SK code

SHOCK GOLD VALVE INSTALLATION - DIRT Type 2 - 50mm (44/40)

<IP SMGV 5051.doc> **SMGV 5051** P Thede © 11-13-08 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 p/n TSSS 01, Valve Core Removal Tool, Safety Glasses, Sag Master p/n TSSM 01

PARTS REQUIRED: Shock Fluid - Race Tech Ultra Slick US-1 Light is preferred, Loctite 271 (Red – High Strength).

NOTE: Many riders will require a new spring. 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 all adjustments out all the way. Measure and record the set length (installed length) of the spring. Remove the spring.

2 **Follow standard rebuild procedures as outlined in your maintenance manual. Use safety glasses.** ***Begin disassembly.*** Clamp the shock in a vise, remove the nitrogen and the valve core. Remove the bladder by first depressing the bladder cap about 10 mm (7/16") to expose the circlip. You can place a socket over the valve stem and tap on the socket to avoid bending the stem. Remove the circlip, then the cap with the bladder attached.

3 ***Remove the end cap from the shock body.*** Showa end caps are pressed-on and must be tapped off with a sharp chisel (a wood chisel works great). Tap it off evenly.

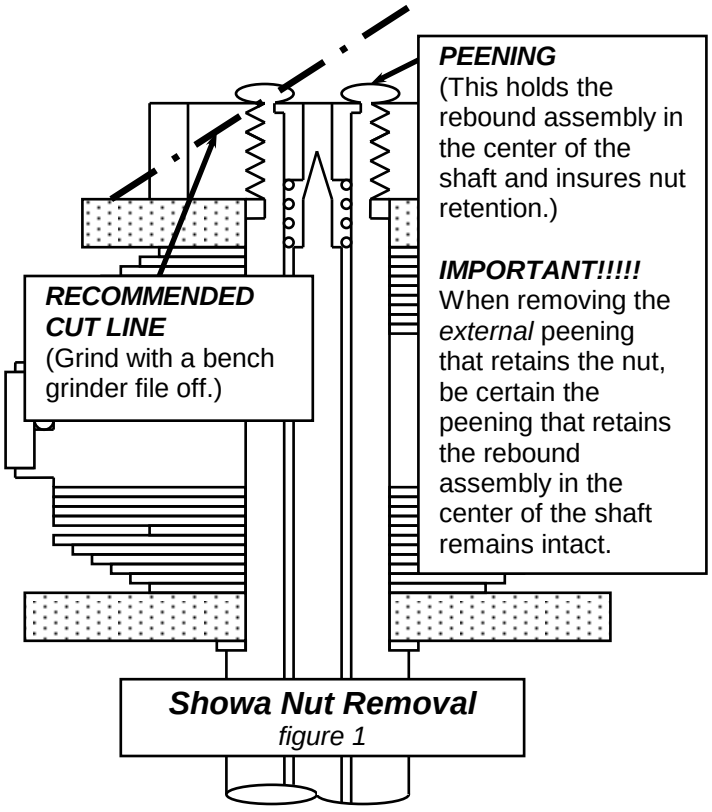
4 Once removed, depress the seal head assembly. Use Race Tech's Seal Head Tool (p/n TSSS 01) or use your fingers. This will expose the circlip. ***Remove the circlip*** with a small screwdriver.

5 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.

6 ***CAUTION: THIS NEXT STEP IS CRITICAL AND SHOULD ONLY BE DONE BY A QUALIFIED SUSPENSION TECHNICIAN. Remove the nut.*** On Showa's you must first grind or machine away some of the peening on the end of the shaft. This peening is there for two reasons, first, to insure that the nut does not come off during use and second, it holds the rebound adjustment assembly into the center of the shaft. (See Fig. 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.

7 ***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.



Showa Nut Removal
figure 1

8 *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. Grease the seal and reassemble the shaft up to the base plate (2). Surface and clean the base plate and install it on the shaft.**

VALVING SELECTION

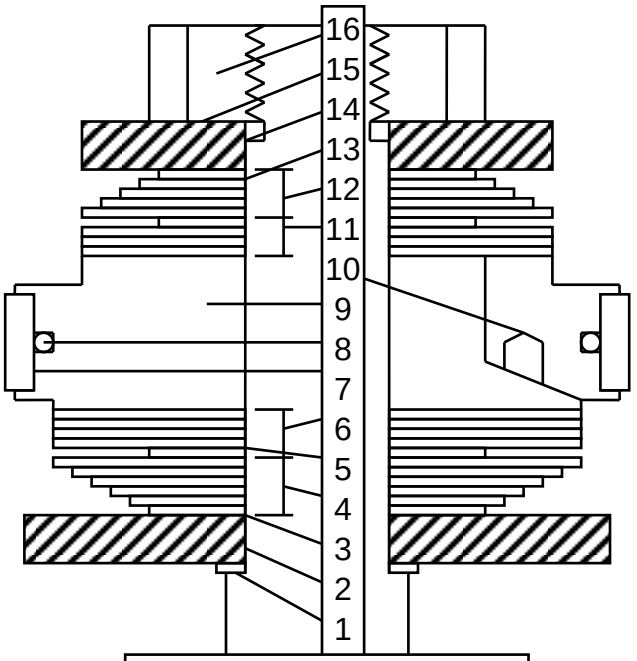
9 **To obtain custom valving settings for your particular application log on to www.racetech.com, go to Digital Valving Search, insert your Access Code (printed on the top of the first page), input your personal specifications and print the custom setup information. If you do not have access to the web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

10 ***Build the Compression Valving Stack.*** The total Compression Valving Stack is a combination of the Low Speed Compression Stack, Mid Speed Stack (if required) and the High Speed Compression Stack. First, install the High Speed Compression Stack (4) on the shaft starting with the smallest diameter shim (3) against the Base Plate (2). Next place the Mid Speed Stack (if required) (not shown) and the Low Speed Compression Stack (6) on the shaft starting with the small diameter shim (5) and ending with the largest diameter shim against the Gold Valve (9) piston face.

11 ***If required, drill the recommended bleed hole in the piston (10).*** Some bikes do not require a bleed hole. **IF YOUR APPLICATION DOES NOT REQUIRE A BLEED, IT WILL SAY "n/a".** If your application does require a bleed, drill the bleed hole starting from the pre-drilled side.

12 ***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 (9) on the shaft** with the large diameter ports facing down towards the compression stack.

13 ***Build the Rebound Stack.*** The total Rebound Valving Stack is a combination of the Low Speed Rebound Stack and the High Speed Rebound Stack. First, install the Low Speed Rebound Stack (11) on the shaft with the largest diameter shim against the piston face. Then install the High Speed Rebound Stack (12) on the shaft starting with the largest shim and ending with the smallest diameter shim.



Gold Valve Cutaway
figure 2

14 ***THIS NEXT STEP IS CRITICAL!!!! You must stack up the total valving thickness so the rebound base plate (very thick washer) straddles the step (#14) 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 (13) (the last shim installed on the shaft before the rebound base plate) is below the height of the lip (14) before the Rebound Base Plate (15) is installed (the shaft must stick up higher than the rebound clamping shim before the rebound base plate is installed). (See Fig. 2)***

**** To add to the thickness of the valving stack you can use some of the original valving shims or add flat washers. Be sure the shims are all 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!***

15 ***Make sure you have the proper nut (16).*** In general Showa uses a 12x1.25 mm thread. Use a metric thread pitch gage to check the thread pitch. ***This is critical!!! Select the proper nut, clean the threads thoroughly, use Loctite 271 and torque the nut to 25 ft-lbs (34 NM).***

16 Hold the completed valving assembly up to the light and ***visually inspect the stack.*** Check for dirt or any irregularities in the stack. Check the crossover gaps between the low speed and high speed damping stacks (5 & 10). Check to make sure the valves are seating flat against the piston face. 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.

17 ***Install the Piston Ring Energizer O-ring (8)*** (supplied in the kit) onto the Gold Valve Shock Piston. Do not re-use the stock o-ring. Be sure the o-ring sits all the way down into the groove and install the new piston ring.

REASSEMBLY

18 You are ready to ***reassemble the shock.*** Make sure everything is clean. Clamp the shock body in the vise and fill the reservoir with the proper fluid. If it is a bladder style shock, install the bladder on the cap with the nitrogen valve core installed. Install the bladder assembly into the reservoir, making sure there is enough fluid in the reservoir so the fluid overflows as the bladder is inserted. Push the cap down far enough to expose the circlip groove and install the circlip. Gently pressurize the bladder with 40 psi (2.8 bar) of air (don't worry air is fine). This will expand the bladder and push extra fluid through the compression adjuster valve. Leave the reservoir pressurized to 40 psi.

19 ***Fill the body*** most of the way with fluid. ***Install the shock shaft assembly*** into the body, holding the piston ring (7) 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.

20 ***FOR BLADDER TYPE SHOCKS (most KYB and Showa) -*** 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. 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.

21 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 or screw it on, depending on the particular type you have. Double-check the piston location if it is a piston type reservoir. ***Pressurize the reservoir to 175 psi (12 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.

22 Grease the threads on the spring adjuster, ***adjust the spring preload*** and tighten the locking collar. ***Set the compression and rebound adjusters*** according to your Digital Valving Setup Sheet.

23 ***Reinstall the shock*** on the bike taking care to service the eyelets and the linkage. Suspension performance will suffer if the linkage needs service or is binding (what the heck, might as well). Set the Race Sag (laden – rider on) to one third of the total travel (95-100 mm or 3 3/4 to 4" on most bikes). A Race Tech Sag Master p/n TSSM 01, makes the job easy. Check that there is 15 to 25 mm (5/8 to 1") of Free Sag (unladen sag – rider off) when there is no one aboard. If there is less than 12 mm (1/2"), you need a heavier spring. If there is more than 35 mm (1.4") you need a lighter spring.

24 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!

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!

Sign up for Race Tech News for the latest innovations like the **ShockClock Suspension Setup Tool** ***at*** **www.racetech.com.**

VALVING SELECTION - DIRT - SMGV 5051 – (44/40)

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 total Compression Valving Stack is a combination of the Low Speed Compression Stack placed on top of a Mid Speed Stack (if required) placed on top of the High Speed Compression Stack. (If no Mid Speed Stack is required it will say "n/a" in the space marked "cM".)

The total Rebound Valving Stack is a combination of the Low Speed Rebound Stack and the High Speed Rebound Stack.

EXAMPLE:

COMPRESSION

The Total Compression Valving Stack is cL8, cM13 and cH100:

Starting from the Gold Valve piston face

Low Speed Compression Stack – cL8
- (8) 0.20x44
- (1) 0.15x26

Mid Speed Compression Stack – cM13
- (2) 0.20x44
- (1) 0.10x26

High Speed Compression – cH100
- (1) 0.20x44
- (1) 0.20x40
- (1) 0.20x38
- (1) 0.20x34
- (1) 0.25x30
- (1) 0.25x28
- (1) 0.25x26
- (1) 0.25x24
- (1) 0.25x18

REBOUND

The Total Rebound Stack is rL4 and rH7:

Starting from the Gold Valve piston face

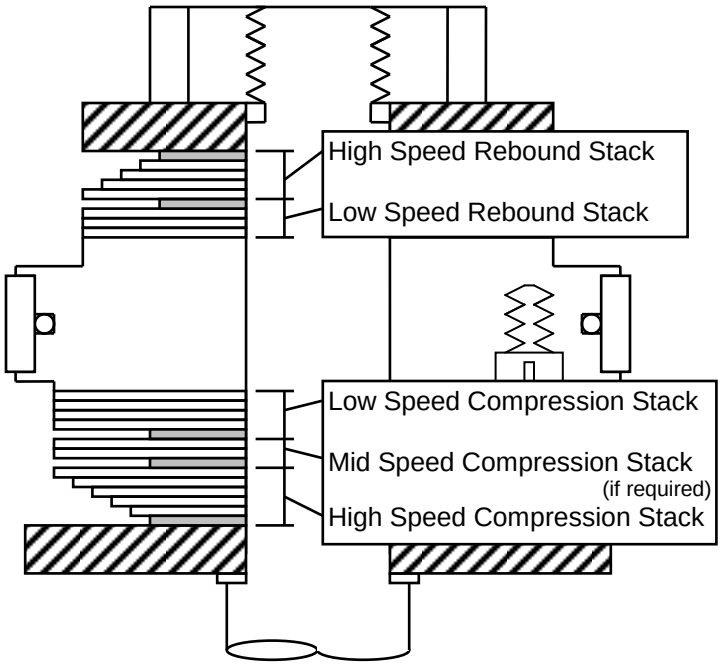
Low Speed Rebound Stack – rL4
- (4) 0.20x40
- (1) 0.10x30

High Speed Rebound – rH7
- (4) 0.25x40
- (1) 0.25x38
- (1) 0.25x36
- (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 on rider weight (except for Supercross). Spring Rate, Preload and Low Speed Compression Damping all affect wallow and bottoming.

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

SHOCK GOLD VALVE CHART - DIRT 50 mm Type 2 (44/40)

<s_vch_5051.doc> Chart #5051D44/40-081113 © P Thede

COMPRESSION

LOW SPEED COMPRESSION VALVING ***STIFFER*** →

cL1	cL2	cL3	cL4	cL5	cL6	cL7	cL8	cL9	cL10
(2).15x44	(2).20x44	(3).20x44	(4).20x44	(5).20x44	(6).20x44	(7).20x44	(8).20x44	(9).20x44	(10).20x44
.15x26	.15x26	.15x26	.15x26	.15x26	.15x26	.15x26	.15x26	.15x26	.15x26
cL11	**cL12**	**cL13**	**cL14**	**cL15***	**cL16***	**cL17***	**cL18***	**cL19***	**cL20***
(8).20x44	(9).20x44	(10).20x44	(11).20x44	(12).20x44	(13).20x44	(14).20x44	(15).20x44	(16).20x44	(17).20x44
.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30

MID SPEED COMPRESSION VALVING (if required) ***STIFFER*** →

cM11	cM12	cM13	cM14	cM15	cM16	cM17*	cM18*	cM19*	cM20*
(2).15x44	(1).20x44	(2).20x44	(1).25x44	(2).25x44	(2).25x44	(3).25x44	(3).25x44	(4).25x44	(5).25x44
.10x26	(1).15x44	.10x26	(1).20x44	.10x26	(1).20x44	.10x26	(1).20x44	.10x26	.10x26
	.10x26		.10x26		.10x26		.10x26		

HIGH SPEED COMPRESSION VALVING ***STIFFER*** →

	cH92	cH93	cH94	cH95	cH96	cH97	cH98	cH99	cH100
	.15x44	.15x44	.15x44	.20x44	.20x44	.20x44	.20x44	.20x44	.20x44
	.15x40	.15x40	.15x40	.20x40	.20x40	.20x40	.20x40	.20x40	.20x40
	.15x38	.15x38	.20x38	.20x38	.20x38	.20x38	.20x38	.20x38	.20x38
	.15x34	.20x34	.20x34	.20x34	.20x34	.20x34	.20x34	.20x34	.20x34
	.20x30	.20x30	.20x30	.20x30	.20x30	.20x30	.25x30	.25x30	.25x30
	.20x28	.20x28	.20x28	.20x28	.20x28	.25x28	.25x28	.25x28	.25x28
	.20x24	.20x24	.20x24	.20x24	.25x24	.25x24	.25x24	.25x24	.25x26
	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x20	.25x24
	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x18	.25x18
cH1	**cH2**	**cH3**	**cH4**	**cH5**	**cH6**	**cH7**	**cH8**	**cH9**	**cH10**
.20x44	.20x44	.20x44	.25x44	.25x44	(2).25x44	.25x44	(2).25x44	(3).25x44	(4).25x44
.20x40	.20x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40
.20x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38
.25x34	.25x34	.25x34	.25x34	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36
.25x30	.25x30	.25x30	.25x30	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34
.25x28	.25x28	.25x28	.25x28	.25x30	.25x30	.25x30	.25x30	.25x30	.25x30
.25x26	.25x26	.25x26	.25x26	.25x28	.25x28	.25x28	.25x28	.25x28	.25x28
.25x24	.25x24	.25x24	.25x24	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26
.25x18	.25x18	.25x18	.25x18	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24
				.25x18	.25x18	.25x20	.25x20	.25x20	.25x20
cH11	**cH12**	**cH13**	**cH14**	**cH15**	**cH16**	**cH17***	**cH18***	**cH19***	
(4).25x44	(5).25x44	(6).25x44	(4).25x44	(5).25x44	(6).25x44	(7).25x44	(8).25x44	(9).25x44	
.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	.25x40	
.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	
.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	.25x21	.25x21	.25x23	.25x23	.25x23	.25x23	.25x23	.25x23	

REBOUND

LOW SPEED REBOUND VALVING ***SLOWER*** →

rL1	rL2	rL3	rL4	rL5	rL6	rL7	rL8*	rL9*	rL10*
(1).20x40	(2).20x40	(3).20x40	(4).20x40	(5).20x40	(6).20x40	(7).20x40	(8).20x40	(9).20x40	(10).20x40
.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30	.10x30
rL11*	**rL12***	**rL13***	**rL14***	**rL15***	**rL16***	**rL17***			
(4).30x40	(5).30x40	(6).30x40	(7).30x40	(6).30x40	(7).30x40	(8).30x40			
.10x30	.10x30	.10x30	.10x30	.10x32	.10x32	.10x32			

HIGH SPEED REBOUND VALVING ***SLOWER*** →

rH1	rH2	rH3	rH4	rH5	rH6	rH7	rH8	rH9	rH10
.25x40	.25x40	(2).25x40	.25x40	(2).25x40	(3).25x40	(4).25x40	(4).25x40	(5).25x40	(6).25x40
.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38
.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36
.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.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	.25x20	.25x22	.25x22	.25x22	.25x22	.25x23	.25x23	.25x23

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

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

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