

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

2006 ENGINE**Engine - 3.0L (4V) - Fusion, Milan & Zephyr****SPECIFICATIONS****GENERAL SPECIFICATIONS****GENERAL SPECIFICATIONS**

Item	Specification
Lubricants and Sealants	
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket Remover ZC-30	-
Motorcraft Metal Surface Prep ZC-31	-
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Silicone Brake Caliper Grease and Dielectric Compound XG-3-A	ESE-M1C171-A
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Motorcraft Premium Gold Engine Coolant with Bittering Agent (US only) VC-7-B (US); CVC-7-A (Canada); or equivalent (yellow color)	WSS-M97B51-A1
Thread Sealant with PTFE TA-24	WSK-M2G350-A2
Engine	
Displacement	3.0L (4V) (182 CID)
No. cylinders	6
Bore/stroke	89.0 x 79.5 mm (3.5 x 3.13 in)
Fire order	1-4-2-5-3-6
Oil pressure (Minimum at 1,500 RPM with engine warmed up after 10 minutes of idling)	76 kPa (11 psi)
Oil capacity (includes filter change)	5.7L (6.0 qt)
Spark plug	AGSF-32M Gap = 1.30-1.40 mm (0.052-0.56 inch)
Cylinder Head and Valve Train	
Cylinder head gasket surface flatness	-
Combustion chamber volume	52 cc (3.17 CI)
Valve arrangement (front to rear)	LH intake I-I-I-I-I-I LH exhaust E-E-E-E-E-E RH intake I-I-I-I-I-I RH exhaust E-E-E-E-E-E
Valve guide bore inner diameter	6.015-6.044 mm (0.236-0.237 in)
Valve stem diameter - intake	5.975-5.995 mm (0.2350-0.2358 in)
Valve stem diameter - exhaust	5.950-5.970 mm (0.2343-0.2350 in)
Valve stem-to-guide clearance - intake	0.019-0.069 mm (0.0007-0.0027 in)

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Valve stem-to-guide clearance - exhaust	0.045-0.094 mm (0.0017-0.037 in)
Valve head diameter - intake	35 mm (1.38 in)
Valve head diameter - exhaust	30 mm (1.18 in)
Valve head diameter (intake) - gauge diameter	33.5 mm (1.3189 in)
Valve head diameter (exhaust) - gauge diameter	28.0 mm (1.10236 in)
Valve face runout	0.05 mm (0.001 in)
Valve face angle	45.5 degrees
Valve seat width - intake	1.1-1.4 mm (0.043-0.055 in)
Valve seat width - exhaust	1.4-1.7 mm (0.055-0.066 in)
Valve seat runout	0.04 mm (0.001 in)
Valve seat angle	44.75 degrees
Valve spring free length (approx.)	46.6 mm (1.84 in)
Valve spring squareness	2.5%
Valve spring compression pressure (N @ spec, length)	693 N @ 30.09 mm (156 lbs @ 1.18 in)
Valve spring installed height	39.89 mm (1.57 in)
Valve spring installed pressure (N @ spec, length)	240 N @ 39.89 mm (53.95 lbs @ 1.57 in)
Valve spring installed pressure - service limit	10% force loss @ specified height
Roller follower ratio @ max. lift	2.0:1
Hydraulic Lash Adjuster	
Diameter (standard)	16-15.988 mm (0.6290-0.6294 in)
Clearance to bore	0.018-0.069 mm (0.0007-0.0027 in)
Hydraulic leakdown rate	5-25 seconds
Collapsed lash adjuster gap	0.50-1.11 mm (0.019-0.043 in)
Camshaft	
Theoretical valve lift @ 0 lash	9.80 mm (0.388 in)
Lobe lift	4.80 mm (0.189 in)
Allowable lobe lift loss	0.76 mm (0.03 in)
Journal diameter (all)	26.962-26.936 mm (1.061-1.060 in)
Camshaft journal bore inside diameter	27.012-26.987 mm (1.063-1.062 in)
Camshaft journal-to-bearing clearance - standard	0.025-0.076 mm (0.001-0.0029 in)
Camshaft journal-to-bearing clearance - service limit	0.121 mm (0.0047 in)
Runout	-
End play - service limit	0.190 mm (0.00748 in)
Cylinder Block	
Cylinder bore diameter - grade 1	89.000-89.010 mm (3.50393-3.504323 in)
Cylinder bore diameter - grade 2	89.010-89.020 mm (3.504323-3.504717 in)
Cylinder bore diameter - grade 3	89.020-82.030 mm (3.504717-3.50511 in)
Cylinder bore maximum taper	0.020 mm (0.0008 in)
Cylinder bore maximum out-of-round	0.015 mm (0.0005 in)

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Cylinder bore maximum out-of-round - service limit	0.020 mm (0.0007 in)
Main bearing bore inside diameter	67.998-68.022 mm (2.677-2.6780 in)
Head gasket surface flatness	-
Crankshaft	
Main bearing journal diameter	62.968-62.992 mm (2.467-2.479 in)
Main bearing journal maximum taper	0.008 mm (0.0003 in)
Main bearing journal maximum out-of-round	0.006 mm (0.0002 in)
Main bearing journal-to-cylinder block clearance	0.024-0.072 mm (0.0009-0.003 in)
Connecting rod journal diameter	49.969-49.991 mm (1.967-1.968 in)
Connecting rod journal maximum taper	0.008 mm (0.0003 in)
Connecting rod journal maximum out-of-round	0.006 mm (0.0002 in)
Crankshaft maximum end play	0.135-0.255 mm (0.005-0.010 in)
Piston and Connecting Rod	
Piston diameter - coated, grade 1	88.990-89.010 mm (3.5035-3.5043 in)
Piston diameter - coated, grade 2	88.998-89.022 mm (3.5039-3.5048 in)
Piston diameter - coated, grade 3	89.010-89.030 mm (3.5043-3.5051 in)
Piston diameter - uncoated, grade 1	88.970-88.980 mm (3.50275-3.50314 in)
Piston diameter - uncoated, grade 2	88.978-88.992 mm (3.50306-3.50362 in)
Piston diameter - uncoated, grade 3	89.010-89.030 mm (3.50432-3.50511 in)
Piston-to-cylinder bore clearance	0.012 to 0.022 mm (0.0005-0.0009 in)
Piston ring end gap - compression (top, gauge diameter) ⁽¹⁾	0.100-0.250 mm (0.0039-0.0098 in)
Piston ring end gap - compression (bottom, gauge diameter)	0.27-0.42 mm (0.0106-0.0165 in)
Piston ring end gap - oil ring (steel rail, gauge diameter)	0.15-0.65 mm (0.0059-0.0255 in)
Piston ring end gap - compression (top, service limit)	0.50 mm (0.0196 in) max
Piston ring end gap - compression (bottom, service limit)	0.65 mm (0.0255 in) max
Piston ring end gap - oil ring (steel rail, service limit)	0.90 mm (0.0354 in) max
Piston ring groove width - compression (top)	1.230-1.245 mm (0.0484-0.0490 in)
Piston ring groove width - compression (bottom)	1.530-1.545 mm (0.0602-0.0608 in)
Piston ring groove width - oil ring	3.030-3.055 mm (0.1192-0.0120 in)
Piston ring width	-
Piston ring-to-groove clearance	-
Piston pin bore diameter	21.008-21.012 mm (0.8270-0.8272 in)
Piston pin diameter	21.011-21.013 mm (0.8271-0.8273 in)
Piston pin length	60.51-60.08 mm (2.382-2.365 in)
Piston pin-to-piston fit	0.002 to 0.009 mm (0.00007-0.0003 in)
Piston-to-connecting rod clearance	-

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Connecting rod-to-pin clearance - standard	0.004-0.02 mm (0.0001-0.0007 in)
Connecting rod-to-pin clearance - service limit	0.035 mm (0.0013 in)
Connecting rod pin bore diameter	21.017-21.031 mm (0.827-0.828 in)
Connecting rod length (center-to-center)	138.06-138.14 mm (5.435-5.38 in)
Connecting rod maximum allowed bend	0.038 per 25 mm (0.0014 per 0.984 in)
Connecting rod maximum allowed twist	0.050 per 25 mm (0.0019 per 0.984 in)
Connecting rod bearing bore diameter	53.015-53.035 mm (2.0872-2.0879 in)
Connecting rod bearing-to-crankshaft clearance	0.028-0.066 mm (0.001-0.0025 in)
Connecting rod side clearance	0.100-0.30 mm (0.0039-0.0118 in)
(1) Specification 82.4 mm (3.2441 in) diameter gauge	

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS**

Description	Nm	lb-ft	lb-in
A/C compressor bolts	25	18	-
A/C compressor bracket bolts	25	18	-
A/C manifold bolt	15	11	-
A/C tube connection bolts	8	-	71
A/C tube retaining bolts	8	-	71
Accessory drive belt tensioner bolt	45	33	-
Accessory drive belt idler (grooved) pulley bolt	25	18	-
Accessory drive belt idler (non-grooved) pulley bolt	48	35	-
Block heater	41	30	-
Camshaft bearing cap bolts ⁽¹⁾	-	-	-
Camshaft thrust bearing cap bolts ⁽¹⁾	-	-	-
Camshaft oil seal retainer bolts	10	-	89
Camshaft position (CMP) sensor electrical connector bracket bolt	12	9	-
Catalyst monitor sensor bracket bolt	12	9	-
Catalytic converter heat shield bolts	11	8	-
Catalytic converter studs	12	9	-

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Catalytic converter nuts	20	15	-
Catalytic converter-to-engine bracket bolts	35	26	-
Catalytic converter bracket-to-converter bolts	20	15	-
Coolant bypass tube nuts	20	15	-
Coolant pump drive pulley cover	6	-	53
Coolant pump bolts	10	-	89
Crankshaft pulley bolt ⁽¹⁾	-	-	-
Crankcase cover bolts	10	-	89
Cylinder head bolts ⁽¹⁾	-	-	-
Exhaust gas recirculation (EGR) tube nuts	40	30	-
EGR valve bolts	25	18	-
Engine front cover bolts (1)	-	-	-
Engine oil filter ⁽¹⁾	-	-	-
Engine cover ball studs	4	-	35
Engine mount bracket bolt	115	85	-
Engine mount bracket nuts	63	46	-
Engine mount damper bolt	23	17	-
Engine mount nut and bolts	55	41	-
Engine roll-restrictor bolts	90	66	-
Flexplate bolts	80	59	-
Generator bolts and stud bolt	48	35	-
Generator B+ terminal nut	6	-	53
Ground wire-to-engine mount bracket bolt	10	-	89
Ground wire-to-transaxle bolt	12	9	-
Halfshaft carrier bearing bracket bolts	55	41	-
Ignition coil-on-plug bolts	7	-	62
Intermediate steering	23	17	-

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shaft bolt			
Knock sensor (KS) bolt	20	15	-
Lower ball joint nuts	200	148	-
Lower control arm-to-strut through bolt	103	76	-
Lower intake manifold bolts	10	-	89
Oil level indicator tube stud bolt	9	-	80
Oil pan baffle nuts ⁽¹⁾	-	-	-
Oil pan bolts and stud bolts ⁽¹⁾	-	-	-
Oil pan-to-engine front cover bolts	25	18	-
Oil pan-to-transaxle bolts	48	35	-
Oil pan drain plug	26	19	-
Oil pressure sender	14	10	-
Oil pump bolts ⁽¹⁾	-	-	-
Oil pump screen and pickup tube bolts	10	-	89
Oil separator cover bolts	10	-	89
Power steering pump bolts	25	18	-
Power steering pressure (PSP) tube bracket-to-cylinder head bolt	9	-	80
PSP tube bracket-to-reservoir bolt	9	-	80
PSP tube bracket-to-steering gear bolt	9	-	80
Power steering reservoir nuts	9	-	80
PSP tube banjo bolts	35	26	-
Radio frequency interference capacitor nut	6	-	53
Spark plugs	15	11	-
Starter motor bolts	27	20	-
Starter B+ terminal nut	12	9	-
Starter S terminal nut	5	-	44
Subframe nuts	150	111	-
Subframe bracket bolts	103	76	-
Sway bar link nuts	40	30	-

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Throttle body bolts	10	-	89
Tie rod end nuts	48	35	-
Timing chain tensioner bolts	25	18	-
Torque converter-to-flexplate nuts	36	27	-
Transaxle control cable bracket	8	-	71
Transaxle-to-engine bolts	48	35	-
Transaxle mount bolts	90	66	-
Upper intake manifold bolts ⁽¹⁾	-	-	-
Vacuum tube bracket	10	-	89
Variable camshaft timing (VCT) actuator bolts ⁽¹⁾	-	-	-
VCT assembly bolts	25	18	-
Valve cover bolts and stud bolts ⁽¹⁾	-	-	-
Windshield washer bottle and A/C tube retaining bolt	7	-	62

(1) Refer to the appropriate procedure.

DESCRIPTION AND OPERATION

ENGINE

The 3.0L Duratec is a 4-valve-per-cylinder, dual overhead camshaft engine. The engine uses a distributorless ignition system. The cylinder block is a 2-piece design with the upper portion housing the cylinders and a separate lower cylinder block containing the main bearing caps. Both sections are made of aluminum, with inserts for the bearing areas and caps. An aluminum oil pan bolts to the bottom of the lower cylinder block and to the transaxle to provide greater strength.

The camshafts are mounted in the cylinder heads and act against a roller follower to open and close the valves. A hydraulic lash adjuster is located on one side of the roller follower and the valve tip on the opposite end. The camshafts are driven off the front of each cylinder head by 2 chains (one each side). Both of the chains are driven by sprockets that are located on the crankshaft, just in front of the oil pump.

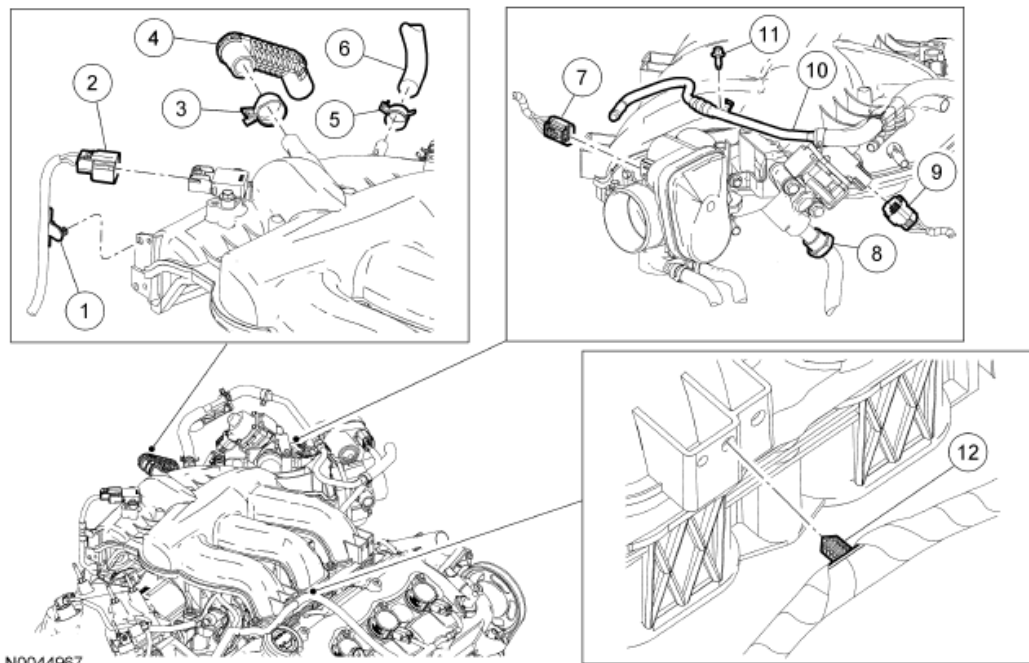
DIAGNOSIS AND TESTING

ENGINE

For basic engine mechanical concerns, refer to **ENGINE SYSTEM-GENERAL INFORMATION** . For driveability concerns, refer to the **INTRODUCTION - GASOLINE** article.

IN-VEHICLE REPAIR

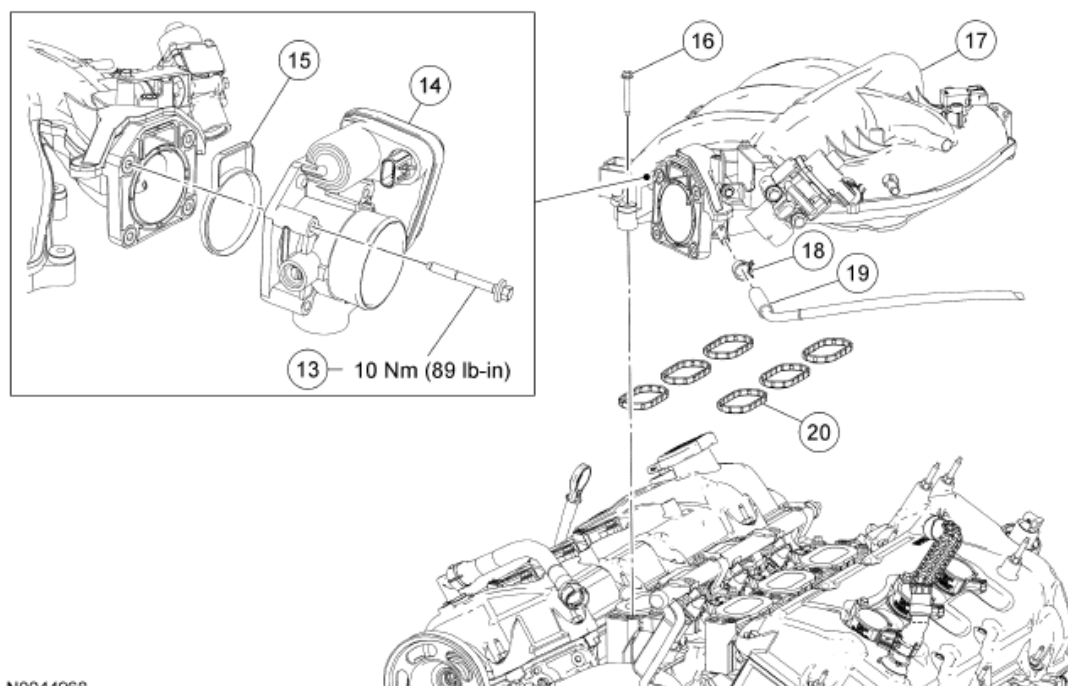
UPPER INTAKE MANIFOLD



Item	Part Number	Description
1	—	Wiring harness retainer (part of 12B637)
2	14A464	Manifold absolute pressure (MAP) sensor electrical connector (part of 12B637)
3	—	Positive crankcase ventilation (PCV) hose clamp (part of 6K817)
4	6K817	PCV hose
5	392984	Brake booster vacuum hose clamp
6	2C053	Brake booster vacuum hose

Item	Part Number	Description
7	2C053	Throttle body electrical connector (part of 12B637)
8	—	Exhaust gas recirculation (EGR) tube nut (part of 9D477)
9	14A464	EGR valve electrical connector (part of 12B637)
10	—	Vacuum tube
11	—	Vacuum tube retainer bolt
12	—	Wiring harness retainer (part of 12B637)

Fig. 1: Identifying Upper Intake Manifold Components (Items 1-12)
 Courtesy of FORD MOTOR CO.



N0044968

Item	Part Number	Description
13	W709168	Throttle body bolt (4 required)
14	9F991	Throttle body
15	9E936	Throttle body gasket
16	9Y450	Upper intake manifold bolt (8 required)
17	9424	Upper intake manifold
18	—	Clamp (part of 9D661)
19	9D661	Evaporative (EVAP) emissions tube
20	9H486	Upper intake manifold gasket (6 required)

Fig. 2: Identifying Upper Intake Manifold Components (Items 13-20) (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

Removal

1. Remove the air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING - 3.0L (4V)**.
2. Disconnect the throttle body electrical connector.
3. Remove the 4 bolts and position the throttle body aside.
 - Discard the gasket.
4. Disconnect the evaporative emissions (EVAP) tube from the intake manifold.
5. Remove the vacuum tube clamp bolt.
6. Disconnect the vacuum tube from the intake manifold.

7. Disconnect the positive crankcase ventilation (PCV) tube from the intake manifold.
8. Disconnect the exhaust gas recirculation (EGR) valve electrical connector.
9. Loosen the EGR tube-to-EGR valve nut.
10. Disconnect the manifold absolute pressure (MAP) sensor electrical connector and the pin-type retainer.
11. Detach the wiring harness retainer from the front of the upper intake manifold.
12. Remove the 8 bolts and remove the upper intake manifold.
 - Remove and discard the gaskets.

Installation

1. Clean and inspect all of the sealing surfaces of the upper intake manifold.

NOTE: Install new gaskets.

2. Install the upper intake manifold, gaskets and the 8 bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

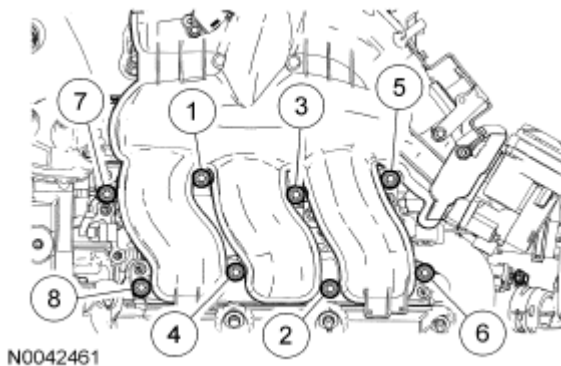


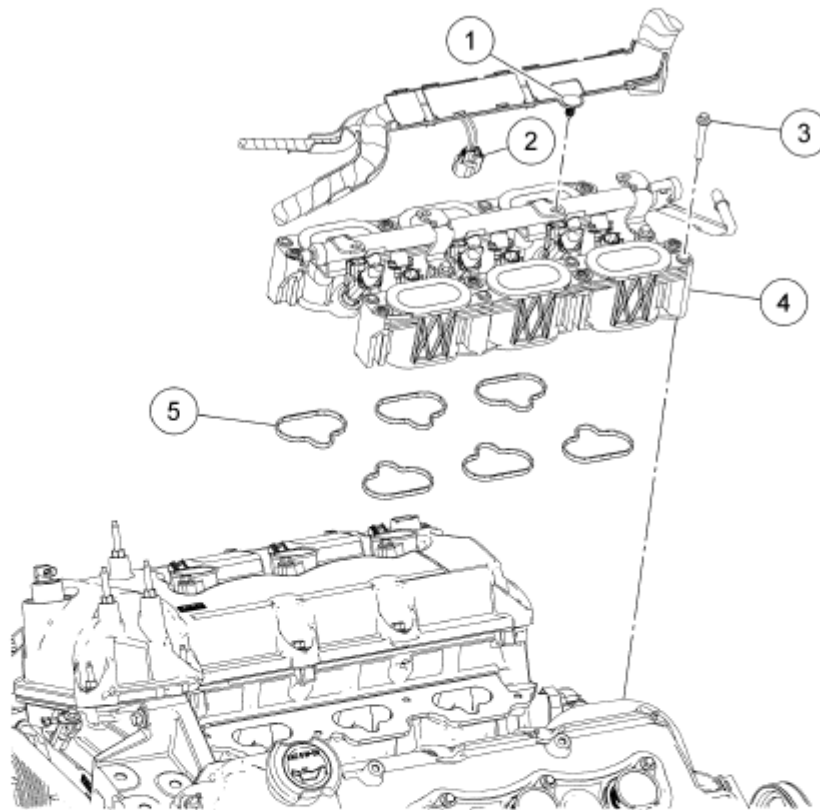
Fig. 3: Identifying Tightening Sequence Of Upper Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

3. Attach the wiring harness retainer to the front of the upper intake manifold.
4. Connect the MAP sensor electrical connector and the pin-type retainer.
5. Install the EGR tube-to-EGR valve nut.
 - Tighten to 40 Nm (30 lb-ft).
6. Connect the EGR valve electrical connector.
7. Connect the PCV tube to the intake manifold.
8. Connect the vacuum tube to the intake manifold.
9. Install the vacuum tube clamp bolt.
 - Tighten to 10 Nm (89 lb-in).
10. Connect the EVAP tube to the intake manifold.

NOTE: Install a new gasket. Install the gasket, throttle body and 4 bolts.

11. Tighten to 10 Nm (89 lb-in).
12. Connect the throttle body electrical connector.
13. Install the air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING - 3.0L (4V)**.

LOWER INTAKE MANIFOLD



N0042015

Item	Part Number	Description
1	—	Wiring harness retainer (3 required) (part of 12B637)
2	14A464	Fuel injector electrical connector (6 required) (part of 12B637)
3	W708187	Lower intake manifold bolt (8 required)
4	9K461	Lower intake manifold
5	9439	Lower intake manifold gasket (6 required)

Fig. 4: Identifying Lower Intake Manifold Components
Courtesy of FORD MOTOR CO.

Removal

WARNING: Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited, resulting in possible personal injury.

WARNING: Fuel in the fuel system remains under high pressure even when the engine is not running. Before repairing or disconnecting any of the fuel system components, the fuel system pressure must be relieved to prevent accidental spraying of fuel, causing personal injury or a fire hazard.

1. Release the fuel system pressure. For additional information refer to **FUEL SYSTEM-GENERAL INFORMATION** .
2. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
3. Remove the upper intake manifold. For additional information, refer to **UPPER INTAKE MANIFOLD**.
4. Disconnect the fuel supply tube quick connect coupling from the fuel rail. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
5. Detach the 2 wiring harness retainers from the LH valve cover stud bolts.
6. Detach the 3 pin-type retainers from the fuel rail.
7. Disconnect the 6 fuel injector electrical connectors.
8. Remove the 8 lower intake manifold bolts and the lower intake manifold.
 - Remove and discard the gaskets.

Installation

NOTE: Clean and inspect all sealing surfaces. Install new gaskets.

1. Position the lower intake manifold and install the 8 bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

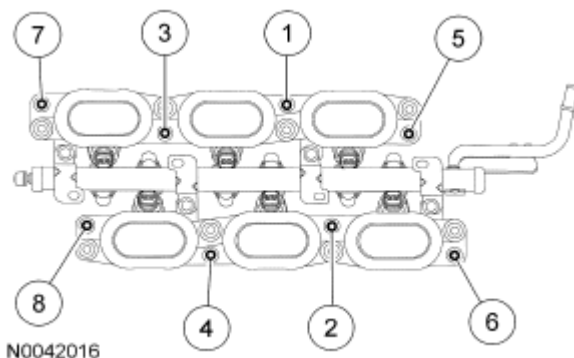


Fig. 5: Identifying Tightening Sequence Of Lower Intake Manifold Bolts

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Courtesy of FORD MOTOR CO.

2. Connect the 6 fuel injector electrical connectors.
3. Attach the 3 pin-type retainers to the fuel rail.
4. Attach the 2 wiring harness retainers to the LH valve cover stud bolts.
5. Connect the fuel supply tube quick connect coupling at the fuel rail. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
6. Install the upper intake manifold. For additional information, refer to **UPPER INTAKE MANIFOLD**.
7. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .

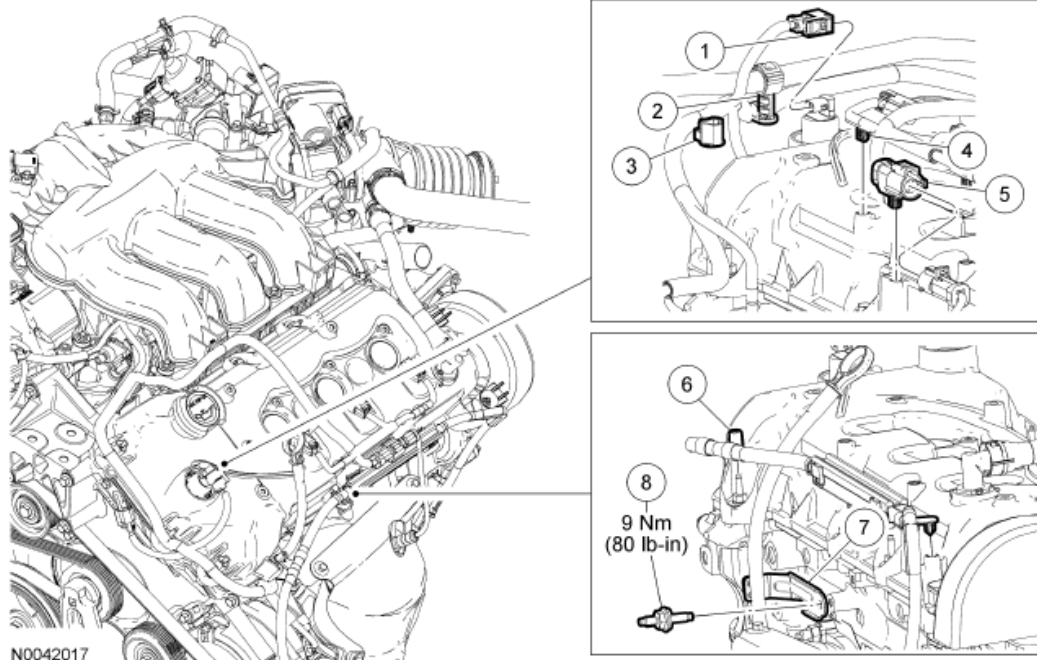
VALVE COVER - LH

MATERIAL

Item	Specification
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4

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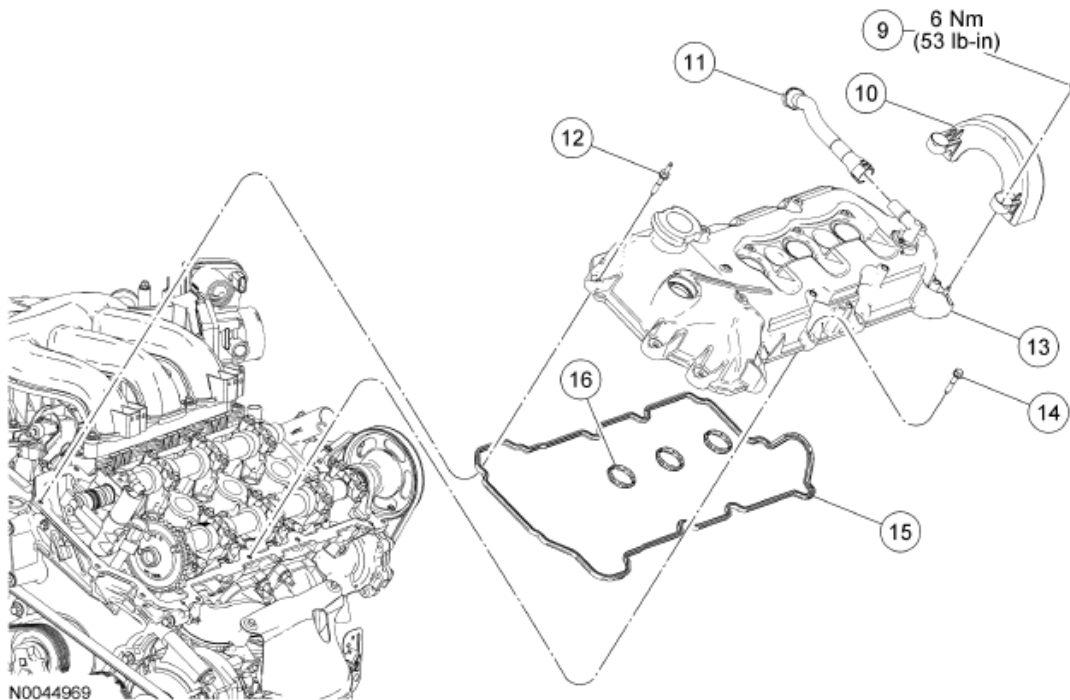
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Item	Part Number	Description
1	14A464	Variable camshaft timing (VCT) solenoid electrical connector (part of 12B637)
2	—	Power steering hose retainer clip
3	—	Wiring harness retainer (3 required) (part of 12B637)
4	13A506	Wiring harness retainer (2 required) (part of 12B637)

Item	Part Number	Description
5	14A464	Heated oxygen sensor (HO2S) electrical connector (part of 12B637)
6	—	Wiring harness retainer (3 required) (part of 12B637)
7	6754	Oil level indicator tube
8	W701822	Oil level indicator tube stud bolt

Fig. 6: Identifying Valve Cover - LH Components (Items 1-8) (With Torque Specifications)
Courtesy of FORD MOTOR CO.



Item	Part Number	Description
9	W701539	Coolant pump drive pulley cover nuts (if equipped) (2 required)
10	8A590	Coolant pump drive pulley cover (if equipped)
11	6758	Crankcase vent hose
12	6C519	Valve cover stud bolt (10 required)
13	6A505	Valve cover
14	6C519	Valve cover bolt (4 required)
15	6A559	Valve cover gasket
16	6C527	Spark plug cavity gasket (3 required)

Fig. 7: Identifying Valve Cover - LH Components (Items 9-16) (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. Remove the LH ignition coil-on-plugs. For additional information, refer to **ENGINE IGNITION - 3.0L (4V)**.
2. Remove the crankcase ventilation tube.

3. Disconnect the variable camshaft timing (VCT) solenoid electrical connector.
4. Disconnect the LH heated oxygen sensor (HO2S) electrical connector and pin type retainer.
5. Detach the power steering hose retainer from the valve cover stud bolt.
6. Remove the oil level indicator.
7. Remove the stud bolt and position the oil level indicator tube aside.
8. Detach the 6 wiring harness retainers from the valve cover stud bolts.
9. Detach the 2 pin-type retainers from the valve cover and position the wiring harness aside.
10. If equipped, remove the 2 nuts and the coolant pump drive pulley cover.
11. Remove the 4 bolts, 10 stud bolts and the valve cover.
 - Discard the gaskets.

Installation

1. Clean the valve cover, cylinder head and front cover sealing surfaces with metal surface cleaner and install new valve cover and spark plug cavity gaskets.

NOTE: **The valve cover must be installed and the bolts and stud bolts tightened within 4 minutes of sealant application.**

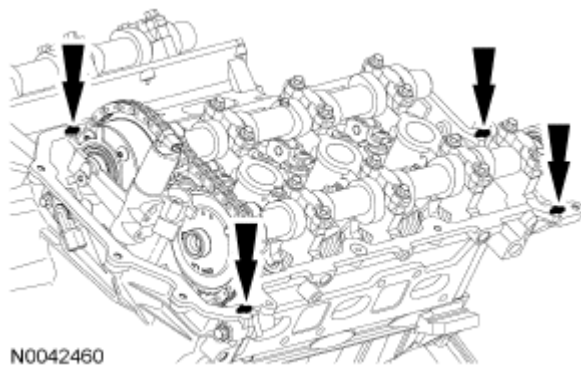


Fig. 8: Locating Silicone Gasket Sealant
Courtesy of FORD MOTOR CO.

2. Apply an 8 mm (0.31 in) dot of silicone gasket sealant to the front cover-to-cylinder head joints and the camshaft seal retainer-to-cylinder head joints.
3. Position the valve cover and install the bolts and stud bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

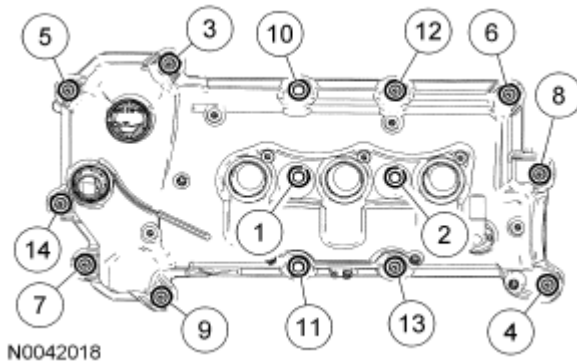


Fig. 9: Identifying Tightening Sequence Of Valve Cover Bolts
Courtesy of FORD MOTOR CO.

4. If equipped, install the coolant pump drive pulley cover and the 2 nuts.
 - Tighten to 6 Nm (53 lb-in).
5. Position the wiring harness and attach the 2 pin-type retainers to the valve cover.
6. Attach the 6 wiring harness retainers to the valve cover stud bolts.
7. Position the oil level indicator tube and install the stud bolt.
 - Tighten to 9 Nm (80 lb-in).
8. Install the oil level indicator.
9. Attach the power steering tube retainer to the valve cover stud bolt.
10. Connect the LH HO2S electrical connector and pin type retainer.
11. Connect the VCT solenoid electrical connector.
12. Install the crankcase ventilation tube.
13. Install the LH ignition coil-on-plugs. For additional information, refer to **ENGINE IGNITION - 3.0L (4V)**.

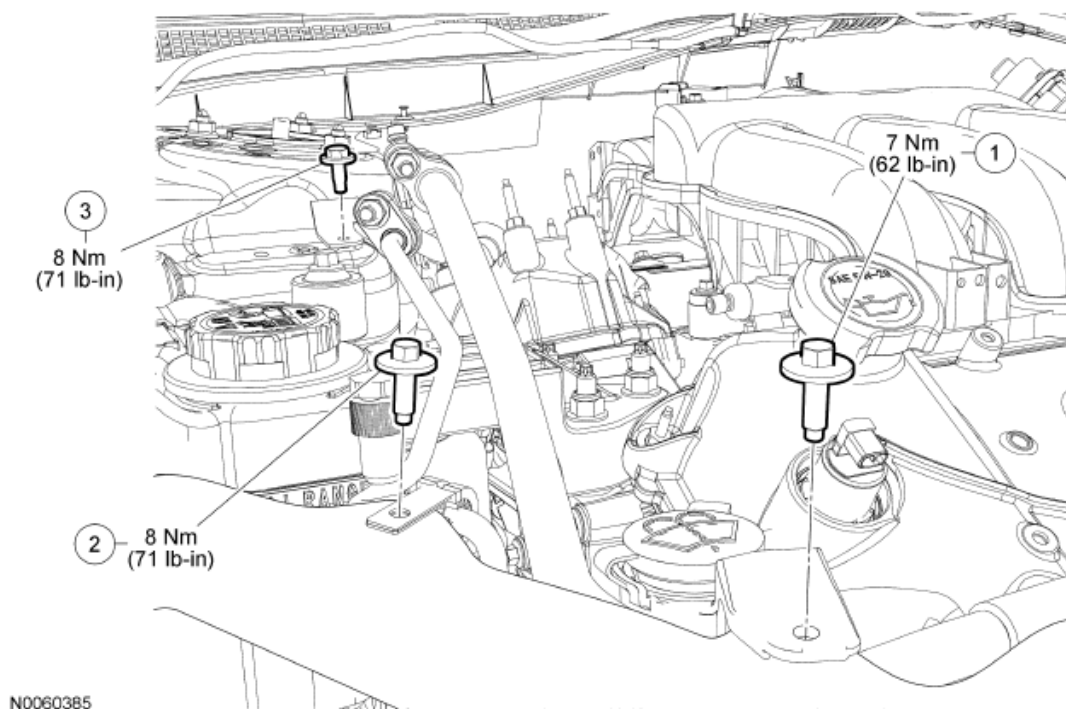
VALVE COVER - RH

MATERIAL

Item	Specification
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

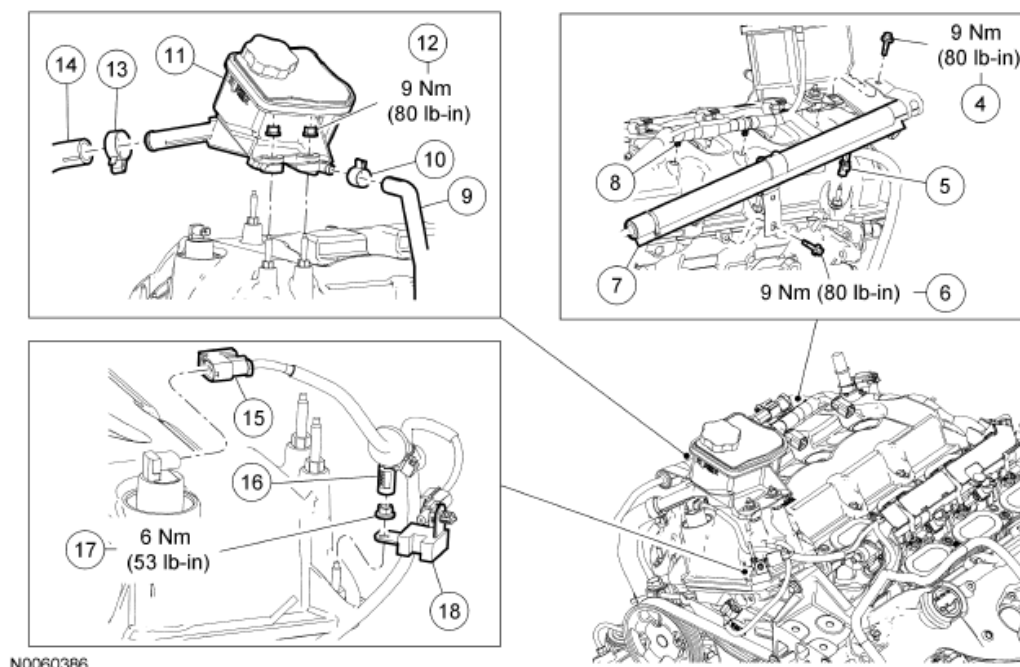


Item	Part Number	Description
1	W503924	Windshield washer bottle and A/C tube retaining clamp bolt
2	W503924	A/C tube retaining clamp bolt
3	W505422	A/C tube retaining clamp bolt

Fig. 10: Identifying Valve Cover - RH Components (Items 1-3) (With Torque Specifications)
Courtesy of FORD MOTOR CO.

2006 Mercury Milan

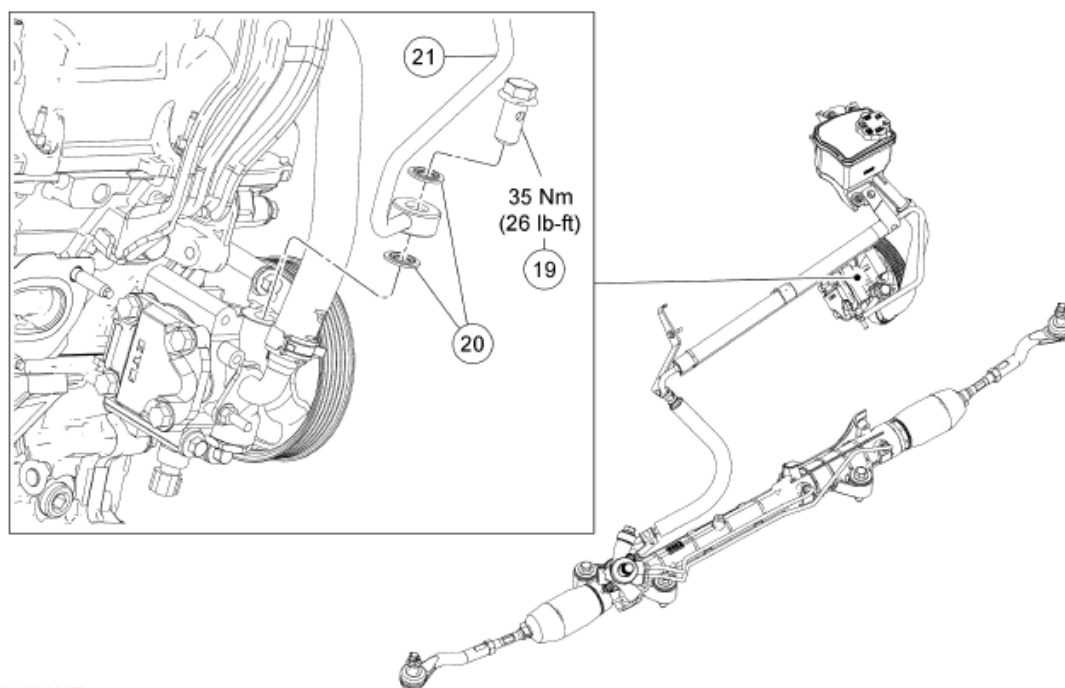
2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



Item	Part Number	Description
4	W506413	Power steering pressure (PSP) tube bracket-to-reservoir bolt
5	—	Wiring harness retainer (part of 12B637)
6	W506413	PSP tube bracket-to-cylinder head bolt
7	3A719	PSP tube
8	—	Wiring harness retainer (2 required) (part of 12B637)
9	3493	Power steering hose
10	—	Power steering hose clamp (part of 3493)
11	3R700	Power steering reservoir

Item	Part Number	Description
12	W520111	Power steering reservoir nut (3 required)
13	—	Power steering hose clamp
14	3681	Power steering hose
15	—	Variable camshaft timing (VCT) solenoid electrical connector (part of 12B637)
16	—	Wiring harness retainer (part of 12B637)
17	W520411	Radio frequency interference capacitor nut
18	18801	Radio frequency interference capacitor

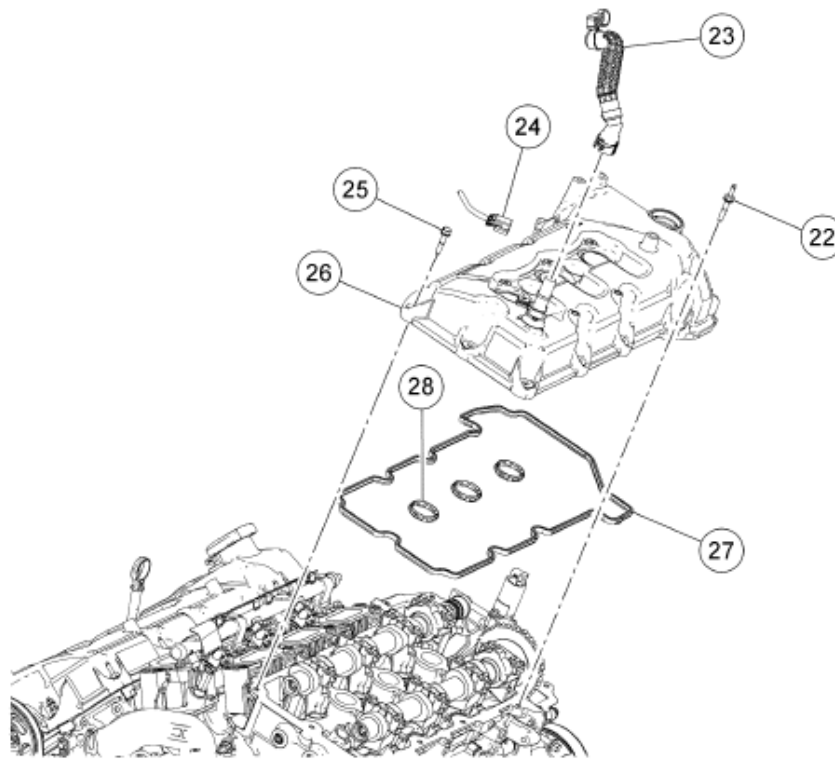
Fig. 11: Identifying Valve Cover - RH Components (Items 4-18) (With Torque Specifications)
Courtesy of FORD MOTOR CO.



N0060387

Item	Part Number	Description
19	506413	Power steering pressure tube-to-power steering pump banjo bolt
20	—	Power steering pressure tube seals
21	3A719	Power steering pressure tube

Fig. 12: Identifying Valve Cover - RH Components (Items 19-21) (With Torque Specifications)
Courtesy of FORD MOTOR CO.



Item	Part Number	Description
22	6C519	Valve cover stud bolt (4 required)
23	6K817	Positive crankcase ventilation (PCV) hose
24	14A464	PCV valve electrical connector (part of 12B637)
25	6C519	Valve cover bolt (10 required)
26	6582	Valve cover
27	6584	Valve cover gasket
28	6C527	Spark plug cavity gasket (3 required)

Fig. 13: Identifying Valve Cover - RH Components (Items 22-28)
 Courtesy of FORD MOTOR CO.

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. Remove the lower cowl panel. For additional information refer to COWL PANEL GRILLE .

2. Remove the RH ignition coil-on-plugs. For additional information, refer to **ENGINE IGNITION - 3.0L (4V)**.
3. Remove the retaining bolt from the windshield washer bottle and A/C tube.
4. Remove the 2 A/C tube retaining bolts and position the A/C tubes aside.
5. Remove the positive crankcase ventilation (PCV) tube.
6. Disconnect the PCV valve electrical connector.
7. Disconnect the power steering hose from the reservoir.
8. Remove the 3 power steering reservoir nuts.
9. Remove the power steering pressure (PSP) tube bracket-to-reservoir bolt.
10. Remove the PSP tube bracket-to-cylinder head bolt.
11. Reposition the power steering reservoir and disconnect the reservoir-to-pump hose.
 - Remove the power steering reservoir.
12. Remove the power steering pressure tube-to-power steering pump banjo bolt and position the power steering pressure tube aside.
 - Discard the bolt and seals.
13. Disconnect the variable camshaft timing (VCT) solenoid electrical connector.
14. Detach the 3 wiring harness retainers from the valve cover stud bolts.
15. Remove the nut and the radio frequency interference capacitor from the valve cover stud bolt.
16. Detach the 2 pin-type retainers from the valve cover and position the wiring harness aside.
17. Remove the 10 bolts, 4 stud bolts and the valve cover.
 - Discard the gaskets.

Installation

1. Clean the valve cover, cylinder head and front cover sealing surfaces with metal surface cleaner and install a new valve cover and spark plug cavity gaskets.

NOTE: **The valve cover must be installed and the bolts and stud bolts tightened within 4 minutes of sealant application.**

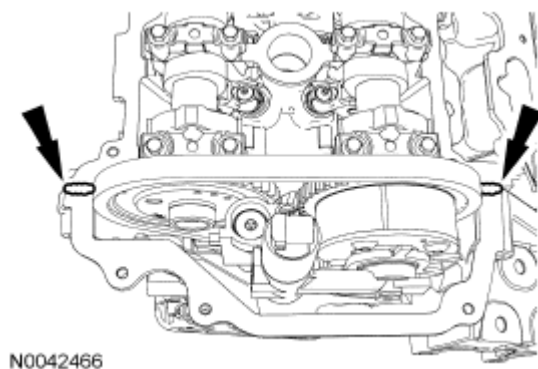


Fig. 14: Locating Silicone Gasket Sealant

Courtesy of FORD MOTOR CO.

2. Apply an 8 mm (0.31 in) dot of silicone gasket sealant to the front cover-to-cylinder head joints.
3. Position the valve cover and install the bolts and stud bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

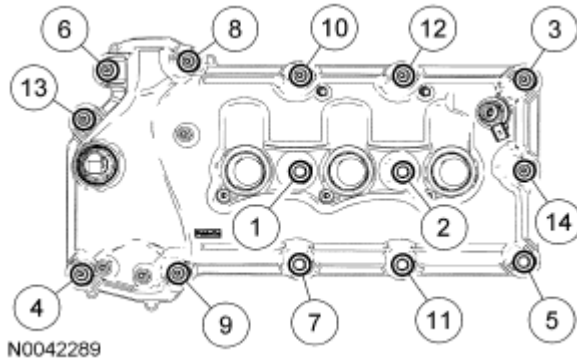


Fig. 15: Identifying Tightening Sequence Of Valve Cover Bolts
Courtesy of FORD MOTOR CO.

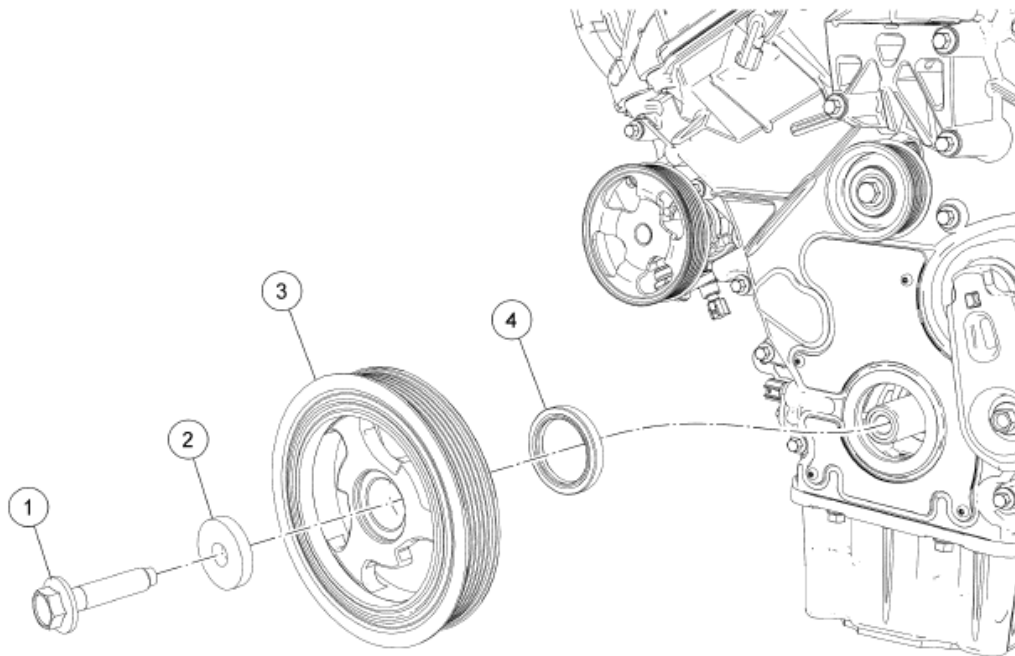
4. Position the wiring harness and attach the 2 pin-type retainers to the valve cover.
5. Install the radio frequency interference capacitor and the nut.
 - Tighten to 6 Nm (53 lb-in).
6. Attach the 3 wiring harness retainers to the stud bolts.
7. Connect the VCT solenoid electrical connector.

CAUTION: A new bolt and new seals must be installed any time the power steering pressure tube is disconnected from the power steering pump.

8. Position the power steering pressure tube-to-power steering pump and install the new seals and banjo bolt.
 - Tighten to 35 Nm (26 lb-ft).
9. Position the power steering reservoir and connect the reservoir-to-pump hose.
10. Install the PSP tube bracket-to-cylinder head bolt.
 - Tighten to 9 Nm (80 lb-in).
11. Install the PSP tube bracket-to-reservoir bolt.
 - Tighten to 9 Nm (80 lb-in).
12. Install the 3 power steering reservoir nuts.
 - Tighten to 9 Nm (80 lb-in).
13. Connect the power steering hose to the reservoir.
14. Connect the PCV valve electrical connector.
15. Install the PCV tube.

16. Position the A/C tubes and install the 2 A/C tube retaining bolts.
 - Tighten to 8 Nm (71 lb-in).
17. Install the A/C tube and windshield washer bottle retaining bolt.
 - Tighten to 7 Nm (62 lb-in).
18. Install the RH ignition coil-on-plugs. For additional information, refer to **ENGINE IGNITION - 3.0L (4V)**.
19. Install the lower cowl panel. For additional information refer to the **COWL PANEL GRILLE**.
20. Fill the power steering system. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION**.

LOWER END COMPONENTS - EXPLODED VIEW, CRANKSHAFT PULLEY AND CRANKSHAFT FRONT SEAL



N0042290

Item	Part Number	Description
1	W701512	Crankshaft pulley bolt
2	N806165	Washer
3	6316	Crankshaft pulley
4	6700	Crankshaft front seal

Fig. 16: Identifying Lower End Components - Exploded View, Crankshaft Pulley And Crankshaft Front Seal

Courtesy of FORD MOTOR CO.

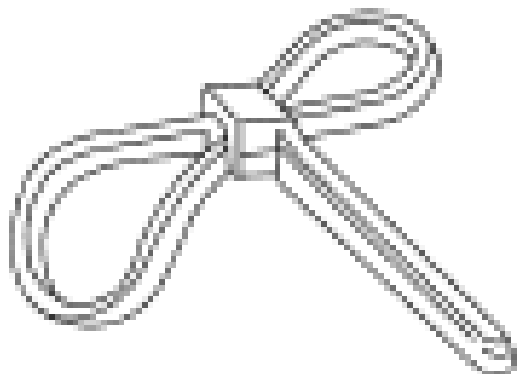
1. For additional information, refer to the appropriate procedure.

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

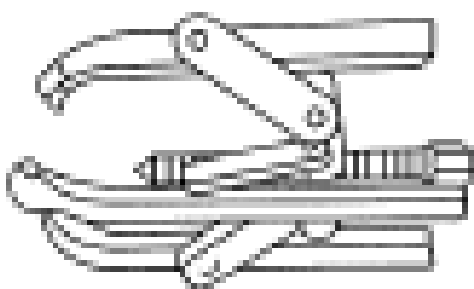
CRANKSHAFT PULLEY

SPECIAL TOOL(S)



ST1438-A

Strap Wrench
303-D055 (D85L-6000-A)



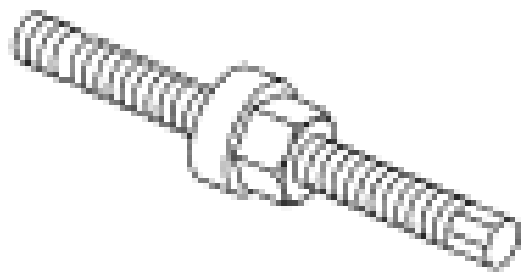
ST1184-A

3-Jaw Puller
303-D121

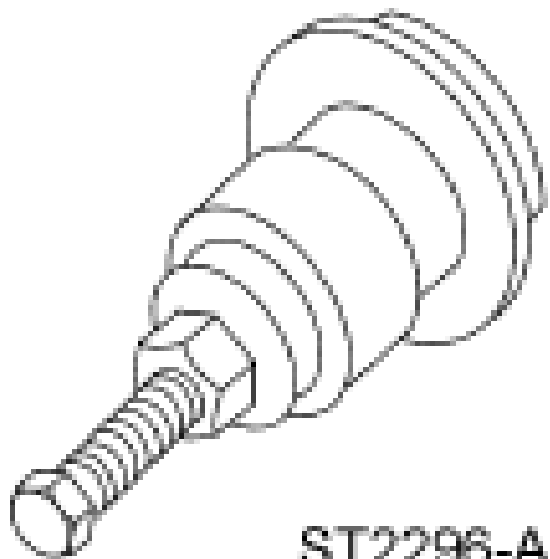
Replacer, Crankshaft Damper
303-102 (T74P-6316-B)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1287-A



ST2296-A

Installer, Front Cover Seal 303-335 (T88T-6701-A)

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING &**

LIFTING .

2. Remove the accessory drive belt. For additional information, refer to **ACCESSORY DRIVE - 3.0L (4V)** .
3. Use the special tool to hold the crankshaft pulley and remove the crankshaft pulley bolt and washer.

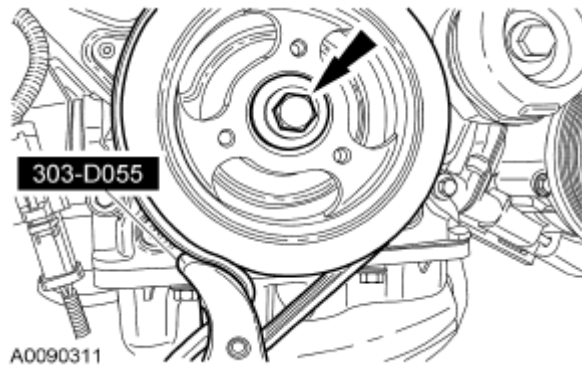


Fig. 17: Locating Special Tool And Crankshaft Pulley Bolt
Courtesy of FORD MOTOR CO.

4. Using the special tool, remove the crankshaft pulley.

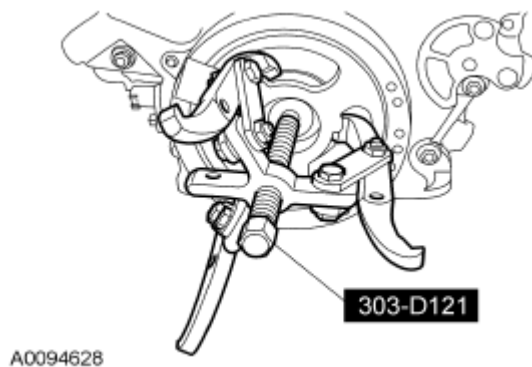


Fig. 18: Identifying Special Tool And Crankshaft Pulley
Courtesy of FORD MOTOR CO.

Installation

1. Lubricate the crankshaft front seal inner lip with clean engine oil.

NOTE: Clean the keyway and slot using metal surface cleaner before applying silicone gasket and sealer.

NOTE: The crankshaft pulley must be installed and the bolt tightened within 4 minutes of applying the silicone gasket and sealer.

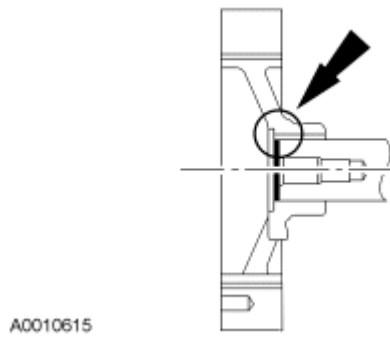


Fig. 19: Applying Silicone Gasket And Sealant
Courtesy of FORD MOTOR CO.

2. Apply silicone gasket and sealant to the end of the keyway slot.

NOTE: Lubricate the outside diameter sealing surfaces with clean engine oil.

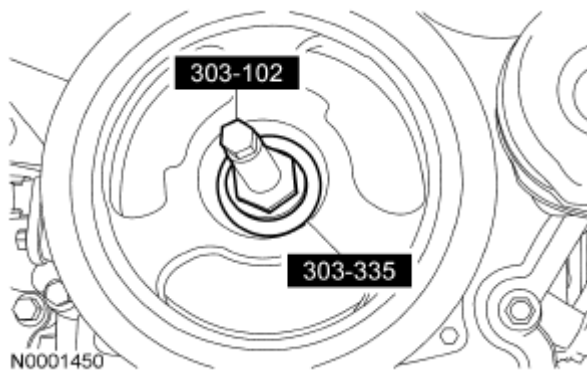


Fig. 20: Identifying Special Tool And Crankshaft Pulley
Courtesy of FORD MOTOR CO.

3. Using the special tool, install the crankshaft pulley.
4. Install the bolt and washer. Using the special tool to hold the crankshaft pulley, tighten the bolt in 4 stages:
 - Stage 1: Tighten to 120 Nm (89 lb-ft).
 - Stage 2: Loosen one full turn.
 - Stage 3: Tighten to 50 Nm (37 lb-ft).
 - Stage 4: Tighten an additional 90 degrees.

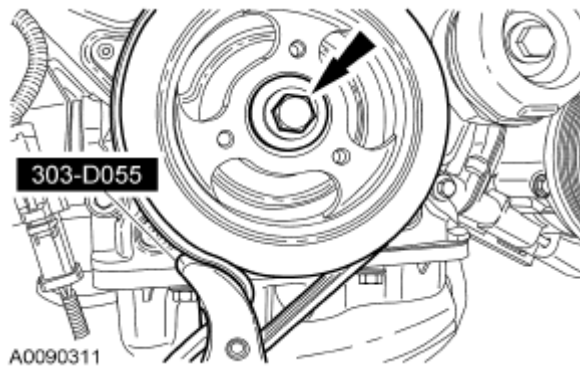


Fig. 21: Identifying Special Tool And Crankshaft Pulley Bolts
Courtesy of FORD MOTOR CO.

5. Install the accessory drive belt. For additional information, refer to **ACCESSORY DRIVE - 3.0L (4V)** .

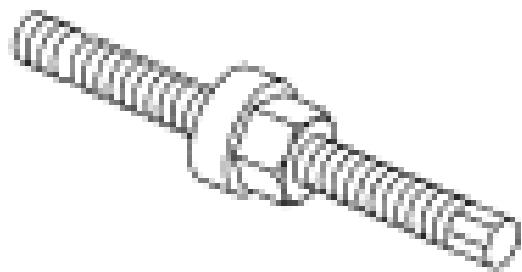
CRANKSHAFT FRONT SEAL

SPECIAL TOOL(S)

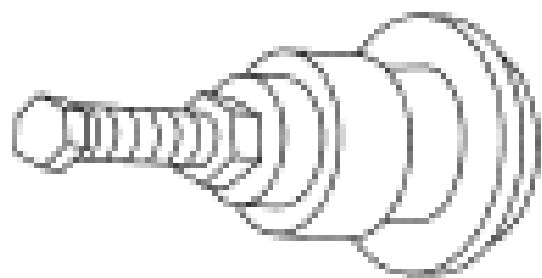
ST1385-A	Remover, Oil Seal 303-409 (T92C-6700CH)
	Replacer, Crankshaft Damper 303-102 (T74P-6316-B)

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2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1287-A



ST1328-A

Installer, Front Cover Seal
303-335 (T88T-6701-A)

MATERIAL

Item	Specification
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the crankshaft pulley. For additional information, refer to **CRANKSHAFT PULLEY**.
3. Using the special tool, remove and discard the crankshaft front seal.

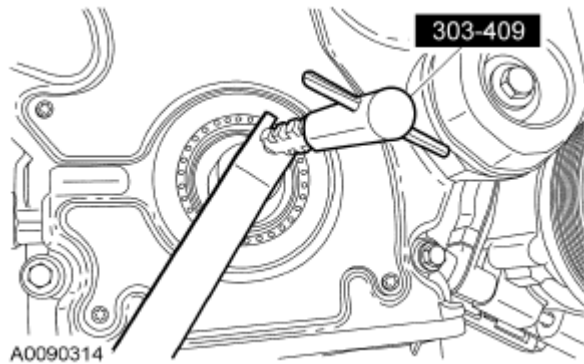


Fig. 22: Identifying Special Tool And Crankshaft Front Seal
Courtesy of FORD MOTOR CO.

Installation

NOTE: Clean all sealing surfaces with metal surface cleaner.

1. Apply clean engine oil to the seal lip and seal bore before installing the seal.
2. Using the special tools, install a new crankshaft front seal.

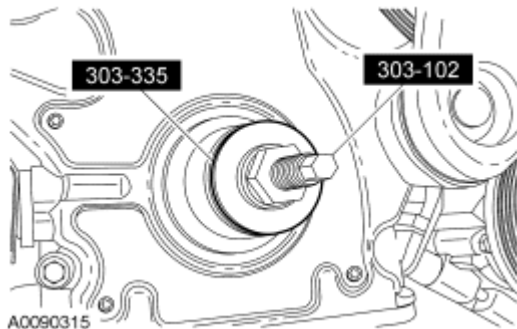
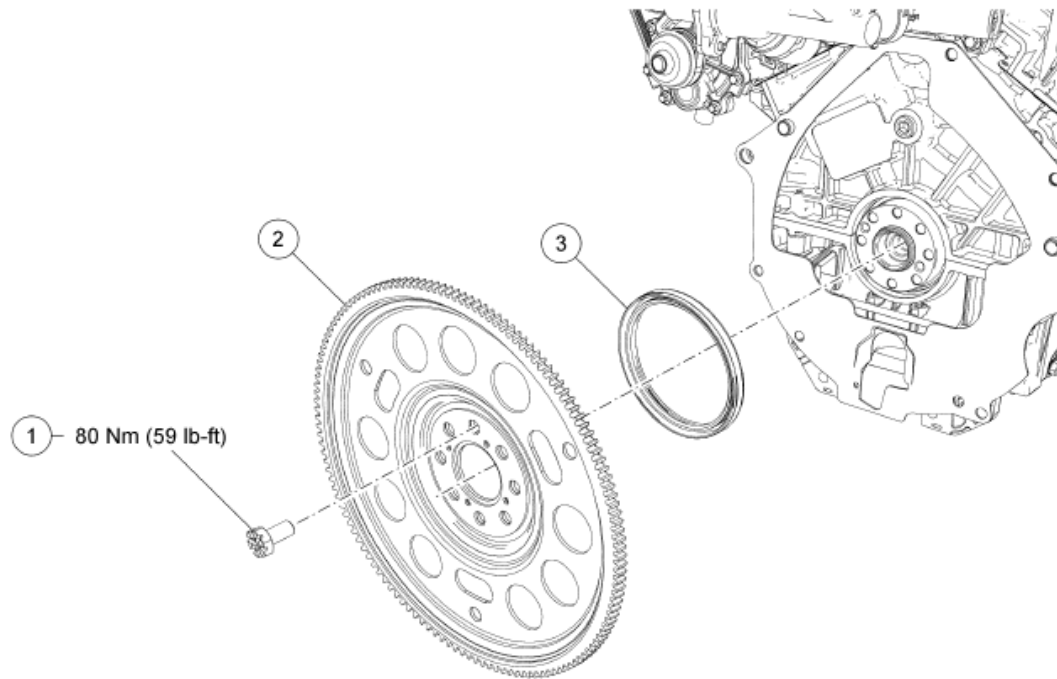


Fig. 23: Installing Crankshaft Seal Using Special Tools (303-335 And 303-102)
Courtesy of FORD MOTOR CO.

3. Install the crankshaft pulley. For additional information, refer to [CRANKSHAFT PULLEY](#).

LOWER END COMPONENTS - EXPLODED VIEW, FLEXPLATE AND CRANKSHAFT REAR SEAL



N0042291

Item	Part Number	Description
1	W701559-S	Flexplate bolt (8 required)
2	6375	Flexplate
3	6701	Crankshaft rear seal

Fig. 24: Identifying Lower End Components - Exploded View, Flexplate And Crankshaft Rear Seal Components (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

1. For additional information, refer to the appropriate procedure.

FLEXPLATE

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the transaxle. For additional information, refer to the appropriate automatic transmission article.

NOTE: One of the 8 flexplate holes are offset so the flexplate can only be installed in one position.

3. Remove the bolts and the flexplate.
 - To install, tighten to 80 Nm (59 lb-ft).
4. To install, reverse the removal procedure.

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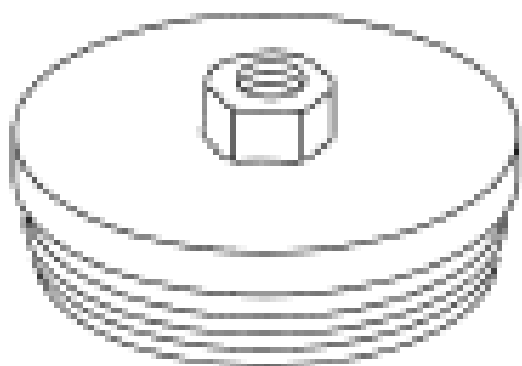
CRANKSHAFT REAR SEAL

SPECIAL TOOL(S)



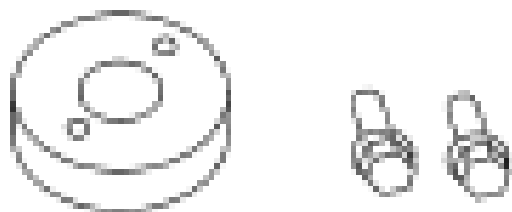
ST1187-A

Slide Hammer
307-005 (T59L-100-B)



ST1382-A

Remover, Crankshaft Rear Seal
303-519 (T95P-6701-DH)



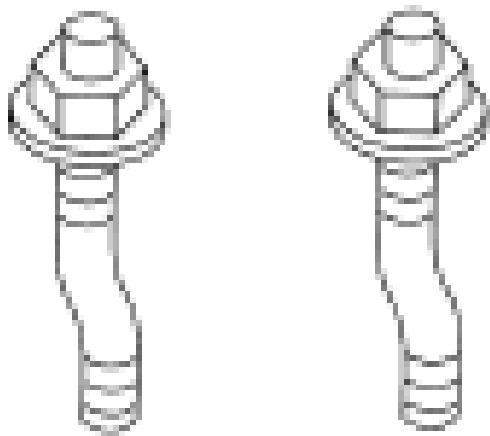
ST1327-A

Installer, Crankshaft Rear Main Oil Seal
303-178 (T82L-6701-A)

Installer Bolts, Crankshaft Rear Main Oil Seal

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1333-A

303-384 (T91P-6701-A)

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the flexplate. For additional information, refer to **FLEXPLATE**.
3. Using the special tools, remove and discard the crankshaft rear oil seal.

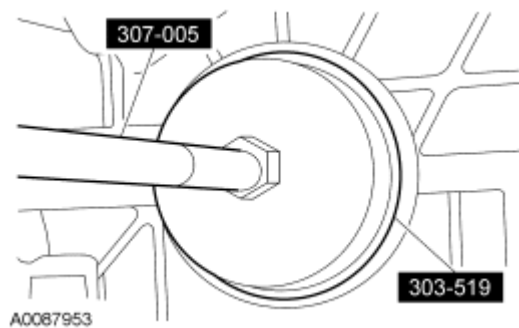


Fig. 25: Identifying Special Tools (307-005 And 303-519)
Courtesy of FORD MOTOR CO.

Installation

NOTE: Clean all sealing surfaces with metal surface cleaner.

NOTE: Apply clean engine oil to the seal lip and seal bore before installing the seal.

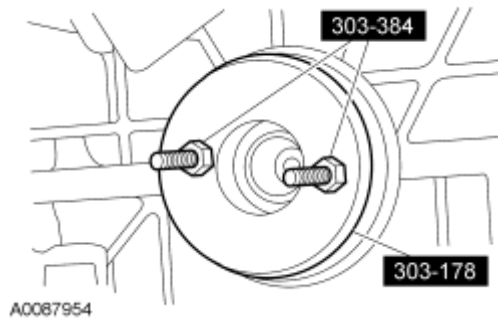


Fig. 26: Identifying Special Tools (303-384 And 303-178)
Courtesy of FORD MOTOR CO.

1. Using the special tools, install the crankshaft rear oil seal.
2. Install the flexplate. For additional information, refer to **FLEXPLATE**.

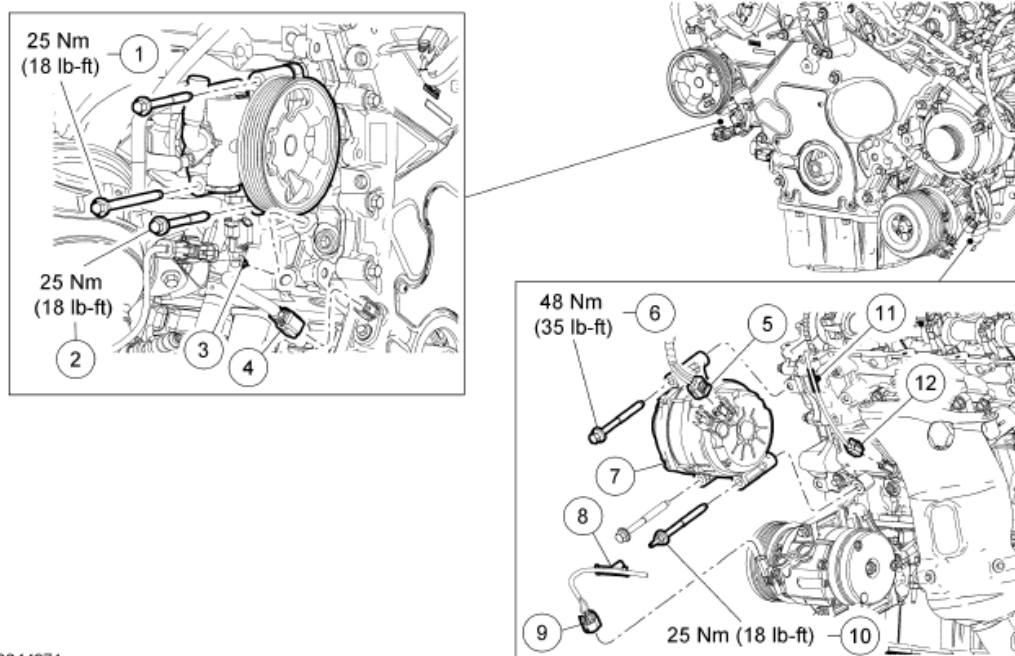
ENGINE FRONT COVER

MATERIAL

Item	Specification
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (in Canada Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12) or equivalent	WSS-M2C930-A

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

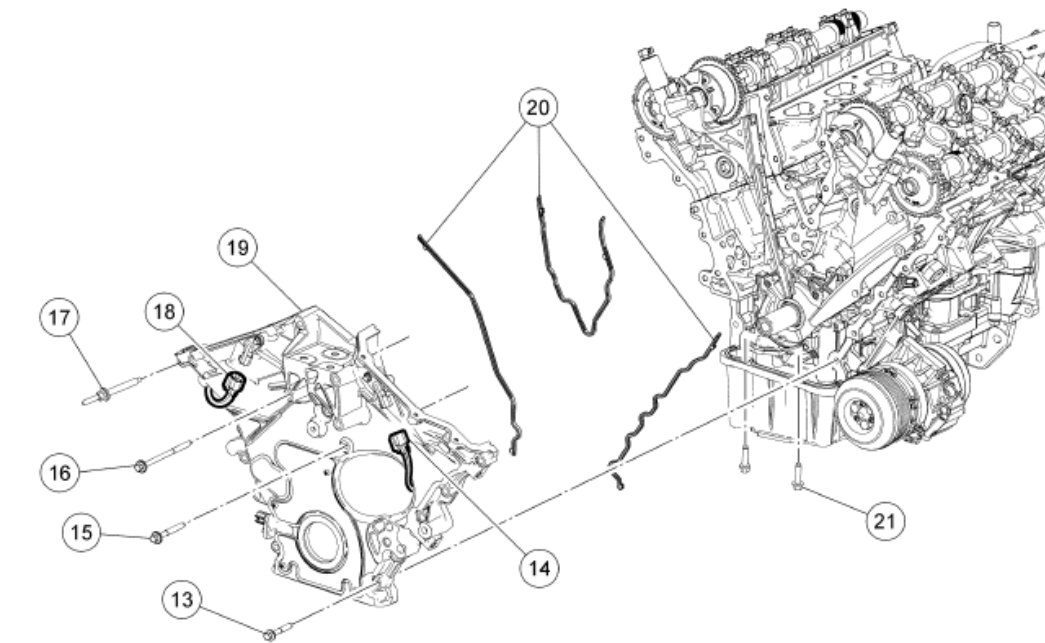


N0044971

Item	Part Number	Description
1	W701234	Power steering pump bolt
2	W701526	Power steering pump bolt (2 required)
3	14A464	Crankshaft position (CKP) sensor electrical connector (part of 12B637)
4	—	Wiring harness retainer (part of 12B637)
5	14A464	Generator electrical connector (part of 12B637)
6	W704747	Generator bolt

Item	Part Number	Description
7	10300	Generator
8	—	Wiring harness retainer (part of 12B637)
9	14A464	A/C compressor electrical connector (part of 12B637)
10	W707669	Generator stud bolt
11	—	Wiring harness retainer (part of 12B637)
12	14A464	Oil pressure sender electrical connector (part of 12B637)

Fig. 27: Identifying Engine Front Cover Components (Items 1-12) (With Torque Specifications)
Courtesy of FORD MOTOR CO.



N0044972

Item	Part Number	Description
13	W701525	Engine front cover bolt (8 required)
14	14A464	LH camshaft position (CMP) sensor electrical connector (part of 12B637)
15	W708222	Engine front cover bolt (3 required)
16	W708221	Engine front cover bolt (3 required)

Item	Part Number	Description
17	W710030	Engine front cover stud bolts (2 required)
18	14A464	RH CMP sensor electrical connector (part of 12B637)
19	6019	Engine front cover
20	—	Engine front cover gaskets (3 required)
21	W709678	Oil pan-to-front cover bolts (2 required)

Fig. 28: Identifying Engine Front Cover Components (Items 13-21)

Courtesy of FORD MOTOR CO.

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION**.
3. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.
4. Remove the crankshaft front seal. For additional information, refer to **LOWER END COMPONENTS - EXPLODED VIEW, CRANKSHAFT PULLEY AND CRANKSHAFT FRONT SEAL** and

CRANKSHAFT FRONT SEAL.

5. If equipped, remove the 7 screws and the underbody cover.

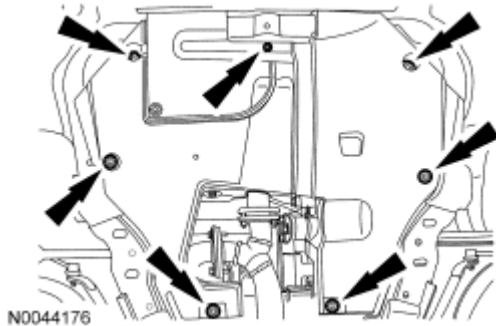


Fig. 29: Locating Underbody Cover Screws
Courtesy of FORD MOTOR CO.

6. Disconnect the crankshaft position (CKP) sensor and pin-type retainer.
7. Remove the accessory drive belt tensioner and 2 idler pulleys. For additional information, refer to ACCESSORY DRIVE - 3.0L (4V).
8. Remove the LH and RH valve covers. For additional information, refer to VALVE COVER - LH and VALVE COVER - RH.
9. Remove the 3 bolts and position the power steering pump aside.
10. Remove the engine mount and bracket. For additional information, refer to ENGINE MOUNT.
11. Remove the LH and RH camshaft position (CMP) sensors. For additional information, refer to ELECTRONIC ENGINE CONTROLS - 3.0L (4V).
12. Disconnect the A/C compressor electrical connector and wiring harness retainer.
13. Disconnect the generator electrical connector.
14. Disconnect the oil pressure sender electrical connector and position the wiring harness aside.
15. Remove the stud bolt, the 2 bolts and position the generator aside.
16. Remove the 2 oil pan-to-front cover bolts.
17. Remove the 14 bolts, 2 stud bolts and the engine front cover.
 - Remove and discard the gaskets.

Installation

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.

CAUTION: Do not damage the oil pan gasket while cleaning the sealant from the lower cylinder block-to-oil pan joint.

1. Use a plastic scraping tool to remove all traces of sealant.

- Clean all sealing surfaces with metal surface cleaner and install new gaskets.

NOTE: The engine front cover must be installed and the bolts tightened within 4 minutes of applying sealant.

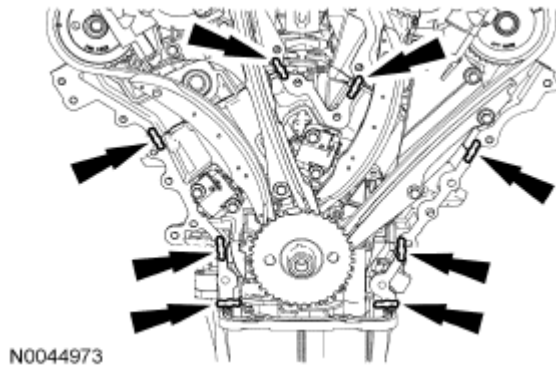
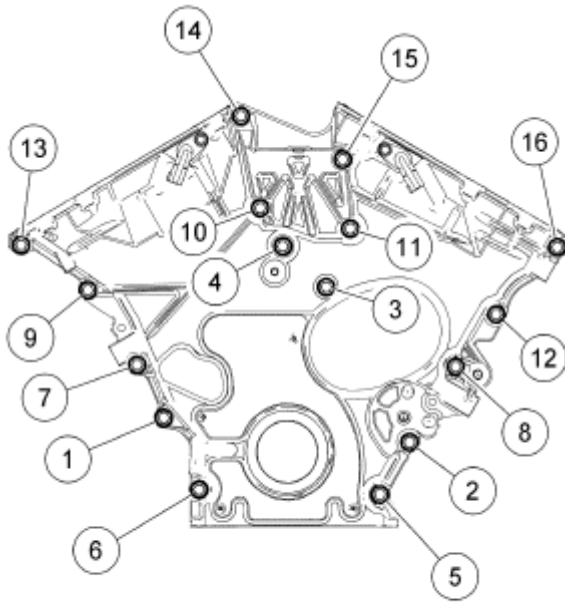


Fig. 30: Locating Silicone Gasket And Sealer To Cylinder Block, Lower Cylinder Block, Cylinder Head And Oil Pan Mating Surfaces
Courtesy of FORD MOTOR CO.

2. Apply a 6 mm (0.23 in) diameter dot of silicone gasket and sealer to the cylinder block, lower cylinder block, cylinder head and oil pan mating surfaces.

NOTE: Fasteners 1 and 13 are stud bolts.

3. Position the engine front cover and install the 14 bolts and the 2 stud bolts.
 - Tighten in the sequence shown to 25 Nm (18 lb-ft).



N0042364

Fig. 31: Identifying Tighten Sequence Front Cover Bolts
Courtesy of FORD MOTOR CO.

4. Install the 2 oil pan-to-front cover bolts.
 - Tighten to 25 Nm (18 lb-ft).
5. Remove the oil pan plug and drain the engine oil.
 - Install the plug and tighten to 26 Nm (19 lb-ft).
6. Install the generator, 2 bolts and the stud bolt.
 - Tighten to 48 Nm (35 lb-ft).
7. Connect the oil pressure sender electrical connector.
8. Connect the generator electrical connector.
9. Connect the A/C compressor electrical connector and wiring harness retainer.
10. Install the LH and RH CMP sensors. For additional information, refer to **ELECTRONIC ENGINE CONTROLS - 3.0L (4V)**.
11. Install the engine mount and bracket. For additional information, refer to **ENGINE MOUNT**.
12. Install the power steering pump and the 3 bolts.
 - Tighten to 25 Nm (18 lb-ft).
13. Install the LH and RH valve covers. For additional information, refer to **VALVE COVER - LH** and **VALVE COVER - RH**.
14. Install the accessory drive belt tensioner and 2 idler pulleys. For additional information, refer to **ACCESSORY DRIVE - 3.0L (4V)**.
15. Connect the CKP sensor electrical connector and pin-type retainer.
16. If equipped, install the underbody cover and 7 screws.

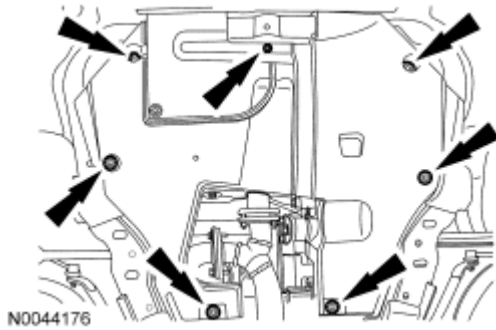


Fig. 32: Locating Underbody Cover Screws
Courtesy of FORD MOTOR CO.

17. Install the crankshaft front seal. For additional information, refer to **LOWER END COMPONENTS - EXPLODED VIEW, CRANKSHAFT PULLEY AND CRANKSHAFT FRONT SEAL** and **CRANKSHAFT FRONT SEAL**.
18. Fill the engine with clean engine oil.
19. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.
20. Fill the power steering system. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION**.

TIMING DRIVE COMPONENTS

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

CAUTION: Failure to verify correct timing drive component alignment will result in severe engine damage.

1. Remove the engine front cover. For additional information, refer to **ENGINE FRONT COVER**.

CAUTION: This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 30RFF (orange in color).

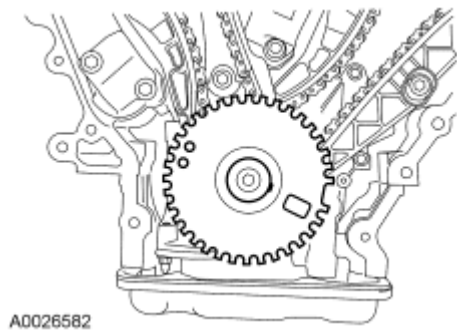


Fig. 33: Identifying Ignition Pulse Wheel
Courtesy of FORD MOTOR CO.

2. Remove the ignition pulse wheel.
3. Install the crankshaft pulley bolt and washer.

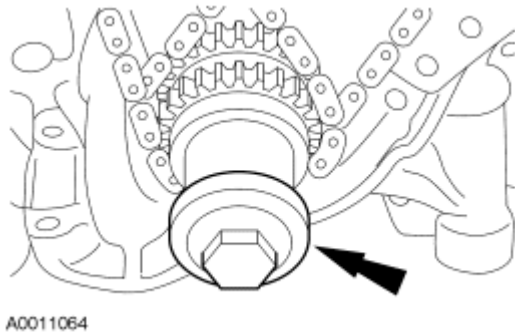


Fig. 34: Identifying Damper Bolt
Courtesy of FORD MOTOR CO.

4. Remove the 6 spark plugs

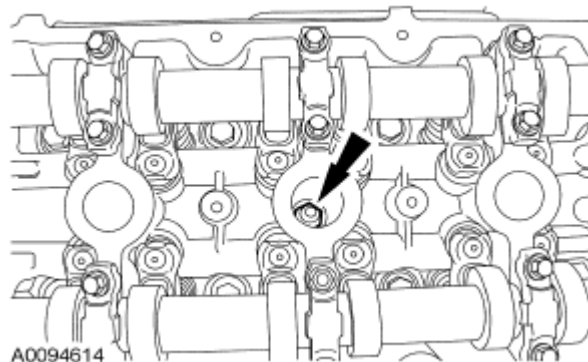
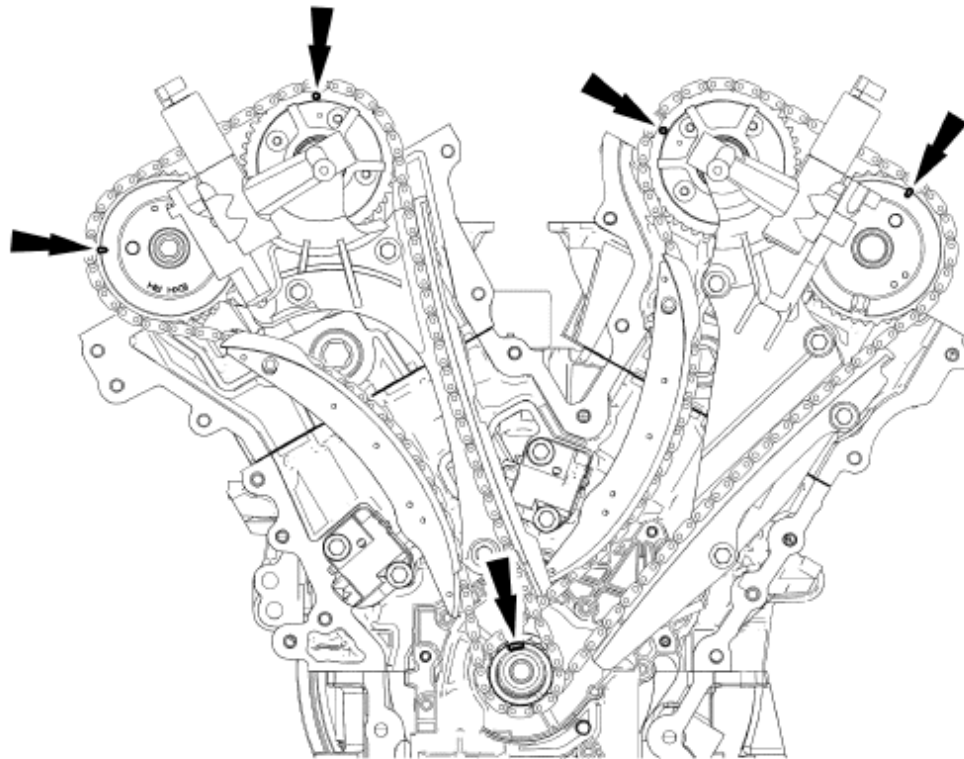


Fig. 35: Locating Spark Plugs
Courtesy of FORD MOTOR CO.

5. 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 No. 1 cylinder at top dead center (TDC).

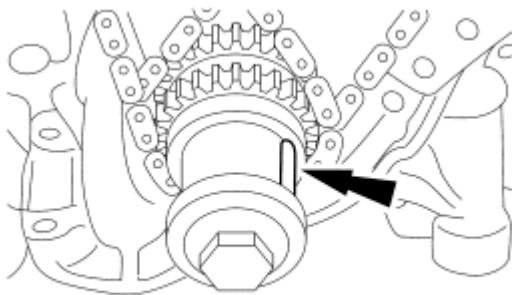
- Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and recheck.



N0044167

Fig. 36: Locating Crankshaft Keyway Position
Courtesy of FORD MOTOR CO.

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



A0011067

Fig. 37: Identifying Crankshaft Keyway
Courtesy of FORD MOTOR CO.

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

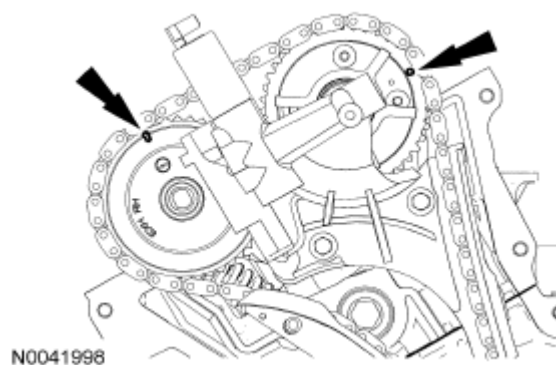


Fig. 38: Locating RH Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

8. Remove the RH timing chain tensioner arm.
 1. Remove the 2 bolts.
 2. Remove the tensioner.
 3. Remove the tensioner arm.

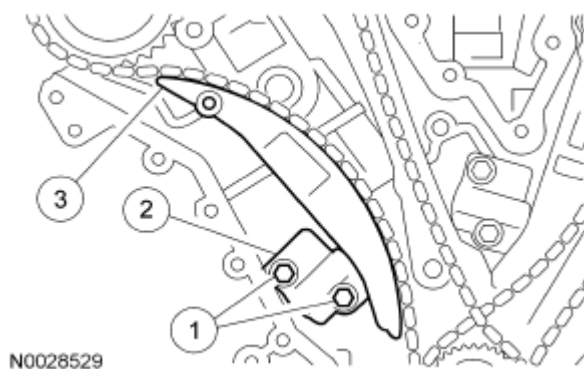


Fig. 39: Identifying RH Timing Chain Tensioner Arm, Bolts And Tensioner
Courtesy of FORD MOTOR CO.

9. Remove the RH timing chain.

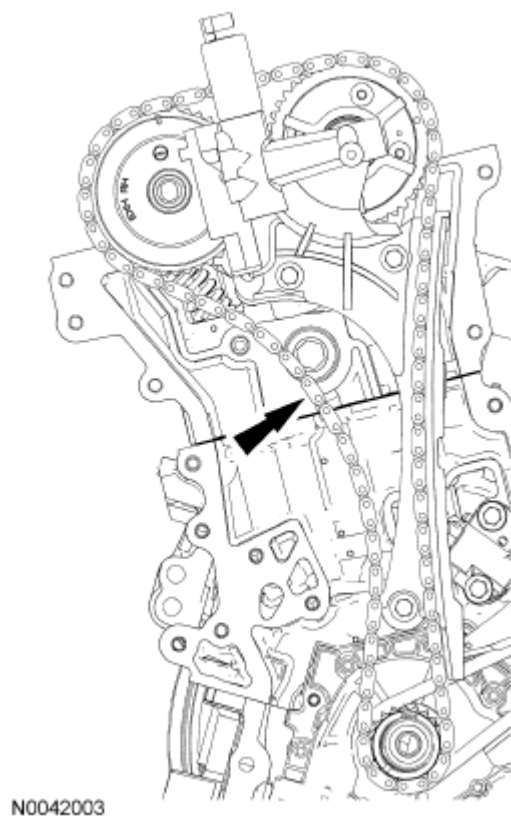


Fig. 40: Locating RH Timing Chain
Courtesy of FORD MOTOR CO.

10. Remove the 3 bolts and the RH VCT assembly.

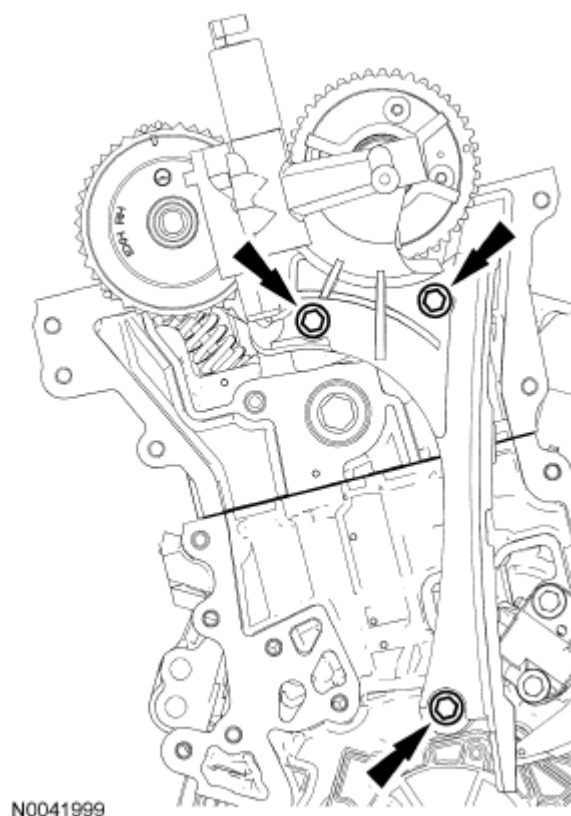


Fig. 41: Locating RH VCT Assembly Bolts
Courtesy of FORD MOTOR CO.

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

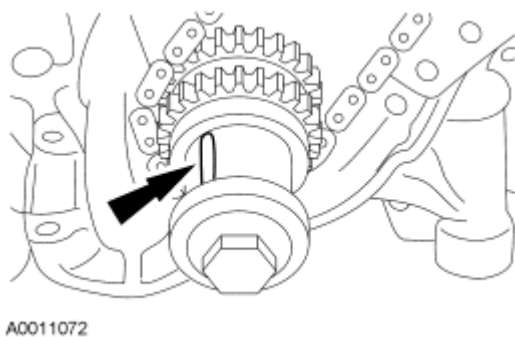


Fig. 42: Positioning Crankcase Key Way In 11 O'Clock Position
Courtesy of FORD MOTOR CO.

12. Verify the LH camshafts are in the neutral position.

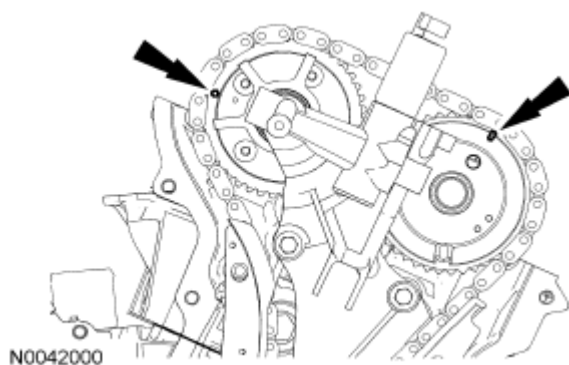


Fig. 43: Locating LH Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

13. Remove the LH timing chain tensioner and tensioner arm.
 1. Remove the 2 bolts.
 2. Remove the tensioner.
 3. Remove the tensioner arm.

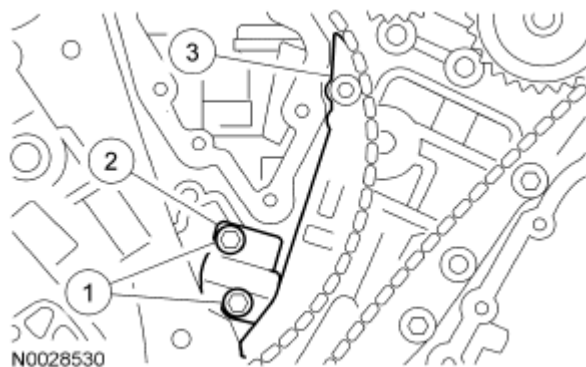
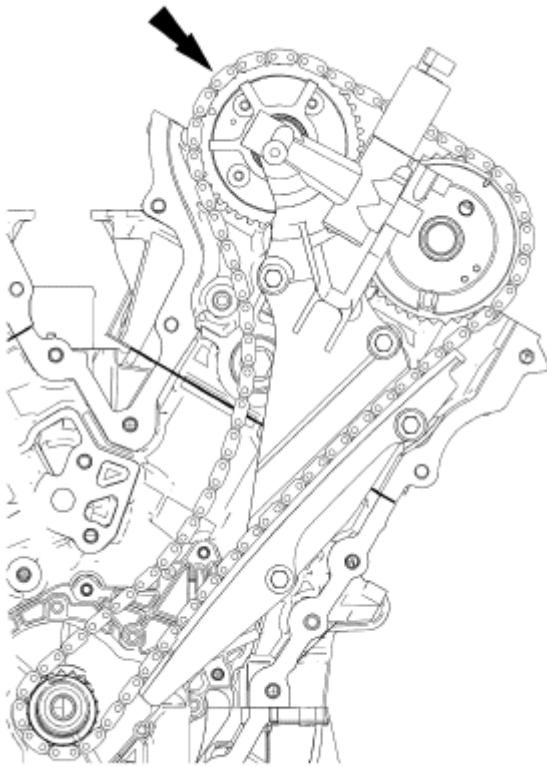


Fig. 44: Identifying LH Timing Chain Tensioner Arm, Bolts And Tensioner
Courtesy of FORD MOTOR CO.

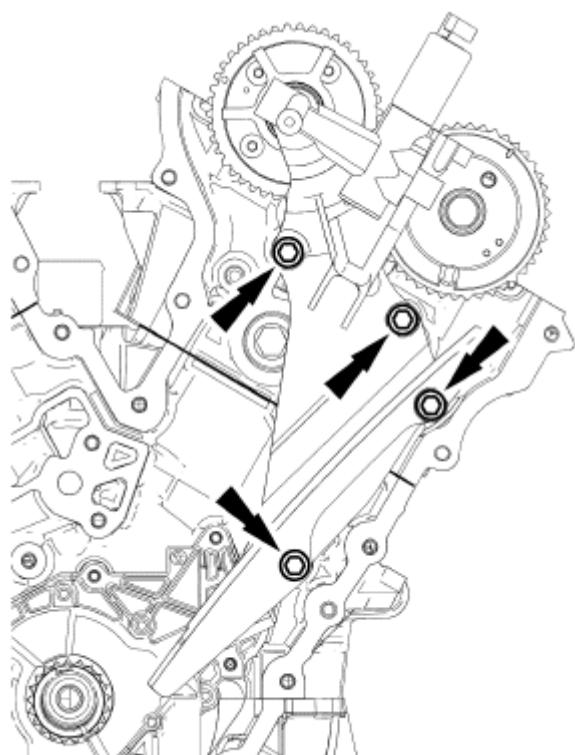
14. Remove the LH timing chain.



N0042001

Fig. 45: Locating LH Timing Chain
Courtesy of FORD MOTOR CO.

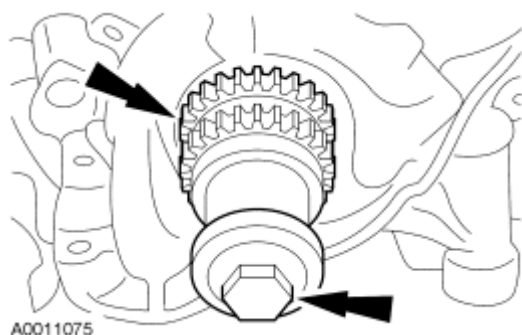
15. Remove the 4 bolts and the LH VCT assembly.



N0042002

Fig. 46: Identifying LH VCT Assembly Bolts
Courtesy of FORD MOTOR CO.

16. Remove the pulley bolt, washer and the crankshaft sprocket.



A0011075

Fig. 47: Locating Damper Bolt & Crankshaft Sprockets
Courtesy of FORD MOTOR CO.

Installation

1. Install the crankshaft sprockets with the timing marks out.

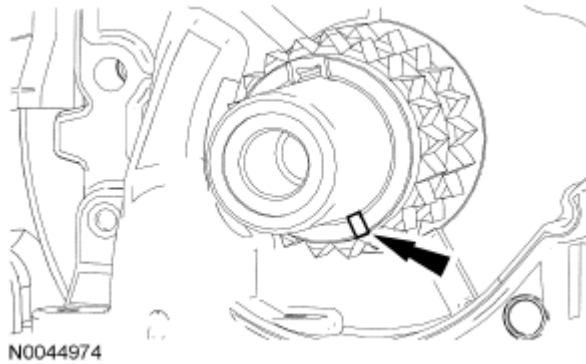


Fig. 48: Locating Timing Marks On Crankshaft Sprockets
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

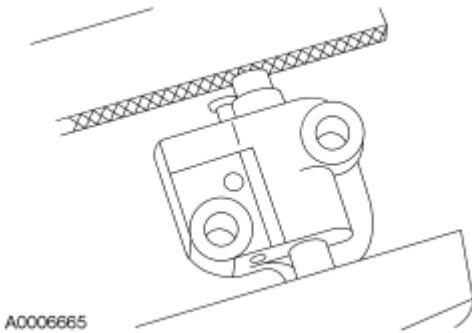


Fig. 49: Identifying Chain Tensioner In Soft-Jawed Vise
Courtesy of FORD MOTOR CO.

2. Position the chain tensioner in a soft-jawed vise.

NOTE: LH shown, RH similar.

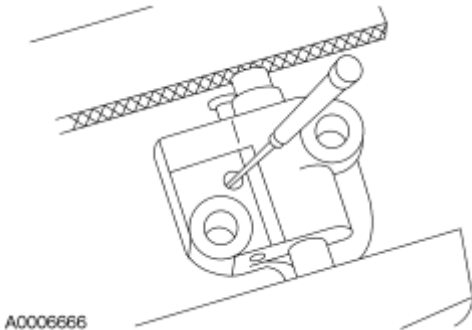


Fig. 50: Holding Chain Tensioner Ratchet Lock Mechanism Away From Ratchet Stem
Courtesy of FORD MOTOR CO.

3. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

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.

4. Slowly compress the timing chain tensioner.
5. Retain the tensioner piston with a 1.5 mm (0.05 in) wire or paper clip.

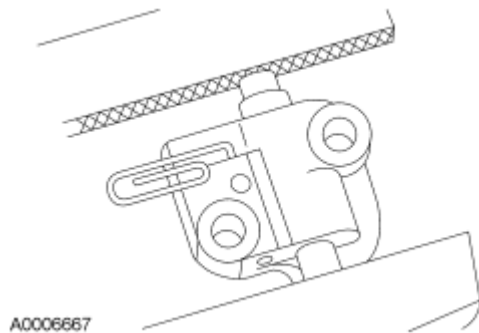


Fig. 51: Retaining Tensioner Piston With 1.5-mm (0.06-in) Wire Or Paper Clip
Courtesy of FORD MOTOR CO.

6. 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.
 1. Mark any link to use as the crankshaft timing mark.
 2. Starting with the crankshaft timing mark, count counterclockwise 29 links and mark the link.
 3. Continue counting counterclockwise to link 42 and mark the link.

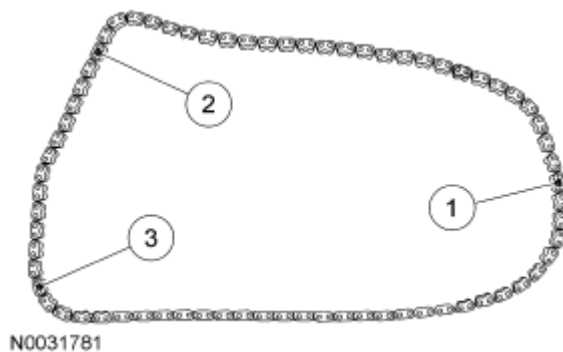


Fig. 52: Identifying Marks On Chain
Courtesy of FORD MOTOR CO.

7. Verify that the LH camshafts are correctly positioned.

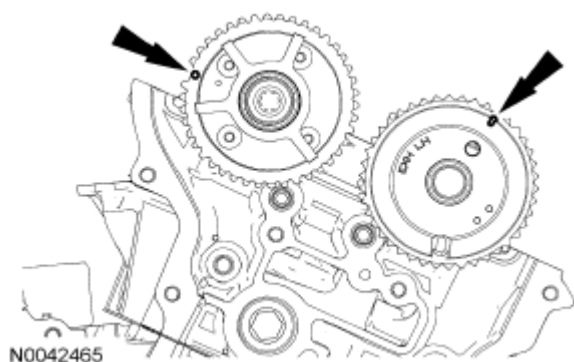


Fig. 53: Locating Camshafts Keyway Position
Courtesy of FORD MOTOR CO.

8. Install the variable camshaft timing (VCT) assembly and the 4 bolts.
 - Tighten to 25 Nm (18 lb-ft).

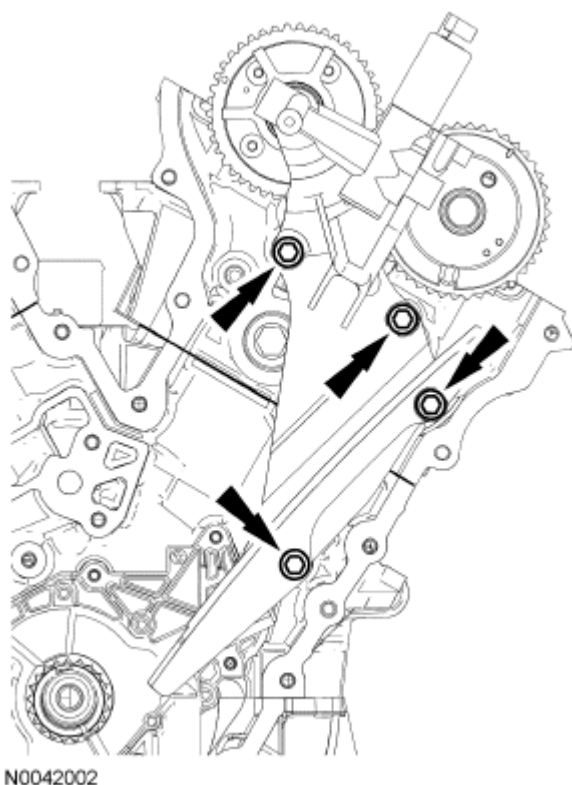


Fig. 54: Locating Variable Camshaft Timing (VCT) Assembly And Bolts
Courtesy of FORD MOTOR CO.

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

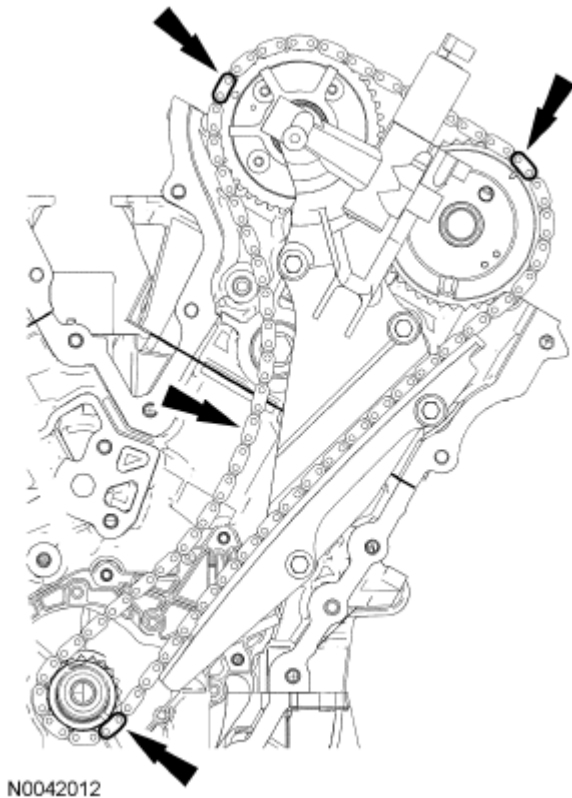


Fig. 55: Aligning Marks On Timing Chain With Marks On Camshaft And Crankshaft Sprockets
Courtesy of FORD MOTOR CO.

10. Install the LH timing chain tensioner arm and the LH timing chain tensioner.
 1. Install the tensioner arm.
 2. Position the tensioner.
 3. Install the 2 bolts.
 - Tighten to 25 Nm (18 lb-ft).

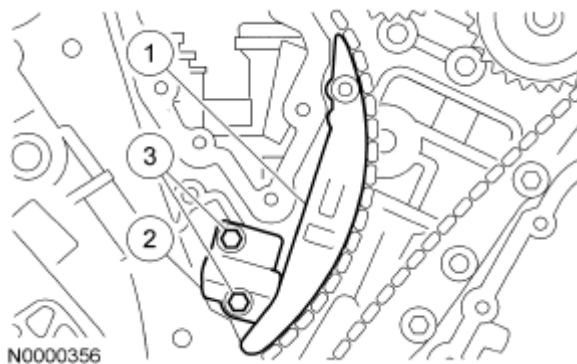


Fig. 56: Identifying Chain Tensioner Arm, Bolts And Tensioner
Courtesy of FORD MOTOR CO.

11. Install the crankshaft pulley bolt and washer and rotate the crankshaft clockwise 120 degrees until the crankshaft key way is in the 3 o'clock position.

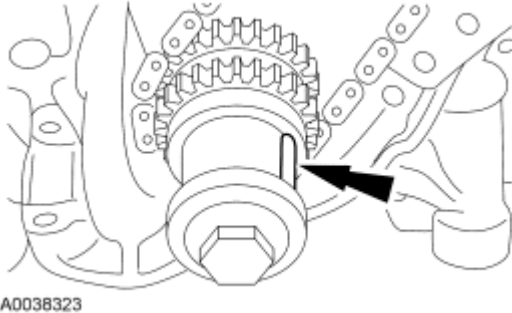


Fig. 57: Locating Crankshaft Keyway
Courtesy of FORD MOTOR CO.

12. Verify that the RH camshafts are correctly positioned.

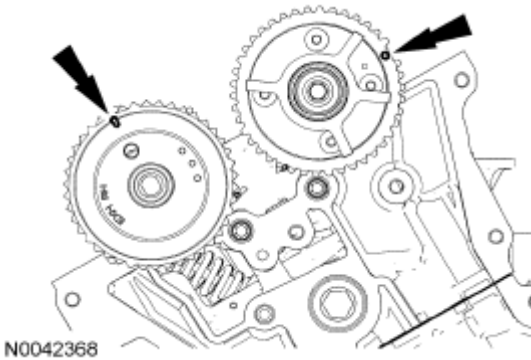


Fig. 58: Identifying RH Camshafts Are Correctly Positioned
Courtesy of FORD MOTOR CO.

13. Install the RH VCT assembly and the 3 bolts.
 - Tighten to 25 Nm (18 lb-ft).

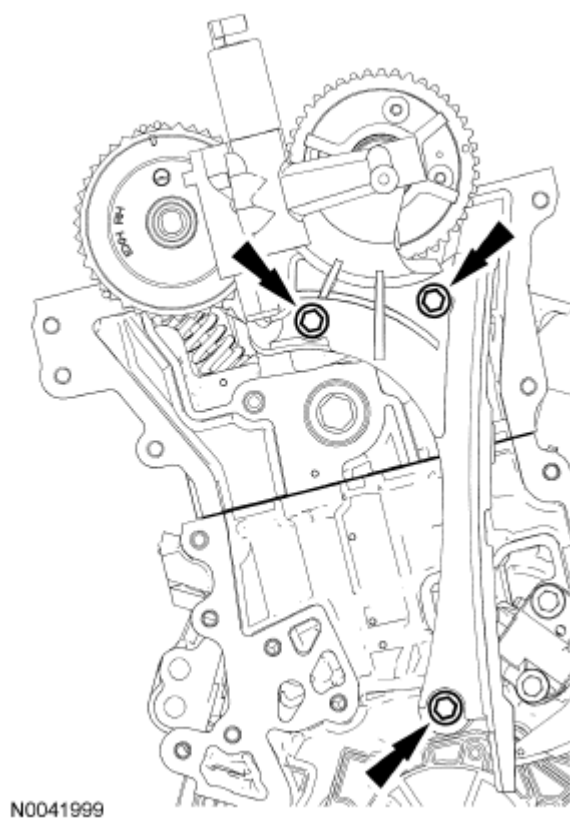


Fig. 59: Locating RH VCT Assembly And Bolts
Courtesy of FORD MOTOR CO.

14. Install the RH timing chain.

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

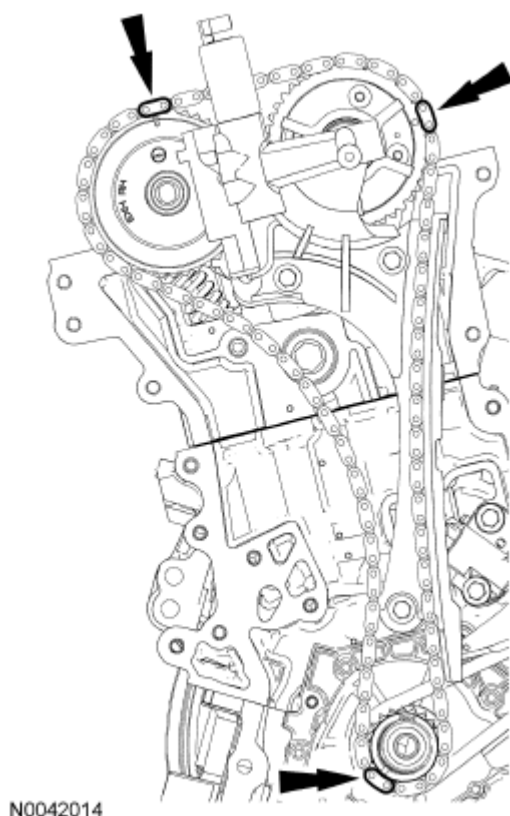


Fig. 60: Locating Marks On Chain
Courtesy of FORD MOTOR CO.

15. Install the RH timing chain tensioner and tensioner arm.
 1. Install the tensioner arm.
 2. Position the tensioner.
 3. Install the 2 bolts.
 - Tighten to 25 Nm (18 lb-ft).

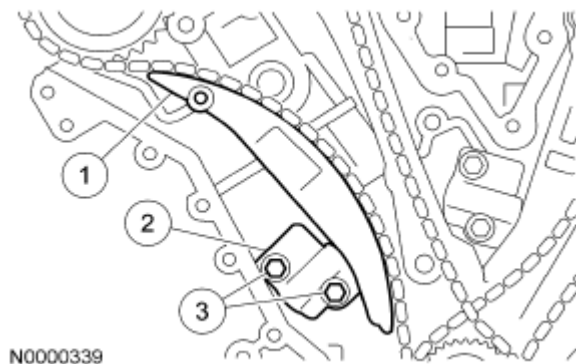
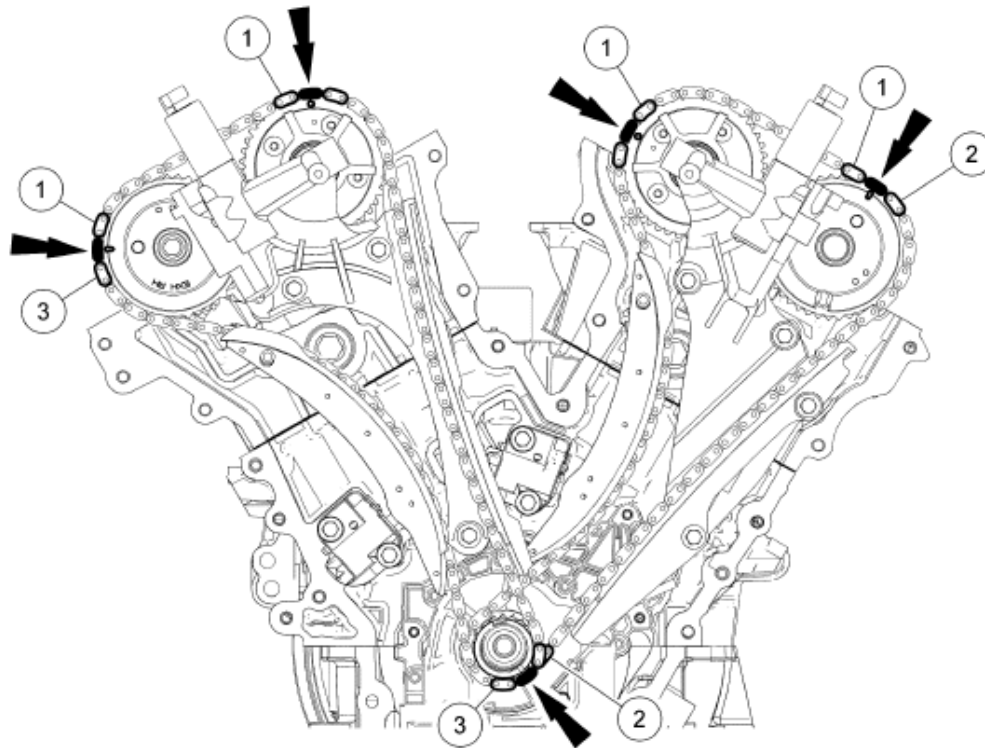


Fig. 61: Identifying Chain Tensioner Arm, Tensioner And Bolts
Courtesy of FORD MOTOR CO.

16. Remove the LH and RH timing chain tensioner piston retaining wires.
17. Rotate the crankshaft counterclockwise 120 degrees to top dead center (TDC).

CAUTION: Failure to verify correct timing drive component alignment will result in severe engine damage.

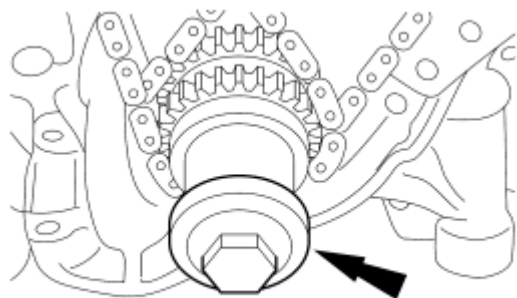
18. Verify the timing with the following steps.
 1. There should be 12 chain links between the camshaft timing marks.
 2. There should be 27 chain links between the camshaft and the crankshaft timing marks.
 3. There should be 30 chain links between the camshaft and the crankshaft timing marks.



N0042459

Fig. 62: Verifying Timing Procedure
Courtesy of FORD MOTOR CO.

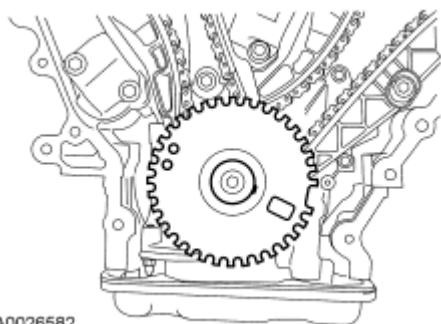
19. Remove the crankshaft pulley bolt and washer.



A0011064

Fig. 63: Identifying Damper Bolt
Courtesy of FORD MOTOR CO.

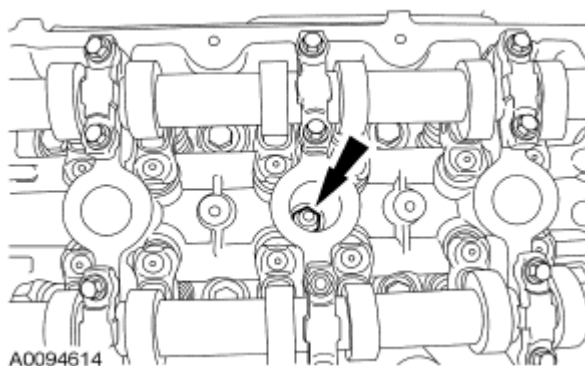
CAUTION: This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 30RFF only (orange in color).



A0026582

Fig. 64: Identifying Ignition Pulse Wheel
Courtesy of FORD MOTOR CO.

20. Install the ignition pulse wheel.
21. Install the 6 spark plugs.
 - Tighten to 15 Nm (11 lb-ft).



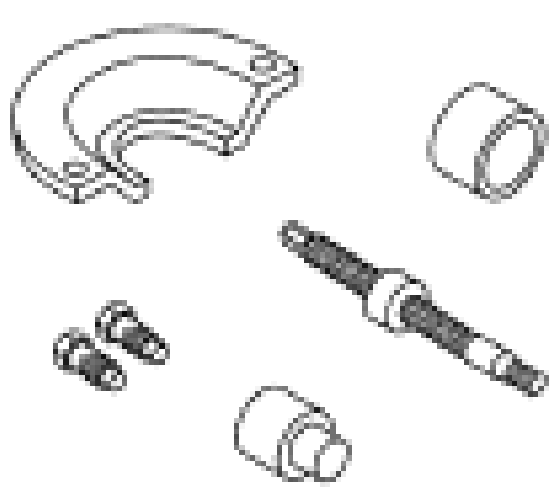
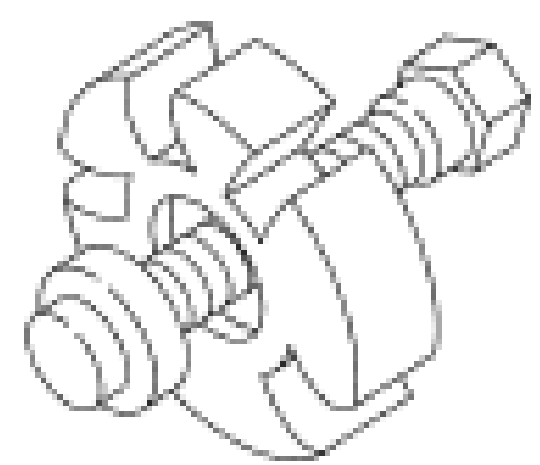
A0094614

Fig. 65: Locating Spark Plugs
Courtesy of FORD MOTOR CO.

22. Install the engine front cover. For additional information, refer to **ENGINE FRONT COVER**.

CAMSHAFTS - LH

SPECIAL TOOL(S)

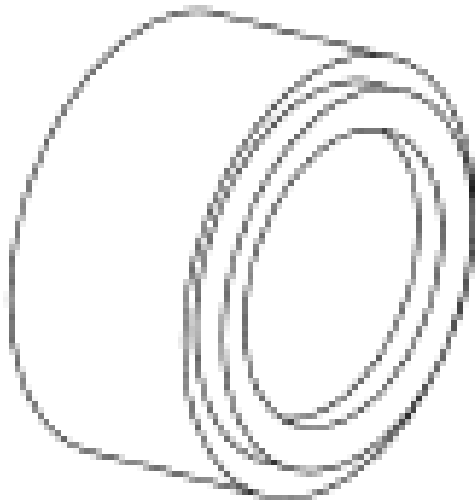
 ST1971-A	Service Set, Water Pump Pulley 303-S455 (T94P-6312-AH)
 ST1286-A	Remover, Crankshaft Vibration Damper 303-009 (T58P-6316-D)
	Remover, Oil Seal 303-409 (T92C-6700-CH)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1385-A



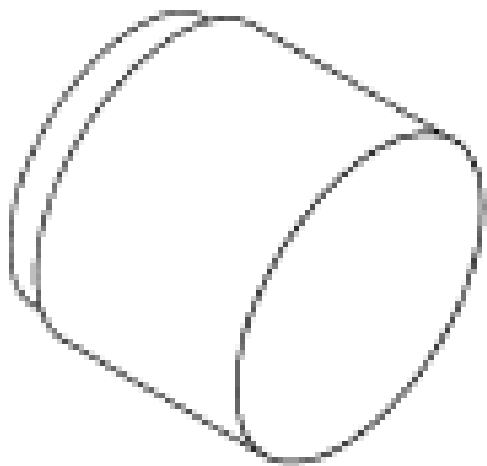
ST1970-A

Installer, Camshaft Oil Seal
303-464 (T94P-6256-BH)

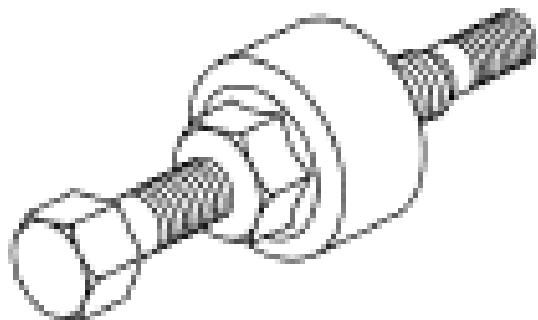
Protector, Camshaft Oil Seal
303-463 (T94P-6256-AH)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2060-A



ST1586-A

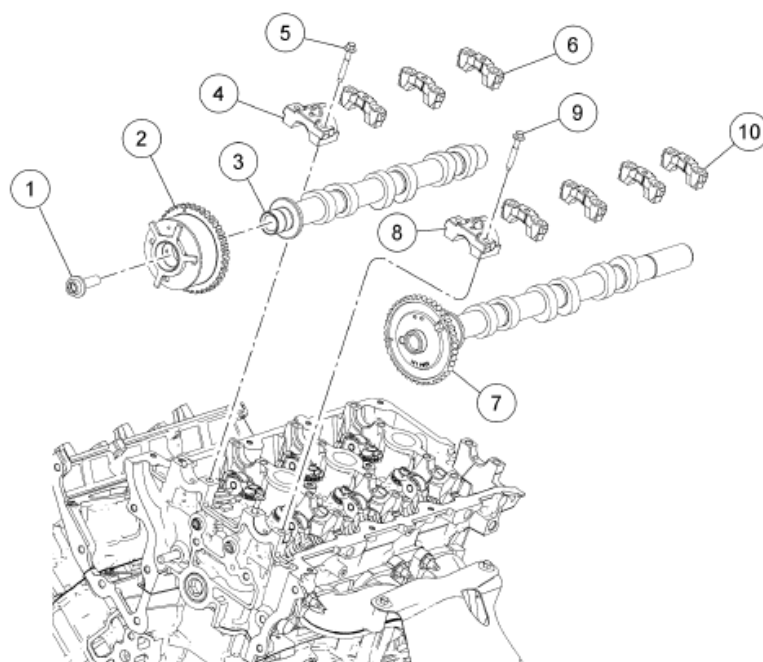
Installer, Power Steering Pump Pulley
211-185 (T91P-3A733-A)

MATERIAL

Item	Specification
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

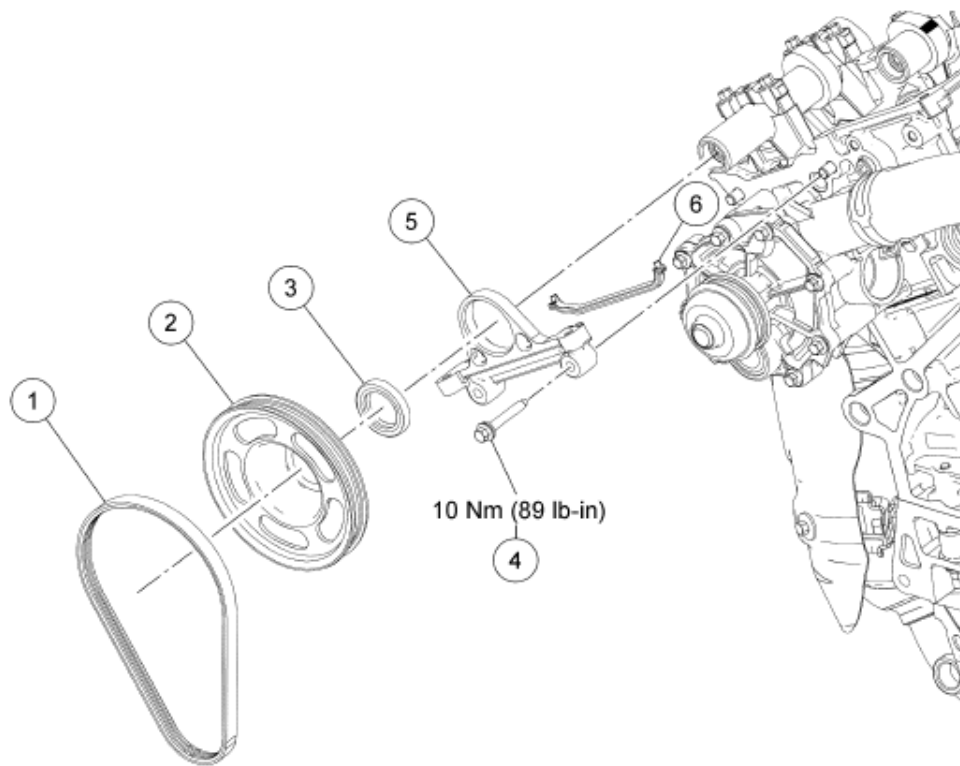


N0043272

Item	Part Number	Description
1	6279	Variable camshaft timing (VCT) actuator bolt
2	6C524	VCT actuator
3	6A267	LH intake camshaft
4	6B280	Intake camshaft thrust bearing cap
5	W710702	Intake camshaft bearing cap bolt (8 required)
6	6B280	Intake camshaft bearing cap (3 required)

Item	Part Number	Description
7	6A269	LH exhaust camshaft
8	6B280	Exhaust camshaft thrust bearing cap
9	W710702	Exhaust camshaft bearing cap bolt (10 required)
10	6B280	Exhaust camshaft bearing cap (4 required)

Fig. 66: Identifying Camshaft - LH Components (Items 1-10)
Courtesy of FORD MOTOR CO.



N0042468

Item	Part Number	Description
1	8K543	Coolant pump drive belt
2	6A359	Coolant pump drive pulley
3	—	Camshaft oil seal
4	W701242	Camshaft oil seal retainer bolt
5	6B293	Camshaft oil seal retainer
6	6B295	Camshaft oil seal retainer gasket

Fig. 67: Identifying Camshaft - LH Components (Items 1-6) (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

Removal

1. Remove the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.
2. Cut and discard the coolant pump belt.

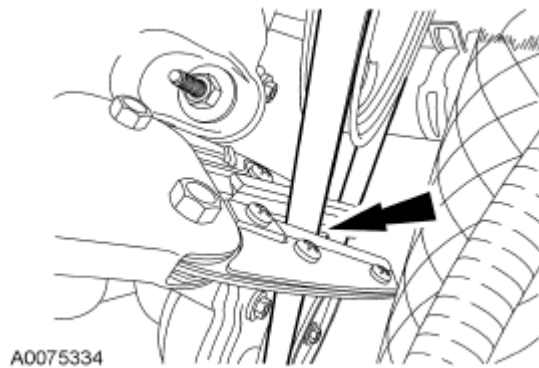


Fig. 68: Locating Coolant Pump Belt
Courtesy of FORD MOTOR CO.

3. Using the special tools, remove the coolant pump drive pulley from the camshaft.

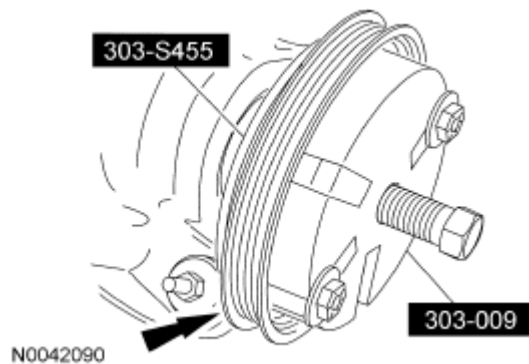


Fig. 69: Identifying Special Tools (303-S455 And 303-009) And Coolant Pump Drive Pulley
Courtesy of FORD MOTOR CO.

NOTE: To make sure of correct sealing, do not scratch the camshaft.

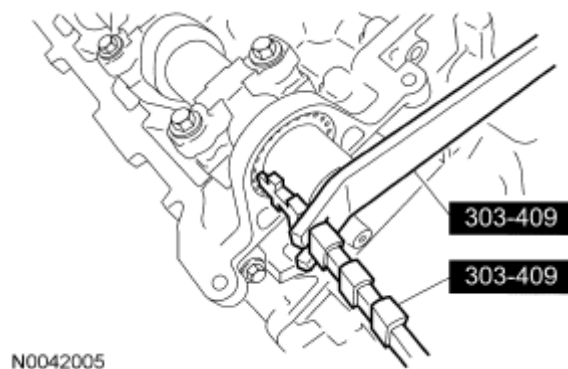


Fig. 70: Identifying Special Tools (303-409)
Courtesy of FORD MOTOR CO.

4. Using the special tools, remove and discard the camshaft oil seal.

5. Remove the 2 bolts and the camshaft oil seal retainer.
 - Discard the press-in-place gasket.

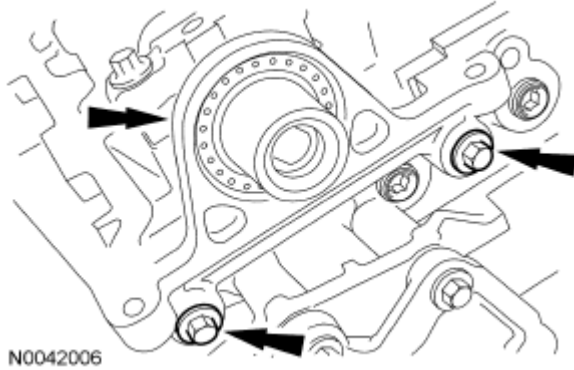


Fig. 71: Locating Camshaft Oil Seal Retainer And Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshafts must be in the neutral position before removing the bearing caps.

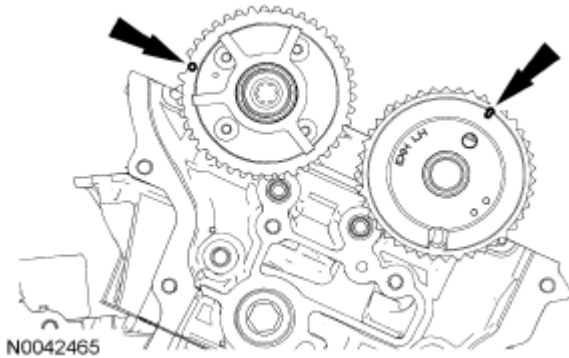


Fig. 72: Locating Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

6. Verify the camshafts are in the neutral position.

CAUTION: Do not allow the camshaft to rotate from the neutral position while removing the variable camshaft timing (VCT) actuator.

NOTE: Install a 3/8-in ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for removal of the VCT actuator bolt.

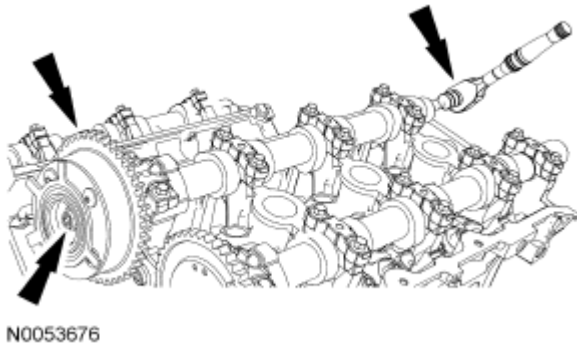


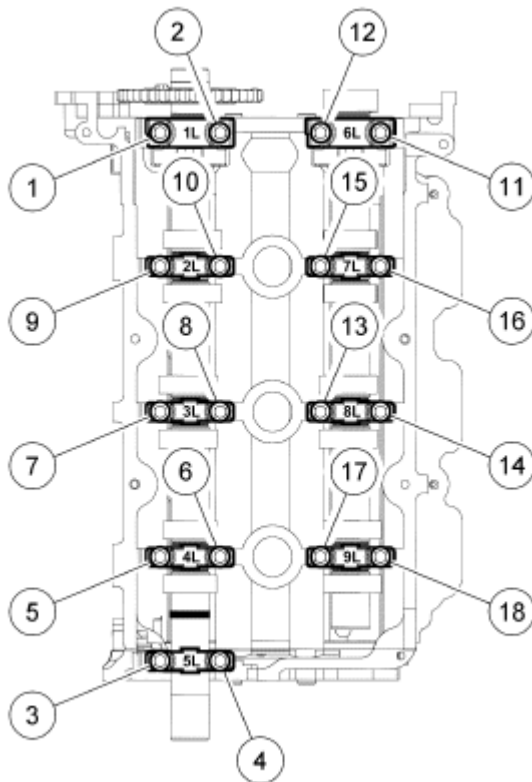
Fig. 73: Locating Bolt And Variable Camshaft Timing (VCT) Actuator
Courtesy of FORD MOTOR CO.

7. Remove the bolt and the variable camshaft timing (VCT) actuator.

CAUTION: Cylinder head camshaft bearing caps are numbered to verify that they are assembled in their original positions. If the numbers cannot be seen, mark the camshaft bearing caps prior to removing them.

CAUTION: After loosening all of the camshaft bearing cap bolts, remove the camshaft bearing thrust caps (1L and 6L) first, or damage to the thrust caps may occur.

8. Loosen the bolts evenly in the sequence shown.
 1. Remove the camshaft bearing thrust caps (1L and 6L).
 2. Remove the remaining camshaft bearing caps.
 3. Remove the camshafts from the cylinder head.

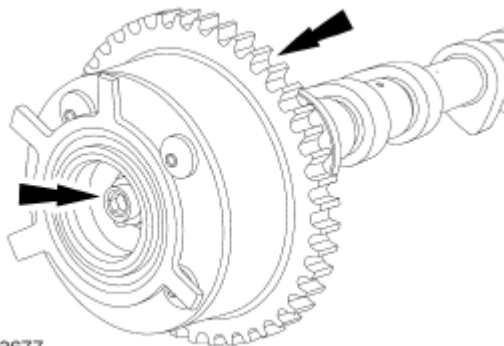


N0053679

Fig. 74: Identifying Loosening Sequence Of Camshaft Bearing Bolts
Courtesy of FORD MOTOR CO.

Installation

1. Position the VCT actuator onto the intake camshaft.
 - Install the bolt finger-tight.



N0053677

Fig. 75: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

CAUTION: The camshafts must be installed in the neutral position.

2. Lubricate the camshafts with clean engine oil and carefully position the camshafts into the cylinder head.
 - Align the camshafts in the neutral position as shown.

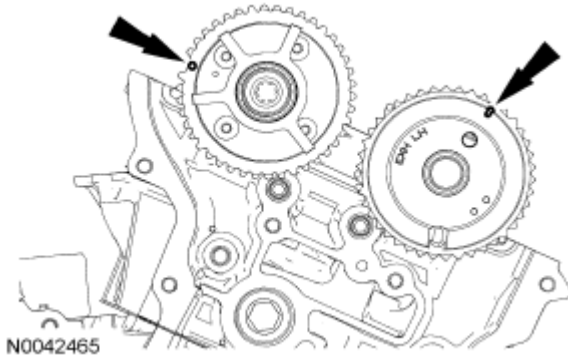


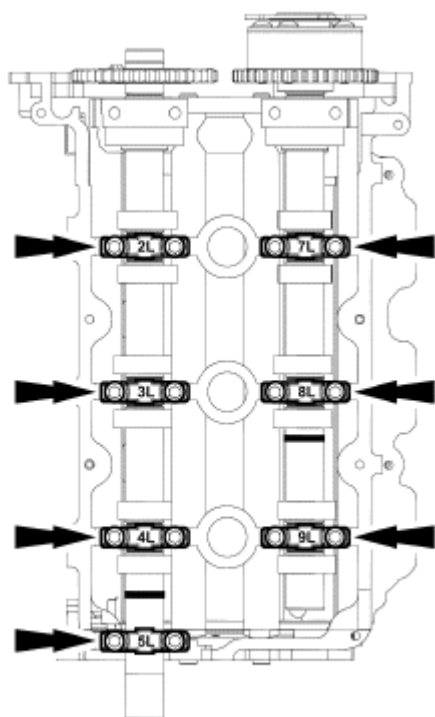
Fig. 76: Locating Camshafts Keyway In Neutral Position
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft caps must be installed in their original positions or damage to the engine may occur.

CAUTION: Do not install the camshaft bearing thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur.

NOTE: Lubricate the bearing surfaces of the camshaft bearing caps with clean engine oil.

3. Install the camshaft bearing caps.
 - Loosely install the bolts.

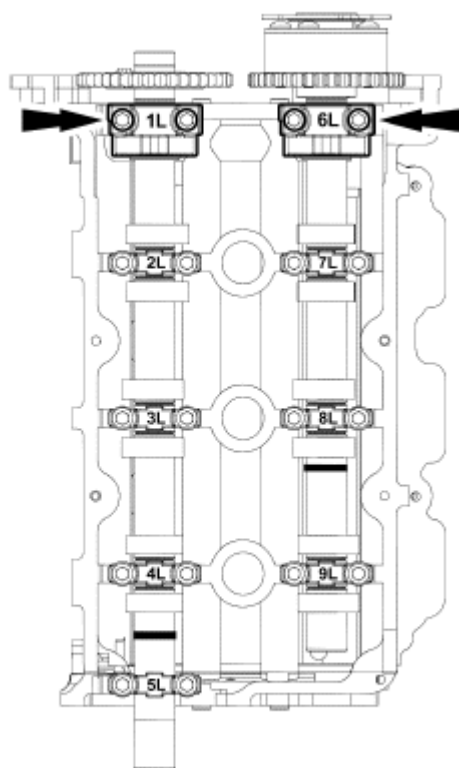


N0042454

Fig. 77: Locating Camshaft Bearing Caps
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the bearing surfaces of the camshaft bearing thrust caps with clean engine oil.

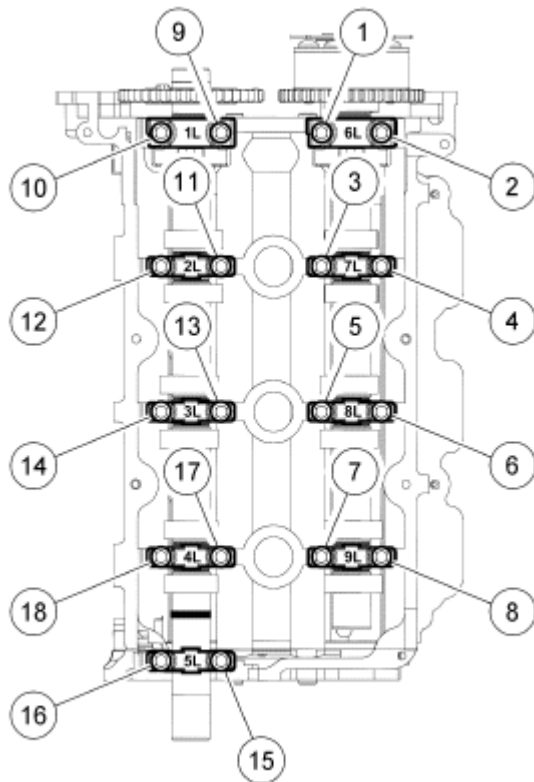
4. Install the camshaft bearing thrust caps.
 - Loosely install the bolts.



N0042455

Fig. 78: Locating Camshaft Bearing Thrust Caps
Courtesy of FORD MOTOR CO.

5. Tighten the camshaft bearing cap bolts in the sequence shown to 10 Nm (89 lb-in).

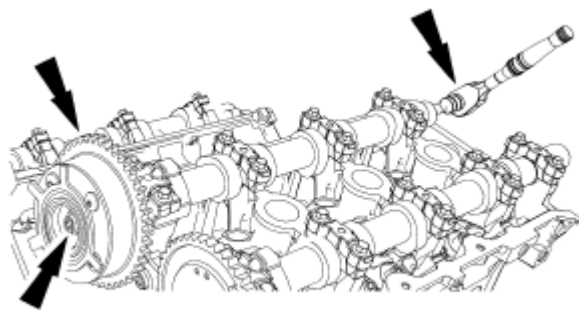


N0042010

Fig. 79: Identifying Tightening Sequence Camshaft Bearing Cap Bolts
Courtesy of FORD MOTOR CO.

CAUTION: Do not allow the camshaft to rotate from the neutral position while tightening the VCT actuator bolt.

NOTE: Install a 3/8-in ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for tightening of the VCT actuator bolt.



N0053676

Fig. 80: Locating VCT Actuator Bolt
Courtesy of FORD MOTOR CO.

6. Tighten the VCT actuator bolt to 40 Nm (30 lb-ft) plus an additional 90 degrees.

NOTE: Clean the sealing surface with metal surface cleaner before installing a new press-in-place gasket.

7. Install the camshaft oil seal retainer and the 2 bolts.
- Tighten to 10 Nm (89 lb-in).

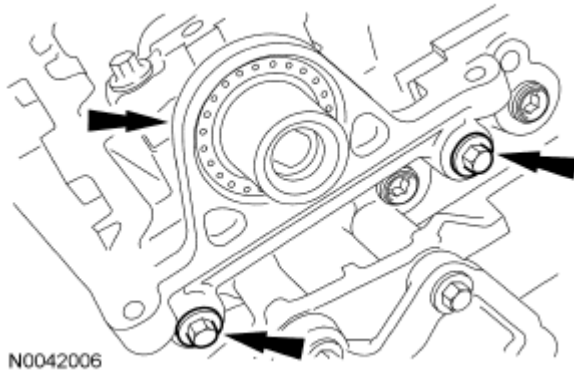


Fig. 81: Locating Camshaft Oil Seal Retainer And Bolts
Courtesy of FORD MOTOR CO.

NOTE: Apply clean engine oil to the seal lip and seal bore before installing the seal.

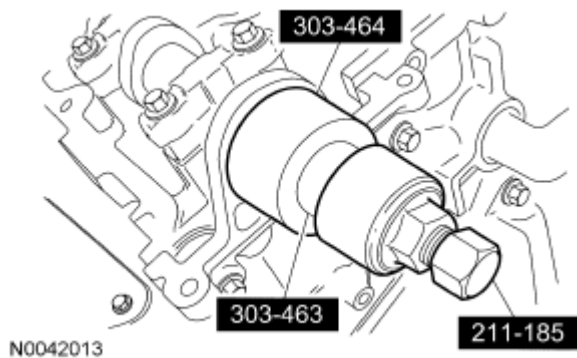


Fig. 82: Identifying Special Tools (303-463, 303-464 And 211-185)
Courtesy of FORD MOTOR CO.

8. Using the special tools, install a new camshaft oil seal.

CAUTION: The pulley is pressed on flush to the end of the camshaft.

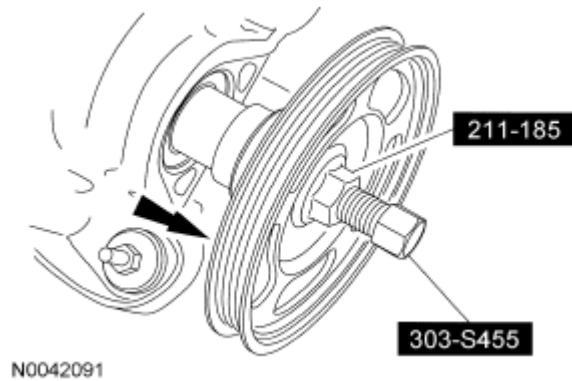


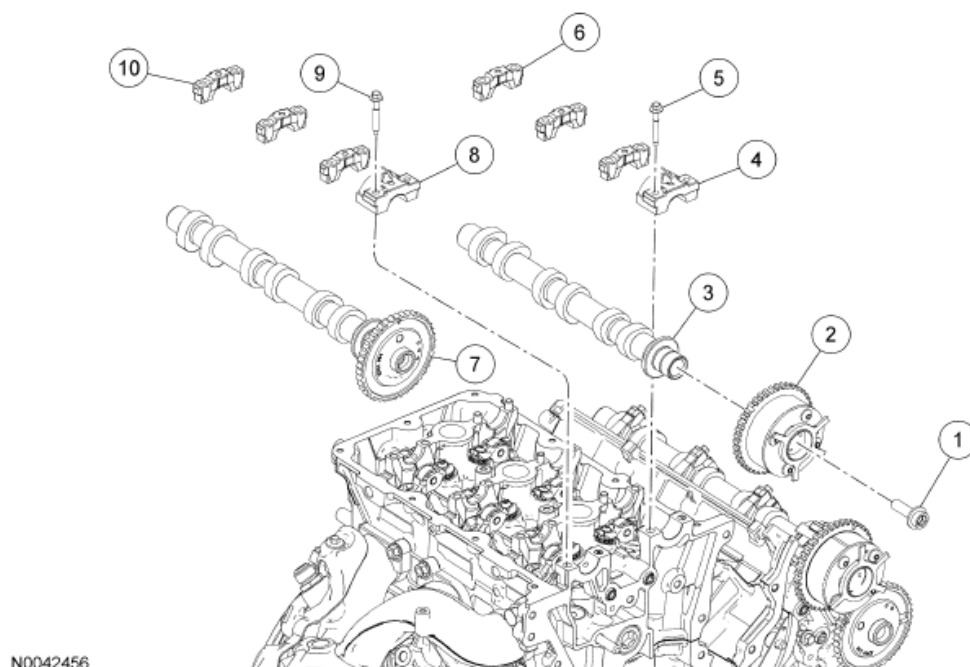
Fig. 83: Identifying Special Tool (211-185 And 303-S455)
Courtesy of FORD MOTOR CO.

9. Using the special tool, install the coolant pump drive pulley.
10. Install the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.
11. Install the coolant pump belt. For additional information, refer to **ACCESSORY DRIVE - 3.0L (4V)**.

CAMSHAFTS - RH

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



N0042456

Item	Part Number	Description
1	6279	Variable camshaft timing (VCT) actuator bolt
2	6C524	VCT actuator
3	6A266	RH intake camshaft
4	6B280	Intake camshaft thrust bearing cap
5	W710702	Intake camshaft bearing cap bolt (8 required)

Item	Part Number	Description
6	6B280	Intake camshaft bearing cap (3 required)
7	6A268	RH exhaust camshaft
8	6B280	Exhaust camshaft thrust bearing cap
9	W710702	Exhaust camshaft bearing cap bolt (8 required)
10	6B280	Exhaust camshaft bearing cap (3 required)

Fig. 84: Identifying Camshaft - RH Components
Courtesy of FORD MOTOR CO.

Removal

1. Remove the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.

CAUTION: The camshafts must be in the neutral position before removing the bearing caps.

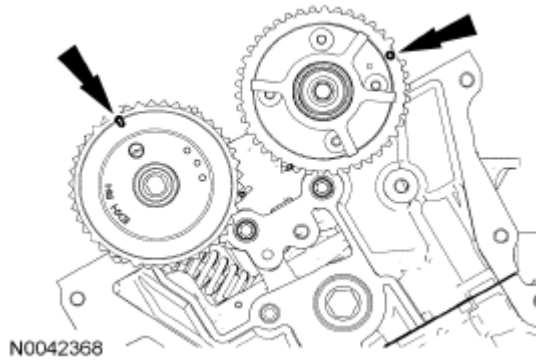


Fig. 85: Locating Camshafts Keyway Position
Courtesy of FORD MOTOR CO.

2. Verify the camshafts are in the neutral position.

CAUTION: Do not allow the camshaft to rotate from the neutral position while removing the variable camshaft timing (VCT) actuator.

NOTE: Install a 3/8-in ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for removal of the VCT actuator bolt.

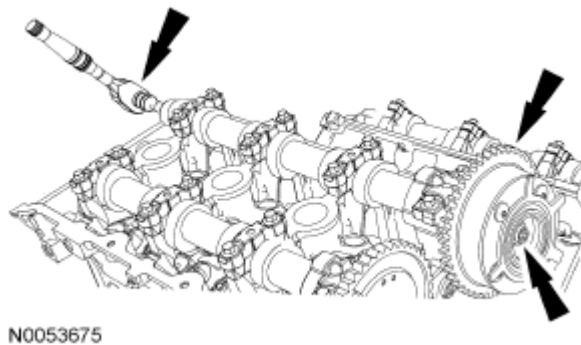


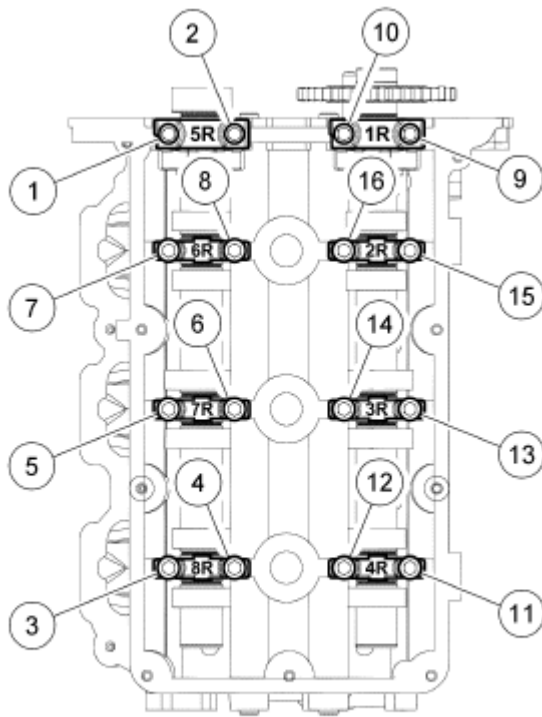
Fig. 86: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

3. Remove the bolt and the VCT actuator.

CAUTION: Cylinder head camshaft bearing caps are numbered to verify that they are assembled in their original positions. If the numbers cannot be seen, mark the camshaft bearing caps prior to removing them.

CAUTION: After loosening all of the camshaft bearing cap bolts, remove the camshaft bearing thrust caps (5R and 1R) first, or damage to the thrust caps may occur.

4. Loosen the bolts evenly in the sequence shown.
 1. Remove the camshaft bearing thrust caps (5R and 1R).
 2. Remove the remaining camshaft bearing caps.
 3. Remove the camshafts from the cylinder head.

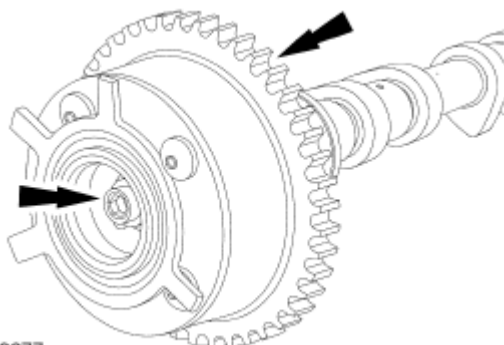


N0053678

Fig. 87: Identifying Loosening Sequence Of Camshaft Bearing Bolts
Courtesy of FORD MOTOR CO.

Installation

1. Position the VCT actuator onto the intake camshaft.
 - Install the bolt finger-tight.



N0053677

Fig. 88: Locating VCT Actuator Onto Intake Camshaft
Courtesy of FORD MOTOR CO.

CAUTION: The camshafts must be installed in the neutral position.

2. Lubricate the camshafts with clean engine oil and carefully position the camshafts onto the cylinder head.
 - Align the camshafts in the neutral position as shown.

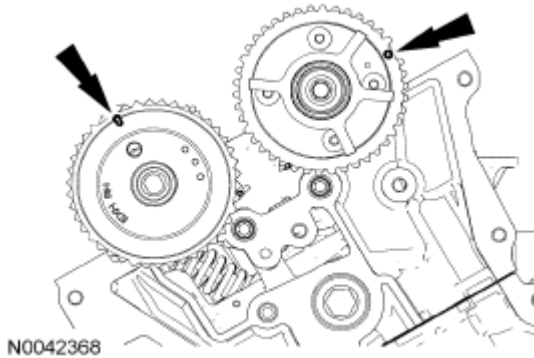


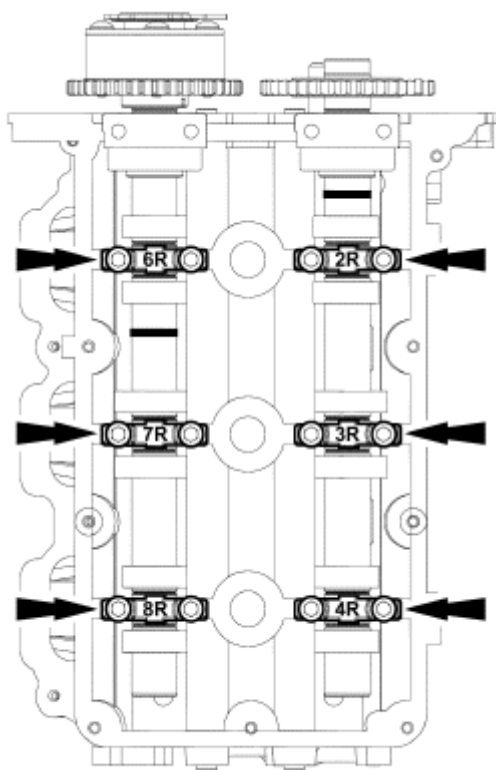
Fig. 89: Locating Camshafts Keyway Position
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft caps must be installed in their original positions or damage to the engine may occur.

CAUTION: Do not install the camshaft bearing thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur.

NOTE: Lubricate the bearing surfaces of the camshaft bearing caps with clean engine oil.

3. Install the camshaft bearing caps.
 - Loosely install the bolts.

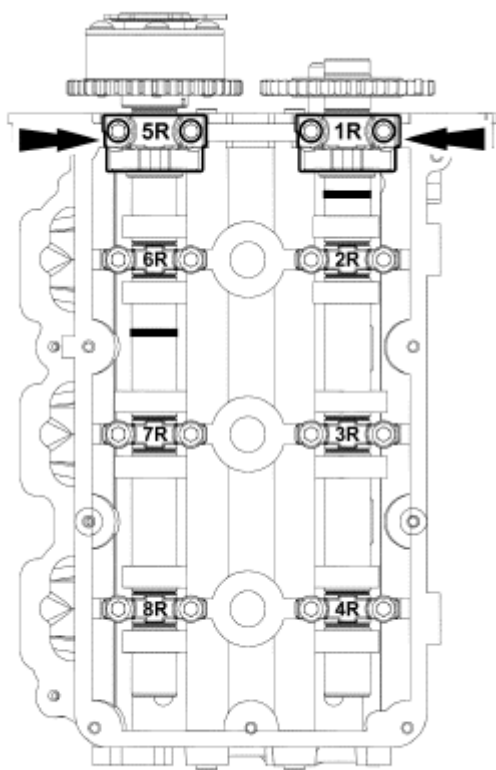


N0042369

Fig. 90: Locating Camshaft Bearing Caps
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the bearing surfaces of the camshaft bearing thrust caps with clean engine oil.

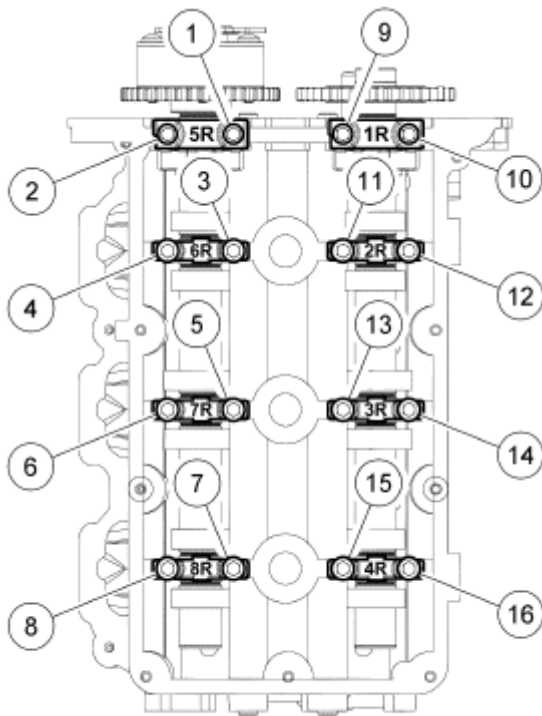
4. Install the camshaft bearing thrust caps.
 - Loosely install the bolts.



N0042453

Fig. 91: Locating Camshaft Bearing Thrust Caps
Courtesy of FORD MOTOR CO.

5. Tighten the camshaft bearing cap bolts in the sequence shown to 10 Nm (89 lb-in).

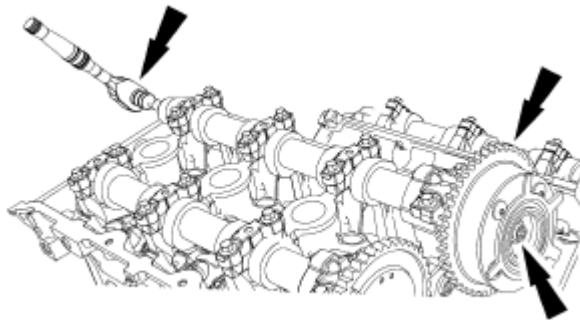


N0042011

Fig. 92: Identifying Tightening Sequence Of Camshaft Bearing Cap Bolts
Courtesy of FORD MOTOR CO.

CAUTION: Do not allow the camshaft to rotate from the neutral position while tightening the VCT actuator bolt.

NOTE: Install a 3/8-in ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for tightening of the VCT actuator bolt.



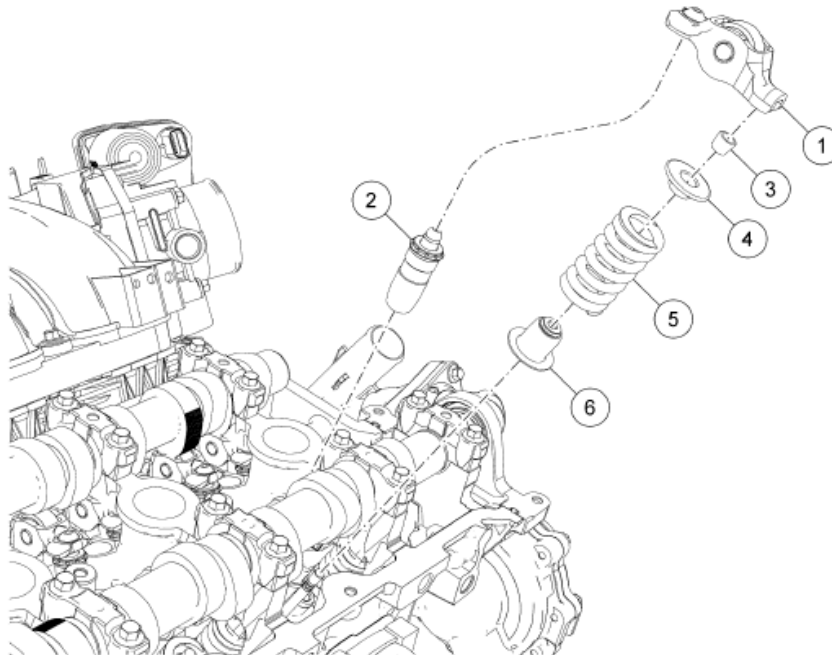
N0053675

Fig. 93: Locating VCT Actuator Bolt
Courtesy of FORD MOTOR CO.

6. Tighten the VCT actuator bolt to 40 Nm (30 lb-ft) plus an additional 90 degrees.
7. Install the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.

VALVE TRAIN COMPONENTS - EXPLODED VIEW

NOTE: LH shown, RH similar.



Item	Part Number	Description
1	6529	Roller follower (24 required)
2	6C501	Hydraulic lash adjuster (24 required)
3	6518	Valve spring retainer key (48 required)
4	6514	Valve spring retainer (24 required)

Item	Part Number	Description
5	6513	Valve spring (24 required)
6	6A517	Valve stem seal (24 required)

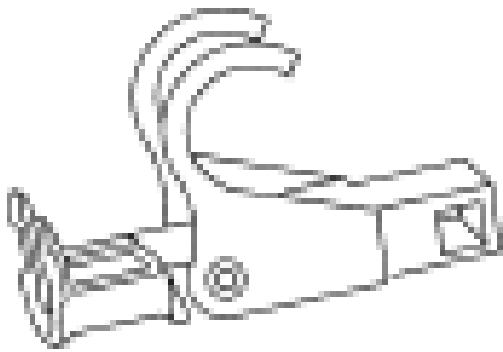
Fig. 94: Exploded View Of Valve Train Components
Courtesy of FORD MOTOR CO.

1. For additional information, refer to the appropriate procedure.

CAMSHAFT ROLLER FOLLOWER

SPECIAL TOOL(S)

Compressor, Valve Spring
303-473 (T94P-6565-BH)



ST1975-A

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Removal and Installation

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the LH and RH valve covers. For additional information, refer to **VALVE COVER - LH** and **VALVE COVER - RH**.
3. Remove the 6 spark plugs.
 - To install, tighten to 15 Nm (11 lb-ft).
4. Remove the 4 screws and position the RH fender splash shield aside.

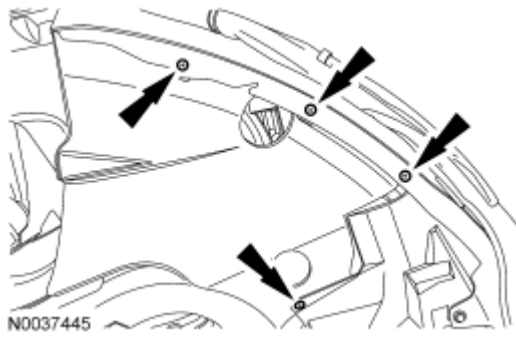


Fig. 95: Locating RH Fender Splash Shield Screws
Courtesy of FORD MOTOR CO.

5. Remove the 6 pin-type retainers (4 shown) and the RH splash shield.

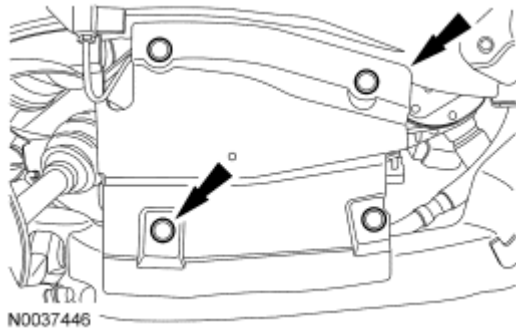


Fig. 96: Locating Splash Shield Pin-Type Retainers
Courtesy of FORD MOTOR CO.

6. Rotate the crankshaft until the camshaft lobe is pointing directly away from the roller follower.

NOTE: Mark the positions of the roller followers to make sure they are assembled in their original positions.



Fig. 97: Identifying Special Tool (303-473)
Courtesy of FORD MOTOR CO.

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

- Using the special tool, remove the roller followers.

NOTE: Lubricate the roller followers with clean engine oil.

- To install, reverse the removal procedure.

HYDRAULIC LASH ADJUSTER

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Removal and Installation

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

- Remove the camshaft roller followers. For additional information, refer to CAMSHAFT ROLLER FOLLOWER.

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

- Remove the hydraulic lash adjusters.

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.
 - Lubricate the hydraulic lash adjusters with clean engine oil.

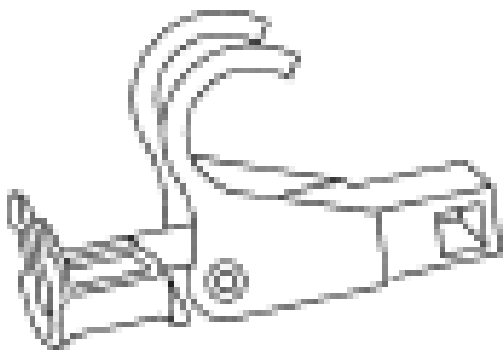
VALVE SPRING, RETAINER, AND SEAL

SPECIAL TOOL(S)

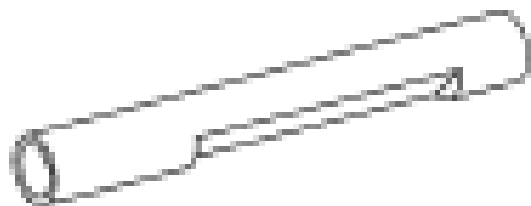
	Compressor, Valve Spring 303-473 (T94P-6565-BH)
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2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1975-A



ST1977-A

Installer, Valve Stem Oil Seal
303-470 (T94P-6510-CH)

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. Remove the camshaft roller followers. For additional information, refer to **CAMSHAFT ROLLER FOLLOWER**.

CAUTION: If air pressure has forced the piston to the bottom of the cylinder, any loss of air pressure will allow the valve to fall into the cylinder. If air pressure must be removed, support the valve prior to removal.

CAUTION: If the components are to be reinstalled, they must be installed in their original positions. Mark the components for installation into their original locations.

NOTE: If a valve drops into the cylinder, remove the cylinder head. For additional information, refer CYLINDER HEAD - RH or CYLINDER HEAD - LH.

2. Pressurize the cylinder using compressed air.
3. Using the special tool, remove the key, retainer and the valve spring.



Fig. 98: Identifying Special Tool (303-473)
Courtesy of FORD MOTOR CO.

NOTE: Camshaft removed for clarity.

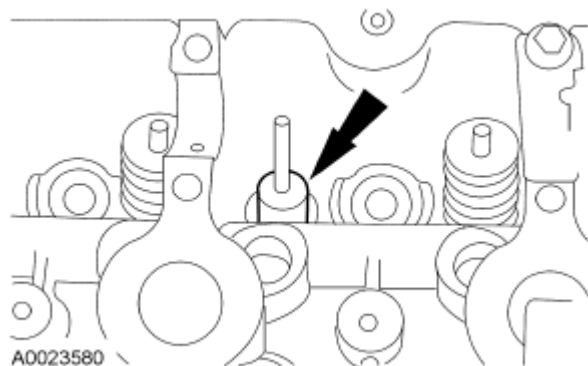


Fig. 99: Locating Valve Seal
Courtesy of FORD MOTOR CO.

4. Remove and discard the valve seal.

Installation

NOTE: Lubricate the valve guide with clean engine oil.

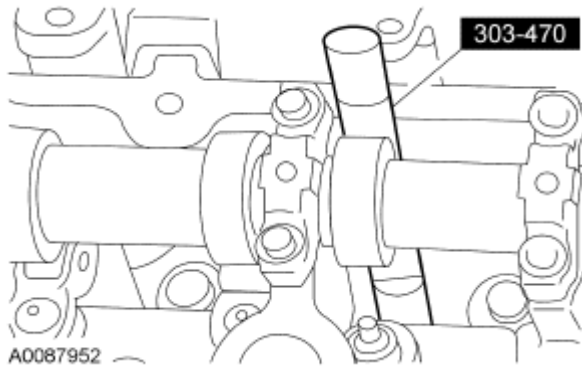


Fig. 100: Identifying Special Tool (303-470)
Courtesy of FORD MOTOR CO.

1. Using the special tool, install the new valve seal.

CAUTION: If the components are to be reinstalled, they must be installed in their original positions.



Fig. 101: Identifying Special Tool (303-473)
Courtesy of FORD MOTOR CO.

2. Using the special tool, install the valve spring, retainer and key.
3. Install the camshaft roller followers. For additional information, refer to **CAMSHAFT ROLLER FOLLOWER**.

CYLINDER HEAD - RH

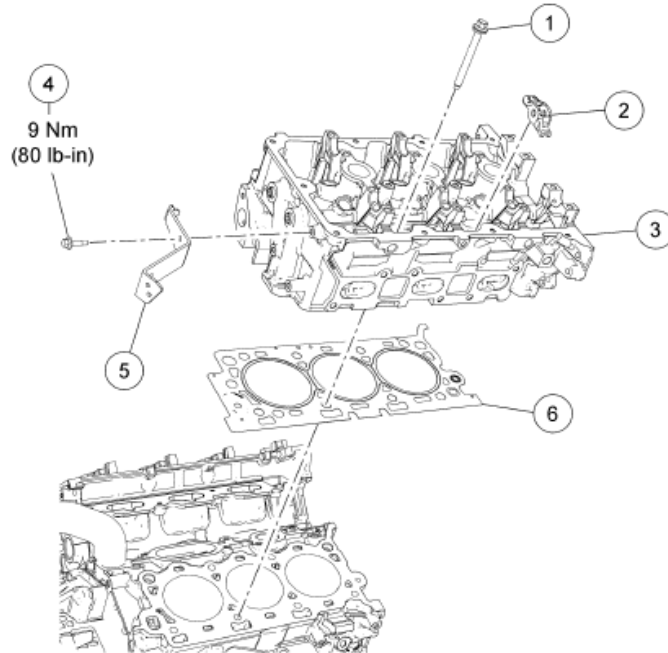
MATERIAL

Item	Specification
Silicone Gasket Remover ZC-30	-
Motorcraft Metal Surface Prep ZC-31	-
Motorcraft SAE 5W-20 Premium Synthetic Blend	WSS-M2C930-A

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Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent



Item	Part Number	Description
1	6065	Cylinder head bolt (8 required)
2	6529	Camshaft roller follower (12 required)
3	6049	Cylinder head

Item	Part Number	Description
4	506413	Power steering pressure (PSP) tube bracket-to-cylinder head bolt
5	3A719	PSP tube bracket
6	6051	Cylinder head gasket

Fig. 102: Identifying Cylinder - RH Components (With Torque Specifications)
Courtesy of FORD MOTOR CO.

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the RH camshafts. For additional information, refer to **CAMSHAFTS - RH**.
3. Remove the coolant bypass tube. For additional information, refer to **ENGINE COOLING**.
4. Remove the bolt and detach the power steering pressure (PSP) tube bracket from the back of the cylinder head.

5. Remove the RH catalytic converter. For additional information, refer to **EXHAUST SYSTEM**.

CAUTION: The camshaft roller followers must be installed in their original positions.

NOTE: Mark the location of the roller followers, using a permanent-type marker.

6. Remove the camshaft roller followers.
7. Loosen the 8 bolts in the sequence shown and remove the cylinder head.
- Discard the bolts and the gasket.

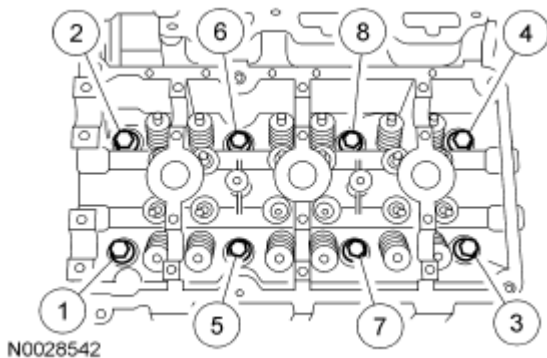


Fig. 103: Identifying Loosening Sequence Of Cylinder Heads Bolts
Courtesy of FORD MOTOR CO.

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 that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

CAUTION: Observe all warnings or cautions and follow all application directions contained on the packaging of the silicone gasket remover and the metal surface prep.

NOTE: If there is no residual gasket material present, metal surface prep can be used to clean and prepare the surfaces.

8. Clean the cylinder head-to-cylinder block mating surface of both the cylinder head and the cylinder block.
1. Remove any large deposits of silicone or gasket material with a plastic scraper.
 2. Apply silicone gasket remover, following package directions, and allow to set for several minutes.
 3. Remove the silicone gasket remover with a plastic scraper. A second application of silicone gasket remover may be required if residual traces of silicone or gasket material remain.
 4. Apply metal surface prep, following package directions, to remove any traces of oil or coolant, and to prepare the surfaces to bond with the new gasket. Do not attempt to make the metal shiny. Some

staining of the metal surfaces is normal.

9. Support the cylinder head on a bench with the head gasket side up.

NOTE: The straightedge used must be flat within 0.0051 mm (0.0002 in) per foot of tool length.

10. Inspect all areas of the deck face with a straightedge and feeler gauge. The cylinder head must not have depressions deeper than 0.0254 mm (0.001 in) across a 38.1 mm (1.5 in) square area, or scratches more than 0.0254 mm (0.001 in).

Installation

1. Clean the cylinder head bolt holes in the cylinder block. Make sure all coolant, oil or other foreign material is removed.
2. Position a new gasket and the cylinder head on the engine.

NOTE: New cylinder head bolts must be installed. They are torque-to-yield designed and cannot be reused.

3. Install the 8 bolts and tighten in 6 stages in the sequence shown.
 - Stage 1: Tighten to 40 Nm (30 lb-ft).
 - Stage 2: Tighten 90 degrees.
 - Stage 3: Loosen one full turn.
 - Stage 4: Tighten to 40 Nm (30 lb-ft).
 - Stage 5: Tighten 90 degrees.
 - Stage 6: Tighten 90 degrees.

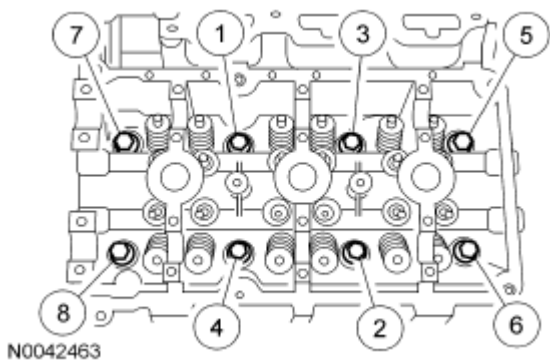


Fig. 104: Identifying Tightening Sequence Of Cylinder Head Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft roller followers must be installed in their original positions.

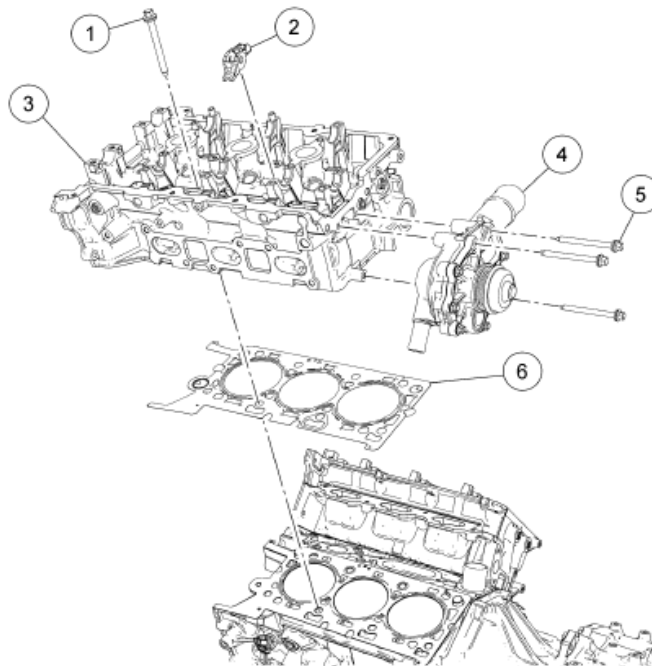
NOTE: Lubricate the camshaft roller followers with clean engine oil.

4. Install the camshaft roller followers.
5. Install the RH catalytic converter. For additional information, refer to **EXHAUST SYSTEM**.
6. Position the PSP tube bracket onto the rear of the cylinder head and install the bolt.
 - Tighten to 9 Nm (80 lb-in).
7. Install the coolant bypass tube. For additional information, refer to **ENGINE COOLING**.
8. Install the RH camshafts. For additional information, refer to **CAMSHAFTS - RH**.

CYLINDER HEAD - LH

MATERIAL

Item	Specification
Silicone Gasket Remover ZC-30	-
Motorcraft Metal Surface Prep ZC-31	-
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



N0042458

Item	Part Number	Description
1	6065	Cylinder head bolt (8 required)
2	6529	Camshaft roller follower (12 required)

Item	Part Number	Description
3	6050	Cylinder head
4	8501	Coolant pump
5	701544	Coolant pump bolt
6	6083	Cylinder head gasket

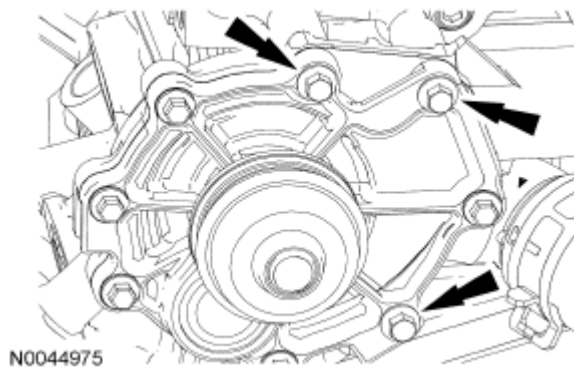
Fig. 105: Identifying Cylinder - LH Components

Courtesy of FORD MOTOR CO.

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the LH camshafts. For additional information, refer to **CAMSHAFTS - LH**.
3. Remove the coolant bypass tube. For additional information, refer to **ENGINE COOLING**.
4. Remove the 3 bolts and position the coolant pump aside.

**Fig. 106: Locating Coolant Pump Bolts**

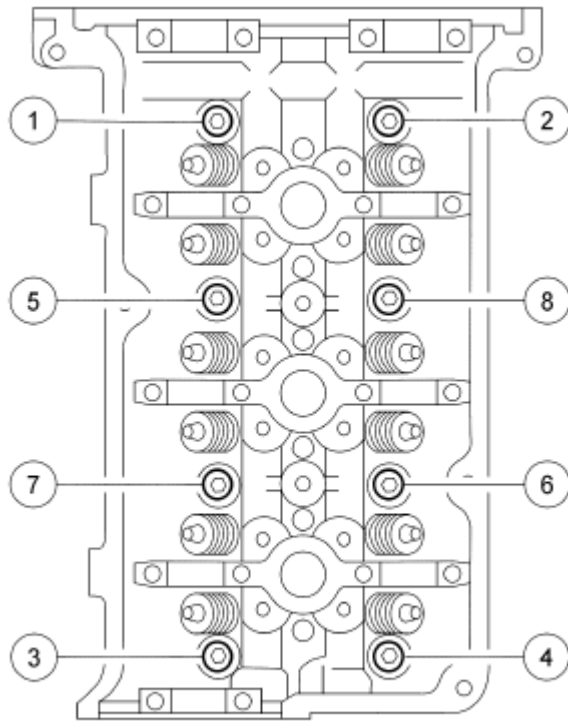
Courtesy of FORD MOTOR CO.

5. Remove the LH catalytic converter. For additional information, refer to **EXHAUST SYSTEM**.

CAUTION: The camshaft roller followers must be installed in their original positions.

NOTE: Mark the location of the roller followers, using a permanent-type marker.

6. Remove the camshaft roller followers.
7. Loosen the 8 bolts in the sequence shown and remove the cylinder head.
 - Discard the bolts and the gasket.



N0001536

Fig. 107: Identifying Loosening Sequence Of Cylinder Head Bolts
Courtesy of FORD MOTOR CO.

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 that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

CAUTION: Observe all warnings or cautions and follow all application directions contained on the packaging of the silicone gasket remover and the metal surface prep.

NOTE: If there is no residual gasket material present, metal surface prep can be used to clean and prepare the surfaces.

8. Clean the cylinder head-to-cylinder block mating surface of both the cylinder head and the cylinder block.
 1. Remove any large deposits of silicone or gasket material with a plastic scraper.
 2. Apply silicone gasket remover, following package directions, and allow to set for several minutes.
 3. Remove the silicone gasket remover with a plastic scraper. A second application of silicone gasket remover may be required if residual traces of silicone or gasket material remain.
 4. Apply metal surface prep, following package directions, to remove any traces of oil or coolant, and to prepare the surfaces to bond with the new gasket. Do not attempt to make the metal shiny. Some staining of the metal surfaces is normal.

9. Support the cylinder head on a bench with the head gasket side up.

NOTE: **The straightedge used must be flat within 0.0051 mm (0.0002 in) per foot of tool length.**

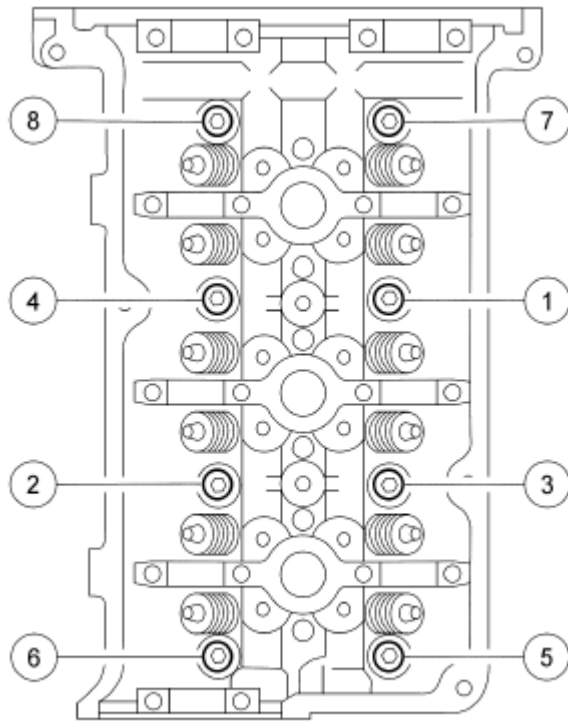
10. Inspect all areas of the deck face with a straightedge and feeler gauge. The cylinder head must not have depressions deeper than 0.0254 mm (0.001 in) across a 38.1 mm (1.5 in) square area, or scratches more than 0.0254 mm (0.001 in).

Installation

1. Clean the cylinder head bolt holes in the cylinder block. Make sure all coolant, oil or other foreign material is removed.
2. Position a new gasket and the cylinder head on the engine.

NOTE: **New cylinder head bolts must be installed. They are torque-to-yield designed and cannot be reused.**

3. Install the 8 bolts and tighten in 6 stages in the sequence shown.
 - Stage 1: Tighten to 40 Nm (30 lb-ft).
 - Stage 2: Tighten 90 degrees.
 - Stage 3: Loosen one full turn.
 - Stage 4: Tighten to 40 Nm (30 lb-ft).
 - Stage 5: Tighten 90 degrees.
 - Stage 6: Tighten 90 degrees.



N0001535

Fig. 108: Identifying Tightening Sequence Of Cylinder Head Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft roller followers must be installed in their original positions.

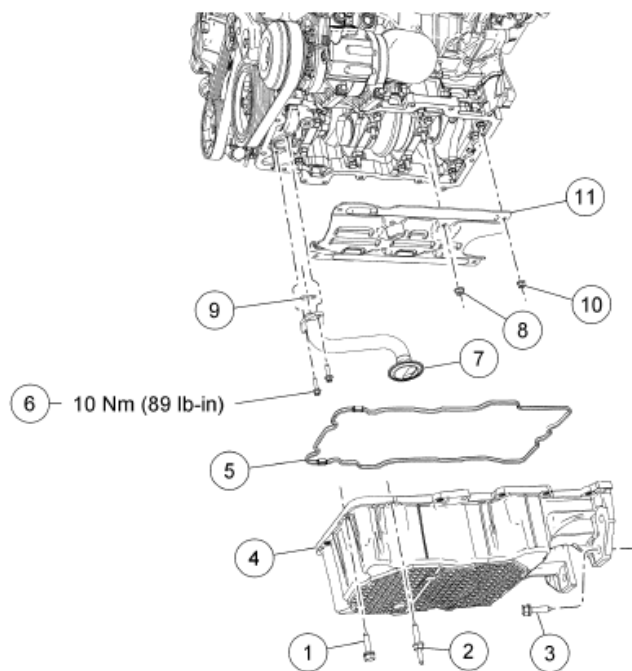
NOTE: Lubricate the camshaft roller followers with clean engine oil.

4. Install the camshaft roller followers.
5. Install the LH catalytic converter. For additional information, refer to **EXHAUST SYSTEM** .
6. Position the coolant pump and install the bolts.
 - Tighten to 10 Nm (89 lb-in) then rotate 90 degrees.
7. Install the coolant bypass tube. For additional information, refer to **ENGINE COOLING** .
8. Install the LH camshafts. For additional information, refer to **CAMSHAFTS - LH**.

ENGINE LUBRICATION COMPONENTS - EXPLODED VIEW

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



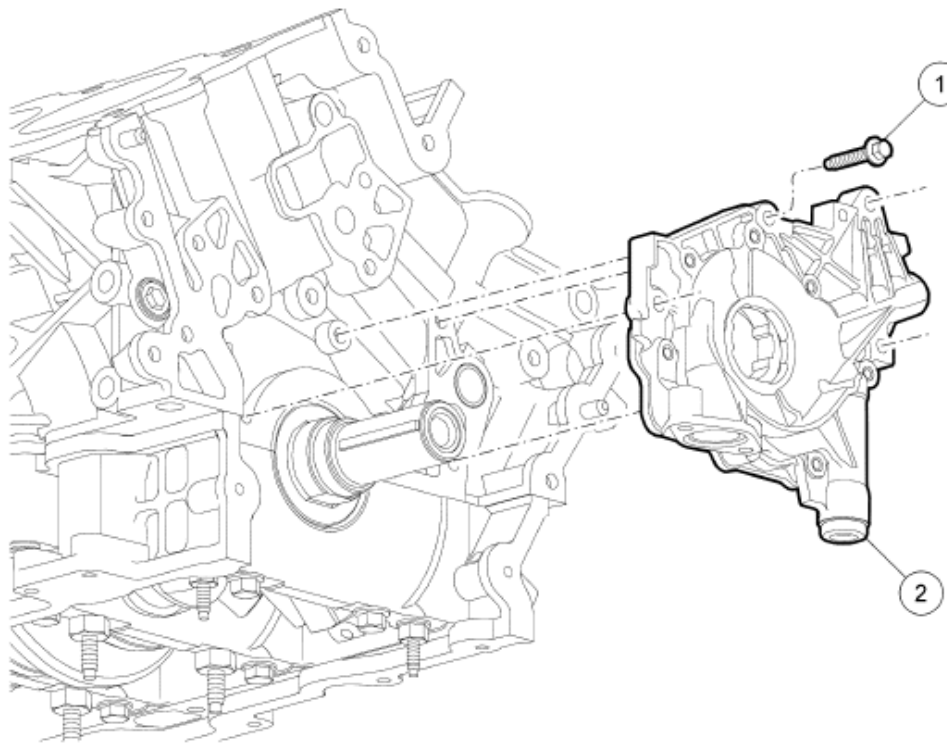
N0042360

Item	Part Number	Description
1	W709678	Oil pan bolt (10 required)
2	W701606	Oil pan stud bolt (5 required)
3	W500120	Oil pan-to-transaxle bolt (2 required)
4	6675	Oil pan
5	6710	Oil pan gasket
6	W700005	Oil pump screen and pickup tube bolt (2 required)
7	6622	Oil pump screen and pickup tube

Item	Part Number	Description
8	W701582	Oil pan baffle nut (4 required)
9	6625	Oil pump screen and pickup tube O-ring seal
10	W701542	Oil pan baffle nut (4 required)
11	6687	Oil pan baffle

Fig. 109: Exploded View Of Oil Pan, Oil Pump Screen And Pickup Tube And Oil Pan Baffle (With Torque Specifications)

Courtesy of FORD MOTOR CO.



N0000295

Item	Part Number	Description
1	W500300	Oil pump bolt (4 required)
2	6621	Oil pump

Fig. 110: Exploded View Of Oil Pump
Courtesy of FORD MOTOR CO.

1. For additional information, refer to the appropriate procedure.

OIL PAN

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket

surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the LH catalytic converter. For additional information, refer to **EXHAUST SYSTEM**.
3. Drain the engine oil and install the drain plug.
 - Tighten to 26 Nm (19 lb-ft).
4. Remove the 2 oil pan-to-transaxle bolts.

NOTE: For reference during installation, mark the location of the stud bolts.

5. Remove the 10 bolts, 5 stud bolts and the oil pan.
 - Discard the gasket.

Installation

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.

NOTE: Use a plastic scraping tool to remove all traces of the oil pan gasket.

1. Clean all sealing surfaces with metal surface cleaner and install a new oil pan gasket.

NOTE: The oil pan must be installed and the bolts tightened within 4 minutes of sealant application.

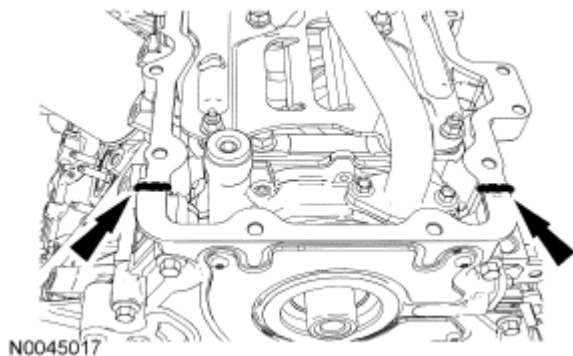


Fig. 111: Locating Silicone Sealant
Courtesy of FORD MOTOR CO.

2. Apply a 10 mm (0.39 in) diameter dot of silicone sealant to the areas indicated.
3. Position the oil pan and install the 10 bolts and 5 stud bolts finger tight.

4. Install the 2 oil pan-to-transaxle bolts.
 - Tighten to 48 Nm (35 lb-ft).
5. Tighten the oil pan-to-engine bolts and stud bolts in the sequence shown to 25 Nm (18 lb-ft).

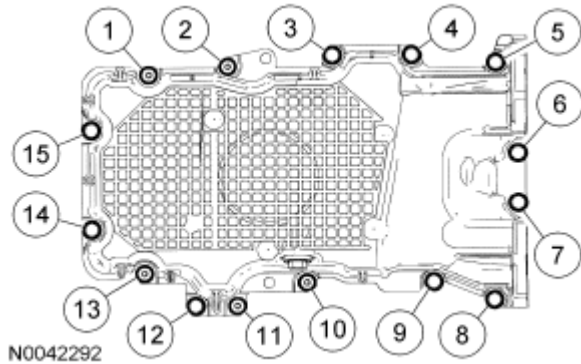


Fig. 112: Identifying Tightening Sequence Of Oil Pan-To-Engine Bolts
 Courtesy of FORD MOTOR CO.

6. Install the LH catalytic converter. For additional information, refer to **EXHAUST SYSTEM**.
7. Fill the engine with clean engine oil.

OIL PUMP SCREEN AND PICKUP TUBE

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the oil pan. For additional information, refer to **OIL PAN**.
3. Remove the 2 bolts and the oil pump screen and pickup tube.
 - Remove and discard the O-ring seal.

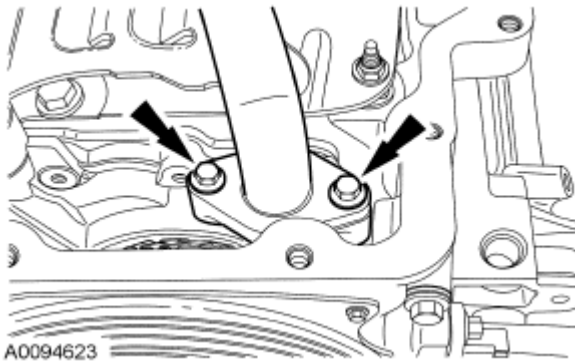


Fig. 113: Locating Oil Pump Screen And Pickup Tube Bolts
Courtesy of FORD MOTOR CO.

Installation

NOTE: Lubricate the O-ring seal with clean engine oil.

1. Install a new O-ring seal on the oil pump screen and pickup tube.
2. Install the oil pump screen and pickup tube and the 2 bolts.
 - Tighten to 10 Nm (89 lb-in).

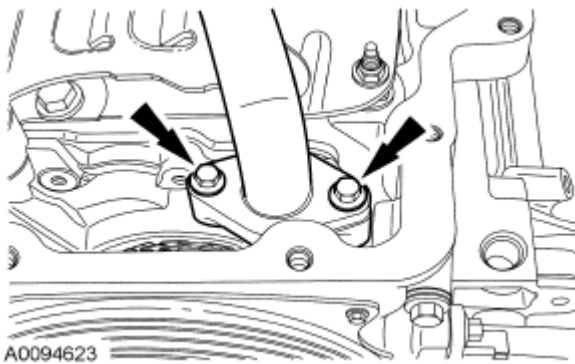


Fig. 114: Locating Oil Pump Screen And Pickup Tube Bolts
Courtesy of FORD MOTOR CO.

3. Install the oil pan. For additional information, refer to **OIL PAN**.

OIL PAN BAFFLE

Removal and Installation

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the oil pump screen and pickup tube. For additional information, refer to **OIL PUMP SCREEN AND PICKUP TUBE**.
3. Remove the 8 nuts and the oil pan baffle.
 - To install tighten the oil pan baffle nuts in 2 stages.
 - Stage 1: Tighten the 4 smaller nuts to 5 Nm (44 lb-in) and the larger nuts to 15 Nm (11 lb-ft).
 - Stage 2: Tighten all 8 nuts an additional 45 degrees.
4. To install, reverse the removal procedure.

OIL PUMP

Removal

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.
3. Remove the oil pump screen and pickup tube. For additional information, refer to **OIL PUMP SCREEN AND PICKUP TUBE**.
4. Remove the 4 bolts in the sequence shown.

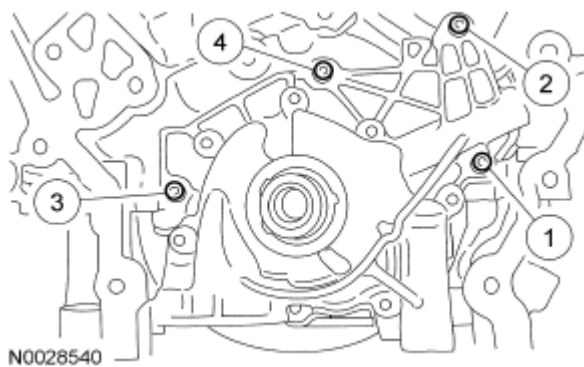


Fig. 115: Identifying Sequence Of Oil Pump Bolts
Courtesy of FORD MOTOR CO.

Installation

1. Position the oil pump and install the 4 bolts.

- Tighten in the sequence shown to 10 Nm (89 lb-in).

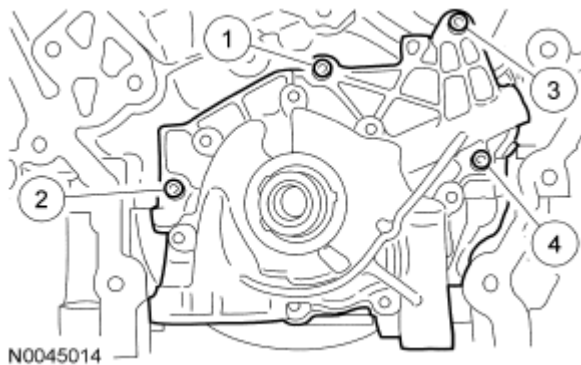


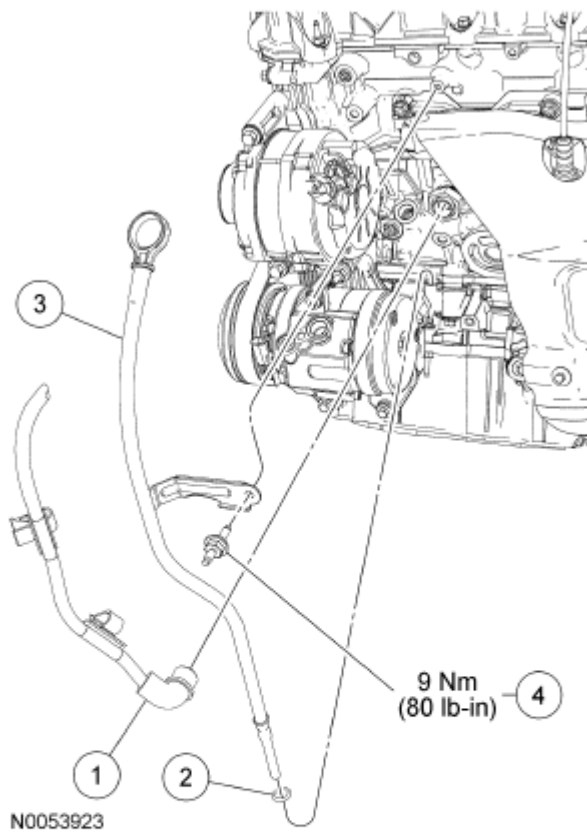
Fig. 116: Identifying Tightening Sequence Of Oil Pump Bolts
Courtesy of FORD MOTOR CO.

2. Install the oil pump screen and pickup tube. For additional information, refer to **OIL PUMP SCREEN AND PICKUP TUBE**.
3. Install the timing drive components. For additional information, refer to **TIMING DRIVE COMPONENTS**.

OIL LEVEL INDICATOR AND TUBE

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



Item	Part Number	Description
1	—	Block heater wiring harness (if equipped)
2	110282	Oil level indicator O-ring seal
3	6754	Oil level indicator tube
4	W701822	Oil level indicator tube stud bolt

Fig. 117: Identifying Oil Level Indicator And Tube Components (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Remove the oil level indicator.
3. Remove the oil pressure sender. For additional information, refer to **ENGINE OIL PRESSURE (EOP) SWITCH**.
4. If equipped, disconnect the block heater electrical connector and wiring harness retainers.
5. Remove the stud bolt and the oil level indicator tube.
 - Discard the O-ring seal.

- To install, tighten to 9 Nm (80 lb-in).

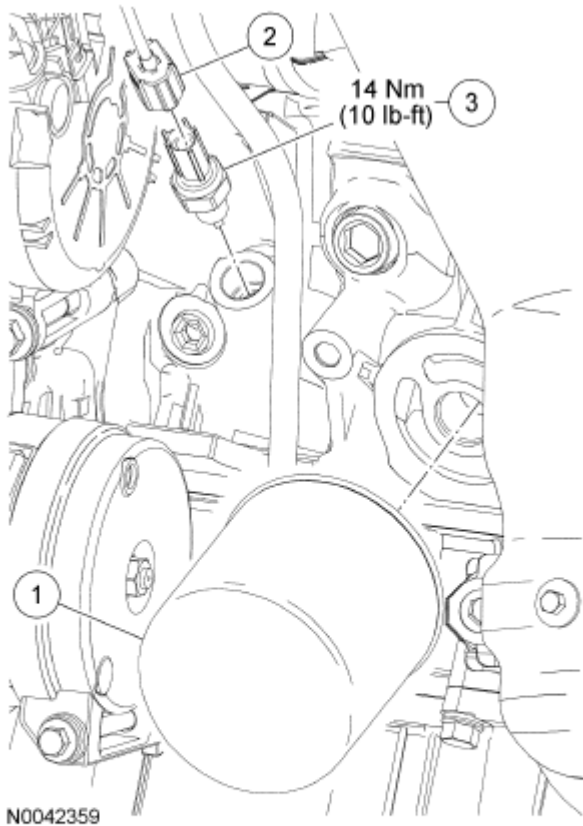
NOTE: Install a new O-ring seal and lubricate with clean engine oil.

- To install, reverse the removal procedure.

ENGINE OIL PRESSURE (EOP) SWITCH

MATERIAL

Item	Specification
Thread Sealant with PTFE TA-24	WSK-M2G350-A2



Item	Part Number	Description
1	6714	Engine oil filter
2	14A464	Oil pressure sender electrical connector (part of 12B637)
3	9278	Oil pressure sender

Fig. 118: Identifying Engine Oil Pressure (EOP) Switch Components (With Torque Specifications)
Courtesy of FORD MOTOR CO.

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. If equipped, remove the 7 screws and the underbody cover.

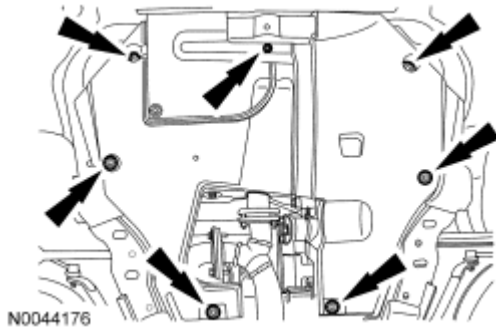


Fig. 119: Locating Underbody Cover Screws
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the engine oil filter gasket with clean engine oil prior to installing.

3. Remove the engine oil filter.
 - To install tighten to 5 Nm (44 lb-in) and then rotate an additional 180 degrees.
4. Disconnect the oil pressure sender electrical connector.
5. Remove the oil pressure sender.
 - To install, tighten to 14 Nm (10 lb-ft).
6. To install, reverse the removal procedure.
 - Apply pipe sealant with Teflon® to the oil pressure sender threads.

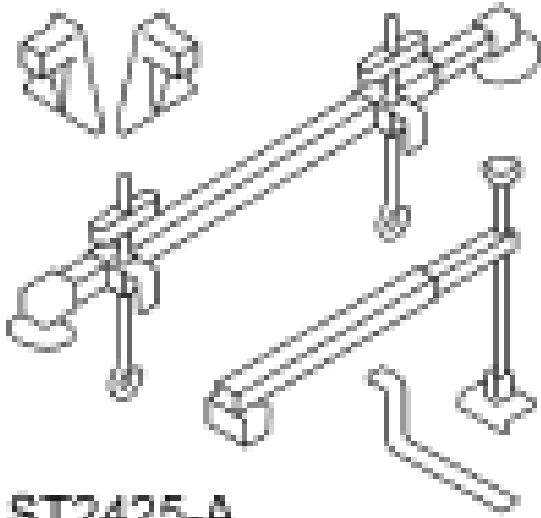
ENGINE MOUNT

SPECIAL TOOL(S)

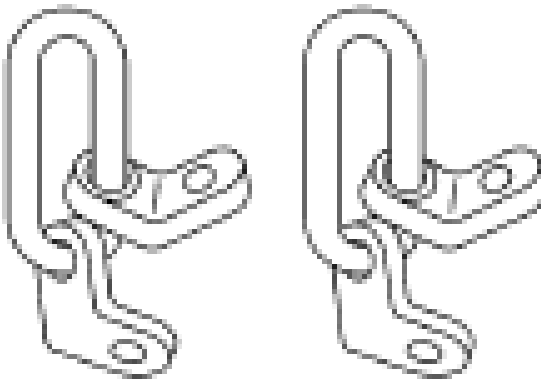
	3-Bar Engine Support Kit 303-F072
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2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2425-A



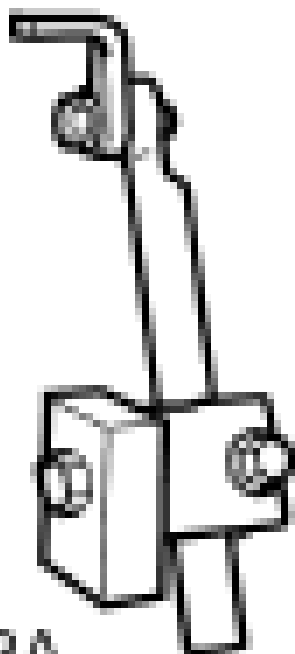
ST1595-A

Lifting Brackets, Engine
303-050 (T70P-6000)

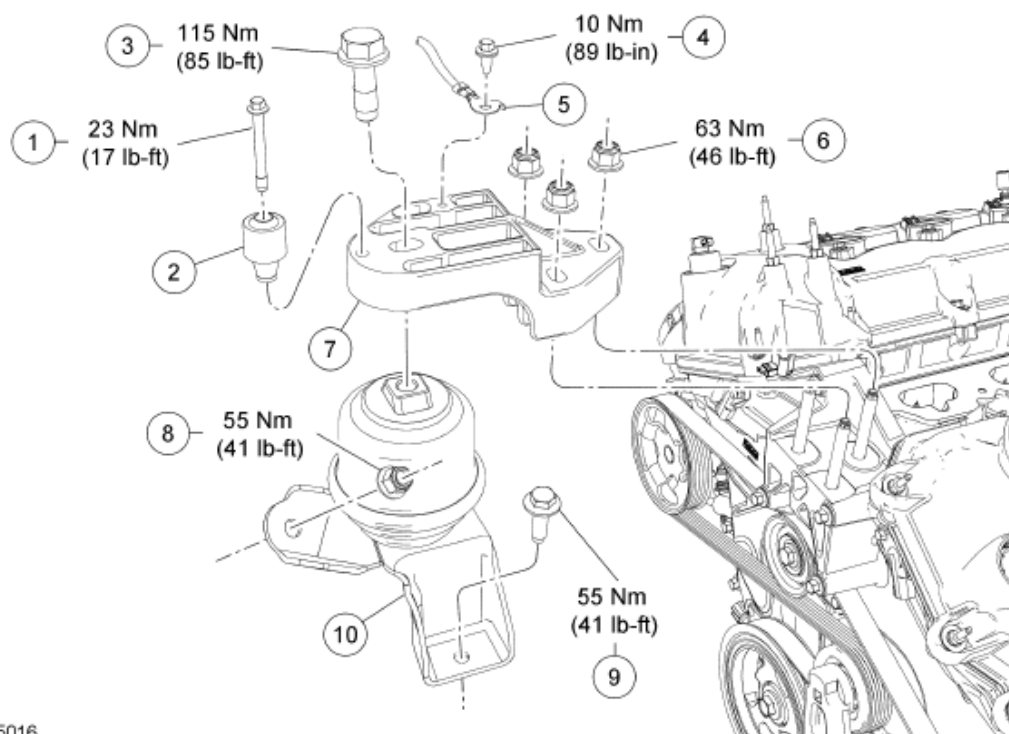
Universal Adapter Brackets
014-0001

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2743A



N0045016

Item	Part Number	Description
1	W711879	Damper bolt
2	7458	Damper
3	W711684	Engine mount bracket bolt
4	W705936	Ground wire bolt
5	19A095	Ground wire
6	W520213	Engine support insulator bracket nuts (3 required)
7	6A094	Engine mount bracket
8	W711578	Engine mount nut
9	W706496	Engine mount bolts (2 required)
10	6F012	Engine mount

Fig. 120: Identifying Engine Mount Components (With Torque Specifications)
 Courtesy of FORD MOTOR CO.

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING**.
2. Release the fuel system pressure. For additional information refer to **FUEL SYSTEM-GENERAL INFORMATION**.
3. Remove the engine coolant degas bottle. For additional information, refer to **ENGINE COOLING**.
4. Remove the lower intake manifold. For additional information, refer to **LOWER INTAKE**.

MANIFOLD.

5. Remove the bolt and position aside the ground wire.
 - To install, tighten to 10 Nm (89 lb-in).
6. Remove the bolt and damper.
 - To install, tighten to 23 Nm (17 lb-ft).
7. Remove the engine mount bracket bolt.
 - To install, tighten to 115 Nm (85 lb-ft).
8. Install the special tools.
 1. Position the 2 universal adapter brackets on top of the cylinder block.
 2. Install 2 M8 x 1.25 x 36 mm (1.41 in) bolts and tighten to 10 Nm (89 lb-in).
 3. Position the universal lifting bracket onto the 2 universal adapter brackets.
 4. Fasten the universal lifting bracket to the 2 universal adapter brackets with a suitable nut and bolt.

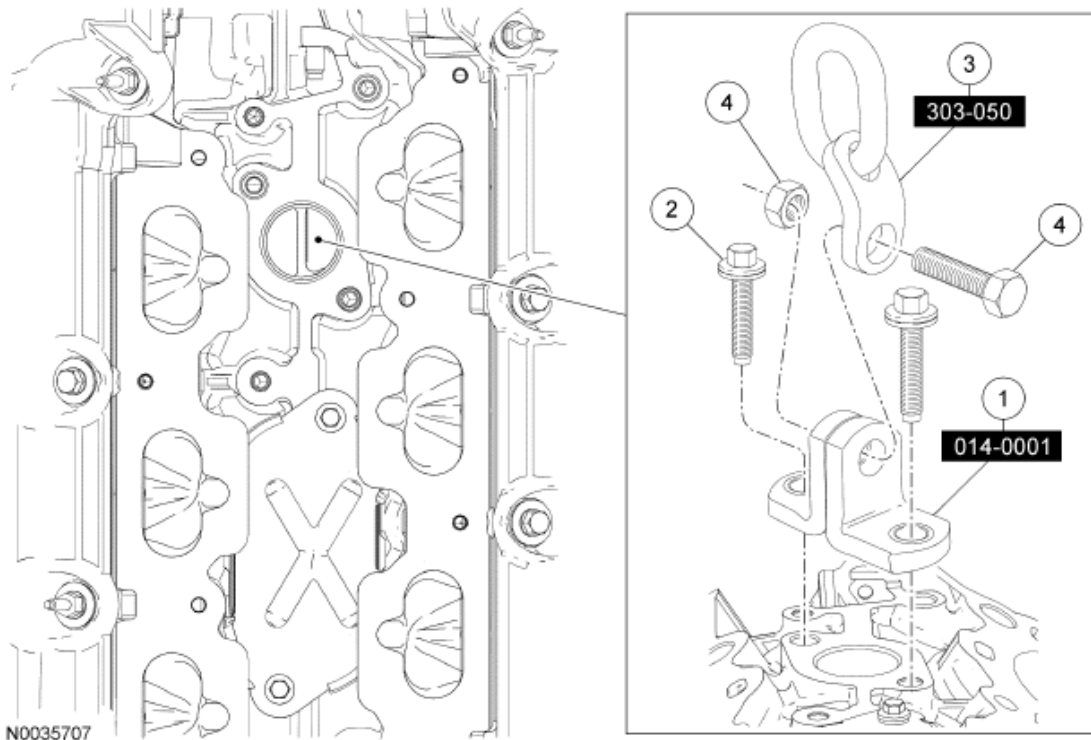
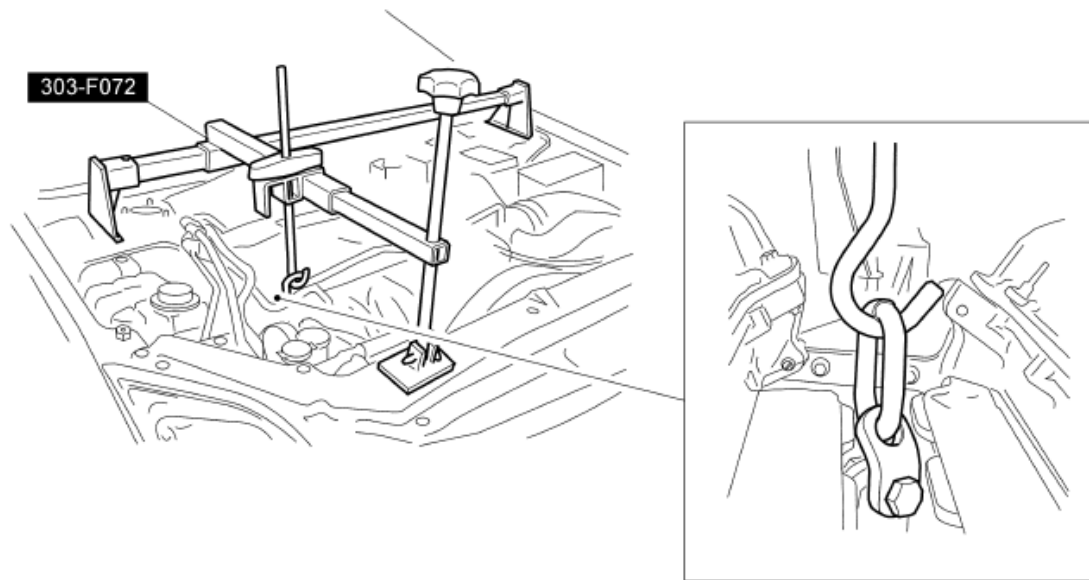


Fig. 121: Identifying Special Tools (303-050 And 014-0001)
 Courtesy of FORD MOTOR CO.

9. Install the special tool and raise the engine 25 mm (0.98 in).



N0042294

Fig. 122: Identifying Special Tools (303-F072)
Courtesy of FORD MOTOR CO.

10. Remove the 3 engine mount bracket nuts.
 - To install, tighten to 63 Nm (46 lb-ft).
11. Remove the nut, 2 bolts and the engine mount.
 - To install, tighten to 55 Nm (41 lb-ft).

NOTE: If the engine mount bracket is to be removed, the engine must be lowered to avoid contact between the A/C tubes and the engine mount bracket.

12. Use the special tool to lower the engine 25 mm (0.98 in).
 - Remove the engine mount bracket.
13. To install, reverse the removal procedure.

REMOVAL

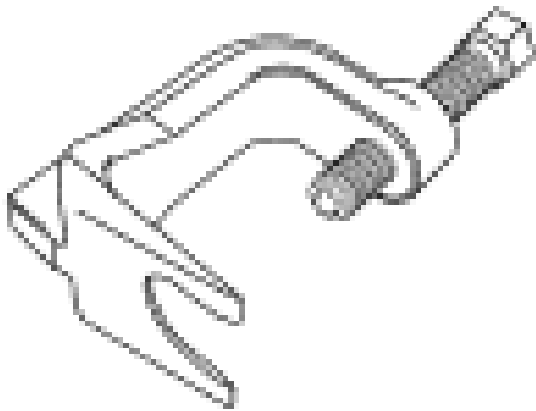
ENGINE

SPECIAL TOOL(S)

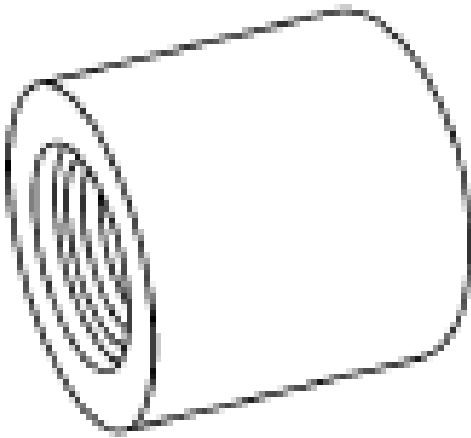
	Separator, Ball joint 205-592
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2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2945-A



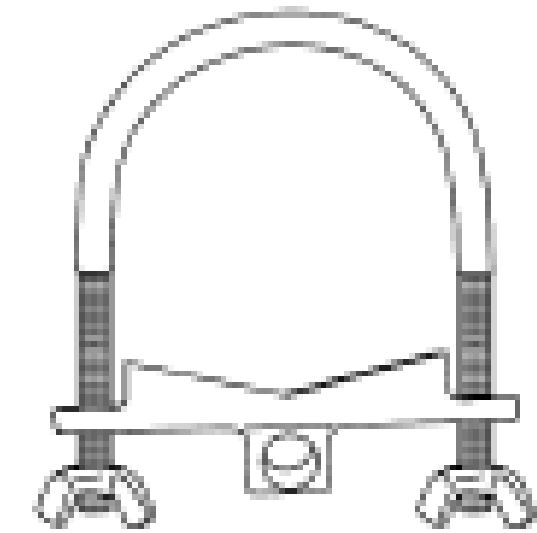
ST2646-A

Adapter for 204-592
204-592/1

Remover, Halfshaft
205-832

2006 Mercury Milan

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ST2934-A



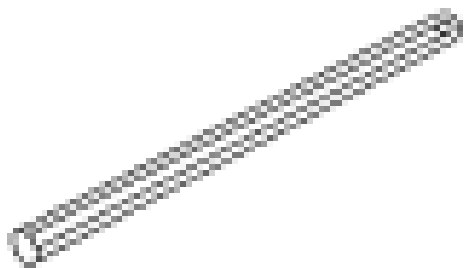
ST1185-A

Slide Hammer
100-001

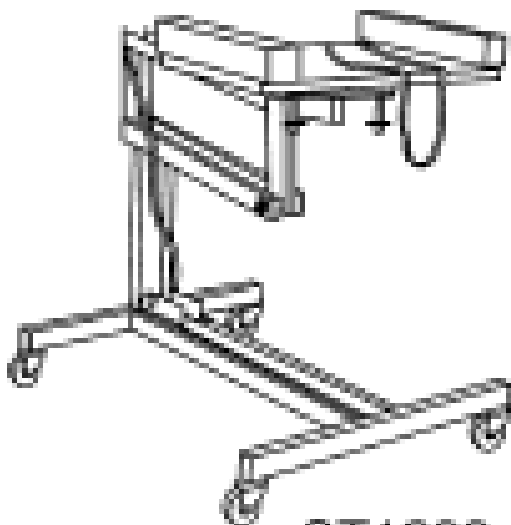
Remover, Halfshaft
205-243

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2939-A



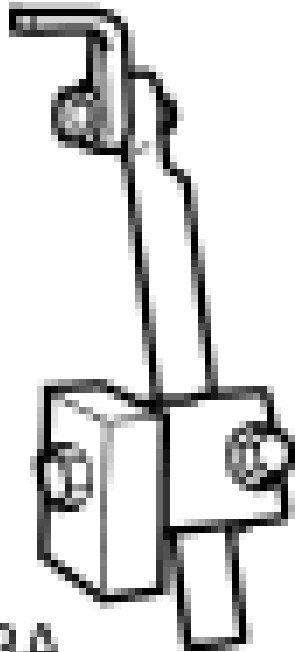
ST1293-A

Powertrain Lift
014-00765

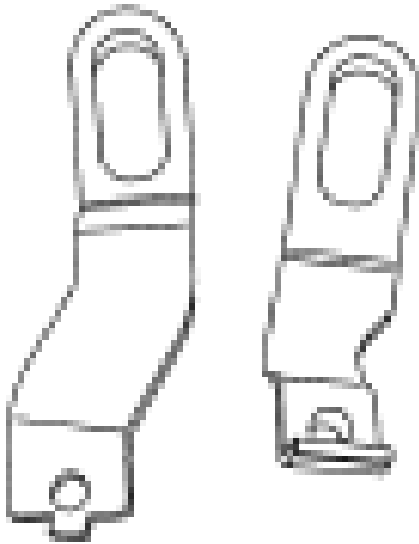
Universal Adapter Brackets 014-0001
Lifting Bracket Set, Engine 303-D095 (D94L-6001-A) or equivalent

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2743A



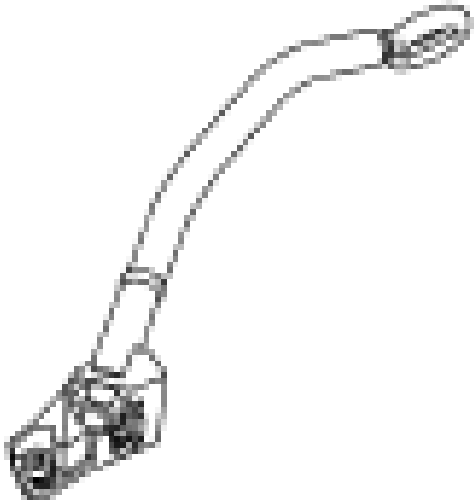
ST2463-A

Lifting Brackets, Engine
134-00243 or equivalent

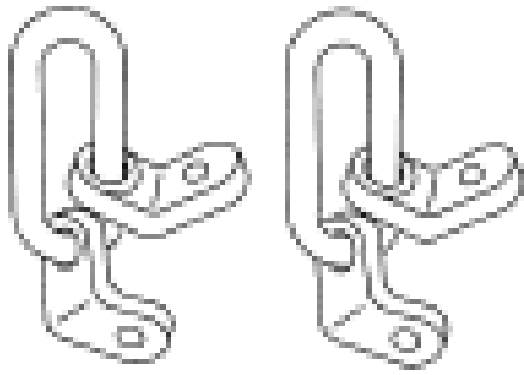
Engine Lifting Bracket Set
303-1140

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2873-A



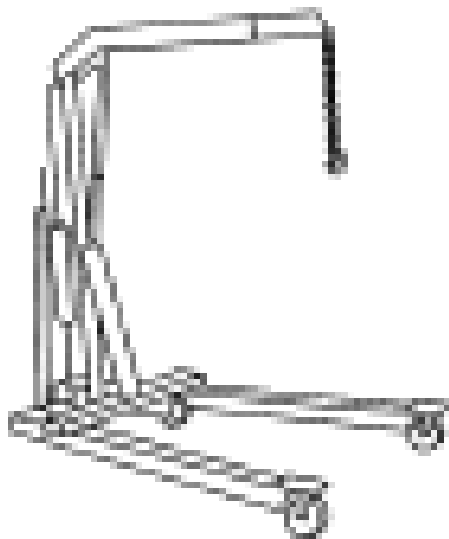
ST2793-A

Lifting Bracket, Engine
303-050 (T70P-6000)

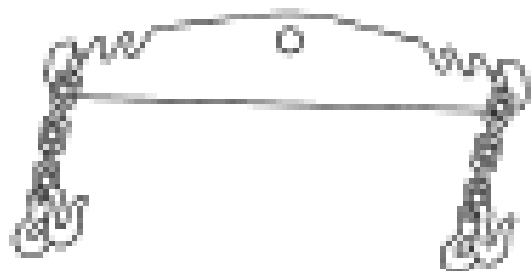
Heavy Duty Floor Crane
014-00071 or equivalent

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



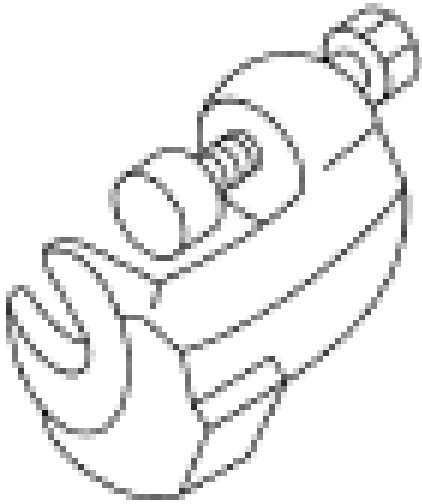
ST1341-A



ST1602-A

Spreader Bar
303-D089 (D93P-6001-A3) or equivalent

Tie-Rod End Remover
211-105 (T85M-3395-A)

**ST1408-A**

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. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING** .
2. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
3. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
4. Recover the air conditioning system. For additional information, refer to **CLIMATE CONTROL SYSTEM-GENERAL INFORMATION AND DIAGNOSTICS**
5. Place the steering wheel in the straight ahead position and the ignition key in the OFF position.
6. Remove the 2 nuts and the steering joint cover.

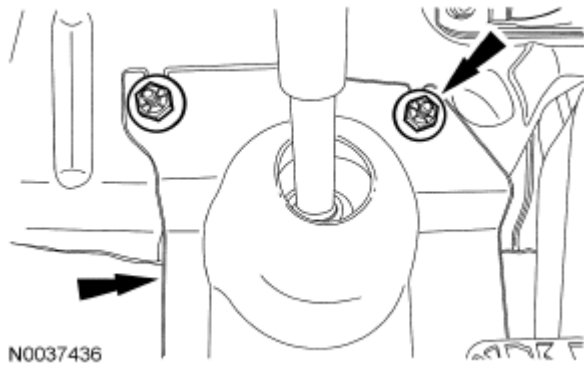


Fig. 123: Locating Steering Joint Cover And Nuts
Courtesy of FORD MOTOR CO.

CAUTION: Do not allow the intermediate shaft to rotate while it is disconnected from the gear or damage to the clockspring can occur. If there is evidence that the intermediate shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to **SUPPLEMENTAL RESTRAINT SYSTEM** .

NOTE: Index the steering column shaft position to the steering gear for reference during installation.

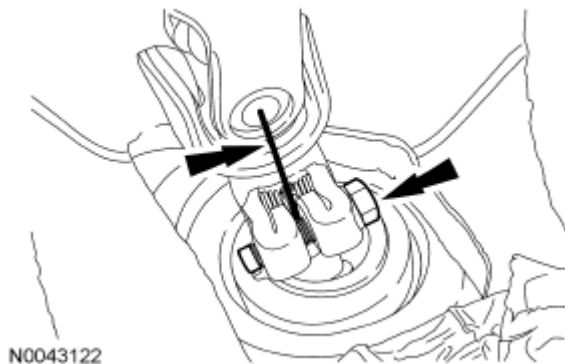


Fig. 124: Locating Steering Column Shaft Bolt
Courtesy of FORD MOTOR CO.

7. Remove the bolt and disconnect the steering column shaft from the steering gear.
8. Drain the cooling system. For additional information, refer to **ENGINE COOLING** .
9. If equipped, remove the 7 screws and the underbody cover.

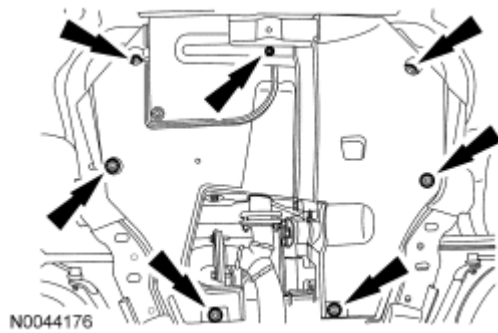


Fig. 125: Locating Underbody Cover Screws
Courtesy of FORD MOTOR CO.

10. Disconnect the power steering cooler tube and drain the power steering fluid into a suitable drain pan.

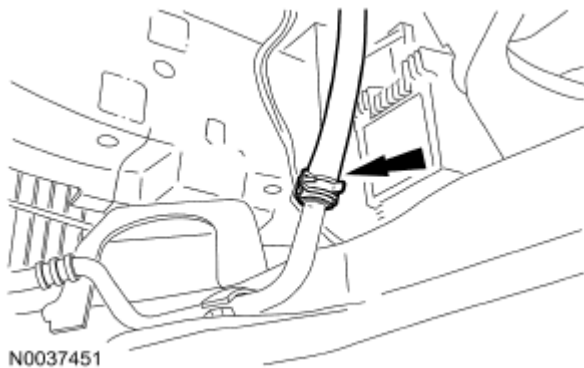


Fig. 126: Locating Power Steering Cooler Tube
Courtesy of FORD MOTOR CO.

11. Remove the exhaust flexible pipe. For additional information, refer to EXHAUST SYSTEM.

CAUTION: The steering gear-to-dash seal must be removed or it will be damaged when lowering the subframe.

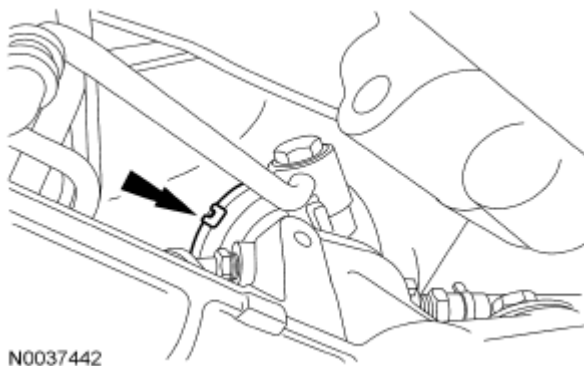


Fig. 127: Locating Steering Gear-To-Dash Seal Clips
Courtesy of FORD MOTOR CO.

12. Release the 4 clips and slide the steering gear-to-dash seal off of the steering gear and into the passenger compartment.
13. Remove the power steering pressure (PSP) hose bracket bolt.

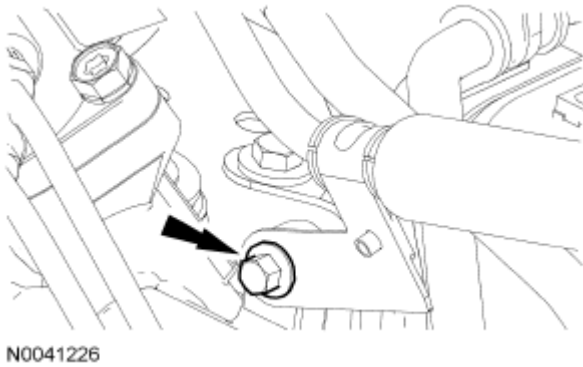


Fig. 128: Locating Power Steering Pressure (PSP) Hose Bracket Bolt
Courtesy of FORD MOTOR CO.

14. Remove and discard the PSP hose banjo bolt and the 2 seals from the steering gear.

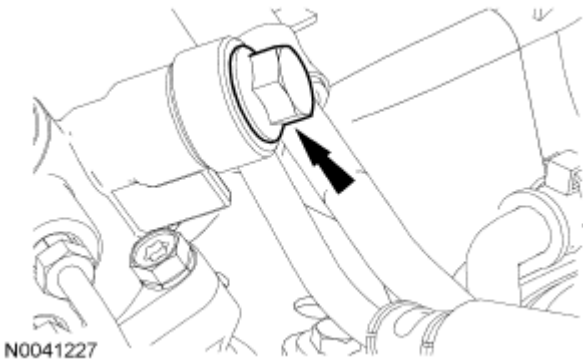


Fig. 129: Locating PSP Hose Banjo Bolt
Courtesy of FORD MOTOR CO.

15. Remove the 2 bolts and the heat shield.

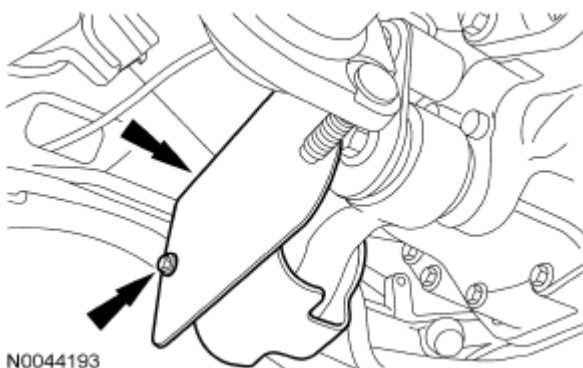


Fig. 130: Locating Heat Shield And Bolts
Courtesy of FORD MOTOR CO.

16. Remove the 2 bolts and the engine roll restrictor.

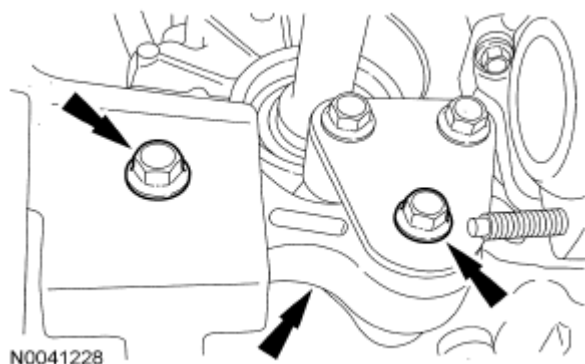


Fig. 131: Identifying Engine Roll Restrictor And Bolts
Courtesy of FORD MOTOR CO.

17. Remove the 4 screws and position the RH fender splash shield aside.

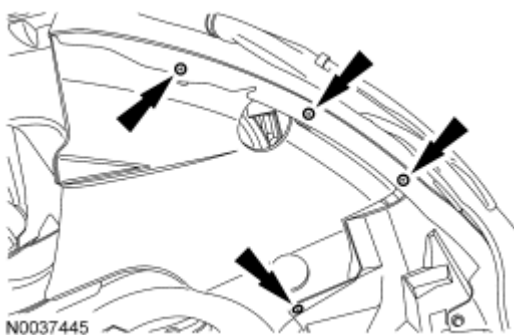


Fig. 132: Locating RH Fender Splash Shield Screws
Courtesy of FORD MOTOR CO.

18. Remove the 6 pin-type retainers (4 shown) and the RH splash shield.

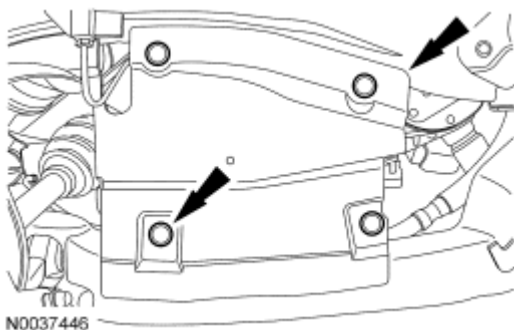


Fig. 133: Locating Splash Shield Pin-Type Retainers
Courtesy of FORD MOTOR CO.

19. Remove the 4 screws and position the LH fender splash shield aside.

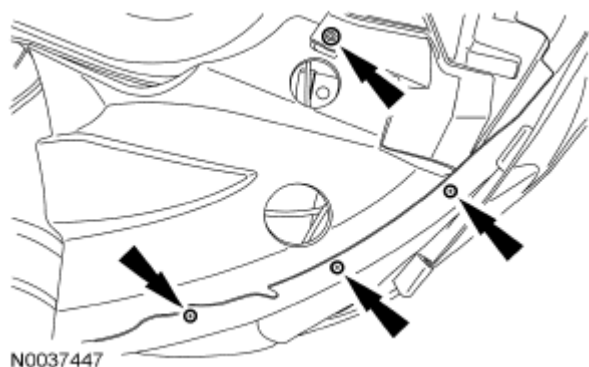


Fig. 134: Locating LH Fender Splash Shield Screws
Courtesy of FORD MOTOR CO.

20. Remove the 6 pin-type retainers (4 shown) and the LH splash shield.

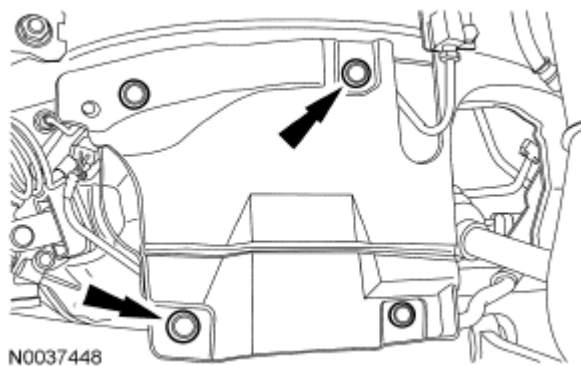


Fig. 135: Locating LH Splash Shield Pin-Type Retainers
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

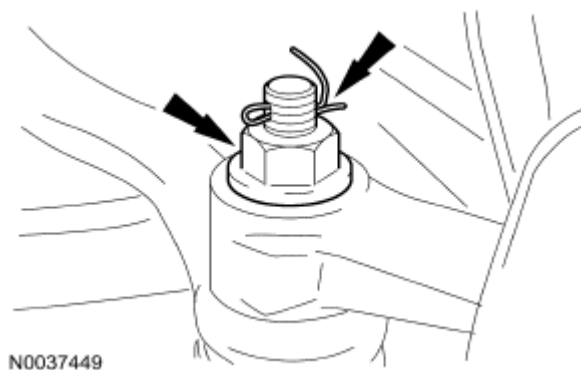


Fig. 136: Locating Tie-Rod Ends Nuts And Cotter Pins

Courtesy of FORD MOTOR CO.

21. Remove the cotter pins and nuts from the tie-rod ends.

NOTE: LH shown, RH similar.

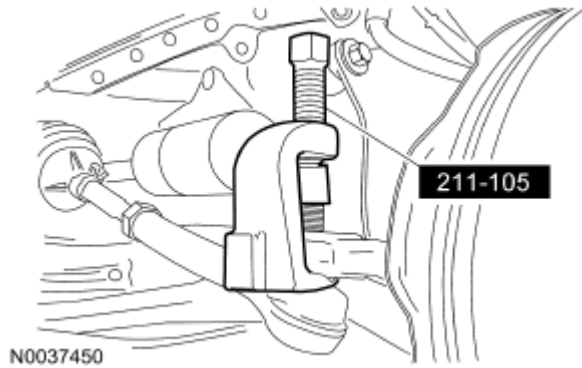


Fig. 137: Identifying Special Tool (211-105)
Courtesy of FORD MOTOR CO.

22. Using the special tool, separate the tie-rod ends from the steering knuckles.

NOTE: LH shown, RH similar.

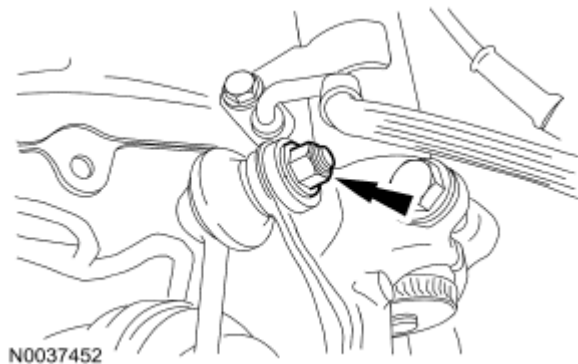


Fig. 138: Locating Stabilizer Bar Links Nut
Courtesy of FORD MOTOR CO.

23. Remove the nuts and separate the stabilizer bar links from the struts.

NOTE: LH shown, RH similar.

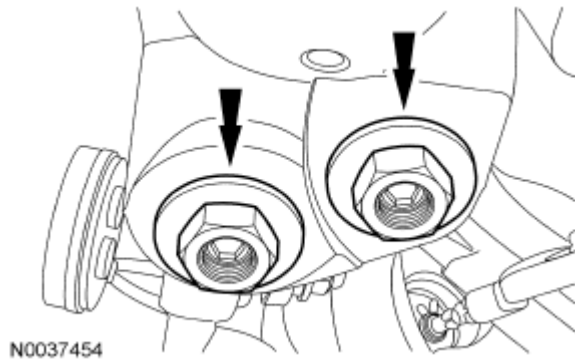


Fig. 139: Locating Lower Ball Joint Nuts
Courtesy of FORD MOTOR CO.

24. Remove the lower ball joint nuts.

CAUTION: When the lower ball joint is separated from the wheel knuckle, the lower arm may strike the outer constant velocity (CV) joint boot with enough force to damage the boot clamp. This will result in a loss of grease from the outer CV joint. Place a block of wood, or similar item, between the lower arm and the outer CV joint to prevent the lower arm from striking the outer CV joint.

NOTE: Once pressure is applied to the ball joint with the special tool, it may be necessary to tap the wheel knuckle at the ball joint area to separate the ball joint from the wheel knuckle.

NOTE: LH shown, RH similar.

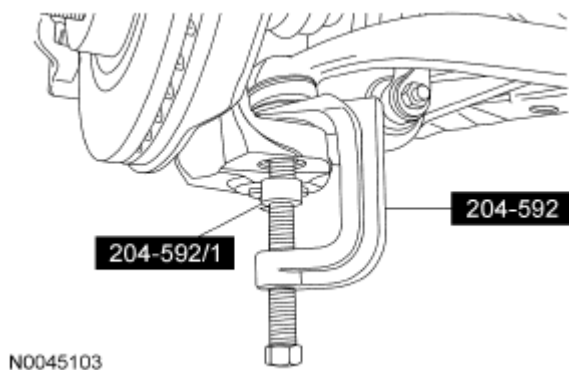
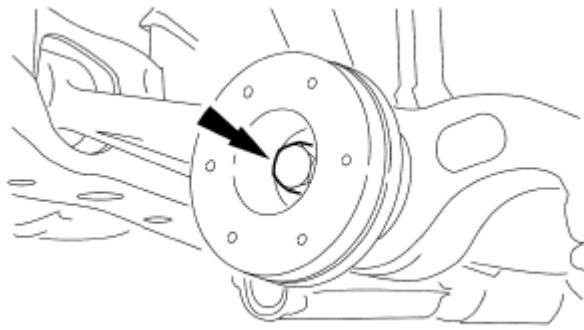


Fig. 140: Identifying Special Tools (204-592/1 And 204-592)
Courtesy of FORD MOTOR CO.

25. Using the special tools, separate the lower ball joints from the lower control arms.

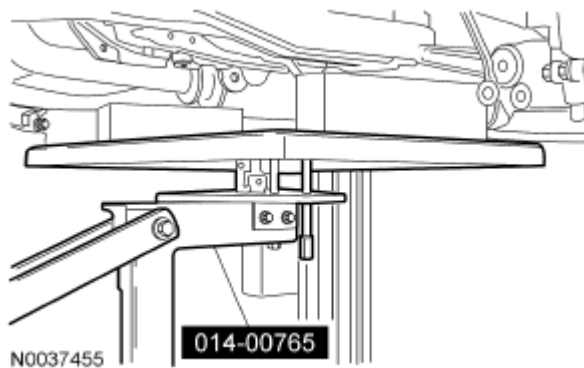
NOTE: LH shown, RH similar.



N0037453

Fig. 141: Locating Lower Control Arms Bolts
Courtesy of FORD MOTOR CO.

26. Remove the through bolts from the lower control arms.
27. Position the special tool under the subframe assembly.

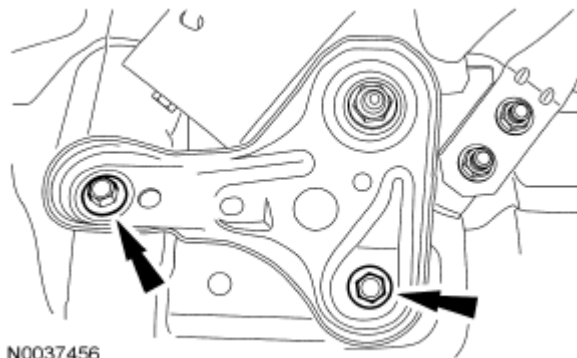


N0037455

014-00765

Fig. 142: Identifying Special Tools (014-00765)
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.



N0037456

Fig. 143: Locating Subframe Bracket-To-Body Bolts
Courtesy of FORD MOTOR CO.

28. Remove the subframe bracket-to-body bolts.

NOTE: LH shown, RH similar.

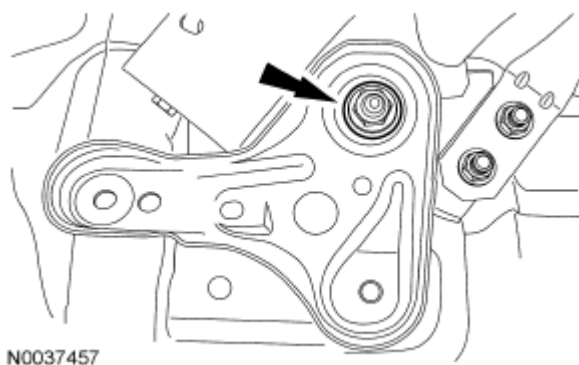


Fig. 144: Locating Subframe Nuts
Courtesy of FORD MOTOR CO.

29. Remove the subframe nuts and the subframe brackets.

NOTE: LH shown, RH similar.

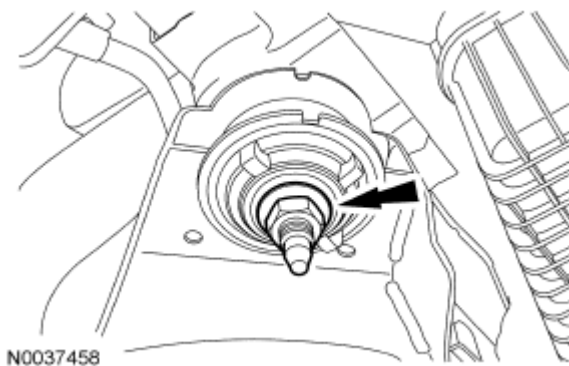


Fig. 145: Locating Front Subframe Nuts
Courtesy of FORD MOTOR CO.

30. Remove the front subframe nuts.
31. Lower the subframe assembly from the vehicle.
32. Disconnect the transaxle cooler hoses.

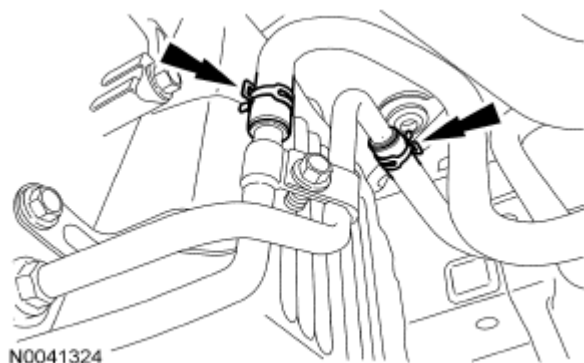


Fig. 146: Locating Transaxle Cooler Hoses Clamps
Courtesy of FORD MOTOR CO.

33. Remove the drain plug and drain the engine oil.
- Install the drain plug and tighten to 27 Nm (20 lb-ft).

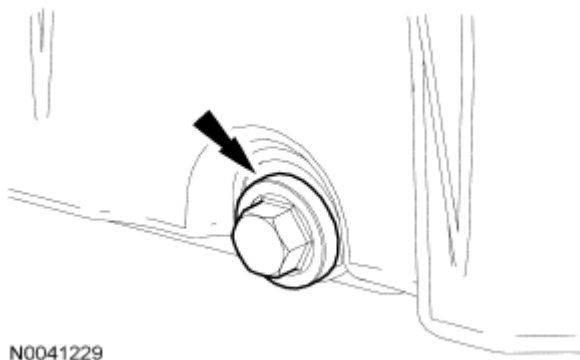


Fig. 147: Locating Drain Plug Bolts
Courtesy of FORD MOTOR CO.

34. Remove and discard the engine oil filter.

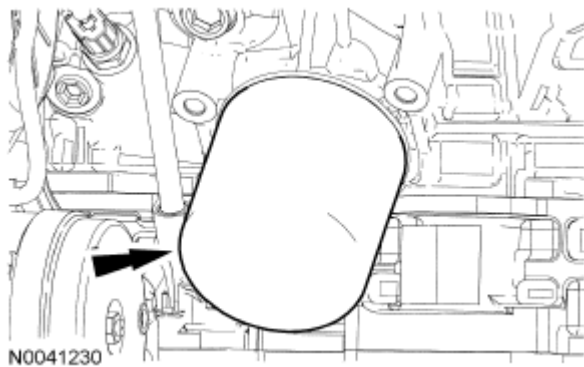


Fig. 148: Locating Engine Oil Filter
Courtesy of FORD MOTOR CO.

35. Remove the engine air cleaner and air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING - 2.3L**.
36. Remove the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.
37. Remove the nut and disconnect the power feed wire from the battery terminal.

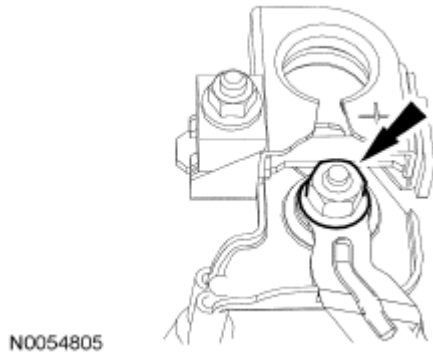


Fig. 149: Locating Power Feed Wire Nut
Courtesy of FORD MOTOR CO.

38. Disconnect the 2 engine wiring harness electrical connectors.

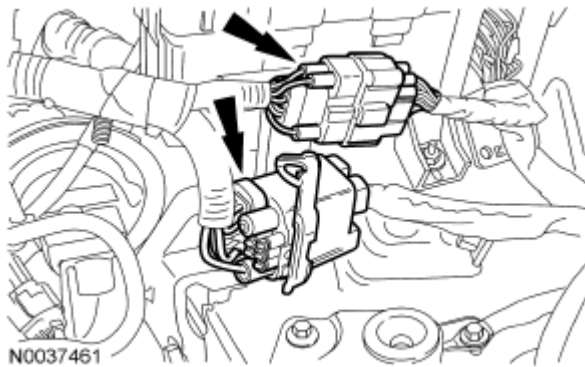


Fig. 150: Locating Engine Wiring Harness Electrical Connectors
Courtesy of FORD MOTOR CO.

39. Remove the bolt and position aside the ground wire.

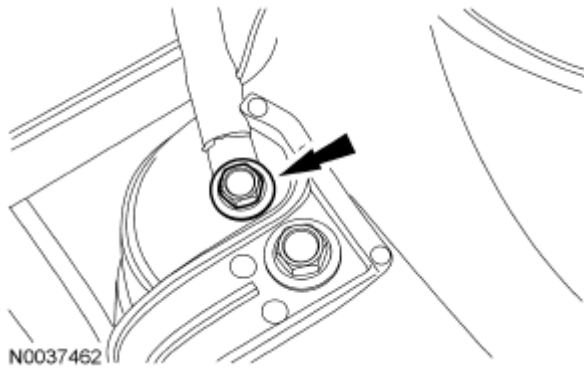


Fig. 151: Locating Ground Wire Bolt
Courtesy of FORD MOTOR CO.

40. Disconnect the powertrain control module (PCM) electrical connector and the pin-type retainer.

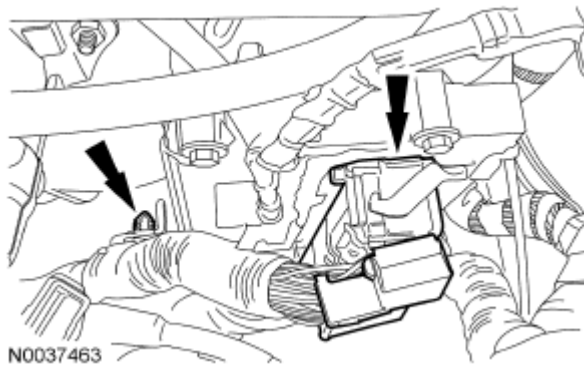


Fig. 152: Locating Powertrain Control Module (PCM) Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

41. Disconnect the fuel supply tube from the fuel rail. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
42. Disconnect the heater hose from the thermostat housing.

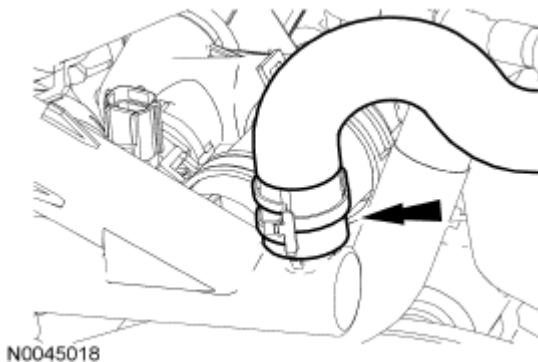


Fig. 153: Locating Heater Hose From Thermostat Housing
Courtesy of FORD MOTOR CO.

43. Disconnect the heater hose inline connection.

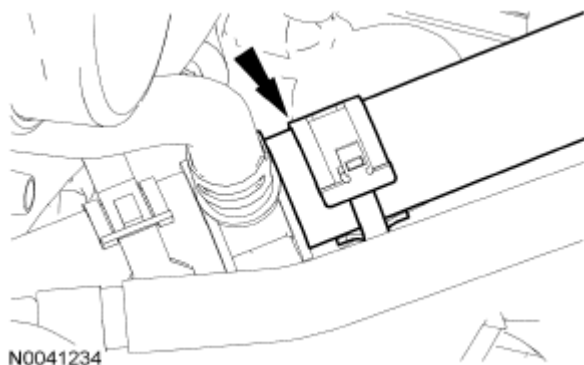


Fig. 154: Locating Heater Hose Inline Connection
Courtesy of FORD MOTOR CO.

44. Disconnect the throttle body coolant hose.

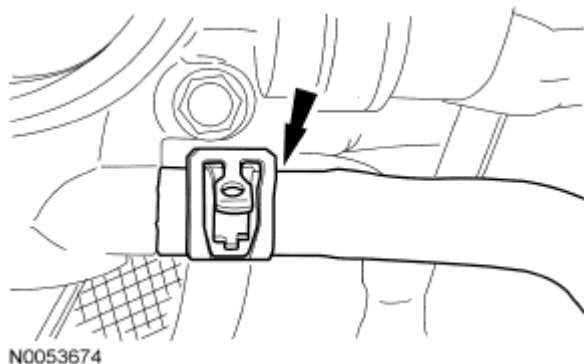


Fig. 155: Locating Throttle Body Coolant Hose
Courtesy of FORD MOTOR CO.

45. Disconnect the evaporative emissions (EVAP) hose.

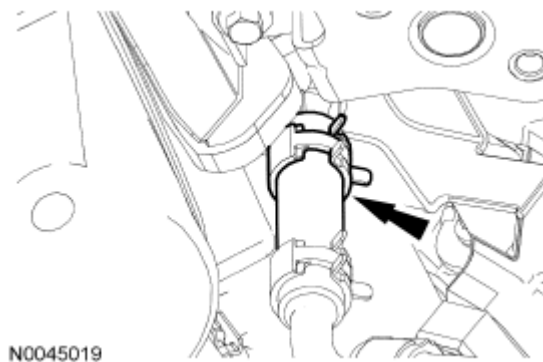


Fig. 156: Locating Evaporative Emissions (EVAP) Hose
Courtesy of FORD MOTOR CO.

46. Disconnect the upper and lower radiator hoses from the thermostat housing.

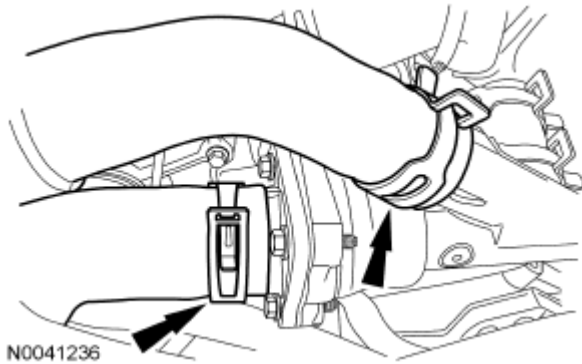


Fig. 157: Locating Upper And Lower Radiator Hoses From Thermostat Housing
Courtesy of FORD MOTOR CO.

47. Disconnect the transaxle control cable from the transaxle selector lever.

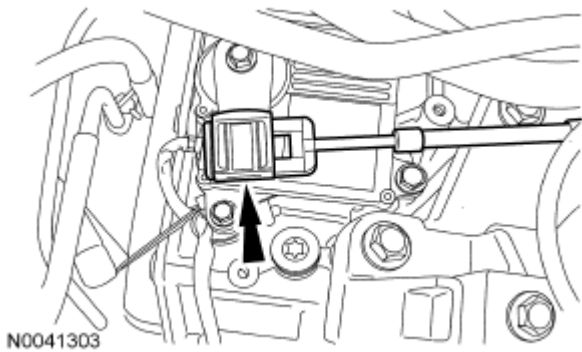


Fig. 158: Locating Transaxle Selector Lever
Courtesy of FORD MOTOR CO.

48. Remove the 3 transaxle control cable bracket bolts and position the cable aside.

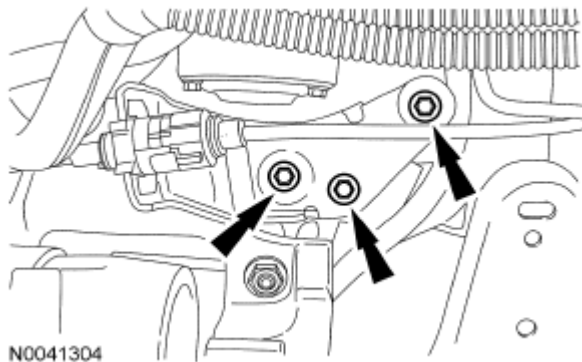


Fig. 159: Locating Transaxle Control Cable Bracket Bolts
Courtesy of FORD MOTOR CO.

49. Remove the bolt and position the ground wire aside.

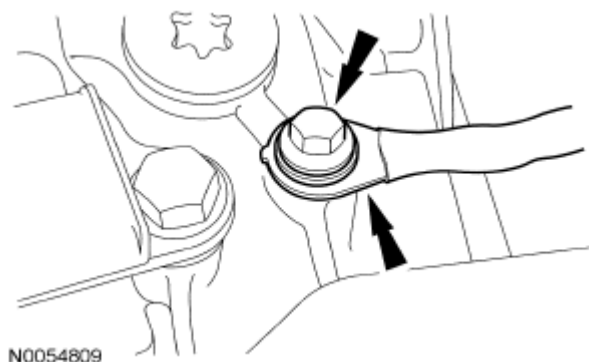


Fig. 160: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

50. Remove the vacuum tube bracket bolt.

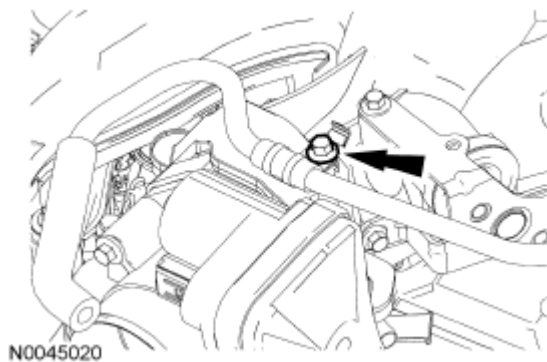


Fig. 161: Locating Vacuum Tube Bracket Bolt
Courtesy of FORD MOTOR CO.

51. Disconnect the vacuum hose from the intake manifold.

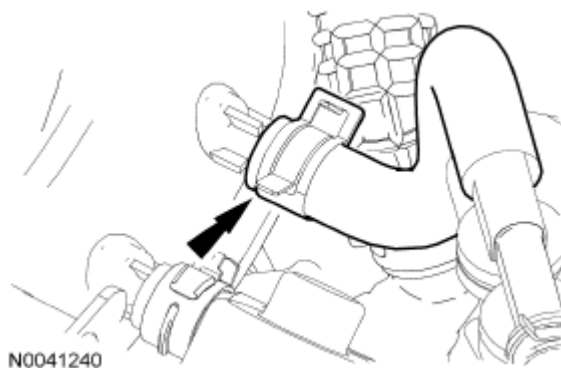


Fig. 162: Locating Vacuum Hose From Intake Manifold
Courtesy of FORD MOTOR CO.

52. If equipped, detach the block heater cable retaining clips from the cooling fan shroud.

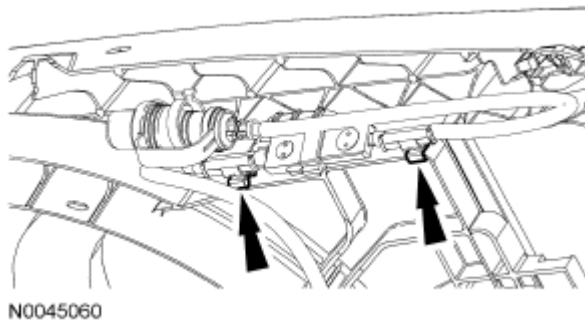


Fig. 163: Locating Block Heater Cable Retaining Clips
Courtesy of FORD MOTOR CO.

53. Disconnect the power steering hose from the power steering reservoir.

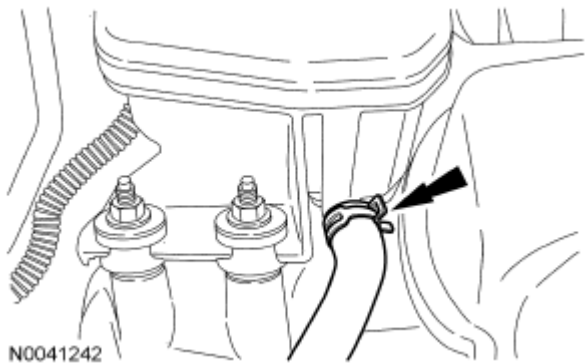


Fig. 164: Locating Power Steering Hose From Power Steering Reservoir
Courtesy of FORD MOTOR CO.

54. Detach the power steering hose retaining clip from the LH valve cover stud bolt and the engine wiring harness.

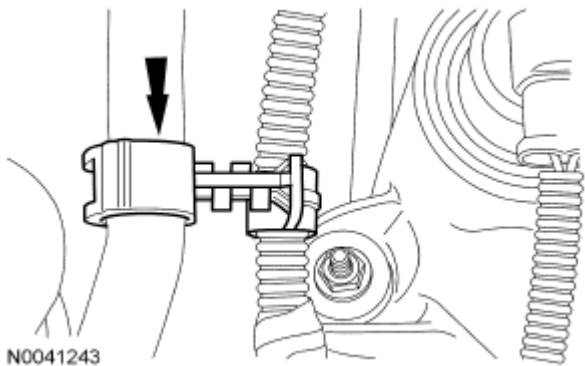


Fig. 165: Locating Power Steering Hose Retaining Clip
Courtesy of FORD MOTOR CO.

55. Disconnect the coolant hose from the degas bottle.

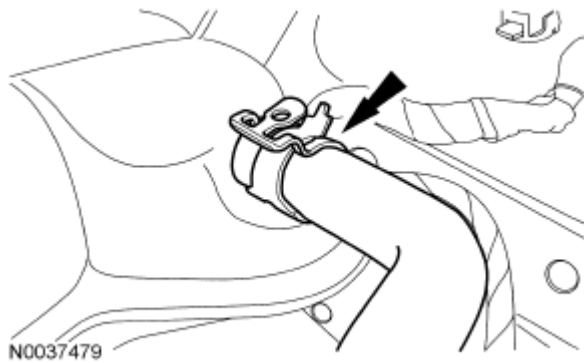


Fig. 166: Locating Degas Bottle Coolant Hose Clamp
Courtesy of FORD MOTOR CO.

56. Detach the coolant hose retaining clip and position the coolant hose aside.

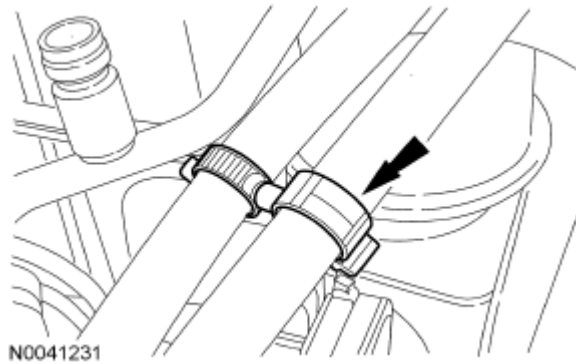


Fig. 167: Locating Coolant Hose Retaining Clip
Courtesy of FORD MOTOR CO.

57. Remove the 2 A/C tube bracket bolts.

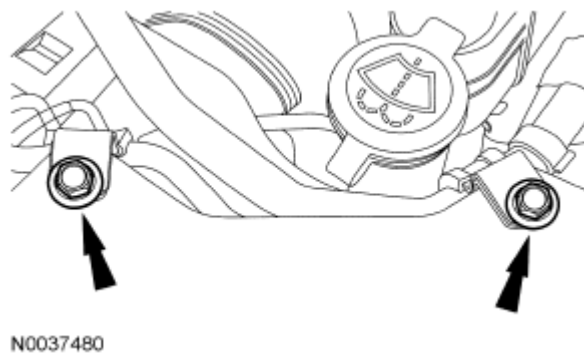


Fig. 168: Locating A/C Tube Bracket Bolts
Courtesy of FORD MOTOR CO.

58. Remove the 2 nuts and disconnect the A/C tubes.

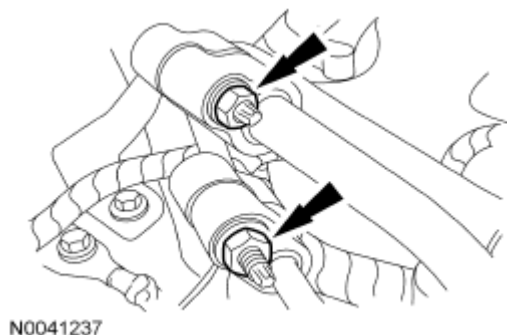


Fig. 169: Locating A/C Tubes Nuts
Courtesy of FORD MOTOR CO.

59. Remove the bolt and the ground wire from the engine mount bracket.

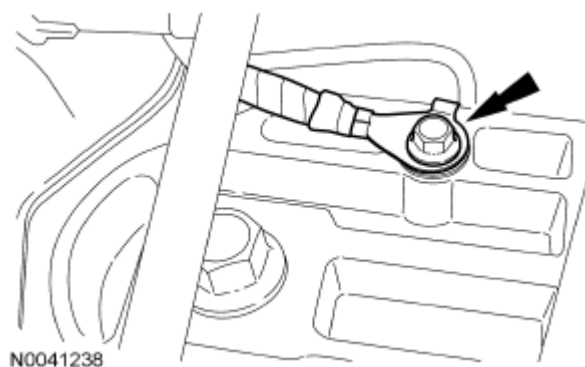


Fig. 170: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

60. Remove the bolt and separate the A/C manifold from the A/C compressor.

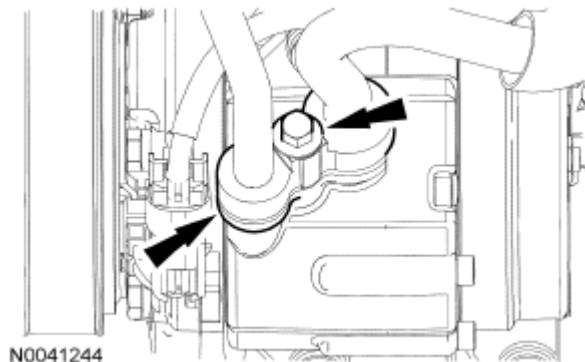


Fig. 171: Locating A/C Manifold And Bolt
Courtesy of FORD MOTOR CO.

61. Using the special tools, separate the LH halfshaft from the transaxle and support the halfshaft with a length of mechanic's wire.

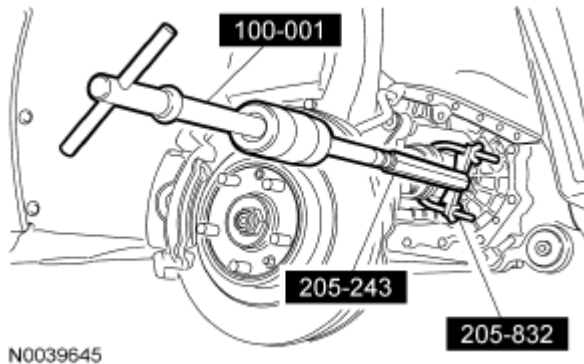


Fig. 172: Identifying Special Tools (100-001, 205-243 And 205-832)
Courtesy of FORD MOTOR CO.

62. Disconnect the crankshaft position (CKP) sensor electrical connector and pin-type retainer.

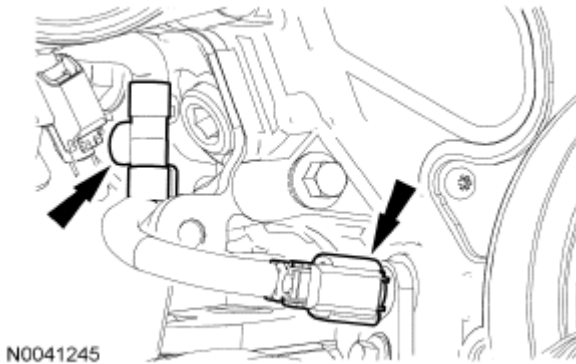


Fig. 173: Locating (CKP) Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

63. Disconnect the power steering pressure (PSP) switch electrical connector.

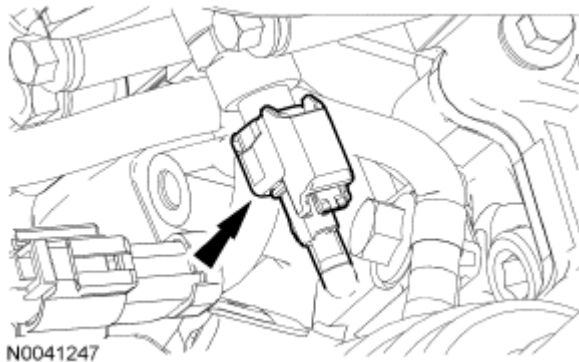


Fig. 174: Locating Power Steering Pressure (PSP) Switch Electrical Connector

Courtesy of FORD MOTOR CO.

64. Disconnect the catalyst monitor sensor (CMS) electrical connector and pin-type retainer.

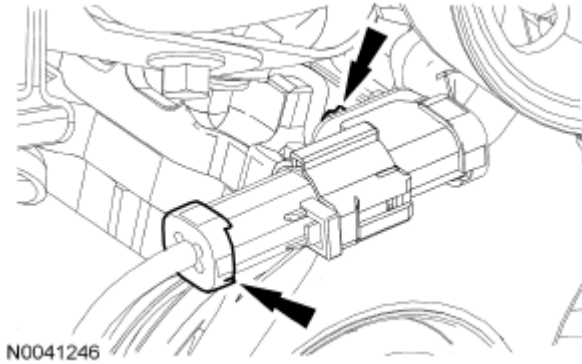


Fig. 175: Locating (CMS) Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

65. Remove the 2 RH halfshaft carrier bearing bracket bolts.

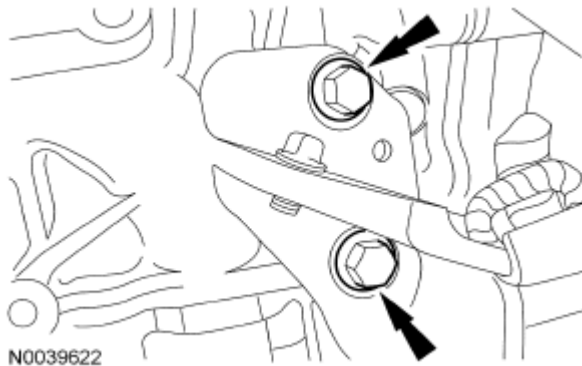


Fig. 176: Locating RH Halfshaft Carrier Bearing Bracket Bolts
Courtesy of FORD MOTOR CO.

66. Separate the RH halfshaft from the transaxle and support the halfshaft with a length of mechanic's wire.

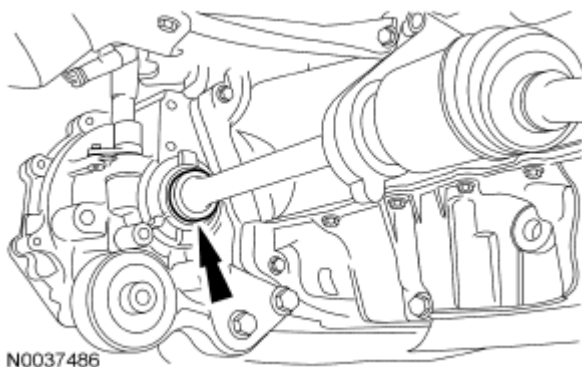


Fig. 177: Locating RH Halfshaft
Courtesy of FORD MOTOR CO.

67. Remove the torque converter nut access plug.

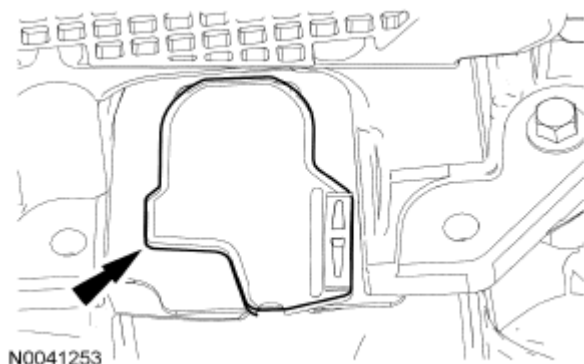


Fig. 178: Locating Torque Converter Nut Access Plug
Courtesy of FORD MOTOR CO.

68. Remove the 3 torque converter nuts.

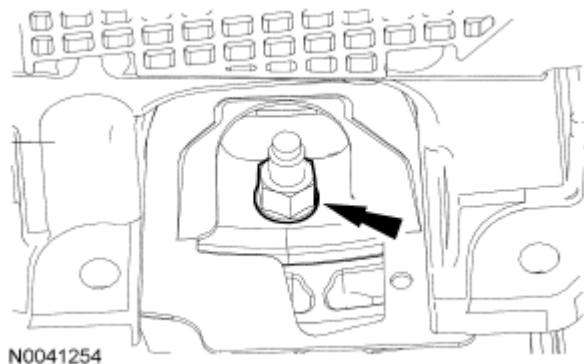


Fig. 179: Locating Torque Converter Nuts
Courtesy of FORD MOTOR CO.

69. Remove the 2 oil pan-to-transaxle bolts.

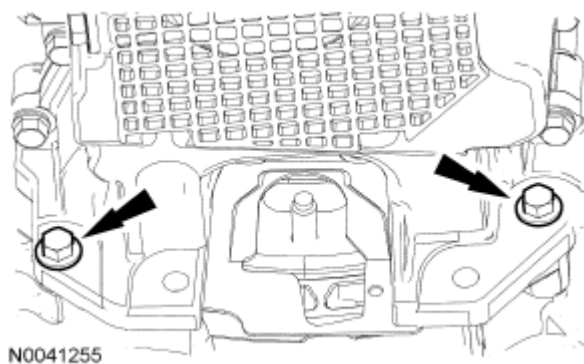


Fig. 180: Locating Oil Pan-To-Transaxle Bolts
Courtesy of FORD MOTOR CO.

NOTE: Position a suitable block of wood under the transaxle.

70. Install the special tools onto the engine.
 - Raise the engine and transaxle 25.4 mm (1 in) to neutralize the engine and transaxle mounts.

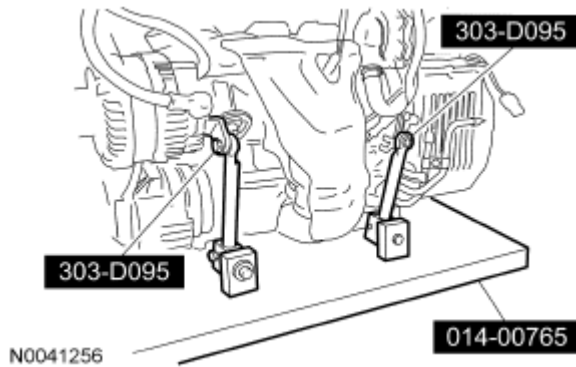


Fig. 181: Identifying Special Tools (303-D095, 014-00765)
Courtesy of FORD MOTOR CO.

71. Remove the 2 transaxle mount bolts.

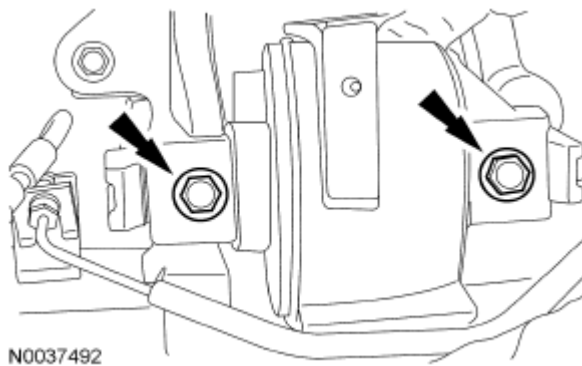


Fig. 182: Locating Transaxle Mount Bolts
Courtesy of FORD MOTOR CO.

72. Remove the bolt and damper.



Fig. 183: Locating Damper And Bolt
Courtesy of FORD MOTOR CO.

73. Remove the bolt, 3 nuts and the engine mount bracket.

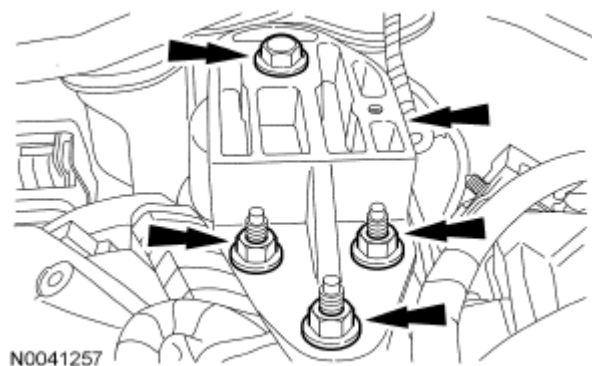


Fig. 184: Locating Engine Mount Bracket, Bolt And Nuts
Courtesy of FORD MOTOR CO.

74. Lower the engine and transaxle from the vehicle.
75. Install the special tools.

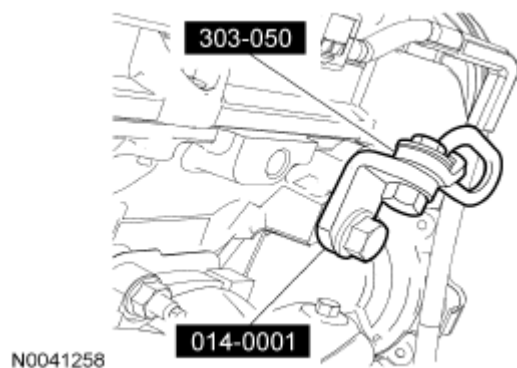


Fig. 185: Identifying Special Tools (303-050 And 014-0001)
Courtesy of FORD MOTOR CO.

76. Detach the wiring harness retainer from the PSP hose bracket.

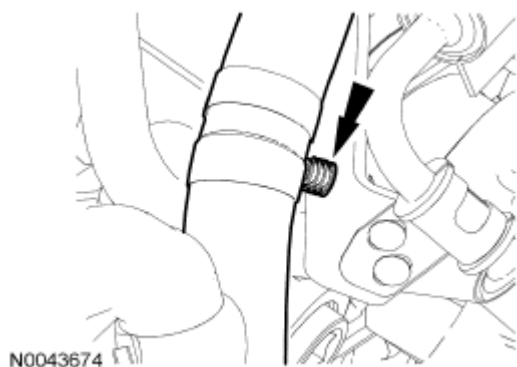


Fig. 186: Locating PSP Hose Bracket Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

77. Remove the bolt and detach the PSP hose bracket from the cylinder head.



Fig. 187: Locating PSP Hose Bracket Bolt
Courtesy of FORD MOTOR CO.

78. Detach the heated oxygen sensor (HO2S) electrical connector from the PSP bracket.

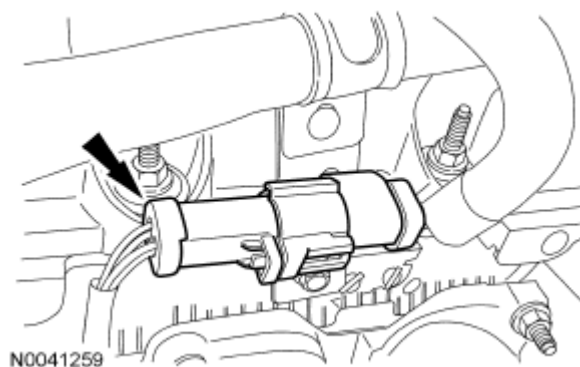


Fig. 188: Locating Heated Oxygen Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

79. Remove the bolt and detach the PSP hose bracket from the cylinder head.

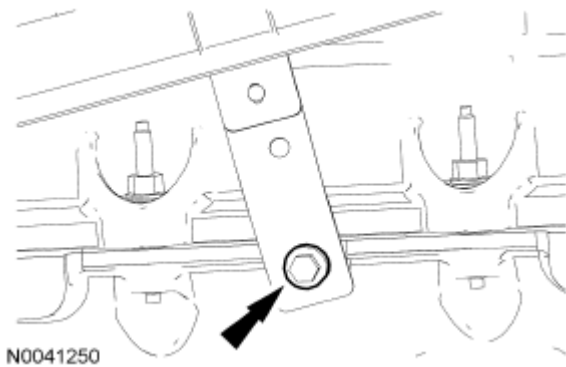


Fig. 189: Locating PSP Hose Bracket Bolt
Courtesy of FORD MOTOR CO.

80. Remove the bolt and detach the PSP hose bracket from the power steering reservoir.

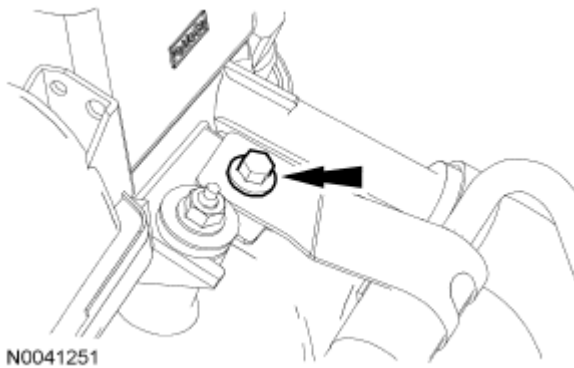


Fig. 190: Locating PSP Hose Bracket Bolt
Courtesy of FORD MOTOR CO.

81. Remove the banjo bolt and the PSP hose.
- Discard the banjo bolt and 2 seals.

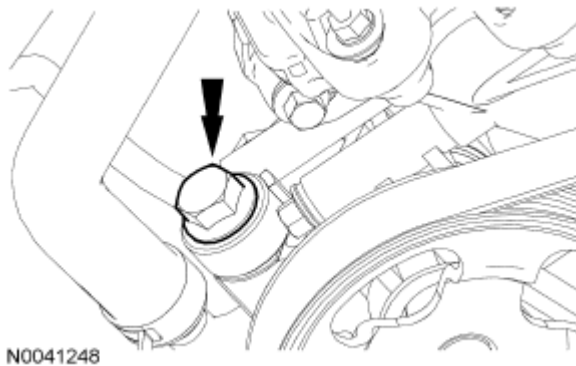


Fig. 191: Locating Banjo Bolt

Courtesy of FORD MOTOR CO.

82. Install the special tool.

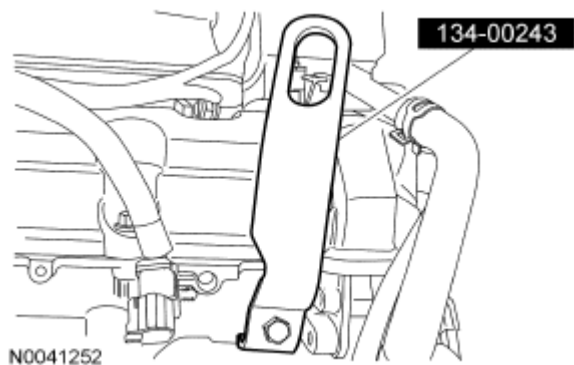


Fig. 192: Identifying Special Tools (134-00243)

Courtesy of FORD MOTOR CO.

83. Disconnect the exhaust gas recirculation (EGR) valve electrical connector.

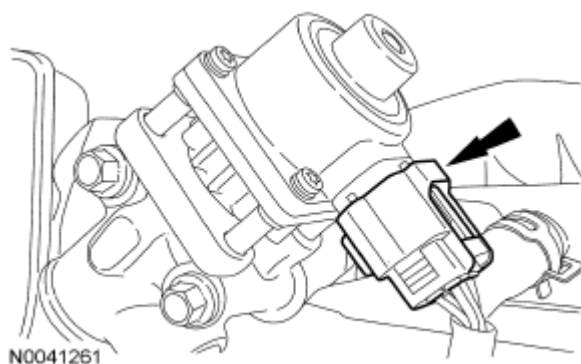


Fig. 193: Locating Exhaust Gas Recirculation Valve Electrical Connector

Courtesy of FORD MOTOR CO.

84. Loosen the EGR tube-to-EGR valve nut.

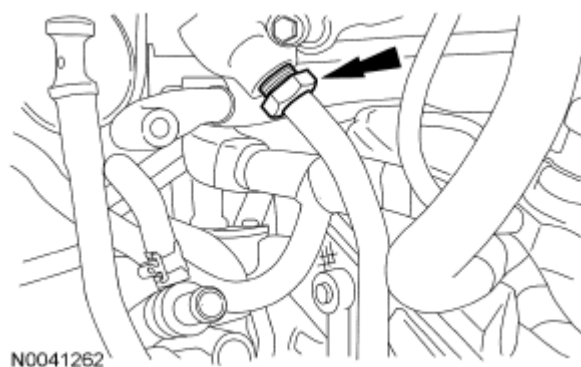


Fig. 194: Locating EGR Tube-To-EGR Valve Nut
Courtesy of FORD MOTOR CO.

85. Remove the 2 bolts and the EGR valve.
- Discard the gasket.

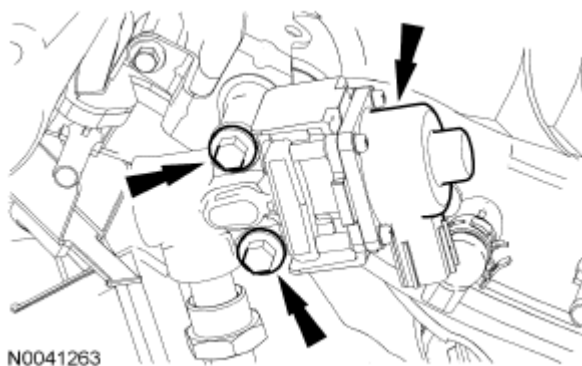


Fig. 195: Locating EGR Valve And Bolts
Courtesy of FORD MOTOR CO.

86. Loosen the EGR tube-to-catalytic converter nut and remove the EGR tube.

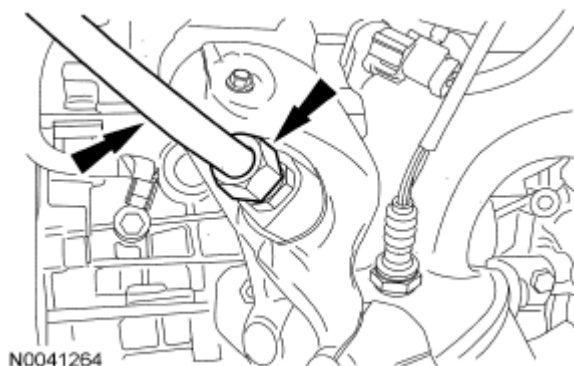


Fig. 196: Locating EGR Tube-To-Catalytic Converter Nut And EGR Tube
Courtesy of FORD MOTOR CO.

87. Remove the 2 bolts and the heat shield.

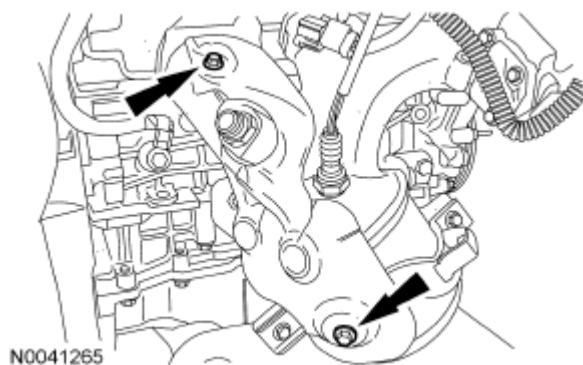


Fig. 197: Locating Heat Shield Bolts
Courtesy of FORD MOTOR CO.

88. Remove the 2 bolts and the catalytic converter bracket.

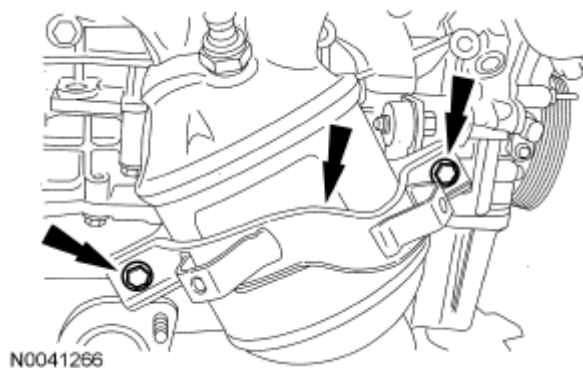


Fig. 198: Locating Catalytic Converter Bracket And Bolts
Courtesy of FORD MOTOR CO.

89. Remove the 2 bolts and the catalytic converter bracket assembly.

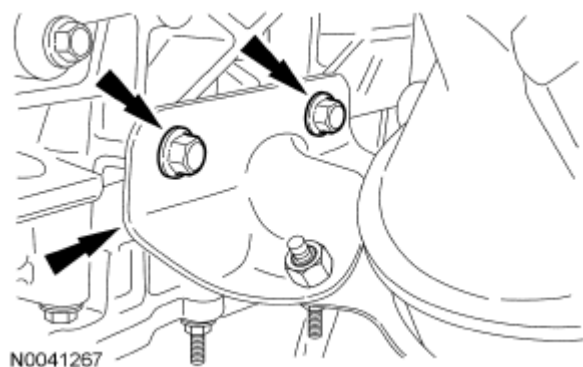


Fig. 199: Locating Catalytic Converter Bracket And Bolts
Courtesy of FORD MOTOR CO.

NOTE: When installing the lower half of the lifting bracket it will be easier to

loosely install the upper bolt first then install the lower bolt.

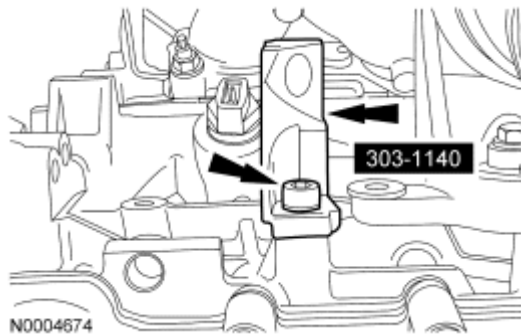


Fig. 200: Identifying Lower Half Of Lifting Hook
Courtesy of FORD MOTOR CO.

90. Install the lower half of the special tool.
91. Install the upper half of the special tool.



Fig. 201: Identifying Upper Half Of Lifting Hook
Courtesy of FORD MOTOR CO.

92. Using the special tools and a suitable engine crane, remove the engine and transaxle from the lift table.

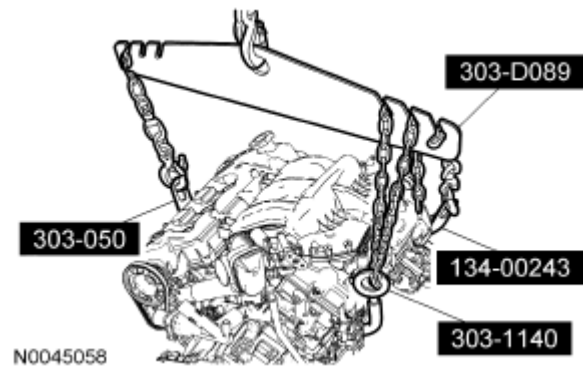


Fig. 202: Identifying Special Tools
Courtesy of FORD MOTOR CO.

93. Remove the bolt and the ground wire.

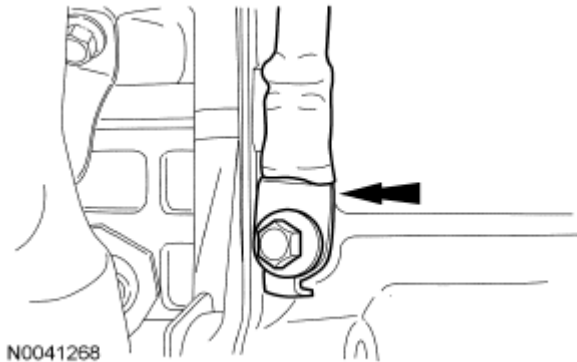


Fig. 203: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

94. Remove the bolt and the catalyst monitor sensor (CMS) electrical connector bracket.

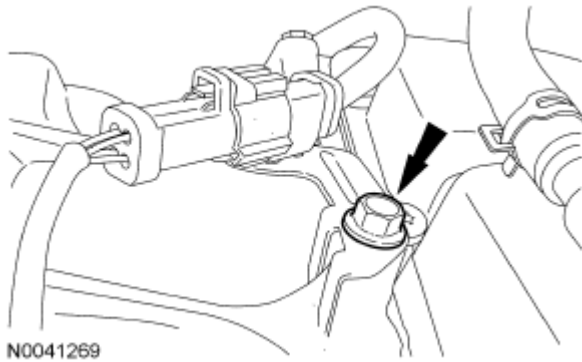


Fig. 204: Locating Catalyst Monitor Sensor (CMS) Electrical Connector Bracket Bolt
Courtesy of FORD MOTOR CO.

95. Disconnect the transmission control module (TCM) electrical connector.

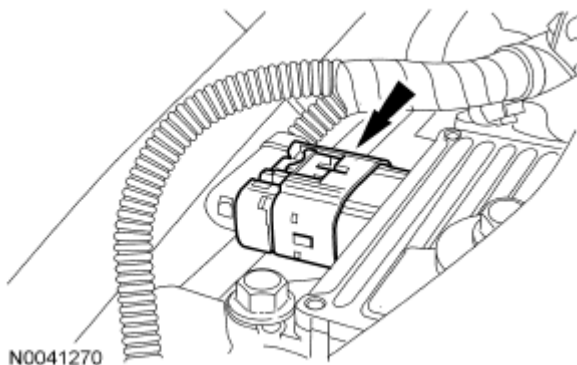


Fig. 205: Locating Transmission Control Module (TCM) Electrical Connector
Courtesy of FORD MOTOR CO.

96. Detach the wiring harness pin-type retainer.

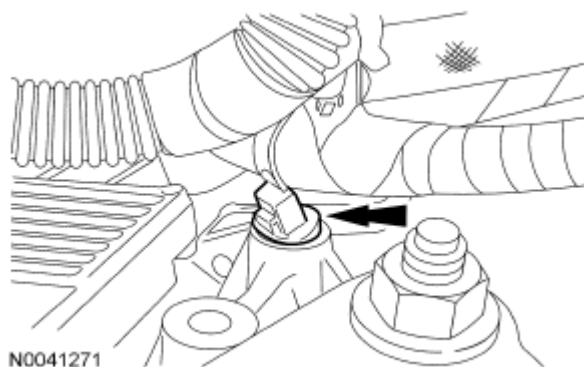


Fig. 206: Locating Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

97. Remove the 2 nuts and the starter motor wiring.

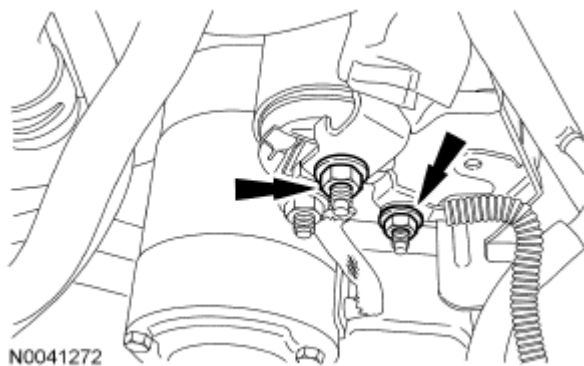


Fig. 207: Locating Starter Motor Wiring Nuts
Courtesy of FORD MOTOR CO.

98. Remove the 2 bolts and the starter motor.

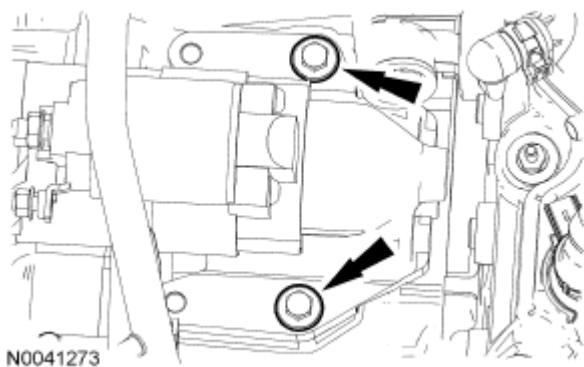


Fig. 208: Locating Starter Motor Bolts
Courtesy of FORD MOTOR CO.

99. Remove the engine-to-transaxle bolt.

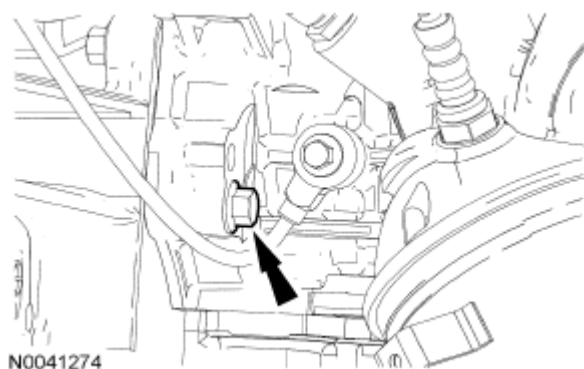


Fig. 209: Locating Engine-To-Transaxle Bolt
Courtesy of FORD MOTOR CO.

100. Remove the 3 transaxle-to-engine bolts.

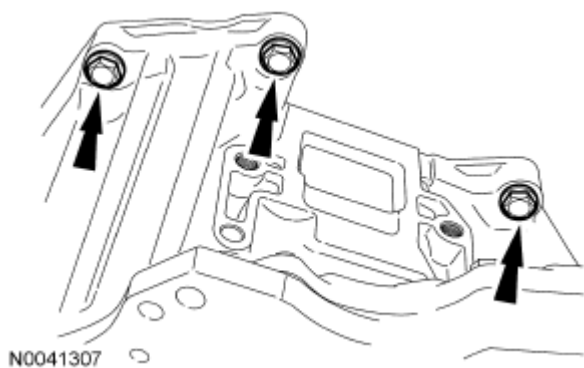


Fig. 210: Locating Transaxle-To-Engine Bolts
Courtesy of FORD MOTOR CO.

101. Detach the wiring harness retainer from the stud bolt.

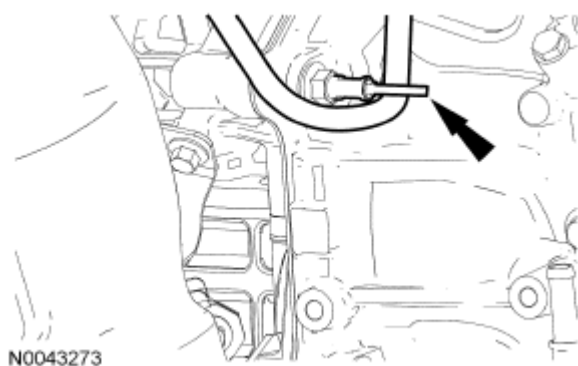


Fig. 211: Locating Wiring Harness Retainer Stud Bolt
Courtesy of FORD MOTOR CO.

102. Remove the transaxle-to-engine stud bolt, bolt and nut.

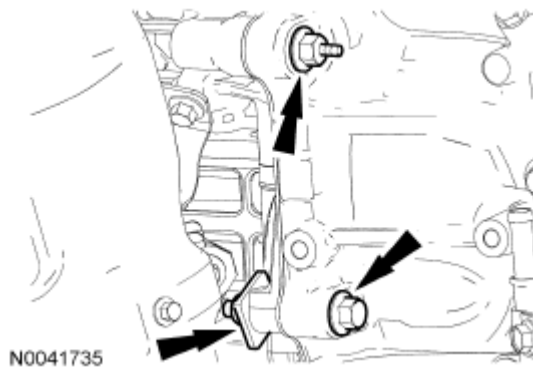


Fig. 212: Locating Transaxle-To-Engine Stud Bolt, Bolt And Nut
Courtesy of FORD MOTOR CO.

103. Using the special tools and a suitable engine crane, separate the engine and transaxle.

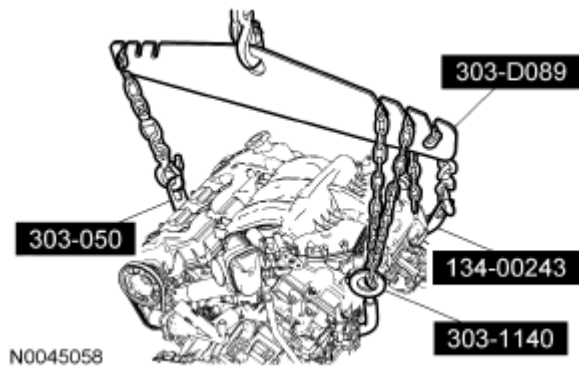


Fig. 213: Identifying Special Tools
Courtesy of FORD MOTOR CO.

DISASSEMBLY

ENGINE

SPECIAL TOOL(S)

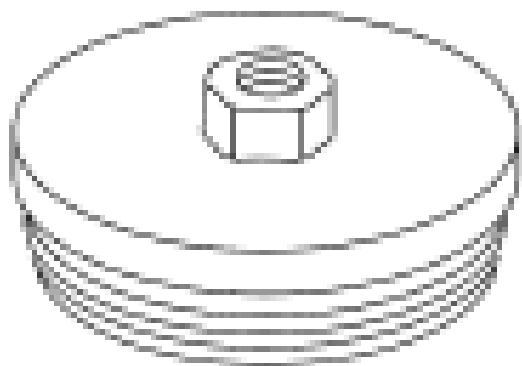
	Slide Hammer 07-005 (T59L-100-B)
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2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

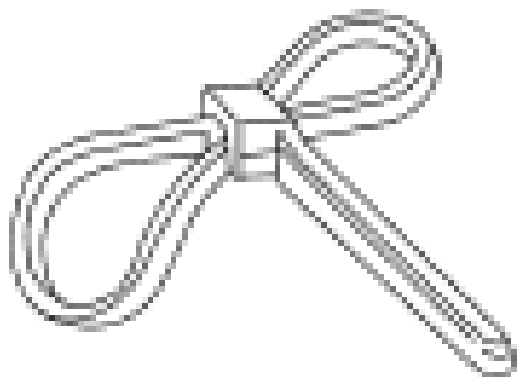


ST1187-A



ST1382-A

Remover, Crankshaft Rear Oil Seal
303-519 (T95P-6701-EH)



ST1438-A

Strap Wrench
303-D055 (D85L-6000-A)

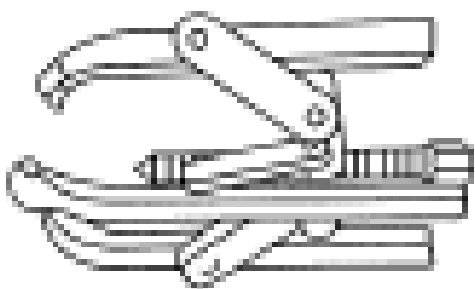
2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1385-A

Remover, Oil Seal
303-409 (T92C-6700CH)



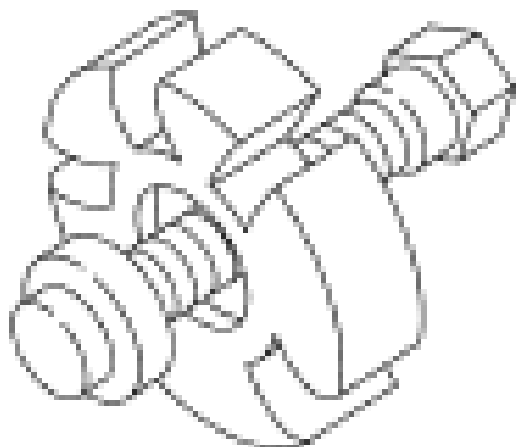
ST1184-A

3-Jaw Puller
303-D121

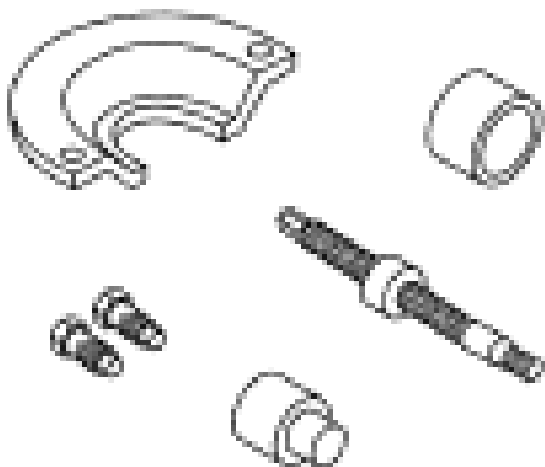
Remover, Crankshaft Vibration Damper
303-009 (T58P-6316-D)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1286-A



ST1971-A

Service Set, Water Pump Pulley
303-S455 (T94P-6312-AH)

MATERIAL

Item	Specification
Motorcraft Metal Surface Prep ZC-31	-
Silicone Gasket Remover ZC-30	-

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

NOTE: For additional information, refer to the appropriate exploded view under the **ASSEMBLY** procedure.

1. Remove the 8 bolts and the flexplate.

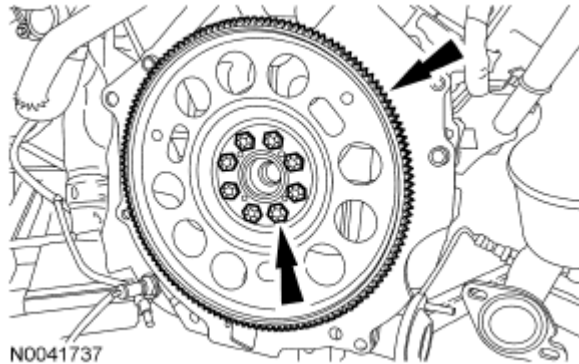


Fig. 214: Locating Flexplate And Bolts
Courtesy of FORD MOTOR CO.

2. Remove the engine-to-transaxle separator plate.

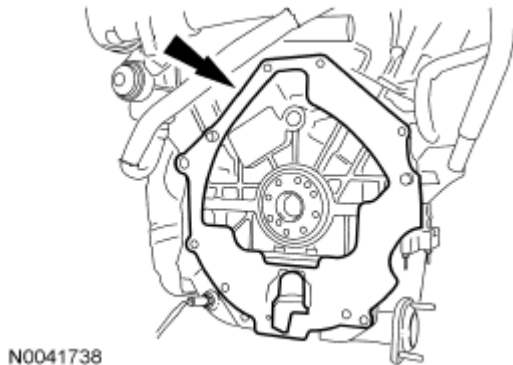


Fig. 215: Locating Engine-To-Transaxle Separator Plate
Courtesy of FORD MOTOR CO.

3. Using the special tools, remove and discard the crankshaft rear oil seal.

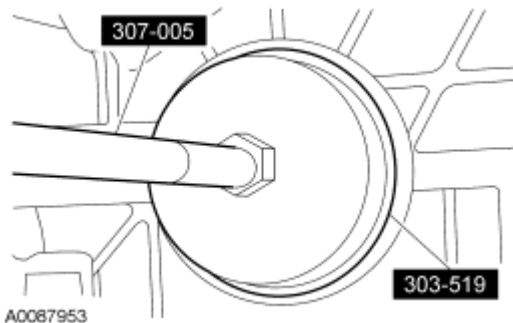
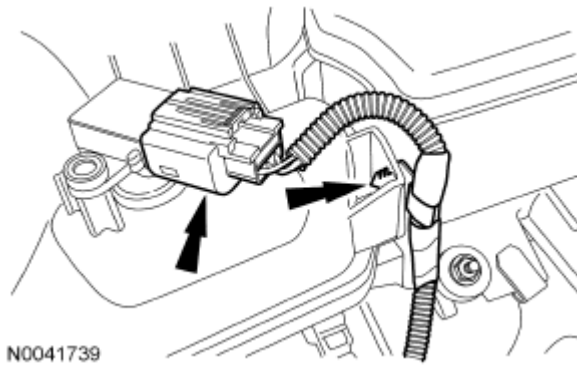
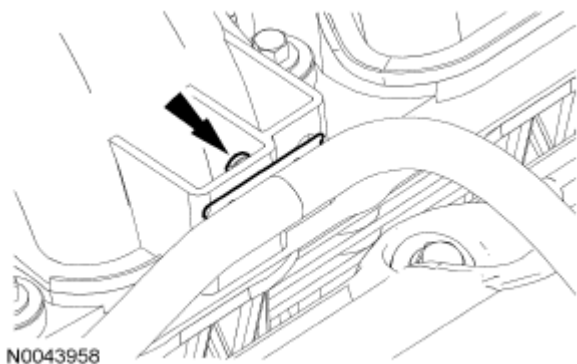


Fig. 216: Identifying Special Tools (307-005 And 303-519)**Courtesy of FORD MOTOR CO.**

4. Mount the engine on a suitable stand.
5. Disconnect the manifold actual pressure (MAP) sensor electrical connector and the pin-type retainer.

**Fig. 217: Locating Manifold Actual Pressure Sensor Electrical Connector And Pin-Type Retainer****Courtesy of FORD MOTOR CO.**

6. Detach the wiring harness pin-type retainer from the upper intake manifold.

**Fig. 218: Locating Wiring Harness Pin-Type Retainer****Courtesy of FORD MOTOR CO.**

7. Disconnect the crankcase vent hose from the upper intake manifold.

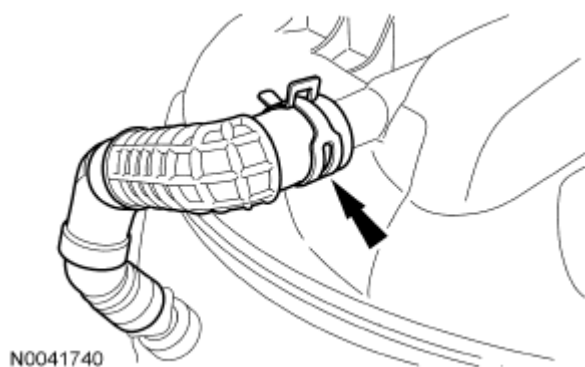


Fig. 219: Locating Crankcase Vent Hose From Upper Intake Manifold
Courtesy of FORD MOTOR CO.

8. Disconnect the electronic throttle body electrical connector.

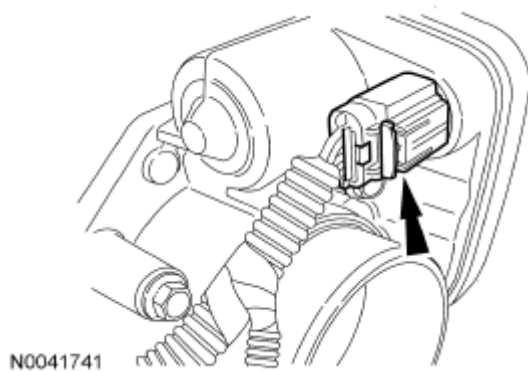


Fig. 220: Locating Electronic Throttle Body Electrical Connector
Courtesy of FORD MOTOR CO.

9. Disconnect the throttle body coolant hose.

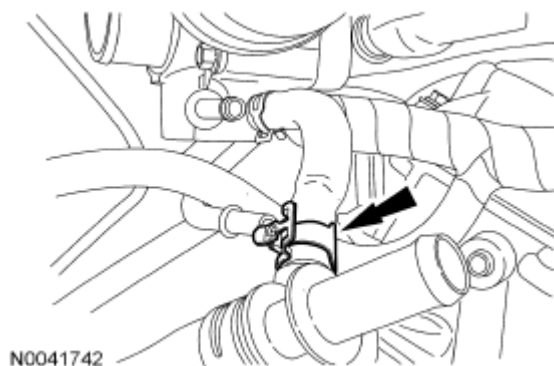


Fig. 221: Locating Throttle Body Coolant Hose
Courtesy of FORD MOTOR CO.

10. Remove the 8 bolts and the upper intake manifold.

- Discard the gaskets.

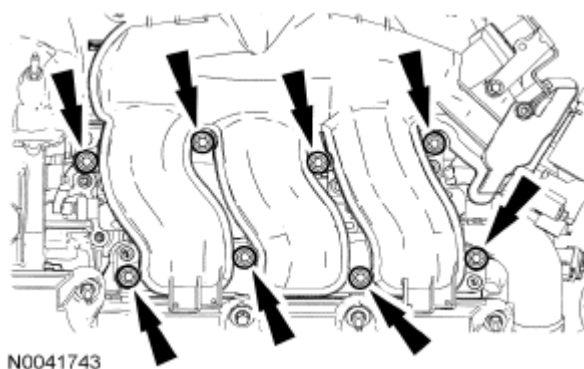


Fig. 222: Locating Upper Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

11. Disconnect the A/C compressor electrical connector.

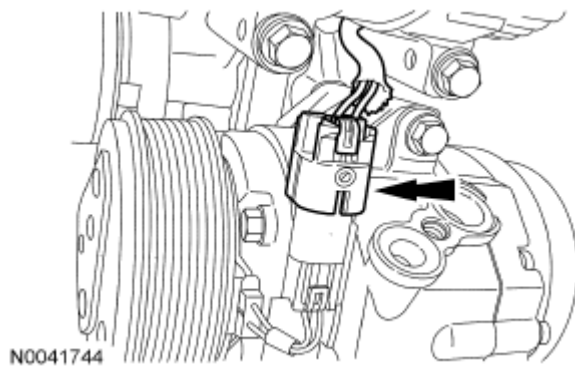


Fig. 223: Locating A/C Compressor Electrical Connector
Courtesy of FORD MOTOR CO.

12. If equipped, disconnect the block heater electrical connector.

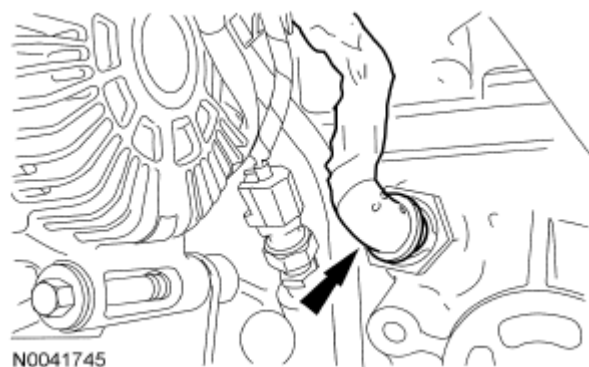


Fig. 224: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

13. If equipped, detach the block heater wiring harness retainers from the oil level indicator tube and remove the harness.

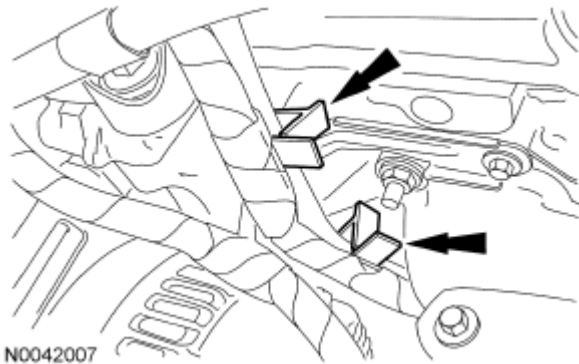


Fig. 225: Locating Block Heater Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

14. Disconnect the oil pressure sender electrical connector.

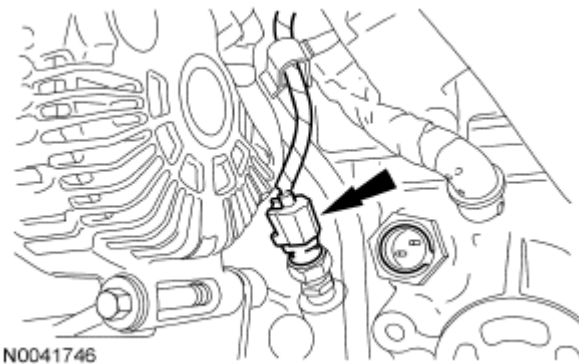


Fig. 226: Locating Oil Pressure Sender Electrical Connector
Courtesy of FORD MOTOR CO.

15. Remove the nut and disconnect the generator B+ cable and electrical connector.

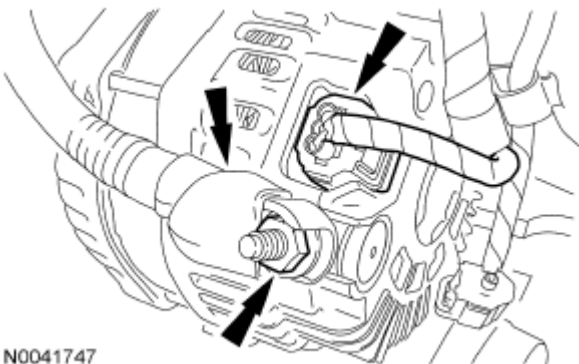


Fig. 227: Locating Generator B+ Cable, Nut And Electrical Connector

Courtesy of FORD MOTOR CO.

16. Disconnect the LH variable camshaft timing (VCT) solenoid and LH camshaft position (CMP) sensor electrical connectors.
 - Detach the 2 wiring harness retainers from the valve cover stud bolts.

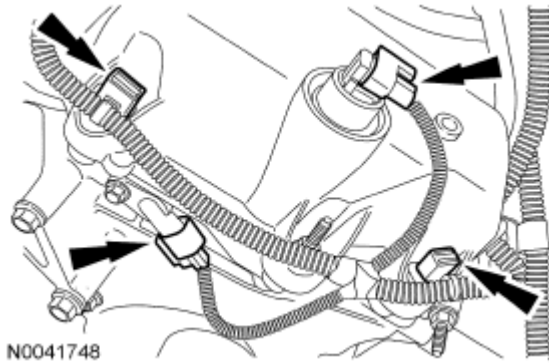


Fig. 228: Locating LH Variable Camshaft Timing Solenoid And LH Camshaft Position Sensor Electrical Connectors

Courtesy of FORD MOTOR CO.

17. Disconnect the LH heated oxygen sensor (HO2S) electrical connector and pin-type retainer.

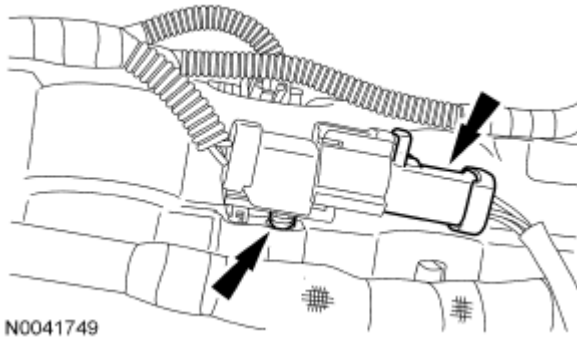


Fig. 229: Locating LH Heated Oxygen Sensor Electrical Connector And Pin-Type Retainer

Courtesy of FORD MOTOR CO.

18. Detach the 3 wiring harness retainers from the valve cover stud bolts.

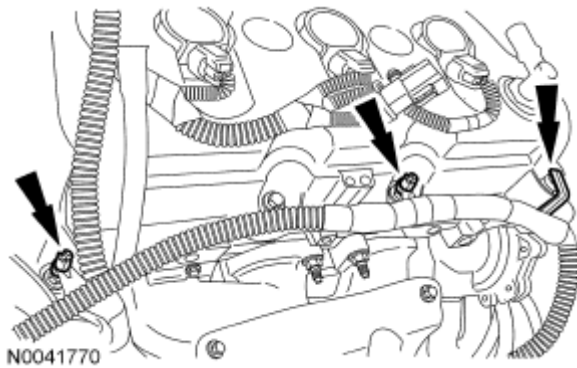


Fig. 230: Locating Wiring Harness Retainers From Valve Cover Stud Bolts
Courtesy of FORD MOTOR CO.

19. Disconnect the 3 LH coil-on-plug electrical connectors.
 - Detach the 2 wiring harness pin-type retainers from the valve cover.

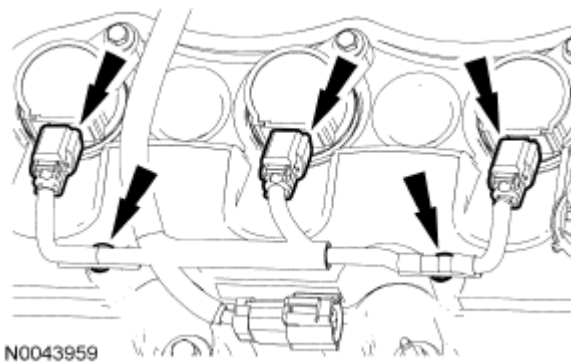


Fig. 231: Locating LH Coil-On-Plug Electrical Connectors
Courtesy of FORD MOTOR CO.

20. Detach the wiring harness retainer from the LH valve cover stud bolt.

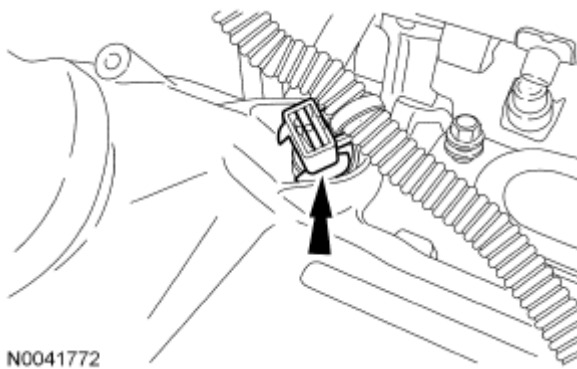


Fig. 232: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

21. Disconnect the 6 (3 shown) fuel injector electrical connectors.

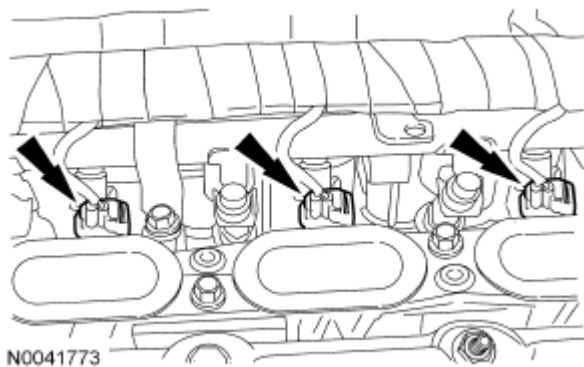


Fig. 233: Locating Fuel Injector Electrical Connectors
Courtesy of FORD MOTOR CO.

NOTE: Only one wiring harness retainer is shown, other wiring harness retainers are similar.

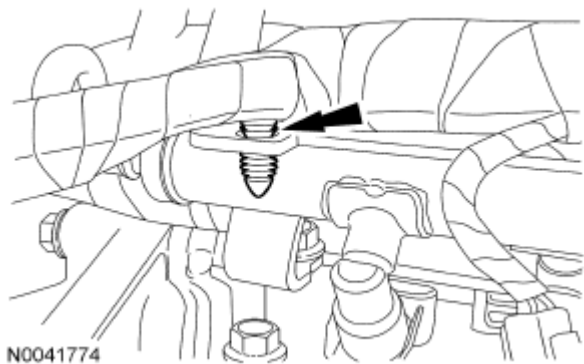


Fig. 234: Locating Fuel Rail Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

22. Detach the 3 wiring harness retainers from the fuel rail.
23. Disconnect the 3 RH coil-on-plug electrical connectors.
- Detach the 2 wiring harness pin-type retainers from the valve cover.

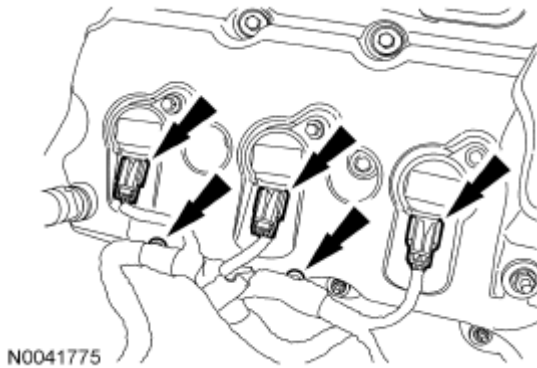


Fig. 235: Locating RH Coil-On-Plug Electrical Connectors
Courtesy of FORD MOTOR CO.

24. Disconnect the RH VCT solenoid and LH CMP sensor electrical connectors.
- Detach the 2 wiring harness retainers from the valve cover stud bolts.

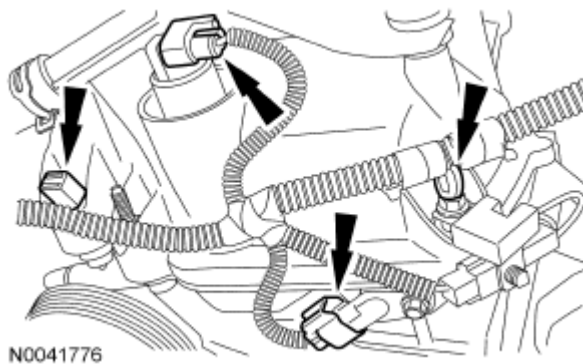


Fig. 236: Locating RH VCT Solenoid And LH CMP Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

25. Remove the nut and the radio frequency interference capacitor.

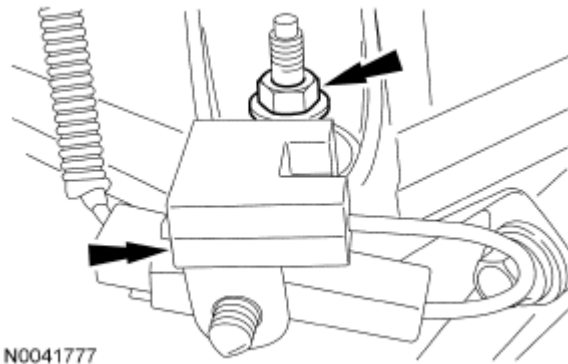


Fig. 237: Locating Radio Frequency Interference Capacitor And Nut
Courtesy of FORD MOTOR CO.

26. Detach the wiring harness retainer from the power steering stud bolt.

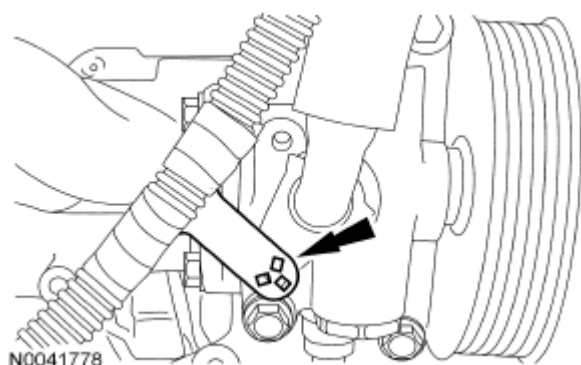


Fig. 238: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

27. Disconnect the RH HO2S electrical connector.

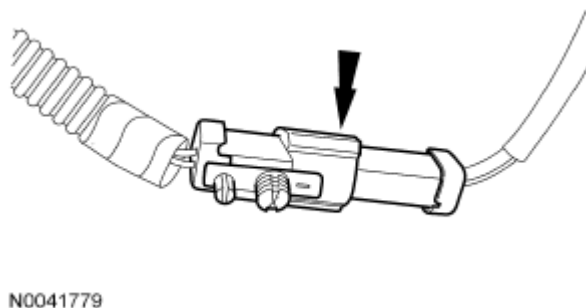


Fig. 239: Locating RH HO2S Electrical Connector
Courtesy of FORD MOTOR CO.

28. Disconnect the positive crankcase ventilation (PCV) valve electrical connector.

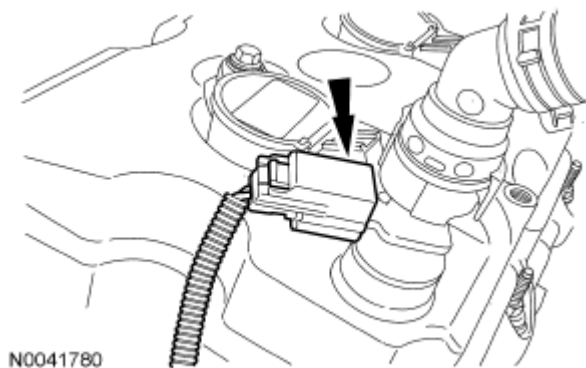


Fig. 240: Locating Positive Crankcase Ventilation Valve Electrical Connector
Courtesy of FORD MOTOR CO.

29. Disconnect the knock sensor (KS) electrical connector.

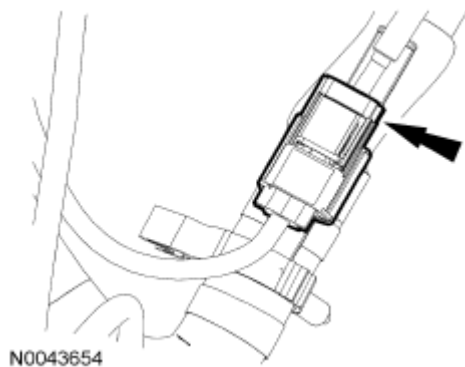


Fig. 241: Locating Knock Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

30. Disconnect the electronic coolant temperature (ECT) sensor electrical connector.

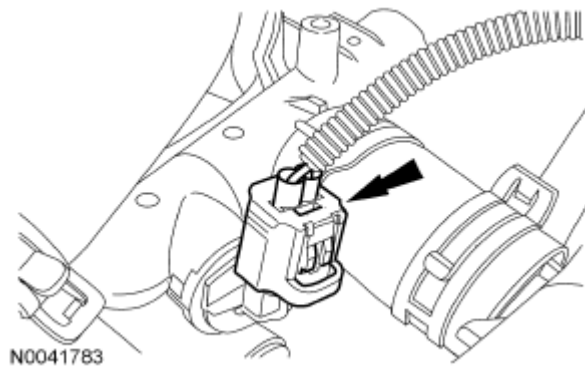


Fig. 242: Locating Electronic Coolant Temperature Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

31. Detach the wiring harness retainer from the coolant bypass stud bolt.

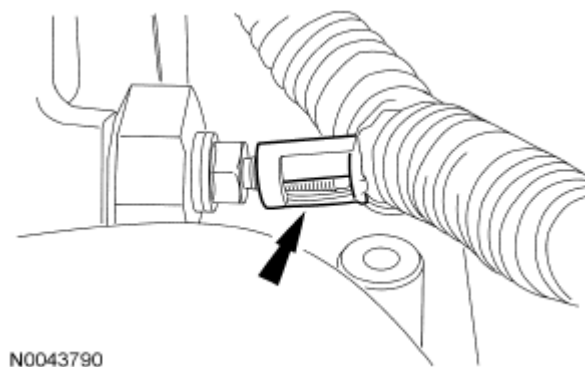


Fig. 243: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

32. Disconnect the LH catalyst monitor sensor (CMS) electrical connector.
- Remove the wiring harness from the engine.

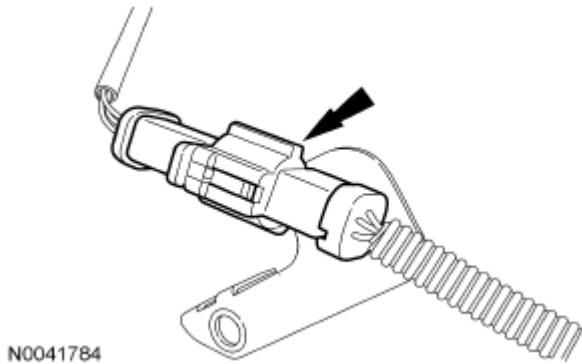


Fig. 244: Locating LH Catalyst Monitor Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

33. Rotate the accessory drive belt tensioner counterclockwise and remove the accessory drive belt.



Fig. 245: Rotating Accessory Drive Belt Tensioner Counterclockwise
Courtesy of FORD MOTOR CO.

34. Remove the 3 bolts and the generator.

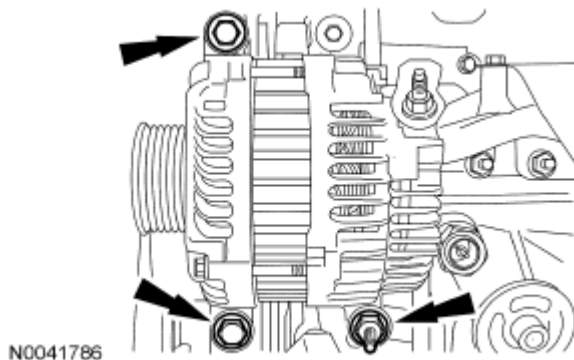


Fig. 246: Locating Generator Bolts

Courtesy of FORD MOTOR CO.

35. Remove the 3 bolts and the A/C compressor.

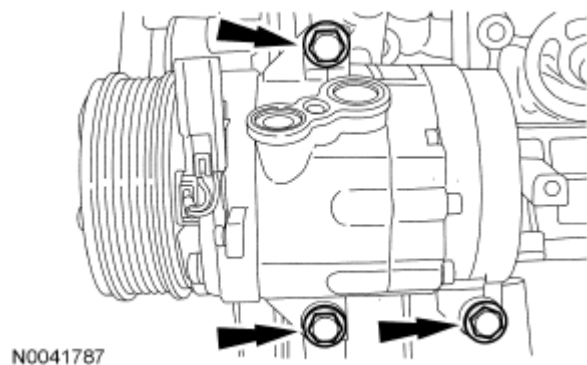


Fig. 247: Locating A/C Compressor Bolts
Courtesy of FORD MOTOR CO.

36. Remove the 3 bolts and the A/C compressor bracket.

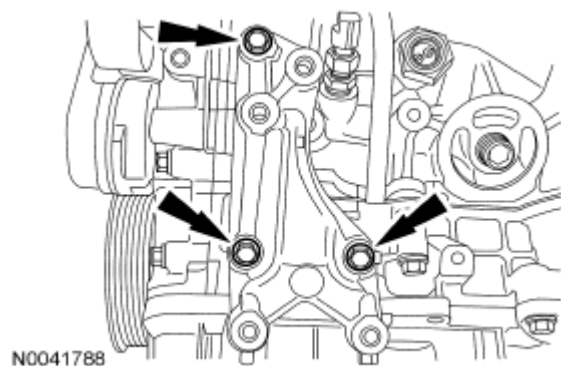


Fig. 248: Locating A/C Compressor Bracket Bolts
Courtesy of FORD MOTOR CO.

37. Remove the 3 power steering reservoir nuts.

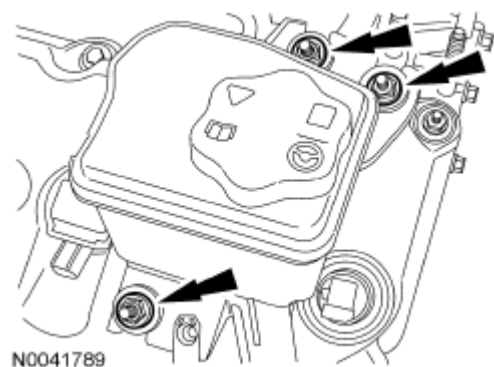


Fig. 249: Locating Power Steering Reservoir Nuts
Courtesy of FORD MOTOR CO.

38. Remove the 3 bolts and the power steering pump and reservoir assembly.

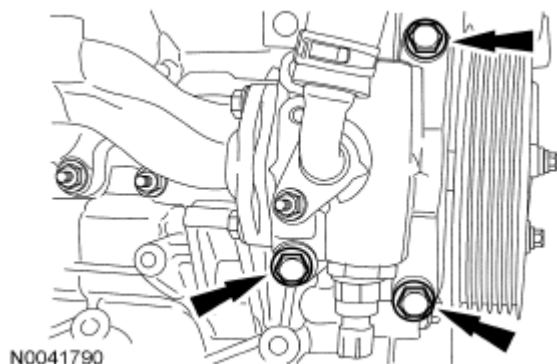


Fig. 250: Locating Power Steering Pump Bolts
Courtesy of FORD MOTOR CO.

39. Remove the 6 nuts and the RH catalytic converter.
- Discard the gasket.

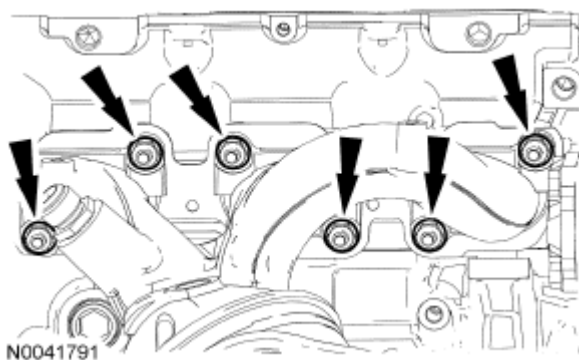


Fig. 251: Locating RH Catalytic Converter Nuts
Courtesy of FORD MOTOR CO.

40. Remove and discard the 6 RH catalytic converter studs.

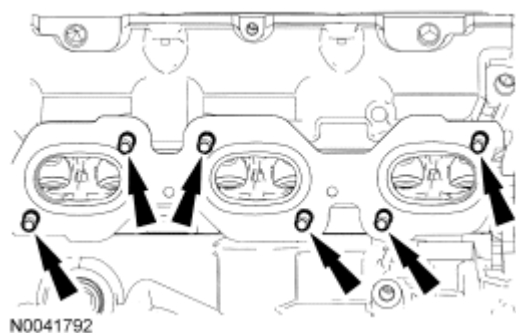


Fig. 252: Locating Exhaust Manifold Studs
Courtesy of FORD MOTOR CO.

41. Remove the 4 bolts and the heat shield.

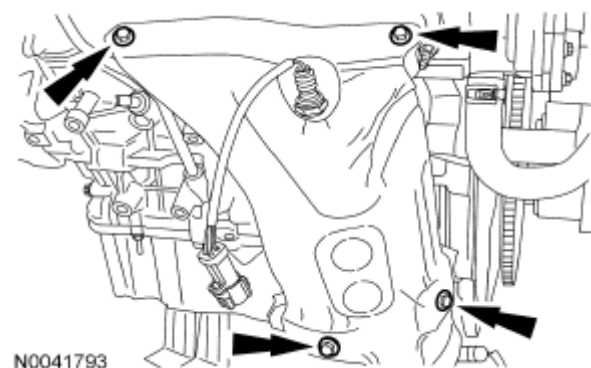


Fig. 253: Locating Heat Shield Bolts
Courtesy of FORD MOTOR CO.

42. Remove the 2 bolts from the LH catalytic converter bracket.

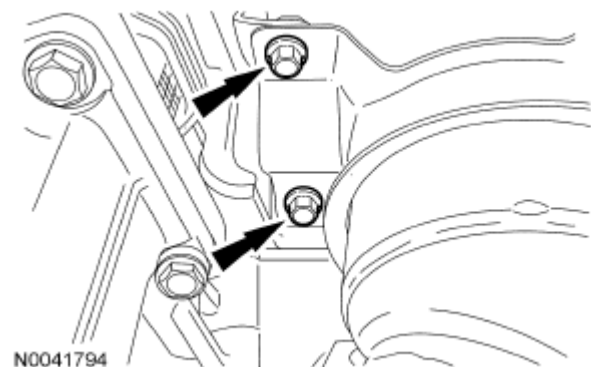


Fig. 254: Locating LH Catalytic Converter Bracket Bolts
Courtesy of FORD MOTOR CO.

43. Remove the 6 nuts and the LH catalytic converter.
- Discard the gasket.

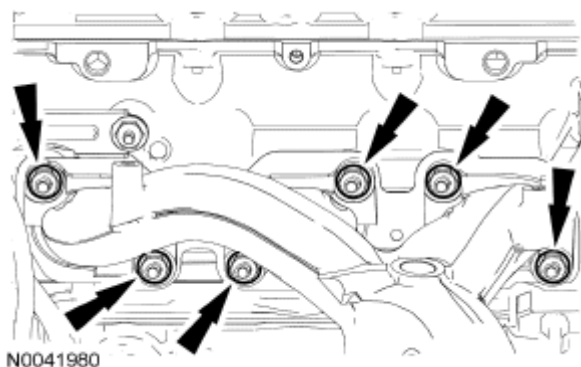


Fig. 255: Locating LH Catalytic Converter Nuts
Courtesy of FORD MOTOR CO.

44. Remove and discard the 6 LH catalytic converter studs.

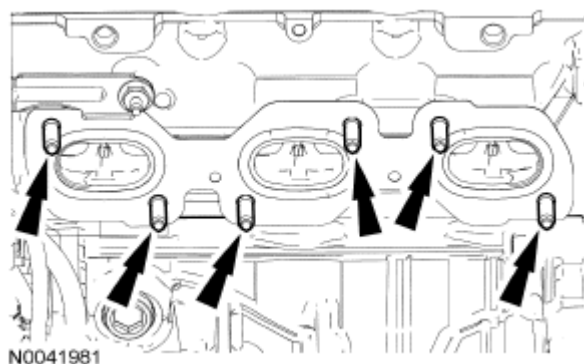


Fig. 256: Locating LH Catalytic Converter Studs
Courtesy of FORD MOTOR CO.

45. Remove the 2 bolts and the LH catalytic converter bracket.

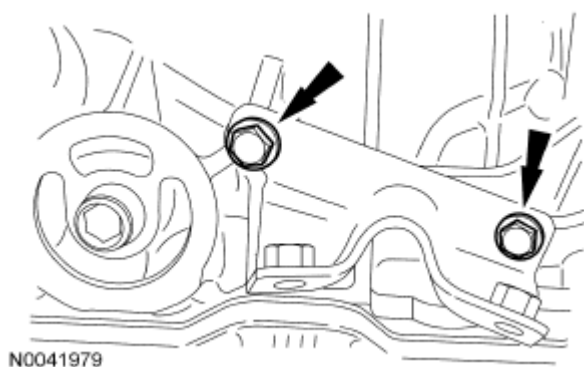


Fig. 257: Locating LH Catalytic Converter Bracket Bolts
Courtesy of FORD MOTOR CO.

46. Remove the bolt and the oil level indicator tube.

- Remove and discard the O-ring seal.

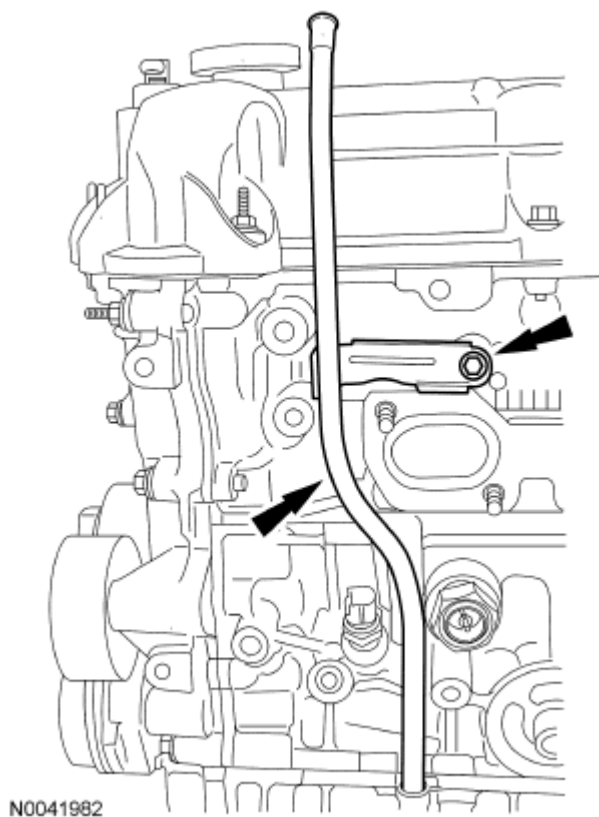


Fig. 258: Locating Oil Level Indicator Tube And Bolt
Courtesy of FORD MOTOR CO.

47. Remove the 8 bolts and the lower intake manifold.
- Discard the gaskets.

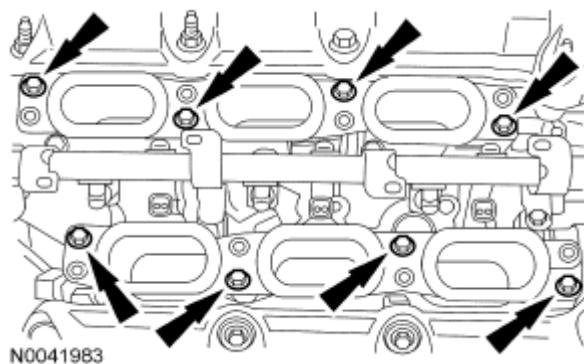


Fig. 259: Locating Lower Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

48. If equipped, remove the 2 nuts and the coolant pump drive pulley cover.

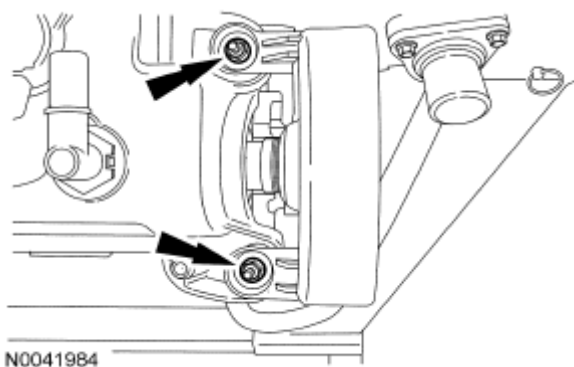


Fig. 260: Locating Coolant Pump Drive Pulley Cover Nuts
Courtesy of FORD MOTOR CO.

49. Cut and discard the coolant pump belt.

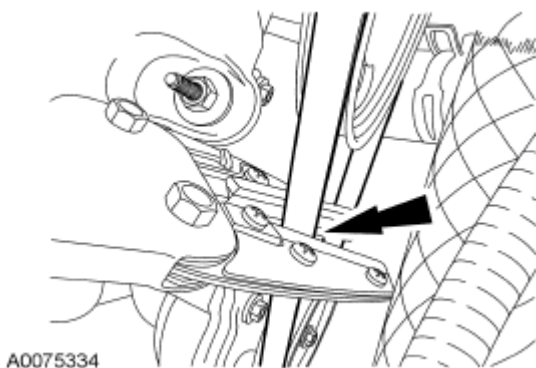


Fig. 261: Locating Coolant Pump Belt
Courtesy of FORD MOTOR CO.

50. Release the 2 clamps and remove the thermostat housing.



Fig. 262: Locating Clamps And Thermostat Housing
Courtesy of FORD MOTOR CO.

51. Remove the bolt, stud bolt and the coolant bypass.

- Remove and discard the O-ring seals.

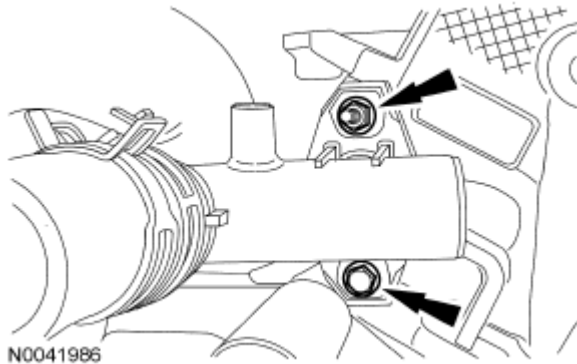


Fig. 263: Locating Bolt, Stud Bolt And Coolant Bypass
Courtesy of FORD MOTOR CO.

52. Disconnect the coolant pump hose from the cylinder block outlet.

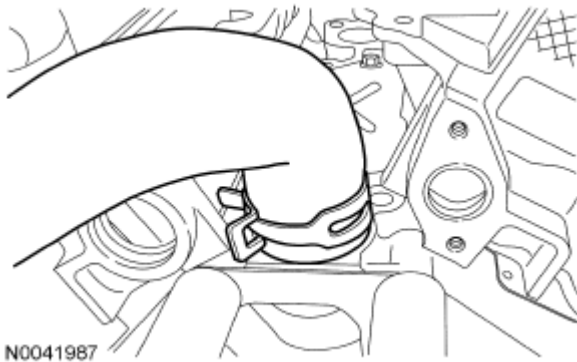


Fig. 264: Locating Coolant Pump Hose From Cylinder Block Outlet
Courtesy of FORD MOTOR CO.

53. Using the special tools, remove the coolant pump drive pulley from the camshaft.

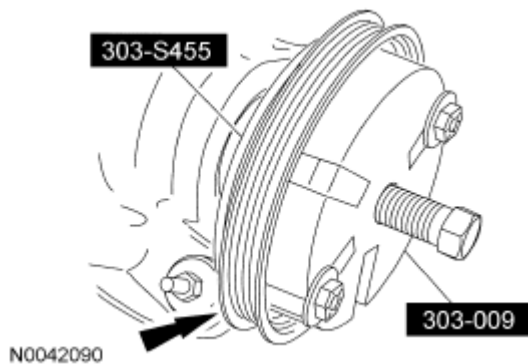


Fig. 265: Identifying Special Tools (303-S455 And 303-009) And Coolant Pump Drive Pulley
Courtesy of FORD MOTOR CO.

54. Remove the 3 bolts and the coolant pump.

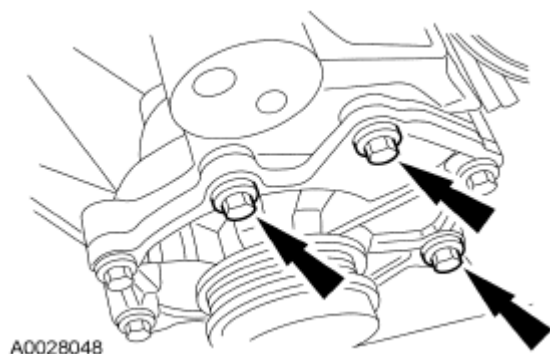


Fig. 266: Locating Coolant Pump Bolts
Courtesy of FORD MOTOR CO.

55. Remove the bolt and the KS.

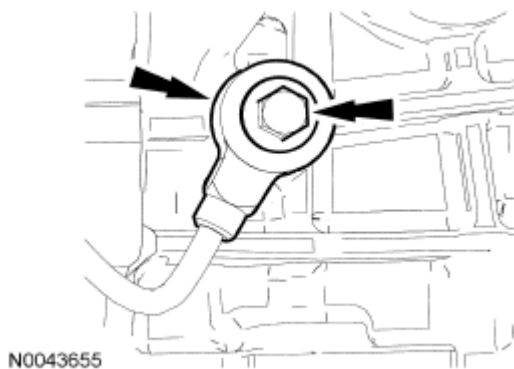


Fig. 267: Locating KS And Bolt
Courtesy of FORD MOTOR CO.

56. Remove the oil pressure sender.

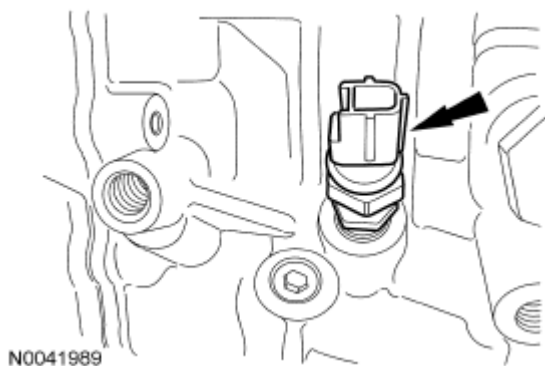


Fig. 268: Locating Oil Pressure Sender
Courtesy of FORD MOTOR CO.

57. If equipped, remove the block heater.

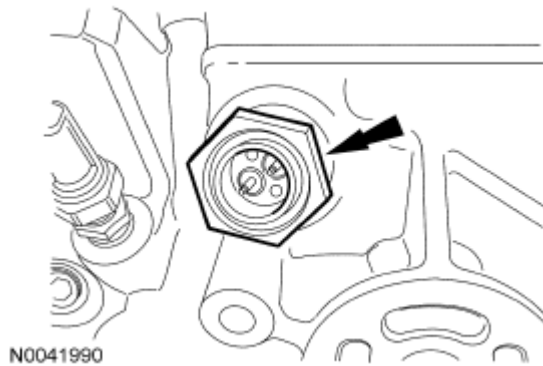


Fig. 269: Locating Block Heater
Courtesy of FORD MOTOR CO.

NOTE: When removing the coil-on-plug assemblies, a slight twisting motion will break the seal and ease removal.

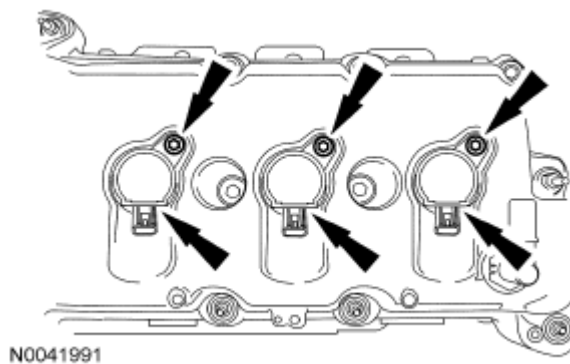


Fig. 270: Locating LH Coil-On-Plug Assemblies And Bolts
Courtesy of FORD MOTOR CO.

58. Remove the 3 bolts and the 3 LH coil-on-plug assemblies.
59. Remove the 4 bolts, 10 stud bolts and the LH valve cover.
- Discard the gaskets.

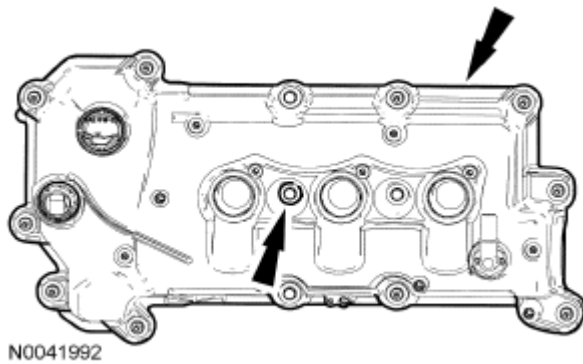


Fig. 271: Locating LH Valve Cover And Bolts
Courtesy of FORD MOTOR CO.

NOTE: When removing the coil-on-plug assemblies, a slight twisting motion will break the seal and ease removal.

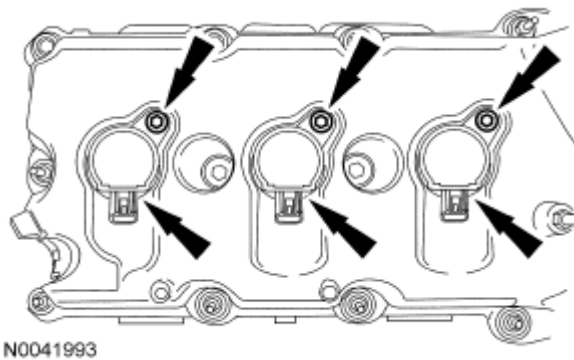


Fig. 272: Locating RH Coil-On-Plug Assemblies And Bolts
Courtesy of FORD MOTOR CO.

60. Remove the 3 bolts and the 3 RH coil-on-plug assemblies.
61. Remove the 6 bolts, 8 stud bolts and the RH valve cover.
 - Discard the gaskets.

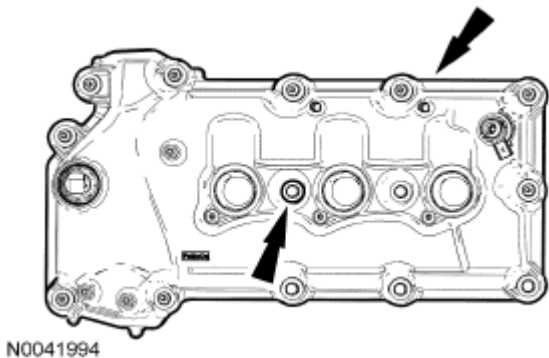


Fig. 273: Locating RH Valve Cover And Bolts

Courtesy of FORD MOTOR CO.

62. Remove the 10 bolts, 5 stud bolts and the oil pan.
- Discard the gasket.

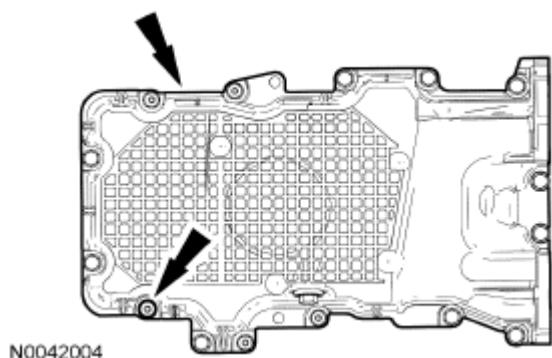


Fig. 274: Locating Oil Pan And Bolts
Courtesy of FORD MOTOR CO.

63. Remove the 2 bolts and the oil pump screen and pickup tube.
- Remove and discard the O-ring seal.

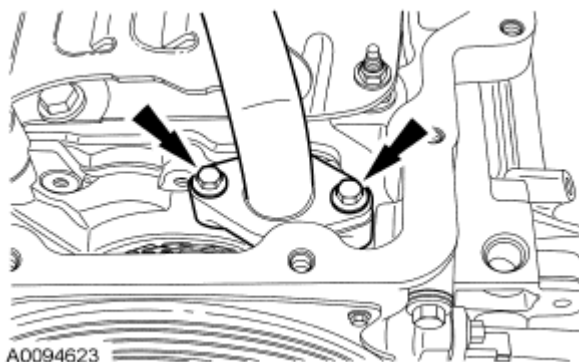


Fig. 275: Locating Oil Pump Screen And Pickup Tube Bolts
Courtesy of FORD MOTOR CO.

64. Remove the 8 nuts and the oil pan baffle.

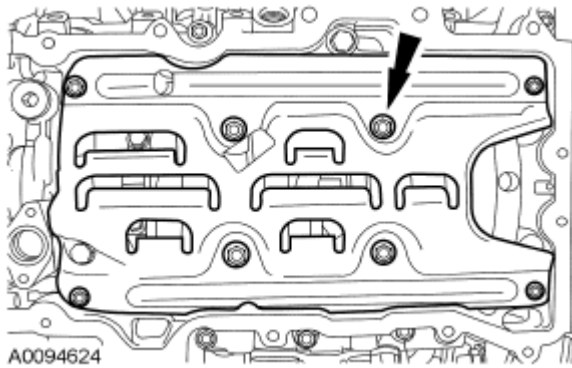


Fig. 276: Locating Oil Pan Baffle And Nuts
Courtesy of FORD MOTOR CO.

65. Remove the accessory drive belt tensioner and the 2 idler pulleys.

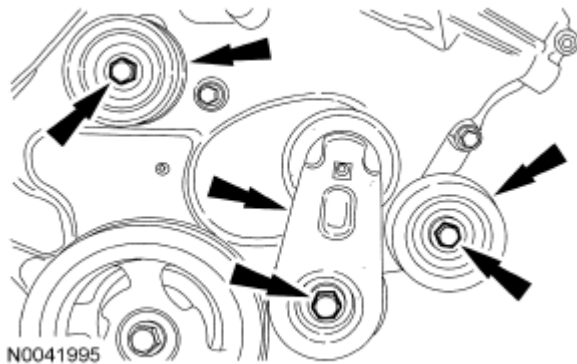


Fig. 277: Locating Accessory Drive Belt Tensioner And Idler Pulleys
Courtesy of FORD MOTOR CO.

66. Using the special tool, remove the crankshaft pulley bolt.

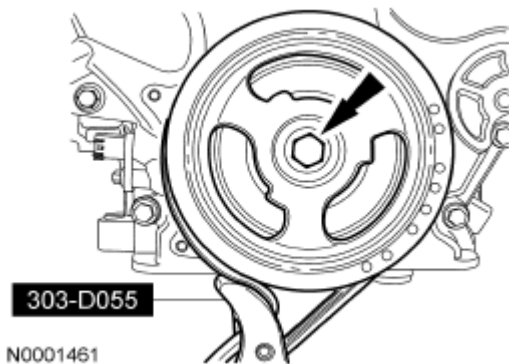


Fig. 278: Identifying Special Tools (303-D055) And Crankshaft Pulley Bolt
Courtesy of FORD MOTOR CO.

67. Using the special tool, remove the crankshaft pulley.

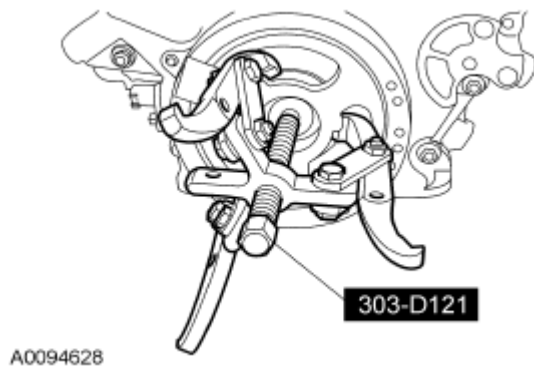


Fig. 279: Identifying Special Tools (303-D121) And Crankshaft Pulley
Courtesy of FORD MOTOR CO.

68. Using the special tool, remove and discard the crankshaft front seal.

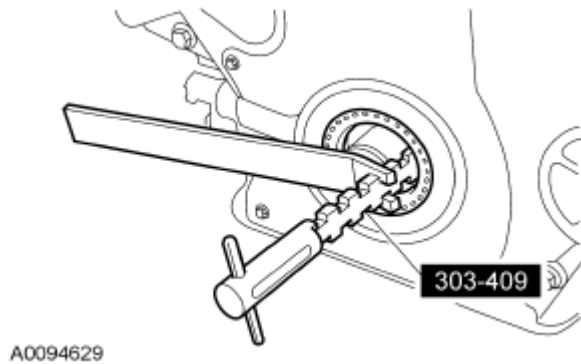
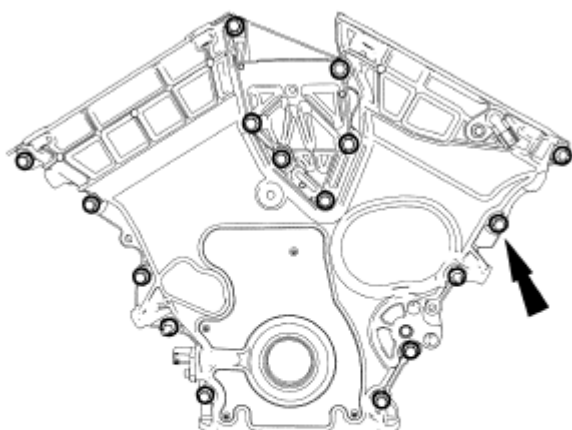


Fig. 280: Identifying Special Tools (303-409)
Courtesy of FORD MOTOR CO.

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.

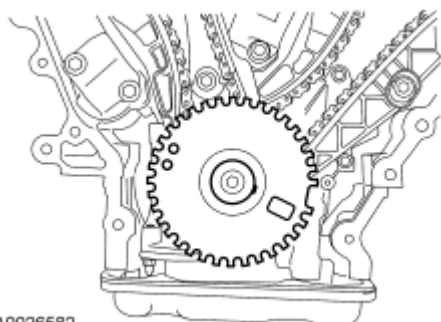
69. Remove the 16 bolts and the engine front cover.
- Discard the gaskets.



A0090759

Fig. 281: Locating Engine Front Cover Bolts
Courtesy of FORD MOTOR CO.

CAUTION: This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped "30" or "30RFF" (orange in color).



A0026582

Fig. 282: Identifying Ignition Pulse Wheel
Courtesy of FORD MOTOR CO.

70. Remove the ignition pulse wheel.
71. Install the crankshaft pulley bolt and washer.

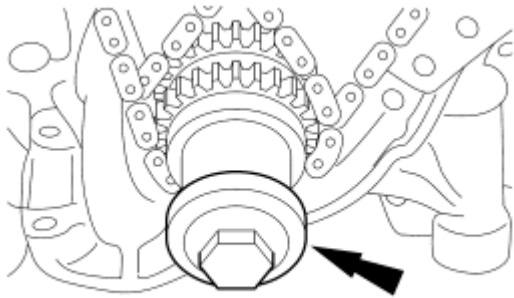


Fig. 283: Identifying Damper Bolt
Courtesy of FORD MOTOR CO.

CAUTION: Only use hand tools when removing or installing the spark plugs, damage can occur to the cylinder head or spark plug.

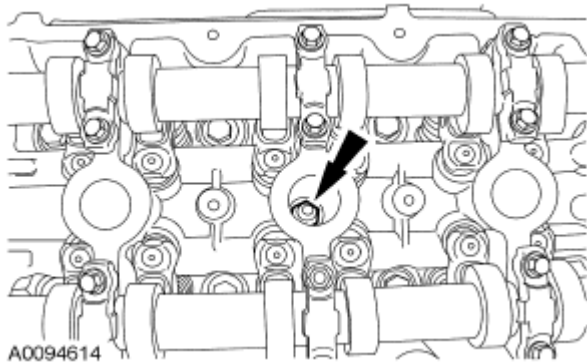
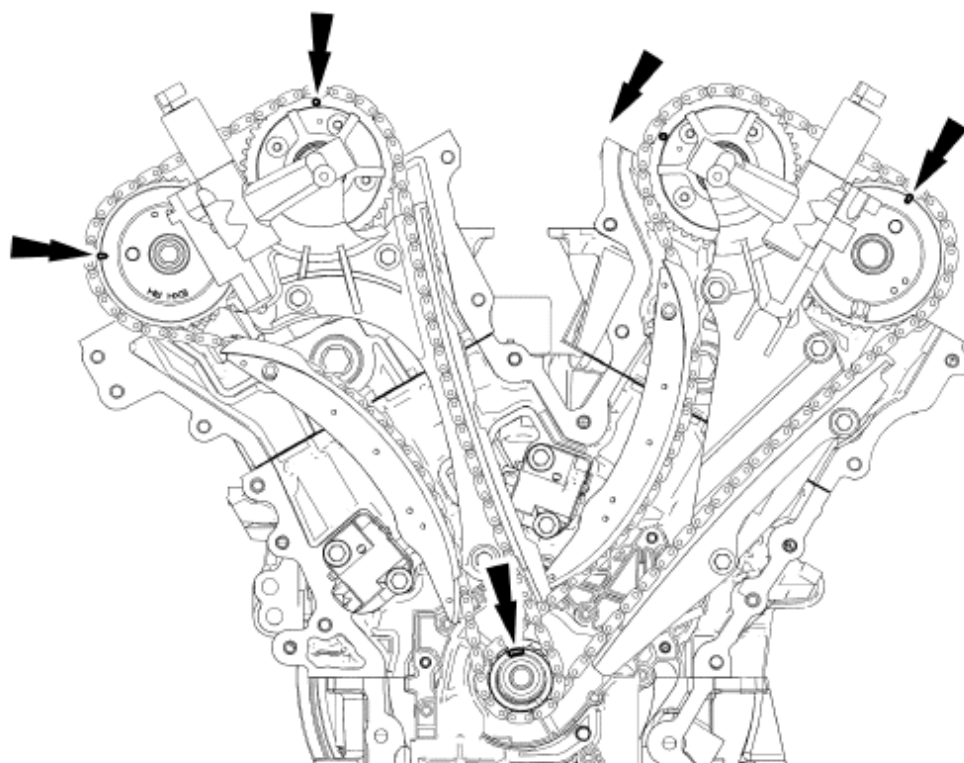


Fig. 284: Locating Spark Plugs
Courtesy of FORD MOTOR CO.

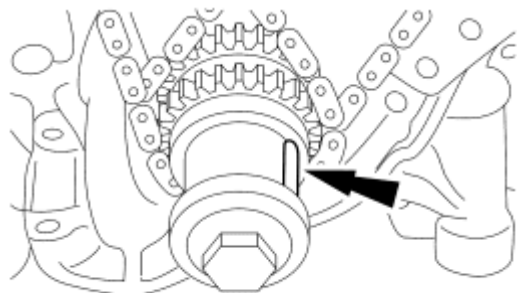
72. Remove the 6 spark plugs
73. Rotate the crankshaft clockwise to position the crankshaft keyway in the 11 o'clock position and position the camshafts in the correct position. This will position the No. 1 cylinder at top dead center (TDC).
 - Verify that the camshafts are correctly located. If not, rotate the crankshaft one additional turn and recheck.



N0042464

Fig. 285: Locating Keyways Position
Courtesy of FORD MOTOR CO.

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



A0011067

Fig. 286: Identifying Crankshaft Keyway
Courtesy of FORD MOTOR CO.

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

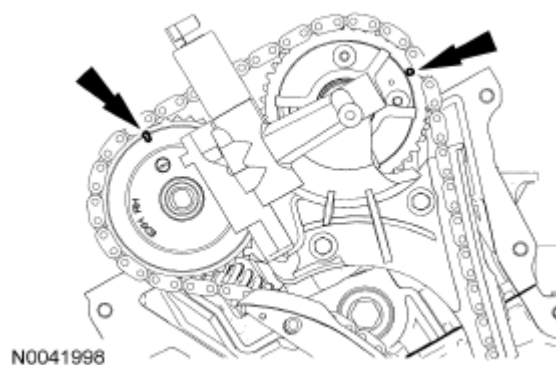


Fig. 287: Locating RH Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

76. Remove the RH timing chain tensioner arm.
1. Remove the bolts.
 2. Remove the tensioner.
 3. Remove the tensioner arm.

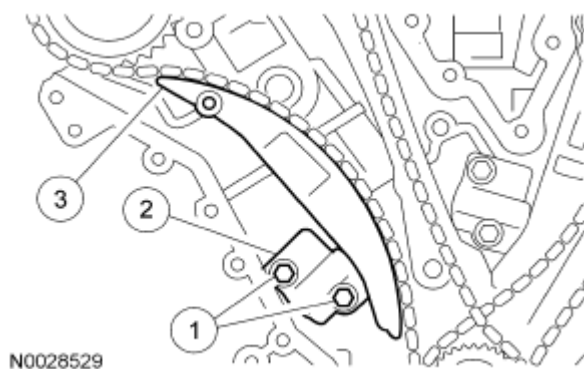


Fig. 288: Identifying Bolts, Tensioner And RH Timing Chain Tensioner Arm
Courtesy of FORD MOTOR CO.

77. Remove the RH timing chain.

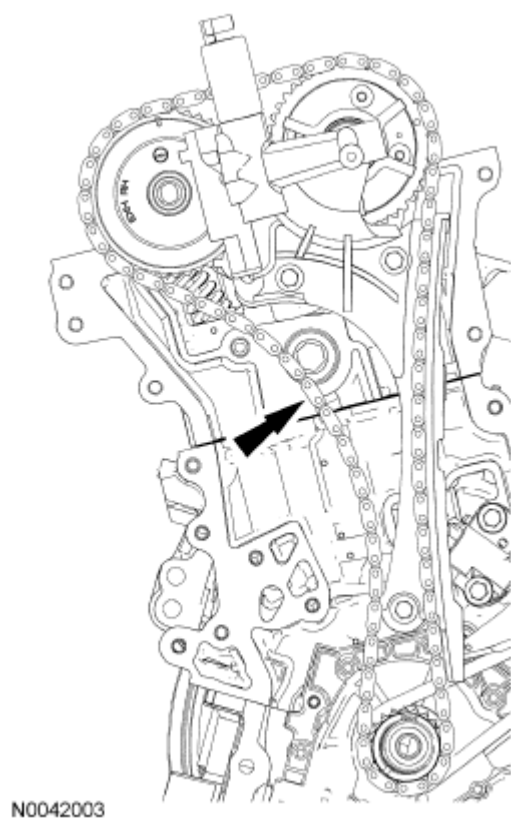


Fig. 289: Locating RH Timing Chain
Courtesy of FORD MOTOR CO.

78. Remove the 3 bolts and the RH VCT assembly.

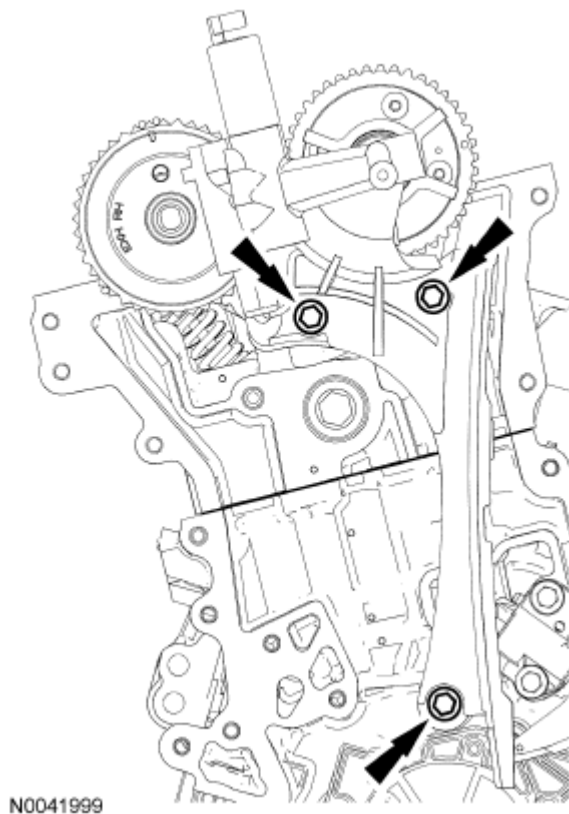


Fig. 290: Locating RH VCT Assembly Bolts
Courtesy of FORD MOTOR CO.

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

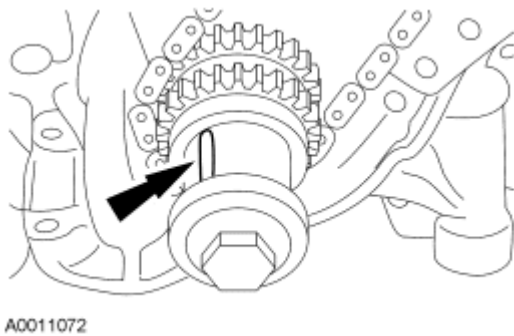


Fig. 291: Positioning Crankcase Key Way In 11 O'Clock Position
Courtesy of FORD MOTOR CO.

80. Verify the LH camshafts are in the NEUTRAL position.

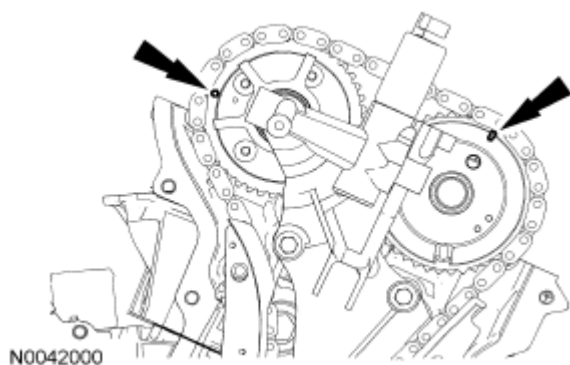


Fig. 292: Locating LH Camshafts Position In NEUTRAL Position
Courtesy of FORD MOTOR CO.

81. Remove the LH timing chain tensioner and tensioner arm.
1. Remove the bolts.
 2. Remove the tensioner.
 3. Remove the tensioner arm.

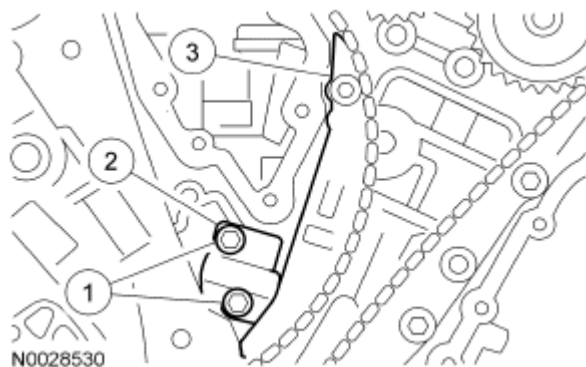
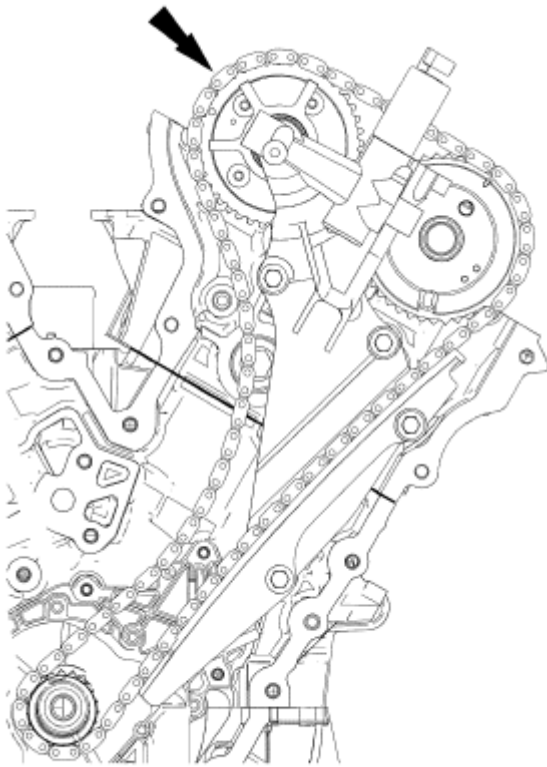


Fig. 293: Identifying Bolts, Tensioner, LH Tensioner Arm
Courtesy of FORD MOTOR CO.

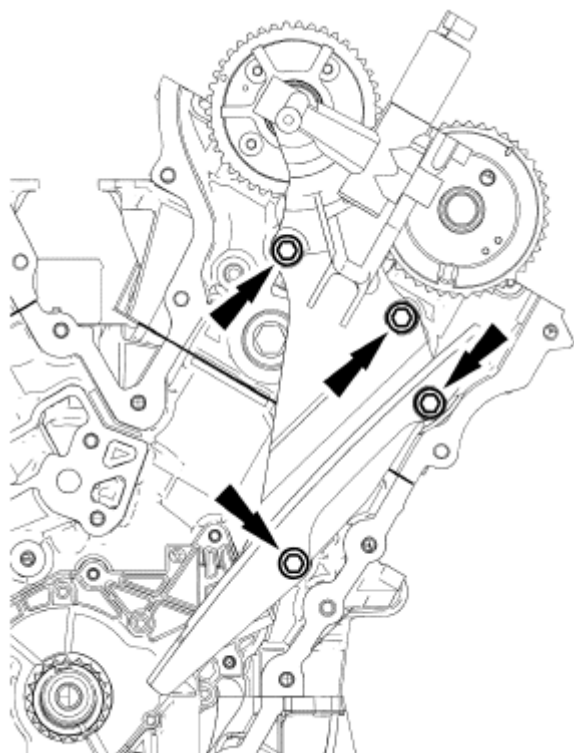
82. Remove the LH timing chain.



N0042001

Fig. 294: Locating LH Timing Chain
Courtesy of FORD MOTOR CO.

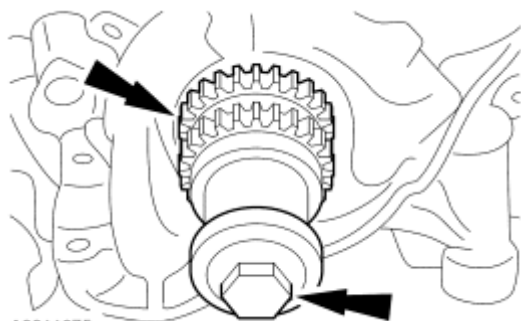
83. Remove the 4 bolts and the LH VCT assembly.



N0042002

Fig. 295: Locating LH VCT Assembly Bolts
Courtesy of FORD MOTOR CO.

84. Remove the pulley bolt, washer and the crankshaft sprocket.



A0011075

Fig. 296: Locating Damper Bolt & Crankshaft Sprockets
Courtesy of FORD MOTOR CO.

85. Remove the 4 bolts in the sequence shown.
- Remove the oil pump.

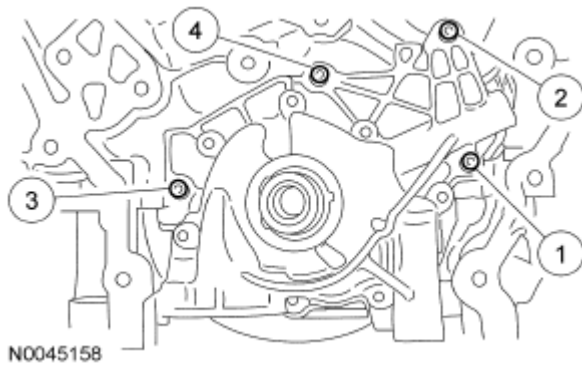


Fig. 297: Locating Removal Sequence Of Oil Pump Bolts
Courtesy of FORD MOTOR CO.

86. Remove the crankshaft key.

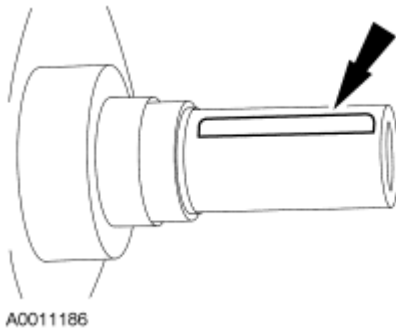


Fig. 298: Locating Crankshaft Key
Courtesy of FORD MOTOR CO.

CAUTION: To make sure of correct sealing, do not scratch the camshaft.

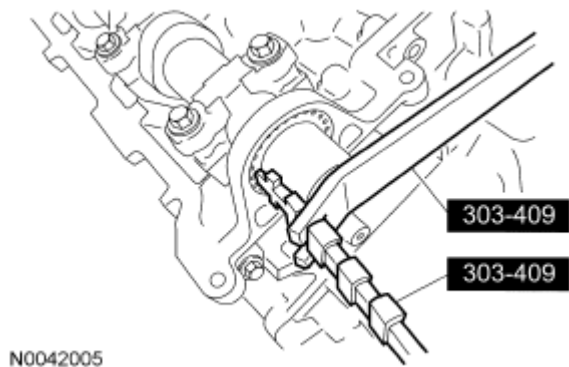


Fig. 299: Identifying Special Tools (303-409)
Courtesy of FORD MOTOR CO.

87. Using the special tools, remove the camshaft oil seal and discard.

88. Remove the 2 bolts and the camshaft oil seal retainer
- Discard the press-in-place gasket.

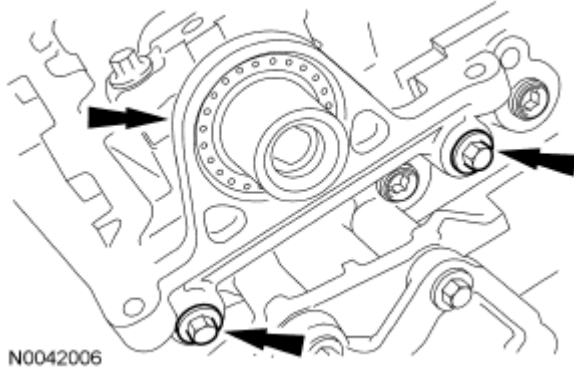


Fig. 300: Locating Camshaft Oil Seal Retainer And Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshafts must be in the neutral position before removing the bearing caps.

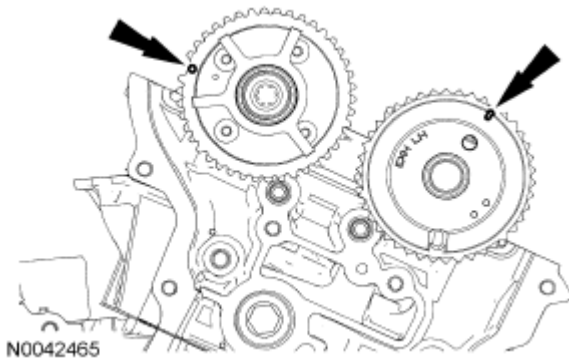


Fig. 301: Locating Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

89. Verify the camshafts are in the neutral position.

CAUTION: Do not allow the camshaft to rotate from the neutral position while removing the variable camshaft timing (VCT) actuator.

NOTE: Install a 3/8-inch ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for removal of the VCT actuator bolt.

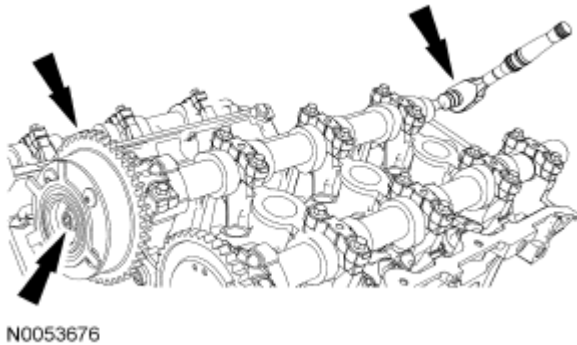


Fig. 302: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

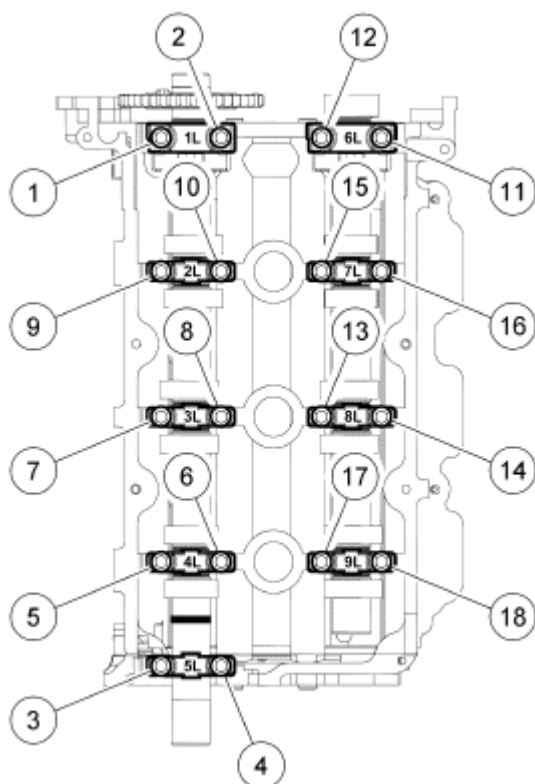
90. Remove the bolt and the VCT actuator.

CAUTION: Cylinder head camshaft bearing caps are numbered to verify that they are assembled in their original positions. If the numbers cannot be seen, mark the camshaft bearing caps prior to removing them.

CAUTION: After loosening all of the camshaft bearing cap bolts, remove the camshaft bearing thrust caps (1L and 6L) first, or damage to the thrust caps may occur.

91. Loosen the bolts evenly in the sequence shown.

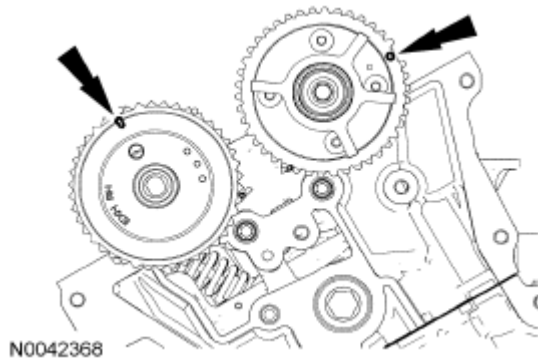
1. Remove the camshaft bearing thrust caps (1L and 6L).
2. Remove the remaining camshaft bearing caps.
3. Remove the camshafts from the cylinder head.



N0053679

Fig. 303: Identifying Loosening Sequence Of Camshaft Bearing Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshafts must be in the neutral position before removing the bearing caps.



N0042368

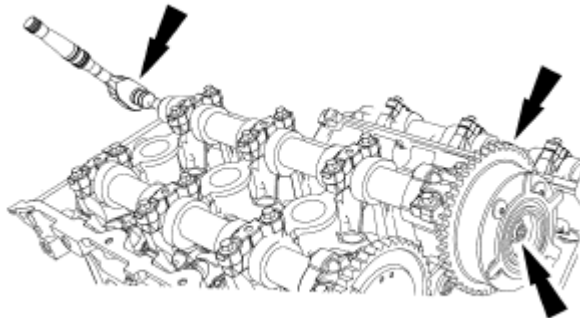
Fig. 304: Locating Camshafts In Neutral Position
Courtesy of FORD MOTOR CO.

92. Verify the camshafts are in the neutral position.

CAUTION: Do not allow the camshaft to rotate from the neutral position while

removing the variable camshaft timing (VCT) actuator.

NOTE: Install a 3/8-inch ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for removal of the VCT actuator bolt.



N0053675

Fig. 305: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

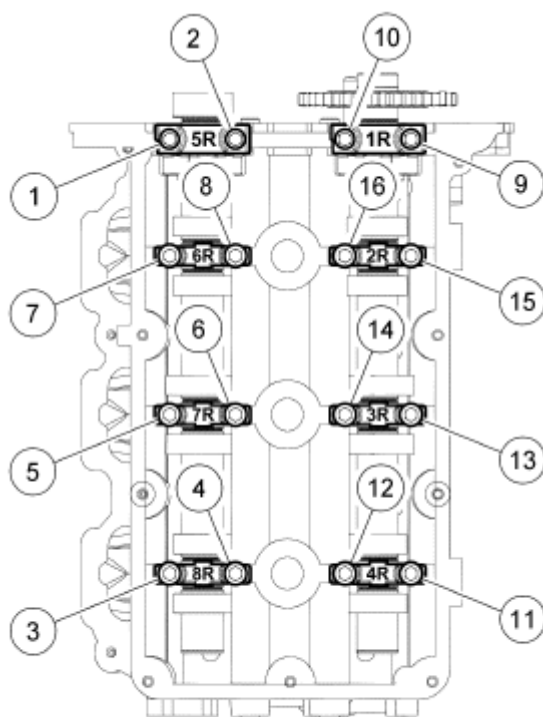
93. Remove the bolt and the VCT actuator.

CAUTION: Cylinder head camshaft bearing caps are numbered to verify that they are assembled in their original positions. If the numbers cannot be seen, mark the camshaft bearing caps prior to removing them.

CAUTION: After loosening all of the camshaft bearing cap bolts, remove the camshaft bearing thrust caps (5R and 1R) first, or damage to the thrust caps may occur.

94. Loosen the bolts evenly in the sequence shown.

1. Remove the camshaft bearing thrust caps (5R and 1R).
2. Remove the remaining camshaft bearing caps.
3. Remove the camshafts from the cylinder head.



N0053678

Fig. 306: Identifying Loosening Sequence Of Camshaft Bearing Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft roller followers must be installed in their original positions.

NOTE: RH shown, LH similar.

NOTE: Mark the location of the roller followers, using a permanent-type marker.

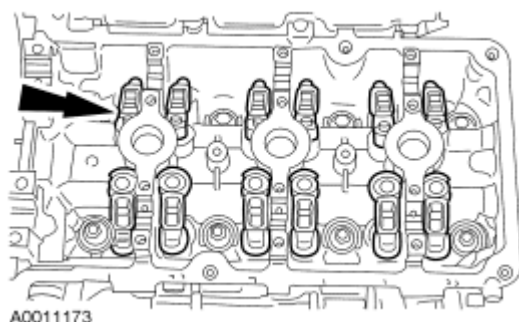


Fig. 307: Locating Camshaft Roller Followers
Courtesy of FORD MOTOR CO.

95. Remove the LH and RH camshaft roller followers.

NOTE: RH shown, LH similar.

96. Loosen the 8 bolts in the indicated sequence and remove the LH and RH cylinder heads.

- Discard the bolts and the gaskets.

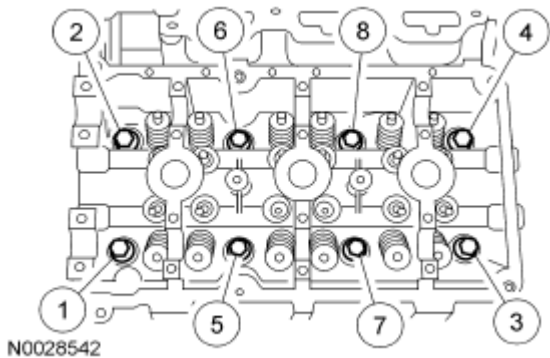


Fig. 308: Identifying Loosening Sequence Of Cylinder Heads Bolts
Courtesy of FORD MOTOR CO.

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 that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

CAUTION: Observe all warnings or cautions and follow all application directions contained on the packaging of the silicone gasket remover and the metal surface prep.

NOTE: If there is no residual gasket material present, metal surface prep can be used to clean and prepare the surfaces.

97. Clean the cylinder head-to-cylinder block mating surface of both the cylinder head and the cylinder block.

1. Remove any large deposits of silicone or gasket material with a plastic scraper.
2. Apply silicone gasket remover, following package directions, and allow to set for several minutes.
3. Remove the silicone gasket remover with a plastic scraper. A second application of silicone gasket remover may be required if residual traces of silicone or gasket material remain.
4. Apply metal surface prep, following package directions, to remove any traces of oil or coolant, and to prepare the surfaces to bond with the new gasket. Do not attempt to make the metal shiny. Some staining of the metal surfaces is normal.

98. Support the cylinder head on a bench with the head gasket side up.

NOTE: The straightedge used must be flat within 0.0051 mm (0.0002 in) per foot of

tool length.

99. Inspect all areas of the deck face with a straightedge and feeler gauge. The cylinder head must not have depressions deeper than 0.0254 mm (0.001 in) across a 38.1 mm (1.5 in) square area, or scratches more than 0.0254 mm (0.001 in).
100. Remove the bolts and the oil separator cover.
 - Discard the gasket.

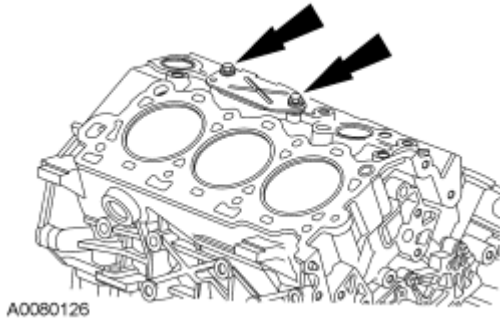
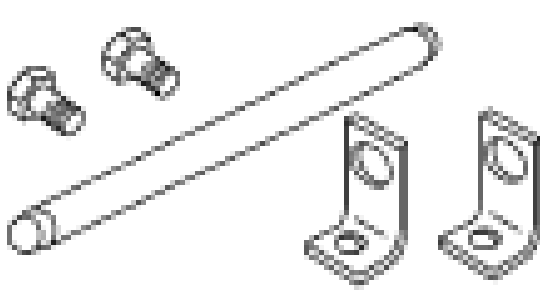


Fig. 309: Locating Oil Separator Cover Bolts
Courtesy of FORD MOTOR CO.

DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

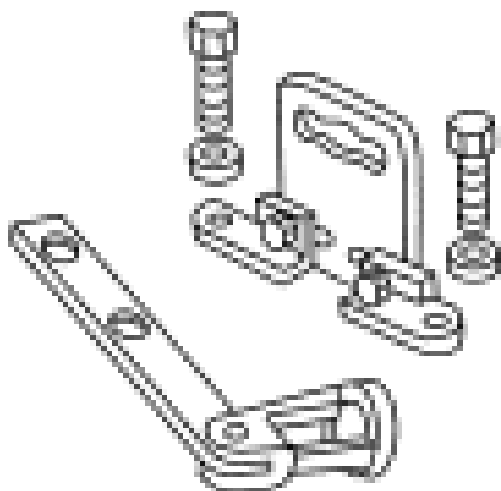
CYLINDER HEAD

SPECIAL TOOL(S)

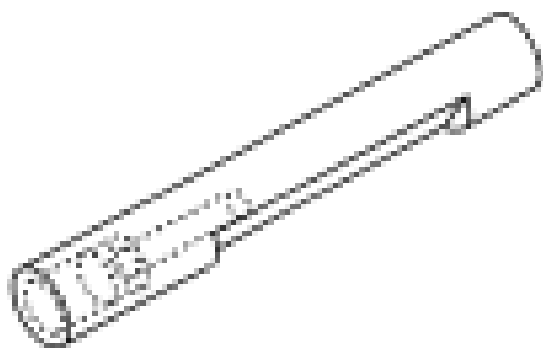
 ST1981-A	Compressor, Valve Spring 303-300 (T87C-6565-A)
	Compressor, Valve Spring 303-350 (T89P-6565-A)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1907-A

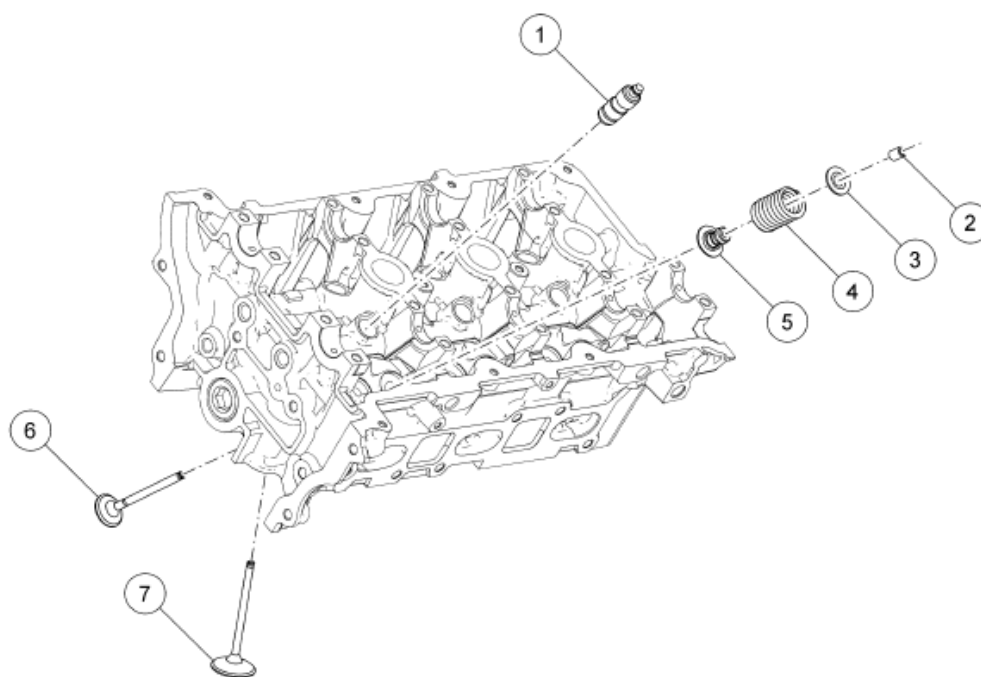


ST1906-A

Installer, Valve Stem Oil Seal
303-470 (T94P-6510-CH)

MATERIAL

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12 (Canada); or equivalent	WSS-M2C930-A



N0042008

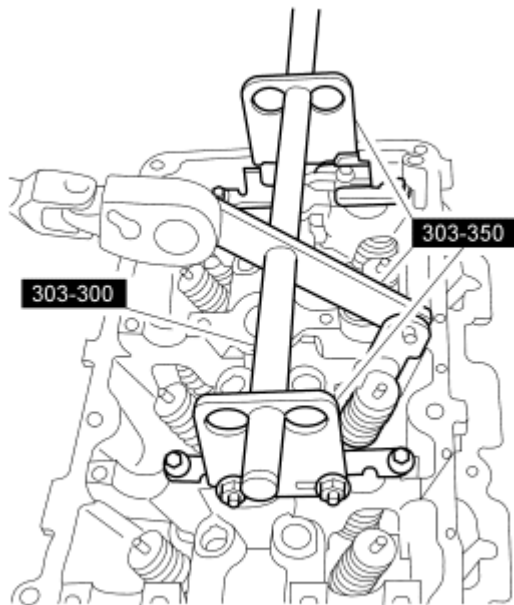
Item	Part Number	Description
1	6C501	Hydraulic lash adjuster (6 required)
2	6518	Valve spring retainer key (12 required)
3	6514	Valve spring retainer (6 required)
4	6513	Valve spring (6 required)
5	6A517	Valve stem seal (6 required)
6	6507	Exhaust valve (3 required)
7	6505	Intake valve (3 required)

Fig. 310: Identifying Cylinder Head Components
 Courtesy of FORD MOTOR CO.

Disassembly

CAUTION: If the components are to be reinstalled, they must be installed in the same positions. Mark the components removed for locations.

1. Remove the hydraulic lash adjusters.
2. Using the special tool, remove the keys, retainer and spring.



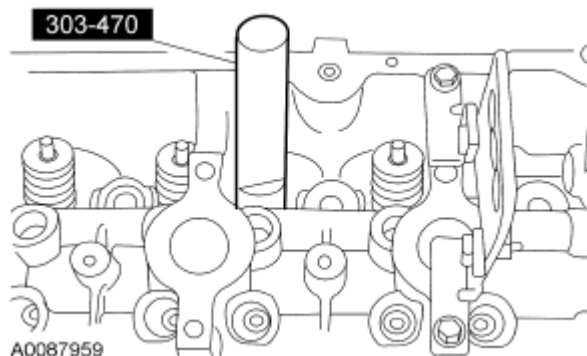
A0087958

Fig. 311: Identifying Special Tools (303-300 And 303-350)
Courtesy of FORD MOTOR CO.

3. Remove the valve from the cylinder head.
4. Remove the valve stem seal.

Assembly

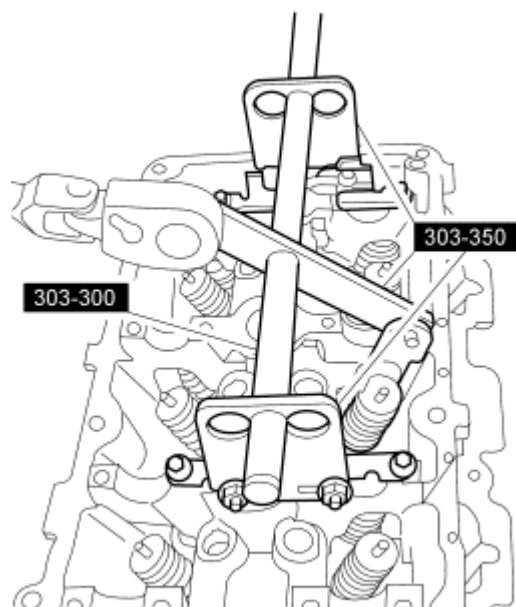
1. Using the special tool, install the valve stem seal.



A0087959

Fig. 312: Identifying Special Tools (303-470)
Courtesy of FORD MOTOR CO.

2. Install the valve.
3. Using the special tool, install the valve spring, retainer and key.



A0087958

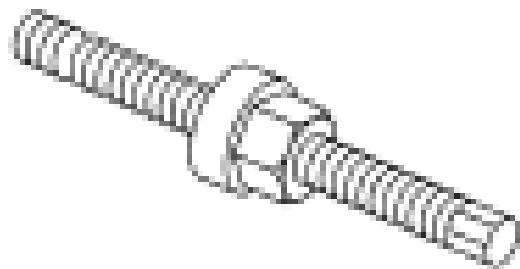
Fig. 313: Identifying Special Tools (303-300 And 303-350)
 Courtesy of FORD MOTOR CO.

4. Install the hydraulic lash adjusters.
 - Lubricate the hydraulic lash adjusters with clean engine oil.

ASSEMBLY

ENGINE

SPECIAL TOOL(S)

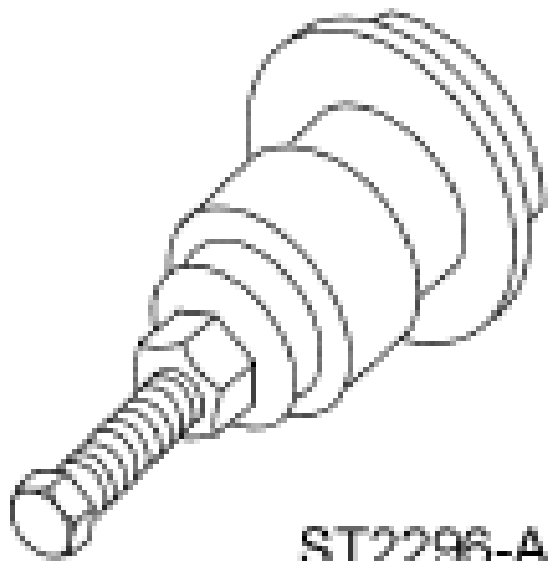


ST1287-A

Installer, Crankshaft Vibration Damper
 303-102 (T74P-6316-B)

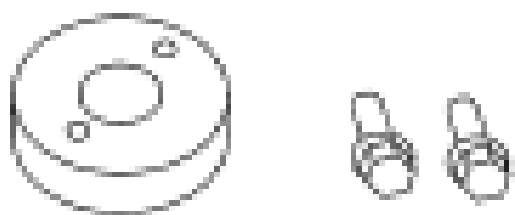
2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2296-A

Installer, Front Cover Oil Seal
303-335 (T88T-6701-A)



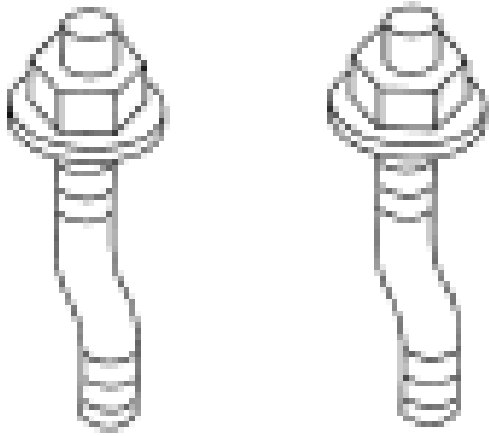
ST1327-A

Installer, Crankshaft Rear Main Oil Seal
303-178 (T82L-6701-A)

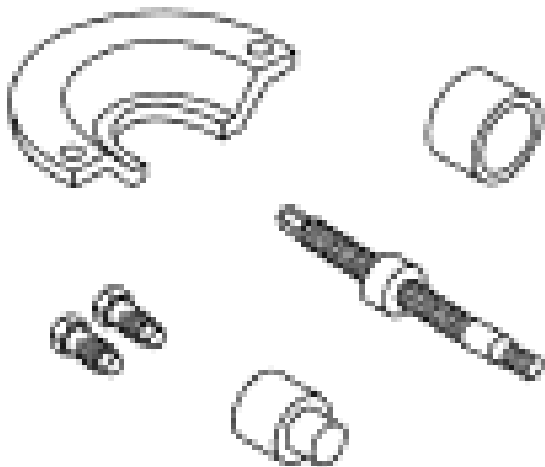
Installer Bolts, Crankshaft Rear Main Oil Seal
303-384 (T91P-6701-A)

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ST1333-A



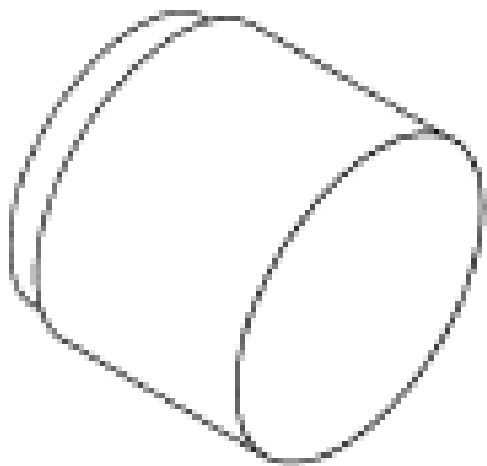
ST1971-A

Service Set, Water Pump Pulley
303-S455 (T94P-6312-AH)

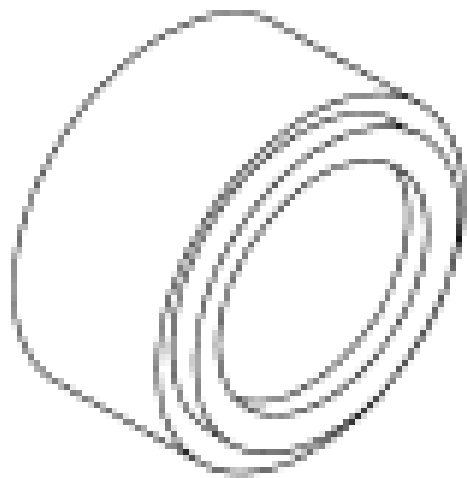
Protector, Camshaft Oil Seal
303-463 (T91P-6256-AH)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2060-A



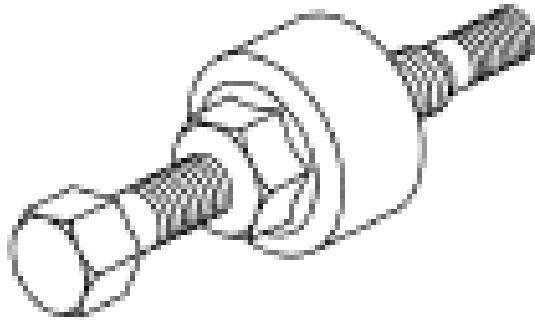
ST1979-A

Installer, Camshaft Oil Seal
303-464 (T94P-6256-BH)

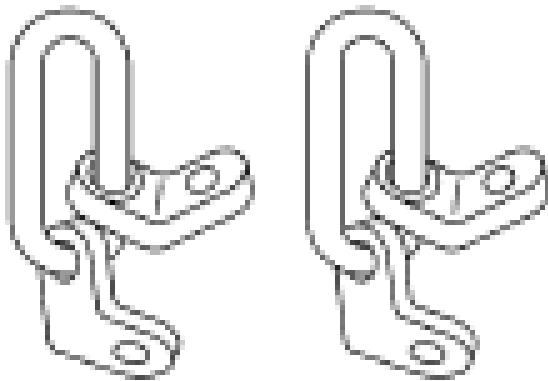
Installer, Power Steering Pump Pulley
211-185 (T91P-3A733-A)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1586-A



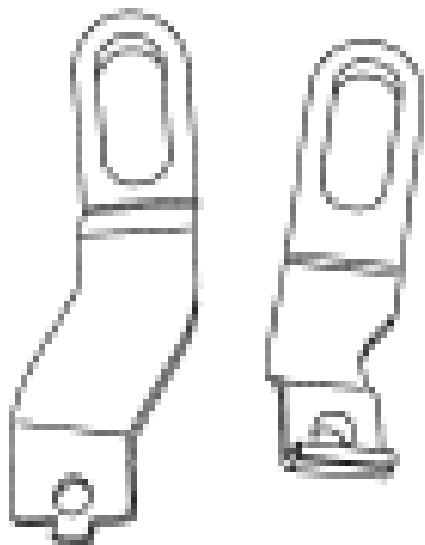
ST1595-A

Lifting Brackets, Engine
303-050 (T70P-6000)

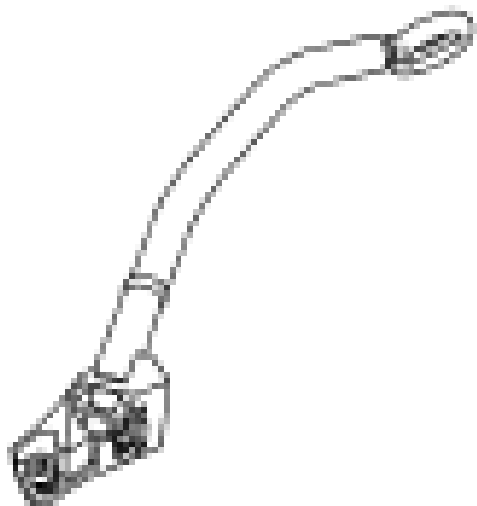
Lifting Brackets, Engine
134-00243 or equivalent

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2463-A



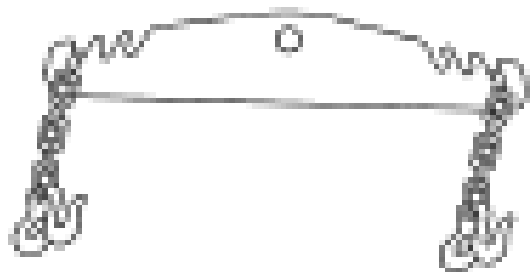
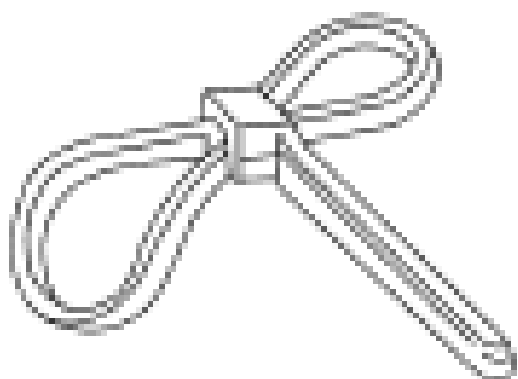
ST2873-A

Engine Lifting Bracket Set
303-1140

Spreader Bar
303-D089 (D93P-6001-A3) or equivalent

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2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

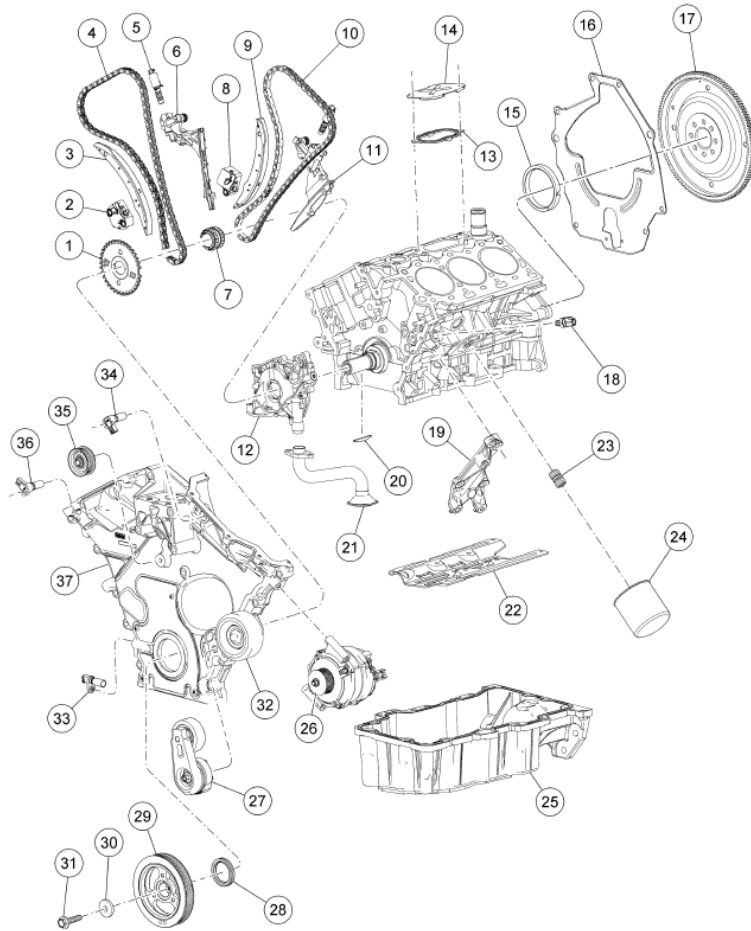
**ST1602-A****ST1438-A**Strap Wrench
303-D055 (D85L-6000-A)**MATERIAL**

Item	Specification
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (in Canada Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12) or equivalent	WSS-M2C930-A
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Silicone Brake Caliper Grease and Dielectric Compound XG-3-A	ESE-M1C171-A
Thread Sealant with PTFE TA-24	WSK-M2G350-A2
Motorcraft Premium Gold Engine Coolant VC-7-A	WSS-M97B51-A1

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

(in California, Oregon and New Mexico VC-7-B, in Canada CVC-7-A) or equivalent (yellow color)



N0045084

Item	Part Number	Description
1	12A227	Ignition pulse wheel
2	6L266	RH timing chain tensioner
3	6K255	RH timing chain tensioner arm
4	6268	RH timing chain
5	6M280	Oil control valve
6	6C260	RH variable camshaft timing (VCT) assembly
7	6306	Crankshaft sprocket
8	6L266	LH timing chain tensioner
9	6K255	LH timing chain tensioner arm
10	6268	LH timing chain
11	6C261	LH VCT assembly
12	6621	Oil pump
13	6B752	Oil separator gasket
14	6869	Cover
15	6701	Crankshaft rear oil seal
16	6A373	Spacer plate
17	6K375	Flexplate
18	9278	Oil pressure sender
19	19N586	A/C compressor bracket

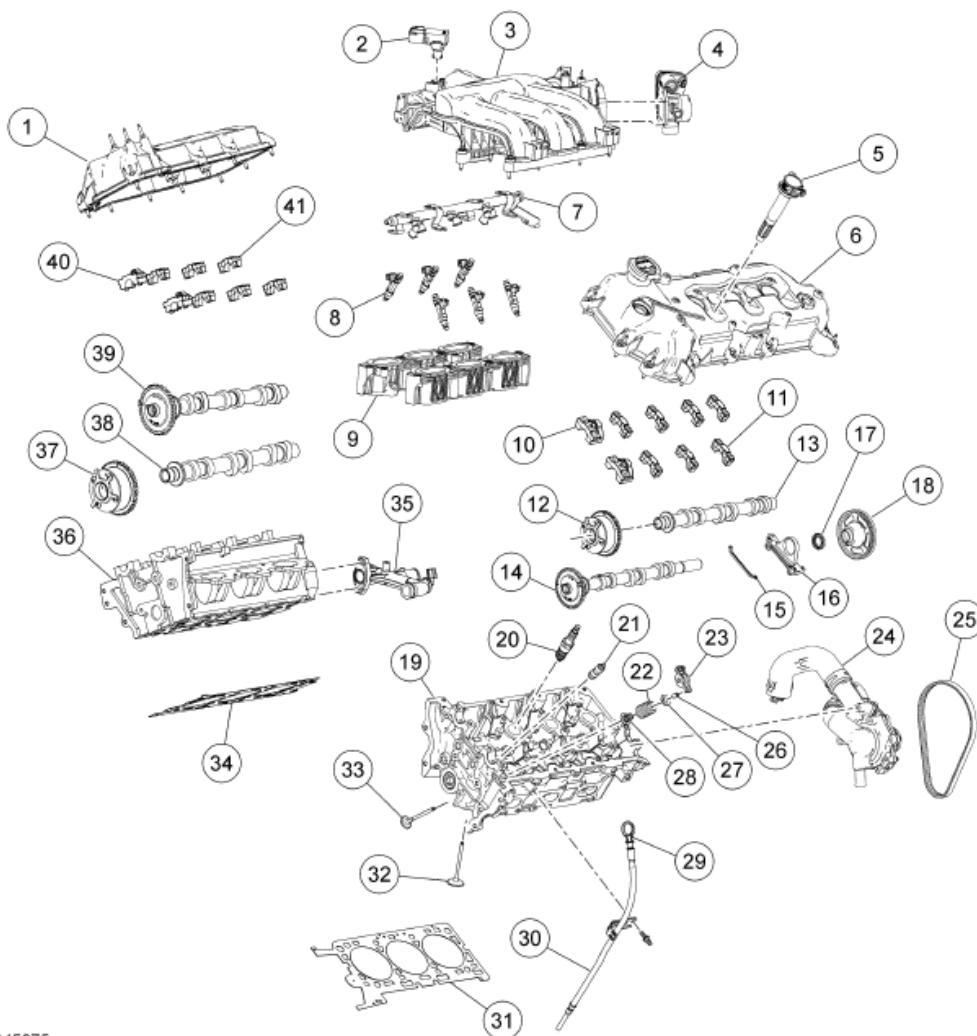
Item	Part Number	Description
20	W705934	Woodruff key
21	6622	Oil pickup tube and screen
22	6687	Oil pan baffle
23	6890	Oil filter adapter
24	6714	Oil filter
25	6675	Oil pan
26	10300	Generator
27	6B209	Accessory drive belt tensioner
28	6700	Crankshaft front seal
29	6316	Crankshaft pulley
30	N806165	Crankshaft pulley washer
31	W701512	Crankshaft pulley bolt
32	19A216	Accessory drive belt idler (non-grooved)
33	6C315	Crankshaft position (CKP) sensor
34	6B288	Camshaft position (CMP) sensor
35	19A216	Accessory drive belt idler pulley (grooved)
36	6B288	CMP sensor
37	6019	Front cover

Fig. 314: Identifying Engine Components (Items 1-37)

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

Courtesy of FORD MOTOR CO.



N0045075

Item	Part Number	Description
1	6582	RH valve cover
2	9F479	Mass air flow (MAF) sensor
3	9424	Upper intake manifold
4	9F991	Throttle body
5	12A375	Coil-on-plug (6 required)
6	6A505	LH valve cover
7	9F792	Fuel rail
8	9F543	Fuel injector (6 required)
9	9K461	Lower intake manifold

Item	Part Number	Description
10	6B280	Camshaft thrust bearing cap
11	6B280	Camshaft bearing cap
12	6C524	VCT actuator
13	6A267	LH intake camshaft
14	6A269	LH exhaust camshaft
15	6B295	Camshaft oil seal retainer gasket
16	6B293	Camshaft oil seal retainer
17	—	Camshaft oil seal
18	6A359	Coolant pump drive pulley

Fig. 315: Identifying Engine Components (Items 1-18)

Courtesy of FORD MOTOR CO.

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr

Item	Part Number	Description
19	6050	LH cylinder head
20	12405	Spark plug
21	6C501	Hydraulic lash adjuster
22	6513	Valve spring
23	6529	Camshaft roller follower
24	8501	Coolant pump
25	8K543	Coolant pump belt
26	6518	Valve spring retainer key
27	6514	Valve spring retainer
28	6A517	Valve stem seal
29	—	Oil level indicator
30	6754	Oil level indicator tube
31	6083	LH cylinder head gasket
32	6507	Intake valve
33	6505	Exhaust valve
34	6051	RH cylinder head gasket
35	8548	Coolant bypass tube
36	6050	RH cylinder head
37	6C254	VCT actuator
38	6A266	RH intake camshaft
39	6A268	RH exhaust camshaft
40	6B280	Camshaft thrust bearing cap
41	6A258	Camshaft bearing cap

Fig. 316: Part Description Chart (Items 19-41)

Courtesy of FORD MOTOR CO.

CAUTION: During engine repair procedures, cleanliness is extremely important. Any foreign material, including any material created while cleaning gasket surfaces that enters the oil passages, coolant passages or the oil pan, can cause engine failure.

CAUTION: If the oil pan was removed during engine disassembly, it must be installed after the engine and transaxle are assembled and the transaxle-to-engine bolts are installed. Failure to follow this assembly sequence can result in engine oil leaks.

1. Install the oil separator cover, a new gasket and the bolts.
 - Tighten to 10 Nm (89 lb-in).

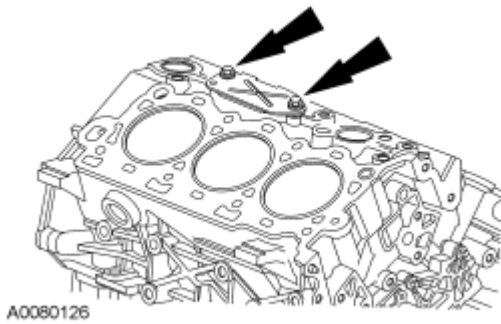


Fig. 317: Locating Oil Separator Cover Bolts
Courtesy of FORD MOTOR CO.

NOTE: RH shown, LH similar.

2. Position the new gaskets and the LH and RH cylinder heads. Install new bolts and tighten in the sequence shown in 6 stages:
 - Stage 1: Tighten to 40 Nm (30 lb-ft).
 - Stage 2: Tighten to 90 Nm (66 lb-ft).
 - Stage 3: Loosen one full turn.
 - Stage 4: Tighten to 40 Nm (30 lb-ft).
 - Stage 5: Tighten 90 degrees.
 - Stage 6: Tighten 90 degrees.

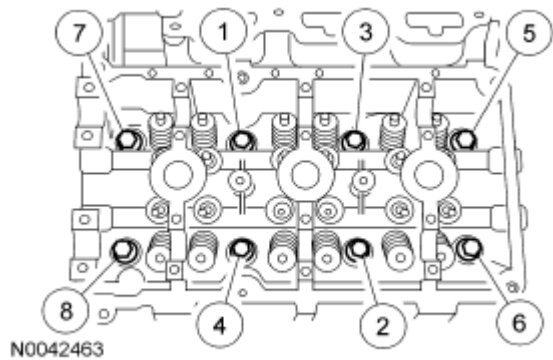


Fig. 318: Identifying Tightening Sequence Of Cylinder Heads Bolts
Courtesy of FORD MOTOR CO.

3. Position the oil pump and install the 4 bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

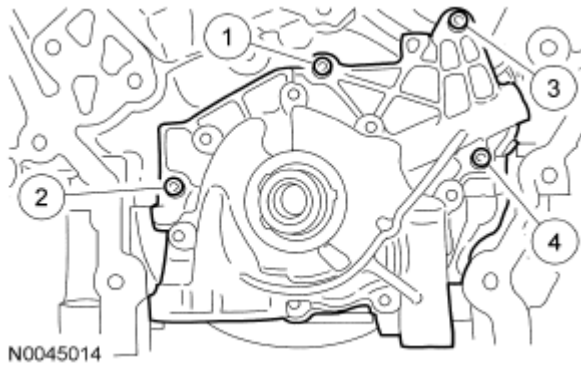


Fig. 319: Locating Tightening Sequence Of Oil Pump Bolts
Courtesy of FORD MOTOR CO.

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

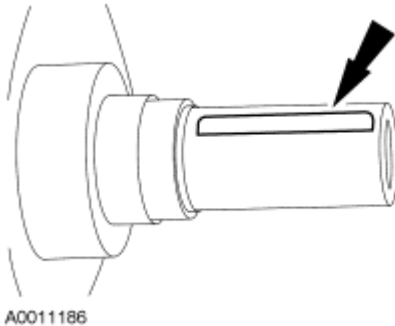


Fig. 320: Locating Crankshaft Key
Courtesy of FORD MOTOR CO.

5. Install the crankshaft pulley bolt and washer and rotate the crankshaft keyway to the 11 o'clock position to locate top dead center (TDC).

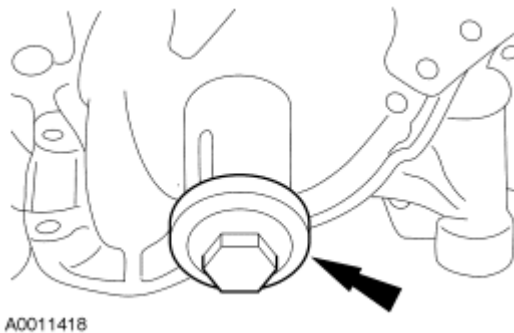


Fig. 321: Locating Crankshaft Damper Bolt
Courtesy of FORD MOTOR CO.

6. Apply clean engine oil to the LH and RH camshaft roller followers.

CAUTION: The camshaft roller followers must be installed in their original positions.

NOTE: RH shown, LH similar.

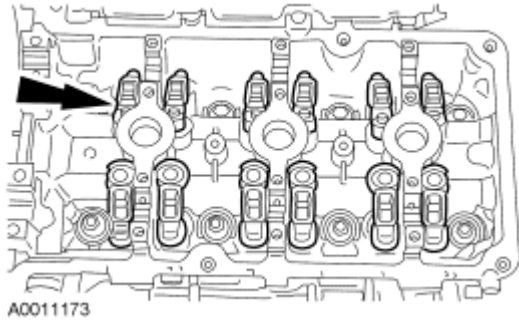


Fig. 322: Locating Camshaft Roller Followers
Courtesy of FORD MOTOR CO.

7. Install the LH and RH camshaft roller followers.
8. Position the variable camshaft timing (VCT) actuators onto the intake camshafts.
 - Install the bolts finger-tight.

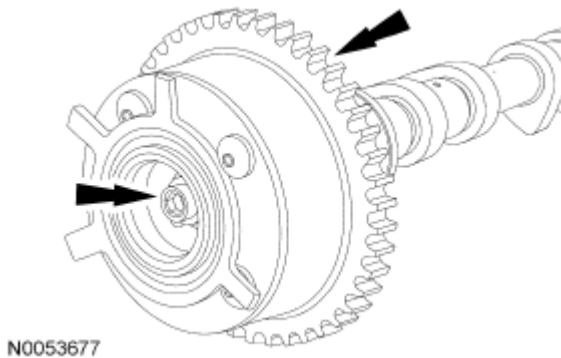


Fig. 323: Locating Variable Camshaft Timing Actuators Onto Intake Camshafts
Courtesy of FORD MOTOR CO.

9. Lubricate the RH camshafts with clean engine oil and carefully position the camshafts onto the cylinder head.
 - Align the RH camshafts as shown.

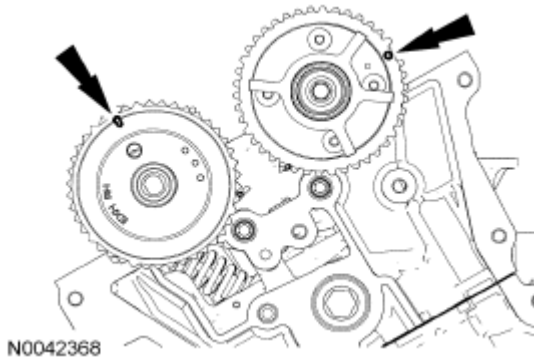


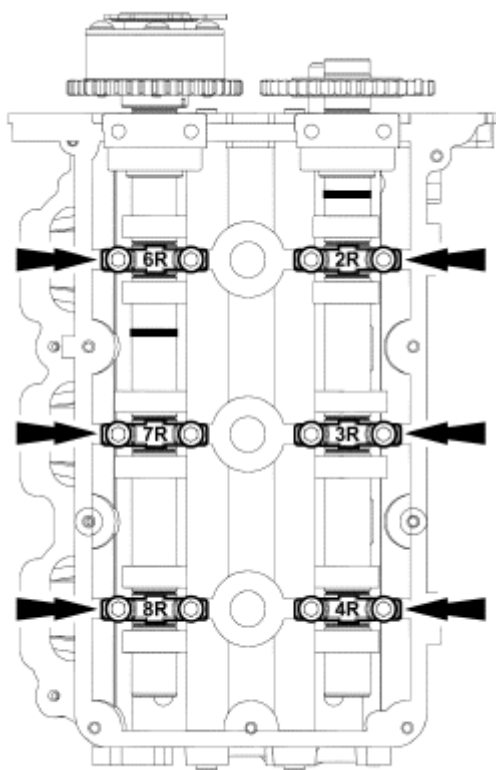
Fig. 324: Aligning RH Camshafts
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft caps must be installed in their original positions or damage to the engine may occur.

CAUTION: Do not install the camshaft bearing thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur.

NOTE: Lubricate the bearing surfaces of the camshaft bearing caps with clean engine oil.

10. Install the RH camshaft bearing caps.
 - Loosely install the bolts.

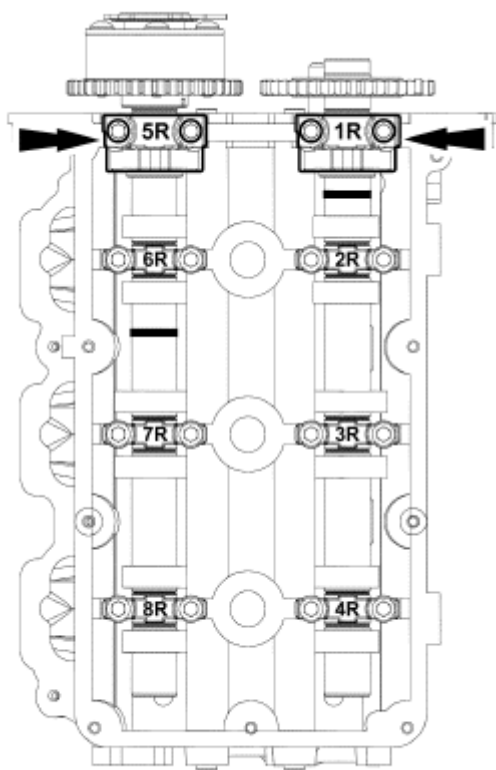


N0042369

Fig. 325: Locating RH Camshaft Bearing Caps
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the bearing surfaces of the camshaft bearing thrust caps with clean engine oil.

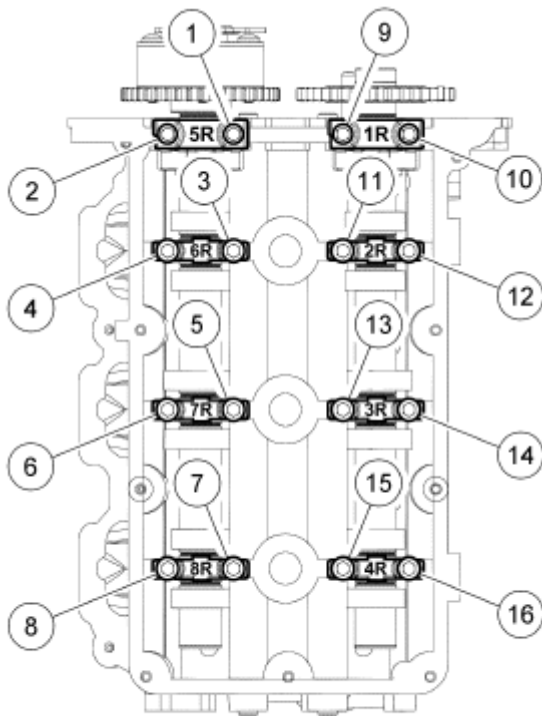
11. Install the RH camshaft bearing thrust caps.
 - Loosely install the bolts.



N0042453

Fig. 326: Locating RH Camshaft Bearing Thrust Caps
Courtesy of FORD MOTOR CO.

12. Tighten the RH camshaft bearing cap bolts in the sequence shown to 10 Nm (89 lb-in).

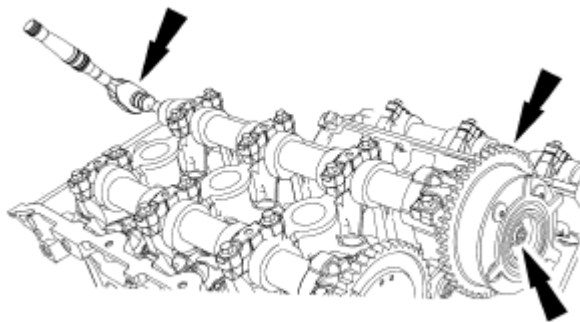


N0042011

Fig. 327: Locating Tightening Sequence Of RH Camshaft Bearing Cap Bolts
Courtesy of FORD MOTOR CO.

CAUTION: Do not allow the camshaft to rotate from the neutral position while removing the VCT actuator.

NOTE: Install a 3/8-inch ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for tightening of the VCT actuator bolt.



N0053675

Fig. 328: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

13. Tighten the RH VCT actuator bolt to 40 Nm (30 lb-ft) plus an additional 90 degrees.
14. Lubricate the LH camshafts with clean engine oil and carefully position the camshafts into the cylinder head.
 - Align the LH camshafts as shown.

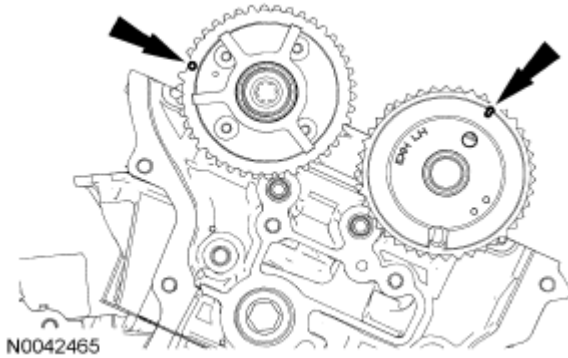


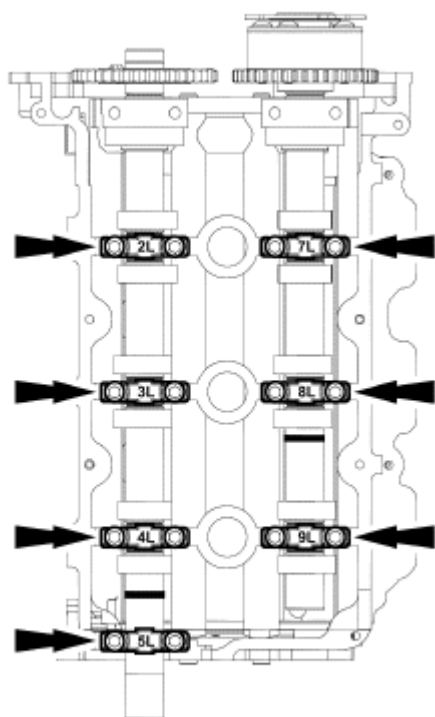
Fig. 329: Aligning LH Camshafts
Courtesy of FORD MOTOR CO.

CAUTION: The camshaft caps must be installed in their original positions or damage to the engine may occur.

CAUTION: Do not install the camshaft bearing thrust caps until all of the camshaft bearing caps have been installed, or damage to the thrust caps may occur.

NOTE: Lubricate the bearing surfaces of the camshaft bearing caps with clean engine oil.

15. Install the LH camshaft bearing caps.
 - Loosely install the bolts.

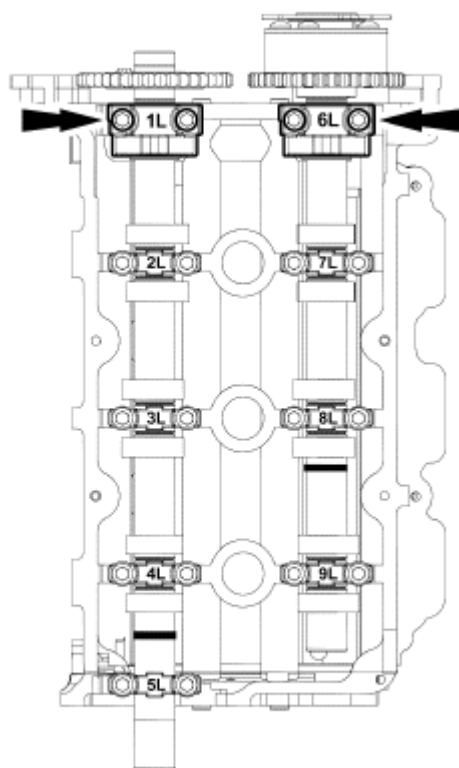


N0042454

Fig. 330: Locating LH Camshaft Bearing Caps
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the bearing surfaces of the camshaft bearing thrust caps with clean engine oil.

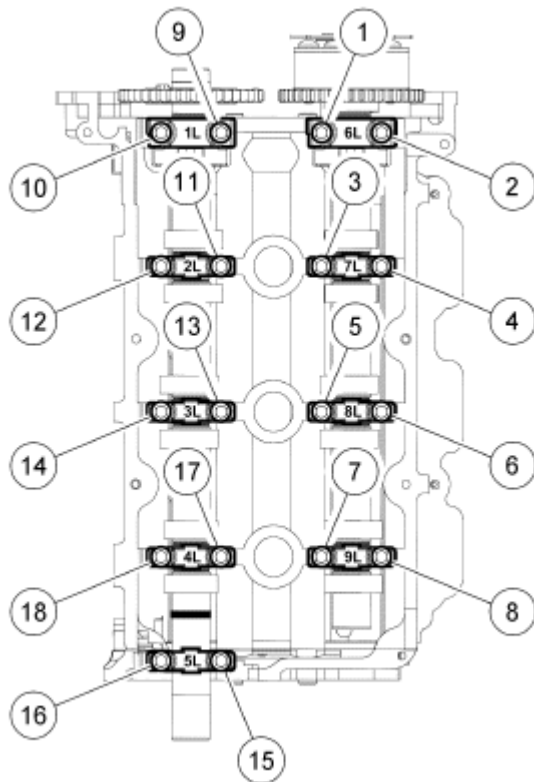
16. Install the LH camshaft bearing thrust caps.
 - Loosely install the bolts.



N0042455

Fig. 331: Locating LH Camshaft Bearing Thrust Caps
Courtesy of FORD MOTOR CO.

17. Tighten the LH camshaft bearing cap bolts in the sequence shown to 10 Nm (89 lb-in).

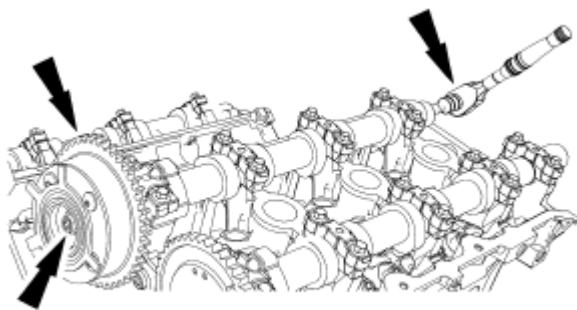


N0042010

Fig. 332: Locating Tightening Sequence Of LH Camshaft Bearing Cap Bolts
Courtesy of FORD MOTOR CO.

CAUTION: Do not allow the camshaft to rotate from the neutral position while tightening VCT actuator bolt.

NOTE: Install a 3/8-inch ratchet and extension into the D-slot on the rear of the intake camshaft to hold the camshaft in place for tightening of the VCT actuator bolt.



N0053676

Fig. 333: Locating VCT Actuator And Bolt
Courtesy of FORD MOTOR CO.

18. Tighten the LH VCT actuator bolt to 40 Nm (30 lb-ft) plus an additional 90 degrees.

NOTE: Clean the sealing surface with metal surface cleaner before installing a new press-in-place gasket.

19. Install the camshaft oil seal retainer and the 2 bolts.
- Tighten to 10 Nm (89 lb-in).

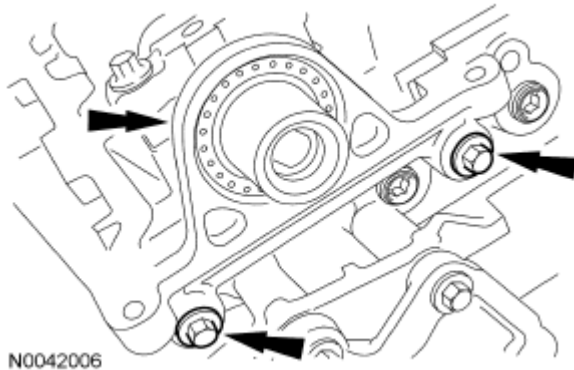


Fig. 334: Locating Camshaft Oil Seal Retainer And Bolts
Courtesy of FORD MOTOR CO.

NOTE: Apply clean engine oil to the seal lip and seal bore before installing the seal.

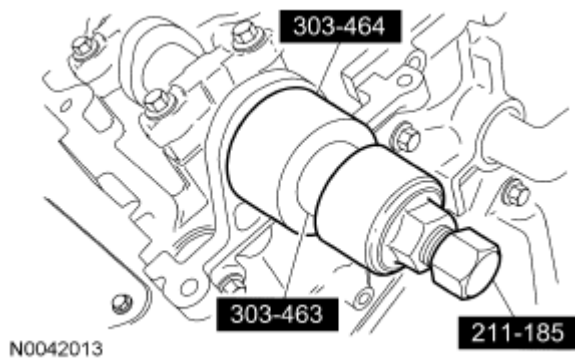
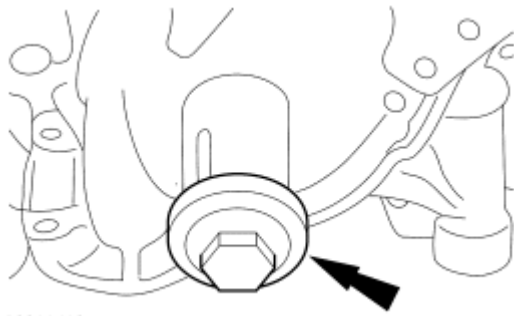


Fig. 335: Identifying Special Tools (303-463, 303-464 And 211-185)
Courtesy of FORD MOTOR CO.

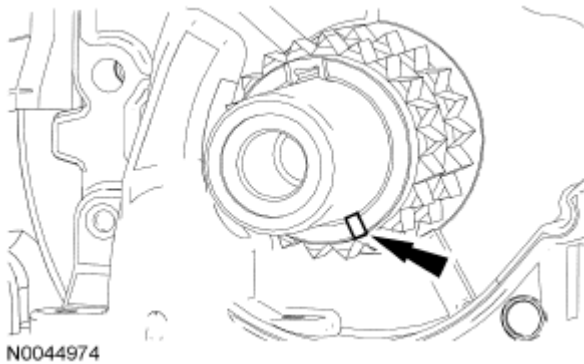
20. Using the special tools, install a new camshaft oil seal.
21. Remove the crankshaft pulley bolt and washer.



A0011418

Fig. 336: Locating Crankshaft Damper Bolt
Courtesy of FORD MOTOR CO.

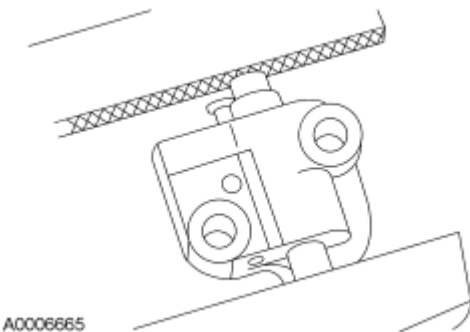
22. Install the crankshaft sprockets with the timing marks out.



N0044974

Fig. 337: Locating Marks On Crankshaft Sprockets
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.



A0006665

Fig. 338: Identifying Chain Tensioner In Soft-Jawed Vise
Courtesy of FORD MOTOR CO.

23. Position the chain tensioner in a soft-jawed vise.

NOTE: LH shown, RH similar.

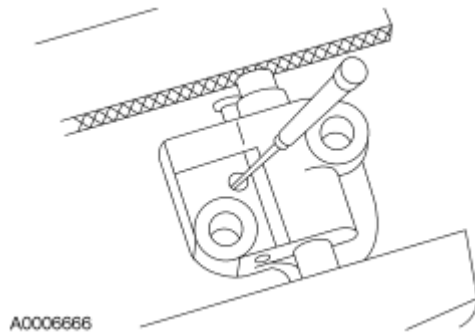


Fig. 339: Holding Chain Tensioner Ratchet Lock Mechanism Away From Ratchet Stem
Courtesy of FORD MOTOR CO.

24. Hold the chain tensioner ratchet lock mechanism away from the ratchet stem with a small pick.

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.

25. Slowly compress the timing chain tensioner.
26. Retain the tensioner piston with a 1.5 mm (0.05 in) wire or paper clip.

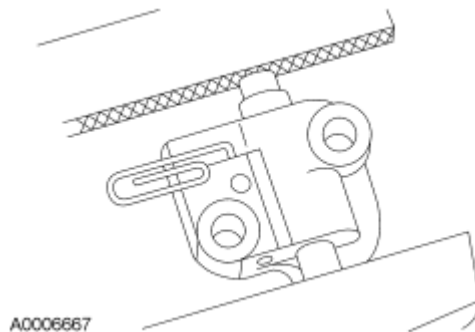


Fig. 340: Retaining Tensioner Piston With 1.5-mm (0.06-in) Wire Or Paper Clip
Courtesy of FORD MOTOR CO.

27. 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.
 1. Mark any link to use as the crankshaft timing mark.
 2. Starting with the crankshaft timing mark, count counterclockwise 29 links and mark the link.
 3. Continue counting counterclockwise to link 42 and mark the link.

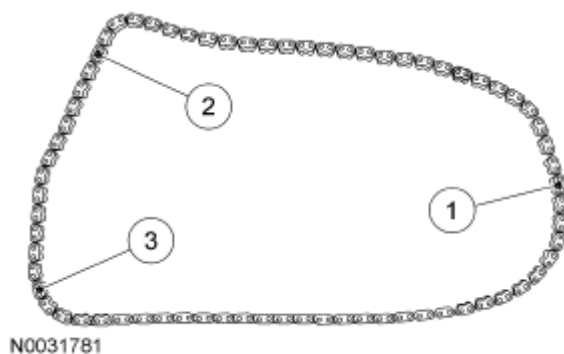


Fig. 341: Identifying Marking On Chains
Courtesy of FORD MOTOR CO.

28. Verify that the LH camshafts are correctly positioned.

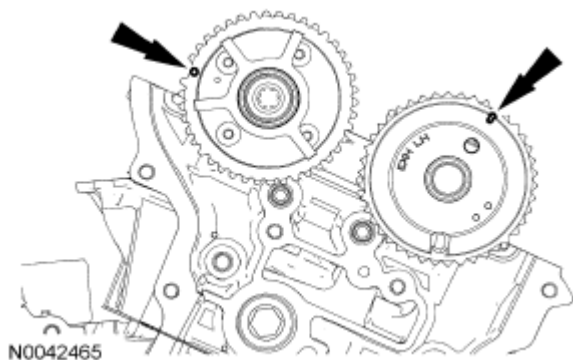
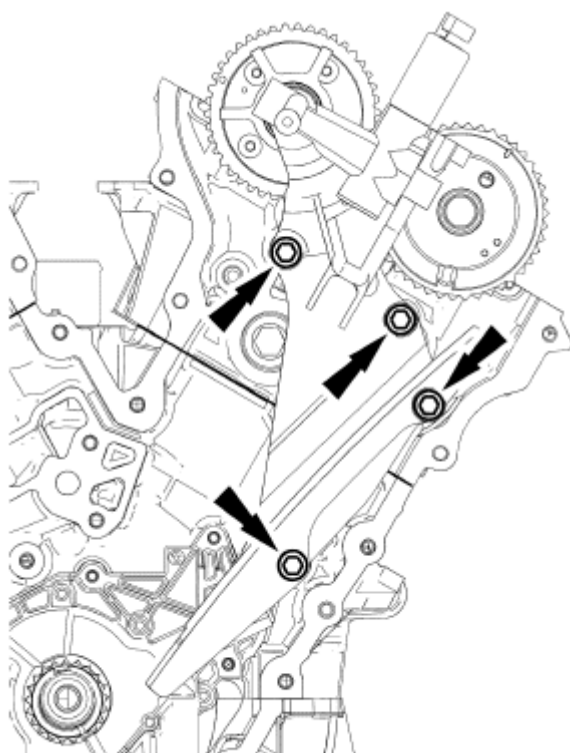


Fig. 342: Locating LH Camshafts Position
Courtesy of FORD MOTOR CO.

29. Install the variable camshaft timing (VCT) assembly and the 4 bolts.
- Tighten to 25 Nm (18 lb-ft).



N0042002

Fig. 343: Locating Variable Camshaft Timing (VCT) Assembly Bolts
Courtesy of FORD MOTOR CO.

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

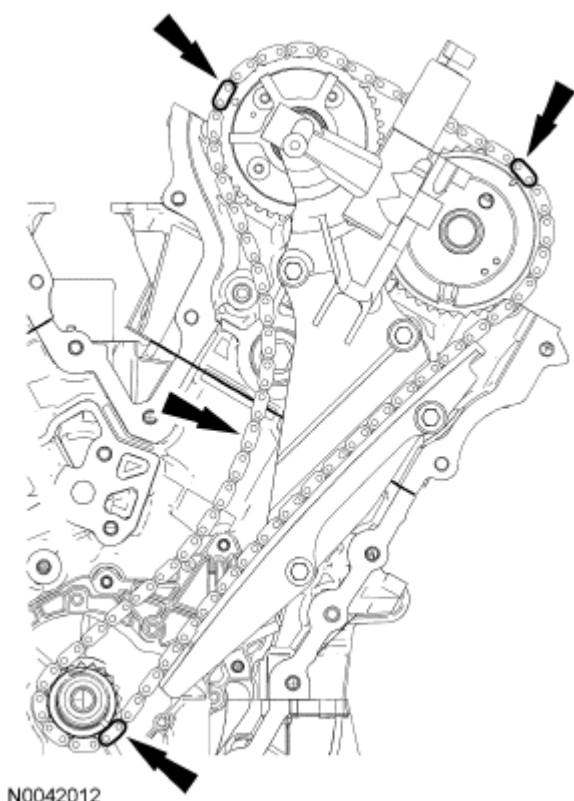


Fig. 344: Aligning Marks On Timing Chain With Marks On Camshaft And Crankshaft Sprockets

Courtesy of FORD MOTOR CO.

31. Install the LH timing chain tensioner arm and the LH timing chain tensioner.
 1. Install the tensioner arm.
 2. Position the tensioner.
 3. Install the 2 bolts.
 - Tighten to 25 Nm (18 lb-ft).

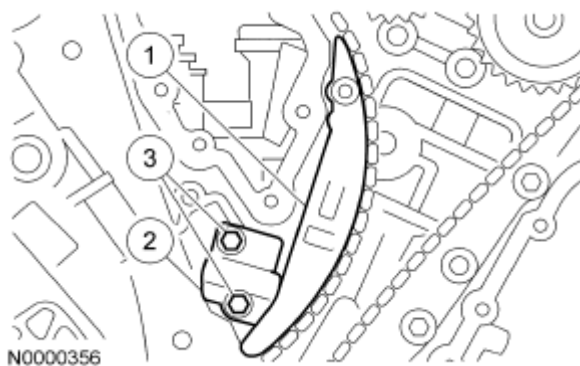


Fig. 345: Identifying LH Tensioner Arm, Tensioner And Bolts

Courtesy of FORD MOTOR CO.

32. Install the crankshaft pulley bolt and washer and rotate the crankshaft clockwise 120 degrees until the crankshaft key way is in the 3 o'clock position.

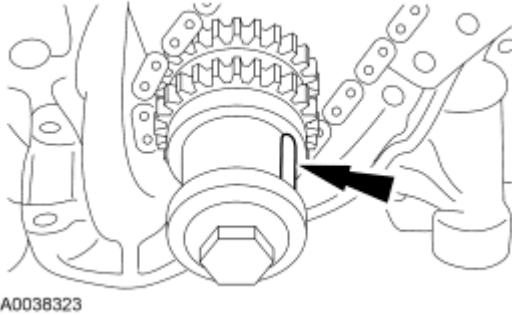


Fig. 346: Locating Crankshaft Keyway
Courtesy of FORD MOTOR CO.

33. Verify that the RH camshafts are correctly positioned.

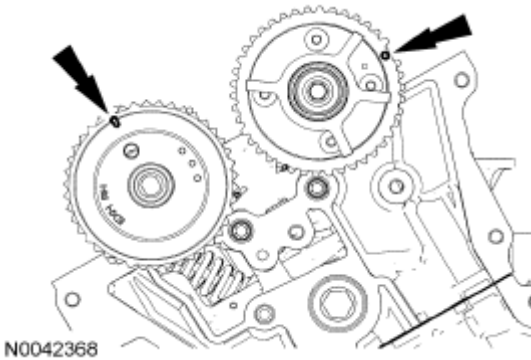


Fig. 347: Locating RH Camshafts Position
Courtesy of FORD MOTOR CO.

34. Install the RH VCT assembly and the 3 bolts.
- Tighten to 25 Nm (18 lb-ft).

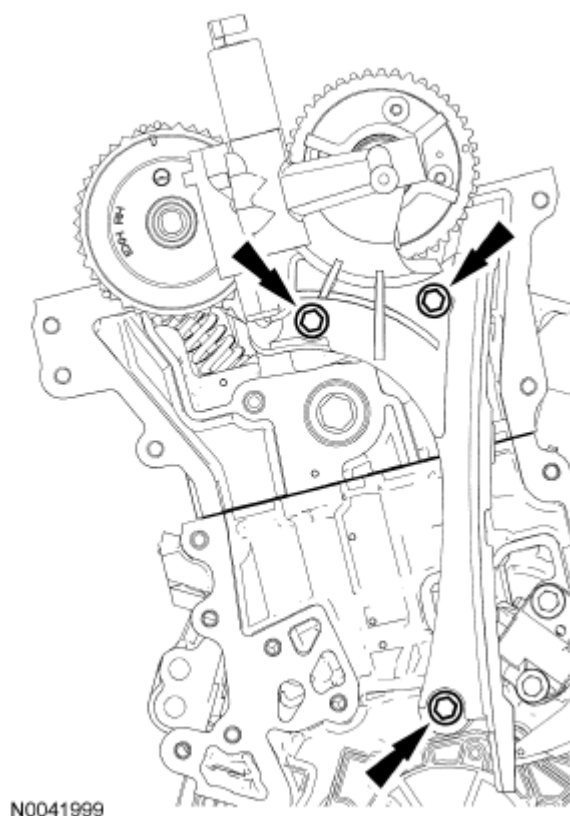


Fig. 348: Locating RH VCT Assembly And Bolts
Courtesy of FORD MOTOR CO.

35. Install the RH timing chain.

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

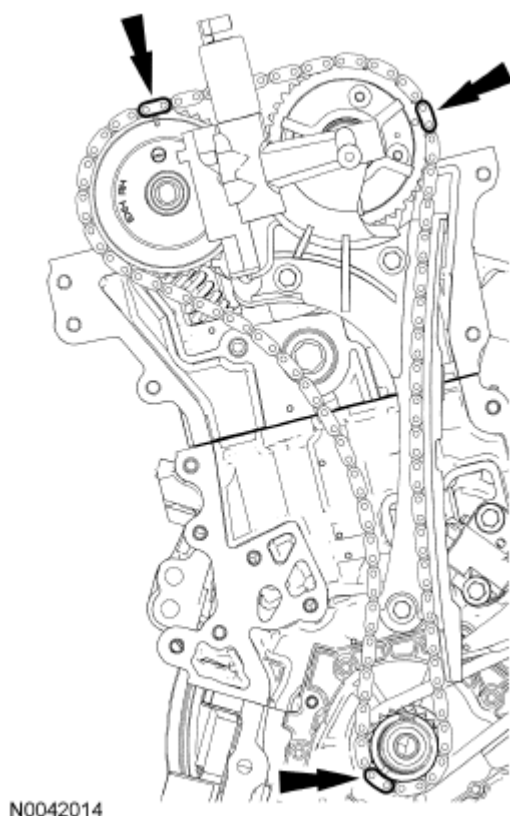


Fig. 349: Aligning Marks On Timing Chain With Marks On Camshaft And Crankshaft Sprockets
 Courtesy of FORD MOTOR CO.

36. Install the RH timing chain tensioner and tensioner arm.
 1. Install the tensioner arm.
 2. Position the tensioner.
 3. Install the 2 bolts.
 - Tighten to 25 Nm (18 lb-ft).

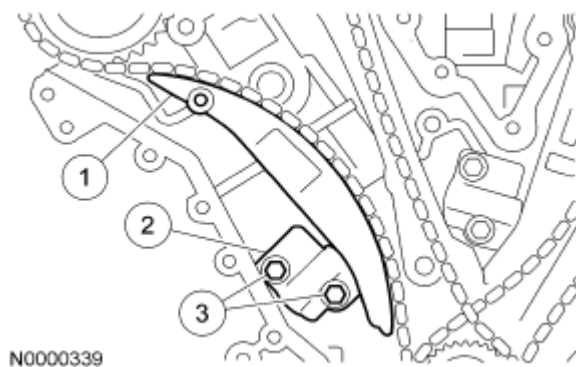
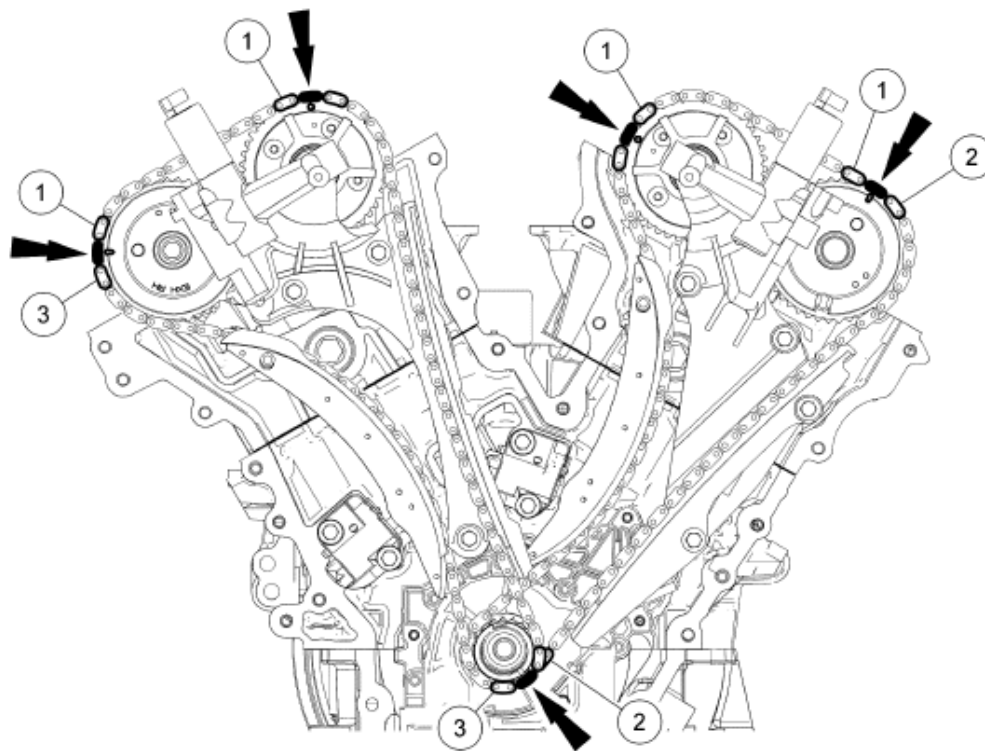


Fig. 350: Identifying Tensioner Arm, Tensioner And Bolts
 Courtesy of FORD MOTOR CO.

37. Remove the LH and RH timing chain tensioner piston retaining wires.
38. Rotate the crankshaft counterclockwise 120 degrees to top dead center (TDC).

CAUTION: Failure to verify correct timing drive component alignment will result in severe engine damage.

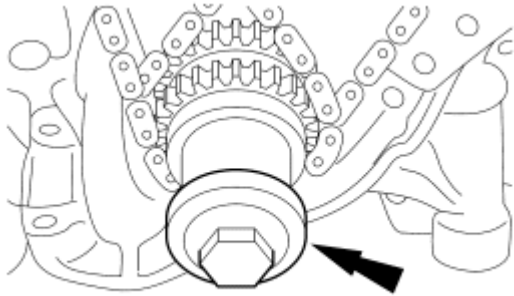
39. Verify the timing with the following steps.
 1. There should be 12 chain links between the camshaft timing marks.
 2. There should be 27 chain links between the camshaft and the crankshaft timing marks.
 3. There should be 30 chain links between the camshaft and the crankshaft timing marks.



N0042459

Fig. 351: Locating Align Marks On Chain
Courtesy of FORD MOTOR CO.

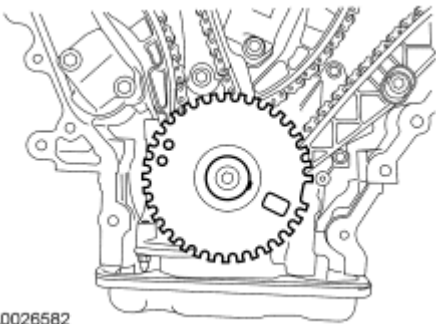
40. Remove the crankshaft pulley bolt and washer.



A0011064

Fig. 352: Identifying Damper Bolt
Courtesy of FORD MOTOR CO.

CAUTION: This pulse wheel is used in several different engines. Install the pulse wheel with the keyway in the slot stamped 30RFF only (orange in color).



A0026582

Fig. 353: Identifying Ignition Pulse Wheel
Courtesy of FORD MOTOR CO.

41. Install the ignition pulse wheel.
42. Install 3 new gaskets in the front cover.

NOTE: Clean the sealing surfaces with metal surface cleaner before applying gasket and sealant.

NOTE: The front cover must be installed and the bolts tightened within 4 minutes of sealant application.

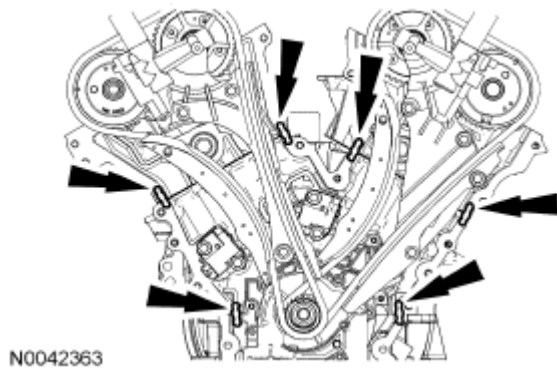


Fig. 354: Locating Silicone Gasket And Sealant On Cylinder Block
Courtesy of FORD MOTOR CO.

43. Apply a 6 mm (0.23 in) dot of silicone gasket and sealant to the cylinder block to lower cylinder block and cylinder head mating surfaces.

NOTE: Fasteners 1 and 13 are stud bolts.

44. Position the engine front cover and install the 14 bolts and 2 stud bolts.
 - Tighten in the sequence shown to 25 Nm (18 lb-ft).

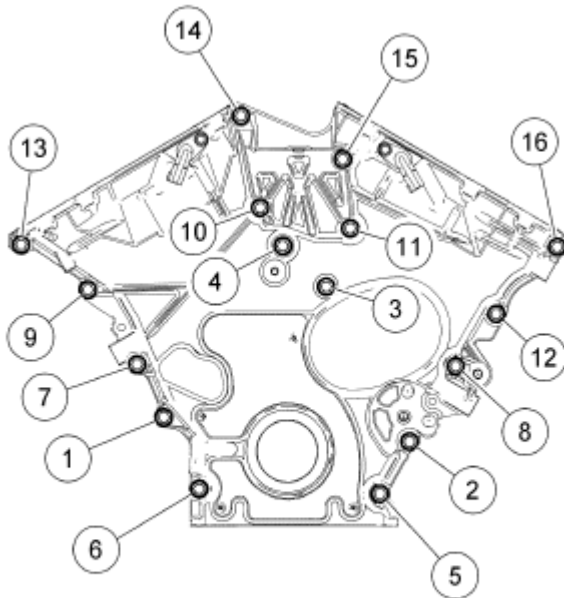


Fig. 355: Locating Tighten Sequence Of Engine Front Cover Bolts
Courtesy of FORD MOTOR CO.

45. Apply clean engine oil to the seal lip and seal bore before installing the seal.

46. Using the special tools, install a new crankshaft front seal.

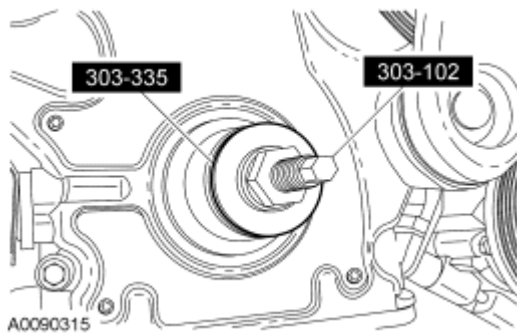


Fig. 356: Installing Crankshaft Seal Using Special Tools (303-335 And 303-102)
Courtesy of FORD MOTOR CO.

NOTE: Clean the keyway and slot using metal surface cleaner before applying silicone gasket and sealant.

NOTE: The crankshaft pulley must be installed and the bolt tightened within 4 minutes of applying the silicone gasket and sealer.

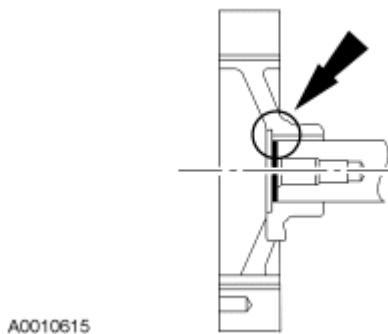


Fig. 357: Applying Silicone Gasket And Sealant
Courtesy of FORD MOTOR CO.

47. Apply silicone gasket and sealant to the end of the keyway slot.

NOTE: Lubricate the outside diameter sealing surfaces with clean engine oil.

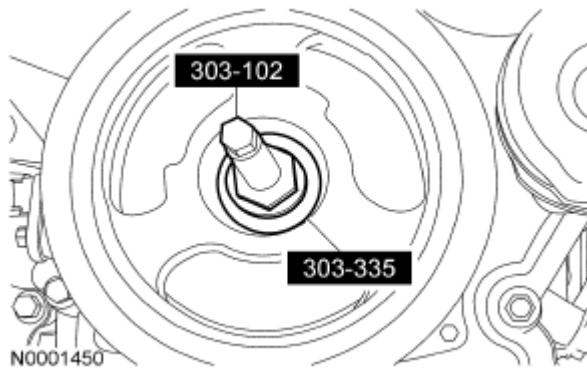


Fig. 358: Identifying Special Tools (303-102 And 303-335)
 Courtesy of FORD MOTOR CO.

48. Using the special tool, install the crankshaft pulley.
49. Install the bolt and washer. Using the special tool to hold the crankshaft pulley, tighten the bolt in 4 stages:
 - Stage 1: Tighten to 120 Nm (89 lb-ft).
 - Stage 2: Loosen one full turn.
 - Stage 3: Tighten to 50 Nm (37 lb-ft).
 - Stage 4: Tighten an additional 90 degrees.

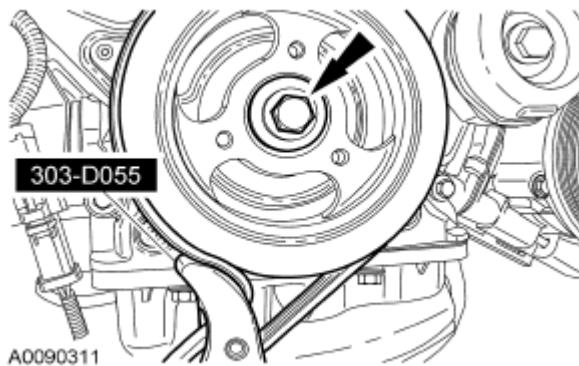


Fig. 359: Identifying Special Tools (303-S055) And Bolt
 Courtesy of FORD MOTOR CO.

50. Install the accessory drive belt tensioner and the 2 idler pulleys.
 - Tighten the tensioner bolt to 45 Nm (33 lb-ft).
 - Tighten the idler pulley bolts to 25 Nm (18 lb-ft).

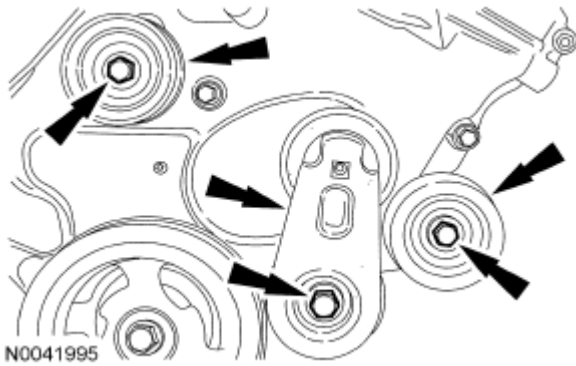


Fig. 360: Locating Accessory Drive Belt Tensioner, Idler Pulleys And Bolts
Courtesy of FORD MOTOR CO.

51. Install the oil pan baffle and the 8 nuts.

- Tighten the oil pan baffle nuts in 2 stages.
 - Stage 1: Tighten the 4 smaller nuts to 5 Nm (44 lb-in) and the larger nuts to 15 Nm (11 lb-ft).
 - Stage 2: Tighten all 8 nuts an additional 45 degrees.

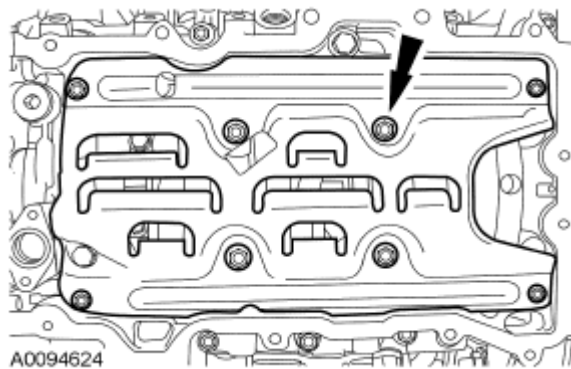


Fig. 361: Locating Oil Pan Baffle And Nuts
Courtesy of FORD MOTOR CO.

52. Install a new O-ring seal on the oil pump screen and pickup tube.

- Lubricate with clean engine oil.

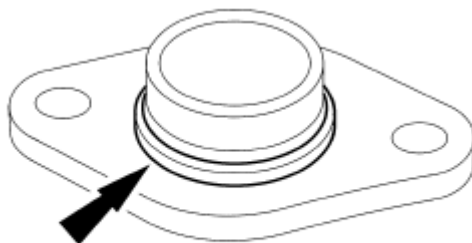


Fig. 362: Locating O-Ring Seal

Courtesy of FORD MOTOR CO.

53. Install the oil pump screen and pickup tube and the 2 bolts.
- Tighten to 10 Nm (89 lb-in).

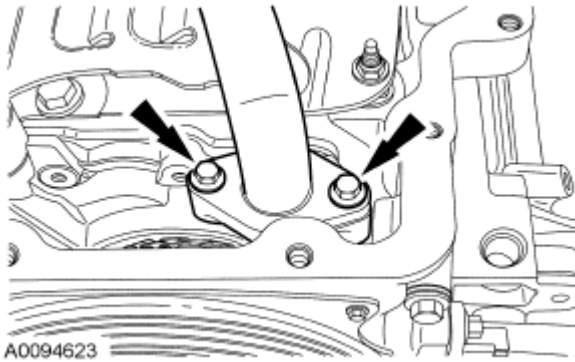


Fig. 363: Locating Oil Pump Screen Bolts
Courtesy of FORD MOTOR CO.

CAUTION: Only use hand tools when removing or installing the spark plugs, damage can occur to the cylinder head or spark plug.

54. Install the LH and RH spark plugs.
- Tighten to 15 Nm (11 lb-ft).

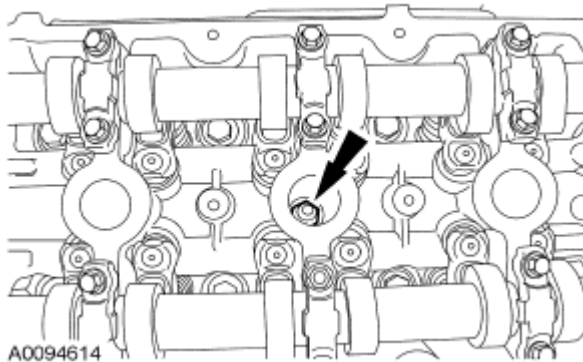


Fig. 364: Locating Spark Plugs
Courtesy of FORD MOTOR CO.

NOTE: The valve cover must be installed and the bolts and stud bolts tightened within 4 minutes of sealant application.

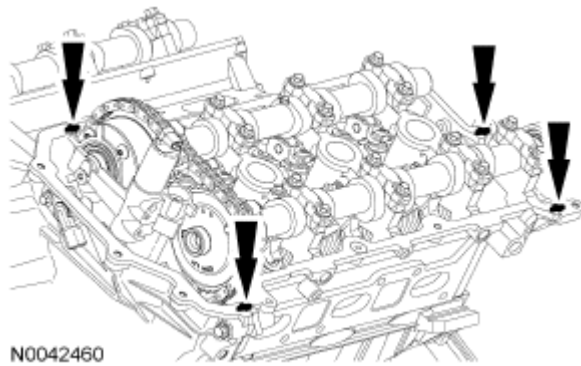


Fig. 365: Locating Silicone Gasket Sealant
Courtesy of FORD MOTOR CO.

55. Apply a an 8 mm (0.31 in) dot of silicone gasket sealant to the front cover-to-cylinder head joints and the cam seal retainer-to-cylinder head joints.
56. Position the LH valve cover and install the bolts and stud bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

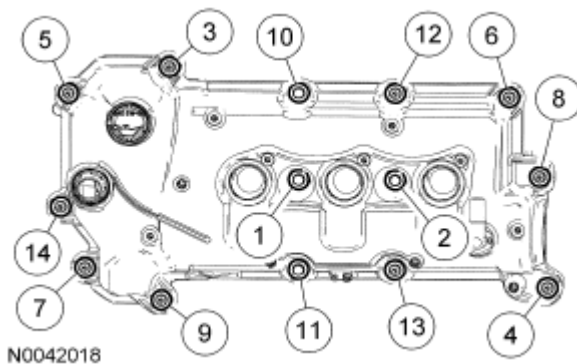


Fig. 366: Locating Tightening Sequence Of LH Valve Cover Bolts
Courtesy of FORD MOTOR CO.

NOTE: Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

57. Install the 3 LH coil-on-plug assemblies and the 3 bolts.
 - Tighten to 7 Nm (62 lb-in).

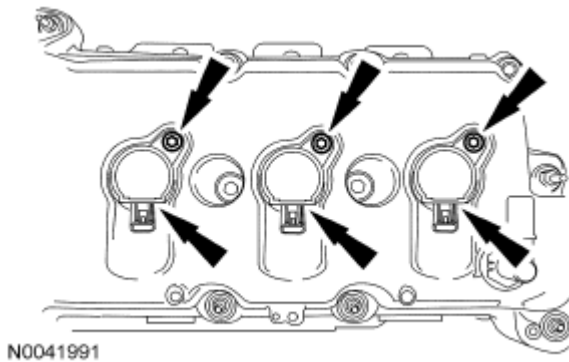


Fig. 367: Locating LH Coil-On-Plug Assemblies And Bolts
Courtesy of FORD MOTOR CO.

NOTE: The valve cover must be installed and the bolts and stud bolts tightened within 4 minutes of sealant application.

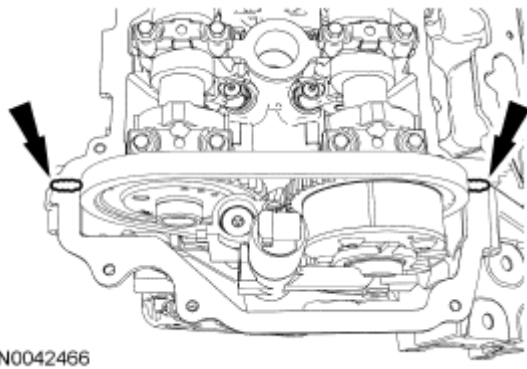


Fig. 368: Locating Silicone Gasket Sealant
Courtesy of FORD MOTOR CO.

58. Apply an 8 mm (0.31 in) dot of silicone gasket sealant to the front cover-to-cylinder head joints.
59. Position the RH valve cover and install the bolts and stud bolts.
 - Tighten in the sequence shown to 10 Nm (89 lb-in).

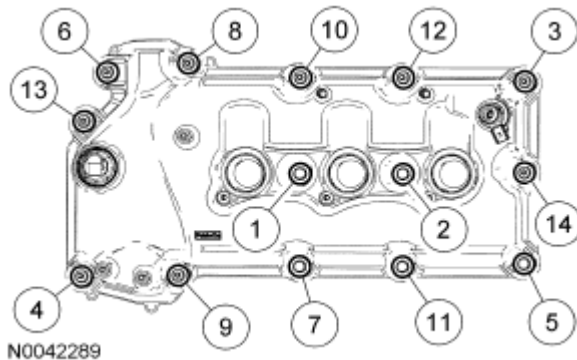


Fig. 369: Locating Tightening Sequence Of RH Valve Cover Bolts
Courtesy of FORD MOTOR CO.

NOTE: Apply a light film of silicone brake caliper grease and dielectric compound to the interior of the spark plug boot prior to installation.

60. Install the 3 RH coil-on-plug assemblies and the 3 bolts.
- Tighten to 7 Nm (62 lb-in).

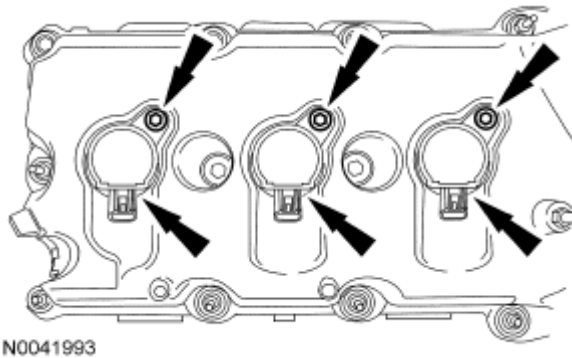


Fig. 370: Locating RH Coil-On-Plug Assemblies And Bolts
Courtesy of FORD MOTOR CO.

61. If equipped, install the block heater.
- Tighten to 41 Nm (30 lb-ft).

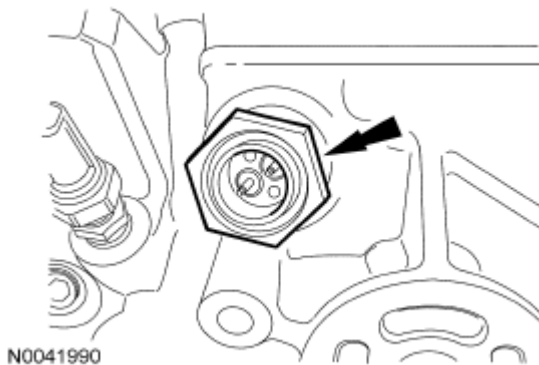


Fig. 371: Locating Block Heater
Courtesy of FORD MOTOR CO.

NOTE: Apply thread sealant with PTFE to the oil pressure sender threads.

62. Install the oil pressure sender.
- Tighten to 14 Nm (10 lb-ft).

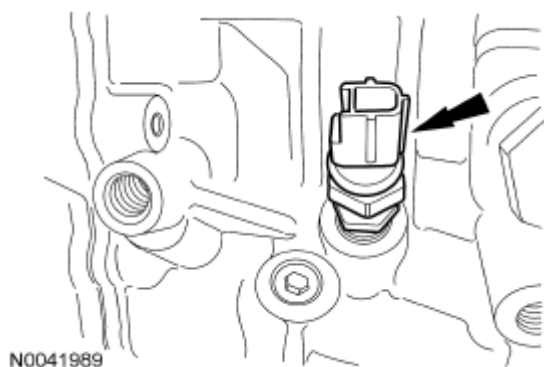


Fig. 372: Locating Oil Pressure Sender
Courtesy of FORD MOTOR CO.

63. Install the knock sensor (KS) and the bolt.
- Tighten to 20 Nm (15 lb-ft).

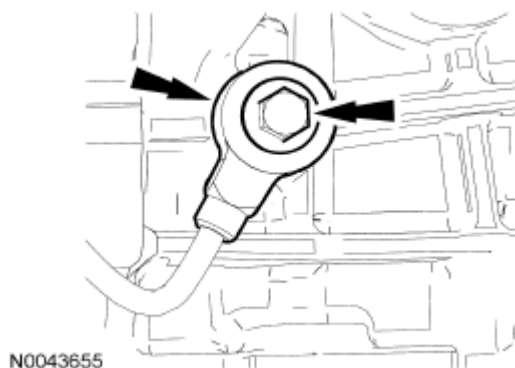


Fig. 373: Locating Knock Sensor (KS) And Bolt
Courtesy of FORD MOTOR CO.

64. Install the coolant pump and the 3 bolts.
- Tighten to 10 Nm (89 lb-in) then rotate 90 degrees.

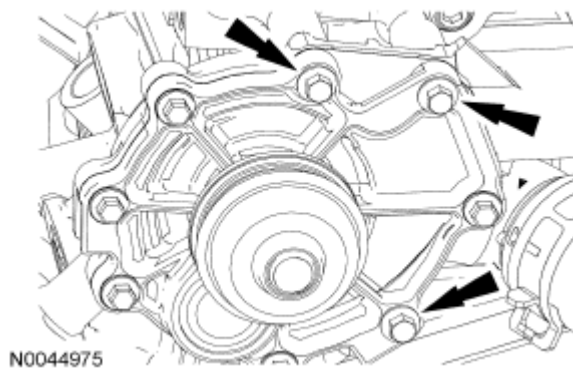


Fig. 374: Locating Coolant Pump And Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The pulley is pressed on flush to the end of the camshaft.

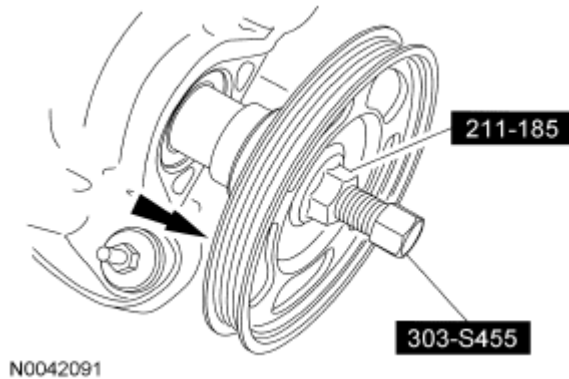


Fig. 375: Identifying Special Tools (211-185 And 303-S455) And Coolant Pump Drive Pulley
Courtesy of FORD MOTOR CO.

65. Using the special tool, install the coolant pump drive pulley.
66. Install the coolant pump belt on the coolant pump pulley and position it on the coolant pump drive pulley.

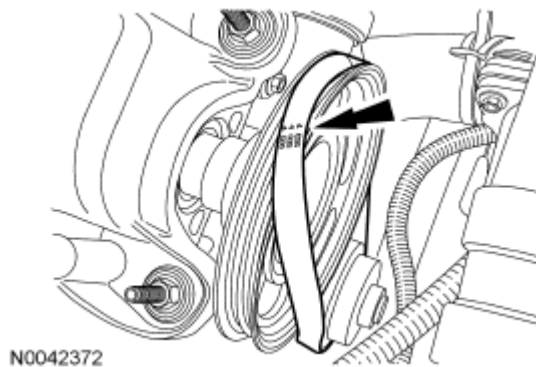


Fig. 376: Locating Coolant Pump Belt On Coolant Pump Pulley
Courtesy of FORD MOTOR CO.

CAUTION: Do not use any screwdrivers, pliers or other metal objects that could cause damage to the belt or pulley while installing the belt.

67. Rotate the crankshaft clockwise to seat the coolant pump belt on the coolant pump drive belt pulley.
68. If equipped, install the coolant pump drive pulley cover and the 2 nuts.
 - Tighten to 6 Nm (53 lb-in).

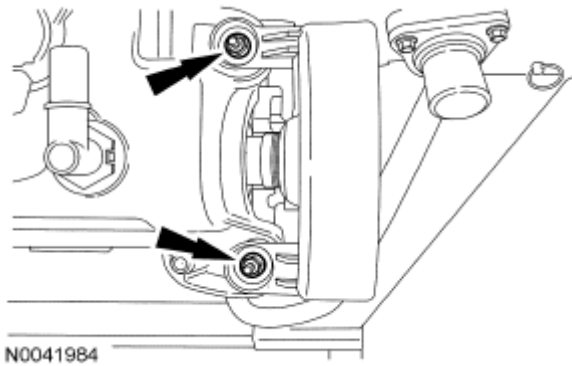


Fig. 377: Locating Coolant Pump Drive Pulley Cover Nuts
Courtesy of FORD MOTOR CO.

69. Connect the coolant pump hose to the cylinder block outlet.

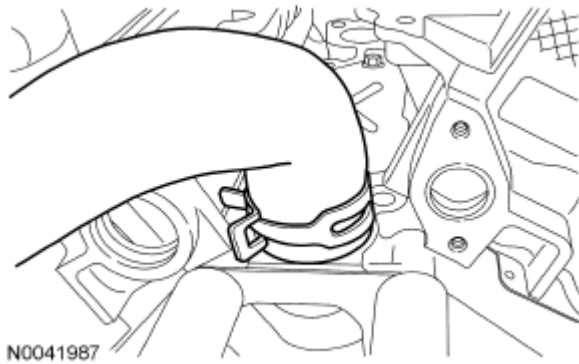


Fig. 378: Identifying Coolant Pump Hose To Cylinder Block Outlet
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the new O-ring seals with clean engine coolant.

70. Install new O-ring seals, the bypass tube, bolt and stud bolt.
- Tighten to 10 Nm (89 lb-in).

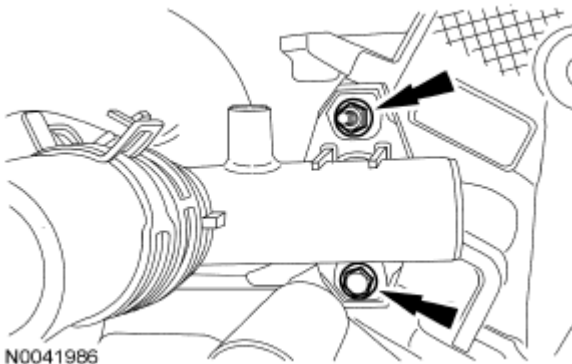


Fig. 379: Locating O-Ring Seals, Bypass Tube, Bolt And Stud Bolt
Courtesy of FORD MOTOR CO.

71. Install the thermostat housing.



Fig. 380: Locating Thermostat Housing
Courtesy of FORD MOTOR CO.

NOTE: Clean and inspect all sealing surfaces. Install new gaskets.

72. Position the lower intake manifold and install the 8 bolts.
- Tighten in the sequence shown to 10 Nm (89 lb-in).

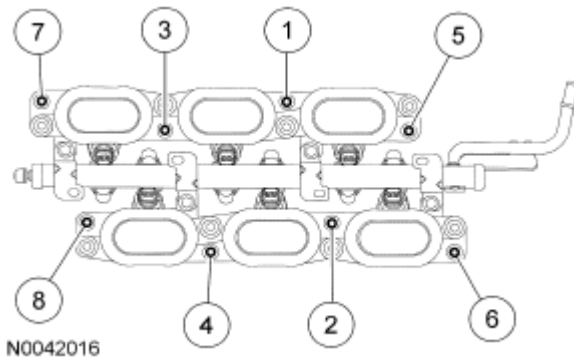
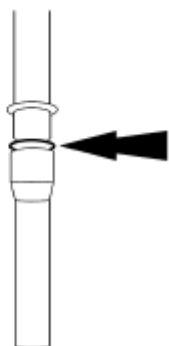


Fig. 381: Identifying Tightening Sequence Of Lower Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

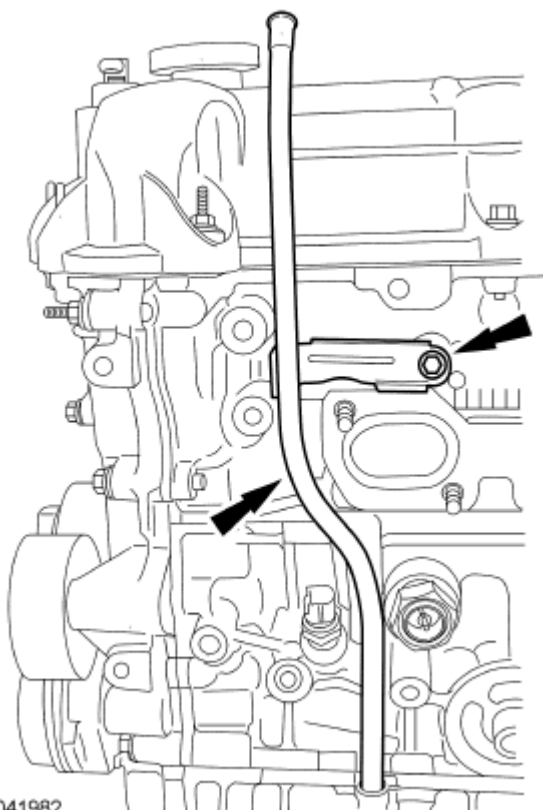
73. Install a new O-ring on the oil level indicator tube. Apply clean engine oil to the O-ring.



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Fig. 382: Locating O-Ring On Oil Level Indicator Tube
Courtesy of FORD MOTOR CO.

74. Position the oil level indicator and tube and install the stud bolt.
 - Tighten to 9 Nm (80 lb-in).



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Fig. 383: Locating Oil Level Indicator, Tube And Stud Bolt
Courtesy of FORD MOTOR CO.

75. Install the LH catalytic converter bracket and the 2 bolts.
 - Tighten to 35 Nm (26 lb-ft).

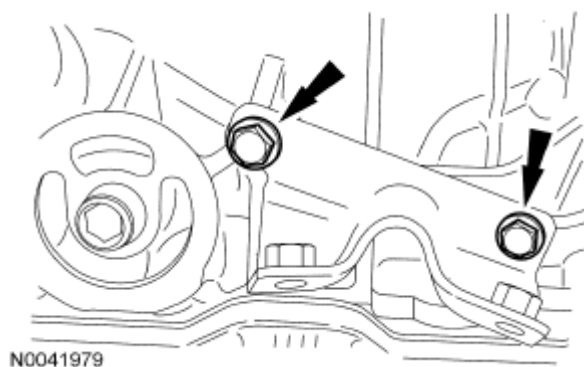


Fig. 384: Locating LH Catalytic Converter Bracket Bolts
Courtesy of FORD MOTOR CO.

76. Install 6 new RH catalytic converter studs.
- Tighten to 12 Nm (9 lb-ft).

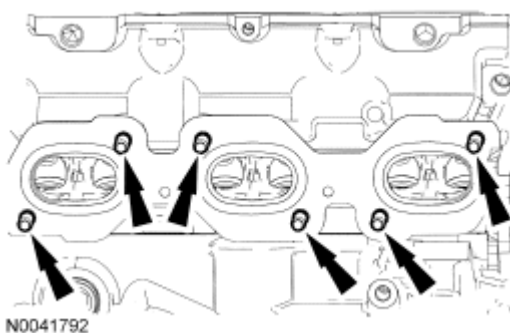


Fig. 385: Locating Exhaust Manifold Studs
Courtesy of FORD MOTOR CO.

77. Install a new gasket, the RH catalytic converter and 6 new nuts.
- Tighten to 20 Nm (15 lb-ft) in the sequence shown.

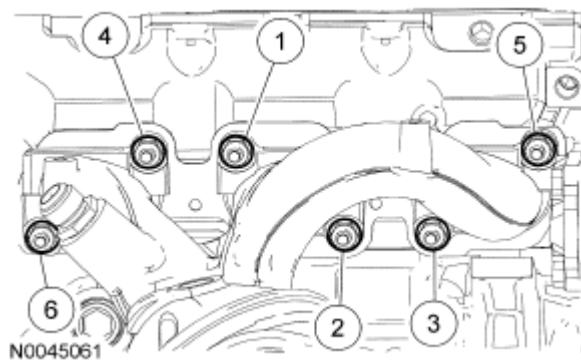


Fig. 386: Identifying Tightening Sequence Of RH Catalytic Converter Nuts
Courtesy of FORD MOTOR CO.

78. Position the power steering pump and reservoir assembly onto the engine and install the 3 bolts.
- Tighten to 25 Nm (18 lb-ft).

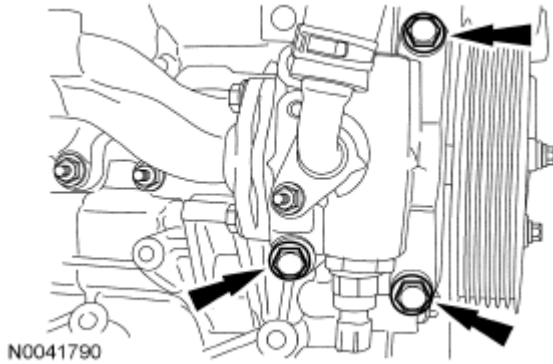


Fig. 387: Locating Power Steering Pump And Reservoir Assembly Engine Bolts
Courtesy of FORD MOTOR CO.

79. Install the 3 power steering reservoir nuts.
- Tighten to 9 Nm (80 lb-in).

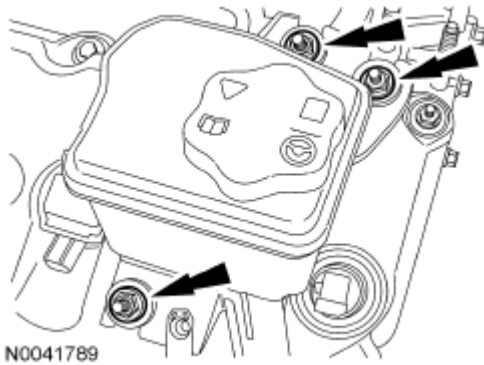


Fig. 388: Locating Power Steering Reservoir Nuts
Courtesy of FORD MOTOR CO.

80. Install the A/C compressor bracket and the 3 bolts.
- Tighten to 25 Nm (18 lb-ft).

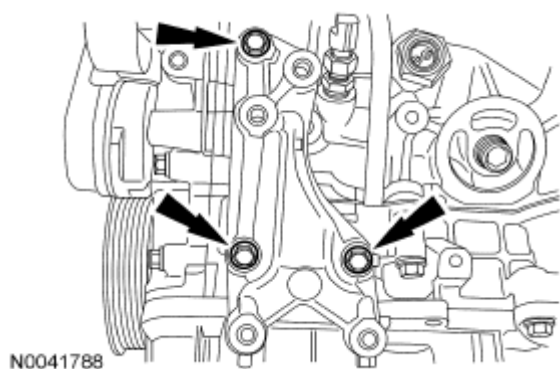


Fig. 389: Locating A/C Compressor Bracket Bolts
Courtesy of FORD MOTOR CO.

81. Install the A/C compressor and the 3 bolts.
- Tighten to 25 Nm (18 lb-ft).

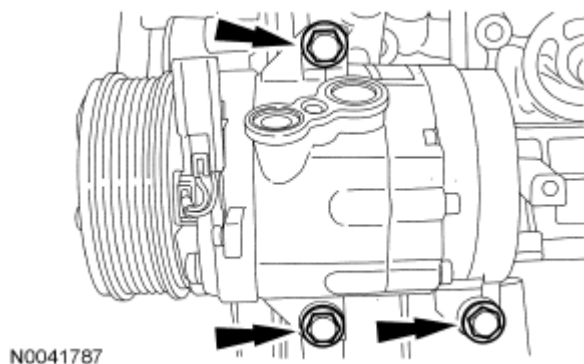


Fig. 390: Locating A/C Compressor Bolts
Courtesy of FORD MOTOR CO.

82. Install the generator and the 3 bolts.
- Tighten to 48 Nm (35 lb-ft).

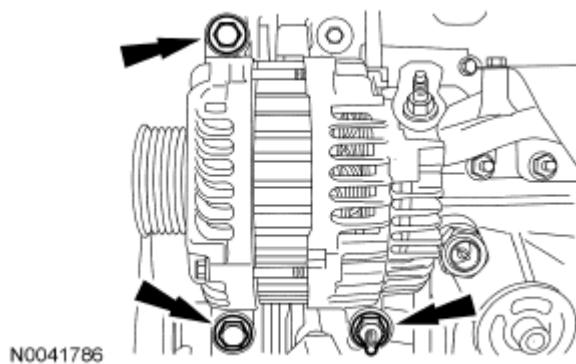


Fig. 391: Locating Generator Bolts
Courtesy of FORD MOTOR CO.

83. Rotate the accessory drive belt tensioner counterclockwise and install the accessory drive belt.



Fig. 392: Rotating Accessory Drive Belt Tensioner Counterclockwise
Courtesy of FORD MOTOR CO.

84. Attach the wiring harness retainer to the coolant bypass stud bolt.

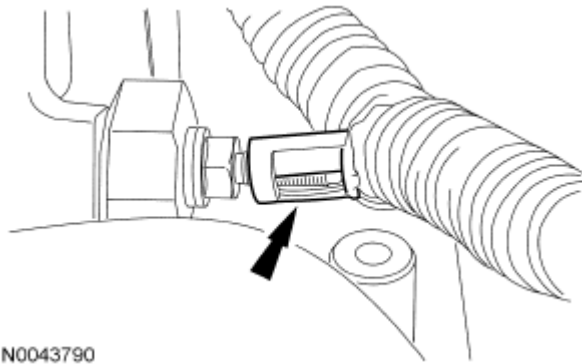


Fig. 393: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

85. Position the wiring harness onto the engine and connect the engine coolant temperature (ECT) sensor electrical connector.

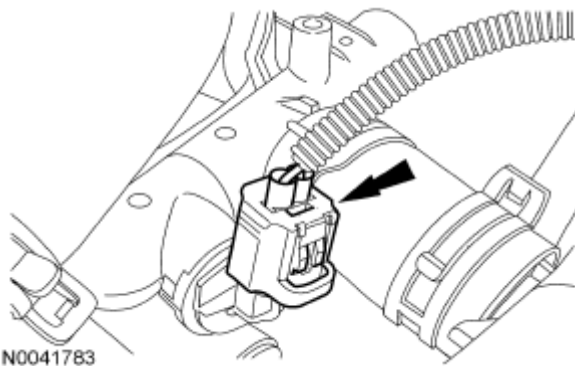


Fig. 394: Locating Coolant Temperature Sensor Electrical Connector

Courtesy of FORD MOTOR CO.

86. Connect the KS electrical connector.

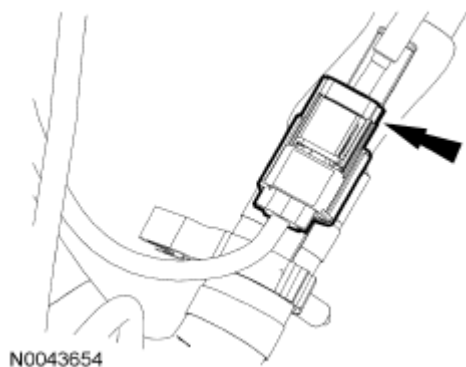


Fig. 395: Locating KS Electrical Connector
Courtesy of FORD MOTOR CO.

87. Connect the positive crankcase ventilation (PCV) valve electrical connector.

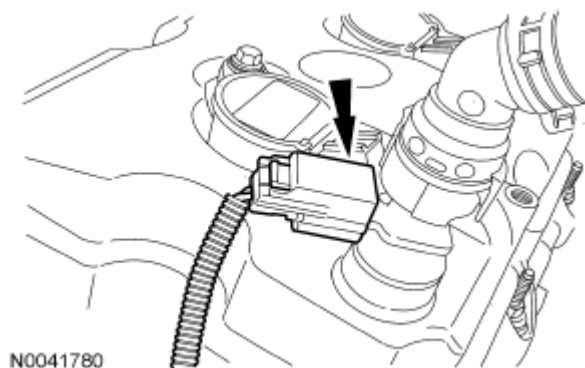


Fig. 396: Locating Positive Crankcase Ventilation Valve Electrical Connector
Courtesy of FORD MOTOR CO.

88. Connect the RH heated oxygen sensor (HO2S) electrical connector.

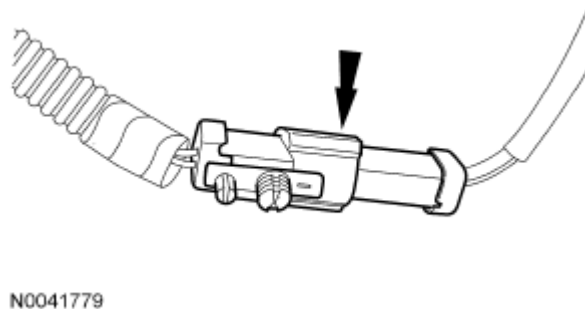


Fig. 397: Locating RH Heated Oxygen Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

89. Attach the wiring harness retainer to the power steering stud bolt.

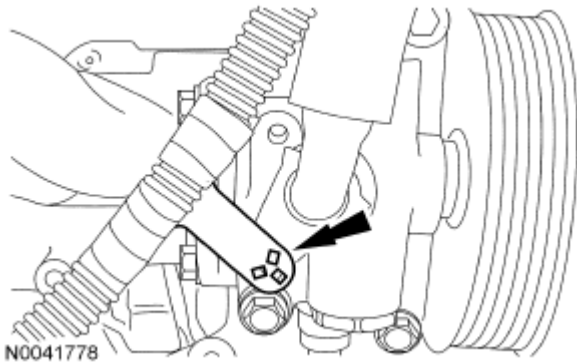


Fig. 398: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

90. Install the radio frequency interference capacitor and the nut.
- Tighten to 6 Nm (53 lb-in).
91. Connect the RH VCT solenoid and LH camshaft position (CMP) sensor electrical connectors.
- Attach the 2 wiring harness retainers to the valve cover stud bolts.

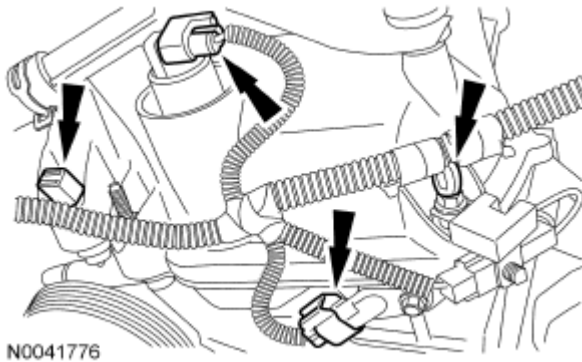


Fig. 399: Locating RH VCT Solenoid And LH Camshaft Position Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

92. Connect the 3 RH coil-on-plug electrical connectors.
- Attach the 2 wiring harness pin-type retainers to the valve cover.

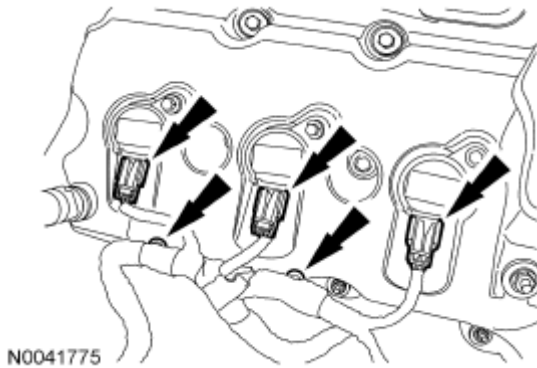


Fig. 400: Locating RH Coil-On-Plug Electrical Connectors
Courtesy of FORD MOTOR CO.

NOTE: Only one wiring harness retainer is shown, other wiring harness retainer is similar.

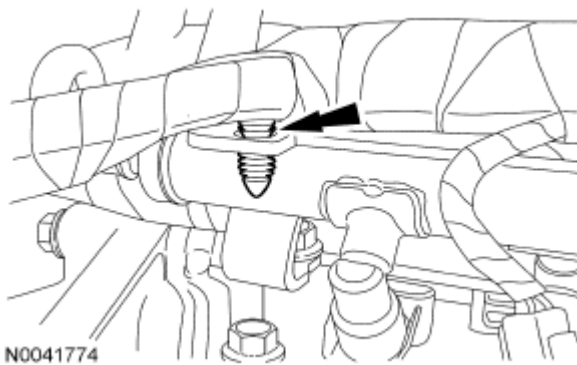


Fig. 401: Locating Fuel Rail Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

93. Attach the 2 wiring harness retainers to the fuel rail.
94. Connect the 6 (3 shown) fuel injector electrical connectors.

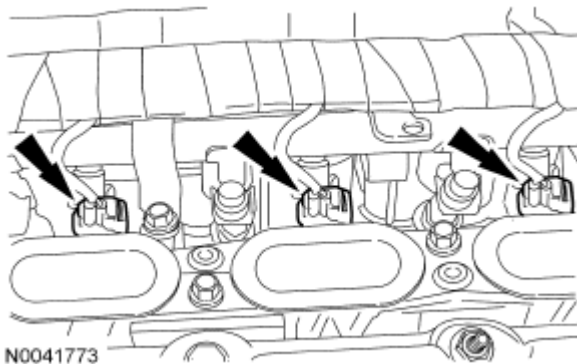


Fig. 402: Locating Fuel Injector Electrical Connectors
Courtesy of FORD MOTOR CO.

95. Attach the wiring harness retainer to the LH valve cover stud bolt.

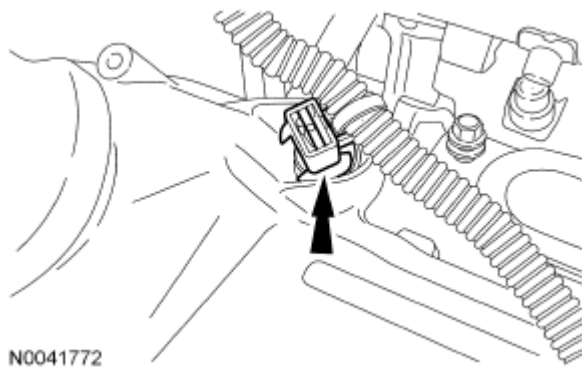


Fig. 403: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

96. Connect the 3 LH coil-on-plug electrical connectors.
- Attach the 2 wiring harness pin-type retainers to the valve cover.

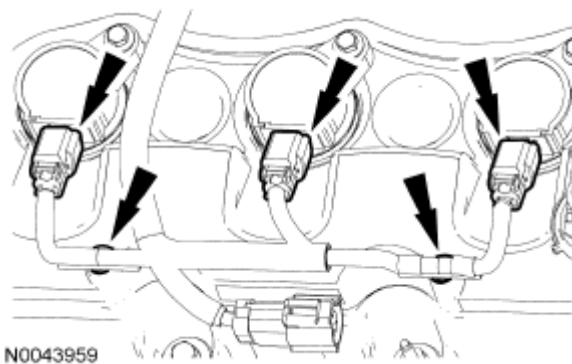


Fig. 404: Locating LH Coil-On-Plug Electrical Connectors
Courtesy of FORD MOTOR CO.

97. Attach the 3 wiring harness retainers to the valve cover stud bolts.

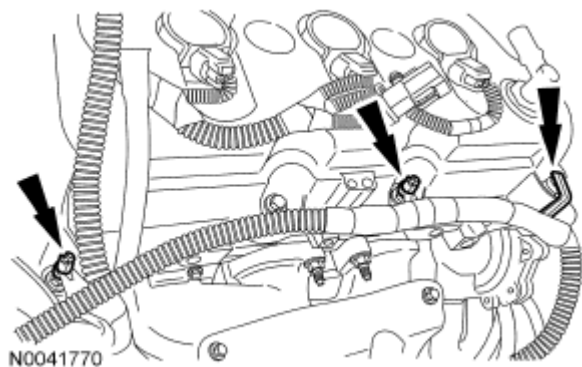


Fig. 405: Locating Wiring Harness Retainers

Courtesy of FORD MOTOR CO.

98. Connect the LH VCT solenoid and LH CMP sensor electrical connectors.
- Attach the 2 wiring harness retainers to the valve cover stud bolts.

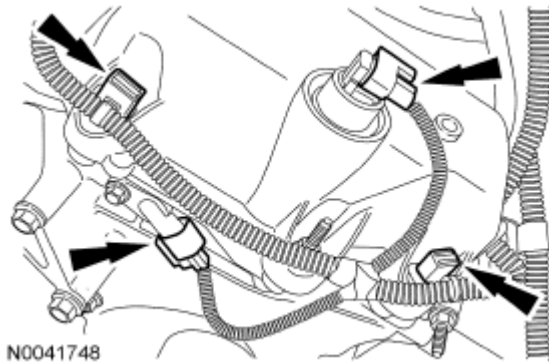


Fig. 406: Locating LH VCT Solenoid And LH CMP Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

99. Connect the generator B+ cable and electrical connector and install the nut.
- Tighten to 6 Nm (53 lb-in).

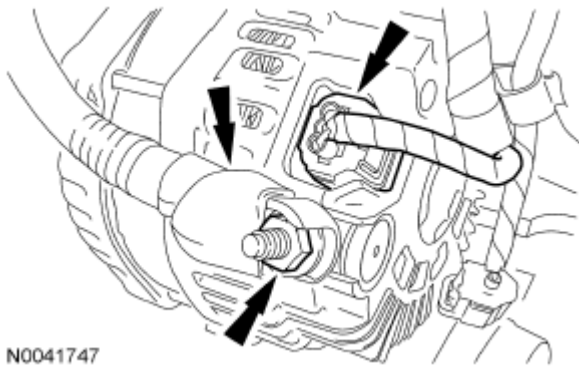


Fig. 407: Locating Generator B+ Cable, Electrical Connector And Nut
Courtesy of FORD MOTOR CO.

100. Connect the oil pressure sender electrical connector.

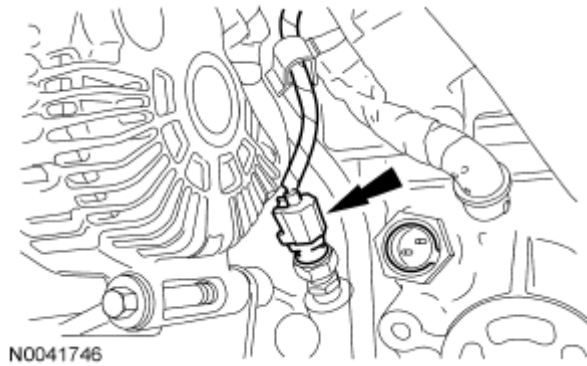


Fig. 408: Locating Oil Pressure Sender Electrical Connector
Courtesy of FORD MOTOR CO.

101. If equipped, attach the block heater wiring harness retainers to the oil level indicator tube and remove the harness.

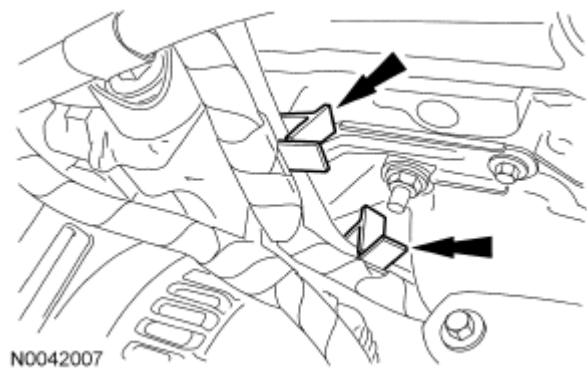


Fig. 409: Locating Block Heater Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

102. If equipped, connect the block heater electrical connector.

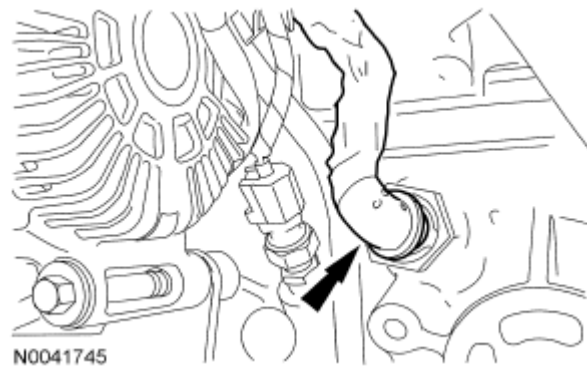


Fig. 410: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

103. Connect the A/C compressor electrical connector.

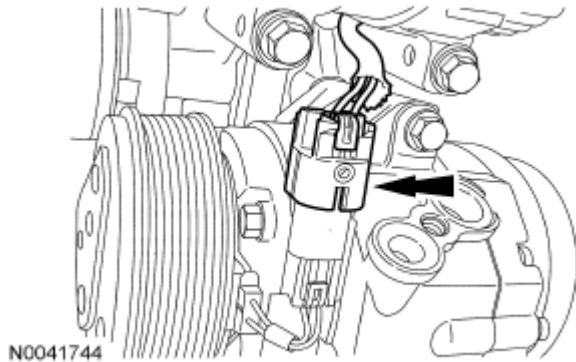


Fig. 411: Locating A/C Compressor Electrical Connector
Courtesy of FORD MOTOR CO.

NOTE: Clean and inspect all sealing surfaces. Install new gaskets.

104. Position the upper intake manifold and install the 8 bolts.
- Tighten in the sequence shown to 10 Nm (89 lb-in).

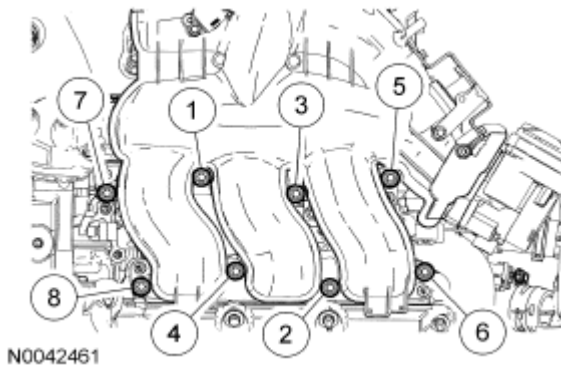


Fig. 412: Identifying Tightening Sequence Of Upper Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

105. Connect the throttle body coolant hose.

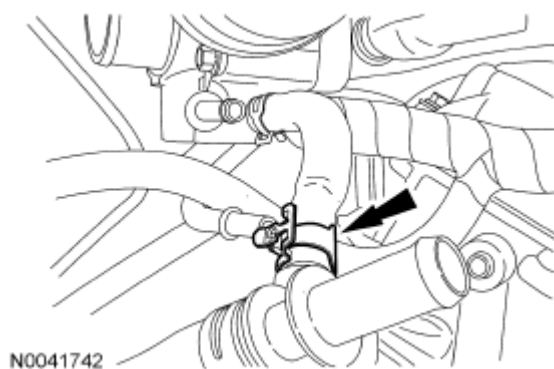


Fig. 413: Locating Throttle Body Coolant Hose Clamp
Courtesy of FORD MOTOR CO.

106. Connect the electronic throttle body electrical connector.

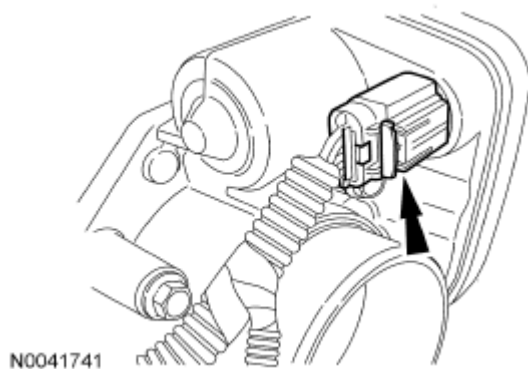


Fig. 414: Locating Electronic Throttle Body Electrical Connector
Courtesy of FORD MOTOR CO.

107. Connect the crankcase vent hose to the upper intake manifold.

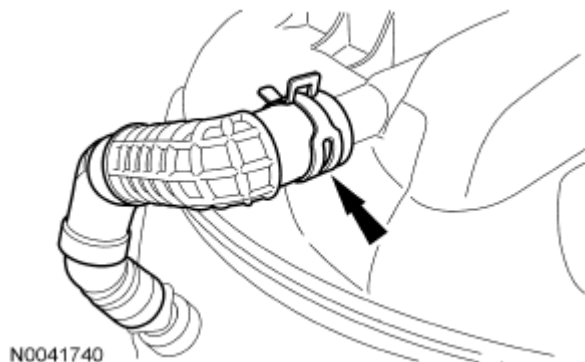


Fig. 415: Locating Crankcase Vent Hose To Upper Intake Manifold Clamp
Courtesy of FORD MOTOR CO.

108. Attach the wiring harness pin-type retainer to the upper intake manifold.



Fig. 416: Locating Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

109. Connect the manifold actual pressure (MAP) sensor electrical connector and the pin-type retainer.

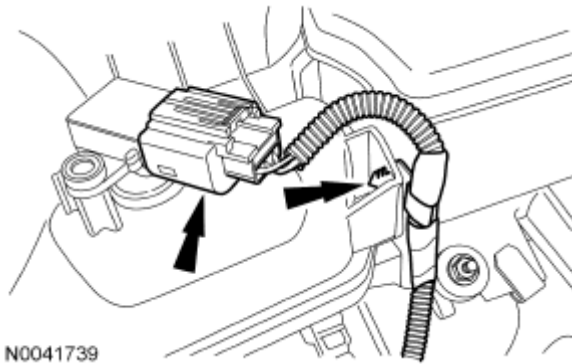


Fig. 417: Locating Manifold Actual Pressure Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

NOTE: When installing the lower half of the lifting bracket it will be easier to loosely install the upper bolt first then install the lower bolt.

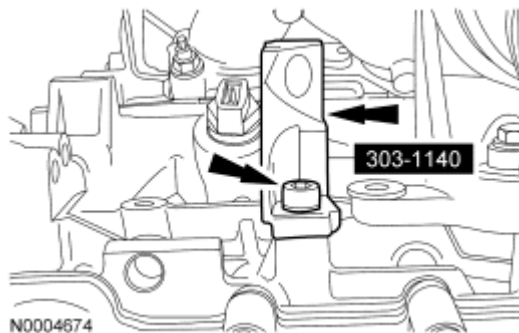


Fig. 418: Identifying Lower Half Of Lifting Hook
Courtesy of FORD MOTOR CO.

110. Install the lower half of the special tool.

111. Install the upper half of the special tool.



Fig. 419: Identifying Upper Half Of Lifting Hook
Courtesy of FORD MOTOR CO.

112. Install the special tool.

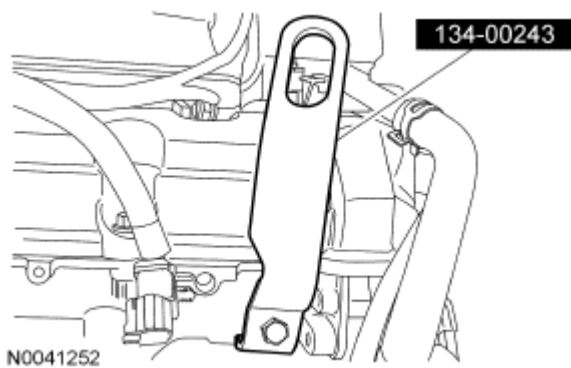


Fig. 420: Identifying Special Tools (134-00243)
Courtesy of FORD MOTOR CO.

113. Install the special tools.

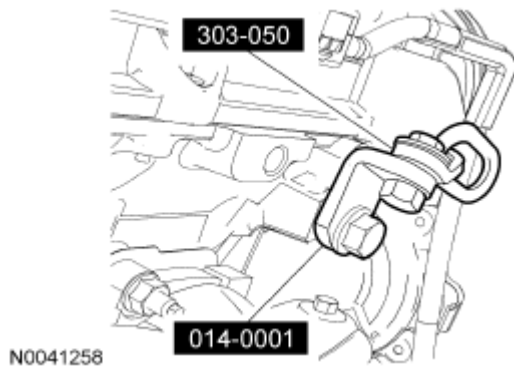


Fig. 421: Identifying Special Tools (303-050 And 014-0001)
Courtesy of FORD MOTOR CO.

114. Using the special tools and a suitable engine crane, remove the engine from the engine stand.

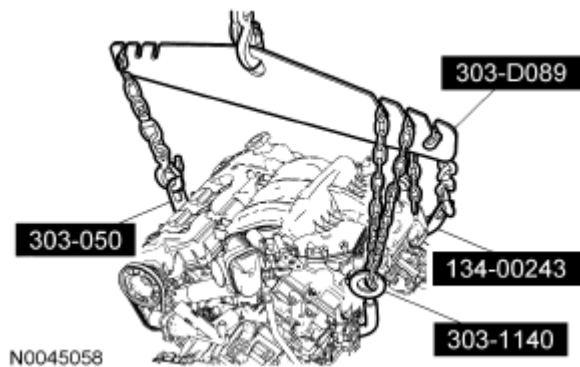


Fig. 422: Identifying Special Tools
Courtesy of FORD MOTOR CO.

NOTE: Lubricate the seal lips and seal bore with clean engine oil before installing.

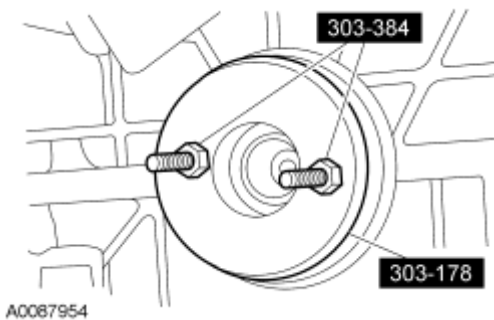


Fig. 423: Identifying Special Tools (303-384 And 303-178)
Courtesy of FORD MOTOR CO.

115. Using the special tools, install the crankshaft rear seal.

116. Install the engine-to-transaxle separator plate.

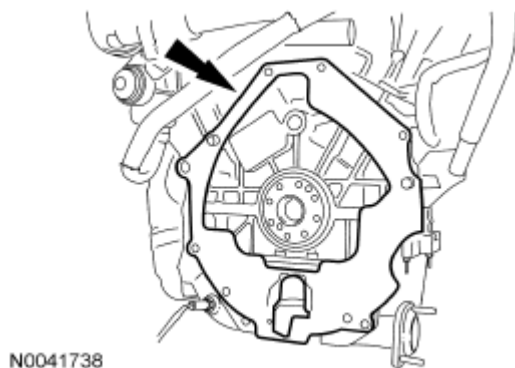


Fig. 424: Locating Engine-To-Transaxle Separator Plate

Courtesy of FORD MOTOR CO.

117. Position the flexplate and install the 8 bolts.

- Tighten to 80 Nm (59 lb-ft).

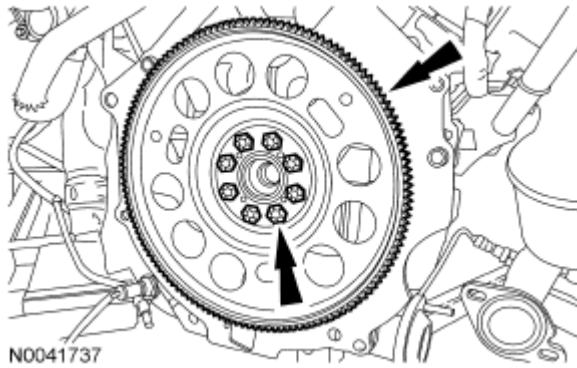


Fig. 425: Locating Flexplate And Bolts
Courtesy of FORD MOTOR CO.

INSTALLATION

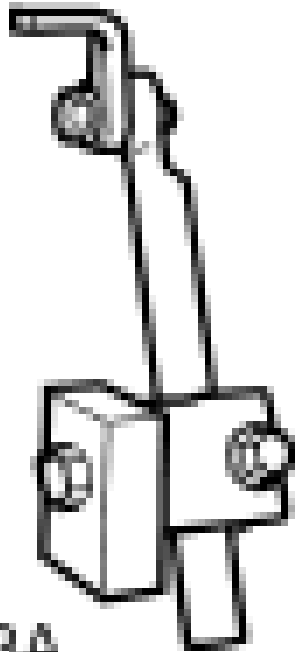
ENGINE

SPECIAL TOOL(S)

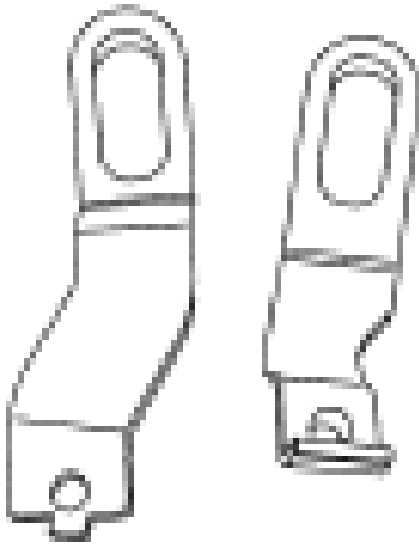
 ST1293-A	Powertrain Lift 014-00765
	Universal Adapter Brackets 014-0001 Lifting Bracket Set, Engine 303-D095 (D94L-6001-A) or equivalent

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2743A



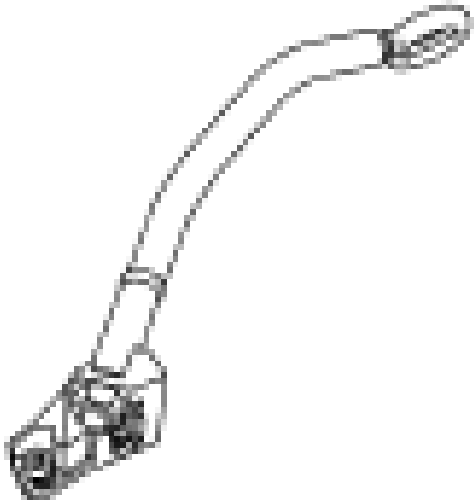
ST2463-A

Lifting Brackets, Engine
134-00243 or equivalent

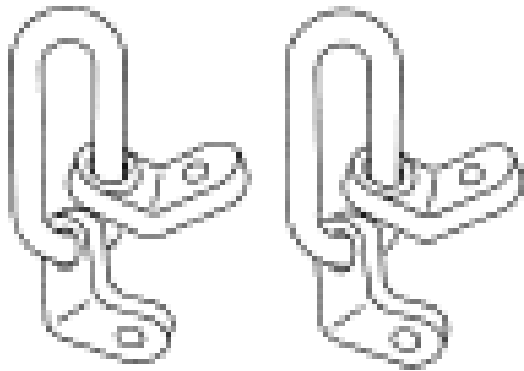
Engine Lifting Bracket Set
303-1140

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST2873-A



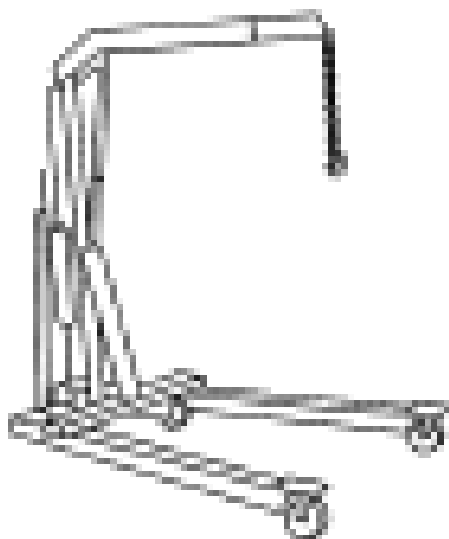
ST2793-A

Lifting Bracket, Engine
303-050 (T70P-6000)

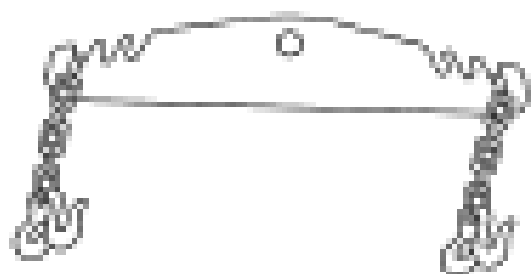
Heavy Duty Floor Crane
014-00071 or equivalent

2006 Mercury Milan

2006 ENGINE Engine - 3.0L (4V) - Fusion, Milan & Zephyr



ST1341-A



ST1602-A

Spreader Bar
303-D089 (D93P-6001-A3) or equivalent

MATERIAL

Item	Specification
Silicone Gasket and Sealant TA-30	WSE-M4G323-A4
Motorcraft Metal Surface Cleaner ZC-21	WSE-M5B392-A
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (in Canada Motorcraft SAE 5W-20 Super Premium Motor Oil CXO-5W20-LSP12) or equivalent	WSS-M2C930-A

Installation

CAUTION: If the oil pan was removed during engine disassembly, it must be installed after the engine and transaxle are assembled and the transaxle-to-engine bolts are installed. Failure to follow this assembly sequence can result in engine oil leaks.

1. Using the special tools and a suitable engine crane, align the engine to the transaxle.

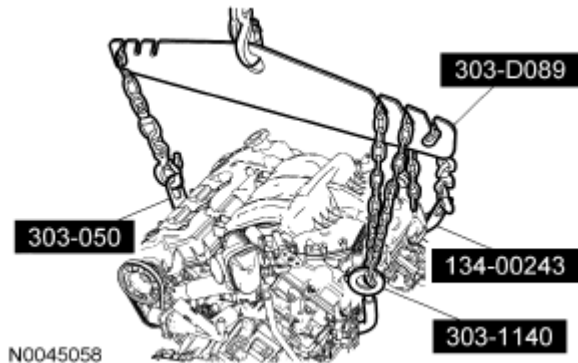


Fig. 426: Identifying Special Tools
Courtesy of FORD MOTOR CO.

2. Install the transaxle-to-engine stud bolt, bolt and nut.
 - Tighten to 48 Nm (35 lb-ft).

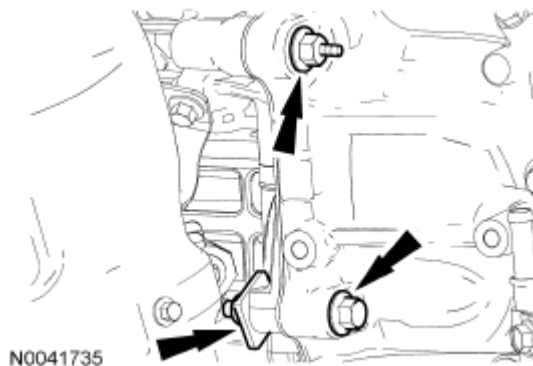


Fig. 427: Locating Transaxle-To-Engine Stud Bolt, Bolt And Nut
Courtesy of FORD MOTOR CO.

3. Attach the wiring harness retainer to the stud bolt.

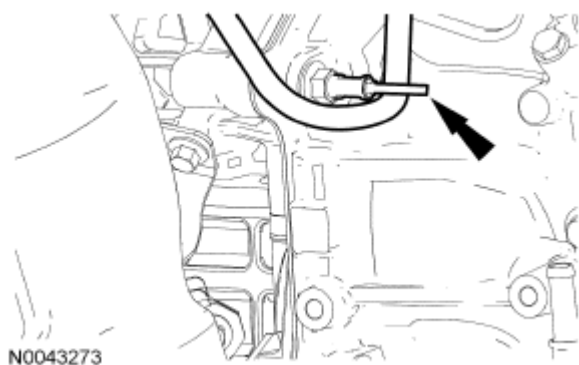


Fig. 428: Locating Wiring Harness Retainer To Stud Bolt
Courtesy of FORD MOTOR CO.

4. Install the 3 transaxle-to-engine bolts.
 - Tighten to 48 Nm (35 lb-ft).

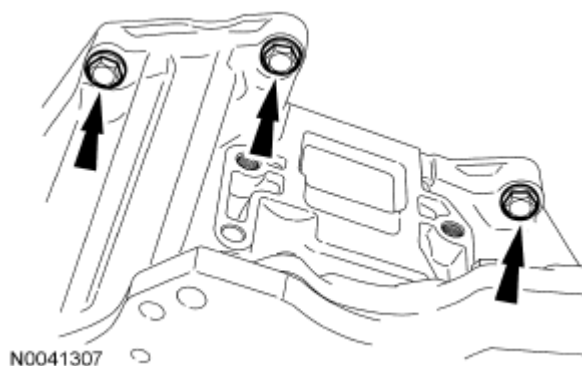


Fig. 429: Locating Transaxle-To-Engine Bolts
Courtesy of FORD MOTOR CO.

5. Install the engine-to-transaxle bolt.
 - Tighten to 48 Nm (35 lb-ft).

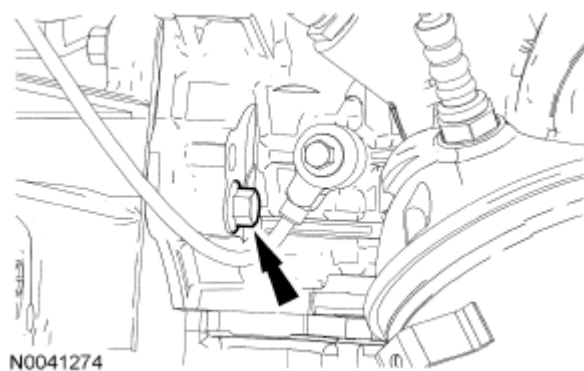


Fig. 430: Locating Engine-To-Transaxle Bolt
Courtesy of FORD MOTOR CO.

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.

6. Use a plastic scraping tool to remove all traces of the oil pan gasket.
 - Clean all sealing surfaces with metal surface cleaner and install a new oil pan gasket.

NOTE: The oil pan must be installed and the bolts tightened within 4 minutes of sealant application.

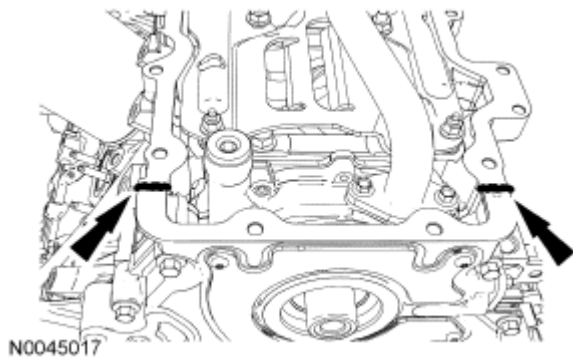


Fig. 431: Locating Silicone Sealant Areas
Courtesy of FORD MOTOR CO.

7. Apply a 10 mm (0.39 in) diameter dot of silicone sealant to the areas indicated.
8. Position the oil pan and install the 10 bolts and 5 stud bolts finger tight.
9. Install the 2 oil pan-to-transaxle bolts.
 - Tighten to 48 Nm (35 lb-ft).

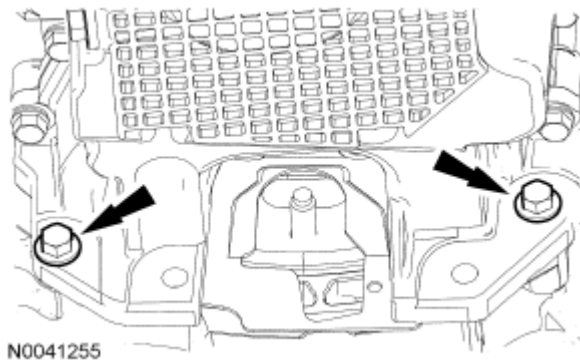


Fig. 432: Locating Oil Pan-To-Transaxle Bolts
Courtesy of FORD MOTOR CO.

10. Tighten the 15 oil pan-to-engine bolts and stud bolts in the sequence shown to 25 Nm (18 lb-ft).

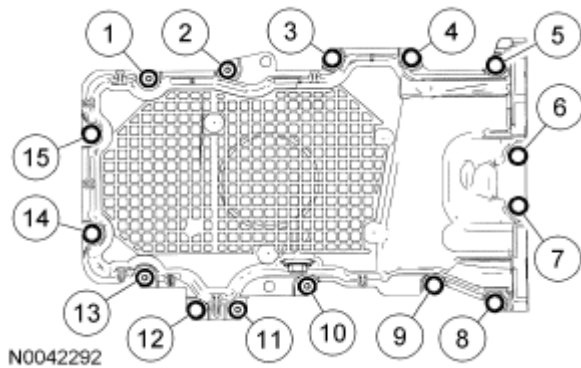


Fig. 433: Locating Tighten Sequence Of Oil Pan-To-Engine Bolts
Courtesy of FORD MOTOR CO.

11. Install 6 new LH catalytic converter studs.
 - Tighten to 12 Nm (9 lb-ft).

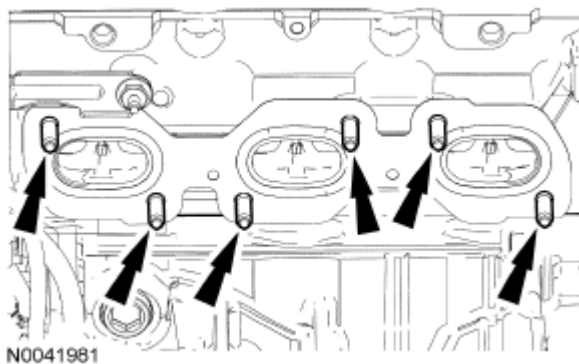


Fig. 434: Locating LH Catalytic Converter Studs
Courtesy of FORD MOTOR CO.

12. Install a new gasket, the LH catalytic converter and 6 new nuts.
 - Tighten to 20 Nm (15 lb-ft) in the sequence shown.

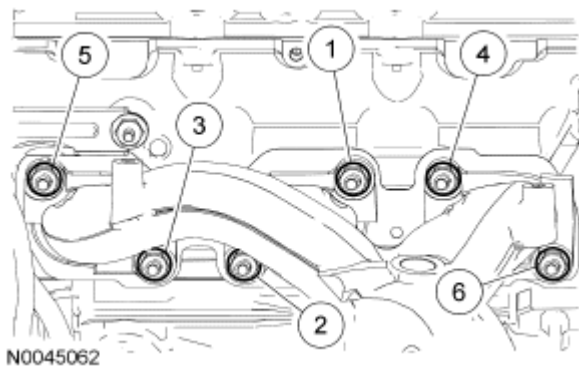


Fig. 435: Identifying Tightening Sequence Of LH Catalytic Converter Nuts
Courtesy of FORD MOTOR CO.

13. Install the LH catalytic converter bracket and the 2 bolts.
- Tighten to 20 Nm (15 lb-ft).

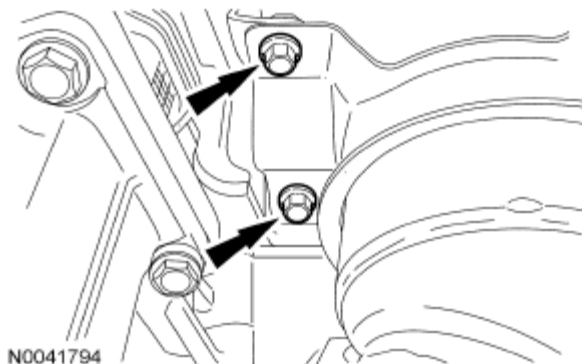


Fig. 436: Locating LH Catalytic Converter Bracket Bolts
Courtesy of FORD MOTOR CO.

14. Install the heat shield and the 4 bolts.
- Tighten to 11 Nm (8 lb-ft).

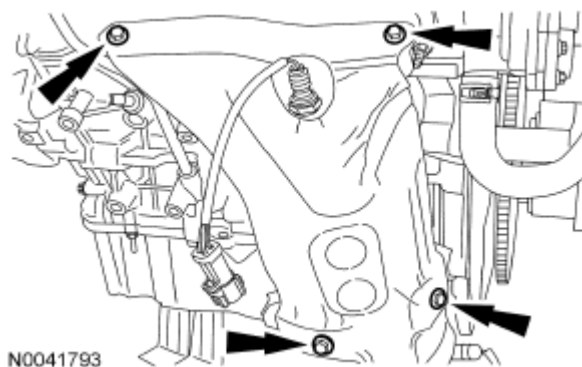


Fig. 437: Locating Heat Shield Bolts
Courtesy of FORD MOTOR CO.

15. Connect the LH heated oxygen sensor (HO2S) electrical connector and pin-type retainer.

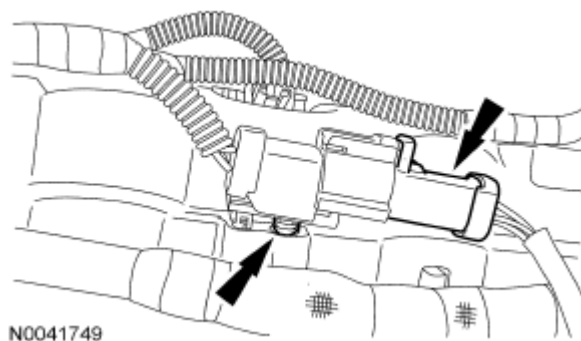


Fig. 438: Locating LH Heated Oxygen Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

16. Connect the LH catalyst monitor sensor (CMS) electrical connector.

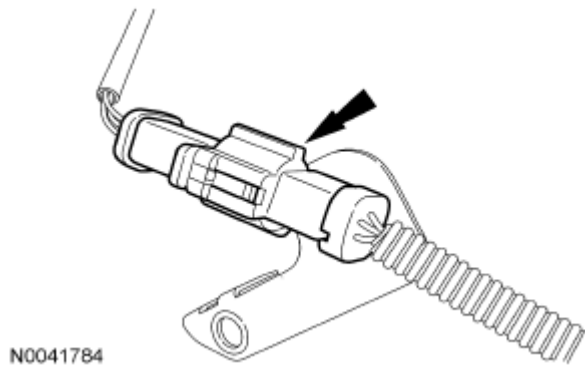


Fig. 439: Locating LH Catalyst Monitor Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

17. Install the starter motor and the 2 bolts.
- Tighten to 27 Nm (20 lb-ft).

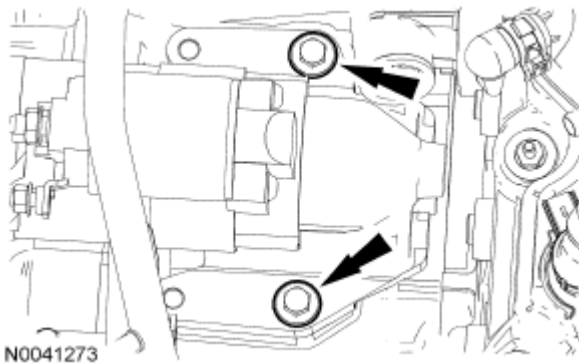


Fig. 440: Locating Starter Motor And Bolts
Courtesy of FORD MOTOR CO.

18. Connect the starter motor wiring and install the 2 nuts.
- Tighten the large nut to 12 Nm (9 lb-ft).
 - Tighten the small nut to 5 Nm (44 lb-in).

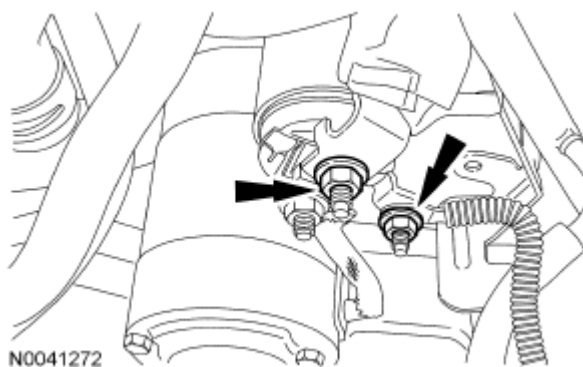


Fig. 441: Locating Starter Motor Wiring Nuts
Courtesy of FORD MOTOR CO.

19. Attach the wiring harness pin-type retainer.

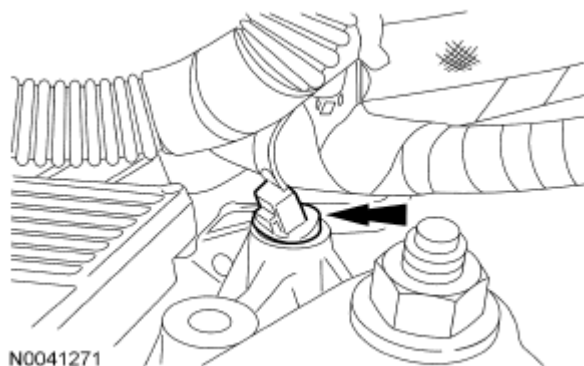


Fig. 442: Locating Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

20. Connect the transmission control module (TCM) electrical connector.

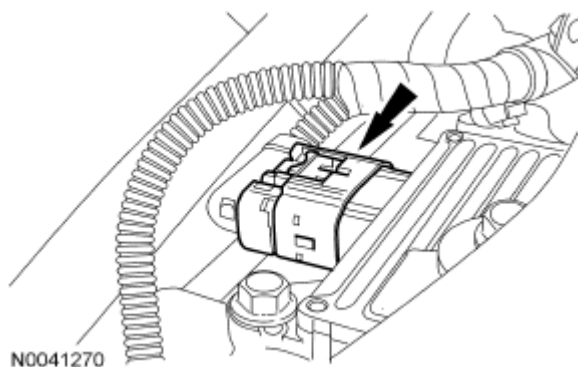


Fig. 443: Locating Transmission Control Module Electrical Connector
Courtesy of FORD MOTOR CO.

21. Install the CMS bracket and the bolt.

- Tighten to 12 Nm (9 lb-ft).

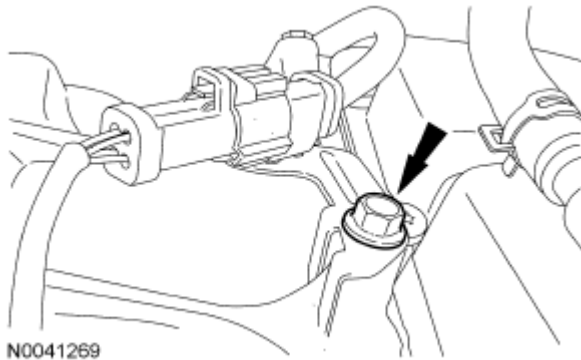


Fig. 444: Locating CMS Bracket And Bolt
Courtesy of FORD MOTOR CO.

22. Install the ground wire and the bolt.
 - Tighten to 12 Nm (9 lb-ft).

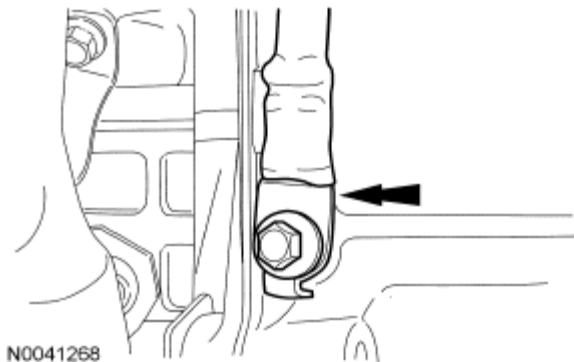


Fig. 445: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

23. Using the special tools and a suitable engine crane, position the engine and transaxle onto the lift table.

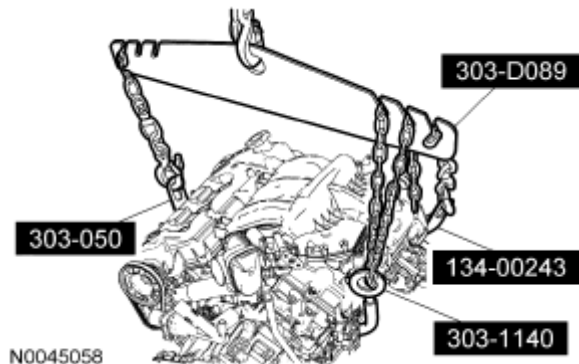


Fig. 446: Identifying Special Tools

Courtesy of FORD MOTOR CO.

NOTE: Position a suitable block of wood under the transaxle.

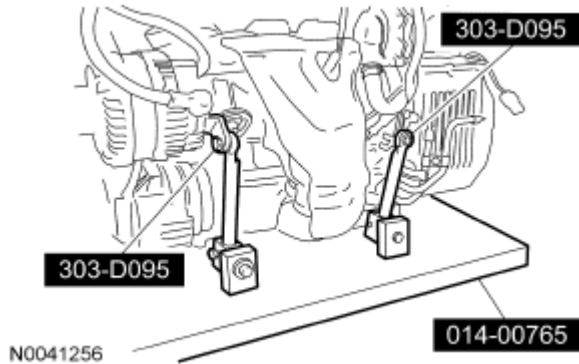


Fig. 447: Identifying Special Tools
Courtesy of FORD MOTOR CO.

24. Install the special tools.
25. Install the catalytic converter bracket assembly and the 2 bolts.
 - Tighten to 35 Nm (26 lb-ft).

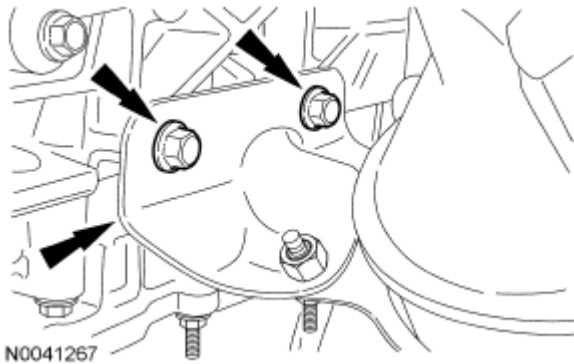


Fig. 448: Locating Catalytic Converter Bracket Assembly Bolts
Courtesy of FORD MOTOR CO.

26. Install the catalytic converter bracket and the 2 bolts.
 - Tighten to 20 Nm (15 lb-ft).

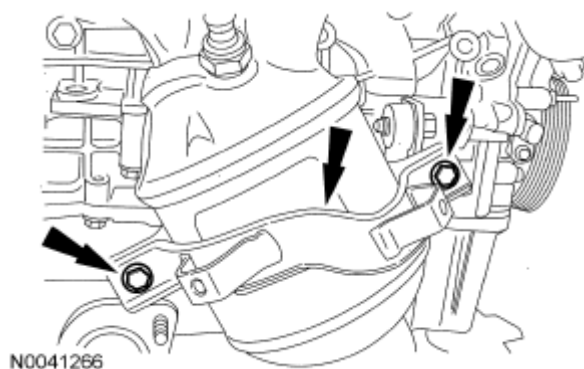


Fig. 449: Locating Catalytic Converter Bracket And Bolts
Courtesy of FORD MOTOR CO.

27. Install the heat shield and the 2 bolts.
- Tighten to 11 Nm (8 lb-ft).

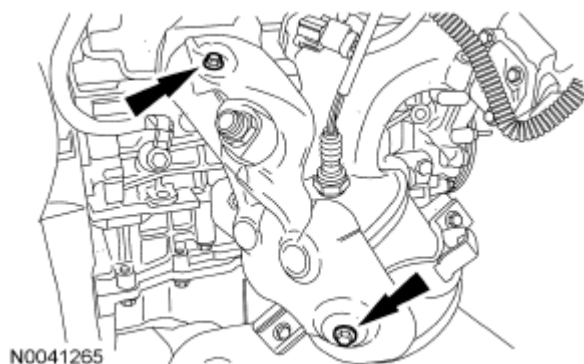


Fig. 450: Locating Heat Shield Bolts
Courtesy of FORD MOTOR CO.

28. Using a new gasket, install the EGR valve and the 2 bolts.
- Tighten to 25 Nm (18 lb-ft).

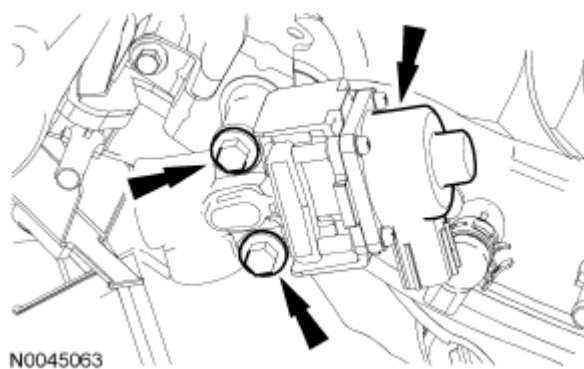


Fig. 451: Locating EGR Valve And Bolts
Courtesy of FORD MOTOR CO.

29. Install the EGR tube.

- Tighten both EGR tube nuts to 40 Nm (30 lb-ft).

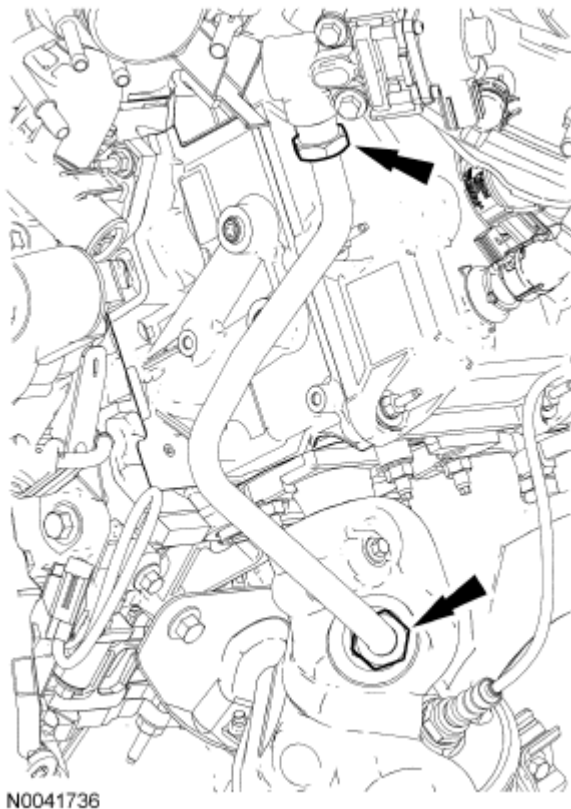


Fig. 452: Locating EGR Tube And Nuts
Courtesy of FORD MOTOR CO.

30. Connect the EGR valve electrical connector.

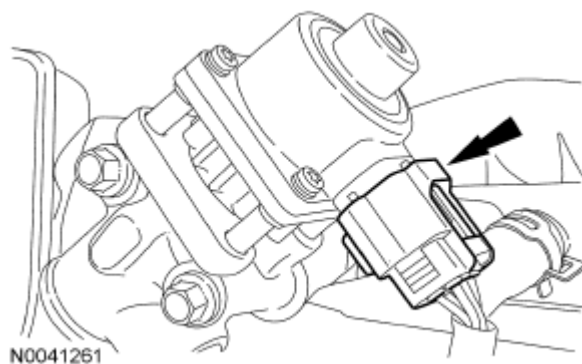


Fig. 453: Locating EGR Valve Electrical Connector
Courtesy of FORD MOTOR CO.

31. Position the power steering pressure (PSP) hose on the engine and install the PSP hose bracket-to-power

steering reservoir bolt.

- Tighten to 9 Nm (80 lb-in).

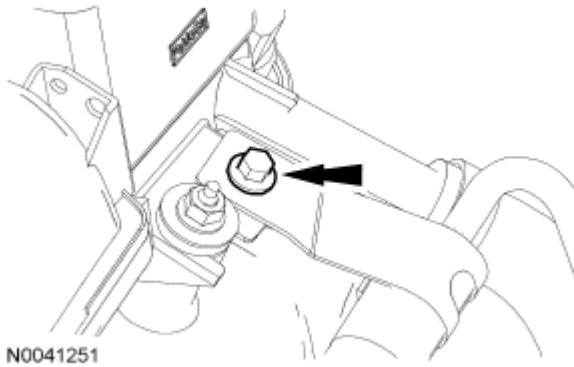


Fig. 454: Locating Power Steering Pressure Hose Bracket-To-Power Steering Reservoir Bolt
Courtesy of FORD MOTOR CO.

32. Using a new banjo bolt and 2 seals, connect the PSP hose to the power steering pump,
- Tighten to 35 Nm (26 lb-ft).

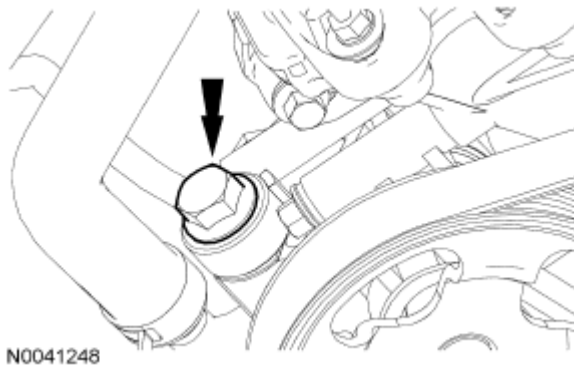


Fig. 455: Locating Banjo Bolt
Courtesy of FORD MOTOR CO.

33. Attach the PSP hose bracket to the cylinder head and install the bolt.
- Tighten to 9 Nm (80 lb-in).

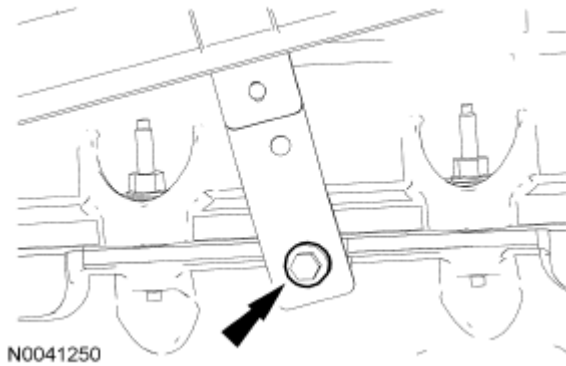


Fig. 456: Locating PSP Hose Bracket To Cylinder Head Bolt
Courtesy of FORD MOTOR CO.

34. Attach the HO2S electrical connector to the PSP bracket.

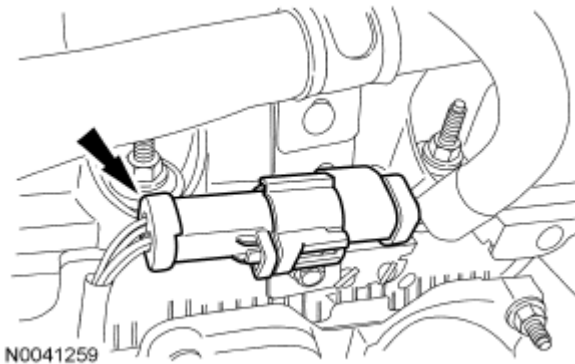


Fig. 457: Locating HO2S Electrical Connector To PSP Bracket
Courtesy of FORD MOTOR CO.

35. Attach the PSP hose bracket to the cylinder head and install the bolt.
- Tighten to 9 Nm (80 lb-in).

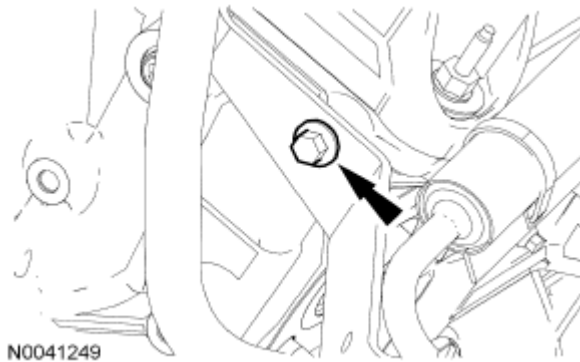


Fig. 458: Locating PSP Hose Bracket To Cylinder Head Bolt
Courtesy of FORD MOTOR CO.

36. Attach the wiring harness retainer to the PSP hose bracket.

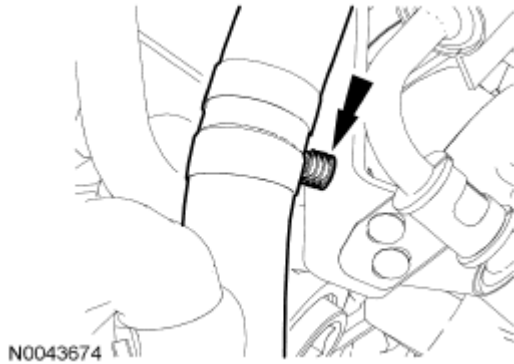


Fig. 459: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

37. Raise the engine and transaxle up into the vehicle.
38. Install the engine mount bracket, 3 nuts and the bolt.
- Tighten the nuts to 63 Nm (46 lb-ft).
 - Tighten the bolt to 115 Nm (85 lb-ft).

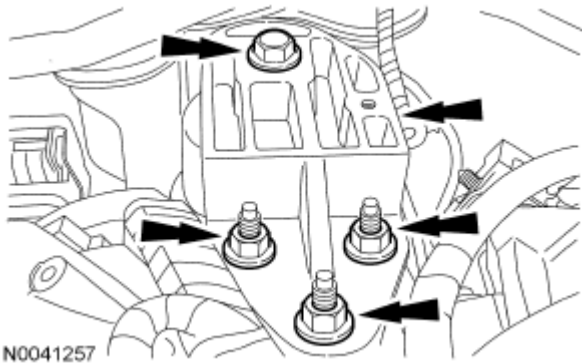


Fig. 460: Locating Engine Mount Bracket, Nuts And Bolt
Courtesy of FORD MOTOR CO.

39. Install the damper and bolt.
- Tighten to 23 Nm (17 lb-ft).

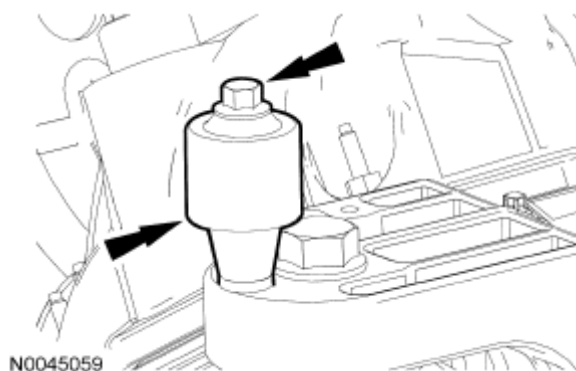


Fig. 461: Locating Damper And Bolt
Courtesy of FORD MOTOR CO.

40. Install the 2 transaxle mount bolts.
 - Tighten to 90 Nm (66 lb-ft).

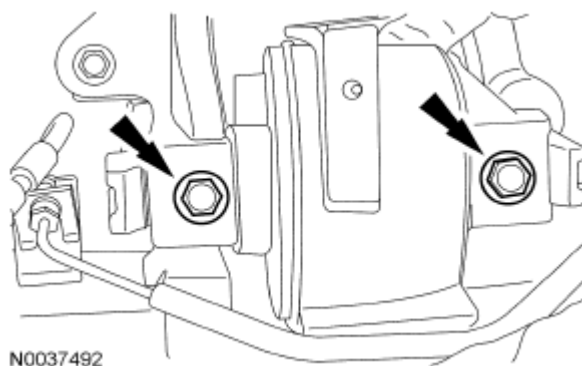


Fig. 462: Locating Transaxle Mount Bolts
Courtesy of FORD MOTOR CO.

41. Install the 3 torque converter nuts.
 - Tighten to 36 Nm (27 lb-ft).

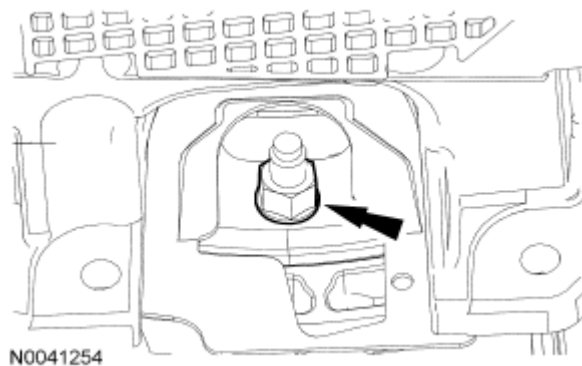


Fig. 463: Locating Torque Converter Nuts
Courtesy of FORD MOTOR CO.

42. Install the torque converter nut access plug.

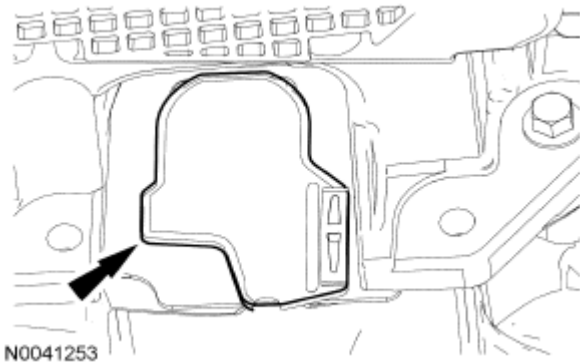


Fig. 464: Locating Torque Converter Nut Access Plug
Courtesy of FORD MOTOR CO.

43. Install the RH halfshaft into the transaxle.

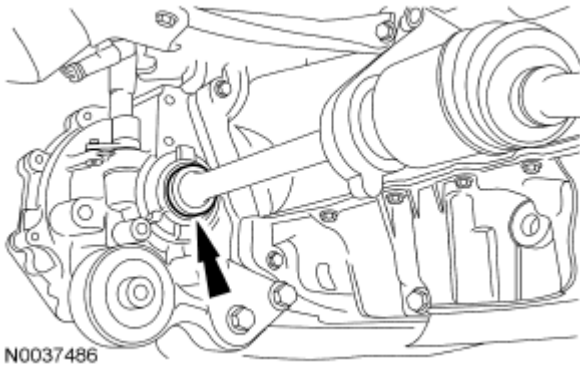


Fig. 465: Locating RH Halfshaft Into Transaxle
Courtesy of FORD MOTOR CO.

44. Install the 2 RH halfshaft carrier bearing bracket bolts.
- Tighten to 55 Nm (41 lb-ft).

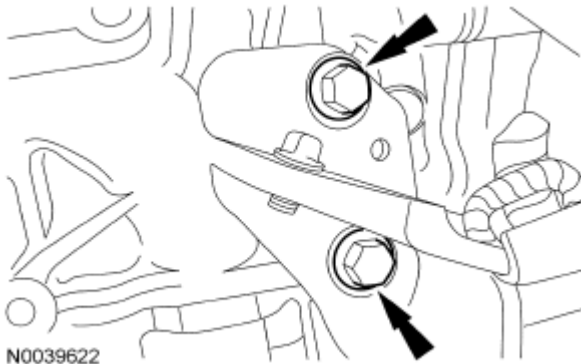


Fig. 466: Locating RH Halfshaft Carrier Bearing Bracket Bolts

Courtesy of FORD MOTOR CO.

45. Connect the CMS electrical connector and pin-type retainer.

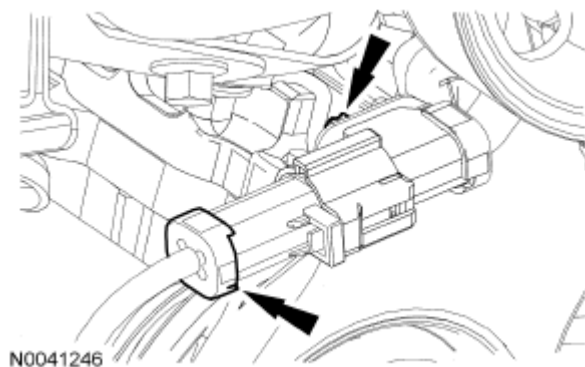


Fig. 467: Locating CMS Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

46. Connect the PSP switch electrical connector.

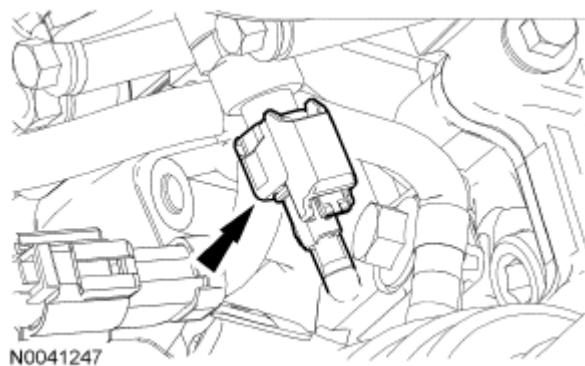


Fig. 468: Locating PSP Switch Electrical Connector
Courtesy of FORD MOTOR CO.

47. Connect the crankshaft position (CKP) sensor electrical connector and pin-type retainer.

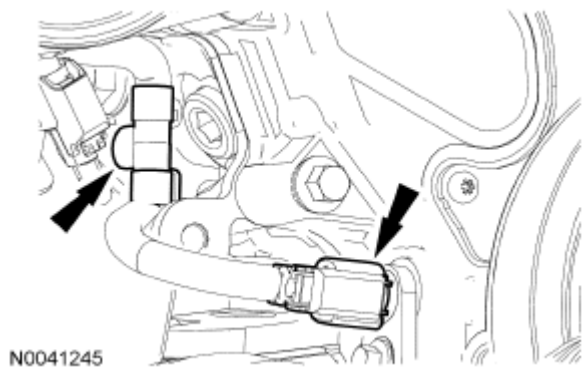


Fig. 469: Locating Crankshaft Position Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

CAUTION: Install a new circlip on the LH halfshaft is removed from the transaxle.

NOTE: Start one end of the circlip in the groove and work the circlip over the halfshaft and into the groove to prevent the circlip from overexpanding.

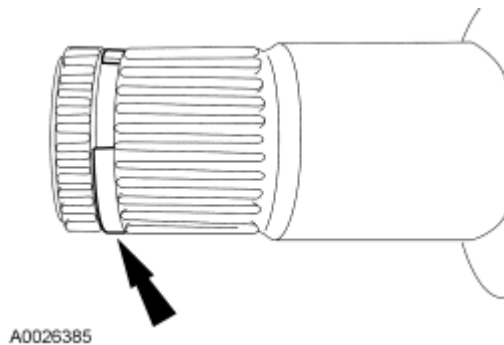


Fig. 470: Locating Halfshaft Circlip
Courtesy of FORD MOTOR CO.

48. Install a new circlip in the groove on the LH halfshaft.
49. Install the LH halfshaft into the transaxle.
50. Position the A/C manifold onto the A/C compressor and install the bolt.
 - Tighten to 15 Nm (11 lb-ft).

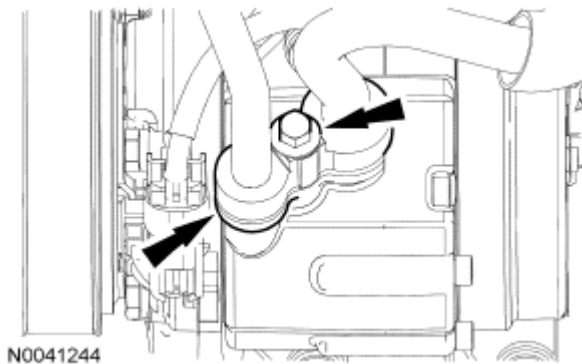


Fig. 471: Locating A/C Manifold Onto A/C Compressor And Bolt
Courtesy of FORD MOTOR CO.

51. Install the ground wire and bolt to the engine mount bracket.
 - Tighten to 10 Nm (89 lb-in).

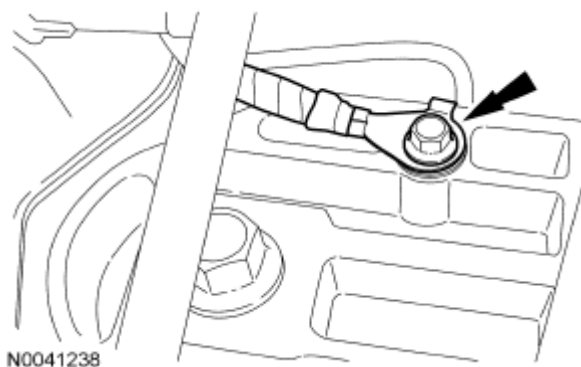


Fig. 472: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

52. Connect the A/C tubes and install the 2 nuts.
- Tighten to 8 Nm (71 lb-in).

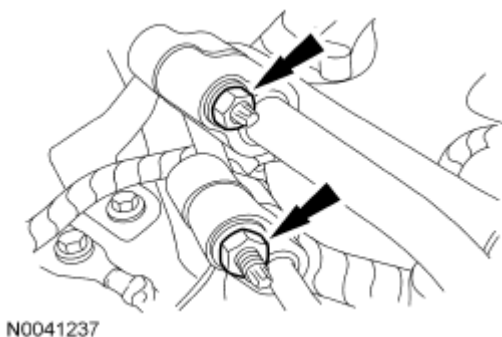


Fig. 473: Locating A/C Tubes And Nuts
Courtesy of FORD MOTOR CO.

53. Install the 2 A/C tube bracket bolts.
- Tighten to 10 Nm (89 lb-in).

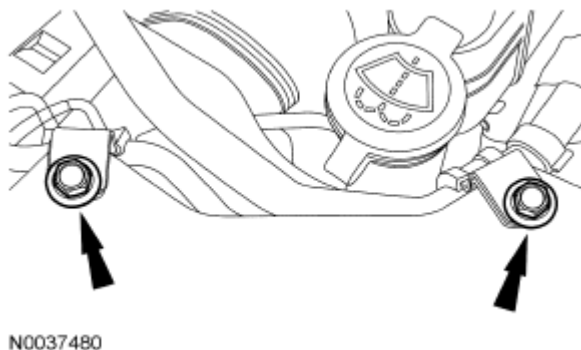


Fig. 474: Locating A/C Tube Bracket Bolts
Courtesy of FORD MOTOR CO.

54. Attach the coolant hose retaining clip.

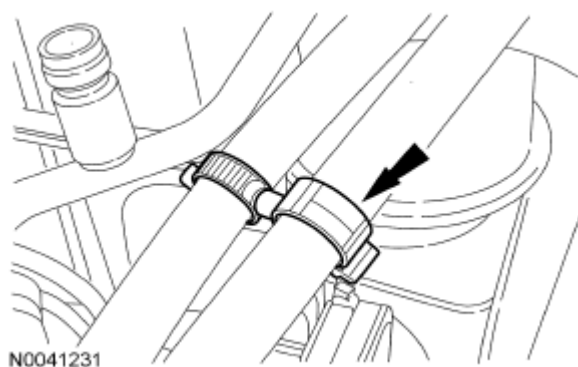


Fig. 475: Locating Coolant Hose Retaining Clip
Courtesy of FORD MOTOR CO.

55. Connect the coolant hose to the degas bottle.

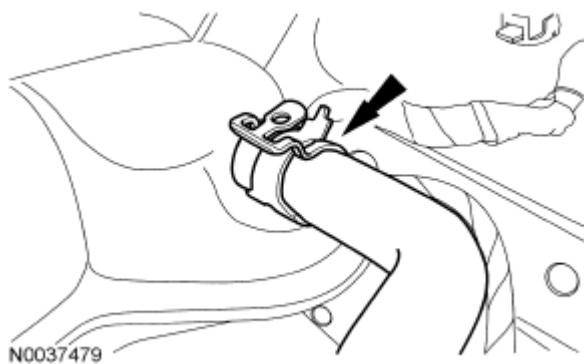


Fig. 476: Locating Coolant Hose To Degas Bottle
Courtesy of FORD MOTOR CO.

56. Attach the power steering hose retaining clip to the engine wiring harness and the LH valve cover stud bolt.

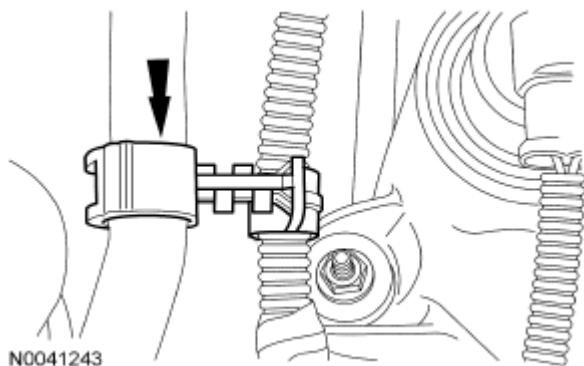


Fig. 477: Locating Power Steering Hose Retaining Clip

Courtesy of FORD MOTOR CO.

57. Connect the power steering hose to the power steering reservoir.

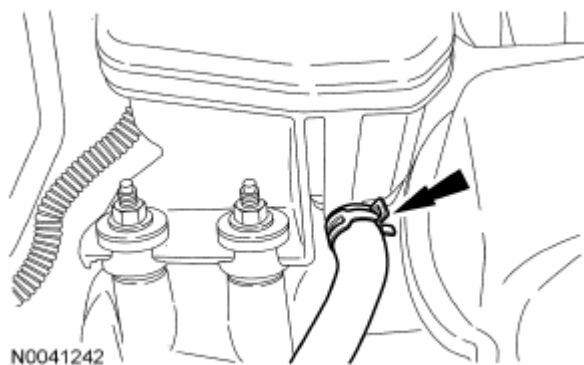


Fig. 478: Locating Power Steering Hose To Power Steering Reservoir Clamp
Courtesy of FORD MOTOR CO.

58. If equipped, attach the block heater cable retaining clips to the cooling fan shroud.

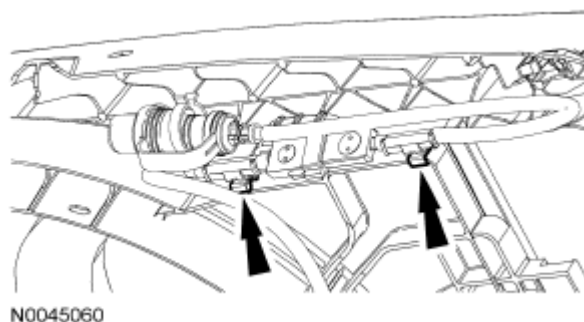


Fig. 479: Locating Block Heater Cable Retaining Clips
Courtesy of FORD MOTOR CO.

59. Connect the vacuum hose to the intake manifold.

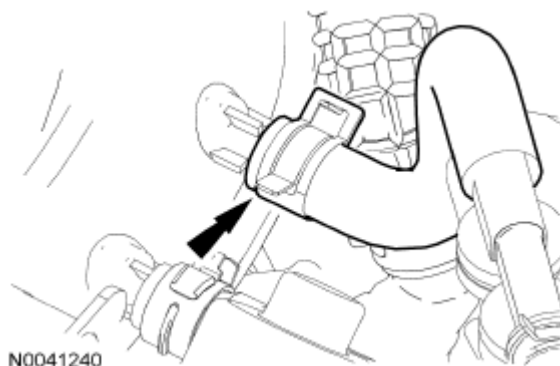


Fig. 480: Locating Vacuum Hose To Intake Manifold Clamp

Courtesy of FORD MOTOR CO.

60. Install the vacuum tube bracket bolt.

- Tighten to 10 Nm (89 lb-in).

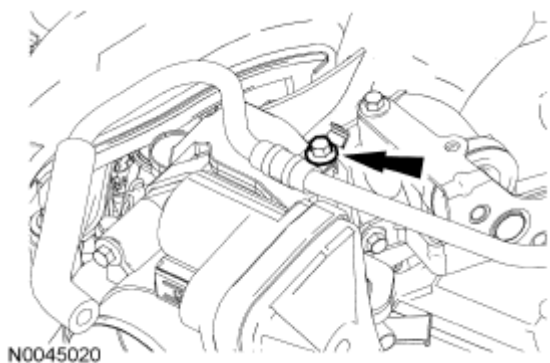


Fig. 481: Locating Vacuum Tube Bracket Bolt
Courtesy of FORD MOTOR CO.

61. Install the ground wire and bolt.

- Tighten to 12 Nm (9 lb-ft).

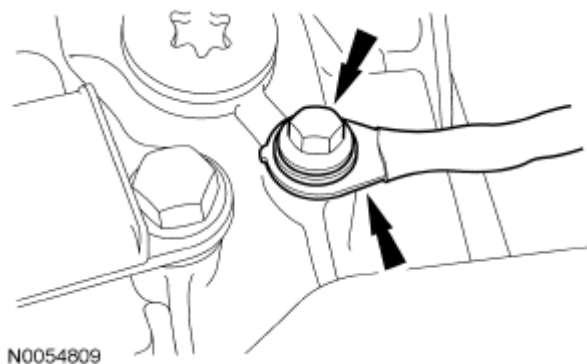


Fig. 482: Locating Ground Wire And Bolt
Courtesy of FORD MOTOR CO.

62. Install the transaxle control cable bracket and the 3 bolts.

- Tighten to 8 Nm (71 lb-in).

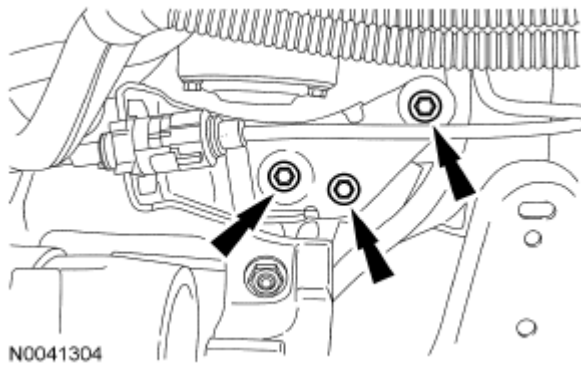


Fig. 483: Locating Transaxle Control Cable Bracket Bolts
Courtesy of FORD MOTOR CO.

63. Connect the transaxle control cable to the transaxle selector lever.

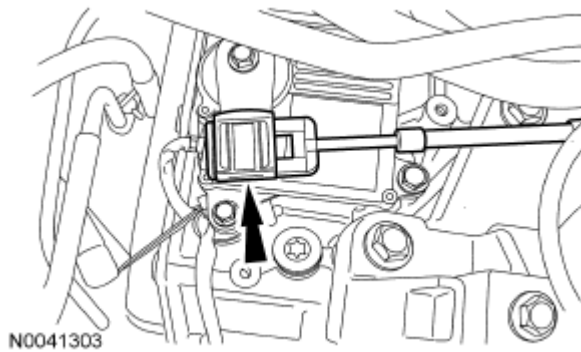


Fig. 484: Locating Transaxle Control Cable To Transaxle Selector Lever
Courtesy of FORD MOTOR CO.

64. Connect the upper and lower radiator hoses to the thermostat housing.

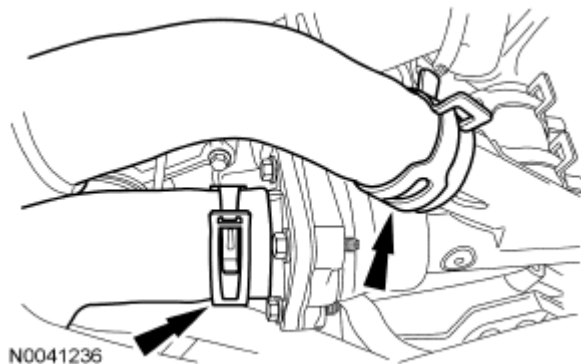


Fig. 485: Locating Upper And Lower Radiator Hoses To Thermostat Housing
Courtesy of FORD MOTOR CO.

65. Connect the evaporative emissions (EVAP) hose.

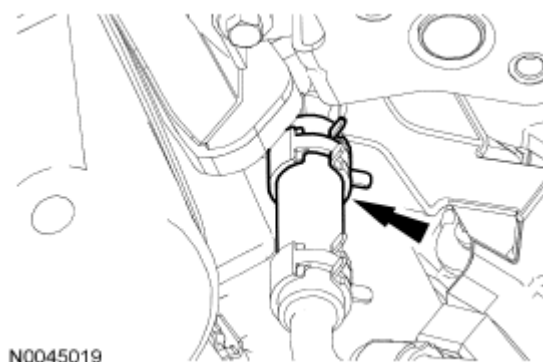


Fig. 486: Locating Evaporative Emissions (EVAP) Hose
Courtesy of FORD MOTOR CO.

66. Connect the throttle body coolant hose.

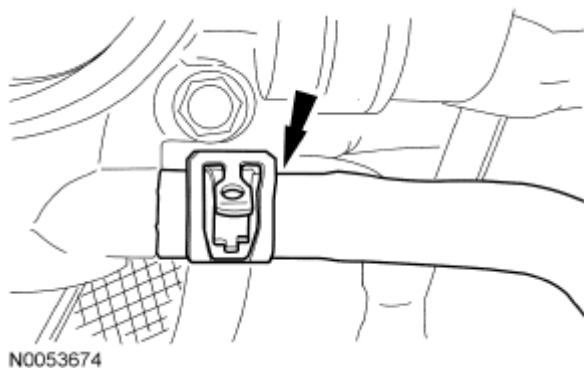


Fig. 487: Locating Throttle Body Coolant Hose
Courtesy of FORD MOTOR CO.

67. Connect the heater hose inline connection.

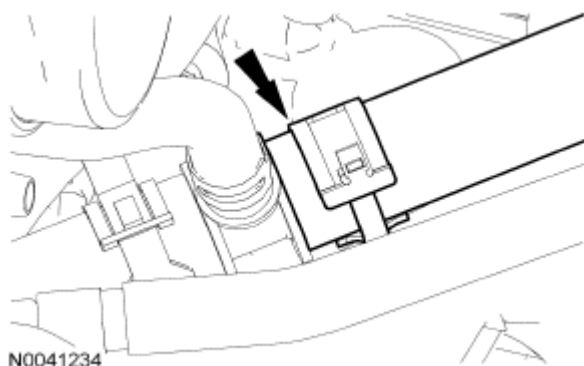


Fig. 488: Locating Heater Hose Inline Connection
Courtesy of FORD MOTOR CO.

68. Connect the heater hose to the thermostat housing.

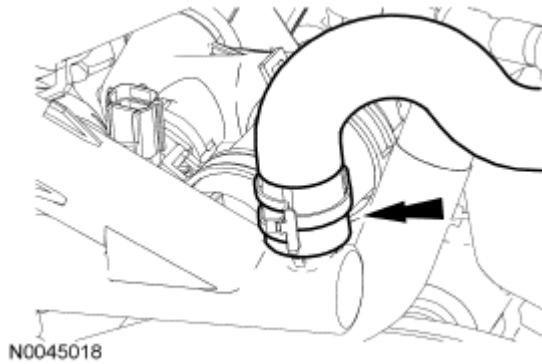


Fig. 489: Locating Heater Hose To Thermostat Housing
Courtesy of FORD MOTOR CO.

69. Connect the fuel supply tube to the fuel rail. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION**.
70. Connect the powertrain control module (PCM) electrical connector and the pin-type retainer.

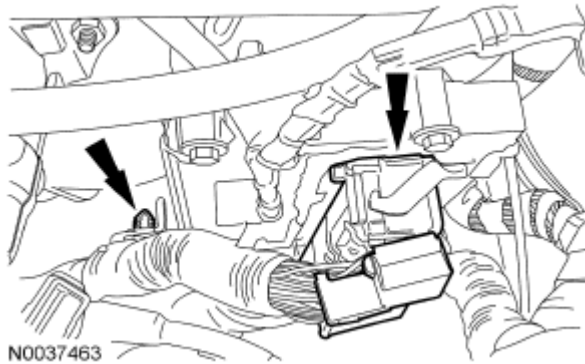


Fig. 490: Locating Powertrain Control Module Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

71. Install the ground wire and bolt.
 - Tighten to 10 Nm (89 lb-in).

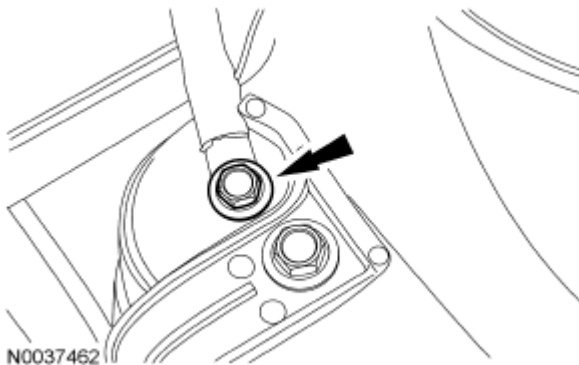


Fig. 491: Locating Ground Wire And Bolt

Courtesy of FORD MOTOR CO.

72. Connect the 2 engine wiring harness electrical connectors.

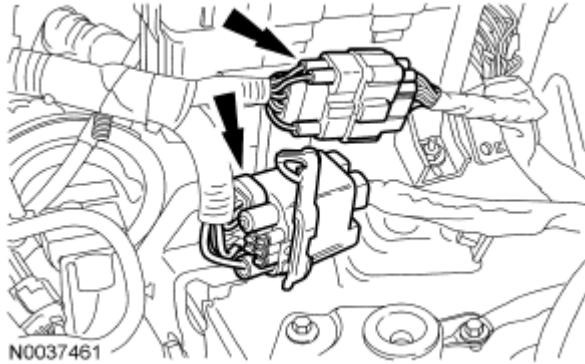


Fig. 492: Locating Engine Wiring Harness Electrical Connectors
Courtesy of FORD MOTOR CO.

73. Connect the power feed to the battery terminal and install the nut.
- Tighten to 6 Nm (53 lb-in).

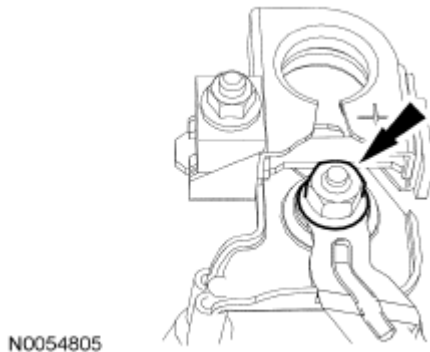


Fig. 493: Locating Power Feed To Battery Terminal And Nut
Courtesy of FORD MOTOR CO.

74. Install the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
75. Install the engine air cleaner and air cleaner outlet pipe. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING - 2.3L** .

NOTE: Lubricate the engine oil filter gasket with clean engine oil prior to installing.

76. Install a new engine oil filter.
- Tighten to 5 Nm (44 lb-in) and then rotate an additional 180 degrees.

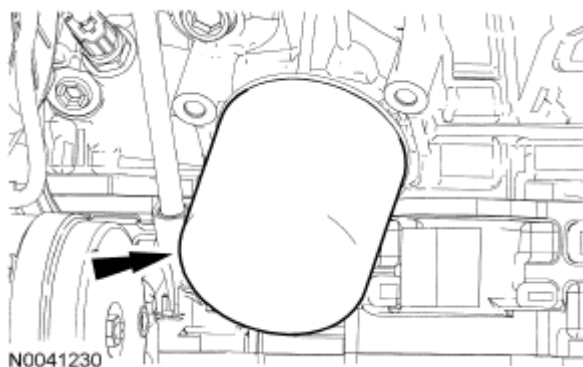


Fig. 494: Locating Engine Oil Filter
Courtesy of FORD MOTOR CO.

77. Connect the transaxle cooler hoses.

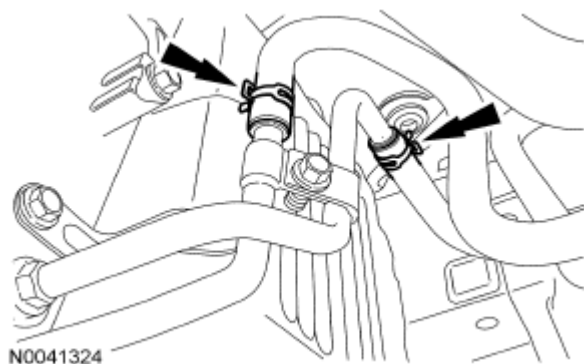


Fig. 495: Locating Transaxle Cooler Hoses Clamps
Courtesy of FORD MOTOR CO.

78. Place the subframe assembly on the special tool and raise the subframe into the installed position.

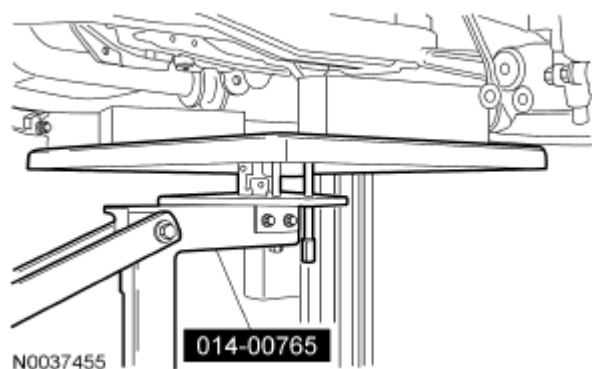


Fig. 496: Identifying Special Tools (014-00765)
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

79. Install the front subframe nuts.

- Tighten to 150 Nm (111 lb-ft).

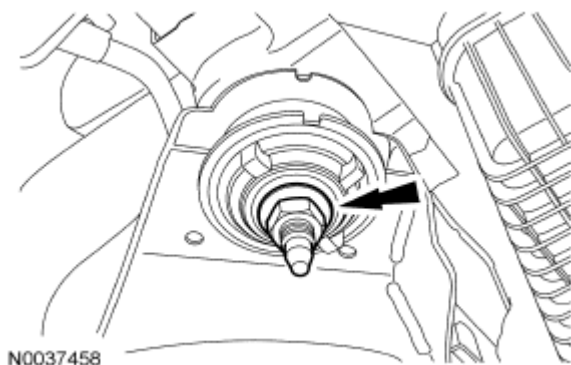


Fig. 497: Locating Front Subframe Nuts
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

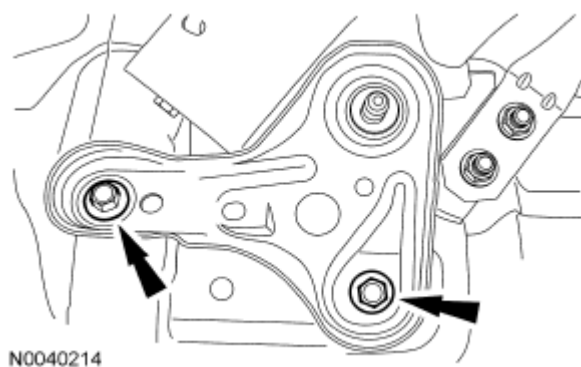


Fig. 498: Locating Subframe Brackets And Bolts Finger-Tight
Courtesy of FORD MOTOR CO.

80. Position the subframe brackets and install the bolts finger-tight.

NOTE: LH shown, RH similar.

81. Install the subframe nuts.

- Tighten to 150 Nm (111 lb-ft).

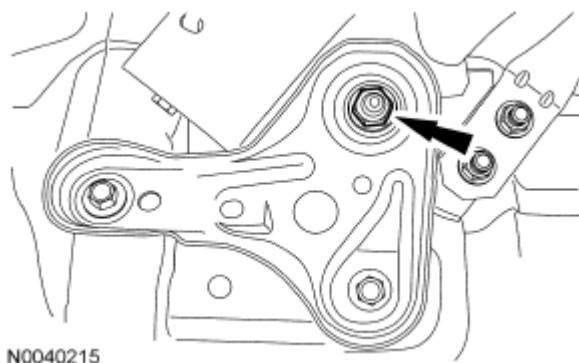


Fig. 499: Locating Subframe Nuts
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

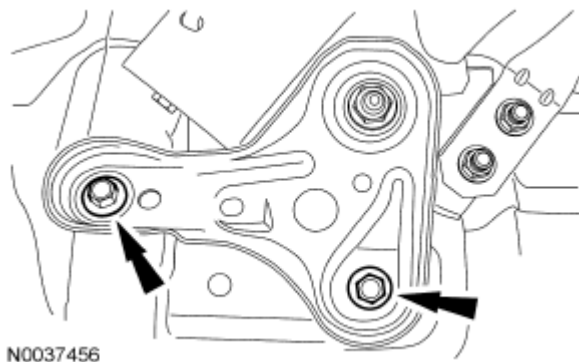
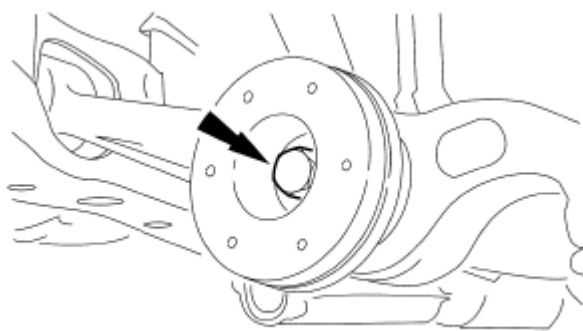


Fig. 500: Locating Subframe Bracket-To-Body Bolts
Courtesy of FORD MOTOR CO.

82. Tighten the subframe bracket-to-body bolts to 103 Nm (76 lb-ft).

NOTE: LH shown, RH similar.

83. Install the through bolts into the lower control arms.
- Tighten to 103 Nm (76 lb-ft).

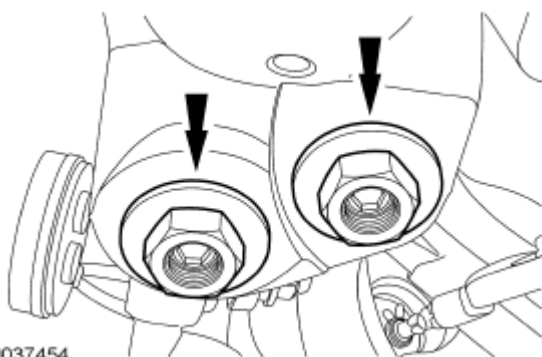


N0037453

Fig. 501: Locating Through Bolts Into Lower Control Arms
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

84. Install the lower ball joint nuts.
- Tighten to 200 Nm (148 lb-ft).



N0037454

Fig. 502: Locating Lower Ball Joint Nuts
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

85. Install the stabilizer bar links and nuts to the struts.
- Tighten to 40 Nm (30 lb-ft).

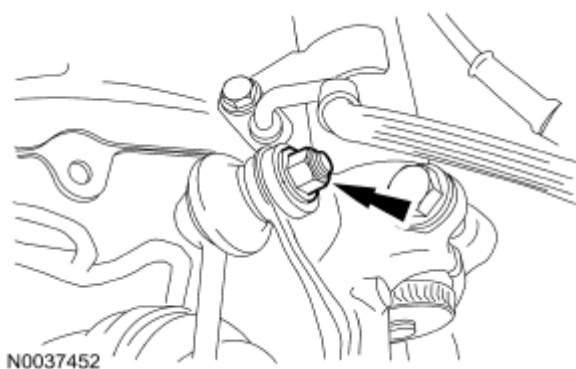


Fig. 503: Locating Stabilizer Bar Links And Nuts To Struts
Courtesy of FORD MOTOR CO.

86. Connect the power steering cooler tube.

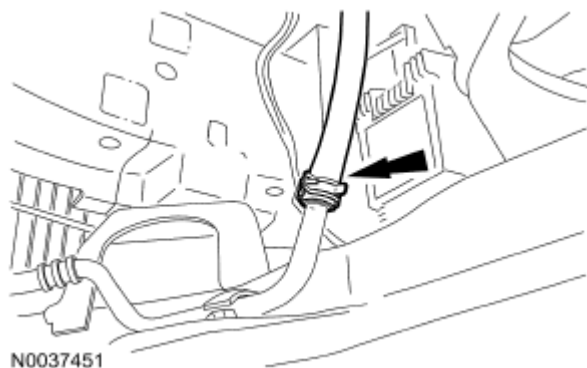


Fig. 504: Locating Power Steering Cooler Tube
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

87. Install tie-rod ends and nuts.
- Tighten to 48 Nm (35 lb-ft).
 - Install the cotter pin.

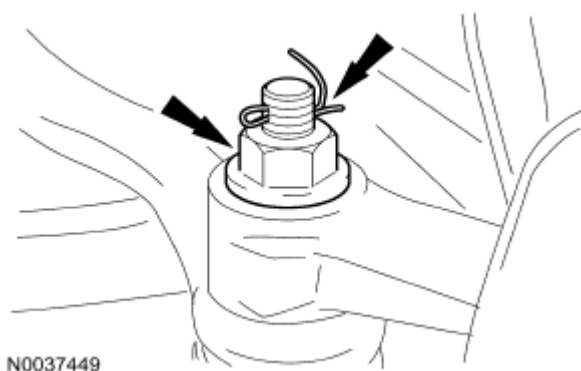


Fig. 505: Locating Tie-Rod Ends And Nuts
Courtesy of FORD MOTOR CO.

88. Install the LH splash shield and the 6 pin-type retainers (4 shown).

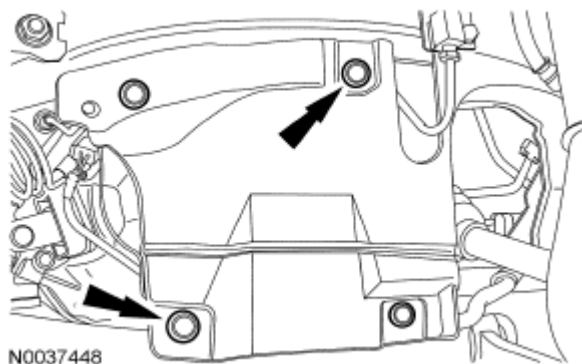


Fig. 506: Locating LH Splash Shield And Pin-Type Retainers
Courtesy of FORD MOTOR CO.

89. Position the LH fender splash shield and install the 4 screws.

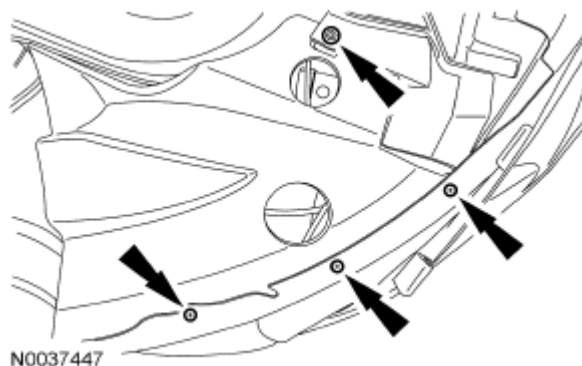


Fig. 507: Locating LH Fender Splash Shield And Screws
Courtesy of FORD MOTOR CO.

90. Install the RH splash shield and the 6 pin-type retainers (4 shown).

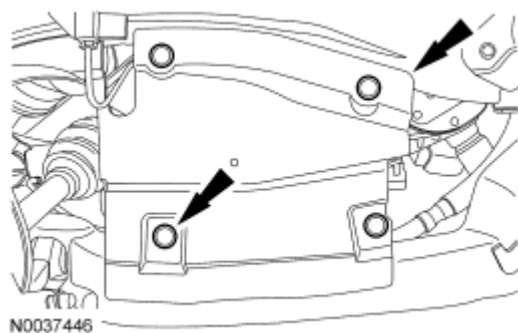


Fig. 508: Locating Splash Shield Pin-Type Retainers
Courtesy of FORD MOTOR CO.

91. Position the RH fender splash shield and install the 4 screws.

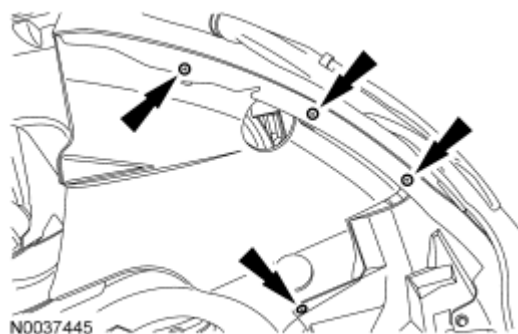


Fig. 509: Locating RH Fender Splash Shield Screws
Courtesy of FORD MOTOR CO.

92. Install the engine roll restrictor and the 2 bolts.
 - Tighten to 90 Nm (66 lb-ft).

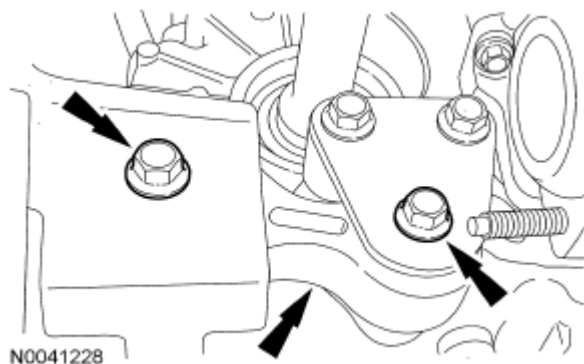


Fig. 510: Locating Engine Roll Restrictor And Bolts
Courtesy of FORD MOTOR CO.

93. Install the heat shield and the 2 bolts.

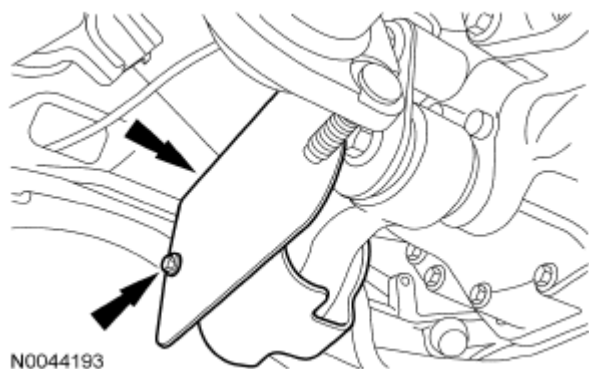


Fig. 511: Locating Heat Shield And Bolts
Courtesy of FORD MOTOR CO.

94. Using a new banjo bolt and 2 seals, connect the PSP hose to the power steering gear.
 - Tighten to 35 Nm (26 lb-ft).

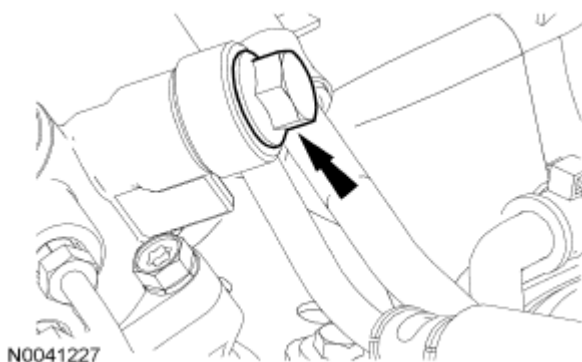


Fig. 512: Locating Banjo Bolt
Courtesy of FORD MOTOR CO.

95. Position the PSP hose onto the steering gear and install the PSP hose bracket bolt.
 - Tighten to 9 Nm (80 lb-in).

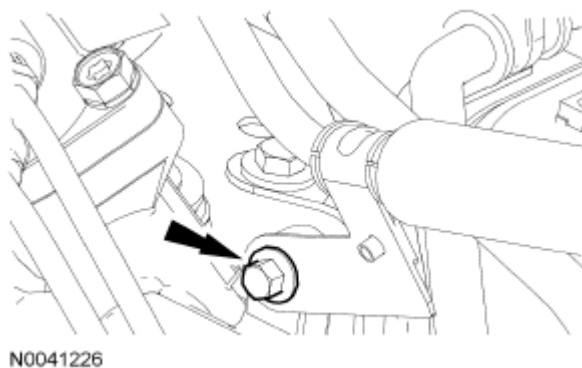


Fig. 513: Locating PSP Hose Bracket Bolt
Courtesy of FORD MOTOR CO.

96. Slide the steering gear-to-dash seal onto the steering gear and engage the 4 retaining clips into the body.
- From under the vehicle, verify that the seal is properly installed on the steering gear and the retaining clips are fully engaged into the body.

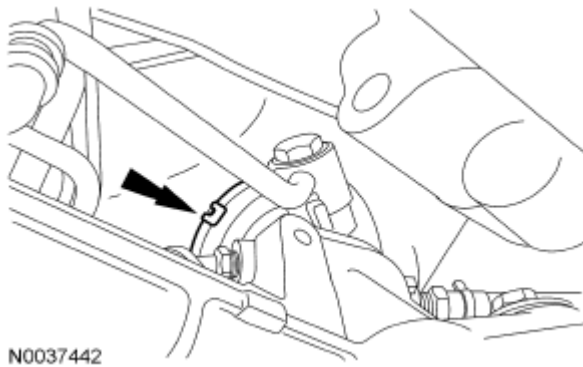


Fig. 514: Locating Retaining Clips
Courtesy of FORD MOTOR CO.

97. Install the exhaust flexible pipe. For additional information, refer to **EXHAUST SYSTEM**.
98. If equipped, install the underbody cover and 7 screws.

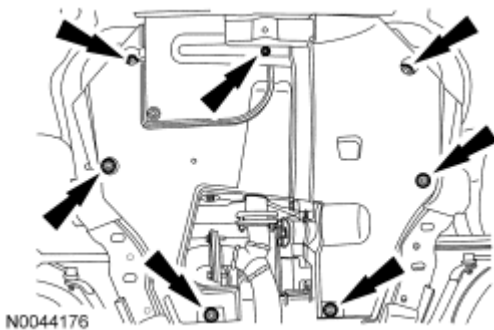


Fig. 515: Locating Underbody Cover Screws
Courtesy of FORD MOTOR CO.

NOTE: Align the index marks made during removal.

99. Install the steering intermediate shaft onto the steering gear and install the bolt.
- Tighten to 23 Nm (17 lb-ft).

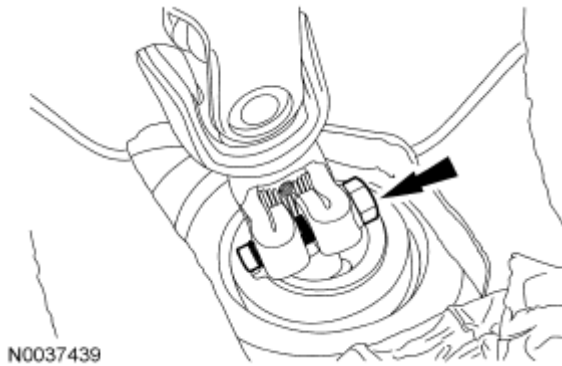


Fig. 516: Locating Steering Gear Bolt
Courtesy of FORD MOTOR CO.

100. Install the steering joint cover and the 2 nuts.

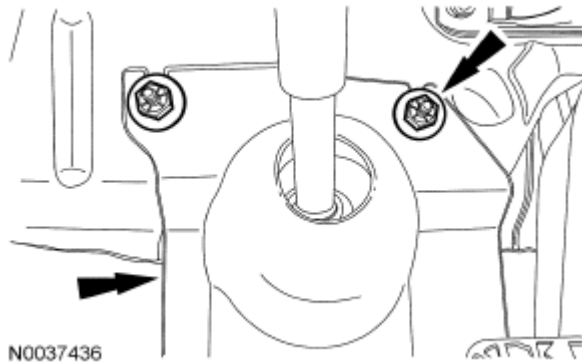


Fig. 517: Locating Steering Joint Cover And Nuts
Courtesy of FORD MOTOR CO.

101. Fill the engine with clean engine oil.
102. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
103. Fill and bleed the cooling system. For additional information, refer to **ENGINE COOLING** .
104. Fill the power steering system. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION** .
105. Check the transaxle fluid and add fluid if necessary. For additional information, refer to the **TRANSMISSION FLUID DRAIN AND REFILL** procedure in .
106. Recharge the air conditioning system. For additional information, refer to **CLIMATE CONTROL SYSTEM-GENERAL INFORMATION AND DIAGNOSTICS** .