

KYB and Showa Shock Service

Rebuilding shocks is fairly simple for the mechanically inclined using common hand tools. If you feel you do not have the mechanical ability, please do not attempt to rebuild your shock.

That said, most of the tools you will need are likely in your toolbox. The only special tool that is absolutely needed is the nitrogen tank and regulators. You can usually rebuild your shock and take it to your local dealer for recharging.

Shocks need rebuilding for various reasons. The oil breaks down after a lot of use and needs to be changed. I change my oil twice a year but riders who ride a lot will need to service their shock more. If you have oil running down your shock shaft, or if your shock suddenly gets springy, your seal head has likely blown. Some of the steps listed below can be ignored if you are only changing your oil. Do all of the steps if you are replacing a seal head. Good luck and e-mail me at motoprof@motocross.com if you have any questions.

I tried to make servicing shocks as easy as I can. This is why this article is written in the way that it is. If you fill in the information when asked, it will make your job easier when reassembling it.

1. Remove the shock from the bike and clean it thoroughly.
2. Measure the installed spring length before removing the spring, **fig 1**. This will allow you to reinstall the spring close to the original sag if using the same spring.

My installed spring length is

3. Screw both the compression and rebound adjusters in while counting how many clicks you hear.

My low speed compression adjuster is
_____ **turns out.**

My high speed compression adjuster is
_____ **turns out (if installed).**

My rebound adjuster is
_____ **turns out.**

4. Turn the compression and rebound adjusters all the way out.

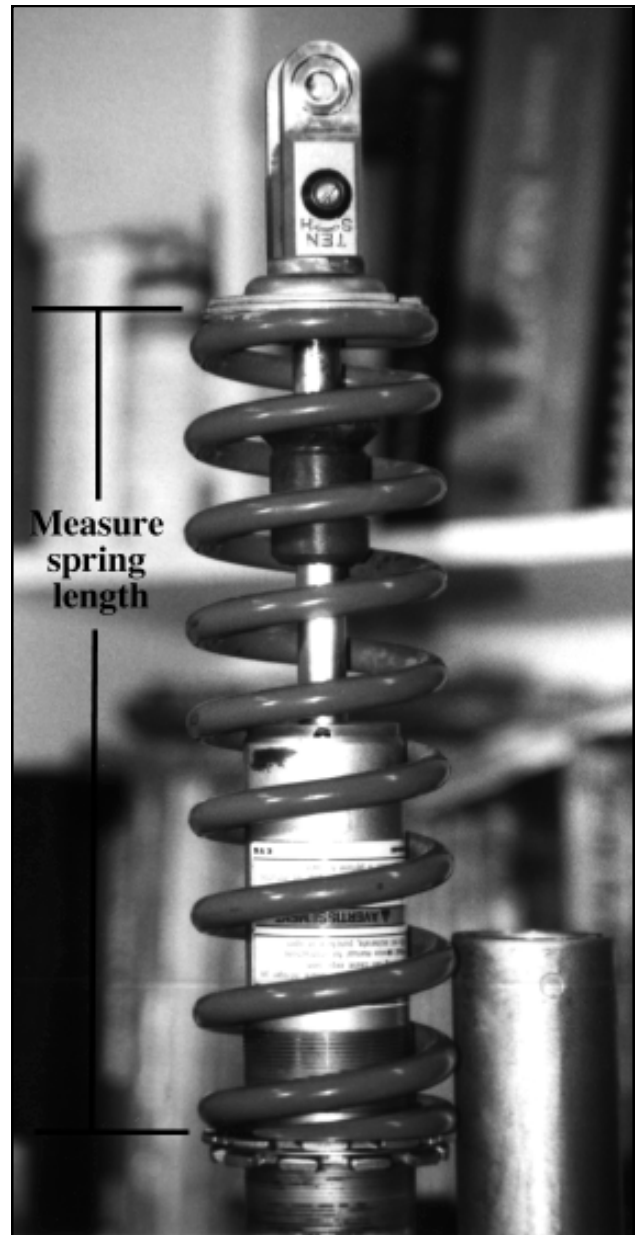


Fig 1
Measure the spring length before removing the spring.

5. Clamp the shock in a padded vice and push down the nitrogen valve core to remove all of the nitrogen from the bladder. Remove the valve core.

6. Use a deep well socket and press the bladder cap down until the circlip is exposed, **fig 2**. Remove the circlip with a small screwdriver and then remove the bladder cap, **fig 3**.



Fig 2
Push down the bladder cap until the circlip is exposed.



Fig 3
Remove the shock bladder.

7. Pour out the old shock oil through the reservoir.

8. Use a punch and tap the shock body end cap up until it is free, **fig 4**. Tap the cap off evenly.



Fig 4
Tap the shock body end cap up.

9. Use a punch and tap the seal head assembly down until the circlip is exposed, **fig 5**. Remove the circlip. Race Tech's seal head tool makes this job easier. Showa shocks often use two circlips to hold their seal heads in place.



Fig 5
Push down the seal head until the circlip can be removed.

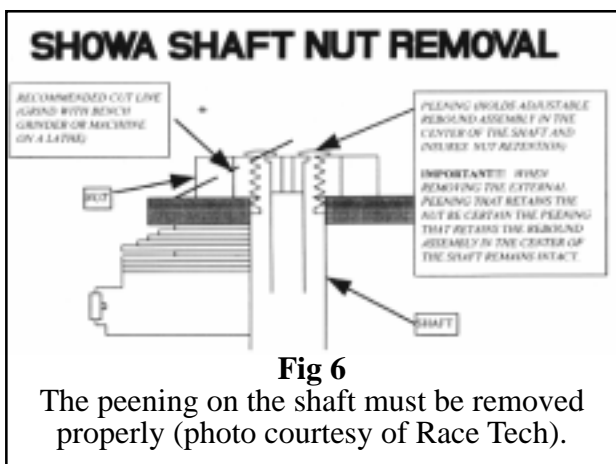
10. Remove the shaft assembly by gently tapping up on the shaft assembly eyelet with a plastic mallet. After the shaft assembly is removed pour out any old oil that is still in the shock body.

11. Clean the shock body and shaft assembly with solvent and let it dry. If you are only changing oil, you can go to **STEP 22**. If you are changing the seal head you can continue onto step 12.

Caution:

The next step is very critical and should be done by a qualified suspension specialist. Do not do it if you do not understand it.

12. Grind off the peening at the end of the shaft assembly. **Fig. 6** shows the correct way to grind this off. When grinding off the peening only grind off enough of the peen to remove the nut. **On some KYB and most all Showa shocks, do not remove the peening that holds the rebound adjustments in.** Leave enough of the nut to get a wrench on it.



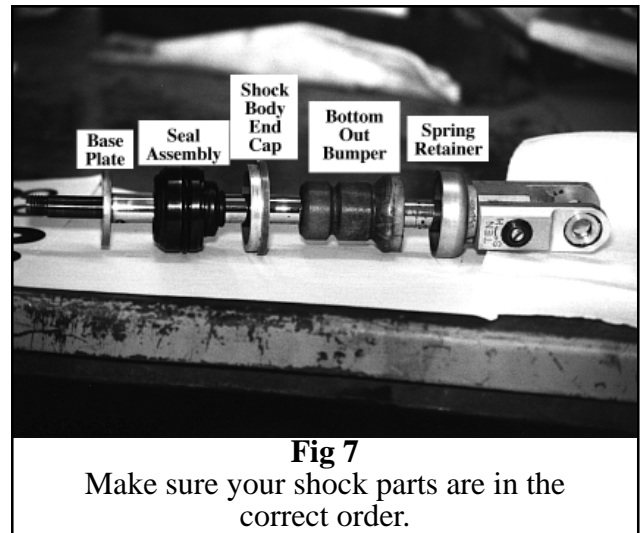
13. Remove the nut and clean up the threads on the shaft. Slightly chamfer the end of the shaft and inspect the threads.

14. Use a piece of bent wire and install it in the rebound hole. Then slide the complete valve stack, nut, and base valve off onto the wire. These parts **MUST BE KEPT IN ORDER** and the wire should keep them in the correct order.

15. Clean the shaft assembly in the parts cleaner and blow out the rebound hole with compressed air. The base valve parts which you put on the wire can be cleaned and blown out with air while they are still on the wire. Do not mess up the order of these parts.

16. Remove the shock seal assembly, shock body end cap, bottom out bumper, and spring retainer. Inspect the shock shaft for wear or missing chrome. Replace the bottom out bumper if it is worn. If the shaft is worn it can be re-chromed by Race Tech. All worn parts can be bought from Race Tech or by contacting me.

17. Install the spring retainer, bottom out bumper, shock body end cap, and shock seal head assembly, **fig 7**.



18. Use a metric thread pitch gage and check the thread pitch on the shock shaft. KYB usually uses a 12 x 1.5mm thread while Showa usually uses a 12 X 1.25 mm thread. You can install a new nut or use your old one if it is still good.

19. Install the base valve and valve stack assembly. If you kept these parts on the wire, they will go on the shock in the correct order. I place the wire in the rebound hole, then slide the parts down onto the shaft. The nut should be the last part that goes on the shaft.

20. Clean the threads and install the nut with **red Loctite**. **Torque the nut to 24 ft/lbs.**

21. Hold the shaft assembly up to the light and look at the valve stack. Check for dirt in the stack, and that the shims are sitting flat against the base valve assembly. Check the crossover gaps between the low and high speed stacks. If there are any problems disassemble the stack and look for burrs or dirt on the base valve or shims.

22. Clamp the shock body in a padded vice. Pour shock oil in the reservoir until it's about an inch (25 mm) from the top.

23. Install the bladder into the reservoir. Oil should be pushed out as the bladder is pushed in. Push the bladder down far enough so the circlip can be put in and install the circlip in the groove. Install the air valve in the bladder.

24. Pressurize the bladder with around 40 PSI of air. The air will inflate the bladder and push oil and air through the compression adjuster.

25. Fill the shock body within one inch (25mm) from the top. Install the shock shaft assembly into the body. The shaft should go in smoothly. If it does not call a suspension specialist.

26. The air must be removed from the shock assembly before final assembly. To bleed the air, push down on the shock shaft quickly and then pull it back up slowly. Forcing the shock down fast will open the valving and force the air out. Continue doing this until there is no more air bubbles coming out.

27. Once the air has been bled, extend the shaft almost out making sure the rebound hole in the shaft does not suck air. If you hear a sucking noise you extended it too far and you will have to start the bleeding procedure all over.

28. Fill the shock body with oil and push the seal head down. Oil will overflow from the shock. Once the o-ring on the seal head has sealed on the shock body, push in the reservoir valve core while still pushing down on the seal head (two large screwdrivers can be used for this). Push the seal head into the shock body until the circlip groove is seen. Install the circlip.

29. Pressurize the reservoir with 20 PSI of air to seat the seal head. **Make sure the seal head is installed properly and the circlip is holding it into place.**

30. Tap the end cap on with a plastic hammer.

31. Put in 120-140 PSI of air in the bladder. Push the shaft down and watch how it goes back up. It should not stop or hesitate on the up stroke. It should extend itself all the way out. A properly working shock will return smoothly. If there are any problems, disassemble the shock and inspect for problems. If there is air in the shock it could cause some of these problems.

32. Let out the air from the bladder. The air was for testing only.

Caution:

Air should never be used in shocks since it will expand with heat and could cause excessive pressures in the shock resulting in a potential serious problem.

33. Using **nitrogen**, pressurize the shock to whatever specification your service manual recommends. Your local shop can help you with this.

34. Install the spring and retainer. Adjust the spring tension to your install free length from step 2.

35. Set the compression and rebound adjusters to the settings from step 3.