



REMOVAL

ENGINE

Special Tool(s)

ENGINE SPECIAL TOOL REFERENCE CHART

 <p>ST1341-A</p>	<p>2,200# Floor Crane, Fold Away 300-OTC1819E</p>
 <p>ST1377-A</p>	<p>Lifting Bracket, Engine 303-F047 (014-00073)</p>

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

WARNING: Before working on or disconnecting any of the fuel tubes or fuel

system components, relieve the fuel system pressure to prevent accidental spraying of fuel. Fuel in the fuel system remains under high pressure, even when the engine is not running. Failure to follow this instruction may result in serious personal injury.

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

NOTE: Index-mark the hood hinge location to aid in hood installation.

NOTE: RH shown in the figure below, LH similar.

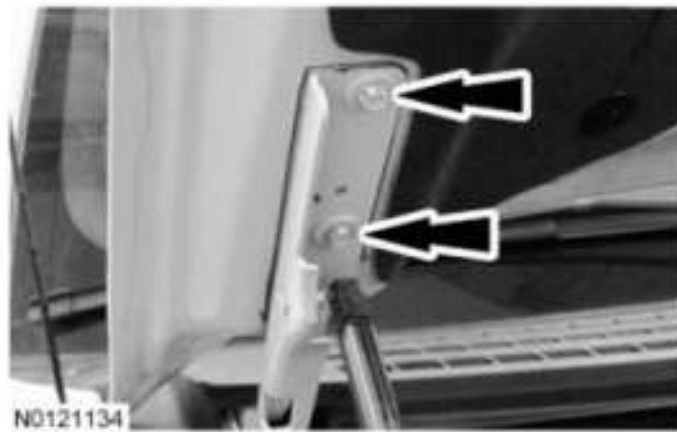


Fig. 463: Locating Hood Mounting Bolts
Courtesy of FORD MOTOR CO.

2. Remove the 4 bolts (2 shown in the figure below) and the hood.
3. Release the fuel system pressure. For additional information, refer to FUEL SYSTEM - GENERAL INFORMATION.
4. Disconnect the battery ground cable. For additional information, refer to BATTERY, MOUNTING AND CABLES.

NOTE: If the engine is repaired or replaced because of upper engine failure, typically including valve or piston damage, check the intake manifold for metal debris. If metal debris is found, install a new intake manifold. Failure to follow these instructions can result in engine damage.

5. Remove the intake manifold. For additional information, refer to INTAKE MANIFOLD.
6. Disconnect the Mass Air Flow (MAF) sensor electrical connector.

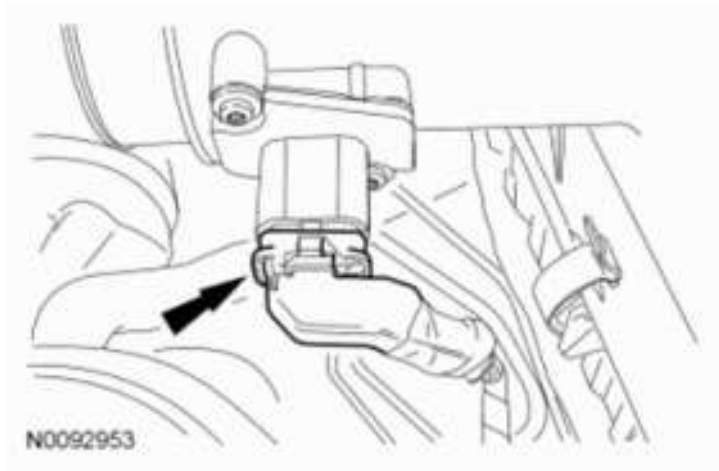


Fig. 464: Locating Mass Air Flow (MAF) Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

7. Remove the Air Cleaner (ACL) upper tray and the ACL element. For additional information, refer to **INTAKE AIR DISTRIBUTION AND FILTERING** .
8. Remove the cooling module. For additional information, refer to **ENGINE COOLING** .
9. Disconnect the A/C pressure transducer electrical connector.

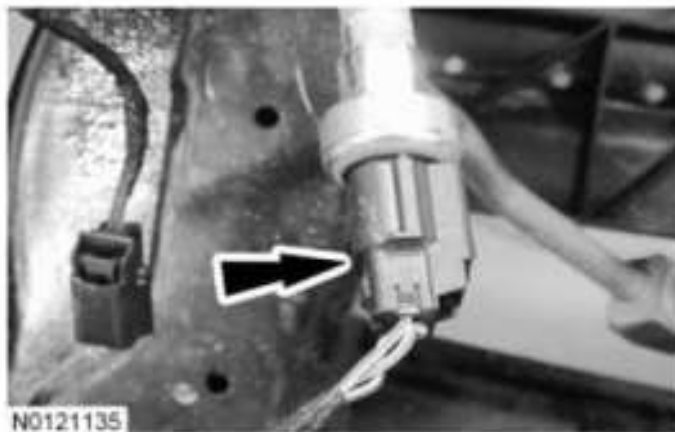


Fig. 465: Locating A/C Pressure Transducer Electrical Connector
Courtesy of FORD MOTOR CO.

10. Disconnect the wiring harness electrical connector and pin-type retainer.
 - Position the Power Distribution Box (PDB) and wiring harness aside.

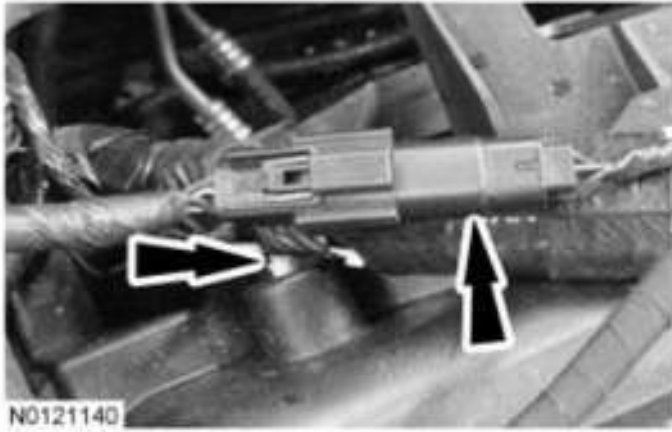


Fig. 466: Locating Wiring Harness Electrical Connector And Pin-Type Retainer
Courtesy of FORD MOTOR CO.

11. Remove the nut and disconnect the A/C tube.
 - Discard the O-ring seal and gasket.

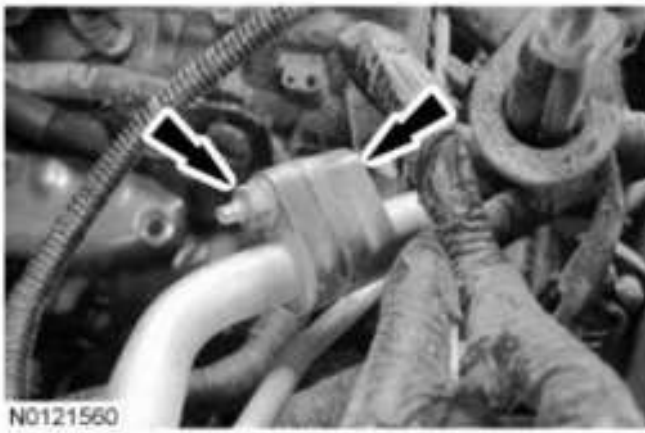


Fig. 467: Locating A/C Tube O-Ring Seal And Gasket
Courtesy of FORD MOTOR CO.

12. Remove the nut and the transmission cooler line bracket from the engine front cover stud bolt.



Fig. 468: Locating Transmission Cooler Line Bracket Mounting Nut
Courtesy of FORD MOTOR CO.

13. Remove the bolt and the ground wire from the RH frame rail.

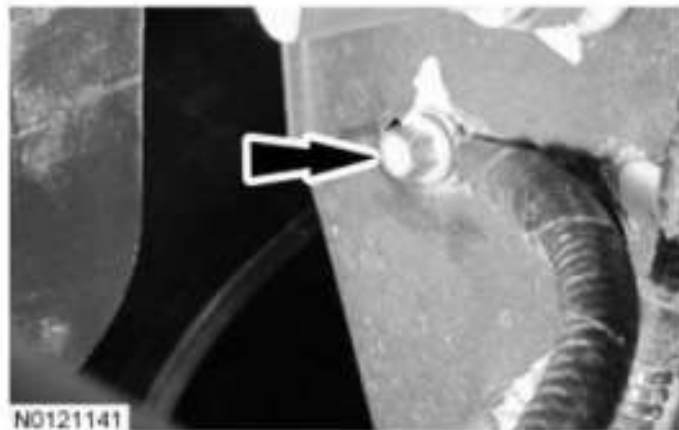


Fig. 469: Locating Frame Rail Ground Wire Mounting Bolt
Courtesy of FORD MOTOR CO.

14. Remove the bolt and the wiring harness bracket from the RH frame rail.

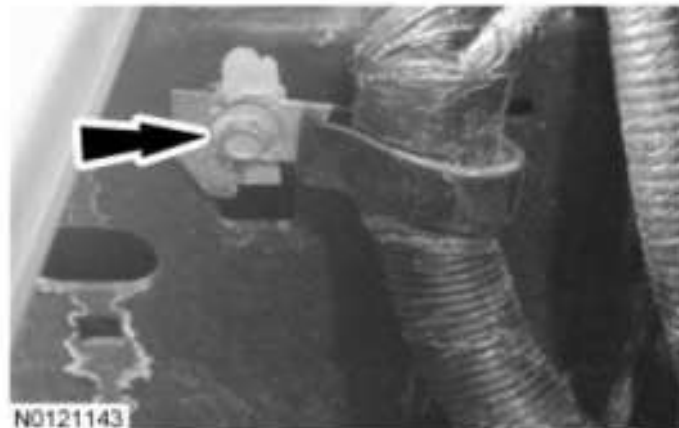


Fig. 470: Locating Wiring Harness Bracket Mounting Bolt
Courtesy of FORD MOTOR CO.

15. Remove the nut and disconnect the B+ wire.
 - Detach the wiring harness retainer from the battery tray.

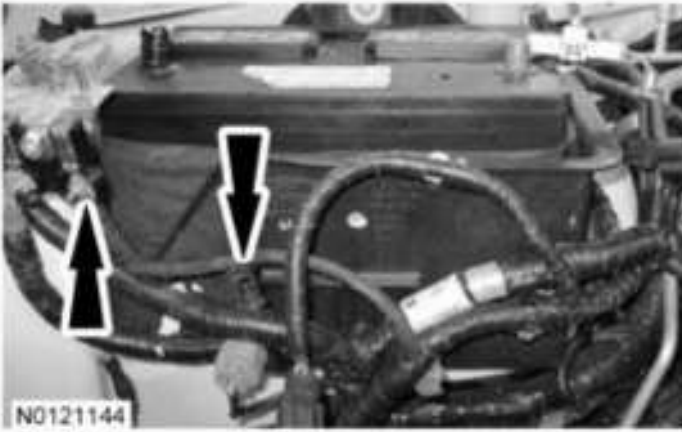


Fig. 471: Locating Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

16. Detach the 5 wiring harness retainers.

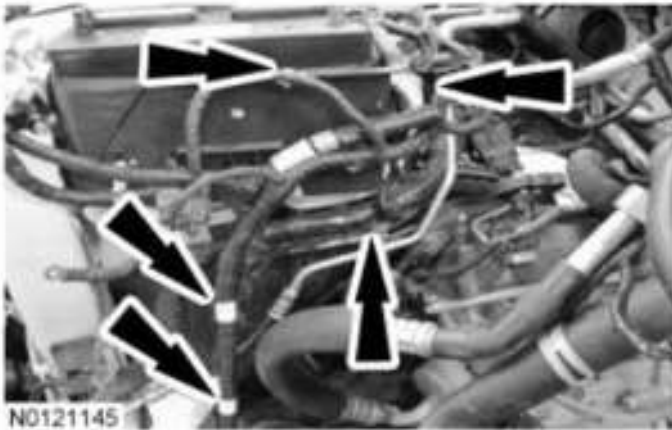


Fig. 472: Locating Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

17. Disconnect the 2 wiring harness connectors and detach the 3 wiring harness retainers.

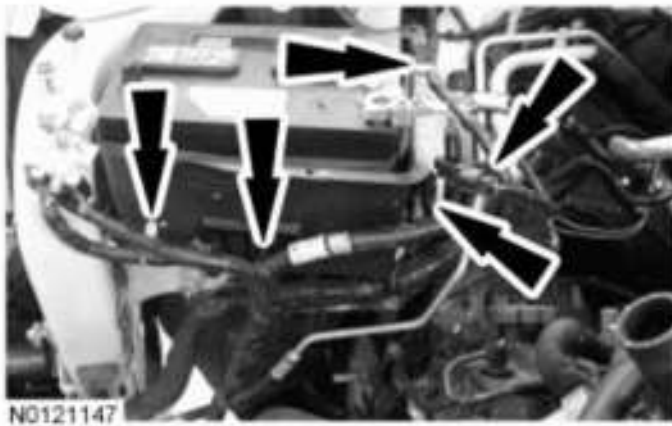


Fig. 473: Locating Wiring Harness Connectors
Courtesy of FORD MOTOR CO.

18. Disconnect the middle PCM electrical connector.



Fig. 474: Locating PCM Electrical Connector
Courtesy of FORD MOTOR CO.

19. Detach and disconnect the engine harness electrical connector.



Fig. 475: Locating Engine Harness Electrical Connector
Courtesy of FORD MOTOR CO.

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



Fig. 476: Locating PCM Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

21. Remove the bolt and the ground strap from the cowl.

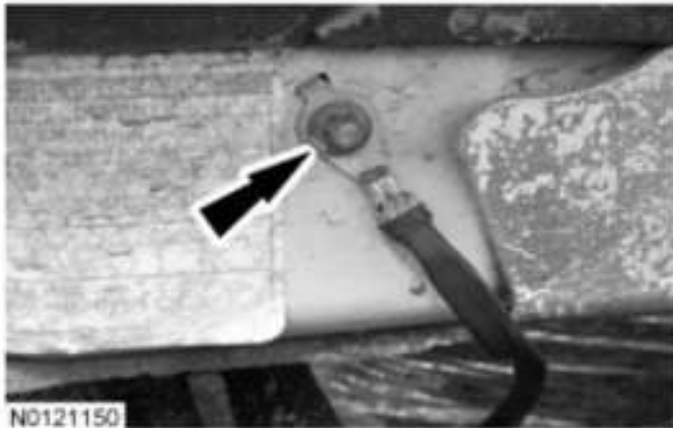


Fig. 477: Locating Cowl Mounting Bolt
Courtesy of FORD MOTOR CO.

22. Disconnect the 2 heater hose quick connect couplings. For additional information, refer to **CLIMATE CONTROL SYSTEM - GENERAL INFORMATION AND DIAGNOSTICS**.



Fig. 478: Locating Heater Hose Quick Connect Couplings
Courtesy of FORD MOTOR CO.

23. Disconnect the 2 coolant hoses and position aside.

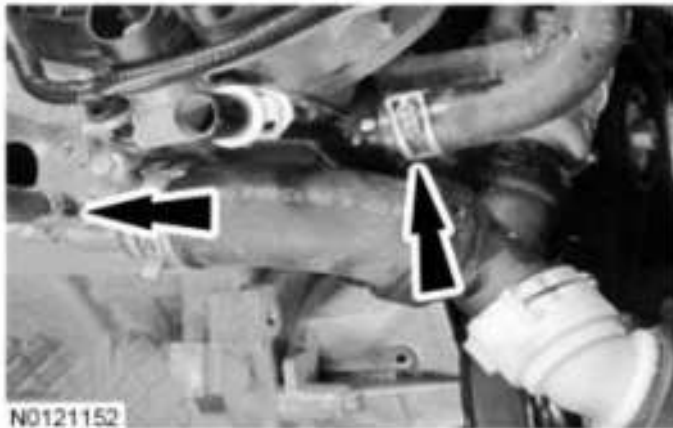


Fig. 479: Locating Coolant Hoses
Courtesy of FORD MOTOR CO.

24. Remove the spring clip, the clamp and disconnect the coolant bypass T assembly from the engine.



Fig. 480: Locating Coolant Bypass T Assembly
Courtesy of FORD MOTOR CO.

25. If equipped, disconnect the block heater electrical connector and the 2 wiring harness retainers.



Fig. 481: Locating Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

26. If equipped, remove the front driveshaft. For additional information, refer to **DRIVESHAFT** .
27. Remove the starter. For additional information, refer to **STARTING SYSTEM** .
28. Remove the 2 bolts and the flexplate inspection cover.



Fig. 482: Locating Flexplate Inspection Cover Mounting Bolts
Courtesy of FORD MOTOR CO.

29. Remove the cylinder block opening cover.

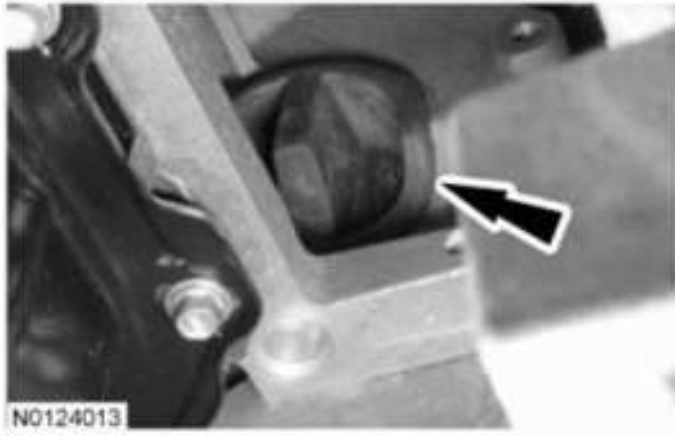


Fig. 483: Locating Cylinder Block Opening Cover
Courtesy of FORD MOTOR CO.

NOTE: Index-mark the end of one torque converter stud and the flexplate for installation.



Fig. 484: Locating Torque Converter-To-Flexplate Nuts
Courtesy of FORD MOTOR CO.

30. Remove the 4 torque converter-to-flexplate nuts.
 - Discard the nuts.

NOTE: The 2 upper transmission-to-engine bolts will be removed later.

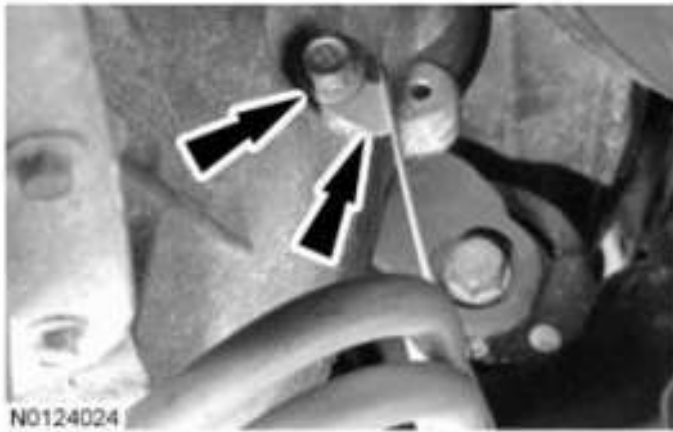


Fig. 485: Locating Transmission-To-Engine Bolt And Transmission Cooler Tube Support Bracket
Courtesy of FORD MOTOR CO.

31. Remove the transmission-to-engine bolt and transmission cooler tube support bracket.
32. Remove the lower transmission-to-engine bolt.

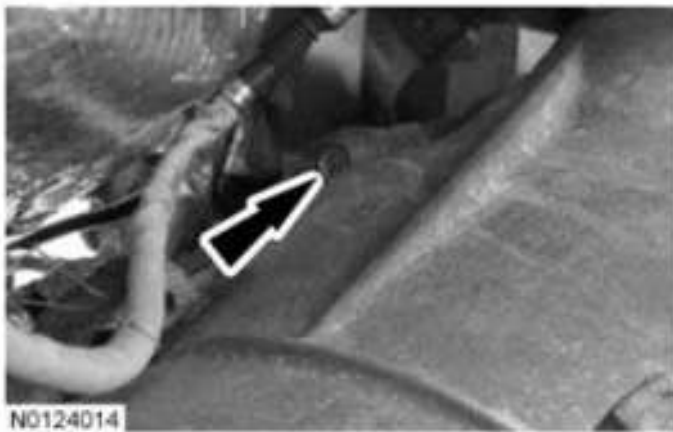


Fig. 486: Locating Lower Transmission-To-Engine Bolt
Courtesy of FORD MOTOR CO.

33. Remove the 2 lower transmission-to-engine bolts.

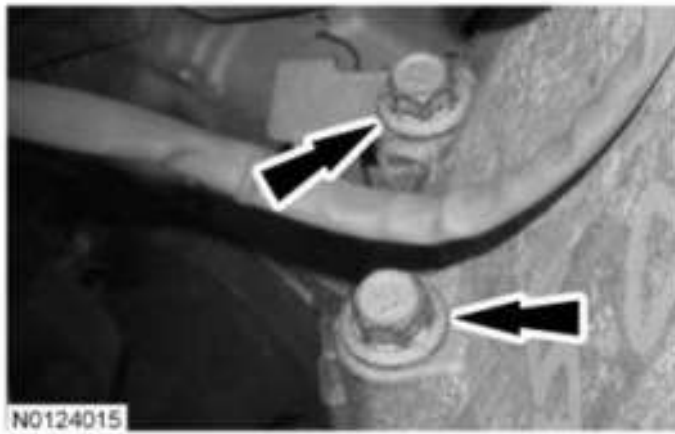


Fig. 487: Identifying Transmission-To-Engine Bolts
Courtesy of FORD MOTOR CO.

34. Remove the lower transmission-to-engine bolt.

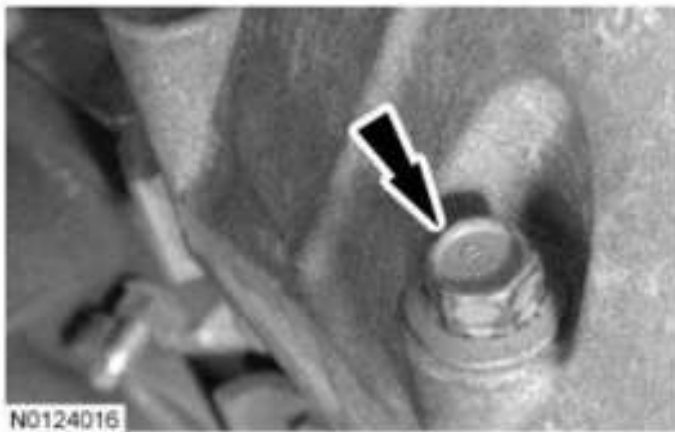


Fig. 488: Locating Lower Transmission-To-Engine Bolt
Courtesy of FORD MOTOR CO.

35. Remove the drain plug and drain the engine oil.
 - Install the drain plug and tighten to 26 Nm (19 lb-ft).
36. Remove and discard the engine oil filter.



Fig. 489: Locating Engine Oil Filter
Courtesy of FORD MOTOR CO.

37. Remove and discard the 2 LH catalytic converter-to-exhaust manifold nuts.

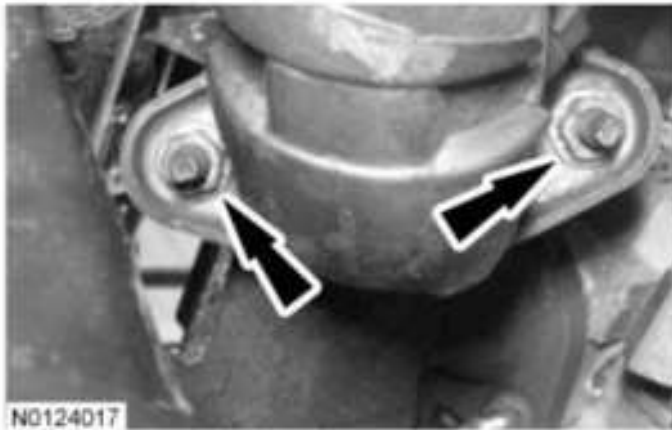


Fig. 490: Locating LH Catalytic Converter-To-Exhaust Manifold Nuts
Courtesy of FORD MOTOR CO.

38. Remove and discard the RH catalytic converter-to-exhaust manifold nut.

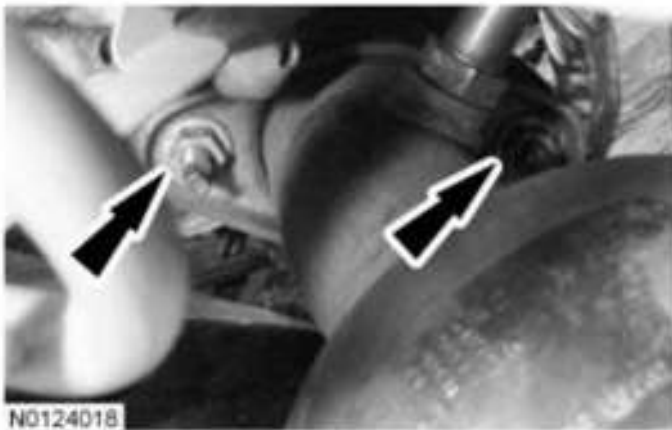


Fig. 491: Locating RH Catalytic Converter-To-Exhaust Manifold Nuts
Courtesy of FORD MOTOR CO.

39. Remove the 2 exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe bolts and separate.
- Discard the 2 bolts.

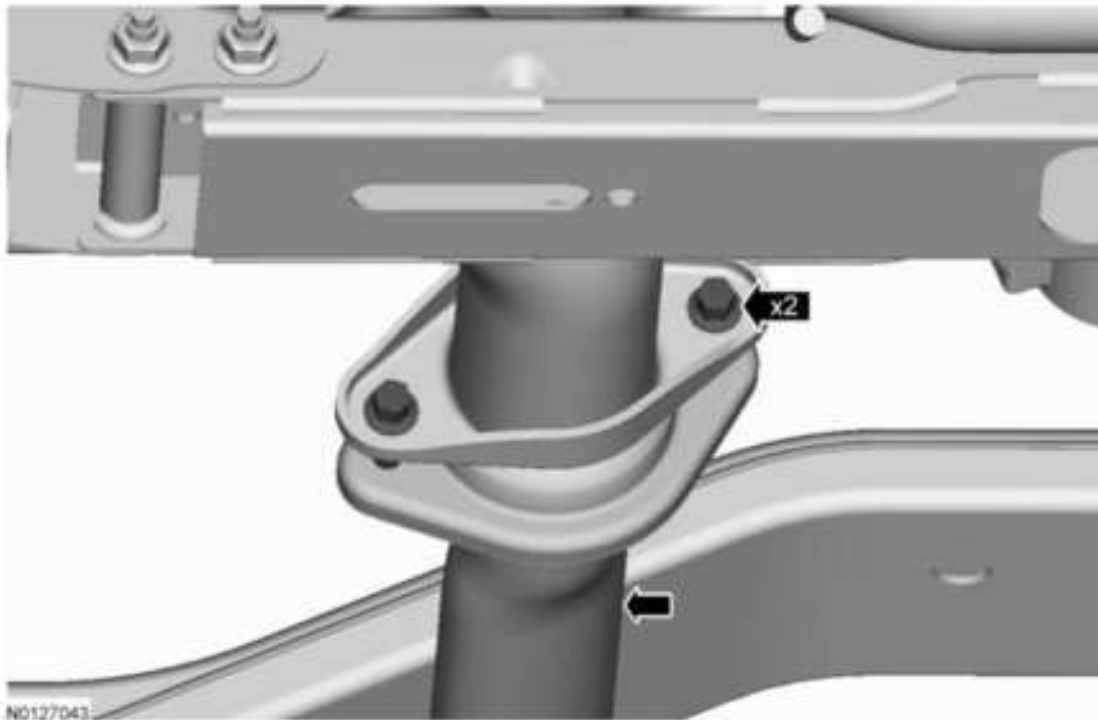


Fig. 492: Locating Exhaust Y-Pipe Dual Catalytic Converter-To-Exhaust Intermediate Pipe Bolts

Courtesy of FORD MOTOR CO.

NOTE: Only use hand tools when removing the engine support insulator nuts or the engine support insulator may be damaged.

NOTE: If during nut removal the stud is extracted from the engine support insulator, separate the nut from the stud prior to installing the stud.

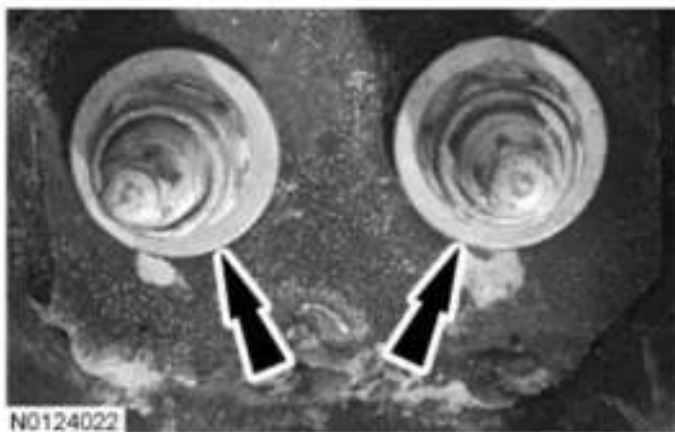


Fig. 493: Locating RH Engine Support Insulator Nuts
Courtesy of FORD MOTOR CO.

40. Remove the 2 RH engine support insulator nuts.

NOTE: Only use hand tools when removing the engine support insulator stud or the engine support insulator may be damaged.



Fig. 494: Locating RH Engine Support Insulator Studs
Courtesy of FORD MOTOR CO.

41. Remove the 2 RH engine support insulator studs.

NOTE: Only use hand tools when loosening the engine support insulator through bolt or the engine support insulator may be damaged.

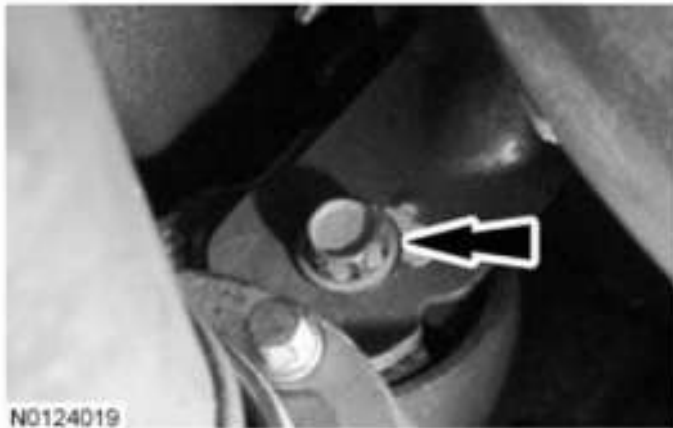


Fig. 495: Locating LH Engine Support Insulator Bolt
Courtesy of FORD MOTOR CO.

42. Remove the LH engine support insulator bolt.

43. Loosen the 2 transmission mount-to-crossmember nuts.

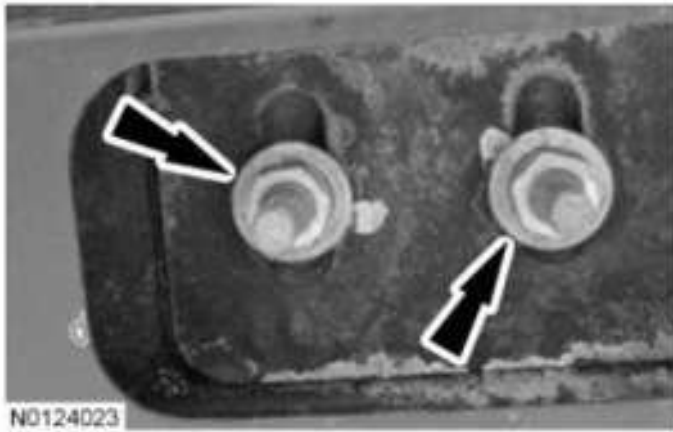


Fig. 496: Locating Transmission Mount-To-Crossmember Nuts
Courtesy of FORD MOTOR CO.

44. Disconnect the oil level sensor electrical connector.



Fig. 497: Locating Oil Level Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

45. Disconnect the quick connect coupling and remove the crankcase ventilation tube. For additional information, refer to **FUEL SYSTEM - GENERAL INFORMATION** .

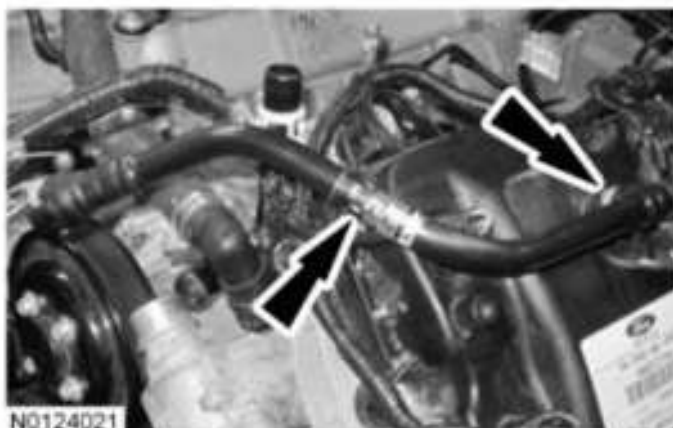


Fig. 498: Locating Quick Connect Coupling And Crankcase Ventilation Tube
Courtesy of FORD MOTOR CO.

NOTE: Do not support the transmission by the fluid pan, failure to follow this instruction may result in serious damage to the transmission.

46. Support the bellhousing of the transmission with a suitable floor jack and a block of wood.

NOTE: On Four-Wheel Drive (4WD) vehicles, it may be necessary to reposition the transfer case vent hose to access the bolts.

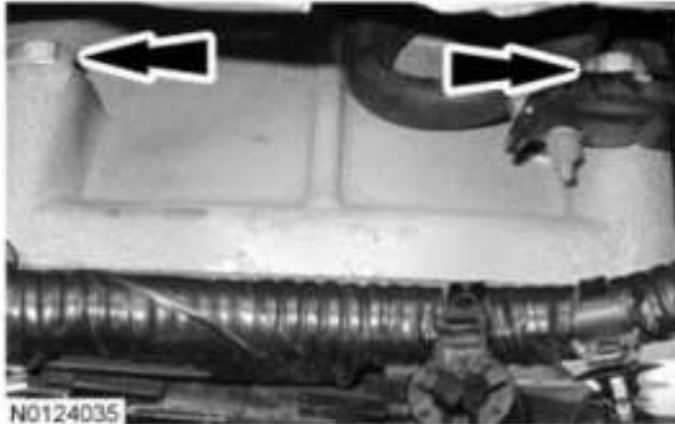


Fig. 499: Locating Upper Transmission-To-Engine Bolts
Courtesy of FORD MOTOR CO.

47. Remove the upper 2 transmission-to-engine bolts.
48. Install the Engine Lifting Bracket.



Fig. 500: Locating Engine Lifting Bracket
Courtesy of FORD MOTOR CO.

49. Using the Heavy Duty Floor Crane and the Engine Lifting Bracket, raise the engine assembly to gain access to the 3 LH engine support insulator bolts.

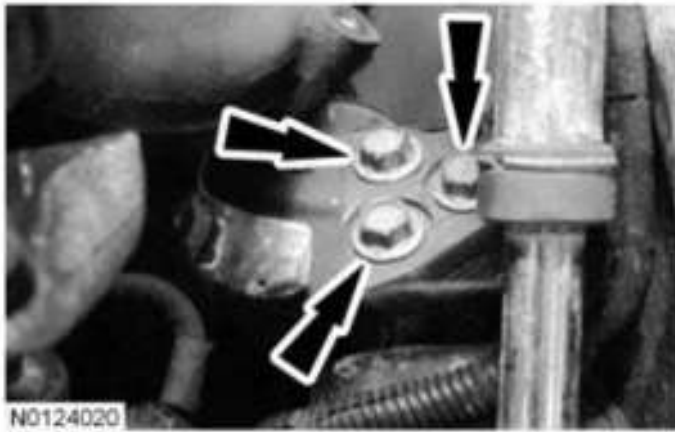


Fig. 501: Locating Engine Support Insulator Bolts
Courtesy of FORD MOTOR CO.

50. Remove the LH engine support insulator from under the vehicle.



Fig. 502: Locating Engine Support Insulator
Courtesy of FORD MOTOR CO.

51. Using the Heavy Duty Floor Crane and the Engine Lifting Bracket, remove the engine assembly from the vehicle.