

RACE TECH

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GOLD VALVE CARTRIDGE EMULATOR INSTRUCTIONS - DIRT

<IP FEGV D.doc> FEGV STD P Thede © 8-25-08 M. Wiley 09-09-09

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TOOLS REQUIRED - Allen Socket (some models require a 6, 8, 10, 12 or 14 mm), air impact, 5/16" (8 mm) or 1/4" (6mm) drill and drill motor, tape measure (metric/inch), tubing cutter, Ultra Slick US-3 (15wt) Fork Fluid or 20-30wt Fork Fluid.

IMPORTANT NOTE: Most models require different fork springs. Consult www.racetech.com or call Race Tech.

NOTE - BEFORE INSTALLATION CHECK FOR PROPER FIT (SEE STEPS 2 AND 6).

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 **Check the fit of the Gold Valve Emulator** by placing it on top of the damping rod. The step on the Emulator must sit into the large hole in the top of the damping rod and must completely cover it so there is no blow-by (figure 1). Do NOT machine down Emulator for fitment!

NOTES:

- Some Emulators (FEGV 4301 and 4101) come with sizing circlips. This allows proper fit for more than one ID damping rod. **Check to determine if you need to use the sizing circlips** by installing the circlip and checking to see if it will fit into the top of the damping rod. The circlip is for location only so there is no blow-by, it does not seal.
- Check the inner diameter of the fork spring** must be at least 4 mm (0.160") larger than the Emulator Valve Plate itself for proper flow (figure 1).

3 **Drill the existing compression holes in the damping rod to 5/16 inch (8 mm) and add additional 5/16" OR 1/4" (6mm based on damping rod size) holes so you end up with six holes (3 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 if any exist.**

NOTES: If there is **any type of compression valve or adjuster**, it must **be removed** by cutting it off where it goes into the bolt. You will no longer have external adjustment, however your internal adjustment is drastically increased. (does not apply to Vintage models)

A few models have an existing valve that sits on top of the damping rod. Remove these stock valves.

4 **Check the Emulator Valving.** The standard valving that is pre-installed is a 64 lb/in Emulator Valve Spring with 2 turns of Valve Spring Preload. **OR** 40 lb/in Emulator Valve Spring with 3 turns of Valve Spring Preload (vintage models)

(The Standard Valving on FEGV 3301 for 80cc mini's is a 101 lb/in spring with 4 turns of Valve Spring Preload) Check the tightness of the jam nut on the Emulator.

5 **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.

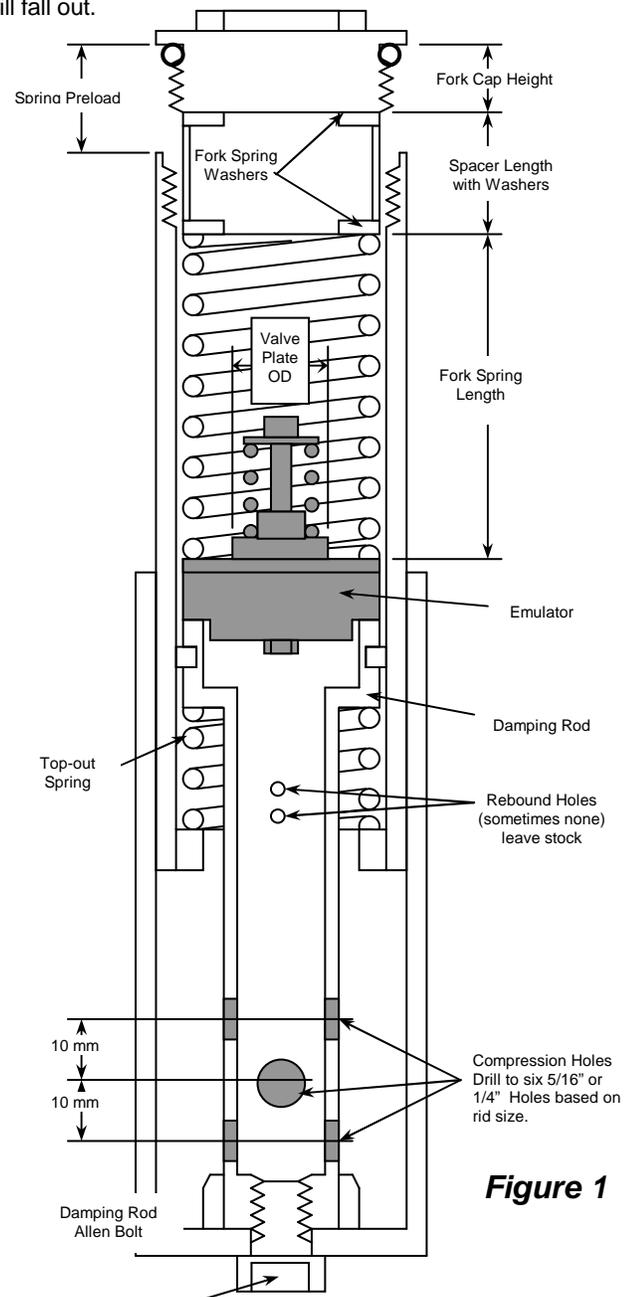


Figure 1

6 **Set the fork spring preload by making the correct length spacers.** This is done before installing the fork fluid. (See the Custom Valving Setup at www.racetech.com)

- 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 or the adapter.
- 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 10 mm (0.4") of total preload for most full size off-road applications. Heavier bikes (XR's) and bikes with oversize gas tanks can use as much as 20 mm (0.8") of total preload. 80cc mini bikes use 5mm (0.2") preload.

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

NOTE: If you use the same spring and there is no preload spacer in the forks, it will have more preload and the front end will ride higher. This is not correct.

7 **Install the fork fluid.** First remove the fork spring and use the oil viscosity recommended by Custom Valving at www.racetech.com or by the manufacturer. Bleed the fork by pumping them. Install the Emulator and then **set the oil level** with the forks completely bottomed and the springs out. Most vintage models will use 15, 20 or 30wt oil. See racetech.com fork notes for your model

8 **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 bolts including the brake caliper bolts. If you have hydraulic brakes, pump them up 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	2-3 Turns	0 to 7 Turns	Overall firmness, controlling a mushy feel and the speed the front end dives under braking & over larger bumps
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.
Emulator Valve Spring Rate	40lbs/in (Blue)	26lbs Silver 40lbs Blue 64lbs Yellow	Overall firmness and the ride on square shaped bumps. Note that most 31-38mm vintage forks work better with the 40lb/in spring at 2-4 turns, some with the 26lbs Silver Spring
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. More Preload gives more compression damping and a firmer ride. **2-3 turns of Valve Spring Preload for lighter riders or a plusher ride. 4-5 Turns for Firmer Race Oriented or aggressive Riders**

** Your kit may come with a 40, 64, or 101 lb/in spring installed. Use the spring & setting recommended for your application in the Product Search in racetech.com "Fork Notes". FEGV 3501 Emulator for 80cc Mini's has a 101 lb/in valving spring with 4 turns preload standard.

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. Bleed Holes affect low speed & very small bumps. The effect of all the variables will overlap, this gives extreme tuning flexibility

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