RACE TECH

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GOLD VALVE CARTRIDGE EMULATOR
HONDA VF700-1100 V-4 Models using SHOWA 37/39/41mm Forks

<IP FEGV S4101V4.doc> **FEGV S4101V4** M. Wiley © 1-20-12   3 pgs
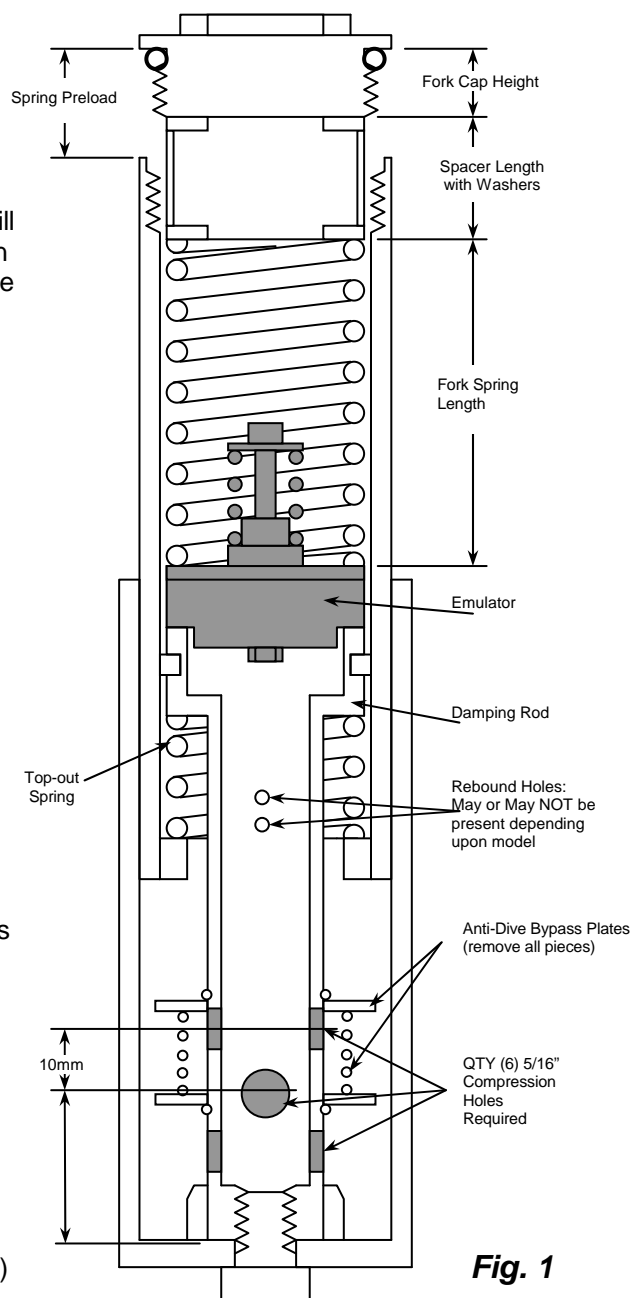
TOOLS REQUIRED - Long 6mm Allen Socket, Impact Wrench, 5/16" (8 mm) Drill & Drill Motor, Tape Measure (metric/inch), Tubing Cutter, TFSD 37, 39 or 41 Fork Seal Driver, OSFO 15 (15wt) Fork Fluid, Service Manual

IMPORTANT NOTE: The V-4 Models use one of two different Damping Rod styles (Cupped or Flat Top) depending upon the model. Review these instructions fully prior to making modifications. All Honda V-4 models have fork springs that are too soft. Use RT FRSP S3234 Series Fork Springs 39 & 41mm forks, FRSP S2938 Series for 37mm forks.

1 ***Remove the forks from the bike and disassemble them***. **CAUTION: IF YOU ARE UNFAMILIAR WITH THIS PROCESS, STOP! SEEK OUT A QUALIFIED SUSPENSION TECHNICIAN.**

2 ***Completely disassemble the forks***. An air or electric impact will help in removing the damping rod bolt. Before disassembly, use a drift and beat on the damping rod bolt to loosen the threads. You will need a long 6 mm Allen socket to remove the damping rod bolts. On TRAC Anti-Dive Forks remove the wire circlips and washers and the bottoming cone sliding them off the end. The Anti-Dive springs/clips/washers will not be needed for reassembly. Note the notch in the bottoming cone that MUST be lined up in the Damping Rod & Fork Slider upon reassembly

3 ***Drill additional compression holes in the damping rod***. You will add 5/16 inch (8 mm) compression holes at the bottom of the damping rods so there is a total of 6 on each damping rod. The exact size of the holes is not critical. It is only important to have enough flow, more than enough does not hurt. Each set of two holes must be perpendicular to the last set so as not to weaken the rod. (See Drawing) After drilling, deburr the compression holes, inside and out. NOTE: See rebound hole details below as procedures vary for different models. NOTE: *With the Emulators installed the anti-dive is unnecessary and is disabled. Remove Bypass Plates as noted.*

4 Reassemble the forks without springs and oil. Reinstall the top-out spring and bottoming cone. The bottoming cone notch MUST line up correctly in the Fork Slider & Damping Rod. Consult manufacturers specs for damping rod bolt torque.

Install Ultra Slick US-3 Suspension Fluid (15wt) and bleed the forks by pumping them. Check the setting on your Emulator and check the tightness of the jam nut & determine if an adapter is required! Cupped Top Damping Rods (Fig. 1) no adapter needed. Flat Top Style (photo pg. 2) requires FPEV AD4101 Adapter (or 1" PVC 15mm tall, use tubing cutter, do NOT Hacksaw!) The Adapter must sit between Damping Rod & Gold Valve. Before setting the oil level, drop the Adapter (if required) with Gold Valve Emulator down the tube. These components sit on top of the damping rod with the valve spring facing up (and is held in place with the main spring). You may choose to epoxy the adapter onto the bottom of the Gold Valve for ease of service during adjustments. Set the OSFO 15 oil level to 150mm (5.9") from the top with the forks collapsed and the springs out.

Spring Preload

Fork Cap Height

Spacer Length with Washers

Fork Spring Length

Emulator

Damping Rod

Top-out Spring

Rebound Holes: May or May NOT be present depending upon model

Anti-Dive Bypass Plates (remove all pieces)

QTY (6) 5/16" Compression Holes Required

10mm

Fig. 1

5   *Install new RT FRSP S3234 Series Springs with 15 - 25mm of preload.* Preload is the amount the spring is compressed when it is installed. The preload spacer (material included in Fork Spring Kit) should be cut to produce 15 - 25mm of preload depending upon rider preference and desired sag. **NOTE**: Cut Preload Spacer with Tubing Cutter to obtain square ends, do NOT Hacksaw! Make sure you install spring washers (provided) at both ends of the preload spacer. The preload spacer must not sit directly on the spring or the fork cap. With the fork fully extended the preload spacer should come to the top of the fork tube or slightly above it. This will be a good starting point for. Air pressure should no longer be used with Race Tech Springs.

6   *UNFORTUNATELY YOU <u>CANNOT USE</u> PROGRESSIVE SUSPENSION BRAND FORK SPRINGS WITH THIS KIT as there is not enough clearance on the inner diameter of the spring.*

Before installing the forks on the bike, push on them, ***checking for any unusual drag or bind*** that would indicate an improperly seated Emulator or assembly error. Install the forks on the bike following the procedure outlined in the shop manual <u>making sure the tubes are aligned</u>. Tighten all bolts including the brake caliper bolts. Pump up the brakes.
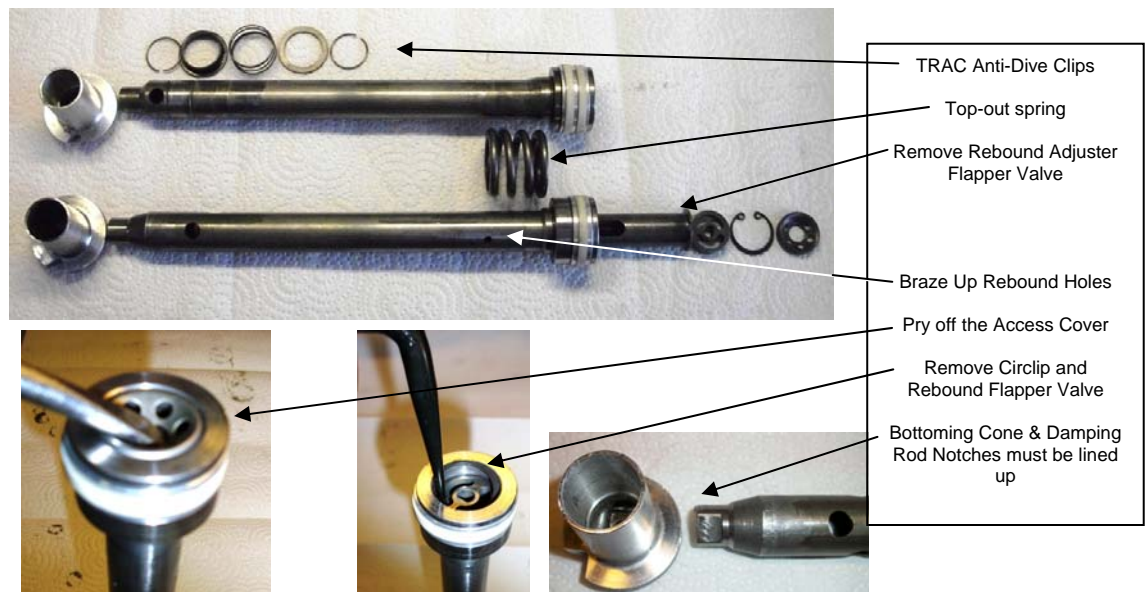

SPECIAL INSTRUCTIONS for ADJUSTABLE REBOUND MODELS

Forks with external rebound adjusters require special treatment which involves disabling the external adjustment. *After this procedure you will no longer have external rebound adjustment.* Honda V-4 models require brazing.
If you are not experienced with this work STOP!!! DO NOT PROCEED. SEEK OUT A QUALIFIED SUSPENSION TECHNICIAN.

HONDA MODELS REQUIRE BRAZING REBOUND HOLES

1   **Remove the damping rods** from the fork tubes.

2   **Disassemble the adjustable rebound mechanism** in the top of the damping rod. This is operated with a "D" shaped rod connected to the fork cap. The rebound mechanism is held into the top of the damping rod with a circlip under the access cover on top of the damping rod. Pry the access cover off, remove the circlip, remove the flapper valve and related components from the damping rod, they are no longer needed.

3   The "D" shaped adjustment rod that is attached to the cap must be removed with a hacksaw. **Cut the rod off** within 25mm (1 in) from the cap. The exact length is not critical.

4   This style damping rod has (3) rebound holes, (1) large upper hole and (2) lowers. **The (2) lower rebound holes must be brazed shut. Once brazed they must be filed smooth. Upon completion there should be only (1) rebound hole.** We have found this to be the best rebound setting with OSFO 15 Suspension Oil.

5   You may want to **record the rebound hole sizes that are to be brazed.** Thus if you desire less rebound in the future you can re-drill one or more of the brazed rebound holes.

6   **Follow the standard installation instructions above for the compression hole modifications**. This includes drilling the additional compression holes (located at the bottom of the damping rod) and removing TRAC Anti-Dive.

7   **Review the pics below for the different damping rod styles: TRAC** (top) **and Adjustable Rebound** (bottom)

TRAC Anti-Dive Clips

Top-out spring

Remove Rebound Adjuster Flapper Valve

Braze Up Rebound Holes

Pry off the Access Cover

Remove Circlip and Rebound Flapper Valve

Bottoming Cone & Damping Rod Notches must be lined up

MEASURING STATIC SAG - FORKS

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

1   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   *30 - 40mm is recommended for Honda V-4 Models*

5   To adjust Static Sag make longer or shorter preload spacers or use the preload adjusters, if available. More sag offers a slightly plusher ride, less sag is firmer ride.

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 and pull it out. Or use a 1/16" (1mm) 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 snug using a socket.

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 Turns	0 to 7 Turns	Overall firmness, controlling a mushy feel and the speed the front end dives under braking. Adjust up or down in ½ turn increments: 1-6 turn range
Oil Viscosity	OSF0 15 (15wt)	OSFO 10, 15, 20 or 30 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	64 lbs/in (Yellow)	26 (Silver), 40 (Blue) or 64 (Yellow) lbs/in	Overall firmness and the ride on square shaped bumps. Note that Touring Riders may prefer the Softer 40lb/in spring at 3-5 turns
Emulator Valve Plate Bleed Holes	2 bleeds	Additional bleeds as desire 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. 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 providing extreme tuning flexibility.

Honda V-4 Model 37, 39 & 41mm Showa Forks Race Tech Product Applications:

FRSP S2938 Series	Fork Springs (.80-1.0kg Rates) 37mm Forks
FRSP S3234 Series	Fork Springs (.80-1.0kg Rates) 39 & 41mm Forks
FEGV S3501	Gold Valve Emulators 37mm Forks
FEGV S3801	Gold Valve Emulators 39mm Forks
FEGV S4101	Gold Valve Emulators 41mm Forks w/Adapters
FPEV AD4101 P	Gold Valve Adapters, pair (*NOT REQUIRED ON 37 & 39mm FORKS*)
HMWC 0813	Copper Washers, each
OSFO 15	Suspension Fluid; Quart, 1 required

Please call Technical Support at 951.279.6655 x109 for assistance.
You may also visit *racetech.com* product search for your model; see the Fork Comments at the top of the page for details on your model.