

## 9. Cylinder Head/Valves

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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.
- Clean all disassembled parts with clean solvent and dry them by blowing off compressed air before inspection.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their proper locations.

### Troubleshooting

- Engine top-end problems usually affect engine performance. This can be diagnosed by a compression or leak down test, or by tracing noises to 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 smoky, check for a seized piston ring.

#### Low Compression

- Valves
  - Incorrect valve adjustment
  - Burned or bent valves
  - Damaged valve spring
  - Incorrect valve timing
  - Uneven valve seating
- Cylinder head
  - Leaking or damaged head gasket
  - Warped or cracked cylinder head
- Faulty cylinder head/piston (section 11)

#### Compression Too High

- Excessive carbon built-up on piston or combustion chamber

#### Excessive Noise

- Incorrect valve adjustment
- Sticking valve or broken/weak valve spring
- Damaged or worn camshaft
- Faulty camchain tensioner
- Worn rocker arm shaft