

**CYLINDER HEAD/VALVES**

ITEM			STANDARD	SERVICE LIMIT
Valve, valve guide	Valve stem O.D.	IN	4.975–4.990 mm (0.1959–0.1965 in)	4.97 mm (0.195 in)
		EX	4.955–4.970 mm (0.1951–0.1957 in)	4.94 mm (0.194 in)
	Valve guide I.D.	IN, EX	5.000–5.012 mm (0.1969–0.1973 in)	5.04 mm (0.198 in)
	Stem-to-guide clearance	IN	0.010–0.037 mm (0.0004–0.0146 in)	0.07 mm (0.003 in)
EX		0.030–0.057 mm (0.0012–0.0022 in)	0.09 mm (0.004 in)	
Cylinder head	Warpage		—	0.10 mm (0.004 in)
	Valve seat width IN/EX		0.9–1.1 mm (0.035–0.043 in)	1.5 mm (0.06 in)

TORQUE VALUES

Camshaft holder bolts	12–16 N·m (1.2–1.6 kg·m, 9–12 ft·lb)	Apply locking agent to threads
Cam sprocket bolts	18–20 N·m (1.8–2.0 kg·m, 13–14 ft·lb)	
Cam chain tensioner bolts	10–14 N·m (1.0–1.4 kg·m, 7–10 ft·lb)	
Cylinder head nuts	26–30 N·m (2.6–3.0 kg·m, 19–22 ft·lb)	
Spark plug	12–18 N·m (1.2–1.8 kg·m, 9–13 ft·lb)	
Oil pipe bolt 7 mm	10–14 N·m (1.0–1.4 kg·m, 7–10 ft·lb)	
8 mm	12–16 N·m (1.2–1.6 kg·m, 9–12 ft·lb)	
10 mm	16–20 N·m (1.6–2.0 kg·m, 12–14 ft·lb)	

TOOLS

Special	
Valve guide reamer	07984–MA60000
Valve guide driver/remover	07942–MA60000
Hydraulic tappet bleeder	07973–MJ 00000
Common	
Valve spring compressor	07757–0010000 or 07957–3290001

TROUBLESHOOTING

Engine top-end problems are usually performance-related and can be diagnosed by a compression test, or are engine noises which can be traced to the top-end with a sounding rod or stethoscope.

Low compression or uneven compression

1. Valves
 - Faulty hydraulic tappet
 - Burned or bent valves
 - Incorrect valve timing
 - Broken valve spring
2. Cylinder head
 - Leaking or damaged head gasket
 - Warped or cracked cylinder head
3. Cylinder and piston (Refer to Section 7)

Compression too high

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

Excessive noise

1. Faulty hydraulic valve tappet system
 - Low engine oil level
 - Contaminated oil
 - Low oil pressure
 - Damaged hydraulic tappet
2. Sticking valve or broken valve spring
3. Damaged or worn camshaft
4. Loose or worn cam chain
5. Worn or damaged cam chain tensioner
6. Worn cam sprocket teeth