1991 Alfa Romeo 33 ABS Installation – Rear Calipers and axle restoration 5/2012

It is now high time to get into the real business of the project. The rear axle and the calipers are the heart of the rear disk conversion.

Of course I wouldn't trust the calipers under their "as is" status. The calipers already counted 20+ years of service life and for sure a ground up repair is required. Thanks to the Internet, I was able to locate a UK based brakes online shop who stock every kind of brakes part. After a week from ordering, I had on hands the complete repair kit.

Here is the brake caliper. It is black and dirty holding many years of brake dust and road grim.

Here is the brake caliper bracket. It is the part that bolts to the stub axle. The same dirt and road grim applies in here also – note on the left that the brake caliper pin is shown stuck. It appears that sometime during the past water and moisture entered the protective boot, and mixed with grease. As a result grease turned to rock solid and the pin has been stuck. Getting old grease out and after some soaking with WD40 the pin was finally out.

Move on removing the caliper piston. Be careful in here are the principle of front caliper pistons is NOT applied on the rear brakes. The rear caliper piston in of the screw-in type and not of the push in. This means that there is a threaded rod behind the piston and getting it in or out requires the shown tool. The brake piston winding tool gives you the ability to bolt in or out the piston without damaging it .

Here is a close-up of the piston after removal. See the threaded bore where the threaded rod bolts in. This design is required if the manufacturer wants to integrate the handbrake mechanism. Applying the handbrake on rear calipers car requires a mechanism to act on the brake pads. This is one of the ways to achieve it.

Here is the piston bore. You can see threaded rod and the spring loaded tower being homocentric to the rod. This tower is held in place with the help of a lock ring on the very bottom of the bore. This is the trickiest part of the disassembly as a long set of pliers is required here. It may be relatively easy to remove the lock ring but when time come to fit it back, it is impossible to do so without a long set of pliers.

The piston bore is now a little bit “empty”

Here is the spring loaded tower along with the lock ring. As you can see there is a slack between the tower legs and the surface below. This space is taken up from the spring tension and it is really difficult to keep the spring down while trying to install the lock ring. All these must performed in a tiny space inside the bore… so you can imagine how important is to have the correct pliers.

Here is the threaded rod out of the piston bore. On the right there is a recess where the rod which appears on the right side photo is placed.

By acting on the handbrake lever this small rod acts on the threaded rod (left photo) and thus the brake pads are acting on the brake disk. This way the rear wheels are locked.

A final step for stripping the caliper bare is to remove the above seal. This is where the handbrake rod enters – this seal keeps away dirt.

In the mean time, the internals of the brake piston have been taken out. We will deal with the piston later on.

Brake calipers have just arrived from the powder coater all nice and shiny. Don’t get annoyed with the shiny color … it is just the camera which exaggerates. Under proper light the color is a nice yellow tone.

The calipers have quite some areas that we don’t want to be filled with powder. So the best trick is to mask everything.

Let’s start assembly. First place the handbrake mechanism lever seal – the fit is tight and you may use a socket in order to push the seal in. Be careful so that you press it straight in otherwise you will ruin the seal. Since it is steel enforced, the only way to remove it is by pulling it out by damaging it.

Apply silicone grease on the handbrake mechanism lever end. This is the place where the actuating rod will land on.

Install the handbrake mechanism lever and push it all the way in.

Apply grease on the threaded rod recess and be sure to replace this o-ring. This is the seal which prevents brake fluid from entering this chamber.

Install the threaded rod and be sure to push it all the way in. Do this only when you are confident that the small rod and the handbrake mechanism lever are properly aligned.

Here is the tricky part. I have failed to take a photo of the process but the principle used is simple. I used a C-clamp and a small cylindrical insert in order to push the spring in. Then using the pliers I installed the lock ring after many times of trial and error.

This is the pliers I am talking about. You can see the spring, tower and lock ring – these are from Dennis rear disk conversion project some years ago. Thanks a lot Dennis for lending me this handy tool!

Install piston seal by carefully placing it on the groove. You must also lubricate the piston bore and seal groove with brake fluid.

Next install the dust seal – again be sure to correctly install the seal on the respective groove.

Finally install the piston. Be sure to expand carefully the seal in order to pass over the piston.

Once it has passed over, use the special tool (this tool is the one for replacing brake pads) to wind in the piston.

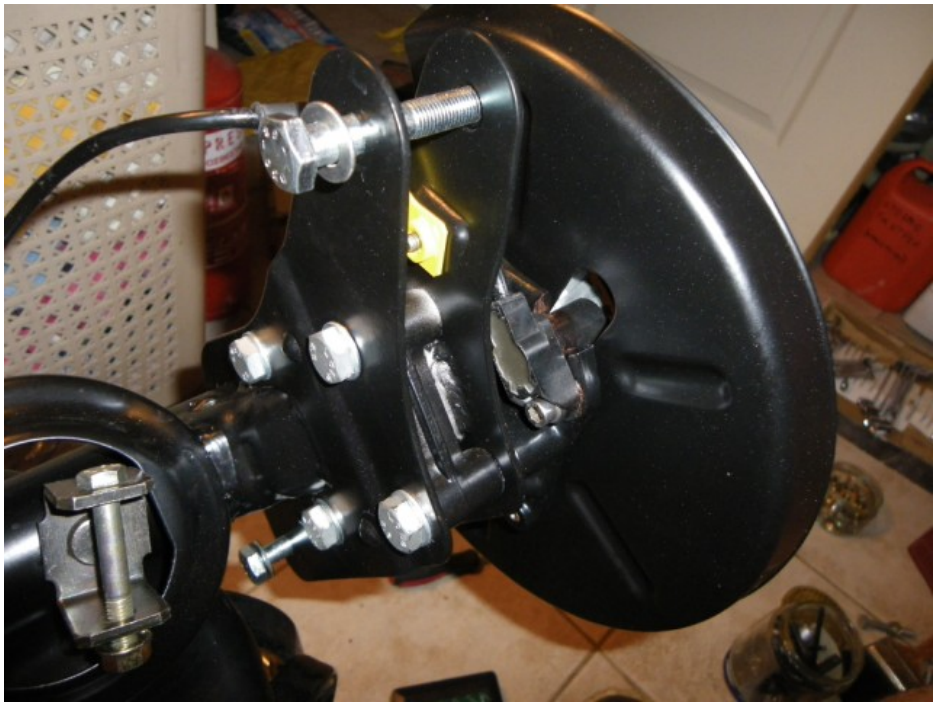
The caliper is now ready.

Let’s now assemble the axle. It has been sandblasted and powder coated in OEM black matte finish. New bolts have been purchased which are treated with anti-seize grease. This area is exposed to the nature elements so in case the stub axle needs to come off, it would be far easier to do so.

In addition, new bolts for the suspension arms and new shock absorber mounts have been purchased.

Stub axle almost in place. Do not fully bolt the stub axle until you have installed the brake caliper bolts.

Place the dust shield and secure it with the dedicated hex screw.



Install ABS sensor and attach the wiring to the specified brackets. I have used anti-seize grease so that the sensor does not corrode to the stub axle. Unfortunately I didn't take a photo showing the wheel bearing – however the grey shade you see on the ABS sensor is the inductive teeth area on the back of the bearing.

Install brake caliper bracket

Place the brake pads and finally install bracket. Be sure to tighten the respective bolts securing caliper to bracket.

Calipers are in position and we are ready for installation to the 33!