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KYB Shock Manual

Shock Disassembly and Assembly
Lowering Kit and Beta Bladder Kit Installation

2T & 4T Models



CONFIDENTIALITY NOTICE

This message (including any attachments) contains information that may be confidential and is for authorized Beta Dealer's use only.

All work must be performed by trained technician.

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INTRODUCTION

The procedures in this manual must take place in a clean environment using professional and some specific tools.

Use caution not to damage the surface of the shock body, shaft, or any suspension components.

When using a bench vise, always use protective jaws made from brass, aluminum or plastic. Always clean suspension components before assembly, using appropriate solvents and lint free towels to prevent contamination. Replace common wear parts such as seals, gaskets, bushings and O-rings every service interval.

CAUTION:

Always wear protective eyewear, gloves and appropriate clothing. Before you perform any maintenance, be sure to read and carefully follow the detailed instructions described in this manual.

The shock absorber unit contains highly compressed gas. Incorrect disassembly/assembly of the shock may cause serious damage, injury, or death to the rider and property.

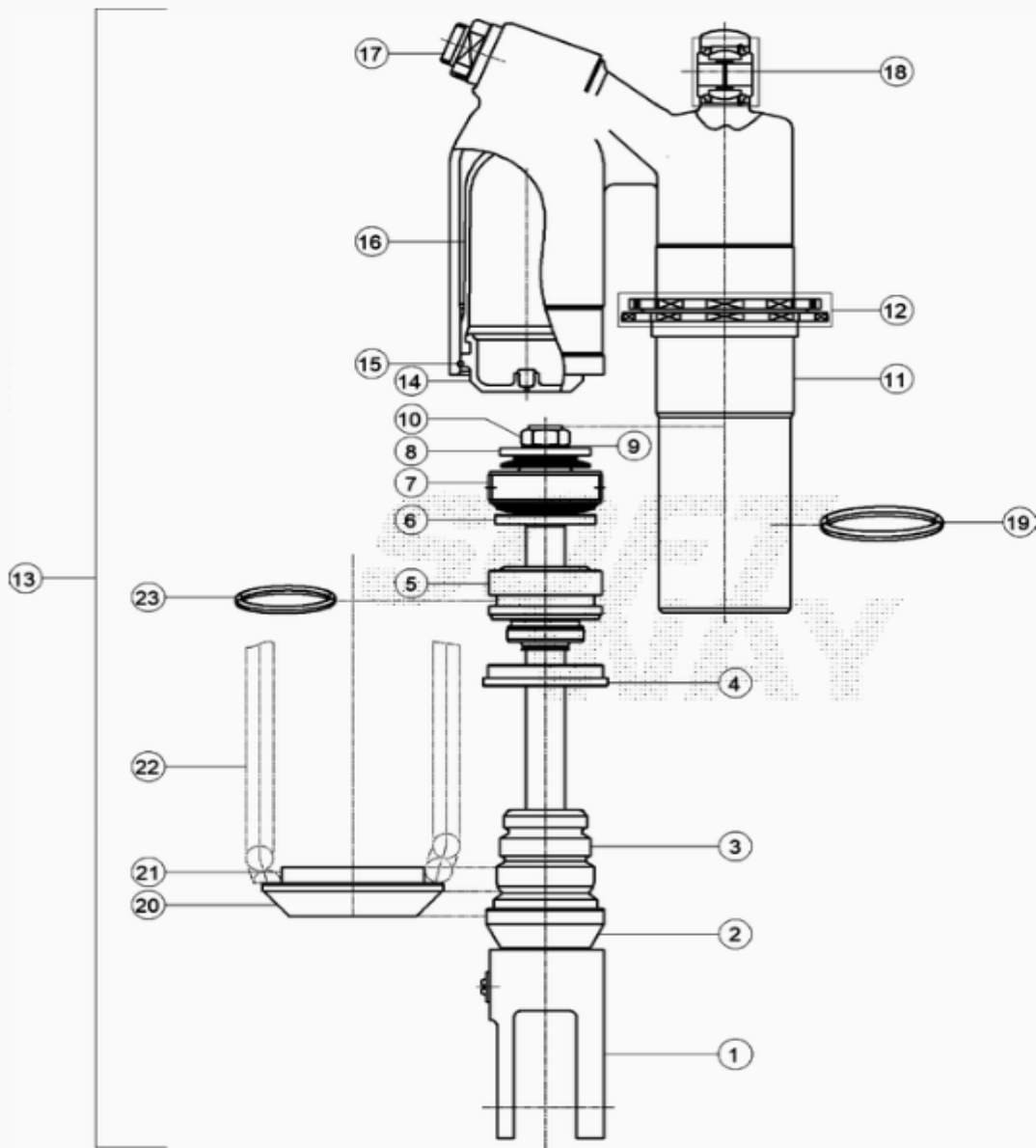
Special tools

08-0843	Motion Pro Shock Lock Ring Punch
AB- 15038	Aluminum 16mm Shock Shaft Clamp
	45-Degree Pick
	KYB Compression Adjuster Housing Socket
612 AEP	Modified Snap On – Long Reach Needle Nose Pistol Grip Pliers
	22-Gauge Hypodermic Needle
	Nitrogen Gauge with hypodermic needle adapter
	Nitrogen with Regulator
	Bench Grinder

DIAGRAM

Explosion drawing:

SWING ARM/REAR SUSPENSION



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- | | |
|------------------------------|--------------------------------|
| 1. Clevis Assembly | 12. Spring Lock Ring Set |
| 2. Bump Stop Rubber Holder | 13. Shock Assembly Complete |
| 3. Bump Stop Rubber | 14. Gas Tank Cap Complete |
| 4. Body Cap | 15. Gas Tank Cap Stop Ring |
| 5. Seal Head Complete | 16. Bladder |
| 6. Support Washer Piston Rod | 17. Compression Adjuster |
| 7. Piston Complete | 18. Bearing, Spacer, Seal Kit |
| 8. Washer Next to Lock Nut | 19. Body Stop Ring |
| 9. Spacing washer | 20. Spring Seat Collar – Alum. |
| 10. Shaft Lock Nut | 21. Spring Seat Collar - Steel |
| 11. Shock Body | 22. Shock Spring |
| | 23. Seal Head O-ring |

Recording Adjustment Settings



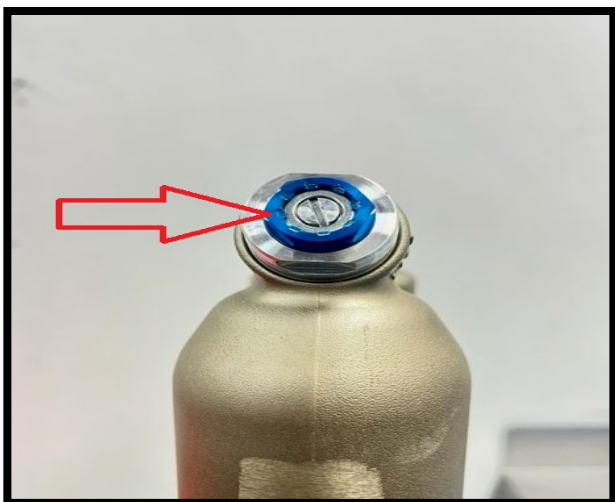
Check and record the position of the rebound adjustment. To do this, turn the flathead screw clockwise until it stops and document the number of “clicks”.

Next, turn the screw counter-clockwise until fully open.



Check and record the position of the low-speed compression adjustment screw. To do this, turn the flathead screw clockwise until it stops and document the number of “clicks”.

Next, turn the screw counter-clockwise until fully open.



Check and record the position of the **high-speed compression**. To do this, turn the **blue hex** nut clockwise until it stops, document the number of “clicks”.

Next, turn the knob counter-clockwise until fully open.

Shock Body Bearing Collar Removal

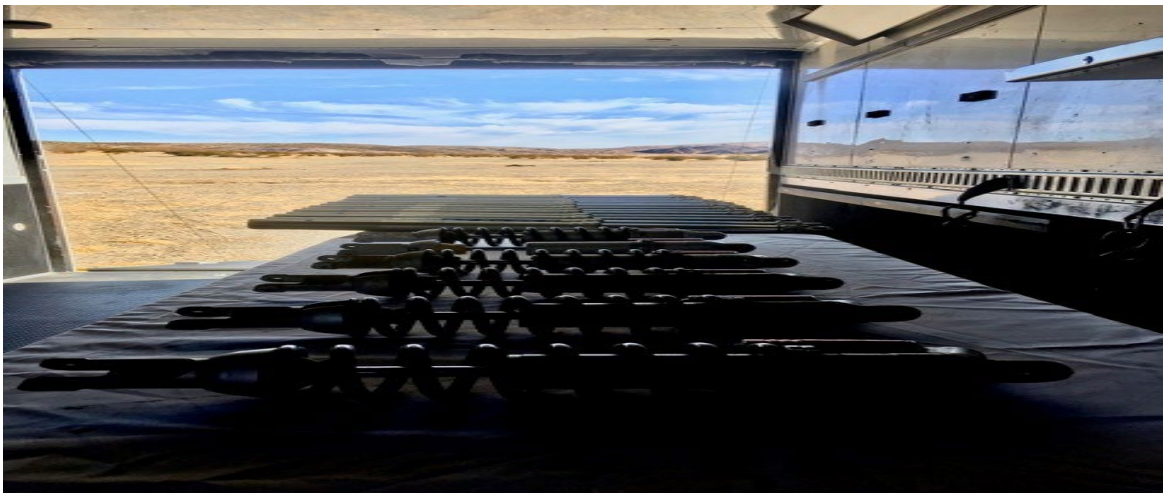


Insert a flathead screwdriver inside the top-eye bearing and push collar out.

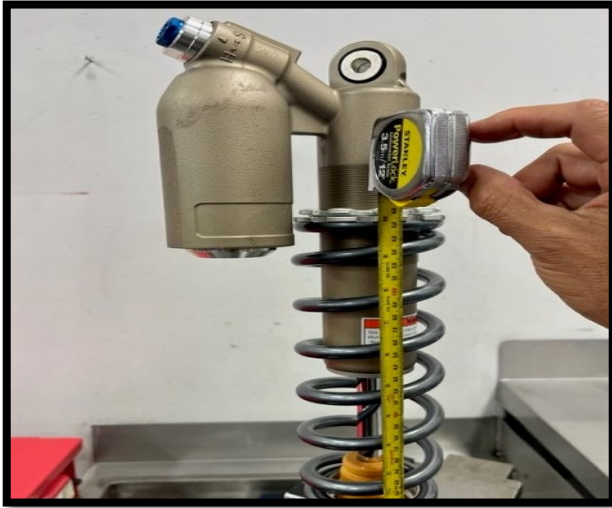


Use a flathead screwdriver to remove the body bearing seal.

Repeat the same procedure for the collar and seal on the opposite side.



Spring Removal

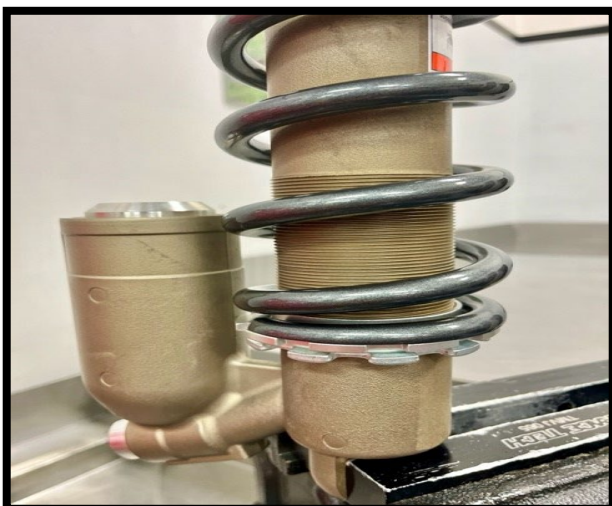


Measure and document the “set length” of the rear spring before loosening the lock rings.



Secure the shock upside down in a bench vise.

Use a motion pro lock ring punch, drift, or similar with a ball peen hammer to loosen the top steel lock ring.



Rotate the steel lock ring completely downward.

Use the rear spring against the aluminum lock ring to help assist loosening and rotate completely downward.



Both lock rings should be lowered with no spring tension.

This will allow enough space for removing the aluminum spring seat collar.



Pull the bump stop rubber downward out of the bump rubber holder.

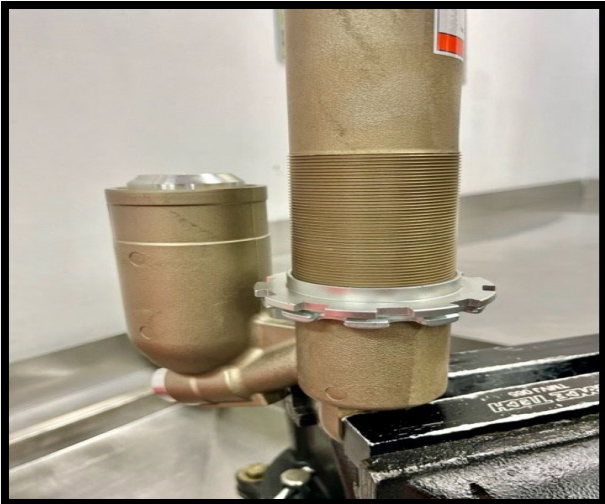
Lift the holder upwards and remove the aluminum spring seat collar.



Remove the steel spring seat collar.



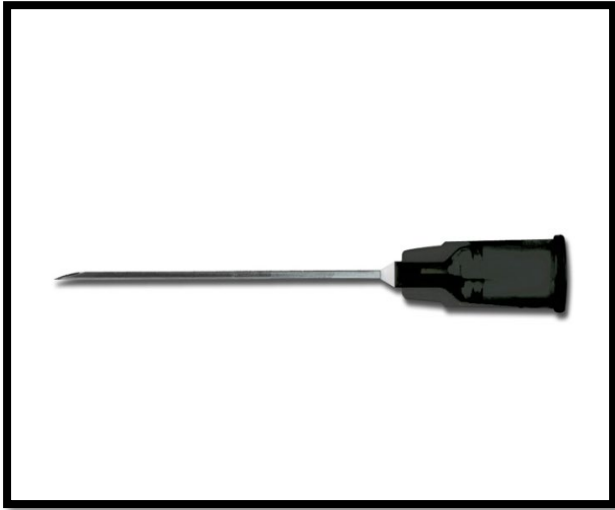
Remove the coil spring from the shock assembly.



It is recommended to remove both lock rings to clean the them, including the shock body threads.



Shock Disassembly



A 22-gauge hypodermic needle will be necessary to release the nitrogen pressure from the shock reservoir.



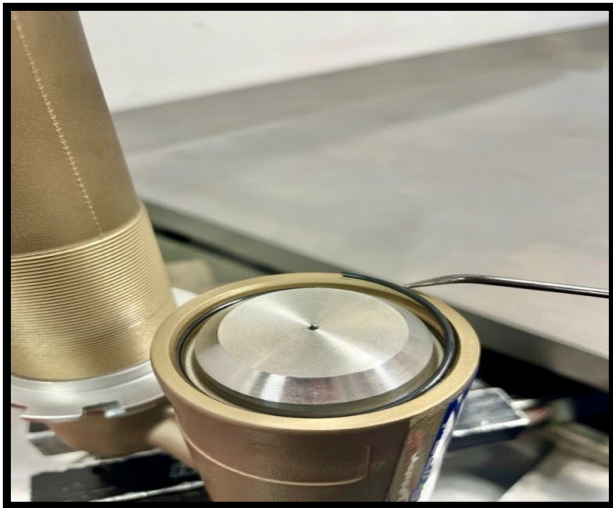
Insert the 22-gauge hypodermic needle inside the small hole of the gas tank cap to pierce through the self healing plug to release the nitrogen.



After all the nitrogen has been released, remove the hypodermic needle.



Use a rubber mallet and tap down the gas tank cap, enough to gain access to the stop ring .



Using a 45-degree pick, remove the reservoir body stop ring. Be careful not to scratch the inside of the body.

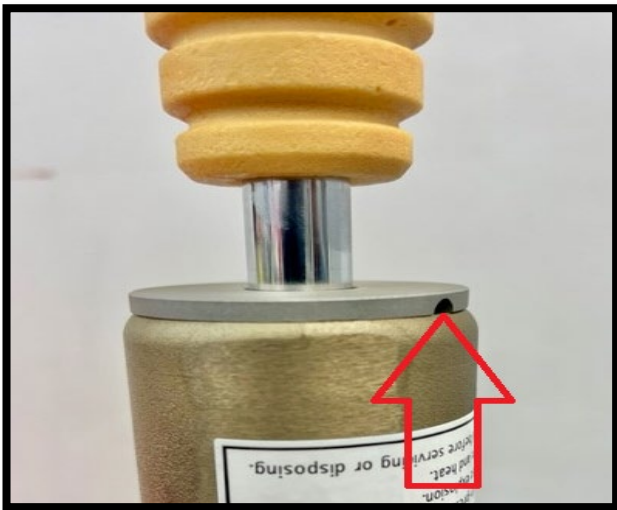


Installed is a KYB prototype gas tank cap removal tool.

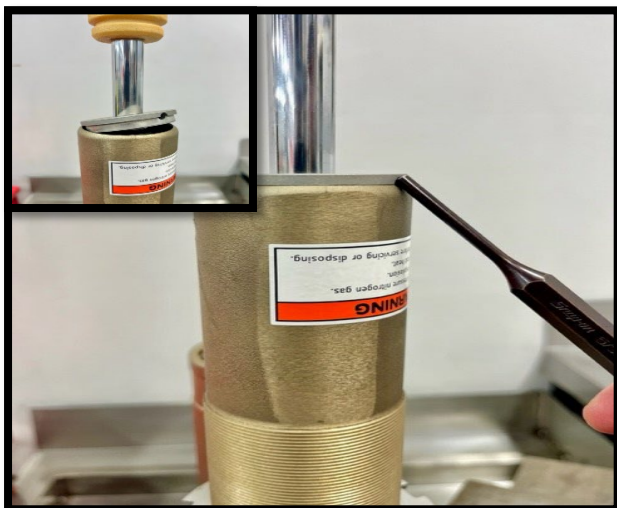
Use a similar clamp, or adjustable pliers to remove the gas tank cap.



The gas tank cap and bladder are removed together with the clamp, similar clamp, or adjustable pliers.



Locate the dome shaped area on the body cap.



Use a ball peen hammer and 5/32 drift punch in the dome shaped area to remove the body cap.



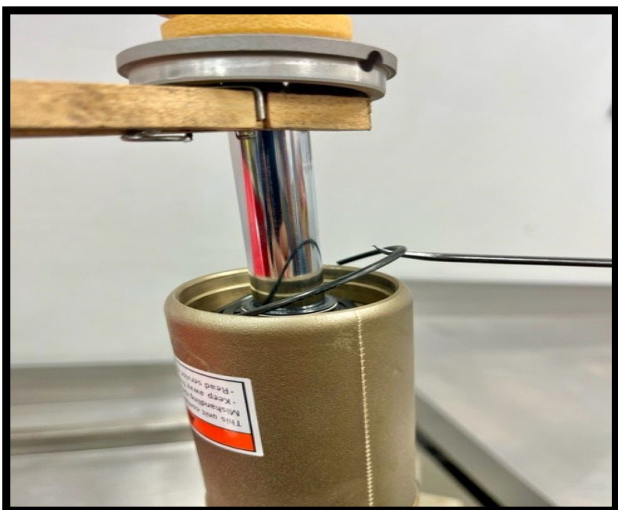
Install a clothespin around the shaft to keep the body cap out of the way and install a seal head seating tool.



Remove the clothespin and set the body cap on top of the seating tool.

Bottom the bump stop rubber against the body cap.

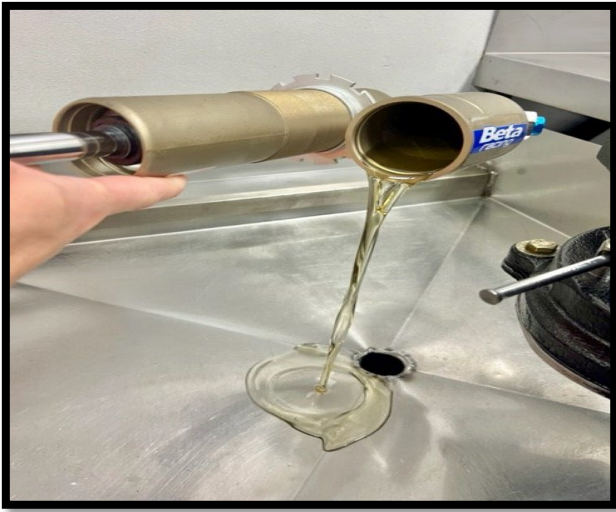
Compress the shaft completely downward until fully bottomed.



Pull upward on the shaft assembly approximately 3-4”.

Re-install the clothespin under the body cap and remove the seating tool.

Use a 45-degree pick to remove the stop ring. Be careful to not scratch the body.



Remove the shock body from the bench vise and drain the oil from the reservoir into an appropriate oil container.

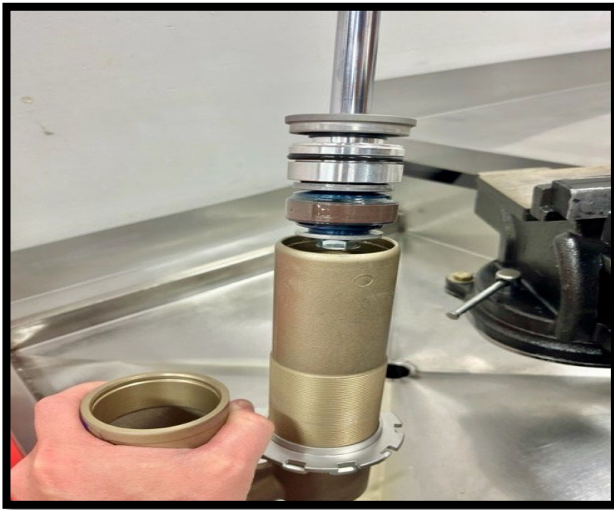
Please recycle.



Secure and clamp the clevis in a bench vise, so the shock is in a horizontal position.



Use a rubber mallet and tap on the reservoir to remove the shaft assembly.



Remove the shaft assembly from the shock body.



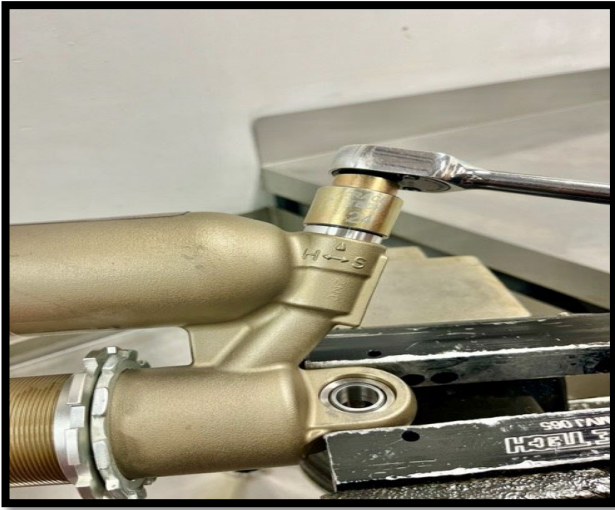
Drain the remaining oil from the shock body into an appropriate oil container.

Please recycle.



Compression Adjuster Removal

* Skip this procedure if unit has never been ridden



Place the shock body top eye area into a bench vise and secure.

Install a compression adjuster housing tool and remove with a 3/8 ratchet.



Remove the compression adjuster housing assembly. Careful to not loose the small valve shim inside the housing.

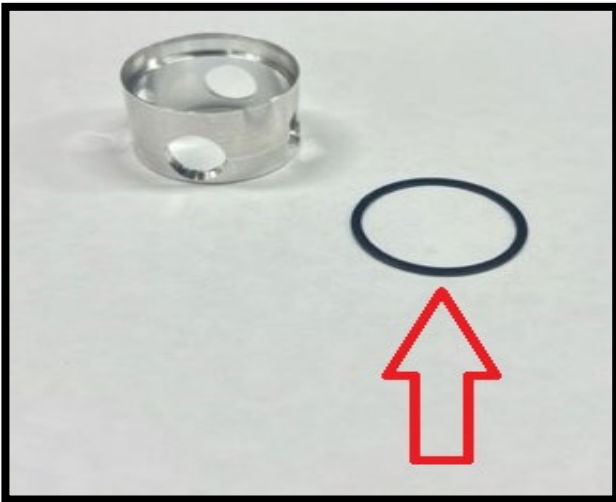
The shim protects the surface between the high-speed spring and blue anodize.



Remove the high-speed spring.



Remove the compression adjuster aluminum body.



Remove the blue shim.

Be aware of a blue shim that is used to protect the bottom of the aluminum body.

The shim could cling inside the aluminum body, or around the valve assembly when the body is removed.



A modified pistol grip plier was used to remove the compression adjuster piston assembly.

Shaft Component Removal



Note the KYB factory peened shaft end.

DO NOT REMOVE THIS NUT IF THE SHAFT PEENED AREA HAS NOT BEEN REMOVED!

Continue reading for nut removal.



Use a bench grinder wheel to remove ONLY the factory peened shaft area.

You may slightly grind the top of the lock nut if needed.



Spray contact cleaner to clean the shaft assembly from any metal debris.

Use compressed air inside the shaft holes to clear out any debris residual.



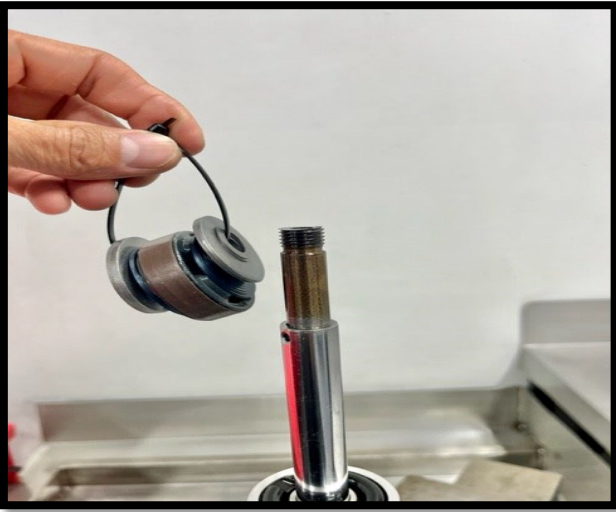
Displayed is the desired appearance after removing the factory shaft peen.



Secure the shaft assembly in a bench vise and use a 17mm box end wrench to remove the shaft lock nut.



When removing the factory lock nut, you will experience a small amount of thread curl. This will be addressed in a few steps.



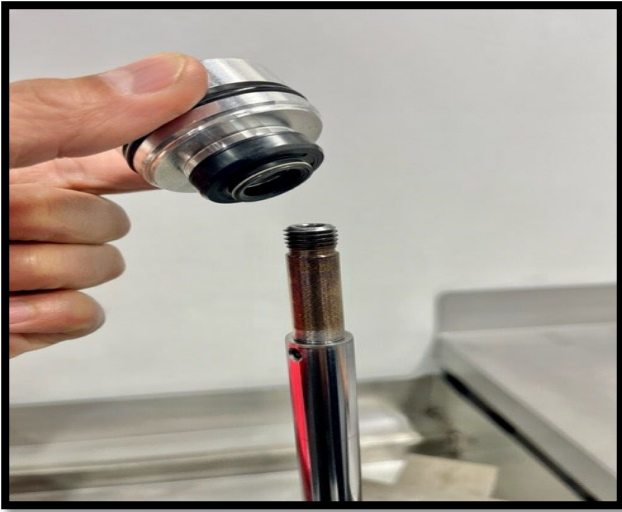
Install a cable tie through the valve shims, piston valve, steel stop, to retain the orientation and valving configuration.



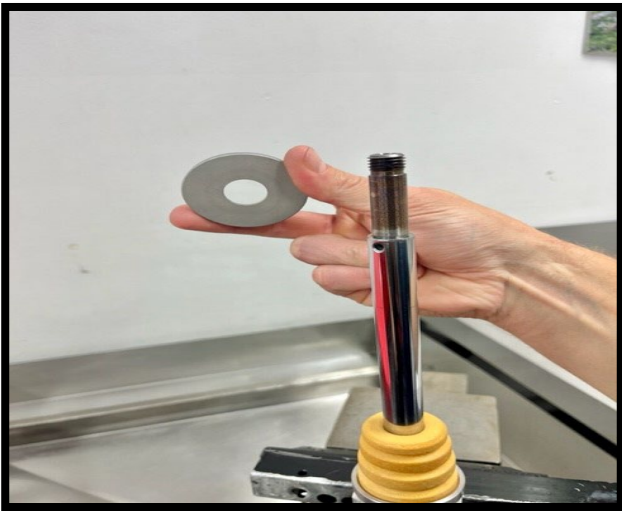
Use a belt sander at a 45-degree angle and clean up the first or starting shaft thread.



Apply a wire wheel to clean up any burrs on the shaft threads.



Carefully remove the seal head assembly from the shock shaft, especially if you don't plan on rebuilding, or replacing it.



Remove the aluminum body cap from the shock shaft.



Remove the bump stop rubber from the shock shaft.

Remove the aluminum bump rubber holder from the shock shaft.

Seal Head Disassembly



Use a bench vise and secure the seal head with a 46mm aluminum clamp.

Insert a flathead screwdriver in-between the top-out rubber and steel washer to remove the rubber.



Remove the steel guide washer.



Remove the oil seal and discard.



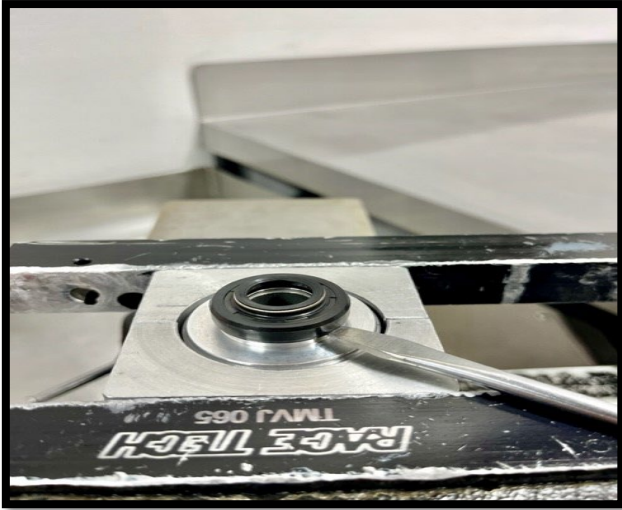
Remove the steel back-up washer.



Use an appropriate bushing driver, or similar (socket) to press out the seal head bushing.



Remove the bushing from the seal head assembly and discard.



Use a bench vise and secure the seal head with a 46mm aluminum clamp.

Use a flathead screwdriver underneath the dust seal to remove it.

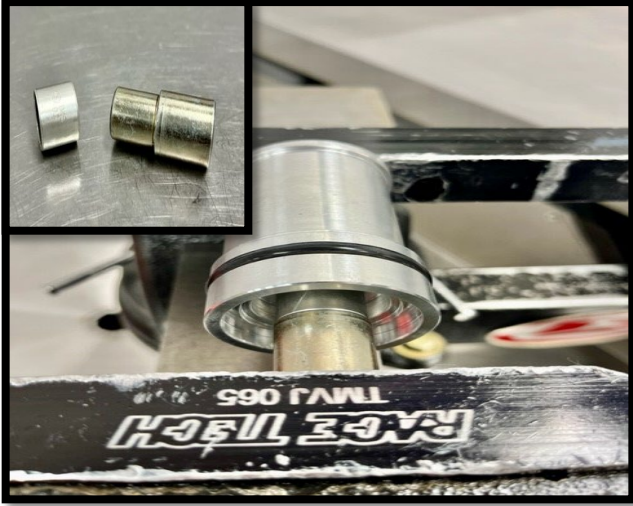


Remove the dust seal and discard.



Remove the seal head assembly O-ring and discard.

Seal Head Assembly

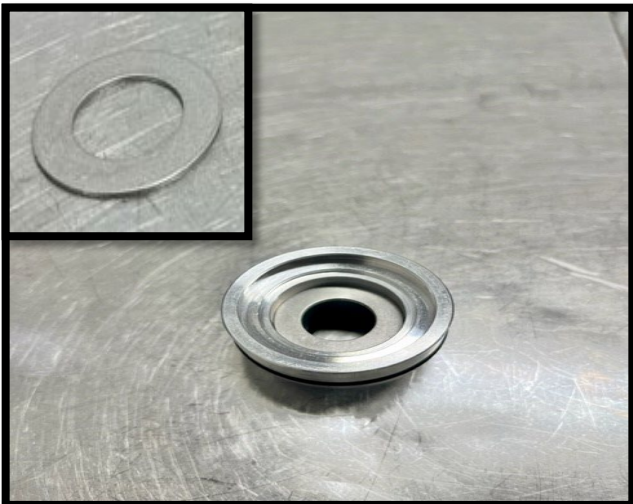


Use an appropriate bushing driver, or similar (socket) with bench vise.

Install a new bushing from the inside of the seal head assembly.



Photo of the new bushing installed.



Install the steel back-up washer.



Apply suspension grease to the inside of the oil seal and install into the seal head.

Photo provided in the top left corner is the top view, or direction to be installed.



Install the steel guide washer with smaller end facing upward.



Install the top-out rubber into the seal head assembly.

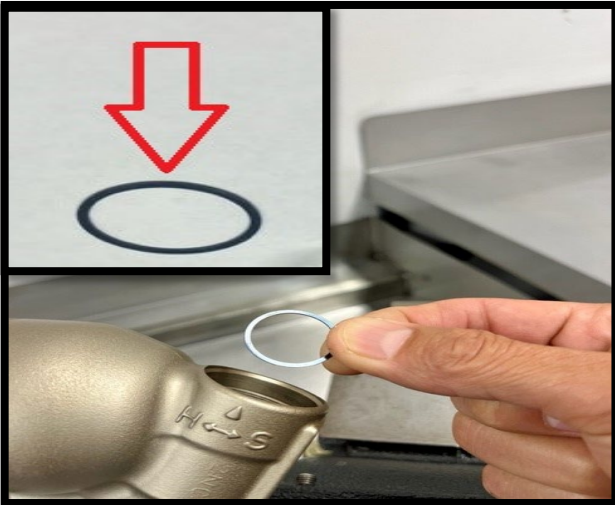
Photo provided in the top left corner is the top view, or direction to be installed.

Compression Adjuster Assembly



Grease both O-rings on the compression valve assembly.

Insert the valve assembly until fully seated inside the shock body.



Install the blue shim inside the body and over the valve assembly.

The shim is used to protect the two mated surfaces.



Install the compression adjuster aluminum body with the recessed area facing downward, so the blue shim can seat inside.

Use photo for correct direction of installation.



Install the high-speed compression spring. The spring is non-directional.



Grease the outer O-ring and install the compression housing.

Be sure to have the blue shim installed inside the housing, so the high-speed spring doesn't contact with the blue anodize.



Use a KYB compression housing socket, and torque wrench to tighten the compression assembly.

Torque Specification: 34Nm / 25 Ft Lb.

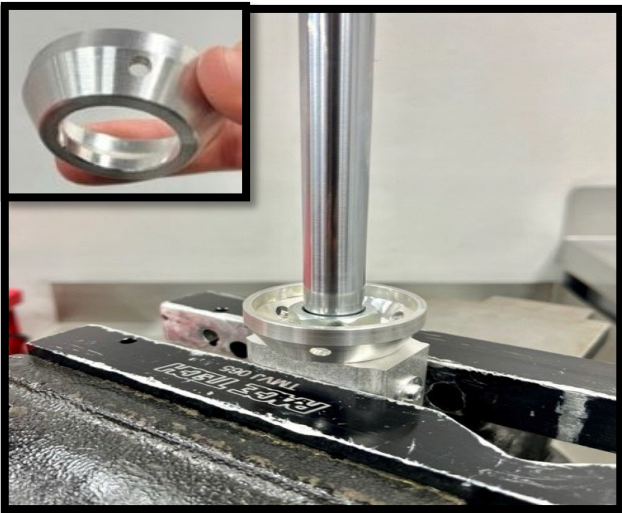
Shaft Assembly

Install a 16mm shock shaft bullet over the top to cover shaft threads.

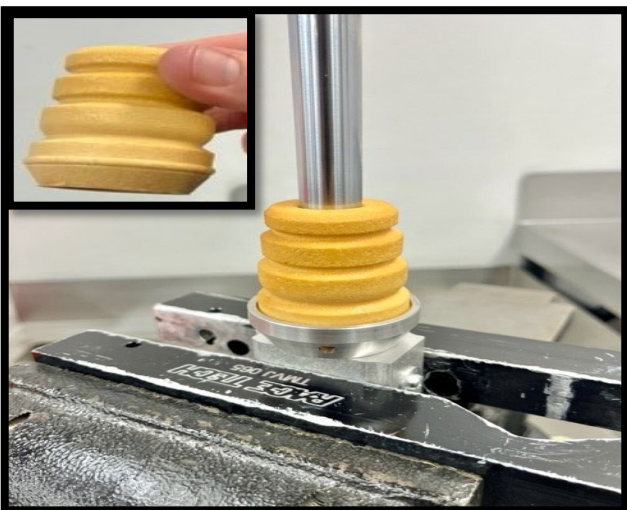


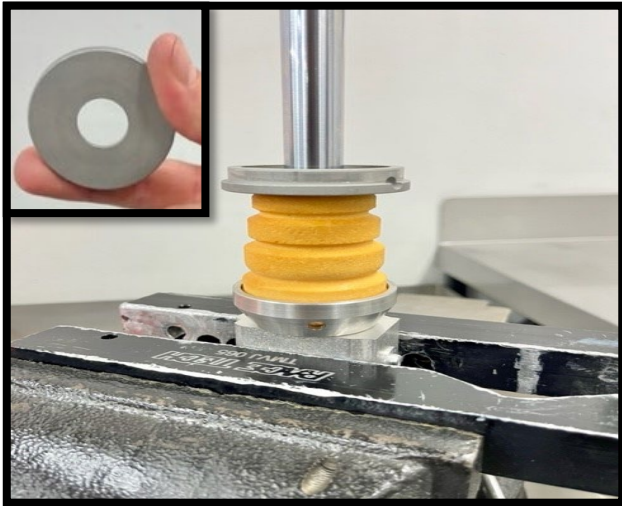
Secure the shock clevis with a bench vise.

Install the aluminum bump rubber holder onto the shock shaft.



Install a new KYB bump stop rubber.





Install the body cap.

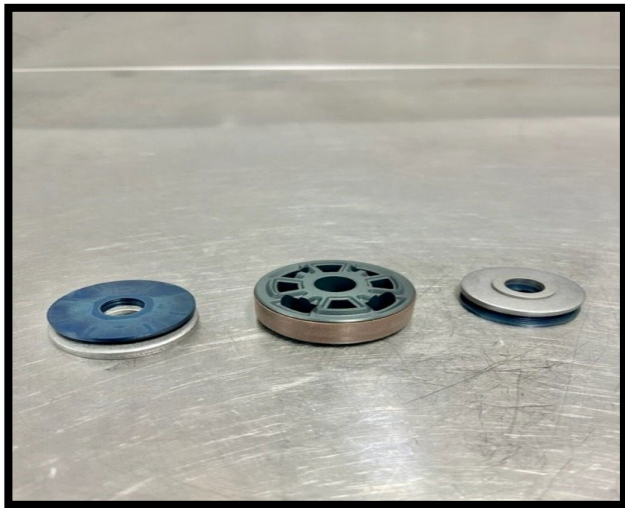


Slide the seal head assembly over the 16mm shaft bullet and onto the shaft.

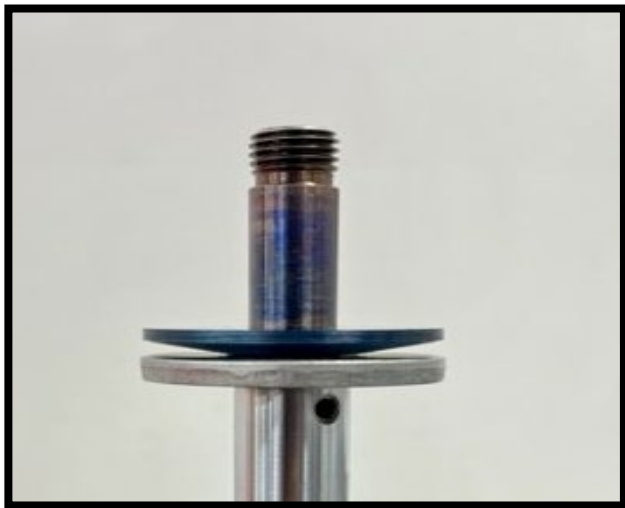
Secure the bullet from moving, as you install the seal head.



Cut the cable tie with all valving components.



On a flat surface, separate the valve assembly into 3 parts, compression valve stack, valve piston and rebound valve stack.



Install the OEM steel stop plate and compression valve shims onto the shaft.

If lowering proceed to page 43 for instructions now. Resume on page 30

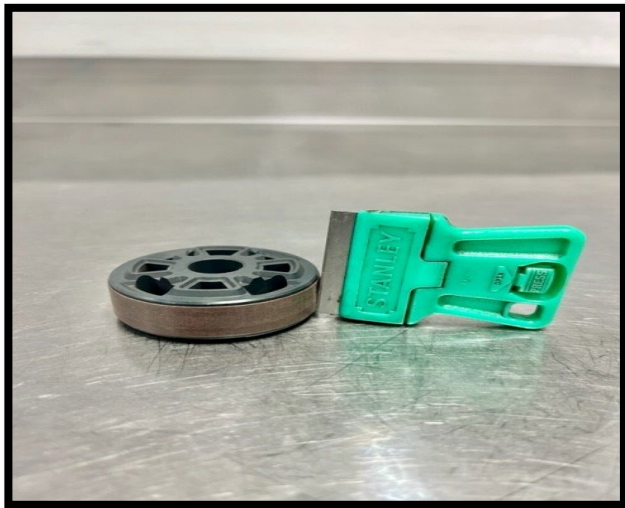


Measure the outside diameter of the Teflon band on the valve piston.

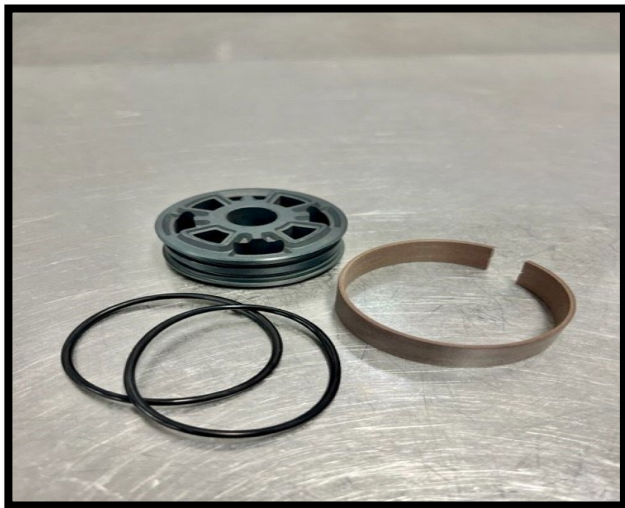
Teflon band tolerance range

46.15-46.30mm

If under the minimum range, replace with a new piston band and O-rings.



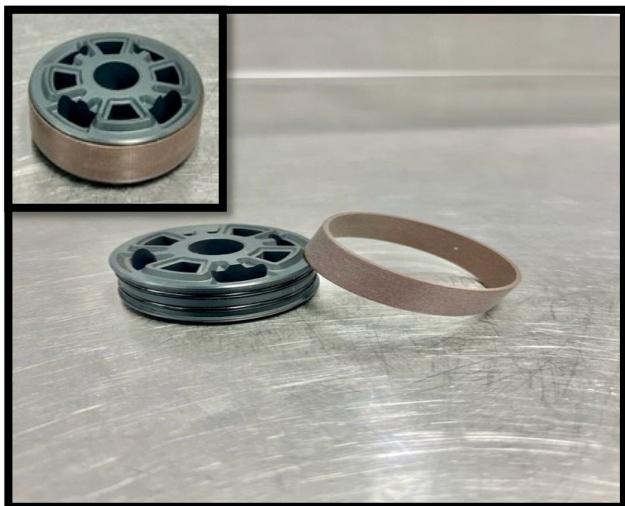
If the Teflon band measurement is **less than 46.15mm**, cut the band off the valve piston for replacement.



Remove the Teflon band with O-rings and discard.



Install new O-rings into the groove of valve piston.



Stretch the new Teflon band around the valve piston with new O-rings.

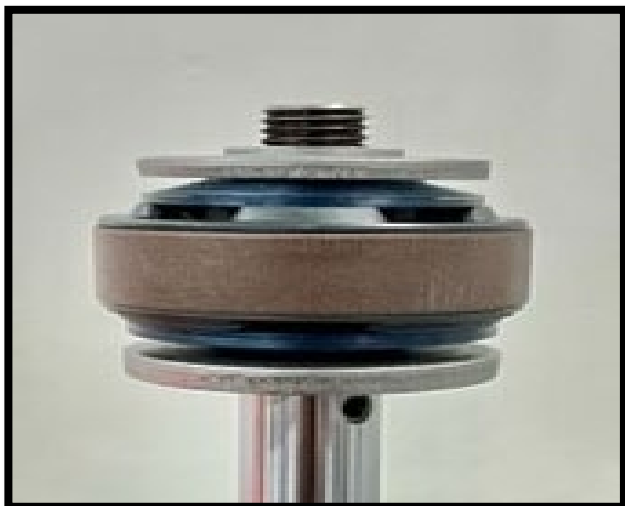


Use a 46mm seating tool to calibrate the piston band to the correct diameter.

Push the piston valve with new Teflon band and O-rings into the seating tool.



Install the valve piston assembly onto the shaft with compression shim stack.



Install the rebound valve shim stack with stop plate and washers onto the shaft.



Clean and dry the shaft lock nut and shaft threads with contact cleaner and compressed air.

Apply **RED** loc-tite to the lock nut



Install the new shaft lock nut with **RED** loc-tite onto the shaft threads.

Use a torque wrench and 17mm socket to tighten the shaft nut.

Torque Specification: 34Nm / 25 Ft lb

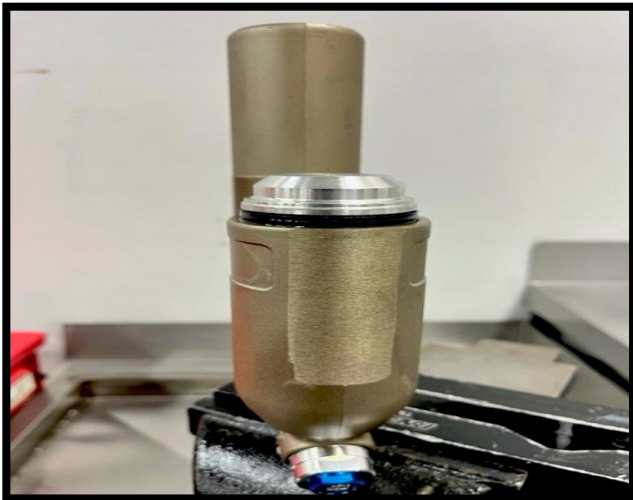
Shock Assembly



Secure the shock body using a bench vise with soft jaws.

DO NOT use the shock body cylinder for securing!

Use Liqui Moly shock fluid 2.5-3W or equivalent and fill the reservoir to 50%.



Grease the outer ribbed edge of the bladder before installing.

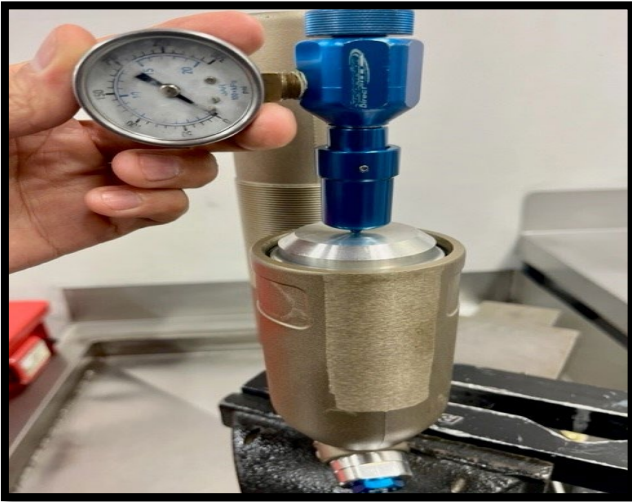
Insert the gas tank cap assembly into the reservoir side, so the schrader valve will point towards the rear of motorcycle.

Make sure fluid overflows around the bladder to eliminate trapped air.



Compress the gas tank cap inside the reservoir far enough to expose the stop ring groove.

Install the stop ring into the groove.



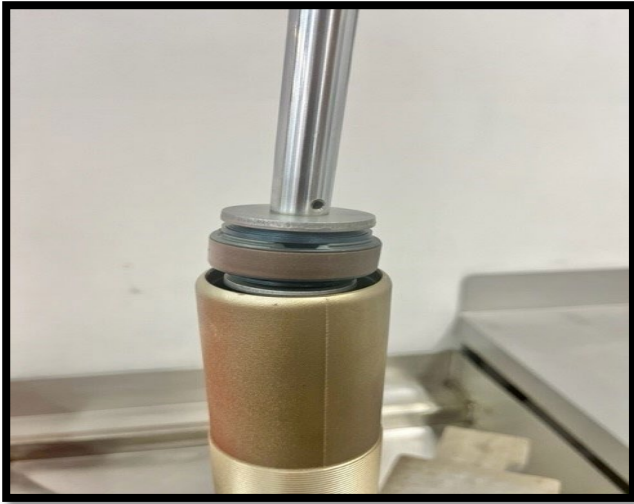
Insert a hypodermic needle with gauge into the gas tank cap and pressurize the bladder to 100+ psi.



It is recommended to pre-bleed the shaft assembly in a ratio-rite with shock fluid before starting the assembly bleeding process.



Fill the shock body completely with oil, leaving no air space inside.



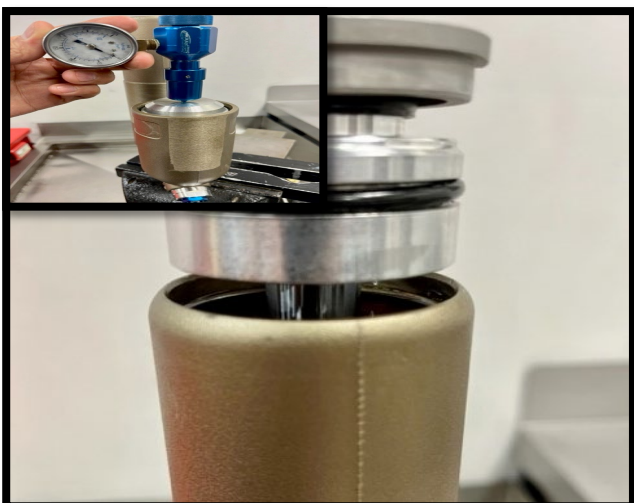
With the shock body filled with fluid and the bladder inflated, remove the shaft assembly from the ratio –rite.

Submerge the shaft assembly into the shock body.



Pull up and down on shaft assembly to bleed out any trapped air in the shock fluid.

This bleeding process usually takes 30 minutes, or until no air is achieved thereafter.



When bleed process is complete, compress shaft assembly downward until the **seal head is approximately 10mm away from the body.**

Slowly release the air from bladder, until the **fluid begins to drop approximately 8mm.**



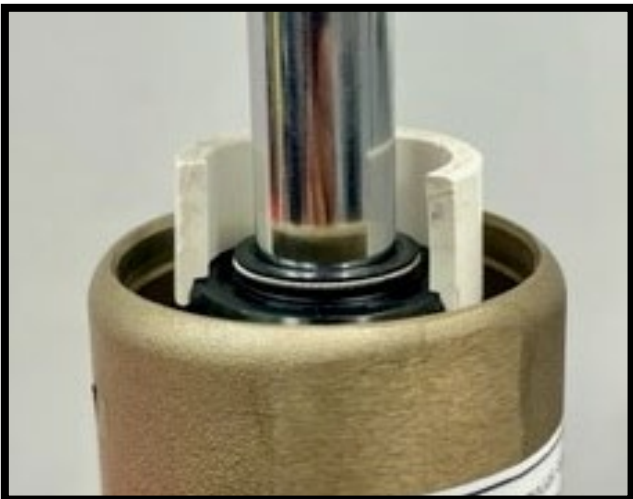
Fill the shock body to the brim with fluid.

Slowly compress the shaft assembly until the seal head O-ring is seated.

With shaft compressed, release the 5% remaining air left inside the bladder.



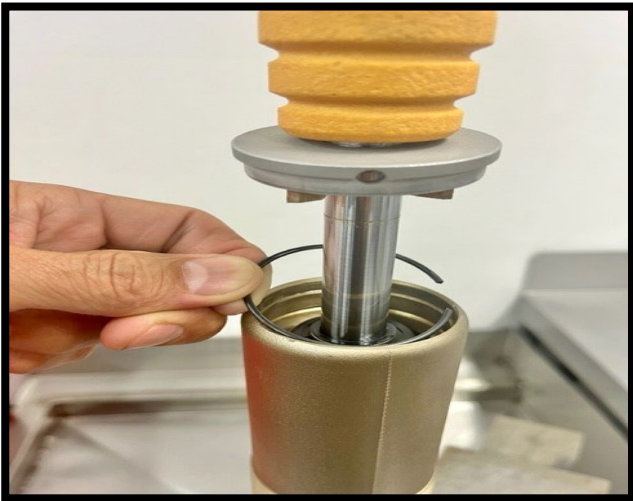
Use one hand to hold down the shock body cap and the other hand to slowly extend the shaft 3-4" inches.



Install a seal head seating tool between the seal head and body cap.



Bottom the body cap against the seal head seating tool and press the seal head into the body beyond the stop ring groove.

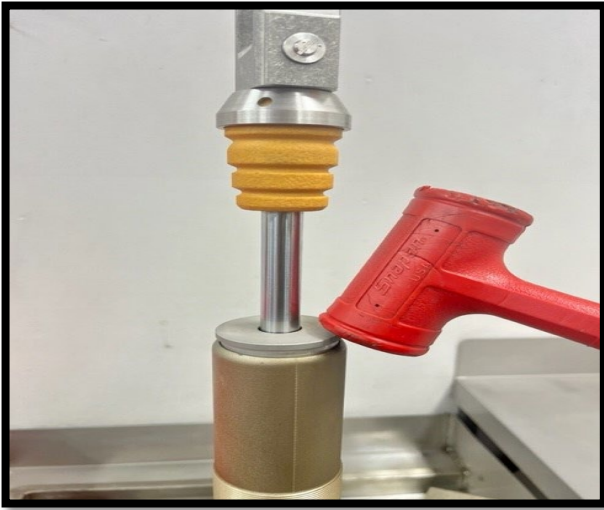


Insert the seal head stop ring into the body stop ring groove. Confirm the stop ring is completely seated.



Install the proper nitrogen gauge and pressurize the bladder with nitrogen.

**Recommended Nitrogen pressure:
150 psi / 10 bar.**



Position the body cap around the inside diameter of the shock body.

Using a rubber mallet, lightly tap around the body cap circumference until fully seated.

Coil Spring Installation



Install the top spring seat lock ring and thread it downward on the body threads.



Install the lower spring seat lock ring, keeping the flange side facing upward and thread it downward on the body threads.



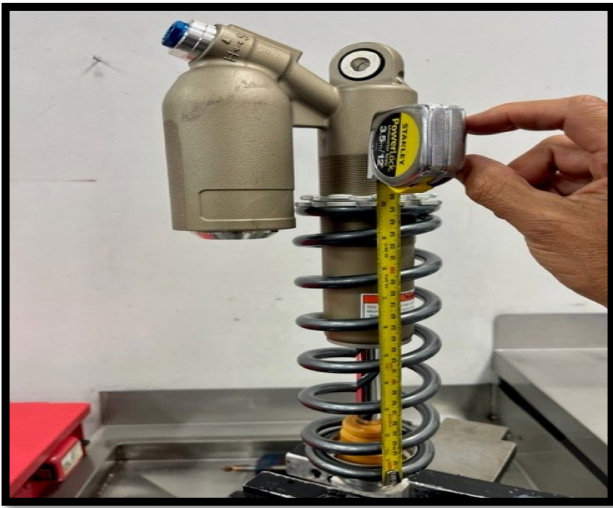
Install the spring over the shaft assembly with the larger inside diameter facing towards the lock rings.



Install the steel spring seat collar over the shaft assembly with the flange side facing downward.



Install the aluminum spring seat collar under the bump stop rubber holder, with the smaller inside diameter facing upward.



Rotate the lower lock ring to compress the spring. Set to the pre documented, or desired spring pre-load amount.

***Spring Pre-load Range (Standard Travel):
5mm – 15mm (Recommend 9mm)***

***Spring Pre-load Range (-1" & 2" Lowering):
5mm – 10mm (Recommend 7mm)***



Secure the shock upside down in a bench vise.

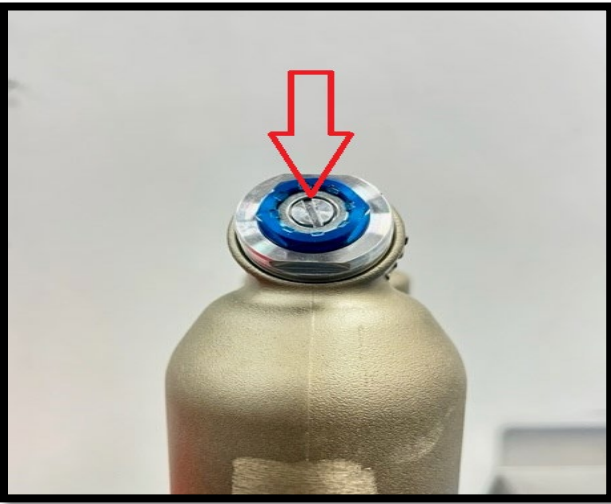
Use a motion pro lock ring punch, drift, or similar with a ball peen hammer to tighten the top steel lock ring.

Over tightening can cause thread damage!



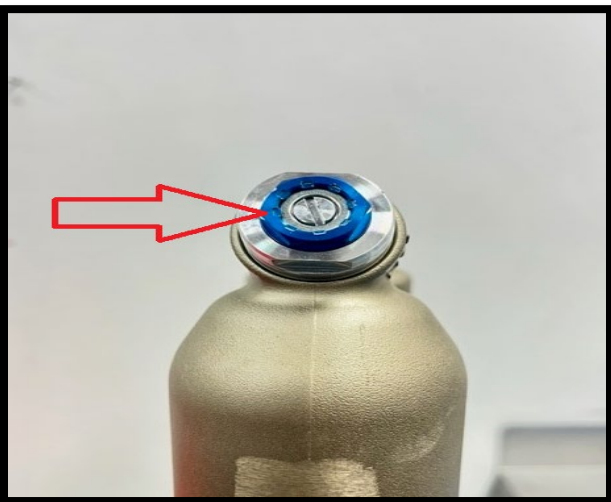
Press the bump stop rubber inside the holder.

External Setting Adjustment



Completely close the low-speed compression flathead screw by turning clock-wise until fully bottomed.

Set the low-speed compression setting by turning the flathead screw counter-clockwise to the pre documented, or desired setting.



Completely close the **high-speed compression adjuster (17mm Hex)** by turning clock-wise until fully bottomed.

Set the **high-speed compression** setting by turning the **blue hex** counter-clockwise to the pre documented, or desired setting.

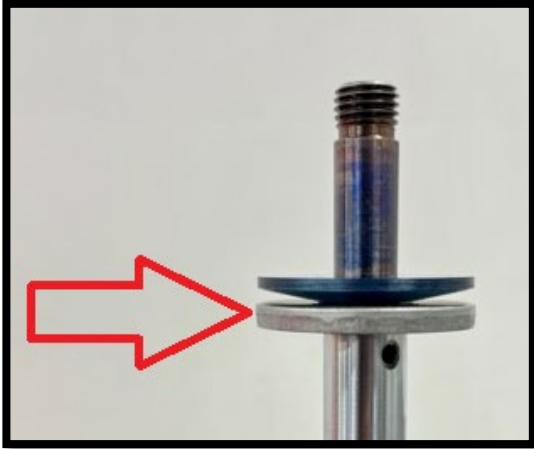


Completely close the rebound flathead screw by adjusting clock-wise until fully bottomed.

Set the rebound setting by turning the flathead screw counter-clockwise to the pre documented, or desired setting.

KYB Shock 1" & 2" Lowering Spacer Installation

- 1) Read the entire manual before installation.
- 2) Review pages 4-33 for shock disassembly, shaft component removal and shaft assembly preparation.
- 3) Follow pages 34-42 for shock assembly.



Remove the OEM steel valve stop, as this will no longer be utilized.



1" lowering spacer installed.
* Single groove line for -1"



Beta -1" Part # AB-41115



2" lowering spacer installed.
* Double groove lines for -2"



Beta -2" Part # AB-41116

Beta KYB Factory Bladder Cap Kit Installation

***Follow shock disassembly procedures on pages 4-33**



Grease the schrader valve O-ring.

Apply a drop of **Blue Loc-tite** on the threads.



Install the supplied schrader valve into the Beta KYB Factory bladder cap with a 10mm socket, or T-handle.



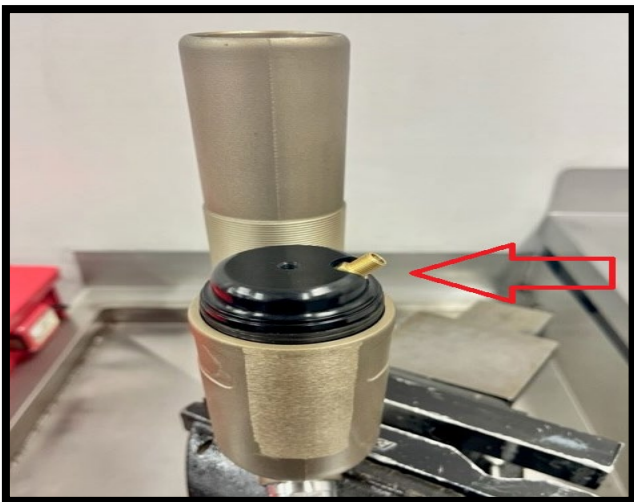
Apply grease to the inside circumference of the bladder.

Insert the Beta KYB Factory bladder cap into the bladder until seated.

Shock Assembly with Beta KYB Bladder Kit



Use Liqui Moly shock fluid 2.5-3W or equivalent and fill the reservoir to 50%.



Grease the outer ribbed edge of the bladder before installing.

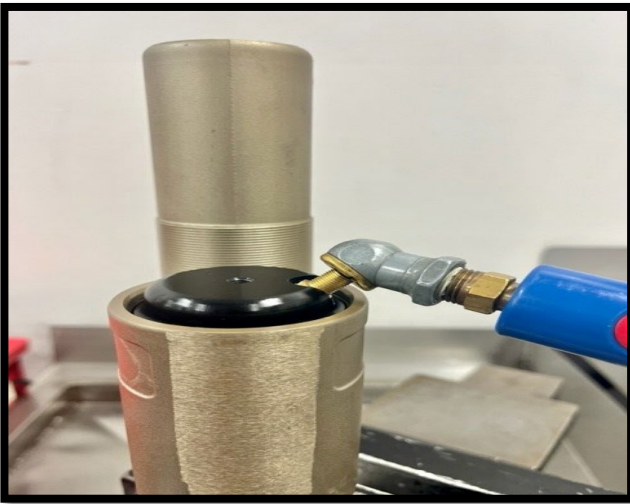
Insert the bladder cap assembly into the reservoir side, so the schrader valve will point towards the rear of motorcycle.

Make sure fluid overflows around the bladder to eliminate trapped air.



Compress the bladder cap inside the reservoir far enough to expose the stop ring groove.

Install the stop ring into the groove.



Confirm the stop ring has been installed.

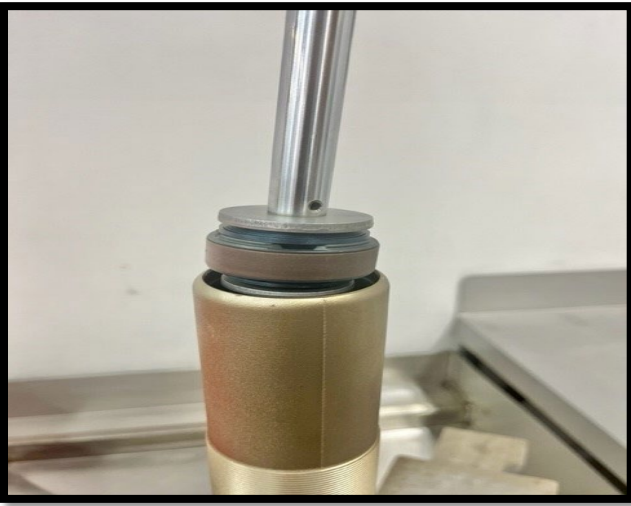
Use an air chuck on the schrader valve and fill the bladder with approximately 100+ psi.



Fill the shock body completely to the brim with shock fluid, leaving no air space inside.

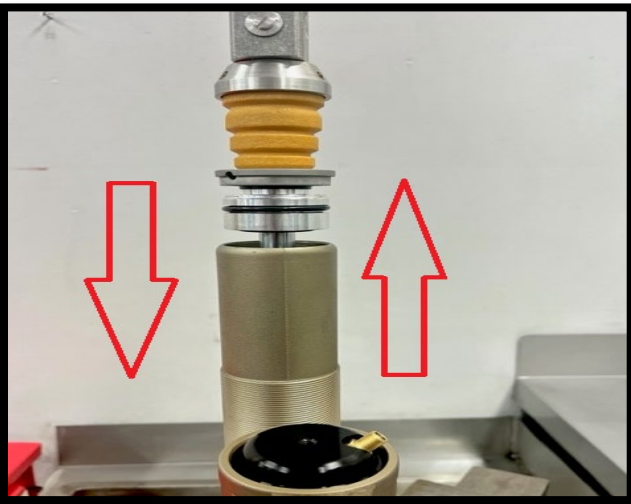


It is recommended to pre-bleed the shaft assembly in a ratio-rite with shock fluid before starting the assembly bleeding process.



With the shock body filled with fluid and the bladder inflated, remove the shaft assembly from the ratio –rite.

Submerge the shaft assembly into the shock body.



Pull up and down on shaft assembly to bleed out any trapped air in the shock fluid.

This bleeding process usually takes 30 minutes, or until no air is achieved thereafter.



When bleed process is complete, compress shaft assembly downward until the **seal head is approximately 10mm away from the body.**

Slowly release the air from bladder, until the **fluid begins to drop approximately 8mm.**



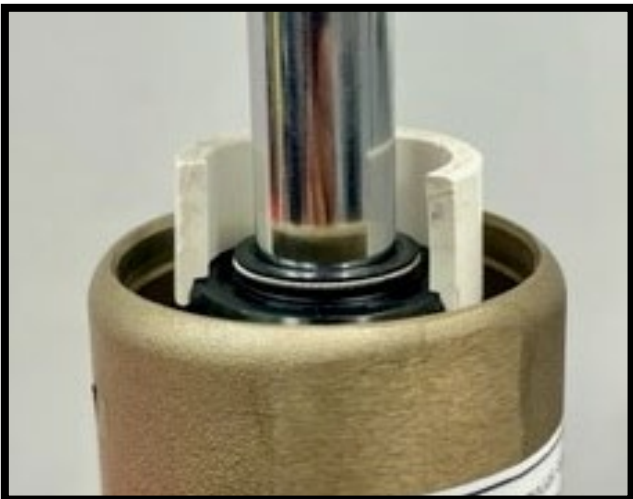
Fill the shock body to the brim with fluid!

Slowly compress the shaft assembly until the seal head O-ring is seated.

With shaft compressed, release the 5% remaining air left inside the bladder.



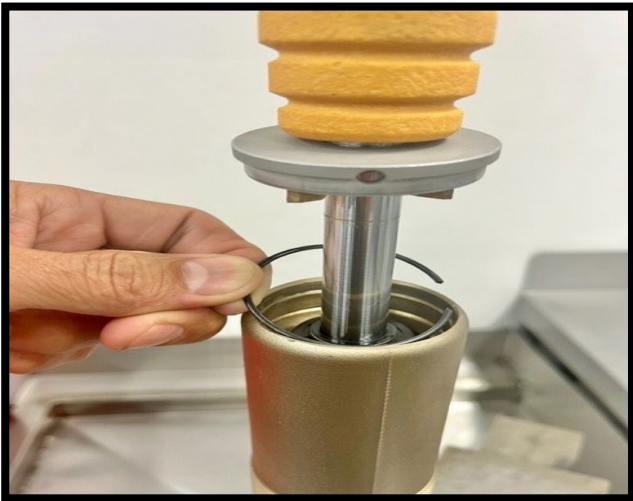
Use one hand to hold down the shock body cap and the other hand to slowly extend the shaft 3-4" inches.



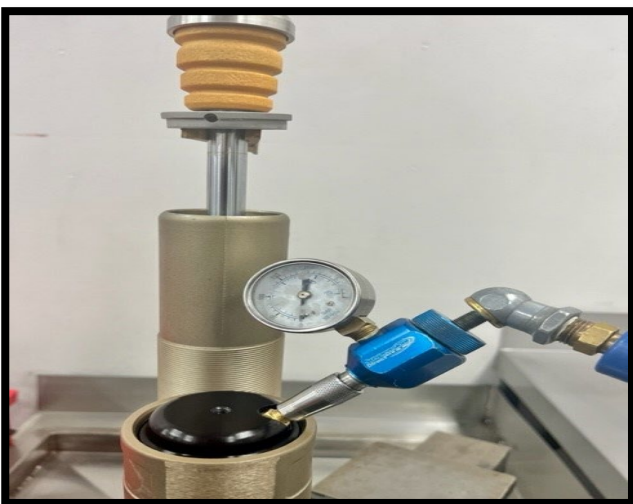
Install a seal head seating tool between the seal head and body cap.



Bottom the body cap against the seal head seating tool and press the seal head into the body beyond the stop ring groove.



Insert the seal head stop ring into the body stop ring groove. Confirm the stop ring is completely seated.



Install the proper nitrogen gauge and pressurize the bladder with nitrogen.

**Recommended Nitrogen pressure:
150 psi / 10 bar.**