

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

2005 ENGINE**Engine - 2.0L & 2.3L - Focus****SPECIFICATIONS****GENERAL SPECIFICATIONS****GENERAL SPECIFICATIONS (2.0L)**

Item	Specification
Engine	
Displacement	2.0L
No. of cylinders	4
Bore/stroke	87.5/83.1
Firing order	1-3-4-2
Oil pressure (hot @ 2,000 RPM)	200-268 kPa (29-39 psi)
Belt tension	Refer to ACCESSORY DRIVE .
Oil capacity	3.9L + 0.38L (4.1 qt + 0.4 qt) with filter
Cylinder Block	
Cylinder bore diameter	87.5-87.53 mm (3.444-3.445 in)
Cylinder bore maximum out-of-round	0.008 mm (0.0003 in)
Main bearing bore diameter	57.020-57.038 mm (2.244-2.245 in)
Head gasket surface flatness	0.1 mm/general 0.05 mm/200 x 200 (0.004 in/general) (0.0019 in/7.87 x 7.87)
Piston	
Diameter (1)	87.5-87.51 mm (3.444-3.445 in)
Diameter (2)	87.51-87.52 mm (3.4452-3.4456 in)
Diameter (3)	87.52-87.53 mm (3.444-3.446 in)
Piston-to-bore clearance	0.025-0.045 mm (0.0009-0.0017 in)
Ring groove width - top	1.203-1.205 mm (0.0473-0.0474 in)
Ring groove width - 2nd	1.17-1.19 mm (0.0460-0.0468 in)
Ring groove width - oil	2.501-2.503 mm (0.0984-0.0985 in)
Piston skirt coating thickness	0.008-0.020 mm (0.0003-0.0007 in)
Piston Pin	
Diameter	20.995-21.0 mm (0.8266-0.8268 in)
Length	59.6-60.4 mm (2.346-2.377 in)
Piston-to-pin clearance	0.008-0.016 mm (0.0003-0.0006 in)
Pin-to-rod clearance	Press fit
Cylinder Head	
Valve lift @ zero lash (exhaust)	7.7 mm (0.30 in)

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Valve lift @ zero lash (intake)	8.8 mm (0.35 in)
Valve guide diameter	5.509-5.539 mm (0.216-0.218 in)
Valve seat width - intake/exhaust	0.99-1.84 mm (0.038-0.072 in)
Valve seat angle	45 degrees
Valve seat runout	0.075 mm (0.0029 in)
Valve lash adjuster bore diameter	31.00-31.03 mm (1.220-1.221 in)
Cam bore diameter	25.015-25.040 mm (0.984-0.985 in)
Valve	
Valve head diameter - intake	34.85-35.15 mm (1.372-1.383 in)
Valve head diameter - exhaust	29.85-30.15 mm (1.175-1.187 in)
Valve stem diameter - intake	5.470-5.485 mm (0.2153-0.2159 in)
Valve stem diameter - exhaust	5.465-5.480 mm (0.2151-0.2157 in)
Valve stem-to-guide clearance - intake	0.0027 mm (0.0001 in)
Valve stem-to-guide clearance - exhaust	0.0029 mm (0.00011 in)
Valve face runout	0.05 mm (0.001 in)
Valve face angle	45 degrees
Valve Spring - Compression Pressure	
Intake and exhaust (installed)	17.5 kg (38.667 lbs)
Intake (valve open) 8.9 mm (0.35 in) of lift	44 kg (97.032 lbs)
Exhaust (valve open) 7.4 mm (0.29 in) of lift	42 kg (93.338 lbs)
Free length	44.92 mm (1.768 in)
Assembled height	37.9 mm (1.492 in)
Crankshaft	
Main bearing journal diameter	51.980-52.000 mm (2.046-2.047 in)
Production repair	51.730-51.750 mm (2.036-2.037 in)
Main bearing clearance	0.019-0.035 mm (0.0007-0.0013 in)
Connecting rod journal diameter	49.980-50.000 mm (1.967-1.968 in)
Production repair	49.730-49.750 mm (1.957-1.958 in)
End play	0.22-0.43 mm (0.008-0.016 in)
Rings	
Width - top	1.17-1.185 mm (0.0460-0.0466 in)
Width - 2nd	1.197-1.199 mm (0.0471-0.0472 in)
Width - oil	2.38-2.45 mm (0.093-0.096 in)
Ring gap (in bore) - top	0.16-0.31 mm (0.006-0.012 in)
Ring gap (in bore) - 2nd	0.33-0.48 mm (0.012-0.018 in)
Ring gap (in bore) - oil	0.2-0.7 mm (0.007-0.027 in)
Valve Tappet	

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Diameter	30.97-30.98 mm (1.2192-1.2196 in)
Tappet-to-valve clearance - intake	0.22- 0.28 mm (0.008-0.011 in)
Tappet-to-valve clearance - exhaust	0.27-0.33 mm (0.010-0.013 in)
Tappet-to-bore clearance	0.02-0.06 mm (0.0007-0.0023 in)
Camshaft	
Lobe lift - intake	8.24999 mm (0.324 in)
Lobe lift - exhaust	7.80007 mm (0.307 in)
Runout (l) ⁽¹⁾	0.03 mm (0.001 in)
Thrust clearance	0.09-0.24 mm (0.003-0.009 in)
Journal diameter	24.96-24.98 mm (0.982-0.983 in)
Journal-to-bore clearance	0.035-0.080 mm (0.001-0.003 in)
Connecting Rod	
Bearing clearance	0.027-0.052 (0.001-0.002 in)
Bearing thickness	1.496-1.520 mm (0.058-0.059 in)
Crank bore diameter	53.025-53.045 mm (2.087-2.088 in)
Pin bore diameter	20.965-20.985 mm (0.825-0.826 in)
Length (center to center)	154.8 mm (6.094 in)
Side clearance	1.95-3.05 mm (0.076-0.120 in)
Axial clearance	0.14-0.36 mm (0.005-0.014 in)
(1) No. 3 Journal - Supported by No. 1 and No. 5 journals.	

GENERAL SPECIFICATIONS (2.3L)

Item	Specification
Engine	
Displacement	2.3L
No. of cylinders	4
Bore/stroke	87.5/94.0
Firing order	1-3-4-2
Oil pressure (hot @ 2,000 RPM)	200-268 kPa (29-39 psi)
Belt tension	Refer to ACCESSORY DRIVE .
Oil capacity	3.9L + 0.38L (4.1 qt + 0.4 qt) with filter
Cylinder Block	
Cylinder bore diameter	87.5-87.53 mm (3.444-3.446 in)
Cylinder bore maximum out-of-round	0.008 mm (0.0003 in)
Main bearing bore diameter	57.020-57.038 mm (2.244-2.245 in)
Head gasket surface flatness	0.1 mm/general 0.05 mm/200 x 200 (0.003 in./general) (0.0019 in./7.87 x 7.87)
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Ring groove width - top	1.203-1.205 mm (0.0473-0.0474 in)
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Camshaft

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GENERAL LUBRICANT SPECIFICATIONS

Item	Specification
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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
Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP (US); Motorcraft SAE 5W-20 Super Premium Synthetic 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
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 Premium Gold Engine Coolant VC-7-A (in California, Oregon and New Mexico VC-7-B, in Canada CVC-7-A) or equivalent (yellow color)	WSS-M97B51-A1
Multi-Purpose Grease XG-4 and/or XL-5	ESB-M1C93-B
Thread Sealant with PTFE TA-24	WSK-M2G350-A2

TORQUE SPECIFICATIONS**TORQUE SPECIFICATIONS**

Description	Nm	lb-ft	lb-in
Camshaft bearing caps ⁽¹⁾	-	-	-
Coolant outlet bolts	10	-	89
Cylinder head bolts ⁽¹⁾	-	-	-
Intake manifold bolts	18	13	-
Flywheel bolts ⁽¹⁾	-	-	-
Pressure plate bolts	27	20	-
Flexplate bolts ⁽¹⁾	-	-	-
Torque converter-to-flexplate nuts	35	26	-

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Crankshaft pulley bolt ⁽¹⁾	-	-	-
Crankshaft position (CKP) sensor	7	-	62
Crankshaft oil seal retainer bolts ⁽¹⁾	-	-	-
A/C compressor mounting bolts	25	18	-
A/C manifold tube bolt	21	15	-
Oil drain plug	28	21	-
Oil pan bolts ⁽¹⁾	-	-	-
Oil pan-to-bellhousing bolts	48	35	-
Oil level indicator tube bolt(s)	10	-	89
Oil pump screen and cover assembly	10	-	89
Oil pressure sensor	15	11	-
Oil filter adapter bolts	25	18	-
Oil pump-to-engine block bolts ⁽¹⁾	-	-	-
Oil pump sprocket bolt	25	18	-
Oil pump chain tensioner bolts	10	-	89
Oil pump chain guide bolts	10	-	89
Knock sensor (KS)	20	15	-
Rear transaxle mounting nut	133	98	-
Motor mount nuts	90	66	-
Motor mount bracket bolts	48	35	-
Transaxle roll-restrictor bolts	48	35	-
Engine-to-transaxle bolts	48	35	-

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Starter motor mounting bolts	25	18	-
Starter B+ cable	12	9	-
Starter relay	5	-	44
Coolant pump bolts	10	-	89
Coolant pump pulley bolts	25	18	--
Engine front cover bolts ⁽¹⁾	-	-	-
Camshaft sprocket bolt	65	48	-
Valve cover bolts ⁽¹⁾	-	-	-
Engine lifting eye bolts	45	33	-
Exhaust gas recirculation (EGR) valve assembly bolts	27	20	-
EGR tube nut	55	41	-
Valve cover retainers	10	-	89
Power distribution harness eyelet nut	10	-	89
Catalytic converter-to-cylinder head nuts ⁽¹⁾	-	-	-
Catalytic converter-to-muffler assembly nuts	47	35	-
Catalytic converter support bracket	47	35	-
Catalytic converter heat shield bolts	10	-	89
Generator mounting bolts	25	18	-
Generator heat shield	18	13	-
Generator B+ cable	8	-	71
Generator B+ cable retainer	25	18	-
Radio interference capacitor bracket	10	-	89
Radio interference	10	-	89

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capacitor ground			
Thermostat housing assembly bolts	10	-	89
Coolant expansion tank bolt	10	-	89
Block heater (if equipped)	21	15	-
Power steering pump mounting bolts	25	18	-
Power steering pressure (PSP) tube nut	65	48	-
PSP tube bracket nut	11	8	-
Engine ground cable bolt	48	35	-
Accelerator control snow shield	10	-	89
Timing chain guide bolts	10	-	89
Timing chain tensioner bolts	10	-	89
Engine plug bolt	20	15	-
Crankcase ventilation cover assembly bolts	10	-	89
Air cleaner outlet tube clamps	4	-	35
Accelerator cable bracket	10	-	89
Coil-on-plug retaining bolt	10	-	89
Accessory drive belt tensioner bolt	25	18	-
Accessory drive belt idler bolt	25	18	-
Cylinder head temperature (CHT) sensor	12	9	--
Spark plugs	15	11	-
Fuel rail bolt	25	18	-
Stabilizer bar	55	41	-

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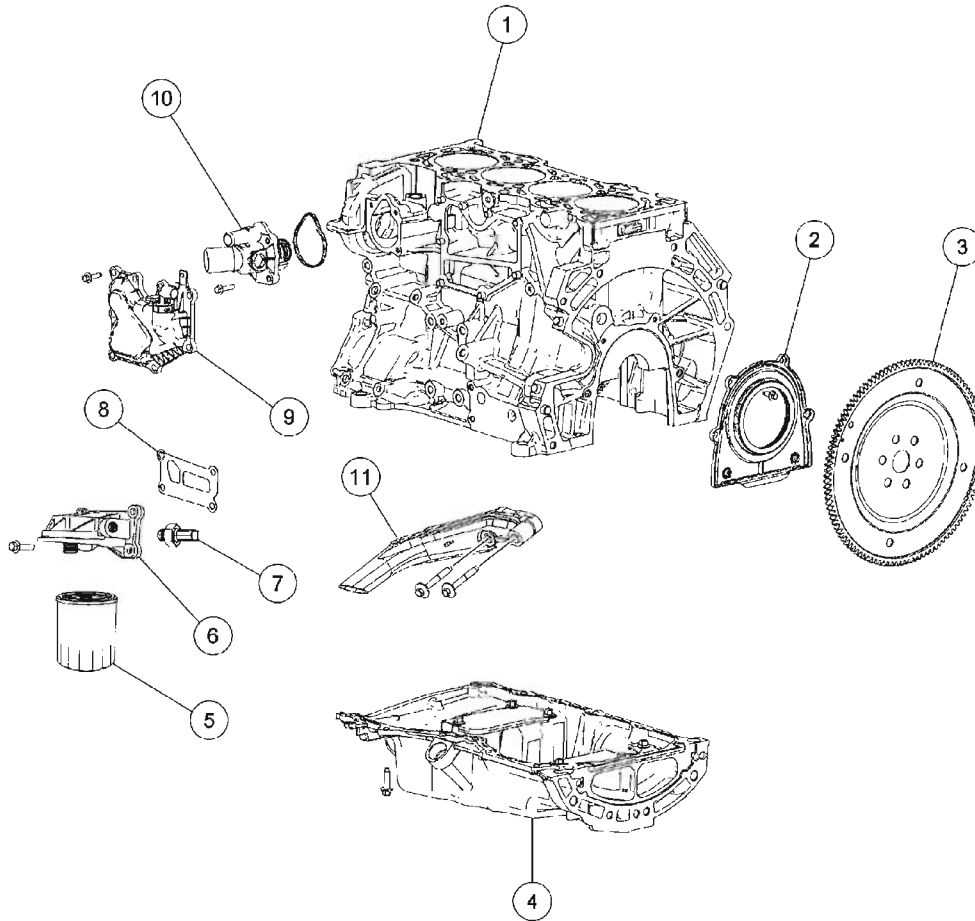
Tie-rod end nut	40	30	-
Front brake caliper	28	21	-
Upper strut mount	35	26	-
Suspension arm ball joint bolt	63	46	-
Intermediate shaft bracket-to-engine bolt	40	30	-
Intermediate shaft mounting bracket bolt	25	18	-
Catalytic converter nuts	55	41	-
Catalytic converter heat shield bolts	11	8	-
Catalytic converter support bracket bolts	47	35	-
Catalytic converter-to-exhaust system nuts	47	35	-
(1) See procedure for specification.			

DESCRIPTION AND OPERATION**ENGINE**

The 2.0L and 2.3L engines are four valve-per-cylinder, dual overhead camshaft engines. The engines use a coil-on-plug ignition system. The cylinder blocks are made of aluminum and the bearing caps are integrated into the ladder assemblies. An aluminum oil pan bolts to the bottom of the lower cylinder block and to the transmission to provide greater strength. The camshafts are mounted in the cylinder heads and act against valve tappets to open and close the valves. The camshafts are driven off the front of the cylinder head by one timing chain. The chain is driven by a sprocket that is located on the crankshaft. The piston assembly is an aluminum piston with a cast iron connecting rod. The oil pump is driven by the crankshaft via a dedicated chain that is driven by the same sprocket that drives the timing chain.

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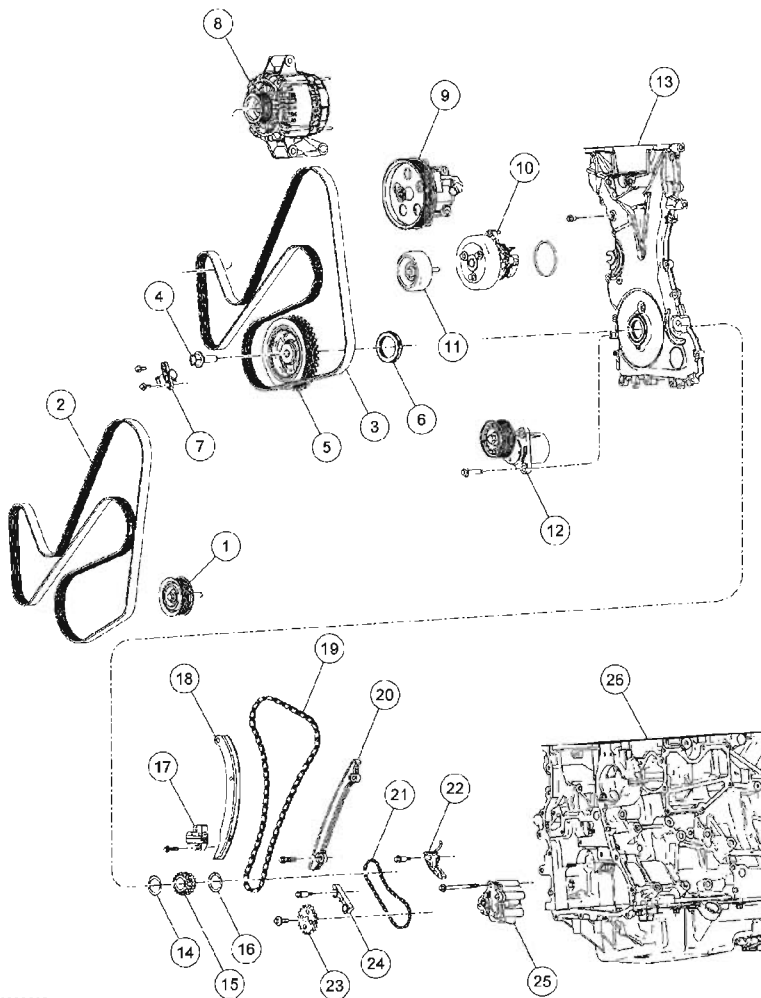
Item	Part Number	Description
1	6010	Cylinder block
2	6K318	Crankshaft rear oil seal and retainer
3	6477	Flywheel
4	6675	Oil pan
5	6714	Oil filter
6	6884	Oil filter adapter

Item	Part Number	Description
7	9278	Oil pressure sensor
8	6A636	Oil filter adapter gasket
9	6A785	Crankcase vent oil separator
10	8575	Thermostat assembly
11	6622	Oil pump screen and pickup tube

Fig. 1: Exploded View Of Lower Engine Block
Courtesy of FORD MOTOR CO.

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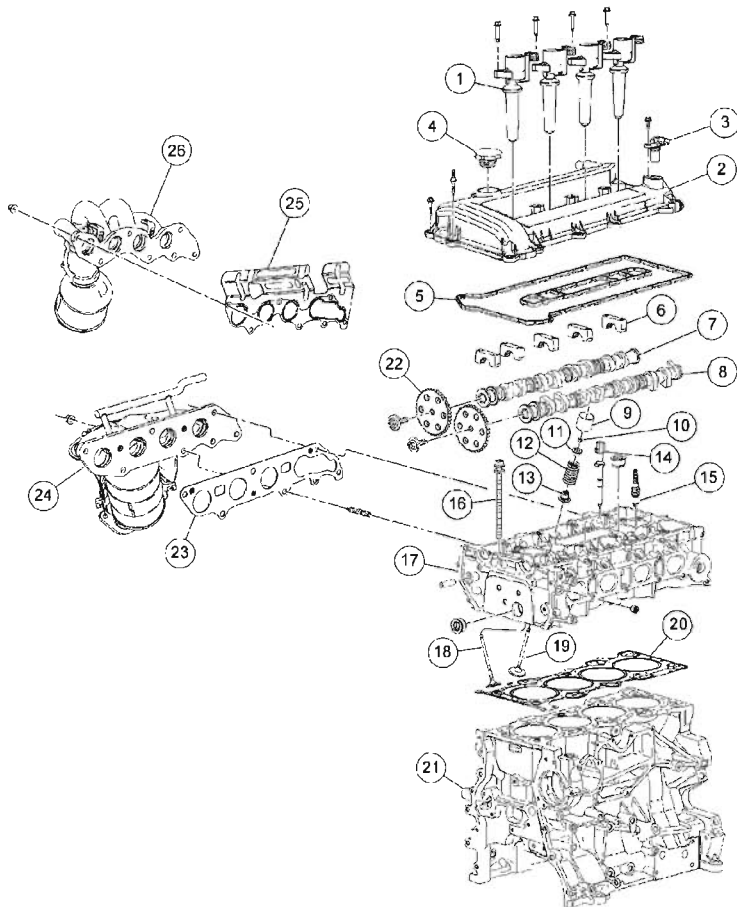
Item	Part Number	Description
1	6C348	Drive belt pulley idler (without A/C)
2	8620	Accessory drive belt (without A/C)
3	8620	Accessory drive belt (with A/C)
4	6A340	Crankshaft pulley bolt
5	6316	Crankshaft damper
6	6700	Crankshaft front seal
7	6C315	Crankshaft position (CKP) sensor
8	10300	Generator
9	3A674	Power steering pump
10	8501	Coolant pump and pulley
11	19A216	Drive belt pulley idler (with A/C)
12	6B209	Drive belt tensioner

Item	Part Number	Description
13	6019	Engine front cover
14	6378	Friction washer
15	6306	Crankshaft sprocket
16	6378	Friction washer
17	6K254	Timing chain tensioner
18	6K255	Timing chain tensioner arm
19	6268	Timing chain
20	6K297	Timing chain guide
21	6A895	Oil pump chain
22	6C271	Oil pump chain tensioner
23	6652	Oil pump drive gear
24	6M256	Oil pump chain guide
25	6600	Oil pump
26	6010	Cylinder block

Fig. 2: Exploded View Of Front Engine Block
 Courtesy of FORD MOTOR CO.

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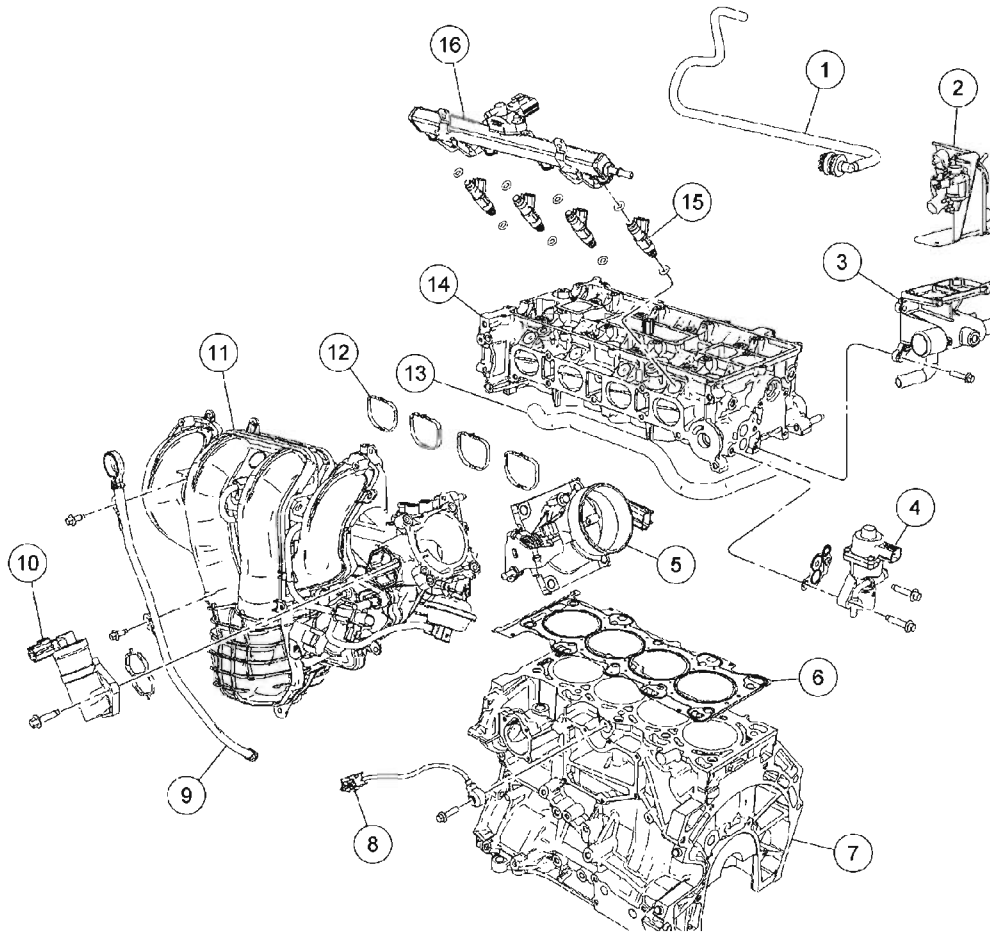
Item	Part Number	Description
1	12A366	Coil-on-plug assembly
2	6M293	Valve cover
3	12K073	Camshaft position (CMP) sensor
4	6766	Oil filler cap
5	6M293	Valve cover gasket
6	6A284	Camshaft bearing caps
7	6A272	Camshaft (exhaust)
8	6A271	Camshaft (intake)
9	6500	Valve tappet (16 req'd)
10	6518	Valve spring retainer key (16 req'd)
11	6514	Valve spring retainer (16 req'd)
12	6513	Valve spring (16 req'd)
13	6A517	Valve stem seal (16 req'd)
14	6G004	Cylinder head temperature (CHT) sensor

Item	Part Number	Description
15	12405	Spark plug (4 req'd)
16	6065	Cylinder head bolt (10 req'd)
17	6049	Cylinder head
18	6505	Exhaust valve (8 req'd)
19	6507	Intake valve (8 req'd)
20	6051	Head gasket
21	6010	Cylinder block
22	6C251	Camshaft sprocket (2 req'd)
23	9448	Catalytic converter gasket (with secondary air injection (AIR))
24	5E211	Catalytic converter (with AIR)
25	9448	Catalytic converter gasket (without AIR)
26	5E211	Catalytic converter (without AIR)

Fig. 3: Exploded View Of Cylinder Head
Courtesy of FORD MOTOR CO.

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Item	Part Number	Description
1	9288	Fuel supply tube
2	9F491	AIR valve and bracket (if equipped)
3	8K556	Coolant outlet
4	9D475	Exhaust gas recirculation (EGR) valve
5	9E926	Throttle body assembly
6	6051	Cylinder head gasket
7	6010	Cylinder block

Item	Part Number	Description
8	12A699	Knock sensor
9	6754	Oil level indicator and tube assembly
10	9F715	Idle air control (IAC) valve assembly
11	9424	Intake manifold
12	9439	Intake manifold gasket
13	8A582	Coolant hose
14	6049	Cylinder head
15	9F593	Fuel injector (4 req'd)
16	9H487	Fuel rail

Fig. 4: Exploded View Of Intake Manifold
Courtesy of FORD MOTOR CO.

DIAGNOSIS AND TESTING

ENGINE

Refer to **ENGINE SYSTEM-GENERAL INFORMATION** for basic mechanical concerns

or See INTRODUCTION - GASOLINE article for driveability concerns.

GENERAL PROCEDURES VALVE

CLEARANCE CHECK

1. Remove the valve cover. For additional information, refer to VALVE COVER.

CAUTION: Turn the engine clockwise only, and use the crankshaft bolt only.

NOTE: Measure each valve's clearance at base circle, with the lobe pointed away from the tappet, before removing the camshafts. Failure to measure all clearances prior to removing the camshafts will necessitate repeated removal and installation and wasted labor time.

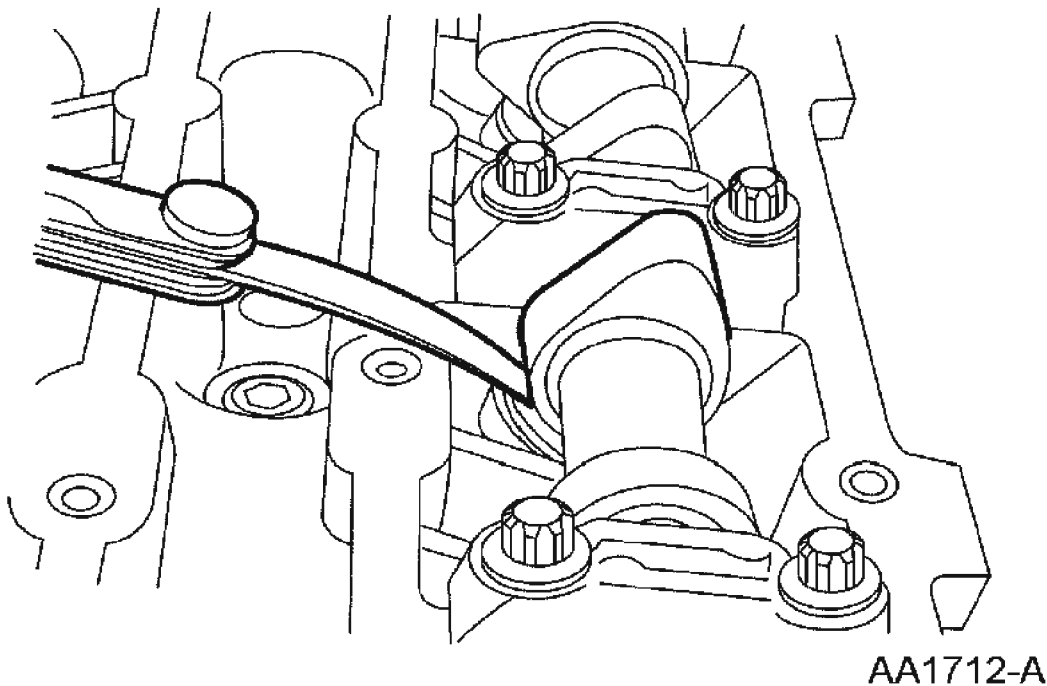


Fig. 5: Using Feeler Gauge To Measure Each Valve's Clearance
Courtesy of FORD MOTOR CO.

2. Use a feeler gauge to measure each valve's clearance and record its location.

NOTE: The number on the valve tappet only reflects the digits that

follow the decimal. For example, a tappet with the number 0.650 has the thickness of 3.650 mm.

NOTE: A mid-range clearance is the most desirable:

3.

- Intake: 0.22-0.28 mm (0.008-0.011 inch)
- Exhaust: 0.27-0.33 mm (0.010-0.013 inch)

Select tappets using this formula: tappet thickness = measured clearance + the base tappet thickness - most desirable thickness.

Select the tappets and mark the installation location.

4. If any tappets do not measure within specifications, install new tappets in these locations. For additional information, refer to **VALVE TAPPETS**.

IN-VEHICLE REPAIR

INTAKE MANIFOLD

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

REMOVAL

All engines

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING**.
2. Remove the cooling fan motor and shroud assembly. For additional information, refer to **ENGINE COOLING**.
3. Remove the lower intake manifold bolt.

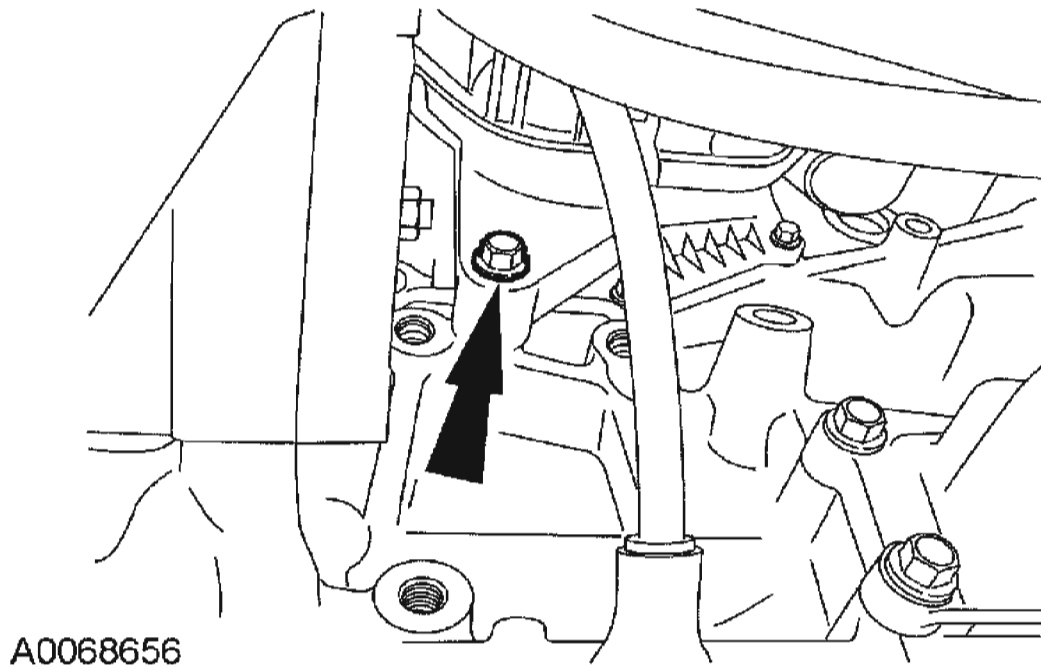


Fig. 6: Removing Lower Intake Manifold Bolt
Courtesy of FORD MOTOR CO.

4. Remove the air cleaner outlet pipe.
 - Loosen the clamps.
 - Disconnect the vent tube and remove the outlet pipe.

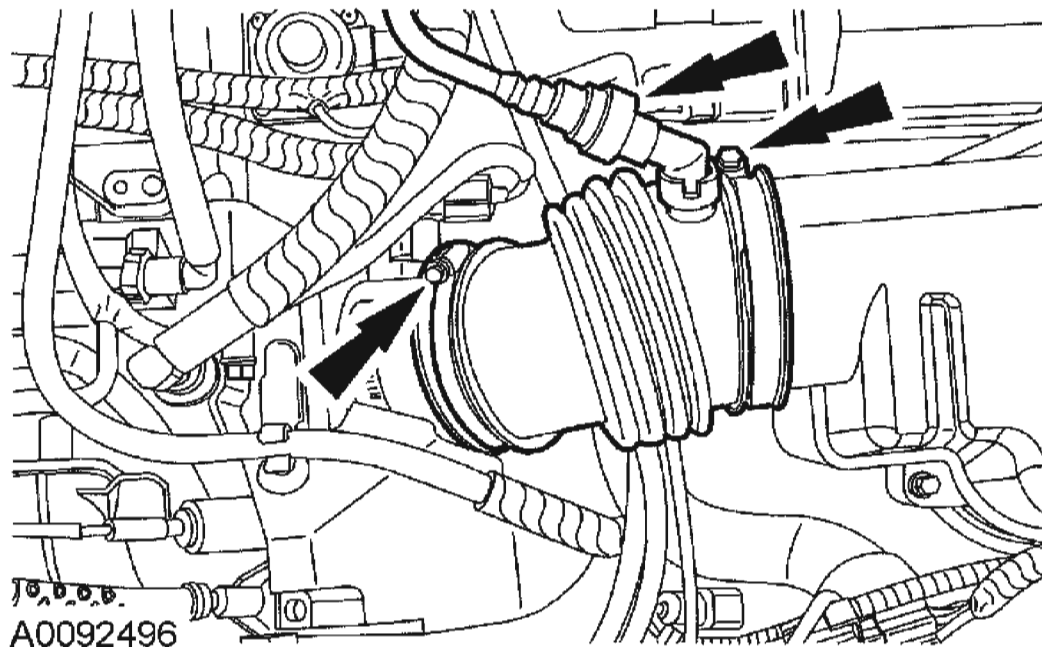


Fig. 7: Removing Air Cleaner Outlet Pipe
Courtesy of FORD MOTOR CO.

5. Remove the accelerator control snow shield.
 - Detach the evaporative emissions hose pin-type retainer.
 - Remove the screw and pin-type retainer.
 - Remove the snow shield.

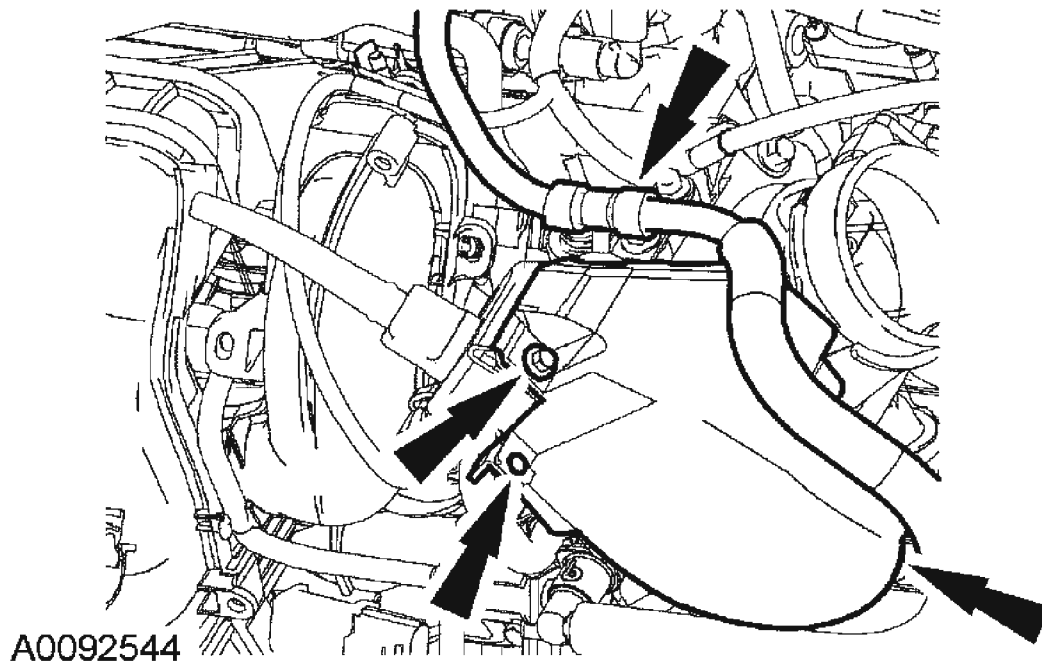


Fig. 8: Removing Accelerator Control Snow Shield
Courtesy of FORD MOTOR CO.

6. Disconnect the accelerator cable and speed control cable (if equipped).
 1. Disconnect the accelerator and speed control cable (if equipped) from the throttle body.
 2. Remove the bolts and position the accelerator control cables and bracket aside.

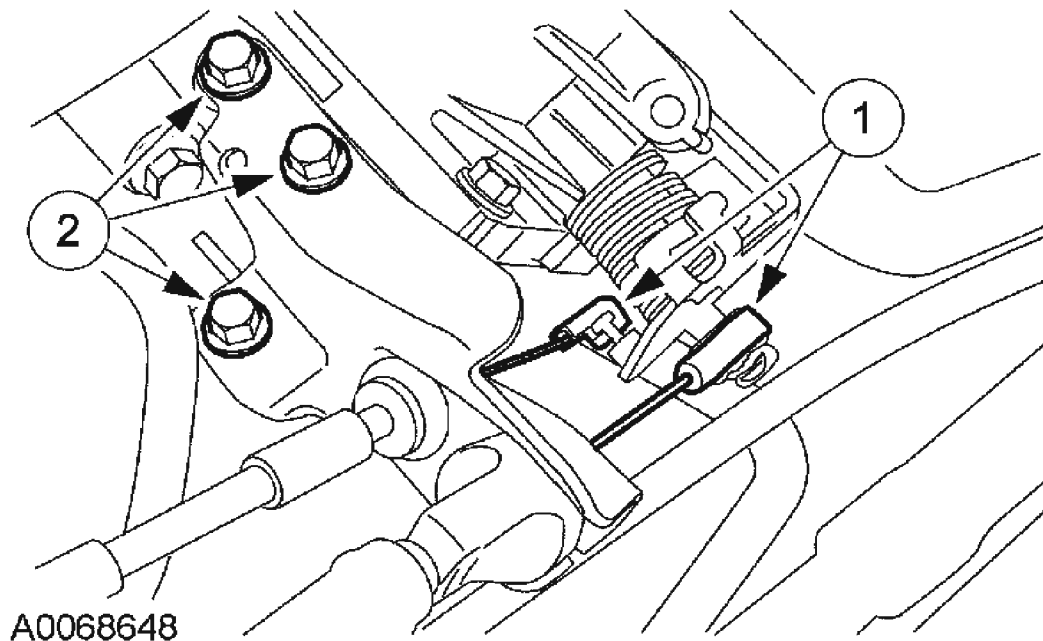


Fig. 9: Disconnecting Accelerator Cable And Speed Control Cable
Courtesy of FORD MOTOR CO.

7. Disconnect the throttle position (TP) sensor electrical connector and wiring harness pin-type retainer.

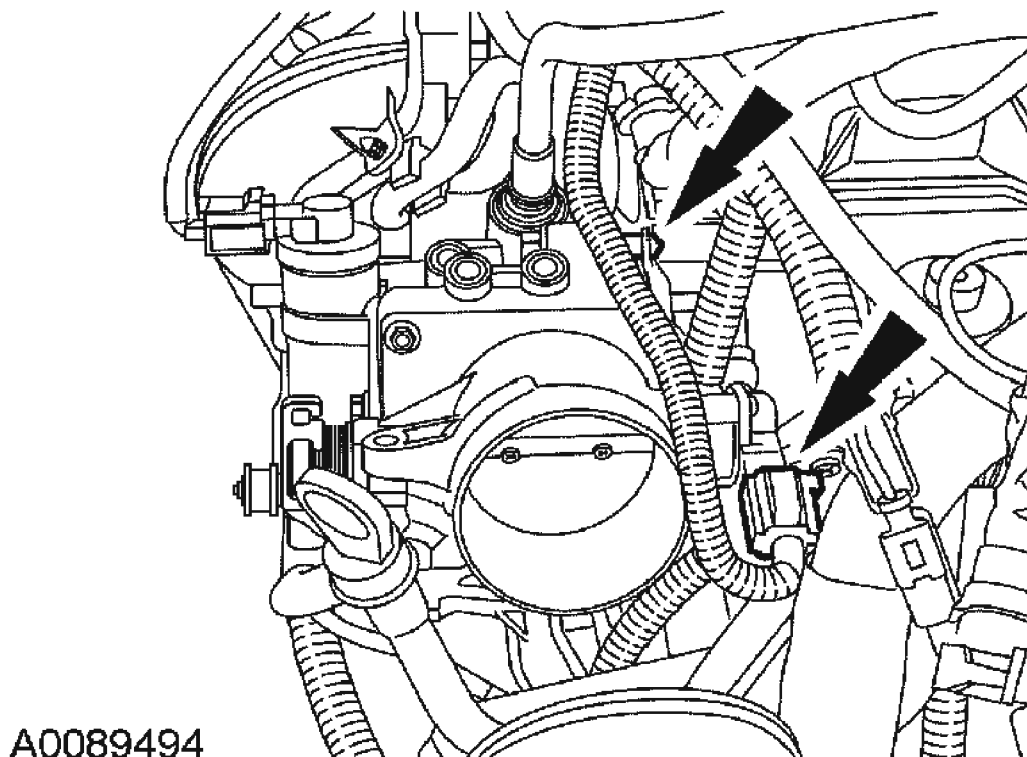


Fig. 10: Disconnecting Throttle Position Sensor Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

8. Disconnect the idle air control (IAC) valve electrical connector and wiring harness pin-type retainer.

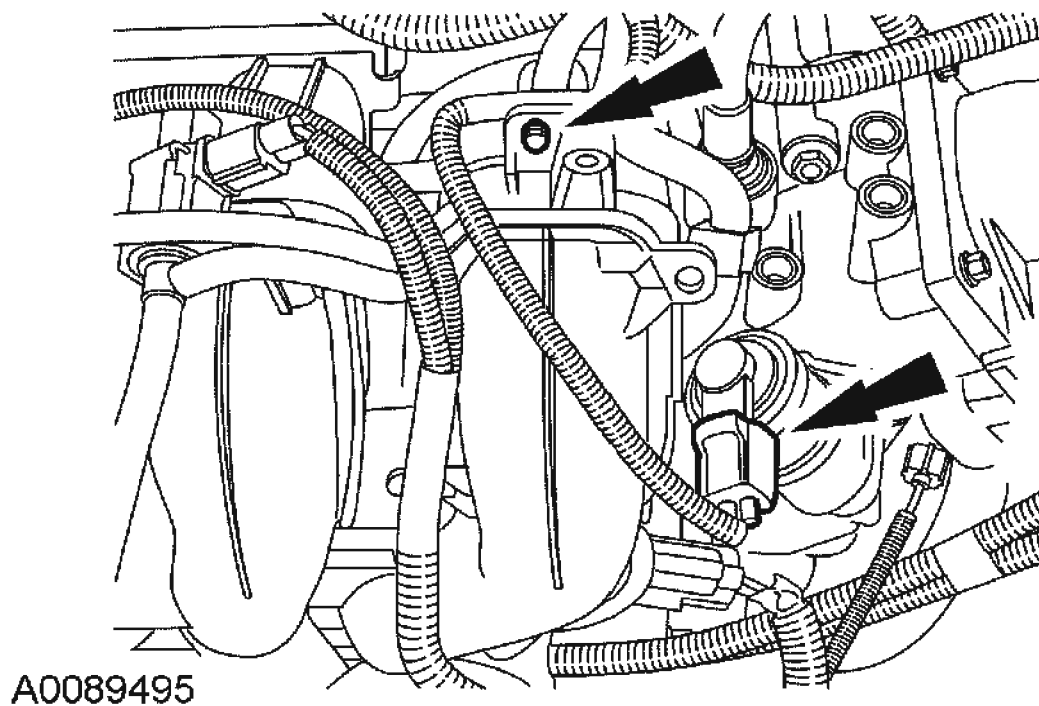


Fig. 11: Disconnecting Idle Air Control Valve Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

9. Disconnect the evaporative emissions hose.

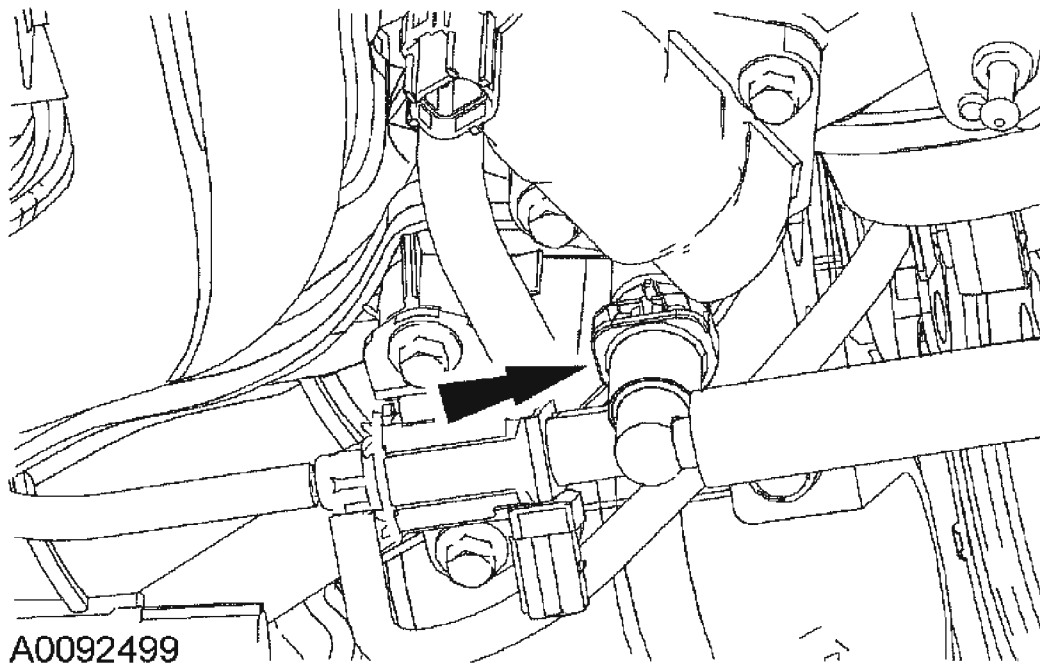


Fig. 12: Disconnecting Evaporative Emissions Hose
Courtesy of FORD MOTOR CO.

10. Disconnect the power brake booster vacuum tube.
 - Depress the quick release locking ring.
 - Pull the vacuum tube out of the quick release fitting.

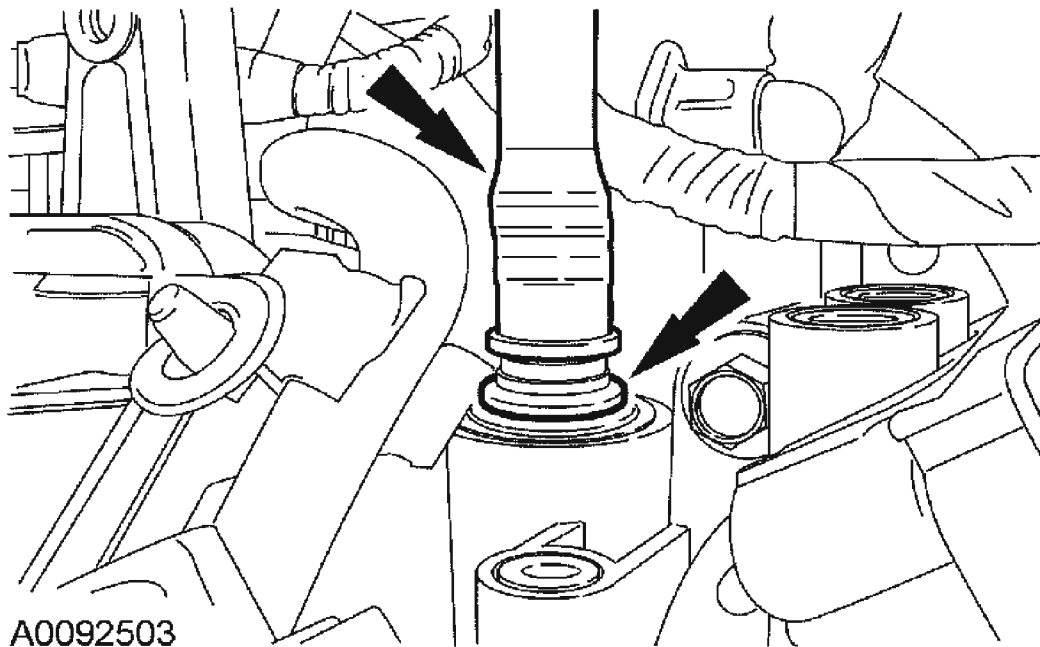


Fig. 13: Disconnecting Power Brake Booster Vacuum Tube
Courtesy of FORD MOTOR CO.

11. Disconnect the fuel rail pressure and temperature sensor vacuum hose.

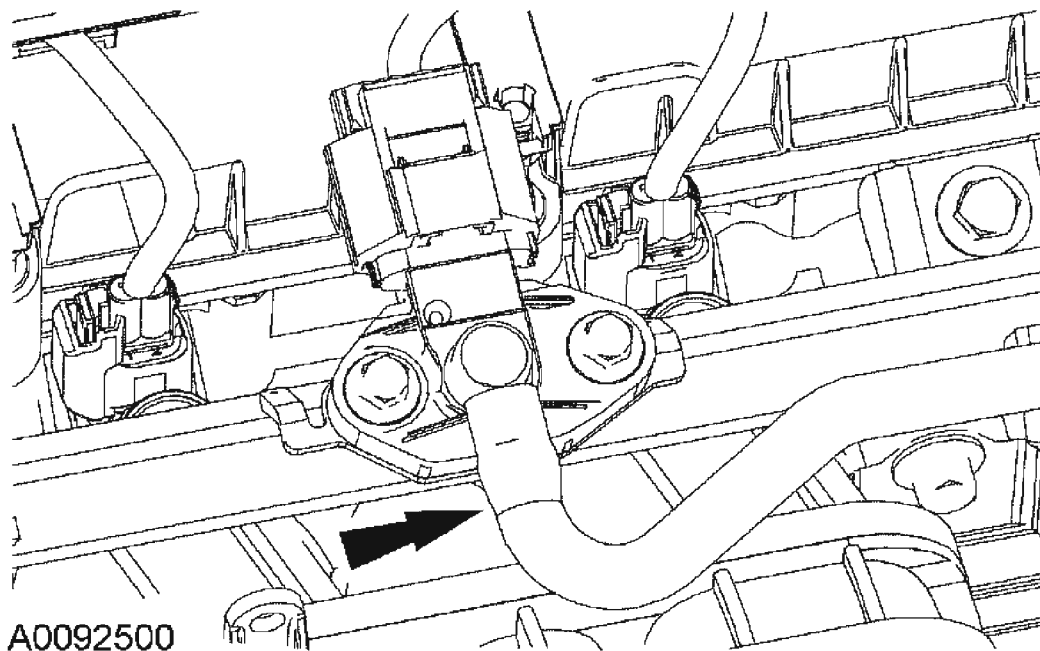


Fig. 14: Disconnecting Fuel Rail Pressure And Temperature Sensor Vacuum Hose
Courtesy of FORD MOTOR CO.

12. Detach the wiring harness pin-type retainer.

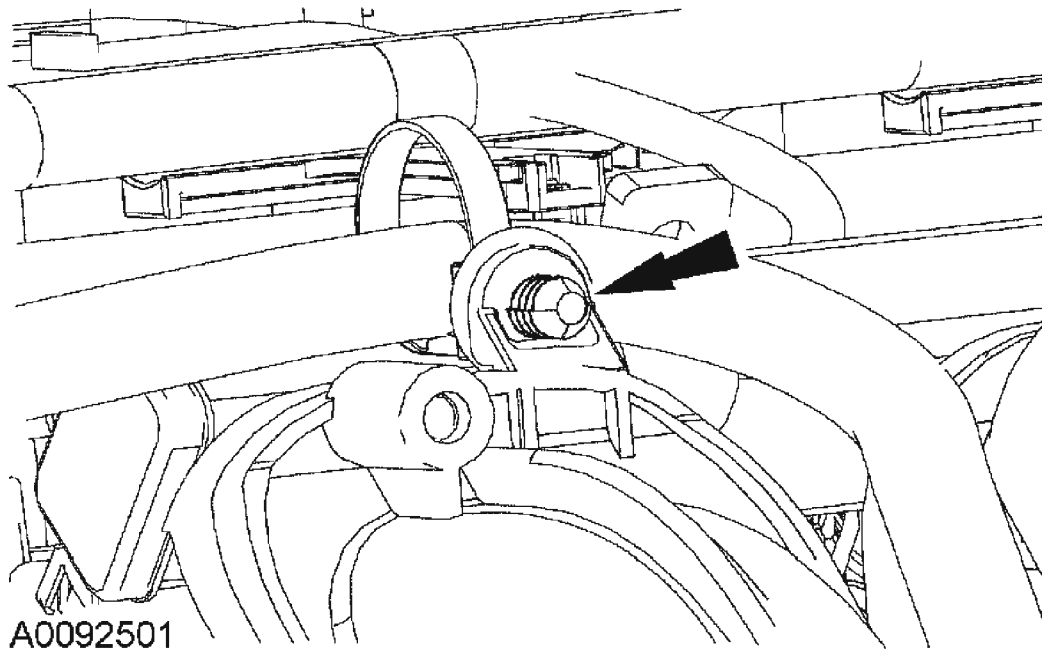


Fig. 15: Detaching Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

13. Disconnect the intake manifold runner control (IMRC) actuator electrical connector.

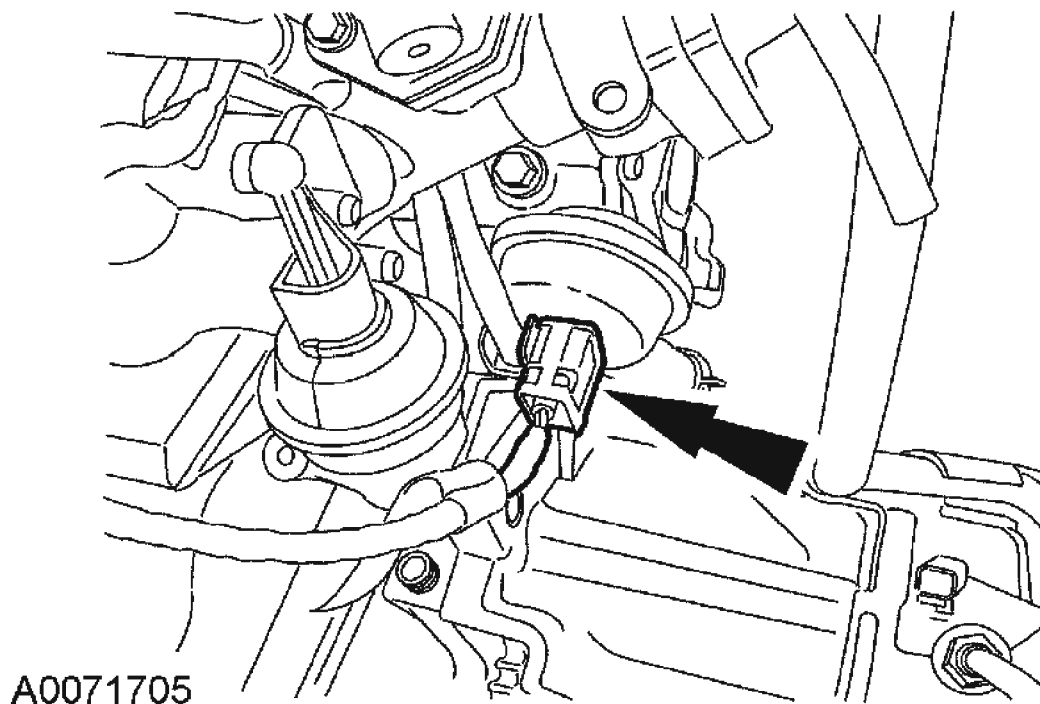


Fig. 16: Disconnecting Intake Manifold Runner Control Actuator Electrical Connector

Courtesy of FORD MOTOR CO.

14. Disconnect the manifold absolute pressure (MAP) sensor electrical connector.

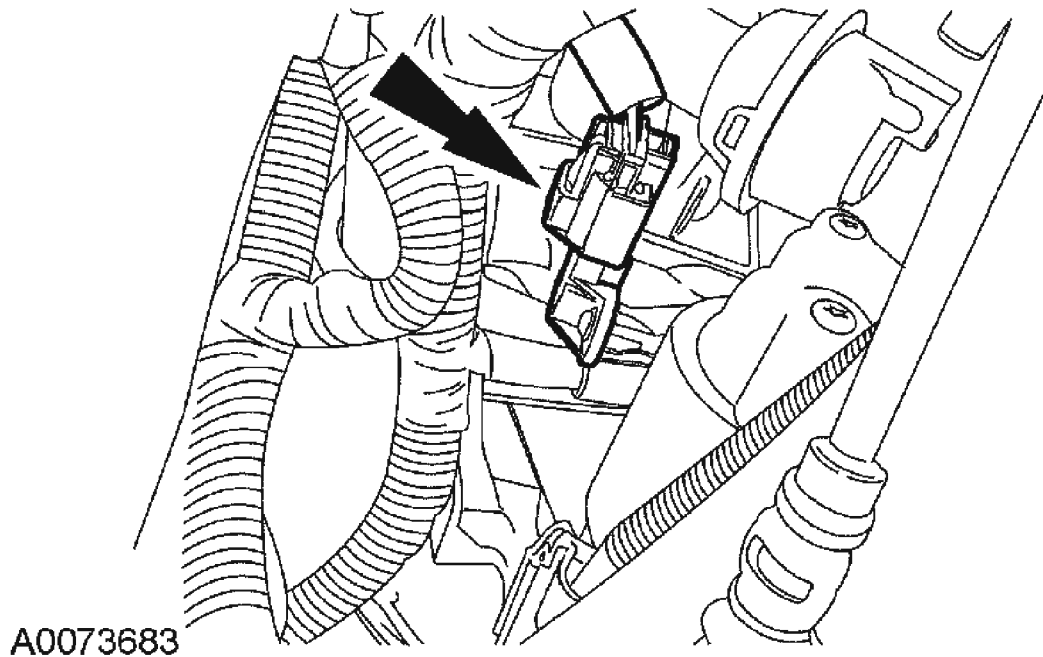


Fig. 17: Disconnecting Manifold Absolute Pressure Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

2.0L engines

15. If equipped, disconnect the secondary air injection (AIR) vacuum supply hose.

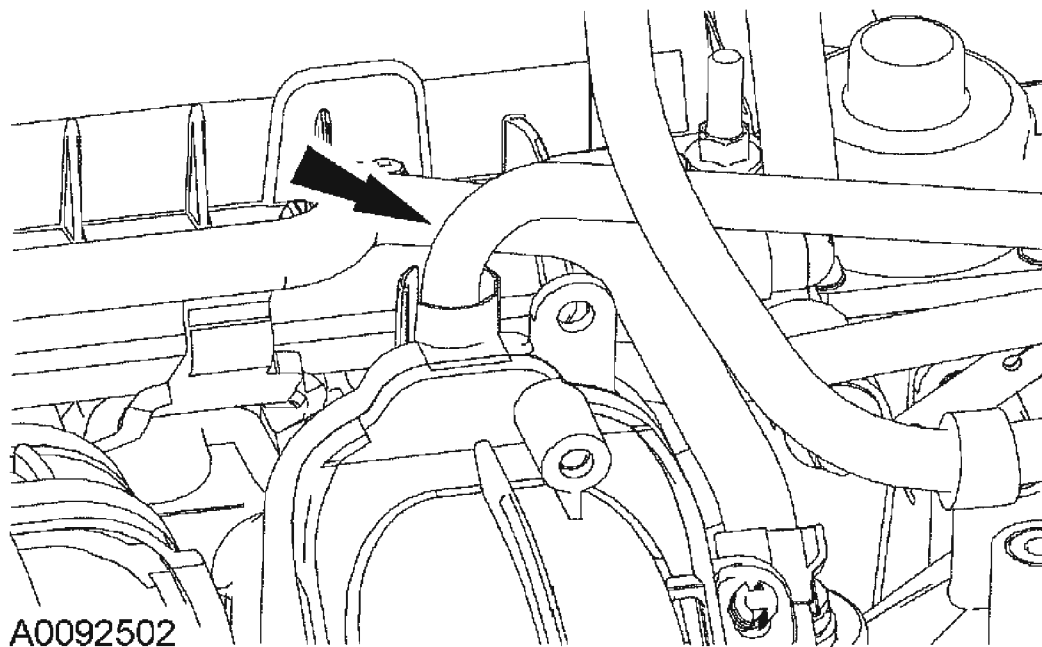


Fig. 18: Disconnecting Secondary Air Injection Vacuum Supply Hose
Courtesy of FORD MOTOR CO.

16. Disconnect the swirl control valve electrical connector.

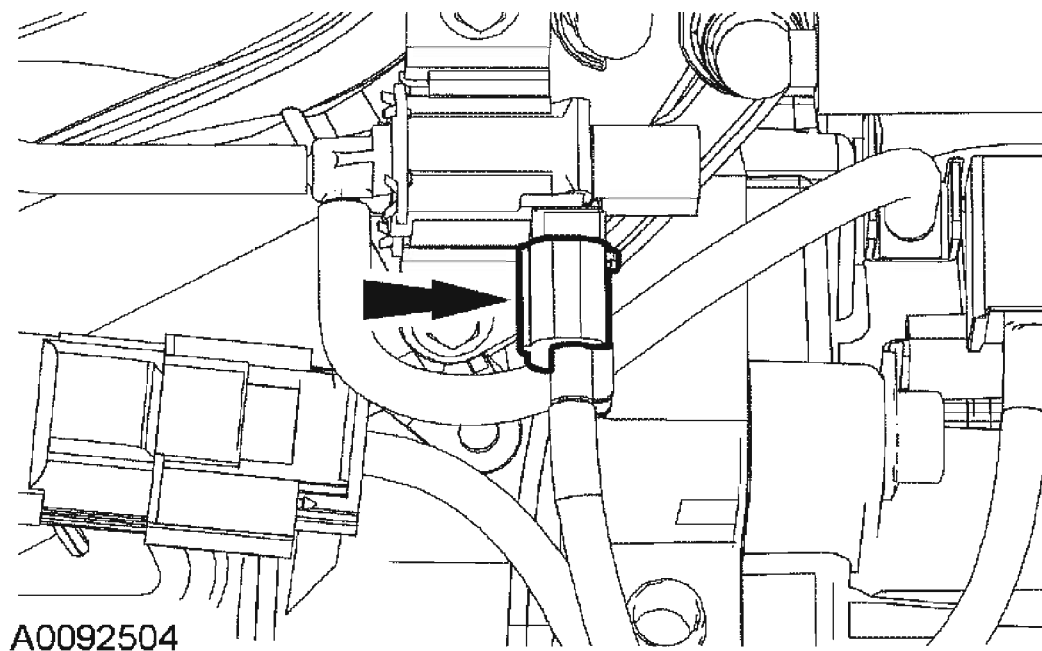


Fig. 19: Disconnecting Swirl Control Valve Electrical Connector
Courtesy of FORD MOTOR CO.

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

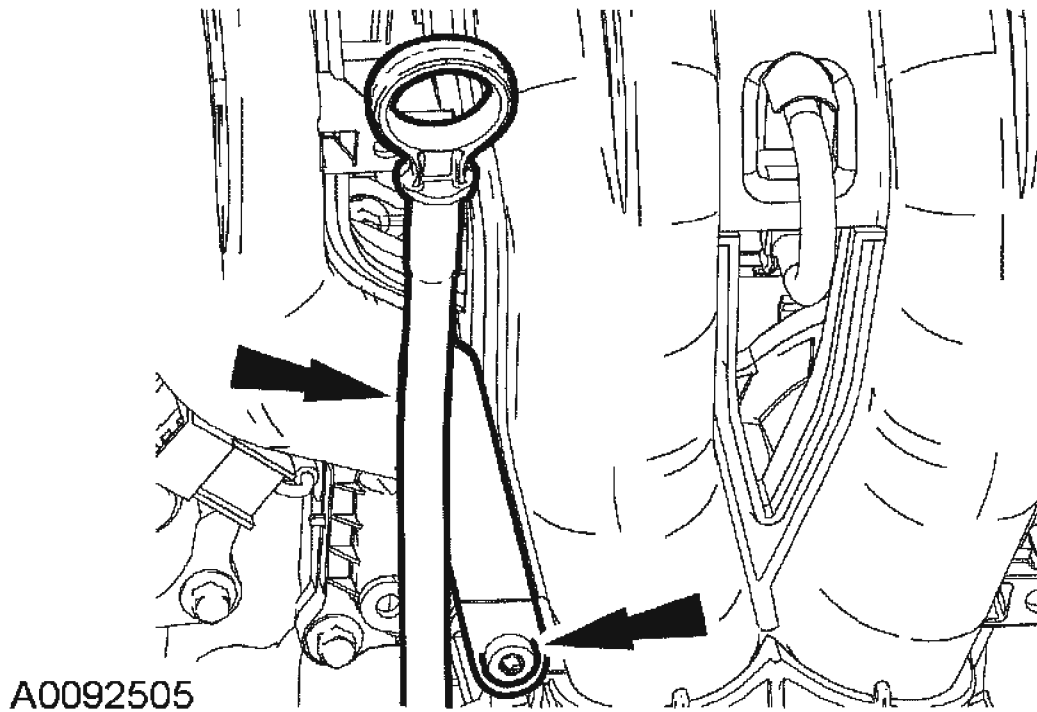


Fig. 20: Removing Bolt And Oil Level Indicator Tube
Courtesy of FORD MOTOR CO.

NOTE: There are three different size bolts used. Mark the location of the bolts to make sure installation is in the correct location.

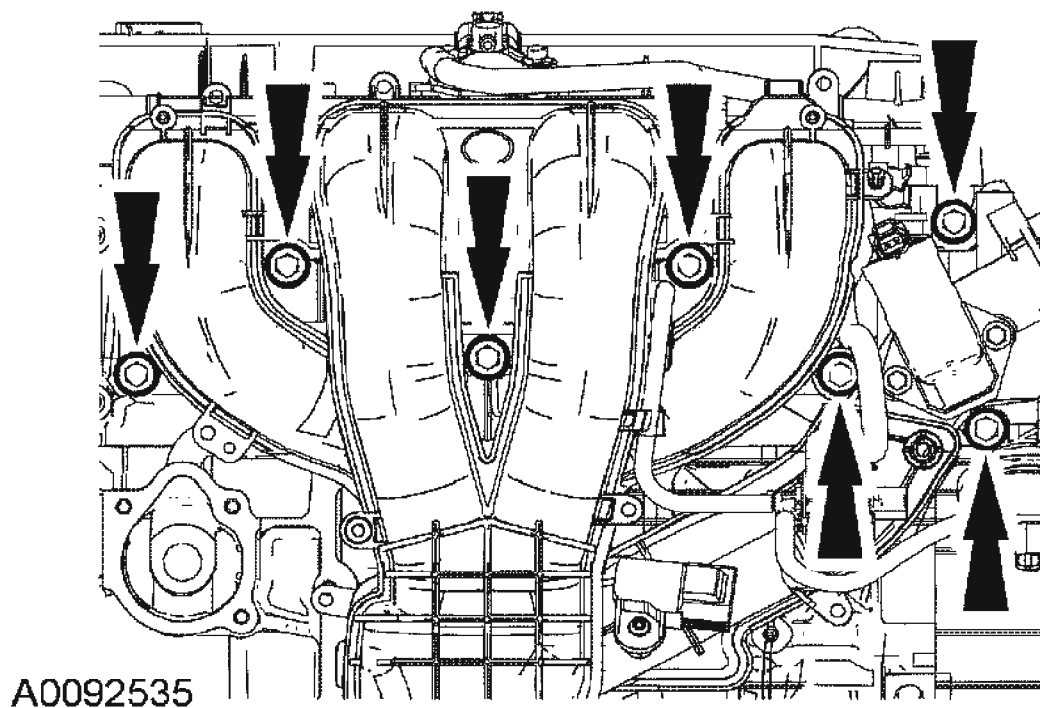


Fig. 21: Removing Seven Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

18. Remove the seven intake manifold bolts.

2.3L engines

19. Disconnect the swirl valve electrical connectors and pin-type retainers.

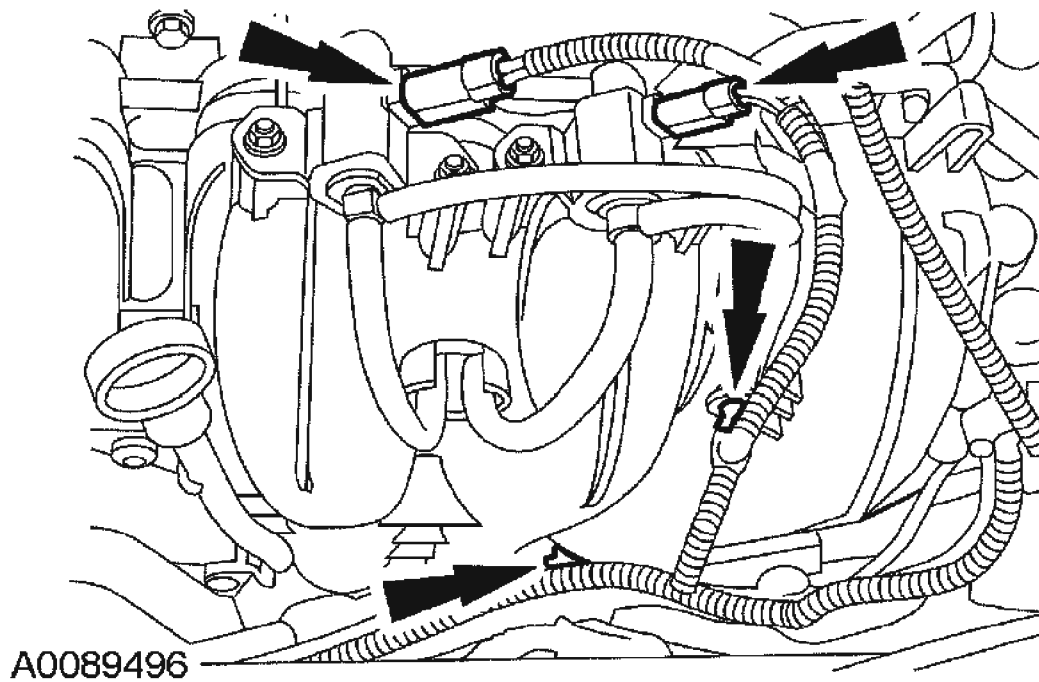
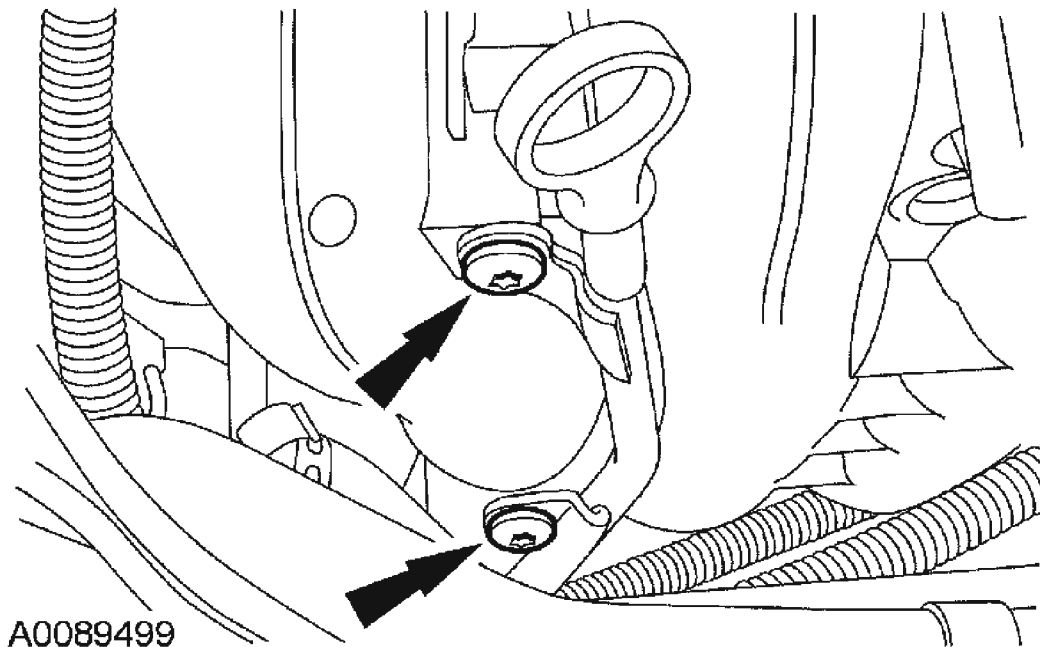


Fig. 22: Disconnecting Swirl Valve Electrical Connectors And Pin-Type Retainers
Courtesy of FORD MOTOR CO.

20. Remove the bolts and the oil level indicator tube.



A0089499

Fig. 23: Removing Bolts And Oil Level Indicator Tube
Courtesy of FORD MOTOR CO.

NOTE: There are three different size bolts used. Mark the location of the bolts to make sure installation is in the correct location.

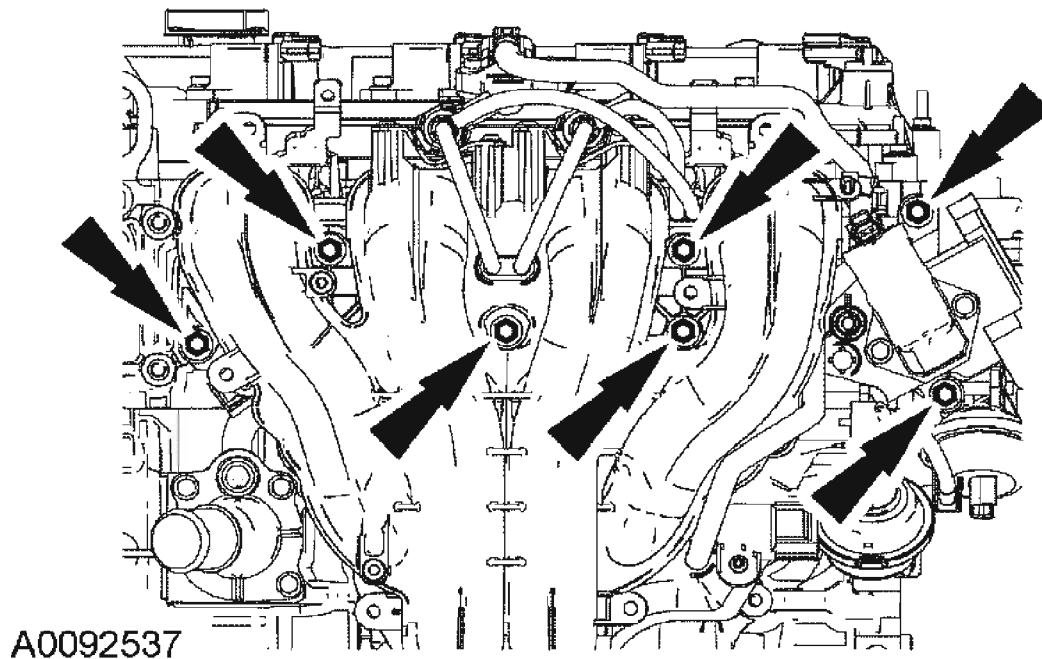


Fig. 24: Removing Seven Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

21. Remove the seven intake manifold bolts.

All engines

22. Raise the intake manifold enough to gain clearance to disconnect the knock sensor (KS) electrical connector.

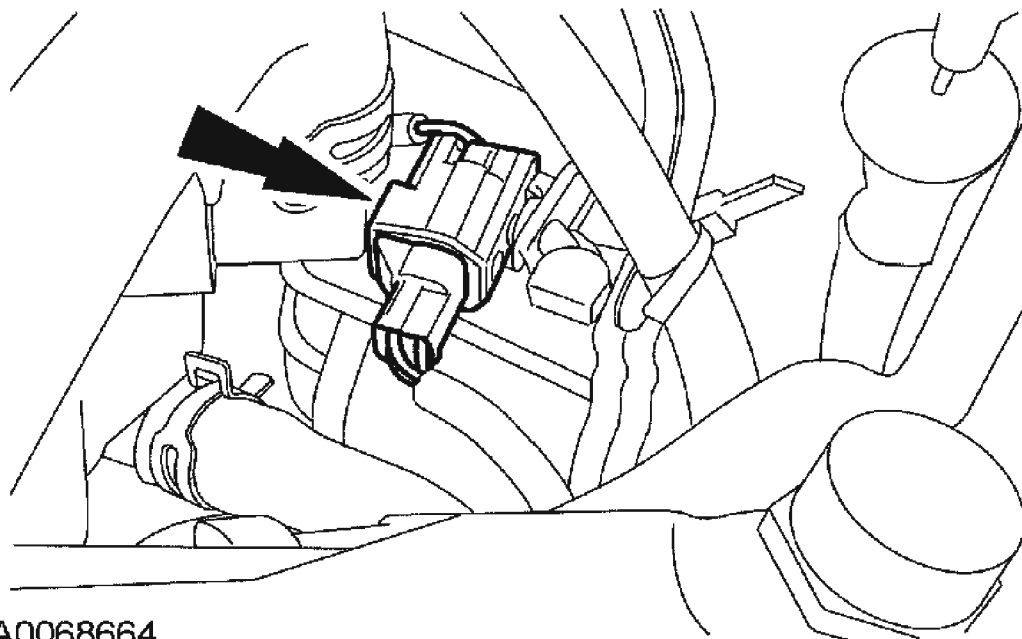


Fig. 25: Raising Intake Manifold Enough To Gain Clearance To Disconnect Knock Sensor (KS) Electrical Connector
Courtesy of FORD MOTOR CO.

23. Disconnect the positive crankcase ventilation (PCV) hose and remove the intake manifold.

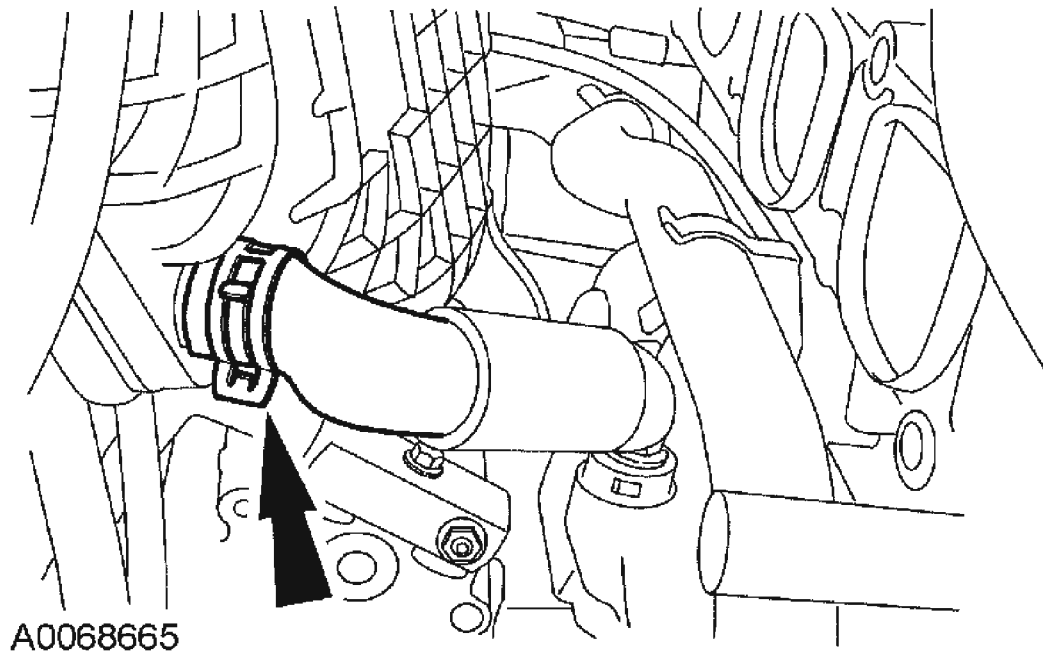


Fig. 26: Disconnecting Positive Crankcase Ventilation (PCV) Hose And Removing Intake Manifold
Courtesy of FORD MOTOR CO.

24. Remove the exhaust gas recirculation (EGR) tube.

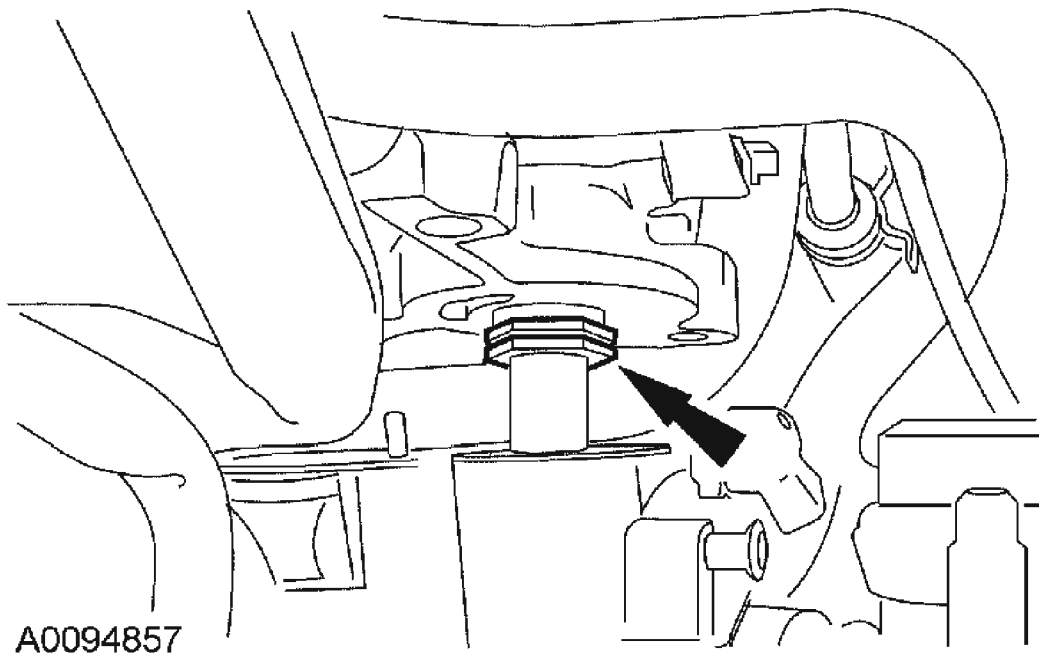
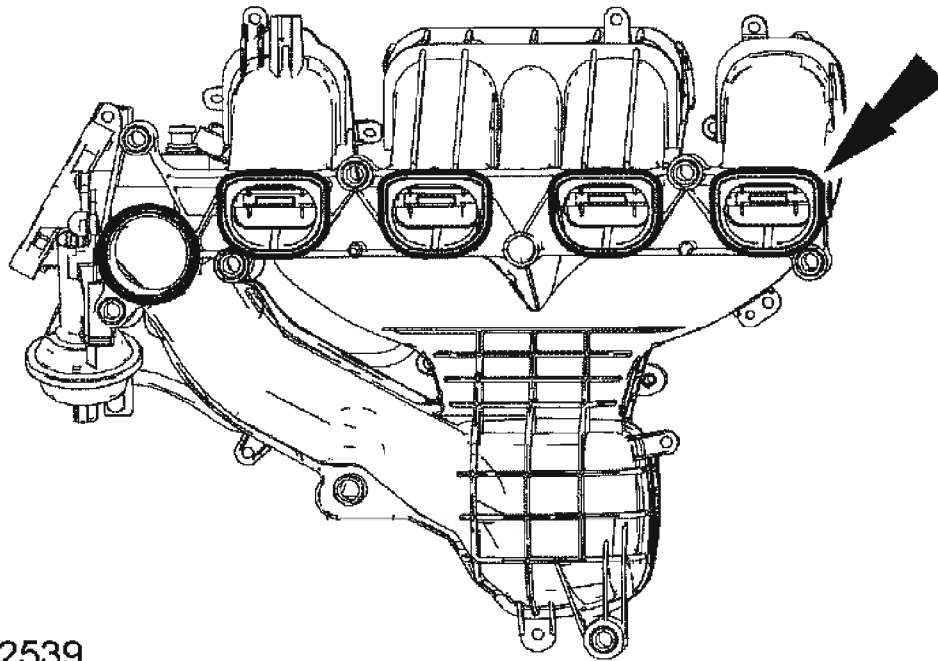


Fig. 27: Removing Exhaust Gas Recirculation (EGR) Tube
Courtesy of FORD MOTOR CO.

Installation

All engines

NOTE: 2.0L engine shown, 2.3L is similar.



A0092539

Fig. 28: Inspecting Intake Manifold Gaskets
Courtesy of FORD MOTOR CO.

1. Inspect and install new intake manifold gaskets if necessary.
2. Install the EGR tube.

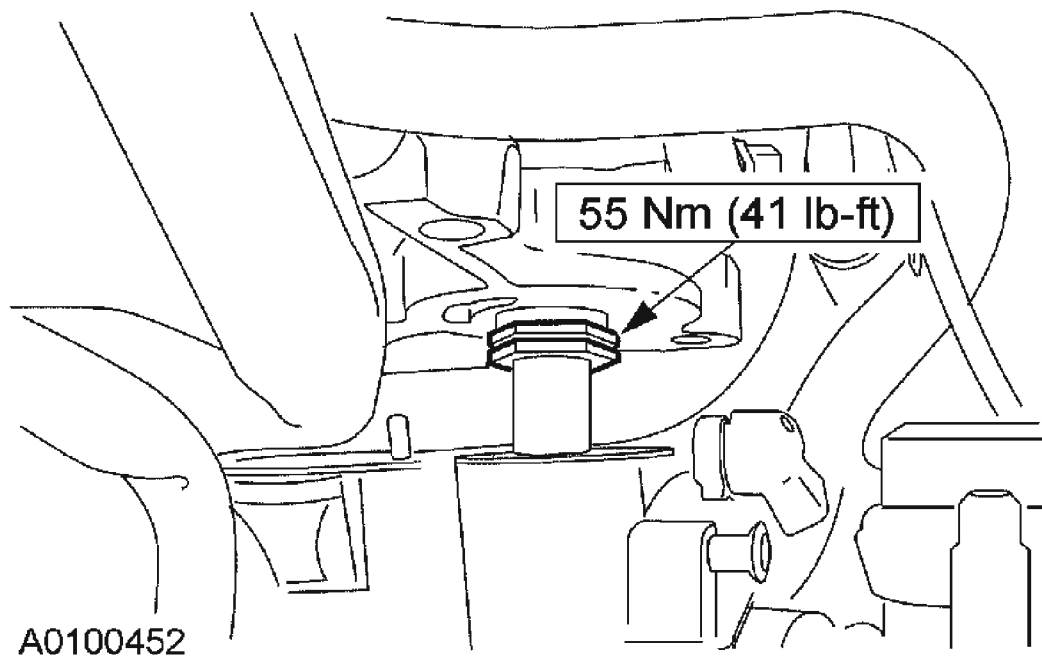


Fig. 29: Installing EGR Tube
Courtesy of FORD MOTOR CO.

3. Position the intake manifold and connect the PCV hose.

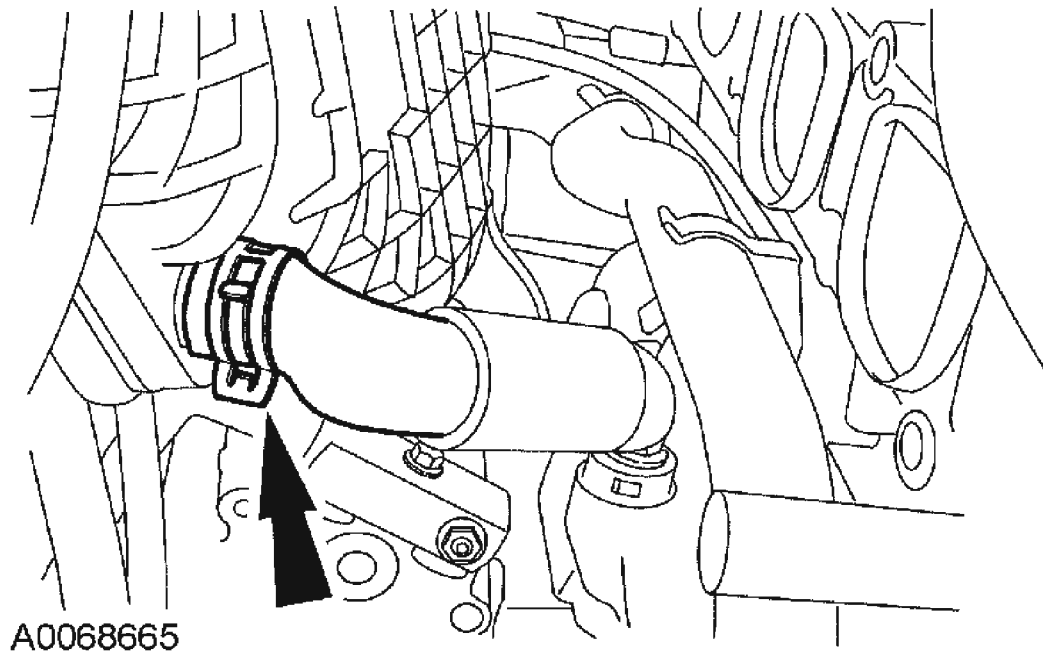


Fig. 30: Installing PCV Hose
Courtesy of FORD MOTOR CO.

4. Connect the KS electrical connector.

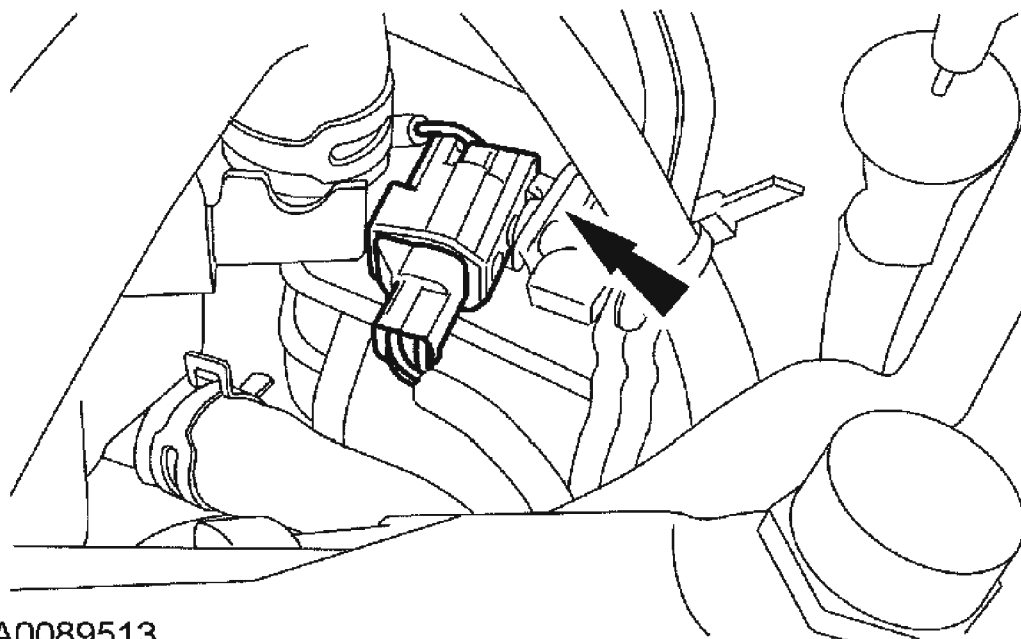


Fig. 31: Connecting KS Electrical Connector
Courtesy of FORD MOTOR CO.

2.3L engines

NOTE: Be sure to install the bolts in the previously marked locations.

NOTE: To ease installation of the intake manifold, lower center mounting bolt, use a 6-inch long, 5/16-inch diameter hose.

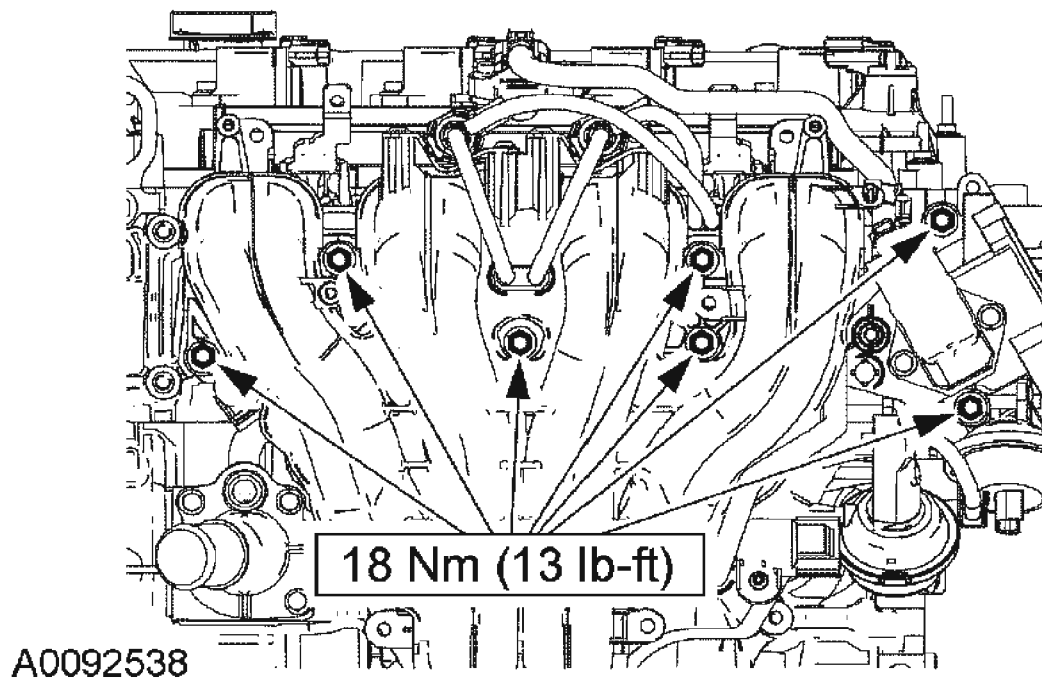


Fig. 32: Installing Intake Manifold Mounting Bolts
Courtesy of FORD MOTOR CO.

5. Install the intake manifold and the seven mounting bolts.

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

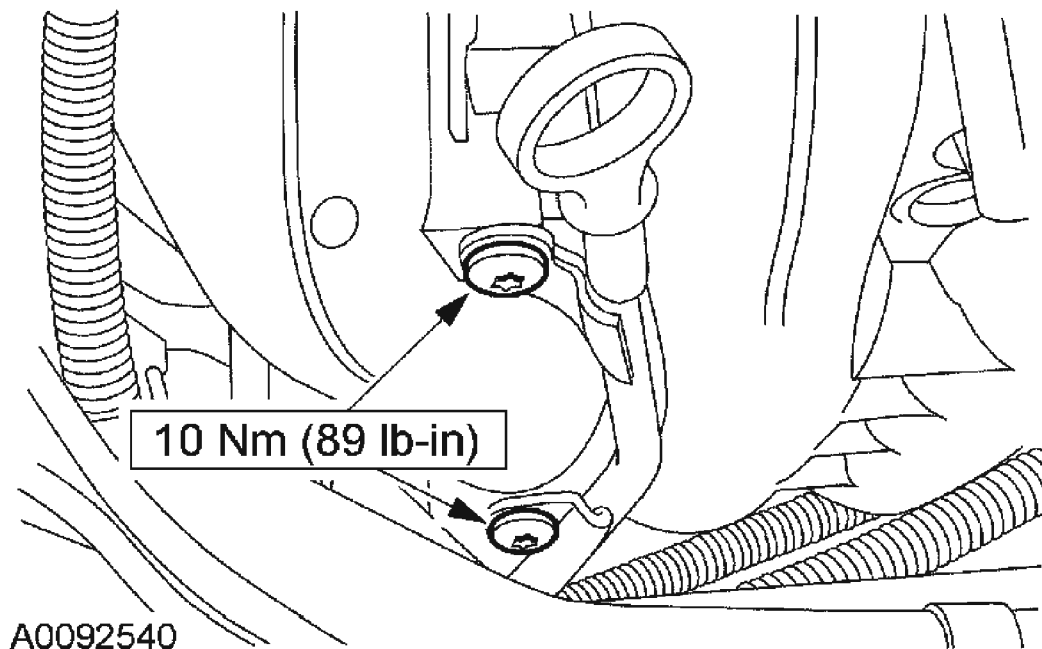


Fig. 33: Installing Oil Level Indicator Tube Bolts
Courtesy of FORD MOTOR CO.

6. Install the oil level indicator tube and bolts.
7. Connect the swirl valve electrical connectors and pin-type retainers.

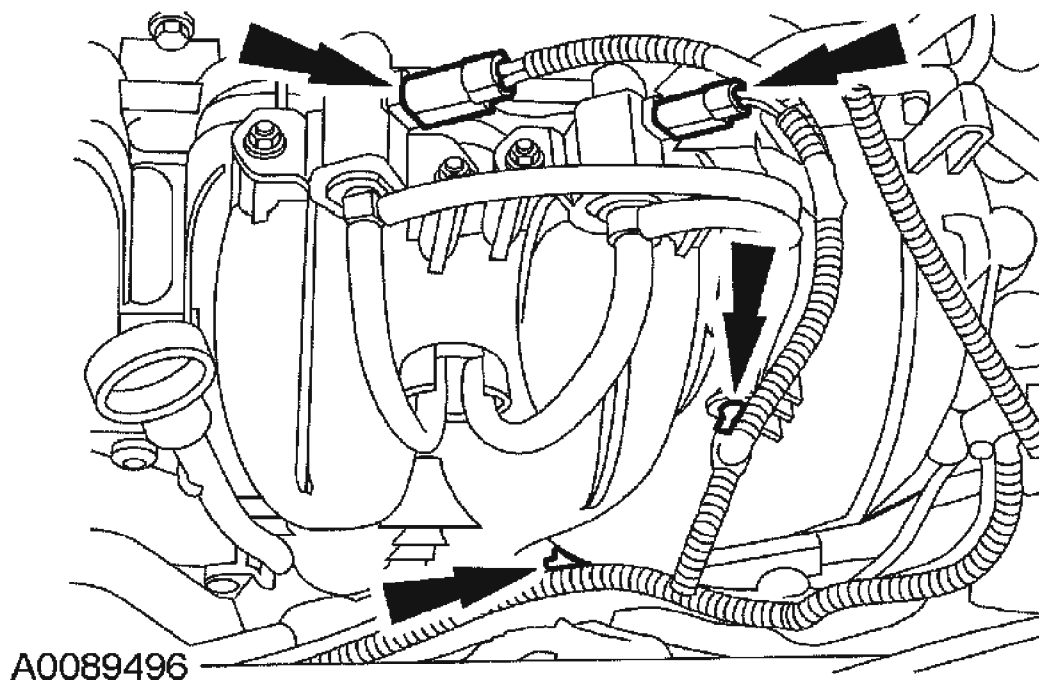


Fig. 34: Connecting Swirl Valve Electrical Connectors And Pin-Type Retainers
Courtesy of FORD MOTOR CO.

2.0L engines

NOTE: Be sure to install the bolts in the previously marked locations.

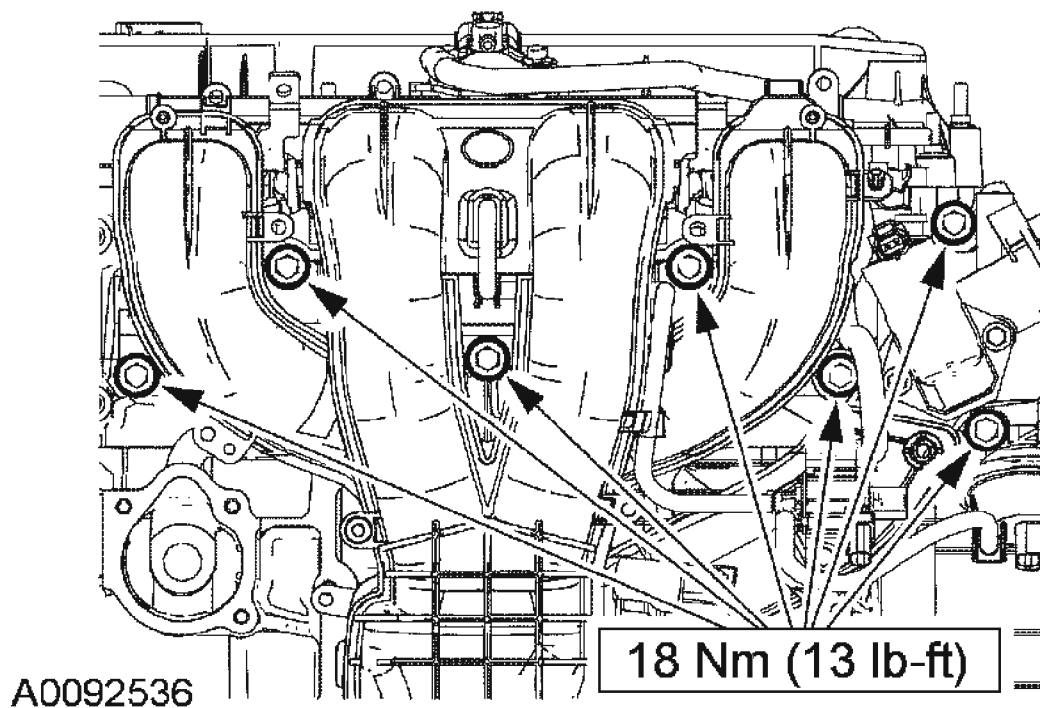


Fig. 35: Installing Intake Manifold Mounting Bolts
Courtesy of FORD MOTOR CO.

8. Install the intake manifold and the seven mounting bolts.

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

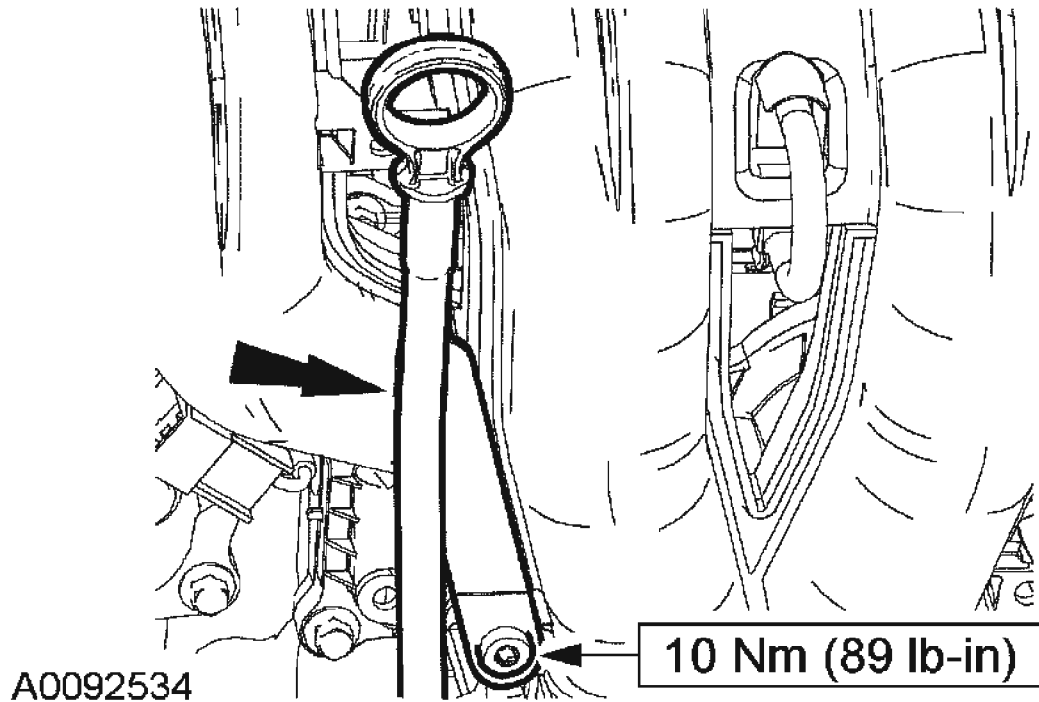


Fig. 36: Installing Oil Level Indicator Tube Bolt
Courtesy of FORD MOTOR CO.

9. Install the oil level indicator tube and bolt.
10. Connect the swirl control valve electrical connector.

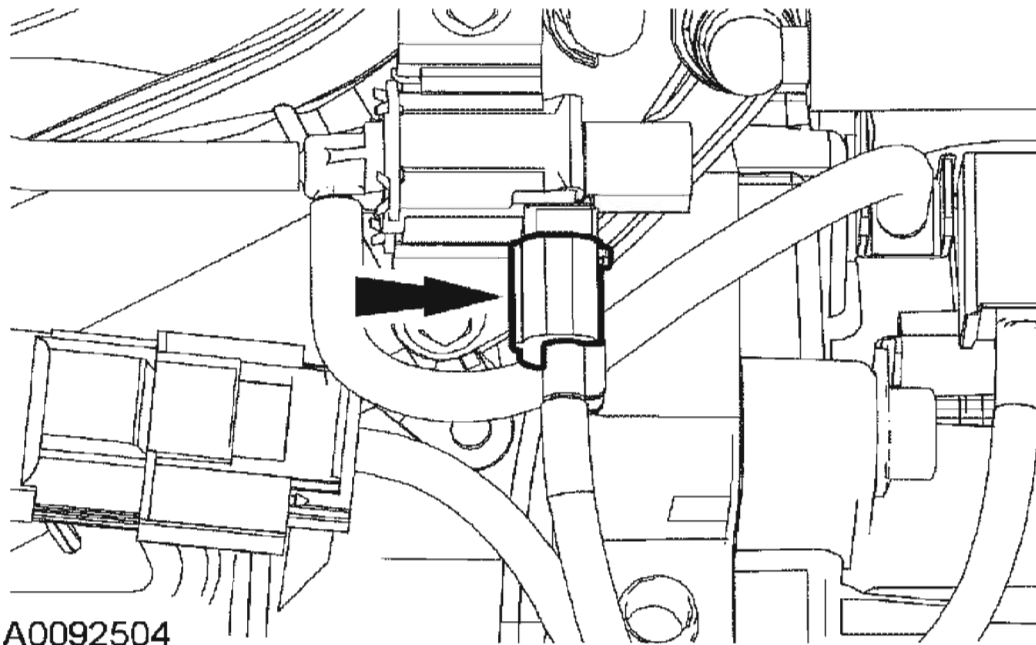


Fig. 37: Connecting Swirl Control Valve Electrical Connector
Courtesy of FORD MOTOR CO.

11. If equipped, connect the AIR vacuum supply hose.

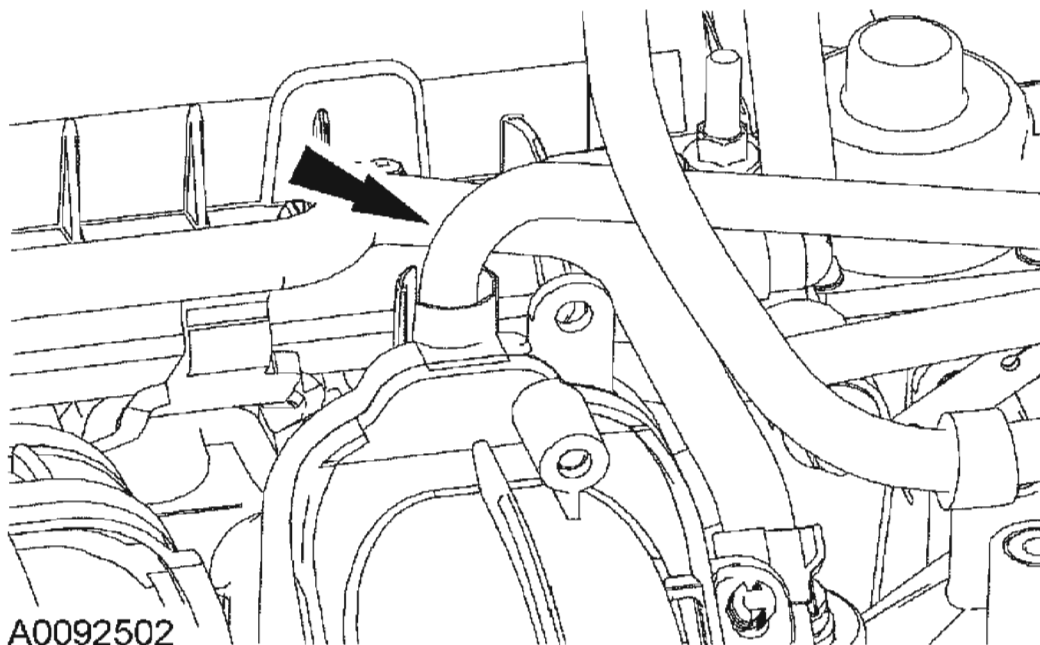


Fig. 38: Connecting AIR Vacuum Supply Hose
Courtesy of FORD MOTOR CO.

All engines

12. Install the lower intake bolt.

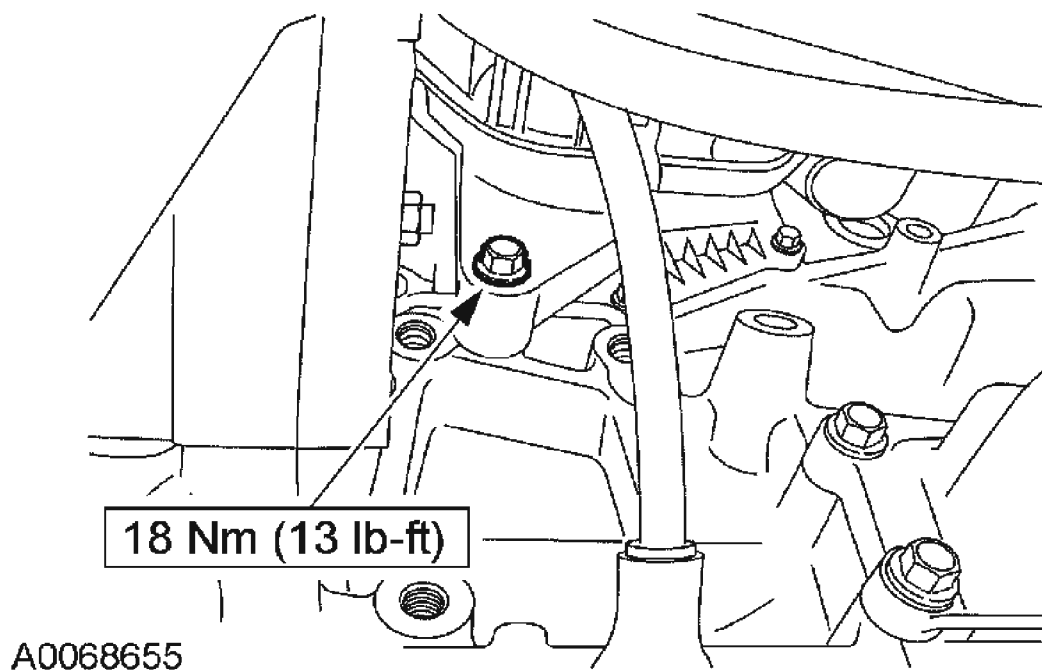
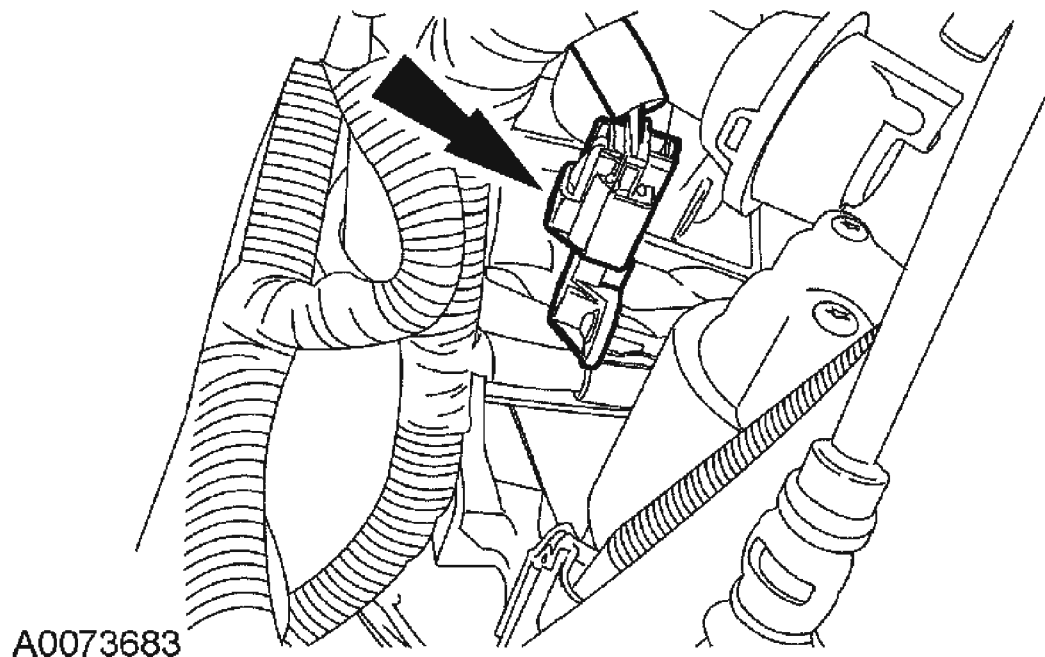


Fig. 39: Installing Lower Intake Bolt
Courtesy of FORD MOTOR CO.

13. Connect the MAP sensor electrical connector.



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Fig. 40: Connecting Map Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

14. Connect the IMRC actuator electrical connector.

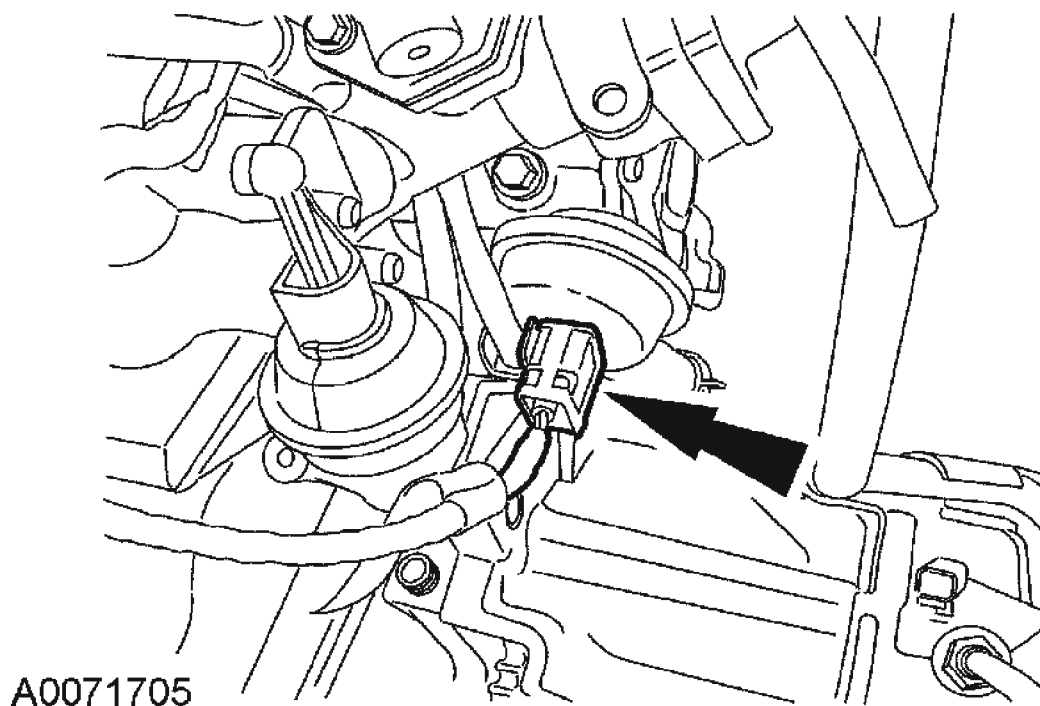


Fig. 41: Connecting IMRC Actuator Electrical Connector
Courtesy of FORD MOTOR CO.

15. Attach the wiring harness pin-type retainer.

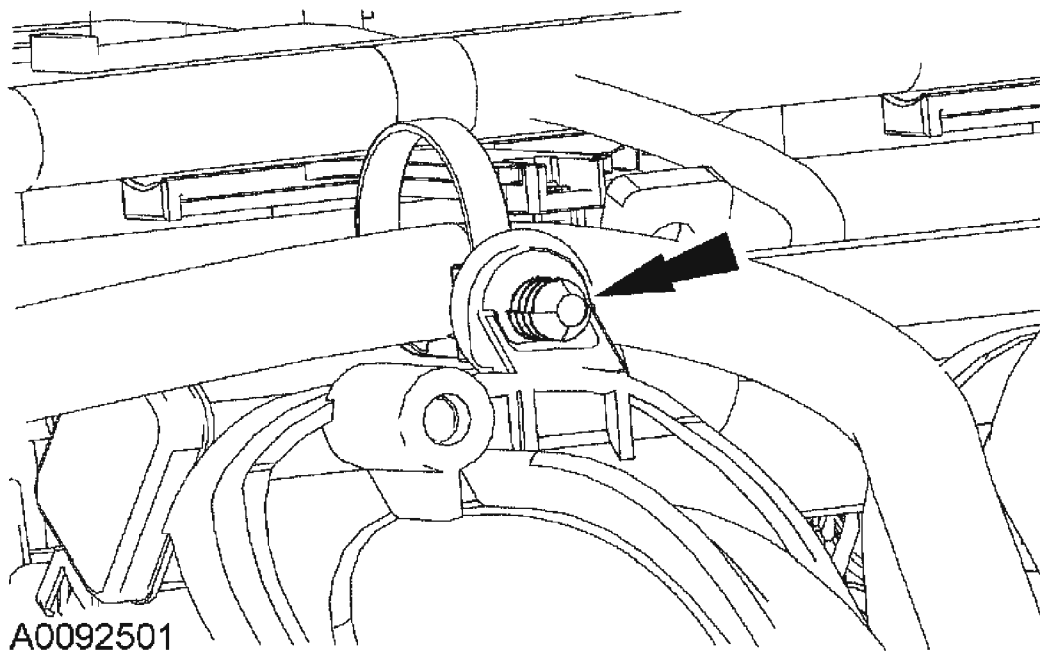


Fig. 42: Attaching Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

16. Connect the fuel rail pressure and temperature sensor vacuum hose.

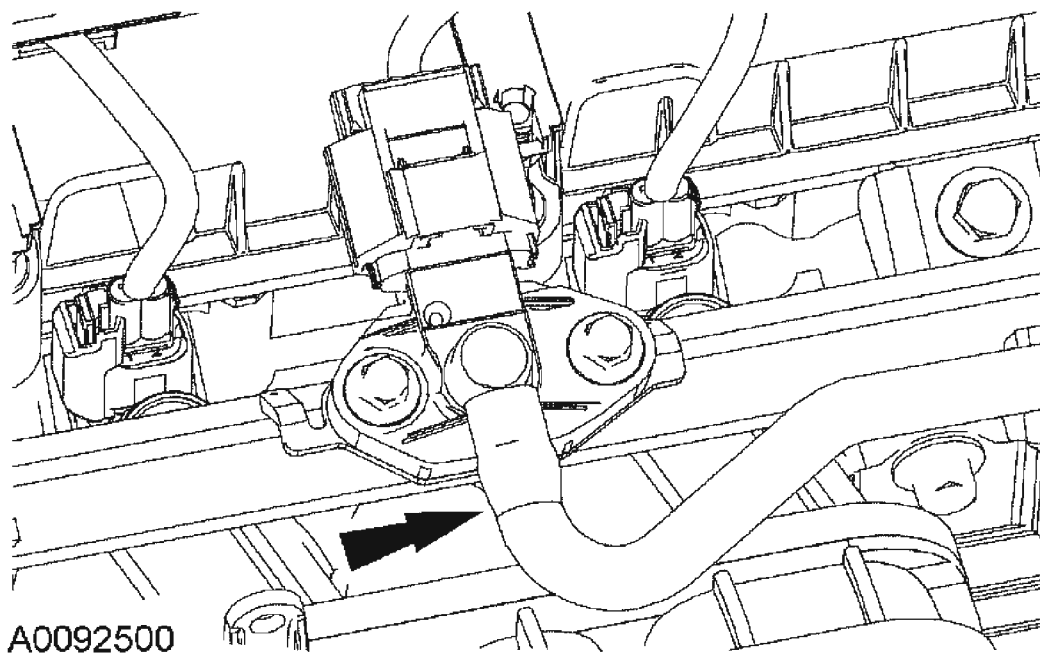


Fig. 43: Connecting Fuel Rail Pressure And Temperature Sensor Vacuum Hose
Courtesy of FORD MOTOR CO.

17. Connect the power brake booster vacuum tube.
 - Push the vacuum tube into the quick release fitting.

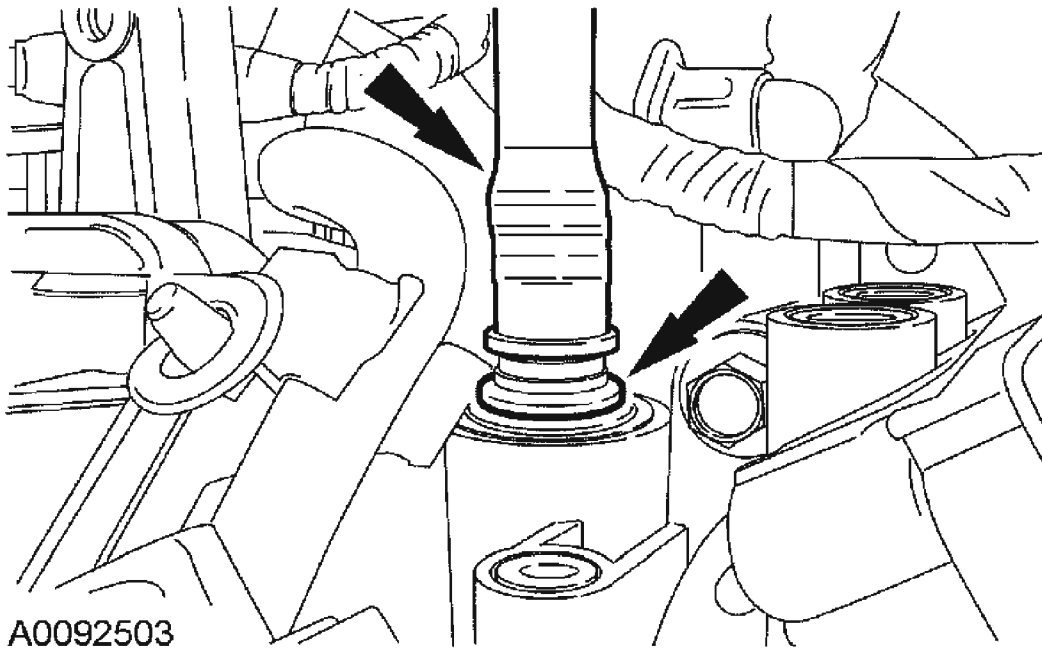


Fig. 44: Connecting Power Brake Booster Vacuum Tube
Courtesy of FORD MOTOR CO.

18. Connect the evaporative emissions hose.

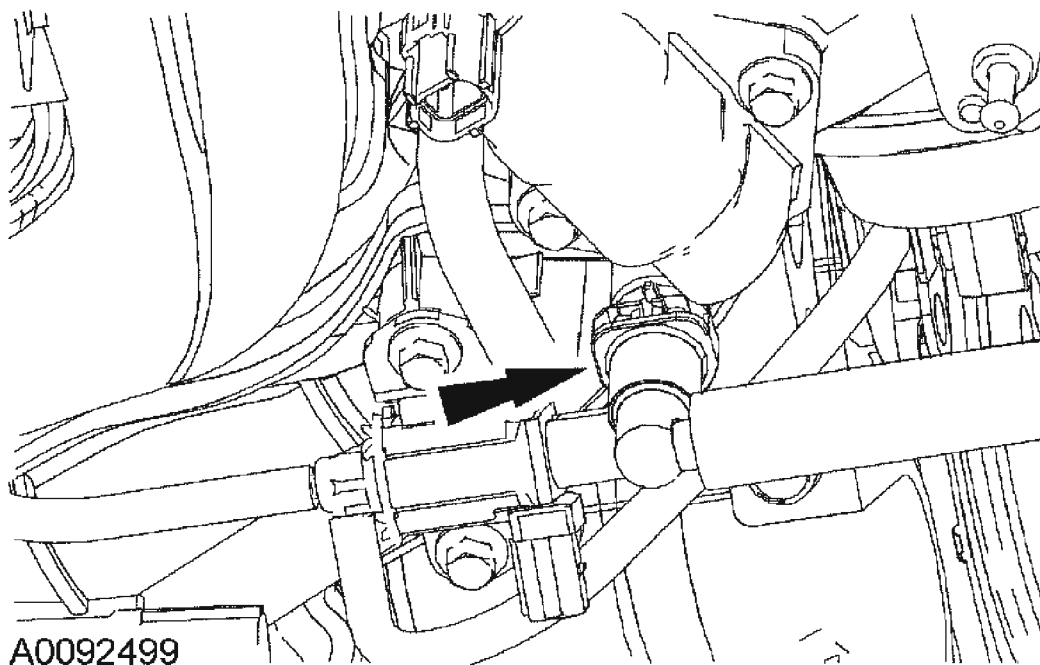


Fig. 45: Connecting Evaporative Emissions Hose
Courtesy of FORD MOTOR CO.

19. Connect the IAC valve electrical connector and wiring harness pin-type retainer.

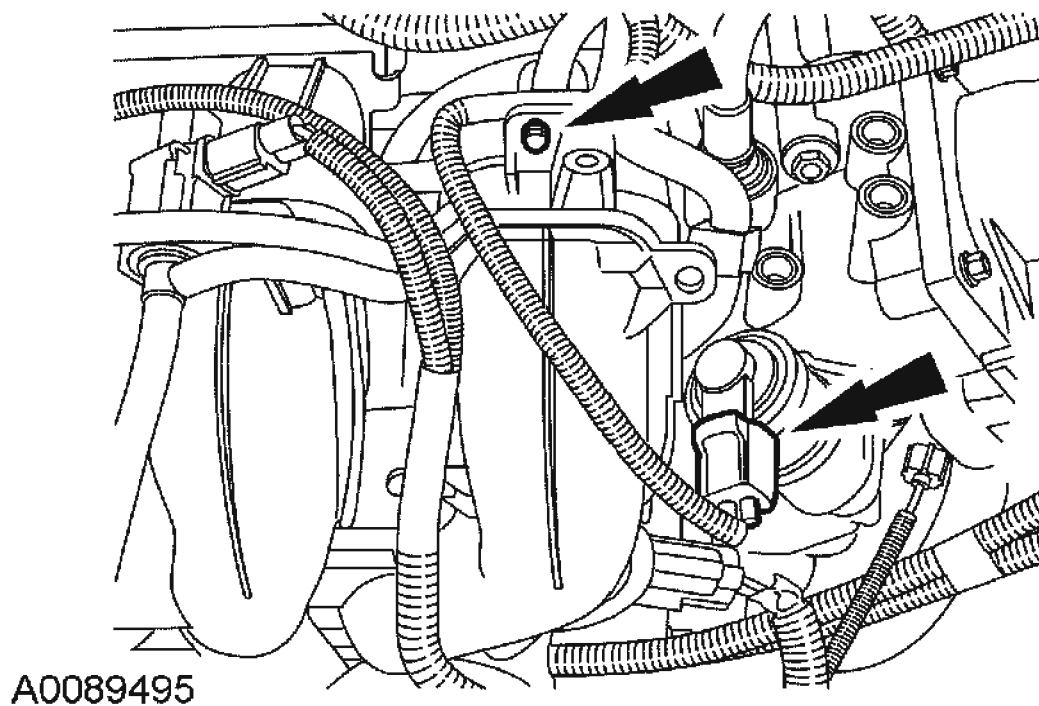


Fig. 46: Connecting IAC Valve Electrical Connector And Wiring Harness Pin-Type Retainer

Courtesy of FORD MOTOR CO.

20. Connect the TP sensor electrical connector and wiring harness pin-type retainer.

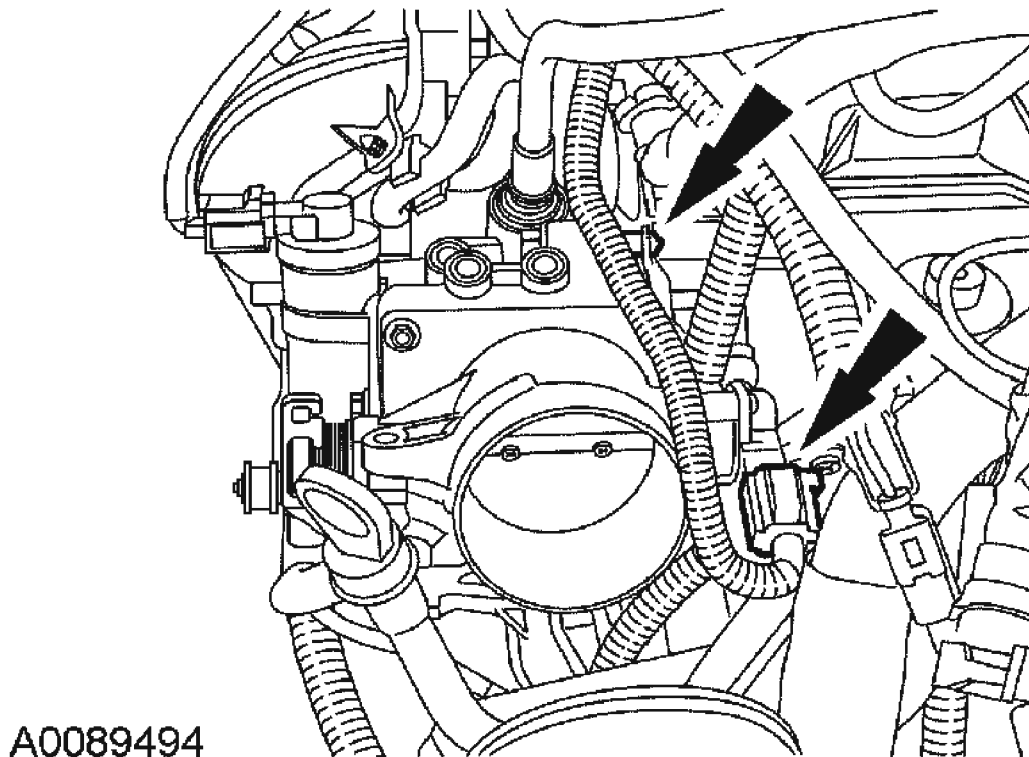


Fig. 47: Connecting TP Sensor Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

21. Connect the accelerator cable and speed control cable (if equipped).
 1. Install the accelerator cable bracket and bolts.
 2. Connect the accelerator and speed control cable (if equipped) to the throttle body.

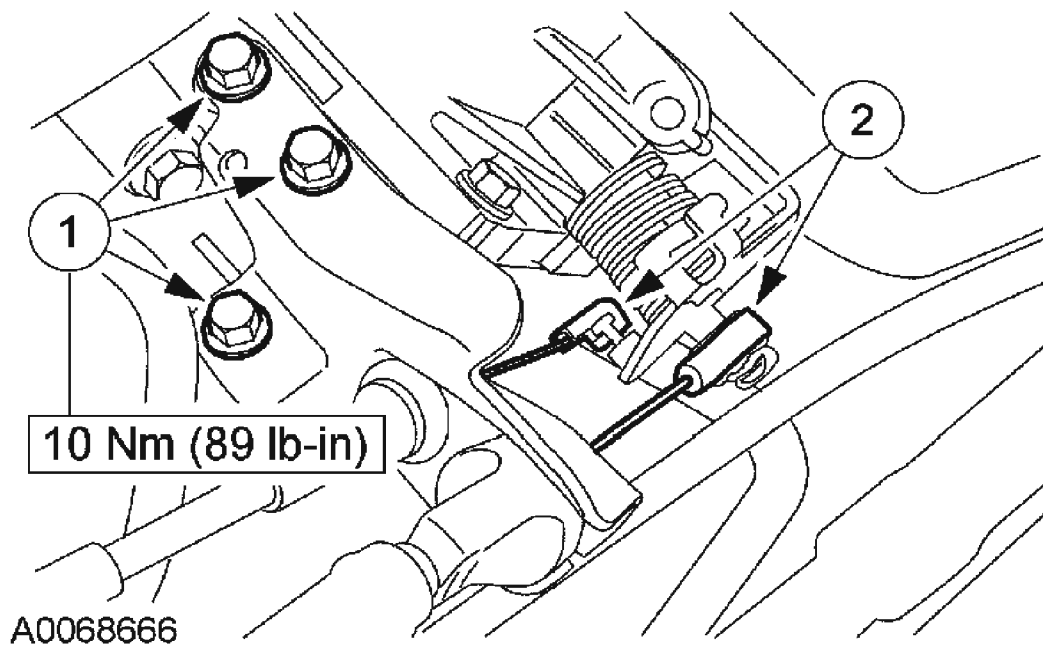


Fig. 48: Connecting Accelerator Cable And Speed Control Cable
Courtesy of FORD MOTOR CO.

22. Install the accelerator control snow shield.
- Position the snow shield and install the retainer.
 - Attach the evaporative emissions hose pin-type retainer.

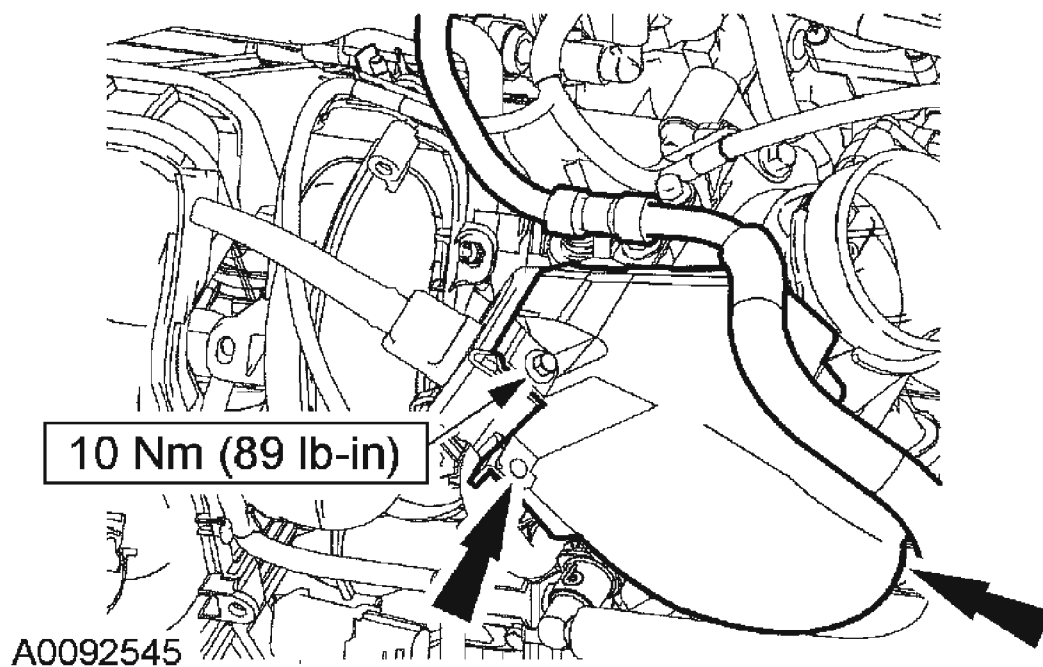


Fig. 49: Installing Accelerator Control Snow Shield
Courtesy of FORD MOTOR CO.

23. Install the air cleaner outlet pipe.

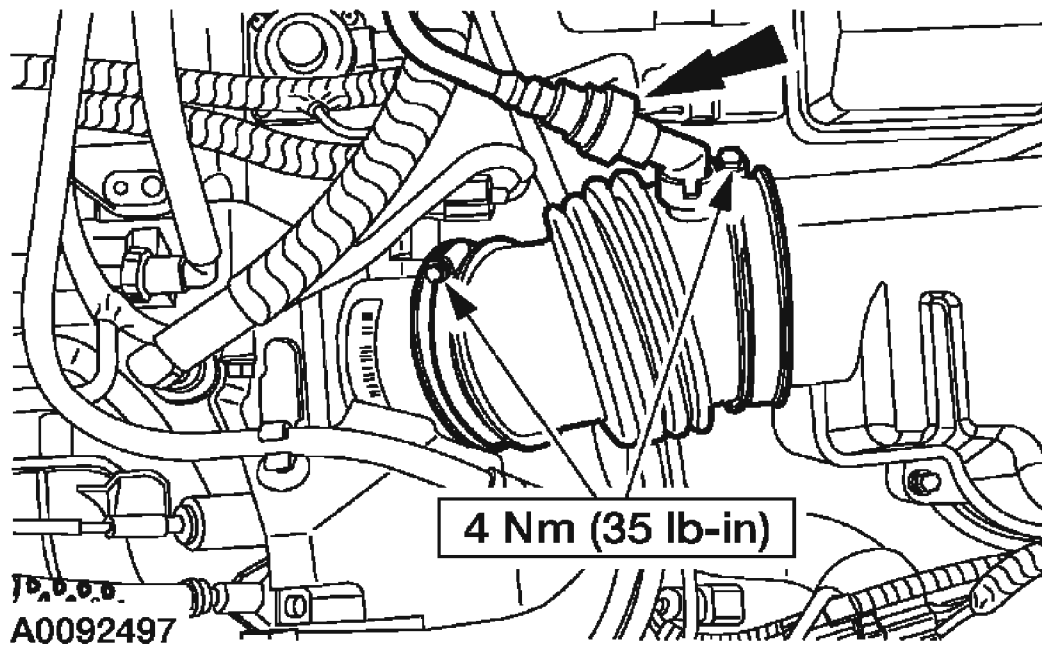


Fig. 50: Installing Air Cleaner Outlet Pipe
Courtesy of FORD MOTOR CO.

24. Install the cooling fan motor and shroud assembly. For additional information, refer to **ENGINE COOLING** .

VALVE COVER

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal

All vehicles

1. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
2. Disconnect the camshaft position (CMP) sensor electrical connector.

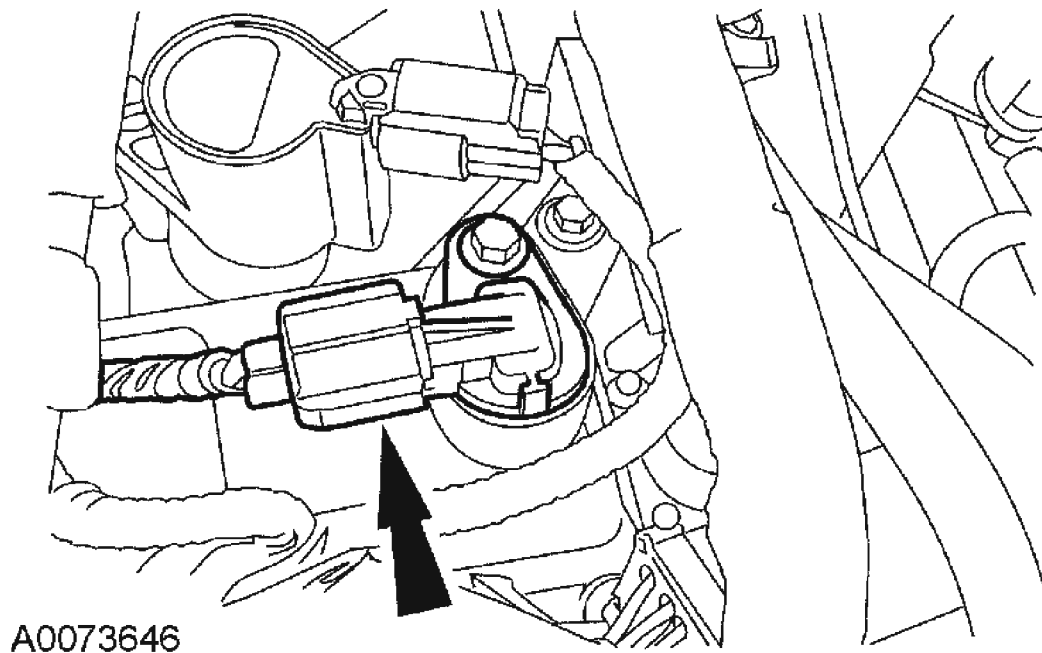
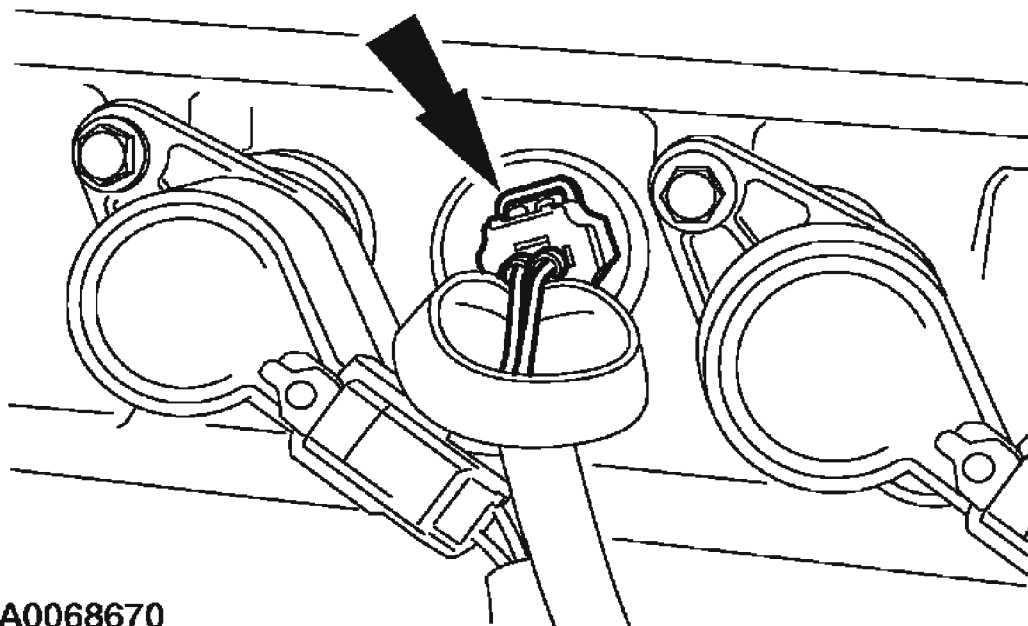


Fig. 51: Disconnecting Camshaft Position Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

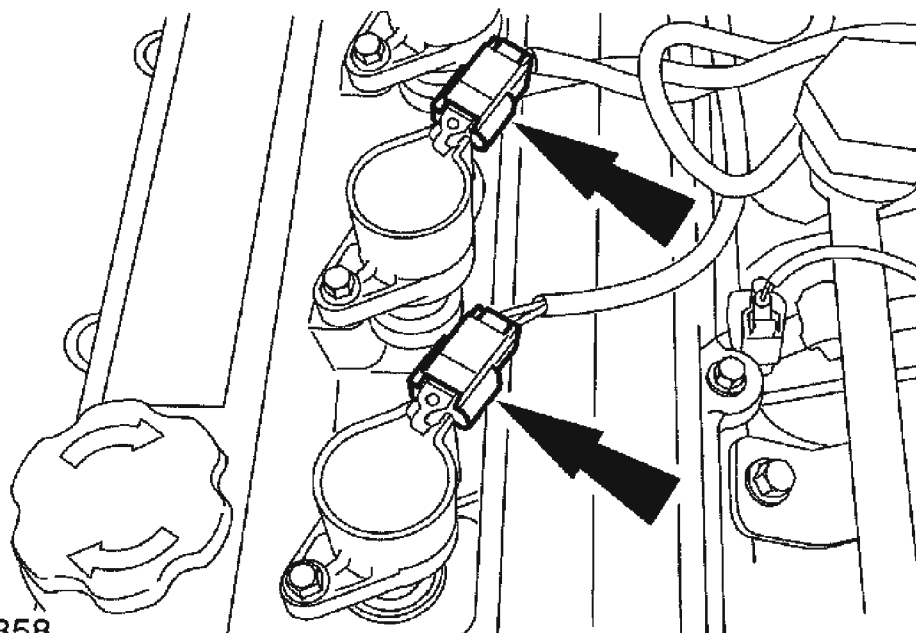
3. Lift up the connector boot and disconnect the cylinder head temperature (CHT) sensor electrical connector.



A0068670

Fig. 52: Disconnecting Cylinder Head Temperature Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

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



A0068858

Fig. 53: Disconnecting Coil-On-Plug Electrical Connectors
Courtesy of FORD MOTOR CO.

5. Remove the ignition coils.
 1. Remove the ignition coil bolts.
 2. While rotating, pull the ignition coils straight up.

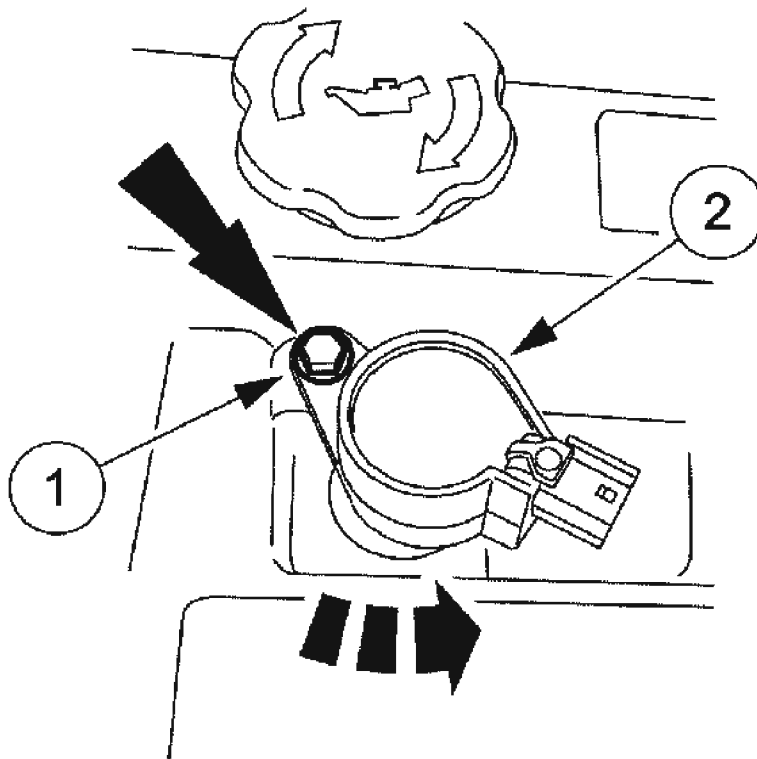


Fig. 54: Removing Ignition Coils
Courtesy of FORD MOTOR CO.

6. Disconnect the breather tube from the valve cover.

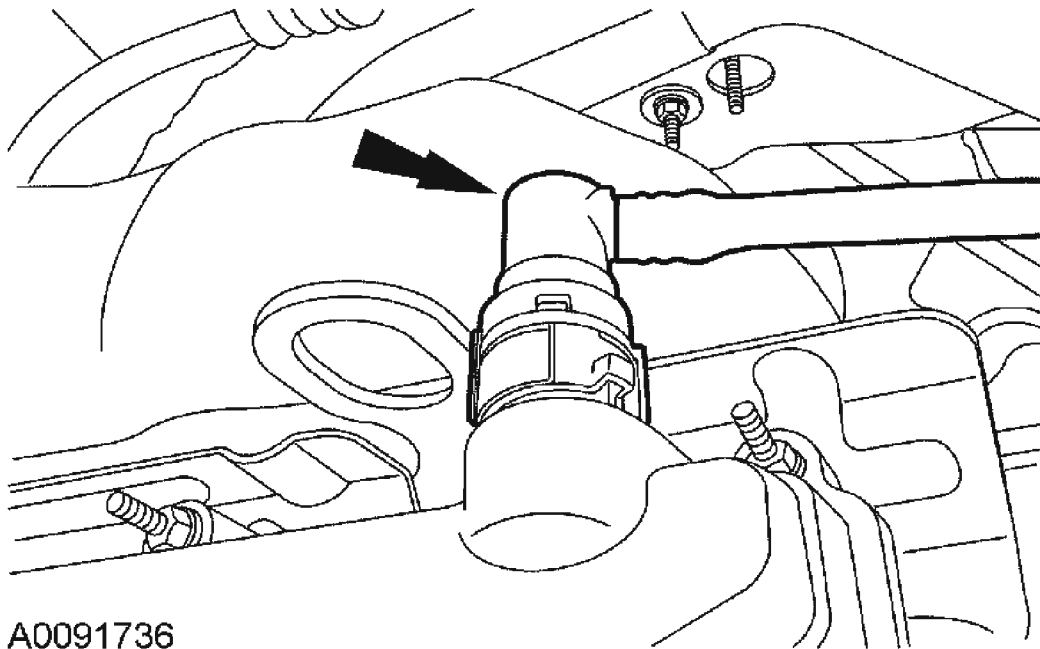
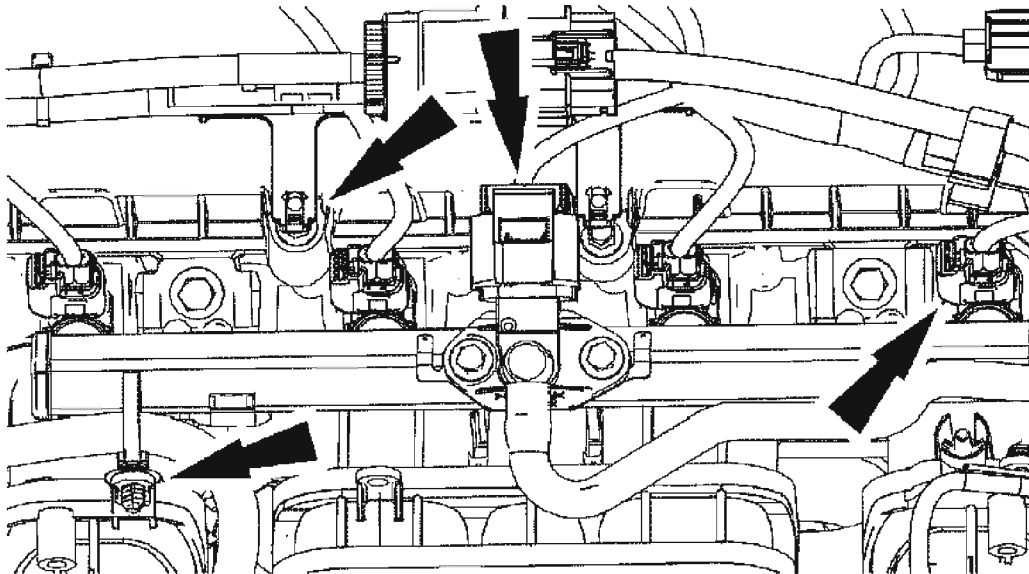


Fig. 55: Disconnecting Breather Tube From Valve Cover
Courtesy of FORD MOTOR CO.

7. Disconnect the fuel rail pressure and temperature sensor and the fuel injector electrical connectors. Detach the wiring harness retainers.



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Fig. 56: Disconnecting Fuel Rail Pressure And Temperature Sensor And Fuel Injector Electrical Connectors
Courtesy of FORD MOTOR CO.

8. Remove the radio interference capacitor bracket bolt and position the bracket aside.

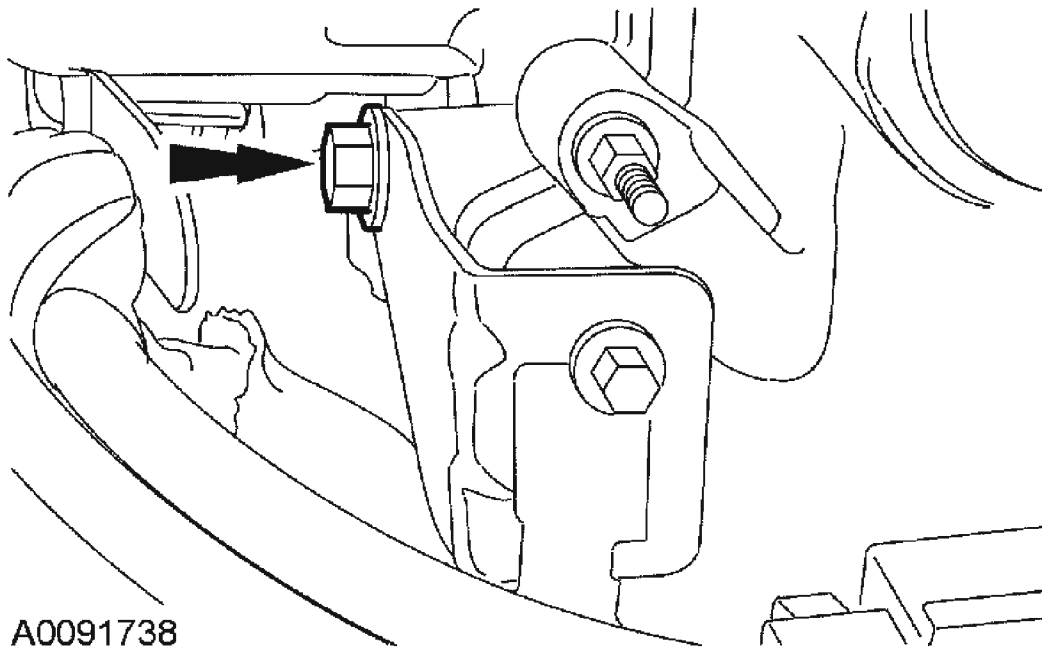
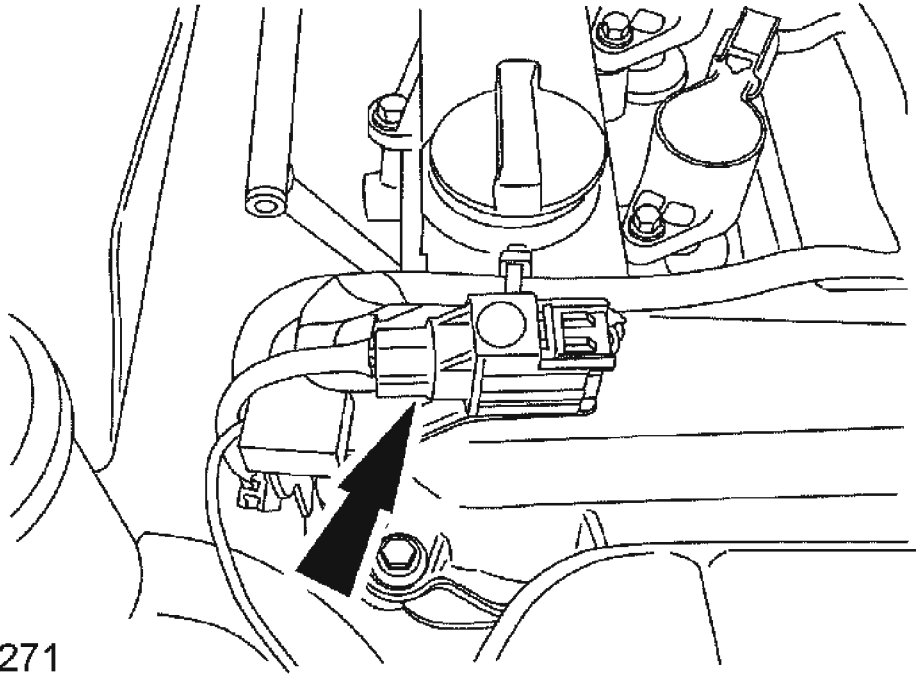


Fig. 57: Removing Radio Interference Capacitor Bracket Bolt
Courtesy of FORD MOTOR CO.

Vehicles with secondary air injection (AIR)

9. Disconnect the heated oxygen sensor (HO2S) electrical connector.



A0071271

Fig. 58: Disconnecting Heated Oxygen Sensor (HO2S) Electrical Connector
Courtesy of FORD MOTOR CO.

All vehicles

10. Disconnect the wiring harness retainer from the valve cover studs and position aside.

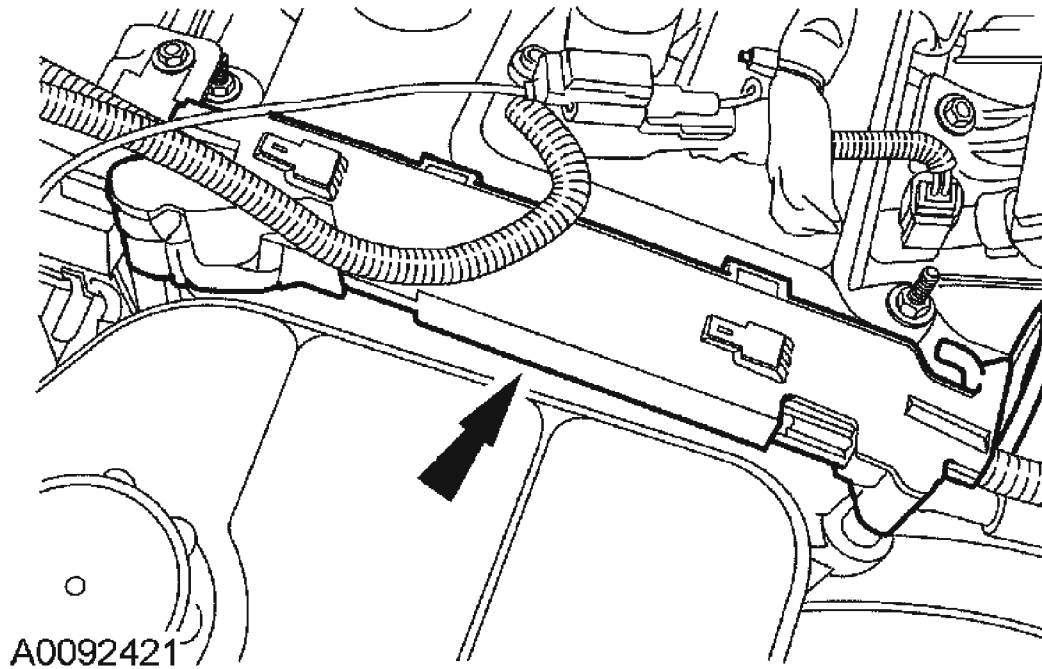


Fig. 59: Disconnecting Wiring Harness Retainer From Valve Cover Studs
Courtesy of FORD MOTOR CO.

11. Remove the bolts and the valve cover.

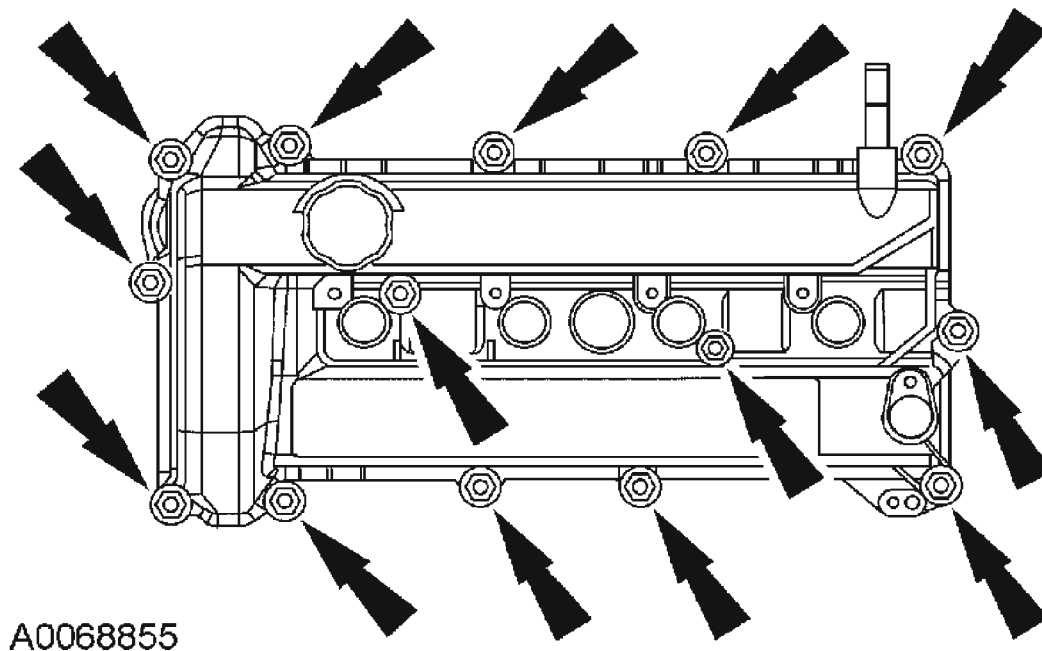


Fig. 60: Removing Valve Cover Bolts
Courtesy of FORD MOTOR CO.

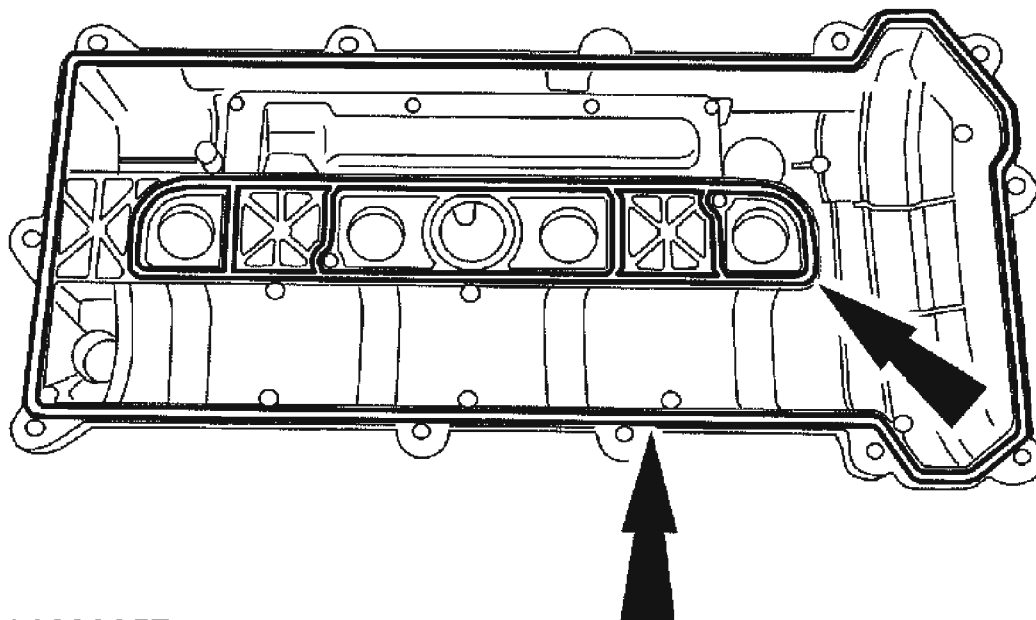
CAUTION: Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges which make leak paths.

12. Clean and inspect the sealing surfaces.

Installation

All vehicles

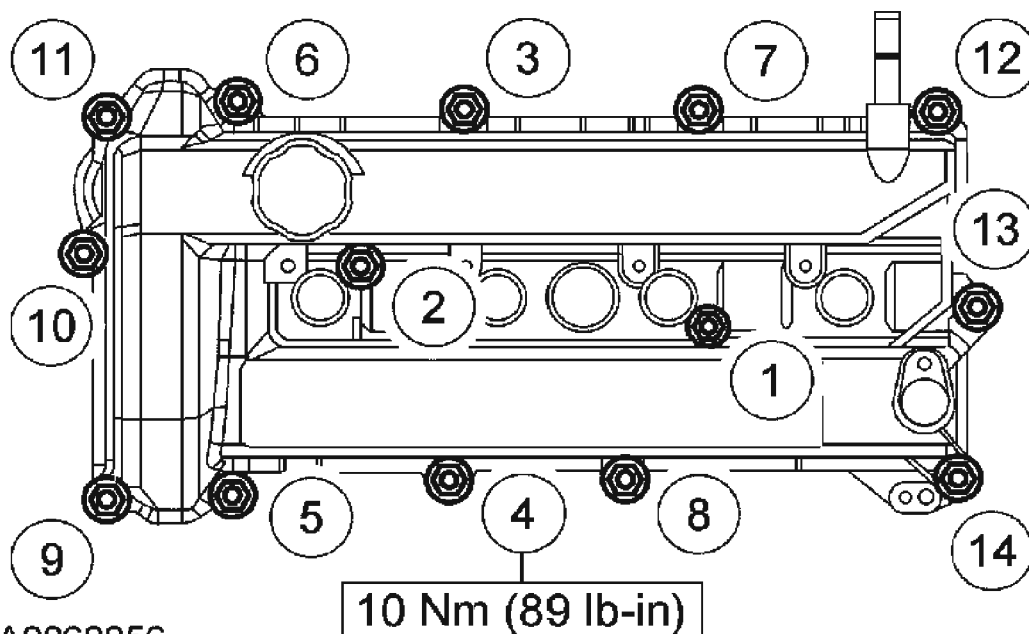
1. Inspect the valve cover gaskets for damage. Install new gaskets if necessary.



A0032257

Fig. 61: Inspecting Valve Cover Gaskets For Damage
 Courtesy of FORD MOTOR CO.

2. Install the valve cover and bolts. Tighten the bolts in the sequence shown.



A0068856

Fig. 62: Installing Valve Cover And Bolts
Courtesy of FORD MOTOR CO.

3. Install the wiring harness retainer on the valve cover studs.

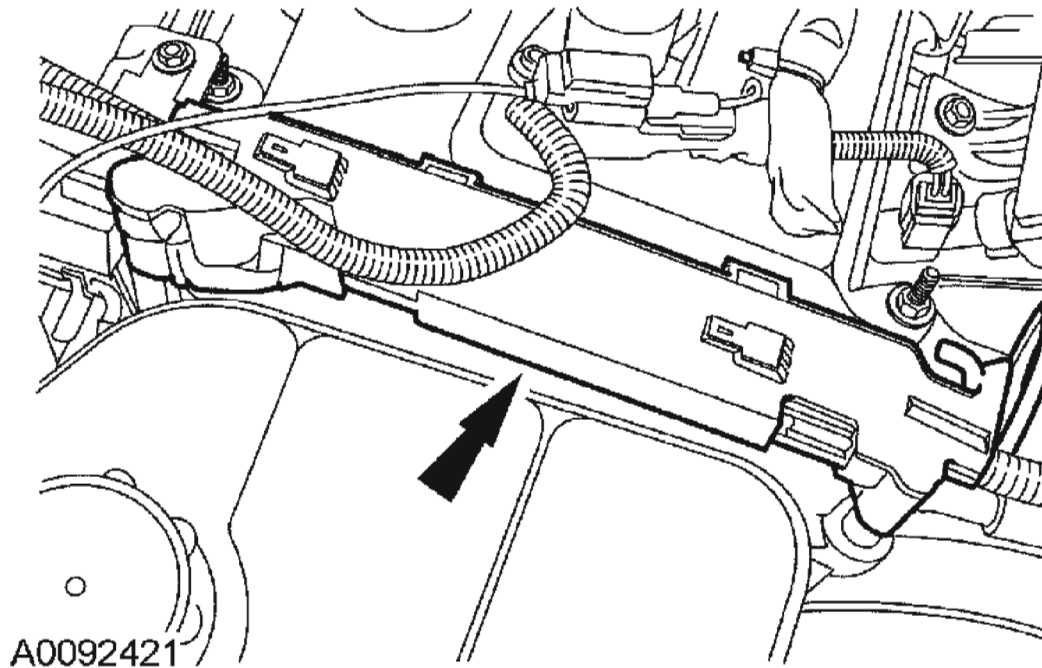


Fig. 63: Installing Wiring Harness Retainer On Valve Cover Studs
Courtesy of FORD MOTOR CO.

Vehicles with secondary air injection (AIR)

4. Connect the HO2S electrical connector.

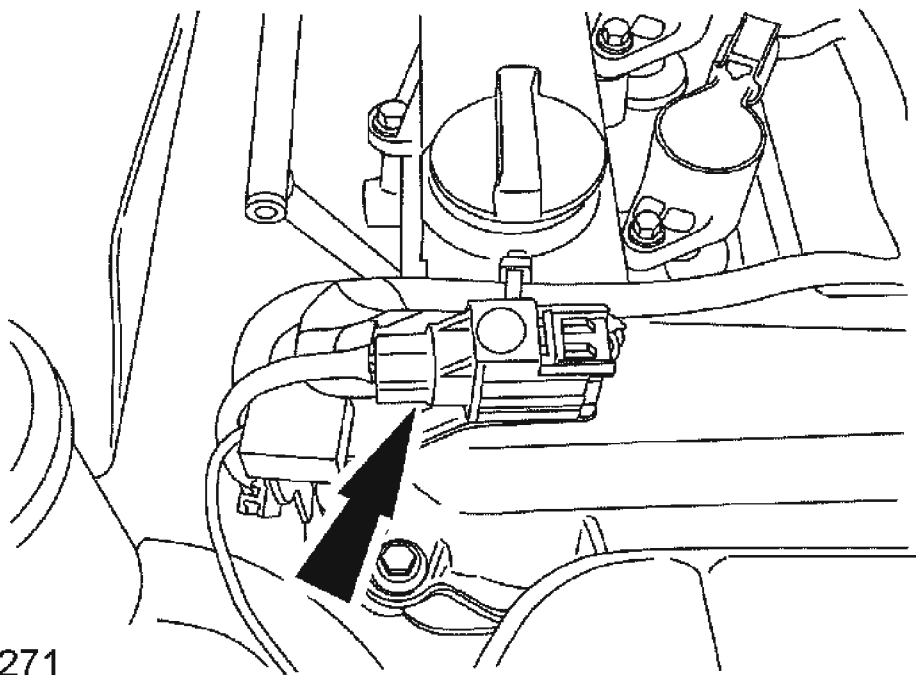


Fig. 64: Connecting HO2S Electrical Connector
Courtesy of FORD MOTOR CO.

All vehicles

5. Position the radio interference capacitor bracket and install the bolt.

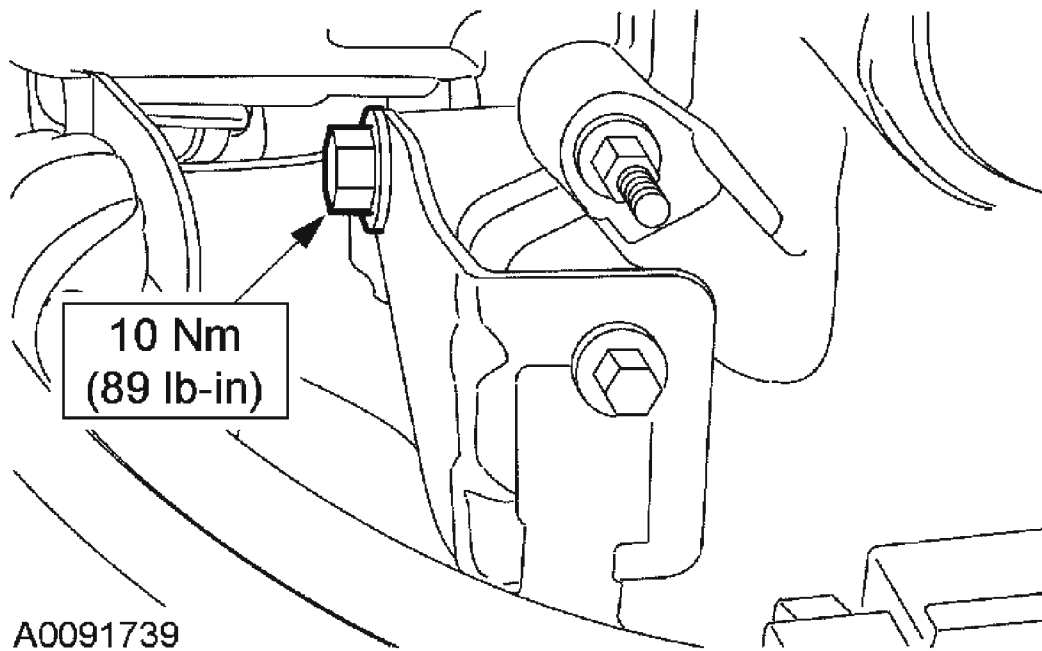
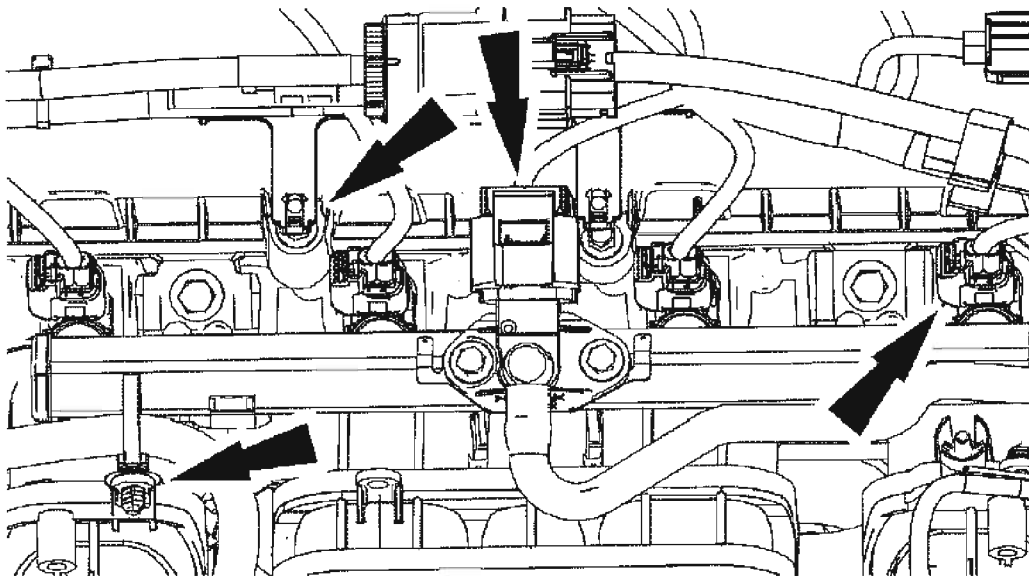


Fig. 65: Installing Radio Interference Capacitor Bracket Bolt
Courtesy of FORD MOTOR CO.

6. Attach the wiring harness retainers. Connect the fuel rail pressure and temperature sensor and the fuel injectors electrical connectors.



A0091737

Fig. 66: Attaching Wiring Harness Retainers And Connecting Fuel Rail Pressure And Temperature Sensor And Fuel Injectors Electrical Connectors
Courtesy of FORD MOTOR CO.

7. Install the breather tube on the valve cover.

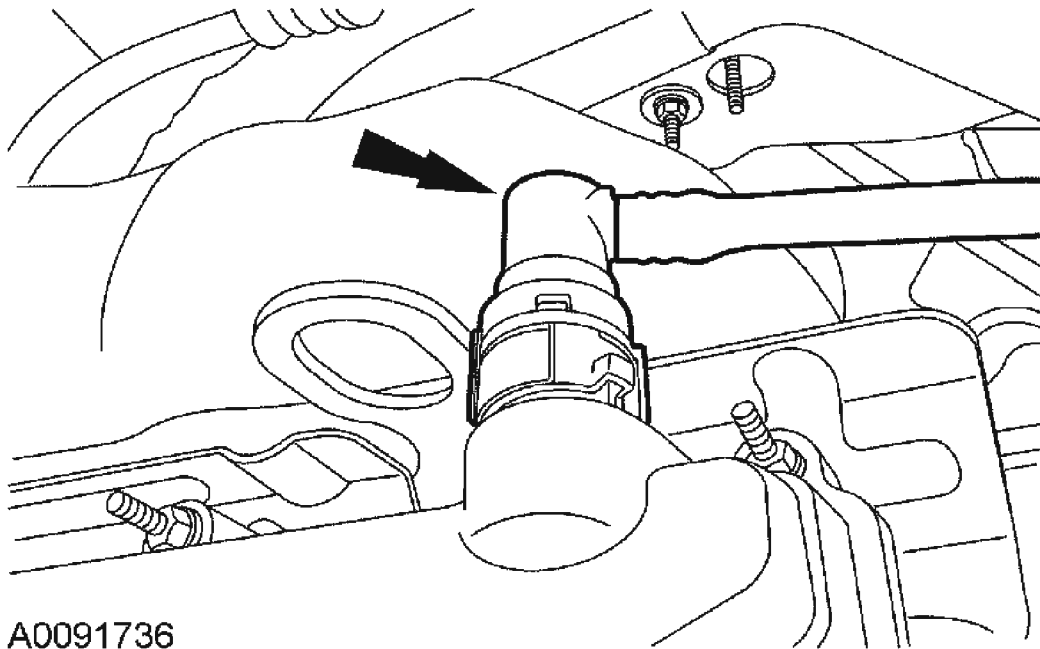


Fig. 67: Installing Breather Tube On Valve Cover
Courtesy of FORD MOTOR CO.

8. Install the coil-on-plug assemblies.

NOTE: **Push the coil assemblies down firmly until the boot seal has sealed the access hole.**

1. Install the coil assemblies.
2. Install the coil assembly bolts.

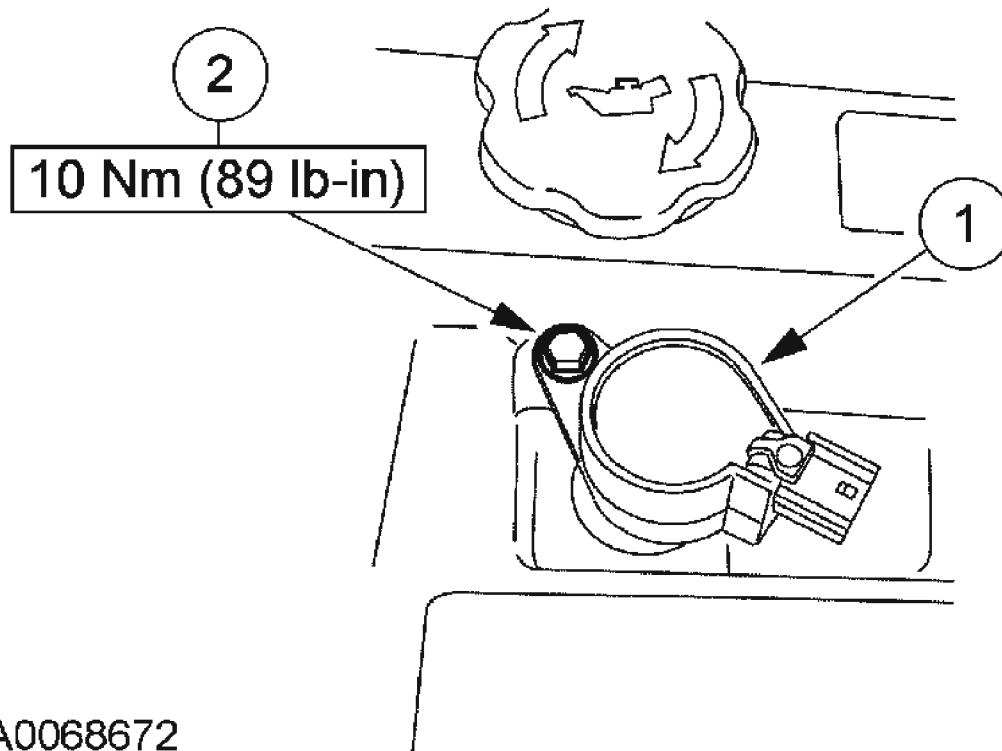


Fig. 68: Installing Coil-On-Plug Assemblies
Courtesy of FORD MOTOR CO.

9. Connect the ignition coil electrical connectors.

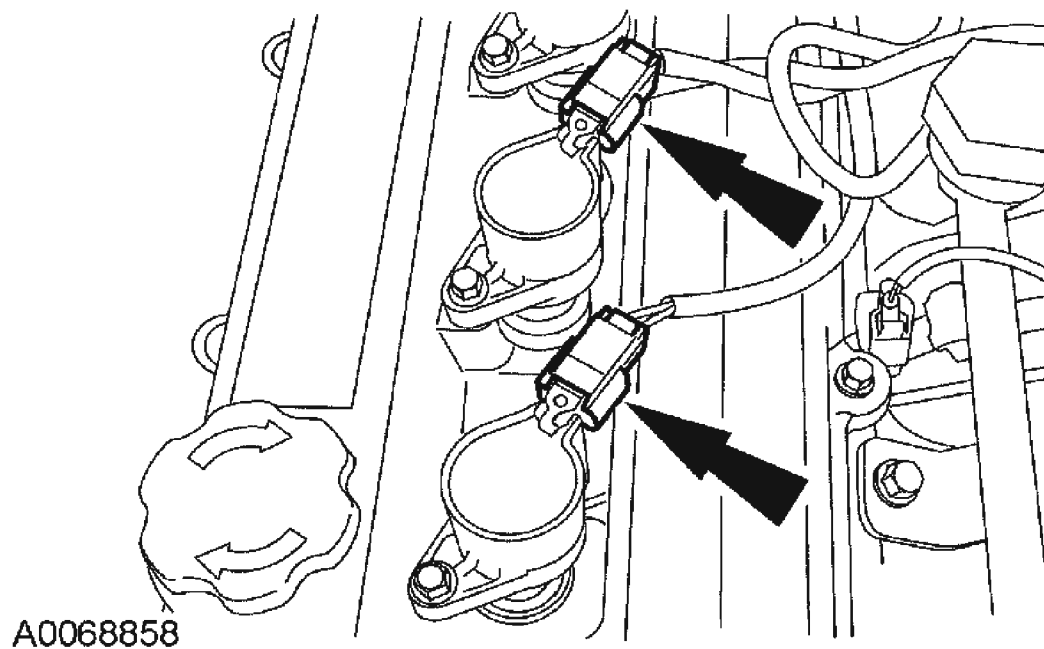


Fig. 69: Connecting Ignition Coil Electrical Connectors
Courtesy of FORD MOTOR CO.

10. Connect the CHT sensor electrical connector and install the connector boot.

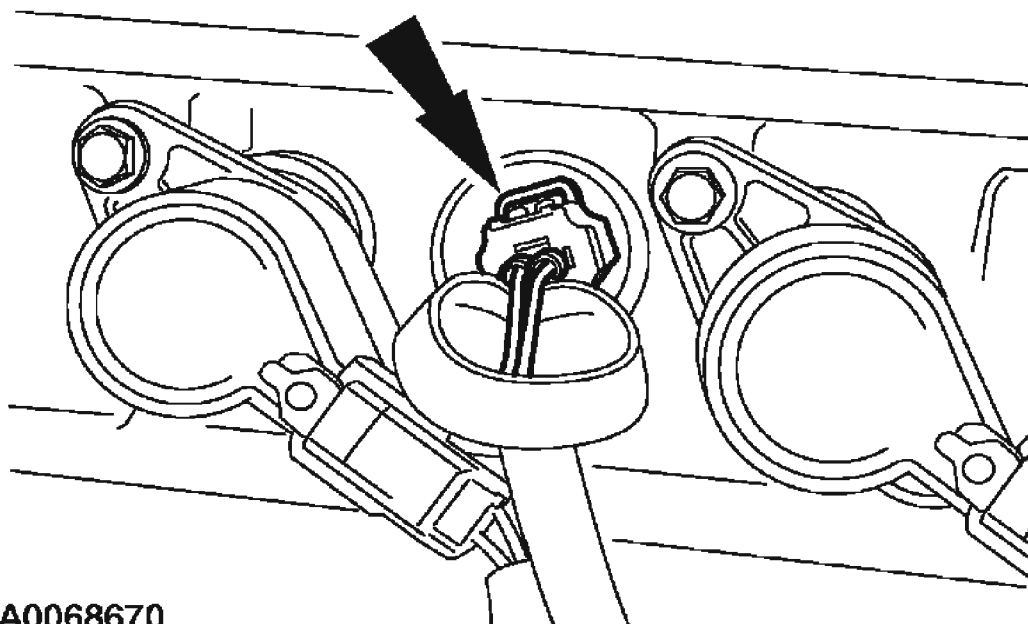


Fig. 70: Connecting CHT Sensor Electrical Connector And Installing Connector Boot

Courtesy of FORD MOTOR CO.

11. Connect the CMP sensor electrical connector.

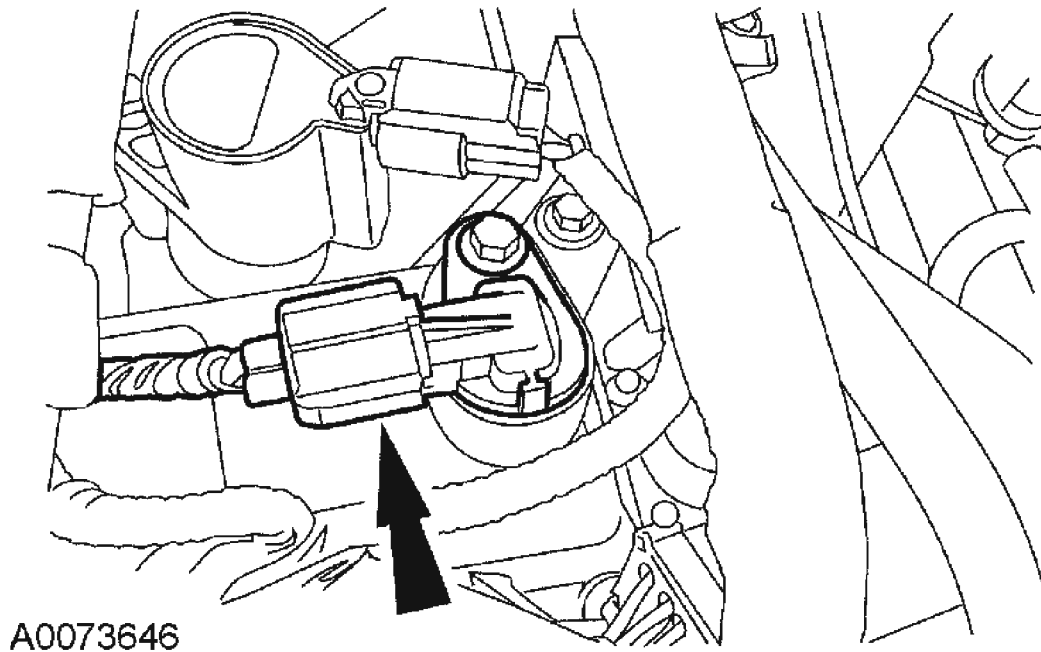


Fig. 71: Connecting CMP Sensor Electrical Connector

Courtesy of FORD MOTOR CO.

12. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.

CRANKSHAFT PULLEY

Special Tool(s)

SPECIAL TOOL DESCRIPTION

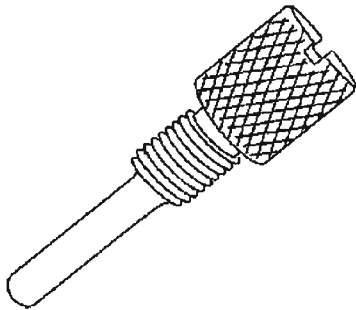
	Alignment Plate, Camshaft 303-465 (T94P-6256-CH)
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2005 Ford Focus ZX5 S

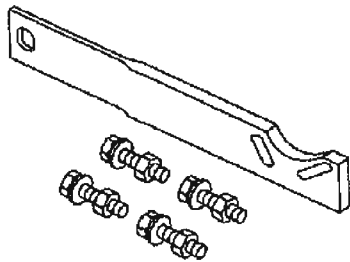
2005 ENGINE Engine - 2.0L & 2.3L - Focus



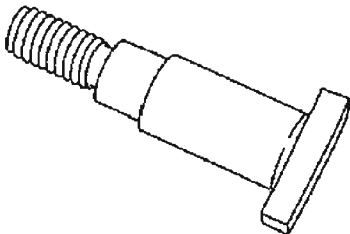
ST2645-A



ST2638-A



ST2647-A



ST2639-A

Timing Peg, Crankshaft 303-507

Holding Fixture, Drive Pinion Flange 205-126 (T78P-4851-A)

Adapter for 205-126 (205-072-02)

Material

MATERIAL SPECIFICATIONS

Item	Specification

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

SAE 5W-20 Premium Synthetic Blend
Motor Oil XO-5W20-QSP or equivalent

WSS-M2C930-A

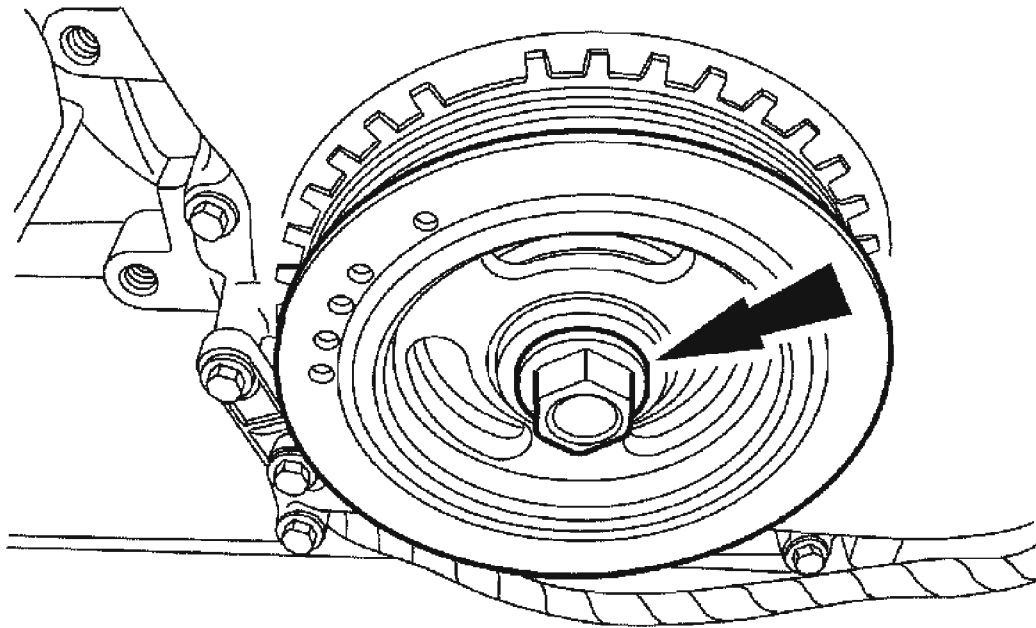
Removal

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.

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

1. Remove the accessory drive belt. For additional information, refer to **ACCESSORY DRIVE**.
2. Remove the valve cover. For additional information, refer to **VALVE COVER**.

CAUTION: Failure to position the No. 1 piston at top dead center (TDC) can result in damage to the engine. Turn the engine in the normal direction of rotation only.



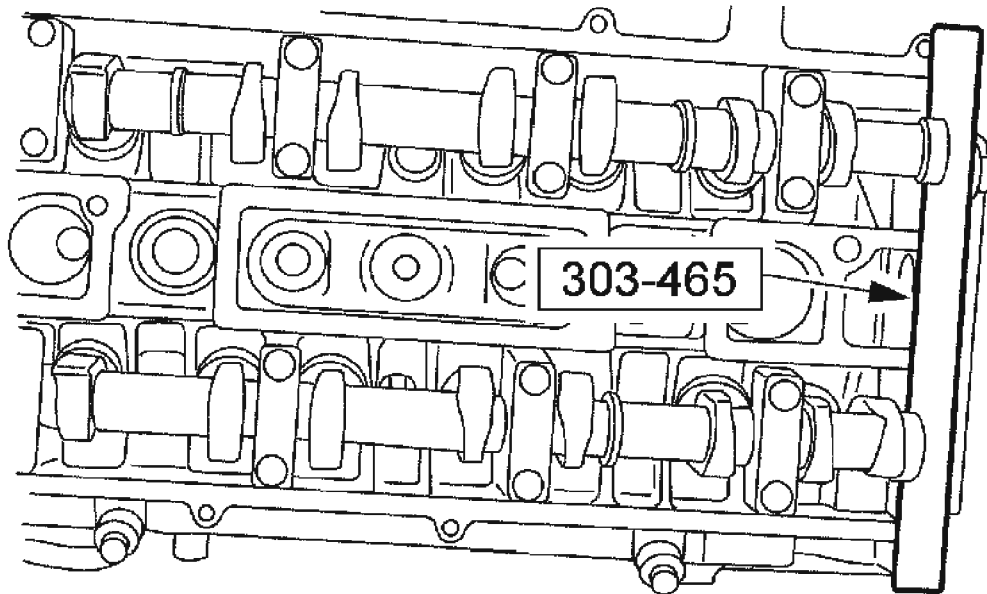
A0032808

Fig. 72: Turning Crankshaft Clockwise To Position No. 1 Piston At TDC
Courtesy of FORD MOTOR CO.

3. Using the crankshaft pulley bolt, turn the crankshaft clockwise to position the No. 1 piston at TDC.

CAUTION: The special tool 303-465 is for camshaft alignment only. Using this tool to prevent engine rotation can result in engine damage.

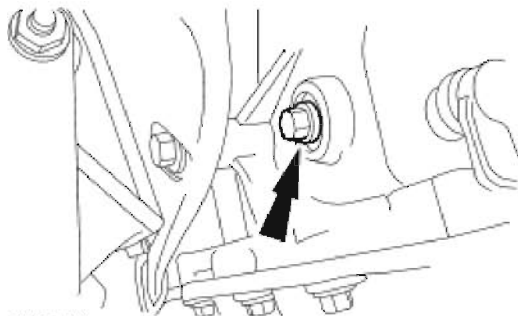
NOTE: The camshaft timing slots are offset. If the special tool cannot be installed, rotate the crankshaft one complete revolution clockwise to correctly position the camshafts.



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Fig. 73: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

4. Install the special tool in the slots on the rear of both camshafts.
5. Remove the plug bolt.



A0032806

Fig. 74: Locating Engine Plug Bolt
Courtesy of FORD MOTOR CO.

NOTE: Only turn the engine in the normal direction of rotation.

NOTE: Installing the special tool in this step will prevent the engine from being rotated in the clockwise direction. However, the engine can still be rotated in the counterclockwise direction.

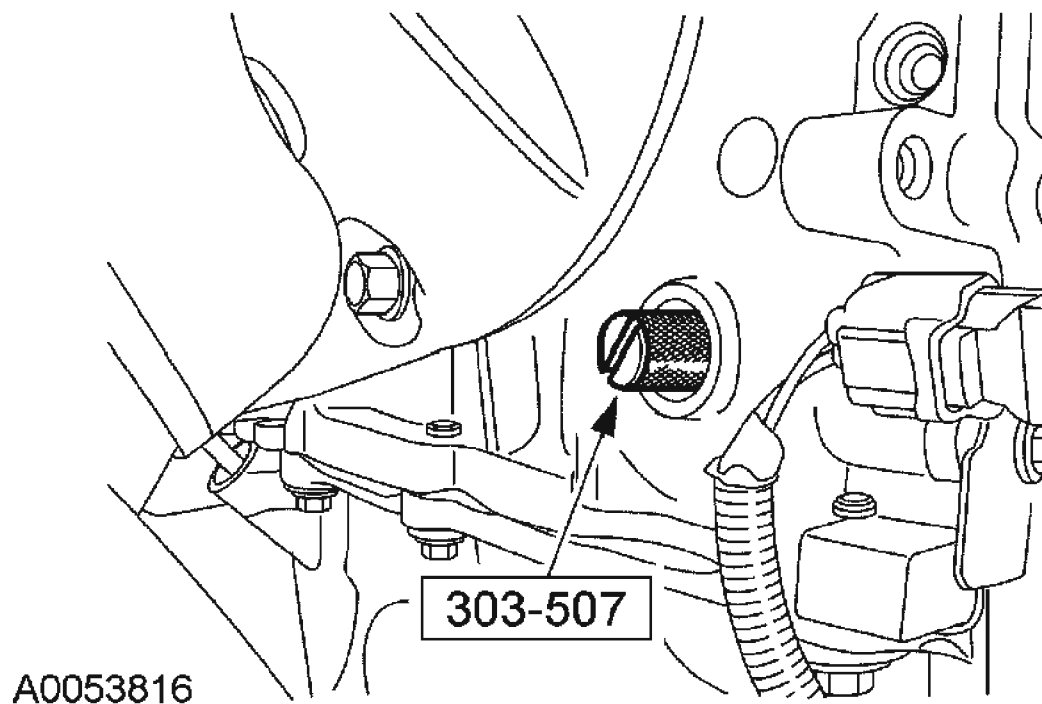


Fig. 75: Identifying Special Tool (303-507)
Courtesy of FORD MOTOR CO.

6. Install the special tool.
7. Install the special tools.

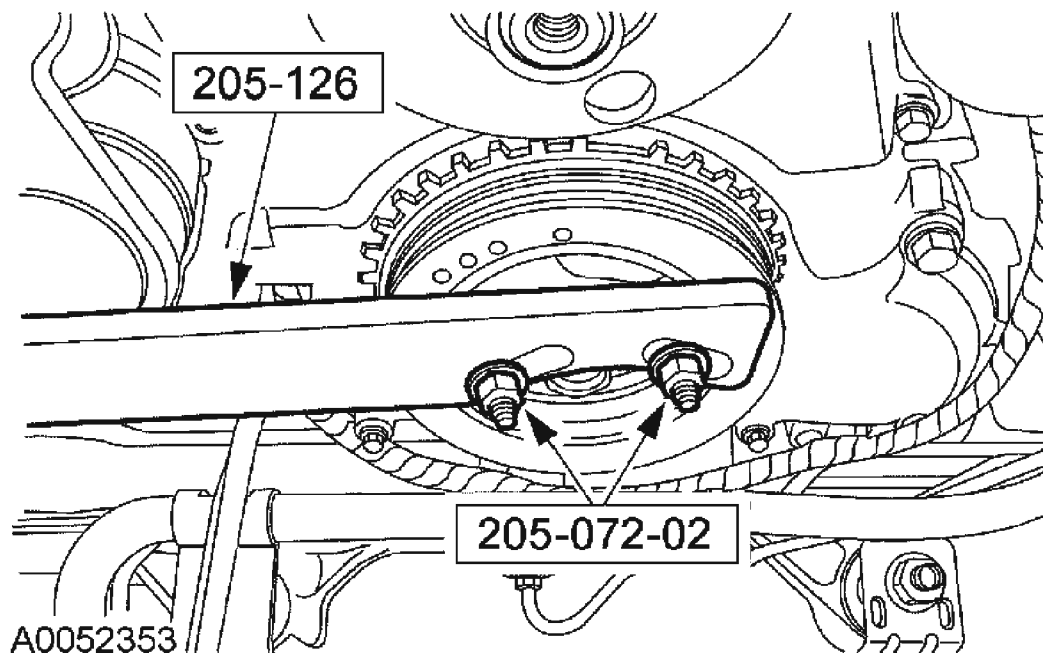


Fig. 76: Installing Special Tools (205-126)

Courtesy of FORD MOTOR CO.

CAUTION: Failure to hold the crankshaft pulley in place during bolt loosening can result in damage to the engine.

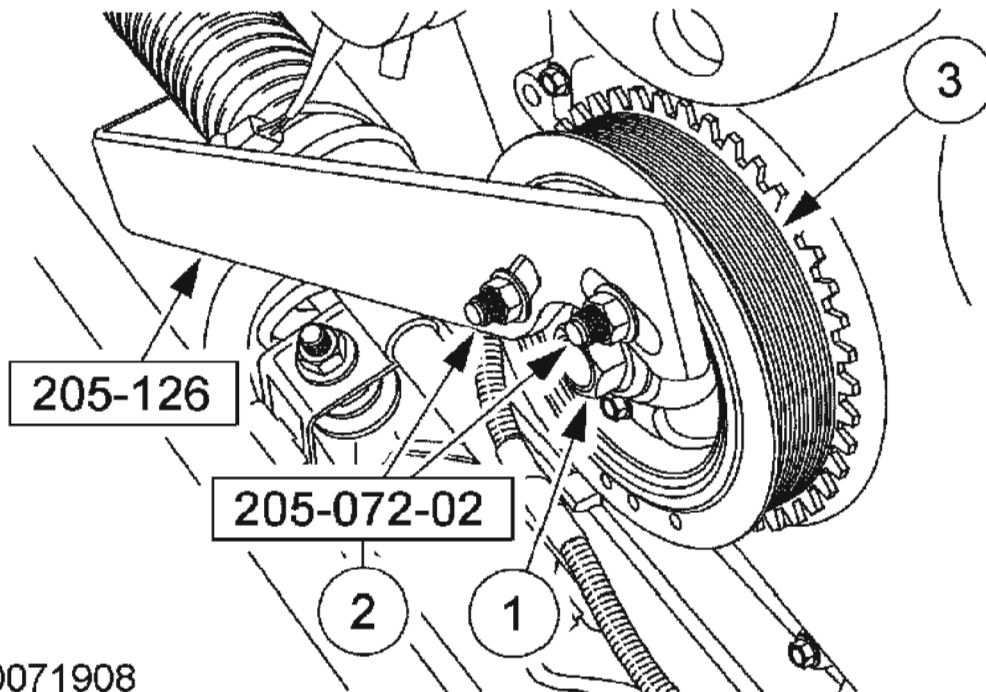


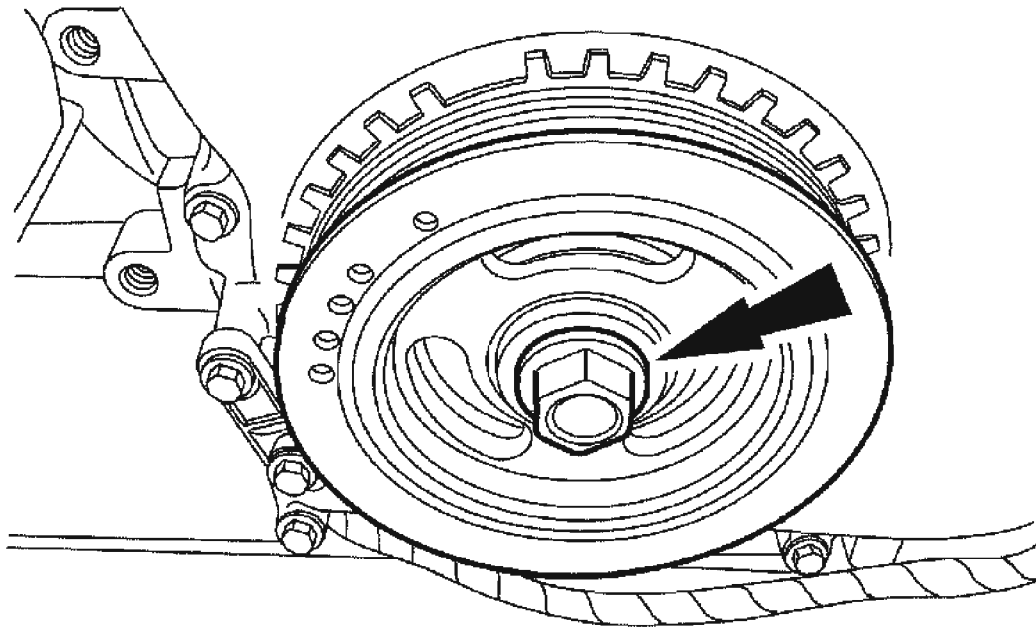
Fig. 77: Removing Crankshaft Pulley
Courtesy of FORD MOTOR CO.

8. Remove the crankshaft pulley.
 1. Remove the crankshaft pulley bolt.
 2. Remove the special tools.
 3. Remove the crankshaft pulley.

Installation

NOTE: Do not reuse the crankshaft damper bolt.

NOTE: Apply clean engine oil on the seal area before installing.



A0032808

Fig. 78: Installing Crankshaft Pulley Bolt
Courtesy of FORD MOTOR CO.

1. Install the crankshaft pulley and hand-tighten the bolt.

CAUTION: Only hand-tighten the bolt or damage to the front cover can occur.

NOTE: This step will correctly align the crankshaft pulley to the crankshaft.

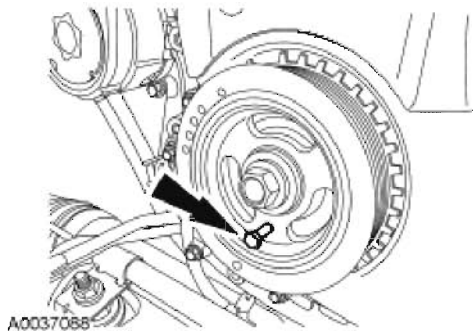


Fig. 79: Installing Bolt Through Crankshaft Pulley And Thread It Into Front Cover
Courtesy of FORD MOTOR CO.

2. Install a standard 6-mm (0.23-in) x 18-mm (0.7-in) bolt through the crankshaft pulley and thread it into the front cover.
 - Rotate the pulley as necessary to align the bolt holes.

CAUTION: Failure to hold the crankshaft pulley in place during bolt tightening can cause damage to the engine front cover.

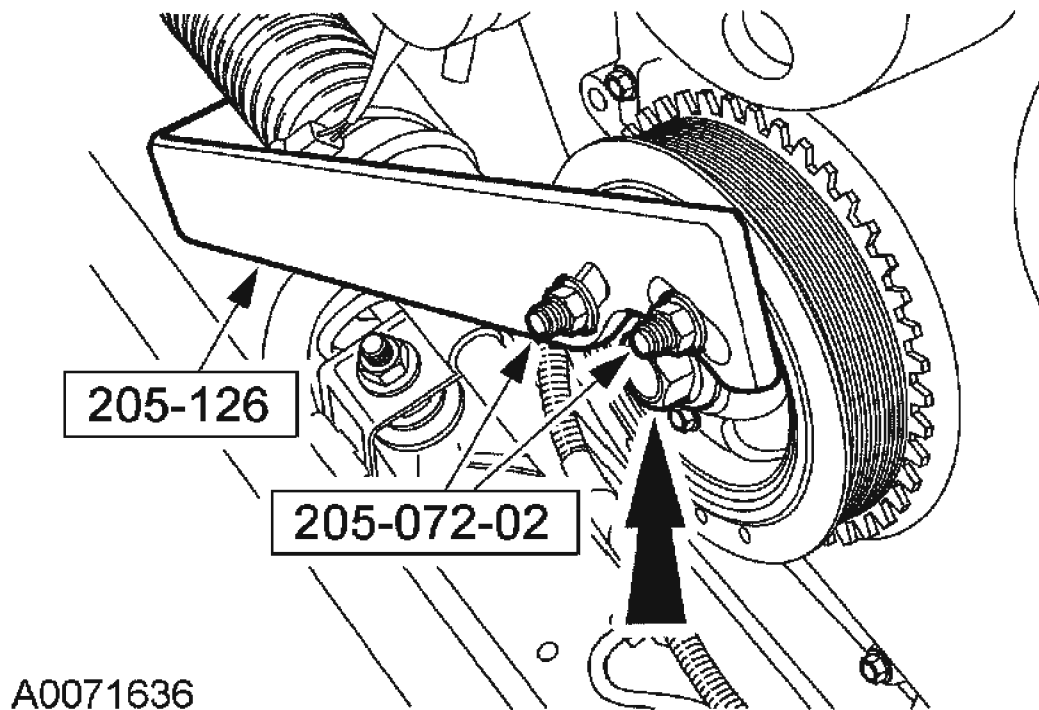


Fig. 80: Using Special Tools To Hold Crankshaft Pulley In Place And Tighten Crankshaft Pulley Bolt
Courtesy of FORD MOTOR CO.

3. Using the special tools to hold the crankshaft pulley in place, tighten the crankshaft pulley bolt in two stages:
 - Stage 1: Tighten to 100 Nm (74 lb-ft).
 - Stage 2: Tighten an additional 90 degrees (1/4 turn).
4. Remove the special tools.

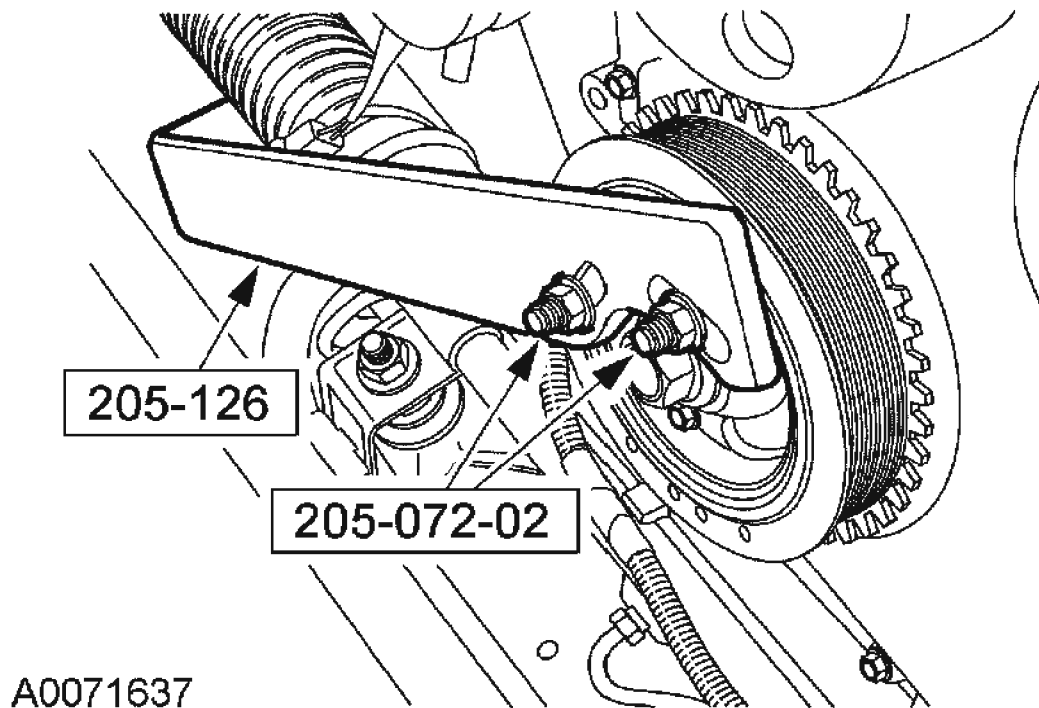


Fig. 81: Removing Special Tools (205-126)
Courtesy of FORD MOTOR CO.

5. Remove the 6-mm (0.23-in) x 18-mm (0.7-in) bolt.

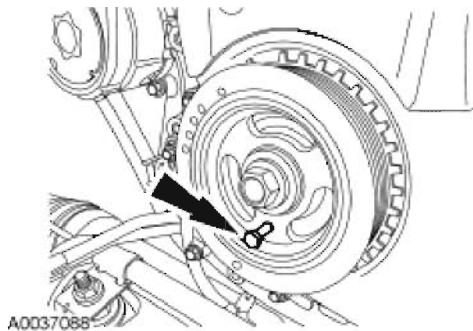


Fig. 82: Installing Bolt Through Crankshaft Pulley And Thread It Into Front Cover
Courtesy of FORD MOTOR CO.

6. Remove the special tool.

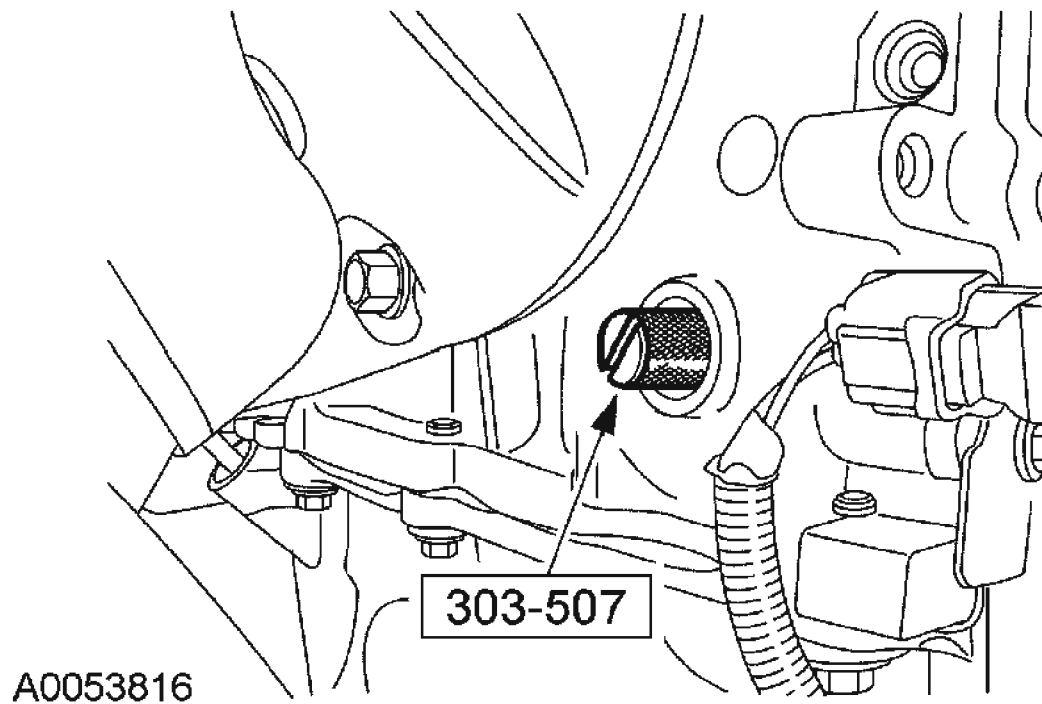
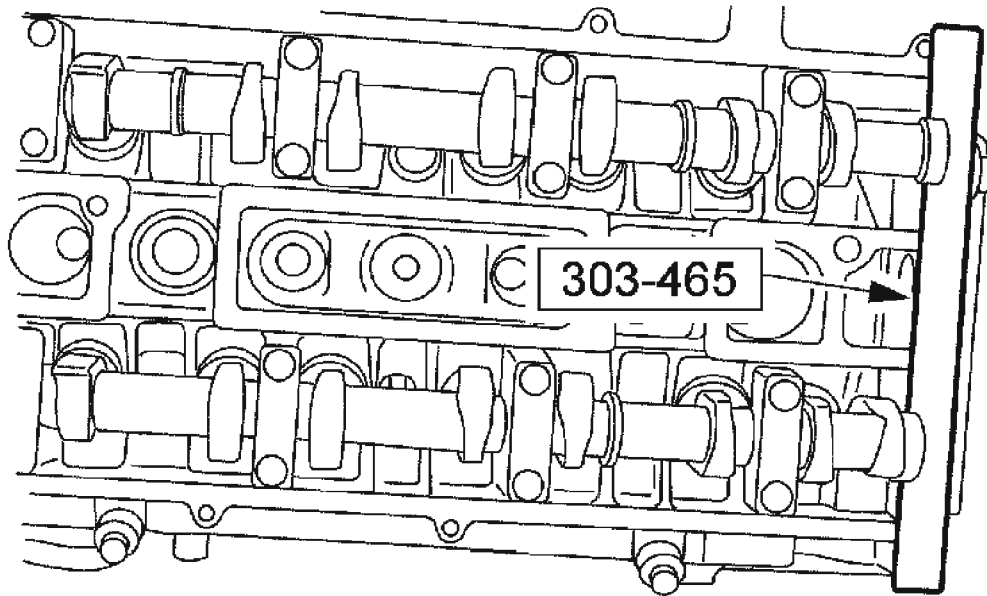


Fig. 83: Removing Special Tool (303-507)
Courtesy of FORD MOTOR CO.

7. Remove the special tool.



A0052352

Fig. 84: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

NOTE: Only turn the engine in the normal direction of rotation.

8. Turn the engine two complete revolutions.

NOTE: Only turn the engine in the normal direction of rotation.

9. Turn the crankshaft until the No. 1 piston is at top dead center (TDC).
10. Install the special tool.

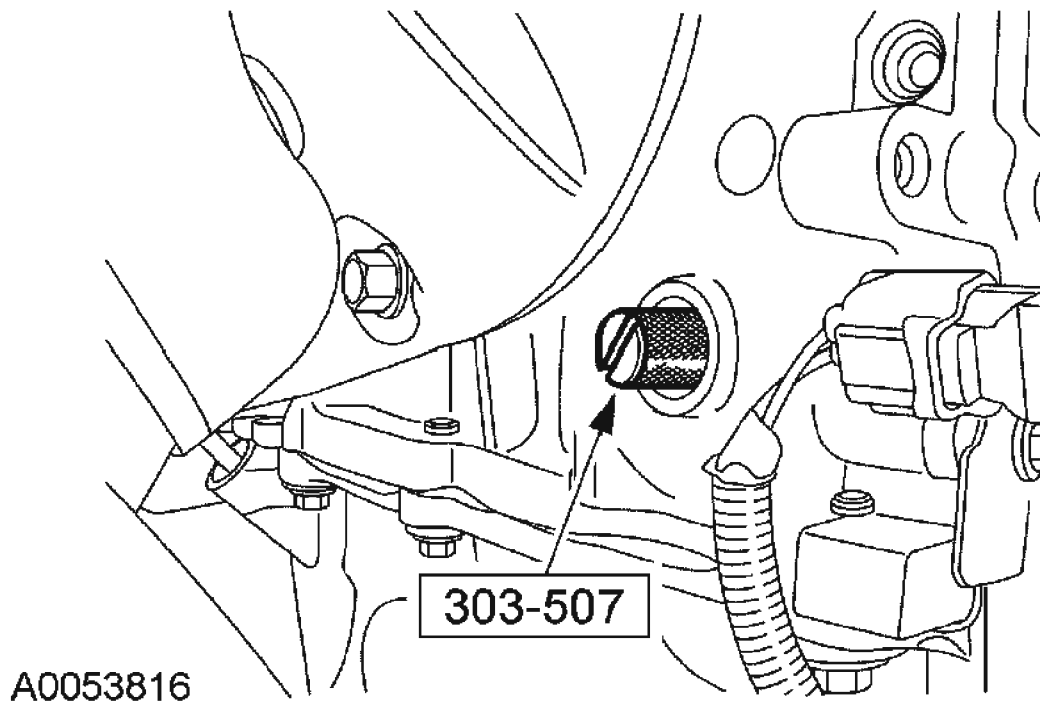


Fig. 85: Installing Special Tool (303-507)
Courtesy of FORD MOTOR CO.

CAUTION: Only hand-tighten the bolt or damage to the front cover can occur.

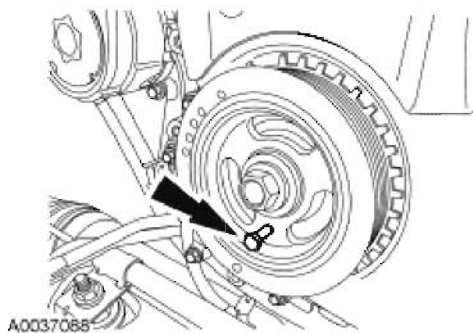
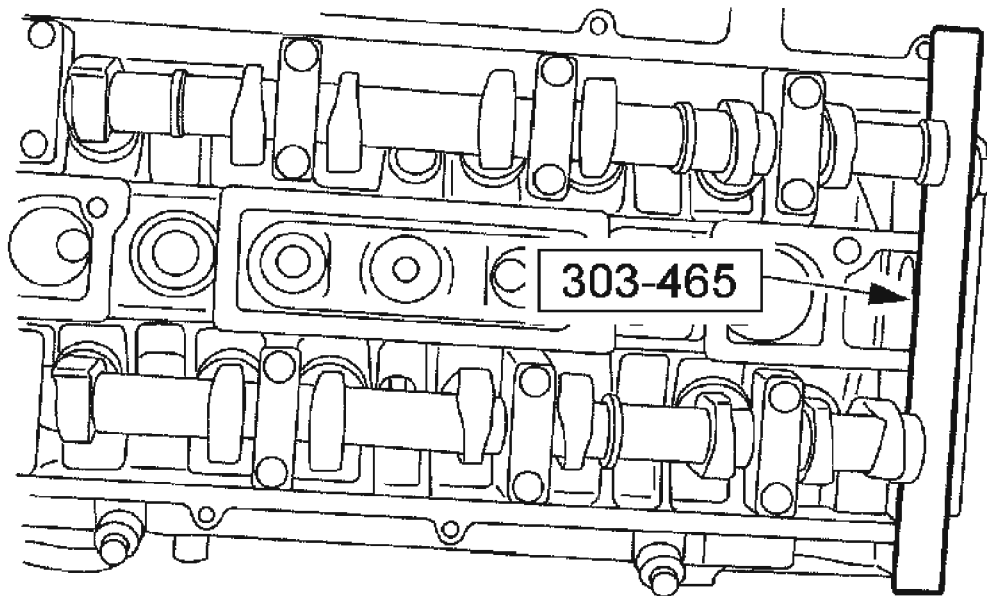


Fig. 86: Installing Bolt Through Crankshaft Pulley And Thread It Into Front Cover
Courtesy of FORD MOTOR CO.

11. Using the 6-mm (0.23-in) x 18-mm (0.7-in) bolt, check the position of the crankshaft pulley.
 - If it is not possible to install the bolt, correct the engine timing.

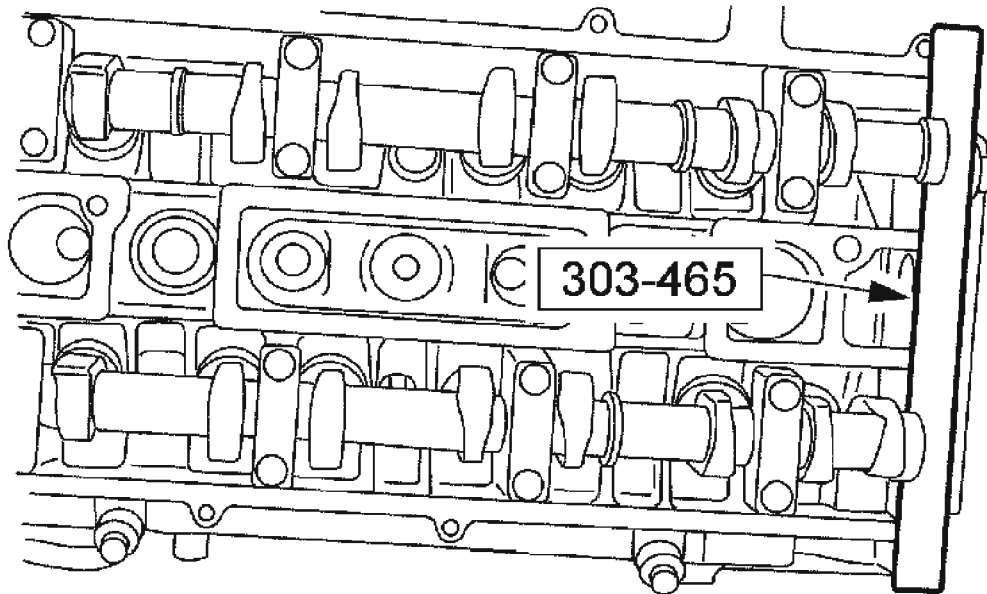
12. Using the special tool, check the position of the camshafts.
 - If it is not possible to install the special tool, correct the engine timing.



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Fig. 87: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

13. Remove the special tool.



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Fig. 88: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

14. Remove the 6-mm (0.23-in) x 18-mm (0.7-in) bolt.

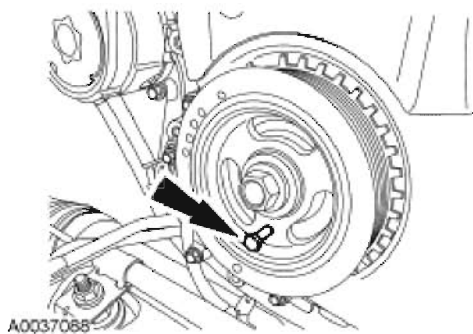


Fig. 89: Installing Bolt Through Crankshaft Pulley And Thread It Into Front Cover
Courtesy of FORD MOTOR CO.

15. Remove the special tool.

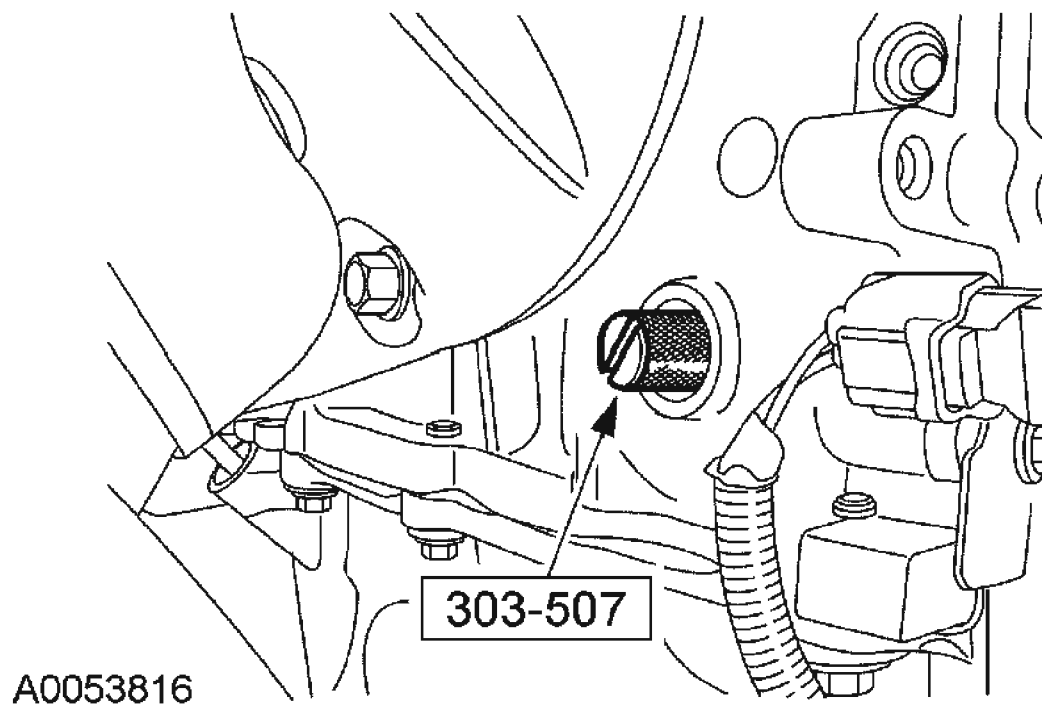


Fig. 90: Removing Special Tool (303-507)
Courtesy of FORD MOTOR CO.

16. Install the plug bolt.

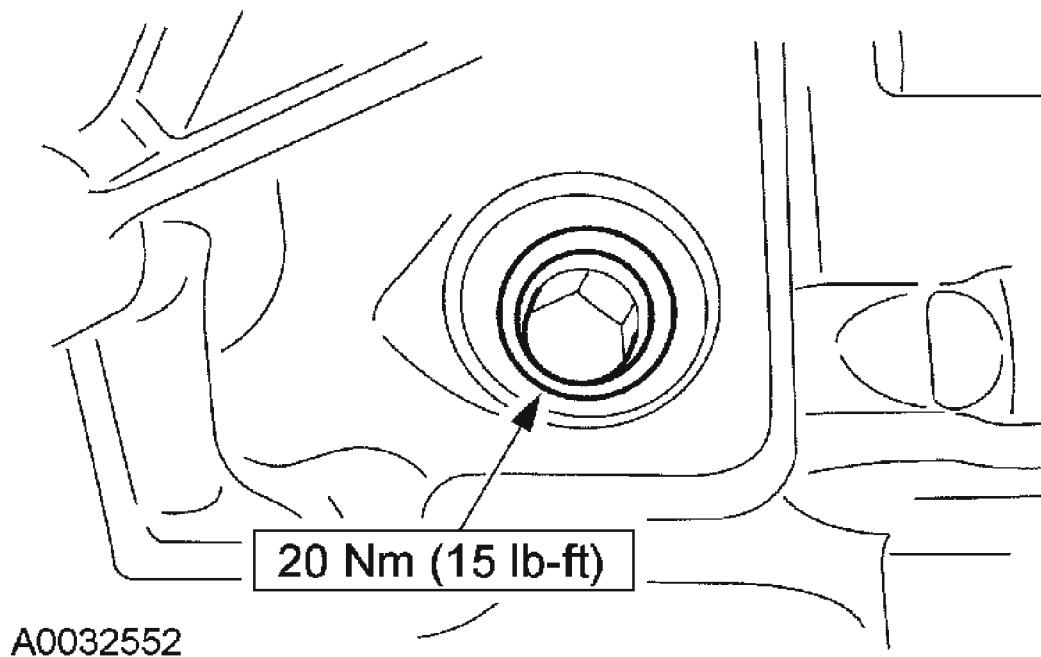


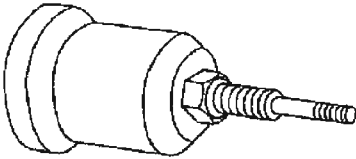
Fig. 91: Installing Plug Bolt
Courtesy of FORD MOTOR CO.

17. Install the valve cover. For additional information, refer to **VALVE COVER**.
18. Install the accessory drive belt. For additional information, refer to **ACCESSORY DRIVE**.

CRANKSHAFT FRONT SEAL

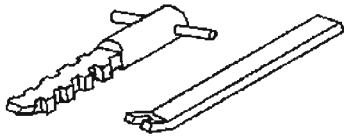
Special Tool(s)

SPECIAL TOOL DESCRIPTION

 <p>ST1917-A</p>	Installer, Front Oil Seal 303-096 (T74P-6150-A)
	Remover, Seal 303-409 (T92C-6700-CH)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1385-A

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

1. Remove the crankshaft pulley. For additional information, refer to **CRANKSHAFT PULLEY**.

CAUTION: Use care not to damage the engine front cover or the crankshaft when removing the seal.

2. Using the special tool, remove the crankshaft front oil seal.

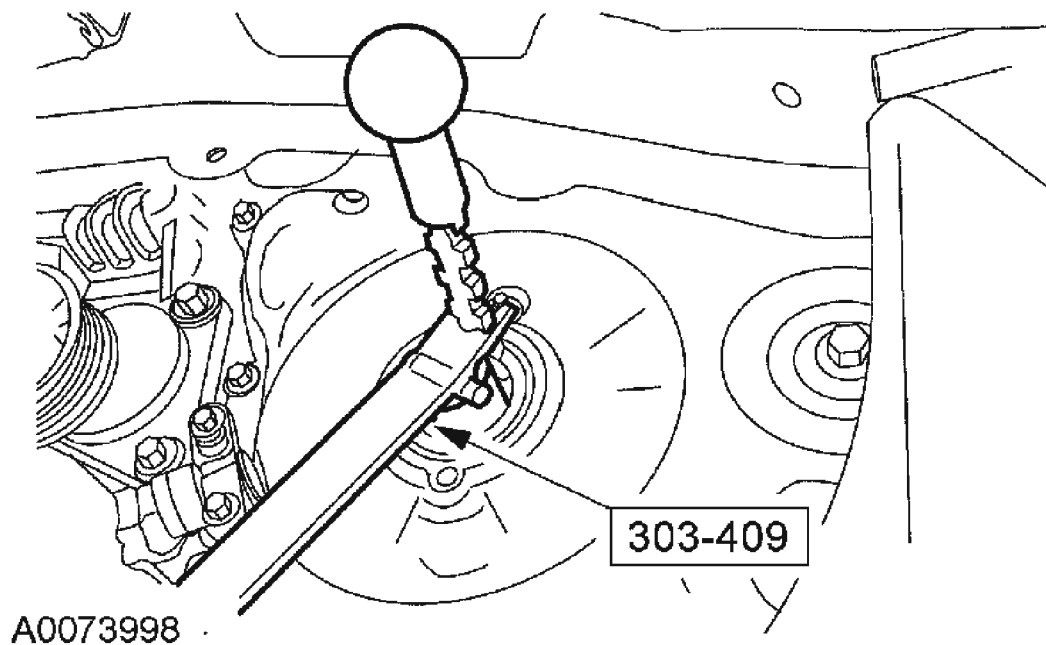


Fig. 92: Using Special Tool To Remove Crankshaft Front Oil Seal
Courtesy of FORD MOTOR CO.

Installation

NOTE: Remove the through-bolt from the special tool.

NOTE: Lubricate the oil seal with clean engine oil.

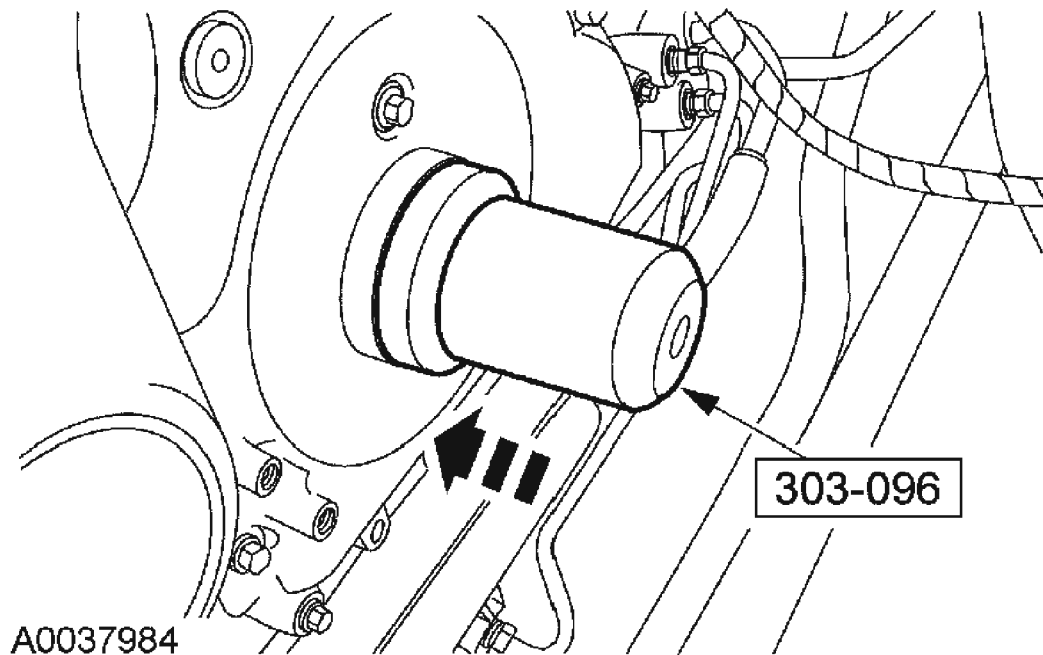


Fig. 93: Using Special Tool To Install Crankshaft Front Oil Seal
Courtesy of FORD MOTOR CO.

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

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

2. Install the crankshaft pulley. For additional information, refer to **CRANKSHAFT PULLEY**.

ENGINE FRONT COVER

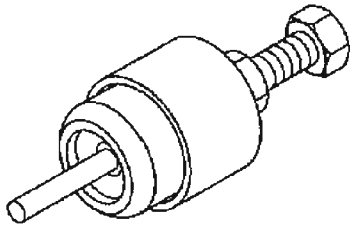
Special Tool(s)

SPECIAL TOOL DESCRIPTION

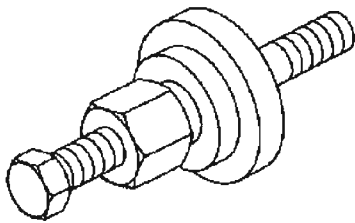
	Remover, Power Steering Pump Pulley 211-016 (T69L-10300-8)
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2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

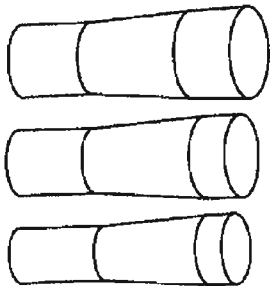


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Installer, Power Steering Pump Pulley
211-185 (T91P-3A733-A)



ST1444-A

Installer Set, Teflon Seal 211-D027
(D90P-3517-A) or equivalent

Material

MATERIAL SPECIFICATIONS

Item	Specification
Silicone Gasket and Sealant F7AZ-19554-EA or equivalent	WSE-M46323-A4

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

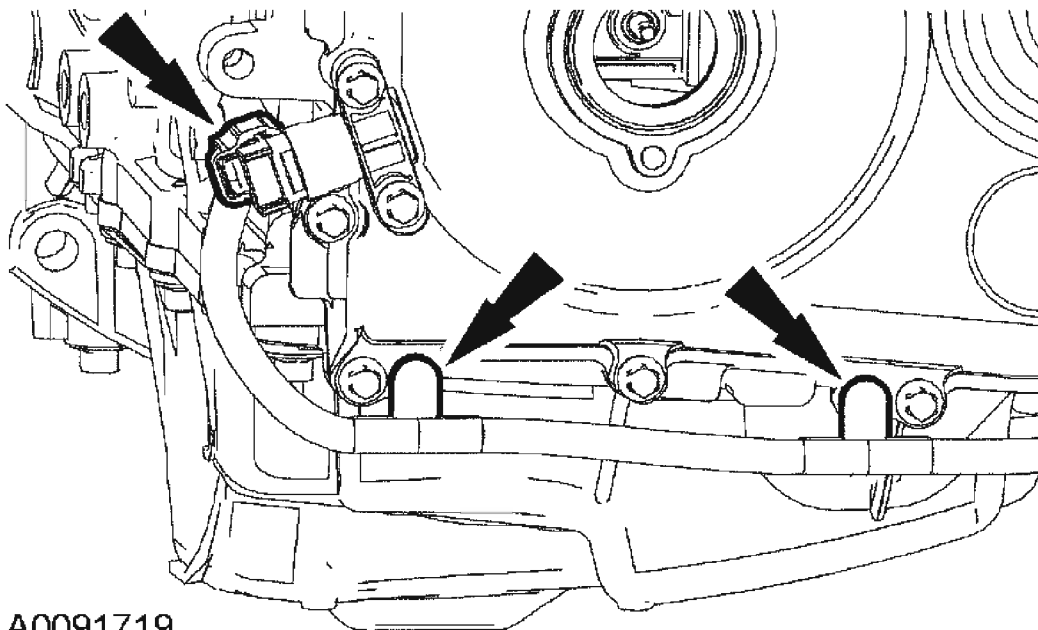
passages, coolant passages or the oil pan can cause engine failure.

1. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

2. Remove the crankshaft pulley. For additional information, refer to **CRANKSHAFT PULLEY**.

NOTE: If the crankshaft position (CKP) sensor is damaged during engine front cover removal, a new CKP sensor must be installed. Refer to the manufacturer instructions for sensor installation.



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Fig. 94: Disconnecting CKP Sensor Electrical Connector And Wiring Harness Pin-Type Retainers

Courtesy of FORD MOTOR CO.

3. Disconnect the CKP sensor electrical connector and wiring harness pin-type retainers.
4. Remove the bolts and the accessory drive belt tensioner.

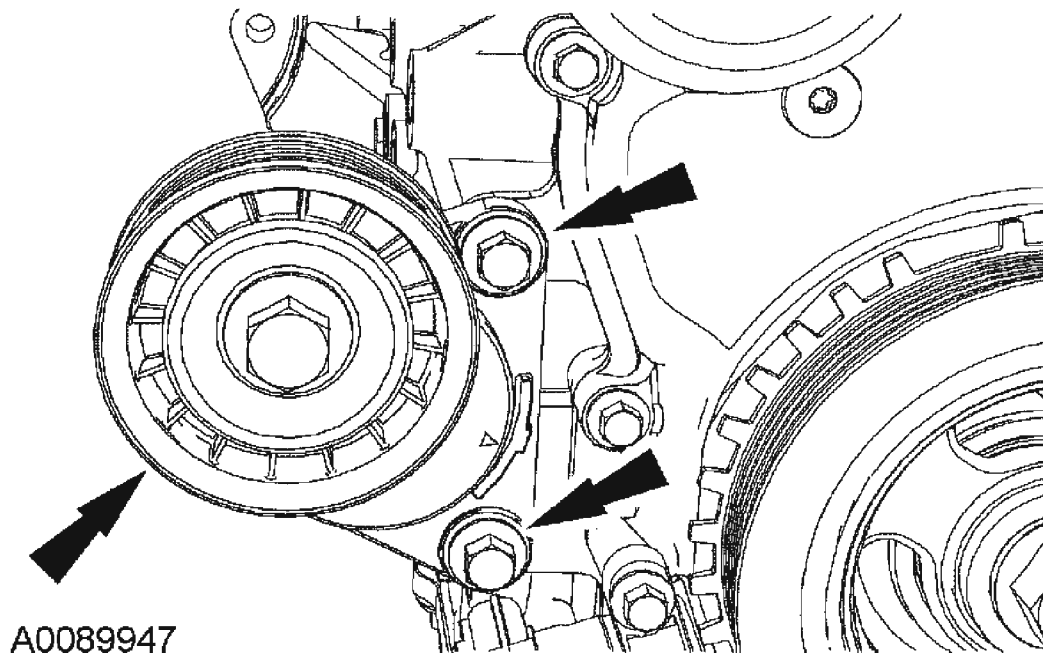


Fig. 95: Removing Accessory Drive Belt Tensioner Bolts
Courtesy of FORD MOTOR CO.

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

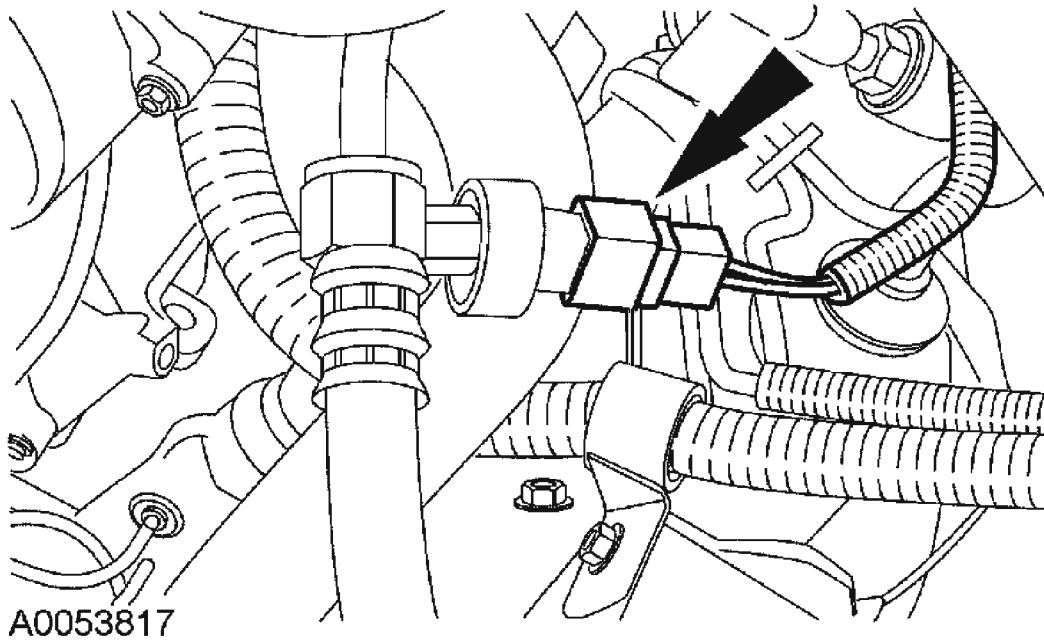


Fig. 96: Disconnecting Power Steering Pressure Switch Electrical Connector
Courtesy of FORD MOTOR CO.

6. Remove the nut and detach the PSP tube bracket.

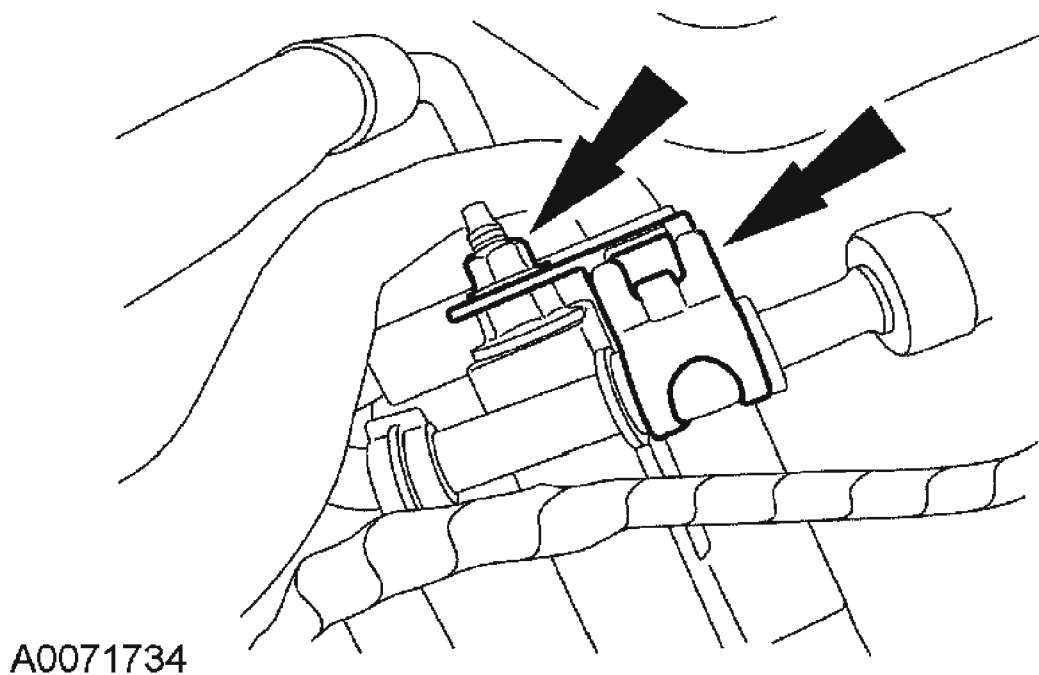


Fig. 97: Removing Nut And Detaching PSP Tube Bracket
Courtesy of FORD MOTOR CO.

7. Using the special tool, remove the power steering pump pulley.

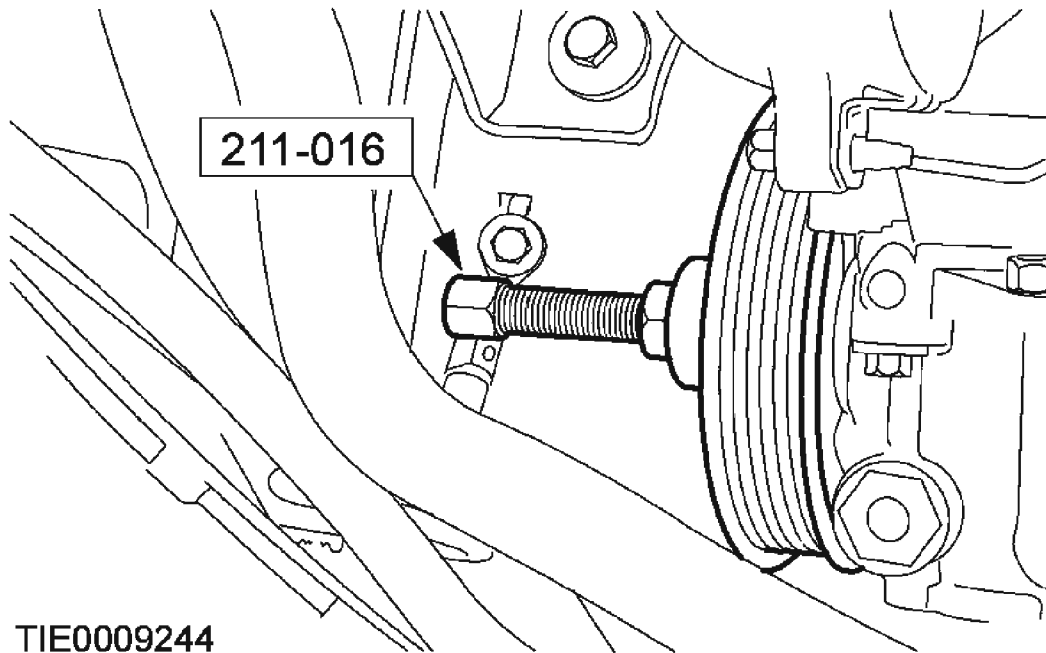


Fig. 98: Removing Power Steering Pump Pulley
Courtesy of FORD MOTOR CO.

8. Disconnect the PSP tube.
 - Remove and discard the O-ring seal.

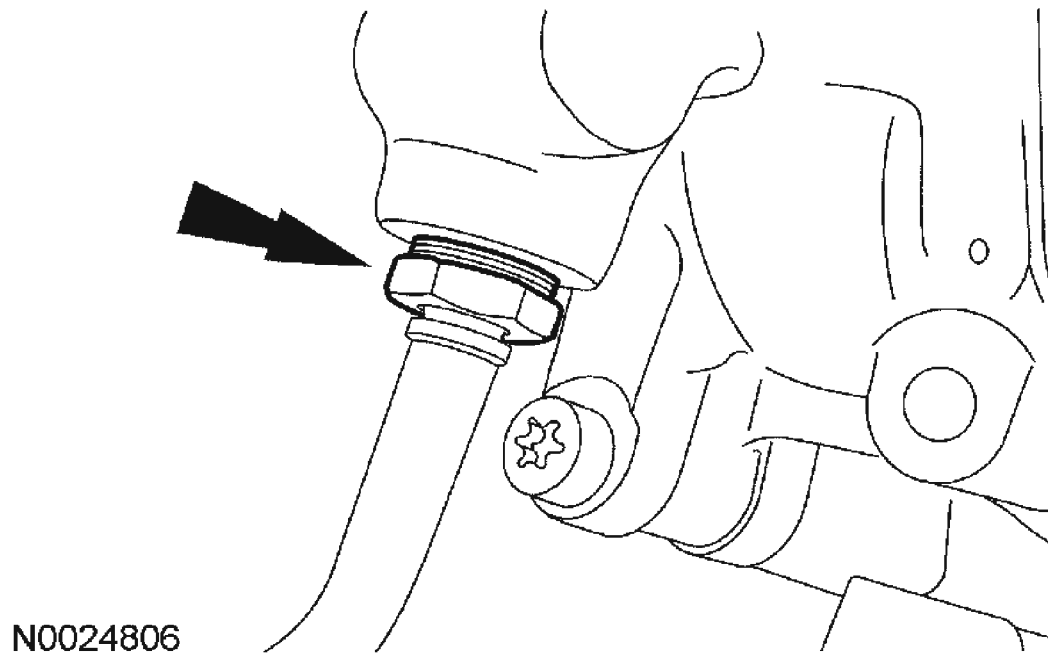
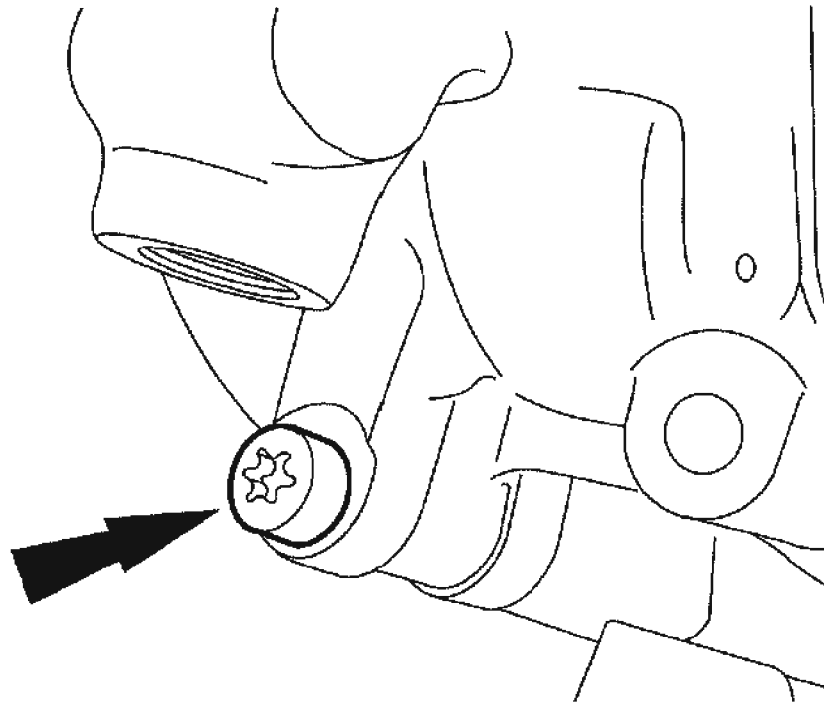


Fig. 99: Disconnecting PSP Tube
Courtesy of FORD MOTOR CO.

9. Remove the four bolts and position the power steering pump aside.



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Fig. 100: Removing Power Steering Pump Bolts
Courtesy of FORD MOTOR CO.

10. Remove the bolts and the coolant pump pulley.

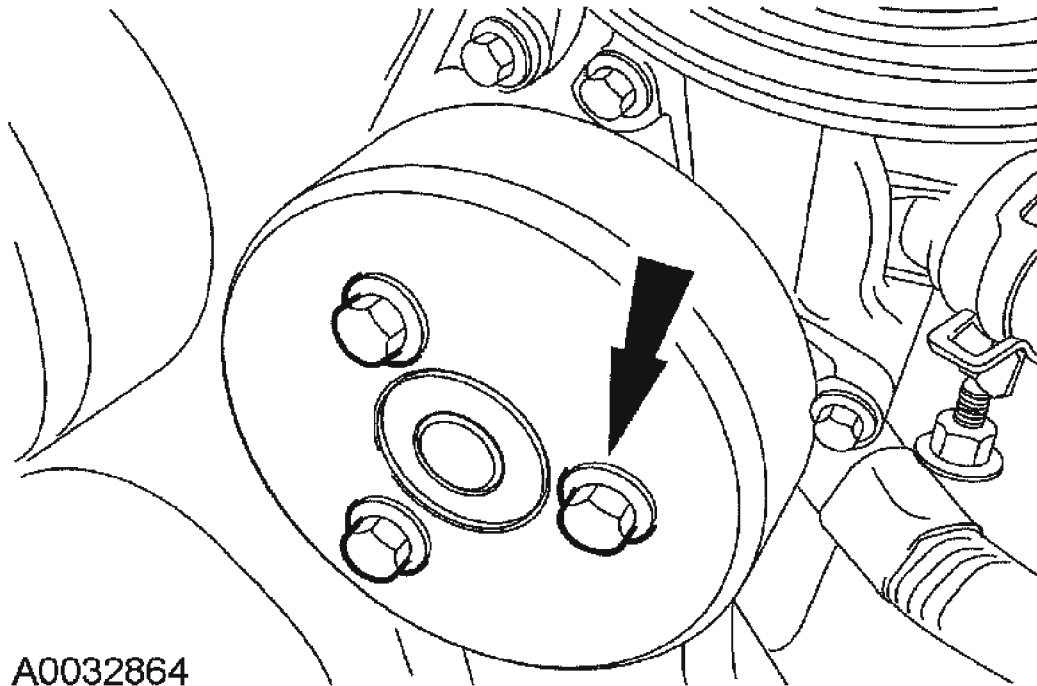


Fig. 101: Removing Coolant Pump Pulley Bolts
Courtesy of FORD MOTOR CO.

11. Remove the engine mount bolts and the engine mount.

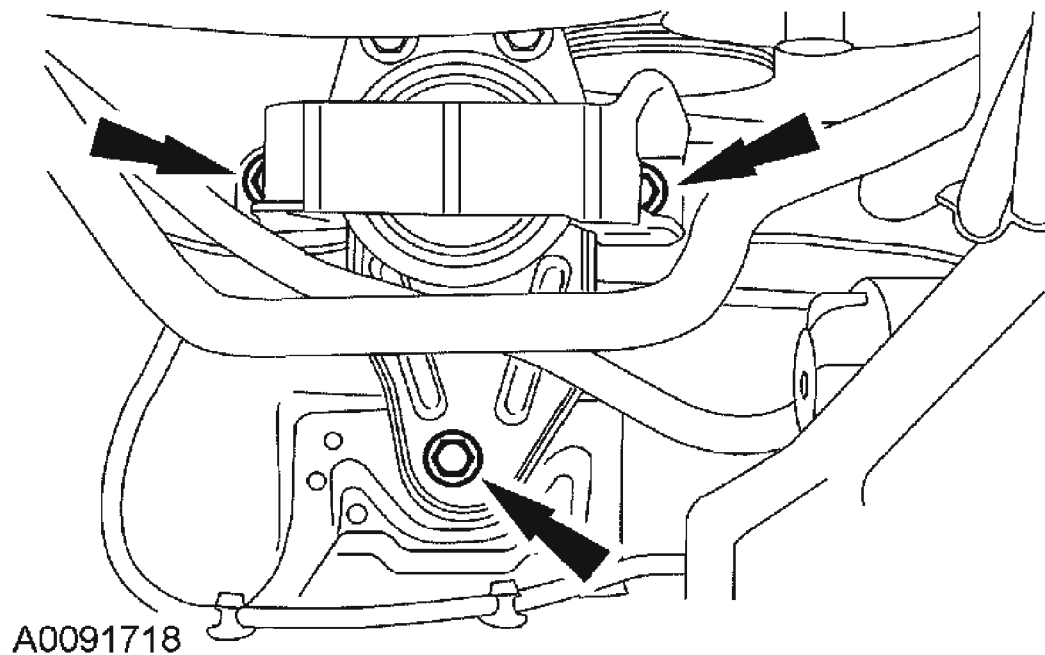


Fig. 102: Removing Engine Mount Bolts And Engine Mount
Courtesy of FORD MOTOR CO.

12. Remove the bolt and the accessory drive belt idler pulley.

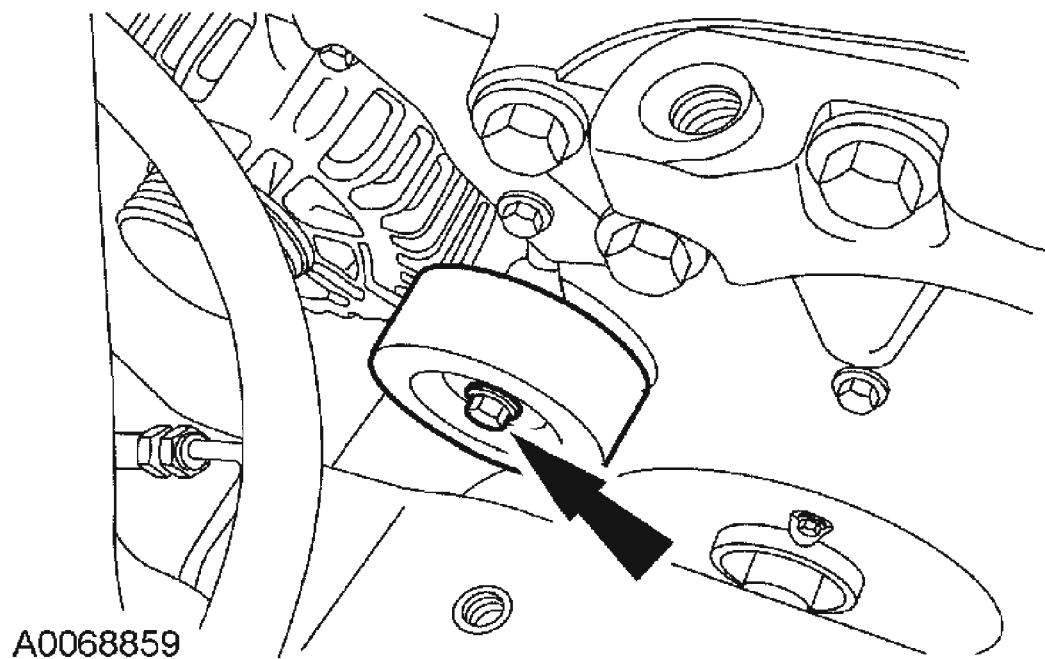
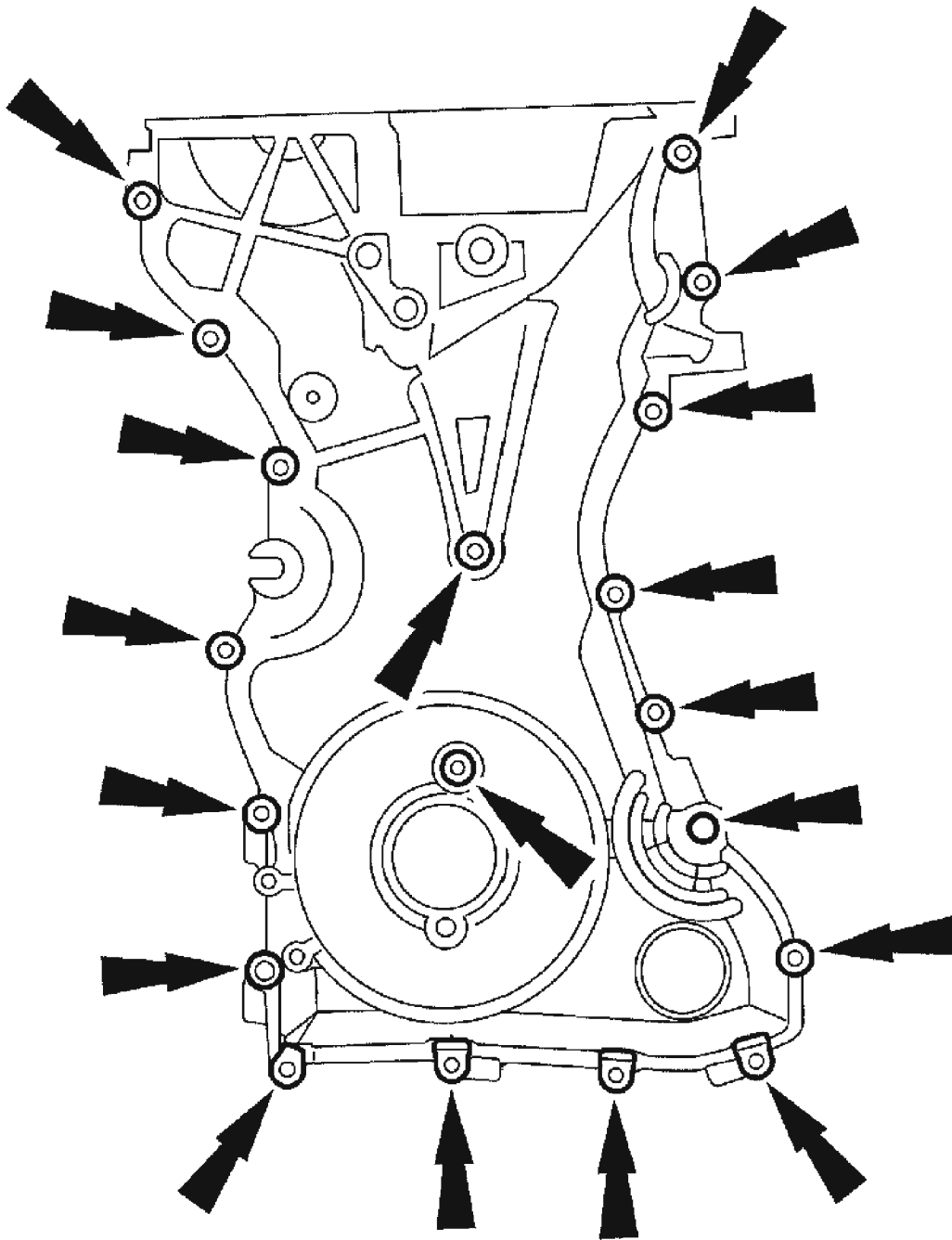


Fig. 103: Removing Bolt And Accessory Drive Belt Idler Pulley
Courtesy of FORD MOTOR CO.

13. Remove the retainers and the engine front cover.



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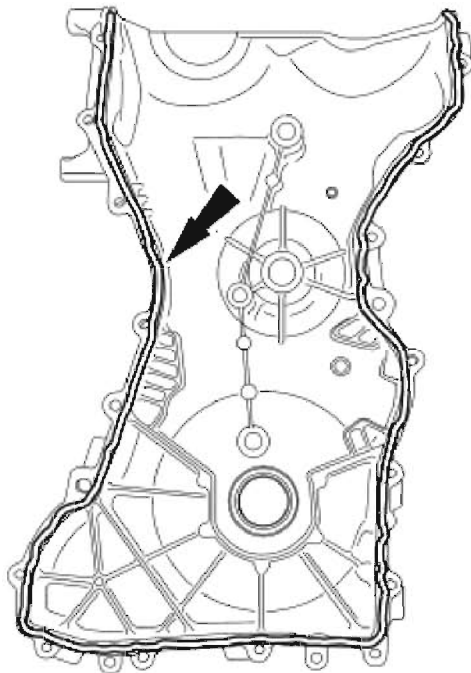
Fig. 104: Removing Retainers And Engine Front Cover
Courtesy of FORD MOTOR CO.

Installation

CAUTION: Do not use metal scrapers, wire brushes, power abrasive disks or other abrasive means to clean sealing surfaces. These tools cause scratches and gouges which make leak paths.

1. Clean and inspect the mounting surfaces of the engine and the front cover.

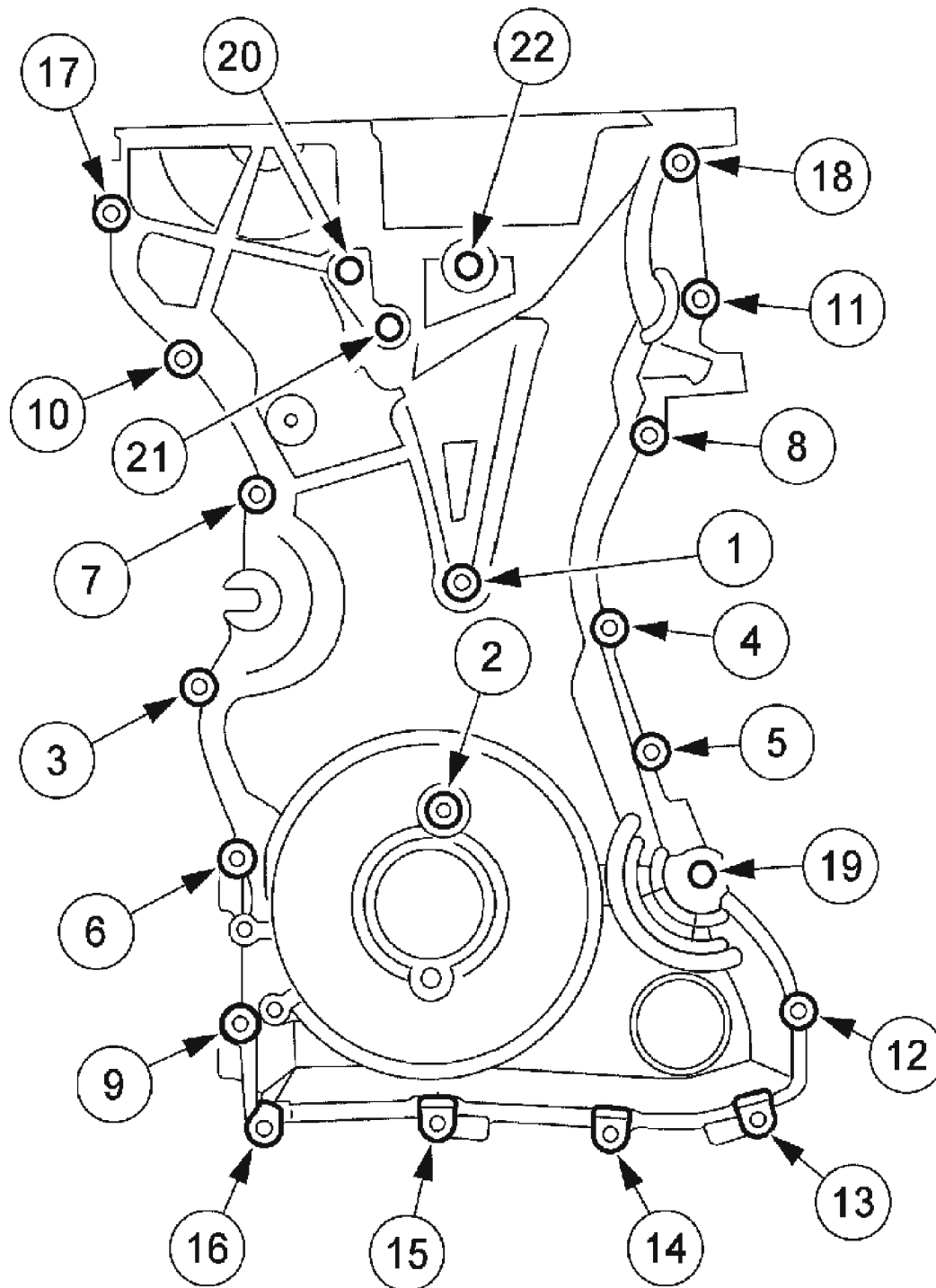
NOTE: The engine front cover must be installed and the bolts tightened within four minutes of applying the silicone gasket and sealant.



A0032803

Fig. 105: Locating Silicone Gasket
Courtesy of FORD MOTOR CO.

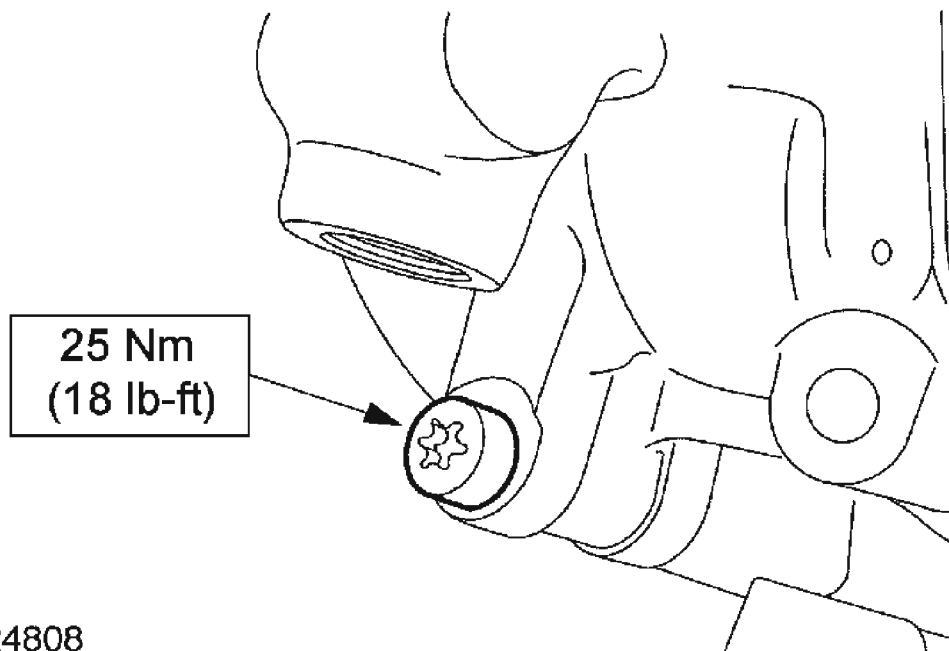
2. Apply a 2.5-mm bead of silicone gasket and sealant to the cylinder head and oil pan joint areas. Apply a 2.5-mm bead of silicone gasket and sealant to the front cover.
3. Install the front cover. Tighten the bolts in the sequence shown to the following specifications:
 - Tighten the 8-mm bolts to 10 Nm (89 lb-in).
 - Tighten the 13-mm bolts to 48 Nm (35 lb-ft).



A0068861

Fig. 106: Tightening Bolts In Sequence
 Courtesy of FORD MOTOR CO.

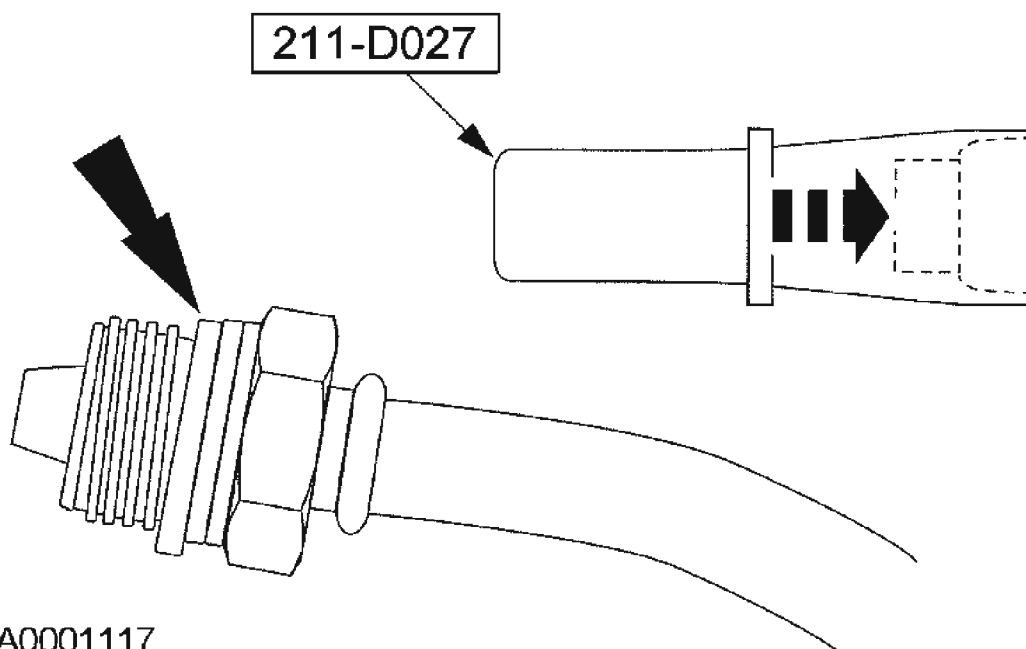
4. Position the power steering pump and install the four retaining bolts.



N0024808

Fig. 107: Installing Power Steering Pump Retaining Bolts
Courtesy of FORD MOTOR CO.

5. Using the special tool, install a new O-ring on the PSP tube fitting.



A0001117

Fig. 108: Installing Teflon Seal On Power Steering Pressure Hose Fitting
Courtesy of FORD MOTOR CO.

6. Connect the power steering PSP tube fitting.

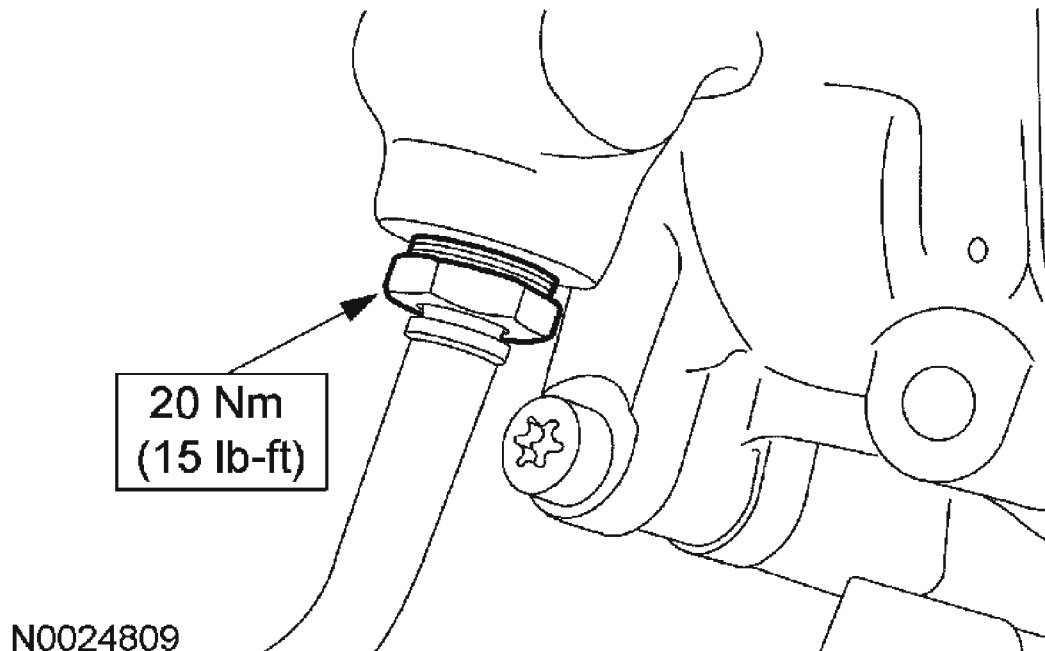


Fig. 109: Connecting Power Steering PSP Tube Fitting
Courtesy of FORD MOTOR CO.

NOTE: Make sure the pulley is flush with the end of the power steering pump shaft.

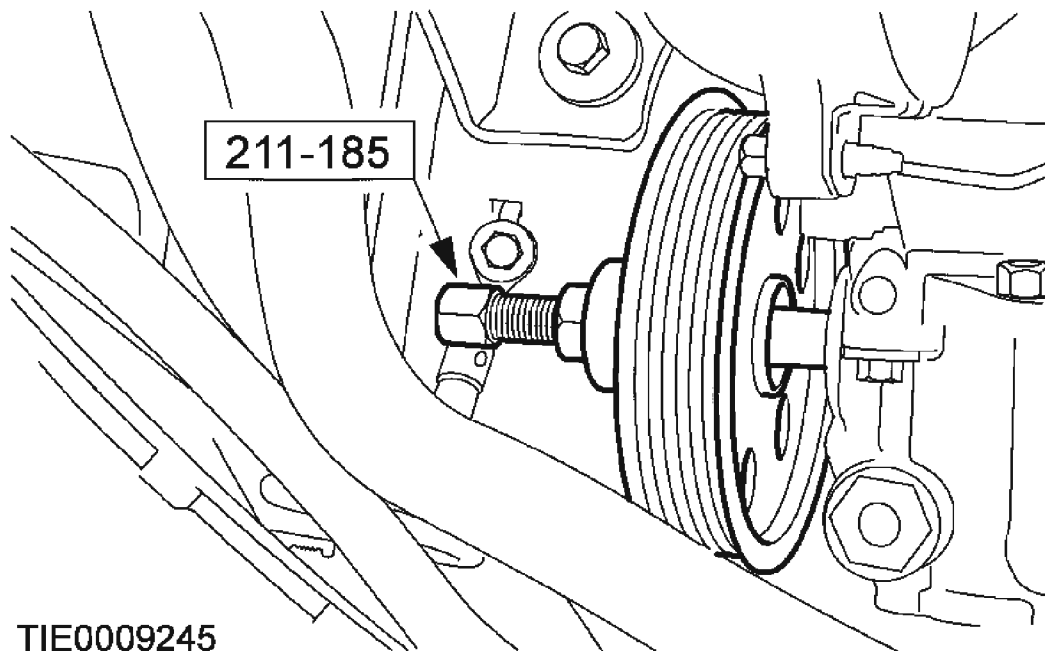


Fig. 110: Using Special Tool To Install Power Steering Pump Pulley
Courtesy of FORD MOTOR CO.

7. Using the special tool, install the power steering pump pulley.
8. Attach the PSP tube bracket and install the nut.

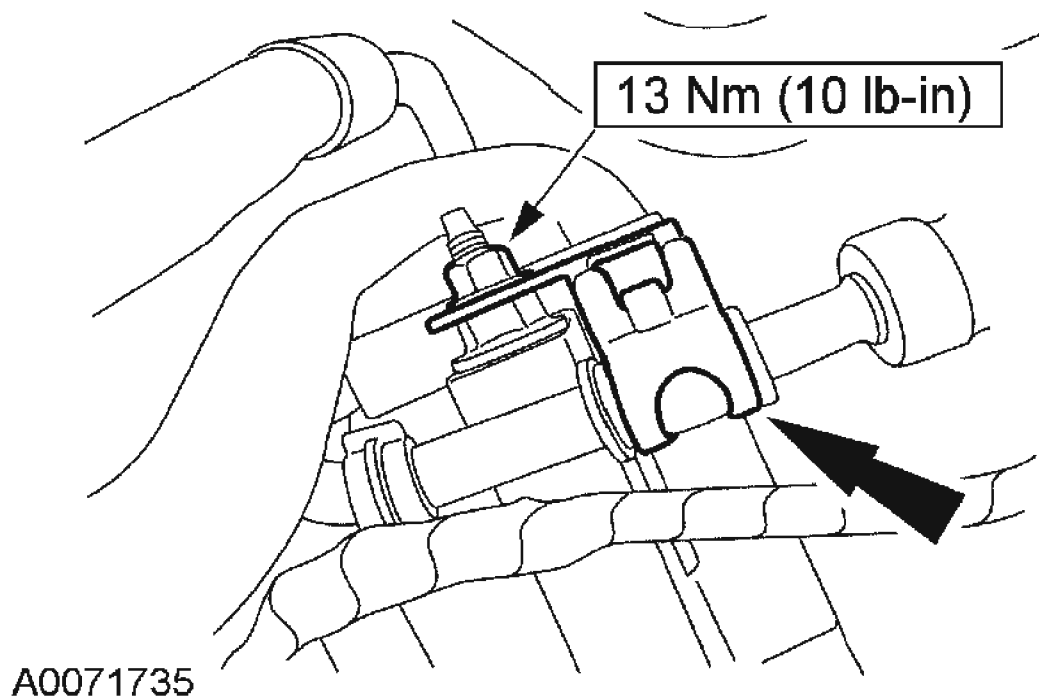


Fig. 111: Attaching PSP Tube Bracket And Installing Nut
Courtesy of FORD MOTOR CO.

9. Connect the PSP switch electrical connector.

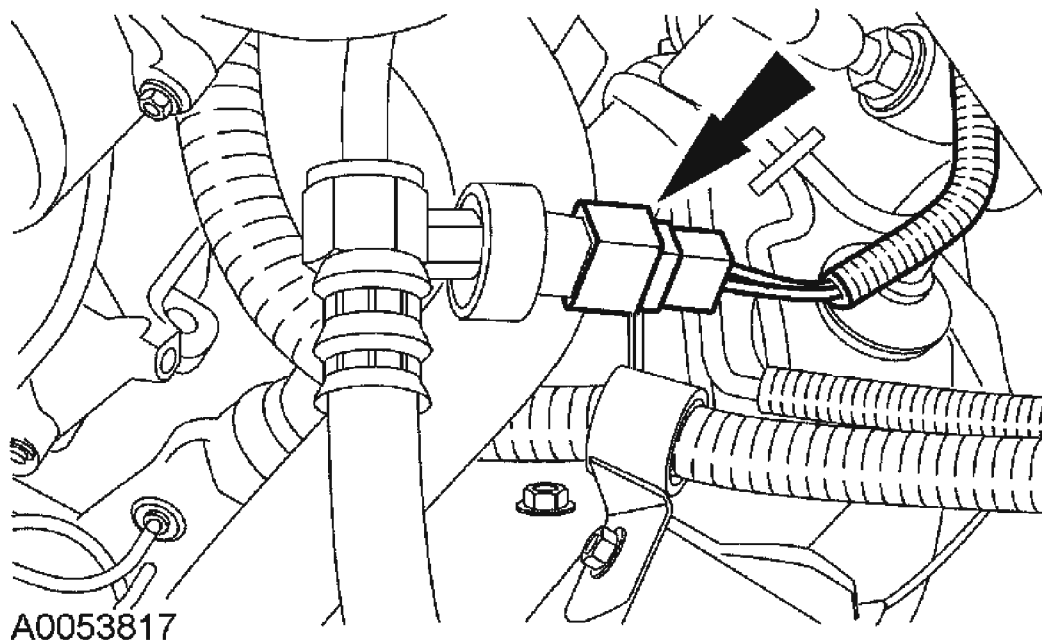


Fig. 112: Connecting PSP Switch Electrical Connector
Courtesy of FORD MOTOR CO.

10. Install the coolant pump pulley and the bolts.

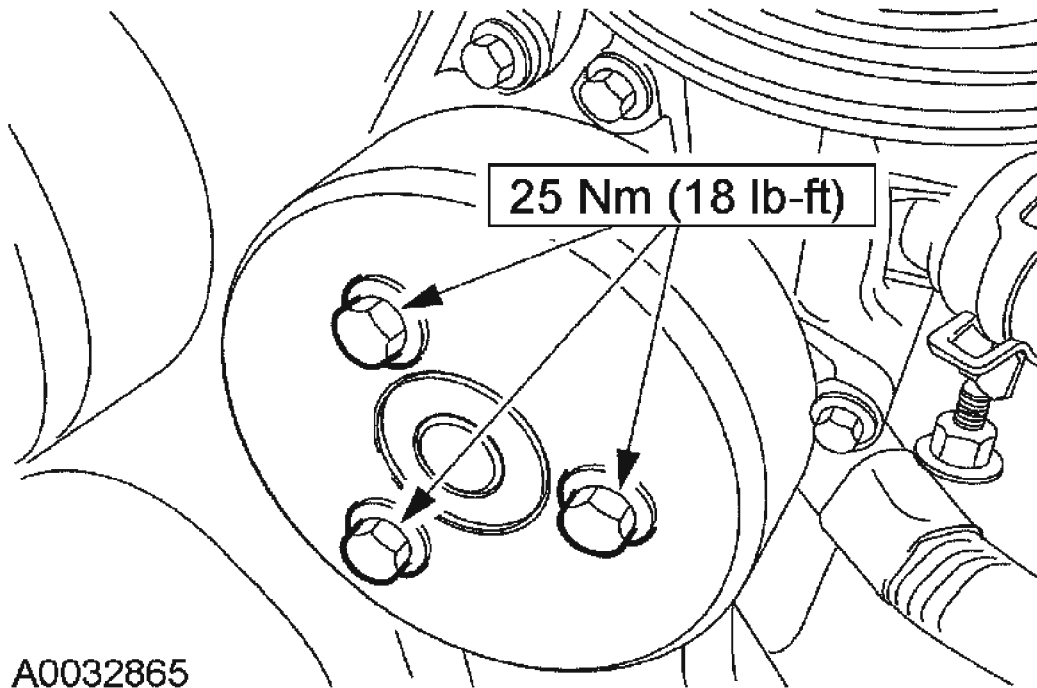


Fig. 113: Installing Coolant Pump Pulley And Bolts
Courtesy of FORD MOTOR CO.

11. Install the accessory drive belt idler pulley and the bolt.

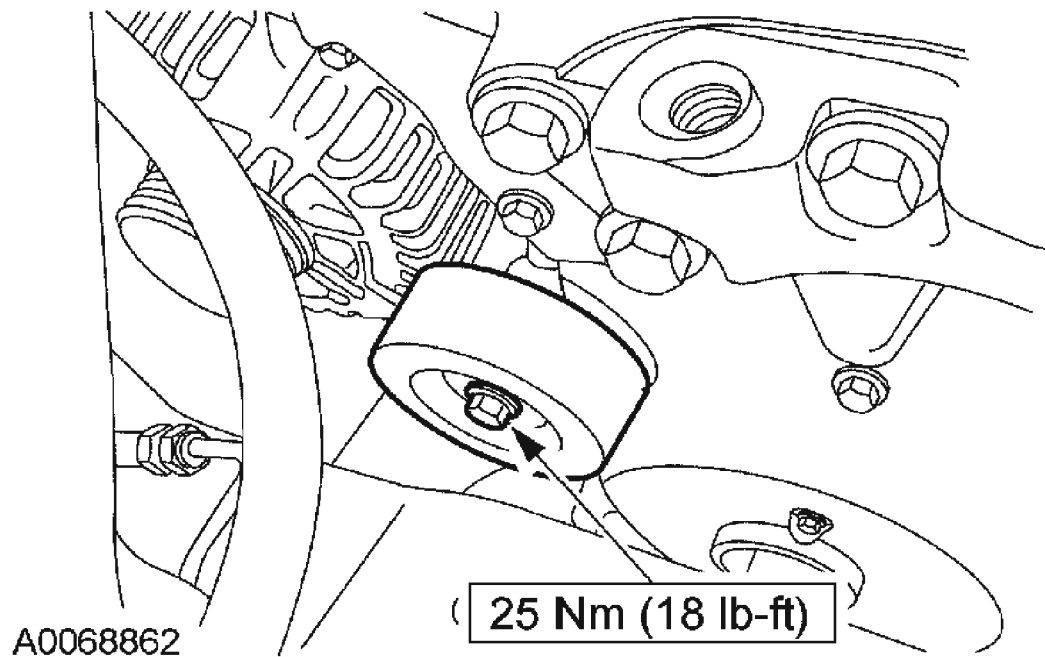


Fig. 114: Installing Accessory Drive Belt Idler Pulley And Bolt
Courtesy of FORD MOTOR CO.

12. Install the accessory belt tensioner.
 1. Position the tensioner.
 2. Install the tensioner bolts.

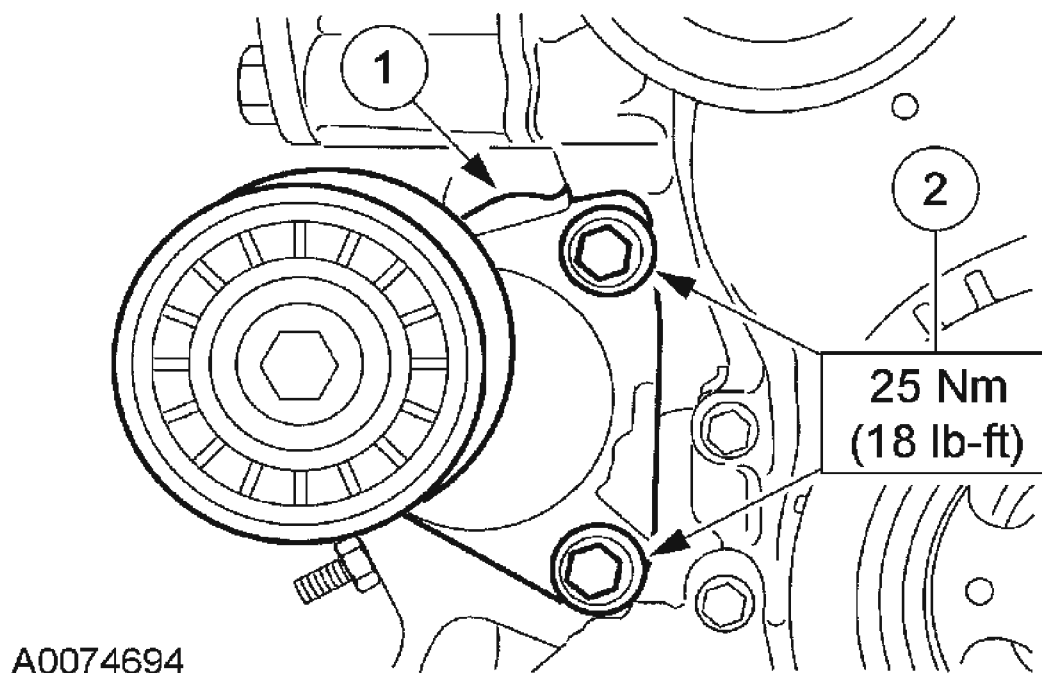


Fig. 115: Installing Accessory Belt Tensioner
Courtesy of FORD MOTOR CO.

13. Install the engine mount and bolts.

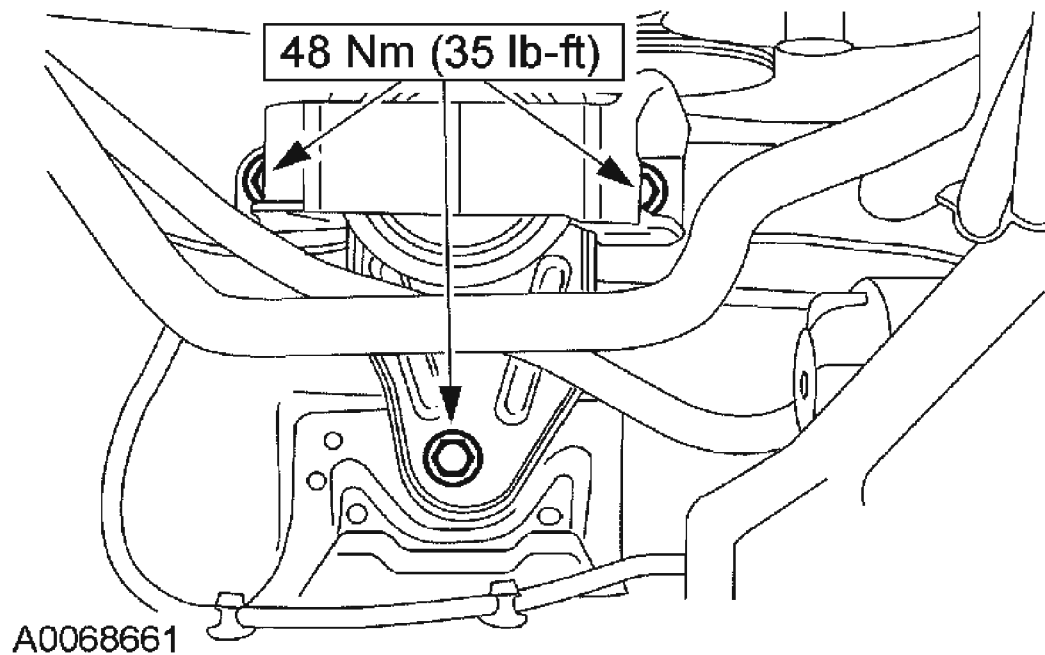


Fig. 116: Installing Engine Mount And Bolts
Courtesy of FORD MOTOR CO.

NOTE: If the crankshaft position (CKP) sensor is damaged during engine front cover installation, a new CKP sensor must be installed. Refer to the manufacturer instructions for sensor installation.

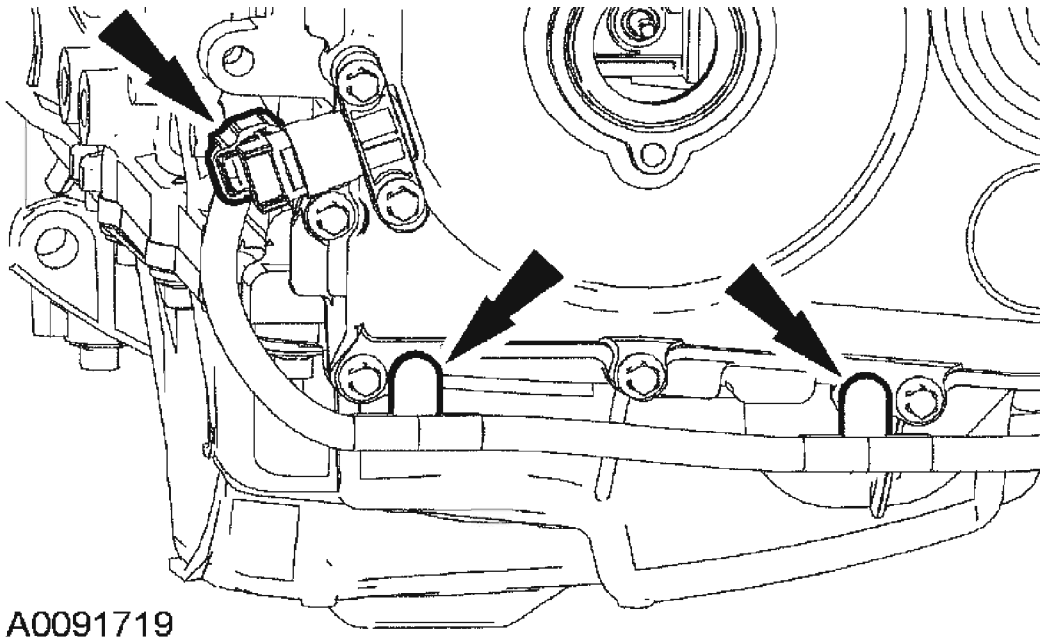


Fig. 117: Connecting CKP Sensor Electrical Connector And Wiring Harness Pin-Type Retainers

Courtesy of FORD MOTOR CO.

14. Connect the CKP sensor electrical connector and the wiring harness pin-type retainers.

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

15. Install the crankshaft pulley. For additional information, refer to **CRANKSHAFT PULLEY**.
16. Connect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.
17. Fill and purge the power steering fluid. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION**.

TIMING DRIVE COMPONENTS

Special Tool(s)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

SPECIAL TOOL DESCRIPTION



ST2645-A

Alignment Plate, Camshaft 303-465
(T949-6256-CH)

Removal

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, with diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore the engine must be re-timed each time the damper is removed. Otherwise severe damage can occur.

1. Remove the engine front cover. For additional information, refer to **ENGINE FRONT COVER**.
2. Remove the timing chain tensioner.
 1. Compress the timing chain tensioner and insert a paper clip into the hole.
 2. Remove the bolts and timing chain tensioner.

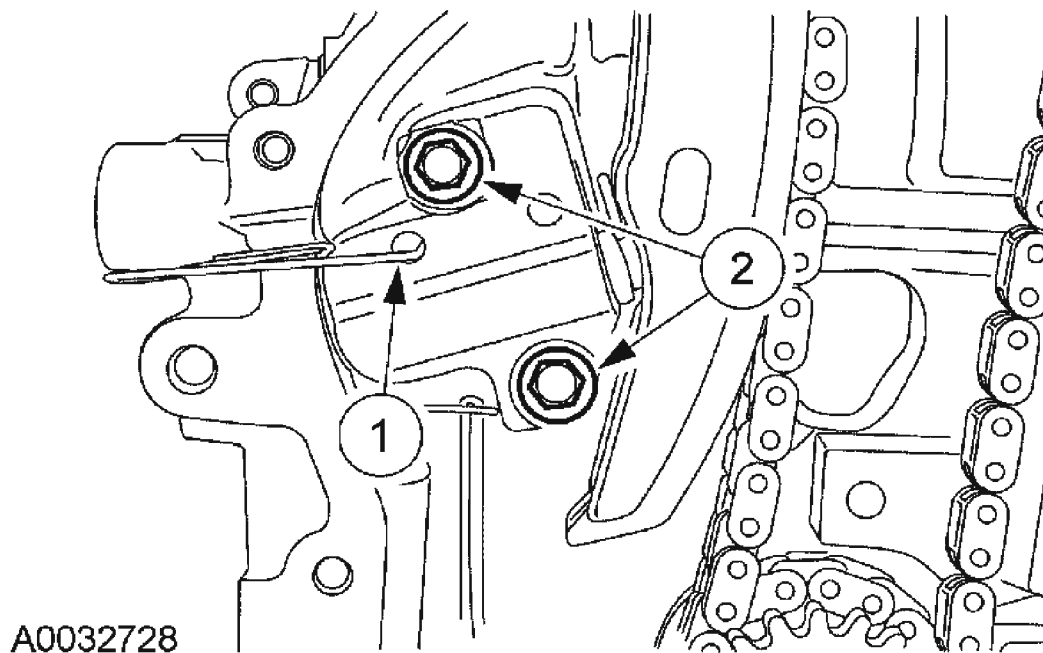


Fig. 118: Removing Timing Chain Tensioner
Courtesy of FORD MOTOR CO.

3. Remove the RH timing chain guide.

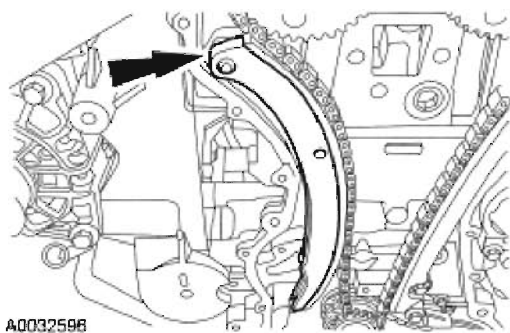


Fig. 119: Locating RH Timing Chain Guide
Courtesy of FORD MOTOR CO.

4. Remove the timing chain.

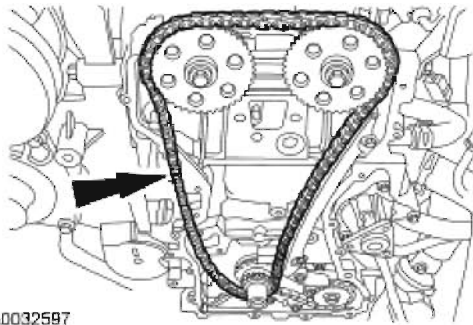


Fig. 120: View Of Timing Chain
Courtesy of FORD MOTOR CO.

5. Remove the bolts and the LH timing chain guide.

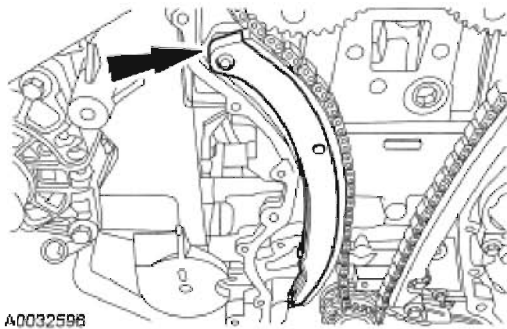


Fig. 121: Locating RH Timing Chain Guide
Courtesy of FORD MOTOR CO.

CAUTION: Do not rely on the Camshaft Alignment Plate to prevent camshaft rotation. Damage to the tool or the camshaft can occur.

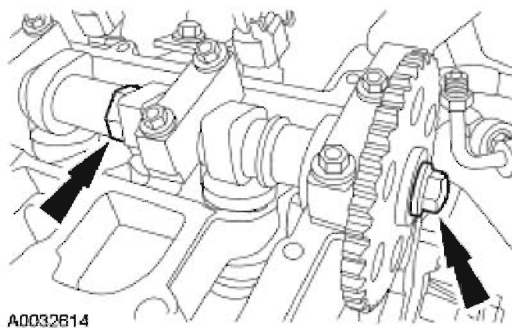
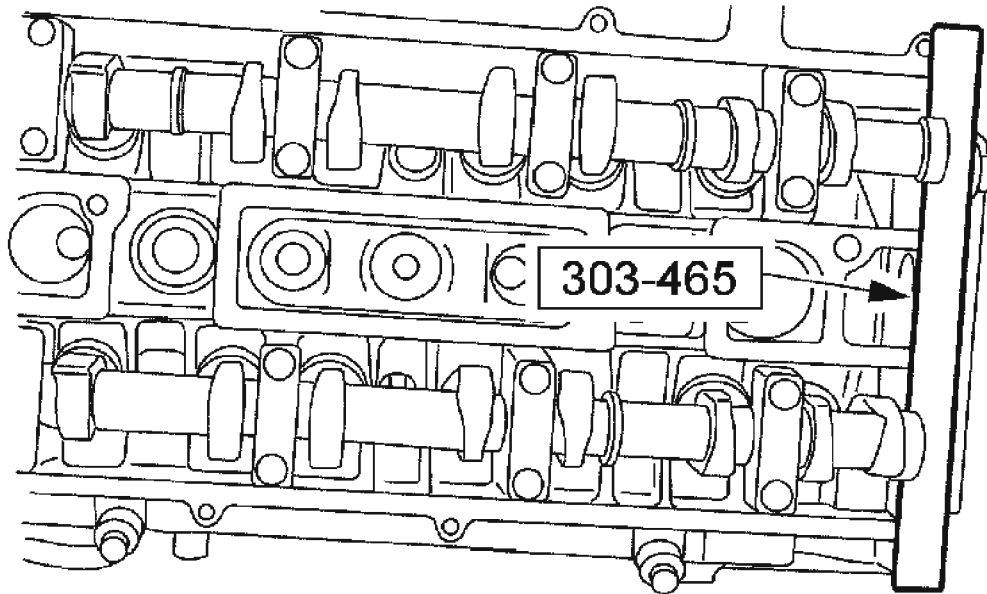


Fig. 122: Locating Cam Holding Area And Sprocket Bolt
Courtesy of FORD MOTOR CO.

6. If necessary, remove the bolts and the camshaft sprockets.
 - Use the flats on the camshaft to prevent camshaft rotation.

Installation

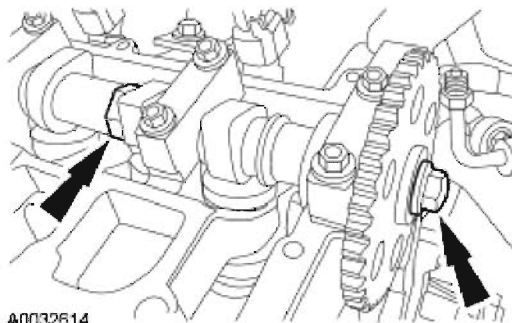
1. Remove the special tool.



A0052352

Fig. 123: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

CAUTION: Do not rotate the camshafts. Damage to the valves and pistons can occur.



A0032614

Fig. 124: Locating Cam Holding Area And Sprocket Bolt
Courtesy of FORD MOTOR CO.

2. If the camshaft sprockets were not removed, use the flats on the camshafts to prevent camshaft rotation and loosen the sprocket bolts.

3. If removed, install the camshaft sprockets and the bolts. Do not tighten the bolts at this time.

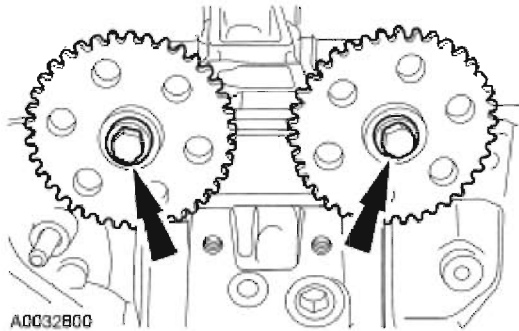


Fig. 125: Locating Camshaft Sprocket Bolts
Courtesy of FORD MOTOR CO.

4. Install the LH timing chain guide and bolts.

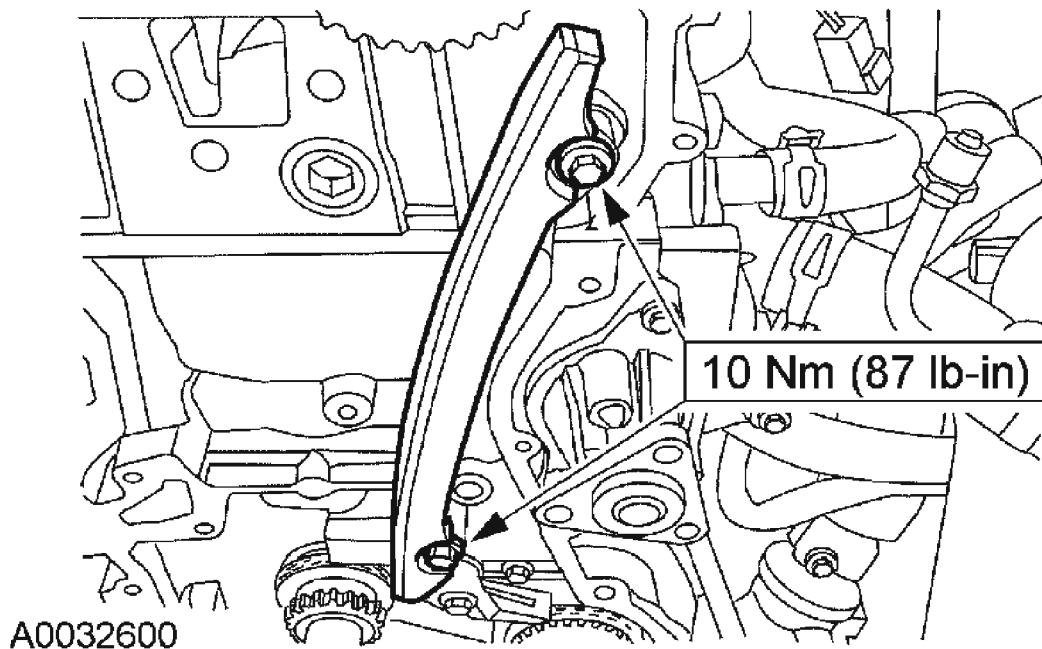


Fig. 126: Installing LH Timing Chain Guide And Bolts
Courtesy of FORD MOTOR CO.

5. Install the timing chain.

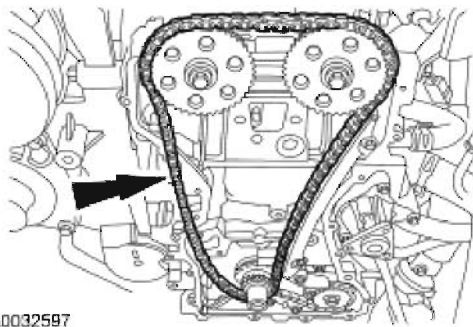


Fig. 127: View Of Timing Chain
Courtesy of FORD MOTOR CO.

6. Install the RH timing chain guide.

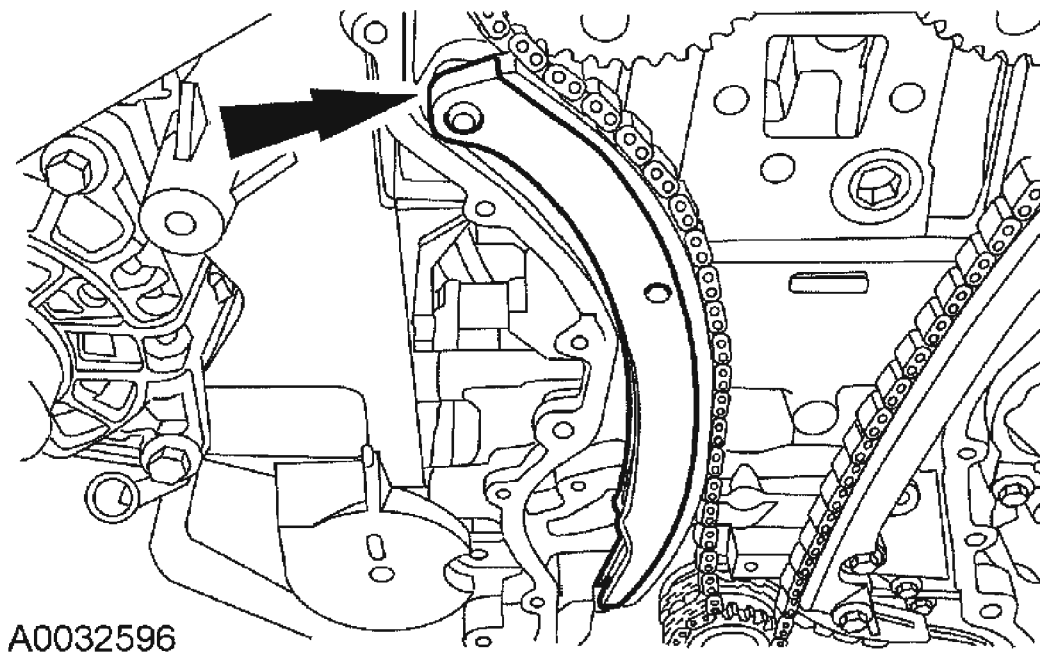


Fig. 128: Installing RH Timing Chain Guide
Courtesy of FORD MOTOR CO.

7. Install the timing chain tensioner and the bolts. Remove the paper clip to release the piston.

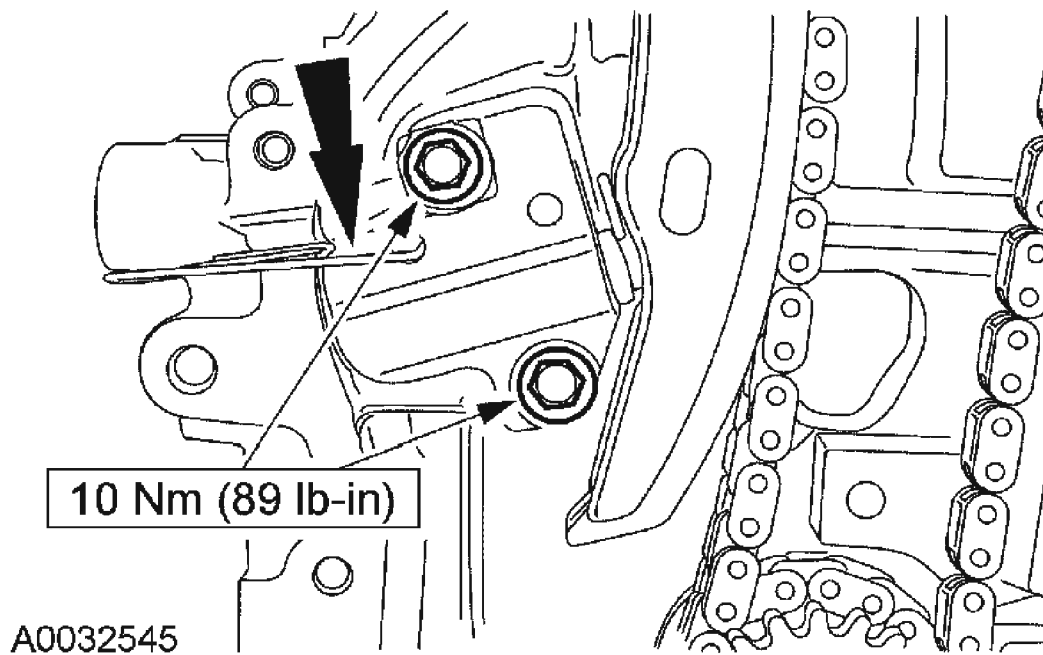
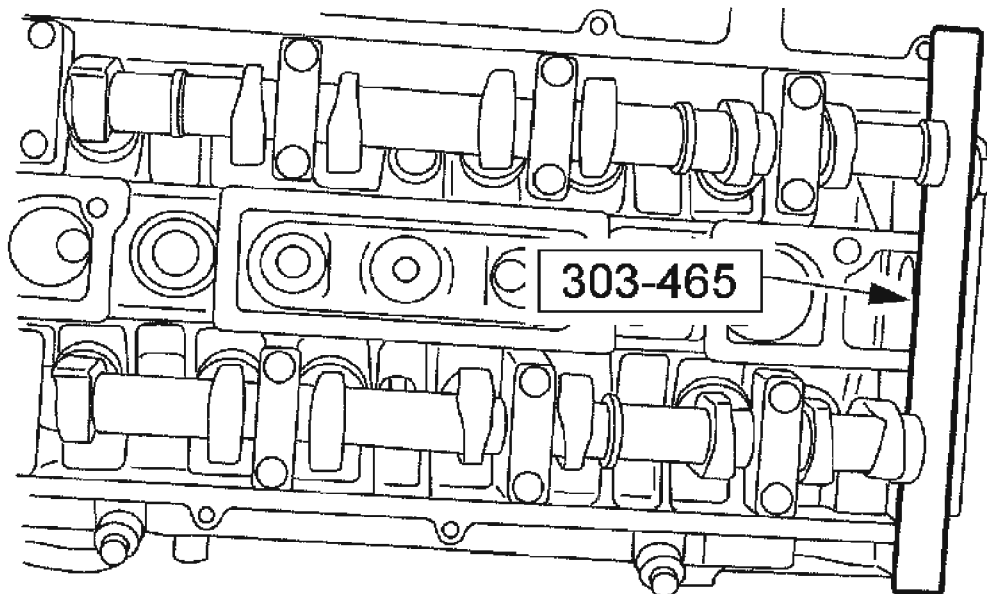


Fig. 129: Installing Timing Chain Tensioner And Bolts And Removing Paper Clip To Release Piston
Courtesy of FORD MOTOR CO.

8. Install the special tool.



A0052352

Fig. 130: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

CAUTION: Do not rely on the Camshaft Alignment Plate to prevent camshaft rotation. Damage to the tool or the camshafts can result.

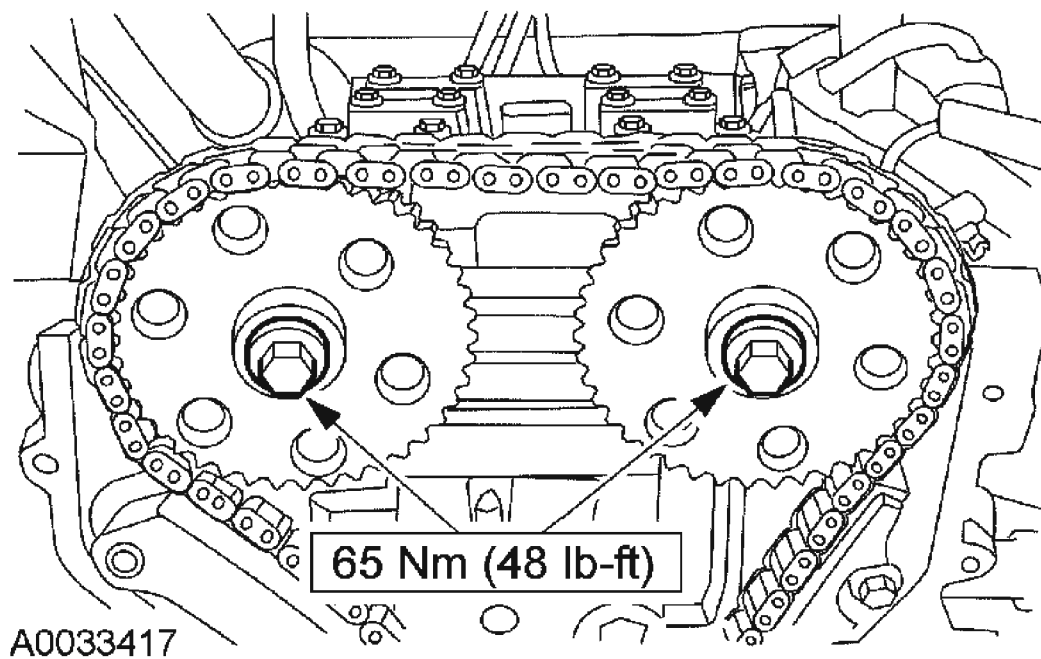


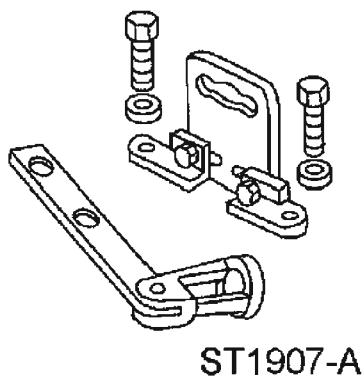
Fig. 131: Tightening Bolts
Courtesy of FORD MOTOR CO.

9. Using the flats on the camshafts to prevent camshaft rotation, tighten the bolts.
10. Install the front cover. For additional information, refer to **ENGINE FRONT COVER**.

VALVE SPRINGS

Special Tool(s)

SPECIAL TOOL DESCRIPTION

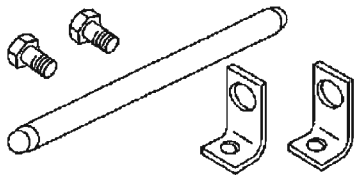


Compressor, Valve Spring 303-350 (T89P-6565-A)

Compressor, Valve Spring 303-300

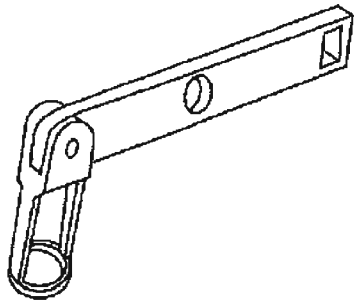
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1981-A

(T87C-6565-A)



ST1902-A

Compressor, Valve Spring 303-472 (T94P-6565-AH)

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

1. Remove the valve tappets. For additional information, refer to VALVE TAPPETS.

WARNING: Always wear protective goggles when working with compressed air. This can prevent injury. Failure to follow these instructions can result in personal injury.

CAUTION: Use compressed air at 689 to 1,034 kPa (100-150 psi).

NOTE: Place all parts in order to one side.

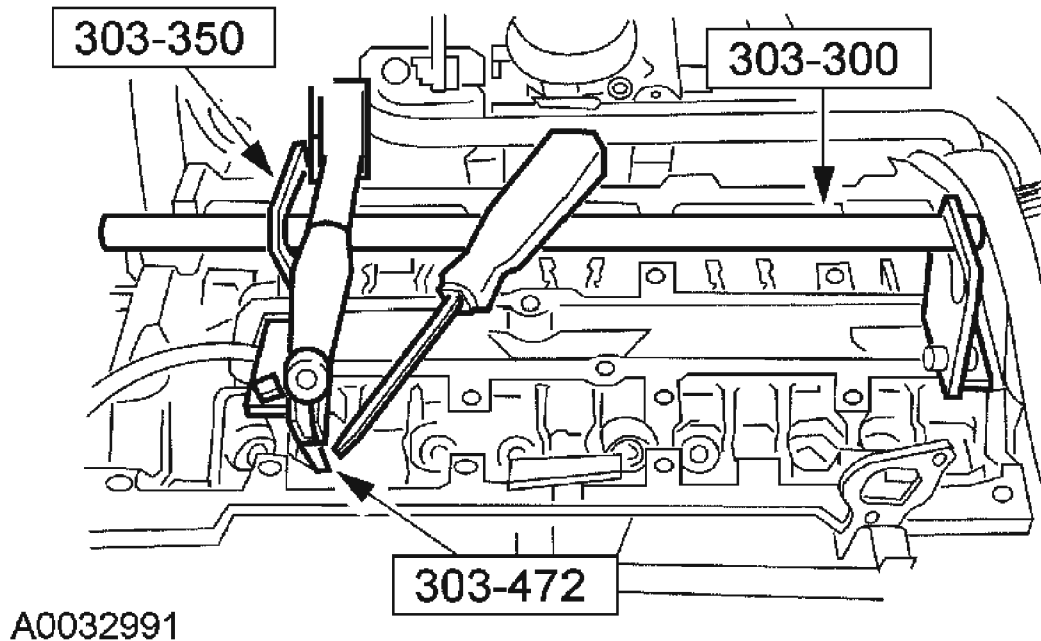


Fig. 132: Using Special Tools To Apply Compressed Air To Cylinder
Courtesy of FORD MOTOR CO.

2. Using the special tools, apply compressed air to the cylinder.
 - Using the special tools, compress the valve springs and remove the valve collets using some grease and a small screwdriver.
 - Remove the valve spring retainers and the valve springs.

Installation

NOTE: Check that there is no dirt or particles within the valve stem grooves. Check the seating of the valve collets.

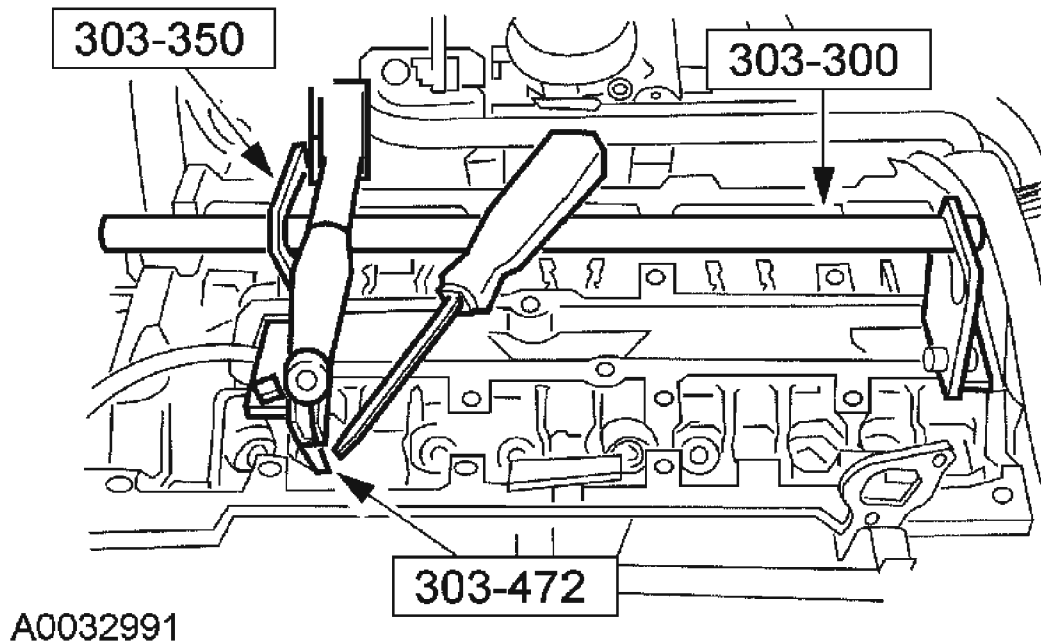


Fig. 133: Using Special Tools To Install Valve Springs
 Courtesy of FORD MOTOR CO.

1. Using the special tools, install the valve springs.
 - Insert the valve springs and the valve spring retainers.
 - Compress the valve springs and install the valve collets.
 - Disconnect and remove the air supply.
2. Install the valve tappets. For additional information, refer to **VALVE TAPPETS**.

VALVE SEALS

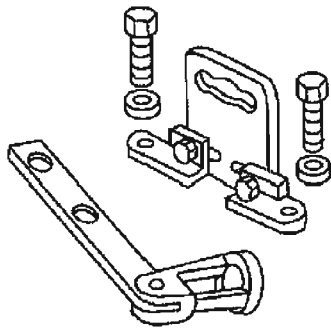
Special Tool(s)

SPECIAL TOOL DESCRIPTION

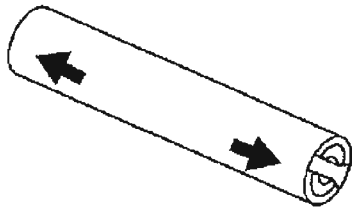
	Compressor, Valve Spring 303-350 (T89P-6565-A)
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2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

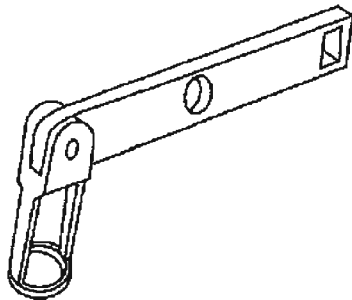


ST1907-A



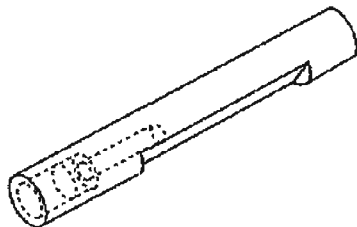
ST1904-A

Remover, Valve Stem Oil Seal 303-468
(T94P-6510-AH)



ST1902-A

Compressor, Valve Spring 303-472 (T94P-
6565-AH)



ST1906-A

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

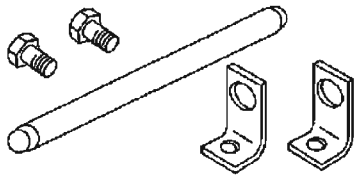
Slide Hammer 307-005 (T59L-100-B)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1187-A



ST1981-A

Compressor, Valve Spring 303-300
(T87C-6565-A)

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A
Multi-Purpose Grease D0AZ-19584-AA	ESB-M1C93-B

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

1. Remove the camshafts. For additional information, refer to CAMSHAFTS.

- Remove the valve tappets and place them in order to one side.

WARNING: Always wear protective goggles when working with compressed air. This can prevent injury. Failure to follow these instructions can result in personal injury.

2. Unscrew the spark plug on cylinder No. 1 and connect the compressed air supply.

CAUTION: Use compressed air at 689 to 1,034 kPa (100-150 psi).

NOTE: Place all parts in order to one side.

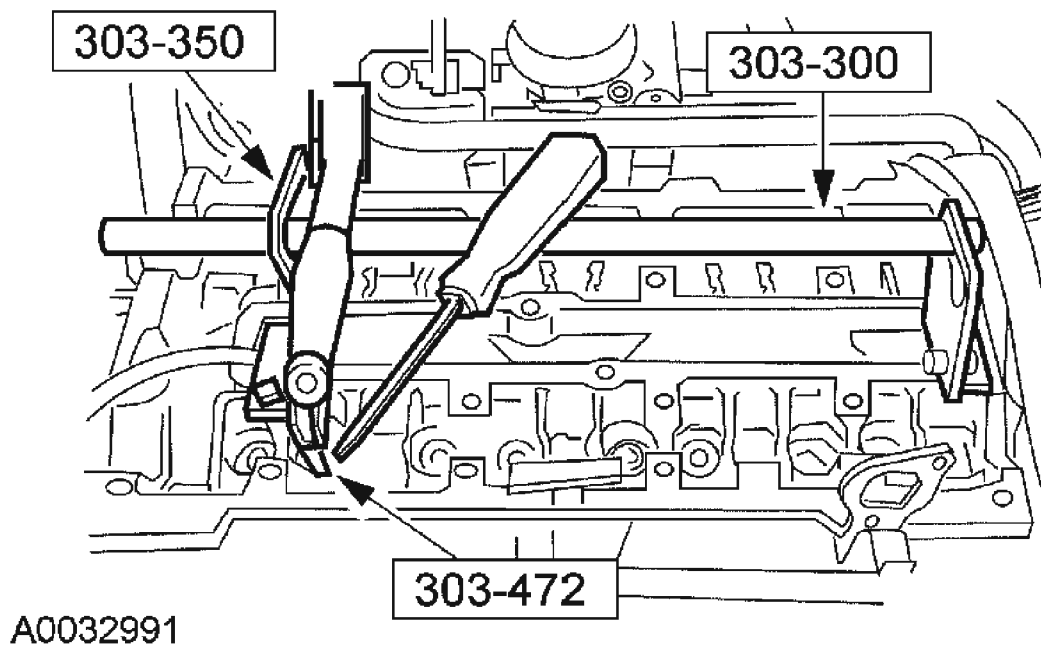


Fig. 134: Using Special Tools To Apply Compressed Air To Cylinder
Courtesy of FORD MOTOR CO.

3. Using the special tools, apply compressed air to the cylinder.
 - Using the special tools, compress the valve springs and remove the valve collets using some grease and a small screwdriver.
 - Remove the valve spring retainers and the valve springs.
4. Using the special tools, remove the valve stem seals.

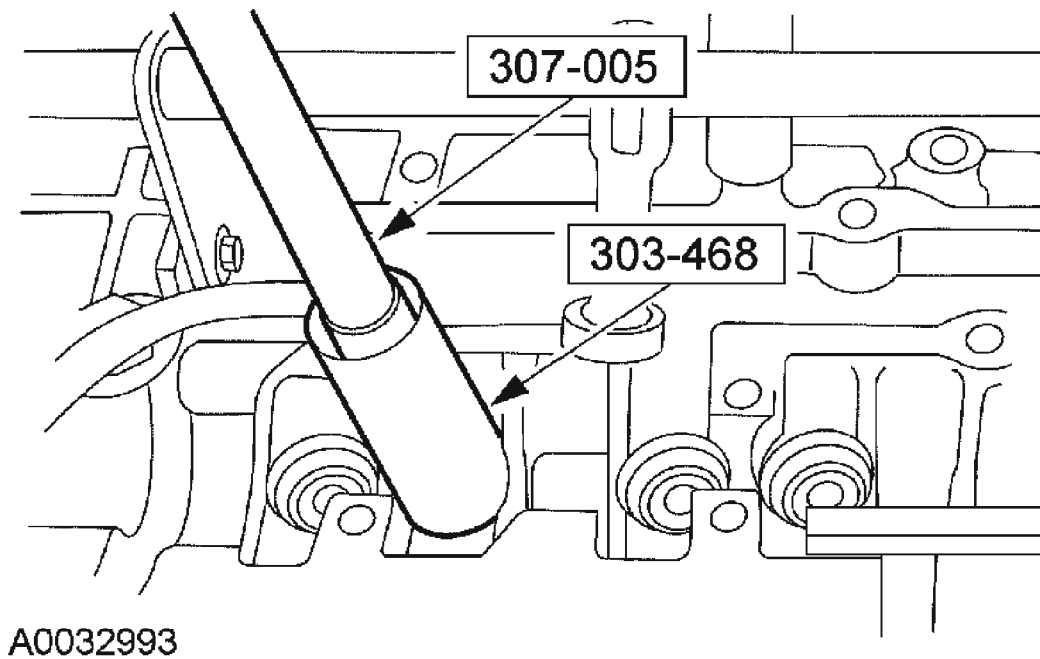


Fig. 135: Using Special Tools To Remove Valve Stem Seals
Courtesy of FORD MOTOR CO.

Installation

1. Install the valve stem seal installation sleeve.

A0032990

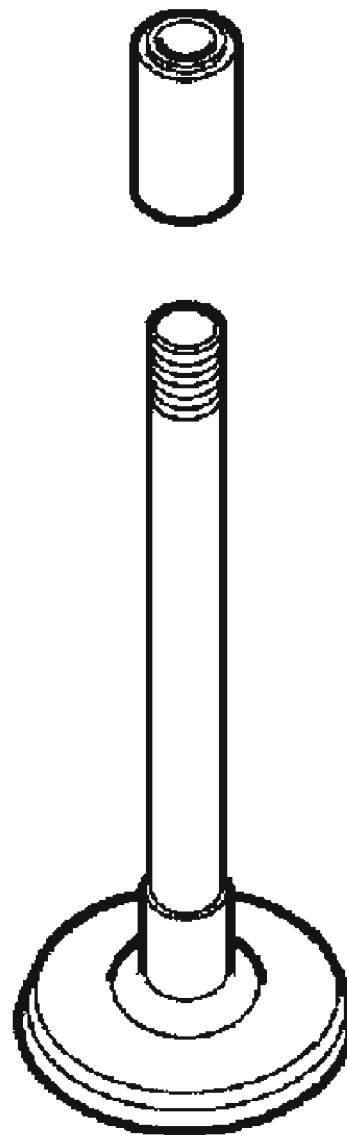


Fig. 136: Installing Valve Stem Seal Installation Sleeve
Courtesy of FORD MOTOR CO.

2. Using the special tool, install the valve stem oil seals.

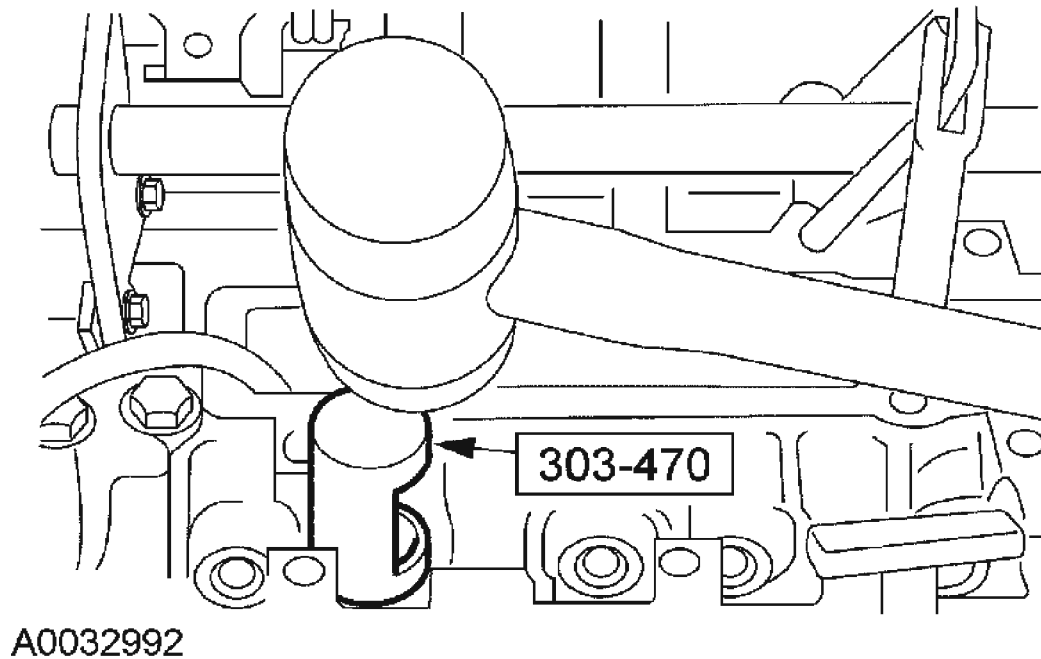


Fig. 137: Using Special Tool To Install Valve Stem Oil Seals
Courtesy of FORD MOTOR CO.

NOTE: Check the seating of the valve collets.

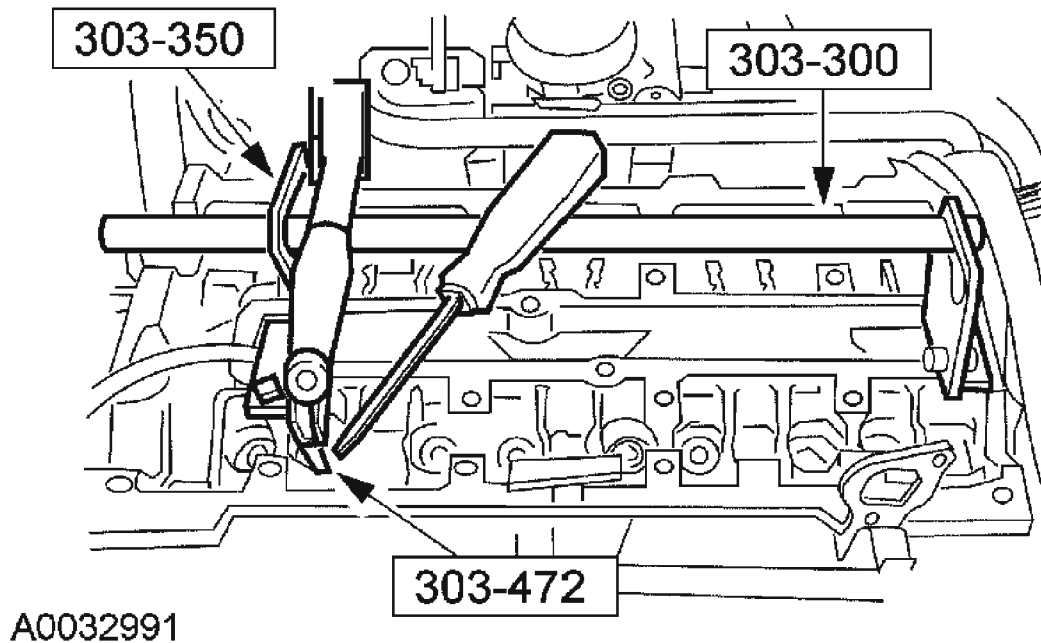


Fig. 138: Using Special Tools To Install Valve Springs
Courtesy of FORD MOTOR CO.

3. Using the special tools, install the valve springs.
 - Insert the valve springs and the valve spring retainers.
 - Compress the valve springs and install the valve collets using some grease and a small screwdriver.

NOTE: Do not tighten the spark plug at this time.

4. Disconnect the compressed air supply and screw in the spark plug.
5. Repeat the appropriate steps for all the other cylinders.
6. Coat the valve tappets with clean engine oil and insert them.
7. Tighten the spark plugs. For additional information, refer to **ENGINE IGNITION - 2.0L AND 2.3L**.
8. Install the camshafts. For additional information, refer to **CAMSHAFTS**.

VALVE TAPPETS

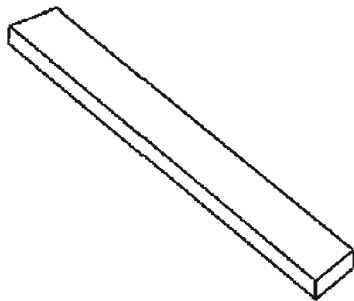
Special Tool(s)

SPECIAL TOOL DESCRIPTION

Camshaft Alignment Timing Tool 303-465
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2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1903-A

(T94P-6256-CH)

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

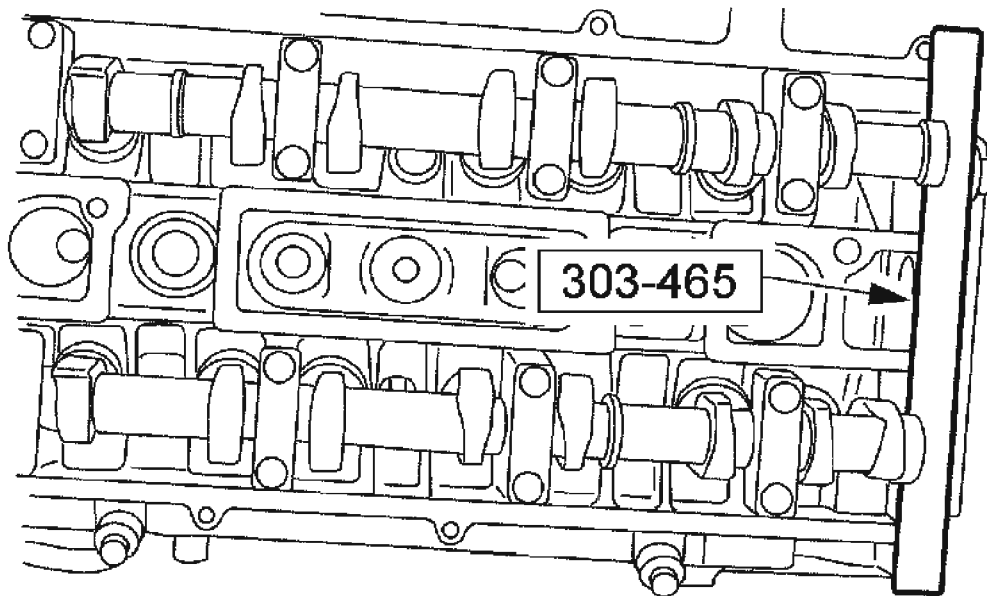
Removal

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.

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

NOTE: Valve tappets are select fit and the valve clearance must be checked before removing the tappets. For additional information, refer to VALVE CLEARANCE CHECK. If the valve clearance has already been checked, proceed with removal.

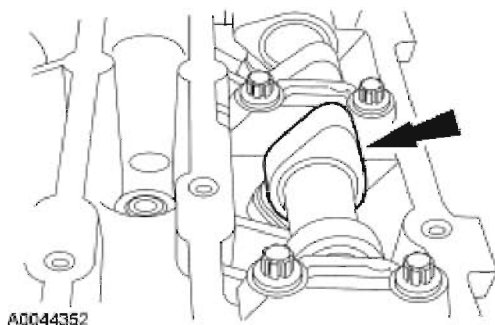
1. Remove the timing chain. For additional information, refer to TIMING DRIVE COMPONENTS.
2. Remove the special tool.



A0052352

Fig. 139: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

3. Mark the position of the camshaft lobes on the No. 1 cylinder for assembly reference.



A0044352

Fig. 140: Locating Camshaft Lobe
Courtesy of FORD MOTOR CO.

CAUTION: Failure to follow the camshaft loosening procedure can result in camshaft damage.

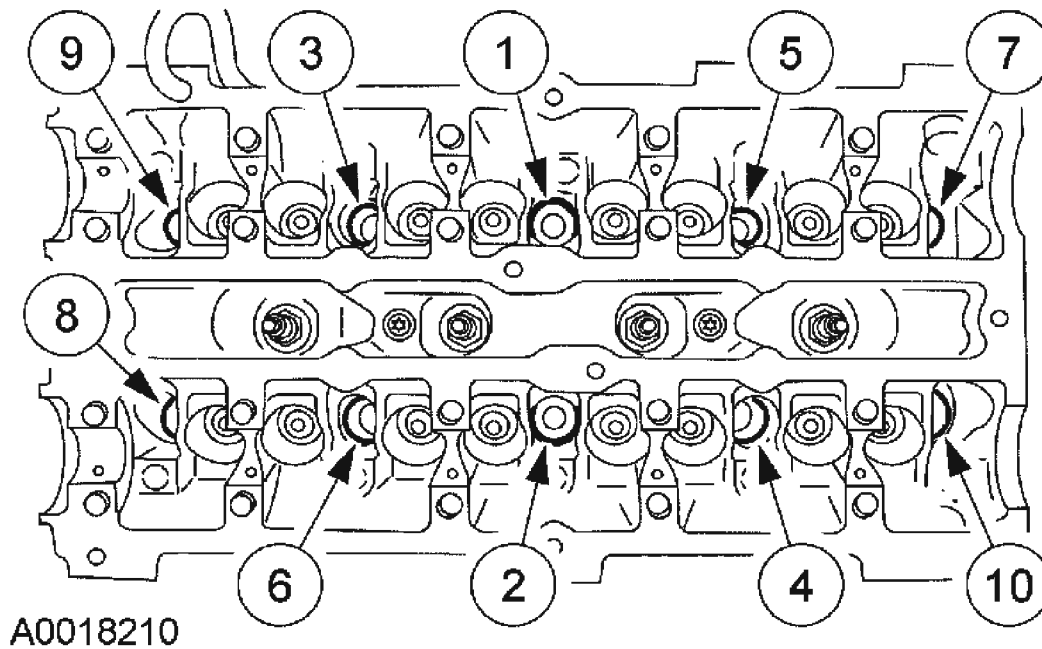


Fig. 141: Loosening Camshaft Bearing Bolts In Sequence
Courtesy of FORD MOTOR CO.

4. Loosen the camshaft bearing bolts in the sequence shown, one turn at a time. Repeat until all the tension is released.
 - Remove the camshaft bearing caps.
 - Remove the camshafts.

CAUTION: If the camshafts and valve tappets are to be reused, mark the location of the valve tappets to make sure they are assembled in their original positions.

5. Remove the valve tappets.

NOTE: The number on the valve tappets only reflects the digits that follow the decimal. For example, a tappet with the number 0.650 has the thickness of 3.650 mm.

6. Inspect the valve tappets. For additional information, refer to **ENGINE SYSTEM-GENERAL INFORMATION**.

Installation

NOTE: Lubricate the valve tappets with clean engine oil.

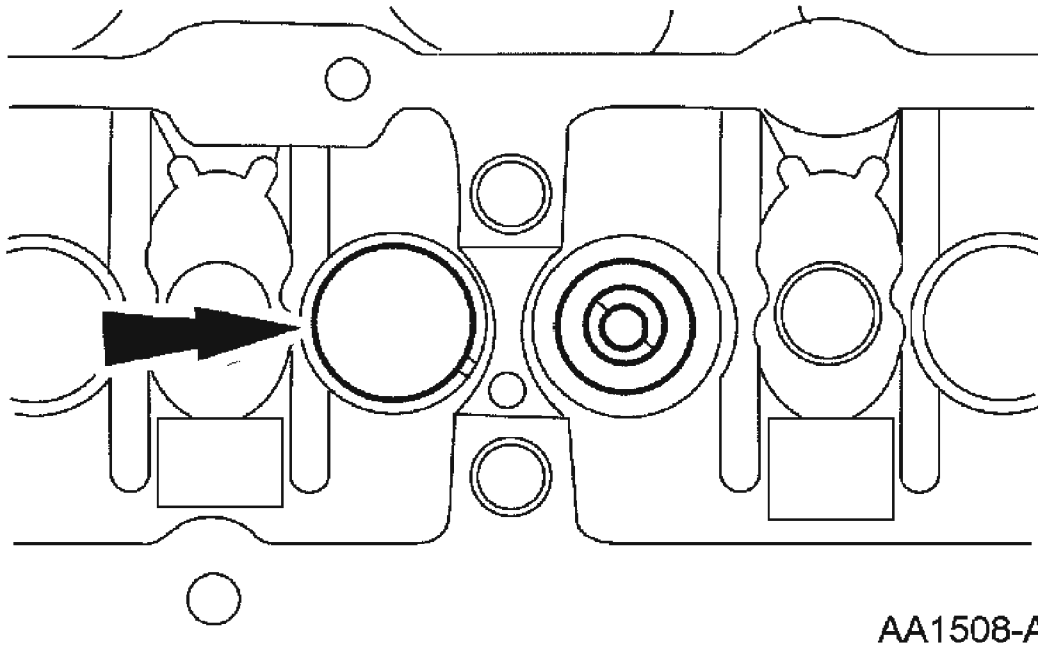


Fig. 142: Installing Valve Tappets
Courtesy of FORD MOTOR CO.

1. Install the valve tappets.

CAUTION: Install the camshafts with the alignment notches in the camshafts lined up so the camshaft alignment plate can be installed. Make sure the lobes on the No. 1 cylinder are in the same position as noted in the removal procedure. Failure to follow this procedure can cause severe damage to the valves and pistons.

NOTE: Lubricate the camshaft journals and bearing caps with clean engine oil.

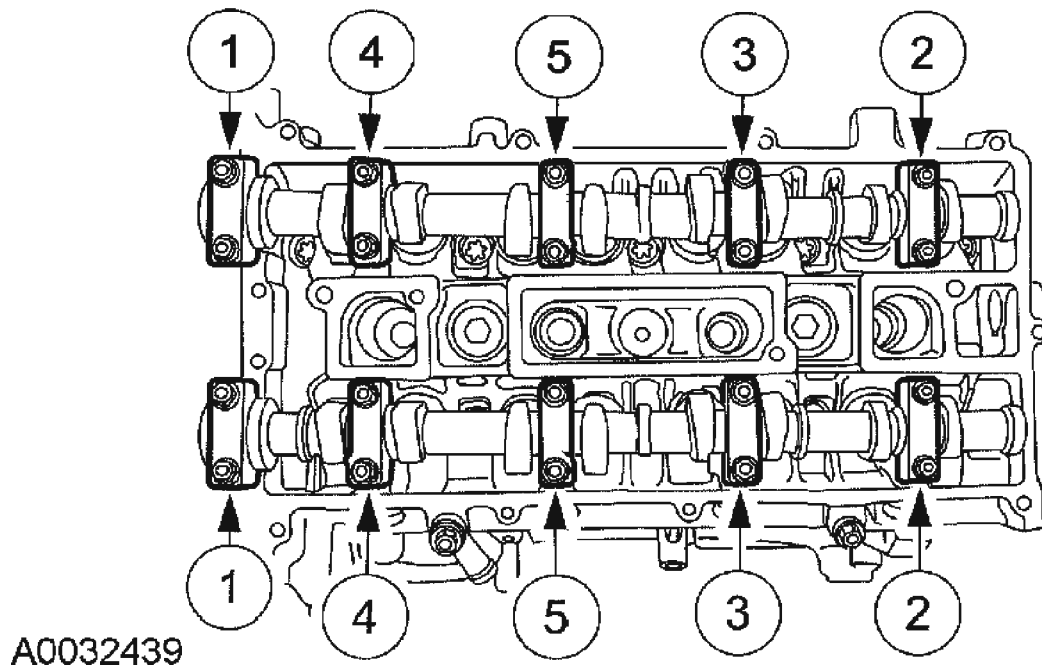
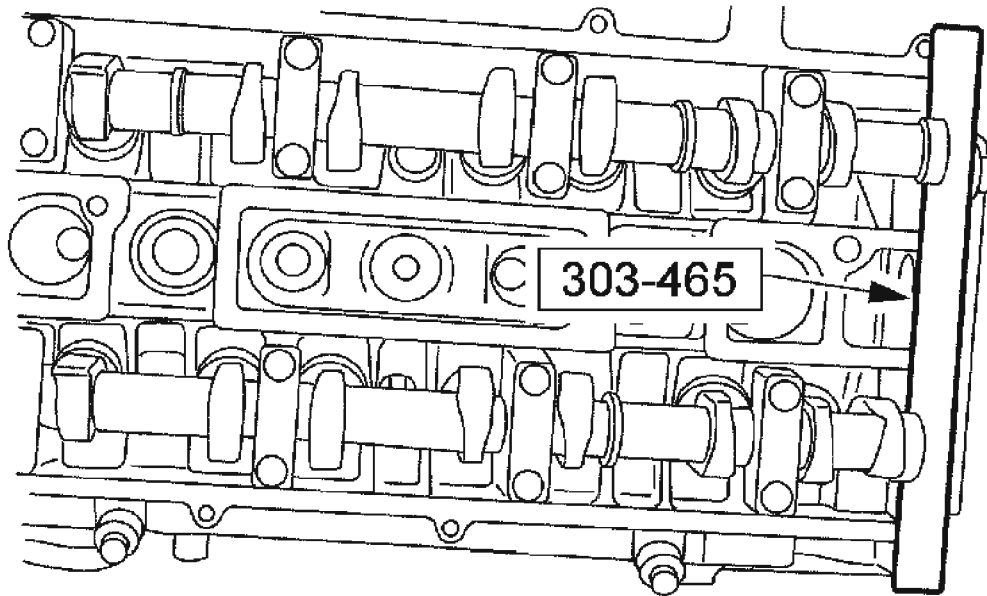


Fig. 143: Identifying Tightening Sequence Of Camshaft Bearing Cap Bolts
Courtesy of FORD MOTOR CO.

2. Install the camshafts and bearing caps. Tighten the bolts in the sequence shown in three stages.
 - Stage 1: Tighten the camshaft bearing cap bolts, one turn at a time, until the cam is fully seated.
 - Stage 2: Tighten the bolts to 7 Nm (62 lb-in).
 - Stage 3: Tighten the bolts to 16 Nm (12 lb-ft).
3. Install the special tool.



A0052352

Fig. 144: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

4. Install the timing chain. For additional information, refer to **TIMING DRIVE COMPONENTS**.
5. Confirm each valve's clearance at base circle with the lobe pointed away from the tappet.

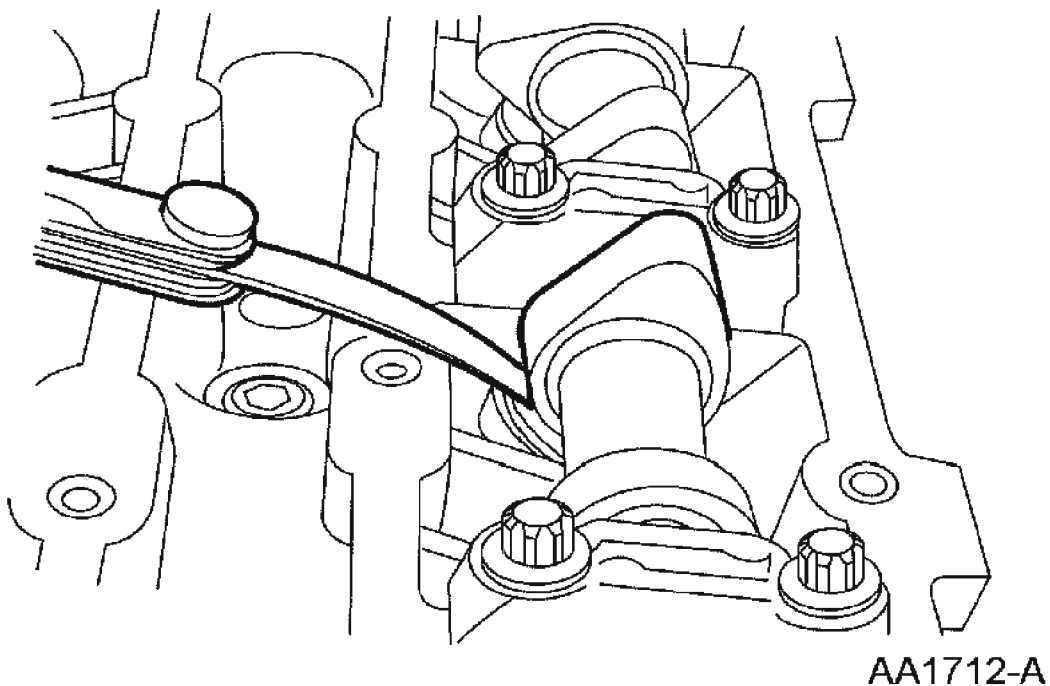


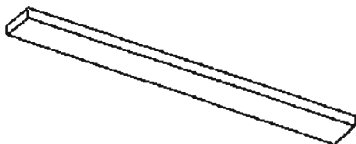
Fig. 145: Confirming Each Valve's Clearance At Base Circle With Lobe Pointed Away From Tappet

Courtesy of FORD MOTOR CO.

CAMSHAFTS

Special Tool(s)

SPECIAL TOOL DESCRIPTION

 ST2645-A	Alignment Plate, Camshaft 303-465 (T94P-6256-CH)
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Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend	WSS-M2C930-A

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

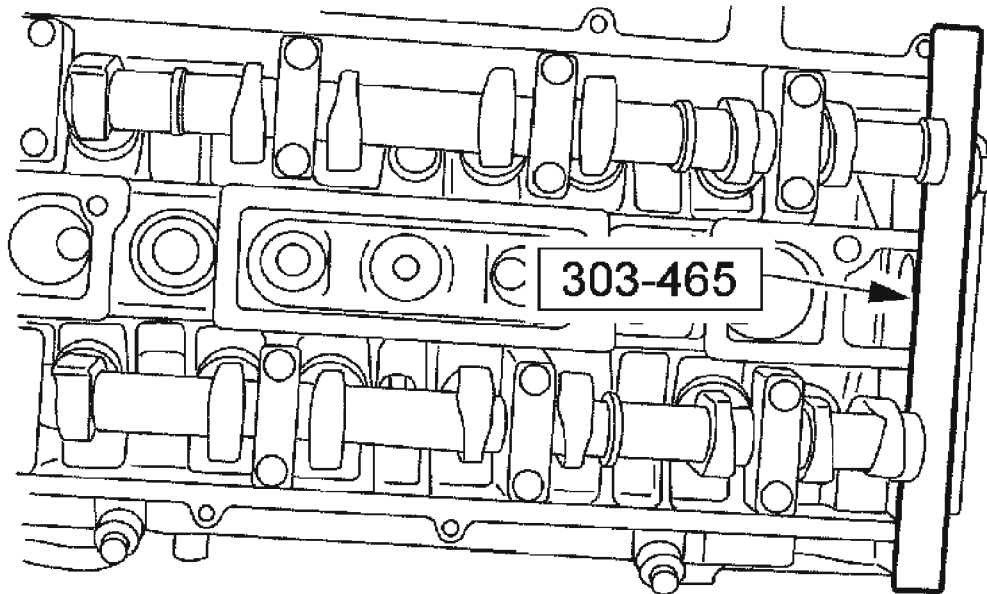
Motor Oil XO-5W20-QSP or equivalent

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

1. Check the valve clearance. For additional information, refer to **VALVE CLEARANCE CHECK**.
2. Remove the timing chain and sprockets. For additional information, refer to **TIMING DRIVE COMPONENTS**.
3. Remove the special tool.



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Fig. 146: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

4. Mark the position of the camshaft lobes on the No. 1 cylinder for assembly reference.

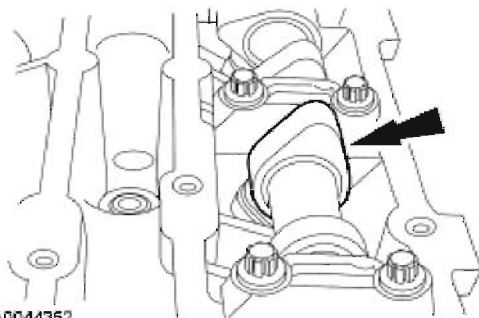


Fig. 147: Locating Camshaft Lobe
Courtesy of FORD MOTOR CO.

CAUTION: Failure to follow the camshaft loosening procedure can result in damage to the camshafts.

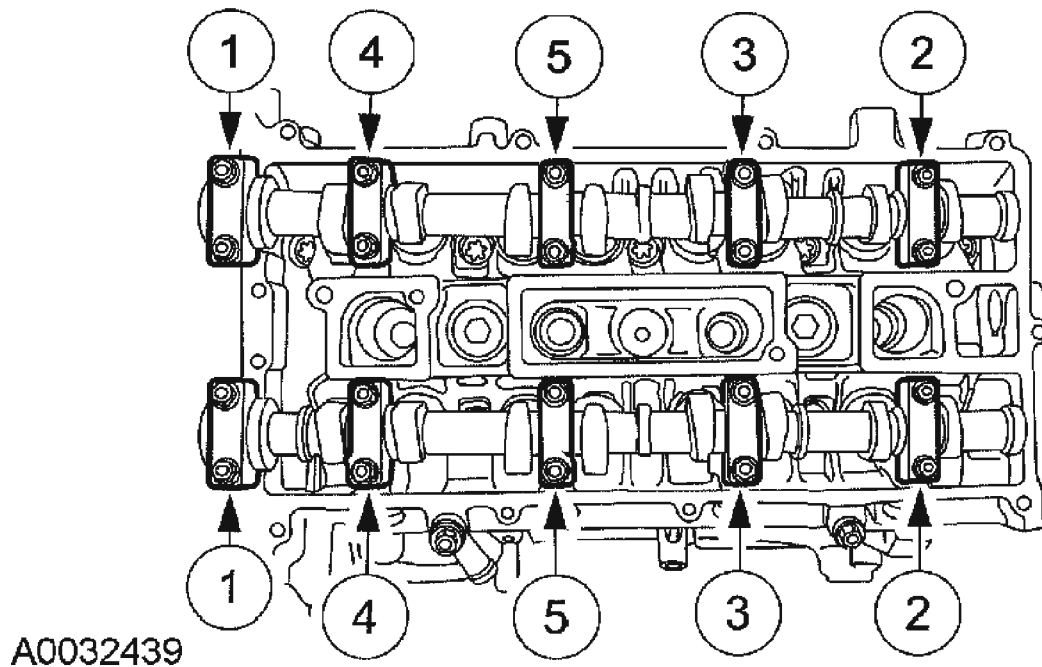


Fig. 148: Removing Camshafts From Engine
Courtesy of FORD MOTOR CO.

5. Remove the camshafts from the engine.
 - Loosen the camshaft bearing cap bolts, in sequence, one turn at a time.
 - Repeat the first step until all tension is released from the camshaft bearing caps.
 - Remove the camshaft bearing caps.
 - Remove the camshafts.

Installation

CAUTION: Install the camshafts with the alignment slots in the camshafts lined up so the Camshaft Alignment Plate can be installed without rotating the camshafts. Make sure the lobes on the No. 1 cylinder are in the same position as noted in the removal procedure. Rotating the camshafts when the timing chain is removed, or installing the camshafts 180 degrees out of position, can cause severe damage to the valves and pistons.

NOTE: Lubricate the camshaft journals and bearing caps with clean engine oil.

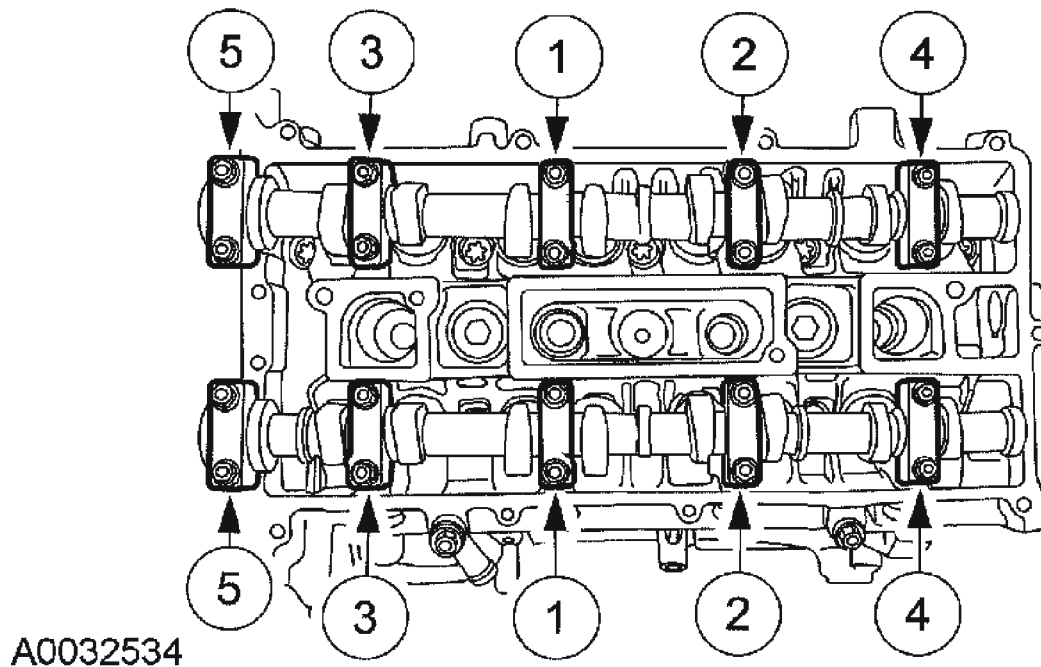


Fig. 149: Identifying Tightening Sequence Of Camshaft Bearing Caps Bolts
Courtesy of FORD MOTOR CO.

1. Install the camshafts and bearing caps. Tighten the bolts in the sequence shown in three stages.
 - Stage 1: Tighten the camshaft bearing bolt caps one turn at a time until tight.
 - Stage 2: Tighten the bolts to 7 Nm (62 lb-in).
 - Stage 3: Tighten the bolts to 16 Nm (12 lb-ft).
2. Install the camshaft drive gears and hand-tighten the bolts.

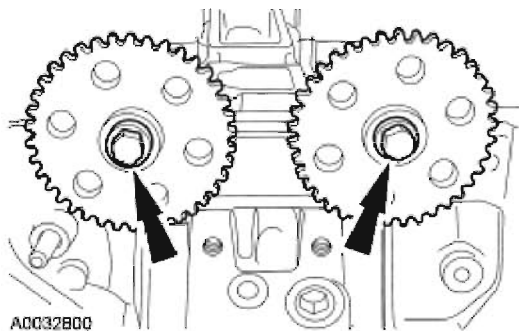


Fig. 150: Locating Camshaft Sprocket Bolts
Courtesy of FORD MOTOR CO.

3. Install the timing chain and sprockets. For additional information, refer to **TIMING**

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

DRIVE COMPONENTS.

CYLINDER HEAD

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A
Motorcraft Silicone Gasket Remover ZC-30	-
Motorcraft Metal Surface Prep ZC-31	-
Silicone Gasket and Sealant TA-30 or equivalent	WSE-M4G323-A4

Removal

All engines

1. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
2. Remove the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
3. Disconnect the dual electric cooling fan electrical connectors.

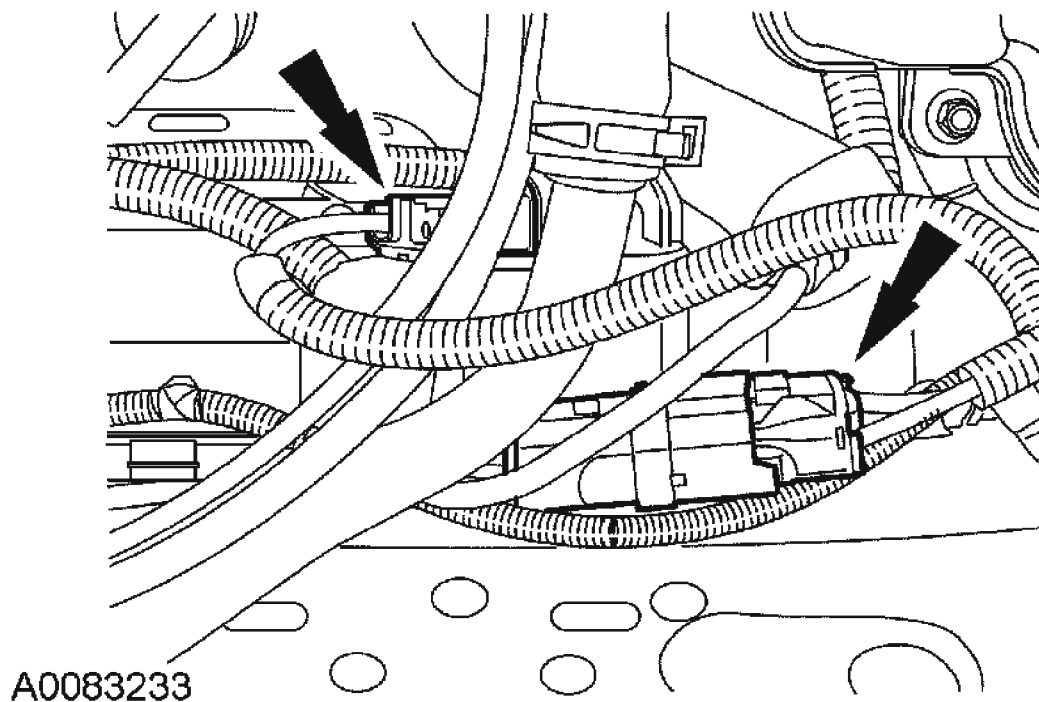
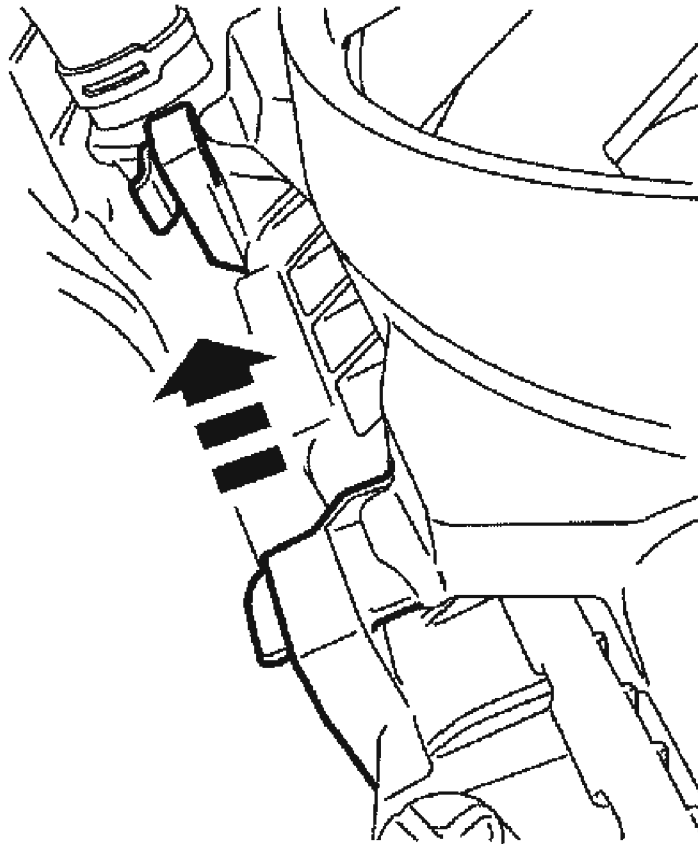


Fig. 151: Disconnecting Dual Electric Cooling Fan Electrical Connectors
Courtesy of FORD MOTOR CO.

4. Lift and remove the cooling fan motors and shroud from the retainer brackets and lower from the vehicle.

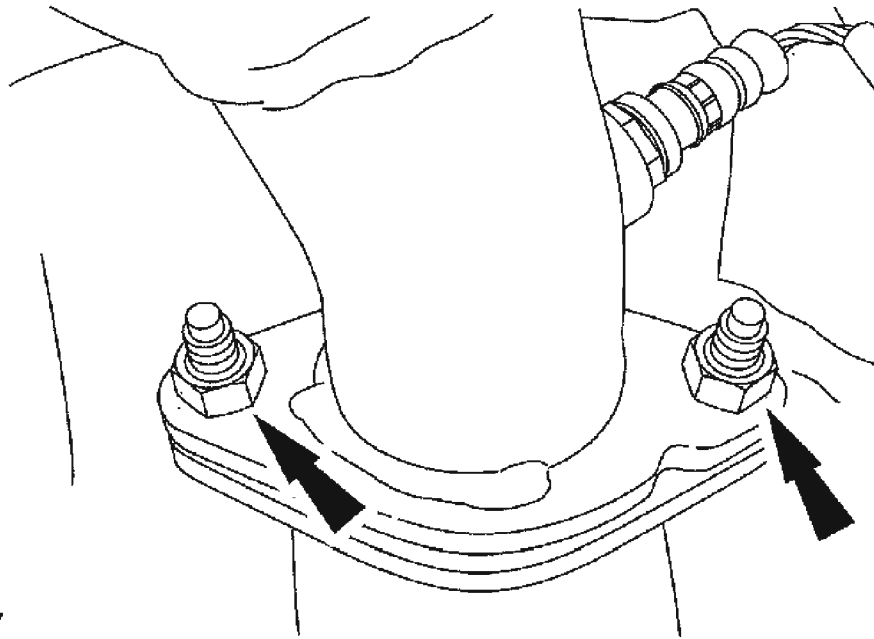


A0071464

Fig. 152: Lifting And Removing Cooling Fan Motors And Shroud From Retainer Brackets

Courtesy of FORD MOTOR CO.

5. Drain the cooling system. For additional information, refer to **ENGINE COOLING** .
6. Remove the nuts and disconnect the catalytic converter from the muffler assembly.
 - Remove and discard the gasket.



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Fig. 153: Removing Nuts And Disconnecting Catalytic Converter From Muffler Assembly

Courtesy of FORD MOTOR CO.

7. Remove the bolts and the catalytic converter support bracket.

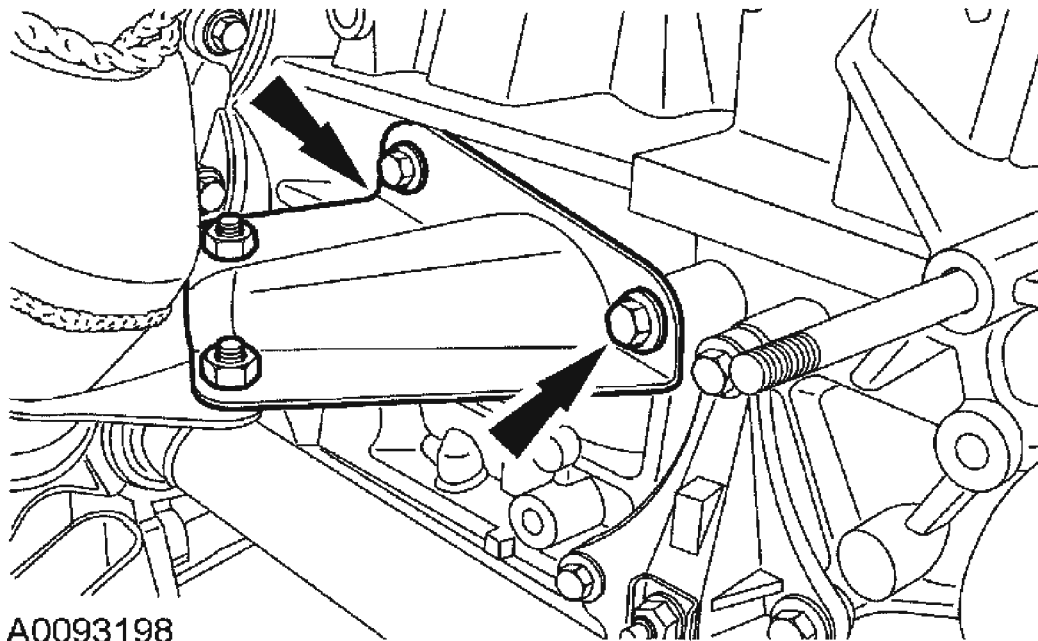


Fig. 154: Removing Bolts And Catalytic Converter Support Bracket
Courtesy of FORD MOTOR CO.

NOTE: All 2.3L engines and some 2.0L engines are equipped with a heat shield that must be positioned aside to access the catalytic converter-to-engine nuts.

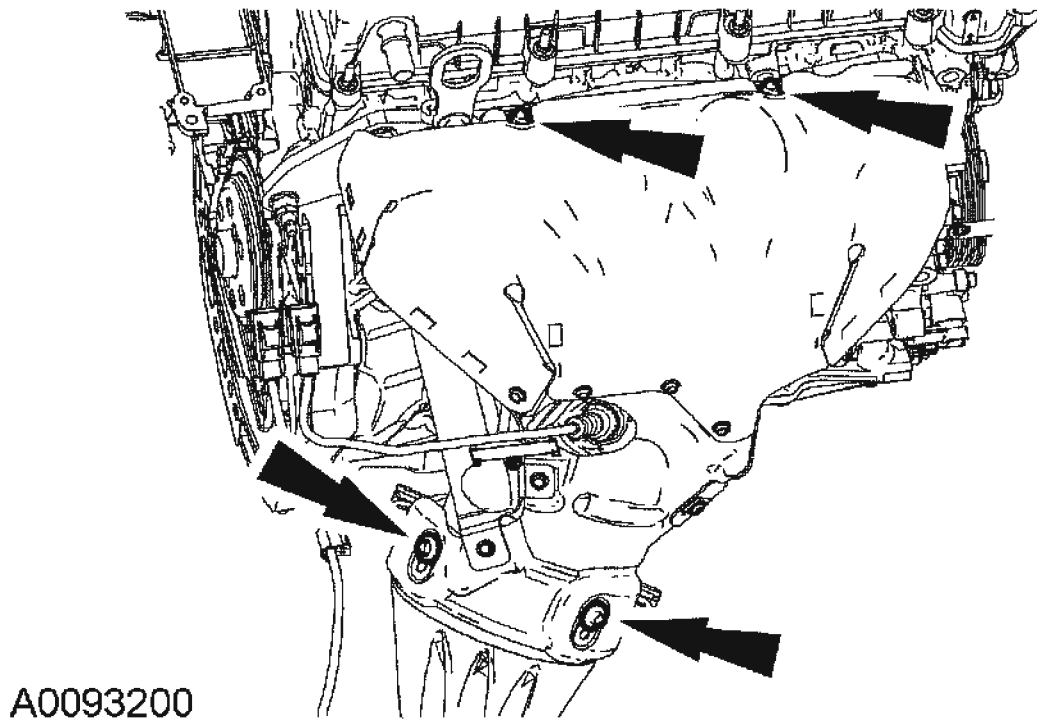
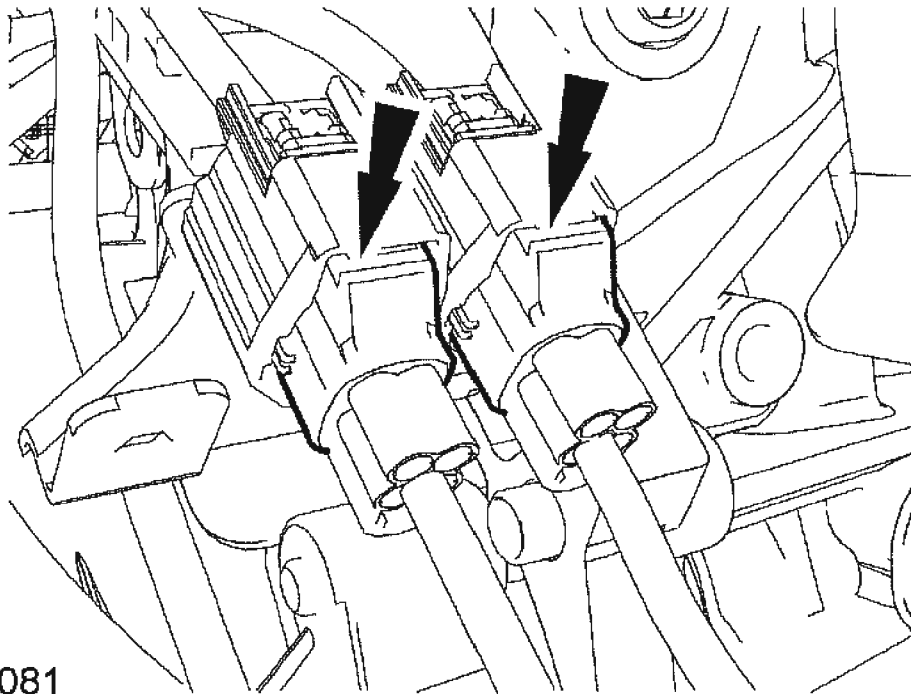


Fig. 155: Removing Four Heat Shield Bolts
Courtesy of FORD MOTOR CO.

8. If equipped, remove the four heat shield bolts and position the heat shield aside.
9. Disconnect the exhaust sensor electrical connectors.



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Fig. 156: Disconnecting Exhaust Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

10. Remove and discard the catalytic converter-to-engine nuts.
 - Position aside the catalytic converter and support with mechanic's wire.
 - Remove and discard the catalytic converter gasket.

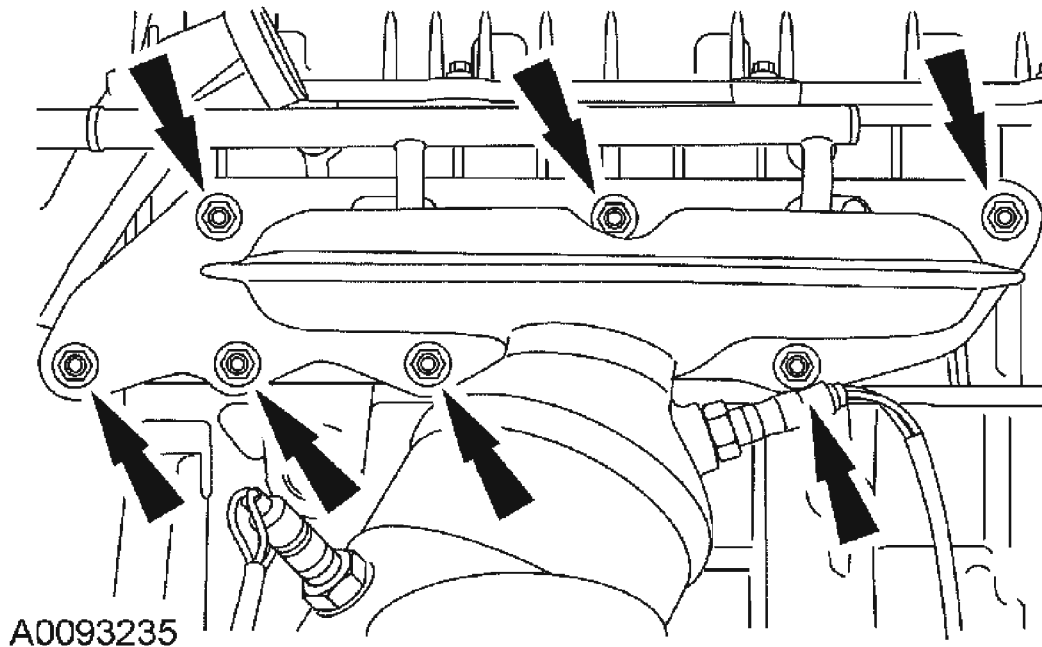


Fig. 157: Removing Catalytic Converter-To-Engine Nuts
Courtesy of FORD MOTOR CO.

11. Remove the generator. For additional information, refer to **GENERATOR AND REGULATOR** .
12. Remove the fuel injection supply manifold. For additional information, refer to **FUEL CHARGING AND CONTROLS - 2.0L AND 2.3L** .
13. Remove the intake manifold. For additional information, refer to **INTAKE MANIFOLD**.

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

14. Remove the valve tappets. For additional information, refer to **VALVE TAPPETS**.

2.0L engines

15. If equipped, disconnect the secondary air injection (AIR) vacuum regulator electrical connector and vacuum hose.

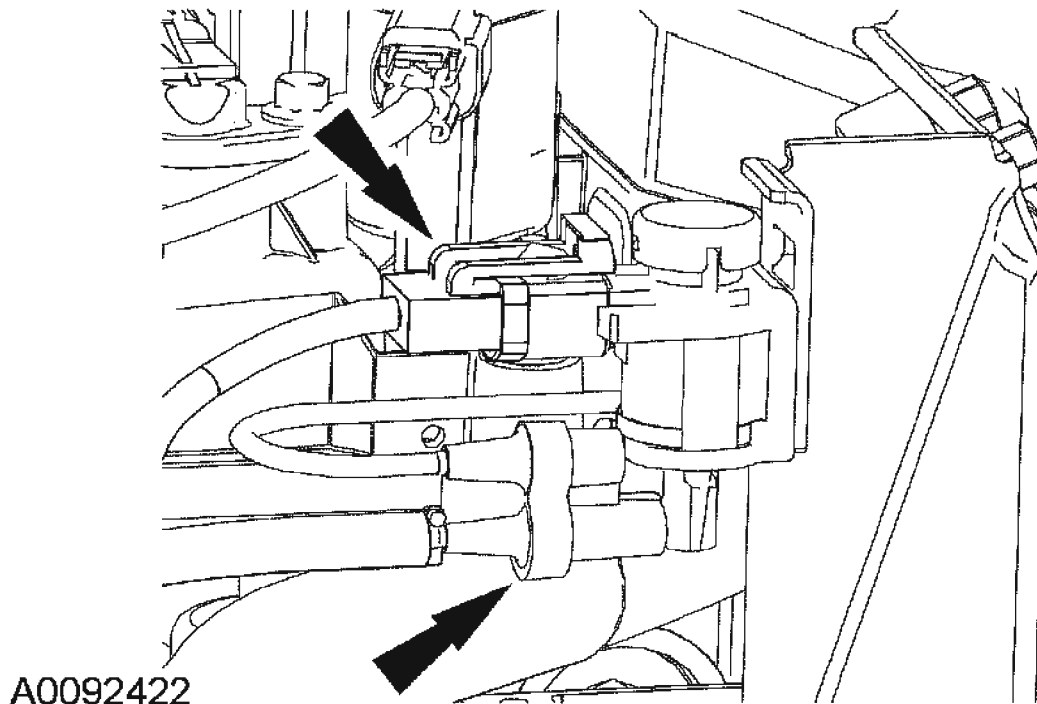


Fig. 158: Disconnecting Secondary Air Injection Vacuum Regulator Electrical Connector And Vacuum Hose
Courtesy of FORD MOTOR CO.

16. If equipped, disconnect the hoses from the AIR control valve.

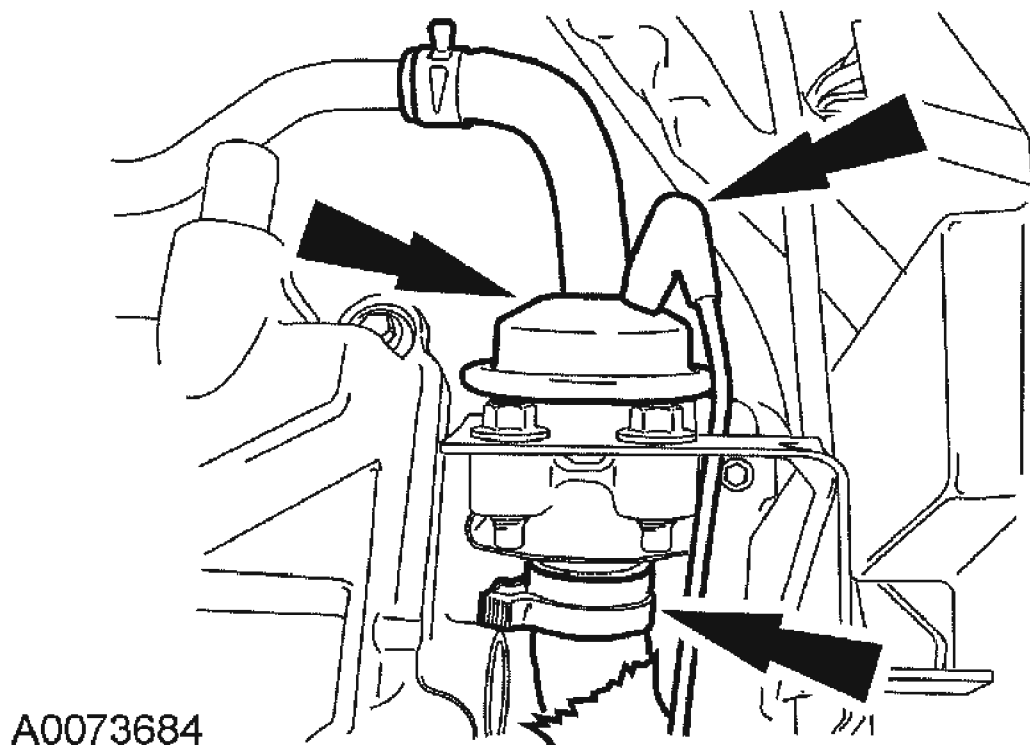


Fig. 159: Disconnecting Hoses From AIR Control Valve
Courtesy of FORD MOTOR CO.

17. If equipped, disconnect the upper exhaust sensor electrical connector and retainer.

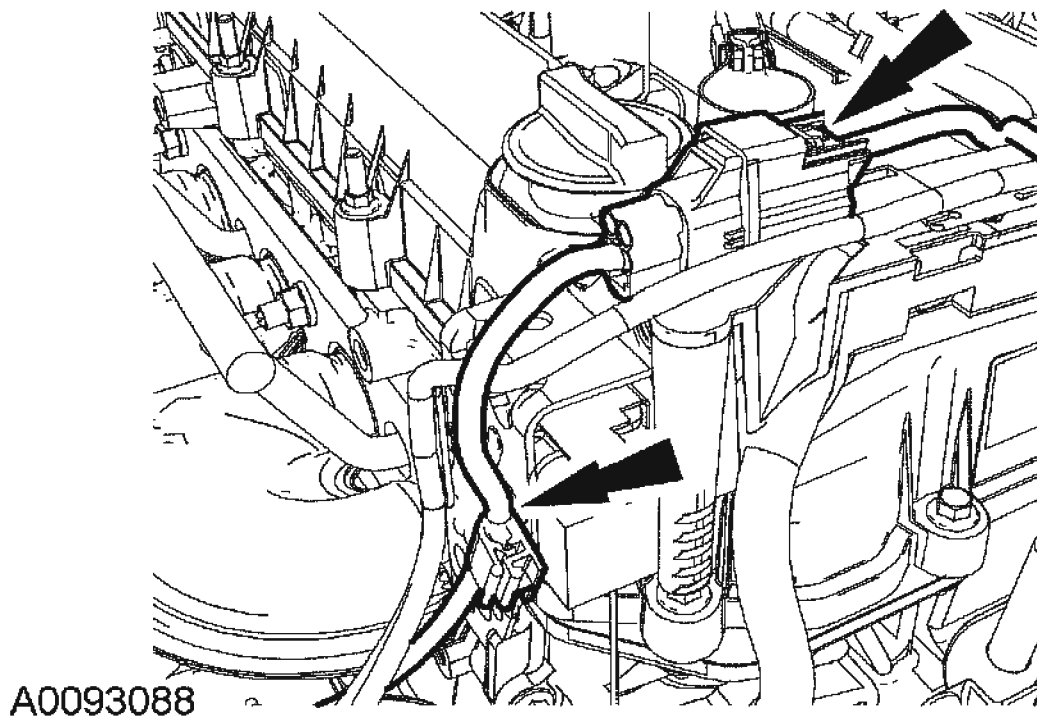


Fig. 160: Disconnecting Upper Exhaust Sensor Electrical Connector And Retainer
Courtesy of FORD MOTOR CO.

All engines

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

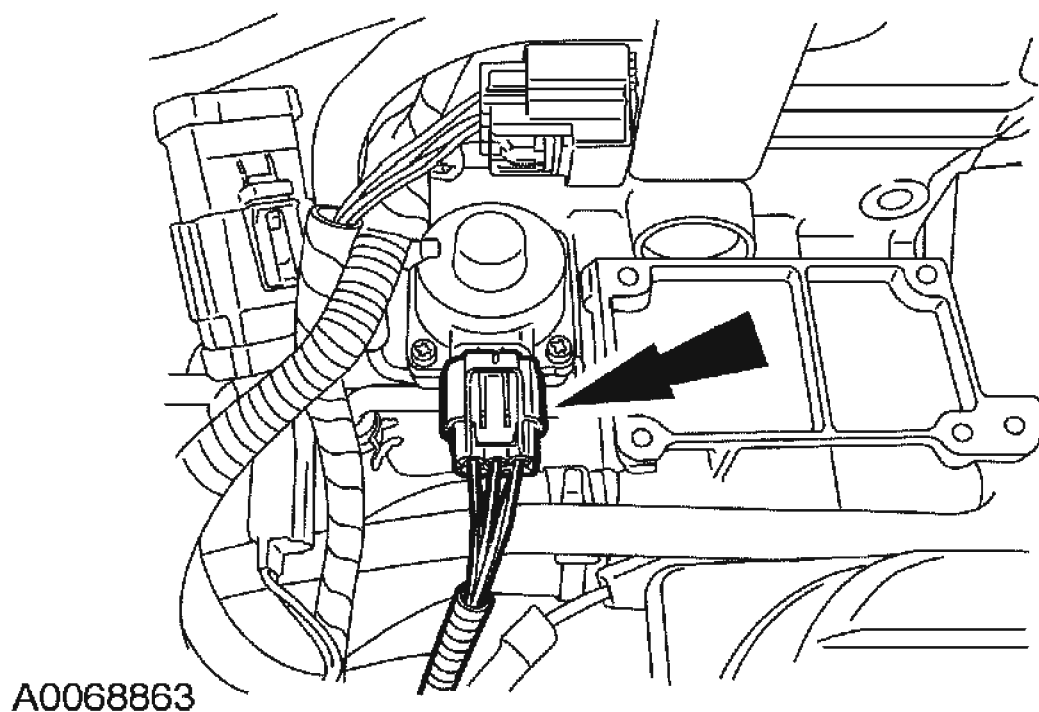


Fig. 161: Disconnecting Exhaust Gas Recirculation Valve Electrical Connector
Courtesy of FORD MOTOR CO.

19. Disconnect the coolant hoses from the coolant bypass.

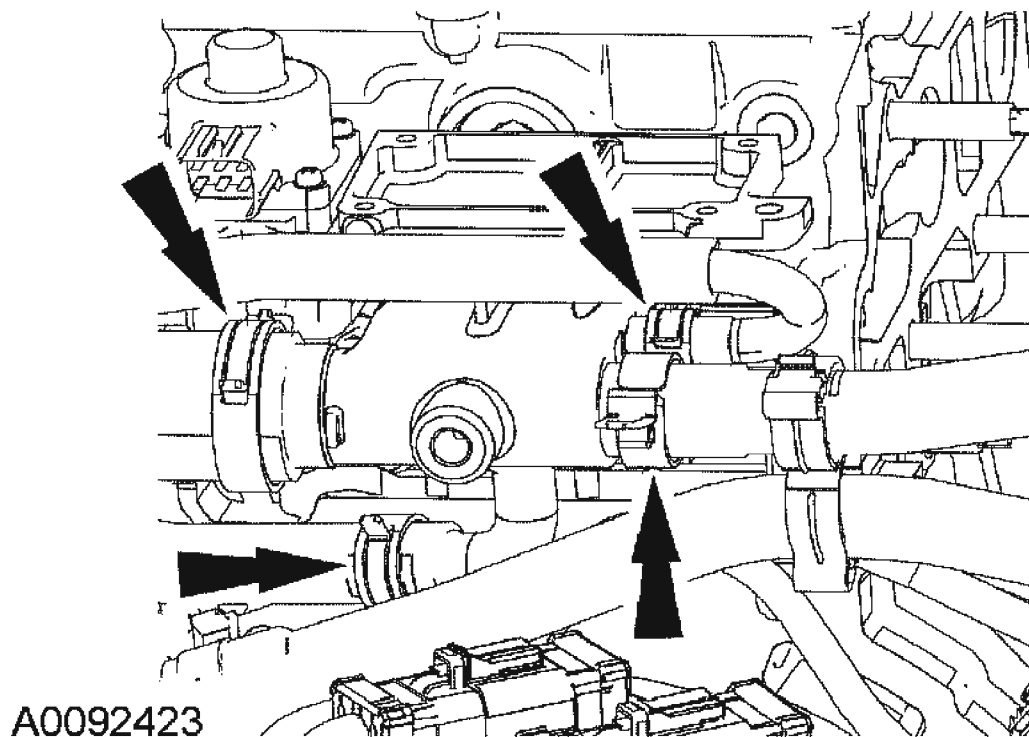


Fig. 162: Disconnecting Coolant Hoses From Coolant Bypass
Courtesy of FORD MOTOR CO.

20. Remove the bolts, coolant bypass and gasket.
 - Discard the gasket.

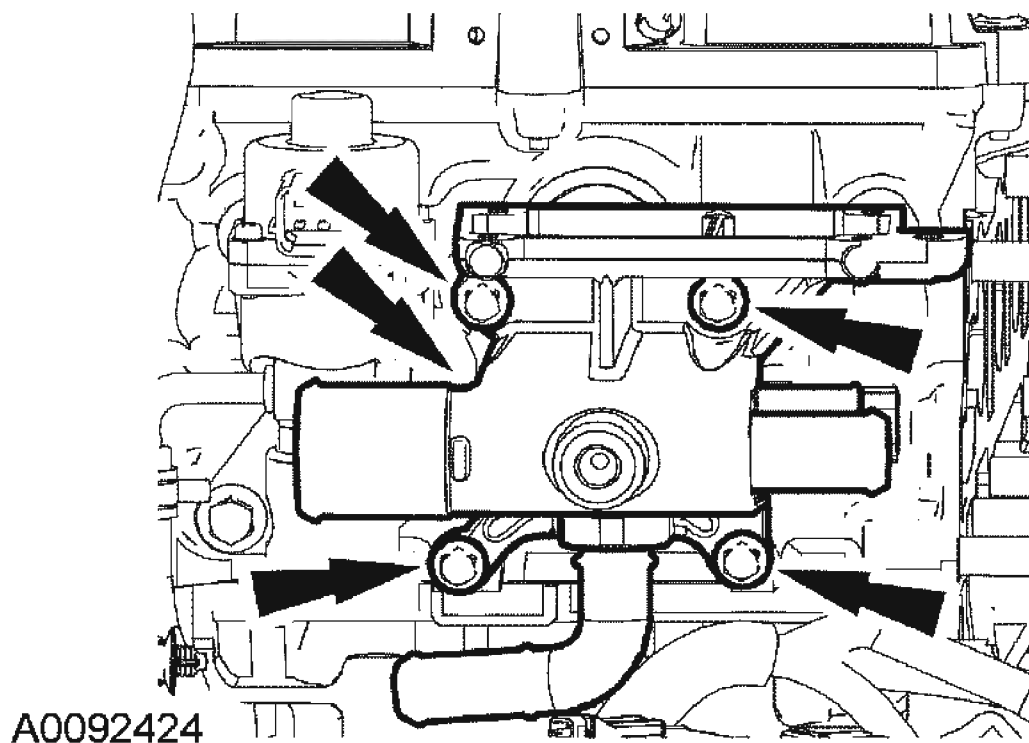
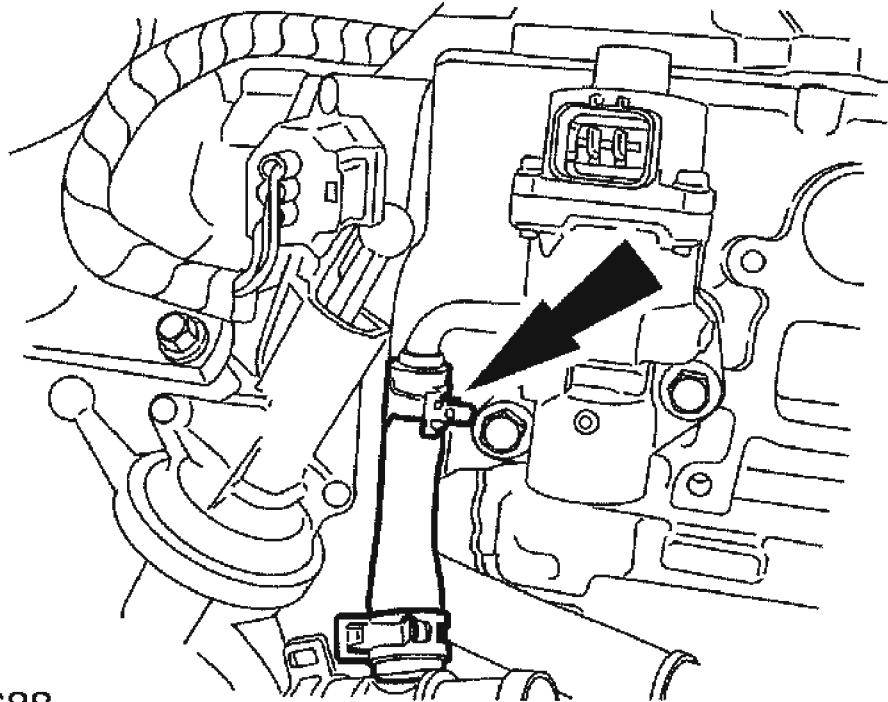


Fig. 163: Removing Bolts, Coolant Bypass And Gasket
Courtesy of FORD MOTOR CO.

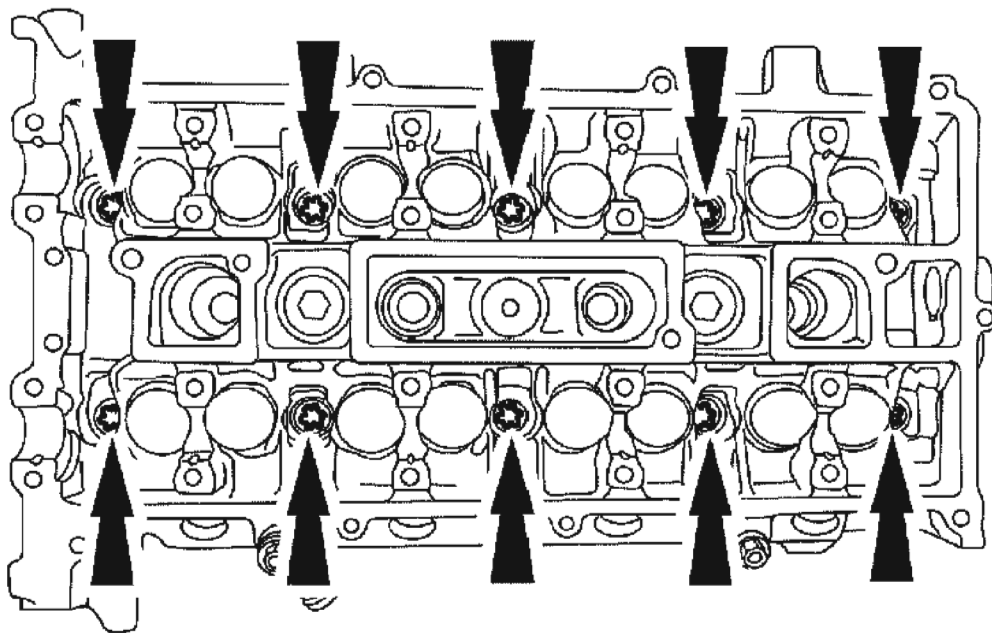
21. Disconnect the EGR coolant hose.



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Fig. 164: Disconnecting EGR Coolant Hose
Courtesy of FORD MOTOR CO.

22. Remove the bolts and the cylinder head.
 - Discard the bolts.



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Fig. 165: Removing Bolts And Cylinder Head
Courtesy of FORD MOTOR CO.

23. Remove and discard the head gasket.

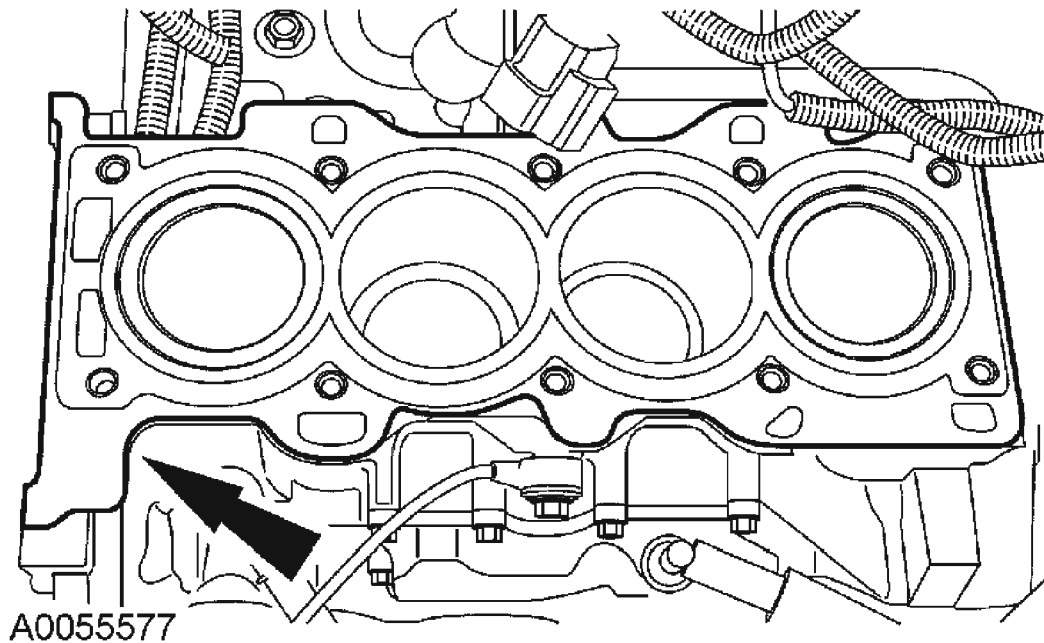


Fig. 166: Removing Head Gasket
Courtesy of FORD MOTOR CO.

24. Inspect the cylinder head mating surfaces. For additional information, refer to **ENGINE SYSTEM-GENERAL INFORMATION**.

Installation

All engines

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.

1. 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.
2. Inspect the cylinder head for distortion. For additional information, refer to **ENGINE SYSTEM-GENERAL INFORMATION**.
3. Apply silicone gasket and sealant to the locations shown.

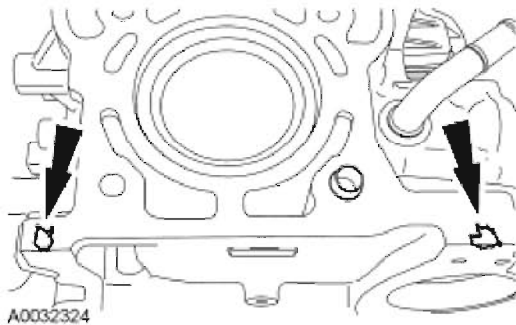


Fig. 167: Identifying Silicone Gasket And Sealant Location
Courtesy of FORD MOTOR CO.

4. Install a new head gasket.

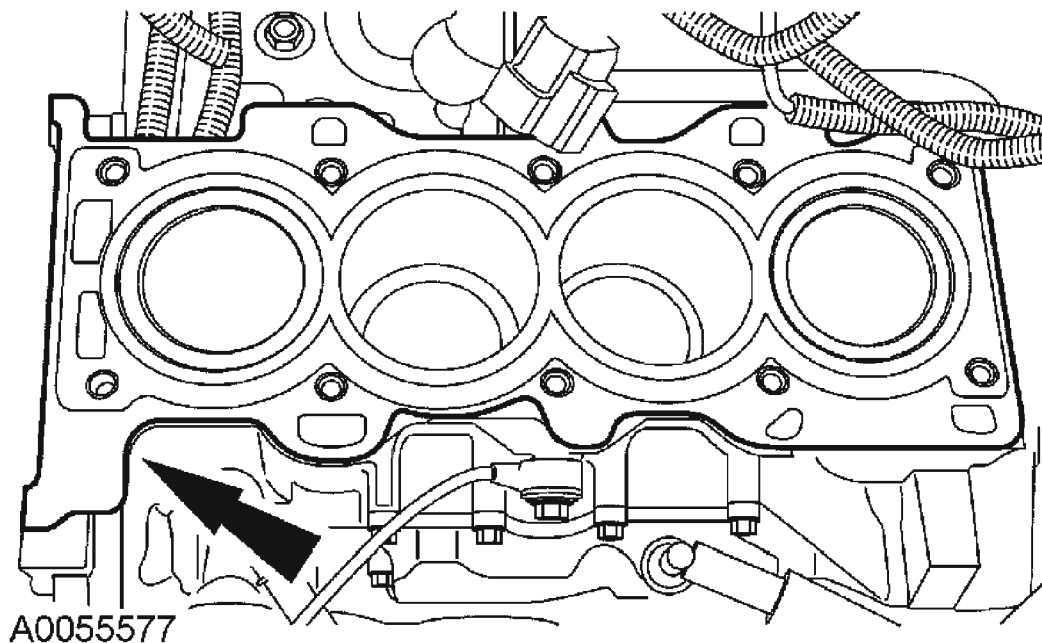


Fig. 168: Installing Head Gasket
Courtesy of FORD MOTOR CO.

- NOTE:** The cylinder head bolts are torque-to-yield and must not be reused. New cylinder head bolts must be installed.
- NOTE:** Lubricate the bolts with clean engine oil prior to installation.

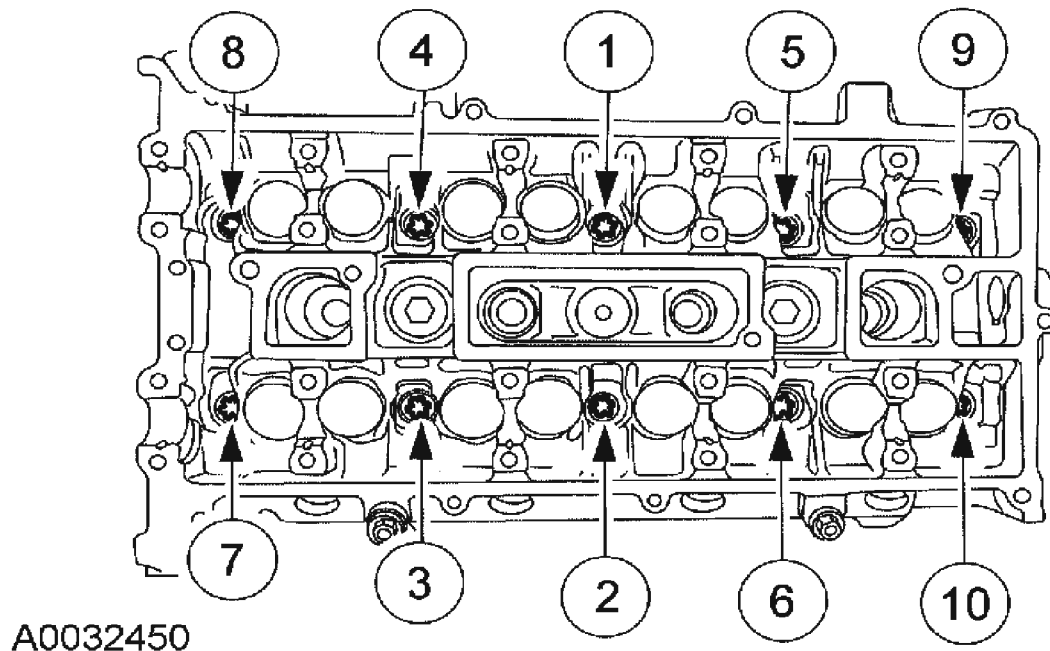
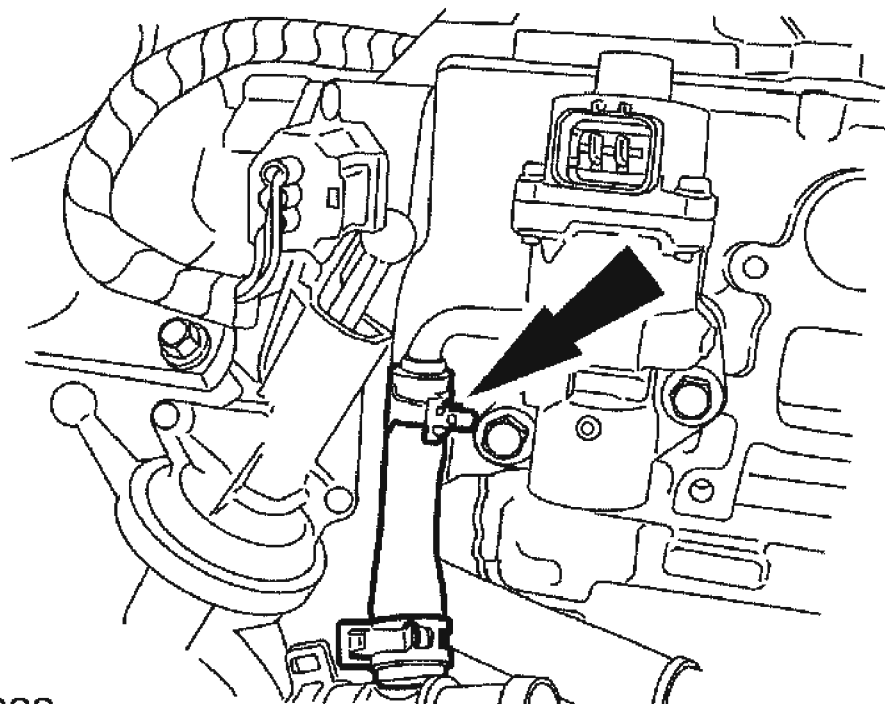


Fig. 169: Identifying Tightening Sequence Of Cylinder Head Bolts
Courtesy of FORD MOTOR CO.

5. Install new cylinder head bolts. Tighten the bolts in the sequence shown in five stages.
 1. Stage 1: Tighten the bolts to 5 Nm (44 lb-in).
 2. Stage 2: Tighten the bolts to 15 Nm (11 lb-ft).
 3. Stage 3: Tighten the bolts to 45 Nm (33 lb-ft).
 4. Stage 4: Turn the bolts 90 degrees.
 5. Stage 5: Turn the bolts an additional 90 degrees.
6. Install the EGR coolant hose.



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Fig. 170: Installing EGR Coolant Hose
Courtesy of FORD MOTOR CO.

7. Using a new gasket, install the coolant bypass.

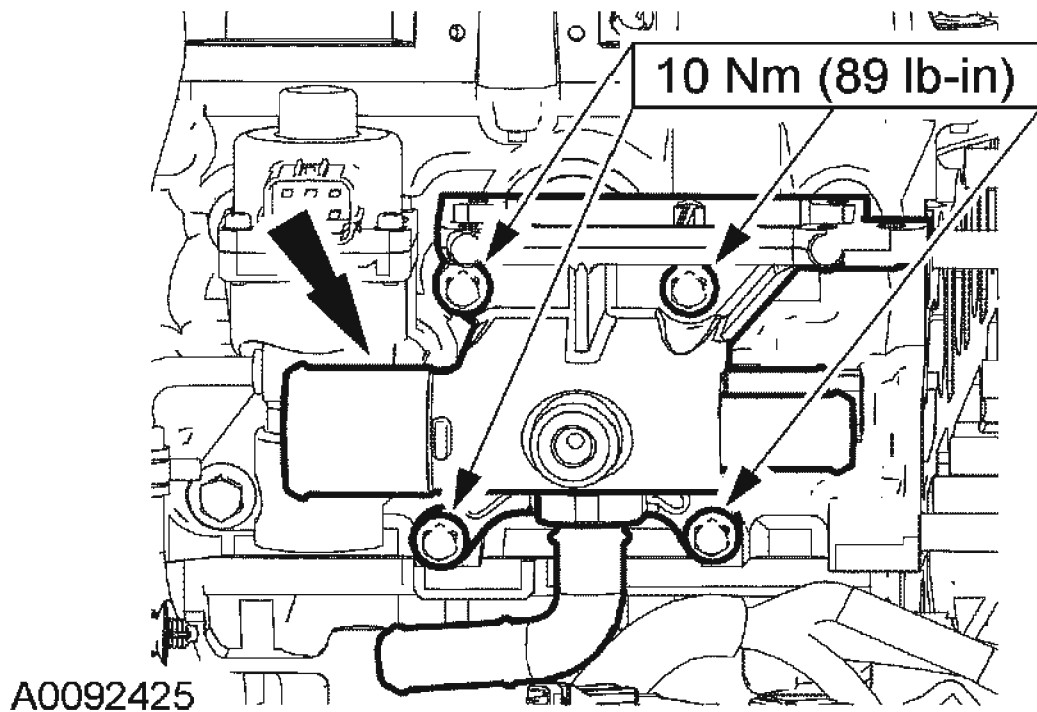


Fig. 171: Installing Coolant Bypass Using New Gasket
Courtesy of FORD MOTOR CO.

8. Connect the coolant hoses onto the coolant bypass.

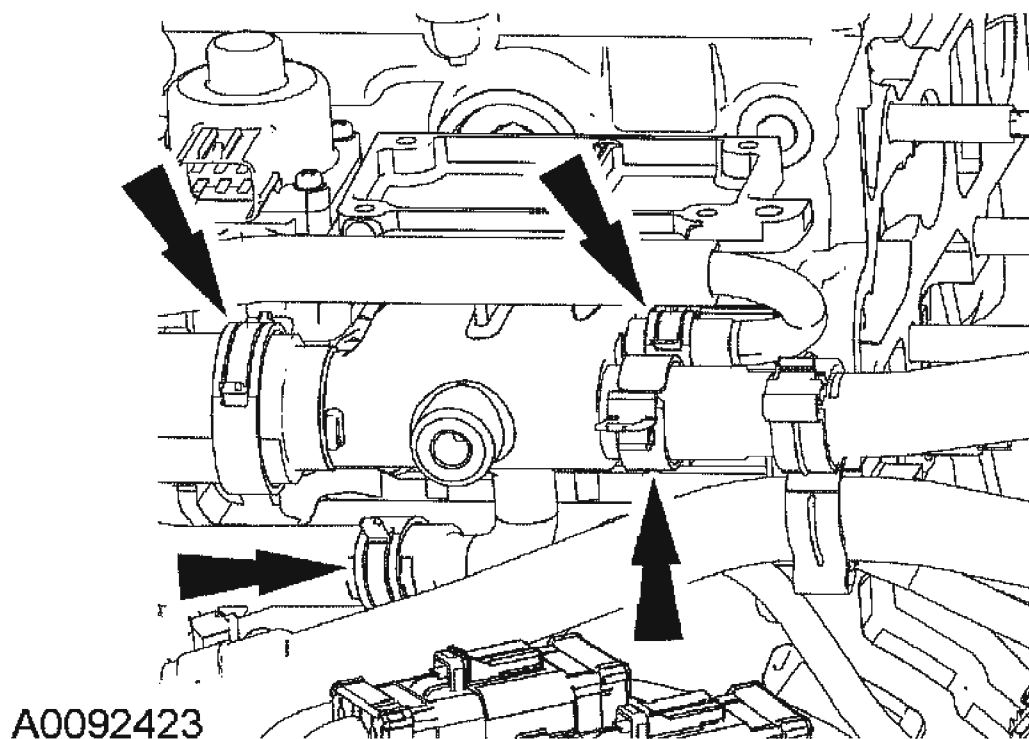


Fig. 172: Connecting Coolant Hoses Onto Coolant Bypass
Courtesy of FORD MOTOR CO.

9. Connect the EGR valve electrical connector.

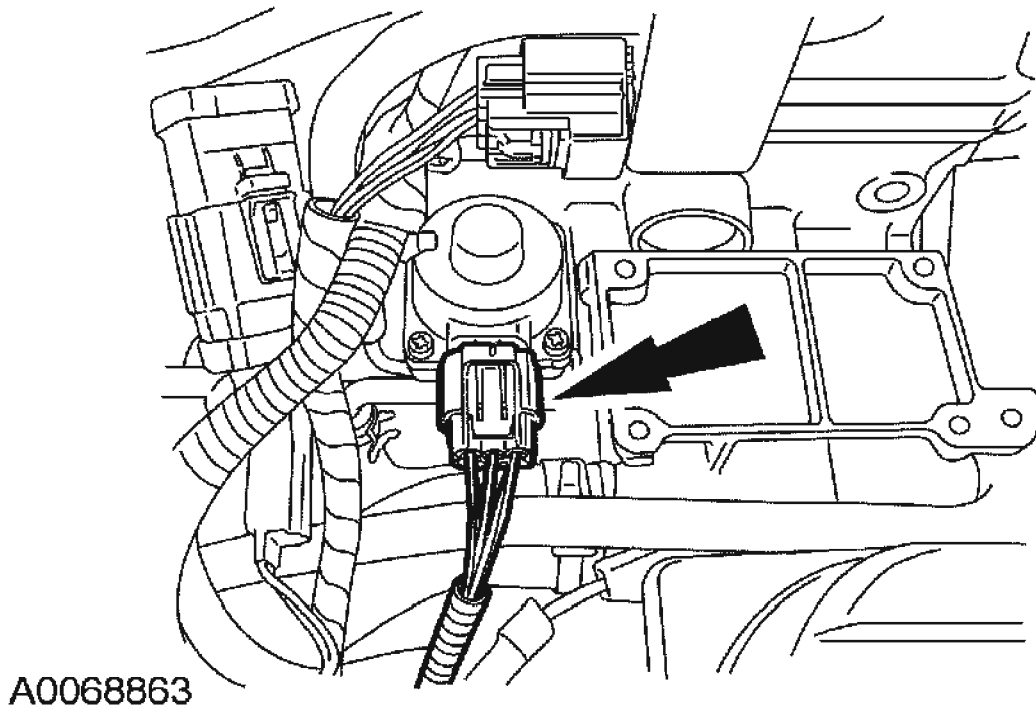
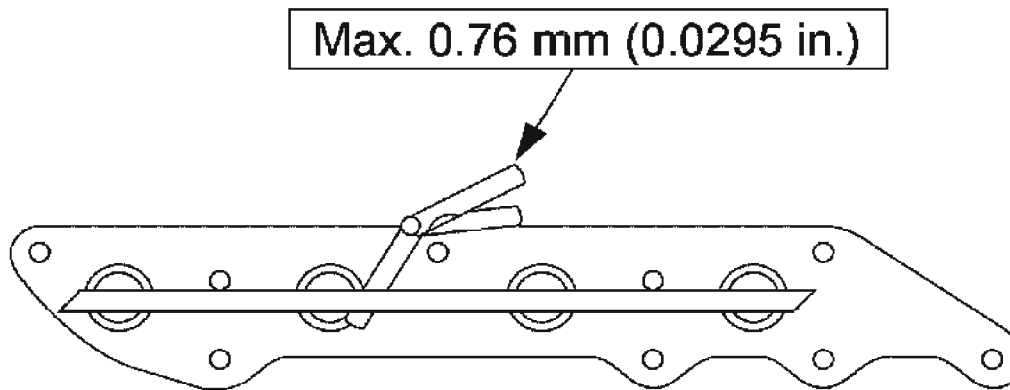


Fig. 173: Connecting EGR Valve Electrical Connector
Courtesy of FORD MOTOR CO.

10. Clean and inspect the catalytic converter flange.
 - Using a straightedge and a feeler gauge, place the straightedge across the catalytic converter flange surface and check for warping with the feeler gauge. If the reading is greater than the maximum specification, install a new catalytic converter, gasket and nuts.



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Fig. 174: Using Straightedge And Feeler Gauge To Check For Warping With Feeler Gauge
Courtesy of FORD MOTOR CO.

11. Using a new gasket and nuts, install the catalytic converter.

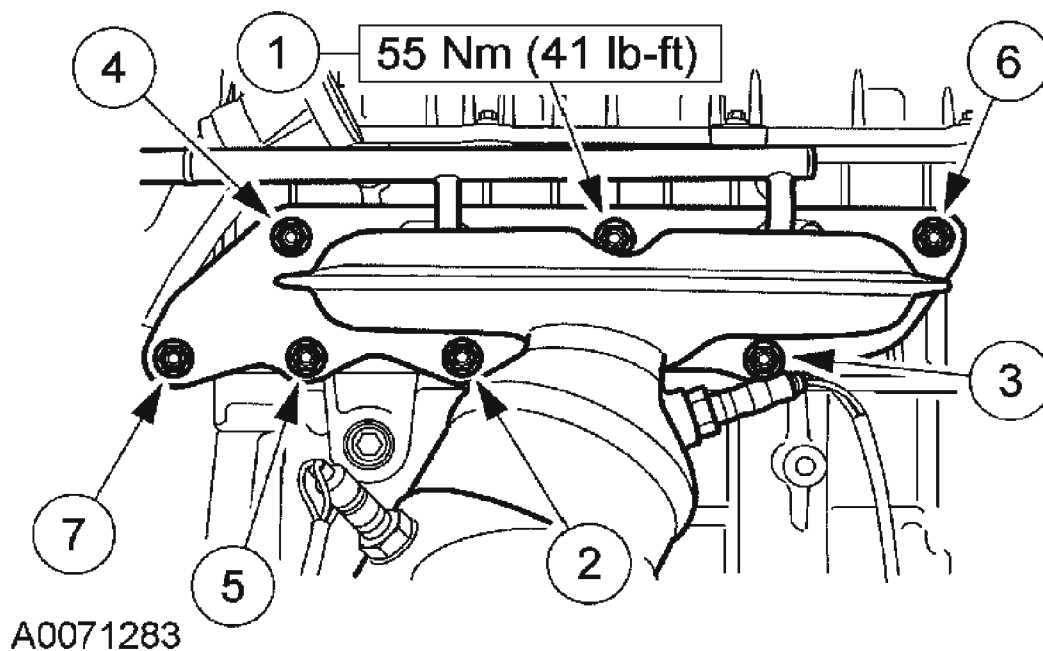


Fig. 175: Using New Gasket And Nuts To Install Catalytic Converter
Courtesy of FORD MOTOR CO.

12. Connect the exhaust sensor electrical connectors.

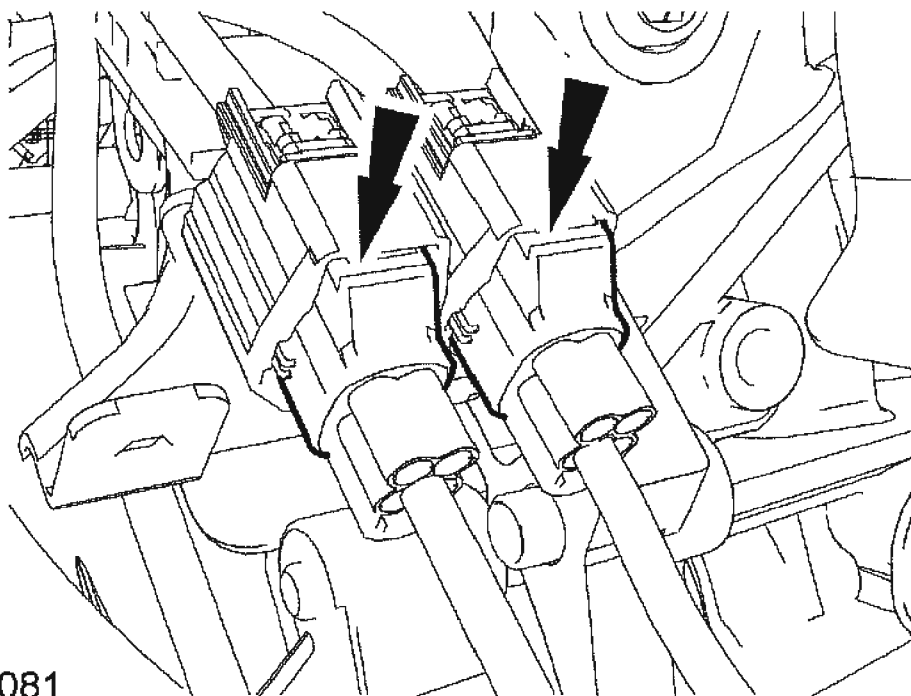


Fig. 176: Connecting Exhaust Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

2.0L engines

13. If equipped, connect the upper exhaust sensor electrical connector and retainer.

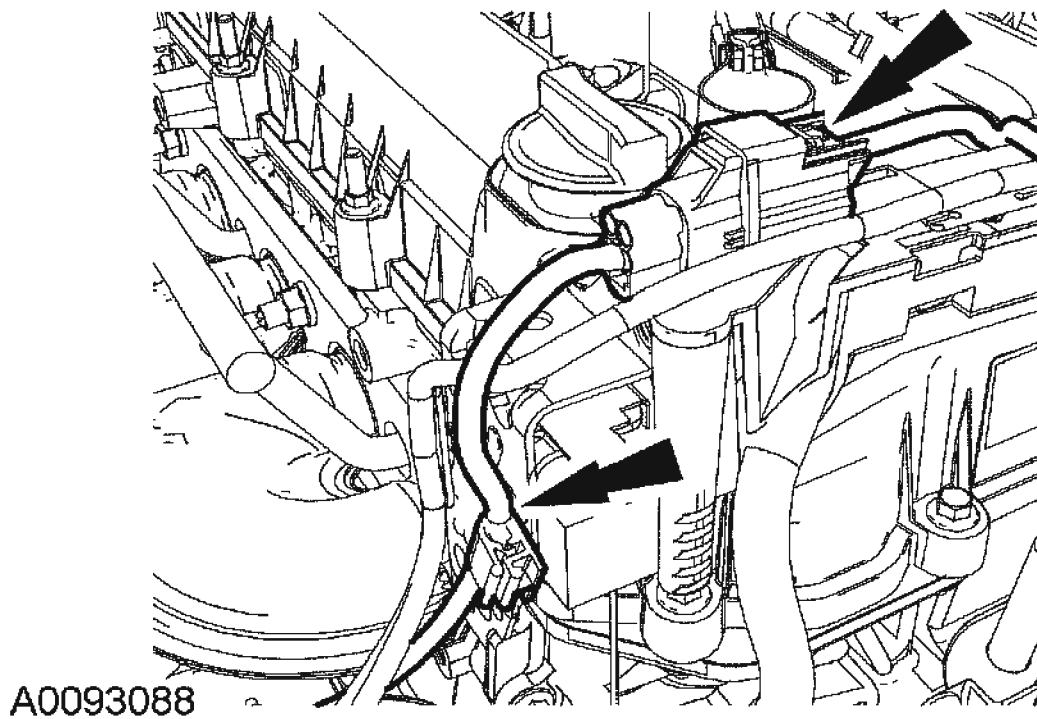


Fig. 177: Connecting Upper Exhaust Sensor Electrical Connector And Retainer
Courtesy of FORD MOTOR CO.

14. If equipped, connect the hoses to the AIR control valve.

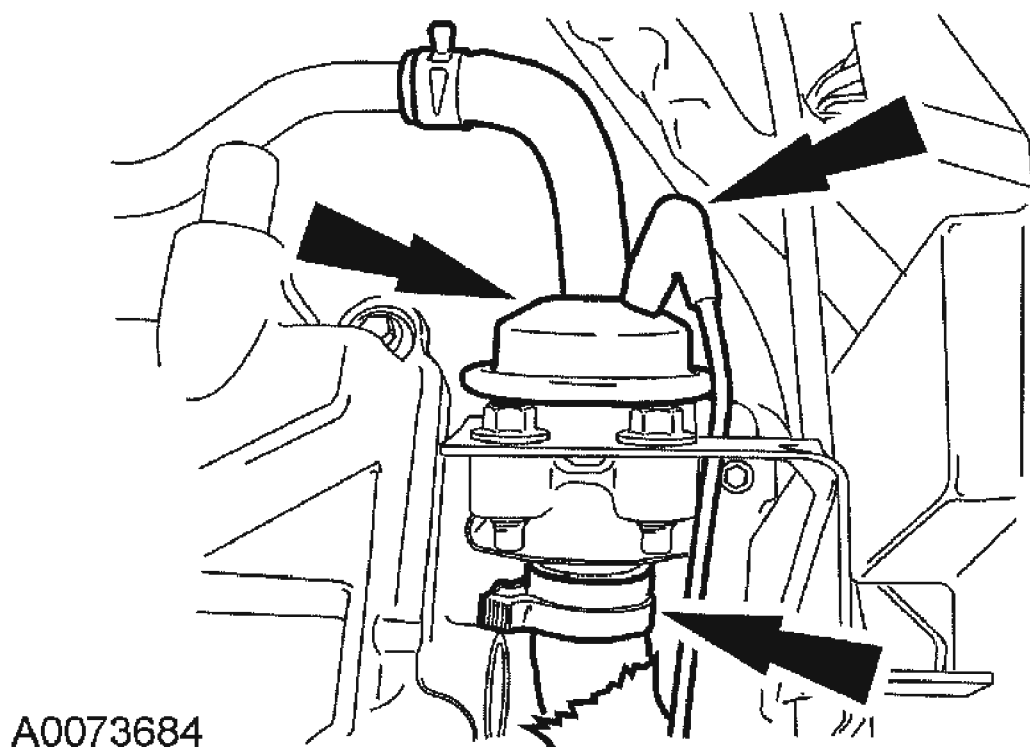


Fig. 178: Connecting Hoses To Air Control Valve
Courtesy of FORD MOTOR CO.

15. If equipped, connect the AIR vacuum regulator electrical connector and vacuum hose.

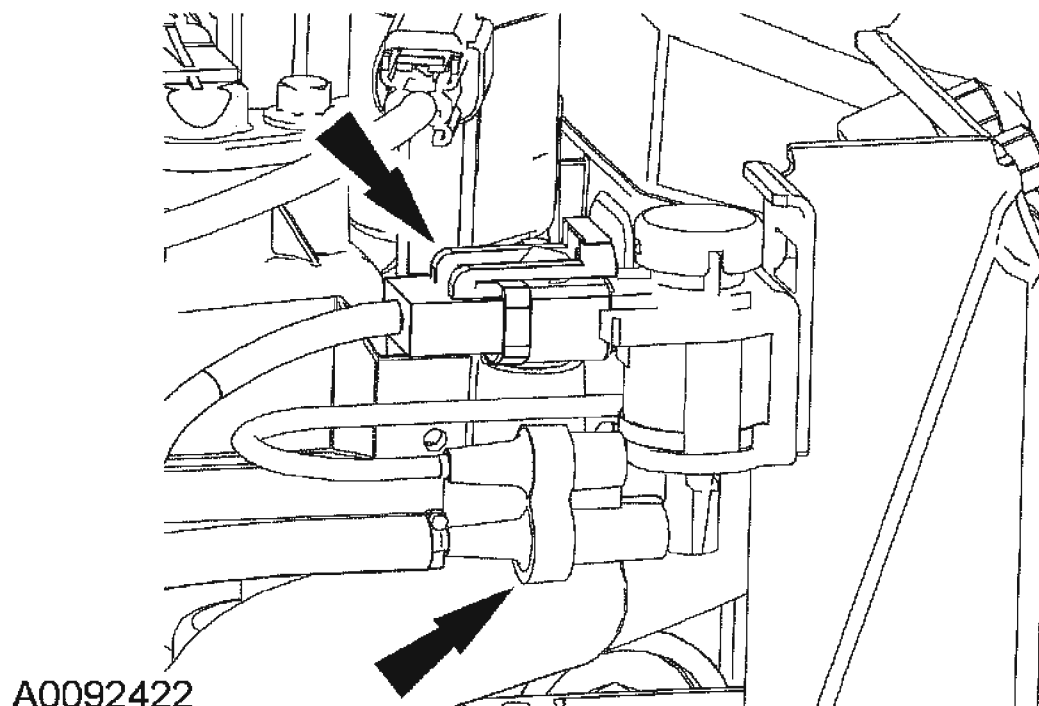


Fig. 179: Connecting AIR Vacuum Regulator Electrical Connector And Vacuum Hose

Courtesy of FORD MOTOR CO.

All engines

16. If equipped, install the heat shield and bolts.

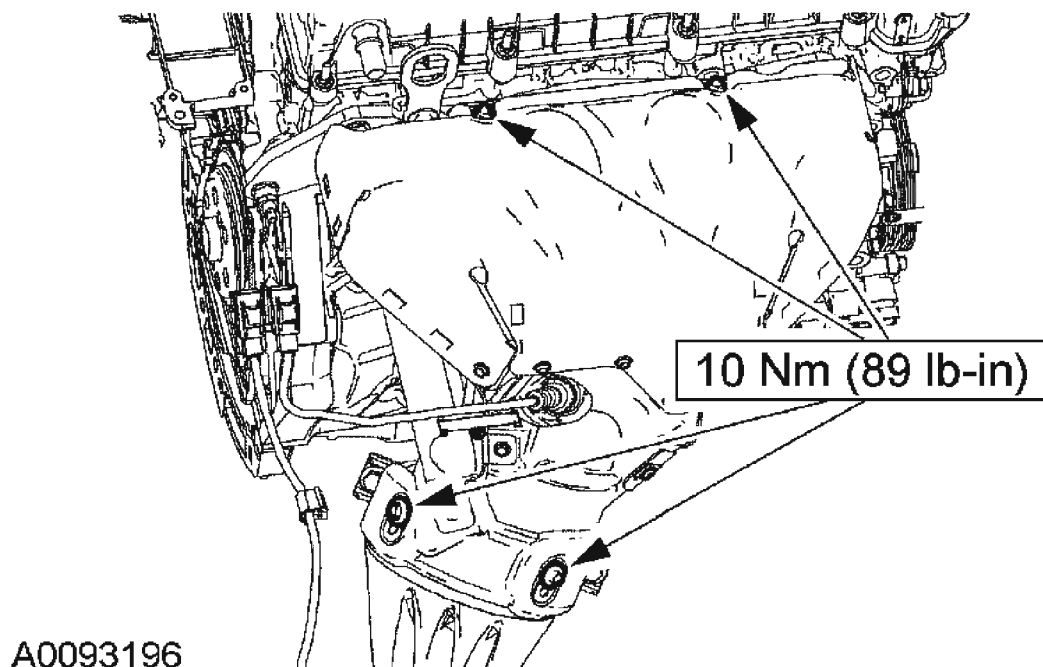


Fig. 180: Installing Heat Shield And Bolts
Courtesy of FORD MOTOR CO.

17. Install the catalytic converter support bracket and bolts.

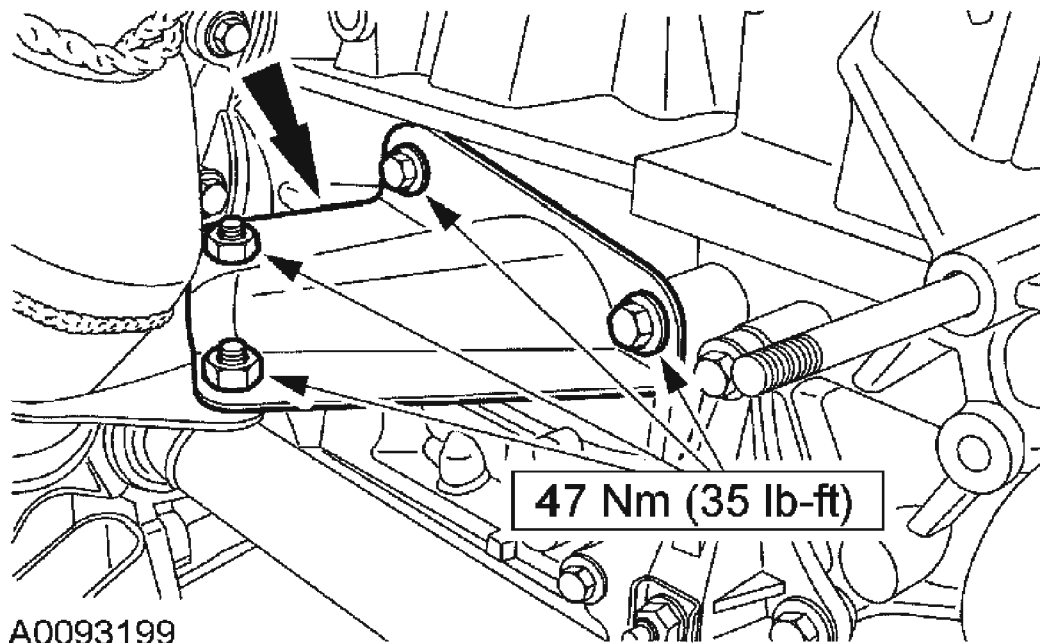
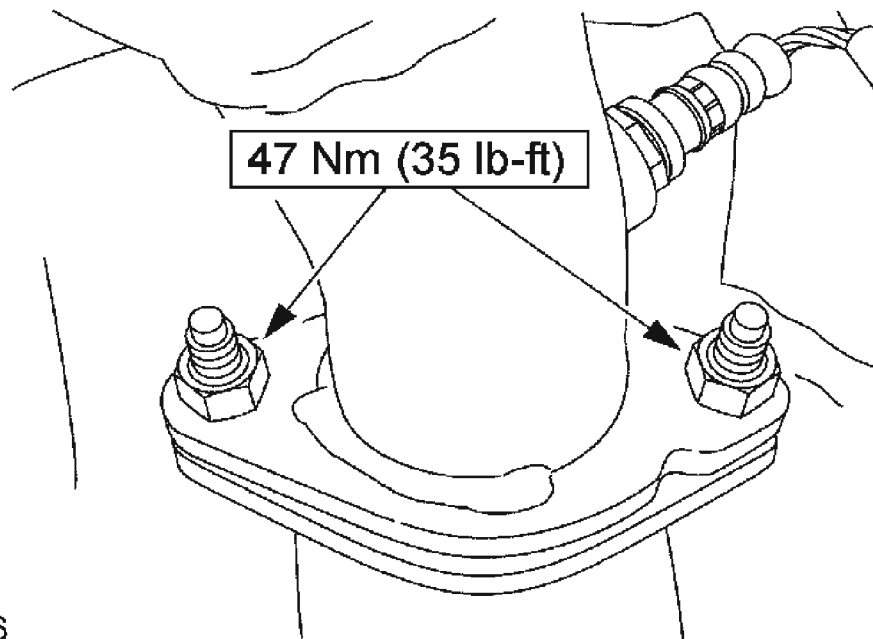


Fig. 181: Installing Catalytic Converter Support Bracket And Bolts
Courtesy of FORD MOTOR CO.

NOTE: Clean the mating surfaces of the muffler assembly and catalytic converter.



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Fig. 182: Using New Gasket And Nuts To Connect Catalytic Converter And Muffler Assembly

Courtesy of FORD MOTOR CO.

18. Using a new gasket and nuts, connect the catalytic converter and muffler assembly.
19. Install the valve tappets. For additional information, refer to **VALVE TAPPETS**.
20. Install the intake manifold. For additional information, refer to **INTAKE MANIFOLD**.
21. Install the fuel injector supply manifold. For additional information, refer to **FUEL CHARGING AND CONTROLS - 2.0L AND 2.3L**.
22. Install the generator. For additional information, refer to **GENERATOR AND REGULATOR**.
23. Install the dual cooling fans and connect the electrical connectors.
24. Install the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.
25. Drain the engine oil and change the filter.
 - Tighten the plug to 28 Nm (21 lb-ft).
26. Fill the engine with clean engine oil.
27. Fill and bleed the cooling system. For additional information, refer to **ENGINE COOLING**.
28. Fill the power steering system. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION**.

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

OIL FILTER ADAPTER

Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING**.
2. Disconnect the oil pressure sender electrical connector.

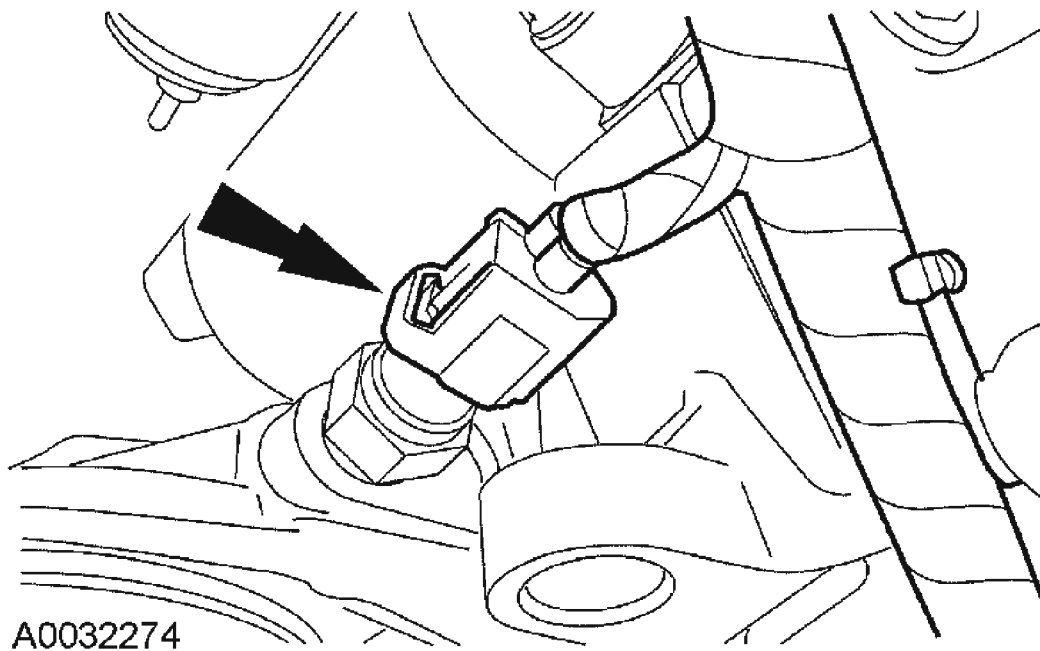


Fig. 183: Disconnecting Oil Pressure Sender Electrical Connector
Courtesy of FORD MOTOR CO.

3. Remove the oil filter.

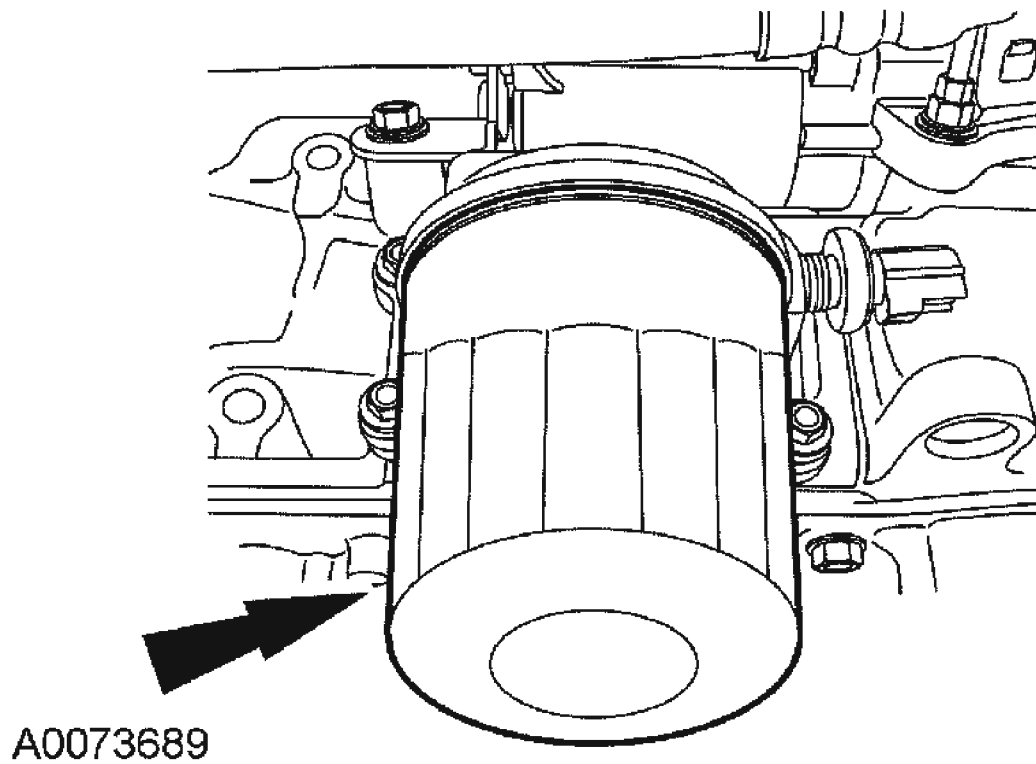


Fig. 184: Removing Oil Filter
Courtesy of FORD MOTOR CO.

4. Remove the bolts and the oil filter adapter.
 - Discard the gasket.

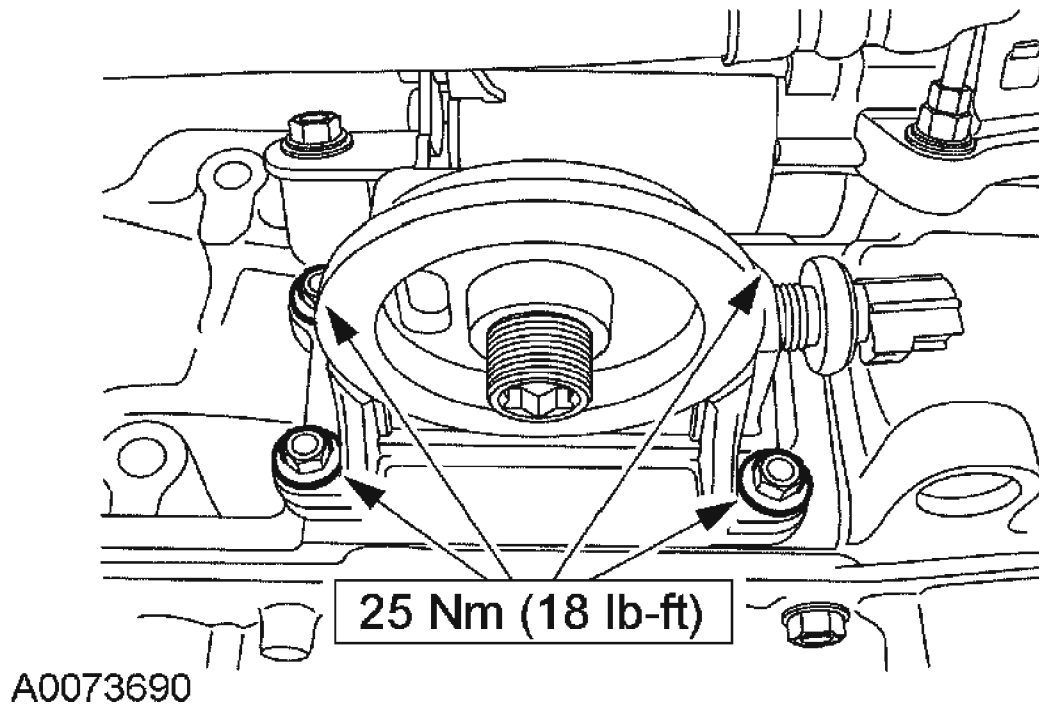


Fig. 185: Removing Bolts And Oil Filter Adapter
Courtesy of FORD MOTOR CO.

5. To install, reverse the removal procedure.
 - Install a new oil filter adapter gasket.
6. Top off the engine with clean engine oil.

OIL PRESSURE SENDER

Material

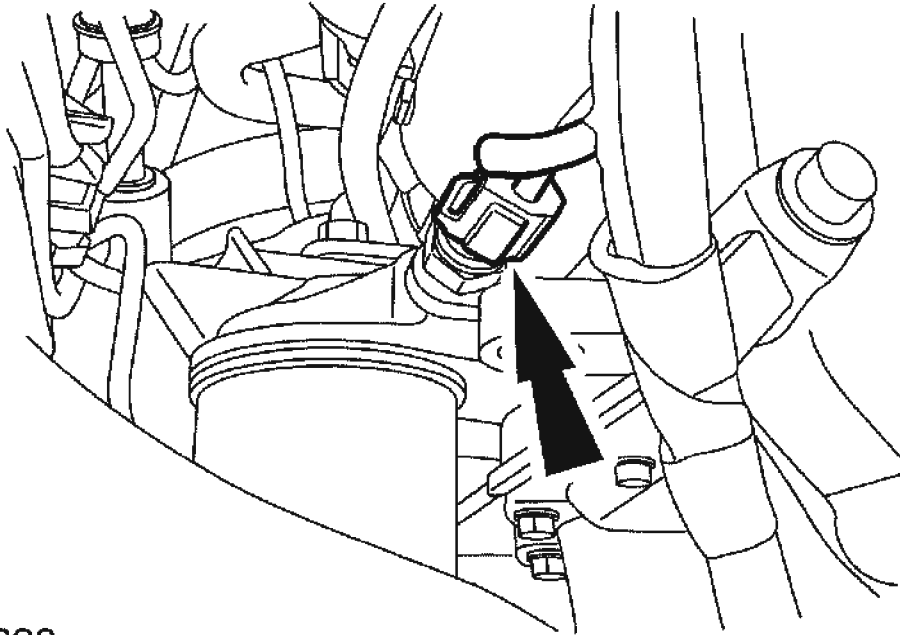
MATERIAL SPECIFICATIONS

Item	Specification
Pipe Sealant with Teflon® D8AZ-19554-A or equivalent	WSK-M2G350-A2

Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING**.
2. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES**.

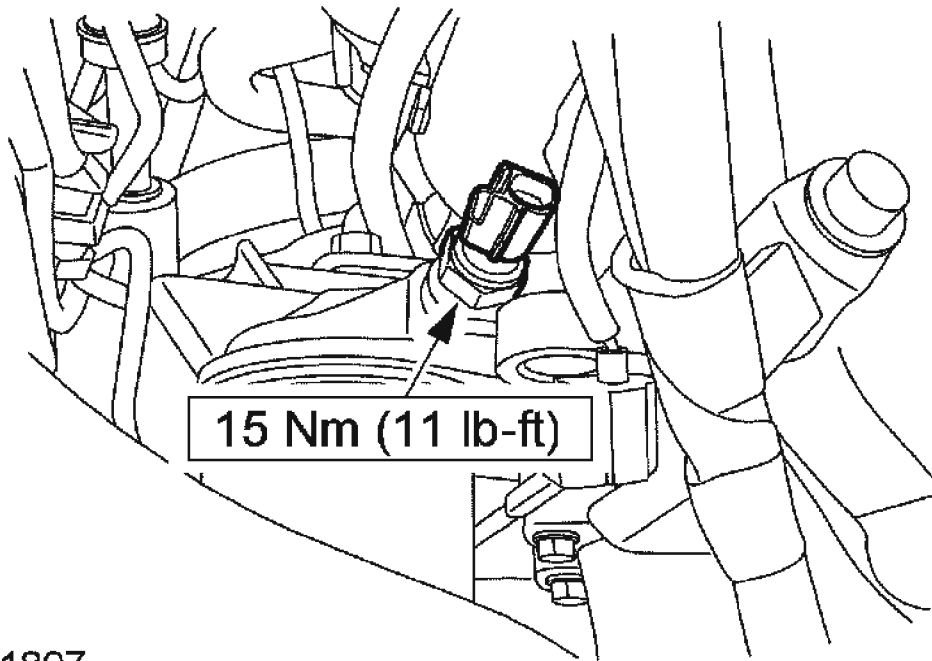
3. Disconnect the electrical connector from the oil pressure sender.



A0031896

Fig. 186: Disconnecting Electrical Connector From Oil Pressure Sender
Courtesy of FORD MOTOR CO.

4. Remove the oil pressure sender.



A0031897

Fig. 187: Removing Oil Pressure Sender
Courtesy of FORD MOTOR CO.

NOTE: Apply pipe sealant with Teflon® to the sender threads.

5. To install, reverse the removal procedure.

OIL LEVEL INDICATOR AND TUBE

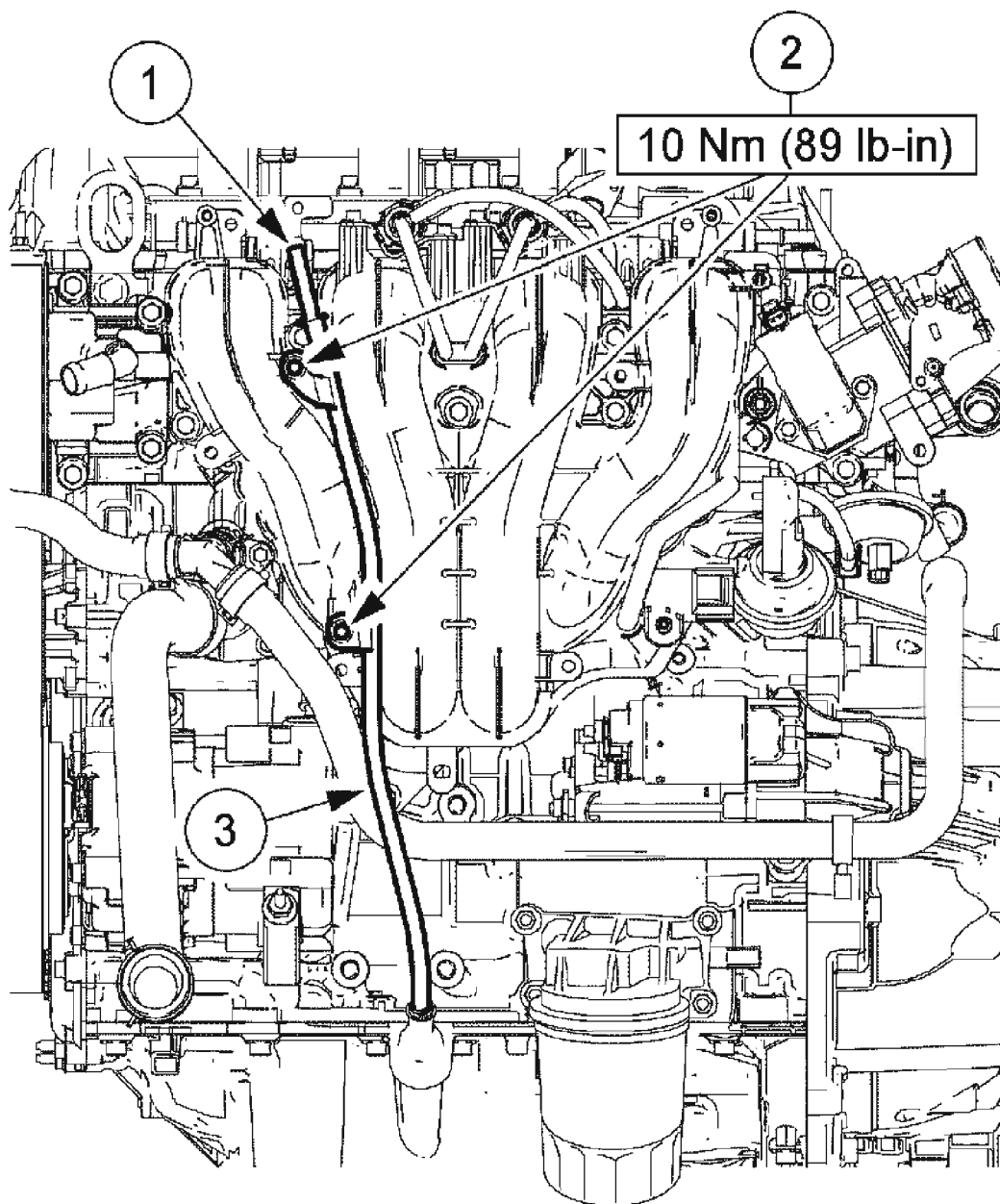
Material

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal and Installation

NOTE: 2.3L engine shown, 2.0L engine is similar with only one retaining bolt.



A0073685

Fig. 188: Removing Oil Level Indicator And Tube
Courtesy of FORD MOTOR CO.

NOTE: Inspect the O-ring and install new if necessary.

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

NOTE: **Apply clean engine oil to the O-ring before installation of the indicator tube.**

1. Remove the oil level indicator and tube.
 1. Remove the oil level indicator.
 2. Remove the 2 bolts for 2.3L engines or the 1 bolt for 2.0L engines.
 3. Remove the oil level indicator tube.

To install, reverse the removal procedure.

OIL PAN

Material

MATERIAL SPECIFICATIONS

Item	Specification
Silicone Gasket and Sealant F7AZ-19554-EA or equivalent	WSE-M4G323-A4
Metal Surface Cleaner F4AZ-19A536-RA	WSE-M5B392-A
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING**.
2. Drain the engine oil.
 - Install the drain plug.

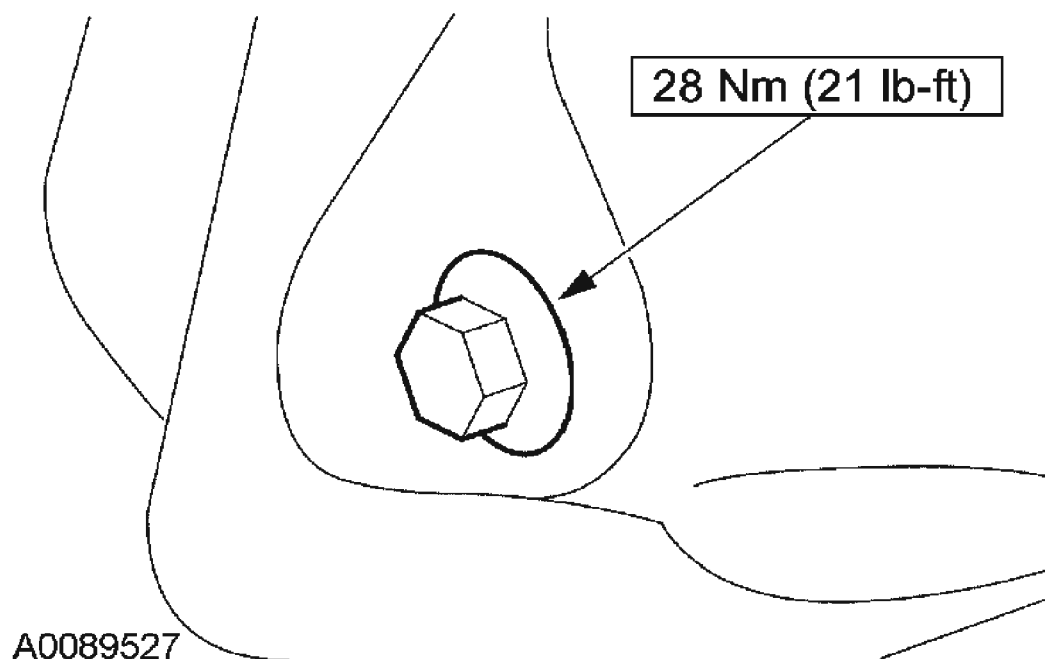


Fig. 189: Installing Drain Plug
Courtesy of FORD MOTOR CO.

NOTE: 2.3L engine shown, 2.0L engine is similar.

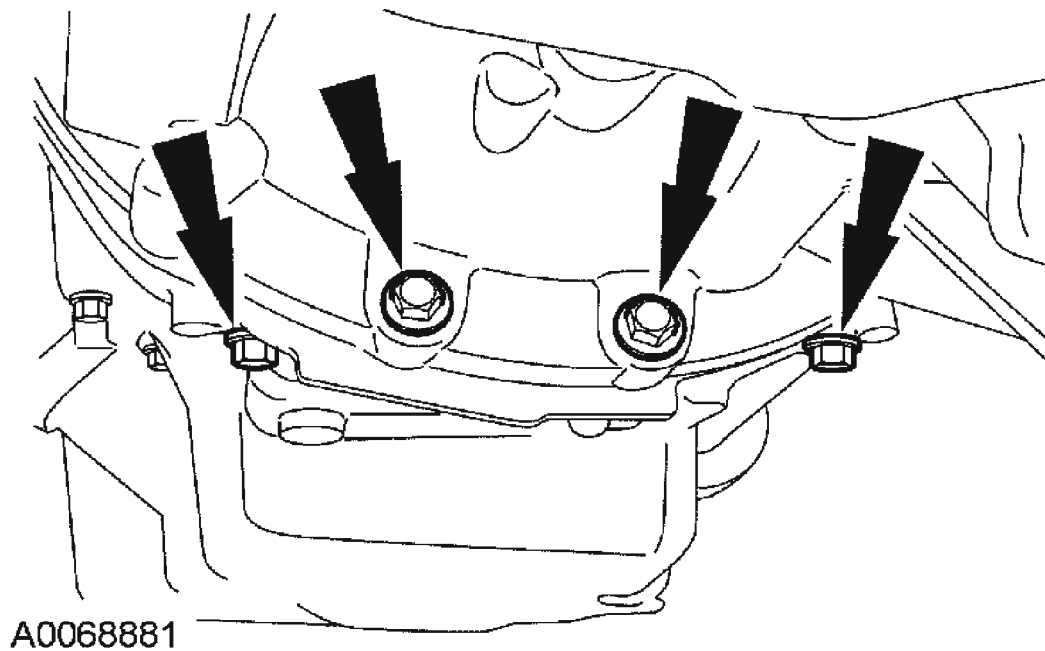
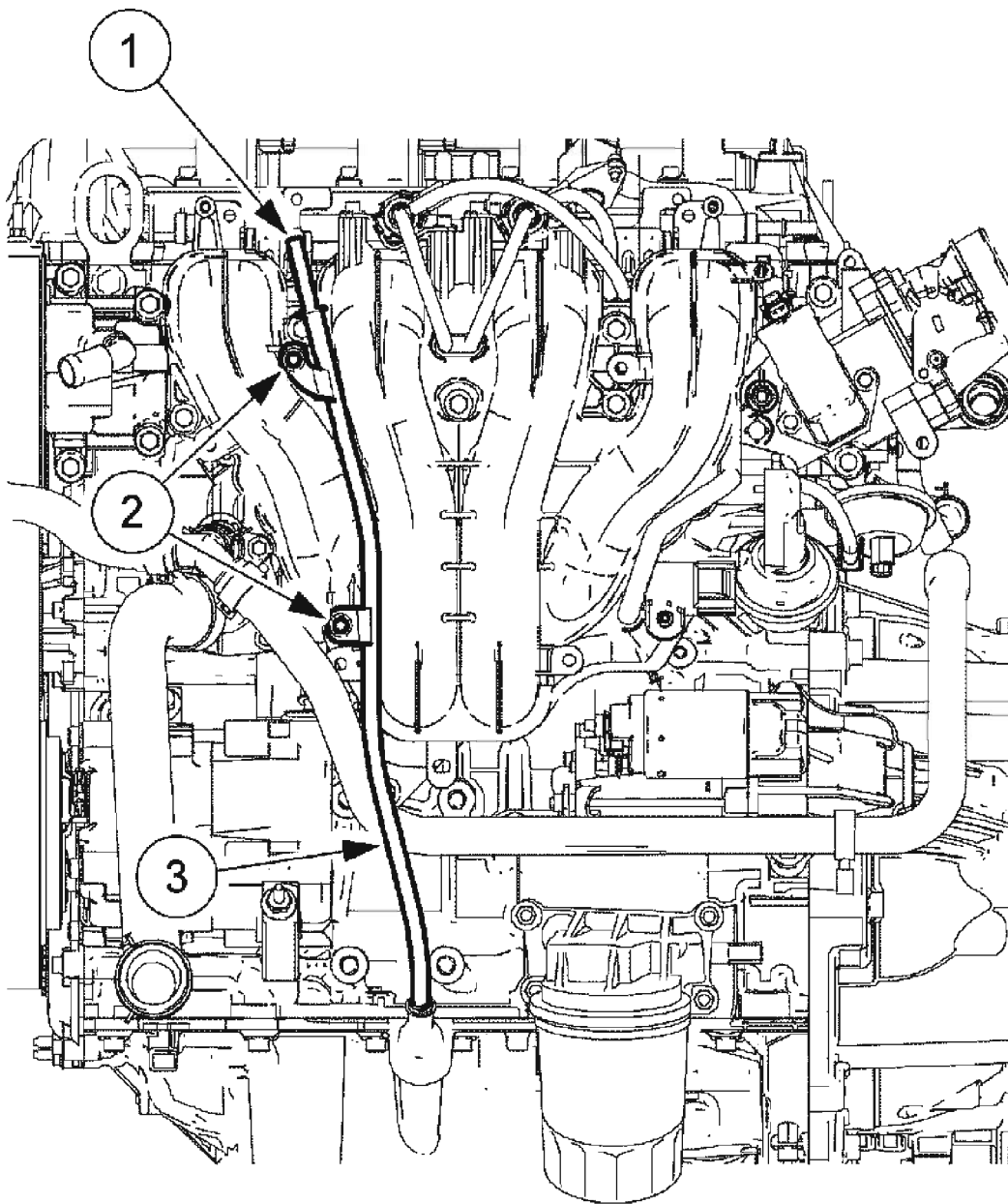


Fig. 191: Removing Oil Pan Bolts
Courtesy of FORD MOTOR CO.

3. Remove the engine oil level indicator tube assembly.
 1. Remove the engine oil level indicator.
 2. Remove the bolt(s).
 3. Remove the engine oil level indicator tube.



A0073692

Fig. 190: Removing Engine Oil Level Indicator Tube Assembly
Courtesy of FORD MOTOR CO.

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

4. Remove the oil pan-to-bellhousing bolts.

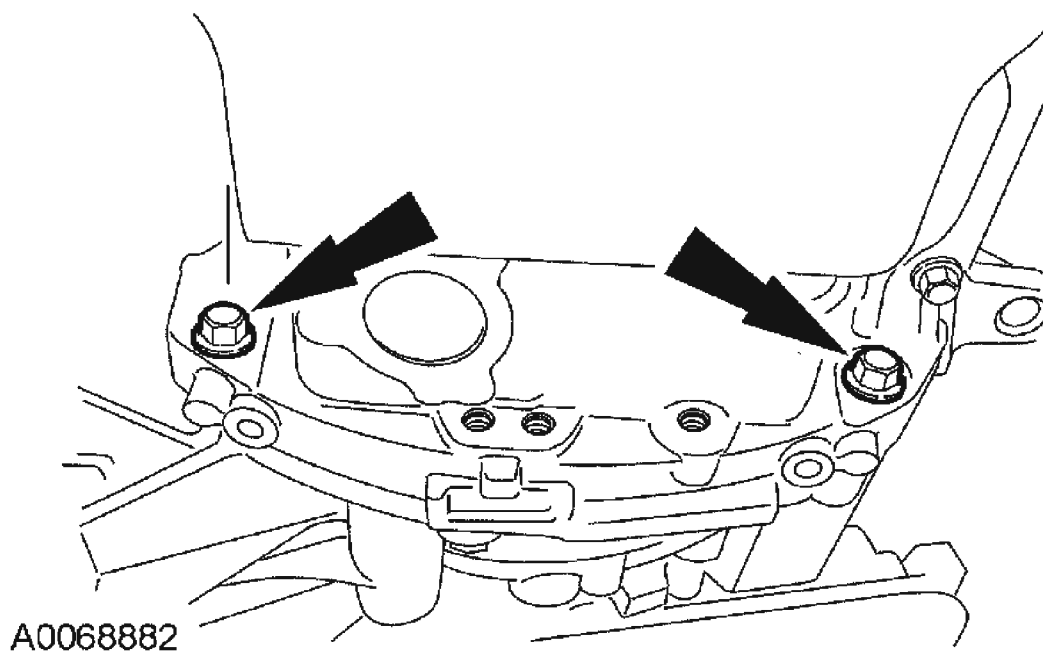


Fig. 192: Removing Oil Pan-To-Bellhousing Bolts
Courtesy of FORD MOTOR CO.

5. Remove the bolts and oil pan.

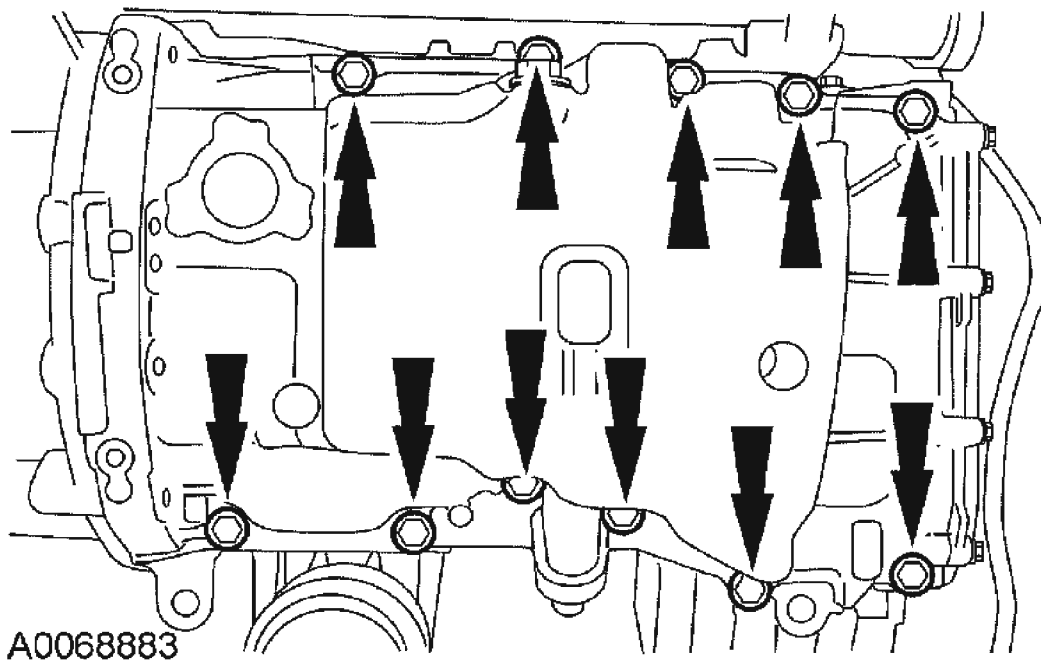


Fig. 193: Removing Bolts And Oil Pan
Courtesy of FORD MOTOR CO.

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

1. Clean and inspect all mating surfaces.

NOTE: If the oil pan is not secured within four minutes of sealant application, the sealant must be removed and the sealing area cleaned with metal surface cleaner. Allow to dry until there is no sign of wetness, or four minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

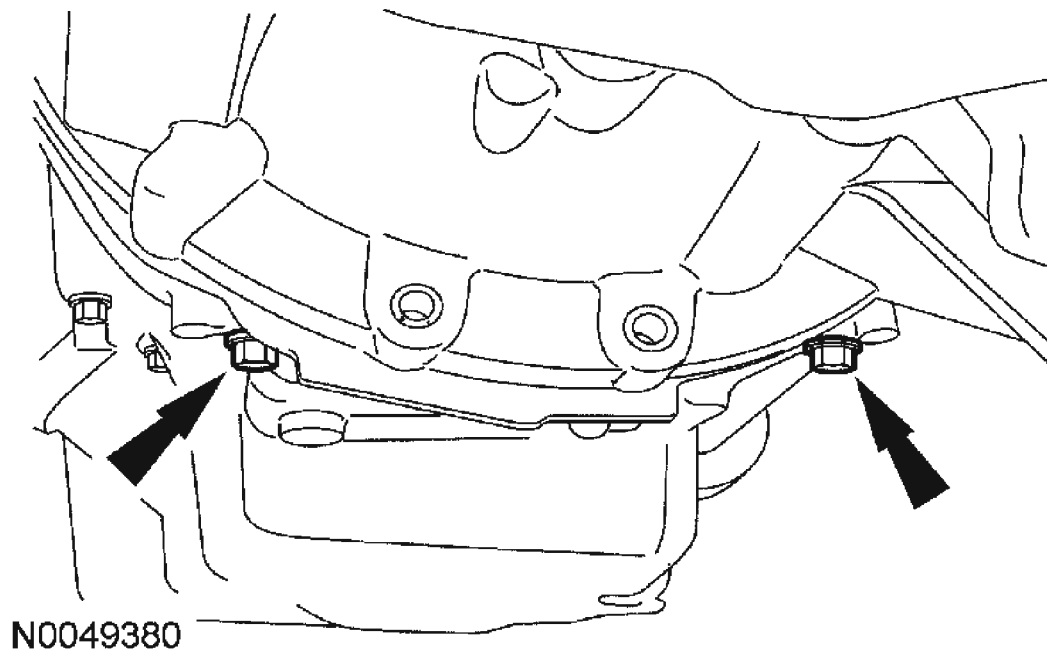
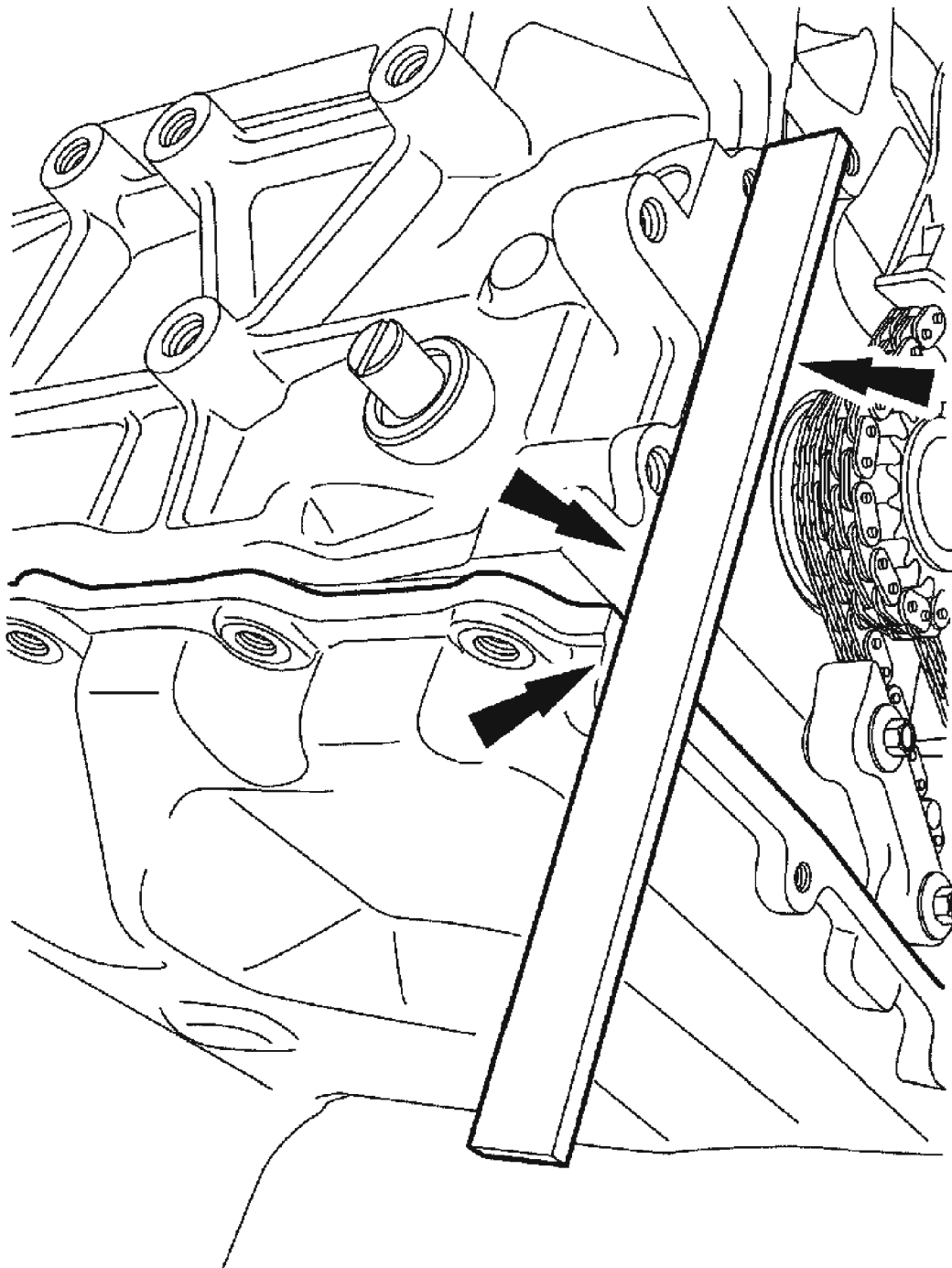


Fig. 194: Installing Two Rear Oil Pan Bolts Finger-Tight
Courtesy of FORD MOTOR CO.

2. Apply a 2.5 mm bead of silicone gasket and sealant to the oil pan.
 - Position the oil pan onto the engine and install the two rear oil pan bolts finger-tight.
3. Using a suitable straightedge, align the front surface of the oil pan flush with the front surface of the engine block.



N0039349

Fig. 195: Using Suitable Straightedge To Align Front Surface Of Oil Pan Flush With Front Surface Of Engine Block
Courtesy of FORD MOTOR CO.

4. Install the remaining oil pan bolts and tighten in the sequence shown.

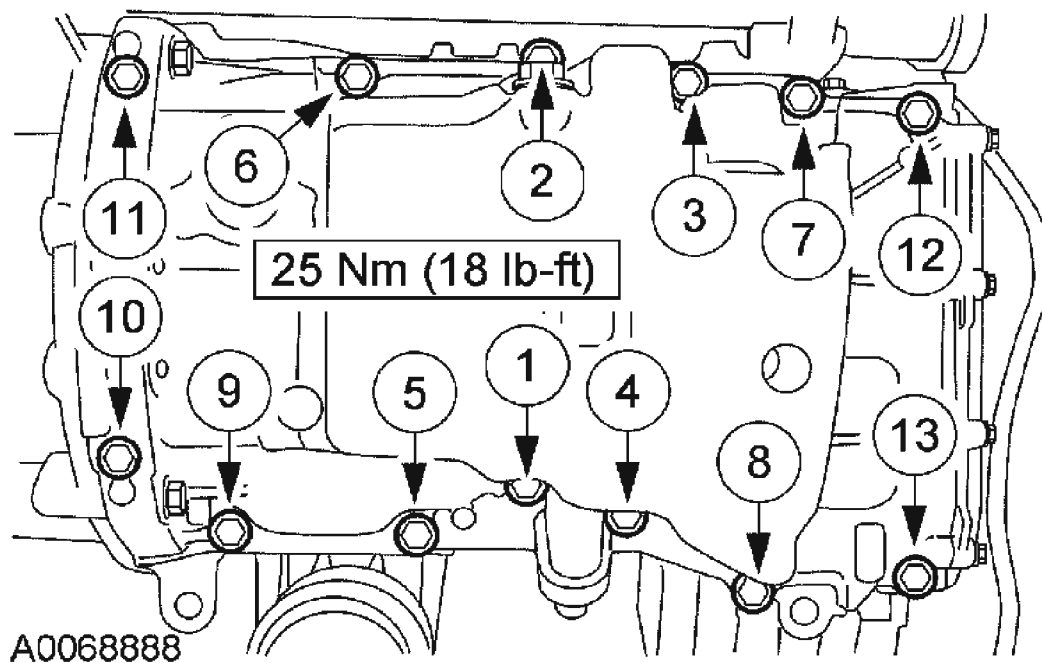


Fig. 196: Identifying Tightening Sequence Of Oil Pan Bolts
Courtesy of FORD MOTOR CO.

5. Install the 2 bellhousing-to-oil pan bolt.

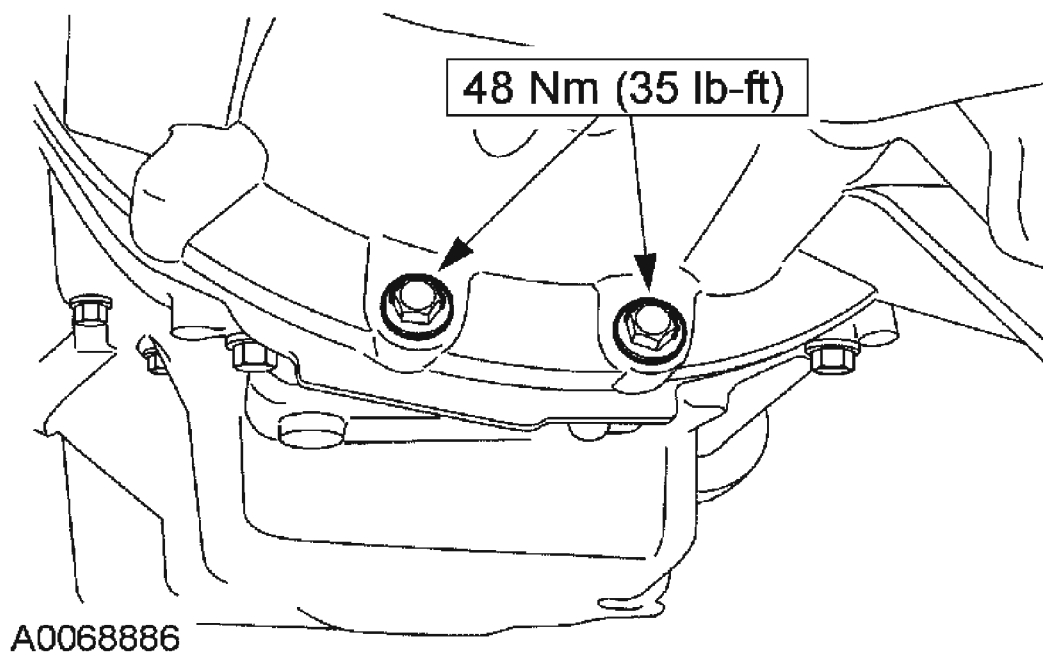


Fig. 197: Installing 2 Bellhousing-To-Oil Pan Bolt
Courtesy of FORD MOTOR CO.

6. Install the 2 oil pan-to-bellhousing bolts.

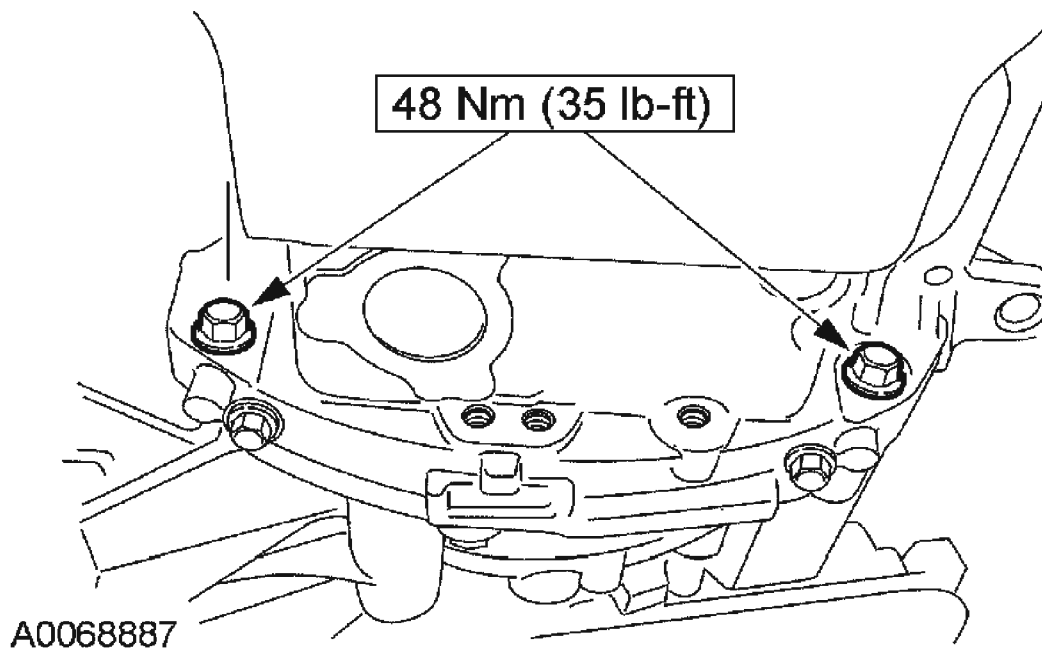
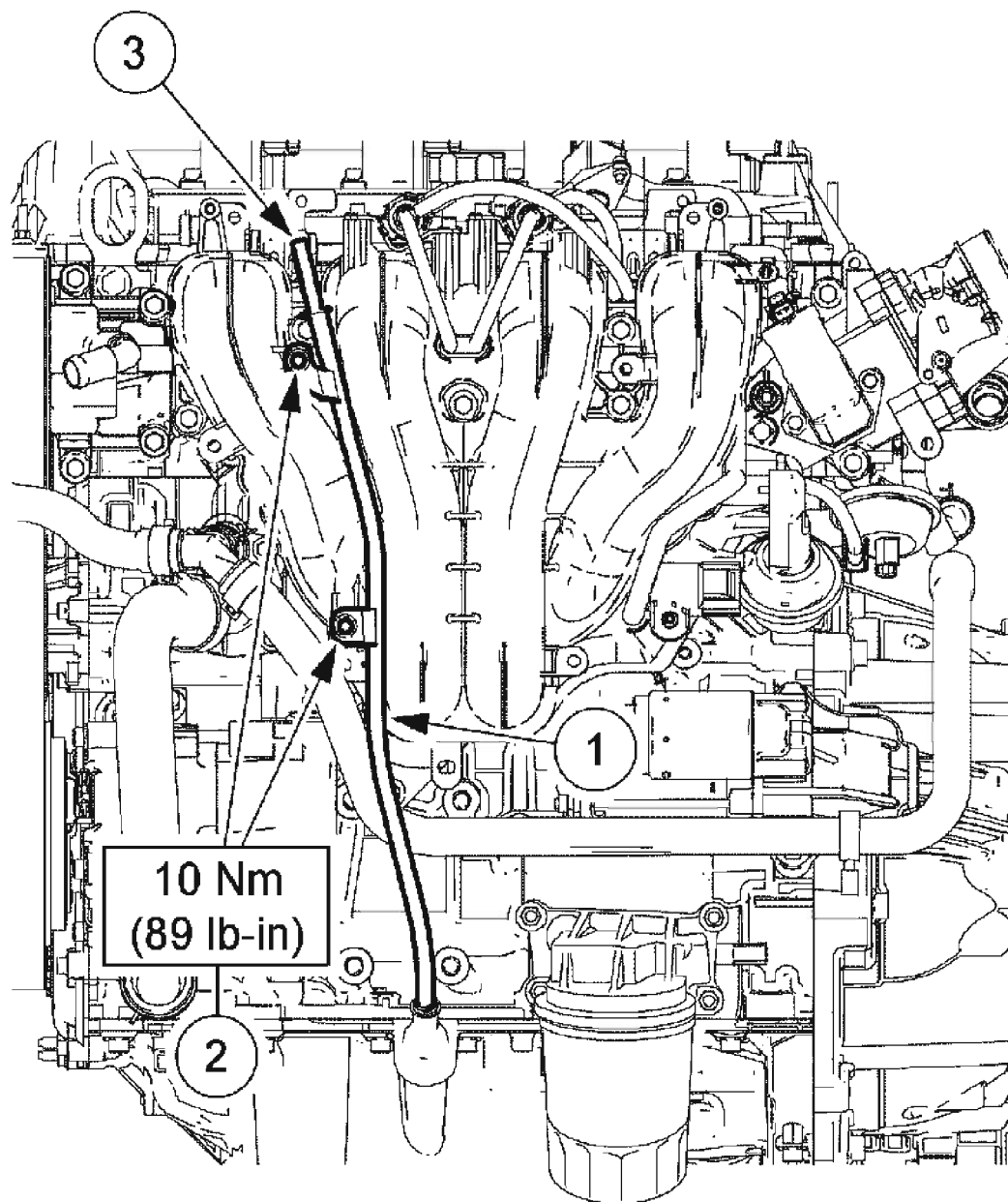


Fig. 198: Installing 2 Oil Pan-To-Bellhousing Bolts
Courtesy of FORD MOTOR CO.

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

NOTE: **2.3L engine shown, 2.0L engine is similar.**

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



A0073768

Fig. 199: Installing Engine Oil Level Indicator Tube Assembly
Courtesy of FORD MOTOR CO.

8. Install the engine oil level indicator tube assembly.
 1. Install the engine oil level indicator tube.

2. Install the bolt(s).
3. Install the oil level indicator.
9. Fill the engine with clean engine oil.

OIL PUMP SCREEN AND PICKUP TUBE

Material

MATERIAL SPECIFICATIONS

Item	Specification
Silicone Gasket and Sealant F7AZ-19554-EA or equivalent	WSE-M4G323-A4
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Removal

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

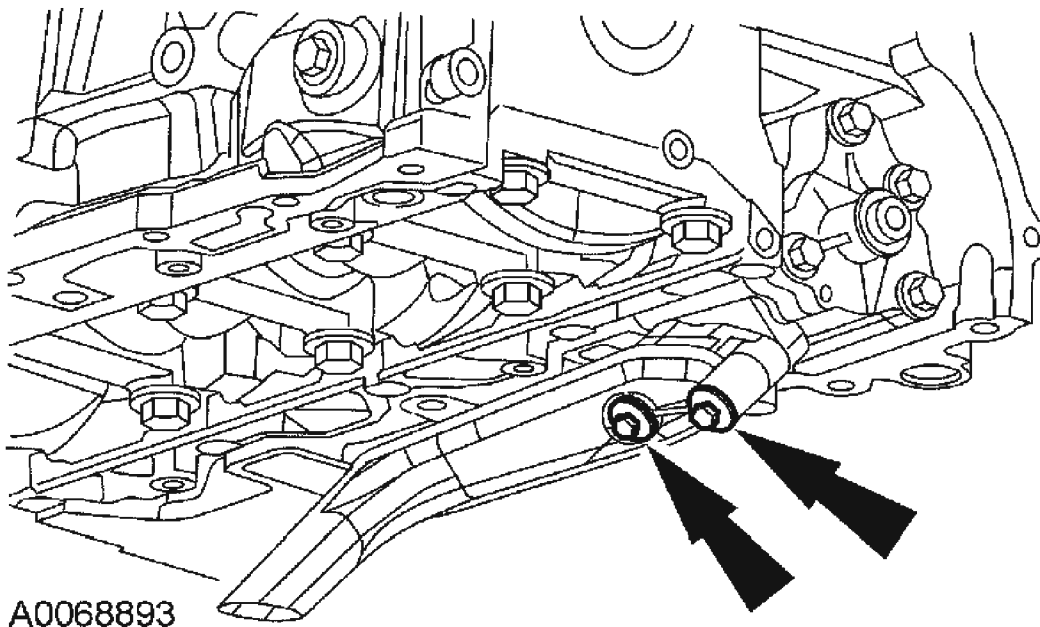


Fig. 200: Removing Oil Pump Screen And Pickup Tube Bolts

Courtesy of FORD MOTOR CO.

Installation

1. Clean and inspect all mating surfaces.
2. Install the oil pump screen and pickup tube with a new mounting gasket.

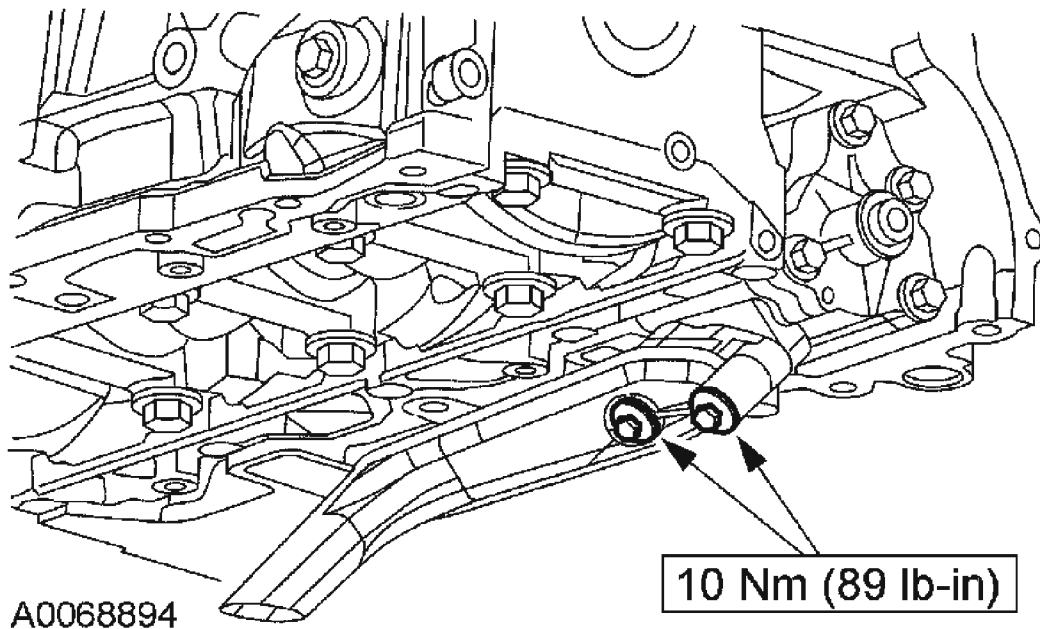


Fig. 201: Installing Oil Pump Screen And Pickup Tube Bolt
Courtesy of FORD MOTOR CO.

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

FLYWHEEL

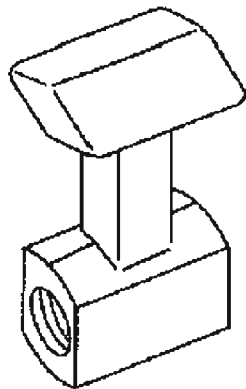
Special Tool(s)

SPECIAL TOOL DESCRIPTION

	Locking Tool, Flywheel 303-103 (T74P-8375-A)
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2005 Ford Focus ZX5 S

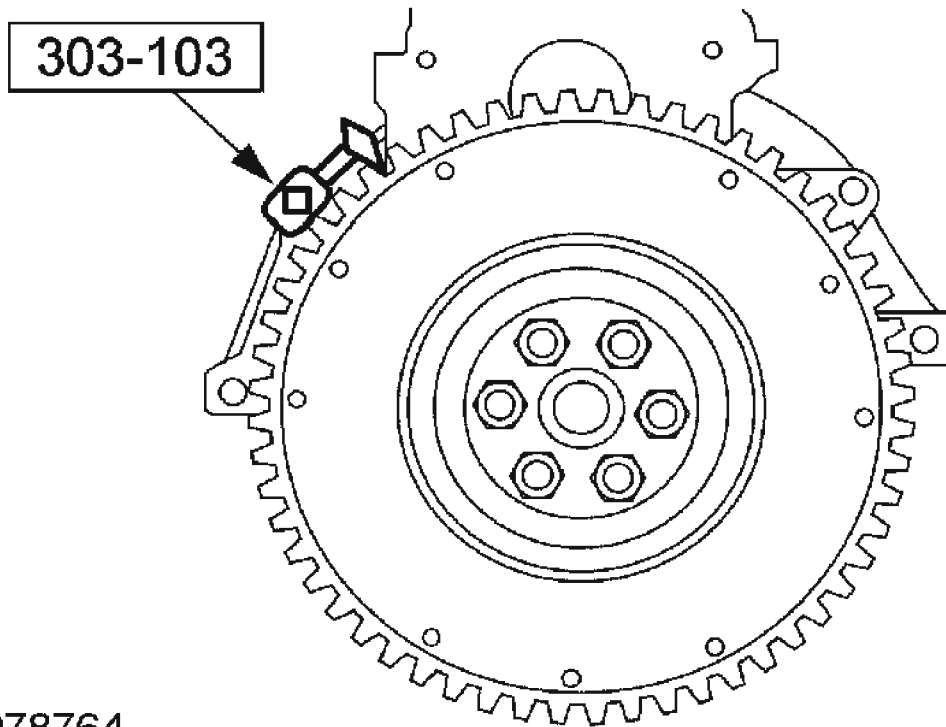
2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2768-A

Removal

1. With vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** .
2. Remove the transmission. For additional information, refer to MANUAL TRANSAXLE/TRANSMISSION .
3. Remove the clutch assembly. For additional information, refer to CLUTCH .
4. Install the special tool and remove the bolts and the flywheel.



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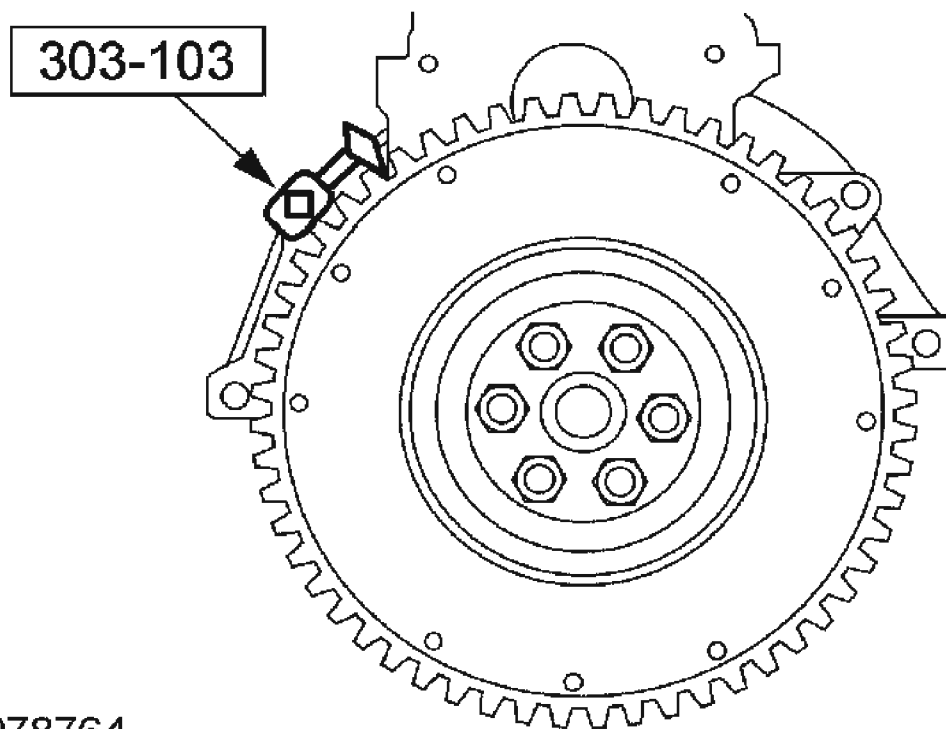
Fig. 202: Installing Special Tool (303-103) On Flywheel
Courtesy of FORD MOTOR CO.

Installation

NOTE: Engine balancing is not required. Balance weights should not be installed on the new flywheel.

NOTE: Special bolts are used for installation. Do not use standard bolts.

1. Inspect the pilot bearing. Install a new pilot bearing as necessary.
2. Install the flywheel.
3. Install the special tool.



A0078764

Fig. 203: Installing Special Tool (303-103) On Flywheel
Courtesy of FORD MOTOR CO.

4. Tighten the bolts in the sequence shown in three stages.
 - Stage 1: Tighten to 50 Nm (37 lb-ft).
 - Stage 2: Tighten to 80 Nm (50 lb-ft).
 - Stage 3: Tighten to 112 Nm (83 lb-ft).

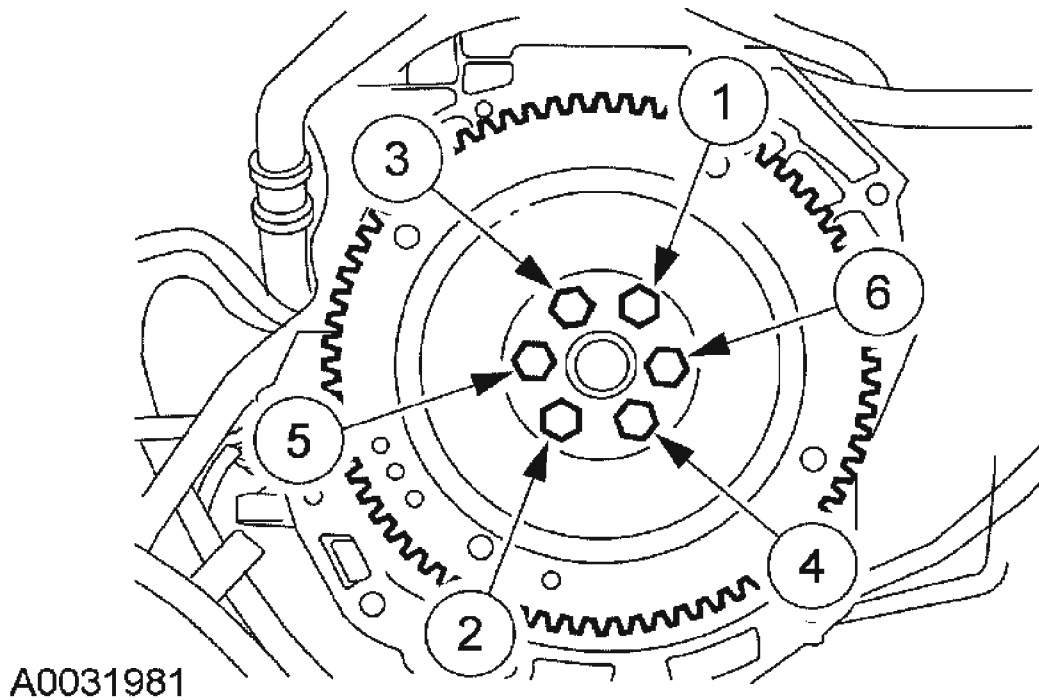


Fig. 204: Identifying Tightening Sequence Of Flywheel Bolts
Courtesy of FORD MOTOR CO.

5. Install the clutch assembly. For additional information, refer to CLUTCH .
6. Install the transmission. For additional information, refer to MANUAL TRANSAXLE/TRANSMISSION .

FLEXPLATE

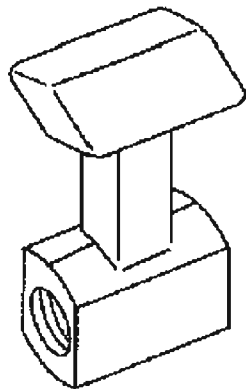
Special Tool(s)

SPECIAL TOOL DESCRIPTION

	Locking Tool, Flexplate 303-103 (T74P-8375-A)
--	---

2005 Ford Focus ZX5 S

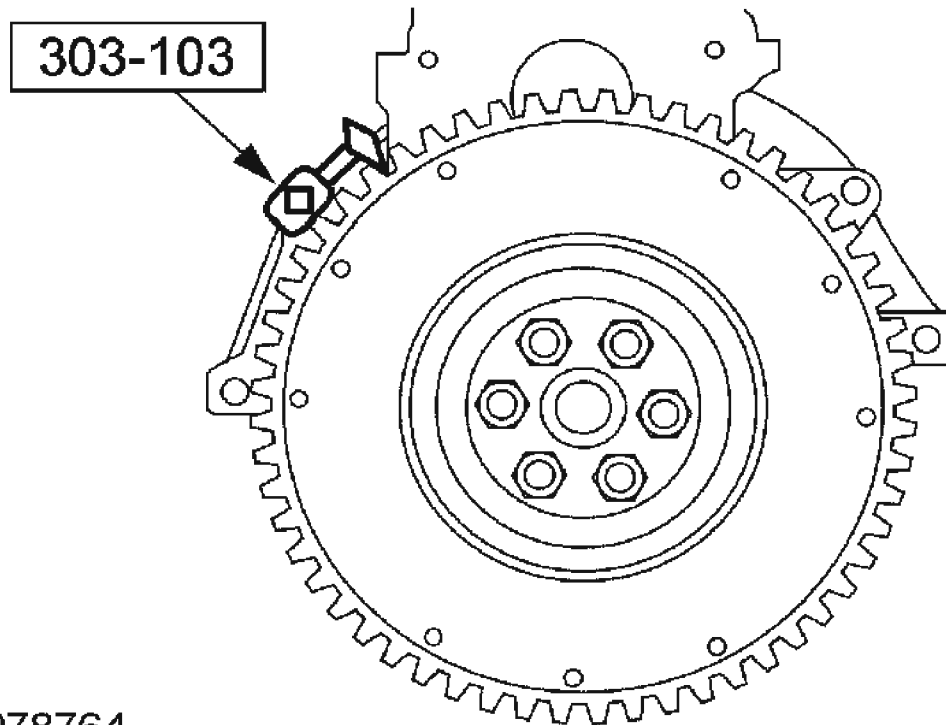
2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2768-A

Removal

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** .
2. Remove the transmission. For additional information, refer to **AUTOMATIC TRANSAXLE/TRANSMISSION** .
3. Install the special tool and remove the flexplate bolts.



A0078764

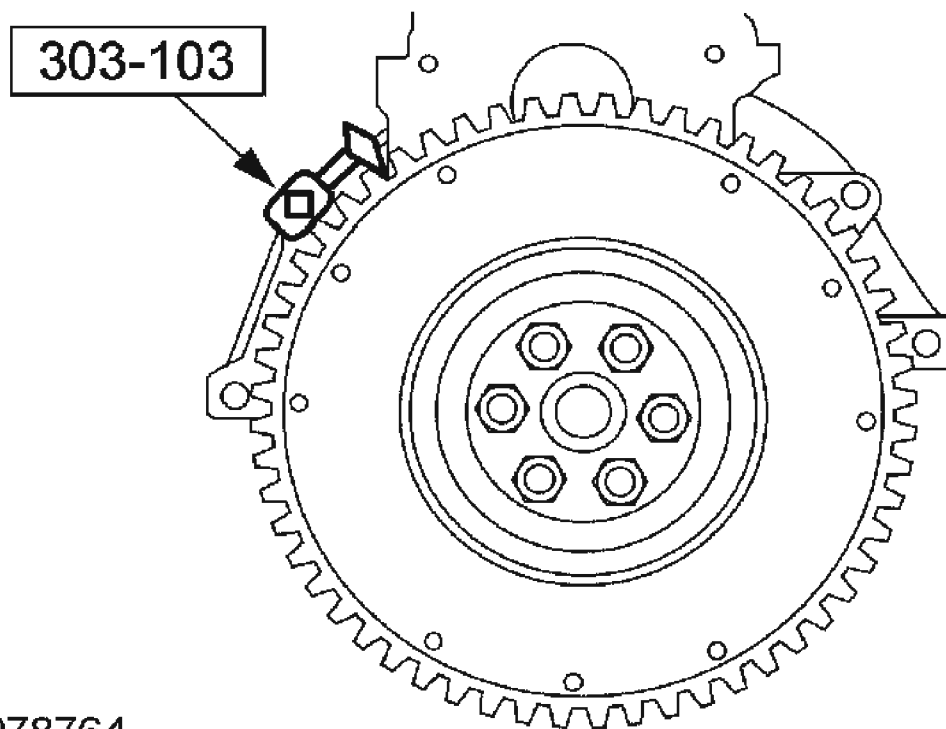
Fig. 205: Installing Special Tool (303-103) On Flexplate
Courtesy of FORD MOTOR CO.

Installation

NOTE: Engine balancing is not required. Balance weights should not be installed on the new flywheel.

NOTE: Special nuts are used for installation. Do not use standard nuts.

1. Install the flexplate.
2. Install the special tool.



A0078764

Fig. 206: Installing Special Tool (303-103) On Flexplate
Courtesy of FORD MOTOR CO.

3. Tighten the nuts in the sequence shown in three stages:
 - Stage 1: Tighten to 50 Nm (37 lb-ft).
 - Stage 2: Tighten to 80 Nm (50 lb-ft).
 - Stage 3: Tighten to 112 Nm (83 lb-ft).

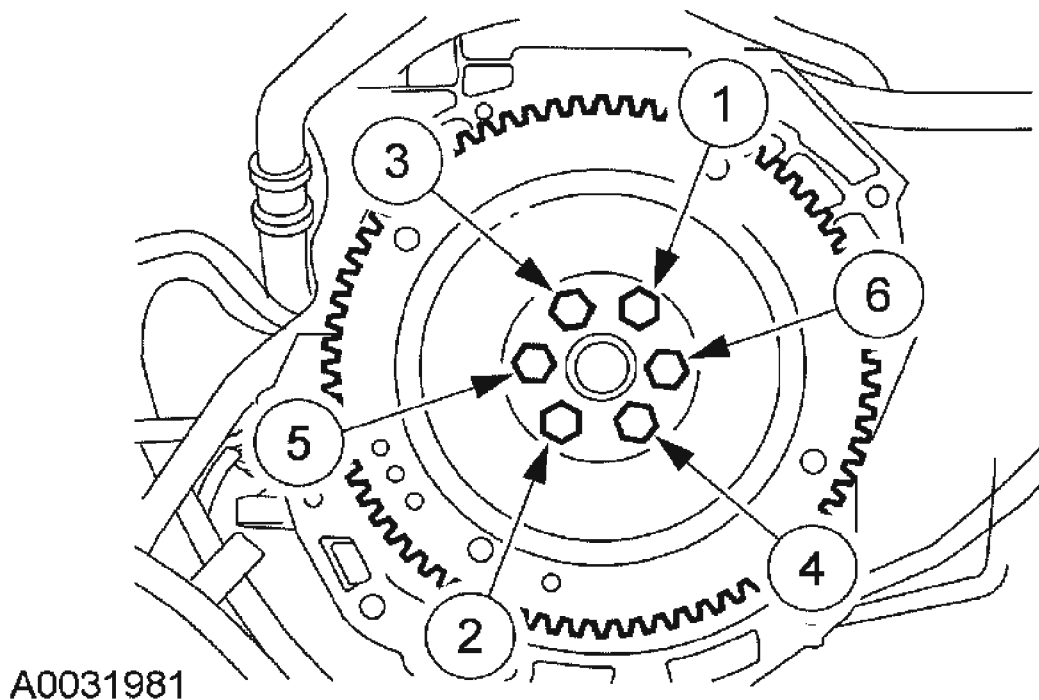
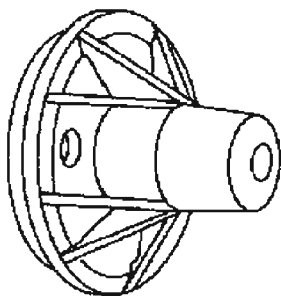


Fig. 207: Identifying Tightening Sequence Of Flexplate Bolts
Courtesy of FORD MOTOR CO.

4. Install the transmission. For additional information, refer to **AUTOMATIC TRANSAXLE/TRANSMISSION**.

CRANKSHAFT REAR SEAL WITH RETAINER PLATE

SPECIAL TOOL DESCRIPTION



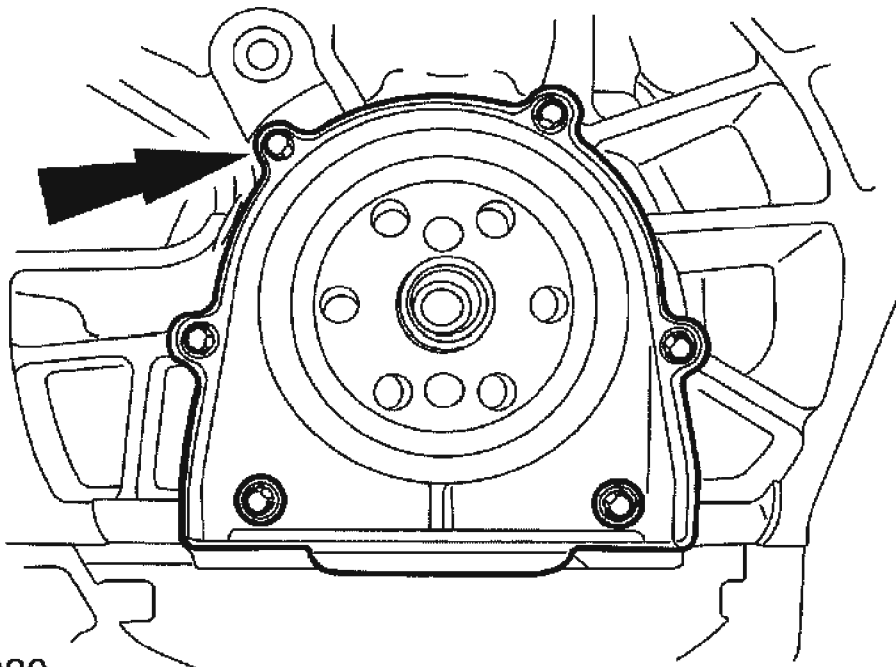
ST1506-A

Installer, Crankshaft Rear Main Oil Seal
303-328 (T88P-6701-B1)

1. Remove the flywheel or flexplate. For additional information, refer to **FLYWHEEL** or **FLEXPLATE**.

CAUTION: If the oil pan is not removed damage to the rear seal retainer joint can occur.

2. Remove the oil pan. For additional information, refer to **OIL PAN**.
3. Remove the bolts and the crankshaft rear oil seal.



A0031980

Fig. 208: Removing Bolts And Crankshaft Rear Oil Seal
Courtesy of FORD MOTOR CO.

Installation

1. Install the crankshaft rear oil seal on the Crankshaft Rear Main Oil Seal Installer.
2. Install the Crankshaft Rear Main Oil Seal Installer and the crankshaft rear oil seal on the crankshaft.
 - Tighten the bolts in the sequence shown to 10 Nm (89 lb-in).

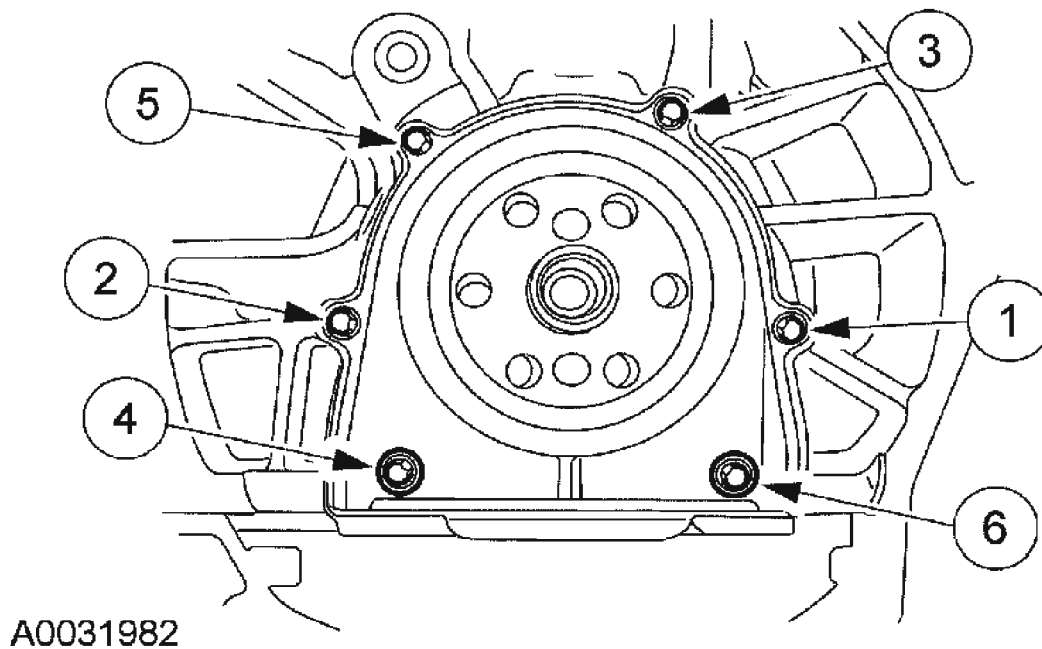
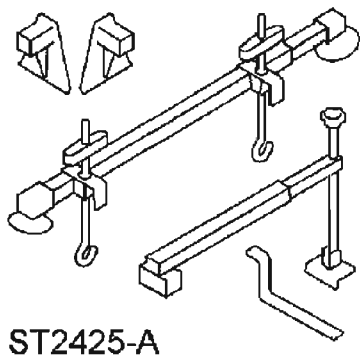


Fig. 209: Identifying Tightening Sequence Of Crankshaft Rear Oil Seal Bolts
Courtesy of FORD MOTOR CO.

3. Remove the Crankshaft Rear Main Oil Seal Installer.
4. Install the oil pan. For additional information, refer to **OIL PAN**.
5. Install the flywheel or flexplate. For additional information, refer to **FLYWHEEL** or **FLEXPLATE**.

ENGINE MOUNT

SPECIAL TOOL DESCRIPTION



Three Bar Engine Support Kit 303-F072

1. Remove the expansion tank bolt.

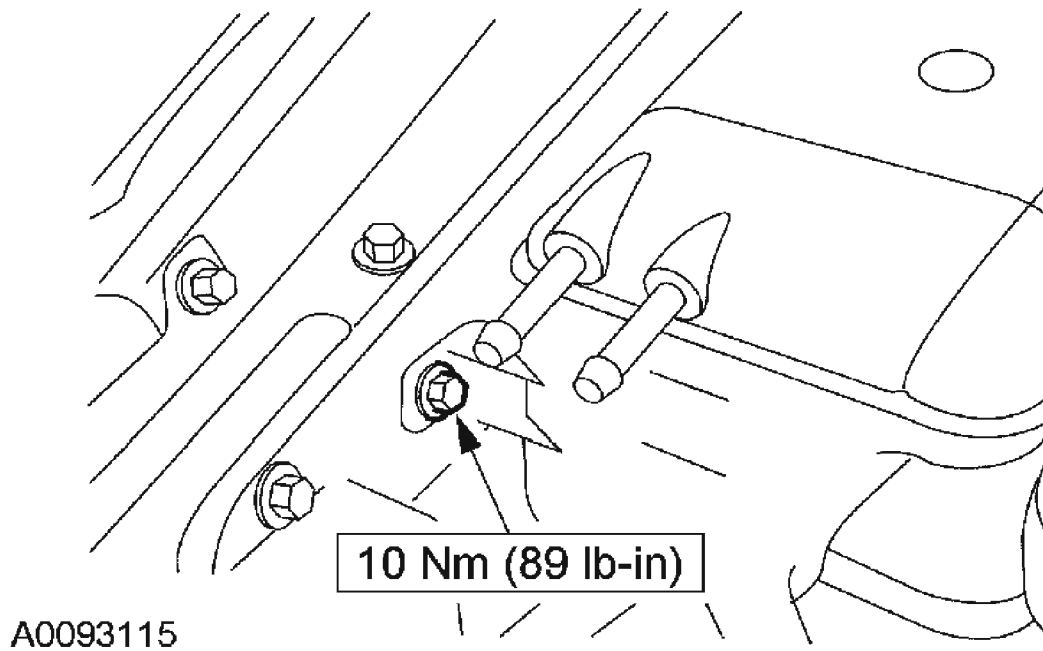


Fig. 210: Removing Expansion Tank Bolt
Courtesy of FORD MOTOR CO.

2. Lift the coolant expansion tank out of the retainer, and position it aside.

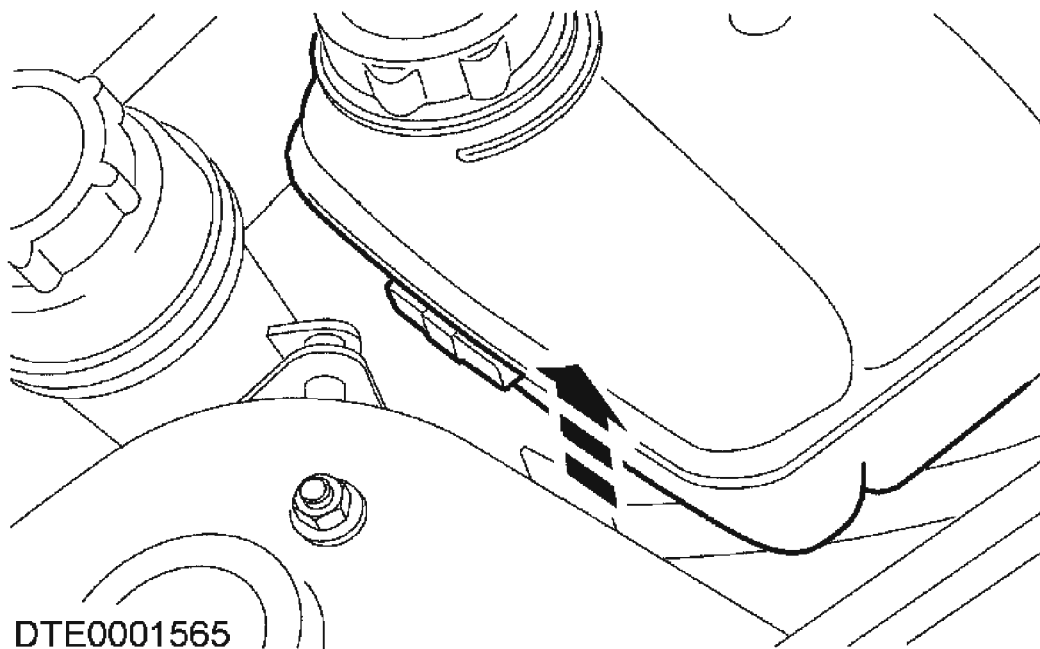


Fig. 211: Lifting Coolant Expansion Tank Out Of Retainer
Courtesy of FORD MOTOR CO.

3. Install the special tool.

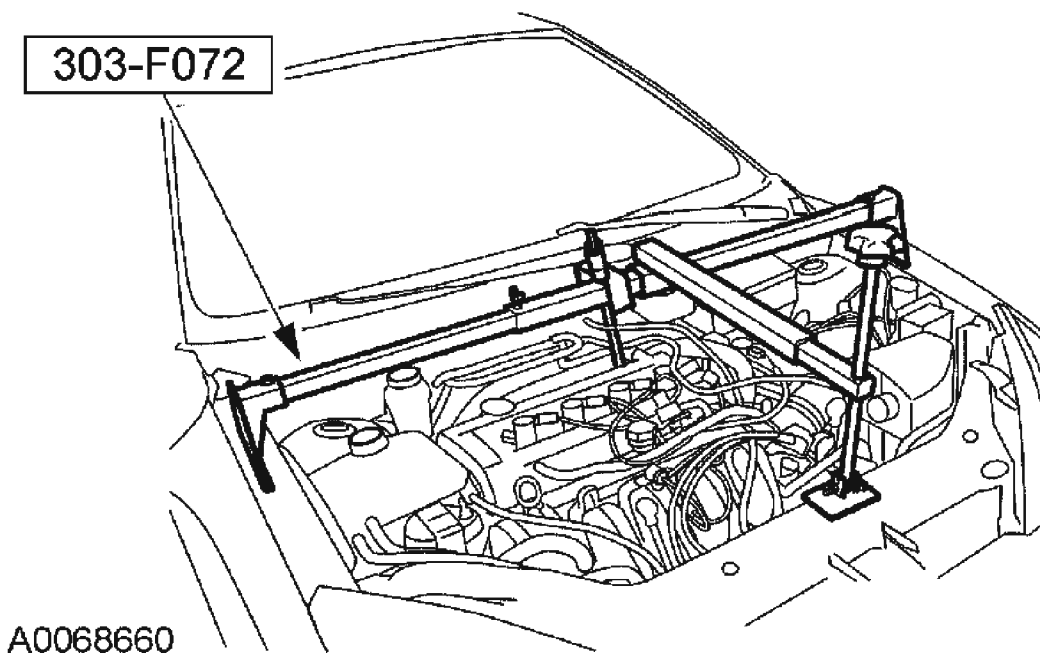


Fig. 212: Installing Special Tool (303-F072)
Courtesy of FORD MOTOR CO.

4. Remove the engine mount nuts

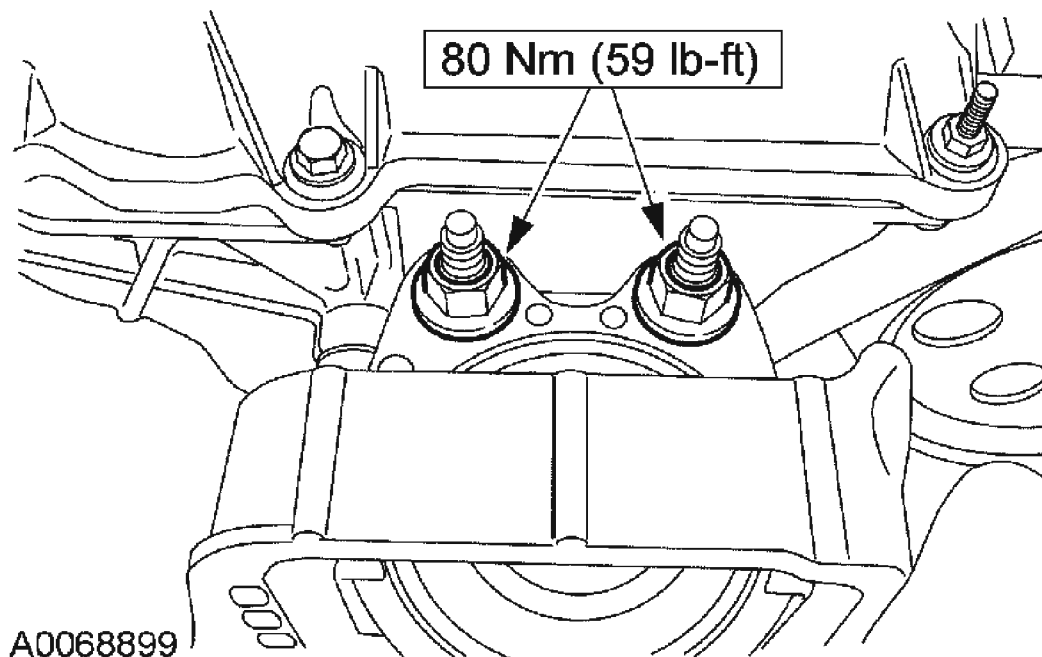


Fig. 213: Removing Engine Mount Nut
Courtesy of FORD MOTOR CO.

5. Remove the engine mount bolts and the engine mount.

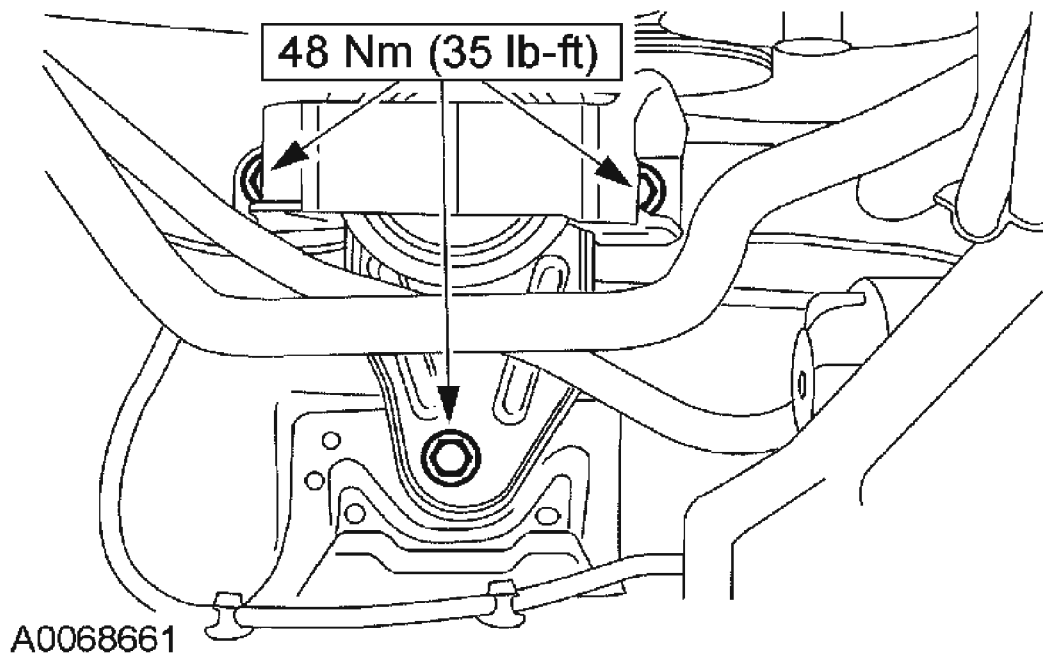


Fig. 214: Removing Engine Mount Bolts And Engine Mount
Courtesy of FORD MOTOR CO.

6. To install, reverse the removal procedure.

REMOVAL

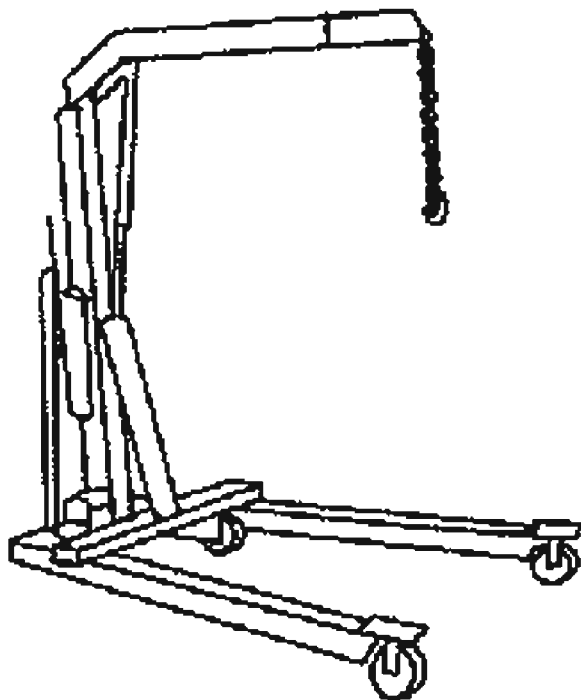
ENGINE

SPECIAL TOOL DESCRIPTION

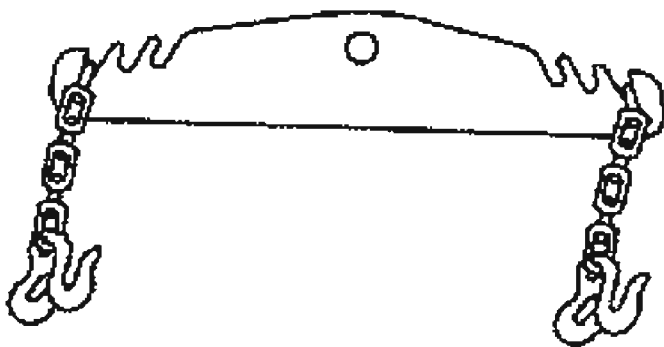
	Heavy Duty Floor Crane 014-00071 or equivalent
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2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1341-A



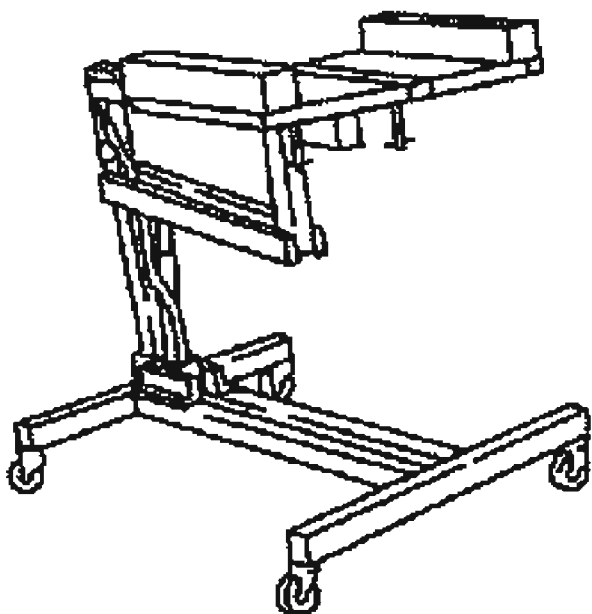
ST1602-A

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

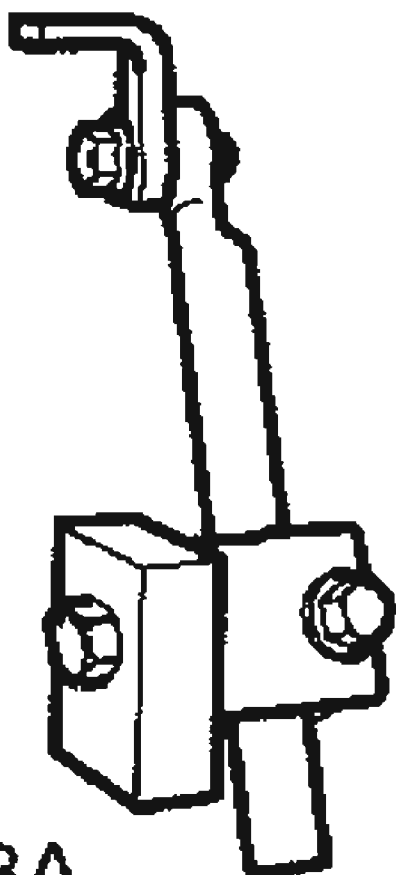
Powertrain Lift with Tilting Plate
014-00765 or equivalent

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1682-A

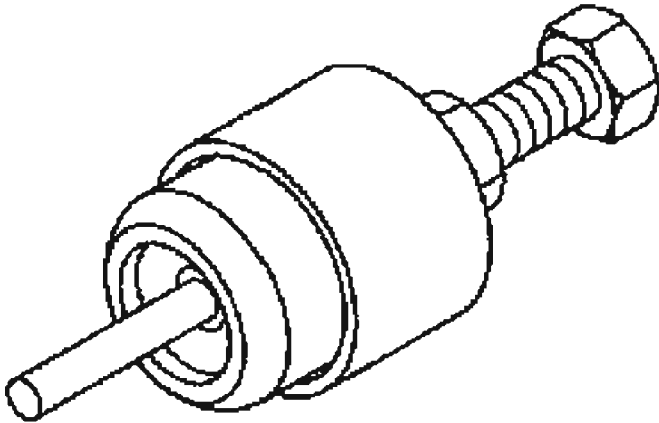


ST2743A

Universal Adapter Brackets 014-0001

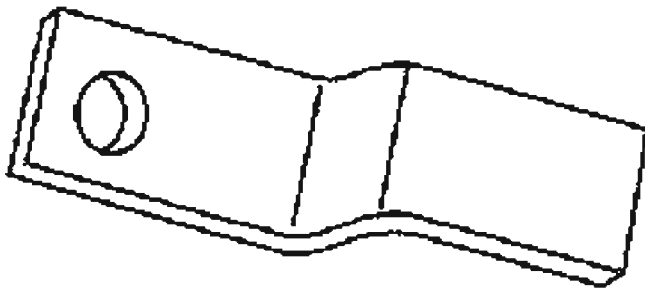
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



13021

Remover, Power Steering Pump
Pulley 211-016 (T69L-10300-8)



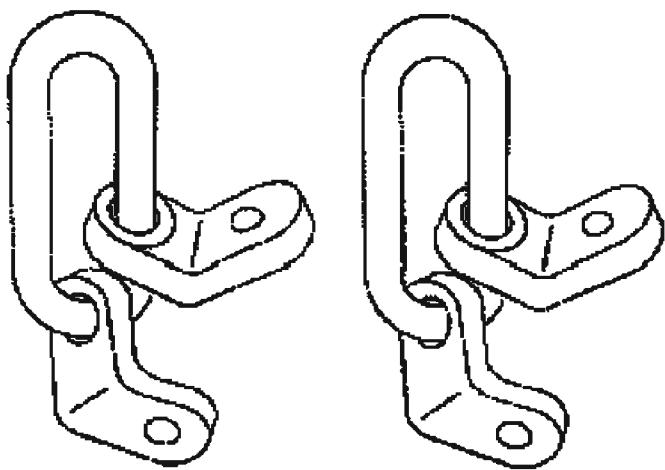
ST1636-A

Torque Converter Holding Tool
307-346 (T97T-7902-A)

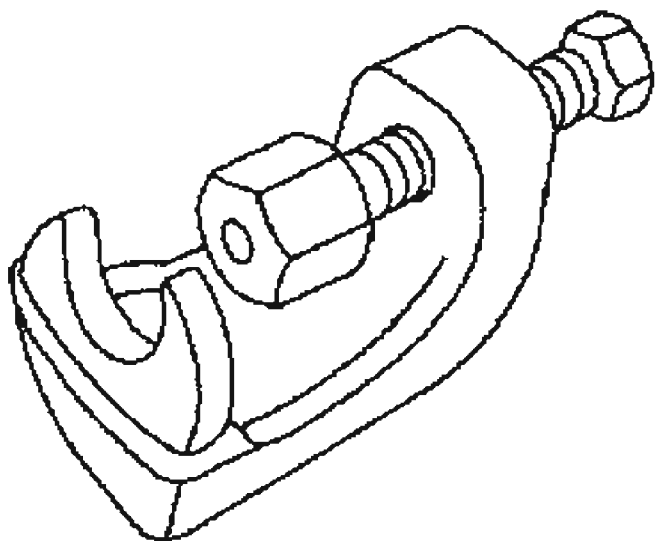
Lifting Bracket, Engine 303-050
(T70P-6000)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2793-A



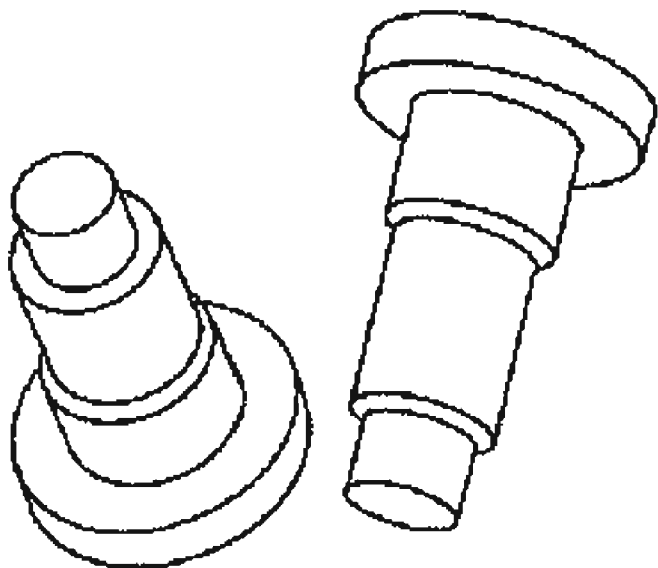
ST1522-A

Tie Rod End Remover 211-001
(TOOL-3290-D) or equivalent

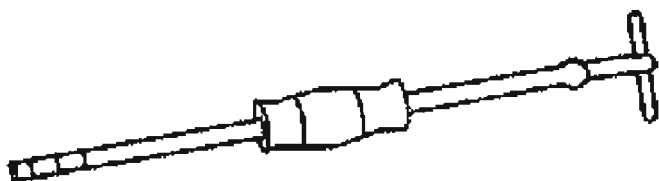
Transaxle Plugs 308-152 (T88C-
7025-AH)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



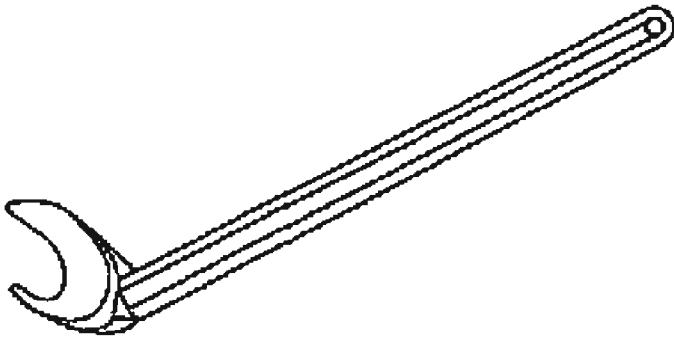
ST1523-A



ST1185-A

Slide Hammer 100-001 (T50T-100-A)

Front Drive Halfshaft Remover
205-D070 (D93P-1175-B) or
equivalent



ST1582-A

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** .
2. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM-GENERAL INFORMATION** .
3. Remove the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .

Vehicles equipped with air conditioning

4. Recover the A/C system. For additional information, refer to **CLIMATE CONTROL SYSTEM-GENERAL INFORMATION** .

All vehicles

5. Drain the engine cooling system. For additional information, refer to **ENGINE COOLING** .
6. Drain the engine oil.
 - Install the drain plug.

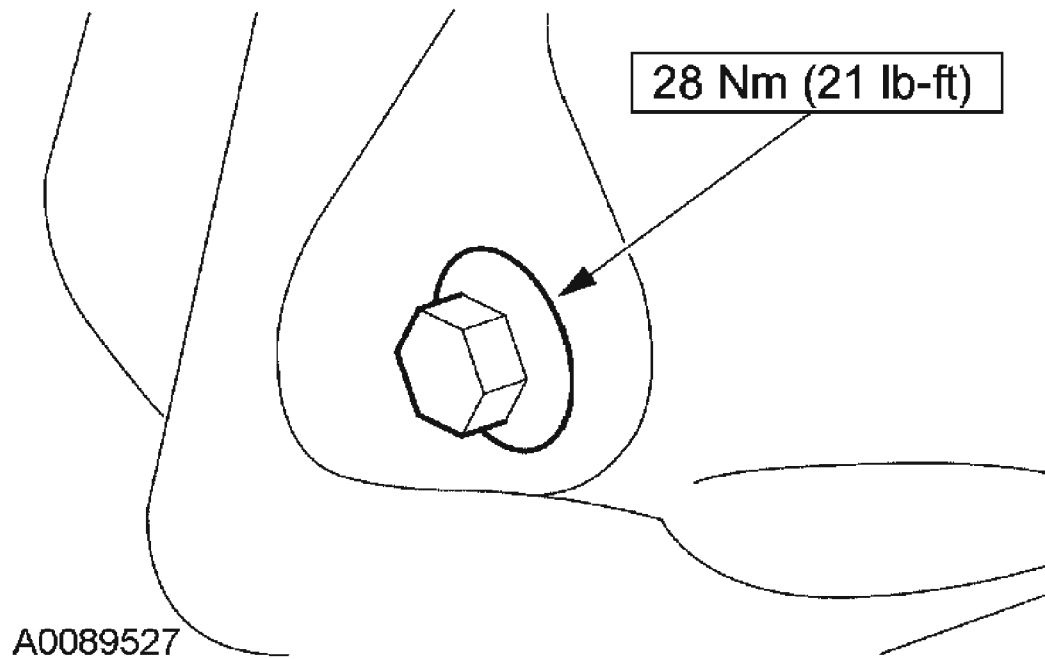


Fig. 215: Installing Drain Plug
Courtesy of FORD MOTOR CO.

7. Remove the accessory drive belt splash shield.

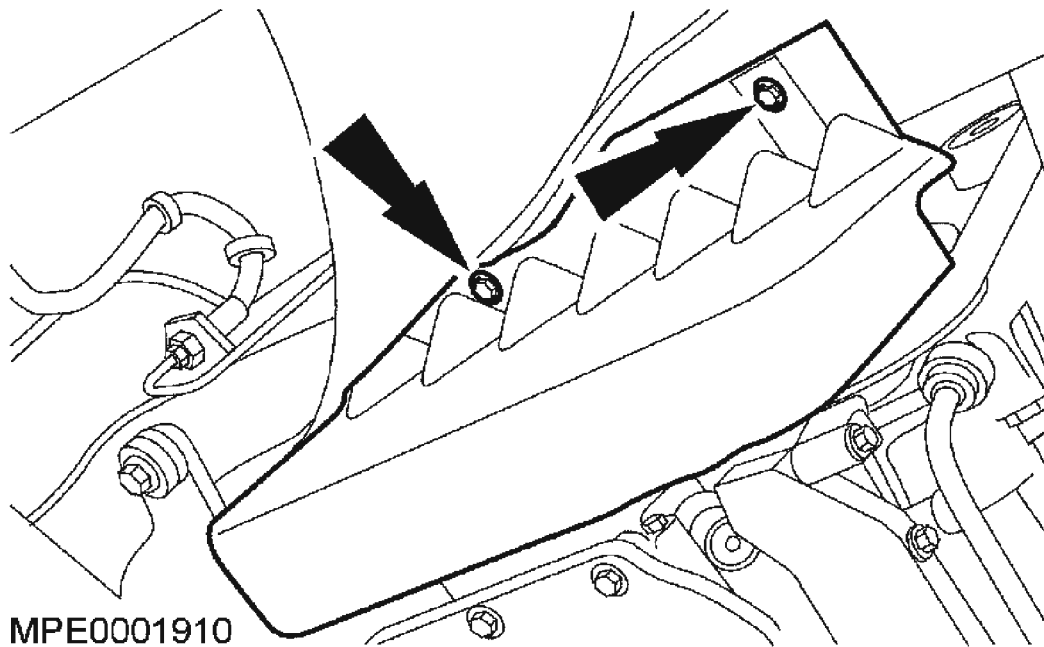
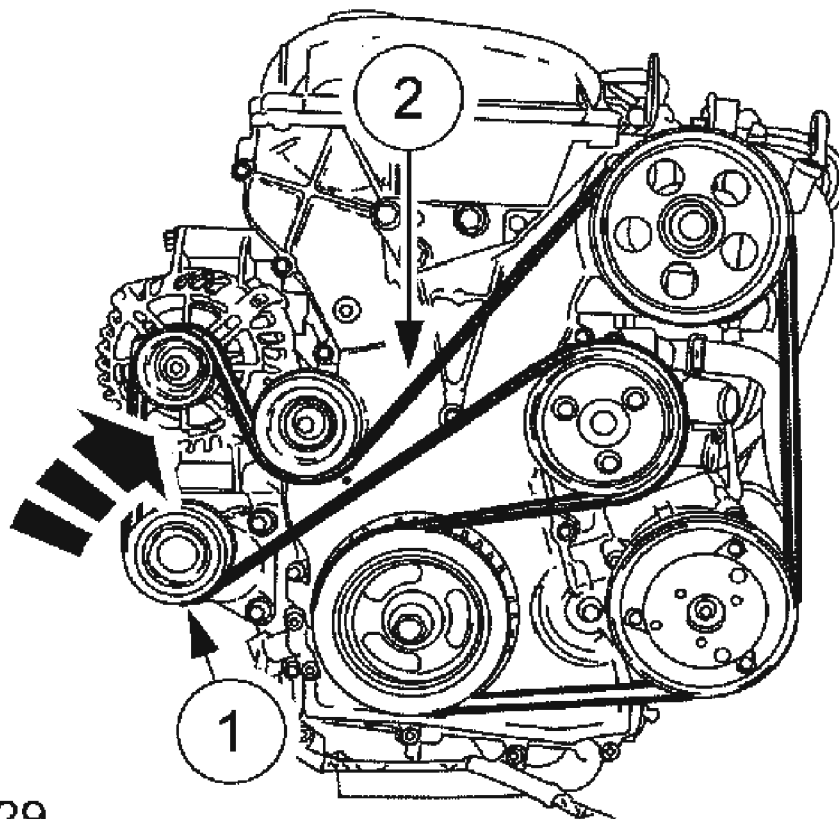


Fig. 216: Removing Accessory Drive Belt Splash Shield
Courtesy of FORD MOTOR CO.

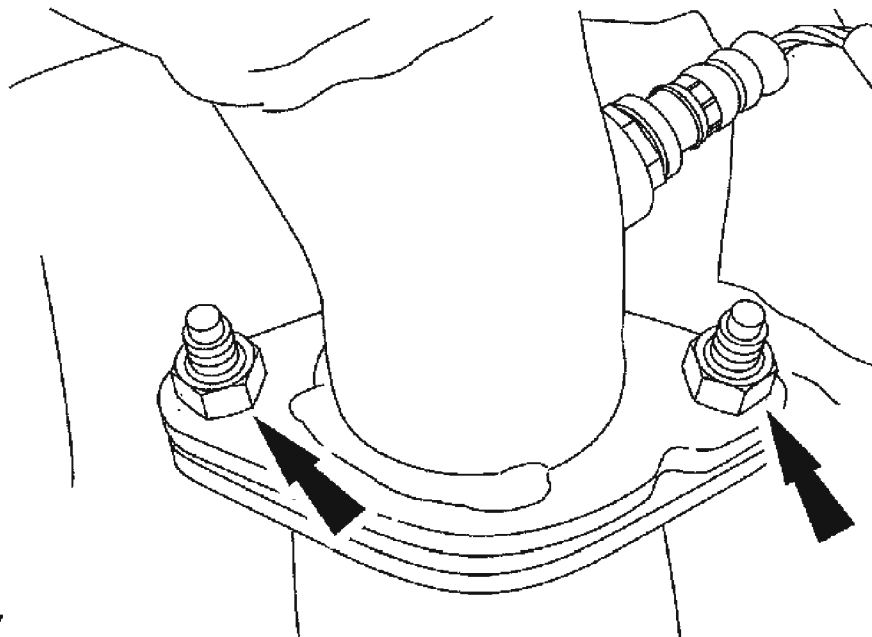
8. Remove the accessory drive belt.
 1. Rotate the tensioner clockwise.
 2. Remove the accessory drive belt.



A0069829

Fig. 217: Removing Accessory Drive Belt
Courtesy of FORD MOTOR CO.

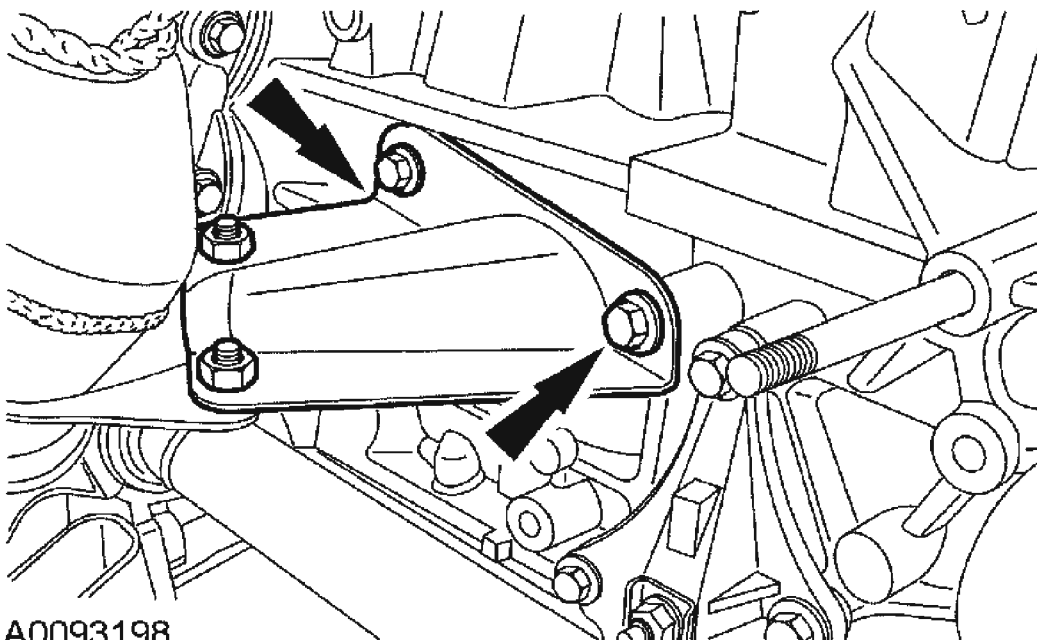
9. Remove the nuts and disconnect the catalytic converter from the muffler assembly.
 - Remove and discard the gasket.



A0093197

Fig. 218: Removing Catalytic Converter Nuts From Muffler Assembly
Courtesy of FORD MOTOR CO.

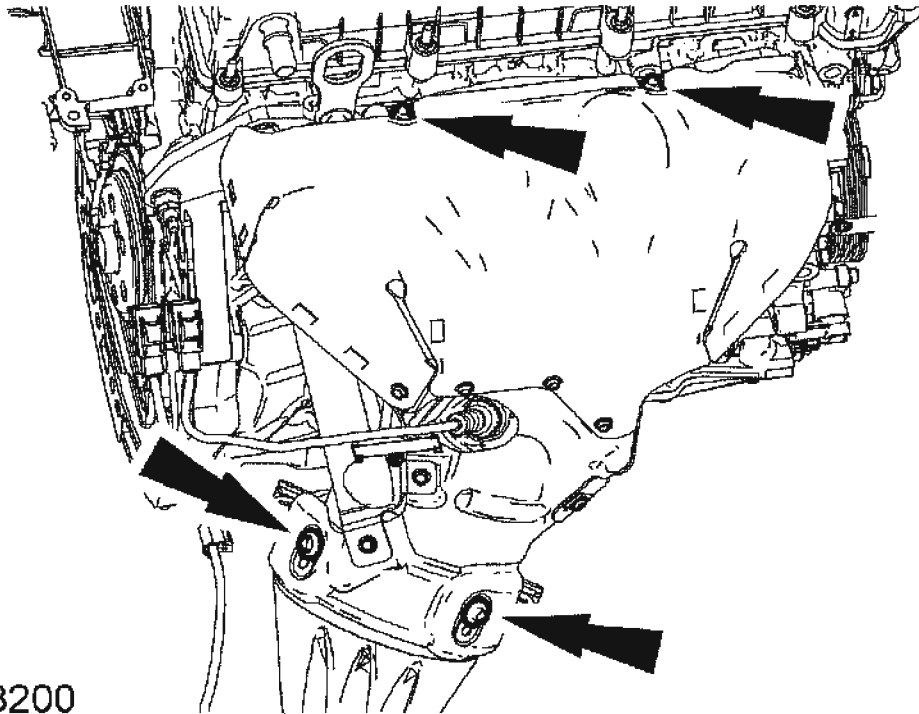
10. Remove the bolts and the catalytic converter support bracket.



A0093198

Fig. 219: Removing Catalytic Converter Support Bracket Bolts
Courtesy of FORD MOTOR CO.

NOTE: All 2.3L engines and some 2.0L engines are equipped with a heat shield that must be positioned aside to access the catalytic converter-to engine nuts.



A0093200

Fig. 220: Removing Heat Shield Bolts
Courtesy of FORD MOTOR CO.

11. If equipped, remove the four heat shield bolts and position the heat shield aside.
12. Disconnect the exhaust sensor electrical connectors.

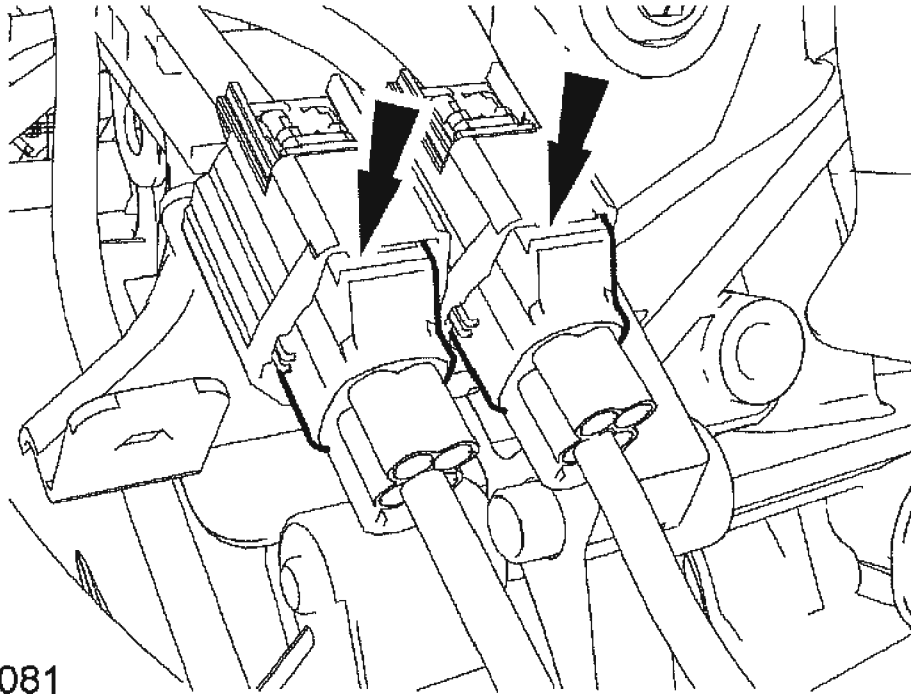


Fig. 221: Disconnecting Exhaust Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

13. If equipped, disconnect the upper exhaust sensor electrical connector and retainer.

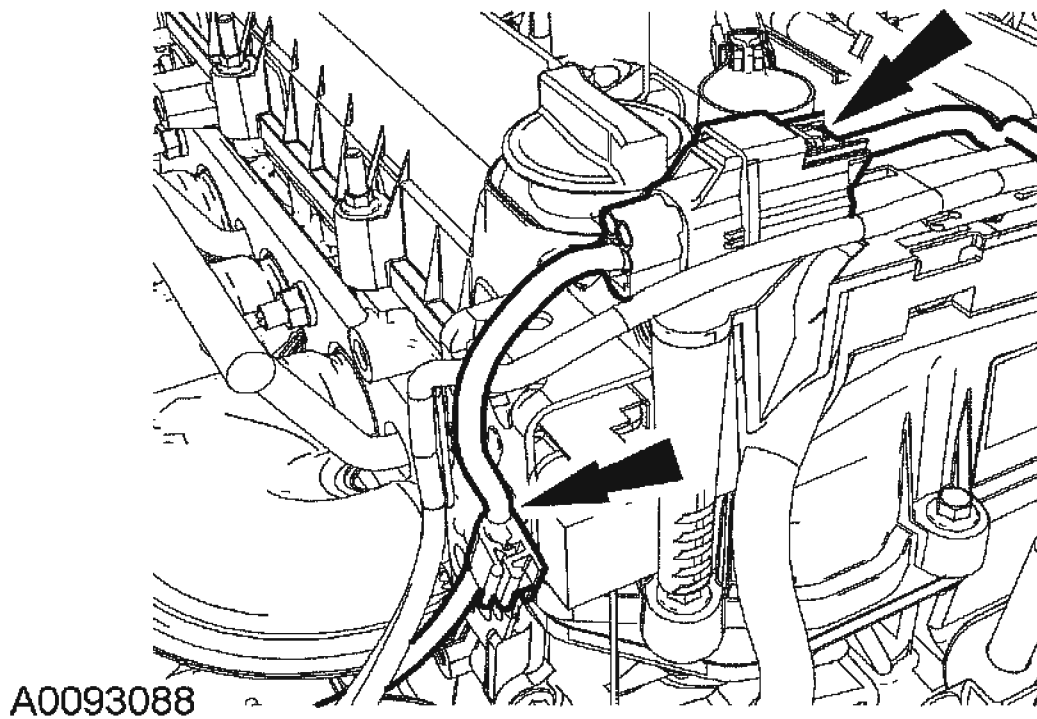


Fig. 222: Disconnecting Upper Exhaust Sensor Electrical Connector And Retainer
Courtesy of FORD MOTOR CO.

14. If equipped, disconnect the secondary air injection (AIR) hose.

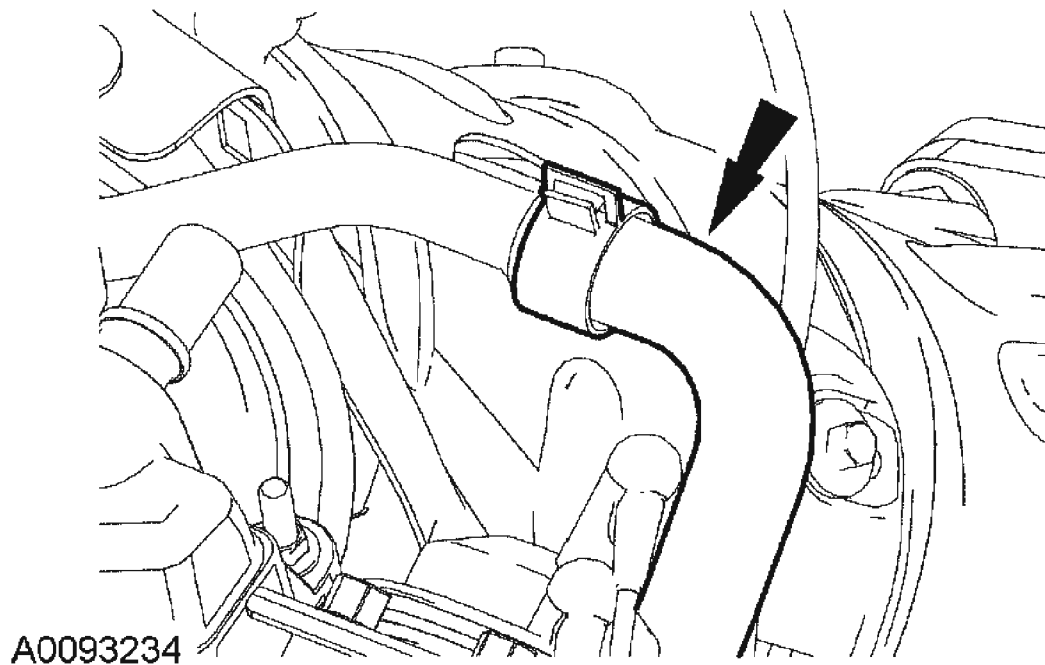


Fig. 223: Disconnecting Secondary Air Injection Hose
Courtesy of FORD MOTOR CO.

15. Remove and discard the catalytic converter-to-engine nuts.
 - Position aside the catalytic converter and support with mechanics wire.
 - Remove and discard the catalytic converter gasket.

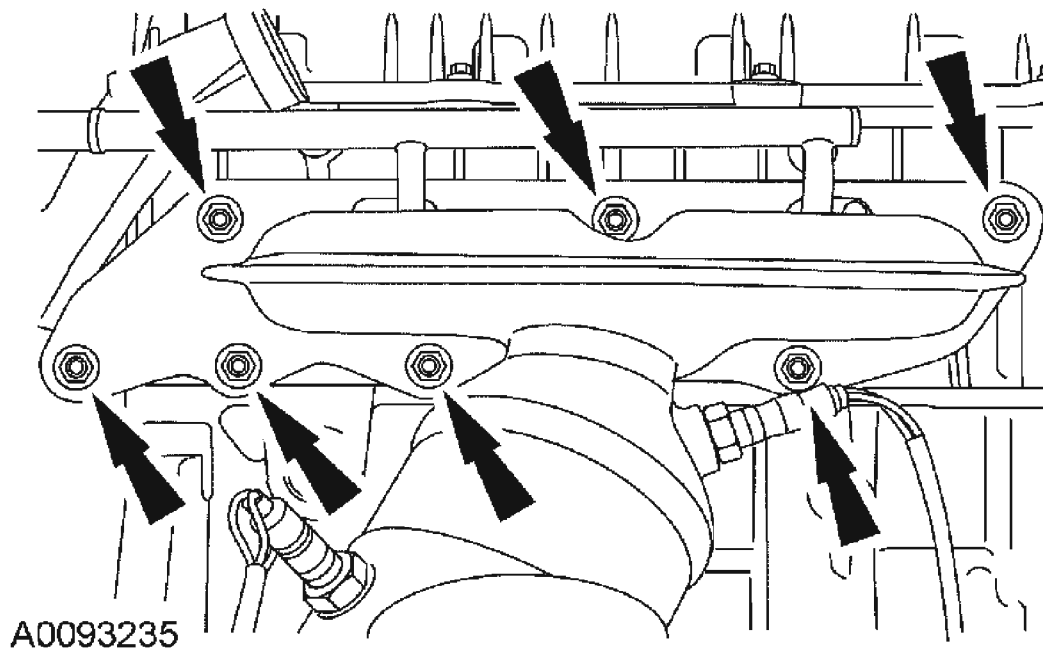


Fig. 224: Removing Catalytic Converter-To-Engine Nuts
Courtesy of FORD MOTOR CO.

16. Loosen the clamp and disconnect the vent tube from the air cleaner outlet pipe.

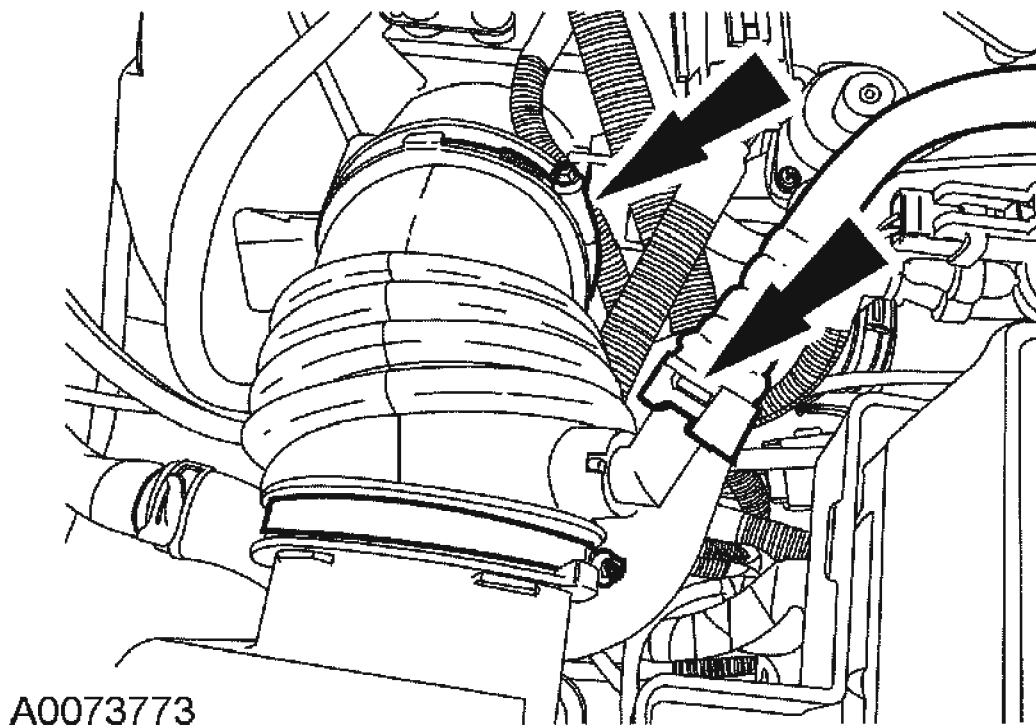


Fig. 225: Disconnecting Vent Tube From Air Cleaner Outlet Pipe
Courtesy of FORD MOTOR CO.

17. Remove the bolts and detach the air intake resonator from the grommets.
 - Remove the air intake resonator and outlet pipe.

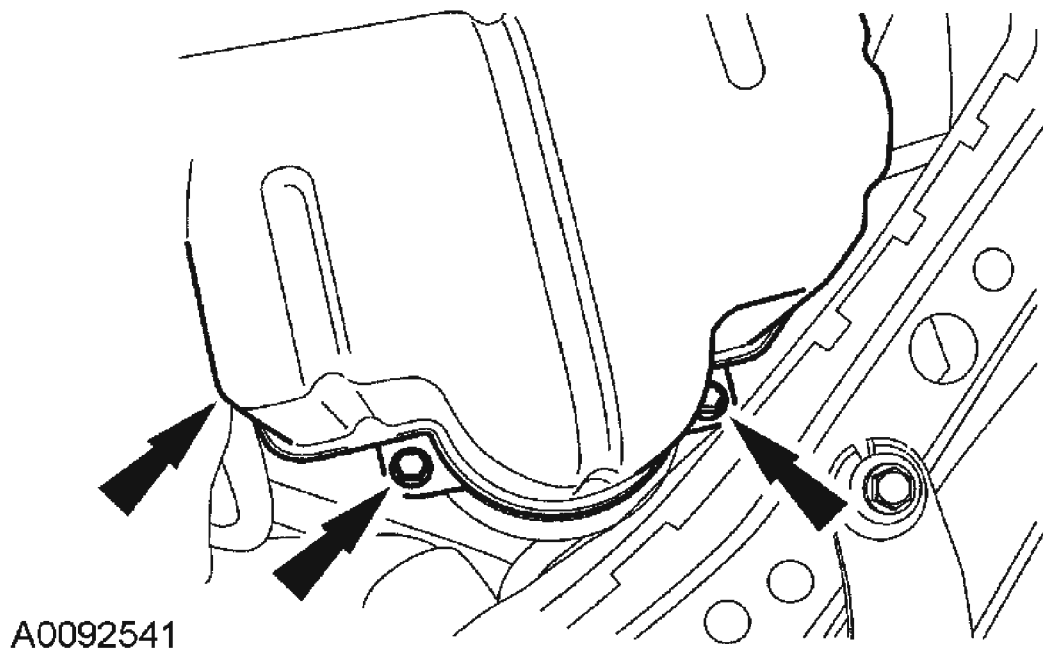


Fig. 226: Removing Bolts And Detaching Air Intake Resonator From Grommets
Courtesy of FORD MOTOR CO.

18. Remove the accelerator control snow shield.
 - Detach the evaporative emissions hose pin-type retainer.
 - Remove the screw, the pin-type retainer and the snow shield.

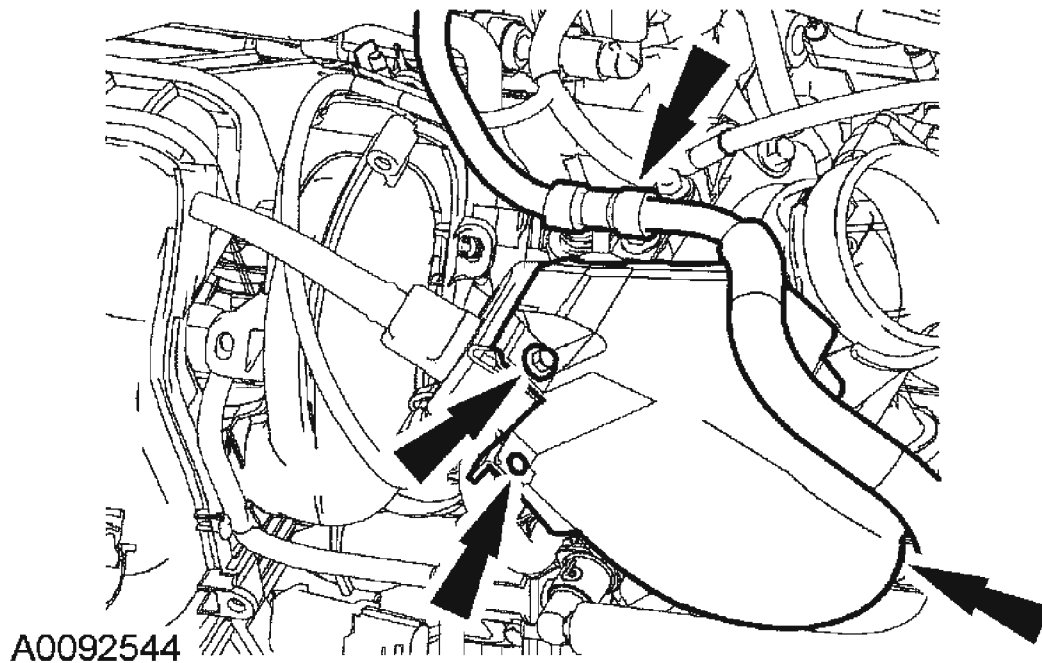


Fig. 227: Removing Accelerator Control Snow Shield
Courtesy of FORD MOTOR CO.

19. Disconnect the accelerator cable and speed control cable (if equipped).
 1. Disconnect the accelerator and speed control cable (if equipped) from the throttle body.
 2. Remove the bolts and position the accelerator control cables and bracket aside.

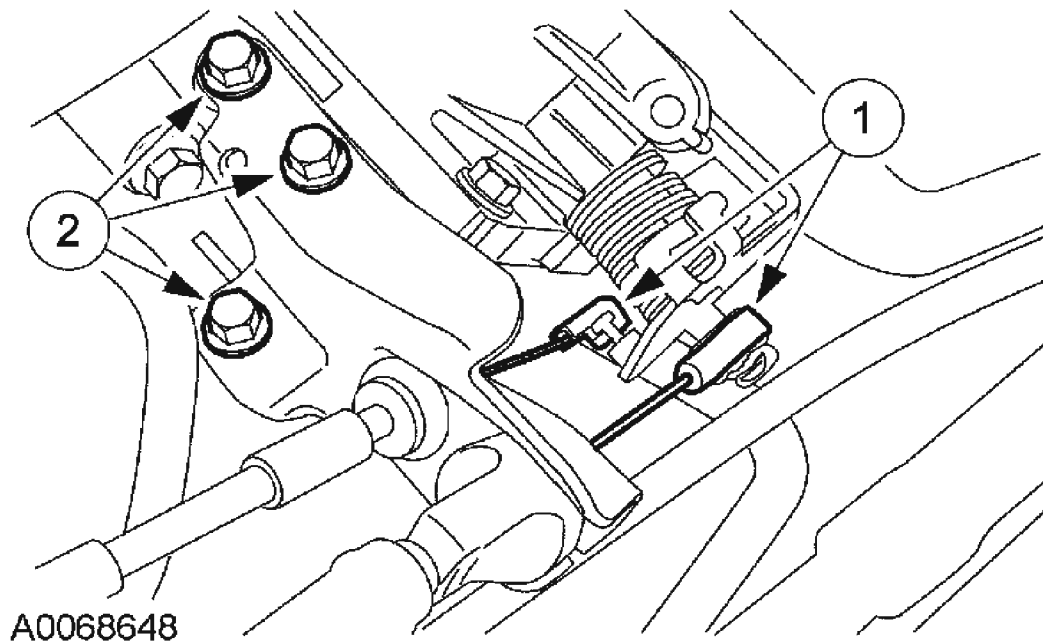
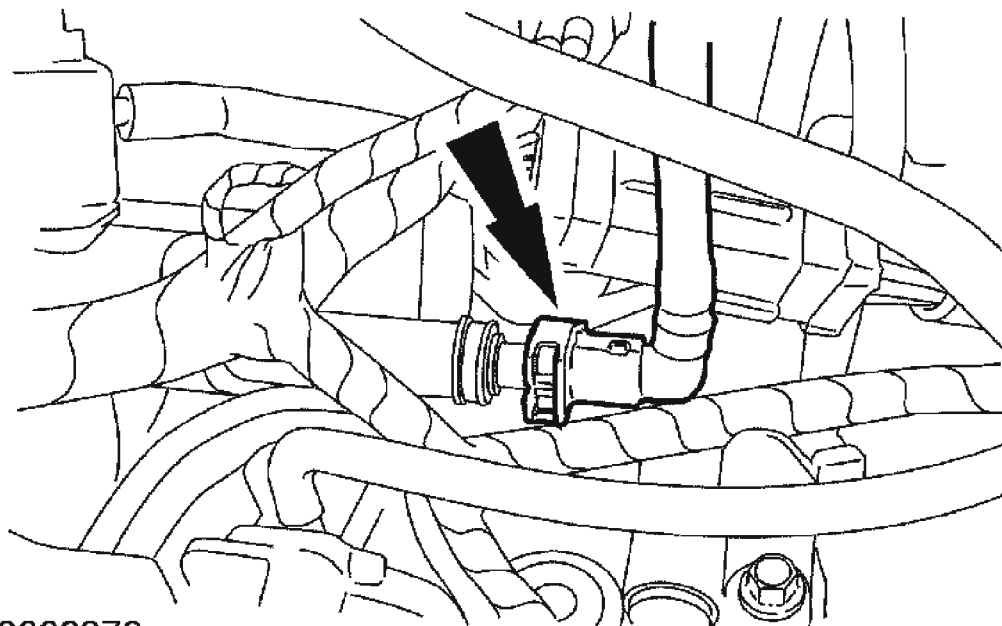


Fig. 228: Disconnect Accelerator Cable And Speed Control Cable
Courtesy of FORD MOTOR CO.

20. Disconnect the fuel tube quick release coupling from the fuel rail and position the fuel tube aside.



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Fig. 229: Disconnecting Fuel Tube Quick Release Coupling From Fuel Rail
Courtesy of FORD MOTOR CO.

21. Disconnect the evaporative emissions tube.

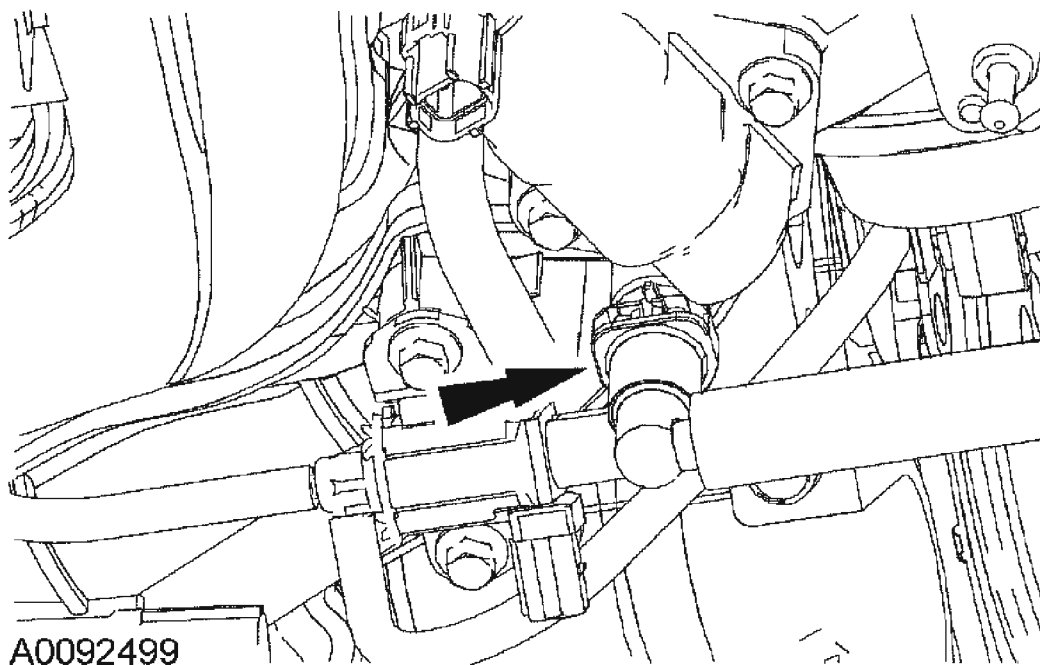


Fig. 230: Disconnecting Evaporative Emissions Tube
Courtesy of FORD MOTOR CO.

22. If equipped, disconnect the AIR hose.

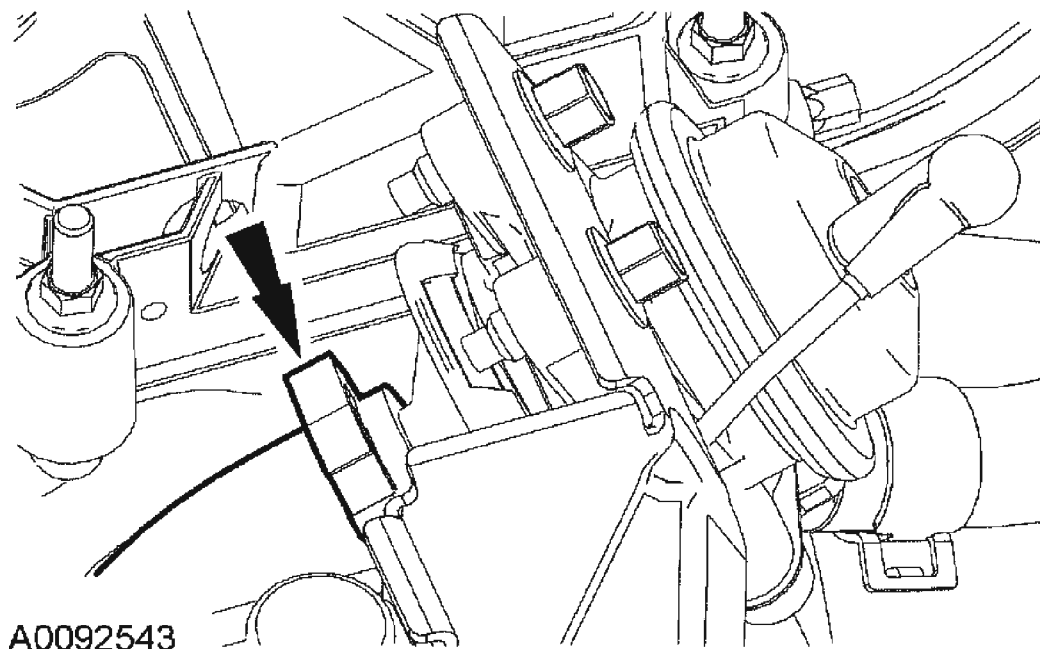


Fig. 231: Disconnecting Air Hose
Courtesy of FORD MOTOR CO.

23. If equipped, disconnect the AIR vacuum regulator electrical connector.

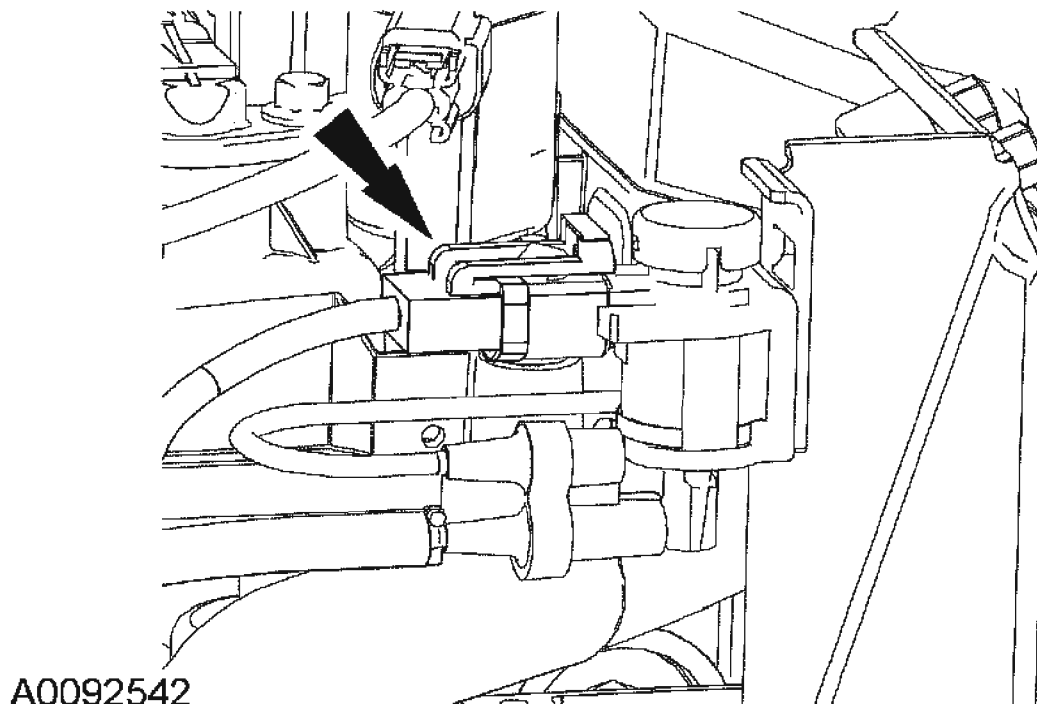


Fig. 232: Disconnecting Air Vacuum Regulator Electrical Connector
Courtesy of FORD MOTOR CO.

24. Disconnect the power brake booster vacuum tube.
 - Depress the quick release locking ring.
 - Pull the vacuum tube out of the quick release fitting.

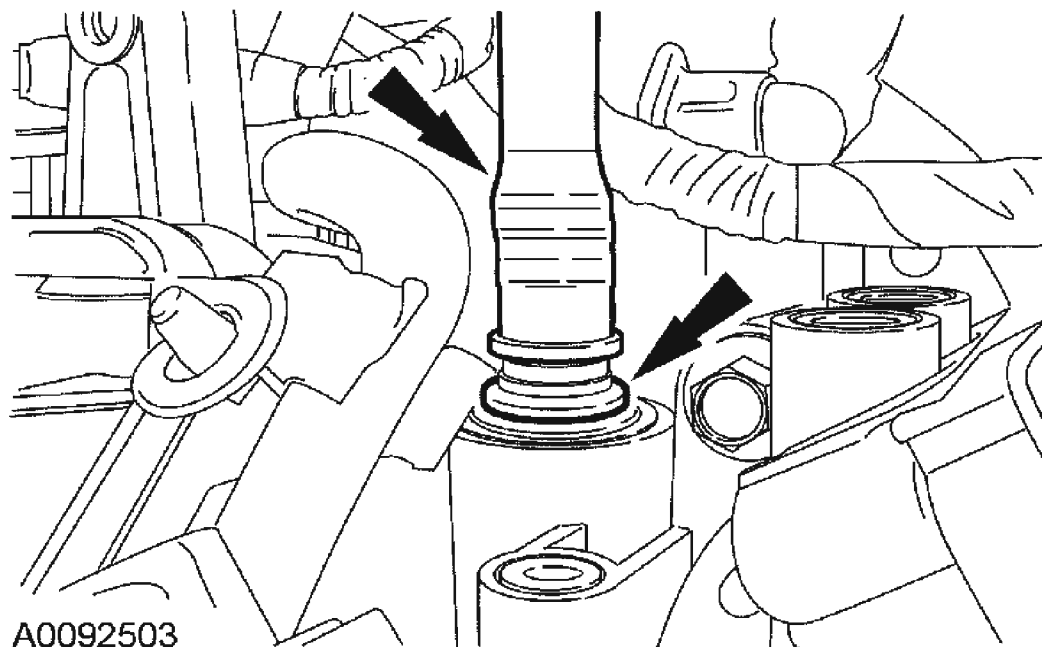


Fig. 233: Disconnecting Power Brake Booster Vacuum Tube
Courtesy of FORD MOTOR CO.

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

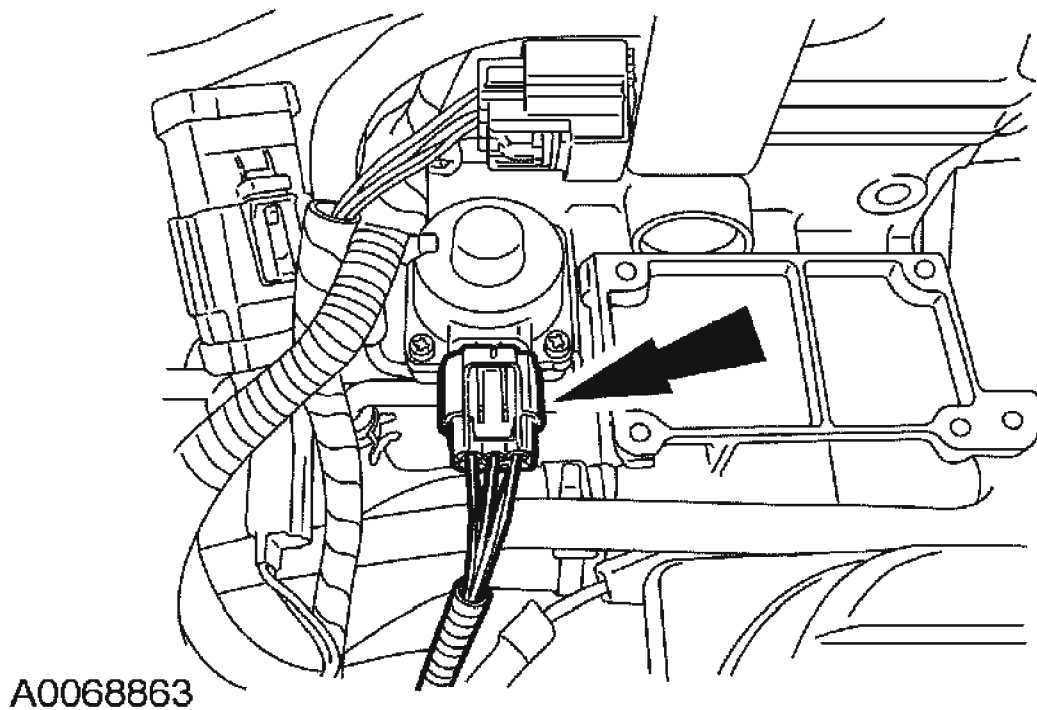


Fig. 234: Disconnecting Exhaust Gas Recirculation Valve Electrical Connector
Courtesy of FORD MOTOR CO.

26. Disconnect the upper radiator hose, the heater hose and the coolant vent hose from the coolant bypass.

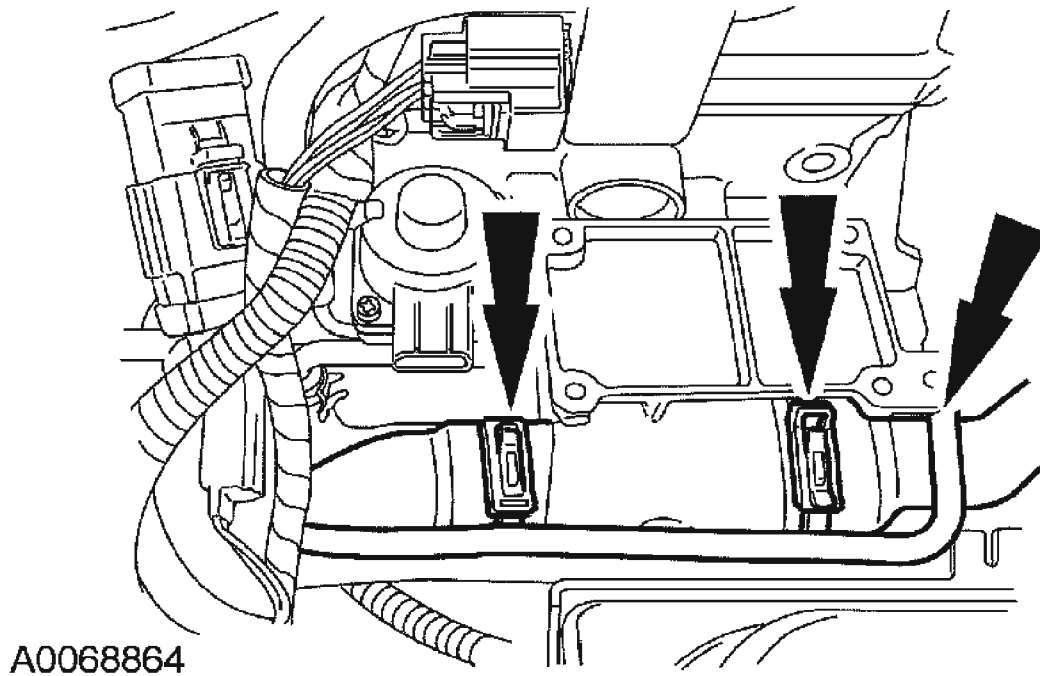


Fig. 235: Disconnecting Upper Radiator Hose, Heater Hose And Coolant Vent Hose From Coolant Bypass
Courtesy of FORD MOTOR CO.

27. Remove the bolt and ground eyelet.

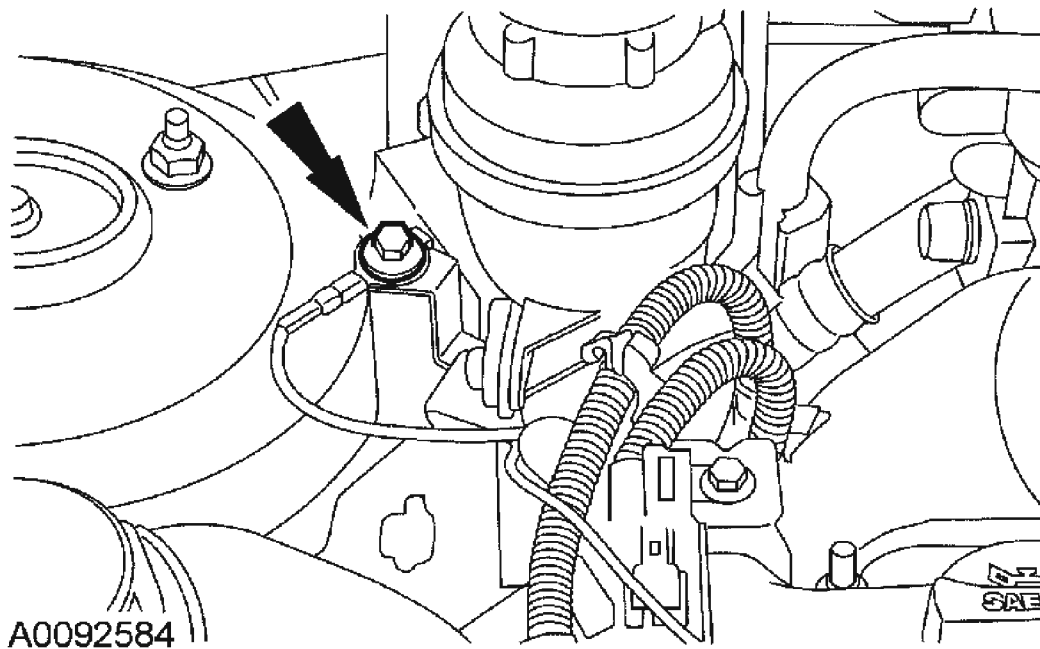


Fig. 236: Removing Ground Eyelet And Bolt
Courtesy of FORD MOTOR CO.

28. Disconnect the fuel charging wiring harness electrical connector and harness retainer.

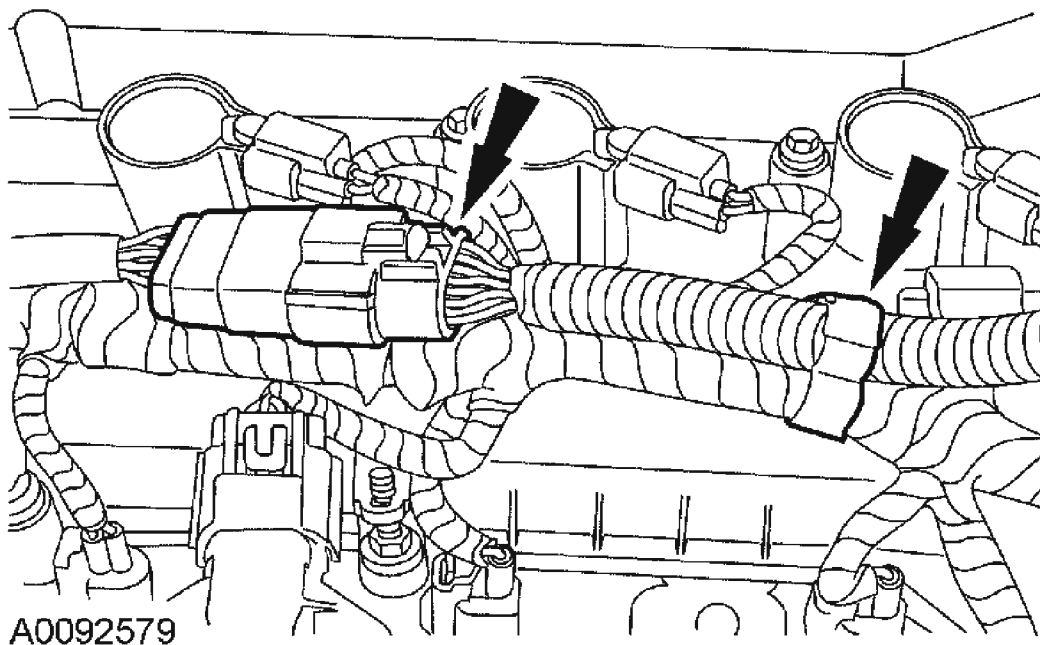


Fig. 237: Disconnecting Fuel Charging Wiring Harness Electrical Connector And Harness Retainer

Courtesy of FORD MOTOR CO.

29. Disconnect the fuel charging wiring harness electrical connector.

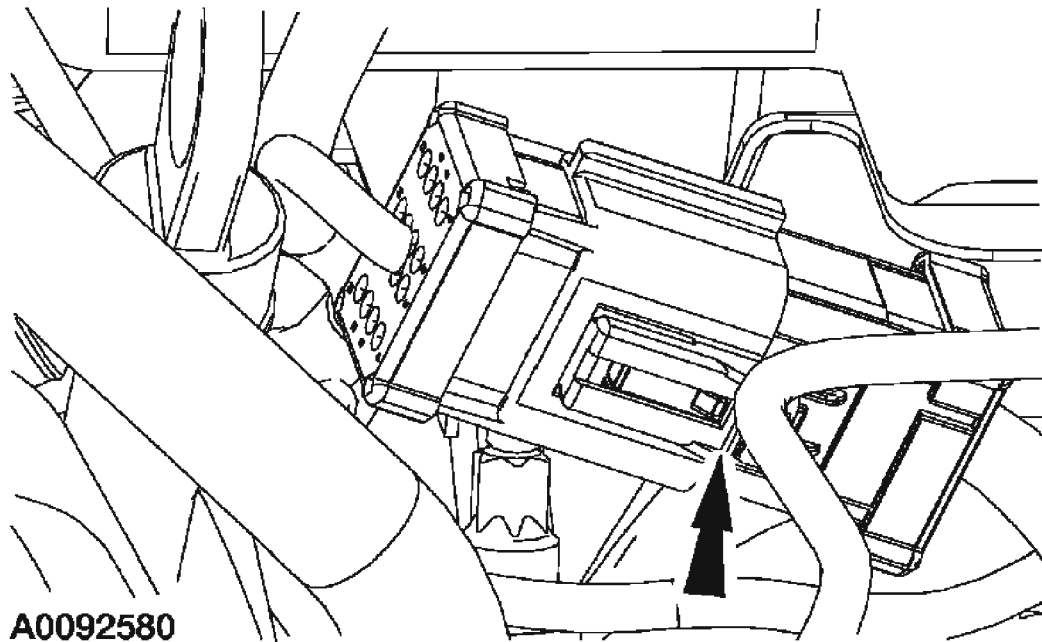


Fig. 238: Disconnecting Fuel Charging Wiring Harness Electrical Connector

Courtesy of FORD MOTOR CO.

30. Disconnect the power distribution wiring harness electrical connector.

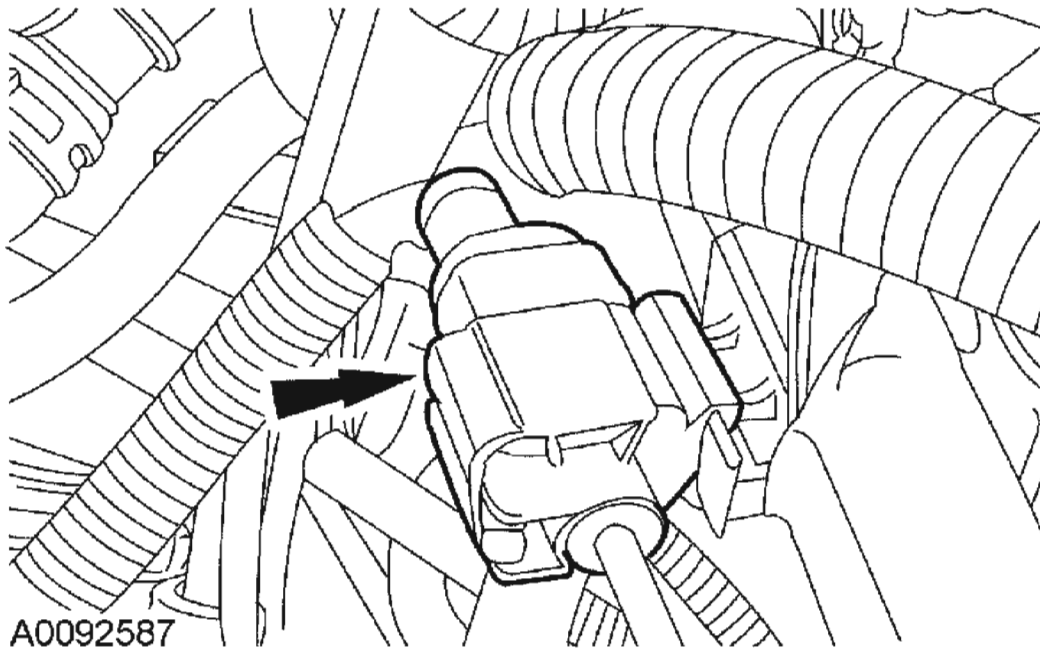


Fig. 239: Disconnecting Power Distribution Wiring Harness Electrical Connector
Courtesy of FORD MOTOR CO.

31. Detach the wiring harness retainers.

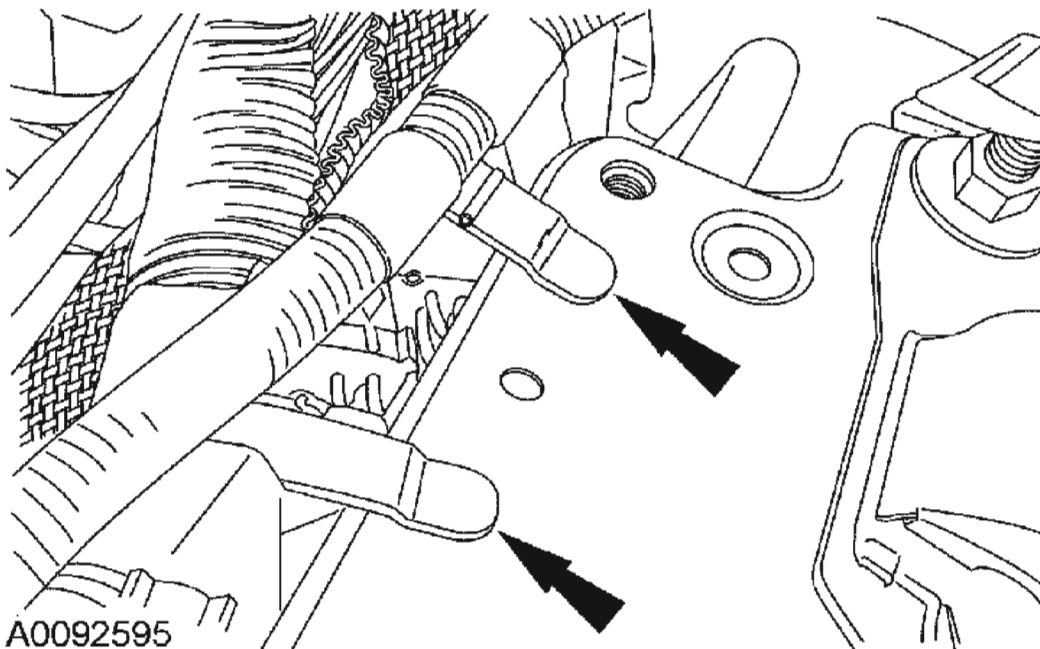


Fig. 240: Detaching Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

32. Remove the nut and the power distribution wiring harness eyelet.

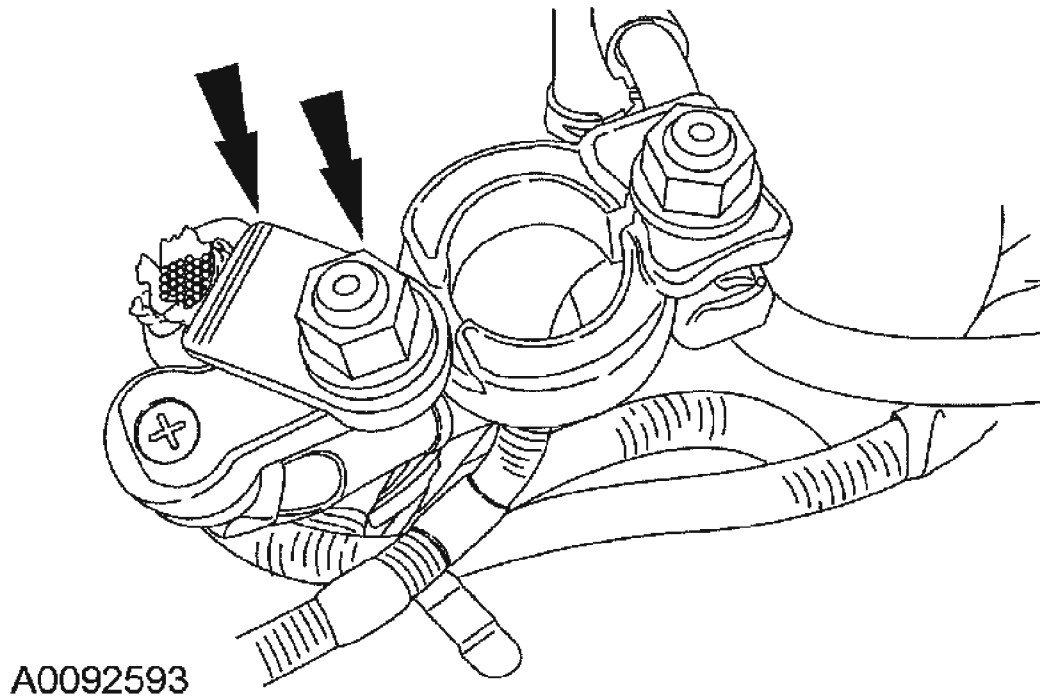
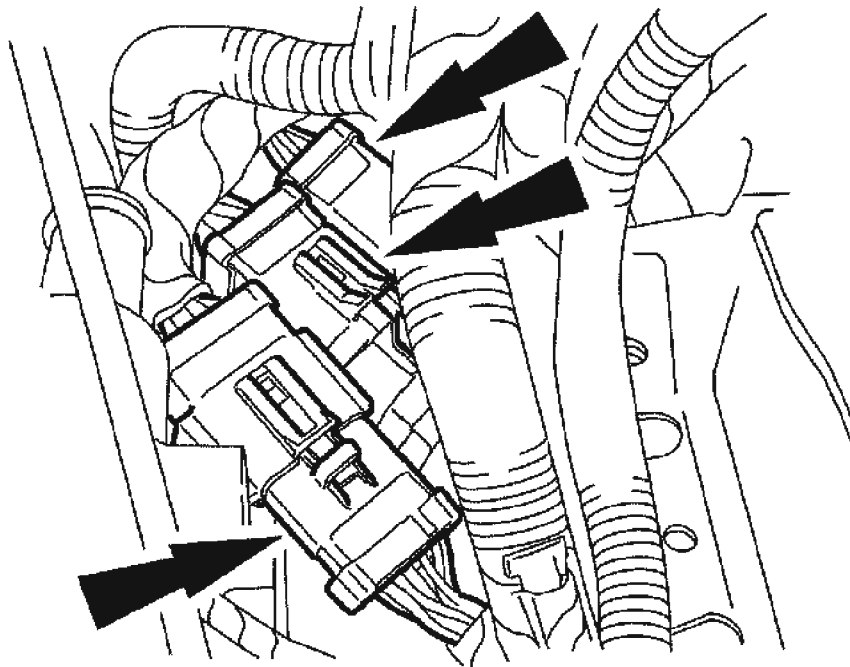


Fig. 241: Removing Power Distribution Wiring Harness Eyelet Nut
Courtesy of FORD MOTOR CO.

33. Disconnect the three main engine wiring harness electrical connectors and detach the connectors from the bracket.



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Fig. 242: Disconnecting Main Engine Wiring Harness Electrical Connectors And Detaching Connectors From Bracket
Courtesy of FORD MOTOR CO.

Vehicles equipped with a manual transmission

NOTE: Press the locking tab.

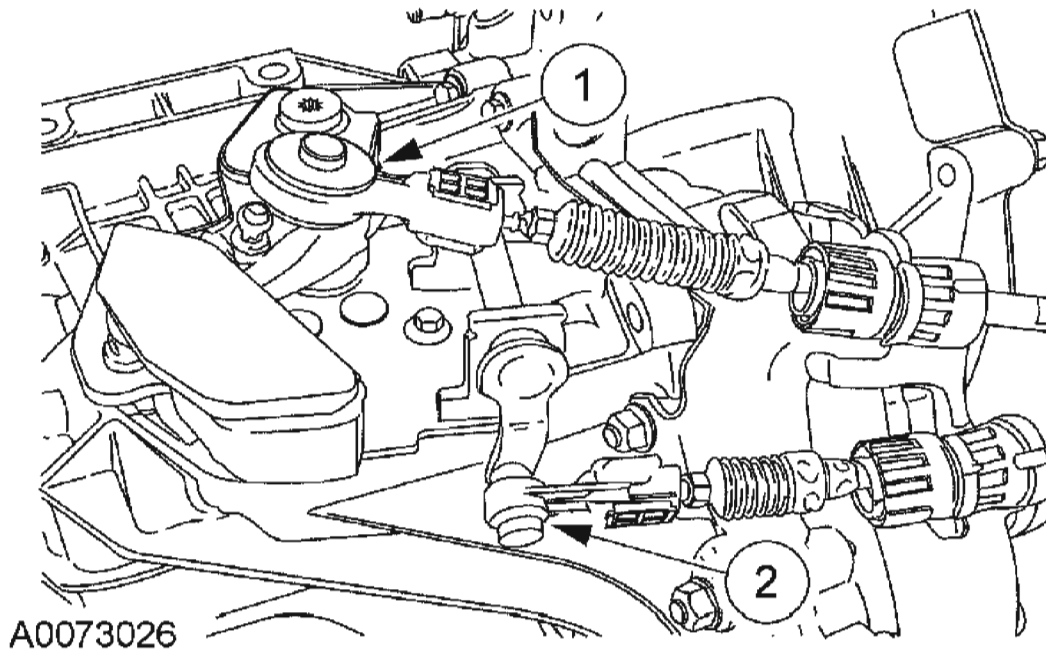


Fig. 243: Detaching Gearshift Cables From Transaxle
Courtesy of FORD MOTOR CO.

34. Detach the gearshift cables from the transaxle.
 1. Detach the shifter cable from the shift mass.
 2. Detach the selector cable from the selector lever.
35. Detach the gearshift cables from the bracket.
 1. Detach the shifter cable from the retaining bracket, turning the abutment sleeves counterclockwise.
 2. Detach the selector cable from the retaining bracket, turning the abutment sleeves counterclockwise.

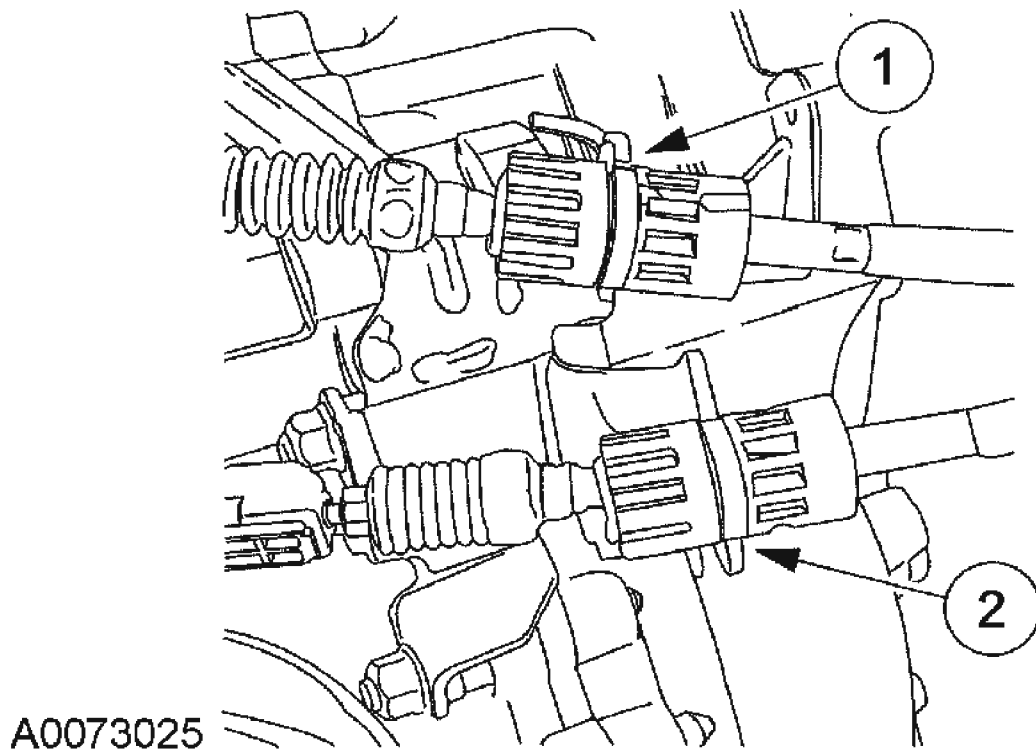


Fig. 244: Detaching Gearshift Cables From Bracket
Courtesy of FORD MOTOR CO.

WARNING: Escaping brake fluid. Do not allow brake fluid to come into contact with the skin or the eyes. If brake fluid does come into contact with the skin or eyes, rinse the affected areas with water immediately. Failure to follow these instructions may result in personal injury.

CAUTION: If brake fluid is spilled on the paint work, the affected area must be immediately washed down with cold water.

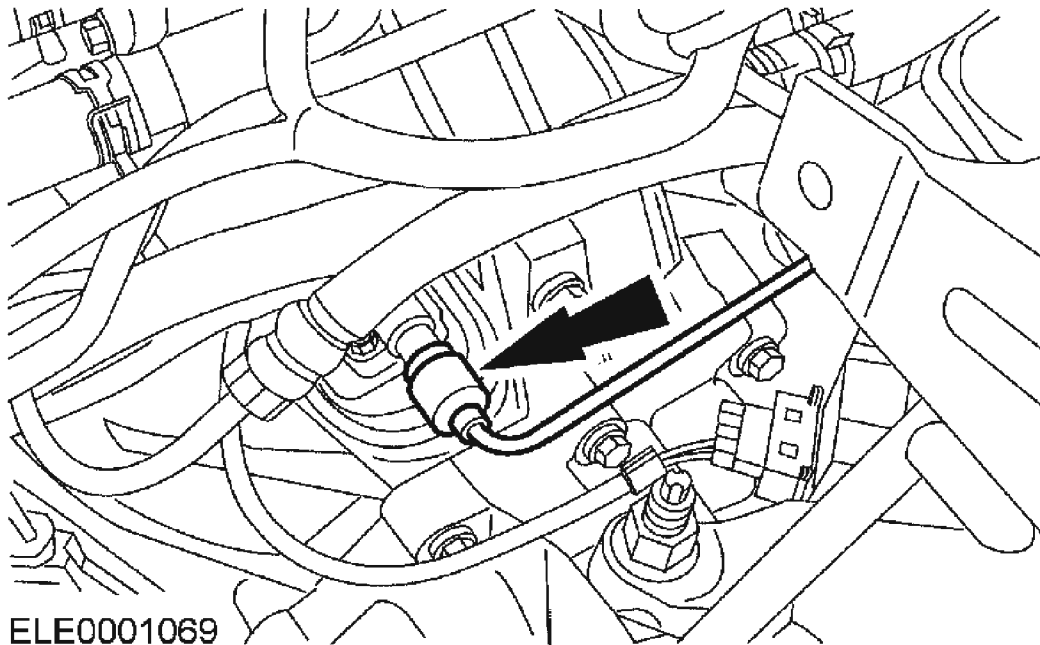


Fig. 245: Removing Clutch Slave Cylinder Supply Tube
Courtesy of FORD MOTOR CO.

36. Remove the clutch slave cylinder supply tube.
 - Remove the clip.
 - Remove the supply tube and secure it to one side using cable ties.
37. Disconnect the reversing lamp switch electrical connector.

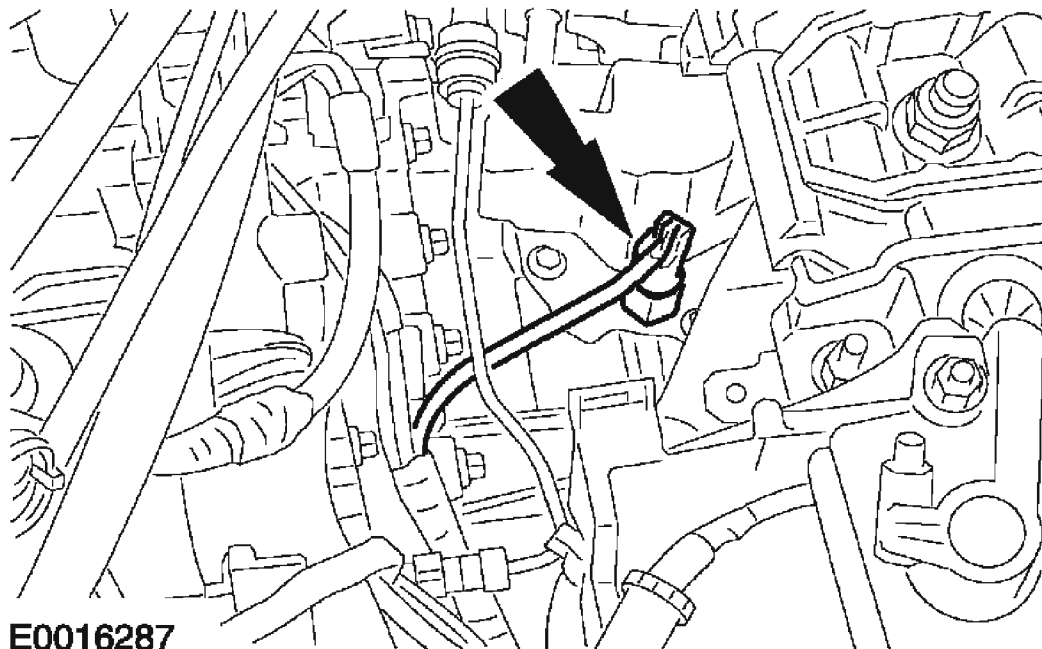
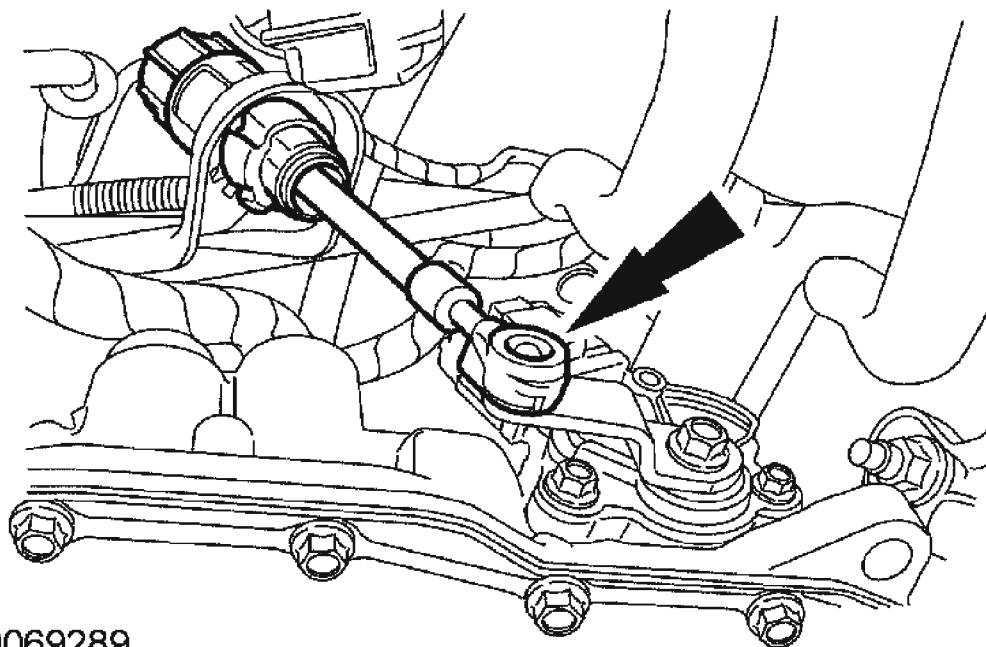


Fig. 246: Disconnecting Reversing Lamp Switch Electrical Connector
Courtesy of FORD MOTOR CO.

Vehicles equipped with a 2.0L engine and automatic transmission

38. Disconnect the transmission shifter cable and position it out of the way.



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Fig. 247: Disconnect Transmission Shifter Cable
Courtesy of FORD MOTOR CO.

39. Disconnect the transmission cooler hoses.

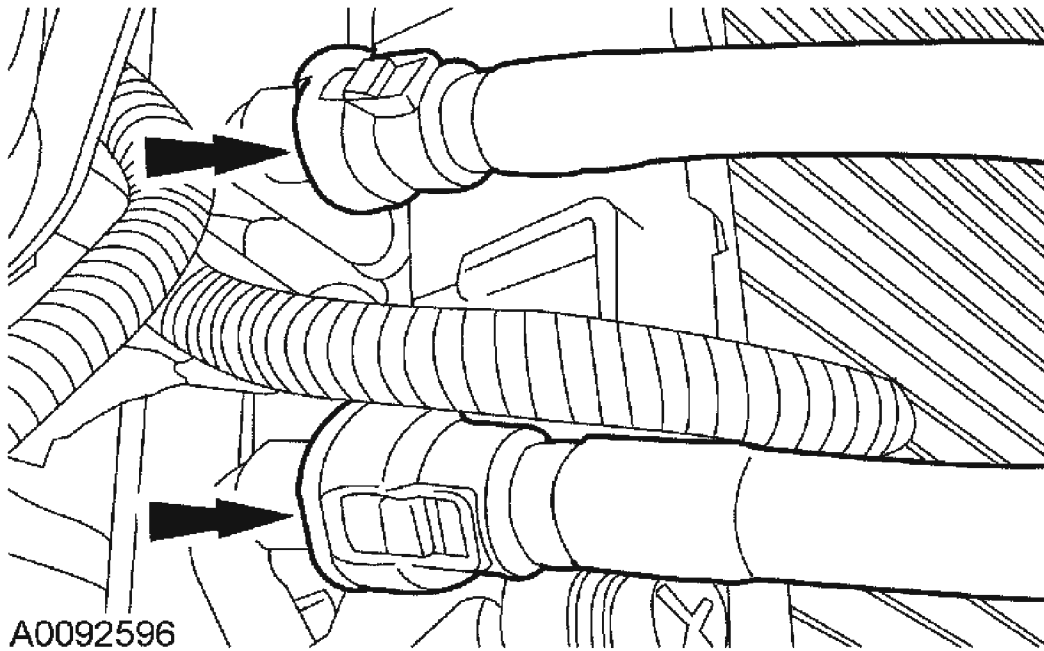
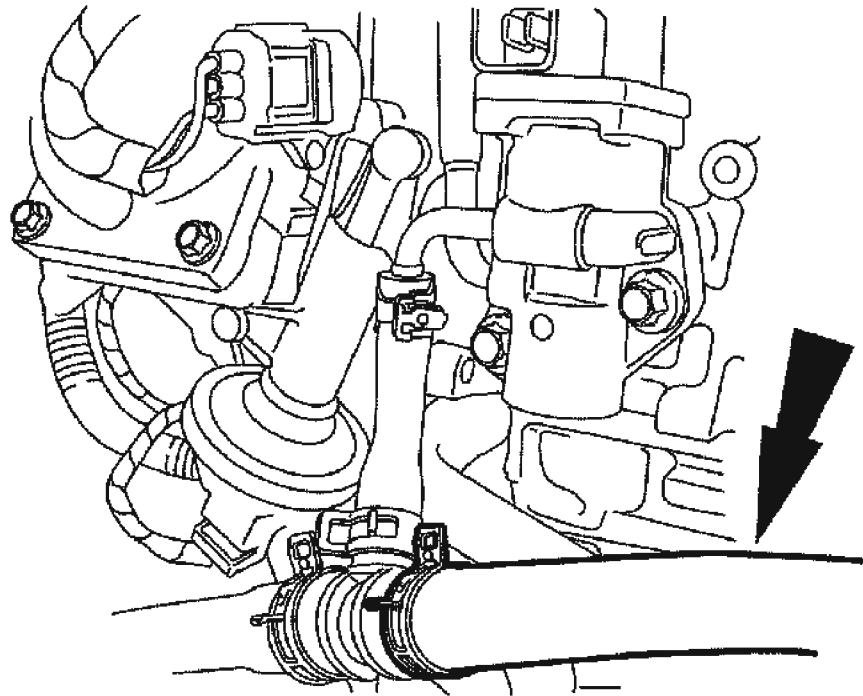


Fig. 248: Disconnecting Transmission Cooler Hoses
Courtesy of FORD MOTOR CO.

All vehicles

40. Disconnect the heater hose from the "T" fitting and position it out of the way.



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Fig. 249: Disconnecting Heater Hose From "T" Fitting
Courtesy of FORD MOTOR CO.

41. Disconnect the coolant hoses from the coolant expansion tank.

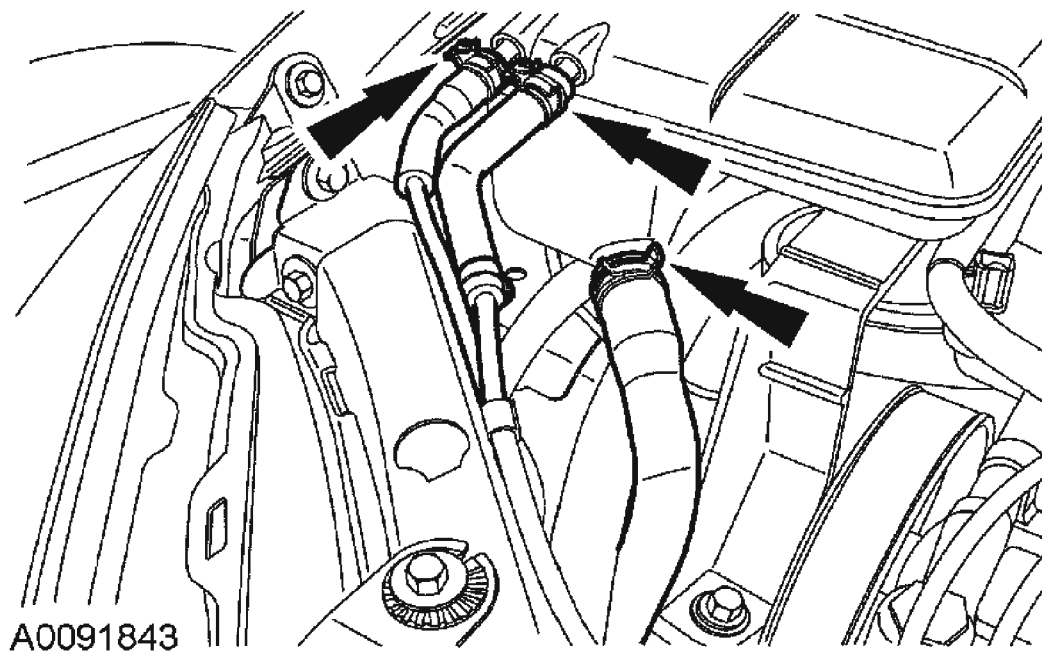


Fig. 250: Disconnecting Coolant Hoses From Coolant Expansion Tank
Courtesy of FORD MOTOR CO.

42. Remove the coolant expansion tank bolt.

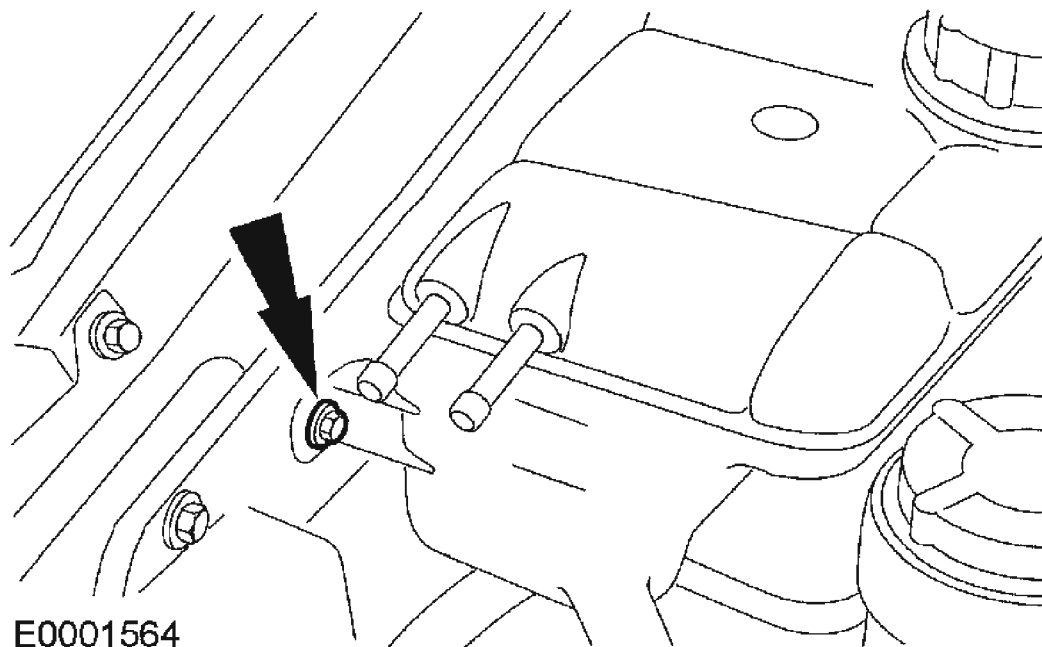


Fig. 251: Removing Coolant Expansion Tank Bolt
Courtesy of FORD MOTOR CO.

43. Remove the coolant expansion tank.
 - Lift the coolant expansion tank out of the retainer.

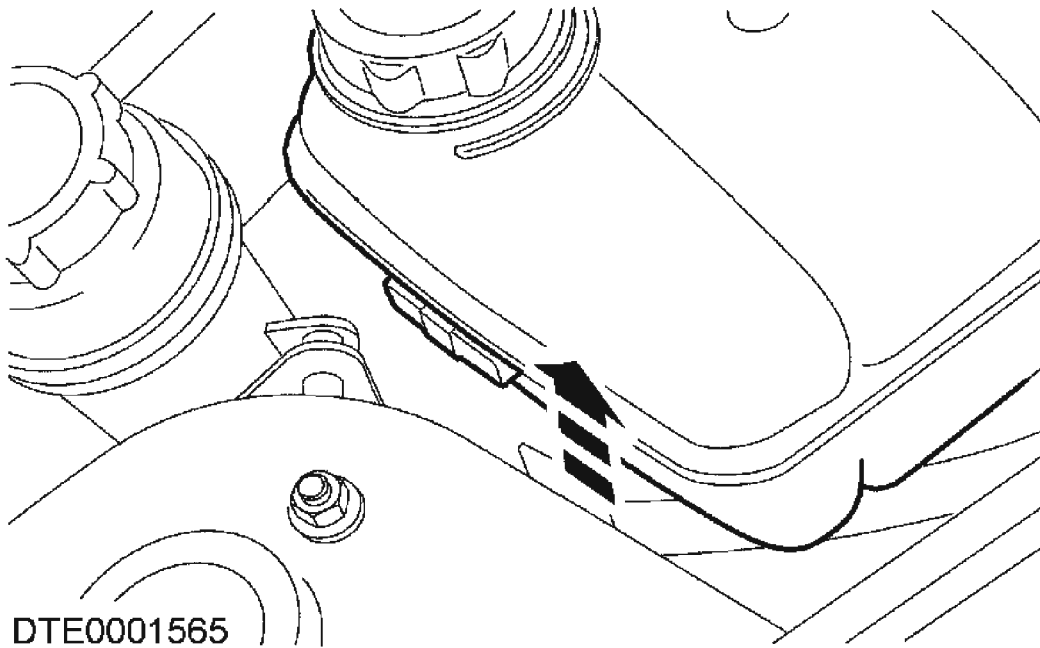


Fig. 252: Removing Coolant Expansion Tank
Courtesy of FORD MOTOR CO.

44. Using the special tool, remove the power steering pump pulley.

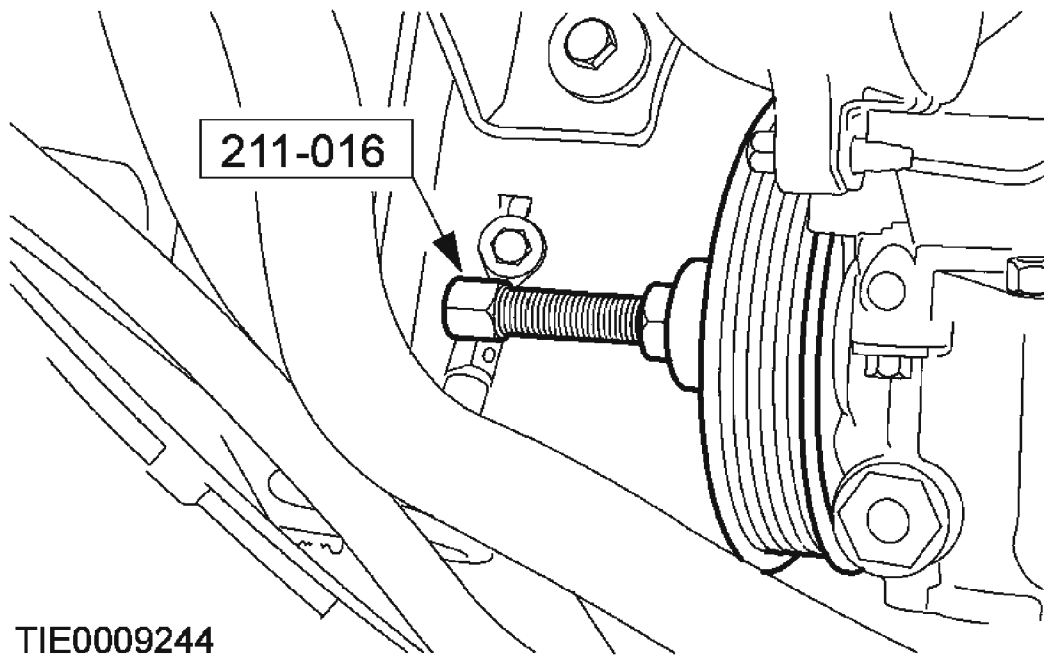
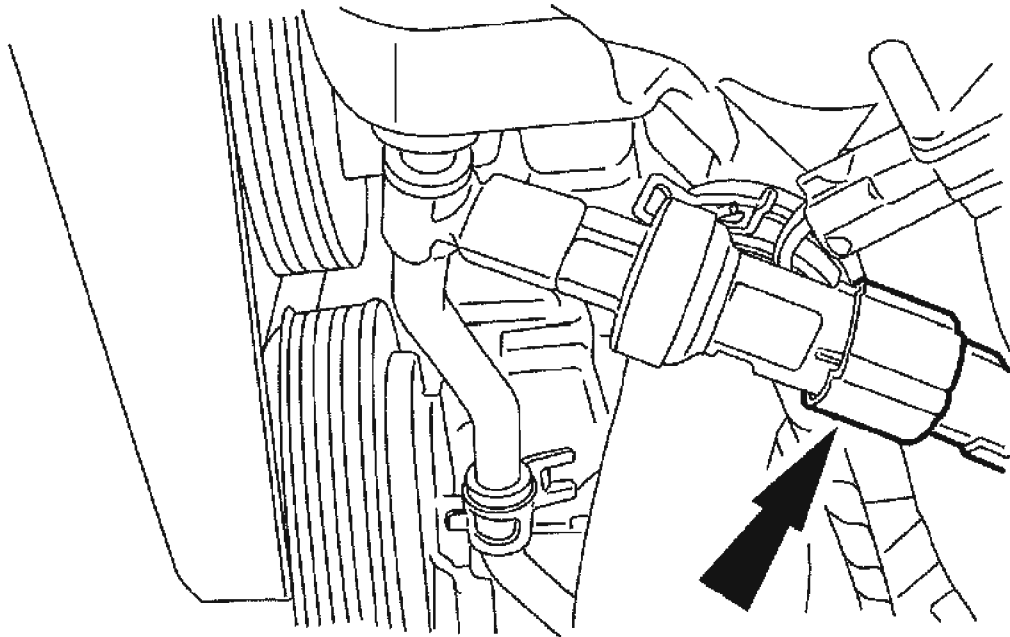


Fig. 253: Removing Power Steering Pump Pulley Using Special Tool
Courtesy of FORD MOTOR CO.

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



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Fig. 254: Disconnecting Power Steering Pressure Switch Electrical Connector
Courtesy of FORD MOTOR CO.

46. Disconnect the PSP tube.

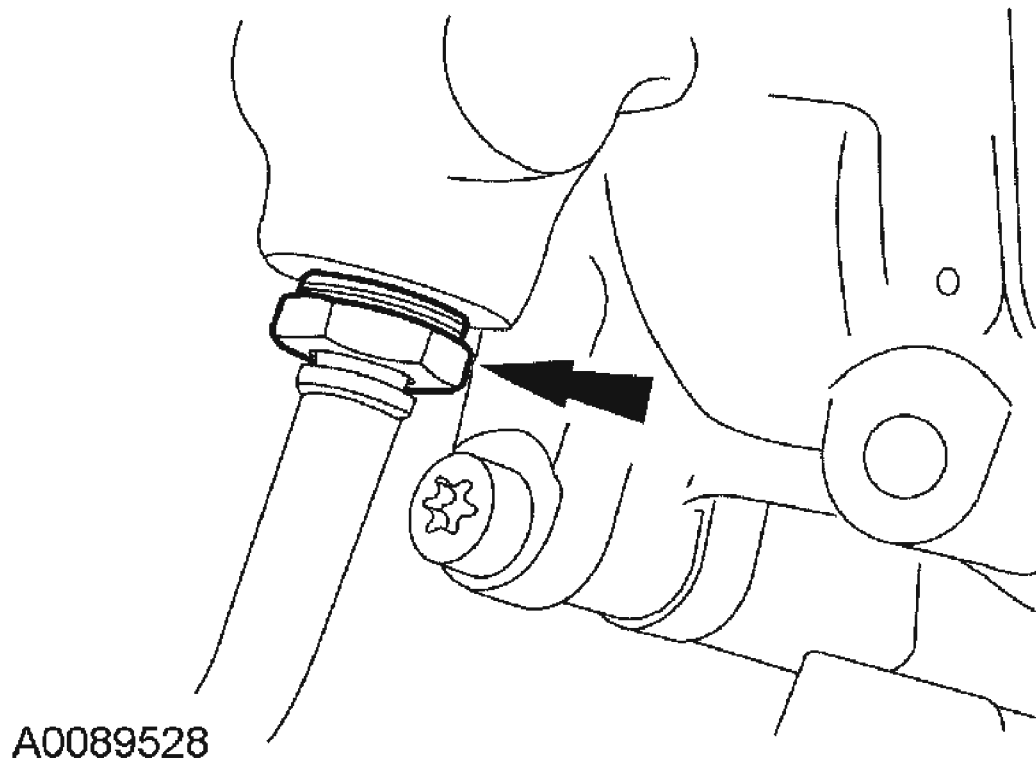


Fig. 255: Disconnecting PSP Tube
Courtesy of FORD MOTOR CO.

47. Remove the power steering pump bolts and position the power steering pump aside.

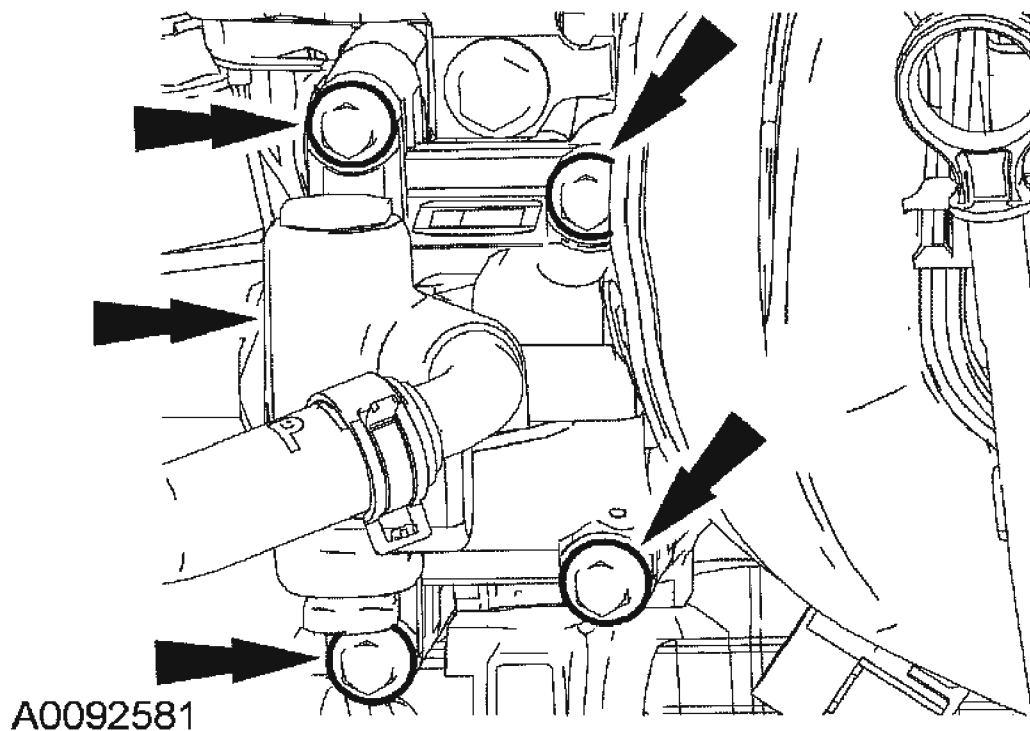


Fig. 256: Removing Power Steering Pump Bolts
Courtesy of FORD MOTOR CO.

48. Disconnect the cooling fan electrical connectors.

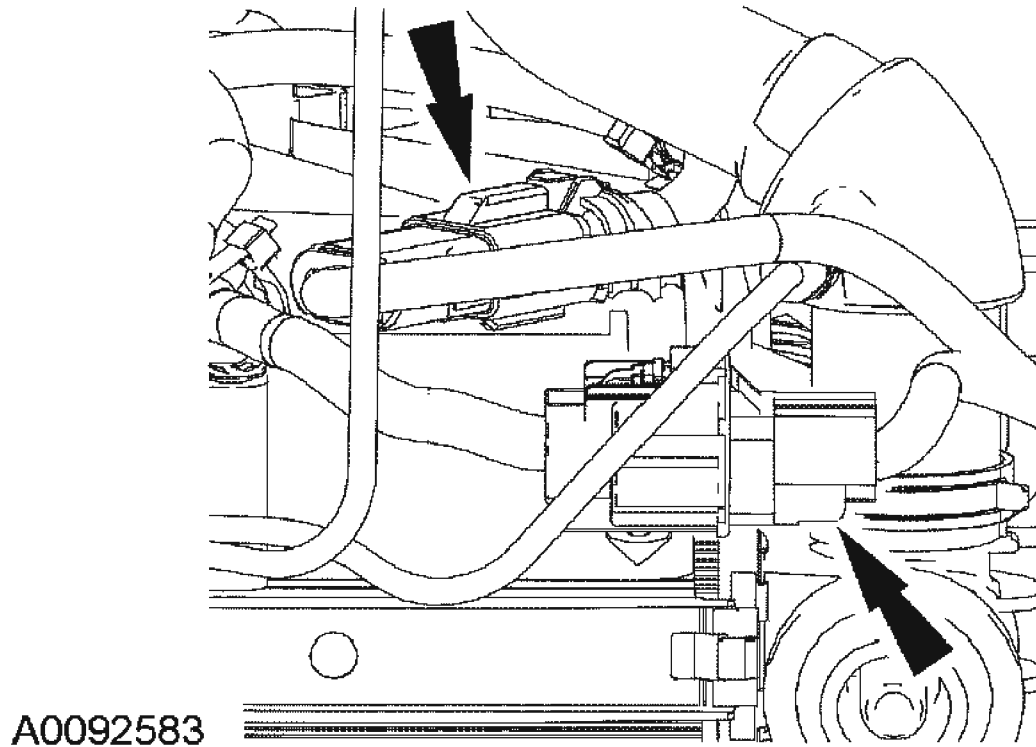
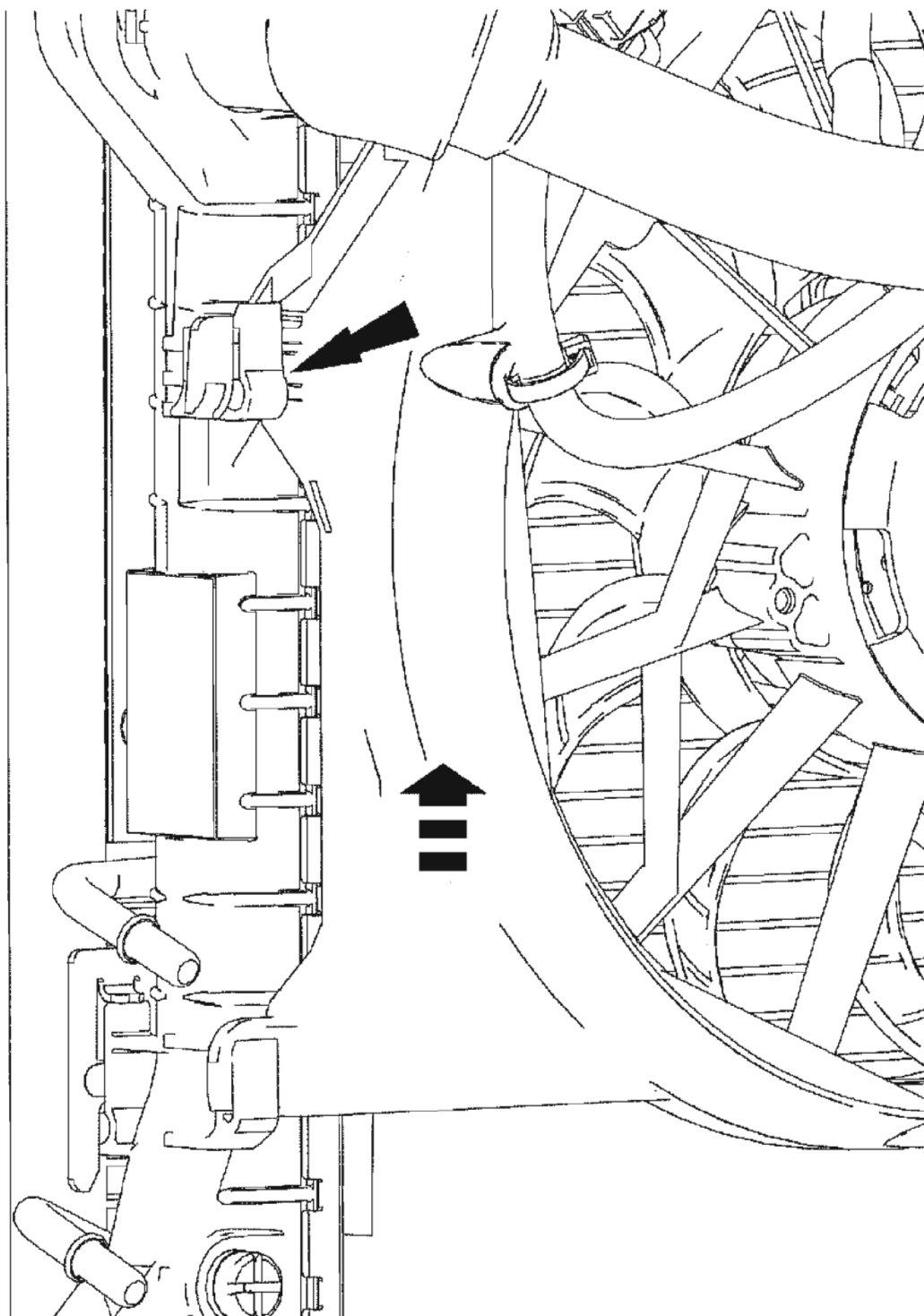


Fig. 257: Disconnecting Cooling Fan Electrical Connectors
Courtesy of FORD MOTOR CO.

49. Release the top cooling fan retaining clips, lift up and remove the cooling fan.



A0092588

Fig. 258: Releasing Top Cooling Fan Retaining Clips, Lifting Up And Removing Cooling Fan

Courtesy of FORD MOTOR CO.

50. Disconnect the lower radiator hose.

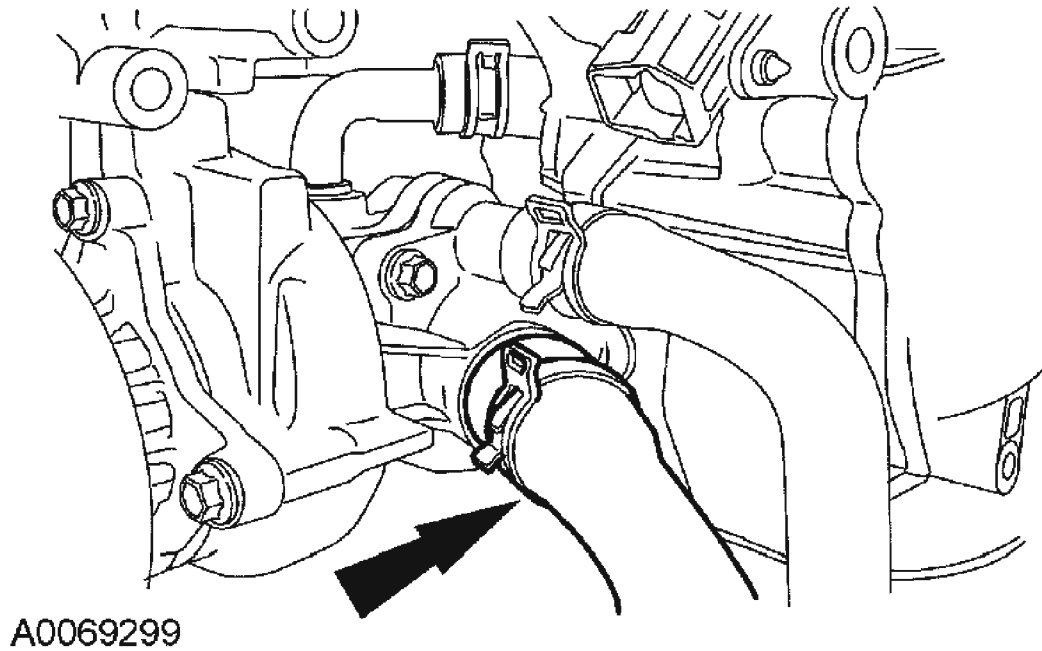


Fig. 259: Disconnecting Lower Radiator Hose
Courtesy of FORD MOTOR CO.

51. Remove the bolt and the ground cable.

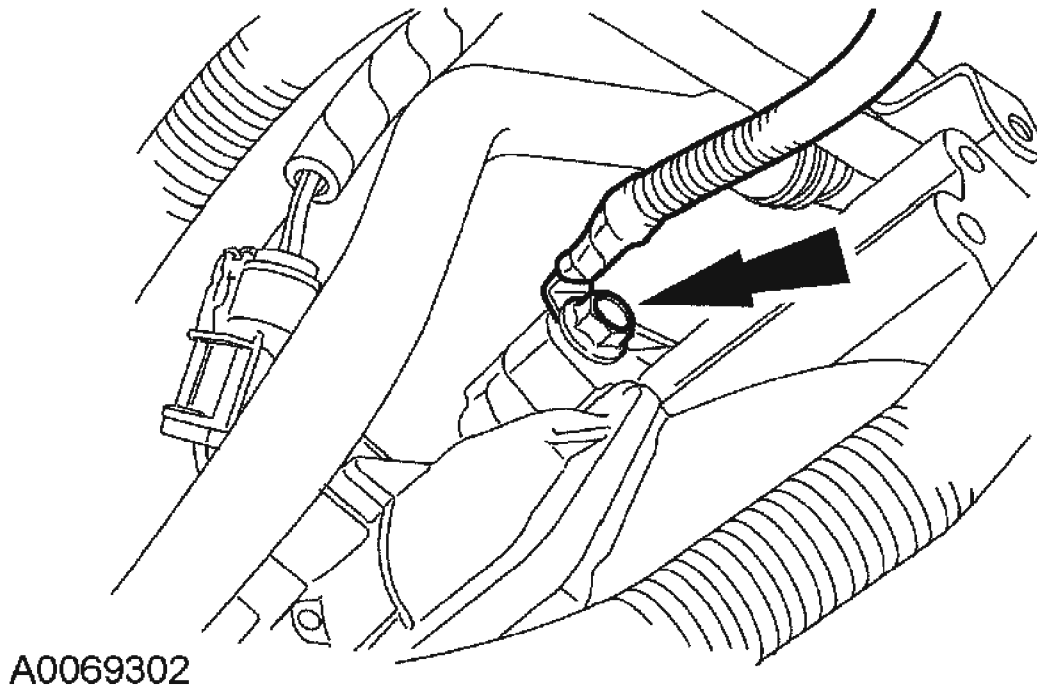
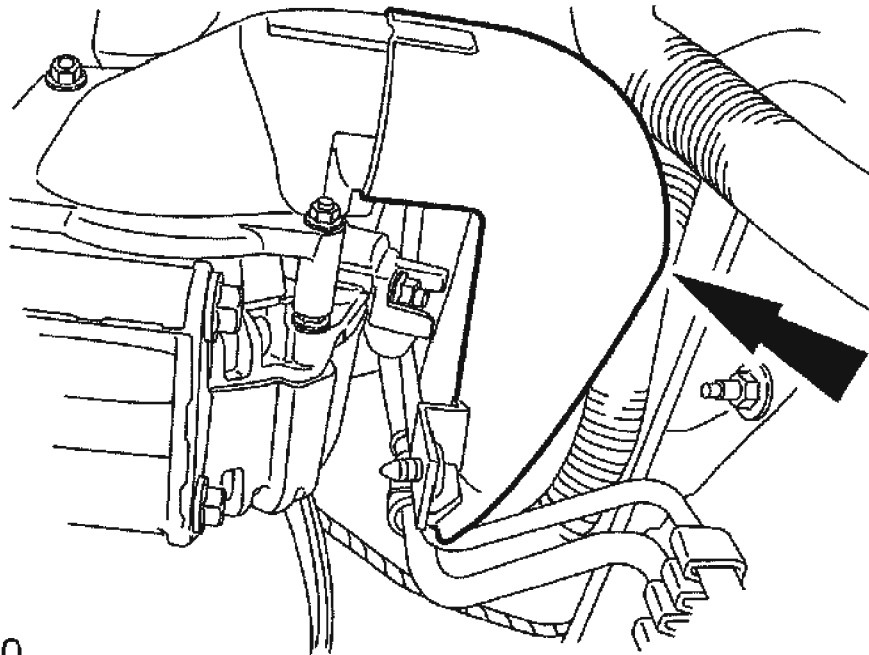


Fig. 260: Removing Ground Cable Bolt
Courtesy of FORD MOTOR CO.

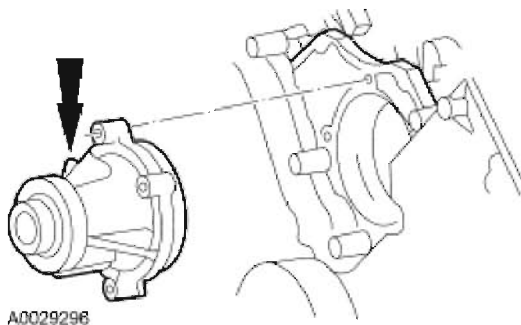
52. Remove the generator cooling pipe.



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Fig. 261: Removing Generator Cooling Pipe
Courtesy of FORD MOTOR CO.

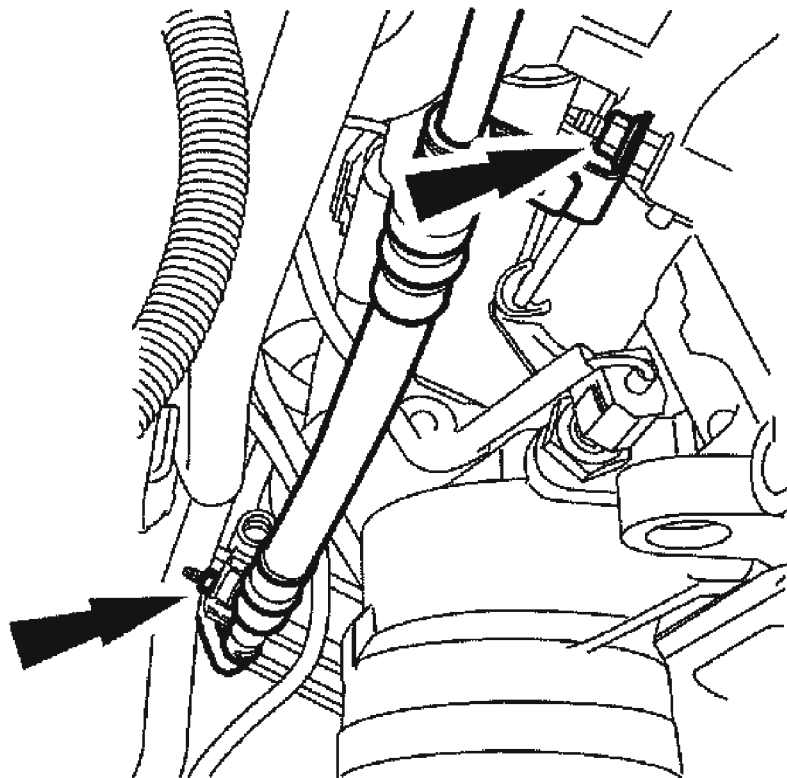
53. Disconnect the starter motor electrical terminals.



A0029296

Fig. 262: Identifying Coolant Pump
Courtesy of FORD MOTOR CO.

54. Remove the nuts and detach the power steering pressure tube brackets from the stud bolts.



A0089529

Fig. 263: Detaching Power Steering Pressure Tube Brackets From Stud Bolts
Courtesy of FORD MOTOR CO.

Vehicles equipped with air conditioning

55. Disconnect the A/C compressor electrical connector.



Fig. 264: Disconnect A/C Compressor Electrical Connector
Courtesy of FORD MOTOR CO.

56. Remove the three A/C compressor bolts.

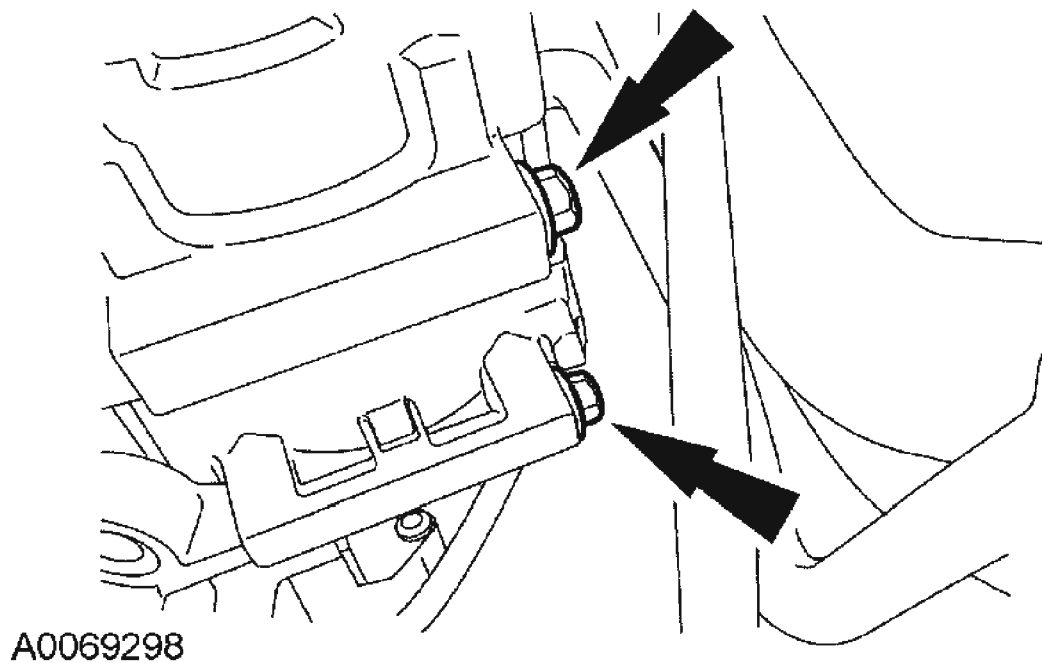


Fig. 265: Removing A/C Compressor Bolts
Courtesy of FORD MOTOR CO.

57. Loosen the bolt and remove the A/C compressor.
- Lower the A/C compressor to access the manifold bolt.
 - Discard the O-ring seals.

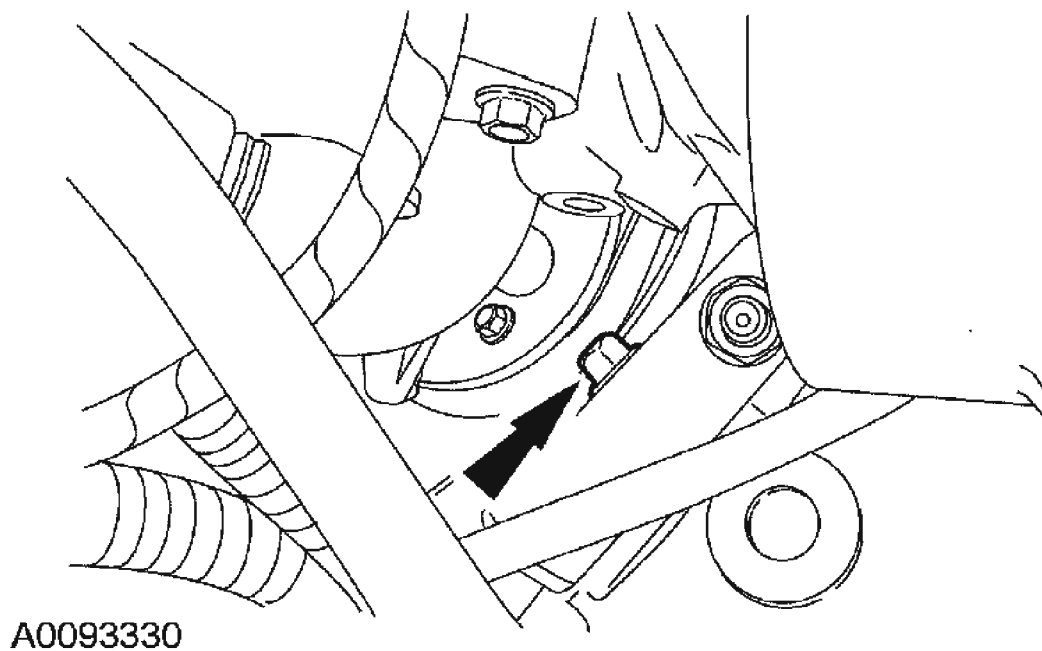


Fig. 266: Removing A/C Compressor
Courtesy of FORD MOTOR CO.

All vehicles

58. Detach the LH brake hose from the support bracket.

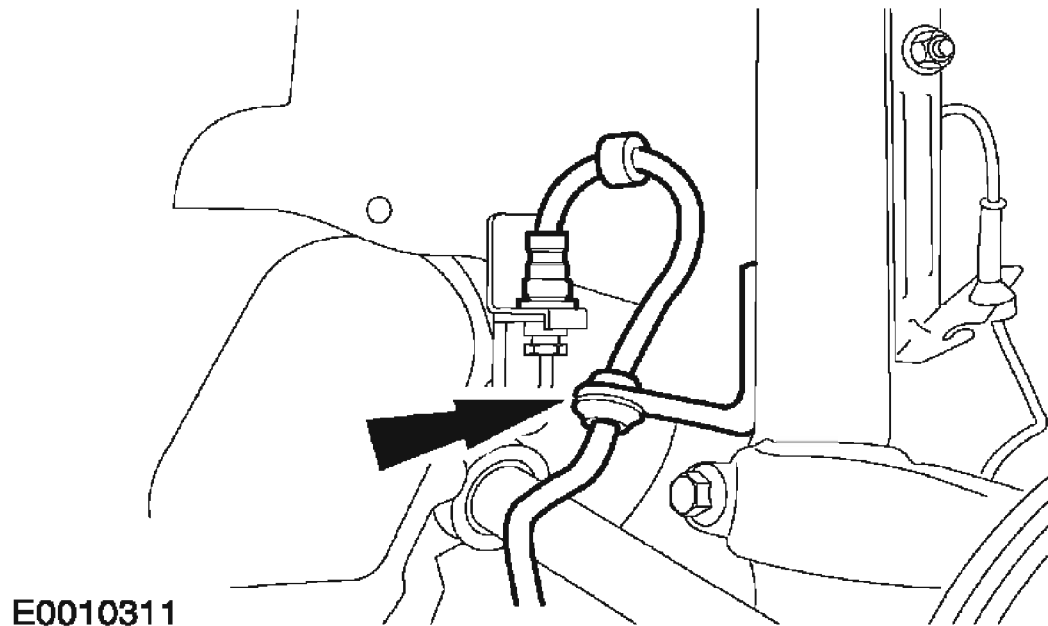


Fig. 267: Detaching LH Brake Hose From Support Bracket
Courtesy of FORD MOTOR CO.

59. Detach the LH caliper.
 1. Remove the bolt covers.
 2. Remove the bolts.

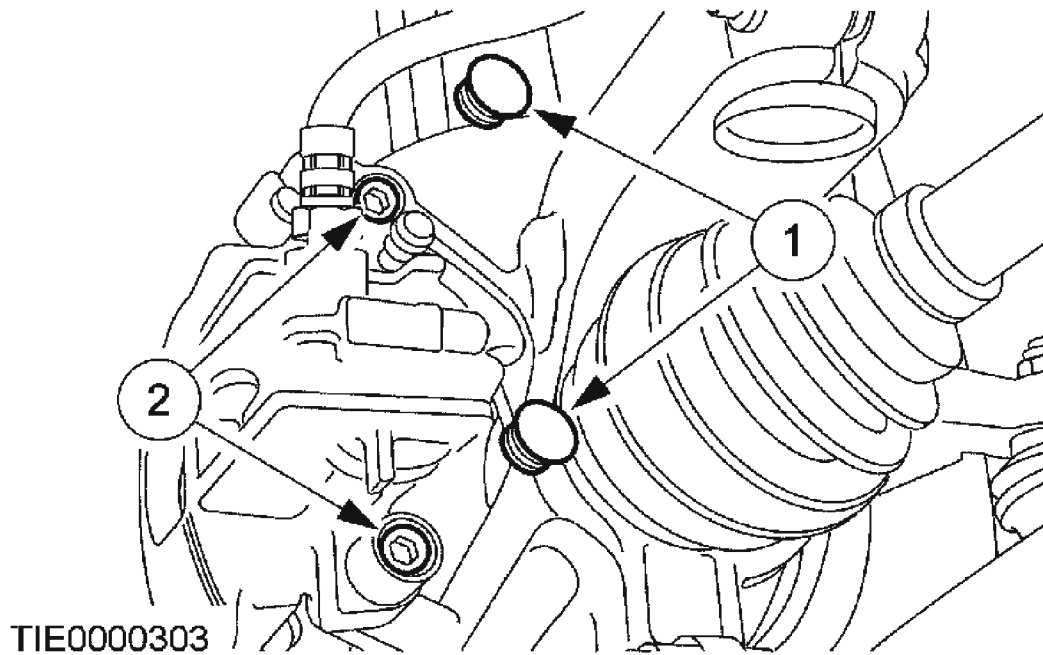


Fig. 268: Detaching LH Caliper
Courtesy of FORD MOTOR CO.

CAUTION: Suspend the caliper to prevent load from being placed on the brake hose.

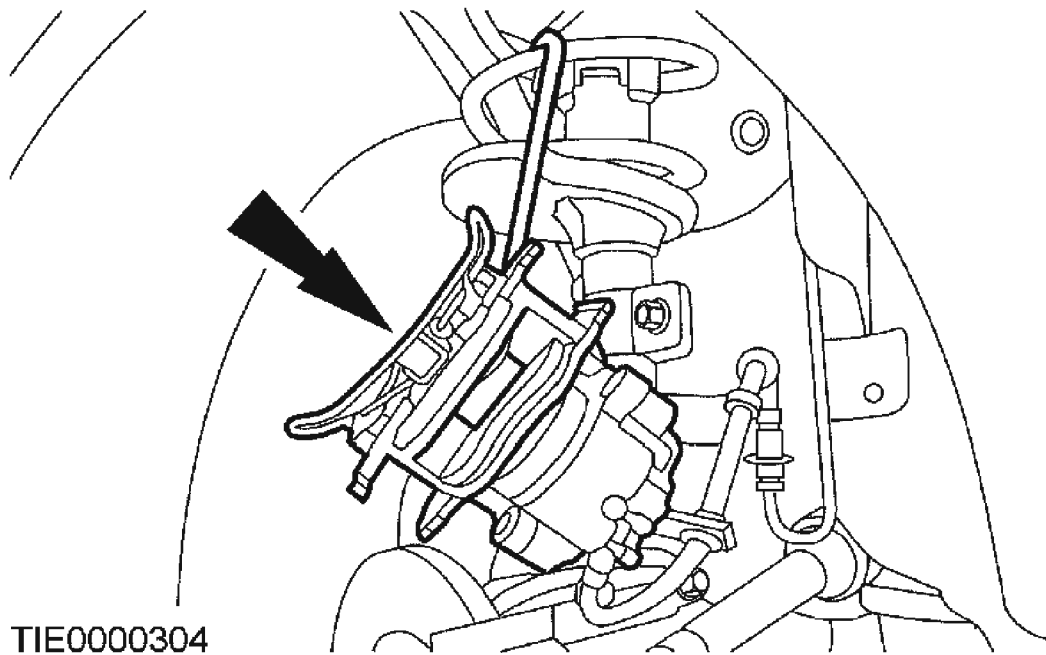


Fig. 269: Supporting Brake Caliper
Courtesy of FORD MOTOR CO.

60. Support the brake caliper.
61. Loosen the LH strut and spring assembly top mount nuts by four turns.

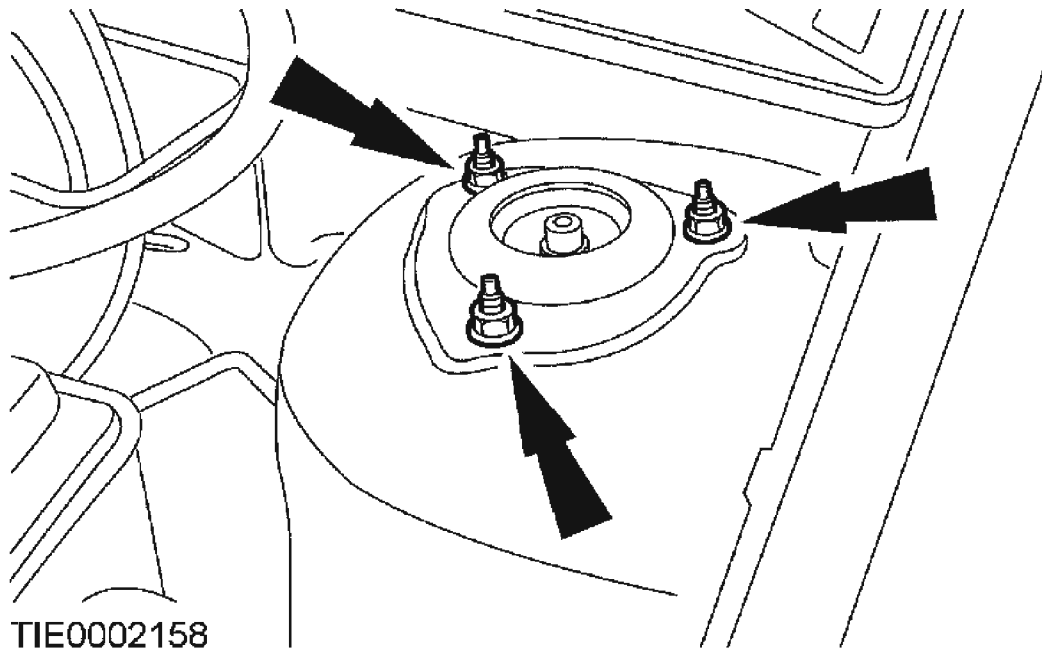


Fig. 270: Loosening LH Strut And Spring Assembly Top Mount Nuts
Courtesy of FORD MOTOR CO.

62. Remove the nut and disconnect the LH stabilizer bar at the strut.

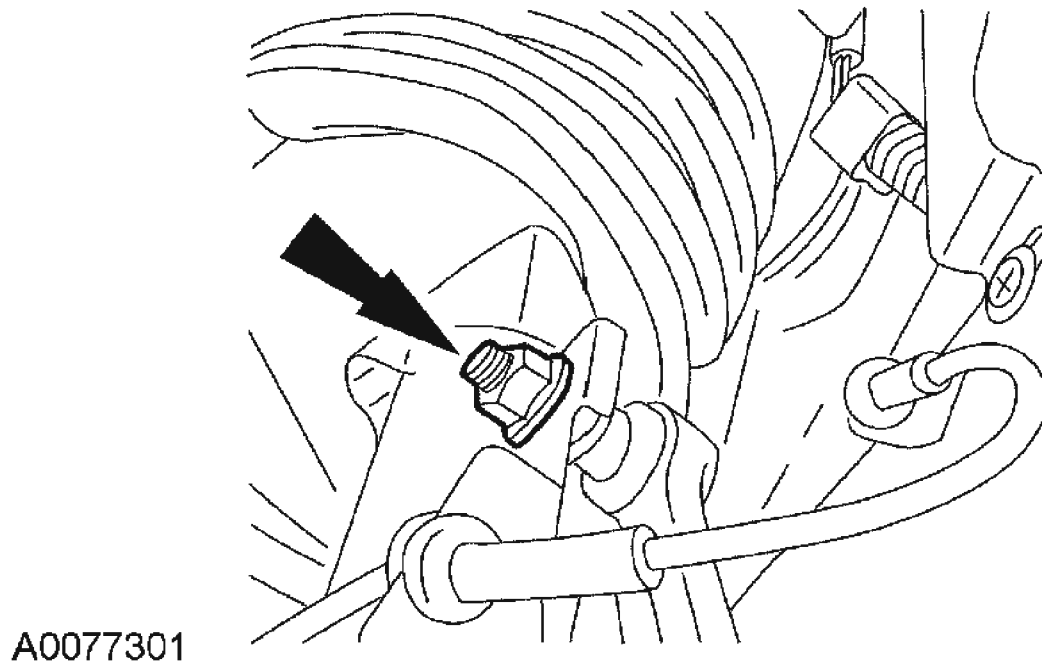
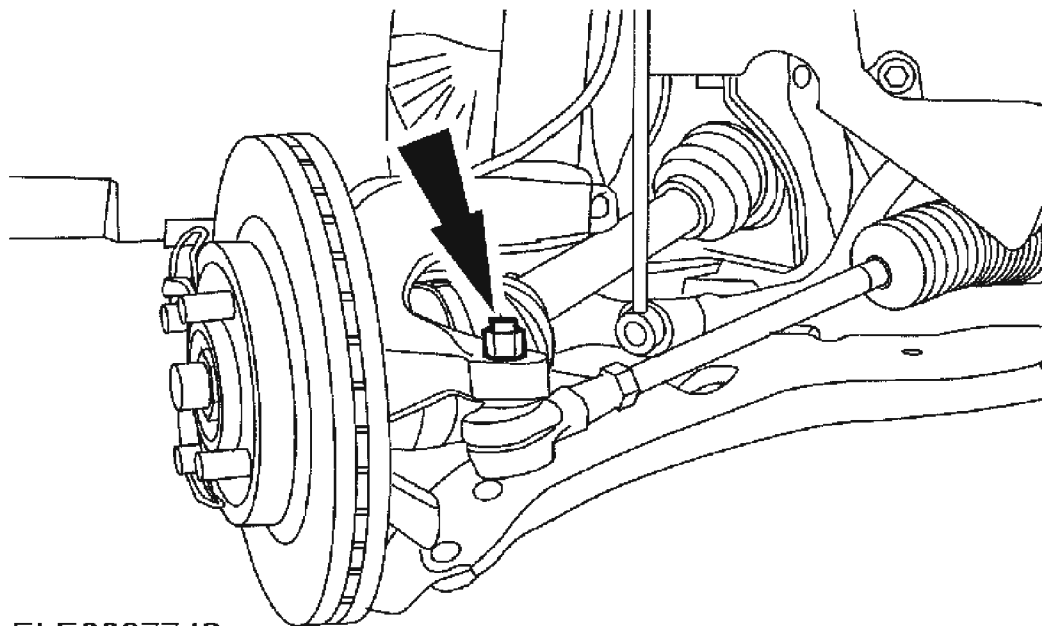


Fig. 271: Removing LH Stabilizer Bar Nut
Courtesy of FORD MOTOR CO.

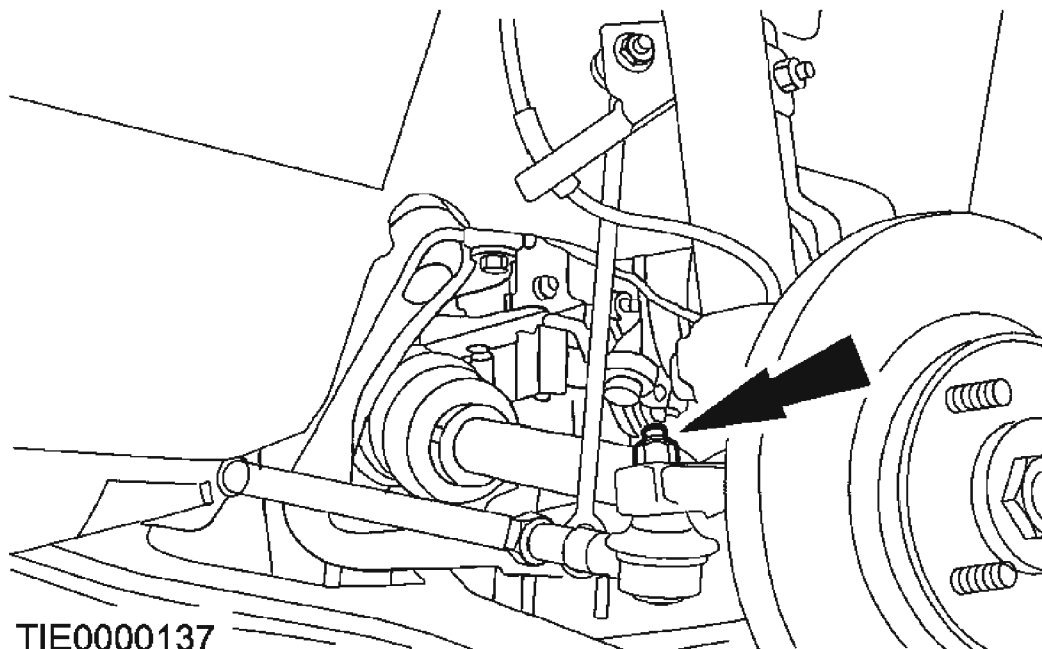
63. Remove the LH tie-rod end nut.



ELE0007748

Fig. 272: Removing LH Tie-Rod End Nut
Courtesy of FORD MOTOR CO.

64. Remove the RH tie-rod end nut.



TIE0000137

Fig. 273: Removing RH Tie-Rod End Nut
Courtesy of FORD MOTOR CO.

65. Using the special tool, disconnect both tie-rods from the knuckles.

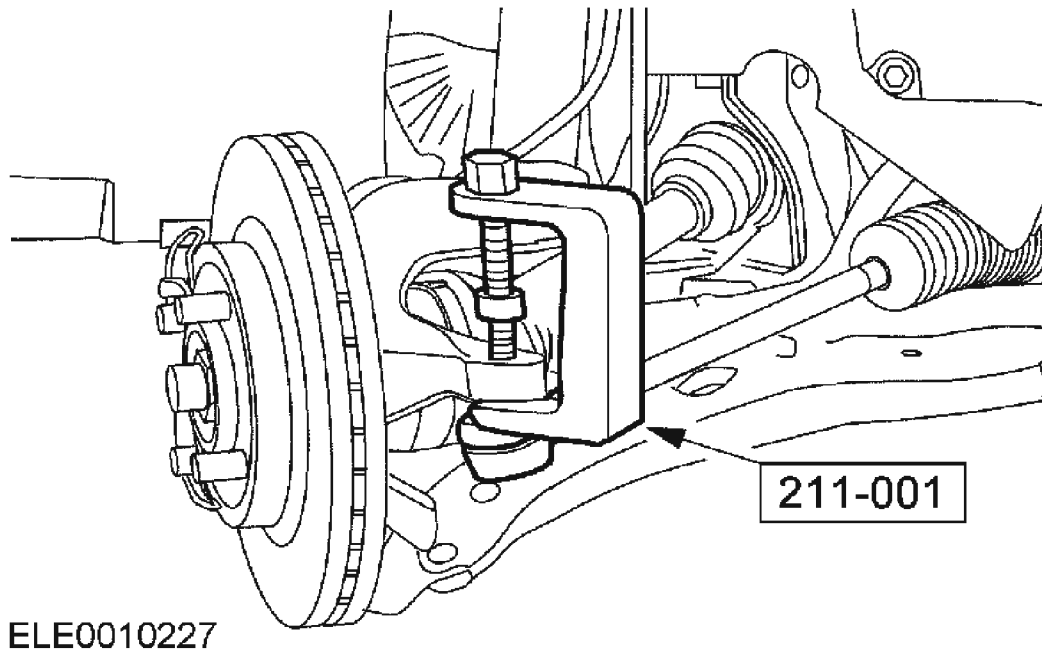
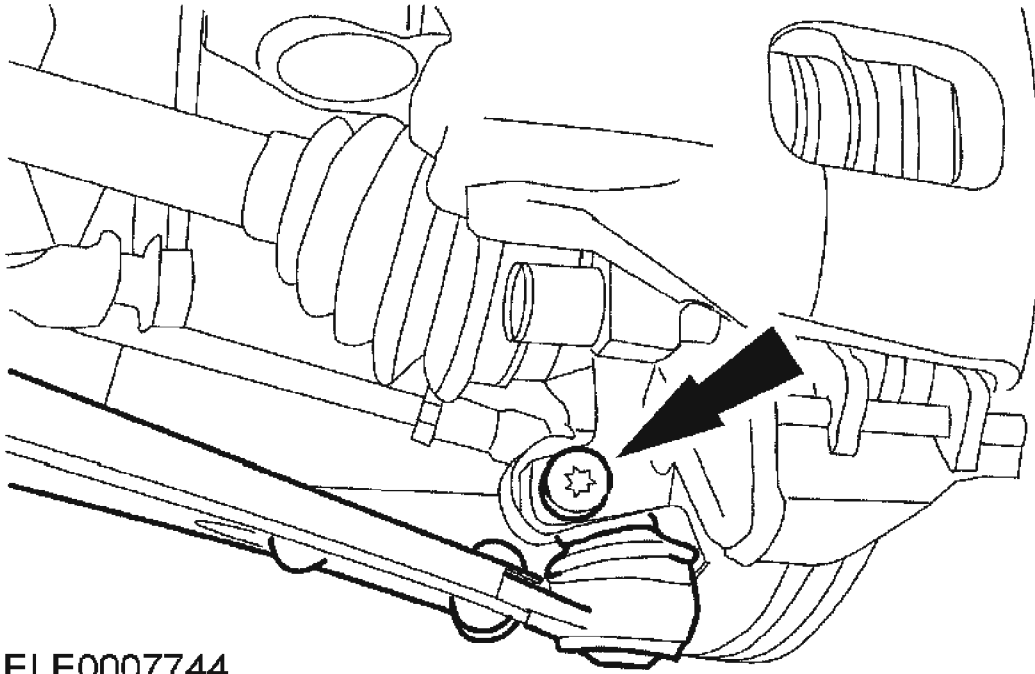


Fig. 274: Disconnecting Both Tie-Rods From Knuckles Using Special Tool
Courtesy of FORD MOTOR CO.

66. Remove the bolts and disconnect both lower control arms from the knuckles.



ELE0007744

Fig. 275: Removing Bolts And Disconnecting Both Lower Control Arms From Knuckles

Courtesy of FORD MOTOR CO.

67. Remove the nuts and the intermediate shaft bearing bracket.

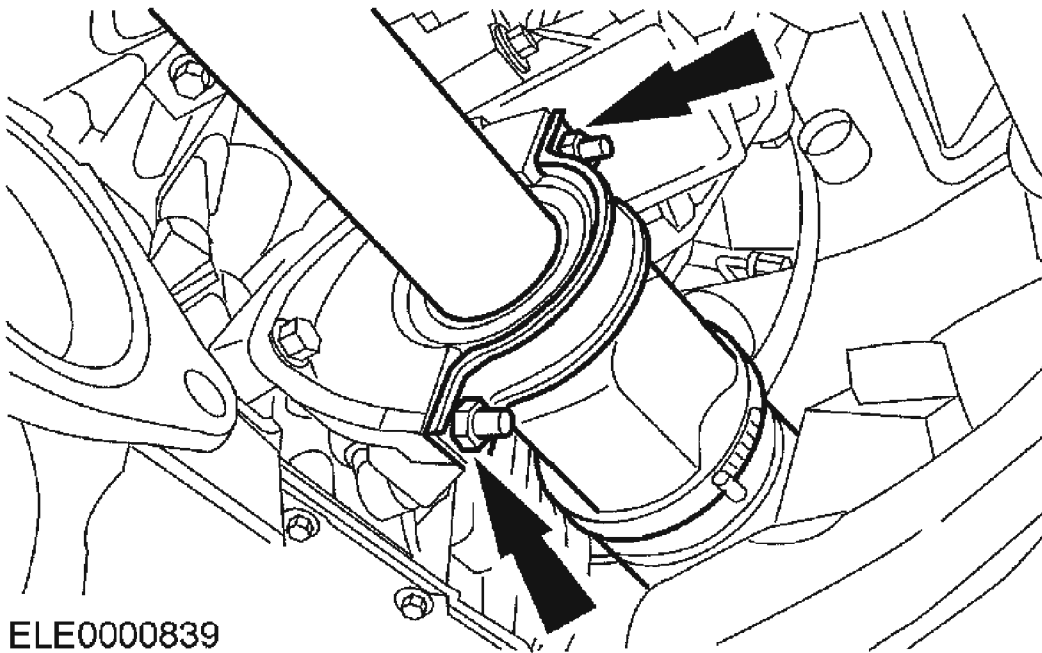


Fig. 276: Removing Nuts And Intermediate Shaft Bearing Bracket
Courtesy of FORD MOTOR CO.

68. Remove the intermediate shaft and RH front drive halfshaft assembly from the transaxle. Position it aside and support with mechanic's wire.
 - Install a plug into the transaxle opening.

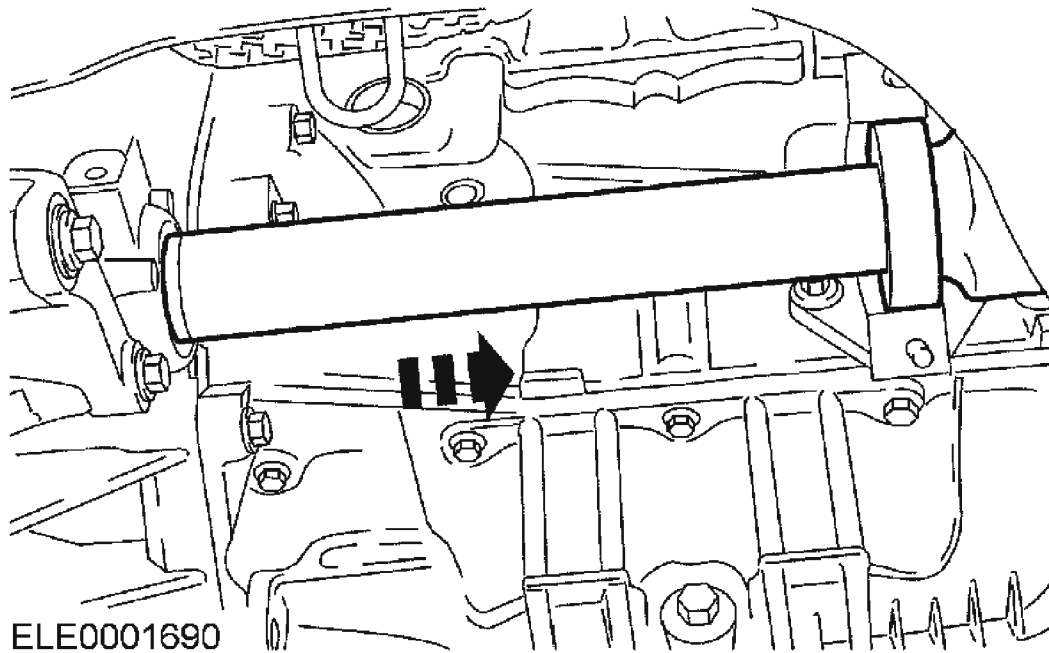


Fig. 277: Removing Intermediate Shaft And RH Front Drive Halfshaft Assembly From Transaxle

Courtesy of FORD MOTOR CO.

69. Using the special tools, remove the LH front drive halfshaft from the transaxle. Position it aside and support with mechanic's wire.
 - Install a plug into the transaxle opening.

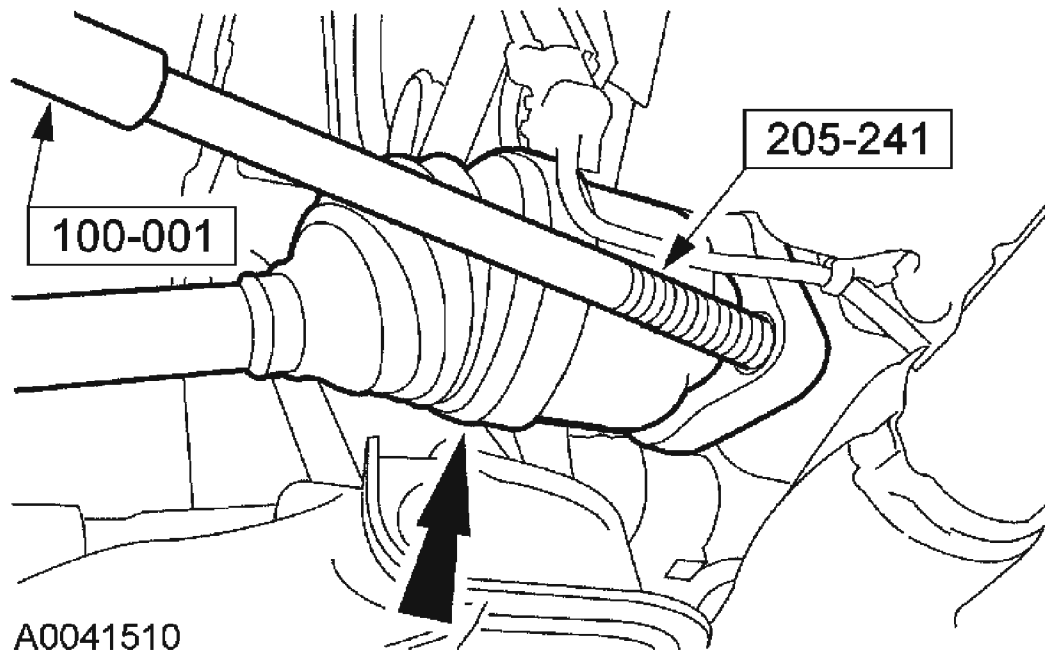


Fig. 278: Removing LH Front Drive Halfshaft From Transaxle Using Special Tools

Courtesy of FORD MOTOR CO.

70. Remove the bolts and the transaxle roll restrictor.

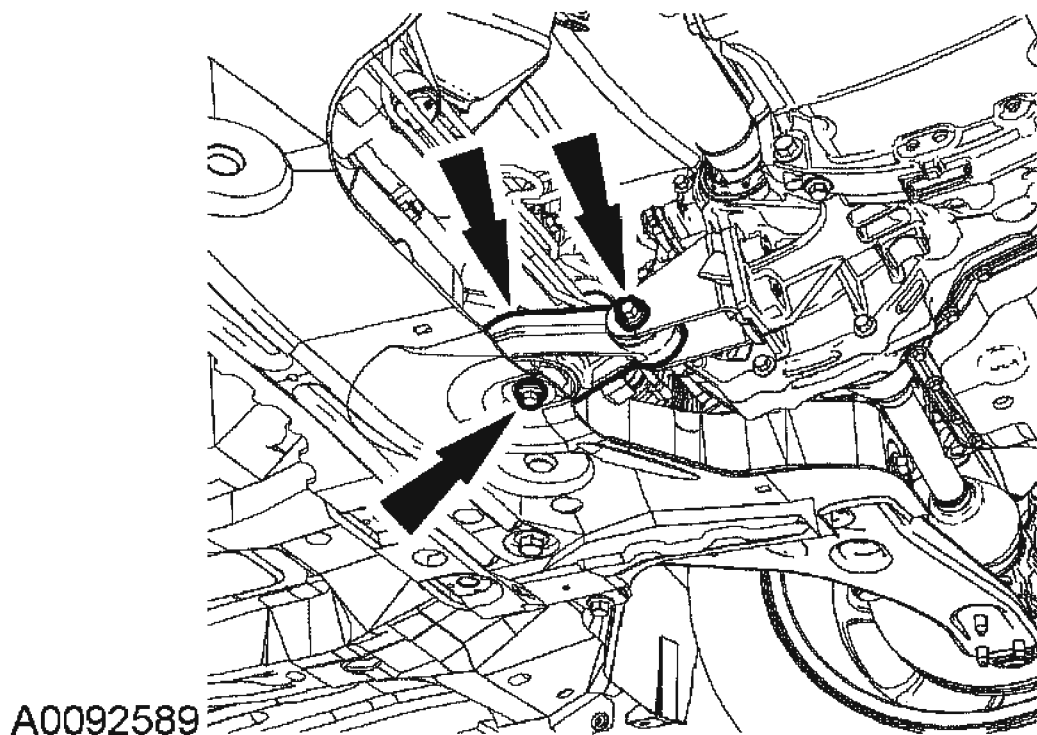


Fig. 279: Removing Transaxle Roll Restrictor Bolts
Courtesy of FORD MOTOR CO.

71. Remove the three bolts and the starter.

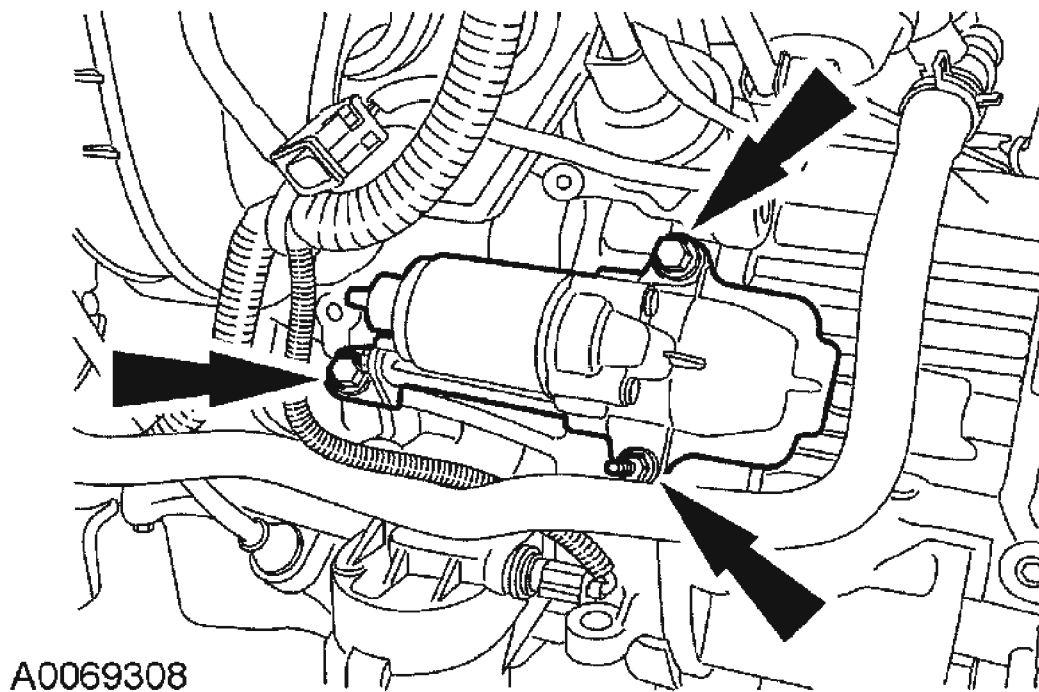


Fig. 280: Removing Three Bolts And Starter
Courtesy of FORD MOTOR CO.

72. Remove the starter isolator.

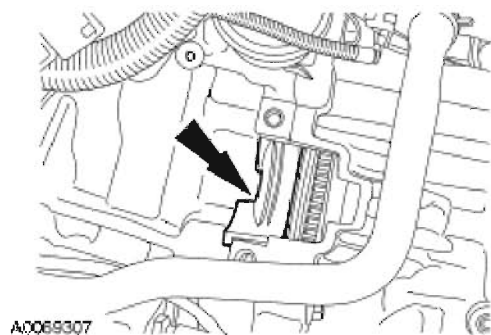


Fig. 281: Identifying Starter Motor Isolator
Courtesy of FORD MOTOR CO.

73. Remove the two lower bell housing bolts.

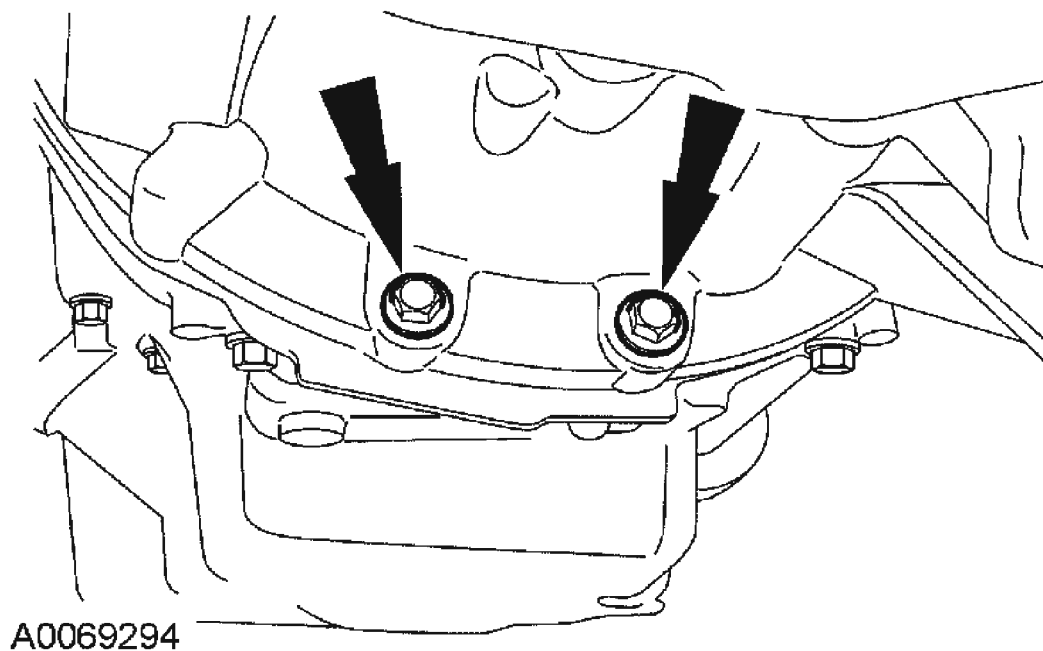


Fig. 282: Removing Lower Bell Housing Bolts
Courtesy of FORD MOTOR CO.

74. Remove the two oil pan-to-bell housing bolts.

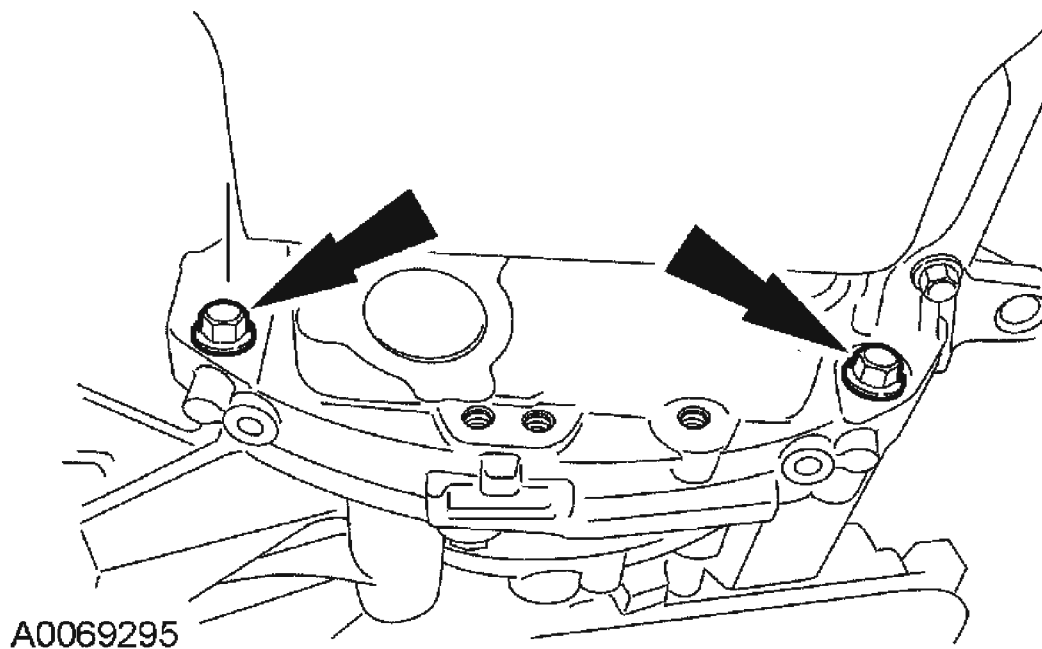
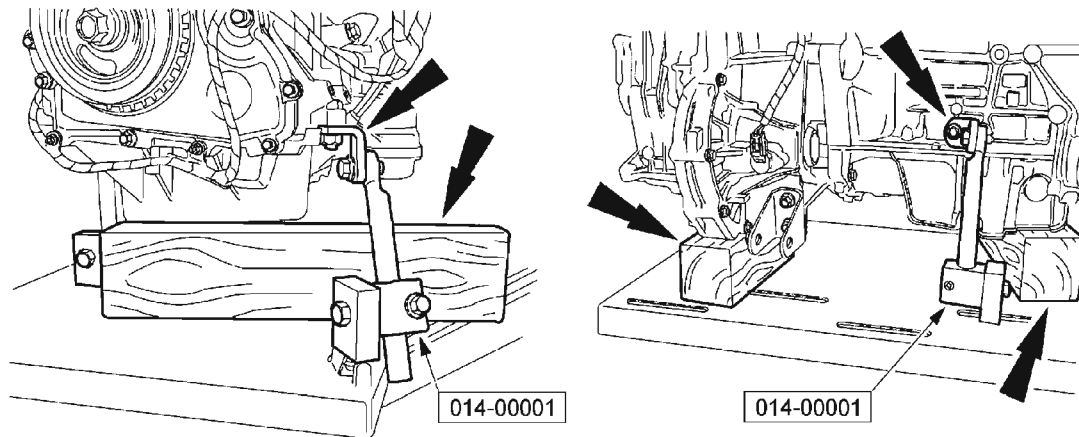


Fig. 283: Removing Oil Pan-To-Bell Housing Bolts
Courtesy of FORD MOTOR CO.

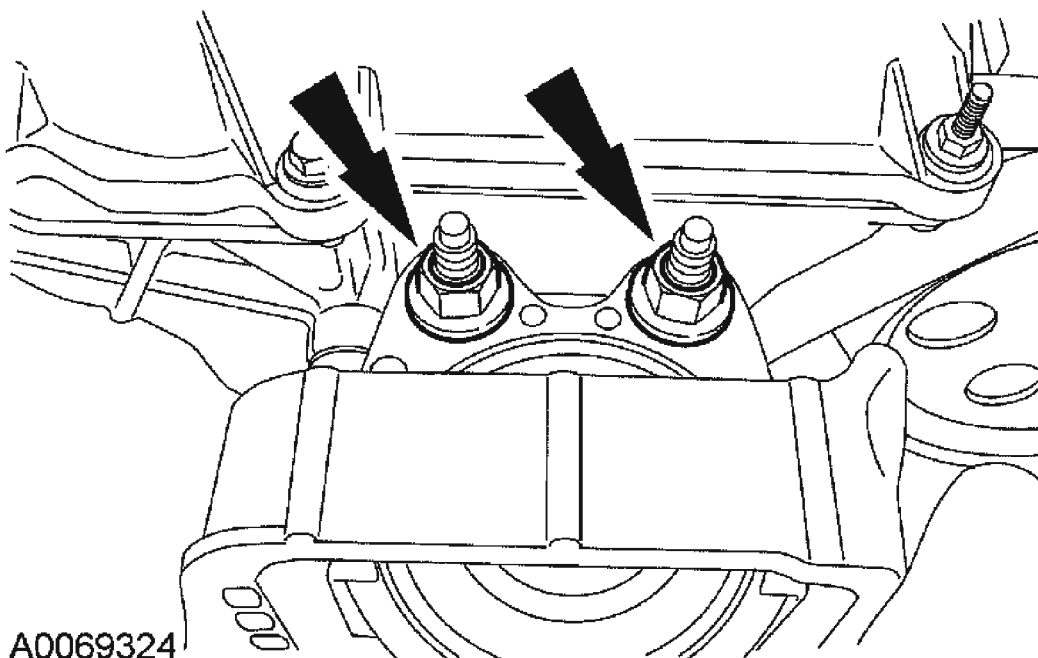
75. Using the special tools, fasten the engine to the lift table.



A0069301

Fig. 284: Fastening Engine To Lift Table Using Special Tools
Courtesy of FORD MOTOR CO.

76. Remove the motor mount nuts.



A0069324

Fig. 285: Removing Motor Mount Nuts

Courtesy of FORD MOTOR CO.

77. Remove the transaxle mount center nut.

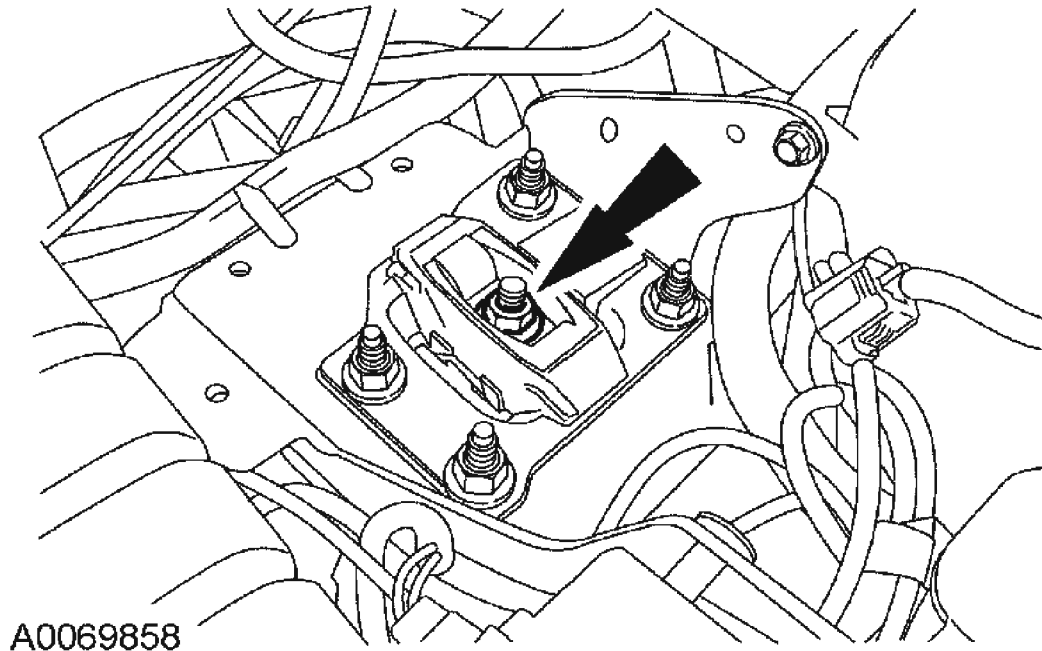


Fig. 286: Removing Transaxle Mount Center Nut
Courtesy of FORD MOTOR CO.

78. Lower the engine and transaxle assembly from the vehicle.

Vehicles equipped with a manual transmission

79. Disconnect the vehicle speed sensor (VSS) electrical connector.

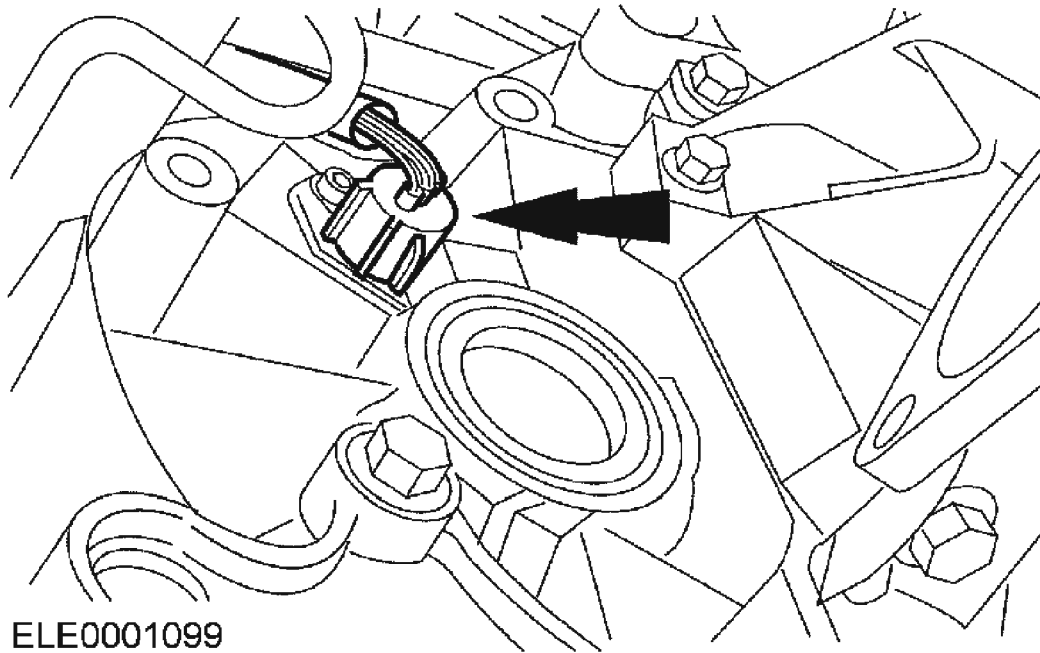


Fig. 287: Disconnecting Vehicle Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

Vehicles equipped with a 2.0L engine and automatic transmission

NOTE: Mark one stud and the flexplate for assembly reference.

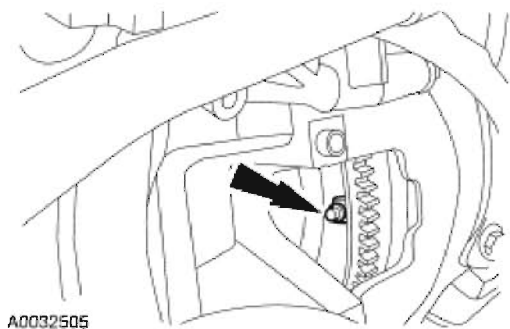


Fig. 288: Locating Torque Converter Nut
Courtesy of FORD MOTOR CO.

80. Remove the four torque converter nuts.
81. Disconnect the output shaft speed (OSS) sensor electrical connector.

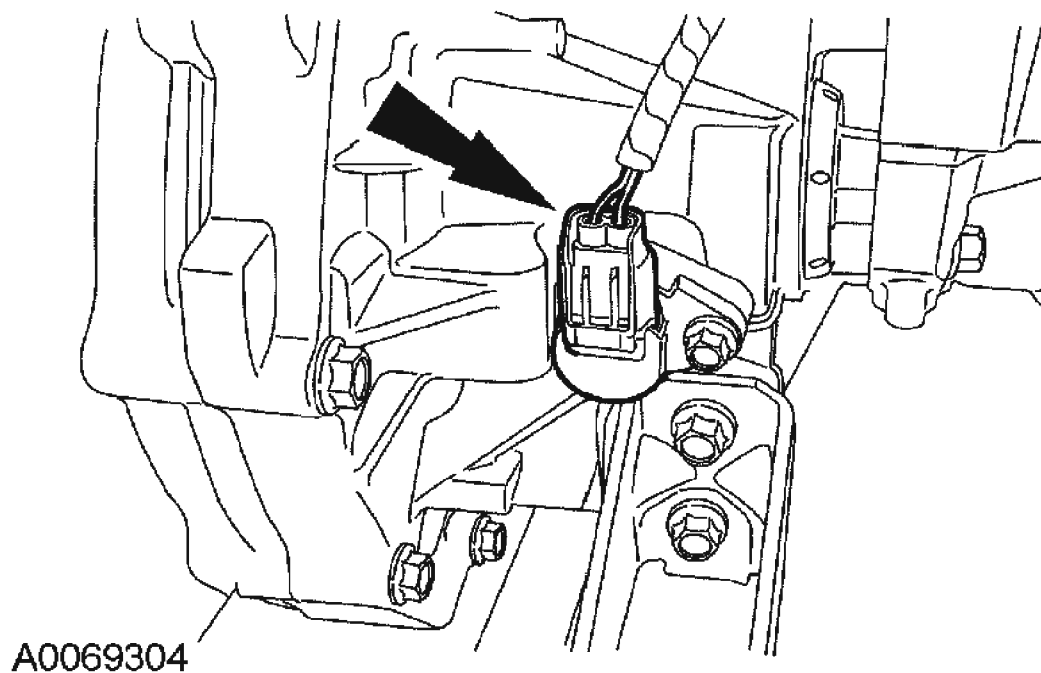
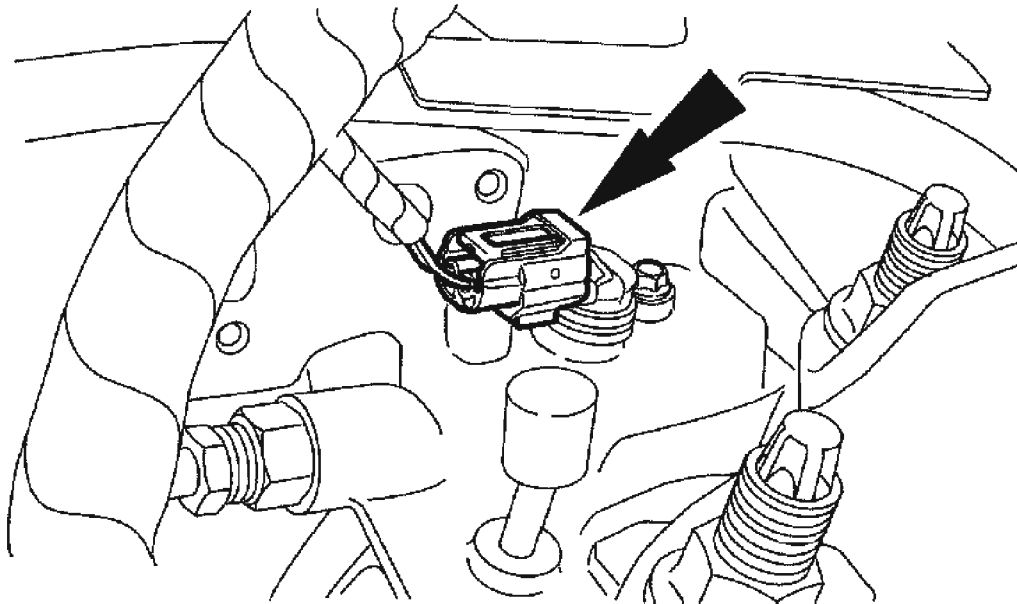


Fig. 289: Disconnecting Output Shaft Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

82. Disconnect the turbine shaft speed (TSS) sensor electrical connector.



A0069305

Fig. 290: Disconnecting Turbine Shaft Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

83. Disconnect the solenoid body and the transmission range (TR) sensor electrical connectors.

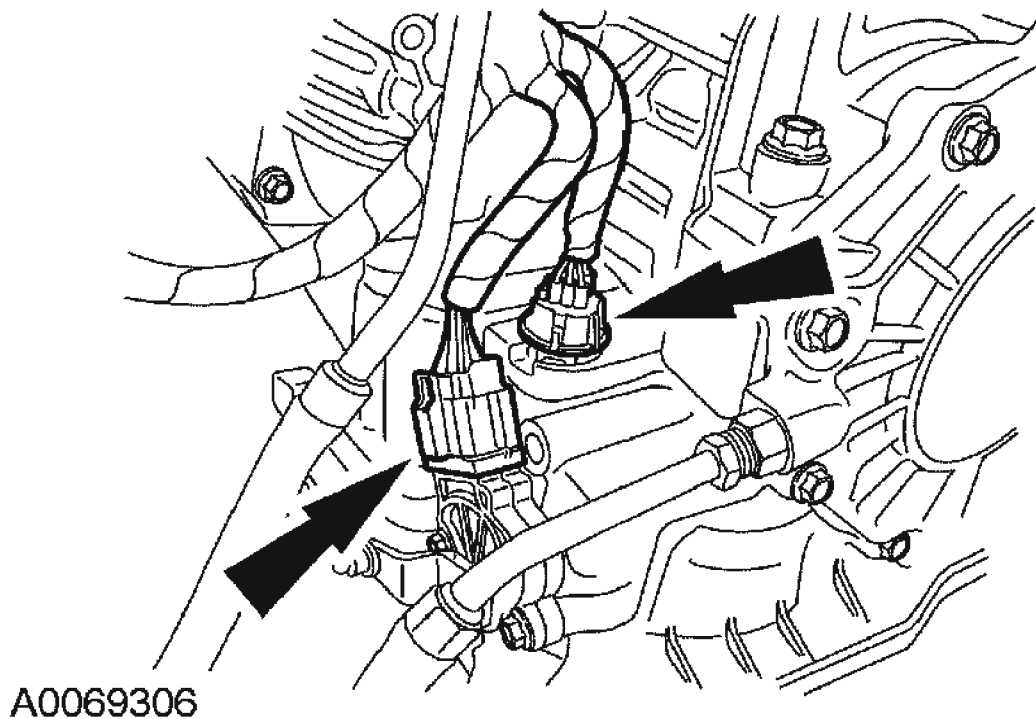


Fig. 291: Disconnecting Solenoid Body And Transmission Range Sensor Electrical Connectors

Courtesy of FORD MOTOR CO.

All vehicles

NOTE: Lower the engine to within a few inches of the floor.

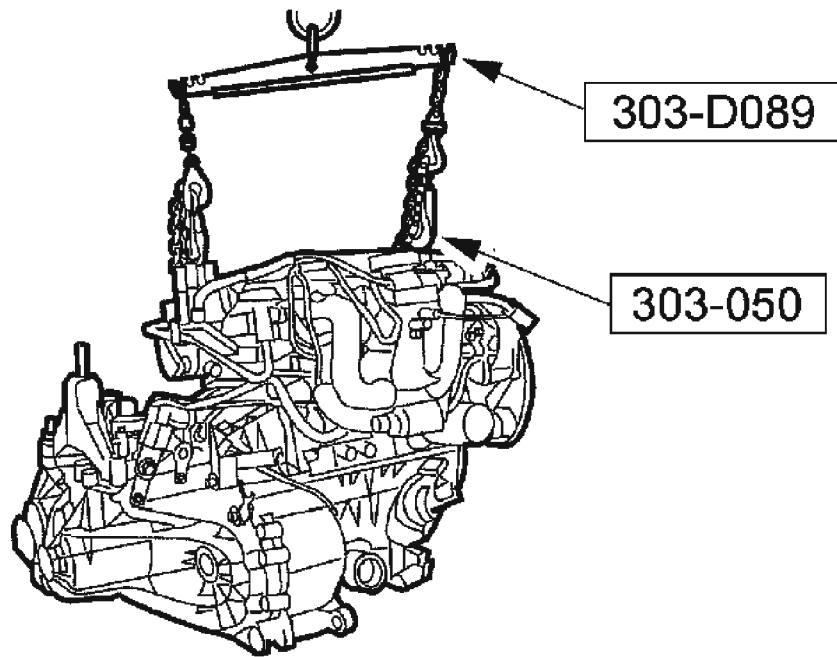


Fig. 292: Removing Engine From Lift Table Using Engine Crane
Courtesy of FORD MOTOR CO.

84. Using the engine crane, remove the engine from the lift table.
85. Remove the remaining bell housing bolts and separate the engine and transmission.
86. Remove and discard the dowel pins.

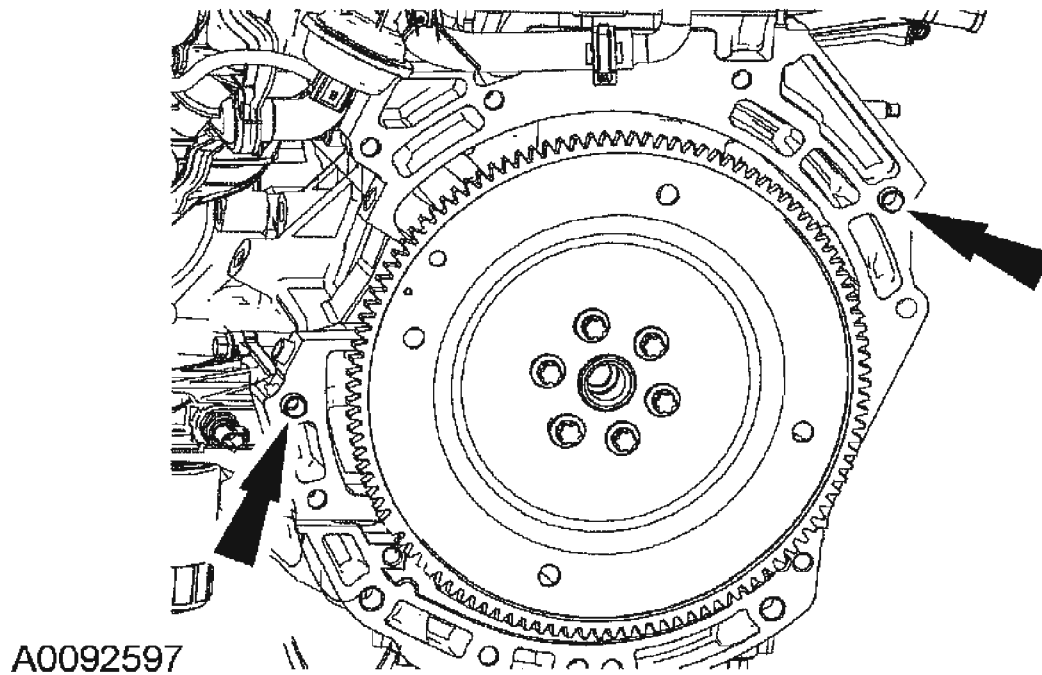


Fig. 293: Removing Dowel Pins
Courtesy of FORD MOTOR CO.

Vehicles equipped with a 2.0L engine and automatic transmission

87. Install the special tool, to prevent damage to the torque converter.

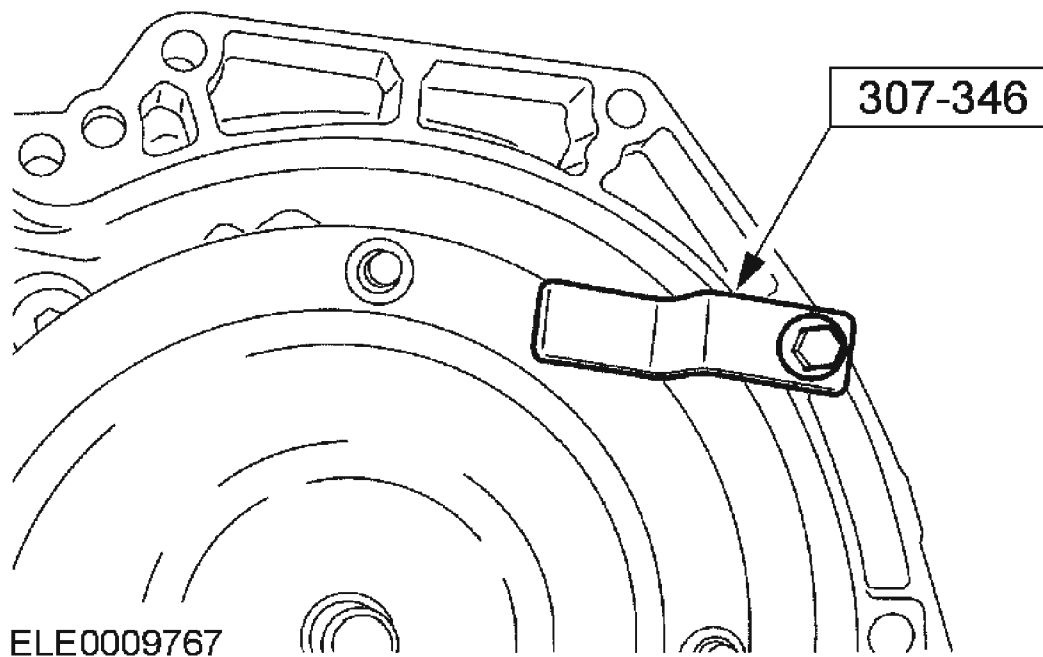


Fig. 294: Installing Special Tool (307-346) To Torque Converter
Courtesy of FORD MOTOR CO.

DISASSEMBLY

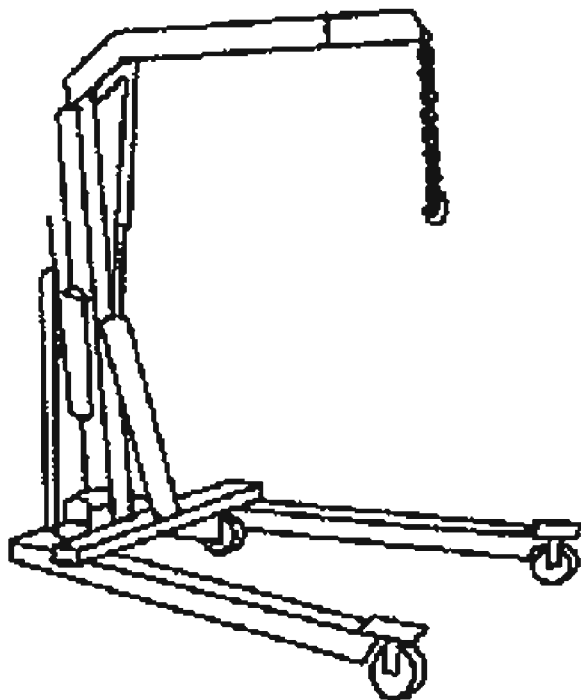
ENGINE

SPECIAL TOOL DESCRIPTION

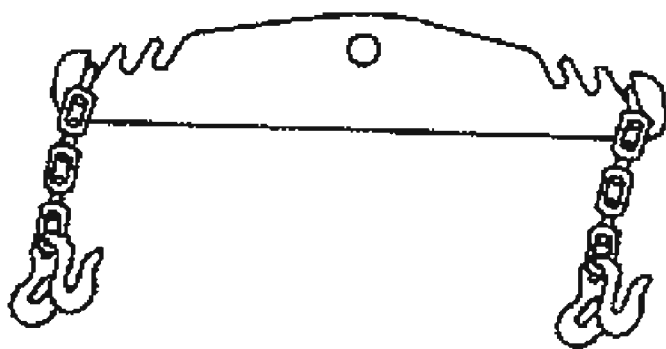
	Heavy Duty Floor Crane 014-00071 or equivalent
--	--

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1341-A



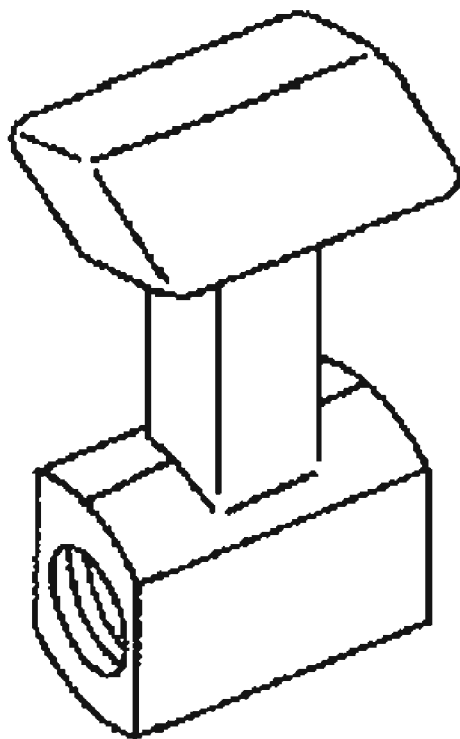
ST1602-A

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

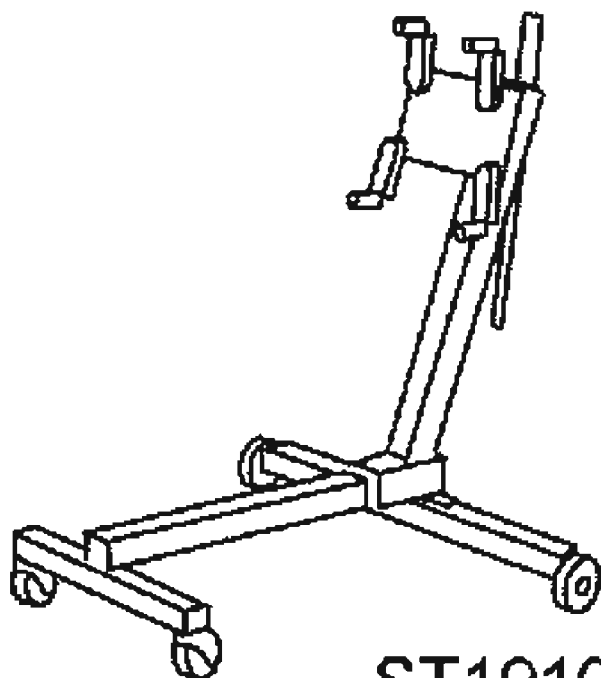
Locking Tool, Flywheel 303-103 (T74P-8375-A)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2768-A

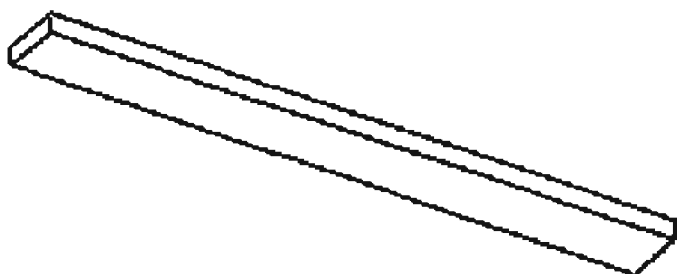


ST1010-A

Engine Stand 014-00232 or
equivalent

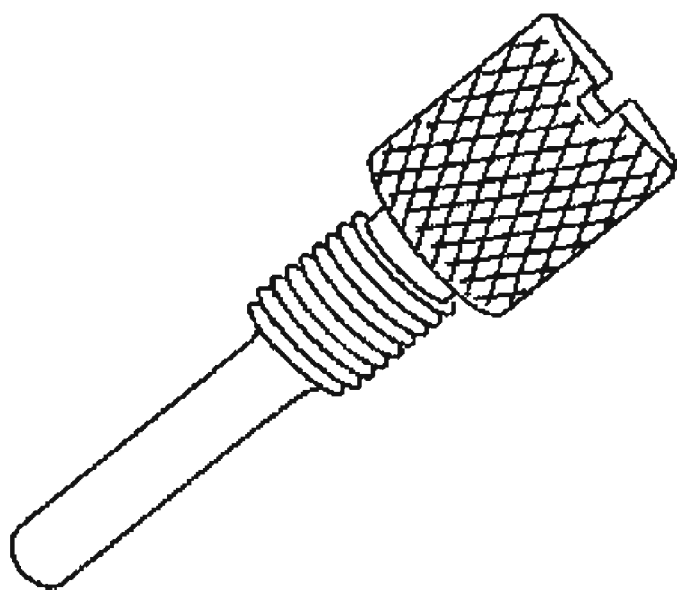
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2645-A

Alignment Plate, Camshaft 303-465
(T94P-6256-CH)



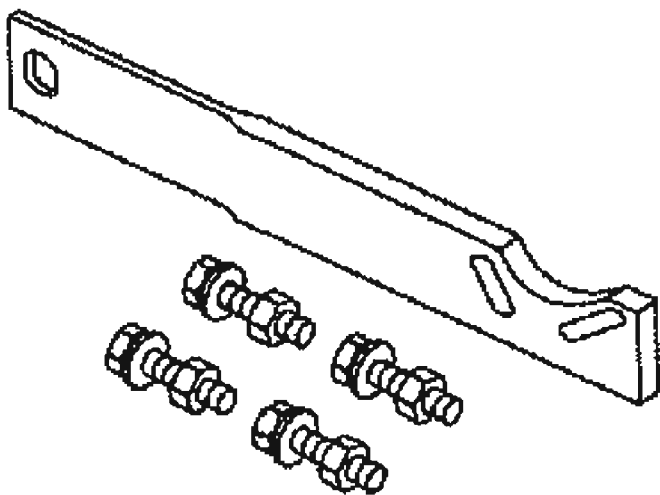
ST2638-A

Timing Peg, Crankshaft 303-507

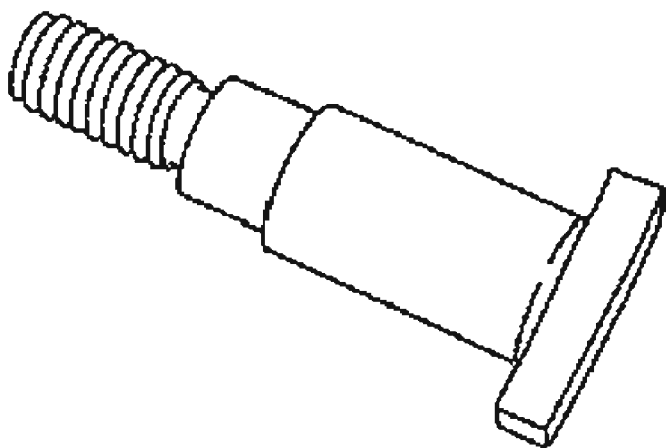
Holding Fixture, Drive Pinion
Flange 205-126 (T78P-4851-A)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



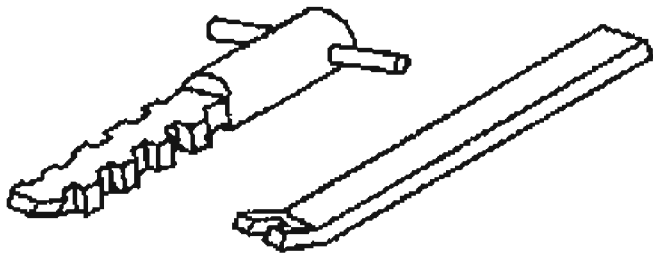
ST2647-A



ST2639-A

Adapter for 205-126 (205-072-02)

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



ST1385-A

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

CAUTION: Due to the precision fit and timing of the balancer shaft assembly, it cannot be removed from the engine block.

Vehicles equipped with a manual transmission

WARNING: The clutch disc and clutch pressure plate are heavy and may fall if not held when the bolts are removed. Failure to follow these instructions may result in personal injury.

CAUTION: Loosen the bolts evenly to prevent pressure plate

damage.

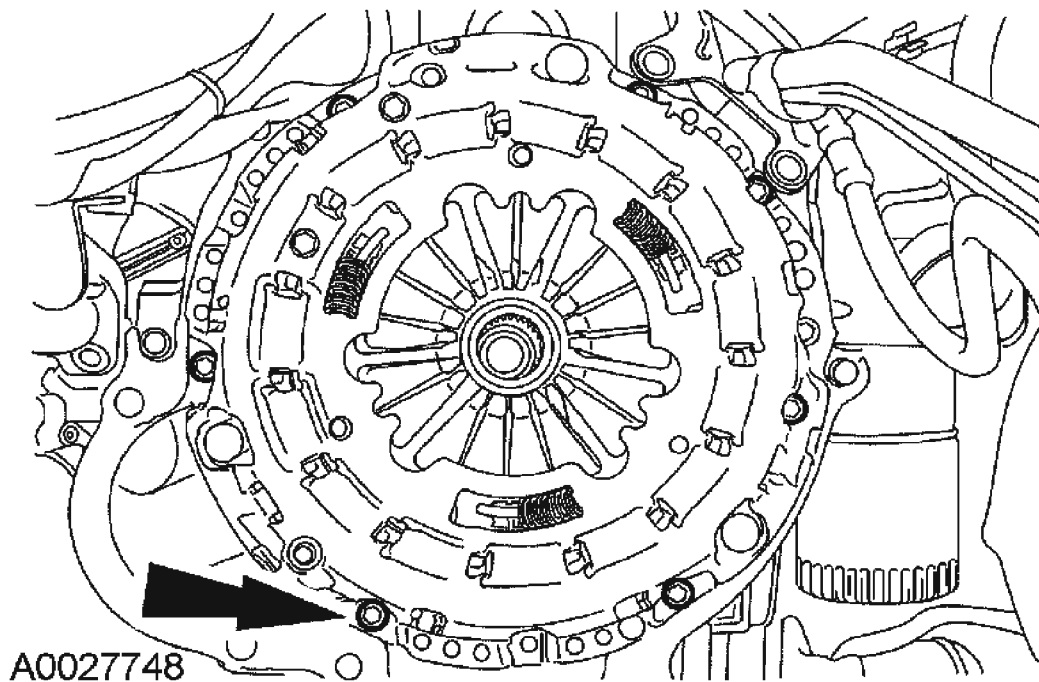
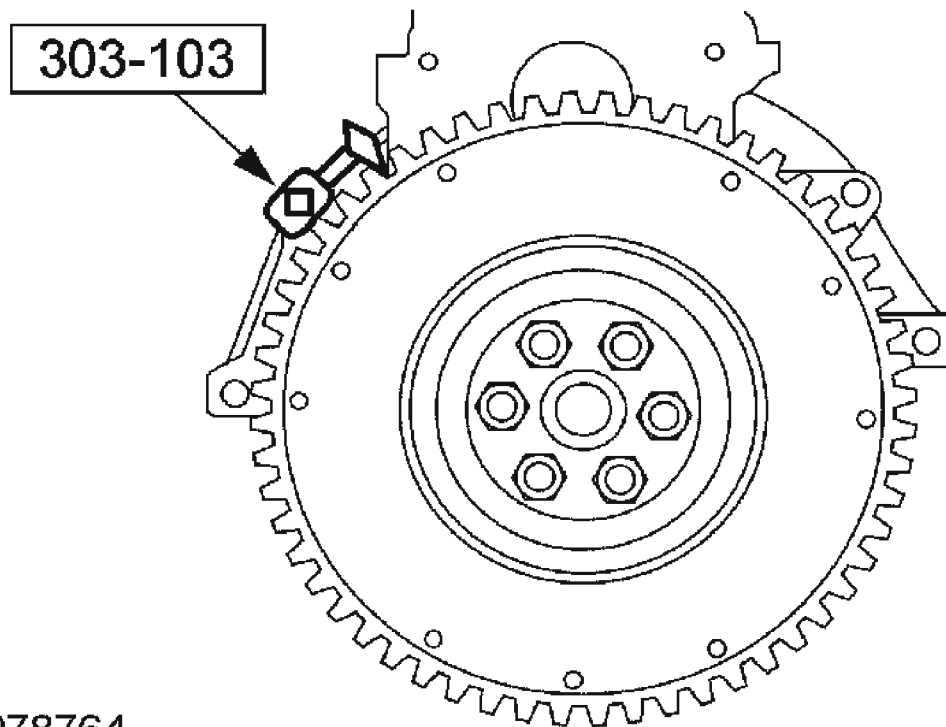


Fig. 295: Removing Bolts, Clutch Pressure Plate And Clutch Disc
Courtesy of FORD MOTOR CO.

1. Remove the bolts, clutch pressure plate and clutch disc.

All vehicles

2. Install the special tool and remove the flywheel or flexplate.



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Fig. 296: Installing Special Tool (303-103) To Flywheel Or Flexplate
Courtesy of FORD MOTOR CO.

3. Mount the engine on a suitable engine stand.
4. Disconnect the crankshaft position (CKP) sensor and the wiring harness pin-type retainers.

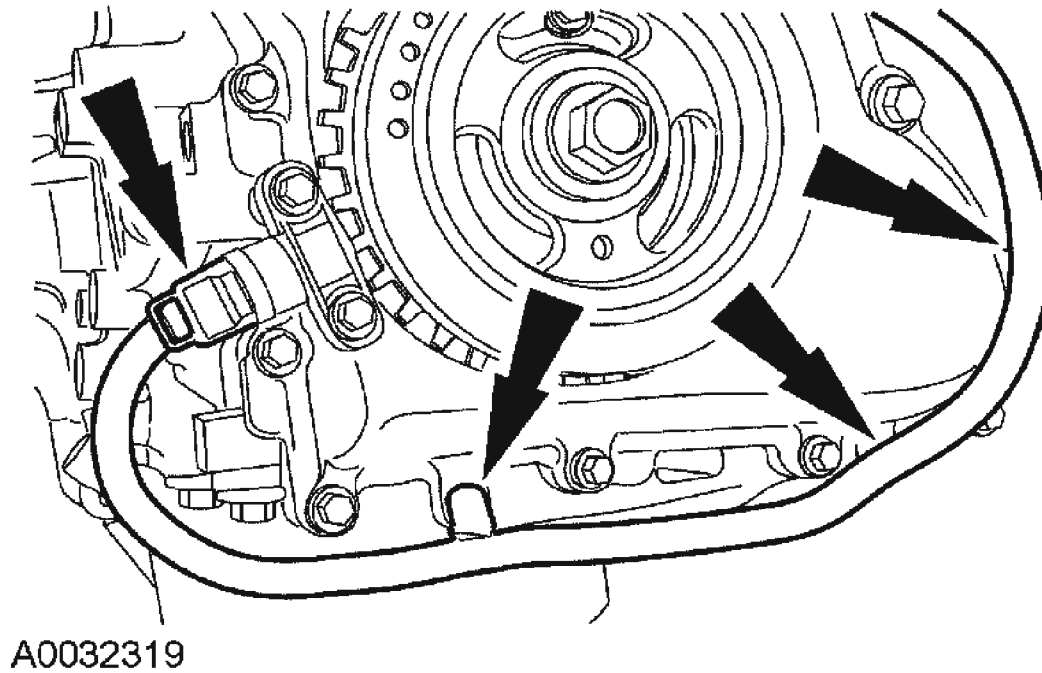


Fig. 297: Disconnecting Crankshaft Position Sensor And Wiring Harness Pin-Type Retainers
Courtesy of FORD MOTOR CO.

5. Remove the nuts and the generator heat shield.

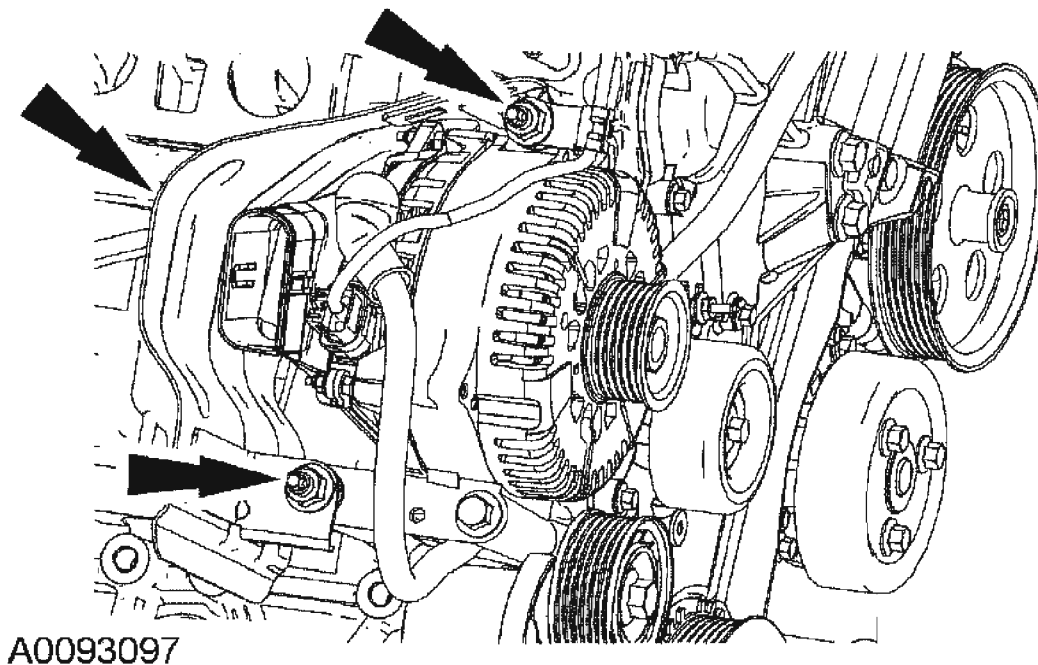
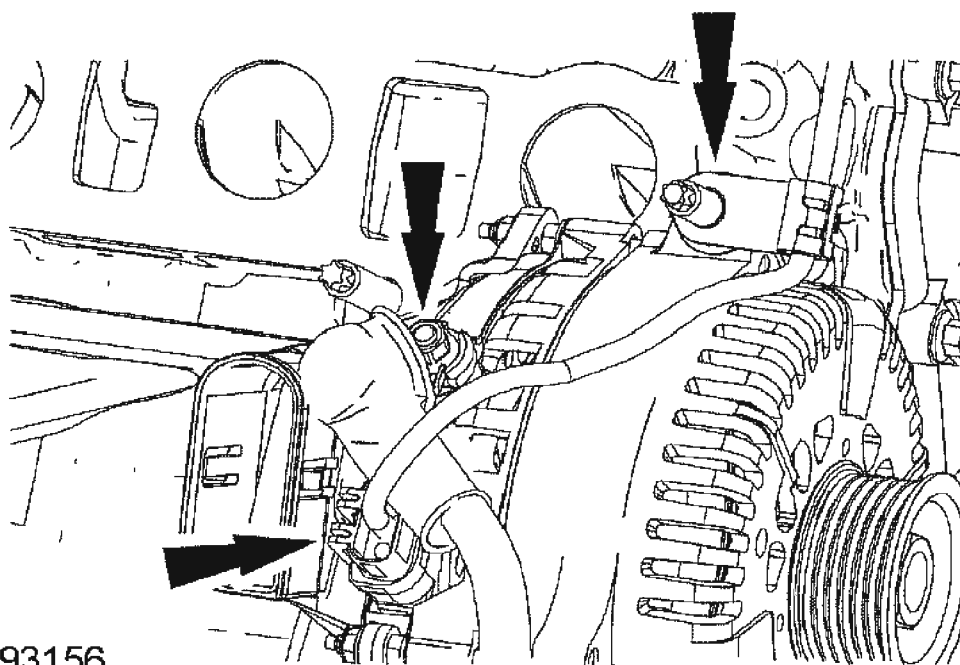


Fig. 298: Removing Nuts And Generator Heat Shield
Courtesy of FORD MOTOR CO.

6. Remove the nut and disconnect the generator electrical connections and harness retainer.



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Fig. 299: Disconnecting Generator Electrical Connections And Harness Retainer
Courtesy of FORD MOTOR CO.

7. Remove the nut and the wiring harness retainer.

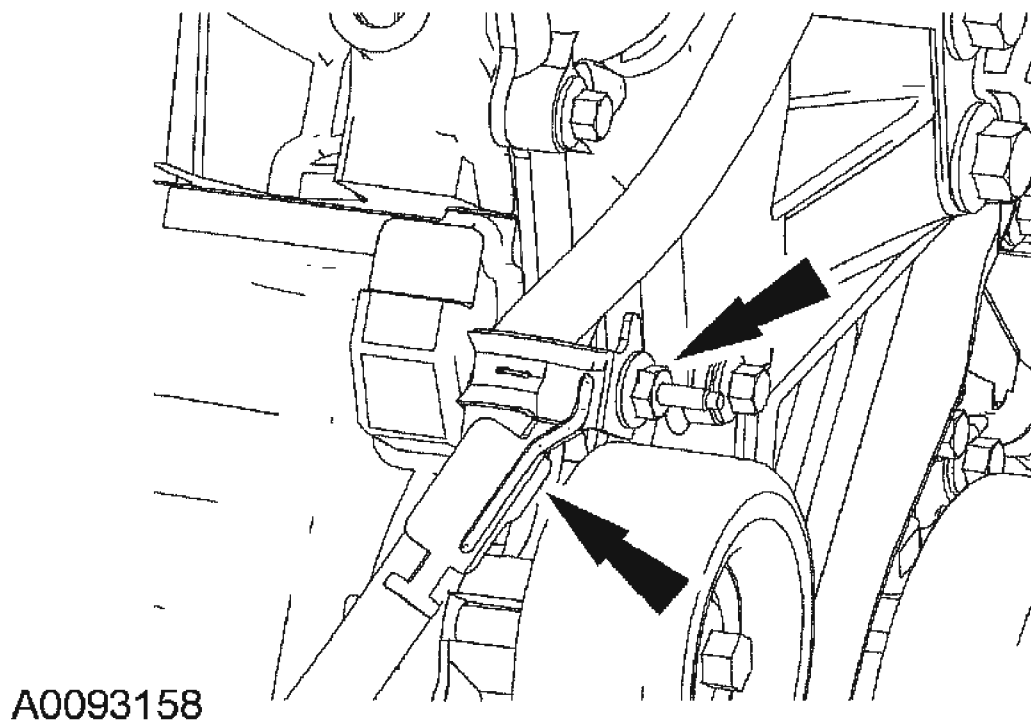


Fig. 300: Removing Nut And Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

8. Remove the bolts and the generator.

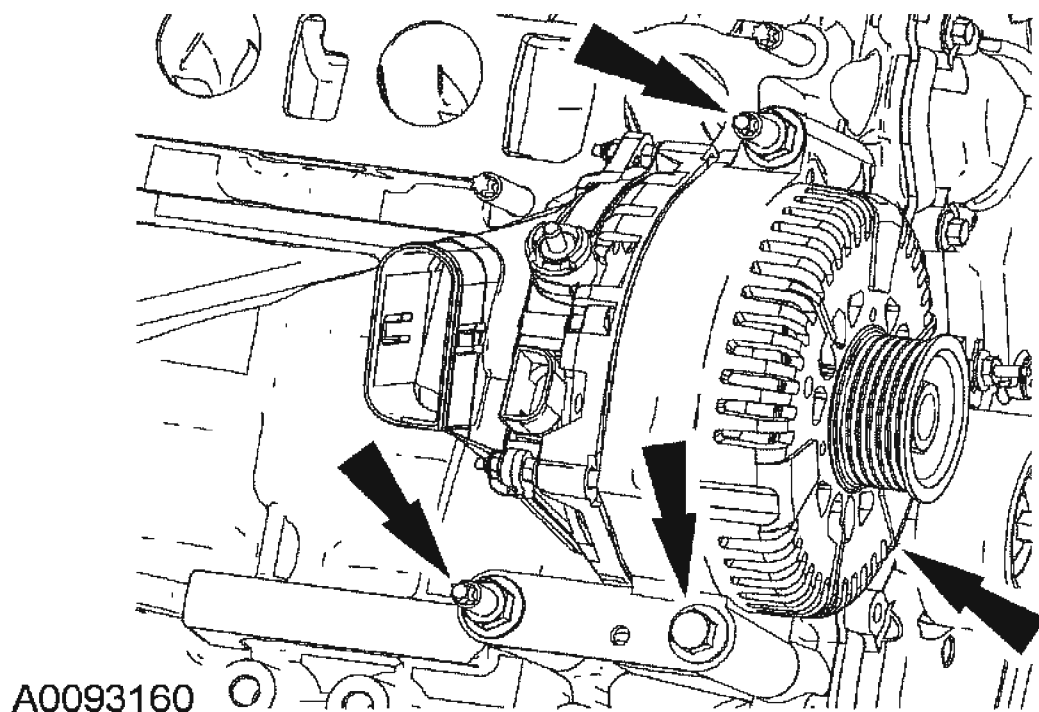


Fig. 301: Removing Bolts And Generator
Courtesy of FORD MOTOR CO.

9. Remove the bolts and the accessory drive belt tensioner.

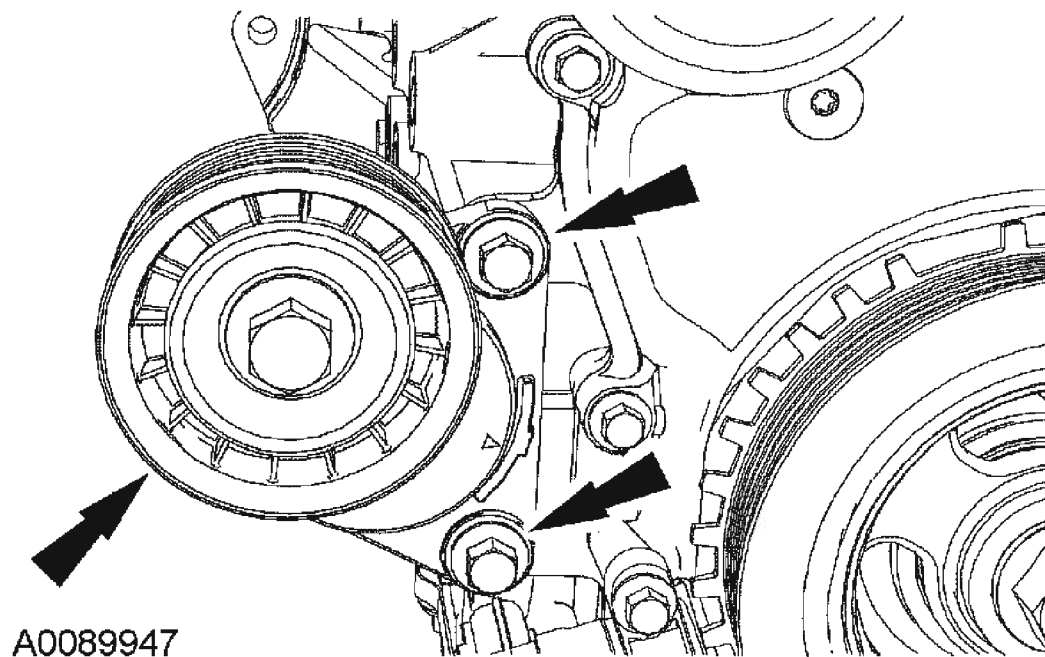


Fig. 302: Removing Bolts And Accessory Drive Belt Tensioner
Courtesy of FORD MOTOR CO.

10. Loosen the bolt and remove the accessory drive belt idler pulley.

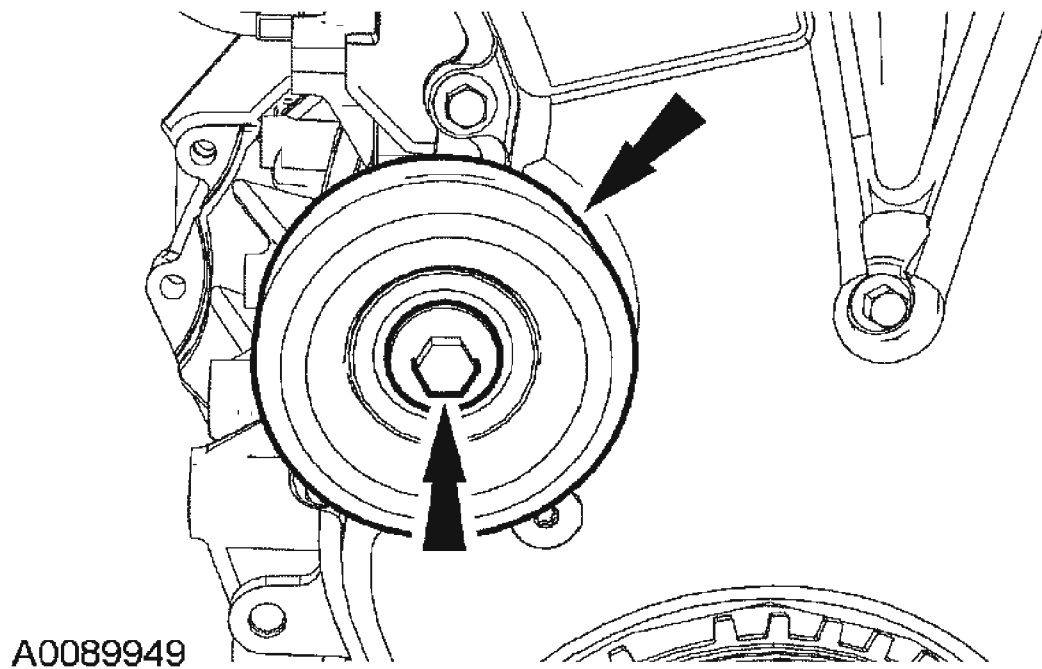


Fig. 303: Loosening Bolt And Removing Accessory Drive Belt Idler Pulley
Courtesy of FORD MOTOR CO.

11. If equipped, loosen the bolt and remove the accessory drive belt idler pulley.

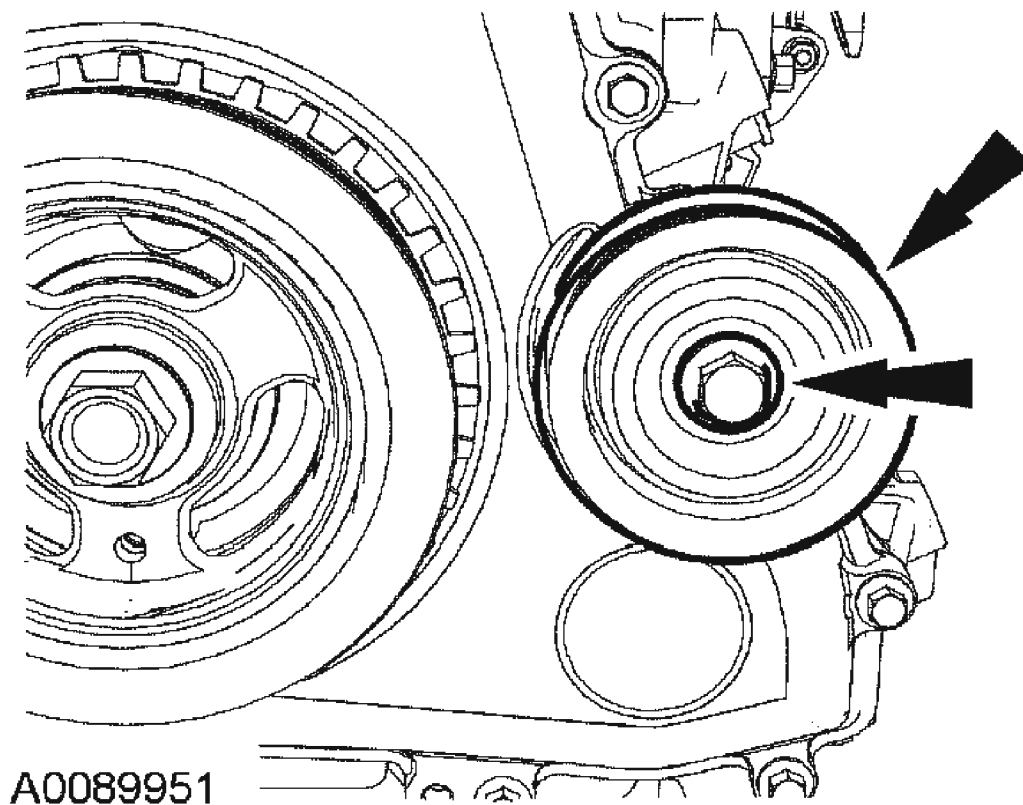


Fig. 304: Loosening Bolt And Removing Accessory Drive Belt Idler Pulley
Courtesy of FORD MOTOR CO.

12. Remove the bolts and the coolant pump pulley.

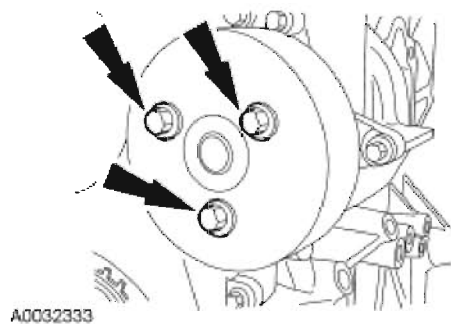


Fig. 305: Locating Coolant Pump Pulley Bolts
Courtesy of FORD MOTOR CO.

13. Remove the bolts and the coolant pump.

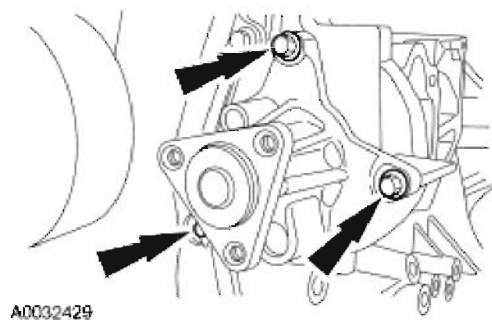


Fig. 306: Locating Coolant Pump Bolts
Courtesy of FORD MOTOR CO.

14. Disconnect the heater hose from the thermostat housing.

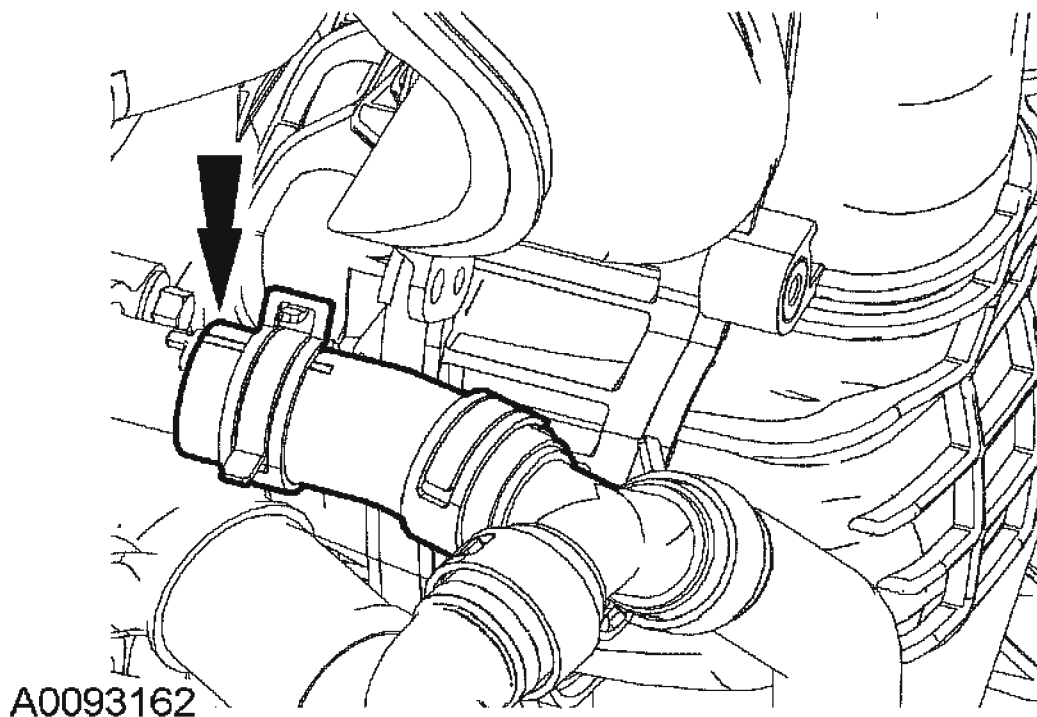


Fig. 307: Disconnecting Heater Hose From Thermostat Housing
Courtesy of FORD MOTOR CO.

15. Remove the bolts and the thermostat housing.

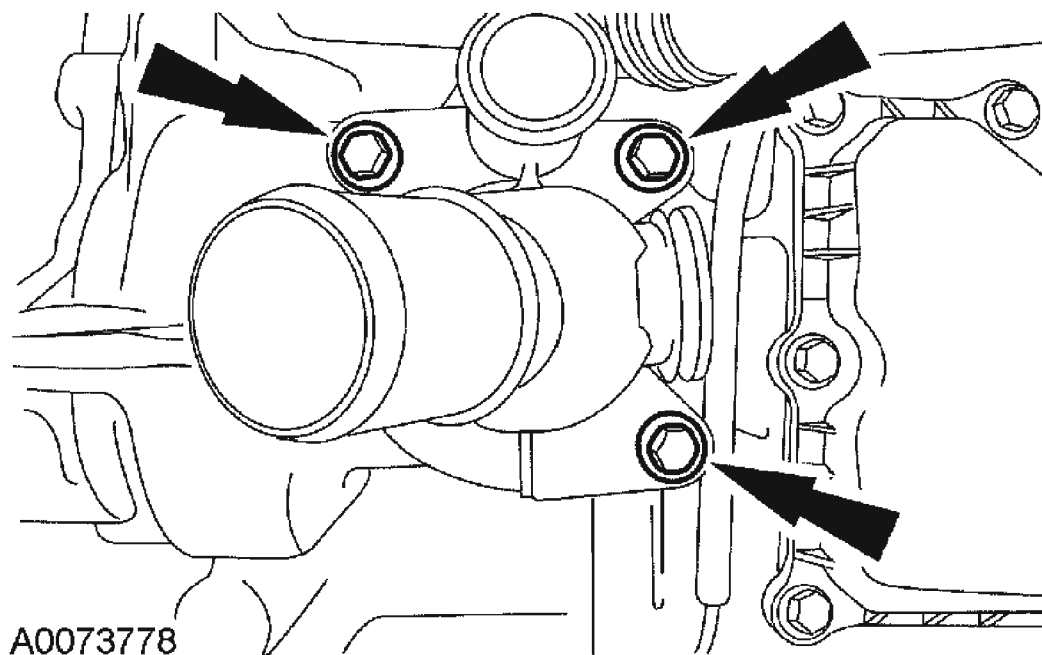


Fig. 308: Removing Bolts And Thermostat Housing
Courtesy of FORD MOTOR CO.

16. Disconnect the oil pressure sensor electrical connector.

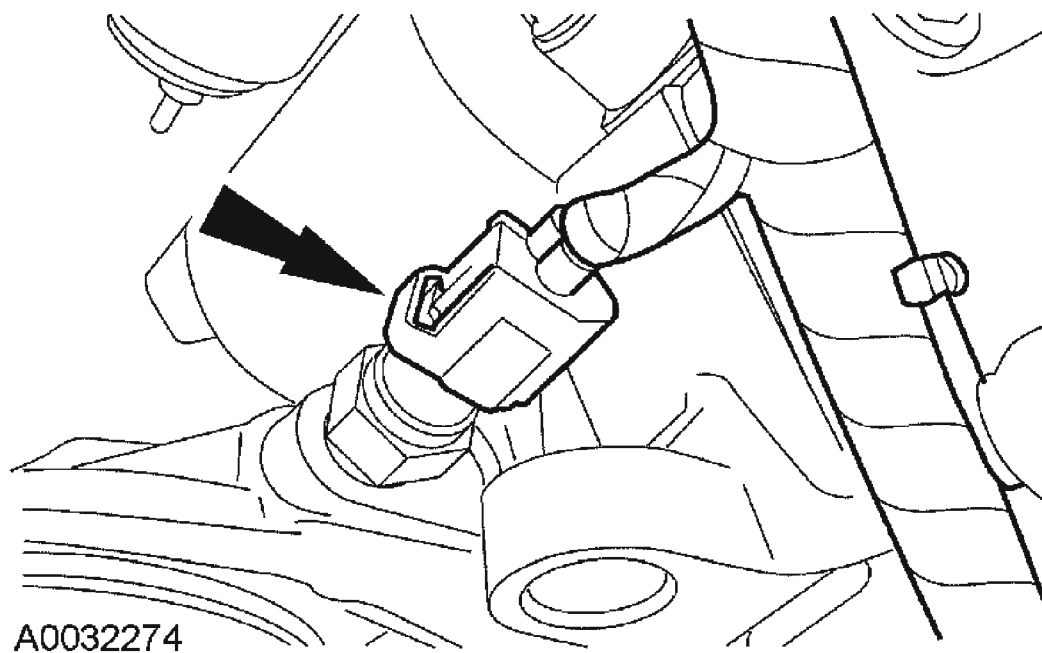


Fig. 309: Disconnecting Oil Pressure Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

17. Remove the oil filter.

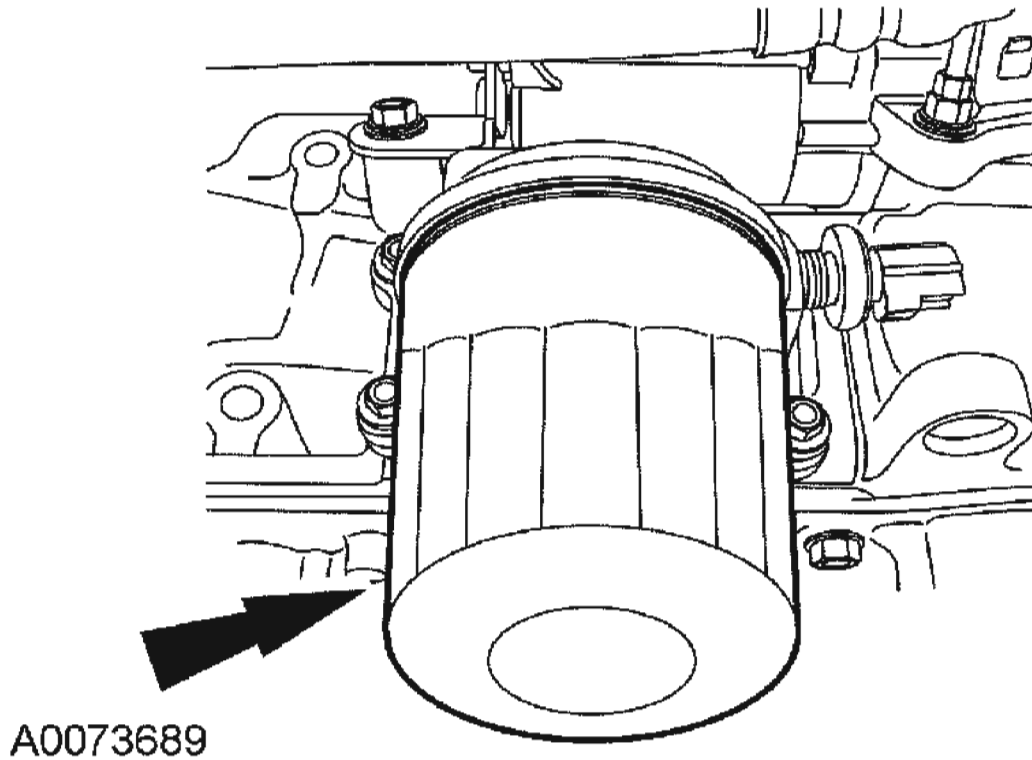


Fig. 310: Removing Oil Filter
Courtesy of FORD MOTOR CO.

18. Remove the bolts and the oil filter adapter.
 - Discard the gasket.

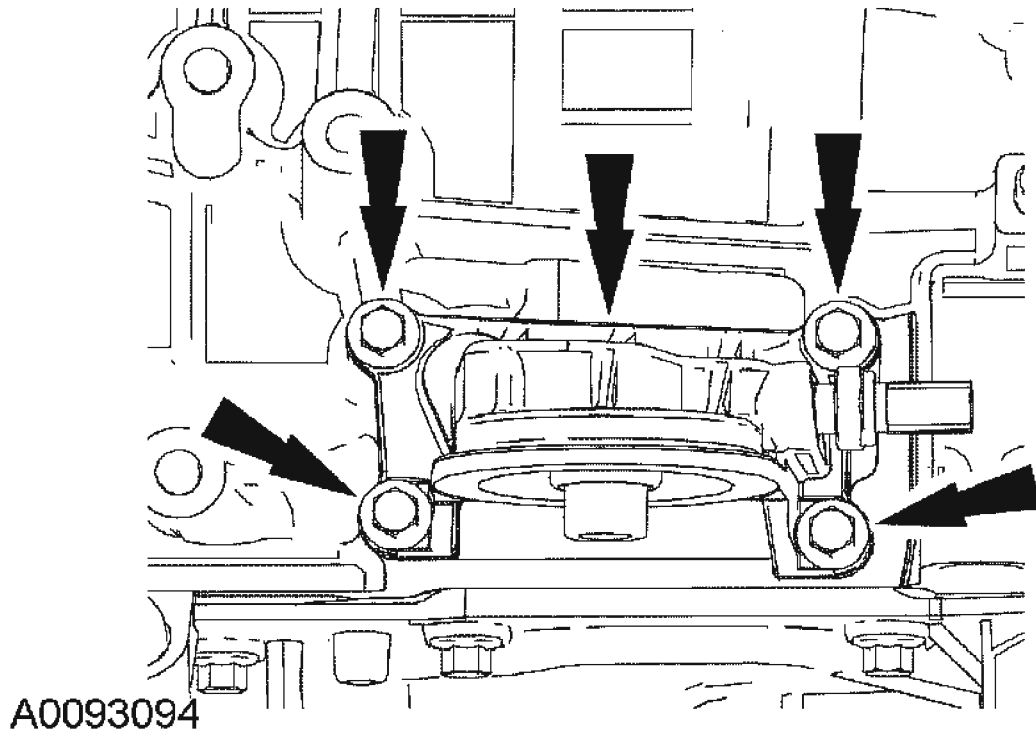
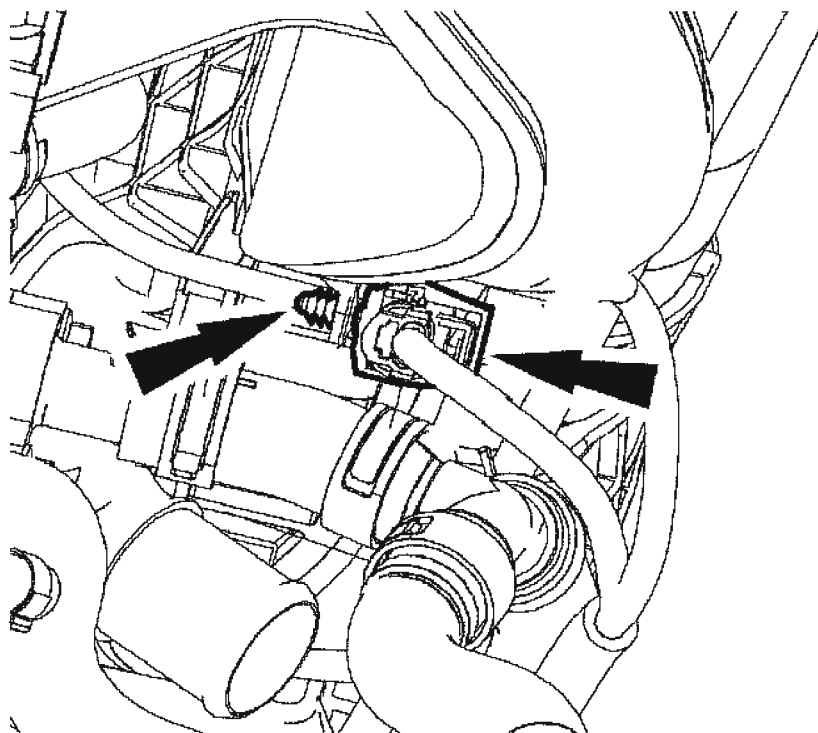


Fig. 311: Removing Bolts And Oil Filter Adapter
Courtesy of FORD MOTOR CO.

19. Disconnect the knock sensor (KS) electrical connector and pin-type retainer.



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Fig. 312: Disconnecting Knock Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

20. Remove the lower intake manifold bolt.

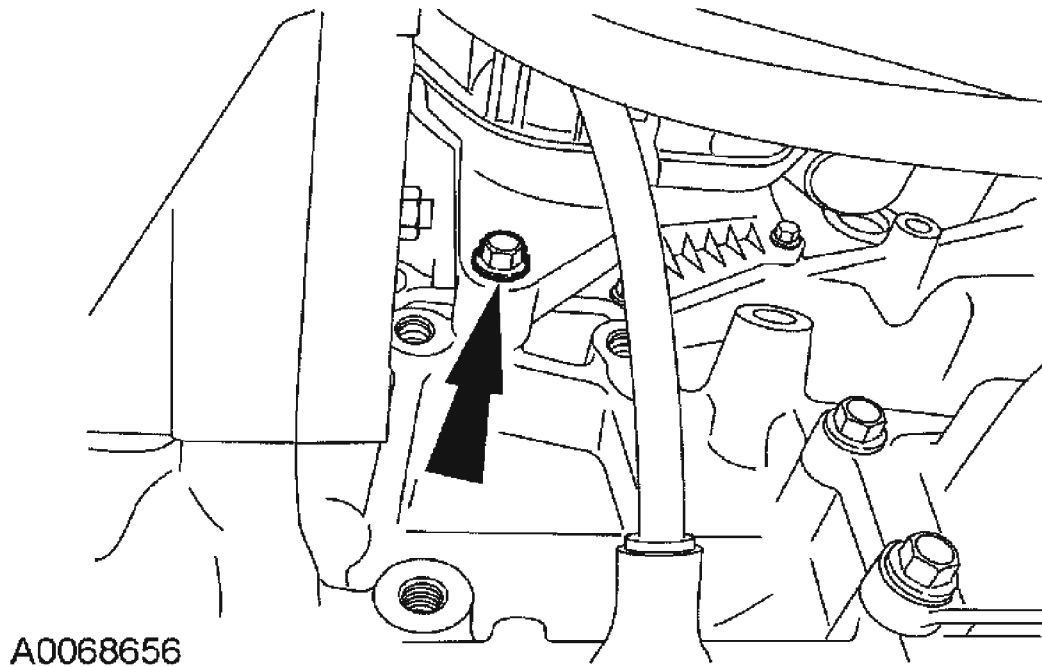


Fig. 313: Removing Lower Intake Manifold Bolt
Courtesy of FORD MOTOR CO.

21. Disconnect the throttle position (TP) sensor electrical connector and wiring harness pin-type retainer.

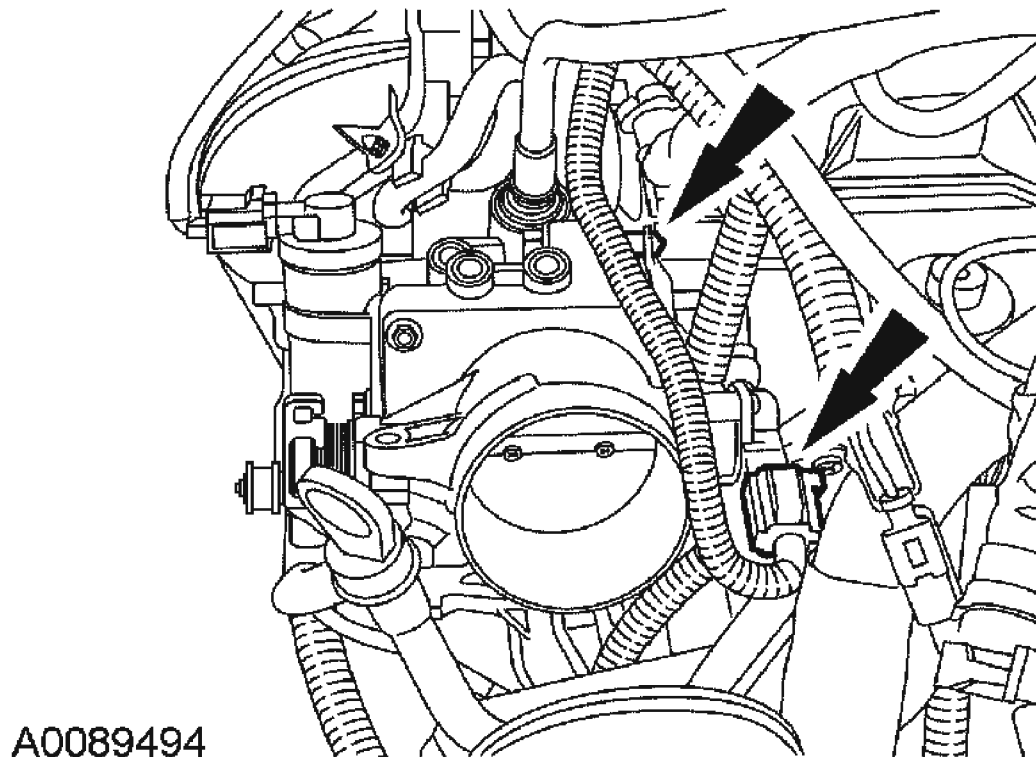


Fig. 314: Disconnecting Throttle Position Sensor Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

22. Disconnect the idle air control (IAC) valve electrical connector and wiring harness pin-type retainer.

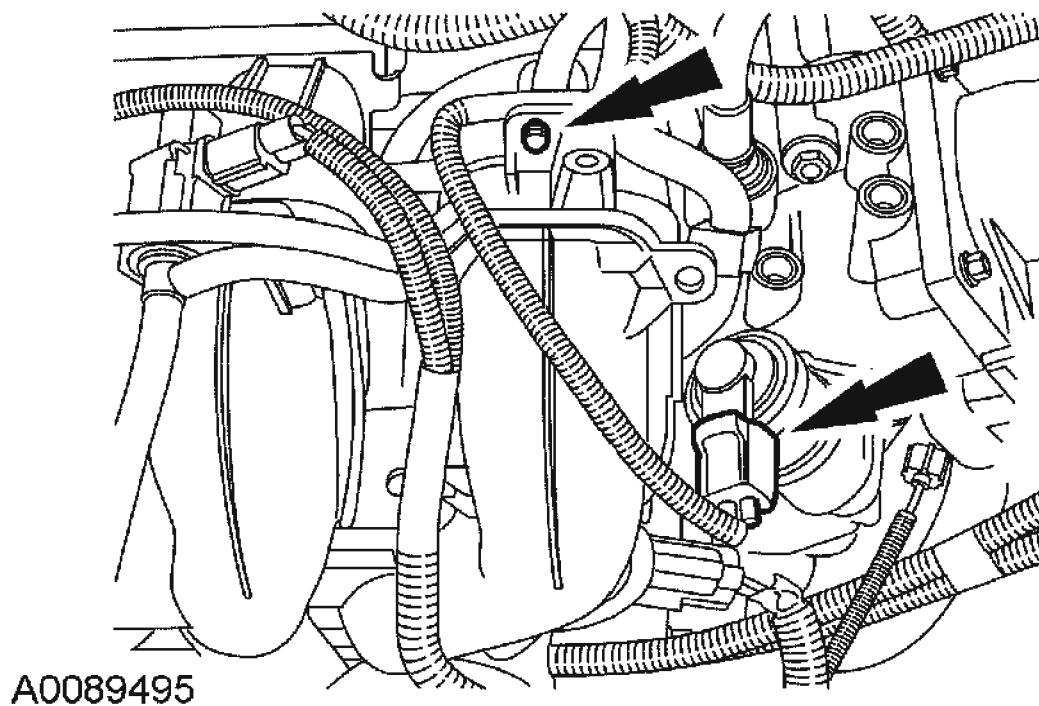


Fig. 315: Disconnecting Idle Air Control Valve Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

23. Disconnect the fuel rail pressure and temperature sensor vacuum hose.

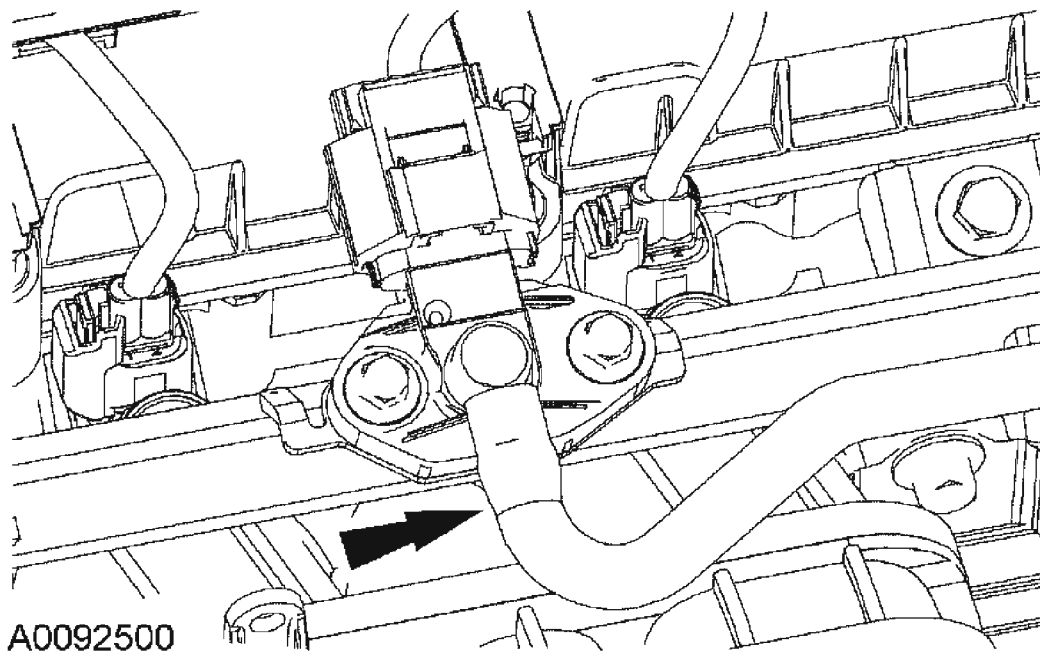


Fig. 316: Disconnecting Fuel Rail Pressure And Temperature Sensor Vacuum Hose

Courtesy of FORD MOTOR CO.

24. Detach the wiring harness pin-type retainer.

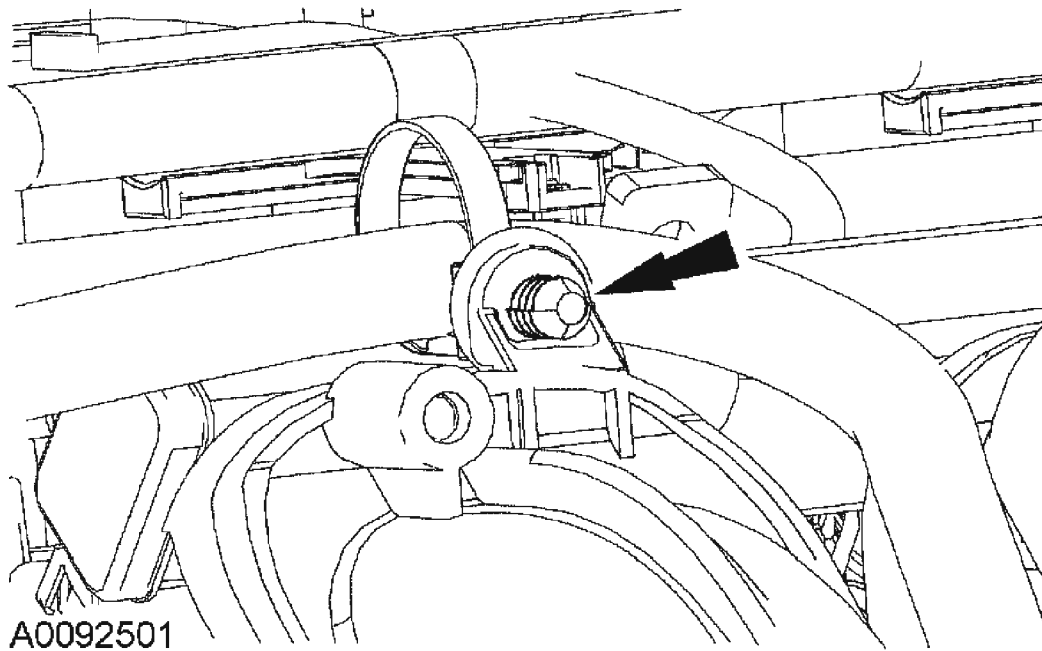


Fig. 317: Detaching Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

25. Disconnect the intake manifold runner control (IMRC) actuator electrical connector.

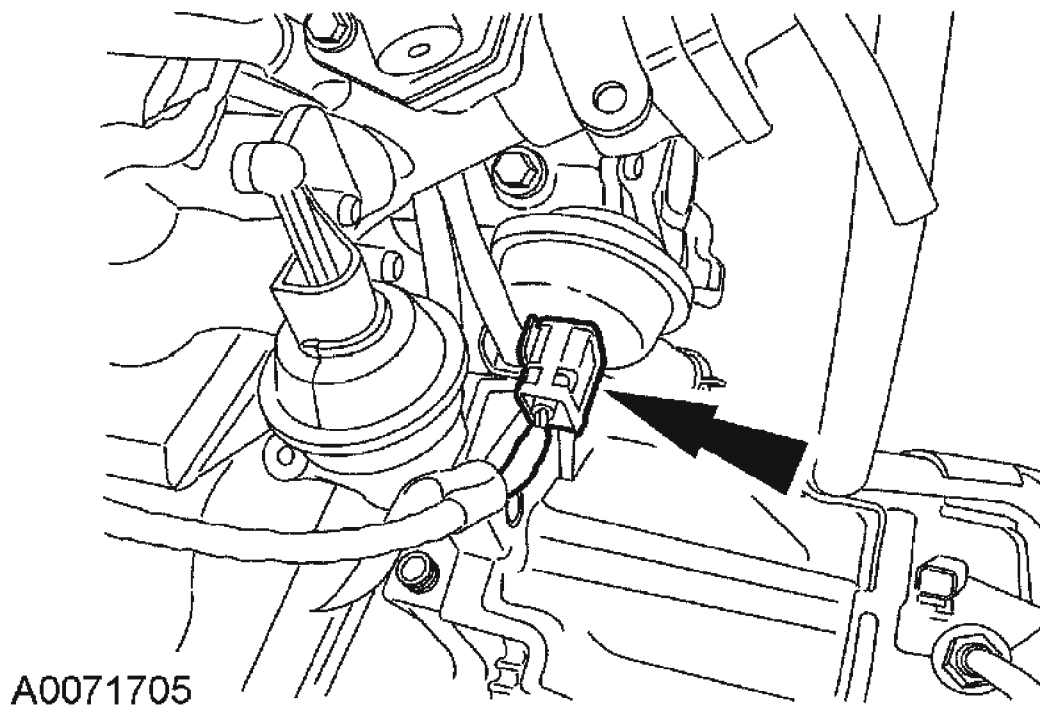


Fig. 318: Disconnecting Intake Manifold Runner Control Actuator Electrical Connector

Courtesy of FORD MOTOR CO.

26. Disconnect the manifold absolute pressure (MAP) sensor electrical connector.

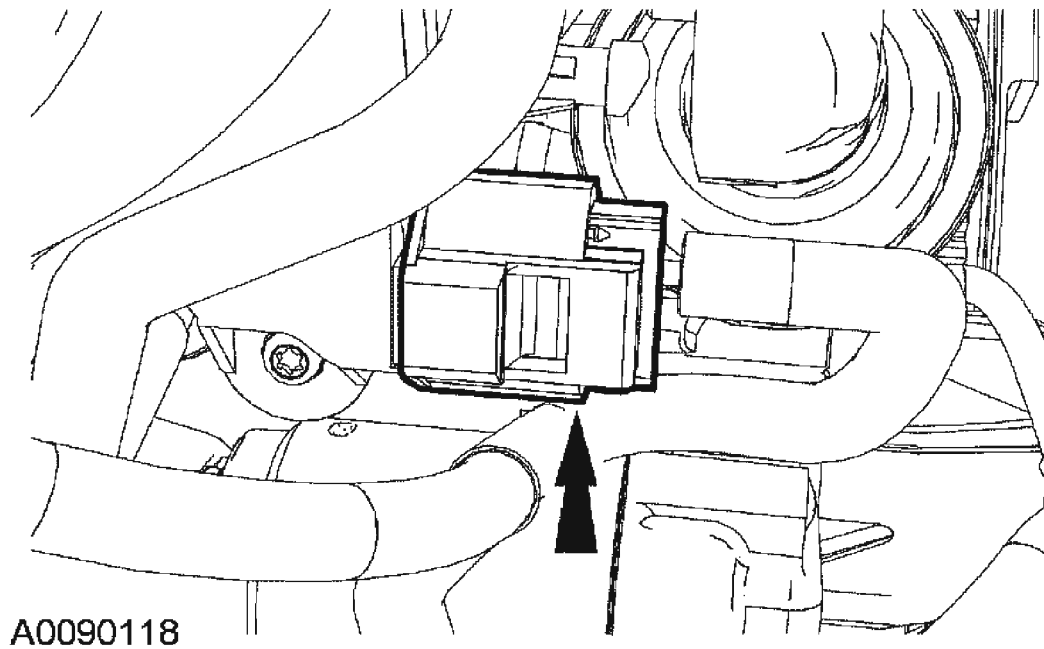


Fig. 319: Disconnecting Manifold Absolute Pressure Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

2.0L engines

27. If equipped, disconnect the secondary air injection (AIR) vacuum supply hose.

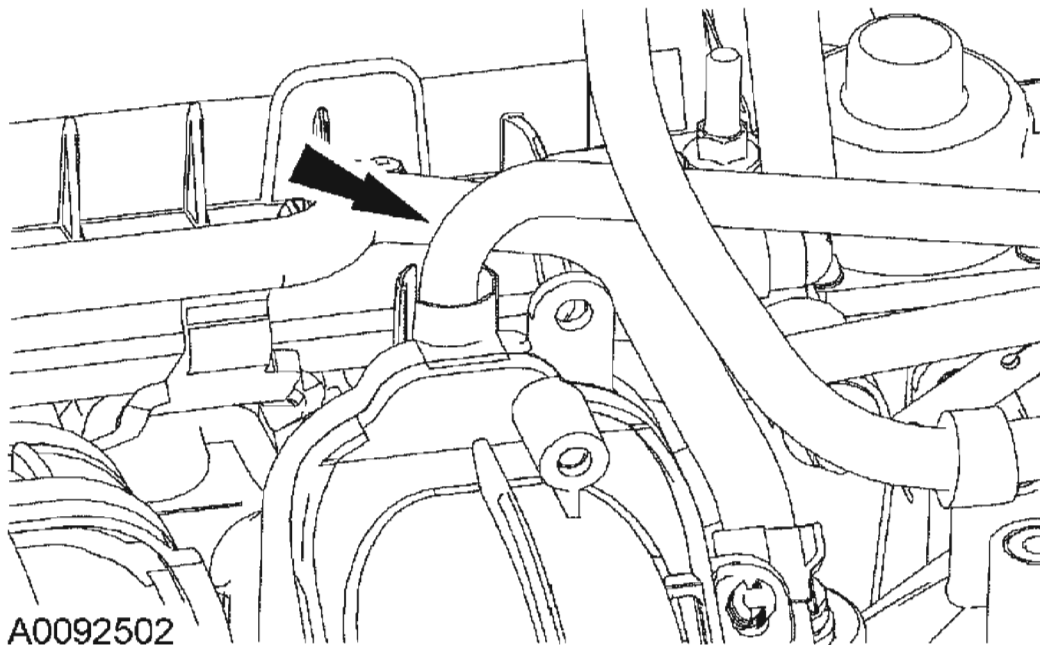


Fig. 320: Disconnecting Secondary Air Injection Vacuum Supply Hose
Courtesy of FORD MOTOR CO.

28. Disconnect the swirl control valve electrical connector.

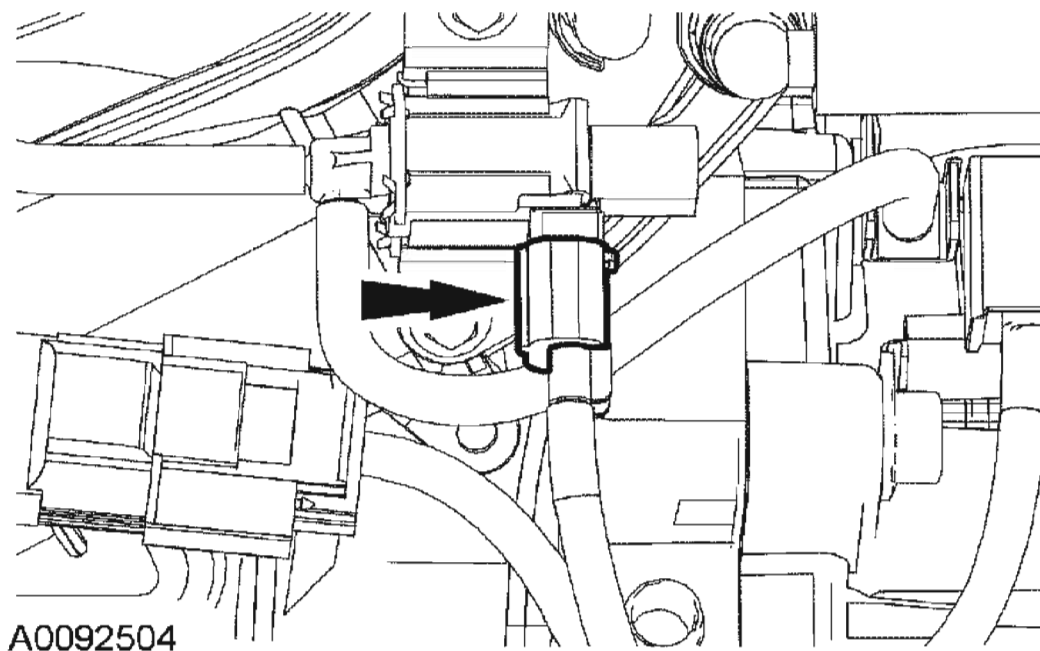


Fig. 321: Disconnecting Swirl Control Valve Electrical Connector
Courtesy of FORD MOTOR CO.

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

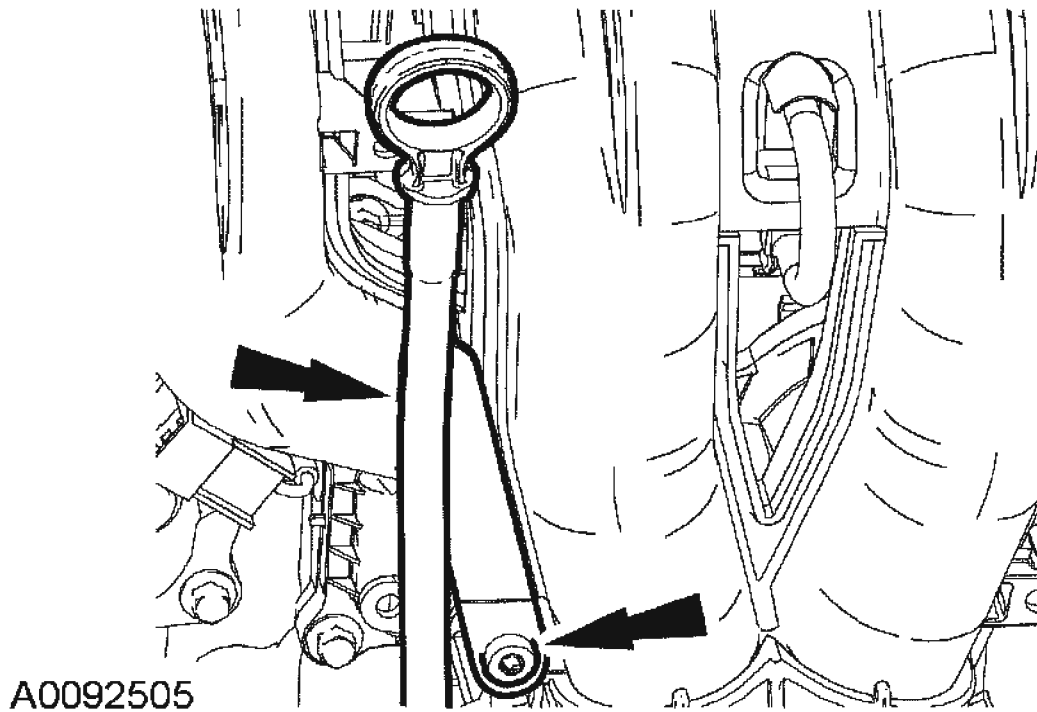


Fig. 322: Removing Bolt And Oil Level Indicator Tube
Courtesy of FORD MOTOR CO.

NOTE: There are three different size bolts used. Mark the location of the bolts to ensure installation in the correct location.

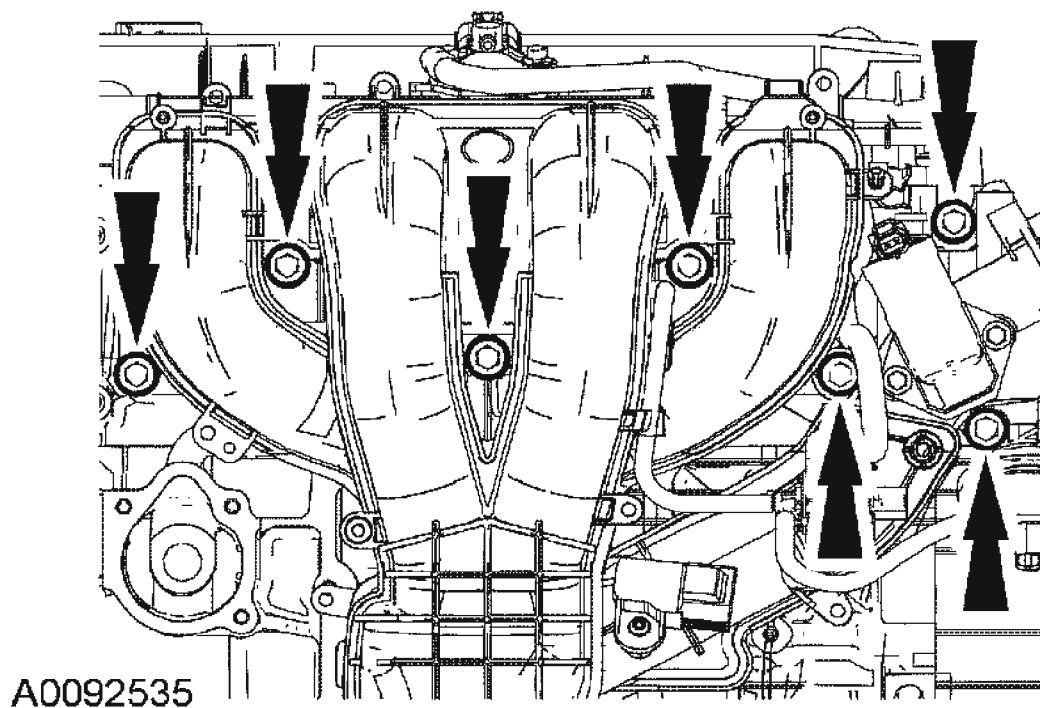


Fig. 323: Removing Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

30. Remove the seven intake manifold bolts.

2.3L engines

31. Disconnect the swirl valve electrical connectors and pin-type retainers.

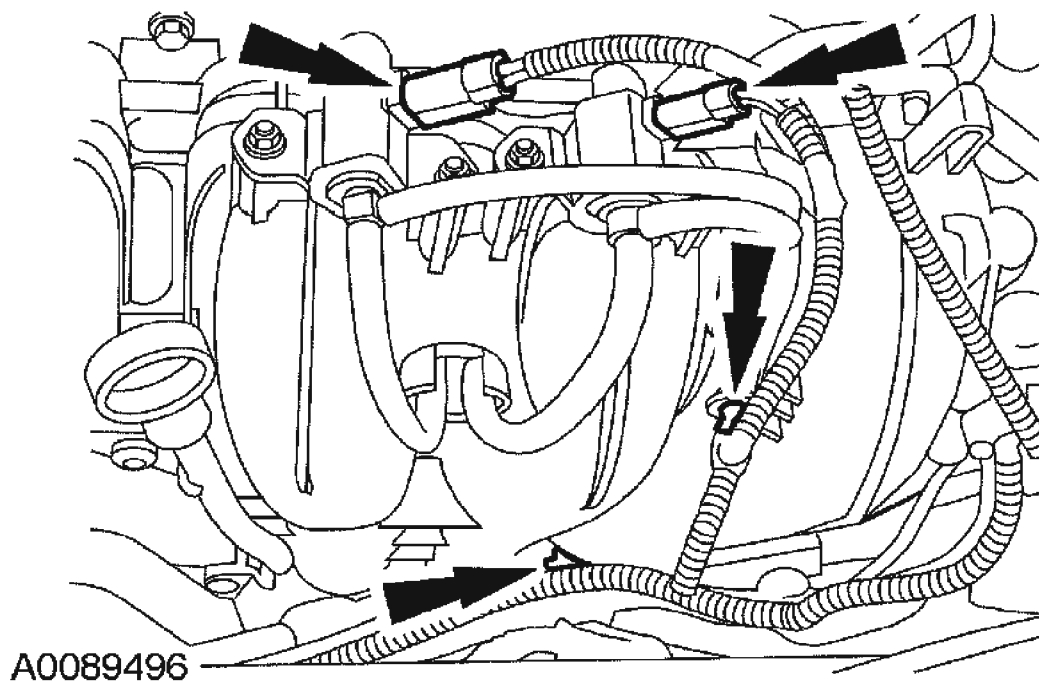


Fig. 324: Disconnecting Swirl Valve Electrical Connectors And Pin-Type Retainers

Courtesy of FORD MOTOR CO.

32. Remove the bolts and the oil level indicator and tube.

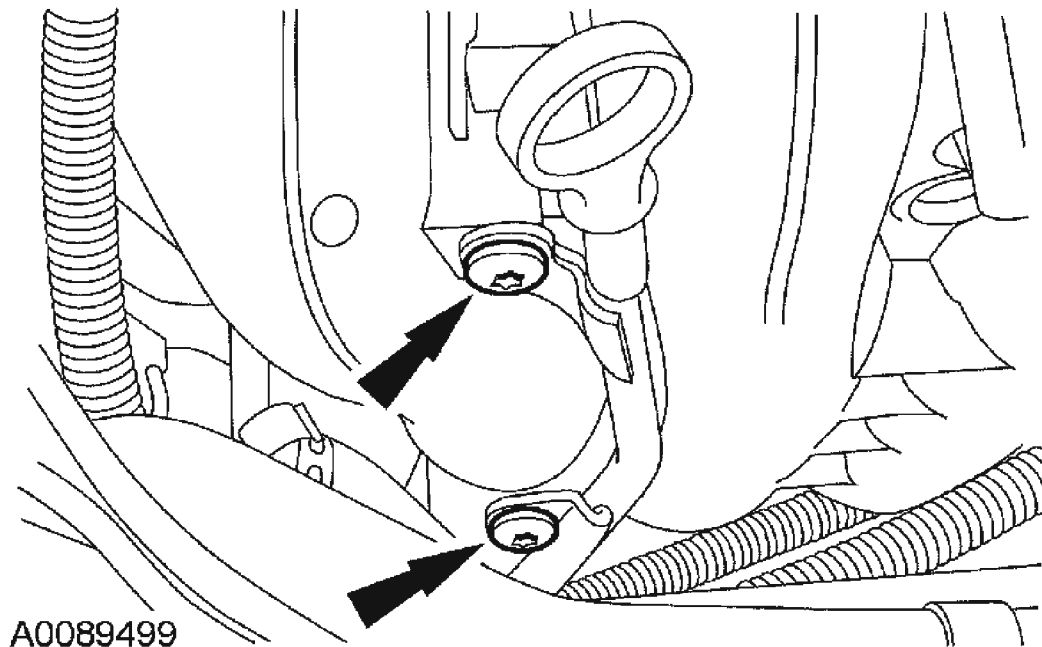


Fig. 325: Removing Bolts, Oil Level Indicator And Tube
Courtesy of FORD MOTOR CO.

NOTE: There are three different size bolts used. Mark the location of the bolts to ensure installation in the correct location.

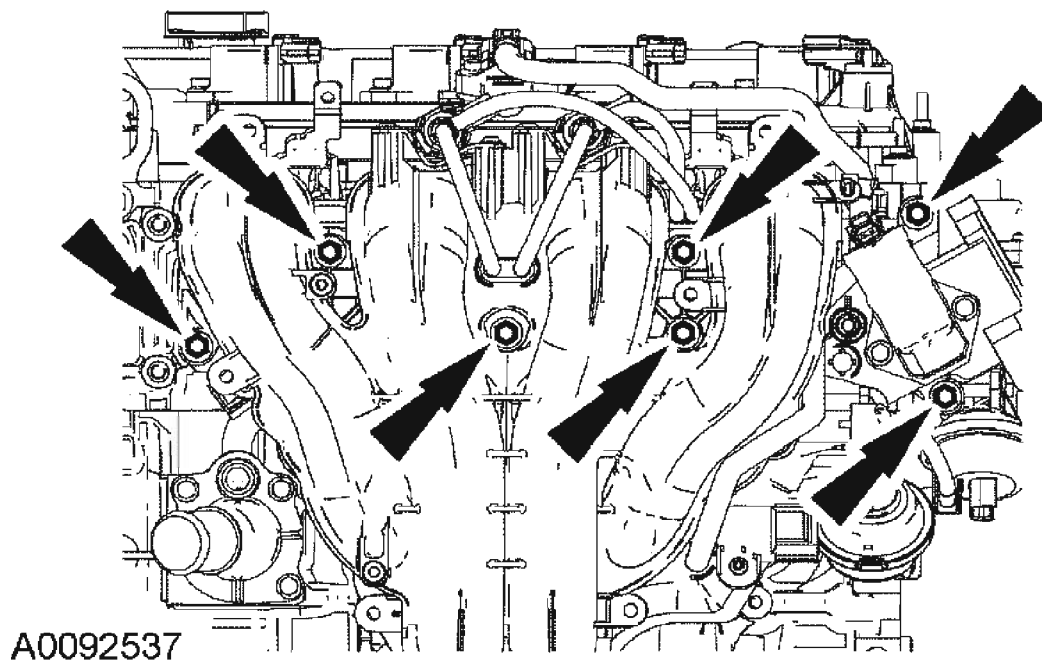


Fig. 326: Removing Intake Manifold Bolts
Courtesy of FORD MOTOR CO.

33. Remove the seven intake manifold bolts.

All engines

34. Disconnect the positive crankcase ventilation (PCV) hose and remove the intake manifold.

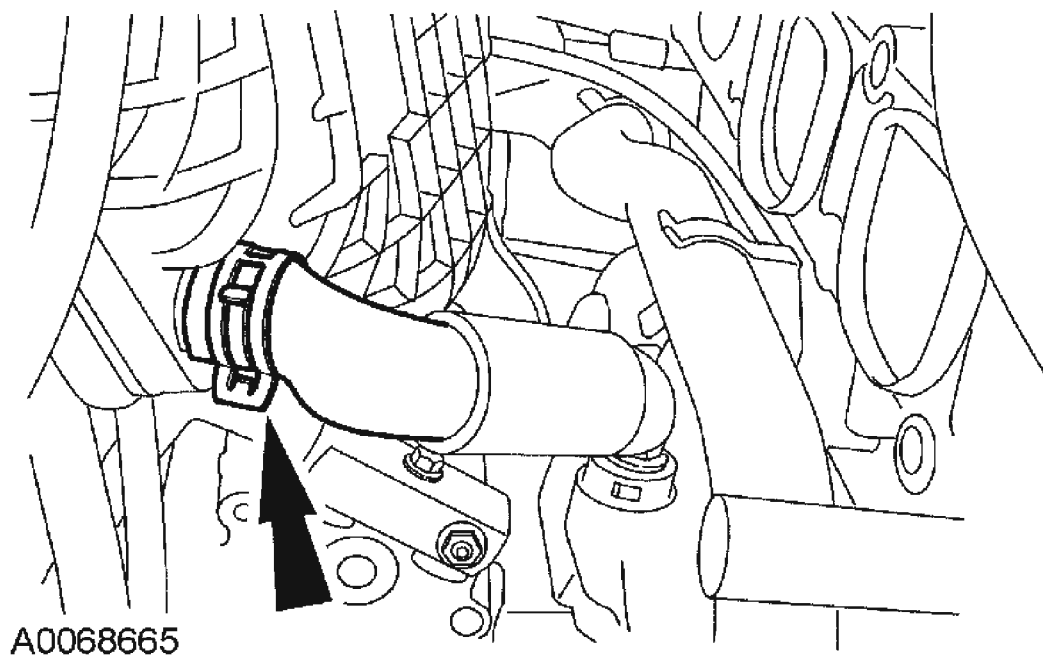


Fig. 327: Disconnecting Positive Crankcase Ventilation (PCV) Hose
Courtesy of FORD MOTOR CO.

35. Remove the exhaust gas recirculation (EGR) tube.

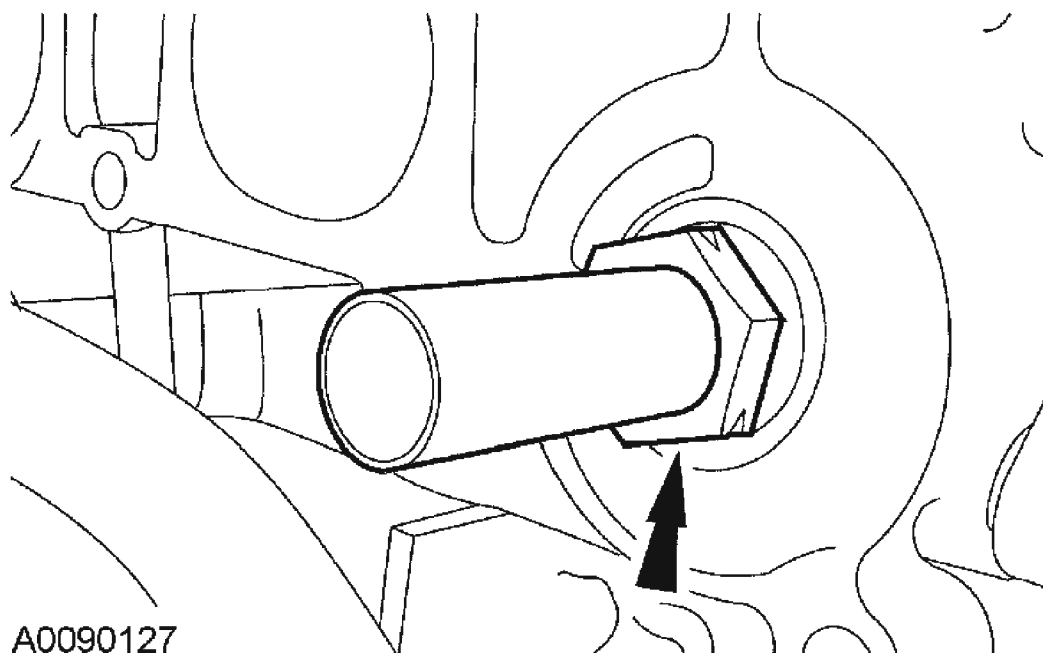


Fig. 328: Removing Exhaust Gas Recirculation Tube
Courtesy of FORD MOTOR CO.

36. Remove the radio interference capacitor bracket bolt and position the bracket aside.

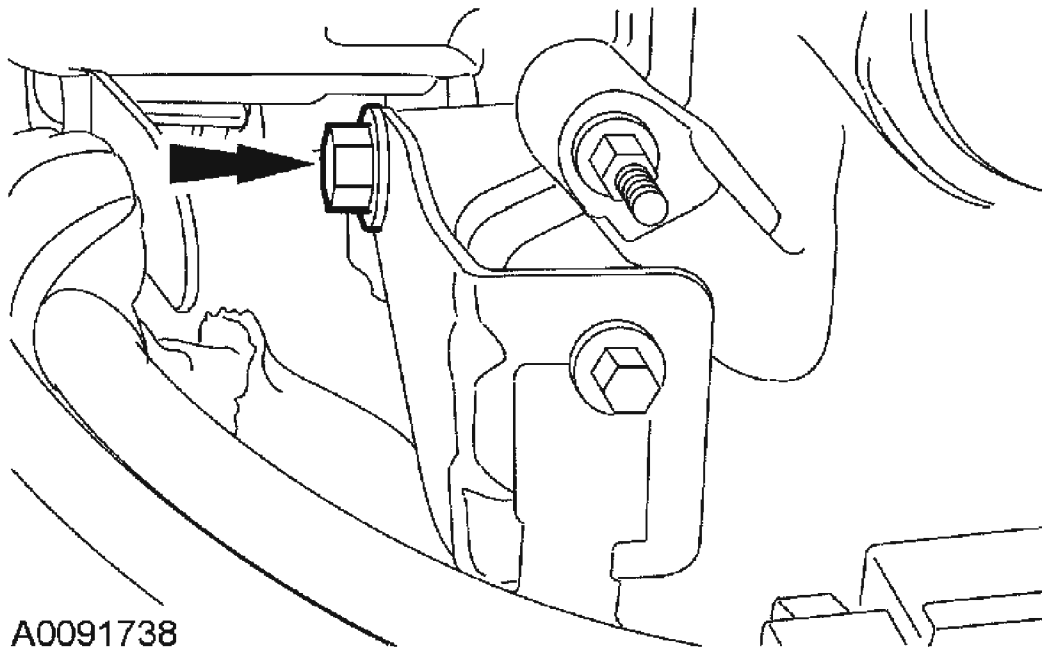


Fig. 329: Removing Radio Interference Capacitor Bracket Bolt
Courtesy of FORD MOTOR CO.

37. Disconnect the wiring harness retainers from the valve cover studs and position aside.

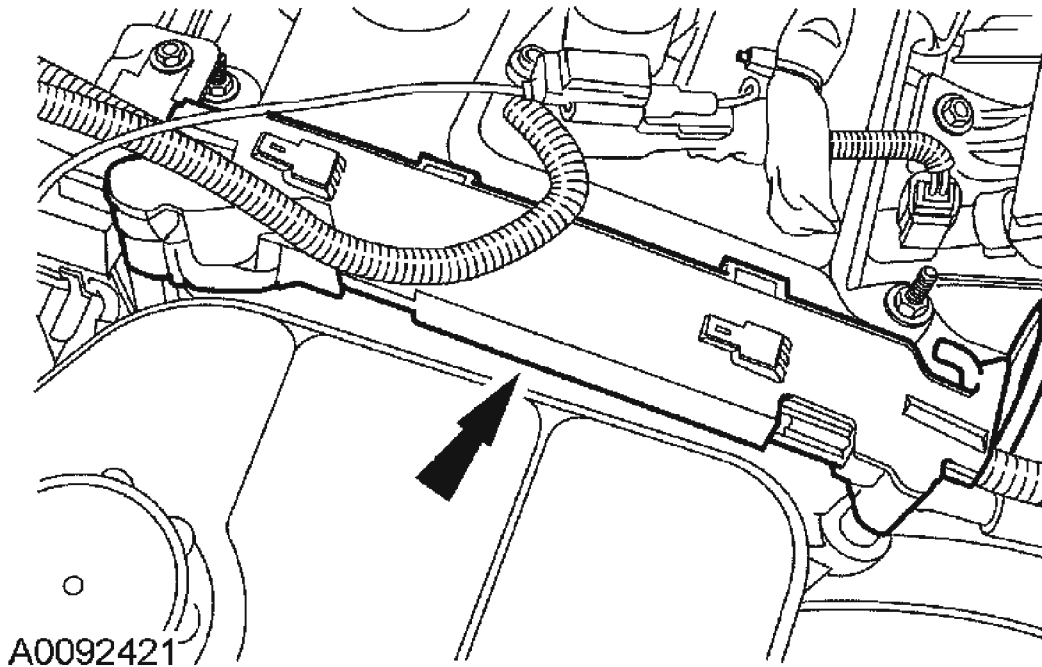


Fig. 330: Disconnecting Wiring Harness Retainers From Valve Cover Studs
Courtesy of FORD MOTOR CO.

38. Disconnect the fuel charging wiring harness.
- Disconnect the fuel rail pressure and temperature sensor electrical connector.
 - Disconnect the four fuel injector electrical connectors.
 - Detach the wiring harness retainers.

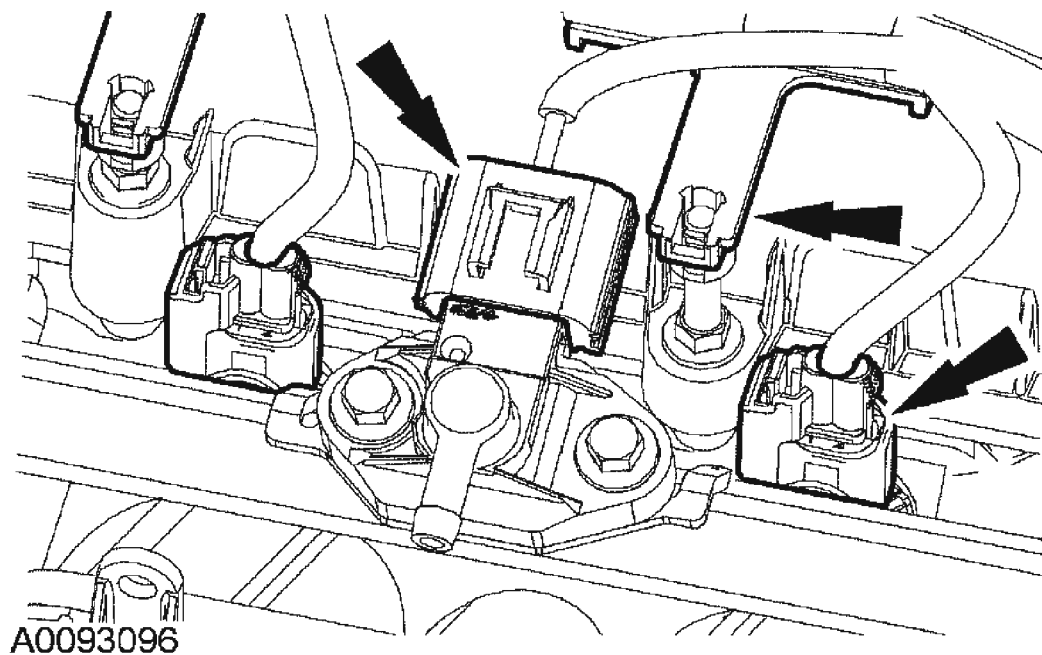


Fig. 331: Disconnecting Fuel Charging Wiring Harness
Courtesy of FORD MOTOR CO.

39. Remove the bolts and the fuel rail with the fuel injectors.

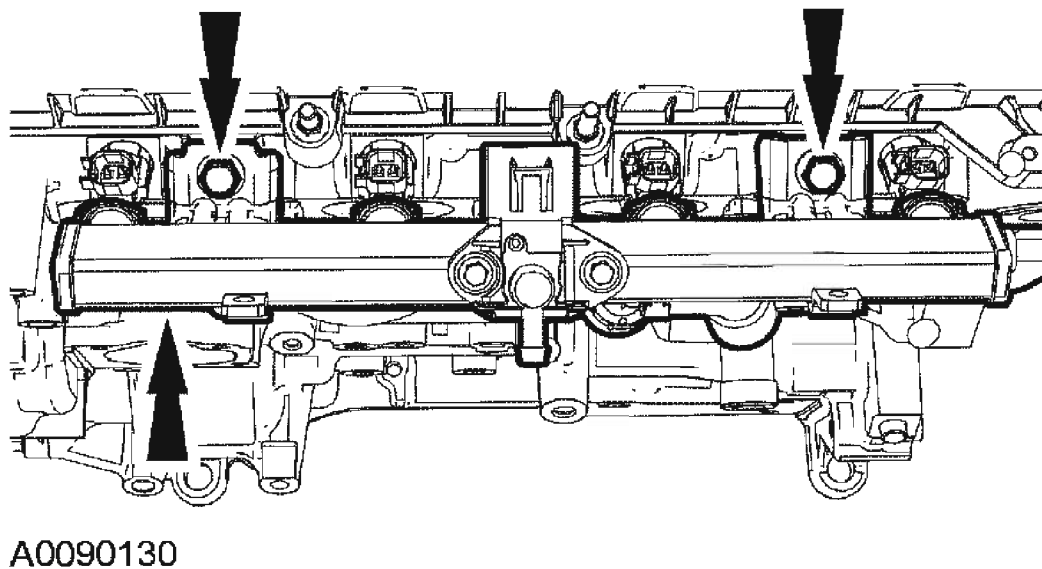
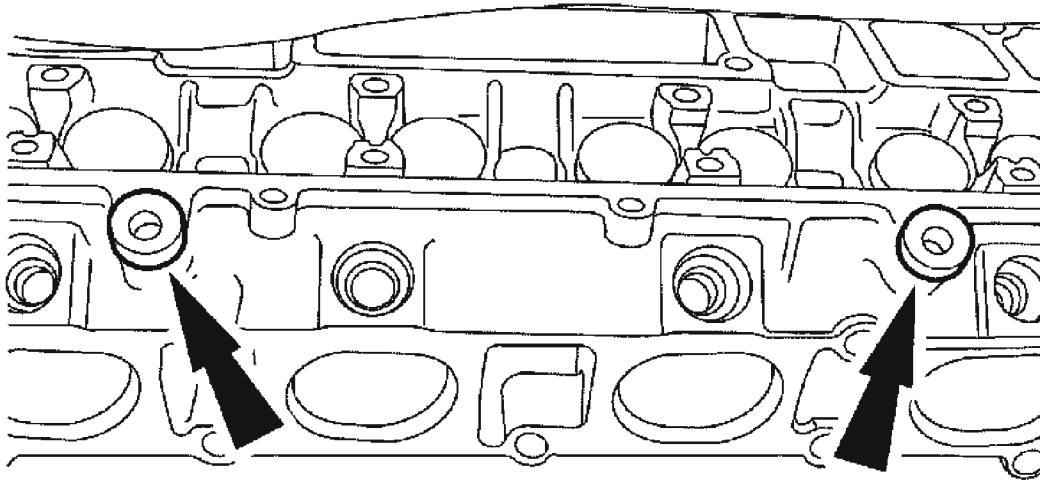


Fig. 332: Removing Bolts And Fuel Rail With Fuel Injectors

Courtesy of FORD MOTOR CO.

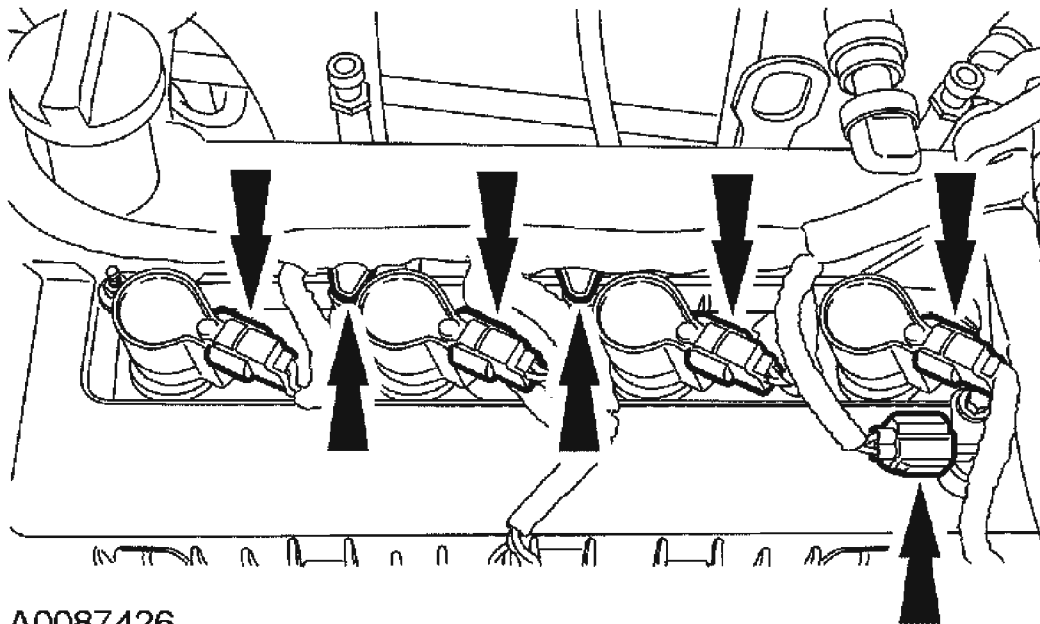
40. Remove the fuel rail spacers.



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Fig. 333: Removing Fuel Rail Spacers
Courtesy of FORD MOTOR CO.

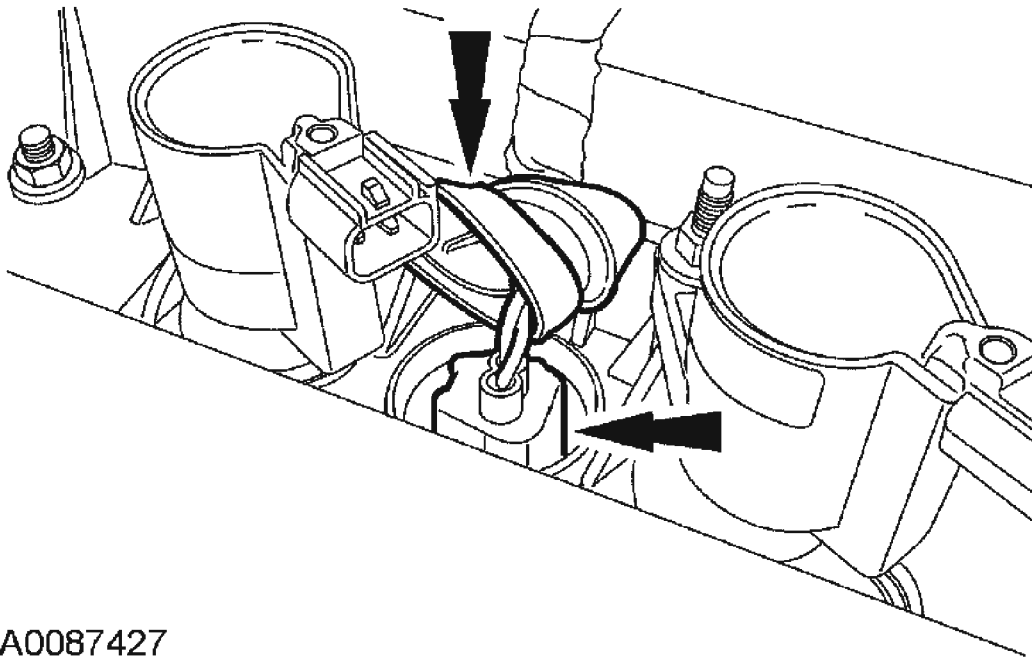
41. Disconnect the coil-on-plug and camshaft position (CMP) sensor electrical connectors.



A0087426

Fig. 334: Disconnecting Coil-On-Plug And Camshaft Position (CMP) Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

42. Position the rubber boot aside and disconnect the cylinder head temperature (CHT) sensor electrical connector. Remove the wiring harness from the engine.



A0087427

Fig. 335: Disconnecting Cylinder Head Temperature Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

43. Disconnect and remove the coolant hose.

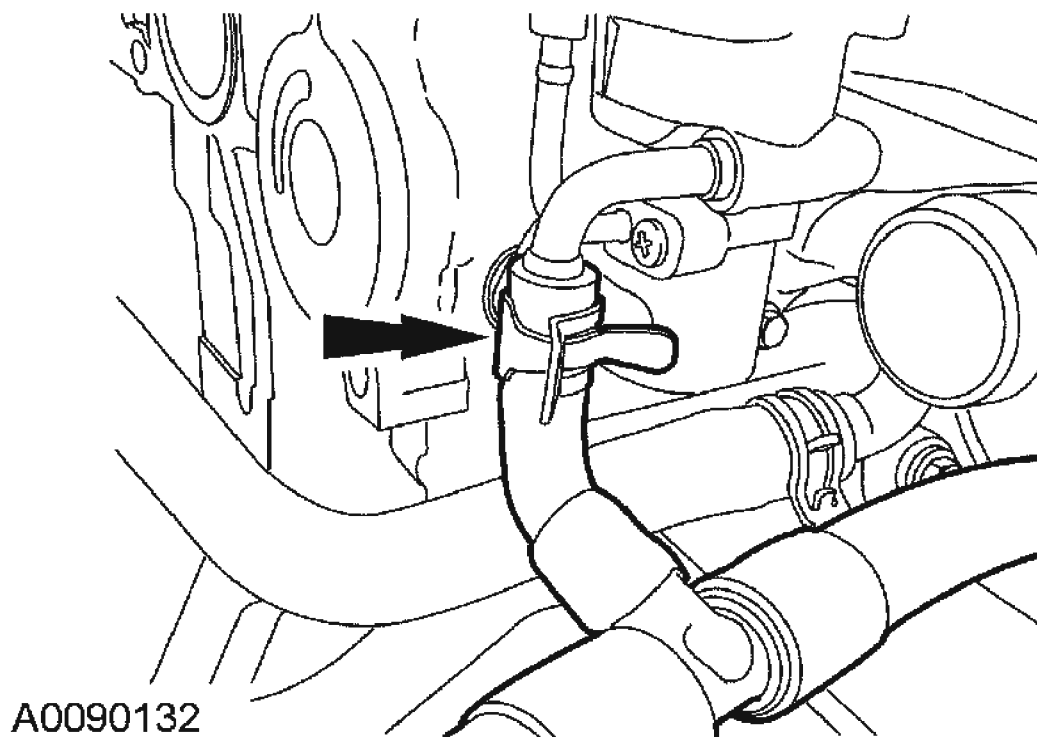


Fig. 336: Removing Coolant Hose
Courtesy of FORD MOTOR CO.

44. Disconnect the coolant bypass hose.

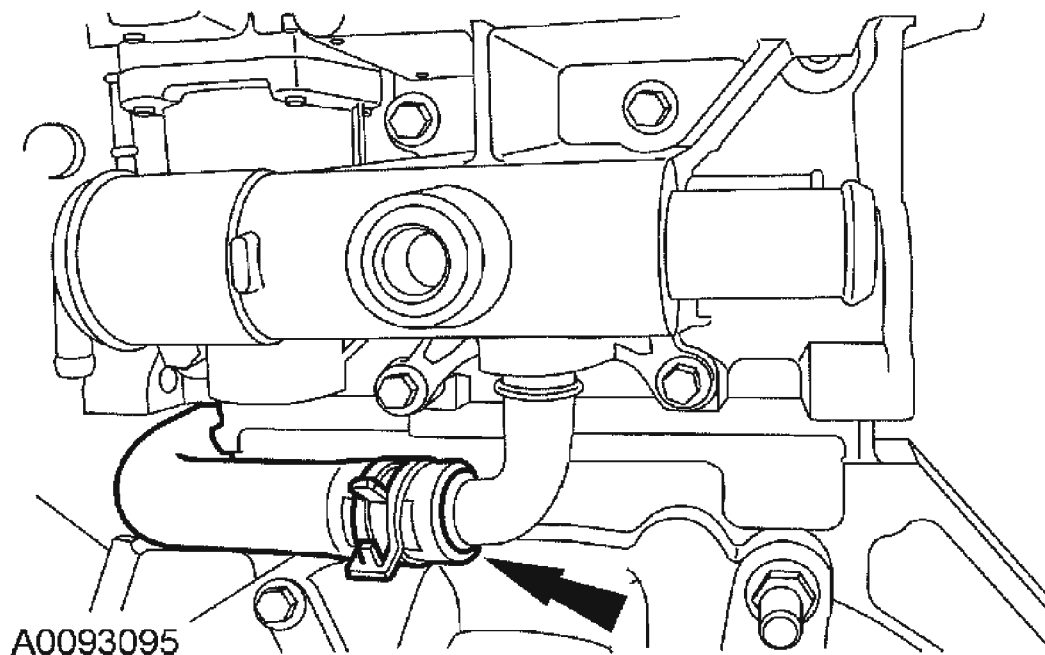


Fig. 337: Disconnecting Coolant Bypass Hose
Courtesy of FORD MOTOR CO.

45. Remove the bolts and the coolant bypass.

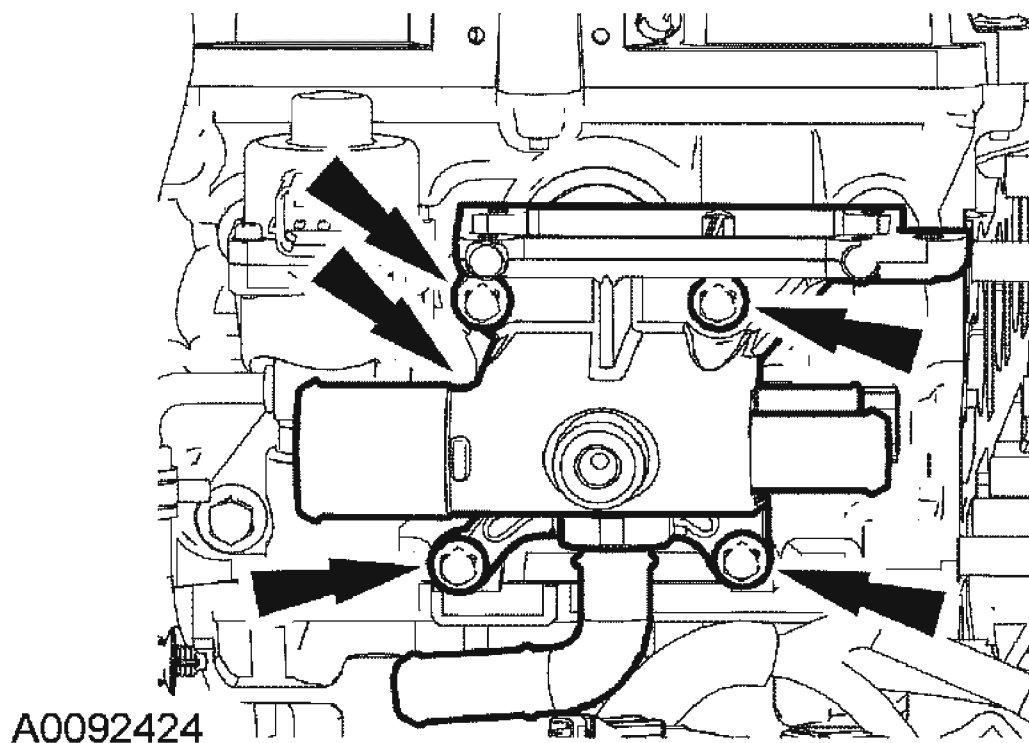


Fig. 338: Removing Bolts And Coolant Bypass
Courtesy of FORD MOTOR CO.

46. Disconnect and remove the coolant bypass hose.

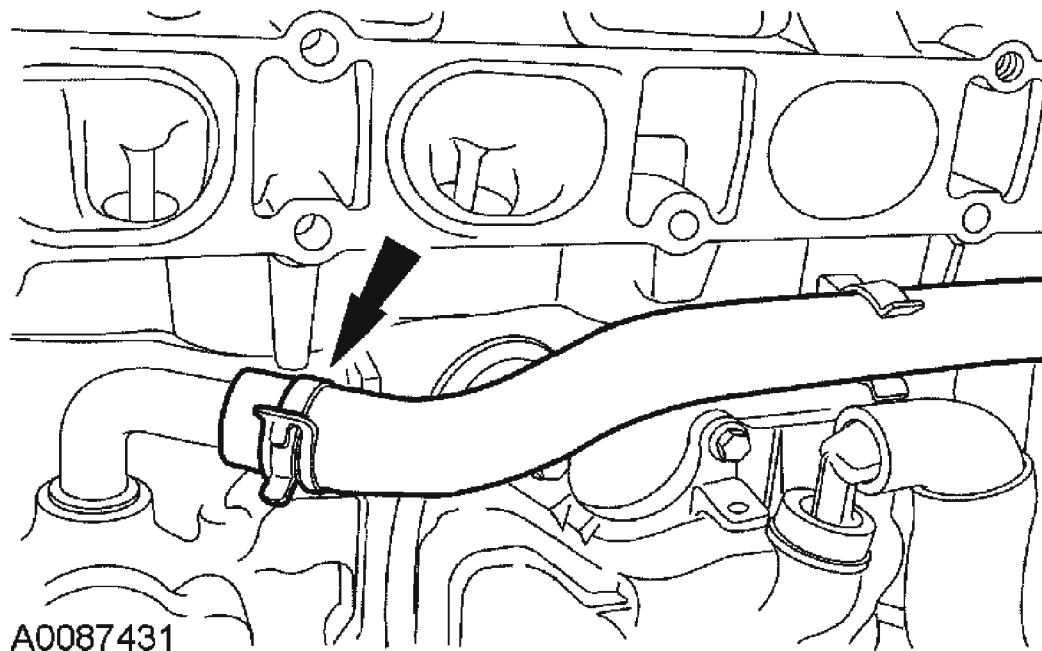


Fig. 339: Removing Coolant Bypass Hose
Courtesy of FORD MOTOR CO.

47. Remove the bolt and the KS.

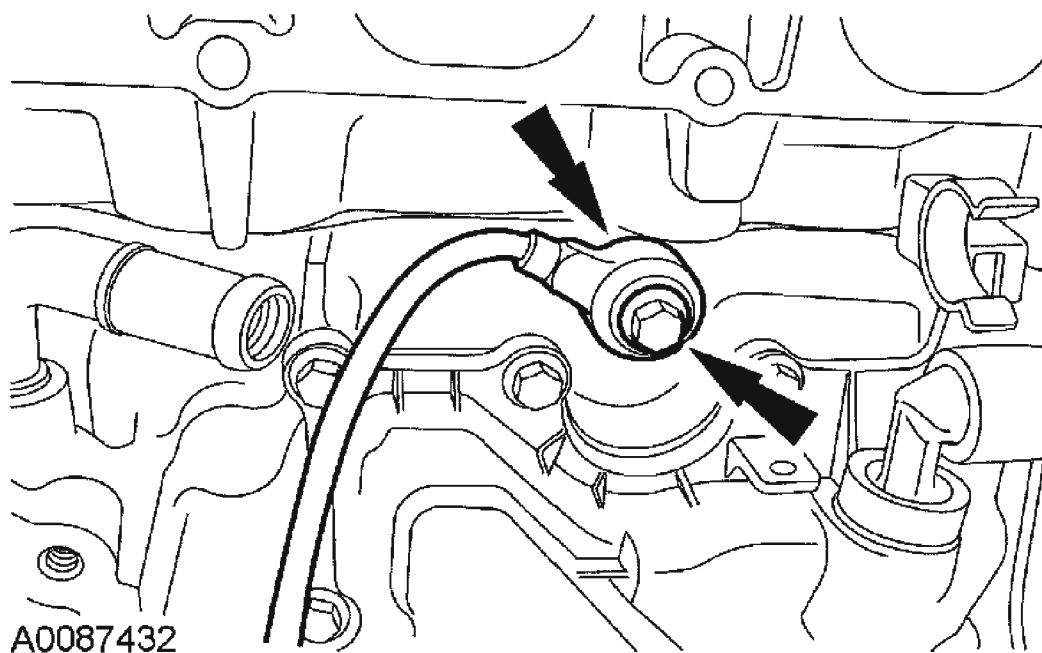


Fig. 340: Removing Bolt And KS
Courtesy of FORD MOTOR CO.

48. Remove the bolts and the crankcase vent oil separator.

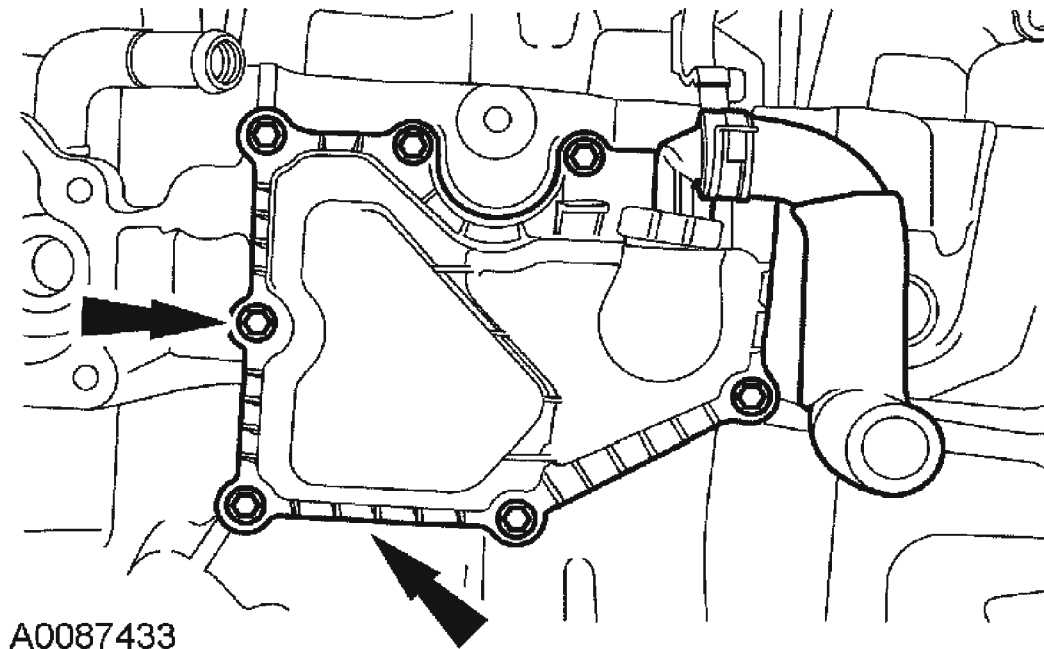


Fig. 341: Removing Bolts And Crankcase Vent Oil Separator
Courtesy of FORD MOTOR CO.

49. If equipped, remove the block heater.

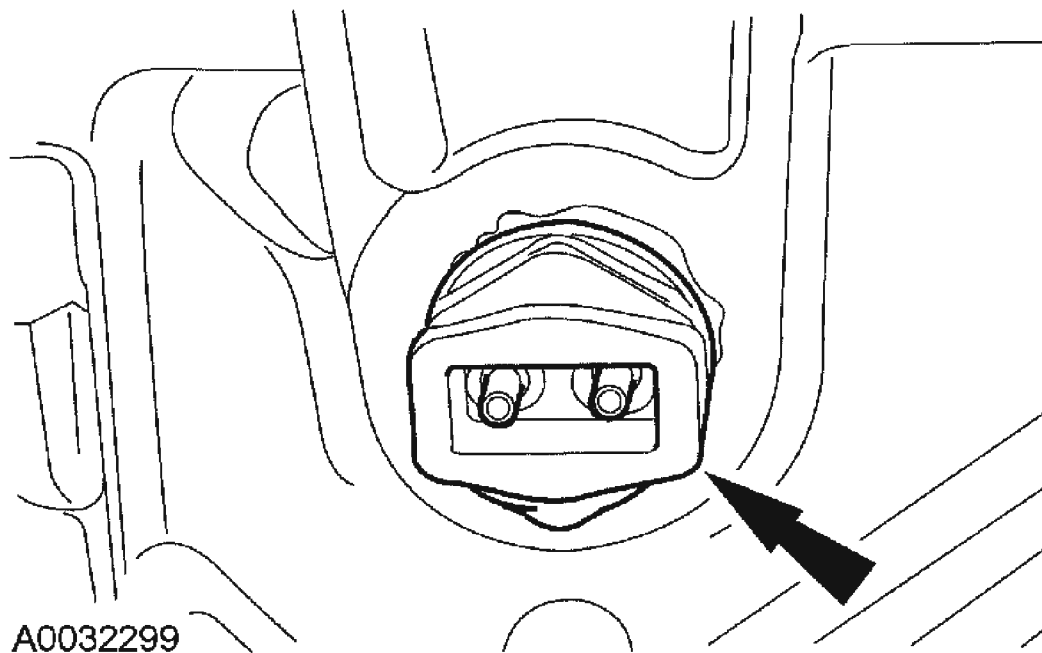


Fig. 342: Removing Block Heater
Courtesy of FORD MOTOR CO.

50. Remove the crankcase vent tube and the coil-on-plugs.

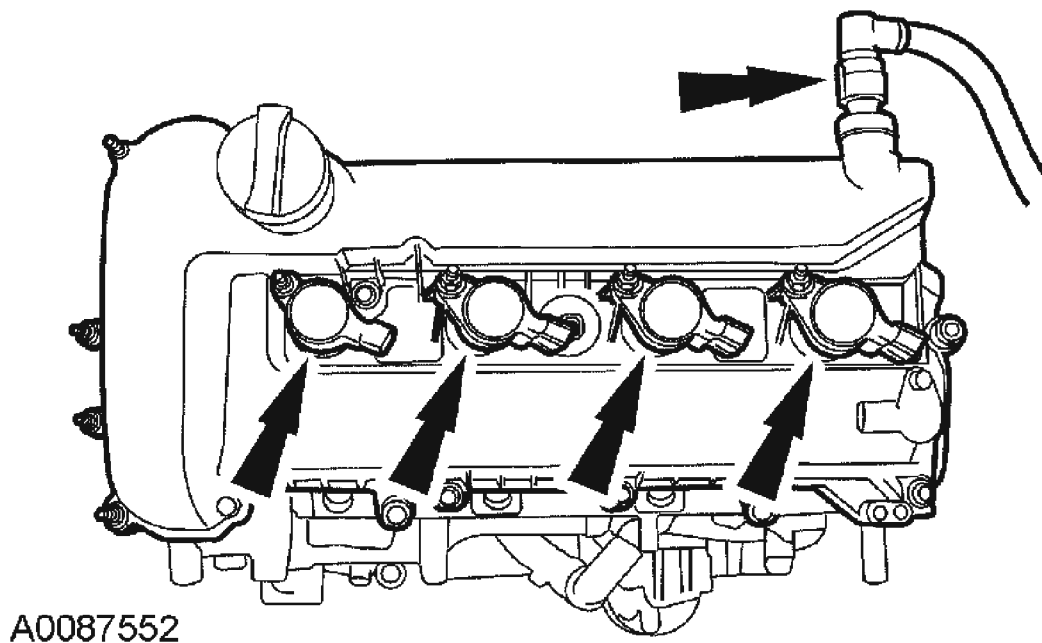


Fig. 343: Removing Crankcase Vent Tube And Coil-On-Plugs
Courtesy of FORD MOTOR CO.

51. Remove the spark plugs.

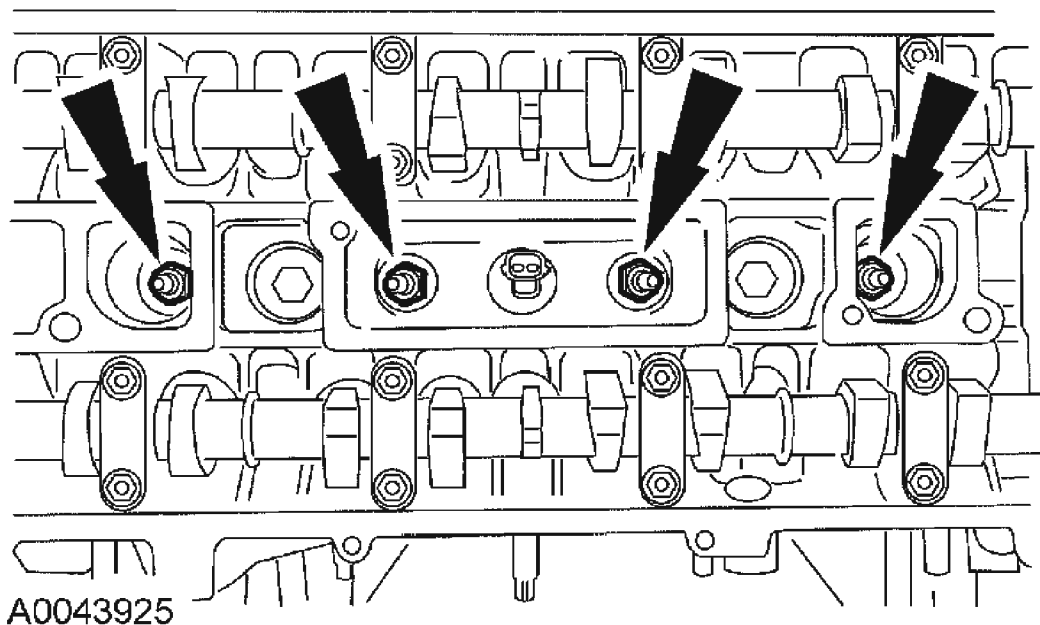


Fig. 344: Removing Spark Plugs
Courtesy of FORD MOTOR CO.

52. Remove the bolts and the valve cover.

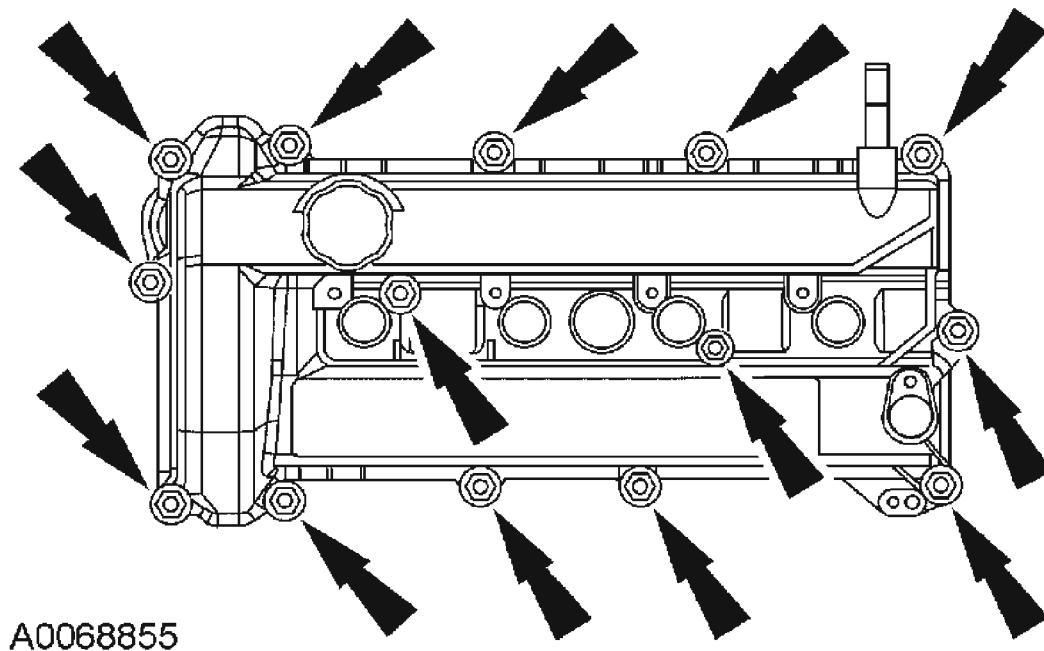


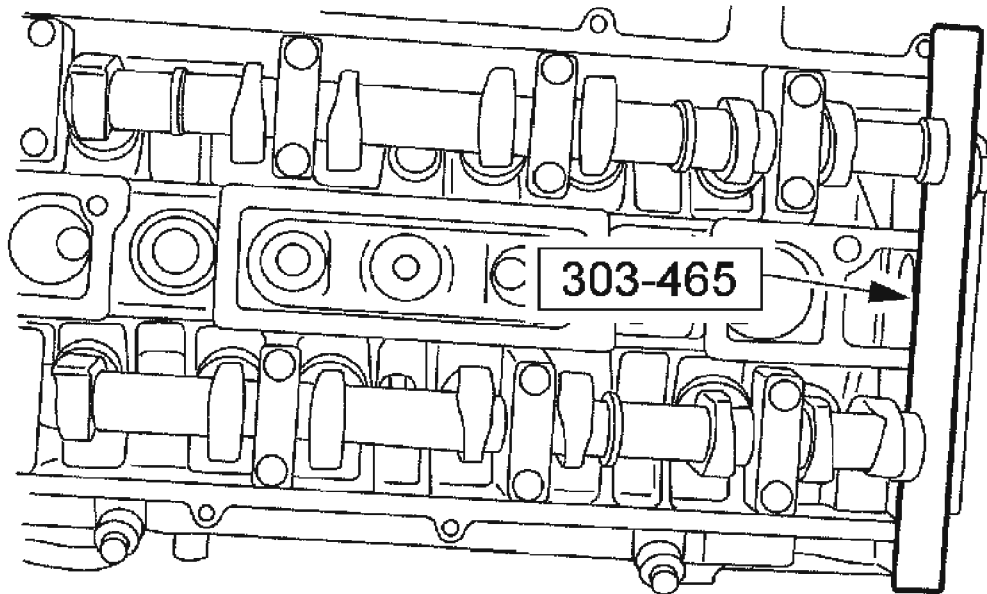
Fig. 345: Removing Bolts And Valve Cover
Courtesy of FORD MOTOR CO.

CAUTION: Failure to position the No. 1 piston at top dead center (TDC) can result in damage to the engine. Turn the engine in the normal direction of rotation only.

53. Using the crankshaft pulley bolt, turn the crankshaft clockwise to position the No. 1 piston at TDC.

CAUTION: The special tool 303-465 is for camshaft alignment only. Using this tool to prevent engine rotation can result in engine damage.

NOTE: The camshaft timing slots are offset. If the special tool cannot be installed, rotate the crankshaft one complete revolution clockwise to correctly position the camshafts.



A0052352

Fig. 346: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

54. Install the special tool in the slots on the rear of both camshafts.
55. Remove the engine plug bolt.



A0032806

Fig. 347: Locating Engine Plug Bolt
Courtesy of FORD MOTOR CO.

NOTE: Only turn the engine in the normal direction of rotation.

NOTE: Installing the special tool in this step will prevent the engine from being rotated in the clockwise direction.

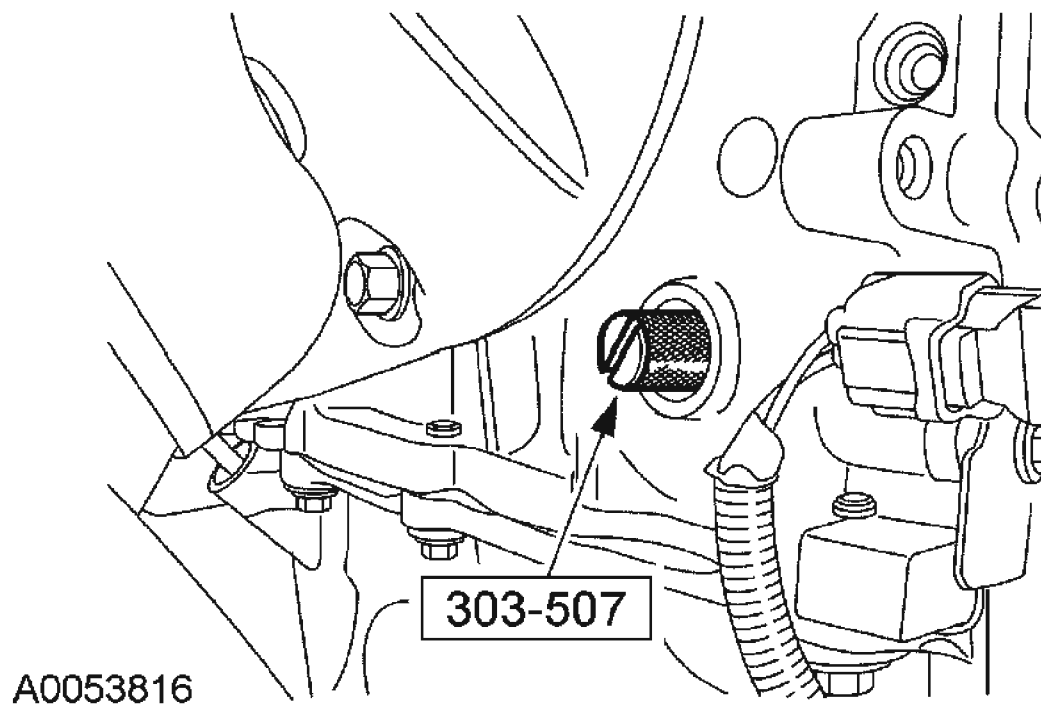
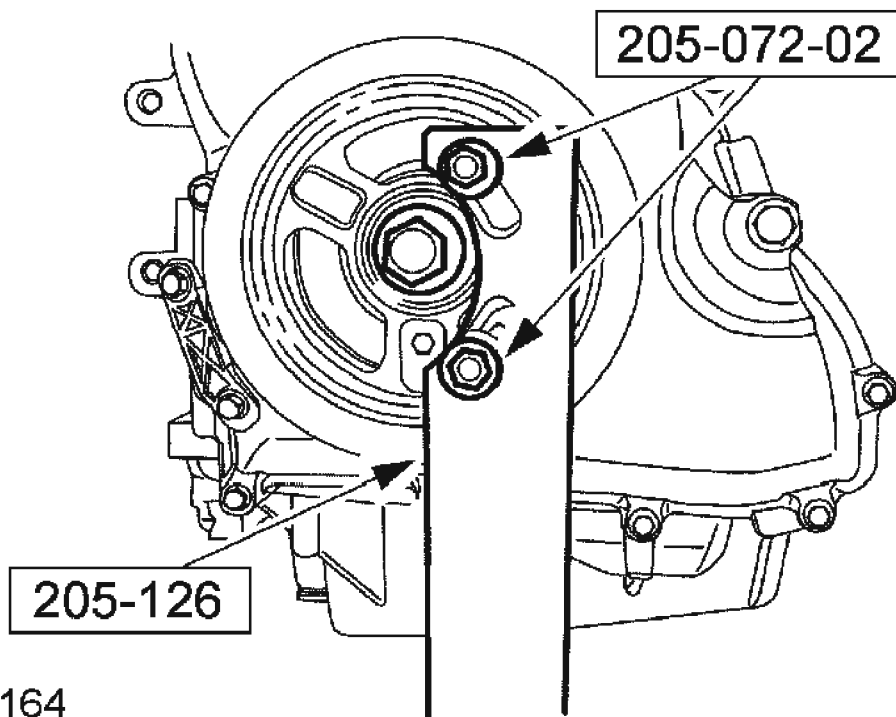


Fig. 348: Identifying Special Tool (303-507)
Courtesy of FORD MOTOR CO.

56. Install the special tool.
57. Install the special tools.



A0093164

Fig. 349: Installing Special Tools (205-072-02 & 205-126)
Courtesy of FORD MOTOR CO.

CAUTION: Failure to hold the crankshaft pulley in place while loosening the bolt can result in damage to the engine.

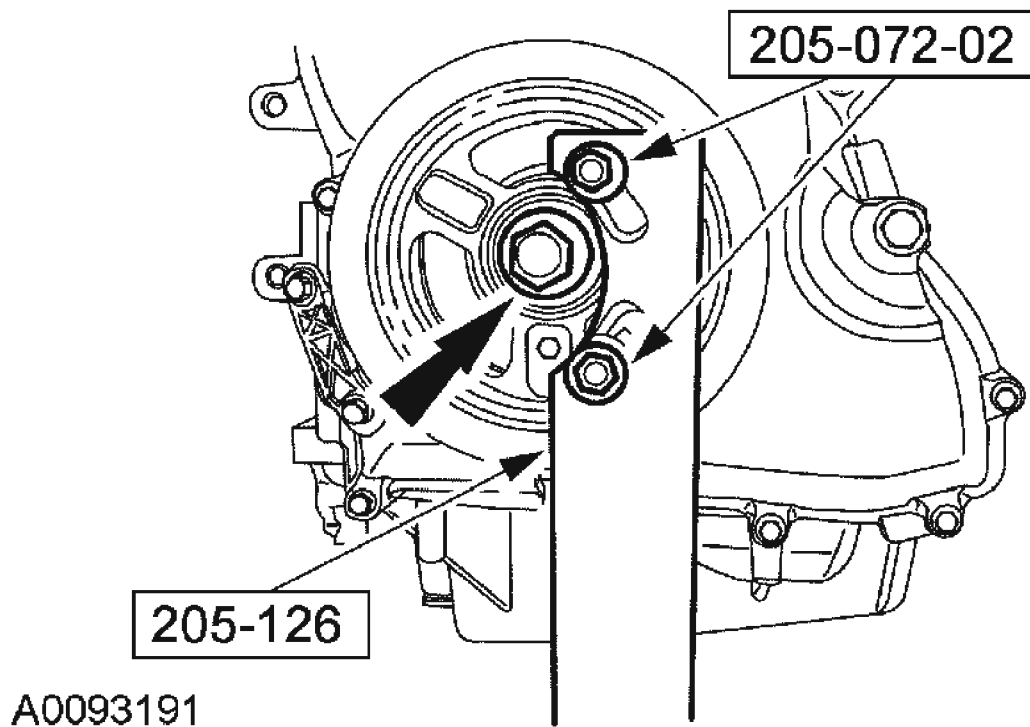


Fig. 350: Removing Crankshaft Pulley
Courtesy of FORD MOTOR CO.

58. Remove the crankshaft pulley.
- Remove the crankshaft pulley bolt and washer. Discard the bolt.
 - Remove the crankshaft pulley.

CAUTION: Use care not to damage the engine front cover or the crankshaft when removing the seal.

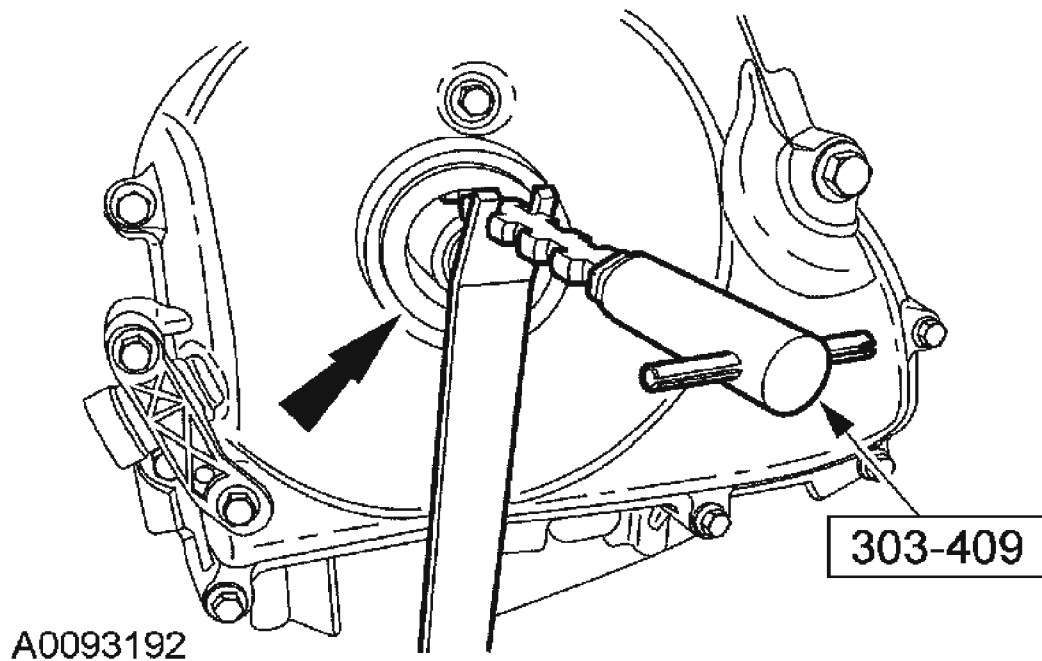


Fig. 351: Removing Crankshaft Front Oil Seal Using Special Tool
Courtesy of FORD MOTOR CO.

59. Using the special tool, remove the crankshaft front oil seal.

NOTE: Whenever the CKP sensor is removed, a new one must be installed using the alignment jig supplied with the new part.

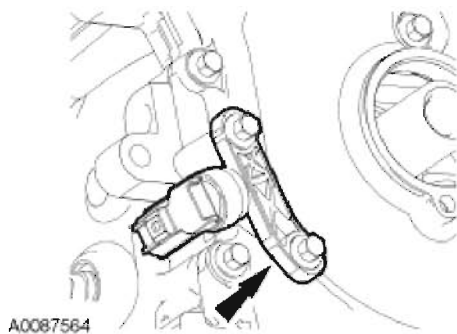
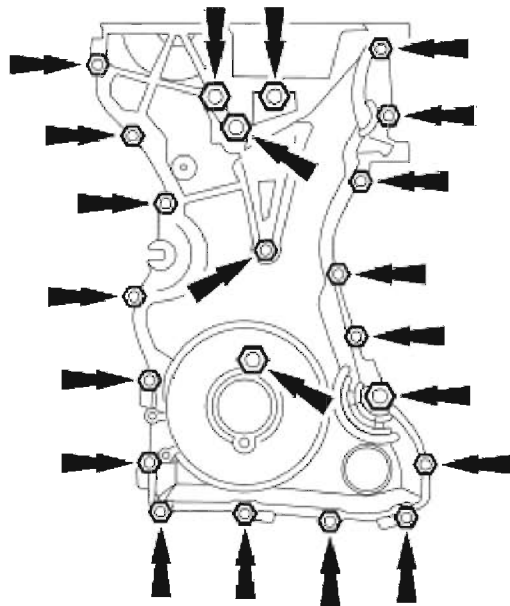


Fig. 352: Locating CKP Sensor
Courtesy of FORD MOTOR CO.

60. Remove and discard the CKP sensor.
61. Remove the bolts and the engine front cover.



A0087412

Fig. 353: Locating Engine Front Cover Bolts
Courtesy of FORD MOTOR CO.

62. Remove the timing chain tensioner.
 1. Compress the timing chain tensioner, and insert a paper clip into the hole to retain the tensioner.
 2. Remove the bolts and timing chain tensioner.

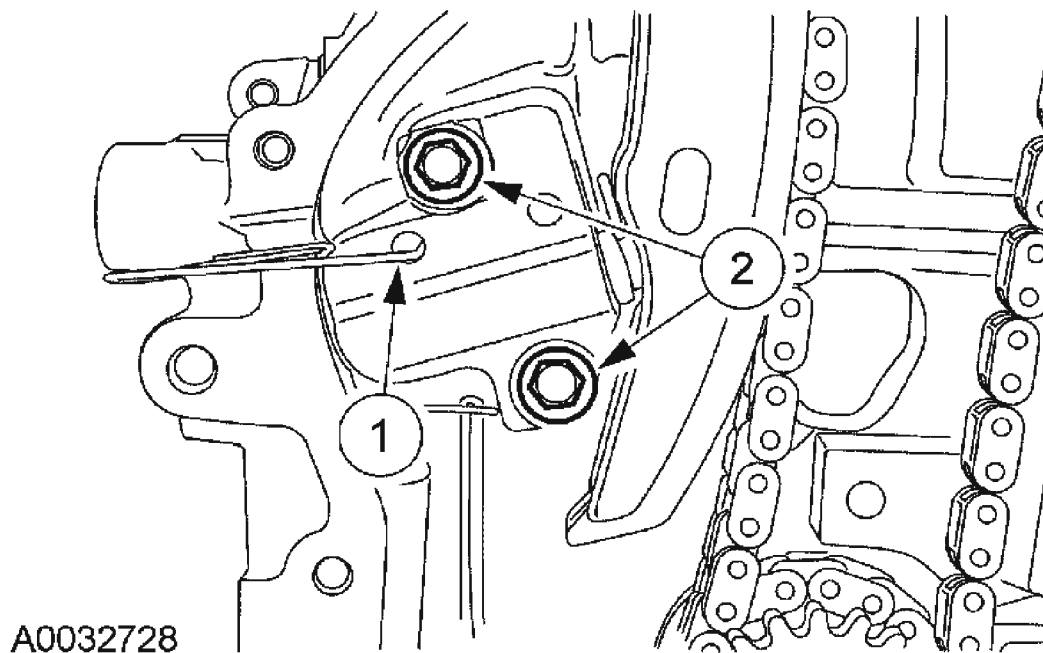


Fig. 354: Removing Timing Chain Tensioner
Courtesy of FORD MOTOR CO.

63. Remove the RH timing chain guide.

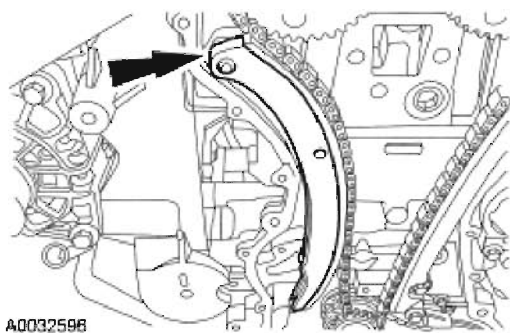
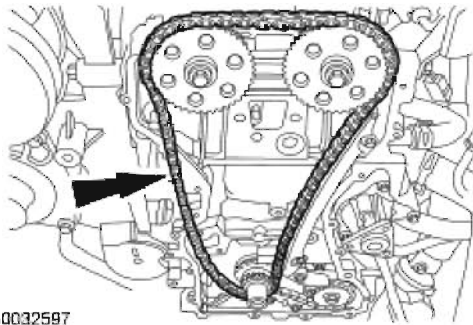


Fig. 355: Locating RH Timing Chain Guide
Courtesy of FORD MOTOR CO.

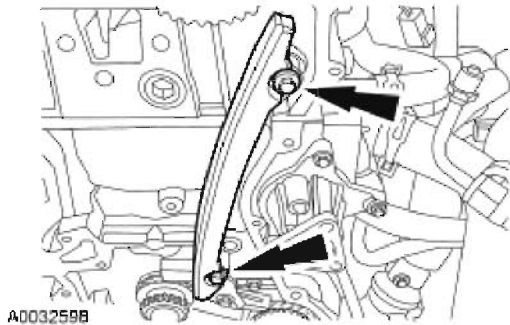
64. Remove the timing chain.



A0032597

Fig. 356: View Of Timing Chain
Courtesy of FORD MOTOR CO.

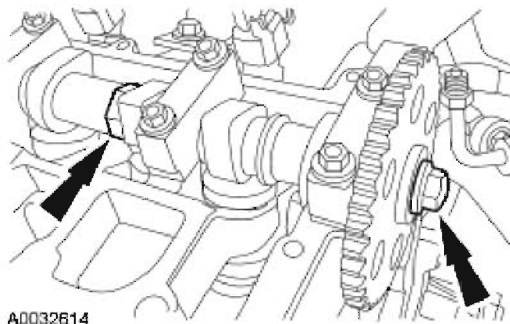
65. Remove the bolts and the LH timing chain guide.



A0032598

Fig. 357: Identifying Bolts And LH Timing Chain Guide
Courtesy of FORD MOTOR CO.

CAUTION: Do not rely on the Camshaft Alignment Plate to prevent camshaft rotation. Damage to the tool or the camshaft can occur.



A0032614

Fig. 358: Locating Cam Holding Area And Sprocket Bolt
Courtesy of FORD MOTOR CO.

66. Using the flats on the camshaft to prevent camshaft rotation, remove the bolts and the camshaft sprockets.
67. Remove the oil pump chain tensioner and guide.

1. Release the tension on the tensioner spring.
2. Remove the tensioner and the shoulder bolt.
3. Remove the guide.

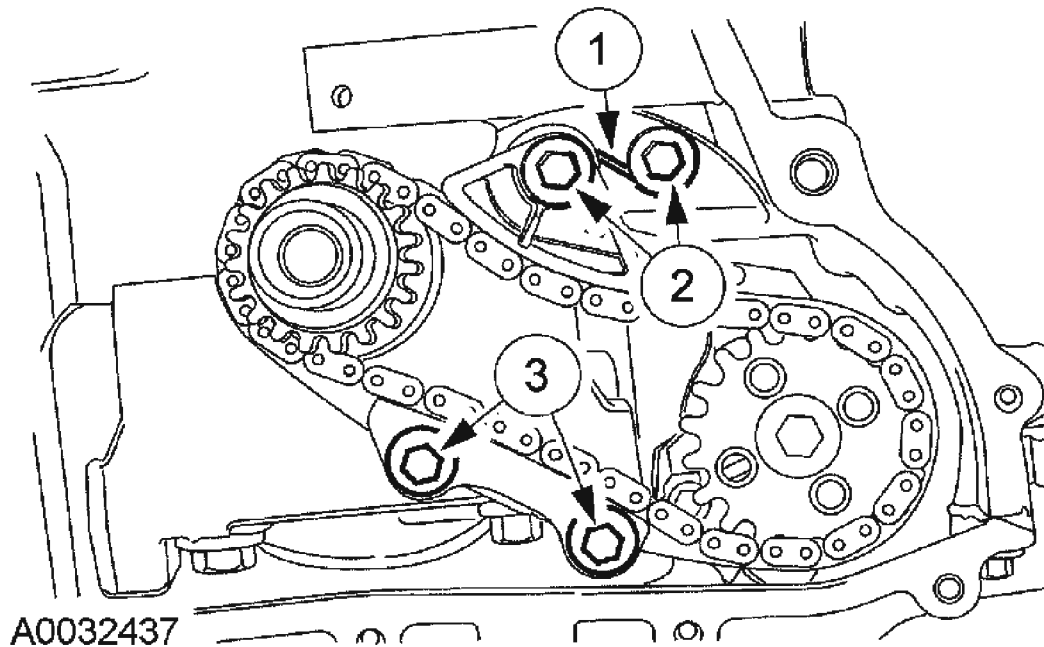


Fig. 359: Removing Oil Pump Chain Tensioner And Guide
Courtesy of FORD MOTOR CO.

NOTE: Remove the crankshaft sprocket diamond washers located in front of and behind the crankshaft sprocket.

NOTE: The oil pump chain sprocket must be held in place.

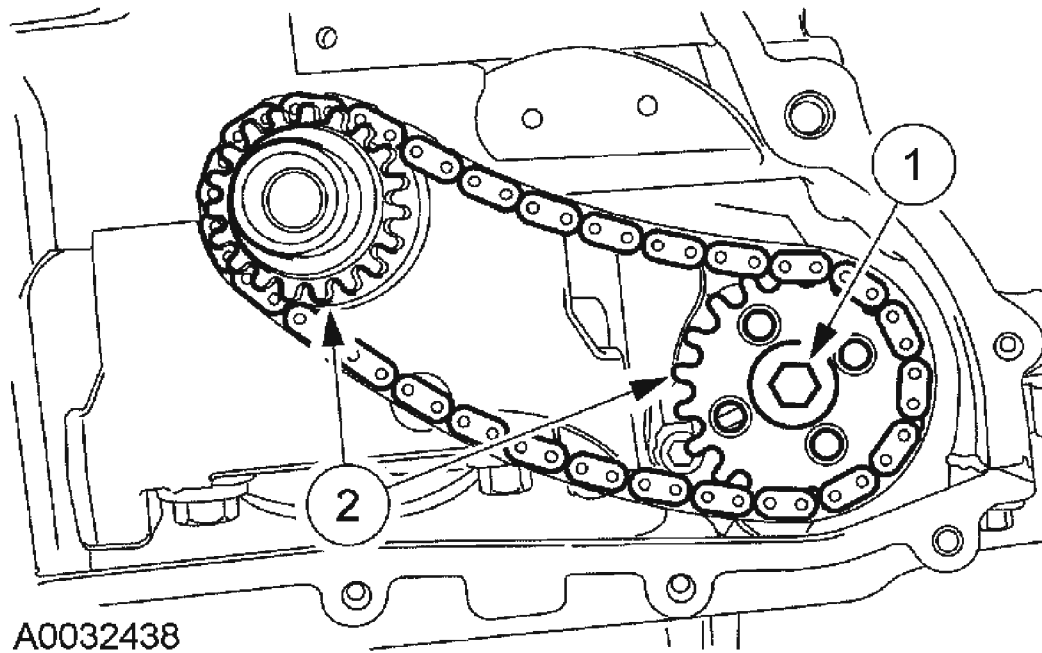


Fig. 360: Removing Oil Pump Chain And Sprockets
Courtesy of FORD MOTOR CO.

68. Remove the oil pump chain and sprockets.
 1. Remove the bolt.
 2. Remove the chain and sprockets.
69. Mark the position of the camshaft lobes on the No. 1 cylinder for assembly reference.

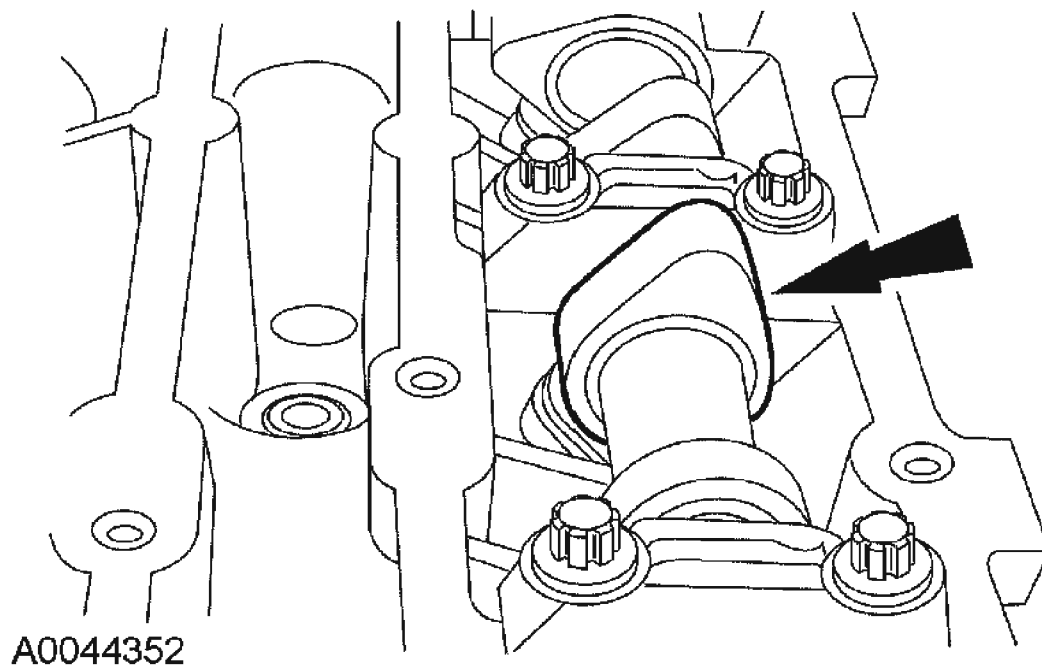


Fig. 361: Marking Position Of Camshaft Lobes On No. 1 Cylinder For Assembly Reference

Courtesy of FORD MOTOR CO.

CAUTION: Failure to follow the camshaft loosening procedure can result in damage to the camshafts.

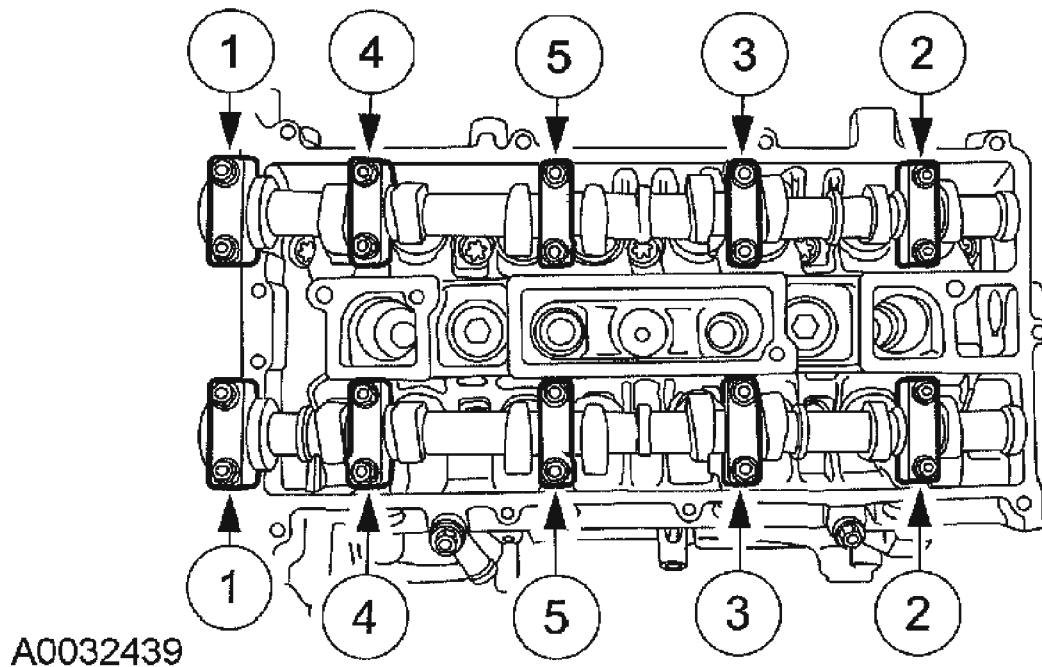
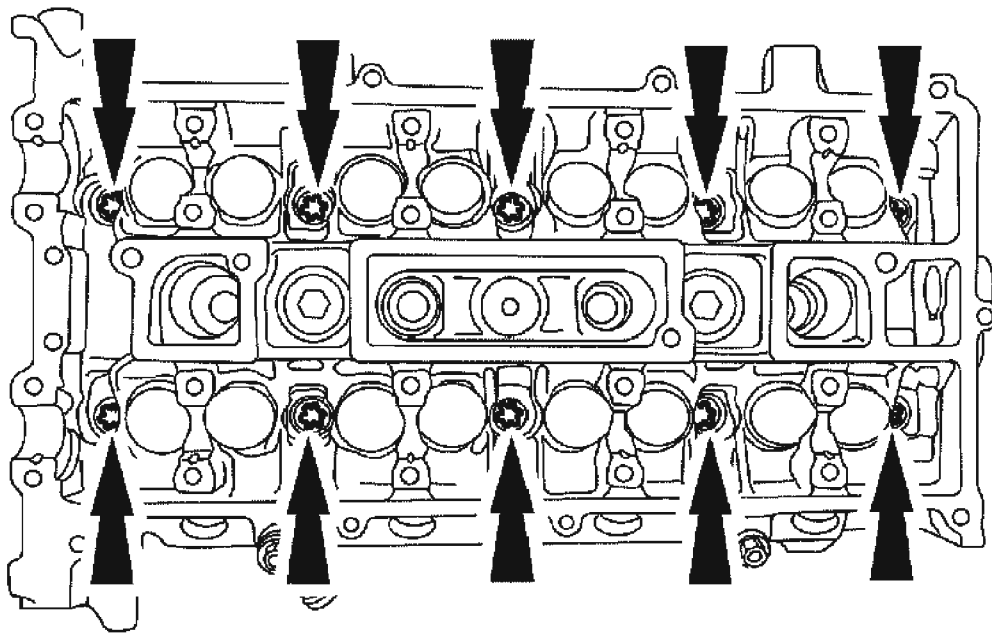


Fig. 362: Removing Camshafts From Engine
 Courtesy of FORD MOTOR CO.

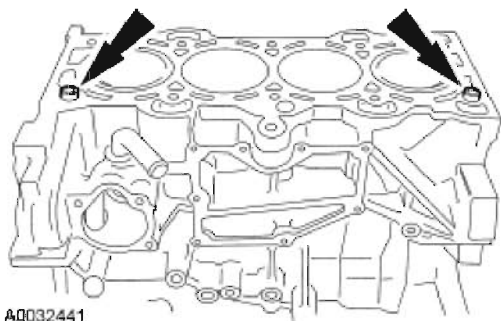
70. Remove the camshafts from the engine.
 - Loosen the camshaft bearing bolts in the sequence shown, one turn at a time. Repeat until all the tension is released.
 - Remove the camshaft bearing caps.
 - Remove the camshafts.
71. Remove the cylinder head.
 - Remove and discard the cylinder head bolts.
 - Remove the cylinder head.
 - Remove and discard the cylinder head gasket.



A0032440

Fig. 363: Removing Cylinder Head
Courtesy of FORD MOTOR CO.

72. Remove the cylinder head alignment dowels.



A0032441

Fig. 364: Identifying Cylinder Head Alignment Dowels
Courtesy of FORD MOTOR CO.

73. Remove the bolts and the oil pan.

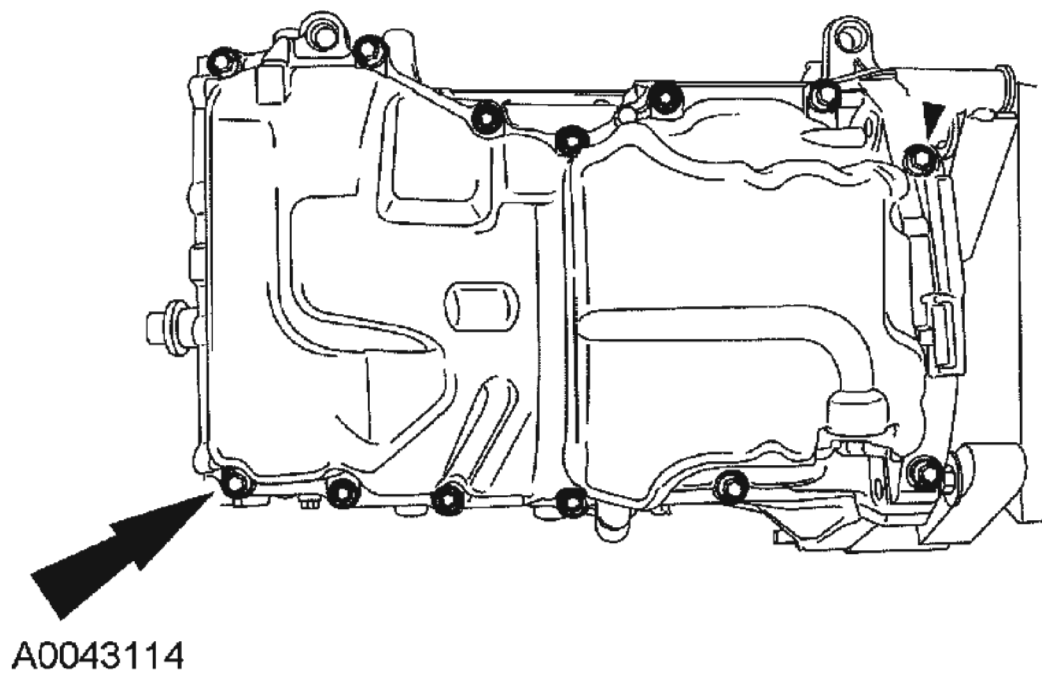


Fig. 365: Removing Oil Pan Bolts
Courtesy of FORD MOTOR CO.

74. Remove the bolts and the rear crankshaft seal.

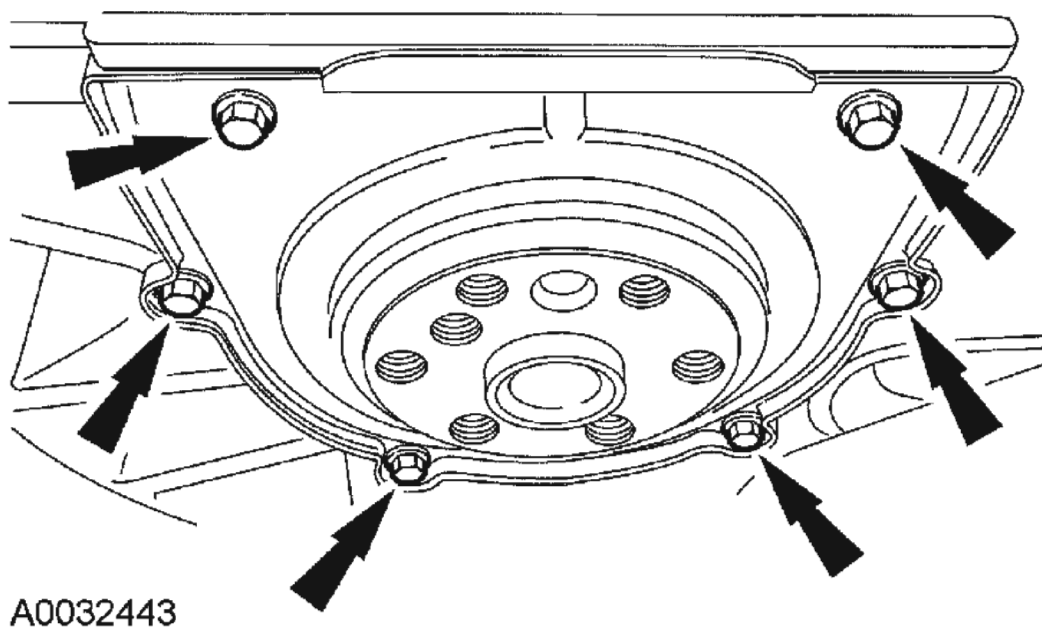


Fig. 366: Removing Rear Crankshaft Seal Bolts
Courtesy of FORD MOTOR CO.

75. Remove the bolts, oil pump pickup tube and gasket.

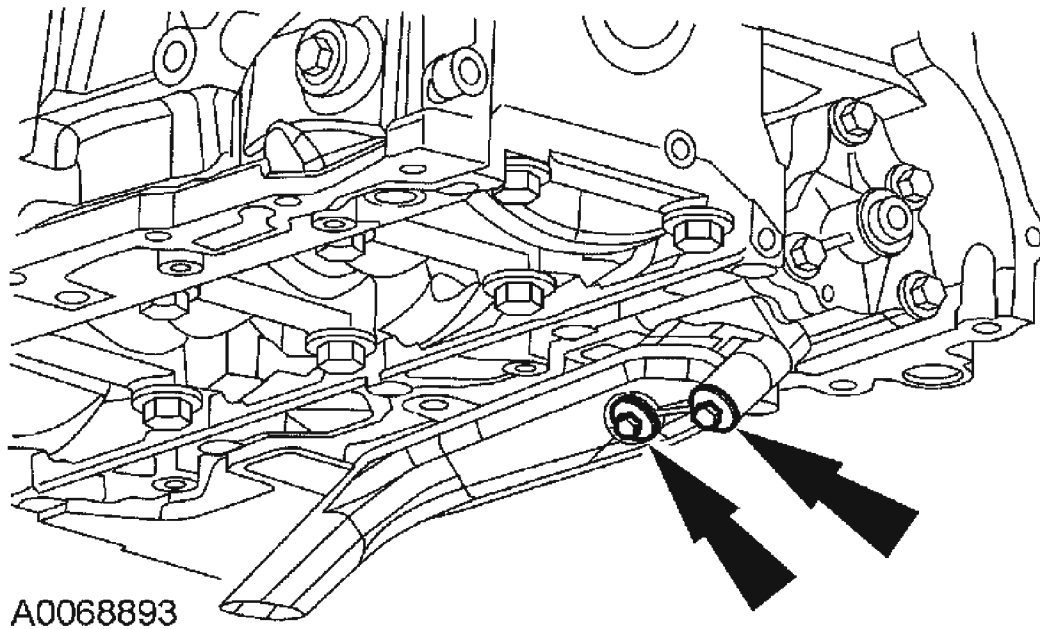
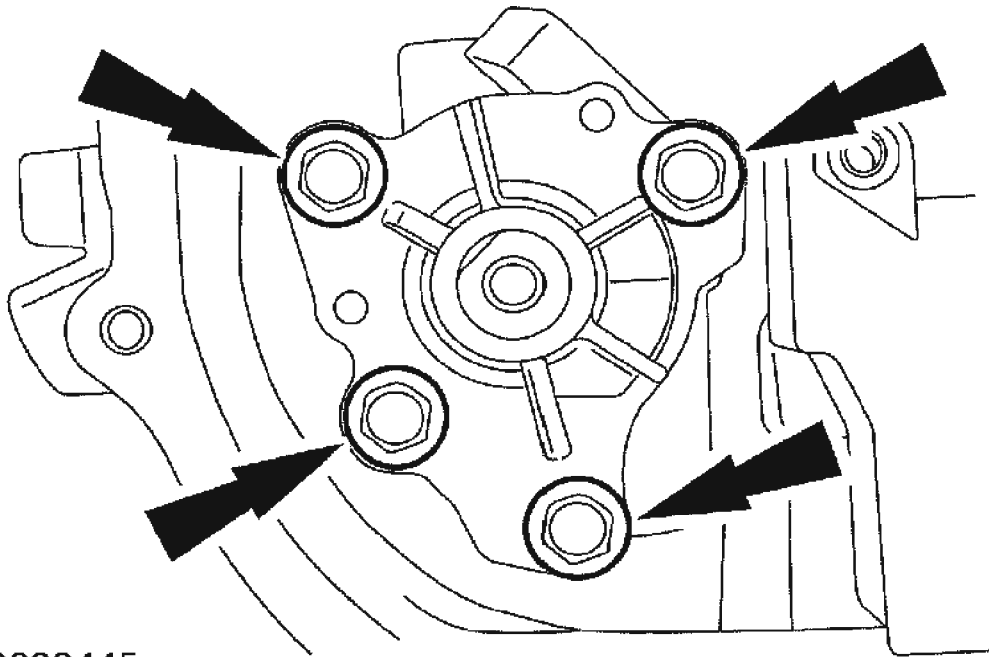


Fig. 367: Removing Oil Pump Pickup Tube Bolts
Courtesy of FORD MOTOR CO.

76. Remove the bolts and the oil pump.



A0032445

Fig. 368: Removing Oil Pump Bolts
Courtesy of FORD MOTOR CO.

77. Remove the bolts and the intermediate shaft bearing bracket.

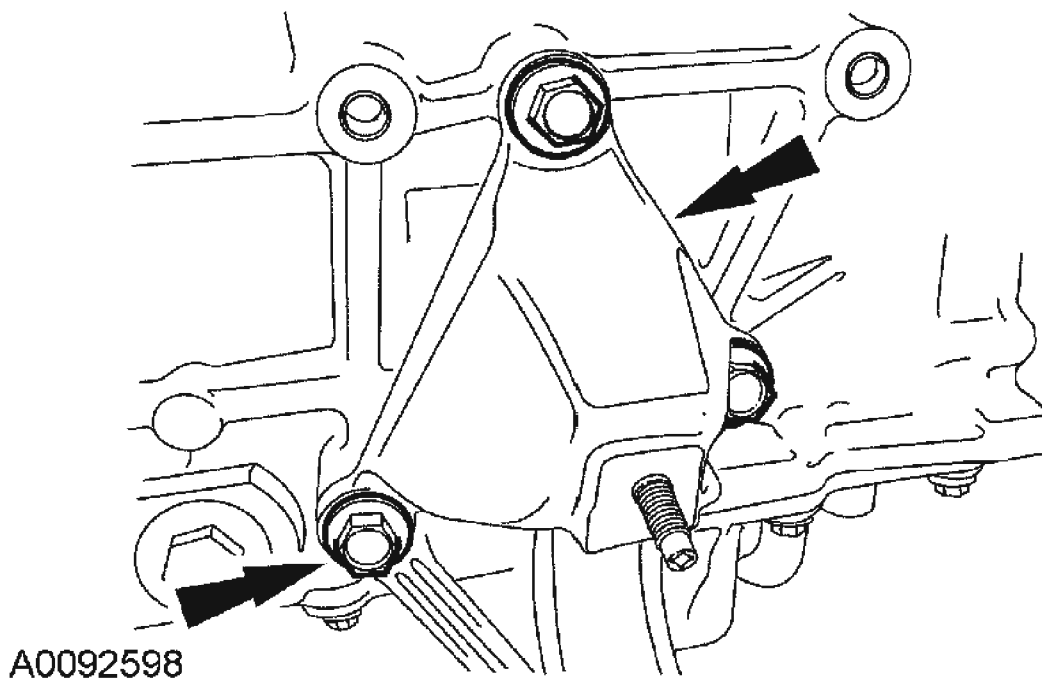


Fig. 369: Removing Intermediate Shaft Bearing Bracket Bolts
Courtesy of FORD MOTOR CO.

DISASSEMBLY AND ASSEMBLY OF SUBASSEMBLIES

CYLINDER HEAD

SPECIAL TOOL DESCRIPTION

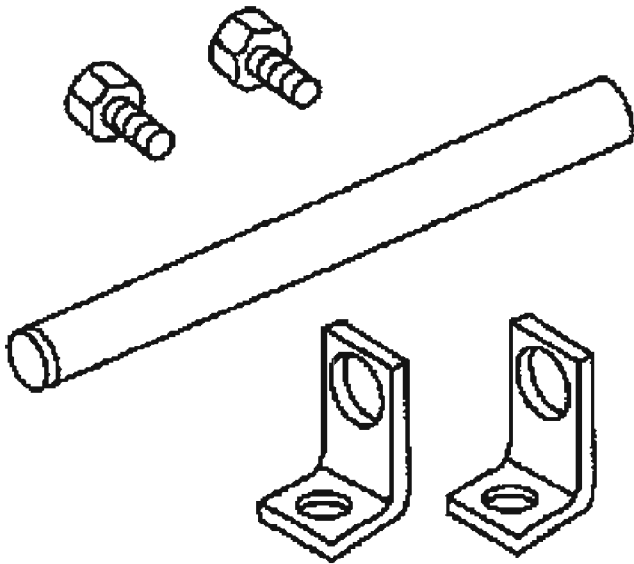


Impact Hammer 307-005 (T59L-100-B)

ST1187-A

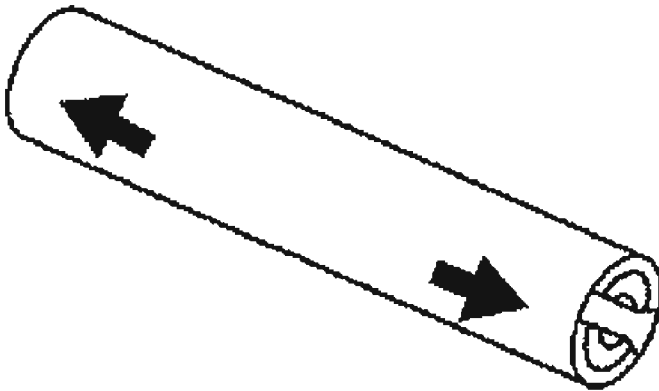
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1909-A

Valve Spring Compressor Set 303-300 (T87C-6565-A)



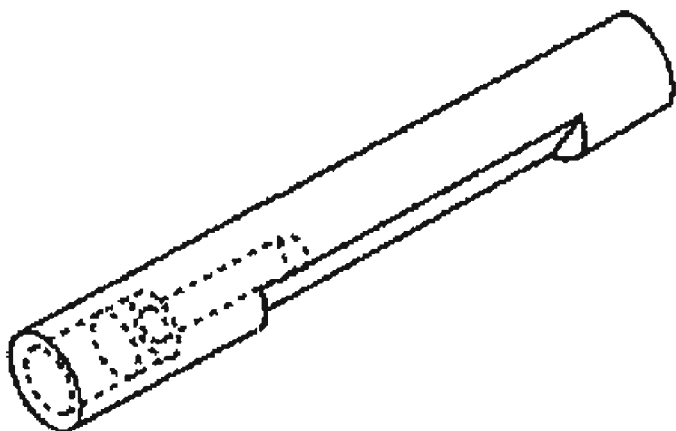
ST1904-A

Valve Stem Seal Remover 303-468 (T94P-6510-AH)

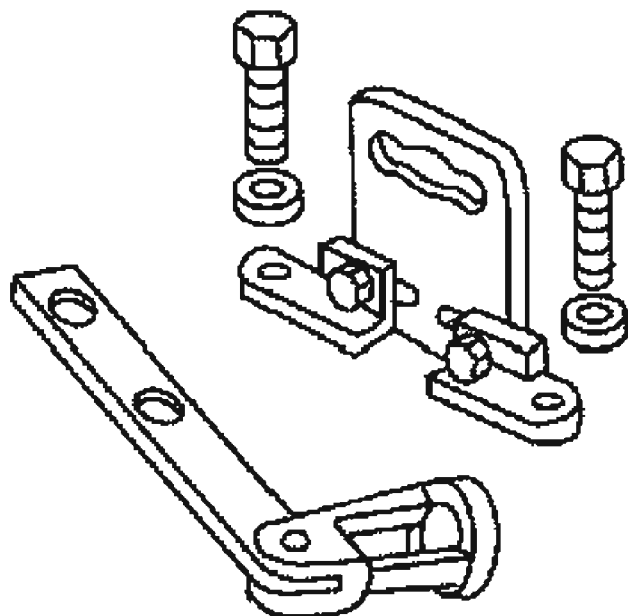
Valve Stem Seal Replacer 303-470 (T94P-6510-CH)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1906-A



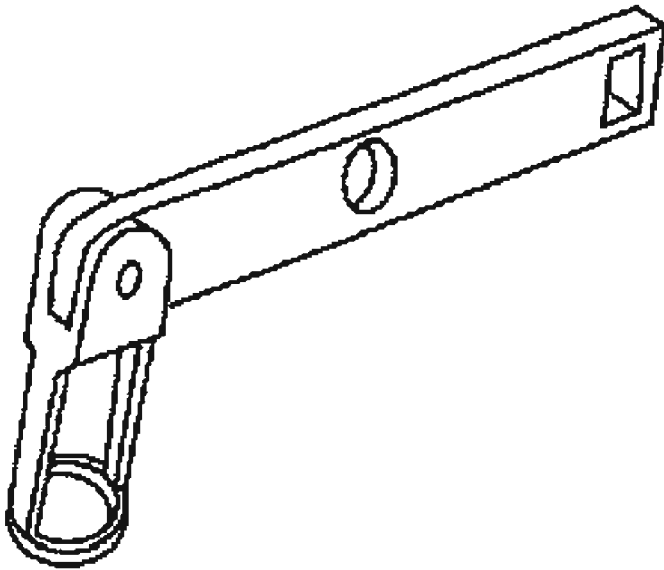
ST1907-A

Valve Spring Compressor 303-350
(T89P-6565-A)

Compressor, Valve Spring 303-472
(T94P-6565-AH)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1902-A

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A

Disassembly

NOTE: One lifting eye is shown, the other is similar.

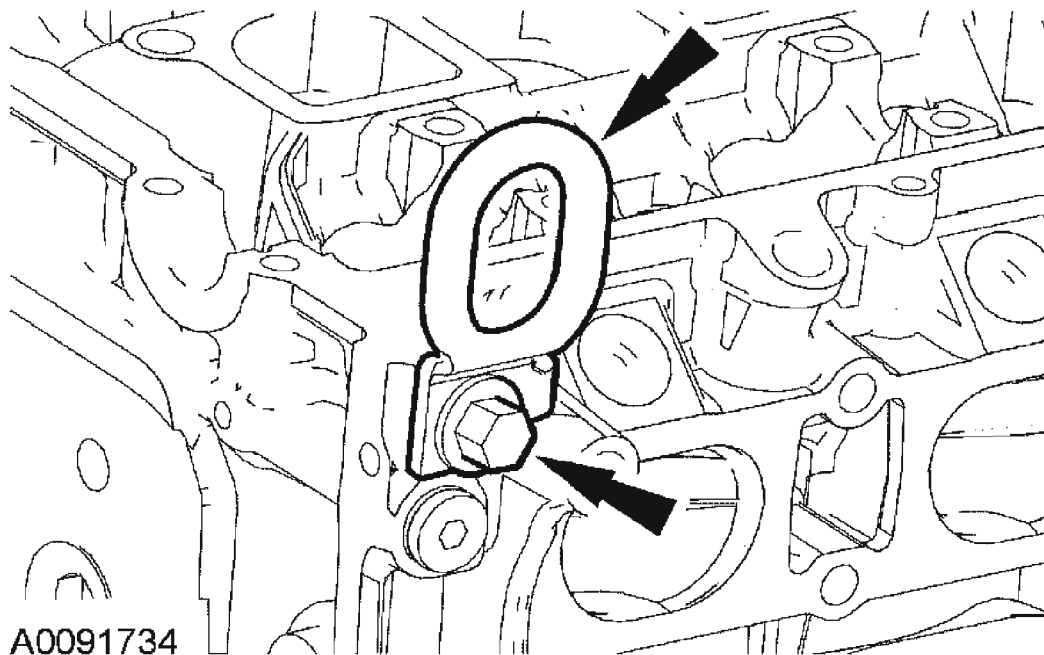


Fig. 370: Removing Bolts And Two Lifting Eyes
Courtesy of FORD MOTOR CO.

1. Remove the bolts and the two lifting eyes.
2. Remove and discard the cylinder head temperature (CHT) sensor.

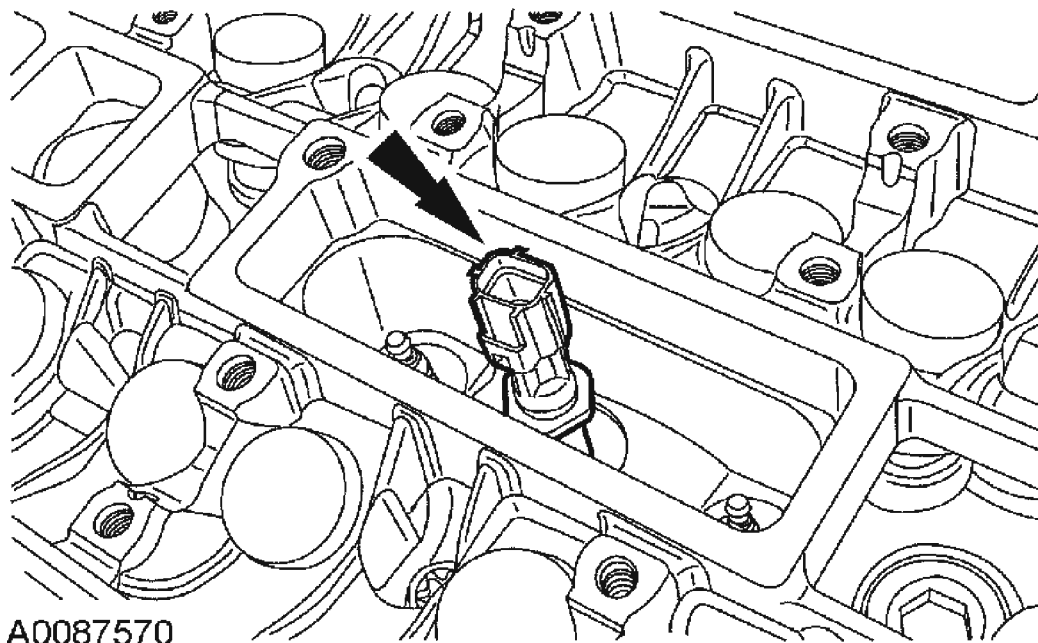


Fig. 371: Removing Cylinder Head Temperature Sensor
Courtesy of FORD MOTOR CO.

3. Remove the bolts and the exhaust gas recirculation (EGR) valve.

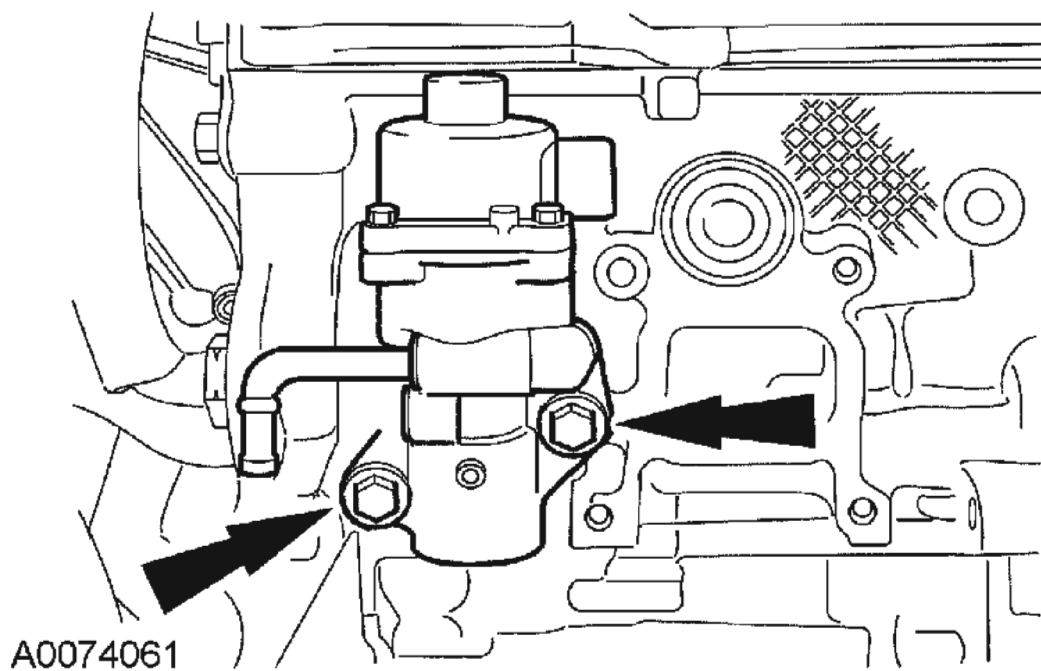


Fig. 372: Removing Bolts And Exhaust Gas Recirculation (EGR) Valve
Courtesy of FORD MOTOR CO.

4. Remove the EGR tube.

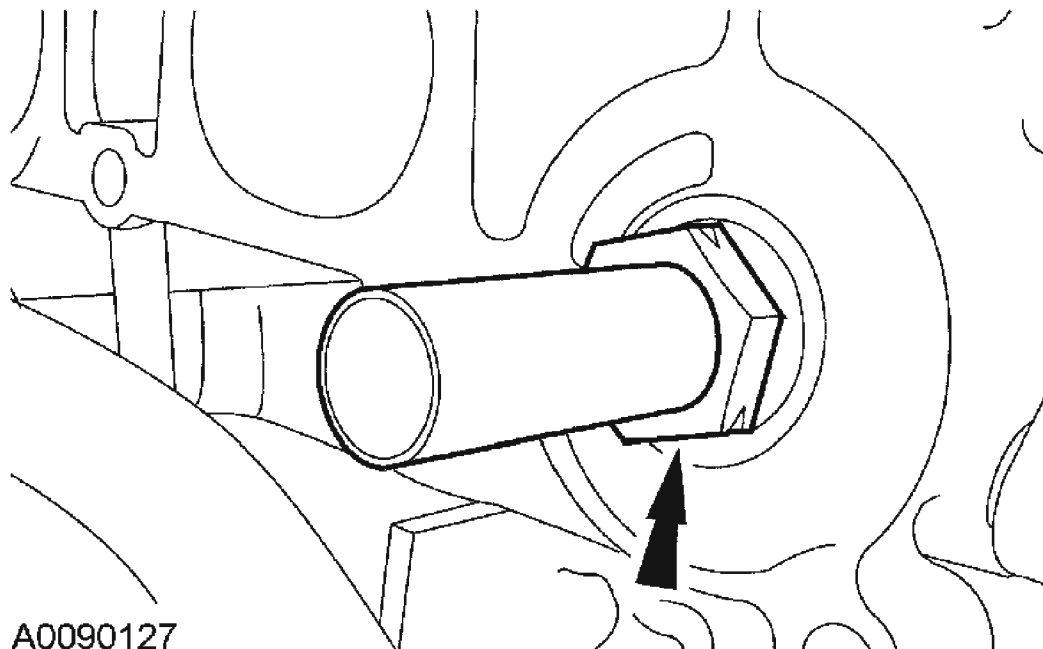


Fig. 373: Removing EGR Tube
Courtesy of FORD MOTOR CO.

5. Remove the spark plugs.

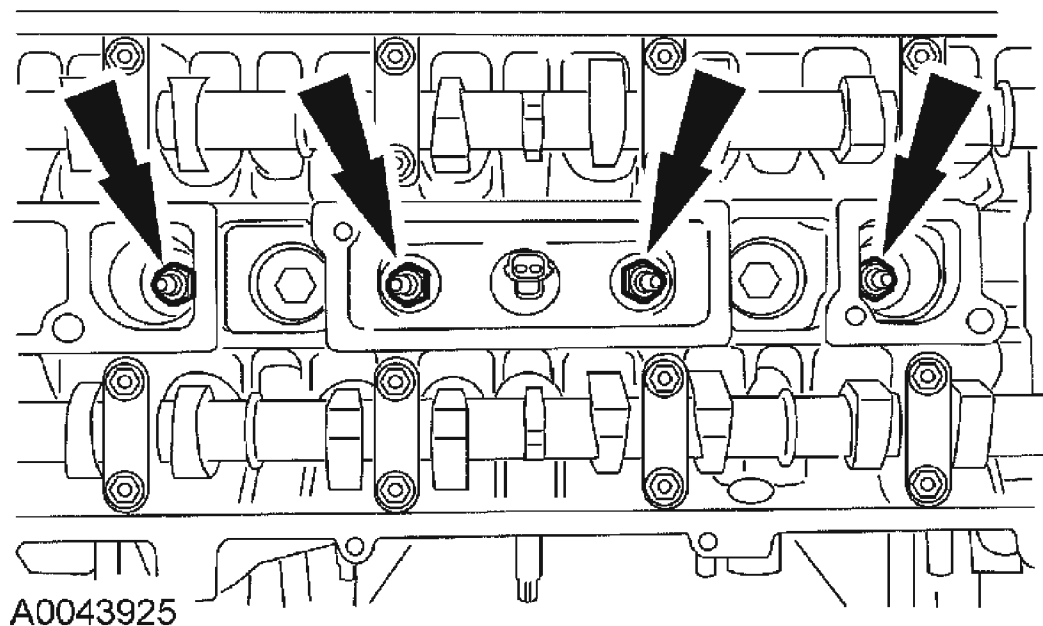


Fig. 374: Removing Spark Plugs
Courtesy of FORD MOTOR CO.

CAUTION: Note location of the tappets prior to removal.

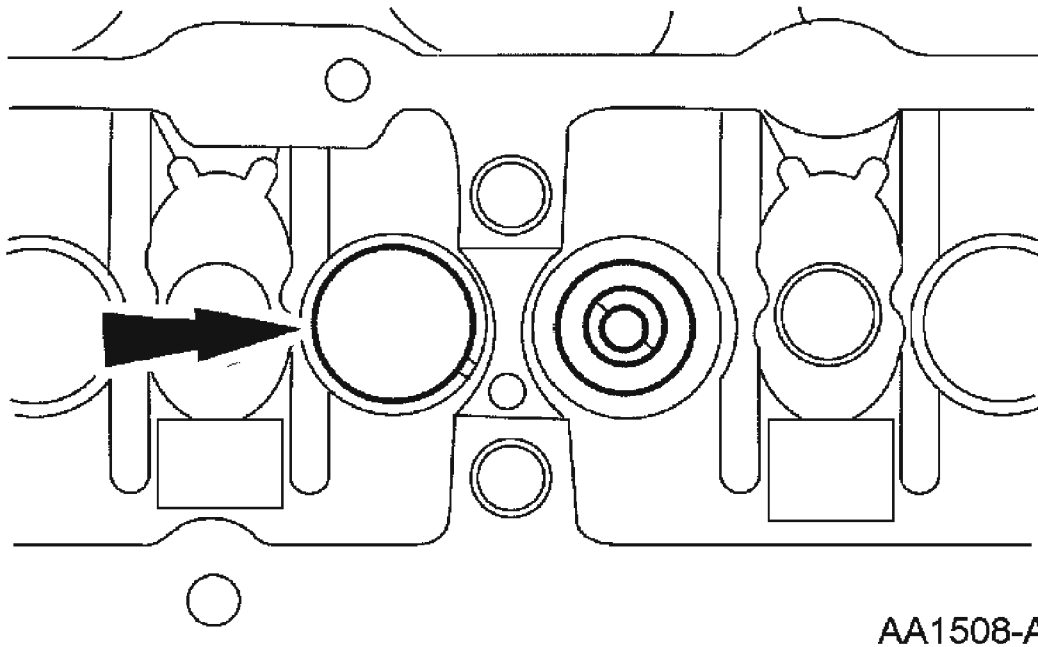


Fig. 375: Removing Tappets
Courtesy of FORD MOTOR CO.

6. Remove the 16 tappets.
7. Using the special tools, compress the valve spring and remove the valve spring retainer keys, the valve spring retainers and the valve springs.
 - Remove the special tools.

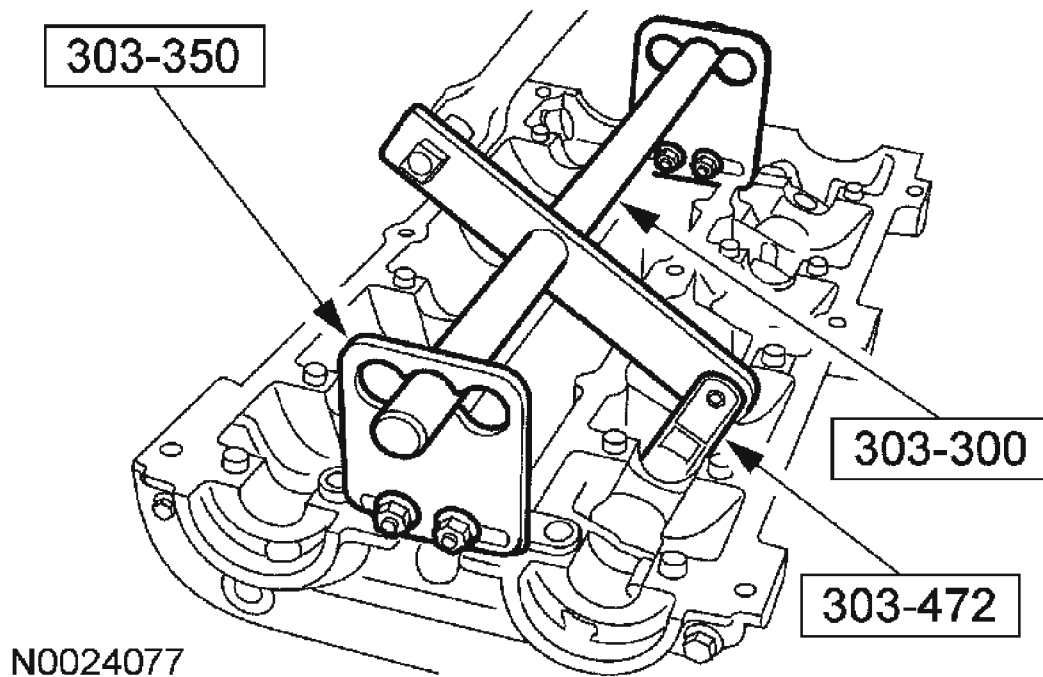


Fig. 376: Using Special Tools To Compress Valve Spring And Remove Valve Spring Retainer Keys, Valve Spring Retainers And Valve Springs
Courtesy of FORD MOTOR CO.

8. Inspect the valve spring, valve spring retainer and valve spring retainer key. For additional information, refer to **ENGINE SYSTEM-GENERAL INFORMATION** . Install new parts as necessary.

CAUTION: Note location of the valves if they are to be reused.

NOTE: Mark each valve if the original valves are to be used.

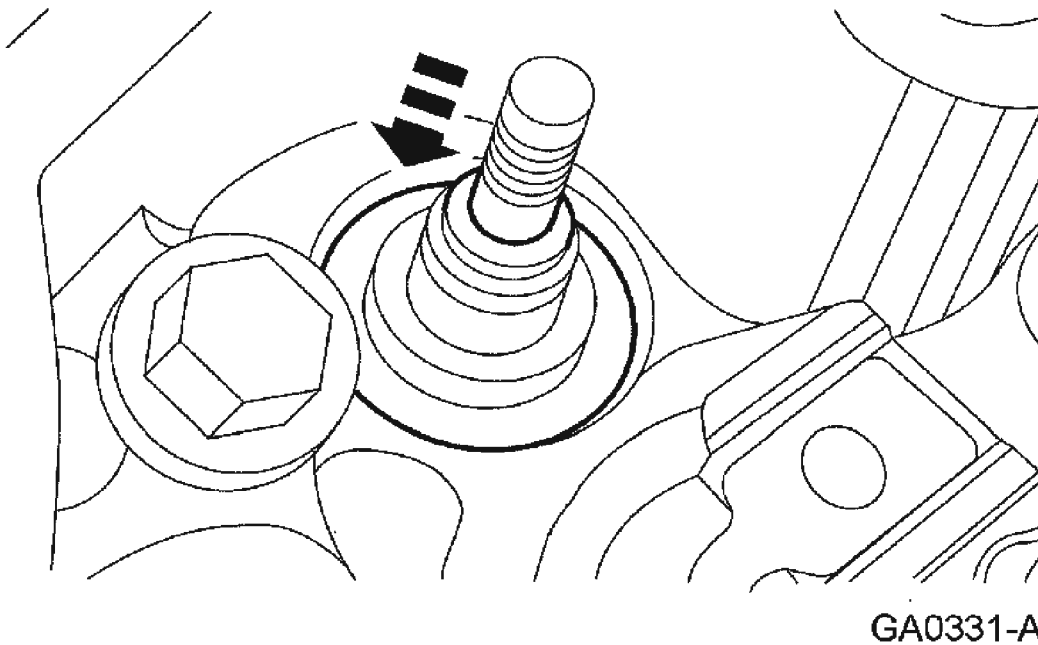


Fig. 377: Removing Valves
Courtesy of FORD MOTOR CO.

9. Remove the valves.
10. Using the special tools, remove and discard the valve stem seals.

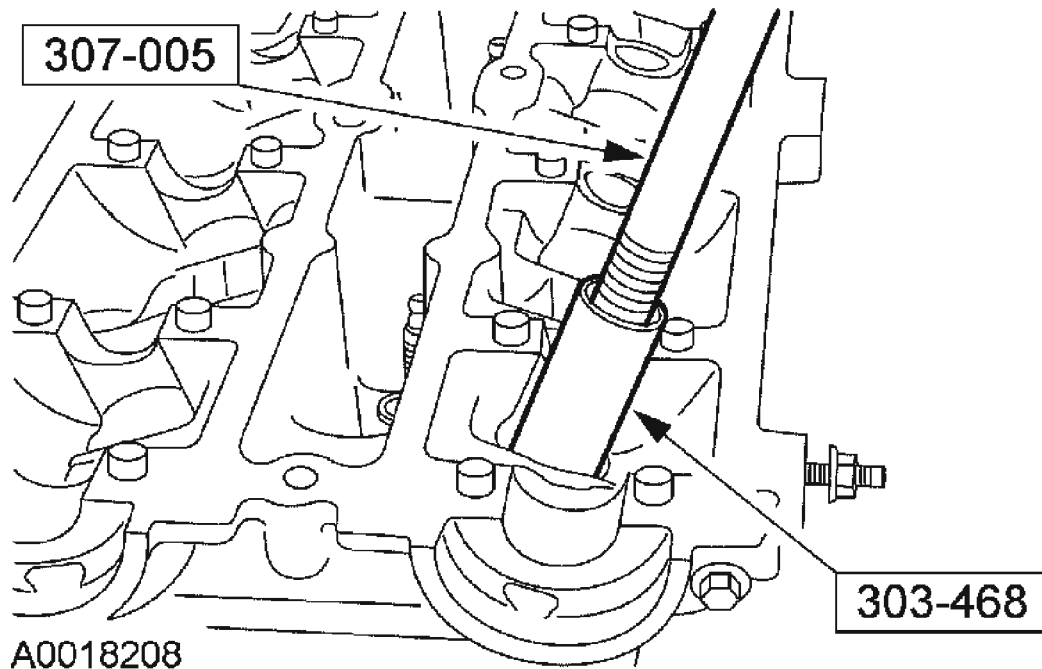
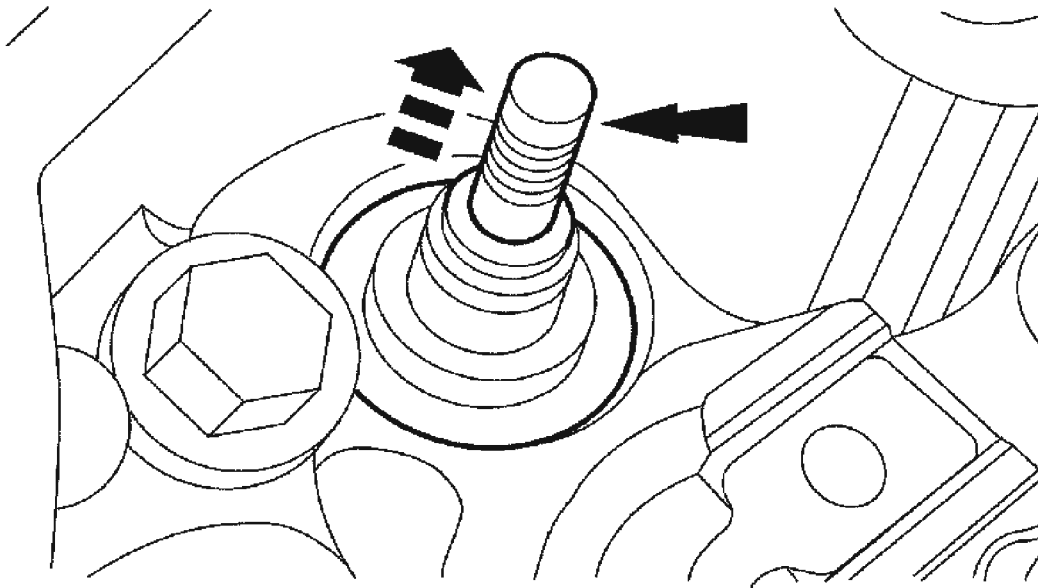


Fig. 378: Removing Valve Stem Seals Using Special Tools
Courtesy of FORD MOTOR CO.

11. Inspect the valves. For additional information, refer to **ENGINE SYSTEM-GENERAL INFORMATION** . Install new parts as necessary.

Assembly

NOTE: If installing the original valves, make sure the valves are installed in the same position from which they were removed. Coat the valve stems with motor oil.



GA0332-B

Fig. 379: Installing Valves
Courtesy of FORD MOTOR CO.

1. Install the valves.

NOTE: Use the seal protector provided with the replacement kit to prevent damage to the valve stem seals.

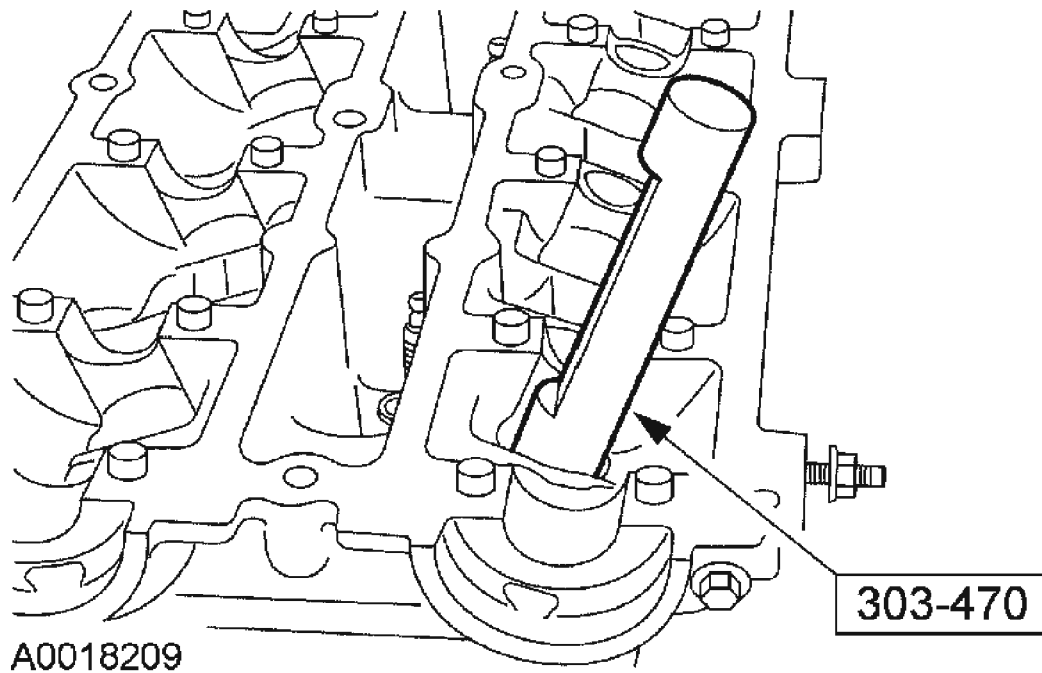


Fig. 380: Installing Valve Stem Seals Onto Cylinder Head Valve Guides Using Special Tool

Courtesy of FORD MOTOR CO.

2. Lubricate the valve and guides with clean engine oil and, using the special tool, install the valve stem seals onto the cylinder head valve guides.
3. Place the valve spring in position over the valve and install the valve spring retainer.
4. Using the special tools, compress the valve spring and install the valve spring retainer keys.
 - Remove the special tools.

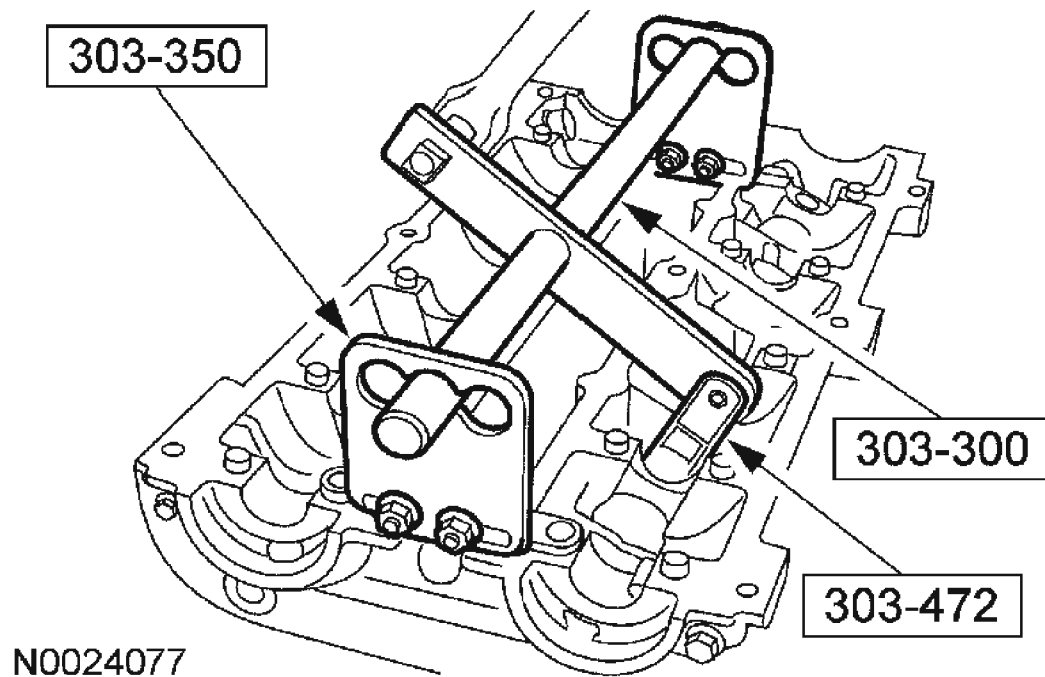
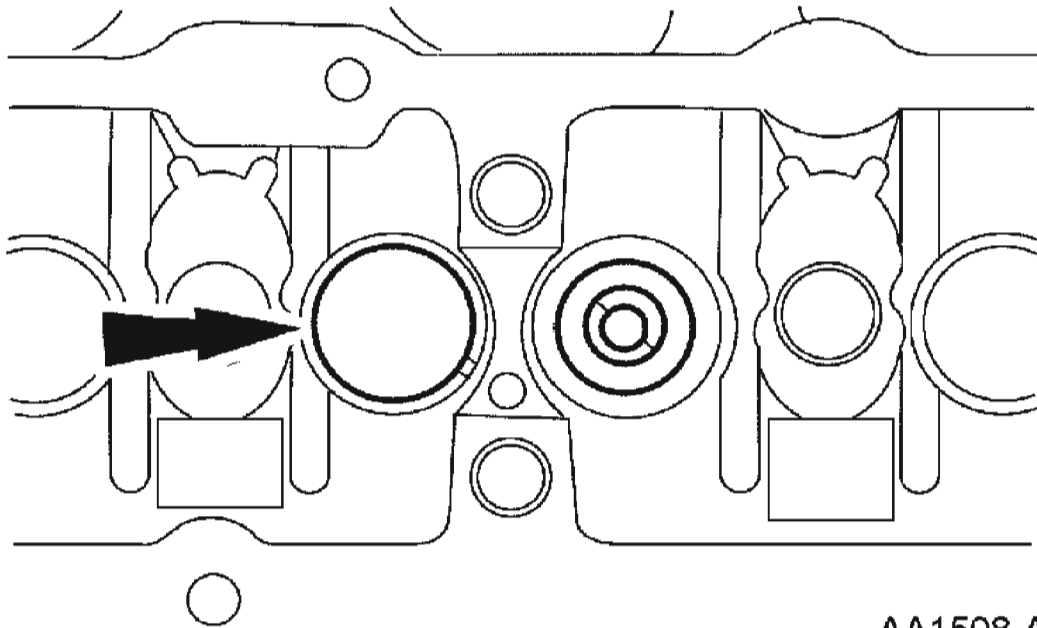


Fig. 381: Using Special Tools To Compress Valve Spring And Install Valve Spring Retainer Keys

Courtesy of FORD MOTOR CO.

NOTE: Be sure to install the tappets in the same location from which they were removed.



AA1508-A

Fig. 382: Installing Tappets
Courtesy of FORD MOTOR CO.

5. Install the 16 tappets.
6. Install a new CHT sensor.

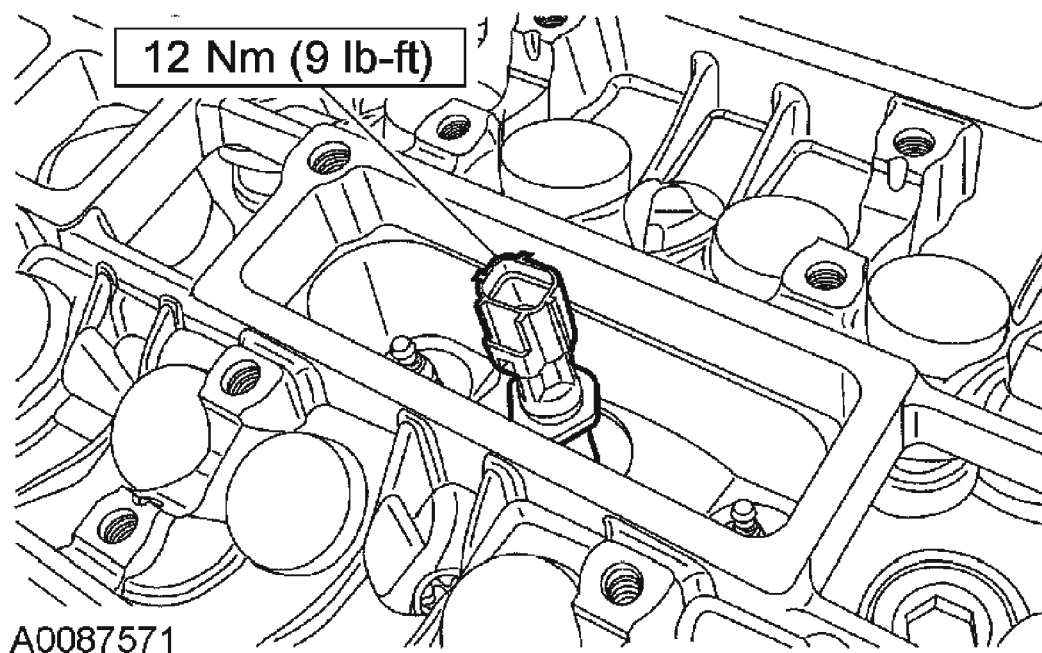


Fig. 383: Installing CHT Sensor
Courtesy of FORD MOTOR CO.

7. Install the spark plugs.

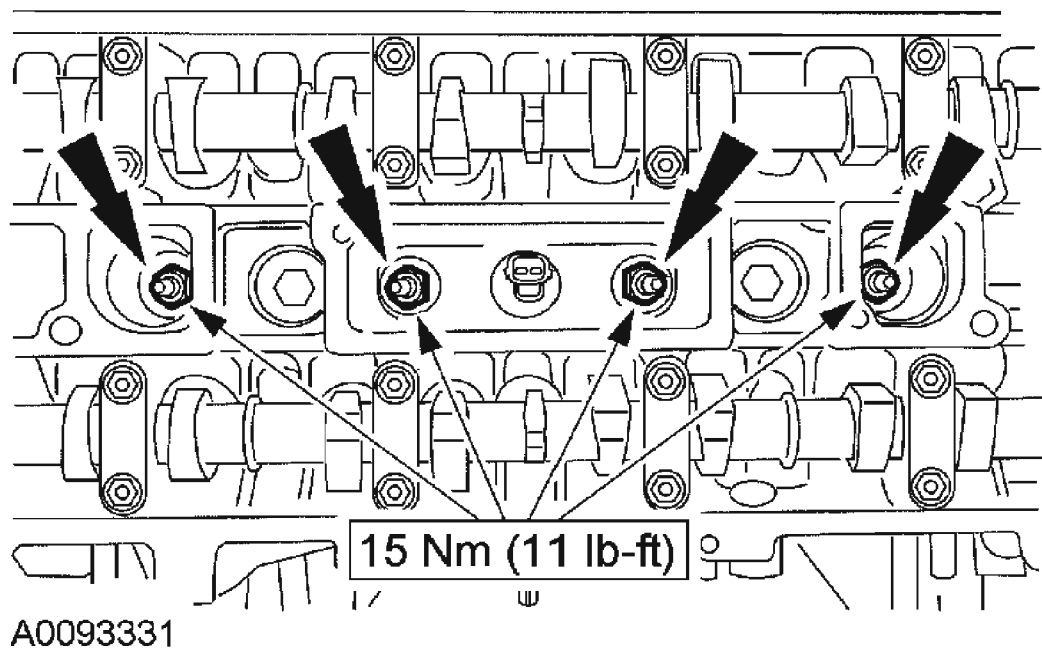


Fig. 384: Installing Spark Plugs
Courtesy of FORD MOTOR CO.

8. Install the EGR tube.

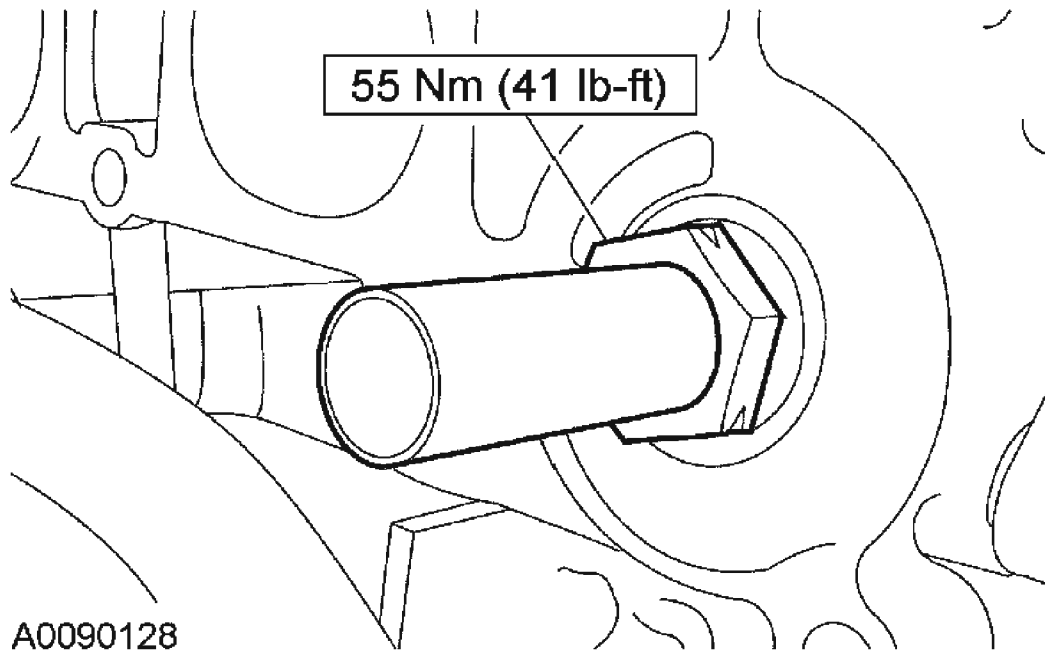


Fig. 385: Installing EGR Tube
Courtesy of FORD MOTOR CO.

9. Install the EGR valve, gasket and bolts.

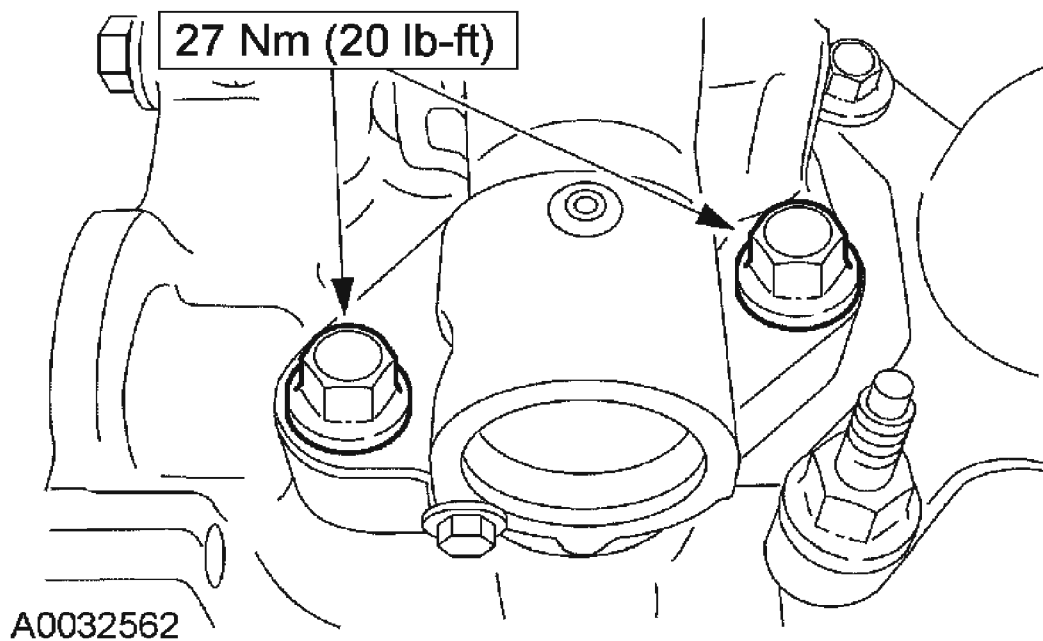


Fig. 386: Installing EGR Valve, Gasket And Bolts
Courtesy of FORD MOTOR CO.

NOTE: One lifting eye is shown, the other is similar.

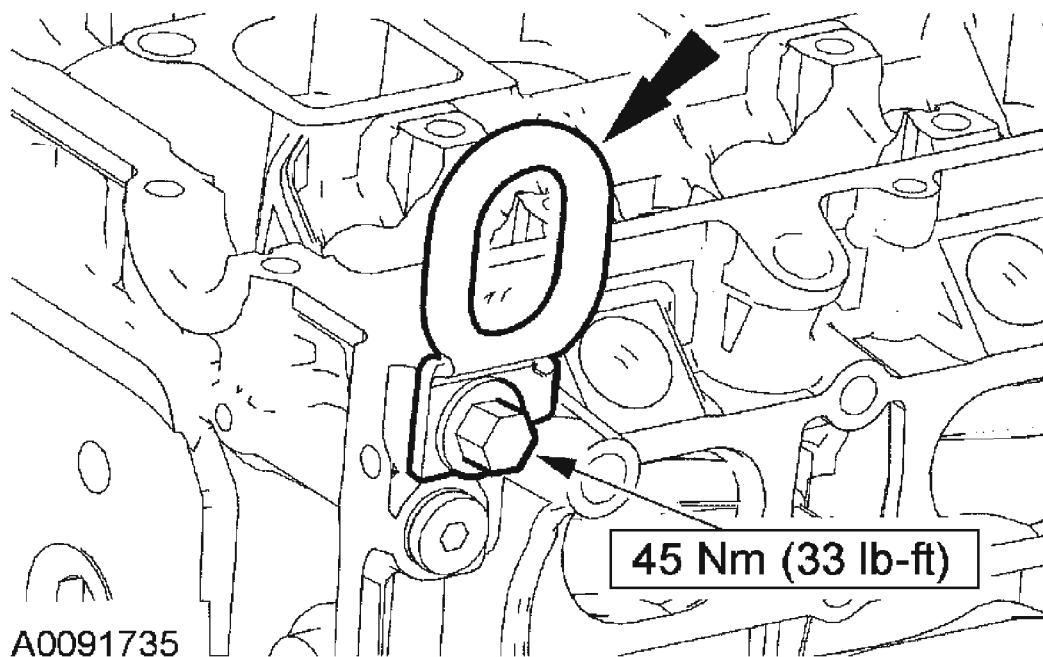


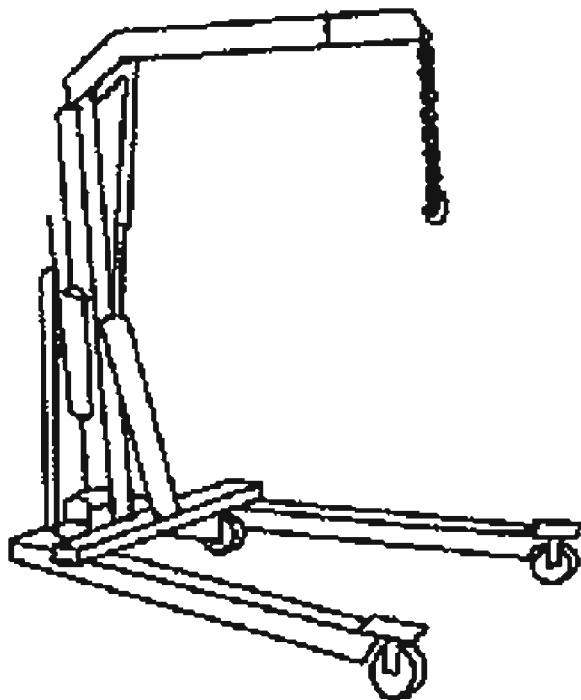
Fig. 387: Installing Lifting Eyes Bolts
Courtesy of FORD MOTOR CO.

10. Install the lifting eyes and bolts.

ASSEMBLY

ENGINE

SPECIAL TOOL DESCRIPTION



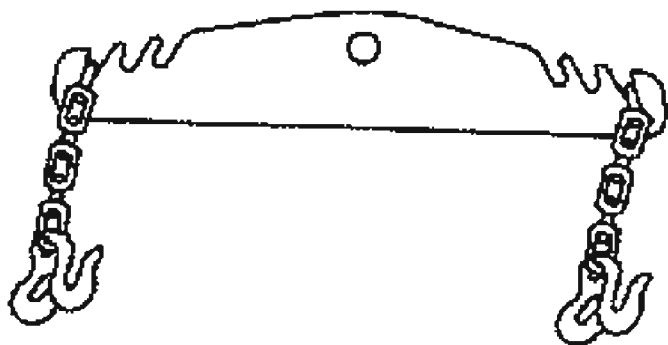
ST1341-A

Heavy Duty Floor Crane 014-00071 or equivalent

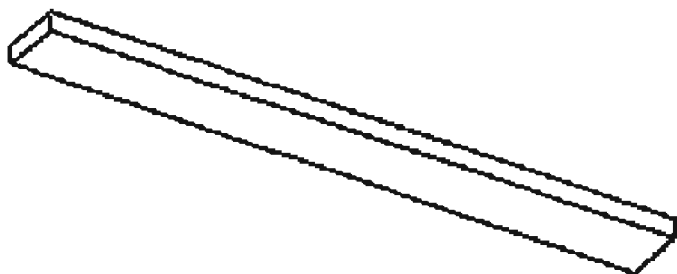
Spreader Bar 303-D089 (D93P-6001-A3) or equivalent

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1602-A



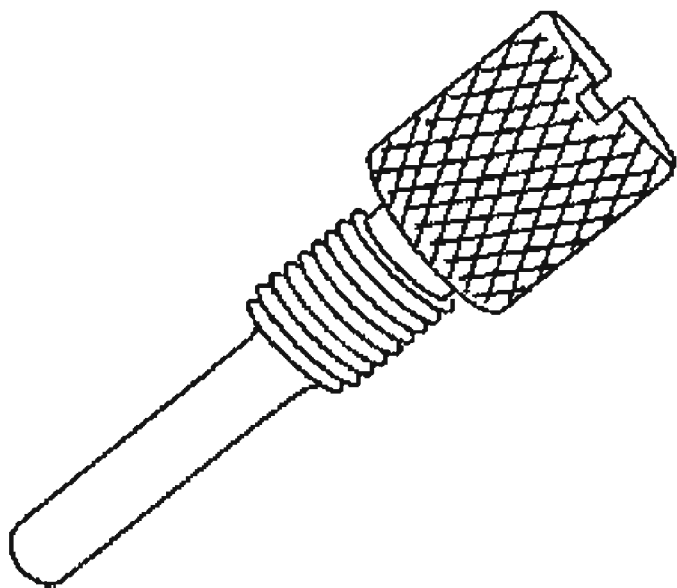
ST2645-A

Alignment Plate, Camshaft 303-465
(T94P-6256-CH)

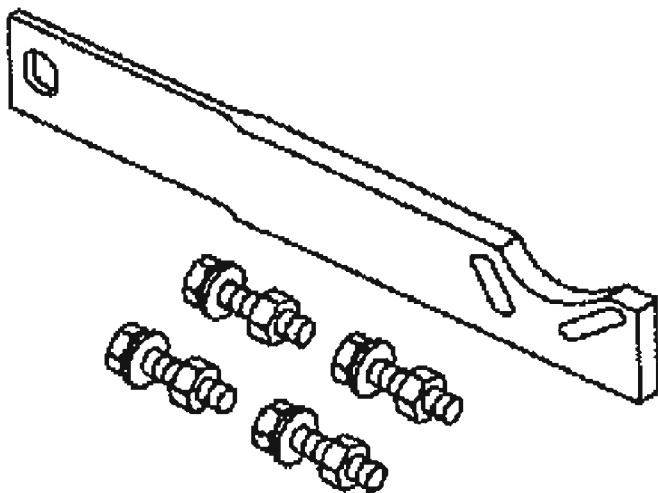
Timing Peg, Crankshaft 303-507

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2638-A



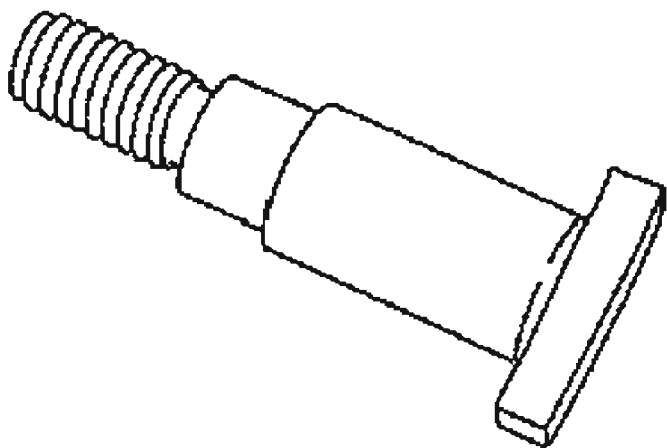
ST2647-A

Holding Fixture, Drive Pinion
Flange 205-126 (T78P-4851-A)

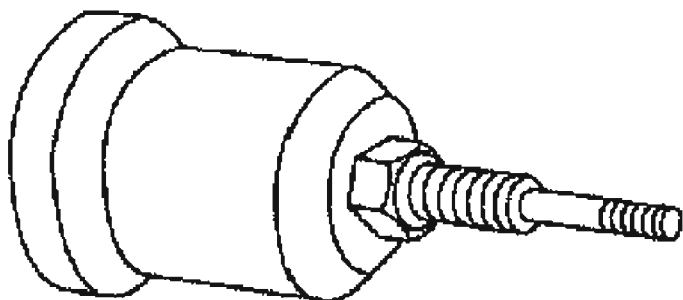
Adapter for 205-126 (205-072-02)

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST2639-A



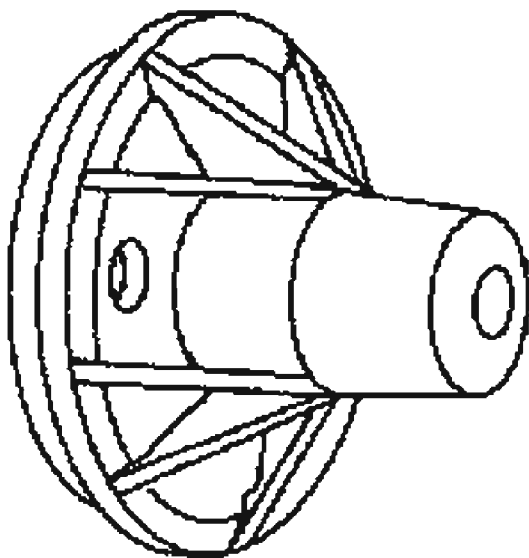
ST1917-A

Installer, Front Oil Seal 303-096
(T74P-6150-A)

Installer, Crankshaft Rear Main Oil
Seal 303-328 (T88P-6701-B1)

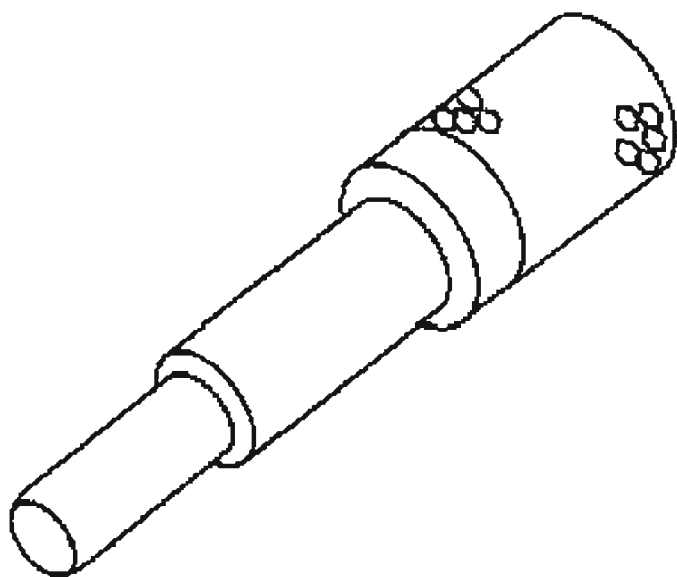
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1506-A

Aligner, Clutch Disc 308-006
(T71P-7137-H)



ST1751-A

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

MATERIAL SPECIFICATIONS

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A
Metal Surface Cleaner F4AZ-19A536-RA	WSE-M5B392-A
Silicone Gasket and Sealant F7AZ-19554-EA	WSE-M4G323-A4
Motorcraft Silicone Gasket Remover ZC-30	-
Motorcraft Metal Surface Prep ZC-31	-
Silicone Brake Caliper Grease and Dielectric Compound XG-3	ESE-M1C171-A
Motorcraft Premium Gold Engine Coolant VC-7-A	WSS-M97B51-A1
High-Temp 4x4 Front Axle and Wheel Bearing Grease E8TZ-19590-A	ESA-M1C198-A

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: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

NOTE: For additional information, refer to the exploded views under DESCRIPTION AND OPERATION.

All engines

1. Install the intermediate shaft bearing bracket and bolts.

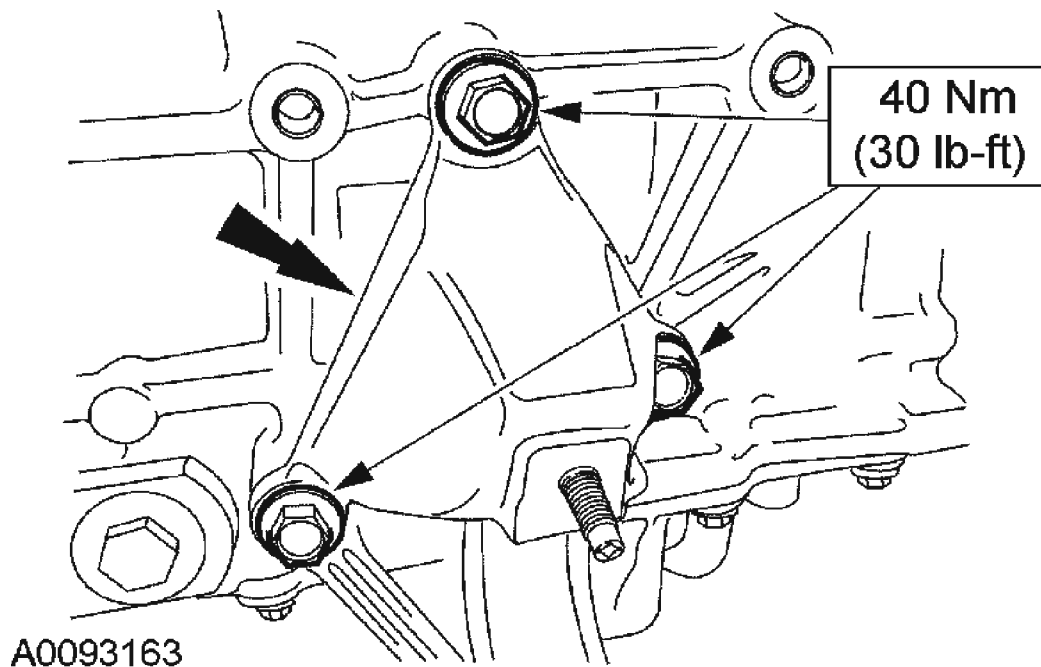


Fig. 388: Installing Intermediate Shaft Bearing Bracket Bolts
Courtesy of FORD MOTOR CO.

WARNING: Failure to position the No. 1 piston at top dead center (TDC) can result in damage to the engine. Turn the engine in the normal direction of rotation only.

2. Using the crankshaft pulley bolt, turn the crankshaft clockwise to position the No. 1 piston at TDC.
3. Remove the engine plug bolt.

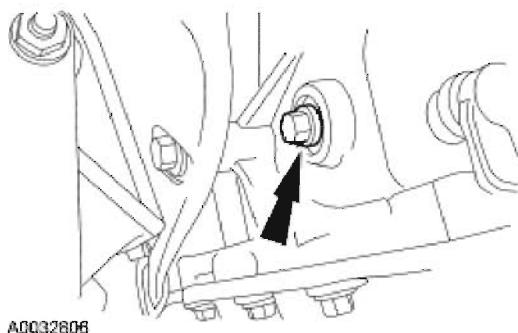


Fig. 389: Locating Engine Plug Bolt
Courtesy of FORD MOTOR CO.

NOTE: Only turn the engine in the normal direction of rotation.

NOTE: Installing the special tool in this step will prevent the engine from being rotated in the clockwise direction. However, the engine can still be rotated in the counterclockwise direction.

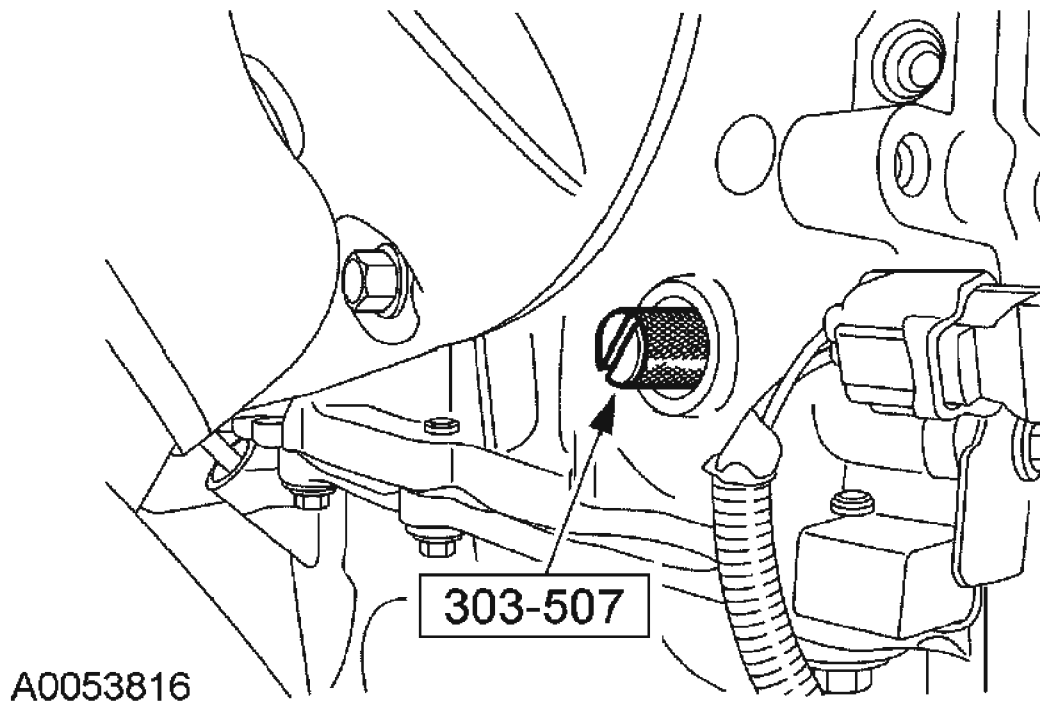
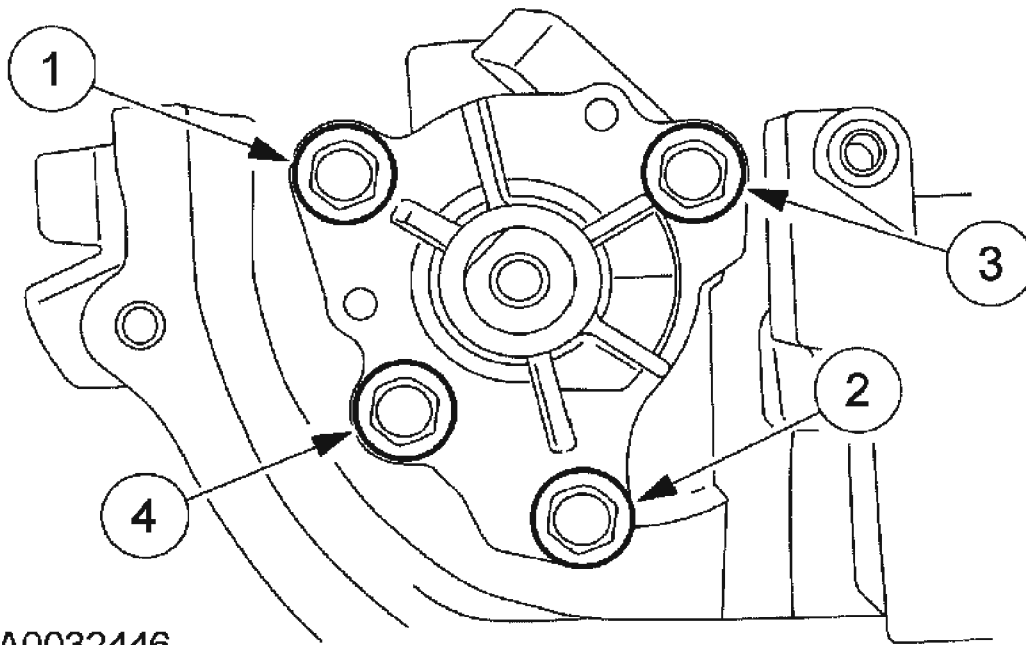


Fig. 390: Installing Special Tool (303-507)
Courtesy of FORD MOTOR CO.

4. Install the special tool.

NOTE: Clean the oil pump and cylinder block mating surfaces with metal surface cleaner.



A0032446

Fig. 391: Identifying Tightening Sequence Of Oil Pump Bolts
Courtesy of FORD MOTOR CO.

5. Install the oil pump assembly. Tighten the bolts in the sequence shown in two stages.
 - Stage 1: Tighten the bolts to 10 Nm (89 lb-in).
 - Stage 2: Tighten the bolts to 20 Nm (15 lb-ft).
6. Install a new oil pump pickup tube gasket and the pickup tube.

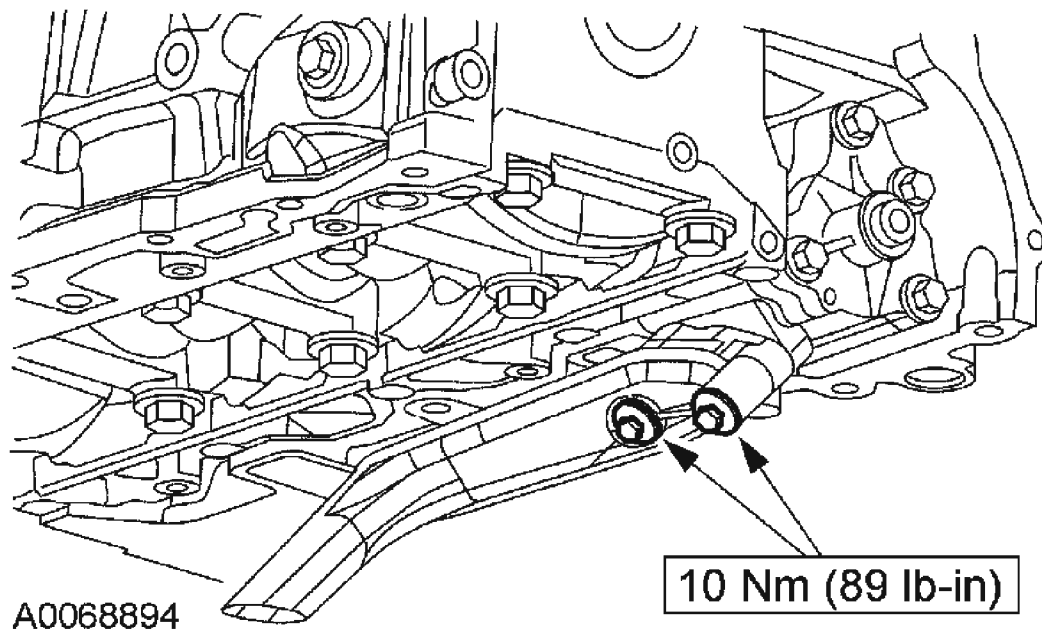


Fig. 392: Installing New Oil Pump Pickup Tube Gasket And Pickup Tube
Courtesy of FORD MOTOR CO.

7. Using the special tool, install the crankshaft rear main oil seal.

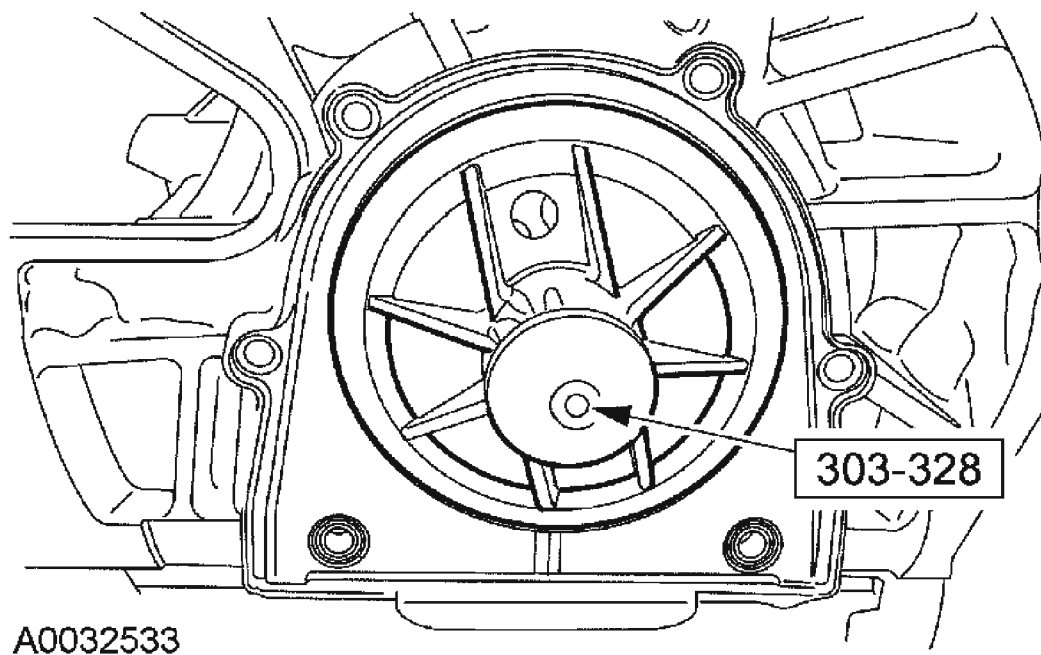


Fig. 393: Installing Crankshaft Rear Main Oil Seal Using Special Tool
Courtesy of FORD MOTOR CO.

8. Tighten the crankshaft rear main oil seal bolts in the sequence shown.

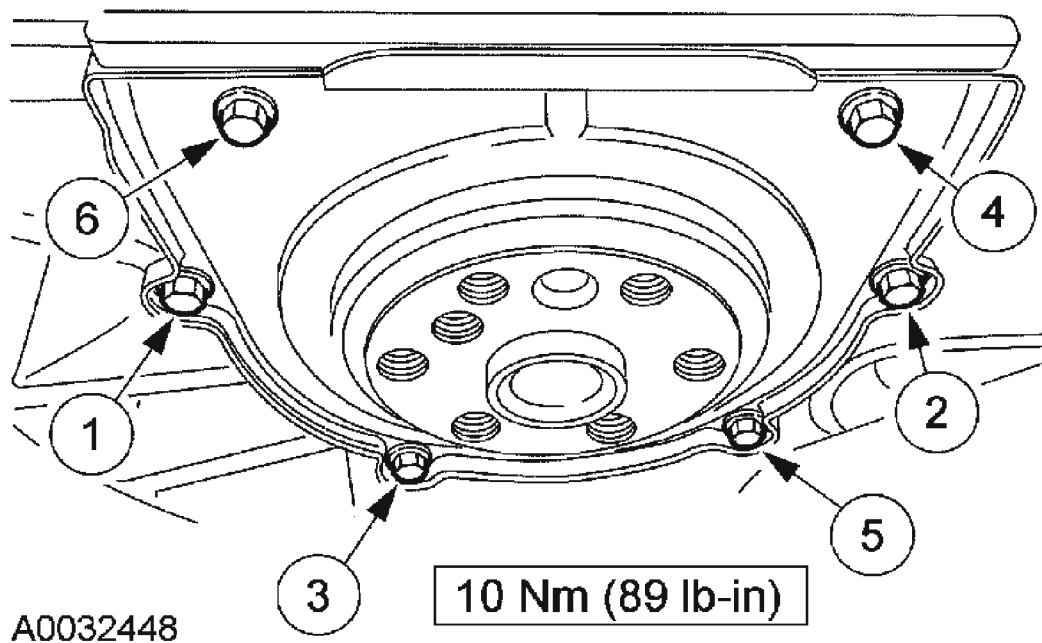


Fig. 394: Identifying Tightening Sequence Of Crankshaft Rear Main Oil Seal Bolts
Courtesy of FORD MOTOR CO.

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, which make leak paths. Use a plastic scraping tool to remove traces of sealant.

9. Clean and inspect all mating surfaces.

NOTE: If the oil pan is not secured within four minutes of sealant application, the sealant must be removed and the sealing area cleaned with metal surface cleaner. Allow to dry until there is no sign of wetness, or four minutes, whichever is longer. Failure to follow this procedure can cause future oil leakage.

NOTE: The oil pan must be installed and the bolts tightened within four minutes of applying the silicone gasket and sealant.

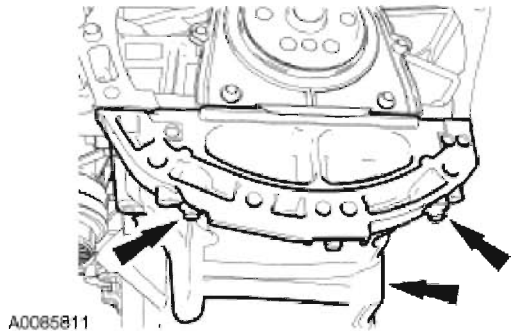


Fig. 395: Identifying Rear Oil Pan Bolts
Courtesy of FORD MOTOR CO.

10. Apply a 2.5 mm bead of silicone gasket and sealant to the oil pan. Install the oil pan. Install the two oil pan bolts finger-tight.
11. Install the bolts.

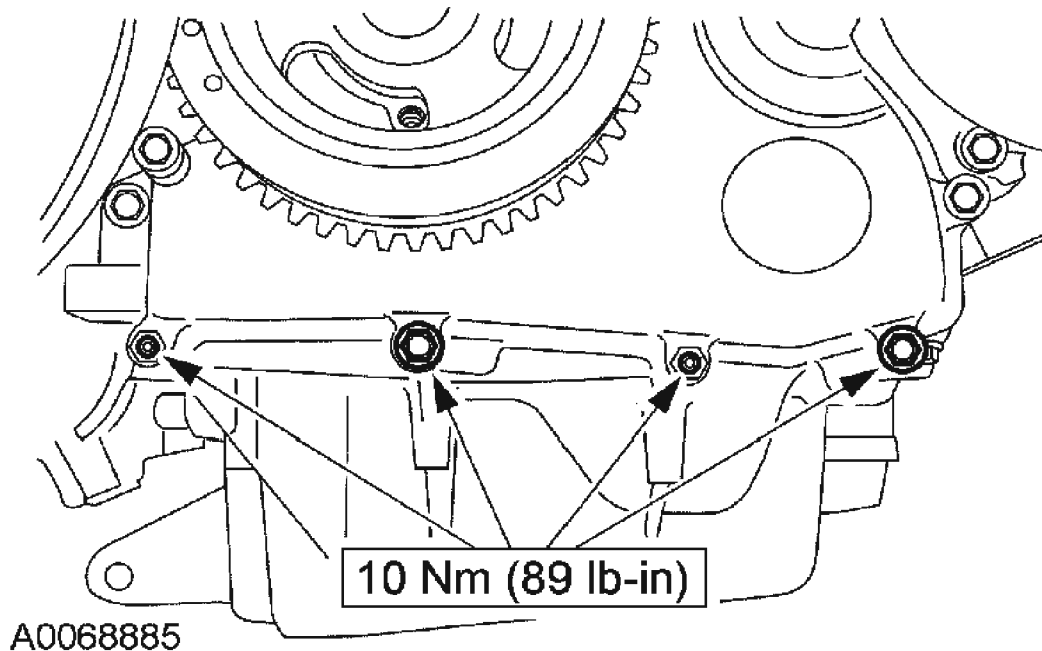


Fig. 396: Installing Oil Pan Bolts
Courtesy of FORD MOTOR CO.

12. Install the remaining oil pan bolts and tighten the oil pan bolts in the sequence shown.

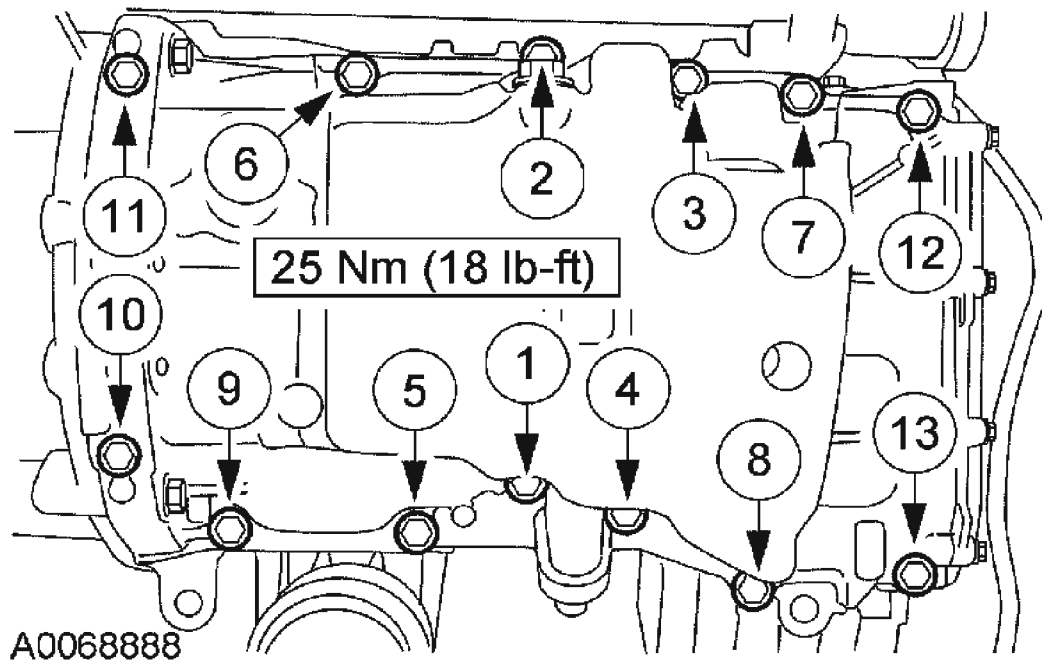


Fig. 397: Identifying Tightening Sequence Of Oil Pan Bolts
Courtesy of FORD MOTOR CO.

13. Install the cylinder head alignment dowels. Dowels must be fully seated in the cylinder block.

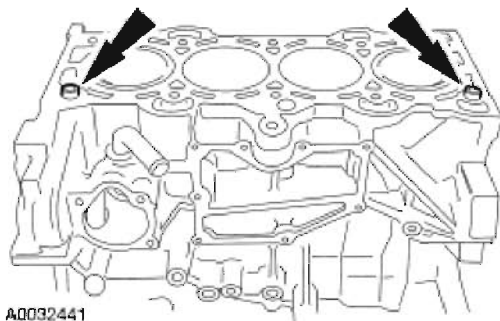


Fig. 398: Identifying Cylinder Head Alignment Dowels
Courtesy of FORD MOTOR CO.

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 and 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.

14. 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.
15. Apply silicone gasket and sealant to the locations shown.

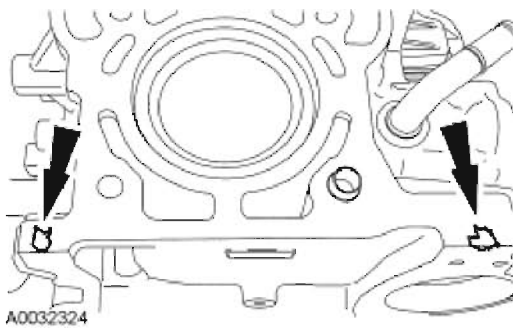
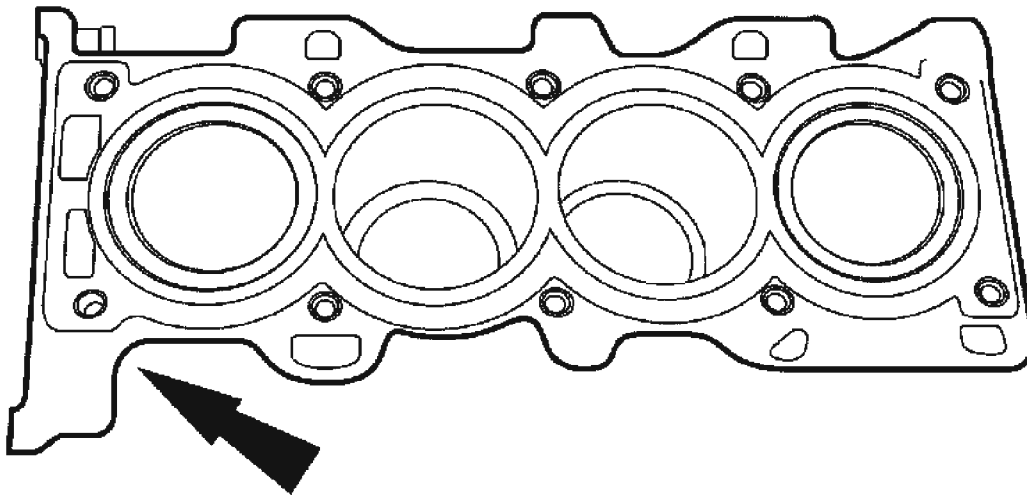


Fig. 399: Identifying Silicone Gasket And Sealant Location
Courtesy of FORD MOTOR CO.

16. Install a new head gasket.



A0087577

Fig. 400: Installing Head Gasket
Courtesy of FORD MOTOR CO.

- NOTE:** The cylinder head bolts are torque-to-yield and must not be reused. New cylinder head bolts must be installed.
- NOTE:** Lubricate the bolts with clean engine oil prior to installation.

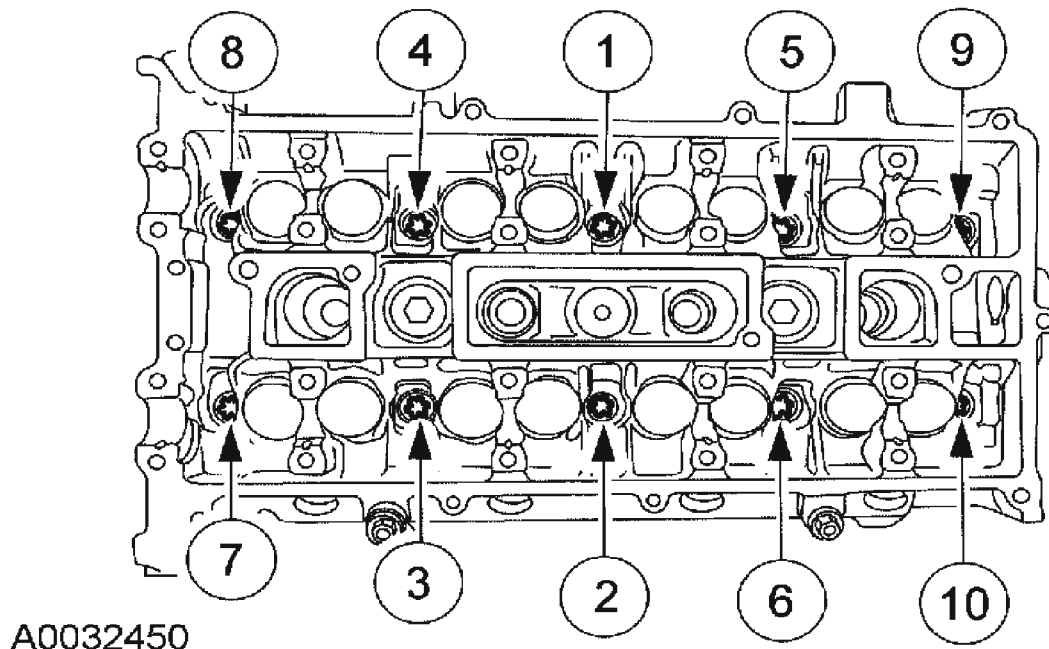


Fig. 401: Identifying Tightening Sequence Of Cylinder Head Bolts
Courtesy of FORD MOTOR CO.

17. Install new cylinder head bolts. Tighten the bolts in the sequence shown in five stages.
1. Tighten the bolts to 5 Nm (44 lb-in).
 2. Tighten the bolts to 15 Nm (11 lb-ft).
 3. Tighten the bolts to 45 Nm (33 lb-ft).
 4. Turn the bolts 90 degrees.
 5. Turn the bolts an additional 90 degrees.

CAUTION: Install the camshafts with the alignment slots in the camshafts lined up so the Camshaft Alignment Plate can be installed without rotating the camshafts. Make sure the lobes on the No. 1 cylinder are in the same position as noted in the disassembly procedure. Rotating the camshafts when the timing chain is removed, or installing the camshafts 180 degrees out of position, can cause severe damage to the valves and pistons.

NOTE: Lubricate the camshaft journals and bearing caps with clean engine oil.

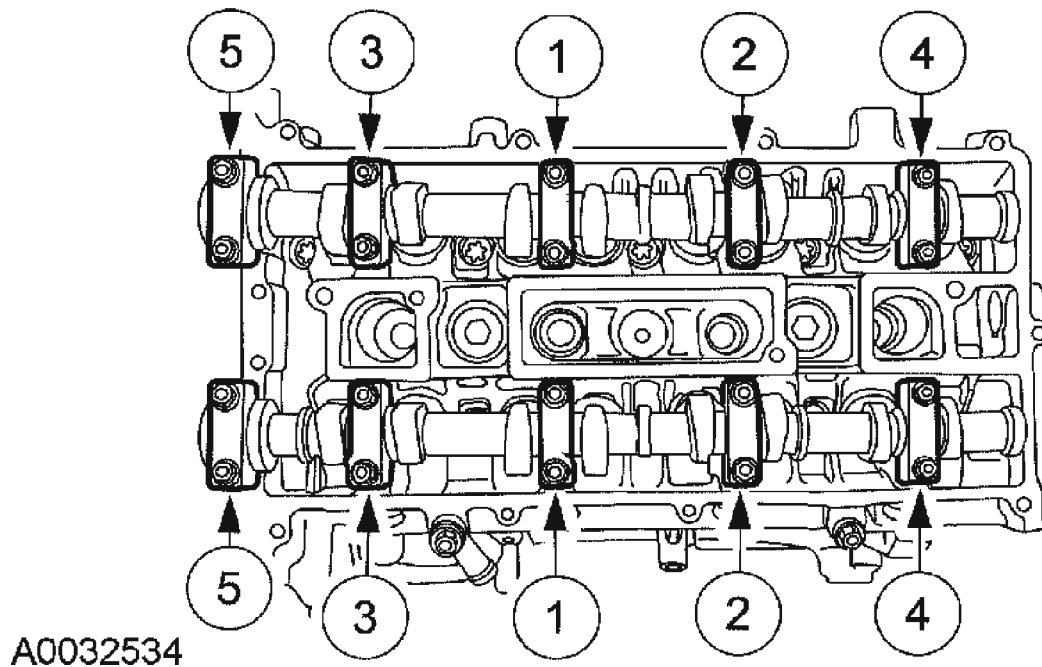
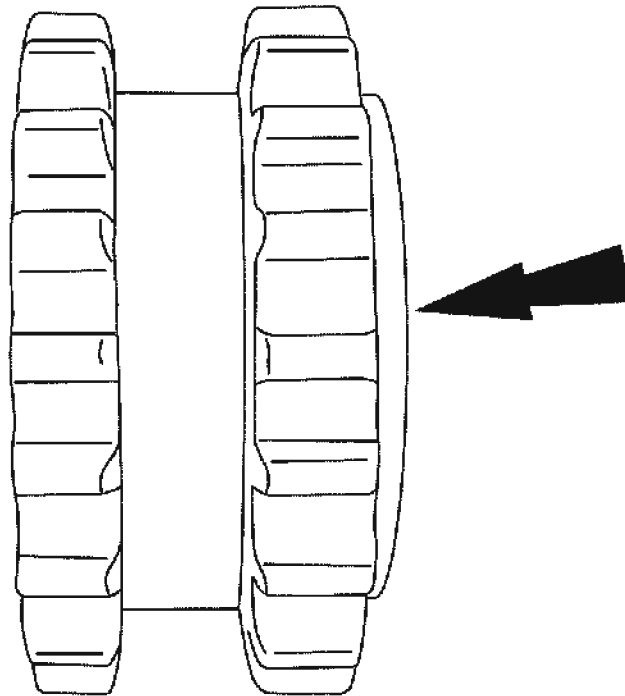


Fig. 402: Identifying Tightening Sequence Of Camshafts Bearing Caps Bolts
Courtesy of FORD MOTOR CO.

18. Install the camshafts and bearing caps. Tighten the bolts in the sequence shown in three stages.
- Stage 1: Tighten the camshaft bearing bolt caps one turn at a time until tight.
 - Stage 2: Tighten the bolts to 7 Nm (62 lb-in).
 - Stage 3: Tighten the bolts to 16 Nm (12 lb-ft).

CAUTION: The crankshaft, the crankshaft sprocket and the pulley are fitted together by friction, using diamond washers between the flange faces on each part. For that reason, the crankshaft sprocket is also unfastened if you loosen the pulley. Therefore, the engine must be re-timed each time the damper is removed. Otherwise severe engine damage can occur.

NOTE: Install a crankshaft sprocket diamond washer on both sides of the crankshaft sprocket.



A0032537

Fig. 403: Identifying Crankshaft Sprocket Flange Is Facing Away From Engine Block

Courtesy of FORD MOTOR CO.

19. Install the crankshaft sprocket, crankshaft sprocket diamond washers, oil pump chain and oil pump sprocket.
 - The crankshaft sprocket flange must be facing away from the engine block.
20. Install the oil pump sprocket bolt.

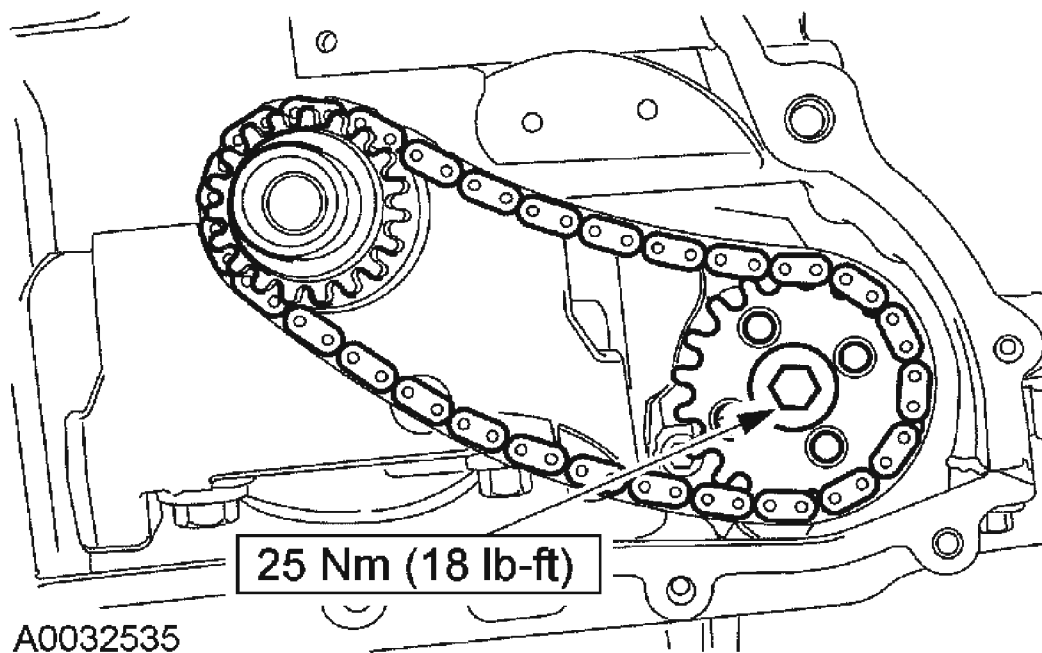


Fig. 404: Installing Oil Pump Sprocket Bolt
Courtesy of FORD MOTOR CO.

21. Install the oil pump chain guide and the shoulder bolts.

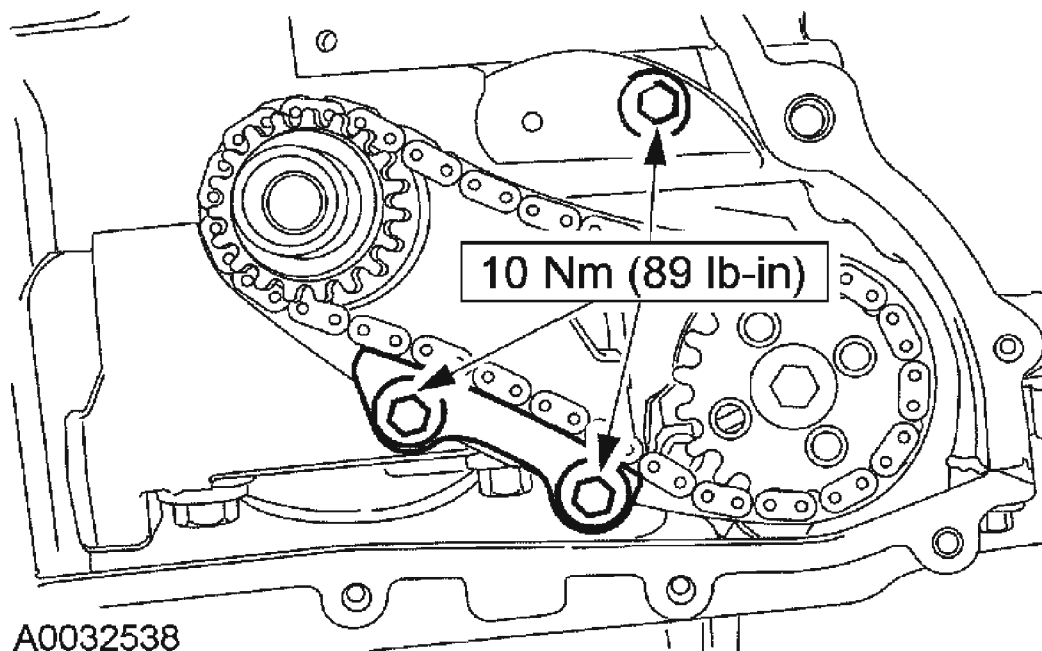


Fig. 405: Installing Oil Pump Chain Guide And Shoulder Bolts
Courtesy of FORD MOTOR CO.

22. Install the oil pump chain tensioner. Hook the tensioner spring around the shoulder bolt.

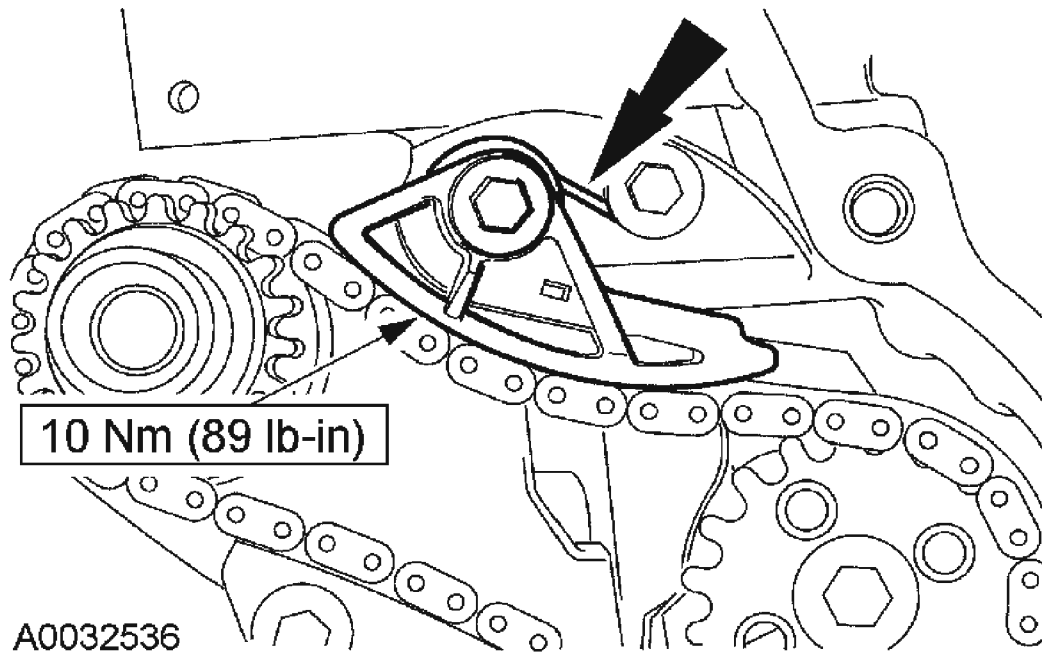
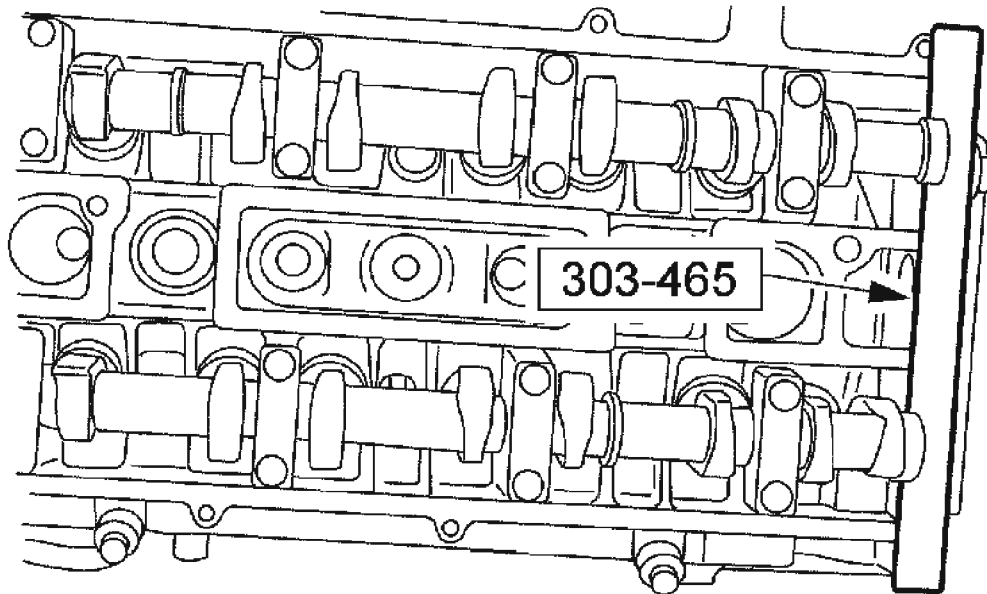


Fig. 406: Installing Oil Pump Chain Tensioner
Courtesy of FORD MOTOR CO.

CAUTION: The special tool 303-465 is for camshaft alignment only. Using this tool to prevent engine rotation can result in engine damage.



A0052352

Fig. 407: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

23. Install the special tool in the slots on the rear of both camshafts.
24. Install the camshaft sprockets and the bolts. Do not tighten the bolts at this time.

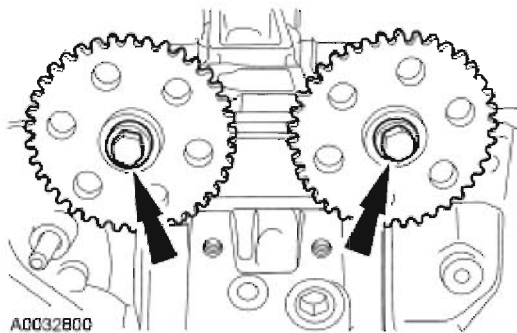


Fig. 408: Locating Camshaft Sprocket Bolts
Courtesy of FORD MOTOR CO.

25. Install the LH timing chain guide and the bolts.

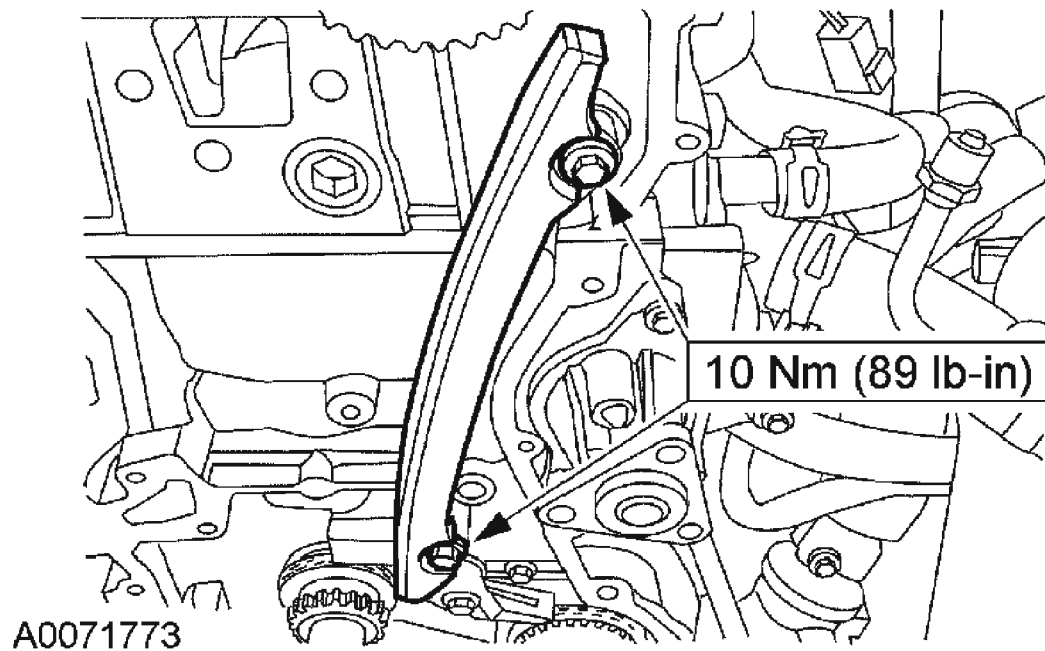


Fig. 409: Installing LH Timing Chain Guide And Bolts
Courtesy of FORD MOTOR CO.

26. Install the timing chain.

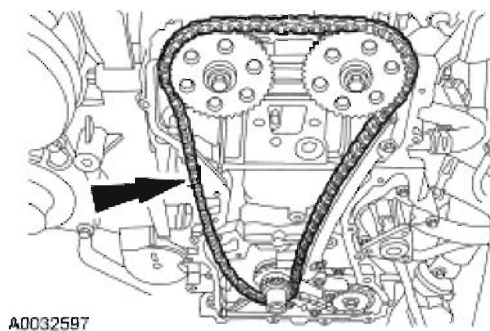


Fig. 410: View Of Timing Chain
Courtesy of FORD MOTOR CO.

27. Install the RH timing chain guide.

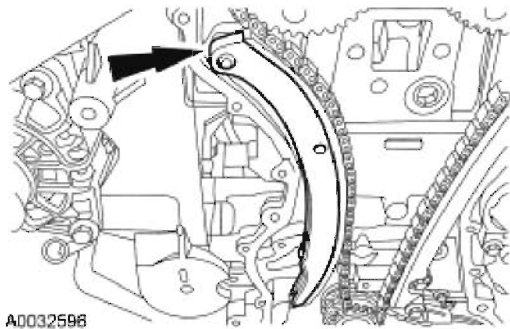
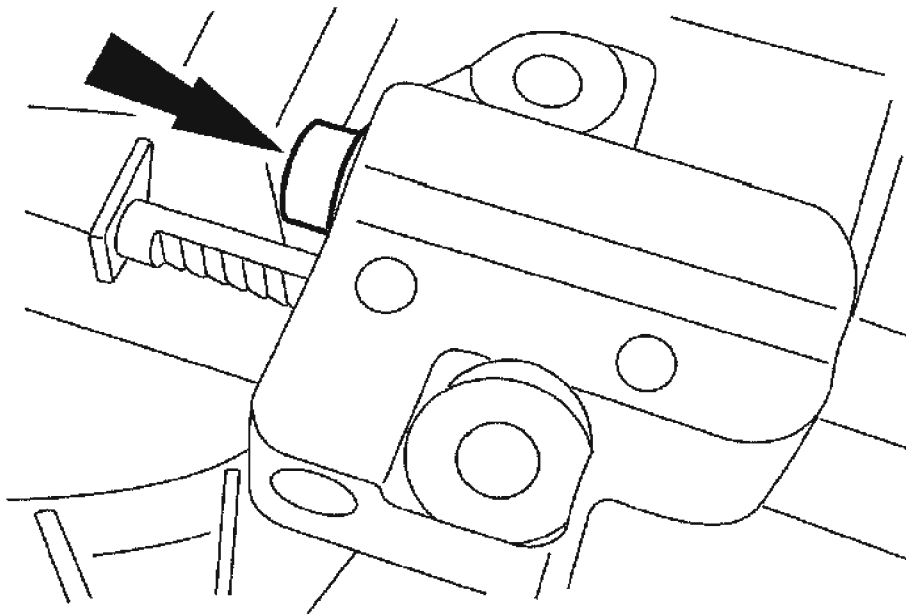


Fig. 411: Locating RH Timing Chain Guide
Courtesy of FORD MOTOR CO.

CAUTION: Do not compress the ratchet assembly. This will damage the ratchet assembly.



A0032539

Fig. 412: Using Edge Of A Vise To Compress Timing Chain Tensioner Plunger
Courtesy of FORD MOTOR CO.

28. Using the edge of a vise, compress the timing chain tensioner plunger.
29. Using a small pick, push back and hold the ratchet mechanism.

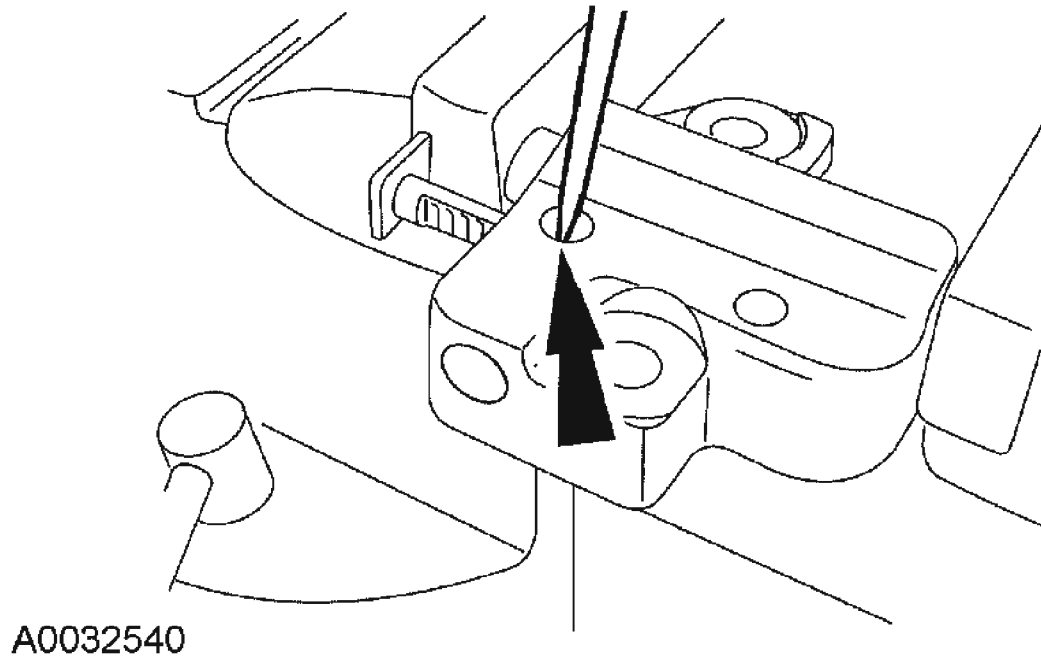


Fig. 413: Using A Small Pick To Push Back And Hold Ratchet Mechanism
Courtesy of FORD MOTOR CO.

30. While holding the ratchet mechanism, push the ratchet arm back into the tensioner housing.

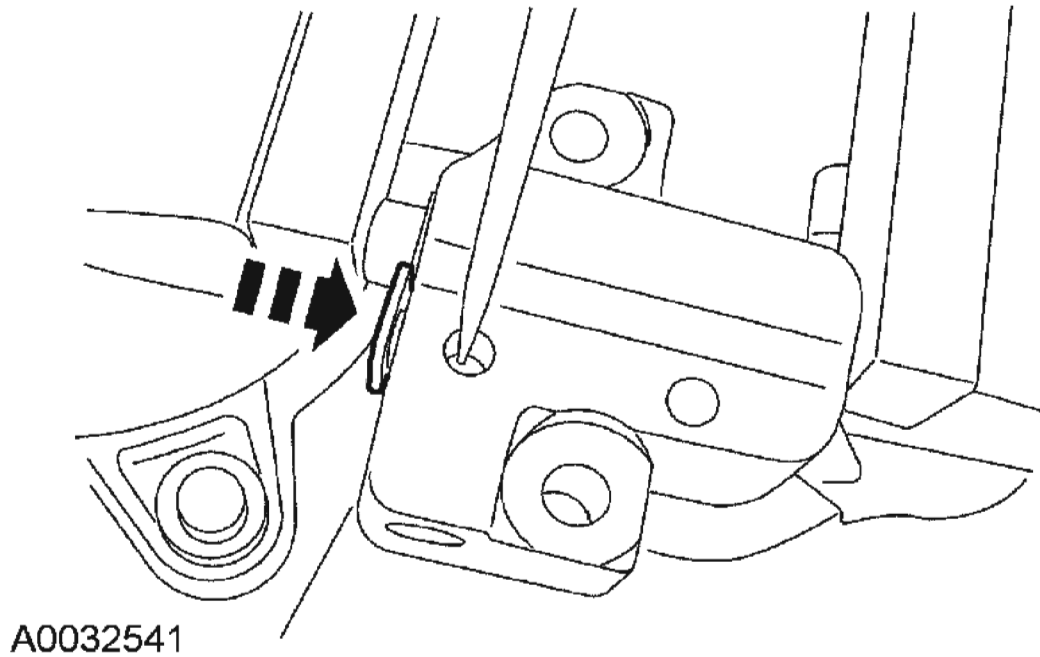
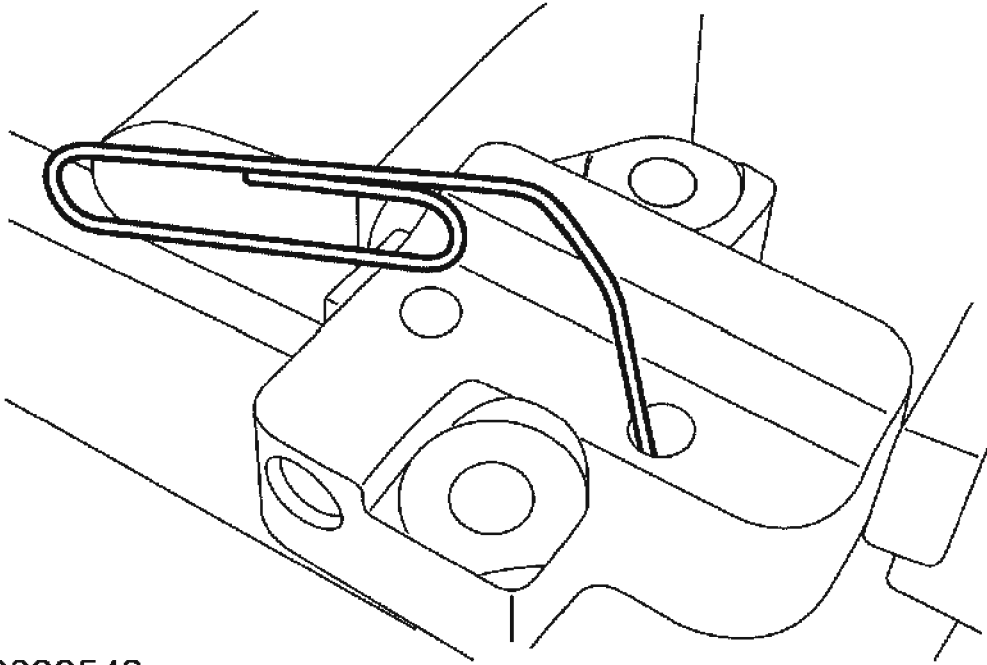


Fig. 414: Pushing Ratchet Arm Back Into Tensioner Housing
Courtesy of FORD MOTOR CO.

31. Install a paper clip into the hole in the tensioner housing to hold the ratchet assembly and the plunger in during installation.



A0032542

Fig. 415: Installing Paper Clip Into Hole In Tensioner Housing To Hold Ratchet Assembly And Plunger

Courtesy of FORD MOTOR CO.

32. Install the timing chain tensioner and the bolts. Remove the paper clip to release the piston.

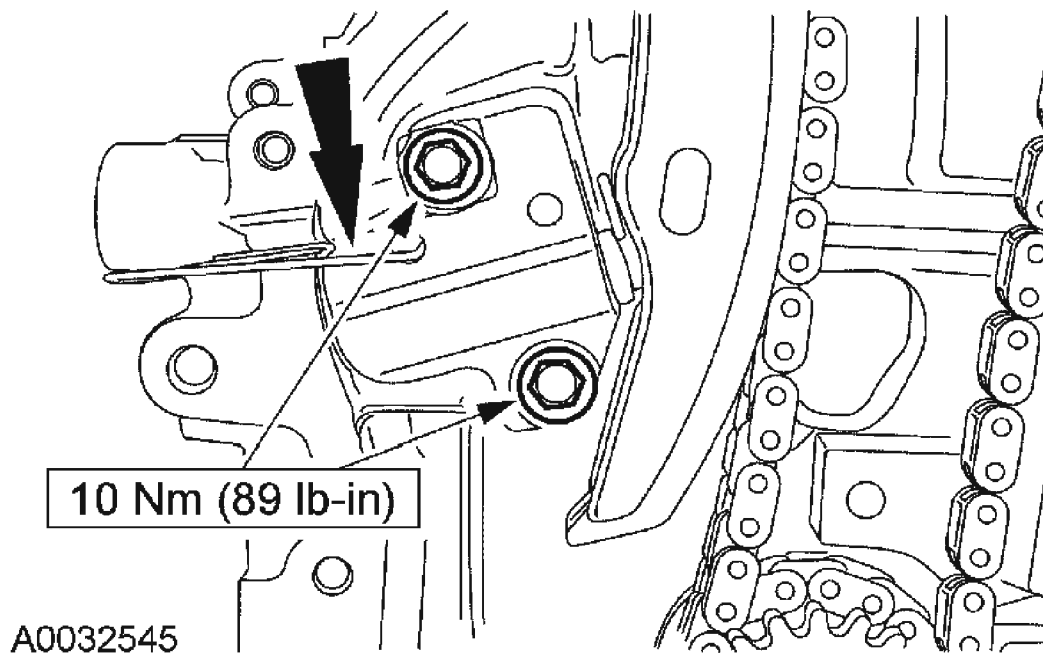


Fig. 416: Installing Timing Chain Tensioner And Bolts
Courtesy of FORD MOTOR CO.

CAUTION: The special tool 303-465 is for camshaft alignment only. Using this tool to prevent engine rotation can result in engine damage.

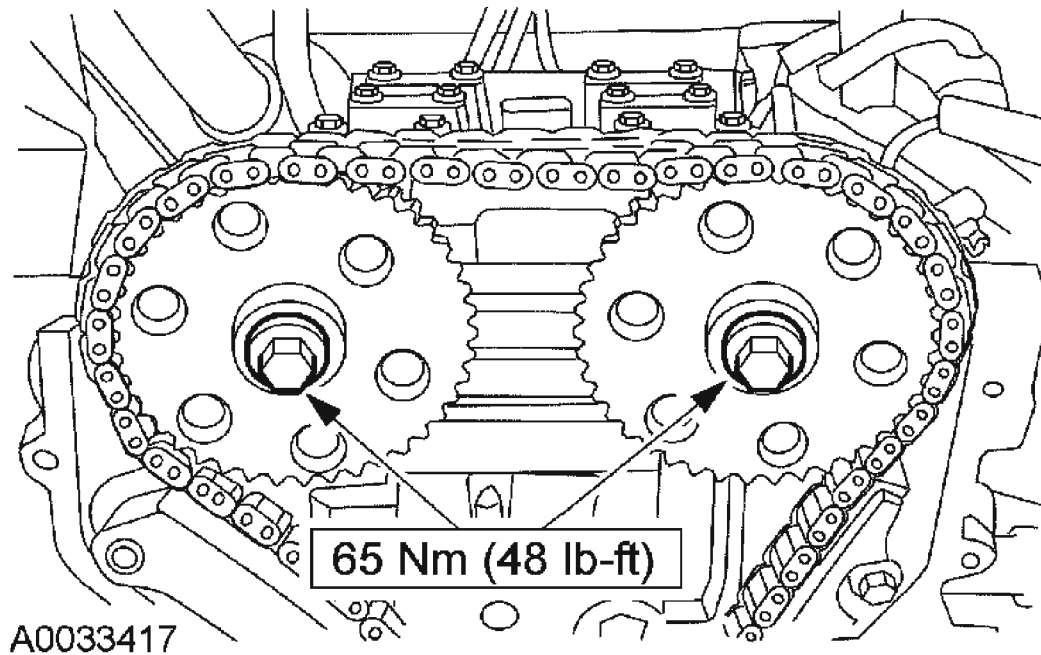


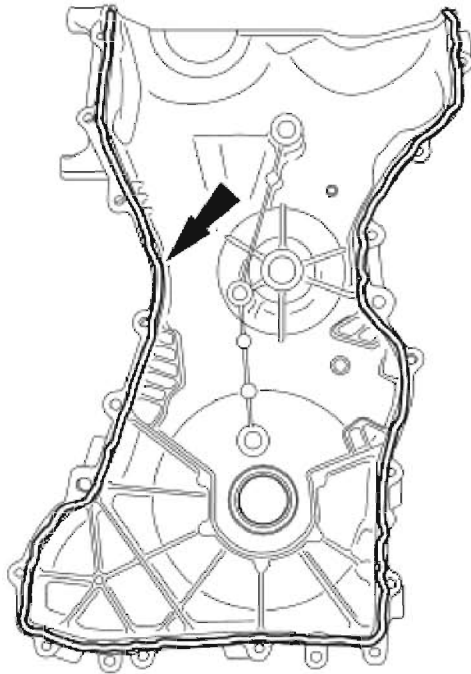
Fig. 417: Tightening Camshaft Sprockets Bolts
Courtesy of FORD MOTOR CO.

33. Using the flats on the camshafts to prevent camshaft rotation, tighten the bolts.

CAUTION: Do not use metal scrapers, wire brushes, power abrasive disks or other abrasive means to clean sealing surfaces. These tools cause scratches and gouges which make leak paths.

34. Clean and inspect the mounting surfaces of the engine and the front cover.

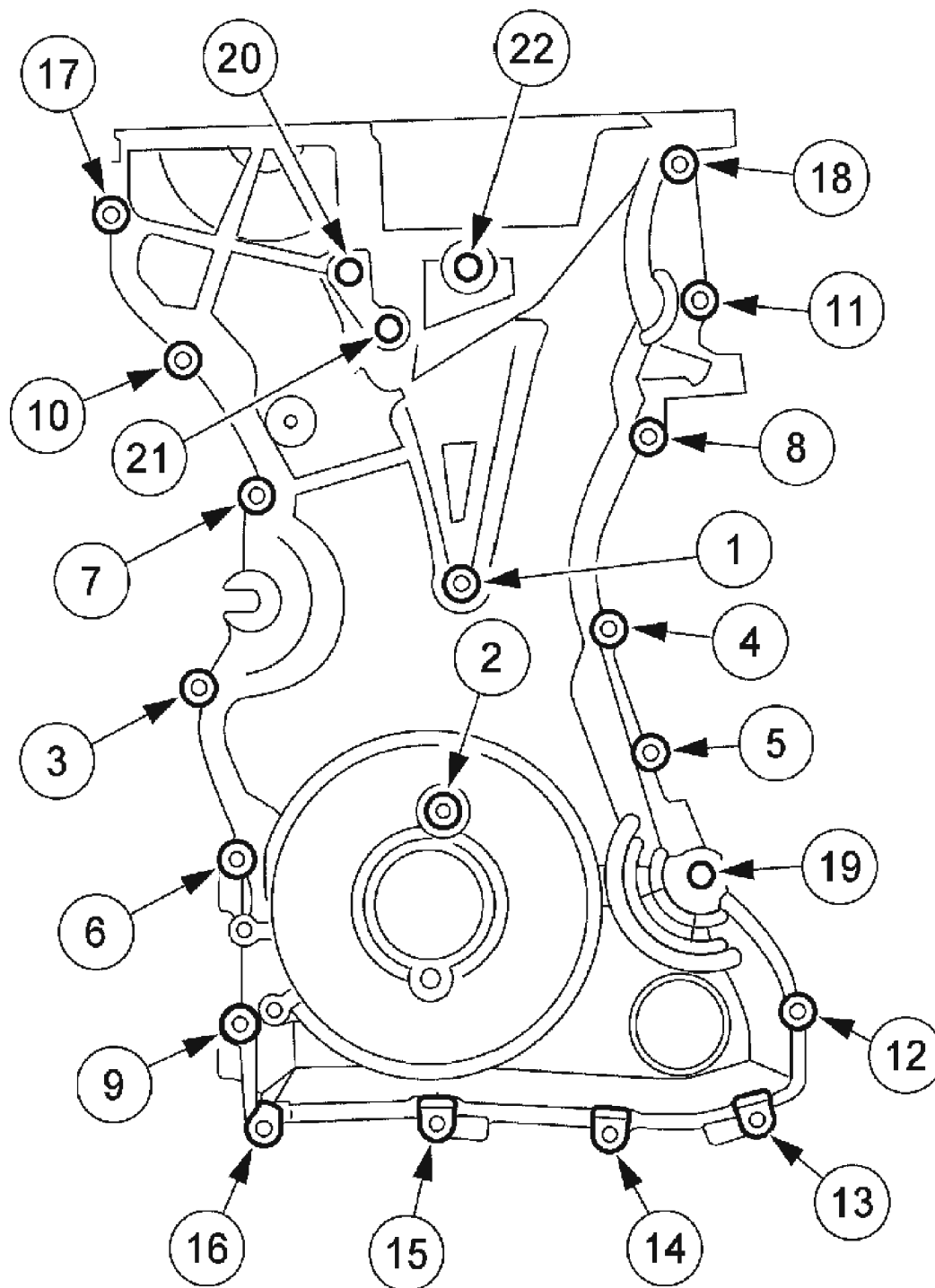
NOTE: The engine front cover must be installed and the bolts tightened within four minutes of applying the silicone gasket and sealant.



A0032803

Fig. 418: Locating Silicone Gasket
Courtesy of FORD MOTOR CO.

35. Apply a 2.5 mm bead of silicone gasket and sealant to the cylinder head and oil pan joint areas. Apply a 2.5 mm bead of silicone gasket and sealant to the front cover.
36. Install the engine front cover. Tighten the bolts in the sequence shown to the following specifications:
 - Tighten the 8 mm bolts to 10 Nm (89 lb-in).
 - Tighten the 13 mm bolts to 48 Nm (35 lb-ft).



A0068861

Fig. 419: Identifying Tightening Sequence Of Engine Front Cover Bolts
Courtesy of FORD MOTOR CO.

NOTE: Remove the through-bolt from the special tool.

NOTE: Lubricate the oil seal with clean engine oil.

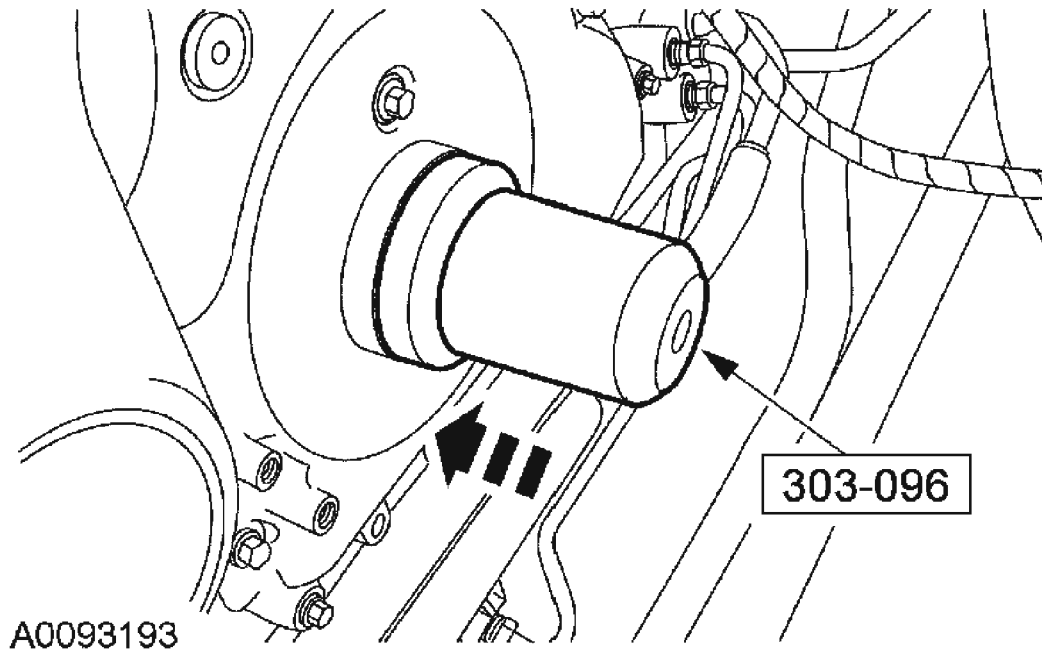


Fig. 420: Installing Crankshaft Front Oil Seal Using Special Tool
Courtesy of FORD MOTOR CO.

37. Using the special tool, install a new crankshaft front oil seal.

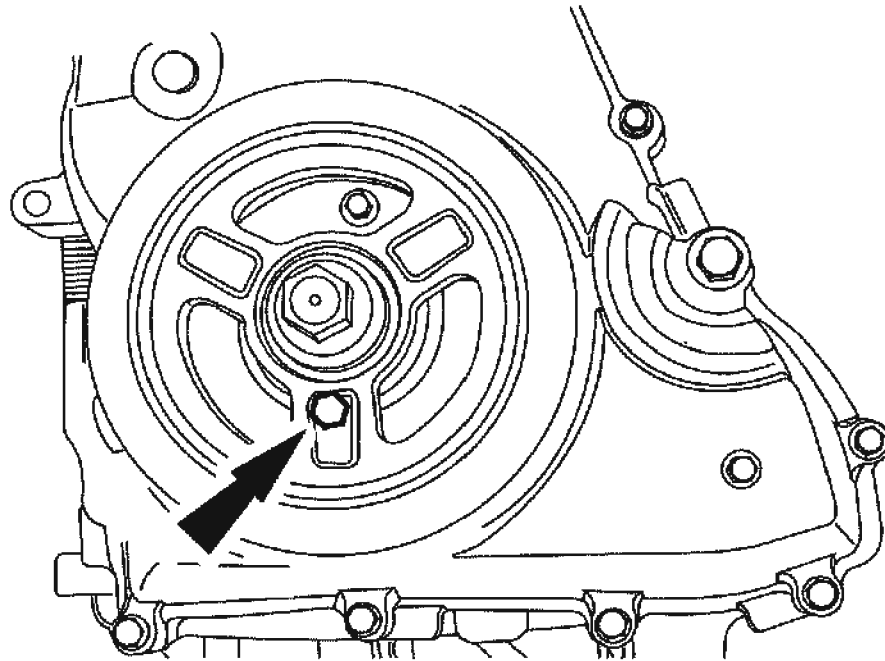
NOTE: Do not reuse the crankshaft damper bolt.

NOTE: Apply clean engine oil on the seal area before installing.

38. Install the crankshaft pulley and hand-tighten the bolt.

CAUTION: Only hand-tighten the bolt or damage to the front cover can occur.

NOTE: This step will correctly align the crankshaft pulley to the crankshaft.



A0087547

Fig. 421: Installing Standard Bolt Through Crankshaft Pulley
Courtesy of FORD MOTOR CO.

39. Install a standard 6 mm (0.23 in) x 18 mm (0.7 in) bolt through the crankshaft pulley and thread it into the front cover.
 - Rotate the pulley as necessary to align the bolt holes.

CAUTION: Failure to hold the crankshaft pulley in place during bolt tightening can cause damage to the engine front cover.

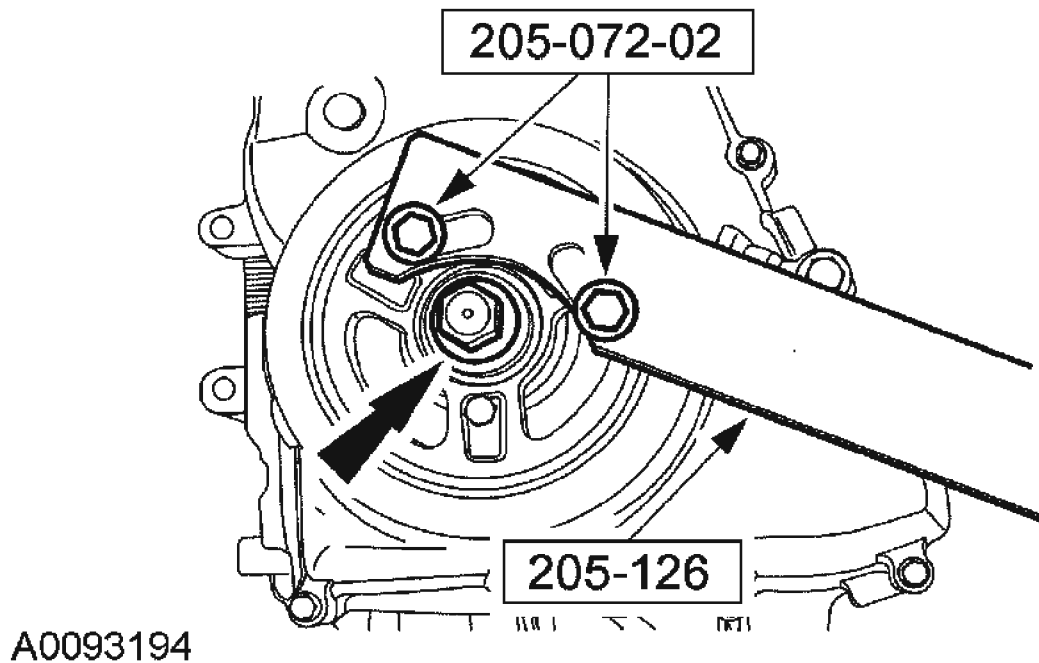
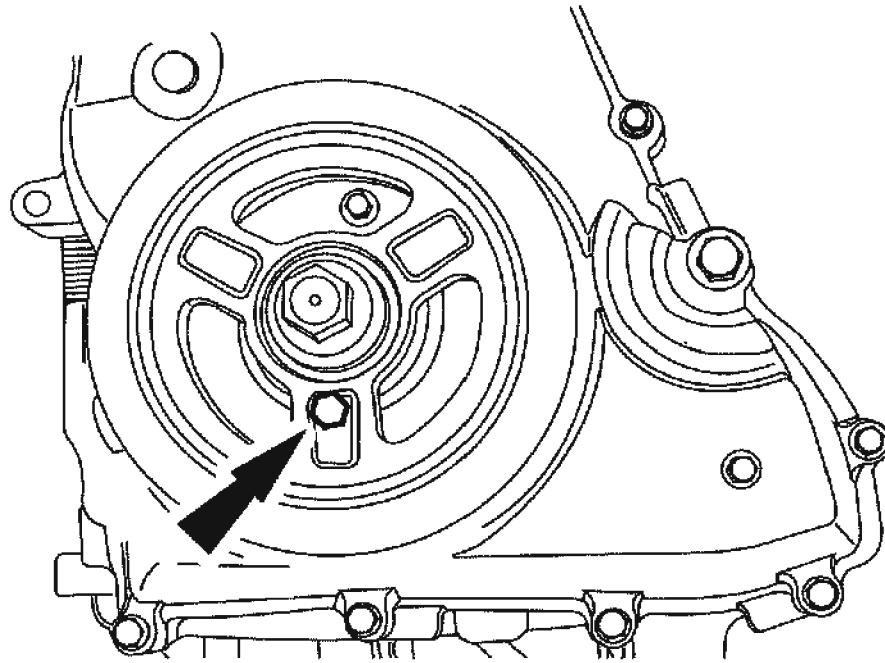


Fig. 422: Using Special Tools To Hold Crankshaft Pulley In Place
Courtesy of FORD MOTOR CO.

40. Using the special tools to hold the crankshaft pulley in place, tighten the crankshaft pulley bolt in two stages:
 - Stage 1: Tighten to 100 Nm (74 lb-ft).
 - Stage 2: Tighten an additional 90 degrees (1/4 turn).
41. Remove the 6 mm (0.23 in) x 18 mm (0.7 in) bolt.



A0087547

Fig. 423: Removing 6 mm Bolt
Courtesy of FORD MOTOR CO.

42. Remove the special tool.

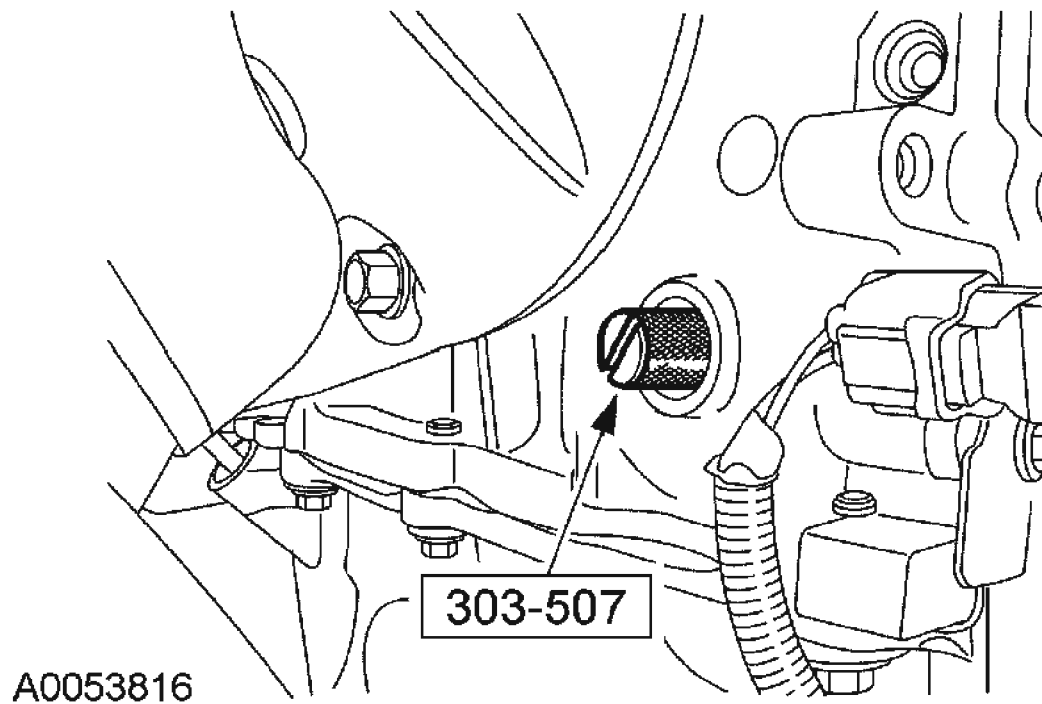
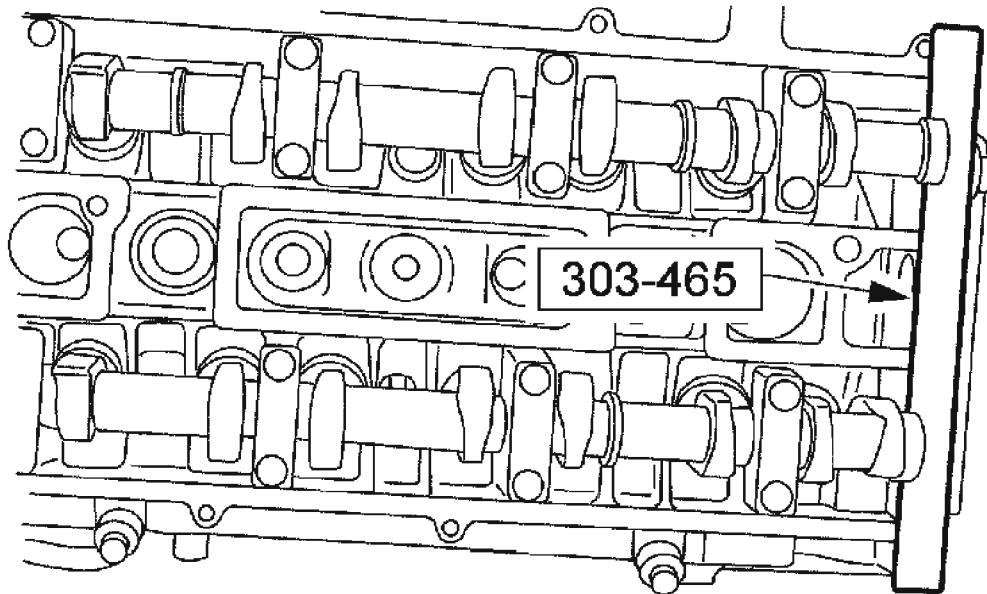


Fig. 424: Removing Special Tool (303-507)
Courtesy of FORD MOTOR CO.

43. Remove the special tool.



A0052352

Fig. 425: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

NOTE: Only turn the engine in the normal direction of rotation.

44. Turn the engine two complete revolutions.

NOTE: Only turn the engine in the normal direction of rotation.

45. Turn the crankshaft until the No. 1 piston is at top dead center (TDC).

46. Install the special tool.

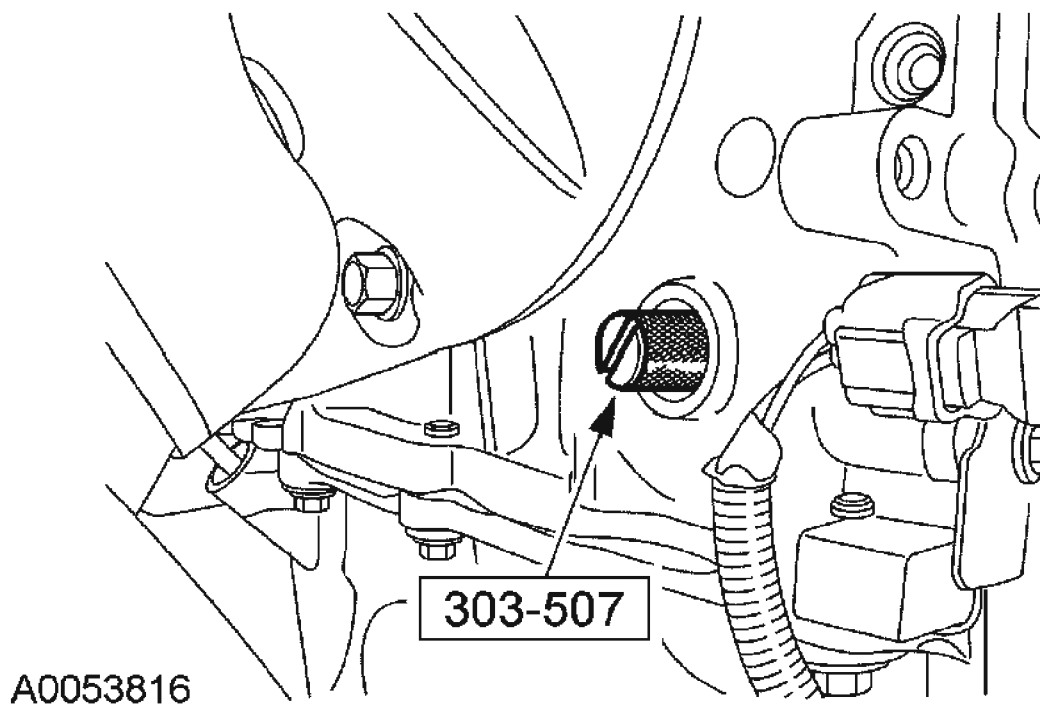
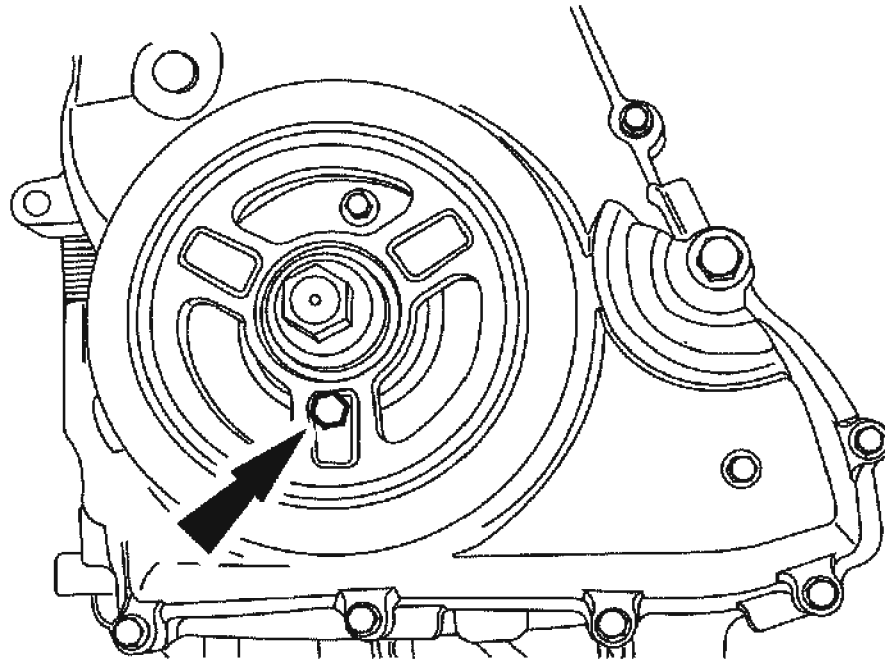


Fig. 426: Identifying Special Tool (303-507)
Courtesy of FORD MOTOR CO.

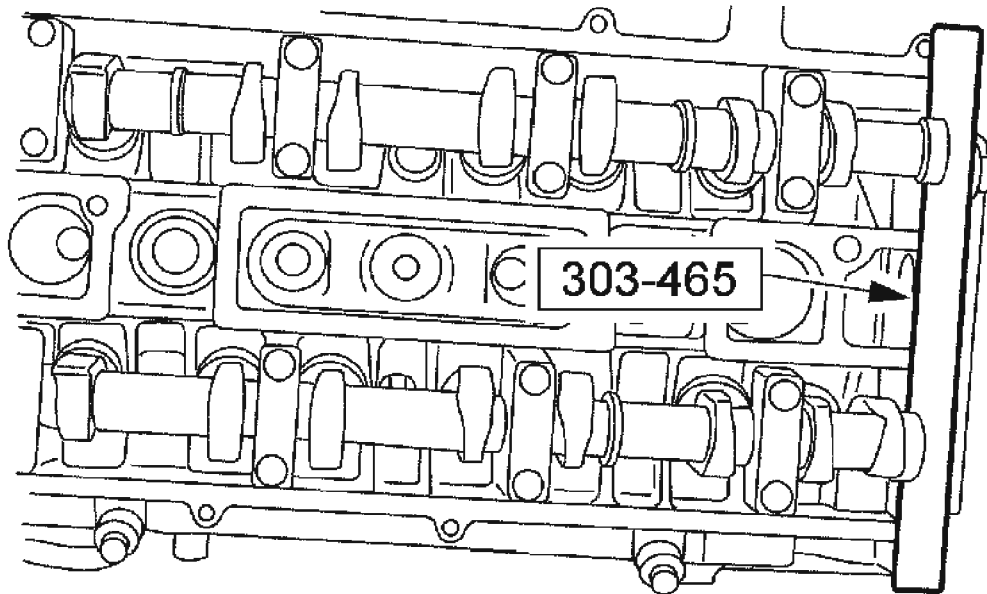
CAUTION: Only hand-tighten the bolt or damage to the front cover can occur.



A0087547

Fig. 427: Using 6 mm Bolt To Check Position Of Crankshaft Pulley
Courtesy of FORD MOTOR CO.

47. Using the 6 mm (0.23 in) x 18 mm (0.7 in) bolt, check the position of the crankshaft pulley.
 - If it is not possible to install the bolt, correct the engine timing.
48. Using the special tool, check the position of the camshafts.
 - If it is not possible to install the special tool, correct the engine timing.



A0052352

Fig. 428: Identifying Special Tool In Slots Of Both Camshafts
Courtesy of FORD MOTOR CO.

NOTE: Whenever the crankshaft position (CKP) sensor is removed, a new one must be installed using the alignment jig supplied with the new part.

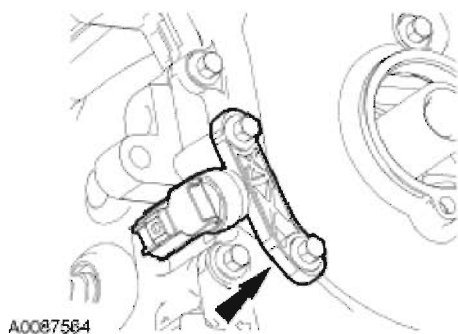


Fig. 429: Locating CKP Sensor
Courtesy of FORD MOTOR CO.

49. Install a new CKP sensor.
 - Do not tighten the bolts at this time.
50. Adjust the CKP sensor with the alignment jig and tighten the bolts.

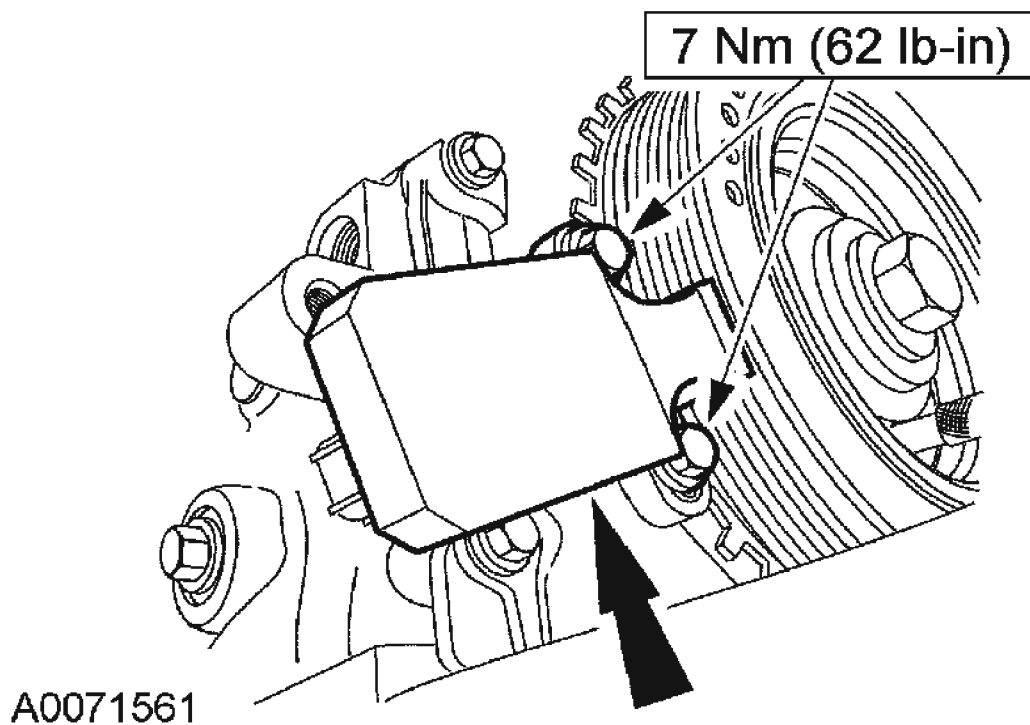
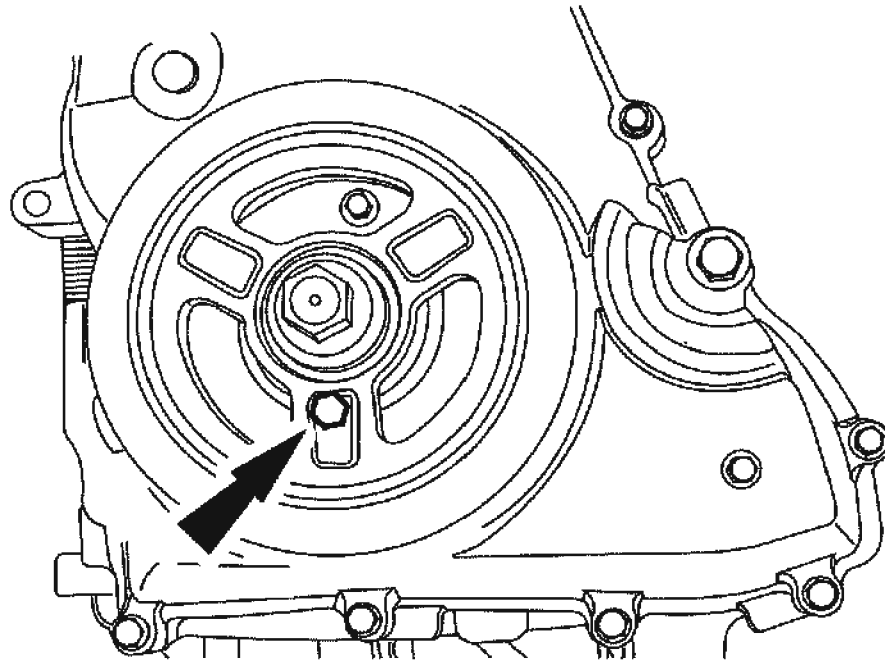


Fig. 430: Adjusting CKP Sensor With Alignment Jig And Tightening Bolts
Courtesy of FORD MOTOR CO.

51. Remove the 6 mm (0.23 in) x 18 mm (0.7 in) bolt.



A0087547

Fig. 431: Removing 6 mm (0.23 in) x 18 mm (0.7 in) Bolt
Courtesy of FORD MOTOR CO.

52. Install the engine plug bolt.

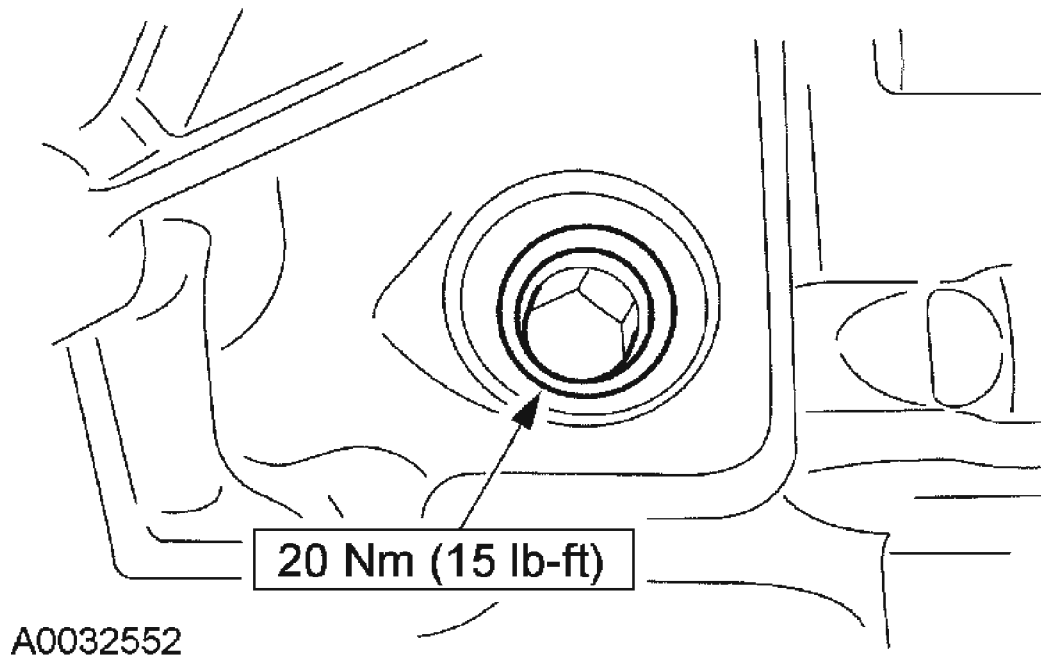
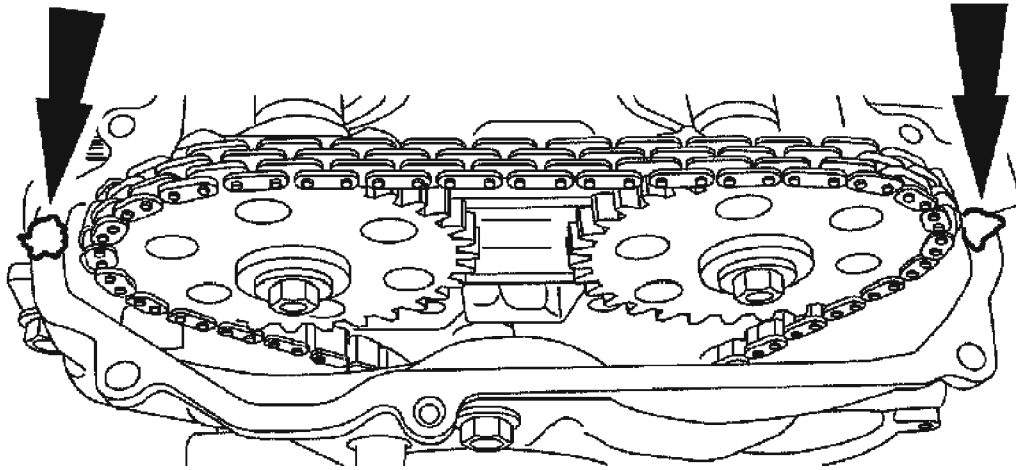


Fig. 432: Installing Engine Plug Bolt
Courtesy of FORD MOTOR CO.

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.

53. Clean the valve cover gasket surface with metal surface cleaner.
54. Apply silicone gasket and sealant to the locations shown.



A0032732

Fig. 433: Applying Silicone Gasket And Sealant To Cylinder Head
Courtesy of FORD MOTOR CO.

NOTE: The valve cover must be secured within four minutes of silicone gasket application. If the valve cover is not secured within four minutes, the sealant must be removed and the sealing area cleaned with metal surface cleaner.

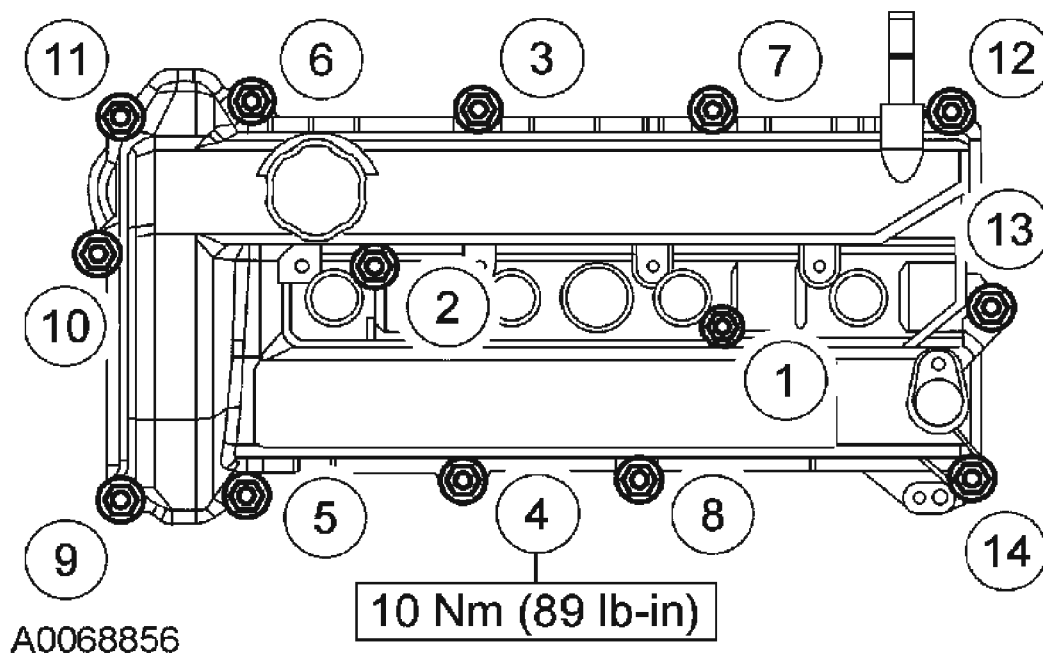


Fig. 434: Identifying Tightening Sequence Of Valve Cover Bolts
Courtesy of FORD MOTOR CO.

55. Install the valve cover.
 - Tighten the bolts in the sequence shown.
56. Install the spark plugs.

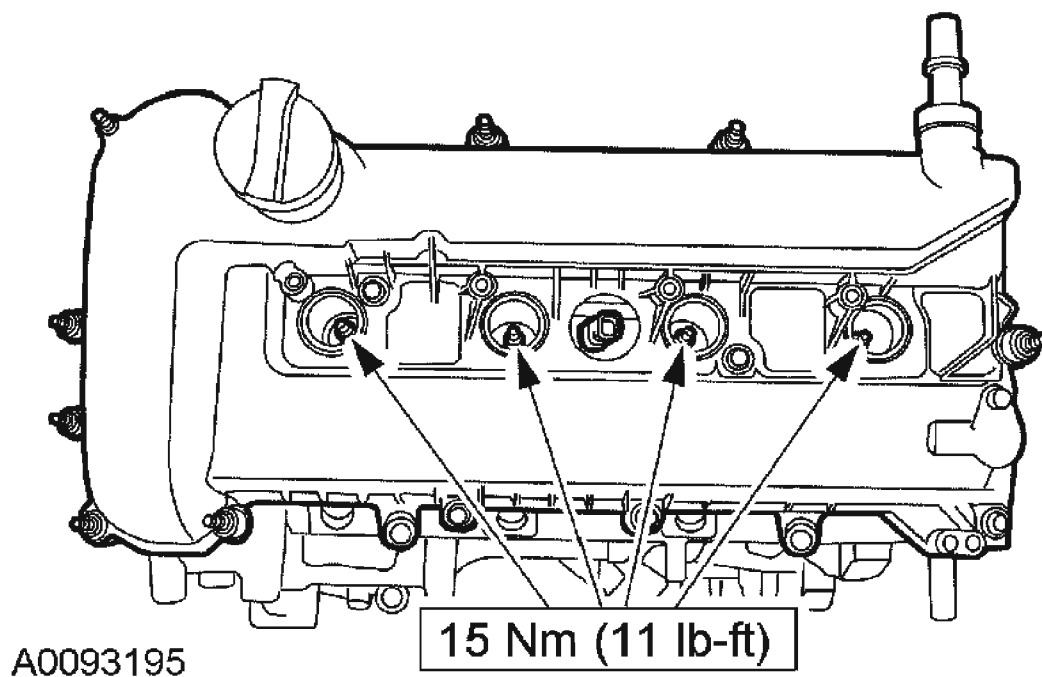


Fig. 435: Installing Spark Plugs
Courtesy of FORD MOTOR CO.

NOTE: Apply dielectric compound to the inside of the coil-on-plug boots.

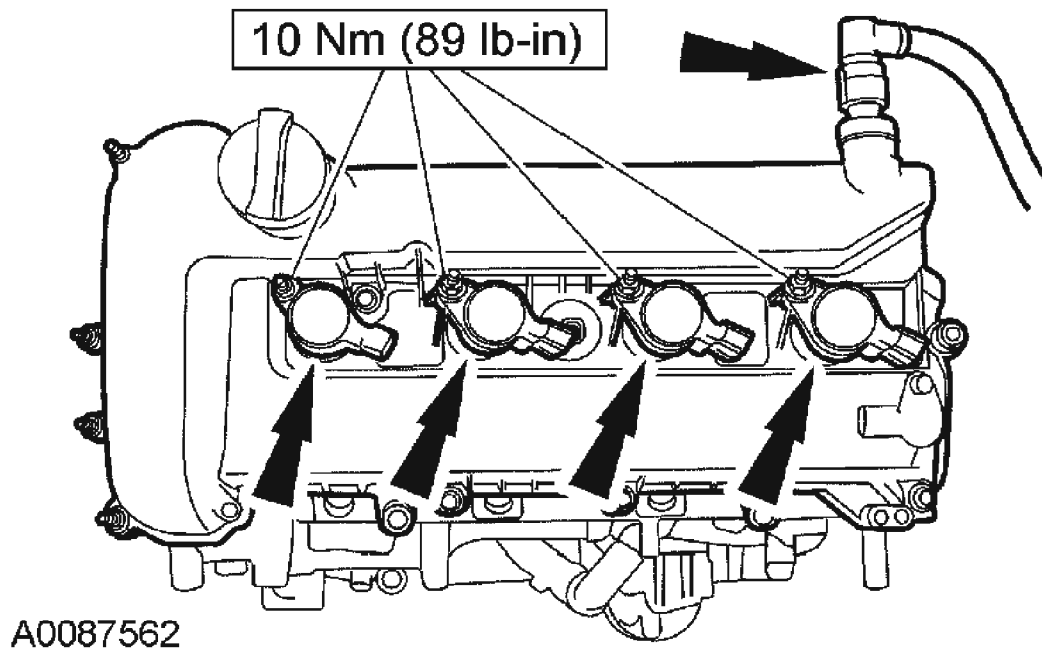


Fig. 436: Installing Coil-On-Plugs And Crankcase Vent Tube
Courtesy of FORD MOTOR CO.

57. Install the coil-on-plugs and the crankcase vent tube.
58. If equipped, install the block heater.

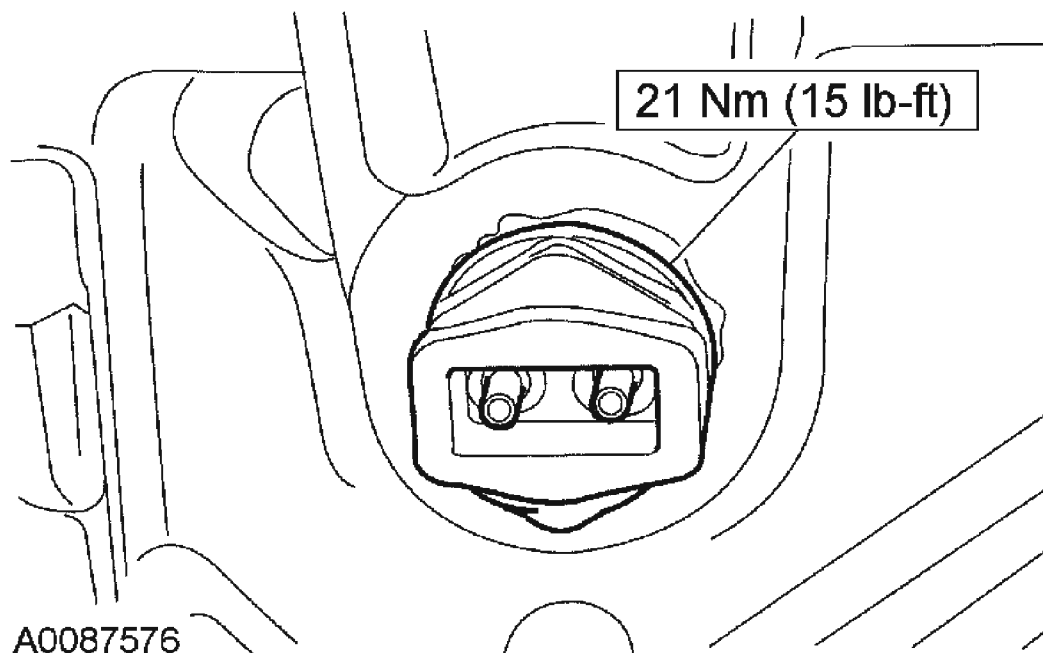
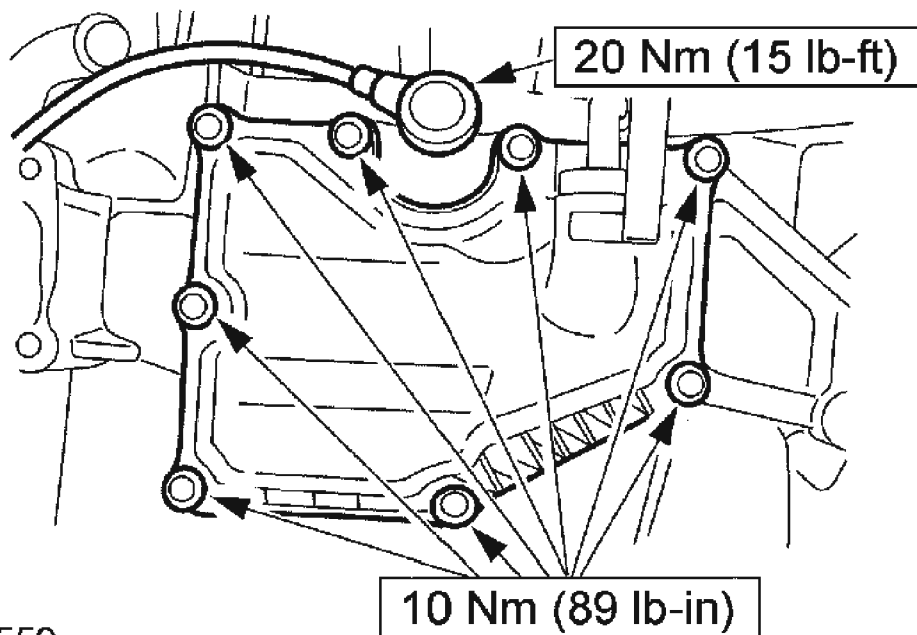


Fig. 437: Installing Block Heater
Courtesy of FORD MOTOR CO.

NOTE: The knock sensor (KS) must not touch the crankcase vent oil separator.



A0032559

Fig. 438: Installing Crankcase Vent Oil Separator And KS
Courtesy of FORD MOTOR CO.

59. Install the crankcase vent oil separator and the KS.
60. Install the coolant bypass hose.

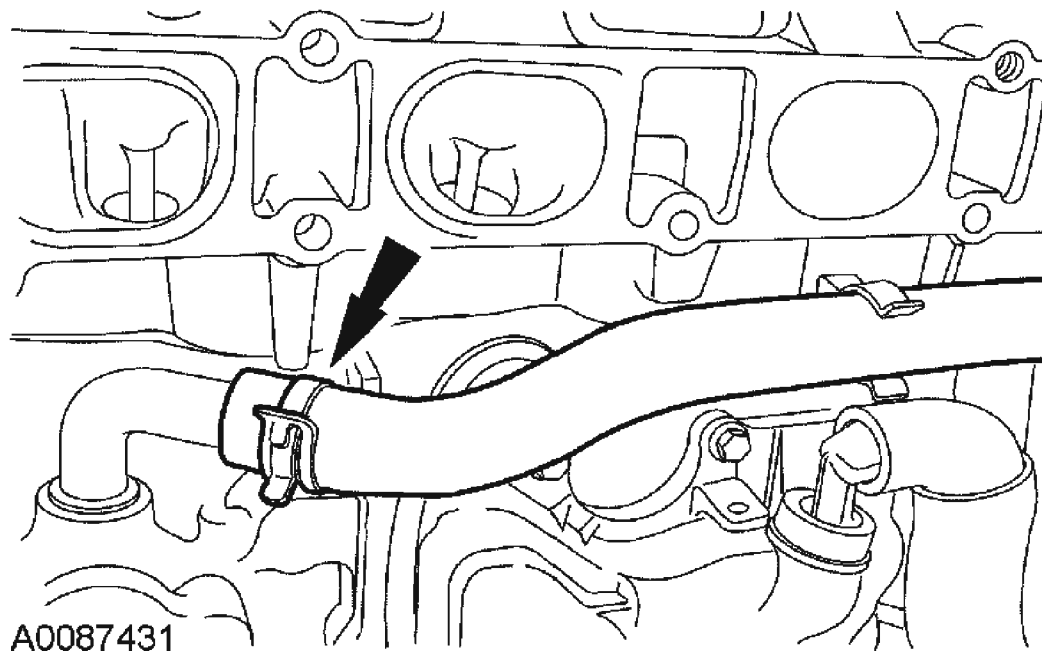


Fig. 439: Installing Coolant Bypass Hose
Courtesy of FORD MOTOR CO.

61. Using a new gasket, install the coolant bypass and bolts.

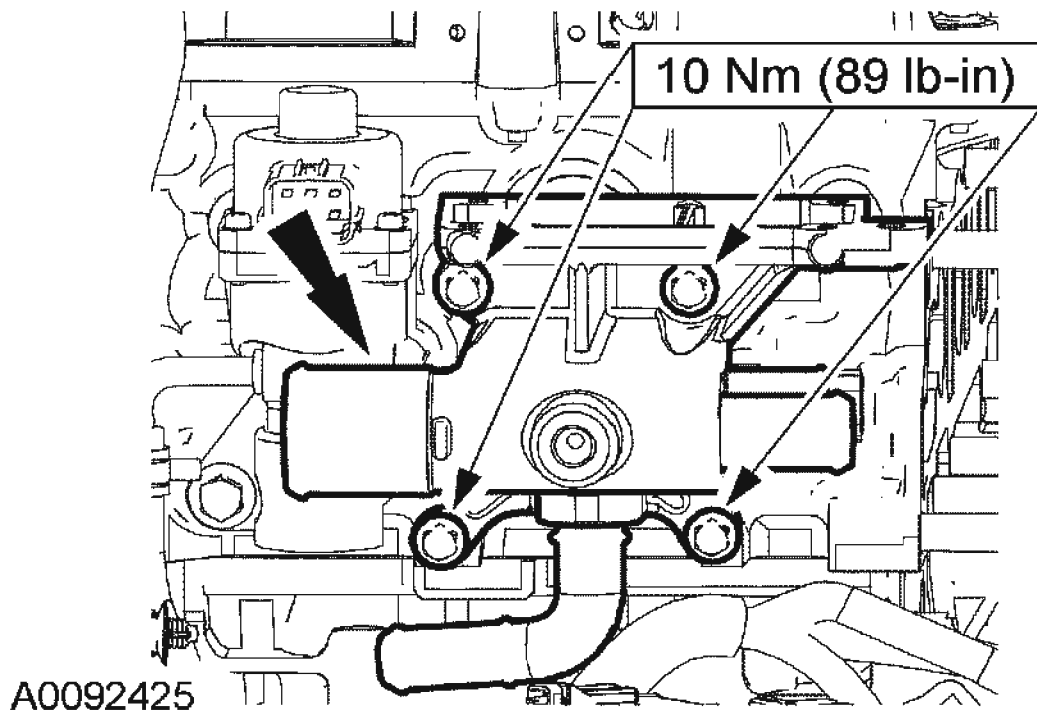


Fig. 440: Installing Coolant Bypass Bolts Using New Gasket
Courtesy of FORD MOTOR CO.

62. Connect the coolant bypass hose.

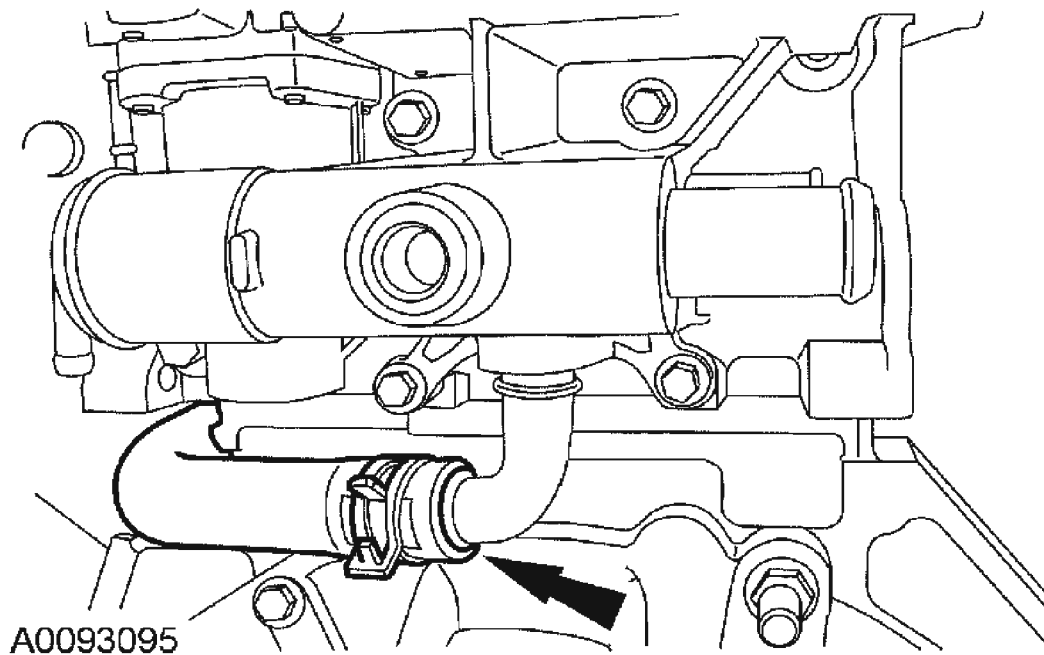


Fig. 441: Connecting Coolant Bypass Hose
Courtesy of FORD MOTOR CO.

63. Install the coolant hose.

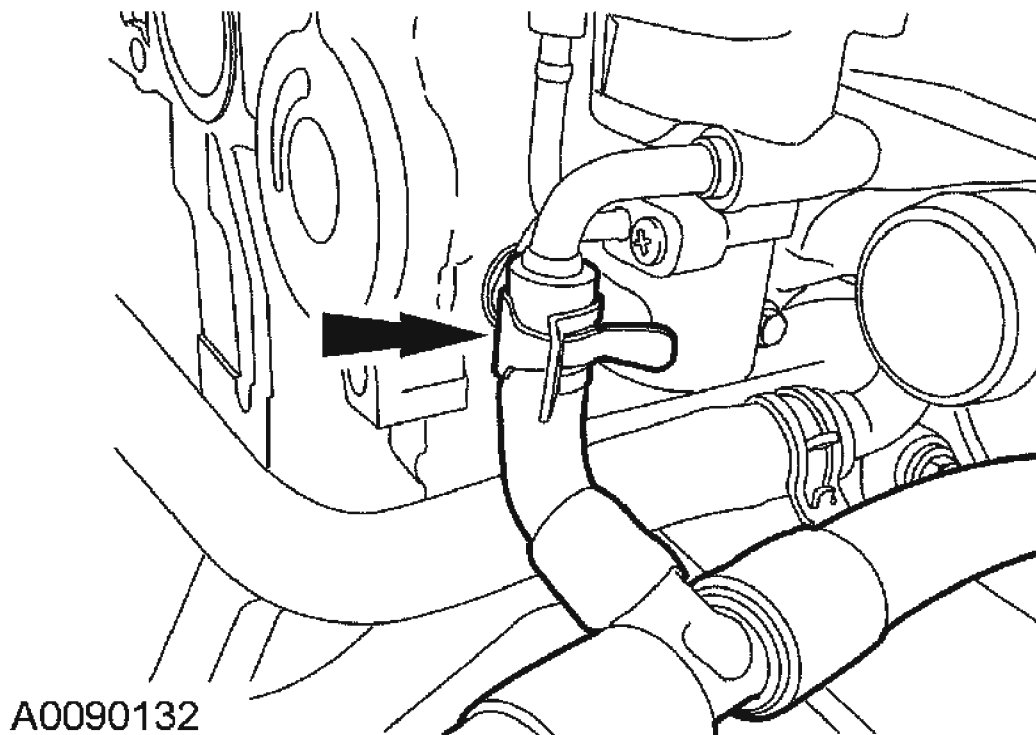
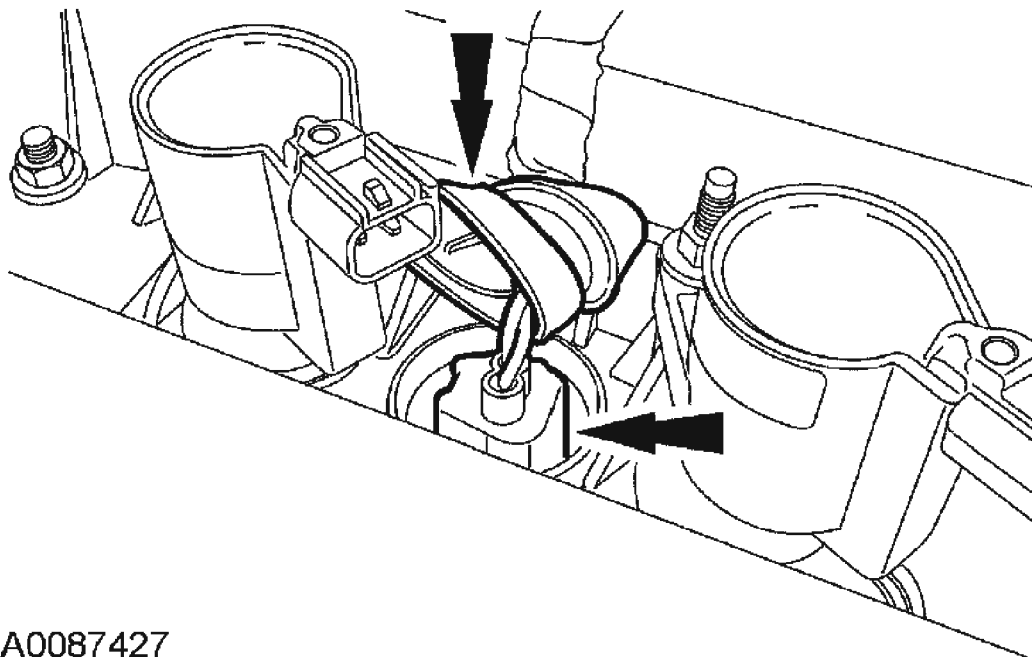


Fig. 442: Installing Coolant Hose
Courtesy of FORD MOTOR CO.

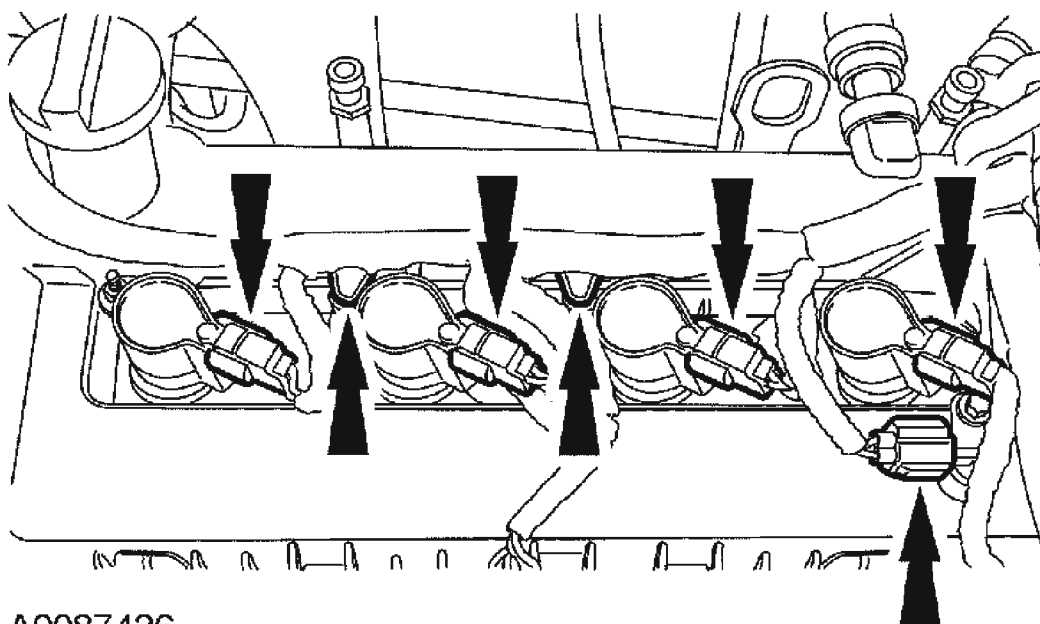
64. Position the engine control wiring harness on the engine and connect the CHT sensor and install the rubber boot.



A0087427

Fig. 443: Connecting CHT Sensor And Installing Rubber Boot
Courtesy of FORD MOTOR CO.

65. Connect the coil-on-plug and camshaft position (CMP) sensor electrical connectors.



A0087426

Fig. 444: Connecting Coil-On-Plug And Camshaft Position Sensor Electrical Connectors

Courtesy of FORD MOTOR CO.

66. Connect the exhaust gas recirculation (EGR) valve and radio interference capacitor electrical connectors. Attach the wiring harness retainer.

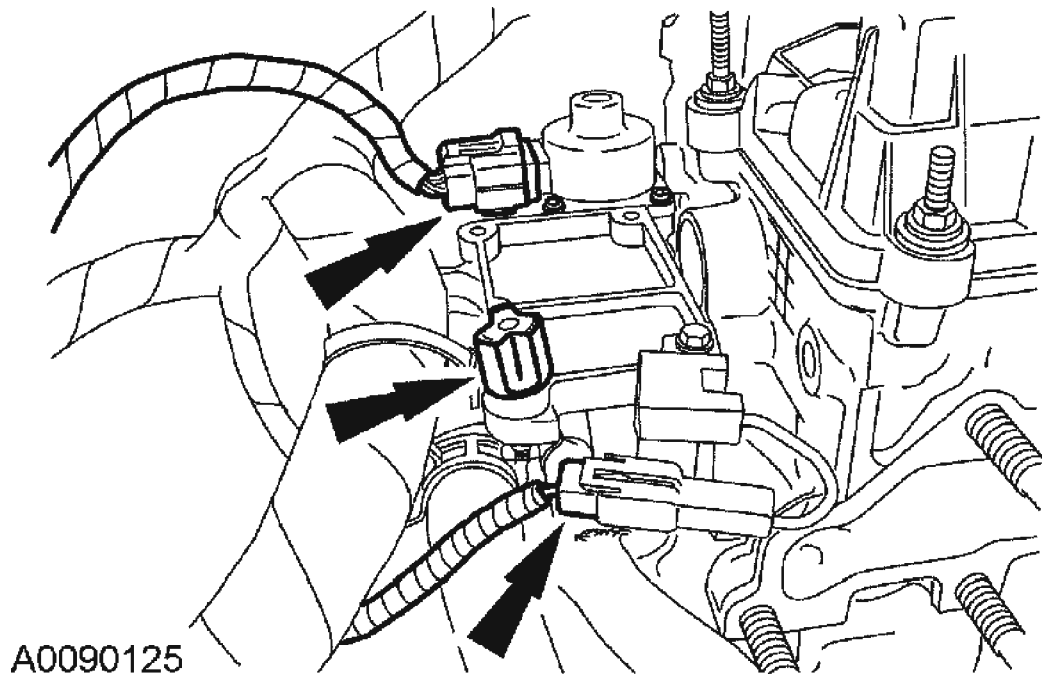


Fig. 445: Connecting Exhaust Gas Recirculation Valve And Radio Interference Capacitor Electrical Connectors

Courtesy of FORD MOTOR CO.

67. Attach the wiring harness retainer.

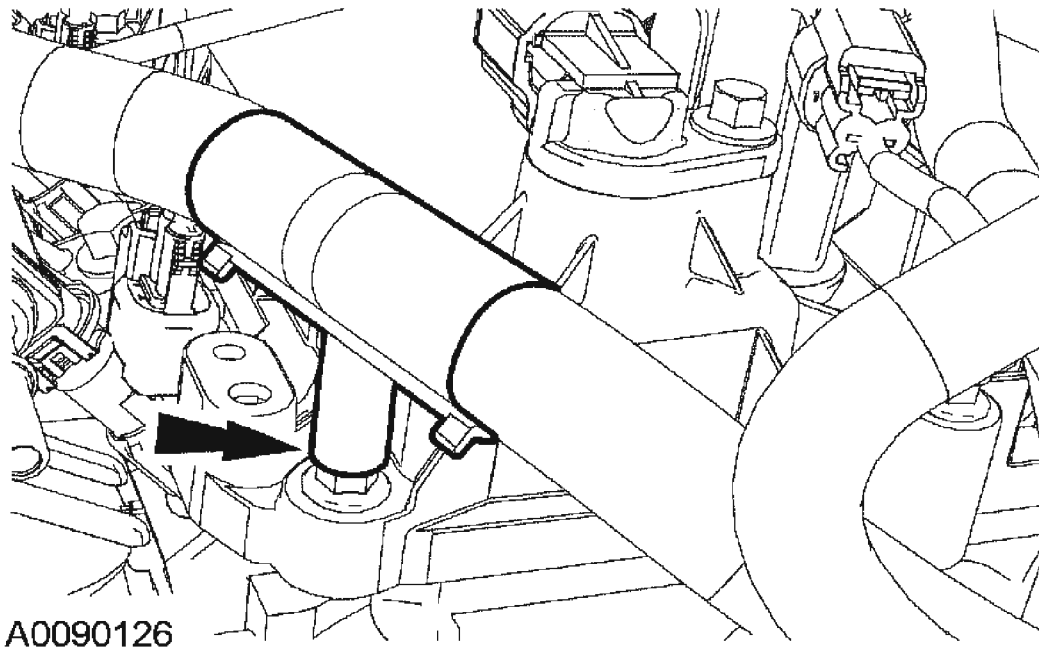
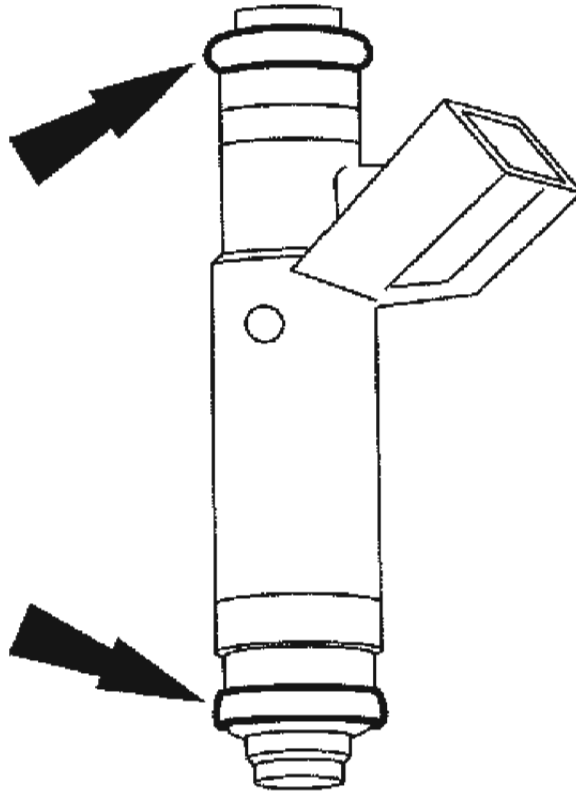


Fig. 446: Attaching Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

CAUTION: Use O-ring seals that are made of special fuel-resistant material. Use of ordinary O-rings can cause the fuel system to leak. Do not reuse the O-ring seals.



AV1418-A

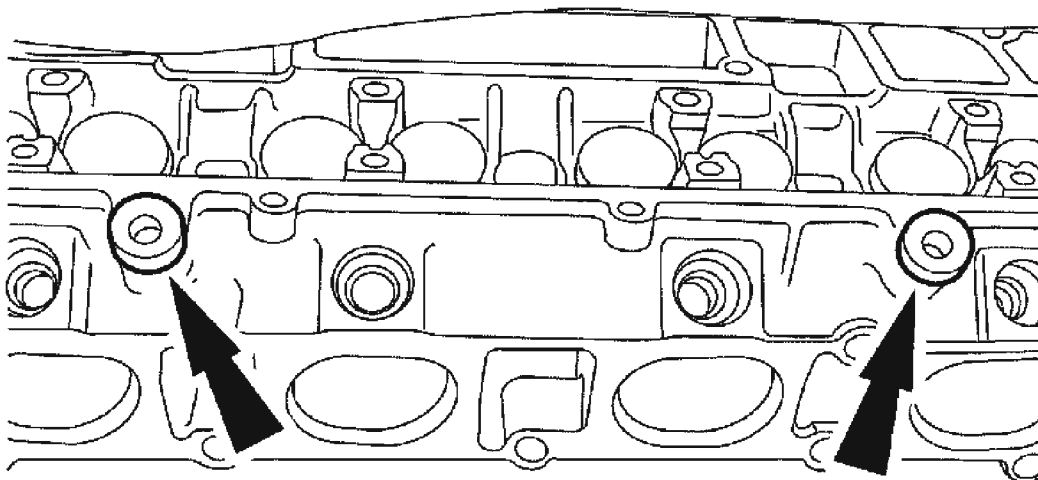
Fig. 447: Locating Fuel Injector O-Ring Seals
Courtesy of FORD MOTOR CO.

68. Installing New Fuel Injector O-Rings

Install new fuel injector O-rings.

- Separate the fuel injectors from the fuel rail.
- Remove and discard the fuel injector O-rings.
- Install new O-rings and lubricate with clean engine oil.
- Install the fuel injectors onto the fuel rail.

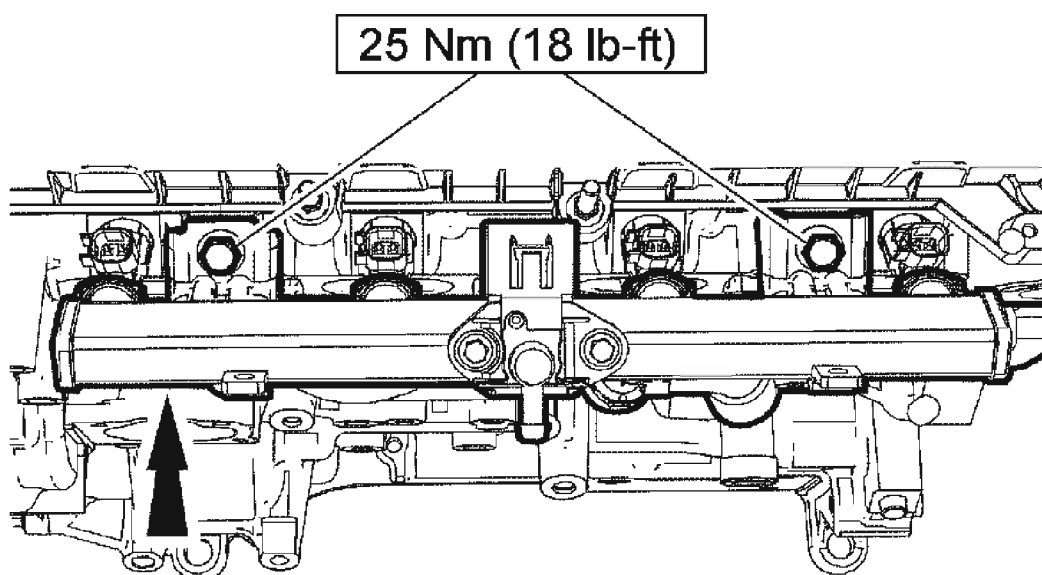
69. Position the fuel rail spacers.



A0032736

Fig. 448: Positioning Fuel Rail Spacers
Courtesy of FORD MOTOR CO.

70. Install the fuel rail with the fuel injectors.



A0090131

Fig. 449: Installing Fuel Rail With Fuel Injectors

Courtesy of FORD MOTOR CO.

71. Connect the fuel charging wiring harness.
- Connect the fuel rail pressure and temperature sensor electrical connector.
 - Connect the four fuel injector electrical connectors.
 - Attach the wiring harness retainers.

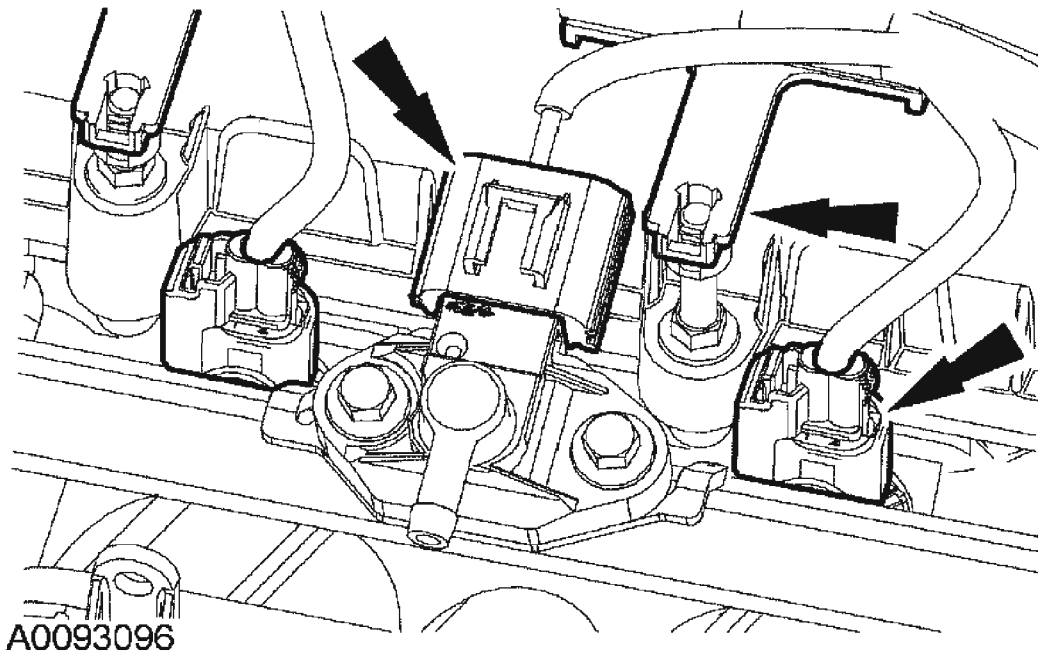


Fig. 450: Connecting Fuel Charging Wiring Harness
Courtesy of FORD MOTOR CO.

72. Connect the wiring harness retainers to the valve cover studs.

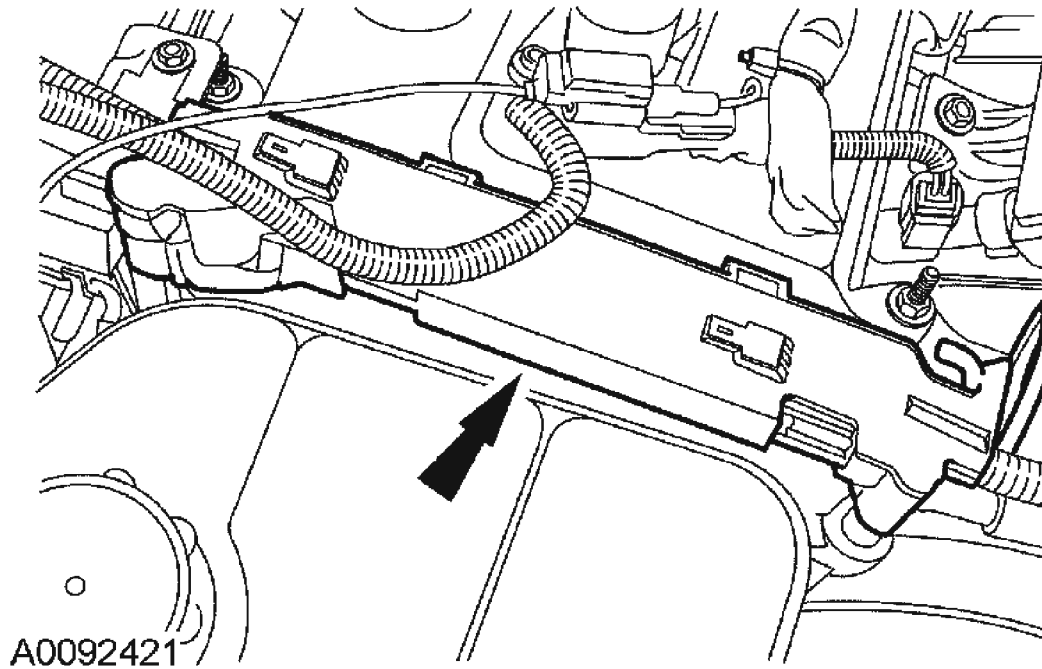


Fig. 451: Connecting Wiring Harness Retainers To Valve Cover Studs
Courtesy of FORD MOTOR CO.

73. Install the radio interference capacitor bracket and bolt.

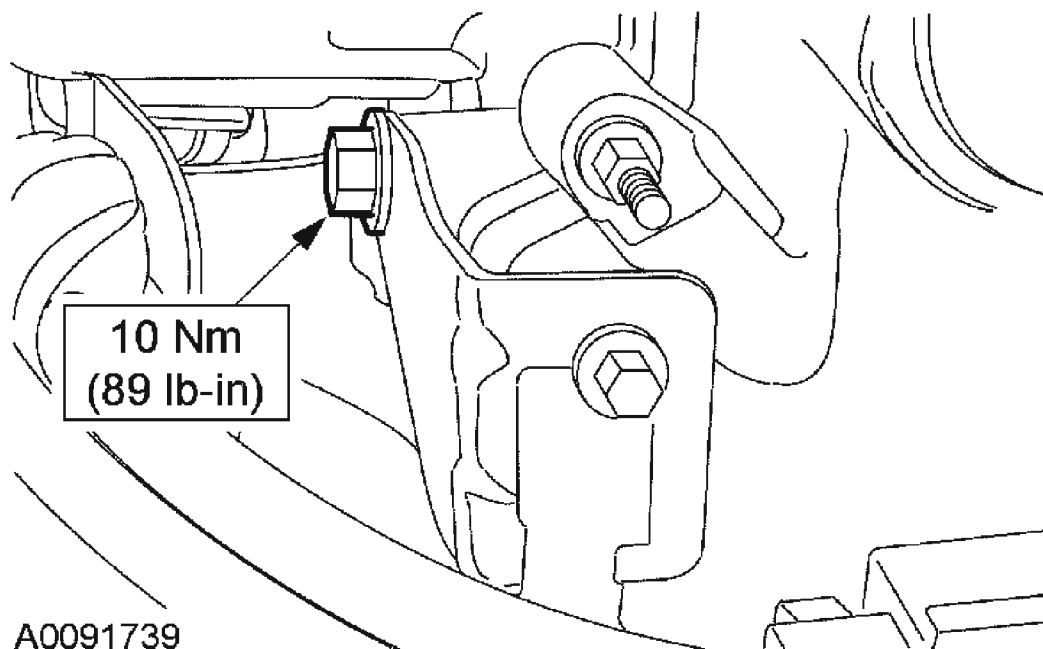


Fig. 452: Installing Radio Interference Capacitor Bracket Bolt
Courtesy of FORD MOTOR CO.

74. Install the EGR tube.

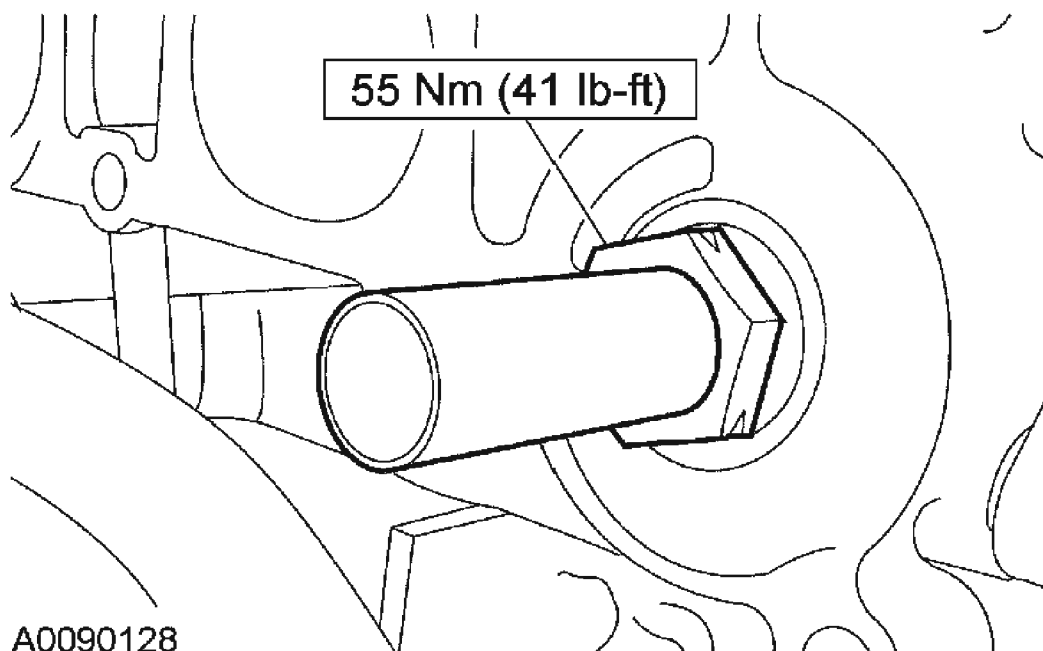


Fig. 453: Installing EGR Tube
Courtesy of FORD MOTOR CO.

75. Inspect and install new intake manifold gaskets if necessary.
76. Position the intake manifold and connect the positive crankcase ventilation hose.

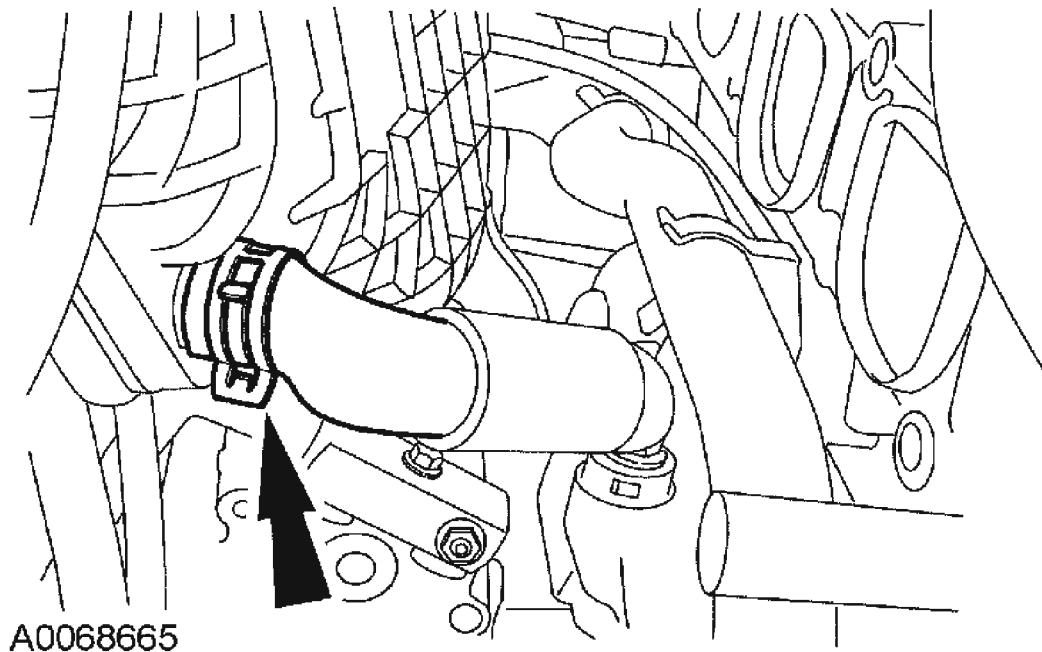


Fig. 454: Connecting Positive Crankcase Ventilation Hose
Courtesy of FORD MOTOR CO.

2.3L engines

NOTE: Be sure to install the bolts in the previously marked locations.

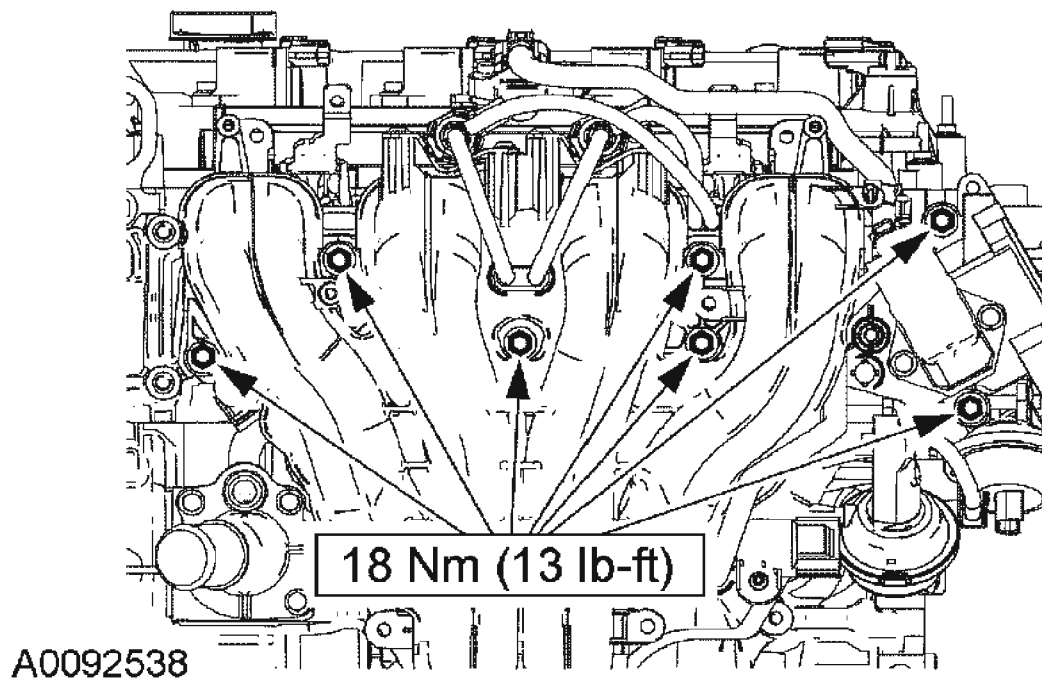


Fig. 455: Installing Intake Manifold And Seven Mounting Bolts
Courtesy of FORD MOTOR CO.

77. Install the intake manifold and the seven mounting bolts.

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

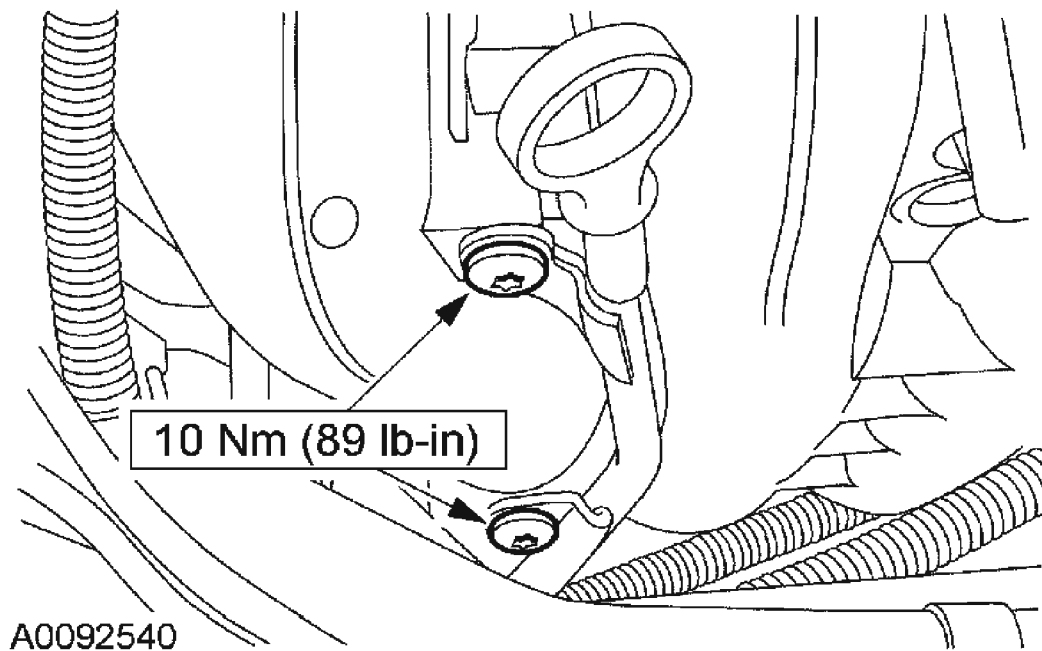


Fig. 456: Installing Oil Level Indicator Tube Assembly Bolts
Courtesy of FORD MOTOR CO.

78. Install the oil level indicator tube assembly and bolts.
79. Connect the swirl valve electrical connectors and pin-type retainers.

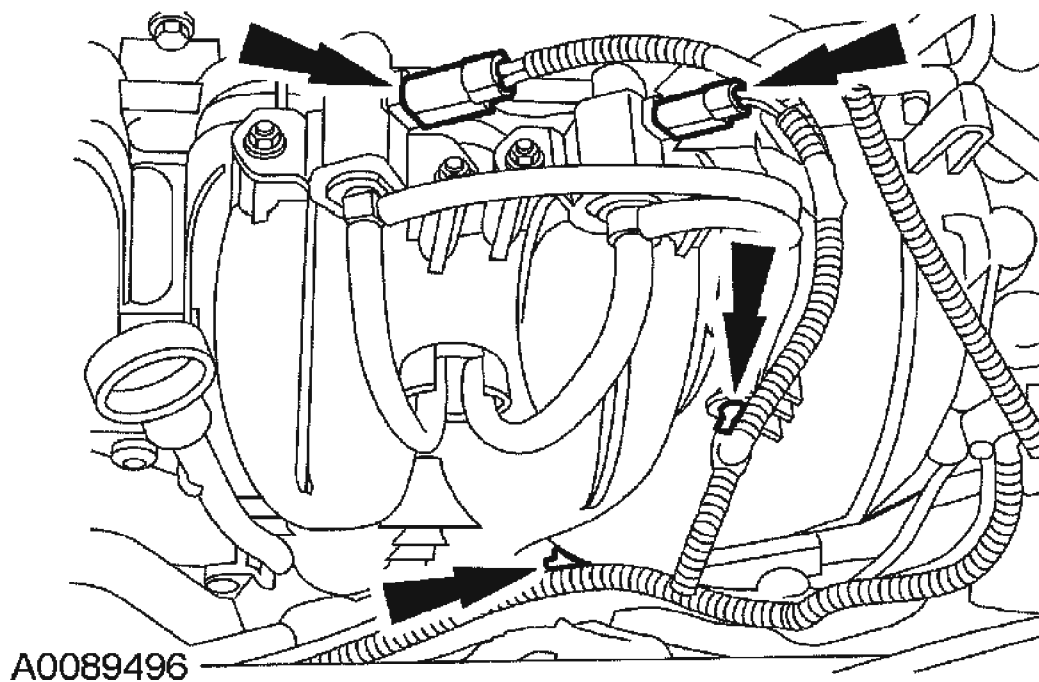


Fig. 457: Connecting Swirl Valve Electrical Connectors And Pin-Type Retainers
Courtesy of FORD MOTOR CO.

2.0L engines

NOTE: Be sure to install the bolts in the previously marked locations.

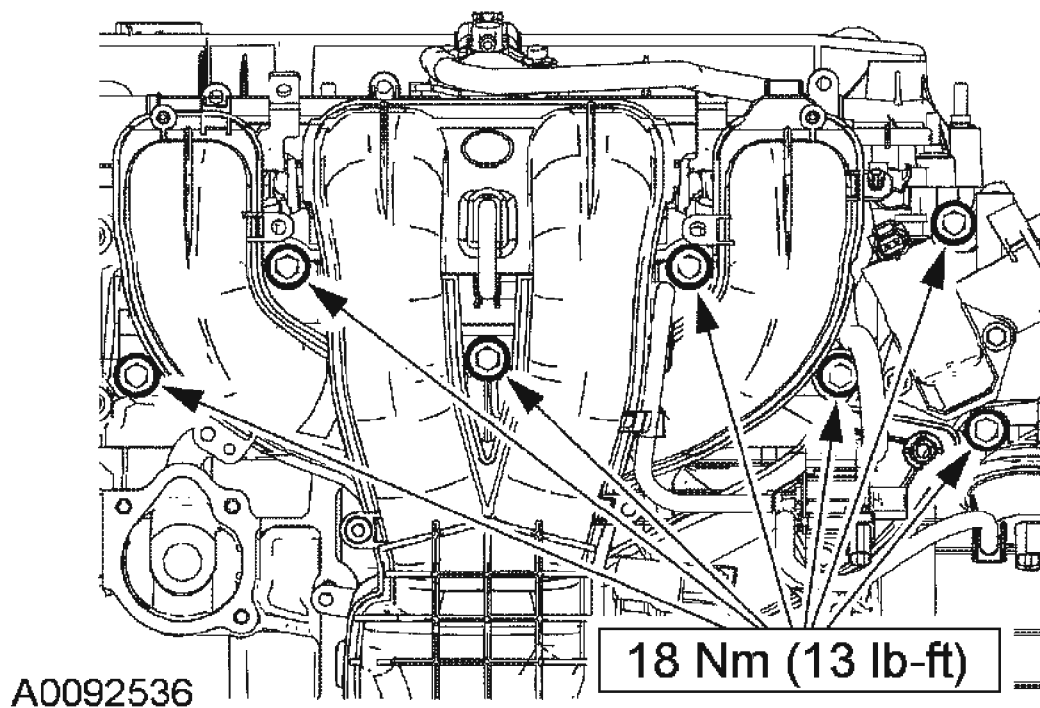


Fig. 458: Installing Intake Manifold And Seven Mounting Bolts
Courtesy of FORD MOTOR CO.

80. Install the intake manifold and the seven mounting bolts.

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

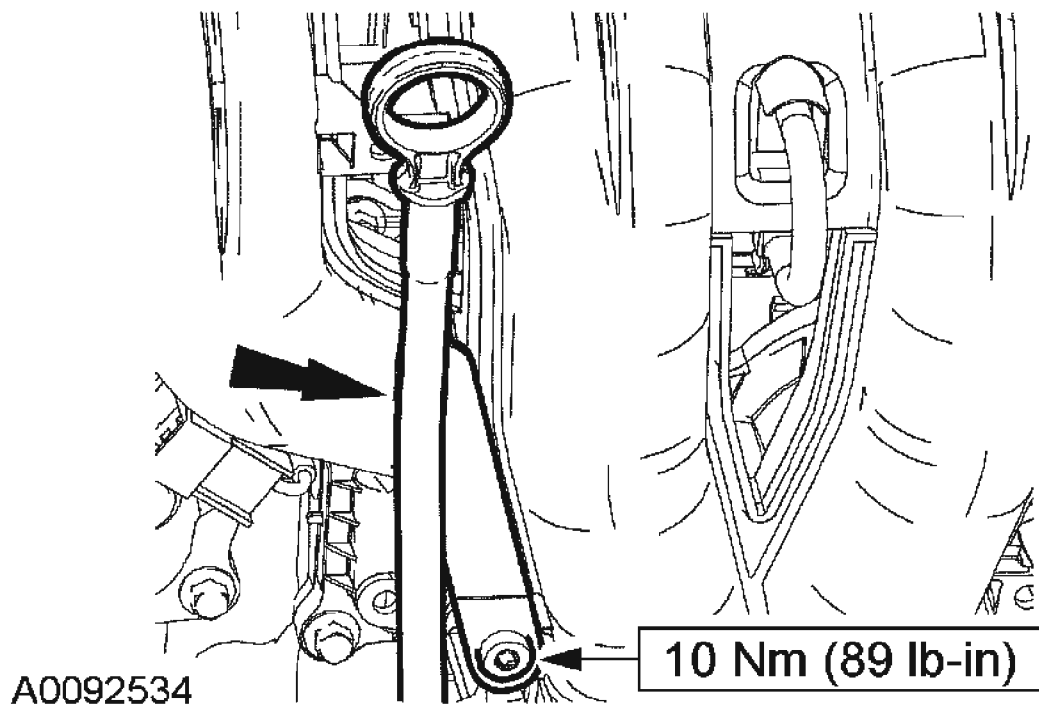


Fig. 459: Installing Oil Level Indicator Tube Assembly And Bolt
Courtesy of FORD MOTOR CO.

81. Install the oil level indicator tube assembly and bolt.
82. Connect the swirl control valve electrical connector.

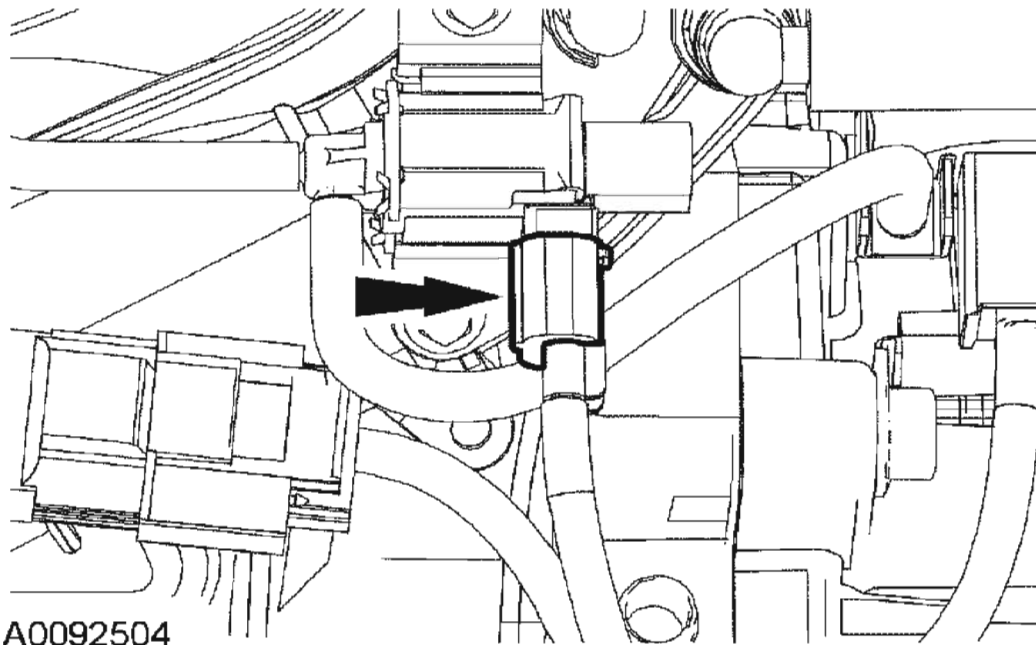


Fig. 460: Connecting Swirl Control Valve Electrical Connector
Courtesy of FORD MOTOR CO.

83. If equipped, connect the AIR vacuum supply hose.

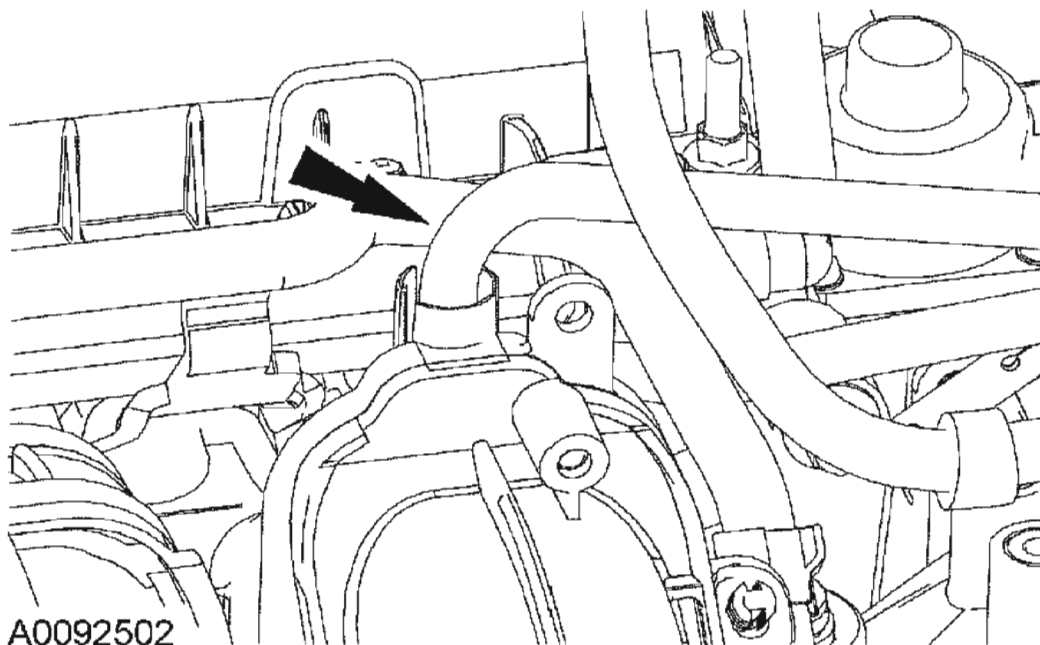


Fig. 461: Connecting Air Vacuum Supply Hose
Courtesy of FORD MOTOR CO.

All engines

84. Connect the manifold absolute pressure (MAP) electrical connector.

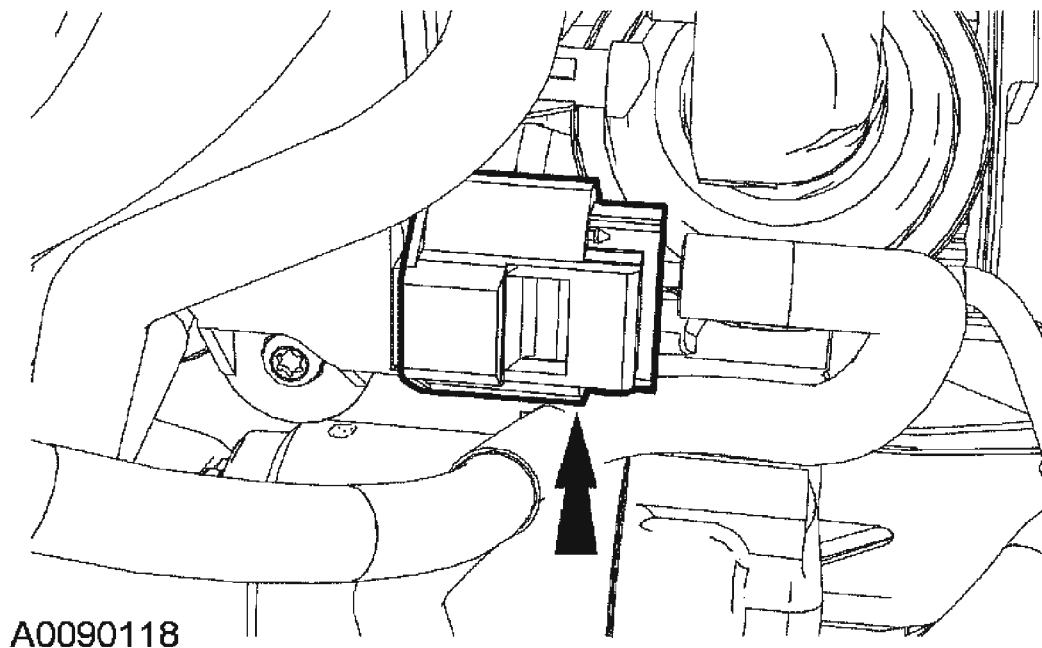


Fig. 462: Connecting Manifold Absolute Pressure Electrical Connector
Courtesy of FORD MOTOR CO.

85. Connect the intake manifold runner control (IMRC) actuator electrical connector.

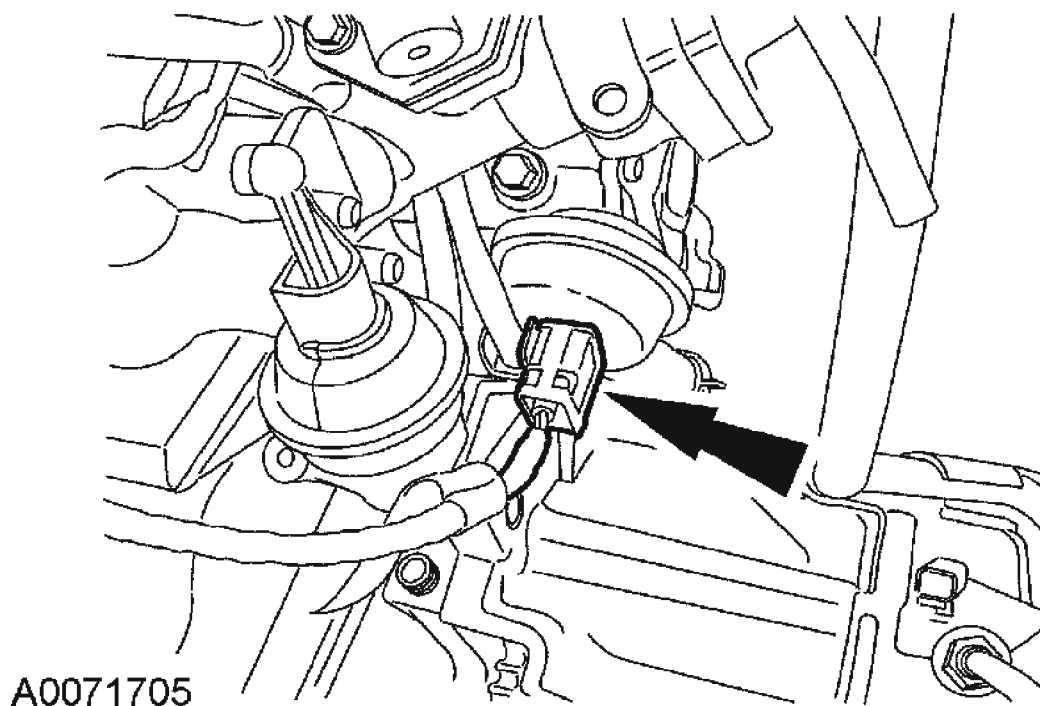


Fig. 463: Connecting Intake Manifold Runner Control Actuator Electrical Connector

Courtesy of FORD MOTOR CO.

86. Attach the wiring harness pin-type retainer.

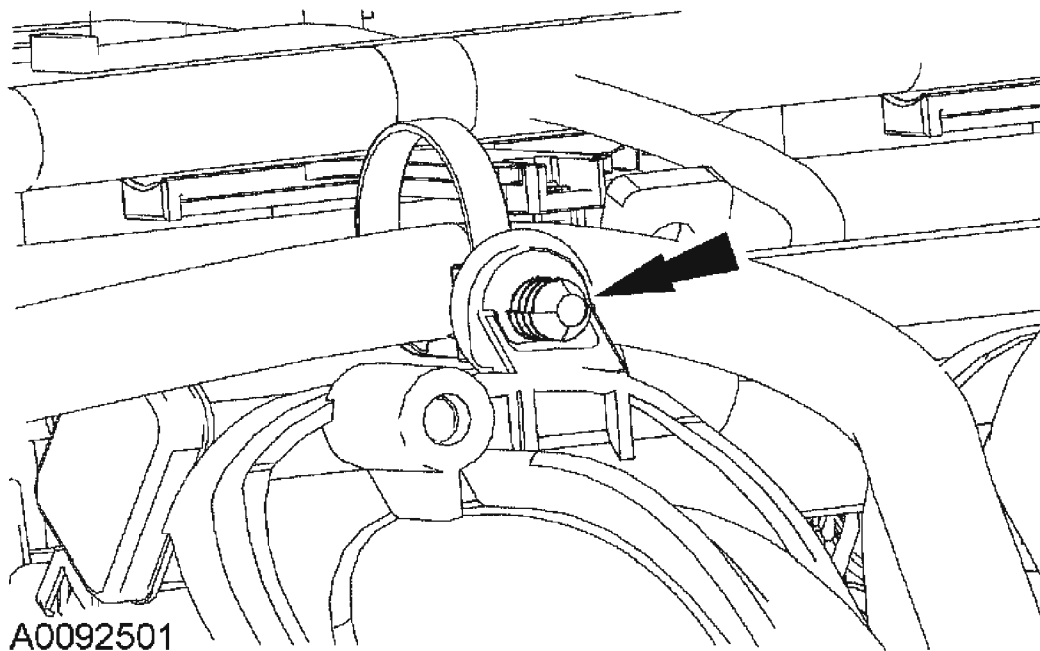


Fig. 464: Attaching Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

87. Connect the fuel rail pressure and temperature sensor vacuum hose.

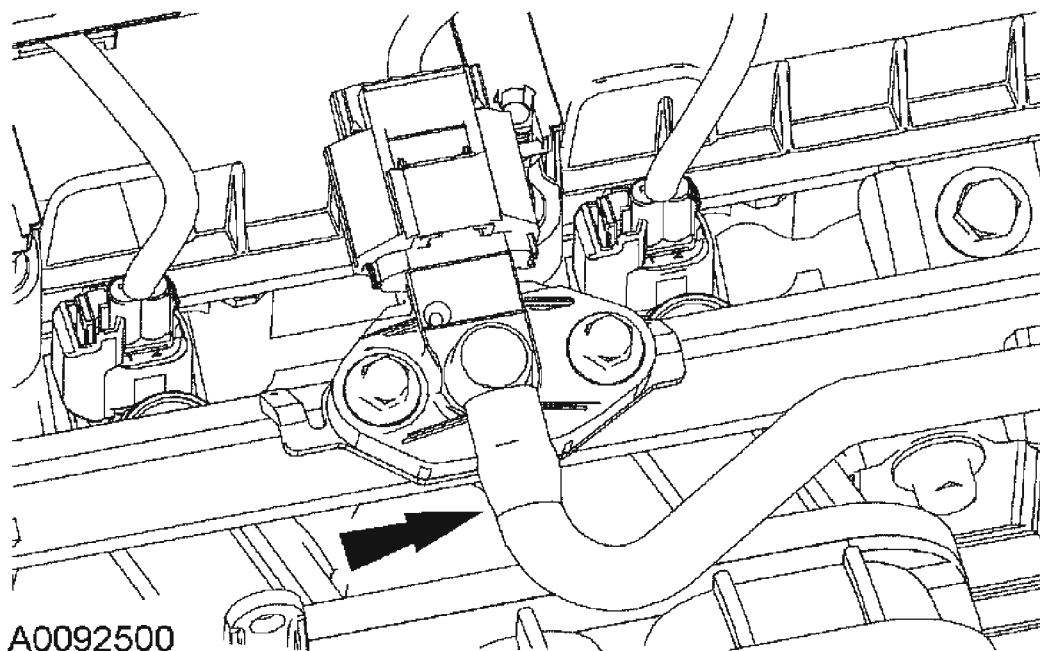


Fig. 465: Connecting Fuel Rail Pressure And Temperature Sensor Vacuum Hose
Courtesy of FORD MOTOR CO.

88. Connect the idle air control (IAC) valve electrical connector and wiring harness pin-type retainer.

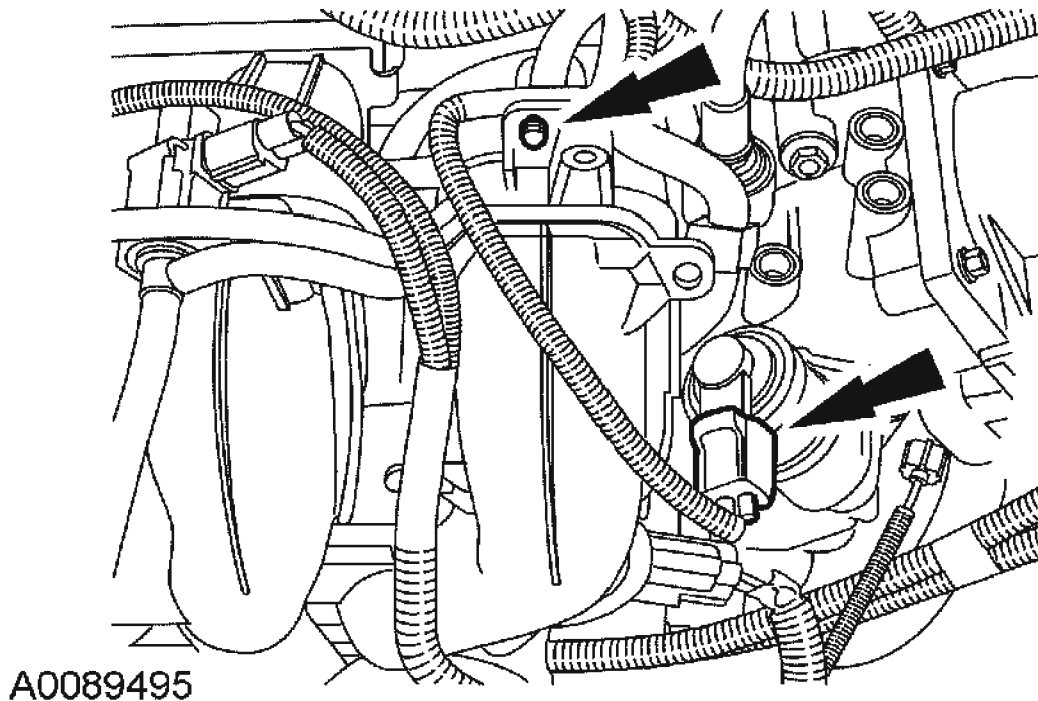


Fig. 466: Connecting Idle Air Control Valve Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

89. Connect the throttle position (TP) sensor electrical connector and wiring harness pin-type retainer.

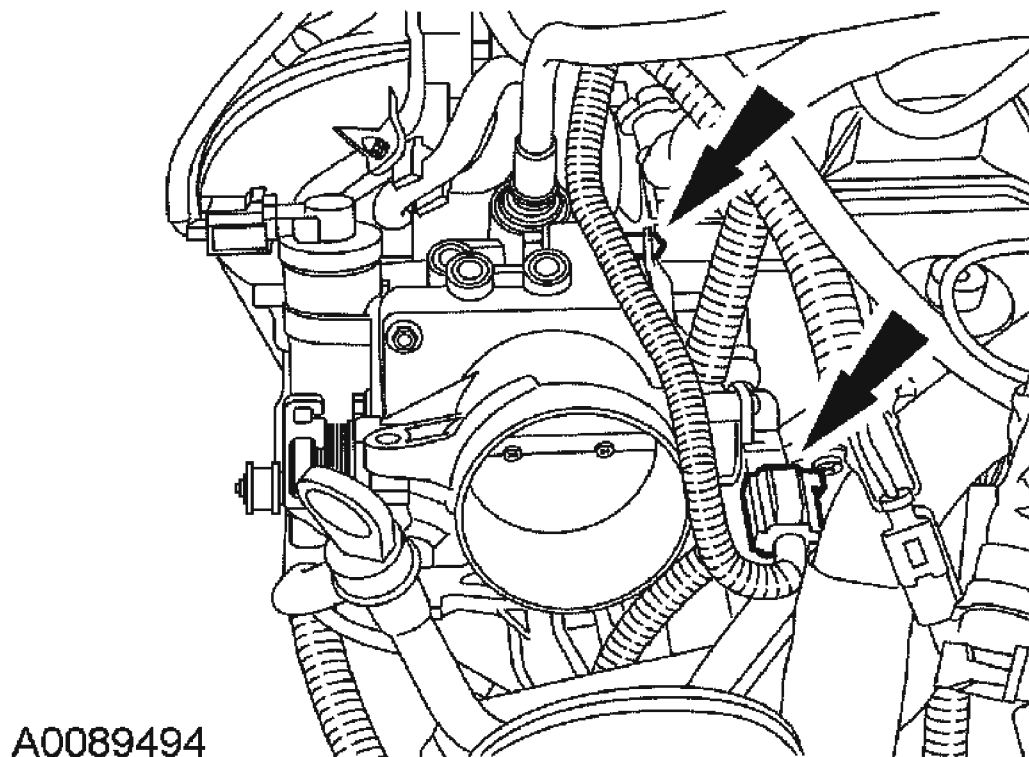


Fig. 467: Connecting Throttle Position Sensor Electrical Connector And Wiring Harness Pin-Type Retainer
Courtesy of FORD MOTOR CO.

90. Install the lower intake bolt.

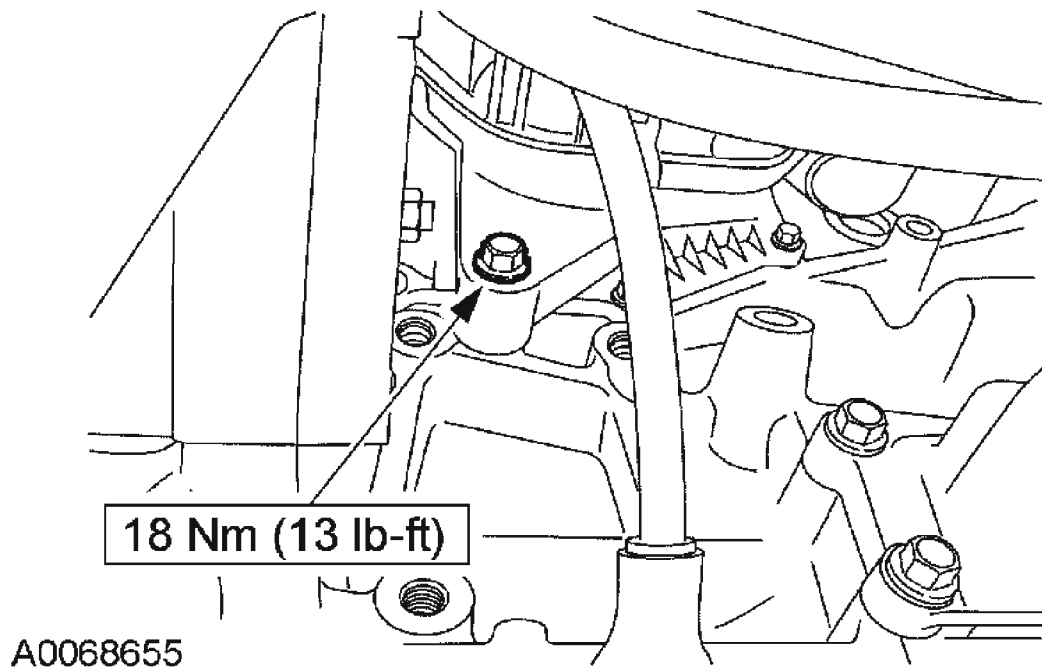
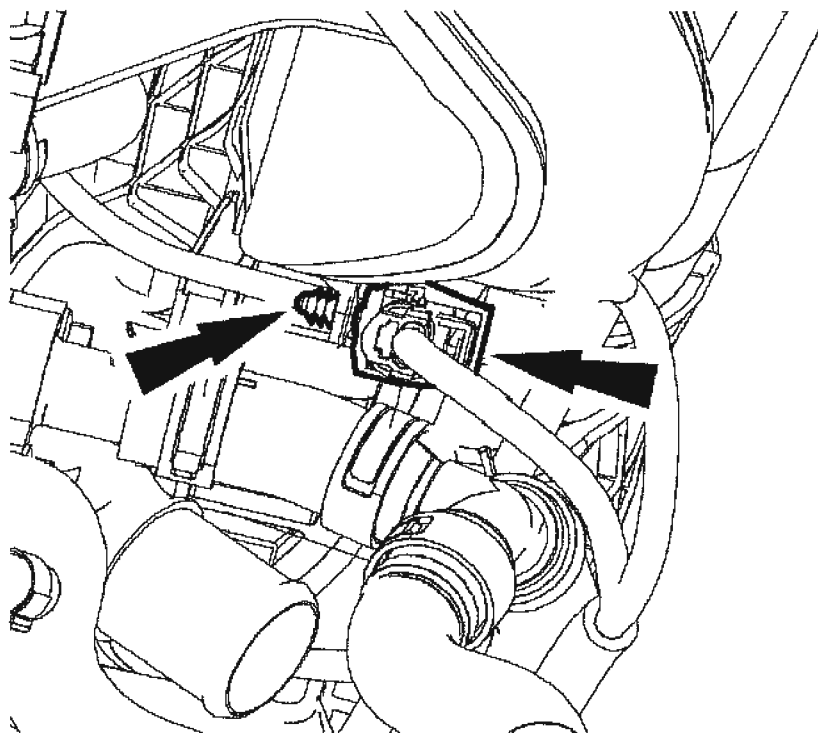


Fig. 468: Installing Lower Intake Bolt
Courtesy of FORD MOTOR CO.

91. Connect the knock sensor (KS) electrical connector and pin-type retainer.



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Fig. 469: Connecting Knock Sensor Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

NOTE: Clean the gasket mating surfaces with metal surface cleaner.

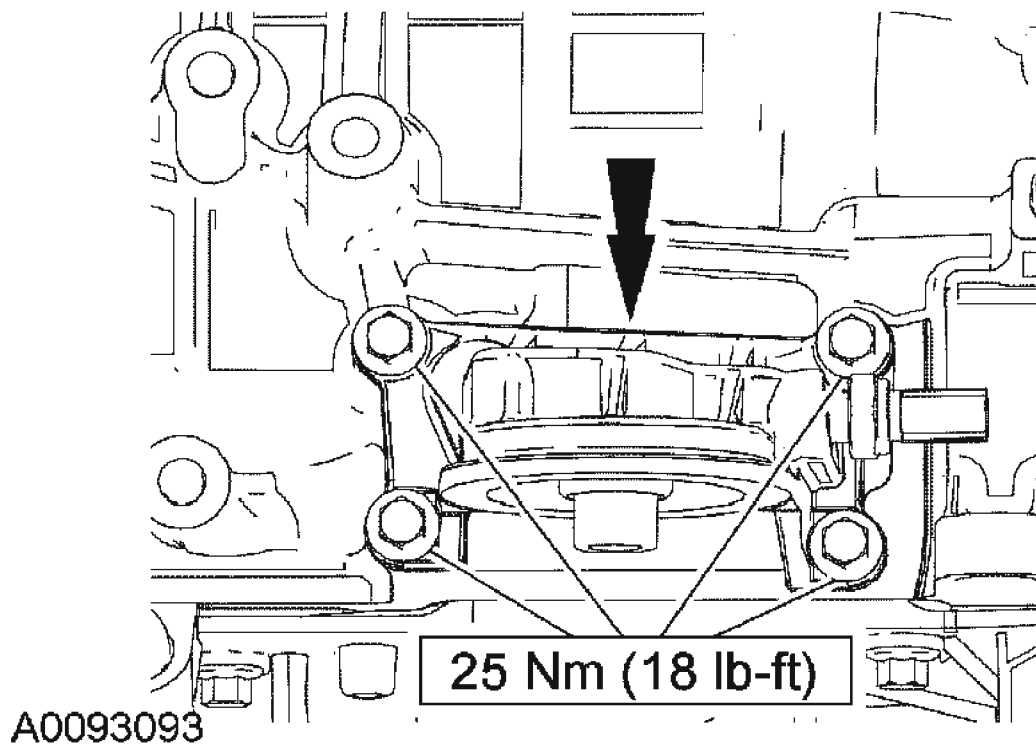


Fig. 470: Installing Oil Filter Adapter With New Gasket
Courtesy of FORD MOTOR CO.

92. Install the oil filter adapter with a new gasket.
93. Install a new oil filter.

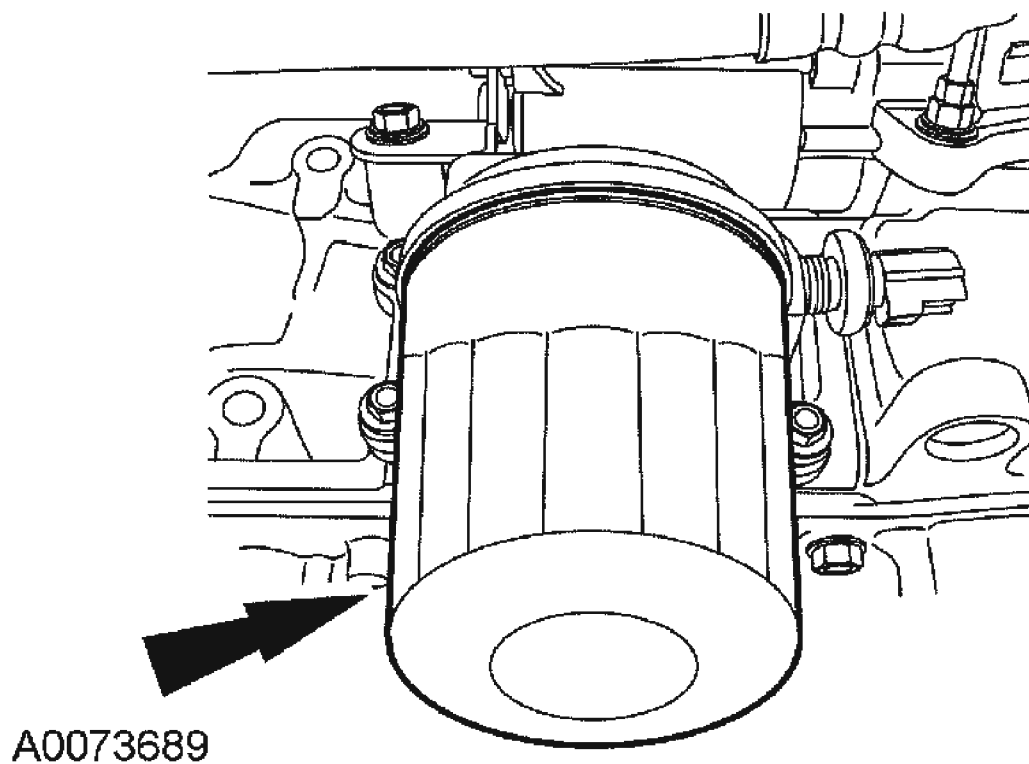


Fig. 471: Installing Oil Filter
Courtesy of FORD MOTOR CO.

94. Connect the oil pressure sensor electrical connector.

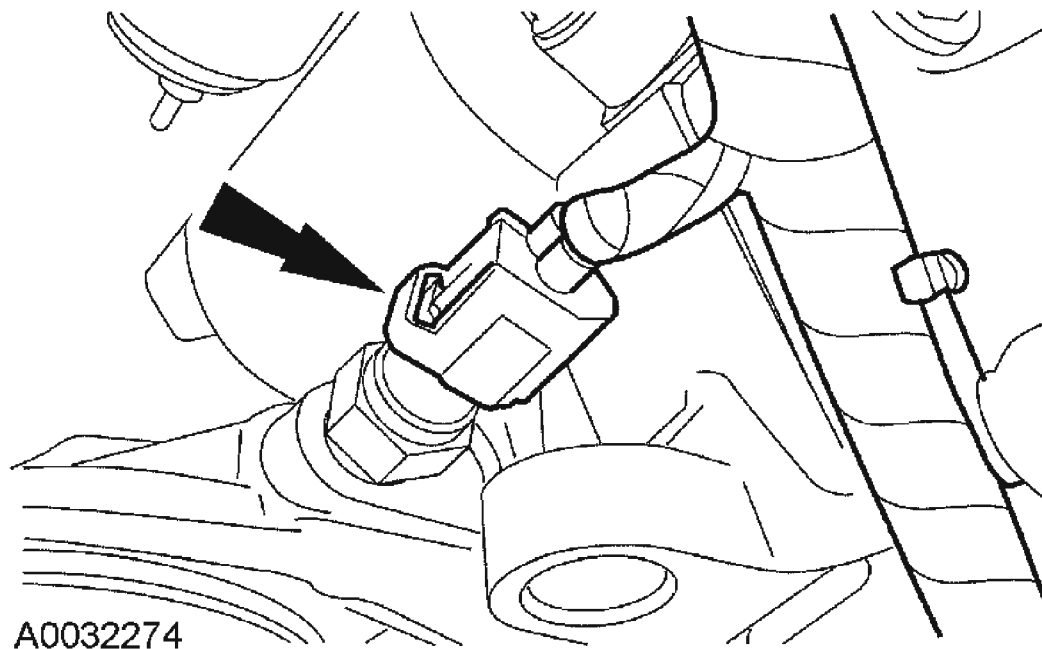


Fig. 472: Connecting Oil Pressure Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

NOTE: Clean and inspect the thermostat housing gasket. Install a new gasket if necessary.

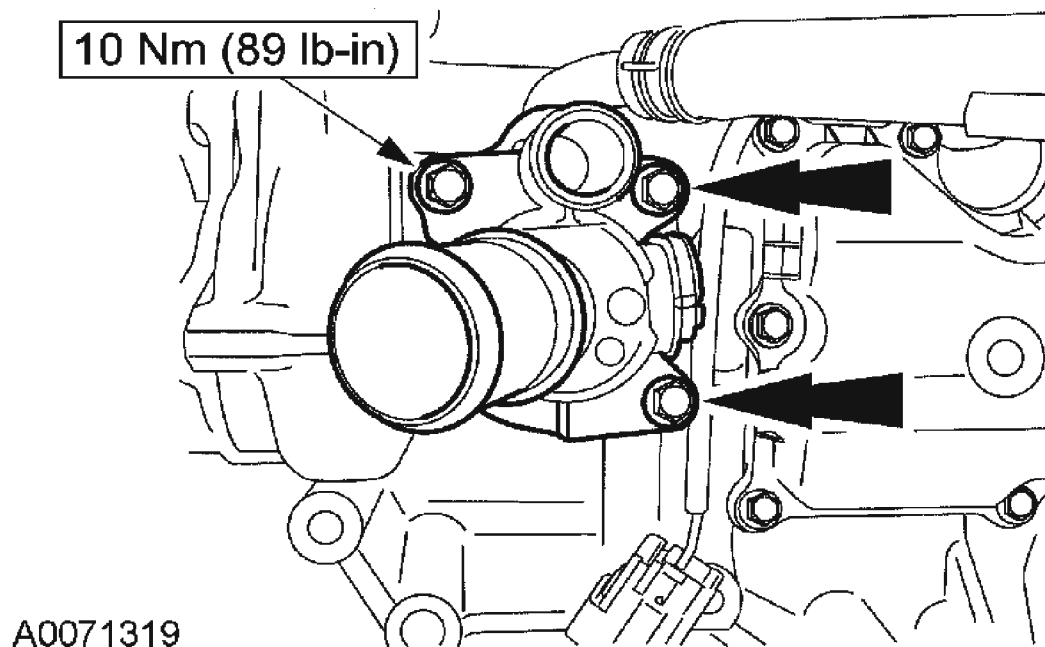


Fig. 473: Installing Thermostat Housing Bolts
Courtesy of FORD MOTOR CO.

95. Install the thermostat housing and bolts.
96. Connect the heater hose to the thermostat housing.

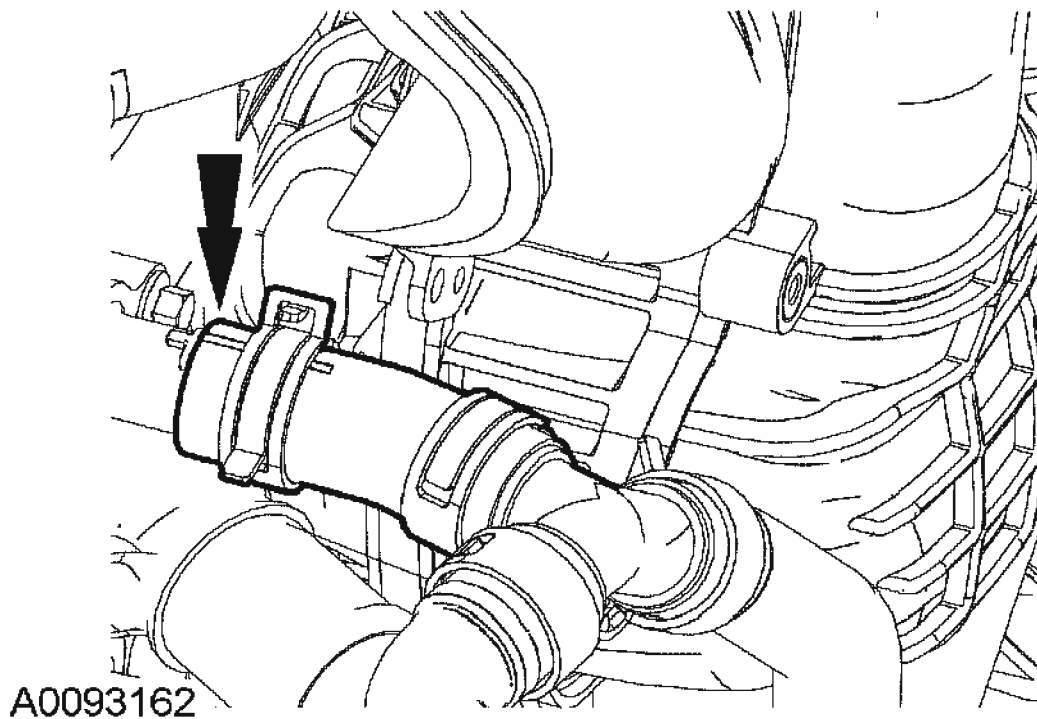


Fig. 474: Connecting Heater Hose To Thermostat Housing
Courtesy of FORD MOTOR CO.

NOTE: Clean the coolant pump mating surface with metal surface cleaner.

NOTE: Lubricate the coolant pump O-ring with clean engine coolant.

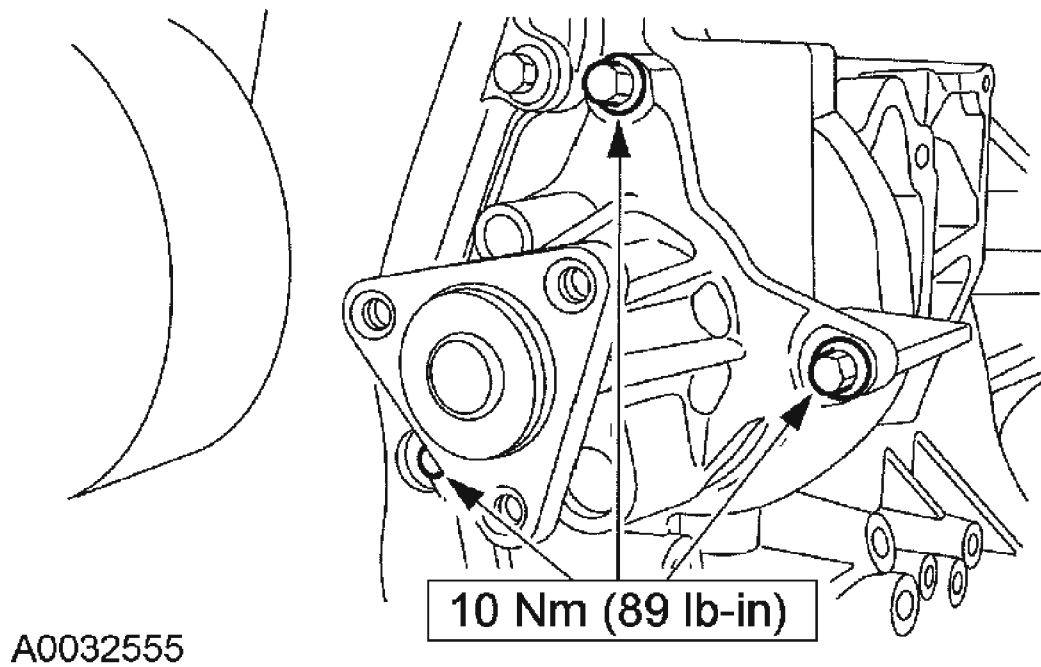


Fig. 475: Installing Coolant Pump Bolts
Courtesy of FORD MOTOR CO.

97. Position the coolant pump and install the bolts.
98. Install the coolant pump pulley and bolts.

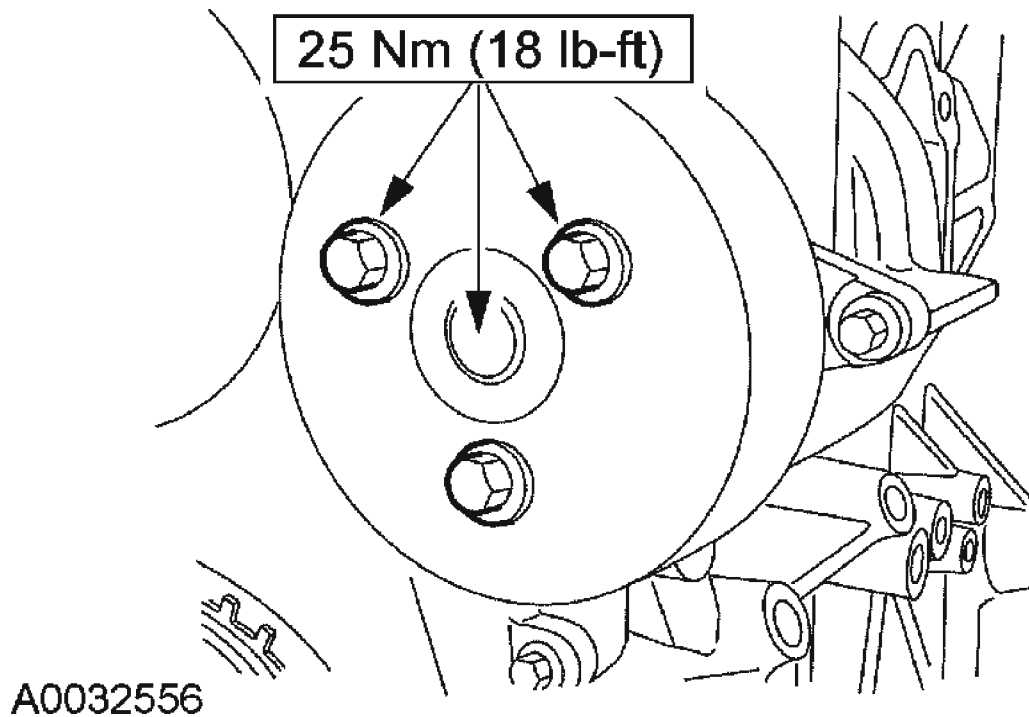


Fig. 476: Installing Coolant Pump Pulley Bolts
Courtesy of FORD MOTOR CO.

99. If equipped, install the accessory drive belt idler pulley and bolt.

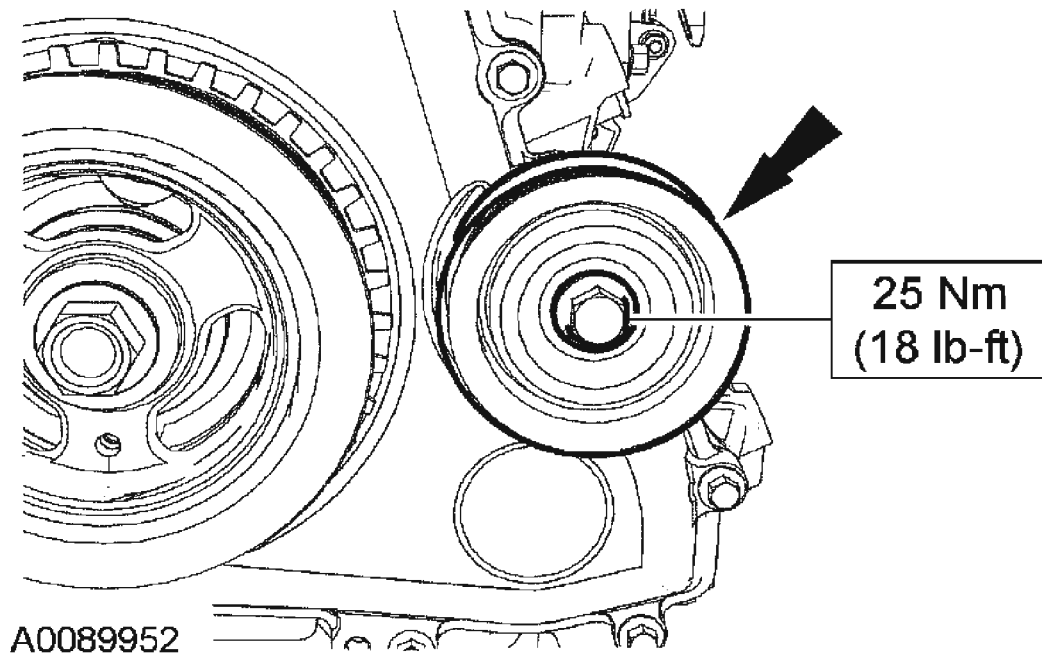


Fig. 477: Installing Accessory Drive Belt Idler Pulley And Bolt
Courtesy of FORD MOTOR CO.

100. Install the accessory drive belt idler pulley and bolt.

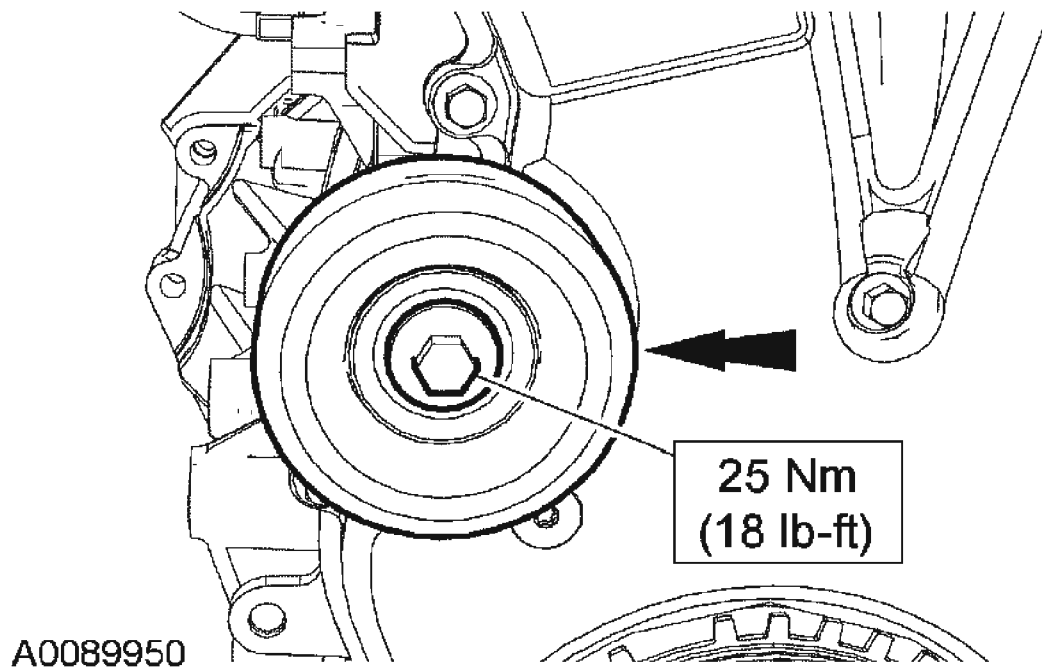


Fig. 478: Installing Accessory Drive Belt Idler Pulley And Bolt
Courtesy of FORD MOTOR CO.

101. Install the accessory drive belt tensioner and bolts.

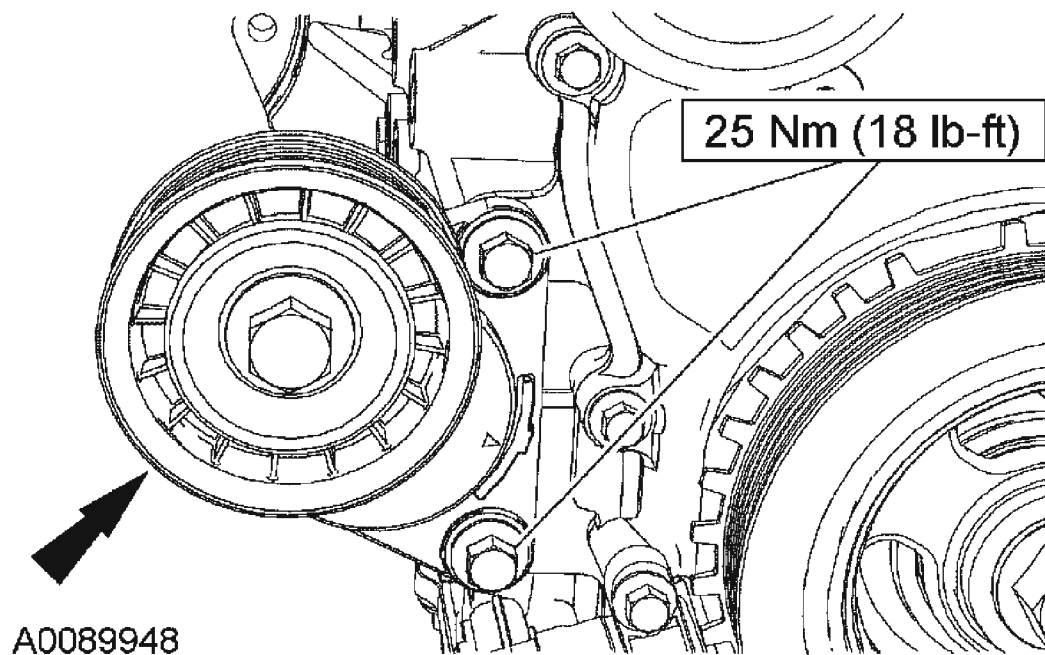


Fig. 479: Installing Accessory Drive Belt Tensioner And Bolts
Courtesy of FORD MOTOR CO.

102. Install the generator and bolts.

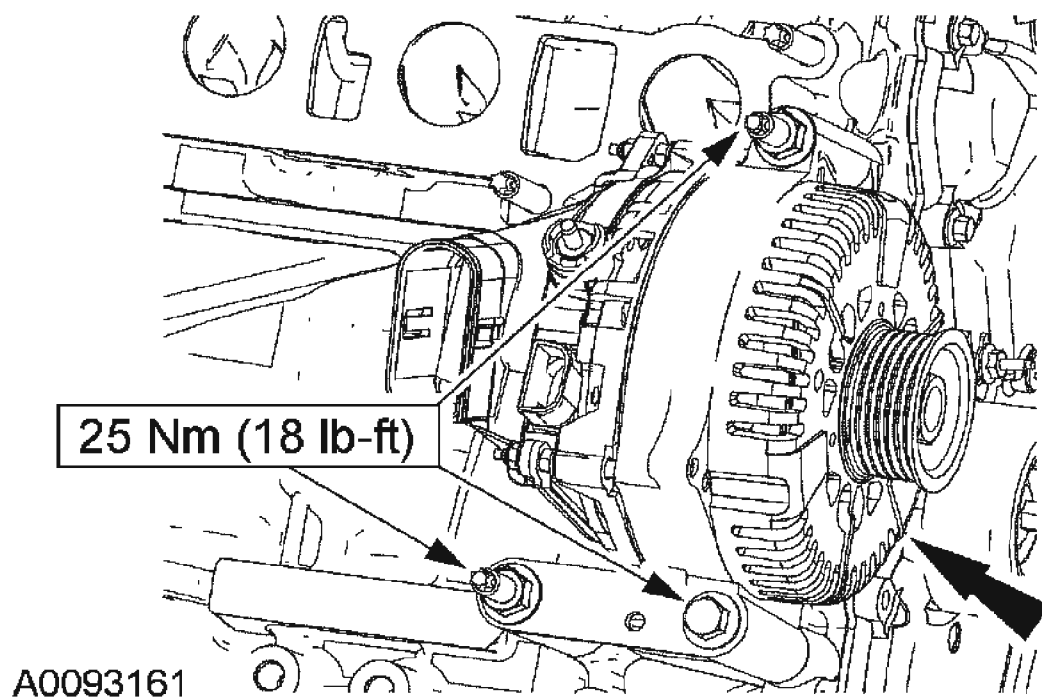


Fig. 480: Installing Generator And Bolts
Courtesy of FORD MOTOR CO.

103. Install the wiring harness retainer and nut.

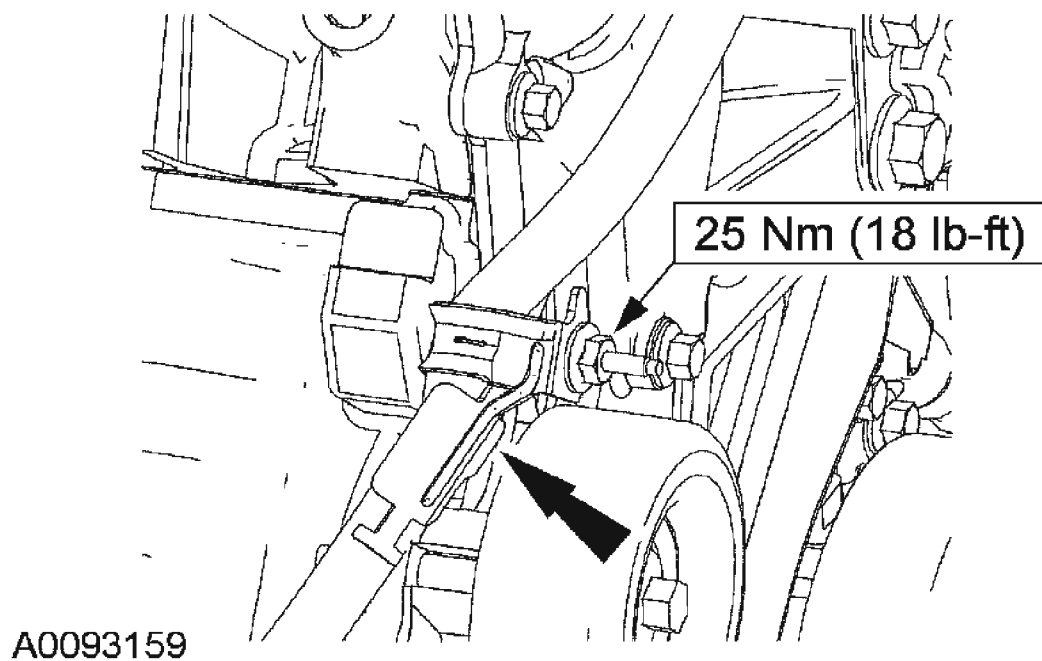


Fig. 481: Installing Wiring Harness Retainer And Nut
Courtesy of FORD MOTOR CO.

104. Connect the generator electrical connections, harness retainer and install the nut.

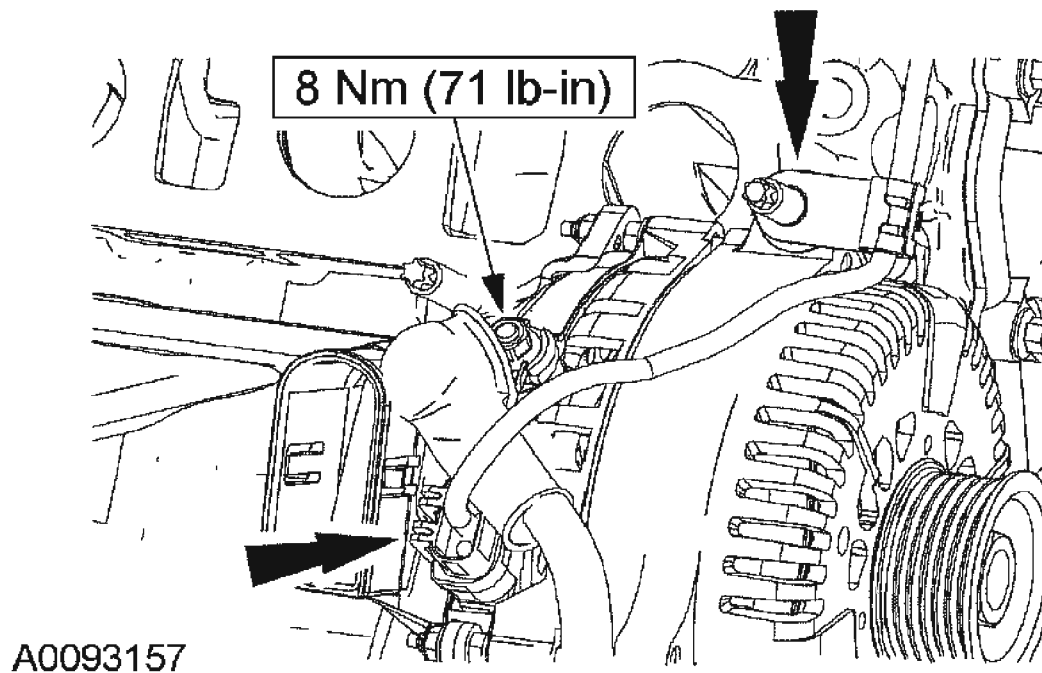


Fig. 482: Connecting Generator Electrical Connections And Harness Retainer, Harness Retainer And Installing Nut
Courtesy of FORD MOTOR CO.

105. Install the generator heat shield and nuts.

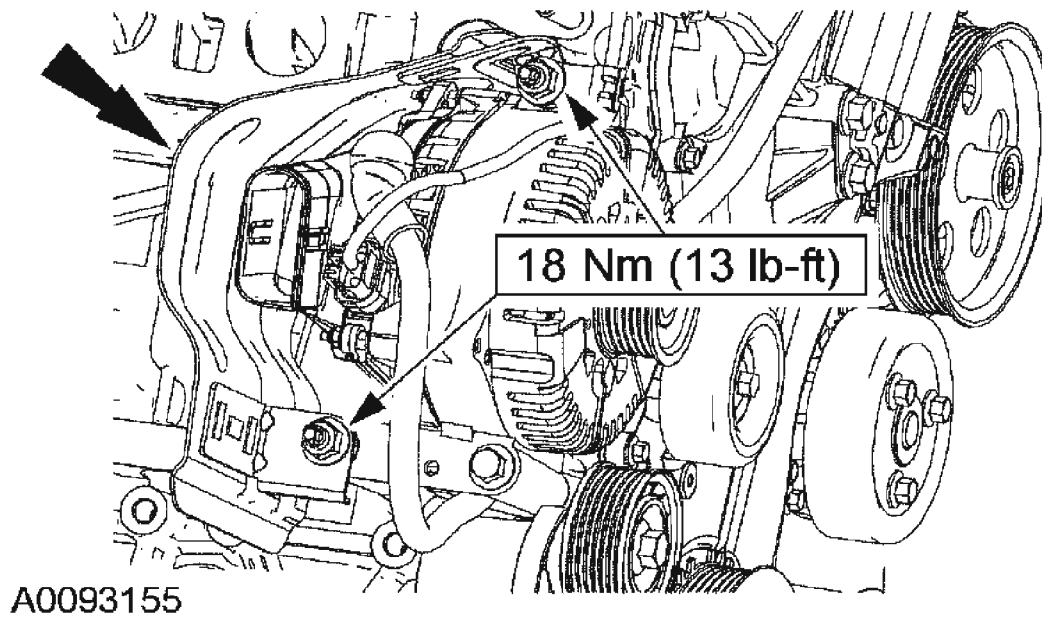


Fig. 483: Installing Generator Heat Shield And Nuts
Courtesy of FORD MOTOR CO.

106. Connect the CKP sensor and the wiring harness pin-type retainers.

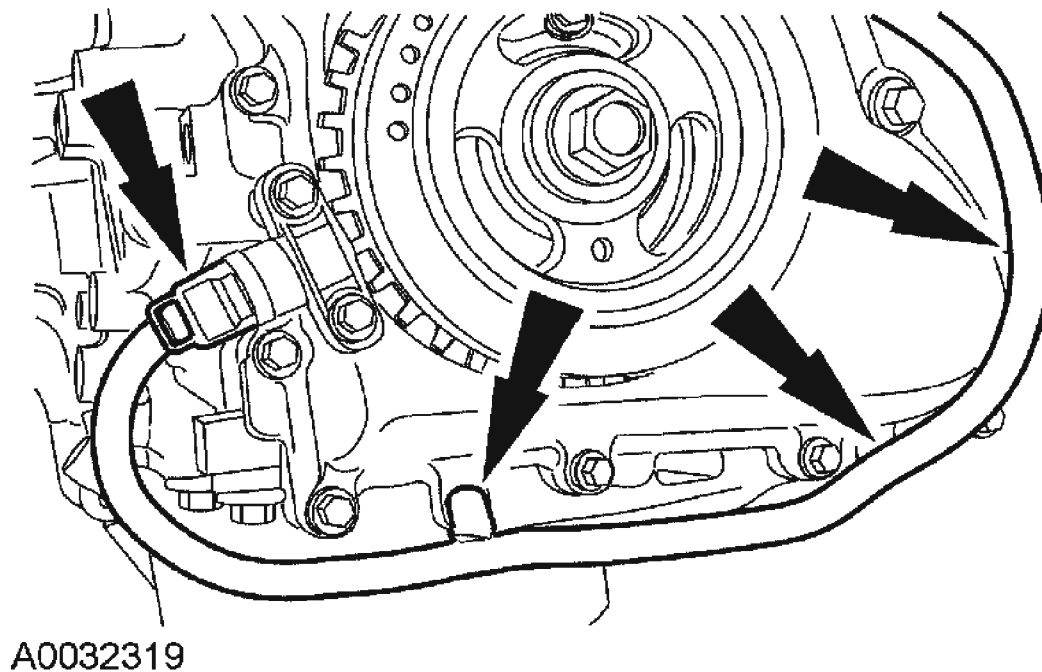


Fig. 484: Connecting CKP Sensor And Wiring Harness Pin-Type Retainers
Courtesy of FORD MOTOR CO.

107. Using the heavy duty floor crane and spreader bar, remove the engine from the engine stand.
108. Install the flexplate or flywheel and the bolts. Tighten the bolts in the sequence shown in three stages.
 - Stage 1: Tighten to 50 Nm (37 lb-ft).
 - Stage 2: Tighten to 80 Nm (50 lb-ft).
 - Stage 3: Tighten to 112 Nm (83 lb-ft).

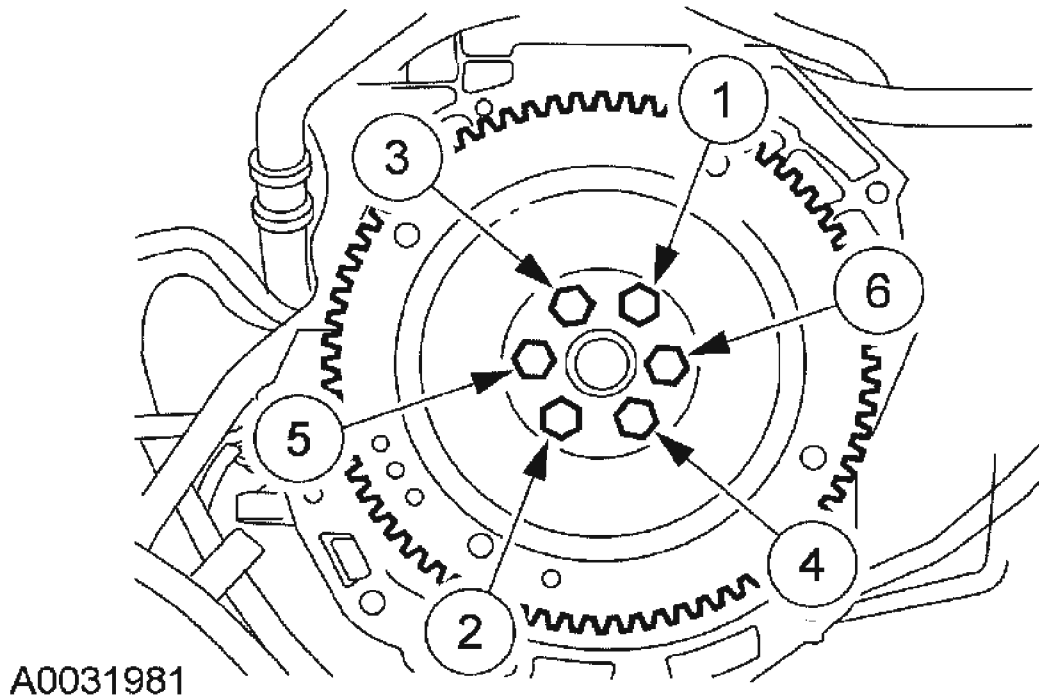
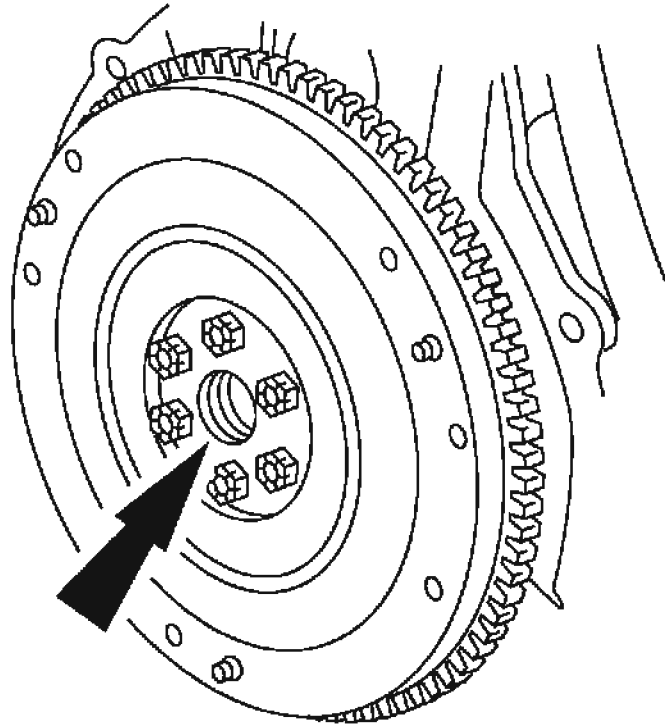


Fig. 485: Identifying Tightening Sequence Of Flexplate Or Flywheel Bolts
Courtesy of FORD MOTOR CO.

Engines equipped with a manual transmission

109. Lubricate the transaxle input shaft pilot bearing with front axle grease.

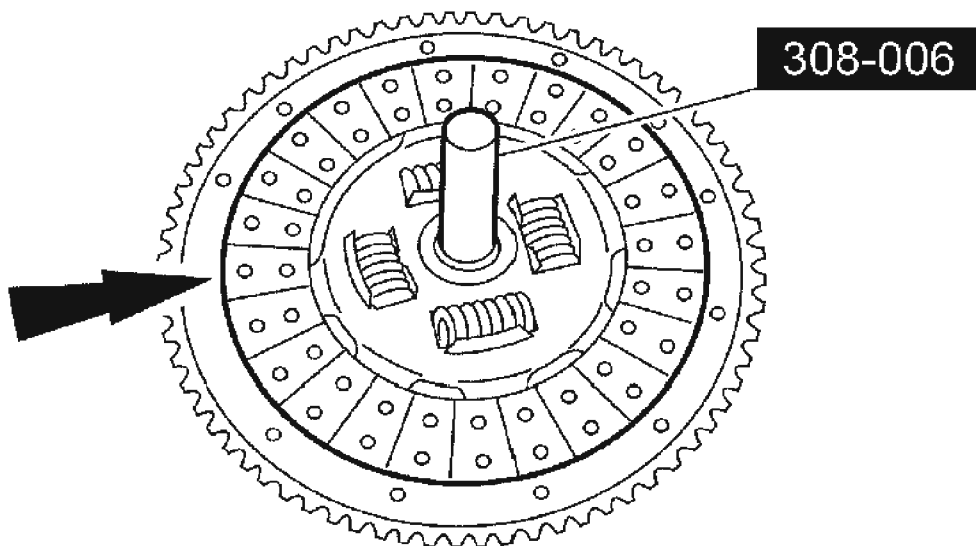


A0027749

Fig. 486: Lubricating Transaxle Input Shaft Pilot Bearing With Front Axle Grease

Courtesy of FORD MOTOR CO.

110. Using the special tool, position the clutch disc on the flywheel.



A0090134

Fig. 487: Using Special Tool To Position Clutch Disc On Flywheel
Courtesy of FORD MOTOR CO.

NOTE: If reusing the clutch pressure plate and flywheel, align the marks made during removal.

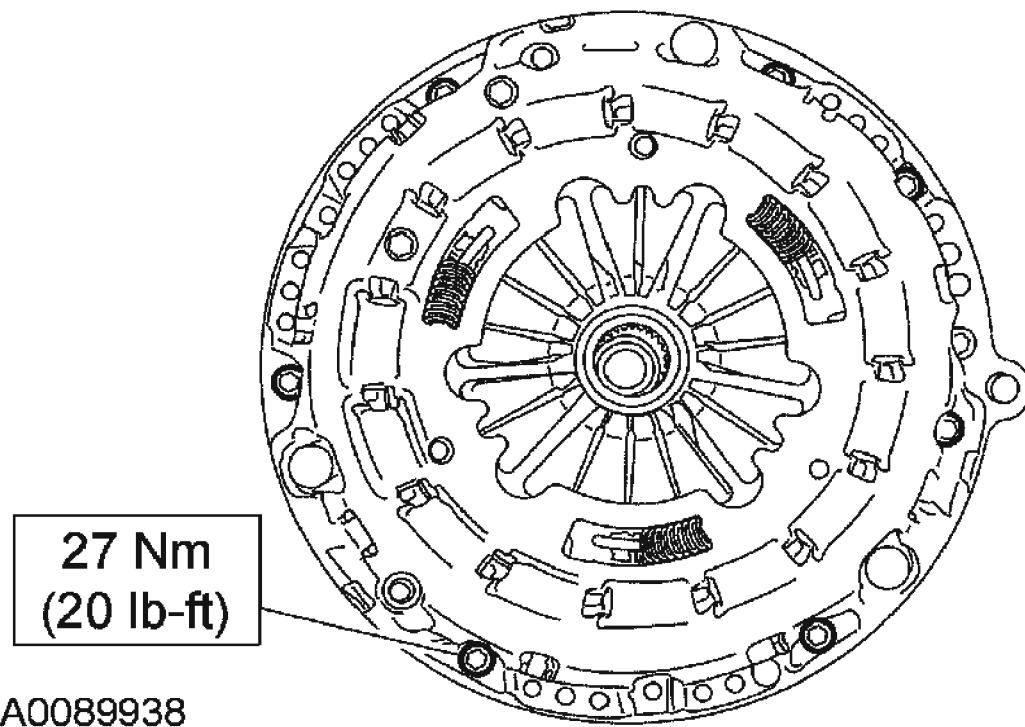


Fig. 488: Installing Clutch Pressure Plate Bolts
Courtesy of FORD MOTOR CO.

111. Position the clutch pressure plate and install the bolts. Tighten the bolts in a star pattern sequence.

INSTALLATION

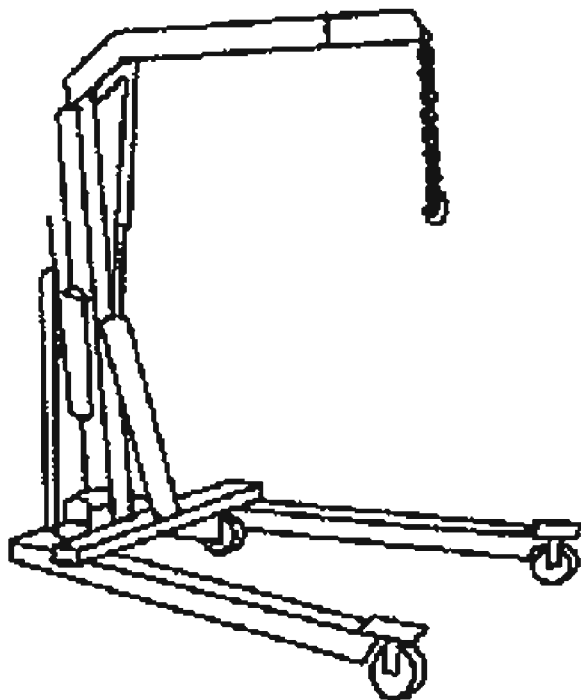
ENGINE

SPECIAL TOOL DESCRIPTION

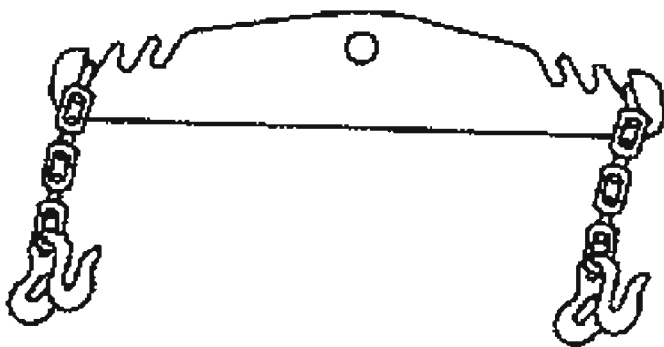
	Heavy Duty Floor Crane 014-00071 or equivalent
--	--

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1341-A



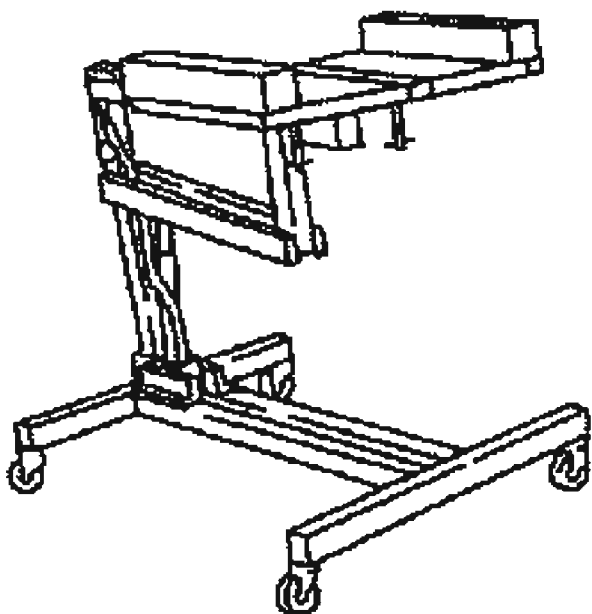
ST1602-A

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

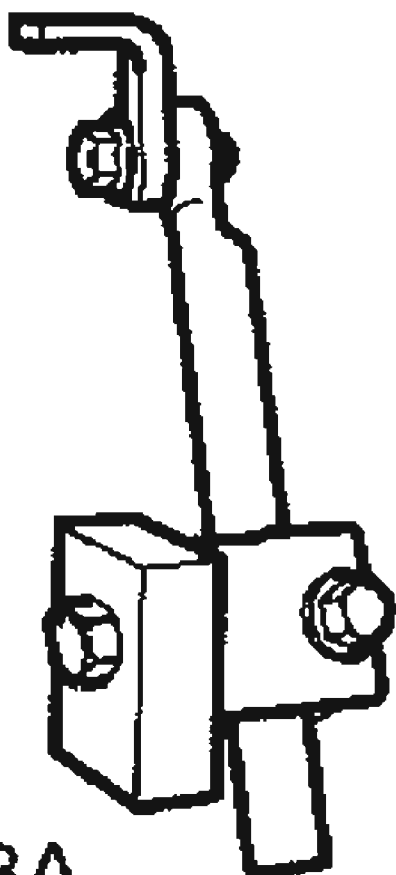
Powertrain Lift with Tilting Plate
014-00765 or equivalent

2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



ST1682-A

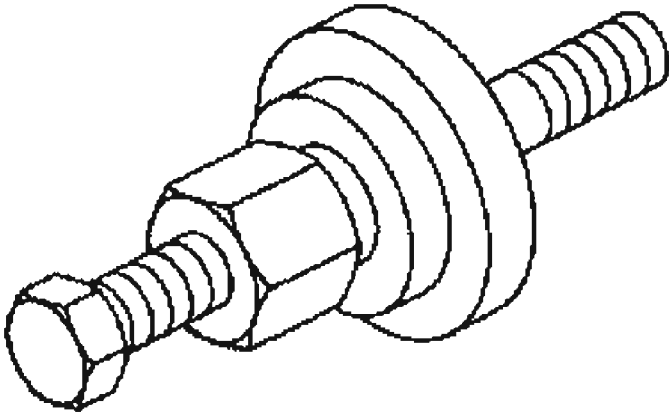


ST2743A

Universal Adapter Brackets 014-0001

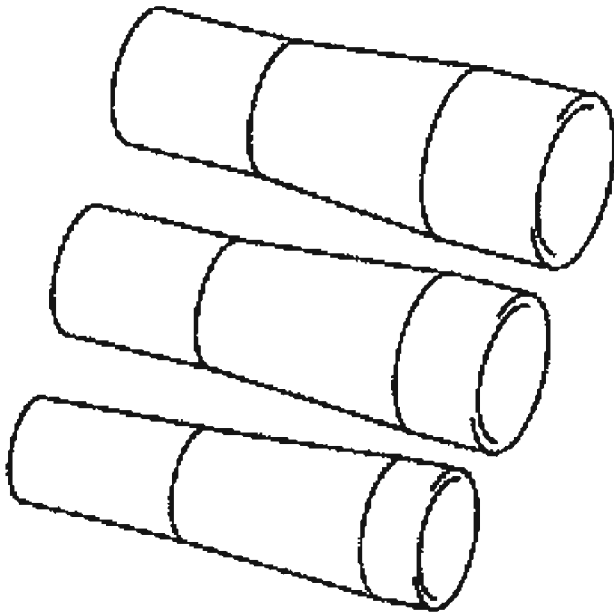
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus



21192

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



ST2787-A

Installer Set, Teflon® Seal 211-
D027 (D90P-3517-A) or equivalent

MATERIAL SPECIFICATIONS

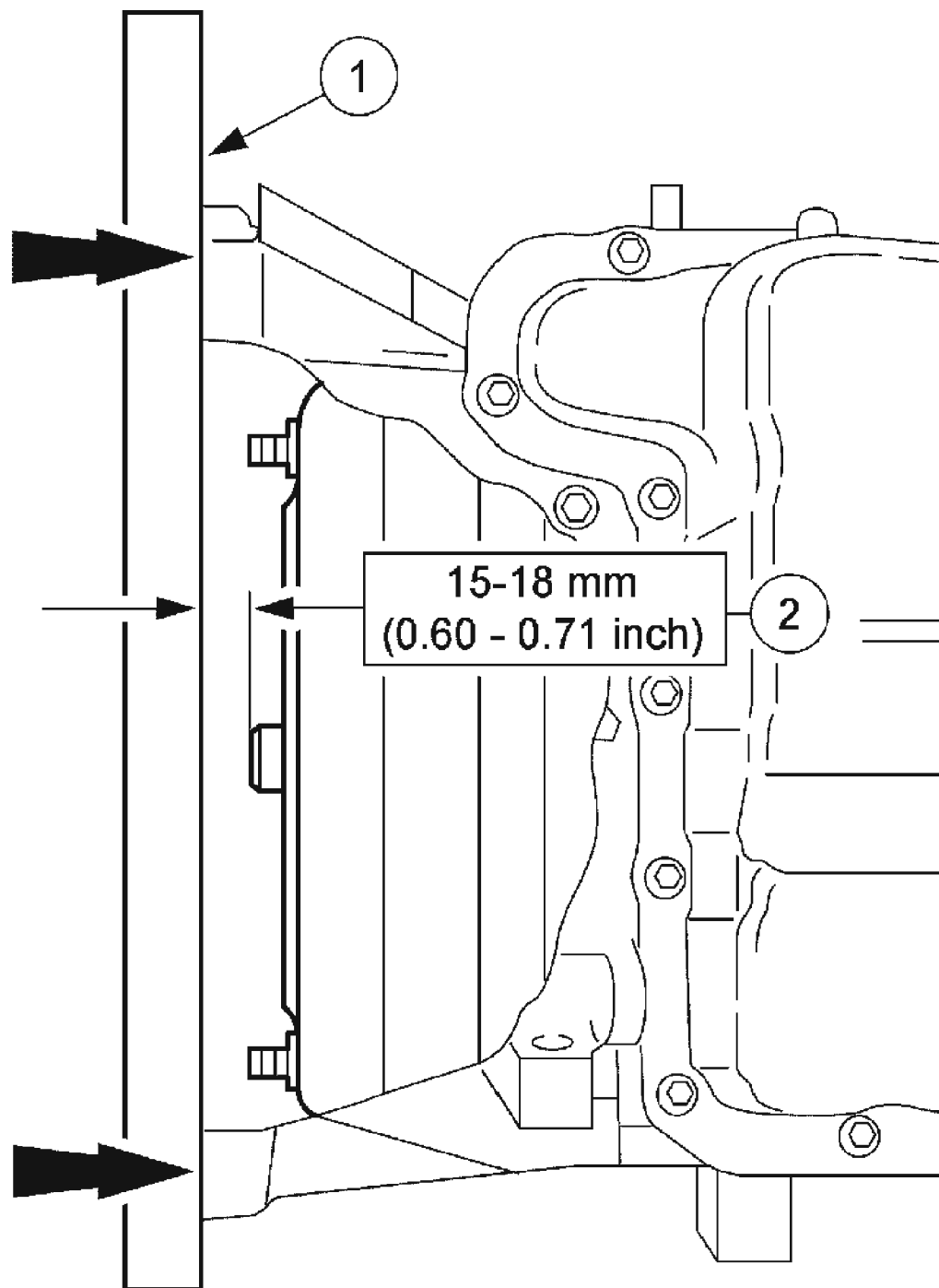
2005 Ford Focus ZX5 S

2005 ENGINE Engine - 2.0L & 2.3L - Focus

Item	Specification
SAE 5W-20 Premium Synthetic Blend Motor Oil XO-5W20-QSP or equivalent	WSS-M2C930-A
Motorcraft Premium Gold Engine Coolant VC-7A or equivalent	WSS-M97B51-A1
R-134a Refrigerant YN-19	WSH-M17B19-A
MERCON V Automatic Transmission Fluid XT-5-QM	MERCON V
Multi-Purpose Grease XG-4	ESR-M1C159-A

Vehicles equipped with a 2.0L engine and automatic transmission

NOTE: **Lubricate the torque converter pilot hub with multi-purpose grease.**



A0071107

Fig. 489: Checking Installation Depth Of Torque Converter
Courtesy of FORD MOTOR CO.

1. Check the installation depth of the torque converter.

1. Lay a straightedge on the automatic transaxle flange.
2. Check the installation depth between the transaxle flange and the torque converter centering spigot for the correct clearance.

All vehicles

2. Install new dowel pins in the engine block.

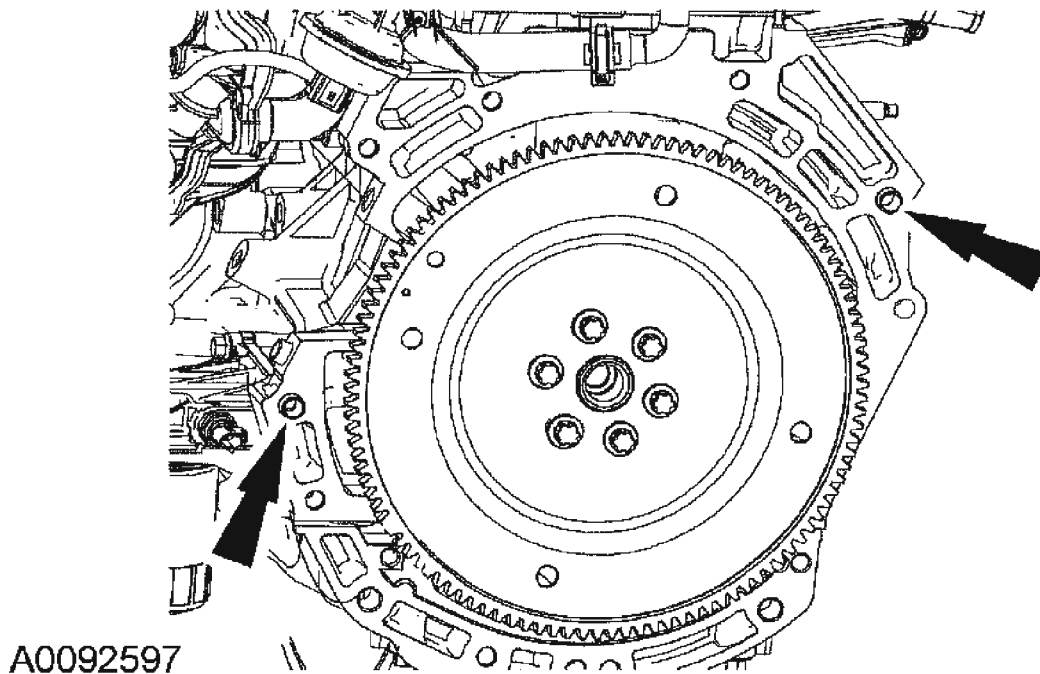


Fig. 490: Installing Dowel Pins In Engine Block
Courtesy of FORD MOTOR CO.

3. Using the engine crane, install the transaxle onto the engine.
 1. Install the two bolts at the dowel pins.
 2. Install the remaining bolts.

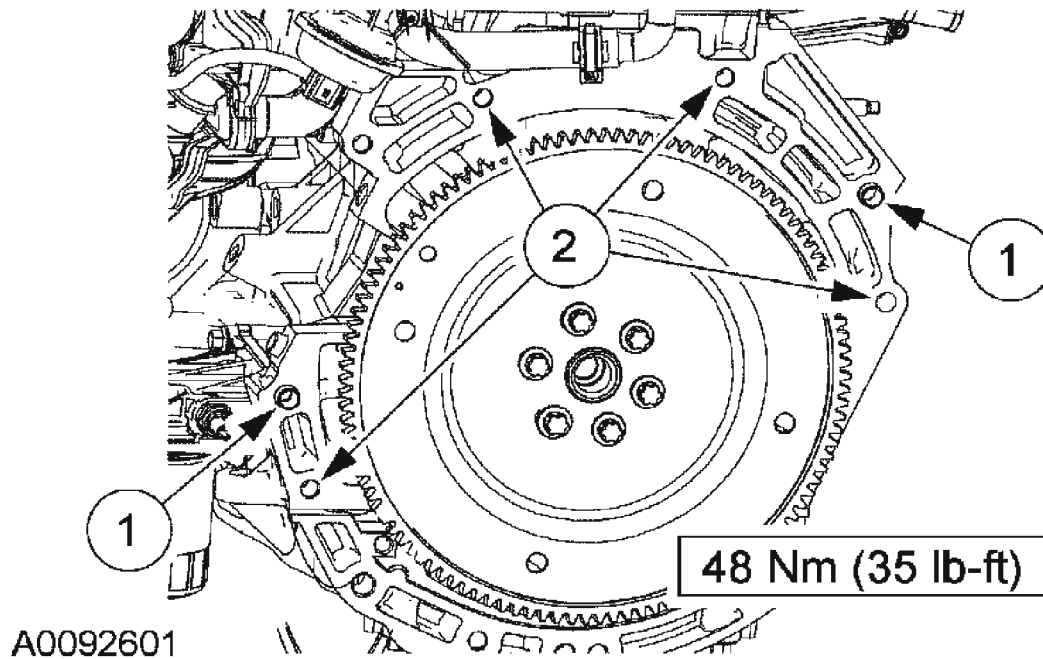


Fig. 491: Installing Transaxle Onto Engine Using Engine Crane
Courtesy of FORD MOTOR CO.

4. Using the special tools, raise the engine and transaxle assembly onto the lift table.

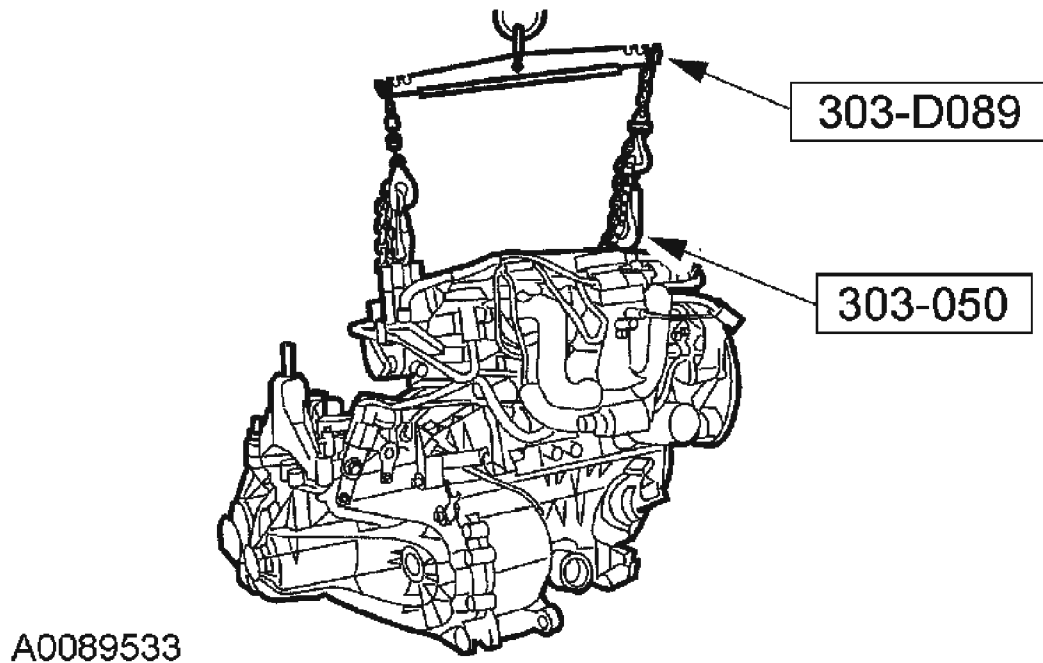


Fig. 492: Raising Engine And Transaxle Assembly Onto Lift Table Using Special Tools

Courtesy of FORD MOTOR CO.

5. Using the special tools, secure the engine and transaxle assembly to the lift table.

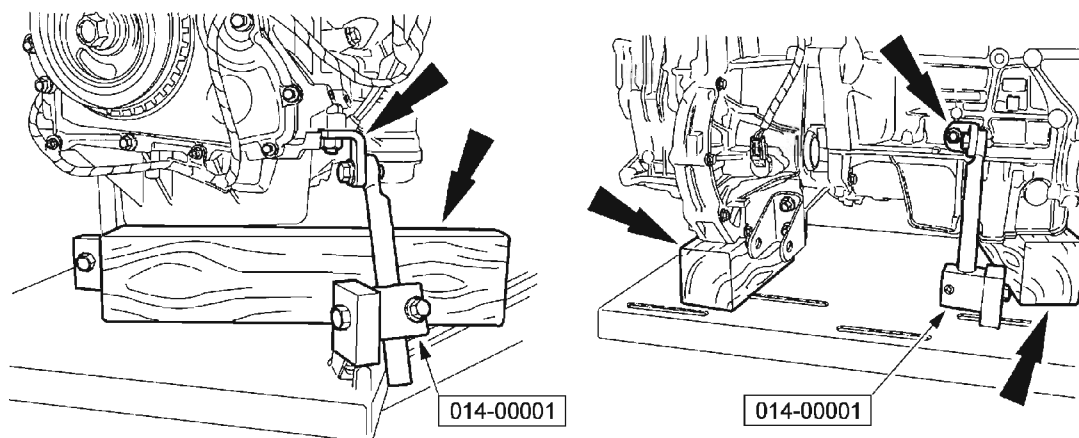


Fig. 493: Securing Engine And Transaxle Assembly To Lift Table Using Special Tools

Courtesy of FORD MOTOR CO.

Vehicles equipped with a 2.0L engine and automatic transmission

6. Connect the solenoid body and the transmission range (TR) sensor electrical connectors.

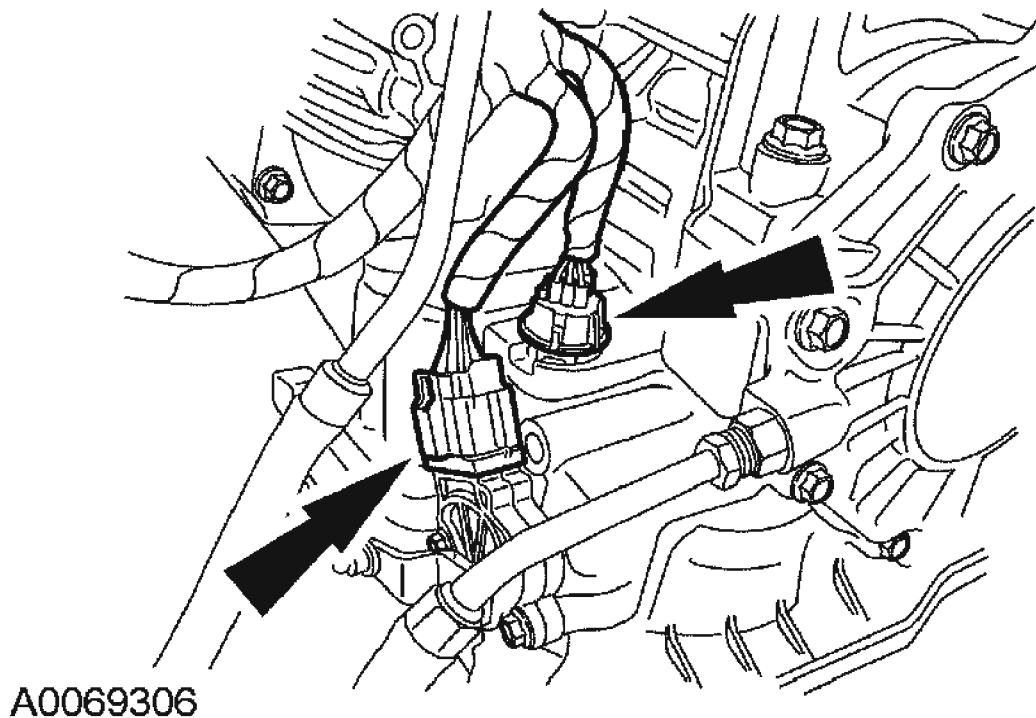


Fig. 494: Connecting Solenoid Body And Transmission Range Sensor Electrical Connectors

Courtesy of FORD MOTOR CO.

7. Connect the turbine shaft speed (TSS) sensor electrical connector.

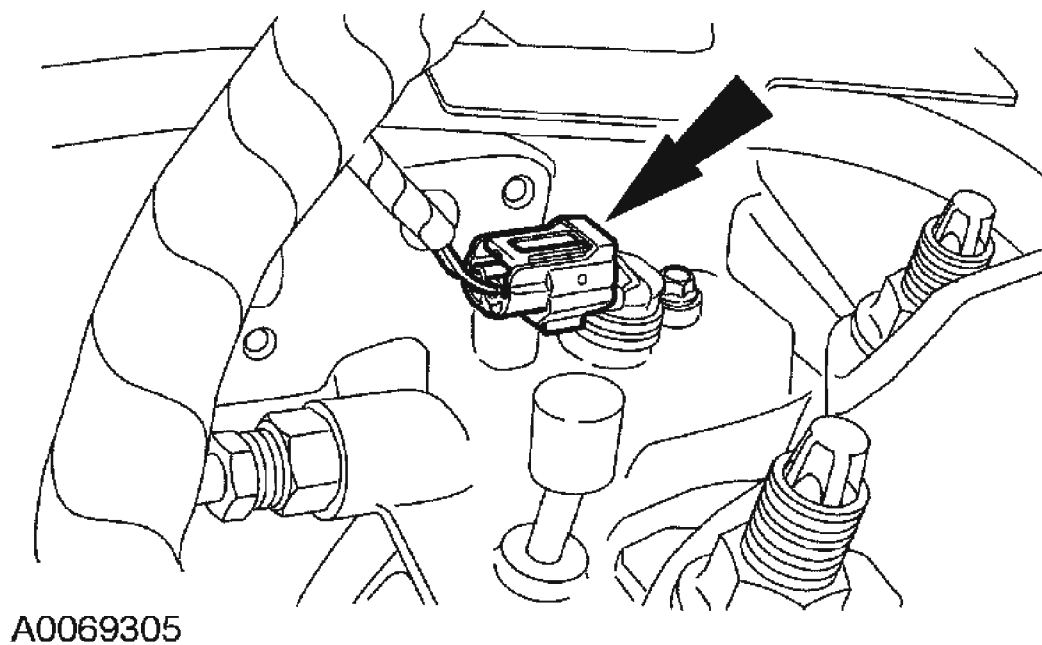


Fig. 495: Connecting Turbine Shaft Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

8. Connect the output shaft speed (OSS) sensor electrical connector.

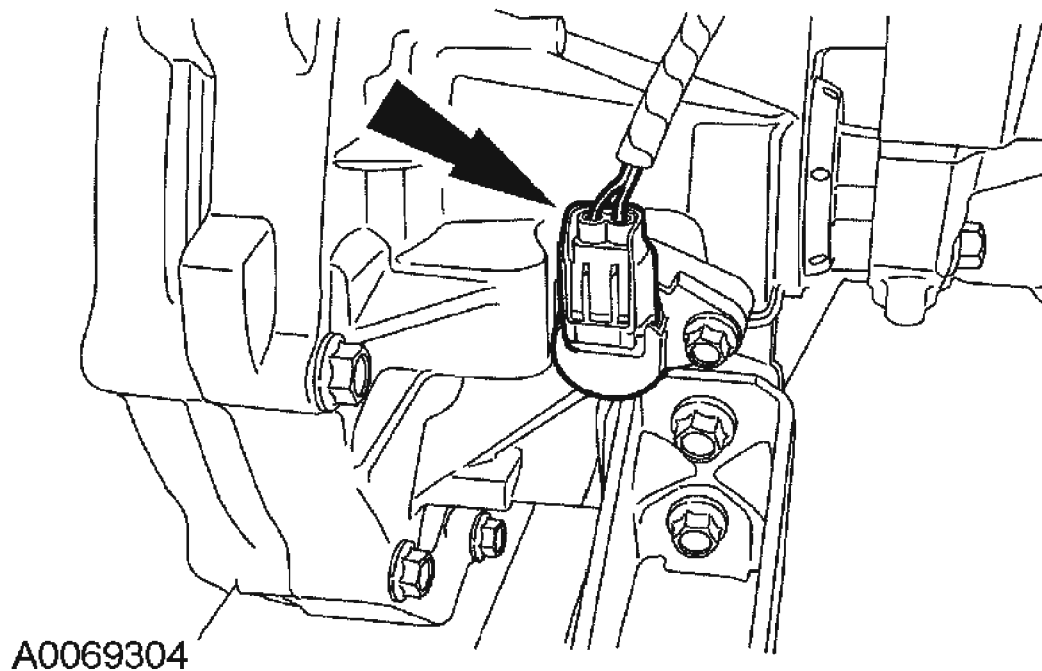


Fig. 496: Connecting Output Shaft Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

NOTE: If new parts are not being used, be sure to align the marks on the flexplate and the stud made during engine removal.

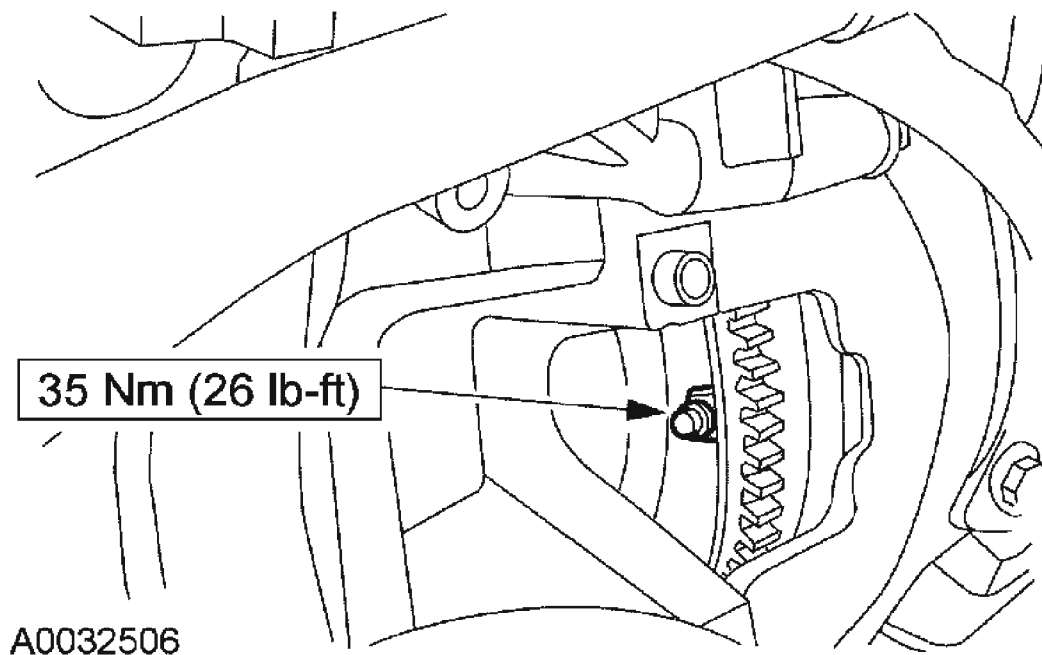


Fig. 497: Installing Torque Converter Nuts
Courtesy of FORD MOTOR CO.

9. Install the four torque converter nuts.

Vehicles equipped with a manual transmission

10. Connect the vehicle speed sensor (VSS) electrical connector.

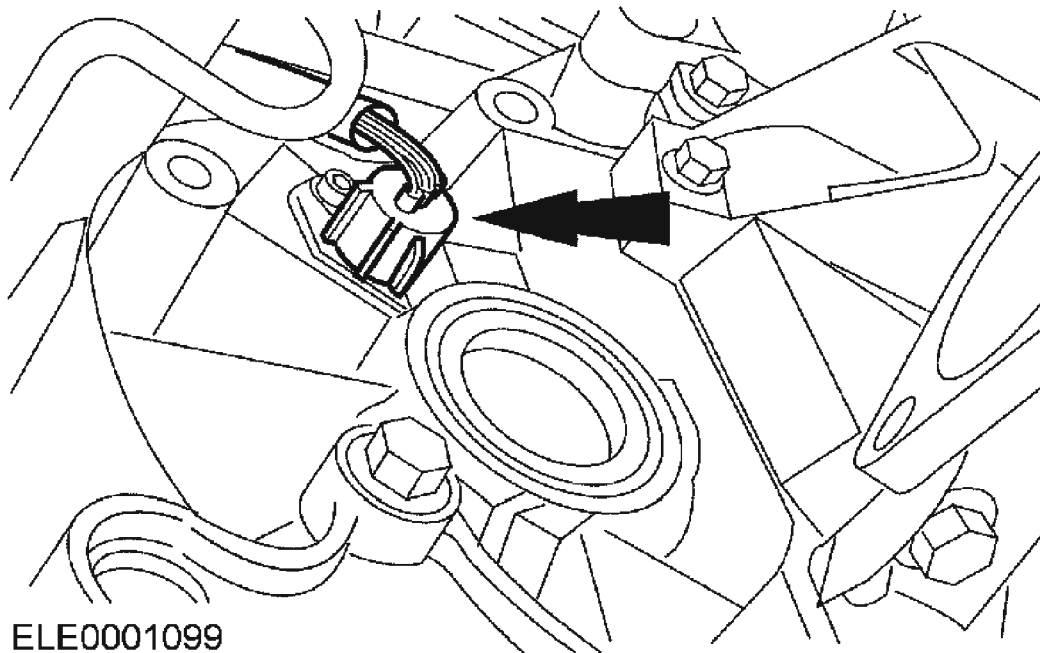


Fig. 498: Connecting Vehicle Speed Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

All vehicles

11. Using the lift table, position the engine and transaxle assembly in the vehicle.
12. Install the transaxle mount center nut.

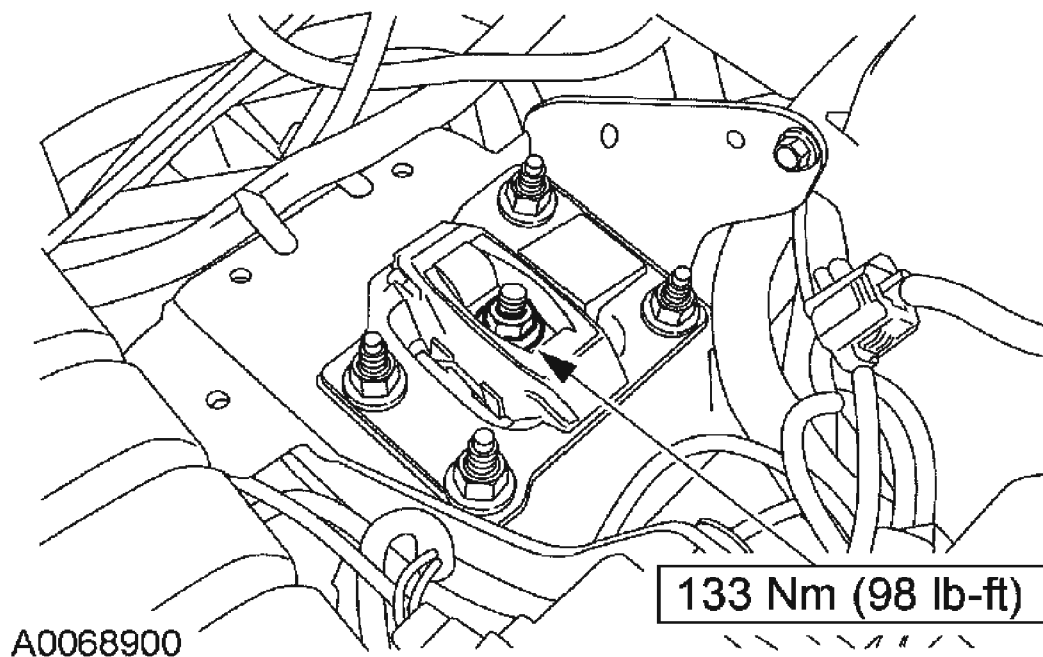


Fig. 499: Installing Transaxle Mount Center Nut
Courtesy of FORD MOTOR CO.

13. Install the motor mount nuts.

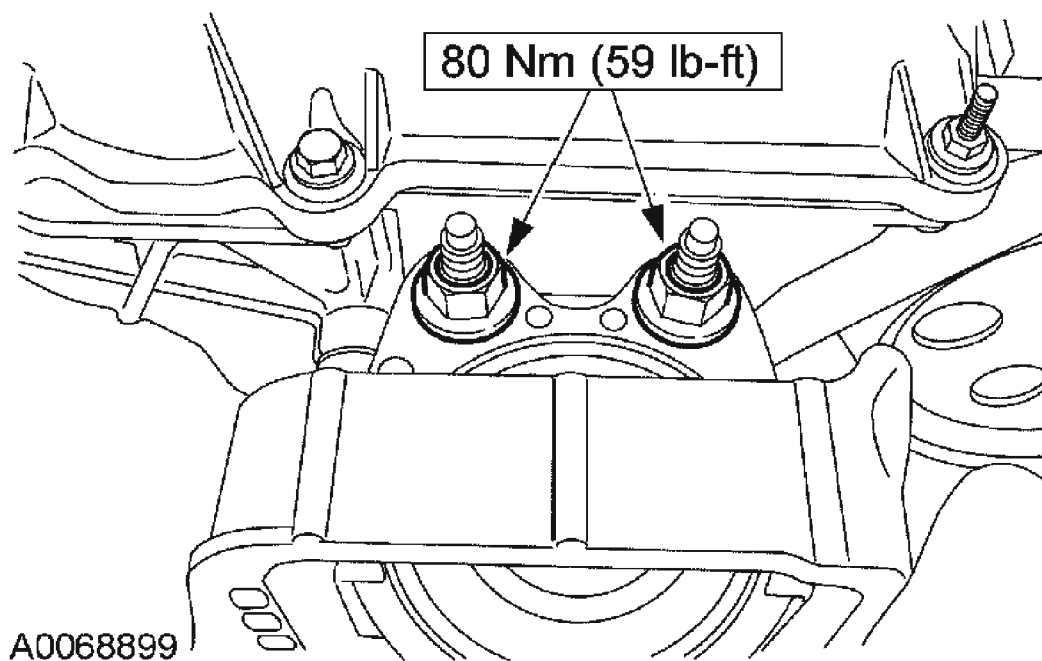


Fig. 500: Installing Motor Mount Nuts
Courtesy of FORD MOTOR CO.

14. Install the remaining engine-to-bell housing bolts.

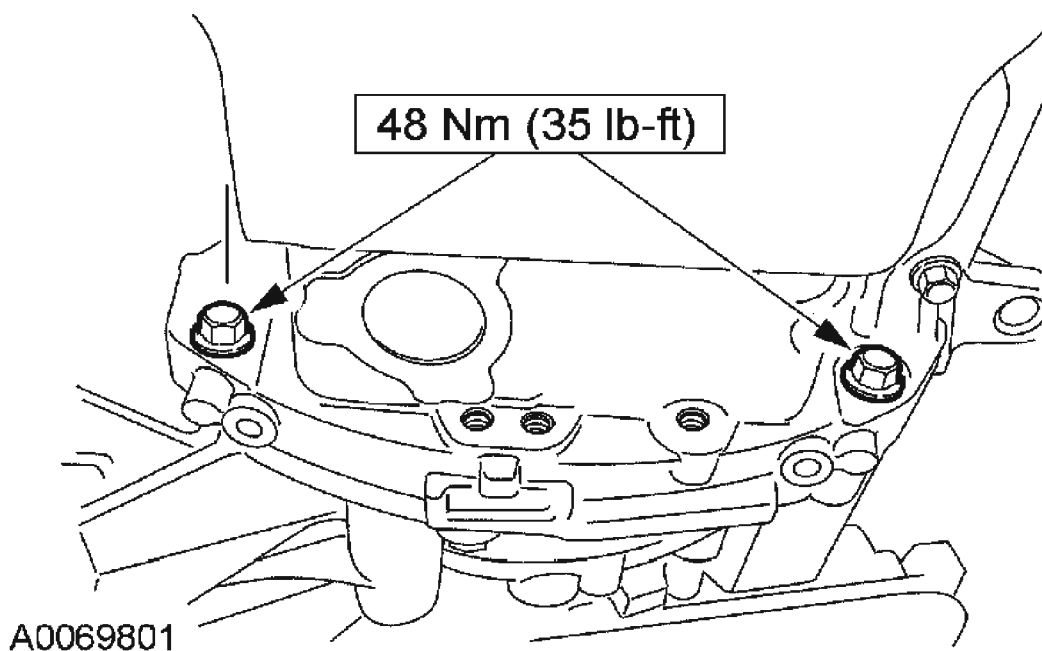


Fig. 501: Installing Remaining Engine-To-Bell Housing Bolts
Courtesy of FORD MOTOR CO.

15. Install the two lower engine-to-bell housing bolts.

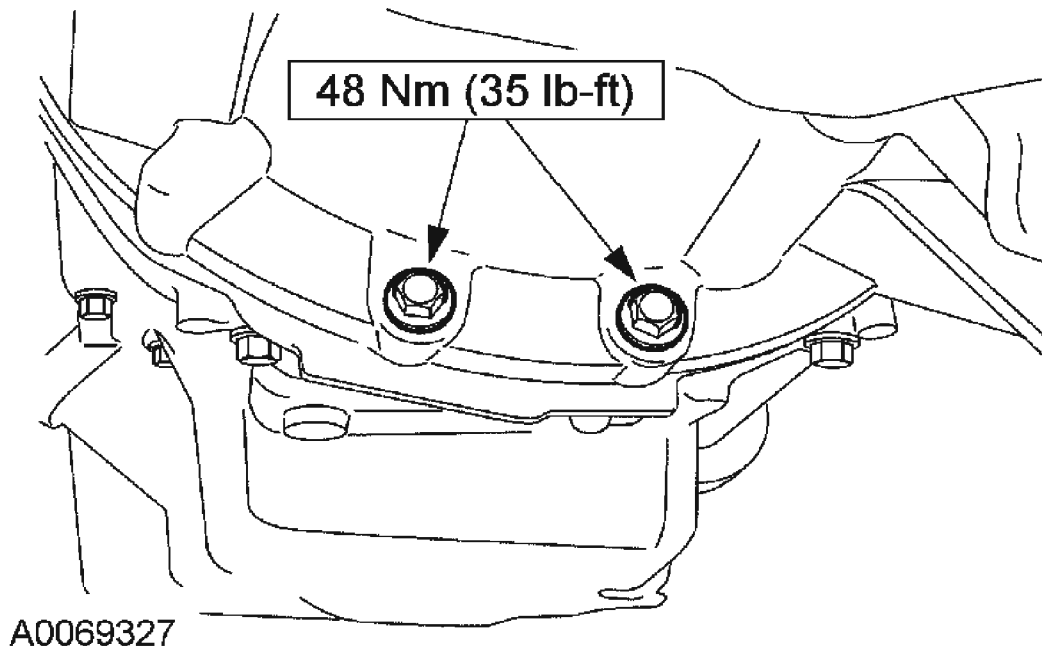


Fig. 502: Installing Lower Engine-To-Bell Housing Bolts
Courtesy of FORD MOTOR CO.

16. Install the starter motor isolator.

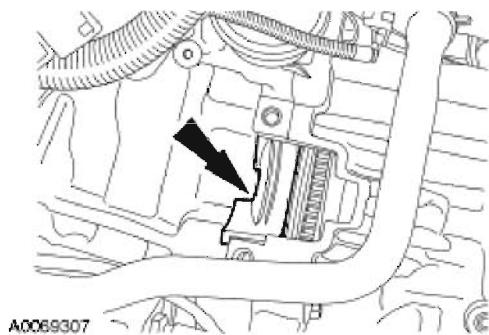


Fig. 503: Identifying Starter Motor Isolator
Courtesy of FORD MOTOR CO.

17. Install the starter motor and the bolts.

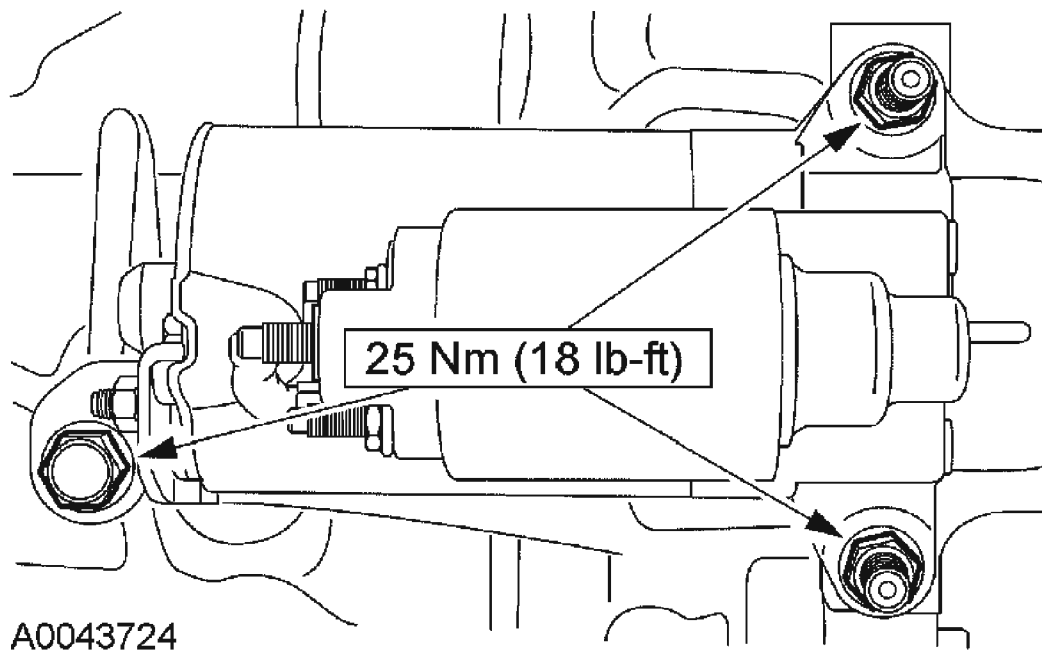


Fig. 504: Installing Starter Motor And Bolts
Courtesy of FORD MOTOR CO.

18. Install the transaxle roll restrictor and bolts.

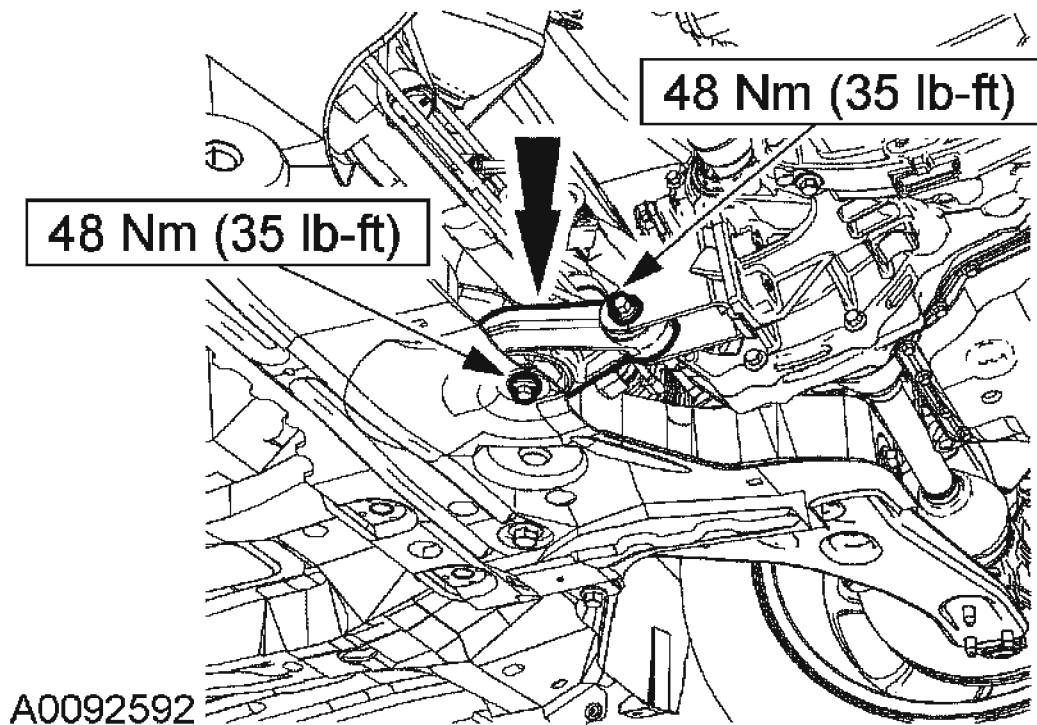


Fig. 505: Installing Transaxle Roll Restrictor And Bolts
Courtesy of FORD MOTOR CO.

NOTE: Install a new snap ring.

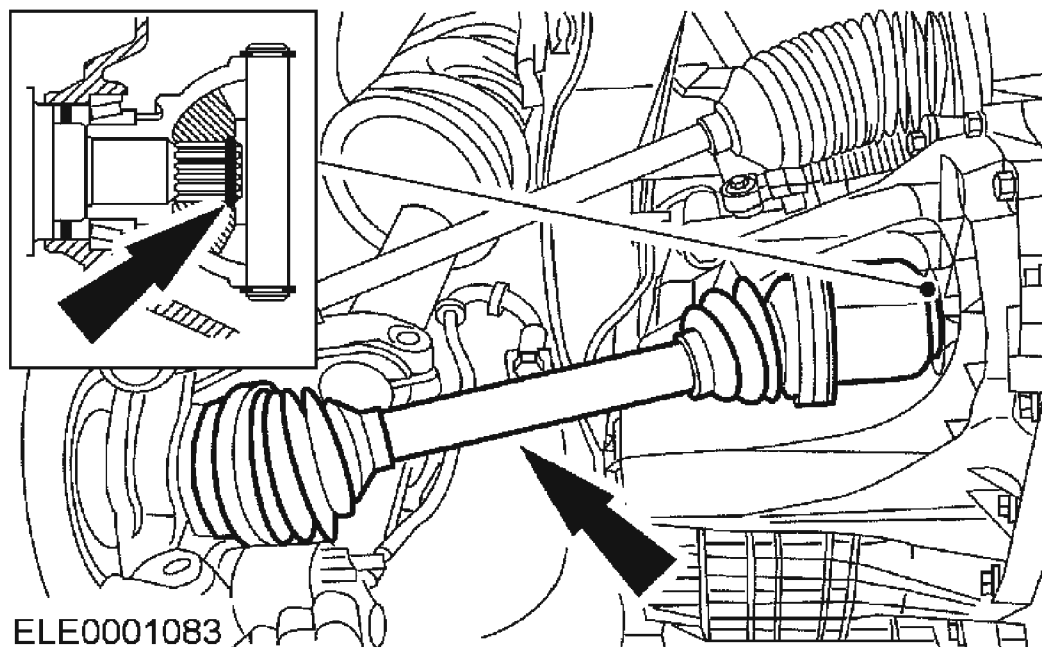


Fig. 506: Installing LH Front Drive Halfshaft
Courtesy of FORD MOTOR CO.

19. Install the LH front drive halfshaft.
20. Install the RH front halfshaft together with the intermediate shaft.

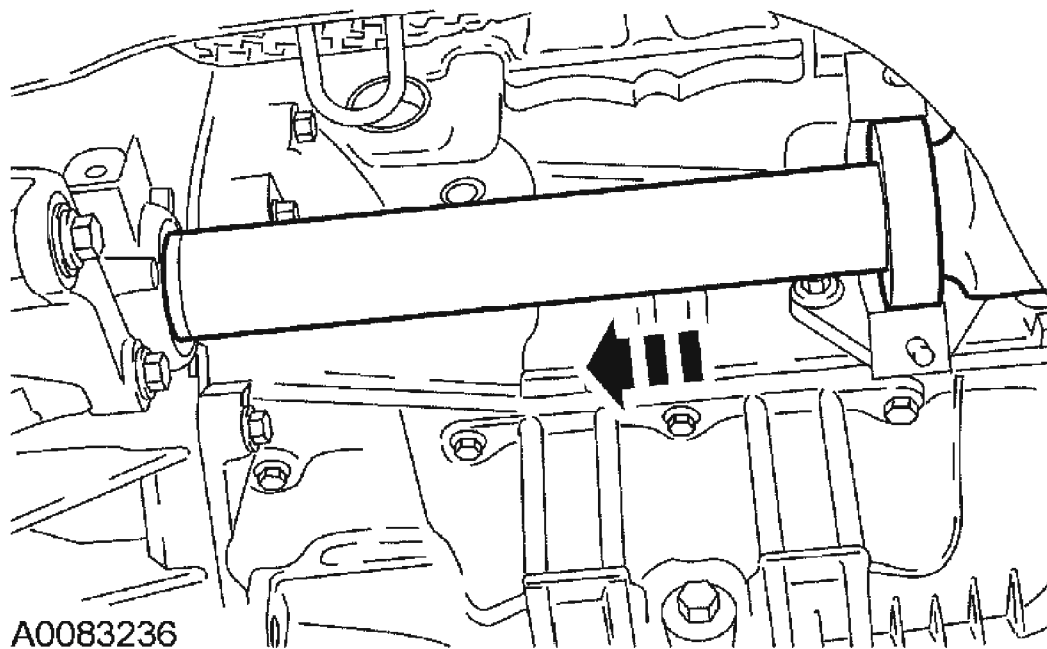


Fig. 507: Installing RH Front Halfshaft Together With Intermediate Shaft
Courtesy of FORD MOTOR CO.

21. Install front drive intermediate shaft bearing mounting bracket.

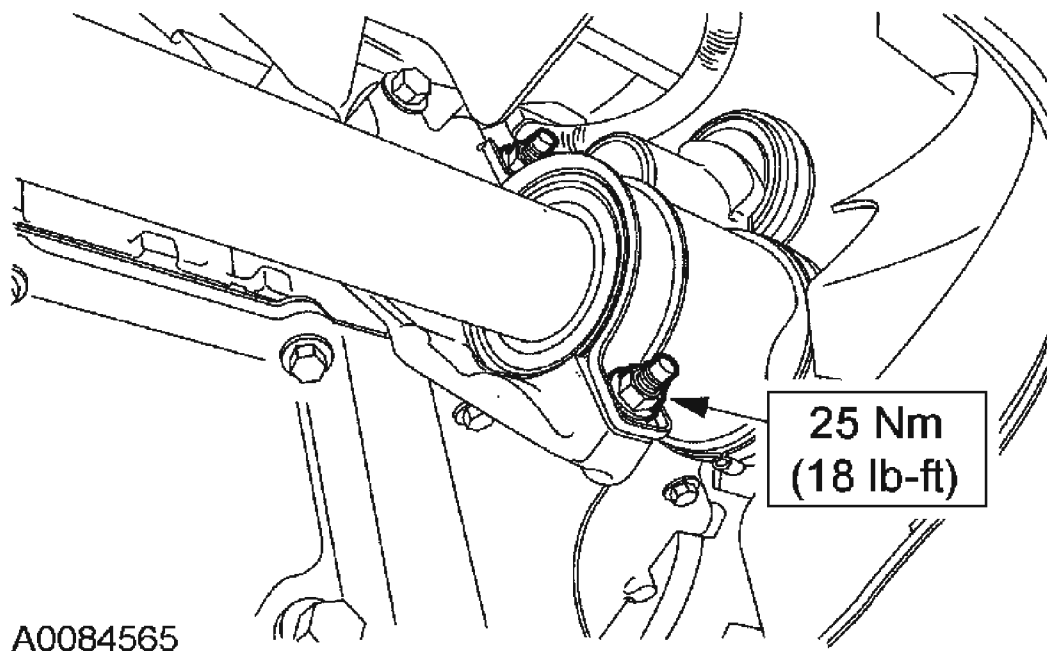


Fig. 508: Installing Front Drive Intermediate Shaft Bearing Mounting Bracket
Courtesy of FORD MOTOR CO.

22. Install both of the lower control arms to the knuckles.
 1. Connect the suspension arm ball joint.
 2. Install the bolt.

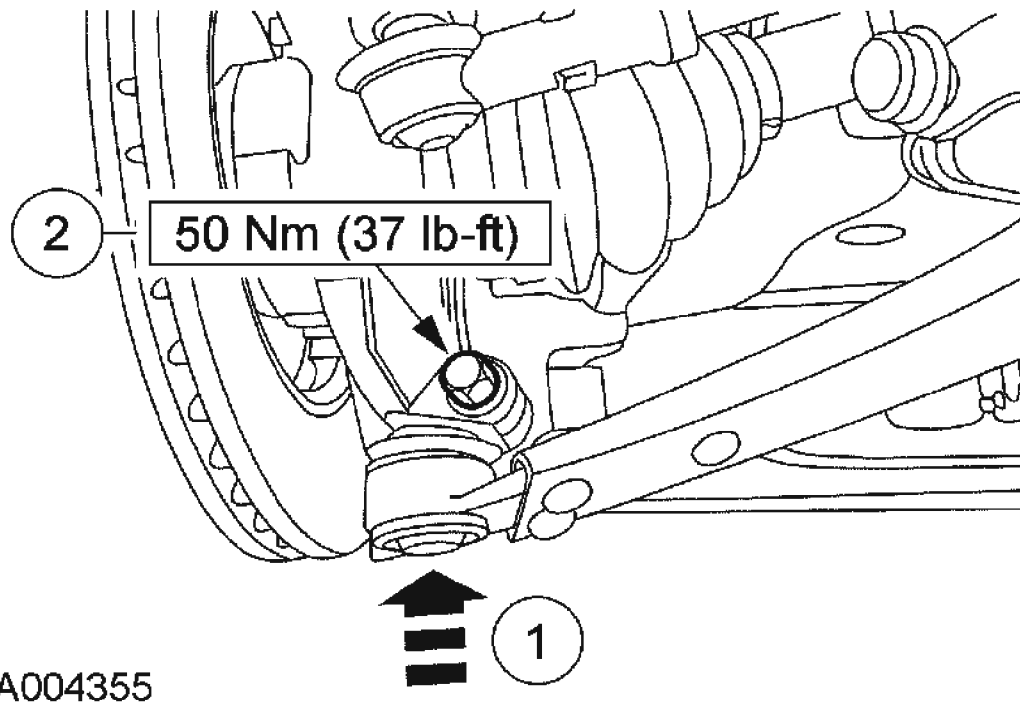
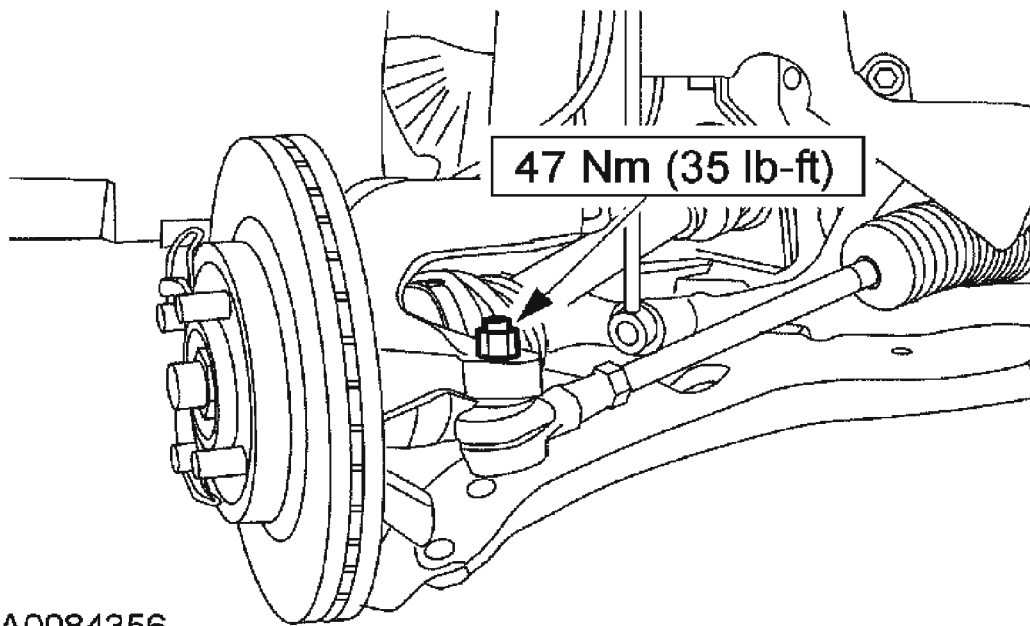


Fig. 509: Installing Both Of Lower Control Arms To Knuckles
Courtesy of FORD MOTOR CO.

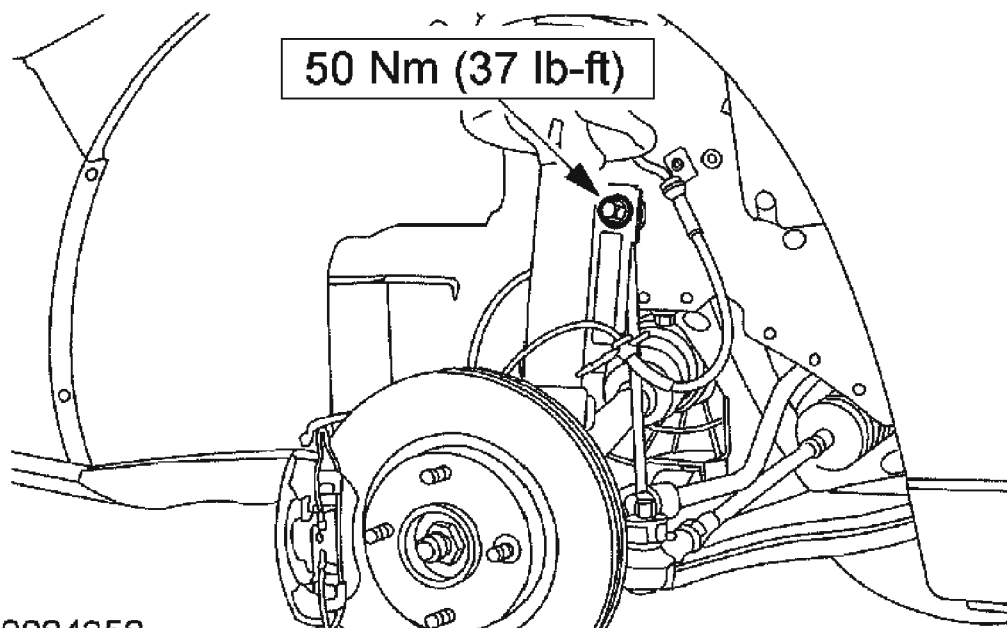
23. Install both of the tie rod ends to the knuckles.



A0084356

Fig. 510: Installing Both Of Tie Rod Ends To Knuckles
Courtesy of FORD MOTOR CO.

24. Connect the stabilizer bar at the struts.



A0084358

Fig. 511: Connecting Stabilizer Bar At Struts
Courtesy of FORD MOTOR CO.

25. Tighten the LH strut and spring assembly top mount nuts.

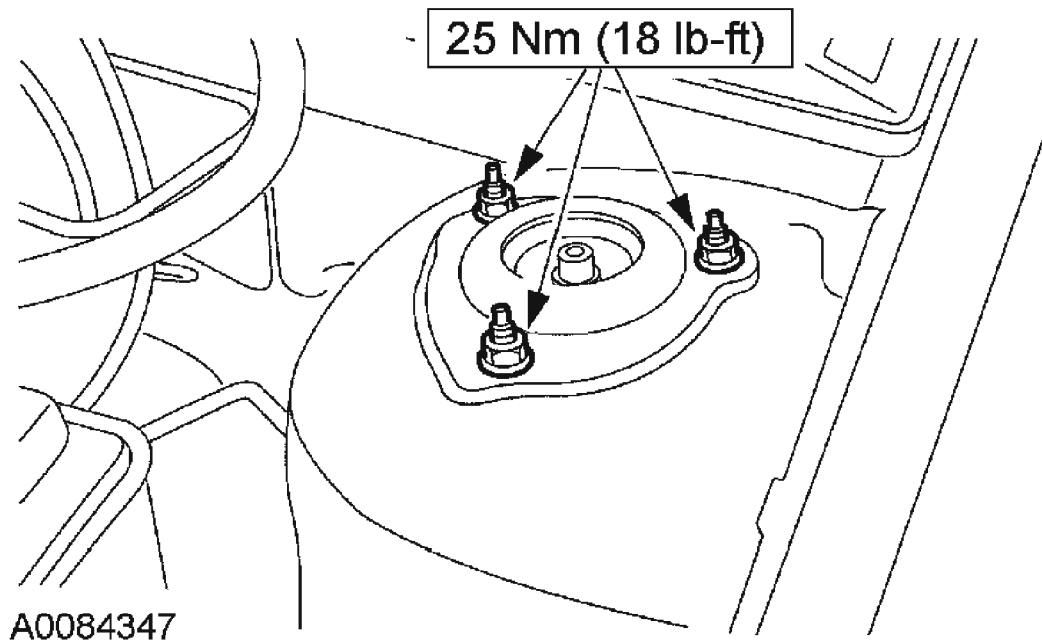


Fig. 512: Tightening LH Strut And Spring Assembly Top Mount Nuts
Courtesy of FORD MOTOR CO.

26. Install the caliper.
1. Position the caliper and install the bolts.
 2. Install the bolt covers.

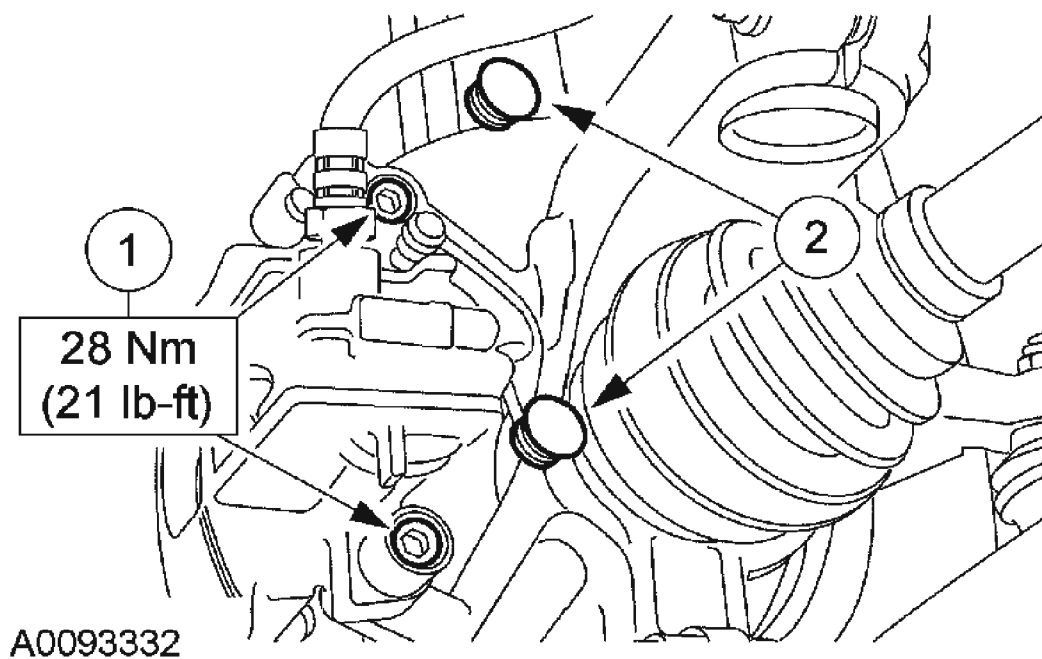


Fig. 513: Installing Caliper
Courtesy of FORD MOTOR CO.

27. Install the brake hose onto the support bracket.

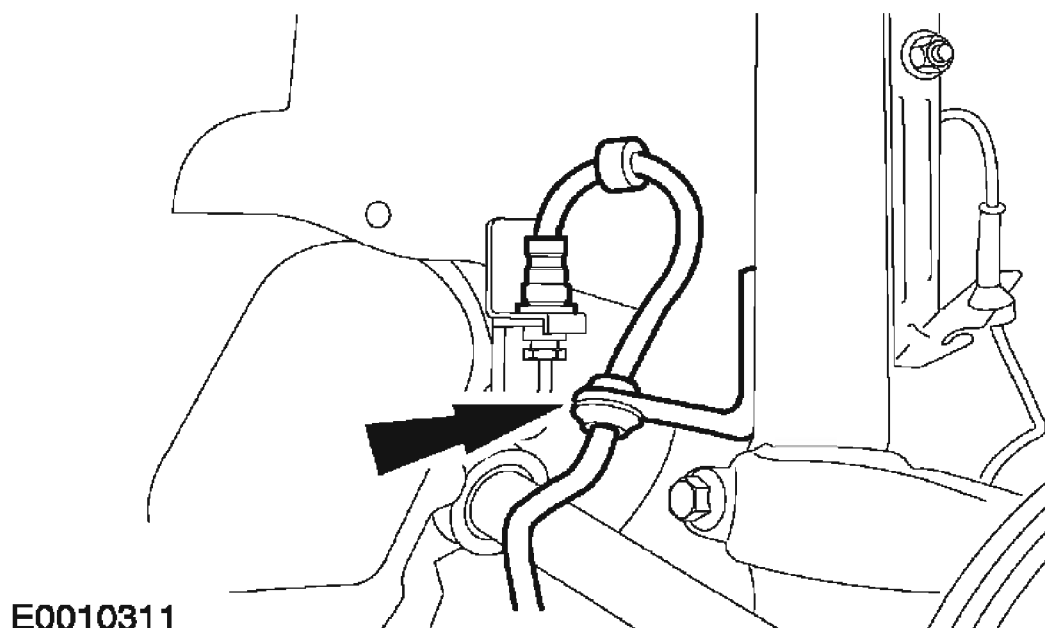


Fig. 514: Installing Brake Hose Onto Support Bracket
Courtesy of FORD MOTOR CO.

Vehicles equipped with air conditioning

NOTE: Install new O-ring seals.

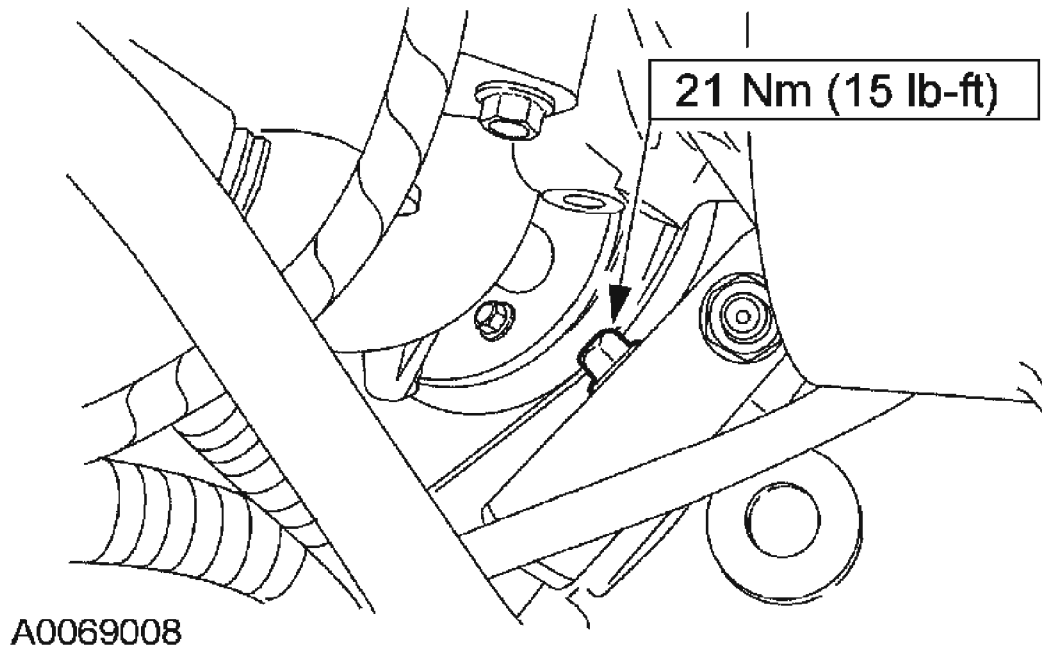


Fig. 515: Installing Manifold And Tube Assembly Onto A/C Compressor
Courtesy of FORD MOTOR CO.

28. Install the manifold and tube assembly onto the A/C compressor.
29. Install the A/C compressor and the three bolts.

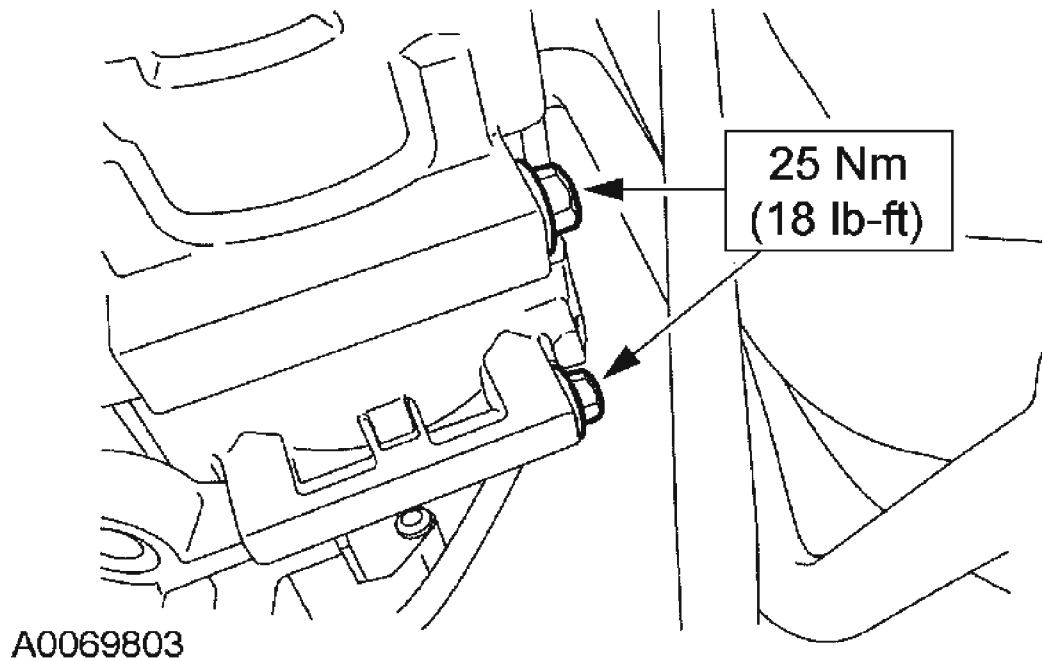


Fig. 516: Installing A/C Compressor And Three Bolts
Courtesy of FORD MOTOR CO.

All vehicles

30. Install the power steering pressure (PSP) tube brackets and nuts.

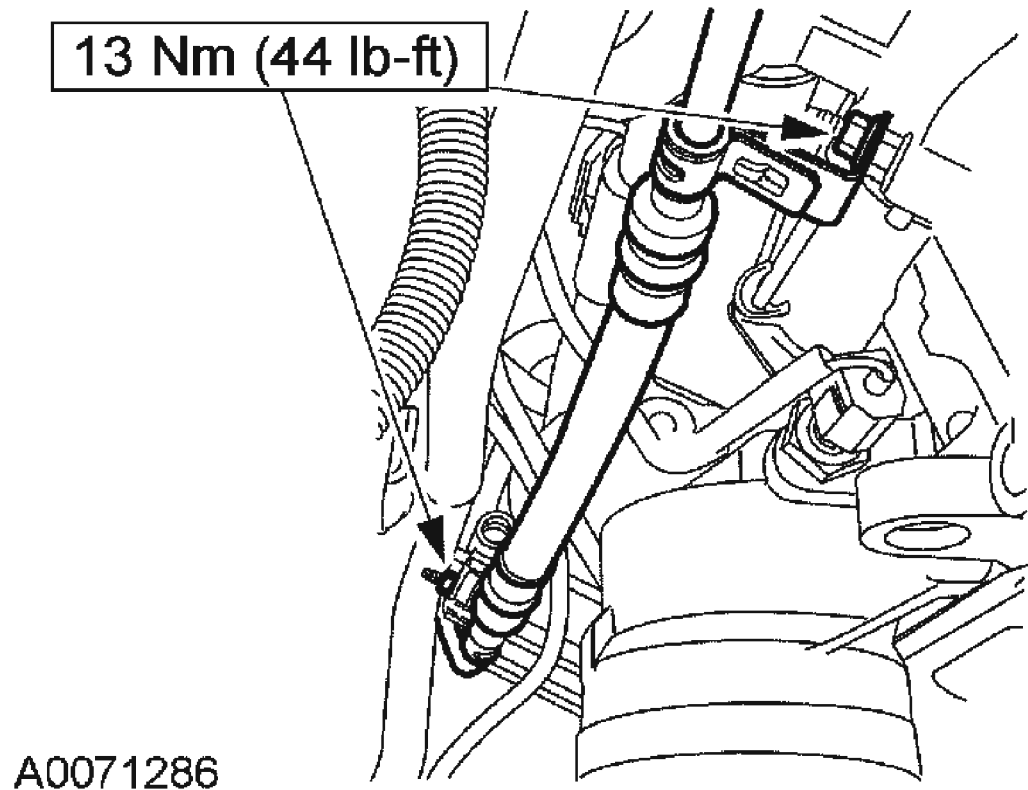


Fig. 517: Installing Power Steering Pressure Tube Brackets And Nuts
Courtesy of FORD MOTOR CO.

31. Connect the starter motor electrical connections.

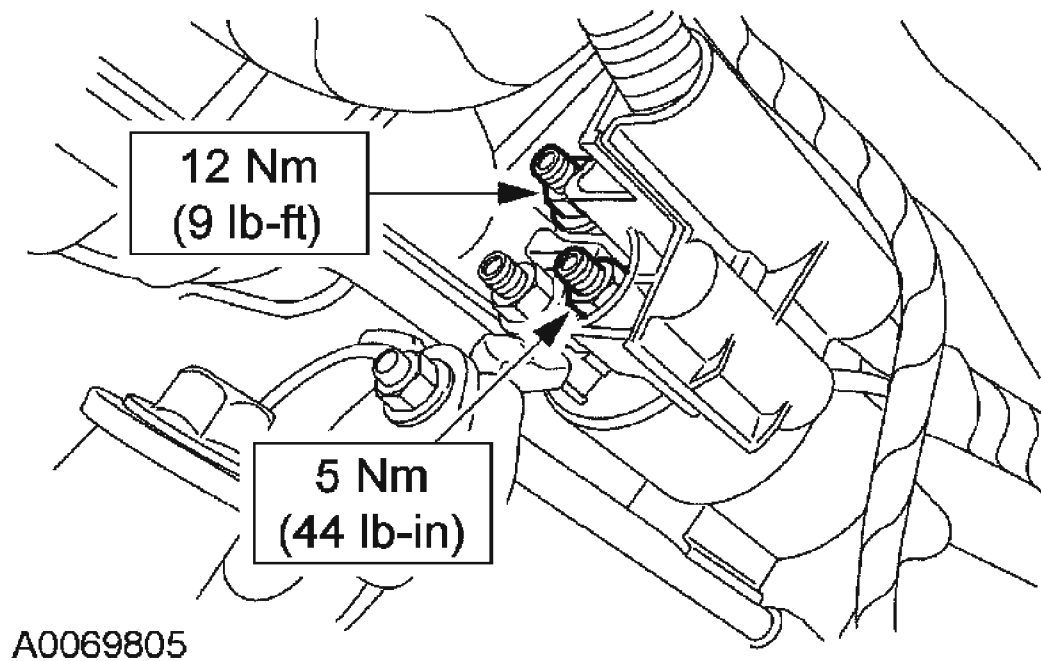
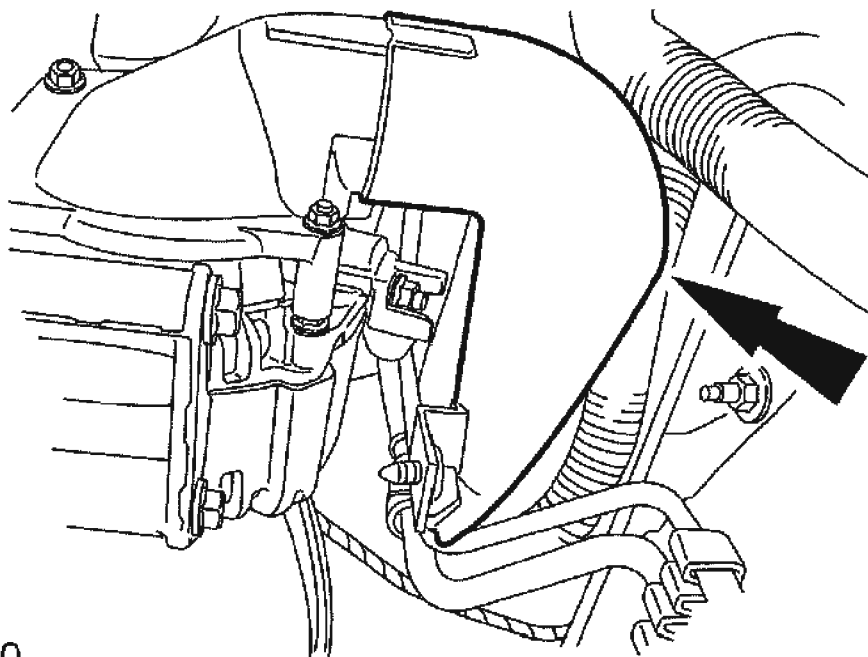


Fig. 518: Connect Starter Motor Electrical Connections
Courtesy of FORD MOTOR CO.

32. Install the generator coolant pipe.



A0069300

Fig. 519: Installing Generator Coolant Pipe
Courtesy of FORD MOTOR CO.

33. Position the ground cable and install the bolt.

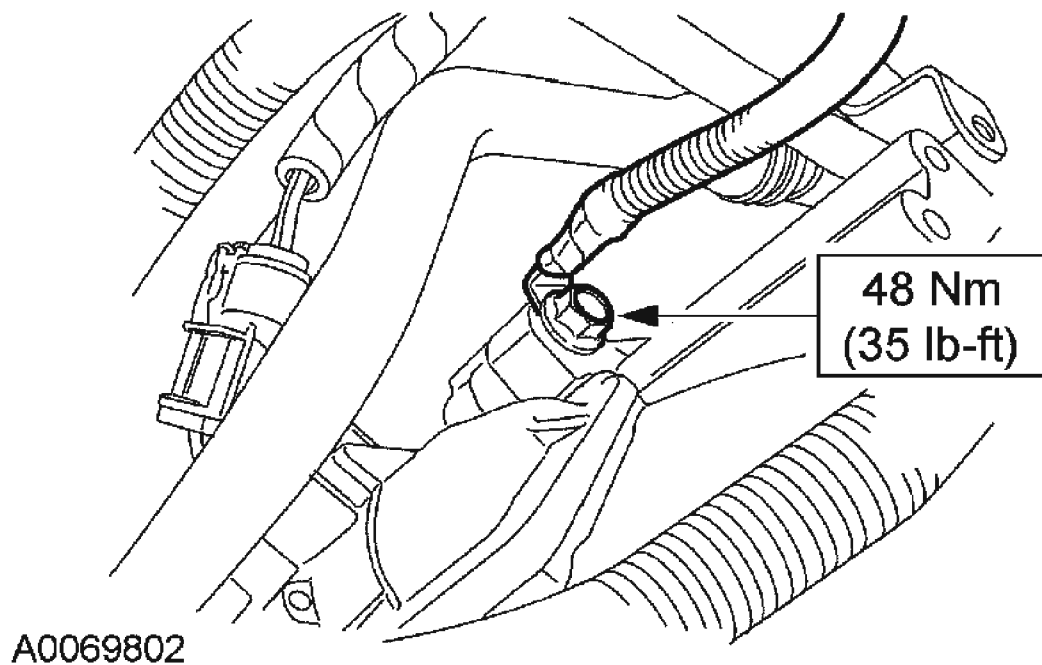
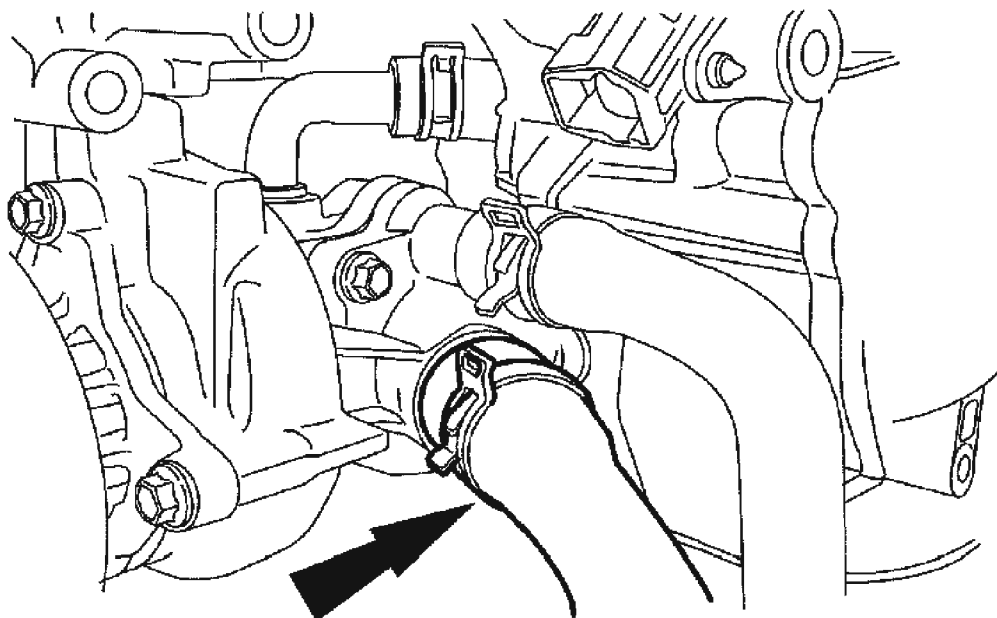


Fig. 520: Installing Ground Cable And Installing Bolt
Courtesy of FORD MOTOR CO.

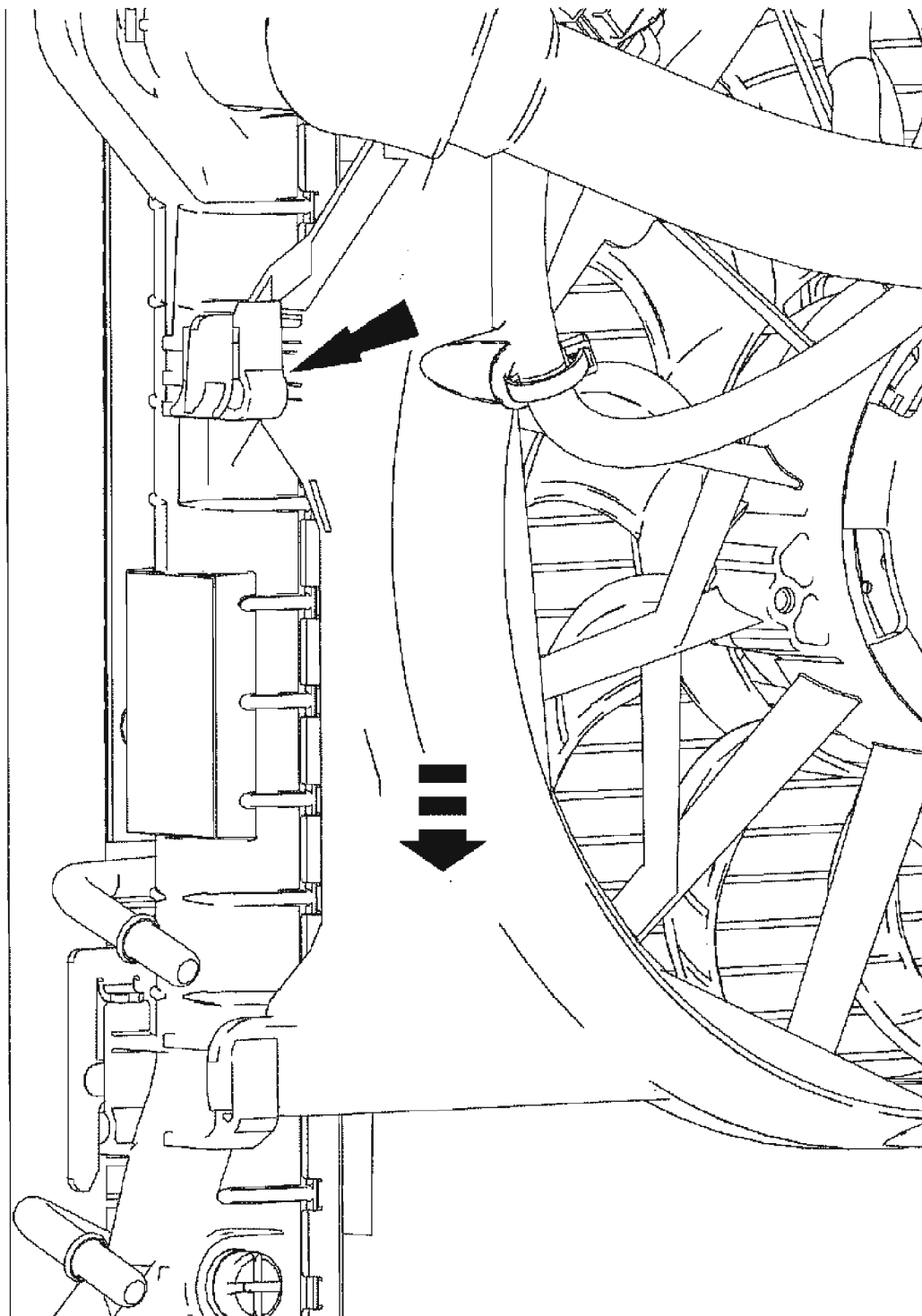
34. Connect the lower radiator hose.



A0069299

Fig. 521: Connecting Lower Radiator Hose
Courtesy of FORD MOTOR CO.

35. Install the cooling fan.



A0092599

Fig. 522: Installing Cooling Fan
Courtesy of FORD MOTOR CO.

36. Connect the cooling fan electrical connectors.

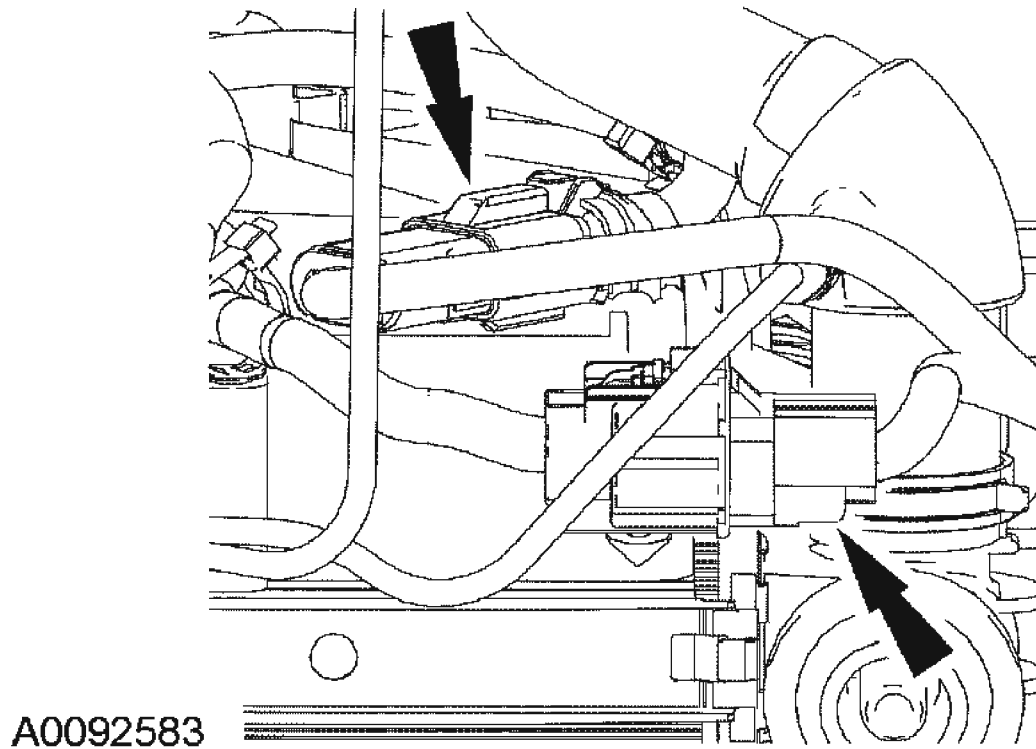


Fig. 523: Connecting Cooling Fan Electrical Connectors
Courtesy of FORD MOTOR CO.

37. Position the power steering pump and the bolts.

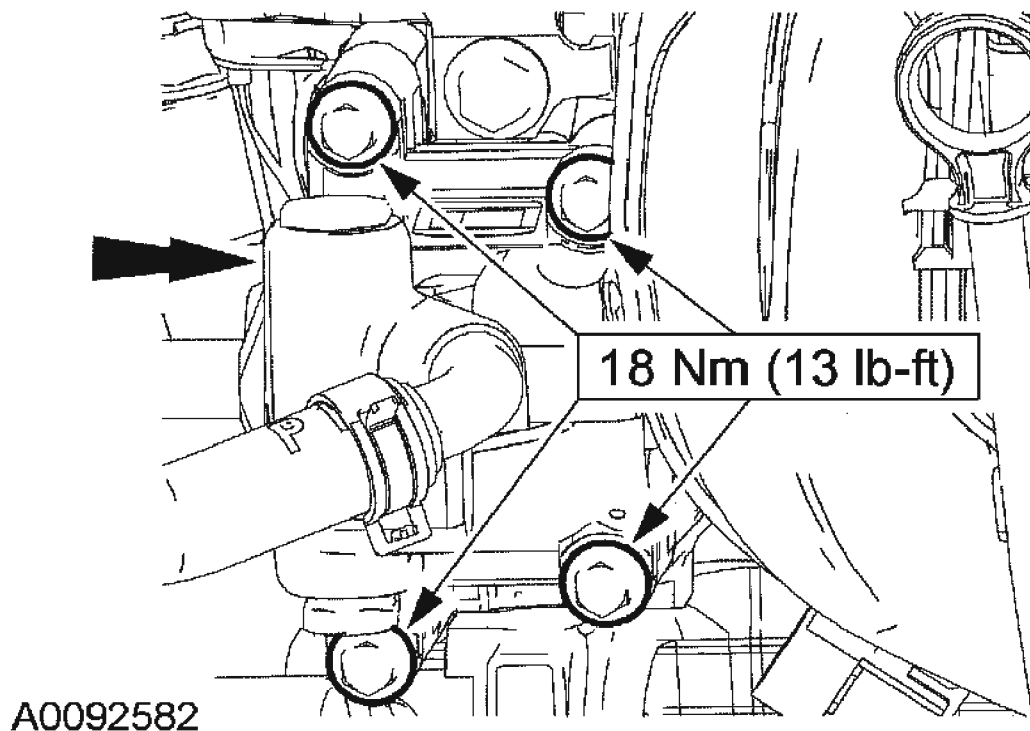


Fig. 524: Installing Power Steering Pump And Bolts
Courtesy of FORD MOTOR CO.

38. Using the special tool, install a new O-ring seal onto the steering gear to power steering pump union.
 1. Push the new O-ring seal onto the special tool.
 2. Locate the special tool onto the union and install the O-ring seal.

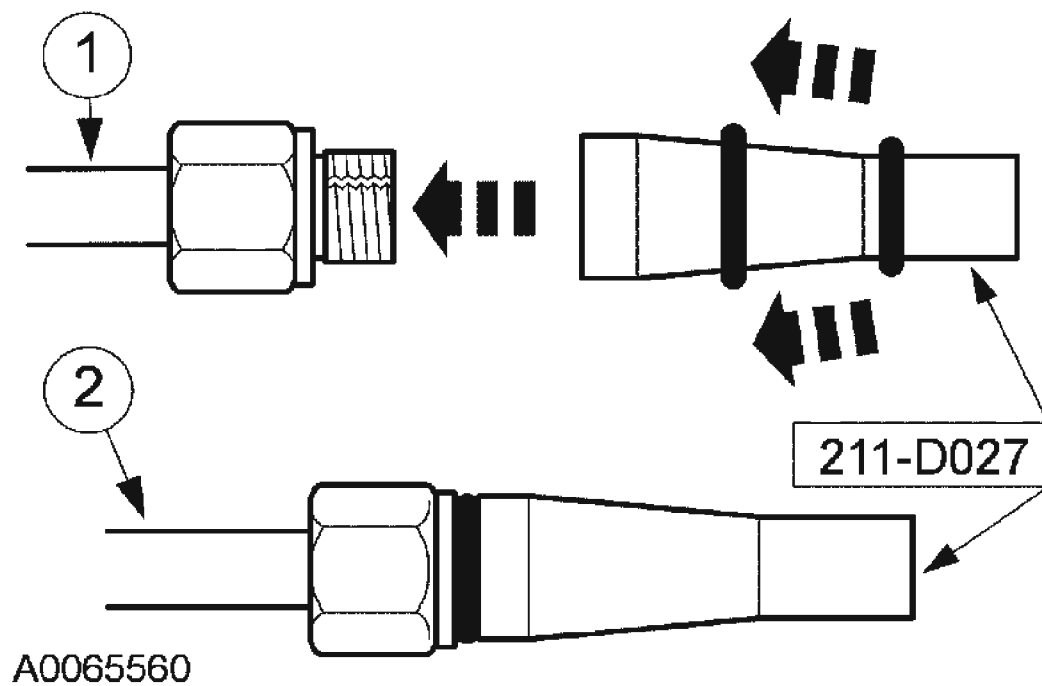


Fig. 525: Installing O-Ring Seal Onto Steering Gear To Power Steering Pump Union Using Special Tool
Courtesy of FORD MOTOR CO.

39. Connect the PSP tube.

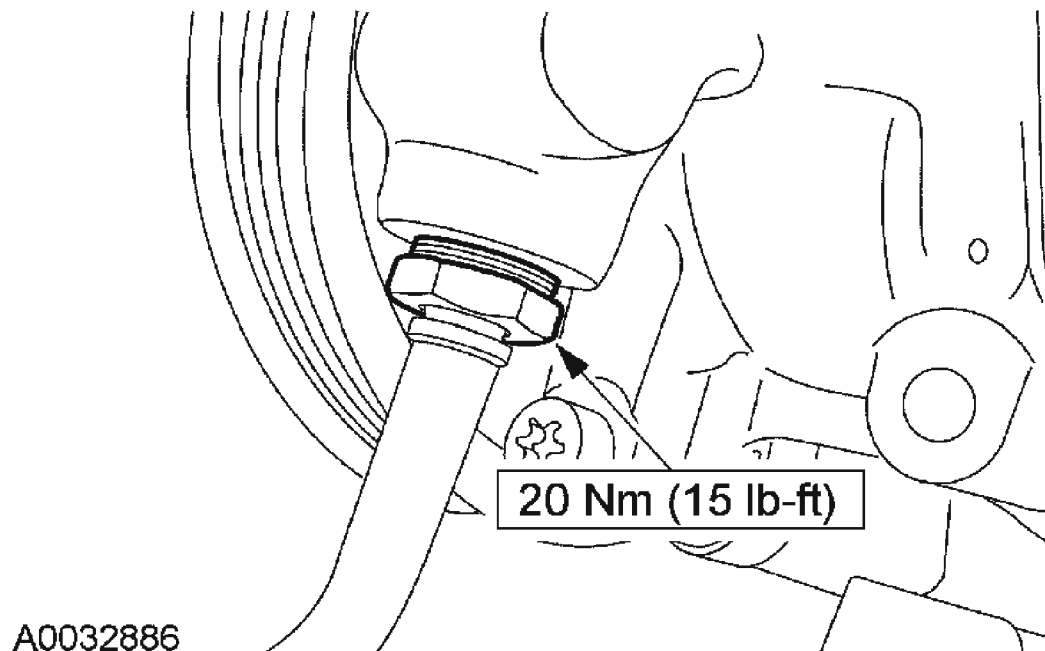
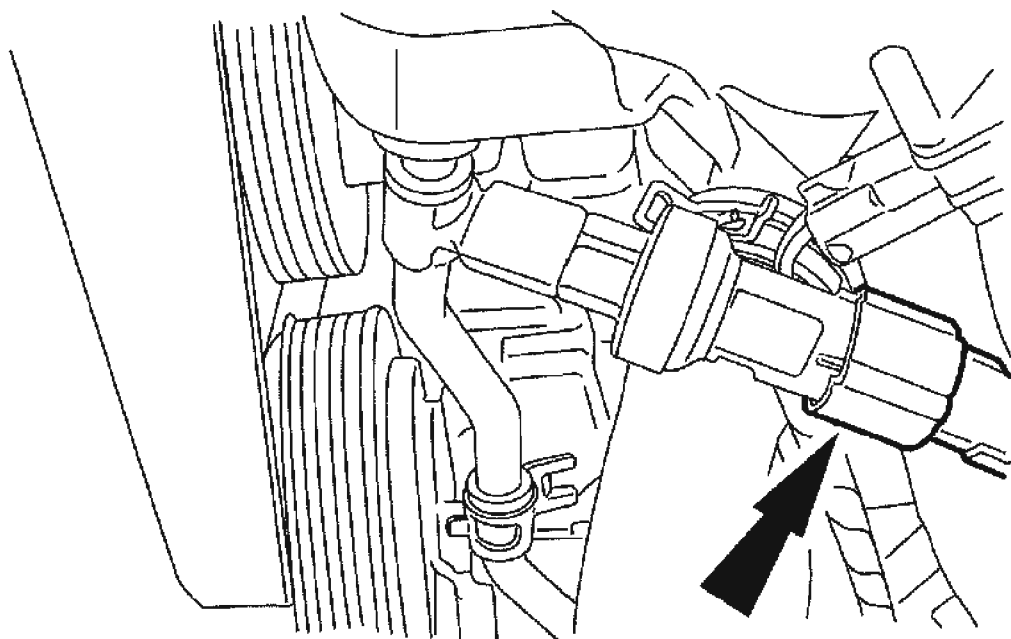


Fig. 526: Connecting PSP Tube
Courtesy of FORD MOTOR CO.

40. Connect the PSP switch electrical connector.



A0069286

Fig. 527: Connecting PSP Switch Electrical Connector
Courtesy of FORD MOTOR CO.

41. Using the special tool, install the power steering pump pulley.

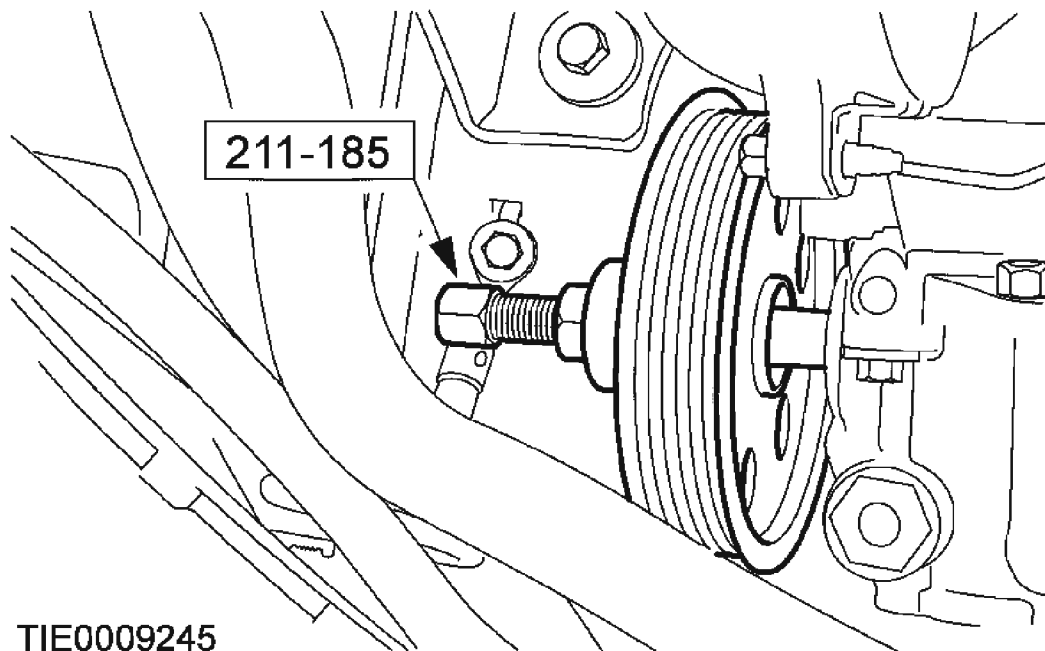


Fig. 528: Installing Power Steering Pump Pulley Using Special Tool
Courtesy of FORD MOTOR CO.

42. Install the coolant expansion tank and the bolt.

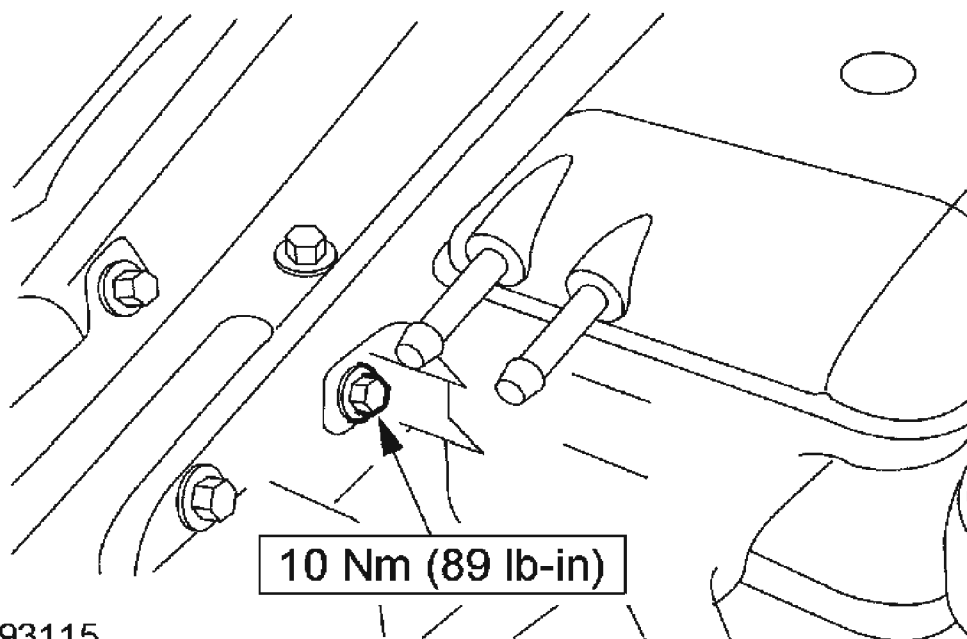


Fig. 529: Installing Coolant Expansion Tank And Bolt
Courtesy of FORD MOTOR CO.

43. Connect the coolant hoses.

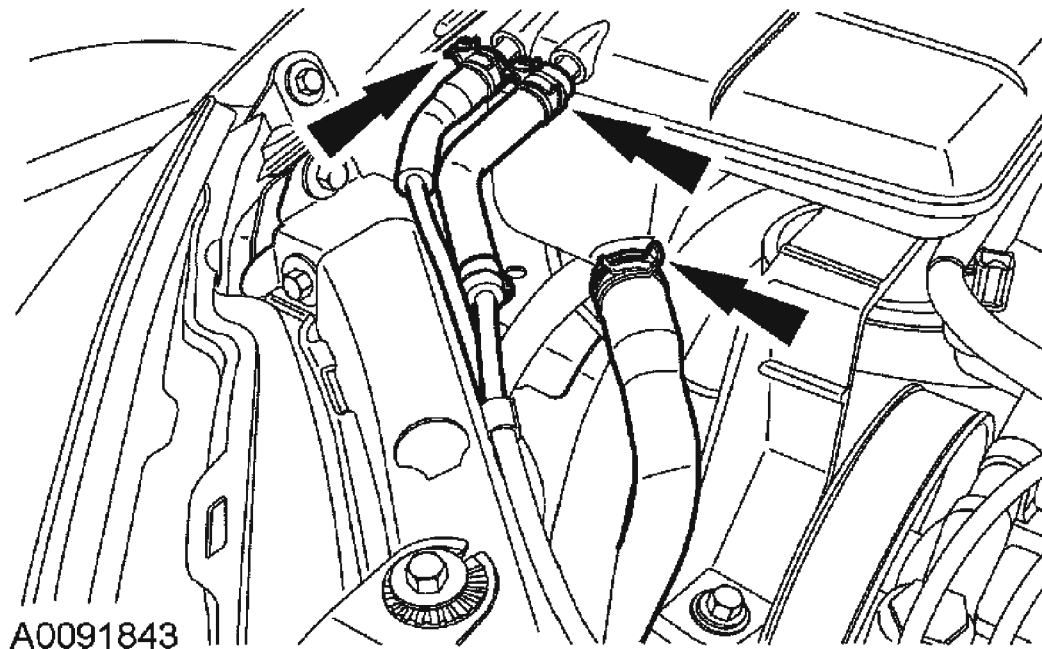
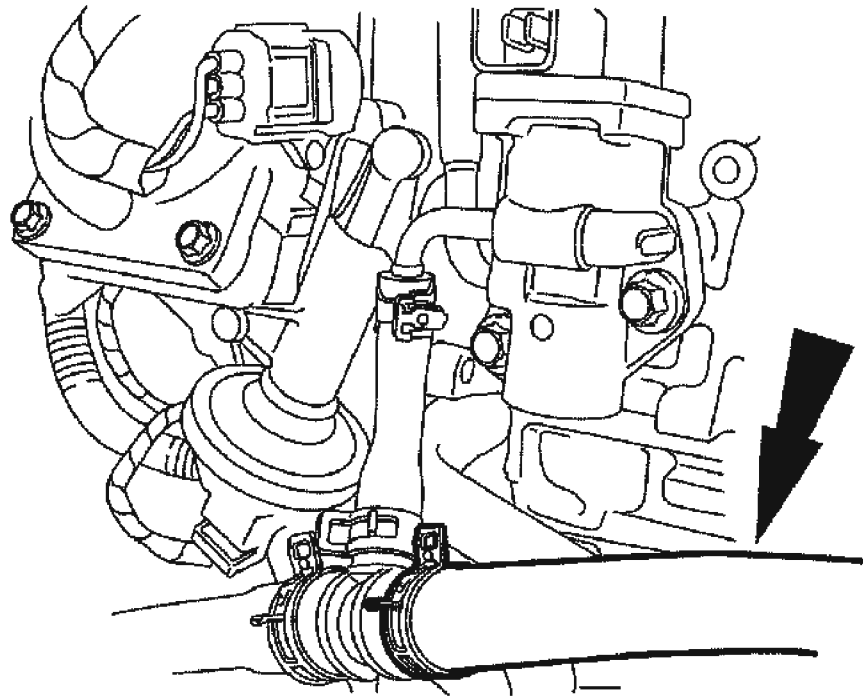


Fig. 530: Connecting Coolant Hoses
Courtesy of FORD MOTOR CO.

44. Connect the heater hose to the "T" fitting.



A0069285

Fig. 531: Connecting Heater Hose To "T" Fitting
Courtesy of FORD MOTOR CO.

Vehicles equipped with a 2.0L engine and automatic transmission

45. Connect the transmission cooler hoses.

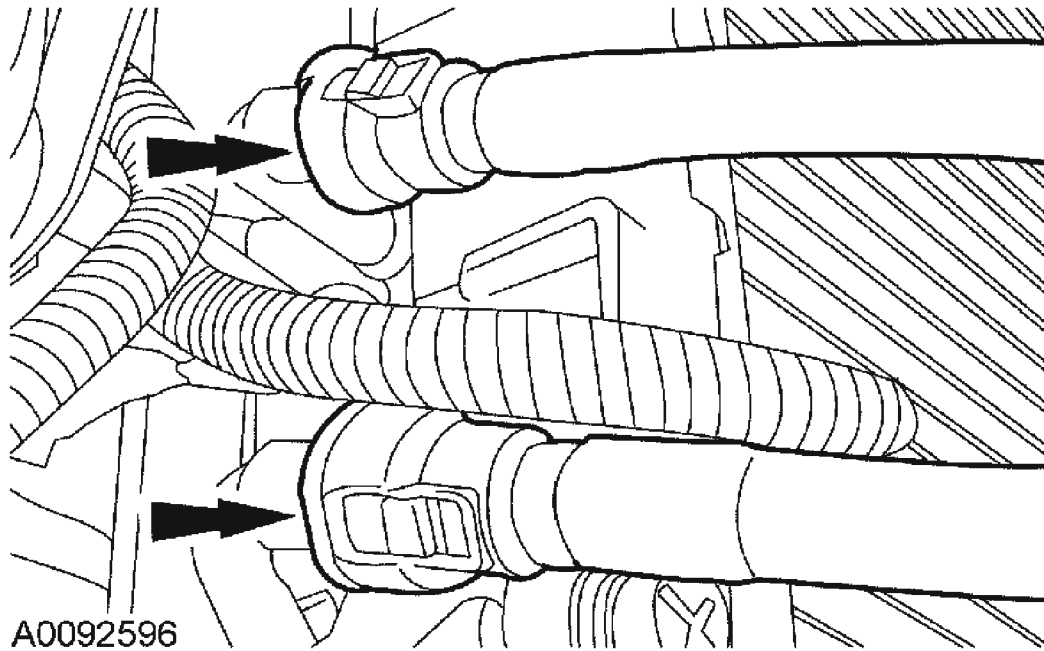
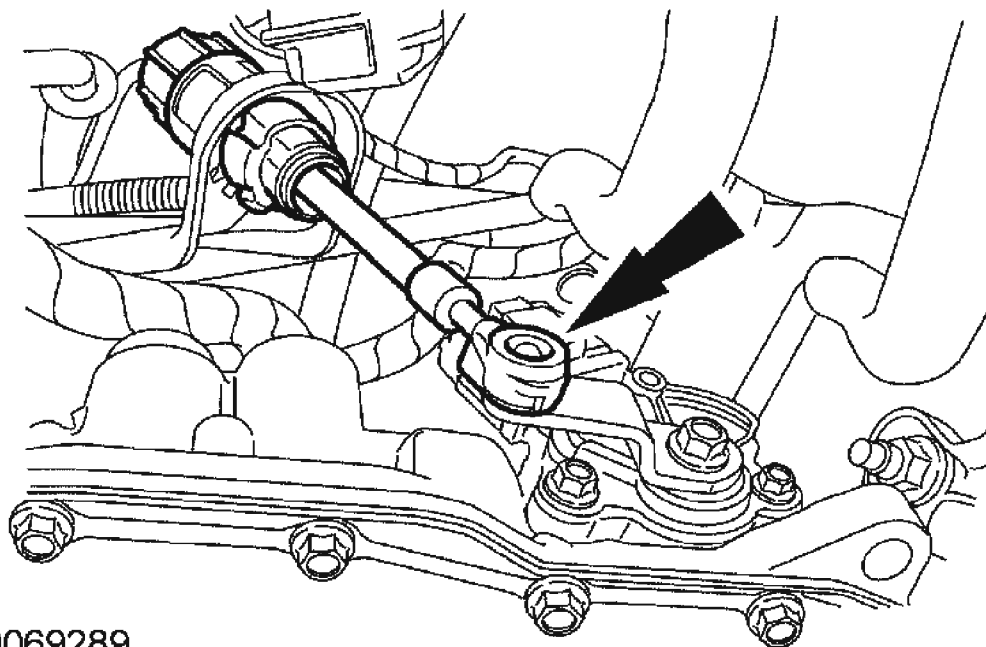


Fig. 532: Connecting Transmission Cooler Hoses
Courtesy of FORD MOTOR CO.

46. Connect the transmission shifter cable.



A0069289

Fig. 533: Connecting Transmission Shifter Cable
Courtesy of FORD MOTOR CO.

Vehicles equipped with a manual transmission

47. Connect the reversing lamp switch electrical connector.

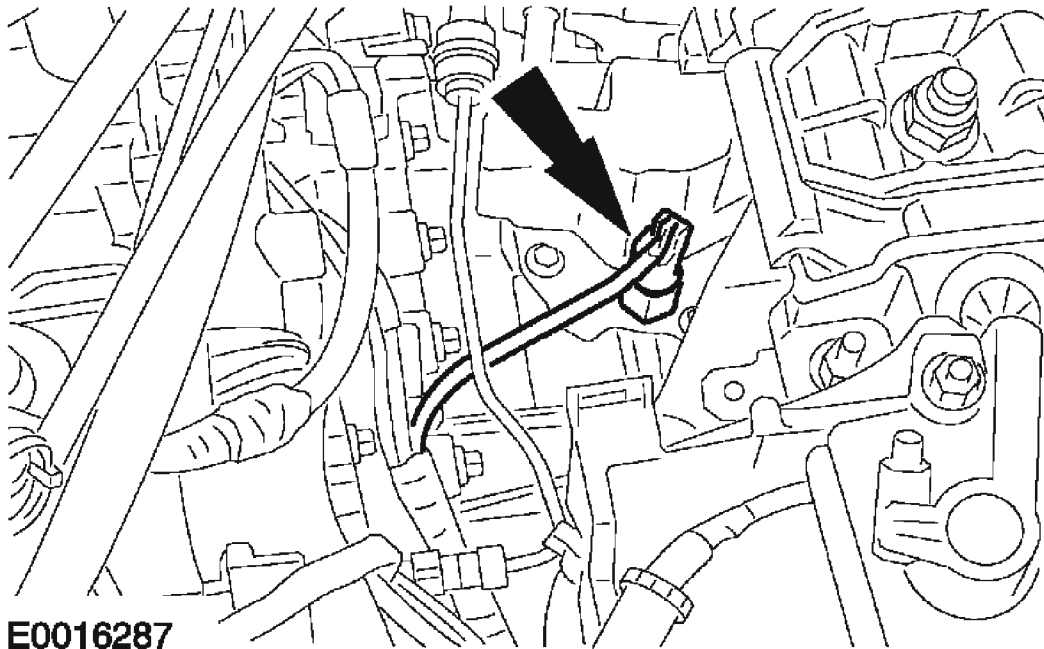


Fig. 534: Connecting Reversing Lamp Switch Electrical Connector
Courtesy of FORD MOTOR CO.

WARNING: Escaping brake fluid. Do not allow brake fluid to come into contact with the skin or the eyes. If brake fluid does come into contact with the skin or eyes, rinse the affected areas with water immediately. Failure to follow these instructions may result in personal injury.

CAUTION: If brake fluid is spilled on the paint work, the affected area must be immediately washed down with cold water.

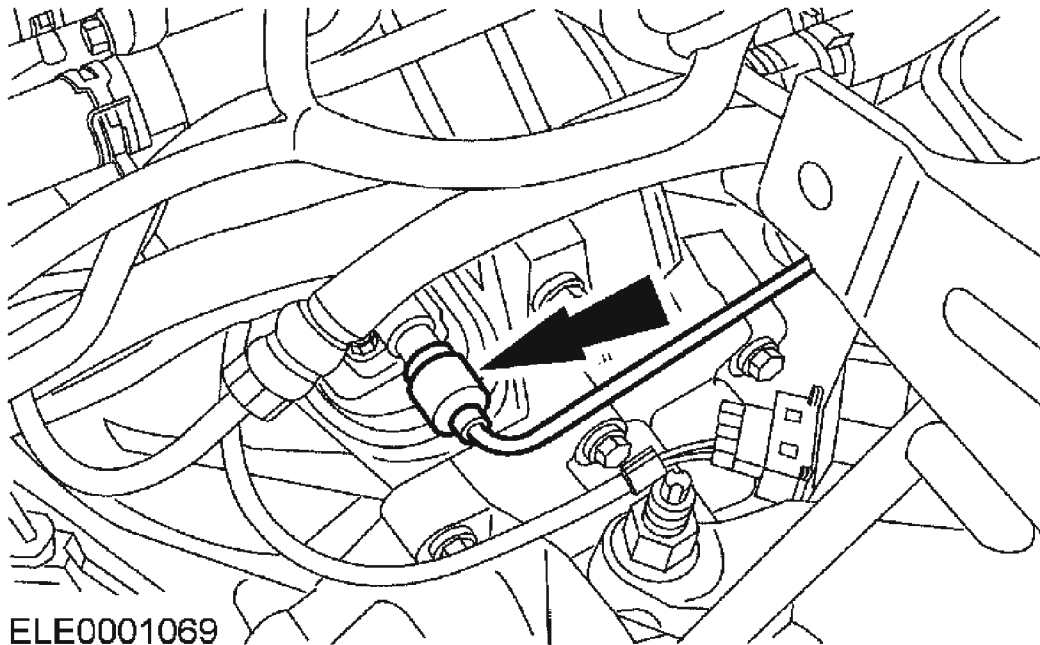


Fig. 535: Connecting Clutch Slave Cylinder Supply Tube
Courtesy of FORD MOTOR CO.

48. Connect the clutch slave cylinder supply tube.
 - Install the clip.

NOTE: The shift cable abutment sleeve is colored white.

NOTE: The selector cable abutment sleeve is colored black.

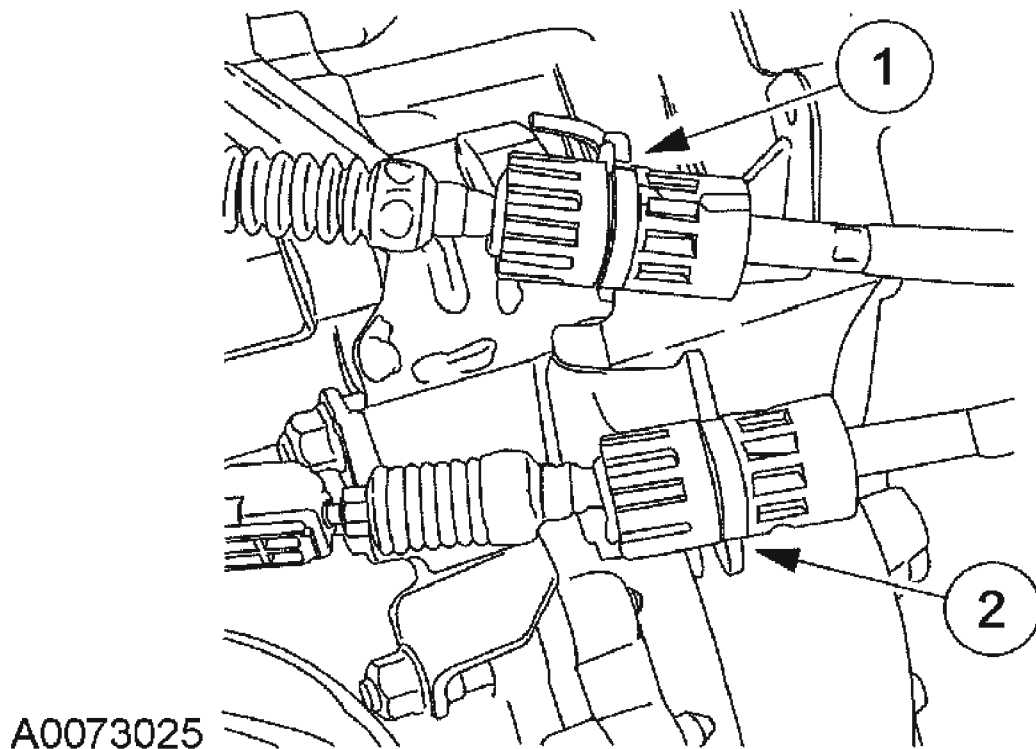


Fig. 536: Attaching Transaxle Cables To Bracket
Courtesy of FORD MOTOR CO.

49. Attach the transaxle cables to the bracket.
 1. Attach the shifter cable to the bracket, turning the abutment sleeves counterclockwise to open. Position the cables into the metal holders.
 2. Attach the selector cable to the bracket, turning the abutment sleeves counterclockwise to open. Position the cables into the metal holders.
50. Attach the gearshift cables.
 1. Attach the shifter cable to the shift mass.
 2. Attach the selector cable to the selector lever.

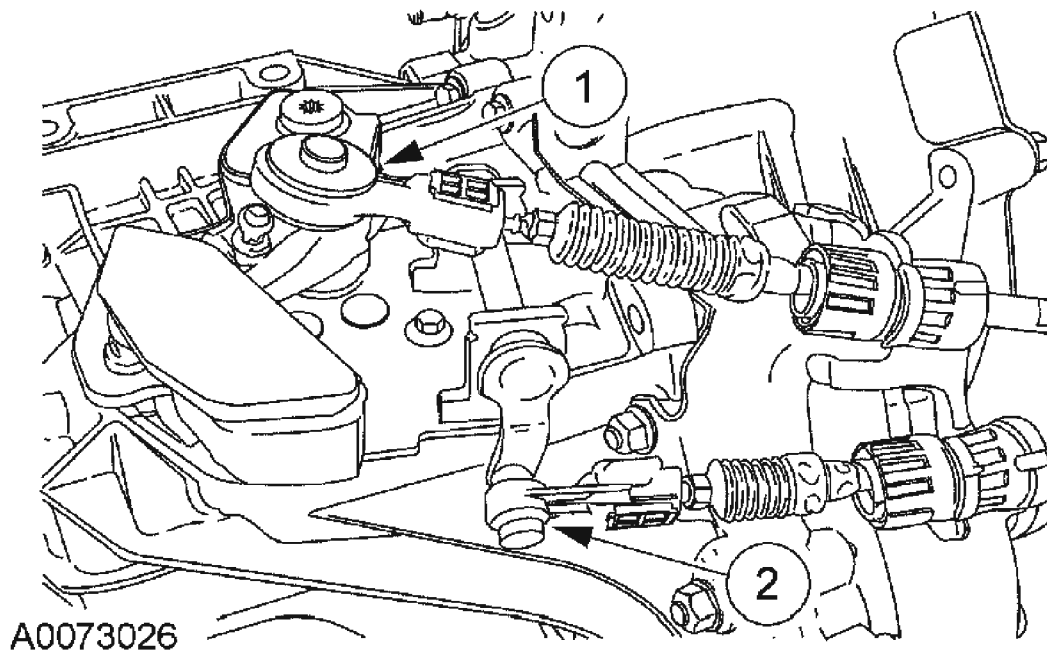
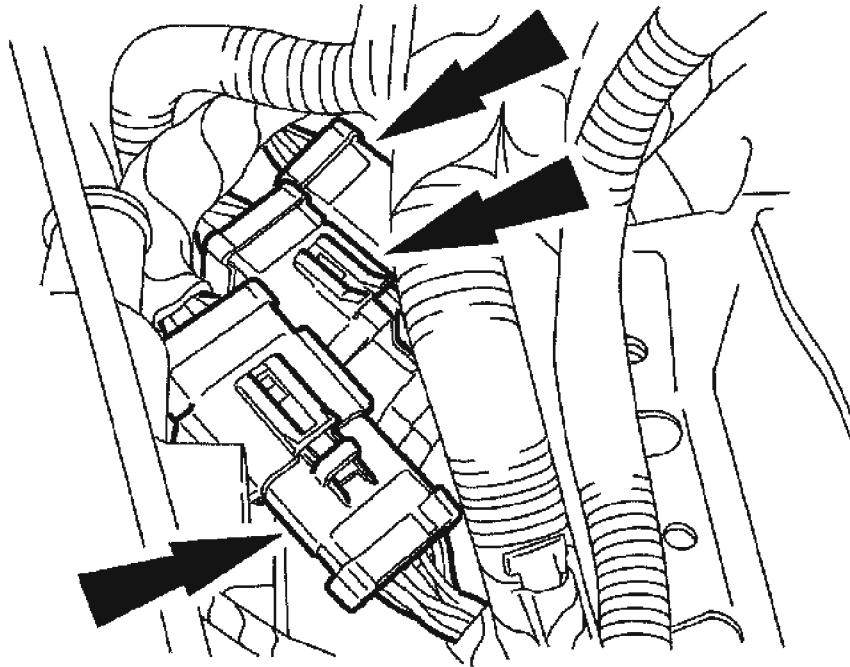


Fig. 537: Attaching Gearshift Cables
Courtesy of FORD MOTOR CO.

51. Adjust the gearshift cables and bleed the clutch system. For additional information, refer to MANUAL TRANSAXLE/TRANSMISSION AND CLUTCH - GENERAL INFORMATION .

All vehicles

52. Connect the three main engine wiring harness connectors and attach the connectors to the bracket.



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Fig. 538: Connecting Main Engine Wiring Harness Connectors And Attach Connectors To Bracket
Courtesy of FORD MOTOR CO.

53. Connect the power distribution harness eyelet and install the nut.

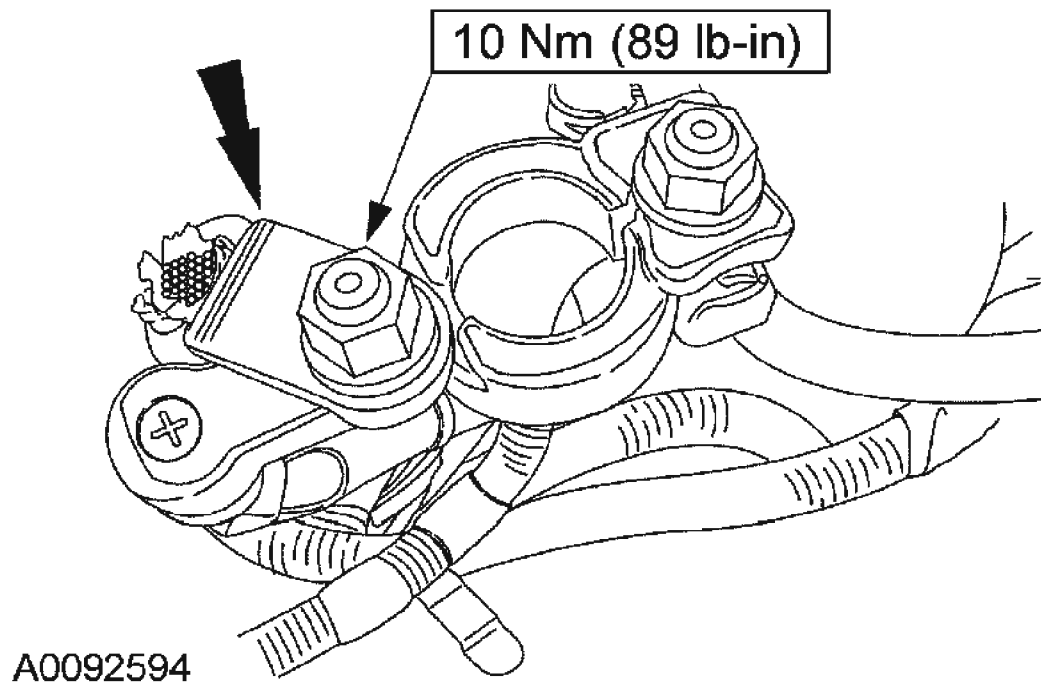


Fig. 539: Connecting Power Distribution Harness Eyelet And Installing Nut
Courtesy of FORD MOTOR CO.

54. Attach the wiring harness retainers.

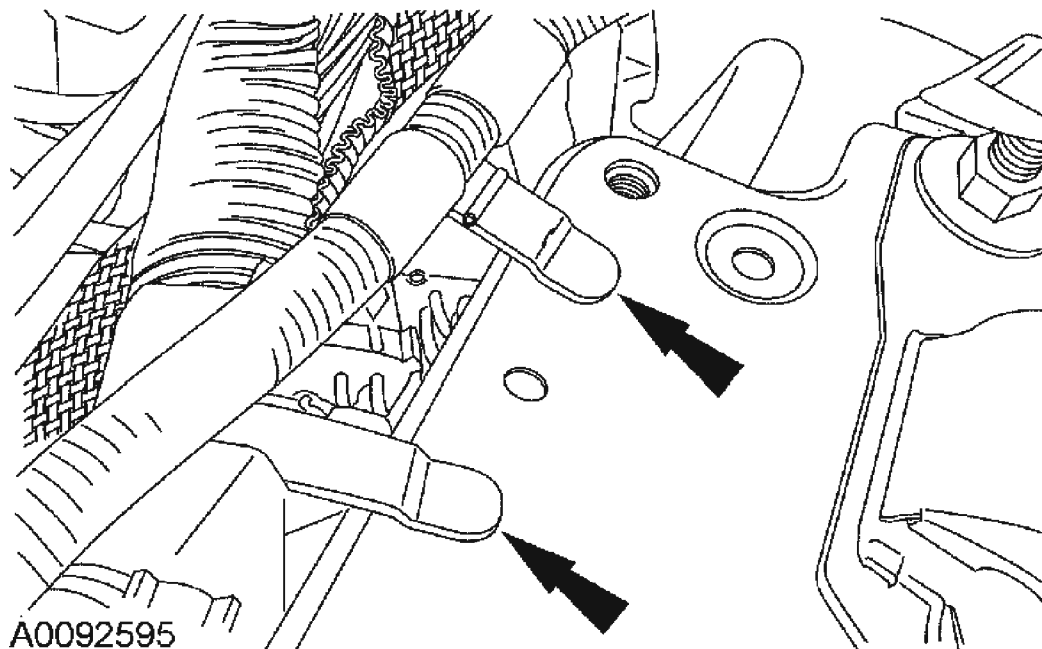


Fig. 540: Attaching Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

55. Connect the power distribution wiring harness electrical connector.

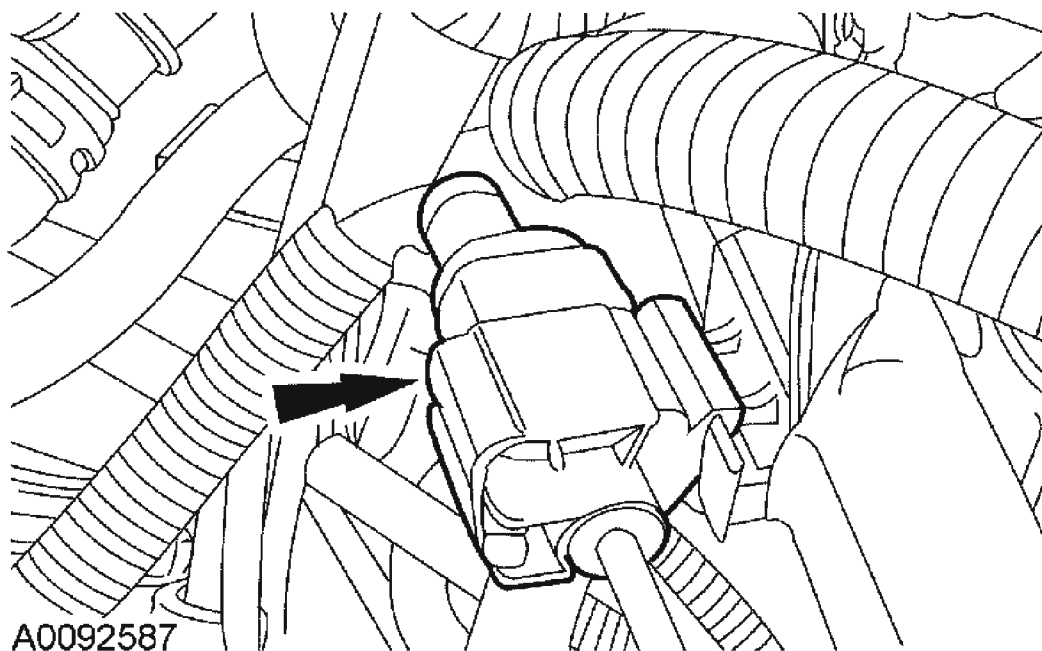


Fig. 541: Connecting Power Distribution Wiring Harness Electrical Connector
Courtesy of FORD MOTOR CO.

56. Connect the fuel charging wiring harness electrical connector.

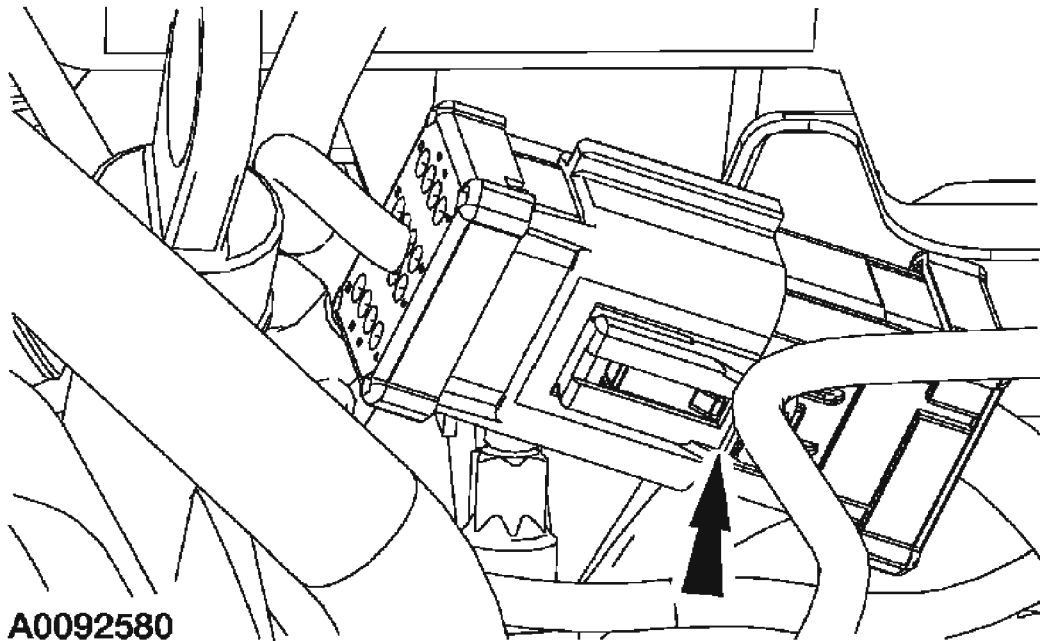


Fig. 542: Connecting Fuel Charging Wiring Harness Electrical Connector
Courtesy of FORD MOTOR CO.

57. Connect the fuel charging wiring harness electrical connector and harness retainer.

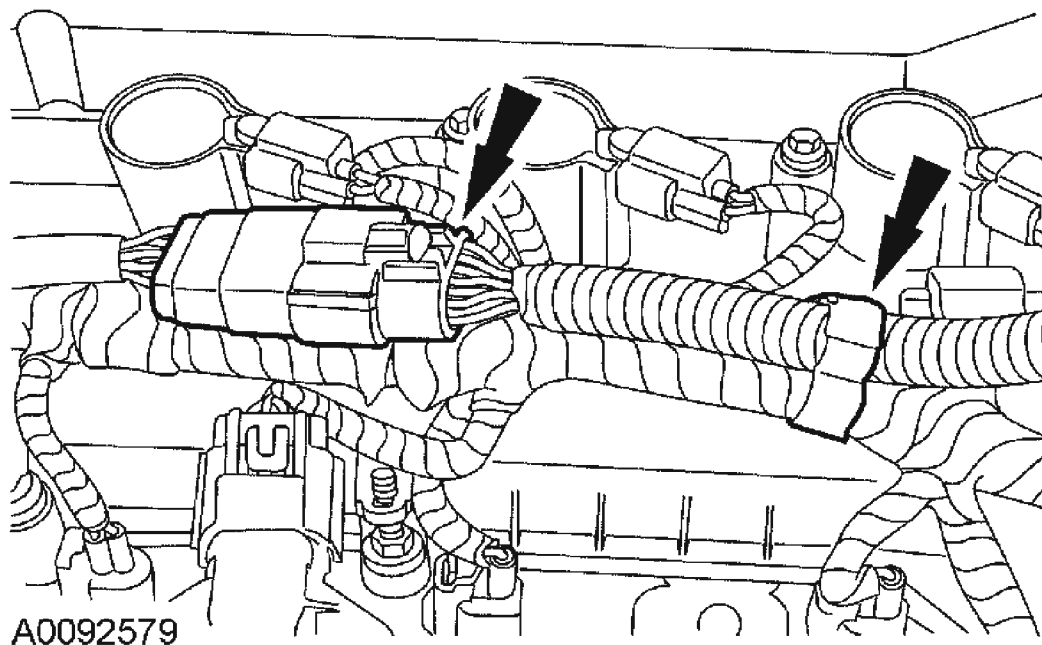


Fig. 543: Connecting Fuel Charging Wiring Harness Electrical Connector And Harness Retainer

Courtesy of FORD MOTOR CO.

58. Install the ground eyelet and bolt.

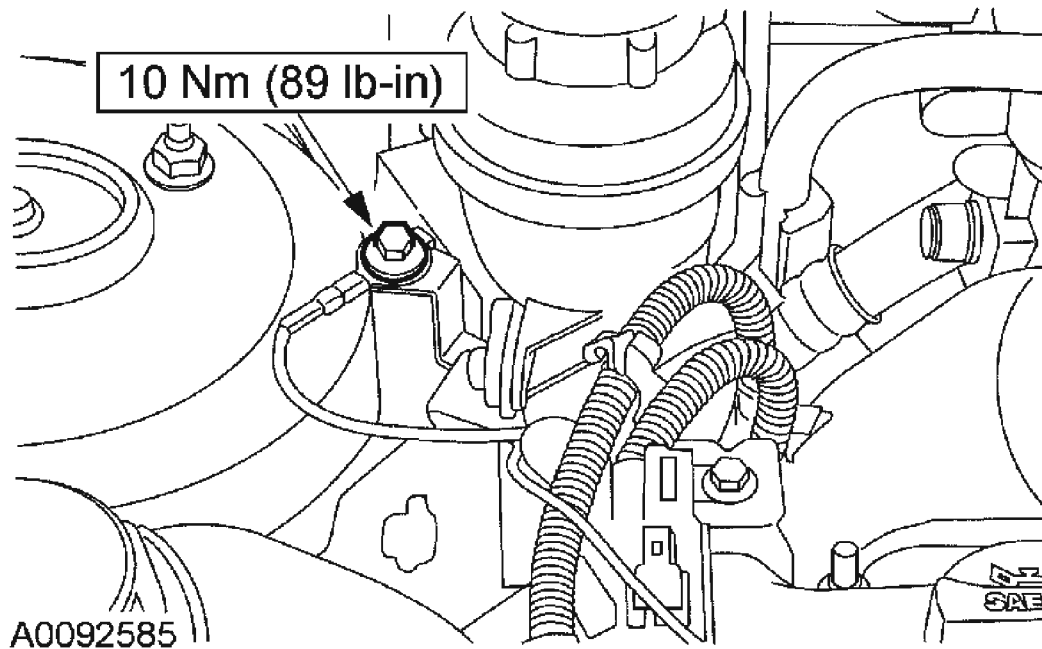


Fig. 544: Installing Ground Eyelet And Bolt
Courtesy of FORD MOTOR CO.

59. Connect the upper radiator hose, the heater hose and the coolant vent hose to the coolant bypass.

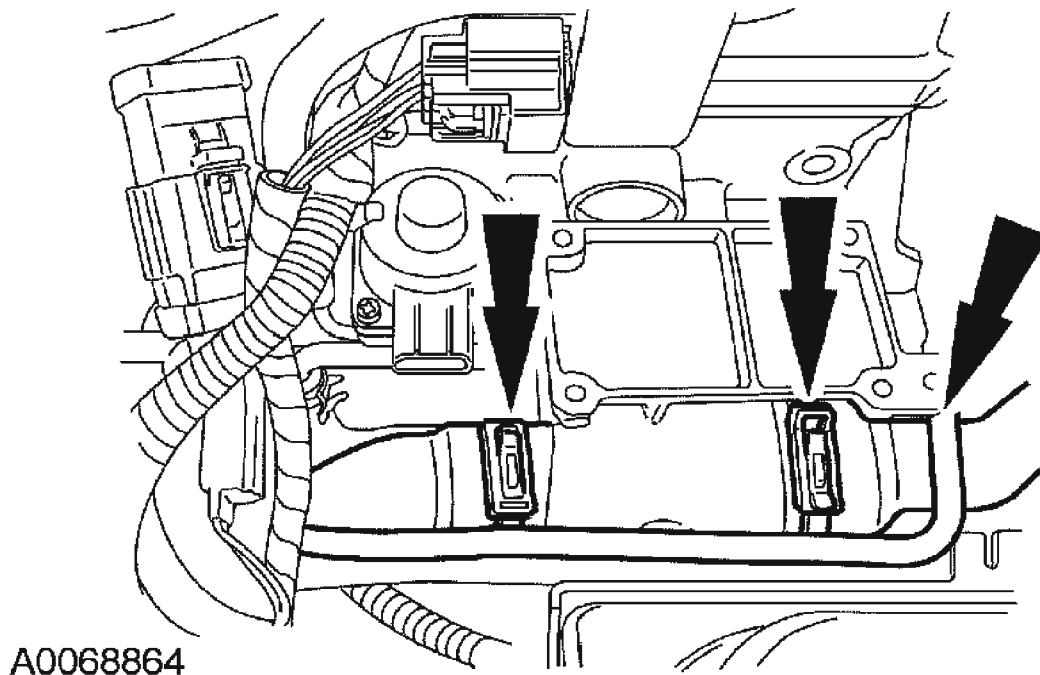


Fig. 545: Connecting Upper Radiator Hose, Heater Hose And Coolant Vent Hose To Coolant Bypass
Courtesy of FORD MOTOR CO.

60. Connect the exhaust gas recirculation (EGR) valve electrical connector.

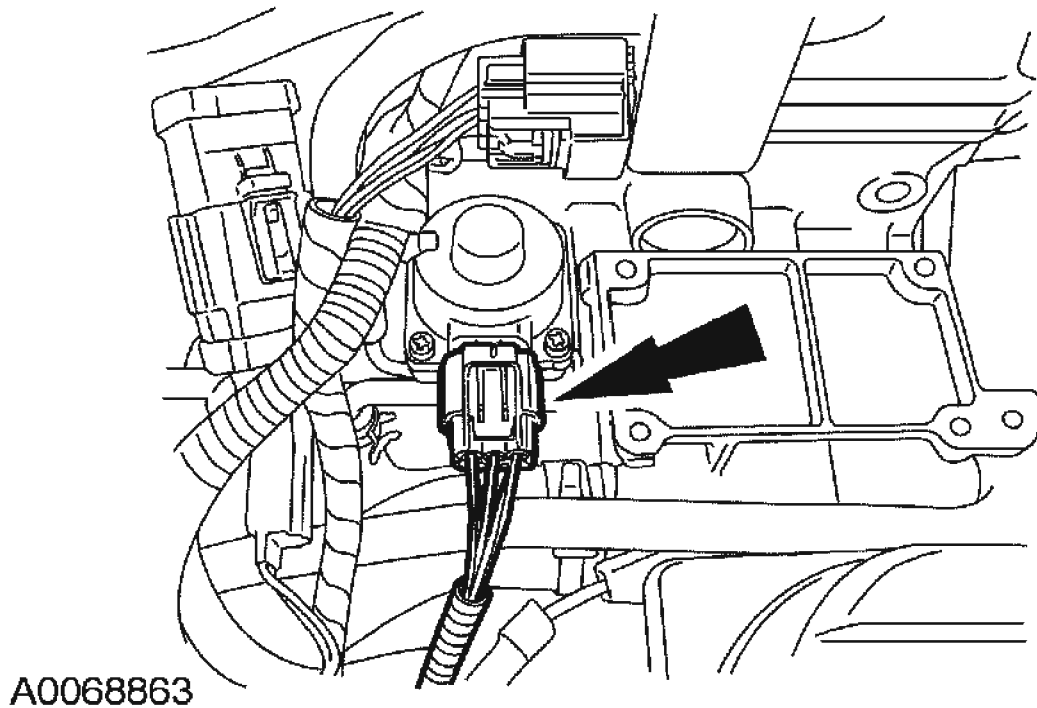


Fig. 546: Connecting Exhaust Gas Recirculation Valve Electrical Connector
Courtesy of FORD MOTOR CO.

61. Install the power brake booster vacuum tube into the quick release fitting.

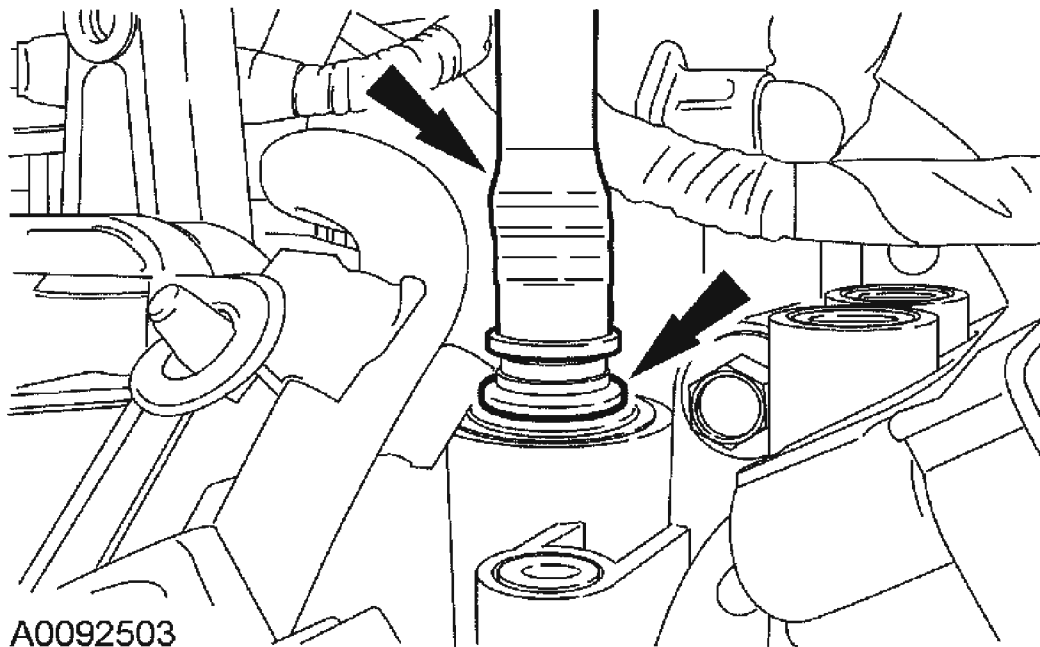


Fig. 547: Installing Power Brake Booster Vacuum Tube Into Quick Release Fitting

Courtesy of FORD MOTOR CO.

62. If equipped, connect the secondary air injection (AIR) vacuum regulator electrical connector.

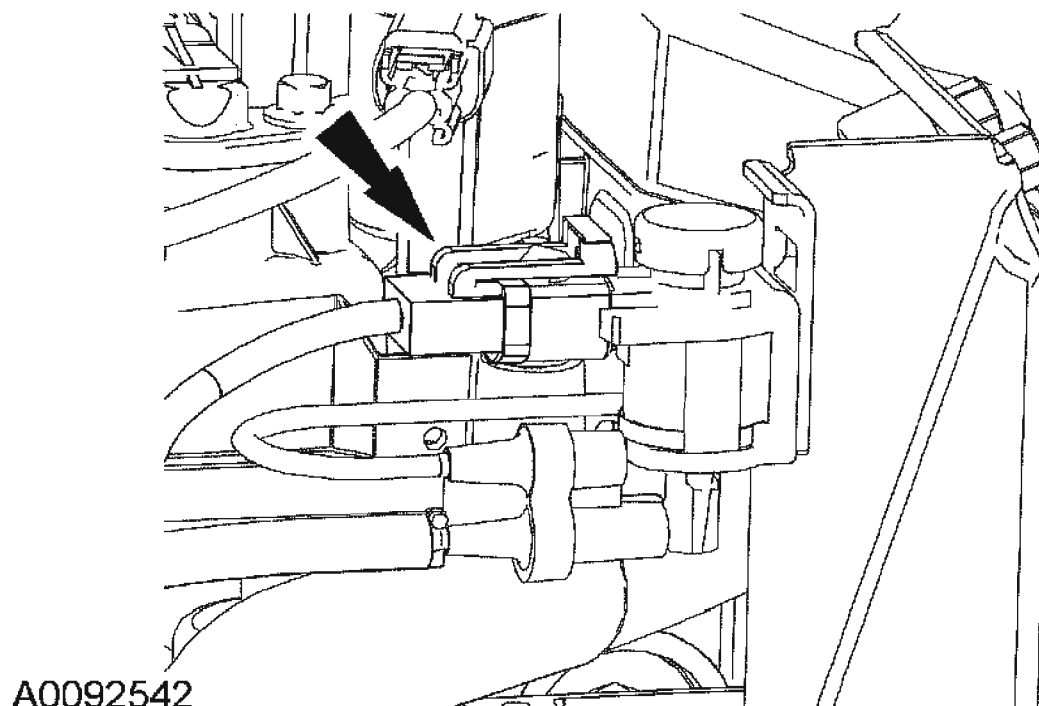


Fig. 548: Connecting Secondary Air Injection Vacuum Regulator Electrical Connector

Courtesy of FORD MOTOR CO.

63. If equipped, connect the AIR hose.

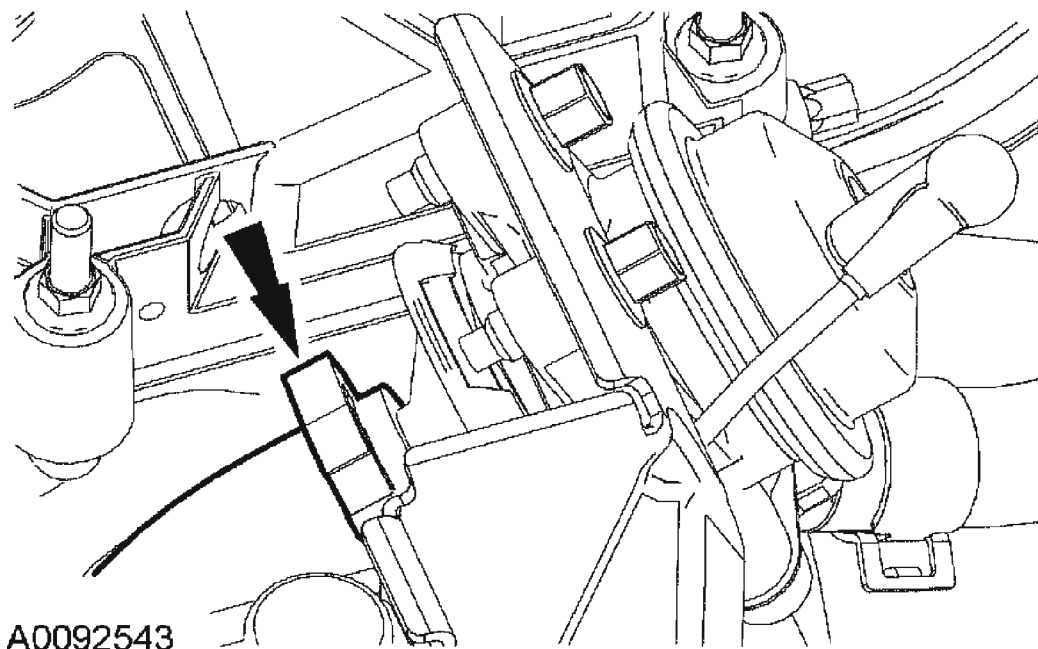


Fig. 549: Connecting Air Hose
Courtesy of FORD MOTOR CO.

64. Connect the evaporative emissions tube.

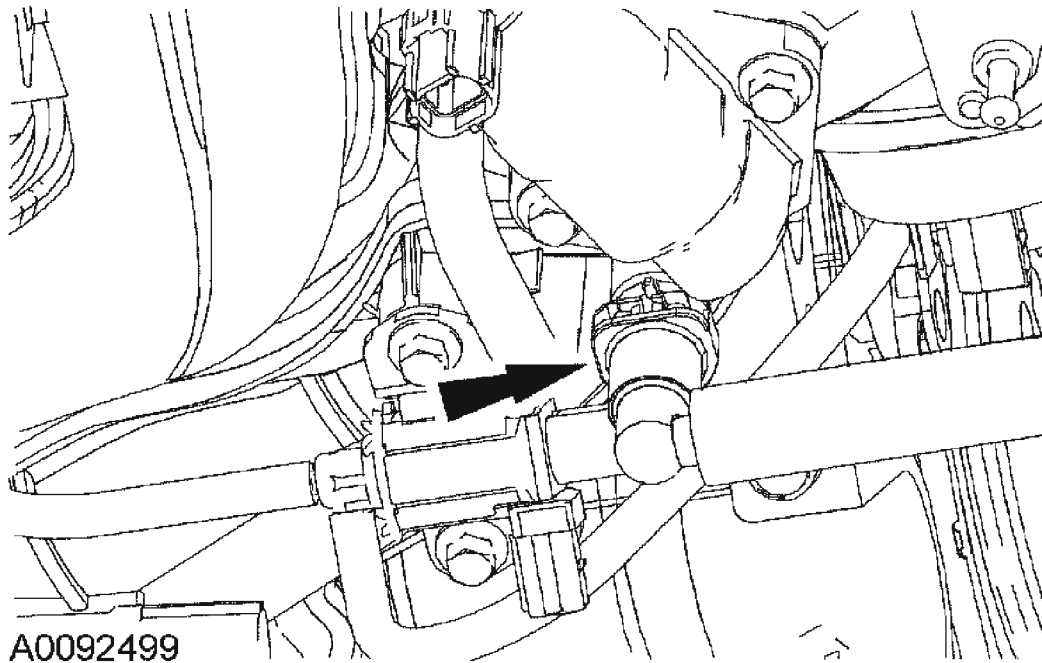
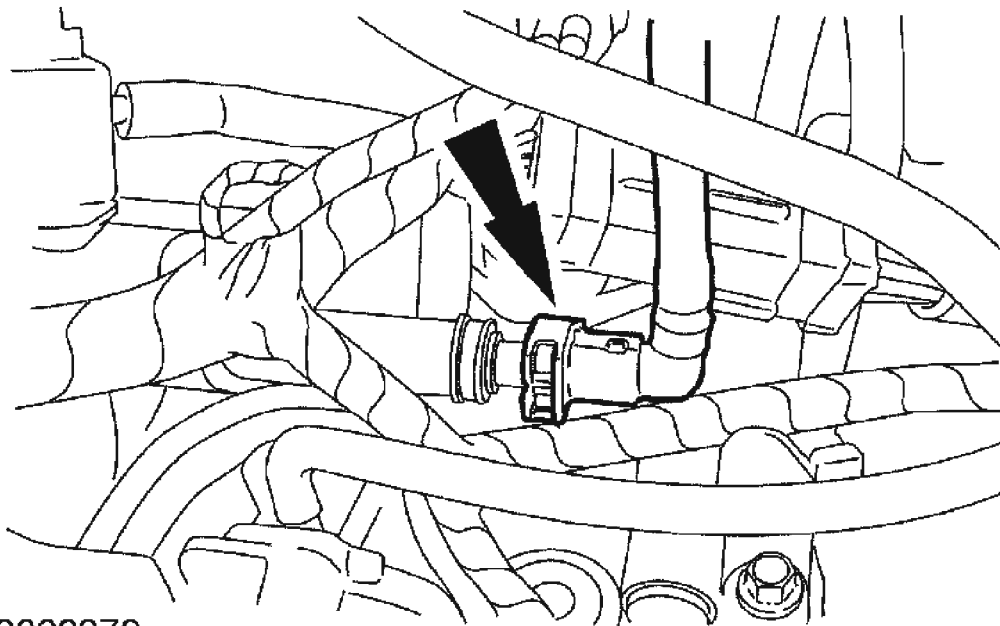


Fig. 550: Connecting Evaporative Emissions Tube
Courtesy of FORD MOTOR CO.

65. Connect the fuel tube quick release coupling onto the fuel rail.



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Fig. 551: Connecting Fuel Tube Quick Release Coupling Onto Fuel Rail
Courtesy of FORD MOTOR CO.

66. Connect the accelerator cable and speed control cable (if equipped).
 1. Install the accelerator cable bracket and bolts.
 2. Connect the accelerator and speed control cable (if equipped) to the throttle body.

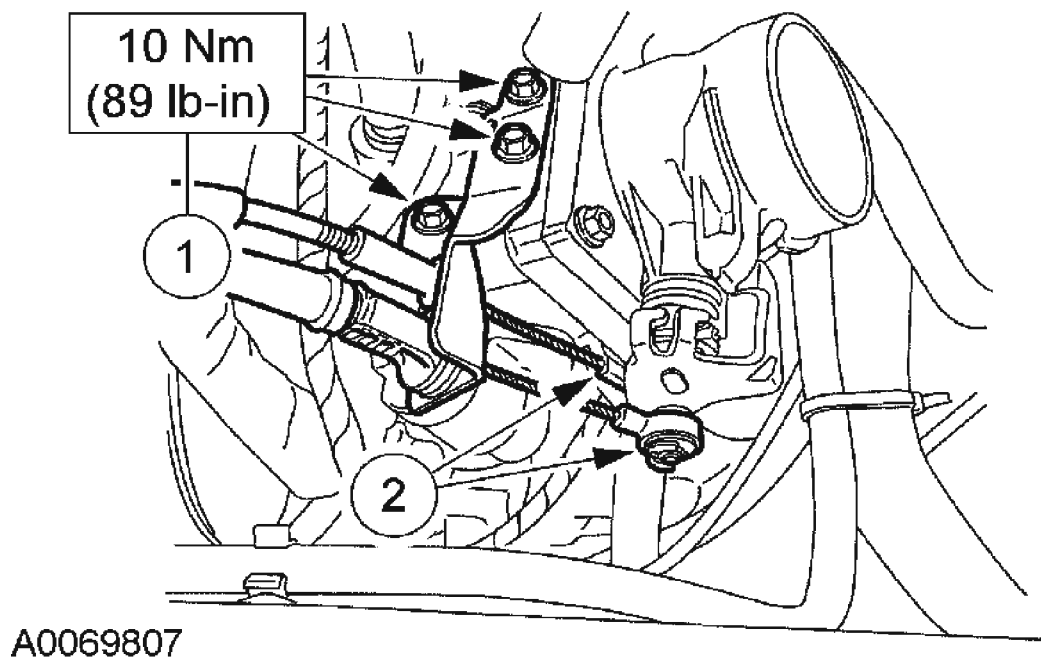


Fig. 552: Connecting Accelerator Cable And Speed Control Cable To Throttle Body

Courtesy of FORD MOTOR CO.

67. Install the accelerator control snow shield.
 - Position the snow shield and install the screw and pin-type retainer.
 - Attach the evaporative emissions hose pin-type retainer.

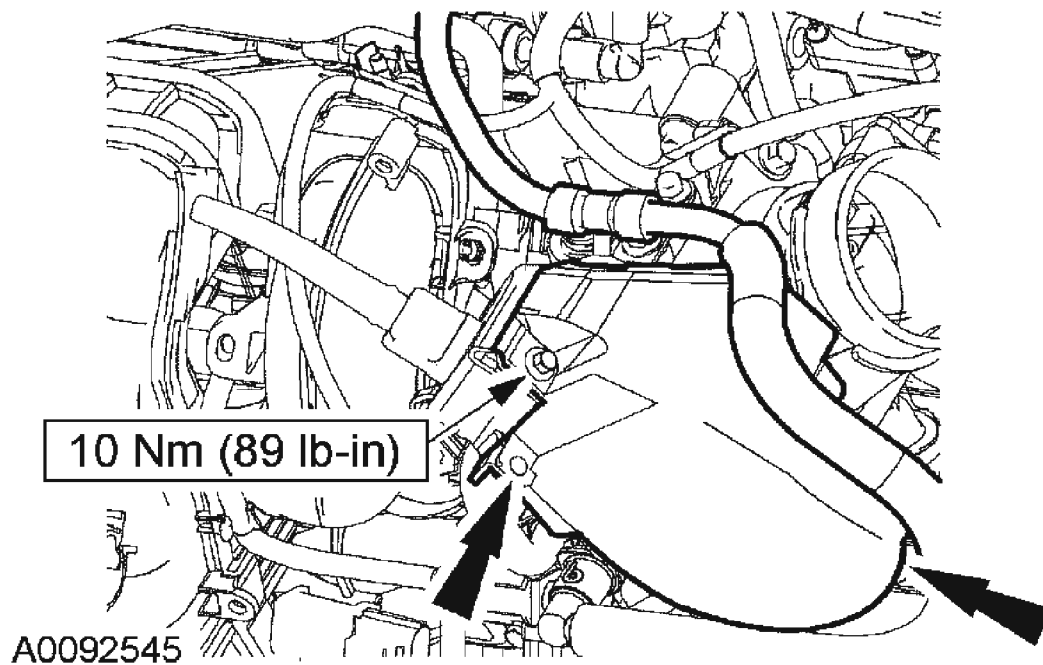


Fig. 553: Installing Accelerator Control Snow Shield
Courtesy of FORD MOTOR CO.

68. Install the air cleaner outlet pipe and air intake resonator into the grommets and install the bolt.

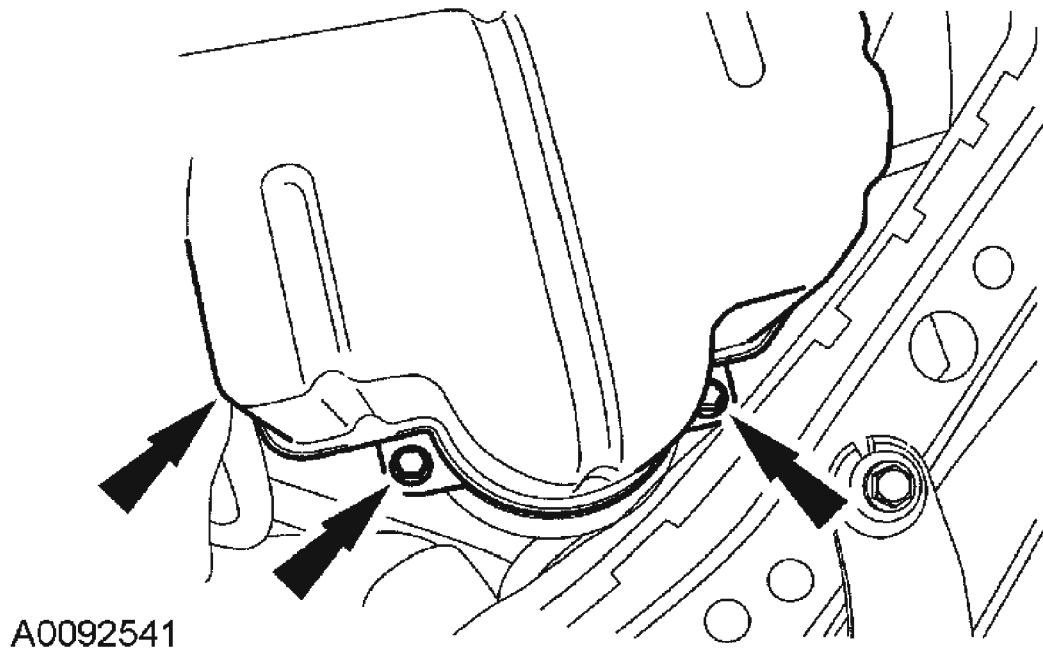


Fig. 554: Installing Air Cleaner Outlet Pipe And Air Intake Resonator Into Grommets And Installing Bolt
Courtesy of FORD MOTOR CO.

69. Tighten the air cleaner outlet pipe and connect the vent tube.

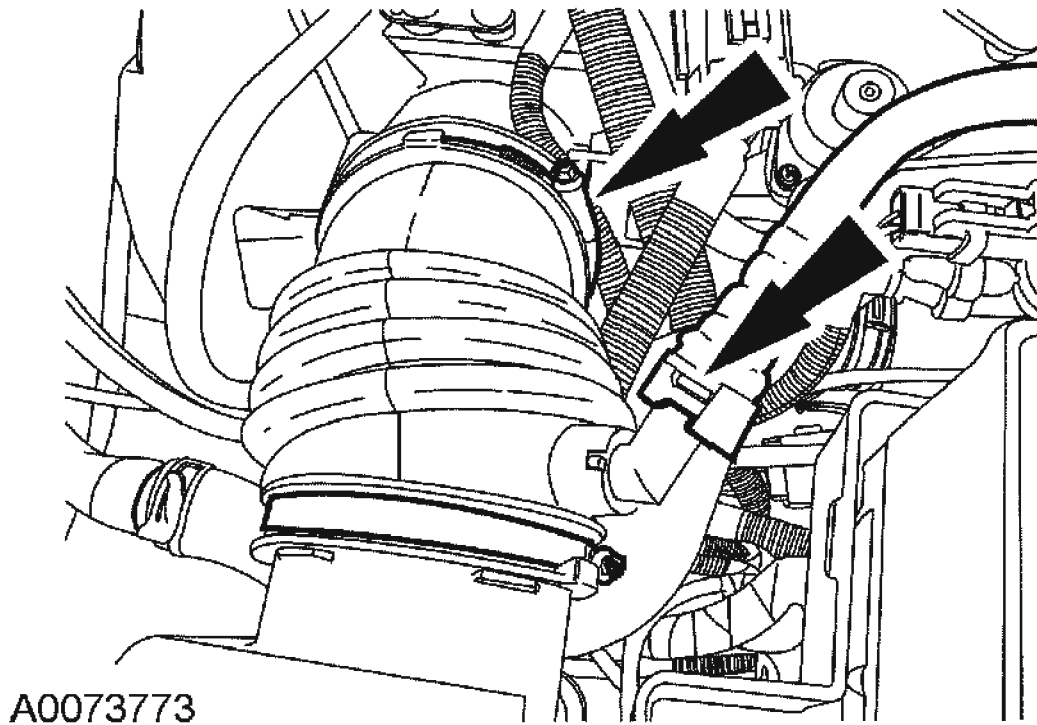
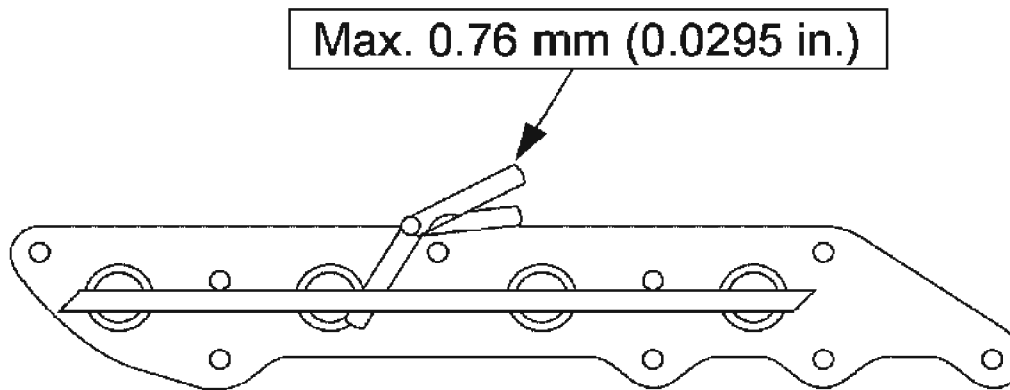


Fig. 555: Tightening Air Cleaner Outlet Pipe And Connecting Vent Tube
Courtesy of FORD MOTOR CO.

70. Clean and inspect the catalytic converter flange.
 - Using a straightedge and a feeler gauge, place the straightedge across the catalytic converter flange surface and check for warping with the feeler gauge. If the reading is greater than the maximum specification, install a new catalytic converter, gasket and nuts.



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Fig. 556: Using Straightedge And Feeler Gauge, Placing Straightedge Across Catalytic Converter Flange Surface And Checking For Warping With Feeler Gauge

Courtesy of FORD MOTOR CO.

71. Using a new gasket and nuts, install the catalytic converter.

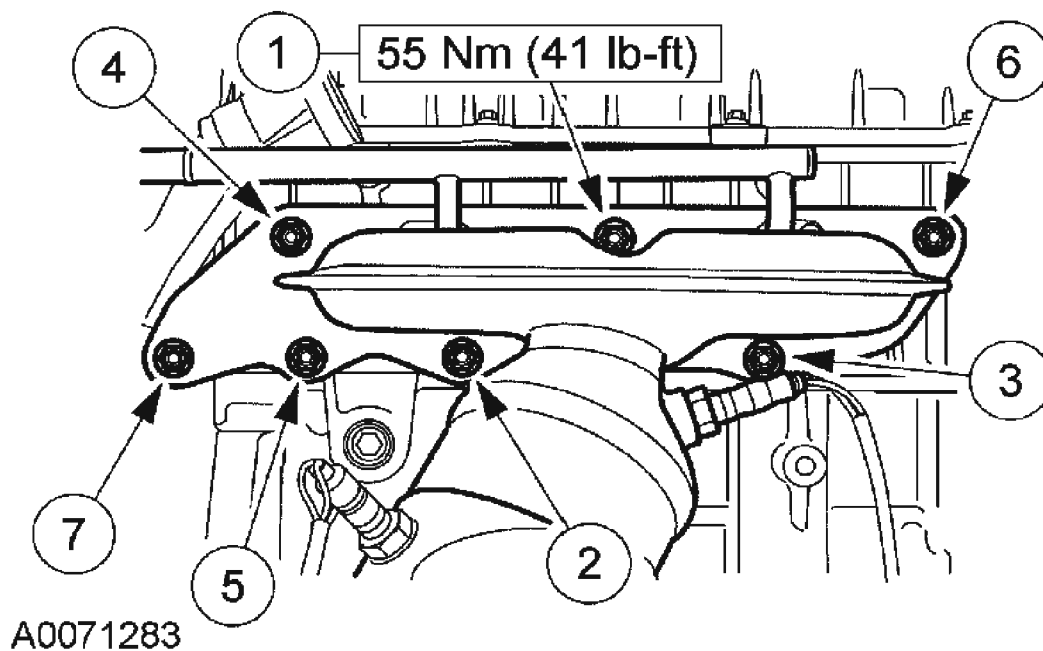


Fig. 557: Using New Gasket And Nuts To Install Catalytic Converter
Courtesy of FORD MOTOR CO.

72. If equipped, connect the AIR hose.

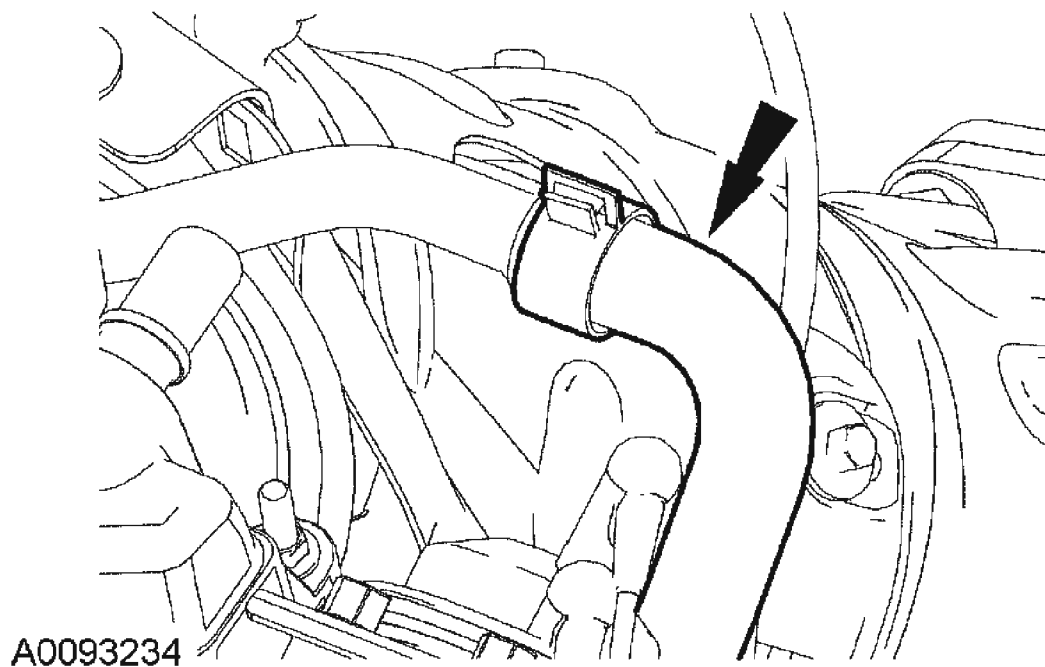


Fig. 558: Connecting Air Hose
Courtesy of FORD MOTOR CO.

73. If equipped, connect the upper exhaust sensor electrical connector and retainer.

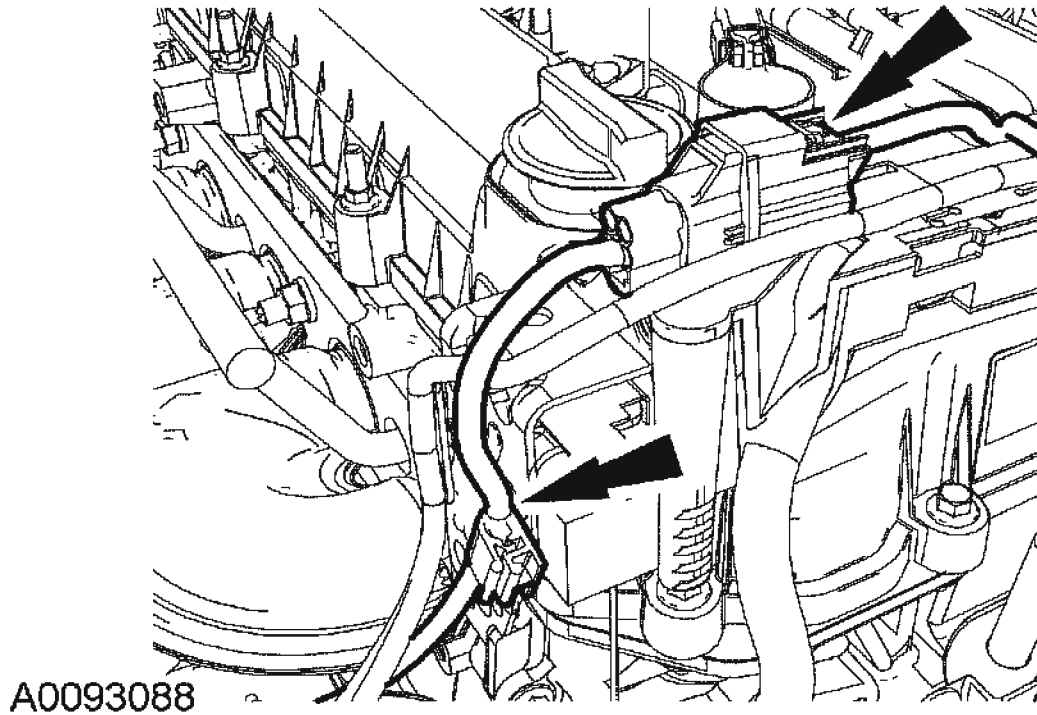


Fig. 559: Connecting Upper Exhaust Sensor Electrical Connector And Retainer
Courtesy of FORD MOTOR CO.

74. Connect the exhaust sensor electrical connectors.

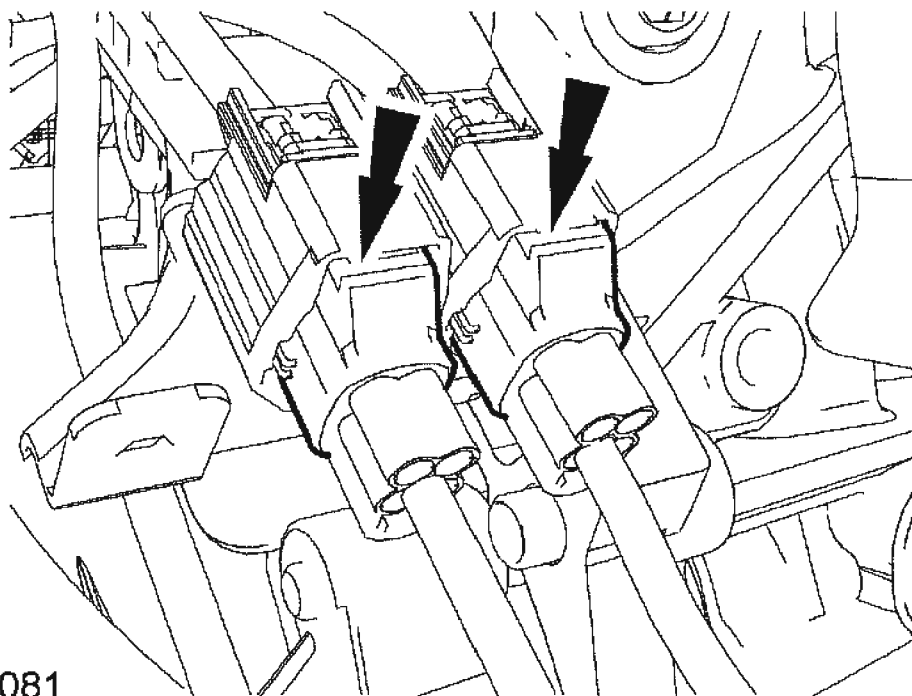


Fig. 560: Connecting Exhaust Sensor Electrical Connectors
Courtesy of FORD MOTOR CO.

75. If removed, install the heat shield and bolts.

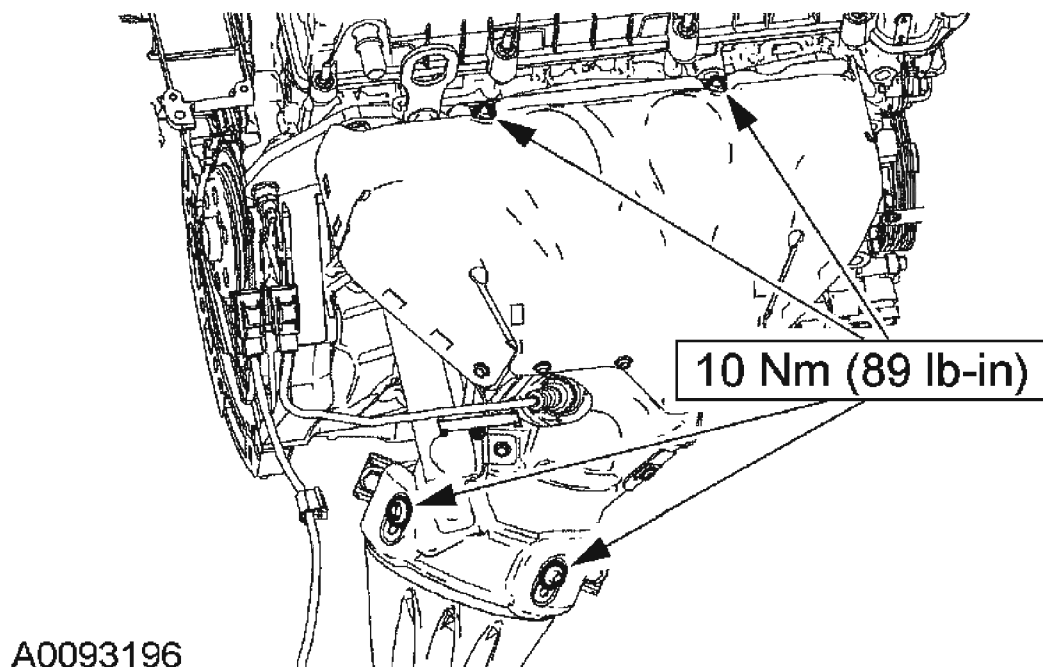


Fig. 561: Installing Heat Shield Bolts
Courtesy of FORD MOTOR CO.

76. Install the catalytic converter support bracket and bolts.

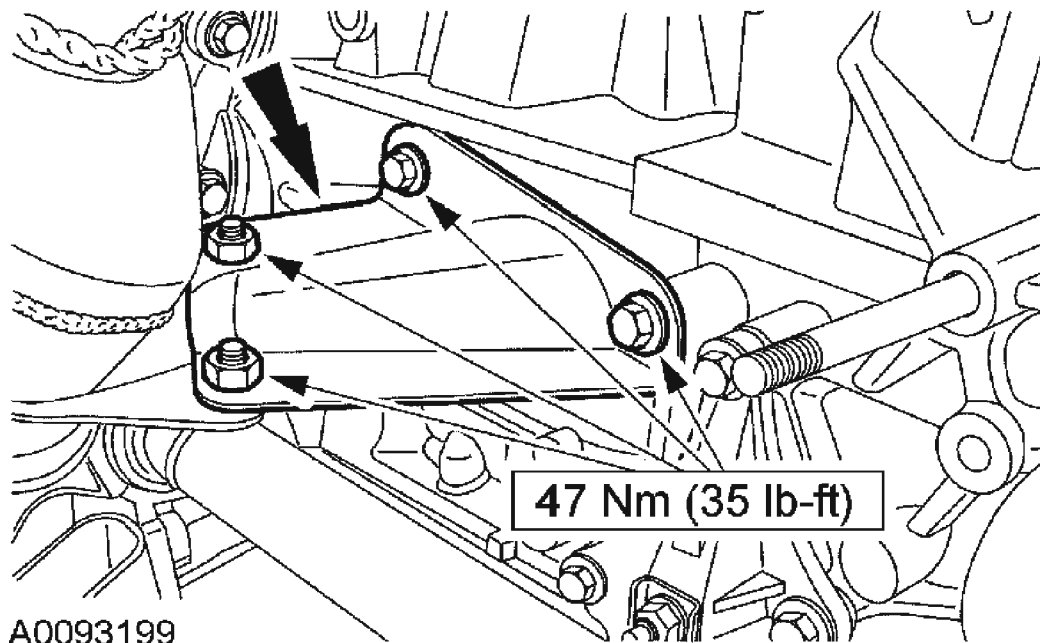
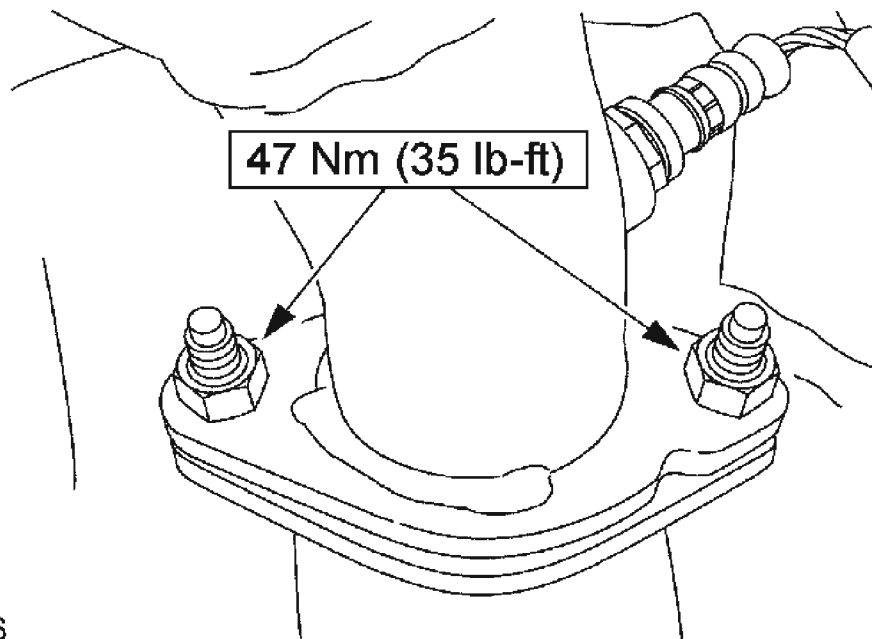


Fig. 562: Installing Catalytic Converter Support Bracket Bolts
Courtesy of FORD MOTOR CO.

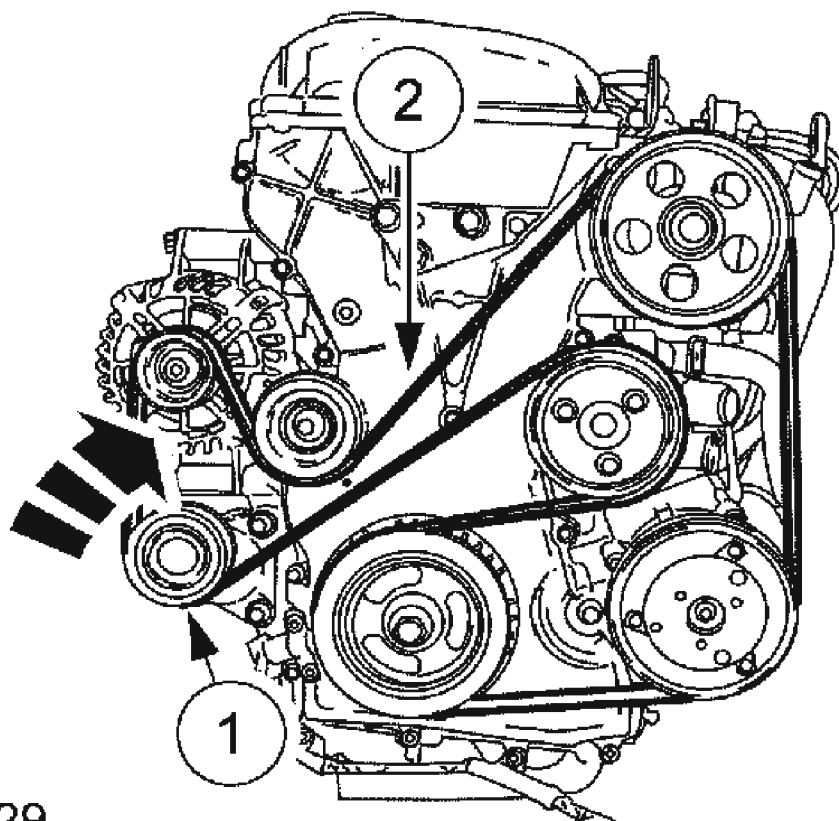
NOTE: Clean the mating surfaces of the muffler assembly and catalytic converter.



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Fig. 563: Installing Catalytic Converter Nuts
Courtesy of FORD MOTOR CO.

77. Using a new gasket and nuts, connect the catalytic converter and muffler assembly.
78. Install the accessory drive belt.
 1. Rotate the tensioner clockwise.
 2. Install the accessory drive belt.



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Fig. 564: Installing Accessory Drive Belt
Courtesy of FORD MOTOR CO.

79. Install the accessory drive belt splash shield.

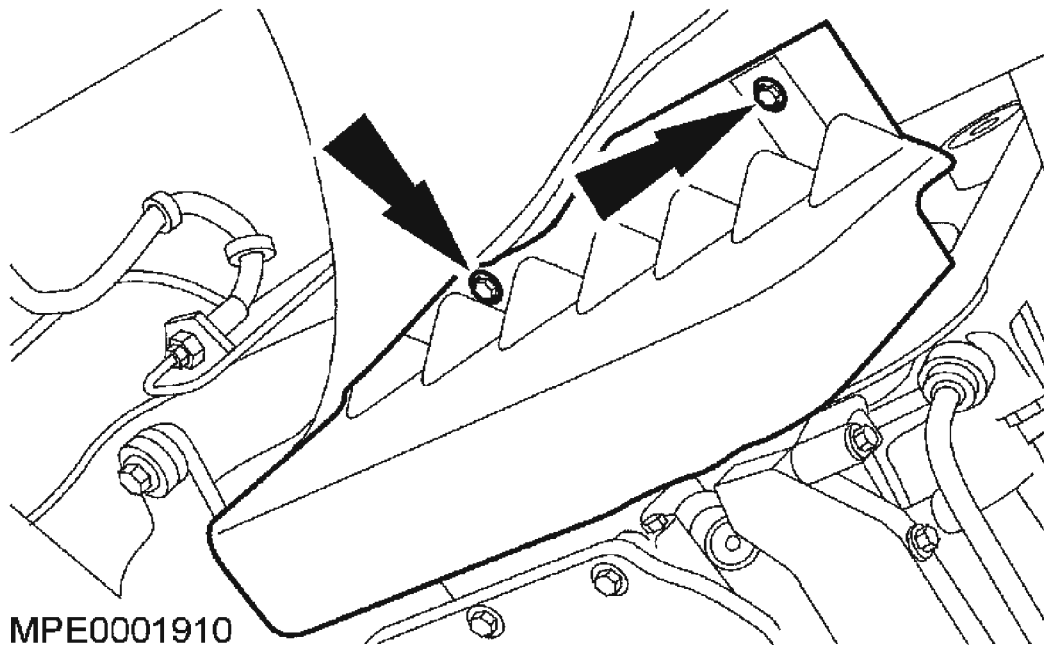


Fig. 565: Installing Accessory Drive Belt Splash Shield
Courtesy of FORD MOTOR CO.

80. Install the battery tray. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
81. Fill the engine with clean engine oil.
82. Fill and bleed the power steering system. For additional information, refer to **STEERING SYSTEM-GENERAL INFORMATION** .
83. Fill and bleed the cooling system. For additional information, refer to **ENGINE COOLING** .

Vehicles equipped with air conditioning

84. Evacuate and charge the A/C system. For additional information, refer to **CLIMATE CONTROL SYSTEM-GENERAL INFORMATION** .