

34. Remove the ground straps.
35. Remove the inertia switch electrical connector.
36. Remove the instrument panel electrical connectors.
37. Remove the instrument panel center brace bolts (RH).
38. Remove the instrument panel center brace nuts (RH).
39. Remove the instrument panel center brace (RH).
40. Remove the instrument panel bolt.
41. Remove the instrument panel defroster grille.
42. Remove the sunload sensor electrical connector.

**[[ WARNING**

**To avoid damaging the sun load sensor electrical connector, remove the grille just enough to remove the connector.**

43. Remove the instrument panel bolts.
44. Remove the antenna lead-in cable.
45. Remove the RCM electrical connector.
46. Remove the ground strap bolt.
47. Remove the instrument panel bolts.

**[[ WARNING**

**To avoid damage to the instrument panel, an assistant is required to support the panel before carrying out this step.**

**[[ WARNING**

**Before removing the instrument panel make sure all electrical connector wiring is free and not hindered.**

48. Remove the instrument panel.
49. Drain the engine coolant.
50. Remove the engine appearance cover.
51. Remove the EGR vacuum regulator solenoid electrical connector.
52. Remove the vacuum hoses.
53. Remove the EGR vacuum regulator solenoid mounting nuts.
54. Remove the EGR vacuum regulator solenoid.
55. Remove the wire harness.
56. Remove the heater tube bracket nut.
57. Compress the clamps and disconnect the heater hoses.
58. Remove the A/C line bracket nut at

- the inner fender well.
59. Remove the A/C line bracket nut at the dash panel.
  60. Remove the disconnect the evaporator outlet line fitting.
  61. Remove the vacuum connector.
  62. Remove the heater core and evaporator core housing nut.
  63. Remove the heater core and evaporator core housing.
  64. Remove the floor ducts.
  65. Remove the housing brace.
  66. Remove the heater tube cover.
  67. Remove the heater tube seal.
  68. Remove the heater core cover.
  69. Remove the heater core.
  70. To install, reverse the removal procedure.

**[[ WARNING**

**The clockspring electrical connectors are unique and cannot be reversed when connected to the driver air bag module. Match the electrical connector key to the keyway in the driver air bag module. Do not force the electrical connectors into the driver air bag module.**

71. Match the electrical connector key to the keyway in the driver air bag module and connect the electrical connectors.

**[[ WARNING**

**The passenger air bag module nuts must be torqued in the sequence shown.**

**⚠Make sure the battery negative cable is still disconnected before continuing with the installation portion of this procedure.**

72. Install the components in the order indicated in the following illustration and table.
73. Install the passenger air bag module.
74. Connect the passenger air bag module electrical connector.
75. Close the glove compartment.
76. Repower the system.
77. Make sure the retaining clips are in place before positioning the passenger air bag module to the instrument panel.
78. Lubricate the refrigerant system with the correct amount of clean PAG oil.
79. Fill and bleed the engine cooling system.
80. Evacuate, leak test and charge the refrigerant system.

**REAR**

**⚠Lubricate the coolant hoses with plain water only if needed.**

1. Position the vehicle on a hoist with the gear selector in NEUTRAL.
2. Using suitable tools, clamp-off the underbody heater hoses at the floorpan bracket.
3. Remove the clamps
4. Remove the auxiliary line floorpan bracket nuts.
5. Remove the line bracket screws.
6. Remove the line bracket.

**⚠The screw and line bracket are located inside the vehicle above the floorpan line bracket.**

7. Remove the auxiliary harness electrical connector.
8. Remove the auxiliary housing bolts.
9. Remove the auxiliary housing nut.
10. Remove the blend door actuator electrical connector.
11. Remove the blend door actuator screws.
12. Remove the auxiliary blend door actuator.
13. Remove the temperature blend door actuator screws.
14. Remove the auxiliary temperature blend door actuator.
15. Remove the heater core cover.
16. Remove the clamps.
17. Remove the auxiliary heater core.
18. To install, reverse the removal procedure.
19. Fill the engine cooling system.

**Cylinder Head**

REMOVAL & INSTALLATION

**4.0L SOHC Engine**

**⚠If only one cylinder head is to be removed, only follow the procedures that apply. The following tools, or their equivalents are absolutely necessary to properly perform this procedure:**

- Cam Chain Tensioner tool T97T-6K254-A
- Cam Gear Removal tool T97T-6256-F
- Cam Gear Torque adapter T97T-6256-G
- Camshaft Gear Positioning/Holding tool T97T-6256-B
- Camshaft Gear Positioning/Holding tool adapter T97T-6256-A
- Camshaft holding tool T97T-6256-C

- Crankshaft holding tool T97T-6303-A
  - Camshaft holding tool adapter T97T-6256-D
1. Before servicing the vehicle, refer to the precautions in the beginning of this section.
  2. Properly relieve the fuel system pressure.
  3. Drain the cooling system.
  4. Remove or disconnect the following:
    - Negative battery cable
    - Lower intake manifold
    - Fan blade and shroud
    - Valve cover
    - Roller followers, if equipped
    - Drive belt
    - Upper radiator hose and tube
    - Alternator electrical connectors
    - Alternator mounting bracket
    - Engine accessory bracket and move it aside
    - Camshaft Position (CMP) electrical connector
    - Crankshaft Position (CKP) sensor electrical connector
    - Engine Coolant Temperature (ECT) sensor electrical connector
    - Coil pack electrical connector
    - Exhaust Gas Recirculation (EGR) valve electrical connector
    - EGR valve bracket and move it aside
    - Heater hoses
    - Fuel injector electrical connectors
    - Water bypass hose
    - Thermostat housing
    - Spark plug wires
    - Fuel injection supply manifold
    - Fuel injectors
    - Crankcase vent separator spring
    - Oil dipstick housing
    - Exhaust manifold
    - Hydraulic chain tensioner
    - Cassette retaining bolt
    - Camshaft sprocket
    - Cylinder head and discard the gasket

**To install:**

5. Thoroughly clean all gasket mating surfaces. Remove all traces of old gasket material, oil, grease or dirt.

6. Insure that the rubber band is holding the right-hand chain to the cassette.

7. Install a new head gasket and the cylinder head.

8. Torque the new cylinder head bolts in sequence as follows:

2001

- Step 1: 28 ft. lbs. (38 Nm).
- Step 2: Plus 90 degrees.
- Step 3: Plus an additional 90 degrees.

2002

- Step 1: 24 ft. lbs. (32 Nm).
- Step 2: Plus 90 degrees.

9. Install or connect the following:

- Camshaft sprocket in the cassette and make certain that the camshaft sprocket turns freely on the camshaft
- Cassette retaining bolt. Torque the bolt to 89 inch lbs. (10 Nm).
- Exhaust manifold
- Oil level indicator tube. Torque the bolt to 18 ft. lbs. (25 Nm).
- Crankcase vent separator and spring
- Thermostat housing. Torque the bolts to 8 ft. lbs. (11 Nm).
- Water bypass hose
- Heater hoses
- EGR bracket. Torque the bolt to 89 inch lbs. (10 Nm).
- EGR tube. Torque the nut to 30 ft. lbs. (40 Nm).
- ECT sensor electrical connector
- Electrical harness retainer. Torque the bolt to 89 inch lbs. (10 Nm).
- CKP and CMP electrical connectors
- Accessory bracket. Torque the bolts to 31 ft. lbs. (42 Nm).
- Alternator mounting bracket. Torque the bolts to 31 ft. lbs. (42 Nm).
- Alternator and electrical connectors
- Drive belt
- Fan shroud
- Roller followers
- Valve cover
- Lower intake manifold
- Negative battery cable

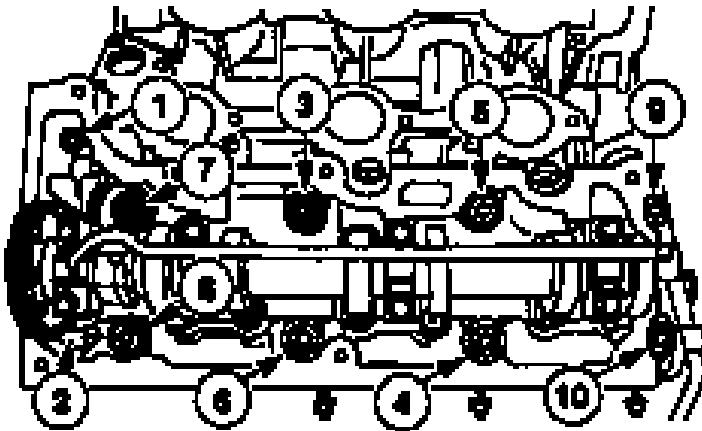
10. Change the engine oil and filter.

11. Refill the cooling system.

12. Start the engine and check for leaks, repair if necessary.

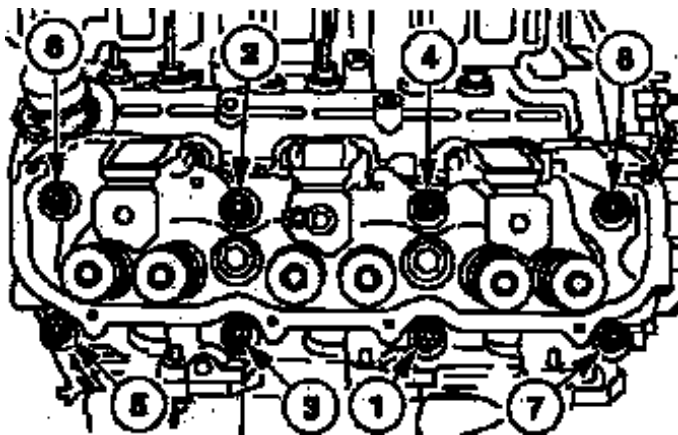
**4.6L SOHC Engine**

1. Before servicing the vehicle, refer to the precautions in the beginning of this section.



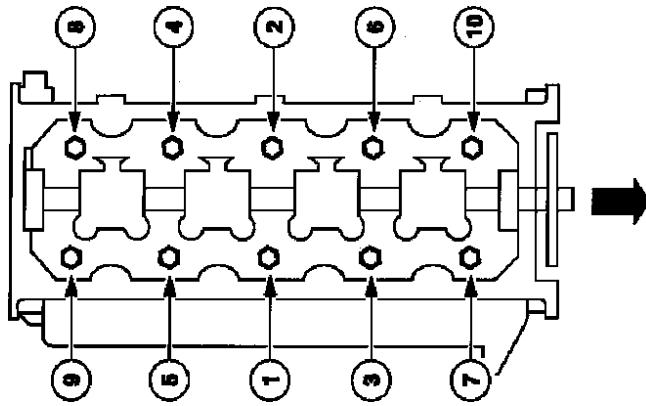
7924EG04

The correct cylinder head bolt loosening sequence must be used to prevent warpage—4.0L SOHC engine



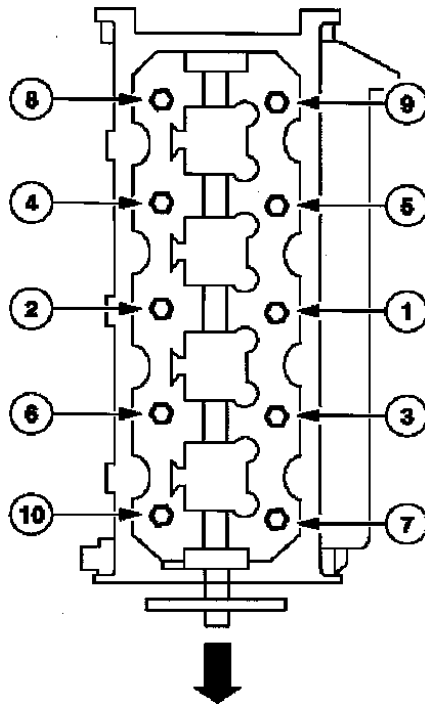
930BEG04

Cylinder head bolt torque sequence—4.0L SOHC engine



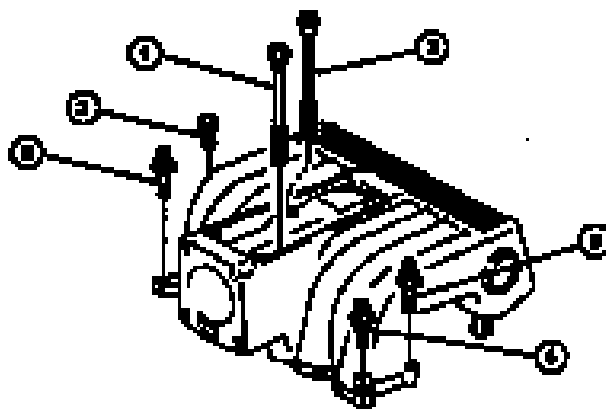
Left cylinder head bolt torque sequence—4.6L SOHC Engine

9355EG01



Right cylinder head bolt torque sequence—4.6L SOHC Engine

9355EG07



Tighten valve cover bolts in the sequence shown—4.6L SOHC Engine

7924EG14






2. Drain the cooling system.
3. Remove or disconnect the following:
  - Negative battery cable
  - Intake manifold
  - Timing chains
  - Exhaust manifolds
  - Water heater tube back and remove. Discard the O-ring seal.

⚠The cylinder head bolts must be discarded with new bolts installed. They are tighten-to-yield designed and cannot be reused. Do not use metal scrapers, wire brushes, power abrasive discs or other abrasive means to clean the sealing surfaces. These tools cause scratches and gouges that make leak paths. Use a plastic scraping tool to remove all traces of the head gasket.

- Bolts and the RH cylinder head
  - Bolts and the LH cylinder head
4. Installation is the reverse of removal. Observe the following notes and torques:
    - a. Install the cylinder head on the head gasket and loosely install the bolts.
    - b. Make sure to tighten the bolts in sequence in six stages.
      - Step 1: Tighten to 40 Nm (30 lb-ft).
      - Step 2: Tighten an additional 85-95 degrees.
      - Step 3: Back out all bolts one full turn (360 degrees).
      - Step 4: Tighten to 40 Nm (30 lb-ft).
      - Step 5: Tighten an additional 85-95 degrees.
      - Step 6: Tighten an additional 85-95 degrees.
    - c. Install a new O-ring seal and position the water heater tube forward. Lubricate the O-ring seal with premium engine coolant.

#### 4.6L DOHC Engine

1. Remove the engine.
2. Remove the flexplate and the spacer plate.
3. Mount the engine on a suitable engine stand.
4. Remove the two bolts and the pin-type retainer from the power steering reservoir bracket.
5. Remove the power steering reservoir and bracket.
6. Disconnect the battery cable harness ground.
7. Disconnect the electrical connector and the battery cable from the alternator.
8. Disconnect the two retainers from the engine front cover studs.
9. Disconnect the two retainers from the A/C compressor.

	<b>Installer, Crankshaft Vibration Damper</b>
	<b>Installer, Crankshaft Front Oil Seal</b>
	<b>Installer, Front Cover Oil Seal</b>
	<b>Compressor, Intake Valve Spring</b>
	<b>Compressor, Exhaust Valve Spring</b>

67197-EXPL-G01

These tools, or their equivalents, are necessary for cylinder head removal and installation on the 4.6L DOHC engine

10. Remove the bolt and the battery cable harness from the right engine mount.
11. Disconnect the electrical connector and the vacuum hose from the fuel pressure sensor.
12. Disconnect the vacuum harness from the intake manifold and remove the harness.
13. Remove the left and right coil covers.
14. Disconnect the right and left ignition coil electrical connectors.
15. Disconnect the radio interference capacitor electrical connector.
16. Disconnect the eight fuel injector electrical connectors.
17. Separate the fuel charging wiring harness retainers from the fuel injection supply manifold.
18. Disconnect the camshaft position (CMP) sensor electrical connector and the two retainers from the valve cover.
19. Disconnect the oil pressure sensor electrical connector.
20. Disconnect the pin-type retainers from the back of the engine in the locations shown.
21. Disconnect the knock sensor (KS) electrical connector and the pin-type retainer.
22. Disconnect the wiring harness retainer from the stud on the cylinder head.
23. Disconnect the intake manifold runner control (IMRC) electrical connector.
24. Disconnect the exhaust gas recircu-

lation (EGR) system module tube nut from the exhaust manifold.

25. Disconnect the cylinder head temperature (CHT) sensor electrical connector and the two pin-type retainers.

26. Disconnect the positive crankcase ventilation (PCV) electrical connector.

27. Remove the PCV tube.

28. Disconnect the right radio interference capacitor electrical connector and the pin-type retainer.

29. Disconnect the throttle position (TP) sensor and the idle air control (IAC) sensor electrical connectors.

30. Disconnect the two retainers from the right valve cover studs.

31. Disconnect the engine coolant temperature (ECT) sensor electrical connector.

32. Disconnect the A/C compressor and the crankshaft position (CKP) sensor electrical connectors.

33. Remove the upper radiator hose.

34. Remove the coolant bypass-to-thermostat housing hose.

35. Remove the accessory drive belt.

36. Remove the bolts and the generator support bracket.

37. Remove the bolts and the generator.

38. Remove the crossover tube.

39. Remove the eight ignition coils.

40. Remove the nut and the bolt from the oil level indicator tube and position the tube aside.

41. Remove the engine lifting eyes.

42. Remove the bolts and the left valve cover.

43. Remove the coolant hose retainers from the right valve cover.

44. Remove the bolts and the right valve cover.

45. Remove the retainers and the upper-to-lower intake bracket.

46. Remove the bolts in the sequence shown and remove the upper and lower intake.

47. Remove the bolt and the coolant bypass tube.

48. Remove the exhaust manifolds.

49. Clean and inspect the exhaust manifolds.

50. Remove the oil level indicator tube.

51. Remove the three remaining bolts and the power steering pump.

52. Install the special tool.

53. Remove the coolant pump pulley.

54. To remove the crankshaft pulley bolt, remove the upper fan shroud and electric fan.

55. Remove the pulley bolt.

56. Remove the crankshaft vibration damper.

57. Remove the crankshaft front seal.