

REMOVAL

ENGINE

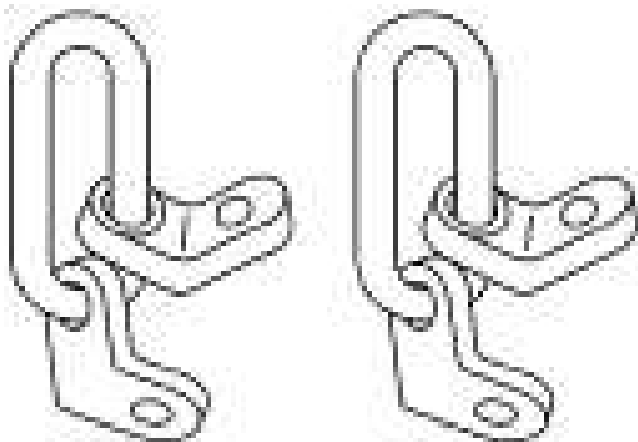
Special Tool(s)

SPECIAL TOOL SPECIFICATION



ST1341-A

Heavy Duty Floor Crane
014-00071 or equivalent



ST1595-A

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



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

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** .
2. Relieve the fuel pressure. For additional information, refer to **FUEL SYSTEM - GENERAL INFORMATION** .
3. Disconnect the battery ground cable. For additional information, refer to **BATTERY, MOUNTING AND CABLES** .
4. Recover the A/C system. For additional information, refer to **CLIMATE CONTROL SYSTEM - GENERAL INFORMATION AND DIAGNOSTICS** .
5. Drain the engine cooling system. For additional information, refer to **ENGINE COOLING** .
6. Drain the engine oil.
7. Remove the hood.
8. Remove the Air Cleaner (ACL) outlet tube. For additional information, refer to **INTAKE AIR DISTRIBUTION & FILTERING** .
9. Remove the upper radiator hose.

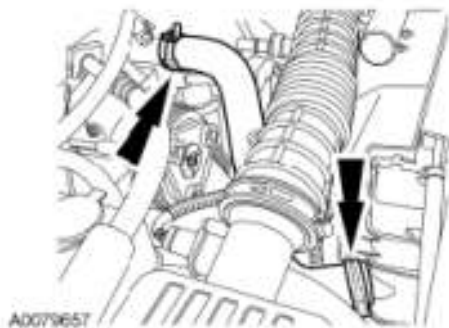


Fig. 110: Identifying Upper Radiator Hose With Clips
Courtesy of FORD MOTOR CO.

10. Remove the lower radiator hose.

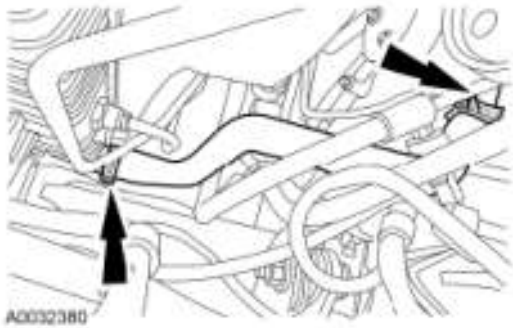


Fig. 111: Identifying Lower Radiator Hose With Clips
Courtesy of FORD MOTOR CO.

11. Remove the fan and shroud. For additional information, refer to **ENGINE COOLING** .
12. Disconnect the 3 PCM electrical connectors. Remove the retaining nut on the harness clamp. Position the harness on the engine.

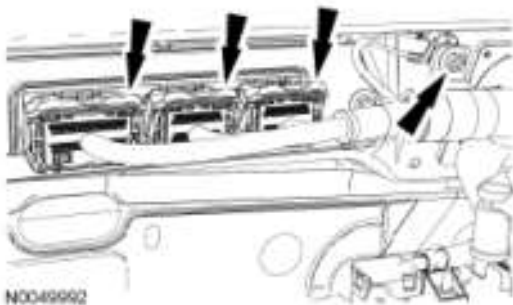


Fig. 112: Locating PCM Electrical Connectors
Courtesy of FORD MOTOR CO.

13. Remove the stud bolt and the ground cable.

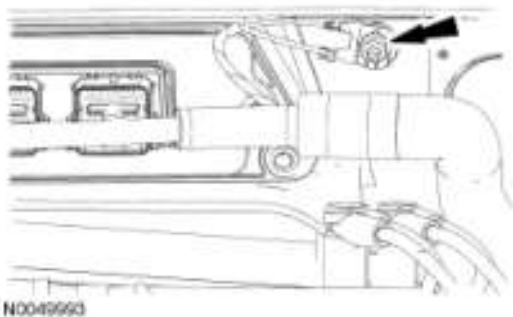


Fig. 113: Locating Stud Bolt And Ground Cable
Courtesy of FORD MOTOR CO.

14. Remove the heater hose assembly.
 1. Disconnect the heater hoses at the bulkhead.
 2. Disconnect the vacuum hose.

3. Disconnect the heater hoses at the engine and remove the assembly.

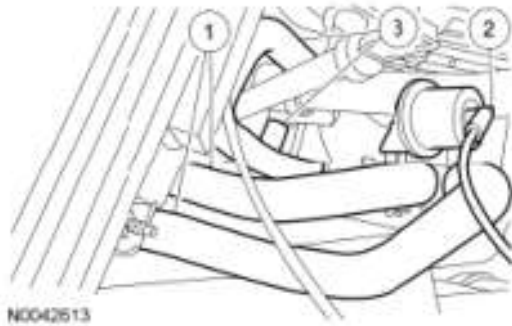


Fig. 114: Identifying Vacuum And Heater Hose
Courtesy of FORD MOTOR CO.

15. Disconnect the vacuum reservoir tube connection.

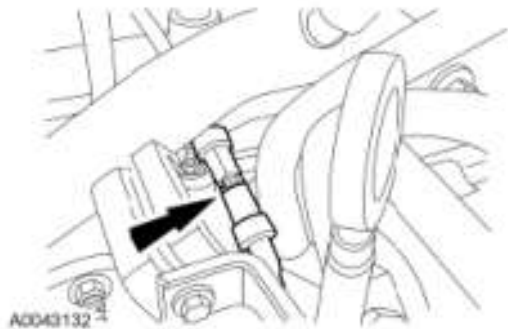


Fig. 115: Locating Vacuum Reservoir Tube Connection
Courtesy of FORD MOTOR CO.

16. Disconnect the engine-to-degas bottle coolant bypass hose.

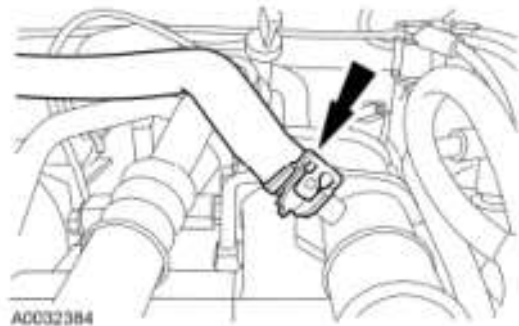


Fig. 116: Locating Engine-To-Degas Bottle Coolant Bypass Hose
Courtesy of FORD MOTOR CO.

17. Disconnect the degas bottle-to-engine coolant supply hose.



Fig. 117: Locating Engine Coolant Supply Hose
Courtesy of FORD MOTOR CO.

18. Disconnect the A/C compressor electrical connector.

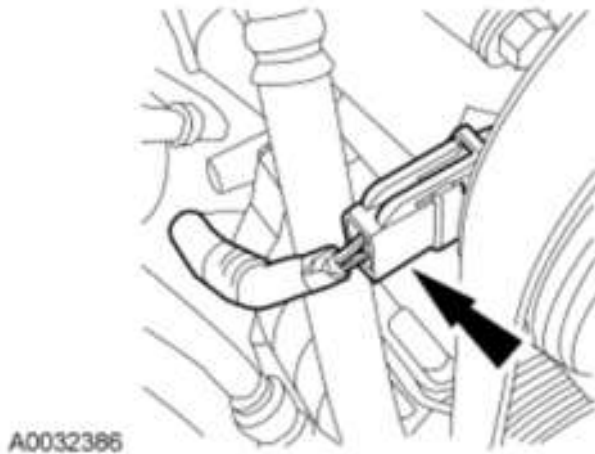


Fig. 118: Locating A/C Compressor Electrical Connector
Courtesy of FORD MOTOR CO.

19. Disconnect the Mass Air Flow (MAF) electrical connector.

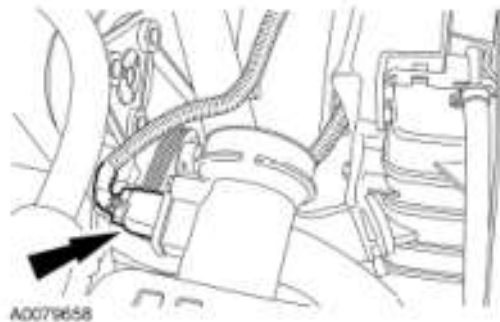


Fig. 119: Locating Mass Air Flow Electrical Connector
Courtesy of FORD MOTOR CO.

20. Disconnect the A/C compressor manifold. Plug the lines and the compressor ports.

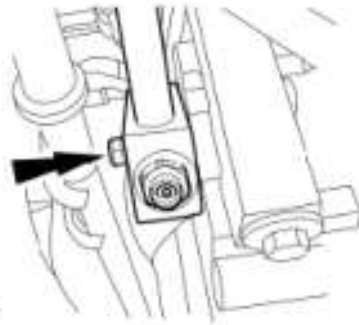


Fig. 120: Locating A/C Compressor Manifold
Courtesy of FORD MOTOR CO.

21. Disconnect the accelerator cable and, if equipped, the speed control cable from the Throttle Body (TB) and the cable mounting bracket and position aside.

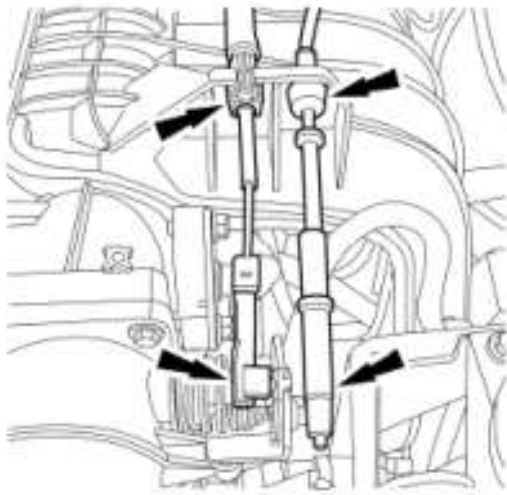


Fig. 121: Identifying Accelerator Cable Mounting Bracket
Courtesy of FORD MOTOR CO.

22. Disconnect and position aside the Power Steering Pressure (PSP) switch electrical connector and the high-pressure power steering tube.



Fig. 122: Locating Power Steering Pressure Switch Electrical Connector And High-Pressure

Power Steering Tube

Courtesy of FORD MOTOR CO.

23. Disconnect the fuel supply tube spring lock coupling. For additional information, refer to FUEL SYSTEM - GENERAL INFORMATION .
24. Detach the fuel supply tube, disconnect the electrical connectors and disconnect the evaporative purge tube quick connect coupling. For additional information, refer to FUEL SYSTEM - GENERAL INFORMATION .



Fig. 123: Locating Evaporative Purge Tube Quick Connect Coupling
Courtesy of FORD MOTOR CO.

25. Disconnect the brake booster vacuum hose and the engine ground strap.

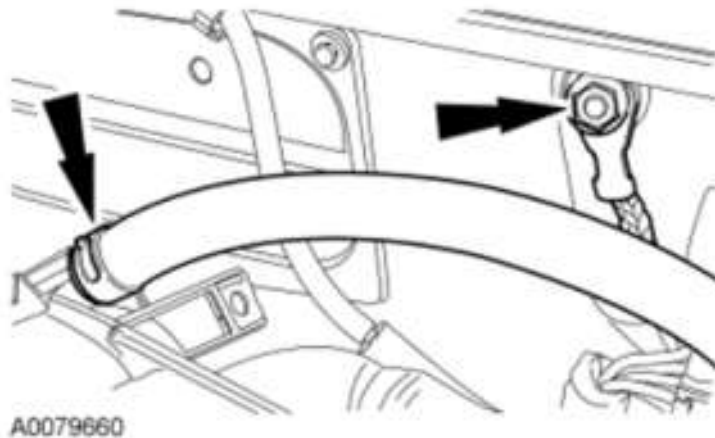


Fig. 124: Locating Brake Booster Vacuum Hose And Engine Ground Strap
Courtesy of FORD MOTOR CO.

26. Remove the 3 nuts and disconnect the positive battery cable, the negative battery cable and the solenoid control wire at the starter.



Fig. 125: Locating Positive And Negative Battery Cable
Courtesy of FORD MOTOR CO.

27. Remove the starter wiring harness support bracket bolt and position the wiring harness aside.

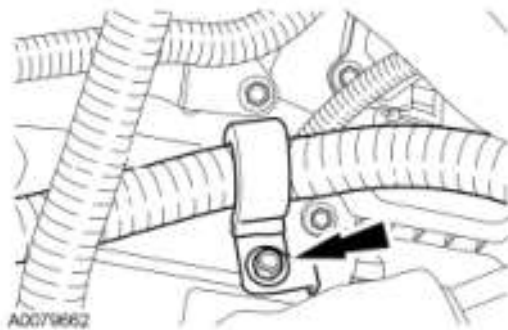


Fig. 126: Locating Starter Wiring Harness Support Bracket And Bolt
Courtesy of FORD MOTOR CO.

28. Remove the 3 rear pushpins and position the RH splash shield aside.

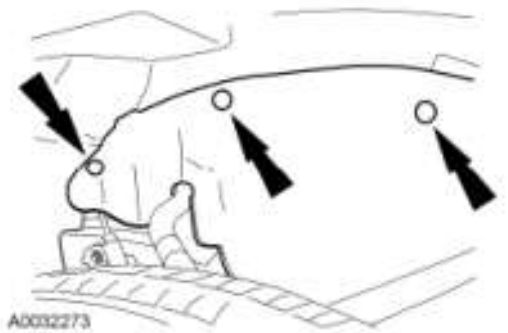


Fig. 127: Locating Rear Pushpins
Courtesy of FORD MOTOR CO.

29. Disconnect the generator electrical connections.

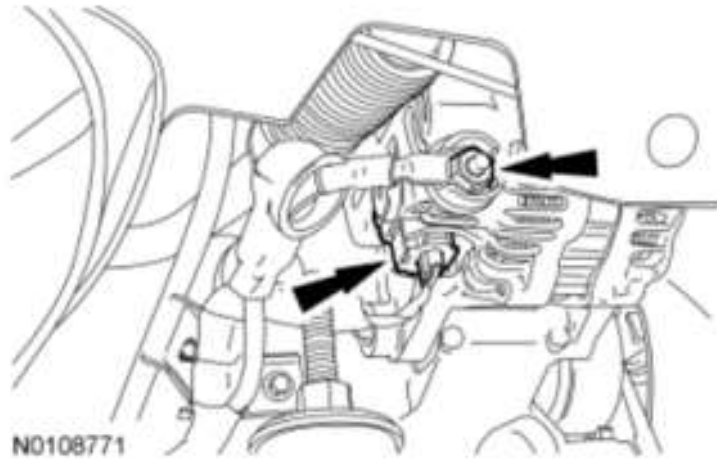


Fig. 128: Locating Generator Electrical Connections
Courtesy of FORD MOTOR CO.

30. Detach generator wiring pin-type retainer.



Fig. 129: Locating Generator Wiring Pin-Type Retainer
Courtesy of FORD MOTOR CO.

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

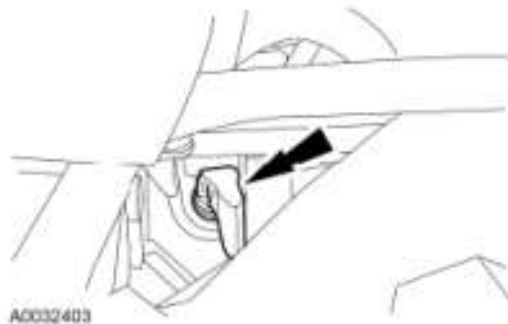


Fig. 130: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

32. Disconnect the front Heated Oxygen Sensor (HO2S) electrical connector at the transmission bell housing.

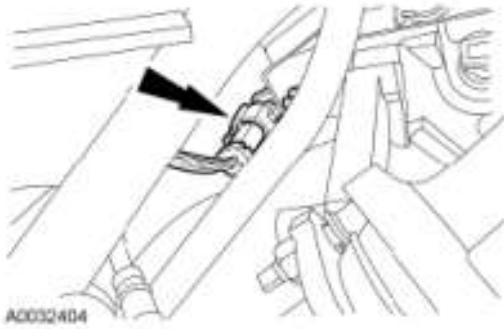


Fig. 131: Locating Front Heated Oxygen Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

Vehicles with an automatic transmission

33. Remove the bolt and the transmission cooling tubes retaining bracket.

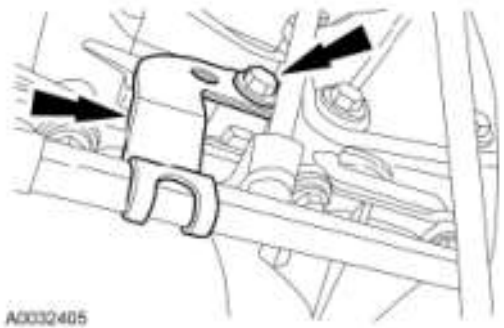


Fig. 132: Locating Transmission Cooling Tubes Retaining Bracket
Courtesy of FORD MOTOR CO.

All vehicles

34. Remove the bolt and the transmission dust shield.



Fig. 133: Locating Transmission Dust Shield
Courtesy of FORD MOTOR CO.

35. Remove the 2 exhaust manifold-to-front pipe nuts.

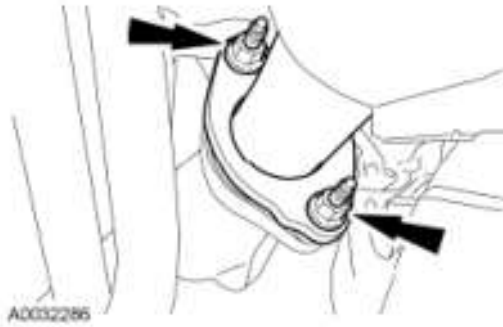


Fig. 134: Locating Exhaust Manifold-To-Front Pipe Nuts
Courtesy of FORD MOTOR CO.

36. Disconnect the engine wiring harness anchor and the pin-type retainer and position the wiring harness aside.

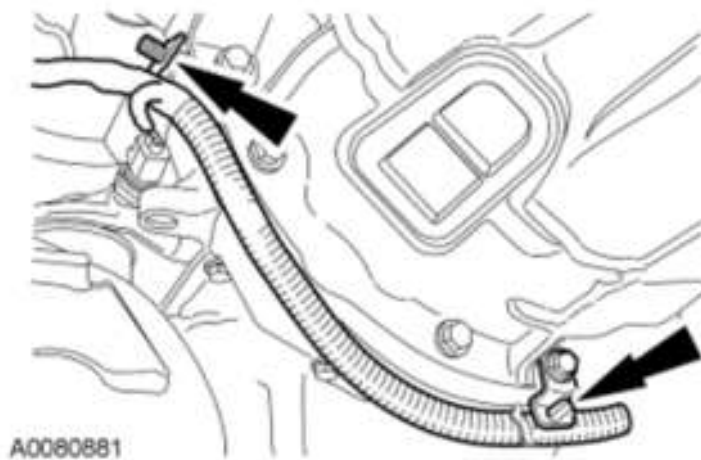


Fig. 135: Locating Engine Wiring Harness Anchor And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

37. Disconnect the Engine Oil Pressure (EOP) sensor electrical connector.

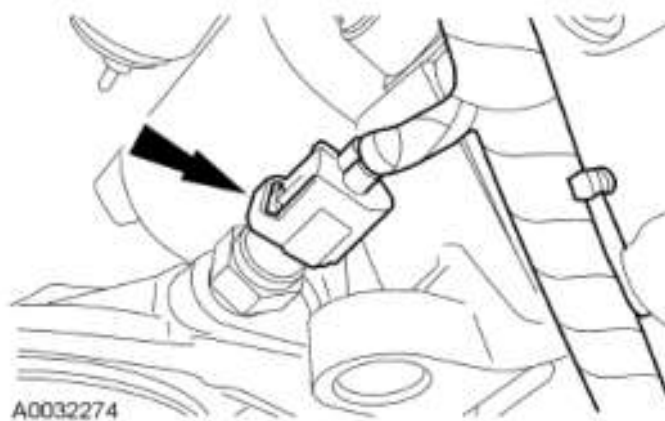


Fig. 136: Locating Engine Oil Pressure Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

38. Remove and discard the engine oil filter.

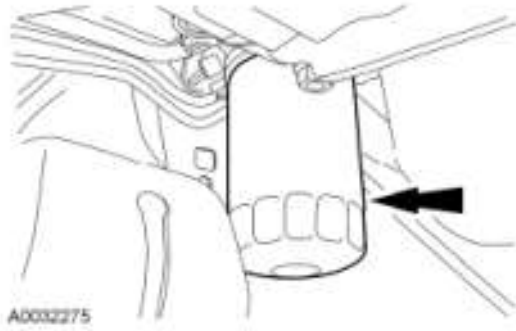


Fig. 137: Locating Engine Oil Filter
 Courtesy of FORD MOTOR CO.

39. Detach the wiring harness from the crossmember and disconnect the electrical connector. Route the wiring harness to the transmission.

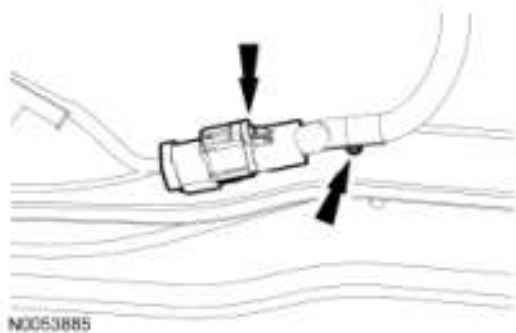


Fig. 138: Locating Electrical Connector
 Courtesy of FORD MOTOR CO.

Vehicles with an automatic transmission

40. Disconnect the rear **HO2S** electrical connector.

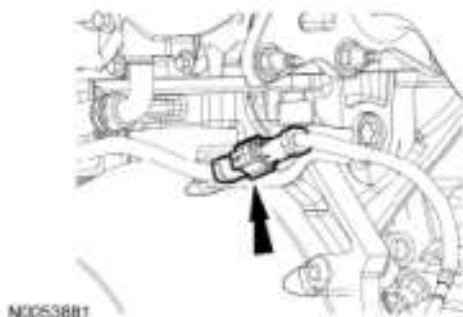


Fig. 139: Locating HO2S Electrical Connector
 Courtesy of FORD MOTOR CO.

41. Disconnect the Catalyst Monitor Sensor (CMS) electrical connector. Remove the nut and route the wiring harness over the transmission.

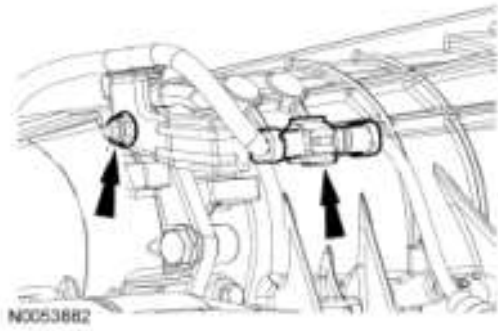


Fig. 140: Locating Catalyst Monitor Sensor Electrical Connector
 Courtesy of FORD MOTOR CO.

42. Disconnect the transmission electrical connectors and detach the wiring harness retainers.

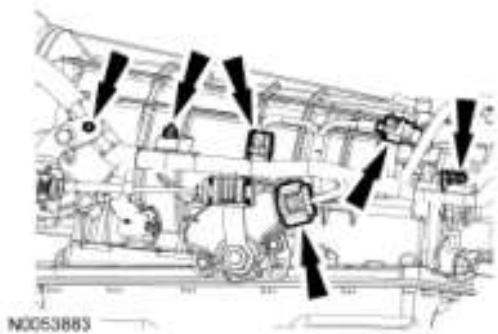


Fig. 141: Locating Transmission Electrical Connectors
 Courtesy of FORD MOTOR CO.

43. Detach the wiring harness retainers.

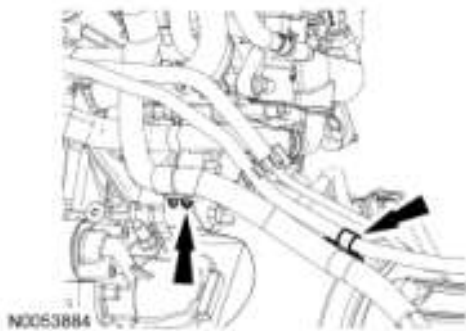


Fig. 142: Locating Wiring Harness Retainers
 Courtesy of FORD MOTOR CO.

Vehicles with a manual transmission

44. Disconnect the **HO2S** electrical connector.

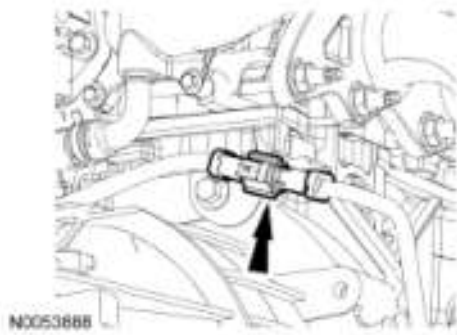


Fig. 143: Locating HO2S Electrical Connector
Courtesy of FORD MOTOR CO.

45. Disconnect the CMS electrical connector. Remove the nut and route the wiring harness over the transmission.

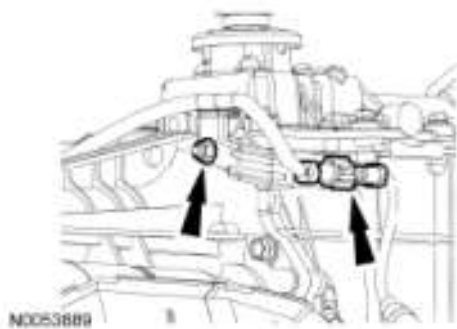


Fig. 144: Locating CMS Electrical Connector
Courtesy of FORD MOTOR CO.

46. Disconnect the transmission electrical connectors and detach the wiring harness retainers.

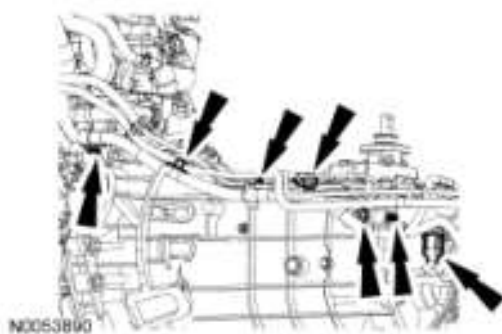


Fig. 145: Locating Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

All vehicles

47. Route the transmission portion of the wiring harness to the engine.
48. Remove the 4 bolts and the oil filter adapter.

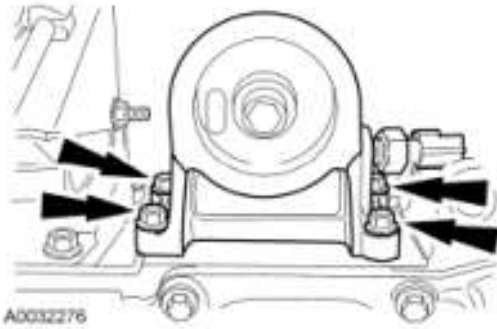


Fig. 146: Locating Oil Filter Adapter Bolts
 Courtesy of FORD MOTOR CO.

49. Remove the bolt, the 2 stud bolts and the starter.

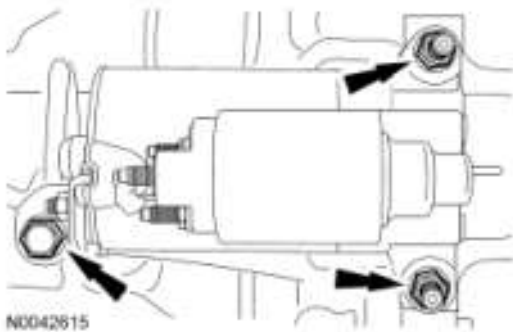


Fig. 147: Locating Starter, Stud Bolts And Nuts
 Courtesy of FORD MOTOR CO.

50. Remove the starter dust shield.

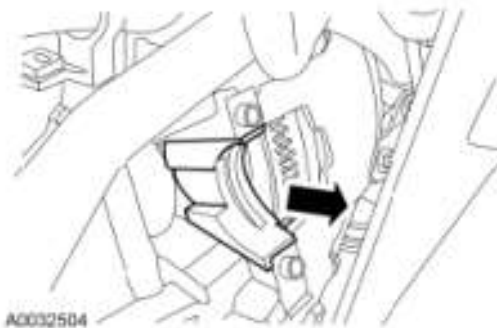


Fig. 148: Locating Starter Dust Shield
 Courtesy of FORD MOTOR CO.

Vehicles with an automatic transmission

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

Remove the 4 torque converter nuts.

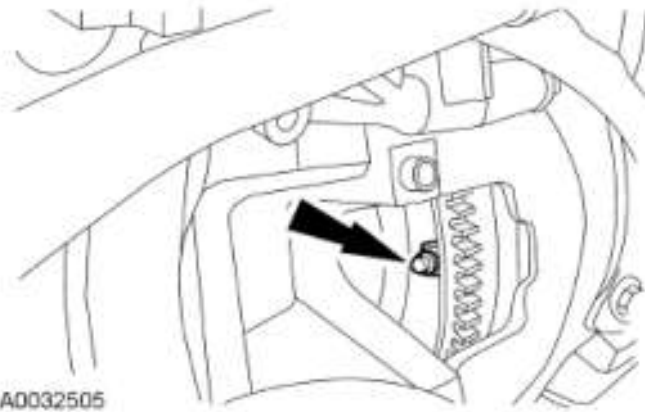


Fig. 149: Locating Torque Converter Nuts
 Courtesy of FORD MOTOR CO.

All vehicles

52. **NOTE:** Leave the 2 side bolts in until the engine is ready to be removed.

Remove 9 of the transmission-to-engine bolts.

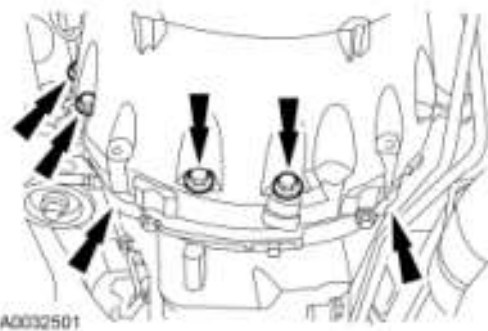


Fig. 150: Locating Transmission-To-Engine Bolts
 Courtesy of FORD MOTOR CO.

Vehicles with an automatic transmission

53. Remove the transmission fluid indicator and tube assembly.

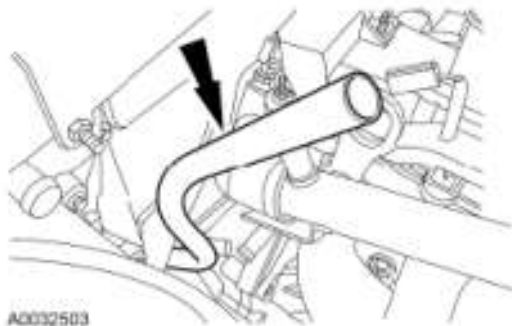


Fig. 151: Locating Transmission Fluid Indicator And Tube Assembly
 Courtesy of FORD MOTOR CO.

All vehicles

54. Install the 2 Engine Lifting Brackets.



Fig. 152: Installing Engine Lifting Brackets
Courtesy of FORD MOTOR CO.

55. Support the transmission with a floor jack.
56. Support the engine with the Floor Crane, using the Spreader Bar.



Fig. 153: Supporting Engine With Floor Crane
Courtesy of FORD MOTOR CO.

57. Remove the 2 side transmission-to-engine bolts.
58. **NOTE: Left side shown in illustration, right side similar.**

Remove the 4 engine support insulator nuts.

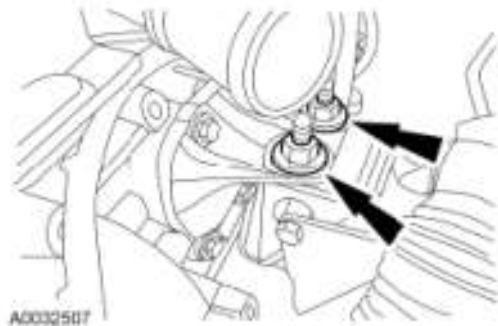


Fig. 154: Locating Engine Support Insulator Nuts
Courtesy of FORD MOTOR CO.

59. Remove the engine from the vehicle.