



REMOVAL

ENGINE

Special Tool(s)

ENGINE REMOVAL SPECIAL TOOL REFERENCE CHART

 <p>ST3101-A</p>	<p>Bar, Engine Spreader 303-1454</p>
 <p>ST1377-A</p>	<p>Lifting Bracket, Engine 303-F047 (014-00073) or equivalent</p>
	<p>Lift Eye, Right Front 303-1566</p>

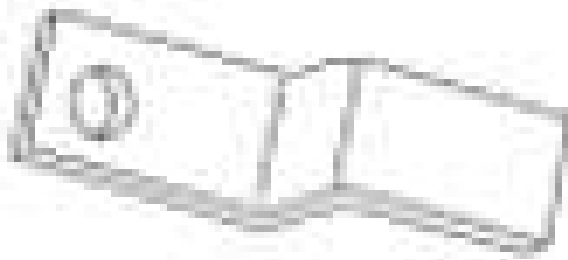


ST3265-A



ST1341-A

2,200# Floor Crane, Fold Away
300-OTC1819E or equivalent



BT1636-A

Retainer, Torque Converter
307-346 (T97T-7902-A) or equivalent

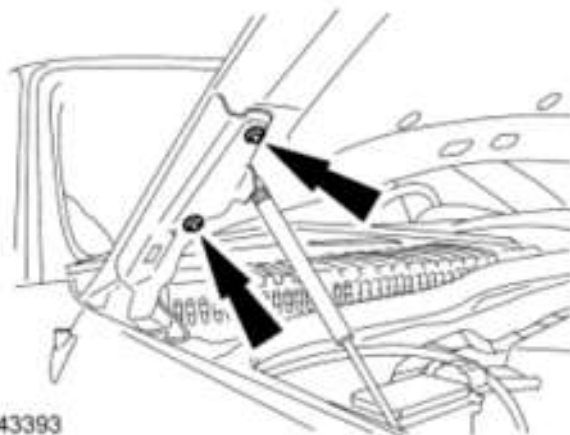
WARNING: Do not smoke, carry lighted tobacco or have an open flame of any type when working on or near any fuel-related component. Highly flammable mixtures are always present and may be ignited. Failure to follow these instructions may result in serious personal injury.

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.



A0043393

Fig. 452: Locating Hood Hinge 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** .
5. If equipped, disconnect the block heater electrical connector at the thermostat housing.
 - Detach the block heater wiring harness retainer from the LH valve cover stud bolt and position aside.



Fig. 453: Locating Block Heater Electrical Connector
Courtesy of FORD MOTOR CO.

6. Remove the cooling module. For additional information, refer **ENGINE COOLING** .
7. Remove the LH and RH turbocharger intake tubes. For additional information, refer to 3.5L Gasoline Turbocharged Direct Injection (GTDI) Charge Air Cooler (CAC) and Tubes Exploded View in **INTAKE AIR DISTRIBUTION AND FILTERING** .
8. Remove the 2 Charge Air Cooler (CAC) inlet tubes and the CAC outlet tube. For additional information, refer to 3.5L Gasoline Turbocharged Direct Injection (GTDI) Charge Air Cooler (CAC) and Tubes Exploded View in **INTAKE AIR DISTRIBUTION AND FILTERING** .
9. Disconnect the Battery Junction Box (BJB) wiring harness and the A/C pressure transducer electrical connectors.

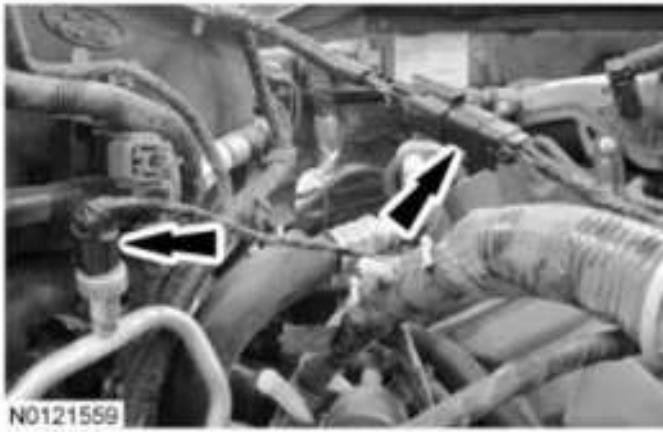


Fig. 454: Locating Battery Junction Box Wiring Harness And A/C Pressure Transducer Electrical Connectors
Courtesy of FORD MOTOR CO.

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

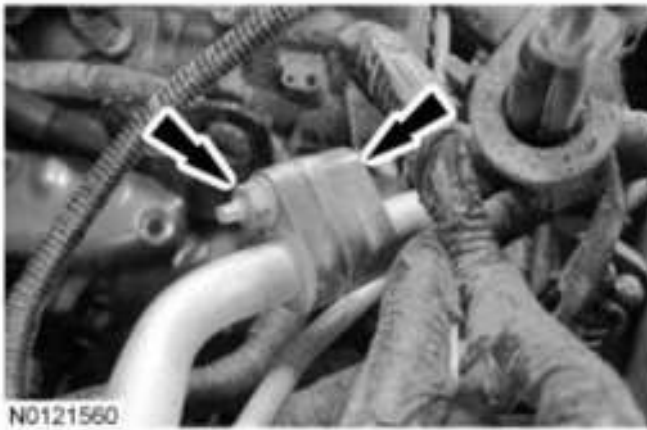


Fig. 455: Locating A/C Tube O-Ring Seal And Gasket
Courtesy of FORD MOTOR CO.

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

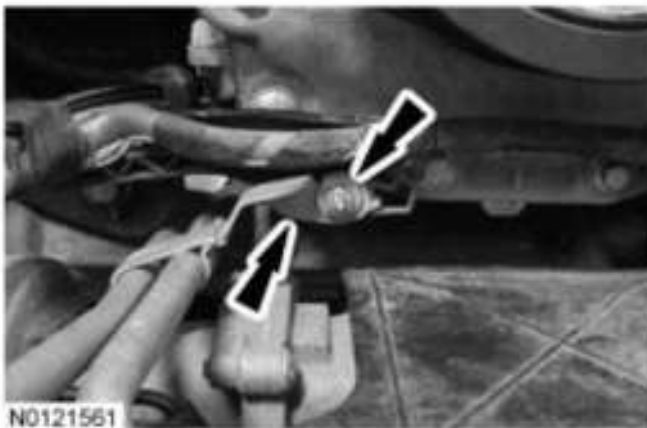


Fig. 456: Locating Transmission Cooler Line Bracket And Nut
Courtesy of FORD MOTOR CO.

12. Detach the generator wiring harness from the engine front cover.



Fig. 457: Identifying Generator Wiring Harness
Courtesy of FORD MOTOR CO.

13. Disconnect the A/C compressor electrical connector.
 - Detach the A/C compressor wiring harness from the A/C compressor.

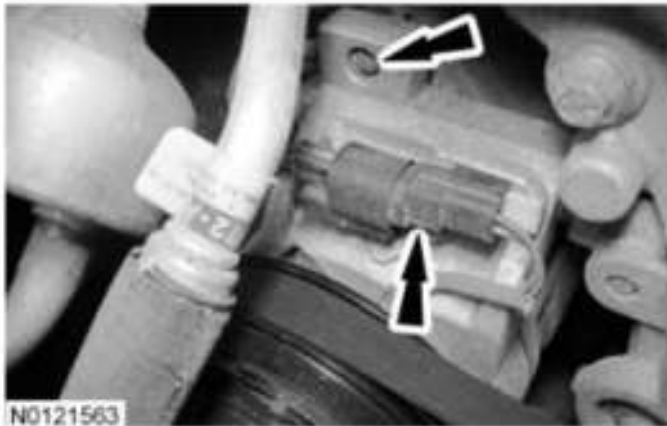


Fig. 458: Locating A/C Compressor Electrical Connector
Courtesy of FORD MOTOR CO.

14. Remove the generator. For additional information, refer to **CHARGING SYSTEM** .
15. Remove the A/C compressor belt. For additional information, refer to **ACCESSORY DRIVE** .
16. Disconnect the PCM electrical connector and the engine wire harness electrical connector.
 - Detach the wiring harness retainers from the fender splash shield.



Fig. 459: Locating PCM Electrical Connector And Engine Wire Harness Electrical Connector
Courtesy of FORD MOTOR CO.

17. Remove the fuel injection pump. For additional information, refer to **FUEL CHARGING AND CONTROLS - 3.5L GTDI**.
18. Remove the intake manifold. For additional information, refer to **INTAKE MANIFOLD**.
19. Disconnect the 2 heater hose couplings at the RH rear of the engine.



Fig. 460: Locating Heater Hose Couplings
Courtesy of FORD MOTOR CO.

20. Disconnect the 2 coolant hoses from the degas bottle.



Fig. 461: Locating Coolant Hoses Of Degas Bottle
Courtesy of FORD MOTOR CO.

21. Detach the wiring harness retainers from the rear of the RH valve cover stud bolt and the rear of the RH cylinder head.

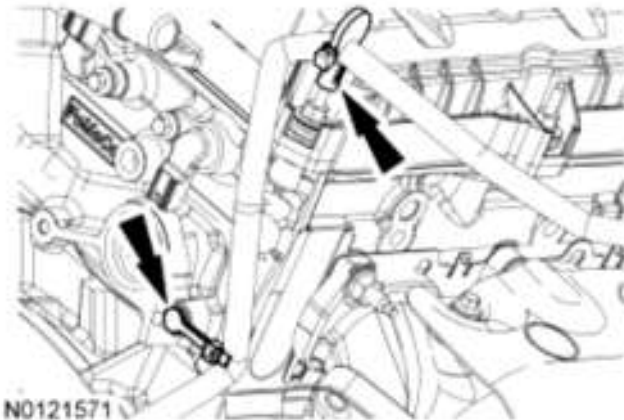


Fig. 462: Locating Wiring Harness Retainers
Courtesy of FORD MOTOR CO.

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

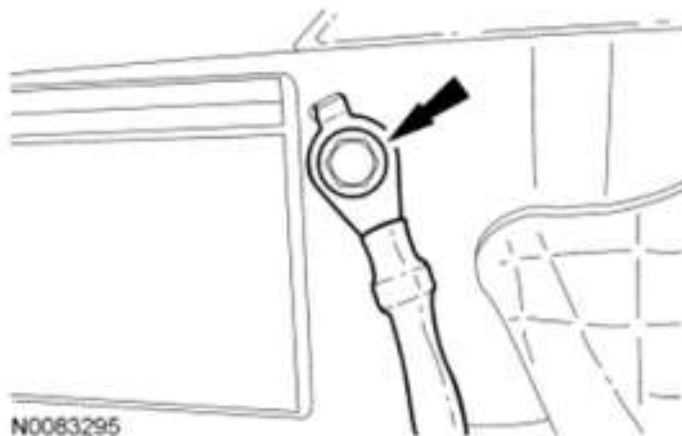


Fig. 463: Locating Ground Strap And Bolt

Courtesy of FORD MOTOR CO.

23. Remove the cowl panel grille. For additional information, refer to **FRONT END BODY PANELS** .
24. Remove the 6 screws and release the 2 cowl panel clips and remove the cowl panel.



Fig. 464: Locating Cowl Panel
Courtesy of FORD MOTOR CO.

25. Disconnect the Heated Oxygen Sensor (HO2S) electrical connector from the engine wiring harness at the rear of the LH cylinder head.
 - Disconnect the **HO2S** electrical connector from the wiring harness retainer.



Fig. 465: Locating Heated Oxygen Sensor Electrical Connector
Courtesy of FORD MOTOR CO.

26. Release the 4 fasteners and the splash shield.

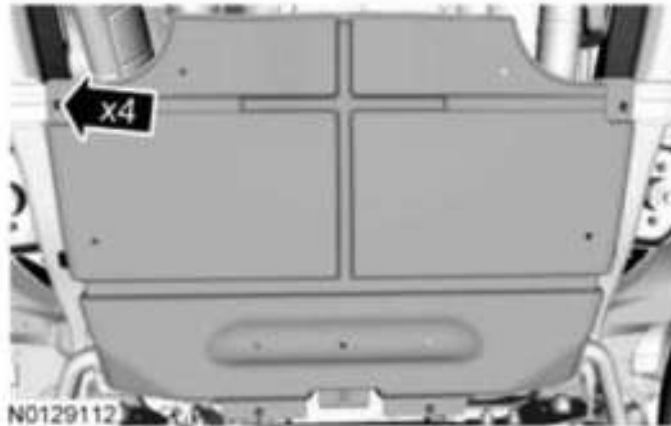


Fig. 466: Locating Splash Shield Fasteners
Courtesy of FORD MOTOR CO.

NOTE: Only one wire harness retainer and one electrical connector shown in the figure below, others similar.

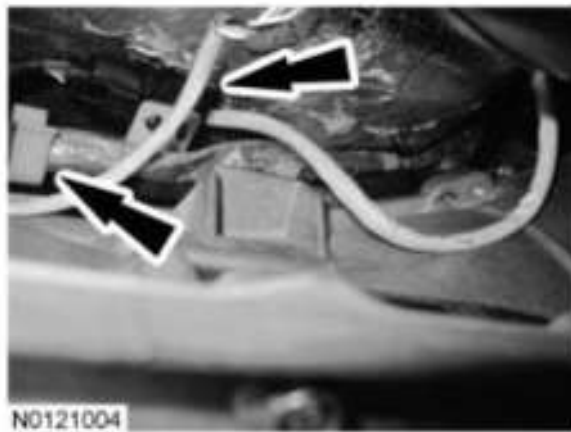


Fig. 467: Locating Transmission Wire Harness Retainers
Courtesy of FORD MOTOR CO.

27. Disconnect the 2 **HO2S** electrical connectors.
- Disconnect the 2 **HO2S** electrical connector retainers.
 - If equipped, disconnect the 5 transmission wire harness retainers from the transfer case wire harness.
28. Disconnect the **HO2S** electrical connector at the LH rear of the transmission.
- Disconnect the electrical connector retainer from the bracket at the rear of the transmission.



Fig. 468: Locating HO2S Electrical Connector Retainer
Courtesy of FORD MOTOR CO.

NOTE: Do not pull on the wire harness to disconnect the connector or damage to the connector will occur.



Fig. 469: Locating Transmission Vehicle Harness Connector
Courtesy of FORD MOTOR CO.

29. Disconnect the transmission vehicle harness connector by twisting the outer shell and pulling back on the connector.
30. Remove the 4 bolts and the skid plate.
31. If equipped, remove the front driveshaft. For additional information, refer to **DRIVESHAFT** .
32. Remove the starter motor. For additional information, refer to **STARTING SYSTEM** .
33. Detach the starter motor wiring harness retainer from the oil pan.



Fig. 470: Locating Starter Motor Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

34. Remove the 2 pin-type retainers and the access cover.

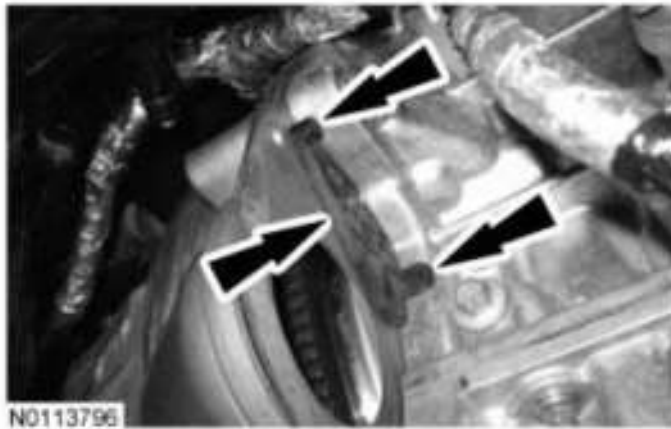


Fig. 471: Locating Access Cover Pin-Type Retainers
Courtesy of FORD MOTOR CO.

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

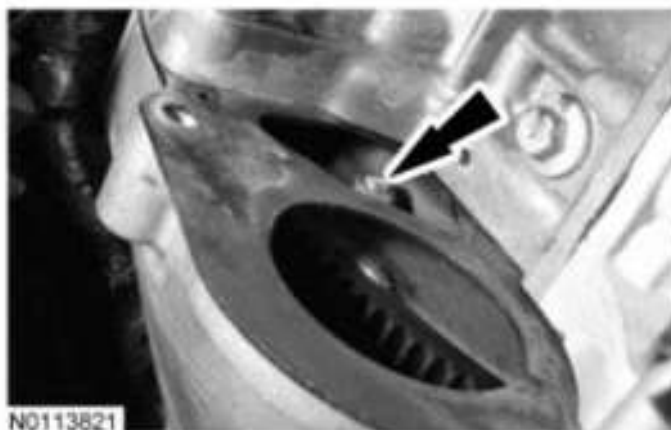


Fig. 472: Locating Torque Converter Nut
Courtesy of FORD MOTOR CO.

35. Remove the 4 torque converter nuts.
36. Remove the 2 exhaust Y-pipe dual catalytic converter-to-exhaust intermediate pipe bolts and separate.
 - Discard the bolts.

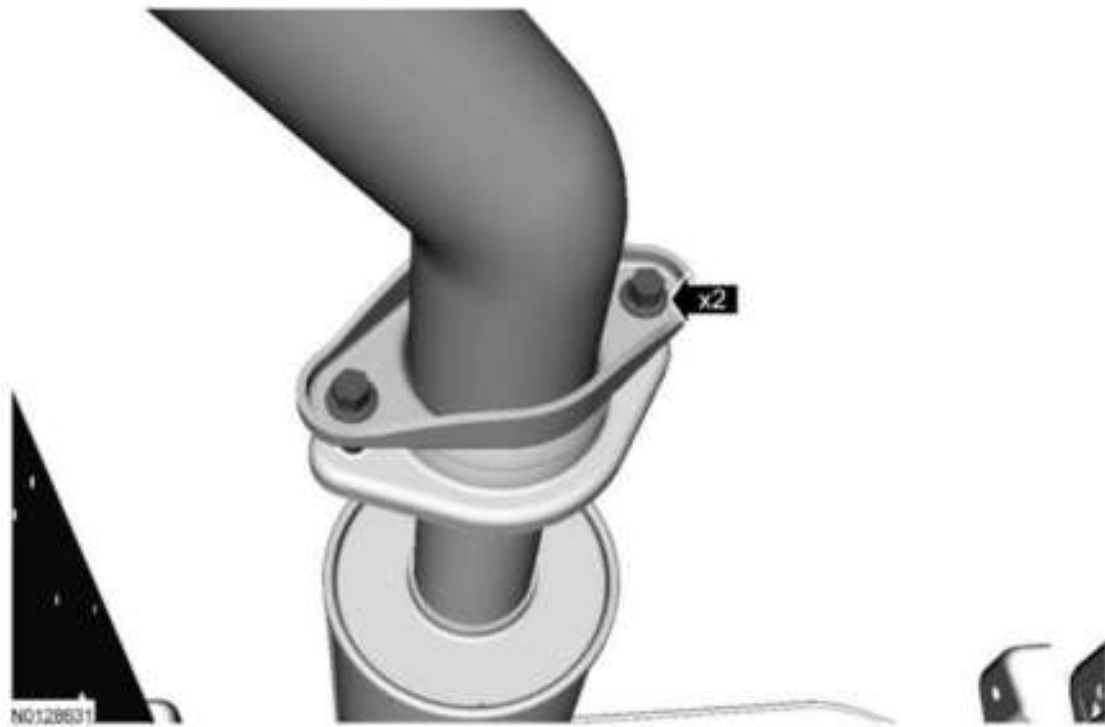


Fig. 473: Locating Exhaust Y-Pipe Dual Catalytic Converter-To-Exhaust Intermediate Pipe Bolts
Courtesy of FORD MOTOR CO.

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



Fig. 474: Locating Catalytic Converter-To-Exhaust Manifold Nuts
Courtesy of FORD MOTOR CO.

37. Remove and discard the 2 LH and RH catalytic converter-to-exhaust manifold nuts.
38. Remove the drain plug and drain the engine oil.
 - Install the drain plug and tighten to 27 Nm (20 lb-ft).



Fig. 475: Locating Drain Plug
Courtesy of FORD MOTOR CO.

39. Remove and discard the engine oil filter.

NOTE: The 2 engine mount studs may come off with the nuts.



Fig. 476: Locating RH Engine Support Insulator Nuts
Courtesy of FORD MOTOR CO.

40. Remove the 2 RH engine support insulator nuts and studs.
41. Remove the engine-to-bellhousing bolt.



Fig. 477: Locating Engine-To-Bell Housing Bolt
Courtesy of FORD MOTOR CO.

42. Remove the oil pan-to-bellhousing bolt.



Fig. 478: Locating Oil Pan-To-Bell Housing Bolt
Courtesy of FORD MOTOR CO.

43. Remove the 2 LH bellhousing-to-engine bolts.

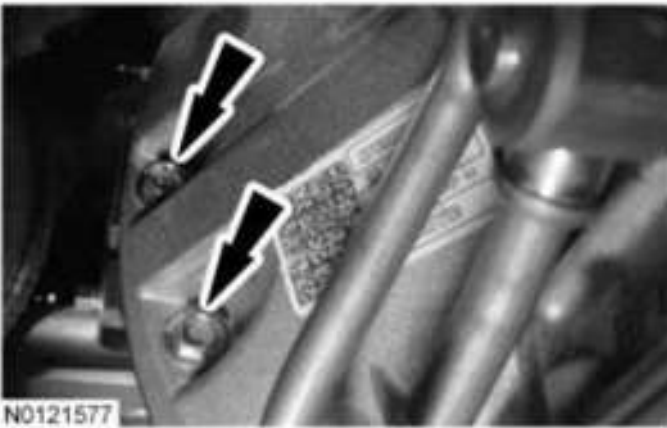


Fig. 479: Locating LH Bell Housing-To-Engine Bolts
Courtesy of FORD MOTOR CO.

44. Remove the 4 upper bellhousing-to-engine bolts.

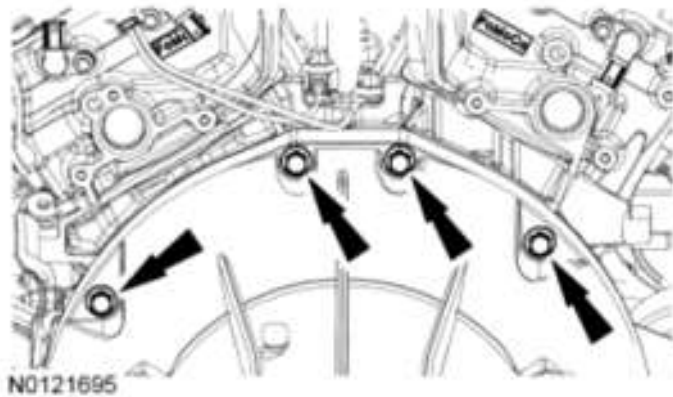


Fig. 480: Locating Upper Bell Housing-To-Engine Bolts
Courtesy of FORD MOTOR CO.

45. Remove the LH engine mount through bolt.

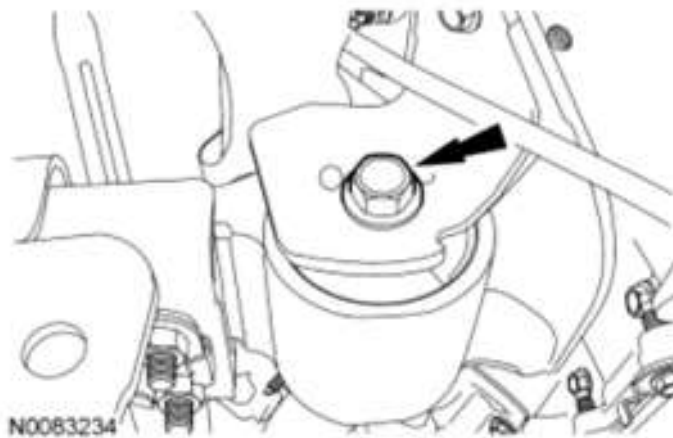


Fig. 481: Locating Engine Support Insulator Bolt
Courtesy of FORD MOTOR CO.

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.
47. Remove the 2 LH bellhousing-to-oil pan bolts.

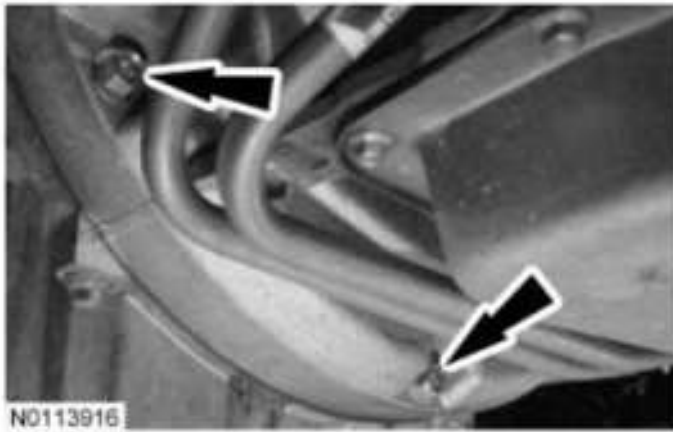


Fig. 482: Locating Bell Housing-To-Oil Pan Bolts
Courtesy of FORD MOTOR CO.

48. Remove the 2 nuts and the CAC tube bracket.
 - Disconnect the coolant hose from the valve cover stud.

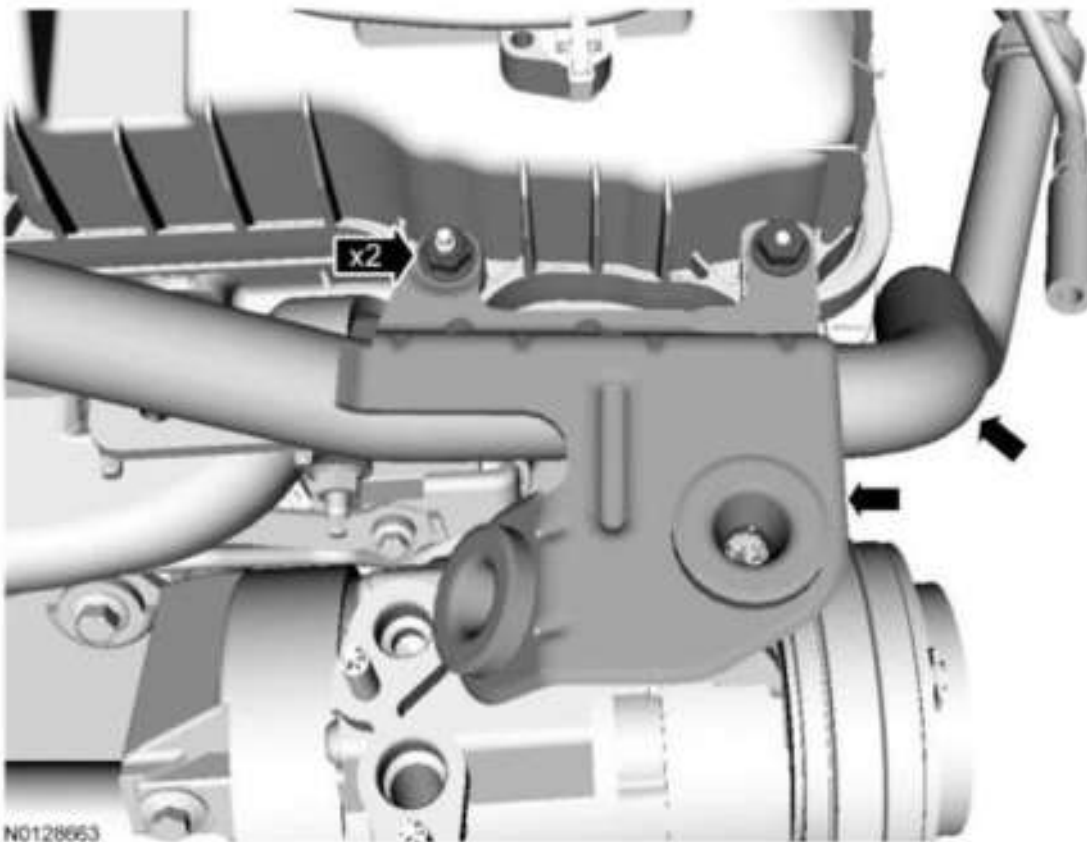


Fig. 483: Locating CAC Tube Bracket And Nuts
Courtesy of FORD MOTOR CO.

49. Install the Right Front Lift Eye.



Fig. 484: Locating Right Front Lift Eye
Courtesy of FORD MOTOR CO.

50. Using part of the Engine Lifting Bracket and a chain, assemble the Engine Spreader Bar as shown in the figure below.

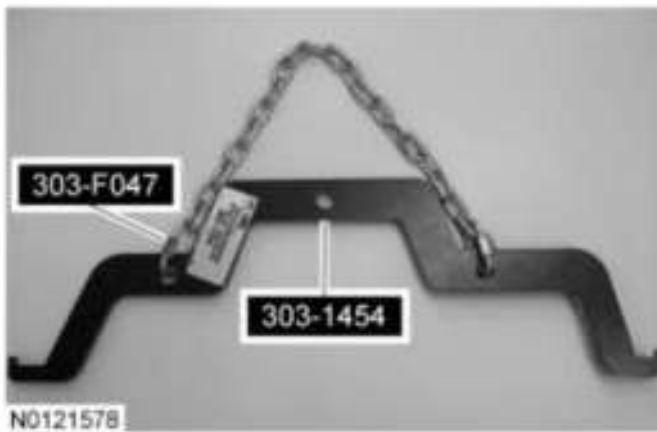


Fig. 485: Assembling Engine Spreader Bar
Courtesy of FORD MOTOR CO.

NOTE: After removing the bolts leave the LH engine support insulator in place.



Fig. 486: Locating Engine Support Insulator Mounting Bolts
Courtesy of FORD MOTOR CO.

51. Remove the 3 bolts for the LH engine support insulator.

NOTE: The use of a ratchet strap may be needed to level the engine.



Fig. 487: Lifting Engine Using Floor Crane And Engine Spreader Bar Assembly
Courtesy of FORD MOTOR CO.

52. Using the Floor Crane and Engine Spreader Bar assembly, lift the engine.
53. Remove the LH engine support insulator.



Fig. 488: Locating Engine Support Insulator
Courtesy of FORD MOTOR CO.

NOTE: The transmission wiring harness is part of the engine wiring harness.



Fig. 489: Locating Generator Wiring Harness Retainer
Courtesy of FORD MOTOR CO.

54. Detach the generator wiring harness retainer from the lower LH side of the engine block.
 - Position the transmission wiring harness on top of the engine for removal.
55. Using the Floor Crane and Engine Spreader Bar assembly, remove the engine.



Fig. 490: Lifting Engine Using Floor Crane And Engine Spreader Bar Assembly
Courtesy of FORD MOTOR CO.

56. Install the Torque Converter Retainer.



Fig. 491: Locating Torque Converter Retainer
Courtesy of FORD MOTOR CO.