

Sachs Shock Manual

Removing the shock components and reassembly including lowering and installing the Beta Bladder Kit

(2012 – 2019) 2 & 4 Stroke



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 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



- 1. Shock shaft with piston
- 2. Reservoir
- 3. Floating piston
- 4. O-ring
- 5. Teflon band
- 6. Reservoir cap
- 7. Cap O-ring
- 8. Circlip
- 9. Schrader valve
- 10. Shock body
- 11 Compression assembly
- 12. High speed compression knob
- 13. O-ring
- 14. Spring seat lock nut collar
- 15. Spring seat adjusting nut
- 16. Spring seat washer
- 17. Shock shaft piston
- 18. Shock shaft piston Teflon band
- 19. Shock shaft piston O-ring
- 20. Shock coil spring

- 21. Bump stop rubber
- 22. Spring seat collar
- 23. Nylon washer
- 24. Clevis assembly
- 25. Rebound adjuster
- 26. Shaft needle assembly
- 27. Case guide stop circlip
- 28. Case guide stop
- 29. Shock shaft
- 30. Aluminum rebound
- adjusting rod
 - 31. Steel rebound adjusting pin

<u>2012-16</u>

- 32. Case guide top out rubber
- 33. Shaft case guide
- 34. Shaft Oil seal
- 35. Shaft seal support washer
- 36. Shaft bushing
- 37. Dust Seal
- 38. O-ring
- 39. Shock body cap

<u>2016-19</u>

- 32(a) Case guide top out rubber
- 33(a) Shaft case guide
- 34(a) O-ring
- 35(a) Shaft bushing
- 36(a) Shaft Oil seal
- 37(a)Dust Seal
- 38(a) Shock body cap



Recording Adjustment Settings

Check and record the location of the rebound adjustment. To do this, turn the screw clockwise until it stops, noting the number of "clicks "made by the screw (A). Then 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 screw (B) clockwise until it stops, noting the number of "clicks". Then turn the screw counter-clockwise until fully open.



Check and record the position of the high speed compression knob (C). To do this, turn the wheel clockwise until it stops, noting the number of "clicks". Then turn the knob counter-clockwise until fully open.

Spring Coil Removal



Measure and record 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.



Unscrew the spring seat lock nut collar downwards.



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



The coil spring should be low enough to allow the bump rubber to be exposed over the top of the spring.



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



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



Raise the coil spring from the shaft assembly for spring removal.



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 needle to release all the nitrogen pressure.



Press down on reservoir cap to expose the circlip.



Using a pick, remove the seal case retaining circlip. Be careful not to scratch the inside of the reservoir.



Remove the reservoir cap using the removal tool, then remove the O-ring.



Move the shaft up and down to hydraulically lift the floating piston to a point where you can lightly pry it up and remove it. Remove the O-ring and Teflon band from the floating piston.



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



Using a pick, remove the seal case retaining circlip from the shock body.



Pull upwards on the shaft assembly to remove the shaft assembly.



Completely drain the oil from the reservoir and shock body.

Compression Adjuster Disassembly



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.



Remove the compression adjuster housing O-ring.



Using a magnet, remove the (2) small steel balls.



Using a magnet, remove the (2) small springs from the same location of the ball bearings.



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.



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



Remove the compression adjuster assembly body housing.



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

Shaft Disassembly



Using a 16mm shock shaft clamp, secure the shaft clamp with a bench vise.

14/16mm Shaft clamp part # AB-15038



Heat the shock clevis and shaft area with a torch for approximately 30 seconds. This heat method is necessary for the clevis removal.



The clevis should be hot to the touch! Remove the clevis from the shaft, by turning the clevis counter-clockwise.



Remove the shock clevis from the shock shaft.



Remove the steel rebound adjusting pin from the shaft end.



Remove the aluminum rebound adjuster push rod from inside the shock shaft.



Remove the bump rubber nylon washer from the shock shaft.



Remove the bump rubber from the shock shaft.



Remove the shock body end cap from the shock shaft.



Carefully remove the rod case guide assembly from the shock shaft by not damaging the seal and bushing over the shaft threads.

Valve Piston Disassembly



Using a 16mm shock shaft clamp, secure the shaft clamp with a bench vise.



Use a 17mm box end wrench to loosen and remove the shaft lock nut.



Remove the steel spacers.



Carefully remove the rebound valve shim stack.



Remove the main valve piston assembly.



Carefully remove the compression valve shim stack.



Using a razor blade, cut a stepped notch on the main valve Teflon piston band.

The Teflon piston band will be reused for re-assembly with a new O-ring, unless replacing with a new complete valve assembly, or the shock unit has minimal usage.



Remove the O-ring from the main valve piston. Always replace the O-ring(s) as it is a common wear part that should be replaced every service interval.

Case Guide Disassembly



2012-2014 models

Insert screwdriver to remove the rod case guide top out rubber to gain access to shaft oil seal and bushing.



2015-2019 models



Use a 2.5mm pin spanner wrench to remove the 4 pin rod case guide housing to access the shaft oil seal and bushing. Noting the orientation of the oil seal with the flat side facing upward.



2012-2014 models

Remove the rod case guide steel washer, noting the cut out grooves need to be facing towards the oil seal



2012-2014 models

Remove the oil shaft seal from the rod case guide, noting the orientation of the oil seal with the cavity side facing upward.



2012-2018 models

Remove the oil seal support washer from the rod case guide.



Remove the outer O-ring from the rod case guide.



Compression Valve Assembly

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



Place the compression adjuster valve assembly into the shock body. Note the orientation in the photo for installation.



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



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



Insert the compression adjuster body housing. Note the orientation in the photo for installation.



Insert the compression adjuster housing assembly.



Make sure the pins on the tool are aligned with the pin holes.

Compression adjuster tool part # AB- 15026



Tighten the compression adjuster assembly and torque to 14Nm.



Align the locking hole of the knob with one of the 4 holes on the compression adjuster assembly. Note the arrows in the photo.



Grease 2 holes opposite each other, perpendicular to the locking screw hole.



Insert the compression adjuster assembly springs into the greased holes.



Place the compression adjuster ball bearings into the holes on top of the springs.



Place the compression adjuster O-ring around the compression adjuster housing.



Place the compression adjuster knob on the housing. Make sure to align the locking Allen screw with the locking hole on the assembly.



Tighten the locking Allen screw.



Valve Piston Assembly

Note: *If lowering, the lowering spacer should be installed prior to installing the piston assembly. See page 50*

Using a 16mm shock shaft clamp, secure the shaft clamp with a bench vise. Install the compression shim stack.



Insert the piston valve assembly onto the shock shaft, making sure the largest valve shims cover the compression valve ports.



Install the rebound shim stack onto the shaft assembly, making sure the largest valve shims cover the rebound valve ports.



Place the 2 steel spacers onto the shaft.



Use a high strength thread locker onto the shaft threads.



Install the 17mm shock shaft lock nut.



Tighten the nut to 34Nm.



Case Guide Assembly

2012-2018 models

Place the oil seal support washer into the rod case guide.



2012-2014 models

Insert the oil seal into the rod case guide with the cavity side facing up.





2012-2014 models

Insert the guide washer making sure the 4 groves are facing down toward the seal.



Place the case guide top out rubber into the rod case guide, assuring it is fully seated.



2015-2019 models

Insert the oil seal into the rod case guide with the flat side facing up. Use the pin spanner wrench to tighten the case guide housin locker on thread area.







Install the outer case guide O-ring.



Apply seal grease to the case guide oil seal.



Grease the entire circumference of the outer case guide O-ring.

Shaft Assembly



Install a shock shaft bullet at the bottom end of the shock shaft.



Slide the rod case guide onto the shaft bullet observing the orientation in the photo.



Install the body cap.



Install the bump stop rubber onto the shock shaft with the narrow end towards the body cap .



Install the nylon washer.



Install the aluminum rebound adjusting rod.



Install the short steel rebound adjustment rod.



Apply a high strength thread locker to the shock shaft threads.



Install the shock shaft clevis assembly.



Secure the clevis assembly onto the shock shaft with a crescent wrench.



Completed shaft assembly.

Reservoir Floating Piston Assembly

*See pages 51-54 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 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 an excess 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.



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. Using your fingers, compress the stepped Teflon band around the valve piston and submerge the shaft assembly into the shock body.



Move shaft up and down to bleed any air out of the shock. **During the bleeding procedure you must keep the floating piston fully bottomed while moving the shaft.** This will maintain backpressure in the shock body, helping to remove any trapped air. Bleed process usually takes 30 minutes, or until all air is completely bled.



With the floating piston fully bottomed, raise the shaft assembly to <u>full extension</u>. <u>DO NOT MOVE THE SHAFT ASSEMBLY</u> <u>THEREAFTER</u>.

*Excludes Beta bladder conversion kit.



Reference point: the case guide stop is flush with the end of the shock body and oil.



Securing the shaft at full extension, slowly lower the case guide until it bottoms onto the case guide stop. Submerge the case guide assembly into the shock body, <u>never ever use the</u> <u>shaft assembly!</u>

Compressing the case guide past the circlip groove will raise the floating piston inside the reservoir to approximately 50%.



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



Install the new O-ring onto the reservoir cap.



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



Insert the reservoir cap into the reservoir body.



Compress the reservoir cap beyond the circlip groove, so the circlip can be installed.



Install the proper nitrogen gauge and fill reservoir with nitrogen.

Recommended Nitrogen pressure: 150 psi or 10 bar.

Coil Spring Installation



Install the steel Schrader valve cap.



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



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 spring coil 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 clevis.



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



Tighten the spring seat adjusting nut until the coil spring is set at the pre removal, or desired length.

Spring pre-load Range: Min = 5mm Max = 15mm



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



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



Press the bump stop rubber downward, until fully bottomed.



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 counterclockwise to the pre removal, or desired setting.



Completely close the low speed compression screw by turning clockwise until fully bottomed.

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



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

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

Shock Lowering

- 1. Review the entire manual
- 2. Follow the disassembly pages 4-21 for access to the area where the lowering spacer is located on the shaft.
- Skip compression adjuster removal and valve piston rebuild if working on a new shock and complete all procedures for a used shock unit.
- 3. The photo below shows the location for the stock spacer and lowering spacer dimensions.
- 4. Follow the shock reassembly instructions pages 24-49 to finish the procedure.



Lightly tap the stock spacer to release it from the circlip.

*NEVER remove the circlip!



Stock spacer







2" Lowering spacer

F

17mm

Beta Bladder/Cap Kit Installation

*Follow disassembly procedures on pages 4-37



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 of the bladder. Compress the Beta bladder cap and bladder together 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. Using your fingers, compress the stepped Teflon band around the valve piston and 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 all air is completely bled.



Using the schrader valve on the bladder cap, <u>slowly</u> 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. <u>Slowly</u> 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, <u>slowly</u> 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 44-49