

RACE TECH

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FORK COMPRESSION AND REBOUND

FK code

GOLD VALVE INSTALLATION - DIRT 34C/28R (2LS) Single Cartridge/1 Spring

<IP FMGV 3421C.doc> 2 part LS FMGV 3421C P Thede © 7.5.11

7 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.

COMPRESSION

- 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 open cartridges. The Damping Rod Clip Tool p/n TFHP 01 easily holds the damping rod when taking off the bottom bolt. When removing the damping rod from the cartridge carefully inspect 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.

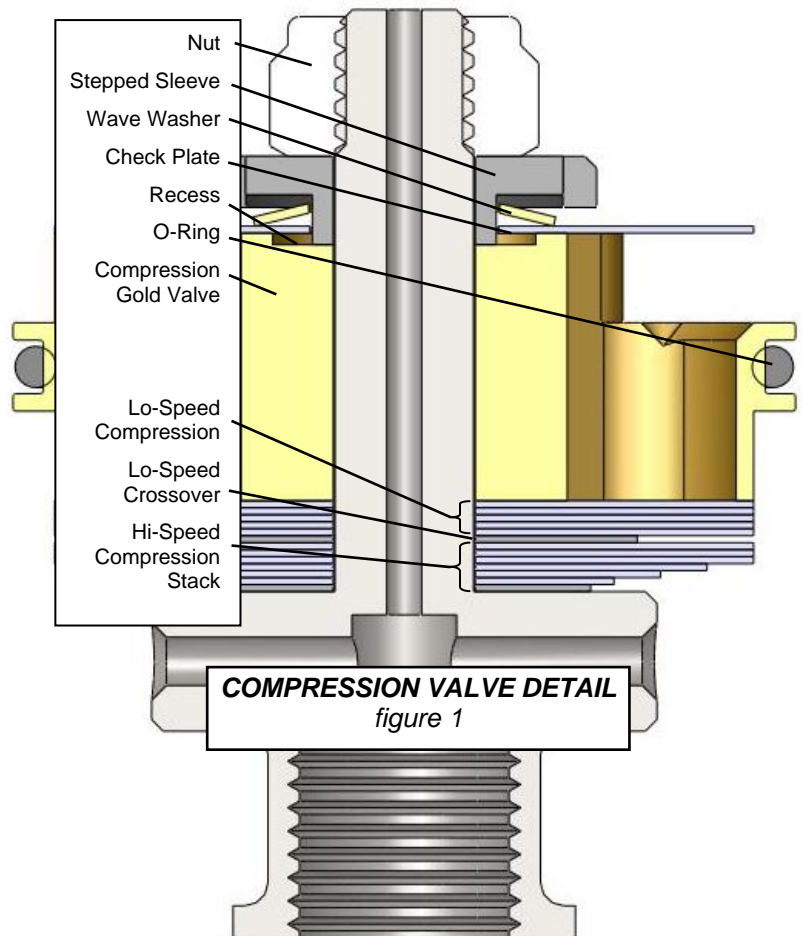
- 3 **Disassemble the valving stack.** Lay out the pieces in the order they come off the shaft. Clean and inspect all the original parts. Be careful to maintain the original order and orientation of the parts. (You may need some of the original valving for spacing purposes, do not discard.)

COMPRESSION VALVING

- 4 **To obtain custom valving settings visit www.racetech.com, go to Digital Valving Search (DVS), 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.**

There are two types of valving for Gold Valves, **Single Stage and Two Stage.** **Two Stage Valving** is used for softer Motocross as well as Enduro, Hare Scrambles, Desert, and Trail. **Single Stage** is used for Motocross and Supercross applications. The feel is firmer and the front end rides higher than Two Stage. You will be asked to choose Single Stage or Two Stage during the DVS process.

- 5 Once you have selected your valving **begin assembling the valve. (refer to figure 1)**



- 5a **Single Stage Stacks** - A Single Stage Stack is a two-part stack made up of a **combination of a Lo-Speed Stack and a Hi-Speed Stack with NO Crossover**. 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 Stack gets placed on top of the Hi-Speed Stack. **You will not use a Crossover**.
- 5b **Two Stage Stacks (shown in figure 1)** - For Two Stage Stacks the total valving stack is made up of a **combination of a Lo-Speed Stack, a 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 gets placed on top of the Hi-Speed Stack, then the Lo-Speed Stack ends up closest to the Gold Valve.
- 6 **Place the Gold Valve on the shaft** with the recess on the piston facing up. Make sure the o-ring is on the Gold Valve.
- 7 **Place the check valve plate (large ID washer) and the spring on the shaft**. Next install the sleeve 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. WARNING: 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 wave washer 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 cross-over between the lo-speed and hi-speed stack (*the small shim near the top of the 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.

BUILDING the COMPRESSION VALVING STACK - DIRT 3421

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 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 for a limited-time.

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

Single Stage Stacks - A Single Stage Stack is a made up of a combination of a Lo-Speed Stack and a Hi-Speed Stack. You will not use a Lo-Speed Crossover.

Two Stage Stacks - A Two Stage Stack is made up of a combination of a Lo-Speed Stack, Lo-Speed Crossover and a Hi-Speed Stack.

Single Stage COMPRESSION EXAMPLE:

The Total Compression Valving Stack is:

cL1514 and cH17 only (no Crossover):

Starting from the Gold Valve piston face

Lo-Speed Stack – cL1514

(14) .15x30

Hi-Speed Stack – cH17

- (1) .15x28
- (1) .15x26
- (1) .15x24
- (1) .15x22
- (1) .15x20
- (1) .15x18

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!

Two Stage COMPRESSION

EXAMPLE:

The Total Compression Valving Stack is:

cL1510, cLX1020 and cH18:

Starting from the Gold Valve piston face

Lo-Speed Stack – cL1510

(10) .15x30

Lo-Speed Crossover – cLX1020

(1) .10x20

Hi-Speed Stack – cH18

- (1) .15x28
- (1) .15x26
- (2) .15x24
- (2) .15x22
- (2) .15x20
- (2) .15x18

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

FORK COMPRESSION GOLD VALVE CHART - DIRT 3421

Chart FC3421-110610 © 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
cL1521*	cL1522*	cL1523*	cL1524*	cL1525*	cL1526*	cL1527*	cL1528*	cL1529*	cL1530*
(21).15x30	(22).15x30	(23).15x30	(24).15x30	(25).15x30	(26).15x30	(27).15x30	(28).15x30	(29).15x30	(30).15x30

LO-SPEED COMPRESSION CROSSOVER

STIFFER →

cLX1018*	cLX1020*	cLX1022	cLX1024	cLX1026	cLX1028
.10x18	.10x20	.10x22	.10x24	.10x26	.10x28

HI-SPEED COMPRESSION

STIFFER →

cH11*	cH12*	cH13*	cH14*	cH15	cH16	cH17	cH18	cH19	cH20
.10x30	.10x30	.10x30	(2).10x30	(2).10x30	(2).10x30	.15x30	.15x30	(2).15x30	.15x30
.10x28	.10x28	.10x28	(2).10x28	(2).10x28	(2).10x28	.15x28	.15x28	(2).15x28	.15x28
.10x26	.10x26	.10x26	(2).10x26	(2).10x26	(2).10x26	.15x26	.15x26	(2).15x26	.15x26
.10x24	.10x24	(2).10x24	(2).10x24	(2).10x24	(2).10x24	.15x24	(2).15x24	(2).15x24	.15x24
.10x22	.10x22	(2).10x22	(2).10x22	(2).10x22	(2).10x22	.15x22	(2).15x22	(2).15x22	.15x22
.10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	(2).10x20	.15x20	(2).15x20	(2).15x20	.15x20
.10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18	(2).10x18	.15x18	(2).15x18	(2).15x18	
.10x16	(2).10x16	(2).10x16	(2).10x16	(2).10x16					
.10x14	.10x14	.10x14	.10x14						
cH21	cH22	cH23	cH24	cH25*	cH26*				
.15x30	(2).15x30	(2).15x30	(2).15x30	(3).15x30	(4).15x30				
.15x28	(2).15x28	(2).15x28	(2).15x28	(3).15x28	(4).15x28				
.15x26	(2).15x26	(2).15x26	(2).15x26	(3).15x26	(4).15x26				
(2).15x24	(2).15x24	(2).15x24	(2).15x24	(2).15x24	(2).15x24				
(2).15x22	(2).15x22	(2).15x22							
(2).15x20	(2).15x20								

* SHIMS NOT PROVIDED IN STANDARD KIT (please call)

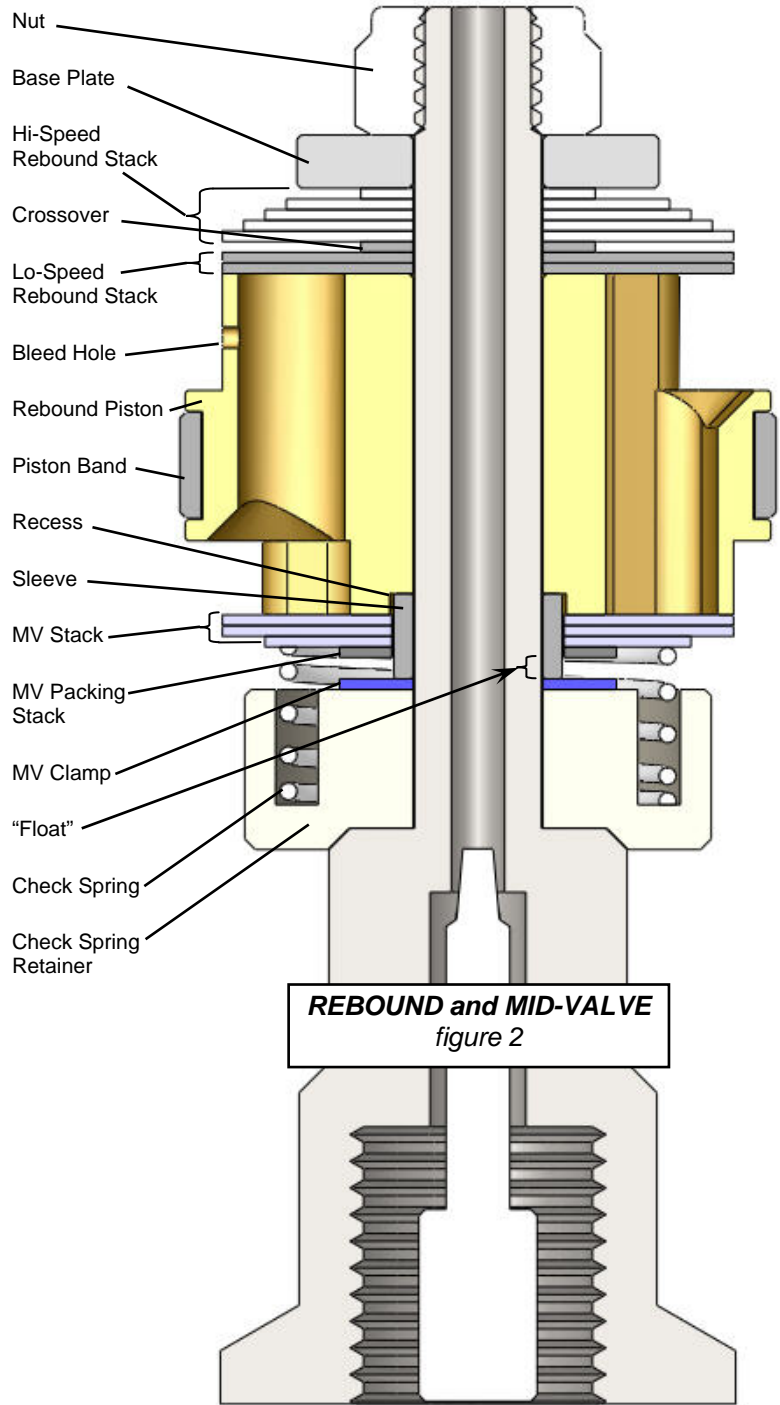
SHIM SIZING: (QUANTITY) THICKNESS x DIAMETER in mm (inches divide by 25.4)

REBOUND

- 12 **Remove the rebound rod from the cartridge.** When the damping rod is removed from the cartridge extreme care must be taken so the thread does not cut the shaft seal. Carefully deburr both ends of the thread and pack the thread with grease.
- 13 **Once the rod is removed, lightly file the peening off the end of the shaft that holds on the nut.** Remove the nut and **disassemble the valving stack.** Lightly deburr the end of the thread.

MID-VALVE & REBOUND VALVING

- 14 Select the Rebound and Mid-Valve Valving according to the DVS. Begin **assembling the Rebound Gold Valve.** Start with the Stock Check Spring Retainer and Check Spring, MV Clamp, MV Packing Stack and Mid-Valve Stack. There are two critical components of the Mid-Valve; the stiffness of the Mid-Valve Stack itself and the "Float". The Float is controlled by a combination of the thickness of the MV Stack and the MV Packing Stack.
- 15 Install the Rebound Gold Valve with the recess toward the Mid-Valve Stack.
- 16 Select the Rebound Valving. Install the Lo-Speed Rebound Stack, Crossover (if required) and Hi-Speed Rebound Stack, Base Plate and Nut. Use Loctite and torque the nut to 30 in-lbs (.35 kgf-m).



BUILDING the MID-VALVE

- DIRT 2824

MID-VALVE EXAMPLE:

The Total Mid-Valve Stack is MV35, MVP110 and MVC14.

Starting from the recessed Gold Valve piston face:

Mid-Valve Stack (8mm id) – MV35 – .75mm thick

- (2).15x24x8
- (1).15x22
- (1).15x20
- (1).15x18

MV Packing Stack (8mm id) – MVP45 - .45mm thick

- (1).15x15x8
- (3).10x15

Sleeve 6 id x 8 od – 2.55mm long (stock)

Recess Depth 1.00mm

MV Clamp (6mm id) – MVC14

- (1).10x14x6
- (3).10x15x6

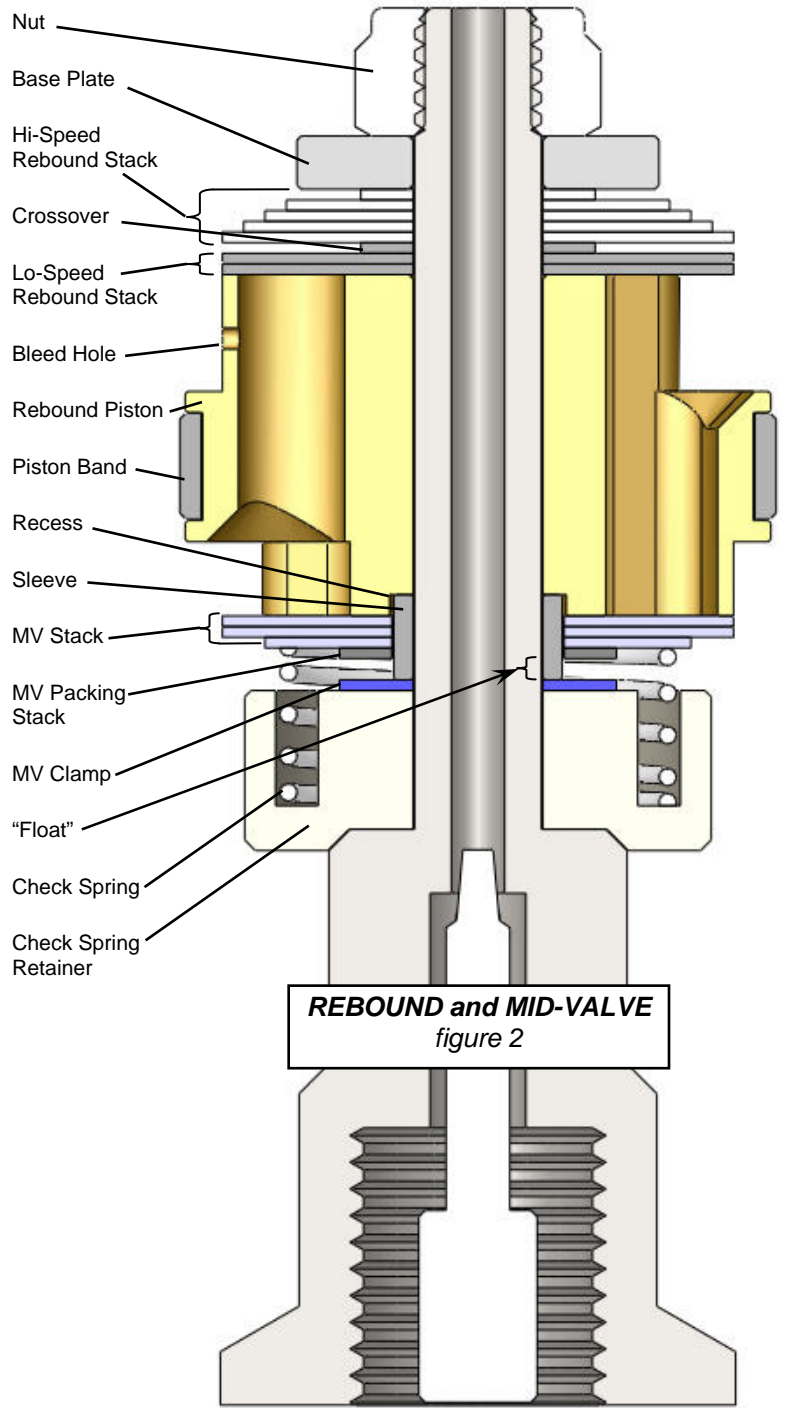
Float = Total Depth – Total Stack Thickness

For this example:

Sleeve Length (stock)	2.55
Recess (std Gold Valve)	— 1.00
Total Depth	= 1.55

MV Stack	.75
MVP Packing	+ .45
Total Stack Thickness	= 1.20

Total Depth	1.55
Total Stack Thickness	— 1.20
Float	= .35



MID-VALVE CHART - DIRT 2824

MID-VALVE STACK (MV) (8mm id)

STIFFER →

8mm ID	MV32	MV33	MV34	MV35	MV36	MV37
THICKNESS	.40mm	.50mm	.60mm	.75mm	.90mm	1.05mm
	(1) .10x24	(2) .10x24	(1) .15x24	(2) .15x24	(3) .15x24	(4) .15x24
	.10x22	.10x22	.15x22	.15x22	.15x22	.15x22
	.10x20	.10x20	.15x20	.15x20	.15x20	.15x20
	.10x18	.10x18	.15x18	.15x18	.15x18	.15x18

MID-VALVE PACKING STACK (MVP) (8mm id)

STIFFER (LESS FLOAT) →

MVP10	MVP15	MVP20	MVP25	MVP30	MVP35	MVP40	MVP45	MVP50	MVP55	MVP60
THICKNESS	.15mm	.20mm	.25mm	.30mm	.35mm	.40mm	.45mm	.50mm	.55mm	.60mm
	(1) .10x15	(1) .15x15	(2) .10x15	(1) .15x15	(3) .10x15	(1) .15x15	(4) .10x15	(1) .15x15	(5) .10x15	(1) .15x15
			(1) .10x15		(2) .10x15		(3) .10x15		(4) .10x15	(6) .10x15

MID-VALVE CLAMP (MVC) (6mm id)

STIFFER →

MVC11	MVC12	MVC13	MVC14	MVC15
(1) .10x11	(1) .10x12	(1) .10x13	(1) .10x14	(1) .10x15
(3) .10x15	(3) .10x15	(3) .10x15	(3) .10x15	(3) .10x15

BUILDING the REBOUND STACK - DIRT 2824

Single Stage REBOUND EXAMPLE:

Lo-Speed	rL1004
Crossover	n/a
Hi-Speed	rH16

Starting from the **flat** Rebound Gold Valve piston face:

Lo-Speed Rebound Stack – rL1004

(4).10x24

Hi-Speed Rebound Stack – rH16

(1).10x22

(1).10x20

(2).10x18

(2).10x16

(1).10x14

Two Stage REBOUND EXAMPLE:

Lo-Speed	rL1006
Crossover	rLX1016
Hi-Speed	rH14

Starting from the **flat** Rebound Gold Valve piston face:

Lo-Speed Rebound Stack – rL1006

(6).10x24

Lo-Speed Crossover – rLX1016

(1).10x16

Hi-Speed Rebound Stack – rH14

(1).10x22

(1).10x20

(1).10x18

(1).10x16

(1).10x14

(1).10x13

FORK REBOUND GOLD VALVE CHART - DIRT 2824

Chart FR2824-110610 © P Thede

LO-SPEED REBOUND

STIFFER →

rL1001	rL1002	rL1003	rL1004	rL1005	rL1006	rL1007	rL1008	rL1009	rL1010
(1).10x24	(2).10x24	(3).10x24	(4).10x24	(5).10x24	(6).10x24	(7).10x24	(8).10x24	(9).10x24	(10).10x24
rL1011	rL1012	rL1013*	rL1014*	rL1015*	rL1016*	rL1017*	rL1018*	rL1019*	rL1020*
(11).10x24	(12).10x24	(13).10x24	(14).10x24	(15).10x24	(16).10x24	(17).10x24	(18).10x24	(19).10x24	(20).10x24

LO-SPEED REBOUND CROSSOVER

STIFFER →

rLX1010*	rLX1011*	rLX1012*	rLX1013	rLX1014	rLX1015	rLX1016	rLX1017*	rLX1018*
.10x10	.10x11	.10x12	.10x13	.10x14	.10x15	.10x16	.10x17	.10x18

HI-SPEED REBOUND

STIFFER →

rH10*	rH11*	rH12*	rH13*	rH14*	rH15	rH16	rH17	rH18	rH19
.10x22	.10x22	.10x22	.10x22	.10x22	.10x22	.10x22	(2).10x22	.10x22	.10x22
.10x18	.10x20	.10x20	.10x20	.10x20	.10x20	.10x20	(2).10x20	.10x20	.10x20
.10x14	.10x18	.10x18	.10x18	.10x18	.10x18	.10x18	(2).10x18	.10x18	(2).10x18
.10x12	.10x16	.10x16	.10x16	.10x16	.10x16	(2).10x16	(2).10x16	.10x16	(2).10x16
.10x10	.10x14	.10x14	.10x14	.10x14	.10x14	.10x14	.10x14	.10x15	.10x15
	.10x12	.10x12	.10x12	.10x13					
	.10x10	.10x11							
rH20	rH21	rH22	rH23	rH24	rH25*	rH26*			
(2).10x22	(2).10x22	.15x22	(2).10x22	.15x22	.15x22	(2).15x22			
(2).10x20	(2).10x20	.15x20	(2).10x20	.15x20	(2).15x20	(2).15x20			
(2).10x18	.15x18	.15x18	.15x18	.15x18	(2).15x18	(2).15x18			
(2).10x16	.15x16	.15x16	.15x16	.15x16	.15x16	.15x16			
.10x15	.10x15	.10x15							

* SHIMS NOT PROVIDED IN STANDARD KIT (please call)

SHIM SIZING: (QUANTITY) THICKNESS x DIAMETER in mm (inches divide by 25.4)

FORK REASSEMBLY

- 17 **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 protected. Pack the thread with heavy grease before you insert it into the cartridge.
- 18 **Fill and bleed the cartridge.** Before installing the compression assembly which includes the reservoir piston and cap make sure the oil level is high enough (100mm (4") 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.
- 19 **Reassemble the forks.** Install the Cartridge Assembly and temporarily screw in the fork cap. Invert the fork. Compress the fork so the Damping Rod extends through the bottom of the fork.
- 20 Use Loctite 271 on the damping rod thread at the Rebound Adjuster. **The Showa "D" Shaped Rod requires special attention.** Slide the "D" shaped Rebound Adjusting Rod on the Adjuster Bolt into the Damping Rod making sure it goes in all the way and registers on the Needle inside. When you screw on the Adjuster Bolt, hold the Adjusting Screw in one place with a screwdriver. This will keep the "D" Shaped Rod from rounding out.
- 21 **Torque the jam nut to manufacturers specs** (typically 16 to 21 ft-lbs [21.7 – 28.5 NM]). Consult shop manual for specs. Tighten the Adjuster Bolt into the Fork Bottom.
- 22 Unscrew the Fork Cap and add the proper oil volume to the outer chamber (consult the DVS). NOTE: The left and right legs have different oil levels. **Tighten the fork cap.**
- 23 **Adjust the compression and rebound adjusters, spring preload, and oil level** according to the DVS Setup Sheet.
- 24 **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.
- 25 **If you have any questions** please call our Technical Support Hotline at 951.279.6655. Feel free to experiment and please call if you need us. Have fun!

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 Low 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 High Speed Valving Chart will increase damping overall, making it stiffer through the entire 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 3–10mm (0.1–0.4"). Use 15mm (0.6") for heavy bikes like XR's and bikes with desert tanks (300 lbs [136kg] 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 10mm (0.4").

Terms

Low Speed Stack - The stack of shims closest to the Gold Valve piston (including the crossover shim).

Crossover Shim - The small diameter shim between the low speed stack and the high speed stack.

High Speed Stack - The stack of shims farthest away from the piston (including the clamping shim).

Clamping Shim - The shim that goes closest to the base plate. (The most critical shim.)

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