

RACE TECH

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FK code

FORK GOLD VALVE INSTALLATION – G2-R DIRT 34 & 35mm (2LS)

<IP FMGV 3420G.doc> 2 part LS FMGV 3420G, 3520G P Thede © 7.6.11

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), 10mm wrench, Fine flat file, Loctite 271 (High Strength), Metric calipers, Metric micrometer 0-25mm.

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

DISASSEMBLY

- 1 **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: 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 easily tear the shaft seal. File as necessary.** As a further precaution pack the thread with heavy grease before you slide the damping rod out.

- 2 **Remove the nut.** When disassembling the compression valve for the first time, **the thread above the nut must be filed off flat.** Lightly deburr the end of the thread.

- 3 **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

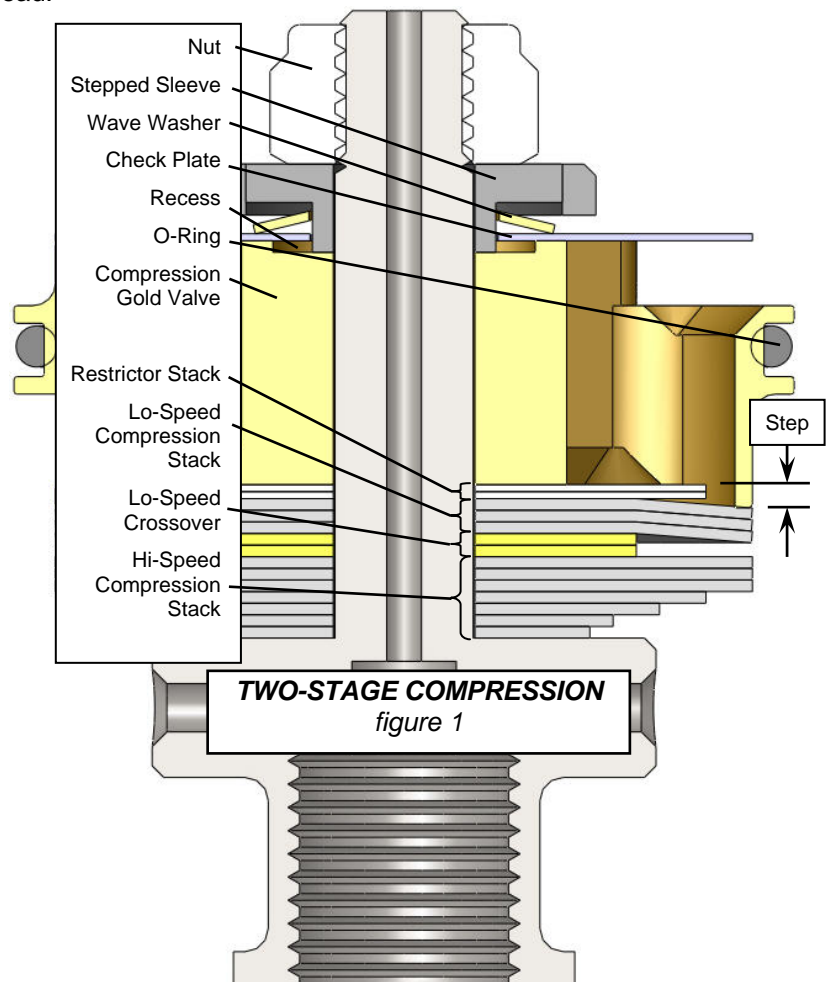
G2-R The Theory - There are many ways to setup the valving with G2-Rs. They are made to be preloaded (digressive) or restricted (progressive). This adds a little complexity but makes them extremely versatile.

The piston face has a 1mm step on it (**distance X**). This means if you put on a standard valving stack the shims will be bent 1mm without opening. We call this a 1mm preloaded stack. The best preloads are typically between zero and 0.2mm. The Restrictor Valving Stack thickness adjusts the preload.

Step – Restrictor Stack Height = Preload

or $X - Y = Z$

ex. $1.0 - 0.8 = 0.2$ preload



The Restrictor Valving serves a second function. If we increase the diameter, it 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.

There are two types of valving for Gold Valves, **Single Stage and Two Stage**. **Single Stage** is used for Motocross and Supercross. **Two Stage** is used for Enduro, Hare Scrambles, Desert, Trail and plusher Motocross. Single Stage feels firmer and the front end rides higher than Two Stage. You will be asked to choose Single Stage or Two Stage.

- 4 **To obtain custom valving settings log on to www.racetech.com, go to Digital Valving Search (DVS), input your Access Code (printed on the top of the first 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. Once you have selected your valving begin assembling the valve.** (figure 1) Place the original Base Plate(s) (*thick washer*) on the shaft of the compression valve.
- 5a **Single Stage Stacks** (figure 2) - 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 shim. Next the Low Speed Stack is installed. You will not use a Crossover Shim but you will use a **Restrictor Valving Stack** installed next to the Gold Valve itself.
- 5b **Two Stage Stacks** (figure 1) - the total valving stack is made up of a combination of a **Restrictor Valving Stack**, a **Lo-Speed Stack**, **Lo-Speed Crossover**, and a **Hi-Speed Stack**. Put the valving on the shaft in the order listed, starting with the smallest diameter shim of the Hi-Speed Stack. Then the Lo-Speed Crossover Shim(s) and the Lo-Speed Stack. Then the Restrictor Valving Stack. (figure 1)
- 6 **Place the Gold Valve on the shaft** with the side of the piston with the large circle (large diameter recess) facing down. Make sure the o-ring is on the Gold Valve.
- 7 **Place the sleeve, the check valve plate (*large ID washer*) and the check spring on the shaft.** Next install the cupped washer. Be sure the check valve plate is free to move on the sleeve washer before you tighten the nut.
- 8 **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. If it does, the nut will not tighten down 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!**
- 9 **Make sure the check valve plate (*large ID washer*) is free** and can move up and down against the spring.
- 10 **CAUTION! The thread can be damaged without extreme care. To install the nut you must use Loctite 271. 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.**
- 11 **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.

Need Tech Support? Call 951.279.6655

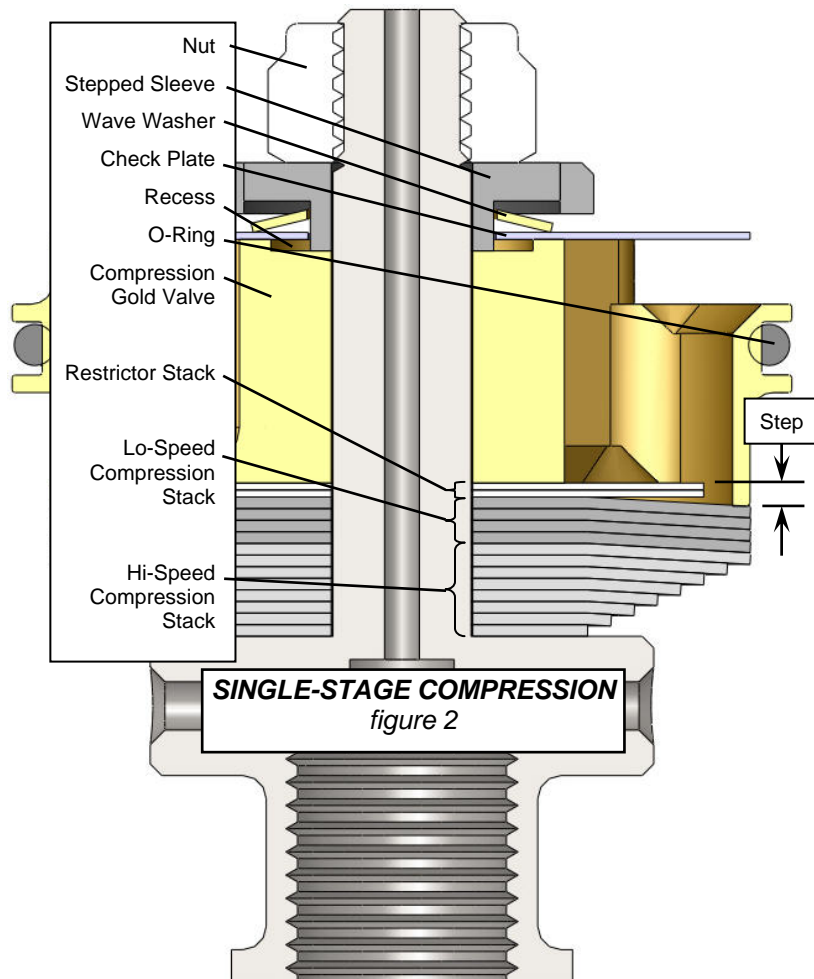
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the latest developments**

MID-VALVE and REBOUND

Rebound Gold Valve Kits are highly recommended. You can expect significant improvement in both plushness and traction with these kits. This is a great time to install them. In cases where plushness is the major concern (trail riding) the Mid-Valve can be converted to a Check Valve. The instructions to do this are in the How-To section of www.racetech.com.

REASSEMBLY

- 13 **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. Pack the thread with heavy grease before you insert it into the cartridge.
- 14 **Fill and bleed the cartridge.** 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.
- 15 Use Loctite 271 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.
- 16 **Adjust the compression and rebound adjusters, spring preload, and oil level** according to the Digital Valving Search Setup Sheet.
- 17 **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.



BUILDING the VALVING STACK - DIRT 34/35mm G2-R

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

1. Log on to our website at www.racetech.com
2. Go to Digital Valving Search (DVS)
3. Input your Access Code when prompted (your Code is printed on top of page 1 of these instructions)
4. Input your personal specifications
5. Print your Digital Valving Search (DVS) Setup

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 Stacks - the total valving stack is made up of a Restrictor Stack, a Lo-Speed Stack and a Hi-Speed Stack – **NO Crossover.**

Two Stage Stacks - the total valving stack is made up of a Restrictor Stack, a Lo-Speed Stack, a Crossover Shim, and a Hi-Speed Stack.

Example Single Stage (figure 2):

The Total Valving Stack is:

Restrictor Valving	cR20.24
Lo-Speed	cL1514
Crossover	cLX – none
Hi-Speed	cH47

Starting from the Gold Valve piston face:

Restrictor Valving – cR20.24

- (4) 0.15x24
- (2) 0.10x17

Lo-Speed Stack – cL1514

- (14) .15x30

Hi-Speed Stack – cH47

- (1) .10x30
- (1) .10x28
- (1) .10x26
- (2) .10x24
- (2) .10x22
- (2) .10x20
- (2) .10x18

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

Example Two Stage (figure 1):

The Total Valving Stack is:

Restrictor Valving	cR10.22
Lo-Speed	cL1510
Crossover	cLX2022
Hi-Speed	cH47

Starting from the Gold Valve piston face:

Restrictor Valving – cR10.22

- (6) 0.15x22

Lo-Speed Stack – cL1510

- (10) .15x30

Lo-Speed Crossover – cLX2022

- (2) .10x22

Hi-Speed Stack – cH47

- (1) .10x30
- (1) .10x28
- (1) .10x26
- (2) .10x24
- (2) .10x22
- (2) .10x20
- (2) .10x18

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 parenthesis the quantity is one. Example: (2).15x30 means quantity two, 15 hundredths of a millimeter thick by 30 millimeters in diameter.

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).
- If your valving needs to be stiffer, move to the right on the valving chart. Moving to the right on the Lo-Speed Valving Chart will stiffen up low speed damping. This will improve bottoming resistance with minimum increase in harshness. Moving to the right on the Hi-Speed Valving Chart will increase damping in the higher speed range. If the forks are too firm, go the opposite direction, to the left.
- Spring rate affects ride height, dive and bottoming. Typical spring preload should be 5–10mm (0.2–0.4"). Use 15mm (0.6") for heavy bikes like XR's and bikes with desert tanks (250 lb [114 kg] or greater).
- 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 10 cc.

Terms

- Lo-Speed Stack** - The stack of shims closest to the Gold Valve piston.
- Crossover Shim** - The small diameter shim between the lo-speed and hi-speed stack.
- Hi-Speed Stack** - The stack of shims farthest away from the piston.
- Clamping Shim** - The smallest diameter shim closest to the base plate.

FORK GOLD VALVE G2-R COMPRESSION CHART - DIRT 34/35x6mm

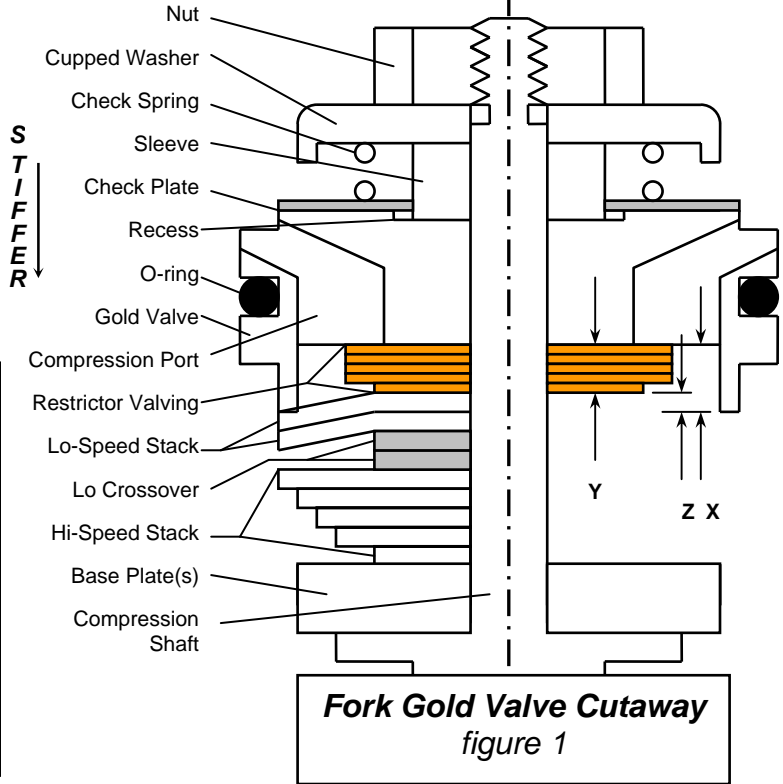
Chart 3406GD-051216 © P Thede

RESTRICTOR VALVING		STIFFER (Diameter) →			
0.00 Preload	cR00.17	cR00.22	cR00.24	cR00.26	
Z = 0.00	(6).15x17	(6).15x22	(6).15x24	(6).15x26	
	(1).10x17	(1).10x17	(1).10x17	(1).10x17	
0.10 Preload	cR10.17	cR10.22	cR10.24	cR10.26	
Z = 0.10	(6).15x17	(6).15x22	(6).15x24	(6).15x26	
0.20 Preload	cR20.17	cR20.22	cR20.24	cR20.26	
Z = 0.20	(4).15x17	(4).15x22	(4).15x24	(4).15x26	
	(2).10x17	(2).10x17	(2).10x17	(2).10x17	

The Restrictor Valving Stack serves 2 purposes. First, because of its diameter, it can restrict the port size. Second, because of its thickness, it can cause preload on the Low Speed Stack. The greater "Z" is the more preload there is.

The piston face has a 1mm step on it (**distance X**). This means if you put on a standard valving stack the shims will be bent 1mm without opening. We call this a 1mm preloaded stack. The best preloads are typically between zero and 0.2mm. The Restrictor Valving Stack thickness (**distance Y**) adjusts the preload (**distance Z**).

'Step' - 'Restrictor Stack Height' = 'Preload'
 or $X - Y = Z$
 ex. $1.0 - 0.8 = 0.2$ mm preload



Fork Gold Valve Cutaway
figure 1

Chart FC34-110622 © P Thede

LO-SPEED COMPRESSION		STIFFER →							
cL1501	cL1502	cL1503	cL1504	cL1505	cL1506	cL1507	cL1508	cL1509*	cL1510*
(1).15x30	(2).15x30	(3).15x30	(4).15x30	(5).15x30	(6).15x30	(7).15x30	(8).15x30	(9).15x30	(10).15x30
cL1511*	cL1512*	cL1513*	cL1514*	cL1515*	cL1516*	cL1517*	cL1518*	cL1519*	cL1520*
(11).15x30	(12).15x30	(13).15x30	(14).15x30	(15).15x30	(16).15x30	(17).15x30	(18).15x30	(19).15x30	(20).15x30

LO-SPEED COMPRESSION CROSSOVER		STIFFER →			
cLX1018*	cLX1020*	cLX1022	cLX1024	cLX1026	cLX1028
.10x18	.10x20	.10x22	.10x24	.10x26	.10x28
cLX2018*	cLX2020*	cLX2022*	cLX2024*	cLX2026*	cLX2028*
(2).10x18	(2).10x20	(2).10x22	(2).10x24	(2).10x26	(2).10x28
cLX3018*	cLX3020*	cLX3022*	cLX3024*	cLX3026*	cLX3028*
(3).10x18	(3).10x20	(3).10x22	(3).10x24	(3).10x26	(3).10x28

HI-SPEED COMPRESSION		STIFFER →							
ch41	ch42	ch43	ch44	ch45	ch46	ch47	ch48	ch49	ch50
.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30
.10x28	.10x28	.10x28	(2).10x28	.10x28	(2).10x28	.10x28	(2).10x28	(2).10x28	(2).10x28
.10x26	.10x26	.10x26	(2).10x26	.10x26	(2).10x26	.10x26	(2).10x26	(2).10x26	(2).10x26
.10x24	.10x24	(2).10x24	(2).10x24	.10x24	(2).10x24	(2).10x24	(2).10x24	(2).10x24	.15x24
.10x22	.10x22	(2).10x22	(2).10x22	(2).10x22	(2).10x22	(2).10x22	(2).10x22	(2).10x22	.15x22
.10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	.15x20
.10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18		
.10x16	(2).10x16	(2).10x16	(2).10x16	(2).10x16	(2).10x16				
.10x14	.10x14	.10x14	.10x14						
ch51	ch52	ch53	ch54	ch55*	ch56*	ch57*	ch58*		
.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30		
.15x28	.15x28	.15x28	(2).15x28	(2).15x28	(3).15x28	(2).15x28	(3).15x28		
.15x26	.15x26	(2).15x26	(2).15x26	(3).15x26	(3).15x26	(2).15x26	(3).15x26		
.15x24	.15x24	(2).15x24	(2).15x24	(3).15x24	(3).15x24	(3).15x24	(3).15x24		
.15x22	.15x22	.15x22	.15x22	.15x22	.15x22				
.15x20									

* SHIMS NOT PROVIDED IN STANDARD KIT (please call) SHIM SIZING: (QUANTITY) THICKNESS x DIAMETER in mm (inches divide by 25.4)