



## Installation Instructions for KPMI Part No.: 20-21800

### Harley Davidson • Milwaukee-Eight Engines (& CVO's\*) • 2017-'24

#### High-Lift Beehive Racing Valve Spring Kit

\*2023-2024 CVO's check valve lift to determine compatibility with KPMI spring kits

**Compatibility Notice:** This spring kit has not been designed for aftermarket rocker arms with increased mass and/or rocker ratio.

#### A) 20-21800 Kit Includes:

<u>Qty</u>	<u>Application</u>	<u>Description</u>
8 - Pcs	Intake / Exhaust	Titanium Retainers
8 - Pcs	Intake / Exhaust	Chrome Silicon Beehive Springs
8 - Pcs*	Intake / Exhaust	HT Steel Basewashers**
8 - Pcs	Intake / Exhaust	Tophat Seals

\*\*Note: These basewashers are designed to fit on top of either the OEM or KPMI Tophat seals provided in this kit.

#### B) Recommended Installed Height - Intake / Exhaust

1. Installed Height .....	<b>1.495"-1.505"</b>
2. Seat Pressure .....	<b>85 lbs</b>
3. Open Pressure at 0.625" lift .....	<b>280 lbs</b>
4. Max Valve Lift .....	<b>0.625"</b>

#### 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

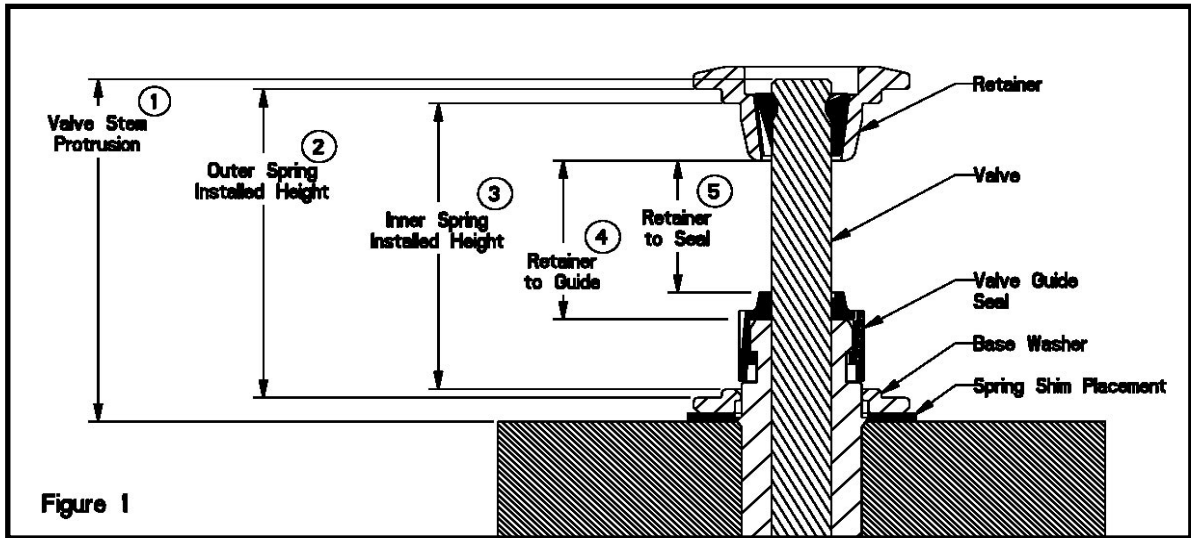


Figure 1

## 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).

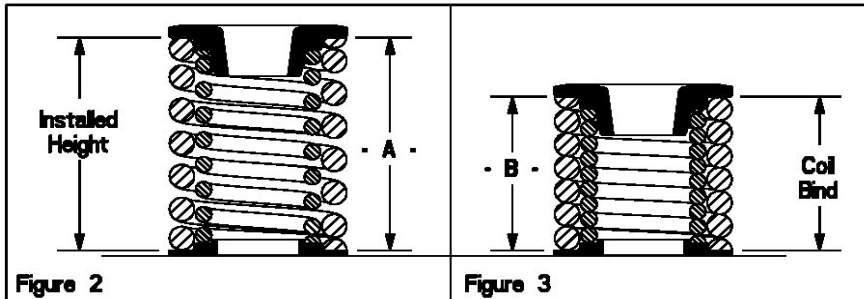


Figure 2

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.