

RACE TECH

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FORK GOLD VALVE INSTALLATION STREET / ROAD RACE 39mm BPF

FK code

<IP FMGV S3901C 43 BPF.doc> FMGV S3901C P Thede © 6.16.14 5 pgs

TOOLS REQUIRED: (In addition to those required for fork disassembly.) In-lb Torque Wrench that accurately measures 0 to 50 in-lbs (0.58 kgf-m), Hi-Strength Loctite (included), Metric Calipers, 0-25mm Metric Micrometer, TFCH 06 Seal Head Tool, TFCW 4549 Fork Cap Wrench.

NOTE: Most riders will require different fork springs. Please consult www.racetech.com or call Race Tech.

This kit makes 3 major changes in the design. First and foremost is the design of the valve itself. The Gold Valve improves the flow characteristics dramatically. Second, the travel is increased. This improves the bump absorption particularly under heavy braking. It also increases front end Trail thereby improving grip. Third, the stock bottom-out mechanism is short and abrupt. This kit makes the bottoming process more gradual and linear decreasing braking chatter and improving traction.

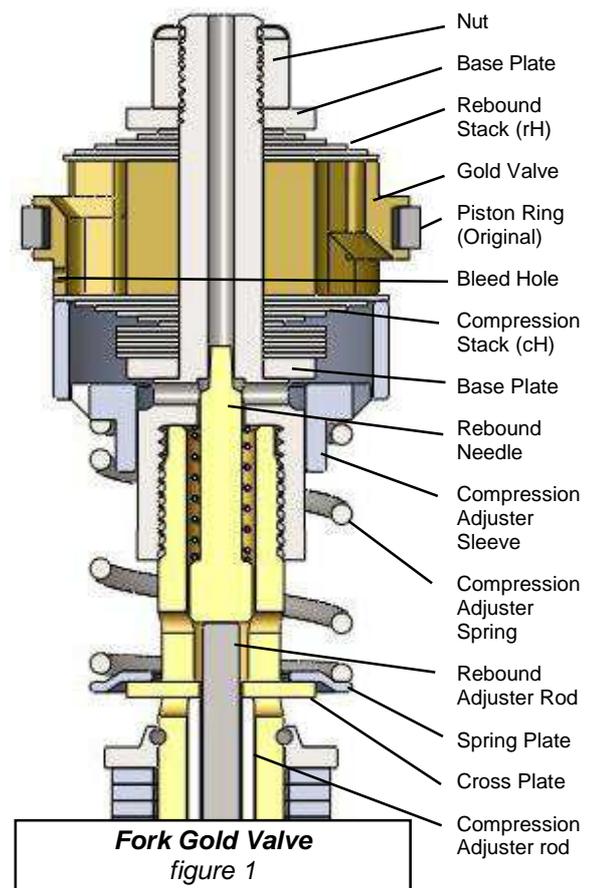
DISASSEMBLY

- 1 **CLEANLINESS IS CRITICALLY IMPORTANT.** Completely *disassemble and clean your front forks*. If you are unfamiliar with this process, **STOP!!!!** Do not proceed. Seek out a qualified suspension technician to complete the installation. Remove the Fork Cap using TFCW 4549 Fork Cap Wrench. Clamp the Fork Bottom in a Vise with Soft Jaws. Use TFCH 06 Seal Head Tool to unscrew the Seal Head from the Fork Tube. There is no need to detach the fork cap from the damping rod at this time.
- 2 **Remove the Nut** that retains the Valve from the end of the shaft. When disassembling the valve for the first time, **the peening on the thread above the nut must be filed off**. Lightly deburr the end of the thread.
- 3 Lay out the pieces in the order they come off the shaft. **Clean and inspect** all the original parts. Be careful to maintain the original order and orientation of the parts. (some of the original parts will be reused, do not discard.)

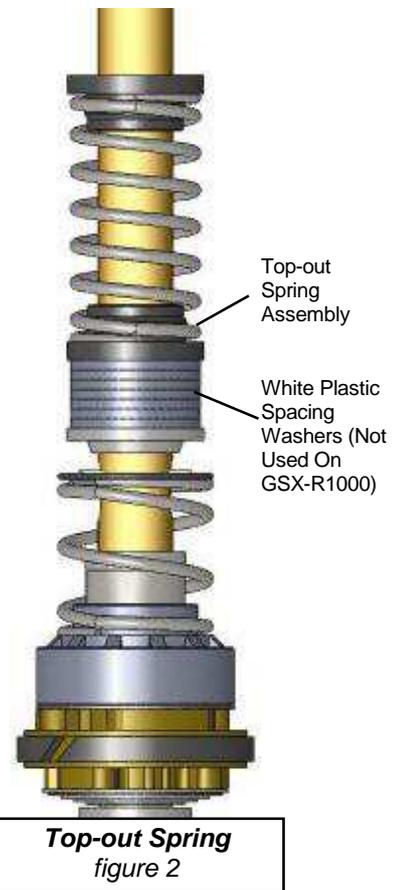
VALVING (figure 1)

This mod will dramatically improve fork action, traction, and control.

- 4 **To obtain custom valving settings for your particular application log on to www.racetech.com, go to Digital Valving Search, insert your Access Code (printed on the top of this page), input your personal specifications and print the custom setup information. If you do not have access to the web, contact our Technical Support Hotline 951.279.6655 for recommendations. Note: The Access Code is good for one limited-time use.**
- 5 This Custom Setup requires a **Bleed Hole** in the Gold Valve Piston. It is pre-drilled.
- 6 **Begin assembly (figure 1).** Place the original base plate (*thick washer*) on the shaft. **Build the Compression Valving Stack. Put the compression valving on the shaft** in the order listed, ending with the largest shim.



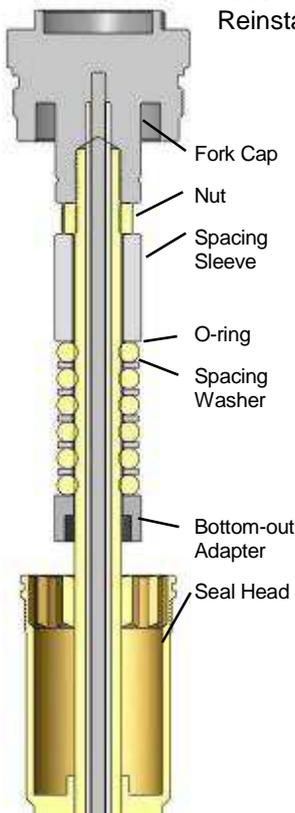
- 7 Check to see there are no burrs on the Gold Valve Piston and the piston faces are flat. If required, surface the piston on a piece of plate glass with 320 grit (very fine) sandpaper (the piston is surfaced from the factory but check it every time you disassemble the valving.) **Put the original piston ring on the Gold Valve. Place the Gold Valve on the shaft** with the piston face that uses the large diameter shim (6 ports) facing down against the Compression Stack.
- 8 **Build the Rebound Stack.** Install the Rebound Stack on the shaft with the largest diameter shim against the piston face. Install the Rebound Base Plate.
- 9 **THIS NEXT STEP IS CRITICAL!!!!** If the installation has been done properly this should automatically be correct. The total valving thickness must be set so the Nut does not run out of thread and has full thread contact. Please call if this is incorrect.
- 10 **Install the nut and tighten it. CAUTION!** The threads can be damaged without extreme care. You must use Loctite. It must be torqued with a torque wrench to 48 in-lbs (4 ft-lbs or 0.56 kgf-m), NO MORE! Do not take this step lightly.
- 11 **Inspect the assembled stack.** Hold the valving stack up to the light and look for proper assembly. If there are any problems, particularly if there is a gap between the piston face and the first shim, disassemble the stack and look for burrs and/or dirt in the valving. Reassemble and check again.



TOP-OUT SPRING REPLACEMENT (figure 2)

This mod will change the Top-out Spring Stiffness and lengthen the fork 6mm.

- 12 Loosen the Jam Nut and **remove the Fork Cap** from the Damping Rod. **Remove the Seal Head and the original Top-out Spring** from the Damping Rod.
- 13 Install 1.6 x 22mm **White Plastic Spacing Washers** if called for in the **DVS Setup Sheet**. Note—11-13 ZX-10 requires (7) Washers while 09-11 GSX-R1000 uses none. Next, slide on the new **Top-out Spring Assembly**. Reinstall the stock **Seal Head Assembly**.



Bottom-out Mod
figure 3

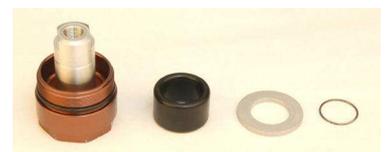
BOTTOM-OUT MODIFICATION (figure 3)

This mod will make the bottom-out more gradual.

- 14 **Install the Bottom-out Assembly as follows** - First install the **Bottom-out Adapter** with the recessed side down towards the Seal Head. Then add the first **Bottom-out O-ring** then one **White Plastic Spacing Washer**. Repeat with the rest of the (7) O-rings and (7) White Plastic Spacing Washers alternating O-rings and Washers as you go. Next slide on the **Spacing Sleeve**.

- 15 **Remove the stock Bottom-out Bumper Assembly on the Cap.** Remove the Retaining Circlip on the Fork Cap. Remove the Washer and stock Bottom-out Bumper.

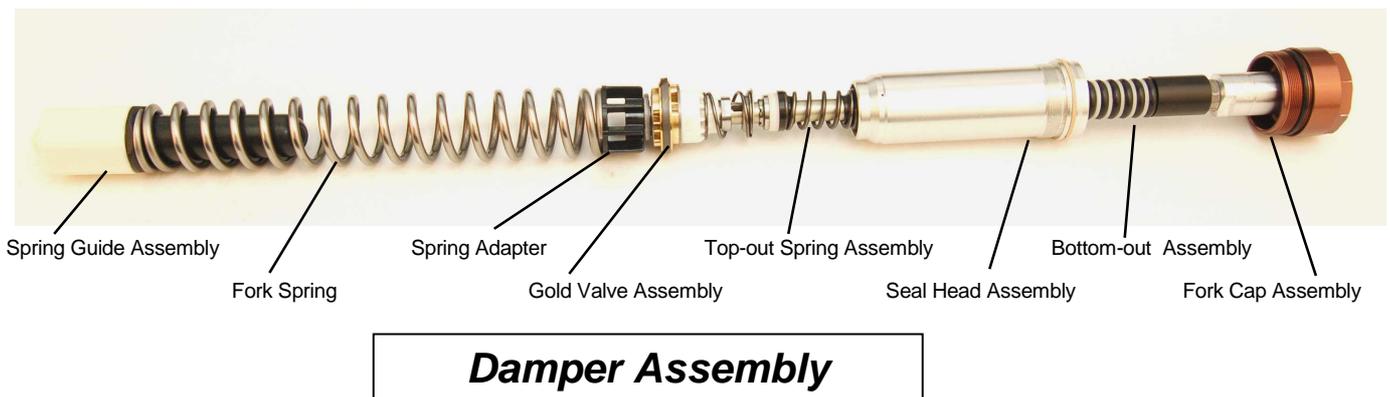
- 16 **Install the original Jam Nut** on the Damping Rod all the way. Insert the Compression and Rebound Adjusting Rods into the Damping Rod. Back out the Compression and Rebound Adjuster Screws all the way. Use Loctite on the thread. **Install the Fork Cap** on the Damping Rod all the way until it bottoms into the Cap. Tighten the Jam Nut and torque to manufacturer spec.



Stock Bottom-out

PRELOAD SETUP AND SPRING REPLACEMENT

- 17 Whether you are replacing the Fork Springs or not you will need to **setup the Spring Preload**. This fork has the Fork Springs and Preload Adjuster located on the bottom of the fork.
- First, back the Preload Adjuster out all the way, and then install the plastic Spring Guide Assembly into the Fork Tube. Install the Fork Spring then the plastic Spring Adapter. Next install the Damping Rod Assembly into the Fork but do not tighten the Seal Head.
 - The **Relaxed Preload** is the distance between the top of the Fork Tube and the mating lip on the Seal Head (just below the Seal Head Piston Ring). This is easier to measure in two parts. With the Outer Fork Tube all the way bottomed, measure from the top of the Outer Tube down to the top of the Inner Fork Tube (measure before installing the Damping Rod Assembly). Insert the Damping Rod Assembly into the Fork Tube. Make sure the Seal Head is resting on the Top-out Spring Assembly. Measure from the top of the Outer Fork Tube to the lip on the Seal Head. **Add these two measurements together for the total Relaxed Preload.**
 - The Relaxed Preload is different than the Actual (Installed) Preload** as the Top-out Spring gets compressed on installation making the fork "grow" in length. This growth decreases the Actual Preload. You can read more about this concept at www.racetech.com/html_files/preload.htm
 - To adjust the preload** the Spring Guide Assembly at the bottom of the fork can be disassembled and shortened by cutting the hex section then reassembling. Make sure it is cut squarely and deburred. This step is required on this model. It will be shortened approximately 10mm if you are using a Race Tech Spring but please do the calculation yourself.
 - The new Top-out Spring will compress about 5 to 7mm on assembly** depending on the main spring rate and preload. This means the fork will grow this same amount. This is the difference between the Relaxed and the Actual Preload. It is common to set 15mm Actual Preload at minimum adjustment. This would mean 20 to 22mm Relaxed Preload.



REASSEMBLY

- 18 **Reassemble the forks according to the procedure in your manual.** With the Inner and Outer Fork Tubes assembled—including Seals and Bushings, **install the Spring Guide Assembly, Spring, and Spring Adapter.** Before installing the Damper Assembly fill the Fork Tubes with oil to within 50mm (2") from the top; pump the outer fork tube up and down to fill the space between the inner and outer fork tubes. **Set the oil level** according to the DVS Setup Sheet with the fork tube bottomed still with the damper assembly out.
 - 19 **Install the Damper Assembly into the Fork Tube.** You may have to raise the outer fork tube slightly to keep the oil from spilling out. Use the TFCH 06 Cartridge Tool to tighten the Seal Head to manufacturer's spec. You will have to move the Bottom-out O-rings out of the way to insert the tool. The o-rings will set themselves with use.
 - 20 **Install the cap** and torque it to manufacturer's specs.
 - 21 **Adjust the compression and rebound adjusters** according to the DVS Setup Sheet.
- NOTE:** When the forks sit for any length of time a small amount of the oil will displace into the upper chamber above the Seal Head. You will feel a "dead spot" for the first couple of strokes then the forks will bleed themselves and this will go away.
- 22 When the forks are put on the bike it is very important to **align the fork tubes.** This is done by first tightening the axle all the way and then align the tubes by pumping the forks up and down with the right-hand axle clamp loose. This will line the tubes up so they won't bind. Finally, tighten the axle clamp.
 - 23 If you have **any questions** please call our Technical Support Hotline at 951.279.6655.

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TUNING NOTES

- Damping is sensitive to vertical wheel velocity, not position in the stroke. If your valving needs to be stiffer, move to the right on the chart. This will improve bottoming resistance by increasing damping overall, making it stiffer through the entire speed range. If the forks are too firm, go the opposite direction, to the left.
- The Compression Damping Adjuster controls the Adjuster Valve Spring Preload and affects the entire range.
- The Rebound Adjuster flows on both the Compression and Rebound stroke. It mostly affects Rebound Damping but will have a slight affect on Compression.
- Spring rate is dependent mostly on rider and bike weight. For racing applications we recommend a slightly stiffer rate. Consult www.racetech.com for recommendations. Spring rate, spring preload and compression damping all combine to affect dive, wallow, and bottoming.
- Oil level can drastically alter bottoming resistance and only affects the last part of the travel (*near bottoming*). If you like the fork action, but the forks bottom too easily, raise your oil level by 10mm (0.4").
- If the forks feel too soft all the way through, increase compression damping with the external adjuster. If that's not enough, change the compression stack internally.
- If you would like assistance, please contact the Race Tech Technical Support Hotline 951.279.6655.

BUILDING the VALVING STACK - STREET / ROAD RACE 39mm

Welcome to the wonderful world of Gold Valving. To obtain your personal Custom Suspension Settings:

1. Log on to www.racetech.com
2. Go to Digital Valving Search (DVS)
3. Input your Access Code (on top of page 1) when prompted
4. Input your personal specifications
5. Print your DVS Custom Suspension Setup Sheet

If you do not have access to the Internet, contact our Technical Support Hotline 951.279.6655 for recommendations. Note: The Access Code is good for one bike, limited-time use.

Once you have your valving settings, build your valving stacks.

EXAMPLE for Compression (repeat with rebound):

The Compression Valving Stack is cH33:

Starting from the Gold Valve piston face

Compression Stack – cH33

- (2) .10x34
- (1) .10x15
- (4) .10x13
- (2) .10x11
- (1) .10x17
- (2) .25x20

Visit www.racetech.com, go to Digital Valving Search with your Access Code (from the top of page 1) for your personal computer calculated valving setup!

OIL LEVEL, EXTERNAL ADJUSTERS, SPRING RATE, and PRELOAD are all listed on the Digital Valving Search on www.racetech.com.

NOTE: All measurements are metric (for inches divide by 25.4). The valving list starts at the piston face and goes towards the base plate. Valve specs are listed by (QUANTITY) THICKNESS x DIAMETER. A number in parentheses means quantity. If there is no number in parentheses the quantity is one. Example: (2).10x32 means quantity two, 10 hundredths of a millimeter thick by 32 millimeters in diameter.

FORK GOLD VALVE CHART - STREET / ROAD RACE 39mm

<F39S-1002> © P Thede

COMPRESSION VALVING

STIFFER →

cH29	cH30	cH31	cH32	cH33	cH34	cH35	cH36	cH37	cH38
(1).10x34	(1).10x34	(1).10x34	(2).10x34	(2).10x34	(2).10x34	(3).10x34	(4).10x34	(5).10x34	(6).10x34
(2).10x11	(1).10x13	(2).10x13	(2).10x13	.10x15	.10x17	.10x17	.10x17	.10x17	.10x17
(3).10x13	(2).10x11	(2).10x11	(2).10x11	(4).10x13	.10x15	.10x15	.10x15	.10x15	.10x15
.10x15	(2).10x13	(2).10x13	(2).10x13	(2).10x11	(4).10x13	(4).10x13	(4).10x13	(4).10x13	(4).10x13
.10x17	.10x15	.10x15	.10x15	.10x17	(2).10x11	(2).10x11	(2).10x11	(2).10x11	(2).10x11
(2).25x20	.10x17	.10x17	.10x17	(2).25x20	(2).25x20	(2).25x20	(2).25x20	(2).25x20	(2).25x20
	(2).25x20	(2).25x20	(2).25x20						

REBOUND VALVING

SLOWER →

	rH41	rH42	rH43	rH44	rH45	rH46	rH47*		
	(1).10x32	(2).10x32	(4).10x32	(6).10x32	(8).10x32	(10).10x32	(10).10x32		
	.15x27	.15x27	.15x27	.15x27	.15x27	.15x27	(2).15x27		
	.15x24	.15x24	.15x24	.15x24	.15x24	.15x24	.15x24		
	.15x20	.15x20	.15x20	.15x20	.15x20	.15x20	.15x20		
	.10x11	.10x11	.10x11	.10x11	.10x11	.10x11	.10x11		
	(8).25x20	(7).25x20	(6).25x20	(6).25x20	(5).25x20	(4).25x20	(3).25x20		

Shim Dimensions - (QUANTITY) THICKNESS x DIAMETER in mm (for inches divide by 25.4) *Shims not included in kit – please call.