Clutch Master Cylinder Replacement

Seems that the clutch master cylinder decided to give up the ghost chronically close with the slave cylinder. The result was weak clutch pedal feel and the worst of all brake fluid has been leaking and corroded the surrounding area of the pedals.

Below are the parts needed along with the respective e-Per part numbers:

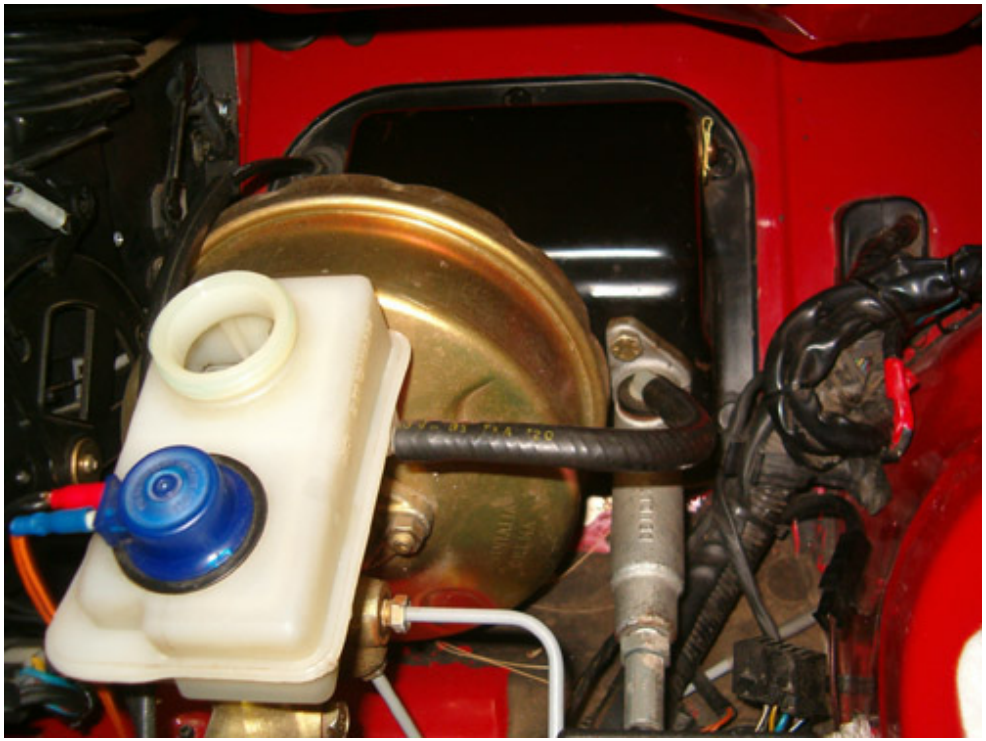
Part	Product Code	Quantity
Clutch master cylinder	60501237 (Benditalia) or 60502664 (ATE)	1
Screws	16135724	2
Nuts	16100811	2
Washers	11194074	2

In addition, you will need brake fluid of the DOT 4 class; since we will flush the entire brake system we need around 1.250 ml of fresh brake fluid in order to be on the safe side.

Here you see the new master cylinder. I chose to buy an ATE cylinder for the sake of excellent engineering these products have. So far I have been very satisfied with these, so I stick to them.

A close up. This nozzle is actually for supplying the cylinder with brake fluid; it is sealed from factory so that no foreign material enters the interior.

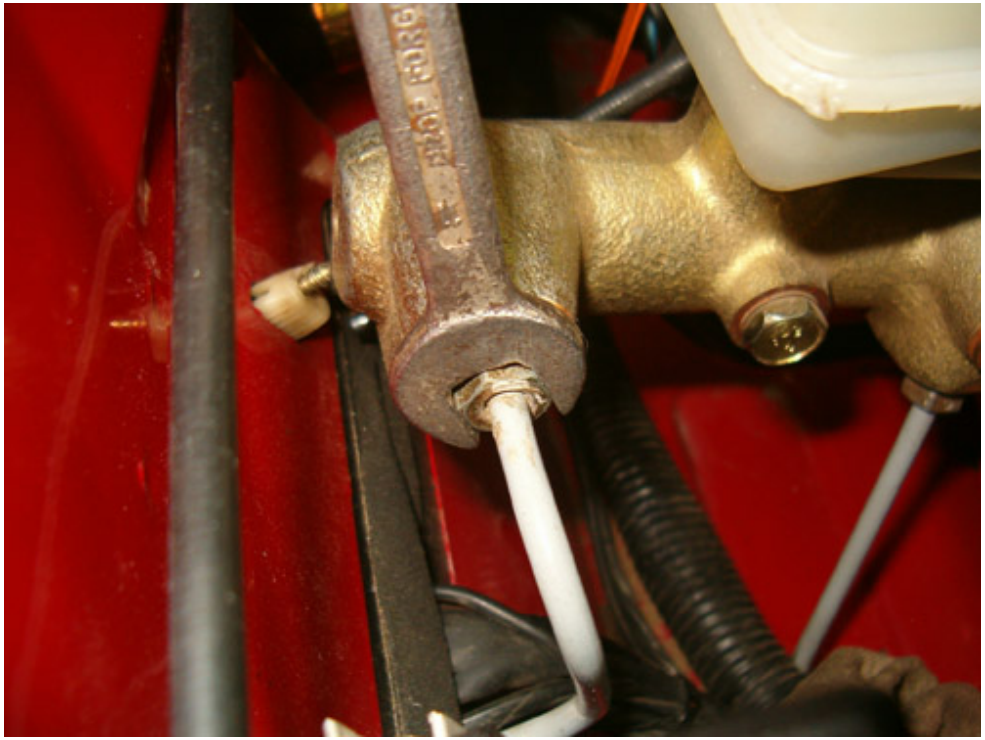
This view is from the interior showing the corrosion done to the area by leaking brake fluid. I will need to remove the pedal assembly so that everything corrosion has ruined is repaired.

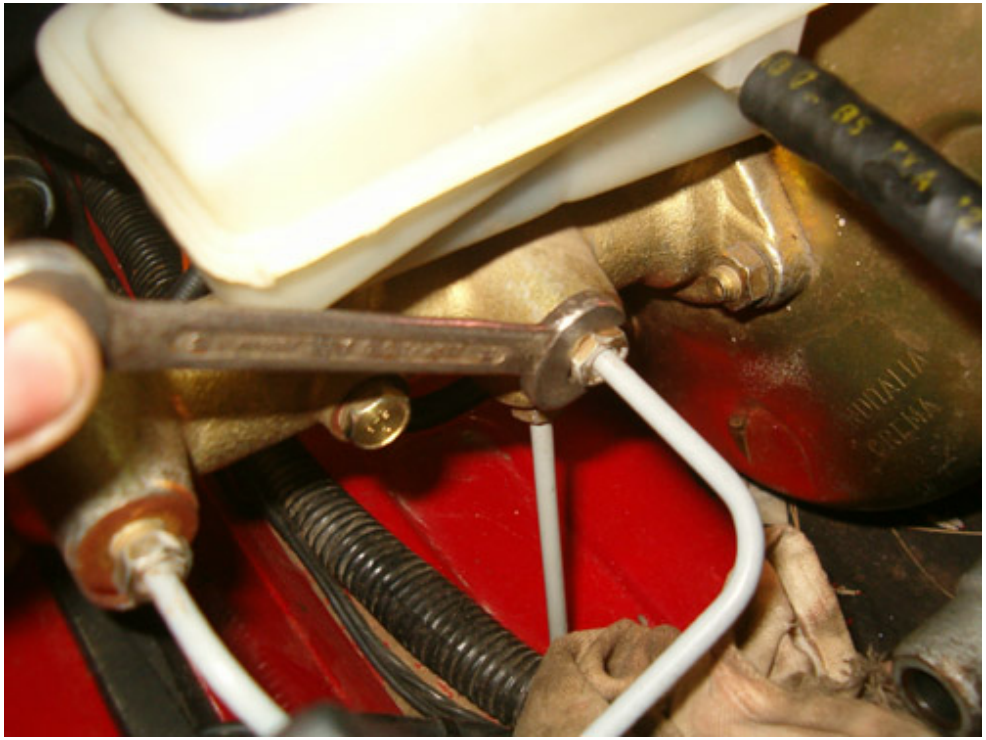


We will remove the pedal assembly (black housing) complete with brake servo and clutch master cylinder.

Remove all brake fluid with a syringe

Using a 17mm wrench undo the slave cylinder hose. Be careful and place rags under the cylinder in order to protect the paintwork from brake fluid slippage.





With a 10mm wrench undo the 3 nuts securing brake lines to brake cylinder

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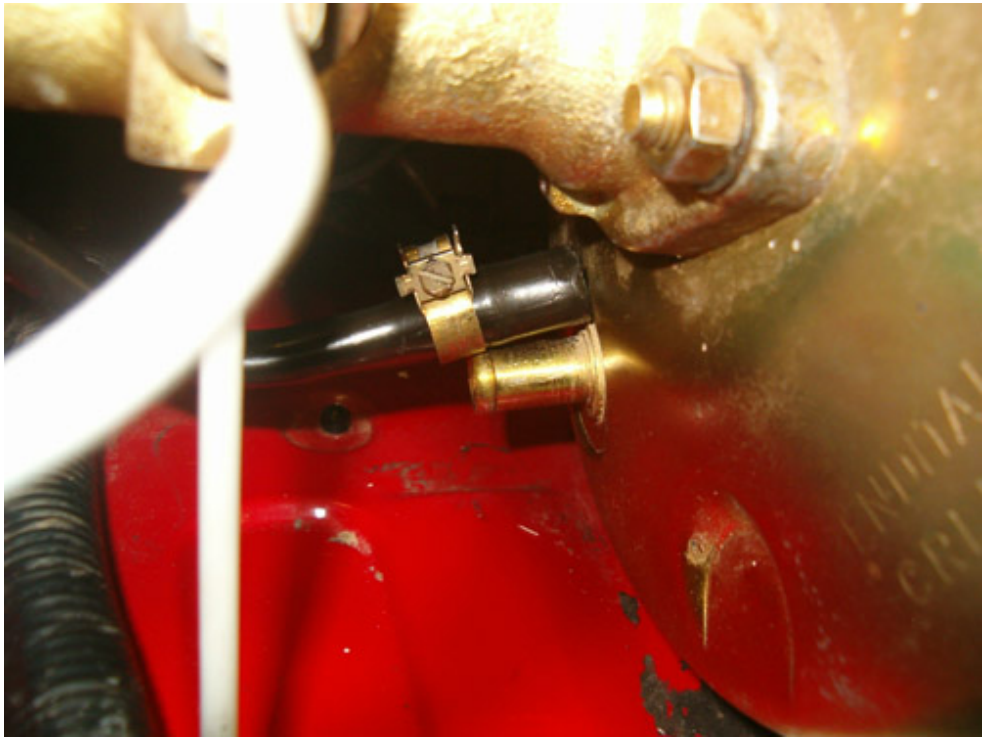
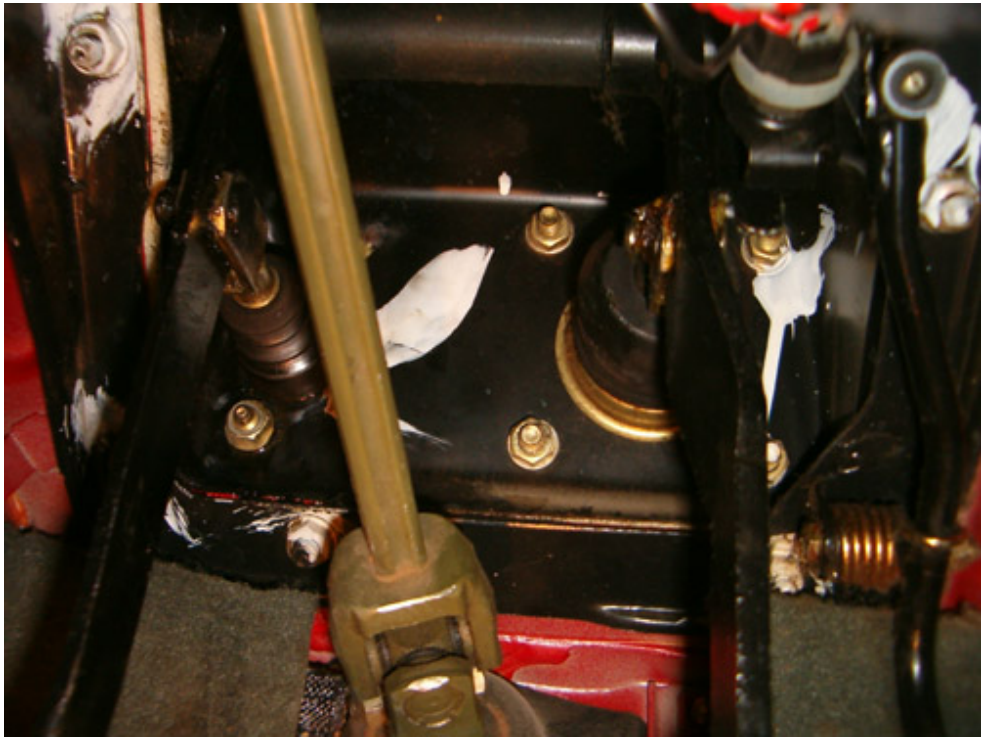
Got them out!



Disconnect vacuum hose from servo to intake manifold



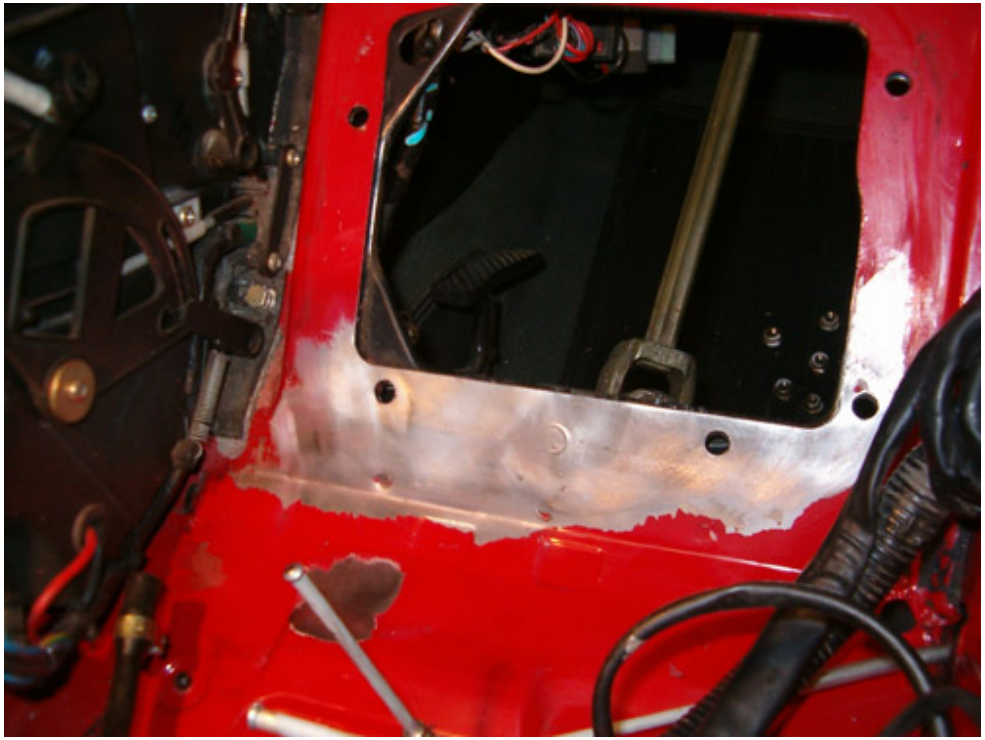
Let's move on to the inside in order to unfasten the pedals from the clutch/brake cylinder rods.

Undo the 6 nuts securing pedal case to chassis and proceed removing the pedal assembly

Here are the pins along with the relative lock rings keeping the cylinders attached to pedals; Also the springs are used so that the pedals are always kept in the beginning of the travel.

The complete assembly is out

Notice the extend of corrosion... Don't worry this will look like new in a short time!

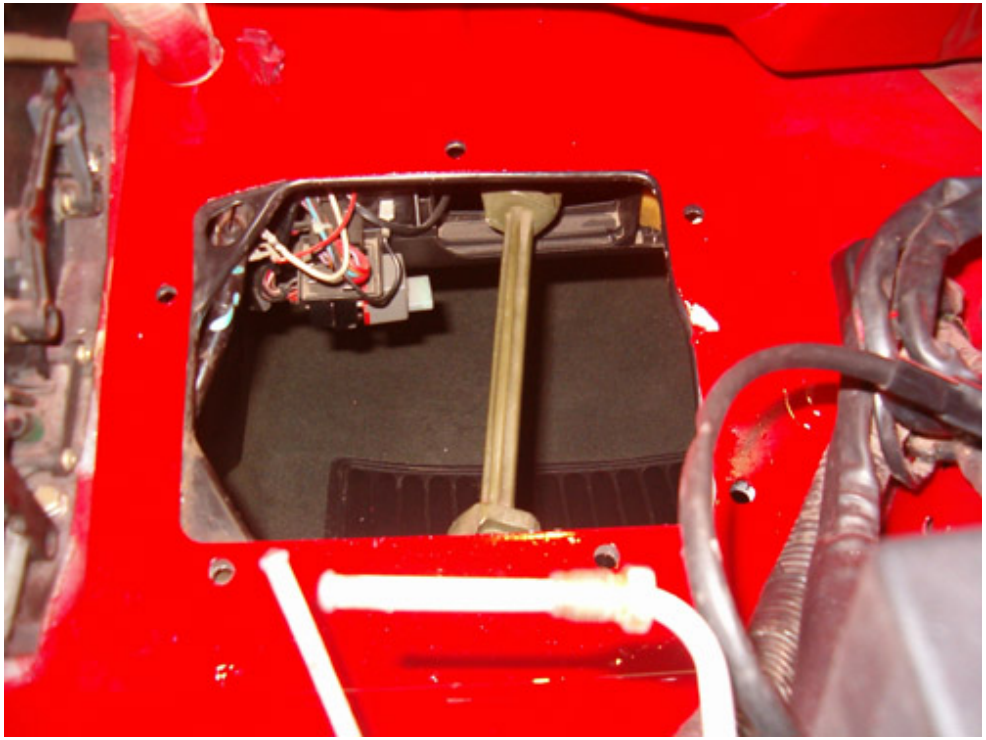


Using a wire brush, I removed corrosion and bare metal is now shown. It would be wise to clean the bare metal surface from dirt or oil traces by using a clean fabric soaked in alcohol; this way primer will stick to the metal as no foreign material will intervene between primer and metal.

Cover the surrounding area with paper sheets so that you don't spill paint around.

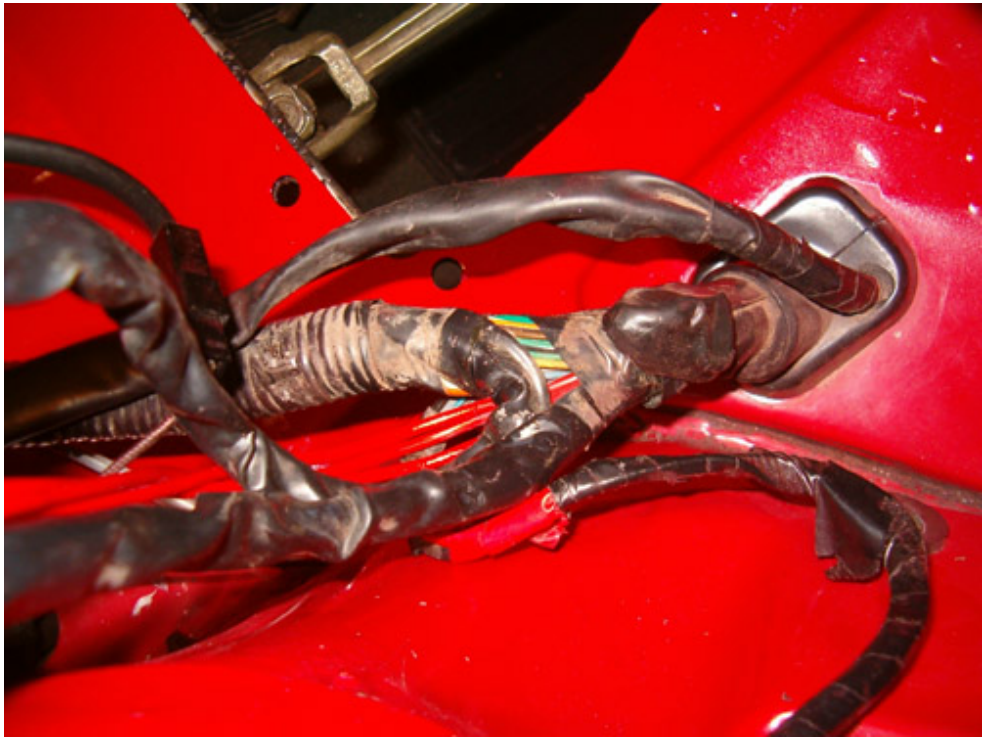
First layer of primer is applied. I will apply another layer of primer and 1 final layer of paint. All these should be done with 24 hours difference between them.

Another view ...

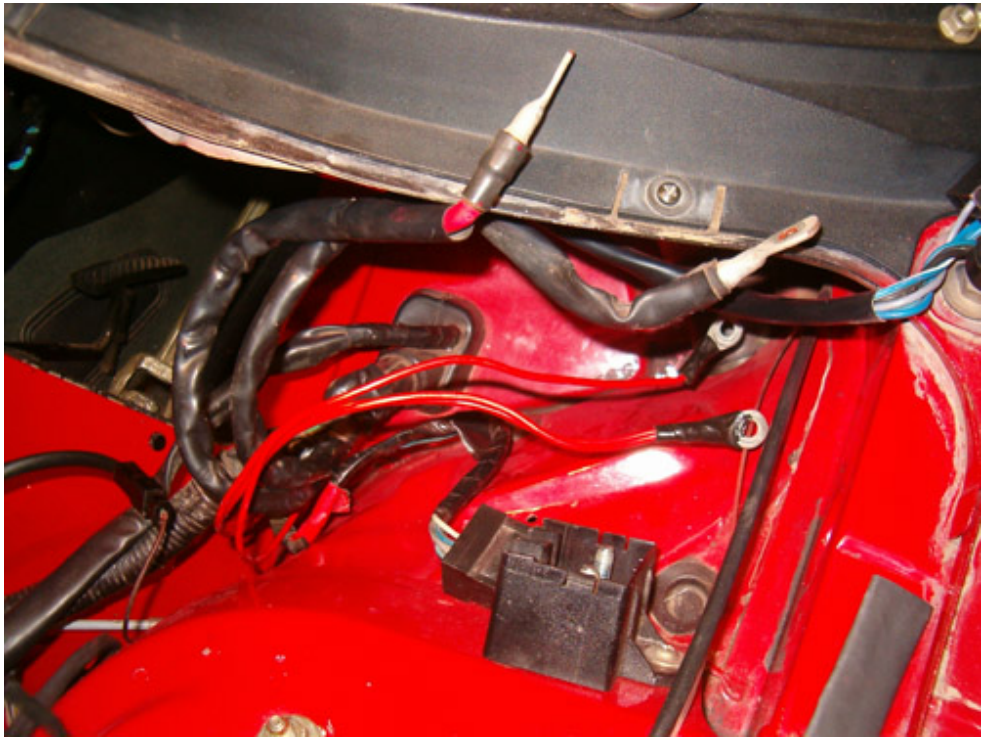


... final layer is applied; this section is ready

By the way here are the two cans used. PPG Deltron primer and PPG Red 130.



Time to sort the wiring harness a little bit. Be sure to disconnect the battery positive pole.



Heat shrinking tubes were used to keep the harness together...

I have used a heat gun to warm up the tubes - this is the final result.

Let's now focus on the pedal assembly.

Remove the old clutch master cylinder ...

... and then the brake servo unit by undoing the 4 10mm nuts. Notice rust formed around the threads of the pedal case; corrosion will be remove and then re-sprayed

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Proceed removing the pedals. Release the lock ring and remove the rod keeping pedals to case.

Pedals are now removed and thoroughly cleaned from old grease and residual dirt

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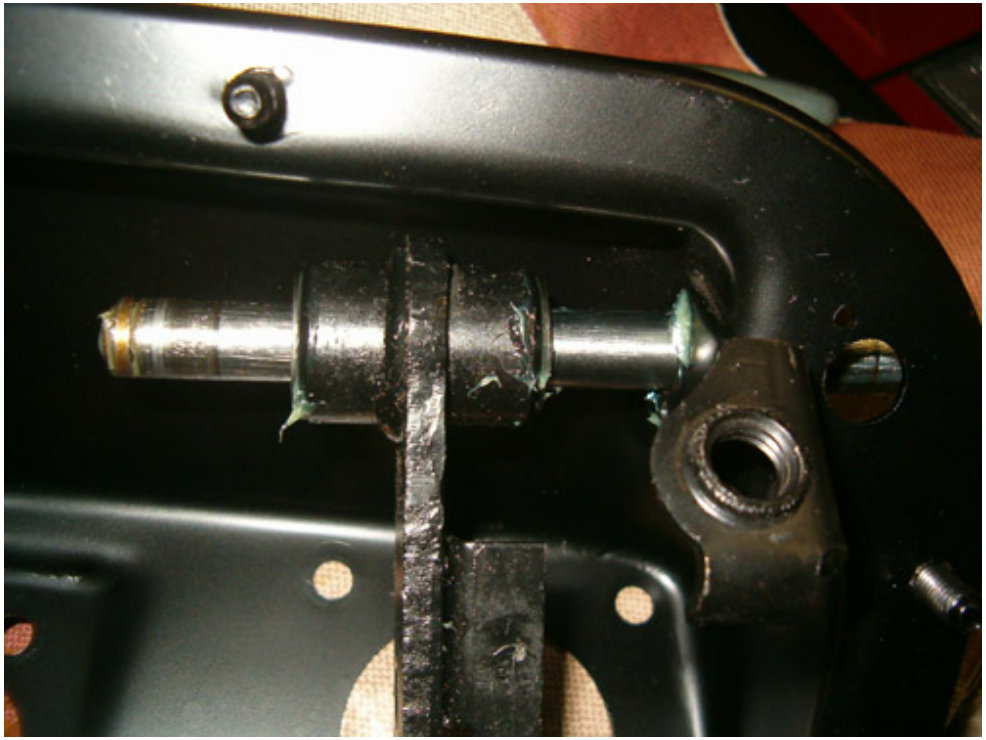
A close up of the pedal shaft and its bushings. Be careful with these bushings as they are plastic and an NLA (No Longer Available) item.

The corrosion has been removed and the pedal shell is now freshly re-sprayed



We we now begin installation of the pedal assembly. Thoroughly grease the pedal shaft and install the brake pedal to the case.

Install middle tube and finally the clutch pedal. Secure the pedals with the lock washer

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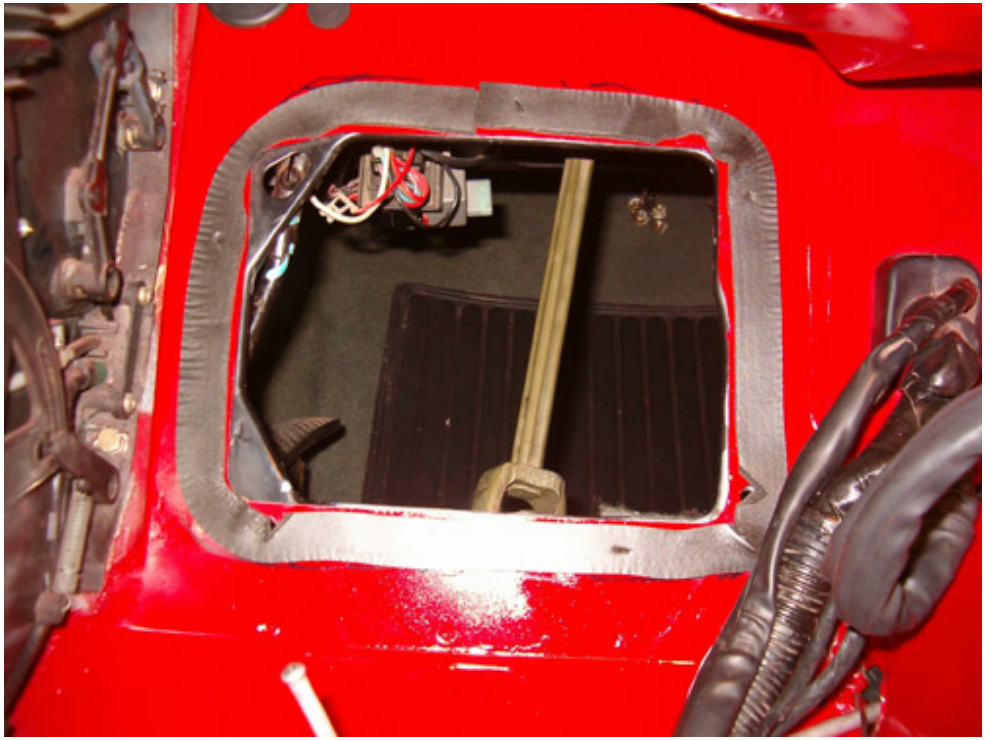
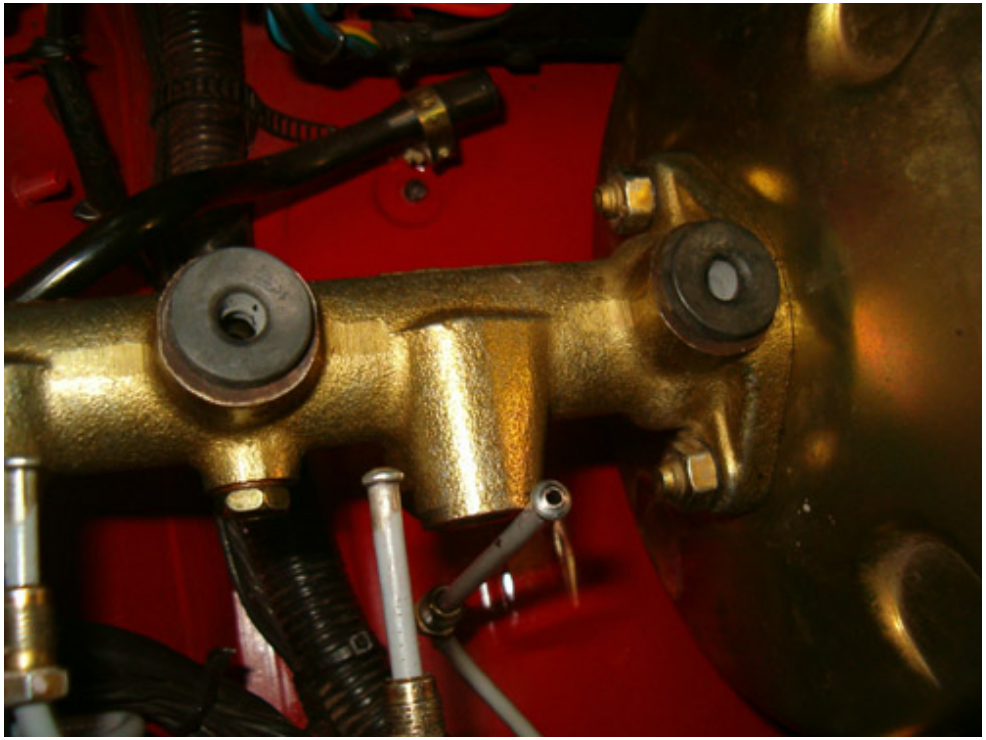


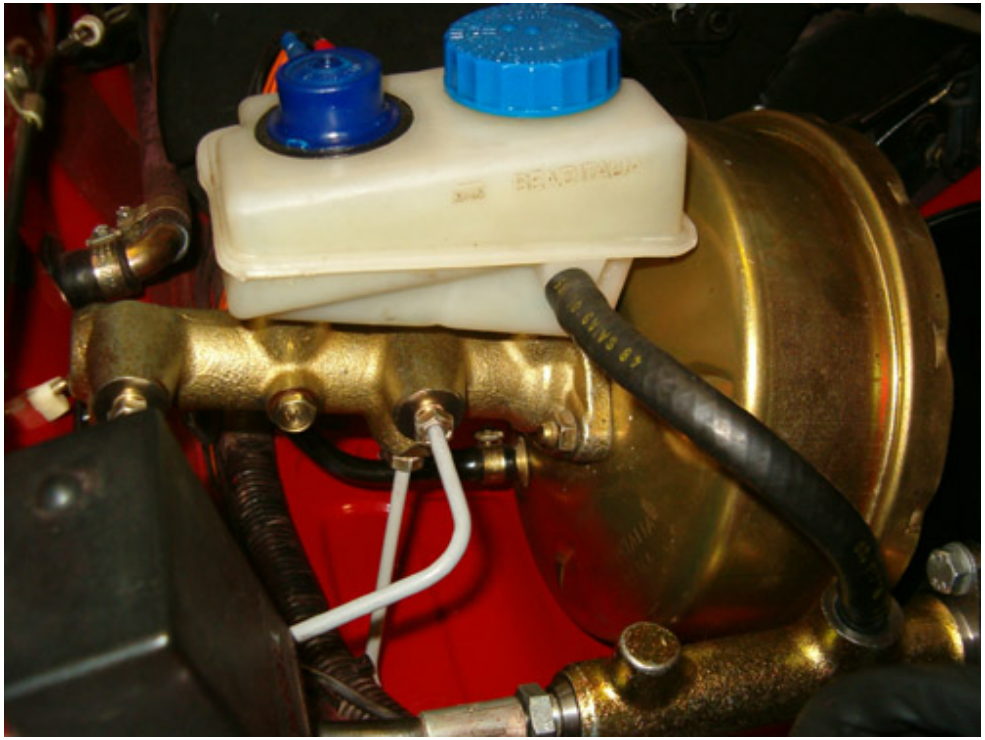
Since the sound deadening gasket is also corroded I deviated from using an OEM gasket and instead a weather stripping was used. This is how it looks in the bulkhead.

Install the pedal case and fully tighten the 6 retaining nuts in cross order.

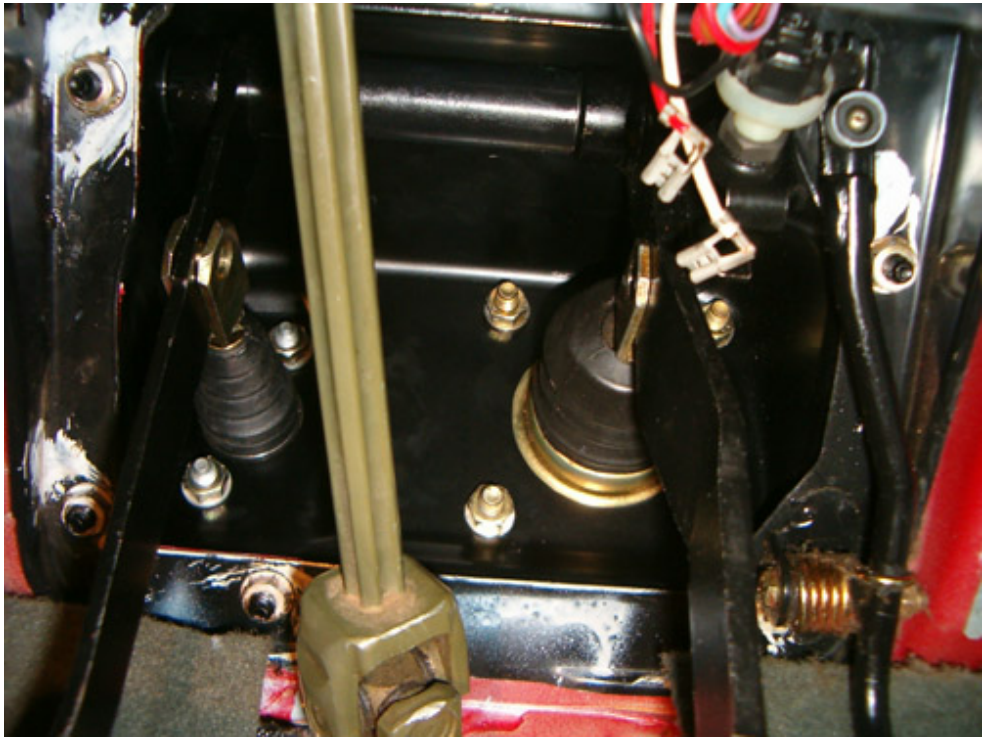
Then install brake servo along with clutch master cylinder



Here you can see new rubber rings intended for the brake fluid reservoir. It is wise to renew them whenever the reservoir is taken apart from the brake cylinder.



Everything is now connected and bolted up. A notice here; the brake fluid reservoir has been soaked in alcohol for a some hours. Alcohol is recommended for removing brake fluid deposits and dirt accumulated in the bottom of the reservoir. Be sure to rinse it with fresh brake fluid prior installation on the brake cylinder.



Move on to the interior and hook up the pins, lock washers and support springs of the pedals shown in the picture below. Don't forget to connect and adjust the brake lights switch.

Pins, lock washers and support springs

This is how the final job looks like. Everything's nice and neat and no corrosion! Top up brake fluid and it is time for the boring job of bleeding the circuit ...

It would be practical to have an assistant help you with bleeding. Pressing the brake pedal and releasing the brake bleeding nipple of the caliper will do the job. Be patient since this process is time consuming until all air is out of the system.

Don't forget to bleed the rear wheels and clutch slave cylinder.

Well done! You may take your 33 for another drive!