

RACE TECH

GOLD VALVE CARTRIDGE EMULATOR INSTRUCTIONS

HARLEY Showa 41mm

2 pgs

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

IMPORTANT NOTE: All these models require different fork springs.

NOTE - BEFORE ASSEMBLY 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, 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 the top of the damping rod. There are two types of damping rods on 41mm Harley forks, one is cupped on the top of the damping rod and the other is flat on the top.

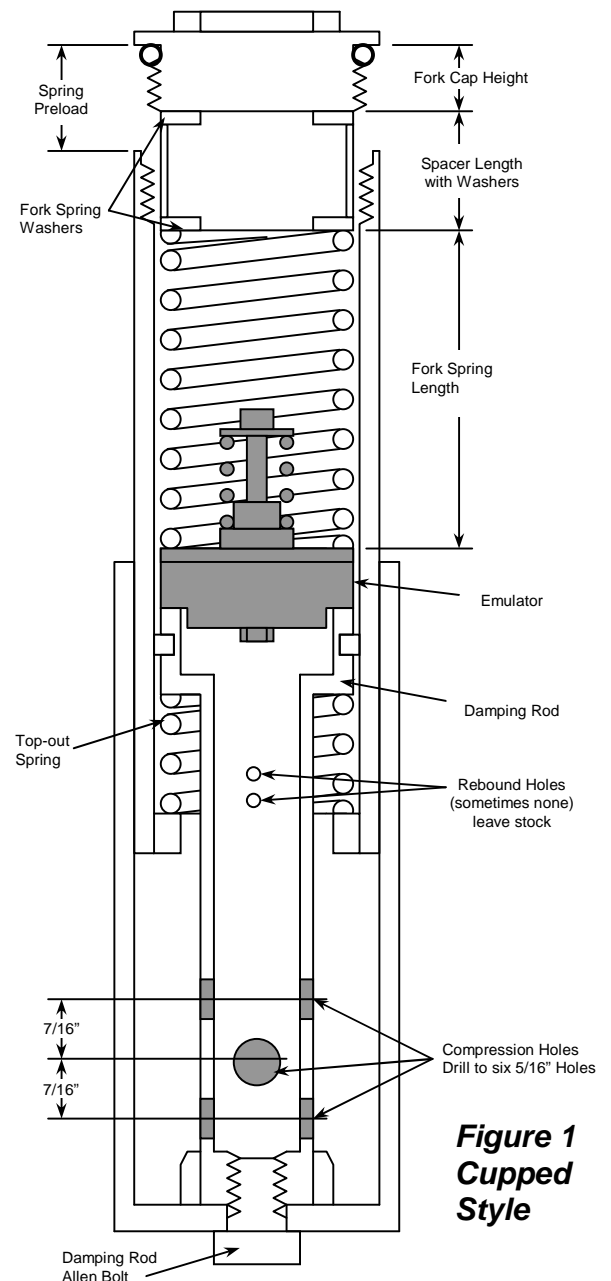
On the cupped style, the step on the Emulator must sit into the top of the damping rod. No adapter is required. (figure 1)

The flat top style requires the adapter supplied in the kit (figure 2). It sits on top of the damping rod and the Emulator sits on top of the adapter. If you are using an aftermarket spring other than Race Tech, the inner diameter of the fork spring must be at least 0.780" (20mm) for proper flow.

3 **Drill the existing compression holes in the damping rod to 5/16 inch (8mm) and add additional 5/16" holes so you end up with six holes (3 sets of 2 holes) (Fig 1).** When drilling new holes, space them lengthwise at 7/16" (10mm) 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.

4 **Check the Emulator Valving.** The standard valving is pre-installed is a blue 40 lb/in Emulator Valve Spring with 3 turns of Valve Spring Preload. The optional Valve Spring included in the kit is 64 lb/in yellow spring for firmer ride. Check the Table below for recommendations. 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. Consult manufacturers specs for damping rod bolt torque.



6 **Set the fork spring preload by making the correct length spacers (see Table below for suggested preload).** This is done before installing the fork fluid.

- 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. If you have flat top style damping rods it requires adapters (figure 2) and they should be installed first, before the Emulator.
- 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 fig. 1). This is a direct measurement of fork spring preload. Shorten the spring spacer tube to achieve the proper preload as shown in the Table.

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

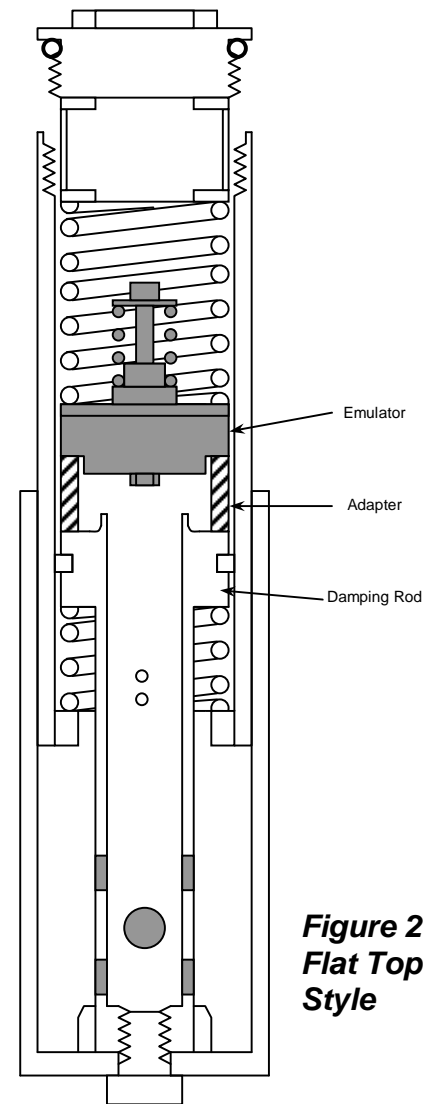
NOTE: **If you are not using Race Tech springs**, make sure the Emulator valve plate has clearance on the ID of the spring (there must be at least 0.160" (4mm) clearance between the OD of the valve plate and the ID of the spring).

NOTE: If one end of the spring has a smaller diameter than the other, the large diameter end should go down against the Emulator.

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

7 **Install the fork fluid.** First remove the fork spring and use the oil viscosity recommended in the table below. Bleed the fork by pumping them. Install the Emulator and set the oil level with the forks completely bottomed and the springs out.

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. Where applicable, align the forks on the axle for minimum bind. Torque all the bolts including the brake calipers, pump up the brakes and enjoy!



**Figure 2
Flat Top
Style**

TUNING NOTES

To adjust the Gold Valve Emulator you must remove it from the fork. To remove the Emulator, use a parts grabber. When tuning, 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.

RECOMMENDED OIL VISCOSITY and LEVEL

Year	Model HARLEY	Oil	Oil Level	Fork Spring Preload	Emulator Valve Spring	Valve Spring Preload *
80-08	FLH/FLT	15w	6.3" (160mm)	1.6" (40mm)	64 lbs/in	2.0 turns
84-08	FLST/FXST	15w	6.3" (160mm)	1.4" (35mm)	40 lbs/in	3.0 turns
93-08	FXDWG	15w	6.3" (160mm)	1.4" (35mm)	40 lbs/in	3.0 turns
80-86	FXWG	15w	6.3" (160mm)	1.4" (35mm)	40 lbs/in	3.0 turns

* 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 Valve Spring Preload gives a firmer ride. Be sure to tighten the Jam Nut after adjusting.