



Installation Instructions for KPMI Part No: **80-82390**

YAMAHA® • VARIOUS 660'S • 2001-2008

GRIZZLY™ 2002-2008 • RAPTOR™ 2001-2005 • RHINO™ 2004-2007

Cylinder Head Service Kit

This kit is verified for the model year range listed above. Certain components in this kit may have larger coverage and are labeled accordingly. When installing KPMI Cylinder Head Service Kits it is important to maintain these highly stressed components in accordance with factory service limits. Always consult with qualified professionals suited to inspect your machine.

A) 80-82390 Kit Includes:

KPMI P/N	QTY	Description	Specification
80-80030	1 Set	Spring Kit	Includes: Titanium Retainers, CrSi Valve Springs, HT Steel Basewashers
80-80060	3 Pcs.	Intake, Standard Valve	Valve • Black Diamond™ • Black Nitroreg Stems
80-80063	2 Pcs.	Exhaust, Standard Valve	Valve • Black Diamond™ • Black Nitroreg Stems
80-80040	3 Pcs.	Intake, Standard Valve Guide	Valve Guide • C630 Bronze
80-80050	2 Pcs.	Exhaust, Standard Valve Guide	Valve Guide • C630 Bronze
80-82391	1 Set	Gasket Kit	Includes: Head Gasket 100mm Bore (1), Base Gasket (1), Exhaust Gasket (2), Cam Chain Tensioner Gasket (1), Valve Seal (5), Radiator Hose O-ring (1), Valve Cover Plug O-ring (1), Oil Tank O-ring (1), Cam Chain Tens. Cap O-ring (1), Dipstick O-ring (1), Tappet Cover O-ring (1), Cylinder Base O-ring (1), Intake Valve Adj. Cover O-ring (1), Oil Line Washers (8)

B) Recommended Installed Height - Intake/Exhaust

- | | |
|---------------------------------|----------------------|
| 1. Installed Height | 1.200"-1.210" |
| 2. Seat Pressure | 55# |
| 3. Open Pressure at 0.345" lift | 145# |
| 4. Max Valve Lift | 0.450" |

C) Notes:

- The difference between the installed height and the coil bind height is considered "Free-Travel"

The coil bind height is determined by compressing the spring(s) with the Retainer and Basewasher in place (a vice can be used for this operation). Once springs are compressed, measure the distance between the Retainer and Basewasher where the Outer Spring contacts them.

- Free-travel should always be gross valve lift +0.060" for safe operation.
- Retainer-to-Seal / Guide clearance should also be gross valve lift +0.060" for safe operation.
- Failure to check valve train clearances can result in serious damage to an engine

Packaged By: _____

Date: _____

TECH TIPS

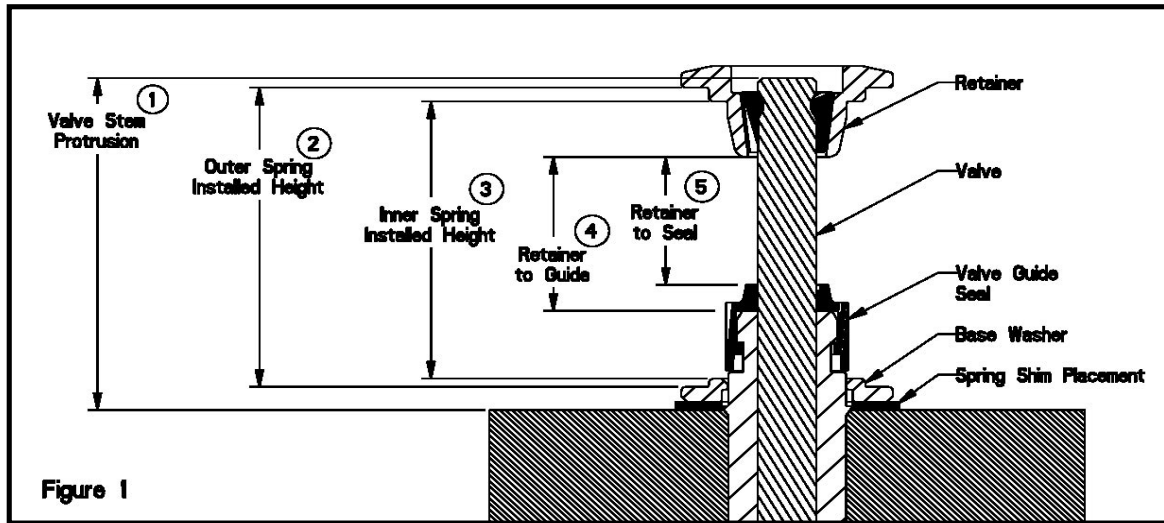


Figure 1

Valve Train Terminology

1. Stem Protrusion is measured from the tip of the valve stem to the cylinder head. See Figure 1.
2. Outer spring installed height is measured where the outer spring contacts the Retainer and Basewasher when assembled (See Figure 1).
3. Inner spring installed height is measured where the inner spring contacts the Retainer and Basewasher when assembled (See Figure 1).
4. Retainer-to-Guide clearance is the distance between the Valve Guide (w/o the seal) and the bottom of the Retainer, with the Valve in the closed position (See Figure 1 and Notes 3 & 4).
5. Retainer-to-Seal clearance is the distance between the Valve Stem Seal and the bottom of the Retainer, with the Valve in the closed position (See Figure 1 and Notes 3 & 4).

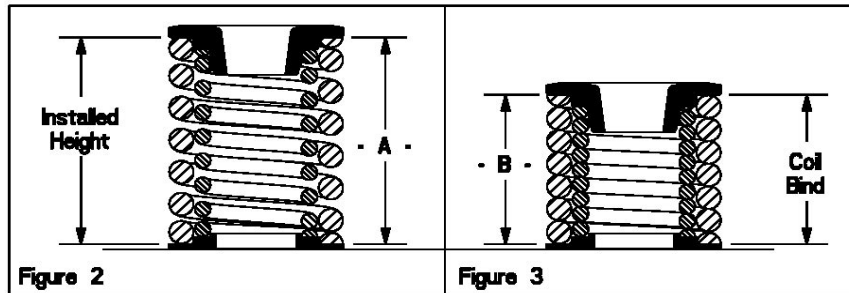


Figure 2

Figure 3

Installed Height

1. In Figure 2 the installed height is measured from where the Outer Spring contacts the Retainer and the Basewasher. This measurement is taken when the Valve, Basewasher, Retainer, and Keepers are assembled in the cylinder head.

Coil Bind / Solid Height:

1. In Figure 3 the coil bind height is determined by compressing the Spring(s) with the Retainer and Basewasher in place (a vice can be used for this operation). Once springs are compressed, measure the distance between the retainer and basewasher where the Outer Spring contacts them.

Notes:

1. The difference between the installed height and the coil bind height is considered "Free-Travel"
2. Free-travel should always be gross valve lift +0.060" for safe operation.
3. Retainer-to-Seal / Guide clearance should also be gross valve lift +0.060" for safe operation.
4. Failure to check valve train clearances can result in serious damage to an engine.