



1501 Pomona Rd, Corona, CA 92880 • 951.279.6655 • fax 951.279.7171 • [www.racetech.com](http://www.racetech.com)

## GOLD VALVE CARTRIDGE EMULATOR INSTRUCTIONS

<IP FEGV S2901.doc> **FEGV S2901** M Wiley © 7-23-08

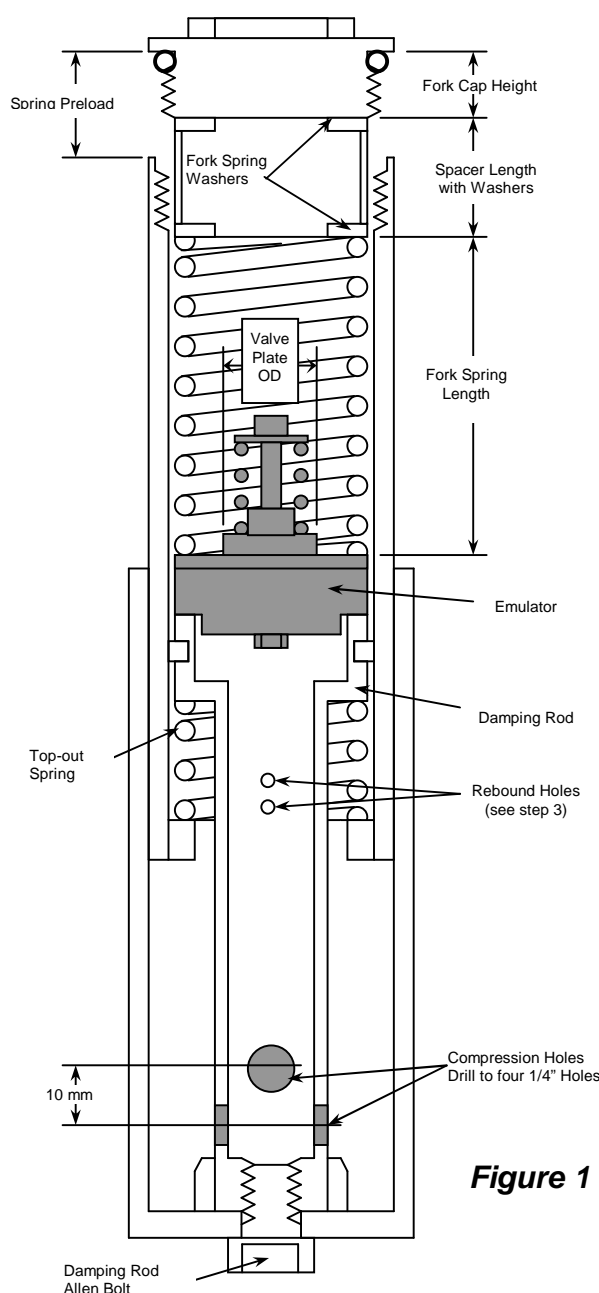
3 pgs

**TOOLS REQUIRED** – 8 mm Allen Socket, air impact, drill motor and 6 mm (1/4") drill, tape measure (metric), tubing cutter, and US-3, 20w or 30w Fork Fluid; see [racetech.com](http://racetech.com)

**IMPORTANT NOTE:** Many riders require different fork springs. Consult [www.racetech.com](http://www.racetech.com) or call Race Tech.

**NOTE:** The damping rods fitted in your motorcycle you may use an adapter not supplied in this kit, see page 3. Please call Race Tech Technical Support for details if necessary.

- 1 Remove the damping rods.** Take the forks off the bike and disassemble them. An air impact and a long Allen socket helps a lot. For stubborn Damping Rod Allen bolts use a drift and beat on the head of the damping rod bolt to jar the threads loose. Unless you are doing a complete overhaul, on most models, you don't have to remove the seals. Simply take the fork spring and the damping rod bolt out, turn the fork upside down and the damping rod will fall out.
- 2 Drill the existing compression holes in the damping rod to 1/4 inch (6 mm) so you end up with four holes (2 sets of 2 holes) (figure 1).** When drilling new holes, space them axially (lengthwise) at 10 mm (7/16") increments. Each set of two holes must be perpendicular to the last set so as not to weaken the rod (figure 1). After drilling, chamfer and deburr the compression holes, inside and out. Do not add or enlarge the rebound holes and leave their edges sharp.
- 3 Check the Emulator Valving.** The standard valving that is pre-installed is a 40 lb/in Emulator Valve Spring with 3 turns of Valve Spring Preload.
- 4 Begin reassembling** the forks according to your manual. Remember to install the top-out spring and bottom-out cone if you have chosen complete disassembly. Consult manufacturers specs for damping rod bolt torque.
- 5 Set the fork spring preload by making the correct length spacers.** This is done before installing the fork fluid.



**Figure 1**

- a. Drop the Emulator down the tube. It sits on top of the damping rod with the Emulator Valve Spring facing up and is held in place with the main fork spring. Refer to figure 1. Visually check to make sure the Emulator is sitting squarely on top of the damping rod.
- b. Extend the fork tube all the way. Insert the fork springs into the fork tube on top of the Emulator. Install a fork spring spacer washer. Place the fork spring spacer tube in next, then another washer.
- c. Set the fork cap on the washer and determine the preload by measuring from the top of the fork tube to the sealing lip on the fork cap (see figure 1). This is a direct measurement of fork spring preload. Shorten the spring spacer tube to achieve the proper preload.

We recommend 5 mm (0.2") of total fork spring preload.

NOTE: You must have washers on both ends of the spacer. The spacer must not rest directly on the spring or the cap.

- 6 **Install the fork fluid.** First remove the fork spring. Bleed the fork by pumping them. Install the Emulator and then set the oil level (typically 125-150mm, see service manual) with the forks completely bottomed and the springs out, see racetech.com If you cannot find oil specs call Race Tech Technical Support 951-279-6655
- 7 **Finish reassembly** by installing the spring and spacer. Before you install the cap, 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. Tighten all the bolts and enjoy!

## TUNING NOTES

To adjust the Gold Valve Emulator you must remove it from the fork. When you remove the fork springs use a twisting motion to avoid oil drips. To remove the Emulator, use a parts grabber. Adjust the Emulator Valve Spring Preload a half turn at a time. More Valve Spring Preload will make the forks stiffer. Before installation, be sure the jam nut on the Emulator is tight using a socket.

### TUNING VARIABLES

VARIABLE	STANDARD	OPTIONAL	PRIMARY EFFECT
Valve Spring Preload	3 Turns	0 to 7 Turns	Overall firmness, controlling a mushy feel and the speed the front end dives under braking
Oil Viscosity	US-3 (15wt)	US-2 (10wt) to 30wt	Use oil viscosity to set rebound, this affects traction and stability. Heavier oil equals slower rebound, lighter oil equals quicker rebound.
Valve Spring Rate	40 lbs/in (Blue)	26, 40 or 64 lbs/in	Overall firmness and the ride on square shaped bumps. Note that most 33-36mm vintage forks work better with the 40lb/in spring at 2-4 turns
Emulator Valve Plate Bleed Holes	2 bleeds	Additional bleeds as desired up to 4 total	Initial fork movement low speed damping & plushness before valve plate opens; small bumps, chatter, etc.

\* 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.

## Technical Support 951-279-6655

NOTE: If you have aftermarket (non-stock) damping rods you must use an adapter not supplied in this kit. KYB Damping rods require some machining, see racetech.com for details or please call Race Tech Technical Support at 951.279.6655 for information. See instructions below for spacer set up

## NON-STANDARD EMULATOR INSTALLATION

## (CUSTOM ADAPTER REQUIRED)

<emu\_adapt.doc> P Thede © 6-1-04

### **FITMENT: Before installation, check the fit of the Gold Valve**

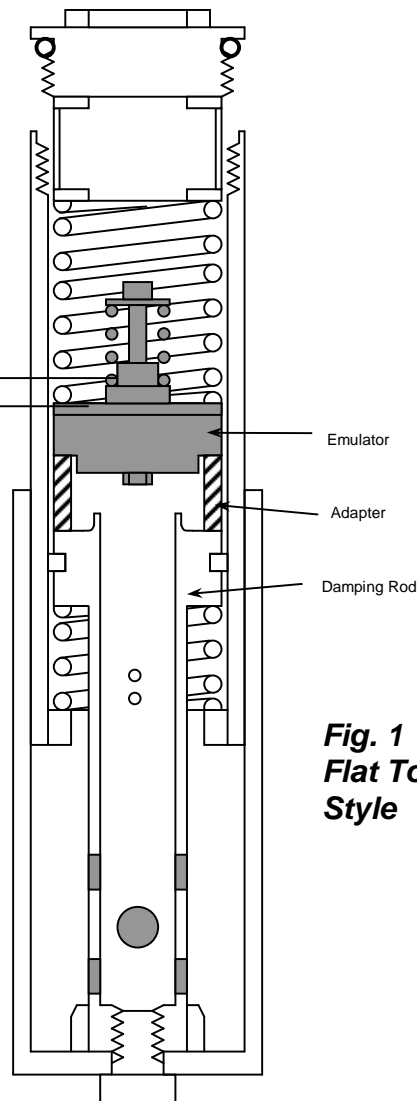
**Emulator** by placing it on the top of the damping rod. There are three basic types of damping rods. One that is cupped on the top of the damping rod, second, one that is flat on the top, and third where the damping rod protrudes on top.

On **the cupped style**, the step on the Emulator must sit into the top of the damping rod. This is the most common style. No adapter is required.

The **flat top style** requires an adapter. The adapter sits on top of the damping rod and the Emulator sits on top of the adapter. These adapters are mostly custom however some of the more common types are available.

The **protruding top style** is just like the flat top style but the adapter must be slightly taller to insure proper flow to the Emulator; Most KYB & European forks

5 mm min.



**Fig. 1  
Flat Top  
Style**

## CUSTOM ADAPTER BASIC DESIGN

Since there are many configurations of the top of the damping rod these guidelines will not apply to all applications. Please call the Technical Support Hotline 951.279.6655 for assistance. Be prepared to supply important dimensions of the fork internals.

Select the proper Emulator (fits into the tube and clears by .5mm minimum).

Material – Aluminum or PVC Plastic

Adapter Outer Diameter – Same as Emulator Outer Diameter

Adapter Inner Diameter - 0.5mm (0.020”) larger than the Step Diameter of the Emulator

Adapter Height – The adapter must be tall enough to allow 5 mm (0.200”) clearance between the top of the hole in the damping rod and the bottom of the jam nut on the Emulator. (fig 1)

**NOTE:** If you have aftermarket (non-stock) damping rods you must use an adapter described above in this kit. KYB Damping rods require some machining, see [racetech.com](http://racetech.com) for details or please call Race Tech Technical Support at 951.279.6655 for information.