

Suzuki GS1000G fork seal replacement

Before you start you require:

- 1) To read workshop service manual for your model
- 2) Socket allen key M8
- 3) Torque wrench
- 4) Special tool to hold inner, make your own, see picture, +-450mm rebar welded to a 19mm nut and a t-bar on the other end.
- 5) Two new seals 37 x 49 x 8/9.5 mm
- 6) Fork oil 502 ml, SAE5 or 10 or 15.
- 7) Measuring device to measure 251ml
- 8) A PVC plumbing joint to insert new seal
- 9) Other miscellaneous tools, see pictures

Its advisable that you read through the Suzuki Service Manual on how to do this and what tools, oils and parts to use. This guide does not replace that process in any way, but helps in making it clearer.



Remove the front wheel, the calipers and the mudguard. Now unscrew the fork air valve cap and push the valve pin in to release the air. Then loosen the upper cap that is screwed into the fork inner tube with a shifting spanner.



If you cannot turn it properly, release the two lower steering pinch bolts and the upper larger one and push the fork up to clear the handlebars and temporary tighten a pinch bolt to stop the fork turning when the upper cap is loosened. Remove the fork leg from the steering clamps after loosening the 3 pinch bolts, two lower and one upper and by turning the fork and pulling downwards. A little oil will help as well.



Removed fork with tools for shown:



Prepare a container for the old fork oil. While keeping the fork upright, turn out the upper cup of the fork tube. Nothing will fly out if the fork is kept fully extended while doing this. Thereafter up end the fork over a container and let the oil run out. You may want to fasten it upside down as this will take a while. Below is what may slip out, but full of oil!



Remove the dustcover and snapping



From the inner tube, pull out the spacer tube, then the spring guide, then the spring, as they will be quite oily put aside out of the way. In the picture the spring guide is laying above the spacer tube, but it actually fits on the top (narrow) end of the spring and then the spacer goes on top of it.

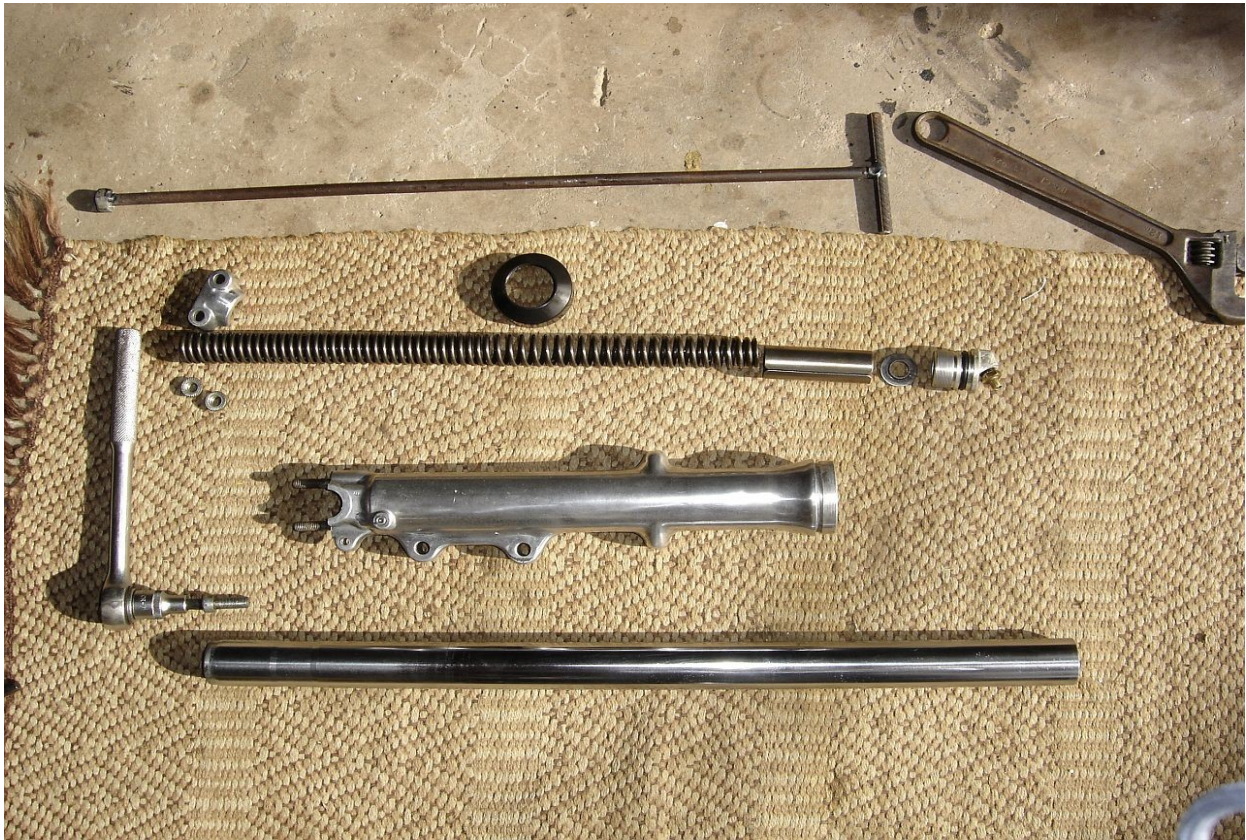


To remove the inner tube, an allen bolt has to be removed in the bottom of the fork. The T-handle in the picture is a piece of rod of about 400 - 500mm welded to a 19mm nut that will keep the inner tube from turning and allow the allen bolt to be loosened and removed.

Push the 19mm nut on the T-handle down the inner shaft and locate it properly in the socket on top of the damper. Fit the allen key socket to the bolt as shown and loosen. If you have difficulty, just put the T-handle in a vice to get more leverage on the allen bolt, do not try to turn the T handle, turn the allen bolt to loosen.. Beware, as you are inverting the fork, some oil may run out and some rags might be advisable.



Below you can see the allen bolt removed and the inner tube removed from the fork bottom end. Do not lose the copper sealing washer under the allen head bolt as it usually sticks to the fork.



Then slide out the damper rod out. Also remove the tapered oil lock piece from the bottom. If it sticks just turn the allen bolt into it and pull it out.



At the top of the lower or outer fork tube and you will see the rubber seal with a locking ring above it. Use a pointed pliers to remove the locking ring. The seal really needs to be pulled out with a proper seal puller, usually with adjustable hooks and a sort of a slide hammer. This seal is very narrow and does not lend itself to drilling and pulling out with a screw.

I sharpened a small chisel at an angle and tapped the sheet metal frame of the seal until I had cut it to the bottom and then bent and pulled it out with a large pliers. It was properly frozen in there as you can see the condition after such a gentle process!

A wide flat screwdriver can also be used if you bend a small bit of copper sheeting over the tube lip to prevent the screwdriver from scarring it, first leave it overnight with penetrating oil on the joint. Be careful not to scar the fork metal or the bush below the seal.



Close up of the chisel, seal retaining ring or “ring oil seal stopper” and the mangled fork seal.



Inspect the teflon bushes for wear and replace if required. These rarely need replacement unless abused badly it seems. There is one in the lower outer tube just below the oil seal, another inside the bottom of the inner tube and another on the damper just under the socket at the top.



Clean all the parts, especially the inside of the fork components. Remove all the old oil if possible.

Inspect the inner fork chrome tubes for rust and see if they are not bent. If you have any small pits of rust that you cannot polish away, but they are not in the seal lip travel area then it should be OK. If you have rust there, the new seals will be damaged and soon start leaking again, you may need to replace them or look at having them re-chromed. Please note that in a case of some rust above the fork travel area it is of utmost importance that the new seal is then only slid up the inner tube from the bottom before any reassembly, just in case you nick the sealing lips on the rust if coming from the top and over it.

Inspect the o-rings on the air valve cap as well as the top nut and replace if needed.

Measure the springs and compare the length to the standard of 421mm and should not be shorter than the service limit of 416mm, otherwise they need to be replaced.

Use this opportunity to replace the small philips oil draining screws at the bottom of the outer/lower tube with stainless steel allen head screws and new copper washers.



The fork seals are size 37mm x 49mm x 8/9.5mm and are shown as seen from the top.

Installing the new fork seals, requires that you oil the seals on the outside and then gently use a suitable drift, socket or piece of PVC waste pipe to tap them evenly in place. Once they are properly seated, install the locking rings.





Now slip the damper into the inner tube, push the tapered oil lock piece in from the bottom.



Then gently slide the inner tube with the damper gently into the outer tube. Take the allen bolt and check that you have the copper sealing washer, coat the threads with thread locking compound and turn it in from the bottom. Once hand tight use the T-handle to prevent the inner tube from turning and torque the allen bolt to the specified torque of 2.0 – 2.6 kg-m (14.5 – 19.0 lb-ft). Thereafter push the dust seals over them.



Make sure you use proper fork oil such as prescribed by the manufacturer, SAE 5W, 10W, 15W even 20 W is available. Usually 10W or 15W is the average weight to use, but if you want a stiffer front suspension then try 20W and vice versa. Always do both forks with the same brand of oil at the same time and an exact measurement for both forks is important. Some people advise using ATF or mixing ATF to get a specific firmness. It has been mentioned that ATF may damage certain types of seals over a long period. I am not sure if this is still true, but keep this in mind. The proper oil is

available and replacing the seal again later is not something to look forward to. Beware of overfilling as the forks can then hydrolock with disastrous effects.

The GS1000G and GS850G manual prescribes 251ml of oil for each fork. Yes, not 250, but 251 ml exactly!

An easy method is to prepare two small plastic drink bottles or baby bottles, (or the narrowest bottles you can get, as this allows for more accurate measurements) with tops that will fit inside the upper opening of the inner tube and fill both with exactly 251 ml of fork oil. Get hold of a large disposable syringe and without the needle, measure off 251ml into each bottle and cap it. Your new and dry fork will take that exactly and it may have to sit there for a while until all the oil has run out, preferably overnight.



There is another method which requires measuring the level of the oil to be 140mm from the top with the forks fully compressed without the springs inserted and properly vertical. This is not easy to do on the bike and best done with the fork off the bike as they need to be properly vertical, but

the best way to go if you have only drained the old oil and have not been able to clean it out fully. Quite a bit of oil stays inside when only draining.

Before filling them, firmly fix or mount the assembled forks temporary, a wooden board, some cable ties and a vice can do the job, without the top cap, spring, and spacer installed, fully extended, properly vertical and allowing space to pump the lower part if needed to get any trapped air out. I clamped them temporary in their place on the bike, with them higher than normal giving you clearance to work and turn the top nuts.



Pour in some oil and carefully pump the lower part, then continue pouring in oil and pump again. Finally just up-end the bottle and leave it in the opening for all the oil to drain into the fork overnight. Do not be too vigorous and pump oil out of the top as your measurement will be affected. Now while the forks are still extended and filled with 251ml of oil gently insert the spring with its wide side first, narrow towards the top or as the manual states the close wound side to the top, this is not very important on heavy bikes, as long as both springs are in the same way. Put the spring guide on the end of the spring, slip the spacer tube in and carefully turn the top cap in as far as it will go. Put a drop of oil on the o-ring so that it slips in easily without pinching. You may now need to temporary clamp the fork in the steering stem to allow you to turn it in fully and tighten without damaging the inner tube.

Then just loosen the pinch screws again, remove the tube and fit the headlight “ears” and the chromed logo, insert and move each tube until it is exactly level with the top surface of the upper stem head. Turn the valve in the direction that makes it easy for you to get the hand pump and pressure gauge on it and tighten the pinch bolts to the specified torque. Upper is 2.0 – 3.0 kg-m (14.5 – 21.5 lg-ft), Lower are 1.5 – 2.5 kg-m (11.0 – 18.0 lb-ft)

Now depending on your settings, carefully pump some air into the fork, the wheels must be in the air and the forks fully extended. Do NOT use an air compressor!! Do not exceed 2.5kg/cm² (35 psi)! Now carefully release small amounts of air and measure with your pressure gauge until you have exactly 0.8 kg/cm² (11.4 psi) in each fork. This measurement is just the average setting and you can change it to suit your requirements when you match the rear and front suspension for your weight and preference, always keep it matched in both forks. Fit the locking caps over the valves and your forks are ready.

Now give your forks inner tubes a very thin coat of grease on the outside. I used Wurths spray on grease over the chromed part to help prevent rust and then wiped most of it off with a dry rag, leaving a slight layer and some in any small pits.

Refit, mudguard, brakes, headlight, flashers etc.