

# RACE TECH

## FORK GOLD VALVE INSTALLATION – G2-R

DIRT 28x6mm WP & Showa

FK code

<IP FMGV 2820Gw.doc> FMGV 2820G P Thede © 12.5.15

**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), 10mm wrench, Fine flat file, Hi-Strength Loctite (included), Metric caliper and micrometer.

**NOTE:** Many riders require different fork springs. Please consult [www.racetech.com](http://www.racetech.com) or call Race Tech.

### DISASSEMBLY

**D1 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.**

**NOTE:** Showa Twin Chamber Forks are slightly different than standard cartridges. The Damping Rod Clip Tool TFHP 01 easily holds the damping rod when taking off the bottom bolt. When removing the damping rod from the cartridge carefully inspect the base of the thread on the end of the damping rod for sharp edges. **These edges can tear the shaft seal. File as necessary.** As a further precaution pack the thread with heavy grease before you slide the damping rod out.

**D2 Remove the nut. On SHOWA forks only** when disassembling the compression valve for the first time, **the threads above the nut must be filed off flat.** Lightly deburr the end of the threads.

**D3 Disassemble the valving stack.** 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. (You may need some of the original valving for spacing purposes, do not discard.)

### VALVING SELECTION

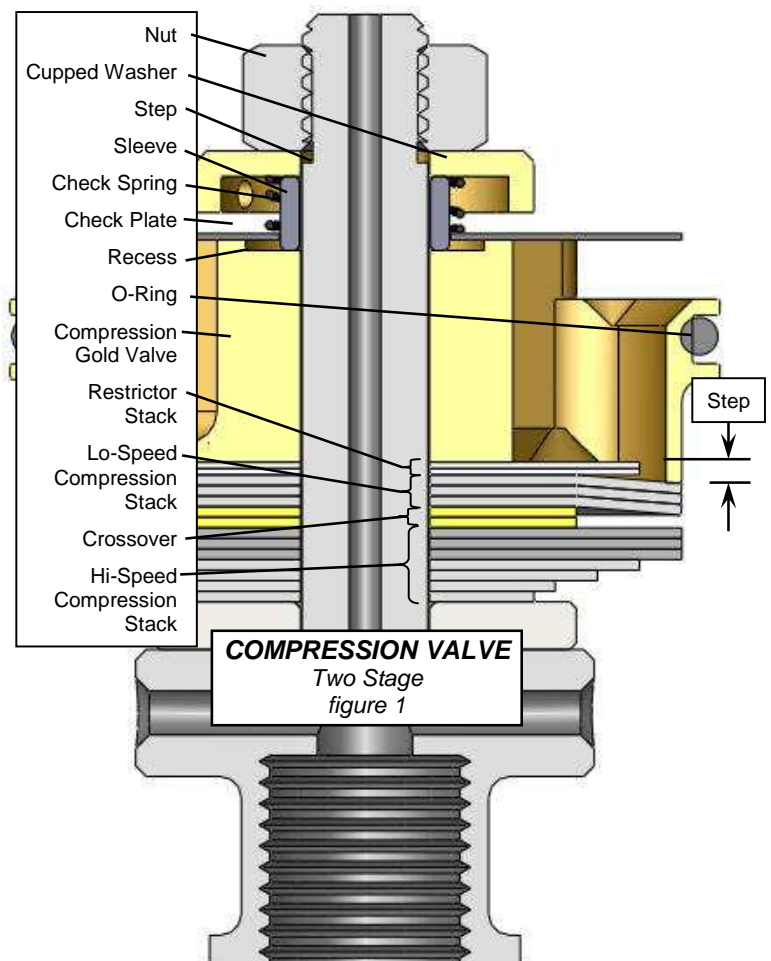
**G2-R The Theory** - There are many ways to setup the valving with G2-Rs. They are made to be preloaded (digressive) or restricted (progressive). This adds a little complexity but makes them extremely versatile.

The piston face has a 0.5mm Step on it (**figure 1**). This means if you put on a standard valving stack the shims will be bent 0.5mm without opening. We call this a 0.5mm preloaded stack. The best preloads are typically between zero and 0.10mm. The Restrictor Valving Stack thickness adjusts the preload.

**'Step' – 'Restrictor Stack Height' = 'Preload'**

ex.  $0.50 - 0.40 = 0.10$  preload

The Restrictor Valving serves a second function. Increasing the diameter restricts the flow area of the ports. This increases the damping at high velocities like landing off a jump but can make it harsher on square-edge bumps.



V1 To obtain custom valving settings go to **Digital Valving Search (DVS)**, input your **Access Code**, input your personal specifications and print the custom setup. 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 time use.** Once you have selected your valving **begin assembling the valve.** (figure 1) Place the original Base Plate (*thick washer*) on the shaft of the compression valve.

V1a **Single Stage Stacks** - Put the valving on the shaft in the order listed, starting with the smallest diameter shim of the **Hi-Speed Stack** and ending with the largest diameter closest to the Gold Valve. **You will not use a Crossover** but you will use a **Restrictor Stack** installed closest to the Gold Valve itself.

V1b **Two Stage Stacks** - the total valving stack is a combination of a **Restrictor Stack**, a **Lo-Speed Stack**, **Crossover Stack**, and a **Hi-Speed Stack**. Put the Hi-Speed Stack on the shaft in the order listed, starting with its smallest diameter shim. Then install the Crossover, the Lo-Speed Stack and the Restrictor Stack.

V2 **Place the Gold Valve on the shaft** with the side of the Piston with the large diameter recess facing down. Make sure the O-ring is on the Gold Valve.

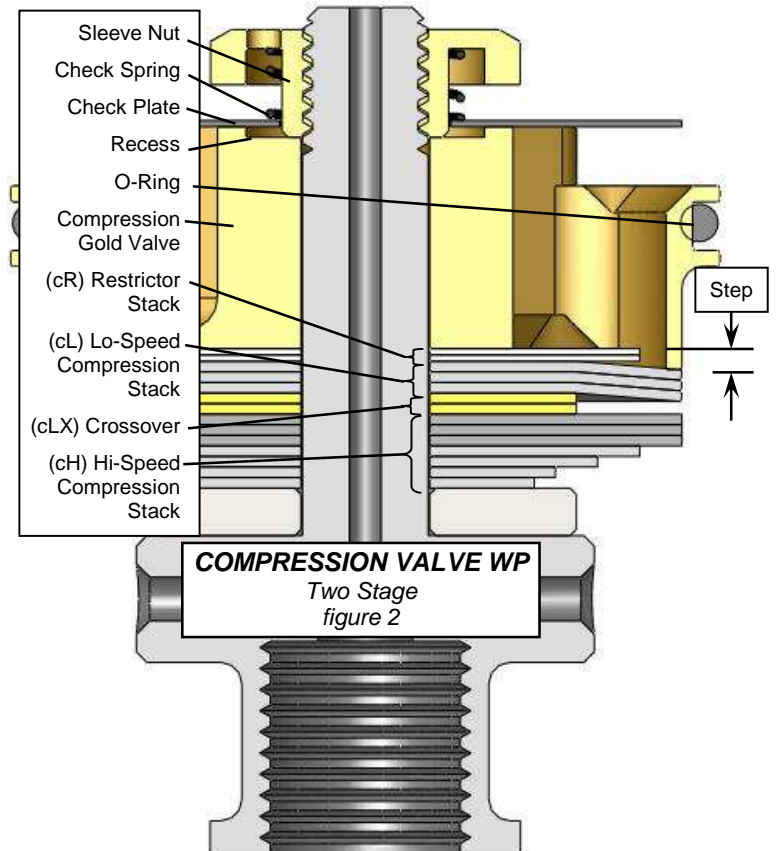
V3 Showa - **Place the Sleeve, the Check Plate (large ID washer) and the Check Spring on the Shaft.** Next install the Cupped Washer. Be sure the Check Plate is free to move on the Sleeve before you tighten the Nut. WP – put the Check Spring and Check Plate on the Sleeve Nut.

V4 **Check to see the total valve stack thickness is correct.** You must be very sure that the nut does not run out of thread onto the straight part of the shaft (on Showa the Cupped Washer must Straddle the Step). If it runs out, the nut will not tighten on the valving. This will cause incorrect operation or the nut will come off. This is a critical part of the installation. To get the proper total valve stack thickness you may need to place some of the original shims on the shaft just after the base plate. **NOTE: Any shims added must be larger in diameter than the last shim in the stack. Be sure the nut is fully engaging the thread!**

V5 **Make sure the Check Plate (large ID washer) is free** and can move up and down against the Spring.

V6 **CAUTION! The thread can be damaged without extreme care. To install the nut you must use Loctite (provided). The 6mm nut (10mm wrench) must be torqued with a torque wrench to 30 in-lbs (2.5 ft-lbs or 0.35 kgf-m), **NO MORE!** Do not take this step lightly.**

V7 **Inspect your work.** For two stage stacks, hold the compression stack up to the light and look for the gap at the crossover between the lo-speed and hi-speed stack. This gap should be visible, if it isn't, disassemble the stack and look for burrs to surface and/or dirt in the valving. Reassemble and check again.



## ASSEMBLY

A1 **Install the damping rod into the cartridge.** Reassemble the forks according to the procedure in your manual. For Twin Chamber Forks the damping rod shaft seal must be in perfect condition. For Showa's, pack the thread with heavy grease before you insert it into the cartridge.

A2 **Fill and bleed the cartridge.** Showa - Before installing the compression assembly which includes the reservoir piston and cap make sure the oil level is 130mm (5.1") down from the top of the cartridge with the damping rod fully extended. When you install the compression assembly it should require quite a bit of force when you push it in with your hand. Once you have tightened the cap compress the damping rod all the way. This will push out any extra oil from inside the cartridge and should be poured out of the holes in the top of the reservoir. When the damping rod is released it should extend all the way by itself. This indicates that there is enough oil inside the cartridge. Torque the cap to manufacturers specs. Consult owner's manual for specs.

- A3 Use Loctite (provided) on the damping rod thread at the Rebound Adjuster Bolt and **torque it to manufacturers specs** (typically 16 to 21 ft-lbs [21.7 – 28.5 NM). Consult owner’s manual for specs.
- A4 **Adjust the compression and rebound adjusters, spring preload, and oil level** according to the Digital Valving Search Setup Sheet.
- A5 **Install the forks on the bike.** 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, then the tubes are aligned 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.
- A6 **If you have any questions** call our Technical Support Hotline at 951.279.6655. Feel free to experiment and please call if you need us. Have fun!

## ***BUILDING the VALVING STACK - DIRT 28mm G2-R***

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

1. **Go to Digital Valving Search (DVS)**
2. **Input your Access Code (on top of page 1) when prompted**
3. **Input your personal specifications**
4. **Print your Digital Valving Search (DVS) 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.

**Single Stage** - made up of a Restrictor Stack and a Hi-Speed Stack.

**Two Stage** - made up of a Restrictor Stack, a Lo-Speed Stack, a Crossover, and a Hi-Speed Stack.

### ***EXAMPLE Single Stage:***

Starting from the Gold Valve piston face:

#### **Restrictor Valving**

- (2) 0.15x17
- (1) 0.10x12

#### **Lo-Speed Stack**

- (4) .15x24

#### **Crossover – none**

#### **Hi-Speed Stack**

- (1) .10x24
- (1) .10x22
- (1) .10x20
- (1) .10x18
- (1) .10x16
- (1) .10x15
- (1) .10x14
- (1) .10x13
- (1) .10x12

### ***EXAMPLE Two Stage:***

Starting from the Gold Valve piston face:

#### **Restrictor Valving**

- (2) 0.15x17
- (1) 0.10x12

#### **Lo-Speed Stack**

- (4) .15x24

#### **Crossover**

- (2) 0.10x16

#### **Hi-Speed Stack**

- (1) .10x24
- (1) .10x22
- (1) .10x20
- (1) .10x18
- (1) .10x16
- (1) .10x15
- (1) .10x14
- (1) .10x13
- (1) .10x12

**OIL LEVEL, EXTERNAL ADJUSTERS, SPRING RATE, and PRELOAD are all listed on the DVS on [racetech.com](http://racetech.com).**

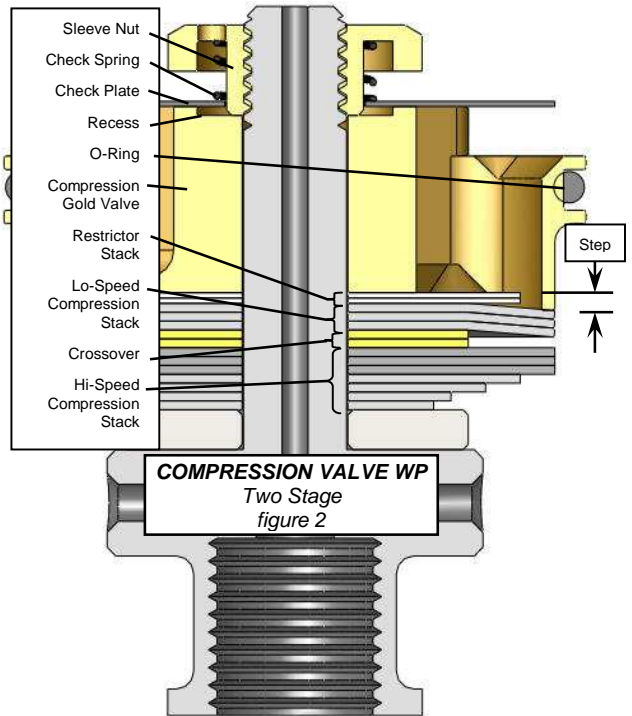
NOTE: All measurements are metric (*for inches divide by 25.4*). The valving list starts at the piston face and goes towards the base plate. Valve specs are listed by (QUANTITY) THICKNESS x DIAMETER. A number in parentheses means quantity. If there is no number in parenthesis the quantity is one. Example: (2).15x30 means quantity two, 15 hundredths of a millimeter thick by 30 millimeters in diameter.

# FORK GOLD VALVE G2-R COMPRESSION CHART - DIRT 28x6mm

<FK GV Chart FCR282402-140127.doc> ©R Brown, P Thede 3.12.14

RESTRICTOR VALVING		STIFFER (Diameter) →			
<b>0.00 Preload</b>	<b>cR00.12</b>	<b>cR00.14</b>	<b>cR00.17</b>	<b>cR00.20</b>	
<b>0.00</b>	(2).15x12	(2).15x14	(2).15x17	(2).15x20	
	(2).10x12	(2).10x12	(2).10x12	(2).10x12	
<b>0.05 Preload</b>	<b>cR05.12</b>	<b>cR05.14</b>	<b>cR05.17</b>	<b>cR05.20</b>	
<b>0.05</b>	(3).15x12	(3).15x14	(3).15x17	(3).15x20	
<b>0.10 Preload</b>	<b>cR10.12</b>	<b>cR10.14</b>	<b>cR10.17</b>	<b>cR10.20</b>	
<b>0.10</b>	(2).15x12	(2).15x14	(2).15x17	(2).15x20	
	(1).10x12	(1).10x12	(1).10x12	(1).10x12	

STIFFER ↓



**The Restrictor Valving Stack serves 2 purposes.** First, its diameter can restrict the port size. Second, its thickness can create preload.

The piston face has a 0.50mm step on it. This means if you put on a standard valving stack the shims will be bent 0.50mm without opening. We call this a 0.50mm preloaded stack. The best preloads are typically between zero and 0.10mm. The Restrictor Valving Stack thickness adjusts the preload.

**'Step' – 'Restrictor Stack Height' = 'Preload'**

Example: 0.50 – 0.40 = 0.10mm preload

## TUNING NOTES

- **Damping depends on vertical wheel velocity, not position in the stroke.**
- **If the forks feel too soft all the way through,** increase compression damping with the external adjuster. If that is not enough, change the compression stack internally.
- **The compression damping adjuster** controls the lowest speed damping and affects the entire range. NOTE: The closer to maximum damping (full clockwise) the more effect one click makes. In other words going from 3 to 2 out has a lot more effect than going from 14 to 13. Adjusters are numbered from all the way clockwise (the slowest or firmest setting).
- **Spring rate affects ride height, dive and bottoming.** Typical spring preload should be 3–5 mm (0.1–0.2").
- **Oil level can drastically alter bottoming resistance and only affects the last part of the travel** (near bottoming). If you like the action but the forks bottom too easily, raise your oil level by 10cc.