

# RACE TECH

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SK code

## SHOCK GOLD VALVE INSTALLATION - STREET 40mm (34/30-2LS)

<IP SMGV S4005.doc> SMGV S4005, 4005 P Thede © 1.30.14

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 Fluid is preferred, Hi-Strength Loctite (included).

**NOTE:** Many riders will require a different spring rate than stock. Consult [www.racetech.com](http://www.racetech.com) or call Race Tech.

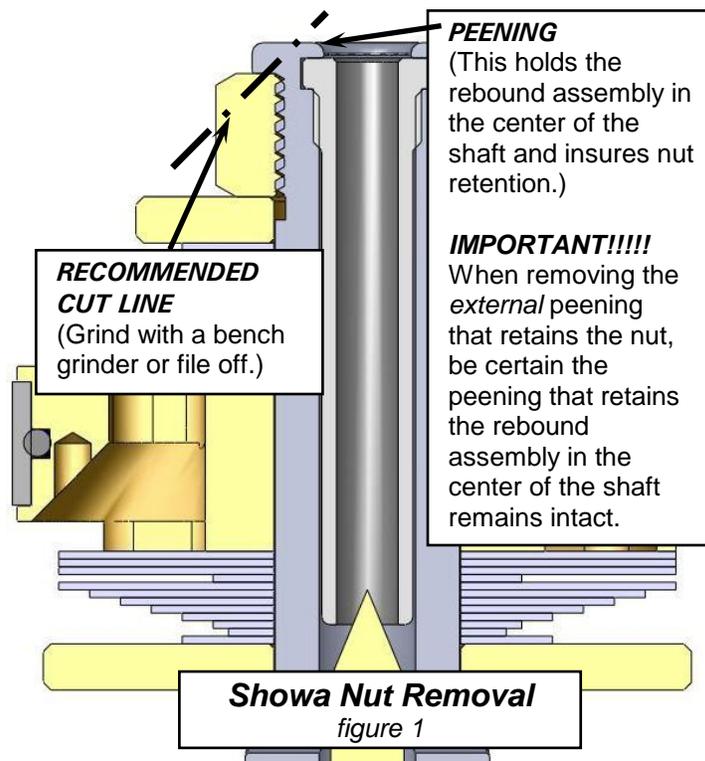
**CAUTION: IF YOU ARE UNFAMILIAR WITH REBUILDING AND REVALVING A SHOCK ABSORBER, STOP!!! DO NOT PROCEED; SEEK OUT A QUALIFIED SUSPENSION TECHNICIAN.**

### 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 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.
- 3 **Remove the end cap from the shock body.** There are two basic types: screwed-on and pressed-on. The screwed-on type usually requires a special wrench, (most notably Ohlins and WP). The pressed-on type (typical Showa and KYB) must be tapped off with a sharp chisel. Tap it off evenly.
- 4 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.
- 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 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 most 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.

On most KYBs this is not a problem and the peening can be ground off flat, however there are a few models that should be treated just like a Showa.



**IMPORTANT!!!!** When removing the external peening that retains the nut, be certain the peening that retains the rebound assembly in the center of the shaft remains intact.

- 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.
- 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. 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.** You will either be building a single-stage or a two-stage compression stack.

- A **Single-Stage Stack** is a combination of a Lo-Speed Stack and a Hi-Speed Stack with NO Lo-Speed Crossover.
- A **Two-Stage Stack** is a combination of a Lo-Speed Stack, Lo-Speed Crossover and a Hi-Speed Stack.

First, install the Hi-Speed Compression Stack starting with the smallest diameter shim against the Base Plate. Next place the Crossover Shim (if required) and the Lo-Speed Compression Stack on the shaft.

- 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.

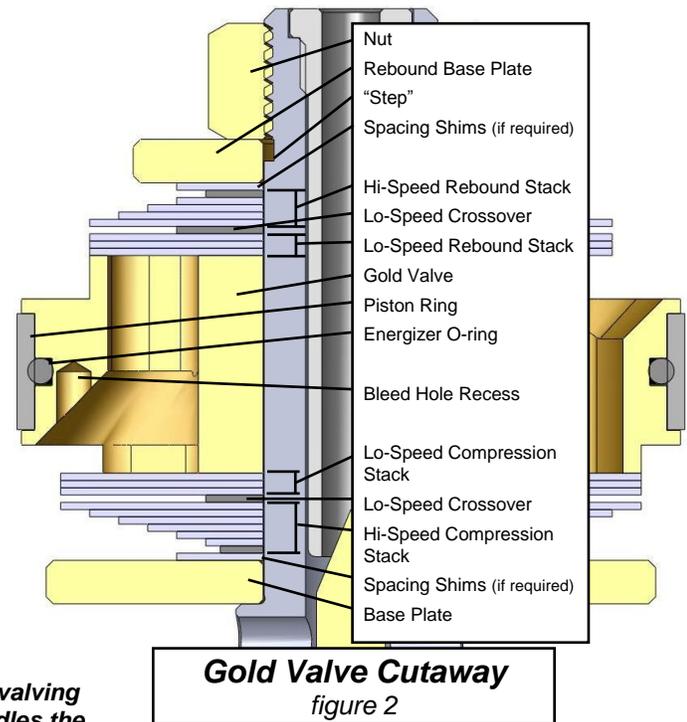
- 13 **Build the Rebound Stack.** The Rebound Valving Stack is either Single-Stage or Two-Stage as with Compression. First, install the Lo-Speed Rebound Stack on the shaft. Then install the Lo-Speed Rebound Crossover Shim (if required) and then the Hi-Speed Rebound Stack starting with the largest shim and ending with the smallest diameter shim.

- 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 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 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 **Select 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. Both are supplied in the kit so use care when selecting the proper nut. **IMPORTANT: If you aren't sure of your nut selection, seek out someone that can assist you. This is critical!!! Select the proper nut, clean the threads thoroughly, use Loctite and torque the nut to 25 ft-lbs (34 NM).**

- 16 **Install the Piston Ring Energizer O-ring** (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

- 17 **Begin reassembling 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 (2.8 bar).
- 18 **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.
- 19 **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.
- 20 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 the DVS recommendation** 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.
- 21 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.
- 22 **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). Set the Race Sag to the DVS setting. A Race Tech Sag Master (TSSM 01), makes the job easy.
- 23 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 developments at [racetech.com](http://racetech.com).

# VALVING SELECTION - STREET - SMGV 4005 (34/30)

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 and build the valving stacks

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.

- **Single-Stage Valving Stacks are a combination of a Lo-Speed and a Hi-Speed Stack with NO Crossover.**
- **Two-Stage Valving Stacks are a combination of a Lo-Speed Stack on top of a Lo-Speed Crossover, placed on top of a Hi-Speed Stack.**

## EXAMPLES of Two-Stage and Single-Stage:

### COMPRESSION (two-stage)

If the Total Compression Valving Stack is cL2009, cLX1522 and cH129:

Starting from the Gold Valve piston face

#### Lo-Speed Compression Stack – cL2009

(9) .20x34

#### Lo-Speed Crossover – cLX1522

(1) .15x22

#### Hi-Speed Compression – cH129

(1) .25x34

(1) .25x32

(1) .25x30

(1) .25x28

(1) .25x26

(1) .25x24

(1) .25x22

(1) .25x20

(1) .25x18

### REBOUND (single-stage)

If the Total Rebound Stack is rL2004 and rH167:

Starting from the Gold Valve piston face

#### Lo-Speed Rebound Stack – rL2004

(4) .20x30

#### Lo-Speed Crossover – rLX n/a

Not used

#### Hi-Speed Rebound – rH167

(1) .30x30

(1) .30x28

(1) .30x26

(1) .30x24

(1) .30x22

(1) .30x20

**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.)

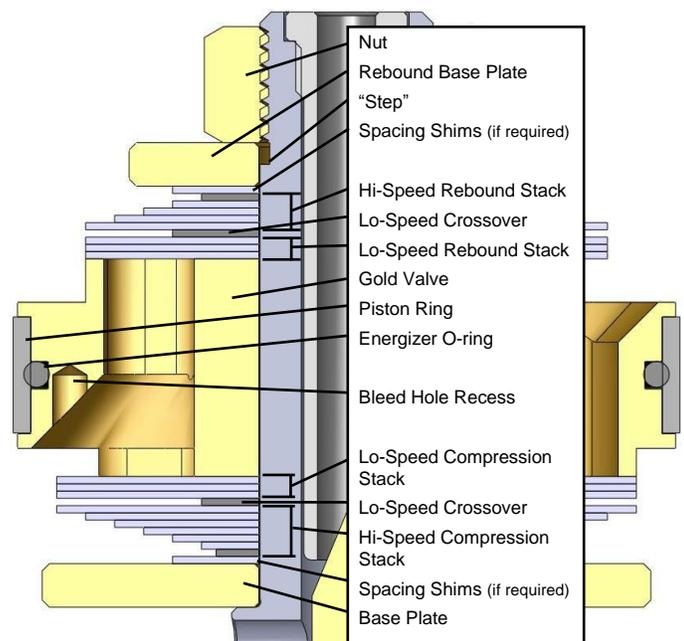
NOTE: All measurements are metric (for inches divide by 25.4). The valving list starts at the piston face and goes towards the base plate. Valve specs are listed by (QUANTITY) THICKNESS x DIAMETER. Example: (2).20x40 means quantity two, 20 hundredths of a millimeter thick by 40 millimeters in diameter.

## 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 Lo-Speed Compression Damping all affect wallow and bottoming.

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



**Gold Valve Cutaway**  
figure 2

# SHOCK GOLD VALVE CHART - 40mm (34/30)

<smgv chart LD 403430.doc> 6.24.11 © P Thede

## LO-SPEED COMPRESSION STACK STIFFER →

<b>cL1501*</b>	<b>cL1502*</b>	<b>cL1503*</b>	<b>cL1504*</b>	<b>cL1505*</b>	<b>cL1506*</b>	<b>cL1507*</b>	<b>cL1508*</b>	<b>cL1509*</b>	<b>cL1510*</b>
.15x34	(2).15x34	(3).15x34	(4).15x34	(5).15x34	(6).15x34	(7).15x34	(8).15x34	(9).15x34	(10).15x34
<b>cL2001</b>	<b>cL2002</b>	<b>cL2003</b>	<b>cL2004</b>	<b>cL2005</b>	<b>cL2006</b>	<b>cL2007</b>	<b>cL2008</b>	<b>cL2009</b>	<b>cL2010</b>
.20x34	(2).20x34	(3).20x34	(4).20x34	(5).20x34	(6).20x34	(7).20x34	(8).20x34	(9).20x34	(10).20x34
<b>cL2501*</b>	<b>cL2502*</b>	<b>cL2503*</b>	<b>cL2504*</b>	<b>cL2505*</b>	<b>cL2506*</b>	<b>cL2507*</b>	<b>cL2508*</b>	<b>cL2509*</b>	<b>cL2510*</b>
.25x34	(2).25x34	(3).25x34	(4).25x34	(5).25x34	(6).25x34	(7).25x34	(8).25x34	(9).25x34	(10).25x34

## LO-SPEED COMPRESSION CROSSOVER STIFFER →

<b>cLX1018*</b>	<b>cLX1020</b>	<b>cLX1022</b>	<b>cLX1024</b>	<b>cLX1026*</b>
.10x18	.10x20	.10x22	.10x24	.10x26
<b>cLX1518*</b>	<b>cLX1520</b>	<b>cLX1522</b>	<b>cLX1524</b>	<b>cLX1526*</b>
.15x18	.15x20	.15x22	.15x24	.15x26

## HI-SPEED COMPRESSION STACK STIFFER →

<b>ch111*</b>	<b>ch112*</b>	<b>ch113*</b>	<b>ch114*</b>	<b>ch115*</b>	<b>ch116*</b>	<b>ch117*</b>	<b>ch118*</b>	<b>ch119*</b>	<b>ch120*</b>
(2).10x34	(2).10x34	(2).10x34	(2).10x34	.15x34	.15x34	.15x34	.15x34	.15x34	.15x34
(2).10x32	(2).10x32	(2).10x32	(2).10x32	.15x32	.15x32	.15x32	.15x32	.15x32	.15x32
(2).10x30	(2).10x30	(2).10x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30	.20x30
(2).10x28	(2).10x28	.15x28	.15x28	.15x28	.15x28	.15x28	.15x28	.20x28	.20x28
(2).10x26	.15x26	.15x26	.15x26	.15x26	.15x26	.15x26	.20x26	.20x26	.20x26
.15x24	.15x24	.15x24	.15x24	.15x24	.15x24	.20x24	.20x24	.20x24	.20x24
.15x22	.15x22	.15x22	.15x22	.15x22	.20x22	.20x22	.20x22	.20x22	.20x22
.15x20	.15x20	.15x20	.15x20	.15x20	.20x20	.20x20	.20x20	.20x20	.20x20
.25x18									
<b>ch121*</b>	<b>ch122</b>	<b>ch123</b>	<b>ch124</b>	<b>ch125</b>	<b>ch126</b>	<b>ch127</b>	<b>ch128</b>	<b>ch129</b>	<b>ch130</b>
.15x34	.20x34	.25x34	.20x34						
.20x32	.25x32	.25x32	.20x32						
.20x30	.20x30	.20x30	.20x30	.20x30	.20x30	.25x30	.25x30	.25x30	.20x30
.20x28	.20x28	.20x28	.20x28	.20x28	.25x28	.25x28	.25x28	.25x28	.20x28
.20x26	.20x26	.20x26	.20x26	.25x26	.25x26	.25x26	.25x26	.25x26	.20x26
.20x24	.20x24	.20x24	.25x24						
.20x22	.20x22	.25x22							
.20x20	.25x20								
.25x18									
<b>ch131</b>	<b>ch132</b>	<b>ch133</b>	<b>ch134</b>	<b>ch135</b>	<b>ch136</b>	<b>ch137</b>	<b>ch138</b>	<b>ch139</b>	<b>ch140</b>
.20x34	.20x34	.20x34	.20x34	.25x34	.25x34	.25x34	.25x34	.25x34	.25x34
.20x32	.20x32	.20x32	.25x32						
.20x30	.20x30	.25x30	.30x30						
.20x28	.25x28	.30x28	.30x28						
.25x26	.30x26	.30x26	.30x26						
.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.30x24	.30x24	.30x24	.30x24
.25x22	.25x22	.25x22	.25x22	.25x22	.30x22	.30x22	.30x22	.30x22	.30x22
.25x20									
<b>ch141</b>	<b>ch142</b>	<b>ch143</b>	<b>ch144</b>	<b>ch145</b>	<b>ch146</b>	<b>ch147</b>	<b>ch148</b>	<b>ch149</b>	<b>ch150</b>
.25x34	.30x34	.25x34	.25x34	.25x34	.25x34	.30x34	.25x34	.25x34	.25x34
.30x32	.30x32	.25x32	.25x32	.25x32	.30x32	.30x32	.25x32	.25x32	.30x32
.30x30	.30x30	.25x30	.25x30	.30x30	.30x30	.30x30	.25x30	.30x30	.30x30
.30x28	.30x28	.25x28	.30x28						
.30x26									
.30x24									
.30x22									
.25x20	.25x20								

**COMPRESSION**

**LO-SPEED REBOUND STACK** **SLOWER** →

rL1501*	rL1502*	rL1503*	rL1504*	rL1505*	rL1506*	rL1507*	rL1508*	rL1509*	rL1510*
.15x30	(2).15x30	(3).15x30	(4).15x30	(5).15x30	(6).15x30	(7).15x30	(8).15x30	(9).15x30	(10).15x30
rL2001	rL2002	rL2003	rL2004	rL2005	rL2006	rL2007	rL2008*	rL2009*	rL2010*
.20x30	(2).20x30	(3).20x30	(4).20x30	(5).20x30	(6).20x30	(7).20x30	(8).20x30	(9).20x30	(10).20x30

**LO-SPEED REBOUND CROSSOVER** **SLOWER** →

rLX1018*	rLX1020	rLX1022	rLX1024
.10x18	.10x20	.10x22	.10x24
rLX1518*	rLX1520	rLX1522	rLX1524*
.15x18	.15x20	.15x22	.15x24

**HI-SPEED REBOUND STACK** **SLOWER** →

rH141*	rH142*	rH143*	rH144*	rH145*	rH146*	rH147*	rH148*	rH149*	rH150*
.10x30	.10x30	.10x30	(2).10x30	.15x30	.15x30	.15x30	.15x30	.15x30	.15x30
.10x28	.10x28	(2).10x28	(2).10x28	.15x28	.15x28	.15x28	.15x28	.15x28	.20x28
.10x26	(2).10x26	(2).10x26	(2).10x26	.15x26	.15x26	.15x26	.15x26	.20x26	.20x26
(2).10x24	(2).10x24	(2).10x24	(2).10x24	.15x24	.15x24	.15x24	.20x24	.20x24	.20x24
(2).10x22	(2).10x22	(2).10x22	(2).10x22	.15x22	.15x22	.20x22	.20x22	.20x22	.20x22
(2).10x20	(2).10x20	(2).10x20	(2).10x20	.15x20	.20x20	.20x20	.20x20	.20x20	.20x20
.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18
rH151	rH152	rH153	rH154	rH155	rH156	rH157	rH158	rH159	rH160
.20x30	.20x30	.20x30	.20x30	.20x30	.20x30	.25x30	.25x30	.25x30	.25x30
.20x28	.20x28	.20x28	.20x28	.20x28	.25x28	.25x28	.25x28	.25x28	.25x28
.20x26	.20x26	.20x26	.20x26	.25x26	.25x26	.25x26	.25x26	.25x26	.25x26
.20x24	.20x24	.20x24	.25x24	.25x24	.25x24	.25x24	.25x24	.25x24	.30x24
.20x22	.20x22	.25x22	.25x22	.25x22	.25x22	.25x22	.25x22	.30x22	.30x22
.20x20	.25x20	.25x20	.25x20	.25x20	.25x20	.25x20	.30x20	.30x20	.30x20
.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18	.25x18
rH161	rH162	rH163	rH164	rH165	rH166	rH167	rH168	rH169	rH170
.25x30	.25x30	.30x30	.25x30	.25x30	.25x30	.30x30	.25x30	.25x30	.25x30
.25x28	.30x28	.30x28	.25x28	.25x28	.30x28	.30x28	.25x28	.25x28	.30x28
.30x26	.30x26	.30x26	.25x26	.30x26	.30x26	.30x26	.25x26	.30x26	.30x26
.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24	.30x24
.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22	.30x22
.30x20	.30x20	.30x20	.30x20	.30x20	.30x20	.30x20			
.25x18	.25x18	.25x18							
rH171	rH172	rH173	rH174	rH175					
.30x30	.30x30	.30x30	.30x30	(2).30x30					
.30x28	.30x28	.30x28	(2).30x28	(2).30x28					
.30x26	.30x26	(2).30x26	(2).30x26	(2).30x26					
.30x24	(2).30x24	(2).30x24	(2).30x24	(2).30x24					
.30x22	.30x22	.30x22	.30x22	.30x22					

**BLEED HOLE (drill if required)** **SLOWER** →

2.2mm	2.0mm	1.8mm	1.6mm	1.5mm	1.3mm	1.2mm	1.0mm
#44	#47	#50	#52	#53	#55	#56	#60

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

REBOUND