

# RACE TECH

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

SK code

## SHOCK GOLD VALVE INSTALLATION – 46x16mm (40/36)

<IP SMGV 4616.doc> P Thede © 2.3.11

6 pgs

**TOOLS REQUIRED:** Metric Micrometer, Calipers or a Metric Ruler, Torque Wrench, High Pressure Nitrogen (regulated), 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)

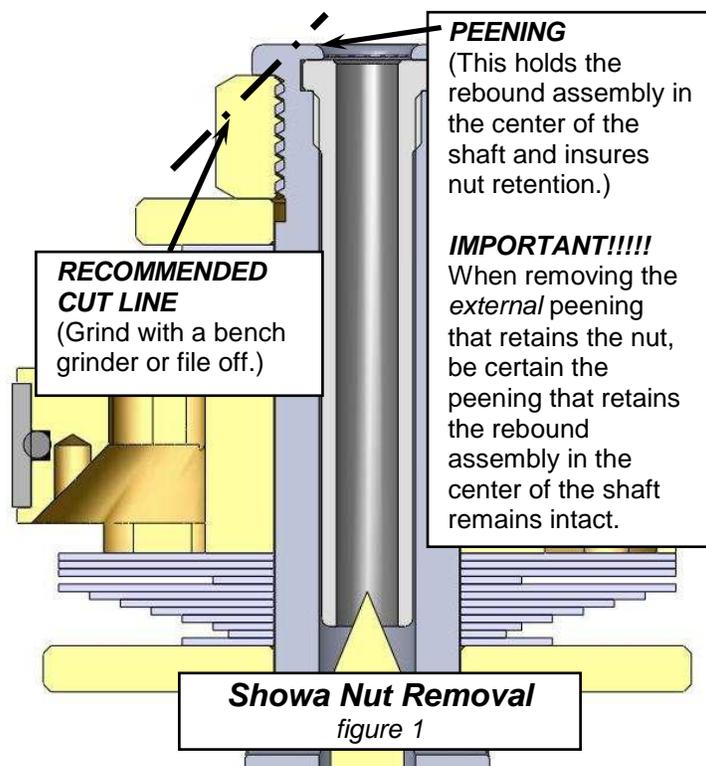
**PARTS REQUIRED:** Shock Fluid - Race Tech Ultra Slick Fluids are preferred, Loctite 271 (Red - High-Strength).

**NOTE:** Many riders require a different spring. Consult [www.racetech.com](http://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

- 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.
- 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 (if applicable). If your shock has a bladder, remove it by first depressing the bladder cap about 10mm (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.
- Remove the end cap from the shock body.** There are two basic types: screwed-on and pressed-on. The screwed-on type may require a special wrench, (most notably Fox, Ohlins and WP). The pressed-on type (typical Showa and KYB) must be tapped off with a sharp chisel. Tap it off evenly.
- Once removed, depress the seal head assembly. Use Race Tech's Seal Head Tool (TSSS 01). This will expose the circlip. **Remove the circlip** with a small screwdriver.
- 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.
- CAUTION: THIS NEXT STEP IS CRITICAL AND SHOULD ONLY BE DONE BY A QUALIFIED SUSPENSION TECHNICIAN. Remove the nut. (NOTE – Fox Shocks have a standard nut – remove and reuse.)** On KYB and Showa units you must first grind or file off 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. On Showa's it serves a second function; it holds the rebound adjustment assembly into the center of the shaft. (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.
- 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.
- 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. Surface and clean the base plate and install it on the shaft. NOTE: On some models there is a Base Plate Washer that goes on the shaft before the base plate and it must be reinstalled.



## VALVING SELECTION

9 To obtain custom valving settings for your particular application log on to [www.racetech.com](http://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 and the High-Speed Compression Stack. First, install the High-Speed Compression Stack on the shaft starting with the smallest diameter shim against the Base Plate. Next place the Mid-Speed Stack (if required) (not shown) and the Low-Speed Compression Stack on the shaft starting with the small diameter shim and ending with the largest diameter shim against the Gold Valve piston face.

11 **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 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 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 on the shaft with the largest diameter shim against the piston face. Then install the High-Speed Rebound Stack on the shaft starting with the largest diameter shim and ending with the smallest diameter shim.

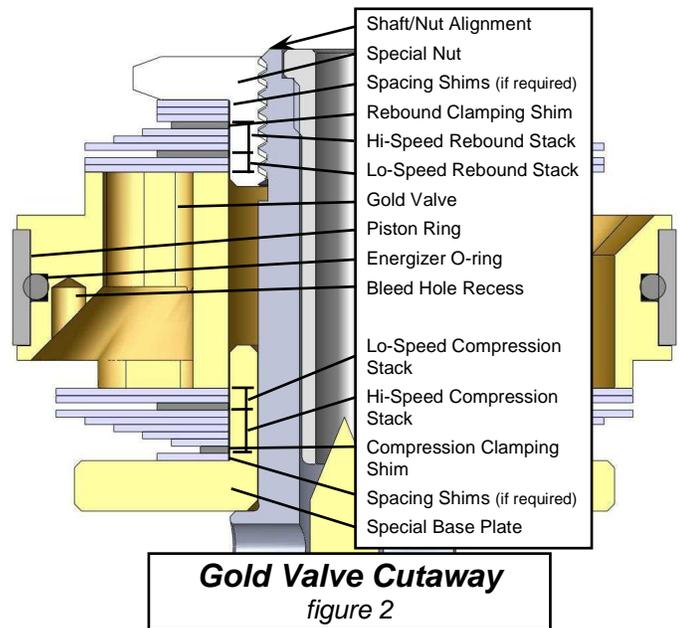
14 **THIS NEXT STEP IS CRITICAL!!!! You must stack up the total valving thickness so the special nut ends up within 1mm (.040") of the end of the shaft when the nut is installed.** NOTE - if your kit doesn't include a Special Nut, please disregard this step.

**\* To add to the thickness of the valving stack use the .25x32 shims provided. DO NOT PUT SHIMS BELOW THE COMPRESSION BASE PLATE!**

15 **Make sure you have the proper nut.** On KYB and Showa there are two different threads used. In general, KYB uses a coarser M12x1.5 thread and Showa uses a finer M12x1.25 thread. Use a metric thread pitch gage to check the thread pitch. **IMPORTANT: If you aren't sure of your nut selection, seek out someone that can assist you. This is critical!!! Make sure you have 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. 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 new Piston Ring Energizer O-ring** 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). 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 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 **A. - 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.
- B. - FOR PISTON TYPE SHOCKS (most Fox, Ohlins and WP)** - When you are done bleeding the shock, you must set the piston location in the reservoir. Remove the pressure from the reservoir. Refer to your owner's manual for the specific location and procedure for your model. Note that the piston is located so that most of the shock is filled with nitrogen not oil. If you have too much fluid you stand the risk of damaging the shock. If you don't have enough oil in the reservoir, the piston will hit the end and it will not push on the oil. If it isn't pushing on the oil the shock will foam and not work properly.
- Once the piston is located, 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.
- 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. If it is a piston type reservoir double-check the piston location. **Pressurize the reservoir to the DVS recommended amount** with nitrogen. 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 DVS Setup Sheet.
- 23 **Reinstall the shock** on the bike taking care to service the heim joints and the linkage. Suspension performance will suffer if the linkage needs service or is binding (what the heck, might as well). Install and setup the springs. Follow the instructions included with the spring kits.
- 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](http://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](http://www.racetech.com).

# VALVING SELECTION - DIRT - SMGV 4616 (40/36)

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](http://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**

If the Total Compression Valving Stack is cL152809, cM n/a and cH149:

Starting from the Gold Valve piston face

### **Low-Speed Compression Stack – cL152809**

- (9) .20x40
- (1) .15x28

### **Mid-Speed Compression Stack – n/a**

Not used

### **High-Speed Compression – cH149**

- (1) .25x40
- (1) .25x38
- (1) .25x36
- (1) .25x34
- (1) .25x32
- (1) .30x30
- (1) .30x28
- (1) .30x26
- (1) .30x24
- (1) .30x22

## **REBOUND**

The Total Rebound Stack is rL102804 and rH165:

Starting from the Gold Valve piston face

### **Low-Speed Rebound Stack – rL102804**

- (4) .20x36
- (1) .10x28

### **High-Speed Rebound – rH165**

- (1) .30x36
- (1) .30x34
- (1) .30x32
- (1) .30x30
- (1) .30x28
- (1) .30x26
- (1) .30x24
- (1) .30x22

**BLEED, EXTERNAL ADJUSTERS, SPRING RATE, and PRELOAD are all listed on the Digital Valving Search on [www.racetech.com](http://www.racetech.com).**

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

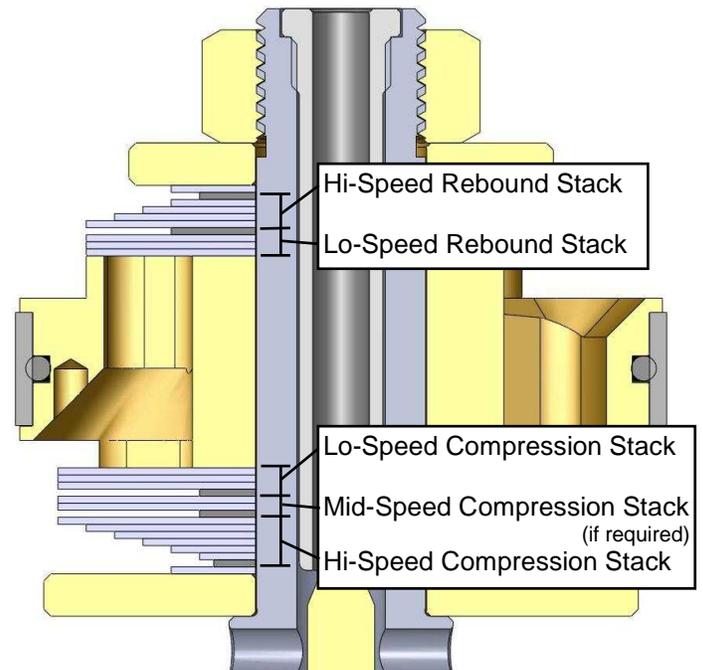
NOTE: All measurements are metric (for inches divide by 25.4). The valving list starts at the piston face and goes towards the base plate. Valve specs are listed by (QUANTITY) THICKNESS x DIAMETER. Example: (2).20x40 means quantity two, 20 hundredths of a millimeter thick by 40 millimeters in diameter.

## **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 46mm (40/36)

<SD-464036-01.doc> 110203 © P Thede

**LOW-SPEED COMPRESSION VALVING**      **STIFFER**       $\longrightarrow$

cL152801	cL152802	cL152803	cL152804	cL152805	cL152806	cL152807	cL152808	cL152809	cL152810
(1).20x40	(2).20x40	(3).20x40	(4).20x40	(5).20x40	(6).20x40	(7).20x40	(8).20x40	(9).20x40	(10).20x40
.15x28									
cL152811	cL152812	cL152813	cL152814	cL152815	cL152816	cL152817	cL152818	cL152819	cL152820
(5).25x40									
(1).20x40	(2).20x40	(3).20x40	(4).20x40	(5).20x40	(6).20x40	(7).20x40	(8).20x40	(9).20x40	(10).20x40
.15x28									

cL153001	cL153002	cL153003	cL153004	cL153005	cL153006	cL153007	cL153008	cL153009	cL153010
(1).20x40	(2).20x40	(3).20x40	(4).20x40	(5).20x40	(6).20x40	(7).20x40	(8).20x40	(9).20x40	(10).20x40
.15x30									
cL153011	cL153012	cL153013	cL153014	cL153015	cL153016	cL153017	cL153018	cL153019	cL153020
(5).25x40									
(1).20x40	(2).20x40	(3).20x40	(4).20x40	(5).20x40	(6).20x40	(7).20x40	(8).20x40	(9).20x40	(10).20x40
.15x30									

**COMPRESSION**

**HIGH-SPEED COMPRESSION VALVING**      **STIFFER**       $\longrightarrow$

cH130	cH131	cH132	cH133	cH134	cH135	cH136	cH137	cH138	cH139
.20x40									
.20x38									
.20x36									
.20x34									
.20x32									
.20x30	.20x30	.20x30	.20x30	.20x30	.25x30	.20x30	.20x30	.20x30	.20x30
.20x28	.20x28	.20x28	.20x28	.25x28	.25x28	.20x28	.20x28	.20x28	.25x28
.20x26	.20x26	.20x26	.25x26	.25x26	.25x26	.20x26	.20x26	.25x26	.25x26
.20x24	.20x24	.25x24	.25x24	.25x24	.25x24	.20x24	.25x24	.25x24	.25x24
.20x22	.25x22	.25x22	.25x22	.25x22	.25x22	.30x22	.30x22	.30x22	.30x22
.25x20	.25x20	.25x20	.25x20	.25x20	.25x20				
cH140	cH141	cH142	cH143	cH144	cH145	cH146	cH147	cH148	cH149
.20x40	.20x40	.20x40	.20x40	.20x40	.25x40	.25x40	.25x40	.25x40	.25x40
.20x38	.20x38	.20x38	.20x38	.25x38	.25x38	.25x38	.25x38	.25x38	.25x38
.20x36	.20x36	.20x36	.25x36						
.20x34	.20x34	.25x34							
.20x32	.25x32								
.25x30	.30x30								
.25x28	.30x28	.30x28							
.25x26	.30x26	.30x26	.30x26						
.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.30x24	.30x24	.30x24	.30x24
.30x22									
cH150	cH151	cH152	cH153	cH154	cH155	cH156	cH157	cH158	cH159
.25x40	.25x40	.25x40	.25x40	.30x40	.25x40	.25x40	.25x40	.25x40	.30x40
.25x38	.25x38	.25x38	.30x38	.30x38	.25x38	.25x38	.25x38	.30x38	.30x38
.25x36	.25x36	.30x36	.30x36	.30x36	.25x36	.25x36	.30x36	.30x36	.30x36
.25x34	.30x34	.30x34	.30x34	.30x34	.25x34	.30x34	.30x34	.30x34	.30x34
.30x32									
.30x30									
.30x28									
.30x26									
.30x24									
.30x22	.30x22	.30x22	.30x22	.30x22	.30x22				

**LOW-SPEED REBOUND VALVING**

**SLOWER** →

rL102601	rL102602	rL102603	rL102604	rL102605	rL102606	rL102607	rL102608	rL102609	rL102610
(1).20x36	(2).20x36	(3).20x36	(4).20x36	(5).20x36	(6).20x36	(7).20x36	(8).20x36	(9).20x36	(10).20x36
.10x26									

rL102801	rL102802	rL102803	rL102804	rL102805	rL102806	rL102807	rL102808	rL102809	rL102810
(1).20x36	(2).20x36	(3).20x36	(4).20x36	(5).20x36	(6).20x36	(7).20x36	(8).20x36	(9).20x36	(10).20x36
.10x28									

**HIGH-SPEED REBOUND VALVING**

**SLOWER** →

**REBOUND**

rH150	rH151	rH152	rH153	rH154	rH155	rH156	rH157	rH158	rH159
.20x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.25x36	.30x36
.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34	.30x34	.30x34
.25x32	.25x32	.25x32	.25x32	.25x32	.25x32	.25x32	.30x32	.30x32	.30x32
.25x30	.25x30	.25x30	.25x30	.25x30	.25x30	.30x30	.30x30	.30x30	.30x30
.25x28	.25x28	.25x28	.25x28	.25x28	.30x28	.30x28	.30x28	.30x28	.30x28
.25x26	.25x26	.25x26	.25x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26
.25x24	.25x24	.25x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24
.25x22	.25x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22
.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20
rH160	rH161	rH162	rH163	rH164	rH165	rH166	rH167	rH168	rH169
.25x36	.25x36	.25x36	.25x36	.25x36	.30x36	.25x36	.25x36	.25x36	.25x36
.25x34	.25x34	.25x34	.25x34	.30x34	.30x34	.25x34	.25x34	.25x34	.30x34
.25x32	.25x32	.25x32	.30x32	.30x32	.30x32	.25x32	.25x32	.30x32	.30x32
.25x30	.25x30	.30x30	.30x30	.30x30	.30x30	.25x30	.30x30	.30x30	.30x30
.25x28	.30x28	.30x28	.30x28	.30x28	.30x28	.30x28	.30x28	.30x28	.30x28
.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26
.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24
.30x22	.30x22	.30x22	.30x22	.30x22	.30x22				
rH170	rH171	rH172	rH173	rH174	rH175	rH176	rH177	rH178	rH179
.30x36	.25x36	.25x36	.25x36	.30x36	.30x36	.30x36	.30x36	.30x36	(2).30x36
.30x34	.25x34	.25x34	.30x34	.30x34	.30x34	.30x34	.30x34	(2).30x34	(2).30x34
.30x32	.25x32	.30x32	.30x32	.30x32	.30x32	.30x32	(2).30x32	(2).30x32	(2).30x32
.30x30	.30x30	.30x30	.30x30	.30x30	.30x30	(2).30x30	(2).30x30	(2).30x30	(2).30x30
.30x28	.30x28	.30x28	.30x28	.30x28	(2).30x28	(2).30x28	(2).30x28	(2).30x28	(2).30x28
.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26	.30x26
.30x24									

**BLEED HOLE (drill 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)