



ZF Sachs Shock Manual

Shock Disassembly - Assembly - Lowering Installation - Beta Bladder Kit

(2020 –2025) 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.

TABLE OF CONTENTS

Introduction	Page 2
Shock Diagram and Component Description	Page 3
Recording the Adjustment Settings	Page 4
Coil Spring Removal	Pages 5-8
Shock Disassembly	Pages 9-13
Compression Adjuster Disassembly	Pages 14-17
Shaft Component Disassembly	Pages 17-20
Rod Case Guide Disassembly	Pages 20-21
Rod Case Guide Assembly	Pages 22-23
Compression Adjuster Assembly	Pages 24-27
Shaft Assembly	Pages 28-30
Reservoir Piston Assembly	Page 31
Shock Reservoir Cap Assembly	Page 32
Shock Assembly	Page 33-41
Coil Spring Installation	Pages 41-44
External Setting Adjustment	Page 45
Shock Lowering Information	Page 46
Beta Bladder Cap Kit Installation	Page 47
Shock Assembly with Beta Bladder Cap Kit	Pages 48-52

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 the 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.

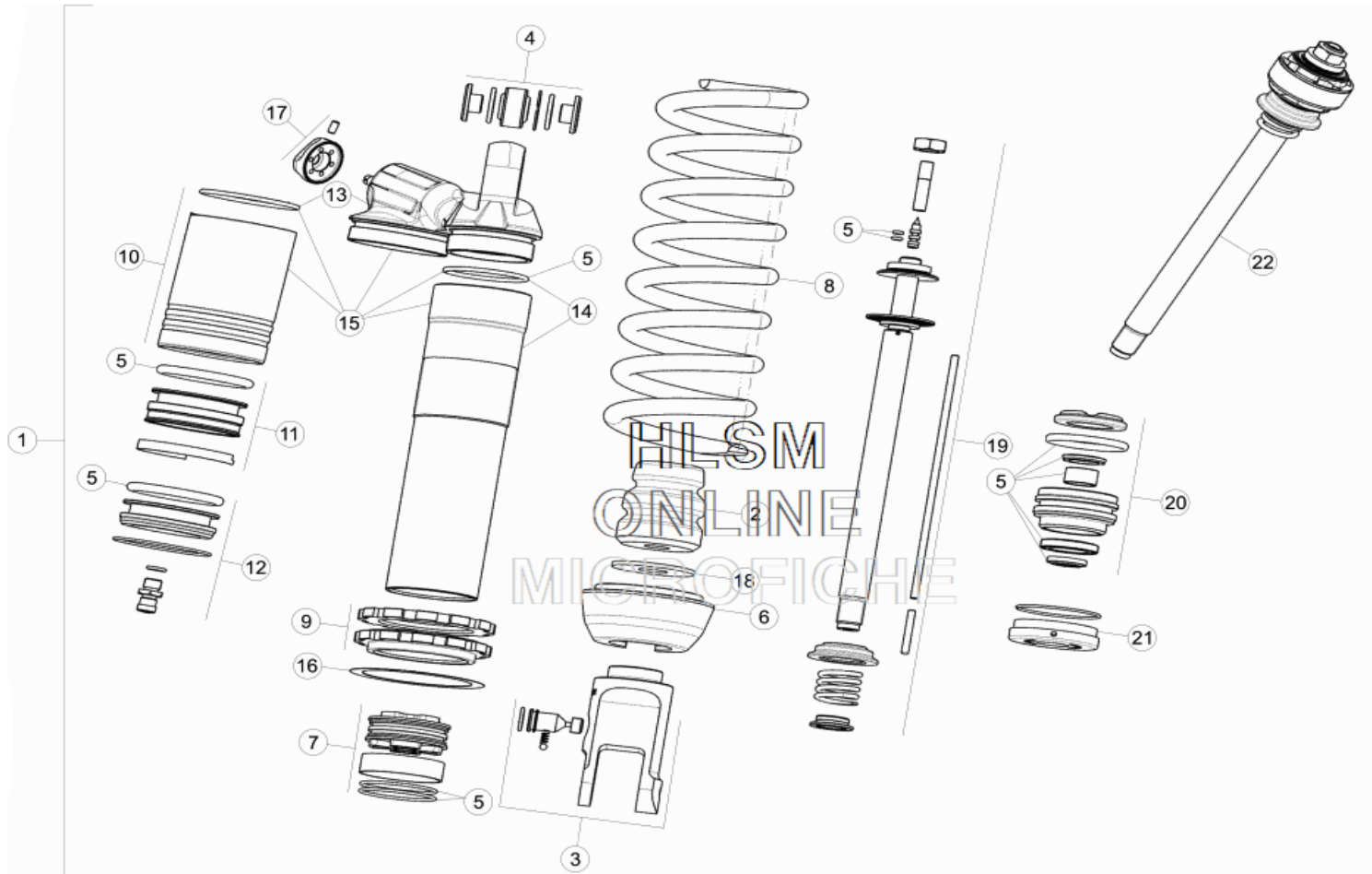
The shock absorber unit contains highly compressed gas. Incorrect disassembly/assembly of the shock may cause serious damage, injury, or death to the rider and property.

Special tools

	Spring seat collar spanner wrench
AB- 15038	Aluminum shock shaft clamp
AB- 15036	Shock adjuster removal tool
	Race Tech schrader valve tool
	2.5mm Pin spanner wrench
	Nitrogen gauge
	Nitrogen with regulator

DIAGRAM

REAR SHOCK ABSORBER



- | | |
|-------------------------------|------------------------------|
| 1. Complete Assembly | 12. Reservoir Cap Complete |
| 2. Bump Stop Rubber | 13. Top Eye Body Complete |
| 3. Clevis Assembly | 14. Body |
| 4. Top Eye Heim Bearing Kit | 15. Body Assembly Complete |
| 5. Rebuild O-ring & Seal Kit | 16. Spring Seat Steel Washer |
| 6. Aluminum Lower Spring Seat | 17. High Speed Adj. Wheel |
| 7. Piston Valve Complete | 18. Bump Stop Rubber Nylon |
| 8. Coil Spring | 19. Shaft Assembly Complete |
| 9. Spring Seat Lock Collars | 20. Rod Case Guide Complete |
| 10. Reservoir | 21. Body Cap w/ Cir-clip |
| 11. Reservoir Piston Complete | 22. Shaft Assembly w/ Valve |

Recording Adjustment Settings



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

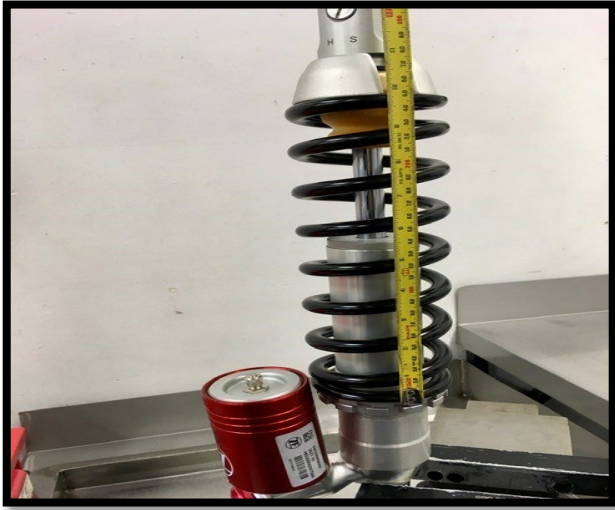
Next, turn the screw counter-clockwise until fully open.



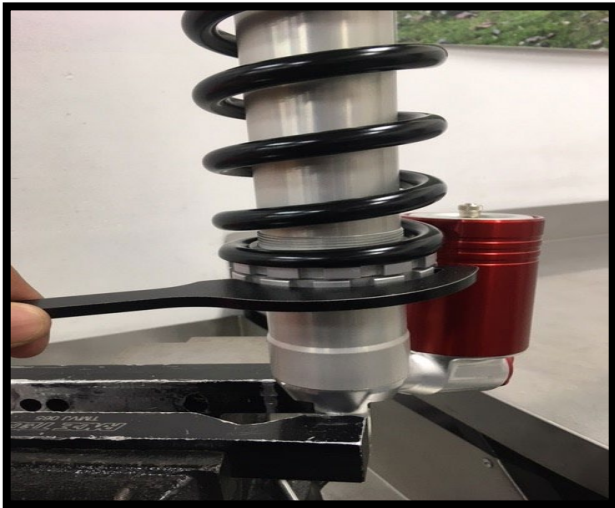
Check and record the position of the high speed compression knob. To do this, turn the red knob clockwise until it stops, document the number of “clicks”.

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

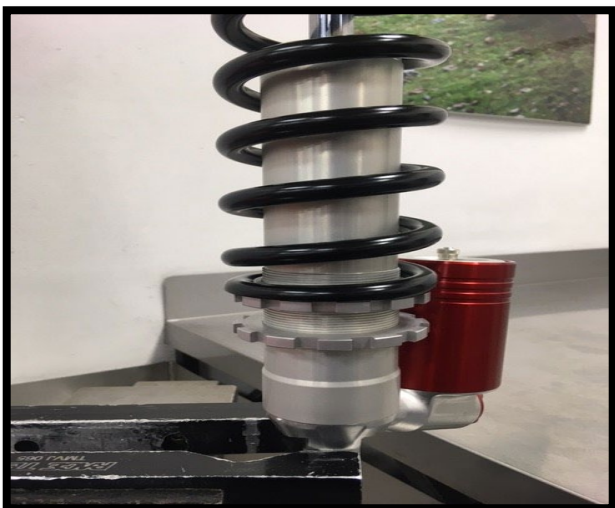
Spring Coil Removal



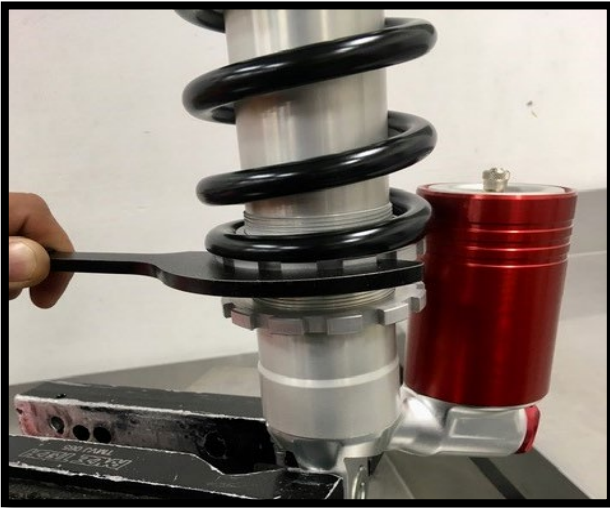
Measure and document the “set length” of the coil spring under preload.



Secure the shock in the vise upside down. Loosen the spring seat lock nut collar, using a preload spanner wrench.



Rotate the spring seat lock nut collar downwards to the ending thread.



Loosen the spring seat adjusting nut collar, removing all coil spring tension.



Push downwards on the nylon washer with bump rubber to allow clearance for the spring seat collar removal.



The ZF Sachs 2020-22' shock design provides minimal space for the aluminum spring seat collar to be easily removed.

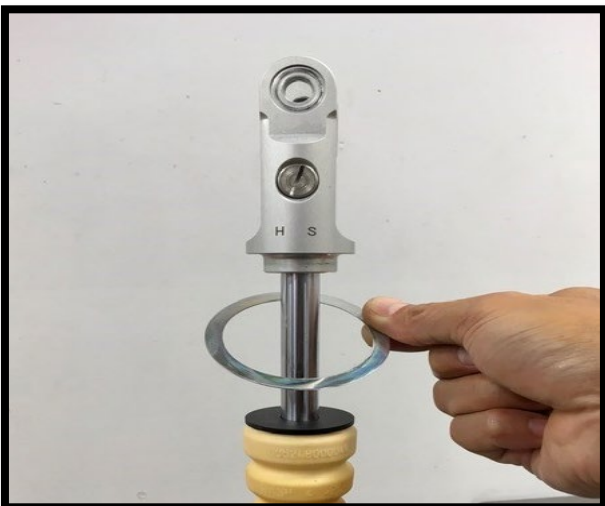
Additional assistance may be required for the spring removal. One person to pull downward on the spring and the other to remove the aluminum spring seat.



With the nylon washer and bump rubber out of the way, remove the spring seat collar.



Remove the coil spring from the shock assembly.



Remove the thin metal spring seat washer from the spring seat adjusting nut collar.



Remove the spring seat adjusting nut collar.



Remove the spring seat lock nut collar.



Shock Disassembly



Unscrew the steel cap from the schrader valve on the reservoir cap.



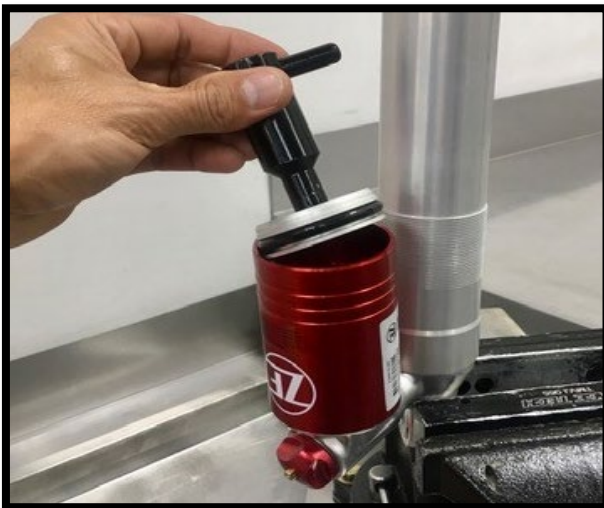
Press the center of the schrader valve core to release all the nitrogen pressure.



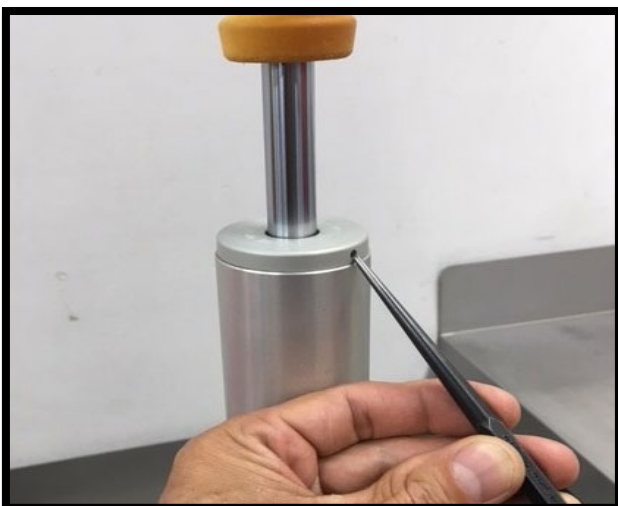
Install a reservoir cap removal tool and tap downward with rubber mallet to expose the reservoir cir-clip.



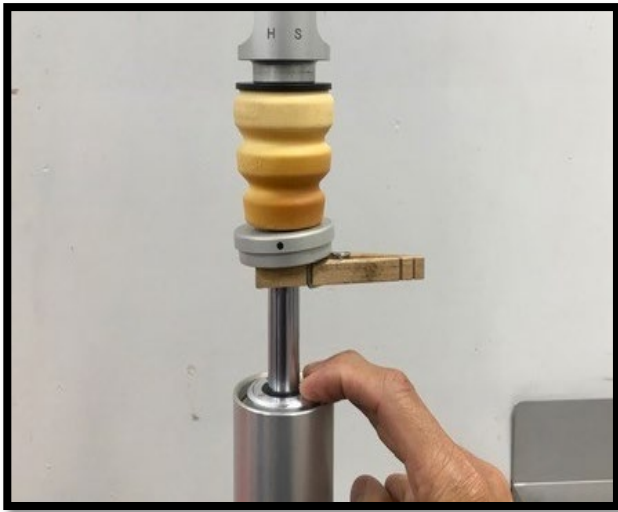
Using a 45 degree pick, remove the reservoir cap cir-clip. Be careful not to scratch the inside of the reservoir.



Using the removal tool, pull upward in a circular motion to remove the reservoir cap.



Locate one hole on the side of the body cap. Using a ball peen hammer and the a 3/32 drift punch, tap on the punch with a 45 degree angle to allow the body cap to be completely removed from the shock body.



Suggested method 1 (No tooling)

Use a clothespin to hold up the body cap. Using extreme finger pressure on the rod case guide, compress downward to expose the body cir-clip.



Suggested method 2:

Use a clothespin to hold up the body cap. Install a rod case guide setting tool on top of the rod case guide.



Suggested method 2 continued:

Remove the clothespin and compress the shaft assembly completely downward until the body cap seats with the shock body.



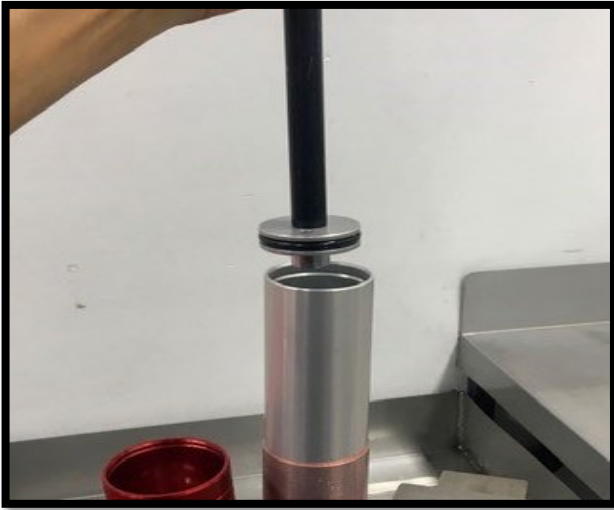
Re-install the clothespin to keep the body cap out of the way for the circlip removal.



Using a 45 degree pick, remove the body cir-clip. Be careful not to scratch the inside of the body.



Pull upward on the shaft assembly to remove it from the body.



Install a 46mm shock shaft plunger tool into the body and push the fluid to the reservoir side. This will create pressure to help ease the removal of the reservoir piston.



Remove the reservoir piston and the shaft plunger tool afterwards.



Drain the excess shock fluid in the body into an appropriate container for disposal.

Compression Adjuster Disassembly

* Skip this procedure if unit has never been ridden



Using a 2.0mm Allen wrench, remove the high speed compression adjusting knob set-screw. Loctite is used from the factory and a heat source maybe useful before removing.



Remove the high speed compression adjusting knob. Careful to not loose the (2) small steel balls, (2) springs and O-ring located underneath. Occasionally, the steel balls will stick to the knob underneath.



Using a magnet, remove a total of (2) small steel balls and (2) small springs inside the holes.



Remove the compression adjuster housing O-ring.



Use the compression adjuster tool to remove the compression adjuster assembly.

Adjuster tool part # **AB- 15036**



Remove the compression adjuster housing assembly.



Remove the compression adjuster assembly spring.



Remove the compression adjuster assembly body housing.



Using a magnet, remove the compression adjuster assembly steel spring seat.



Remove the compression adjuster valve assembly, by using needle nose pliers on the flat side of lock nut. Pull in an upward direction for removal.

Shaft Component Removal



Note the factory has peening at the shaft end. This will be addressed a few steps further, in the meantime it is safe to remove the shaft nut.



Use a 17mm box end wrench to remove the shaft locking nut.



Use a cable tie through the locking nut, valve shims, piston valve, steel stop with top-out spring to assure orientation and valving configuration is retained.



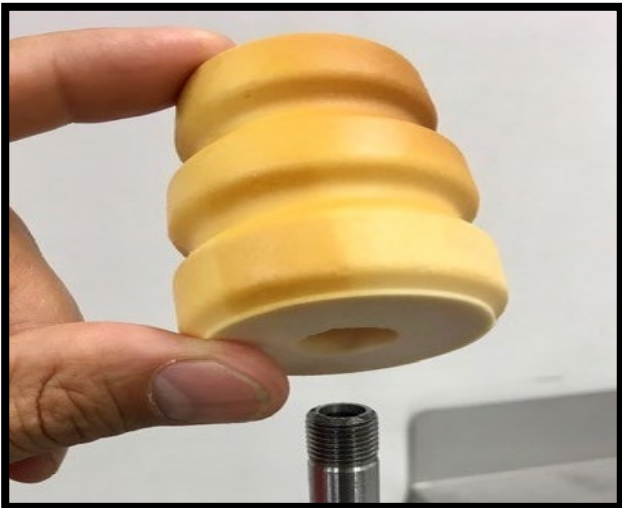
Piston valve assembly secured with a cable tie.



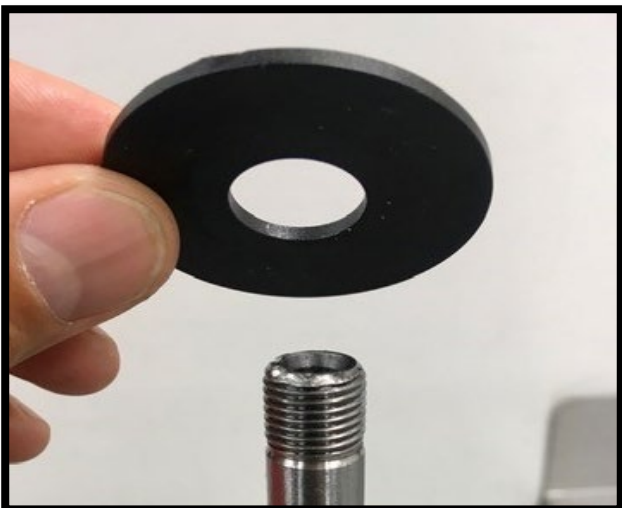
Remove the rod case guide from the shock shaft. Careful not to touch the threaded area when removing.



Remove the body cap from the shock shaft.



Remove the bump stop rubber nylon from the shock shaft.



Remove the bump stop rubber nylon from the shock shaft.

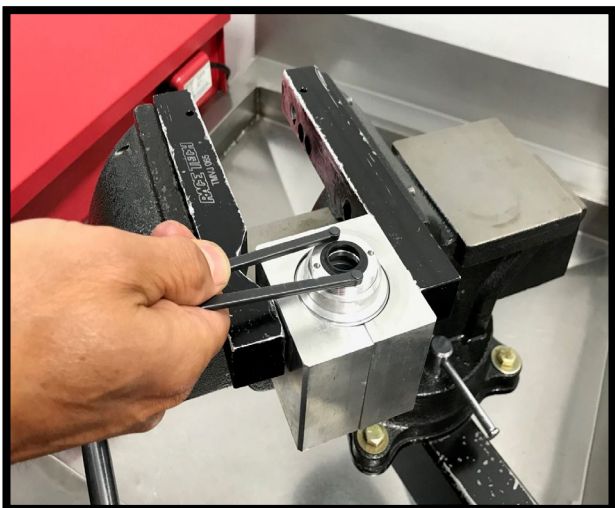


Smooth out the first thread by using a belt sander to chamfer the end and clean up the factory peening.



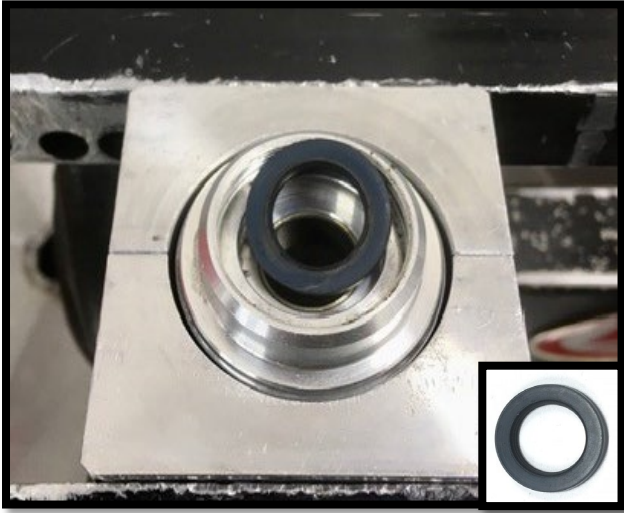
Shaft thread after clean up.

Rod Case Guide Disassembly



Secure the rod case guide with an aluminum 46mm clamp. Use a 2.5mm pin spanner wrench to remove the 4 pin rod case guide dust seal housing.





Remove the shaft oil seal from the rod case guide. Note the direction when removed.



Use a bushing driver, or similar (socket) to push out the rod case guide bushing. Recommended outside diameter of the driver should be 16.40mm



Remove the rod case guide O-ring and discard.

Rod Case Guide Assembly



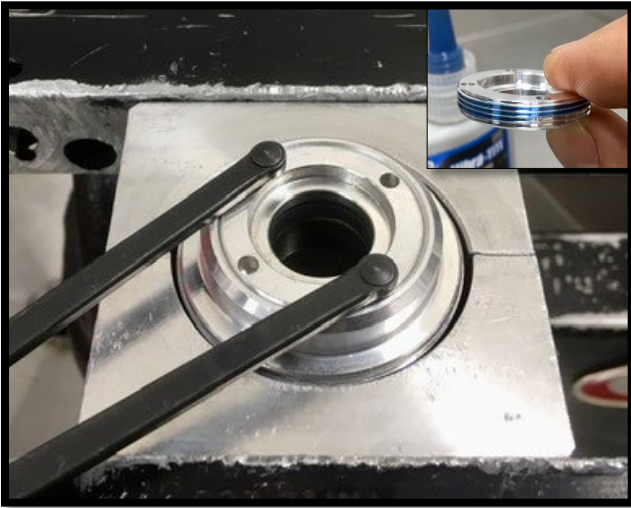
Install the new bushing into the rod case guide with a bushing driver until seated.



Grease the inside lip of the oil seal and install into the rod case guide. Note the direction of the oil seal is flat side facing upward.



Install a new rod case guide O-ring.



Use a small amount of **BLUE** Loctite around the dust seal housing threads to adhere it to the rod case guide assembly.



Install the new dust seal into the dust seal housing with a bushing driver until completely seated.



Apply grease inside the new dust seal.

Compression Adjuster Assembly



Grease the O-ring on the compression adjuster valve assembly.



Install the compression adjuster valve assembly into the shock body.

Note the direction in the photo for installation.



Insert the compression adjuster assembly steel spring seat. Note the direction in the photo for installation.



Insert the compression adjuster body housing.

Note the direction in the photo for installation.



Place the conical spring inside with the smaller diameter facing downwards onto the steel spring seat.



Insert the compression adjuster housing assembly.

Note where the adjuster body mates with the housing. in the smaller corner photo.



Make sure the 4 pins of the tool are aligned and seated inside the pin holes.

Tighten the compression adjuster assembly and torque to 14Nm.



Align the set screw locking hole for the knob with one of the 4 holes on the compression adjuster assembly.



Grease each hole on the left and right side of the locking set screw hole.

Insert (1) small spring into one hole and place (1) small steel ball on top of the small spring. Repeat the same procedure with the remaining spring and steel ball on the opposite side.



Install the O-ring around the compression adjuster housing.



Install the red adjusting knob onto the assembly with the set screw aligned with the locking hole location.



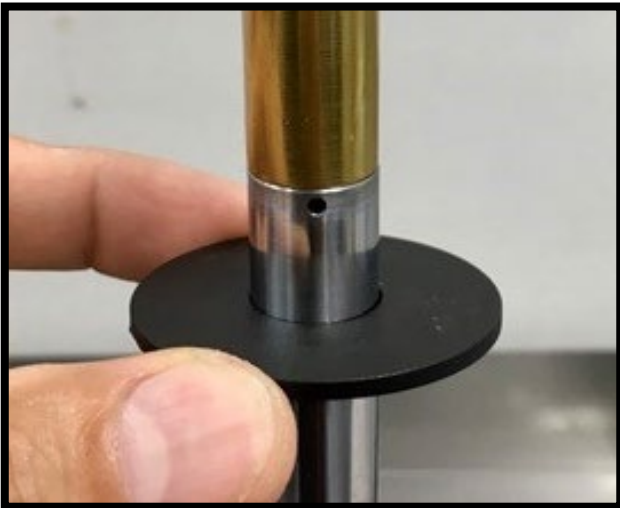
Apply a drop of **BLUE** loc-tite to the set screw.

Holding down the knob in place, tighten the set screw with a 2.0mm allen wrench until snug.

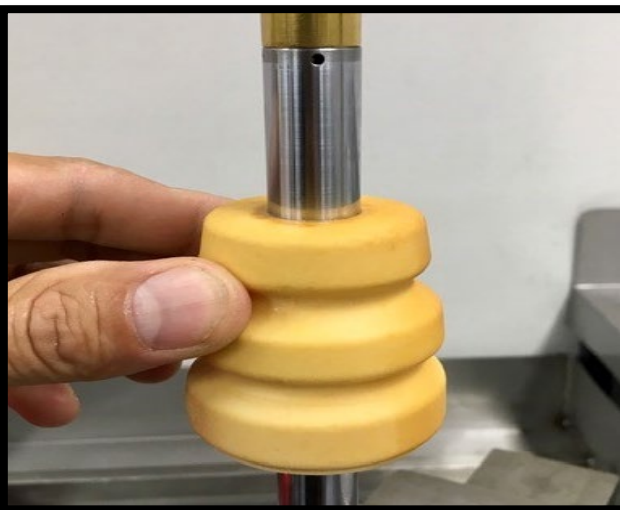
Shaft Assembly



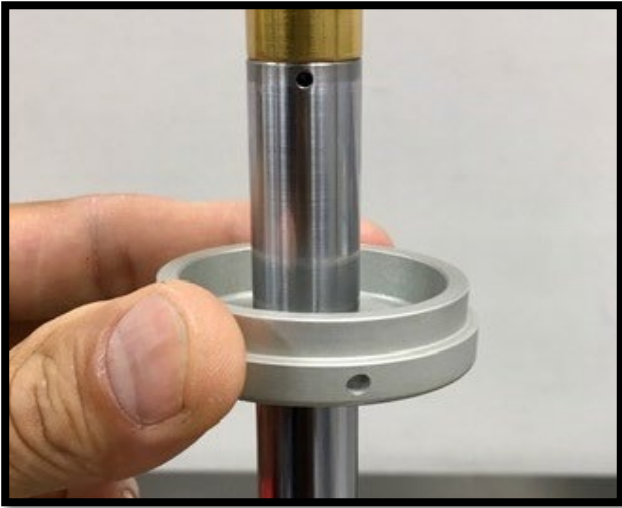
Install a shock shaft bullet over the top of the shaft to cover lock nut threads.



Slide the bump stop rubber nylon over the shaft bullet and position it at the bottom of the shaft.



Install the bump stop rubber.



Install the body cap.



Slide the rod case guide over the shaft bullet and onto the shaft.

Note the direction of the rod case guide installation.



Cut the cable tie with all valving components and install the valve stop with top-out spring assembly.

If lowering proceed to page 46 for instructions now. Resume on page 30



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

Teflon band tolerance range

46.05-46.20mm

If under the minimum range, replace with a new complete valve piston assembly.



First, install the valve shims onto the valve stop, next the valve piston assembly, and last the remaining valve shims on top.



Clean and dry the shaft thread area including the lock nut with contact cleaner and air.

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

Use a torque wrench and tighten the shaft Lock nut to 34Nm.

Reservoir Floating Piston Assembly

**See pages 47-52 BETA bladder/cap conversion kit installation*



Install the new O-ring onto the reservoir floating piston.



Install the Teflon band around the reservoir floating piston.

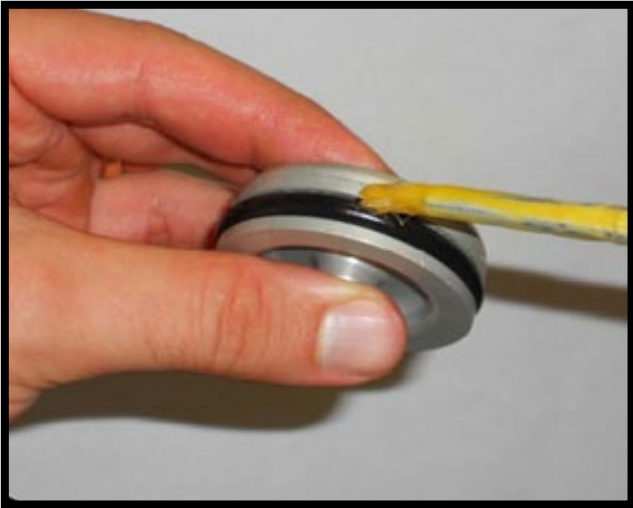


Apply grease to the circumference of the reservoir floating piston O-ring and Teflon band.

Shock Reservoir Cap Assembly



Install the new O-ring onto the reservoir cap.



Grease the entire circumference of the O-ring on the reservoir cap.



Remove the Schrader valve needle core, inspect and replace needle core if needed.

Install core needle to 4in lbs.

Shock Assembly



Secure the shock body using a bench vise with soft jaws. DO NOT use the shock body cylinder for securing! Using Motul VI400 2.5-3W or light shock fluid , fill the reservoir until it is flush with the edge.



Insert the floating piston into the reservoir tank with the flat side facing the oil.

Make sure a small amount of oil spills outside the reservoir before the reservoir O-ring is seated, assuring no air is trapped between the piston and oil.



Compress the reservoir floating piston downward until fully bottomed, so oil can travel through the compression adjuster and into the shock body.



Install the reservoir cap and circlip.



Use a reservoir tool to pull up on the cap until fully seated with circlip.



Use an air chuck to fill the reservoir chamber with air to 100 psi.



Fill the shock body completely with shock fluid.



Turn the rebound screw clockwise until it stops



Use a 2.5mm T-Handle allen and insert inside the center of the shaft end.



Simultaneously, apply slight downward pressure with the 2.5mm T-Handle allen and turn the rebound screw out counter-clockwise until it stops.

This procedure will push the internal needle downward and eliminate the shock shaft from being “seized” during the bleeding process.

TECH TIP:

If the internal rebound needle rises and doesn't stay down, air is trapped inside the shaft causing the rebound needle to move upward.

FIX:

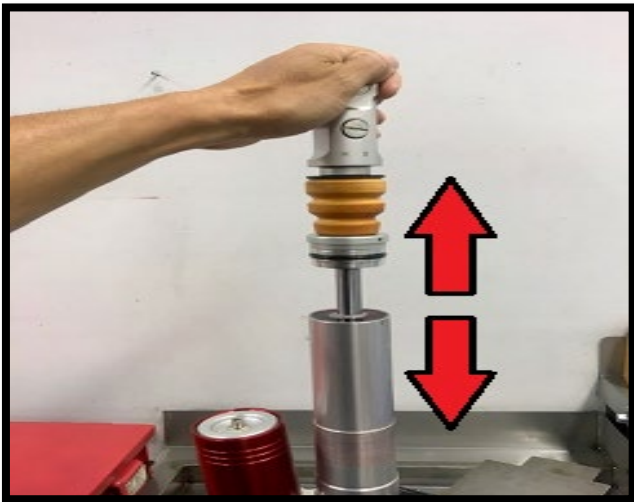
The trapped air pressure can be relieved through the O-ring around the rebound adjusting screw. Carefully lift the O-ring to release the trapped air and repeat the step above to reseal the rebound needle before assembly.



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



Remove the shaft assembly from the ratio –rite and submerge the shaft assembly into the shock body.



Cycle the shaft assembly up and down to force all trapped air out of the shock oil. The bleed process usually takes 30+ minutes, or until all air is completely removed.

Take your time, don't be impatient.



Raise the shaft assembly to full extension. Be careful not to extend too far and draw air back inside the shock!

YOU WILL NOT COMPRESS THE SHAFT ASSEMBLY TO INSTALL THE ROD CASE GUIDE!!

****Excludes Beta bladder conversion kit, see page 48 for shaft assembly procedure.***



Reference point: the valve stop with top-out spring is slightly above the fluid and the shock body.

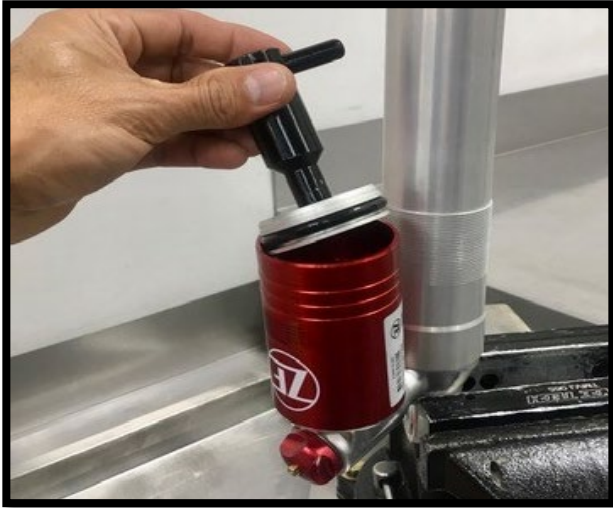


Release the air pressure from inside the reservoir



Use the reservoir tool to push the reservoir cap past the circlip groove.

Use a 45 degree pick and remove the cir-clip. Be careful not to scratch the inside of the reservoir.



Remove the reservoir cap



With the shaft at full extension, slowly lower the case guide until it bottoms onto the top-out spring. Compress the rod case guide assembly into the shock body.

NEVER EVER USE THE SHAFT ASSEMBLY TO COMPRESS THE ROD CASE GUIDE!

When the rod case guide is below the circlip groove, it will raise the floating piston inside the reservoir to approximately 50% capacity.



Insert the rod case guide circlip into the shock body circlip groove. Assure the circlip is completely seated.



Insert the reservoir cap into the reservoir body. Secure the reservoir cap with circlip.



Install the proper nitrogen gauge and fill the reservoir with nitrogen.

Recommended Nitrogen pressure:
150 psi or 10 bar.



Install the steel Schrader valve cap.



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 spring seat lock nut and thread it downward towards the base.



Install the spring seat adjusting nut, keeping the flange side facing upward.



Install the thin metal spring seat washer.



Slide the coil spring over the shaft assembly and shock body.



Push the nylon washer and bump stop rubber downward to make room for installing the spring seat collar.



Install the spring seat collar, until seated onto the coil spring and centered with the clevis.



Tighten the spring seat adjusting nut by hand and use a spanner wrench to achieve the desired spring preload.

Spring pre-load Range:

Minimum Range = 5mm

Maximum Range = 15mm



Thread the spring seat locking nut against the spring seat adjusting nut collar.

Tighten the spring seat adjusting nut collar against the spring seat locking nut until tight.



Using 2 spanner wrenches, tighten the lock nut and adjusting nut collars against each other until secured.



Press the bump stop rubber downward, until fully bottomed.

USE CAUTION WHEN ADJUSTING ON BIKE!



Beta Sachs rear shock units utilize a 2 piece body. The body cylinder is threaded and Loctite is applied from the manufacture.

The body is susceptible to unscrew if the top lock nut collar is used forcefully to tighten both spring seat collars together.

Use the LOWER adjusting collar for tightening. This will help prevent the body to become unfastened!!

External Setting Adjustment



Completely close the high speed compression adjusting knob by turning clock-wise until fully bottomed.

Set the high speed compression setting by turning adjustment knob counter-clockwise to the pre removal, or desired setting.



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

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



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

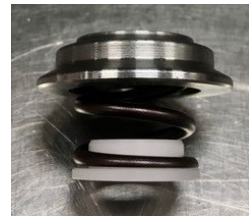
Set the rebound by turning the screw counter-clockwise to the documented, or desired setting.

Shock 1" & 2" Lowering Spacer Installation

- 1) Read the entire manual before installation.
- 2) Review pages 4-30 for shock disassembly, shaft component removal and shaft assembly preparation.
- 3) Follow pages 33-41 for shock assembly.



Remove the OEM steel valve stop with top out spring. You will no longer use this component with your new lowering spacer.



1" lowering spacer installed.



2" lowering spacer installed.



Beta Bladder/Cap Kit Installation

*Follow shock disassembly procedures on pages 4-30



Remove the schrader valve from the stock OEM Sachs reservoir cap with a 13mm socket.



Install the schrader valve into the Beta bladder cap with a 13mm socket.

** Bladder cap appearance may vary from year and model specific**



Grease the inside circumference of the bladder. Insert the Beta bladder cap into the bladder until seated.

Shock Assembly with Beta Bladder Kit



Using Motul VI400 2.5-3W or light shock fluid , fill the reservoir 50%.



Grease the outer ribbed edge of the bladder before installing.

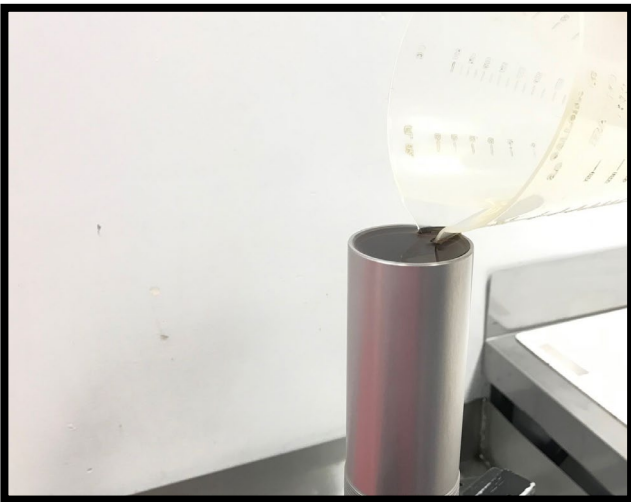
Insert the bladder cap assembly into the reservoir tank, assuring an excess amount of oil spills outside the reservoir.



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



Assuring the circlip has been installed, use the bladder cap schrader valve and fill the bladder with compressed at 100 PSI.



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



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



With the shock body completely filled with oil, remove the shaft assembly from the ratio –rite.

Submerge the shaft assembly into the shock body.



Move shaft up and down to bleed any air out of the shock. The bleeding process usually takes 30 minutes, or until no air is achieved thereafter.



Using the schrader valve on the bladder cap, **slowly** release 95% of the air from the bladder.

After the air is released you will notice the oil level in the shock body should be slightly under the circlip groove.



Fill the shock body with oil until completely full.

Slowly compress the entire shaft assembly inside the shock body until the case guide O-ring is seated inside the body.

Release the 5% remaining air left inside the bladder.



Using one hand, hold down the shock body cap to eliminate the case guide from moving.

With the body cap restrained, slowly use your other hand to pull up on the shaft assembly 3-4" inches.



Using your fingers, compress the case guide beyond the body circlip groove to be exposed.

*A clothespin is useful to restrain the body cap during this process.



Insert the case guide circlip into the shock body circlip groove. Assure the circlip is completely seated.



Install the proper nitrogen gauge and fill reservoir with nitrogen.

Recommended Nitrogen pressure:
150 psi or 10 bar.

*** Resume Assembly on Pages 41-45**

