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GOLD VALVE CARTRIDGE EMULATOR INSTRUCTIONS - ST1100

<IP FEGV S3803.doc> **FEGV S3803** P Thede © 10-28-05 2 pgs

TOOLS REQUIRED - Long Allen Socket (typically 6, 8 or 10 mm), Air Impact, 5/16" (8 mm) Drill and Drill Motor, Tape Measure (metric/inch), Tubing Cutter, Ultra Slick US-2 (10wt) Fork Fluid.

IMPORTANT NOTE: Most riders on ST1100's require stiffer fork springs. Consult www.racetech.com or call Race Tech.

91-97 ST1100 and 92-95 ST1100A's have a unique fork setup. In the right fork leg they have a cartridge, in the left they have a standard damping rod. This kit has an Emulator that gets fitted into the left leg with the damping rod. The cartridge side remains unchanged except for oil and spring.

1 **Remove the forks from the bike and disassemble the left leg with the damping rod**. An air impact and a long Allen socket helps a lot. For stubborn 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 **FITTMENT: Before installation, check the fit of the Gold Valve Emulator** by placing it on the top of the damping rod. The step on the Emulator must sit into the top of the damping rod and must completely cover the end of the rod (Fig 1). The Emulator must also fit into the fork tube itself. Also, the inner diameter of the **fork spring** must be at least 4mm (.160") larger than the Emulator Plate itself (small OD plate with the bleed hole) for proper flow.

3 **Drill additional compression holes in the damping rod**. No matter how many compression holes come stock, you must end up with at least six 5/16 inch (8 mm) holes (3 sets of 2 holes). The exact size of the holes is not critical. It is only important to have **enough** flow, more than enough does not hurt. Drill the existing holes larger and, when necessary, add additional holes. If you are 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 (Fig 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.**

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 Before installing the fork fluid, **setup the spring preload**. Drop the Gold Valve Emulator down the tube. It sits on top of the damping rod with the **valve spring facing up** and is held in place with the main spring. Visually check to make sure the Emulator is sitting squarely on top of the damping rod. Install the spring and set the preload. If you are using the same spring and you want to maintain the same preload, the spacer must be shortened 14 mm (0.550"), as that's how long they are. This can be accomplished with a tubing cutter available at hardware stores. If you are using Race Tech Fork Springs (part # FRSP S3534 Series) the spacer you must cut will be 185 mm (7 1/4") long on the damping rod

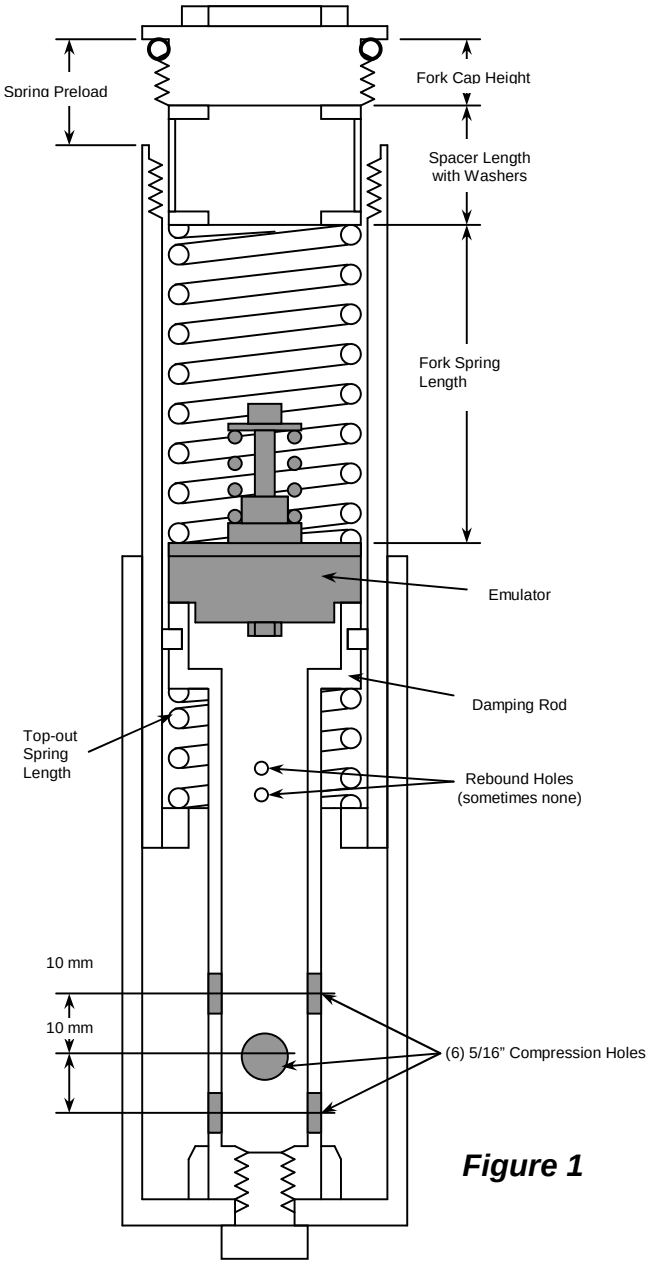

Figure 1

side and 105 mm (4.1”) long on the cartridge side. This will provide 25 mm of preload.

7 Remove the fork spring and **install fork fluid** using US-2 (10wt). Bleed the fork by pumping it up and down. Do not set the oil level until the Emulator is installed. **Check the Emulator settings** (2 turns preload for street standard). Check the tightness of the jam nut on the Emulator. **Set the oil level** with the forks completely bottomed and the springs out to 130 mm (5.1”).

8 **Finish reassembly** by installing the spring and spacer. 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

To adjust the Gold Valve Emulator, simply remove it from the fork to make changes (you don't have to remove the forks from the bike in most cases). Remove the springs using a twisting motion to avoid oil drips. To remove the Emulator use a parts grabber. Or use a 1/16" (1 mm) welding rod with 1/4" (6 mm) of both ends bent over 90 degrees into an "L" shape. Push one end into the rebound check valve slot and turn it 90 degrees to hook the Emulator. Make your valving changes and be sure the jam nut on the Emulator is tight using a socket.

TUNING VARIABLES

VARIABLE	*Standard*	*Optional*	*Primary Effect*
Valve Spring Preload*	2 Turns	0 to 7 Turns	Overall firmness, controlling a mushy feel and the speed the front end dives under braking
Oil Viscosity	US-2 (10wt)	US-1 to US-3	Use oil viscosity to set rebound, this affects traction and stability
Valve Spring Rate	64 lbs/in	26 or 101 lbs/in	Overall firmness and the ride on square shaped bumps

* 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 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 will overlap, this gives extreme tuning flexibility.

MEASURING STATIC SAG - FORKS

Static Sag is the amount the bike compresses from fully extended, with the rider on board.

1 First extend the forks completely and measure from the wiper to the bottom of the triple clamp. This is L1.

2 Take the bike off the stand, put the rider on board in riding position. Get an assistant to balance the bike or have the rider hold onto something, push down on the front end and let it extend **very slowly**. Where it stops, measure the distance between the wiper and the bottom of the triple clamp again. **Do not bounce**. This is L2. (If there were no friction in the seals the bike would come up a little further.)

3 Next lift up on the front end and let it drop **very slowly**. Where it stops measure again. **Do not bounce**. This is L3. The reason L2 and L3 are different is due to stiction or drag in the seals and bushings. (If there were no friction in the seals the bike would drop a little further.)

4 Half way between L1 and L2 is where it would be with no friction. Therefore L2 and L3 must be averaged and subtracted from L1 to calculate true Static Sag.

Static Sag = L1 - (L3 + L2)/2

5 To adjust Static Sag make longer or shorter preload spacers or use the preload adjusters, if available.

RECOMMENDED OIL VISCOSITY and LEVEL (US-2=10wt)

Year	*Model*	*Emulator*	*Oil*	*Oil Level*	*Dmm*	*Mfg*	*Stock Spring*	*RT Fork Spring*
	HONDA							
92-95	ST 1100 ABS	FEGV S3803	US-2	130	41C	S		FRSP S3234xx