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FORK COMPRESSION & REBOUND GOLD VALVE INSTALLATION
2009-2013 Yamaha R1

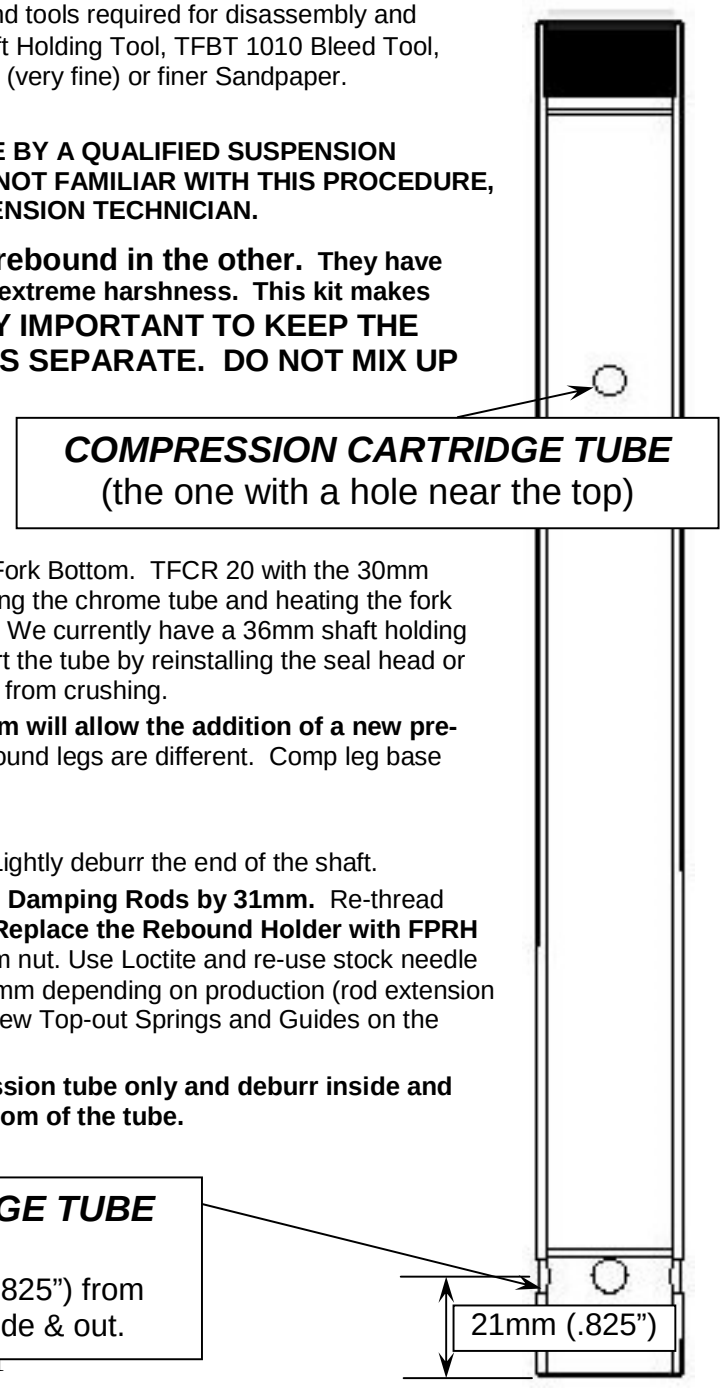
FK code

<IP FMGV S30303C.doc> P. Thede © 2.4.14 3 pgs

TOOLS REQUIRED: Service Manual, common hand tools required for disassembly and assembly, TFCH 04A Cartridge Holding Tool, TFSH 10 Shaft Holding Tool, TFBT 1010 Bleed Tool, TFSD 43 Seal Driver, Hi-Strength Loctite (included), 400 grit (very fine) or finer Sandpaper.

CAUTION: THIS PROCEDURE SHOULD ONLY BE DONE BY A QUALIFIED SUSPENSION TECHNICIAN. IT REQUIRES MACHINING. IF YOU ARE NOT FAMILIAR WITH THIS PROCEDURE, STOP! CONTACT RACE TECH OR A QUALIFIED SUSPENSION TECHNICIAN.

These forks have compression in one leg and rebound in the other. They have serious problems that cause inconsistent damping and extreme harshness. This kit makes major changes to cure these problems. IT IS VITALLY IMPORTANT TO KEEP THE COMPRESSION AND REBOUND COMPONENTS SEPARATE. DO NOT MIX UP THE FORK PARTS.



DISASSEMBLY – Both Legs

1 **Disassemble the forks** and remove the cartridges with TFCH 04A. Remove the cartridge tube from the Fork Bottom. TFCR 20 with the 30mm adapter might work. However this may require removing the chrome tube and heating the fork bottom, using a 34mm shaft holding tool and a press. We currently have a 36mm shaft holding tool that can be bushed down with shim stock. Support the tube by reinstalling the seal head or inserting a 30mm dowel into the ID to protect the tube from crushing.

2 **Removing the Cartridge Tube from the Fork Bottom will allow the addition of a new pre-assembled Base Valves**. The compression and rebound legs are different. Comp leg base valve is much stiffer. No bleed holes in any piston.

3 **Remove the damping rod from the cartridge.**

4 Remove the nut and disassemble the valving stack. Lightly deburr the end of the shaft.

5 **Remove the stock rebound holders. Shorten both Damping Rods by 31mm.** Re-thread M10x1.25 12mm long. Thread relief 2.5mm 8.5 OD. **Replace the Rebound Holder with FPRH 1012503 and Top-out Spring FRST 2138150**. No jam nut. Use Loctite and re-use stock needle and needle spring. Shorten Adjusting Rods by 31-32mm depending on production (rod extension 1.5mm with needle bottomed-out—shut). Install the new Top-out Springs and Guides on the Rebound Holders.

6 **Drill additional holes in the bottom of the compression tube only and deburr inside and out. Drill (4) 6mm (1/4") holes 21mm from the bottom of the tube.**

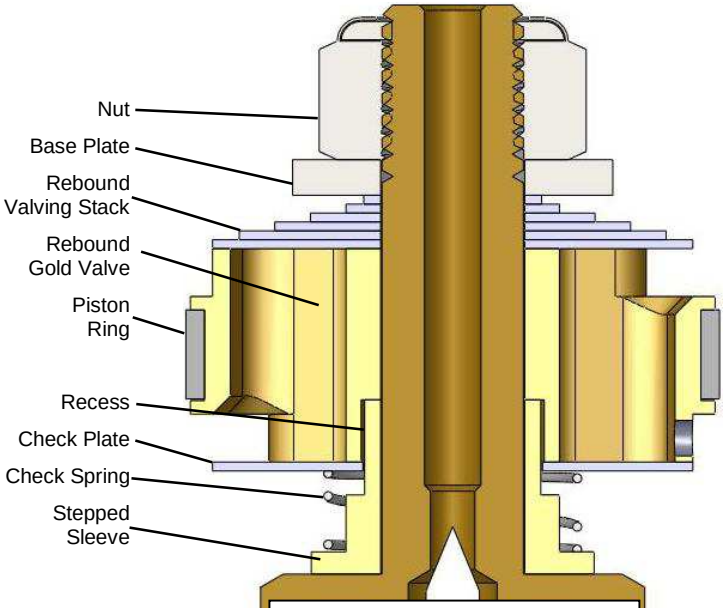
REBOUND LEG *(figure 1)*

7 **The Rebound Leg is the one with the hole near the bottom.** It looks like a standard cartridge. Install the Rebound Gold Valve on the Damping Rod.

8 **Assemble the Rebound Rod Valve on the Damping Rod**. Starting with the stock Stepped Sleeve, Check Spring, Check Plate, Rebound Gold Valve (the recess towards the check plate), **Rebound Valving Shim Stack (rH42)**, Base Plate and Nut. Use Loctite and torque the nut to 48 in-lbs (0.56 kgf-m).

Polish both damping rods with Scotch Brite or 400 grit (very fine) or finer sandpaper. This will drastically improve bushing life and reduce friction. The important part is the lower half of the rod.

9 **Install the Rebound Damping Rod into its Cartridge Tube** (1 hole on the bottom only). **NOTE: THE REBOUND LEG WILL MAKE A SMALL AMOUNT OF COMPRESSION DAMPING.**



REBOUND ROD VALVE
figure 1

Rebound Rod Valve** (on Damping Rod) (8mm ID)* ***SLOWER →

rH40	rH41	rH42	rH43	rH44	rH45
(4) .20x27	(5) .20x27	(6) .20x27	(7) .20x27	(8) .20x27	(9) .20x27
.20x24	.20x24	.20x24	.20x24	.20x24	.20x24
.20x22	.20x22	.20x22	.20x22	.20x22	.20x22
.20x20	.20x20	.20x20	.20x20	.20x20	.20x20
.20x18	.20x18	.20x18	.20x18	.20x18	.20x18
.20x16	.20x16	.20x16	.20x16	.20x16	.20x16
.20x14	.20x14	.20x14	.20x14	.20x14	.20x14
.20x12	.20x12	.20x12	.20x12	.20x12	.20x12

Shim Dimensions - (QUANTITY) THICKNESS x DIAMETER in mm *(for inches divide by 25.4)*

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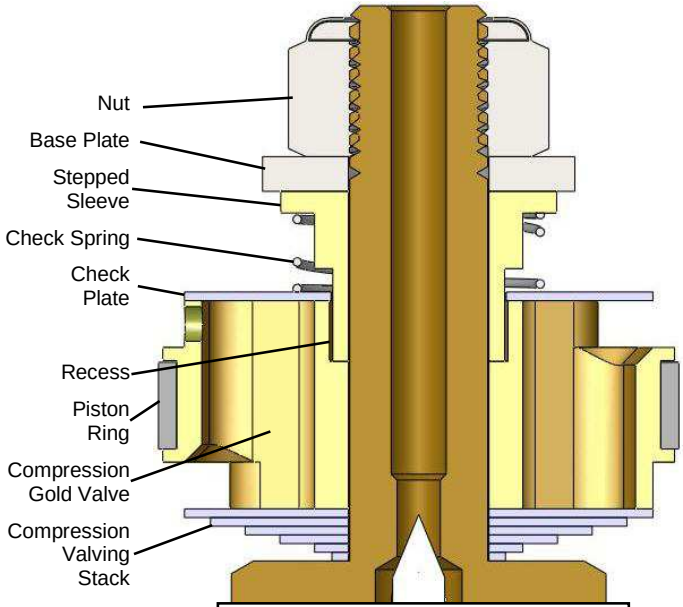
COMPRESSION LEG *(figure 2)*

10 **The Compression Cartridge is the one with a hole up at the top and no holes at the bottom (stock).** Drill four 6mm (1/4") Compression Holes, 21mm (.83") from the bottom. Deburr inside and out.

11 **Assemble the Compression Rod Valve on the Damping Rod.** The Piston and Valving will be reversed from the Rebound Leg (this is not a standard cartridge setup). Starting with the Base Plate, **Compression Valving Stack (cH53)**, Compression Gold Valve (it is the same as the Rebound Gold Valve but is reversed on the shaft), Check Plate, (the recess towards the check plate), Check Spring, stock Stepped Sleeve, and Nut. **NOTE: THE COMPRESSION LEG WILL NOT MAKE ANY REBOUND DAMPING.**

12 **Install the Compression Damping Rod into its modified Cartridge Tube** (1 holes at the top + 4 added holes on the bottom).



COMPRESSION ROD VALVE
figure 2

Compression Rod Valve** (on Damping Rod) (8mm ID)* ***STIFFER →

cH50	cH51	cH52	cH53	cH54	cH55	cH56
(1) .10x27	(1) .10x27	(1) .15x27	(2) .15x27	(3) .15x27	(4) .15x27	(5) .15x27
.10x24	.15x24	.15x24	.15x24	.15x24	.15x24	.15x24
.15x22	.15x22	.15x22	.15x22	.15x22	.15x22	.15x22
.15x20	.15x20	.15x20	.15x20	.15x20	.15x20	.15x20
.15x18	.15x18	.15x18	.15x18	.15x18	.15x18	.15x18
.15x16	.15x16	.15x16	.15x16	.15x16	.15x16	.15x16
.15x14	.15x14	.15x14	.15x14	.15x14	.15x14	.15x14
(4) .10x12	(4) .10x12	(4) .10x12	(4) .10x12	(4) .10x12	(4) .10x12	(4) .10x12

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ASSEMBLY – Both Legs

1. **Install the Base Valve Assembly in the Cartridges.** Use the Pre-Assembled Base Valve Assembly provided. They are different. The stiffer valving stack is used in the compression leg. There is no need to revalve the new Base Valve Assemblies.
2. **Reassemble the forks according to your manual. Use a small drop of Loctite on the cartridge tube threads.**
3. **Set the fork spring preload*. FRSP S3827 Series Springs fit without modification.***

   Follow the instructions in the Race Tech Fork Spring Kit.
4. **Install the fork fluid.** Pump the cartridge rod using the TFBT 1010 Bleed Tool to bleed the air out.

   Set the oil level using USF-05 Suspension Fluid (5 wt) with the fork and cartridge rod completely bottomed and the spring out.
5. **Install** the Washer, **Fork Spring**, Spacer, Preload Tube, Jam Nut, and Jam Nut Washer. Install the Adjusting Rod.
6. **Install the cap on the cartridge rod.** Use Loctite on the damping rod thread at the cap and torque it to manufacturers' specs. Set the Compression Adjuster to 14 clicks out from all the way in. Set the Rebound Adjuster to 8 clicks out.

FORK INSTALLATION

When the forks are reinstalled on the bike it is very important to ***align the fork tubes on the axle*** so they won't bind. First, tighten the axle all the way, and then pump the forks with the right-hand axle clamp loose. Finally, tighten the axle clamp.

BASE VALVE CHART

The Base Valves are pre-assembled and are different from each other. The Base Valve for the compression leg has much stiffer valving. A Valving Chart is provided for reference only; no assembly needed. **Make sure the flat surface on the Base Plate goes towards the valving stack.**

Base Valving Compression Leg 6mm ID	Base Valving Rebound Leg 6mm ID
(10) .15x28	.15x28
.15x24	.15x24
.15x21	.15x21
.15x20	.15x20
.15x17	.15x17
.15x14	.15x14
.15x13	.15x13
Base Plate	.15x12
	Base Plate

If you would like assistance please contact the Race Tech Technical Support 951.279.6655