

2015 KYB Air Fork Rebuild (with Links to Compression and Rebound Gold Valve Installations)

This is a single chamber Air Fork with a Balance Spring. There is one air chamber per leg.

The cartridges are Open-Chamber.

Compression adjustment is on the fork cap of the left leg while Rebound Adjustment is on the fork cap of the right leg. Keep all components for the left leg separate from the right.

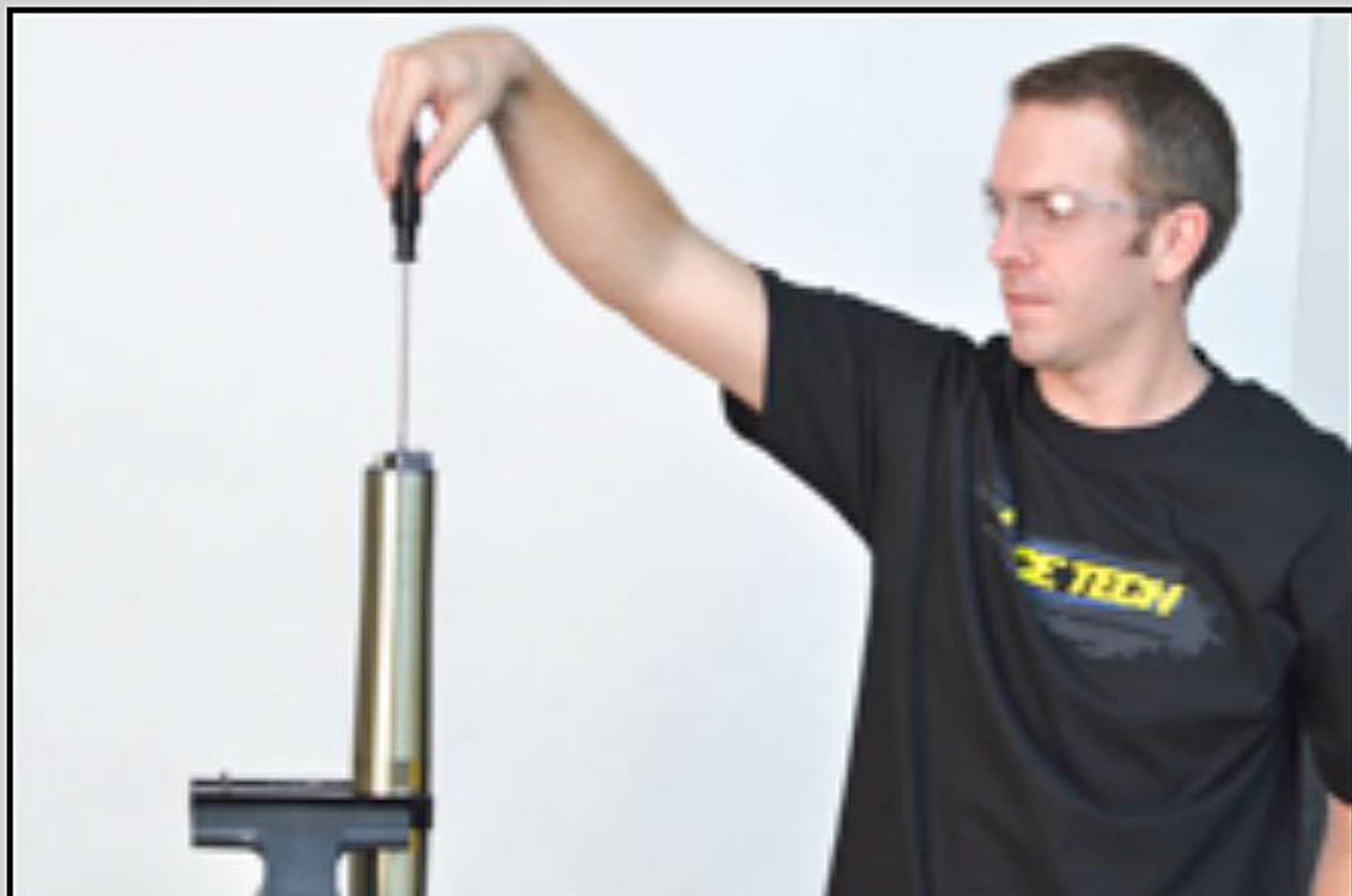
RT has a Spring Conversion Kit for these forks that converts it from Air Spring to Coil Spring. It is a SFF (Single Function Fork) meaning there is only one fork spring.

See your DVS Setup Sheet for valving and setup recommendations.

[DVS Setup Sheet](#) - If you haven't already, go to [DVS Valving Search](#), insert your [Access Code](#), and rider data and print your [DVS Setup Sheet](#).

Shortcuts:

- > [FORK DISASSEMBLY](#)
- > [CARTRIDGE DISASSEMBLY](#)
- > [COMPRESSION VALVING](#)
- > [REBOUND VALVING](#)
- > [CARTRIDGE ASSEMBLY](#)
- > [FORK ASSEMBLY](#)



FORK DISASSEMBLY

FD1- Place the fork firmly in a vice at the lower triple clamp location and back out the adjusters.

Be careful when clamping the fork tube as to not damage it. This is much easier with TMVJ 065 aluminum vise jaws. They have a large "V" and are very gentle to the tube while holding quite solidly.



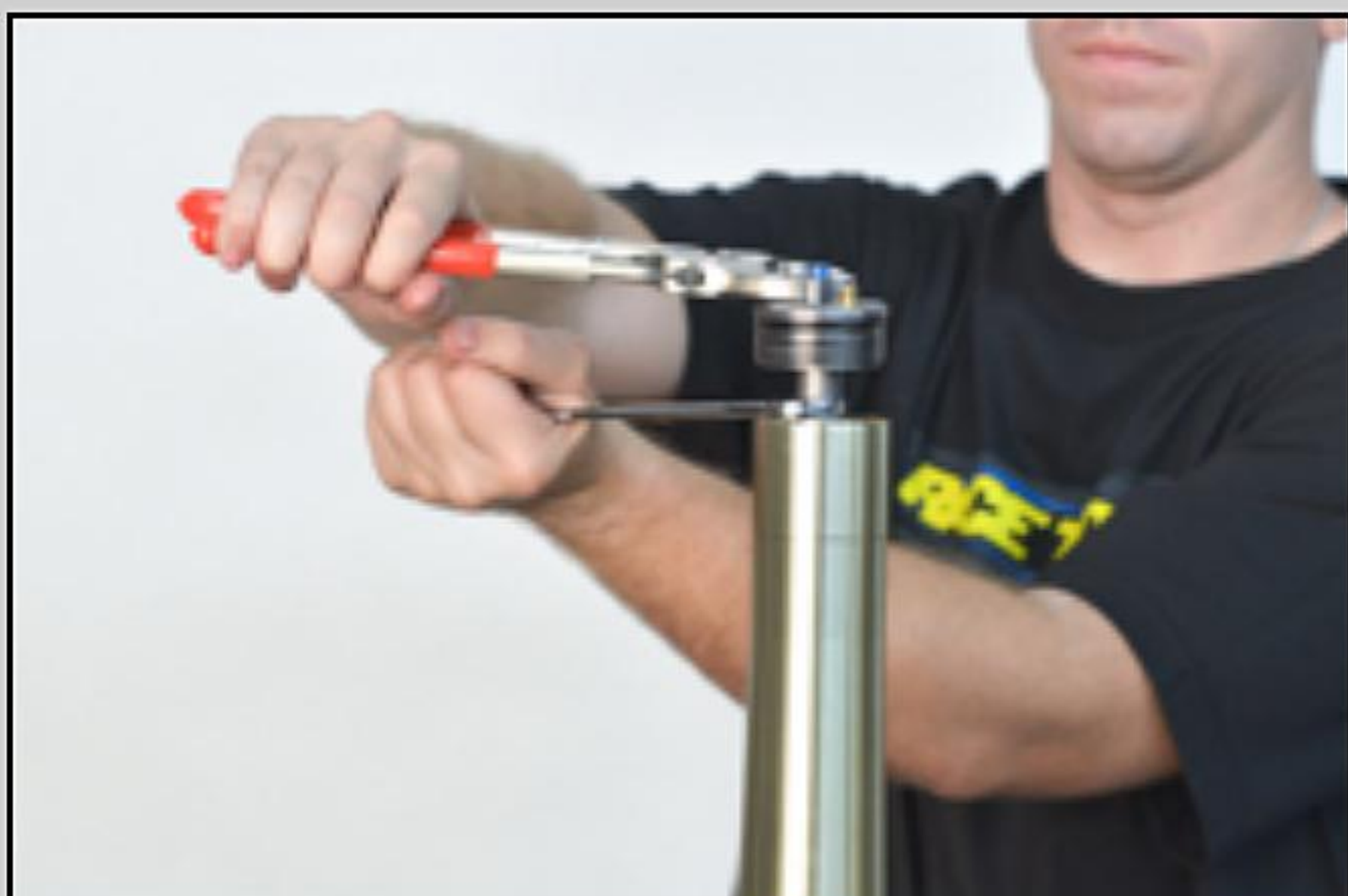
FD2- Remove the valve stem cap.



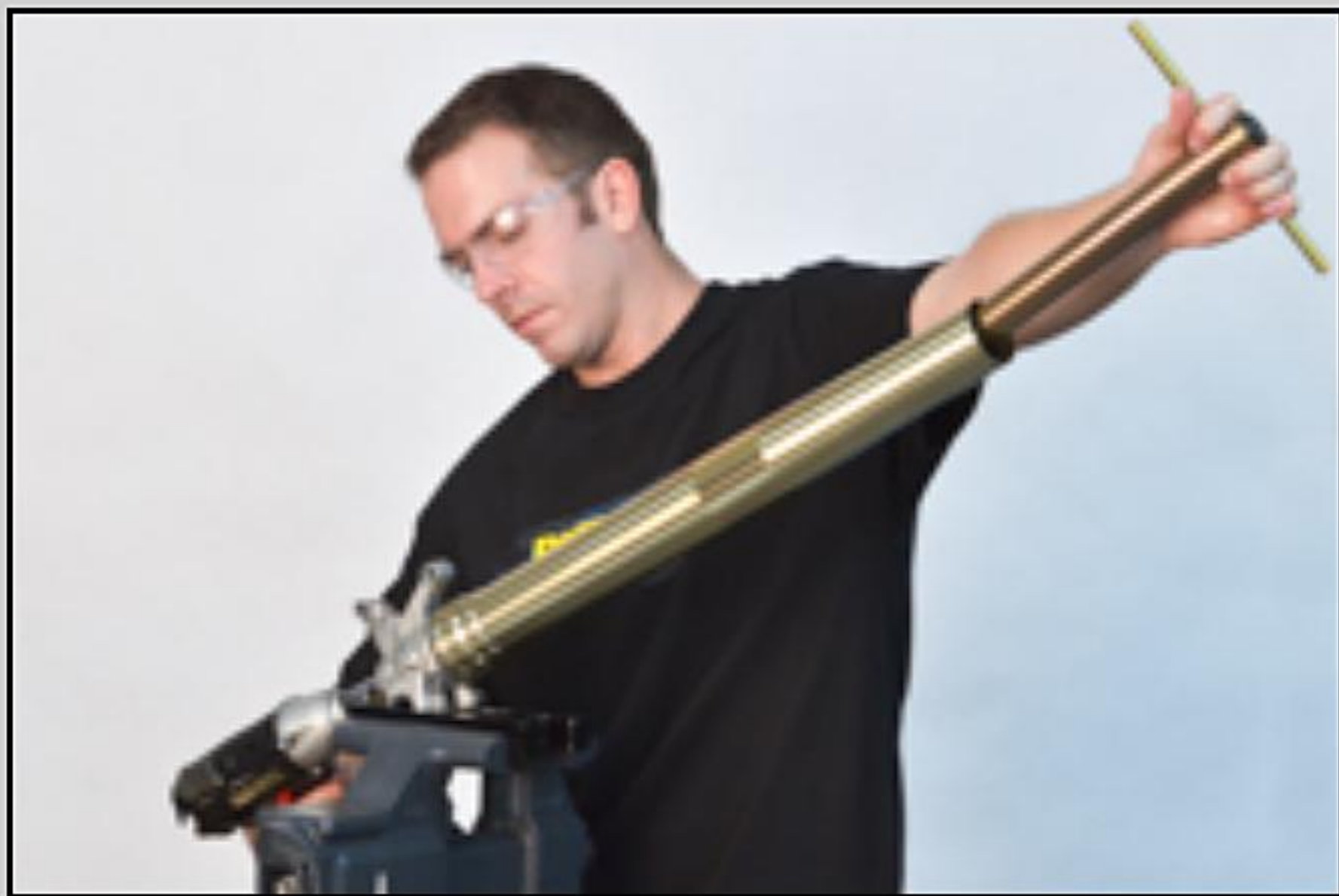
FD3- Using the Race Tech Tool, remove the valve core to release pressure.



FD4- Remove the fork cap using flat pliers or wrench.



FD5- Remove the cap from the rod.



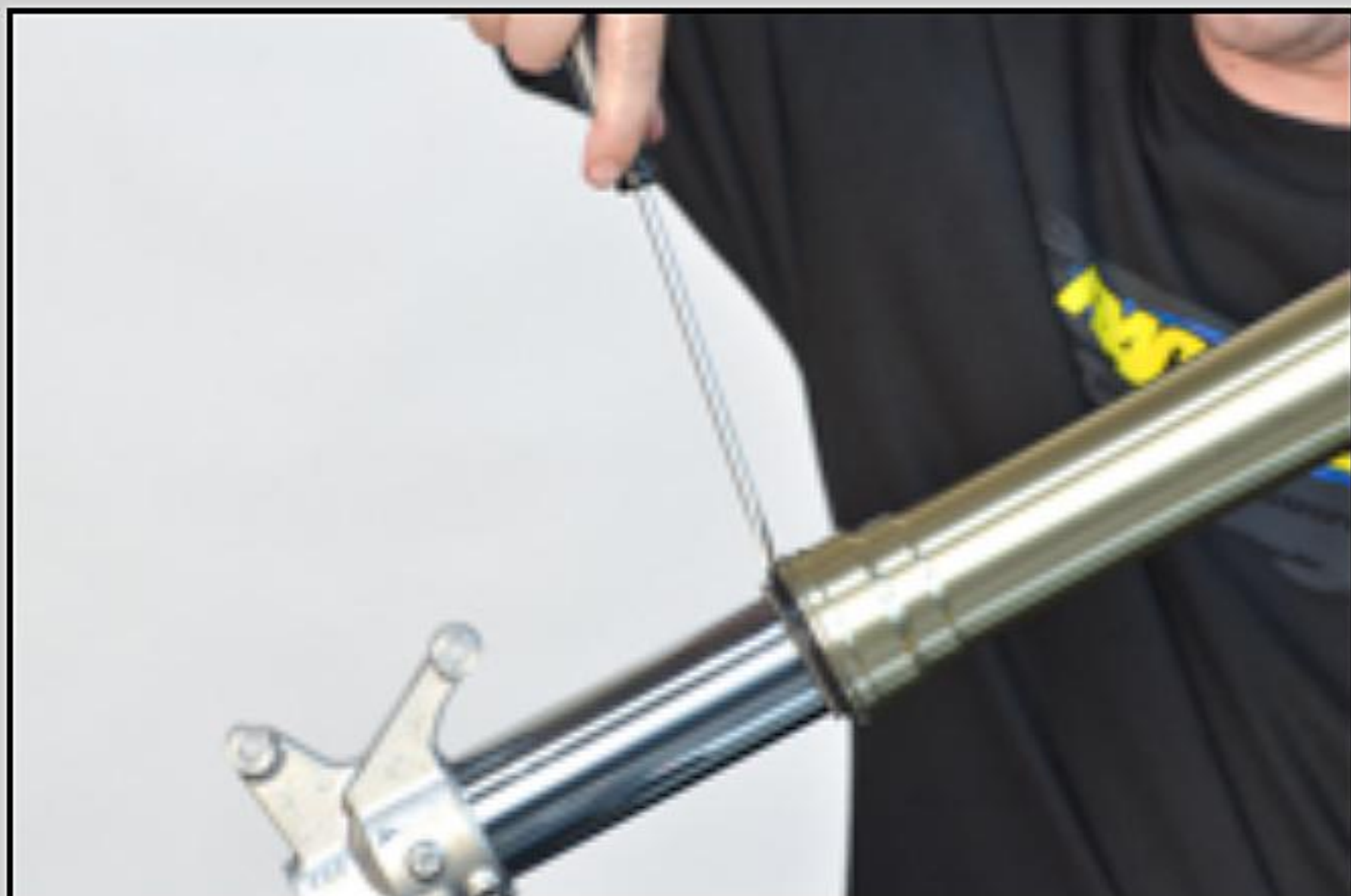
FD6- Using the Cartridge Holding Tool, hold the cartridge in place while removing the bottom fork bolt.



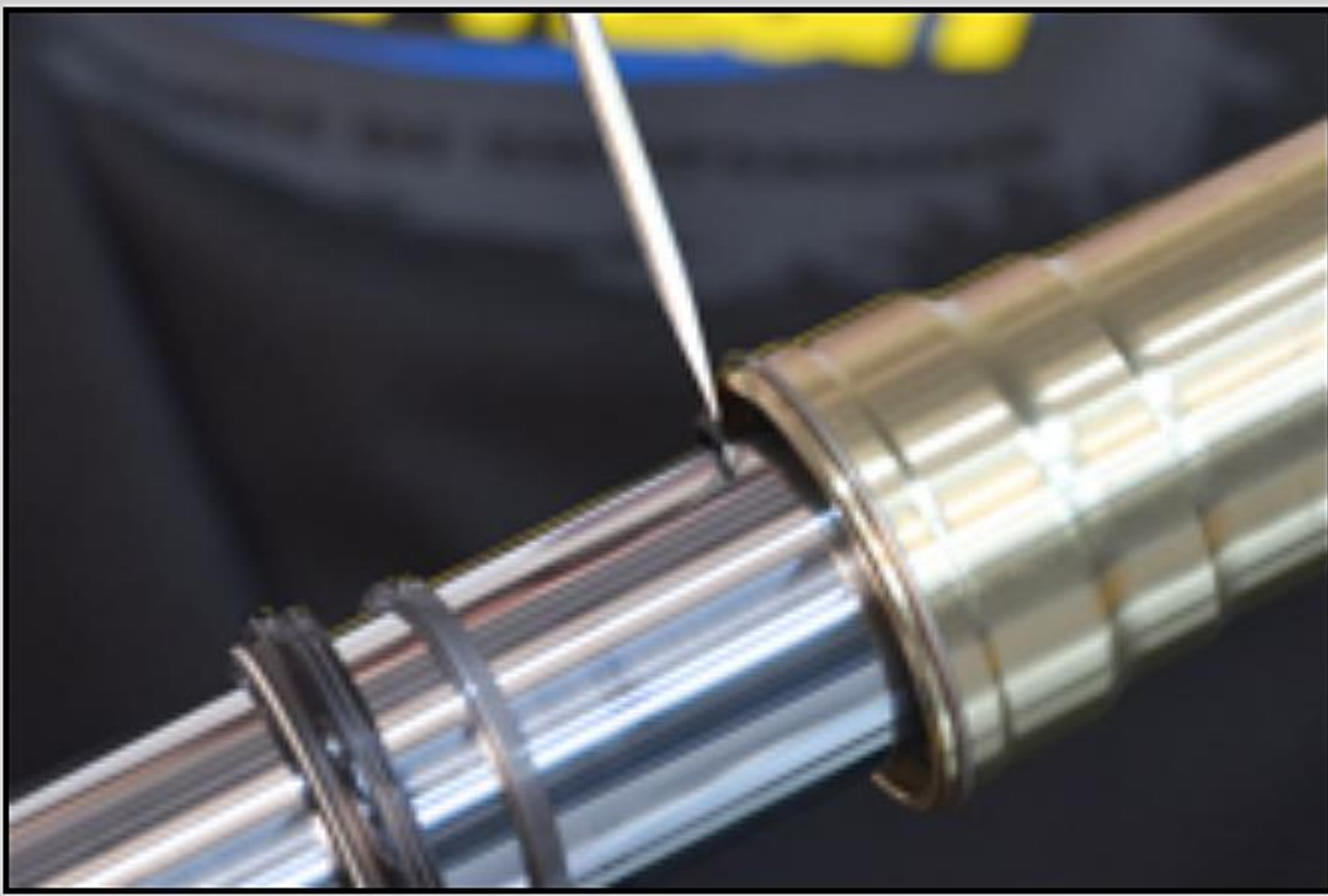
FD7- Remove the bottom fork bolt.



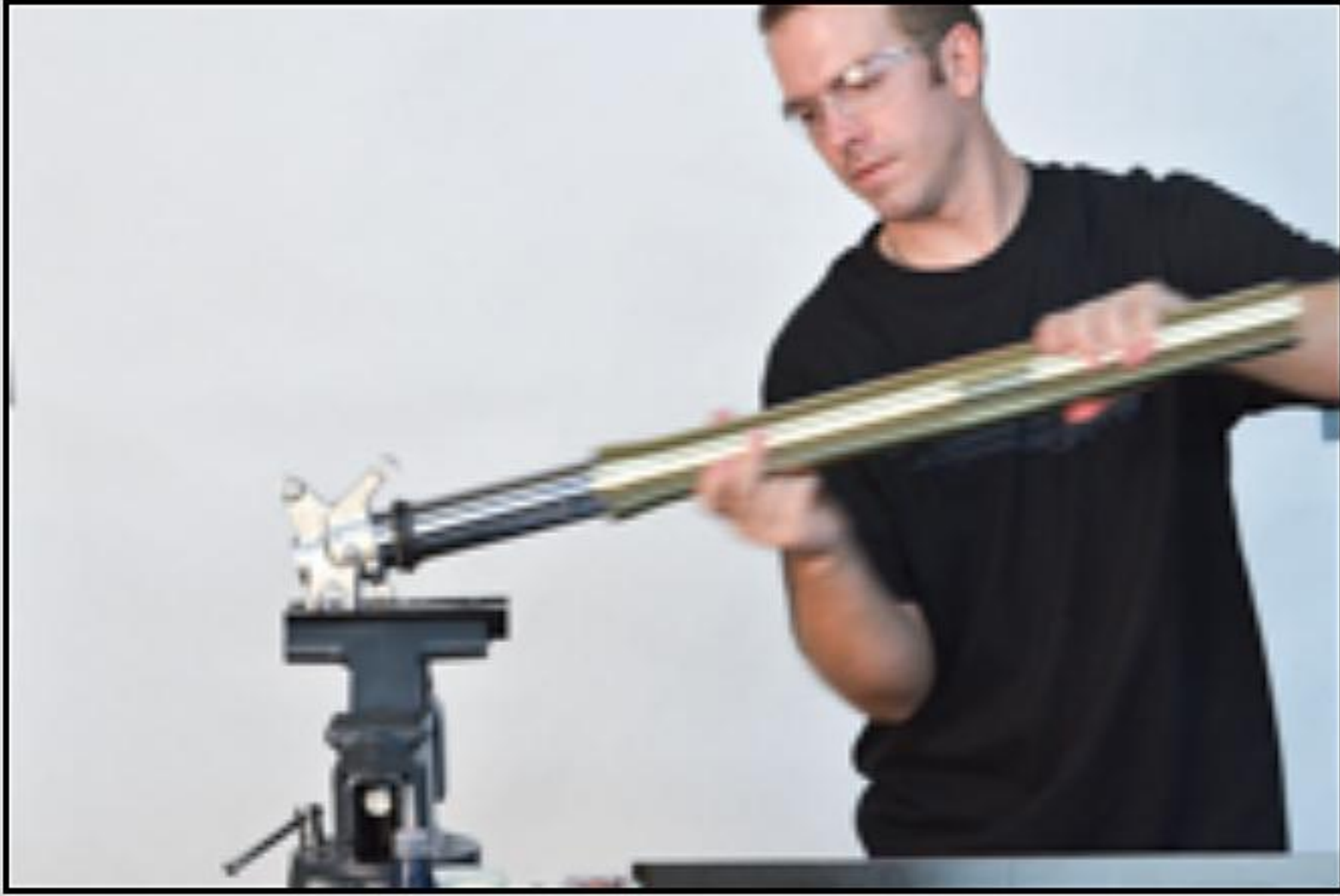
FD8- Remove the cartridge.



FD9- Using a flat head screwdriver, remove the dust seal.



FD9- Remove the circlip.



FD10- Remove the fork tube by slide hammering.



FD18- Tip: You may need to heat the seal/bushing area if the tubes don't come apart easily during slide hammering. Try slide hammering after heating the specified area.



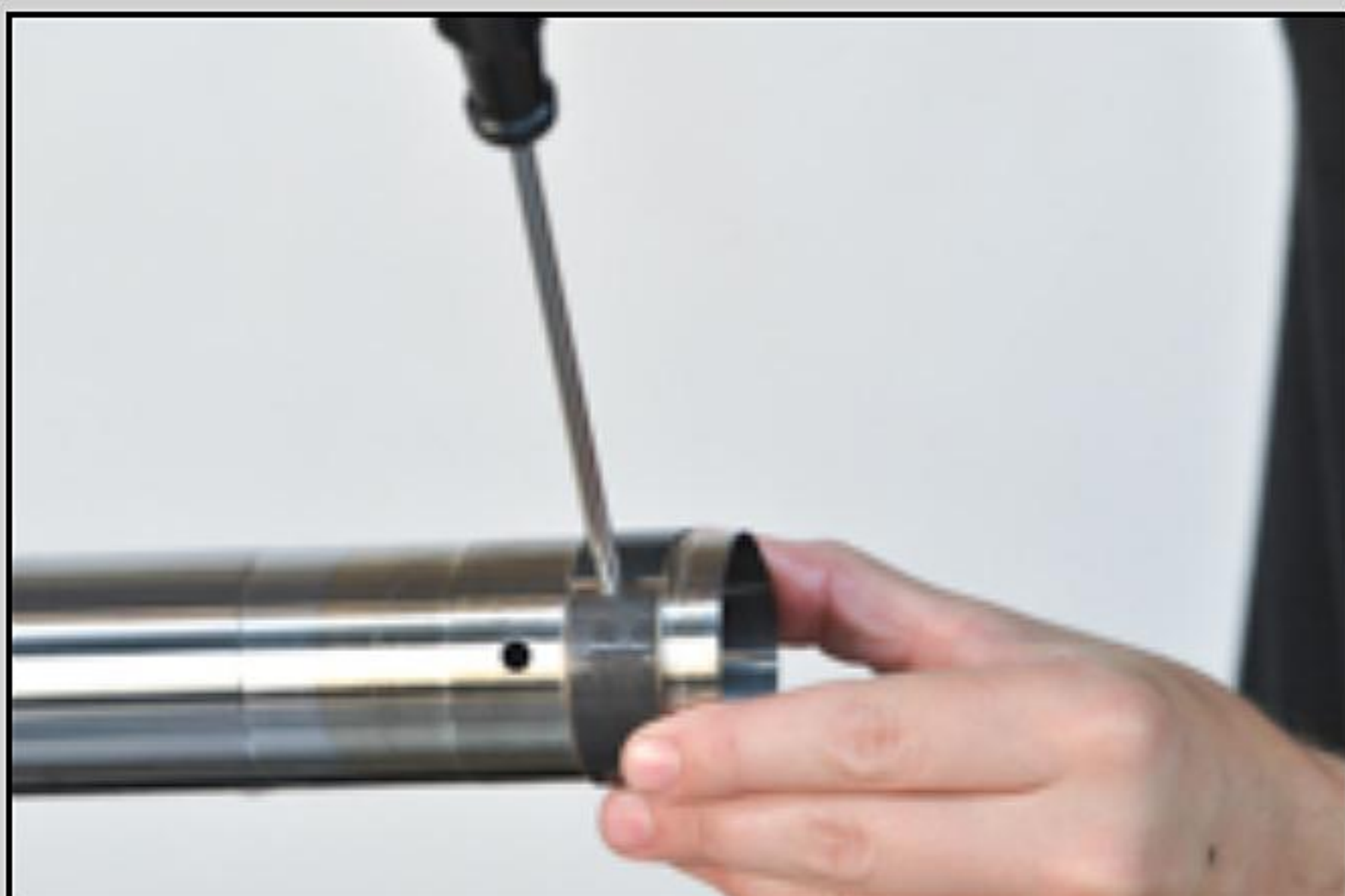
FD19- Some forks may suffer damage to the Teflon bushings during disassembly (as shown). It's good to have replacement bushings on hand, just in case.



FD20- Another way to remove the seal with a minimal chance of damage to the bushing is to completely fill the fork with used oil, invert it, remove the wiper and clip, and put it into hydraulic press to force the seal out.

This seems like it could be a big mess but if the fork is completely full and there is no compressible air space, the seal pushes out and a small amount dribbles over the edge.

Once the seal is out it is usually much easier to get the bushing out.



FD21- Remove the inner fork bushing with a screwdriver or fingernail. Fingernails are better if you have the strength.

FD22- Remove the bushings and the seal washer.



FD23- If you're not replacing seals, use blue painters tape or electrical tape to cover the sharp edge of the bushing groove during removal.



FD24- Inspect the bushings for damage, including worn-down Teflon* or embedded material.

*Teflon is a Trademark of Dupont Corp.



FD25- Inspect the fork tube for pits, dings, and straightness.

Come on AJ, you can look closer than that!



CARTRIDGE DISASSEMBLY

CD1- Hold the cartridge Tube with TFSH 32 Shaft Holding Tool. Loosen the compression base assembly from the cartridge.

You may need to use some heat on the thread. Do not heat over 350° F.

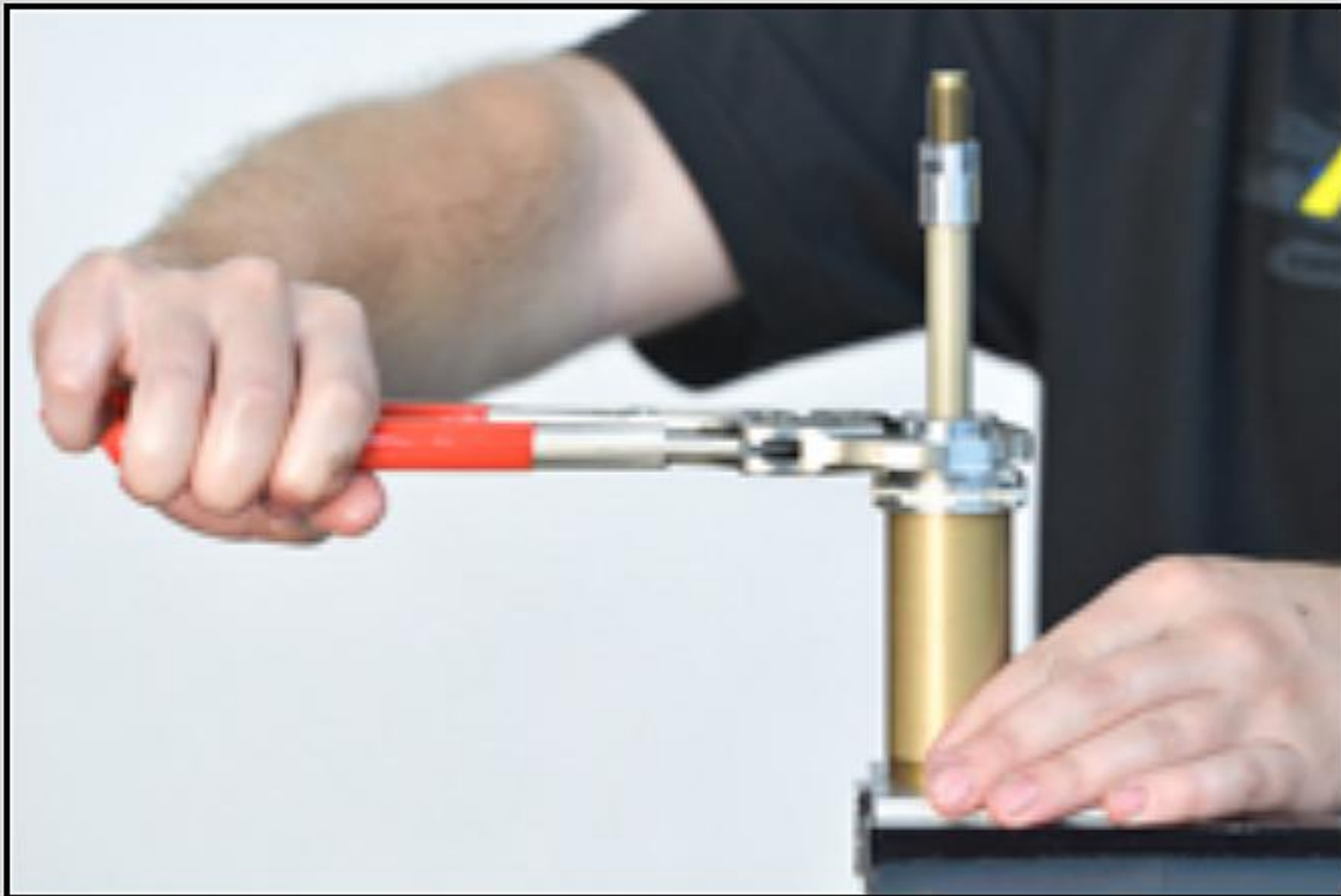
Laying the cartridge horizontally on an anvil and tapping with a plastic mallet on the threaded area works well too.



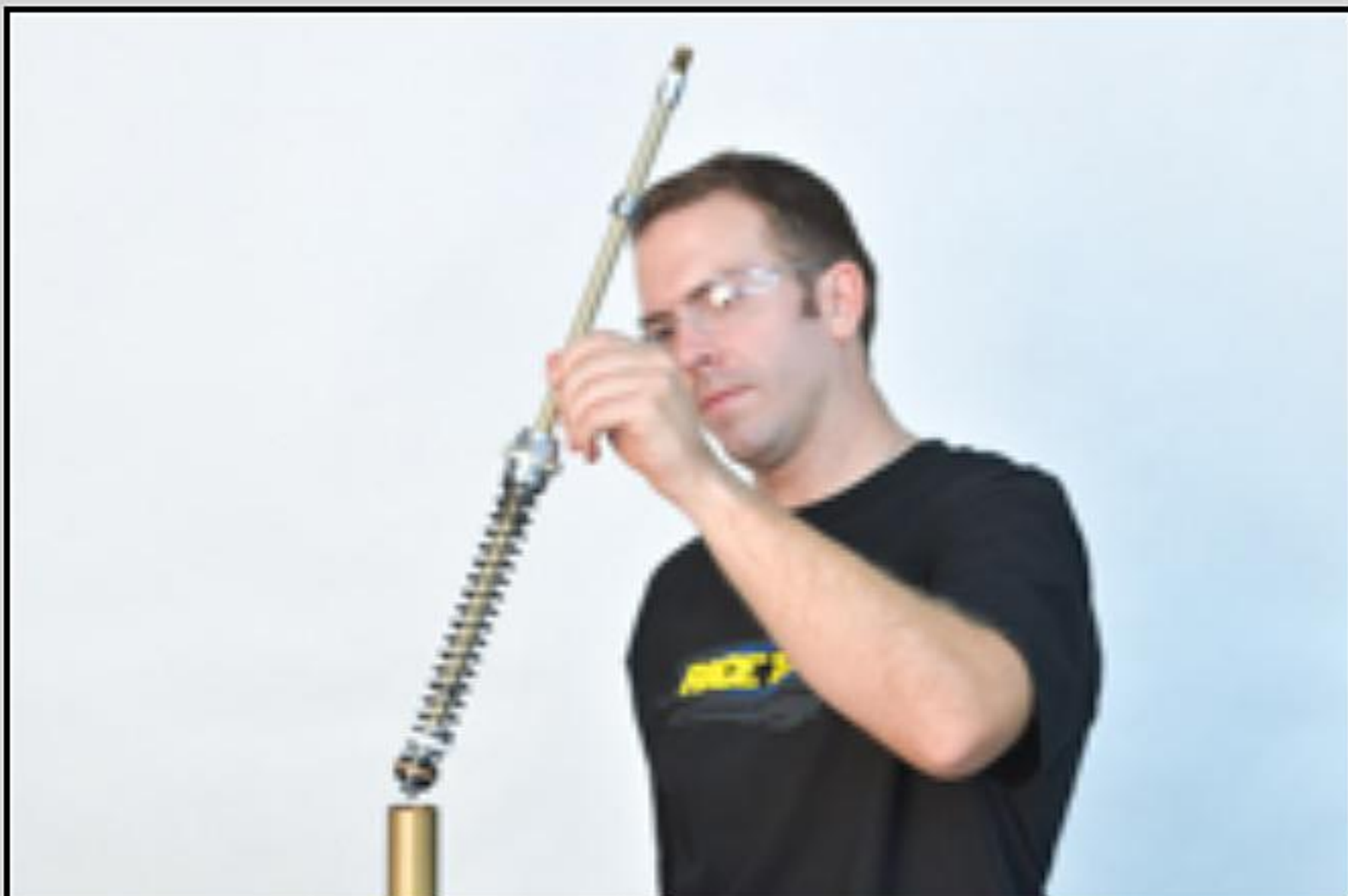
CD2- Remove the compression base assembly from the cartridge.



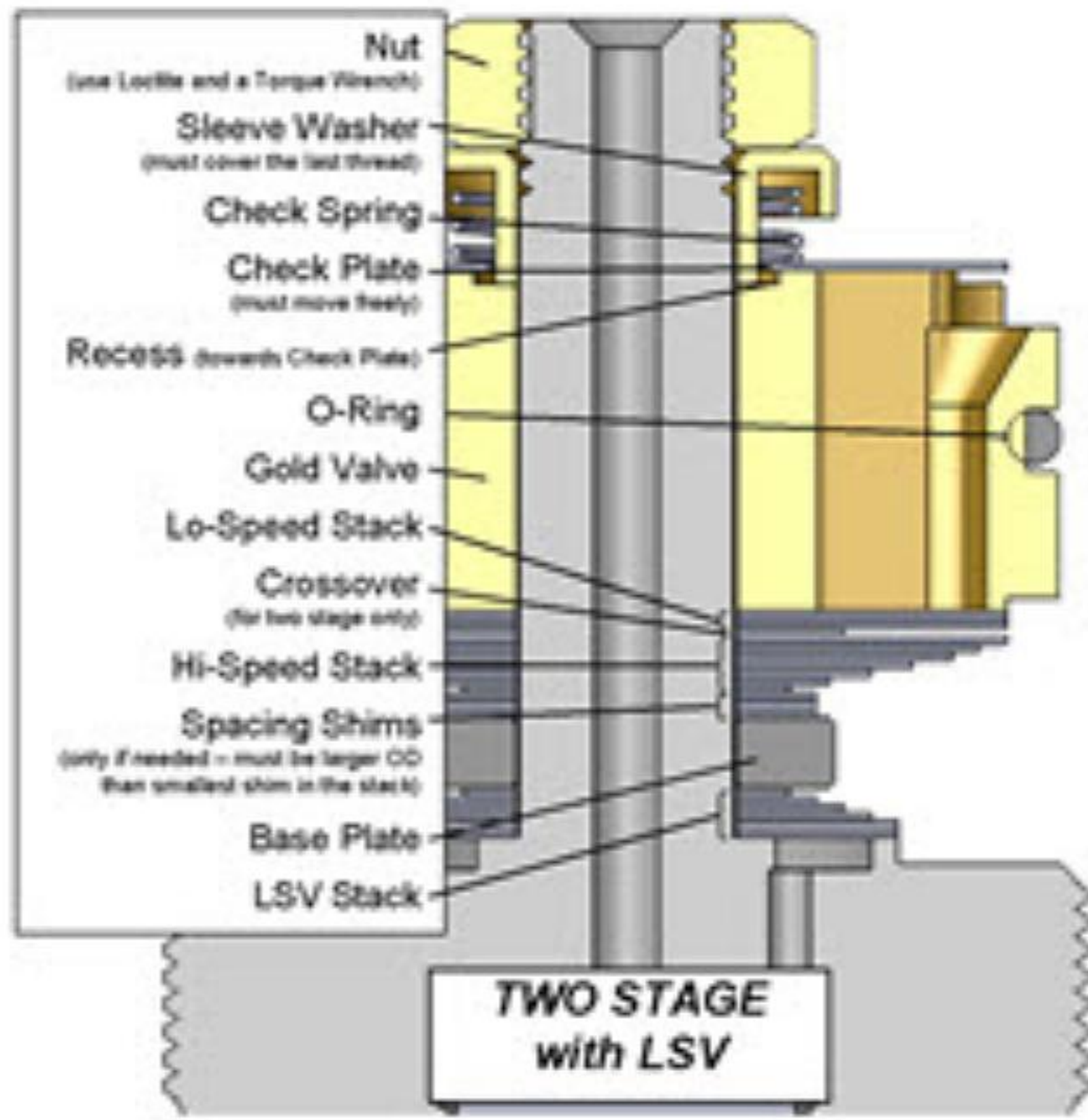
CD3- Loosen the cartridge head.



CD4- Remove the rebound rod and valving assembly.



FMGV 320802 2 STAGE 2015 KYB AIR



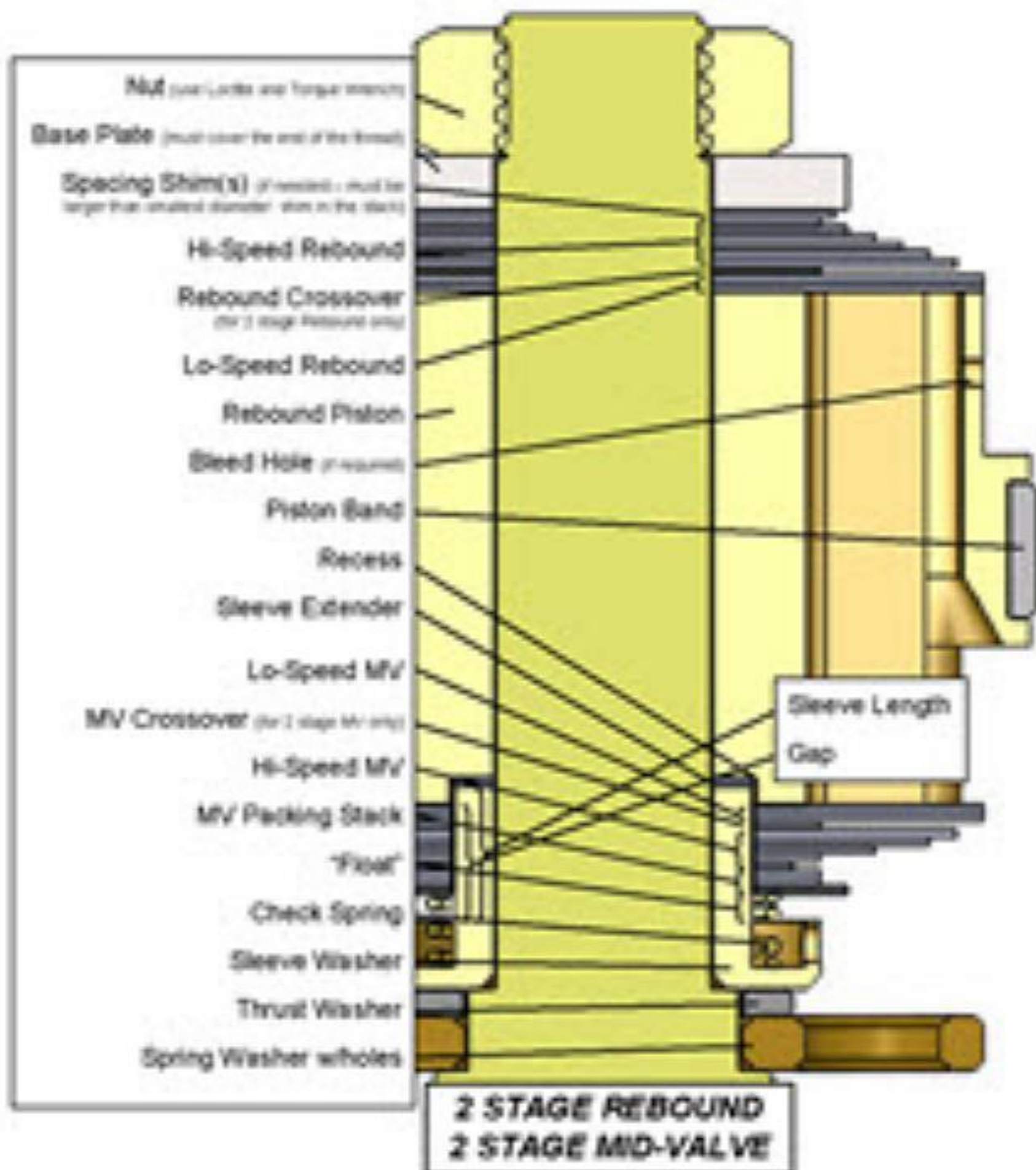
COMPRESSION VALVING

This is a Post Type Compression Assembly.

It has a LSV Valve (Low Speed Valve) below the compression stack.

You will replace the stock Wave Washer and Cupped Washer with the ones supplied in the kit.

FRGV 320802 2 STAGE KYB 2015 CRF450R AIR



REBOUND VALVING

CARTRIDGE ASSEMBLY

CA1- Apply Loctite to the cartridge head.



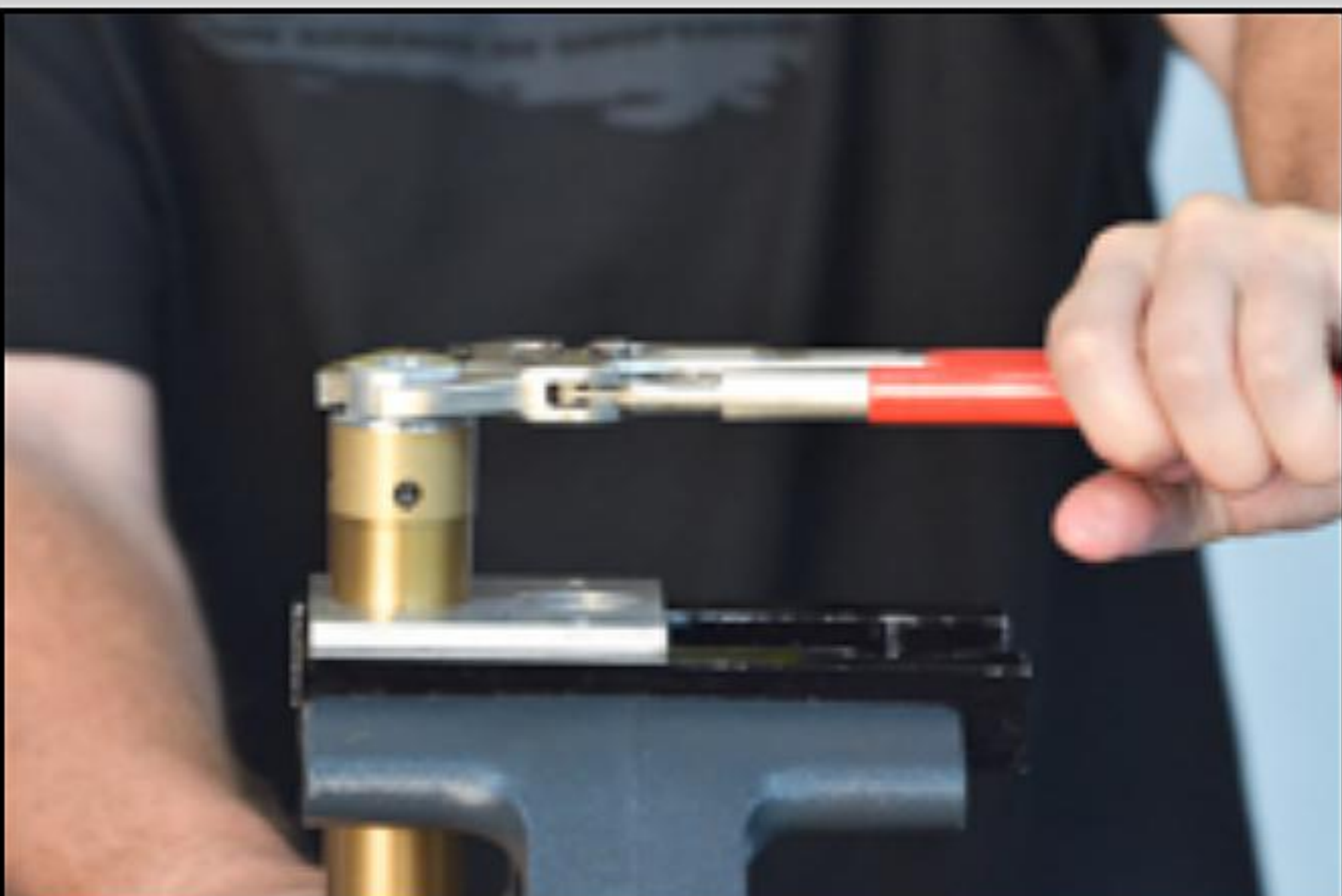
CA2- Insert the rebound rod assembly into the cartridge and tighten securely.



CA3- Apply Loctite to compression base assembly.



CA4- Tighten the compression base assembly into the cartridge.



FORK ASSEMBLY

FA1- Insert the cartridge into the fork tube.



FA2- Install the fork bottom bolt.

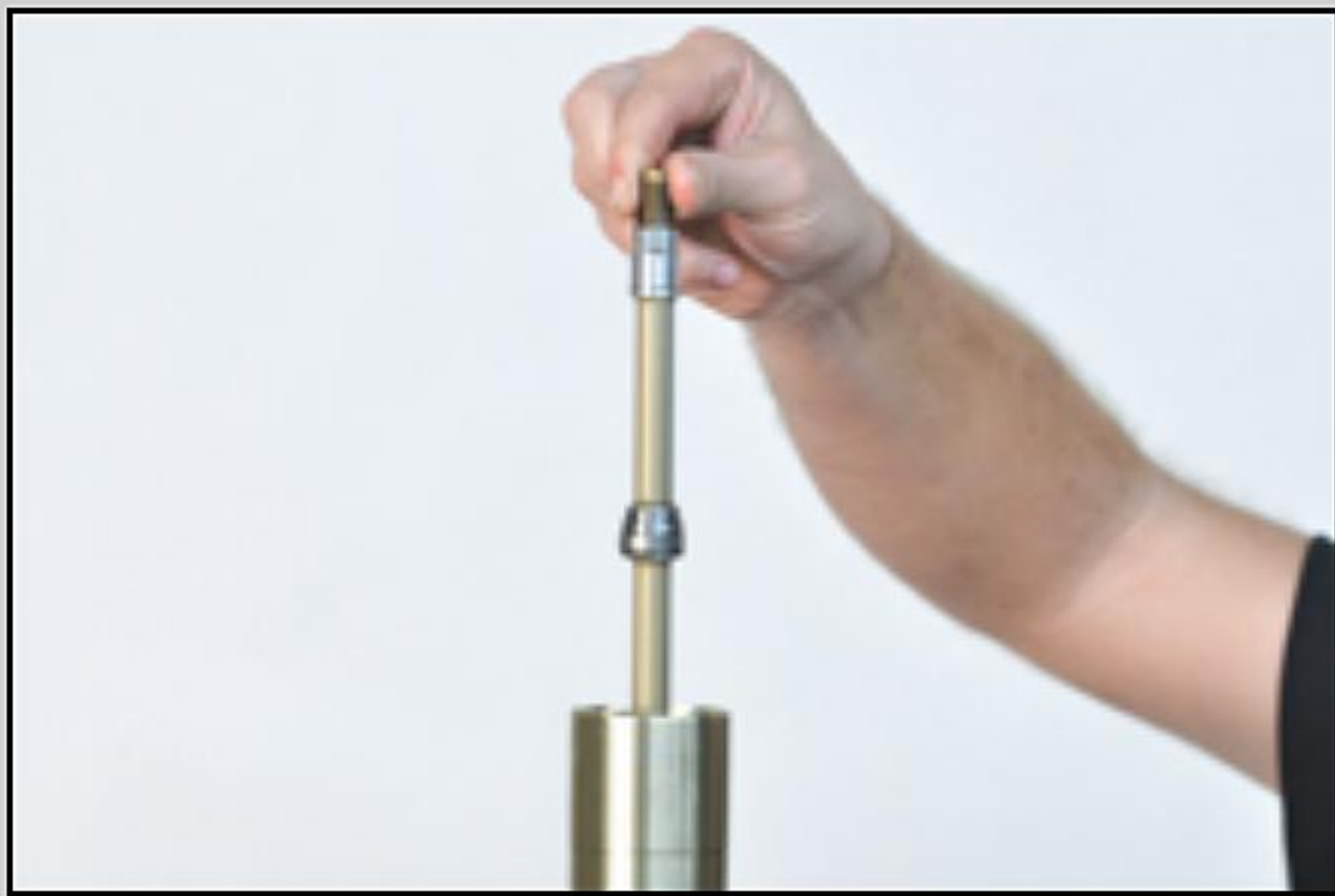


FA3- Using the Race Tech tool, tighten down the fork bottom bolt.



FA4- Pour oil into the fork tube.

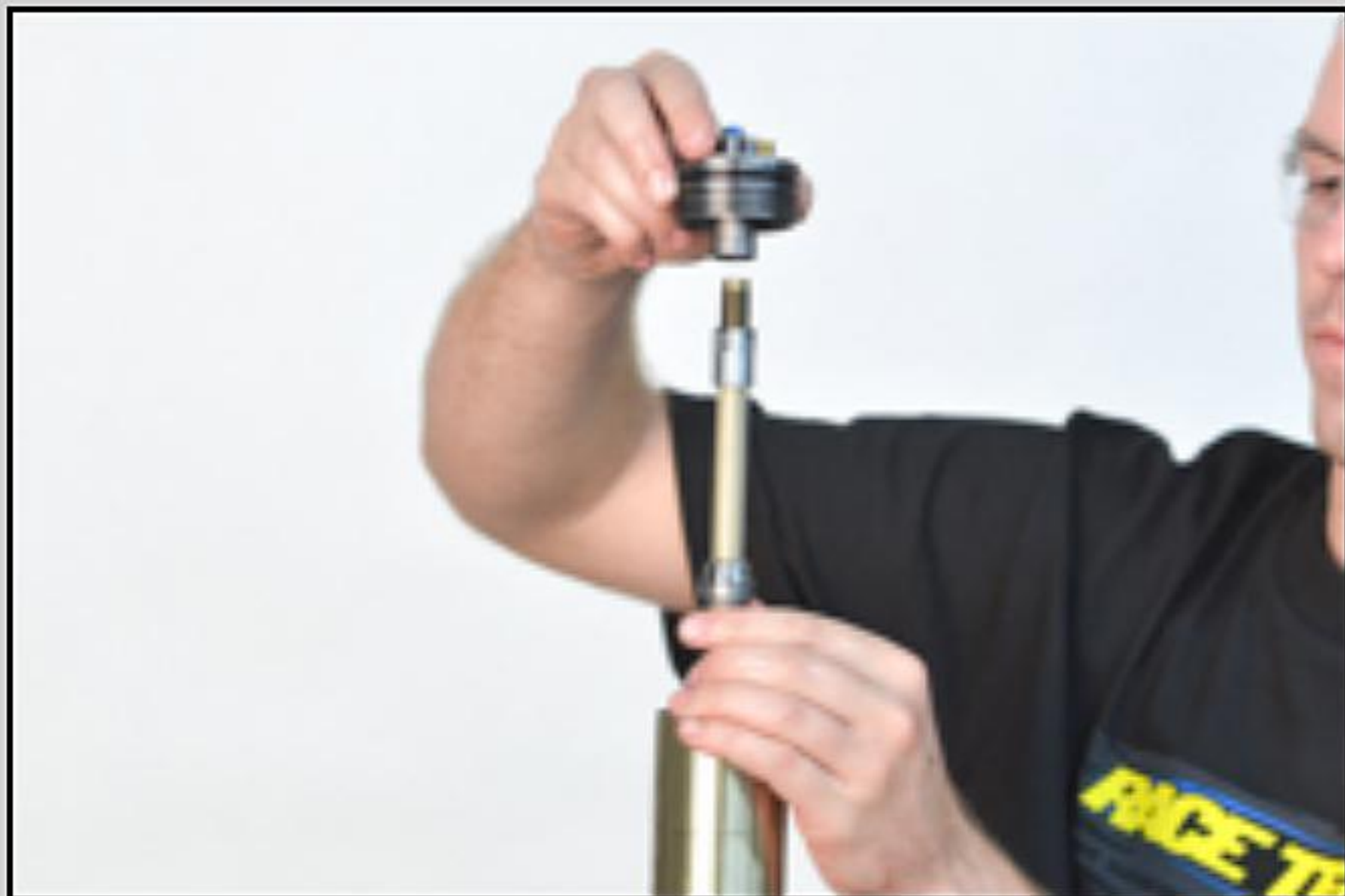




FA5- Pull up to bleed oil through and..



FA6- compress to finish the process. Repeat until the fork is bled fully.



FA7- Install the cap onto the rebound rod.



FA8- Secure the lock nut to the cap.

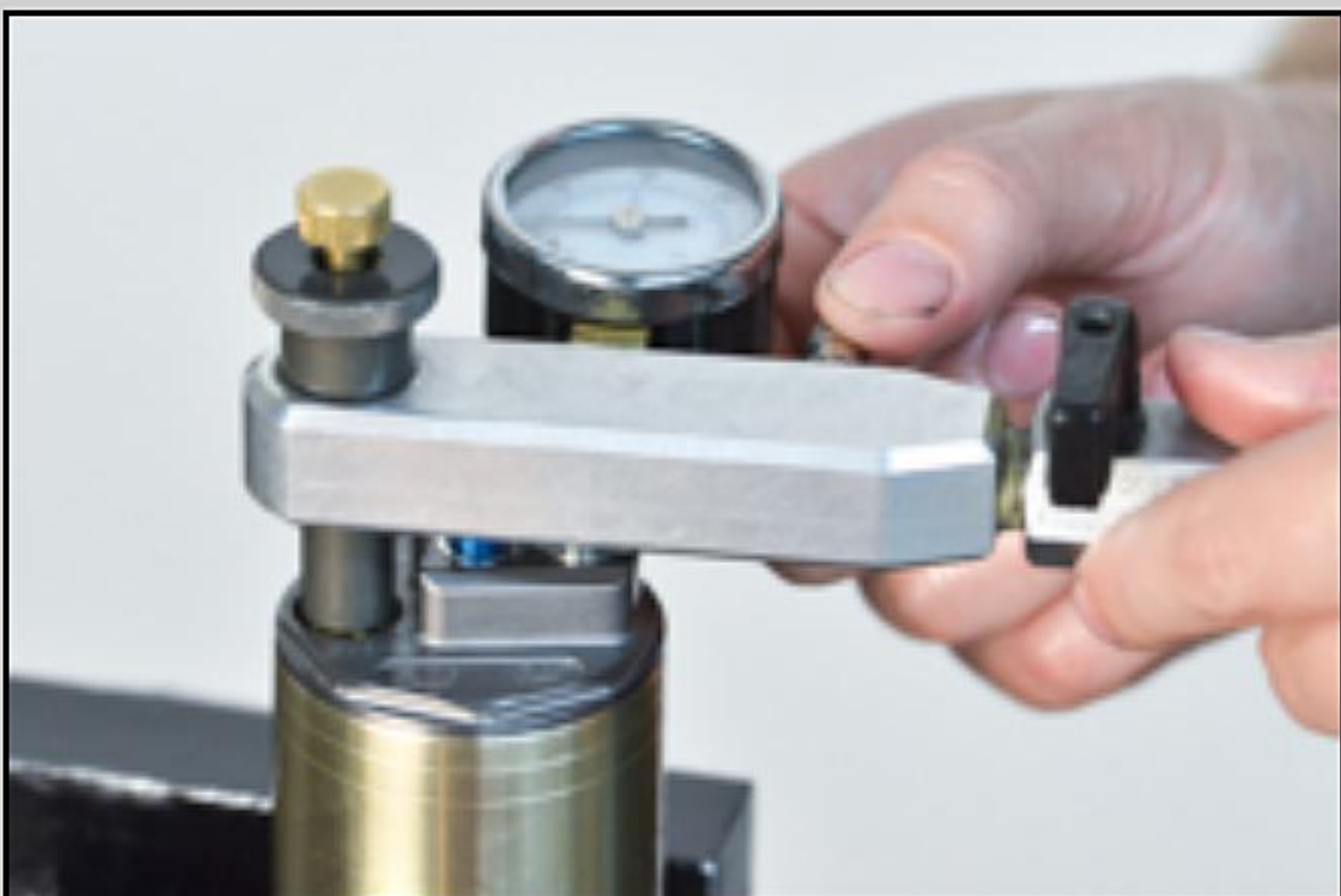
FA9- Securely tighten down the cap.



FA10- Install the valve core.



FA11- Pressurize the fork to required specification from DVS sheet.



FA12- Install the valve cap.

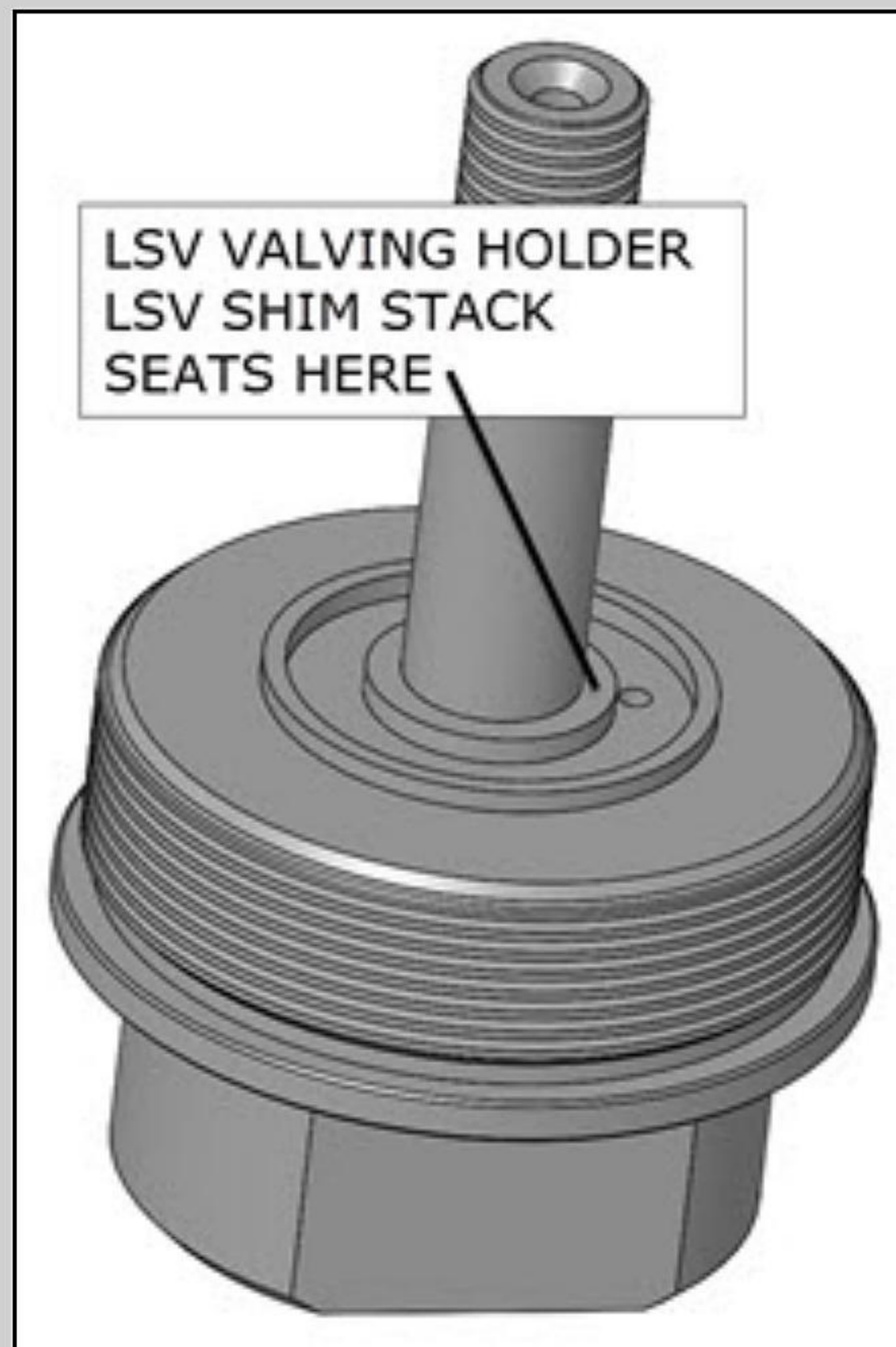
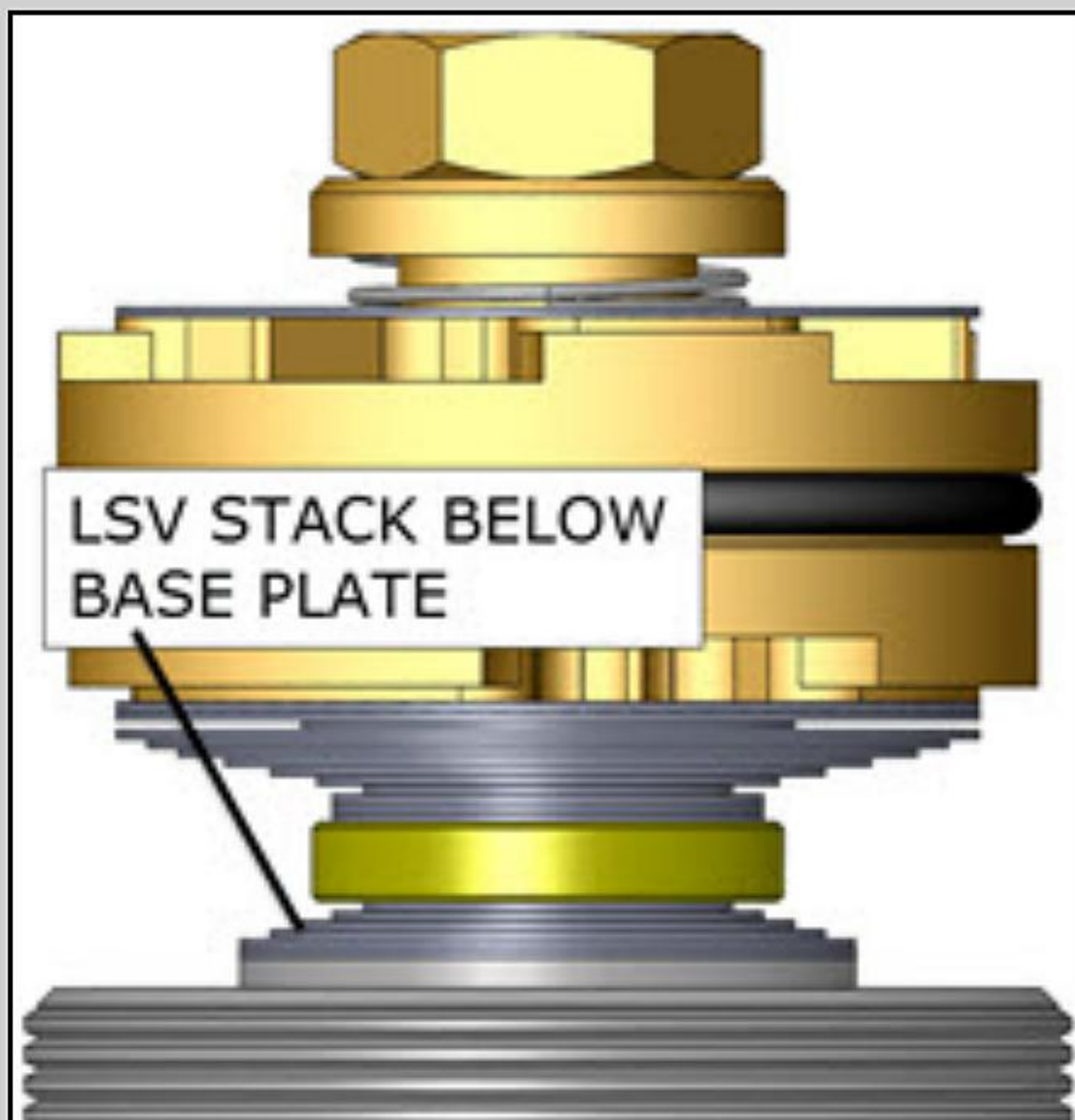


FA13- Apply 5 more horsepower by installing Race Tech sticker.



FORK COMPRESSION GOLD VALVE INSTALLATION WITH LSV (LOW SPEED VALVE)

These instructions cover Compression Valving Assemblies with a Low Speed Valve (LSV). LSV Compression Holders are identified by a second valving stack below the Compression Base Plate. The LSV Stack is fed by the Compression Adjuster. Stiffer LSV Valving makes the front end ride higher.



Welcome to the wonderful world of Gold Valving. To obtain your personal Custom Suspension Settings:

[DVS Setup Sheet](#) - If you haven't already, go to [DVS Valving Search](#), insert your Access Code, and rider data and print your DVS Setup Sheet.

For general fork rebuild procedure refer to the [Fork Gold Valve Instruction List](#).

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

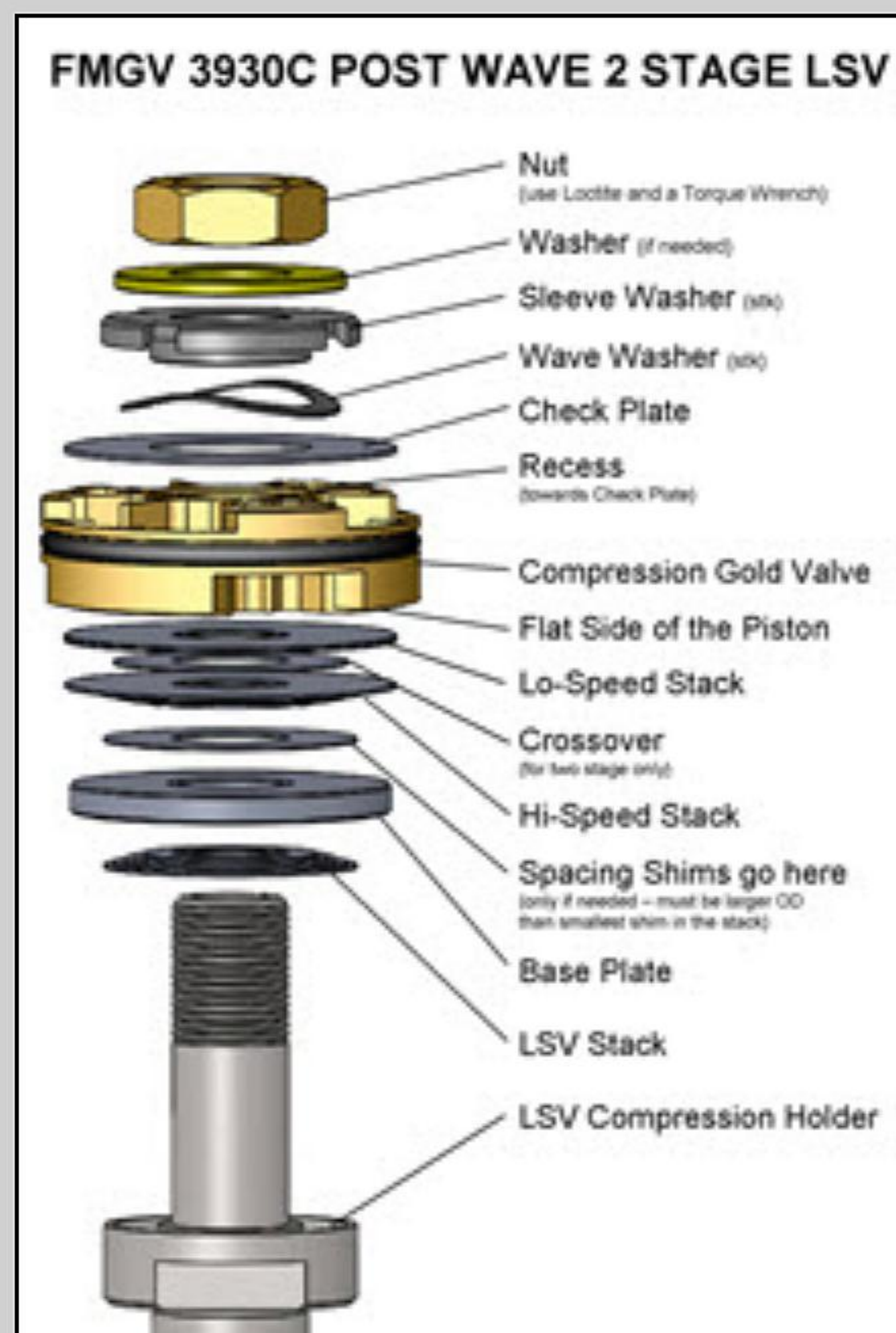
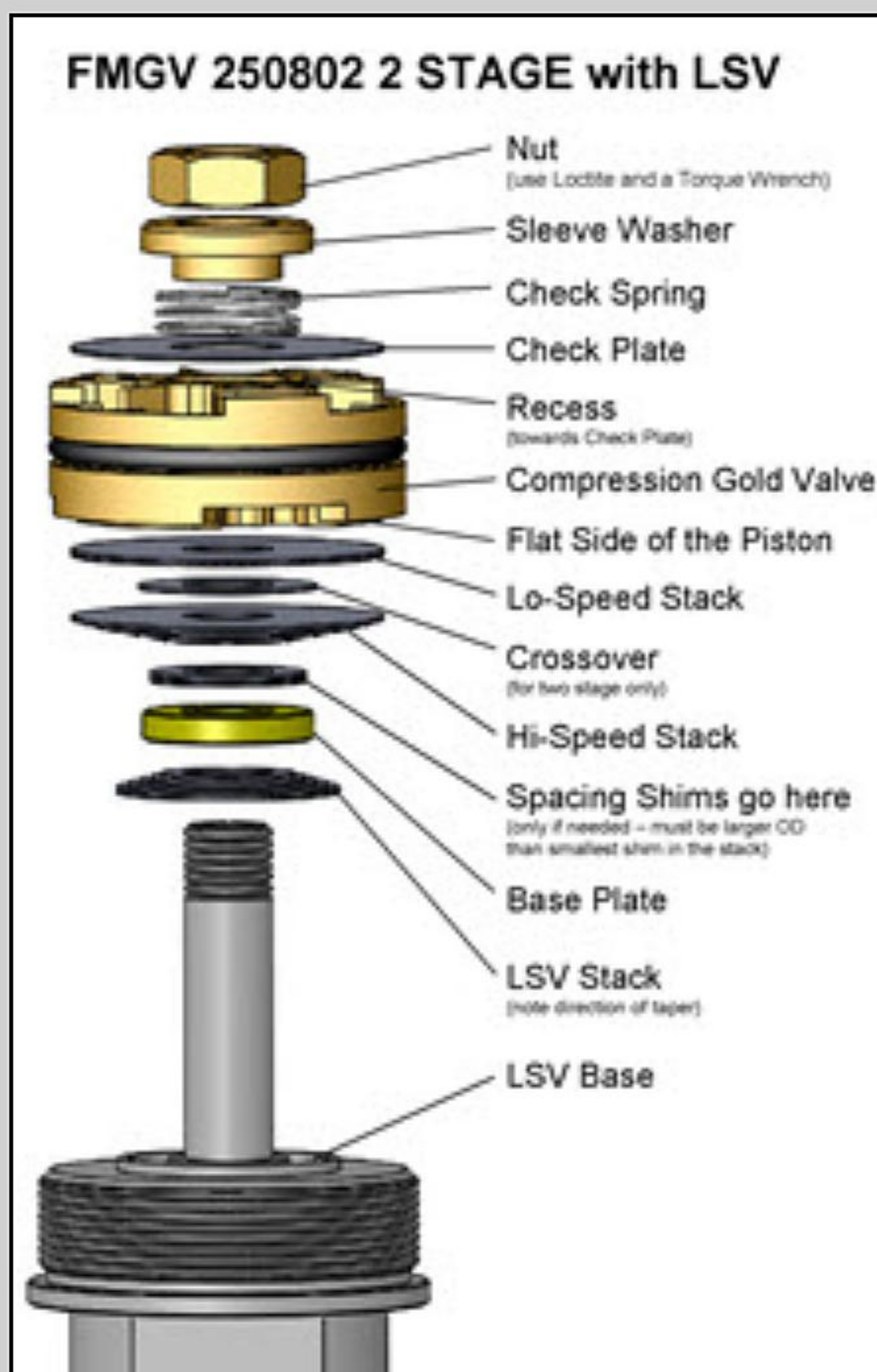
NOTE: All measurements are metric (for inches divide by 25.4). The valving list starts at the piston face and goes towards the Base Plate. Valve specs are listed by (QUANTITY) THICKNESS x DIAMETER. A number in parentheses means quantity. If there is no number in parenthesis the quantity is one. Example: (2).15x30 means quantity two, 15 hundredths of a millimeter thick by 30 millimeters in diameter.



Tools Required

- In-lb torque wrench that accurately measures 0 to 50 in-lbs (0.58 kgf-m) (SnapOn Digital Torque Wrench shown)
- Hi-Strength Loctite (included)
- Metric calipers and micrometer

There are about four styles of compression holders. There are a few subtle hardware differences but are all very similar.





VP1- Most Japanese forks like KYB and Showa have peening on the end of the shaft for nut retention insurance.

File the peening from the top of the compression shaft down to the top of the nut.

There are some models where the shaft is "staked". This means there are sharp notches instead of smooth peening. In this case be sure the notches are completely cleaned out.

Euro models like WP, Sachs, and Ohlins are not peened and don't require this step.



VP2- The shaft should be ground to the nut's surface. Once this is done, remove the nut and Valving Stack.



VP3- On peened type holders, slightly chamfer the end of the thread with a fine file. Do not be too aggressive as on some models there is not much thread.

If you blow it and mess up the thread please call us as we may have a solution available.

Dressing the end with a wire wheel makes it very clean.



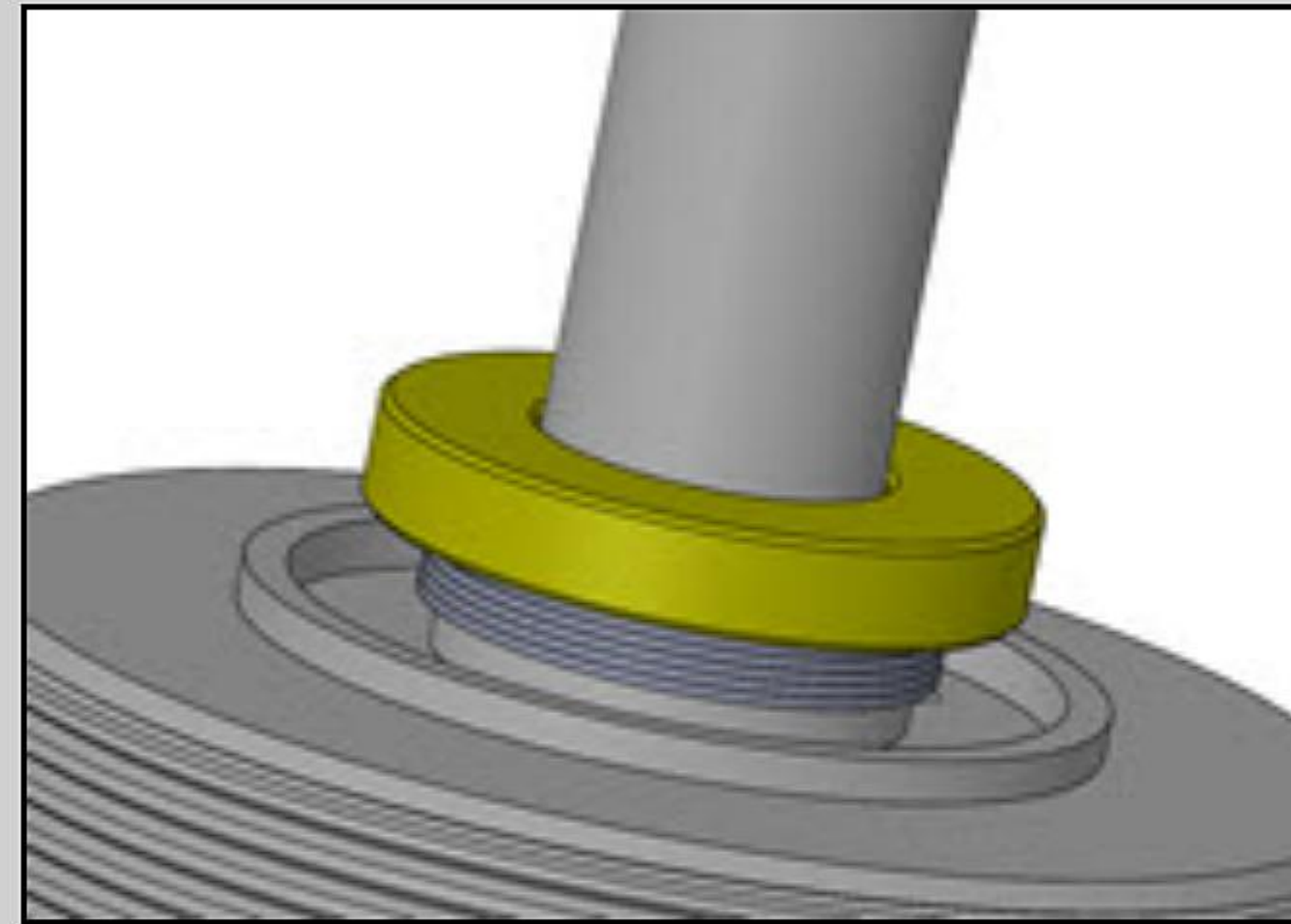
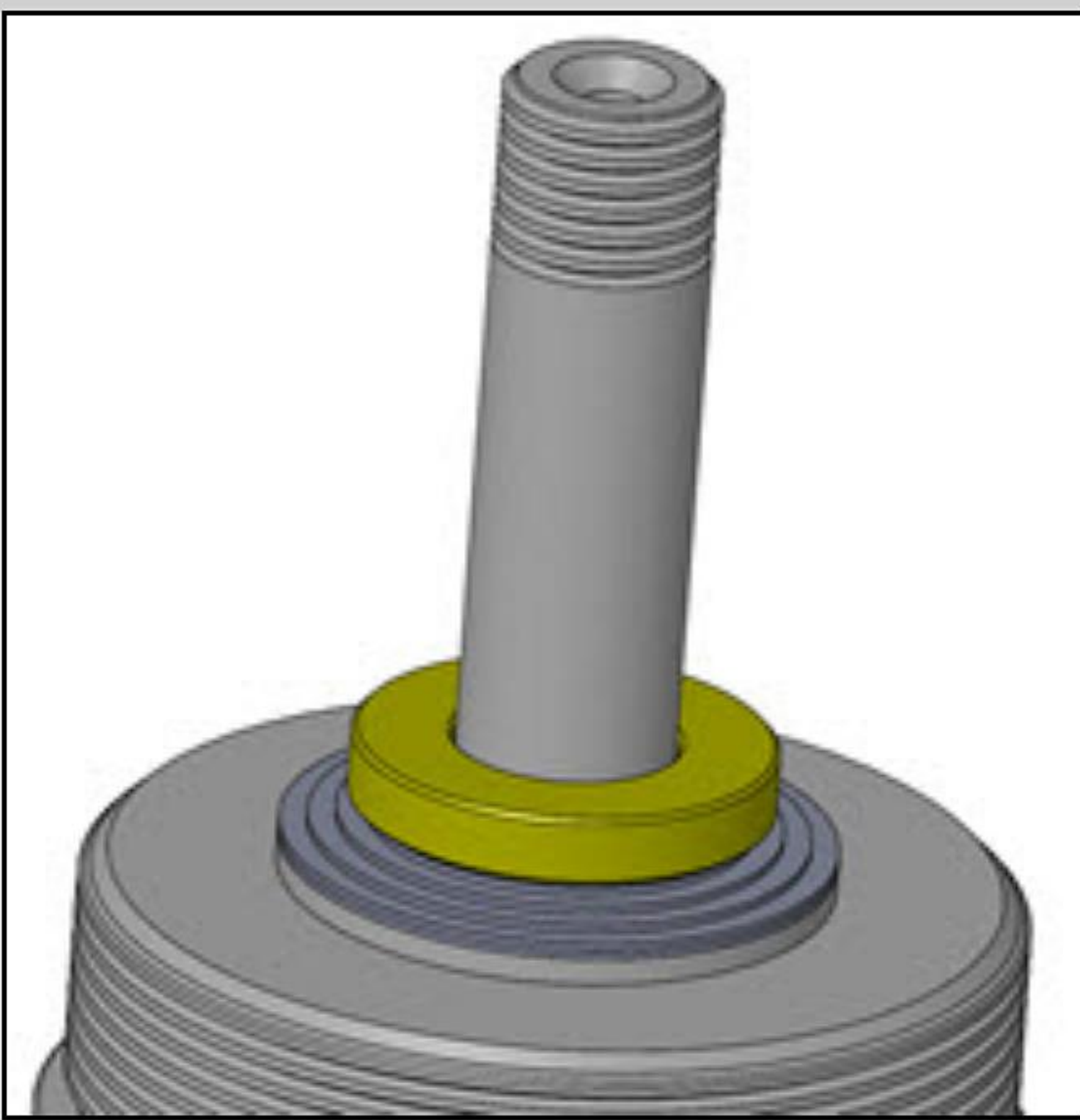
VP4- Blow air through one of the side holes while covering up the other side hole. This blows out fillings. Use contact cleaner and repeat.

VP5- Install the LSV Stack and the Base Plate on the Shaft.

Note the largest diameter shim goes on the shaft first.

There are models that require 2 or even 3 Base Plates to create the correct Total Valve Stack Height. See step VP11.

There are some valving stacks that do not completely cover the seat. This disables the LSV and converts it to a conventional adjustable bleed. See your DVS Setup Sheet and the image below.



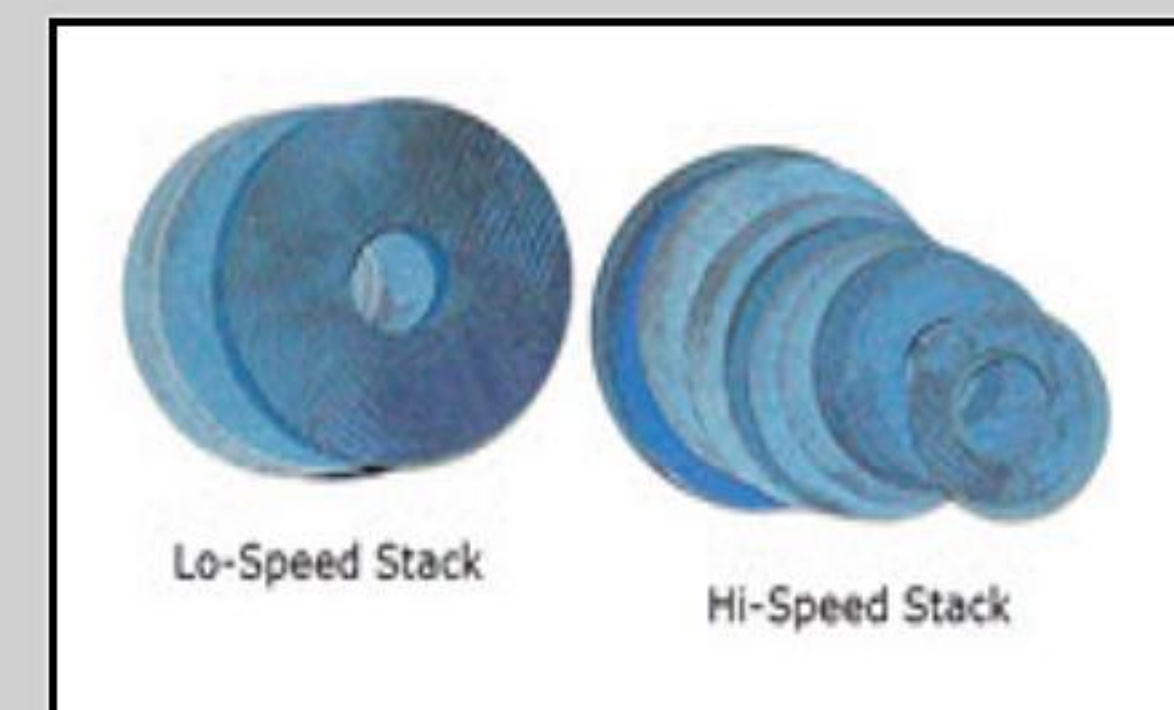
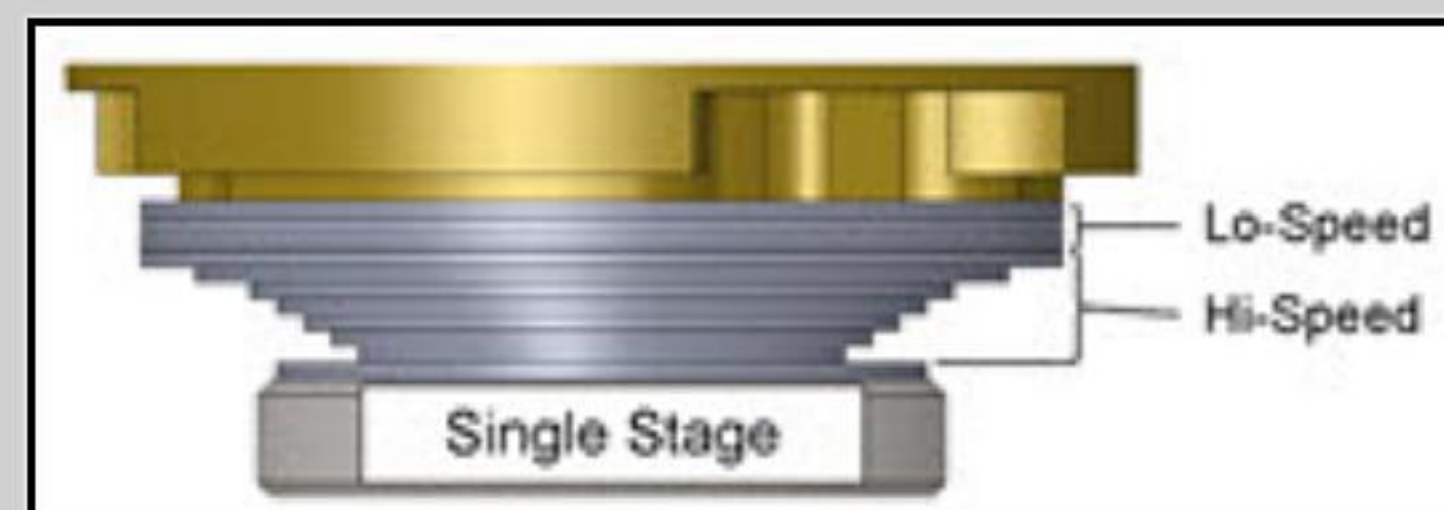
VALVING STACK TYPES - SINGLE OR TWO STAGE

VP6- You will either be building a Single Stage or a Two Stage Stack. The difference is the Crossover. The Crossover is a smaller diameter shim between the Lo-Speed and the Hi-Speed Stacks.

Note: The DVS Custom Setup Sheet displays individual shims and does not label Hi-Speed, Crossover, and Lo-Speed. This is for your information only. Also you will not use all the shims provided in the Gold Valve Kit.

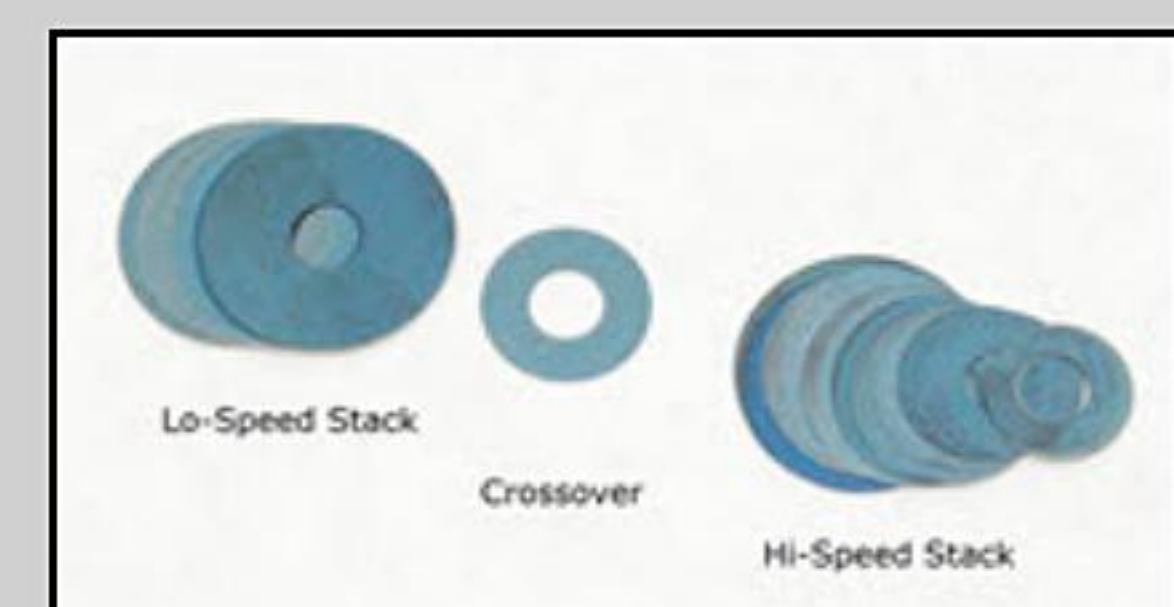
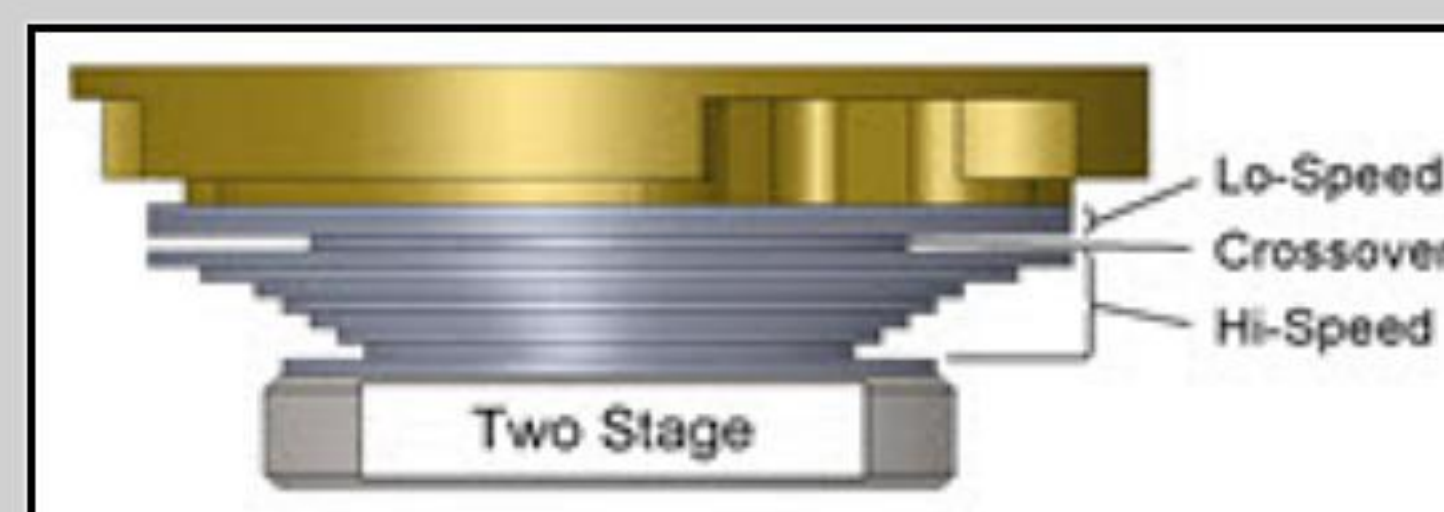
- **Single Stage** - made of:
Lo-Speed Stack
Hi-Speed Stack

There is NO Crossover
(it becomes one stack.)

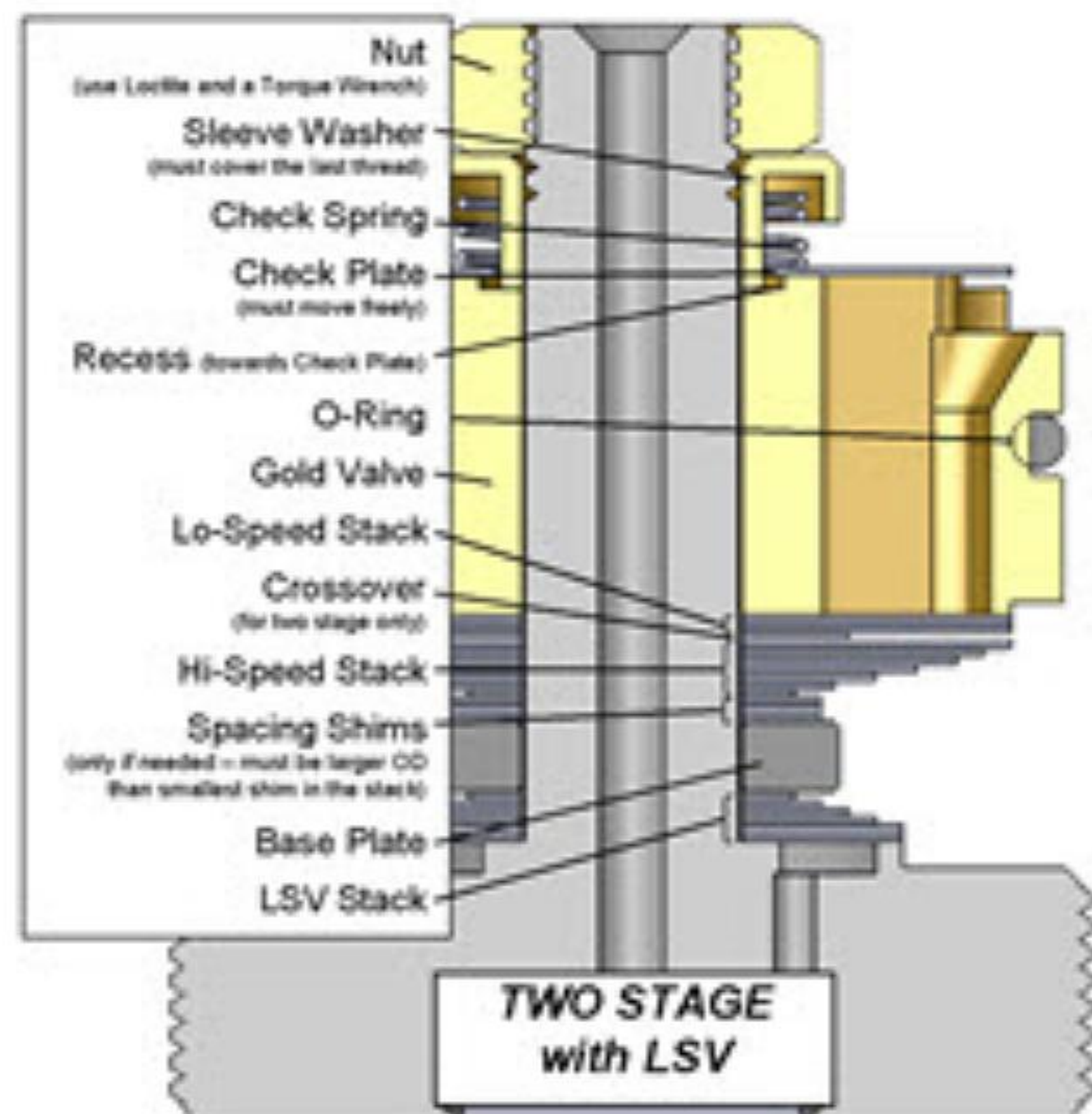


- **Two Stage** - made of:
Lo-Speed Stack
Crossover
Hi-Speed Stack

The Crossover Gap is visible



FMGV 320802 2 STAGE 2015 KYB AIR



VP7- Two Stage Example

(Single Stage is exactly the same except there is no Crossover)

Put the valving on the shaft **in the reverse of the order listed**, starting with the last (smallest) shim of the Hi-Speed Stack.

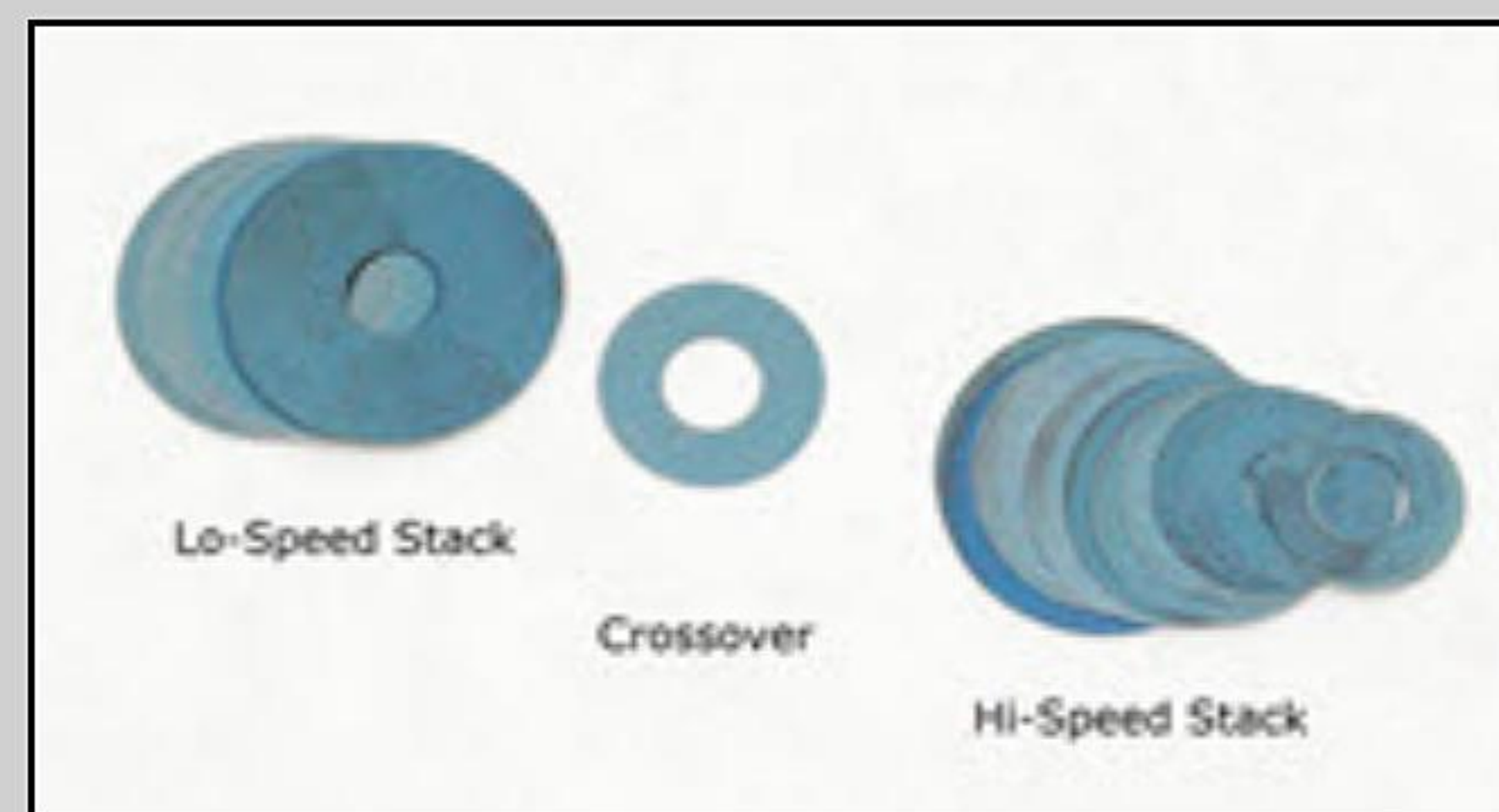
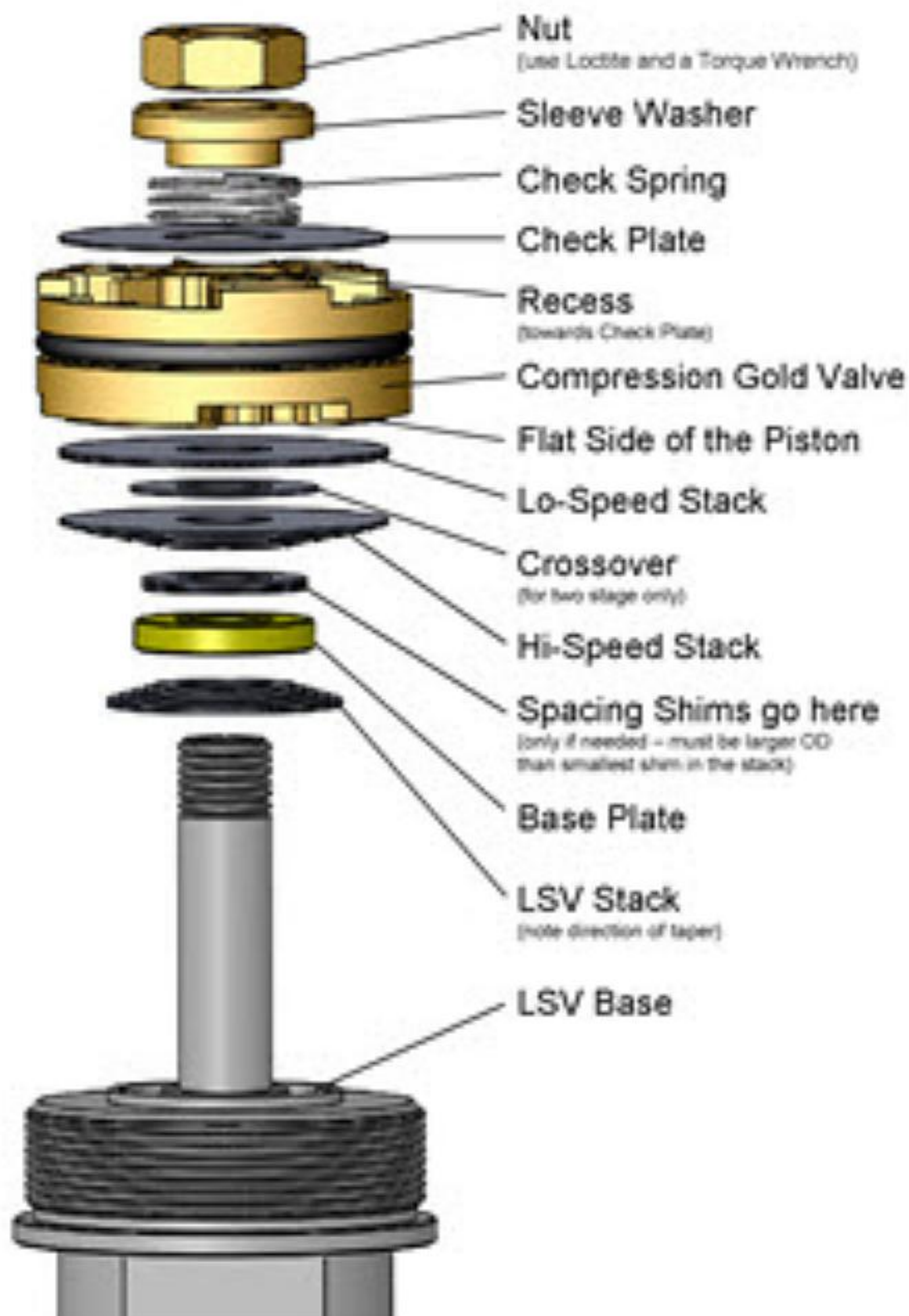
For Two Stage the total valving stack is made up of a:
Lo-Speed Stack
Crossover and a
Hi-Speed Stack

(this is only an example for a 20mm piston to show the direction of the taper - not your setting)

The Total Valving Stack starting from the Gold Valve piston face:

- (4) .15x17 - Lo-Speed Stack
- (1) .10x11 - Crossover (notice the smaller diameter)
- (1) .10x17 - Hi-Speed Stack
- (1) .10x16
- (1) .10x15
- (1) .10x14
- (1) .10x13
- (1) .10x12
- (1) .10x11
- (1) .10x10

FMGV 250802 2 STAGE with LSV

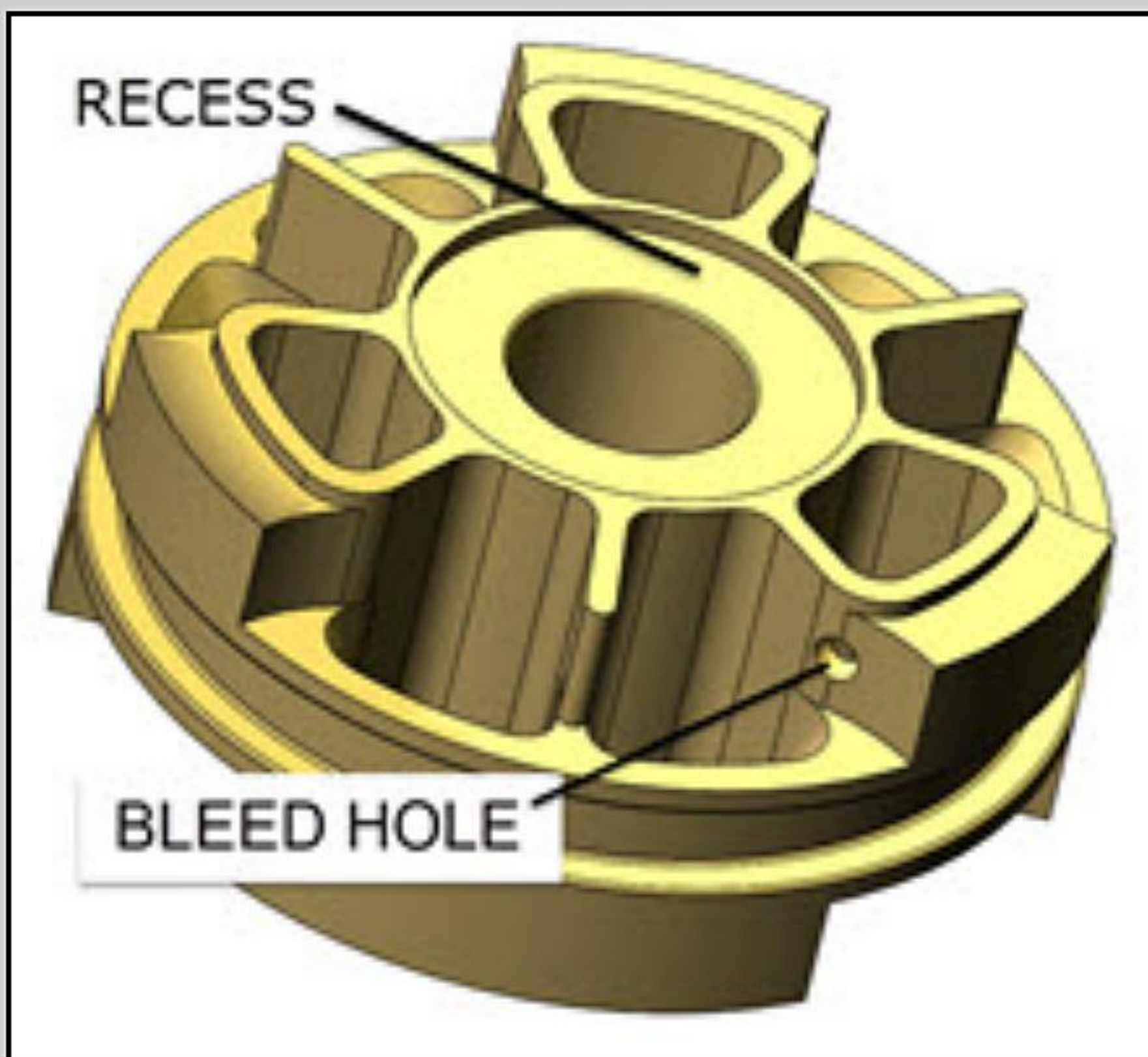


VP8- COMPRESSION BLEED HOLE

If the DVS does not call for a Compression Bleed Hole skip this step.

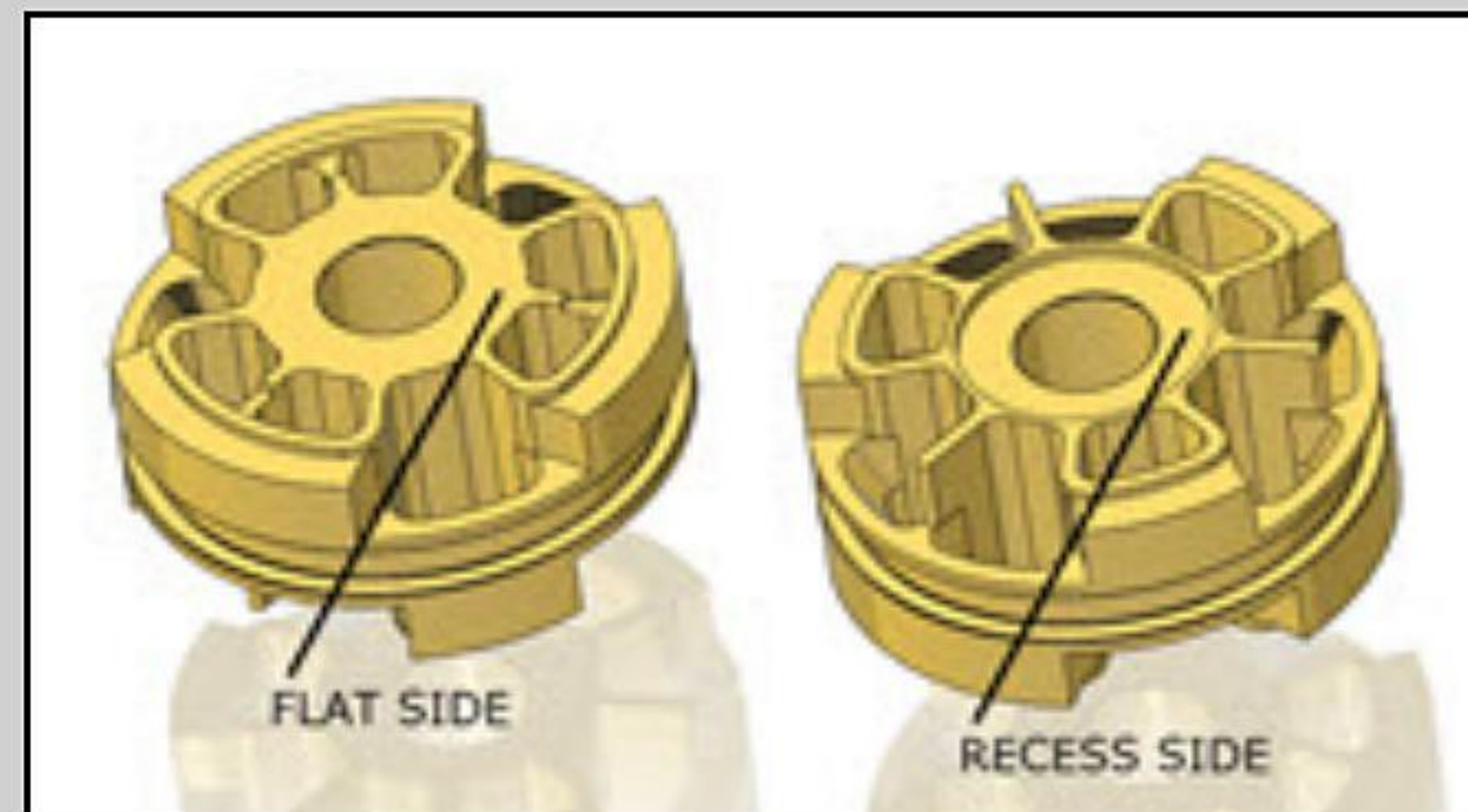
If your DVS Setup Sheet calls for a Compression Bleed Hole check to see if it is already pre-drilled in the piston. If it is not you will need to drill one.

Notice that the bleed hole is on the side of the piston with the recess and is drilled sideways. It connects the two sides of the piston and bypasses the valving stack. The exact location is not critical.



VP9- Install the Gold Valve. The recessed side goes up.

The Recess is the circular pocket on the top face of the Gold Valve Piston.

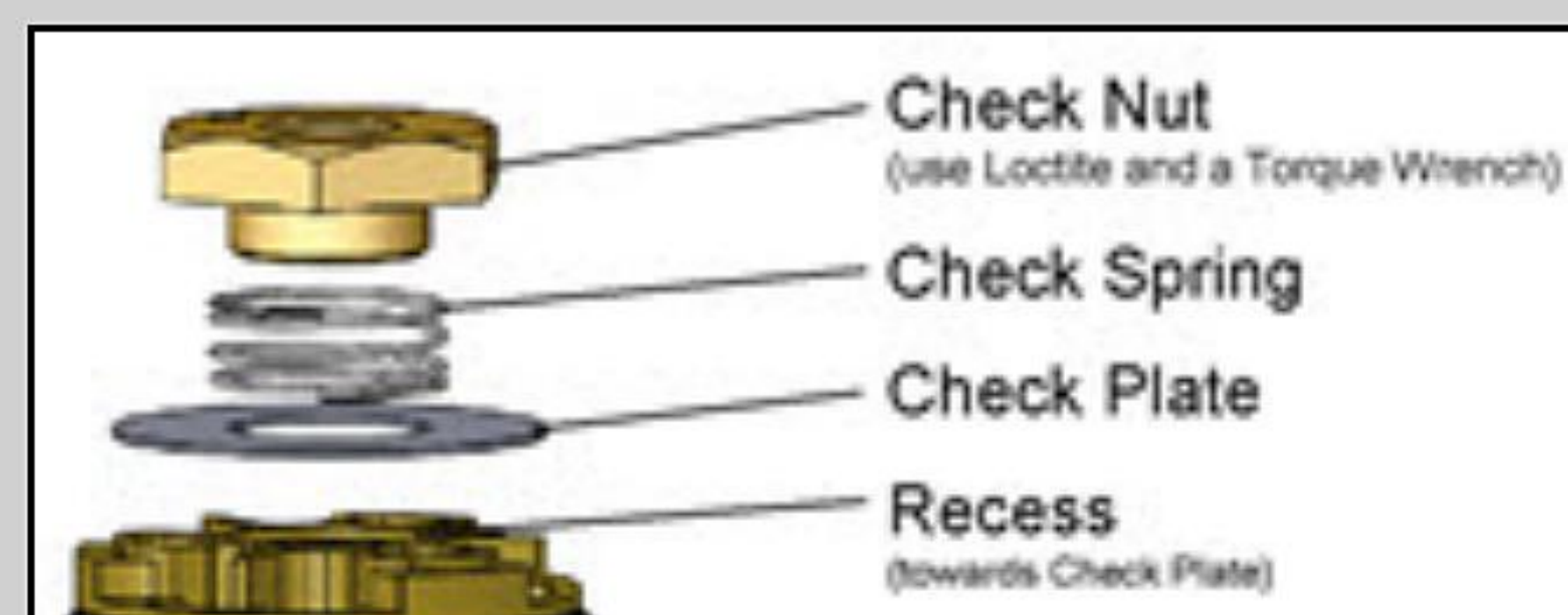
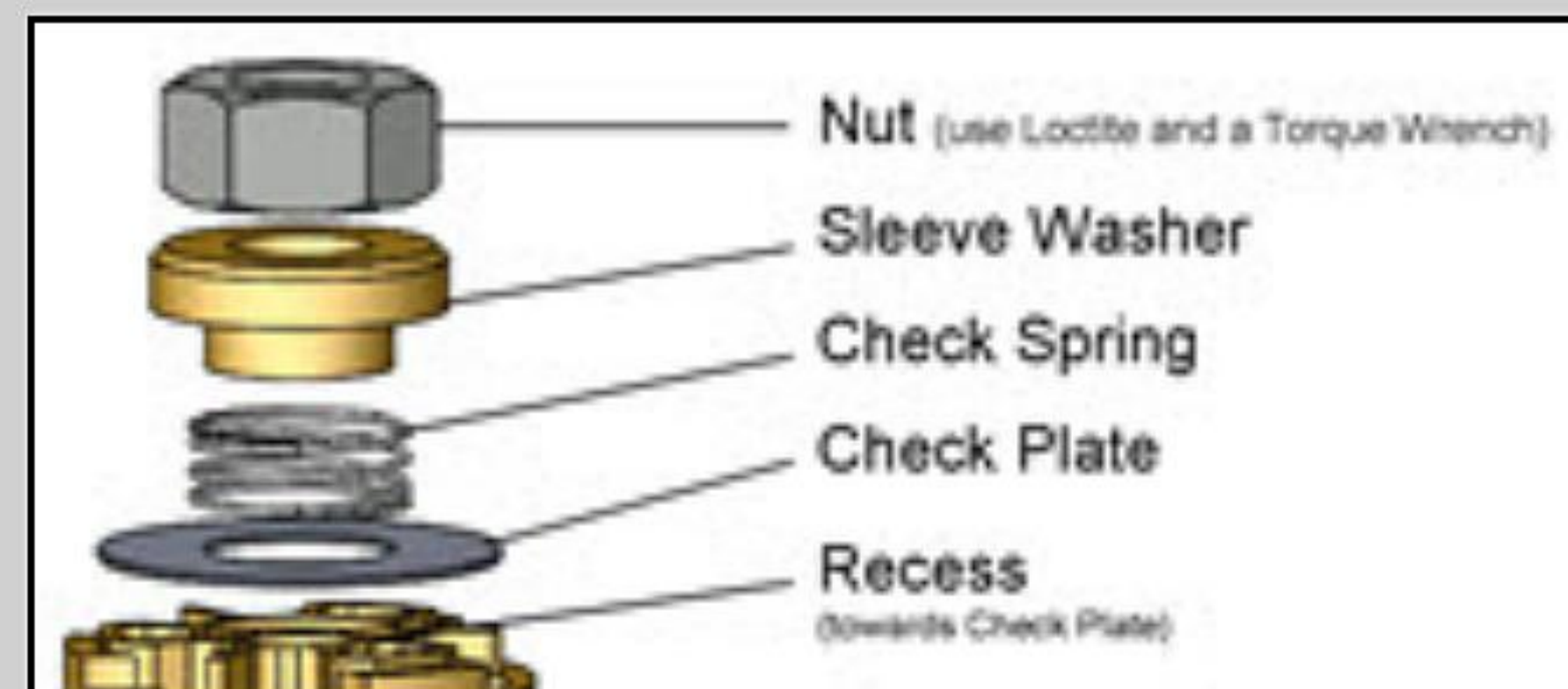
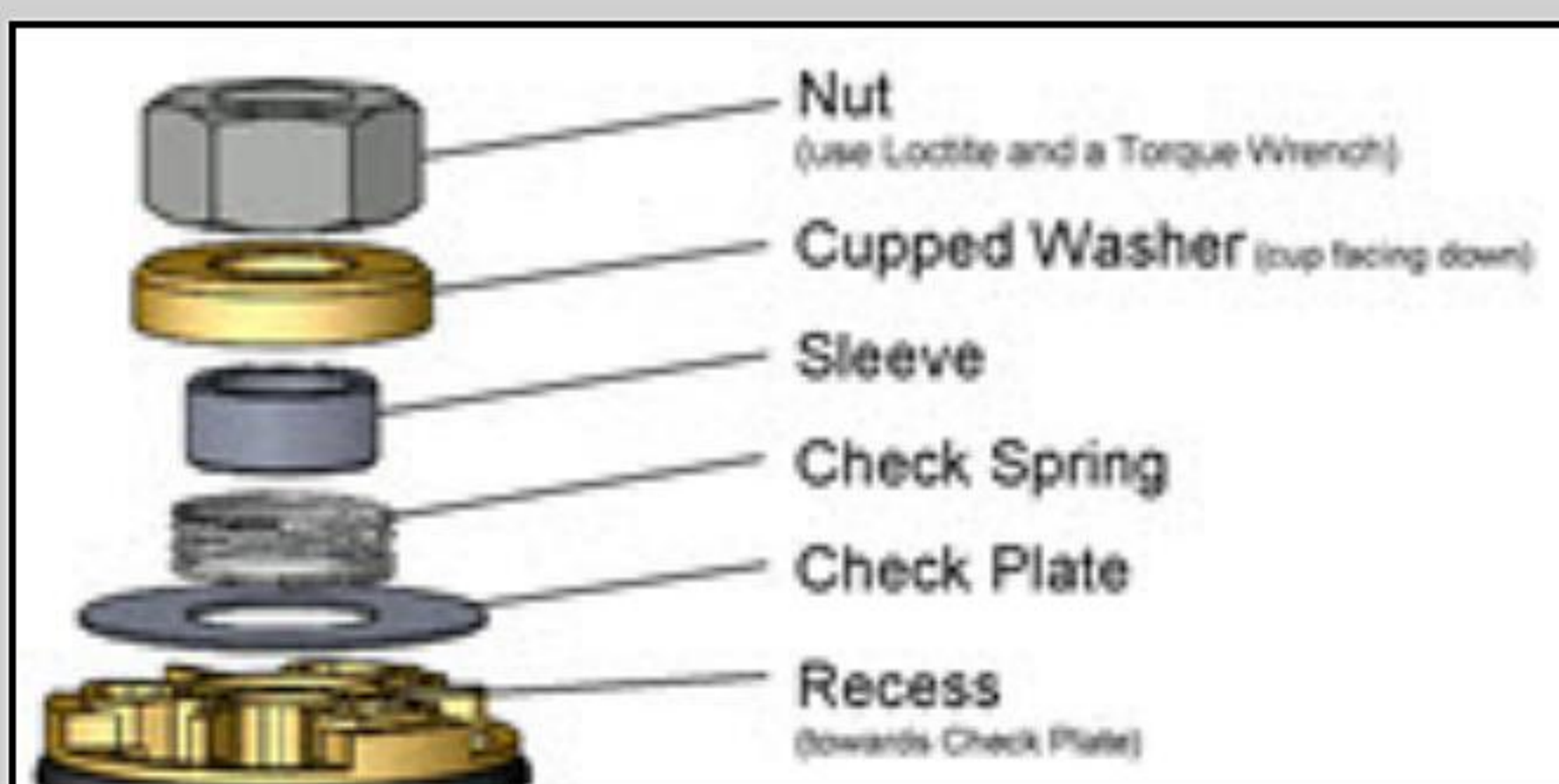


VP10- Place the Check Plate, Check Spring, and either:

1- Sleeve, Cupped Washer, and Nut

or
2- Sleeve Washer and Nut
(This type could also use a Wave Washer instead of a coil spring.)

or
3- Check Nut
on the Shaft.



VP11- Make sure the Total Valving Stack Height is correct.

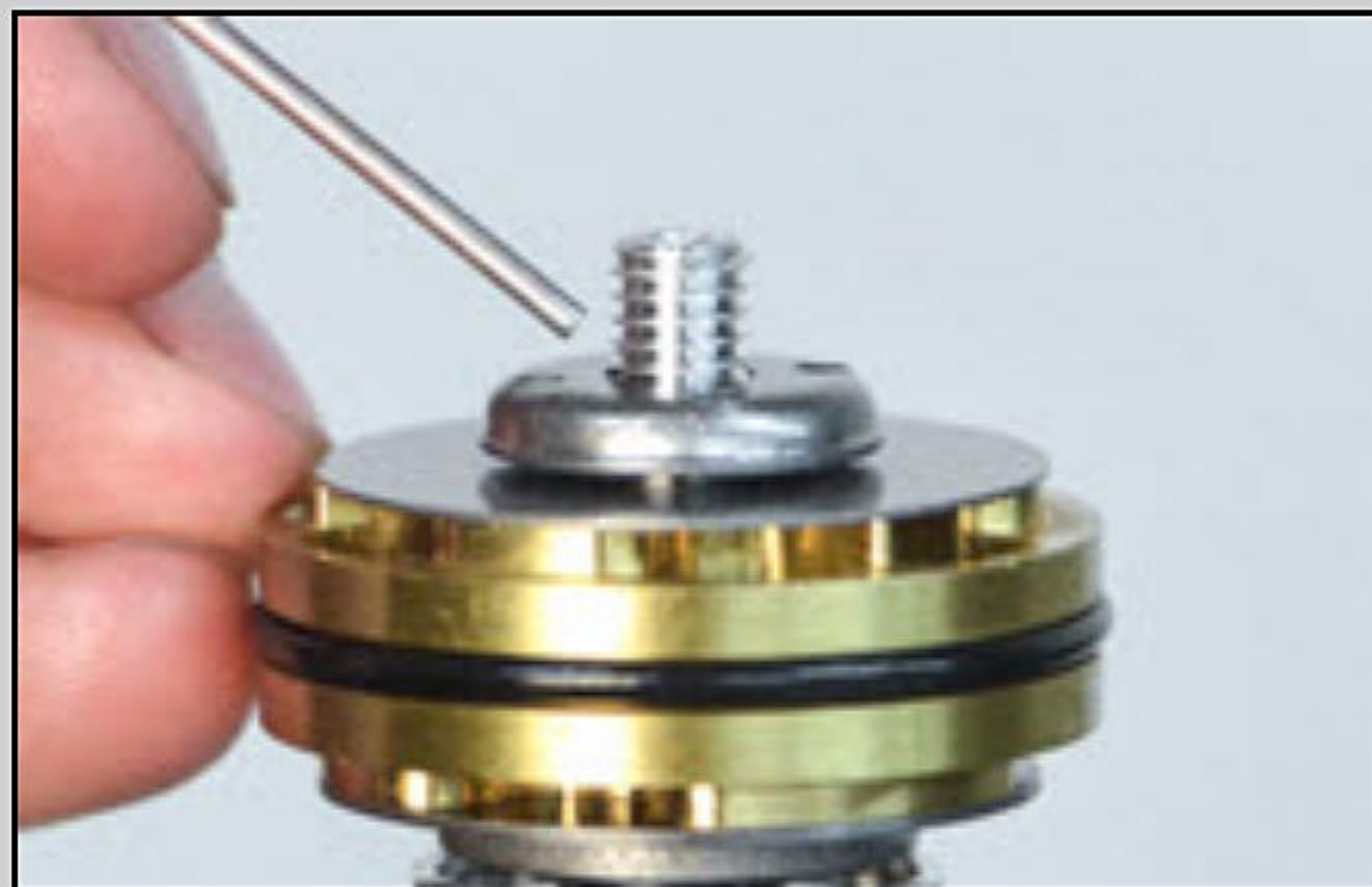
This step is here to insure you don't "run out of thread" when tightening the Nut and the Nut gets full engagement.

The shims should be guided with the straight, non-threaded part of the shaft and should not be on the thread so the thread should be covered by the Base Plate.

This height adjustment is done with Spacing Shims. If needed, they should be added just above the Base Plate. Spacing Shims must be larger in diameter than the smallest shim in the stack.

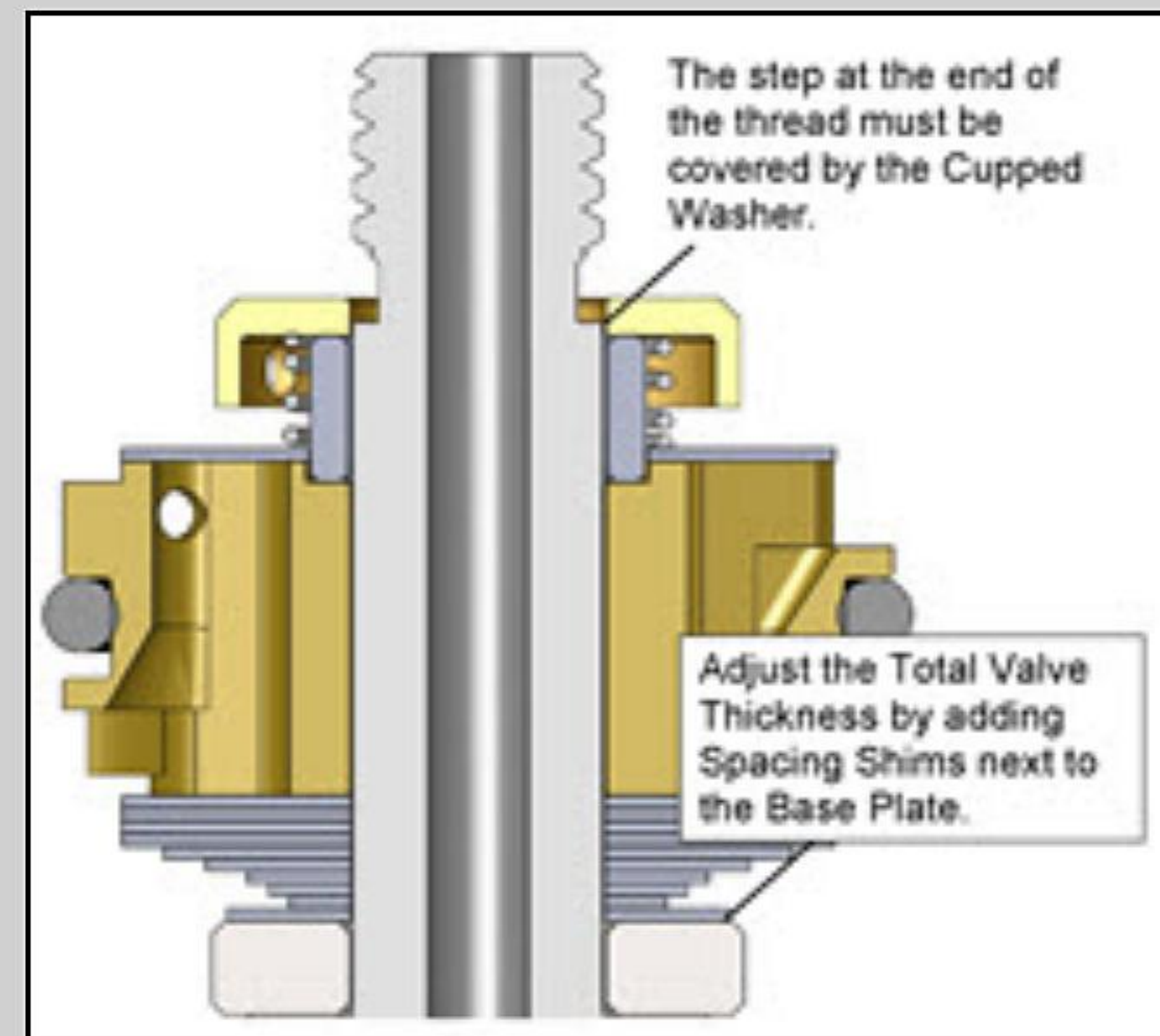


Incorrect stack height is shown in this photo (this stack is too short).



This is correct.

Click on the image to enlarge.





VP12- Apply a small drop of Loctite to the valving shaft nut.



VP13- Check to make sure the check valve is free before the nut is tightened.

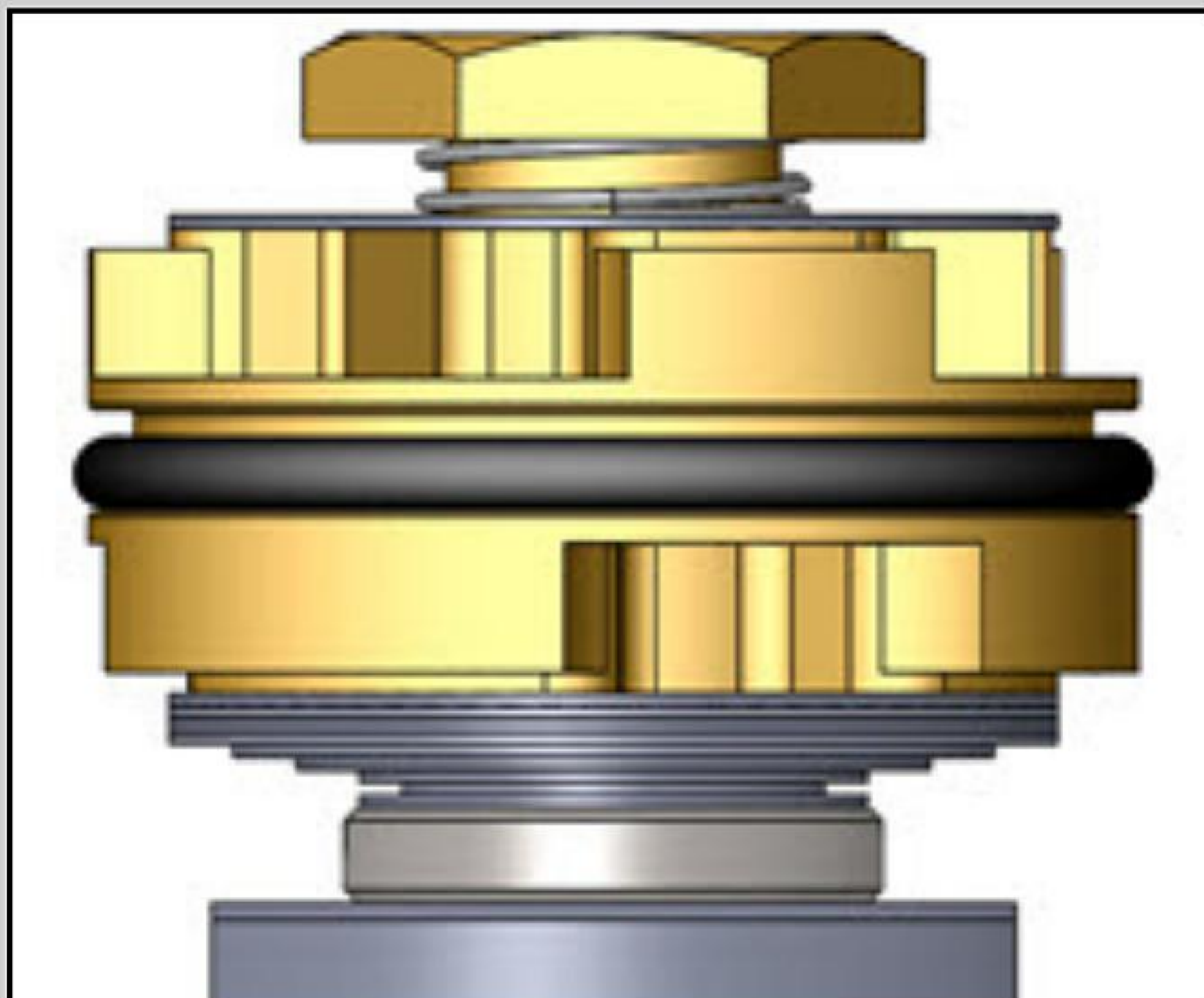


VP14- tighten it to spec with a torque wrench.

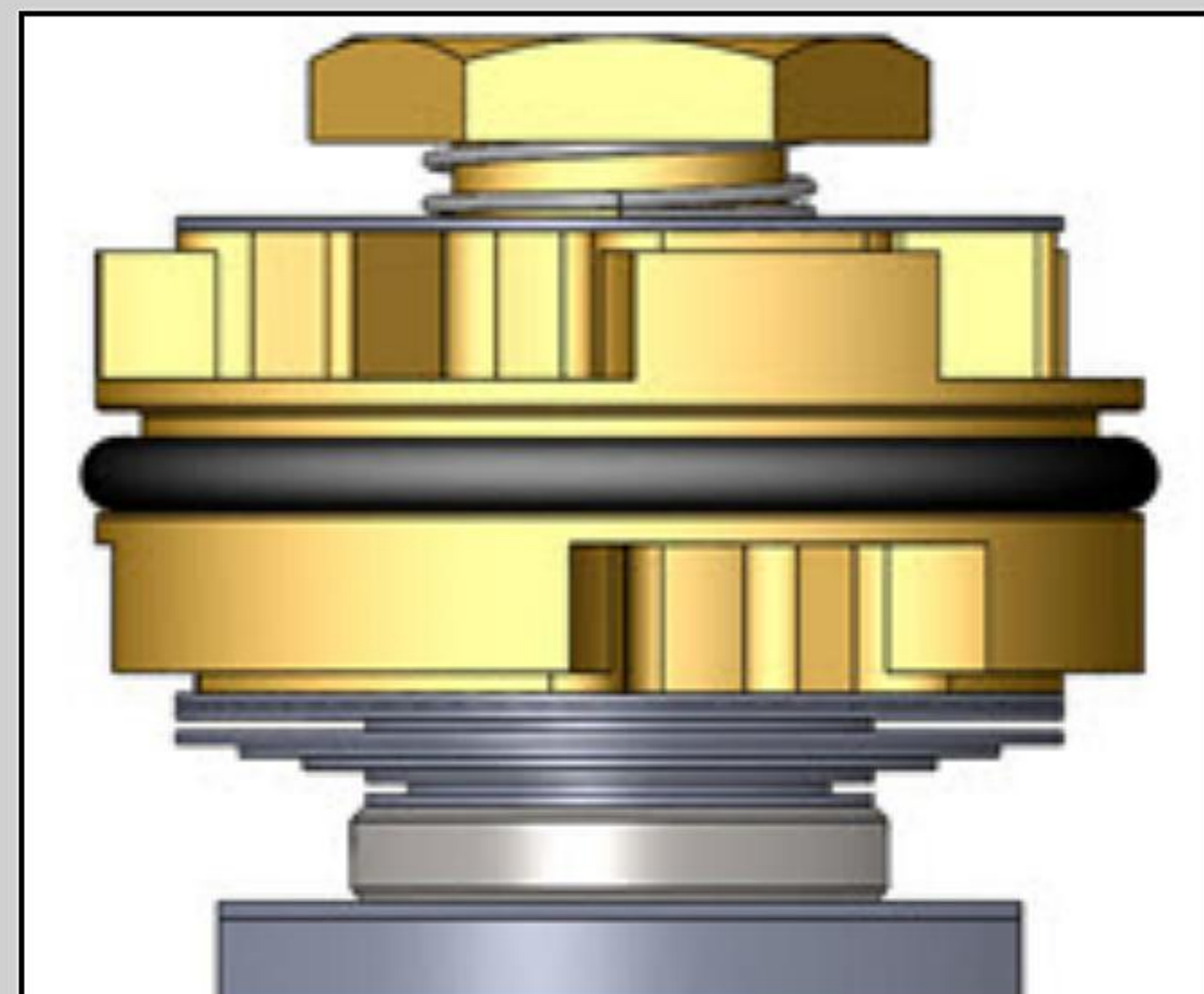
CAUTION! The threads can be damaged without extreme care. You must use Loctite. Torque the Nut to the spec on your DVS Setup Sheet. NO MORE! Do not take this step lightly.

This is critical!

VP15- ***Single Stage***



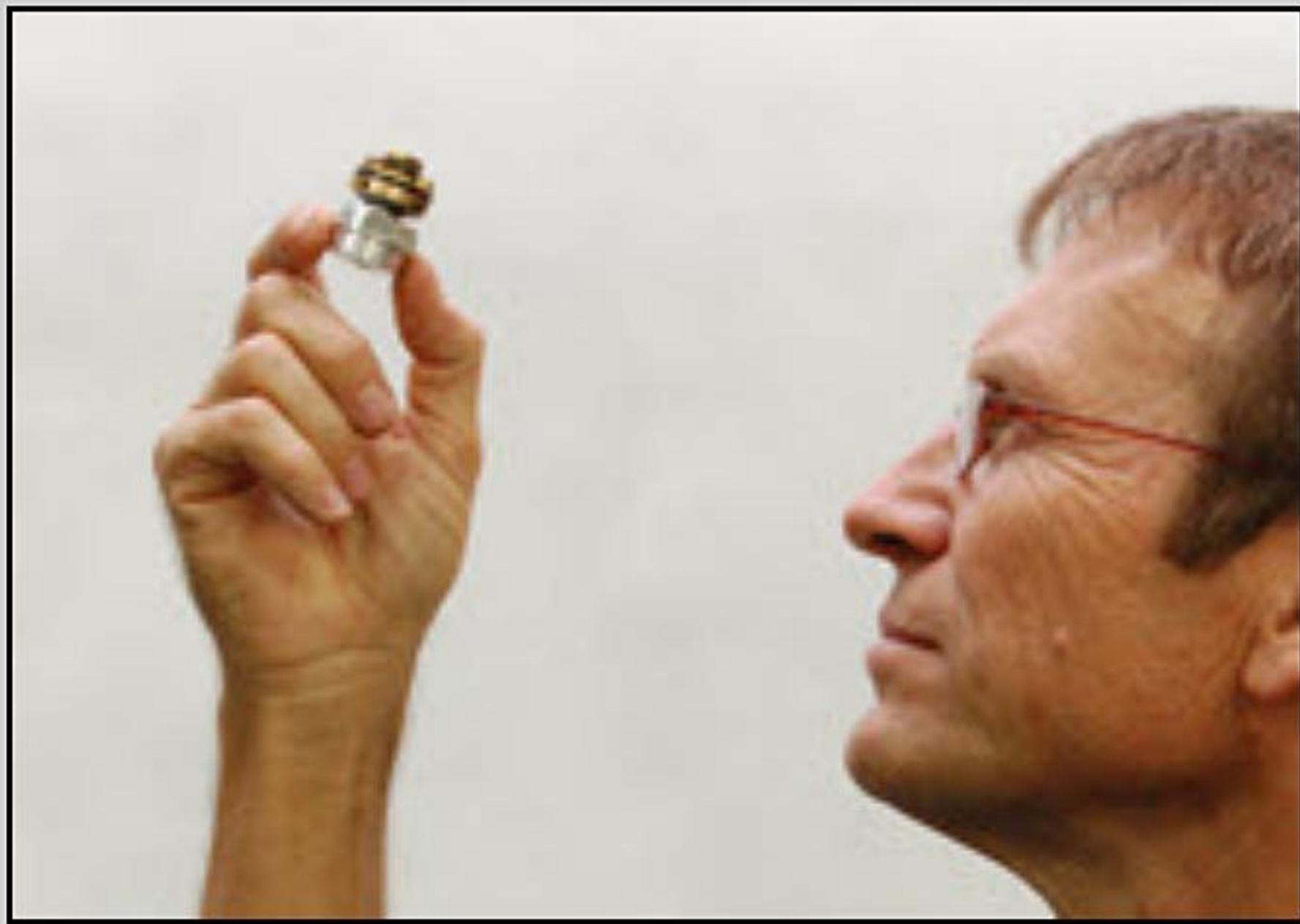
VP15- ***Two Stage***



Notice the gap in the valving stack where the Crossover is. The Crossover Gap should be clearly visible.



VP16- Make sure the Check Plate is free and can move up and down against the Spring.

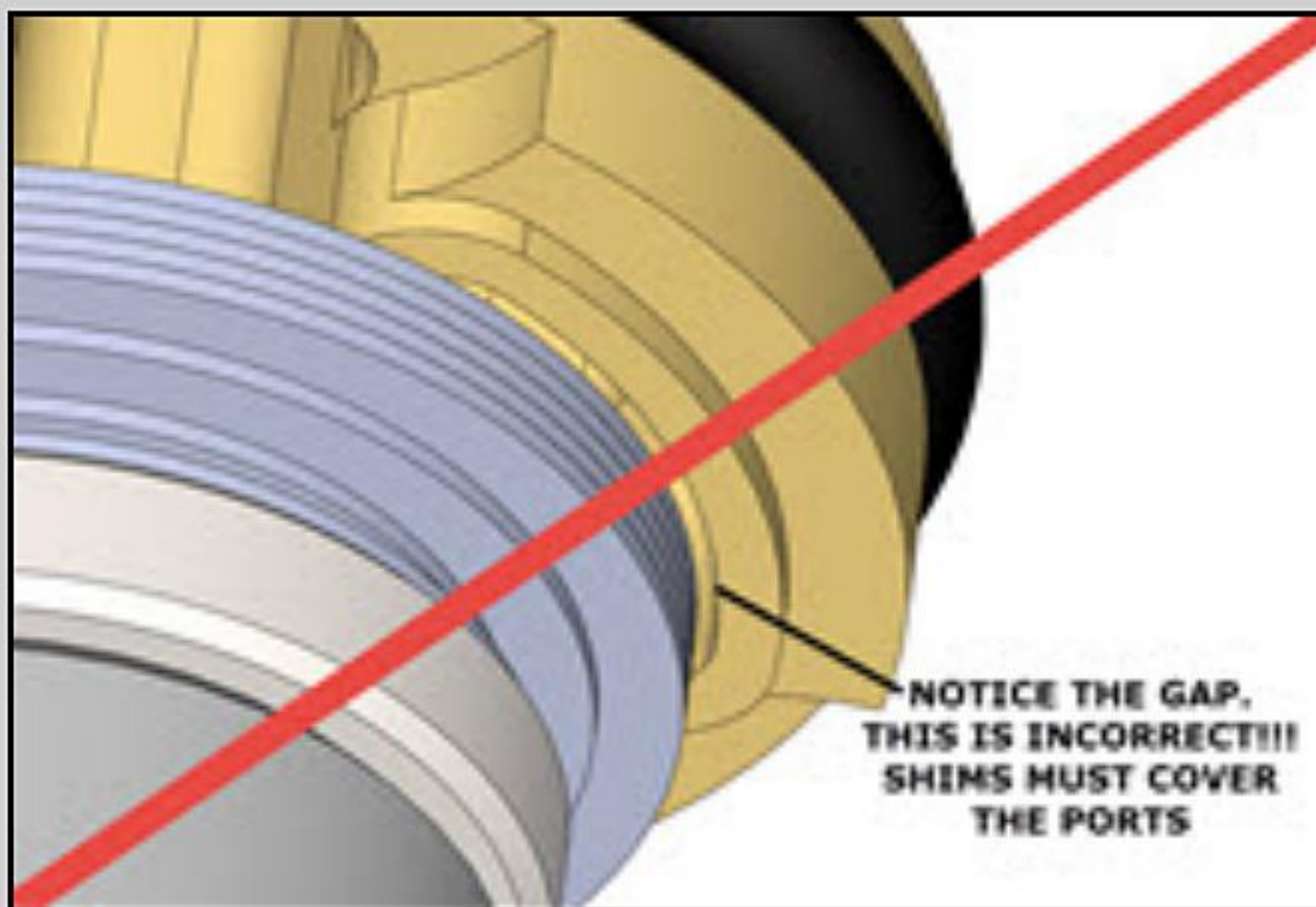


VP17- Visually check your work.

Hold the Valving Stack up to the light and look for proper assembly. If there are any problems, disassemble the stack and look for burrs to surface and/or dirt in the valving. Reassemble and check again.

On two-stage stacks make sure the Crossover Gap is clearly visible.

Make sure the o-ring is on the Gold Valve. Some kits contain more than one o-ring. See your DVS Setup Sheet Valving Comments for the correct o-ring.



VP18- Make sure the shims that go next to the Gold Valve completely cover the ports on both sides of the piston! If the ports are not covered there will not be enough damping.

This could be caused by a number of reasons. Please call Tech Support if this occurs and you can't figure it out.

VP19- Return to the main instructions and continue with Rebound Valving and Assembly.

FORK REBOUND and MID-VALVE GOLD VALVE INSTALLATION FRGV 320802 Dirt 32mm

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The Left and Right Fork Leg are different. Keep all the components separate.

RT has a Spring Conversion Kit available for this fork that eliminates the Air Spring and replaces it with a Coil Spring. Call for details.



Tools Required

- In-lb torque wrench that accurately measures 0 to 50 in-lbs (0.58 kgf-m) (SnapOn Digital Torque Wrench shown)
- Hi-Strength Loctite (included)
- Metric calipers and micrometer

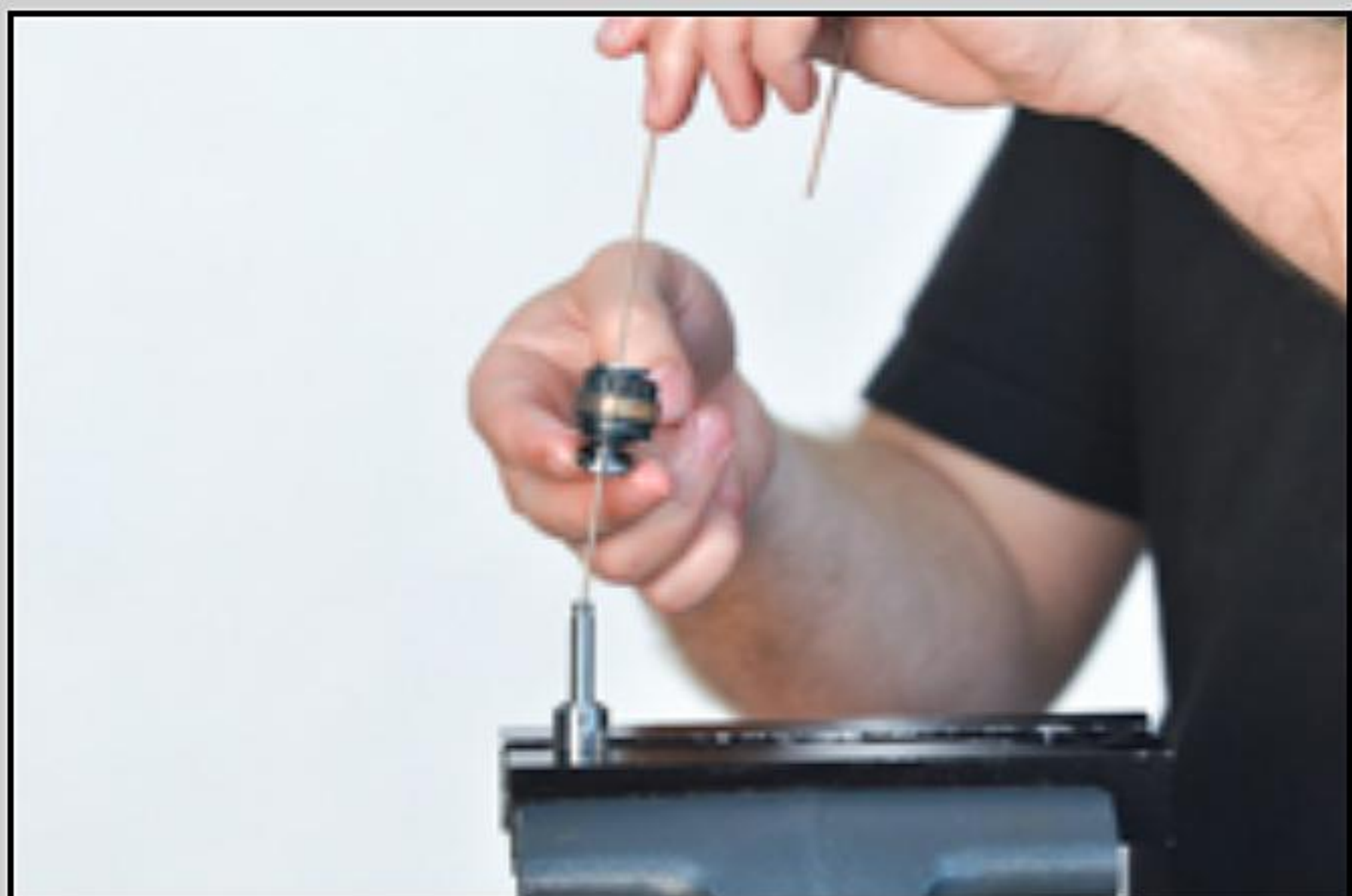


VR1- Put the rebound rod in the shaft holding tool and remove the peening by filing it down to the nut face.

This step is not required on WP and Ohlins.



VR2- Remove the rebound valving nut.



VR3- Remove the rebound valving assembly.



VR4- Chamfer the rebound valving shaft lightly. Use a wire wheel on the shaft end to smooth it.



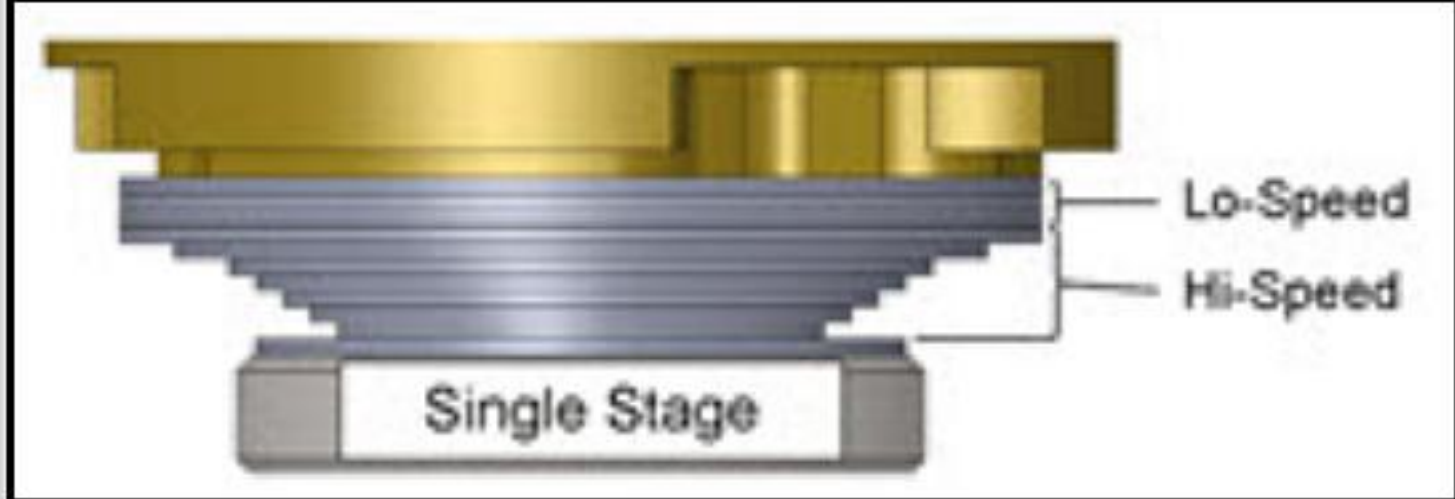
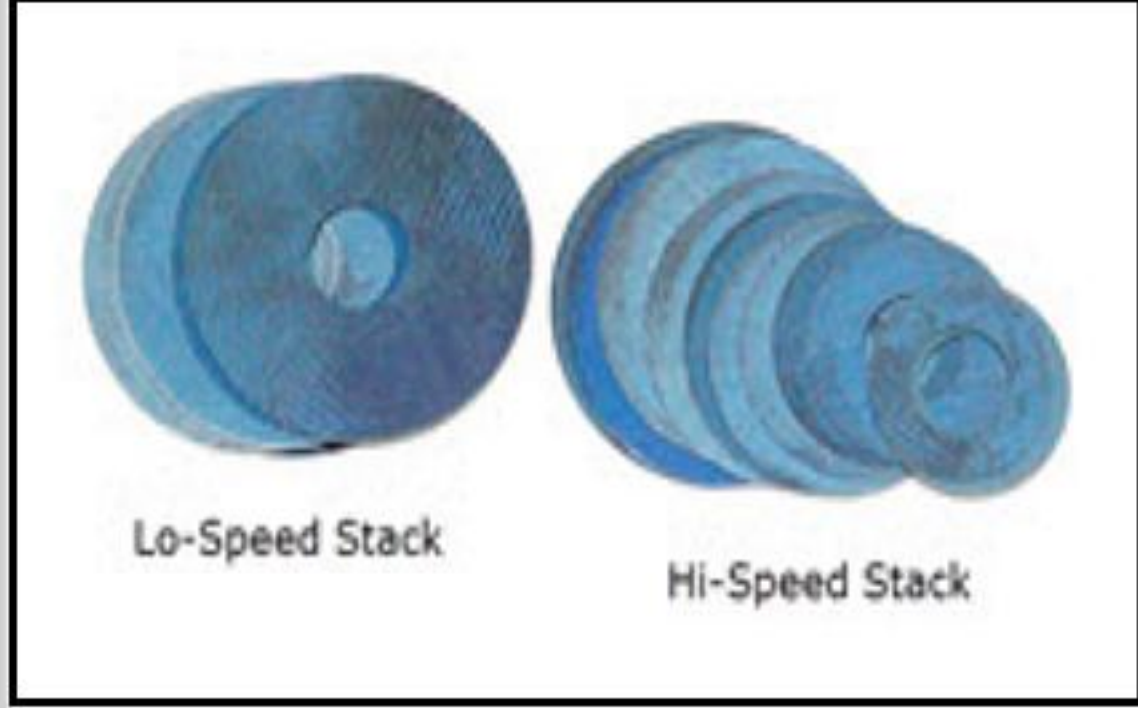
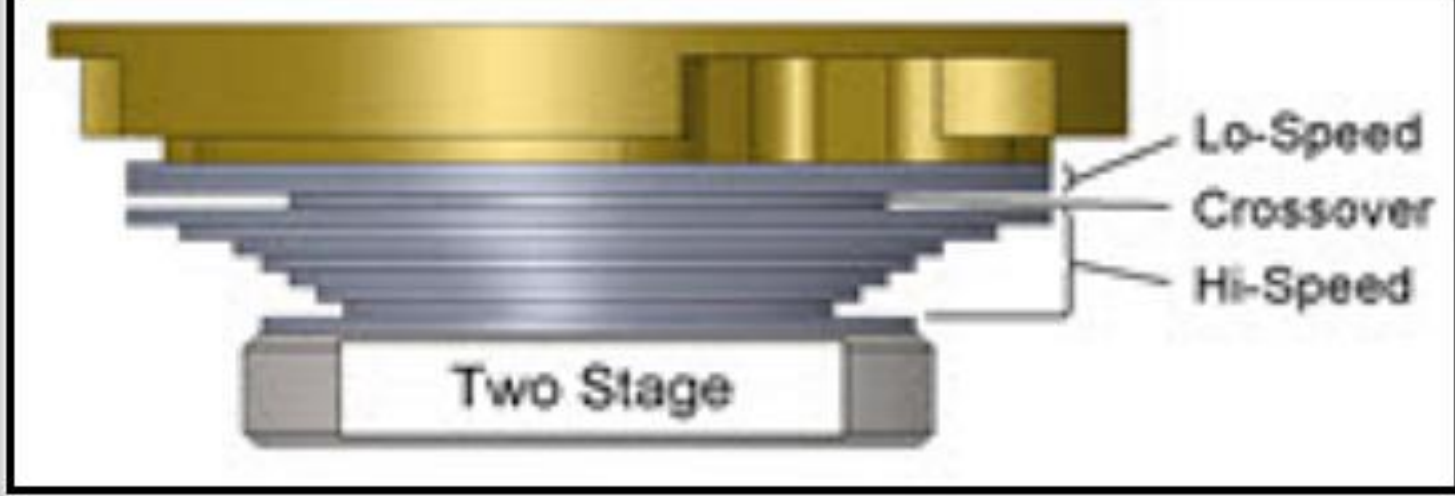
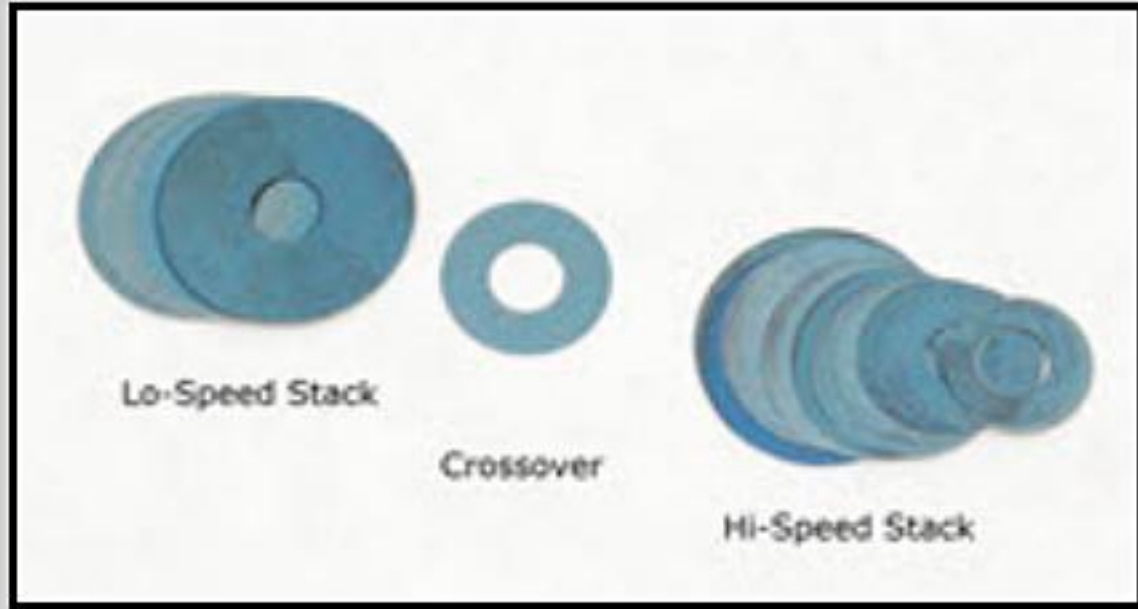
VR5- Blow air through one of the side holes while covering up the other side hole. This allows any fillings that may be in the shaft to be removed through the top hole.

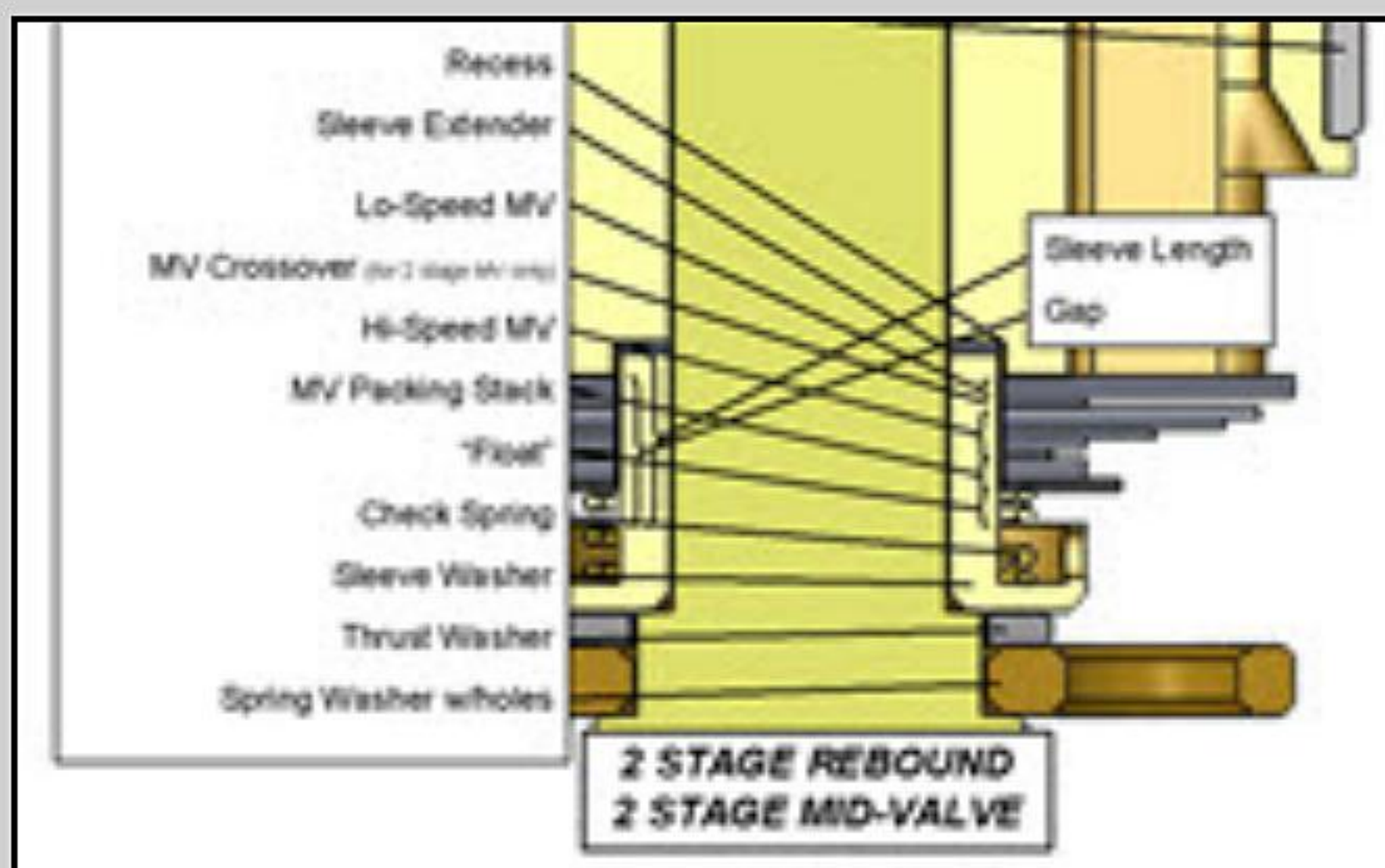
VALVING STACK TYPES - SINGLE OR TWO STAGE

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Please note that the DVS might call for a Single Stage Mid-Valve Stack and a Two Stage Rebound Stack (or the other way around).

Note: The DVS Custom Setup Sheet displays individual shims and does not label Hi-Speed, Crossover, and Lo-Speed. This is for your information only. Also you will not use all the shims provided in the Gold Valve Kit.

<ul style="list-style-type: none"> • Single Stage - made of: Lo-Speed Stack Hi-Speed Stack <p>There is <u>NO</u> Crossover (it becomes one stack.)</p>	 <p>Lo-Speed Hi-Speed Single Stage</p>	 <p>Lo-Speed Stack Hi-Speed Stack</p>
<ul style="list-style-type: none"> • Two Stage - made of: Lo-Speed Stack Crossover Hi-Speed Stack <p>The Crossover Gap is visible</p>	 <p>Lo-Speed Crossover Hi-Speed Two Stage</p>	 <p>Lo-Speed Stack Crossover Hi-Speed Stack</p>



VR7- MID-VALVE STACK

Install the stack:
Spring Washer (with holes) and the
Thrust Washer

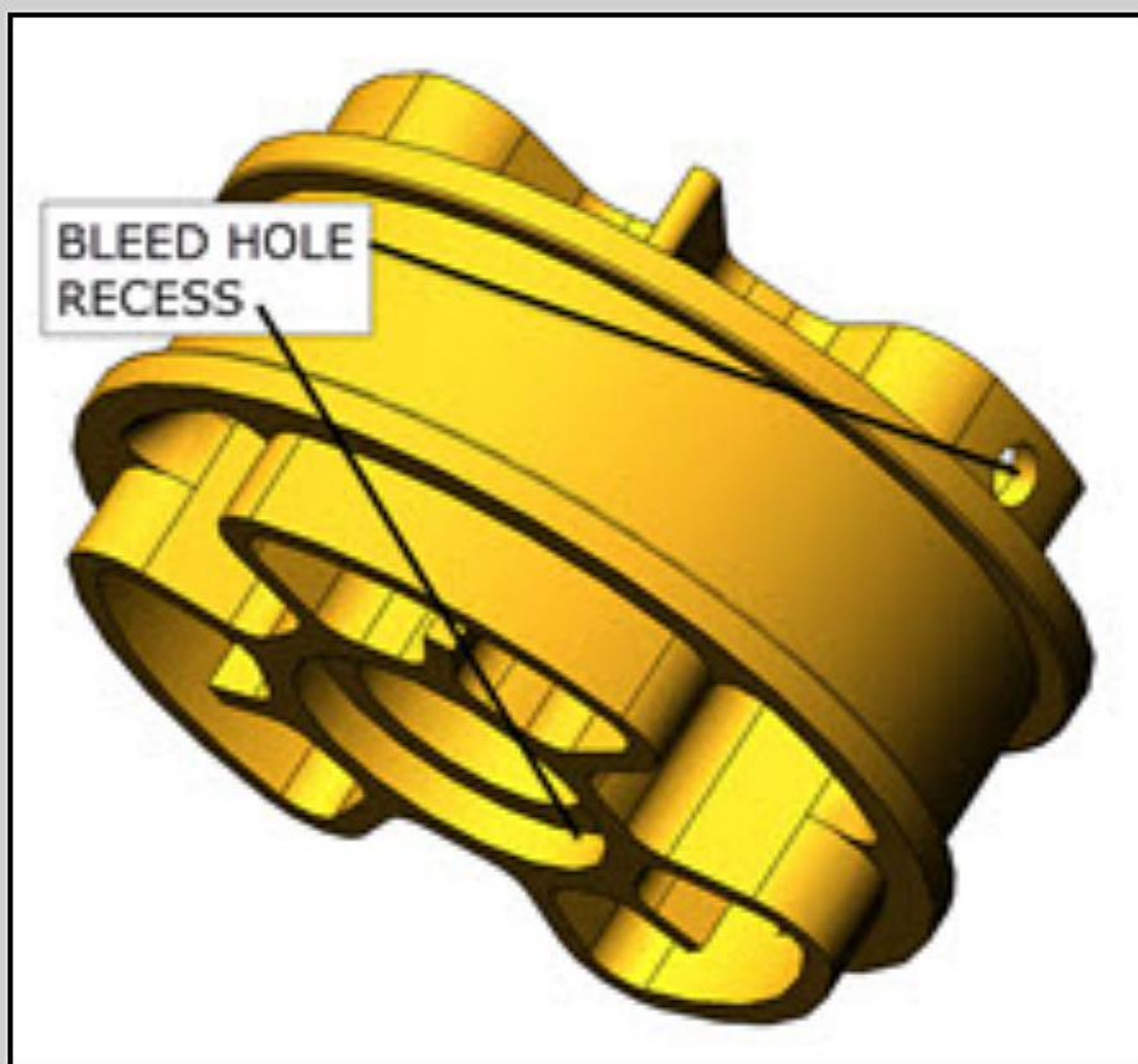
The DVS calculates all the shims required in order. Install the Mid-Valve Stack onto the Valving Shaft starting with the:

Sleeve Washer
Check Spring

Mid-Valve Packing Stack
Hi-Speed Mid-Valve Stack
Mid-Valve Crossover (only if it is a two stage Mid-Valve stack)
Lo-Speed Mid-Valve Stack
and
Sleeve Extender Shim(s) (8 id x 11mm od shims) (if required)

Float is the amount the Mid-Valve stack moves before it has to bend.

Once the **complete assembly** is built, **check the Float with a feeler gauge** (step VR14). This may be off due to production tolerances on all of the parts in the assembly. Adjust the MV Packing Stack to create the correct Float.

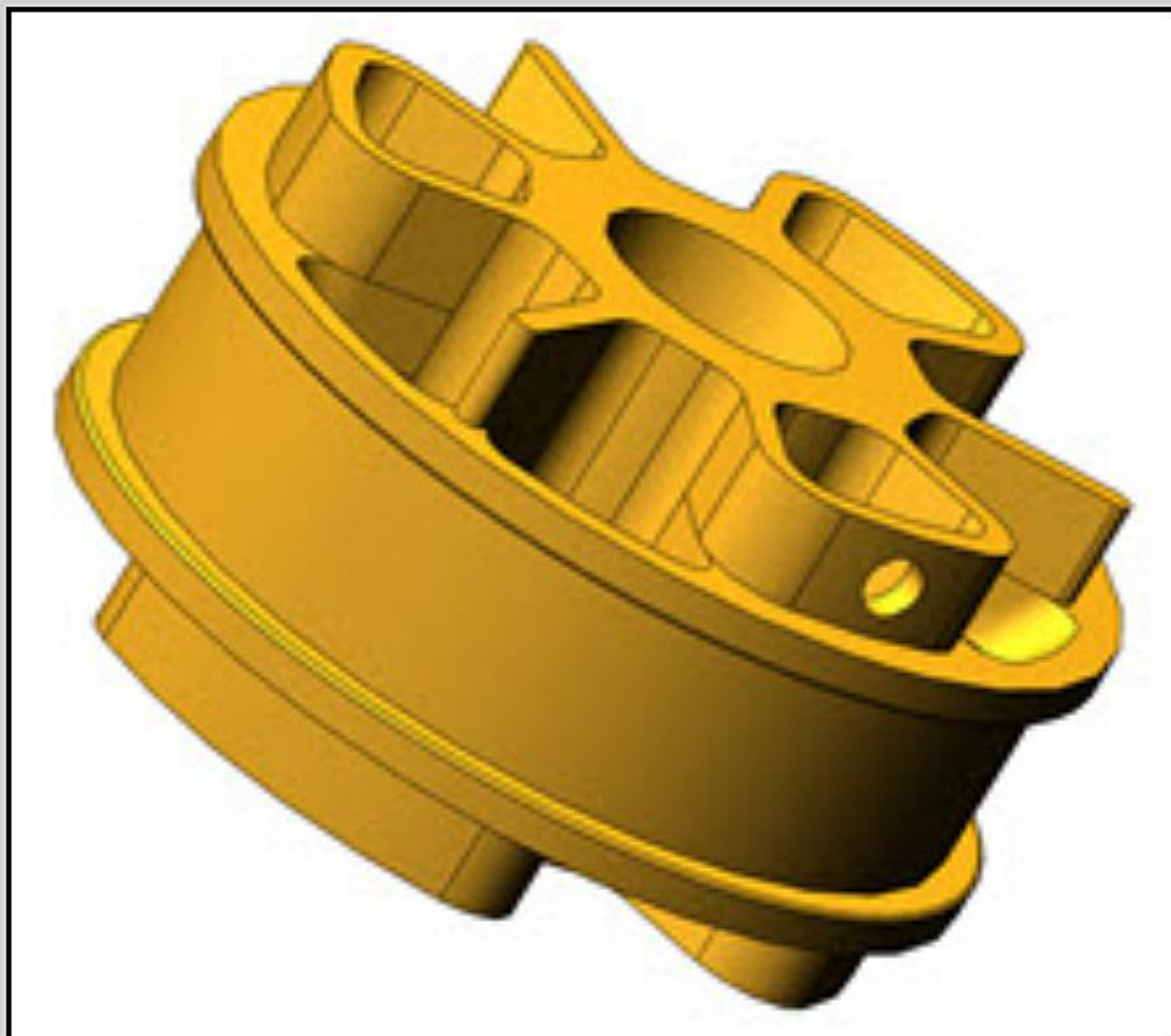


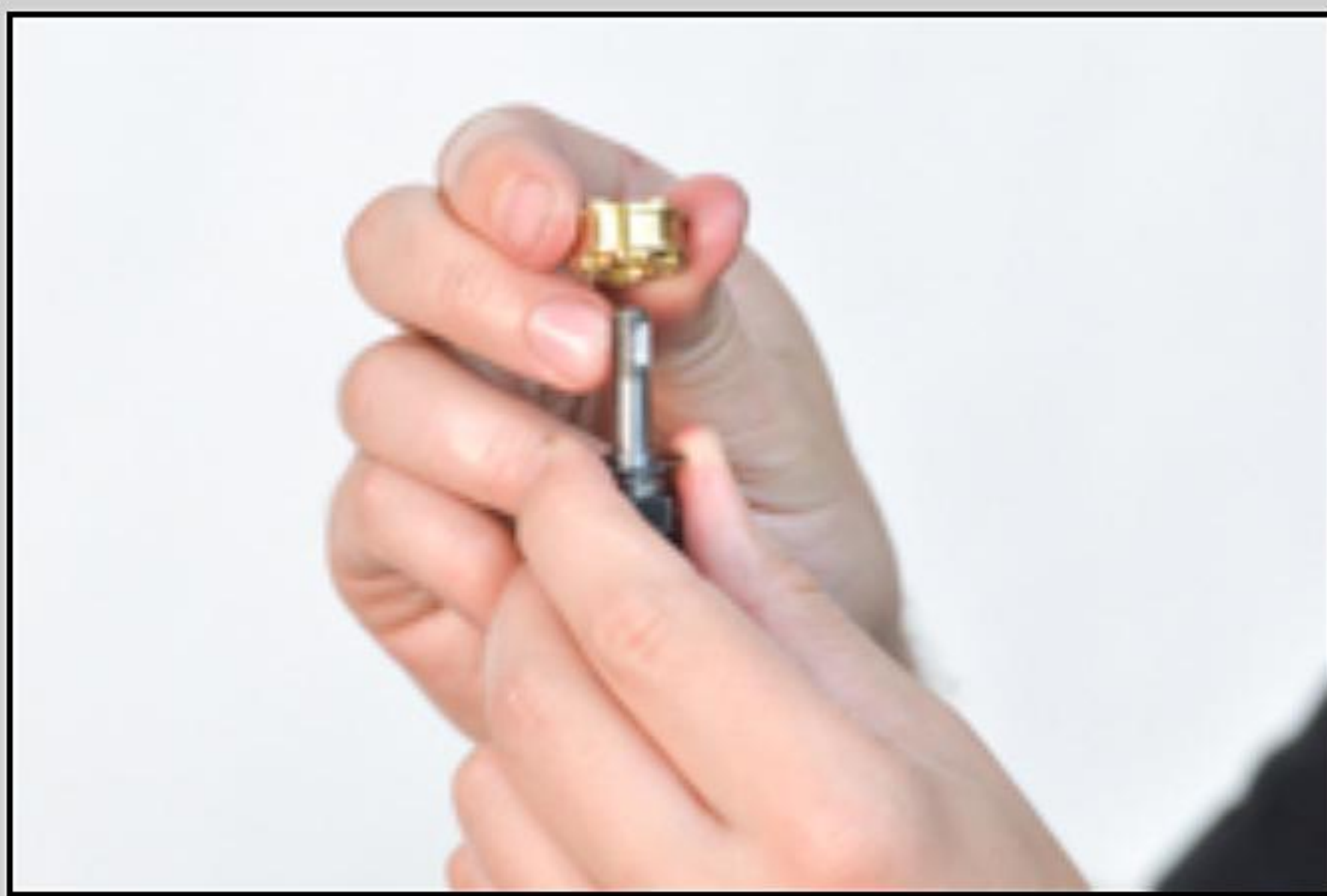
VR8- **REBOUND BLEED HOLE**

If the DVS does not call for a Rebound Bleed Hole skip this step.

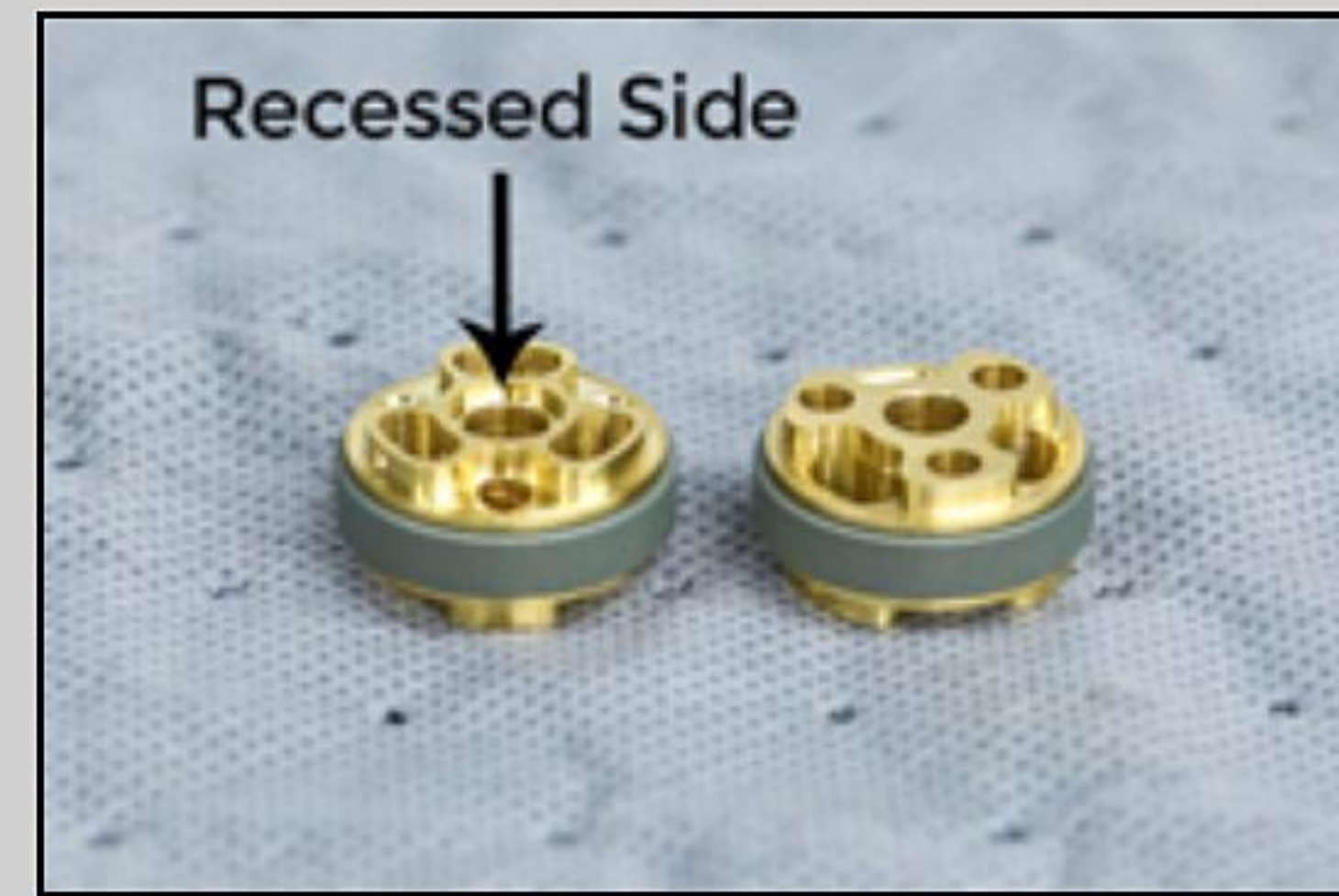
If your DVS Setup Sheet calls for a Rebound Bleed Hole check to see if there is one already pre-drilled in the piston. If one is called for, and there is no pre-drilled bleed hole, you will need to drill one.

Notice that the bleed hole is on the **opposite** side of the piston with the Recess and is drilled sideways. It connects the two sides of the piston and bypasses the valving stack. The exact location is not critical.





VR9- Install the Rebound Gold Valve **WITH THE RECESS IN THE GOLD VALVE FACING DOWN TOWARDS THE MID-VALVE.**



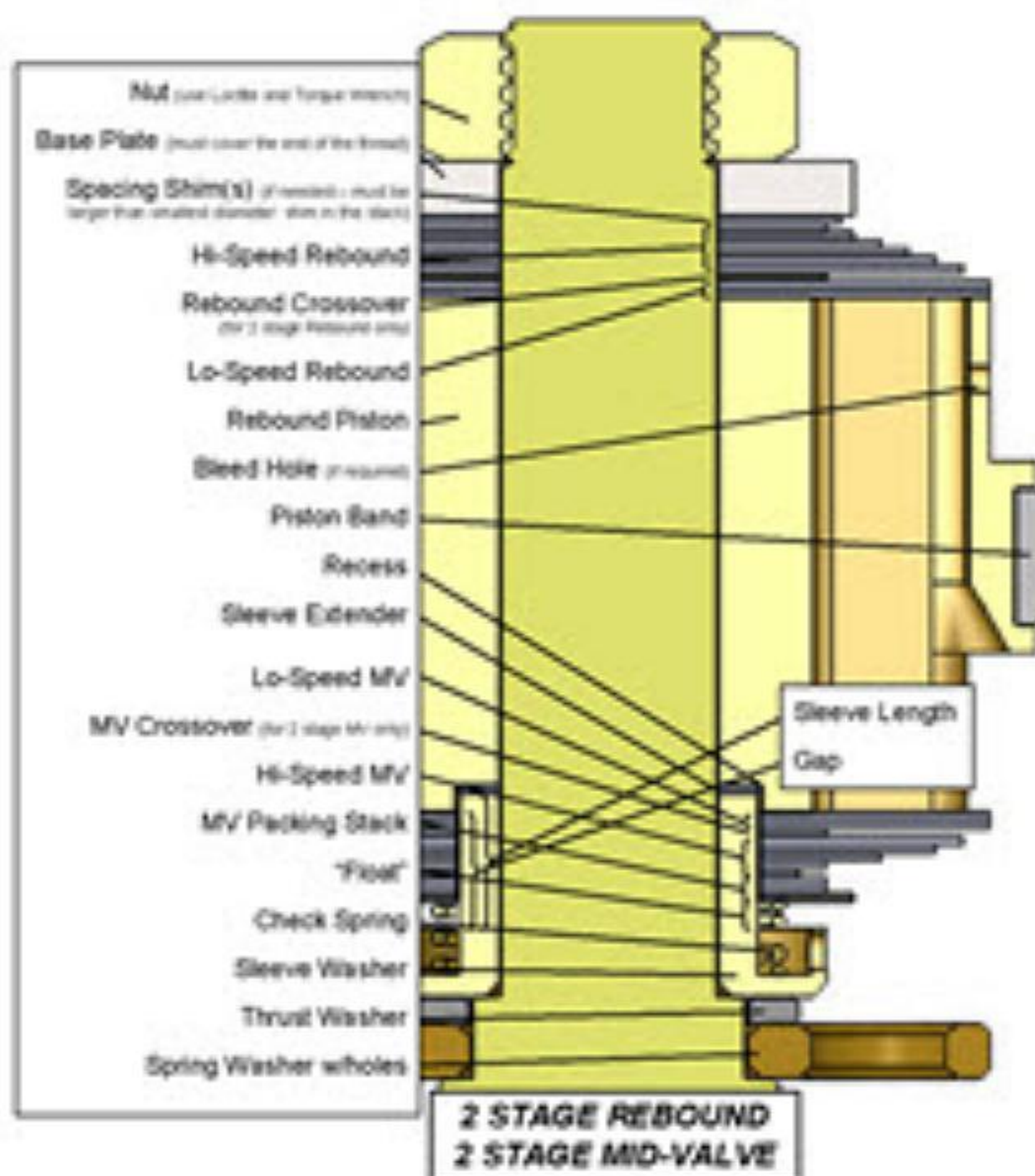
VR10- **REBOUND STACK**

Install the DVS recommended Rebound Stack with the largest shim of the Lo-Speed Stack first against the piston face. Make sure the shims completely cover the ports.

If a two stage rebound stack is called for in the DVS, install the Rebound Crossover.

Install the Hi-Speed Rebound Stack in the order listed starting with the largest diameter shim and ending with the smallest diameter shim.

FRGV 320802 2 STAGE KYB 2015 CRF450R AIR



VR11- **Two Stage Rebound Example**

(Single Stage is exactly the same except there is no Crossover)

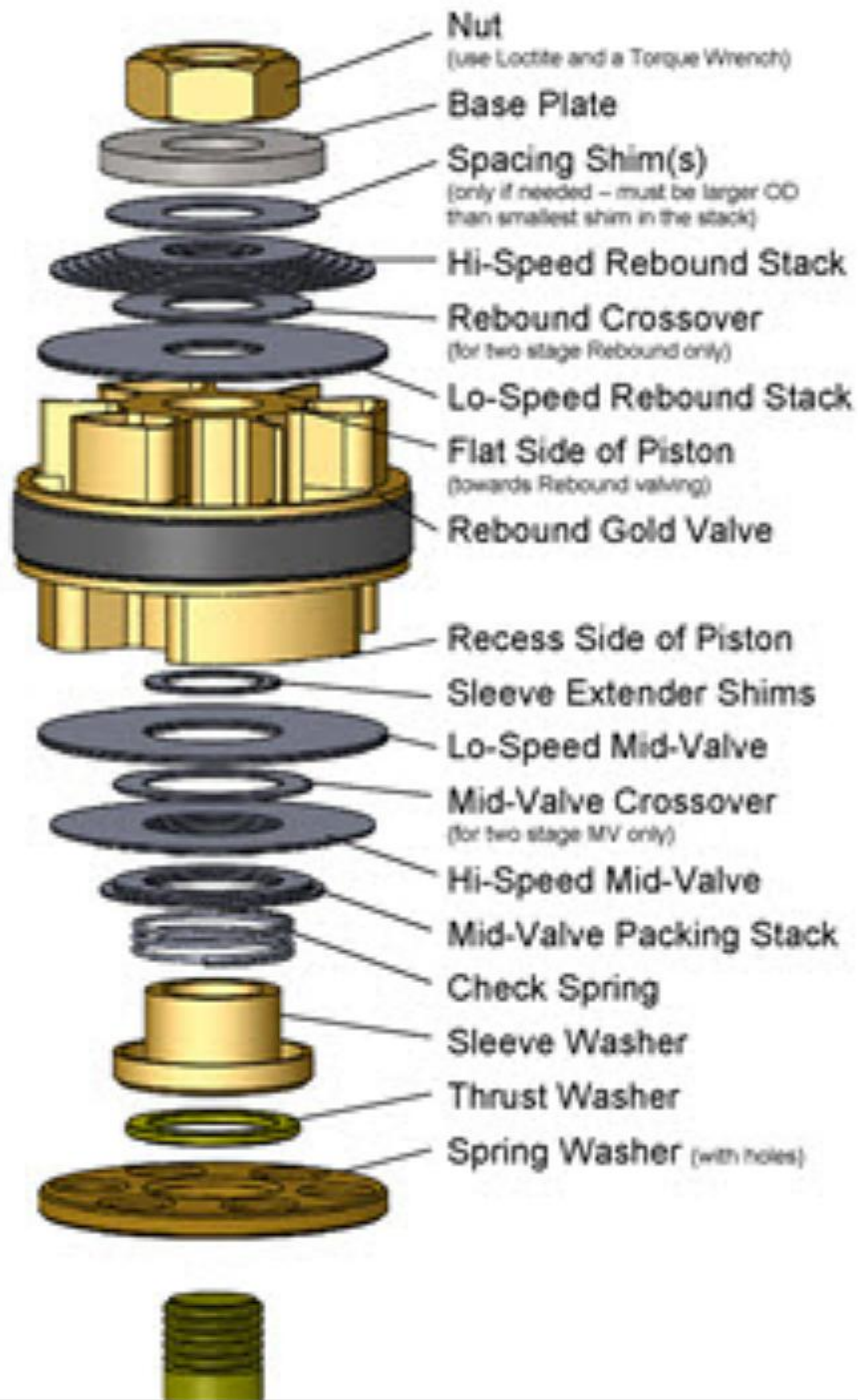
For Two Stage the total valving stack is made up of a:
Lo-Speed Stack
Crossover and a
Hi-Speed Stack

(this is only an example - not your setting)

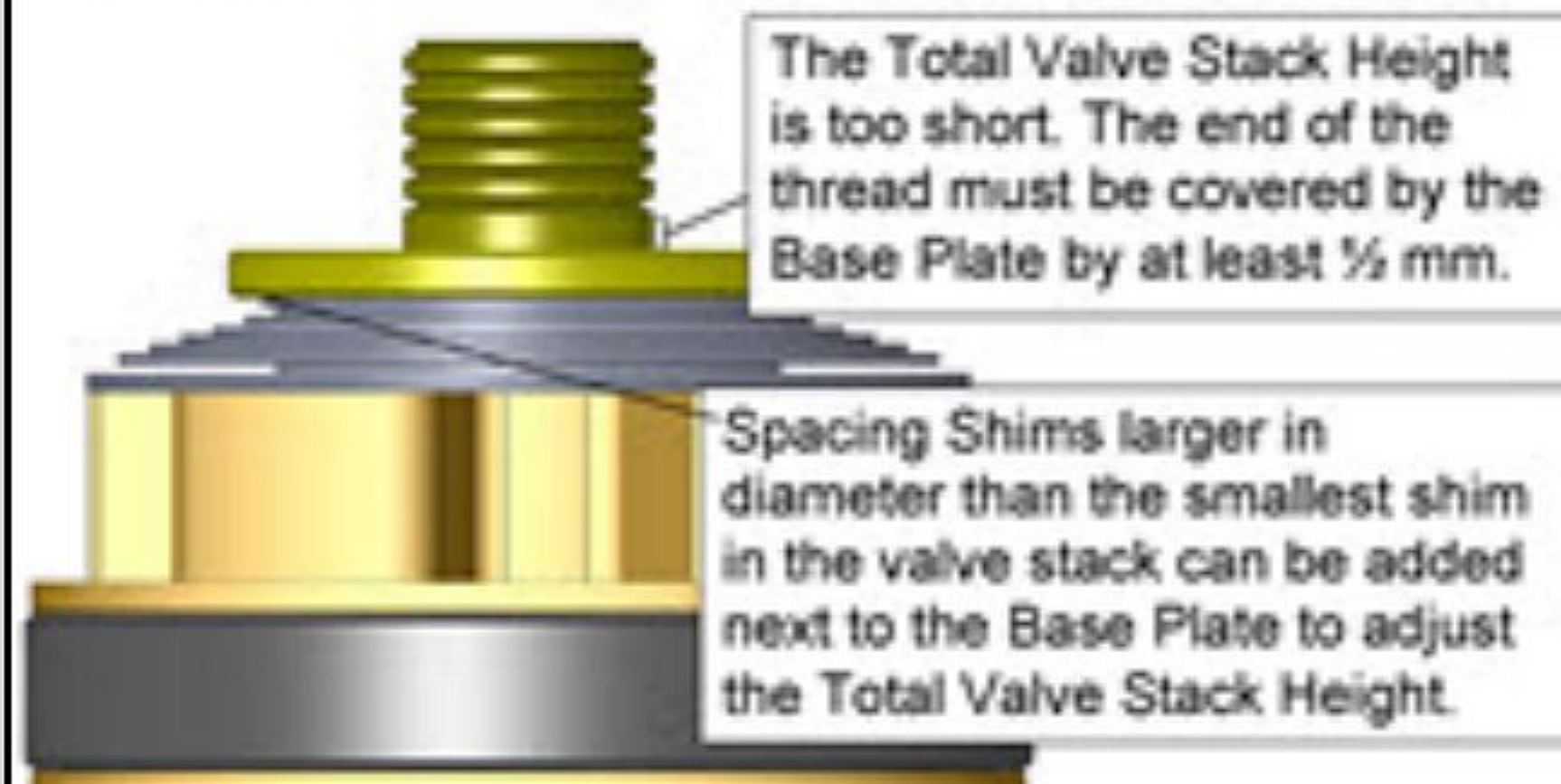
The Total Rebound Valving Stack starting from the Gold Valve piston face:

- (4) .15x28 - Lo-Speed Stack
- (1) .10x14 - Crossover (notice the smaller diameter)
- (1) .10x26 - Hi-Speed Stack
- (1) .10x22
- (1) .10x20
- (1) .10x18
- (1) .10x16
- (1) .10x14

FRGV 320802 2 STAGE REBOUND 2 STAGE MID-VALVE



STACK HEIGHT – Too Low

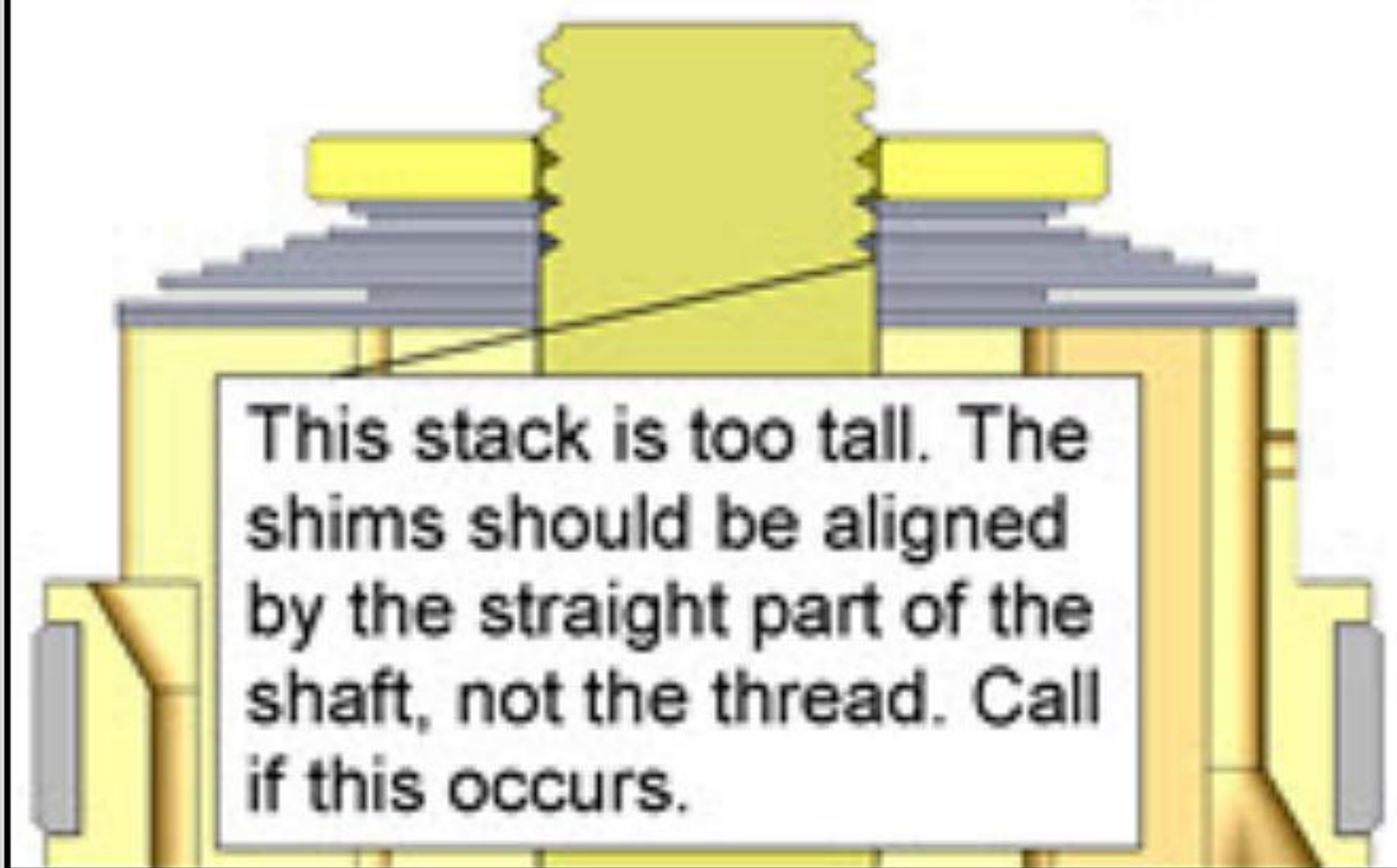


VR12- Make sure the Total Valving Stack Height is correct. Critical!!

This step is here to insure you don't "run out of thread" onto the straight, non-threaded, portion of the shaft when tightening the Nut and the Nut gets full engagement.

The shims should be guided with the straight, non-threaded part of the shaft and should not be on the thread. **The Rebound Base Plate should cover or "straddle" the end of the thread.**

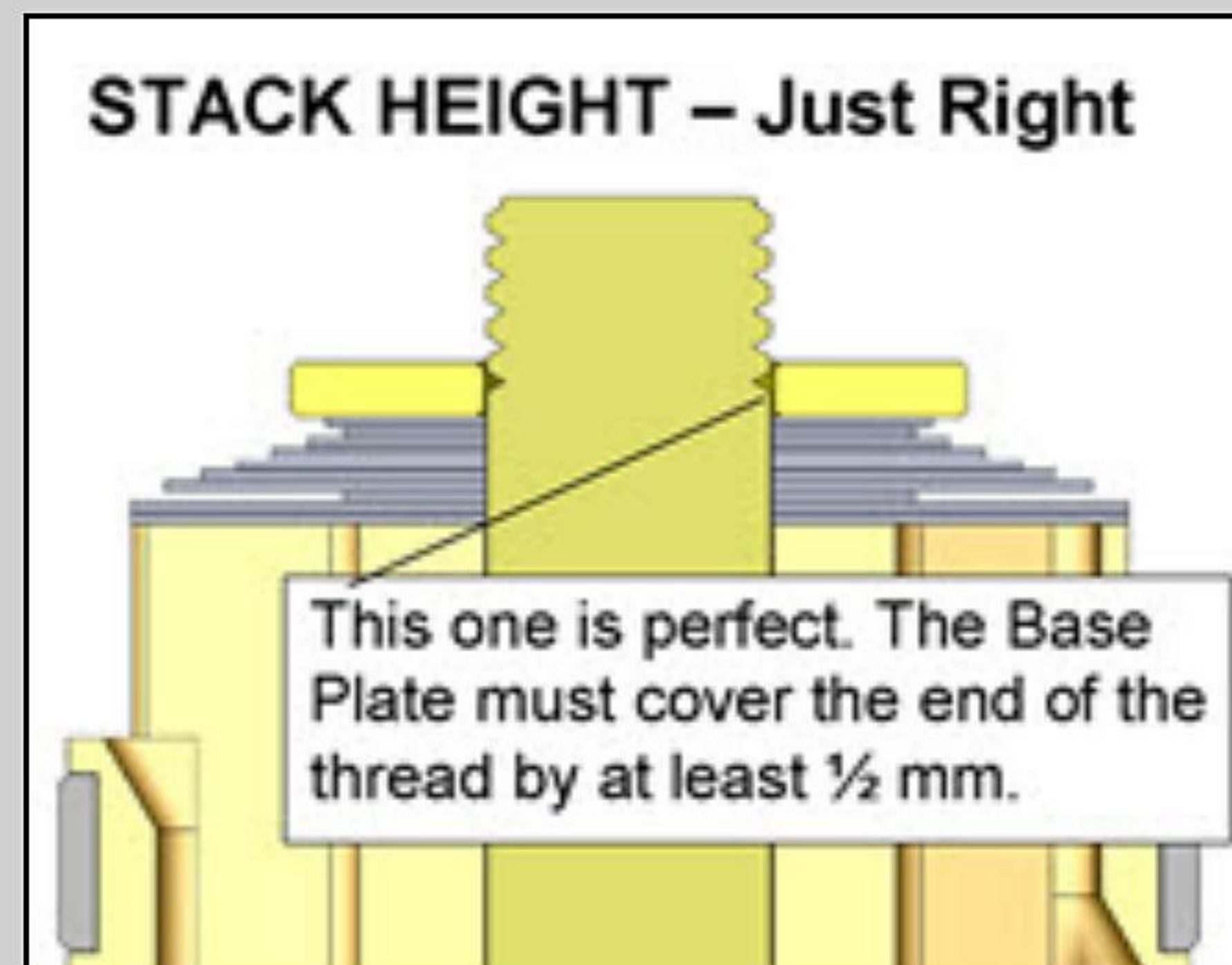
STACK HEIGHT – Too High



If needed, height adjustment is done with Spacing Shims added just below the Rebound Base Plate.

Spacing Shims must be larger in diameter than the smallest shim in the stack. Sometimes this is best accomplished by adding additional Base Plates.

STACK HEIGHT – Just Right



VR13- Make sure there is Loctite on the Nut and tighten it to spec with a torque wrench.

CAUTION! The threads can be damaged without extreme care. You must use Loctite. The 8mm bolt must be torqued with a torque wrench to 45 in-lbs (3.8 ft-lbs or 0.52 kgf-m), NO MORE! Do not take this step lightly.



VR14- Make sure the mid-valve is free to move up and down.

CHECK THE FLOAT

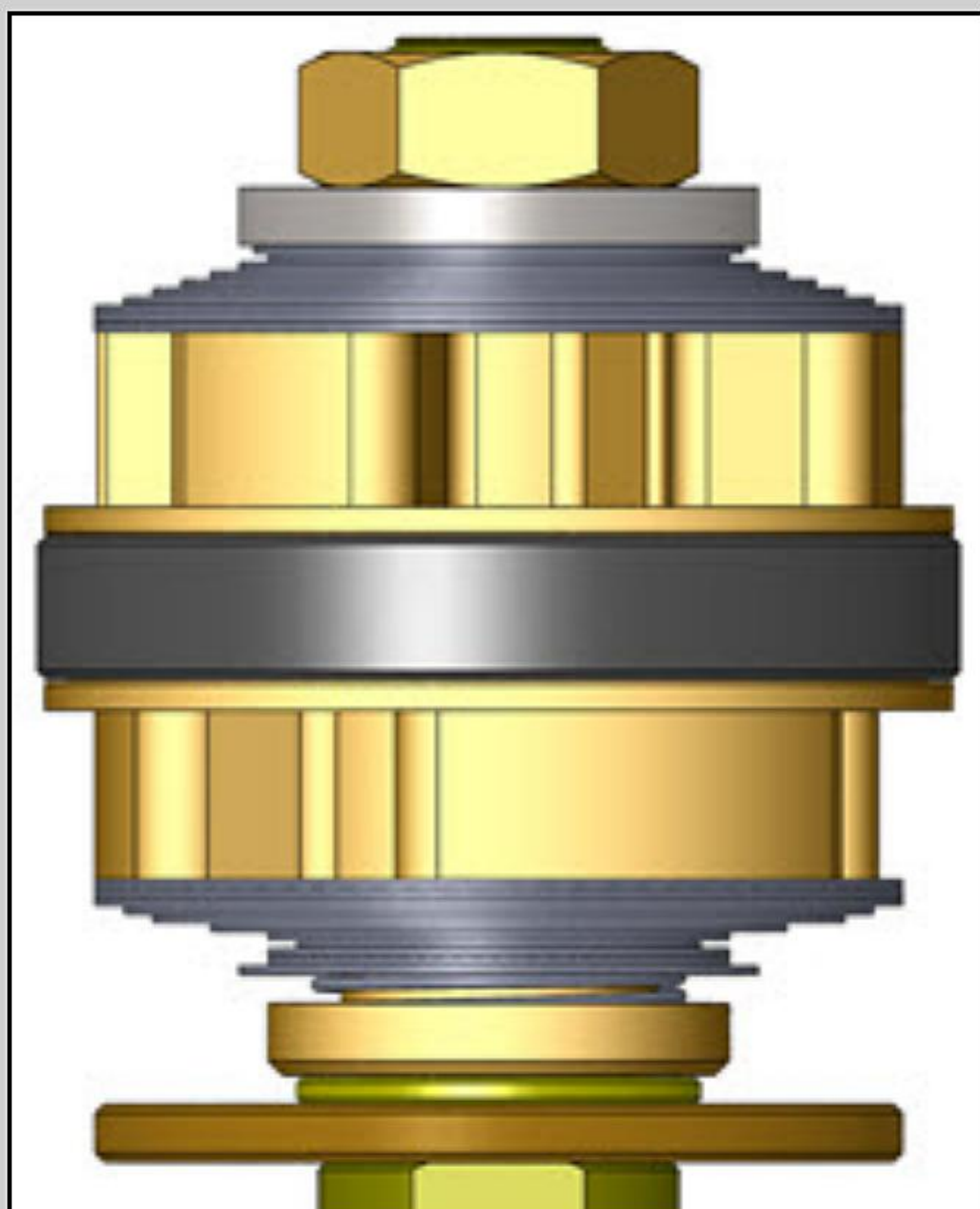
The most critical valving setup in the entire front fork is the FLOAT. Use a feeler gauge to measure the actual "float" of the mid-valve. The float is the amount the stack moves before it has to bend.

Insert the feeler gauge between the Gold Valve Piston face and the first shim. Make sure the feeler gauge goes all the way in to the surface of the inner sleeve.

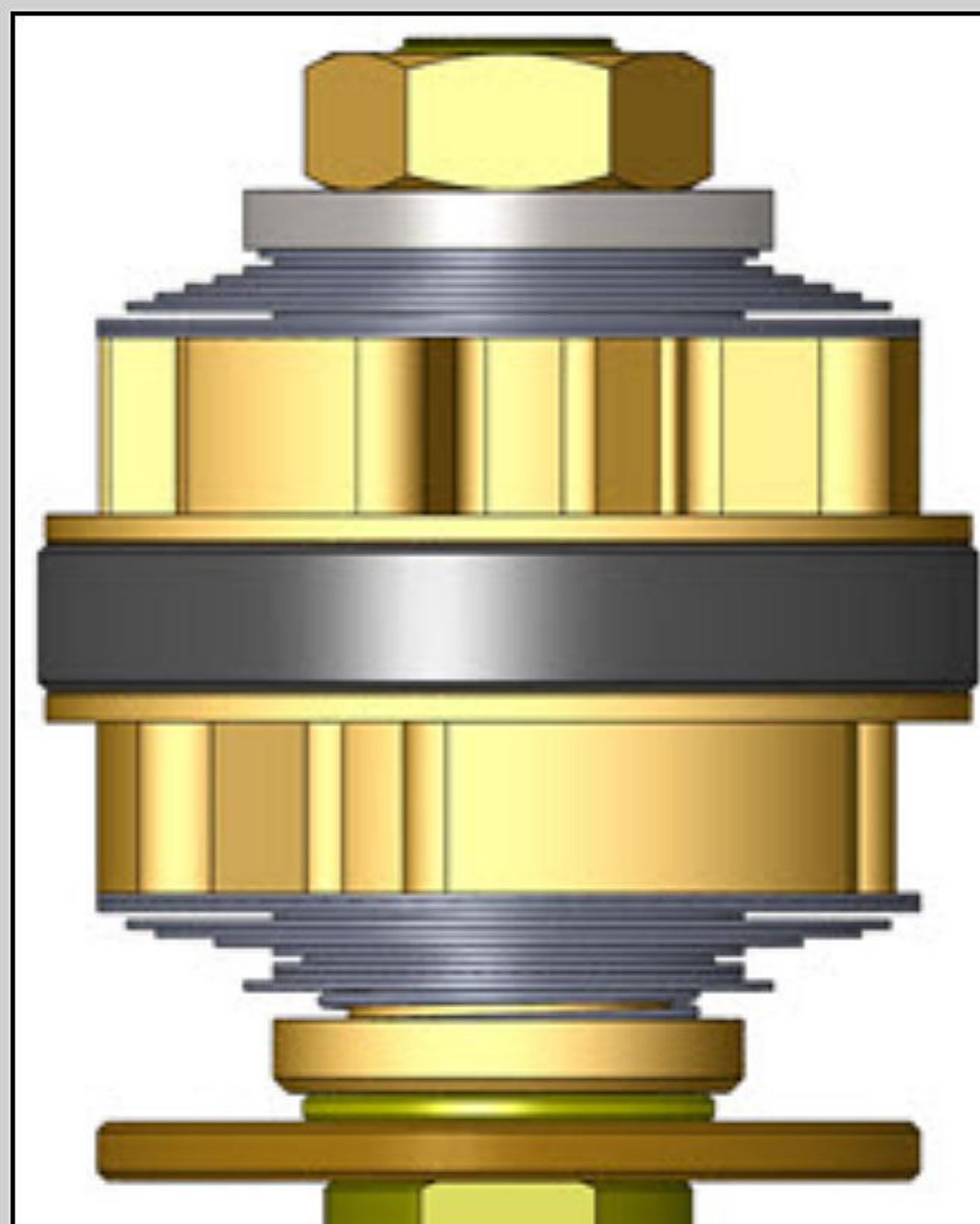
This is the best way to check the float as there are always production tolerances that will throw the predicted float off of the calculated number.

Adjust the packing stack to get the correct float. THIS IS CRITICAL!

VR15- **Single Stage Rebound and Single Stage Mid-Valve**



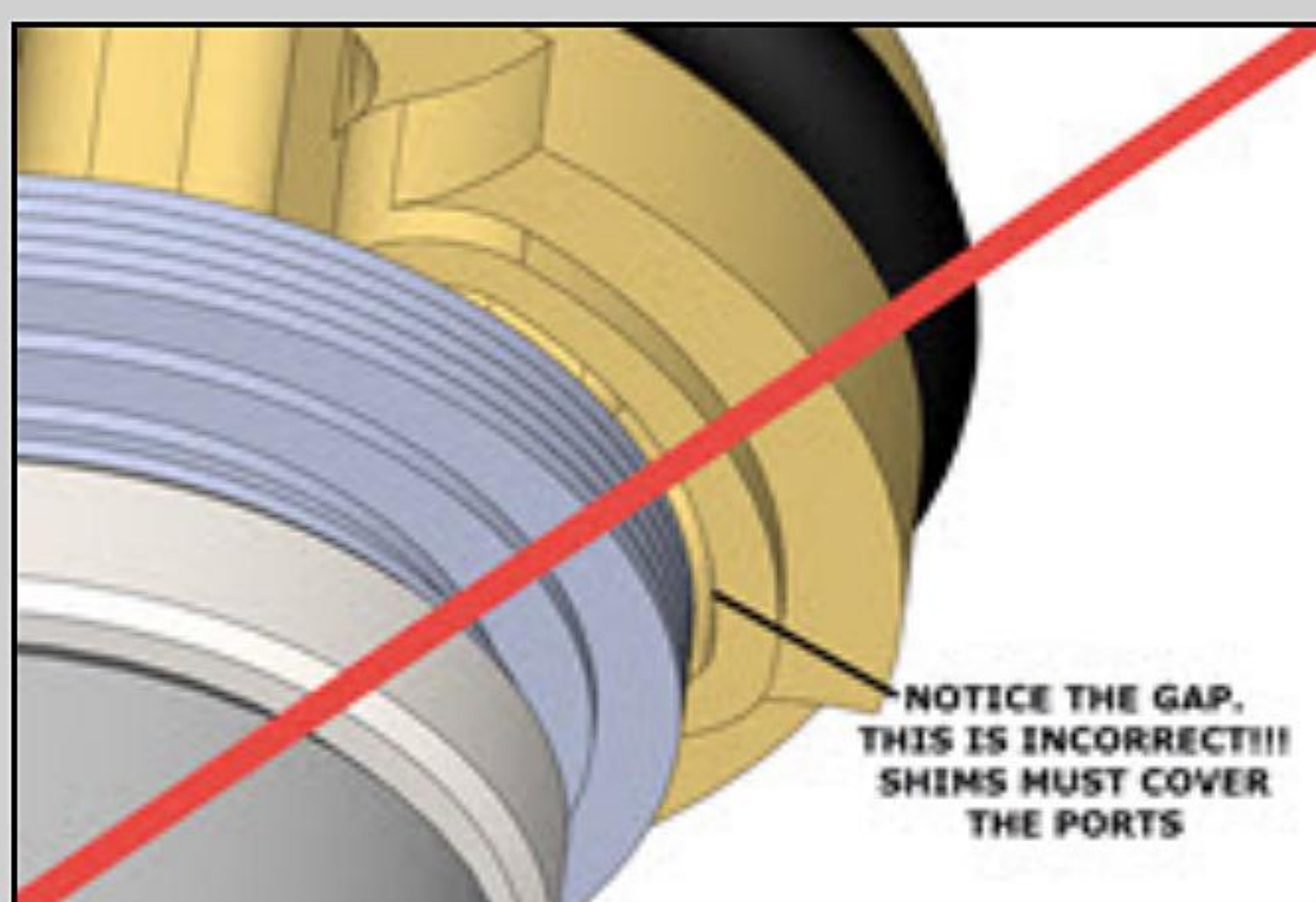
VR15- **Two Stage Rebound and Two Stage Mid-Valve**



Notice the gap in the valving stack where the Crossover is. The crossover gap should be clearly visible upon inspection.



VR16- Check your work. Hold the valve assembly up to the light and look for proper assembly. If there are any problems, disassemble the stack and look for burrs to surface and/or dirt in the valving. Reassemble and check again.



VR17- **Make sure the shims that go next to the Gold Valve completely cover the ports on both sides of the piston!** If the ports are not covered there will not be enough damping.

This could be caused by a number of reasons. Please call Tech Support if this occurs.

VR18- Continue with installation of the Compression Gold Valve and fork assembly.