

IN-VEHICLE SERVICE (Continued)

20. Install upper radiator hose and heater hoses. Tighten retaining clamps securely.
21. Connect vacuum lines to premarked locations.
22. Connect electrical connections to IAT and distributor (unleaded gasoline only). Connect electrical connections to IAC, TP, ECT, PFE or DPFE sensor, ignition coil and coolant temperature sending unit.
NOTE: Engine coolant is corrosive to all engine bearing material. Replacing oil after removal of a coolant carrying component prevents damage.
23. Fill and bleed cooling system with specified coolant and proper mixture.
24. Fill crankcase with the correct viscosity and amount of engine oil.
25. Install air cleaner outlet tube to throttle body and engine air cleaner. Tighten retaining clamps to 2.7-5.4 N·m (24-48 lb-in).
26. Install PCV system closure tube to rocker arm cover and air cleaner outlet tube. Install aspirator hose to air cleaner outlet tube.
27. Connect battery ground cable.
28. Start engine and check for coolant, oil, fuel and vacuum leaks.
NOTE: FF base initial engine timing is not adjustable.
29. Verify and if necessary correct base initial engine timing to 10 degrees BTDC. Refer to the Powertrain Control/Emissions Diagnosis Manual.³ Tighten distributor retaining bolt to 24 N·m (18 lb-ft).
30. Install idle air control valve snowshield.

Pistons and Connecting Rods**Tools Required:**

- Rotunda Piston Ring Compressor 014-00290
- Rotunda Cylinder Ridge Reamer 014-00292

Removal

1. Drain cooling system.
2. Remove throttle body as outlined in this section.
3. Remove intake manifold as outlined in this section.
4. Remove cylinder heads as outlined in this section.
5. Remove oil pan as outlined in this section.
6. Remove oil pump assembly and intermediate shaft.

³ Can be purchased as a separate item.

7. Before removing the piston, inspect the top of each cylinder bore. If a ridge has formed at the top of the cylinder it must be removed before piston removal. Remove ridge as follows:
 - a. Turn crankshaft until the piston to be removed is at the bottom of cylinder bore.
 - b. Place a clean shop cloth over the piston head to collect cuttings.
 - c. Remove ridge using Rotunda Cylinder Ridge Reamer 014-00292 or equivalent. Never cut into the ring travel area more than 0.794mm (1/32 inch) when removing the ridge.
8. Turn crankshaft until the piston to be removed is at the lowest point of its travel. If more than one piston is being removed, identify the pistons and connecting rod caps. Each component should be installed in its original position during assembly.
NOTE: The cylinder number is stamped on the top of the piston. Matched letters are stamped on the sides of corresponding rod and cap.
9. Remove connecting rod cap retaining nuts and cap.
CAUTION: Use care to prevent damage to bearing surfaces.
10. Install a 50mm (2 inch) piece of 3/8 inch fuel hose (or similar protector) over connecting rod cap studs and push piston out through top of the cylinder bore.
11. Install connecting rod cap and hold in position with cap retaining nuts.
12. If piston is to be disassembled, refer to Piston Disassembly.
13. Inspect cylinder bore. If new piston rings are to be installed on the piston, a visible cross-hatch pattern should be obvious on cylinder bore wall. If honing is required, remove glaze from cylinder wall using spring-loaded hone. Follow manufacturer's instructions when using this type of equipment.

After honing, thoroughly clean cylinder bore using a detergent and water solution.

Installation

Lightly oil all retaining bolt and stud bolt threads before installation except those specifying special sealant.

1. Lubricate cylinder wall and piston with Engine Assembly Lubricant D9AZ-19579-D (ESR-M99C80-A) or equivalent heavy engine oil.
2. Install a 50mm (2 inch) piece of 3/8 inch fuel hose (or similar protector) on the connecting rod studs.