attached. Remove all accessory brackets that attach to the water pump.

5. Remove the water pump pulley. Disconnect the lower radiator hose, heater hose and water pump bypass hose at the water pump.

6. Remove the crankshaft pulley from the crankshaft vibration damper. Remove the damper attaching bolt and washer and remove the damper using a puller.

7. Remove the fuel line from the clip on the front cover, if equipped.

8. Remove the oil pan-to-front cover attaching bolts. Use a thin blade knife to cut the oil pan gasket flush with the cylinder block face prior to separating the cover from the cylinder block.

9. Remove the cylinder front cover and water pump as an assembly.

➨Cover the front oil pan opening while the cover assembly is off to prevent foreign material from entering the pan.

To install:

10. If a new front cover is to be installed, remove the water pump from the old front cover and install it on the new front cover.

11. Clean all gasket-mating surfaces. Pry the old oil seal from the front cover and install a new one, using a seal installer.

12. Coat the gasket surface of the oil pan with sealer, cut, position the required sections of a new gasket on the oil pan, and apply silicone sealer at the corners. Apply sealer to a new front cover gasket and install on the block.

13. Position the front cover on the cylinder block. Use care to avoid seal damage or gasket misalignment. It may be necessary to force the cover downward to slightly compress the pan gasket. Use a front cover aligner tool to assist the operation.

14. Coat the threads of the front cover attaching screws with pipe sealant and install. While pushing in on the alignment tool, tighten the oil pan to cover attaching screws to 9–11 ft. lbs. (12–15 Nm).

15. Tighten the front cover to cylinder block attaching bolts to 15–18 ft. lbs. (20–24 Nm). Remove the alignment tool.

16. Apply multi-purpose grease to the sealing surface of the vibration damper. Apply silicone sealer to the keyway of the vibration damper.

17. Line up the vibration damper keyway with the crankshaft key and install the damper using a suitable installation tool. Tighten the retaining bolt to 70–90 ft. lbs. (95–122 Nm). Install the crankshaft pulley.

18. Install the remaining components in the reverse order of their removal.

19. Fill the crankcase with the proper type and quantity of engine oil. Fill the cooling system.

20. Connect the negative battery cable, start the engine and check for leaks.

REMOVAL & INSTALLATION

5.0L engines

◗ See Figures 134 and 135

1. Remove the crankshaft damper as described in this Section.

2. Use a suitable seal removal tool to remove the seal from the cover. Be careful not to damage the crankshaft or the seal bore in the timing chain cover.

To install:

3. Lubricate the seal bore in the front cover and the seal lip with clean engine oil.

4. Install the new seal using a suitable seal installation tool. Make sure the seal is installed evenly and straight.

5. Install the crankshaft damper. Be sure to lubricate the sealing surface of the damper with clean engine oil prior to installation.

6. Start the engine and check for leaks.

Timing Chain and Gears

REMOVAL & INSTALLATION

3.8L Engine

◗ See Figures 136, 137 and 138

1. Disconnect the negative battery cable. Drain the cooling system and crankcase.

2. Remove the timing chain/engine front cover and water pump as an assembly. For details, please refer to the timing chain cover procedure located earlier in this section.

3. Remove the camshaft sprocket bolt and washer from end of the camshaft.

4. Remove the distributor drive gear.

5. Remove the camshaft sprocket, crankshaft sprocket, and timing chain.

➨If the crankshaft sprocket is difficult to remove, carefully pry to sprocket off the shaft using a pair of large prybars positioned on both sides of the crankshaft sprocket.

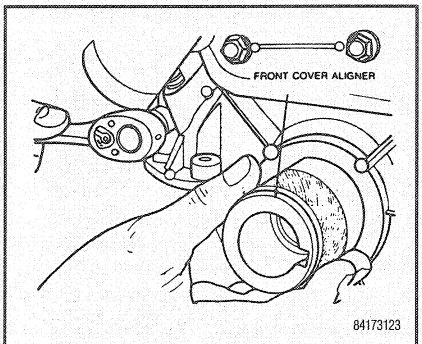

Fig. 133 Positioning the front cover aligner tool—5.0L engines

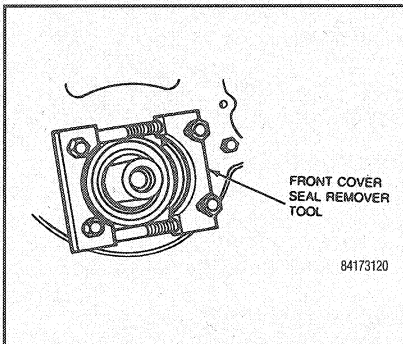

Fig. 134 Removing the timing chain cover seal—5.0L engines

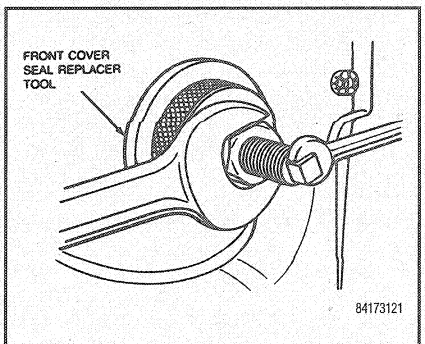

Fig. 135 Installing the timing chain cover seal

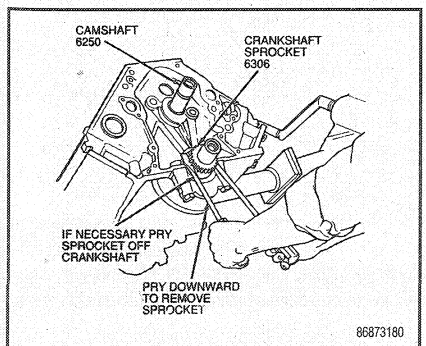

Fig. 136 If difficulty is encountered removing the crankshaft sprocket, use 2 prybars to carefully pry if off the shaft

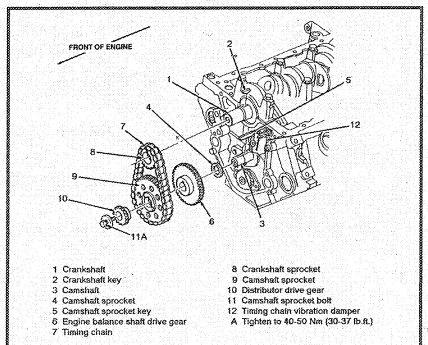

Fig. 137 Timing chain and related components—3.8L engine

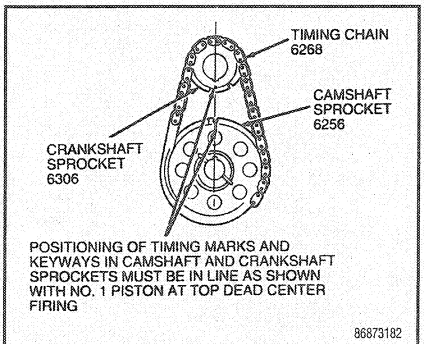

Fig. 138 Position of the timing marks when the No. 1 piston is at TDC