



**FEULING**  
**BEEHIVE**  
VALVE SPRINGS

**BEEHIVE VALVE SPRING INSTALLATION INSTRUCTIONS**

PART #'S 1100, 1101, 1105, 1200, 1201, 1205, 1206, 1212, 1213, 1214

**IMPORTANT NOTICE**

**THIS INSTALLATION SHOULD BE DONE BY AN EXPERIENCED MECHANIC WHO HAS ACCESS TO A FACTORY SERVICE MANUAL AND ALL REQUIRED TOOLS.**

**CAUTION**

**INCORRECT INSTALLATION CAN CAUSE ENGINE DAMAGE NOT COVERED UNDER WARRANTY. FAILURE TO INSTALL COMPONENTS CORRECTLY CAN CAUSE ENGINE SEIZURE. ENGINE SEIZURE MAY RESULT IN SERIOUS INJURY TO MOTORCYCLE, OPERATOR, PASSENGER, AND/OR OTHERS.**

**CAUTION**

**REMOVAL OF THE ROCKER ARMS AND OR PUSHRODS WITH THE VALVE TRAIN LOADED CAN DAMAGE ROCKER ARMS, PUSH RODS, BUSHINGS AND OR CAMPLATE. ROTATE ENGINE TO TDC OF COMPRESSION STROKE ON THE SERVICING CYLINDER.**

**SPECIAL HANDLING INSTRUCTIONS**

**FEULING ENDURANCE SPRINGS REQUIRE THE USE OF THE PROVIDED GLOVES TO AVOID DEPOSITING CORROSIVE HAND OILS ON VALVE SPRING FINISH**

1. Clean & Inspect new springs, seats, retainers and locks, remove all burrs. Chamfer spring I.D. to obtain good retainer to spring clearance.
2. Refer to the correct service manual for your model engine for removal of the valves & valve springs.
3. Measure: Installed spring height and valve seal to bottom of retainer clearance.
4. FEULING recommends a minimum of 0.030" clearance from top of valve seal to bottom of retainer.
5. Measure installed spring height - proper clearance is critical! Too little clearance will cause valve-train damage while too much can cause spring surge. Ideal coil bind clearance is achieved at open height do not go below open height and with Endurance springs only increase by 0.050", HIGH LOAD springs only increase by 0.070"

NOTE: If using a conventional spring height gauge the smaller beehive retainer can rest down in the tool recess - subtract this amount from your calculations.

6. If machining is required, make modification then wash cylinder heads and re-measure all clearances before installation.



Clean & Inspect new springs & hardware



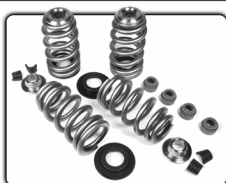
Remove original valve springs & hardware



Measure spring installed height and seal to retainer clearance. Proper clearance from coil bind is critical.



**ENDURANCE**



**Part # 1100** - EVO/Twin Cam '84-'04 Big Twin, 86-'03 XL, '92-'02 Buell, Standard 5/16" valve stem and keeper groove

**Parts # 1101** - SE heads with 0.530" guide O.D.

**Part # 1105** - Twin Cam '05-'14, 7mm valve stem with stock triple keeper groove

**Part # 1213** - Steel valve locks '05-'14, 7mm stock triple groove

198 Lbs. @ 1.685" (0.535" Lift)  
194 Lbs. @ 1.703" (0.553" Lift)  
190 Lbs. @ 1.724" (0.574" Lift)  
187 Lbs. @ 1.754" (0.604" Lift)  
185 Lbs. @ 1.780" (0.630" Lift)  
160 Lbs. @ 1.800" (0.650" Lift)  
375 Lbs. @ 1.150" OPEN HEIGHT  
COIL BIND @ 1.100"

**HIGH LOAD**



**Part # 1200** - EVO, T/C '84-'04 Big Twin, 86-'03 XL, Std 5/16" valve stem and keeper groove

**Part # 1201** - SE heads with 0.530" guide O.D.

**Part # 1205** - T/C '05-'14, 7mm valve stem with stock triple keeper groove

**Part # 1206** - 0.050" off set 10°, 5/16" steel valve locks, raises the valve spring retainer to gain 0.050" installed height without machining the cylinder head valve seat.

**Part # 1214** - Ti - valve locks, 10°, 5/16" fit FEULING® High Load BeeHive valve spring set up

217 Lbs @ 1.789" (0.574" Lift)  
215 Lbs @ 1.800" (0.585" Lift)  
208 Lbs @ 1.819" (0.604" Lift)  
200 Lbs @ 1.845" (0.630" Lift)  
185 Lbs @ 1.900" (0.685" Lift)  
170 Lbs @ 1.935" (0.720" Lift)  
415 Lbs @ 1.215 OPEN HEIGHT  
COIL BIND @ 1.125"



Pre-lube valves, install seat shims if needed, then install spring seats.



Install valve seals. Use protective sleeve on valve to protect seal during installation. Pre-lube seals with engine oil prior to installation



FEULING recommends the use a seal installer to prevent seal damage. Install spring, retainer & locks.



VALVE	YEAR	STOCK	ENDURANCE
5/16" STD Groove	'84 - '04	28.7 g	10 g
7MM Triple Groove	'05 - '14	14.4 g	9.4 g
VALVE	YEAR	STOCK	HIGH LOAD
5/16" STD Groove	'84 - '04	28.7 g	14.1 g W/Ti Locks 11.4 g
7MM Triple Groove	'05 - '14	14.4 g	8.5 g



## **SETTING VALVE SPRING OPEN HEIGHT**

**EXAMPLE: USING ENDURANCE SPRINGS WHICH HAVE A OPEN HEIGHT SPEC OF 1.150"**

<b>MEASURED INSTALLED SPRING HEIGHT</b>	<b>1.800"</b>
<b><u>MAX CAMSHAFT LIFT</u></b>	<b>- 0.553"</b>
	<b>= 1.247" OPEN HEIGHT</b>

**THIS SETUP REQUIRES INSTALLATION OF SPRING SEAT SHIMS WITH 0.097" THICKNESS  
NEEDED TO ACHEIVE THE 1.150" OPEN HEIGHT.**

<b>MEASURED OPEN HEIGHT</b>	<b>1.247"</b>
<b><u>VALVE SPRING SEAT SHIMS</u></b>	<b>- 0.097"</b>
	<b>= 1.150" OPEN HEIGHT</b>

**\*THE CLOSER THE SPRING IS INSTALLED TO THE OPEN HEIGHT SPEC WITHOUT GOING  
UNDER, THE QUIETER AND SMOOTHER THE VALVE-TRAIN WILL BE. WE DO ALLOW A 0.050"  
MARGIN MEANING SHIM THICKNESS FOR THE EXAMPLE SETUP COULD BE BETWEEN 0.047"  
- 0.097".**