

# 8. CYLINDER HEAD/CYLINDER/PISTON

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## SERVICE INFORMATION

- Camshaft service can be done with the engine in the frame.
- Camshaft lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling the cylinder head. Fill the cylinder head oil pockets with the clean engine oil of the proper type and viscosity.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Before reassembly, lubricate the camshaft journals and cam lobes with a molybdenum oil solution.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their proper locations.
- Be careful not to damage the mating surfaces by using a screwdriver when removing the cylinder. Do not strike the cylinder too hard during disassembly, even with a rubber or plastic mallet, to prevent the possibility of damage to the cylinder fins.
- Take care not to damage the cylinder walls and pistons.
- Store the valve and piston components in the same order they were installed so they can be reinstalled in the original positions.

## TROUBLESHOOTING

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression or leak down test, or by tracing noises in the top-end with a sounding rod or stethoscope.

If performance is poor at low speeds, check for white smoke in the crankcase breather tube. If the tube is smokey, check for seized piston rings.

### NOTE

- For cylinder compression and leak-down test procedures, refer to section 3 of the Common Service Manual.

#### Rough idle

- Low cylinder compression

#### Low compression

- Incorrect valve shim adjustment (page 3-5)
- Burned or bent valves
- Incorrect valve timing
- Broken valve spring
- Uneven valve seating
- Leaking or damaged head gasket
- Warped or cracked cylinder head
- Loose spark plug
- Worn, stuck or broken piston rings
- Worn or damaged cylinder and piston

#### Compression too high

- Excessive carbon build-up on piston top or combustion chamber

#### Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

#### Excessive noise

- Incorrect valve shim adjustment (page 3-5)
- Sticking valve or broken valve spring
- Damaged or worn camshaft
- Damaged camshaft drive gear

#### Abnormal noise (piston)

- Worn cylinder and piston
- Worn piston pin or piston pin hole
- Worn connecting rod big end bearing