

REMOVAL

ENGINE

Special Tool(s)

SPECIAL TOOL SPECIFICATION



ST1341-A

Heavy Duty Floor Crane
014-00071 or equivalent



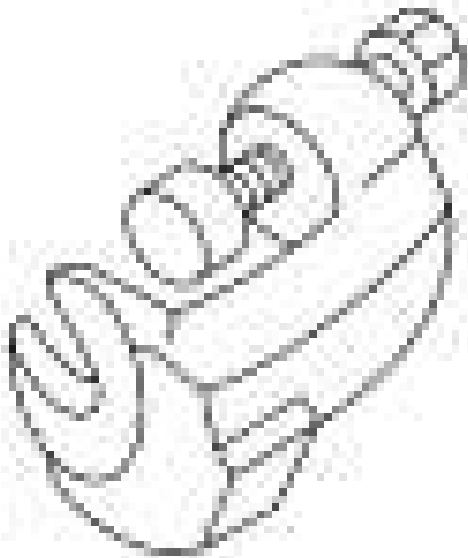
ST1293-A

Powertrain Lift
014-00765 or equivalent



ST2569-A

Remover, Halfshaft Oil Seal
308-428



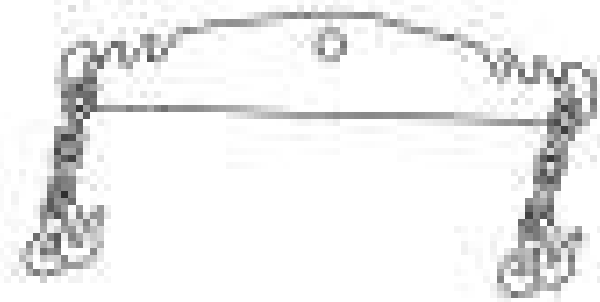
ST1408-A

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



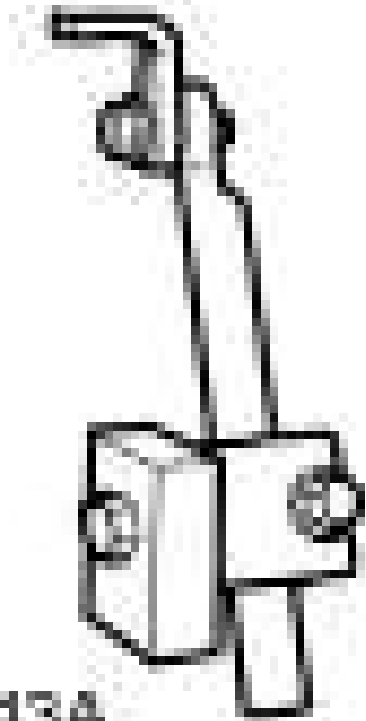
ST1605-A

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



ST1602-A

Spreader Bar
303-D089 (D93P-6001-A3) (part of 303-
DS086) or equivalent



ST2743A

Universal Adapter Brackets
014-0001 or equivalent

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.

All vehicles

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING & LIFTING -- ESCAPE, ESCAPE HYBRID, MARINER & MARINER HYBRID** .
2. Release the fuel system pressure. For additional information, refer to **FUEL SYSTEM PRESSURE RELEASE** .
3. Remove the battery tray. For additional information, refer to **BATTERY TRAY -- HYBRID** .

NOTE: Use a steering wheel holding device (such as Hunter® 28-75-1 or equivalent).

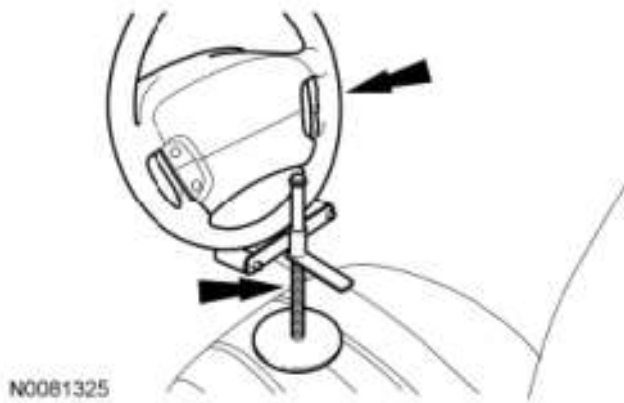


Fig. 174: Holding Steering Wheel
 Courtesy of FORD MOTOR CO.

4. Place the steering wheel in the straight-ahead position and the ignition key in the OFF position.
5. Disable the vehicle high-voltage electrical system. For additional information, refer to **HIGH-VOLTAGE TRACTION BATTERY SYSTEMS DEPOWERING** .
6. Recover the A/C system. For additional information, refer to **CLIMATE CONTROL SYSTEM - GENERAL INFORMATION AND DIAGNOSTICS - HYBRID** .
7. Drain the cooling system. For additional information, refer to **COOLING SYSTEM DRAINING, FILLING AND BLEEDING** .
8. Drain the Motor Electronics Cooling System (MECS). For additional information, refer to **MOTOR ELECTRONICS COOLING SYSTEM DRAINING AND FILLING** .
9. Remove the engine coolant degas bottle. For additional information, refer to **DEGAS BOTTLE** .
10. Remove the engine Air Cleaner (ACL). For additional information, refer to **AIR CLEANER** .
11. Disconnect the fuel supply tube. For additional information, refer to **QUICK CONNECT COUPLING** .

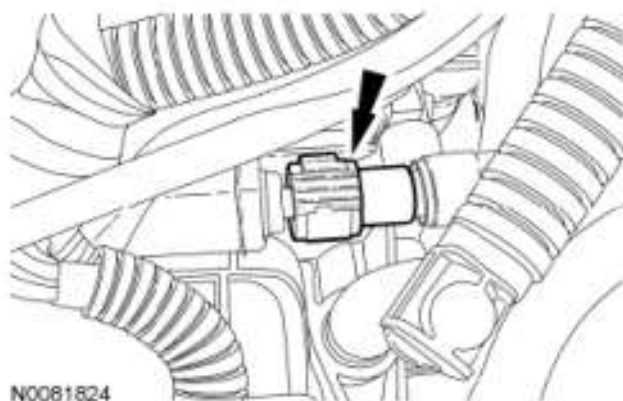


Fig. 175: Locating Fuel Supply Tube
 Courtesy of FORD MOTOR CO.

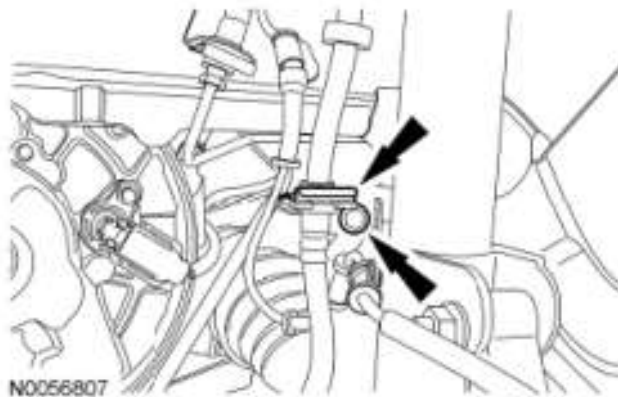
12. Remove the front wheels and tires. For additional information, refer to **WHEEL AND TIRE** .
13. Remove the bolts and the lateral support crossmember.



A0087403

Fig. 176: Locating Lateral Support Crossmember Bolts
Courtesy of FORD MOTOR CO.

14. Remove the exhaust intermediate pipe. For additional information, refer to **EXHAUST INTERMEDIATE PIPE -- 2.5L, HYBRID** .
15. Remove the brake hose retainer and the ABS sensor retaining bolt from the LH strut.



N0056807

Fig. 177: Locating Brake Hose Retainer And ABS Sensor Retaining Bolt
Courtesy of FORD MOTOR CO.

16. Disconnect the LH suspension.
 1. Remove the nut and disconnect the stabilizer bar link.
 2. Remove and discard the tie-rod end retaining nut.

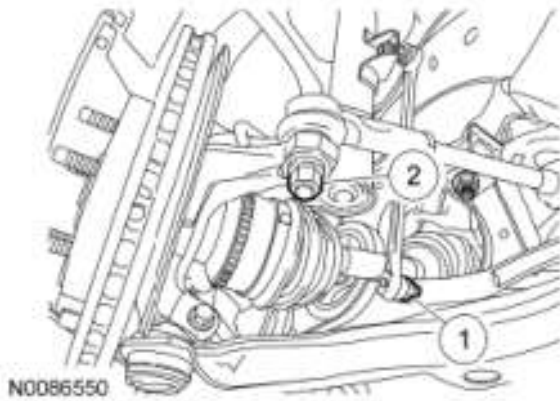


Fig. 178: Identifying Stabilizer Bar Link And Retaining Nut
Courtesy of FORD MOTOR CO.

17. Remove the brake hose retainer and the ABS sensor retaining bolt from the RH strut.

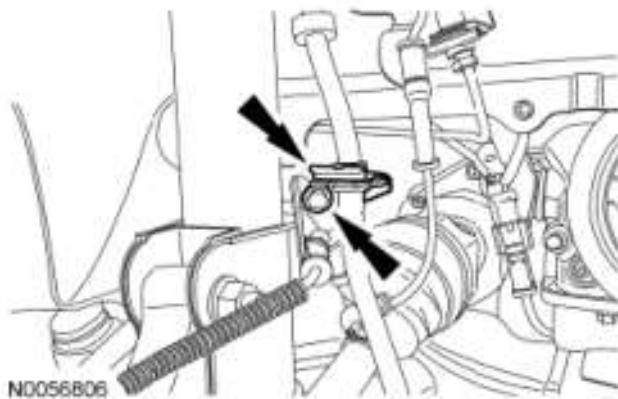


Fig. 179: Locating Brake Hose Retainer And ABS Sensor Retaining Bolt
Courtesy of FORD MOTOR CO.

18. Disconnect the RH suspension.
 1. Remove the nut and disconnect the stabilizer bar link.
 2. Remove and discard the tie-rod end retaining nut.



Fig. 180: Identifying Stabilizer Bar Link And Tie-Rod End Retaining Nut
Courtesy of FORD MOTOR CO.

NOTE: LH shown, RH similar.

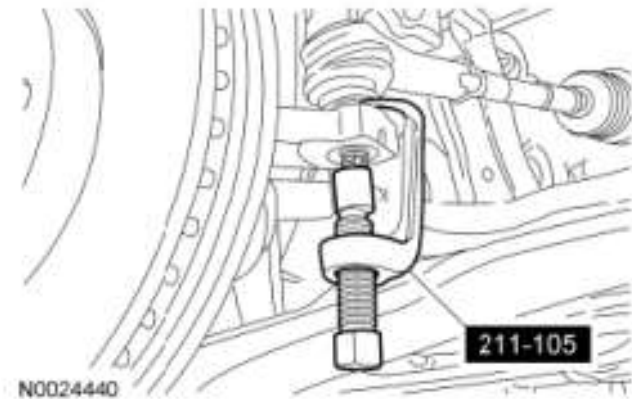


Fig. 181: Disconnecting LH And RH Tie Rod End From Steering Knuckle
Courtesy of FORD MOTOR CO.

19. Using the Tie-Rod End Remover, disconnect the LH and RH tie-rod end from the steering knuckle.
20. Remove the RH and LH halfshafts. For additional information, refer to **HALFSHAFT** .
21. Remove the 2 intermediate shaft bearing retainer nuts.

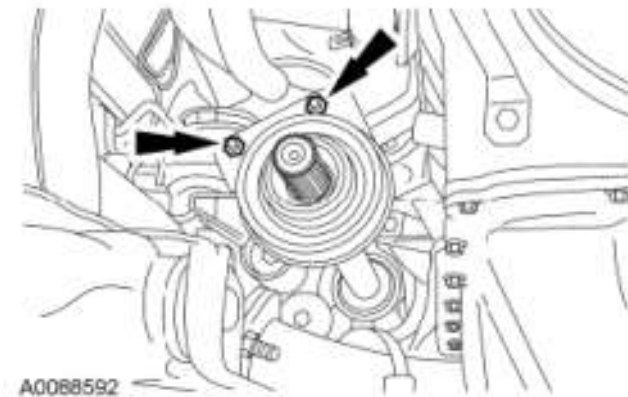


Fig. 182: Identifying Intermediate Shaft Retaining Nuts
Courtesy of FORD MOTOR CO.

NOTE: On All-Wheel Drive (AWD) vehicles, the Power Transfer Unit (PTU) seal must be replaced every time the intermediate shaft is removed.

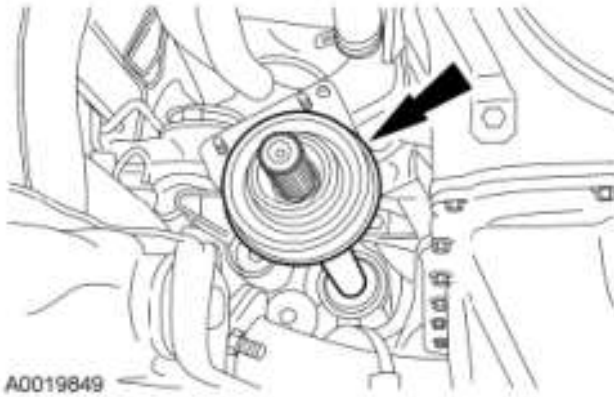


Fig. 183: Locating Intermediate Shaft
Courtesy of FORD MOTOR CO.

22. Remove the intermediate shaft.
23. Drain the transmission fluid. For additional information, refer to **TRANSMISSION FLUID DRAIN AND REFILL** .

All-Wheel Drive (AWD) vehicles

24. Remove the driveshaft. For additional information, refer to **DRIVESHAFT** .
25. Remove the 2 catalytic converter bracket bolts.

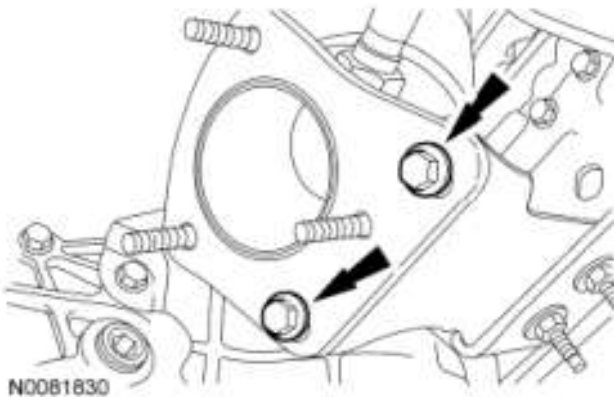


Fig. 184: Locating Catalytic Converter Bracket Bolts
Courtesy of FORD MOTOR CO.

NOTE: **Catalytic converter manifold is removed for clarity.**

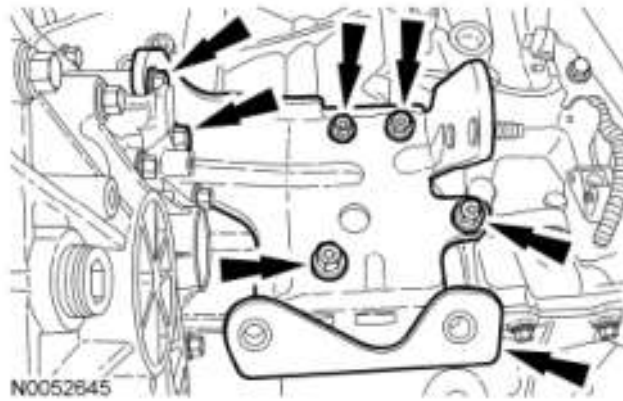


Fig. 185: Locating Transfer Case-To-Engine Bracket Bolts
Courtesy of FORD MOTOR CO.

26. Remove the 6 bolts and the PTU -to-engine bracket.
27. Remove the 3 PTU heat shield bolts and the PTU heat shield.

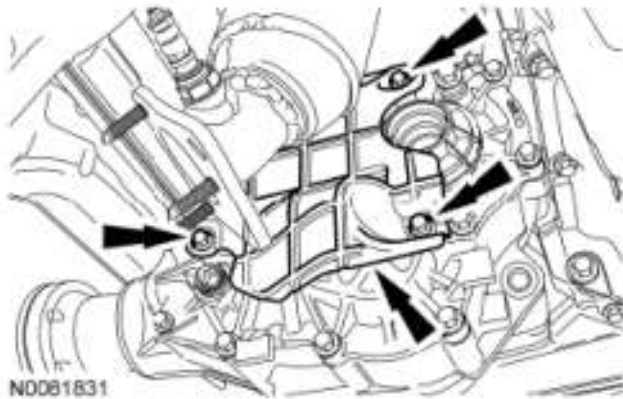


Fig. 186: Locating PTU Heat Shield Bolts
Courtesy of FORD MOTOR CO.

28. Disconnect the PTU vent hose and position it aside.

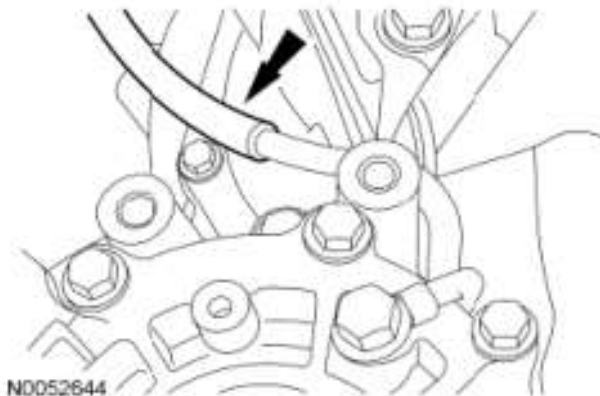
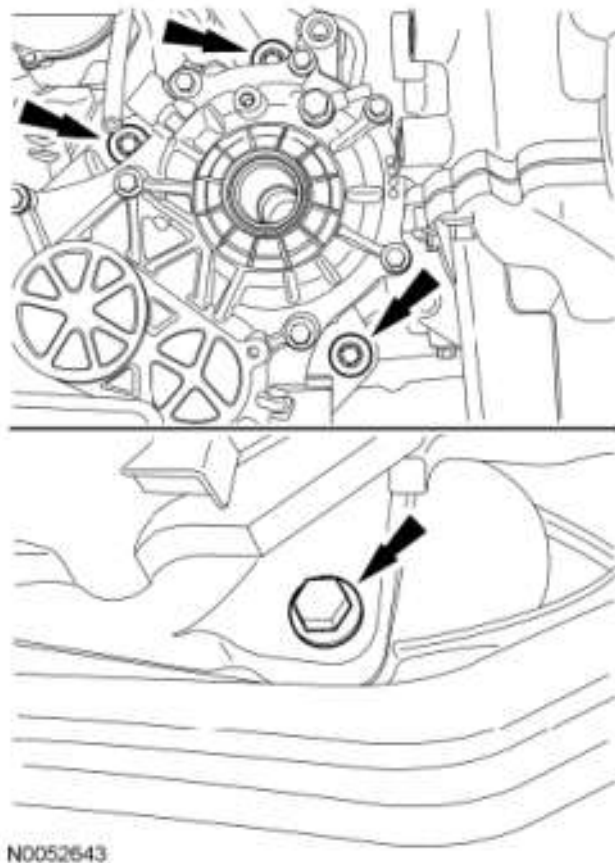


Fig. 187: Locating PTU Vent Hose
Courtesy of FORD MOTOR CO.

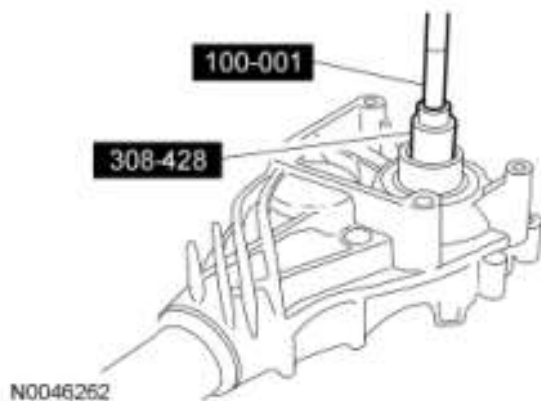
NOTE: Catalytic converter manifold removed for clarity.



N0052643

Fig. 188: Identifying Transfer Case-To-Transaxle Bolts And Transfer Case
Courtesy of FORD MOTOR CO.

29. Remove the 4 PTU -to-transaxle bolts and remove the PTU .
30. Using the Halfshaft Oil Seal Remover and Slide Hammer, remove the intermediate shaft seal.



N0046262

Fig. 189: Removing Intermediate Shaft Seal
Courtesy of FORD MOTOR CO.

All vehicles

31. Remove the engine oil filter.

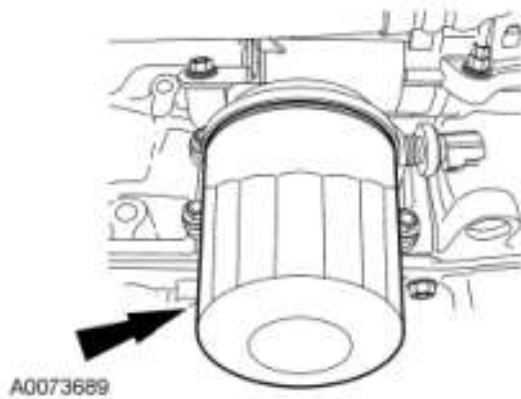


Fig. 190: Locating Engine Oil Filter
Courtesy of FORD MOTOR CO.

32. Drain the engine oil.

- Install the drain plug.
- Tighten to 28 Nm (21 lb-ft).

33. Disconnect the heater hoses from the heater core.

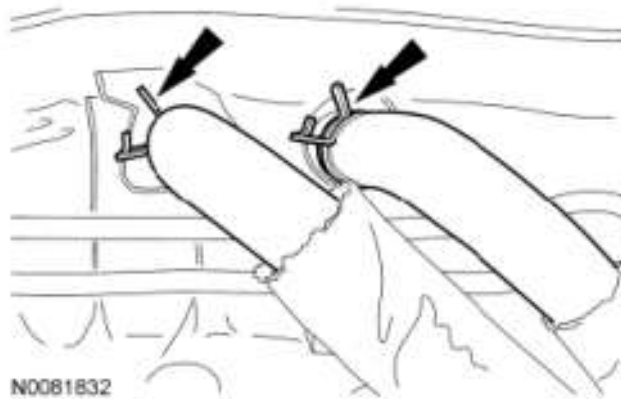


Fig. 191: Locating Heater Hoses Clamp
Courtesy of FORD MOTOR CO.

34. Disconnect the upper radiator hose from the radiator.

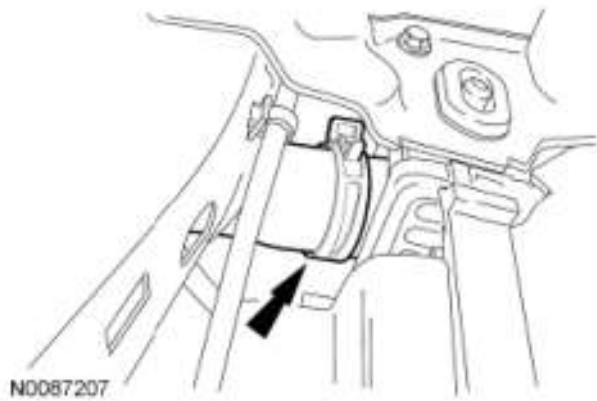


Fig. 192: Locating Upper Radiator Coolant Hose
Courtesy of FORD MOTOR CO.

35. Disconnect the brake booster vacuum tube from the brake booster.

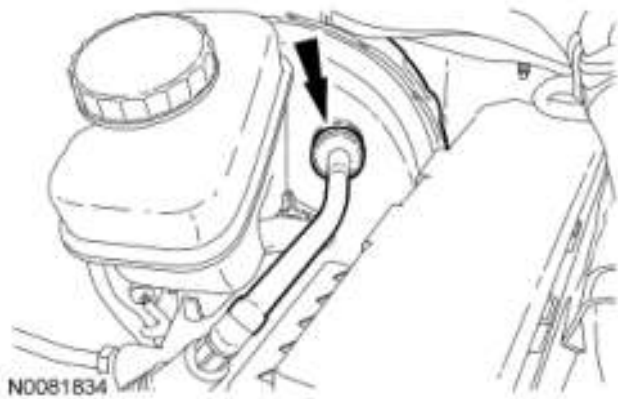


Fig. 193: Locating Brake Booster Vacuum Tube
Courtesy of FORD MOTOR CO.

36. Disconnect the PCM center electrical connector.
- Remove the wiring harness retainer.

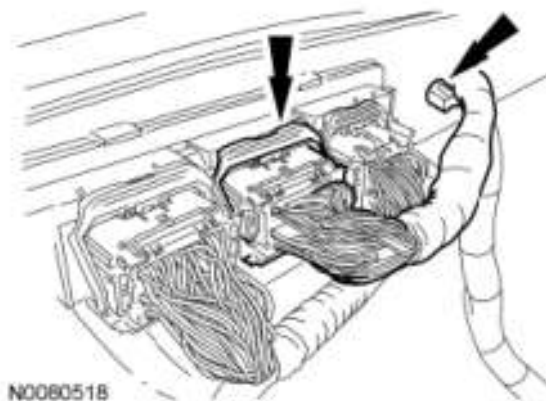


Fig. 194: Locating PCM Center Electrical Connector
Courtesy of FORD MOTOR CO.

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

- Detach the harness retainer clips and position harness aside.

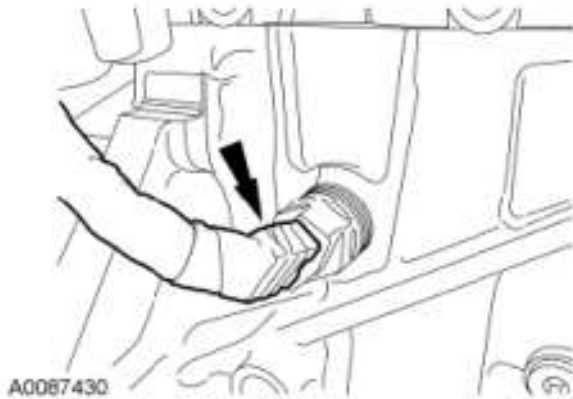


Fig. 195: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

38. Disconnect the engine control harness electrical connector.
- Detach the engine control harness wiring retainer from the intake manifold.

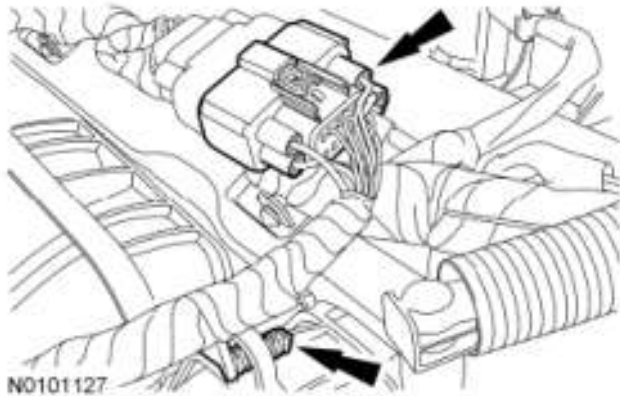


Fig. 196: Locating Engine Control Harness Electrical Connector
Courtesy of FORD MOTOR CO.

39. Disconnect the upper Evaporative Emission (EVAP) tube quick connect coupling from the purge valve. For additional information, refer to **QUICK CONNECT COUPLING** .

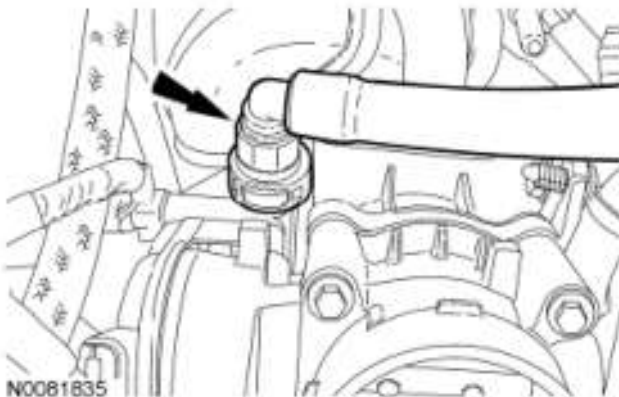


Fig. 197: Locating Upper Evaporative Emission Tube Quick Connect Coupling
Courtesy of FORD MOTOR CO.

40. Remove the stud bolt and disconnect the transaxle harness electrical connector.

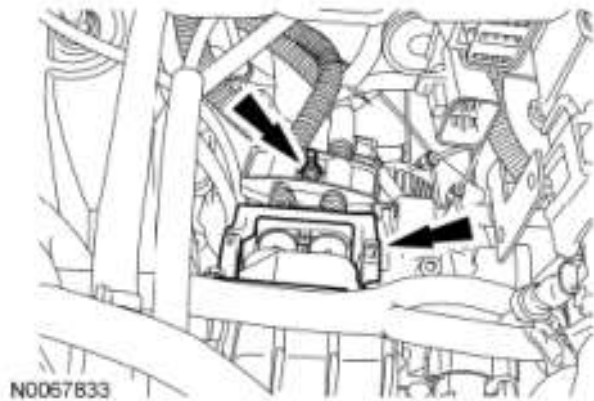


Fig. 198: Locating Stud Bolt And Transaxle Harness Electrical Connector
Courtesy of FORD MOTOR CO.

41. Disconnect the 2 low voltage electrical connectors and the engine harness-to-body harness retainer.

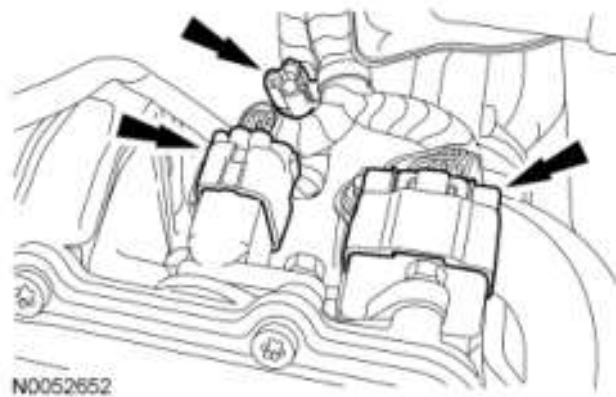


Fig. 199: Locating Low Voltage Electrical Connectors And Engine Harness-To-Body Harness Retainer
Courtesy of FORD MOTOR CO.

42. Disconnect the coolant vent hose.



Fig. 200: Locating Coolant Vent Hose Clamp
 Courtesy of FORD MOTOR CO.

43. Release the locking tab and disconnect the DC-to-DC converter electrical connector and 2 wire harness retainers.



Fig. 201: Locating DC-To-DC Converter Electrical Connector And Wiring Harness Retainers
 Courtesy of FORD MOTOR CO.

44. Remove the 3 nuts and position aside the DC-to-DC converter.

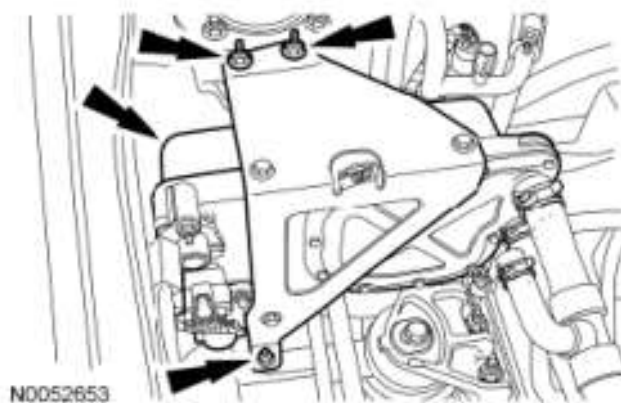


Fig. 202: Locating DC-To-DC Converter
 Courtesy of FORD MOTOR CO.

45. Disconnect the 2 vehicle high-voltage electrical system electrical connectors.

- Detach the wiring harness retainer.

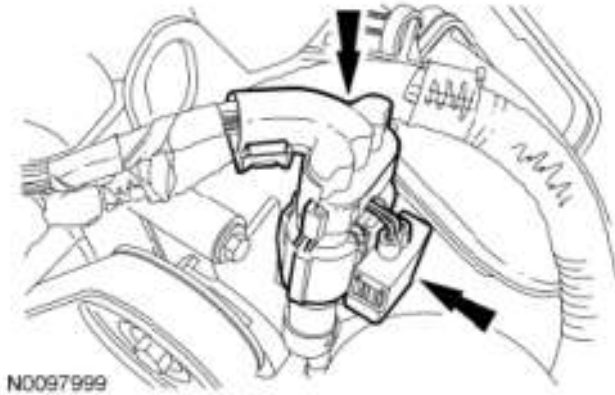


Fig. 203: Locating Vehicle High-Voltage Electrical System Electrical Connectors
Courtesy of FORD MOTOR CO.

46. Detach the 2 high-voltage electrical system wiring retainers from the valve cover stud bolts.
 - Position wiring aside.

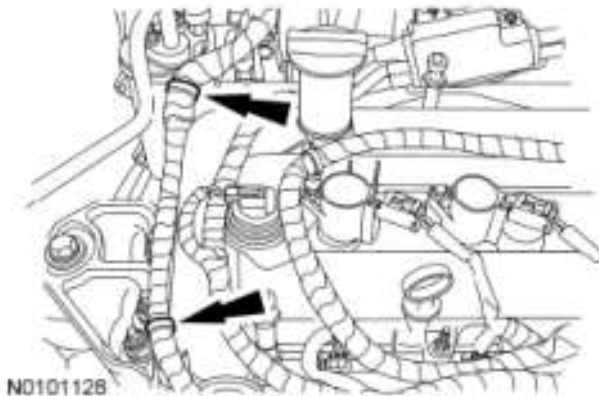


Fig. 204: Locating High-Voltage Electrical System Wiring Retainers
Courtesy of FORD MOTOR CO.

47. Disconnect the transaxle coolant temperature sensor electrical connector.
 - Detach the wiring retainer from the transaxle stud bolt.

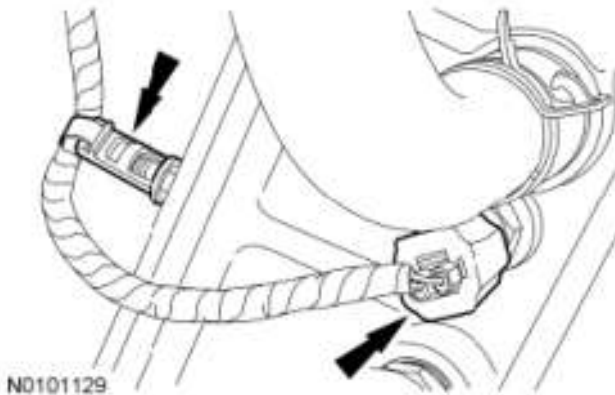


Fig. 205: Locating Transaxle Coolant Temperature Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

48. Disconnect the transaxle coolant hoses.



Fig. 206: Locating Transaxle Coolant Hoses
Courtesy of FORD MOTOR CO.

49. Detach the transaxle selector lever cable fastener from the engine front cover stud bolt.

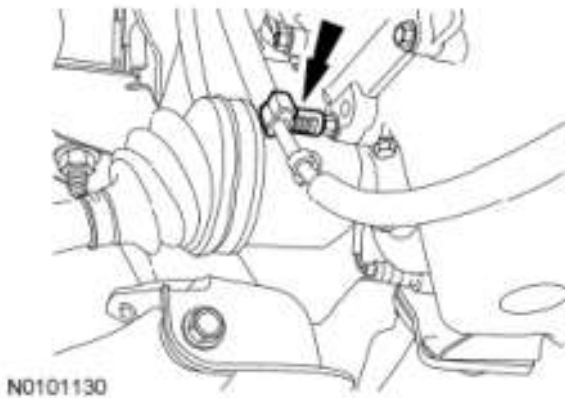


Fig. 207: Locating Transaxle Selector Lever Cable Fastener
Courtesy of FORD MOTOR CO.

50. Detach the transaxle selector lever cable fastener from the A/C compressor mounting bracket.

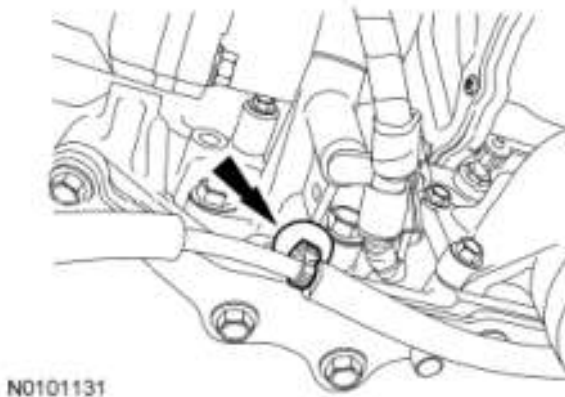


Fig. 208: Locating Transaxle Selector Lever Cable Fastener
Courtesy of FORD MOTOR CO.

51. Remove the 2 bolts and the transaxle control snow shield.

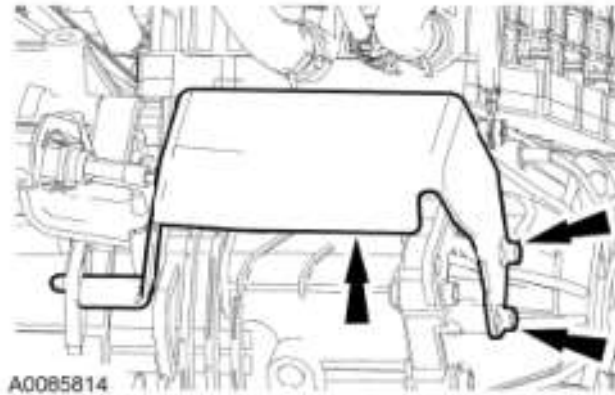


Fig. 209: Locating Bolts And Transaxle Control Snow Shield
Courtesy of FORD MOTOR CO.

52. Disconnect the transaxle control cable.
- Release the transaxle control cable from the control lever.
 - Remove the nuts from the transaxle control cable bracket.

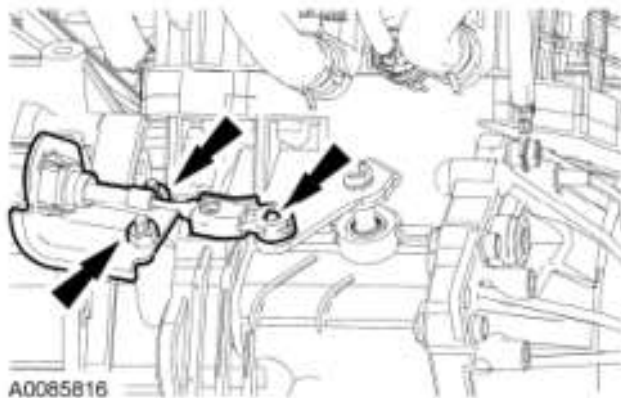


Fig. 210: Identifying Selector Lever Cable Bracket And Nuts
Courtesy of FORD MOTOR CO.

53. Remove the 2 harness fasteners, the nut and the ground cable.

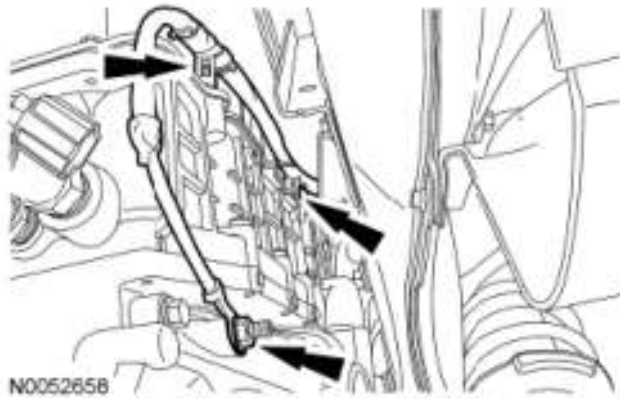


Fig. 211: Locating Harness Fasteners, Nut And Ground Cable
Courtesy of FORD MOTOR CO.

54. Disconnect the vacuum pump assembly electrical connector and detach the harness retainer.

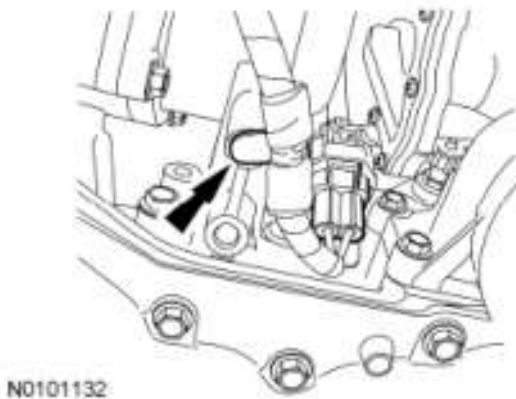


Fig. 212: Locating Vacuum Pump Assembly Electrical Connector
Courtesy of FORD MOTOR CO.

55. Remove the 2 bolts and position the MECS pump aside.

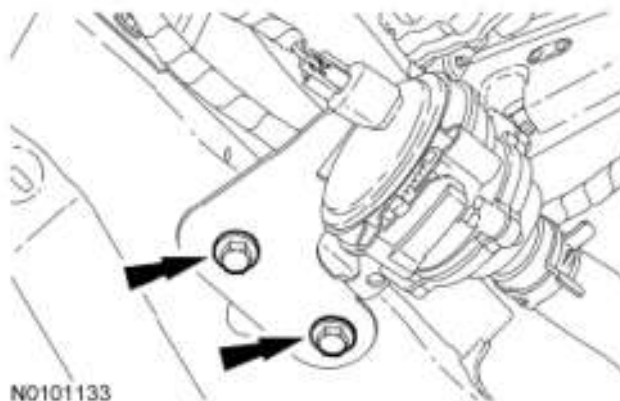


Fig. 213: Locating MECS Pump Bolts
Courtesy of FORD MOTOR CO.

56. Remove the nut and disconnect the A/C tube from the A/C compressor.
- Discard the gasket.



Fig. 214: Locating A/C Compressor Nut
Courtesy of FORD MOTOR CO.

57. Remove the nut and disconnect the A/C tube from the A/C compressor.
- Discard the gasket.

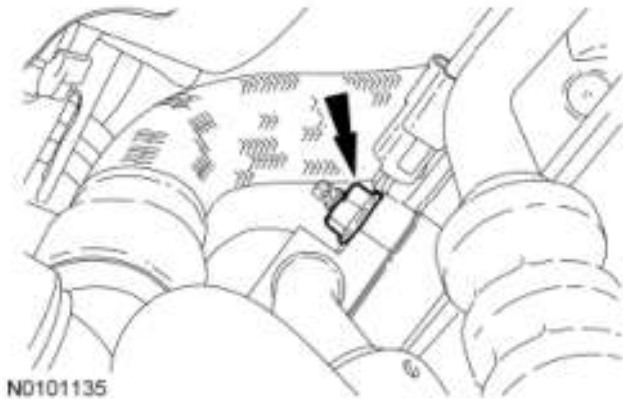


Fig. 215: Locating A/C Compressor Nut
Courtesy of FORD MOTOR CO.

58. Remove the 2 bolts and disconnect the auxiliary coolant pump electrical connector.
- Position the auxiliary coolant pump aside.

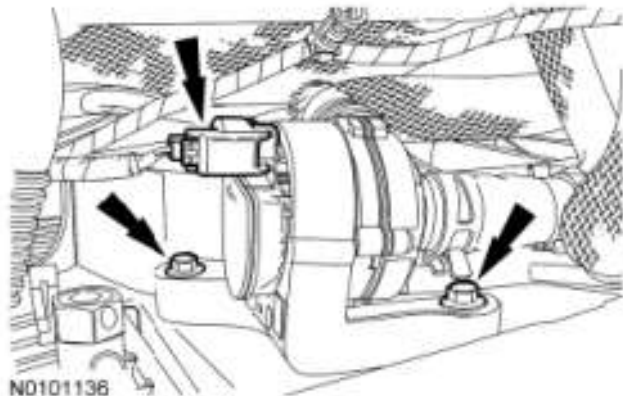


Fig. 216: Locating Auxiliary Coolant Pump Electrical Connector
Courtesy of FORD MOTOR CO.

59. Disconnect the lower radiator hose from the radiator.
- Release the wire clip and disconnect the hose.

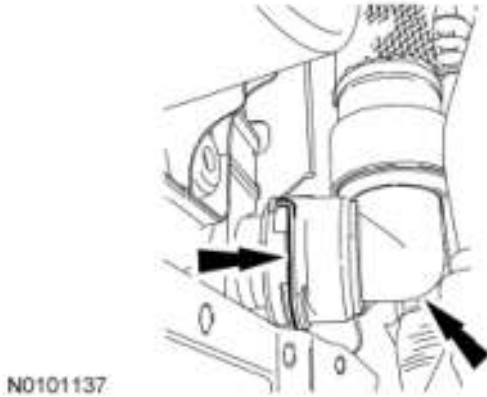


Fig. 217: Locating Lower Radiator Hose
Courtesy of FORD MOTOR CO.

60. Remove the lower transaxle insulator through bolt.



Fig. 218: Locating Lower Insulator Through Bolt
Courtesy of FORD MOTOR CO.

61. Remove the rear roll restrictor-to-crossmember through bolt.



Fig. 219: Locating Rear Roll Restrictor-To-Crossmember Bolt
Courtesy of FORD MOTOR CO.

62. Remove the nut, bolts and the engine support crossmember.
- Discard the nut.

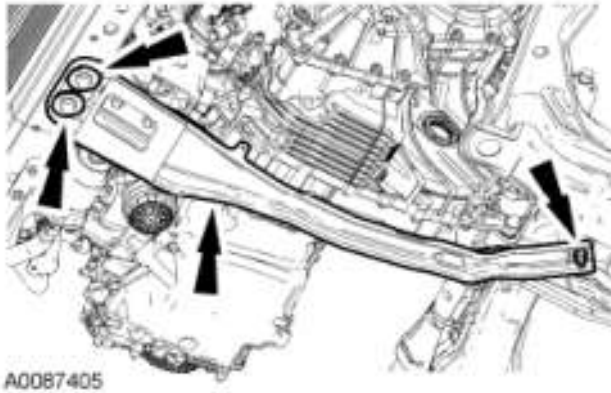


Fig. 220: Identifying Engine Support Crossmember Nut And Bolts
Courtesy of FORD MOTOR CO.

NOTE: The transaxle-to-engine bolts differ in length. Mark the bolts for correct installation.

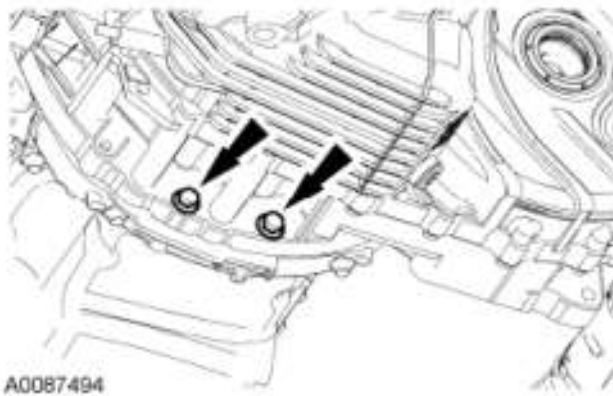


Fig. 221: Identifying Transaxle-To-Engine Bolts
Courtesy of FORD MOTOR CO.

63. Remove the 2 transaxle-to-engine bolts.

NOTE: The transaxle-to-engine bolts differ in length, mark the bolts for correct installation.

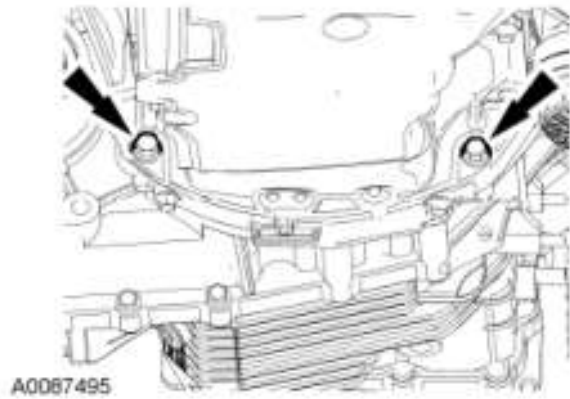


Fig. 222: Identifying Transaxle-To-Engine Bolts
Courtesy of FORD MOTOR CO.

64. Remove the 2 transaxle-to-engine bolts.
65. Remove the rear transaxle insulator through bolt.



Fig. 223: Locating Rear Transaxle Insulator Through Bolt
Courtesy of FORD MOTOR CO.

NOTE: Do not allow the steering wheel to rotate while the intermediate shaft is disconnected or damage to the clockspring can result. If there is evidence that the shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to **GENERAL PROCEDURES** .

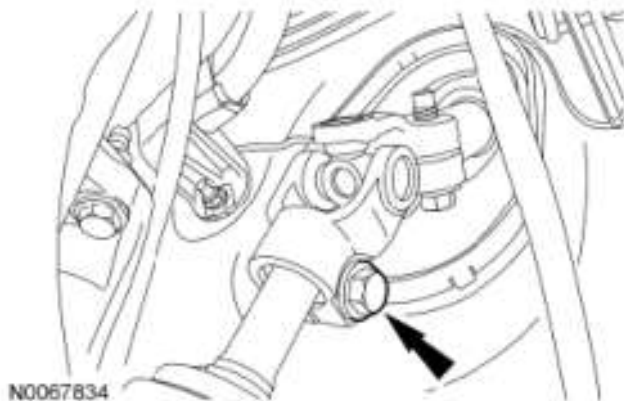


Fig. 224: Locating Steering Column Coupling Pinch Bolt
Courtesy of FORD MOTOR CO.

66. Remove and discard the steering column coupling-to-steering gear pinch bolt and separate coupling from the steering gear.
67. Remove the 2 bolts, and the roll restrictor and bracket.

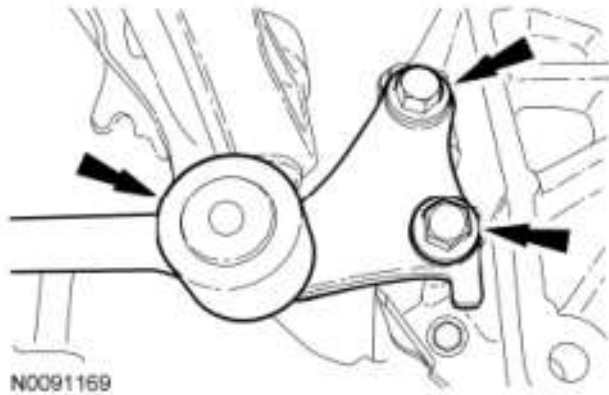


Fig. 225: Locating Bolts, Roll Restrictor And Bracket
Courtesy of FORD MOTOR CO.

68. Using the Powertrain Lift, support the subframe.

NOTE: Do not allow the subframe bolts to come out of the lower control arm bushing.

NOTE: RH shown, LH similar.

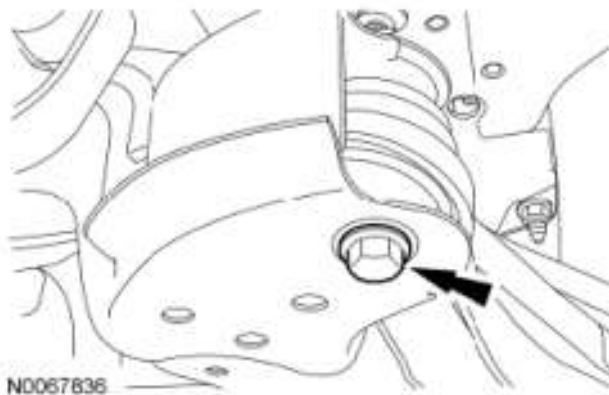


Fig. 226: Locating Front Subframe Bolts
Courtesy of FORD MOTOR CO.

69. Loosen the 2 subframe bolts.

NOTE: RH shown, LH similar.

70. Remove the 2 subframe nuts and lower the subframe.
 - Remove the subframe from the Powertrain Lift.

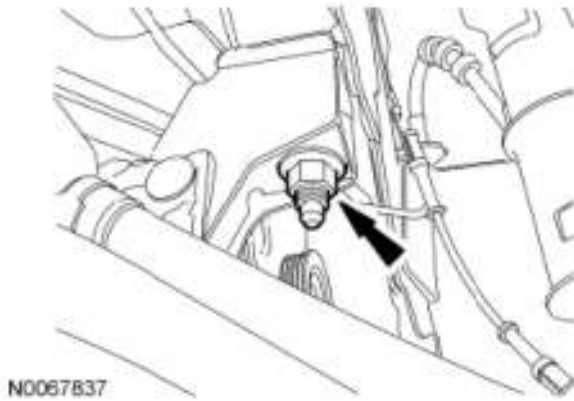


Fig. 227: Locating Subframe Nuts
Courtesy of FORD MOTOR CO.

NOTE: Due to the weight of the transaxle, special care should be taken to mount the powertrain securely to the Powertrain Lift.

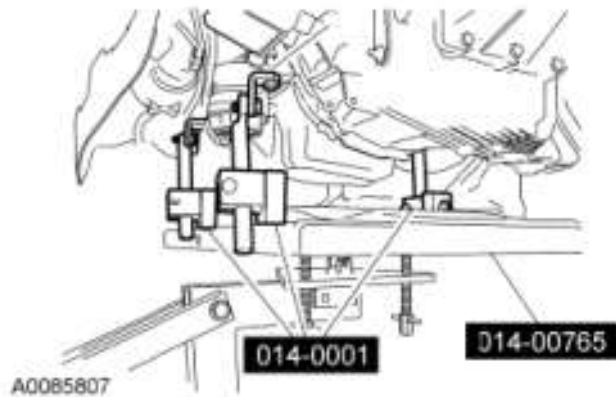


Fig. 228: Identifying Powertrain Lift And Universal Adapter Brackets
Courtesy of FORD MOTOR CO.

71. Using the Powertrain Lift and Universal Adapter Brackets, secure the engine to the Powertrain Lift.
72. Remove the engine mount bracket bolt.

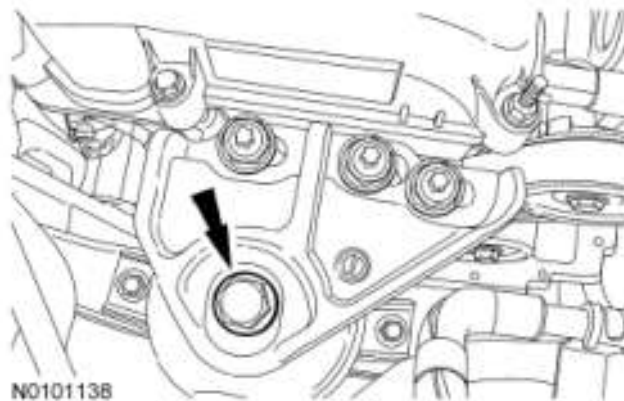


Fig. 229: Locating Engine Mount Bracket Bolt
Courtesy of FORD MOTOR CO.

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

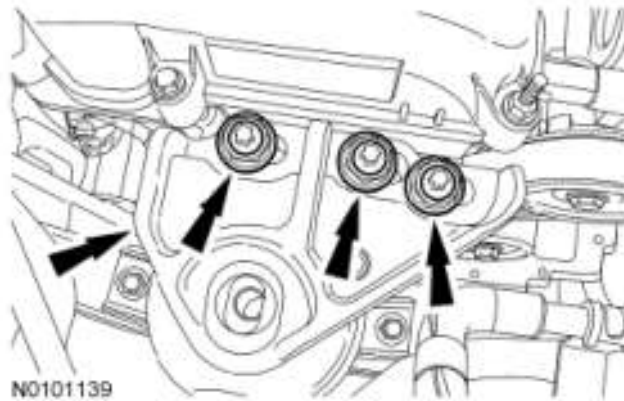


Fig. 230: Locating Engine Mount Bracket
Courtesy of FORD MOTOR CO.

74. Remove the upper transaxle insulator bracket bolts and remove the bracket.

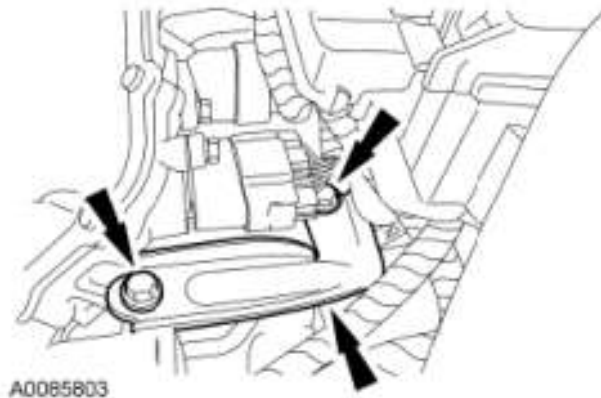


Fig. 231: Locating Upper Insulator Bracket
Courtesy of FORD MOTOR CO.

75. Remove the upper transaxle insulator through bolt.

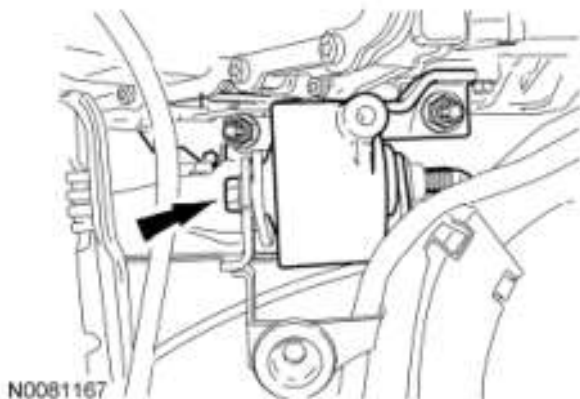


Fig. 232: Locating Upper Insulator Through Bolt
Courtesy of FORD MOTOR CO.

76. Remove the 2 nuts and the upper transaxle insulator.

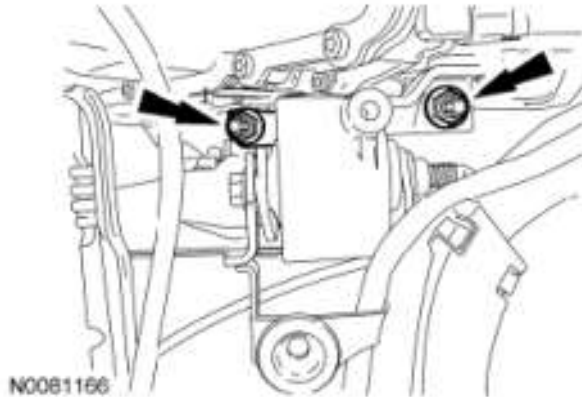


Fig. 233: Locating Upper Insulator Nuts
Courtesy of FORD MOTOR CO.

77. Lower the engine and transaxle from the vehicle.
78. Using the Heavy Duty Floor Crane and the Spreader Bar, remove the engine and transaxle from the Powertrain Lift.
79. Release the locking tab and disconnect the high-voltage wiring harness electrical connector.

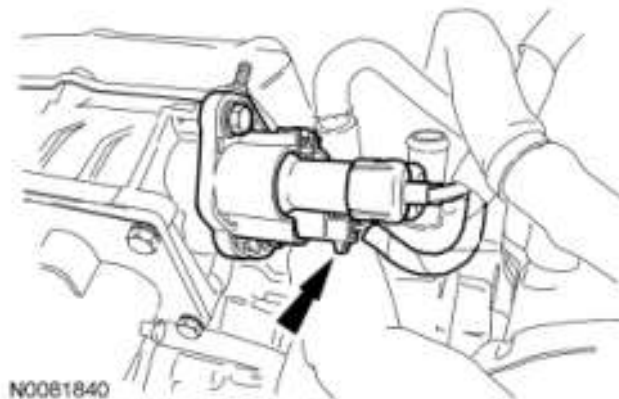


Fig. 234: Locating High Voltage Wiring Harness Electrical Connector
Courtesy of FORD MOTOR CO.

NOTE: The transaxle-to-engine bolts differ in length, mark the bolts for correct installation.

80. Remove the remaining 6 engine-to-transaxle bolts and separate the engine and transaxle.

NOTE: Due to packaging requirements, the correct bolt must be used at the damper locations.

NOTE: The damper contains a clutch which is designed to slip briefly during vehicle operation. It is essential that no grease, oil or cleaning solvents be allowed to contaminate the slip clutch. Do not use grease on transmission input shaft. Should the damper become contaminated, it

must be replaced.



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Fig. 235: Locating Transaxle Damper Bolts
Courtesy of FORD MOTOR CO.

81. Remove the bolts and the transaxle damper.