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Installation Instructions for KPMI Part No.: 20-24400

Harley Davidson • Milwaukee-Eight Engines (& CVO's*) • 2017-'25

High-Lift Beehive Racing Valve Spring Kit

*2023-2025 CVO's check valve lift to determine compatibility with KPMI spring kits

A) 20-24400 Kit Includes:

Qty	Application	Description
8 - Pcs	Intake / Exhaust	HT Steel Retainers**
8 - Pcs	Intake / Exhaust	Chrome Silicon Beehive Springs
8 - Prs	Intake / Exhaust	HT Steel Keepers (9°)**
8 - Pcs	Intake / Exhaust	Tophat Seals

**Note: The retainers and keepers in this kit utilize a high-strength high-angle design. They are meant to work together as a system are are not interchangeable with OEM retainers or keepers.

B) Recommended Installed Height - Intake / Exhaust

1. Installed Height . . . . . **1.575"-1.585"**
2. Seat Pressure . . . . . **83 lbs**
3. Open Pressure at 0.640" lift . . . . . **285 lbs**
4. Max Valve Lift . . . . . **0.640"**

C) Notes:

1. 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.

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

Packaged By:_____ Date:_____ .

TECH TIPS

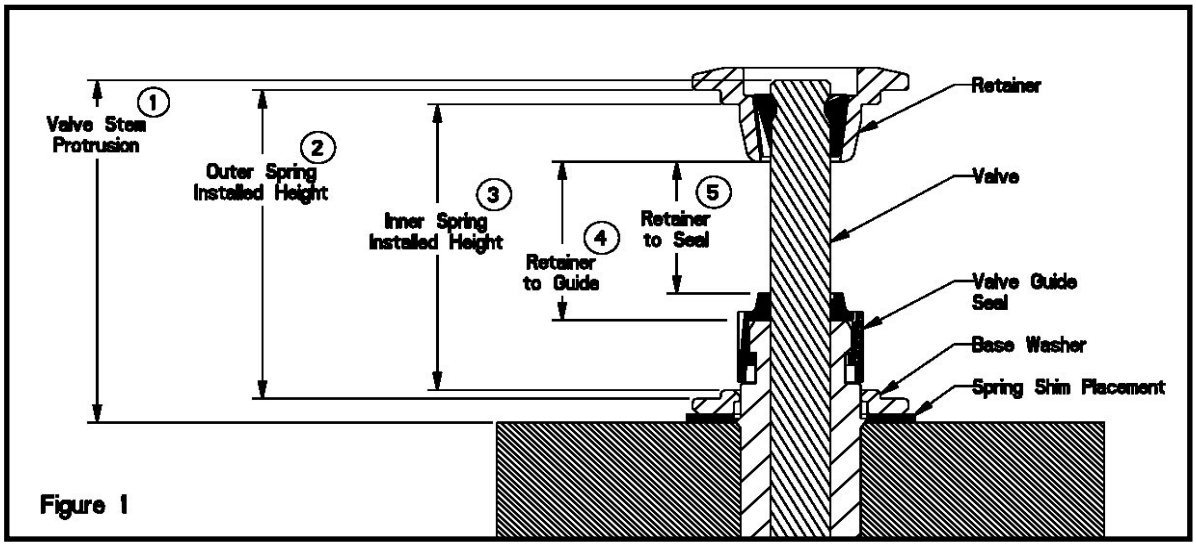


Figure 1

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).

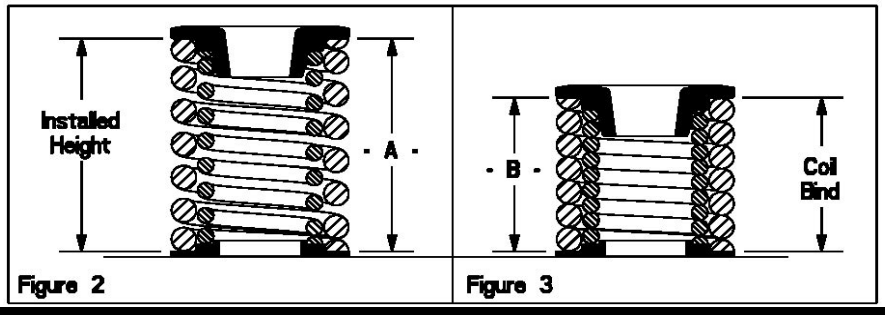


Figure 2 Figure 3

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.