verify that the RH camshafts are in the neutral position.



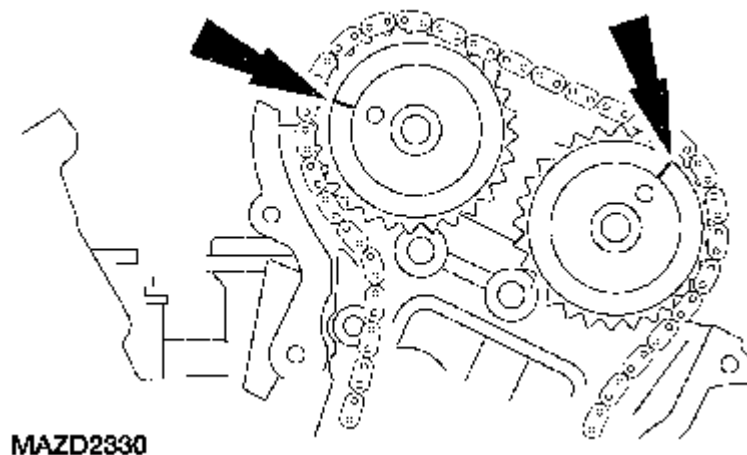
1. Remove the RH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.



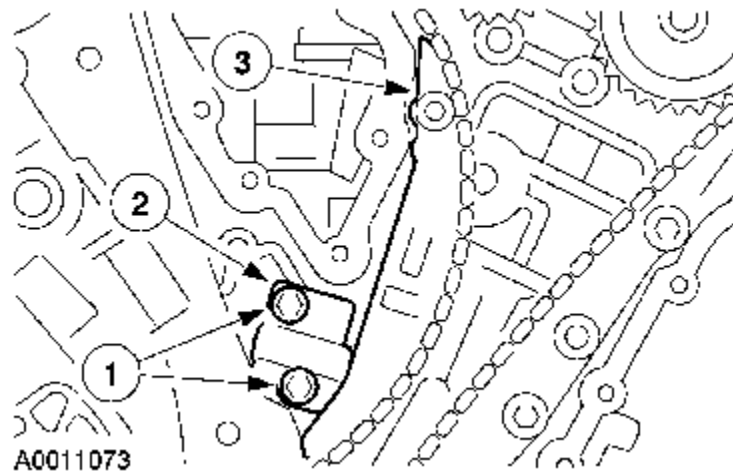
1. Remove the bolts, RH timing chain guide and the timing chain.



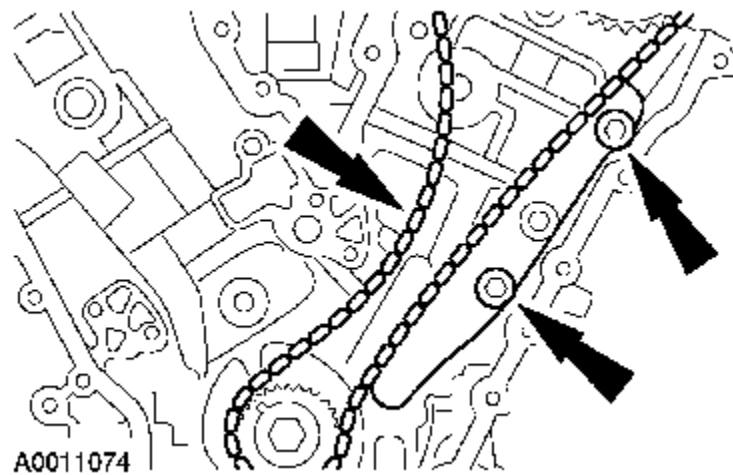
1. Rotate the crankshaft clockwise 600 degrees (1-2/3 times) to position the crankshaft keyway in the 11 o'clock position. This will position the LH camshafts in the neutral position.



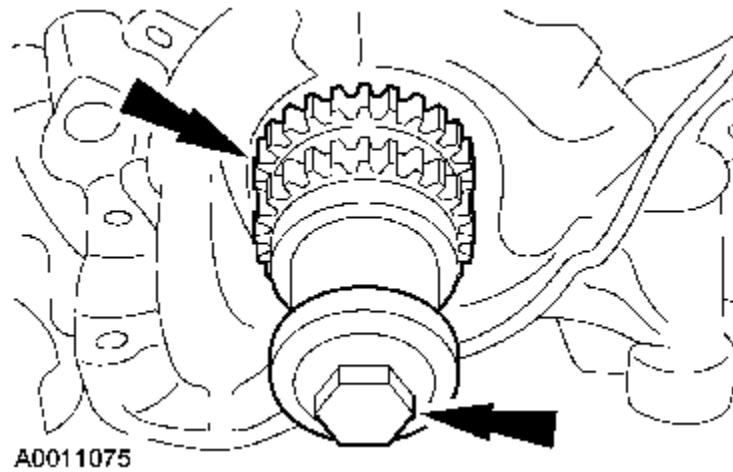
1. Verify that the LH camshafts are in the neutral position.



1. Remove the LH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.

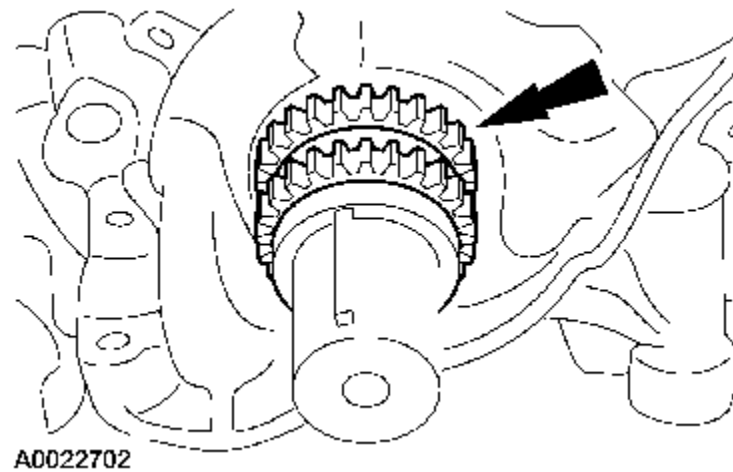


1. Remove the LH timing chain and timing chain guide.

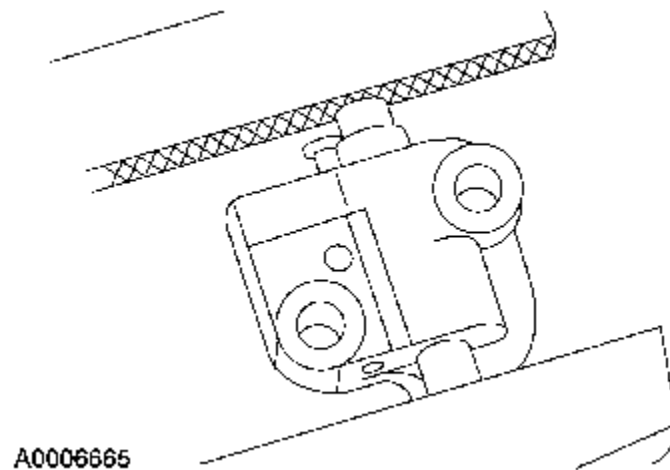


1. Remove the damper bolt and the crankshaft sprockets.

Installation



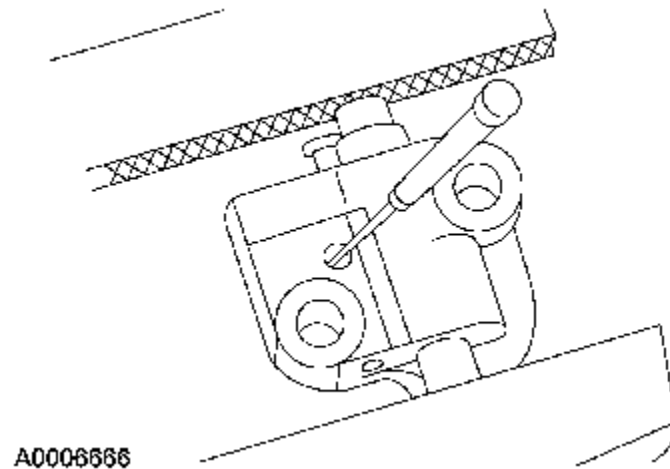
1. Install the crankshaft sprockets.



1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

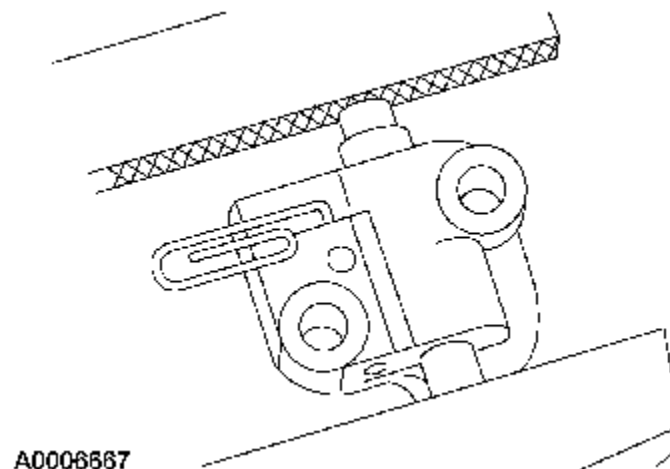
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

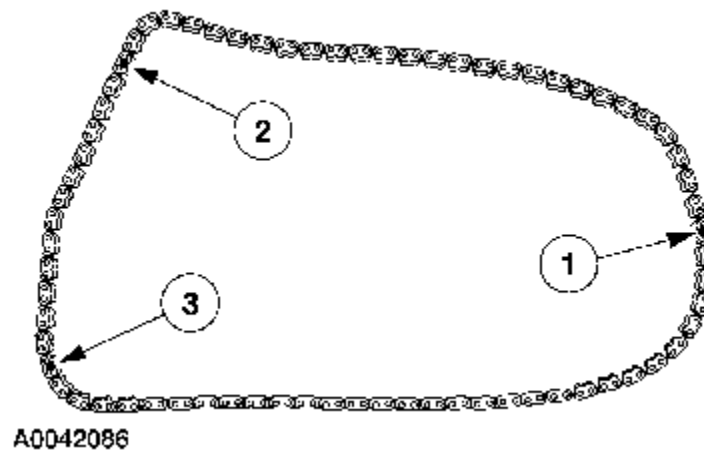
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.

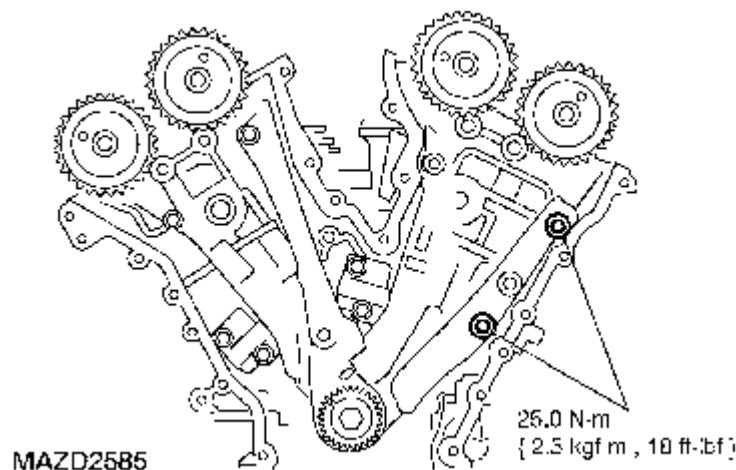


1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.

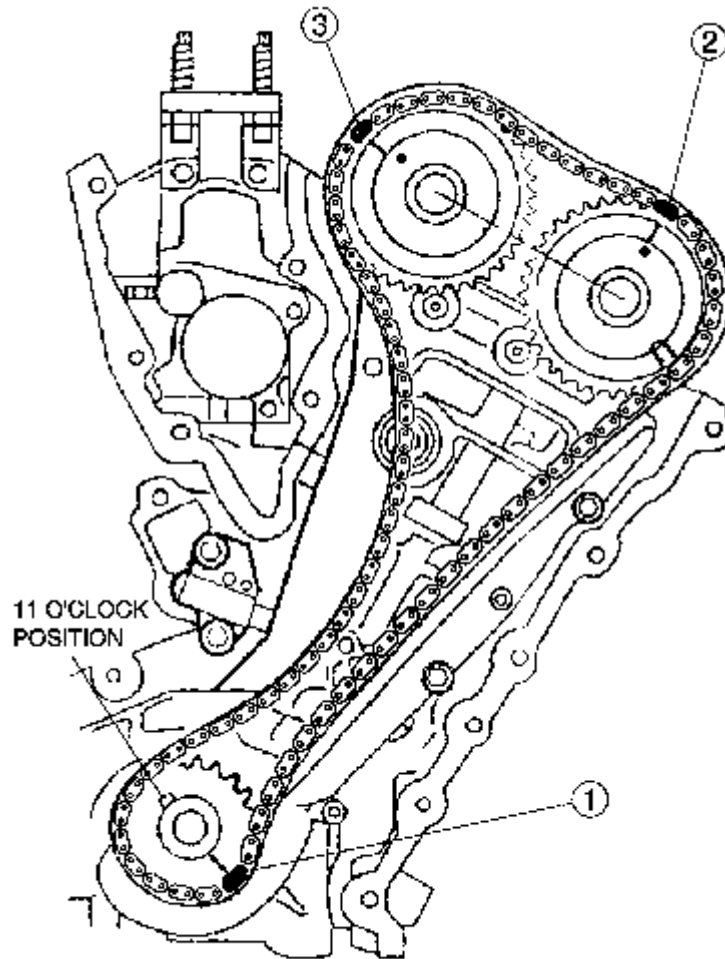


1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

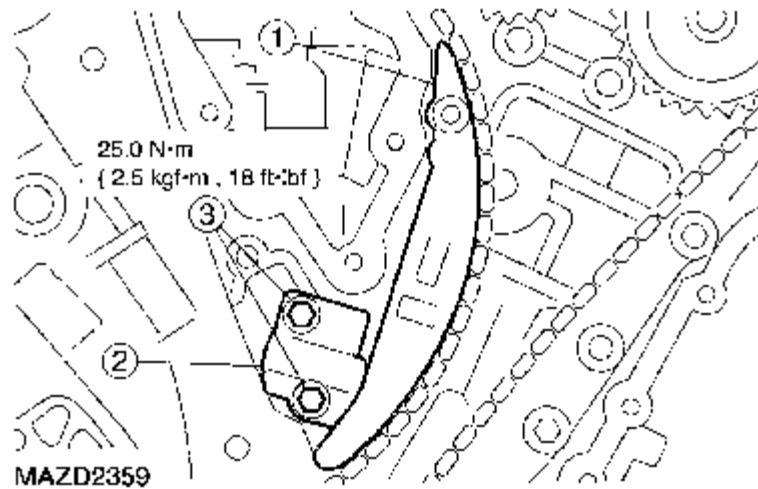
- a. Mark any link to use as the crankshaft timing mark.
- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark



1. Position the guide and install the bolts.

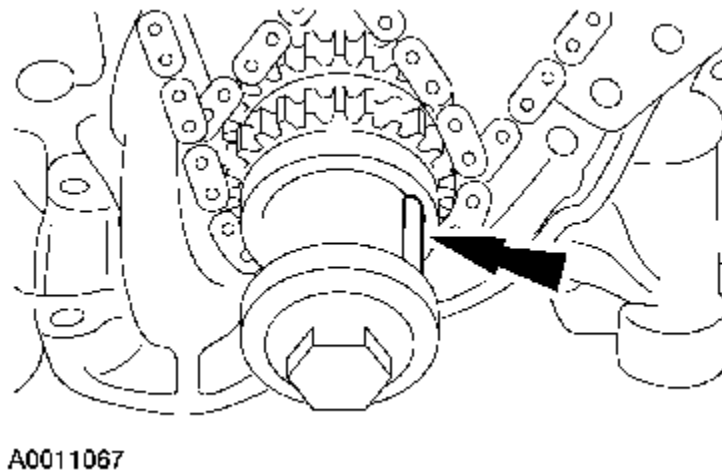
**MAZD2331**

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link, including the starting link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.

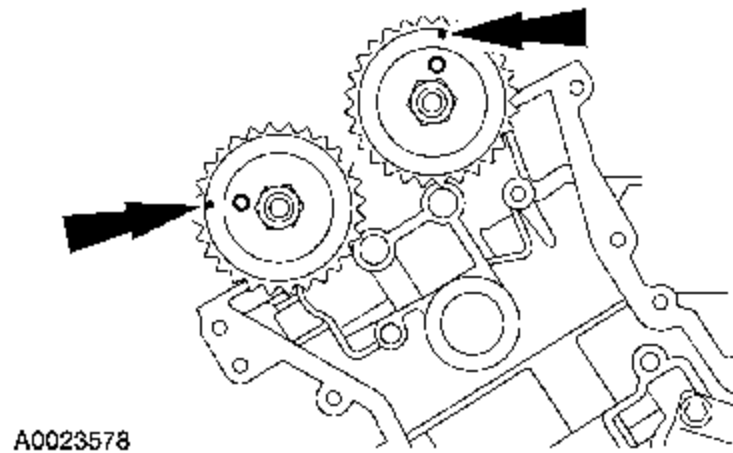


1. Install the LH timing chain and tensioner arm.

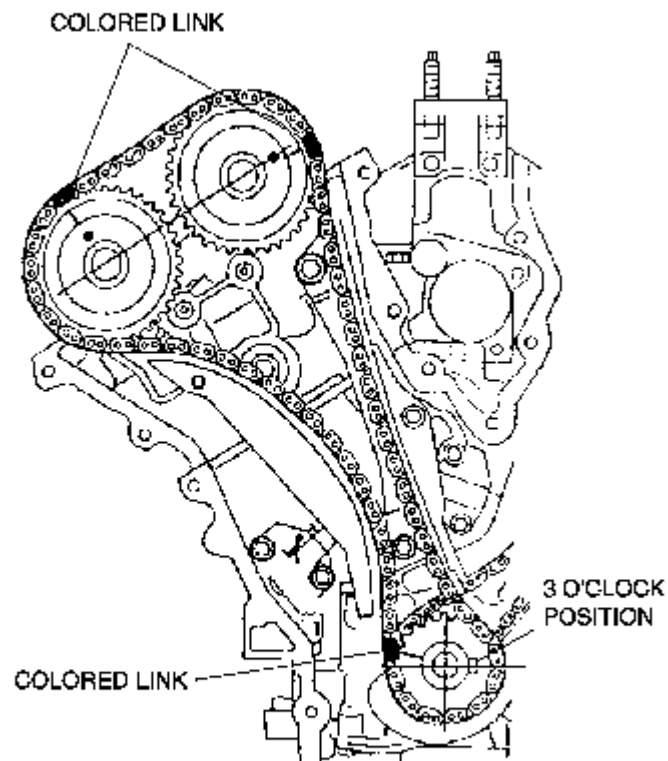
- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolt.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



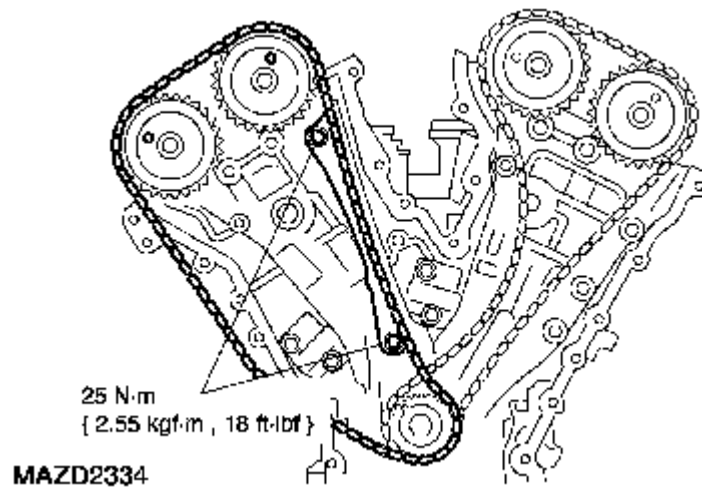
1. Verify that the RH camshafts are correctly positioned.



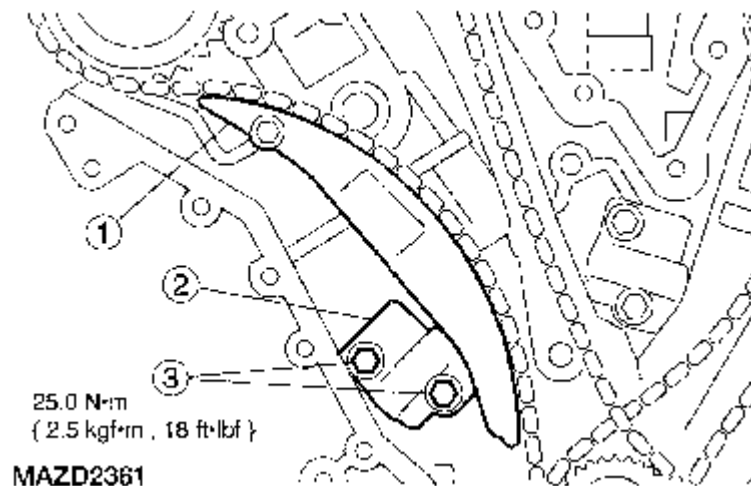
MAZD2332

1. Install the RH timing chain.

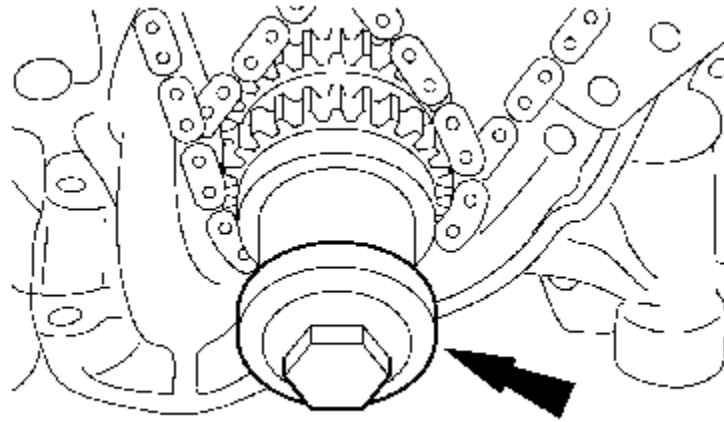
- Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

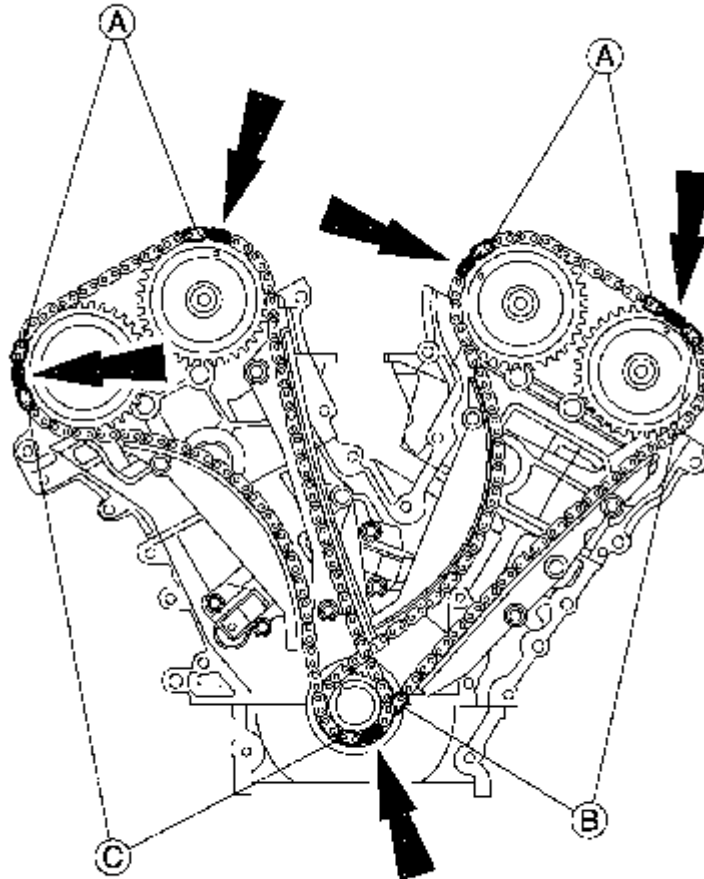


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

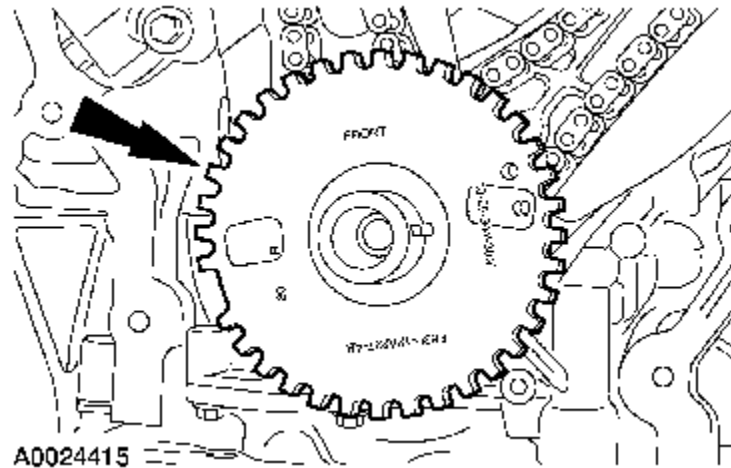
1. Remove the crankshaft damper bolt.



MAZD2333

1. Verify the timing with the following steps.

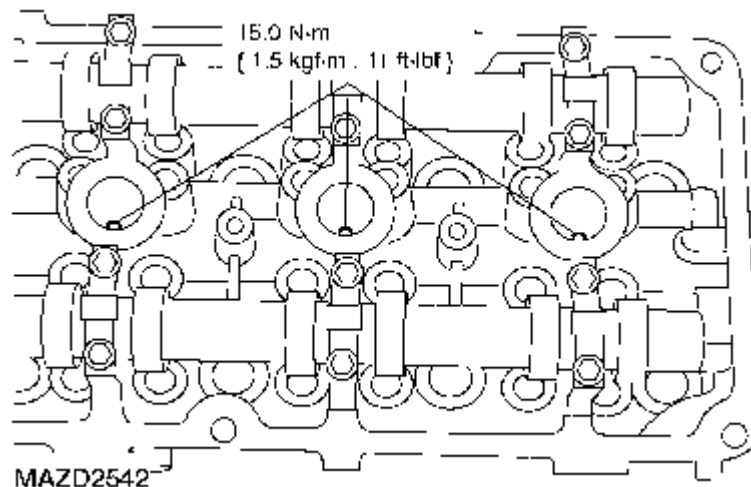
- a. There should be 12 chain links between the front camshaft timing marks.
- b. There should be 27 chain links between the camshaft and crankshaft timing marks.
- c. There should be 30 chain links between the camshaft and crankshaft timing marks.



1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the key way in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the LH and RH spark plugs. (RH shown, LH similar.)
2. Raise the vehicle.
3. Install the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).

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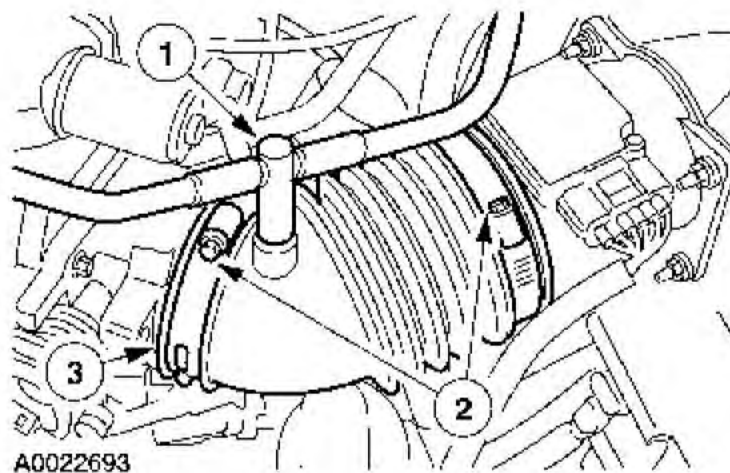
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VIN or Model Year 2002 Model TRIBUTE o Upper IntakeGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

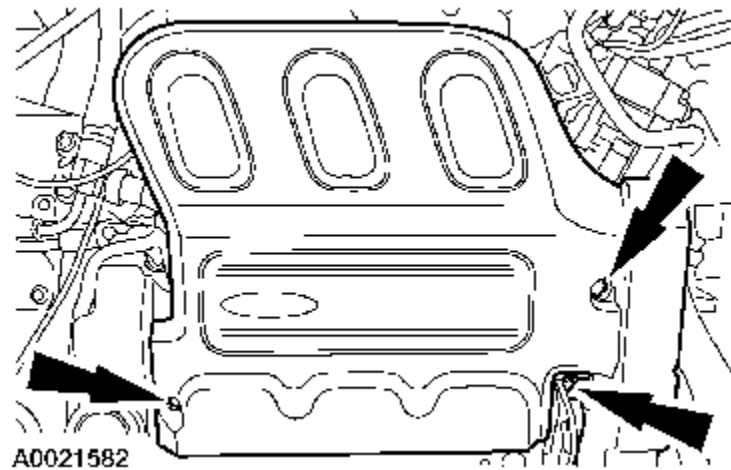
2002 - Tribute - Workshop Manual - Engine

UPPER INTAKE MANIFOLD

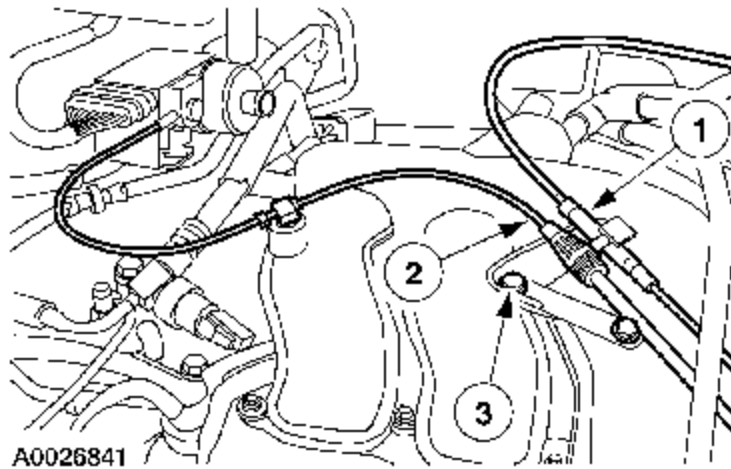
Removal



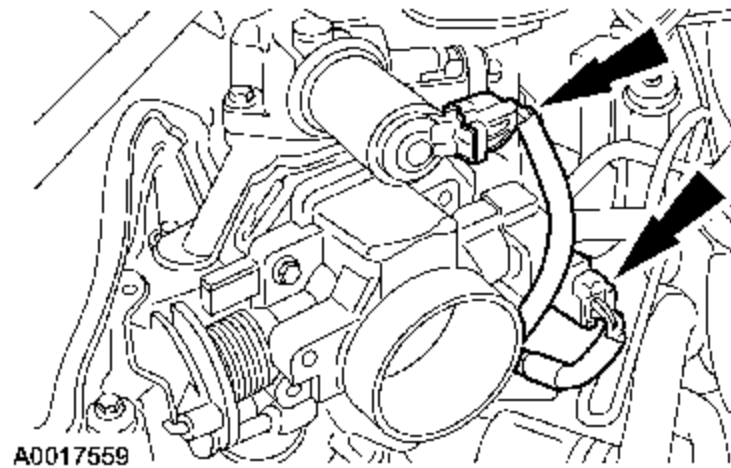
1. Remove the air cleaner outlet tube.
 - a. Remove the vacuum hose.
 - b. Loosen the clamps.
 - c. Remove the air cleaner outlet tube.



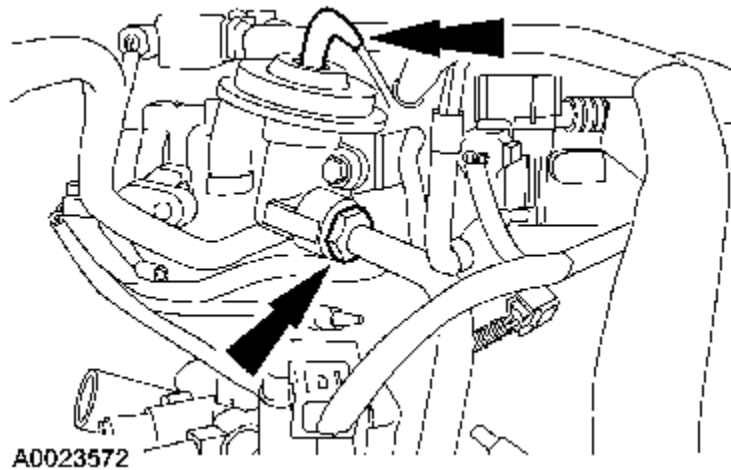
1. Remove the three nuts and the engine appearance cover.



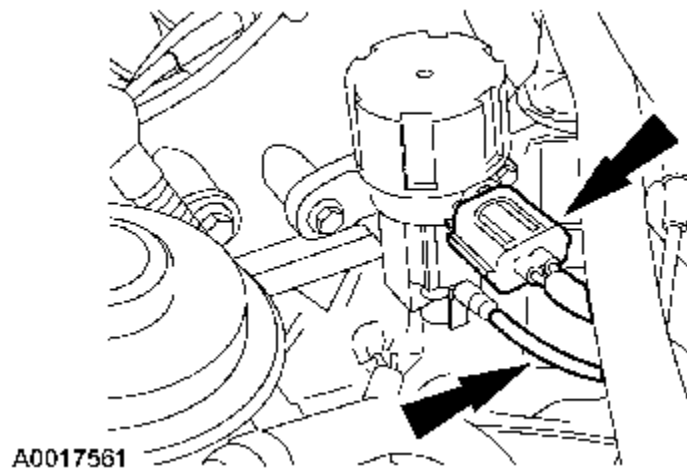
1. Disconnect the cables.
 - a. Disconnect the throttle cable.
 - b. If equipped, disconnect the cruise control cable.
 - c. Remove the throttle cable bracket bolts.



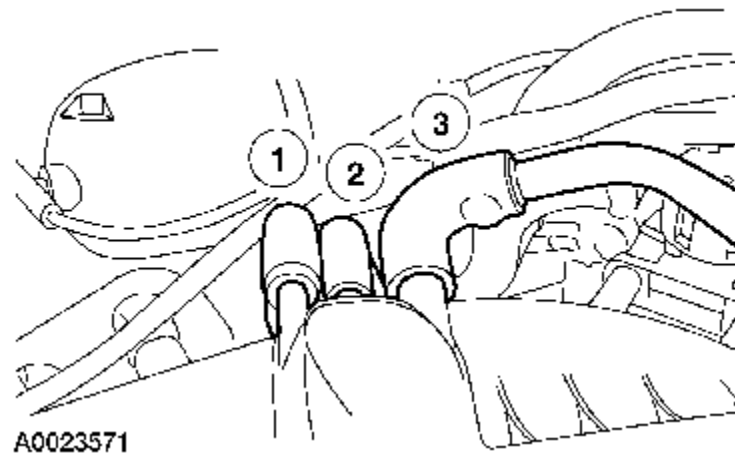
1. Disconnect the throttle position (TP) sensor and idle air control (IAC) electrical connectors.



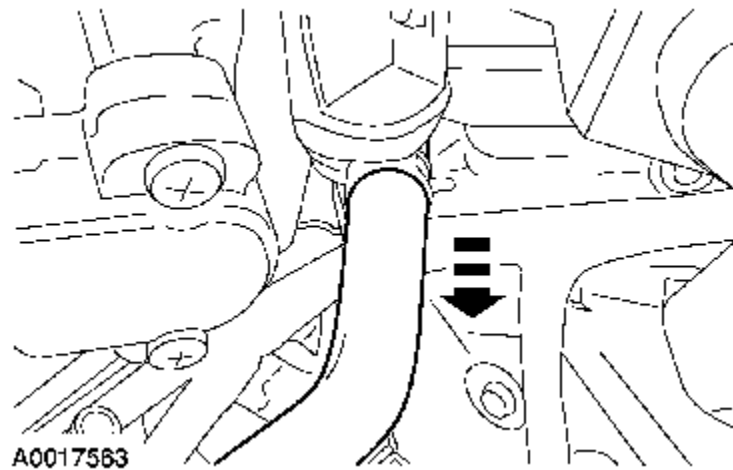
1. Disconnect the exhaust gas recirculation (EGR) valve vacuum hose and EGR tube nut.



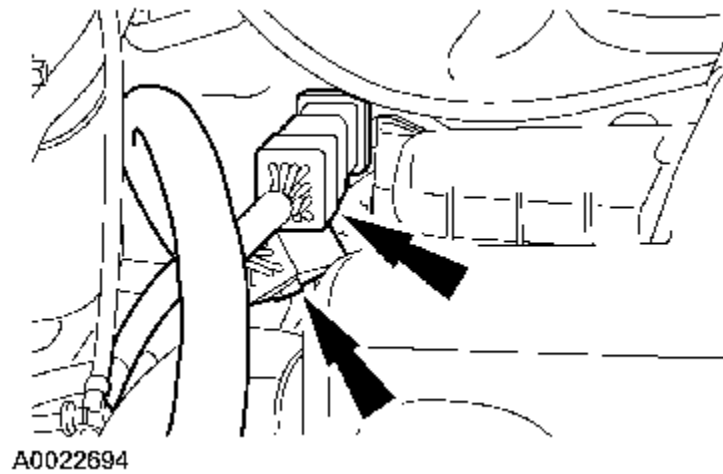
1. Disconnect the EGR vacuum regulator valve electrical connector and vacuum hose.



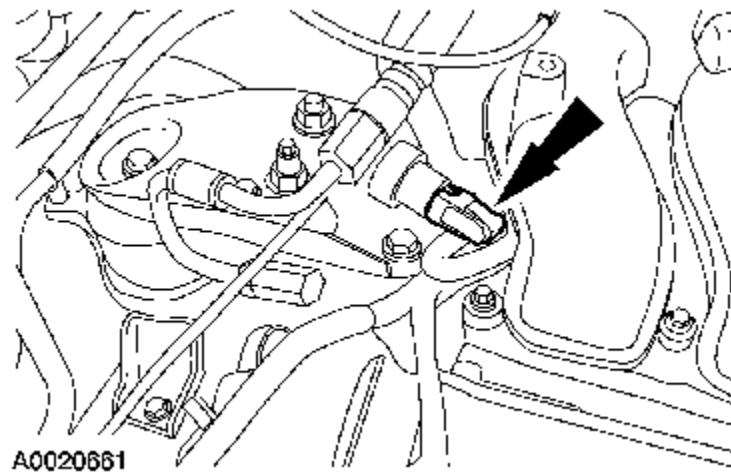
1. Disconnect the three vacuum hoses on the back of the intake manifold.
 - a. Connect the chassis vacuum hose.
 - b. Connect the engine vacuum hose.
 - c. Connect the positive crankcase ventilation (PCV) hose.



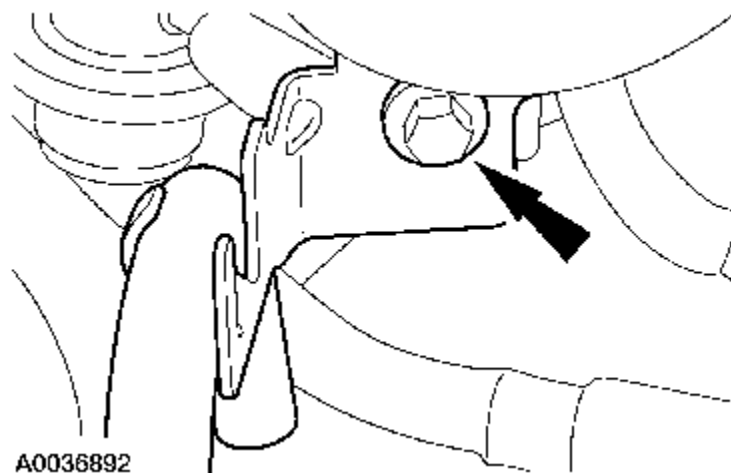
1. Disconnect the vapor management valve (VMV) vacuum hose.



1. Disconnect the two electrical connectors attached to the left side of the upper intake manifold.

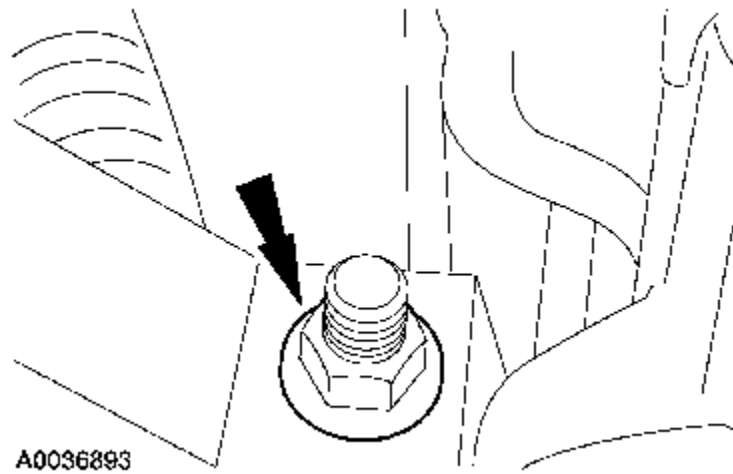


1. Disconnect the power steering pressure (PSP) sensor electrical connector.

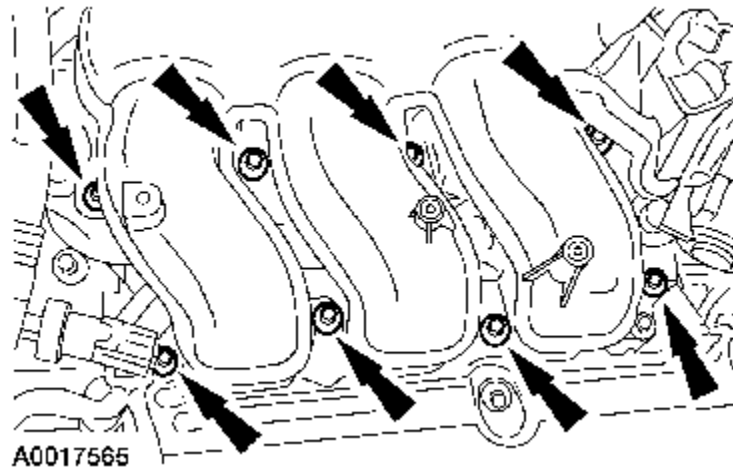


1. Position the transaxle vent hose and bracket aside.

- Remove the bolt,



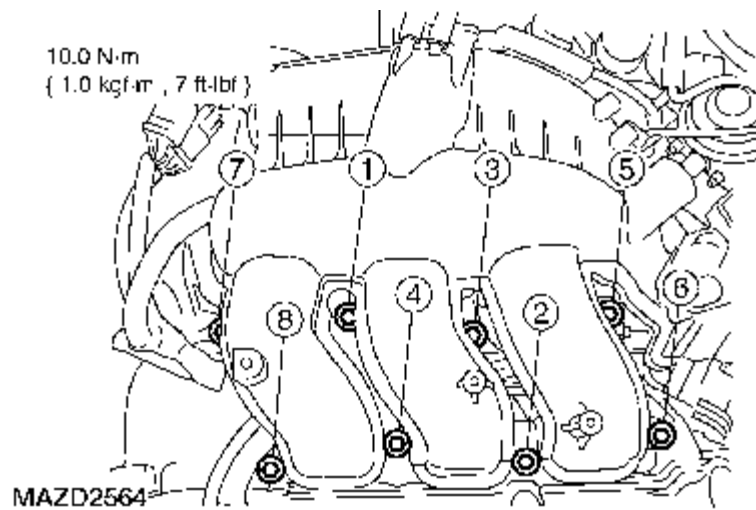
1. Remove the nut from the wire harness.



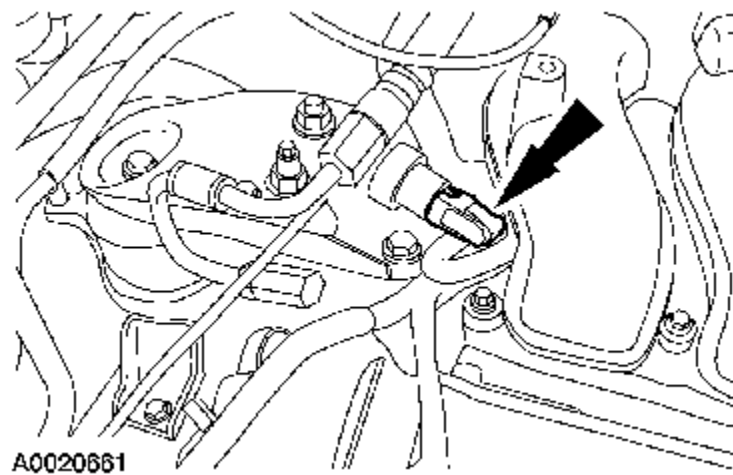
1. Remove the eight bolts and the upper intake manifold.
 - Remove and inspect the gaskets. Discard if damaged.
 - Clean all sealing surfaces.

Installation

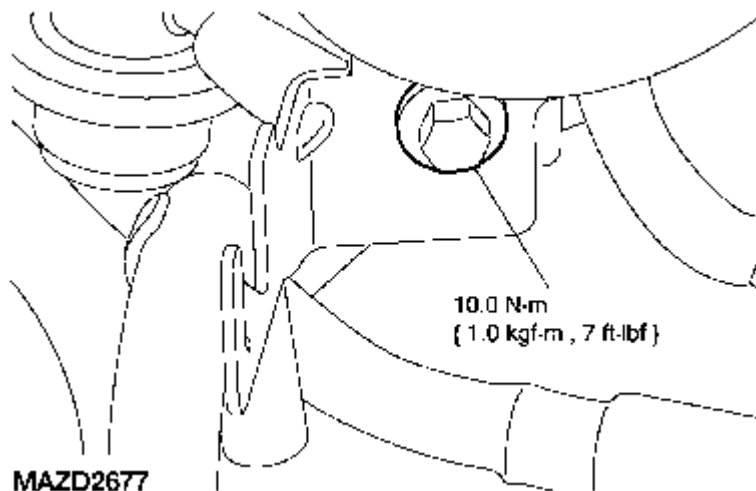
1. Position the gaskets in the upper intake manifold.



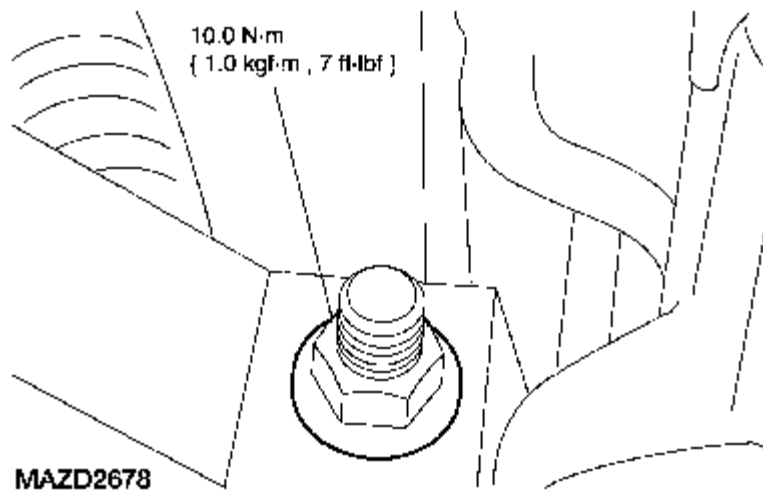
1. Position the upper intake manifold and tighten the bolts in the sequence shown.



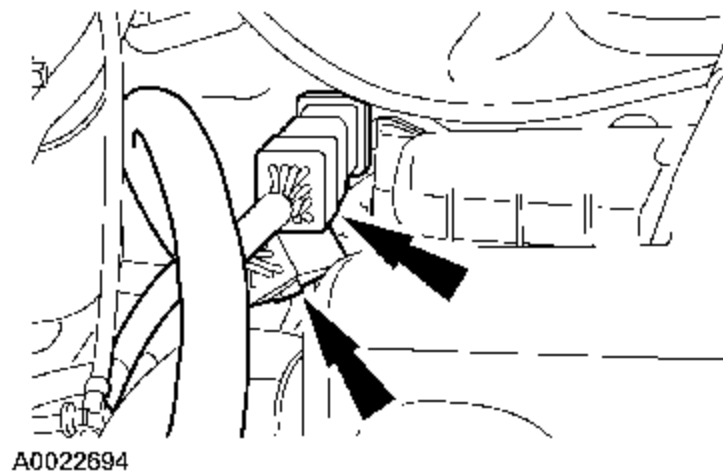
1. Connect the PSP electrical connector.



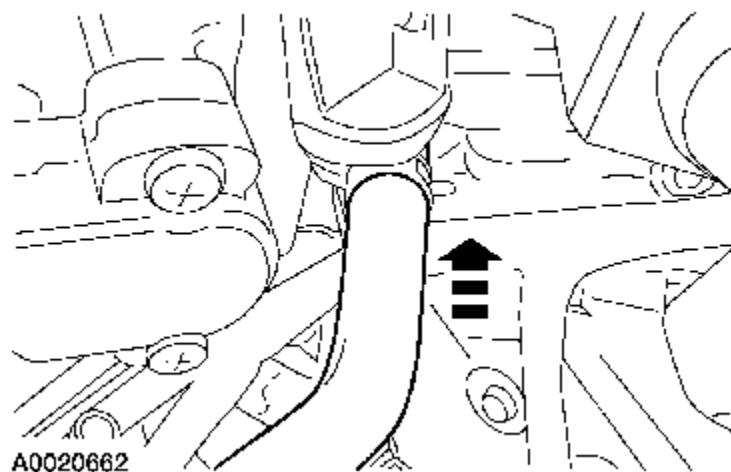
1. Install the transaxle vent tube and bracket.



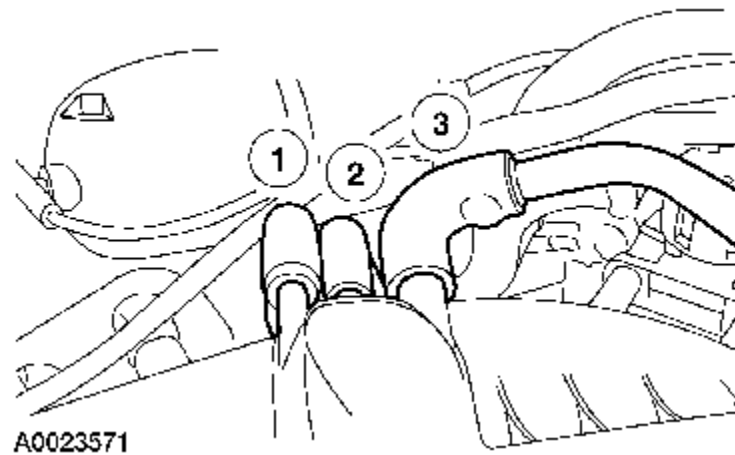
1. Position the wire harness and install the nut.



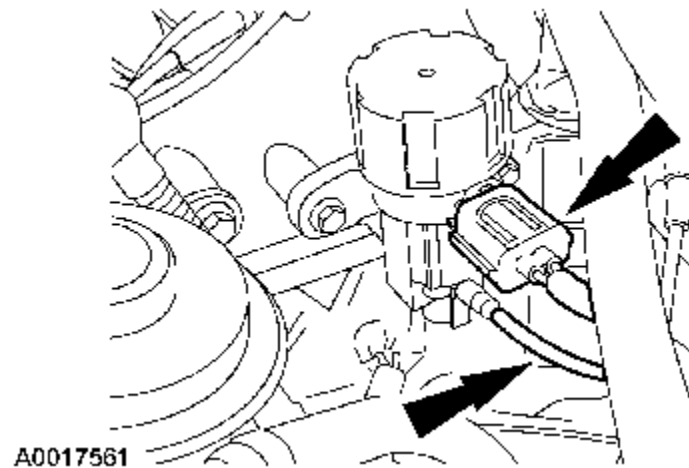
1. Install the two electrical connectors on the left side of the intake manifold.



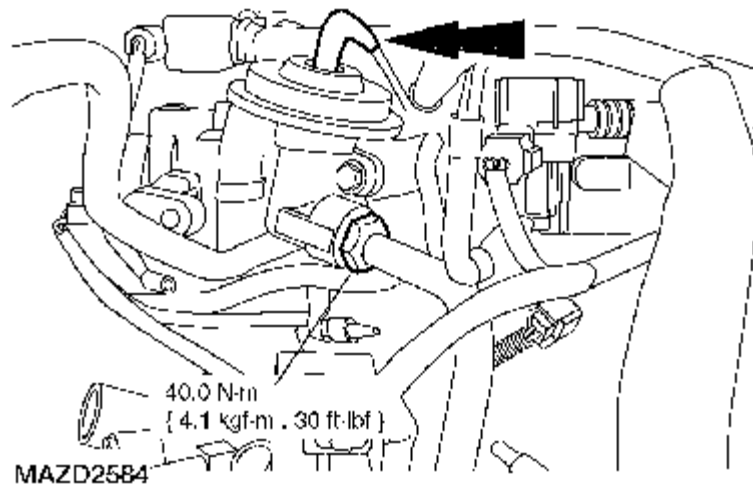
1. Install the vapor management valve (VMV) vacuum hose.



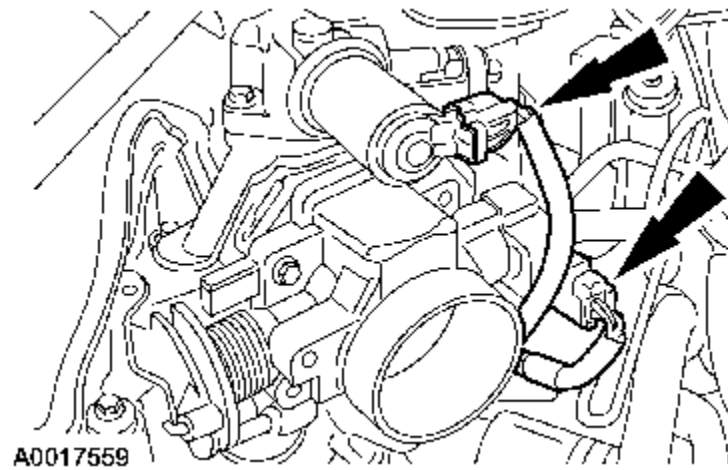
1. Connect the three vacuum hoses on the back of the upper intake manifold.
 - a. Connect the chassis vacuum hose.
 - b. Connect the engine vacuum hose.
 - c. Connect the PCV hose.



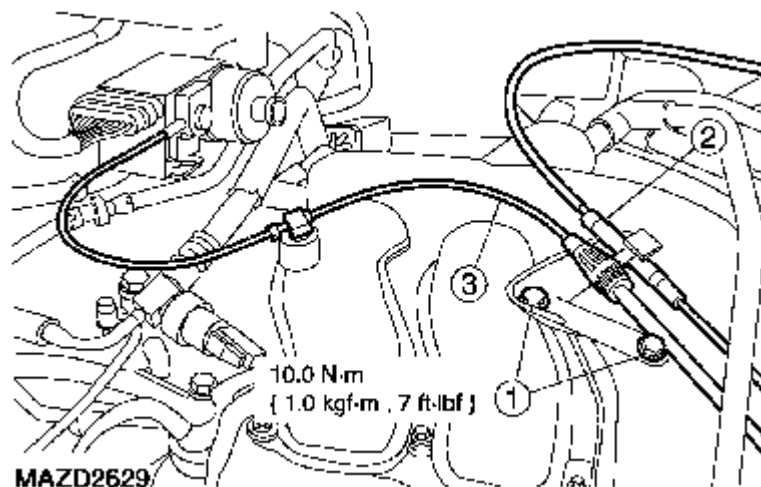
1. Connect the E.G.R. Vacuum regulator electrical connector.



1. Install the EGR valve vacuum hose and EGR tube nut.

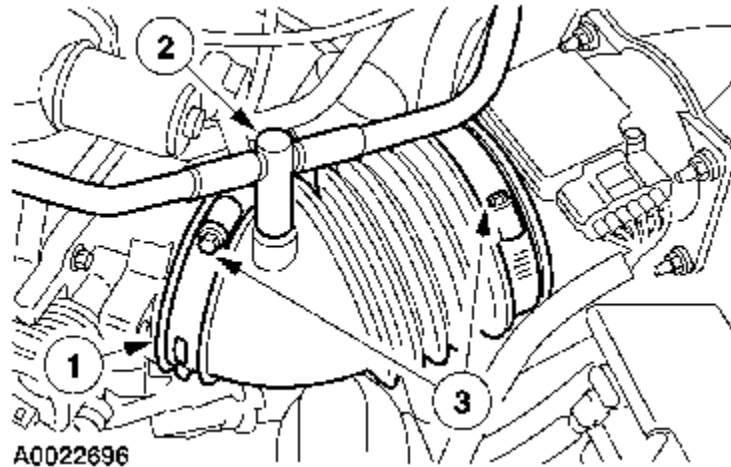


1. Connect the TP sensor and IAC electrical connectors.

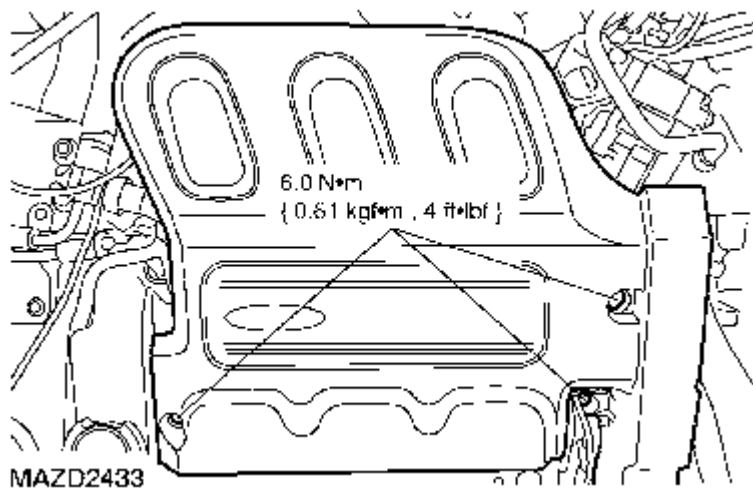


1. Connect the throttle cables.

- a. Install the throttle cable bracket bolts.
- b. Connect the throttle cable.
- c. If equipped, connect the cruise control cable.



1. Install the air cleaner outlet tube.
 - a. Position the air cleaner outlet tube.
 - b. Install the hoses.
 - c. Install the clamps.



1. Install the splash shield.

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VIN or Model Year 2002 - Model TRIBUTE - valve cover

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

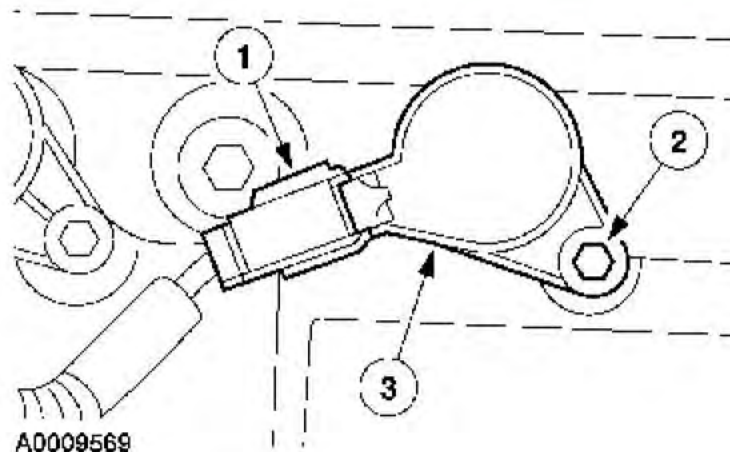
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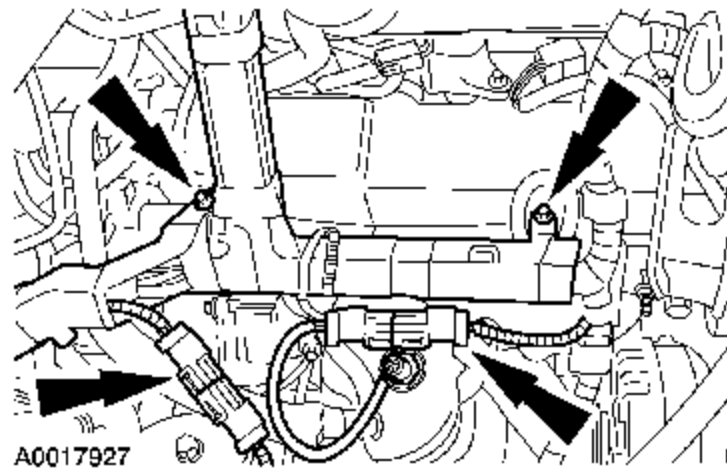
VALVE COVER — RH

Removal

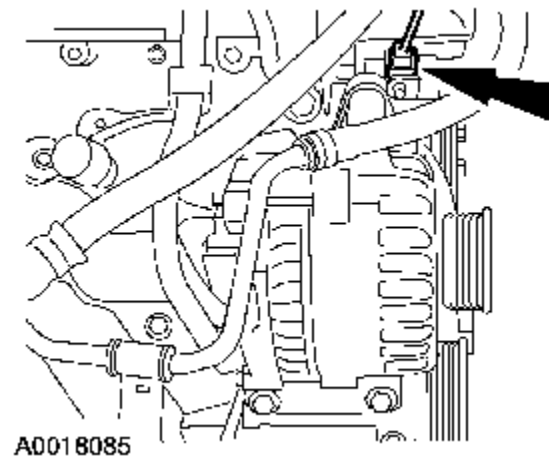
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



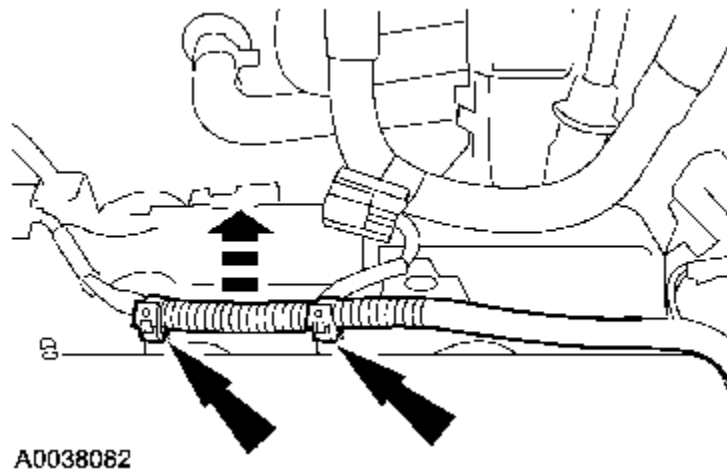
1. Remove the RH coil-on-plugs.
 - a. Disconnect the three electrical connectors.
 - b. Remove the three bolts.
 - c. Remove the RH coil-on-plugs.



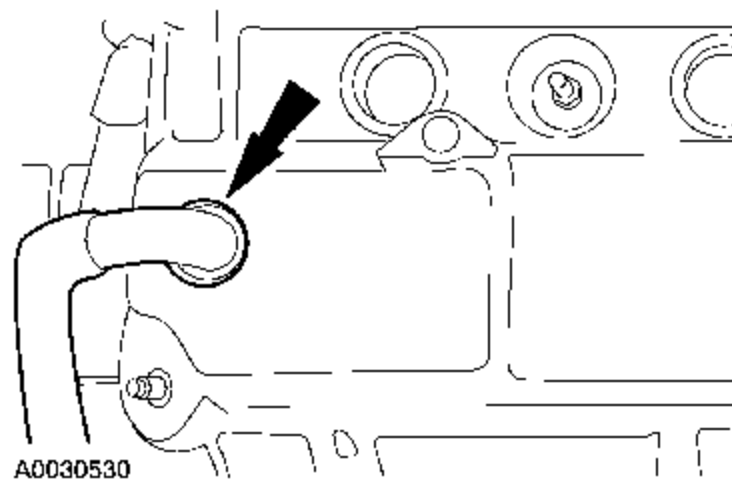
1. Remove the wiring harness nuts and disconnect the (O2) sensor electrical connectors.



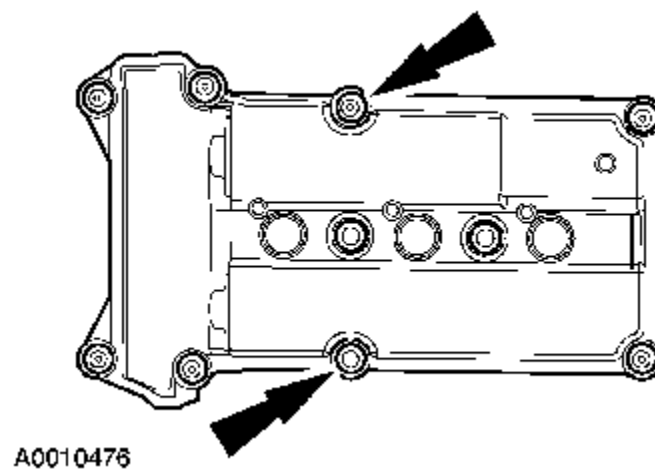
1. Disconnect the radio ignition interference capacitor.



1. Separate the harness from the center locating pins and position aside.



1. Disconnect the crankcase ventilation tube from the valve cover.



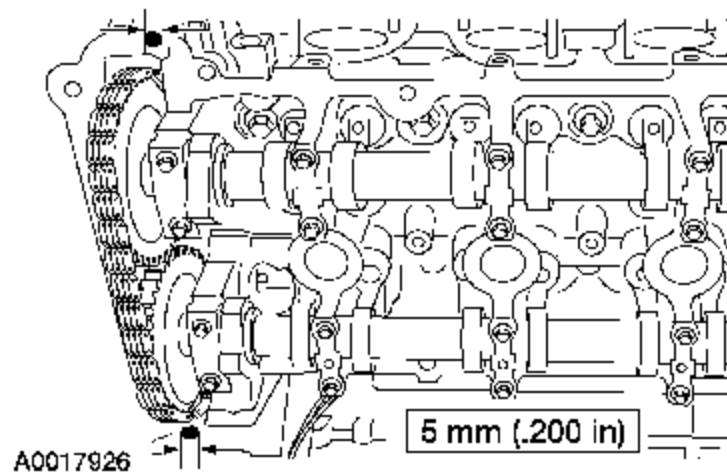
1. Remove the bolts, studs and the RH valve cover.
 - Remove and discard the gasket.

Installation

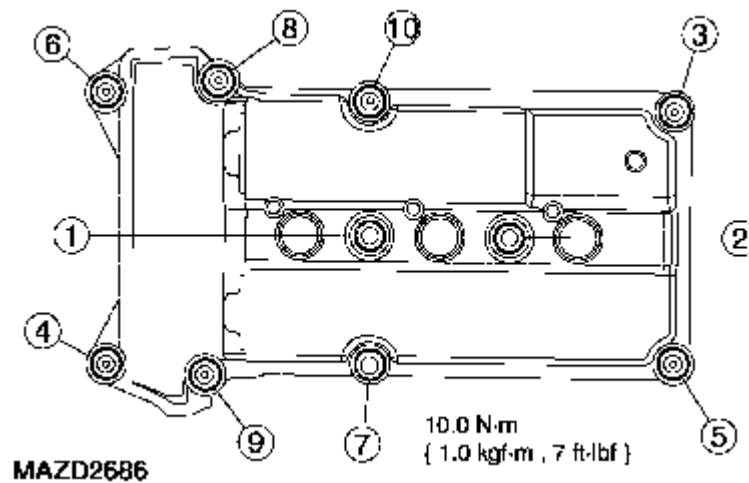
NOTE:

The valve cover must be installed and the bolts tightened within six minutes of applying the sealant.

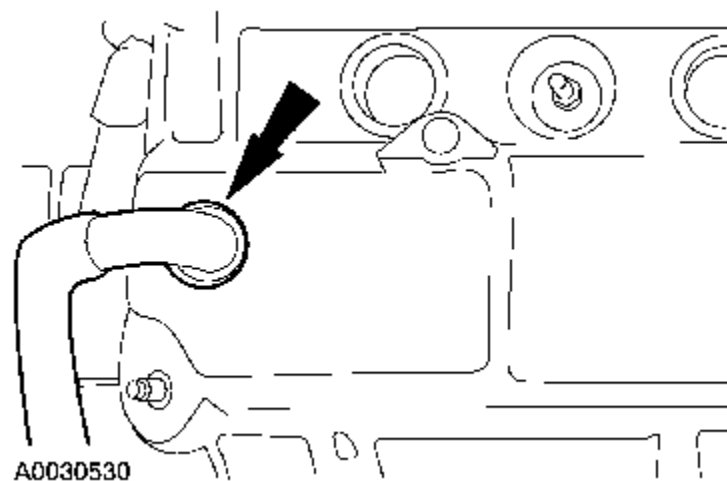
1. Install a new valve cover gasket if damaged.



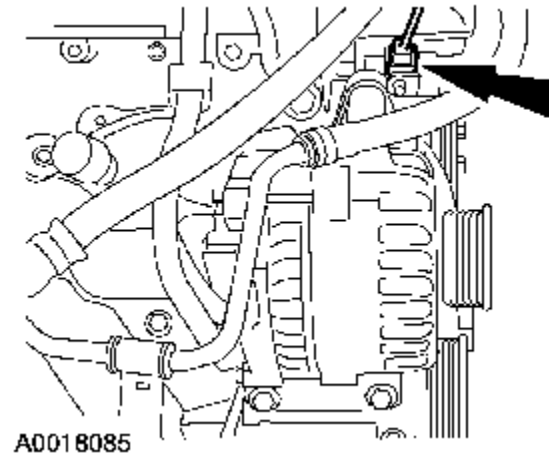
1. Apply a 5 mm dot of silicone gasket sealant to the front cover to cylinder head joints.



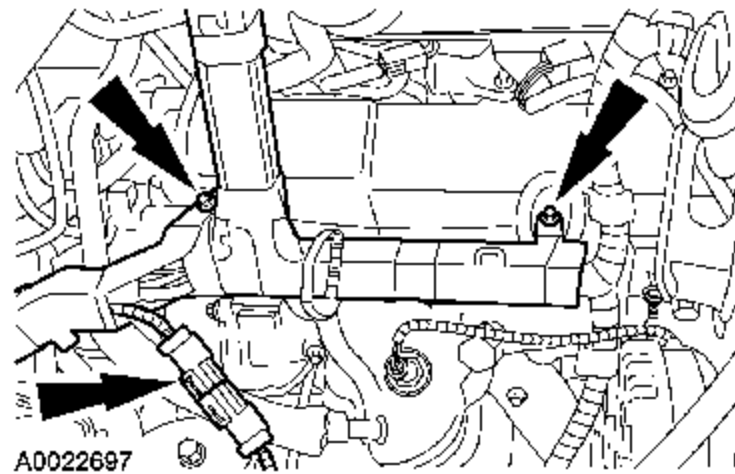
1. Position the valve cover and install the bolt and the studs in the sequence shown.



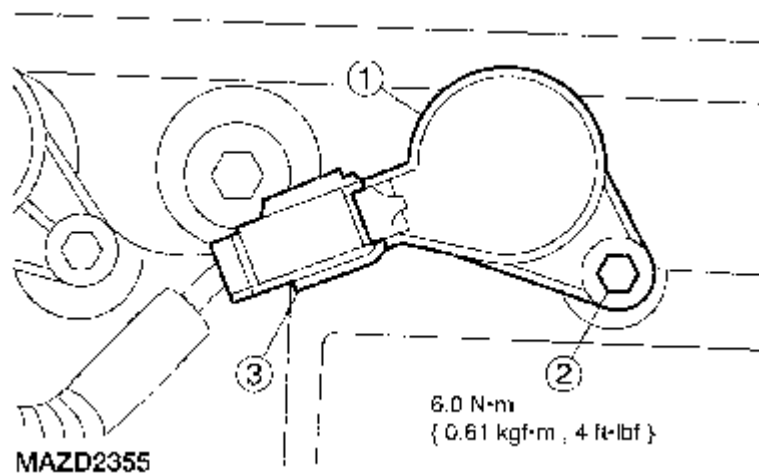
1. Connect the crankcase ventilation tube to the valve cover.



1. Connect the radio ignition interference capacitor.



1. Connect the (O2) sensor electrical connectors and wiring harness to the the RH valve cover stud.



1. Install the RH coil-on-plugs.
 - a. Position the RH coil-on-plugs.
 - b. Install the three bolts.
 - c. Connect the three electrical connectors.
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

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VIN or Model Year 2002 - Model TRIBUTE - valve seals

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

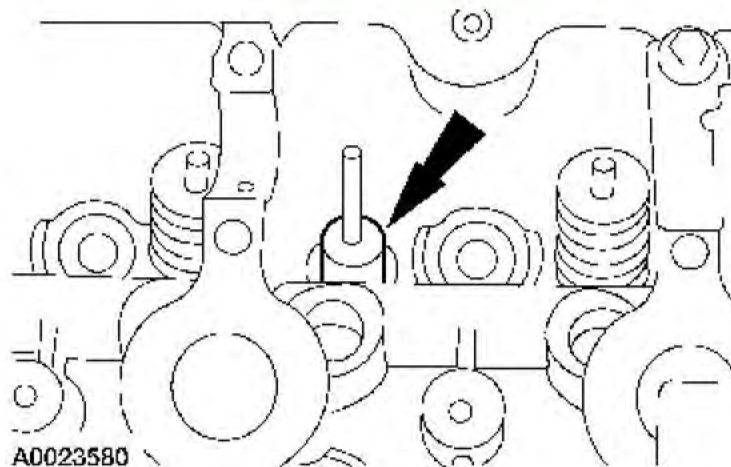
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VALVE SEALS

Removal

1. Remove the valve spring. Refer to [01-10C VALVE SPRING](#).



- 1.

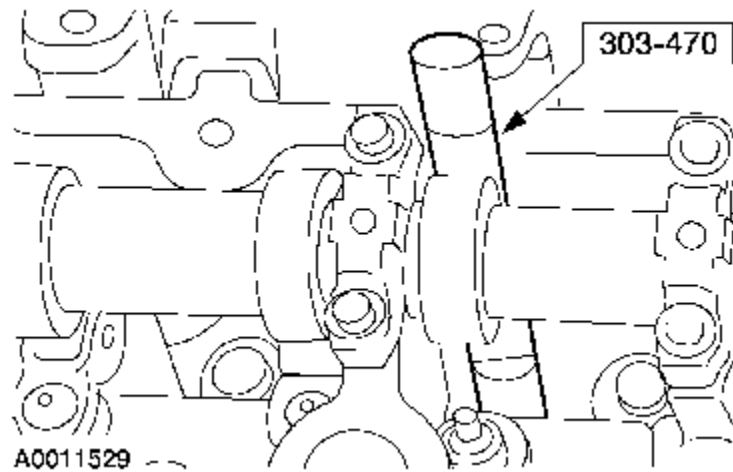
NOTE:

Camshaft removed for clarity. Remove the valve seal.

Installation

NOTE:

Lubricate the valve guide with SAE 5W-20 motor oil.



1. Using the special tool, install the valve seal.
2. Install the valve spring. Refer to [01-10C VALVE SPRING](#).

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VIN or Model Year 2002 Model TRIBUTE valve spring 1[General Information](#) ☐ [Engine](#) ☐ [Suspension](#) ☐ [Transmission/Transaxle](#) ☐ [HVAC](#) ☐ [V](#)
[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restraints](#) ☐ [Bo](#)[< Previous](#) [Next >](#)

2002 - Tribute - Workshop Manual - Engine

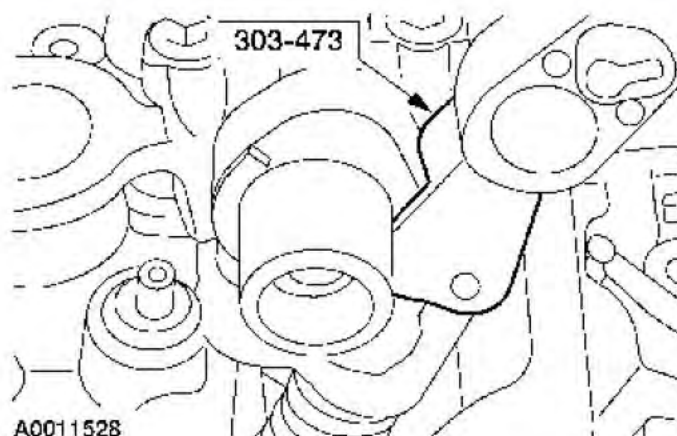
VALVE SPRING

Removal and Installation

1. Remove the roller followers. Refer to [01-10C ROLLER FOLLOWERS](#).
- 2.

NOTE:

If air pressure has forced the piston to the bottom of the cylinder, any loss of air pressure will allow the valve(s) to fall into the cylinder. A rubber band, tape or string wrapped around the end of the valve stem will prevent this from happening. Pressurize the cylinder using compressed air.



1. Using the special tool, remove the key, retainer, and valve spring.
2. To install, reverse the removal procedure.

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APPENDIX 18

18a Copy of Repair Procedures

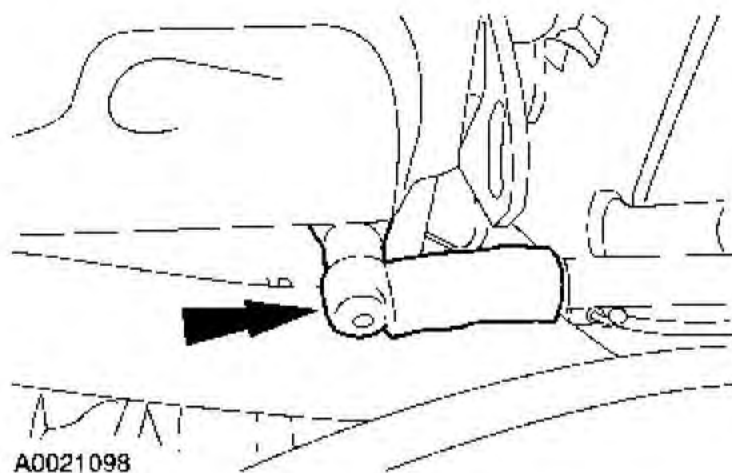
2003 Tribute Tribute

VIN or Model Year 2003 Model TRIBUTE accelerator cable bracket☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

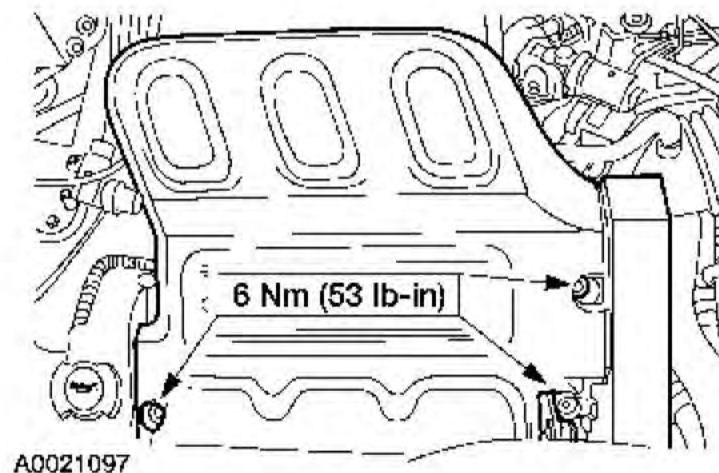
2003 - Tribute - Workshop Manual - Engine

ACCELERATOR CABLE BRACKET

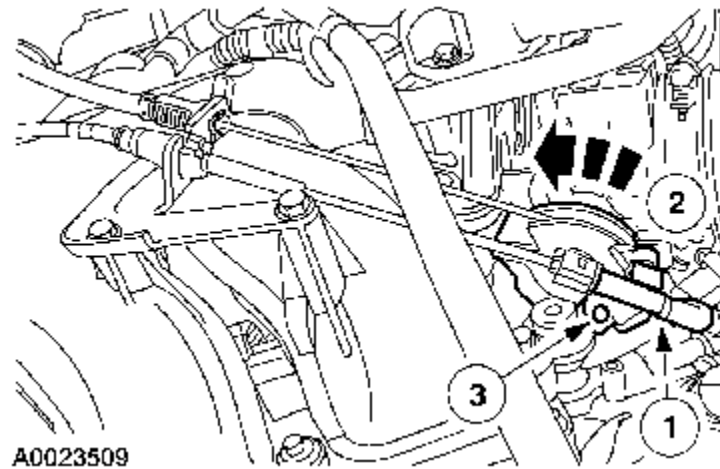
Removal and Installation



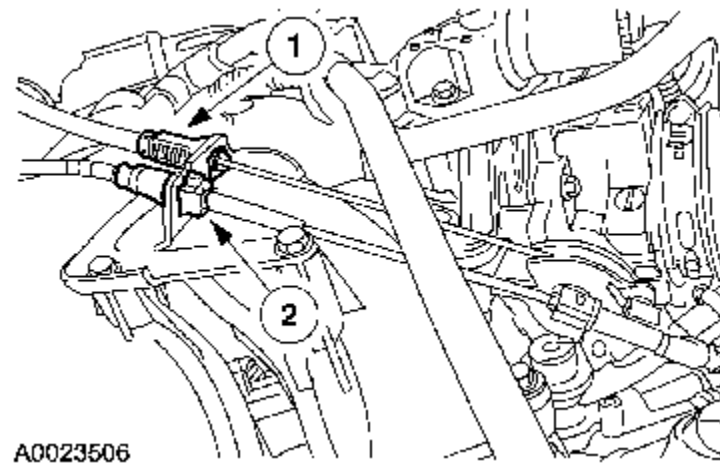
1. Disconnect the crankcase ventilation hose.



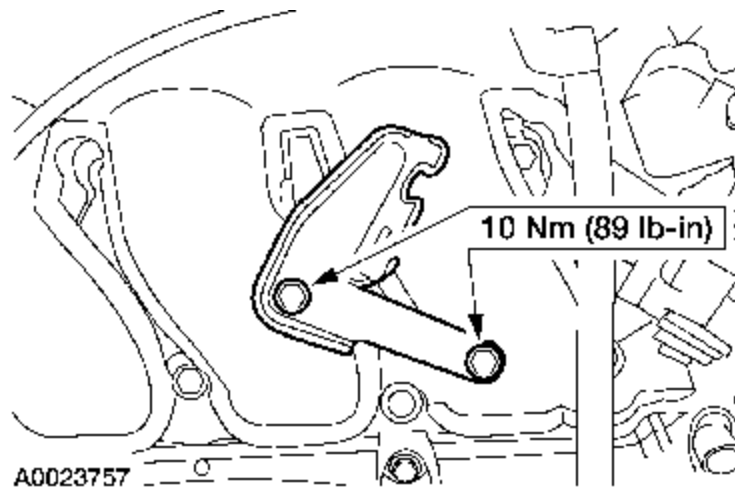
1. Remove the bolt, nuts and the engine appearance cover.



1. Disconnect the throttle control linkage from the throttle lever.
 - a. If equipped, disconnect the cruise control cable from the throttle lever.
 - b. Rotate the throttle lever.
 - c. Slide the accelerator cable end out of the throttle lever.



1. Disconnect the throttle control linkage from the accelerator cable bracket.
 - a. Disconnect the accelerator cable from the bracket.
 - b. If equipped, squeeze the tabs and disconnect the cruise control cable from the accelerator cable bracket.



1. Remove the bolts and the accelerator cable bracket.
2. To install, reverse the removal procedure.

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**Mazda Service**[Home](#) [View Content](#) [Other Applications](#) [As Built Data](#) [MyMazda](#) [IDS](#) [Training](#) [Return To Search Results](#)VIN or Model Year 2003 - Model TRIBUTE - camshafts

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

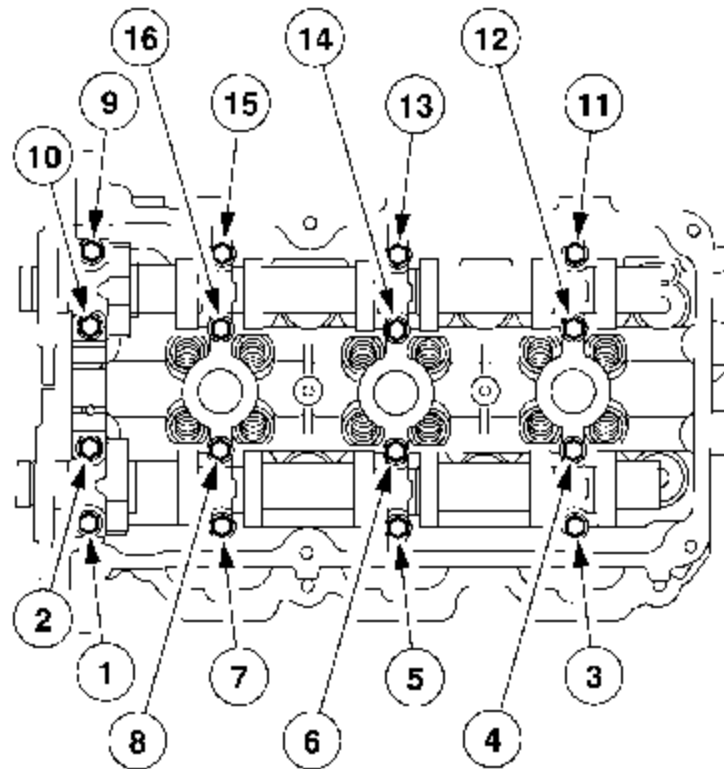
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2003 - Tribute - Workshop Manual - Engine

CAMSHAFTS — RH

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

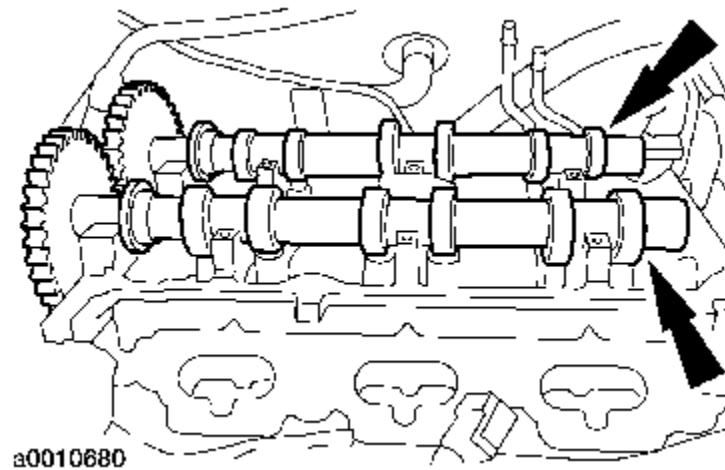


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1.

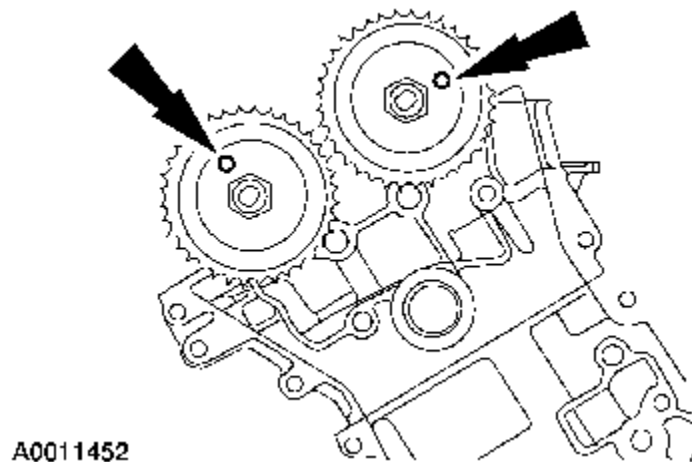
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the RH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



1. Remove the camshafts.

Installation

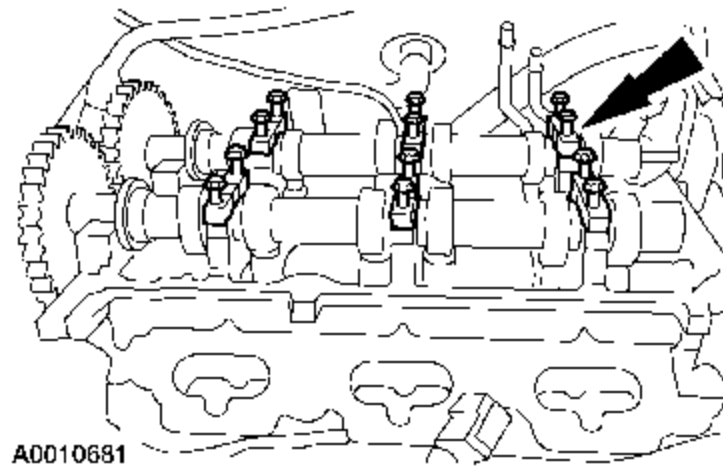


- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

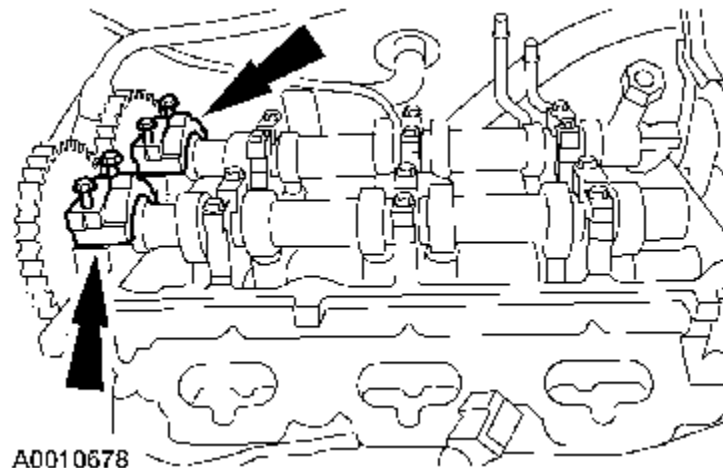
- a. Align the camshafts as shown.



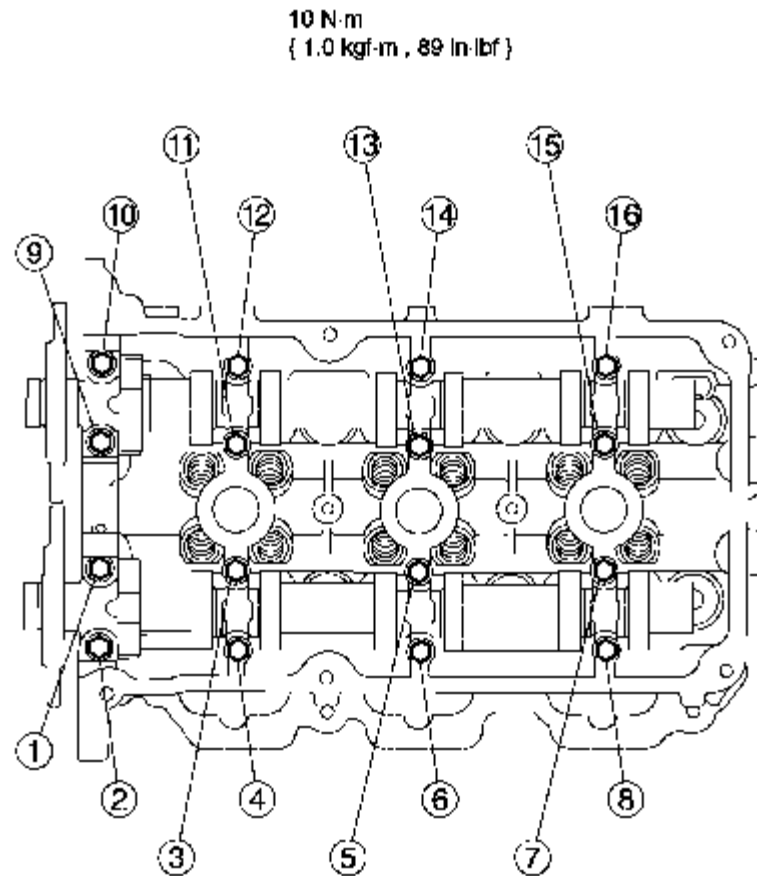
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil and install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil . Install the bearing thrust caps and loosely install the bolts.

**MAZD2356**

1. Tighten the bolts in the sequence shown.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

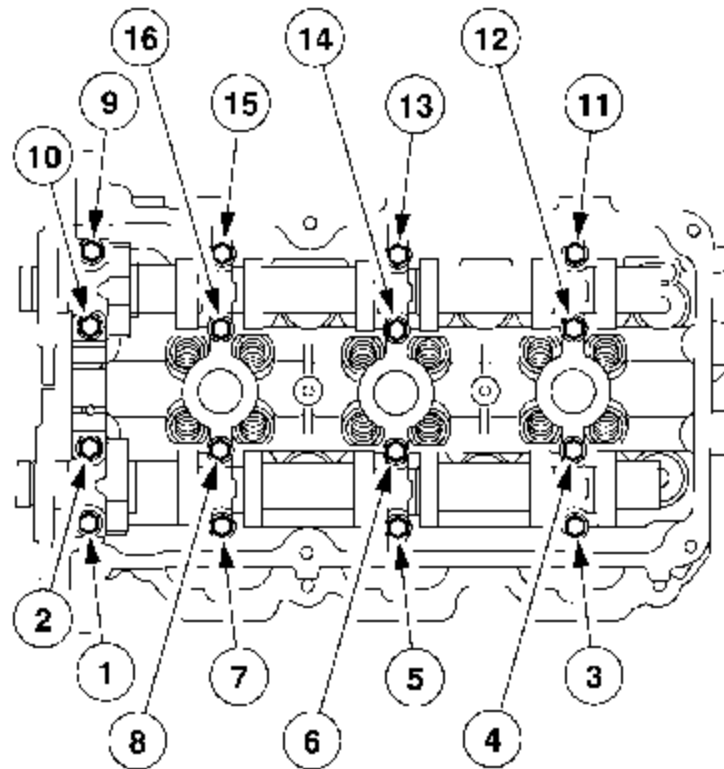
[< Previous](#) [Next >](#)

2003 - Tribute - Workshop Manual - Engine

CAMSHAFTS — RH

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

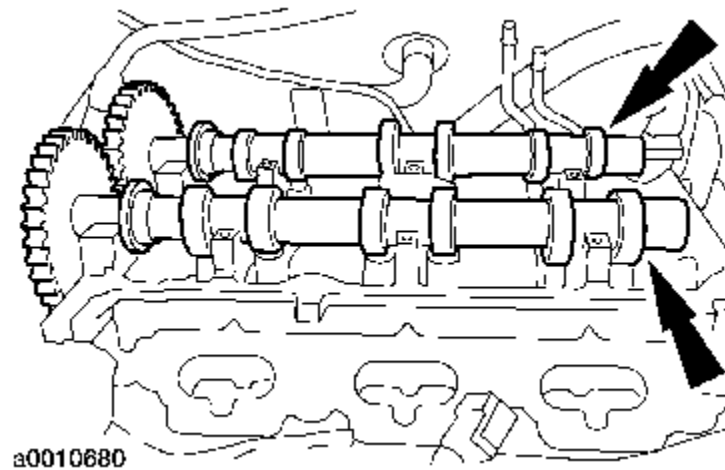


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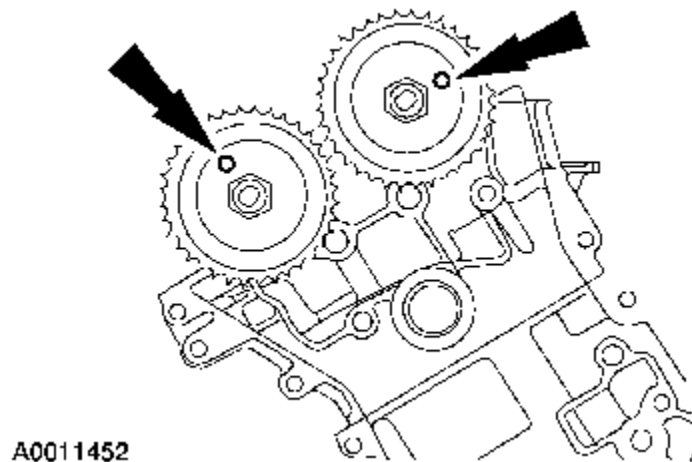
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the RH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



1. Remove the camshafts.

Installation

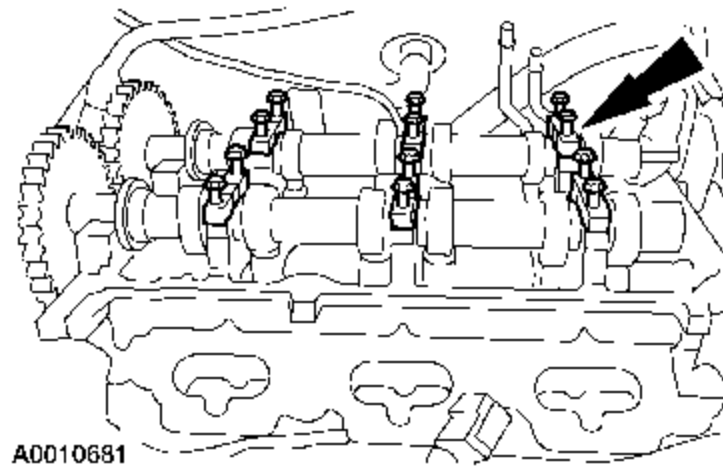


- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

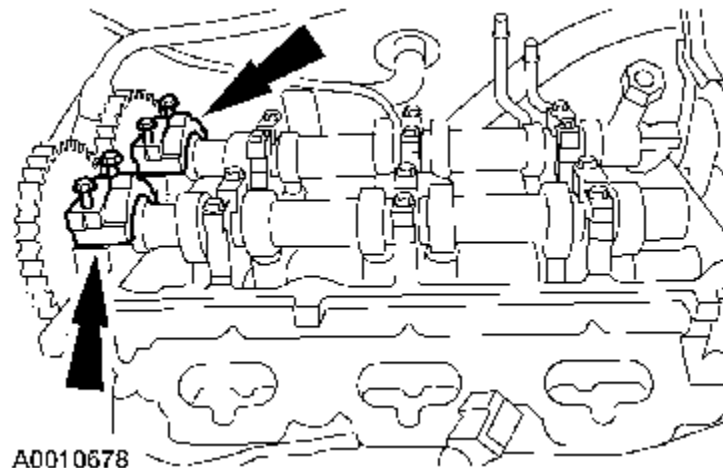
- a. Align the camshafts as shown.



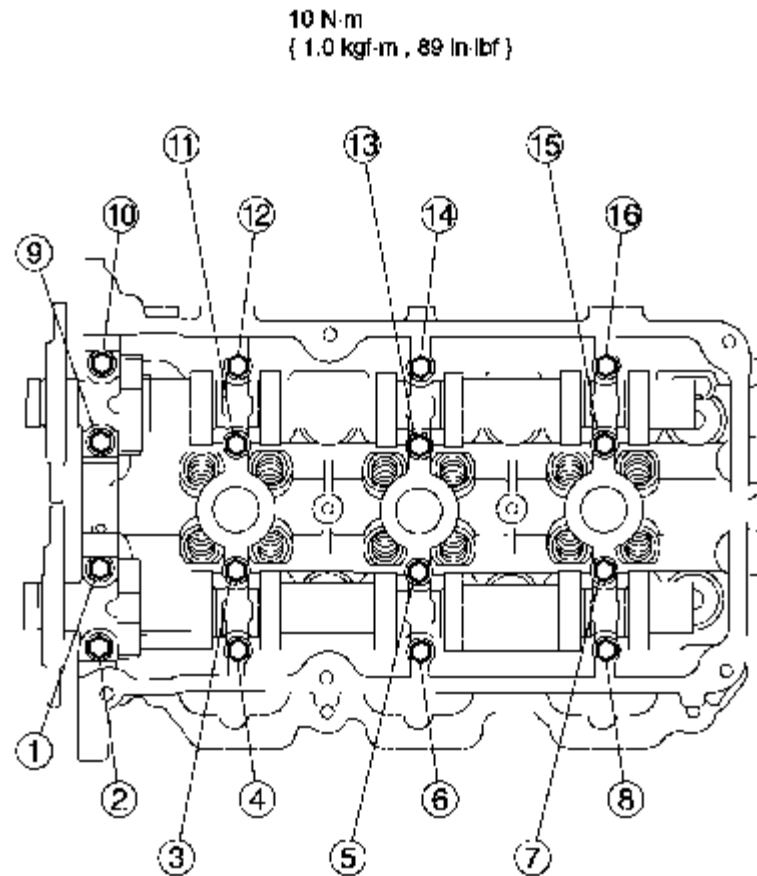
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil and install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil . Install the bearing thrust caps and loosely install the bolts.

**MAZD2356**

1. Tighten the bolts in the sequence shown.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2003 Model TRIBUTE hydraulic lash adjuster
General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

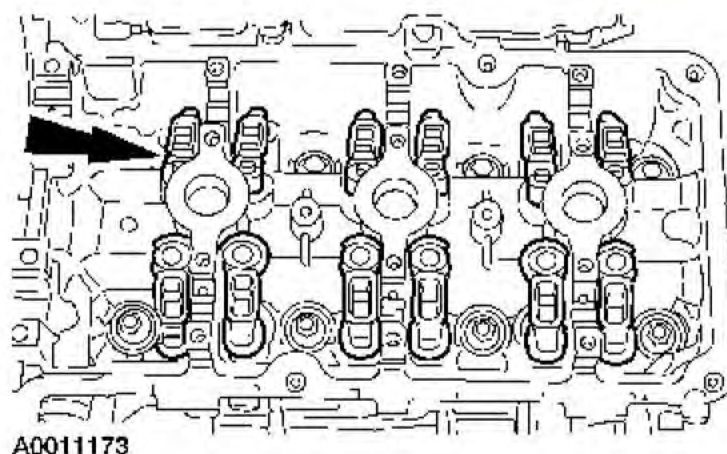
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2003 - Tribute - Workshop Manual - Engine

CYLINDER HEAD — LH

Removal

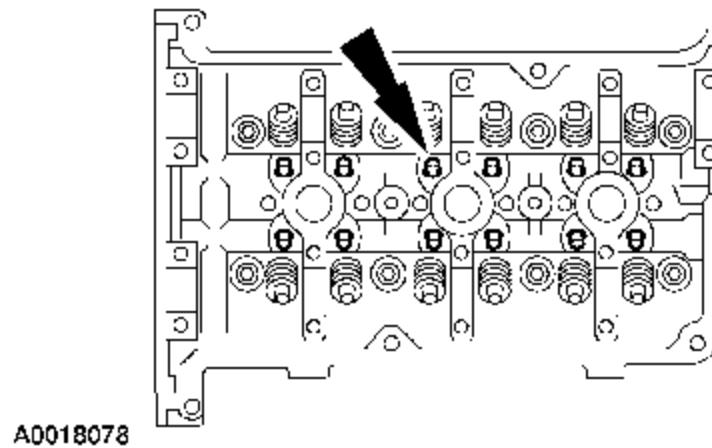
1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).



1.

CAUTION:

The camshaft followers must be installed in their original position. Remove the camshaft followers.



1.

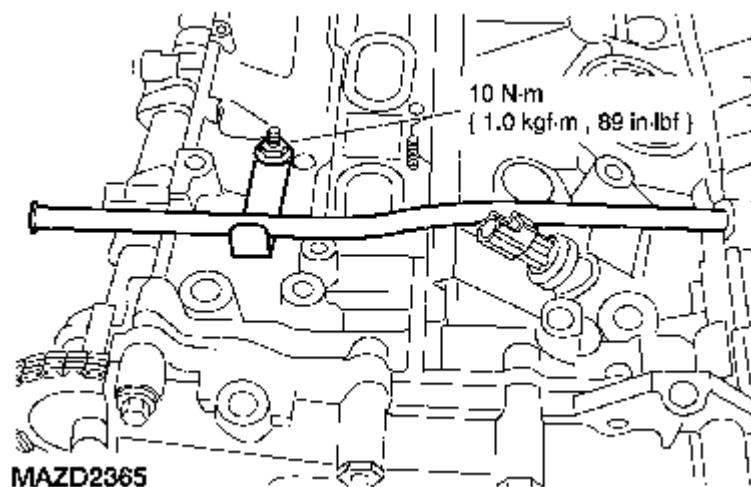
CAUTION:

The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Position the water pump and housing aside. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)

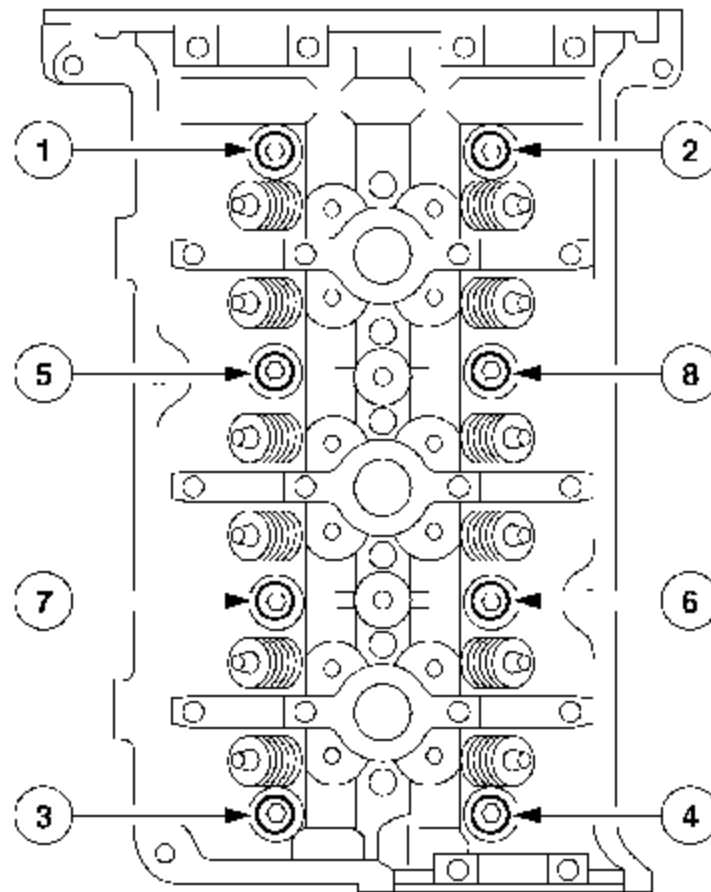
3. Raise the vehicle.

4. Remove the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



1. Remove the oil level indicator tube nut.

2. Lower the vehicle.



A0017922

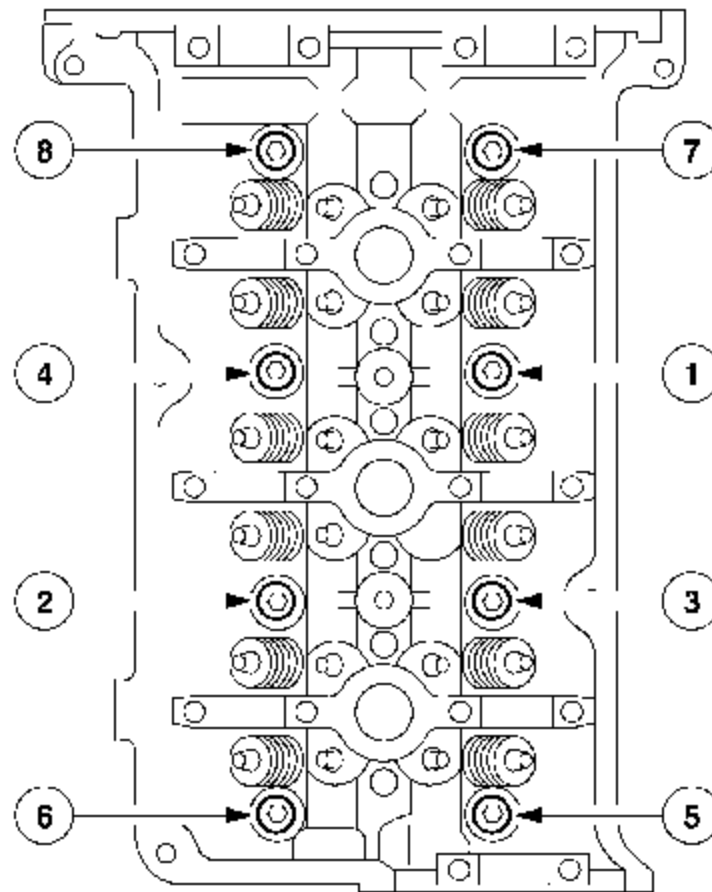
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- a. Discard the gasket and the bolts.

Installation



A0017924

1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

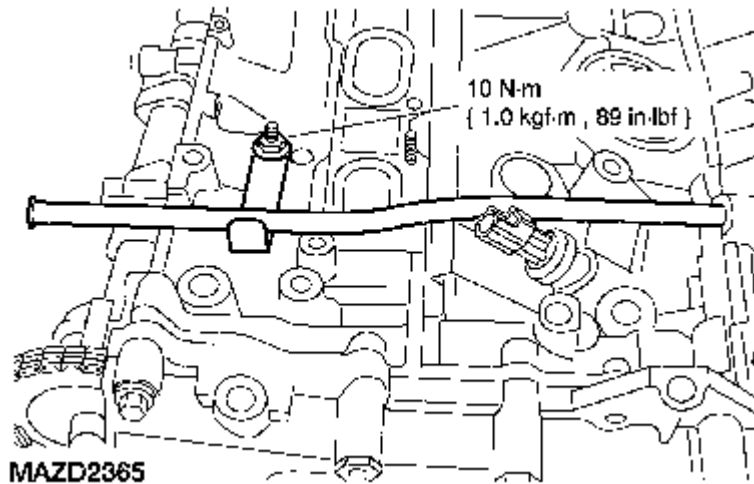
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

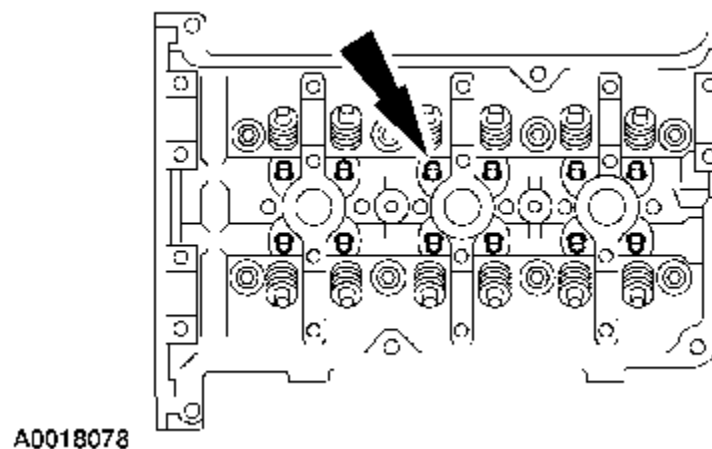
Position the LH cylinder head, gasket and install the bolts in the sequence shown.

- a. Tighten the bolts in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).

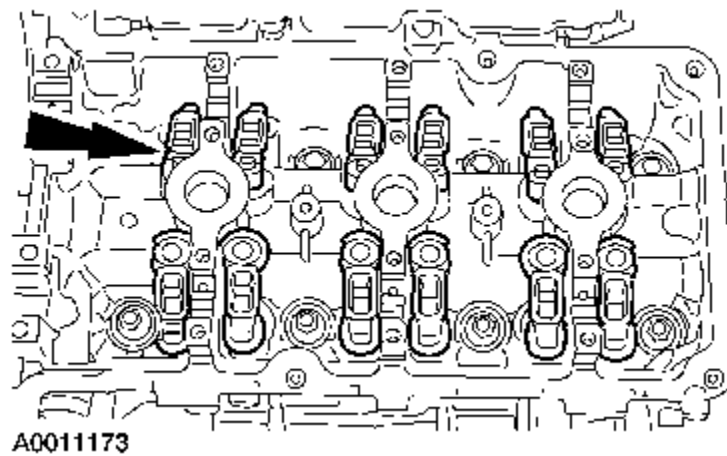
- c. Stage 2: Tighten bolts 90 degrees.
 - d. Stage 3: Loosen one full turn.
 - e. Stage 4: Tighten to 40 Nm (30 lb-ft).
 - f. Stage 5: Tighten 90 degrees.
 - g. Stage 6: Tighten 90 degrees.
- 2. Install the water pump. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)
 - 3. Raise the vehicle.
 - 4. Install the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



- 1. Install the oil level indicator tube nut.
- 2. Lower the vehicle.



1. Install the hydraulic lash adjusters.
 - a. Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.
 - a. Lubricate the camshaft followers with SAE 5W-20 motor oil.
2. Install the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).
3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
4. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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VIN or Model Year 2003 Model TRIBUTE hydraulic lash adjuster
 General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
 Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐

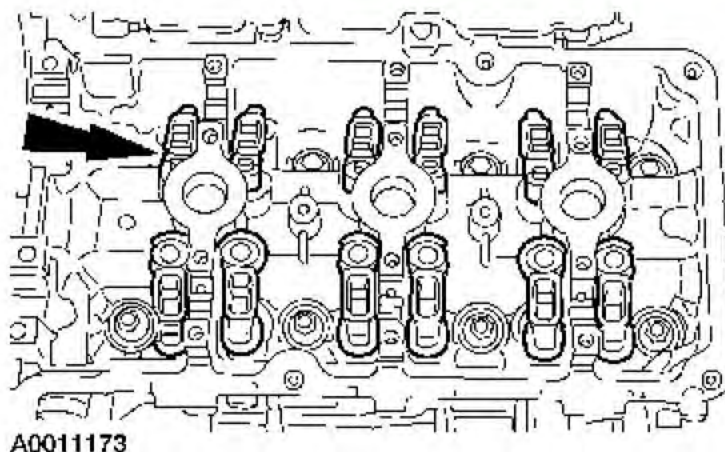
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2003 - Tribute - Workshop Manual - Engine

CYLINDER HEAD — RH

Removal

1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).
4. Remove the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

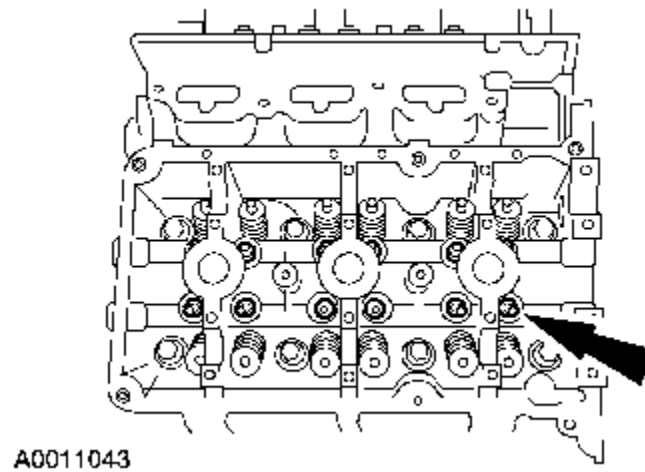


1.

CAUTION:

The camshaft followers must be installed in their original positions. Remove the camshaft

followers.

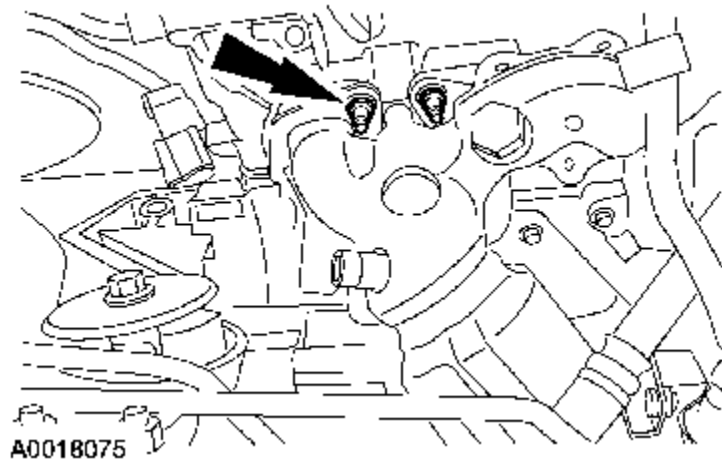


1.

CAUTION:

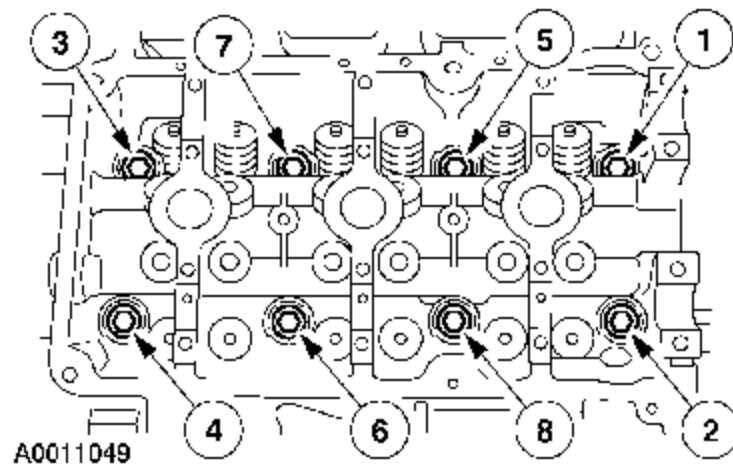
The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Raise the vehicle.



1. Remove the six nuts from the RH exhaust manifold.

2. Lower the vehicle.



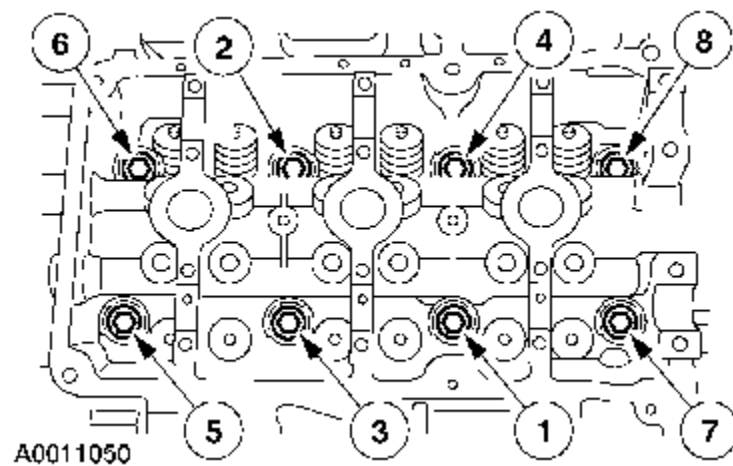
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- Discard the gasket and the bolts.

Installation



1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

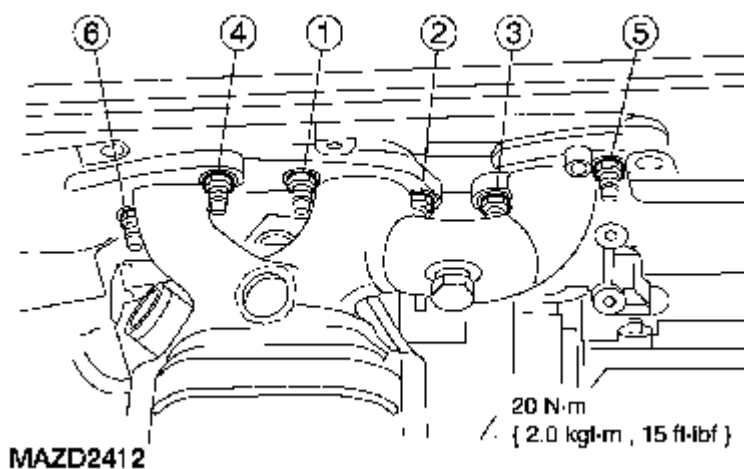
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

Position the RH cylinder head, gasket and install the bolts in the sequence shown.

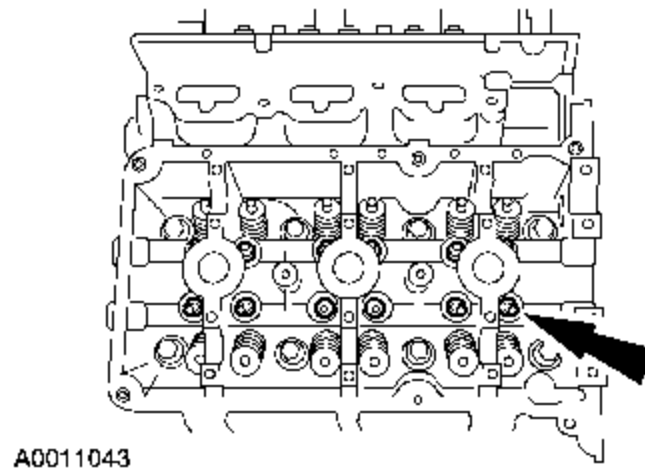
- Tighten the bolts in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten bolts 90 degrees.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.

2. Raise the vehicle.



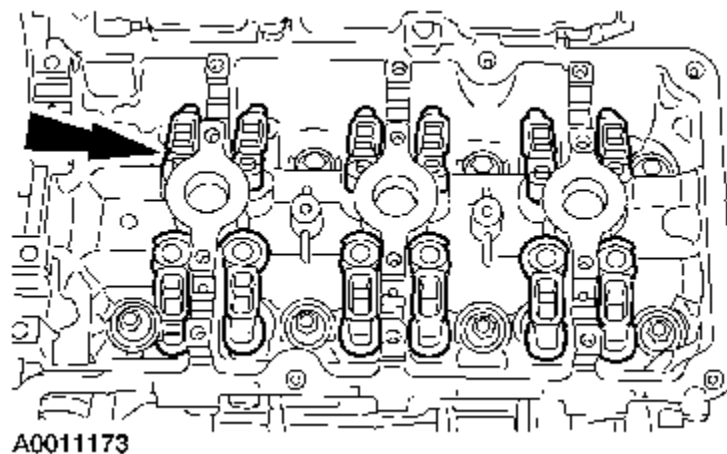
1. Install RH exhaust manifold nuts in the sequence shown.

2. Lower the vehicle.



1. Install the hydraulic lash adjusters.

- Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.

- Lubricate the camshaft followers with SAE 5W-20 motor oil.

2. Install the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).

4. Install the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).

5. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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VIN or Model Year 2003 Model TRIBUTE engine assemblyGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

2003 - Tribute - Workshop Manual - Engine

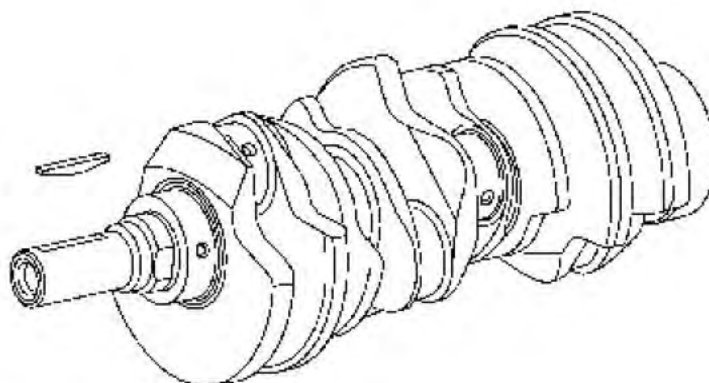
ENGINE

Assembly

1.

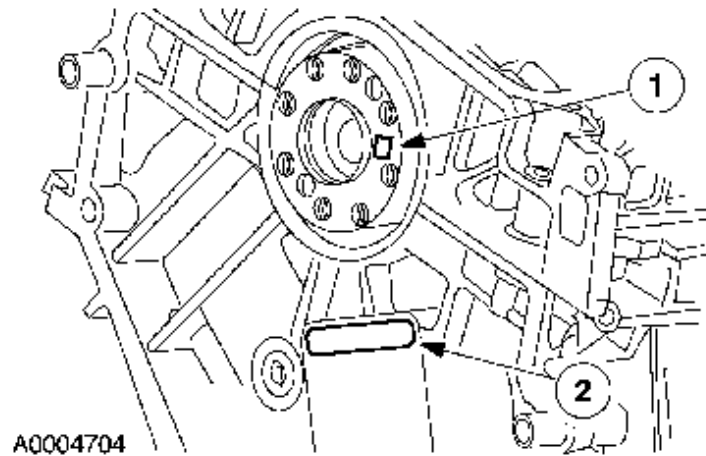
WARNING:

Eye protection is required to be worn during the use of compressed air. Failure to wear eye protection could result in possible personal injury. Clean gasket material, dirt and foreign material from the cylinder block. Wash the cylinder block with a suitable soap and water solution, and dry with compressed air.



A0004226

1. If removed, install the crankshaft key into the keyway on the crankshaft.



1.

NOTE:

This procedure is for selecting bearings using a new crankshaft. Select the crankshaft main bearings for each crankshaft journal.

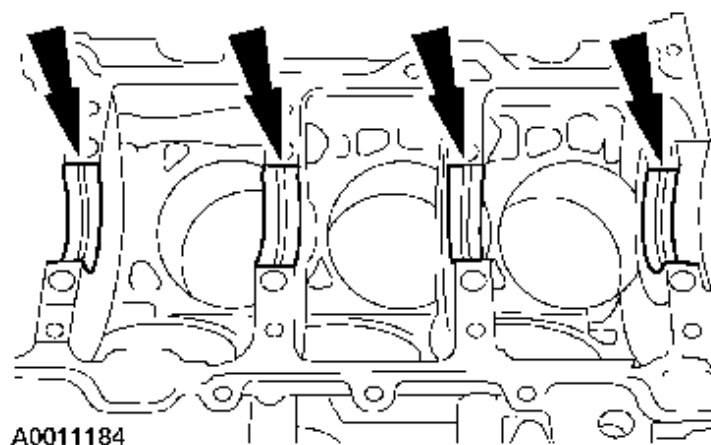
- a. Read the code on the crankshaft flange.
- b. Read the code on the cylinder block rear face.
 - The first two numbers after the asterisk make up the code for main No. 1 and the next two numbers for main No. 2.
 - The first two numbers after the second asterisk make up the code for main No. 3 and the last two numbers for main No. 4.

	BLOCK CODE																							
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
CRANKSHAFT CODE	91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
	88	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	87	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
	86	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
	85	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
	84	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3
	83	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3
	82	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
	81	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	80	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	79	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
	78	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
	77	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
	76	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	75	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
	74	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
	73	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
	72	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
	71	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	70	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	69	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	68	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

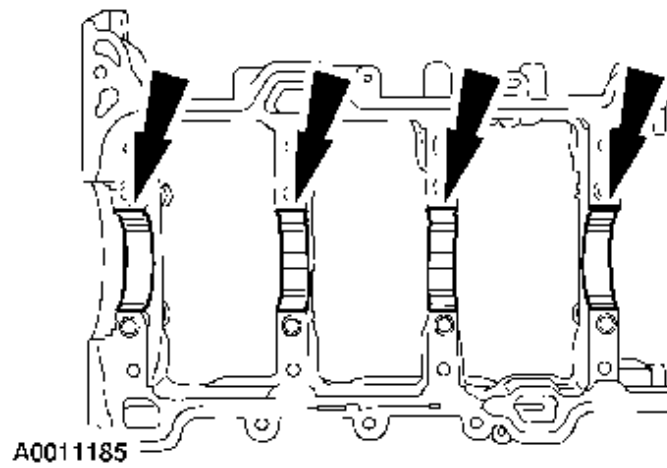
A0004705

1. Using the chart, choose a bearing for each main. Match the block and crankshaft code with its corresponding column or row, by reading across the "crankshaft" row and down the "block" column.

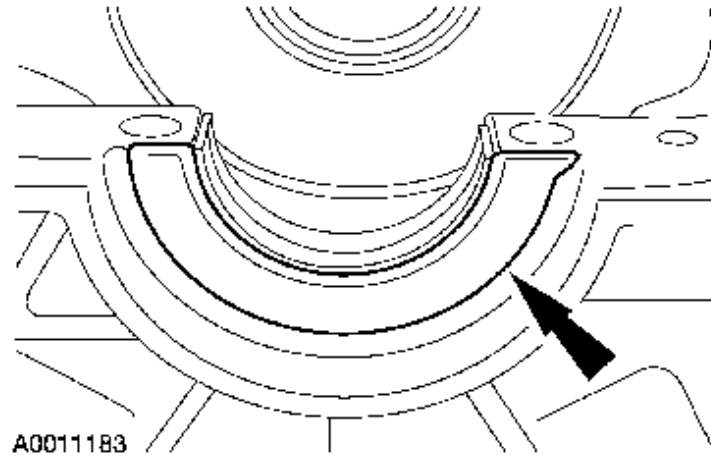
- For example: If the block code is *0609*0711* and the crankshaft code is *8480*8082*, main No. 1 should use grade 1 bearings, as determined by the intersection of the 06 block column and the 84 crankshaft row. Mains 2,3 and 4 should all be grade 2.



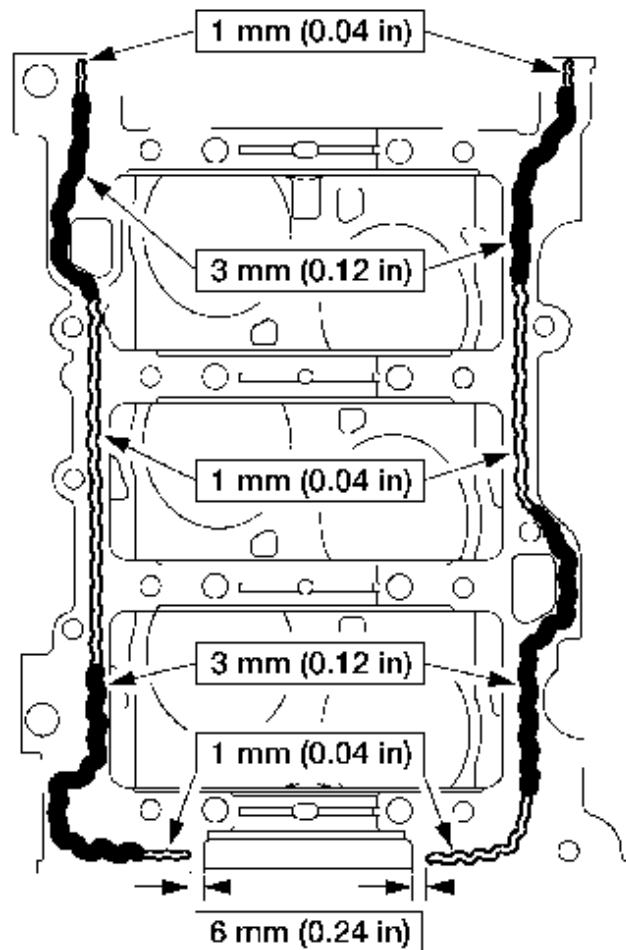
1. Install the main bearings into the cylinder block.



1. Install the main bearings into the lower cylinder block.

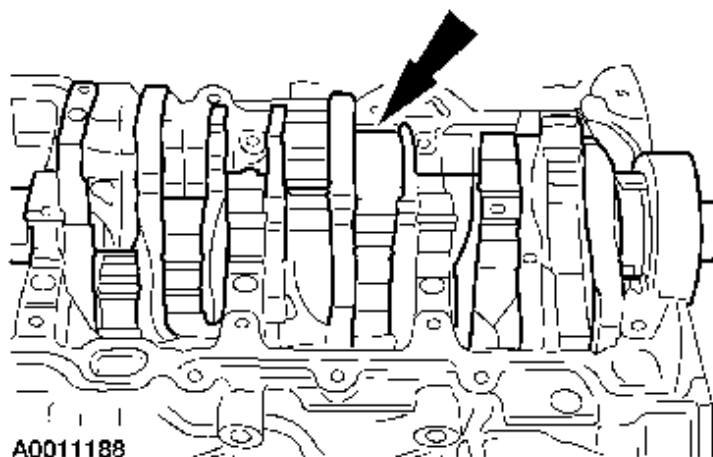


1. Install the crankshaft thrust bearing.



A0011187

1. Apply SAE 5W-20 motor oil to the crankshaft main and rod bearing journals.



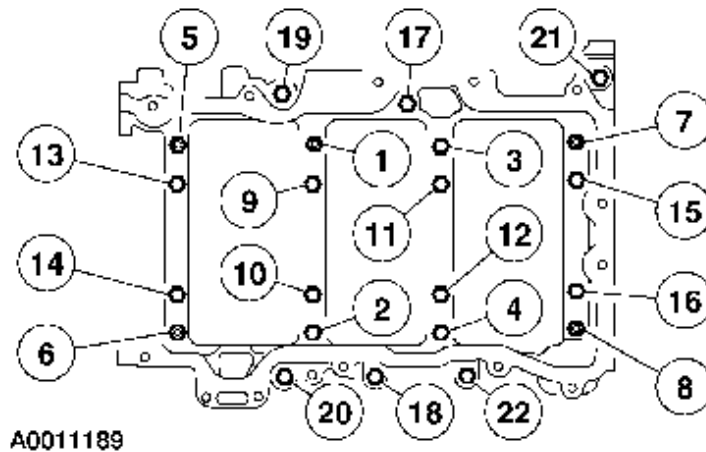
A0011188

1. Position the crankshaft in the cylinder block.

2.

CAUTION:

The lower cylinder block must be installed and the bolts tightened within four minutes of applying the sealant. Apply Silicone Gasket and Sealant to the cylinder block as shown.

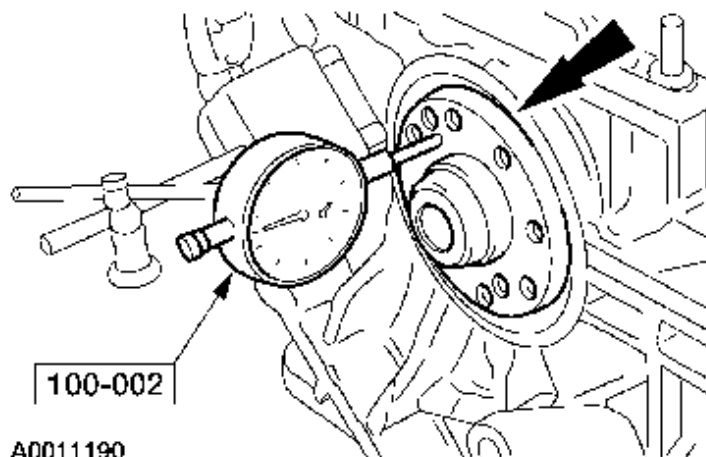


1.

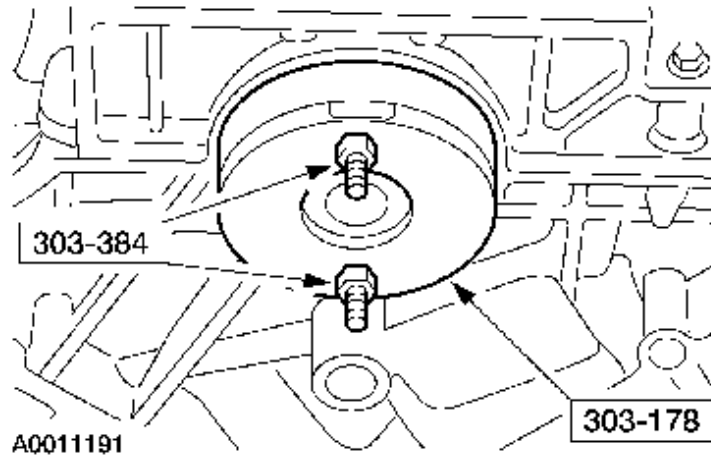
CAUTION:

Fasteners No. 1, 5, 6, 7, 8 are studs. Fasteners No. 18–22 are M8 x 1.25 mm x 79.3 mm (0.05 in x 3.12 in) bolts. Fasteners No. 2–4, 17 are M8 x 1.25 mm x 95.3 mm (0.05 in x 3.75 in) bolts. Fasteners 9–16 are M10 x 1.5 mm x 106 mm (0.06 in x 4.17 in) bolts. The bolts and studs must be installed in the correct position or engine damage may result. Position the lower cylinder block and install the bolts and studs.

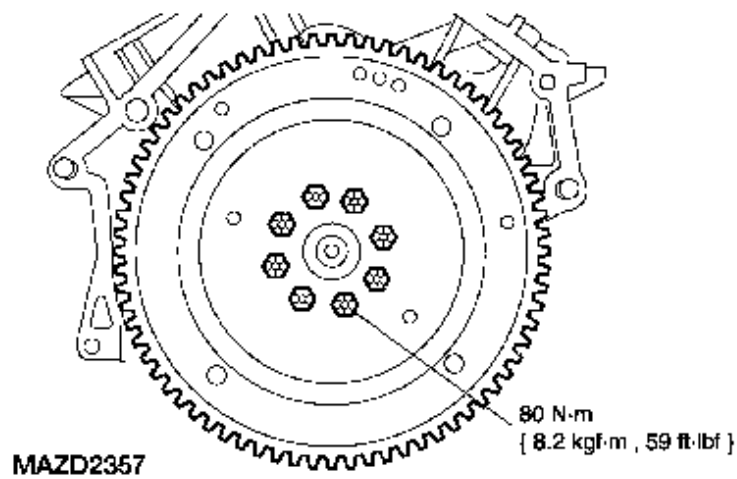
- Tighten the bolts and studs in the sequence shown in four stages.
- Stage 1: Tighten fasteners 1–8 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.
- Stage 2: Tighten fasteners 9–19 to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 3: Tighten fasteners 1–16 90 degrees.
- Stage 4: Tighten fasteners 17–22 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.



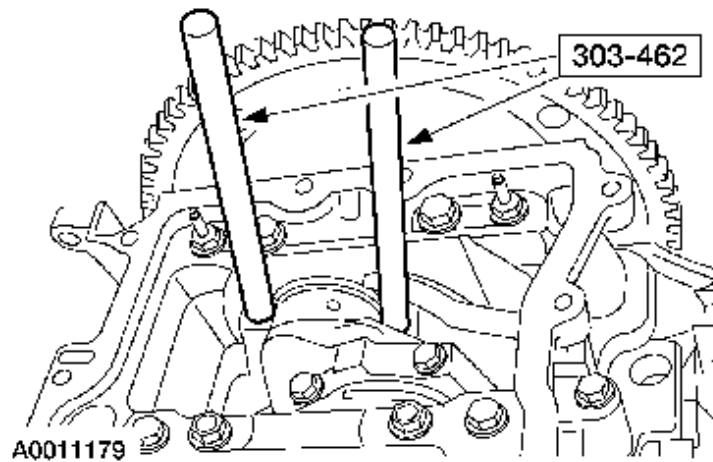
1. Using the special tool, measure the crankshaft end play. Refer to — [01-10A CRANKSHAFT END PLAY](#).



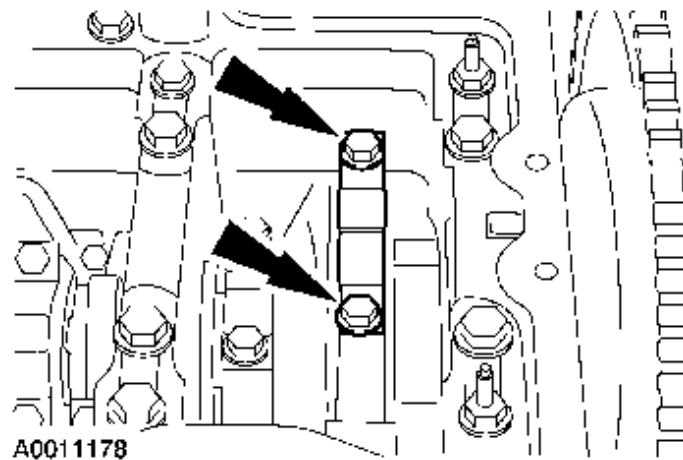
1. Using the special tool, install the crankshaft rear oil seal.



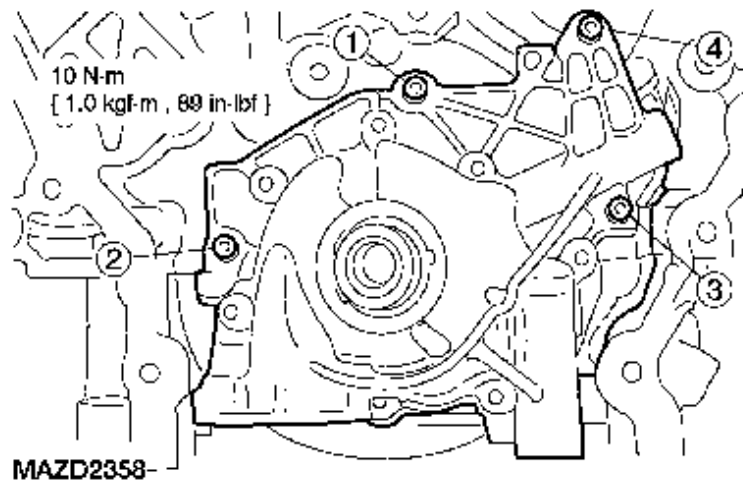
1. Position the flexplate and install the bolts.
2. Mount the engine on an engine stand.
3. Apply SAE 5W-20 motor oil to the cylinder bores.



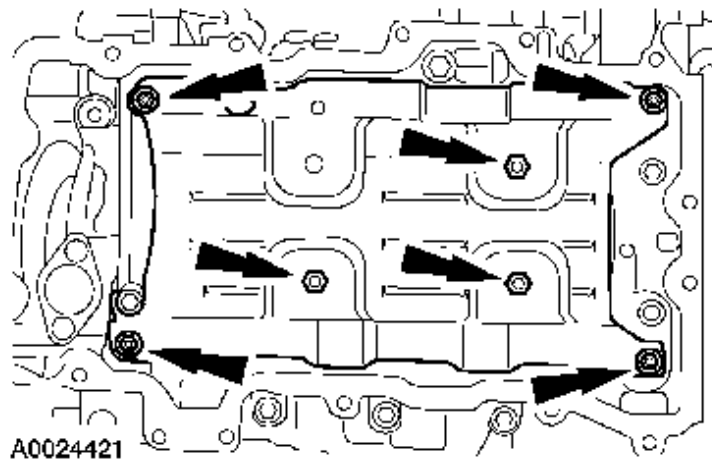
1. Using the special tools, install the piston and connecting rod assemblies.
2. Check connecting rod bearing clearance. Refer to — [01-10A CONNECTING ROD BEARING JOURNAL CLEARANCE](#)



1. Install the connecting rod caps and bolts.
 - Tighten the bolts in two stages.
 - Stage 1: Tighten to 23 N•m {2.3 kgf•m , 17 ft•lbf}.
 - Stage 2: Tighten to 43 N•m {4.4 kgf•m , 32 ft•lbf}.

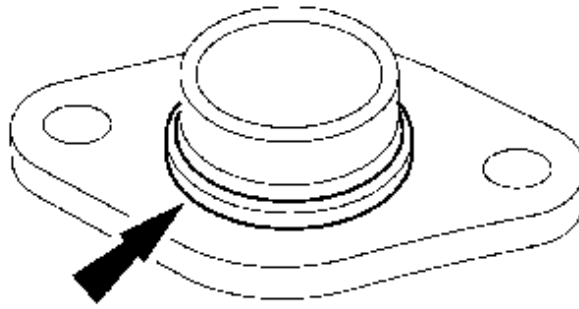


1. Position the oil pump and install the bolts in the indicated sequence.



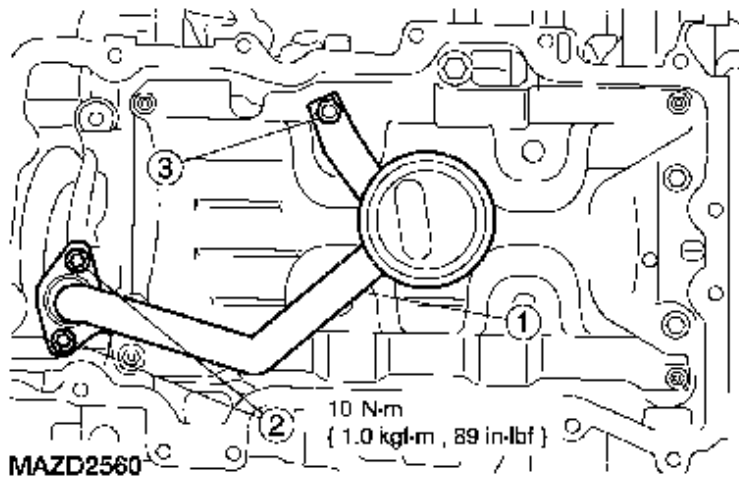
1. Position the oil pan baffle and install the nuts.

- Tighten the nuts in two stages.
- Stage 1: Tighten to 5 N·m {0.5 kgf·m, 44 in·lbf}.
- Stage 2: Tighten 45 degrees.

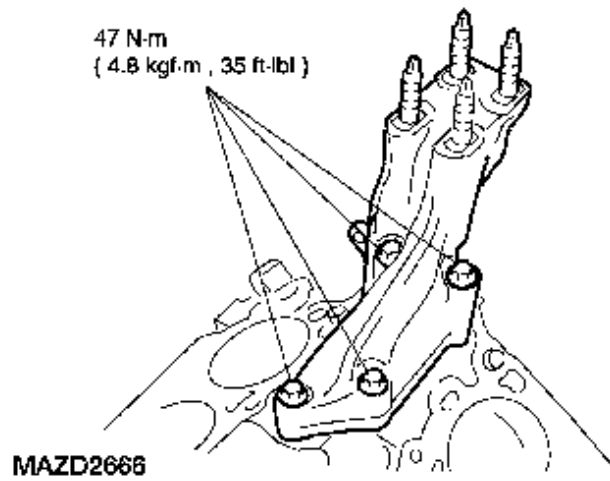


A0011413

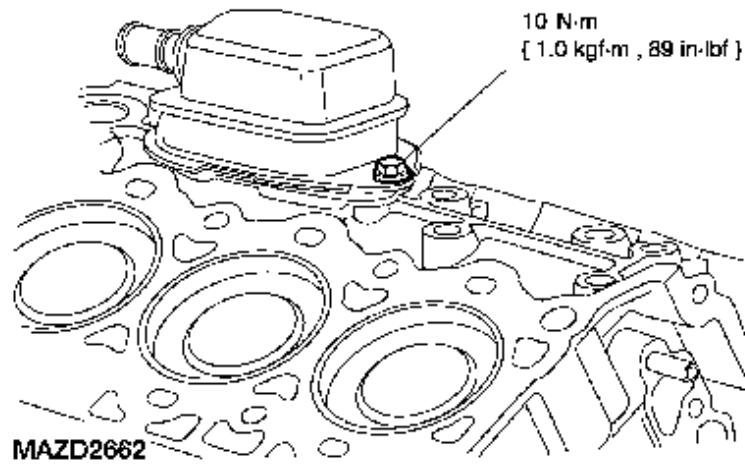
1. Install a new O-ring seal on the oil pump screen and pick-up tube.



1. Install the oil pump screen and pick up tube.
 - a. Position the oil pump screen and pick up tube.
 - b. Install the bolts.
 - c. Install the nut.
 - Tighten the nut in two stages.
 - Stage 1: Tighten to 5 N·m { 0.5 kgf·m, 44 in·lbf }.
 - Stage 2: Tighten 45 degrees.

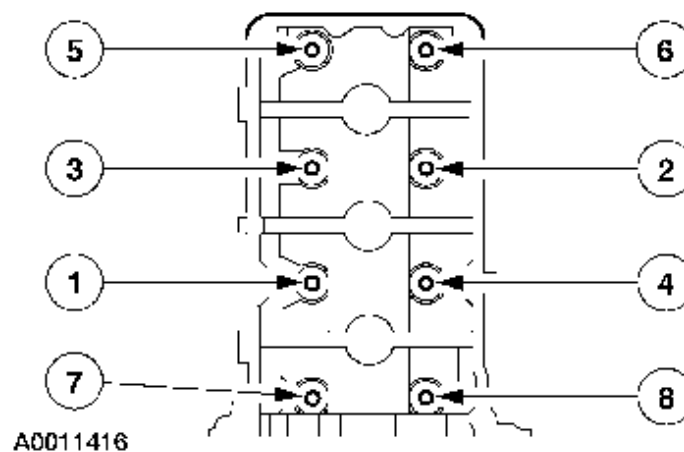


1. Install the power steering/engine support bracket.



1. Install the oil separator.

- Install the two bolts.

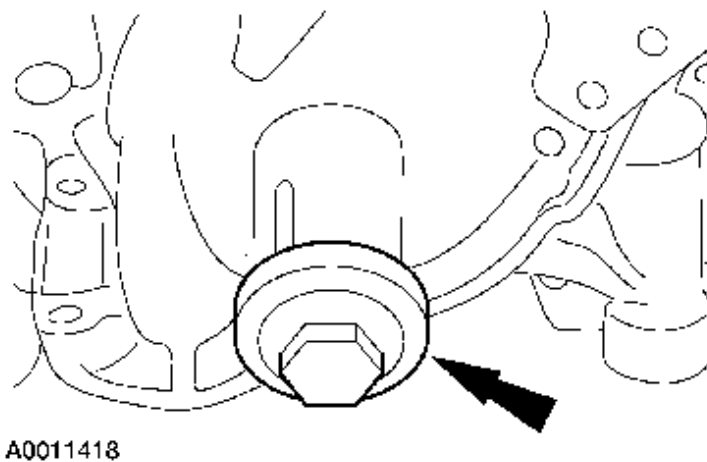


1.

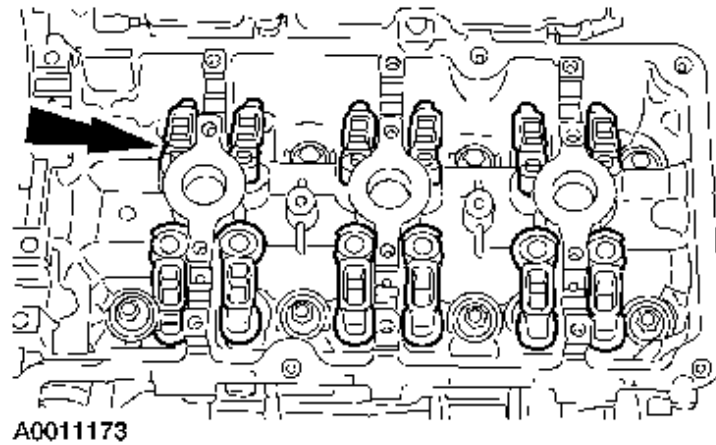
NOTE:

LH shown, RH similar. Position the LH and RH cylinder heads, gaskets, and install the bolts.

- Tighten the bolts in the sequence shown in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position to locate top dead center (TDC).
2. Apply SAE 5W-20 motor oil to the LH and RH camshaft followers.



1.

CAUTION:

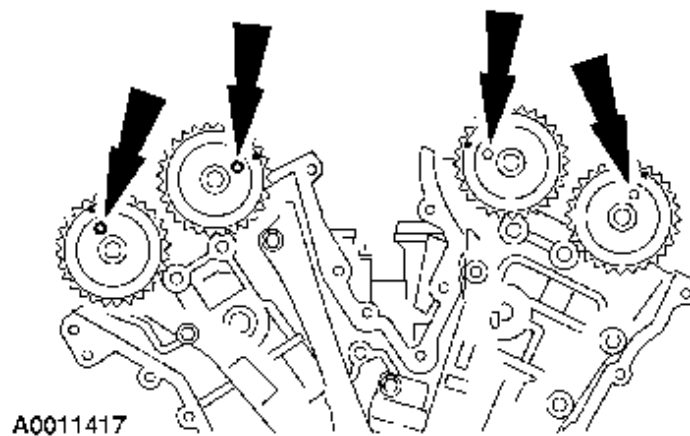
The camshaft followers must be installed in the original position.

NOTE:

RH shown, LH similar.

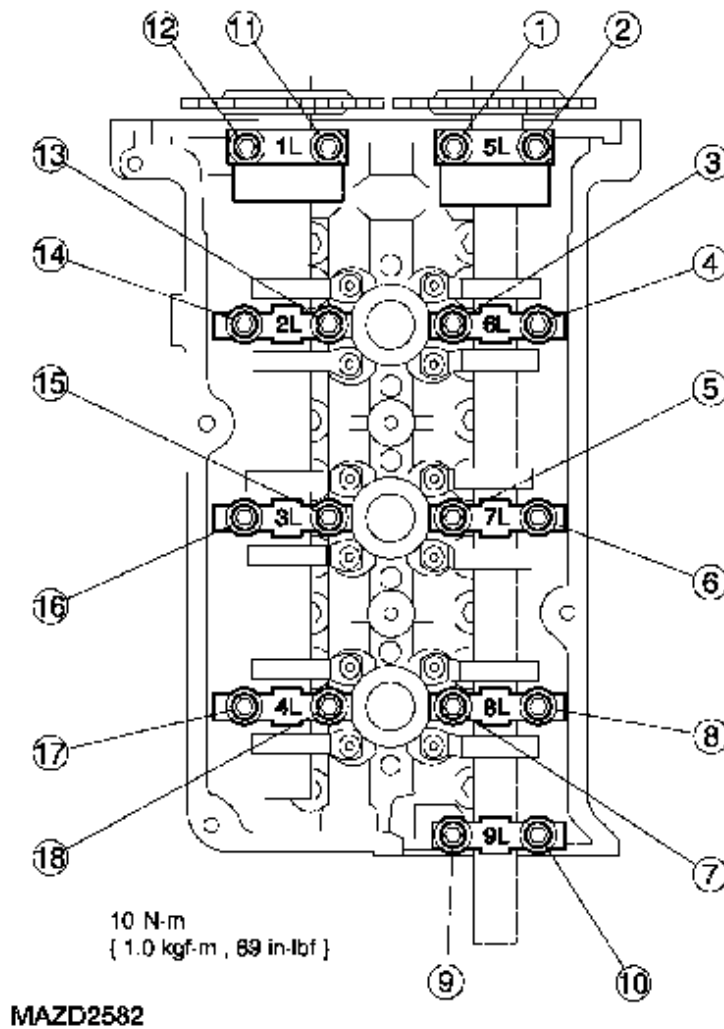
Install the LH and RH camshaft followers.

2. Apply SAE 5W-20 motor oil to the LH and RH camshafts.



1. Install the LH and RH camshafts.

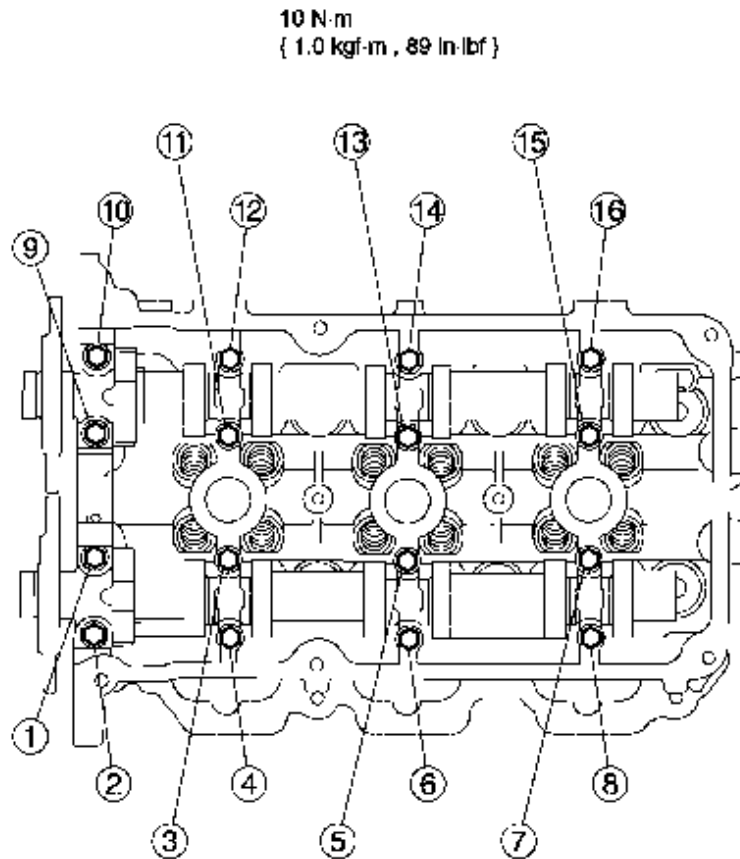
- Locate the camshafts as shown.



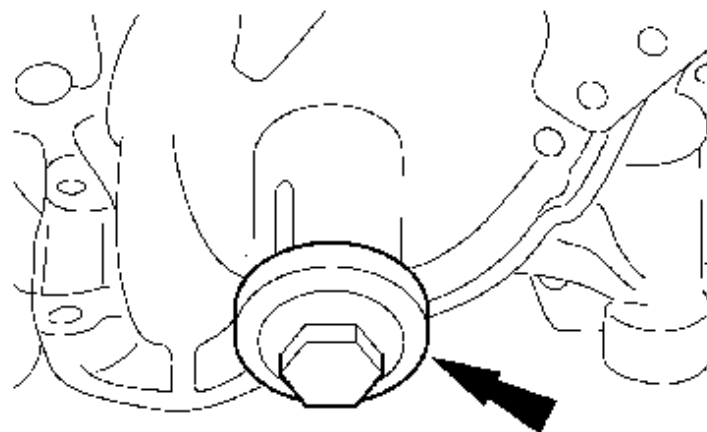
1.

CAUTION:

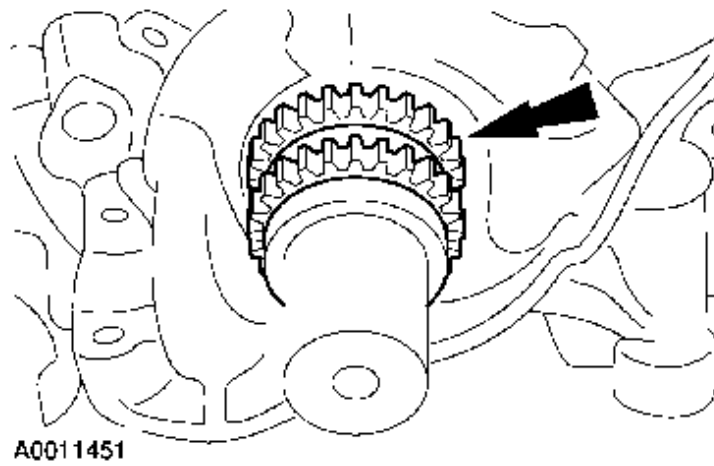
Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Position the LH camshaft caps and install the bolts in the sequence shown.

**MAZD2356**

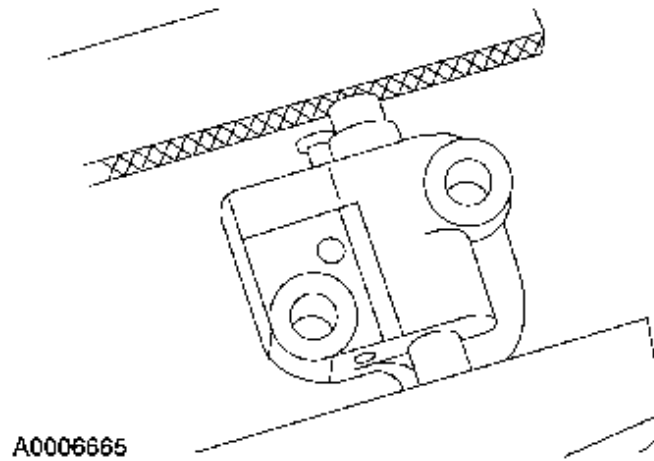
1. Position the RH camshaft caps and install the bolts in the sequence shown.

**A0011418**

1. Remove the crankshaft damper bolt.



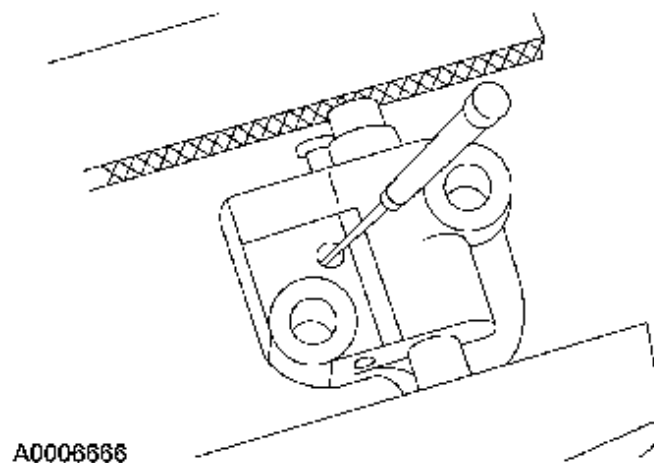
1. Install the crankshaft sprockets.



- 1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

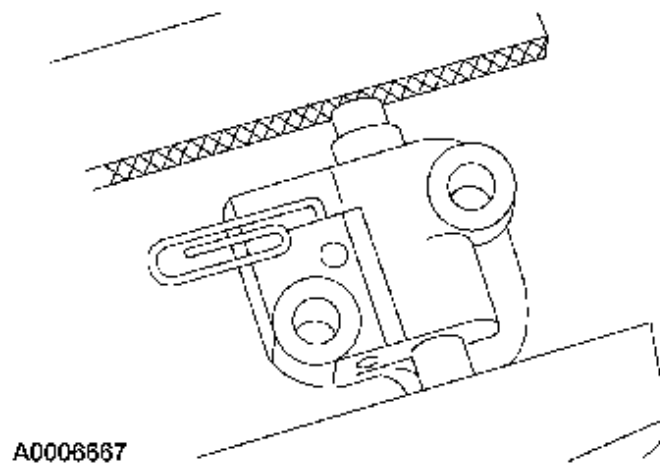
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

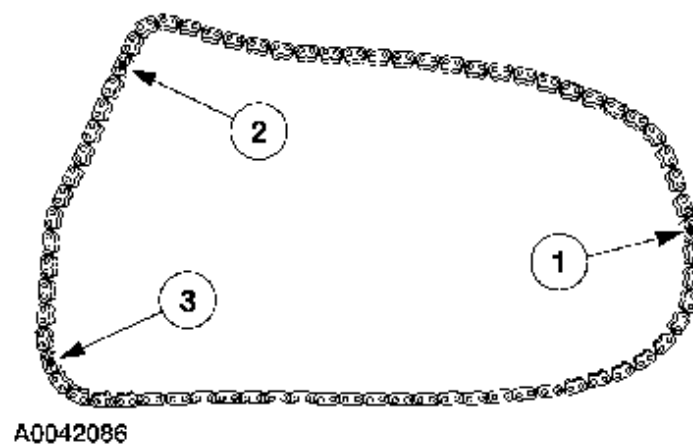
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.



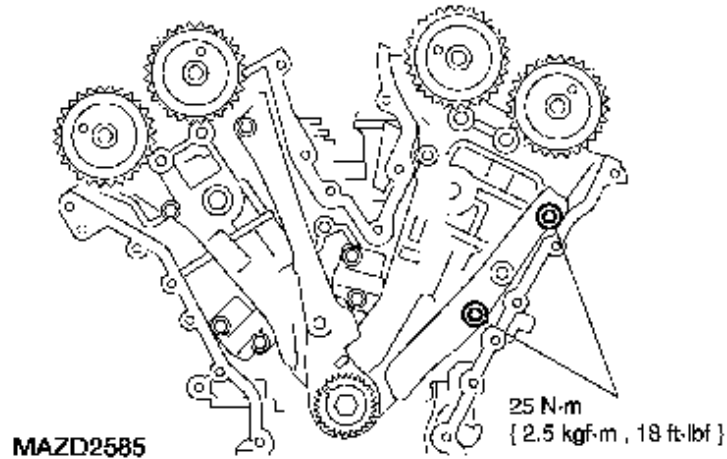
1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.



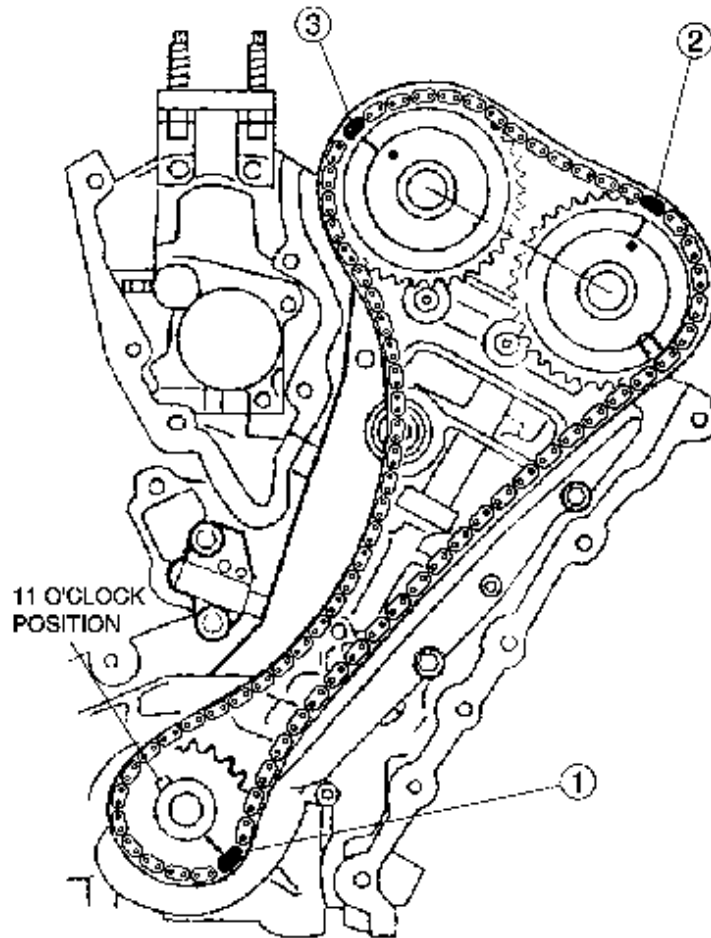
1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

a. Mark any link to use as the crankshaft timing mark.

- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark

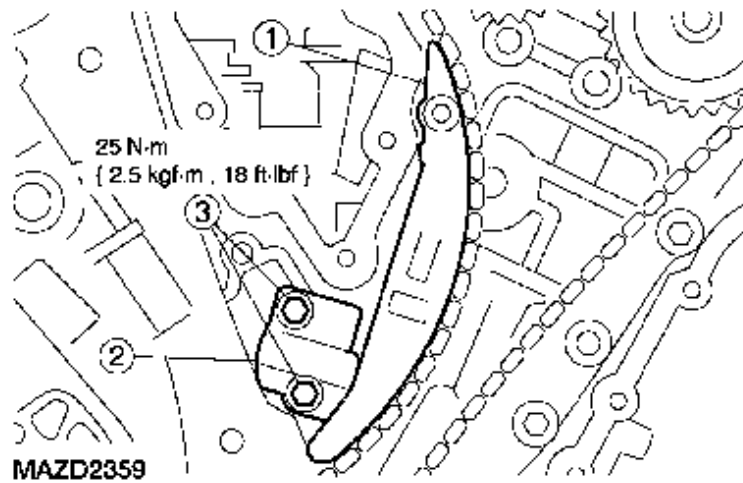


1. Position the guide and install the bolts.



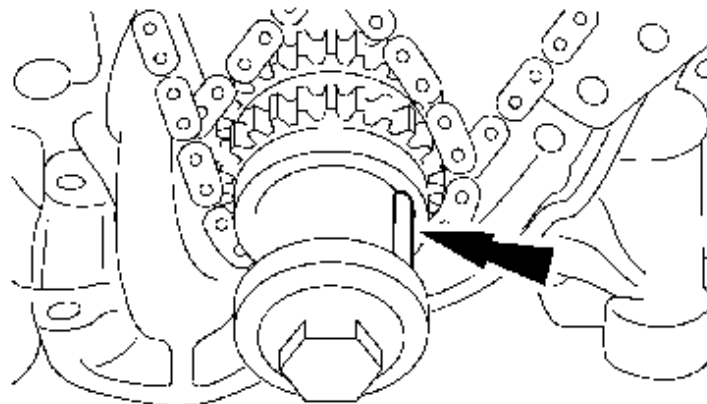
MAZD2331

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.



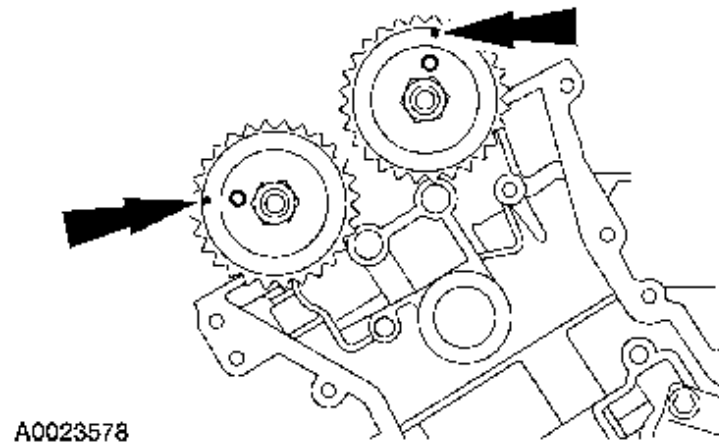
1. Install the LH timing chain tensioner and tensioner arm.

- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolts.

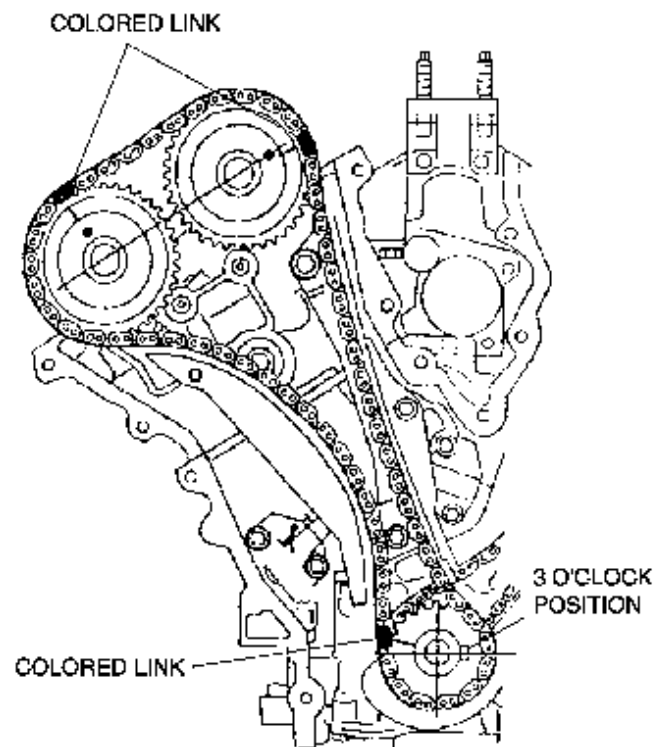


A0011067

1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



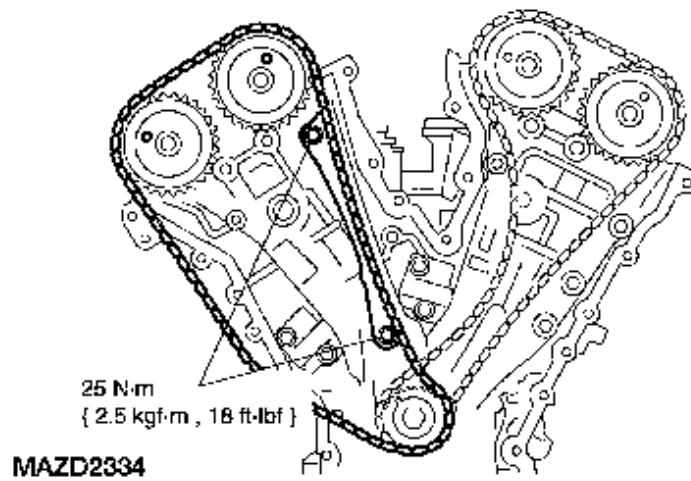
1. Verify that the RH camshafts are correctly positioned.



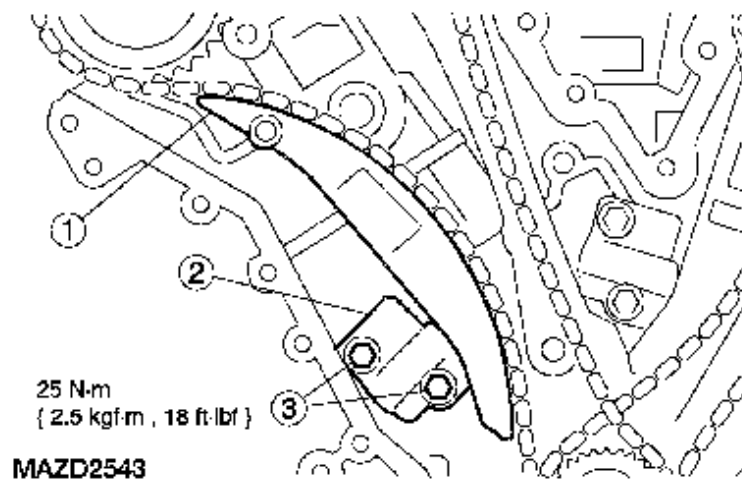
1. Install the RH timing chain.

- Align the marks on the timing chain with the marks on the camshaft and

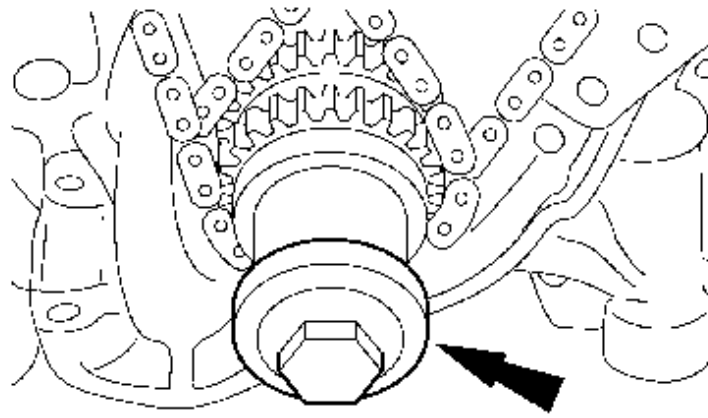
crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

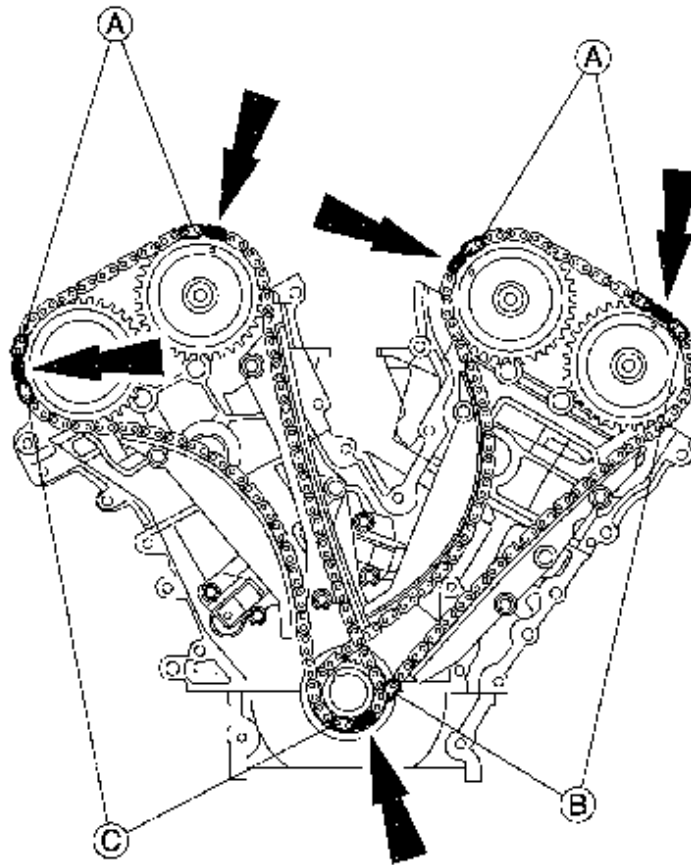


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

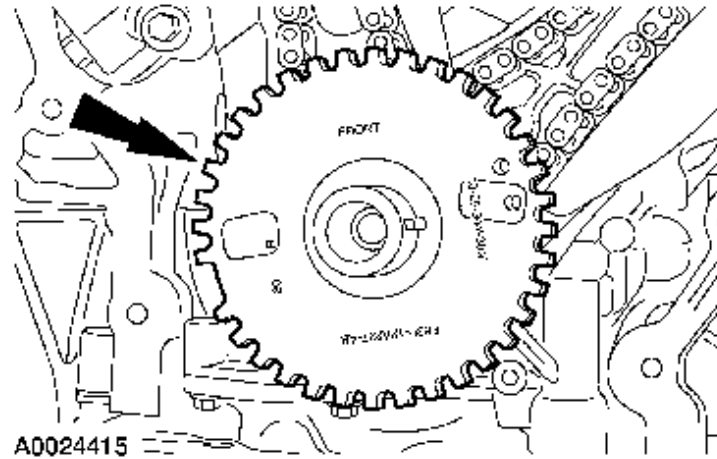
1. Remove the crankshaft damper bolt.



MAZD2333

1. Verify the timing with the following steps.
 1. There should be 12 chain links between the front camshaft timing marks.

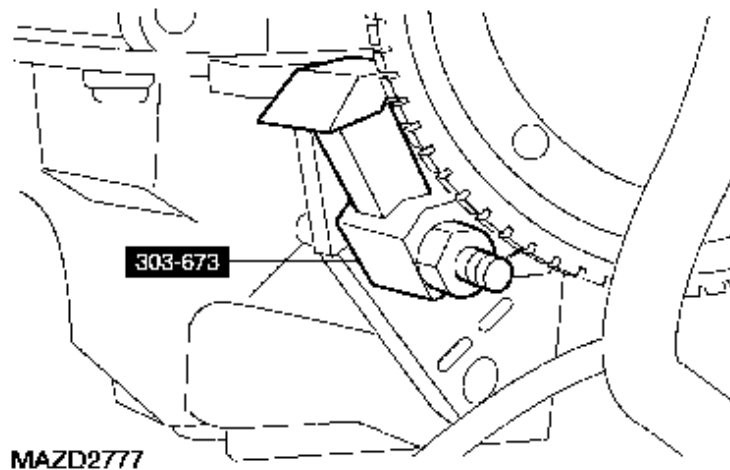
2. There should be 27 chain links between the camshaft and crankshaft timing marks.
3. There should be 30 chain links between the camshaft and crankshaft timing marks.



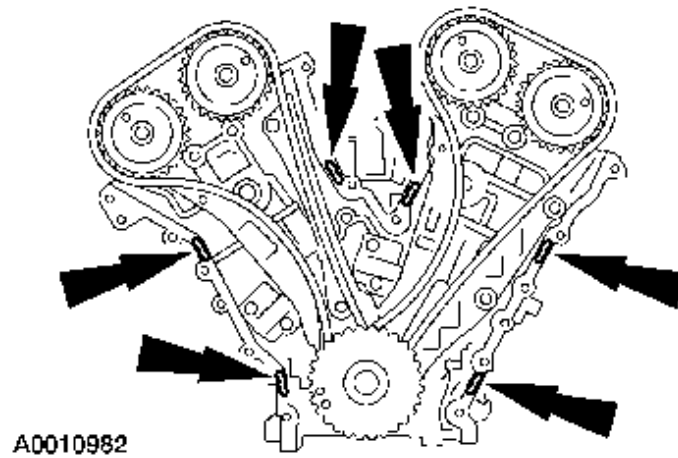
1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the special tool to hold the flexplate.
2. Install three gaskets in the front cover.

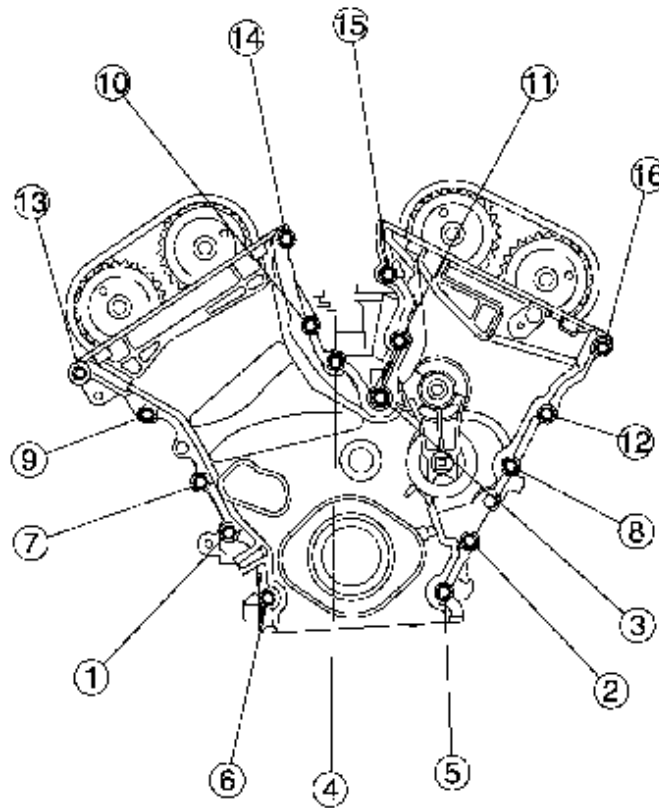


1.

NOTE:

The front cover must be installed and the bolts tightened within six minutes of sealant application. Apply a 6 mm (0.24 in) dot of silicone gasket and sealant to the cylinder block to lower cylinder block and cylinder head mating surfaces.

25 N·m
{ 2.5 kgf-m , 18 ft-lbf }

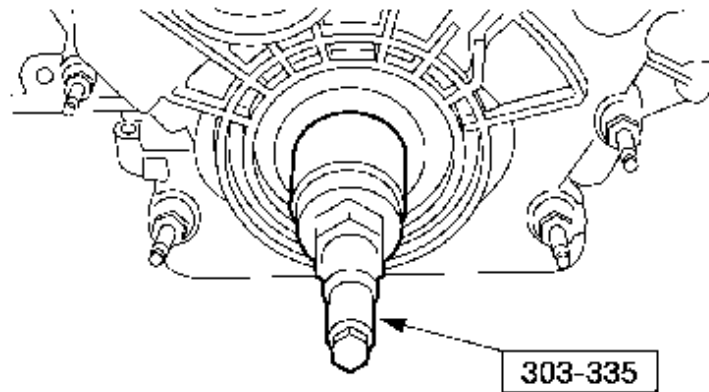


MAZD2555

1.

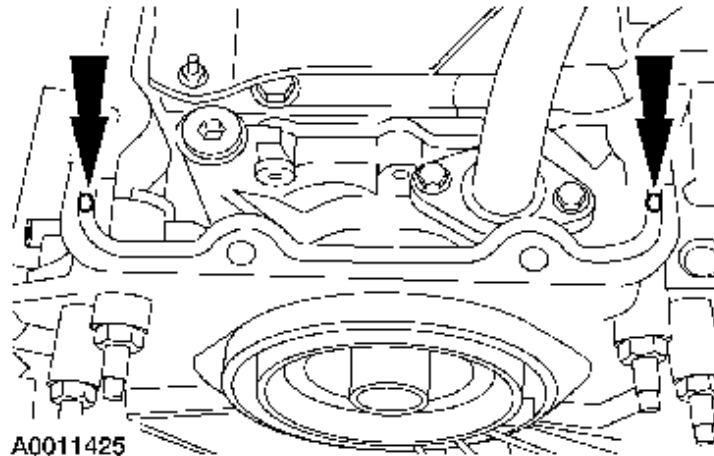
NOTE:

Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the front cover and install the bolts and studs in the sequence shown.



A0011428

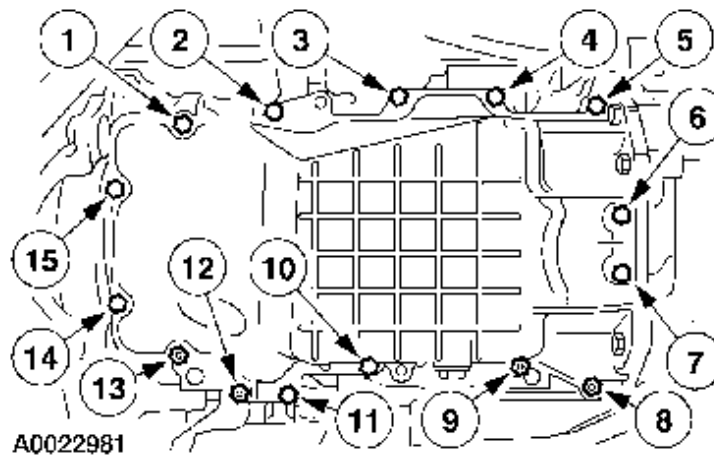
1. Using the special tool, install the crankshaft front oil seal.



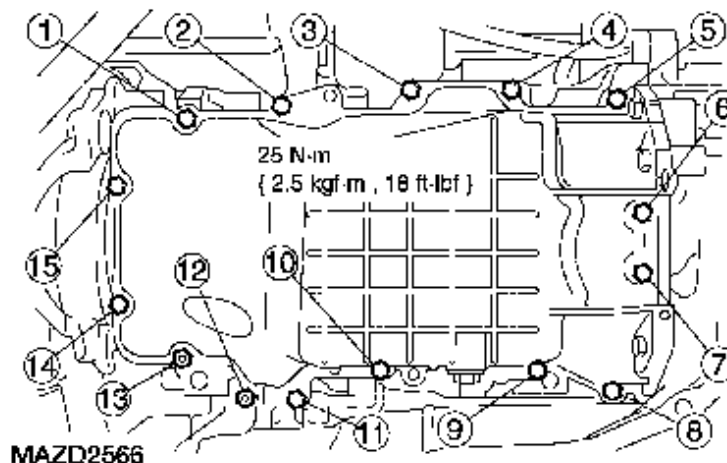
- 1.

NOTE:

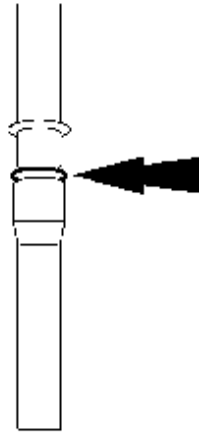
The oil pan must be installed and the bolts tightened within six minutes of sealant application. Apply a 10 mm (0.39 in) dot of silicone gasket and sealant to the front cover to cylinder block mating surface.



1. Position the oil pan and gasket and loosely install the bolts and studs in the indicated sequence.
2. Align the transaxle face of the oil pan with the rear of the cylinder block. The pan should be 0.00 mm (0.0 in)–0.25 mm (0.009 in) under flush. Assemblies that are between 0.26 (0.01 in) –0.50 mm (0.019 in) should be shimmed using either one or two 0.25 mm (0.009 in) gold shims. Assemblies that are between 0.51 mm (0.20 in) –0.75 mm (0.029 in) should be shimmed using either one or two 0.50 mm (0.019 in) silver shims. If the pan measures greater than 0.75 mm (0.029 in) or the pan is over flush of the cylinder block, the entire pan assembly must be removed and a new one installed.

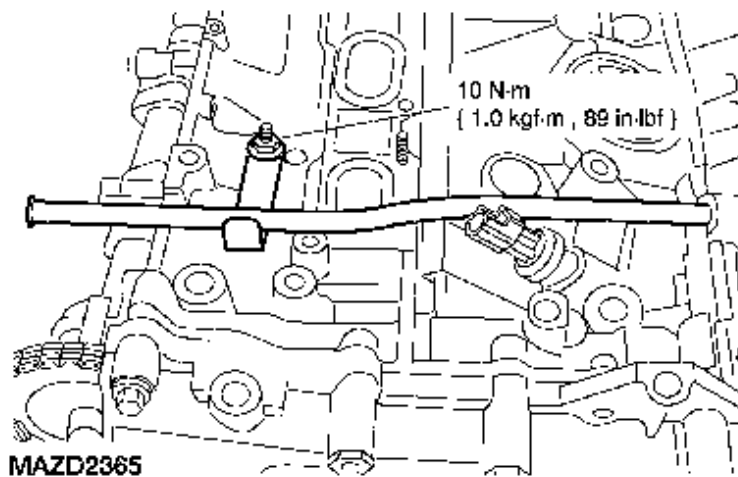


1. Tighten the oil pan bolts and studs in the sequence shown.

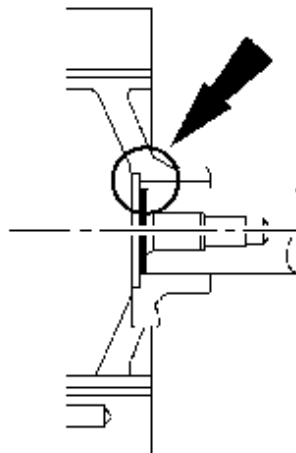


A0011038

1. Install a new seal on the oil level indicator tube.



1. Install the oil level indicator tube and install the bolt.

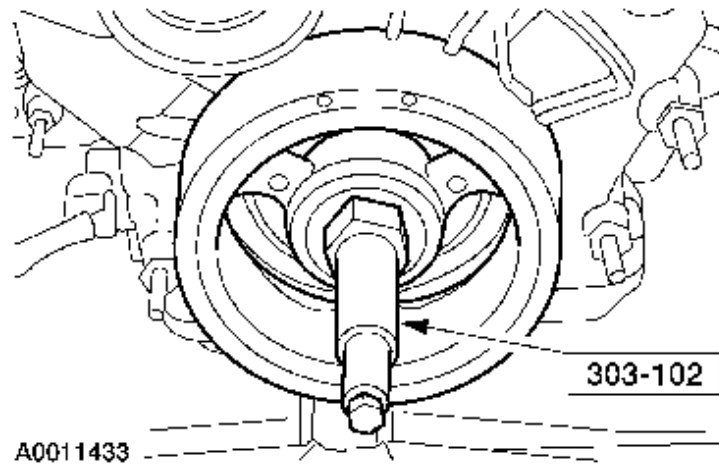


A0010615

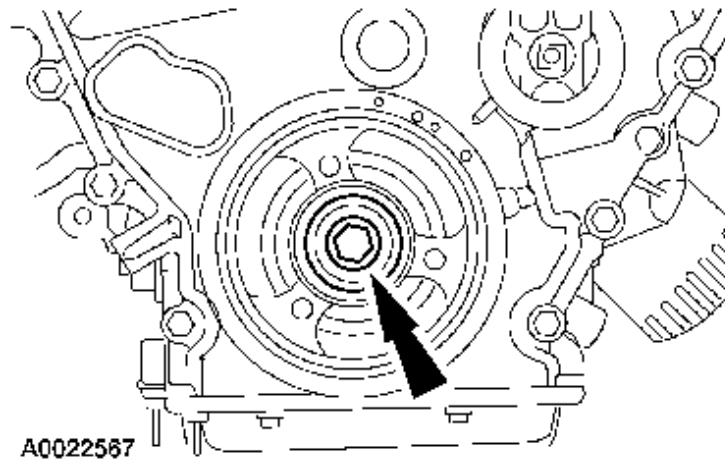
- 1.

NOTE:

The crankshaft damper must be installed and the bolt tightened within six minutes of sealant application. Apply silicone gasket and sealant to the end of the crankshaft damper keyway slot.



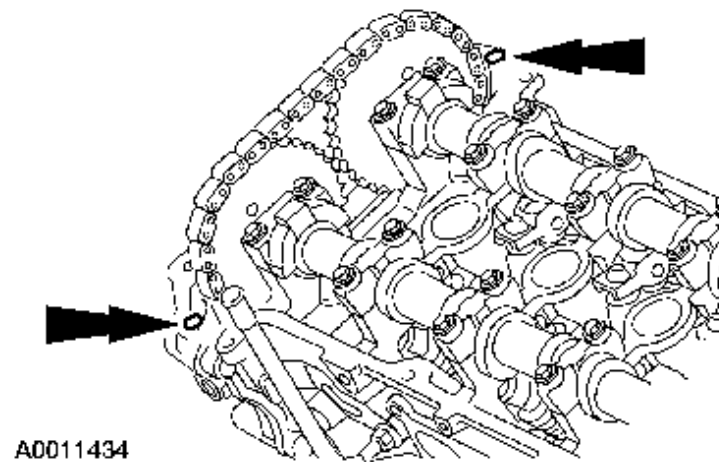
1. Using the special tool, install the crankshaft vibration damper.



1. Install the crankshaft vibration damper washer and bolt.

- Tighten the bolt in four stages.
- Stage 1: Tighten to 120 N•m {1.22 kgf•m , 89 ft•lbf}.
- Stage 2: Loosen one full turn (360 degrees).
- Stage 3: Tighten to 50 N•m {5.1 kgf•m , 37 ft•lbf}.
- Stage 4: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.

2. Install new gaskets in the valve covers.



1.

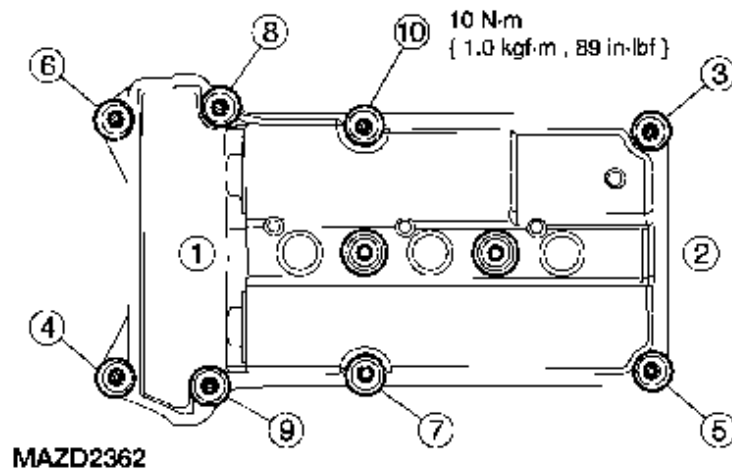
NOTE:

The valve cover must be installed and the bolts and studs tightened within six minutes of sealant application.

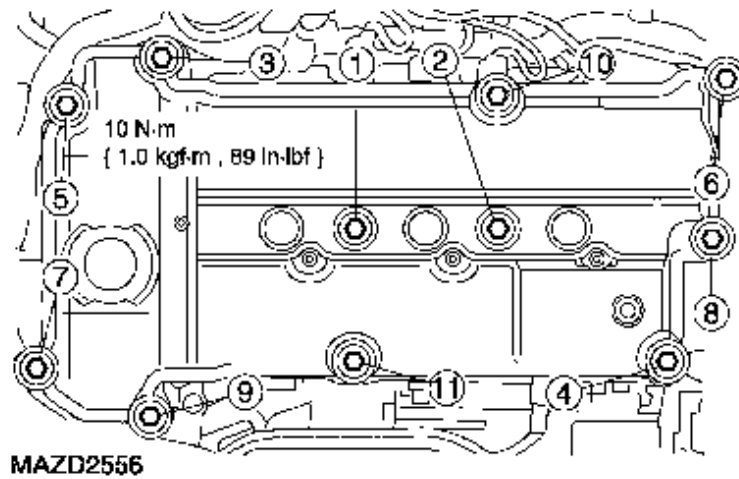
NOTE:

LH shown, RH similar.

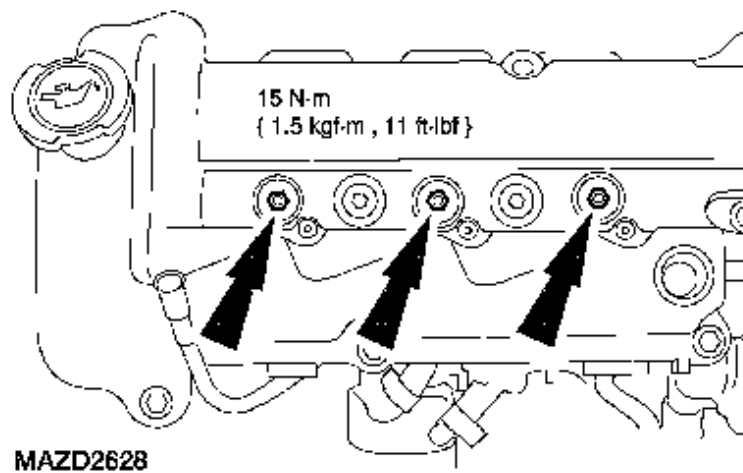
Apply a 8 mm (0.31 in) dot of silicone gasket and sealant at the cylinder block to front cover mating surface of the LH and RH valve covers.



1. Position the RH valve cover and install the bolts and studs in the sequence shown.



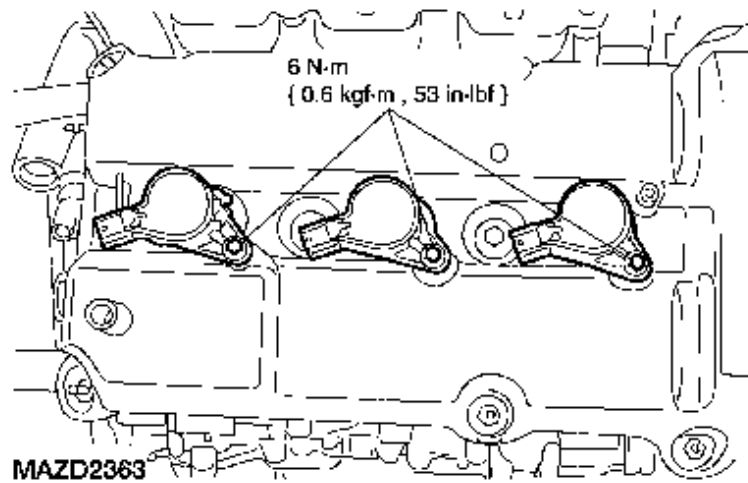
1. Position the LH valve cover and install the bolts and studs in the sequence shown.



- 1.

NOTE:

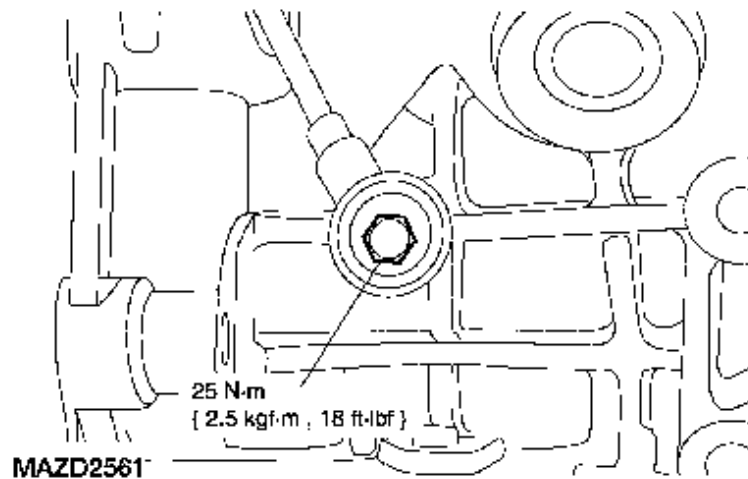
RH shown, LH similar. Install the spark plugs.



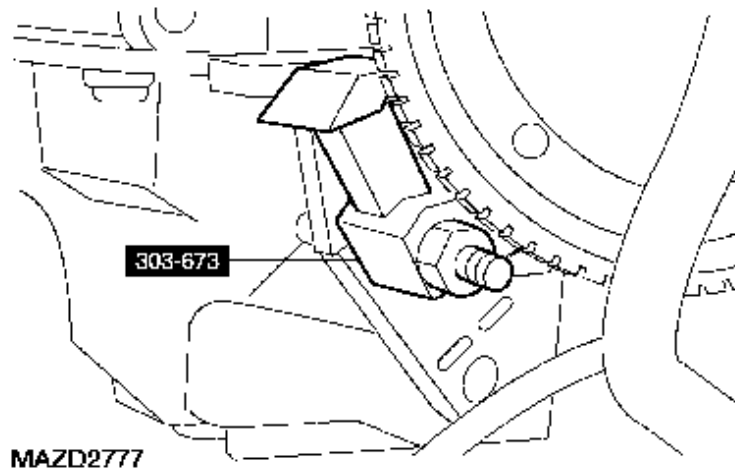
1.

NOTE:

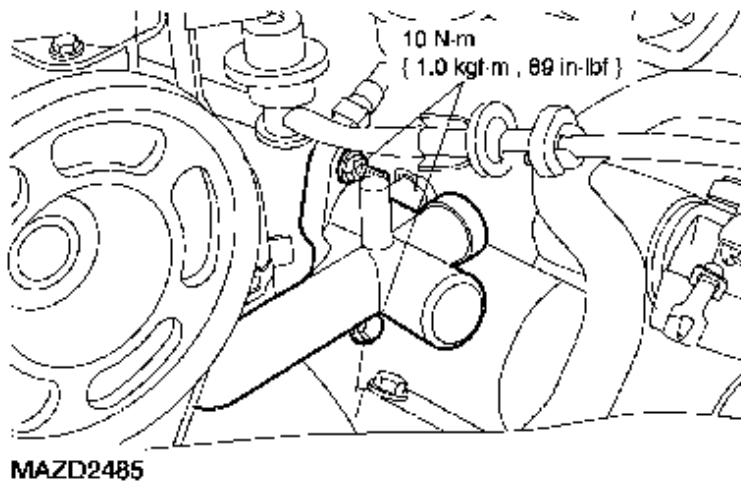
RH shown, LH similar. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation. Install the six coil-on-plugs and install the bolts.



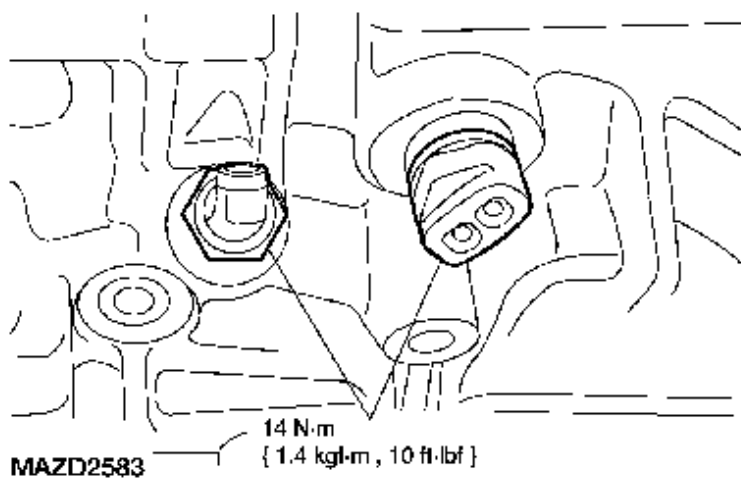
1. Position the knock sensor and install the bolt.



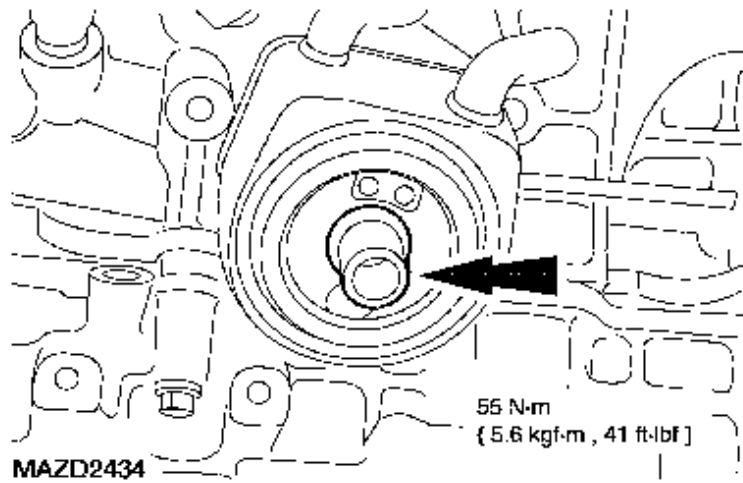
1. Remove the special tool.



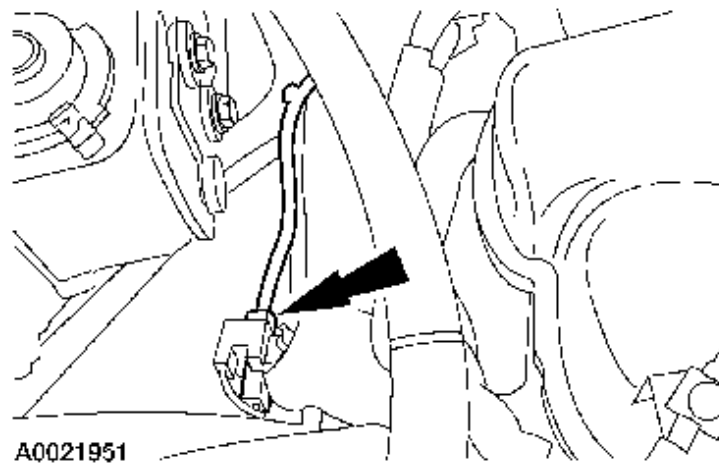
1. Position the coolant bypass tube and connect the hoses.



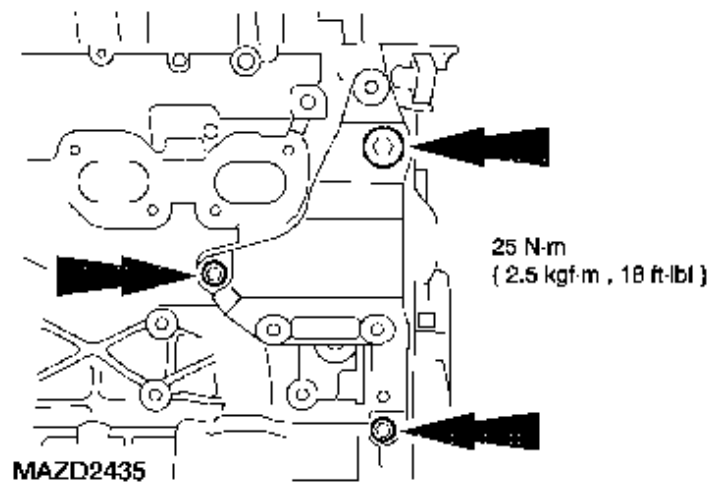
1. Install the oil pressure sender and the block heater.



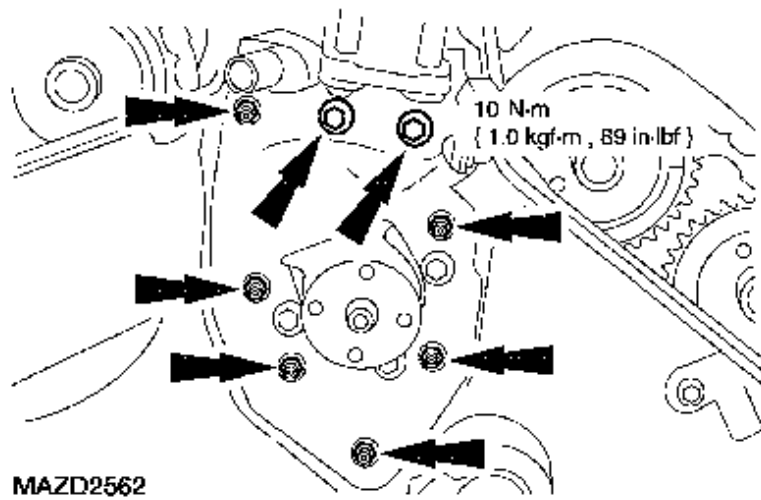
1. Install the oil cooler.



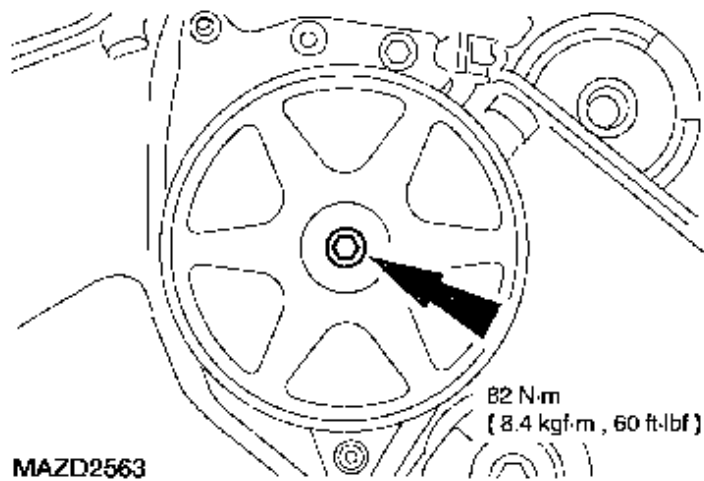
1. Install the radio ignition noise suppressor electrical connector.



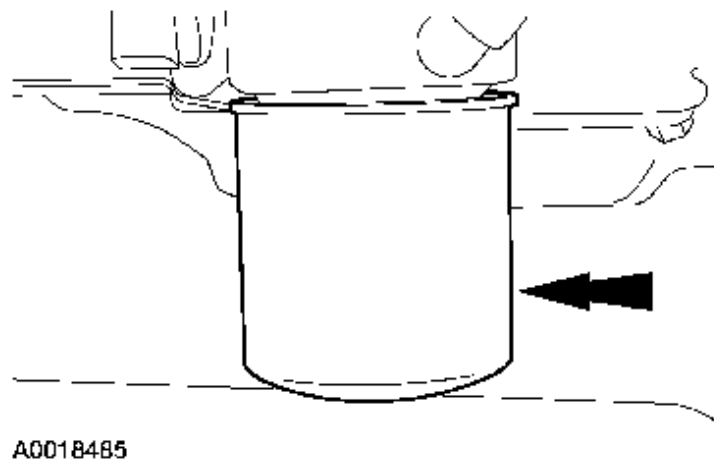
1. Install the generator support bracket.



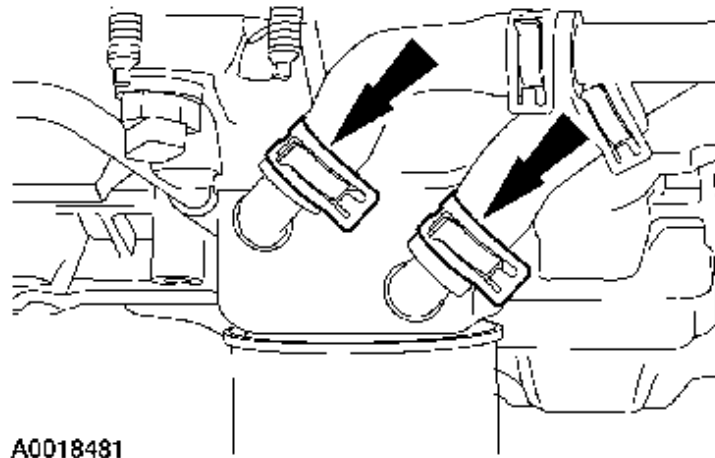
1. Install the power steering pump.



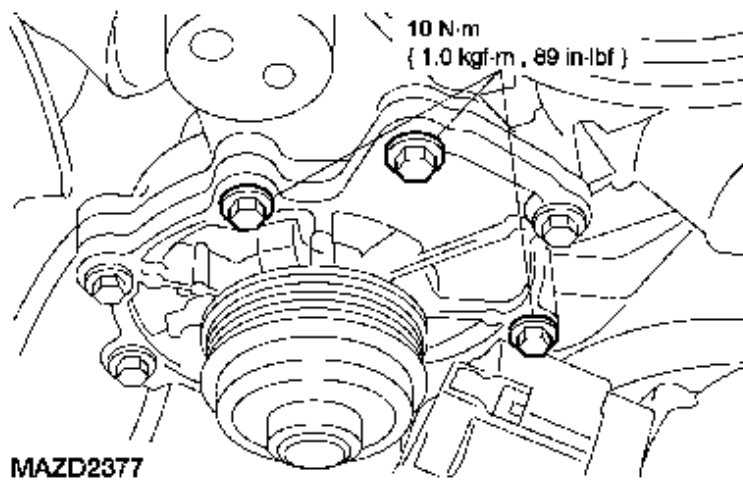
1. Install the power steering pump pulley.



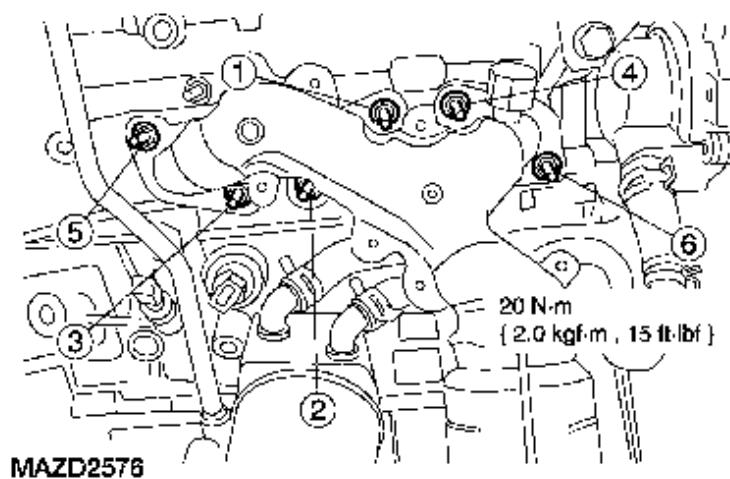
1. Install the oil filter.



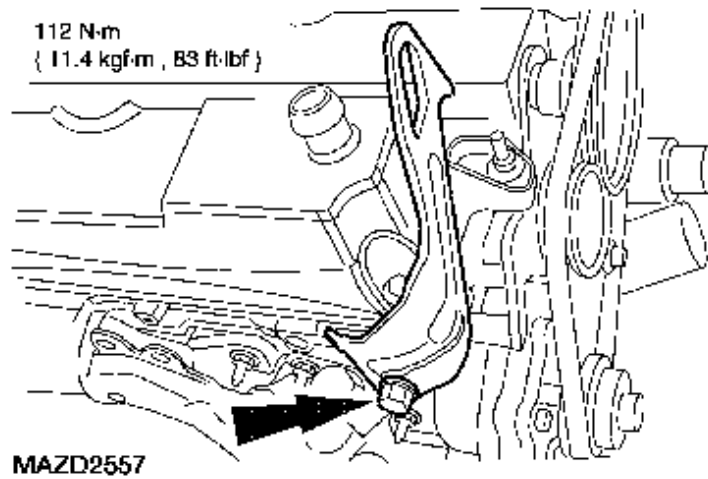
1. Connect the coolant hoses at the oil cooler.



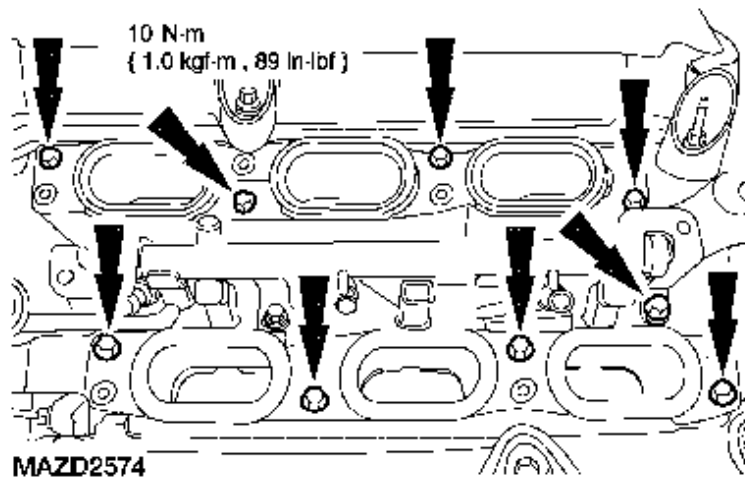
1. Install the water pump assembly.



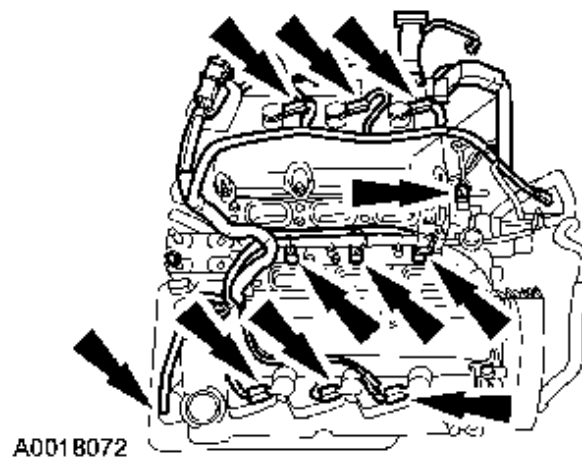
1. Position a new gasket and tighten the LH exhaust manifold nuts in the sequence shown.



1. Install the engine lift bracket.

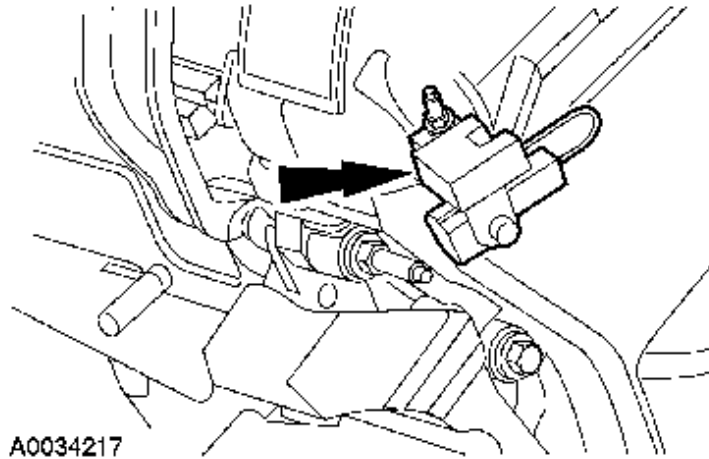


1. Position the gasket and install the lower intake manifold.

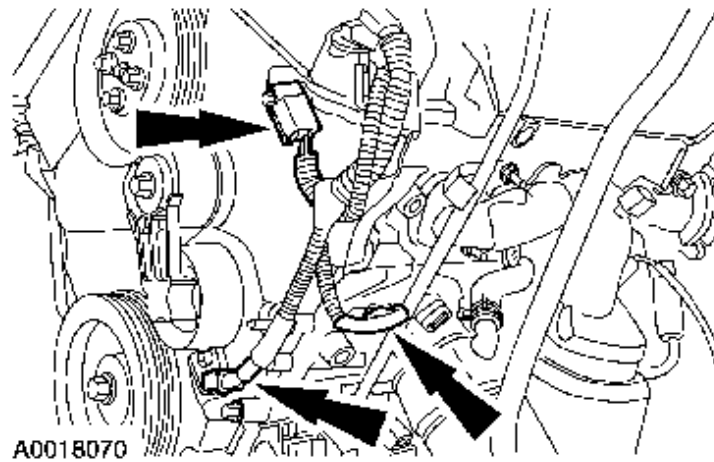


1. Position and connect the engine control sensor wiring to the following components:

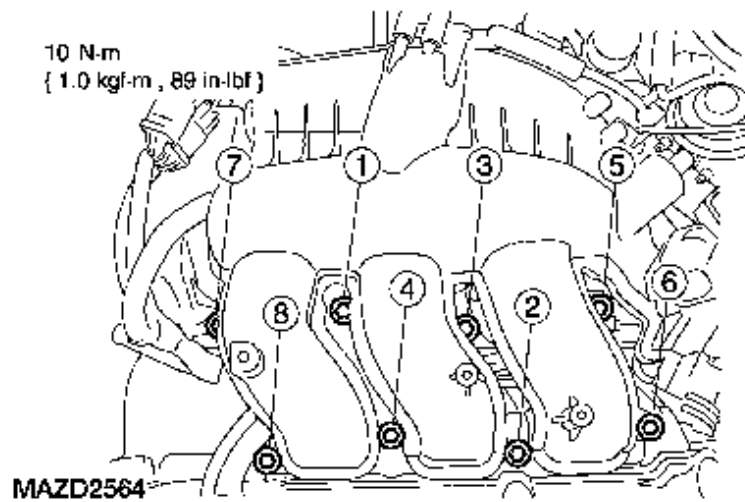
- coils on plugs
- fuel injectors



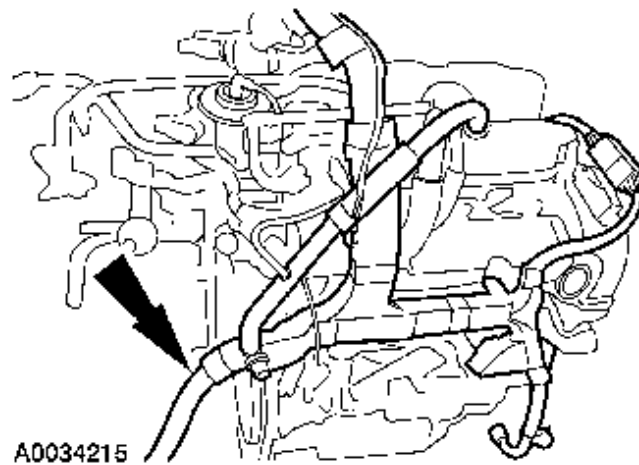
1. Connect the radio interference capacitor.



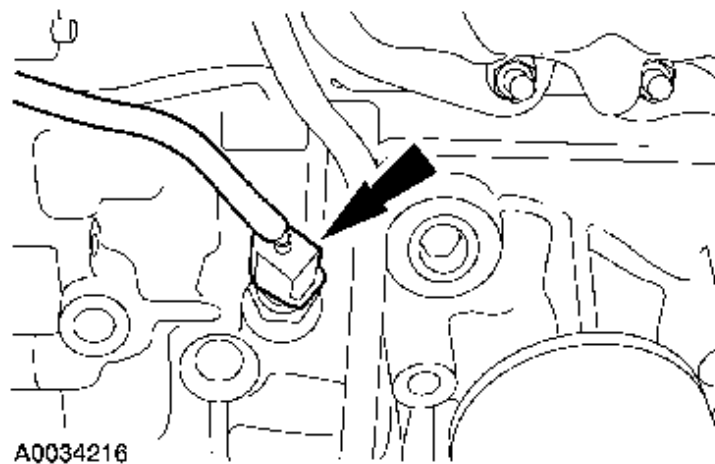
1. Connect the crankshaft and camshaft position sensor electrical connectors.
2. Install new gaskets in the upper intake manifold.



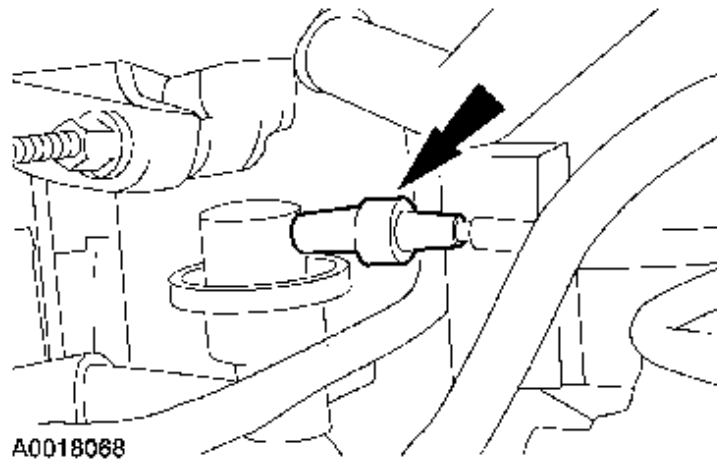
1. Install the upper intake manifold.



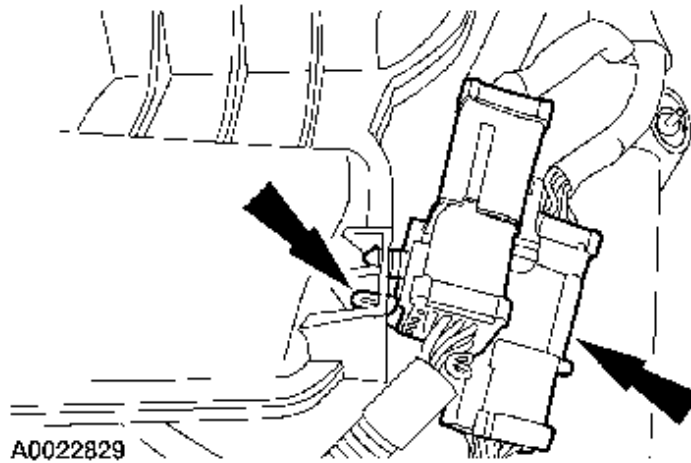
1. Install and connect the engine control wire harness.



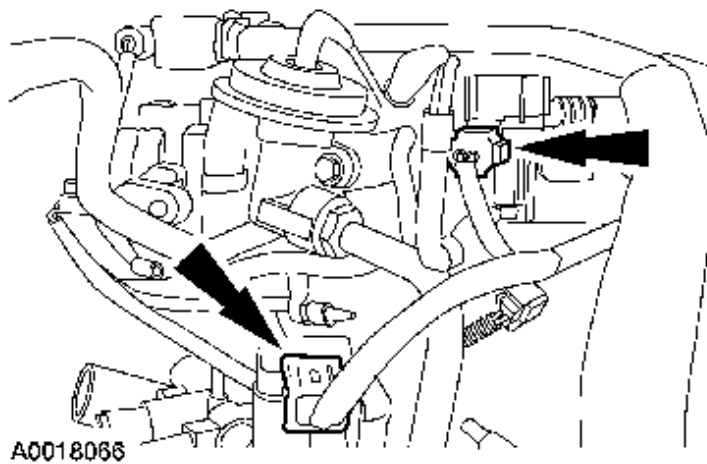
1. Connect the coolant temperature sender and the oil pressure switch.



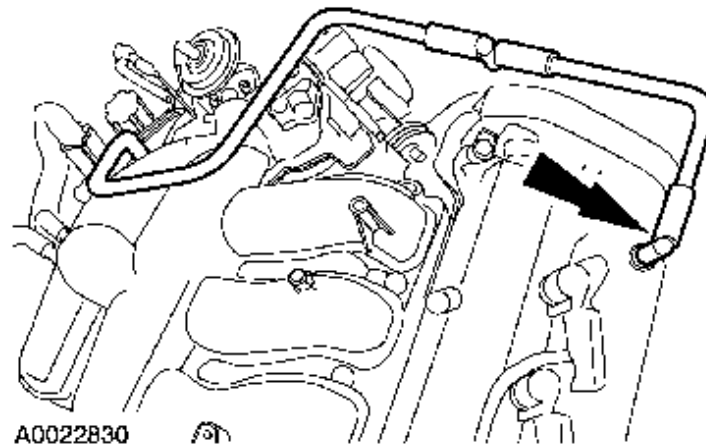
1. Connect the vacuum line to the fuel pressure damper.



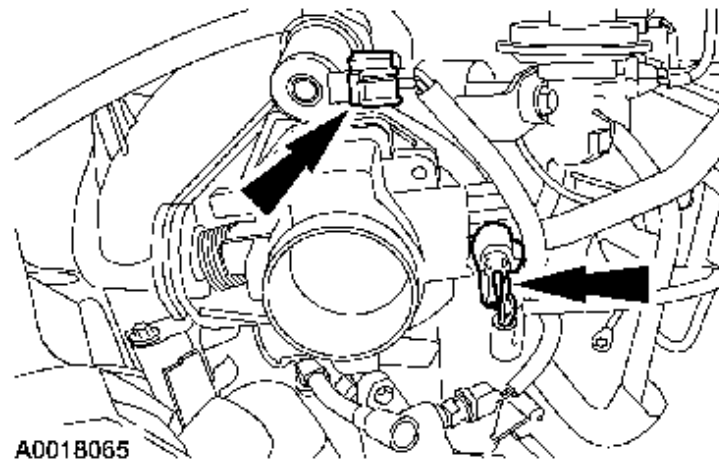
1. Connect the engine control sensor wiring to the upper intake manifold.



1. Connect the EGR vacuum regulator and the differential pressure feedback EGR electrical connectors.



1. Install the PCV tube.



1. Connect the idle air control (IAC) valve and the throttle position (TP) sensor electrical connectors.

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VIN or Model Year 2003 Model TRIBUTE engine front cover

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

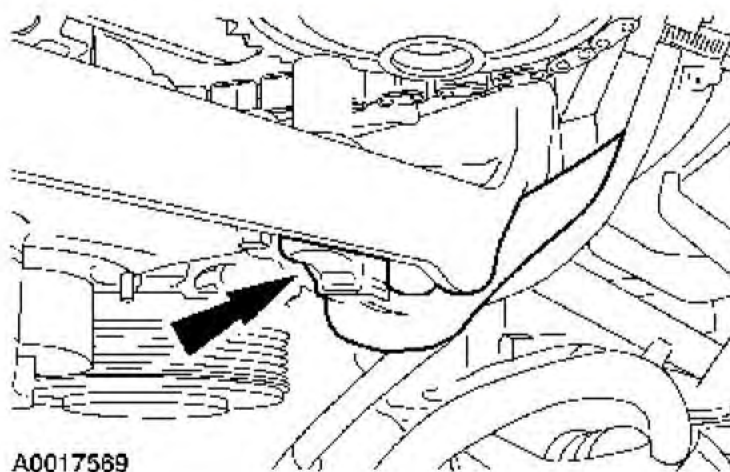
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2003 - Tribute - Workshop Manual - Engine

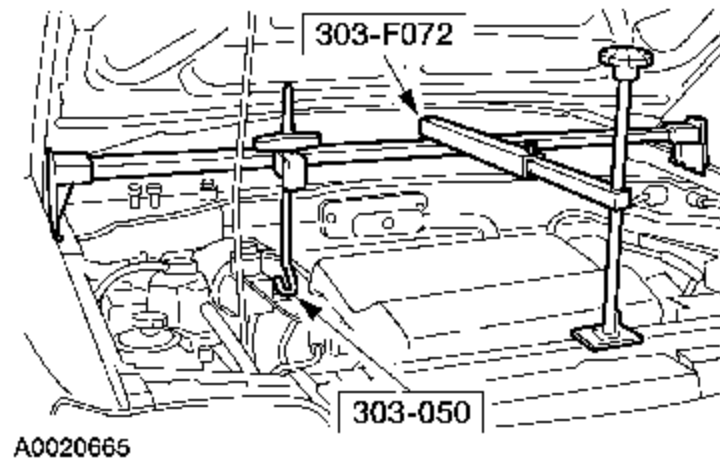
ENGINE FRONT COVER

Removal

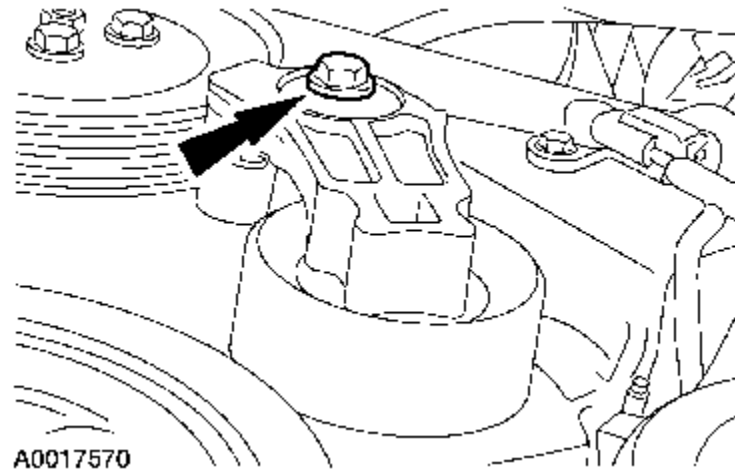
1. Remove the RH and LH valve covers. Refer to — [01-10C VALVE COVER LH](#) and — [01-10C VALVE COVER RH](#).
2. Remove the oil pan. Refer to [01-11B OIL PAN](#).
3. Remove the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).



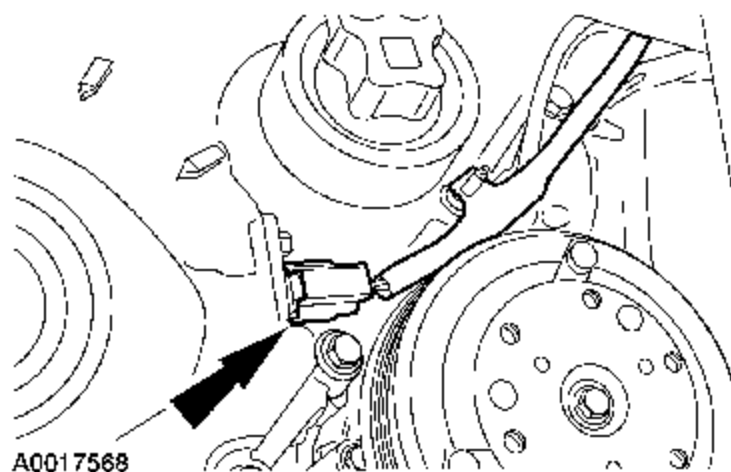
1. Remove the bolt and the camshaft position (CMP) sensor.
2. Lower the vehicle.
3. Position the power steering pump aside. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#)



1. Remove the special tool.
2. Raise the vehicle.

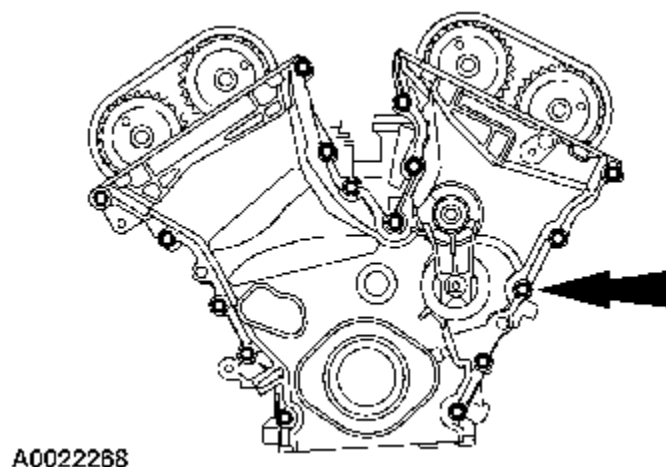


1. Remove the bolt and remove the belt tensioner.
2. Remove the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Remove the crankshaft position (CKP) sensor.

- Disconnect the electrical connector.
- Remove the bolt and the sensor.



1.

NOTE:

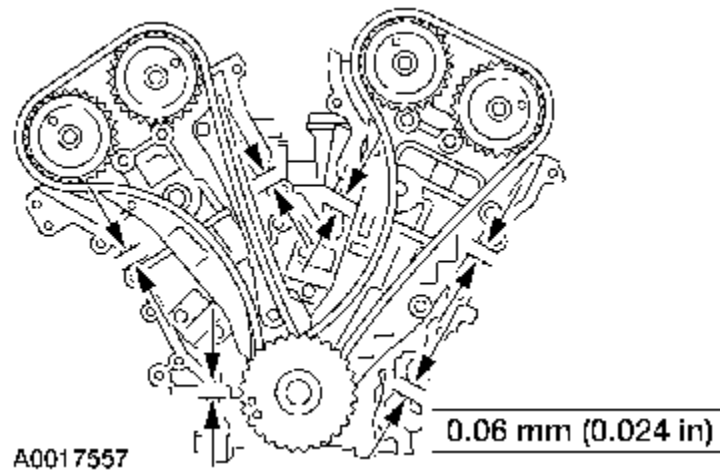
Remove the engine front cover with the vehicle raised in the air. Remove the bolts, studs and the engine front cover.

Installation

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surface. These tools cause scratches and gouges, which make leak paths. Use a plastic scraping tool to remove all traces of sealant.

1. Clean all sealing surfaces with Metal Surface Cleaner.
2. Install three new gaskets in the front cover.

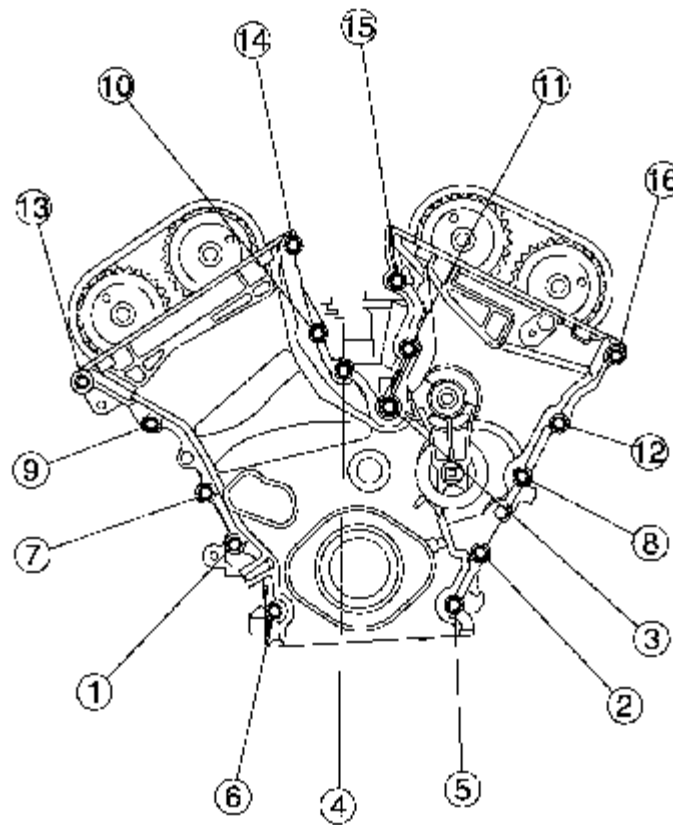


1.

NOTE:

The engine front cover must be installed and the bolts tightened within four minutes of applying the sealant. Apply a 6 mm (0.24 in) diameter dot of silicone gasket and sealer to the cylinder block, lower cylinder block, and cylinder head mating surfaces.

25 N·m
{ 2.5 kgf-m , 18 ft-lbf }

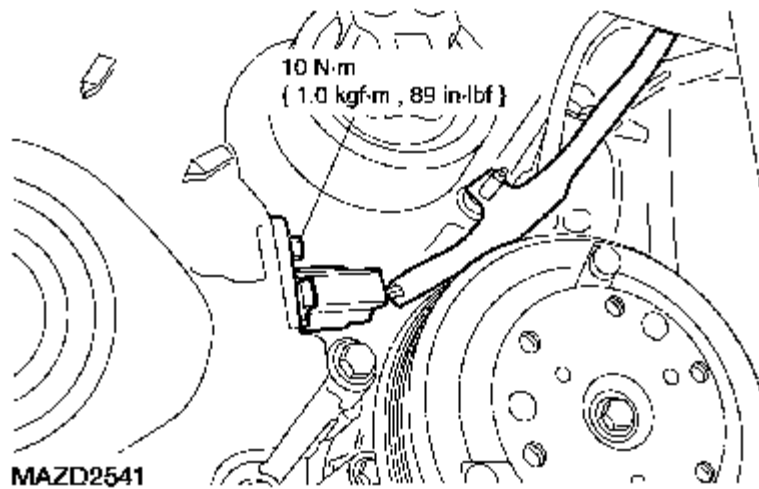


MAZD2555

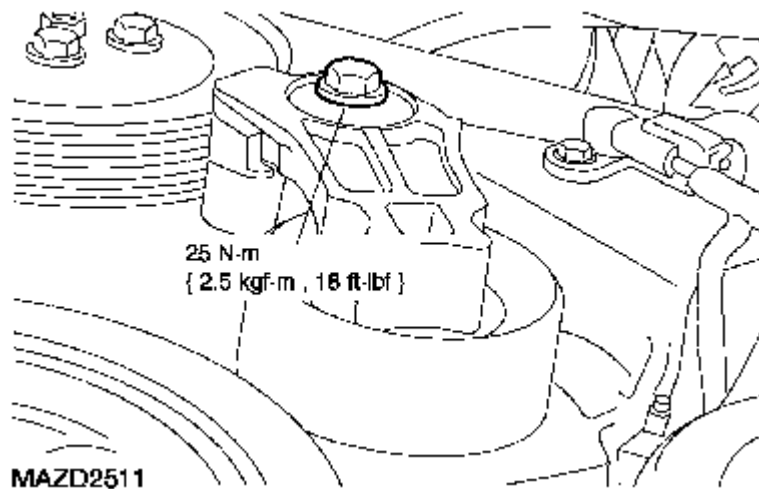
1.

NOTE:

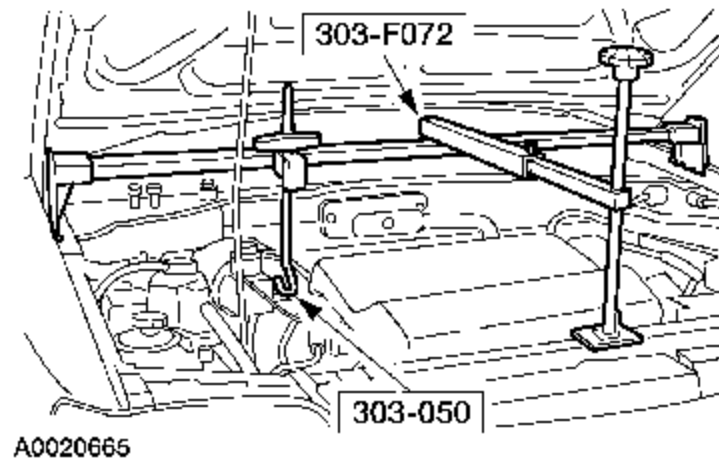
Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the cover and install the studs and bolts in the sequence shown.



1. Install the (CKP) sensor and connect the electrical connector.
2. Install the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Install the tensioner and bolt.
2. Install the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).
3. Install the oil pan. Refer to [01-11B OIL PAN](#).
4. Lower the vehicle.



1. Install the special tool.
2. Remove the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#).
3. Install the power steering pump. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the RH and LH Valve cover. Refer to — [01-10C VALVE COVER LH](#) and — [01-10C VALVE COVER RH](#).

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VIN or Model Year 2003 - Model TRIBUTE - engine removal

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

[< Previous](#) [Next >](#)

2003 - Tribute - Workshop Manual - Engine

ENGINE

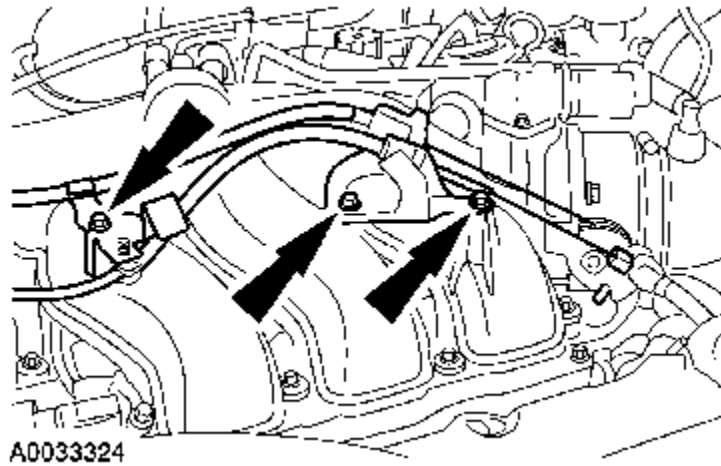
Removal

1. Remove the battery tray. Refer to [01-17 BATTERY TRAY](#).
2. Remove the air cleaner outlet tube and air cleaner. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).
3. Discharge and recover the refrigerant. For additional information, refer to [07-10 DISCHARGING AND RECOVERY](#).
4. Raise and support the vehicle. Refer to [00-00 LIFTING](#).
5. Remove the lower radiator air deflectors.
6. Drain the engine cooling system. Refer to [01-12B COOLING SYSTEM DRAINING, FILLING AND BLEEDING](#).

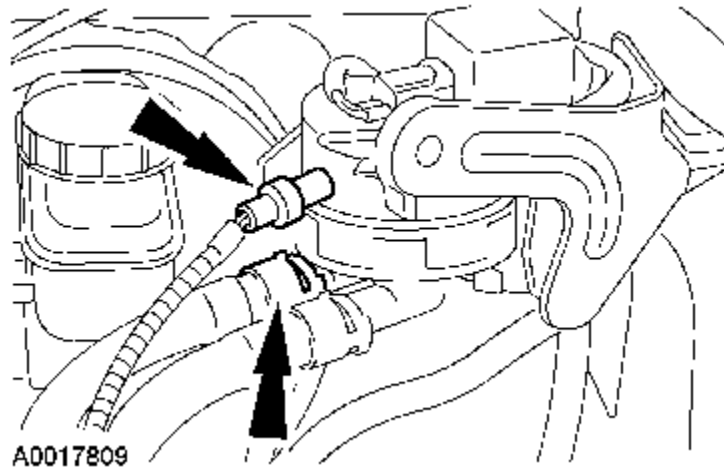


1. Drain the engine oil.

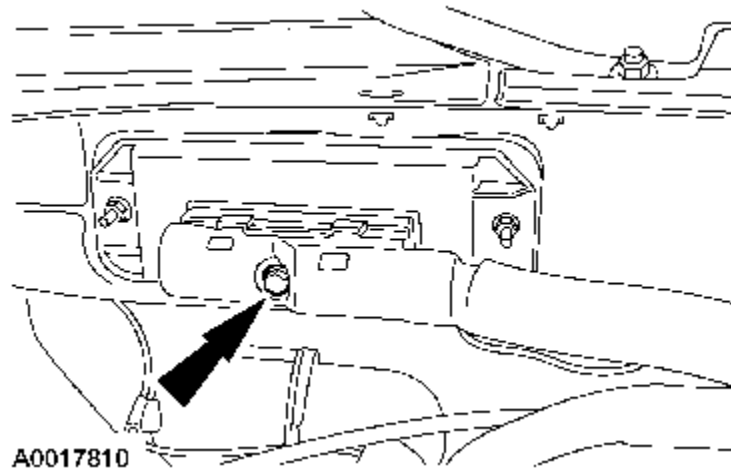
- Install a new drain plug gasket and tighten the drain plug.
2. Lower the vehicle.
 3. Disconnect the fuel line. Refer to — [01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC \(4V\)](#).
 4. Remove the water pump drive belt.



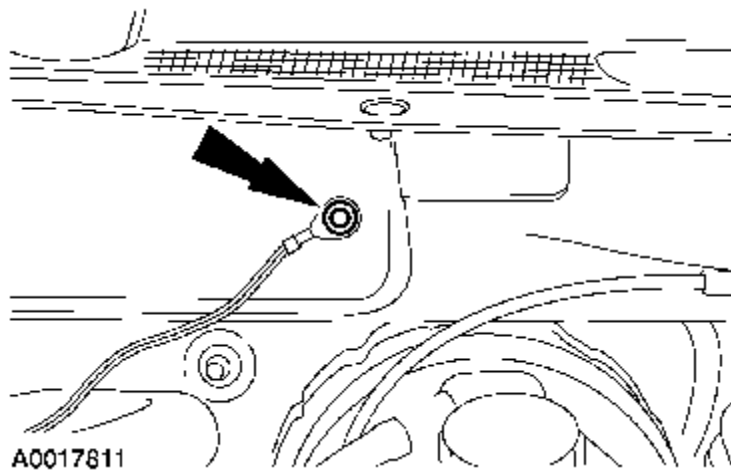
1. Disconnect the accelerator cable and if equipped cruise control actuator cable.



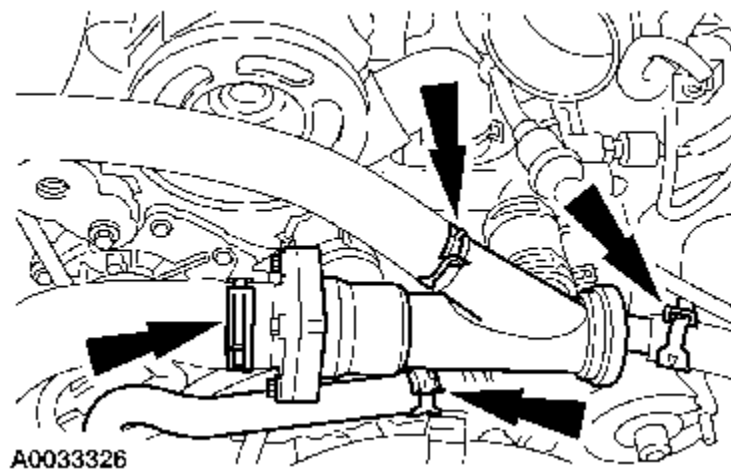
1. Disconnect the vapor management valve (VMV).



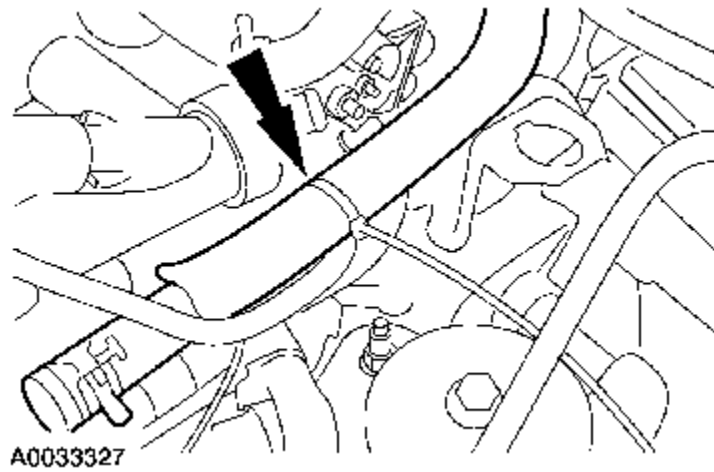
1. Disconnect the powertrain control module.



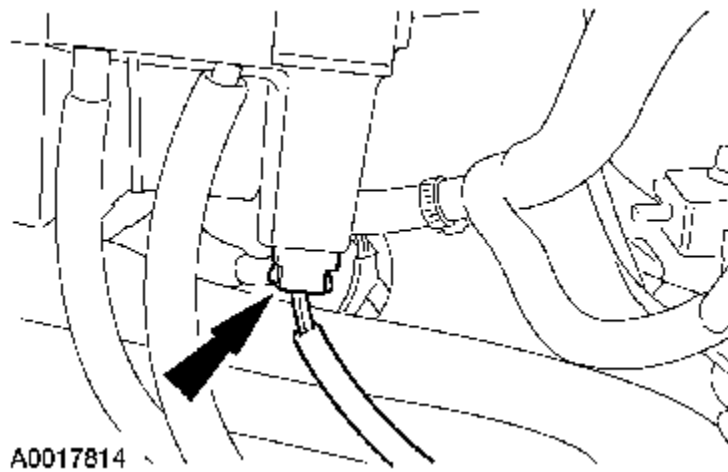
1. Disconnect the ground wire.



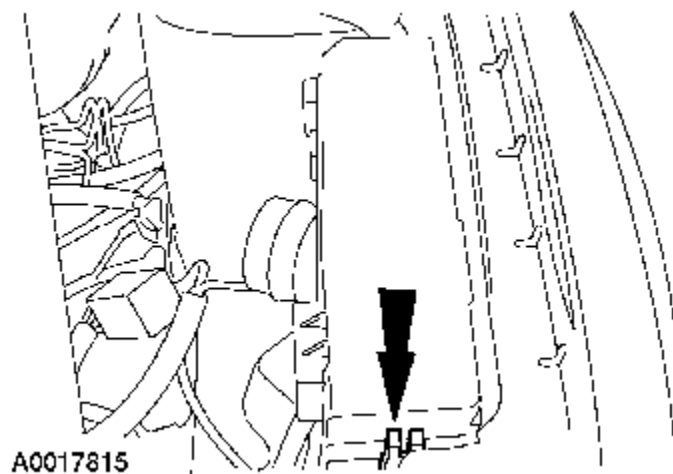
1. Disconnect the hoses.



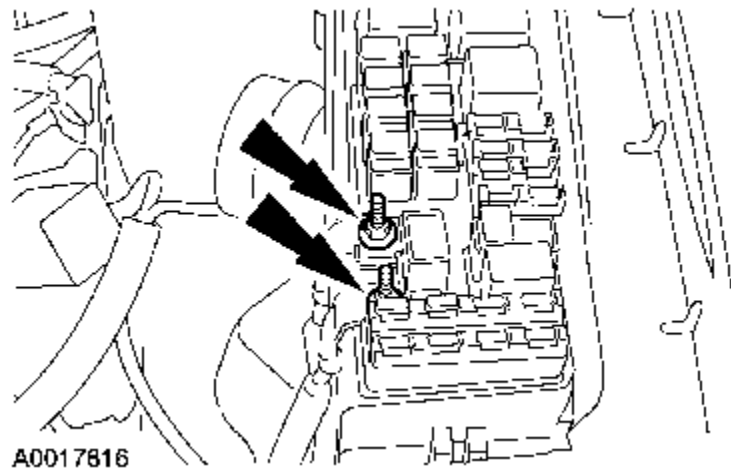
1. Remove the tie-strap and position the hose out of the way.



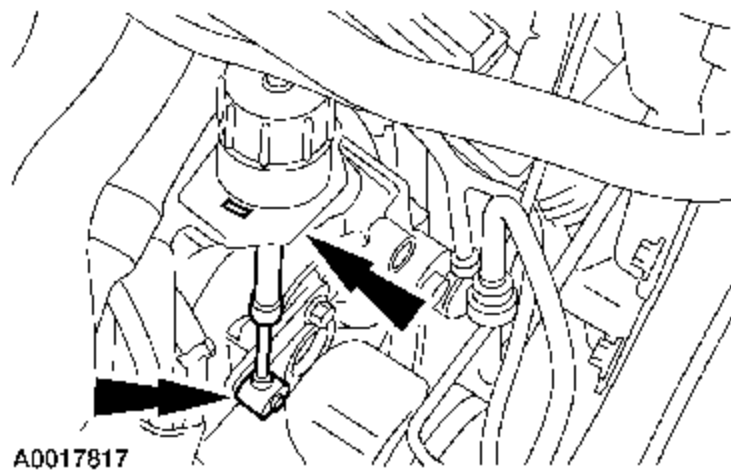
1. Disconnect the connector from the power distribution box.



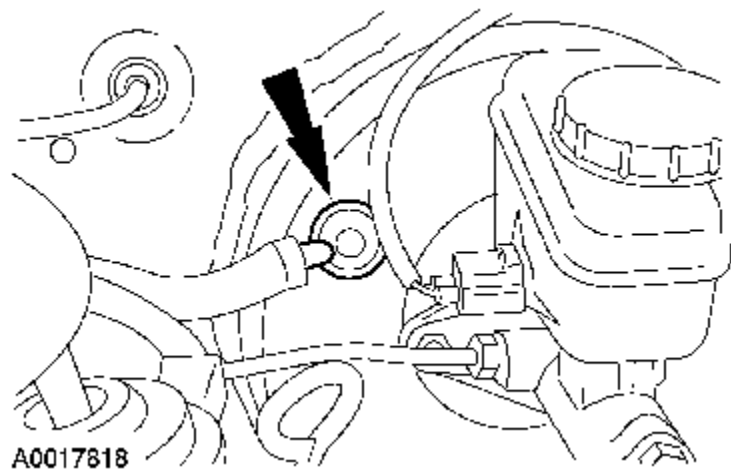
1. Remove the power distribution box cover.



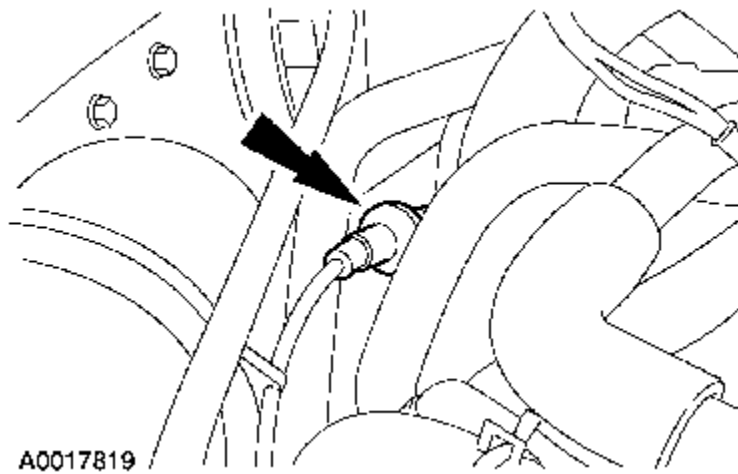
1. Remove the nuts and the cables.



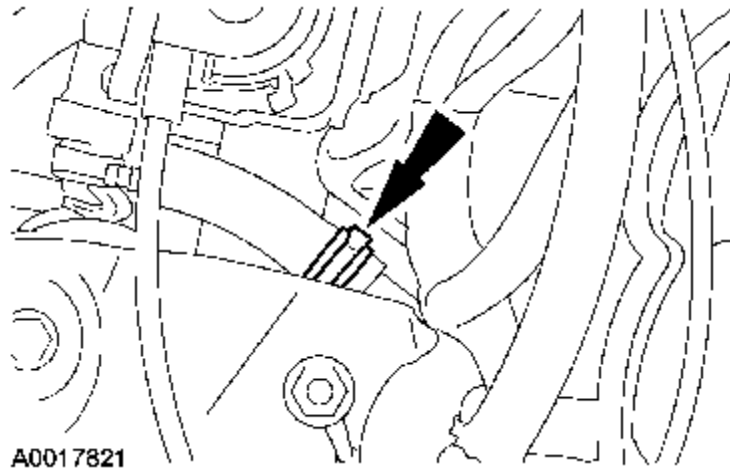
1. Disconnect the transaxle linkage.



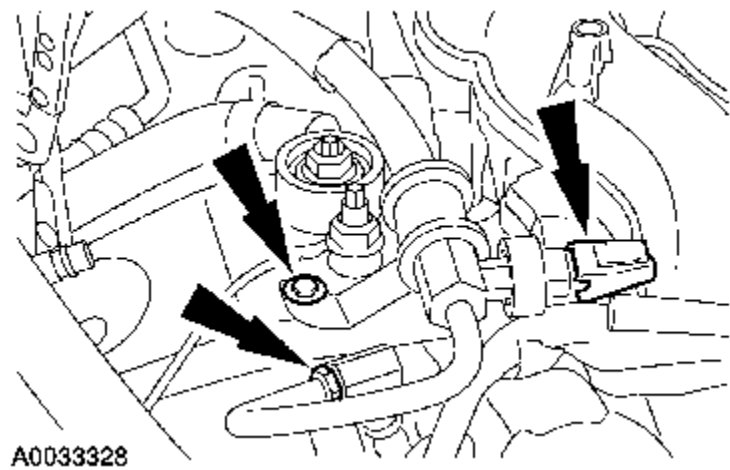
1. Disconnect the brake booster vacuum hose.



1. Disconnect the vacuum line.

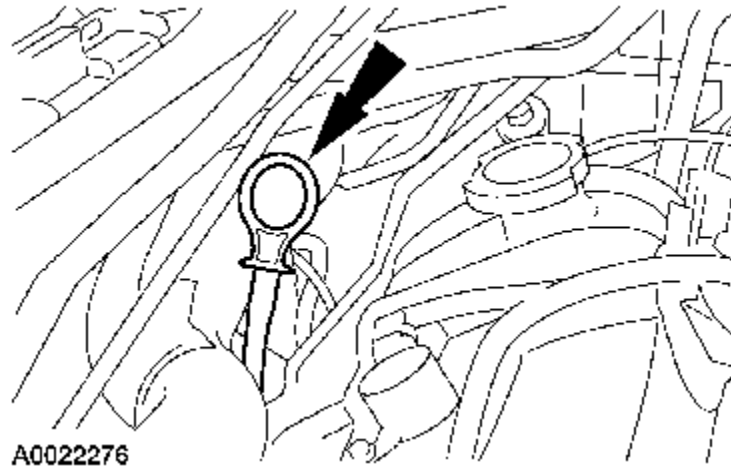


1. Disconnect the power steering return line.

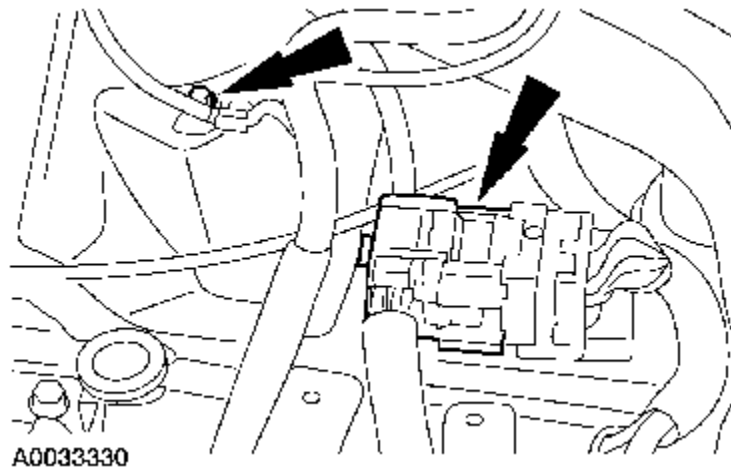


1. Disconnect the power steering line.

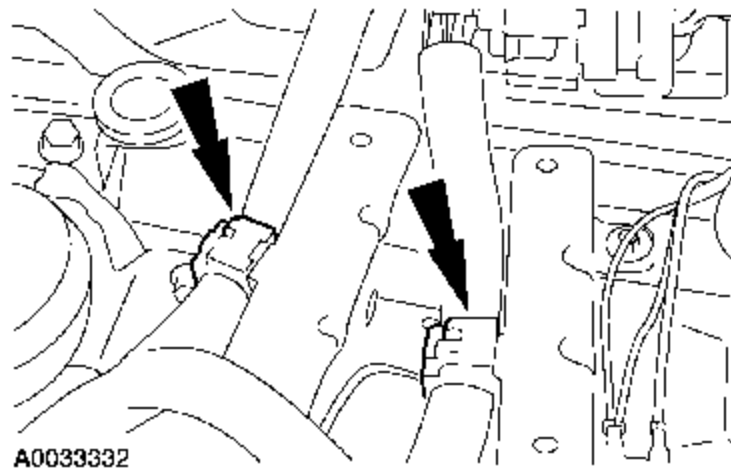
- Disconnect the power steering pressure (PSP) switch electrical connector.
- Remove the bracket bolt.
- Disconnect the power steering line.



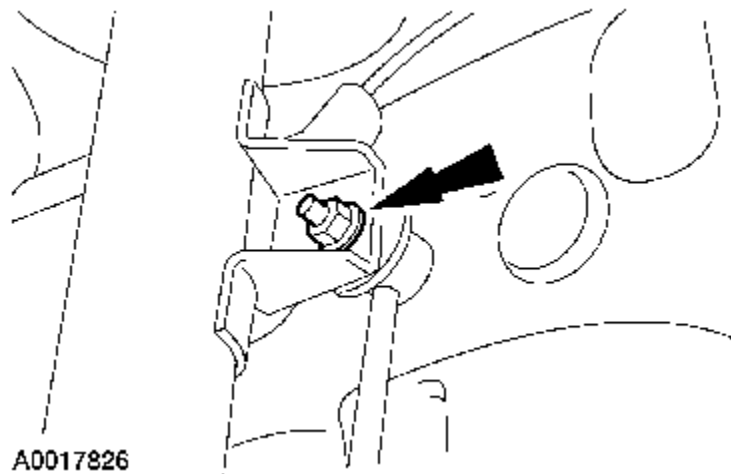
1. Remove the oil level indicator.



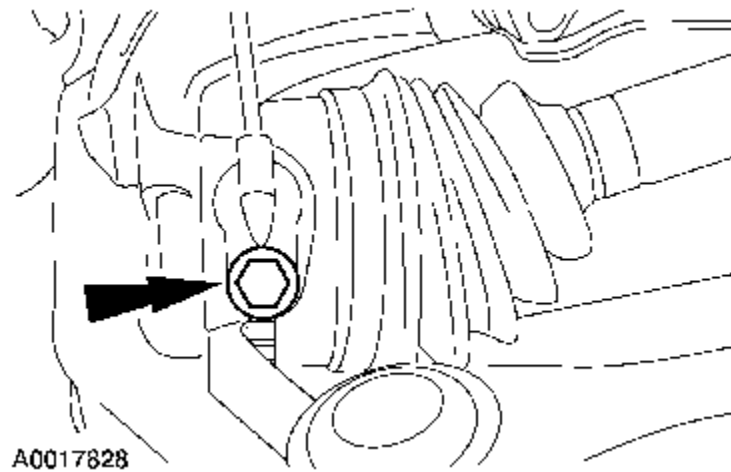
1. Disconnect the ground strap and the connector.



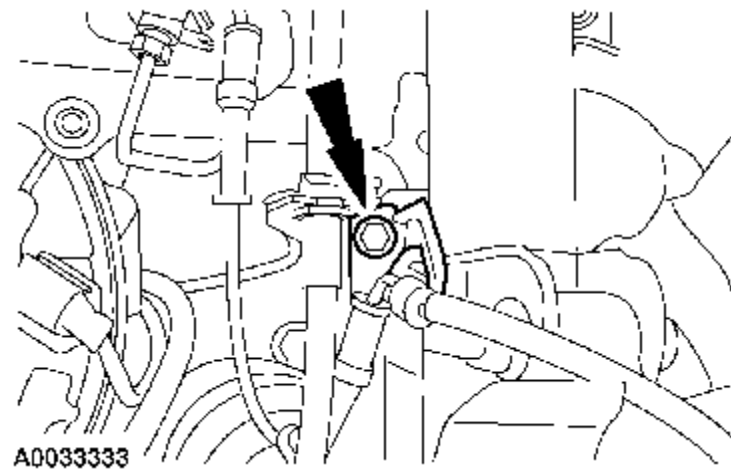
1. Remove the harness retainers and position the harness out of the way.
2. Remove the exhaust flexible pipe. Refer to — [01-15B EXHAUST FLEXIBLE PIPE 3.0L DURATEC \(4V\)](#).
3. Remove the A/C compressor. Refer to — [07-11 AIR CONDITIONING \(A/C\) COMPRESSOR 3.0L DURATEC \(4V\)](#).
4. Remove both front wheel and tire assemblies.
5. If equipped, remove the intermediate drive shaft. Refer to [03-13 INTERMEDIATE SHAFT](#).



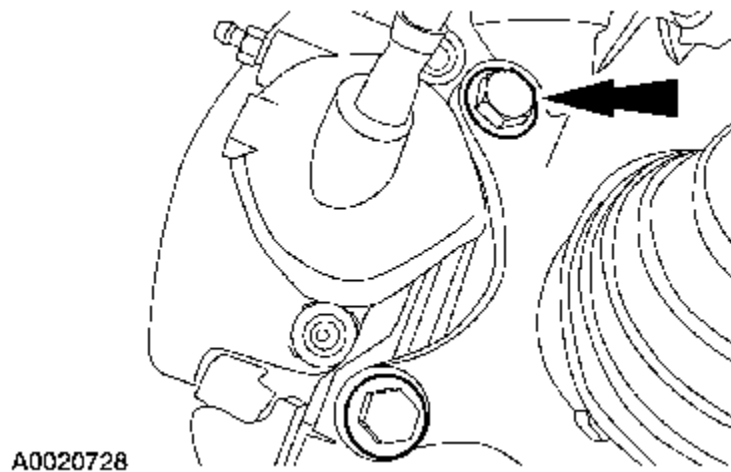
1. Separate the LH and RH sway bar links from the strut mount.



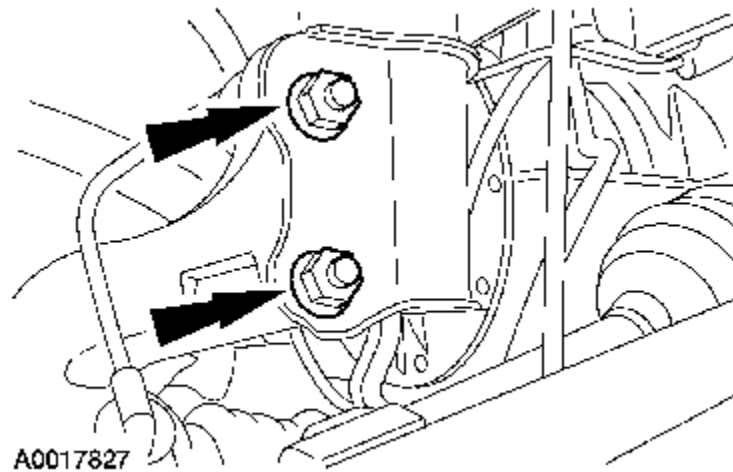
1. Remove the bolt and position aside the LH and RH wheel speed sensors if equipped.



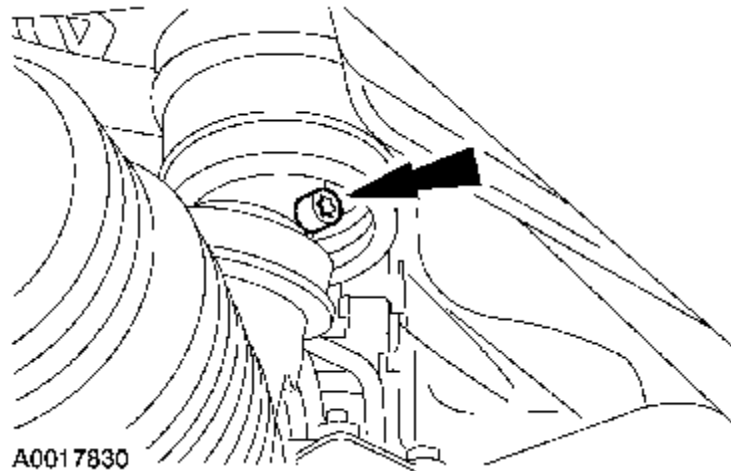
1. If equipped, remove the LH and RH wheel speed sensor brackets.



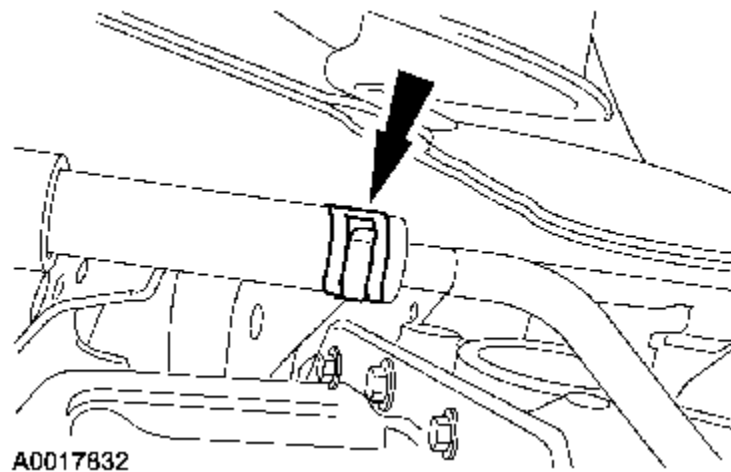
1. Remove the LH and RH brake calipers from the steering knuckles and support them to the struts.



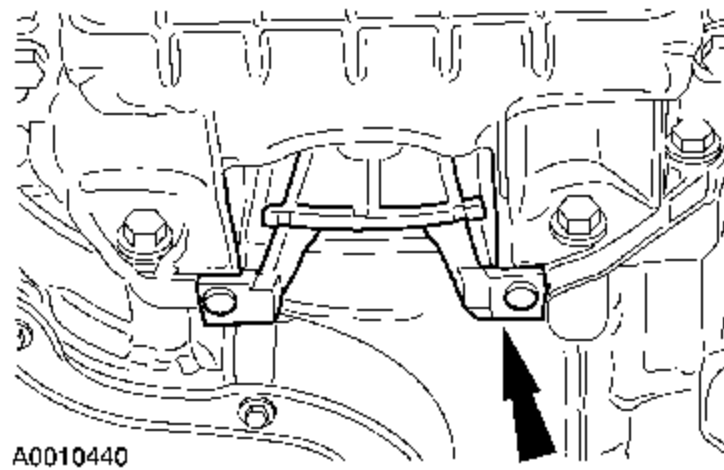
1. Remove the bolt and separate the struts from the LH and RH steering knuckles.



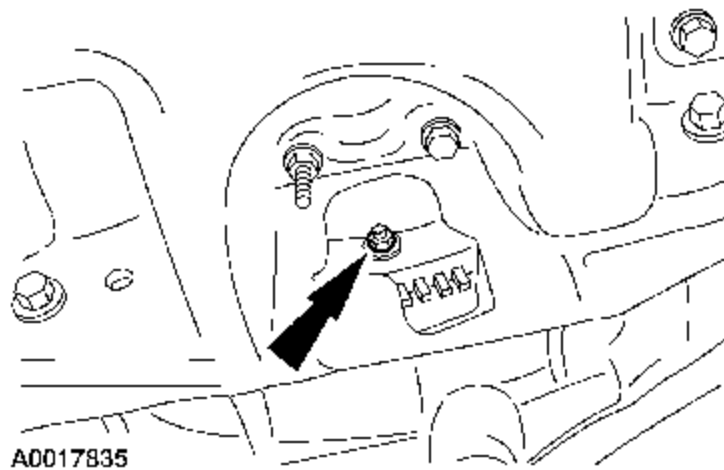
1. Remove the bolt and separate the steering shaft from the rack.



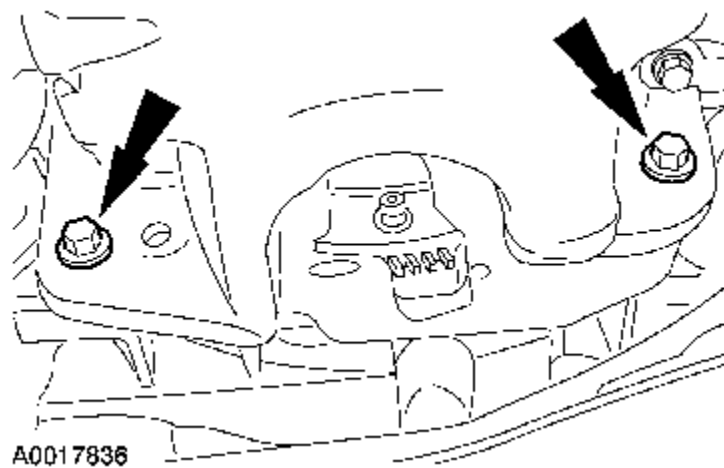
1. Disconnect the two transaxle cooler lines.



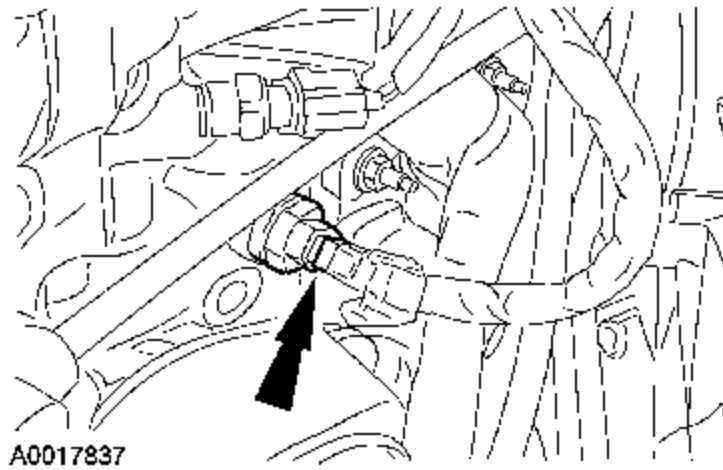
1. Remove the torque converter inspection cover.



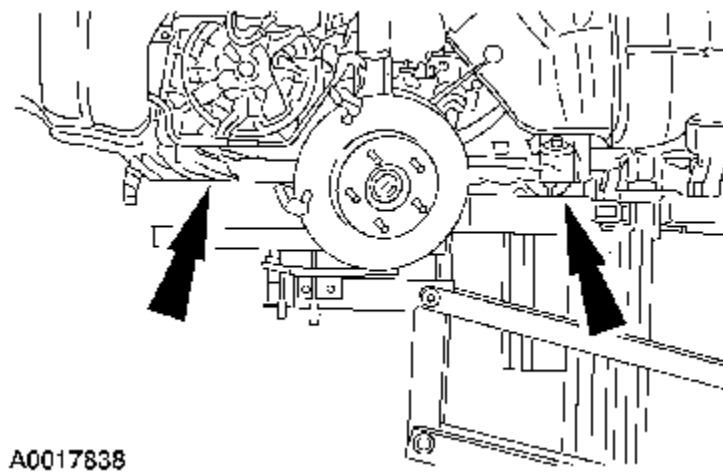
1. Remove the four torque converter nuts.



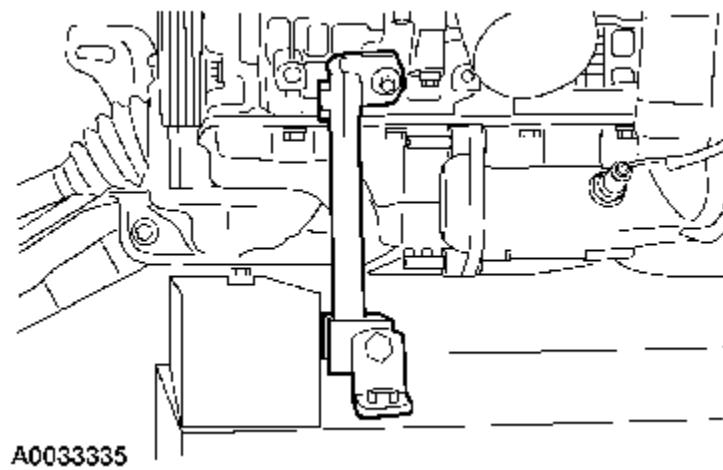
1. Remove the four bolts.



1. If equipped disconnect the block heater wiring.



1. Position the universal powertrain lift.



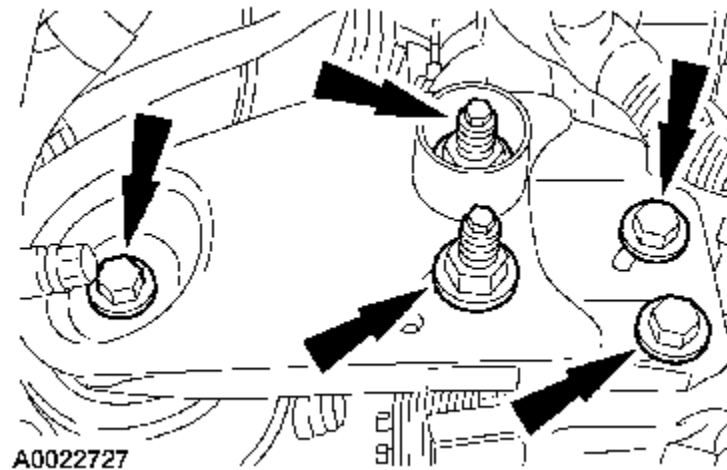
- 1.

CAUTION:

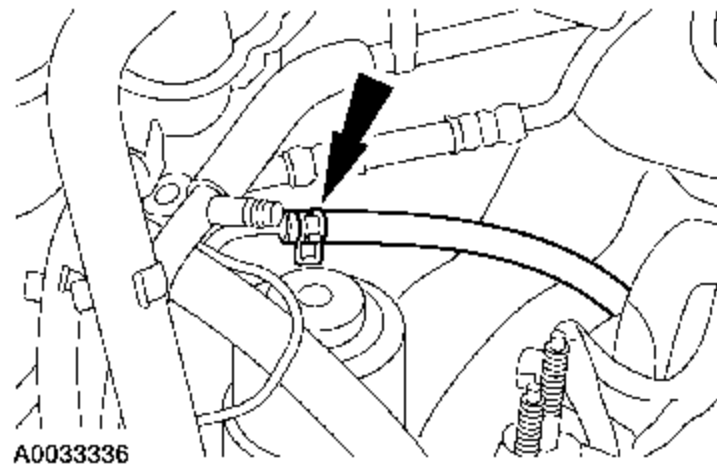
Do not allow the engine oil pan to rest on the powertrain lift. Using a bracket from the heavy duty engine stand, support the front of the engine.

NOTE:

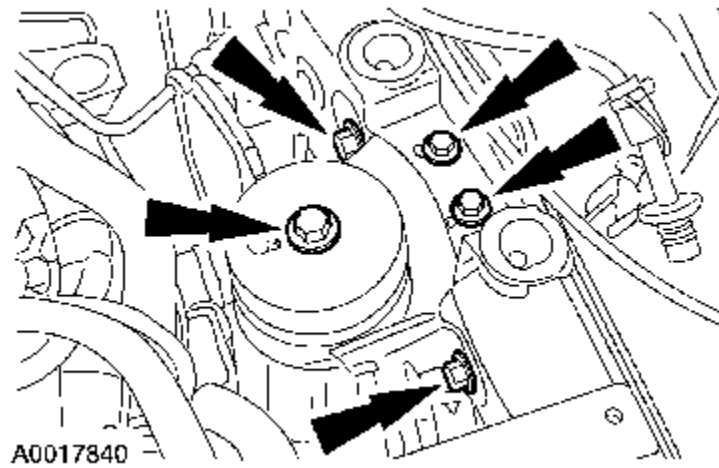
The next seven steps must be carried out with the vehicle raised and the universal powertrain lift in position.



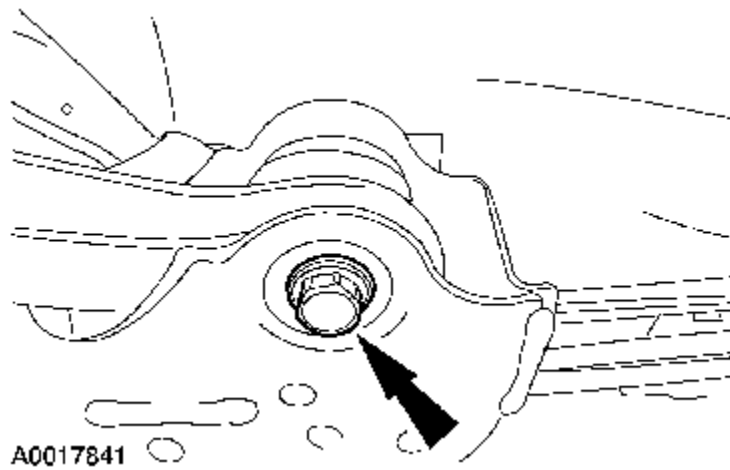
1. Remove the bolts and the nuts, remove the engine support bracket.



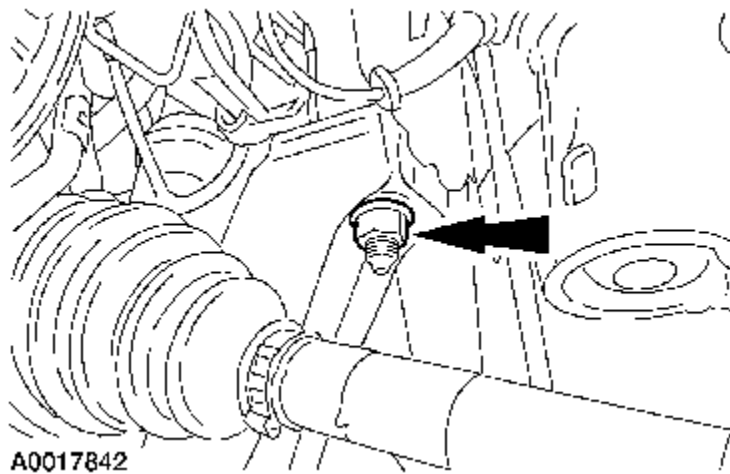
1. Disconnect the power steering return hose.



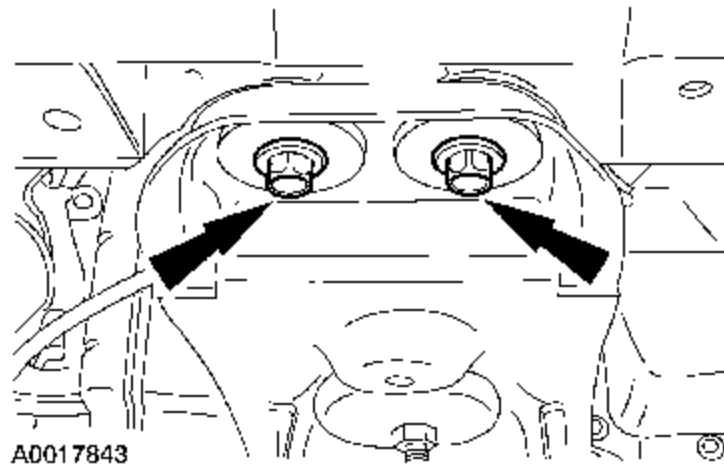
1. Remove the bolts and the transaxle support.



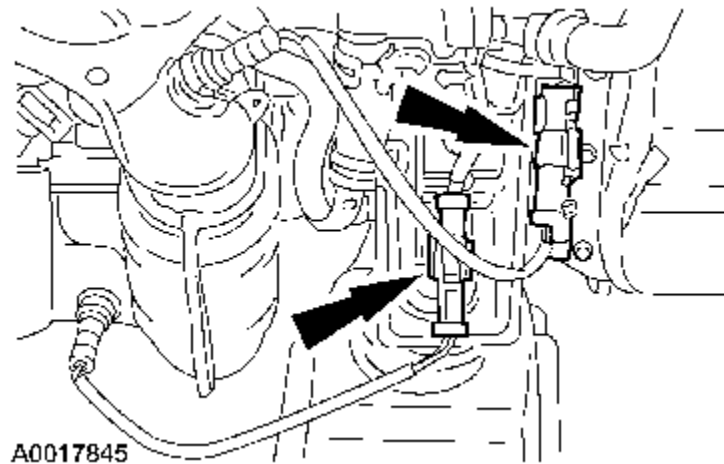
1. Remove two rear subframe bolts.



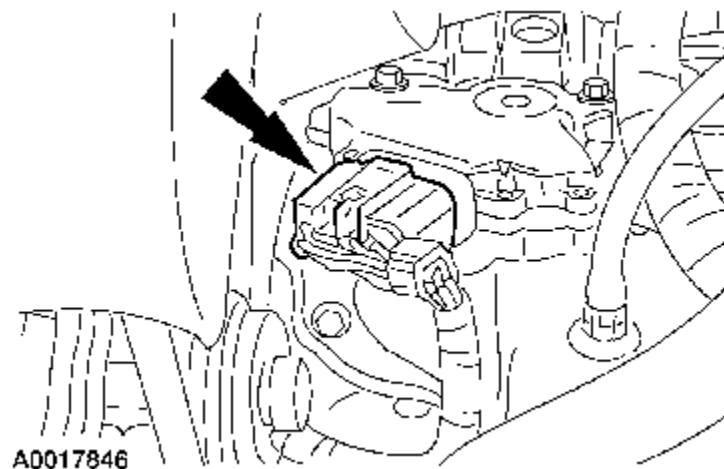
1. Remove the two subframe side nuts.



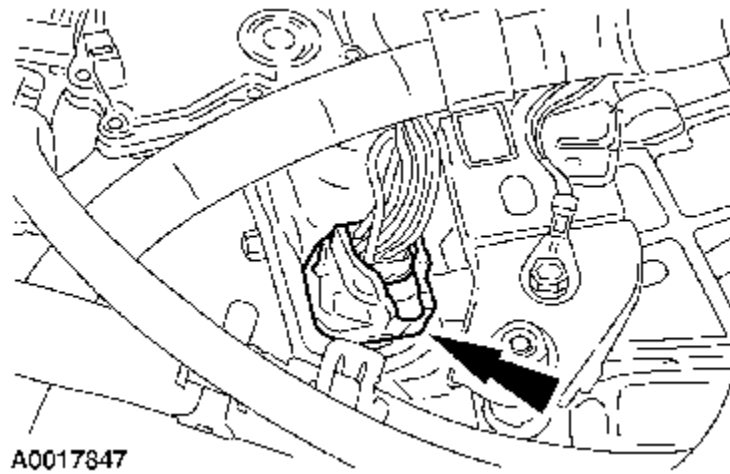
1. Remove the two bolts from the motor mount support.
2. Remove the powertrain from the vehicle.



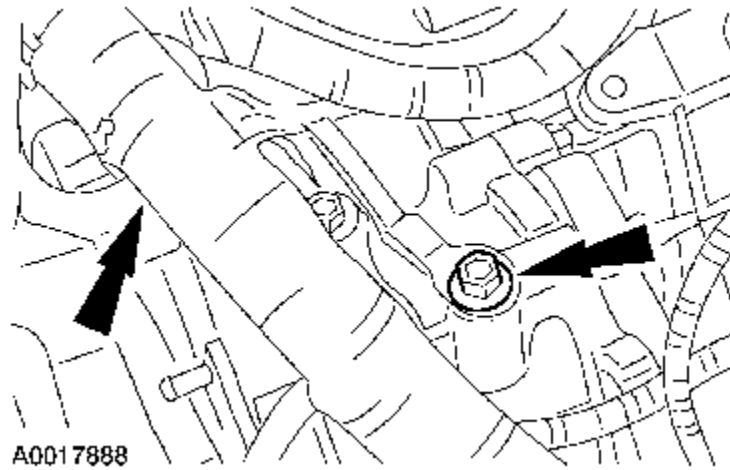
1. Disconnect the heated oxygen sensors.



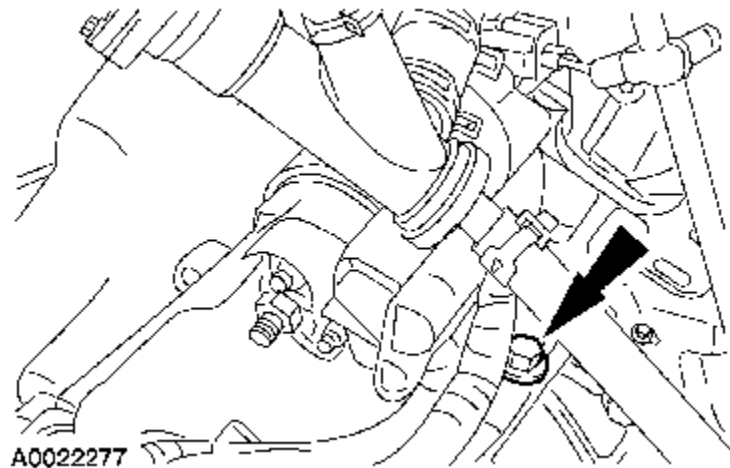
1. Disconnect the TR sensor.



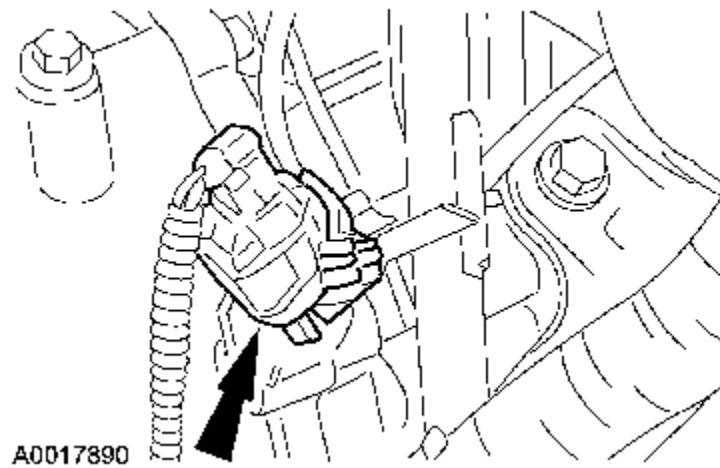
1. Disconnect the transaxle harness electronic control switch.



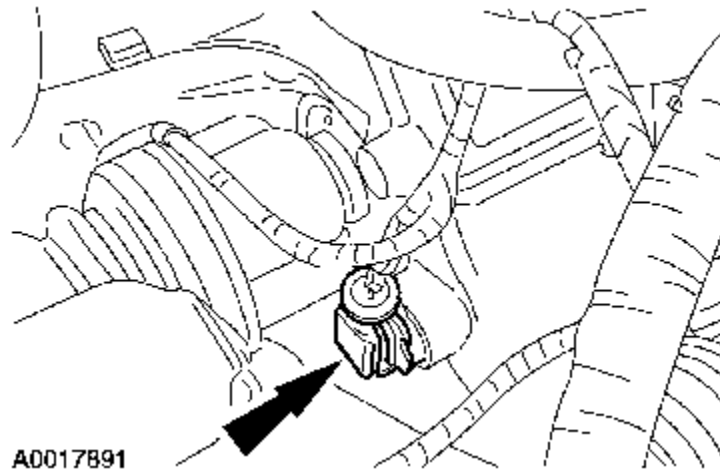
1. Remove the bolt and separate the transaxle control harness from the bracket.



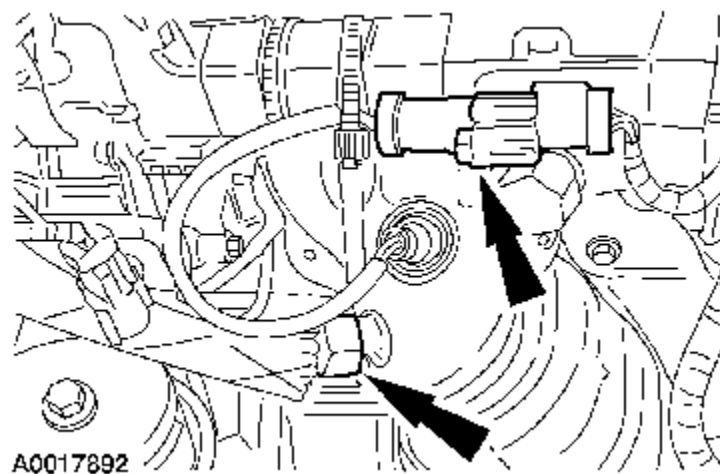
1. Remove the two bolts, the starter and harness as an assembly.



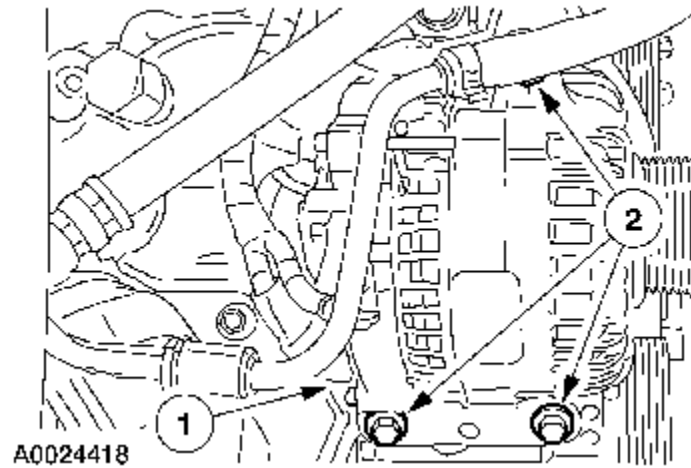
1. Disconnect the knock sensor jumper electrical connector.



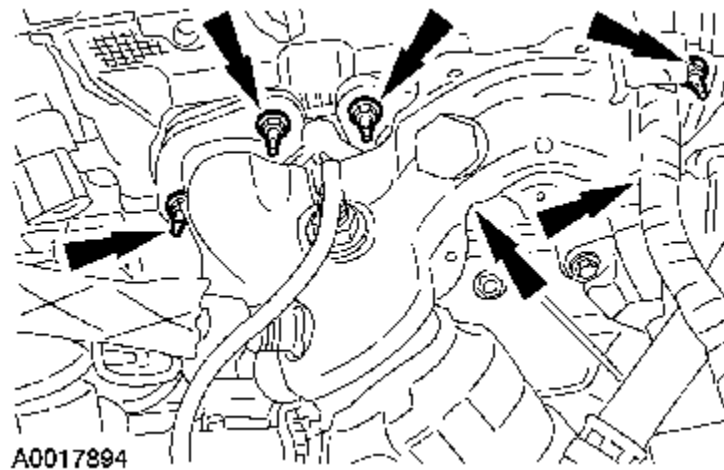
1. Disconnect the output shaft speed (OSS) sensor and the turbine shaft speed (TSS) sensor electrical connectors.



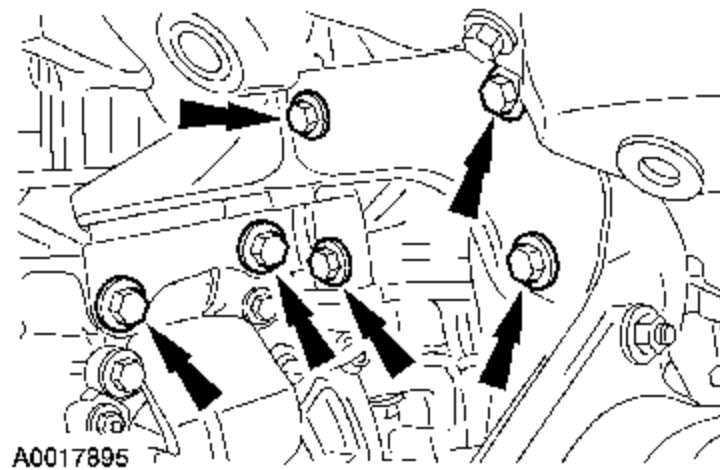
1. Disconnect the HO2S and the EGR tube from the exhaust manifold.
2. Disconnect the DPFE hoses and remove the EGR tube from the EGR valve.



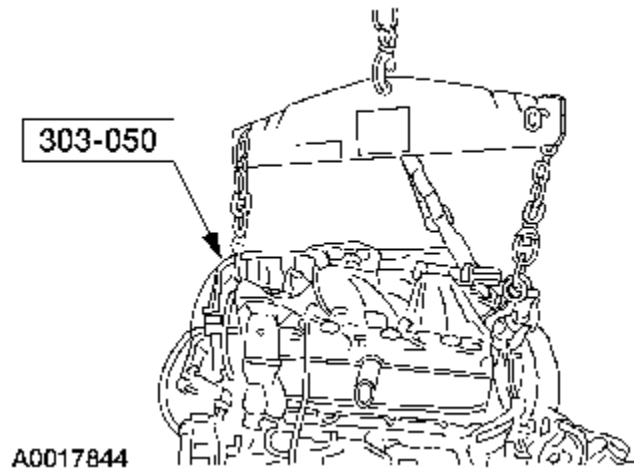
1. Remove the generator.
 - a. Disconnect the electrical connector.
 - b. Remove the bolts.



1. Remove the six RH exhaust manifold nuts and gasket.



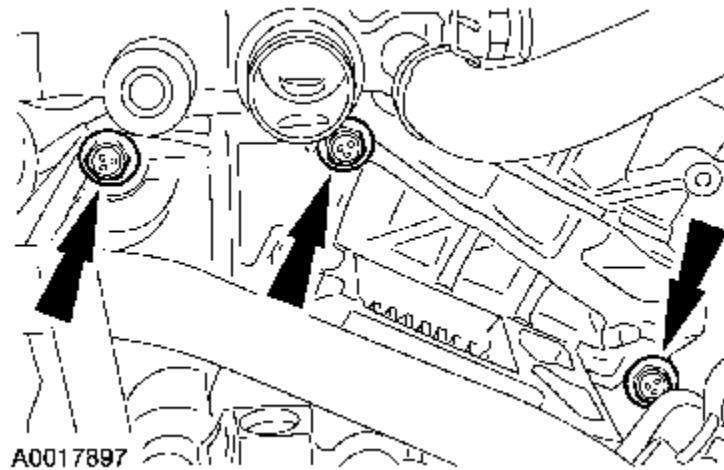
1. Remove the bolts and position the halfshaft support bracket out of the way.



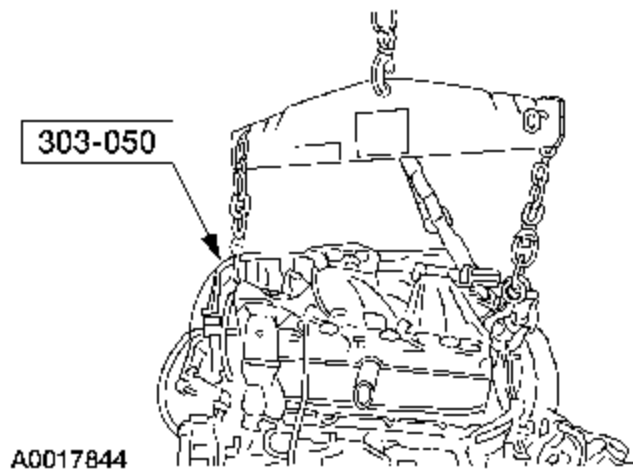
- 1.

NOTE:

Once the engine is supported by the engine crane, remove the bracket supporting the front of the engine. Using the special tools, remove the powertrain from the universal powertrain lift.



1. Remove the six transaxle bolts.



1. Using the special tools, remove the engine from the transaxle and mount on a suitable engine stand.

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VIN or Model Year 2003 Model TRIBUTE fuel charging

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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2003 - Tribute - Workshop Manual - Engine

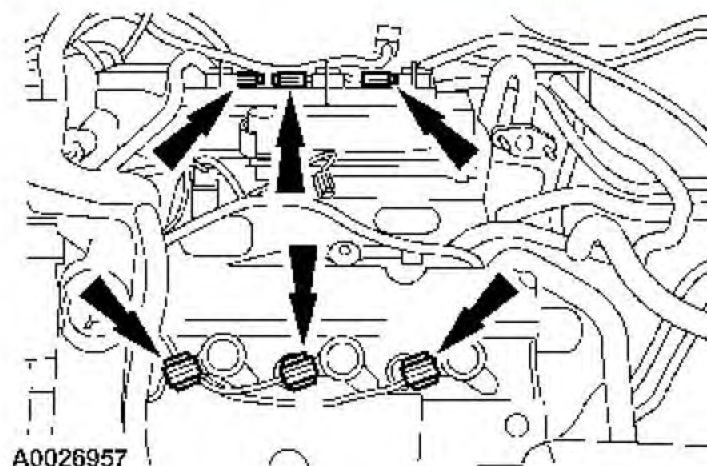
FUEL CHARGING WIRING HARNESS

Removal and Installation

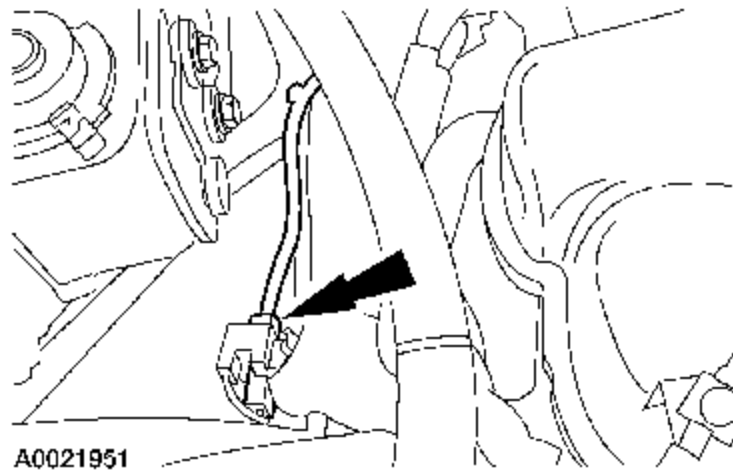
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

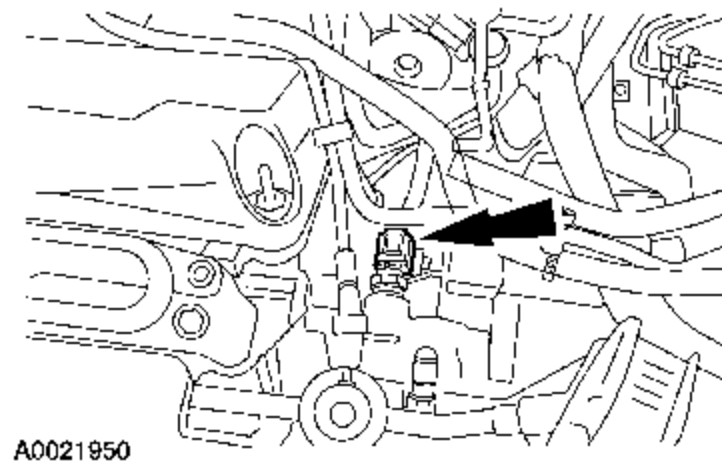
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



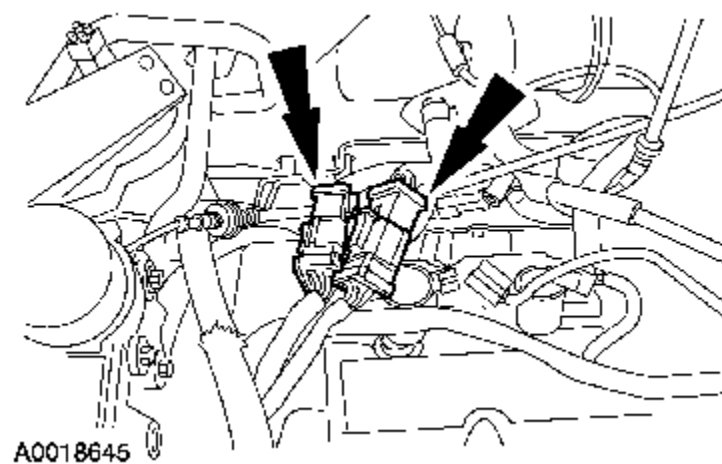
1. Disconnect the coil-on-plug electrical connectors.



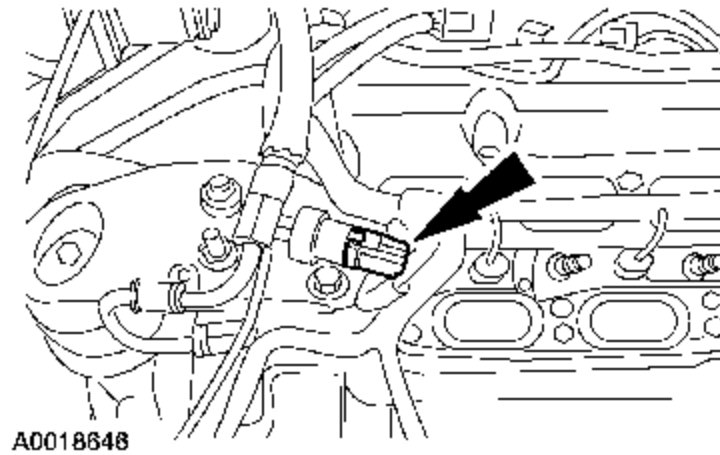
1. Disconnect the radio ignition noise suppressor electrical connector.



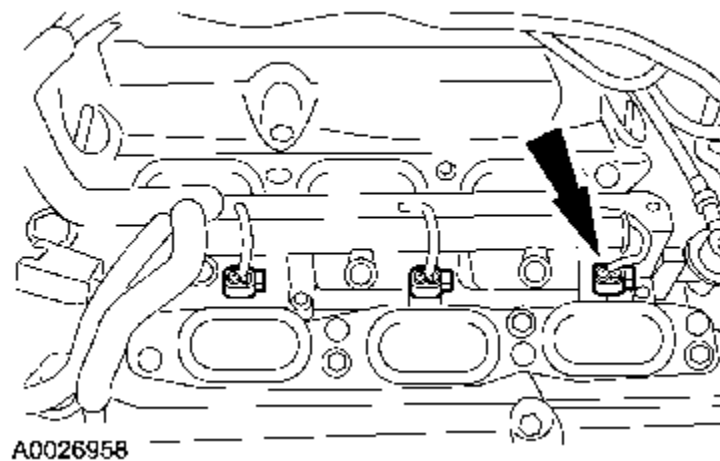
1. Remove the engine coolant temperature (ECT) sensor electrical connector.



1. Disconnect the 16-pin electrical connectors.



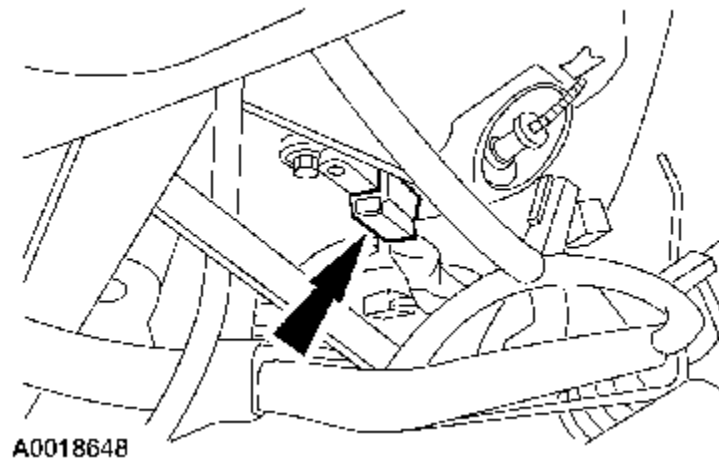
1. Disconnect power steering pressure (PSP) switch electrical connector.



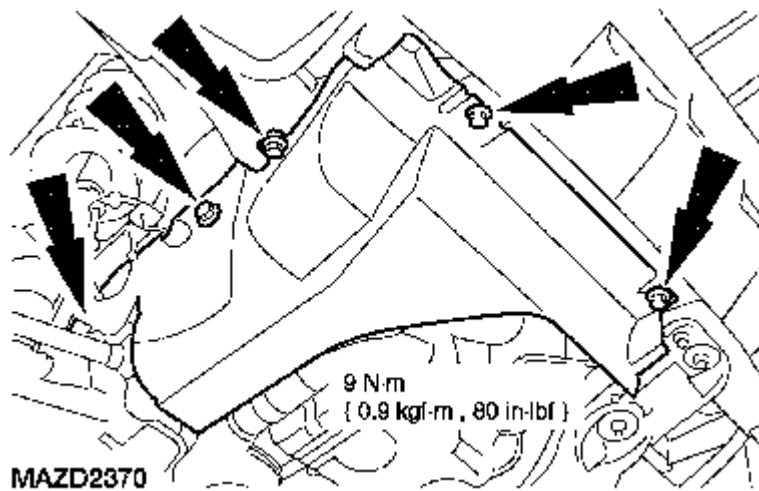
- 1.

NOTE:

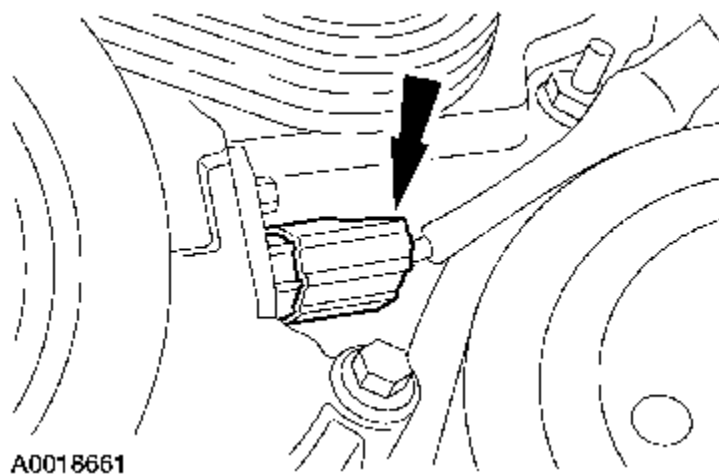
One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



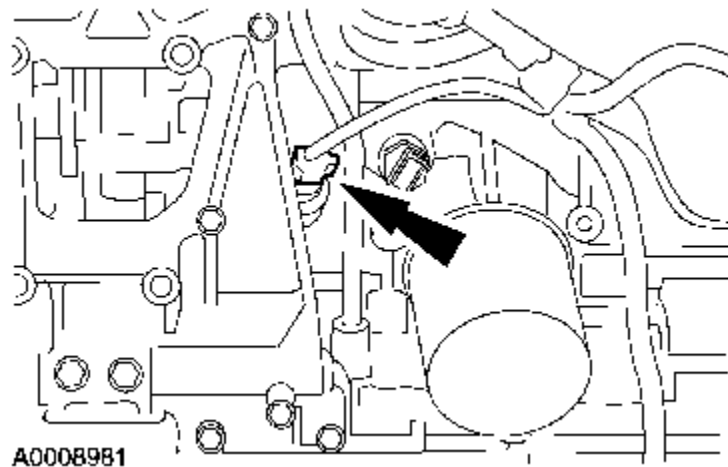
1. Disconnect the camshaft position (CMP) sensor electrical connector.
2. Remove the RH wheel and tire assembly.



1. Remove the RH lower splash shield.



1. Disconnect the crankshaft position (CKP) sensor electrical connector.



- 1.

NOTE:

The oil pressure sensor is located behind the rear of the A/C compressor. The A/C compressor has been removed for clarity. Disconnect the oil pressure sensor electrical connector.

2. Lower the vehicle.
3. Remove the fuel charging wiring harness from the vehicle.
4. To install, reverse the removal procedure.

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VIN or Model Year 2003 Model TRIBUTE fuel injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

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FUEL INJECTION SUPPLY MANIFOLD

Removal and Installation

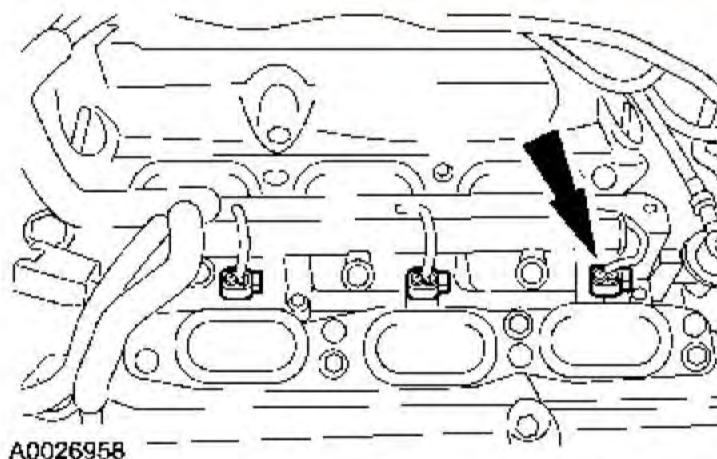
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#)
2. Disconnect the fuel line. Refer to [01-14 SPRING LOCK COUPLINGS](#).

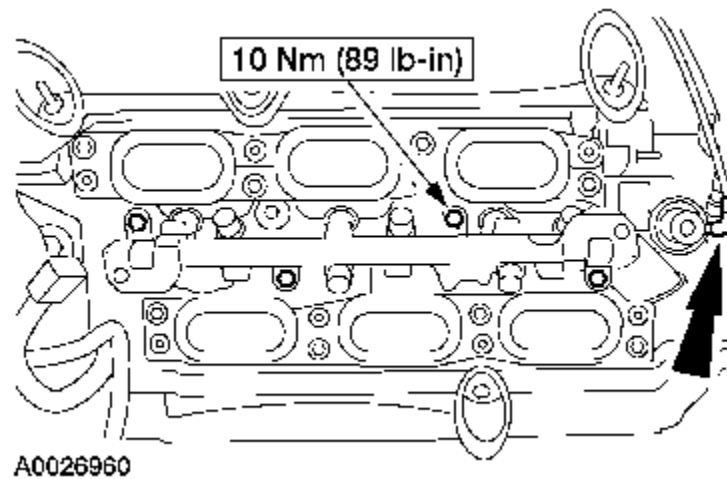


A0026958

1.

NOTE:

One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



1. Remove the fuel injection supply manifold.

- a. Remove the vacuum hose.
- b. Remove the bolts and the manifold.

2.

NOTE:

Lubricate the fuel injector O-ring seals with clean engine oil to aid installation. To install, reverse the removal procedure.

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VIN or Model Year 2003 Model TRIBUTE fuel injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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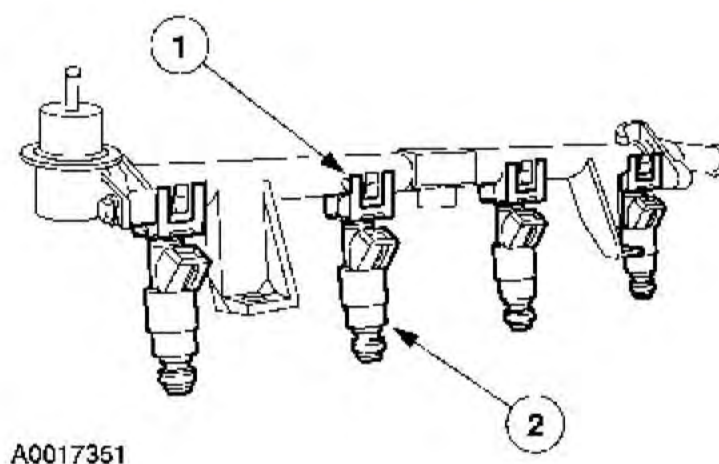
FUEL INJECTORS

Removal and Installation

WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

1. Remove the fuel injection supply manifold. Refer to [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 2.0L Zetec, or [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 3.0L (4V).

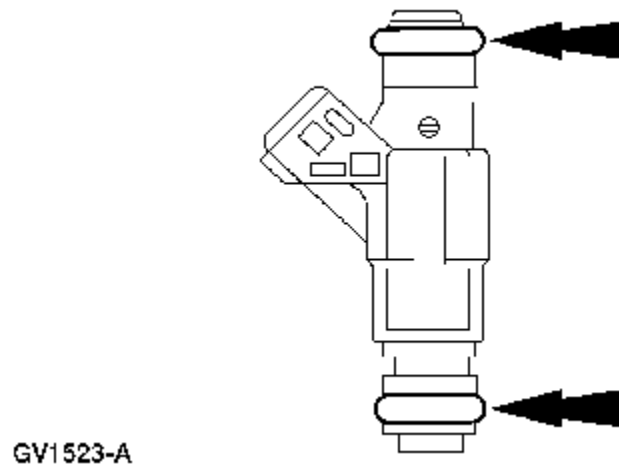


- 1.

NOTE:

A gentle twisting motion may be used while removing the fuel injectors from the fuel supply manifold. Remove the fuel injectors from the supply manifold.

- a. Release the retaining clips.
- b. Remove the fuel injectors.



1. Inspect the O-ring seals. Discard if damaged.
- 2.

CAUTION:

Use O-ring seals made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog fuel injectors.

NOTE:

Lubricate the O-ring seals with clean SAE 5W-30 motor oil to aid installation.

NOTE:

Install the fuel injector retaining clips onto the fuel injectors before installing the injectors onto the supply manifold.

To install, reverse the removal procedure.

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☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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FUEL PULSE DAMPER

Removal and Installation

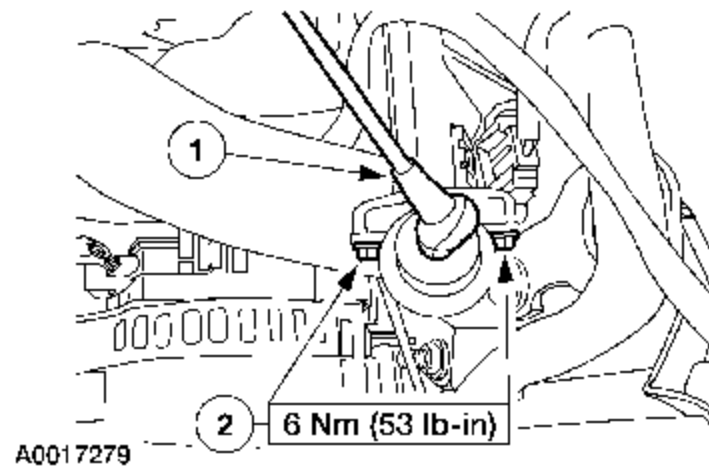
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Relieve the fuel system pressure. Refer to — [01-14 FUEL SYSTEM PRESSURE RELEASE 2.0L ZETEC](#) or — [01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC \(4V\)](#).
2. For 3.0L (4V) engine, remove the throttle body. Refer to [01-13B THROTTLE BODY](#).



1. Remove the fuel pulse damper.
 - a. Disconnect the vacuum line.
 - b. Remove the bolts and the damper.
2. Inspect the O-ring seal and install a new seal if damaged.
- 3.

CAUTION:

Use an O-ring seal made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog the fuel injectors.

NOTE:

Lubricate the O-ring seal with clean SAE 5W-30 motor oil to aid installation.

To install, reverse the removal procedure.

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VIN or Model Year 2003 - Model TRIBUTE - hydraulic lash adjuster

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/

☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

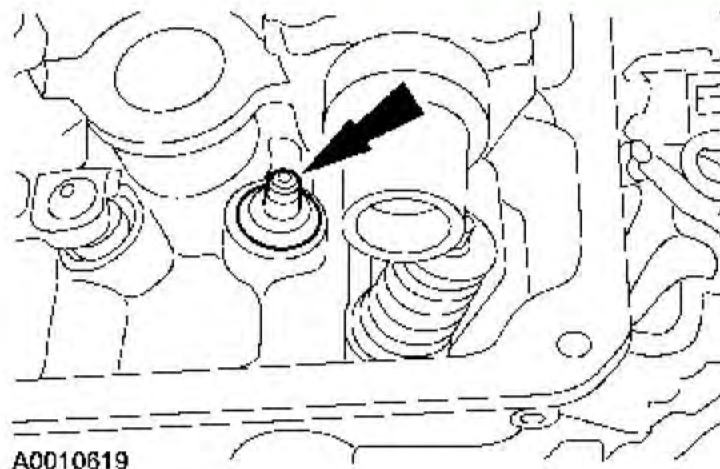
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HYDRAULIC LASH ADJUSTERS

Removal and Installation

1. Remove the camshaft followers. Refer to [01-10C ROLLER FOLLOWERS](#).



- 1.

NOTE:

Mark the positions of the hydraulic lash adjusters to make sure they are assembled in their original position. Remove the hydraulic lash adjusters.

- 2.

NOTE:

Inspect the hydraulic lash adjusters for scoring marks and uneven wear in the bore. Install new lash adjusters if necessary. To install, reverse the removal procedure.

- a. Lubricate the hydraulic lash adjusters with SAE 5W-20 Motor Oil.

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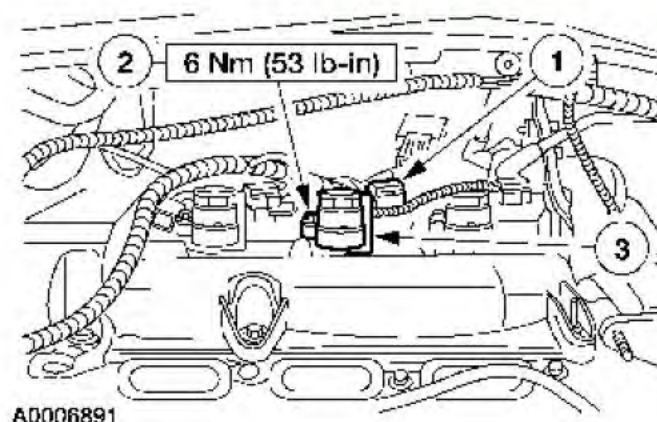
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IGNITION COIL-ON-PLUG — RH

Removal and Installation

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Remove the ignition coil-on-plug.
 - a. Disconnect the electrical connector.
 - b. Remove the bolt.
 - c. Remove the coil-on-plug.
2. To install, reverse the removal procedure.
 - a. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

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VIN or Model Year 2003 Model TRIBUTE upper intake manifold
General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

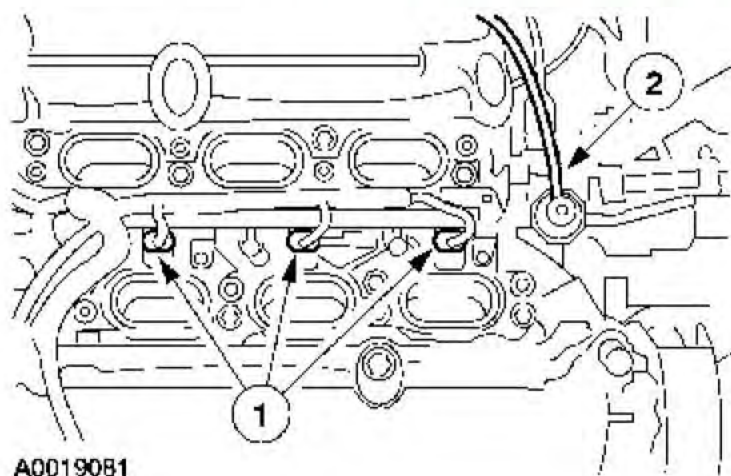
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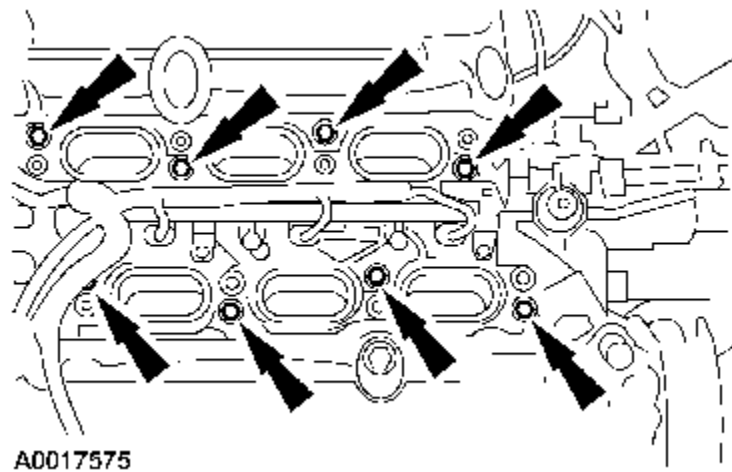
LOWER INTAKE MANIFOLD

Removal

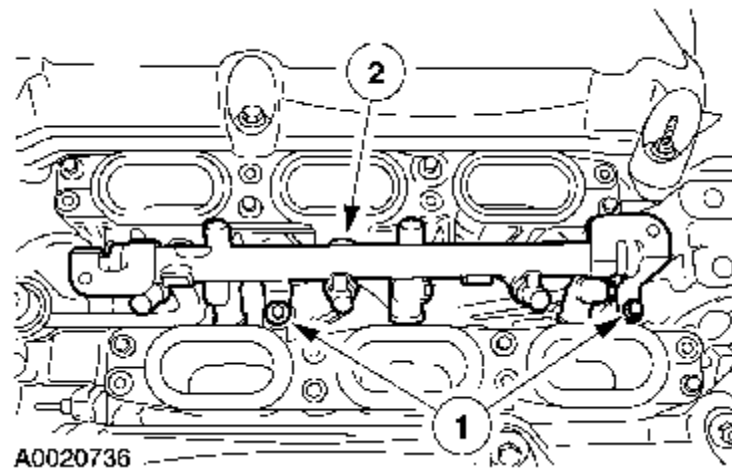
1. Disconnect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).
2. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Disconnect the fuel rail.
 - a. Disconnect the six fuel injector electrical connectors (1).
 - b. Disconnect the fuel pressure damper vacuum line (2).



1. Remove the bolts and the lower intake manifold.



1. Remove the fuel rail.
 - a. Remove the bolts (1).
 - b. Carefully separate the lower intake manifold from the fuel rail (2).
2. Remove the six fuel injectors from the lower intake manifold.
3. Remove and discard the gaskets if damaged.

Installation

1. Install the gaskets in the lower intake manifold.
- 2.

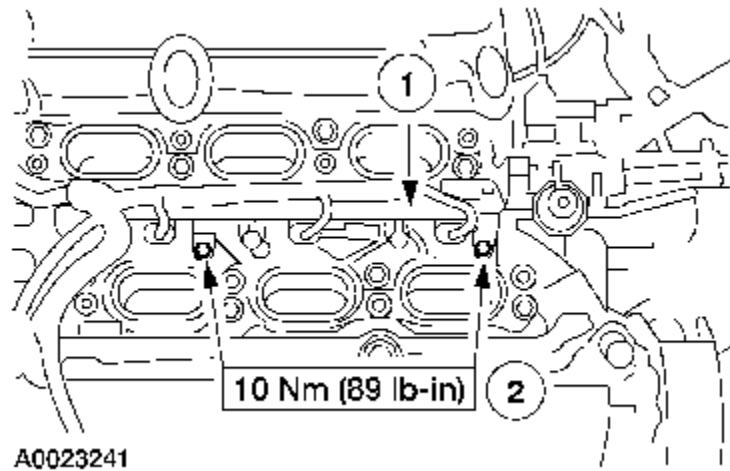
CAUTION:

Never use silicone grease. It will clog the fuel injectors.

NOTE:

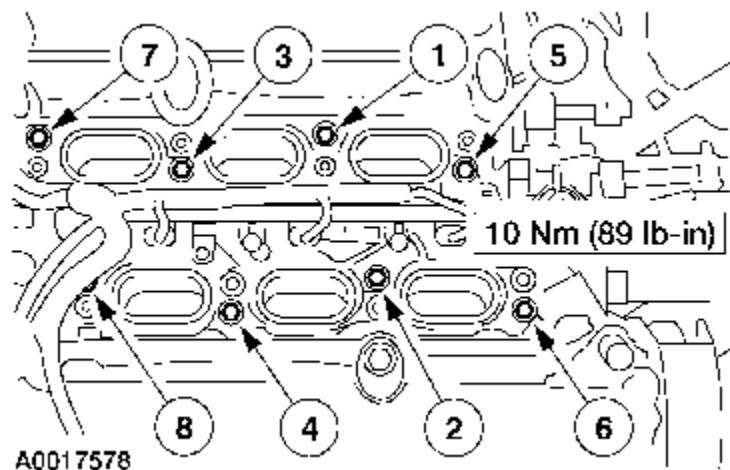
Inspect the fuel injector O-ring seals and install O-ring seals if necessary.

Lubricate the O-ring seals lightly with SAE 5W-20 Motor Oil and install the fuel injectors into the lower intake manifold.

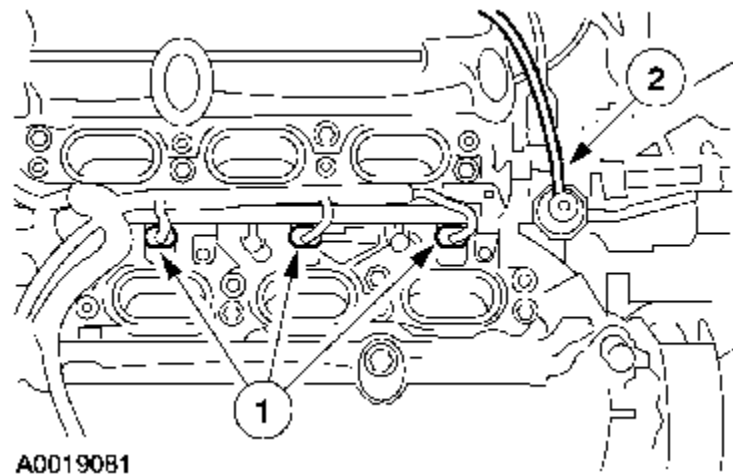


1. Install the fuel rail.

- a. Position the fuel rail (1).
- b. Install the four bolts (2).



1. Install the lower intake manifold assembly and tighten the bolts in the sequence shown.



1. Connect the fuel rail.
 - a. Connect the six fuel injectors (1).
 - b. Connect the fuel pressure damper vacuum line (2).
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).
3. Connect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).

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VIN or Model Year 2003 Model TRIBUTE oil pump

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

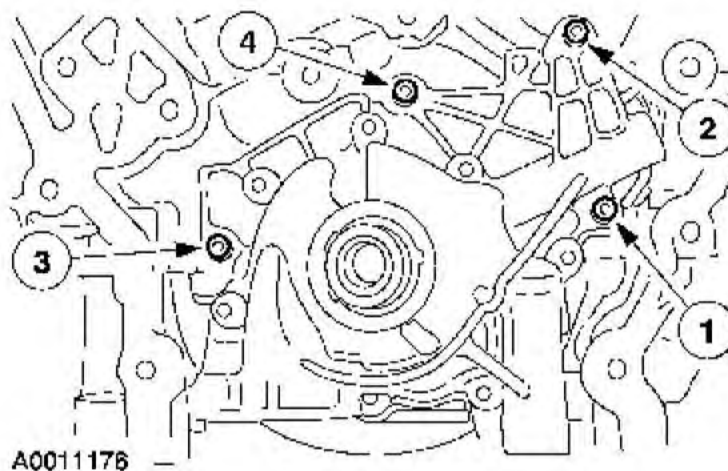
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OIL PUMP

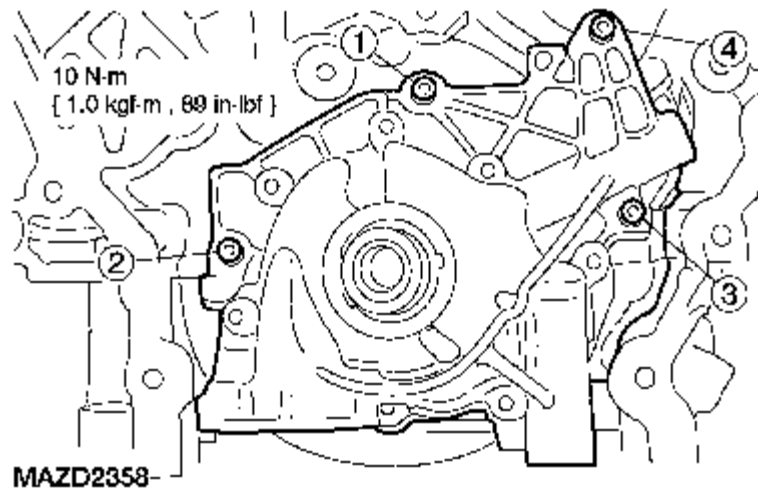
Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).
2. Remove the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).



1. Remove the bolts in the indicated sequence and remove the oil pump.

Installation



1. Position the oil pump and install the bolts in the sequence shown.
2. Install the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).
3. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2003 Model TRIBUTE engine front cover

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

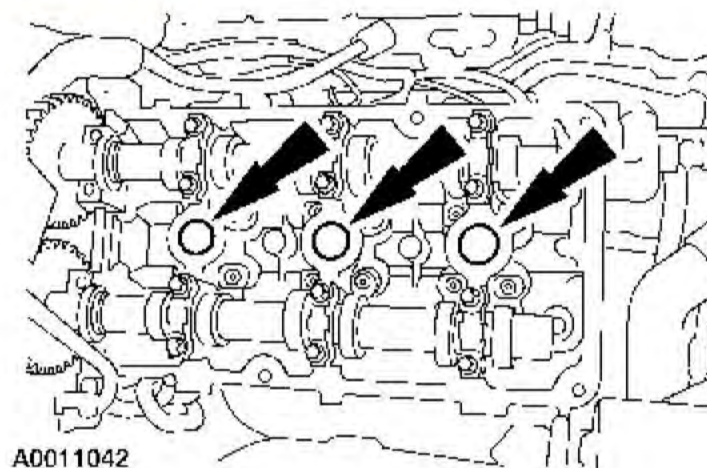
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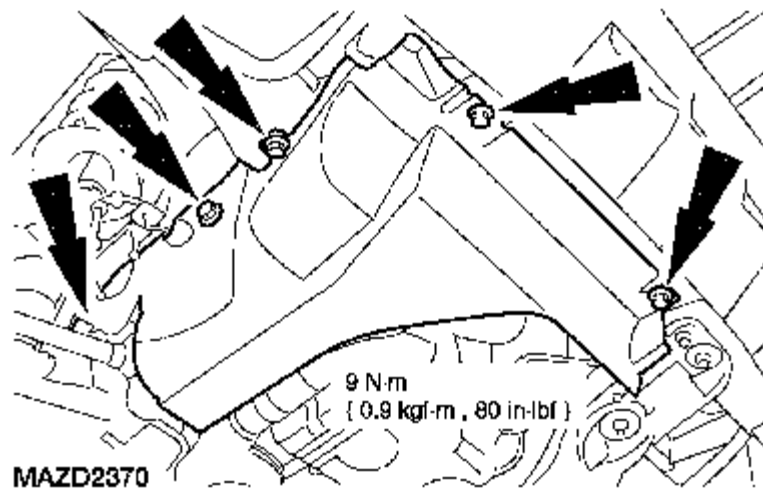
ROLLER FOLLOWERS

Removal and Installation

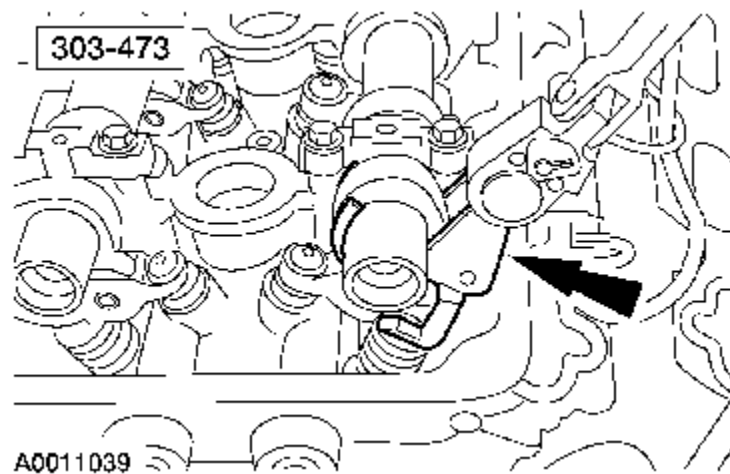
1. Remove the LH and RH valve covers. Refer to — [01-10C VALVE COVER RH](#) and — [01-10C VALVE COVER LH](#).



1. Remove the LH and RH spark plugs.
2. Remove the RH front wheel. Refer to [02-12 WHEEL AND TIRE](#).



1. Remove the splash shield.
2. Rotate the crankshaft until the camshaft lobe is pointing directly away from the follower.



1. Using the special tool, remove the followers.
 2. To install, reverse the removal procedure.
- Lubricate the camshaft followers with SAE 5W-20 Motor Oil .

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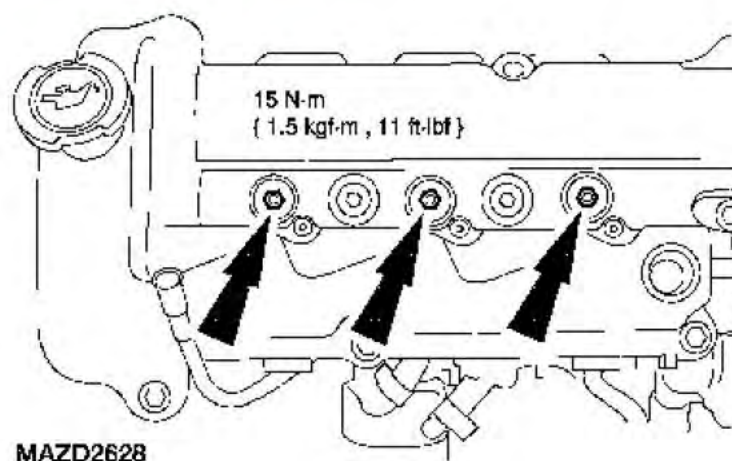
VIN or Model Year 2003 Model **TRIBUTE** spark plugGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐[< Previous](#) [Next >](#)

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SPARK PLUGS — 3.0L DURATEC (4V)

Removal

1. Remove the ignition coil-on-plugs. Refer to — [01-18 IGNITION COIL-ON-PLUG LH](#) and — [01-18 IGNITION COIL-ON-PLUG RH](#).



- 1.

NOTE:

LH shown, RH similar. Remove the LH and RH spark plugs.

2. Inspect the spark plugs. Refer to — [01-18 SPARK PLUG INSPECTION](#).
3. To install, reverse the removal procedure.

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VIN or Model Year 2003 - Model TRIBUTE - speed control cable

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

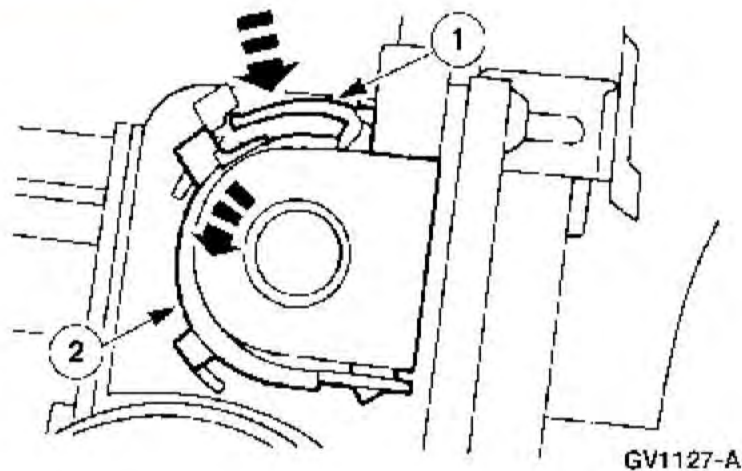
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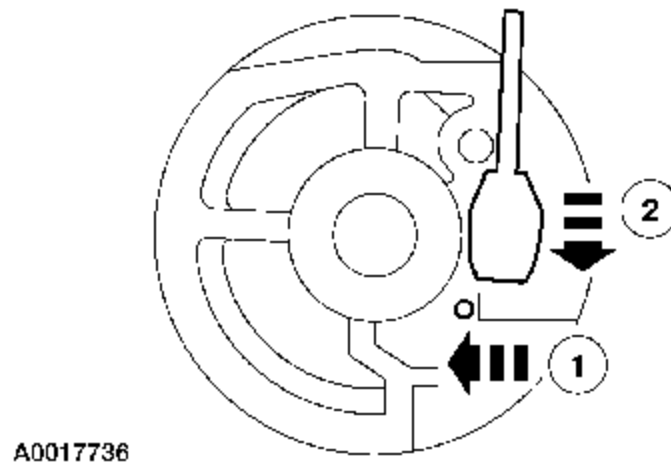
SPEED CONTROL ACTUATOR

Removal and Installation

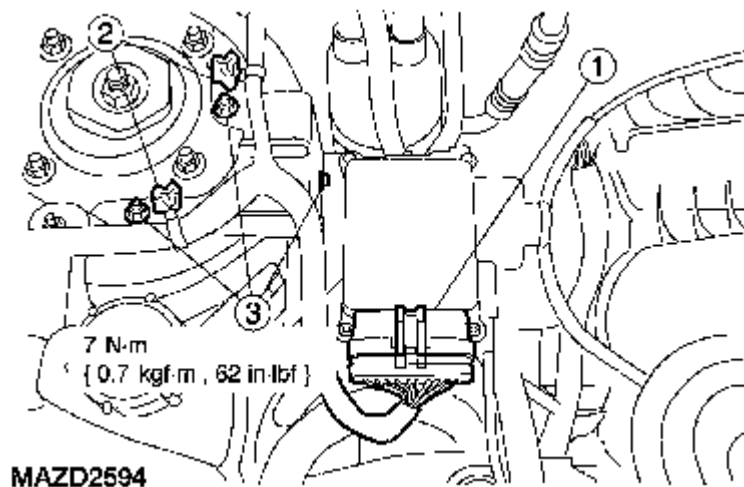
1. Disconnect the battery ground cable. For additional information, refer to [01-17 BATTERY DISCONNECT](#).



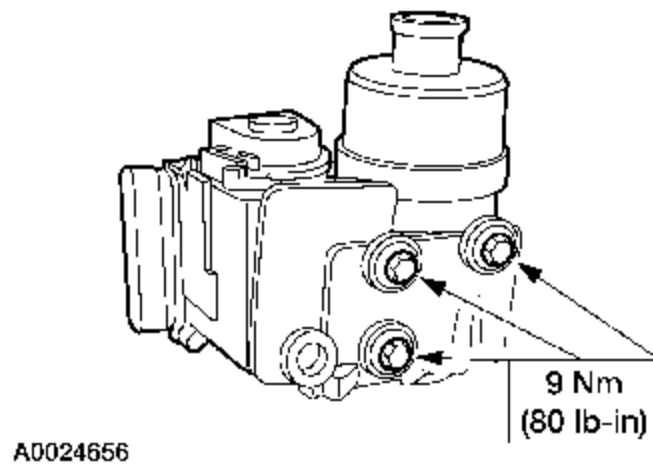
1. Release the cruise control cable cap.
 - a. Squeeze the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.



1. Remove the cruise control actuator assembly.
 - a. Disconnect the electrical connector.
 - b. Separate the wire harness from the bracket.
 - c. Remove the nuts.



1. Remove the bolts and separate the cruise control actuator from the bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2003 - Model TRIBUTE - speed control cable

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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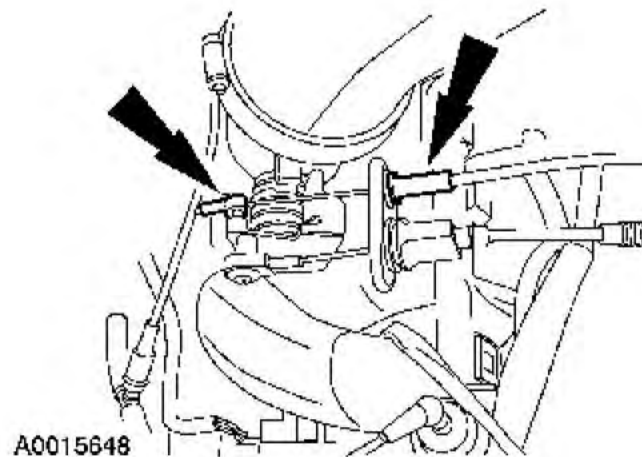
SPEED CONTROL CABLE

Removal and Installation

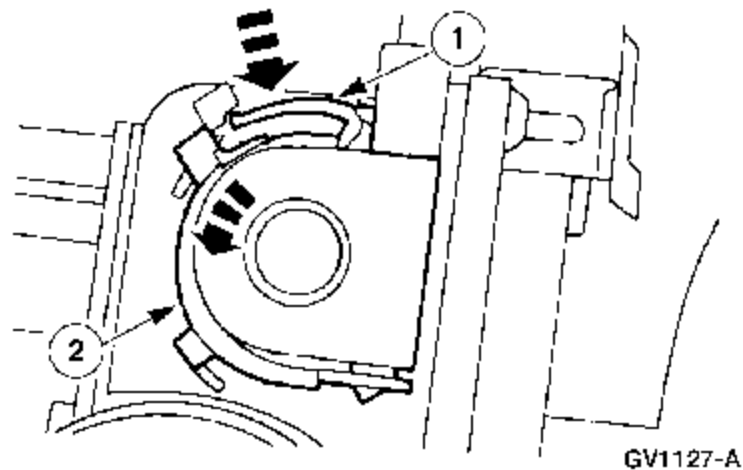
NOTE:

The cruise control actuator cable is not adjustable.

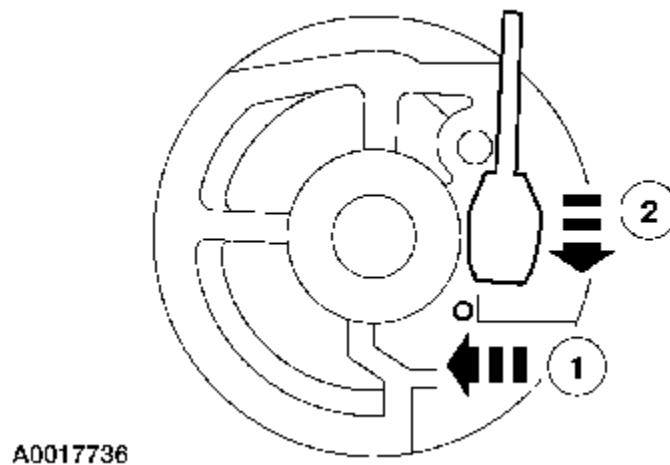
Vehicles equipped with 2.0L Zetec engine



1. Disconnect the cruise control cable from the throttle control linkage and bracket.



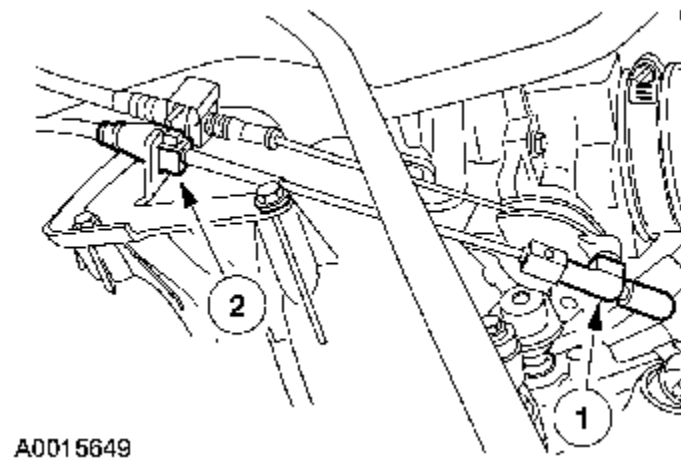
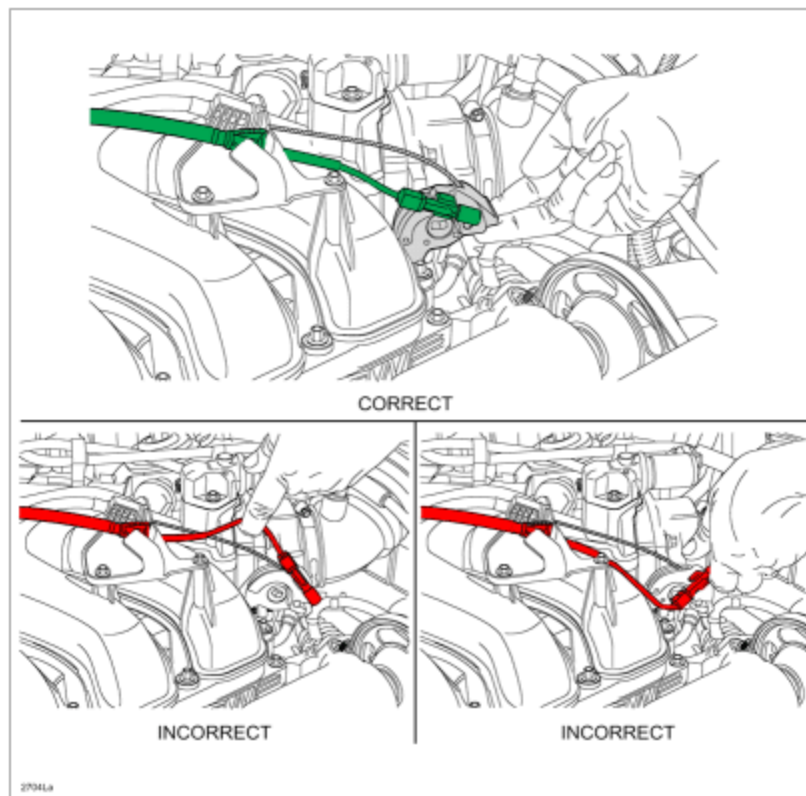
1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



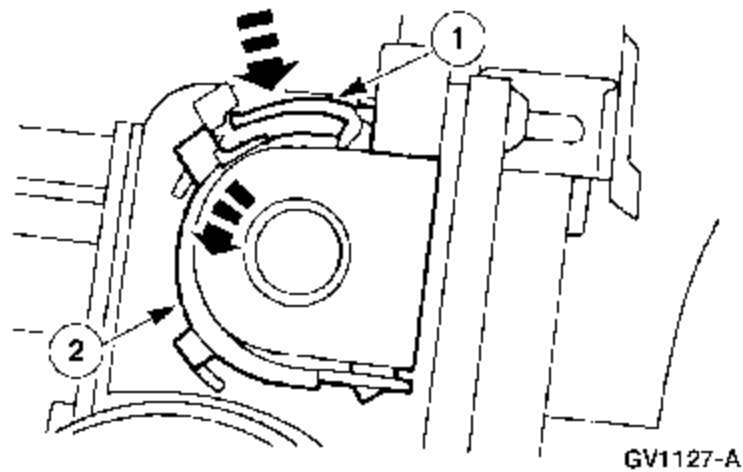
1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

Vehicles equipped with 3.0L (4V) engine

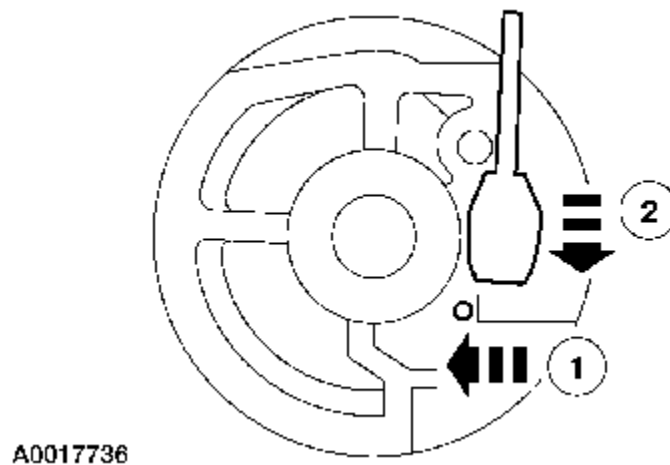
CAUTION: Damage to the speed control cable may result if the throttle body cam is rotated by lifting up on the speed control cable or the speed control cable connector end. When disconnecting the accelerator cable from the throttle body, rotate the throttle body cam only by lifting up on the cam itself. See Figure below.



1. Disconnect the cruise control cable from the throttle control linkage and bracket.
 - a. Disconnect the cable from the throttle control linkage.
 - b. Squeeze the tabs and disconnect the cruise control cable from the bracket



1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

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VIN or Model Year 2003 Model TRIBUTE throttle body

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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THROTTLE BODY

Removal and Installation

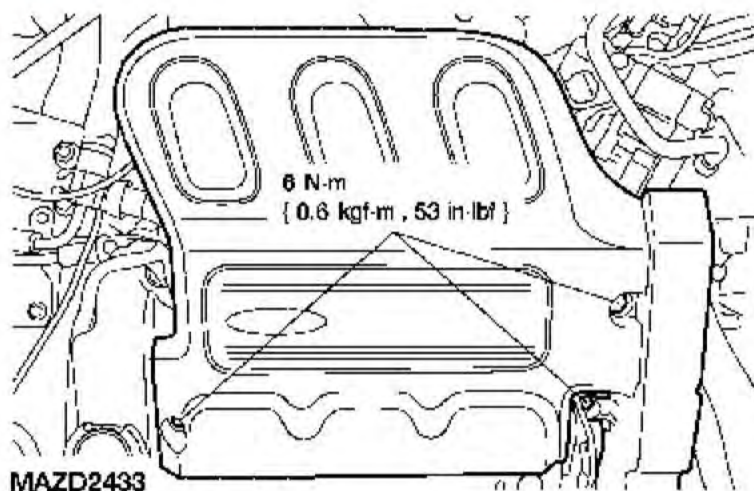
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

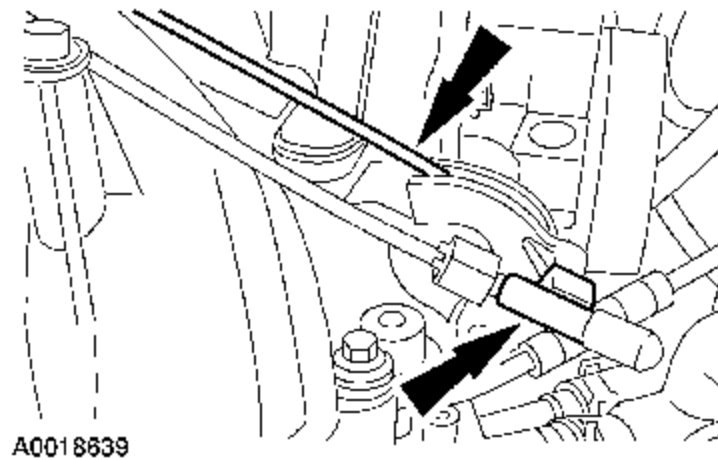
CAUTION:

Throttle body bore and plate area have a special coating and should not be cleaned.

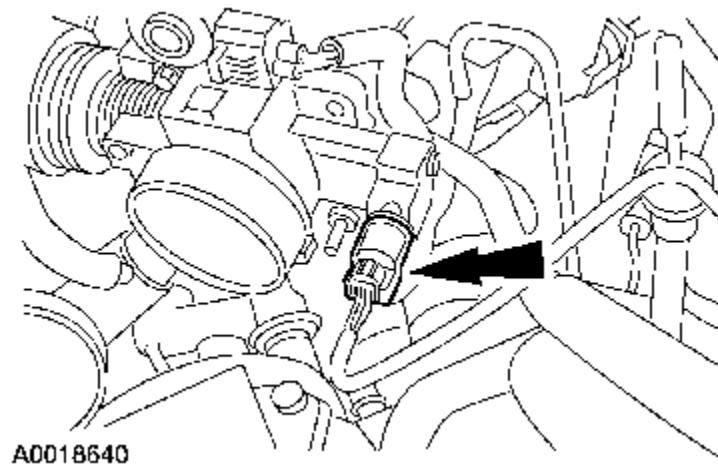
1. Remove the air cleaner outlet tube. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).



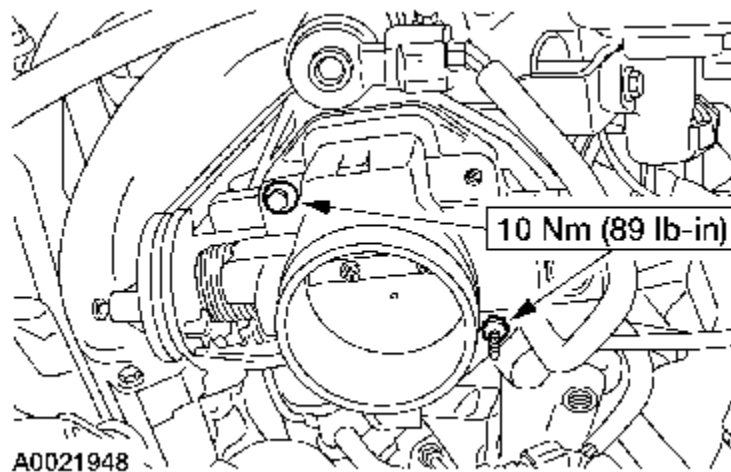
1. Remove the nuts and the engine appearance cover.



1. Disconnect the accelerator cable and the cruise control cable (if equipped) from the throttle body lever.



1. Disconnect the throttle position (TP) sensor electrical connector.



1. Remove the bolt, the stud bolt and the throttle body.

- a. Discard the gasket.
2. To install, reverse the removal procedure.
 - a. Install a new gasket.

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VIN or Model Year 2003 Model TRIBUTE engine front cover

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[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restraints](#)

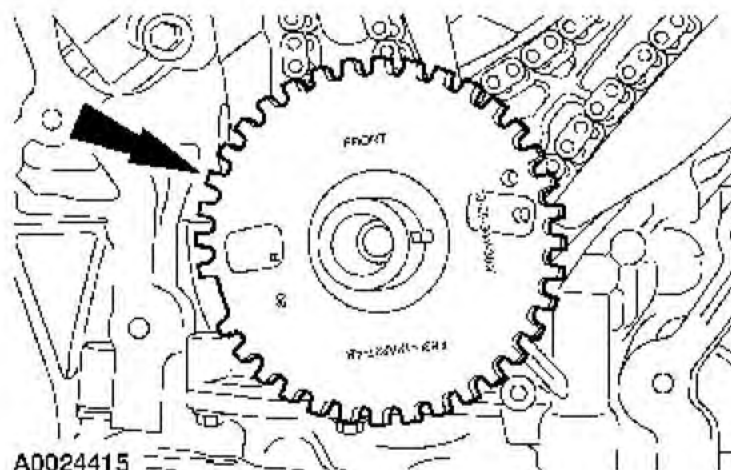
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TIMING DRIVE COMPONENTS

Removal

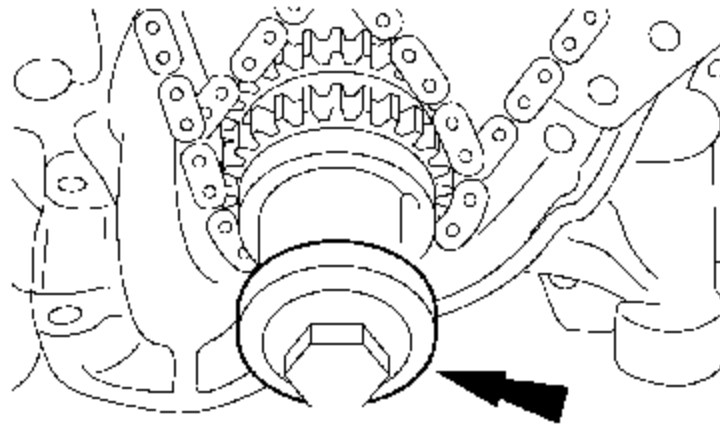
1. Remove the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).
2. Lower the vehicle.



- 1.

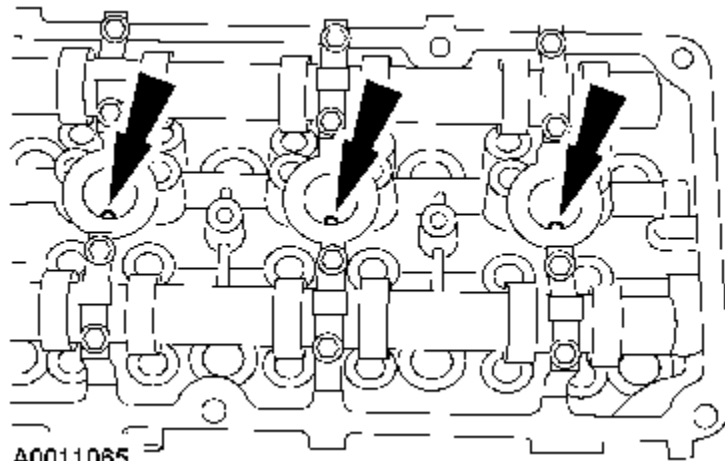
CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Remove the ignition pulse wheel.



A0022699

1. Install the damper bolt.

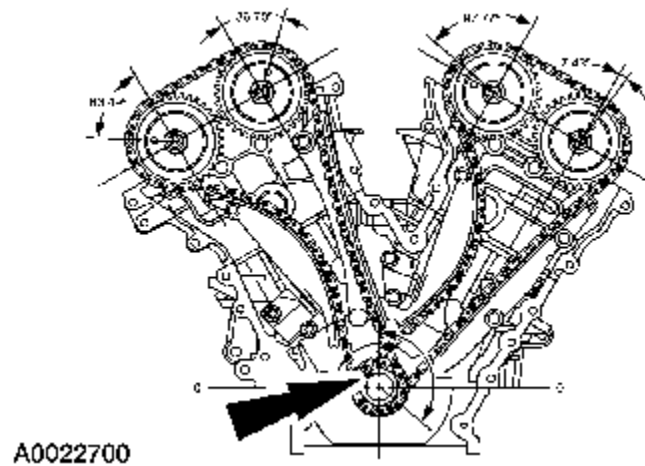


A0011065

- 1.

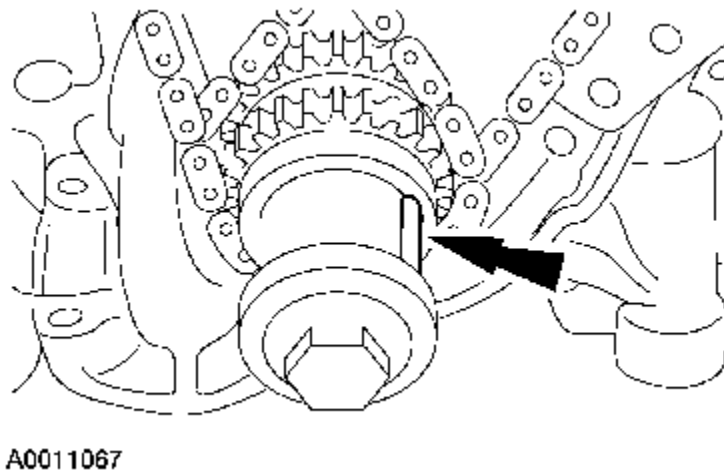
NOTE:

RH shown, LH similar. Remove the LH and RH spark plugs.

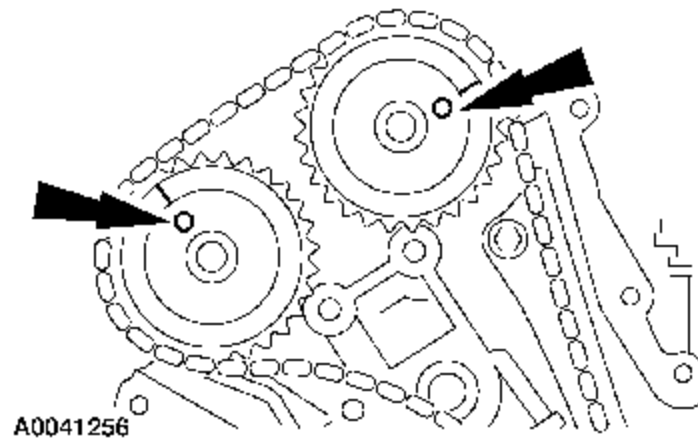


1. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at top dead center (TDC).

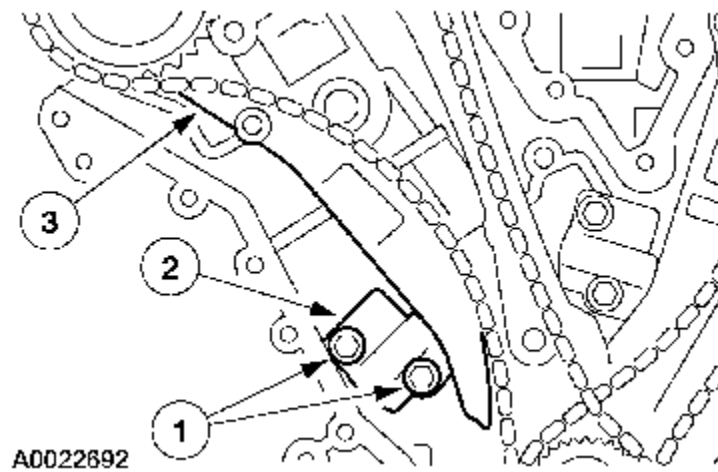
- Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and re-check.



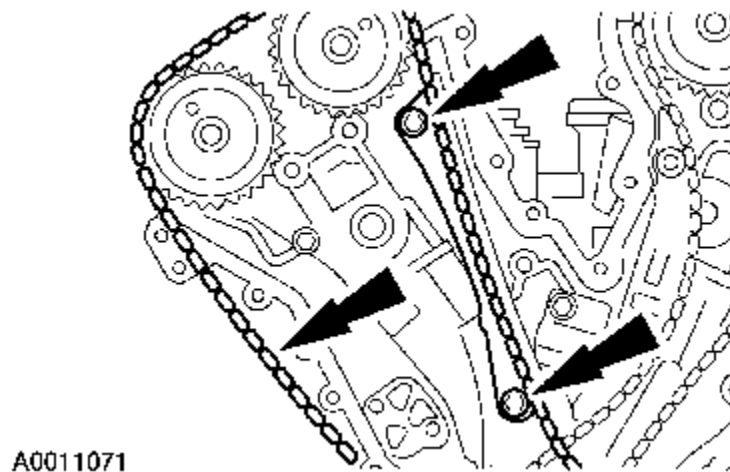
1. Rotate the crankshaft clockwise 120 degrees to the 3 o'clock position to locate the RH camshafts in the neutral position.



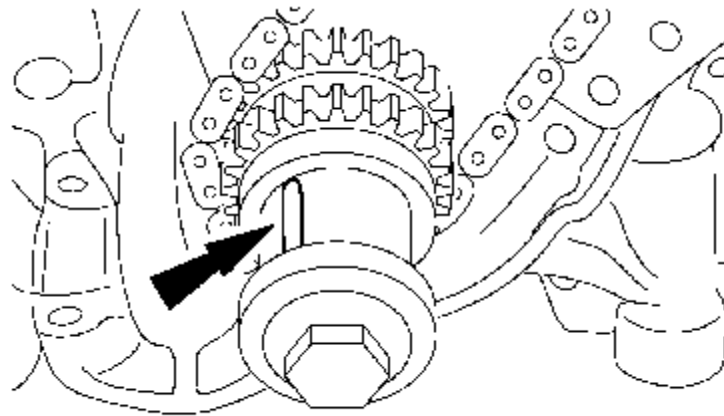
1. Verify that the RH camshafts are in the neutral position.



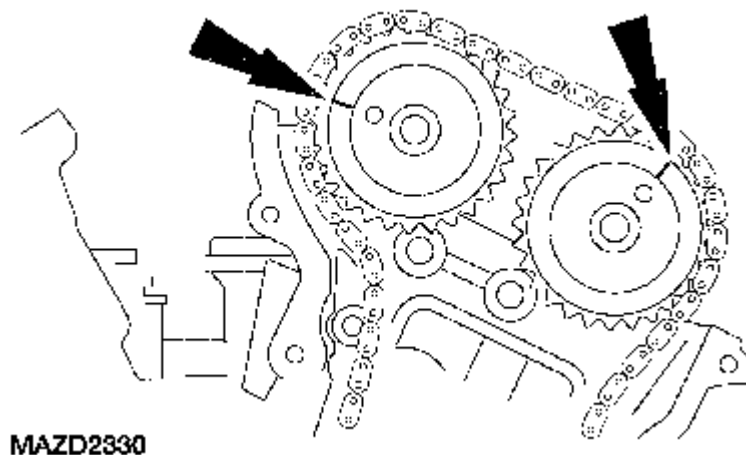
1. Remove the RH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.



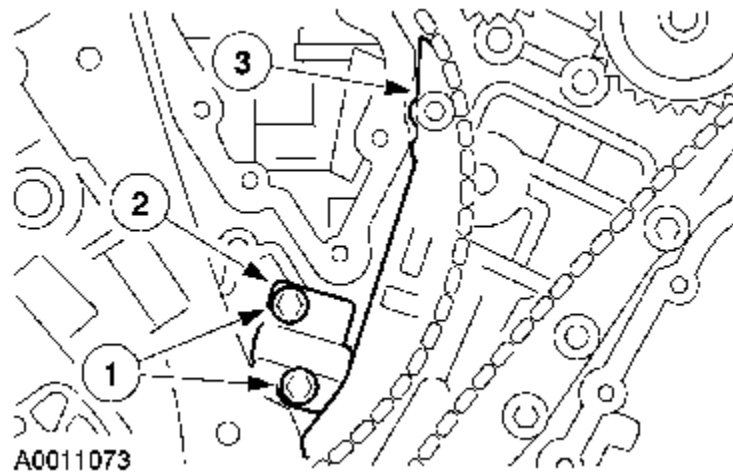
1. Remove the bolts, RH timing chain guide and the timing chain.



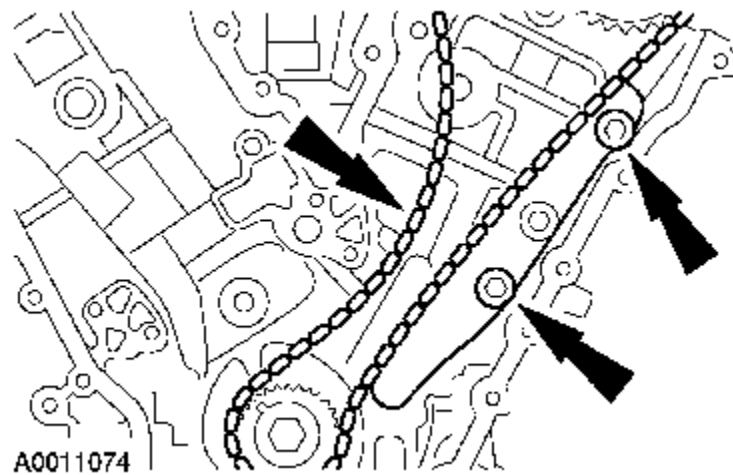
1. Rotate the crankshaft clockwise 600 degrees (1-2/3 times) to position the crankshaft keyway in the 11 o'clock position. This will position the LH camshafts in the neutral position.



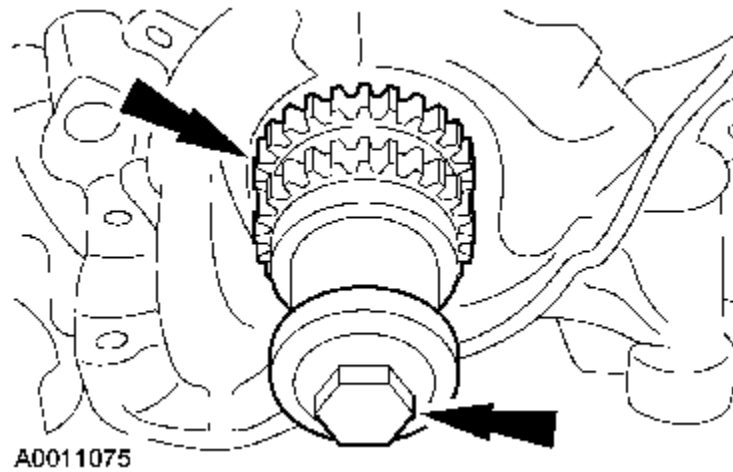
1. Verify that the LH camshafts are in the neutral position.



1. Remove the LH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.

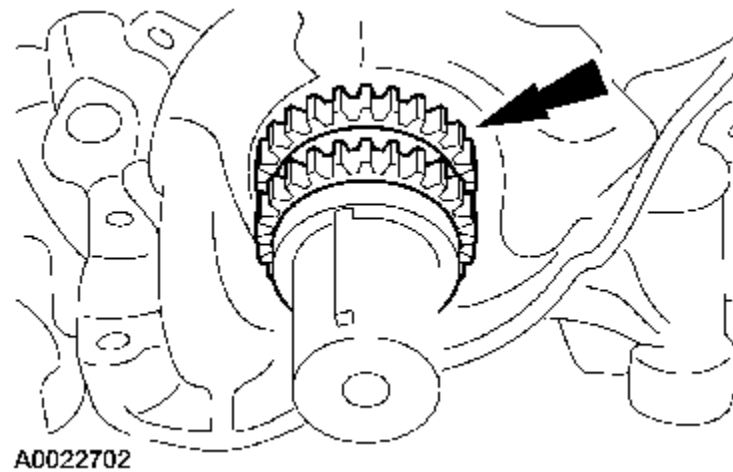


1. Remove the LH timing chain and timing chain guide.

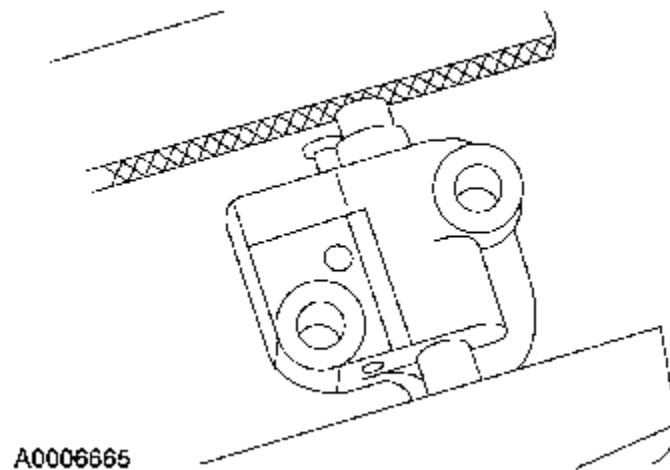


1. Remove the damper bolt and the crankshaft sprockets.

Installation



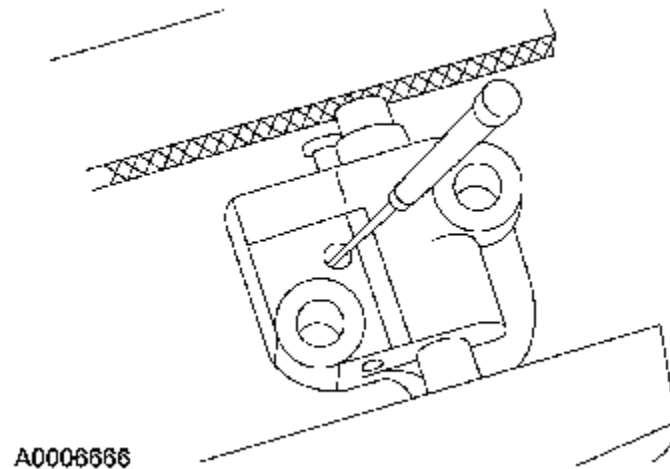
1. Install the crankshaft sprockets.



1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

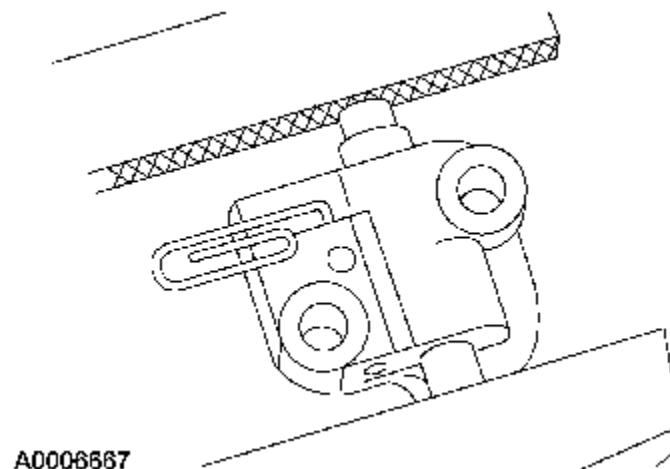
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

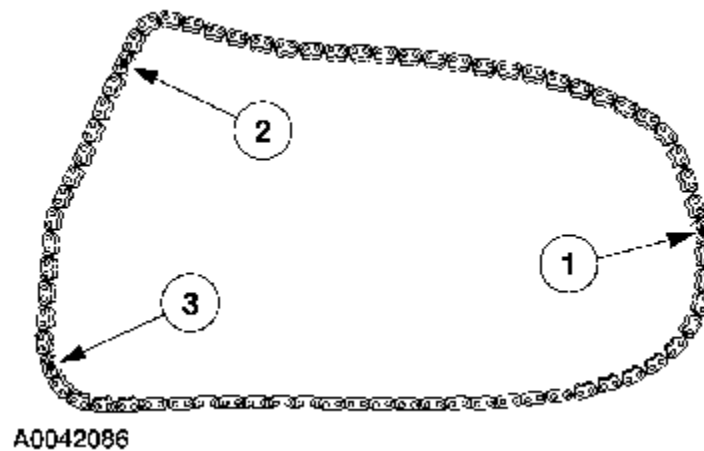
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.

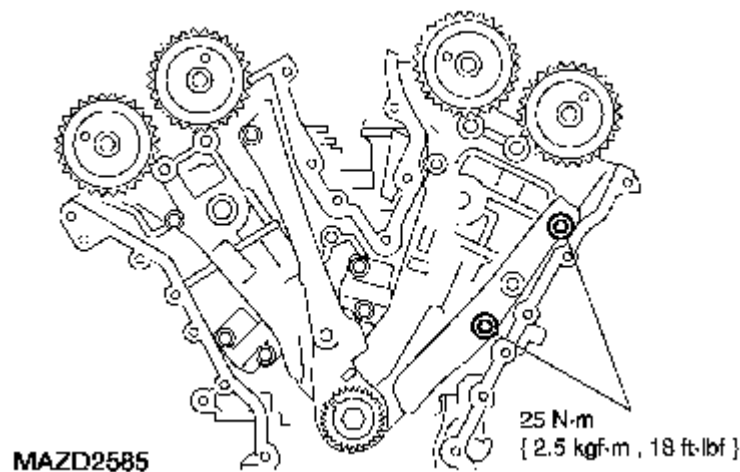


1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.

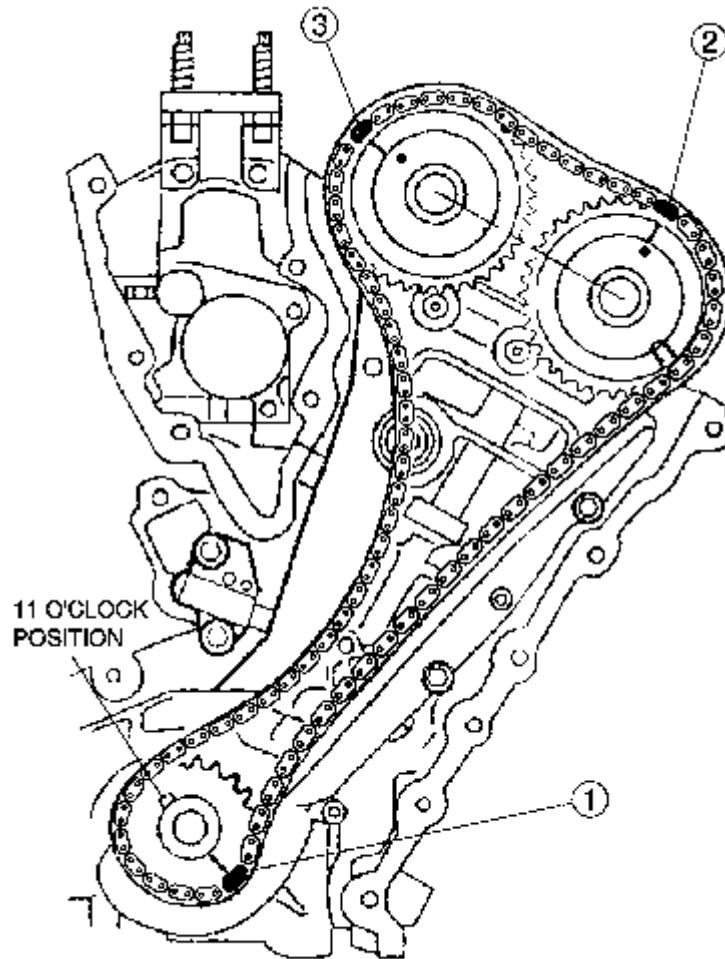


1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

- a. Mark any link to use as the crankshaft timing mark.
- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark

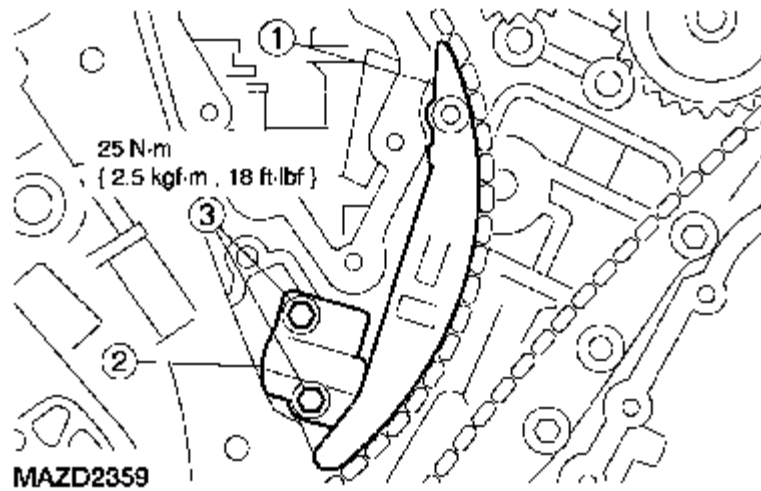


1. Position the guide and install the bolts.



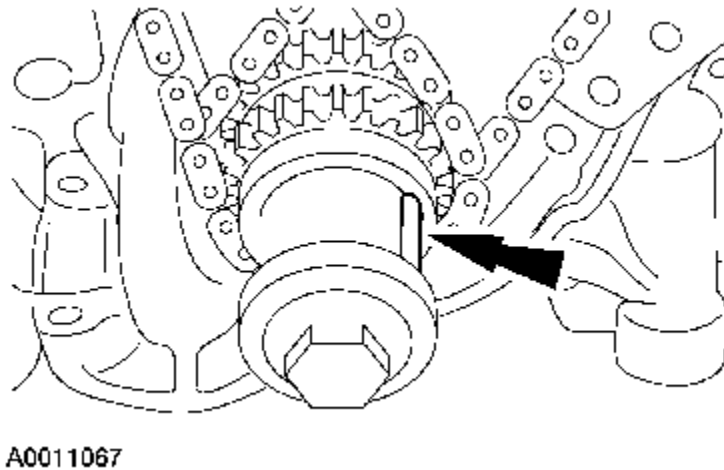
MAZD2331

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link, including the starting link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.

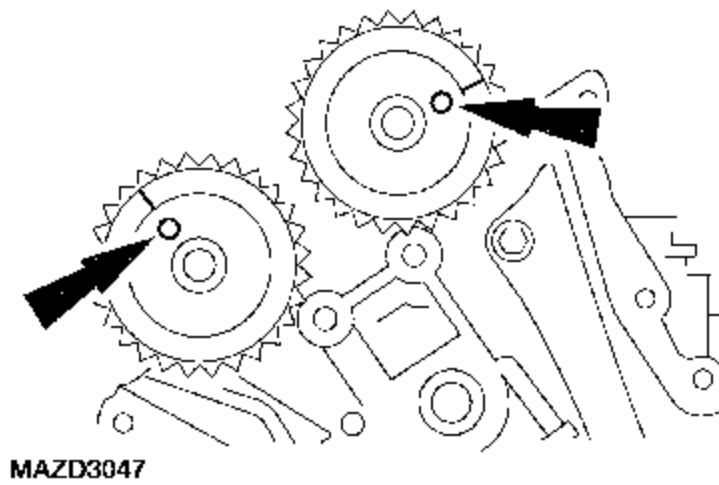


1. Install the LH timing chain and tensioner arm.

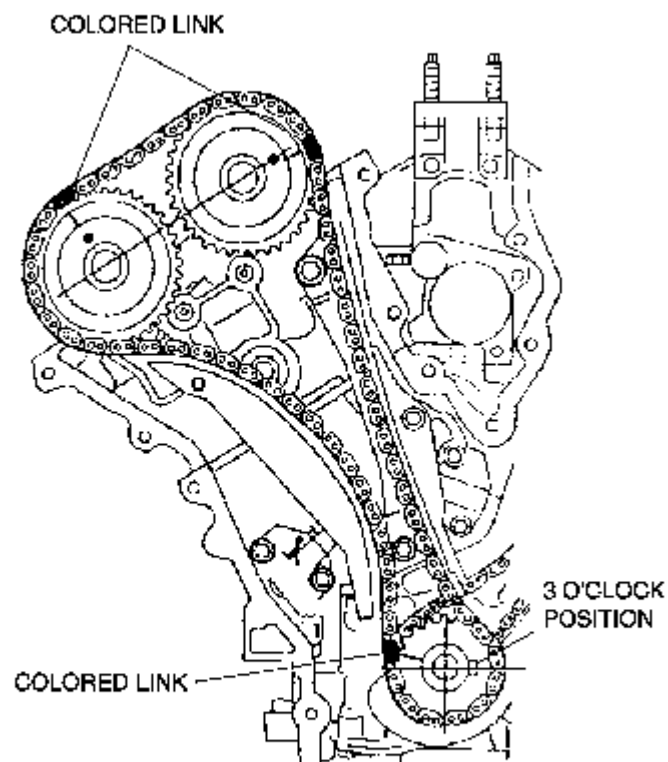
- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolt.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.

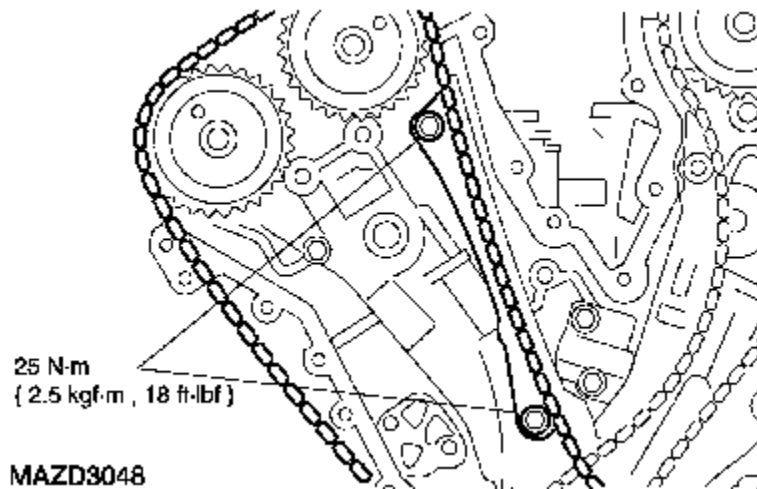


1. Verify that the RH camshafts are correctly positioned.

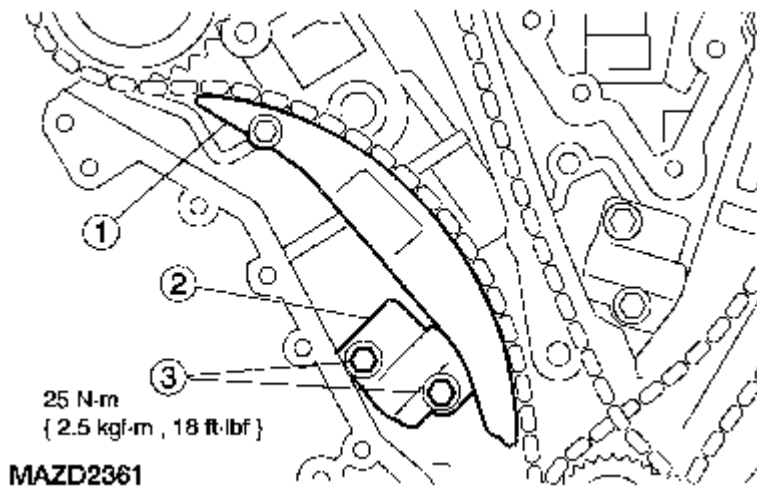


1. Install the RH timing chain.

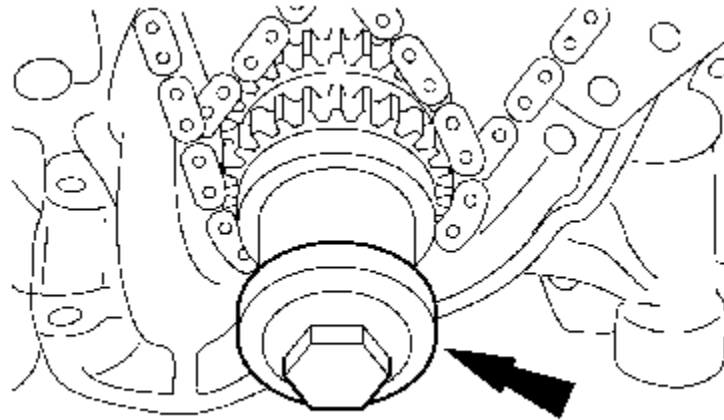
- Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

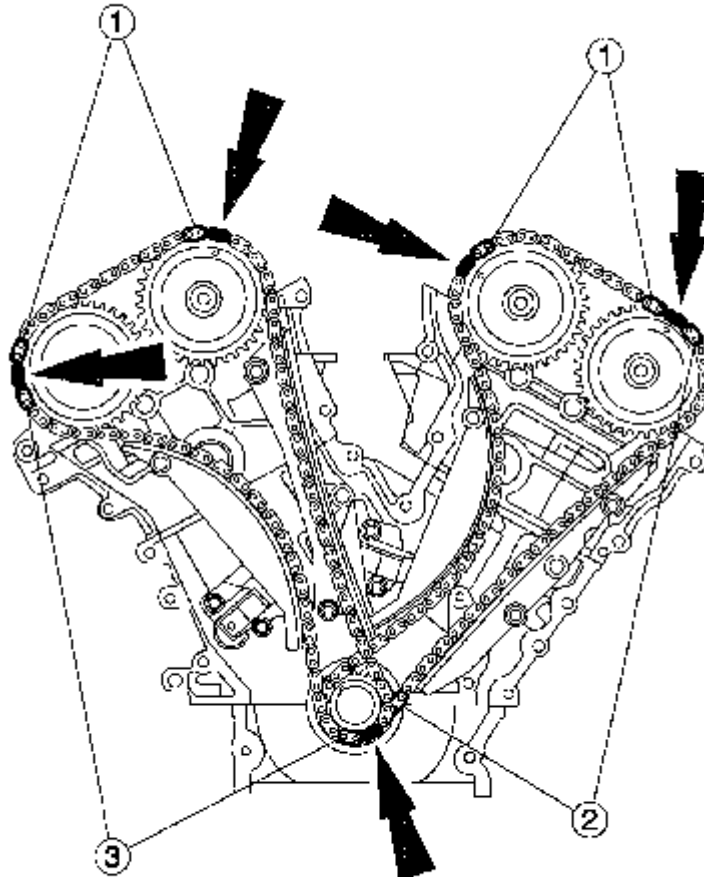


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

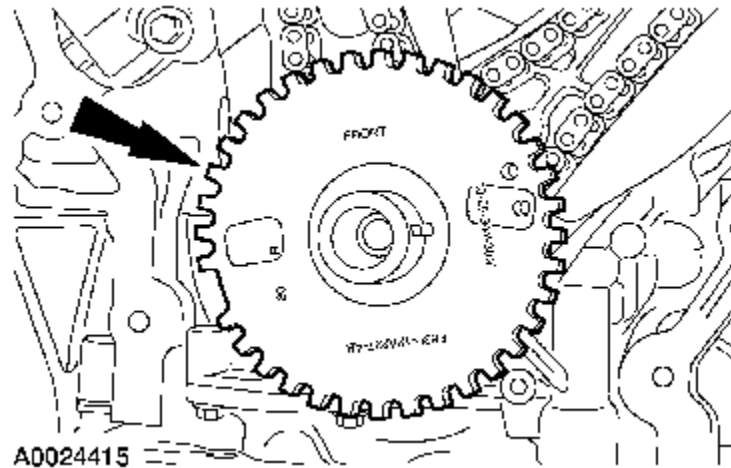
1. Remove the crankshaft damper bolt.



MAZD3049

1. Verify the timing with the following steps.

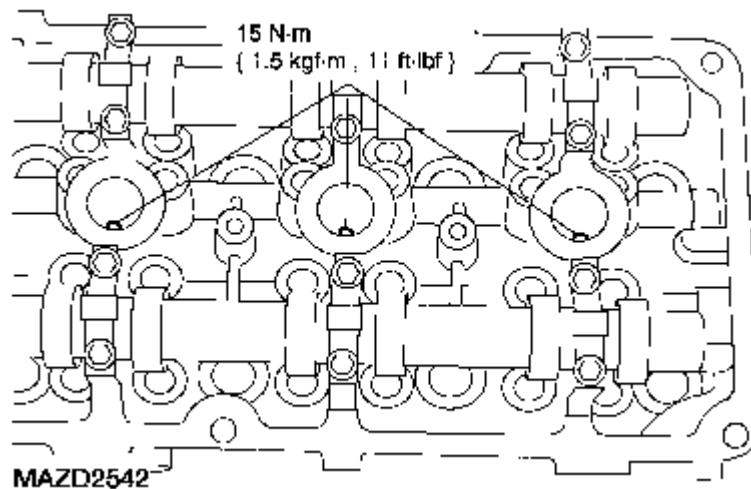
- a. There should be 12 chain links between the front camshaft timing marks.
- b. There should be 27 chain links between the camshaft and crankshaft timing marks.
- c. There should be 30 chain links between the camshaft and crankshaft timing marks.



1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the key way in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the LH and RH spark plugs. (RH shown, LH similar.)
2. Raise the vehicle.
3. Install the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).

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VIN or Model Year 2003 Model TRIBUTE upper intake manifold

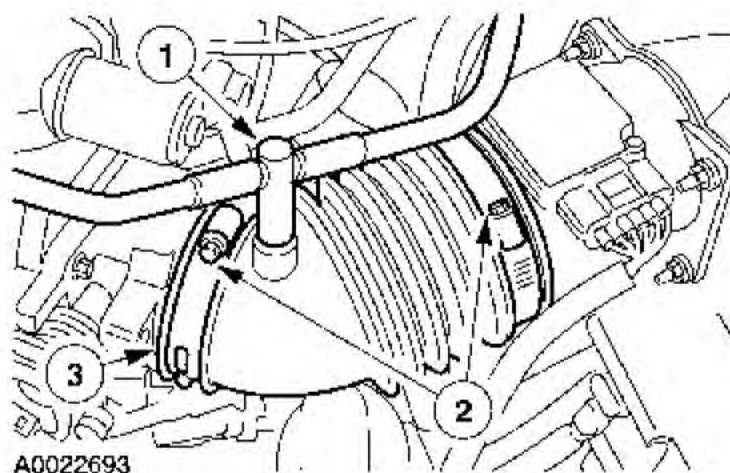
☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

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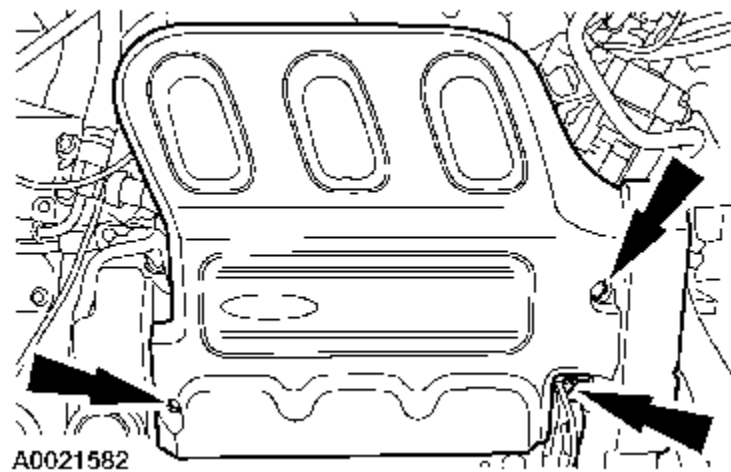
2003 - Tribute - Workshop Manual - Engine

UPPER INTAKE MANIFOLD

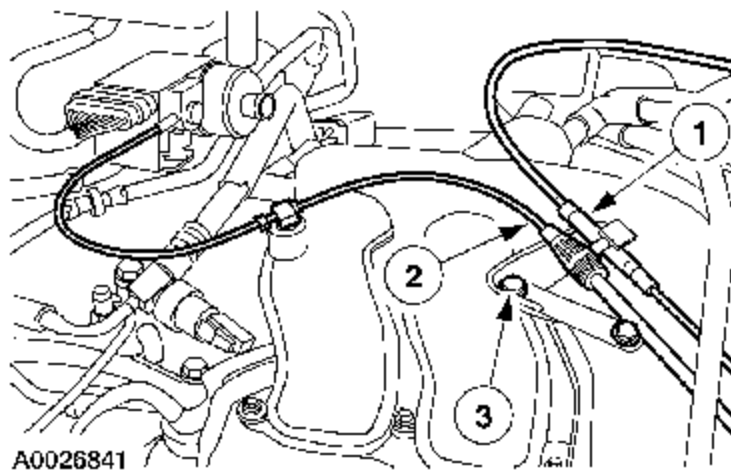
Removal



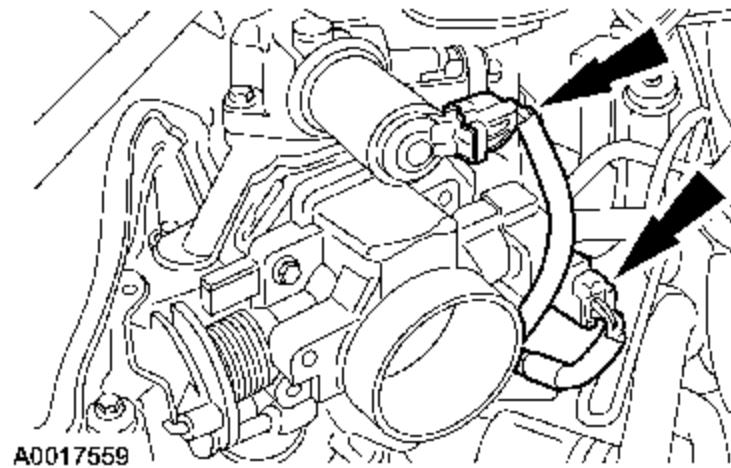
1. Remove the air cleaner outlet tube.
 - a. Remove the vacuum hose.
 - b. Loosen the clamps.
 - c. Remove the air cleaner outlet tube.



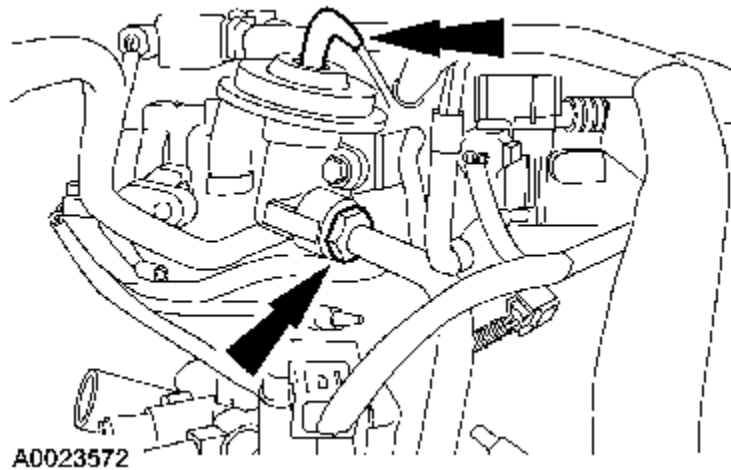
1. Remove the three nuts and the engine appearance cover.



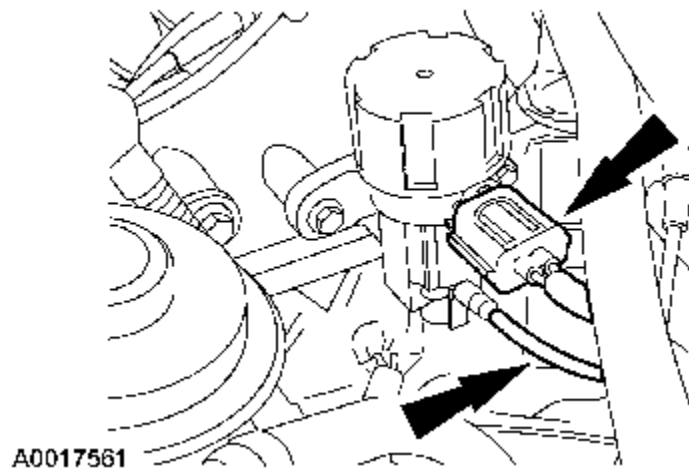
1. Disconnect the cables.
 - a. Disconnect the throttle cable.
 - b. If equipped, disconnect the cruise control cable.
 - c. Remove the throttle cable bracket bolts.



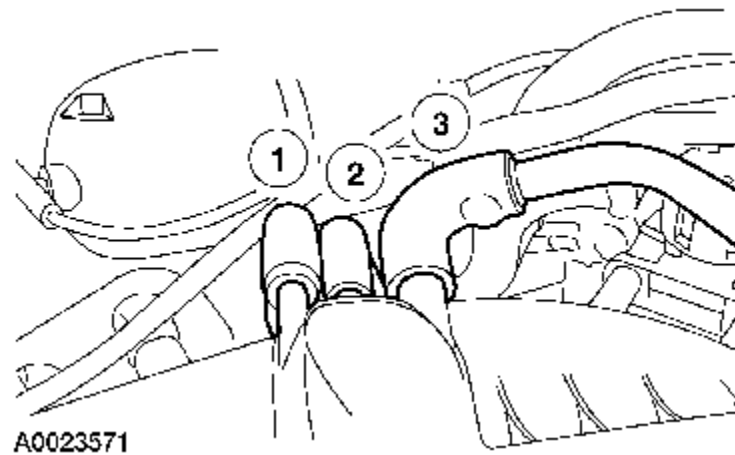
1. Disconnect the throttle position (TP) sensor and idle air control (IAC) electrical connectors.



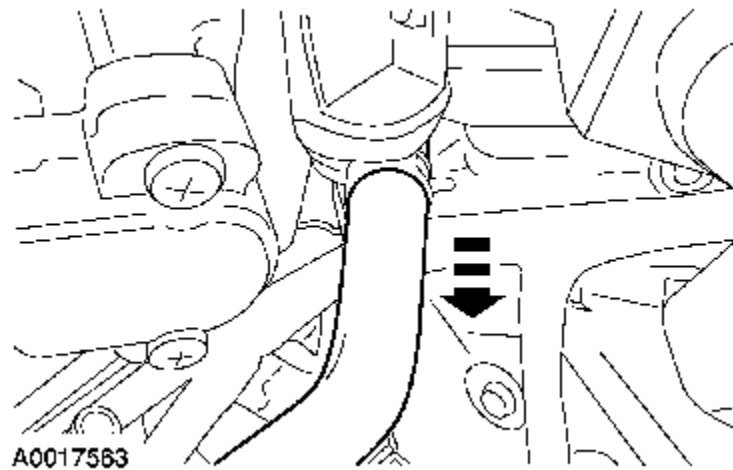
1. Disconnect the exhaust gas recirculation (EGR) valve vacuum hose and EGR tube nut.



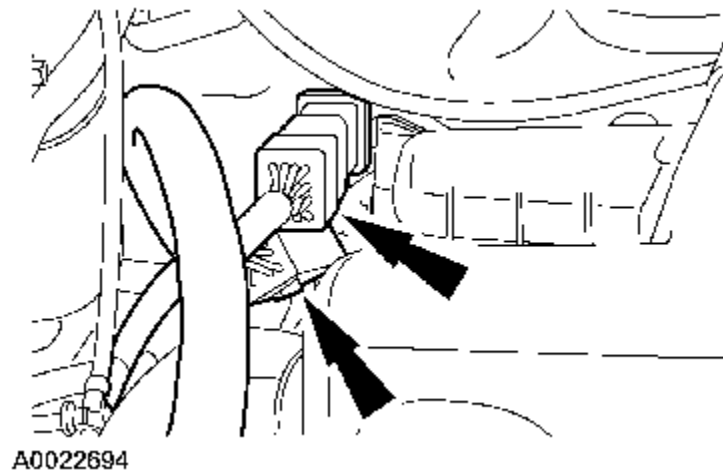
1. Disconnect the EGR vacuum regulator valve electrical connector and vacuum hose.



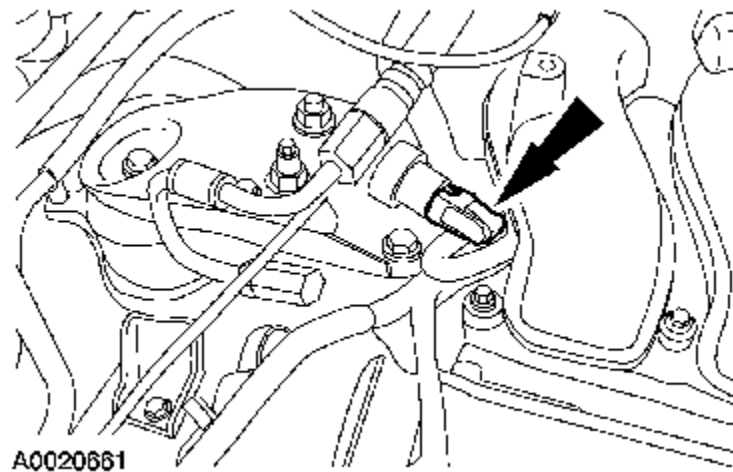
1. Disconnect the three vacuum hoses on the back of the intake manifold.
 - a. Connect the chassis vacuum hose.
 - b. Connect the engine vacuum hose.
 - c. Connect the positive crankcase ventilation (PCV) hose.



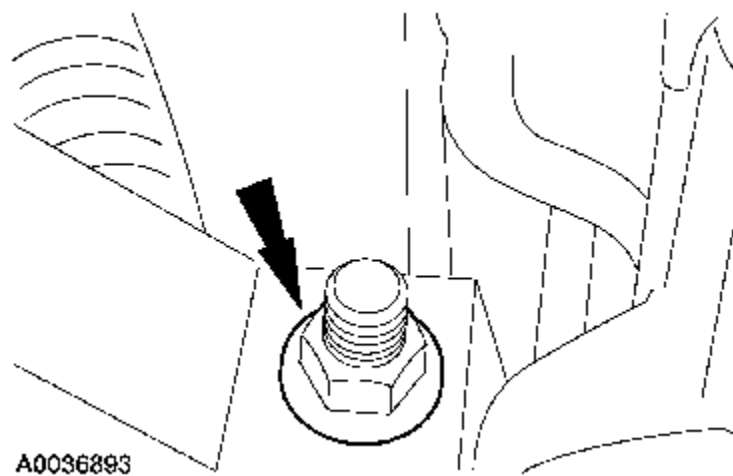
1. Disconnect the vapor management valve (VMV) vacuum hose.



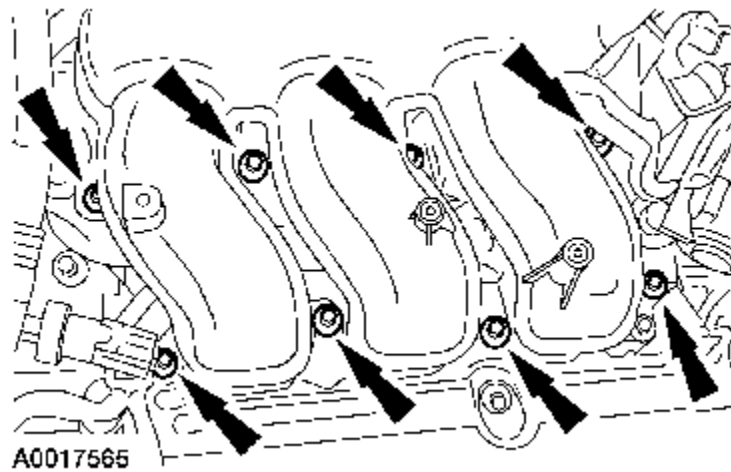
1. Disconnect the two electrical connectors attached to the left side of the upper intake manifold.



1. Disconnect the power steering pressure (PSP) sensor electrical connector.
2. Position the transaxle vent hose aside.



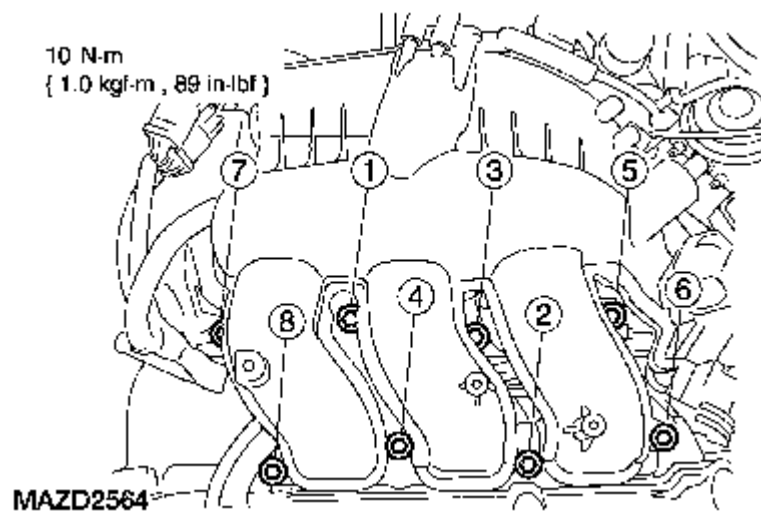
1. Remove the nut from the wire harness.



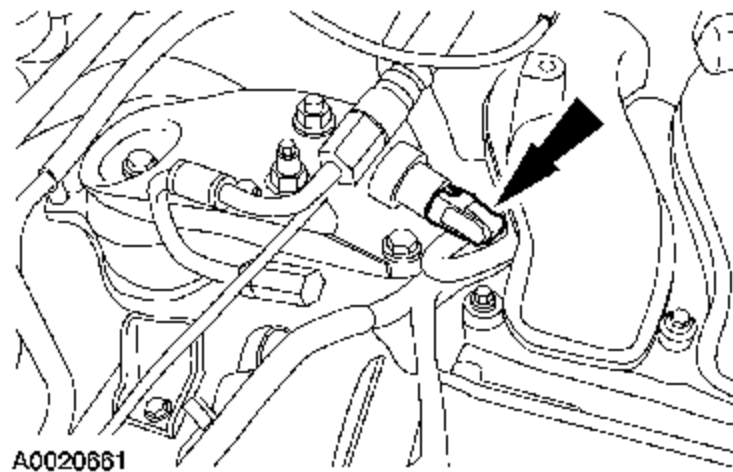
1. Remove the eight bolts and the upper intake manifold.
 - Remove and inspect the gaskets. Discard if damaged.
 - Clean all sealing surfaces.

Installation

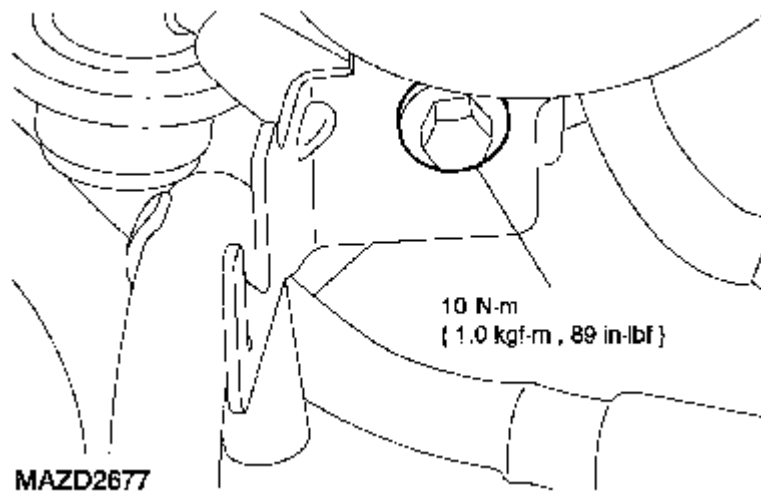
1. Position the gaskets in the upper intake manifold.



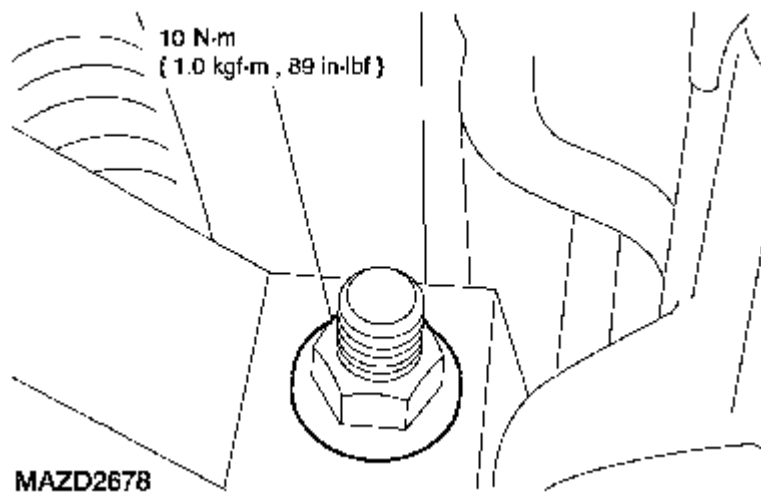
1. Position the upper intake manifold and tighten the bolts in the sequence shown.



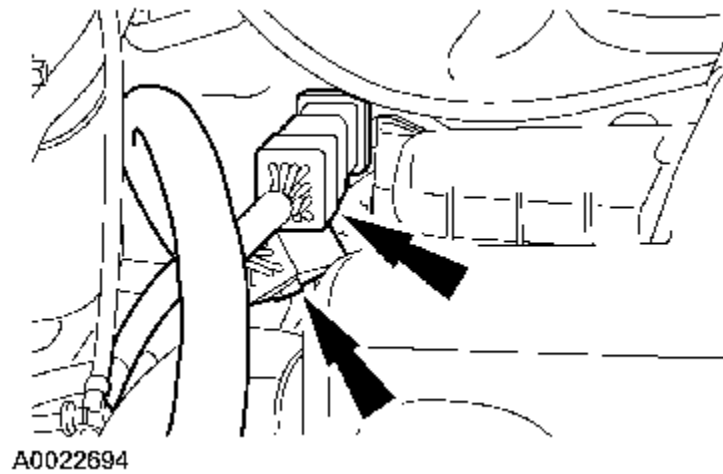
1. Connect the PSP electrical connector.



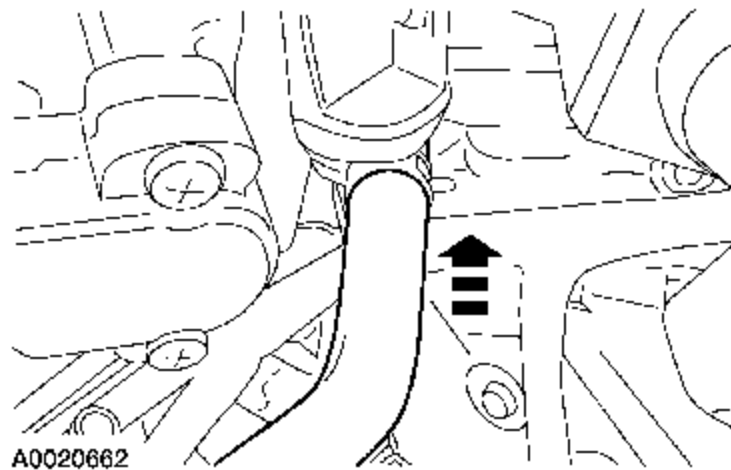
1. Install the transaxle vent tube and bracket.



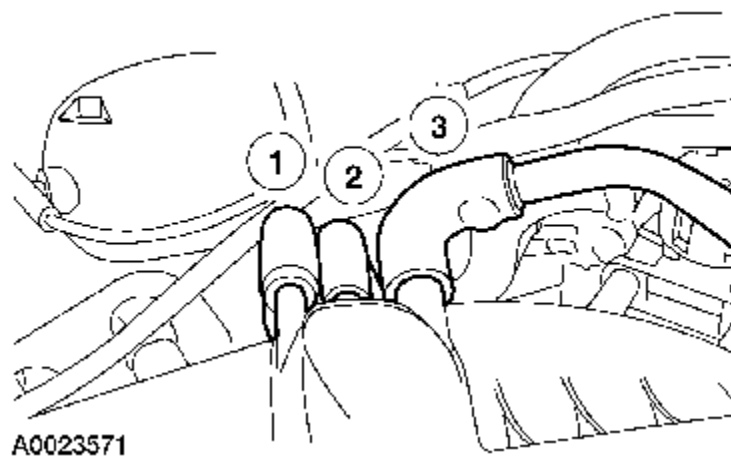
1. Position the wire harness and install the nut.



1. Install the two electrical connectors on the left side of the intake manifold.

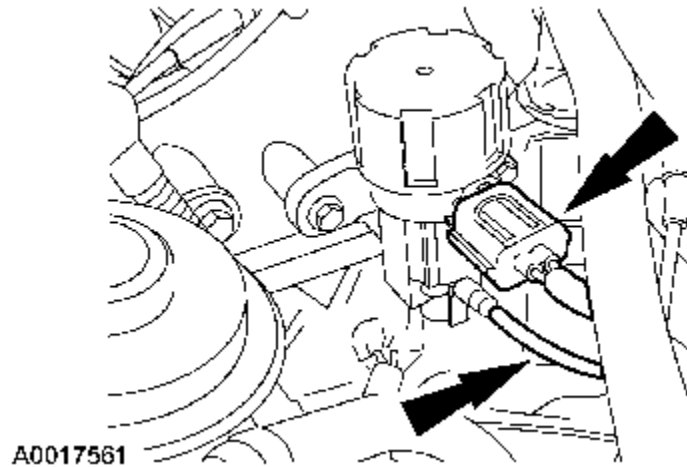


1. Install the vapor management valve (VMV) vacuum hose.

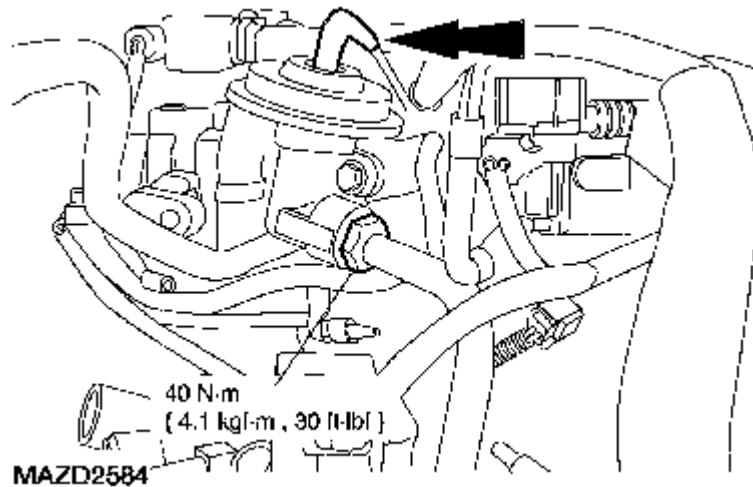


1. Connect the three vacuum hoses on the back of the upper intake manifold.

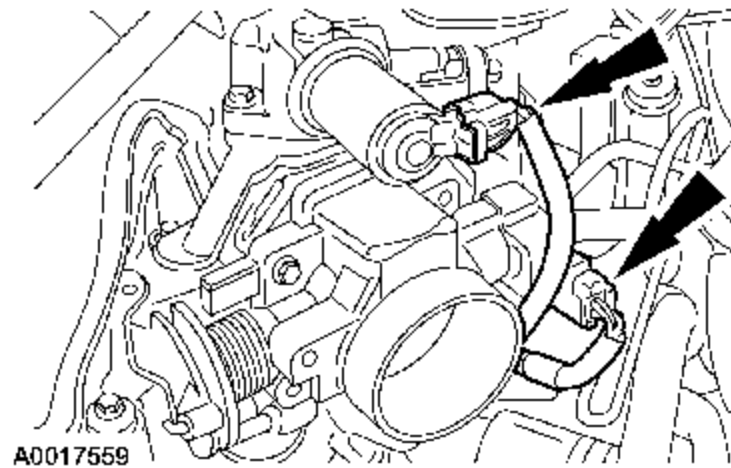
- a. Connect the chassis vacuum hose.
- b. Connect the engine vacuum hose.
- c. Connect the PCV hose.



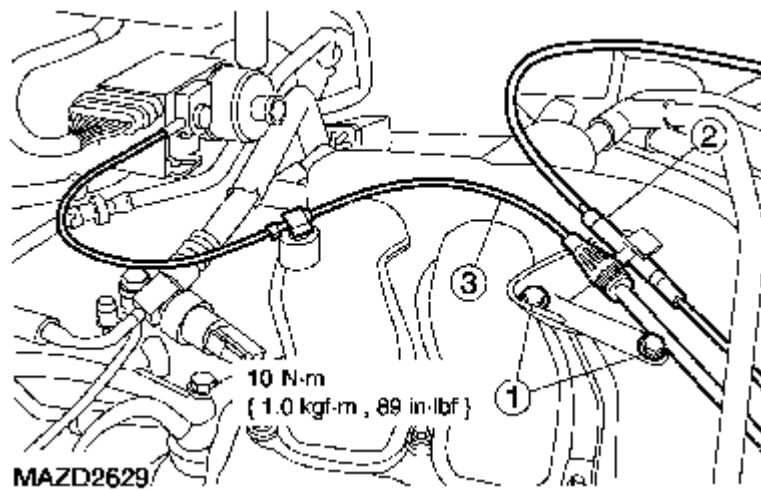
1. Connect the E.G.R. Vacuum regulator electrical connector.



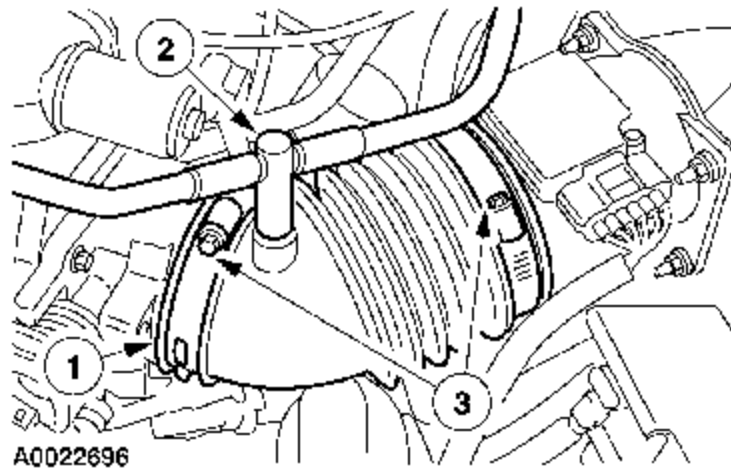
1. Install the EGR valve vacuum hose and EGR tube nut.



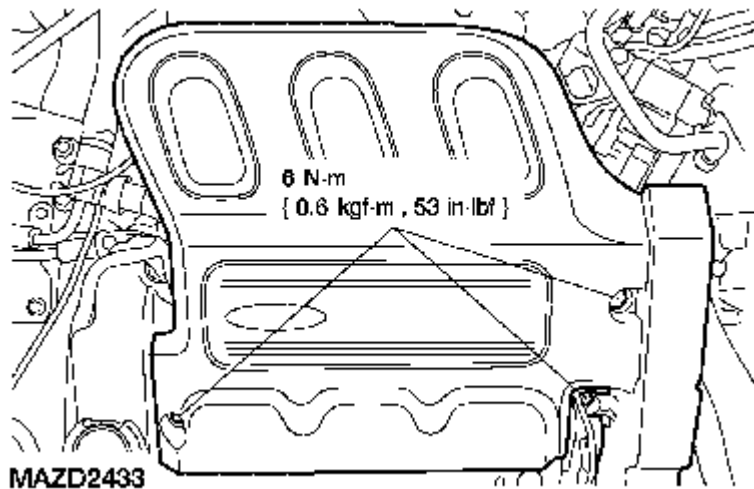
1. Connect the TP sensor and IAC electrical connectors.



1. Connect the throttle cables.
 - a. Install the throttle cable bracket bolts.
 - b. Connect the throttle cable.
 - c. If equipped, connect the cruise control cable.



1. Install the air cleaner outlet tube.
 - a. Position the air cleaner outlet tube.
 - b. Install the hoses.
 - c. Install the clamps.



1. Install the splash shield.

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VIN or Model Year 2003 Model TRIBUTE engine front cover

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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2003 - Tribute - Workshop Manual - Engine

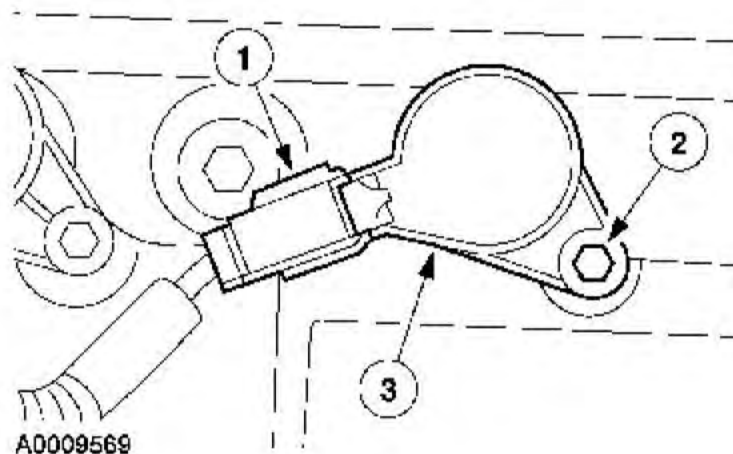
VALVE COVER — RH

Removal

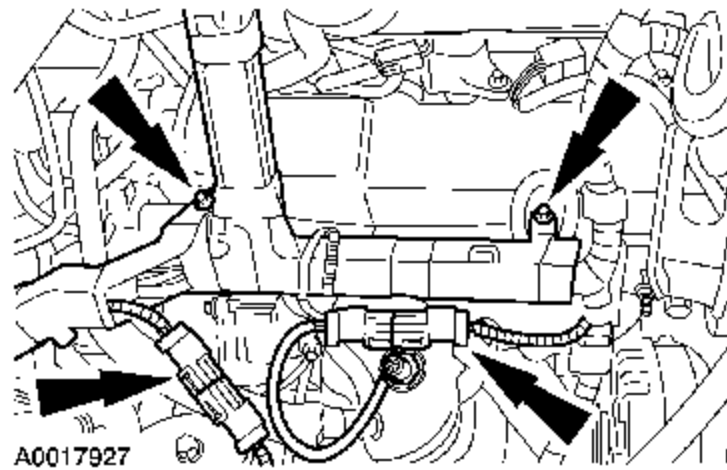
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

NOTE:

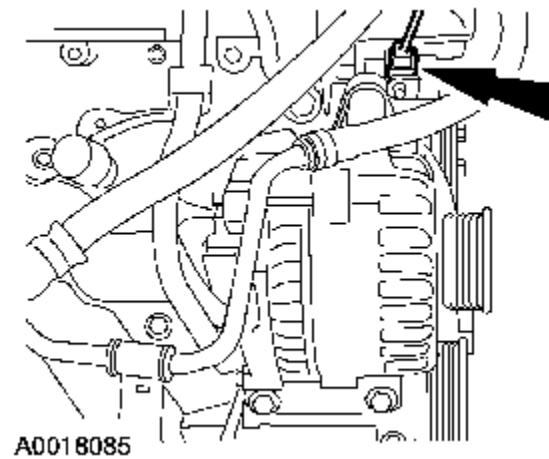
When removing the coil-on-plugs, a slight twisting motion will break the seal and ease removal.



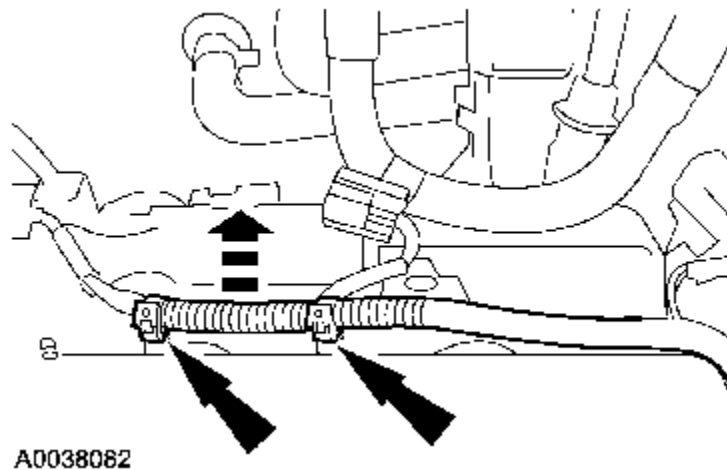
1. Remove the RH coil-on-plugs.
 - a. Disconnect the three electrical connectors.
 - b. Remove the three bolts.
 - c. Remove the RH coil-on-plugs.



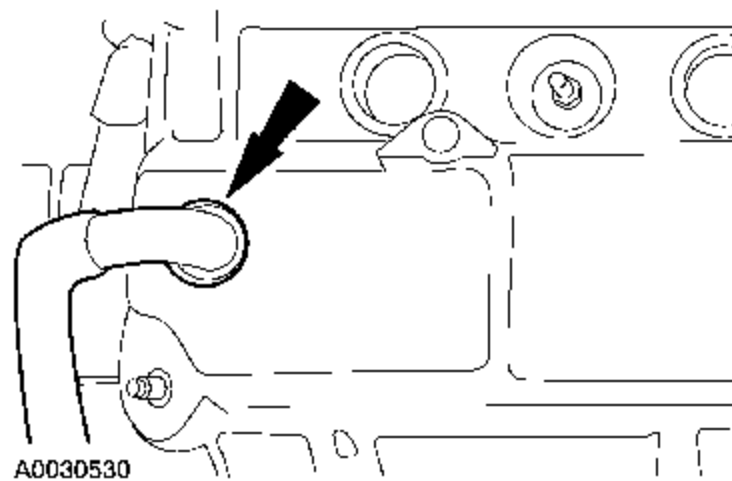
1. Remove the wiring harness nuts and disconnect the oxygen sensor electrical connectors.



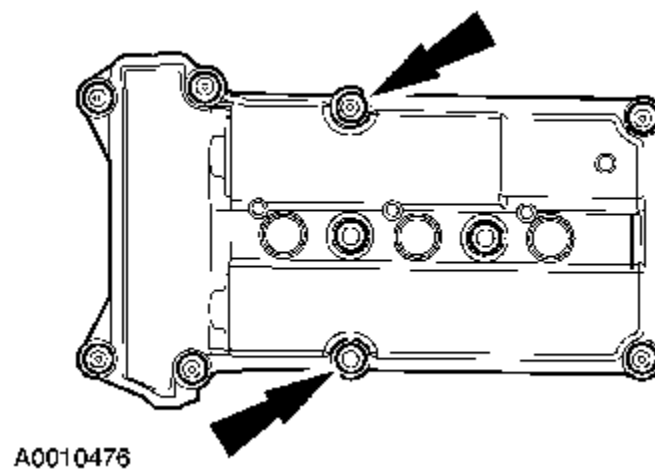
1. Disconnect the radio ignition interference capacitor.



1. Separate the harness from the center locating pins and position aside.



1. Disconnect the crankcase ventilation tube from the valve cover.



1. Remove the bolts, studs and the RH valve cover.
 - Remove and discard the gasket.

Installation

NOTE:

Clean the valve cover sealing area before installing a new gasket.

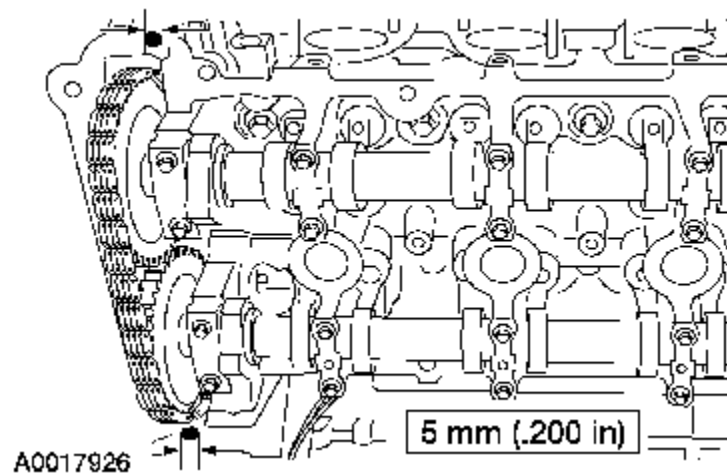
1. Install a new valve cover gasket.

NOTE:

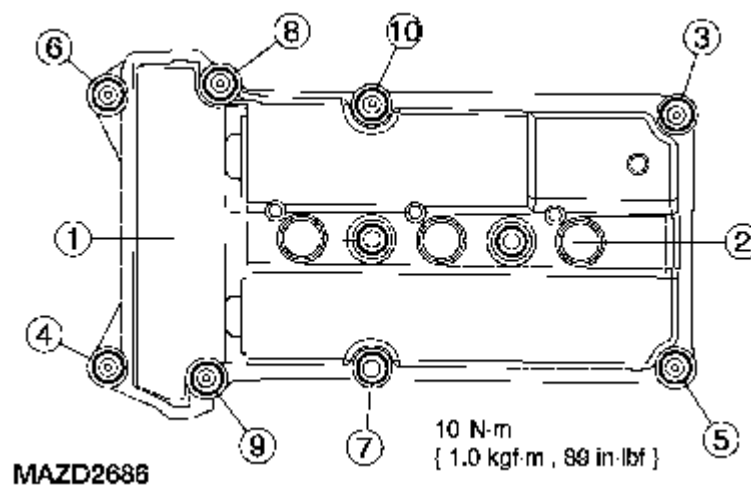
Clean the head and front cover sealing surfaces using metal surface cleaner before applying silicone gasket and sealant.

NOTE:

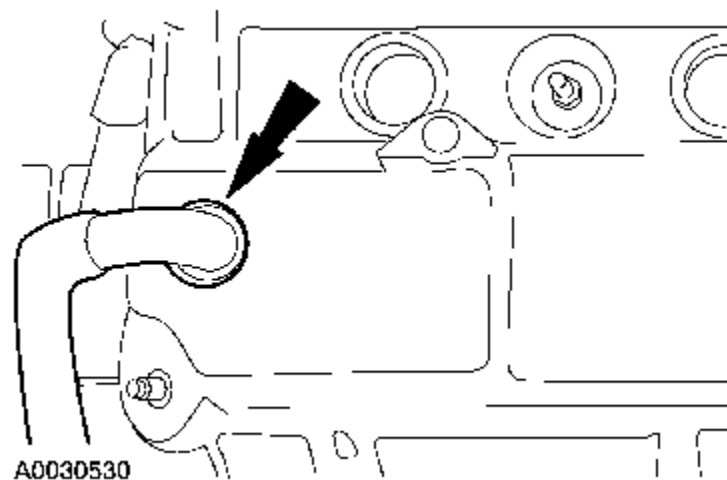
The valve cover must be installed and the bolts tightened within four minutes of applying the sealant.



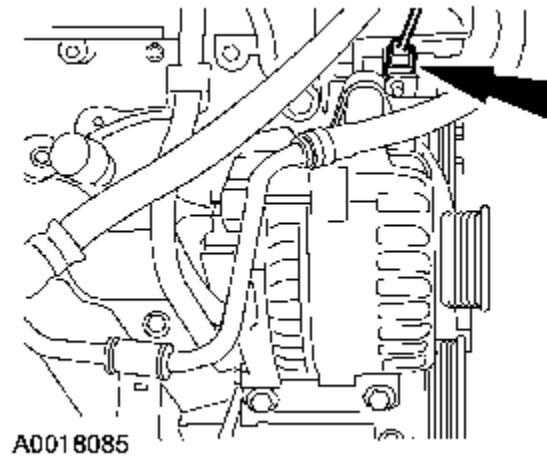
1. Apply a 5 mm dot of silicone gasket sealant to the front cover to cylinder head joints.



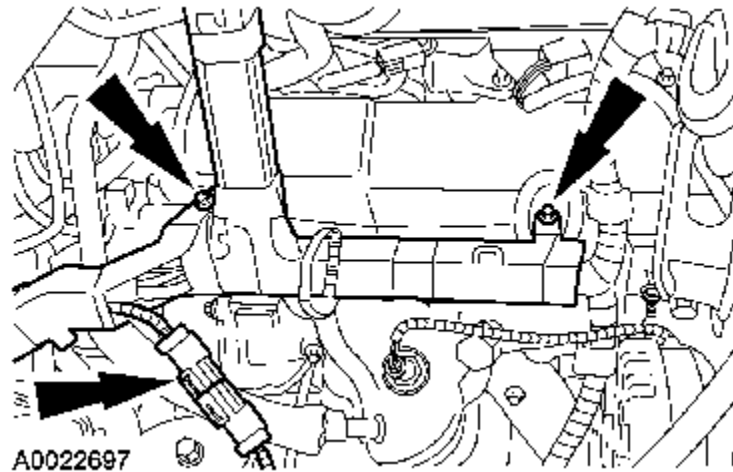
1. Position the valve cover and install the bolt and the studs in the sequence shown.



1. Connect the crankcase ventilation tube to the valve cover.



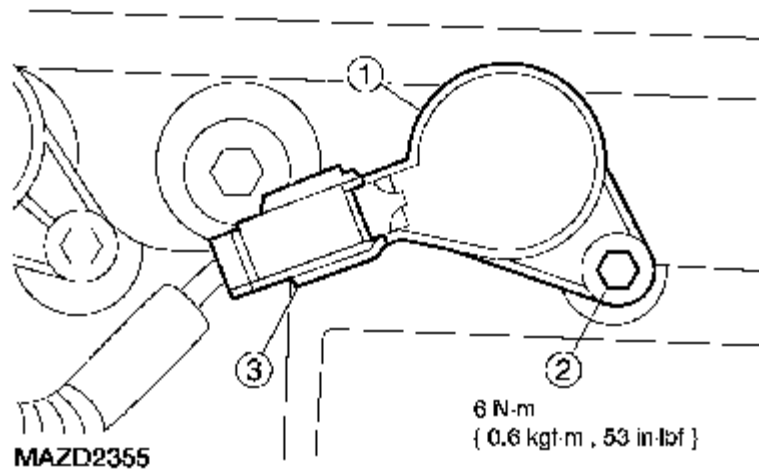
1. Connect the radio ignition interference capacitor.



1. Connect the oxygen sensor electrical connectors and wiring harness to the RH valve cover stud.

NOTE:

Apply a light film of brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.



1. Install the RH coil-on-plugs.
 - a. Position the RH coil-on-plugs.
 - b. Install the three bolts.
 - c. Connect the three electrical connectors.
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

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VIN or Model Year 2003 - Model TRIBUTE - valve seal

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[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restrain](#)

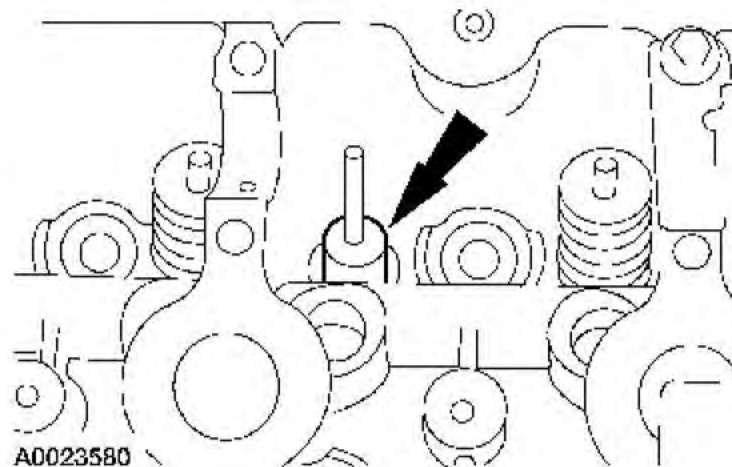
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VALVE SEALS

Removal

1. Remove the valve spring. Refer to [01-10C VALVE SPRING](#).



- 1.

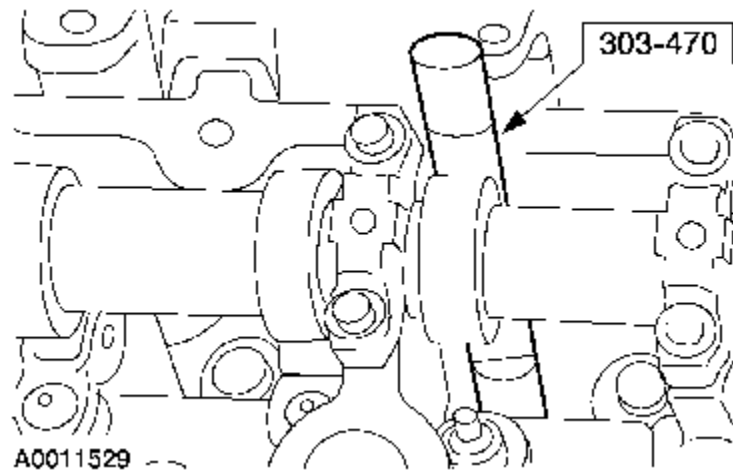
NOTE:

Camshaft removed for clarity. Remove the valve seal.

Installation

NOTE:

Lubricate the valve guide with SAE 5W-20 motor oil.



1. Using the special tool, install the valve seal.
2. Install the valve spring. Refer to [01-10C VALVE SPRING](#).

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VIN or Model Year 2003 Model TRIBUTE valve spring 1General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐ V
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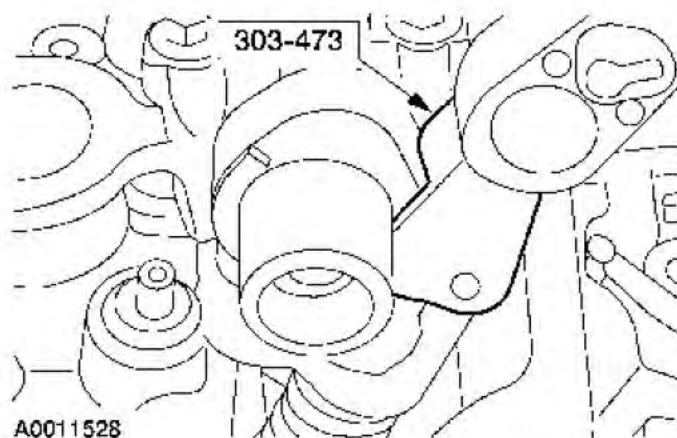
VALVE SPRING

Removal and Installation

1. Remove the roller followers. Refer to [01-10C ROLLER FOLLOWERS](#).
- 2.

NOTE:

If air pressure has forced the piston to the bottom of the cylinder, any loss of air pressure will allow the valve(s) to fall into the cylinder. A rubber band, tape or string wrapped around the end of the valve stem will prevent this from happening. Pressurize the cylinder using compressed air.



1. Using the special tool, remove the key, retainer, and valve spring.
2. To install, reverse the removal procedure.

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APPENDIX 18

18a Copy of Repair Procedures

2004 Tribute

VIN or Model Year 2004 Model TRIBUTE speed control cable

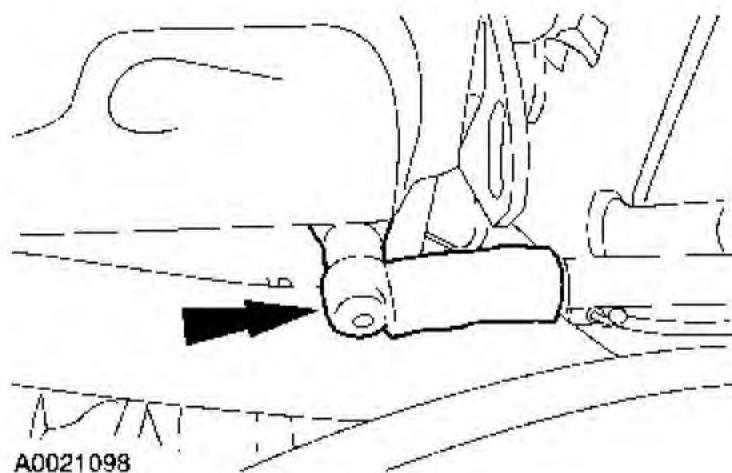
☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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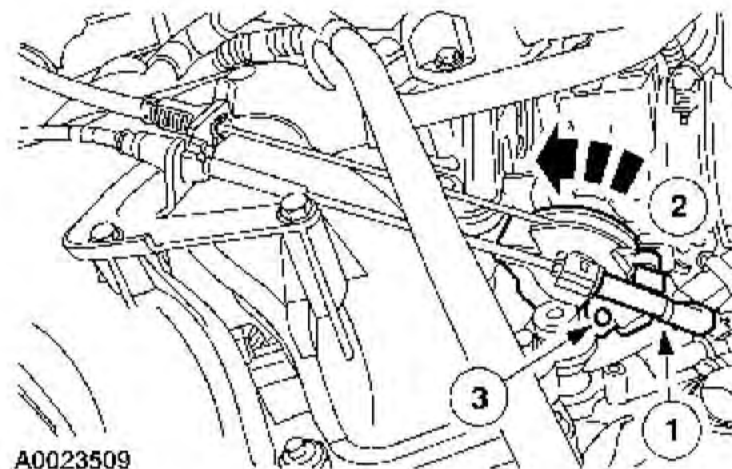
2004 - Tribute - Workshop Manual - Engine

ACCELERATOR CABLE BRACKET

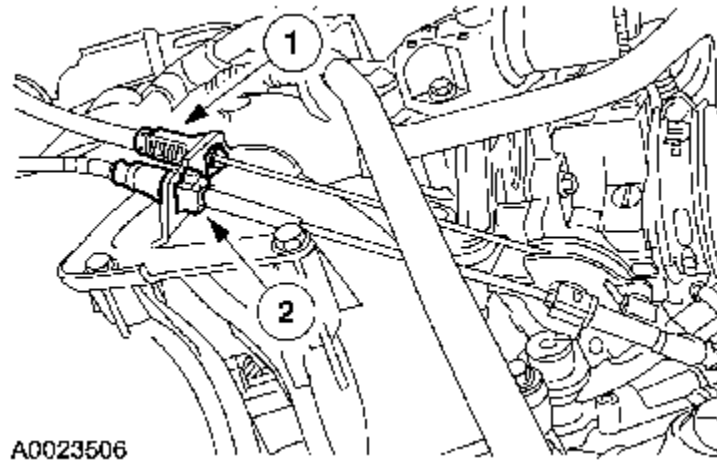
Removal and Installation



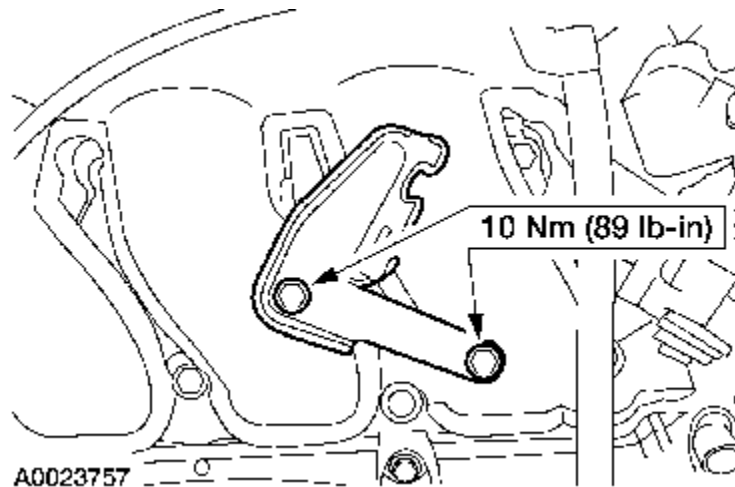
1. Disconnect the crankcase ventilation hose.



1. Disconnect the throttle control linkage from the throttle lever.
 - a. If equipped, disconnect the cruise control cable from the throttle lever.
 - b. Rotate the throttle lever.
 - c. Slide the accelerator cable end out of the throttle lever.



1. Disconnect the throttle control linkage from the accelerator cable bracket.
 - a. Disconnect the accelerator cable from the bracket.
 - b. If equipped, squeeze the tabs and disconnect the cruise control cable from the accelerator cable bracket.



1. Remove the bolts and the accelerator cable bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE camshafts

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☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

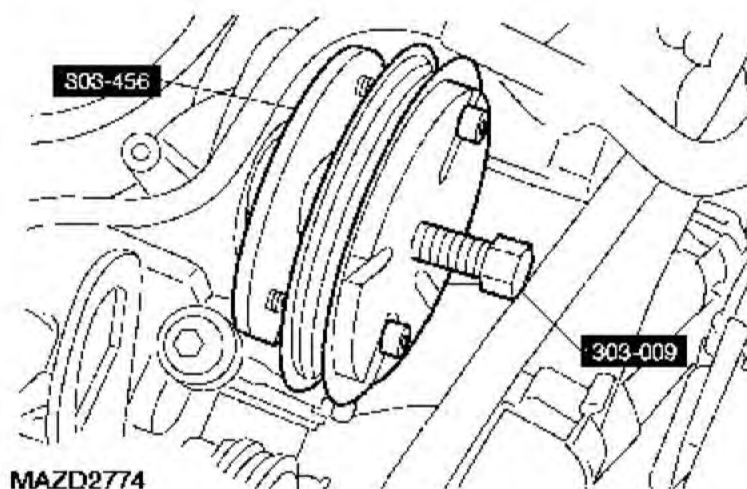
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CAMSHAFTS — LH

Removal

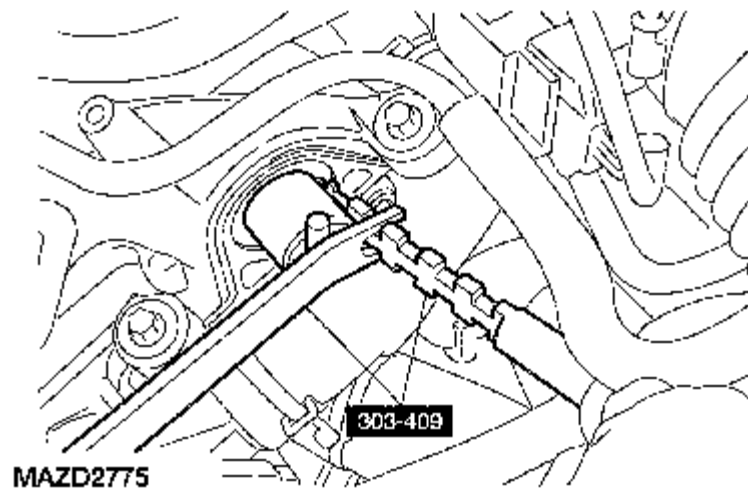
1. Remove the water pump belt. Refer to 01-10C WATER PUMP BELT — 3.0L DURATEC (4V) WITHOUT TENSIONER.



CAUTION:

The OEM pulley is pressed on 4.74 mm (0.18 in) past flush of the end of the camshaft. The service pulley is pressed on flush to the end of the camshaft.

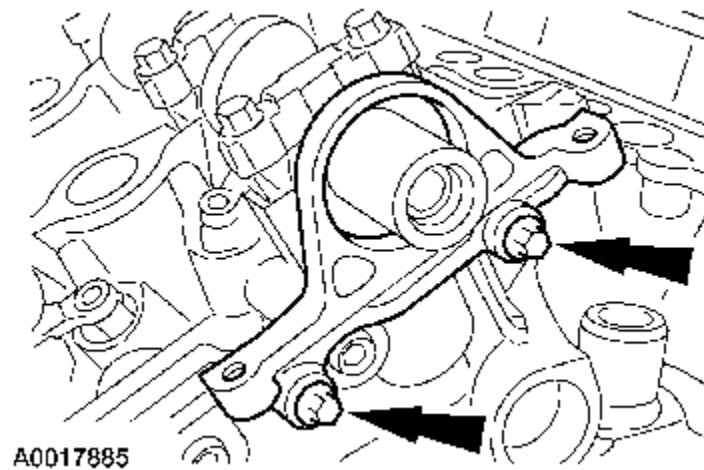
1. Using the special tools remove the water pump drive pulley.
2. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).



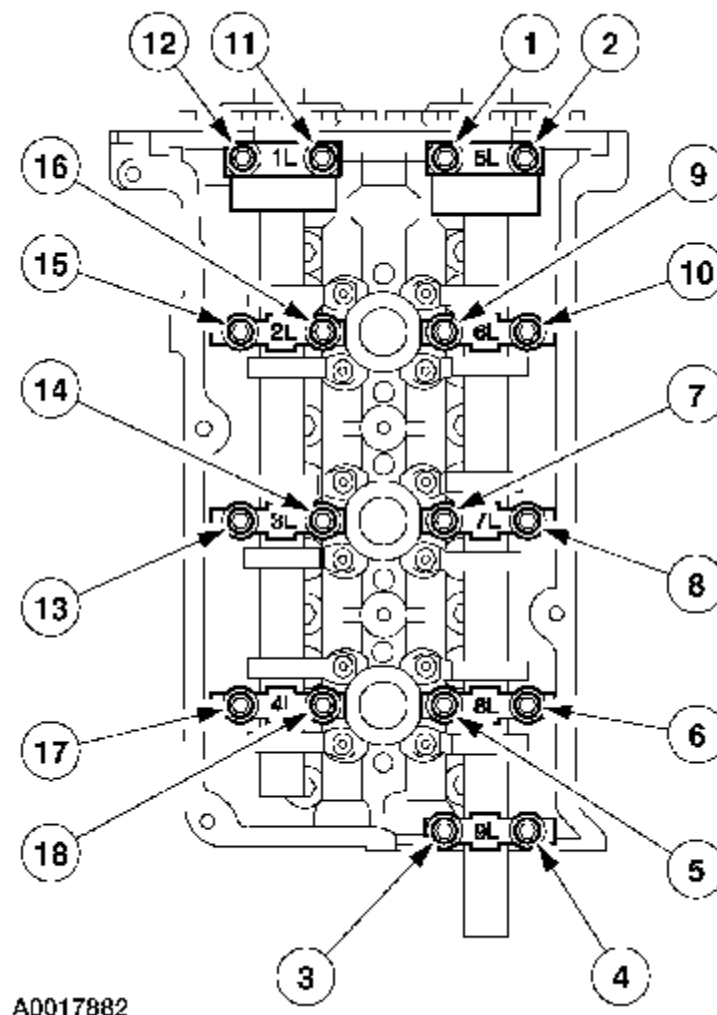
1.

NOTE:

In order to assure correct sealing do not scratch the camshaft. Using the special tools, remove the camshaft oil seal and discard.



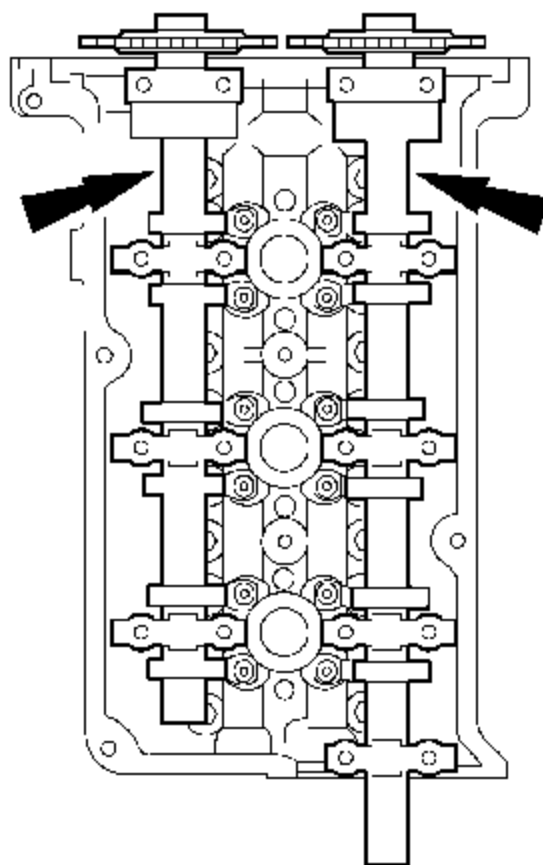
1. Remove the bolts, the intake camshaft oil seal retainer and discard the press-in-place gasket.



1.

CAUTION:

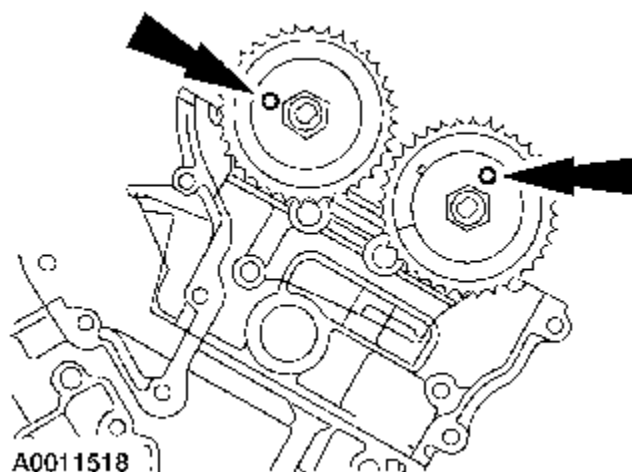
Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the LH camshaft cap bolts evenly in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



A0017884

1. Remove the camshafts.

Installation



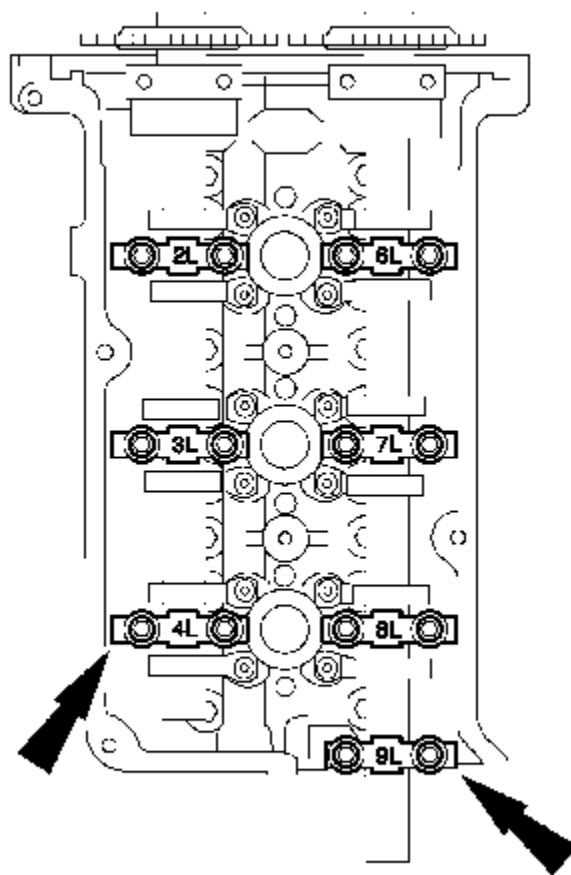
A0011518

- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

- Align the camshafts as shown.

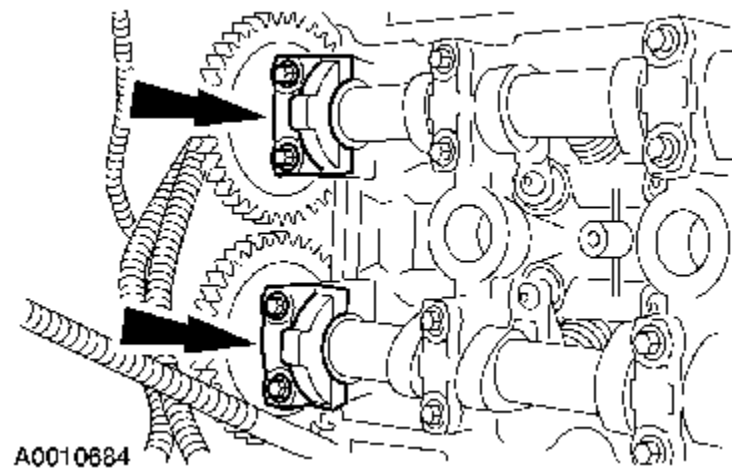


A0017886

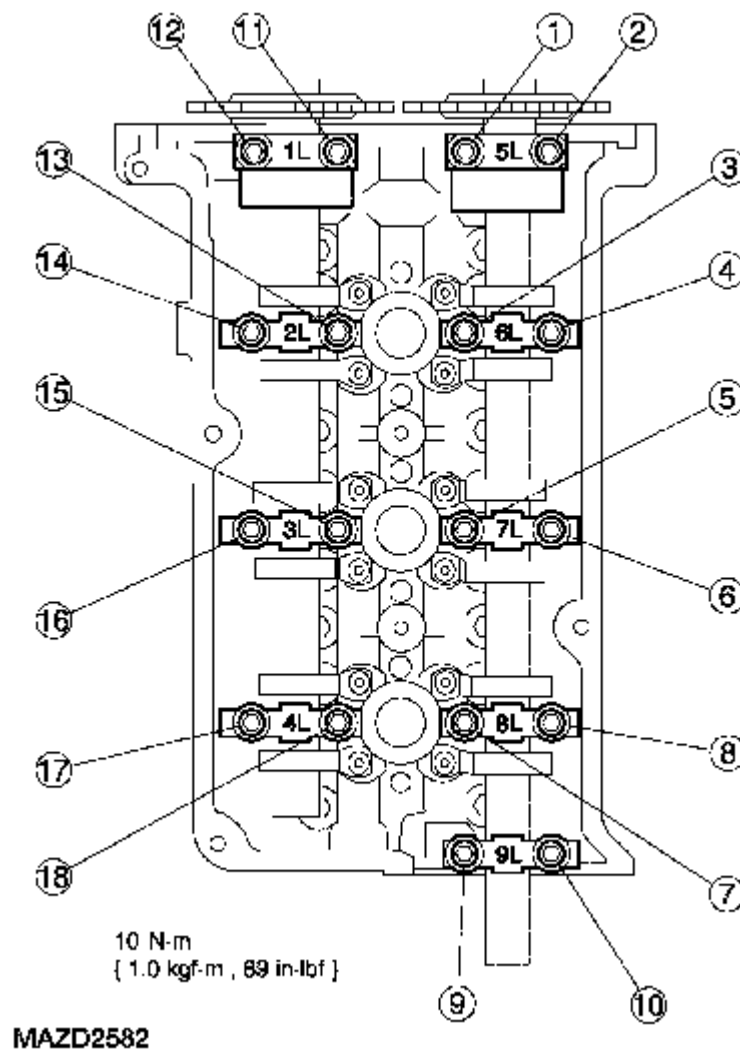
1.

CAUTION:

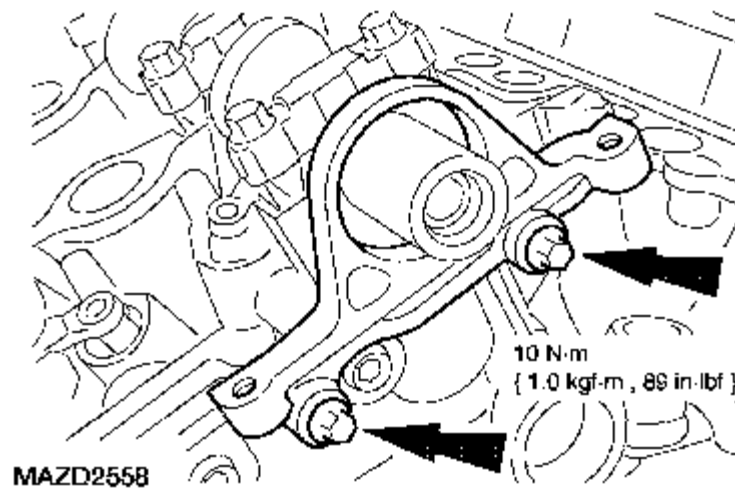
Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil. Install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil. Install the bearing thrust caps and loosely install the bolts.

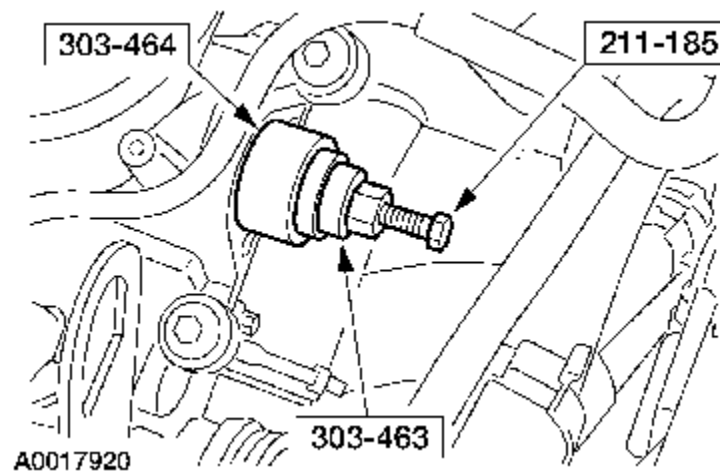


1. Tighten the bolts in the sequence shown.

**NOTE:**

Clean and degrease the sealing surfaces with metal surface cleaner.

1. Install a new press-in-place gasket and install the camshaft oil seal retainer.
 - Install a new gasket.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

**NOTE:**

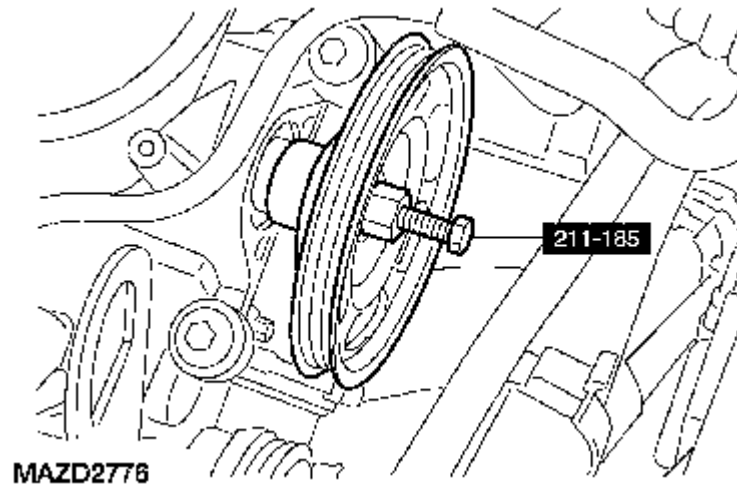
Lubricate the camshaft oil seal with clean engine oil.

1. Install the new camshaft oil seal.

NOTE:

Lubricate the camshaft oil seal with SAE 5W-30 motor oil.

Using special tools positioned over the oil seal, turn to install to the seal.



CAUTION:

The OEM pulley is pressed on 4.74 mm (0.18 in) past flush of the end of the camshaft. The service pulley is pressed on flush to the end of the camshaft.

1. Using special tool, install the water pump drive pulley.
2. Install the water pump belt. Refer to 01-10C WATER PUMP BELT — 3.0L DURATEC (4V) WITHOUT TENSIONER .

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☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

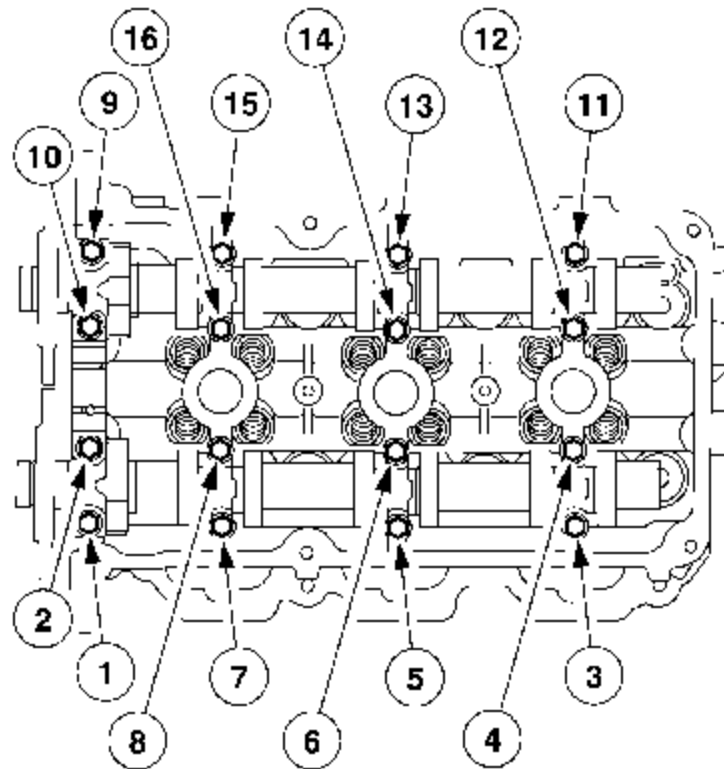
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CAMSHAFTS — RH

Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

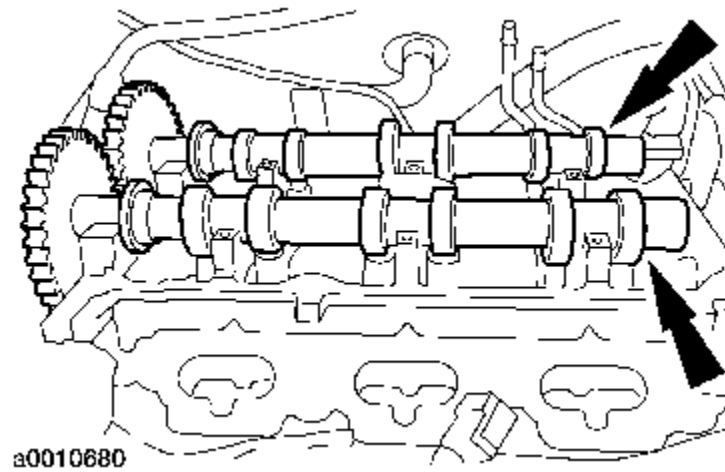


A0010679

1.

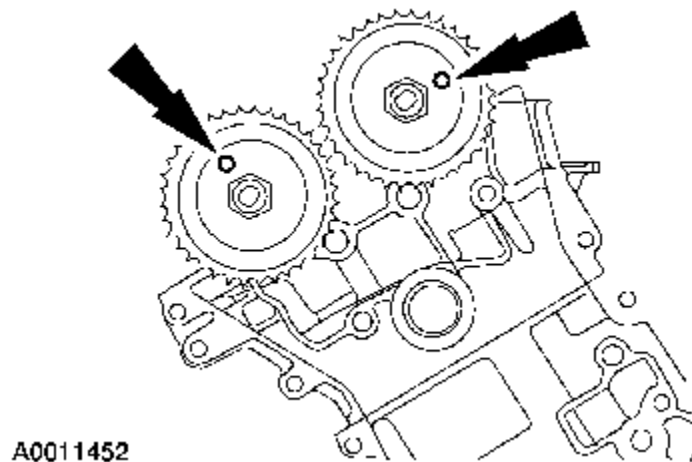
CAUTION:

Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Loosen the RH camshaft cap bolts in sequence to allow the camshafts to rise from the cylinder head and remove the caps.



1. Remove the camshafts.

Installation

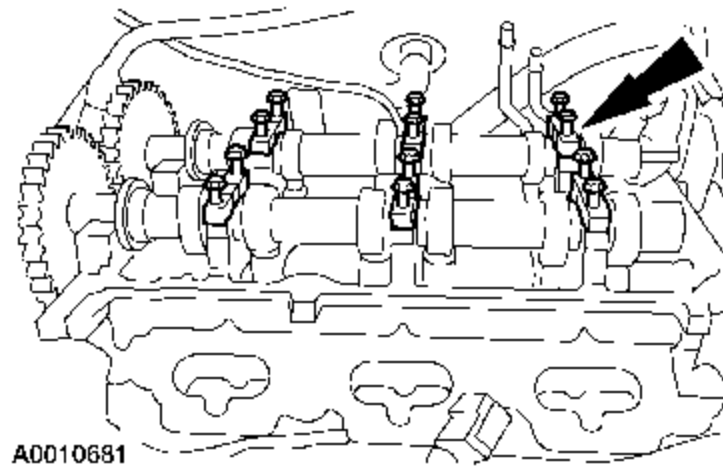


- 1.

NOTE:

Be sure camshaft bearing caps are installed in the original positions. Lubricate camshafts with SAE 5W-30 motor oil and carefully position the camshafts into the cylinder head.

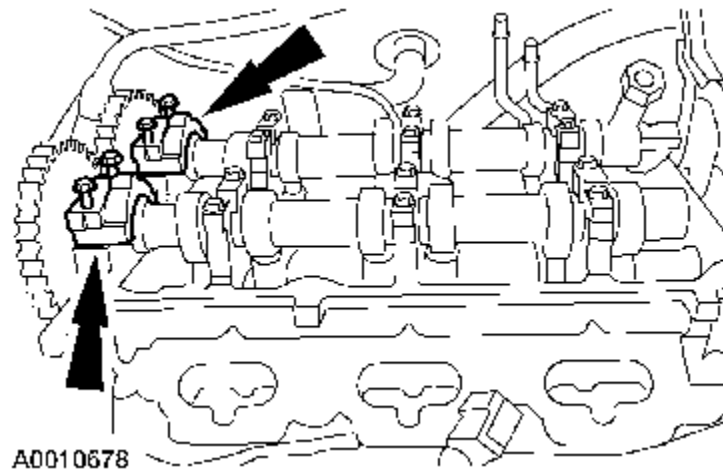
- a. Align the camshafts as shown.



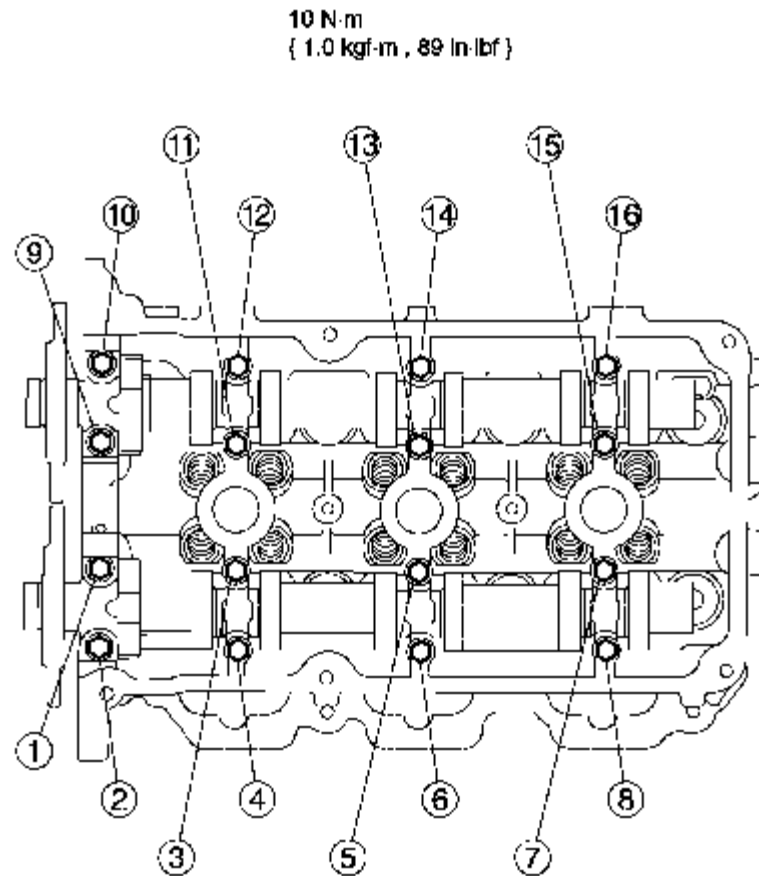
1.

CAUTION:

Do not install the camshaft journal thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur. Lubricate the bearing surfaces of the camshaft bearing caps with SAE 5W-30 motor oil and install the bearing caps and loosely install the bolts.



1. Lubricate the bearing surfaces of the camshaft bearing thrust caps with SAE 5W-30 motor oil . Install the bearing thrust caps and loosely install the bolts.

**MAZD2356**

1. Tighten the bolts in the sequence shown.
2. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2004 Model TRIBUTE cylinder head

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☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

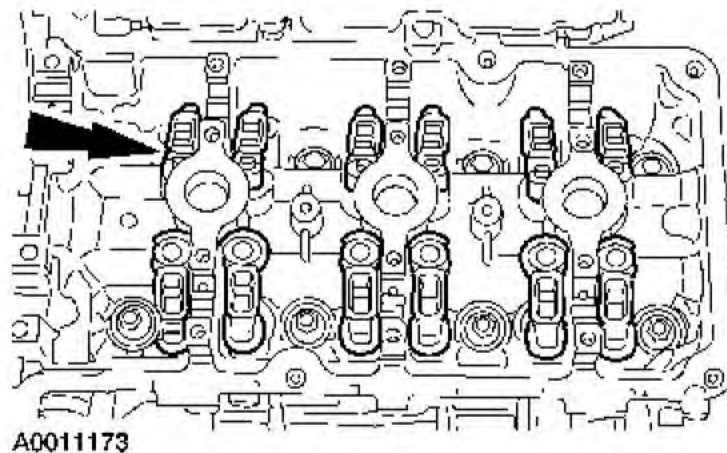
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CYLINDER HEAD — LH

Removal

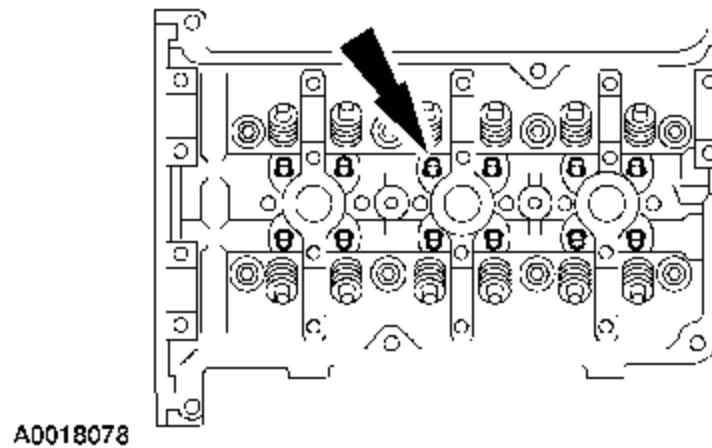
1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).



1.

CAUTION:

The camshaft followers must be installed in their original position. Remove the camshaft followers.



1.

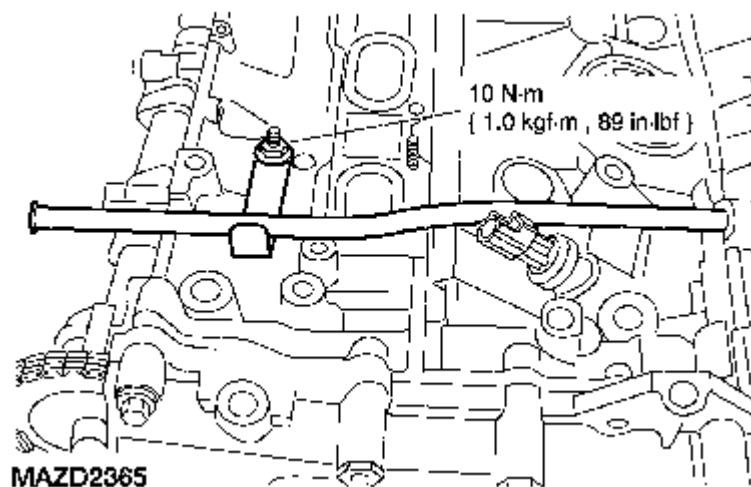
CAUTION:

The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Position the water pump and housing aside. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)

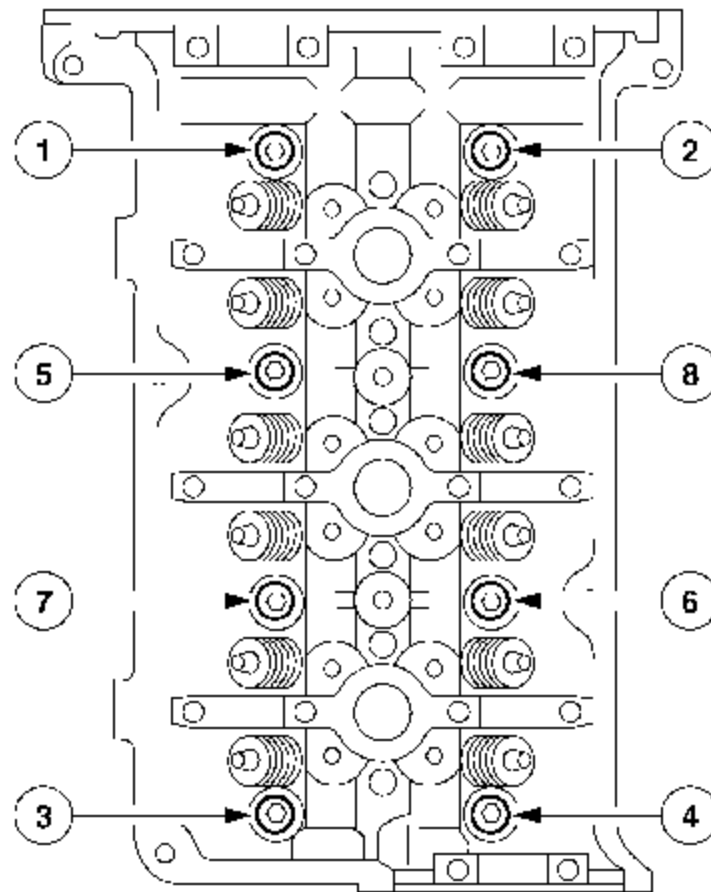
3. Raise the vehicle.

4. Remove the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



1. Remove the oil level indicator tube nut.

2. Lower the vehicle.



A0017922

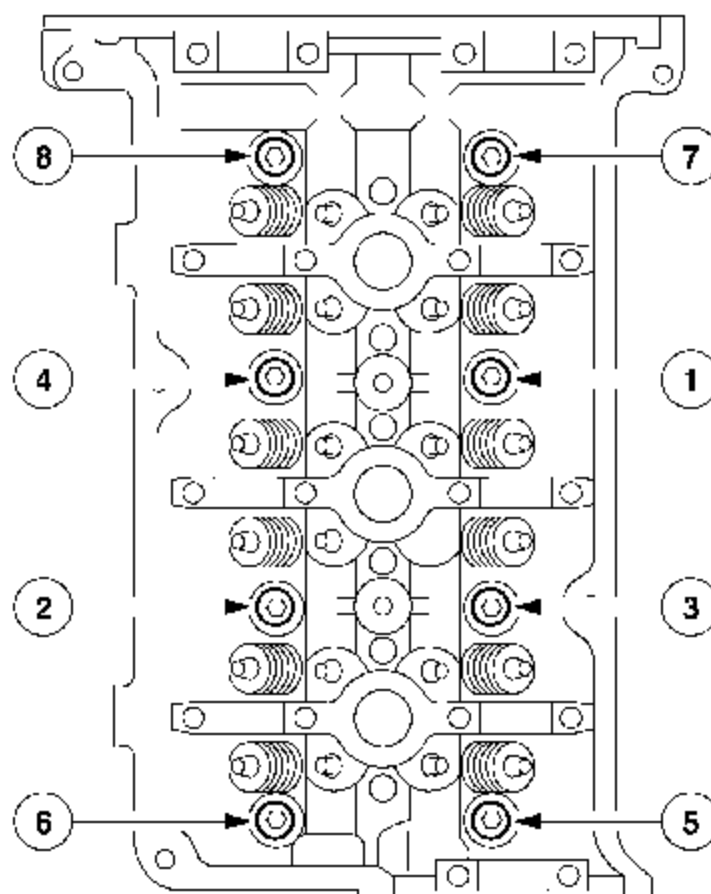
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- a. Discard the gasket and the bolts.

Installation



A0017924

1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

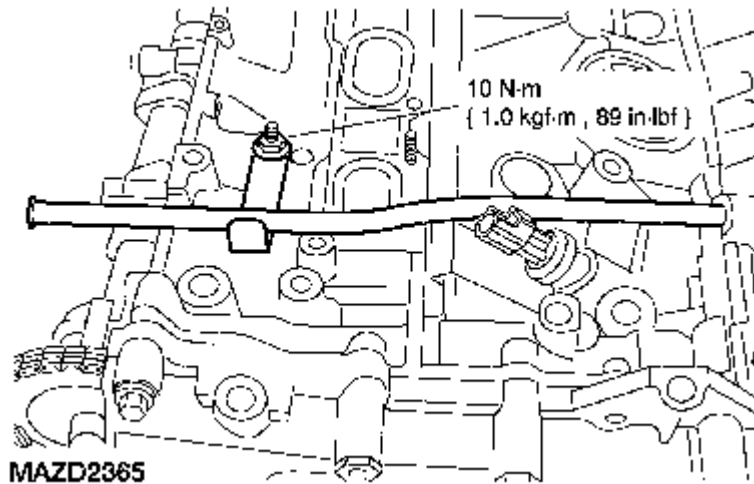
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

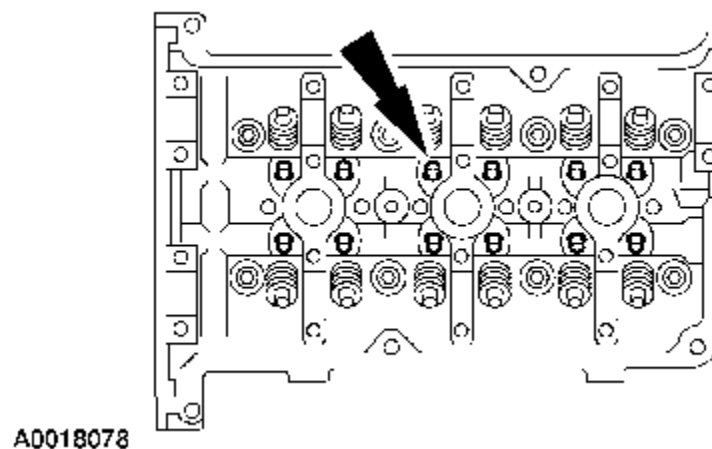
Position the LH cylinder head, gasket and install the bolts in the sequence shown.

- a. Tighten the bolts in six stages.
- b. Stage 1: Tighten to 40 Nm (30 lb-ft).

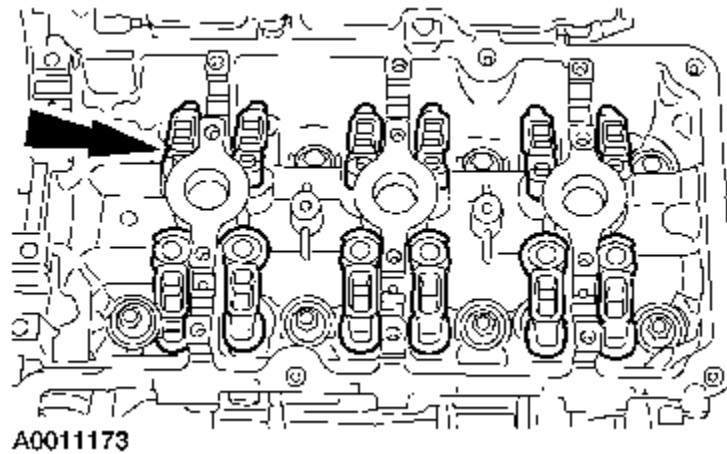
- c. Stage 2: Tighten bolts 90 degrees.
 - d. Stage 3: Loosen one full turn.
 - e. Stage 4: Tighten to 40 Nm (30 lb-ft).
 - f. Stage 5: Tighten 90 degrees.
 - g. Stage 6: Tighten 90 degrees.
- 2. Install the water pump. Refer to — [01-12B WATER PUMP 3.0L DURATEC \(4V\)](#)
 - 3. Raise the vehicle.
 - 4. Install the LH exhaust manifold. Refer to — [01-15B EXHAUST MANIFOLD LH](#)



- 1. Install the oil level indicator tube nut.
- 2. Lower the vehicle.



1. Install the hydraulic lash adjusters.
 - a. Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.
 - a. Lubricate the camshaft followers with SAE 5W-20 motor oil.
2. Install the LH camshafts. Refer to — [01-10C CAMSHAFTS LH](#).
3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
4. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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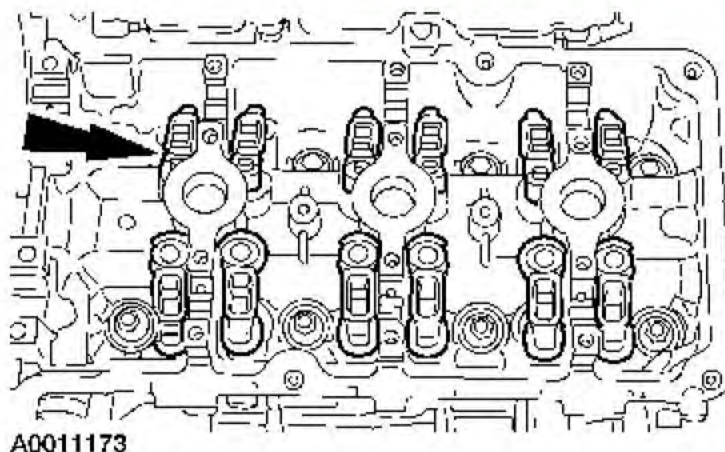
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CYLINDER HEAD — RH

Removal

1. Remove the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).
2. Remove the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).
3. Remove the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).
4. Remove the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

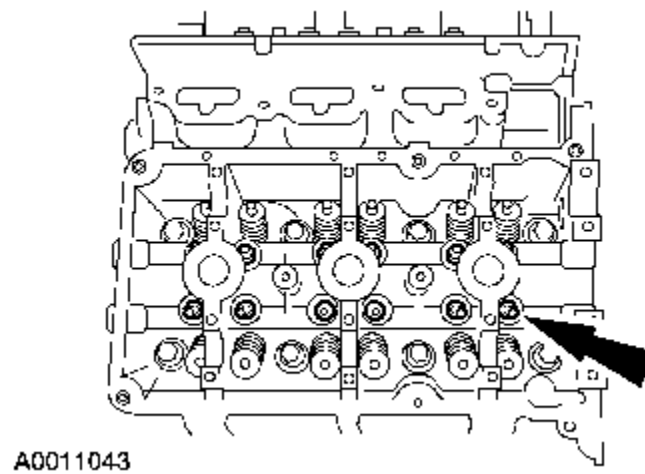


1.

CAUTION:

The camshaft followers must be installed in their original positions. Remove the camshaft

followers.

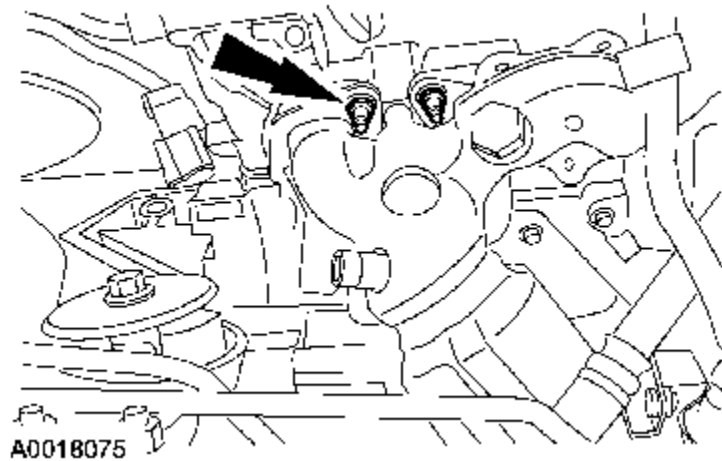


1.

CAUTION:

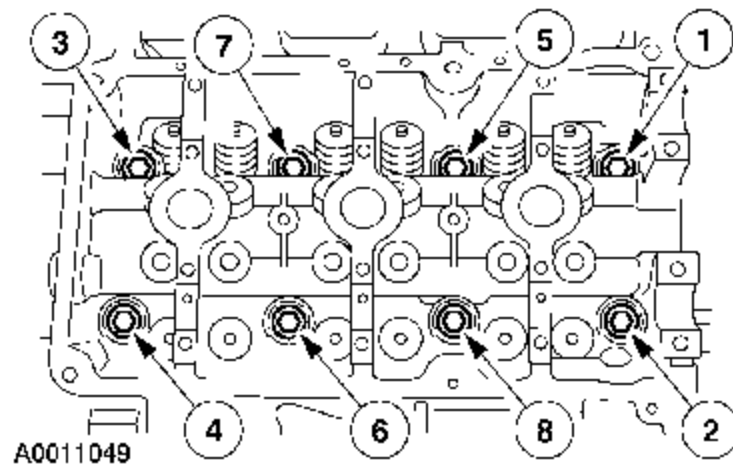
The hydraulic lash adjusters must be installed in their original position. Remove the hydraulic lash adjusters.

2. Raise the vehicle.



1. Remove the six nuts from the RH exhaust manifold.

2. Lower the vehicle.



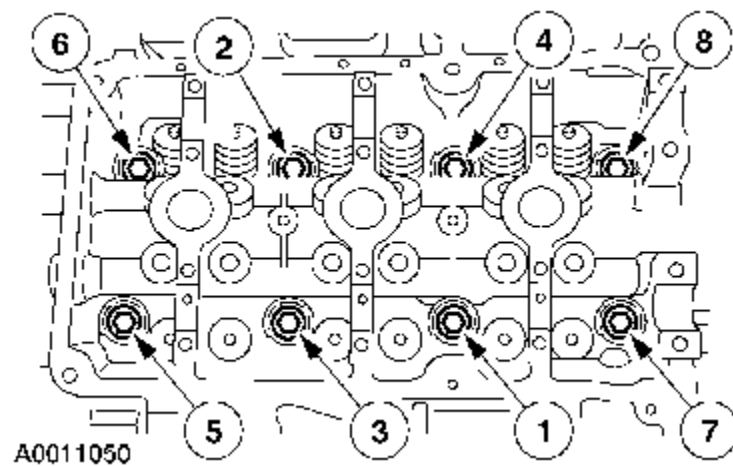
1.

NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused. Remove the bolts in the sequence shown and remove the cylinder head.

- Discard the gasket and the bolts.

Installation



1.

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths. Use a plastic scraping tool to remove all traces of the head gasket. Clean all sealing surfaces with Metal Surface Cleaner.

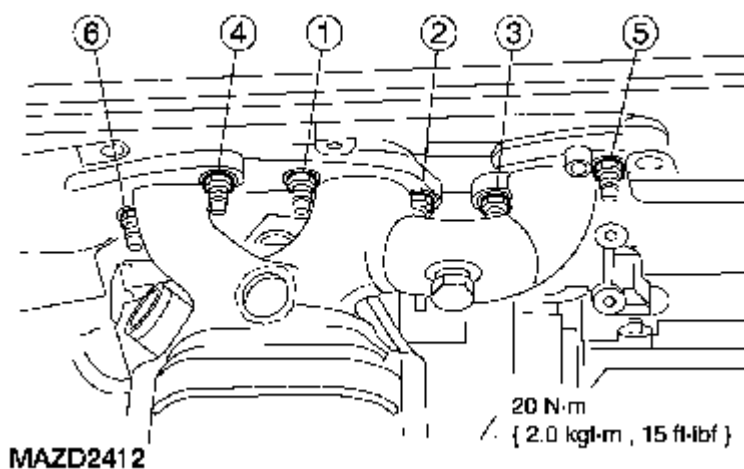
NOTE:

The cylinder head bolts must be replaced with new bolts. They are torque-to-yield designed and cannot be reused.

Position the RH cylinder head, gasket and install the bolts in the sequence shown.

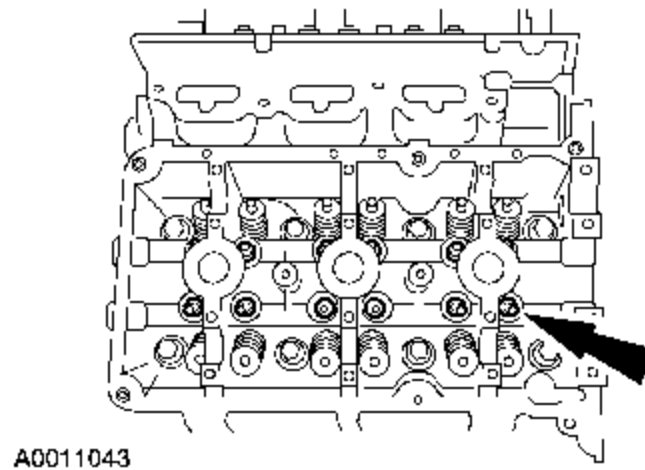
- Tighten the bolts in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten bolts 90 degrees.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.

2. Raise the vehicle.



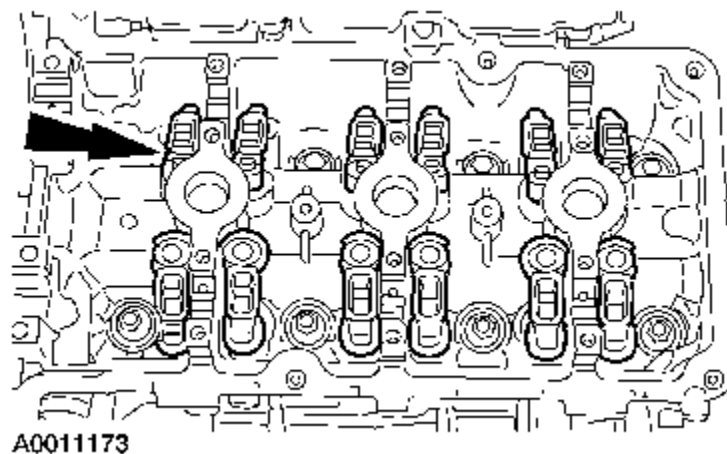
1. Install RH exhaust manifold nuts in the sequence shown.

2. Lower the vehicle.



1. Install the hydraulic lash adjusters.

- Lubricate the hydraulic lash adjusters with SAE 5W-20 motor oil.



1. Install the camshaft followers.

- Lubricate the camshaft followers with SAE 5W-20 motor oil.

2. Install the RH camshafts. Refer to — [01-10C CAMSHAFTS RH](#).

3. Install the coolant bypass tube. Refer to — [01-12B BYPASS TUBE 3.0L DURATEC \(4V\)](#).

4. Install the exhaust gas recirculation (EGR) tube. Refer to — [01-16 EXHAUST MANIFOLD TO EXHAUST GAS RECIRCULATION \(EGR\) VALVE TUBE 3.0L DURATEC \(4V\)](#).

5. Install the lower intake manifold. Refer to [01-13B LOWER INTAKE MANIFOLD](#).

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ENGINE

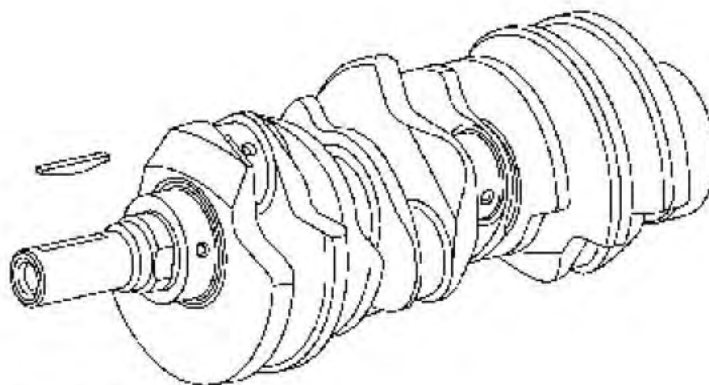
Assembly

All vehicles

1.

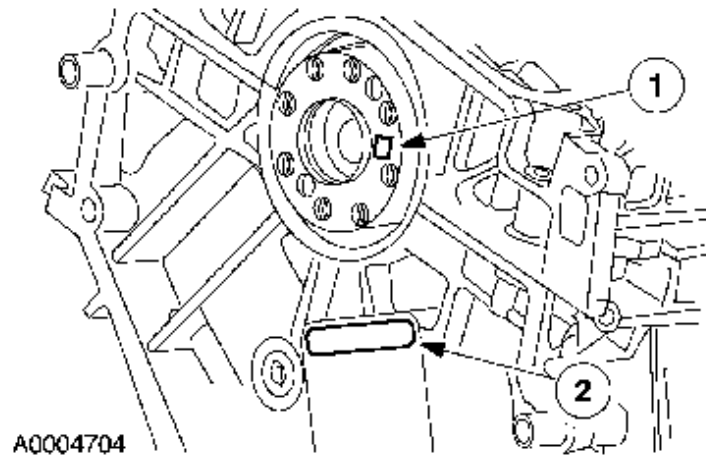
WARNING:

Eye protection is required to be worn during the use of compressed air. Failure to wear eye protection could result in possible personal injury. Clean gasket material, dirt and foreign material from the cylinder block. Wash the cylinder block with a suitable soap and water solution, and dry with compressed air.



A0004226

1. If removed, install the crankshaft key into the keyway on the crankshaft.



1.

NOTE:

This procedure is for selecting bearings using a new crankshaft. Select the crankshaft main bearings for each crankshaft journal.

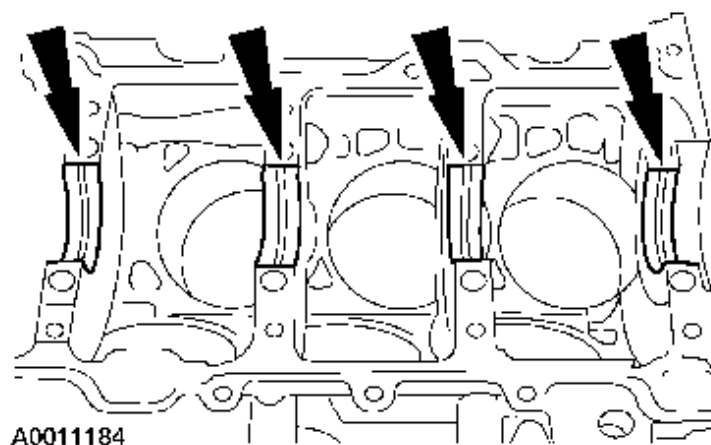
- a. Read the code on the crankshaft flange.
- b. Read the code on the cylinder block rear face.
 - The first two numbers after the asterisk make up the code for main No. 1 and the next two numbers for main No. 2.
 - The first two numbers after the second asterisk make up the code for main No. 3 and the last two numbers for main No. 4.

	BLOCK CODE																							
	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
CRANKSHAFT CODE	91	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
	89	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
	88	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2
	87	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
	86	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2
	85	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2
	84	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3
	83	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
	82	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3
	81	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
	80	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
	79	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
	78	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
	77	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	76	1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
	75	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
	74	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3
	73	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
	72	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
	71	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	70	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	69	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	68	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

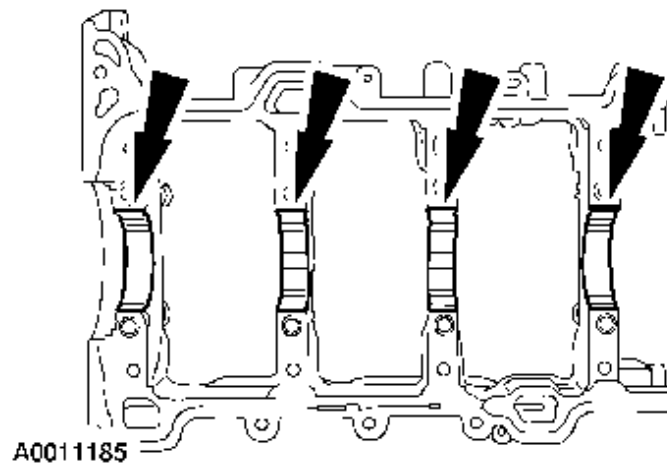
A0004705

1. Using the chart, choose a bearing for each main. Match the block and crankshaft code with its corresponding column or row, by reading across the "crankshaft" row and down the "block" column.

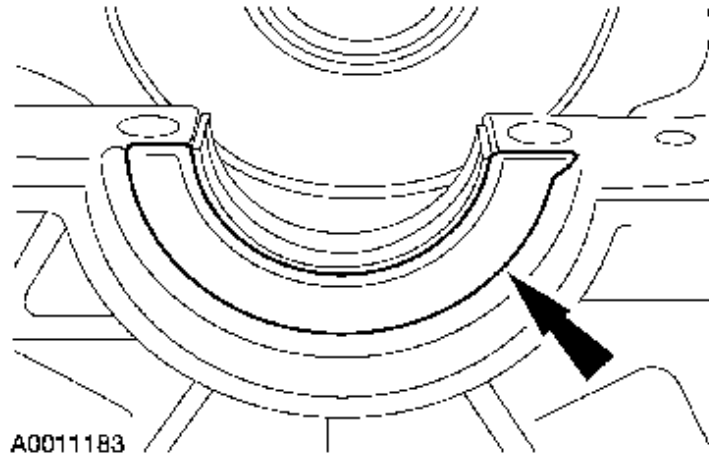
- For example: If the block code is *0609*0711* and the crankshaft code is *8480*8082*, main No. 1 should use grade 1 bearings, as determined by the intersection of the 06 block column and the 84 crankshaft row. Mains 2,3 and 4 should all be grade 2.



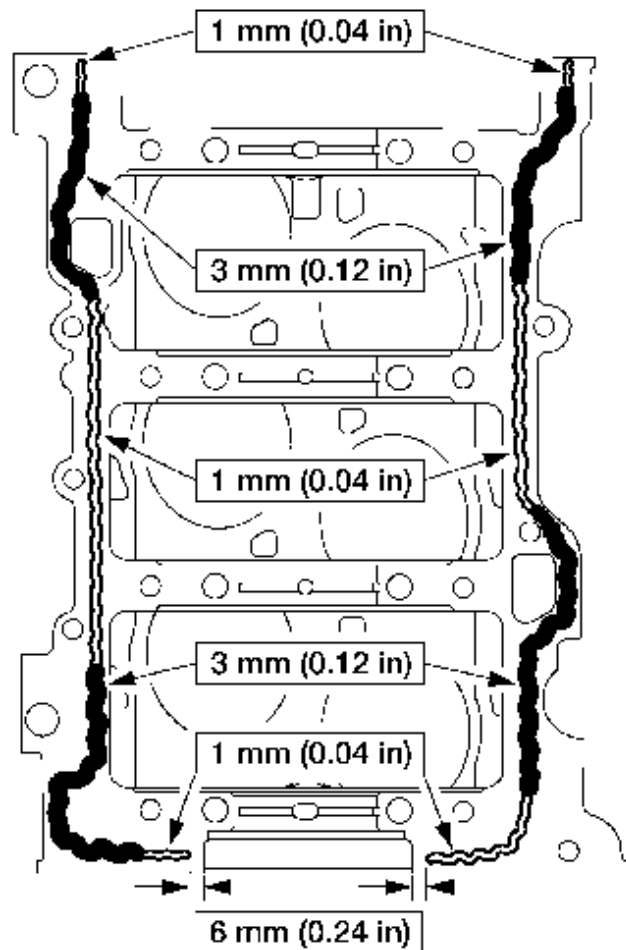
1. Install the main bearings into the cylinder block.



1. Install the main bearings into the lower cylinder block.

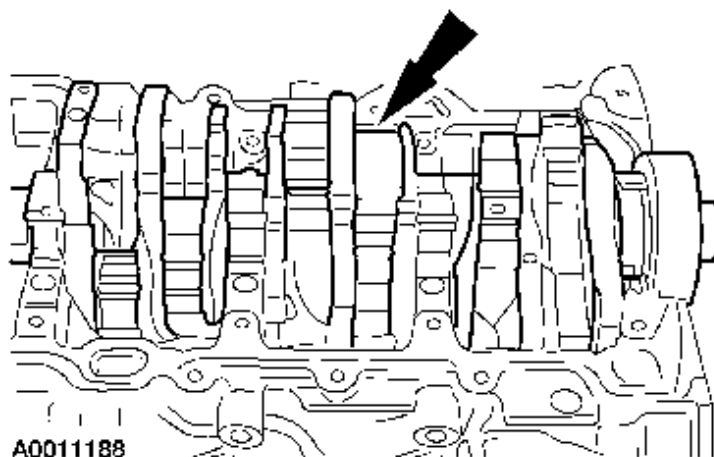


1. Install the crankshaft thrust bearing.



A0011187

1. Apply SAE 5W-20 motor oil to the crankshaft main and rod bearing journals.

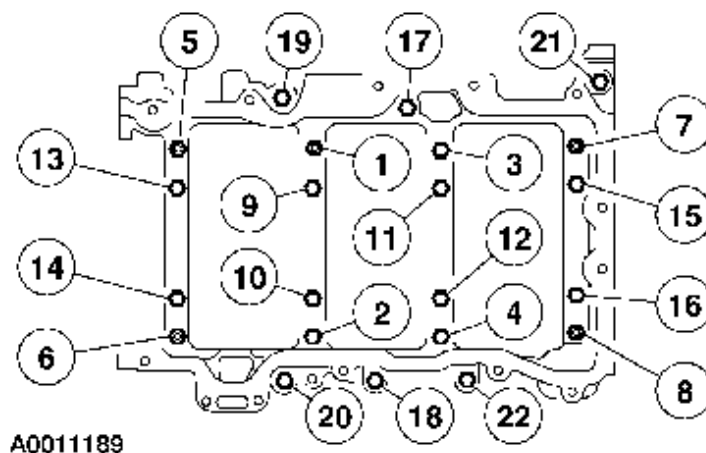


A0011188

1. Position the crankshaft in the cylinder block.
- 2.

CAUTION:

The lower cylinder block must be installed and the bolts tightened within four minutes of applying the sealant. Apply Silicone Gasket and Sealant to the cylinder block as shown.

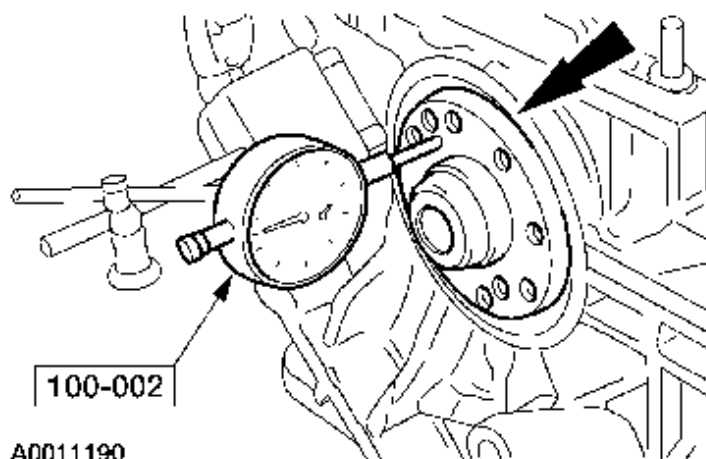


1.

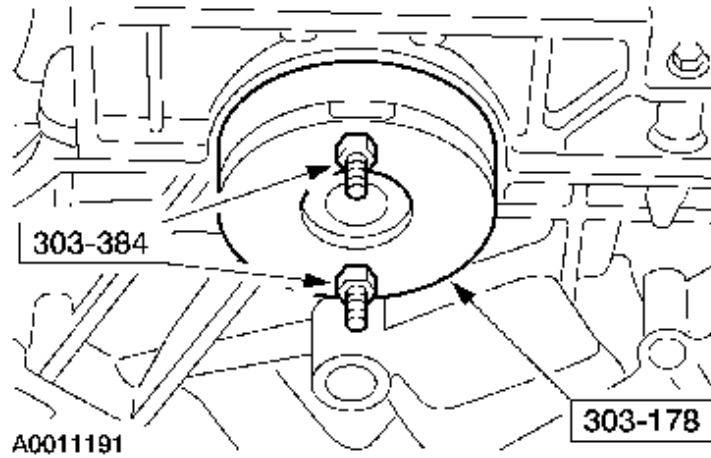
CAUTION:

Fasteners No. 1, 5, 6, 7, 8 are studs. Fasteners No. 18–22 are M8 x 1.25 mm x 79.3 mm (0.05 in x 3.12 in) bolts. Fasteners No. 2–4, 17 are M8 x 1.25 mm x 95.3 mm (0.05 in x 3.75 in) bolts. Fasteners 9–16 are M10 x 1.5 mm x 106 mm (0.06 in x 4.17 in) bolts. The bolts and studs must be installed in the correct position or engine damage may result. Position the lower cylinder block and install the bolts and studs.

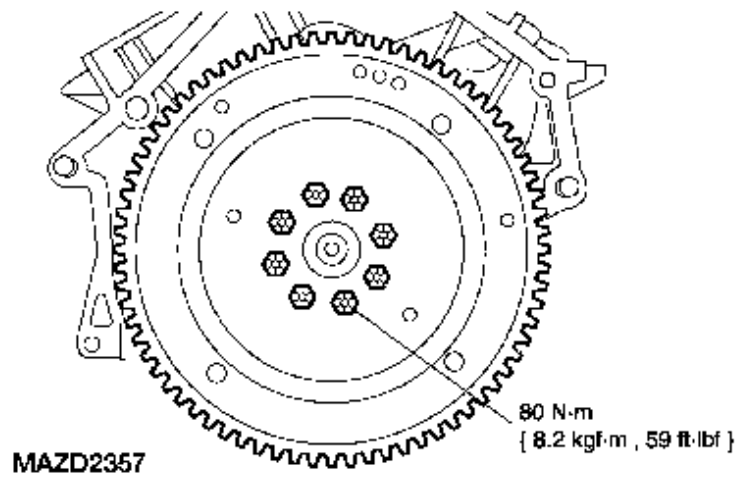
- Tighten the bolts and studs in the sequence shown in four stages.
- Stage 1: Tighten fasteners 1–8 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.
- Stage 2: Tighten fasteners 9–19 to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 3: Tighten fasteners 1–16 90 degrees.
- Stage 4: Tighten fasteners 17–22 to 25 N•m {2.5 kgf•m , 18 ft•lbf}.



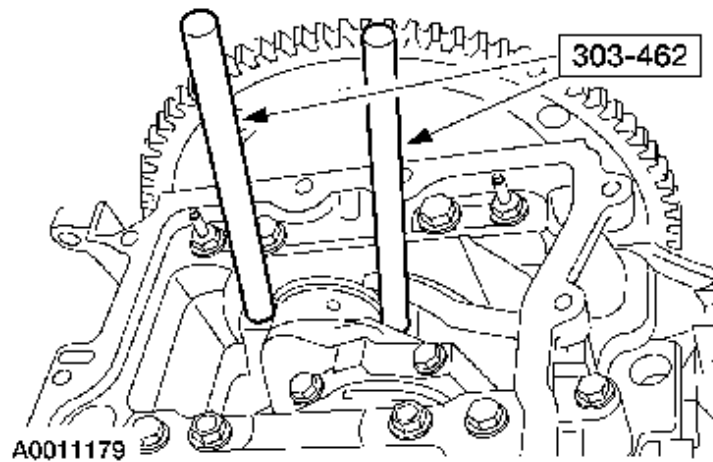
1. Using the special tool, measure the crankshaft end play. Refer to 01-10A CRANKSHAFT— END PLAY .



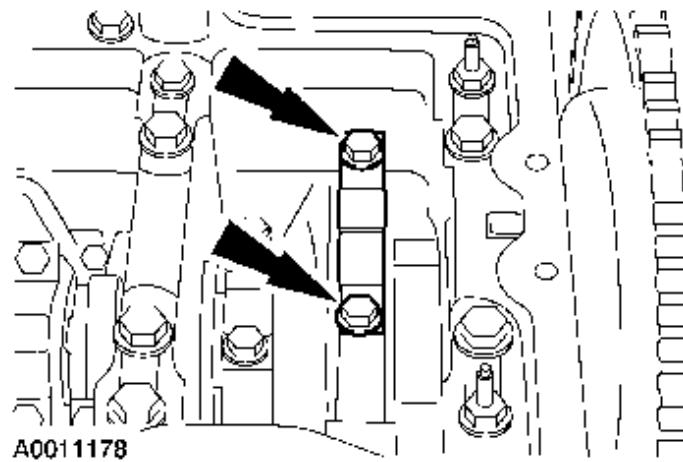
1. Using the special tool, install the crankshaft rear oil seal.



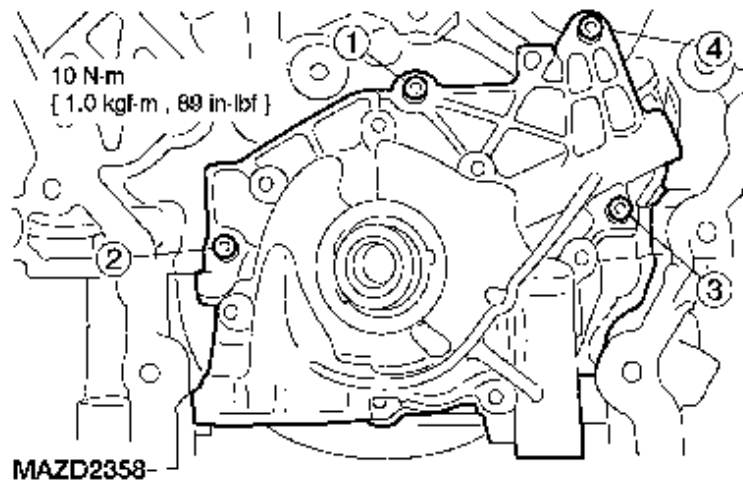
1. Position the flexplate and install the bolts.
2. Mount the engine on an engine stand.
3. Apply SAE 5W-20 motor oil to the cylinder bores.



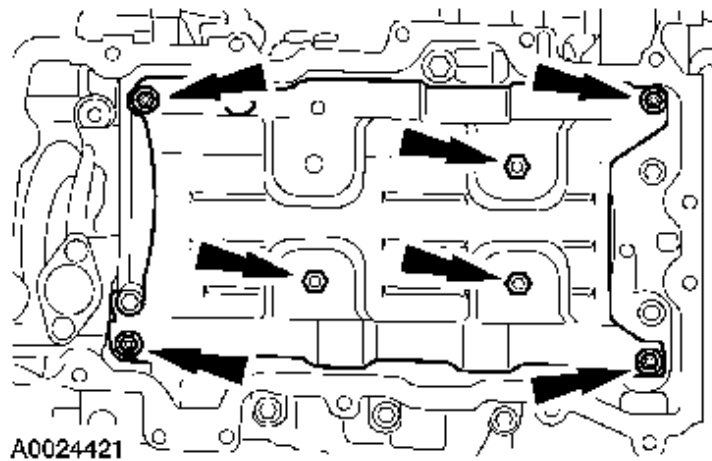
1. Using the special tools, install the piston and connecting rod assemblies.
2. Check connecting rod bearing clearance. Refer to 01-10A CONNECTING ROD — BEARING JOURNAL CLEARANCE



1. Install the connecting rod caps and bolts.
 - Tighten the bolts in two stages.
 - Stage 1: Tighten to 23 N•m {2.3 kgf•m , 17 ft•lbf}.
 - Stage 2: Tighten to 43 N•m {4.4 kgf•m , 32 ft•lbf}.

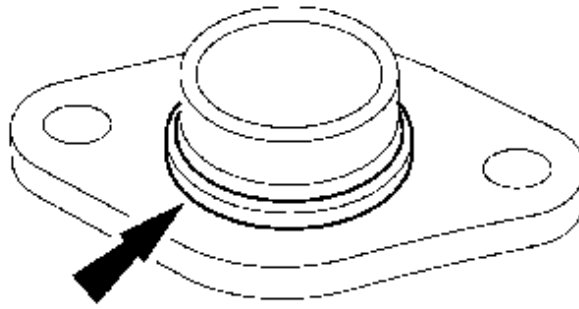


1. Position the oil pump and install the bolts in the indicated sequence.



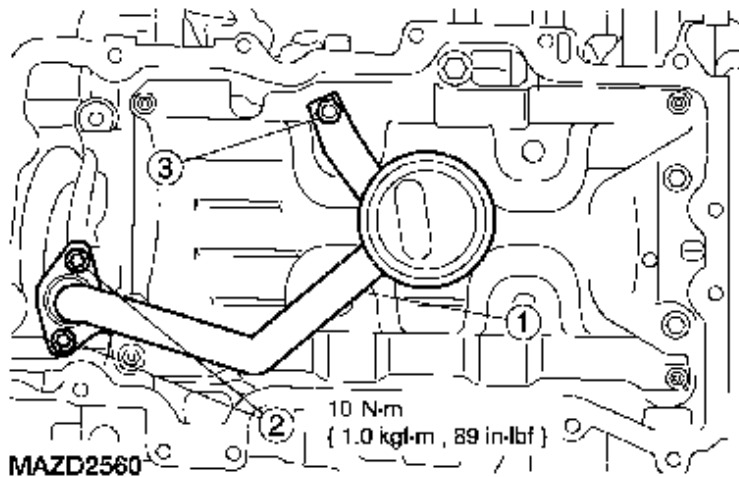
1. Position the oil pan baffle and install the nuts.

- Tighten the nuts in two stages.
- Stage 1: Tighten to 5 N·m {0.5 kgf·m, 44 in·lbf}.
- Stage 2: Tighten 45 degrees.

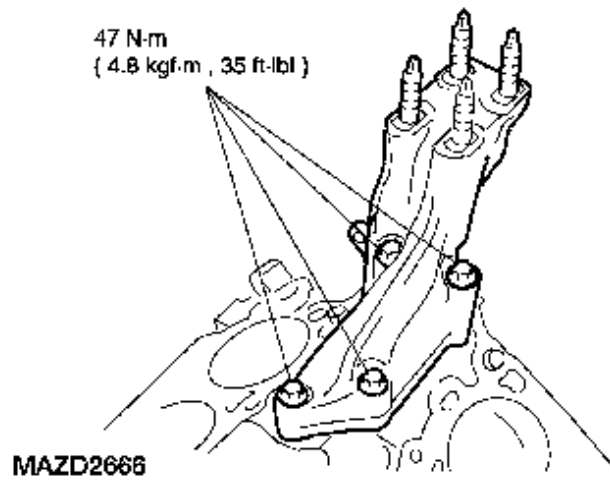


A0011413

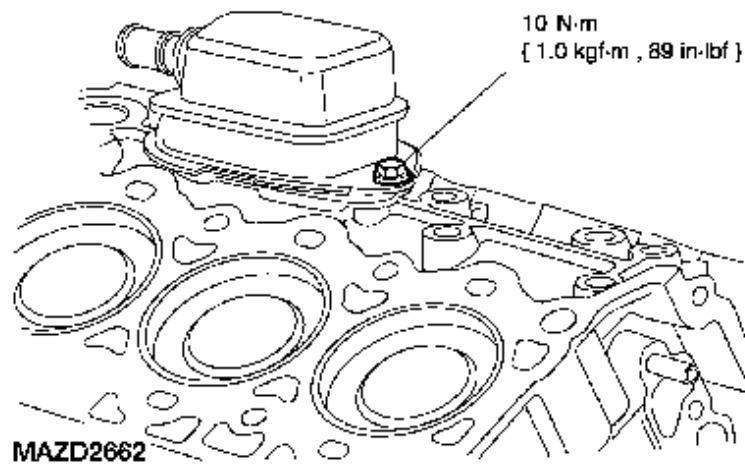
1. Install a new O-ring seal on the oil pump screen and pick-up tube.



1. Install the oil pump screen and pick up tube.
 - a. Position the oil pump screen and pick up tube.
 - b. Install the bolts.
 - c. Install the nut.
 - Tighten the nut in two stages.
 - Stage 1: Tighten to 5 N·m { 0.5 kgf·m, 44 in·lbf }.
 - Stage 2: Tighten 45 degrees.

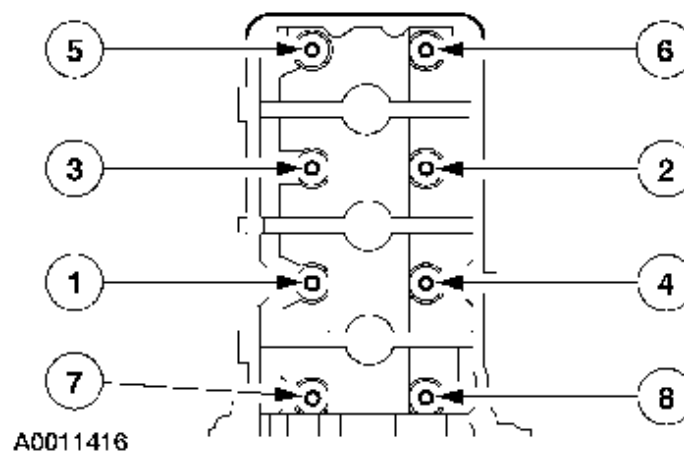


1. Install the power steering/engine support bracket.



1. Install the oil separator.

- Install the two bolts.

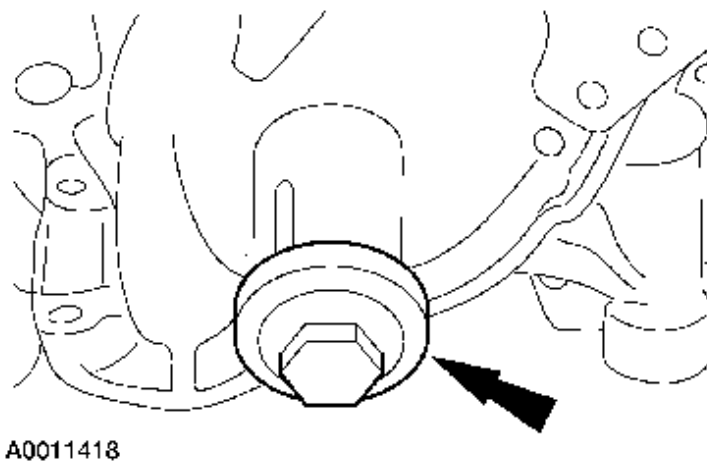


1.

NOTE:

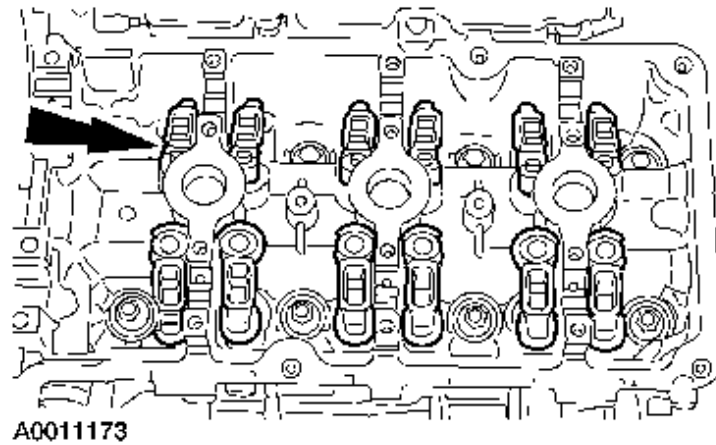
LH shown, RH similar. Position the LH and RH cylinder heads, gaskets, and install the bolts.

- Tighten the bolts in the sequence shown in six stages.
- Stage 1: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 2: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.
- Stage 3: Loosen one full turn.
- Stage 4: Tighten to 40 N•m {4.1 kgf•m , 30 ft•lbf}.
- Stage 5: Tighten 90 degrees.
- Stage 6: Tighten 90 degrees.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position to locate top dead center (TDC).

2. Apply SAE 5W-20 motor oil to the LH and RH camshaft followers.



1.

CAUTION:

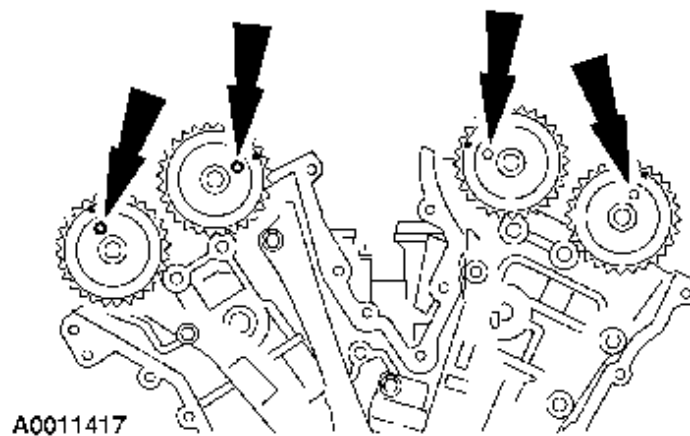
The camshaft followers must be installed in the original position.

NOTE:

RH shown, LH similar.

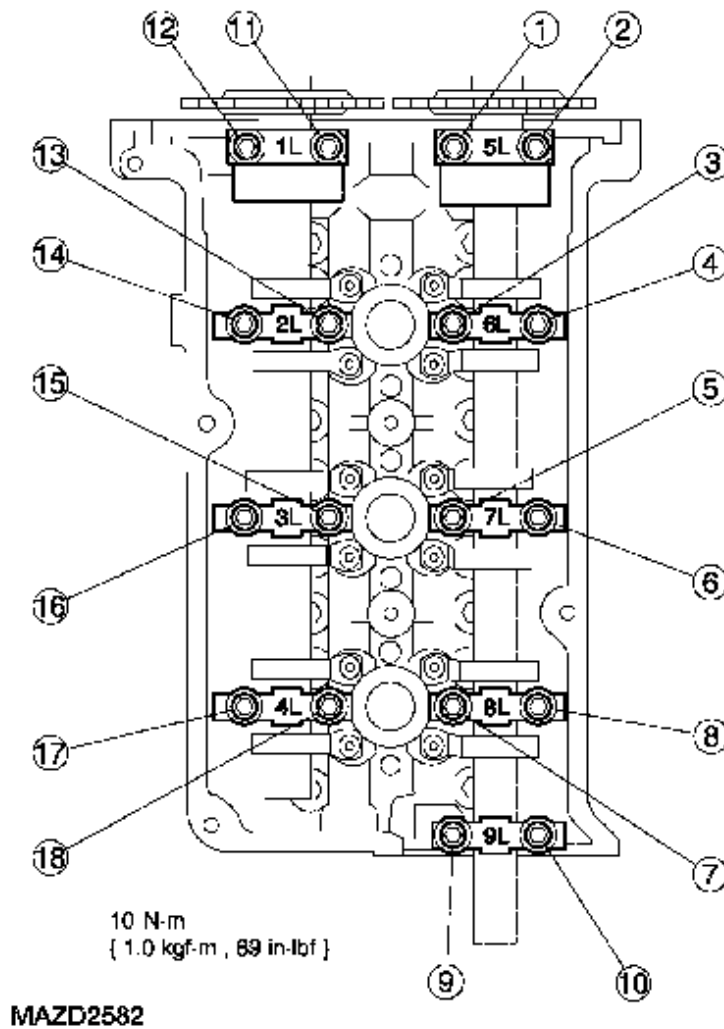
Install the LH and RH camshaft followers.

2. Apply SAE 5W-20 motor oil to the LH and RH camshafts.



1. Install the LH and RH camshafts.

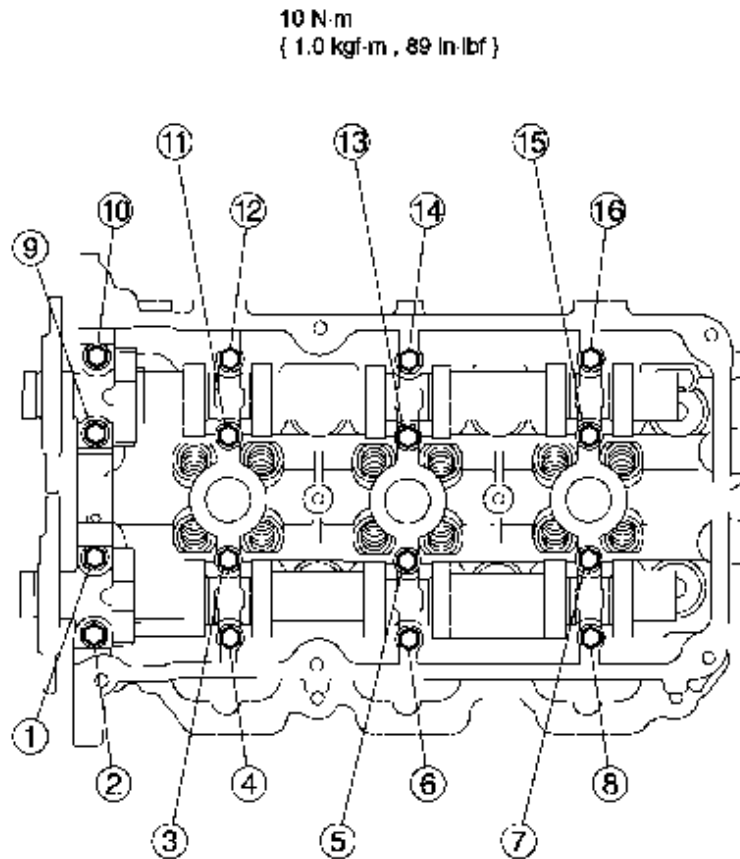
- Locate the camshafts as shown.



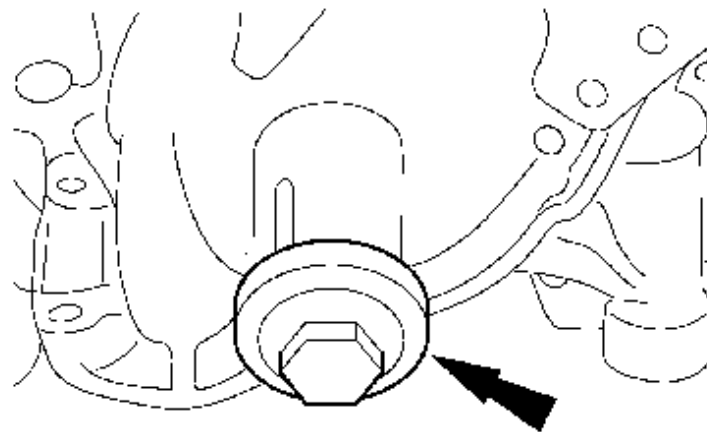
1.

CAUTION:

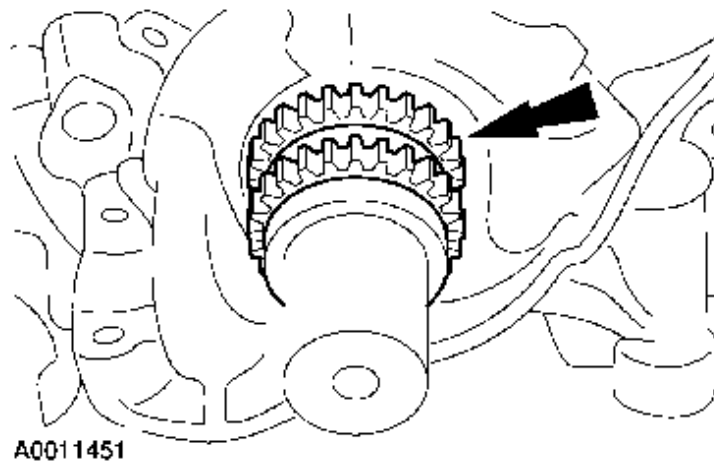
Cylinder head camshaft journal caps and cylinder heads are numbered to verify that they are assembled in their original positions. Position the LH camshaft caps and install the bolts in the sequence shown.

**MAZD2356**

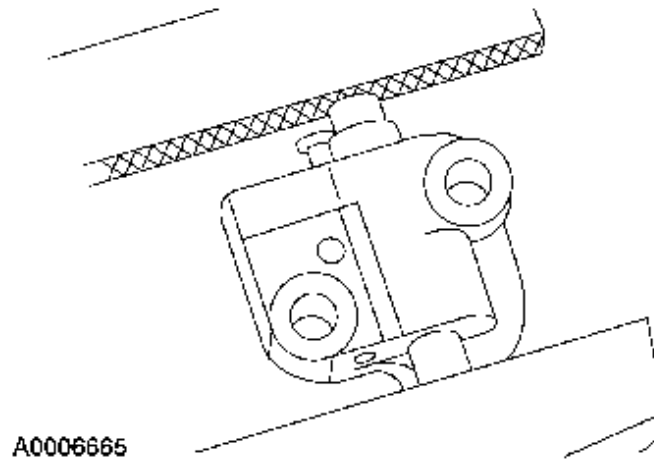
1. Position the RH camshaft caps and install the bolts in the sequence shown.

**A0011418**

1. Remove the crankshaft damper bolt.



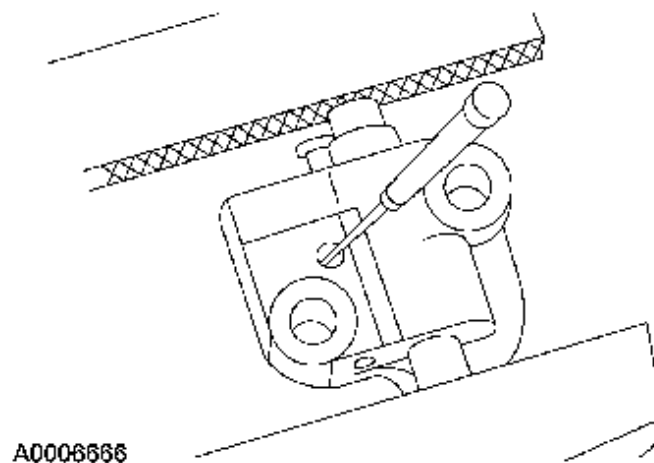
1. Install the crankshaft sprockets.



- 1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

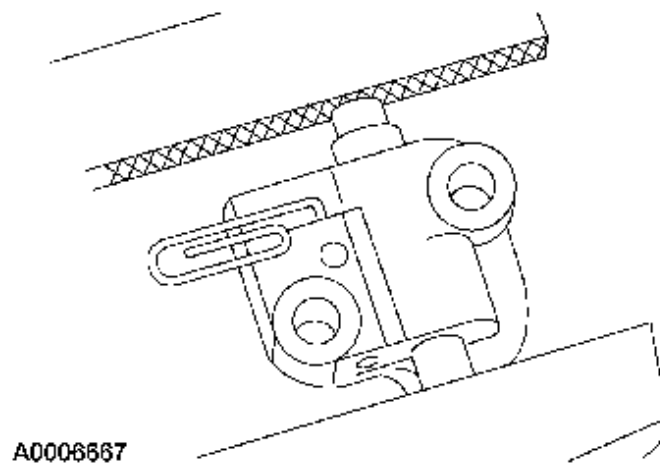
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

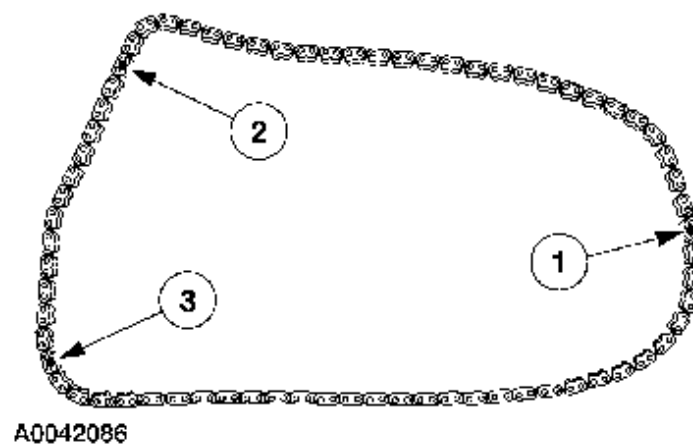
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.



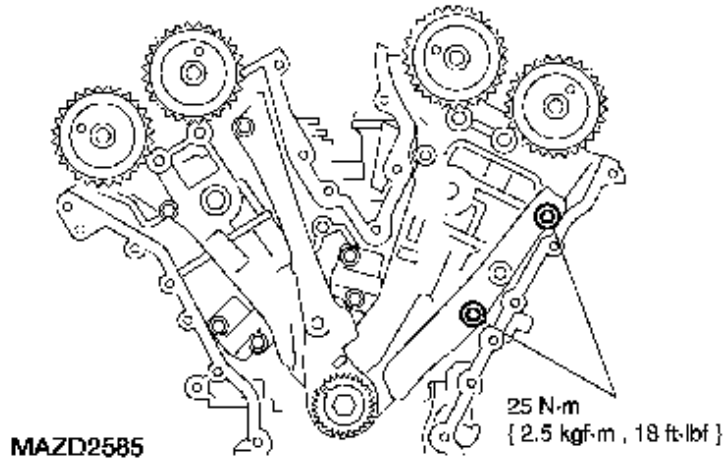
1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.



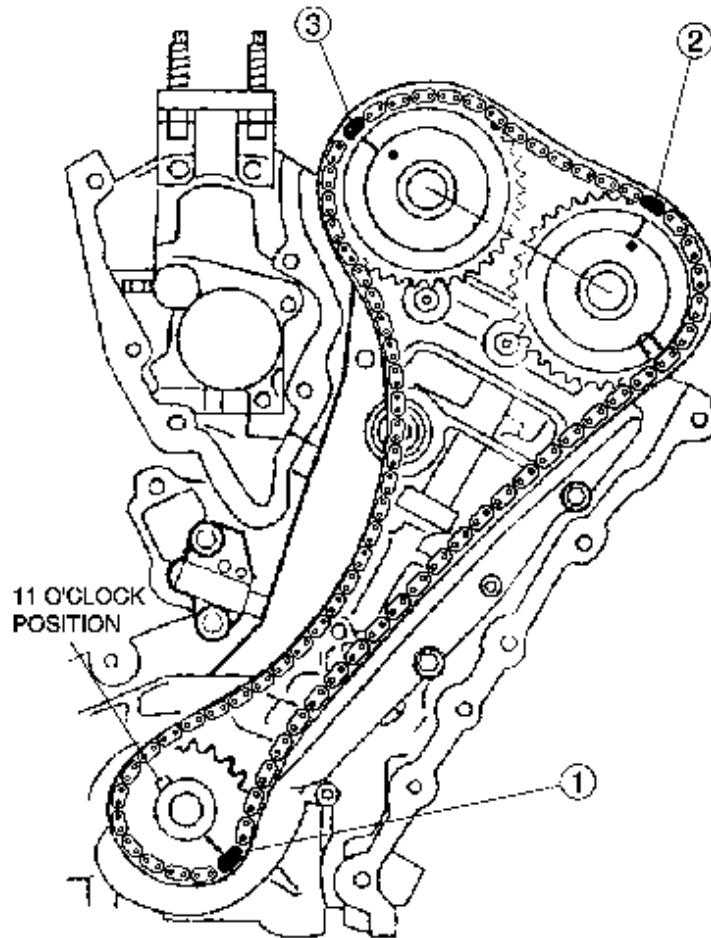
1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

a. Mark any link to use as the crankshaft timing mark.

- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark

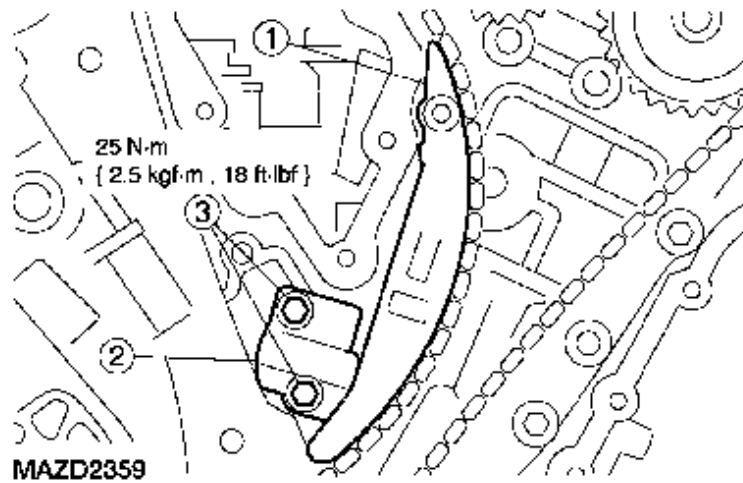


1. Position the guide and install the bolts.



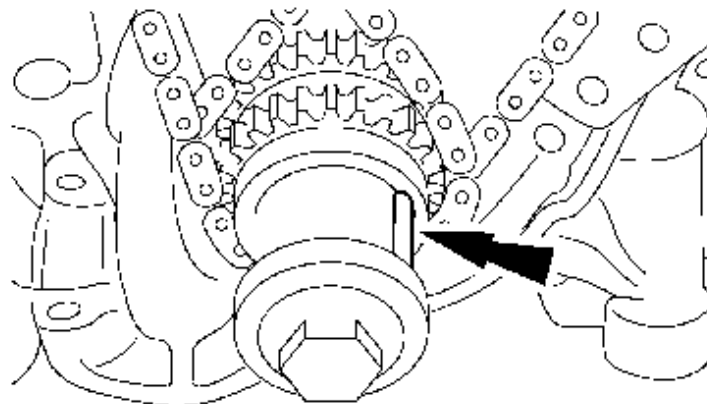
MAZD2331

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.



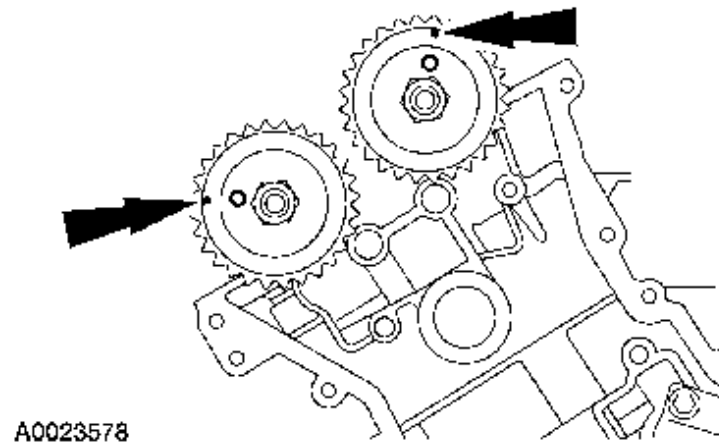
1. Install the LH timing chain tensioner and tensioner arm.

- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolts.

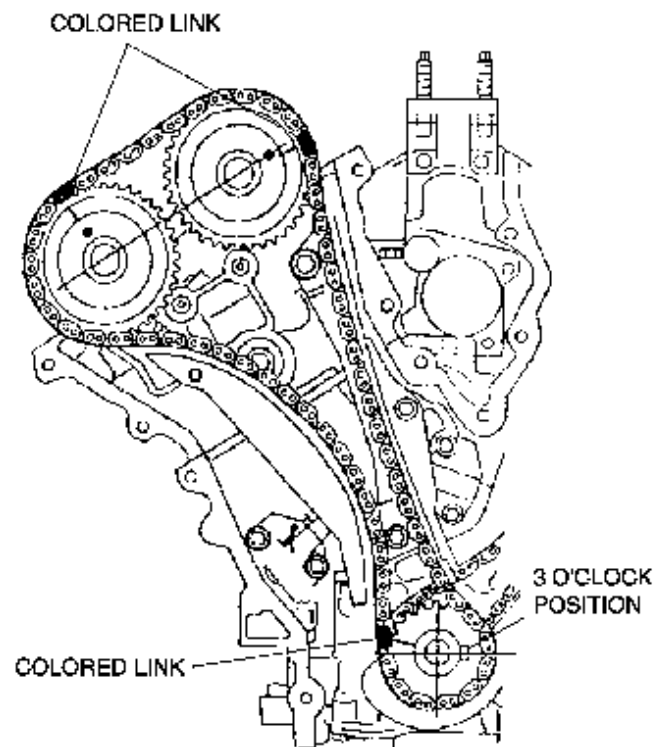


A0011067

1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.



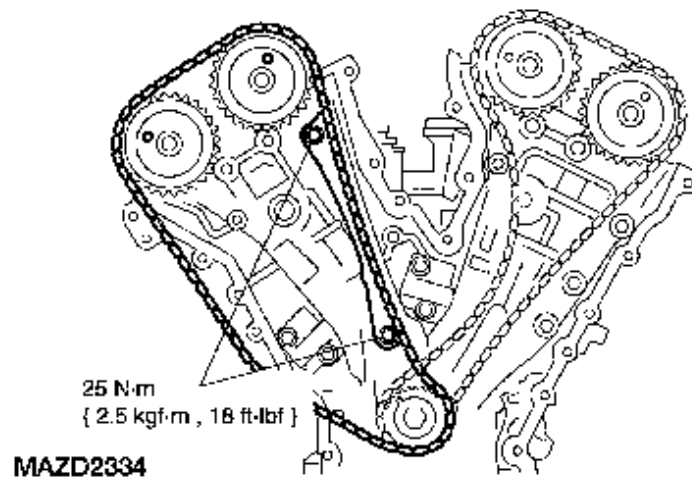
1. Verify that the RH camshafts are correctly positioned.



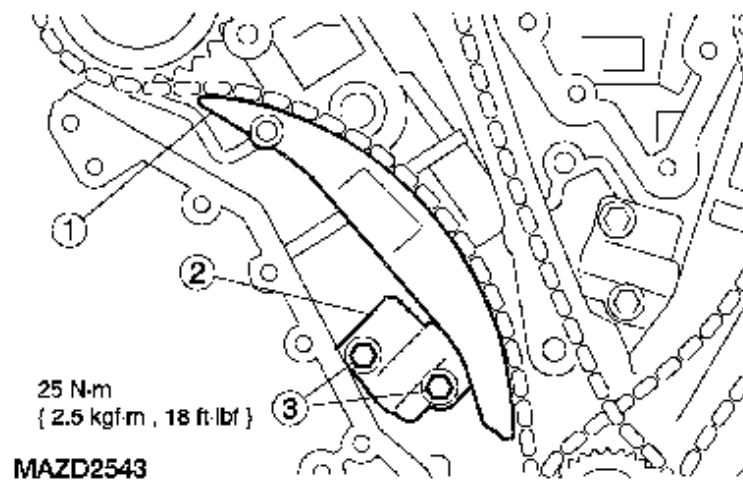
1. Install the RH timing chain.

- Align the marks on the timing chain with the marks on the camshaft and

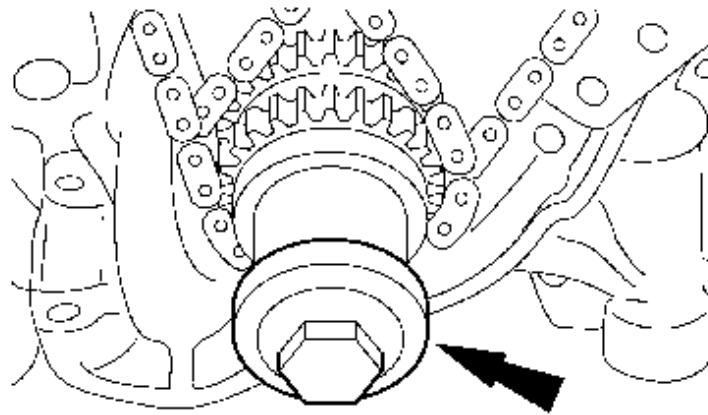
crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

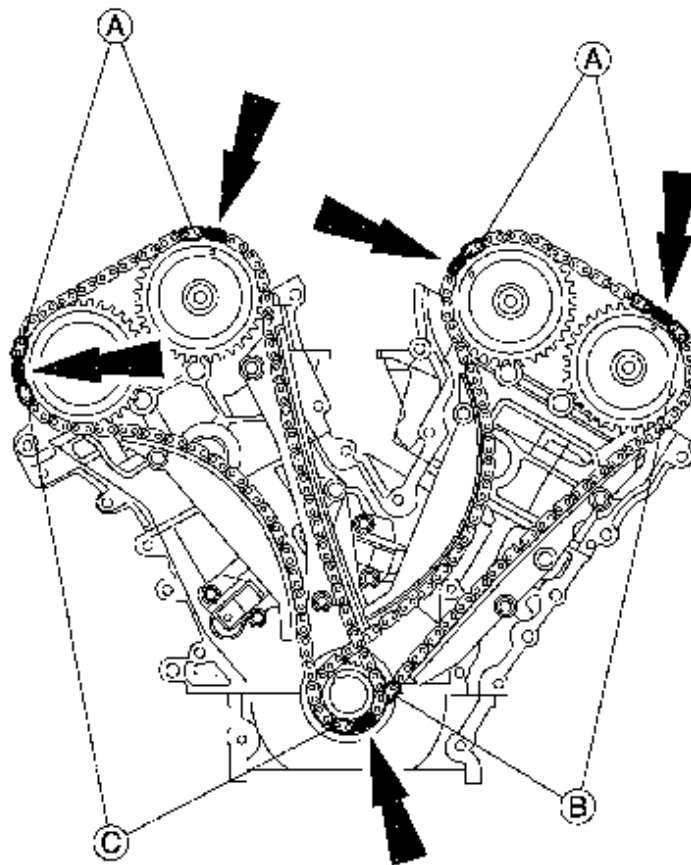


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

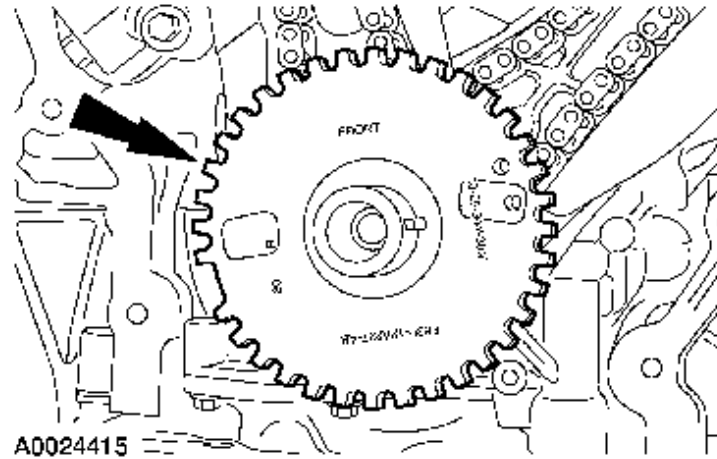
1. Remove the crankshaft damper bolt.



MAZD2333

1. Verify the timing with the following steps.
 1. There should be 12 chain links between the front camshaft timing marks.

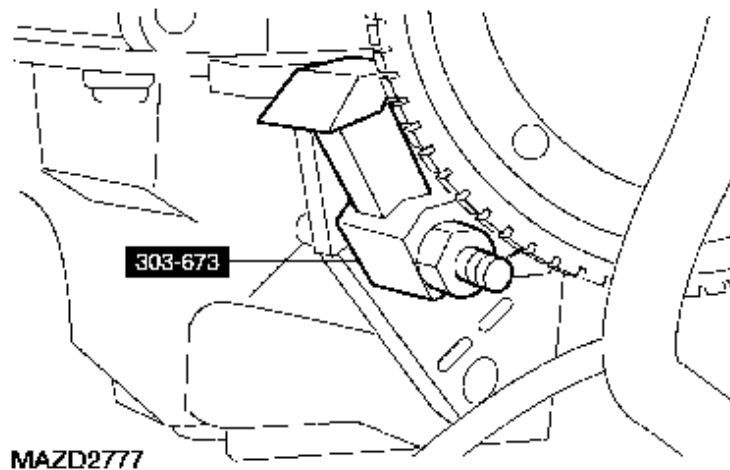
2. There should be 27 chain links between the camshaft and crankshaft timing marks.
3. There should be 30 chain links between the camshaft and crankshaft timing marks.



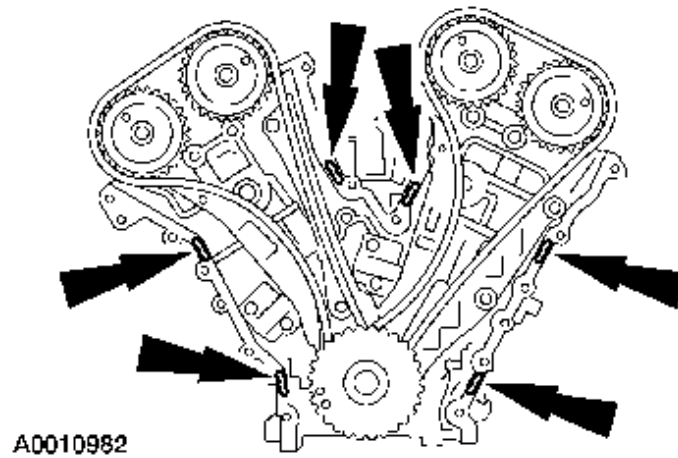
1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the special tool to hold the flexplate.
2. Install three gaskets in the front cover.

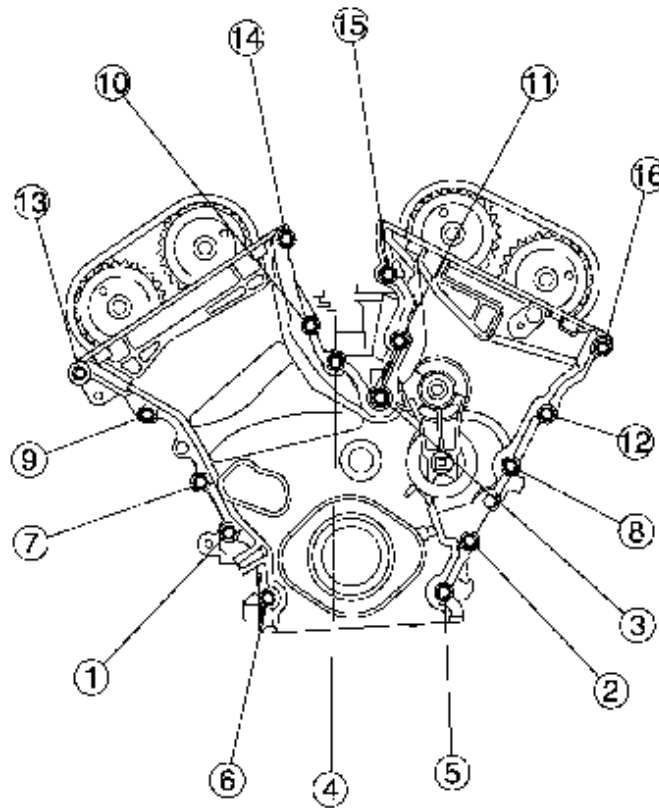


1.

NOTE:

The front cover must be installed and the bolts tightened within six minutes of sealant application. Apply a 6 mm (0.24 in) dot of silicone gasket and sealant to the cylinder block to lower cylinder block and cylinder head mating surfaces.

25 N·m
{ 2.5 kgf-m , 18 ft-lbf }

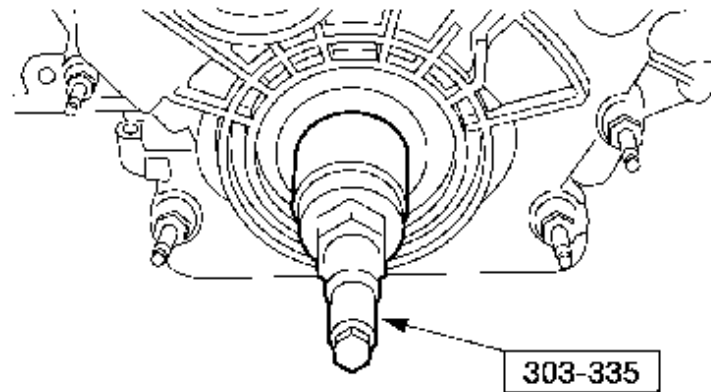


MAZD2555

1.

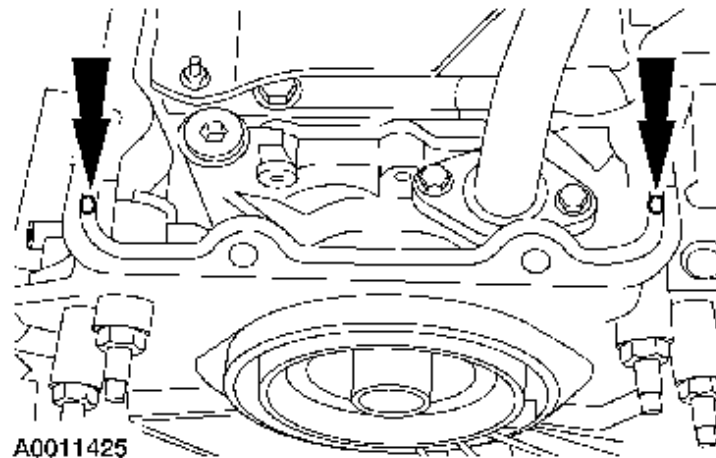
NOTE:

Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the front cover and install the bolts and studs in the sequence shown.



A0011428

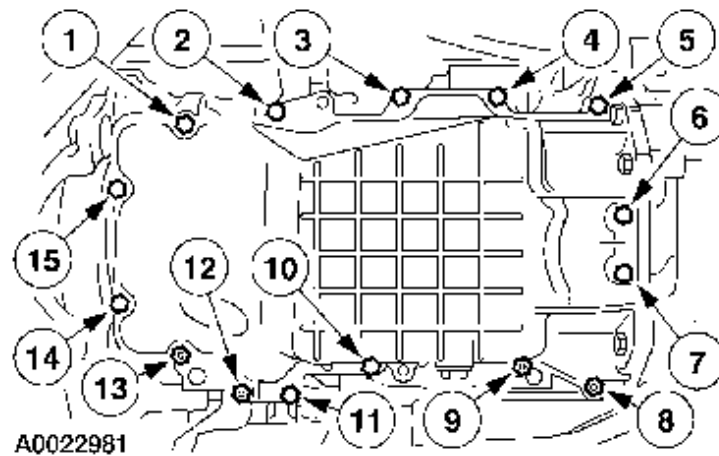
1. Using the special tool, install the crankshaft front oil seal.



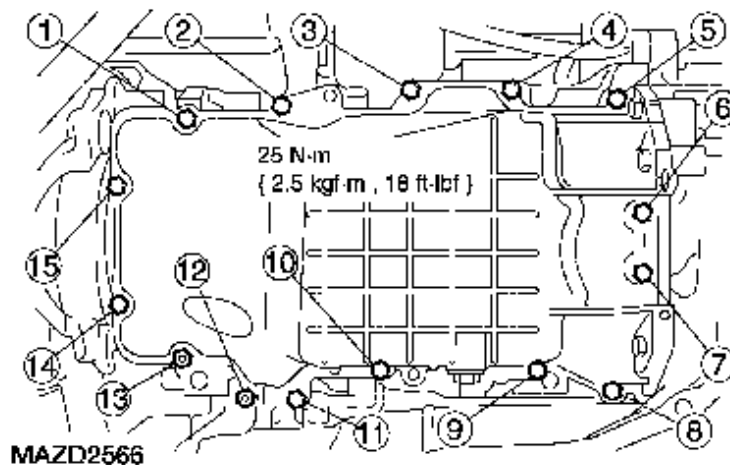
- 1.

NOTE:

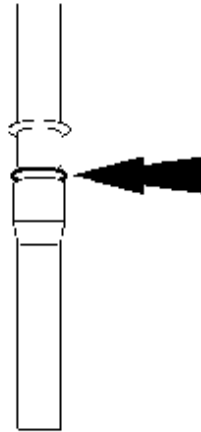
The oil pan must be installed and the bolts tightened within six minutes of sealant application. Apply a 10 mm (0.39 in) dot of silicone gasket and sealant to the front cover to cylinder block mating surface.



1. Position the oil pan and gasket and loosely install the bolts and studs in the indicated sequence.
2. Align the transaxle face of the oil pan with the rear of the cylinder block. The pan should be 0.00 mm (0.0 in)–0.25 mm (0.009 in) under flush. Assemblies that are between 0.26 (0.01 in) –0.50 mm (0.019 in) should be shimmed using either one or two 0.25 mm (0.009 in) gold shims. Assemblies that are between 0.51 mm (0.020 in) –0.75 mm (0.029 in) should be shimmed using either one or two 0.50 mm (0.019 in) silver shims. If the pan measures greater than 0.75 mm (0.029 in) or the pan is over flush of the cylinder block, the entire pan assembly must be removed and a new one installed.

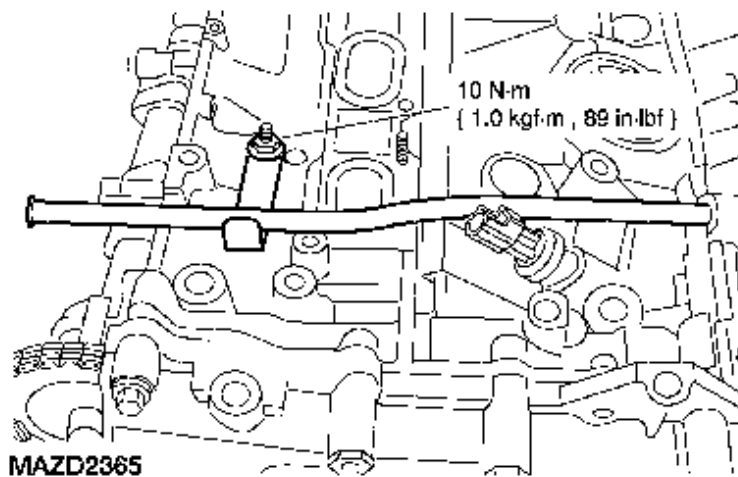


1. Tighten the oil pan bolts and studs in the sequence shown.

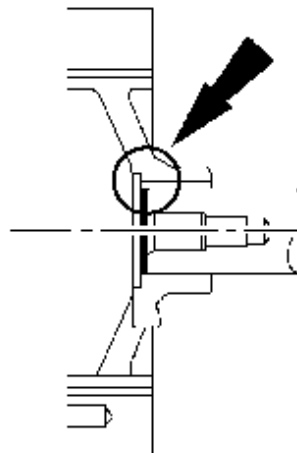


A0011038

1. Install a new seal on the oil level indicator tube.



1. Install the oil level indicator tube and install the bolt.

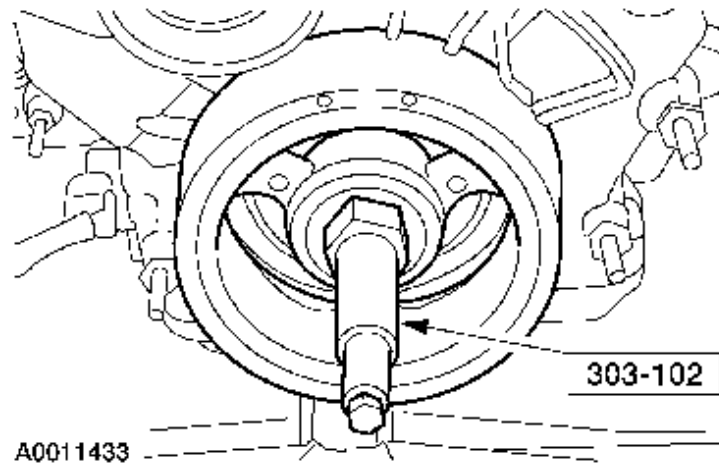


A0010615

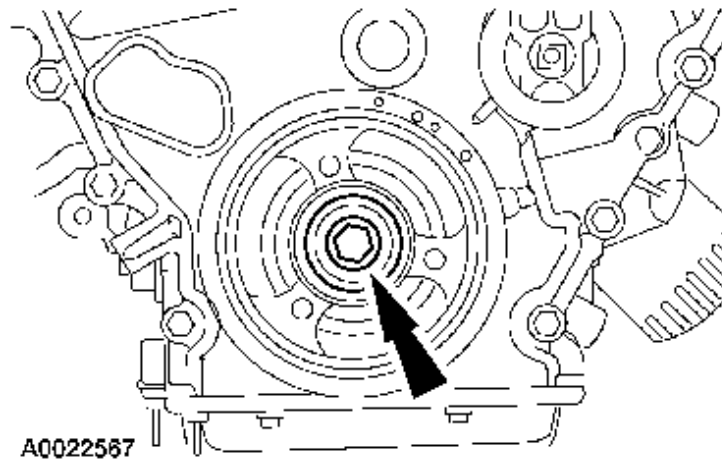
- 1.

NOTE:

The crankshaft damper must be installed and the bolt tightened within six minutes of sealant application. Apply silicone gasket and sealant to the end of the crankshaft damper keyway slot.



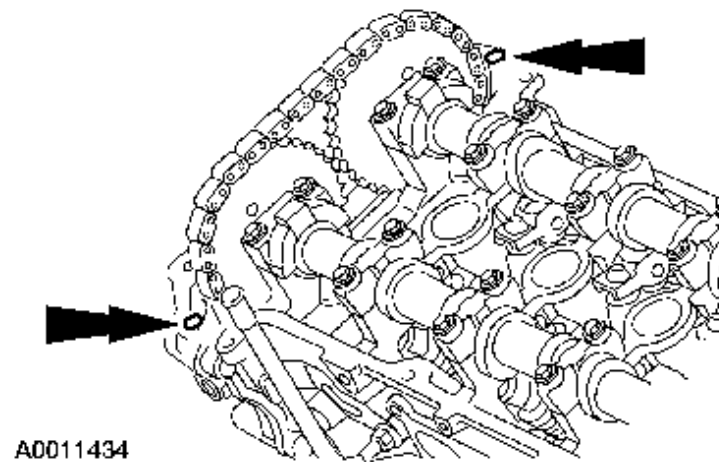
1. Using the special tool, install the crankshaft vibration damper.



1. Install the crankshaft vibration damper washer and bolt.

- Tighten the bolt in four stages.
- Stage 1: Tighten to 120 N•m {1.22 kgf•m , 89 ft•lbf}.
- Stage 2: Loosen one full turn (360 degrees).
- Stage 3: Tighten to 50 N•m {5.1 kgf•m , 37 ft•lbf}.
- Stage 4: Tighten to 90 N•m {9.2 kgf•m , 66 ft•lbf}.

2. Install new gaskets in the valve covers.



1.

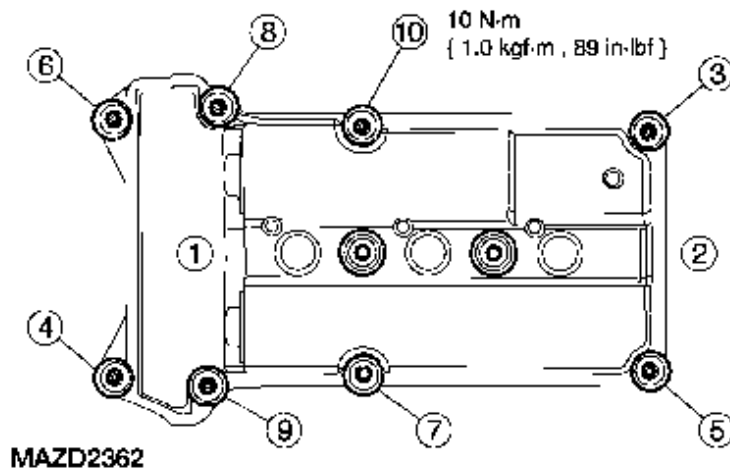
NOTE:

The valve cover must be installed and the bolts and studs tightened within six minutes of sealant application.

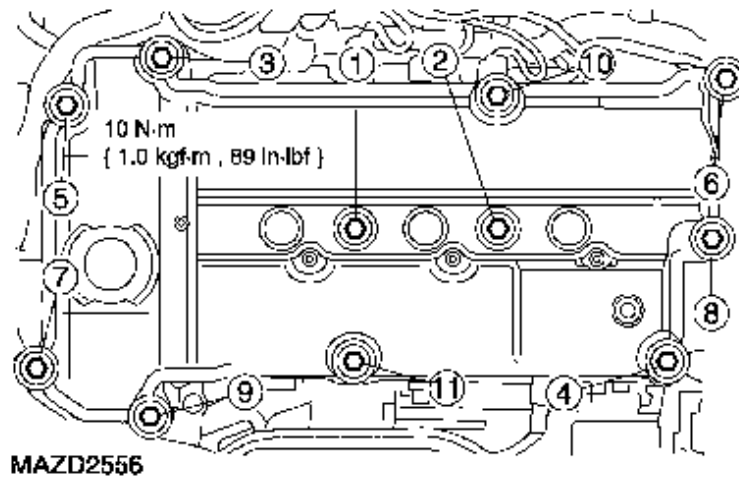
NOTE:

LH shown, RH similar.

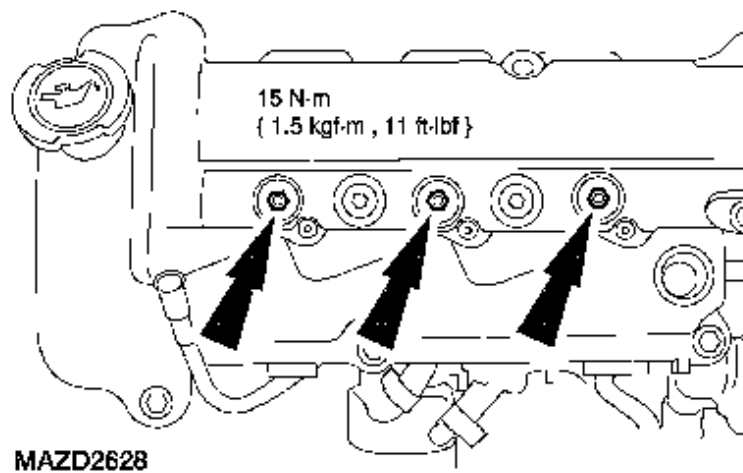
Apply a 8 mm (0.31 in) dot of silicone gasket and sealant at the cylinder block to front cover mating surface of the LH and RH valve covers.



1. Position the RH valve cover and install the bolts and studs in the sequence shown.



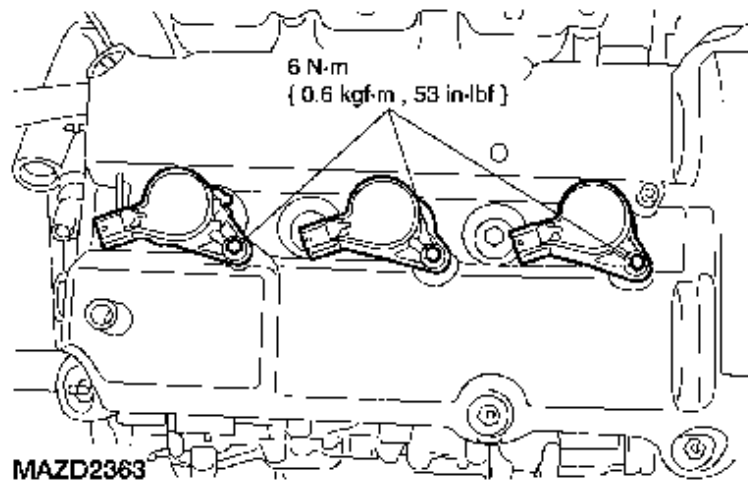
1. Position the LH valve cover and install the bolts and studs in the sequence shown.



- 1.

NOTE:

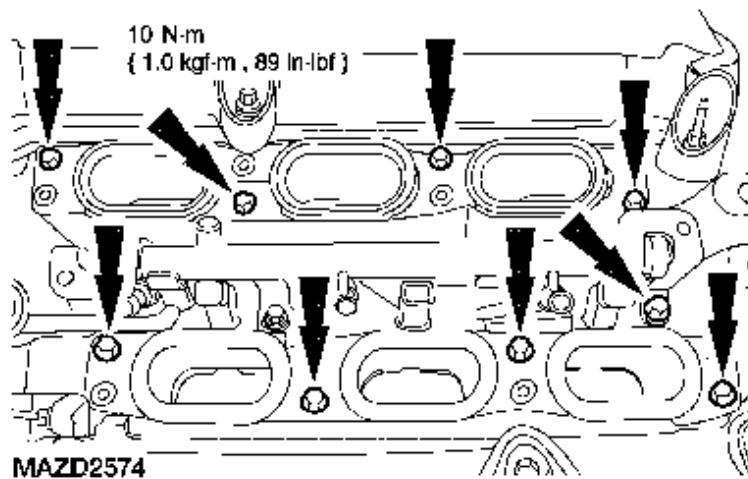
RH shown, LH similar. Install the spark plugs.



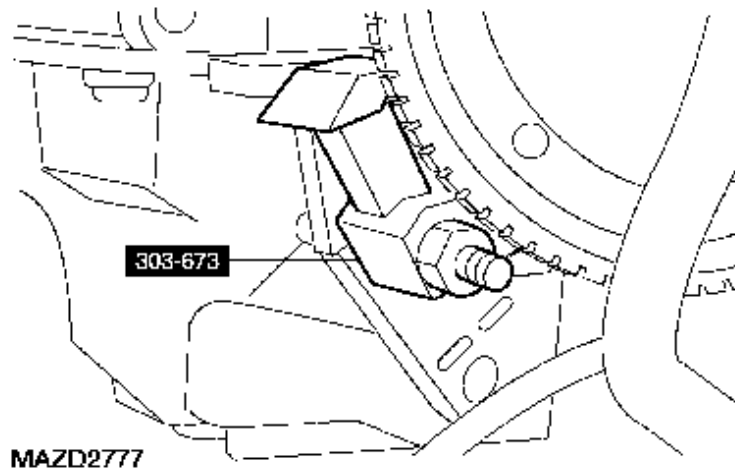
1.

NOTE:

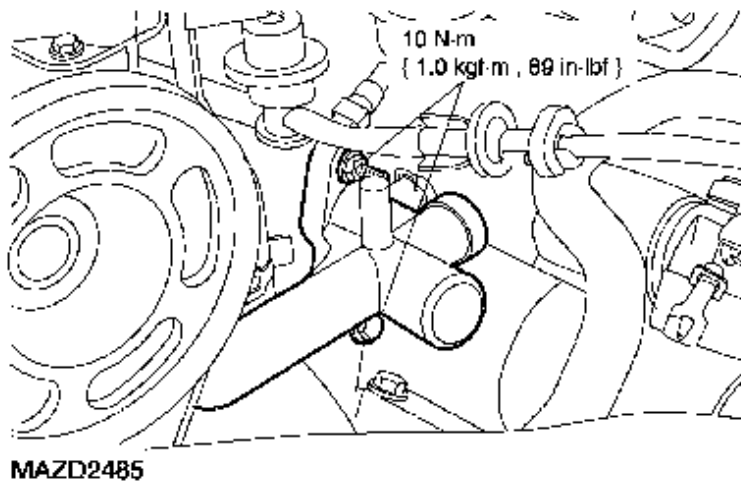
RH shown, LH similar. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation. Install the six coil-on-plugs and install the bolts.



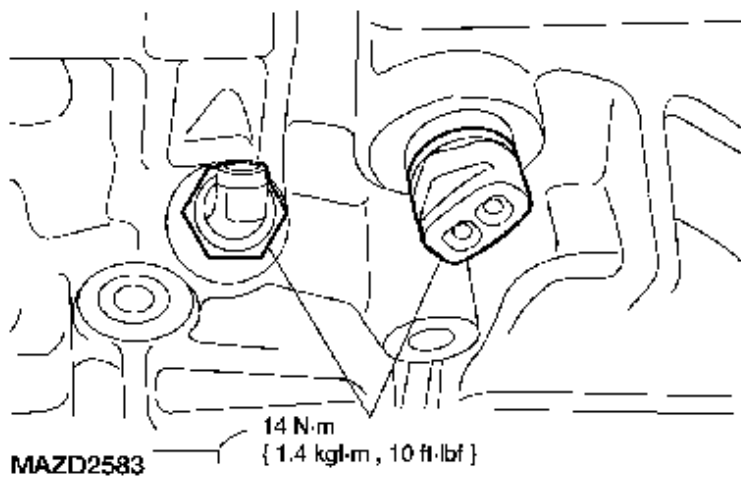
1. Position the gasket and install the lower intake manifold.



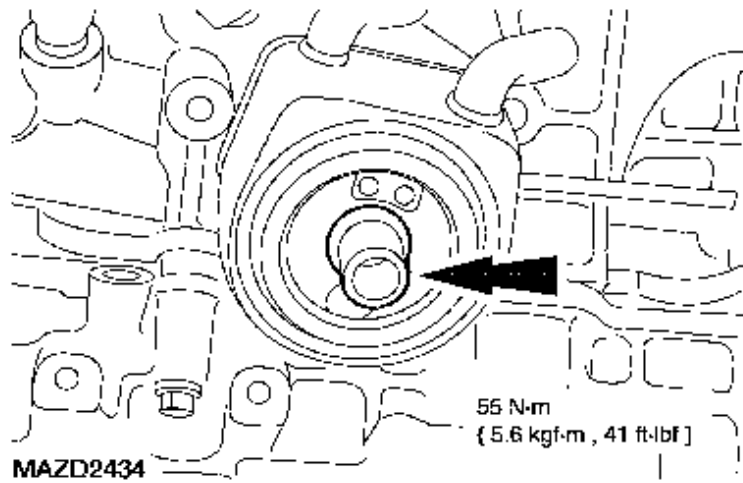
1. Remove the special tool.



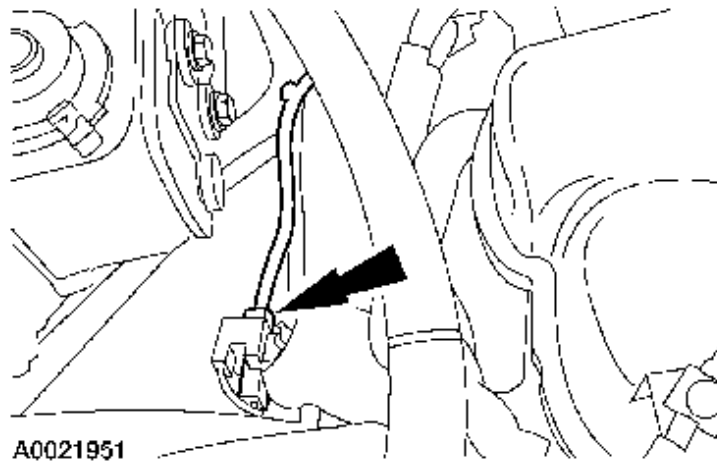
1. Position the coolant bypass tube and connect the hoses.



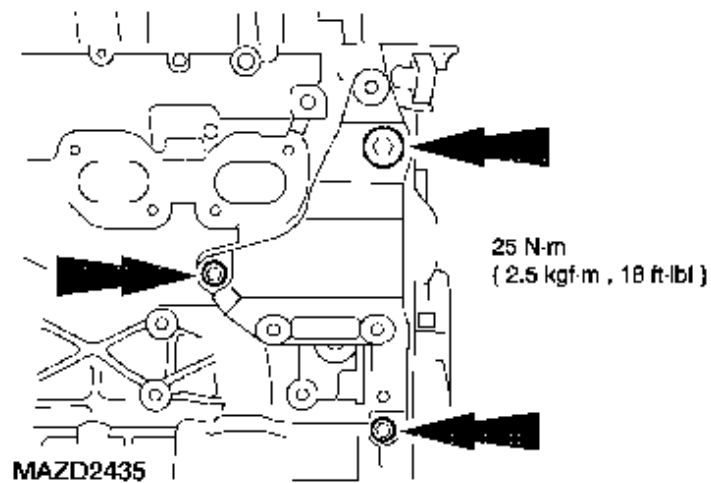
1. Install the oil pressure sender and the block heater.



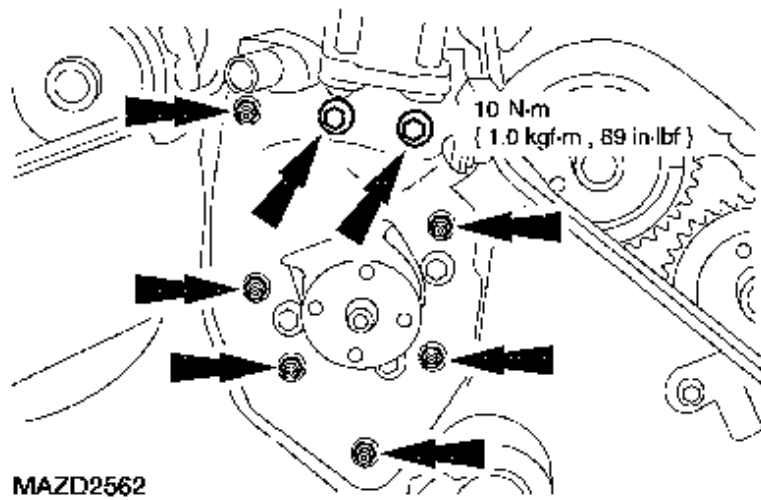
1. Install the oil cooler.



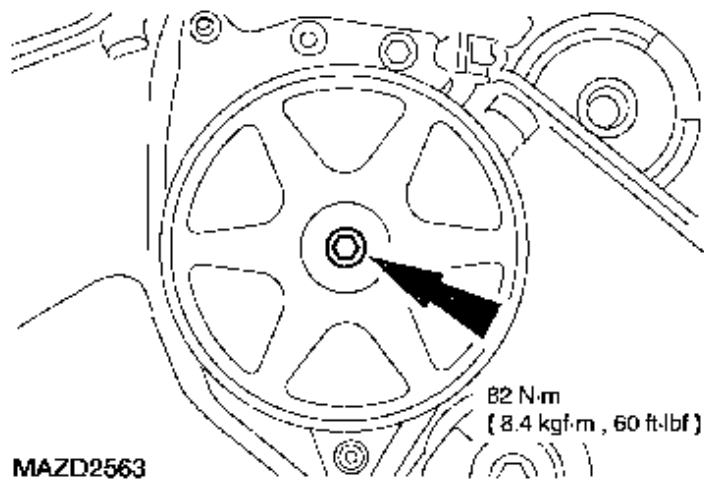
1. Install the radio ignition noise suppressor electrical connector.



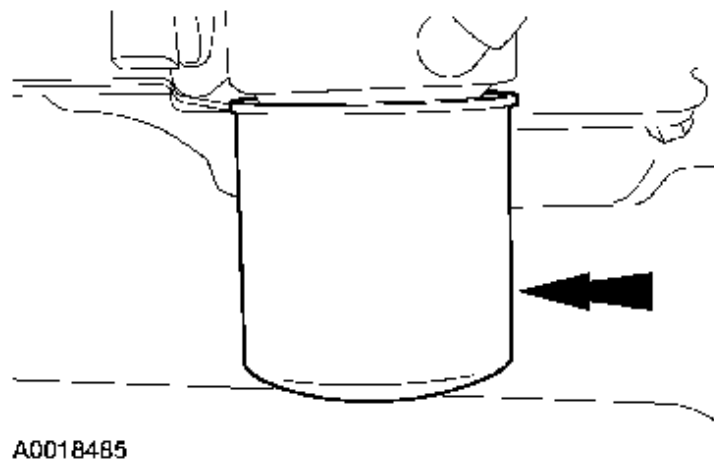
1. Install the generator support bracket.



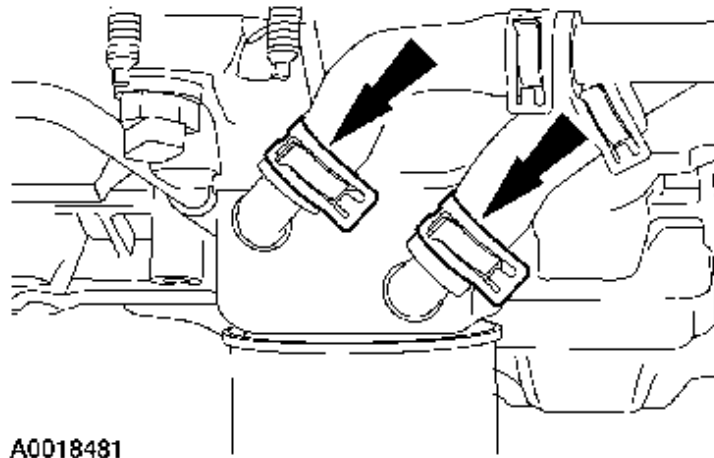
1. Install the power steering pump.



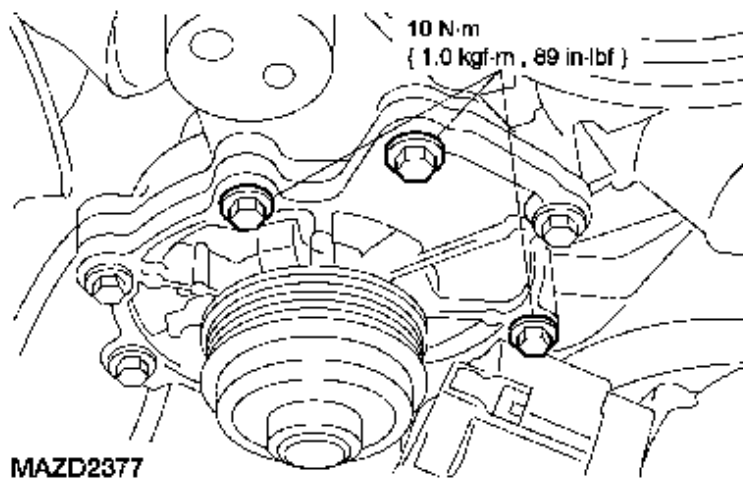
1. Install the power steering pump pulley.



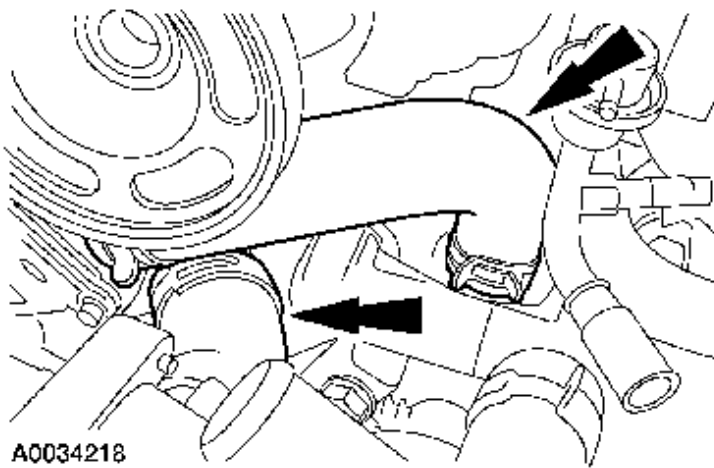
1. Install the oil filter.



1. Connect the coolant hoses at the oil cooler.

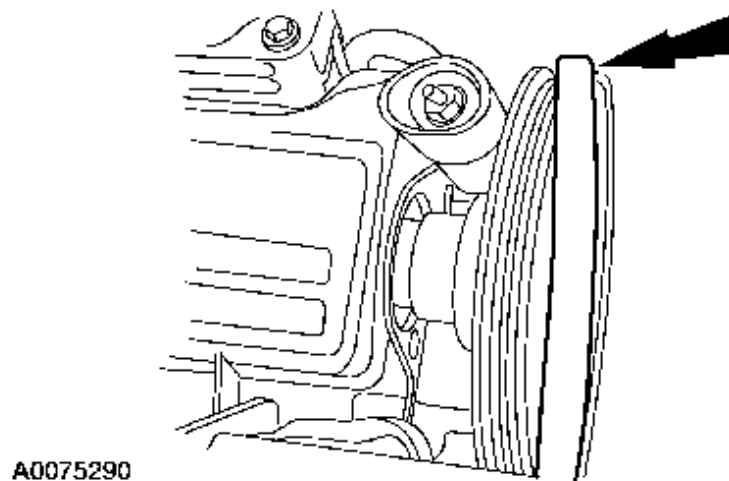


1. Install the water pump assembly.



1. Connect the hoses.

Vehicles not equipped with water pump belt tenisoner

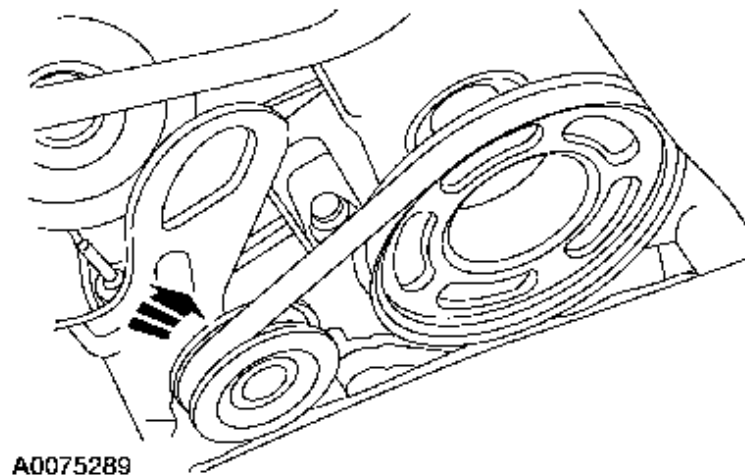


1. Install the water pump belt on the water pump pulley and position it on the camshaft pulley.
- 2.

CAUTION:

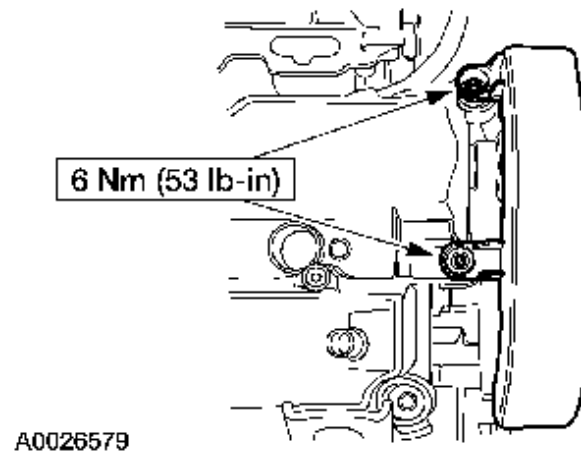
Do not use any screwdrivers, pliers or other metal objects that could cause damage to the belt or camshaft pulley while installing the belt. Rotate the crankshaft clockwise to seat the water pump belt on the camshaft pulley.

Vehicles equipped with water pump belt tensioner

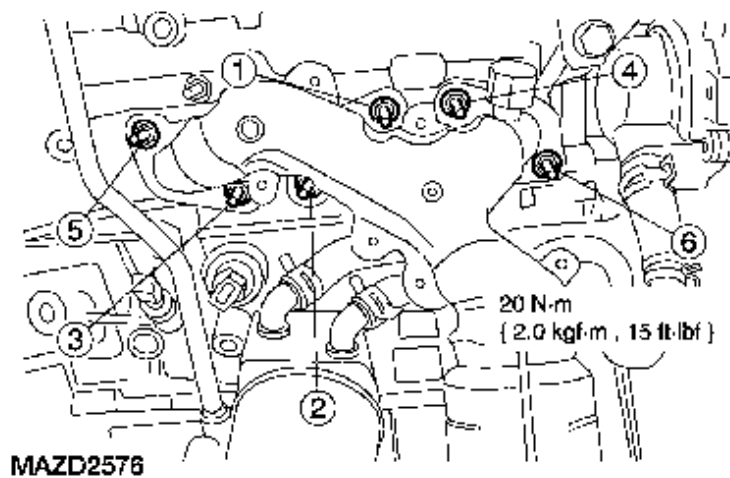


1. Rotate the belt tensioner clockwise and install the water pump belt.

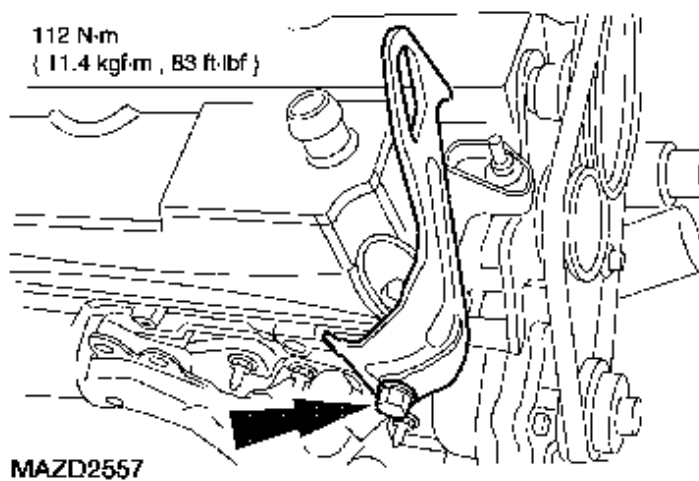
All vehicles



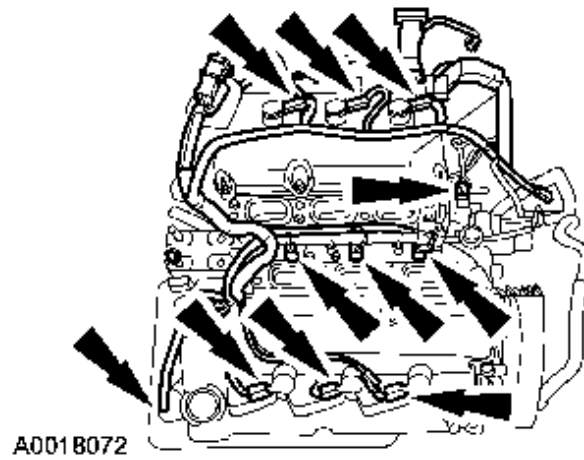
1. Install the water pump belt cover



1. Position a new gasket and tighten the LH exhaust manifold nuts in the sequence shown.

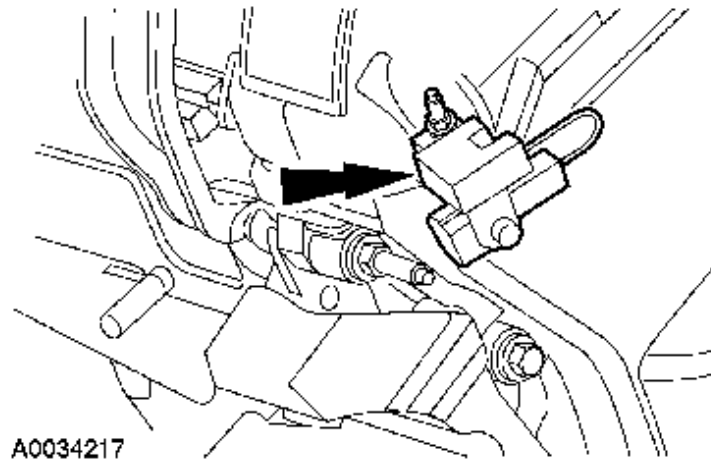


1. Install the engine lift bracket.

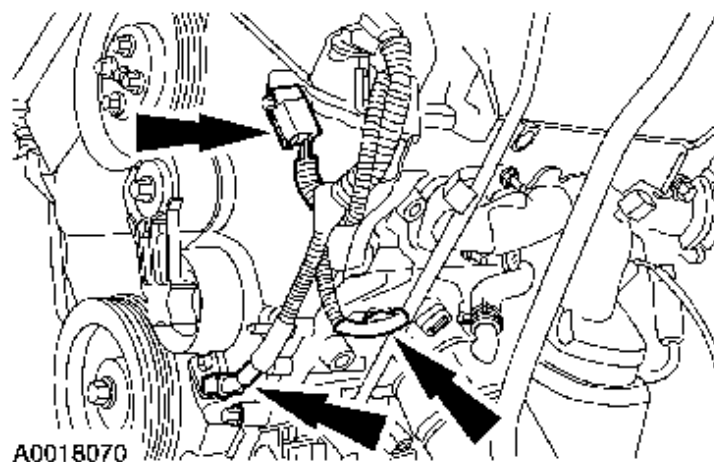


1. Position and connect the engine control sensor wiring to the following components:

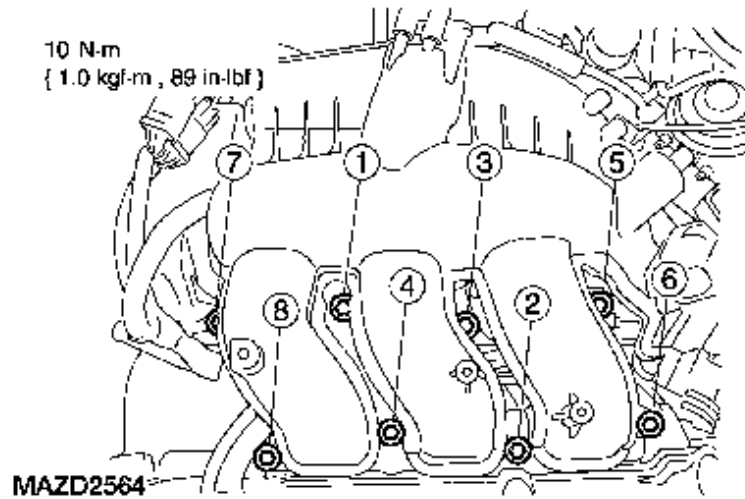
- coils on plugs
- fuel injectors



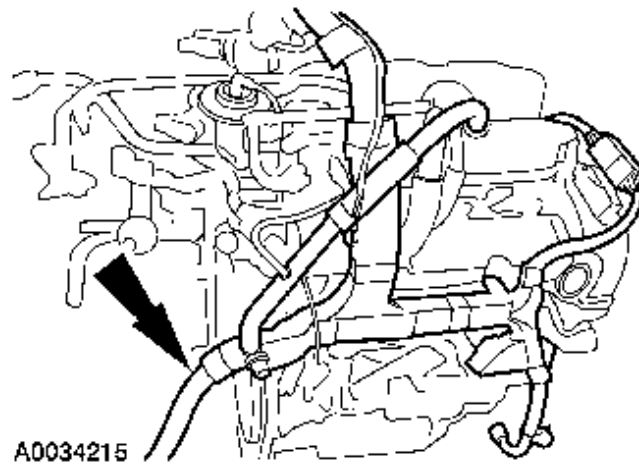
1. Connect the radio interference capacitor.



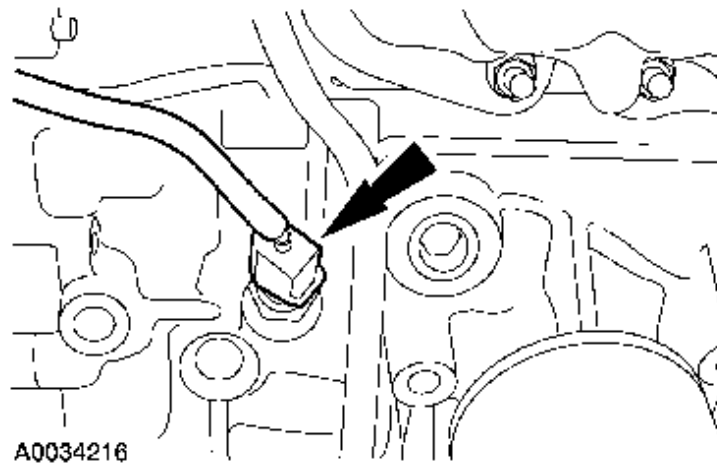
1. Connect the crankshaft and camshaft position sensor electrical connectors.
2. Install new gaskets in the upper intake manifold.



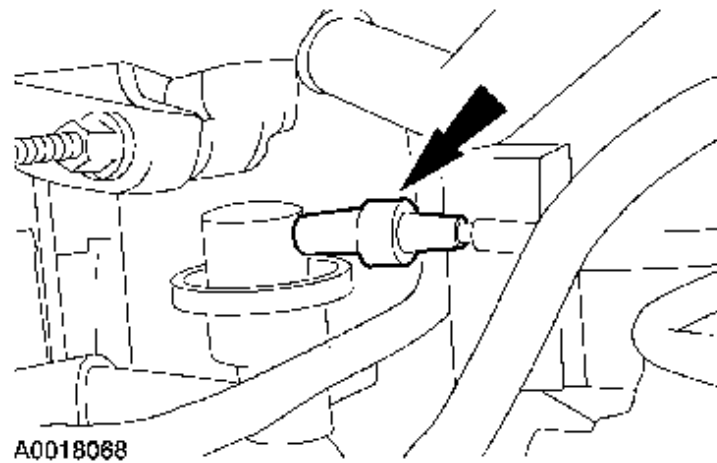
1. Install the upper intake manifold.



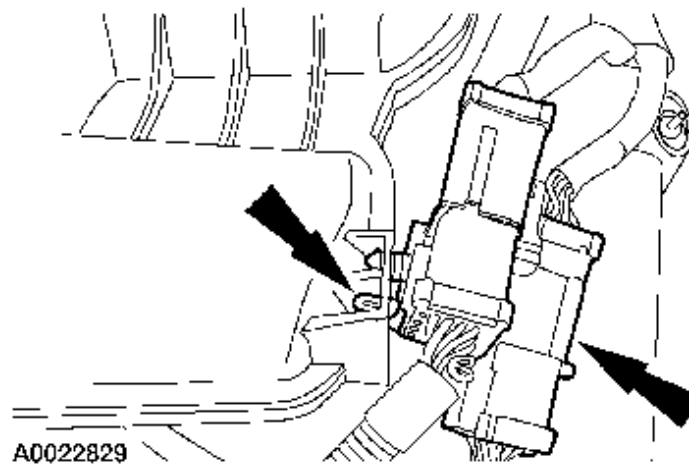
1. Install and connect the engine control wire harness.



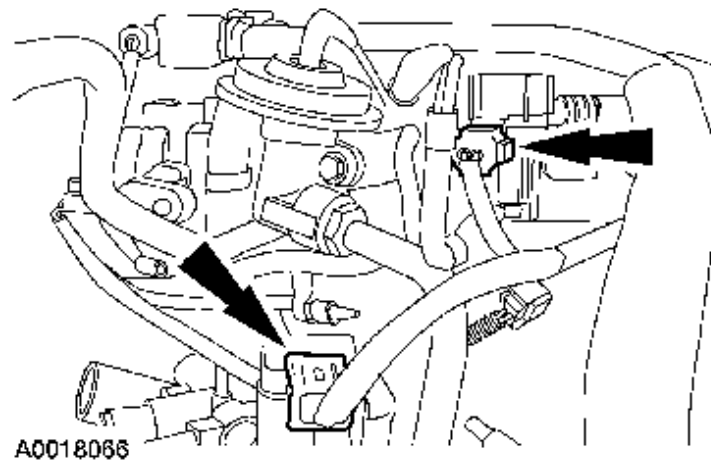
1. Connect the coolant temperature sender and the oil pressure switch.



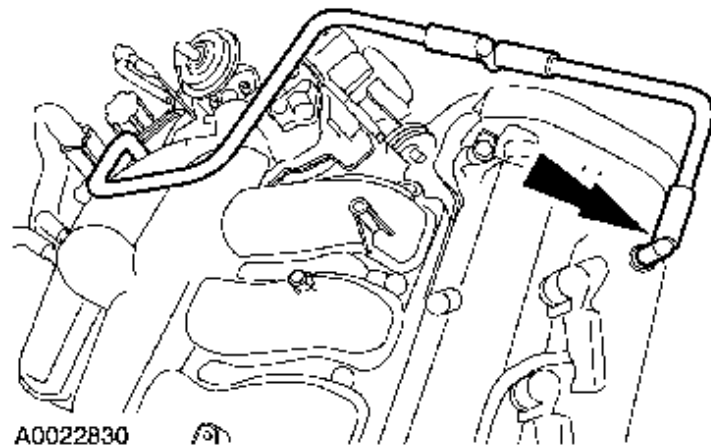
1. Connect the vacuum line to the fuel pressure damper.



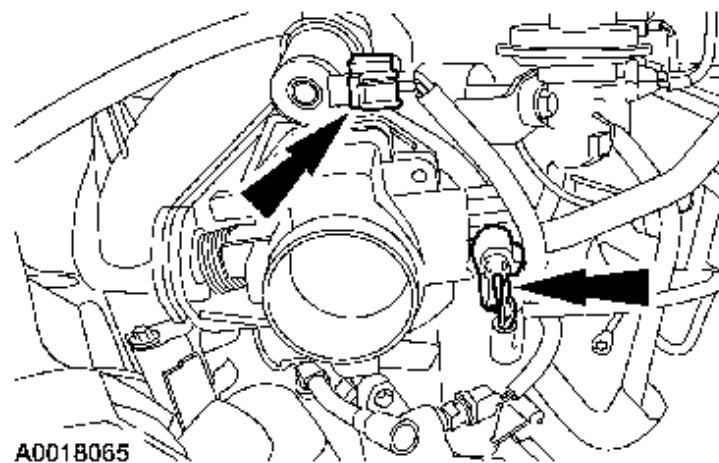
1. Connect the engine control sensor wiring to the upper intake manifold.



1. Connect the EGR vacuum regulator and the differential pressure feedback EGR electrical connectors.



1. Install the PCV tube.



1. Connect the idle air control (IAC) valve and the throttle position (TP) sensor electrical connectors.

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VIN or Model Year 2004 Model TRIBUTE engine front cover

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

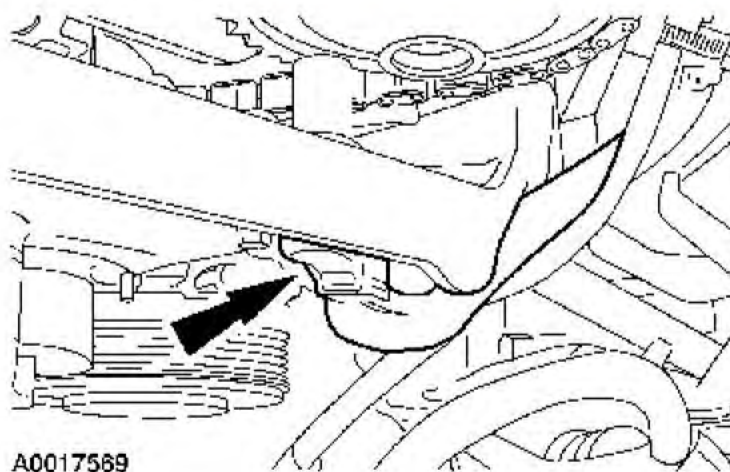
[< Previous](#) [Next >](#)

2004 - Tribute - Workshop Manual - Engine

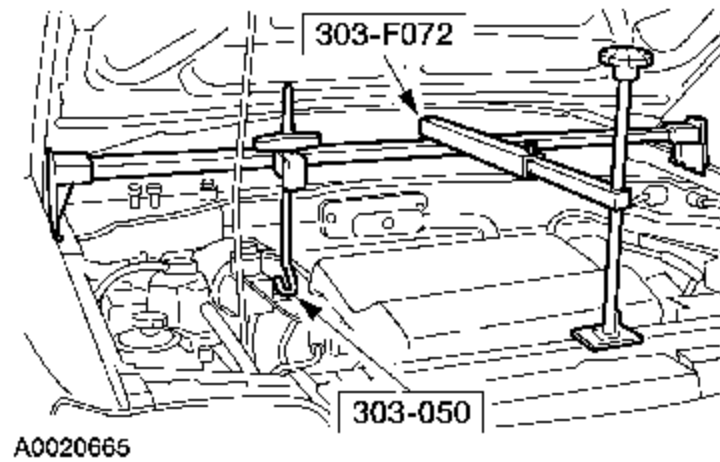
ENGINE FRONT COVER

Removal

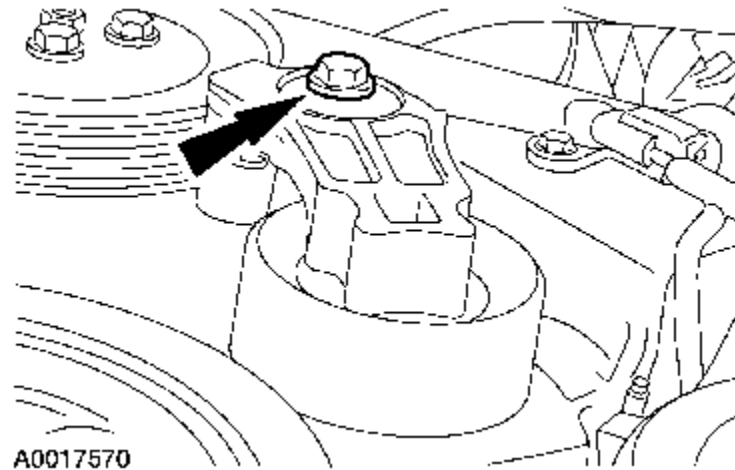
1. Remove the RH and LH valve covers. Refer to — [01-10C VALVE COVER LH](#) and — [01-10C VALVE COVER RH](#).
2. Remove the oil pan. Refer to [01-11B OIL PAN](#).
3. Remove the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).



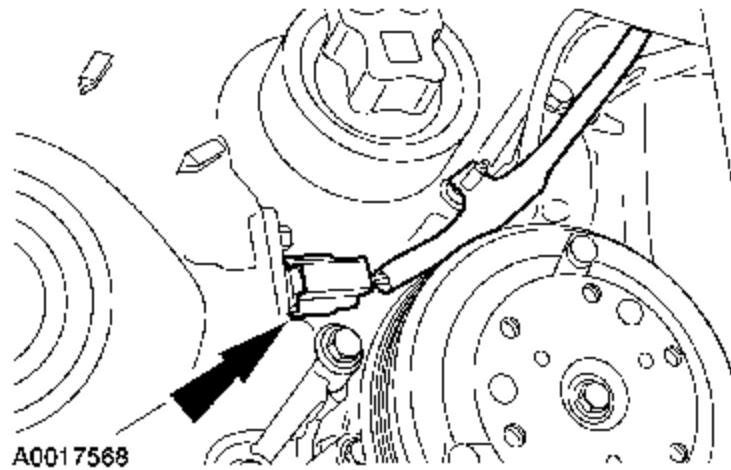
1. Remove the bolt and the camshaft position (CMP) sensor.
2. Lower the vehicle.
3. Position the power steering pump aside. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#)



1. Remove the special tool.
2. Raise the vehicle.

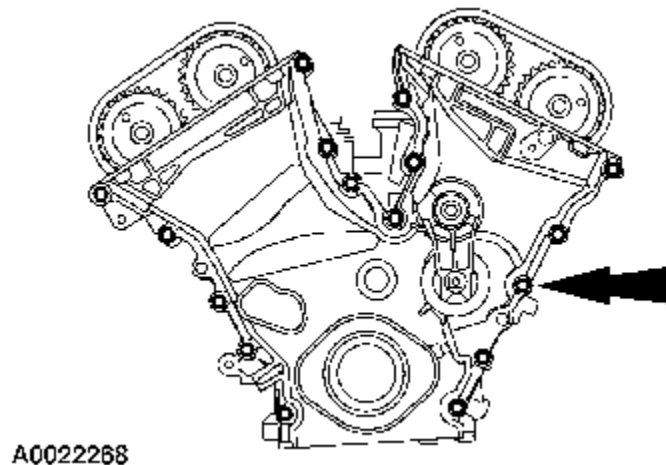


1. Remove the bolt and remove the belt tensioner.
2. Remove the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Remove the crankshaft position (CKP) sensor.

- Disconnect the electrical connector.
- Remove the bolt and the sensor.



1.

NOTE:

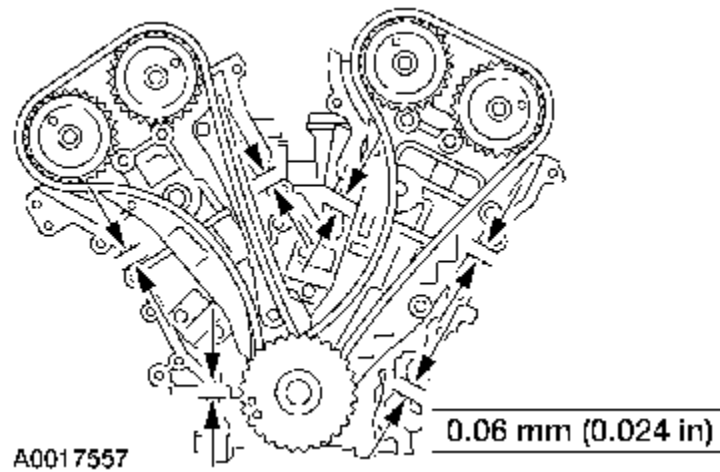
Remove the engine front cover with the vehicle raised in the air. Remove the bolts, studs and the engine front cover.

Installation

CAUTION:

Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surface. These tools cause scratches and gouges, which make leak paths. Use a plastic scraping tool to remove all traces of sealant.

1. Clean all sealing surfaces with Metal Surface Cleaner.
2. Install three new gaskets in the front cover.

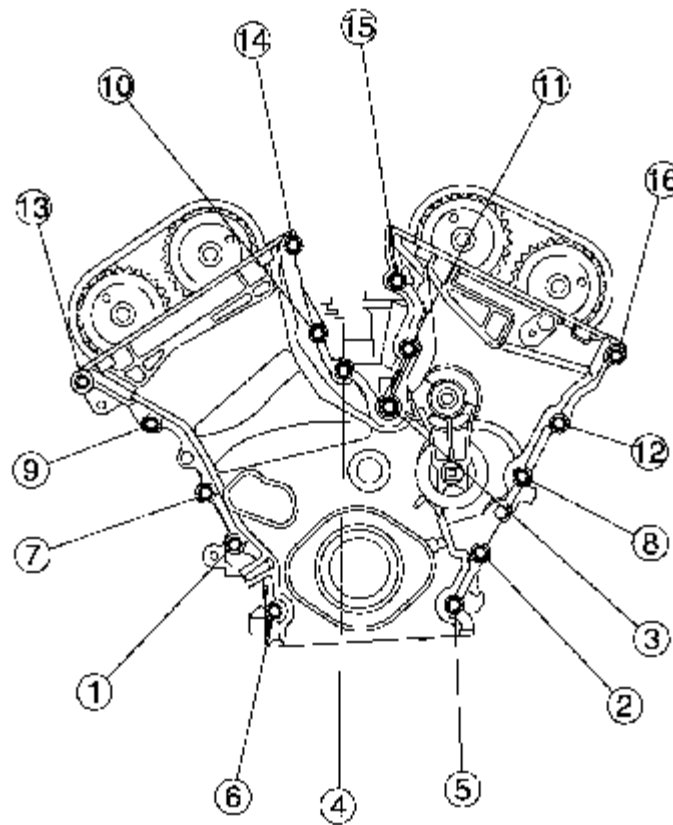


1.

NOTE:

The engine front cover must be installed and the bolts tightened within four minutes of applying the sealant. Apply a 6 mm (0.24 in) diameter dot of silicone gasket and sealer to the cylinder block, lower cylinder block, and cylinder head mating surfaces.

25 N·m
{ 2.5 kgf-m , 18 ft-lbf }

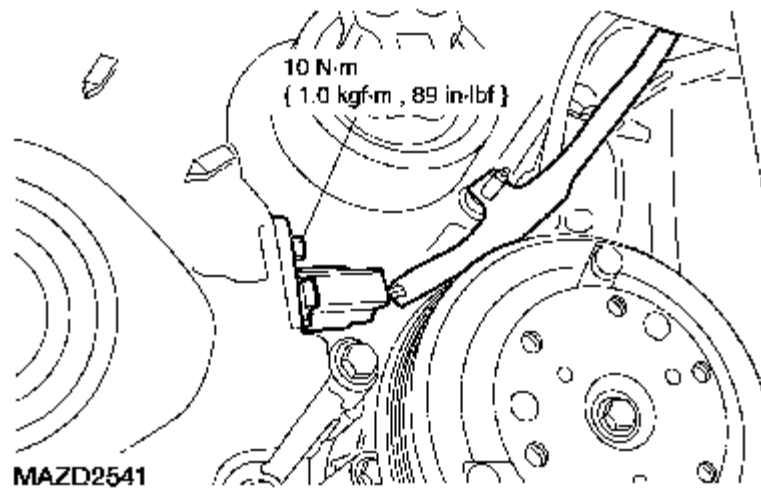


MAZD2555

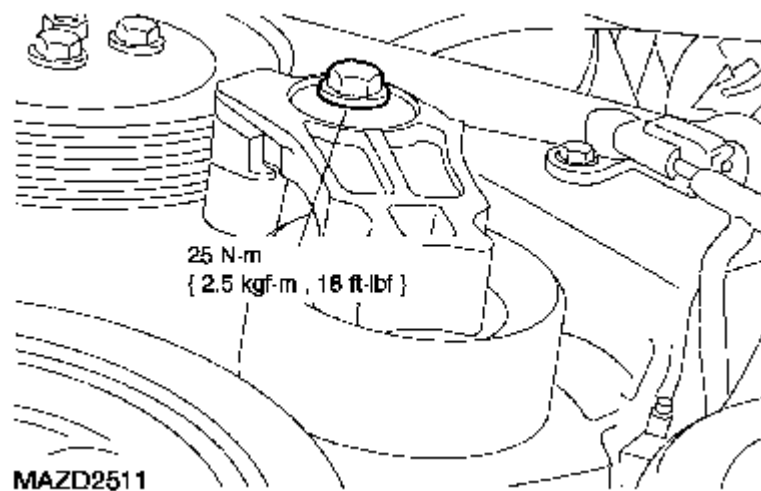
1.

NOTE:

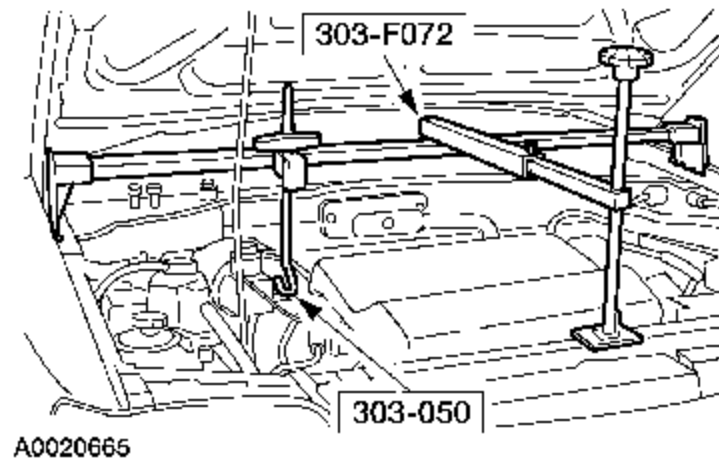
Fasteners No. 1, 3, 4, 8, 10, 11, 14, 15 and 16 are studs. Position the cover and install the studs and bolts in the sequence shown.



1. Install the (CKP) sensor and connect the electrical connector.
2. Install the crankshaft pulley. Refer to [01-10C CRANKSHAFT PULLEY](#).



1. Install the tensioner and bolt.
2. Install the generator. Refer to — [01-17 GENERATOR 3.0L DURATEC \(4V\)](#).
3. Install the oil pan. Refer to [01-11B OIL PAN](#).
4. Lower the vehicle.



1. Install the special tool.
2. Remove the front engine support insulator. Refer to — [01-10C ENGINE SUPPORT INSULATORS FRONT, RH](#).
3. Install the power steering pump. Refer to — [06-12 POWER STEERING PUMP 3.0L DURATEC \(4V\)](#).
4. Install the RH and LH Valve cover. Refer to — [01-10C VALVE COVER LH](#) and— [01-10C VALVE COVER RH](#).

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VIN or Model Year 2004 Model TRIBUTE Engine removal☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain[< Previous](#) [Next >](#)

2004 - Tribute - Workshop Manual - Engine

ENGINE

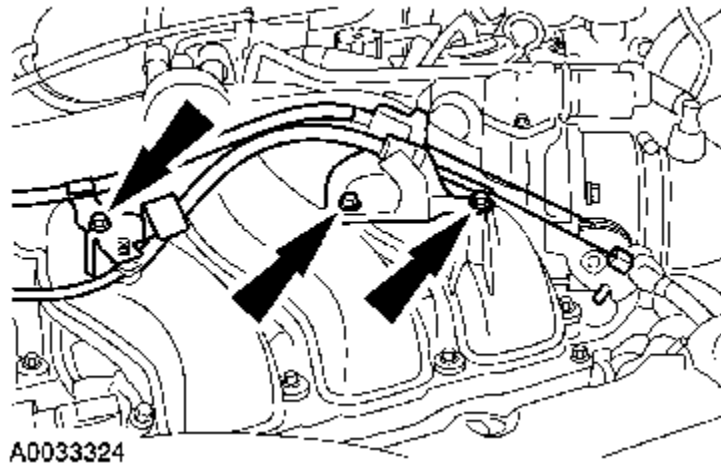
Removal

1. Remove the battery tray. Refer to [01-17 BATTERY TRAY](#).
2. Remove the air cleaner outlet tube and air cleaner. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).
3. Discharge and recover the refrigerant. For additional information, refer to [07-10 DISCHARGING AND RECOVERY](#).
4. Raise and support the vehicle. Refer to [00-00 LIFTING](#).
5. Remove the lower radiator air deflectors.
6. Drain the engine cooling system. Refer to [01-12B COOLING SYSTEM DRAINING, FILLING AND BLEEDING](#).

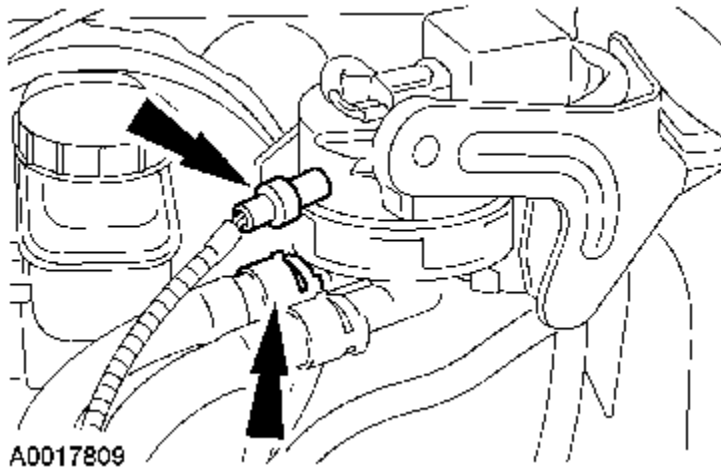


1. Drain the engine oil.

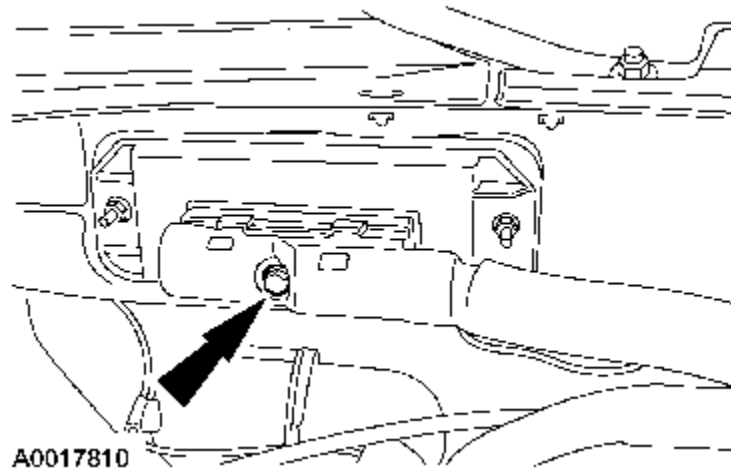
- Install a new drain plug gasket and tighten the drain plug.
2. Lower the vehicle.
 3. Disconnect the fuel line. Refer to — [01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC \(4V\)](#).
 4. Remove the water pump drive belt.



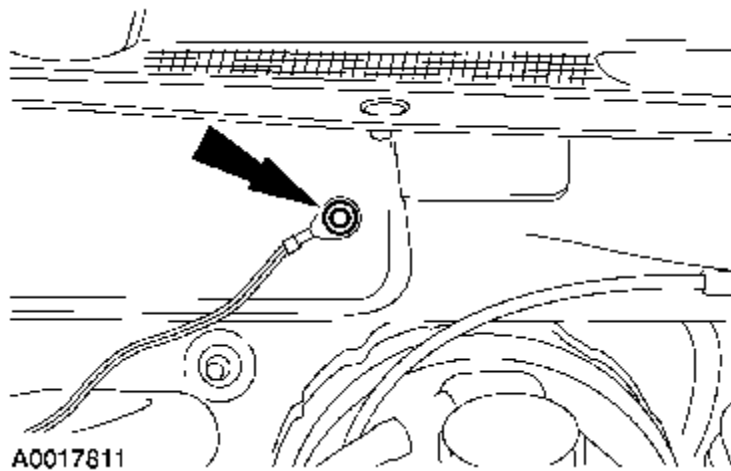
1. Disconnect the accelerator cable and if equipped cruise control actuator cable.



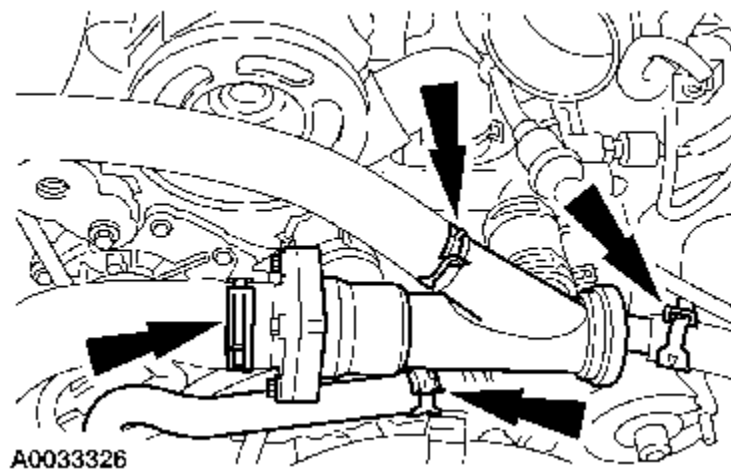
1. Disconnect the vapor management valve (VMV).



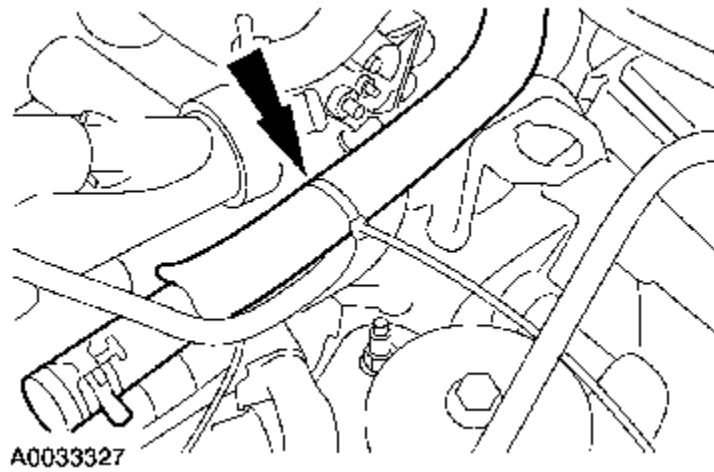
1. Disconnect the powertrain control module.



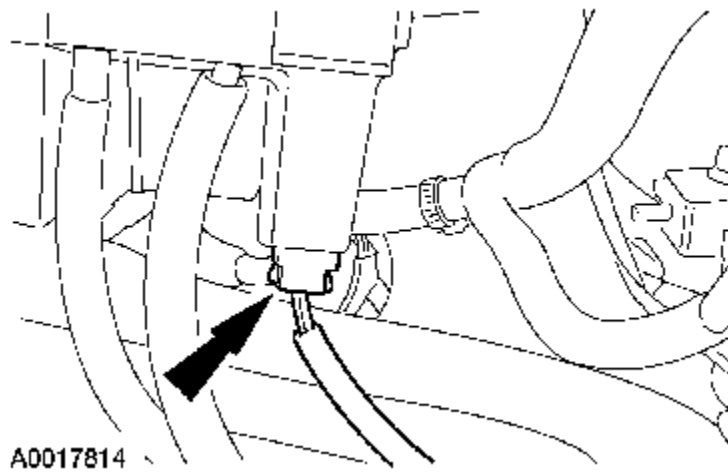
1. Disconnect the ground wire.



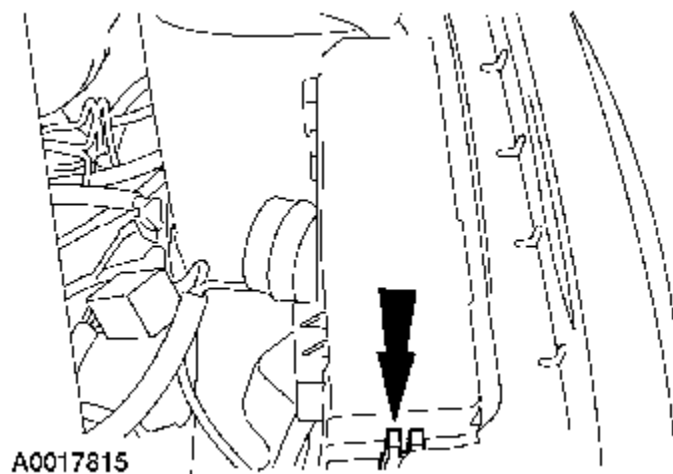
1. Disconnect the hoses.



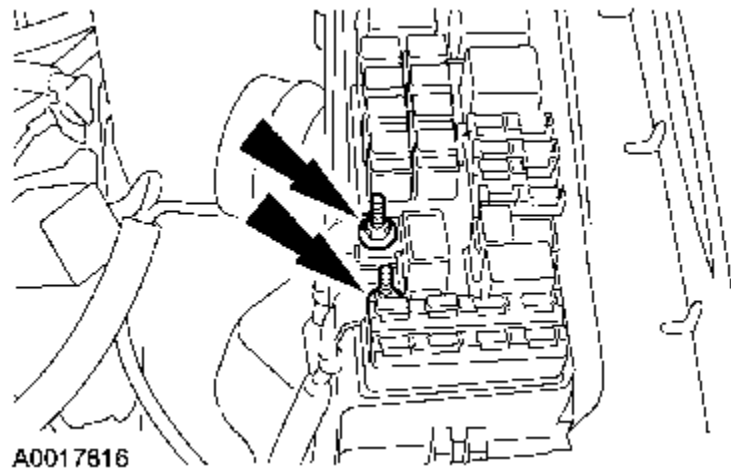
1. Remove the tie-strap and position the hose out of the way.



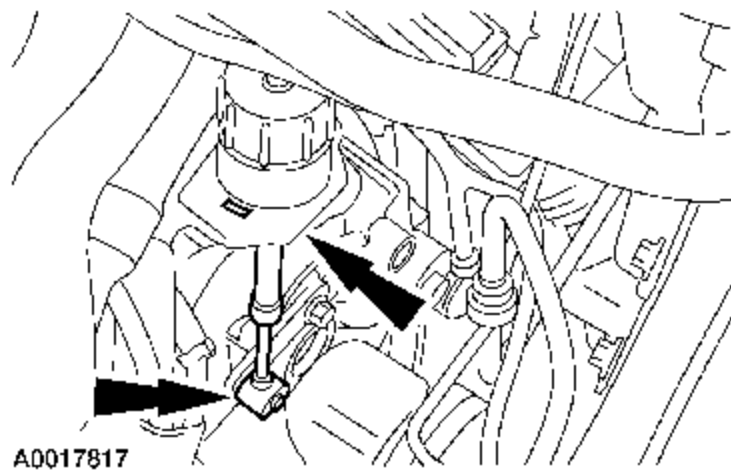
1. Disconnect the connector from the power distribution box.



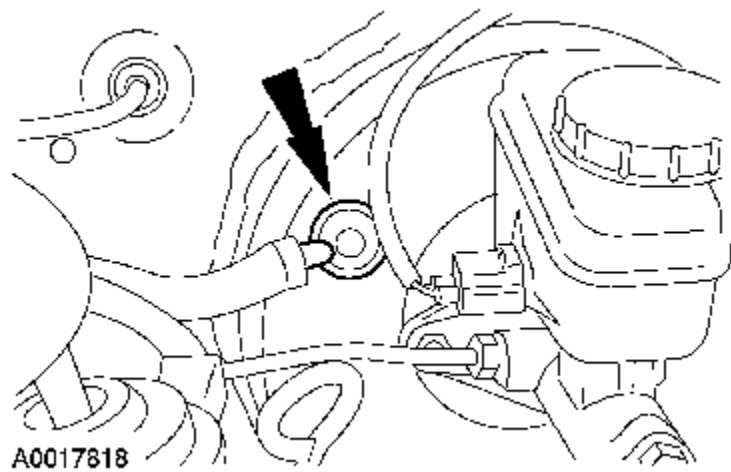
1. Remove the power distribution box cover.



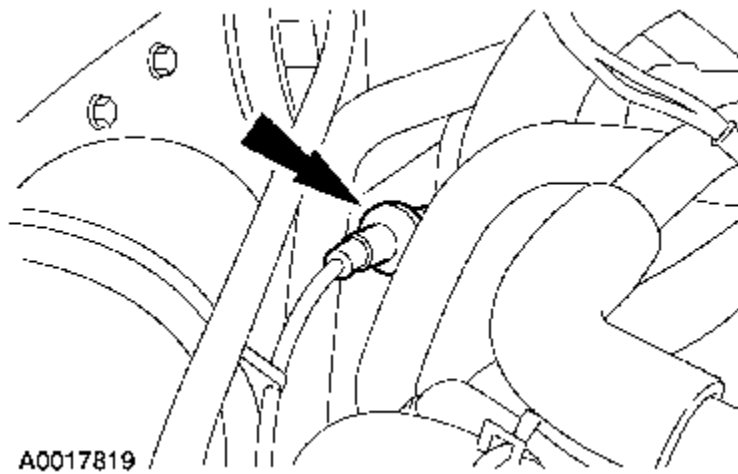
1. Remove the nuts and the cables.



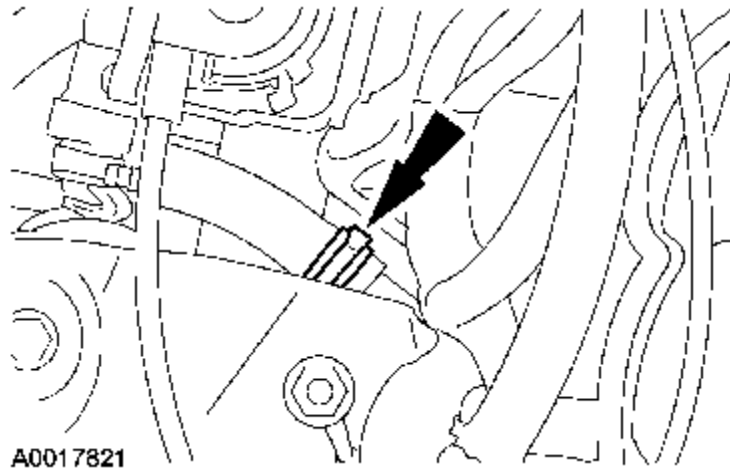
1. Disconnect the transaxle linkage.



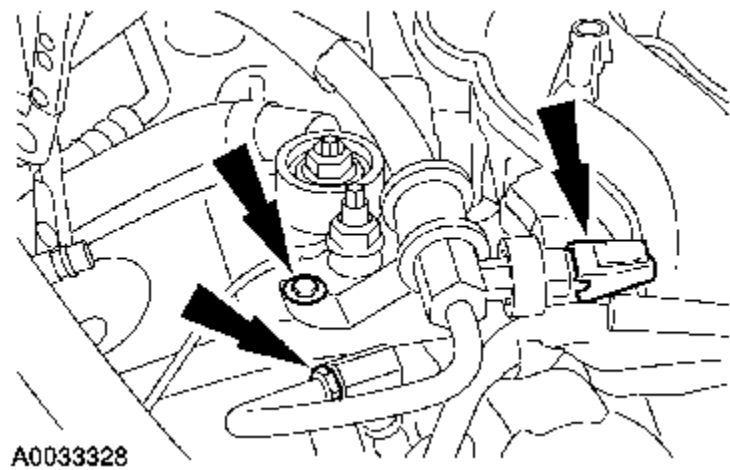
1. Disconnect the brake booster vacuum hose.



1. Disconnect the vacuum line.

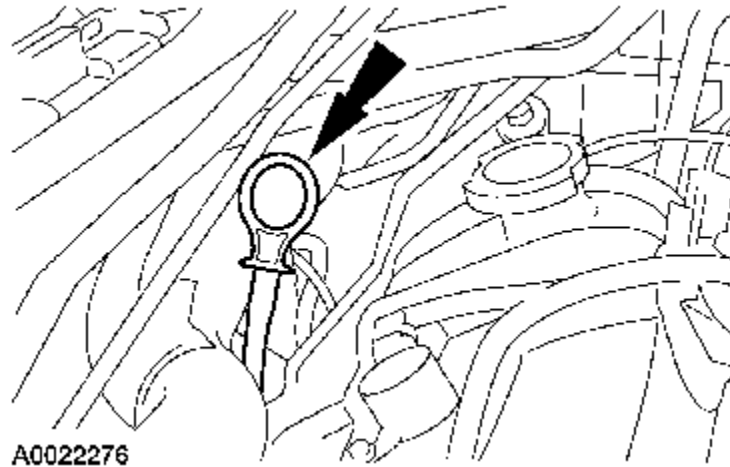


1. Disconnect the power steering return line.

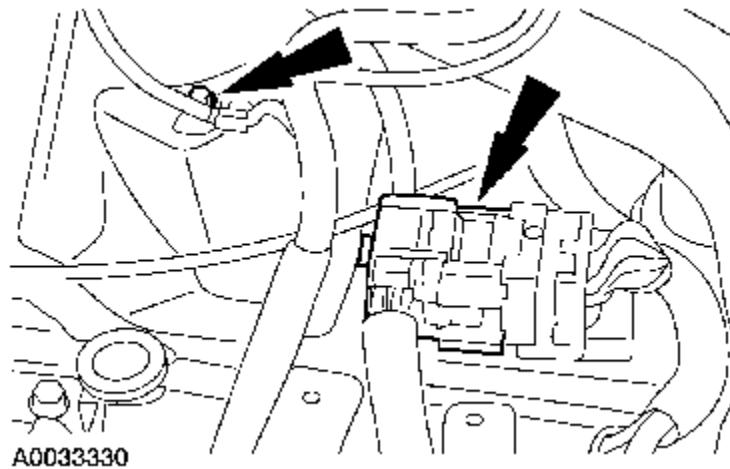


1. Disconnect the power steering line.

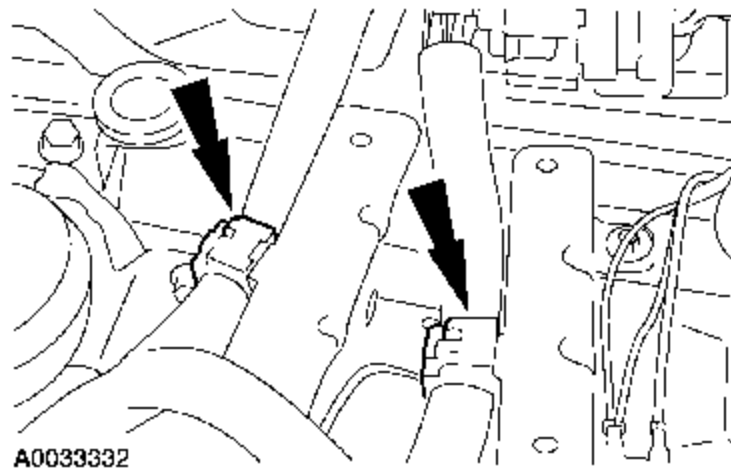
- Disconnect the power steering pressure (PSP) switch electrical connector.
- Remove the bracket bolt.
- Disconnect the power steering line.



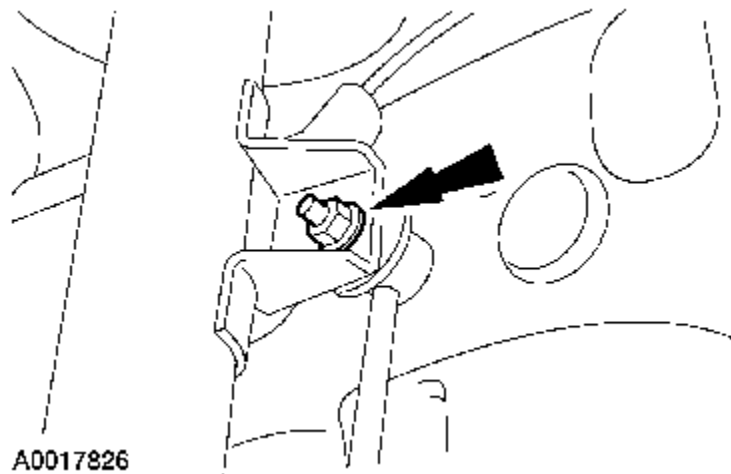
1. Remove the oil level indicator.



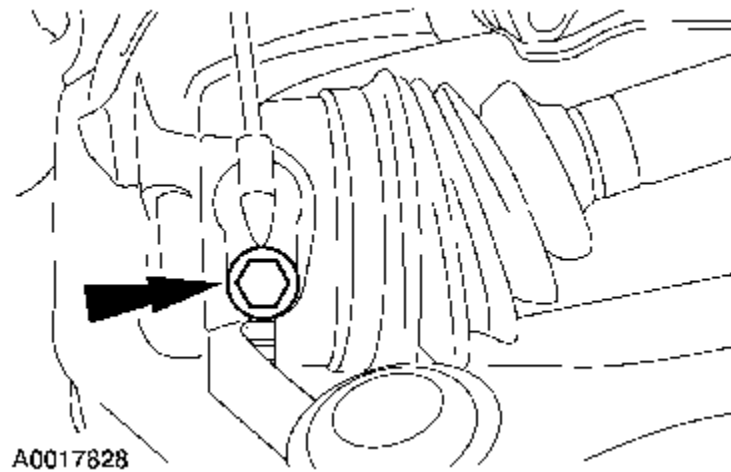
1. Disconnect the ground strap and the connector.



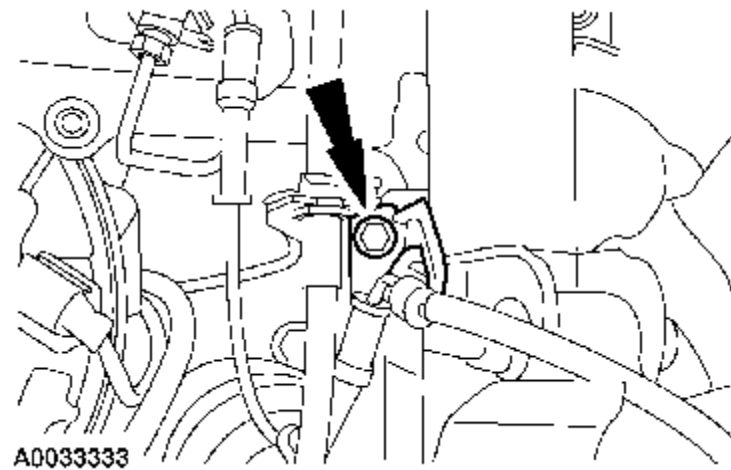
1. Remove the harness retainers and position the harness out of the way.
2. Remove the exhaust flexible pipe. Refer to — [01-15B EXHAUST FLEXIBLE PIPE 3.0L DURATEC \(4V\)](#).
3. Remove the A/C compressor. Refer to — [07-11 AIR CONDITIONING \(A/C\) COMPRESSOR 3.0L DURATEC \(4V\)](#).
4. Remove both front wheel and tire assemblies.
5. If equipped, remove the intermediate drive shaft. Refer to [03-13 INTERMEDIATE SHAFT](#).



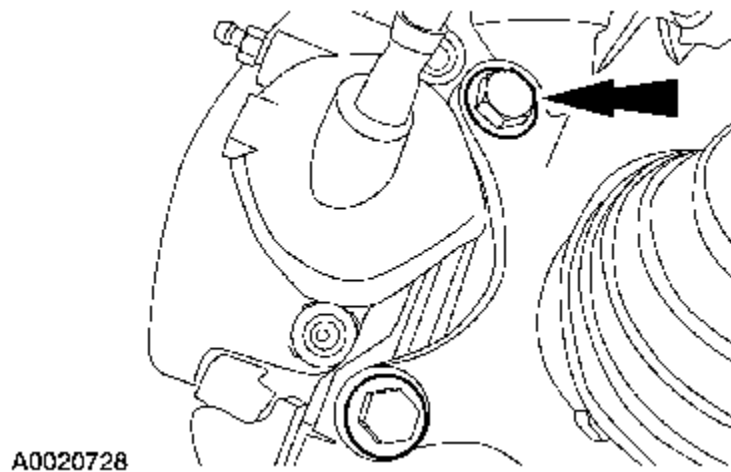
1. Separate the LH and RH sway bar links from the strut mount.



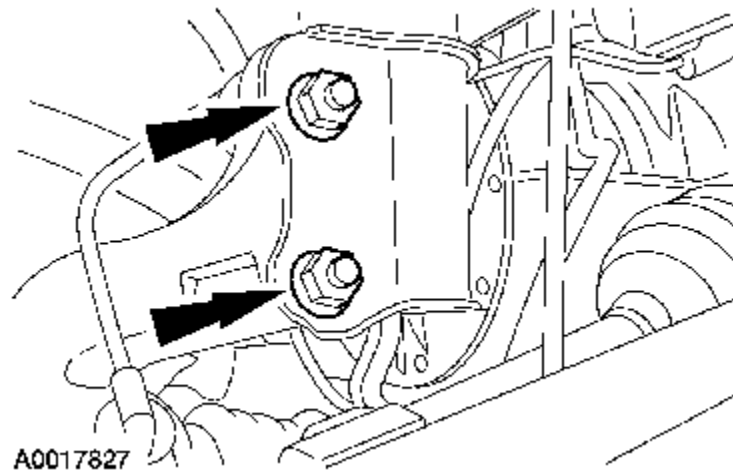
1. Remove the bolt and position aside the LH and RH wheel speed sensors if equipped.



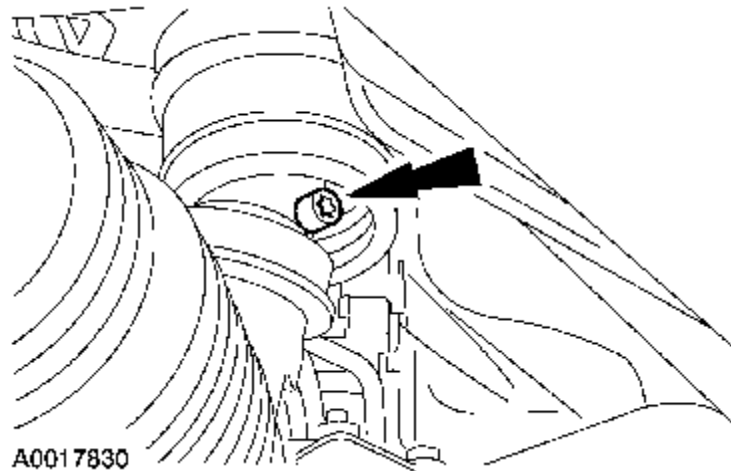
1. If equipped, remove the LH and RH wheel speed sensor brackets.



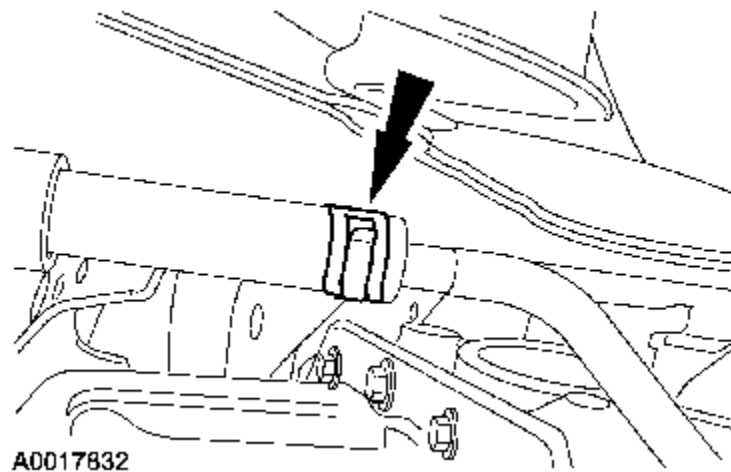
1. Remove the LH and RH brake calipers from the steering knuckles and support them to the struts.



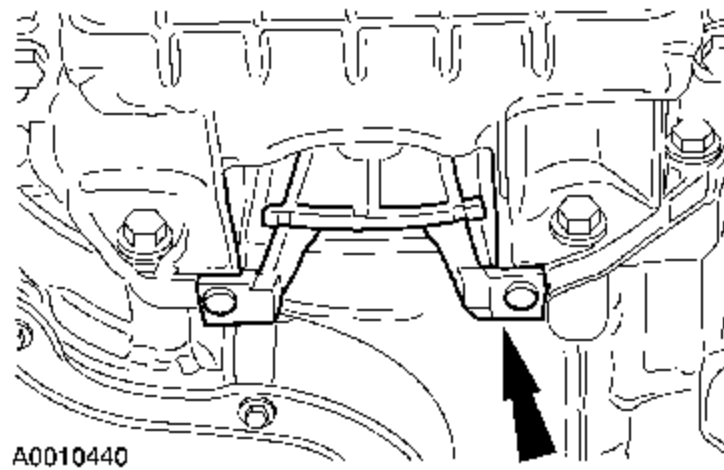
1. Remove the bolt and separate the struts from the LH and RH steering knuckles.



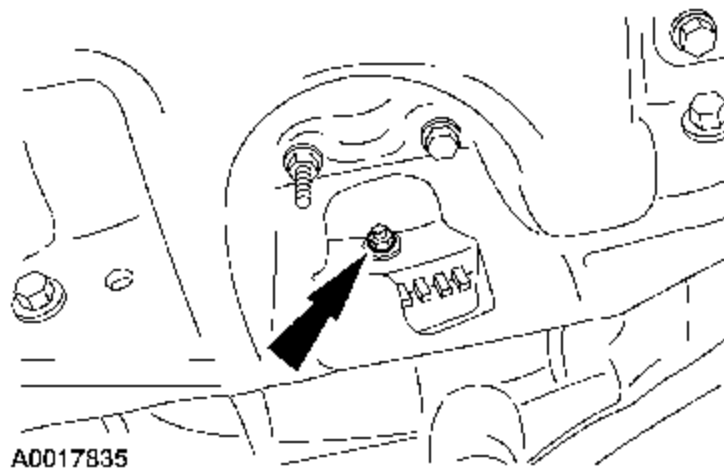
1. Remove the bolt and separate the steering shaft from the rack.



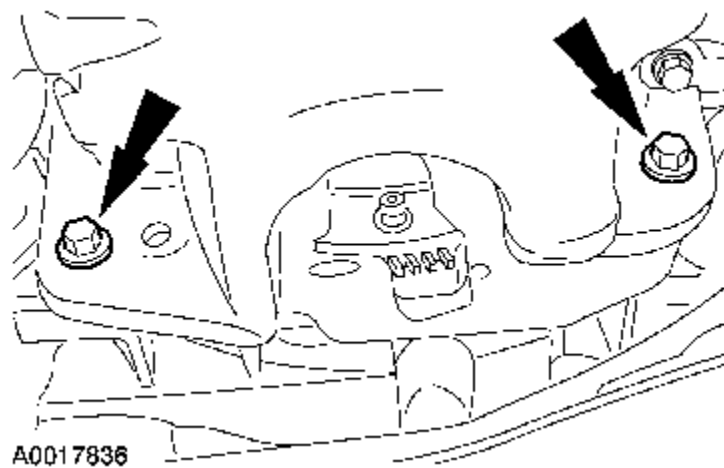
1. Disconnect the two transaxle cooler lines.



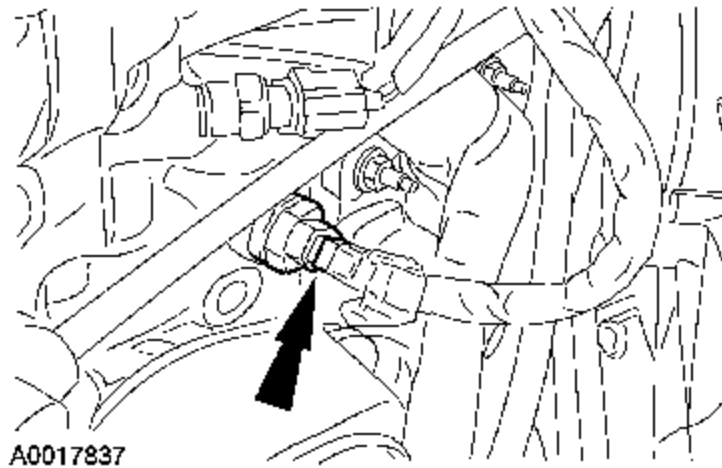
1. Remove the torque converter inspection cover.



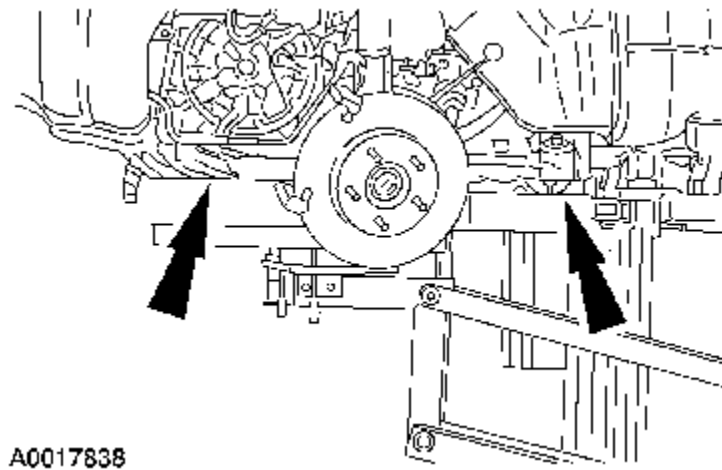
1. Remove the four torque converter nuts.



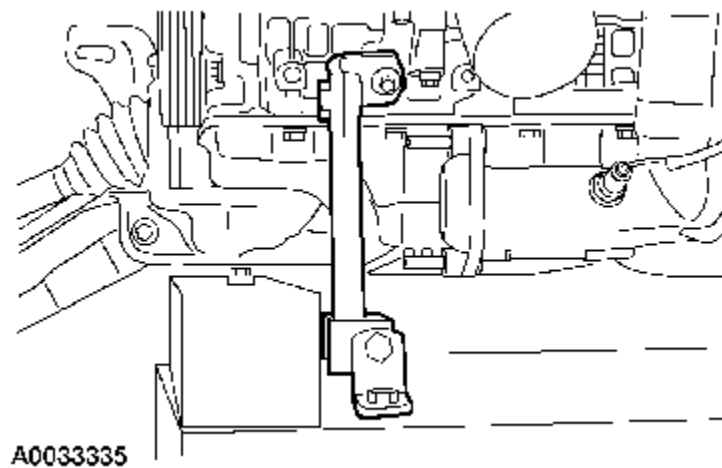
1. Remove the four bolts.



1. If equipped disconnect the block heater wiring.



1. Position the universal powertrain lift.



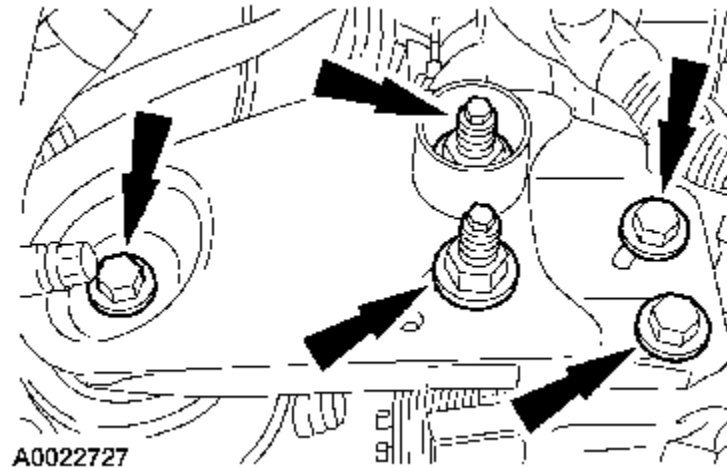
- 1.

CAUTION:

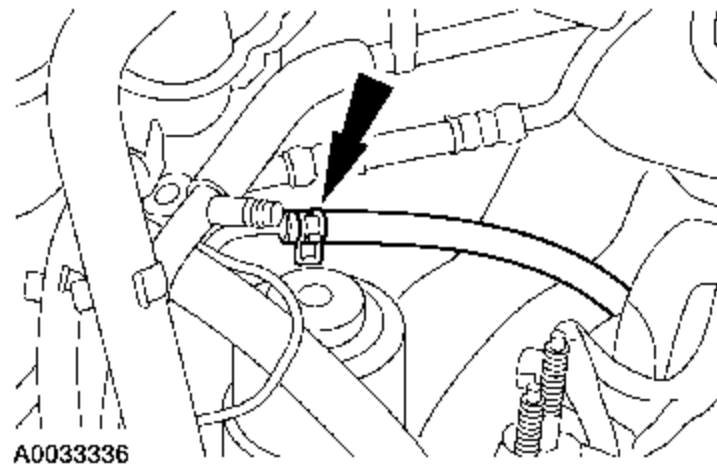
Do not allow the engine oil pan to rest on the powertrain lift. Using a bracket from the heavy duty engine stand, support the front of the engine.

NOTE:

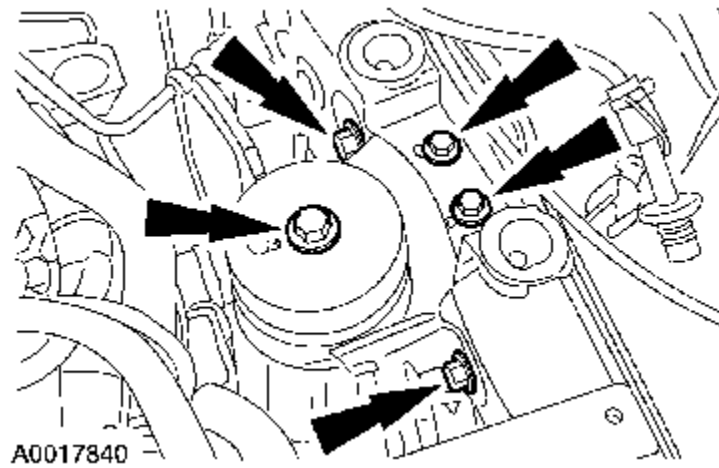
The next seven steps must be carried out with the vehicle raised and the universal powertrain lift in position.



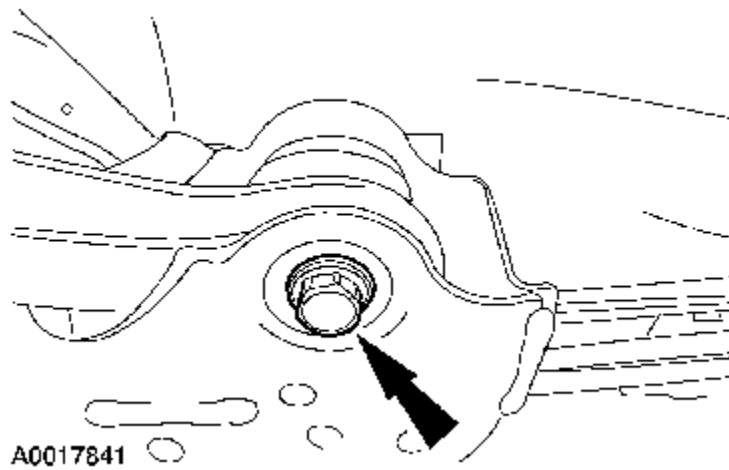
1. Remove the bolts and the nuts, remove the engine support bracket.



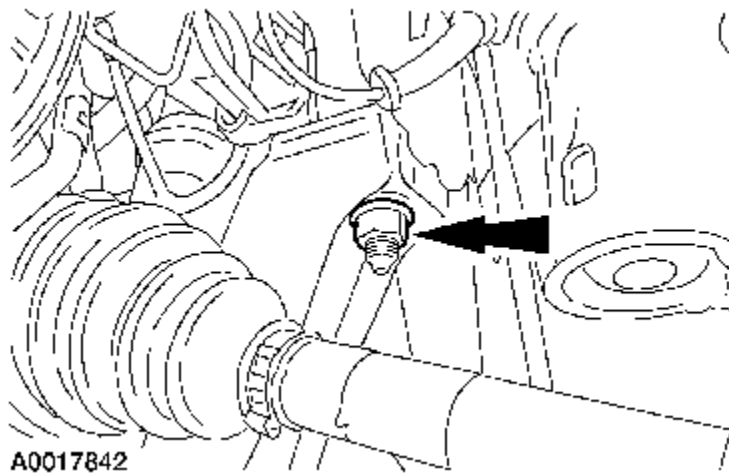
1. Disconnect the power steering return hose.



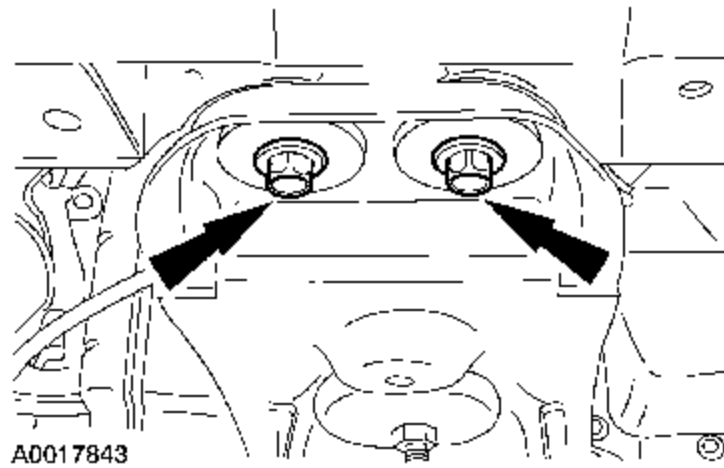
1. Remove the bolts and the transaxle support.



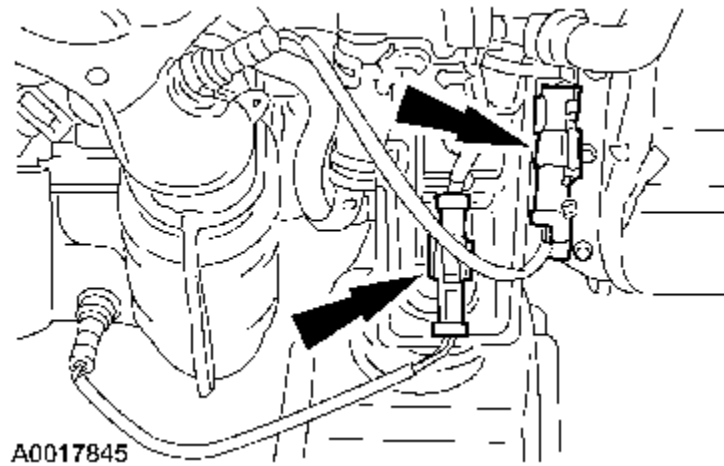
1. Remove two rear subframe bolts.



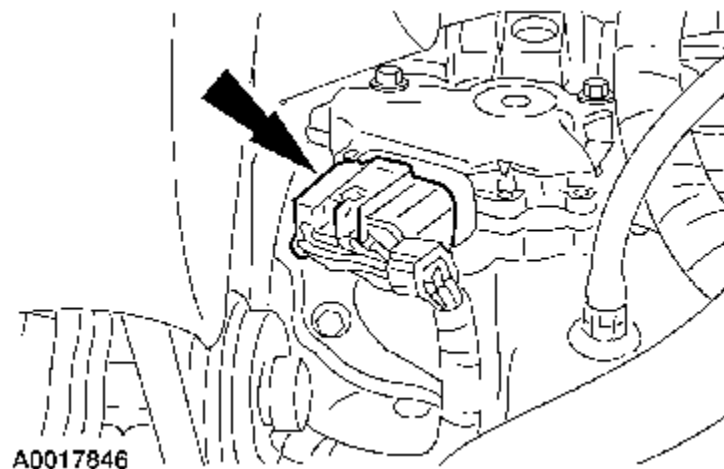
1. Remove the two subframe side nuts.



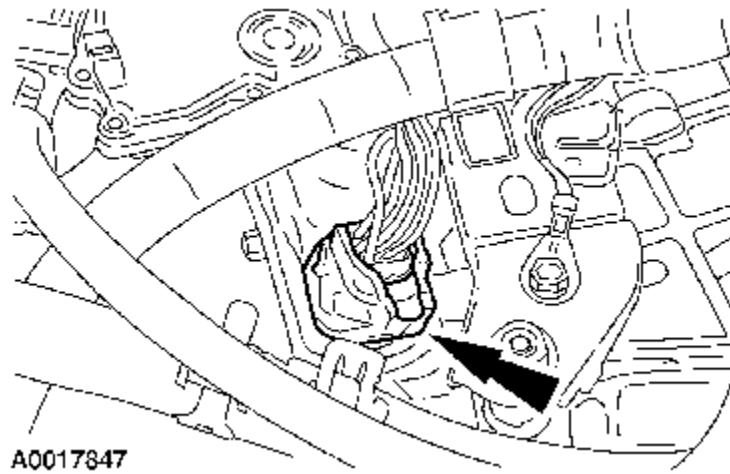
1. Remove the two bolts from the motor mount support.
2. Remove the powertrain from the vehicle.



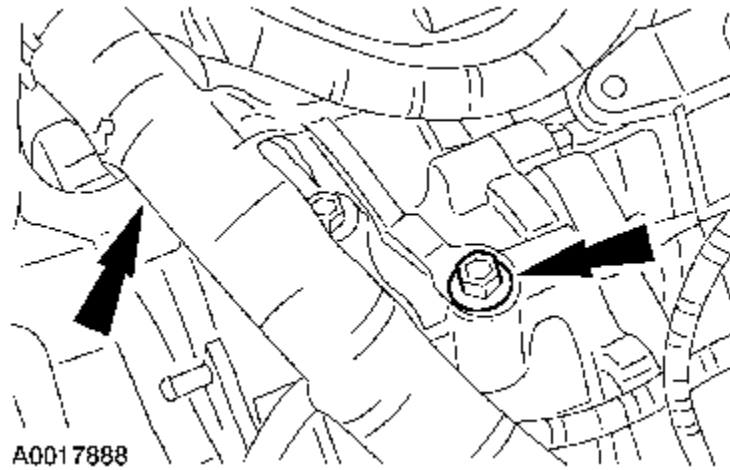
1. Disconnect the heated oxygen sensors.



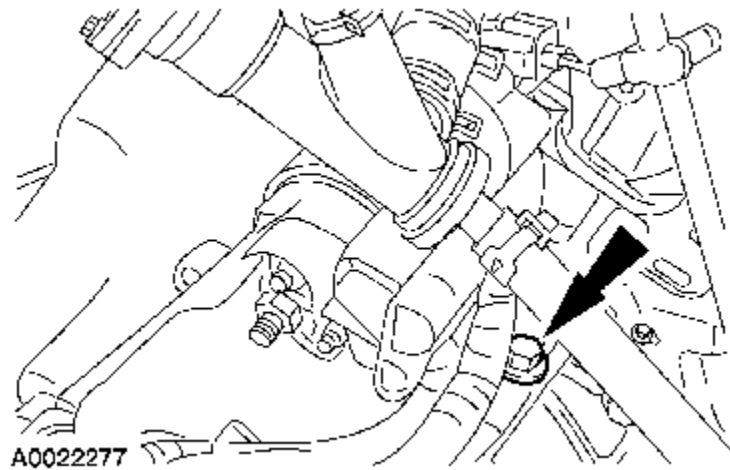
1. Disconnect the TR sensor.



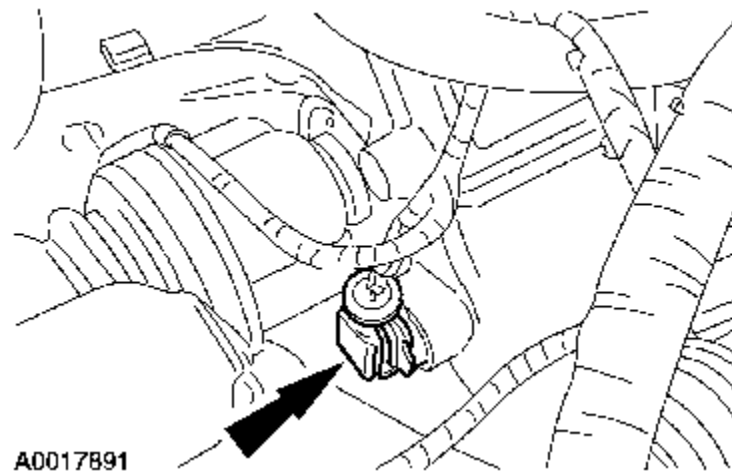
1. Disconnect the transaxle harness electronic control switch.



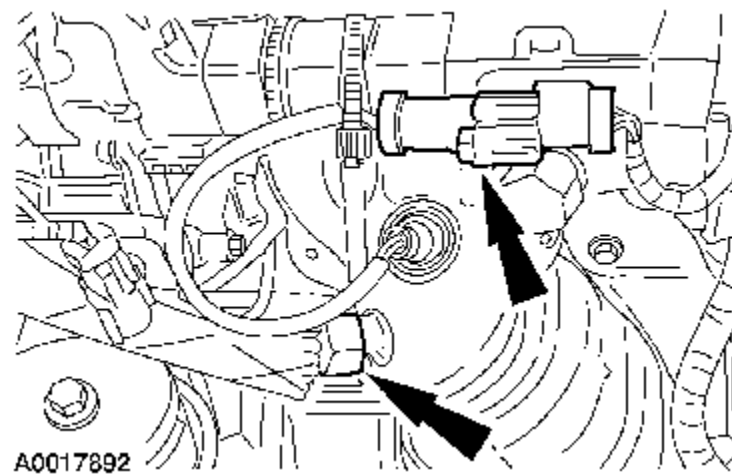
1. Remove the bolt and separate the transaxle control harness from the bracket.



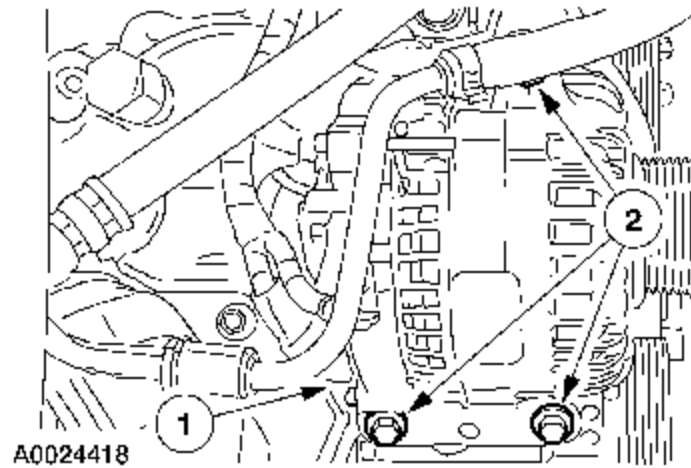
1. Remove the two bolts, the starter and harness as an assembly.



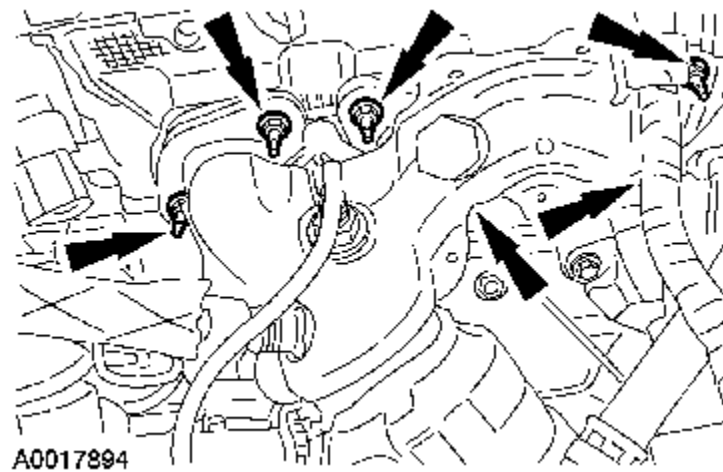
1. Disconnect the output shaft speed (OSS) sensor and the turbine shaft speed (TSS) sensor electrical connectors.



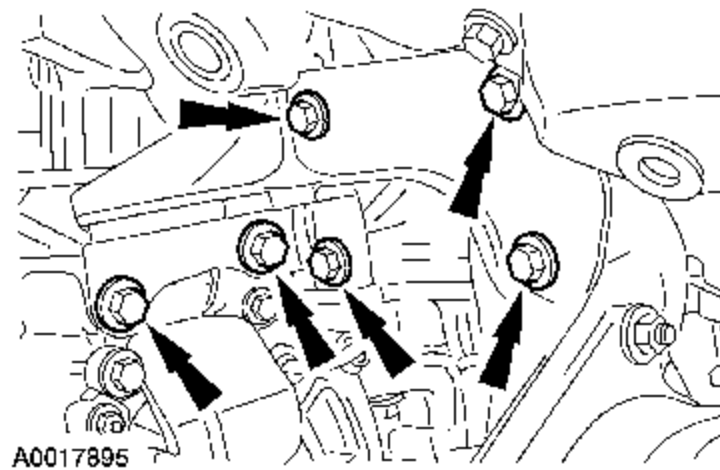
1. Disconnect the HO2S and the EGR tube from the exhaust manifold.
2. Disconnect the DPFE hoses and remove the EGR tube from the EGR valve.



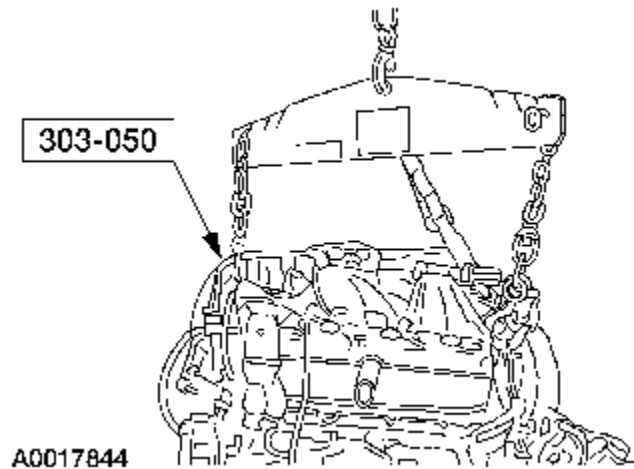
1. Remove the generator.
 - a. Disconnect the electrical connector.
 - b. Remove the bolts.



1. Remove the six RH exhaust manifold nuts and gasket.



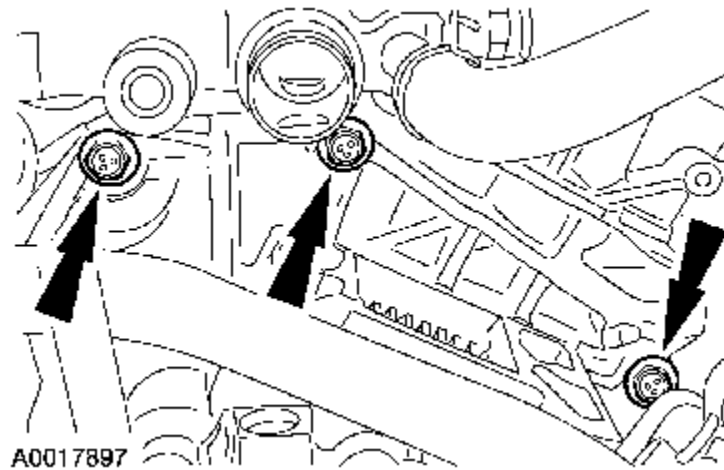
1. Remove the bolts and position the halfshaft support bracket out of the way.



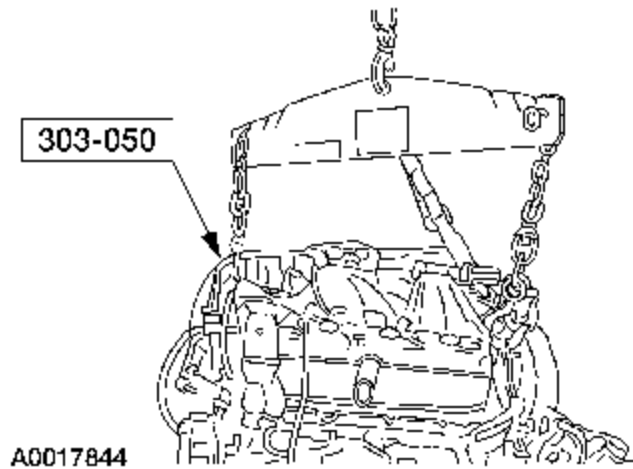
- 1.

NOTE:

Once the engine is supported by the engine crane, remove the bracket supporting the front of the engine. Using the special tools, remove the powertrain from the universal powertrain lift.



1. Remove the six transaxle bolts.



1. Using the special tools, remove the engine from the transaxle and mount on a suitable engine stand.

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VIN or Model Year 2004 Model TRIBUTE fuel charging

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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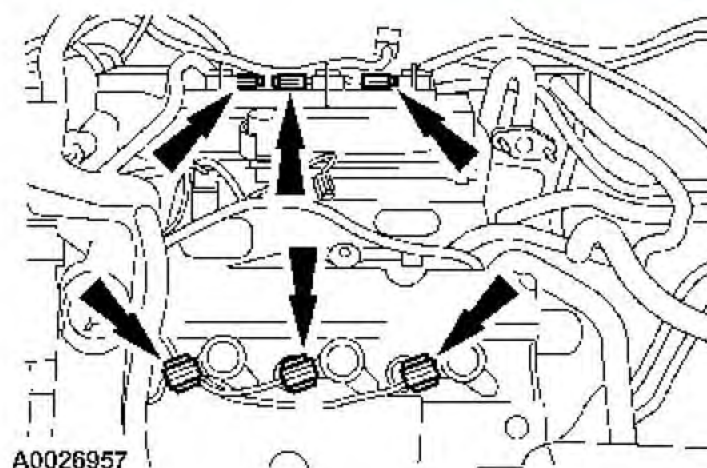
FUEL CHARGING WIRING HARNESS

Removal and Installation

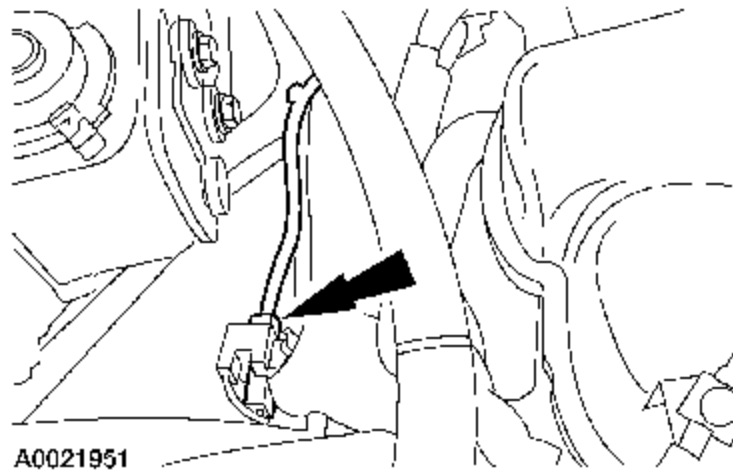
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

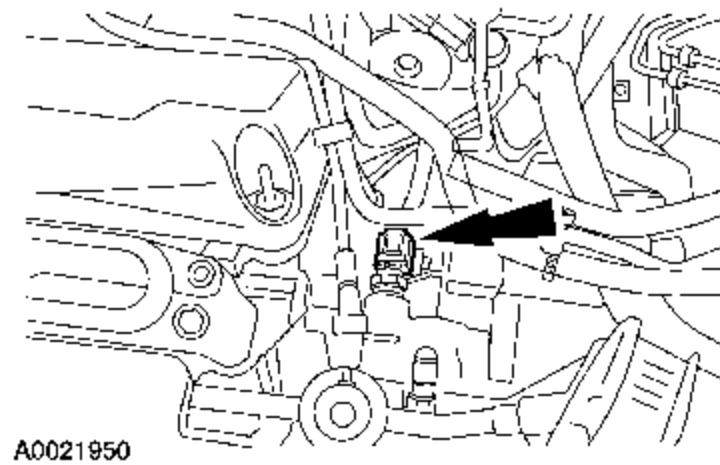
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



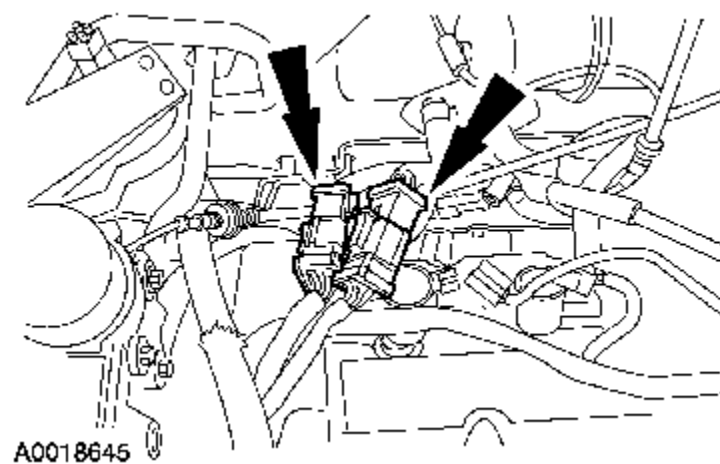
1. Disconnect the coil-on-plug electrical connectors.



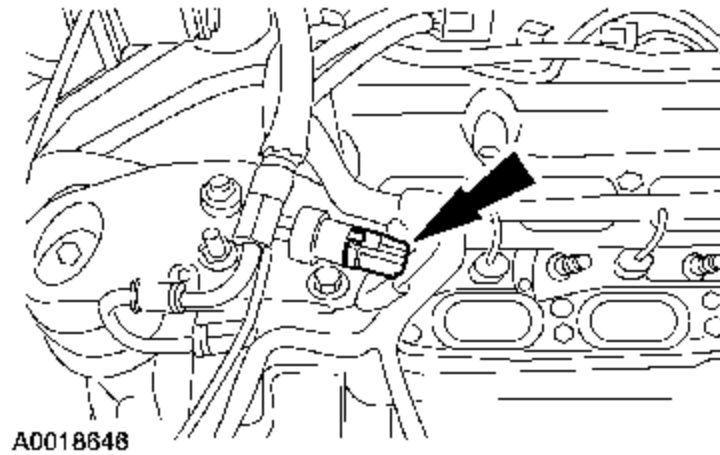
1. Disconnect the radio ignition noise suppressor electrical connector.



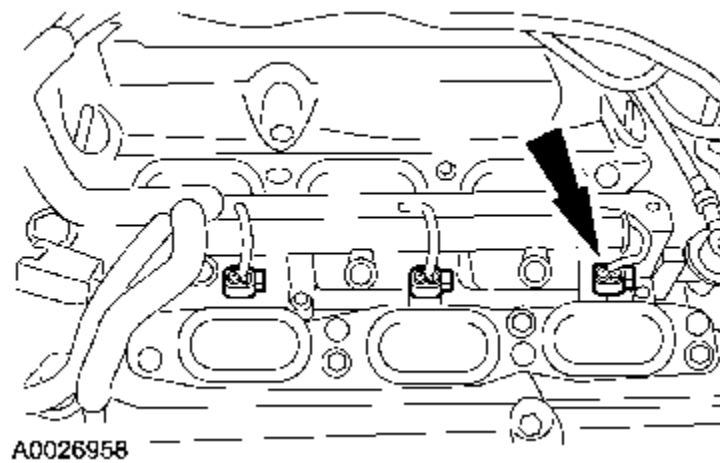
1. Remove the engine coolant temperature (ECT) sensor electrical connector.



1. Disconnect the 16-pin electrical connectors.



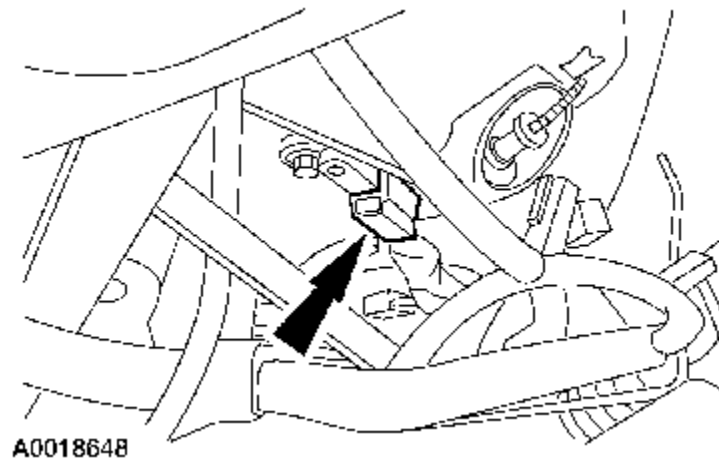
1. Disconnect power steering pressure (PSP) switch electrical connector.



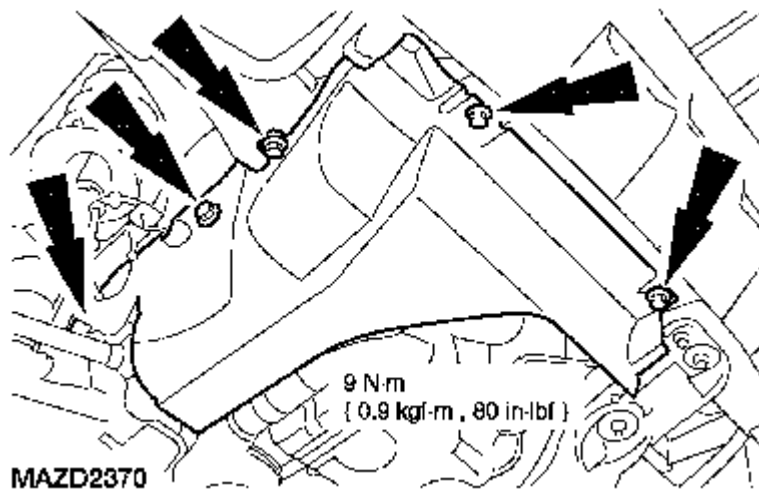
- 1.

NOTE:

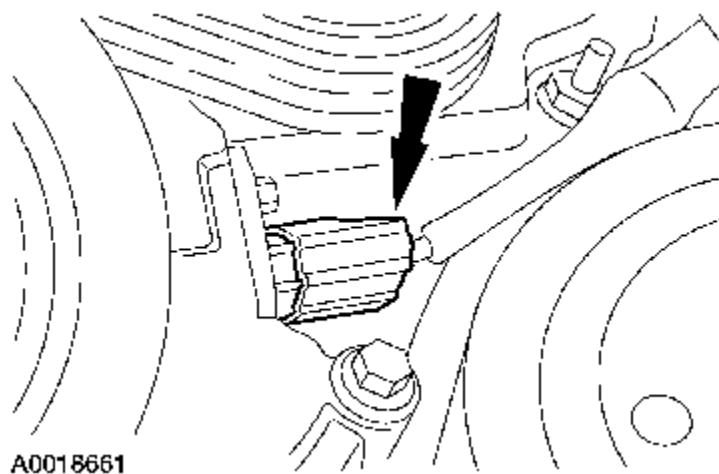
One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



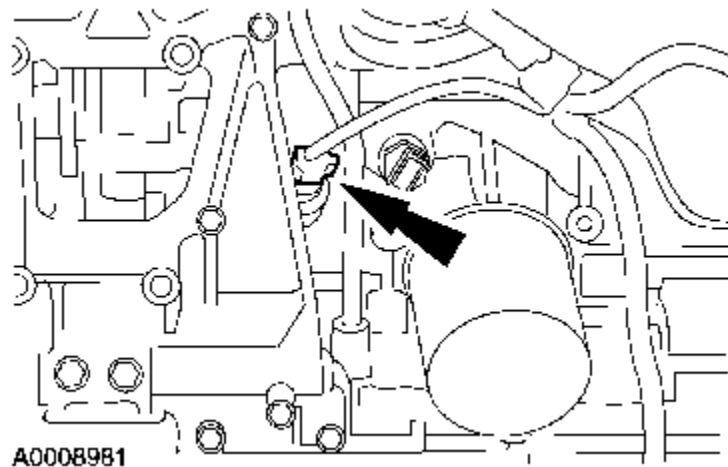
1. Disconnect the camshaft position (CMP) sensor electrical connector.
2. Remove the RH wheel and tire assembly.



1. Remove the RH lower splash shield.



1. Disconnect the crankshaft position (CKP) sensor electrical connector.



- 1.

NOTE:

The oil pressure sensor is located behind the rear of the A/C compressor. The A/C compressor has been removed for clarity. Disconnect the oil pressure sensor electrical connector.

2. Lower the vehicle.
3. Remove the fuel charging wiring harness from the vehicle.
4. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE fuel injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restrain

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FUEL INJECTION SUPPLY MANIFOLD

Removal and Installation

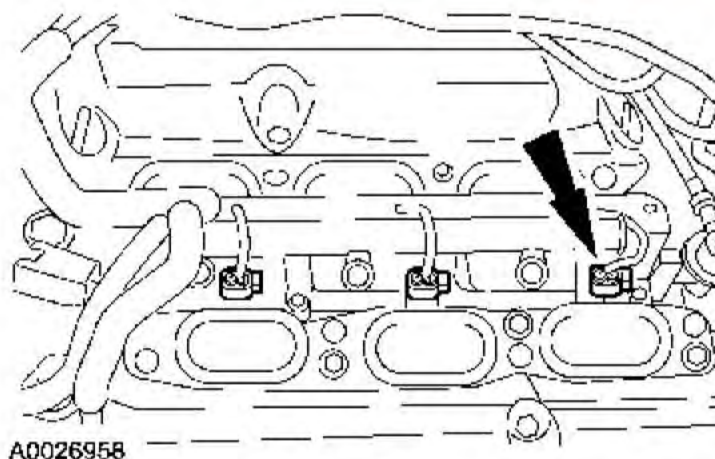
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#)
2. Disconnect the fuel line. Refer to [01-14 SPRING LOCK COUPLINGS](#).

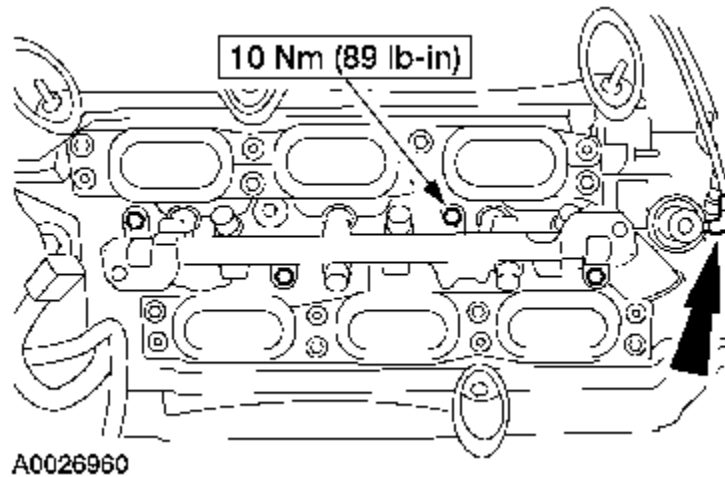


A0026958

1.

NOTE:

One connector is shown, the other five connectors are similar. Disconnect the six fuel injector electrical connectors and release the wiring harness locators from the fuel injection supply manifold.



1. Remove the fuel injection supply manifold.

- a. Remove the vacuum hose.
- b. Remove the bolts and the manifold.

2.

NOTE:

Lubricate the fuel injector O-ring seals with clean engine oil to aid installation. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE fuel injector

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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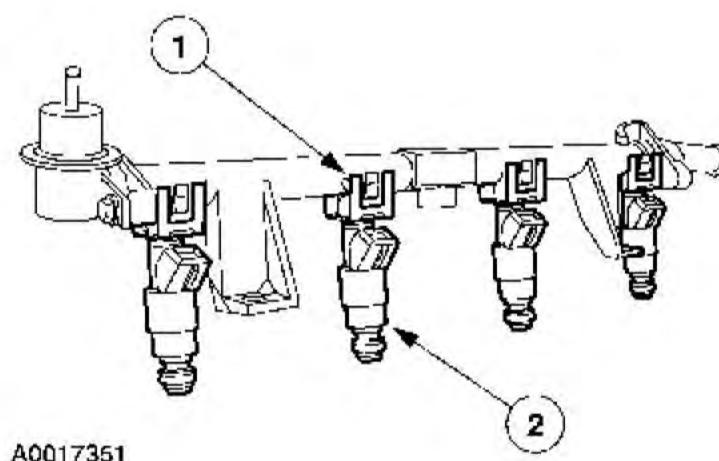
FUEL INJECTORS

Removal and Installation

WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

1. Remove the fuel injection supply manifold. Refer to [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 2.0L Zetec, or [01-14 FUEL INJECTION SUPPLY MANIFOLD](#) for 3.0L (4V).

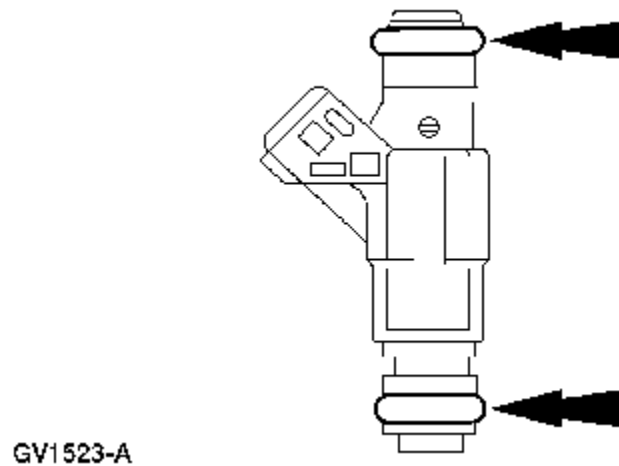


- 1.

NOTE:

A gentle twisting motion may be used while removing the fuel injectors from the fuel supply manifold. Remove the fuel injectors from the supply manifold.

- a. Release the retaining clips.
- b. Remove the fuel injectors.



1. Inspect the O-ring seals. Discard if damaged.
- 2.

CAUTION:

Use O-ring seals made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog fuel injectors.

NOTE:

Lubricate the O-ring seals with clean SAE 5W-30 motor oil to aid installation.

NOTE:

Install the fuel injector retaining clips onto the fuel injectors before installing the injectors onto the supply manifold.

To install, reverse the removal procedure.

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**Mazda Service**[Home](#) [View Content](#) [Other Applications](#) [As Built Data](#) [MyMazda](#) [IDS](#) [Training](#) [Return To Search Results](#)VIN or Model Year 2004 Model TRIBUTE fuel pulse damper☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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FUEL PULSE DAMPER

Removal and Installation

WARNING:

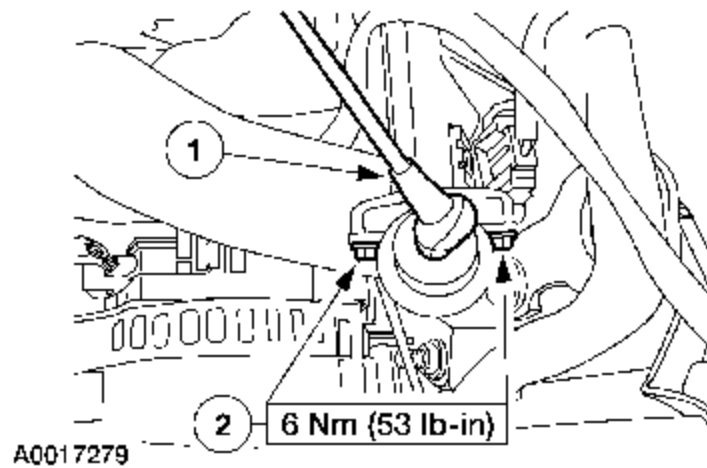
Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

WARNING:

Fuel in the fuel system remains under high pressure even when the engine is not running. Before working on or disconnecting any of the fuel lines or fuel system components, the fuel system pressure must be relieved. Failure to follow these instructions may result in personal injury.

1. Relieve the fuel system pressure. Refer to 01-14 FUEL SYSTEM PRESSURE RELEASE— 2.0L ZETEC or —[01-14 FUEL SYSTEM PRESSURE RELEASE 3.0L DURATEC\(4V\)](#).

2. For 3.0L (4V) engine, remove the throttle body. Refer to [01-13B THROTTLE BODY](#).



1. Remove the fuel pulse damper.
 - a. Disconnect the vacuum line.
 - b. Remove the bolts and the damper.
2. Inspect the O-ring seal and install a new seal if damaged.
- 3.

CAUTION:

Use an O-ring seal made of fuel-resistant material. Use of incorrect O-ring seals may result in fuel leakage.

CAUTION:

Never use silicone grease. Silicone grease may clog the fuel injectors.

NOTE:

Lubricate the O-ring seal with clean SAE 5W-30 motor oil to aid installation.

To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE roller

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

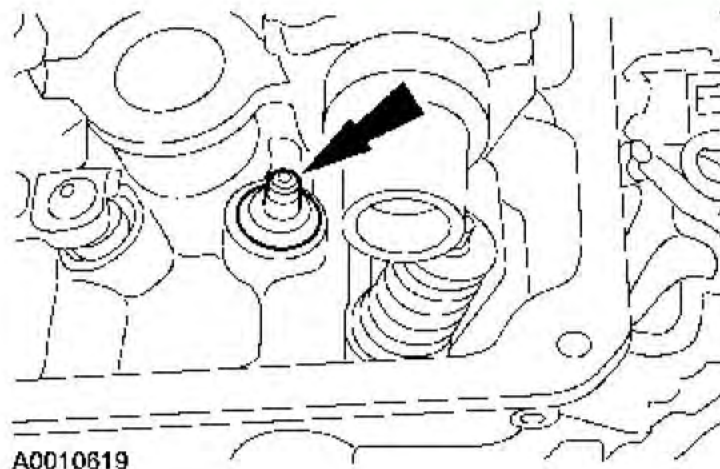
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2004 - Tribute - Workshop Manual - Engine

HYDRAULIC LASH ADJUSTERS

Removal and Installation

1. Remove the camshaft followers. Refer to [01-10C ROLLER FOLLOWERS](#).



- 1.

NOTE:

Mark the positions of the hydraulic lash adjusters to make sure they are assembled in their original position. Remove the hydraulic lash adjusters.

- 2.

NOTE:

Inspect the hydraulic lash adjusters for scoring marks and uneven wear in the bore. Install new lash adjusters if necessary. To install, reverse the removal procedure.

- a. Lubricate the hydraulic lash adjusters with SAE 5W-20 Motor Oil.

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VIN or Model Year 2004 Model TRIBUTE ignition coil on plug 1

General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐ \

Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐ Bo

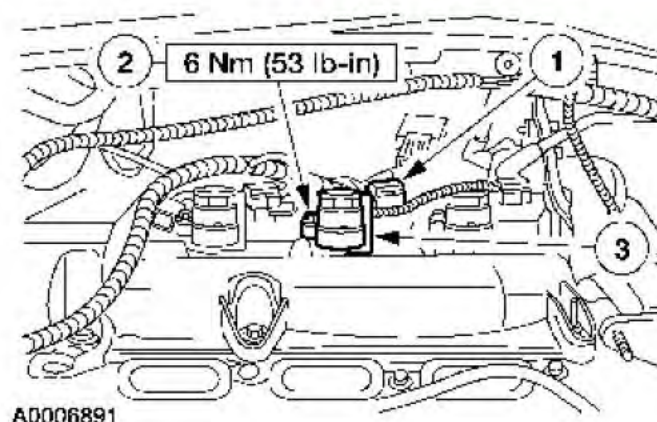
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IGNITION COIL-ON-PLUG — RH

Removal and Installation

1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Remove the ignition coil-on-plug.
 - a. Disconnect the electrical connector.
 - b. Remove the bolt.
 - c. Remove the coil-on-plug.
2. To install, reverse the removal procedure.
 - a. Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

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VIN or Model Year 2004 Model TRIBUTE upper intake manifold
General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

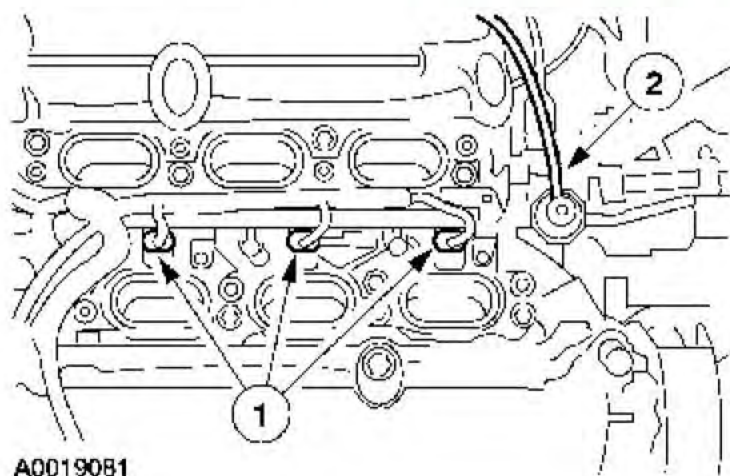
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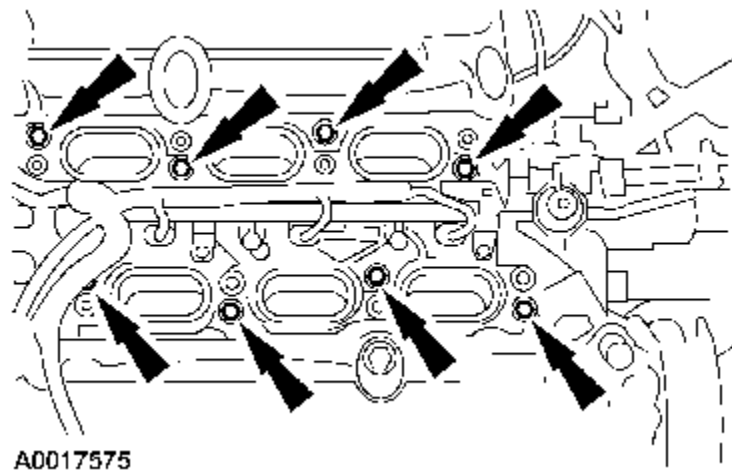
LOWER INTAKE MANIFOLD

Removal

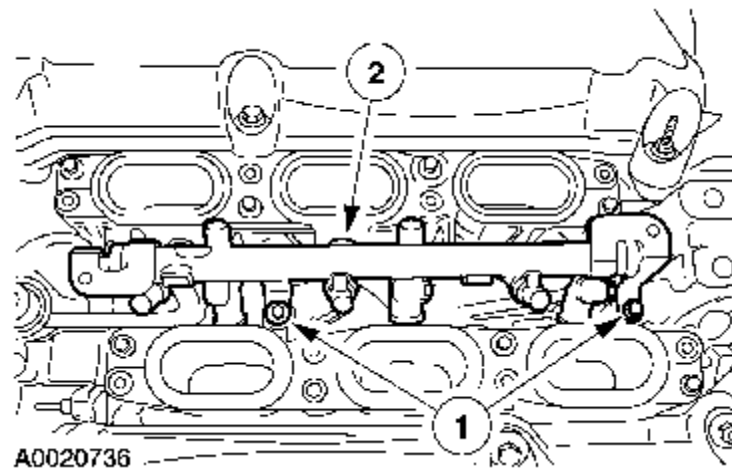
1. Disconnect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).
2. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).



1. Disconnect the fuel rail.
 - a. Disconnect the six fuel injector electrical connectors (1).
 - b. Disconnect the fuel pressure damper vacuum line (2).



1. Remove the bolts and the lower intake manifold.



1. Remove the fuel rail.
 - a. Remove the bolts (1).
 - b. Carefully separate the lower intake manifold from the fuel rail (2).
2. Remove the six fuel injectors from the lower intake manifold.
3. Remove and discard the gaskets if damaged.

Installation

1. Install the gaskets in the lower intake manifold.
- 2.

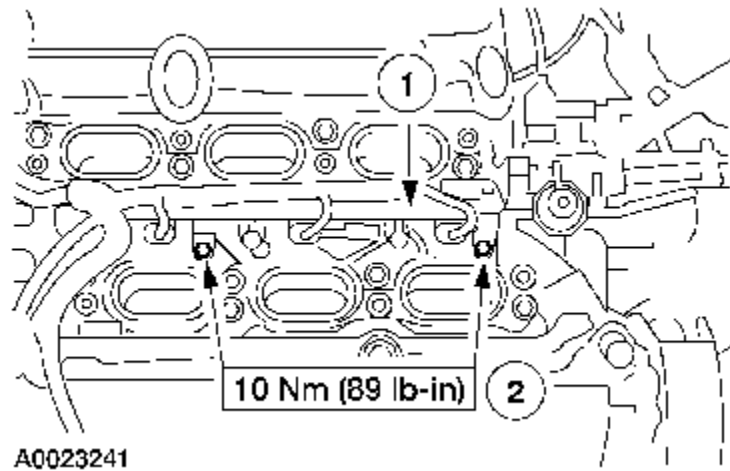
CAUTION:

Never use silicone grease. It will clog the fuel injectors.

NOTE:

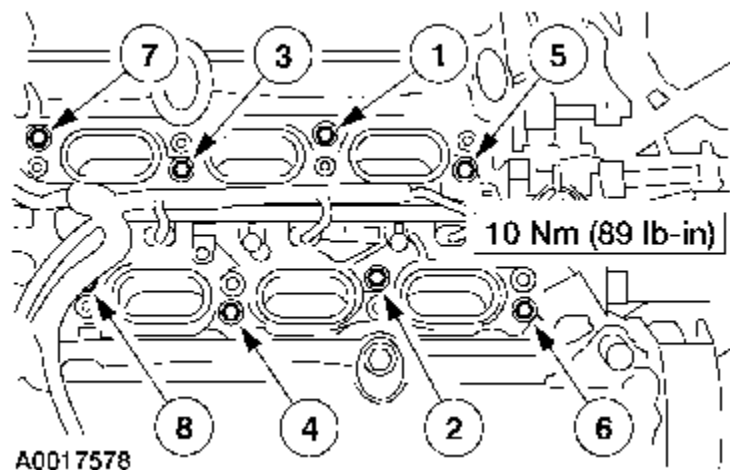
Inspect the fuel injector O-ring seals and install O-ring seals if necessary.

Lubricate the O-ring seals lightly with SAE 5W-20 Motor Oil and install the fuel injectors into the lower intake manifold.

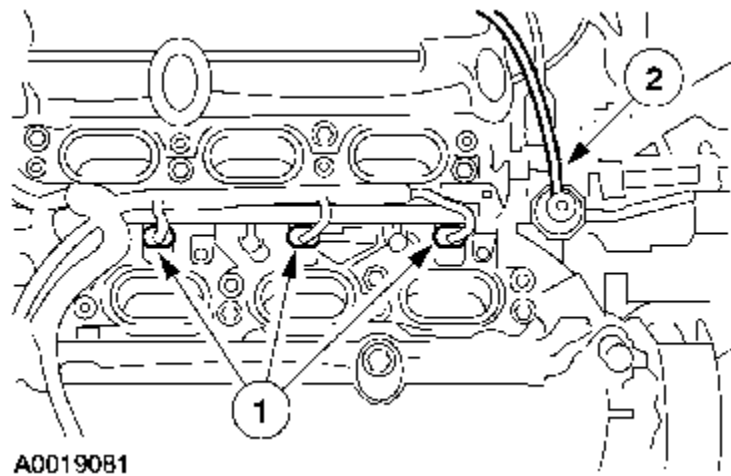


1. Install the fuel rail.

- a. Position the fuel rail (1).
- b. Install the four bolts (2).



1. Install the lower intake manifold assembly and tighten the bolts in the sequence shown.



1. Connect the fuel rail.
 - a. Connect the six fuel injectors (1).
 - b. Connect the fuel pressure damper vacuum line (2).
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).
3. Connect the fuel line spring lock coupling. Refer to [01-14 SPRING LOCK COUPLINGS](#).

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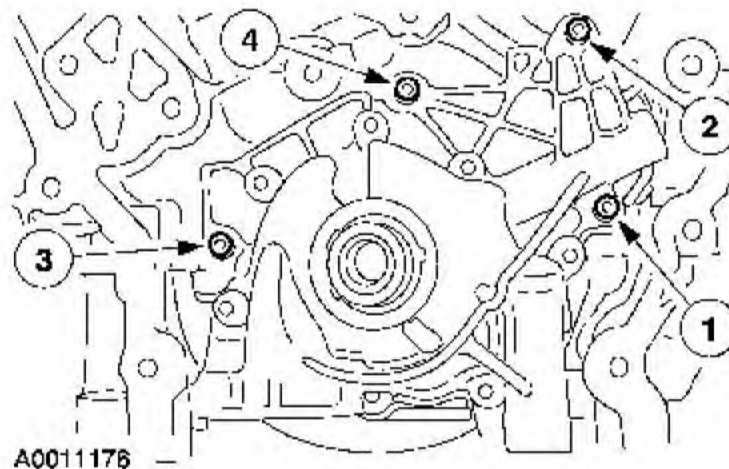
VIN or Model Year 2004 Model TRIBUTE oil pump☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints[< Previous](#) [Next >](#)

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OIL PUMP

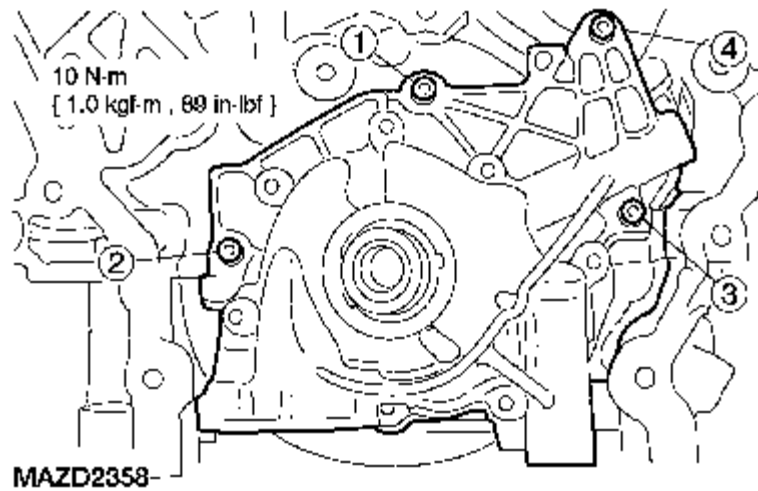
Removal

1. Remove the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).
2. Remove the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).



1. Remove the bolts in the indicated sequence and remove the oil pump.

Installation



1. Position the oil pump and install the bolts in the sequence shown.
2. Install the oil pump screen cover and tube. Refer to [01-11B OIL PUMP SCREEN AND PICKUP TUBE](#).
3. Install the timing drive components. Refer to [01-10C TIMING DRIVE COMPONENTS](#).

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VIN or Model Year 2004 Model TRIBUTE roller

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

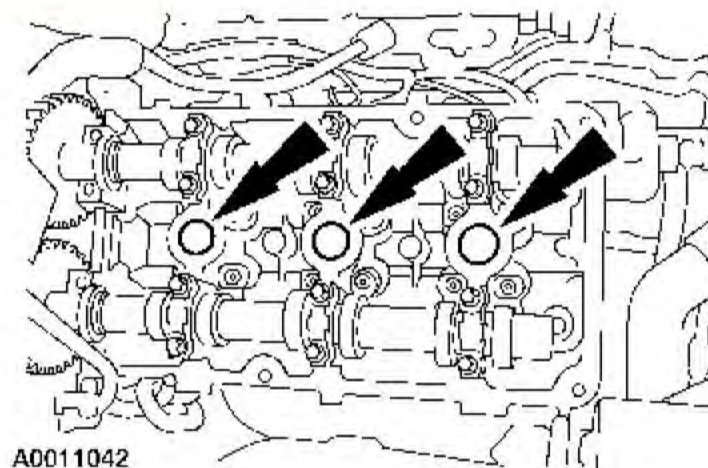
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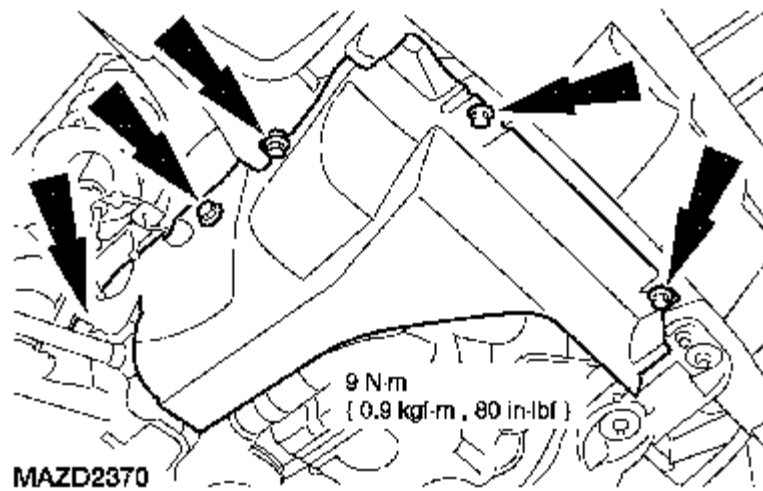
ROLLER FOLLOWERS

Removal and Installation

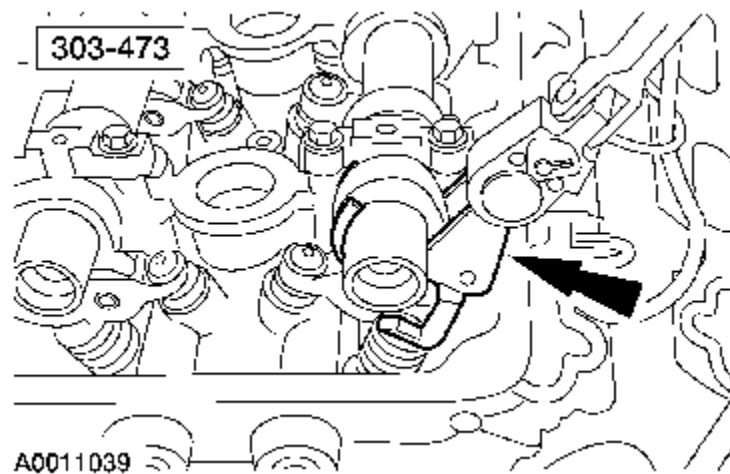
1. Remove the LH and RH valve covers. Refer to — [01-10C VALVE COVER RH](#) and — [01-10C VALVE COVER LH](#).



1. Remove the LH and RH spark plugs.
2. Remove the RH front wheel. Refer to [02-12 WHEEL AND TIRE](#).



1. Remove the splash shield.
2. Rotate the crankshaft until the camshaft lobe is pointing directly away from the follower.



1. Using the special tool, remove the followers.
 2. To install, reverse the removal procedure.
- Lubricate the camshaft followers with SAE 5W-20 Motor Oil .

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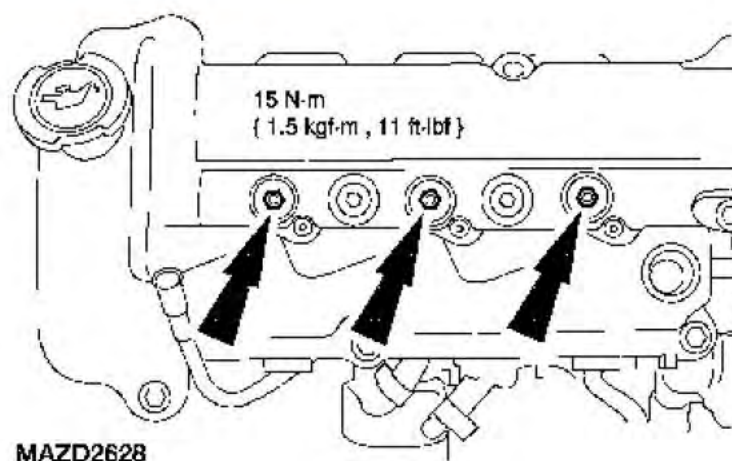
VIN or Model Year 2004 Model TRIBUTE spark plugGeneral Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC ☐
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints ☐[< Previous](#) [Next >](#)

2004 - Tribute - Workshop Manual - Engine

SPARK PLUGS — 3.0L DURATEC (4V)

Removal

1. Remove the ignition coil-on-plugs. Refer to 01-18 IGNITION COIL-ON-PLUG— LH and — [01-18 IGNITION COIL-ON-PLUG RH](#).



- 1.

NOTE:

LH shown, RH similar. Remove the LH and RH spark plugs.

2. Inspect the spark plugs. Refer to — [01-18 SPARK PLUG INSPECTION](#).
3. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE speed control cable

General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

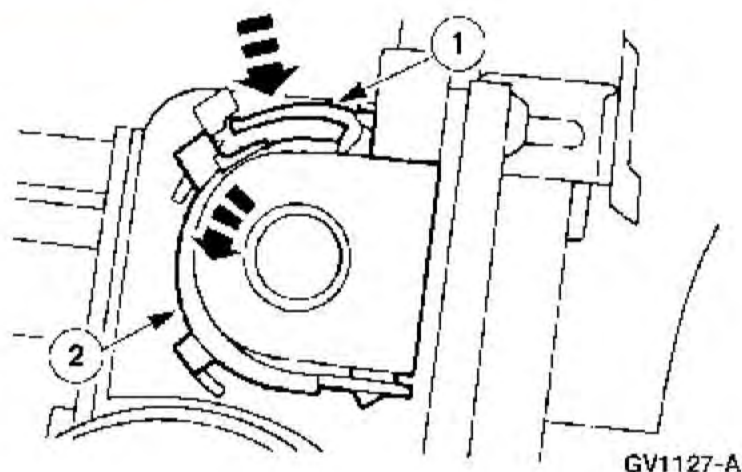
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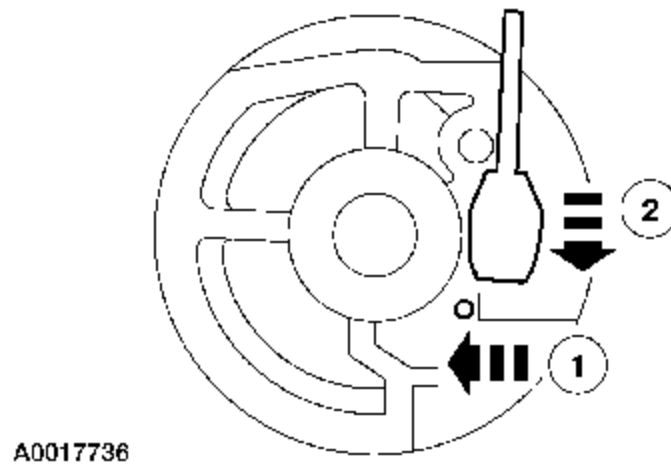
SPEED CONTROL ACTUATOR

Removal and Installation

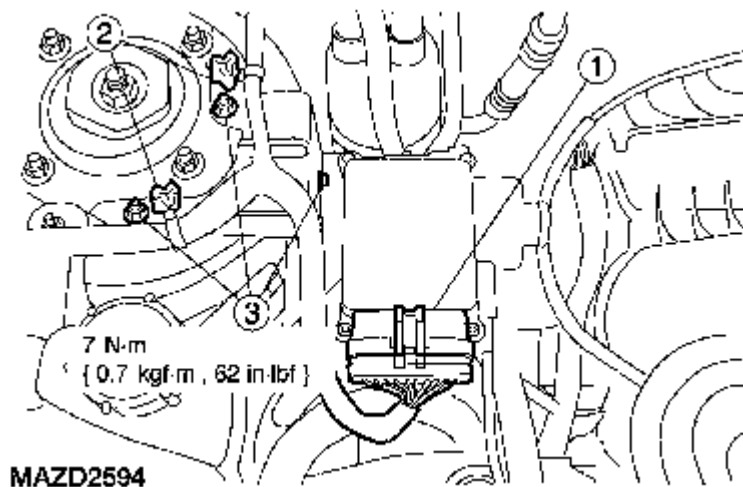
1. Disconnect the battery ground cable. For additional information, refer to [01-17 BATTERY DISCONNECT](#).



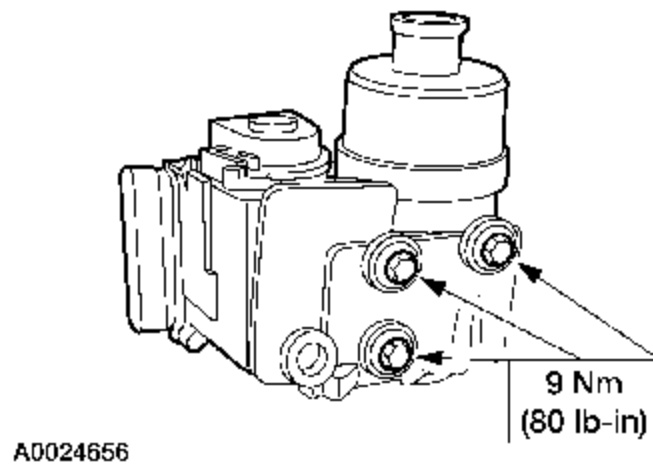
1. Release the cruise control cable cap.
 - a. Squeeze the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.



1. Remove the cruise control actuator assembly.
 - a. Disconnect the electrical connector.
 - b. Separate the wire harness from the bracket.
 - c. Remove the nuts.



1. Remove the bolts and separate the cruise control actuator from the bracket.
2. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE speed control cable

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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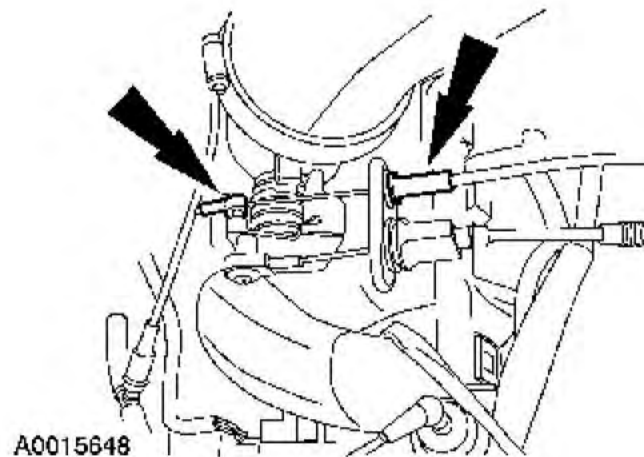
SPEED CONTROL CABLE

Removal and Installation

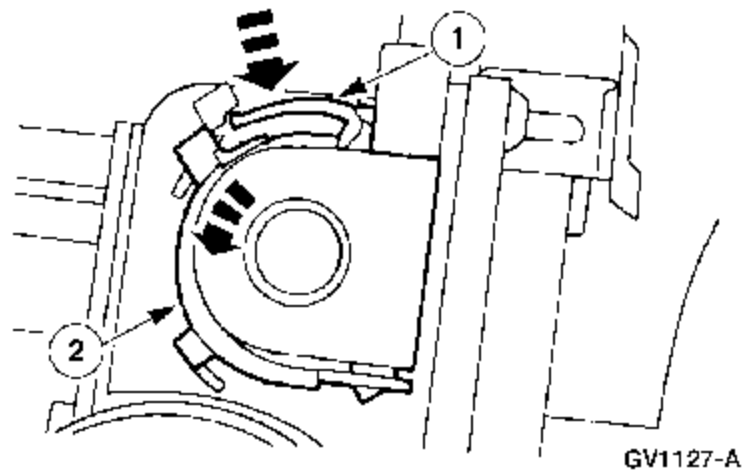
NOTE:

The cruise control actuator cable is not adjustable.

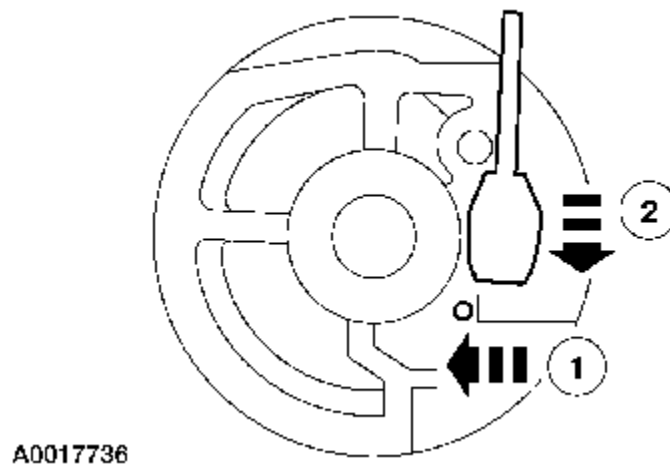
Vehicles equipped with 2.0L Zetec engine



1. Disconnect the cruise control cable from the throttle control linkage and bracket.



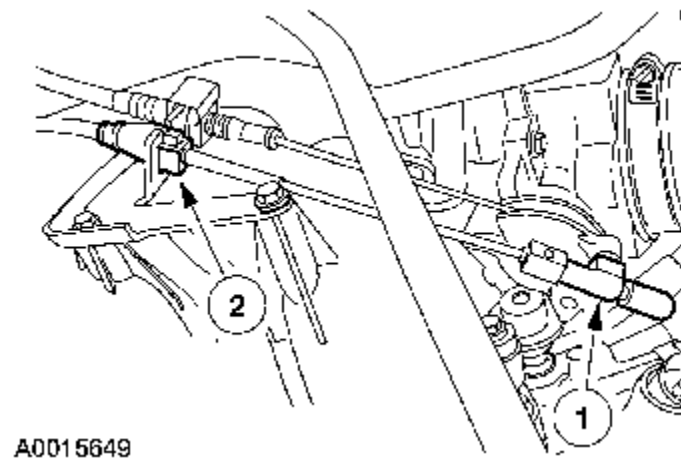
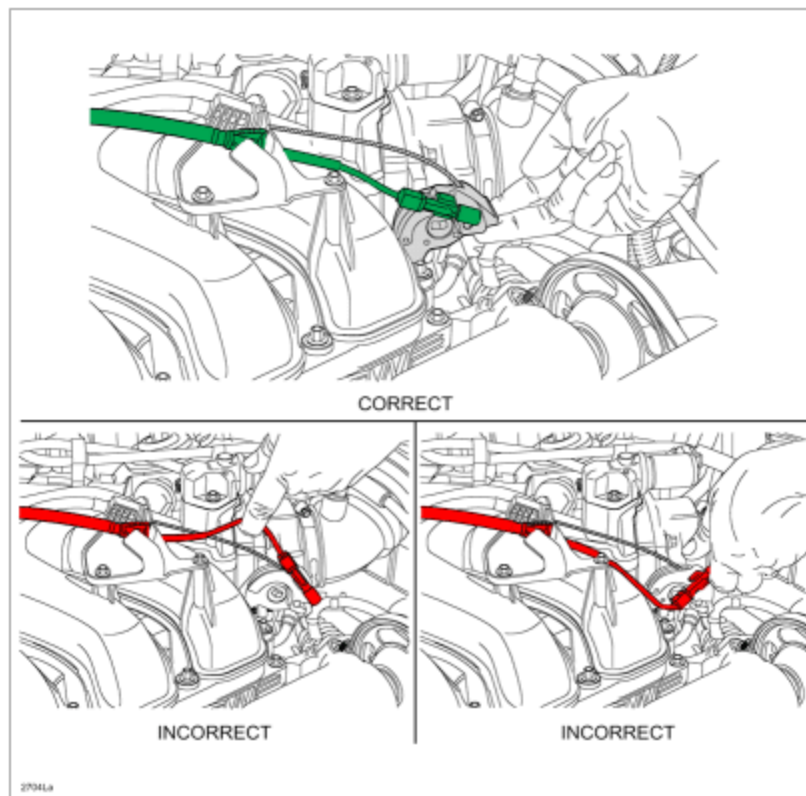
1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



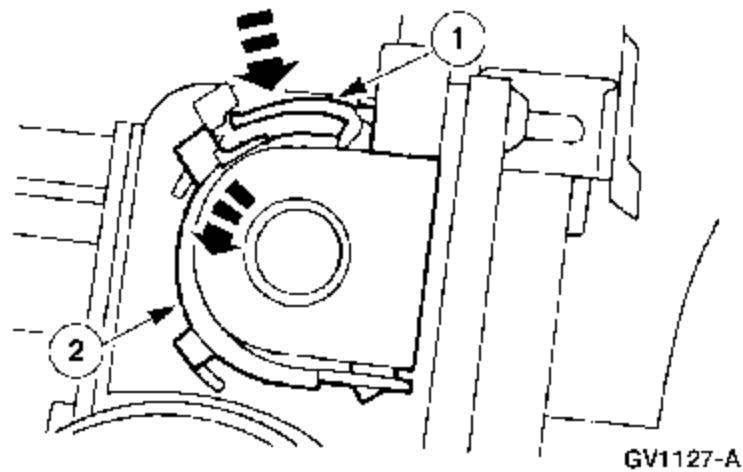
1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

Vehicles equipped with 3.0L (4V) engine

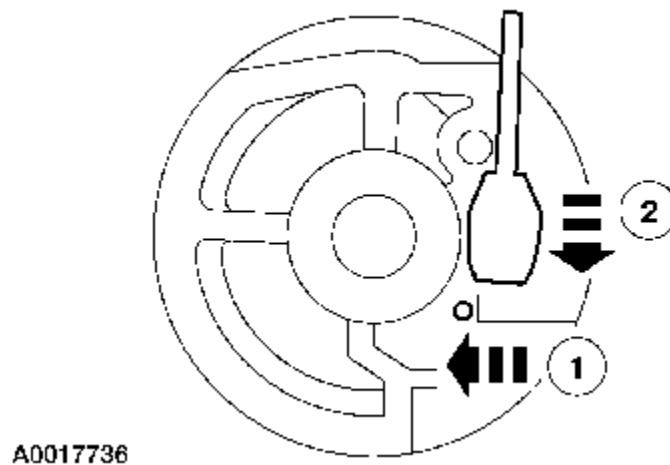
CAUTION: Damage to the speed control cable may result if the throttle body cam is rotated by lifting up on the speed control cable or the speed control cable connector end. When disconnecting the accelerator cable from the throttle body, rotate the throttle body cam only by lifting up on the cam itself. See Figure below.



1. Disconnect the cruise control cable from the throttle control linkage and bracket.
 - a. Disconnect the cable from the throttle control linkage.
 - b. Squeeze the tabs and disconnect the cruise control cable from the bracket



1. Release the cruise control cable cap.
 - a. Depress the cruise control cable cap retaining tab.
 - b. Rotate the cruise control cable cap.



1. Remove the cruise control cable.
 - a. Depress the spring retainer.
 - b. Slide the core wire end out of the cruise control servo pulley and remove the cruise control cable.
2. To install, reverse the removal procedure.

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VIN or Model Year 2004 Model TRIBUTE throttle body

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

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THROTTLE BODY

Removal and Installation

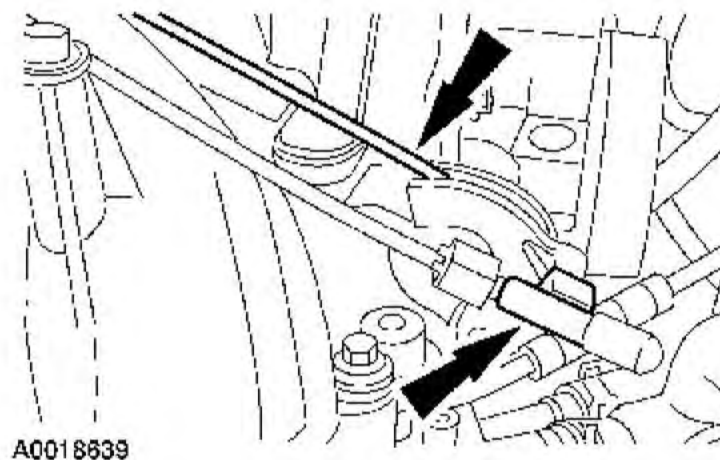
WARNING:

Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related components. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in personal injury.

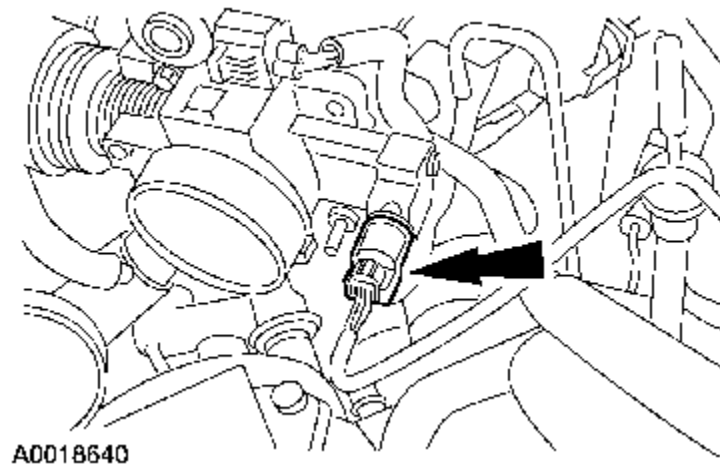
CAUTION:

Throttle body bore and plate area have a special coating and should not be cleaned.

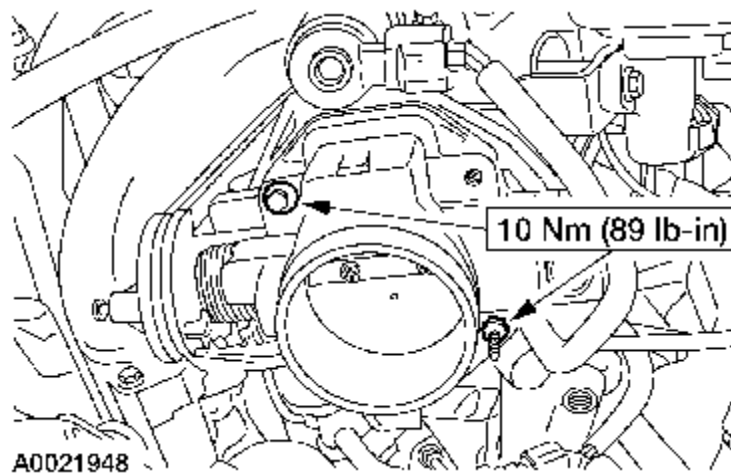
1. Remove the air cleaner outlet tube. Refer to — [01-13B AIR CLEANER OUTLET PIPE 3.0L DURATEC \(4V\)](#).



1. Disconnect the accelerator cable and the cruise control cable (if equipped) from the throttle body lever.



1. Disconnect the throttle position (TP) sensor electrical connector.



1. Remove the bolt, the stud bolt and the throttle body.
 - a. Discard the gasket.
2. To install, reverse the removal procedure.
 - a. Install a new gasket.

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VIN or Model Year 2004 Model TRIBUTE timing drive

[General Information](#) ☐ [Engine](#) ☐ [Suspension](#) ☐ [Transmission/Transaxle](#) ☐ [HVAC](#)
[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restraints](#)

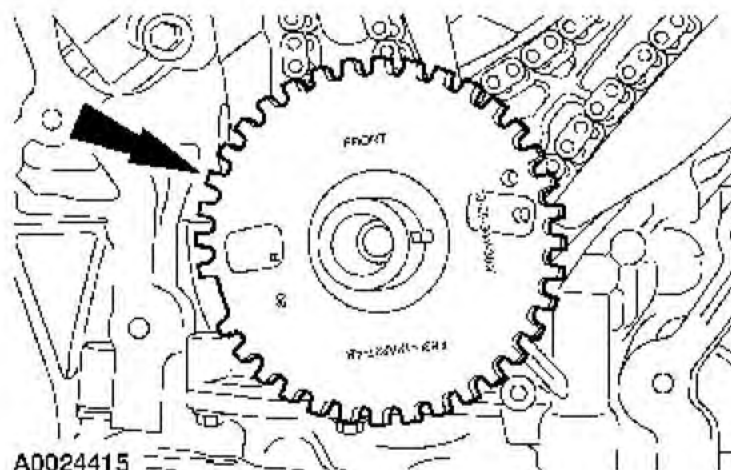
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TIMING DRIVE COMPONENTS

Removal

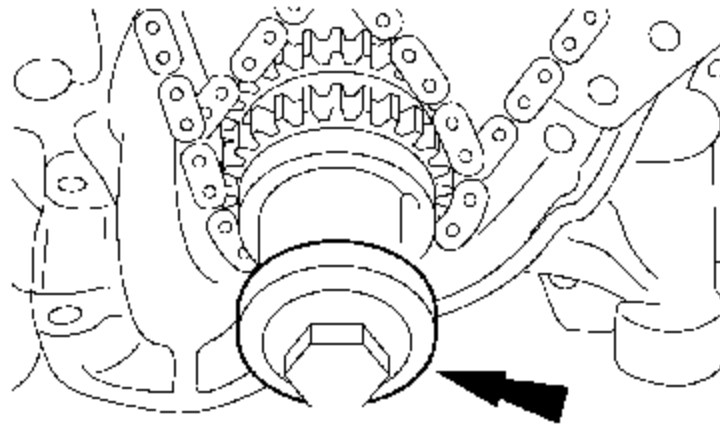
1. Remove the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).
2. Lower the vehicle.



- 1.

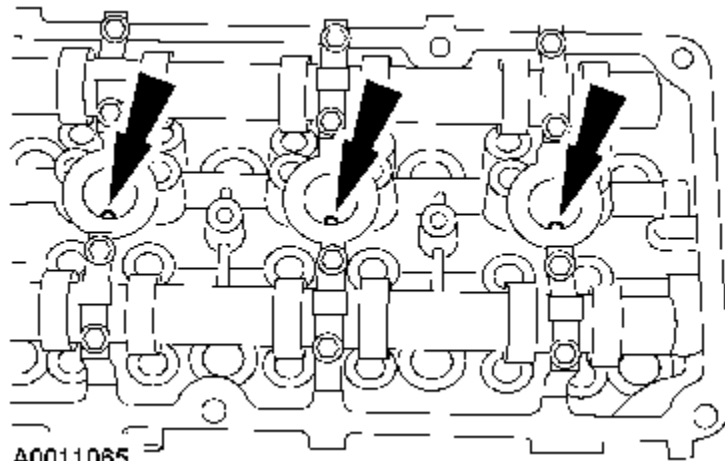
CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 20-25-34Y-30M (Color Blue). Remove the ignition pulse wheel.



A0022699

1. Install the damper bolt.

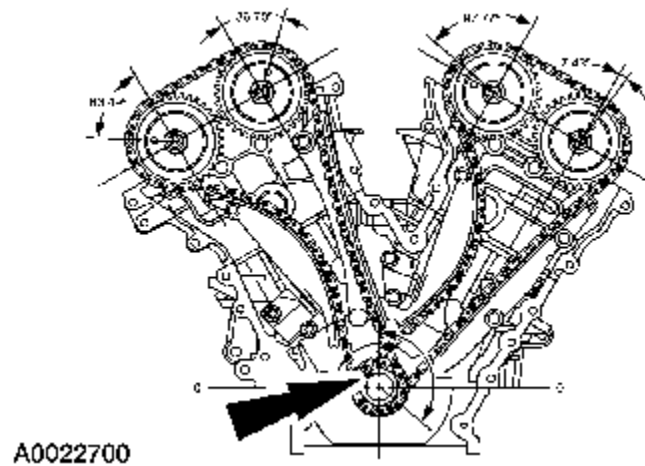


A0011065

- 1.

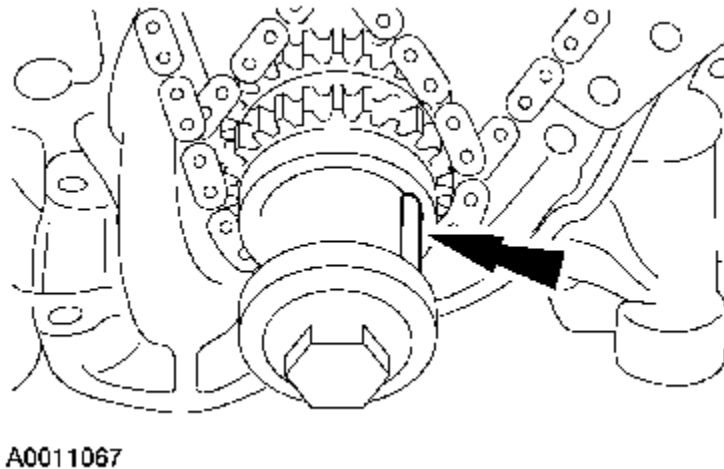
NOTE:

RH shown, LH similar. Remove the LH and RH spark plugs.

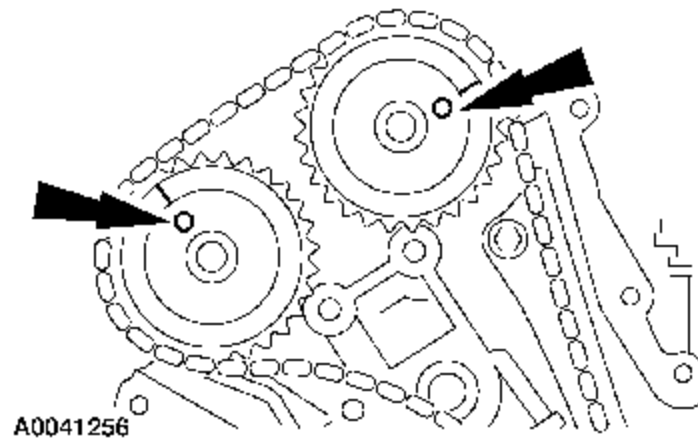


1. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the number one cylinder at top dead center (TDC).

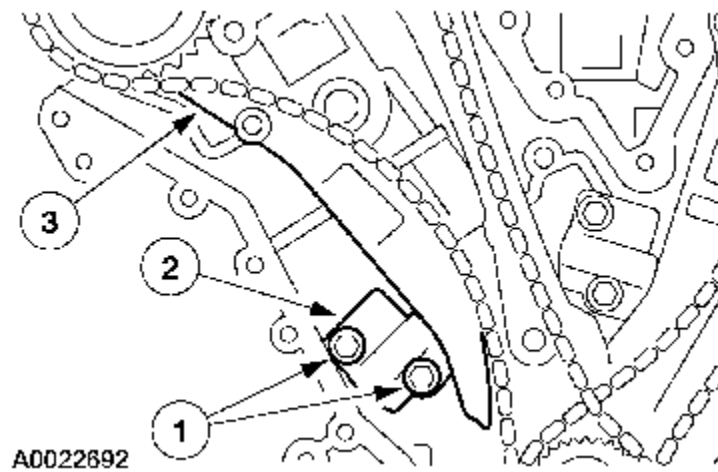
- Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and re-check.



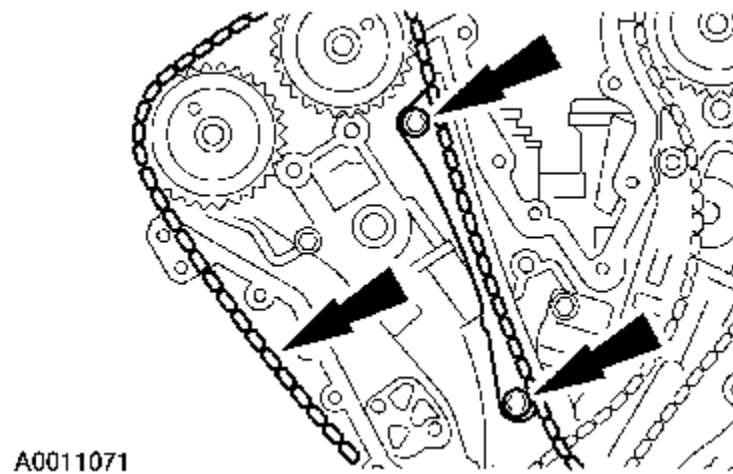
1. Rotate the crankshaft clockwise 120 degrees to the 3 o'clock position to locate the RH camshafts in the neutral position.



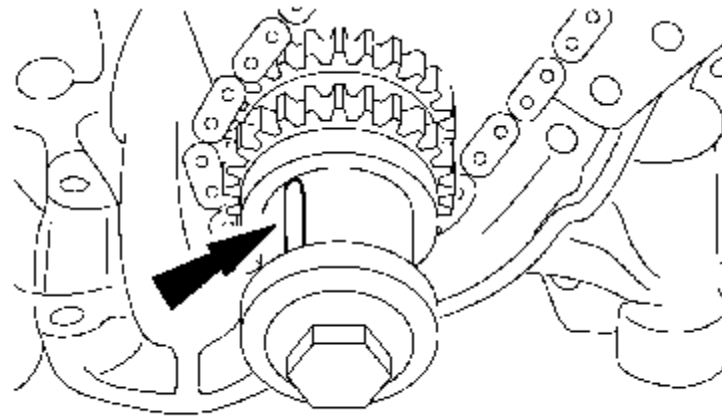
1. Verify that the RH camshafts are in the neutral position.



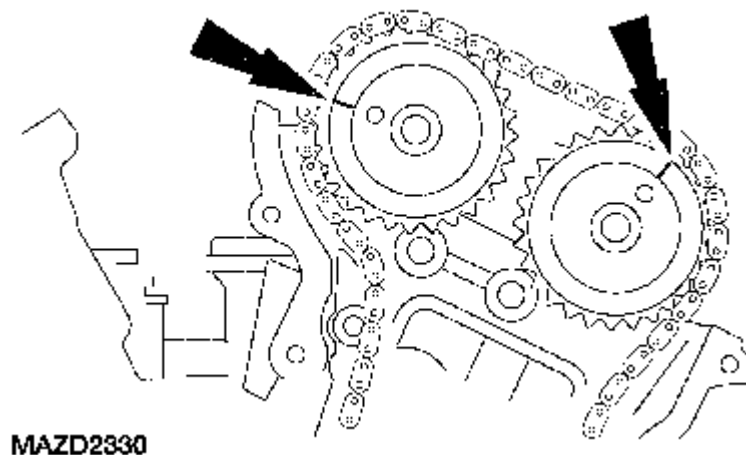
1. Remove the RH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.



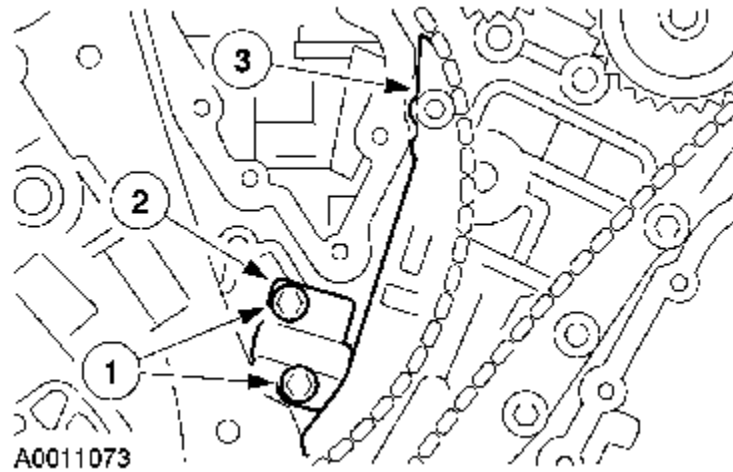
1. Remove the bolts, RH timing chain guide and the timing chain.



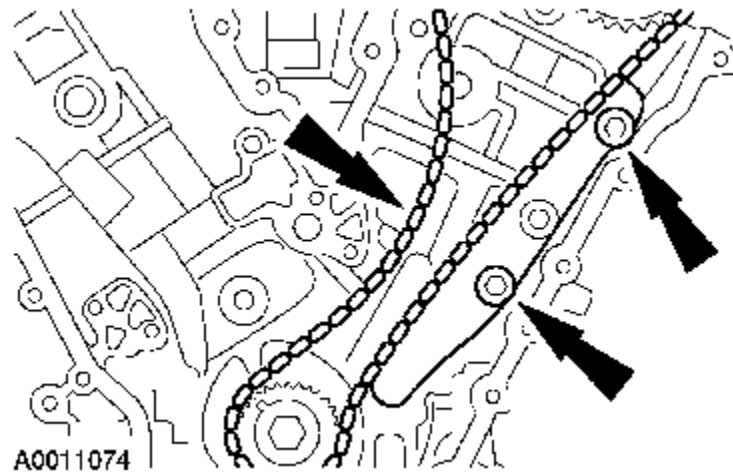
1. Rotate the crankshaft clockwise 600 degrees (1-2/3 times) to position the crankshaft keyway in the 11 o'clock position. This will position the LH camshafts in the neutral position.



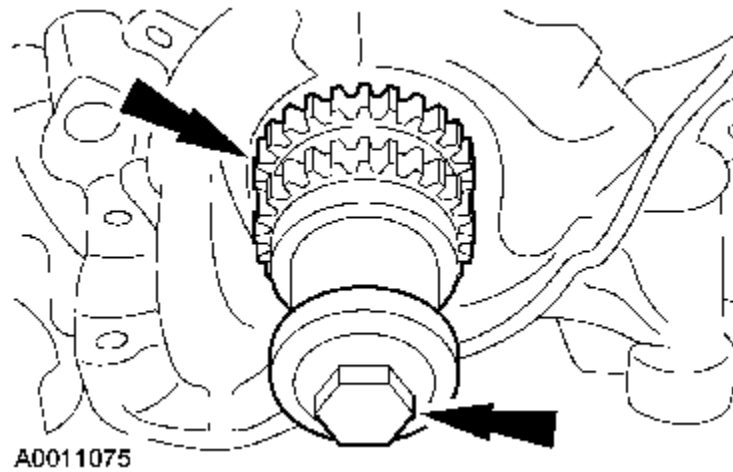
1. Verify that the LH camshafts are in the neutral position.



1. Remove the LH timing chain and tensioner arm.
 - a. Remove the bolts.
 - b. Remove the tensioner.
 - c. Remove the tensioner arm.

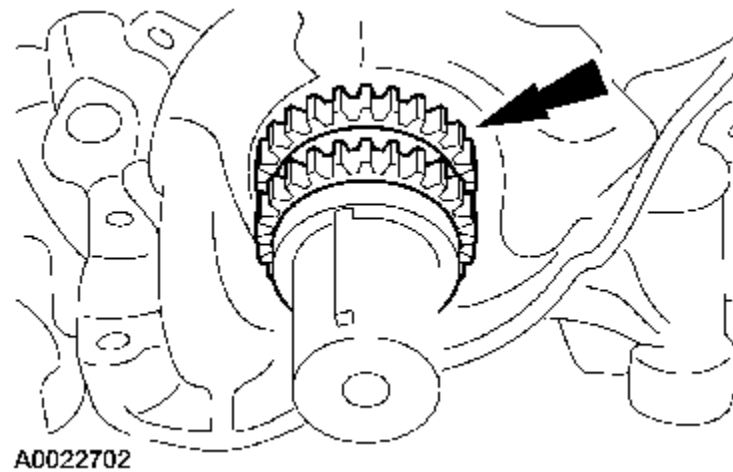


1. Remove the LH timing chain and timing chain guide.

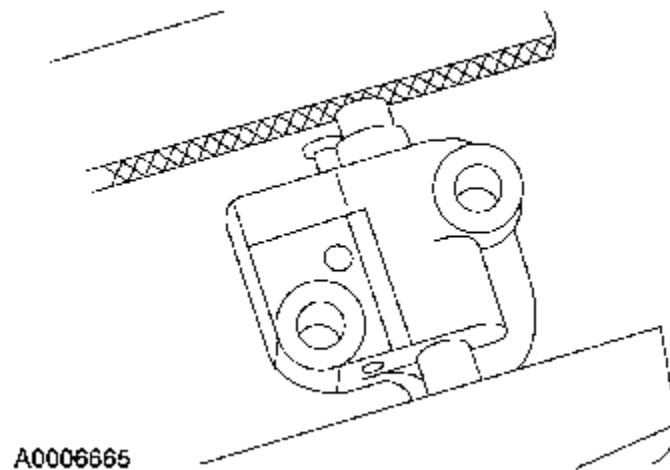


1. Remove the damper bolt and the crankshaft sprockets.

Installation



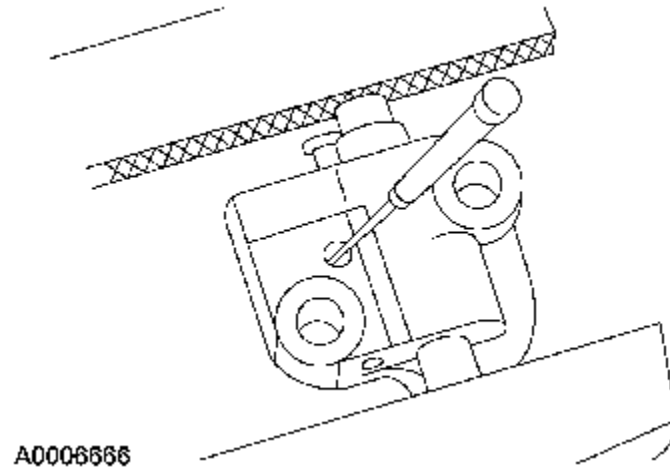
1. Install the crankshaft sprockets.



1.

NOTE:

LH shown, RH similar. Position the chain tensioner in a soft-jawed vise.



1.

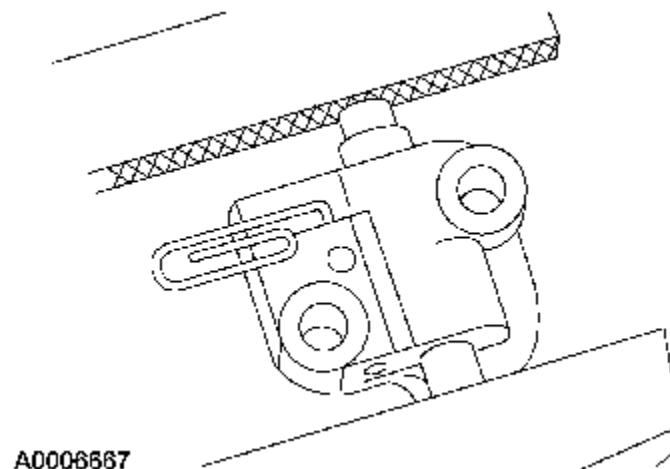
NOTE:

LH shown, RH similar. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

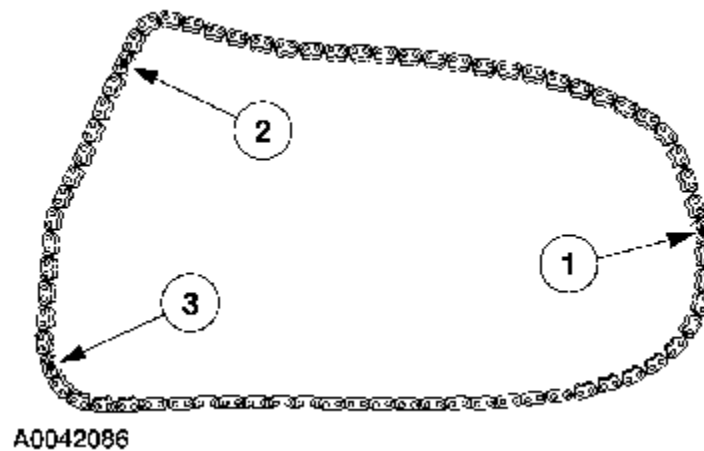
2.

CAUTION:

During tensioner compression, do not release the ratchet stem until the tensioner piston is fully bottomed in its bore or damage to the ratchet stem will result. Slowly compress the timing chain tensioner.

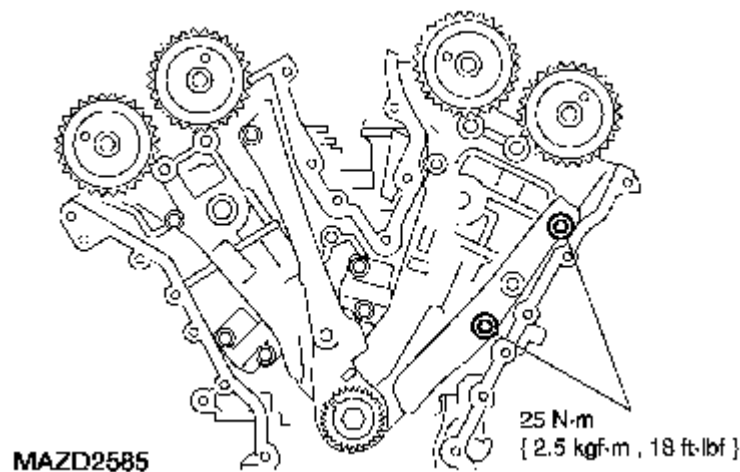


1. Retain the tensioner piston with a 1.5 mm (0.06 in) wire or paper clip.

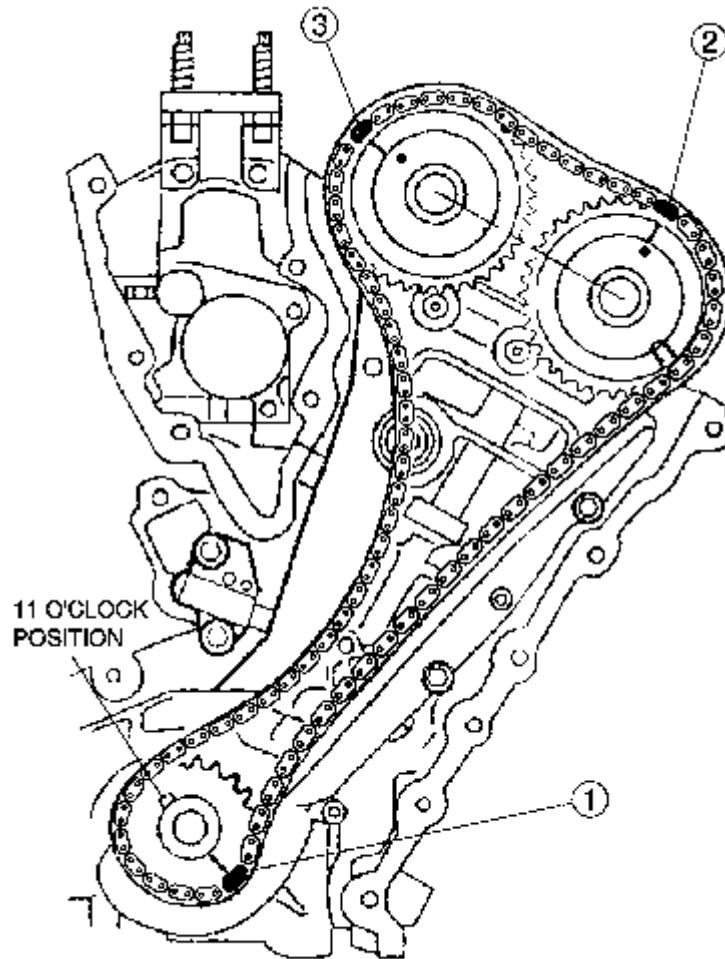


1. If timing marks on the timing chains are not evident, use a permanent-type marker to mark on the LH and RH timing chains.

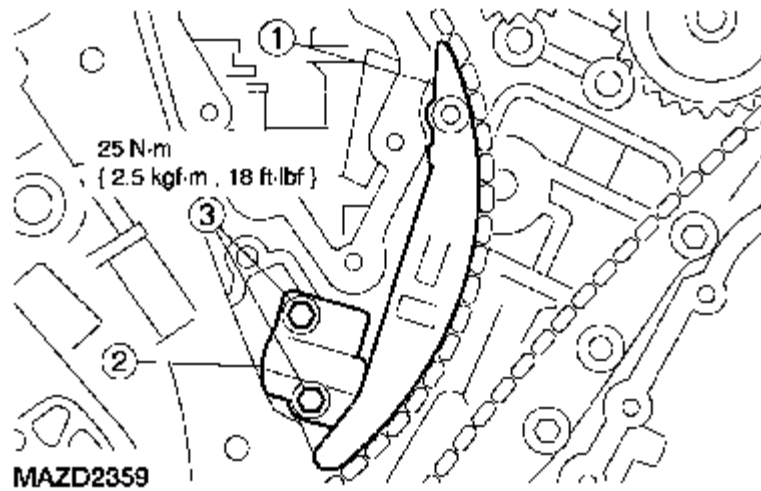
- a. Mark any link to use as the crankshaft timing mark.
- b. Count 29 links counterclockwise from the crankshaft timing mark (including the starting link) and mark this link as the (LH chain Exhaust/ RH chain Intake) cam sprocket timing mark.
- c. Continue counting counterclockwise to 42 and mark this link as the (LH chain Exhaust/ RH chain Intake) sprocket timing mark



1. Position the guide and install the bolts.

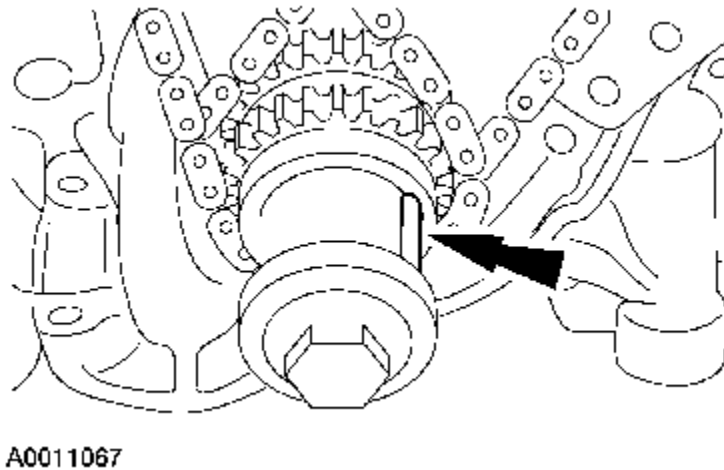
**MAZD2331**

1. Install the LH timing chain.
 - a. Position number one on the crankshaft.
 - b. Count twenty-nine links from the number one link, including the starting link. Position on the exhaust cam sprocket.
 - c. Continue counting to forty-two and position link on intake sprocket timing mark.

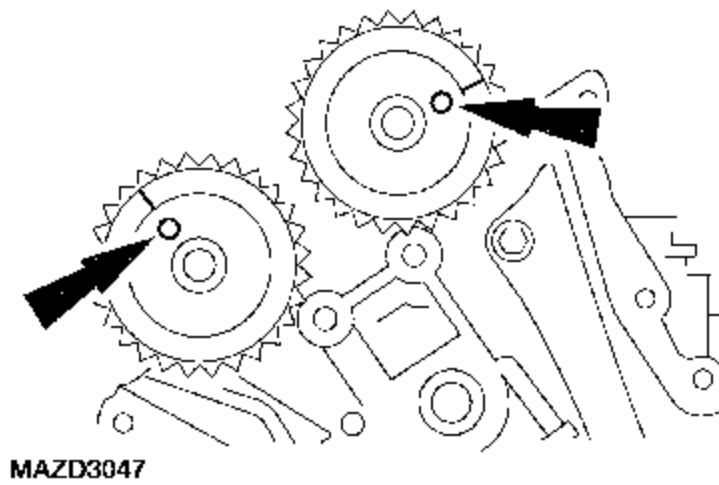


1. Install the LH timing chain and tensioner arm.

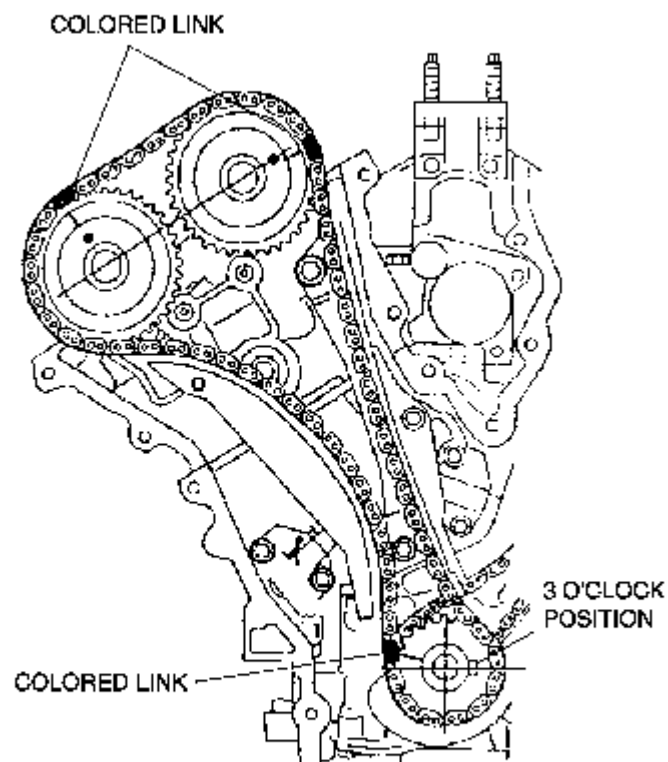
- a. Install the tensioner arm.
- b. Position the tensioner.
- c. Install the bolt.



1. Install the crankshaft damper bolt and rotate the crankshaft keyway to the 3 o'clock position.

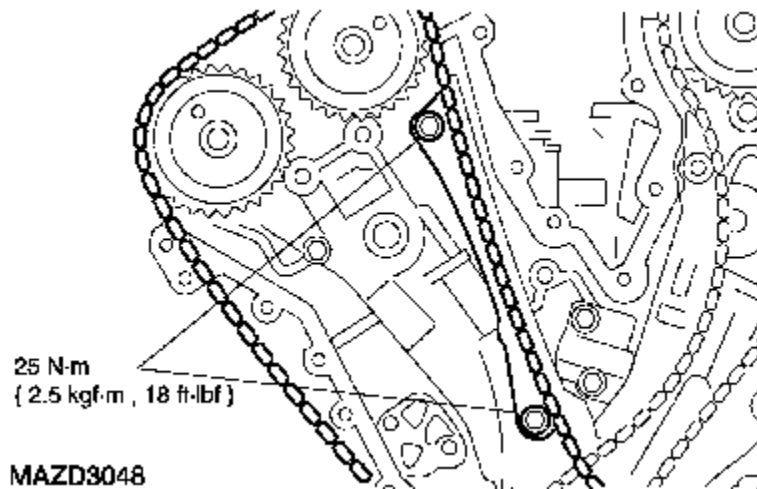


1. Verify that the RH camshafts are correctly positioned.

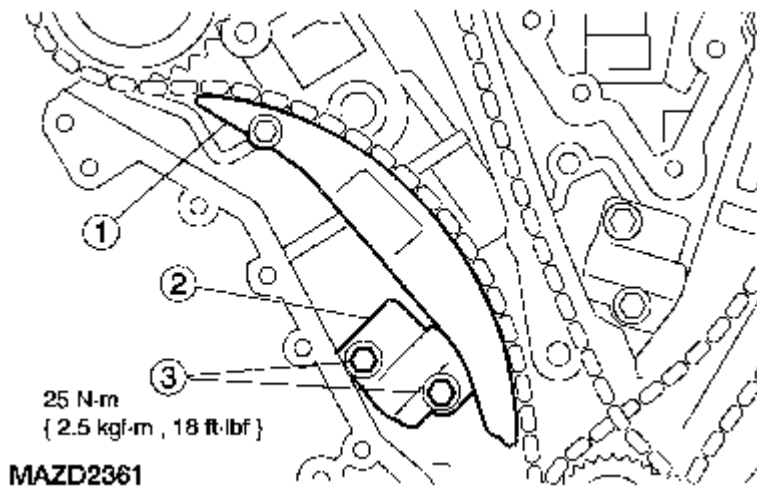


1. Install the RH timing chain.

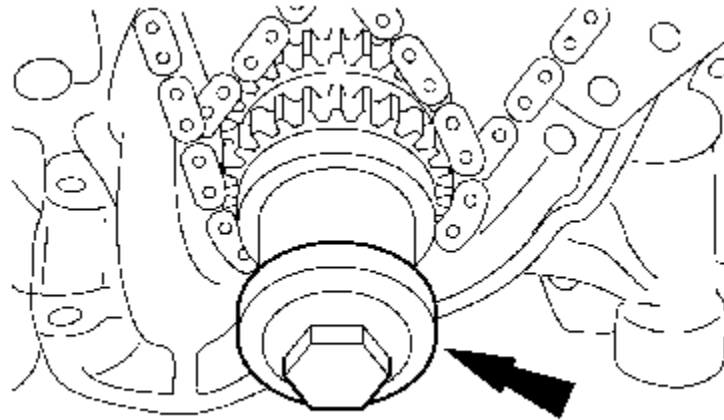
- Align the marks on the timing chain with the marks on the camshaft and crankshaft sprockets.



1. Install the RH timing chain guide and install the bolts.

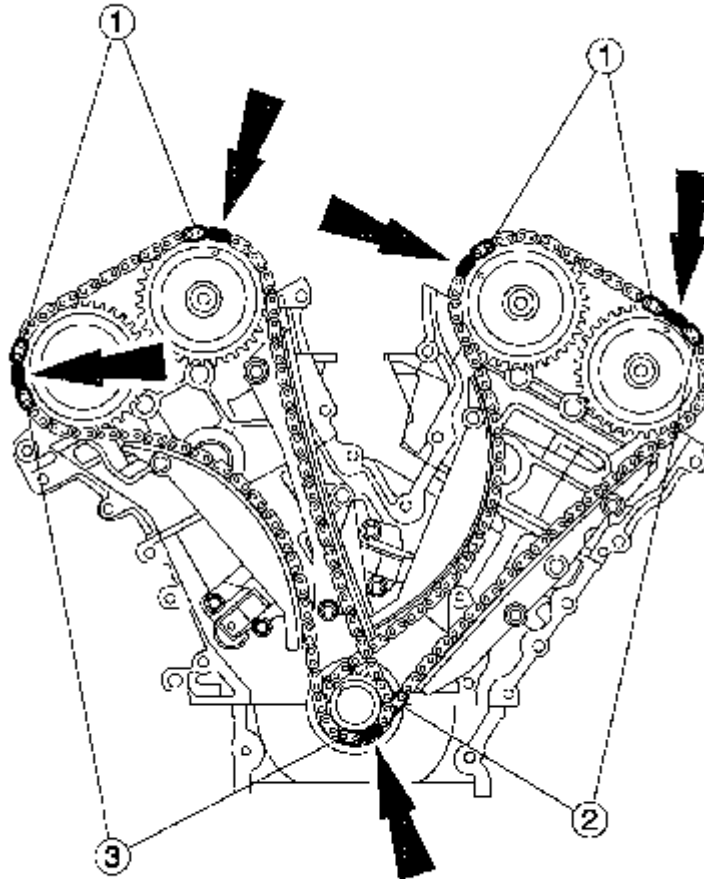


1. Install the RH timing chain tensioner and tensioner arm.
 - a. Install the tensioner arm.
 - b. Position the tensioner.
 - c. Install the bolts.
2. Remove the LH and RH timing chain tensioner piston retaining wires.



A0011064

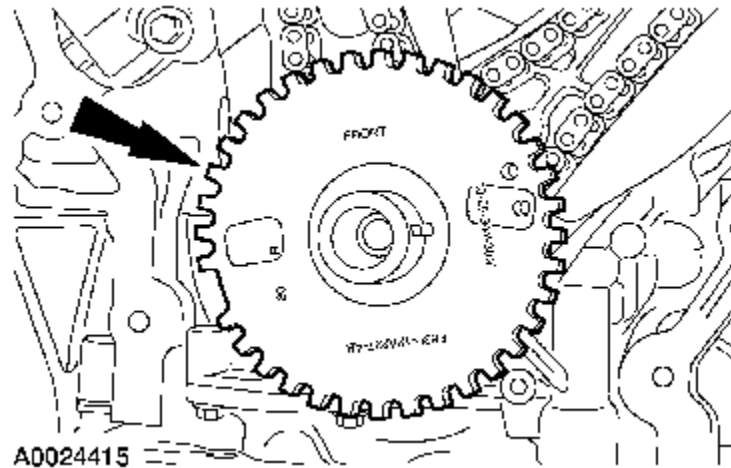
1. Remove the crankshaft damper bolt.



MAZD3049

1. Verify the timing with the following steps.

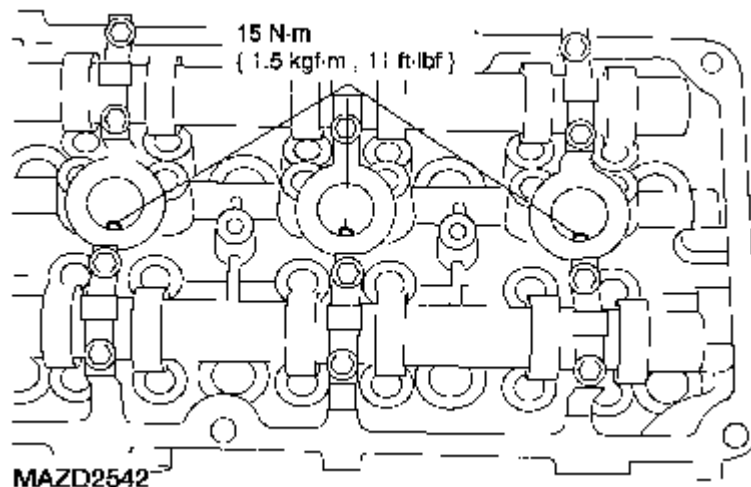
- a. There should be 12 chain links between the front camshaft timing marks.
- b. There should be 27 chain links between the camshaft and crankshaft timing marks.
- c. There should be 30 chain links between the camshaft and crankshaft timing marks.



1.

CAUTION:

This pulse wheel is used in several different engines. Install the pulse wheel with the key way in the slot stamped 20-25-34Y-30M (Color Blue). Install the ignition pulse wheel.



1. Install the LH and RH spark plugs. (RH shown, LH similar.)
2. Raise the vehicle.
3. Install the engine front cover. Refer to [01-10C ENGINE FRONT COVER](#).

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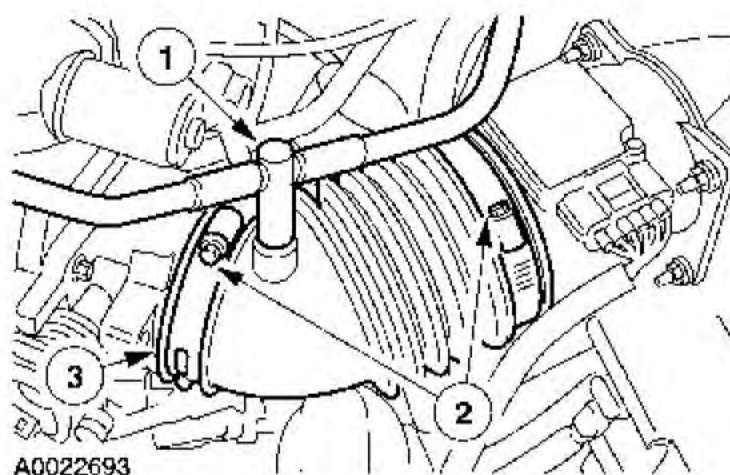
VIN or Model Year 2004 Model TRIBUTE upper intake manifold
General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HVAC
Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restraints

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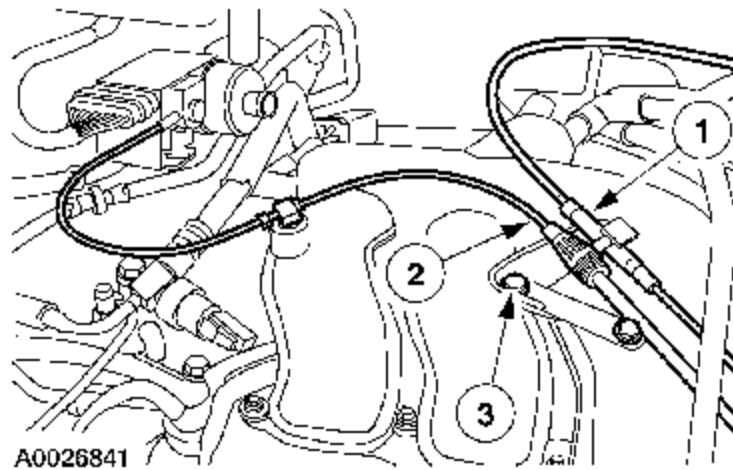
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UPPER INTAKE MANIFOLD

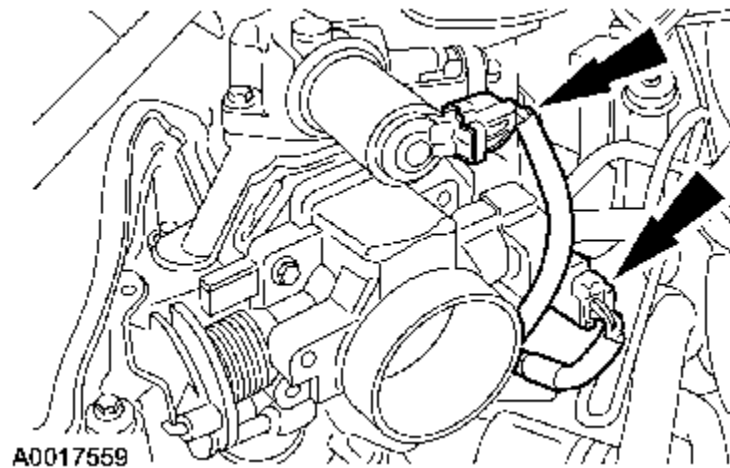
Removal



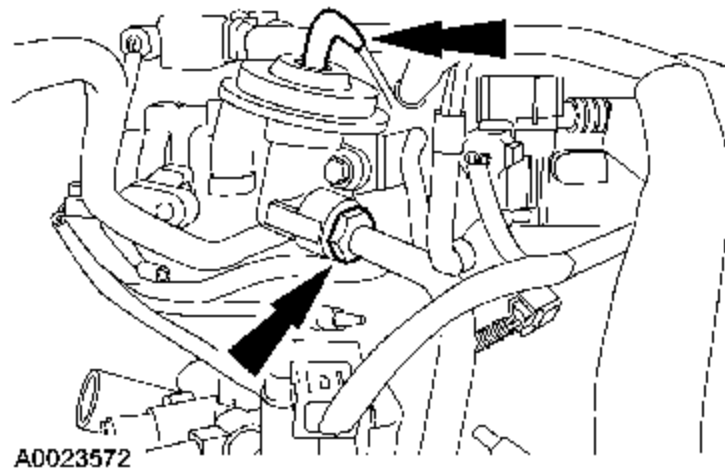
1. Remove the air cleaner outlet tube.
 - a. Remove the vacuum hose.
 - b. Loosen the clamps.
 - c. Remove the air cleaner outlet tube.



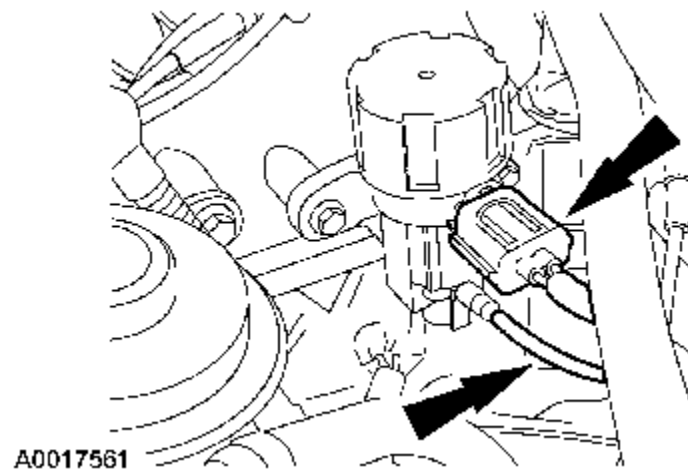
1. Disconnect the cables.
 - a. Disconnect the throttle cable.
 - b. If equipped, disconnect the cruise control cable.
 - c. Remove the throttle cable bracket bolts.



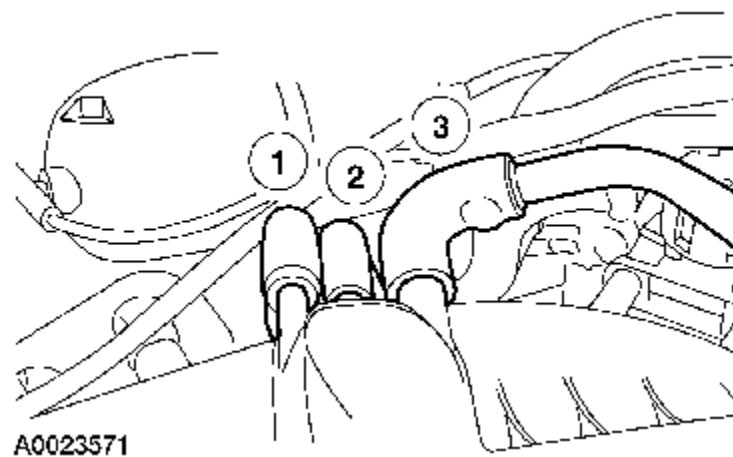
1. Disconnect the throttle position (TP) sensor and idle air control (IAC) electrical connectors.



1. Disconnect the exhaust gas recirculation (EGR) valve vacuum hose and EGR tube nut.

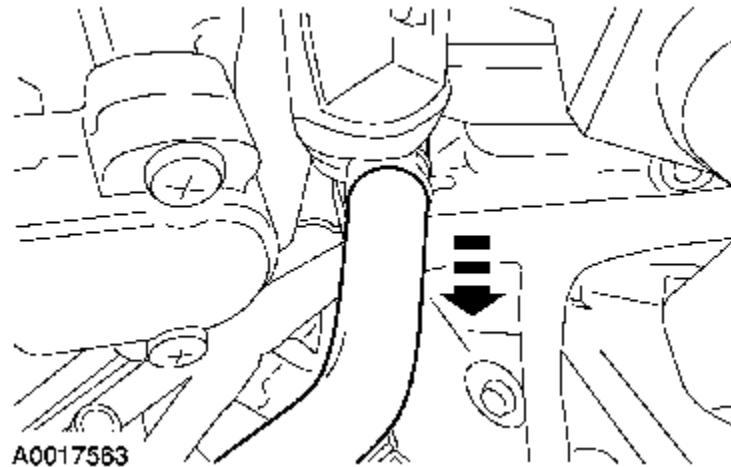


1. Disconnect the EGR vacuum regulator valve electrical connector and vacuum hose.

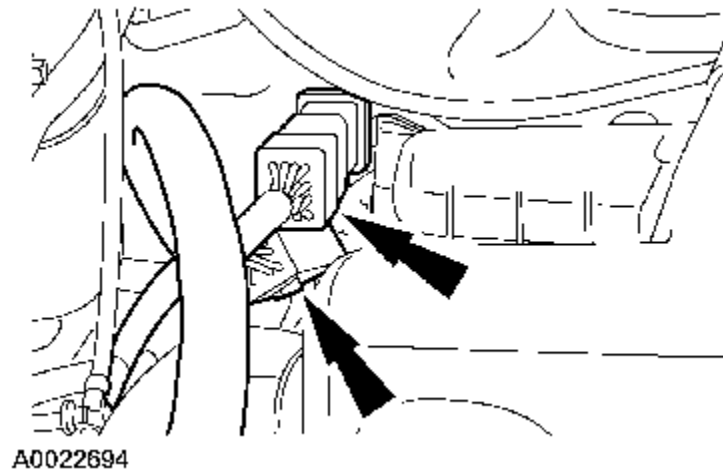


1. Disconnect the three vacuum hoses on the back of the intake manifold.

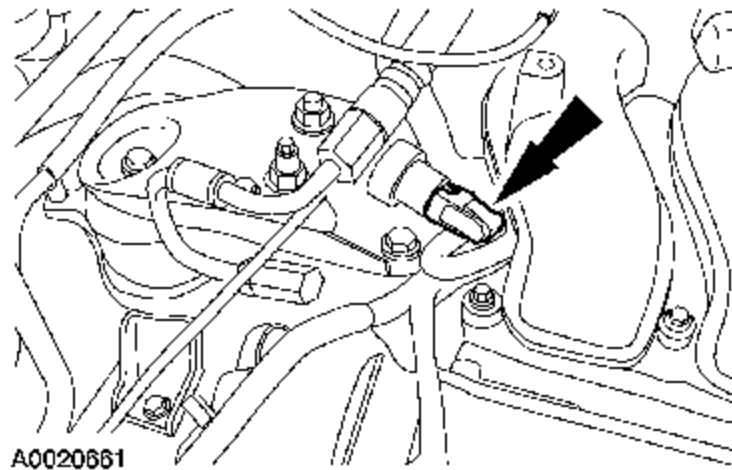
- a. Connect the chassis vacuum hose.
- b. Connect the engine vacuum hose.
- c. Connect the positive crankcase ventilation (PCV) hose.



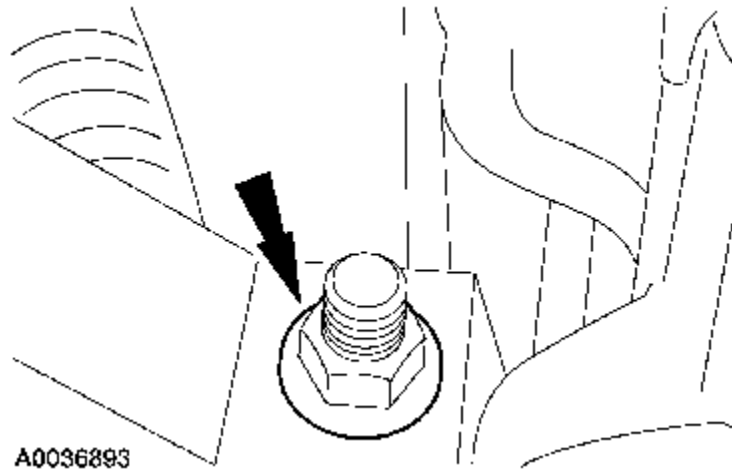
1. Disconnect the vapor management valve (VMV) vacuum hose.



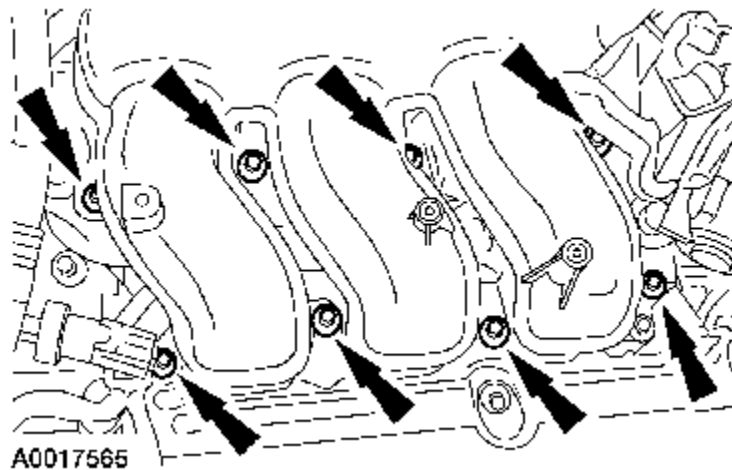
1. Disconnect the two electrical connectors attached to the left side of the upper intake manifold.



1. Disconnect the power steering pressure (PSP) sensor electrical connector.
2. Position the transaxle vent hose aside.



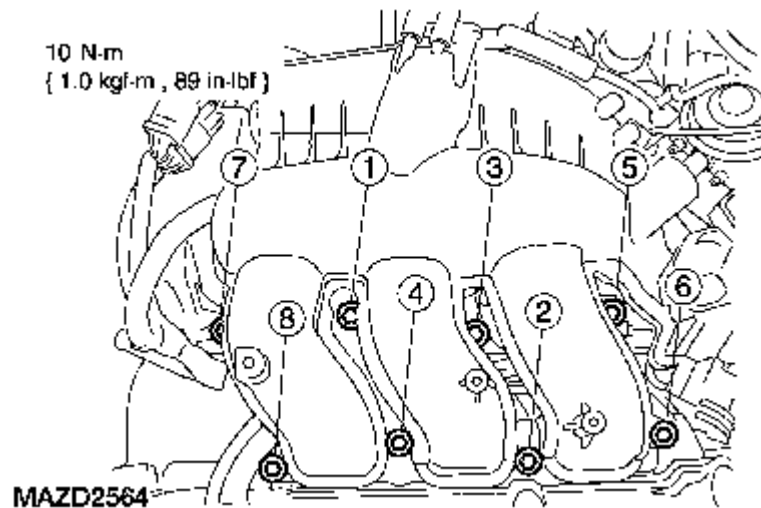
1. Remove the nut from the wire harness.



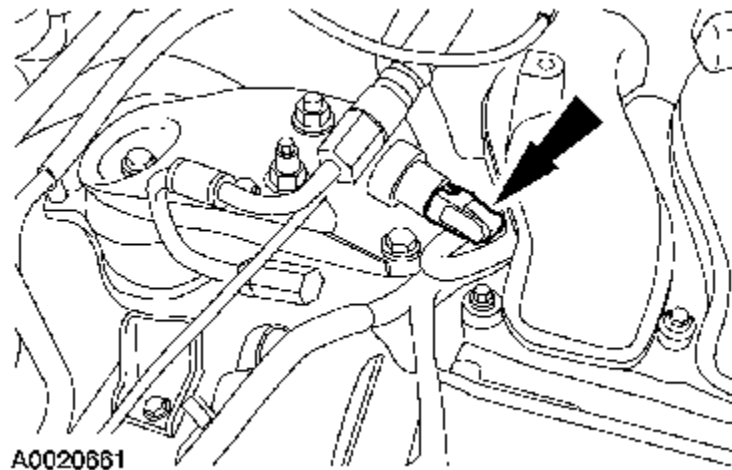
1. Remove the eight bolts and the upper intake manifold.
 - Remove and inspect the gaskets. Discard if damaged.
 - Clean all sealing surfaces.

Installation

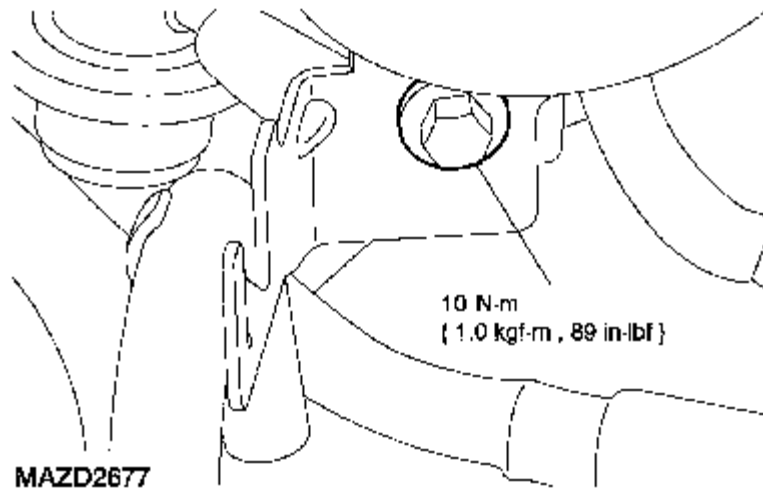
1. Position the gaskets in the upper intake manifold.



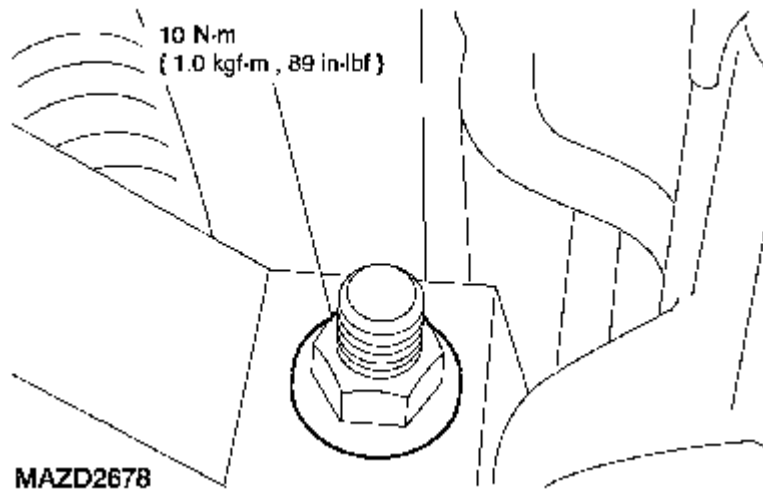
1. Position the upper intake manifold and tighten the bolts in the sequence shown.



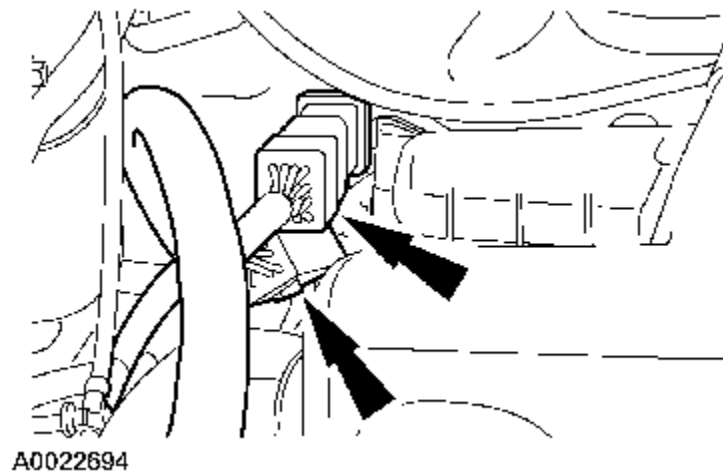
1. Connect the PSP electrical connector.



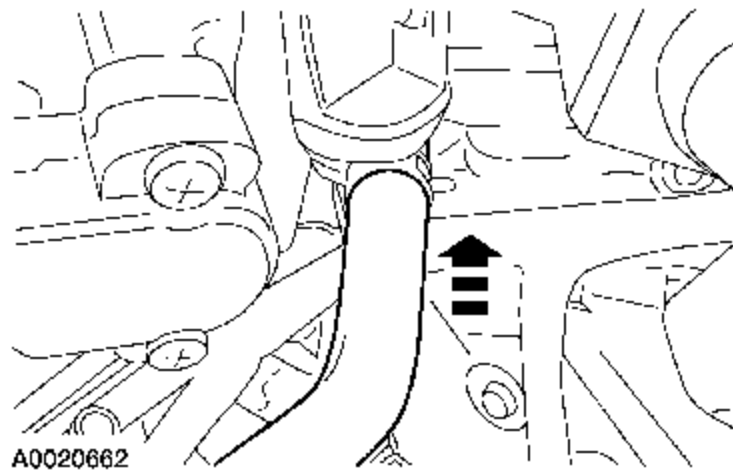
1. Install the transaxle vent tube and bracket.



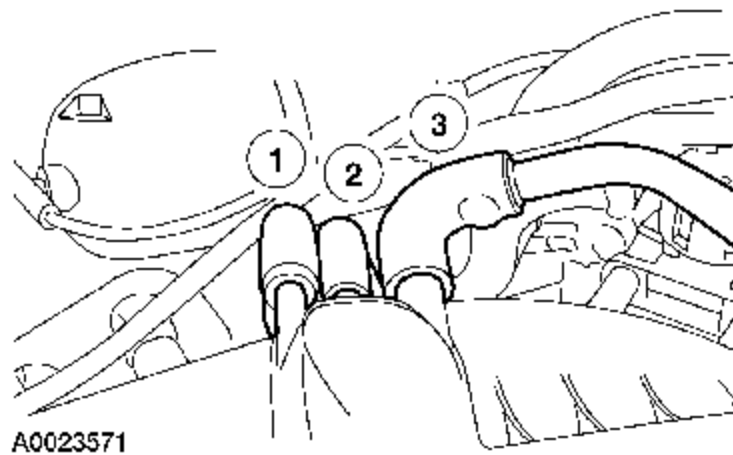
1. Position the wire harness and install the nut.



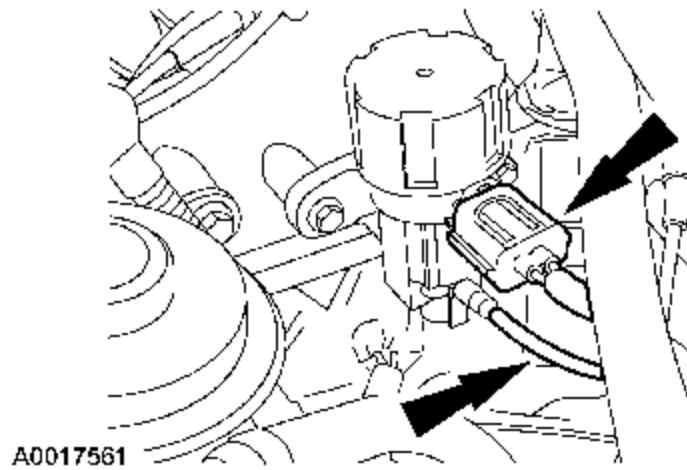
1. Install the two electrical connectors on the left side of the intake manifold.



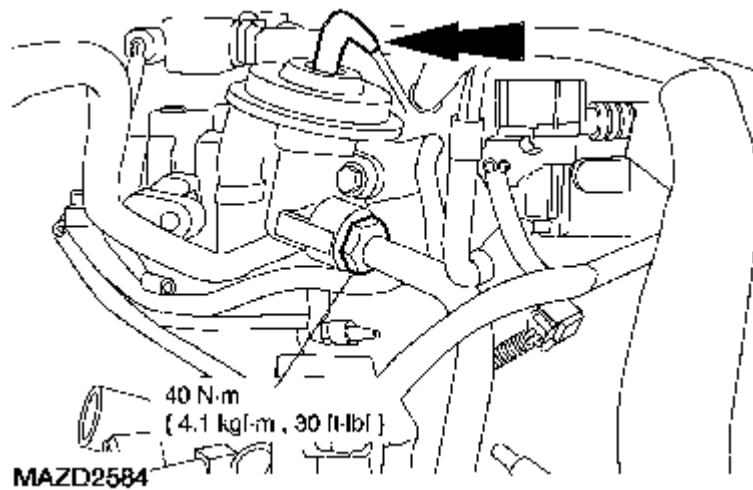
1. Install the vapor management valve (VMV) vacuum hose.



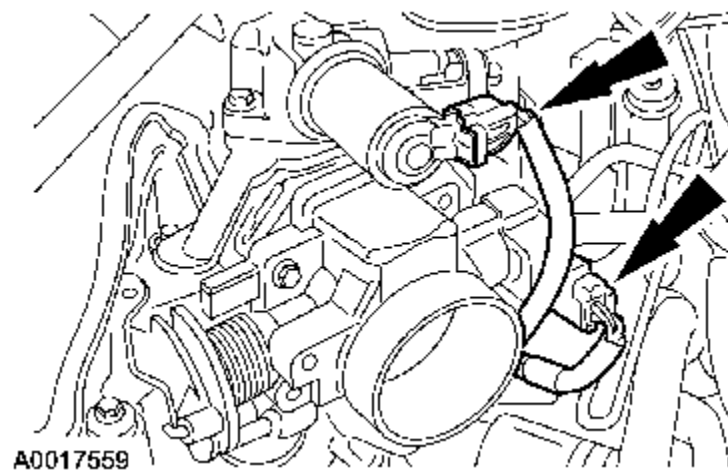
1. Connect the three vacuum hoses on the back of the upper intake manifold.
 - a. Connect the chassis vacuum hose.
 - b. Connect the engine vacuum hose.
 - c. Connect the PCV hose.



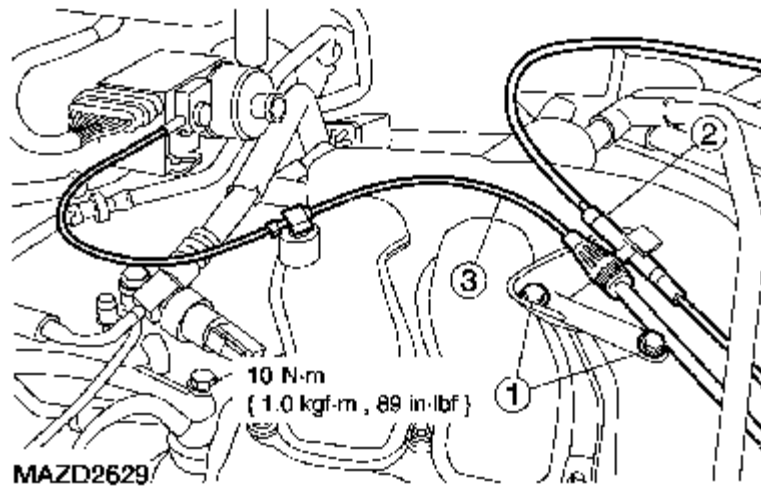
1. Connect the E.G.R. Vacuum regulator electrical connector.



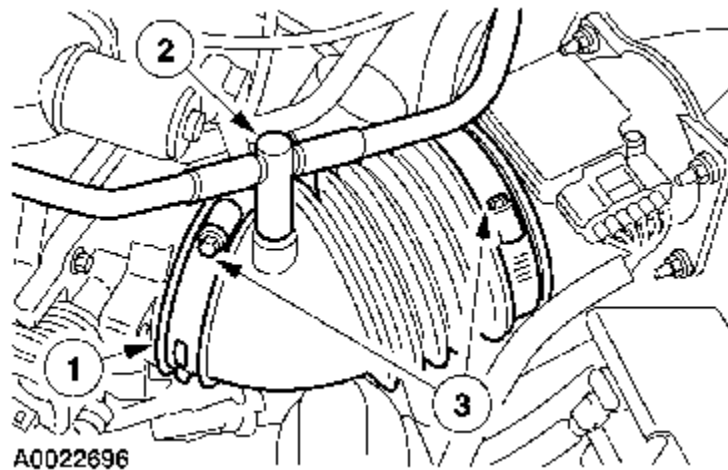
1. Install the EGR valve vacuum hose and EGR tube nut.



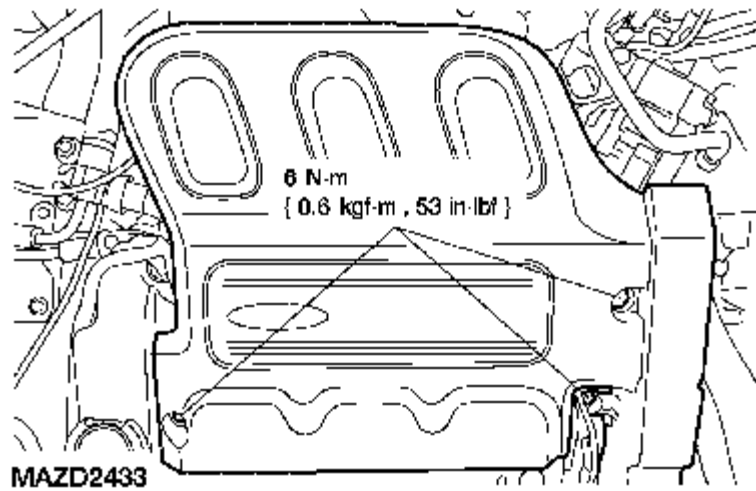
1. Connect the TP sensor and IAC electrical connectors.



1. Connect the throttle cables.
 - a. Install the throttle cable bracket bolts.
 - b. Connect the throttle cable.
 - c. If equipped, connect the cruise control cable.



1. Install the air cleaner outlet tube.
 - a. Position the air cleaner outlet tube.
 - b. Install the hoses.
 - c. Install the clamps.



1. Install the splash shield.

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VIN or Model Year 2004 Model TRIBUTE valve cover RH

☐ General Information ☐ Engine ☐ Suspension ☐ Transmission/Transaxle ☐ HV/
☐ Multiplex Communication System ☐ Steering ☐ Brakes ☐ DriveLine/Axle ☐ Restrain

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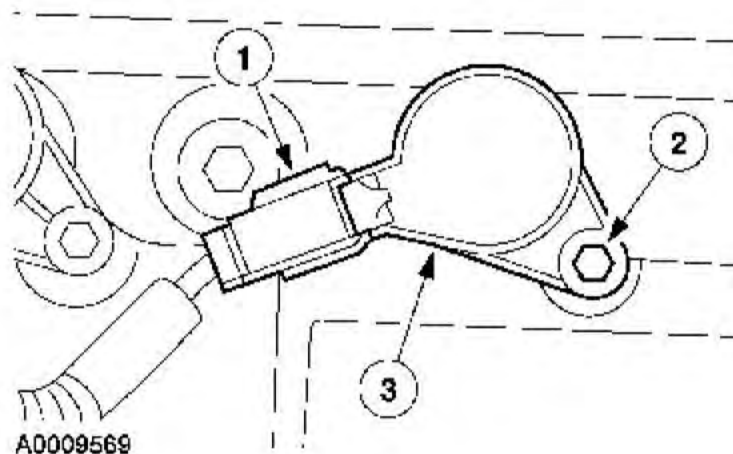
VALVE COVER — RH

Removal

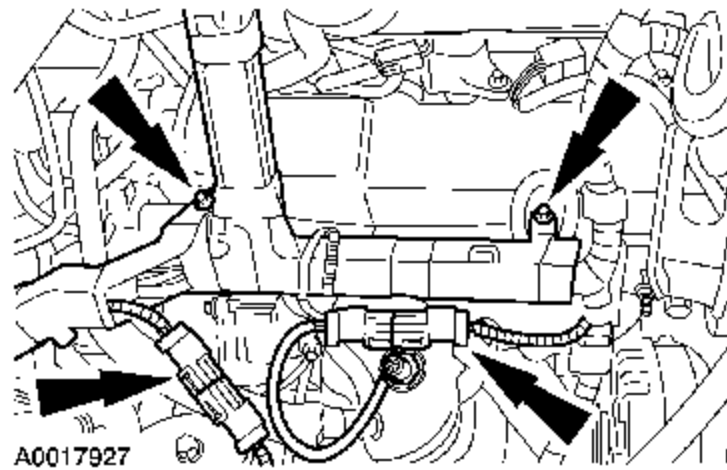
1. Remove the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

NOTE:

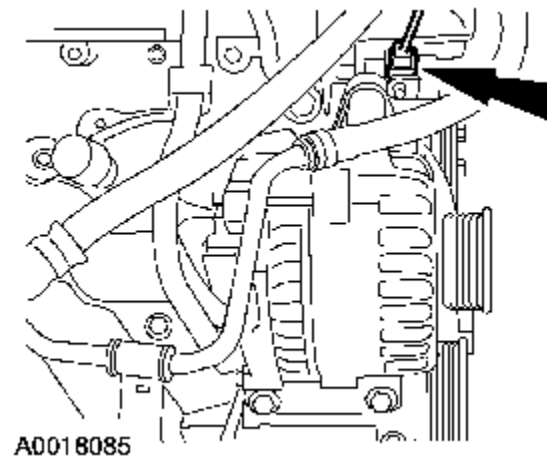
When removing the coil-on-plugs, a slight twisting motion will break the seal and ease removal.



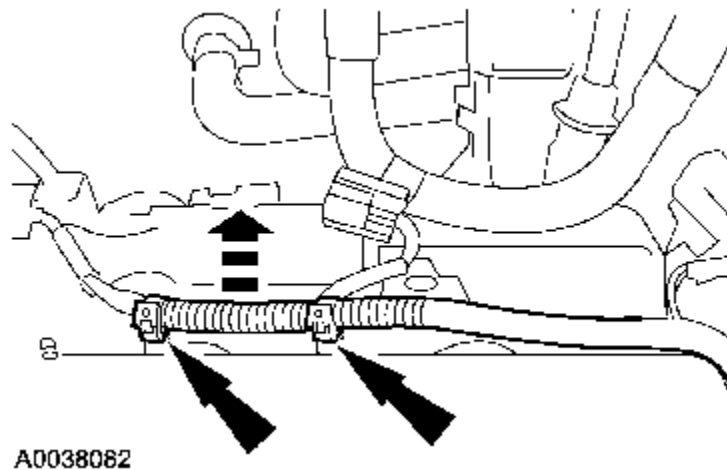
1. Remove the RH coil-on-plugs.
 - a. Disconnect the three electrical connectors.
 - b. Remove the three bolts.
 - c. Remove the RH coil-on-plugs.



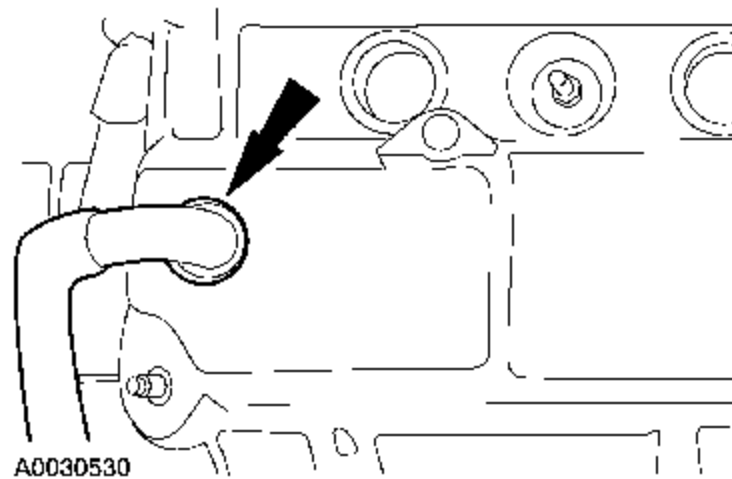
1. Remove the wiring harness nuts and disconnect the oxygen sensor electrical connectors.



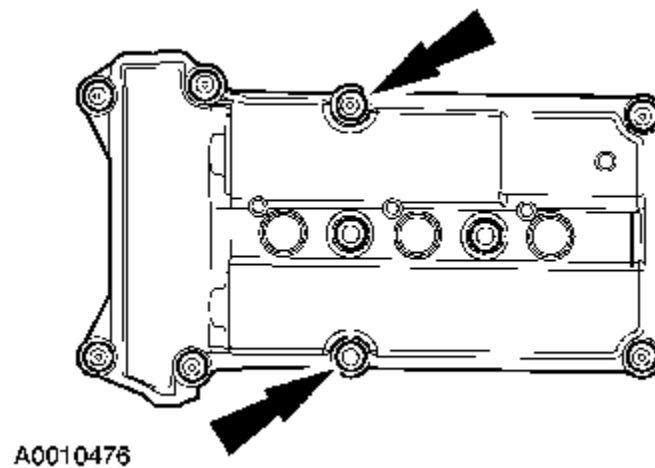
1. Disconnect the radio ignition interference capacitor.



1. Separate the harness from the center locating pins and position aside.



1. Disconnect the crankcase ventilation tube from the valve cover.



1. Remove the bolts, studs and the RH valve cover.
 - Remove and discard the gasket.

Installation

NOTE:

Clean the valve cover sealing area before installing a new gasket.

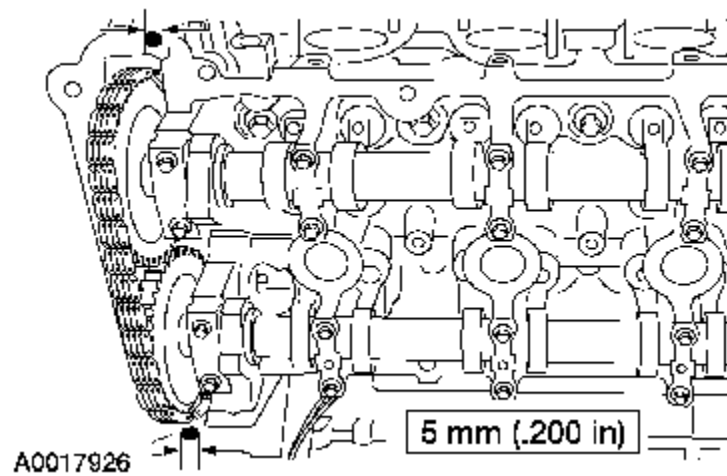
1. Install a new valve cover gasket.

NOTE:

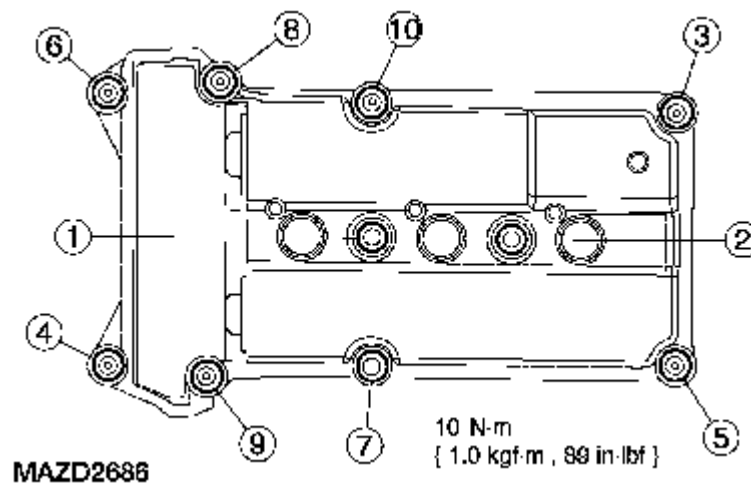
Clean the head and front cover sealing surfaces using metal surface cleaner before applying silicone gasket and sealant.

NOTE:

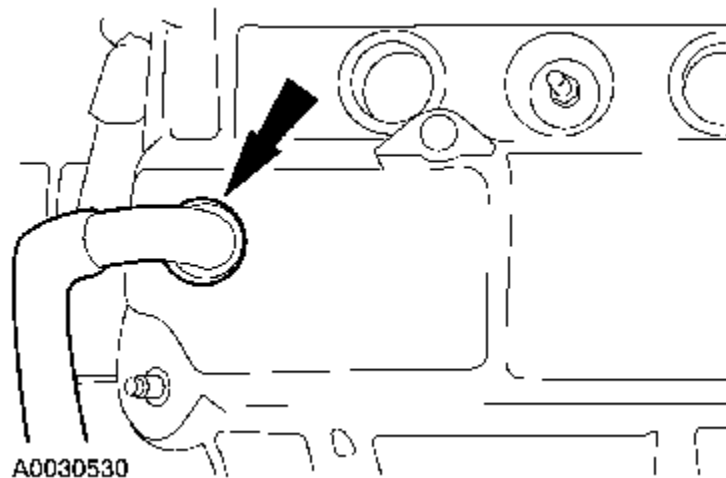
The valve cover must be installed and the bolts tightened within four minutes of applying the sealant.



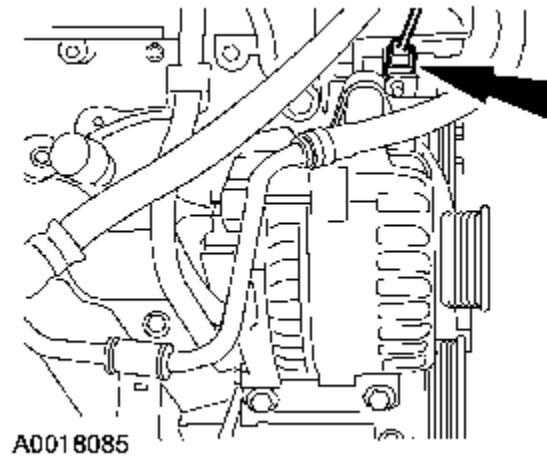
1. Apply a 5 mm dot of silicone gasket sealant to the front cover to cylinder head joints.



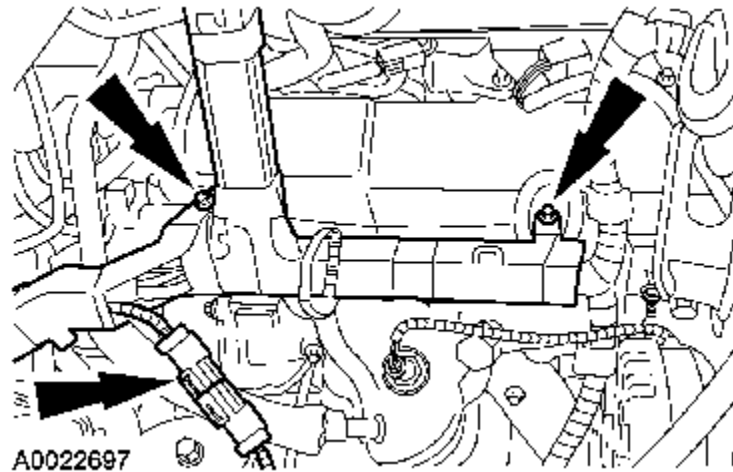
1. Position the valve cover and install the bolt and the studs in the sequence shown.



1. Connect the crankcase ventilation tube to the valve cover.



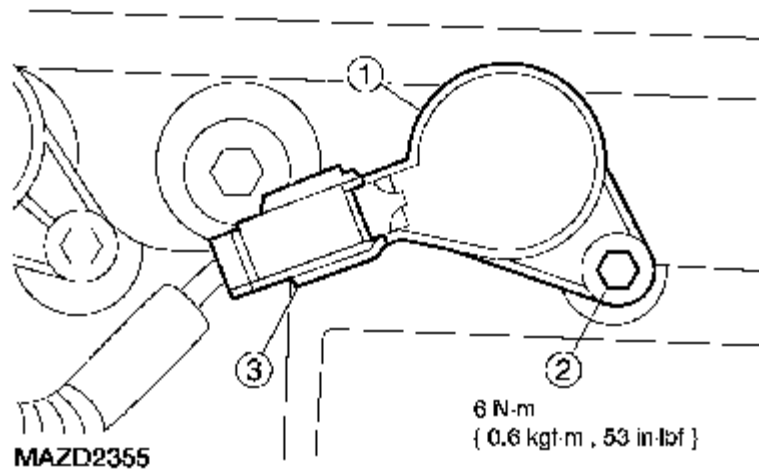
1. Connect the radio ignition interference capacitor.



1. Connect the oxygen sensor electrical connectors and wiring harness to the RH valve cover stud.

NOTE:

Apply a light film of brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.



1. Install the RH coil-on-plugs.
 - a. Position the RH coil-on-plugs.
 - b. Install the three bolts.
 - c. Connect the three electrical connectors.
2. Install the upper intake manifold. Refer to [01-13B UPPER INTAKE MANIFOLD](#).

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VIN or Model Year 2004 Model TRIBUTE valve seals

☐ General Information	☐ Engine	☐ Suspension	☐ Transmission/Transaxle	☐ HVAC
☐ Multiplex Communication System	☐ Steering	☐ Brakes	☐ DriveLine/Axle	☐ Restraints

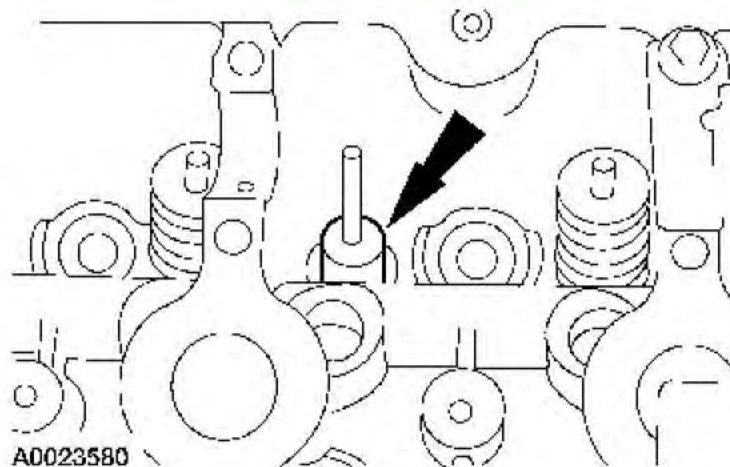
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VALVE SEALS

Removal

1. Remove the valve spring. Refer to [01-10C VALVE SPRING](#).



- 1.

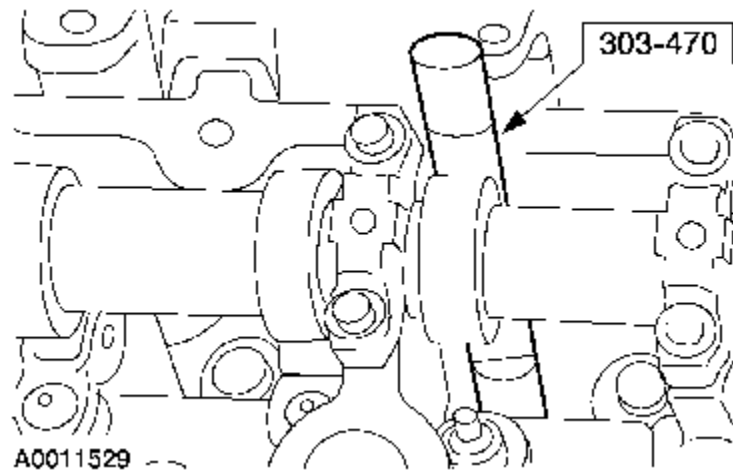
NOTE:

Camshaft removed for clarity. Remove the valve seal.

Installation

NOTE:

Lubricate the valve guide with SAE 5W-20 motor oil.



1. Using the special tool, install the valve seal.
2. Install the valve spring. Refer to [01-10C VALVE SPRING](#).

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VIN or Model Year 2004 Model TRIBUTE roller 1[General Information](#) ☐ [Engine](#) ☐ [Suspension](#) ☐ [Transmission/Transaxle](#) ☐ [HVAC](#) ☐ [V](#)
[Multiplex Communication System](#) ☐ [Steering](#) ☐ [Brakes](#) ☐ [DriveLine/Axle](#) ☐ [Restraints](#) ☐ [Bo](#)[< Previous](#) [Next >](#)

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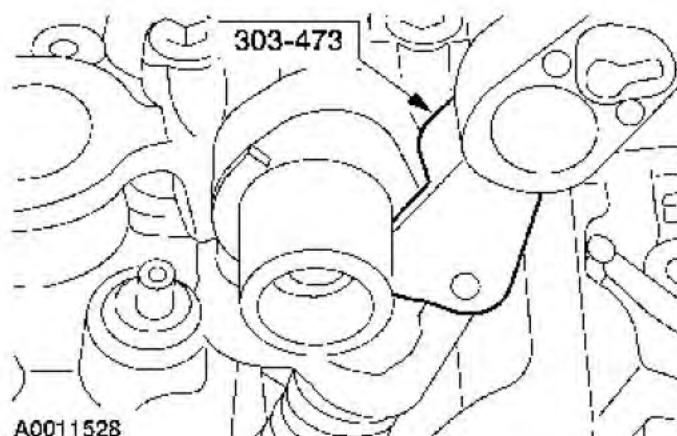
VALVE SPRING

Removal and Installation

1. Remove the roller followers. Refer to [01-10C ROLLER FOLLOWERS](#).
- 2.

NOTE:

If air pressure has forced the piston to the bottom of the cylinder, any loss of air pressure will allow the valve(s) to fall into the cylinder. A rubber band, tape or string wrapped around the end of the valve stem will prevent this from happening. Pressurize the cylinder using compressed air.



1. Using the special tool, remove the key, retainer, and valve spring.
2. To install, reverse the removal procedure.

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