




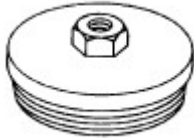



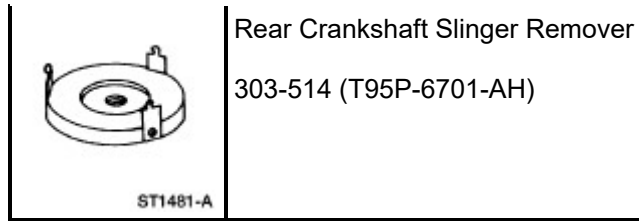
SECTION 303-01: Engine
DISASSEMBLY AND ASSEMBLY

1998 Mark VIII Workshop Manual

Engine

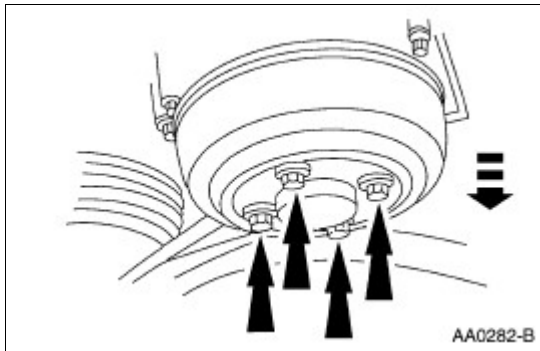
Special Tool(s)

 <p>ST1715-A</p>	<p>Camshaft Holding Tool 303-446 (T93P-6256-AH)</p>
 <p>ST1337-A</p>	<p>Connecting Rod Guide Tool 303-442 (T93P-6136-A)</p>
 <p>ST1286-A</p>	<p>Crankshaft Damper Remover 303-009 (T58P-6316-D)</p>
 <p>ST1276-A</p>	<p>Cylinder Ridge Reamer 303-016 (T64L-6011-EA)</p>
 <p>ST1288-A</p>	<p>Front Cover Seal Remover 303-107 (T74P-6700-A)</p>
 <p>ST1382-A</p>	<p>Rear Crankshaft Seal Remover 303-519 (T95P-6701-EH)</p>
 <p>ST1185-A</p>	<p>Slide Hammer 100-001 (T50T-100-A)</p>

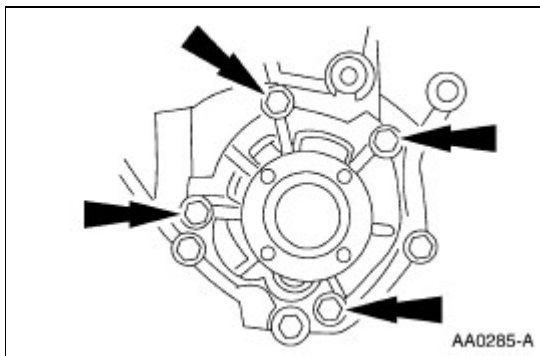


Disassembly

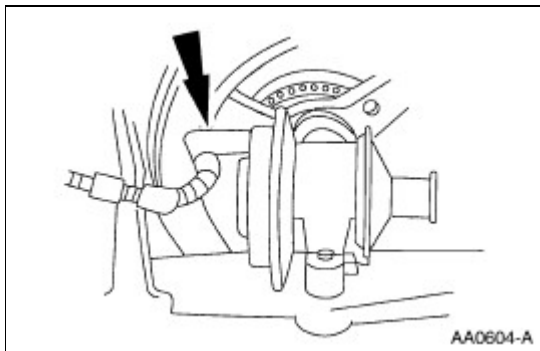
1. Remove the engine; refer to Engine Removal and Installation in this section.
2. Remove the drive belt (8620).
3. Remove the bolts and the water pump pulley (8509).



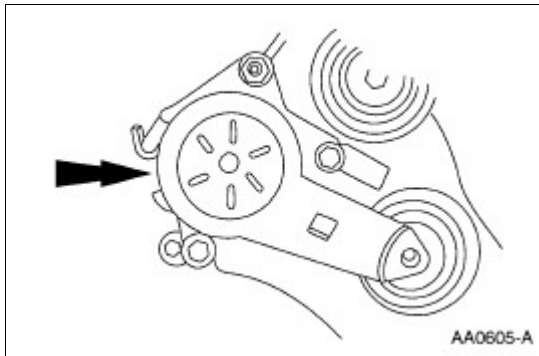
4. Remove the bolts and the water pump (8501).



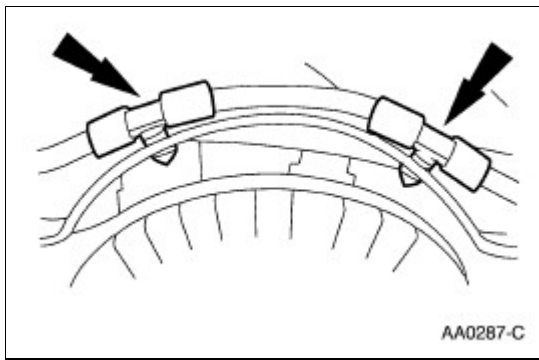
5. Remove the vacuum line from secondary air injection diverter valve (9F491).



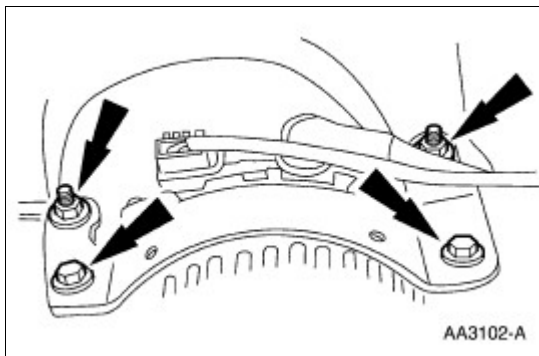
6. If necessary, remove the bolts and remove the drive belt tensioner (6B209).



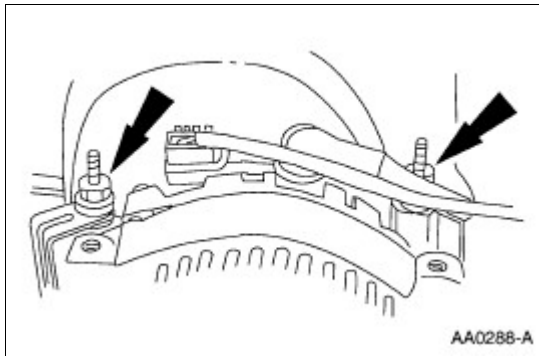
7. Disconnect the wire from the support bracket.



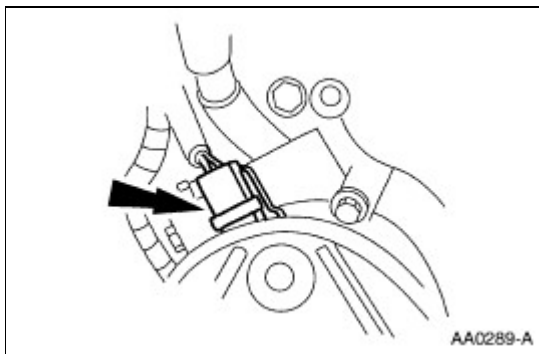
8. Remove the bolts and the generator mounting bracket (10153).



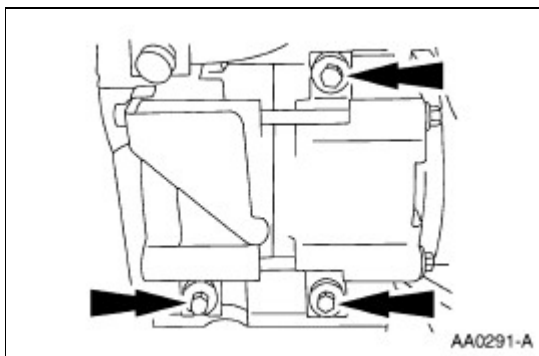
9. Remove the nuts and remove the water bypass tube (8548).



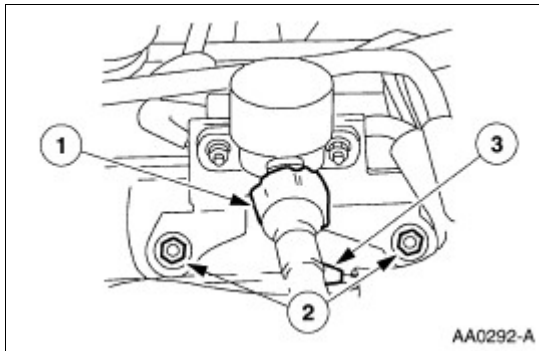
10. Disconnect the engine control sensor wiring from the A/C compressor (19703).



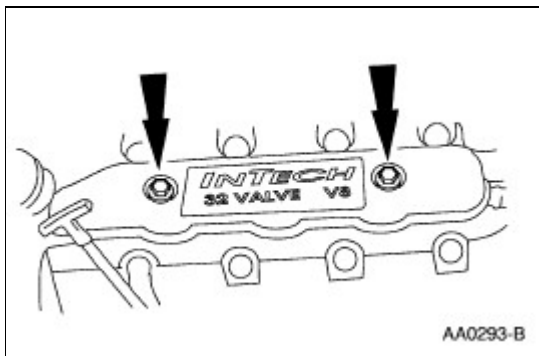
11. Remove the bolts from the A/C compressor and remove the A/C compressor.



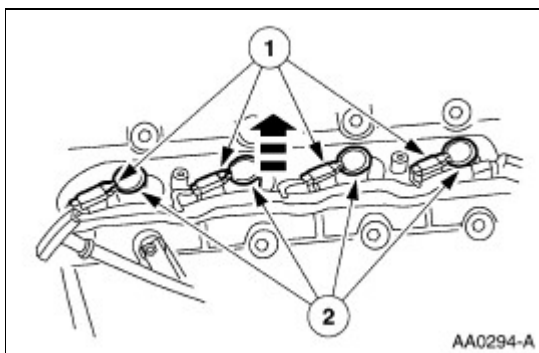
12. Remove the EGR vacuum regulator control and bracket assembly.
1. Disconnect connector from EGR vacuum regulator.
 2. Remove the retaining nuts from the EGR vacuum regulator control and bracket assembly.
 3. Remove two vacuum lines and remove the EGR vacuum regulator control and bracket assembly.



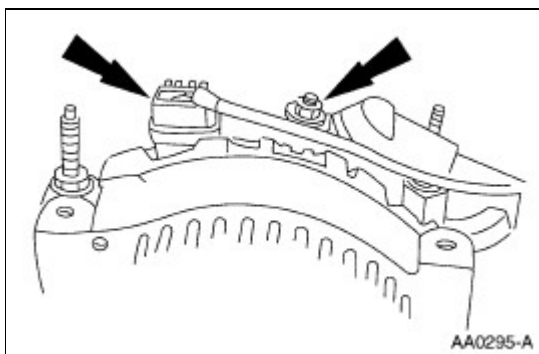
13. Remove the bolts from both ignition coil covers and remove the ignition coil wire.



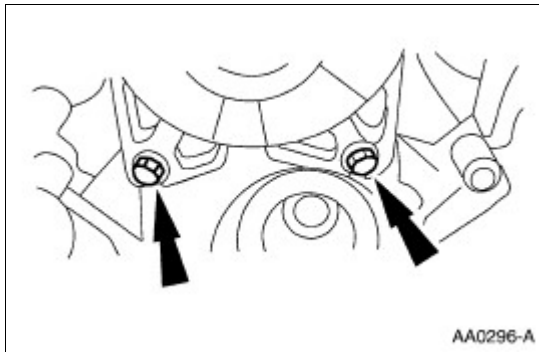
14. Remove the RH and LH ignition coil assembly from the ignition coils.
1. Disconnect the ignition coil connectors from the ignition coils.
 2. Pull and remove the ignition coil assembly.



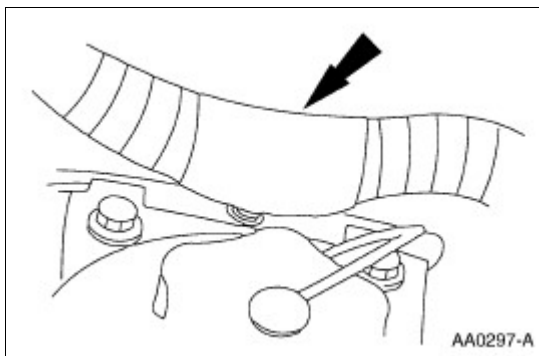
15. Remove the generator wiring.



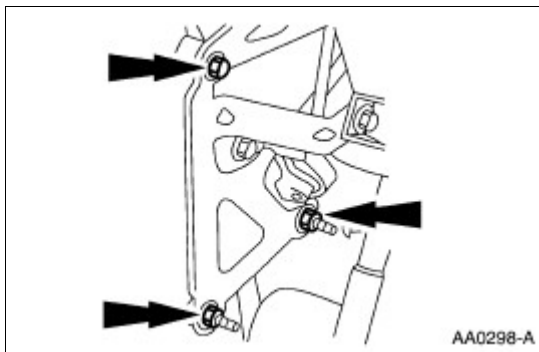
16. Loosen bolts and remove the generator (GEN) (10300).



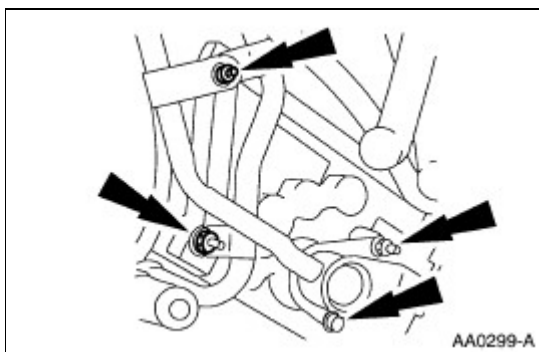
17. Disconnect the wire harness from the power steering reservoir bracket.



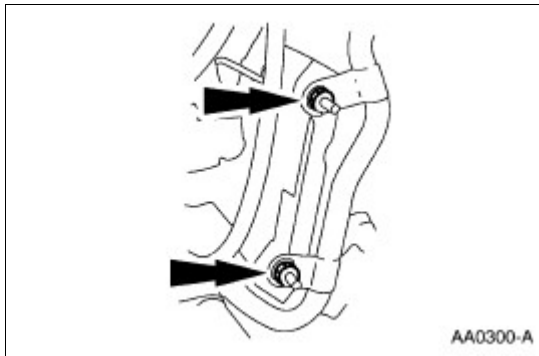
18. Remove the bolts from the power steering reservoir bracket.



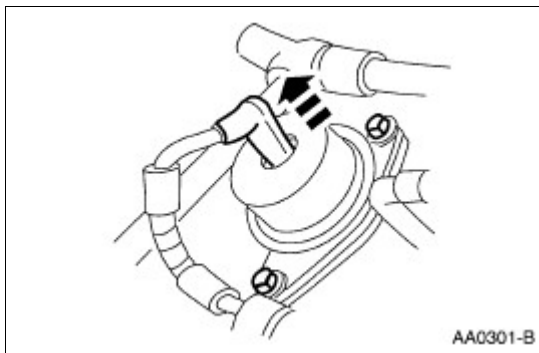
19. Remove the nut and bolts from the water inlet tube and remove the heater water tube.



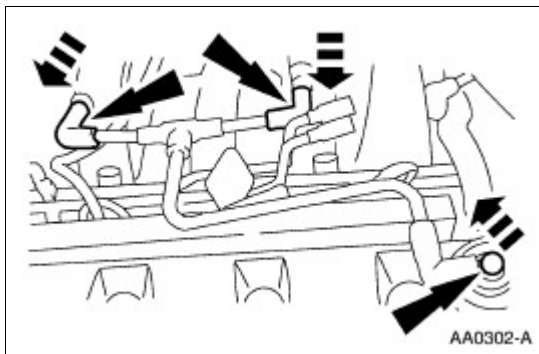
20. Remove the stud bolts from the heater outlet hose.



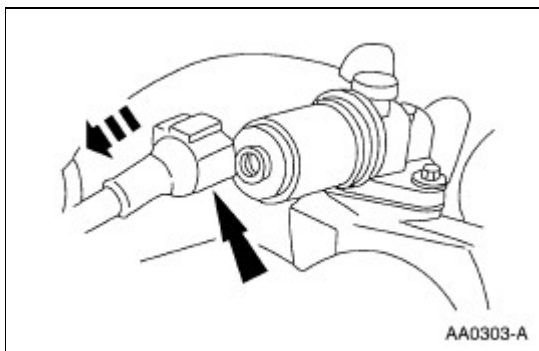
21. Disconnect vacuum hose from the fuel pressure regulator (9C968).



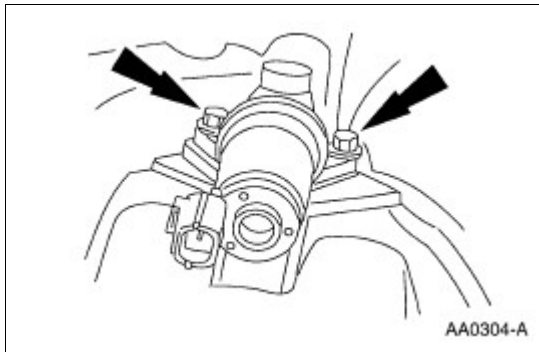
22. Remove the crankcase vent connector and hose (6C324).



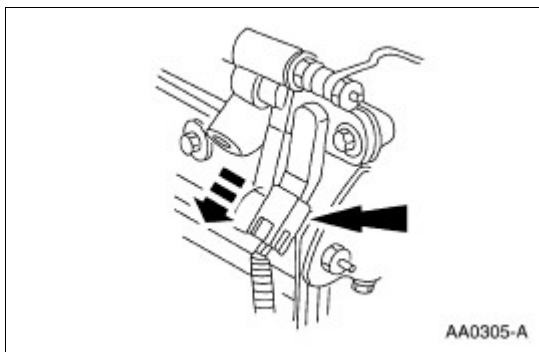
23. Remove the connector from the idle air control valve (IAC valve) (9F715).



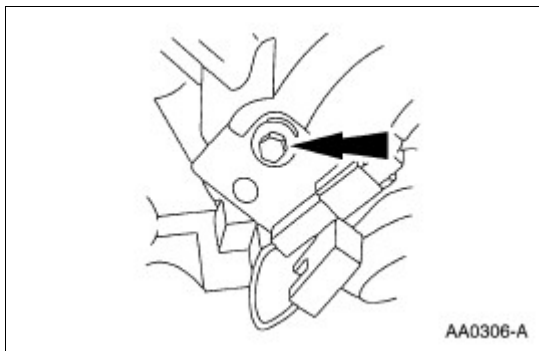
24. If necessary, remove the bolts and the idle air control valve.



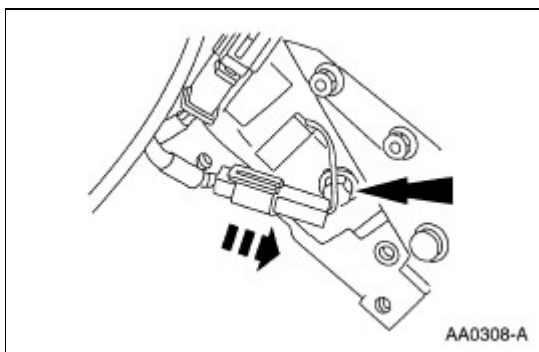
25. Disconnect the connector from the crankshaft position sensor (CKP sensor) (6C315).



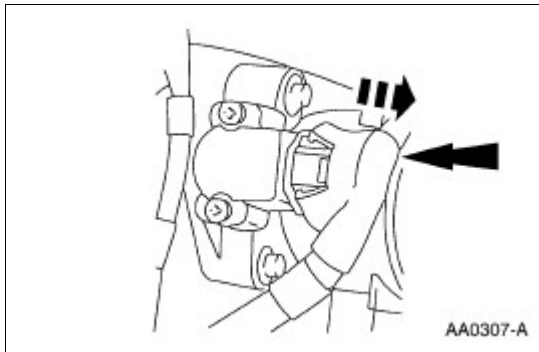
26. Remove the bolt from the RH radio ignition interference capacitor (18801).



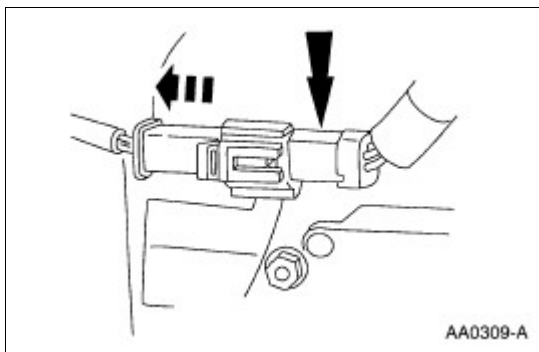
27. Remove the bolt from the LH radio ignition interference capacitor.



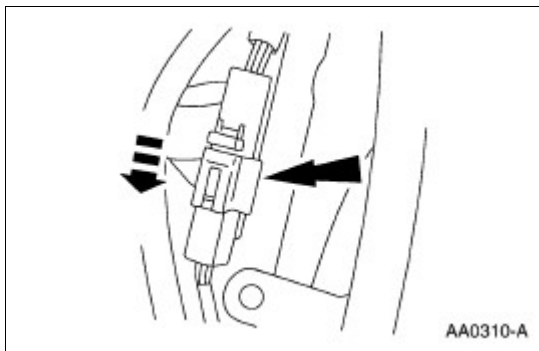
28. Disconnect the connector from the throttle position sensor (TP sensor) (9B989).



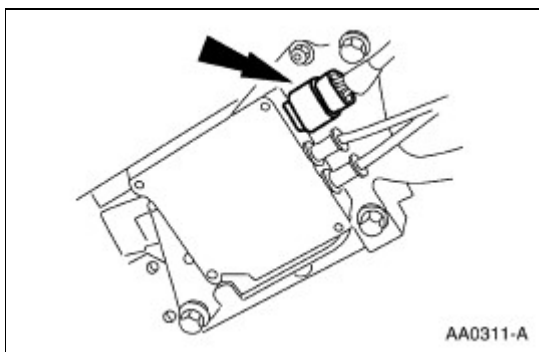
29. Disconnect the connector from the heated oxygen sensor (HO2S) (9F472).



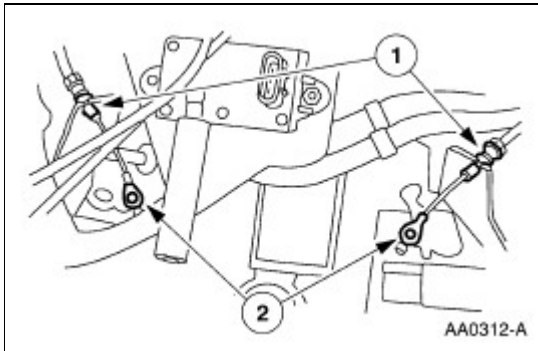
30. Disconnect the connector from knock sensor (KS) (12A699).



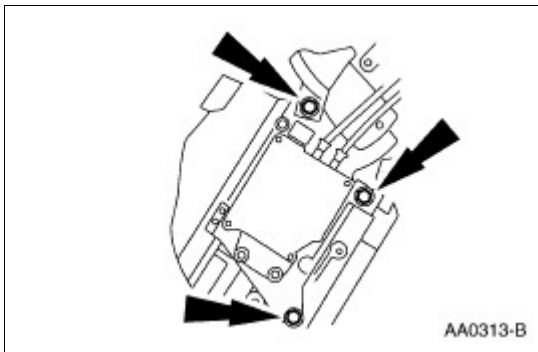
31. Disconnect the connector from the IMRC actuator and bracket assembly.



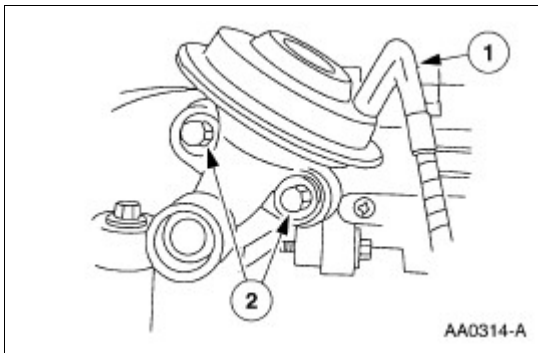
32. Disconnect the intake manifold runner control actuator cable.
1. Disconnect the cable from the intake manifold runner control housing 2 cable bracket.
 2. Disconnect the cable from the lever.



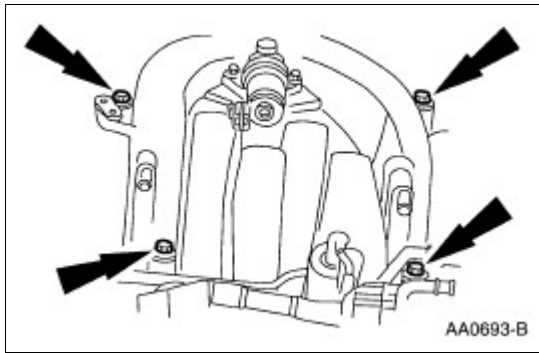
33. Remove the bolts from the IMRC actuator and bracket assembly.



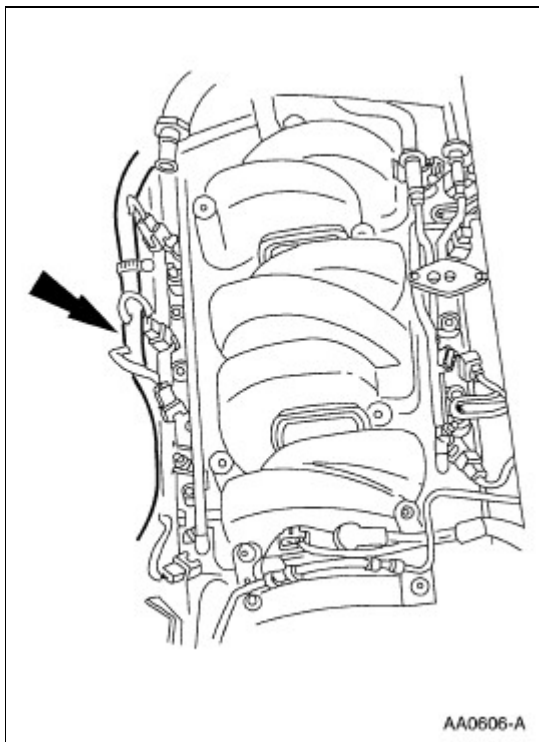
34. If necessary, remove the EGR valve (EGR valve) (9D475).
1. Remove the vacuum hoses.
 2. Remove the retaining bolts.



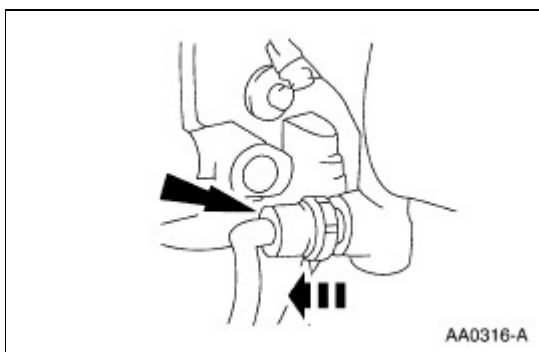
35. Remove the bolts from the upper upper intake manifold.



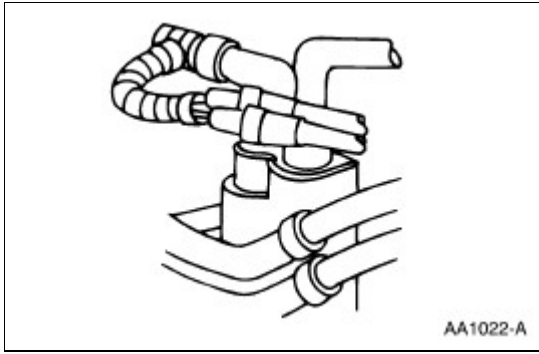
36. Disconnect the fuel injector wiring.



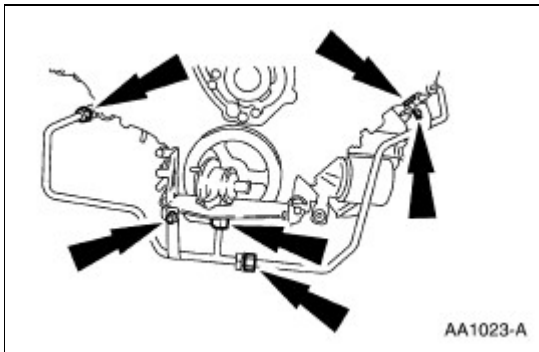
37. Disconnect the connector from the oil pressure sensor (9278).



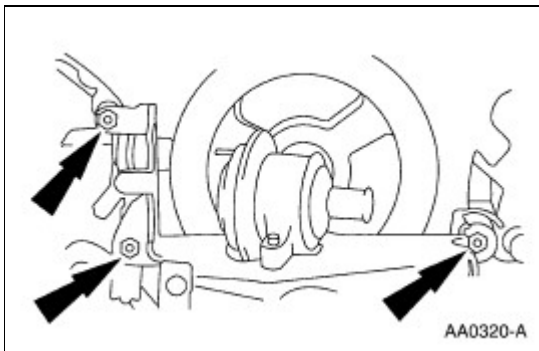
38. Disconnect the chassis vacuum hose from the lower intake manifold.



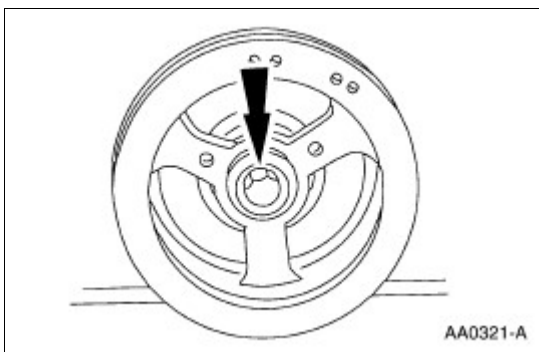
39. Disconnect the tube from both the exhaust manifold and the secondary air injection diverter valve.



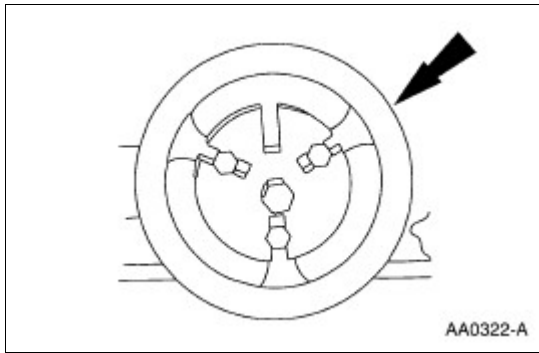
40. Remove the nuts from the bracket and remove the secondary air injection diverter valve.



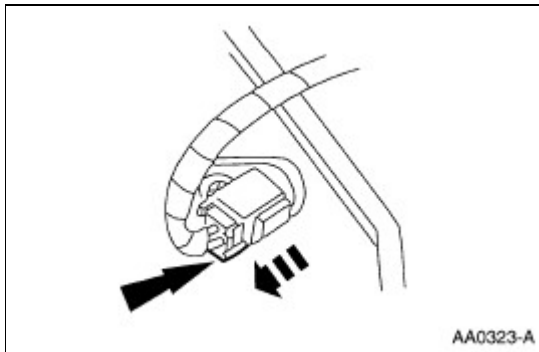
41. Remove the bolt from the crankshaft pulley (6312).



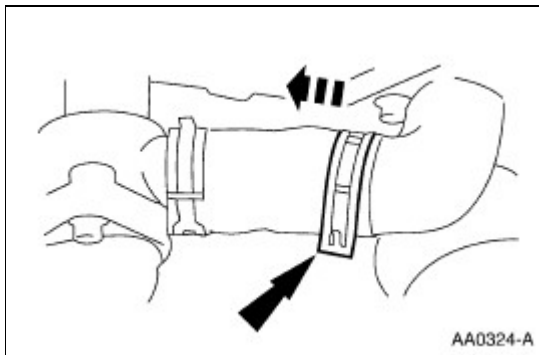
42. Remove the crankshaft pulley using the Crankshaft Damper Remover.



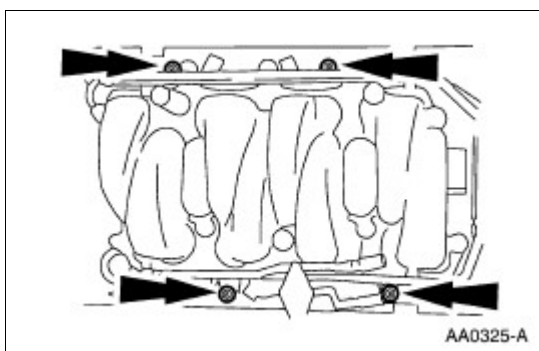
43. Disconnect the connector from the camshaft position sensor (CMP sensor) (6B288).



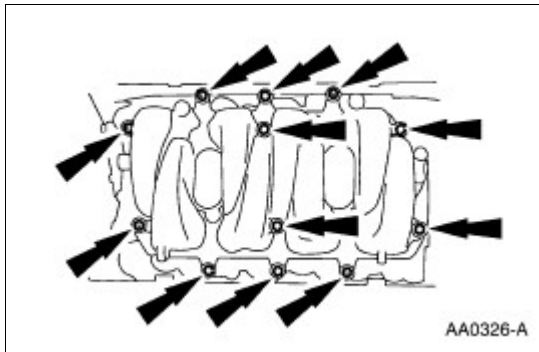
44. Remove the hose clamp and disconnect hose from the coolant inlet.



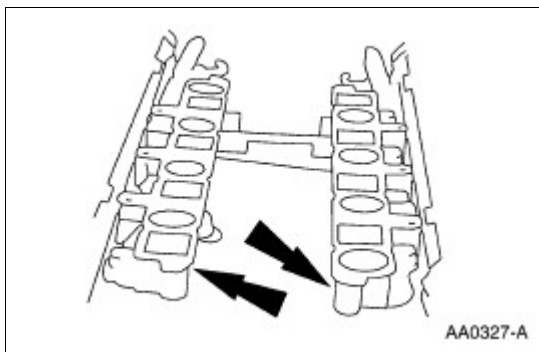
45. Remove the bolts from the fuel rail and remove the fuel injection supply manifold (9F792) with fuel injectors.



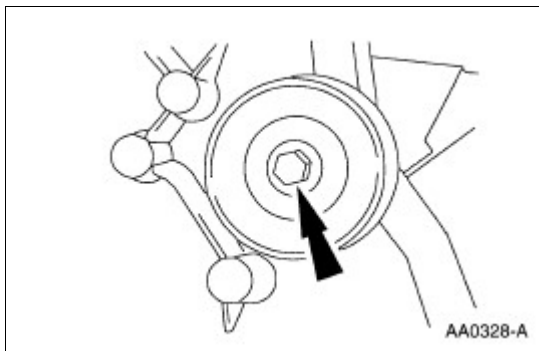
46. Remove the bolts from the lower intake manifold and remove the lower intake manifold (9424).



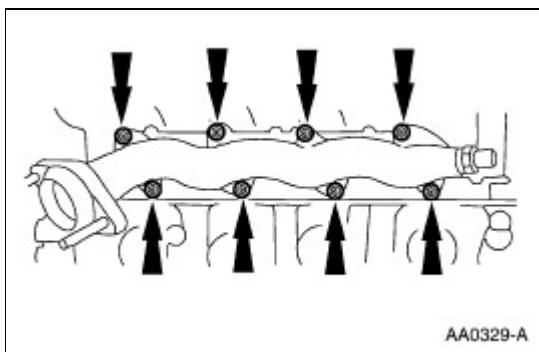
47. Remove the intake manifold runner control units (IMRC).



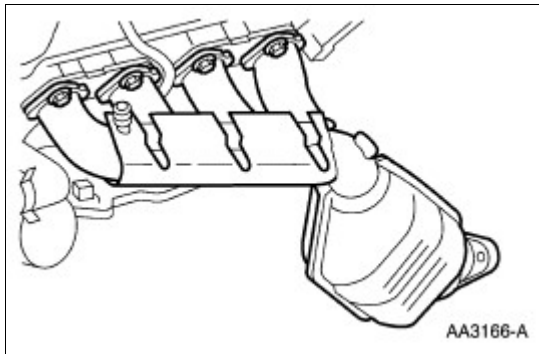
48. Remove the bolt from the belt idler pulley and remove the belt idler pulley (8678).



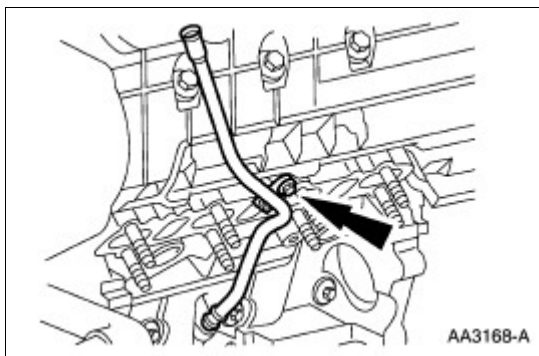
49. Remove the bolt nuts from the RH exhaust manifold and remove the RH exhaust manifold (9430).



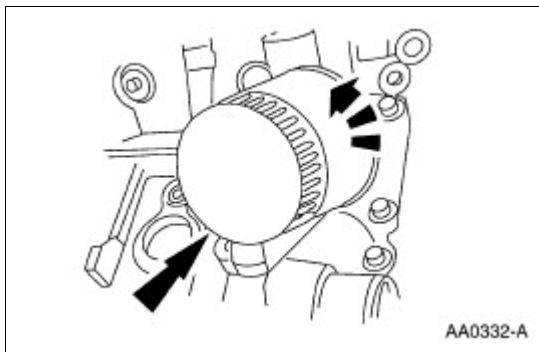
50. Remove the nuts from the LH exhaust manifold and remove the LH exhaust manifold.



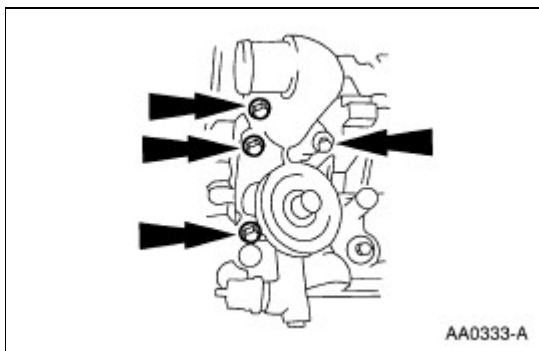
51. Remove the nuts from the oil level indicator tube and remove the oil level indicator tube (6754).



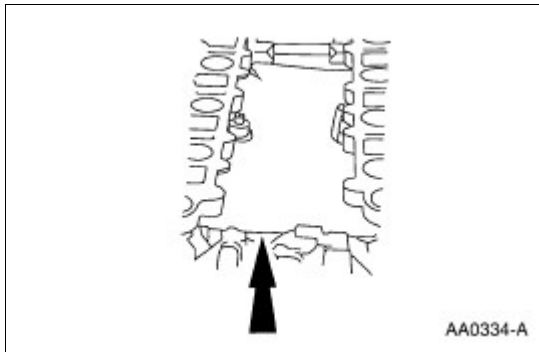
52. Remove the oil bypass filter (6714).



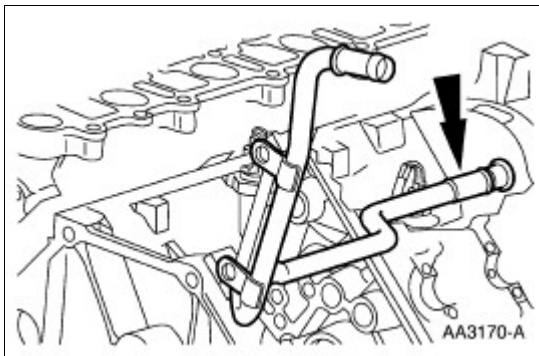
53. Remove the bolts from the oil filter adapter and remove the oil filter adapter (6881).



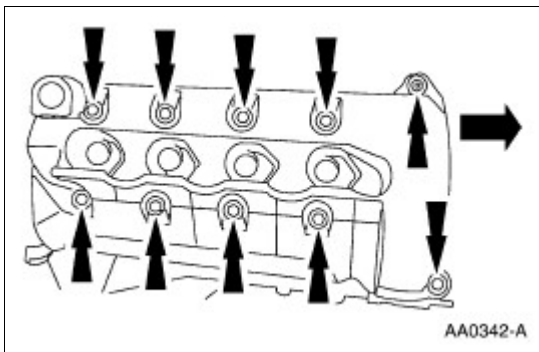
54. Remove the noise shield.



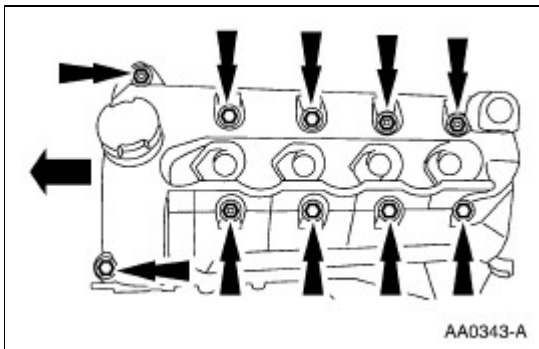
55. Remove the heater water hose (18472) from the water outlet tube.



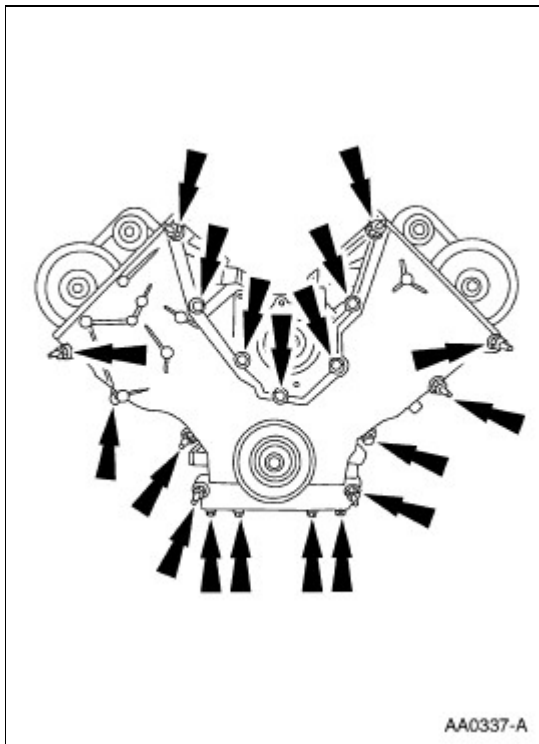
56. Remove the bolts from the RH valve cover (6582) and remove the RH valve cover.



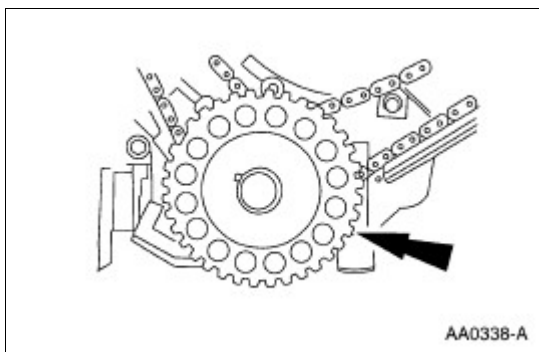
57. Remove the bolts from the LH valve cover and remove the LH valve cover.



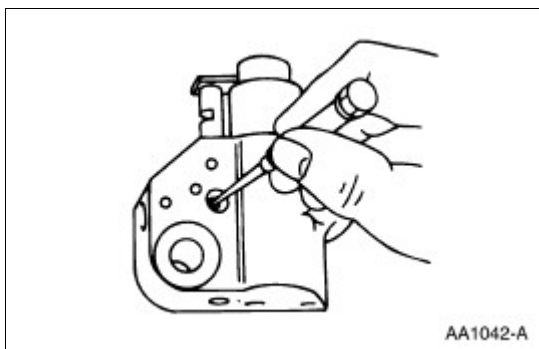
58. Remove the bolts from the engine front cover (6019) and the oil pan (6675) and remove the engine front cover.



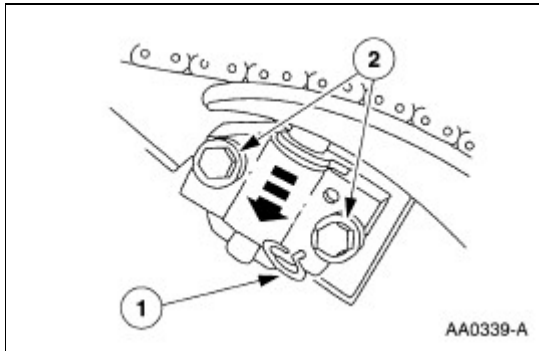
59. Remove the crankshaft position sensor (cap) pulse wheel.



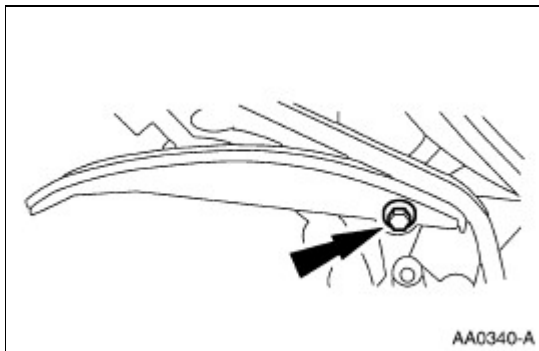
60. Release the ratchet lock while the piston is being compressed.



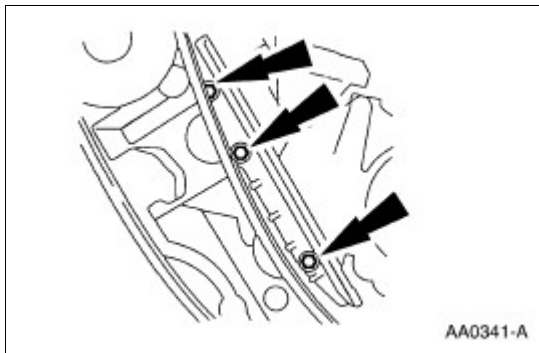
61. Remove the RH and LH timing chain tensioner (6L266).
1. Compress the timing chain tensioner and install the retaining pins.
 2. Remove the bolts and remove the timing chain tensioner.



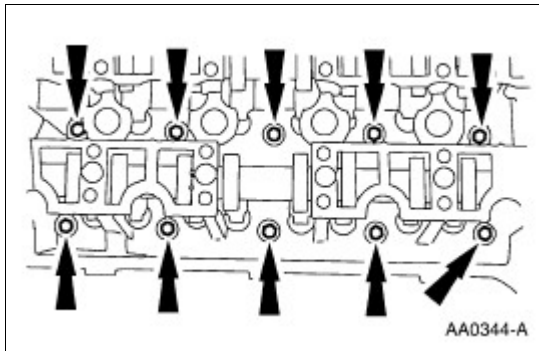
62. Remove the bolts from the RH and LH timing chain tensioner arms and remove the timing chain tensioner arm (6L253), the camshaft sprocket (6256) and the timing chain/belt (6268).



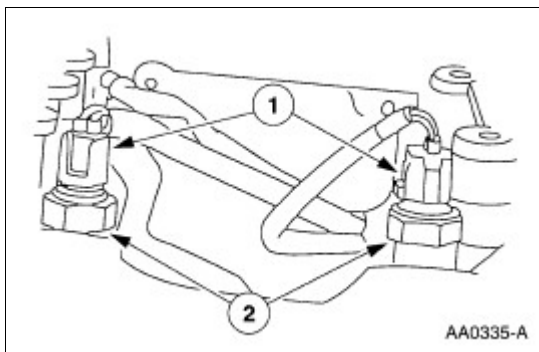
63. Remove the retaining bolts from the RH and LH timing chain tensioner arms and remove the timing chain guide (6K297).



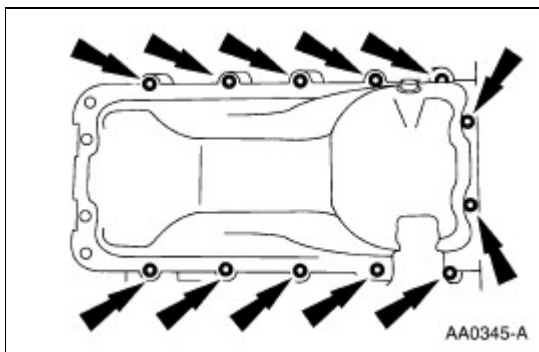
64. Remove the bolts from the RH and LH cylinder head (6049) and remove the cylinder heads.



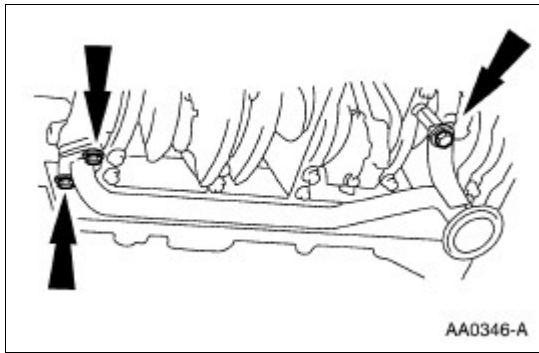
65. If necessary, remove the knock sensor.
1. Disconnect the connector from the knock sensor.
 2. Remove the knock sensor from the cylinder block.



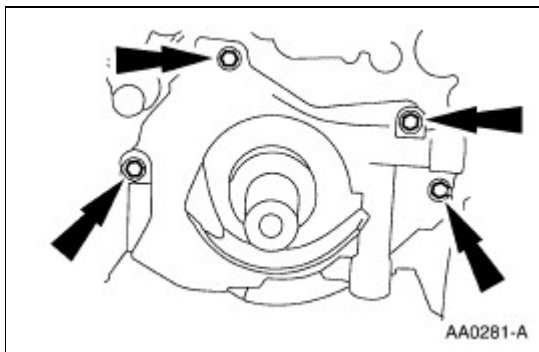
66. Remove the bolts from the oil pan and remove the oil pan.



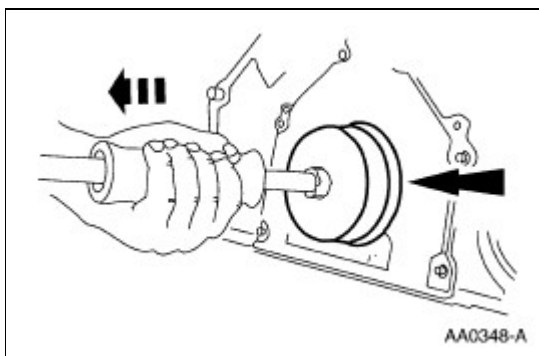
67. Remove the bolts from the oil pump screen and cover and remove the oil pump screen cover and tube (6622) and spacer.



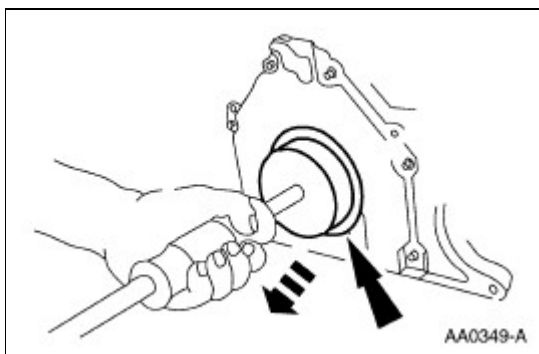
68. Remove the bolts from the oil pump and remove the oil pump.



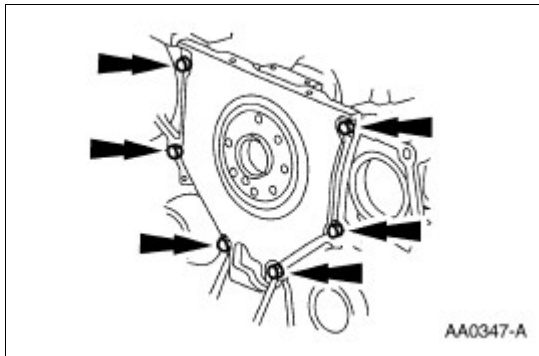
69. Use the Rear Crankshaft Slinger Remover and the Slide Hammer to remove the crankshaft oil slinger (6310).



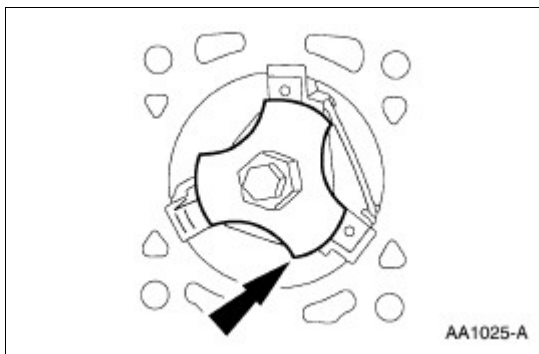
70. Use the Rear Crankshaft Seal Remover and the Slide Hammer to remove the crankshaft rear oil seal (6701).



71. Remove the bolts for the rear oil seal retainer and remove the crankshaft rear oil seal retainer.

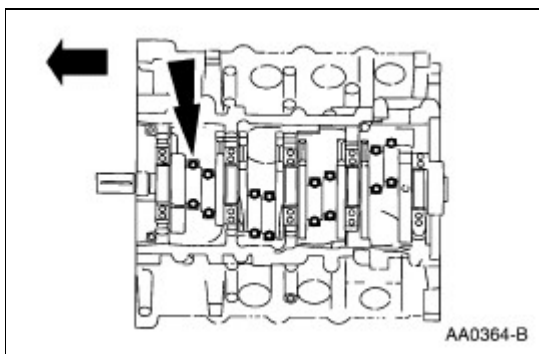


72. Before removing pistons, inspect the top of the cylinder bores. If necessary, remove the ridge or carbon deposits from each cylinder using Cylinder Ridge Reamer following manufacturer's instructions.




73. **NOTE:** Connecting rods and rod caps should be numbered to keep the proper orientation in the following sequence.

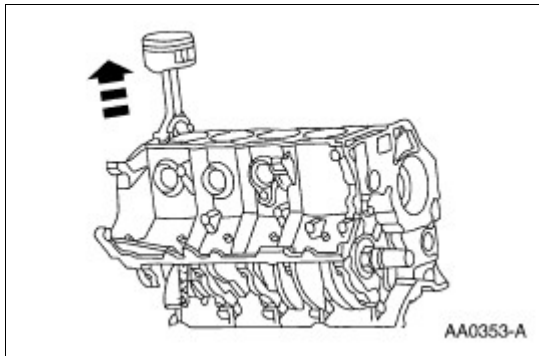
Remove the bolts and the connecting rod caps for piston number 1 and 6.



74. Discard the 16 bolts.

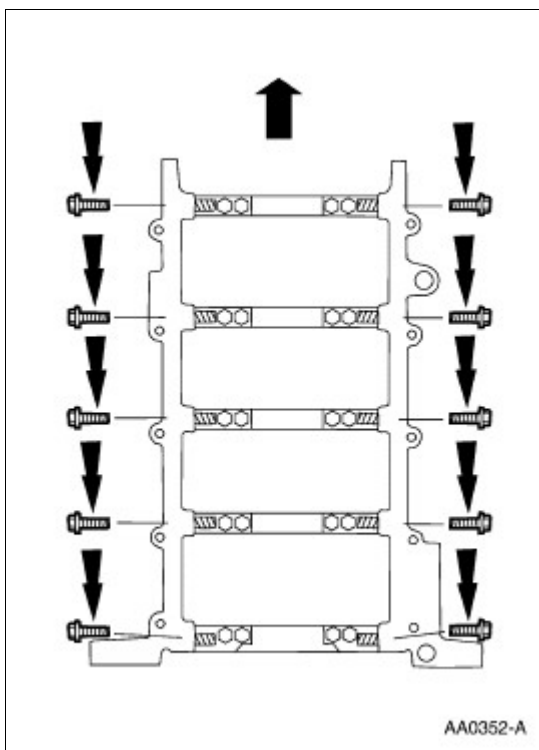
75.  **CAUTION:** Do not scratch the cylinder walls or crankshaft journals with the connecting rod.

Use the Cylinder Rod Guide Tool to push the pistons number 1 and 6 through the top of the cylinder block.

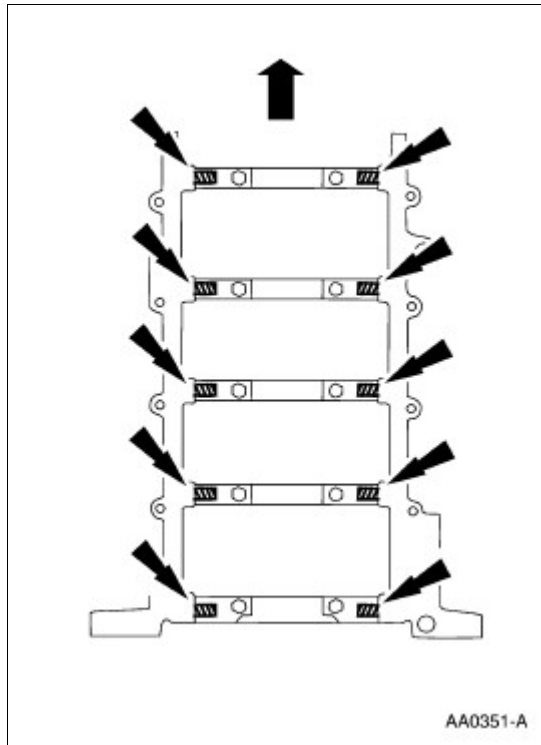


76. To remove pistons 3 and 5, 4 and 7, 2 and 8, turn crankshaft 90 degrees and repeat steps 73-75.

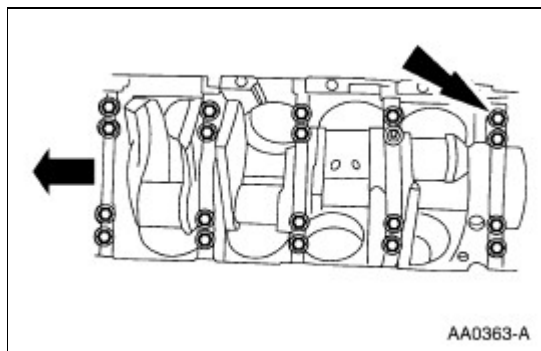
77. Remove the side bolts.



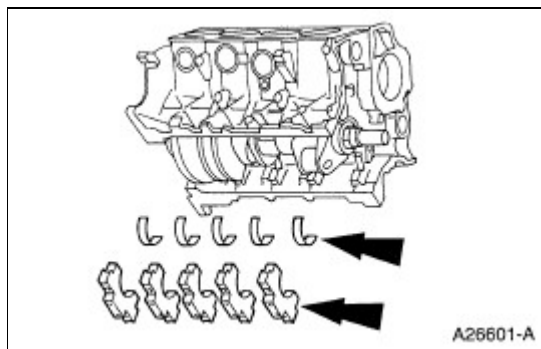
78. Loosen the jack screws.



79. Remove and discard the bolts.



80. Remove the main bearing cap and the crankshaft main bearings (6333) from the cylinder block (6010).



81. Remove the crankshaft (6303), the crankshaft thrust washer (6334), and the crankshaft main bearings from the cylinder block.

