

# RACE TECH

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## GOLD VALVE CARTRIDGE EMULATOR INSTRUCTIONS H-D V-Rod – FEGV S4901

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**TOOLS REQUIRED** - Long Allen Socket (10 mm), air impact, 5/16" (8 mm) drill and drill motor, tape measure (metric/inch), tubing cutter, Fork Fluid.

**Please read the instructions completely before proceeding. If you have questions please call Race Tech. If you are unfamiliar with this process, stop and have a qualified mechanic assist you.**

### DISASSEMBLY AND PREPARATION

- 1 **Remove the forks and completely disassemble them. When removing the fork cap use caution as the stock springs are preloaded heavily and the cap can be released with a lot of force.** For stubborn damping rod bolts (on the bottom of the fork), hit the head of the damping rod bolt with a drift and hammer to jar the threads loose. An air impact and a long Allen socket also helps.
- 2 Drill the existing Compression Holes larger and add additional holes. No matter how many compression holes come stock, you must end up with six 5/16 inch (8 mm) holes (3 sets of 2 holes) (see Figure 1). When drilling new holes, space them lengthwise at 7/16" (10 mm) increments. Each set of two holes must be perpendicular to the last set (figure 1). After drilling, chamfer and deburr the compression holes, inside and out. **Do not modify the rebound holes.**

### EMULATOR VALVING SETUP

- 3 The compression damping is controlled by the Emulator Valve Spring setup. Double-check this setting. Set up the Emulator Valve Spring with (1 ½) turns of preload. This is done by first loosening the lock nut on the bottom of the Emulator and backing off the Allen bolt (counter clockwise) until there is no tension on the spring. From there turn the Allen bolt in (clockwise) (1 ½) revolutions and tighten the lock nut.
- 4 **Begin reassembling** the forks according to your manual. Remember to install the Top-out Spring and bottom-out cone. Consult the manufacturers specs for damping rod bolt torque.

### CUT THE PRELOAD SPACERS

- 5 Spring preload is the amount the spring is compressed when it is installed with the forks fully extended. Do this step with no fork fluid. (See figure 1) Extend the fork all the way. **Install the Aluminum Adapter and the Emulator** by dropping them down the fork tube. The Emulator must sit on top of the Adapter with the Emulator Valve Spring facing up. Visually check to make sure the Emulator is sitting squarely on top of the Adapter.  
**Install the spring.** Place both spring washers on top of the spring temporarily. Rest the Fork Cap on top of the Spacer. Measure the distance between the top of the fork tube and the bottom of the sealing lip on the Fork Cap (the point that touches the top of the tube when the cap is tightened). This is a direct measurement of Preload. Cut spacers to provide 2 3/8" (60 mm) of preload.

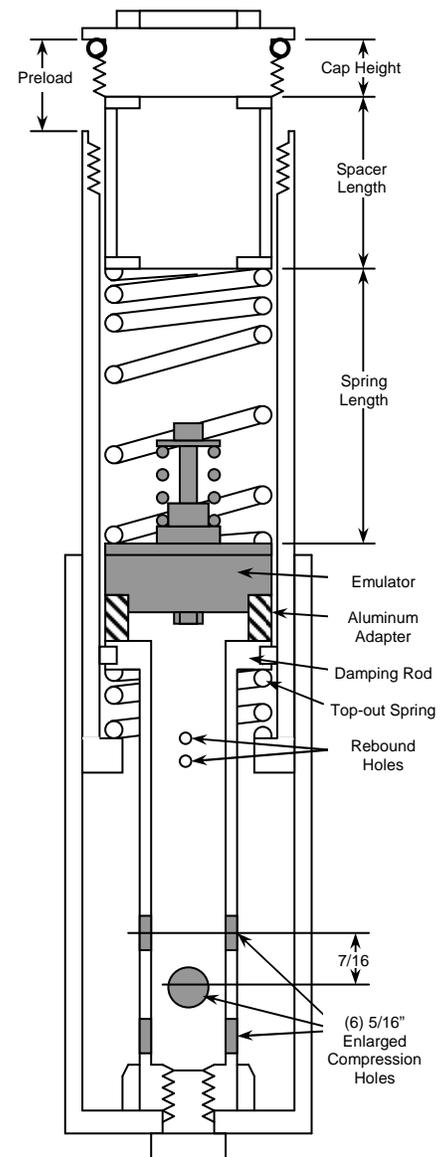


Figure 1

**Cut the spacers** with a tubing cutter (available at hardware stores). Washers must be installed on both ends of the spacer. The spacer must not rest on the spring or the cap directly. Double-check your preload by stacking the spring, spacer, washers and cap and measuring the distance from the sealing lip on the cap to the top of the fork tube (see Figure 1).

## OIL LEVEL SETUP

- Remove the fork spring and **install fork fluid**. Use the recommended oil viscosity and level. Bleed the air bubbles out of the fork by pumping them up and down. The oil level is measured from the top of the fork tube down to the top of the oil with the fork completely collapsed and the fork spring out. Be sure to set the oil level with the Emulator installed.
- Finish reassembly** by installing the spring. We highly recommend the Race Tech FRSP S4435P20 fork springs. They work very well with Emulators. **Install the springs with the close coils up at the top**, then the first spring washer, the spacer and the second spring washer. Re-check the spring preload. This will indicate whether the Emulator is seated properly. Install the fork caps and, with the forks off the bike, push on them, checking for any unusual drag or bind that would indicate an improperly seated Emulator. Install the forks back on the bike. Align the forks on the axle for minimum bind. Torque all the bolts including the brake calipers, pump up the brakes and enjoy!

## TUNING NOTES

Most riders will use the standard settings, however if you would like to experiment with a different "feel", here are some guidelines. To adjust the Gold Valve Emulator you must remove it from the fork leg (you don't have to remove the forks from the bike in some cases). Remove the springs using a twisting motion to avoid oil drips. To remove the Emulator, use a parts grabber or a 1/16" (1.5 mm) welding rod with 1/4" (6 mm) of both ends bent over 90 degrees into an "L" shape. Push the end into the Emulator slot and turn it 90 degrees to hook the Emulator. Before installation, be sure the jam nut on the Emulator is tight.

## TUNING VARIABLES

<b>VARIABLE</b>	<b>Standard</b>	<b>Optional</b>	<b>Primary Effect</b>
Valve Spring Preload*	1 ½ Turns	0 to 5 Turns	Overall firmness, controlling a mushy feel and the speed the front end dives under braking
Oil Viscosity**	20 wt	30 wt	Use oil viscosity to set rebound, this affects traction and stability
Oil Level	130 mm / 5.1"	120 to 150 mm	Affects bottoming resistance
Valve Spring Rate	40 lbs/in	26 or 64 lbs/in	Overall firmness and the ride on square shaped bumps
Fork Spring Preload	2 3/8" / 60 mm	1.5 to 3"	Lowers or raises ride height

\* Measured from zero preload (no tension) on the Valve Spring. To find zero preload back off on the adjuster bolt until the spring is loose then tighten it until the spring just touches. More Preload gives more compression damping and a firmer ride.

Use oil viscosity to set the amount of rebound damping, then adjust the compression with the Emulator settings. The Emulator does not affect rebound, however oil viscosity does. The primary compression adjustment is the amount of Emulator Valve Spring Preload. Increasing Valve Spring Preload makes the fork stiffer. The effect of all the variables overlap giving extreme tuning flexibility. If you use heavier viscosity oil, back off on the Emulator Valve Spring Preload to compensate for the increased compression damping this causes.

## TERMS

**Spring Rate** - The spring stiffness measured in kg/mm or lbs/in. This is not Preload.

**Spring Free Length** - The length of the spring when it is not installed.

**Spring Set Length** - The installed length of the spring with the forks fully extended.

**Spring Preload** - Amount the spring is compressed from it's Free Length to install it. It is not the length of the spacer. Free Length minus Set Length equals Preload.