1501 Pomona Rd, Corona, CA 92880 • 951.279.6655 • fax 951.279.7171 • www.racetech.com

SK code

SHOCK GOLD VALVE INSTALLATION - CBR 600/900 46mm (38/34)

<IP SMGV S4602.doc> **SMGV S4602** P Thede © 4.22.10 5 pgs

TOOLS REQUIRED: Metric Micrometer, Calipers or a Metric Ruler, Torque Wrench, High Pressure Nitrogen (regulated) or dry air, High Pressure Gauge, Bench Grinder, Numbered Drill Set, Drill Motor, Metric Thread Pitch Gage, Seal Head Tool (TSSS 01), Valve Core Removal Tool, Safety Glasses, Sag Master (TSSM 01)

PARTS REQUIRED: Shock Fluid - Race Tech Ultra Slick US-2 is preferred, Loctite 271 (Red – High Strength).

NOTE: Many riders will require a new spring rate. Consult www.racetech.com or call Race Tech.

CAUTION: IF YOU ARE UNFAMILIAR WITH REBUILDING AND REVALVING THIS SHOCK ABSORBER, STOP!!! DO NOT PROCEED; SEEK OUT A QUALIFIED SUSPENSION TECHNICIAN.

DISASSEMBLY

1 ***Remove the shock*** from the bike and clean it thoroughly. Check and record the compression and rebound adjustment settings. Back both adjustments out all the way. Measure and record the Set Length (installed length) of the spring. Remove the spring.

2 **Follow standard rebuild procedures. Use safety glasses.** The standard reservoir does not have a means of charging the shock with nitrogen. The reservoir cap provided in the kit solves this problem and allows this shock to be modified with a Gold Valve to perform with the best in the world. **The nitrogen must be removed carefully.**

Begin disassembly by clamping the shock reservoir in a vise. Remove the nitrogen by drilling a 3mm (1/8") hole in the steel reservoir end cap. **CAUTION: Wear safety glasses, as when the drill breaks through, the high-pressure nitrogen will be released blowing the chips out as well.** Remove the reservoir cap by first depressing it about 10mm (7/16") to expose the circlip. Remove the circlip, then the cap.

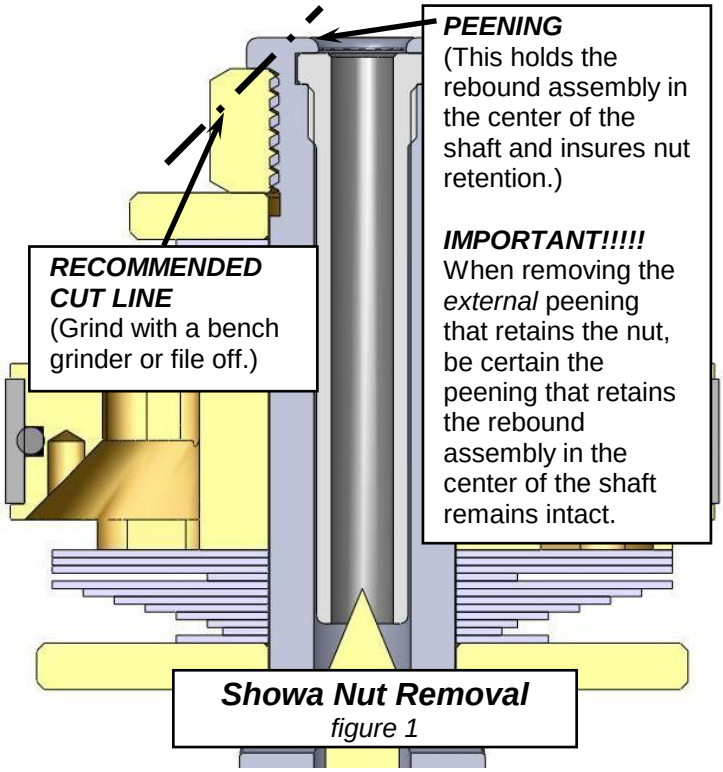
3 ***Disassemble the reservoir.*** The bladder is reversed from conventional designs (the inside contains the fluid). This requires a special procedure. Remove the reservoir hose from the reservoir, noting its orientation. This will allow you to depress the hose-end reservoir cap, exposing the circlip and allowing you to remove the reservoir body (sleeve). Once this is removed you can take the bladder off.

4 Clamp the shock body in the vise by the eyelet with the shaft end up. ***Remove the end cap*** from the shock body. It is pressed-on and must be tapped off with a **sharp** chisel. Tap it off evenly.

5 Once removed, the seal head assembly must be depressed. Use Race Tech's Seal Head Tool (TSSS 01). This will expose the circlip. ***Remove the circlip*** with a small screwdriver.

6 Next ***remove the shaft assembly*** from the body by gently tapping upward on the shaft eyelet with a plastic mallet. Pour out the old fluid and dispose of properly. Clean the body with solvent and set it aside to dry.

7 ***CAUTION: THIS NEXT STEP IS CRITICAL AND SHOULD ONLY BE DONE BY A QUALIFIED SUSPENSION TECHNICIAN.*** Remove the nut. You must first grind or file away some of the peening on the end of the shaft. This peening is there to insure that the nut does not come off during use. It also serves a second function; it holds the rebound adjustment assembly into the center of the shaft. (figure 1)



Showa Nut Removal
figure 1

WARNING!!! You must use extreme caution when removing this peening. You must not remove the peening that holds the rebound adjustment in. If you do, it will come apart during use and could possibly lock up the shock. One method that works is to grind the nut and the very end of the shaft, in the shape of a cone, leaving enough of the hex shape to grip it with a wrench. You must leave enough of a lip on the Inner Diameter to hold the rebound adjustment in. Once you have the nut off, slightly chamfer the end of the shaft and check to be sure the threads are in good shape.

8 ***Disassemble the valving stack,*** lay it out in the exact order and orientation that it comes off the shaft. Clean all the parts including the inside of the shock shaft where the rebound mechanism is. Blow it out using compressed air, being sure to wear safety glasses.

9 ***Clean and inspect all the parts*** including the seal, the shaft, shaft bushing, o-rings and the bottom-out bumper. If the bottom-out bumper is cracked or worn, replace it. NOTE: Parts are available from Race Tech. Install the new Dust Seal onto the seal head assembly. Grease the seal and reassemble the shaft up to the base plate.

RIDE HEIGHT ADJUSTMENT

10 Ride height can be adjusted internally by installing Ride Height Spacing Washers on the shaft below the Compression Base Plate (figure 2). Each Spacing Washer is 0.75mm (0.030") thick. Each Washer will raise the rear of the bike by approximately 2.5mm. You can stack up a total of five washers for a maximum increase in ride height of 12.5mm (0.5"). Most street riders will prefer the standard ride height. **Surface and clean the base plate and install it on the shaft.**

VALVING SELECTION

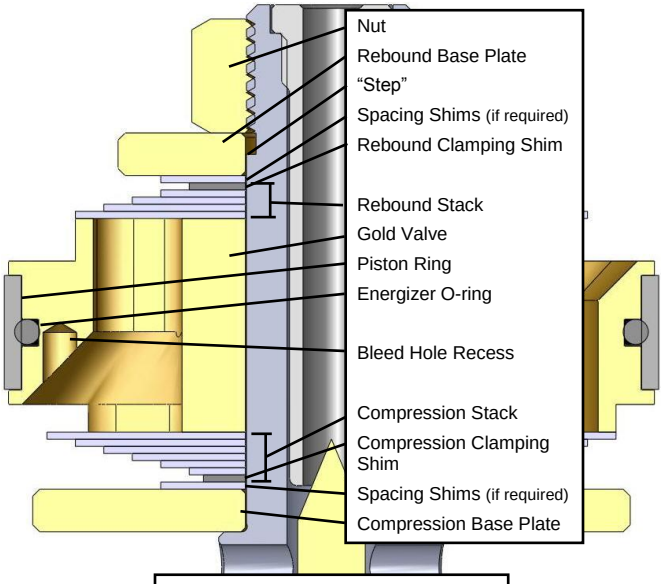
11 **To obtain custom valving settings for your particular application log on to <u>www.racetech.com</u>, go to Digital Valving Search, insert your Access Code (printed on the top of the first page), input your personal specifications and print the custom setup information. If you do not have access to the web contact our Technical Support Hotline 951.279.6655 for recommendations. Note: The Access Code is good for one limited-time use.**

12 ***Build the Compression Valving Stack.*** Install the Compression Stack on the shaft starting with the smallest diameter shim against the Base Plate and ending with the largest diameter shim against the Gold Valve piston face.

13 ***If required, drill the recommended bleed hole in the piston.*** Some bikes do not require a bleed hole. **IF YOUR APPLICATION DOES NOT REQUIRE A BLEED, IT WILL SAY "n/a".** If your application <u>does</u> require a bleed, drill the bleed hole starting from the pre-drilled side.

14 ***Check to see there are no burrs*** on the Gold Valve Shock 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.) Install the Gold Valve on the shaft with the large diameter ports facing down towards the compression stack (the head or slotted side on the jet will also be facing towards the compression stack).

15 ***Build the Rebound Stack.*** Install the Rebound Stack on the shaft with the largest diameter shim against the piston face and ending with the smallest diameter shim.



Gold Valve Cutaway
figure 2

16 ***THIS NEXT STEP IS CRITICAL!!!! You must stack up the total valving thickness so the rebound base plate straddles the "step" at the end of the straight part of the shaft (before the threads begin). This means when the rebound base plate is installed, the lip on the shaft is not sticking up higher than the base plate. This also means the rebound clamping shim (the last shim installed on the shaft before the rebound base plate) is below the height of the lip before the base plate is installed (the shaft must stick up higher than the rebound clamping shim before the rebound base plate is installed). (figure 2)***

**** To add to the thickness of the valving stack use the brass Base Plates provided or some of the original valving shims or <u>add flat</u> washers. Be sure the shims are <u>all</u> larger in diameter than the clamping shim (the last rebound shim, farthest away from the piston). If any of the shims or additional washers are smaller in diameter than the clamping shim it will decrease rebound damping. DO NOT PUT SHIMS BELOW THE COMPRESSION BASE PLATE!***

17 ***Install the nut. Clean the threads thoroughly, use Loctite 271 and torque the nut to 25 ft-lbs (34 NM).***

18 Hold the completed valving assembly up to the light and ***visually inspect the stack.*** Check for dirt or any irregularities in the stack. If anything looks abnormal, disassemble the valving and look for dirt, burrs on the valve or even burrs on the shims. Once corrected, reassemble and inspect again.

19 ***Install the Piston Ring Energizer O-ring*** (supplied) onto the Gold Valve Shock Piston. Do not re-use the stock o-ring. Install the new piston ring.

REASSEMBLY

20 ***Begin reassembling the shock.*** Make sure everything is clean. ***Fill the bladder*** with Ultra Slick US-2 Medium Suspension Fluid. ***Install the bladder on the cap*** while holding the bladder upright so the fluid does not spill. ***Install the reservoir body sleeve*** over the bladder. Push the sleeve down far enough to expose the circlip groove and ***install the circlip.*** Clamp the shock body in the vise with the reservoir hose pointing down. ***Install the hose*** onto the reservoir. ***Fill the shock body*** half way with fluid.

Put the original o-ring onto the new reservoir end cap and ***install the end cap*** by pushing it down far enough to expose the circlip groove and ***installing the circlip.*** While holding the reservoir below the shock with the nitrogen valve end pointing down, ***gently pressurize the reservoir with 40 psi (2.8 bar) of air*** (don't worry air is fine). This will compress the bladder and push extra fluid through the compression adjuster valve. If you hold the reservoir and line in this manner it will purge the air bubbles out. Leave the reservoir pressurized to 40 psi.

21 ***Fill the body*** most of the way with fluid. Install the shock shaft assembly into the body, holding the piston ring in place as you insert it into the fluid. The shaft should go into the body relatively easily. If it does not the o-ring is probably incorrect, call Race Tech if this occurs.

Bleed the bubbles past the piston by stroking the shock quickly and forcefully on compression and **pulling up slowly on rebound**. Quickly on compression to open the valving allowing the trapped air to get out. Slowly on rebound or bubbles will form behind the piston as you pull the shaft up.

22 When you are done bleeding the shock extend the shaft almost all the way out (do not let it suck air through the rebound feed hole or you must start bleeding again). Top off the shock with fluid and ***push the seal head down the shaft*** and into the oil using the Race Tech Seal Head Tool or your fingers. Oil will overflow as the seal head goes down the shaft, until the seal head o-ring seals on the shock body. At this point, keep pressure on the seal head and depress the valve core on the reservoir allowing the air to escape and the seal head to go into the shock body.

23 Push the seal head past the circlip groove and ***install the circlip.*** Pressurize the reservoir with 20 psi (1.4 bar) to seat the seal head on the circlip. Visually check to see that it is seated properly and install the end cap with a plastic mallet. Pressurize the reservoir to 250 psi (17.1 bar) with nitrogen or dry air. Stroke the shock through its travel making sure it rebounds to full extension. If it does not, stop, disassemble and inspect the shock.

24 ***Adjust the spring preload. Set the compression and rebound adjusters*** according to your Digital Valving Setup Sheet.

25 ***Reinstall the shock*** on the bike taking care to service the heim joints and the linkage. Set the Static "Race" Sag 25-35mm or 1 to 1 3/8" on most bikes. A Race Tech Sag Master (TSSM 01) makes the job easy.

26 On the first laps of riding, ***use caution, get used to the new feel*** of the bike and reset the adjustments according to standard testing procedure. Enjoy!

SHOCK VALVING SELECTION - STREET / ROAD RACE - SMGV S4602 (38/34)

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 Custom Suspension 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. The Compression Valving Shim Stack is made up of only a High-Speed Compression Stack. (No Low-Speed Stack is required so it will say "n/a" in the space marked "cL".)

The Rebound Valving Stack is made up of only a High-Speed Rebound Stack. (No Low-Speed Stack is required so it will say "n/a" in the space marked "rL".)

EXAMPLE:

COMPRESSION

The Total Compression Valving Stack is "n/a" and cH5:

Starting from the Gold Valve piston face

Low-Speed Rebound Stack – "n/a"

This means use the High-Speed Stack Only

High-Speed Compression Stack – cH5

(1) 0.25x38
(1) 0.25x36
(1) 0.25x34
(1) 0.25x30
(1) 0.25x28
(1) 0.25x26
(1) 0.25x24
(1) 0.25x20

REBOUND

The Total Rebound Stack is "n/a" and rH10:

Starting from the Gold Valve piston face

Low-Speed Rebound Stack – "n/a"

This means use the High-Speed Stack Only

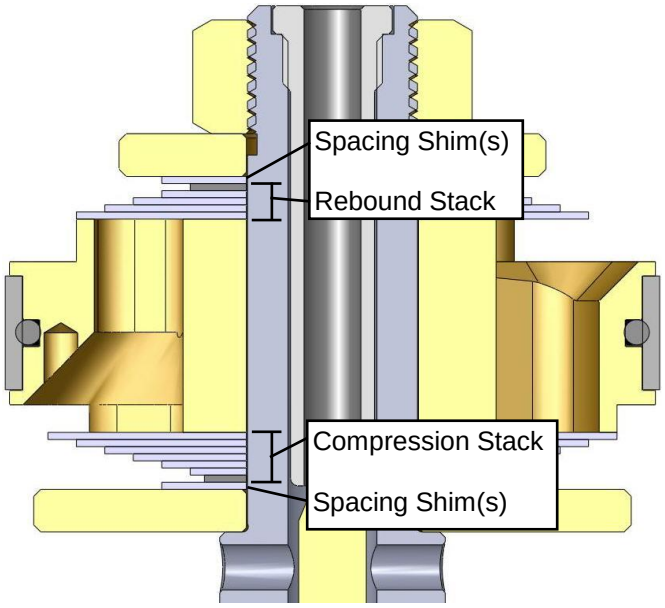
High-Speed Rebound Stack – rH7

(4) 0.25x34
(1) 0.25x30
(1) 0.25x28
(1) 0.25x26
(1) 0.25x24
(1) 0.25x22

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

(Double-check your Preload by measuring Static "Race" Sag when the shock is installed on the bike.)

NOTE: All measurements are metric *(if you want inches simply divide the numbers 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. If there is a number in parentheses that means quantity. If there is no number in parentheses the quantity is one. Example: (2).20x40 means quantity two, 20 hundredths of a millimeter thick by 40 millimeters in diameter.



TUNING NOTES

Damping is sensitive to vertical wheel velocity, not position in the stroke. Please feel free to use the compression damping adjuster. Please note that on some shocks it has very little affect. 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 out. If your valving needs to be stiffer internally, move to the right. This will increase damping.

Spring rate is dependent mostly on rider and bike weight. Spring Rate, Spring Preload and Low-Speed Compression Damping all affect wallow and bottoming.

If you would like assistance please contact the Technical Support Hotline 951.279.6655.

SHOCK GOLD VALVE CHART – STREET / ROAD RACE 46mm CBR 600/900 (38/34)

<s_vchs44.doc> Chart #44S-018 © P Thede

COMPRESSION VALVING ***STIFFER*** →

cH1	cH2	cH3	cH4	cH5	cH6	cH7	cH8	cH9	cH10
.20x38	.25x38	.25x38	.25x38	.25x38	(2).25x38	(3).25x38	(4).25x38	(4).25x38	(5).25x38
.25x34	.25x34	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36
.25x30	.25x30	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34
.25x28	.25x28	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30
.25x26	.25x26	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28
.25x24	.25x24	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26
.25x18	.25x18	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24
		.25x18	.25x19	.25x20	.25x20	.25x20	.25x20	.25x21	.25x21
cH11	**cH12**	**cH13**	**cH14**	**cH15**	**cH16**	**cH17***	**cH18***	**cH19***	
(6).25x38	(4).25x38	(5).25x38	(6).25x38	(7).25x38	(8).25x38	(5).30x38	(6).30x38	(7).30x38	
.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	
.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	
.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	
.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	
.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	
.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	
.25x21	.25x23	.25x23	.25x23	.25x23	.25x23	.25x23	.25x23	.25x23	

REBOUND VALVING ***SLOWER*** →

rH1	rH2	rH3	rH4	rH5	rH6	rH7	rH8	rH9	rH10
.25x34	.25x34	.25x34	.25x34	(2).25x34	(3).25x34	(4).25x34	(4).25x34	(5).25x34	(6).25x34
.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30
.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28
.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26
.25x20	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24
	.25x20	.25x21	.25x22	.25x22	.25x22	.25x22	.25x23	.25x23	.25x23
rH11*	**rH12***	**rH13***	**rH14***	**rH15***	**rH16***	**rH17***	**rH18***	**rH19***	**rH20***
(3).30x34	(4).30x34	(5).30x34	(6).30x34	(7).30x34	(4).38x34	(5).38x34	(6).38x34	(7).38x34	(8).38x34
.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30
.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28
.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26
.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24

BLEED HOLE (must be drilled if required) ***SLOWER*** →

2.6mm	2.5mm	2.4mm	2.2mm	2.1mm	1.9mm	1.8mm	1.6mm	1.3mm	1.0mm
#38	#40	#42	#44	#46	#48	#50	#52	#55	#60

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