Front Caliper Rejuvenation – GS850GT and later

Once you have the Calipers removed from the motorcycle it is relatively easy to rebuild / rejuvenate them. If you have never attempted this before, read the instructions thoroughly and plan on doing the work over two days if you are repainting them. As you do more, it will become easier.

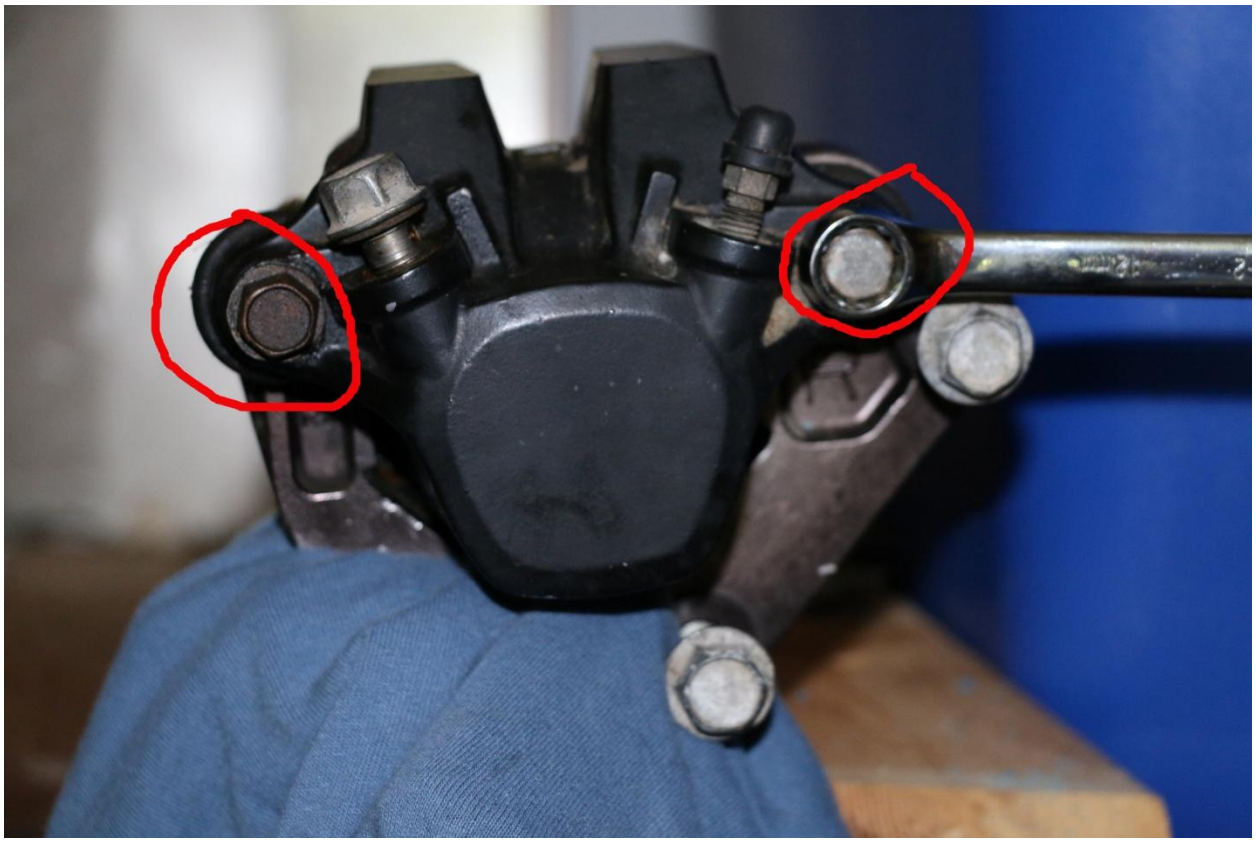
The most time will likely be spent cleaning and waiting for paint to dry. For cleaning you should have on hand soapy water, brake fluid and brake cleaner along with rags and a stiff nylon bristled toothbrush, or similar small brush. A pick set comes in handy as well.

The photos used in this explanation show a Caliper with relatively few miles on it, but one that sat outside for a number of years and then in a dusty garage for a few more. This is the first tear down for this one in 38 years. It is a right hand caliper but the left is the same only mirrored.

I purchased and installed a new kit, but re-used the pistons.

A vice comes in handy for the initial tear down. But, you can do this without a vice if needed.

Place the Caliper Holder in the vice and remove the two Axle Bolts.



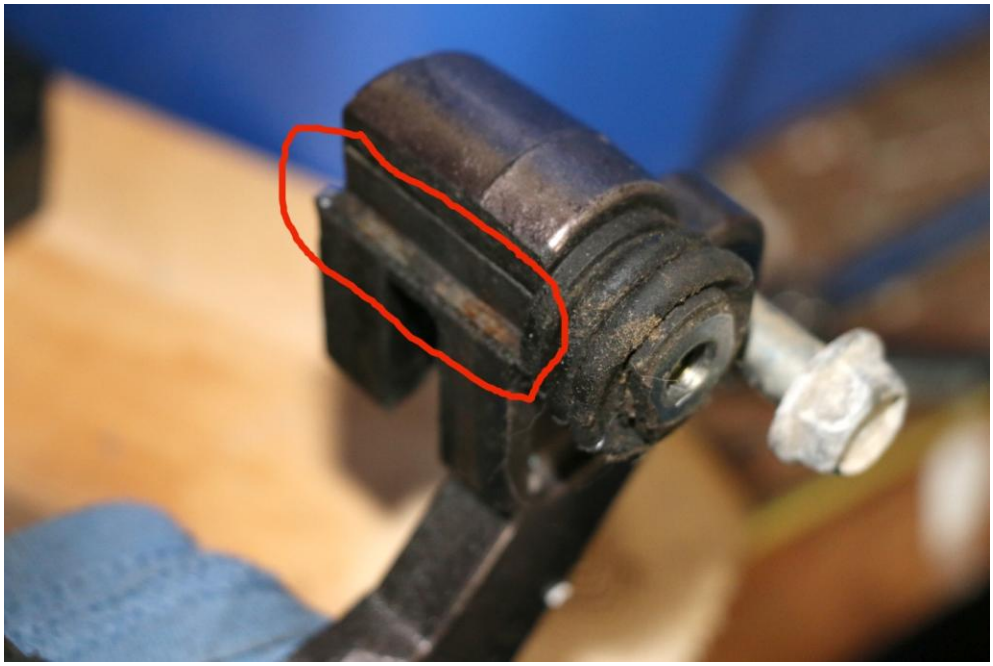
Once these are removed the working part of the caliper will lift off, in fact it may fall off, so be careful.

There are several parts in here that are loose once the housing is disconnected – the Pads and the two Pad Guides in the Caliper Holder and, the Pad Spring in the Caliper Body. Ensure you do not lose them.

We will clean and rebuild the Caliper Holder parts first.

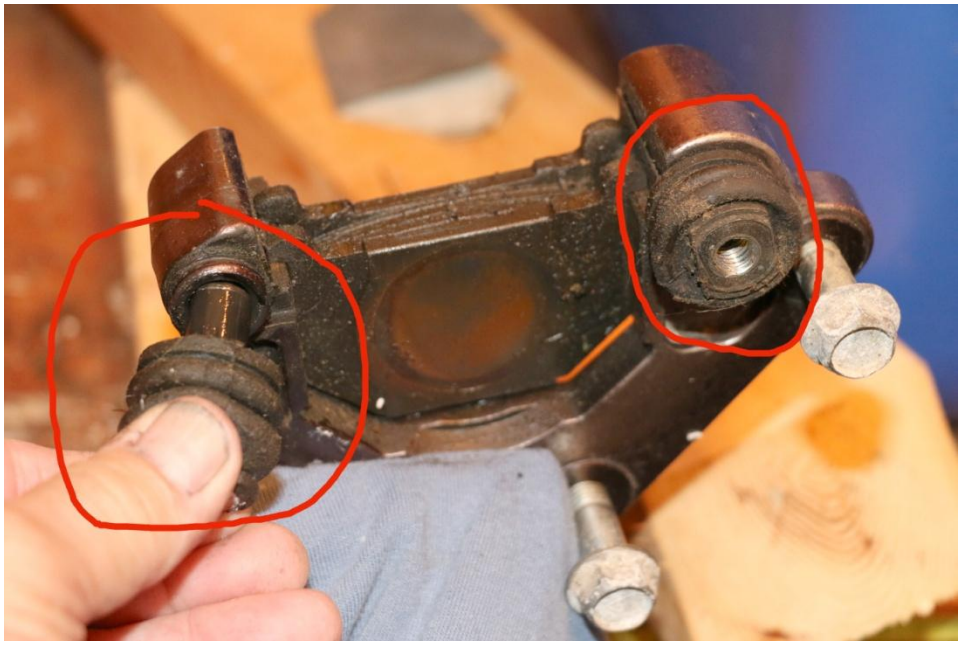
The Pads may be caked with dirt and crud along the outside edges. If you are re-using them, because there is still enough wear remaining, hold the pads together and you can remove most of this with a pick or small scraper. Then you can spray the pads with brake cleaner and set them aside.

The Pad Guides should be shiny clean. The pads slide along these guides so it is essential they are clean. In this caliper they were coated with brake dust and dirt and had to be removed with a pick, after removing some of the crud. There is one on each side.



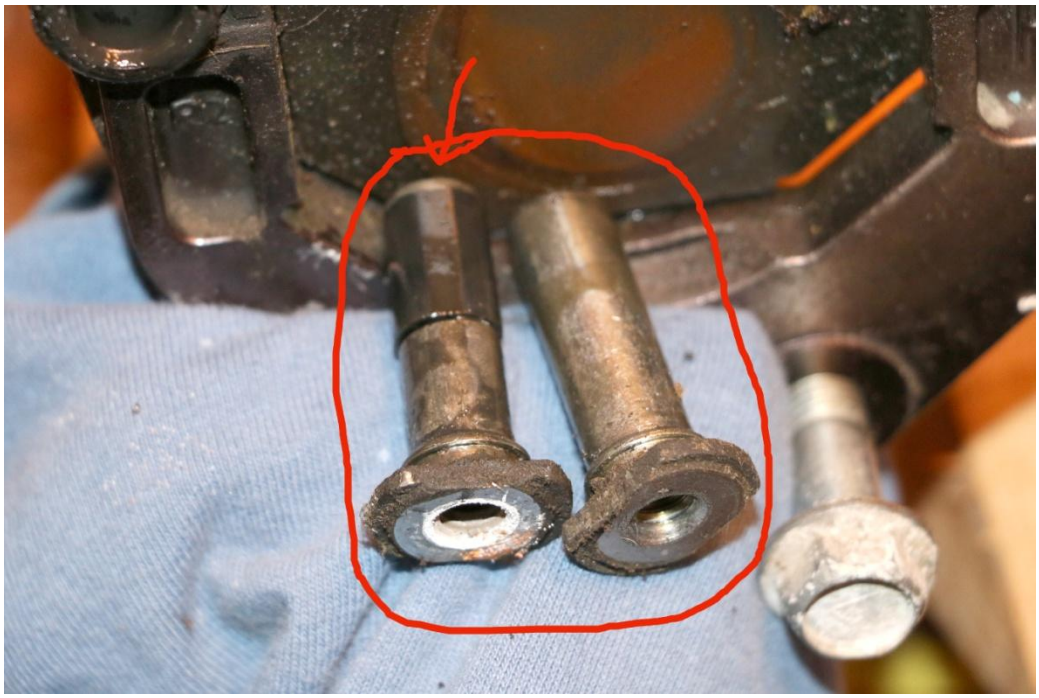
The Pad Spring should also be relatively shiny clean. Again in this caliper the spring was covered in brake dust and road grime that had to be scraped and washed clean.

Next, you can tackle the Caliper Axles. They are different in that one of them has a sleeve on it. If the calipers are extremely dirty, or have been sitting for a long time, the one with the sleeve can be difficult to remove and may have to be pulled with pliers. The sleeved axle is always the one farthest away from the bolts that hold the caliper to the fork.



Before you pull them, note how the Axle Boots are oriented.

Once they are removed, you can clean up the old grease on them, remove the Axle Boots and set them aside.



Finally, clean up the Caliper Holder.

When you move on to the Caliper body itself you will have to determine how best to get the Piston out. Some people use compressed air. Some people are able to gently pull the piston out. Be aware that you can not scar the outside of the piston except at the very edge where it contacts the pads.

But if you have a very stuck piston, like this one was, you can always hook it back up to the working brake line and pump the brakes until it pops out.

Be aware that you will have to semi-bleed the line first and when the piston releases there will be a fair bit of brake fluid coming out so be prepared to catch it. You should also be aware that brake fluid is a paint stripper so keep plenty of rags on hand and protect painted parts.

These brakes had been sitting for years and I suspect this was the original brake fluid. You can see the color and the smell was horrible.

Your Piston may have gunk and corrosion on it that has to be cleaned. Brake fluid, soap and water and brake cleaner all come in handy for this job. Clean it by working horizontally around the piston, not vertically from one end to the other.

The Piston may be slightly pitted from rust and this is okay, as long as the pits do not run vertically up the side and as long as there aren't too many.

Once it is clean, set it aside.

The Piston Boot has to be removed. It sits in a groove just inside the caliper body and from years of work and / or neglect, it may be glued into place. You can pull it out by hand, or use a pick to start it out if it is going to tear. You can see some of the crud that was attached to the Boot.

On this Caliper, the boot was soft and spongy and stuck in the groove. It had to be literally torn out.

Once this is out the Piston seal also has to be removed. It could be gunked up in place as well but shouldn't be as hard to remove as the Boot.

Now comes the most time consuming part – cleaning the bore. You can see the attached "stuff" on this bore. And you can see some of the corrosion in the grooves for the Boot and the Seal.

All of this will come off but it takes patience. Again make sure that you don't scratch the bore vertically, working your way horizontally around the bore.

One other word on this. You may think that you have all the corrosion off the bore because the color looks the same as the bore. Don't be fooled. When you think it is clean, clean it again. Do this until you don't see any change.

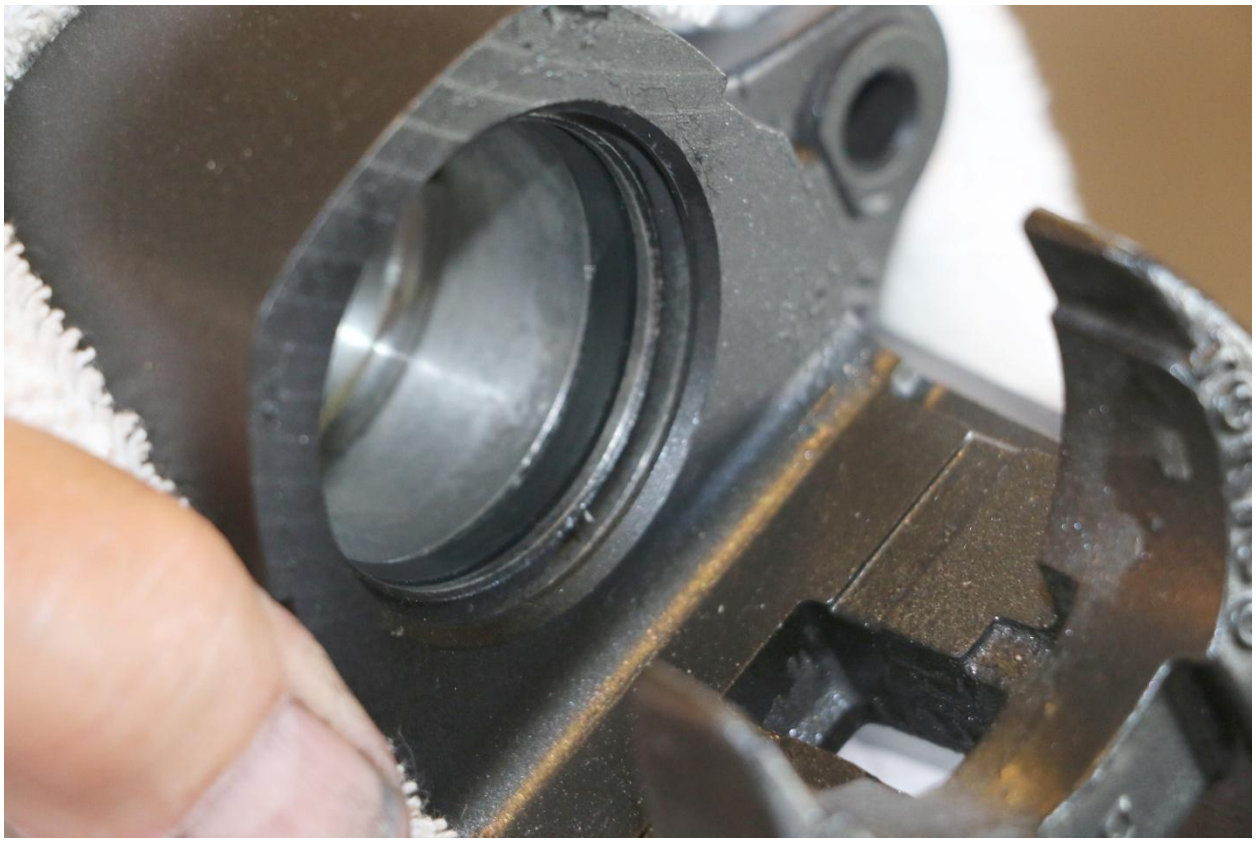
Cleaning the bore I usually wipe it out first with a clean rag to get as much loose debris out as possible. Then I rub it with brake fluid and give it a blast of cleaner.

Then it gets dunked into soapy water and wiped. Then I attack it with the toothbrush, brake fluid, cleaner and soapy water in varying orders as I work the corrosion out.

Corrosion that is stuck on hard in the Seal or Boot grooves can be scraped carefully with a pick, but do not use anything harder than nylon bristles on the bore.

It took three hours of steady work to clean this one up.

In the picture below I have also already installed the new Seal after painting. If you repaint and accidently get some paint in the bore, a little brake fluid will clean it up.



Once this is clean and dry, if you wish to paint, give them a light sanding and paint away. Be aware that you will probably get brake fluid on the freshly painted parts during re-assembly so keep some touch up paint on hand.

Now it's time for reassembly.

It doesn't matter what you do first but I always start with the Caliper Holder.

Place the new Axle Boots onto the Axles, making sure to place the lip in the groove on the Axle. Add some of the grease that came with your rebuild kit and slide the Axles back into place.

Make sure to attach the Boots on the other end now, as they become almost impossible to do once the Caliper is back on.

Place the Pad Guides back in their spot. The tangs go down and the widest edge is on the side. They will only fit one way but refer to the Parts Diagram if you are confused. It shows one in its correct orientation.

Put the Pads back in place.

To reassemble the Caliper body the first step is to lightly coat the inside of the bore with Brake Fluid.

Then insert the new Seal. It goes in easily. And coat it with a bit of Brake Fluid.

And now comes the sometime frustrating part – attaching the Piston Boot and inserting the Piston.

Some people have luck inserting the boot into its groove first and then working the piston into the bore, through the Boot.

I use another method that others also prefer. I slide the boot onto the Piston, leaving a fair bit hanging off the end.

Then I work the lip of the Boot into its groove while also manipulating the piston so it holds it in place as I go.

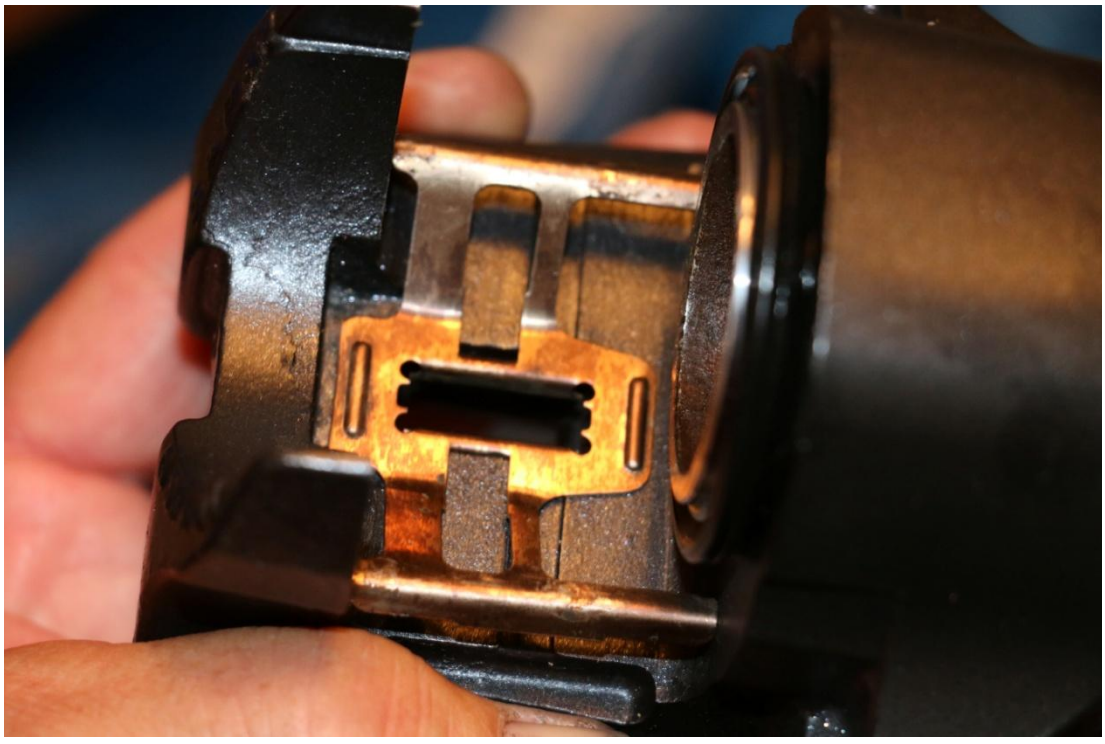
As I stated, this can be frustrating at first. Be careful not to damage the boot.

And use a rag to keep hands with Brake Fluid on them off the new paint.

Once it is started I find it easiest to use a clamp and gently and slowly ease the piston into the bore. It will hesitate slightly at the Seal but should slip past it.

Once the Piston is all the way in the Boot lip will drop into the outer groove on the Piston by itself. But make sure you double check that it has.

Now you can take this assembly and re-install the Pad Spring. It fits so the rectangular cut out is exactly over the Sight Hole. The tangs should slide down into the sight hole and may or may not hold it in place. You may have to hold it while placing the Caliper Body onto the Caliper Holder.



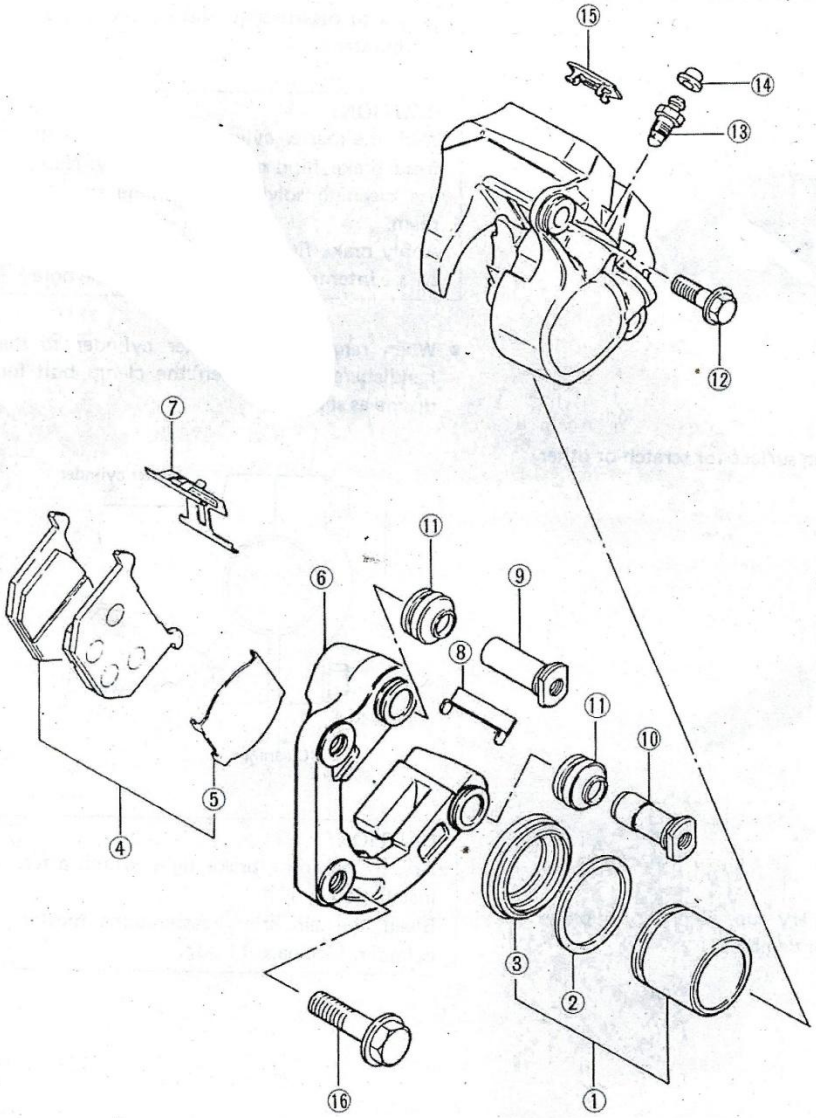
The next step is to re-attach the Axle Bolts and tighten them to 11.0 to 14.5 lb-ft.

If the axles spin while tightening the bolts they are flattened so you can grasp them with pliers. Once the bolts are tight, you should be able to move them in and out so they settle into place.

The final step is to re-attach Sight Cover and you are finished.

You can touch up whatever paint was damaged during re-assembly and then reattach to the forks.

The Exploded Diagram follows below ...



① Piston set
② Piston seal
③ Piston boot
④ Pad set
⑤ Pad shim
⑥ Caliper holder
⑦ Pad spring
⑧ Pad guide
⑨ Caliper axle No. 1
⑩ Caliper axle No. 2
⑪ Axle boot
⑫ Bolt
⑬ Bleeder
⑭ Cap
⑮ Cover
⑯ Bolt

	Tightening torque	
	kg·m	lb·ft
⑫	1.5 – 2.0	11.0 – 14.5
⑯	2.5 – 4.0	18.0 – 29.0