How to Remove and Replace your Soft top Motor

The primary cause for the motor to go bad is water intrusion into the motor housing.
If you are decently handy with tools you can do this yourself, saving a TON of money from the dealer.

This How-To and the How-To to remove the Soft Top will also be available on my website in PDF format. http://www.shipkiller.com

Tools:
Screw drivers (Flathead and Phillips)
Metric Sockets and Wrench's.
Metric Allen Wrench's
Razor Blades or equivalent.
Flashlights or Drop lights

Parts Needed: (Refer to Drawing:
http://www.realoem.com/bmw/showparts.do?model=BT33&mospid=47798&btnr=54_0313&hg=54&fg=10

Use your VIN number to for the most up to date drawing and part numbers from RealOEM.....

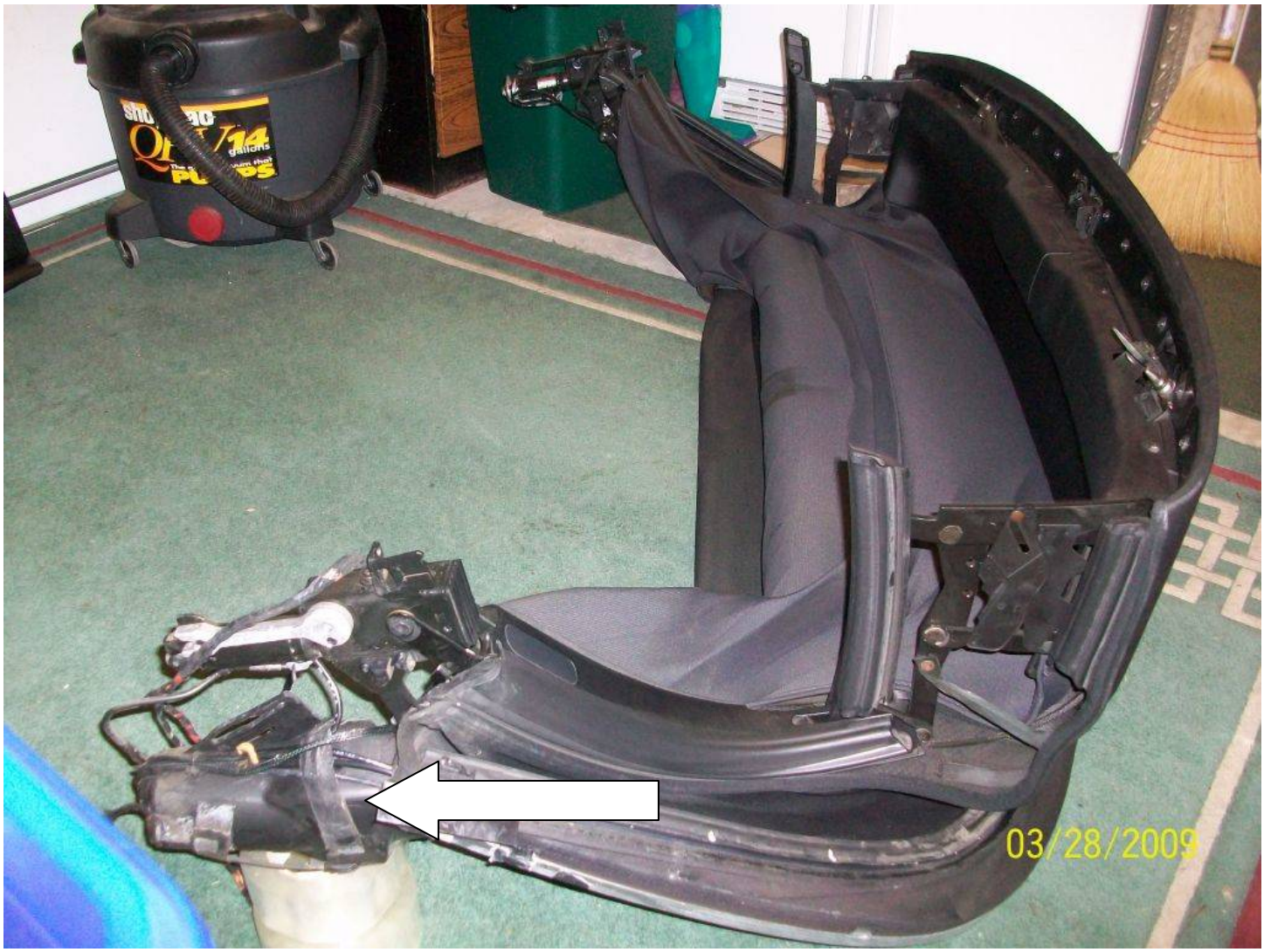
Some Tie-Wraps or tape.
Rags.
A new motor. No. ONE on the drawing.....There are different P/N's for different years.
A new Sound Isolation. No. Eight on the drawing......This is the protective case/housing that the motor reside in. The existing case has sound isolation foam in it. The foam is waterlogged, very dirty/rusty and will take days to properly dry out.
Go ahead, spend the extra money and just replace it.....Do you really want to do this AGAIN?

Extras:
A tube of RTV. This is used in case you want to SEAL the motor housing so you do not have to do this repair again.....

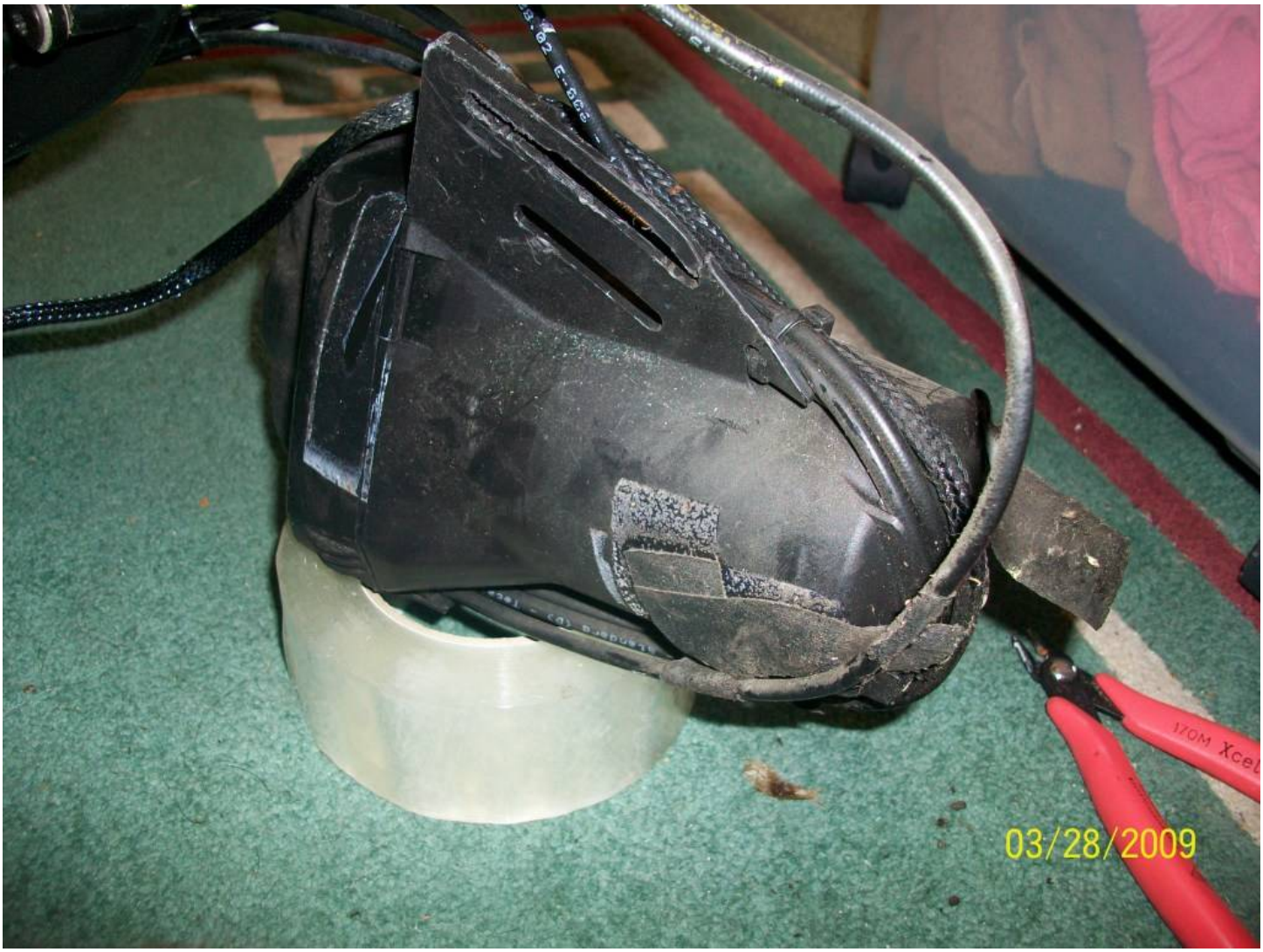
Like I said in the Soft Top removal How-To, take pictures of the motor wiring and hydraulic lines for reassembly....

If you have not figured it out yet, the top MUST be out of the car. Remove the top now…

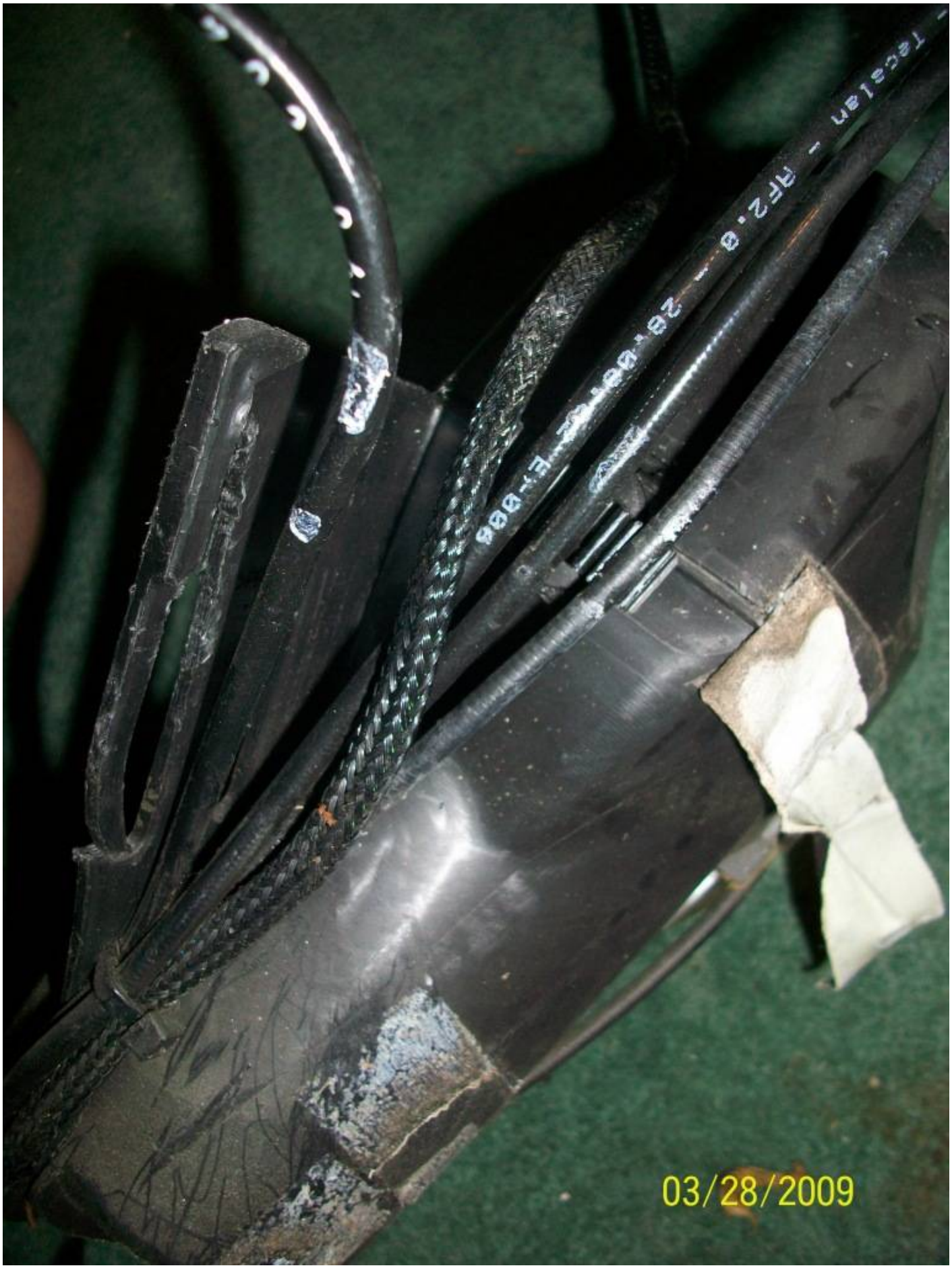
The motor is housing is designed to be attached to the top. I had a busted mount. And later on, after my first drive, I discovered that the broken motor housing, just resting in the well was the cause of the squeak/noise in my left ear while driving....



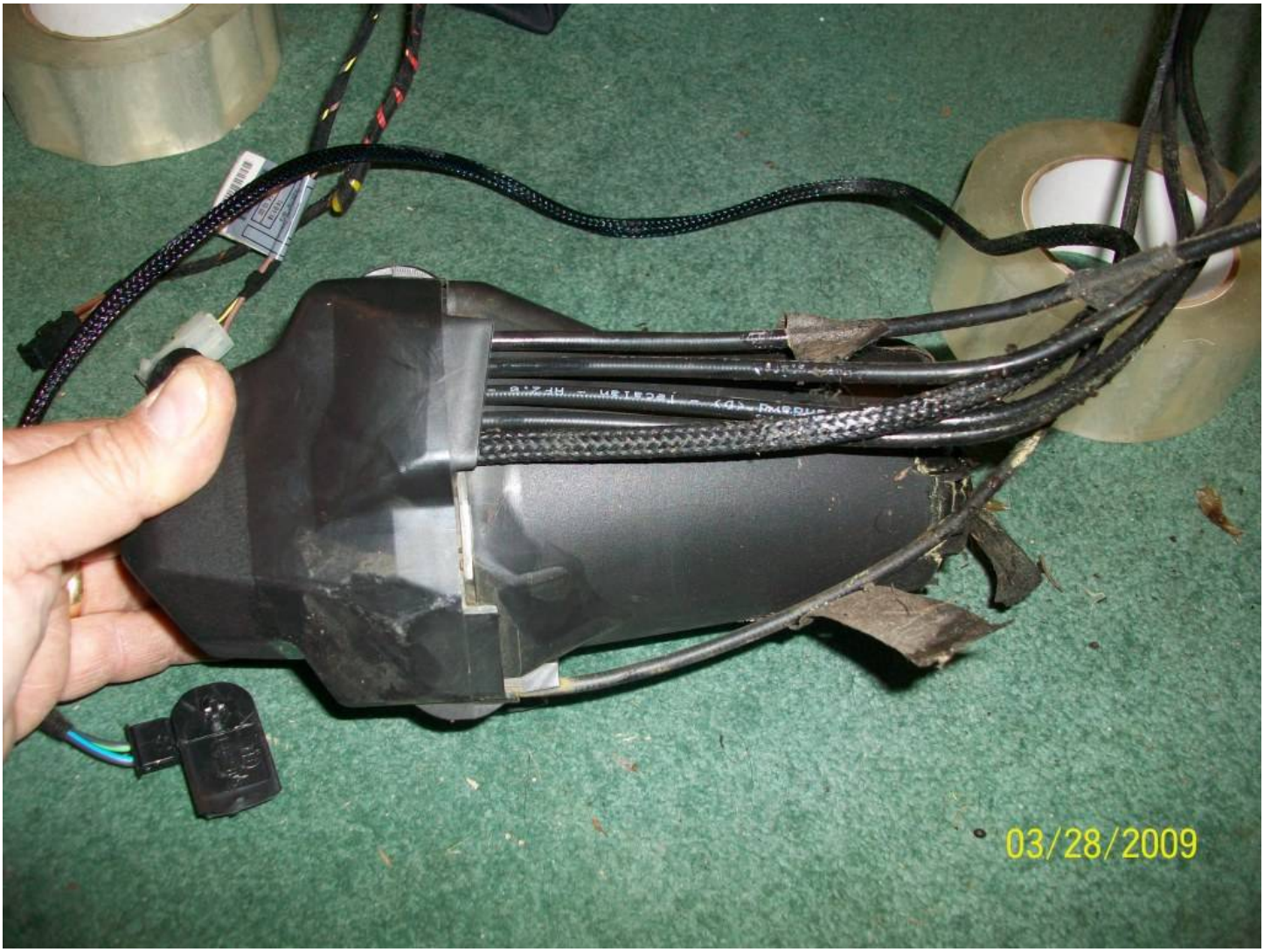
Remove the mount from the top frame and note (Take a picture) of the wiring and hydraulic line placement.



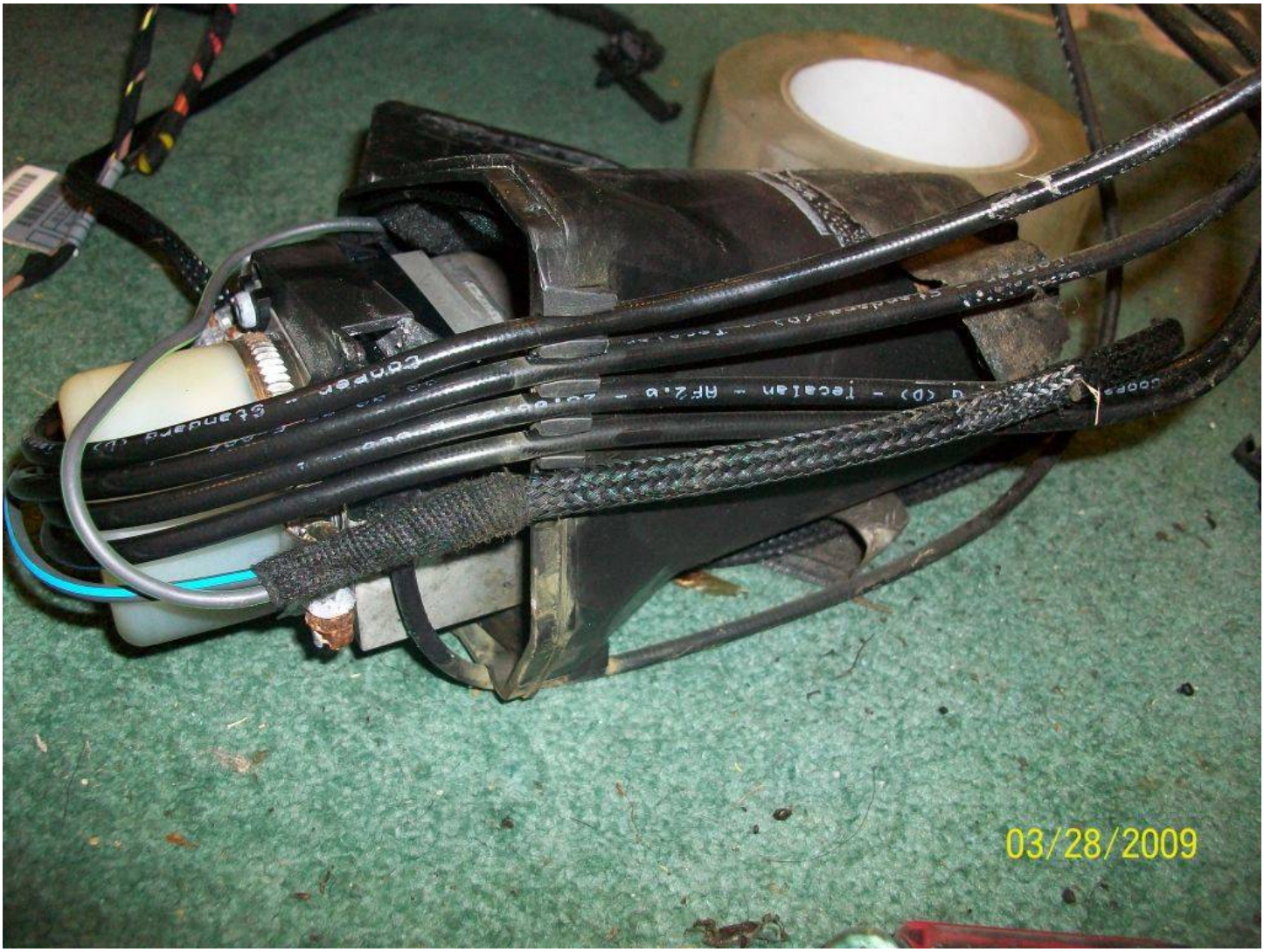
Remove the tape and tie-wraps from the cables and hoses.



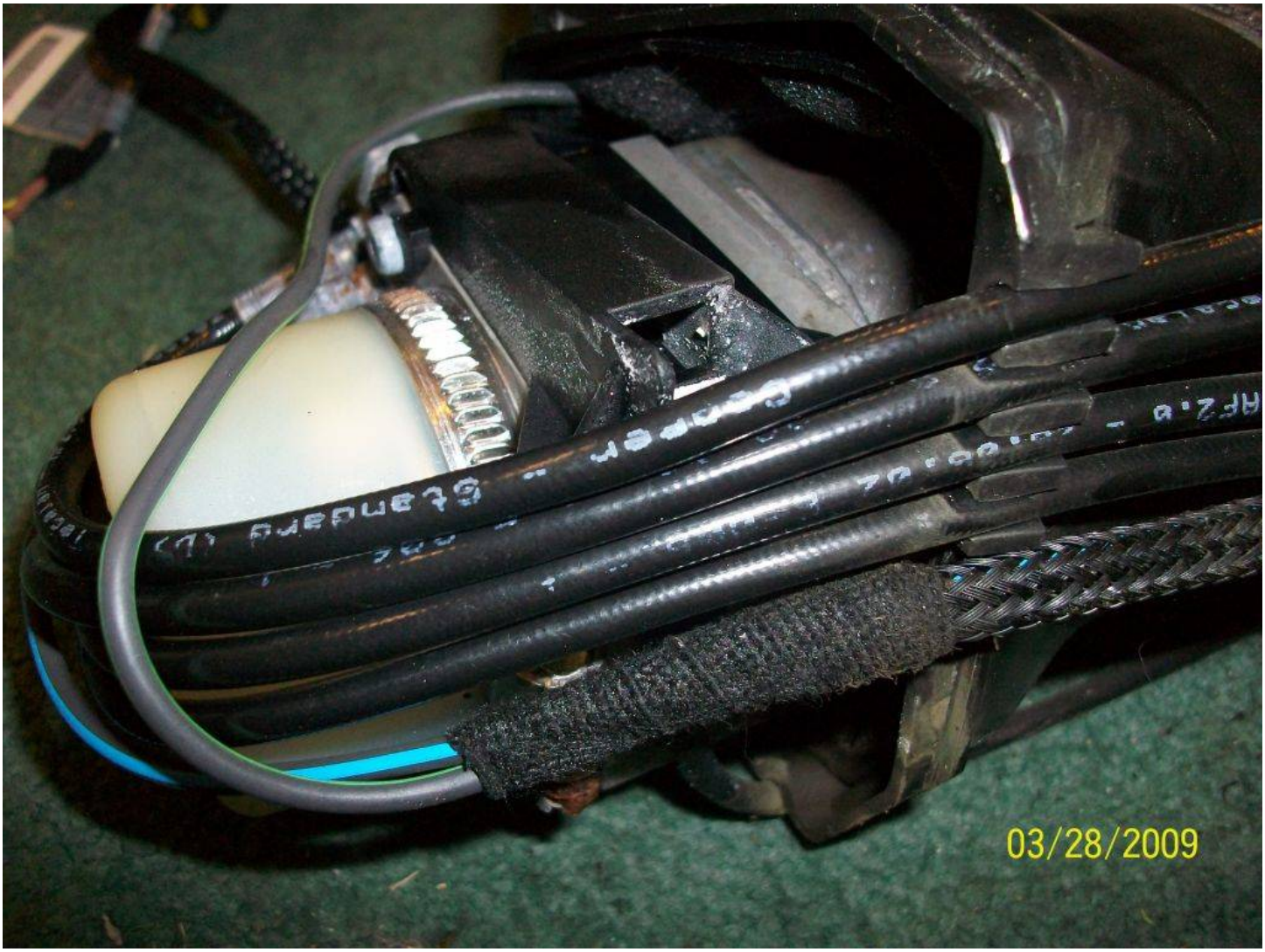
Now remove the housing cover.



Housing cover removed. You can already see the corrosion.

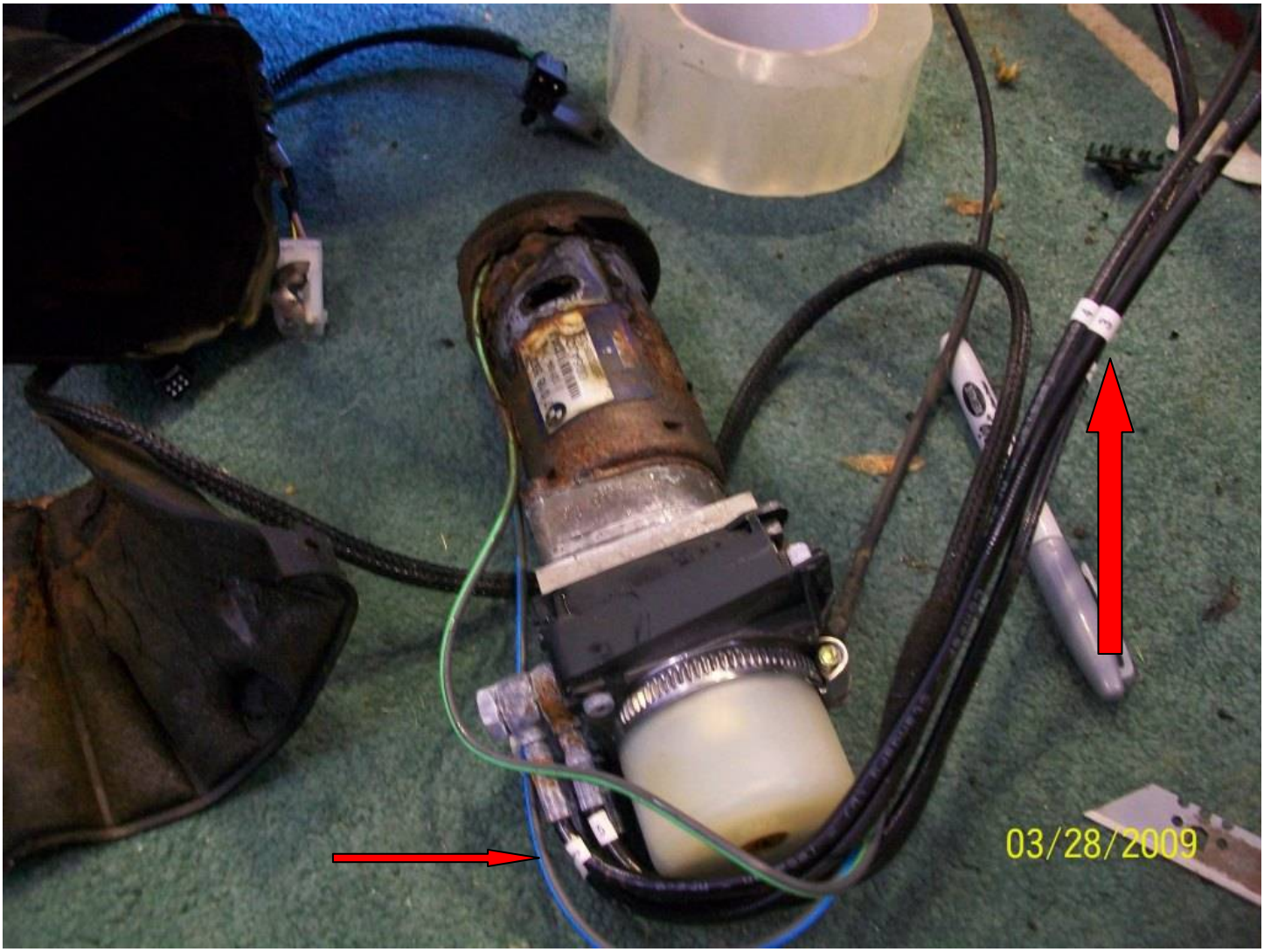


As extra insurance, before I pulled the motor out, I labeled the hydraulic lines. 3,4,5,6. and then after the motor was out of the housing, labeled the old housing the same way. Just to be sure.

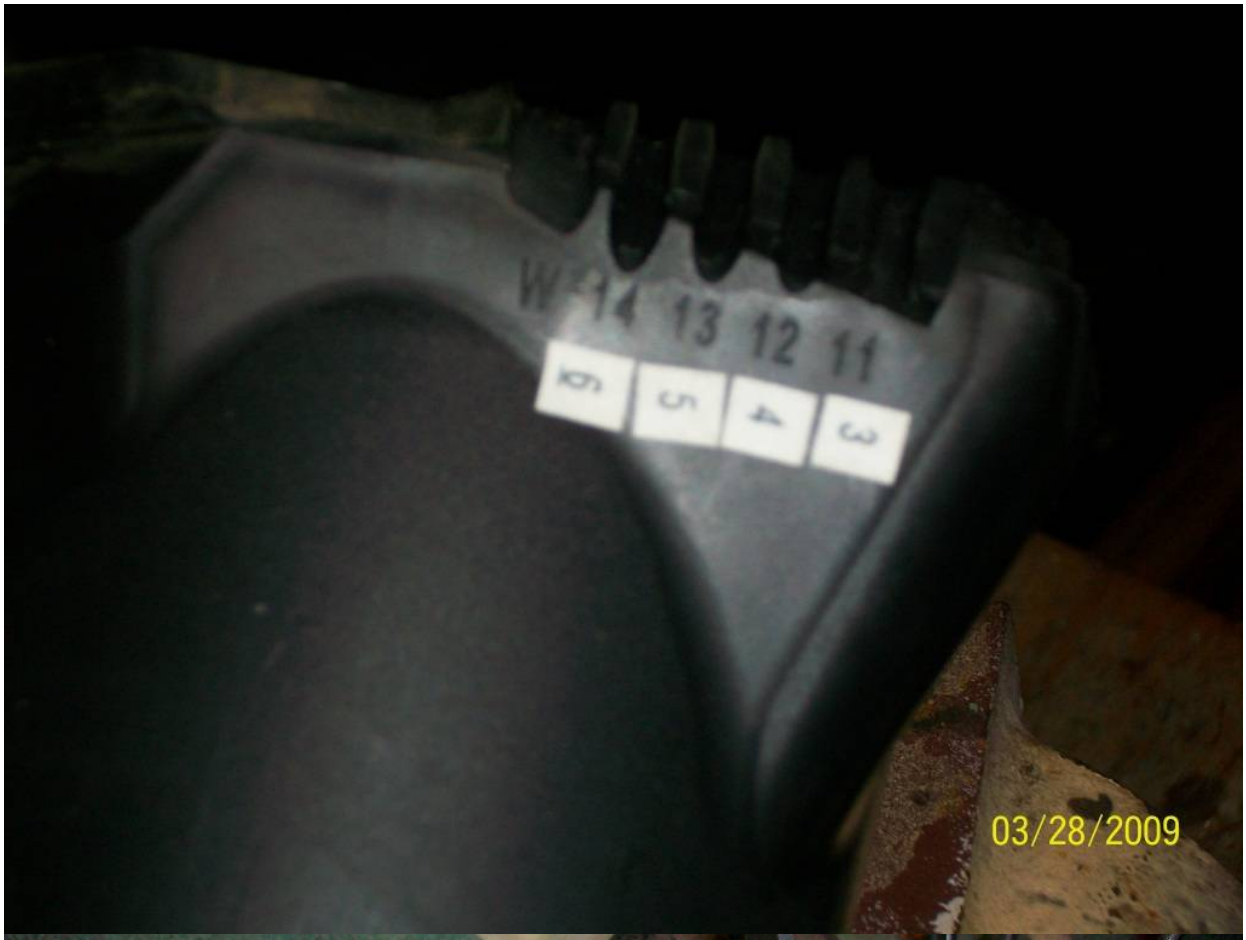


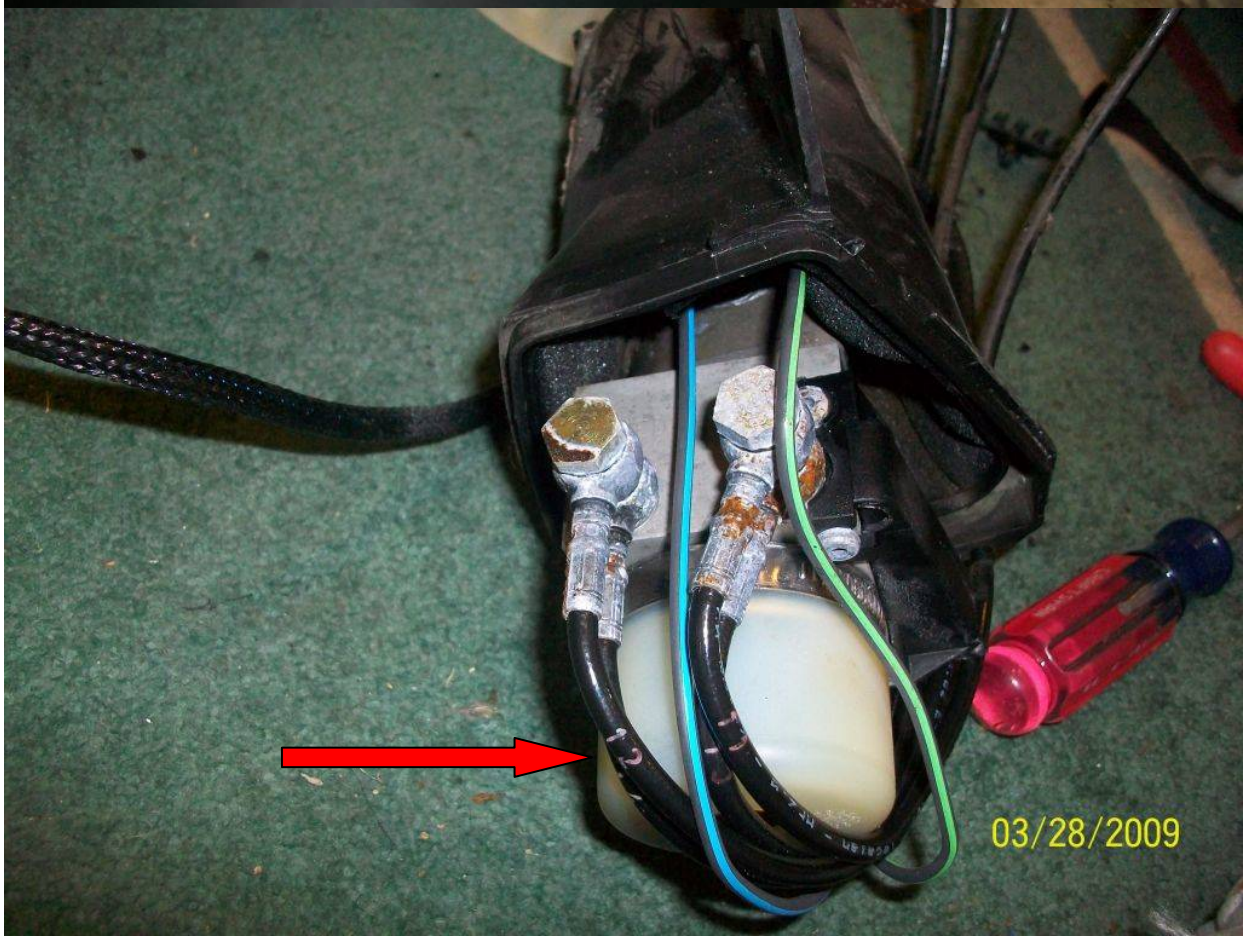
Pull out the motor. The damn thing is soaked....

Notice the wire markers…You don’t have to do this, but just to be sure…..

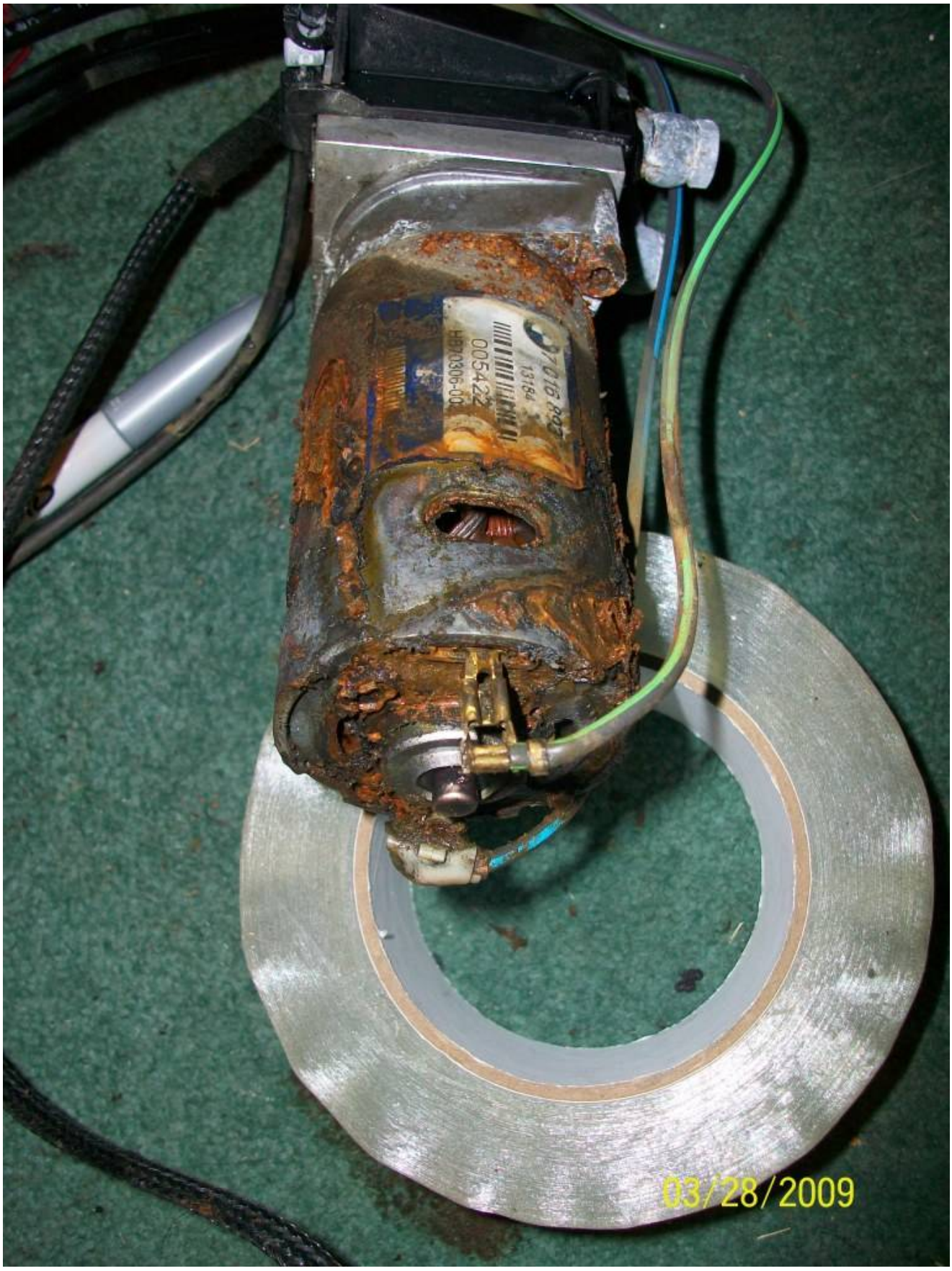


The old housing. It shows my labels and labels from BMW. 11,12,13,14 and W for the wire. Later on I found that the hydraulic lines are also labeled if you look carefully. Can't be too careful.....

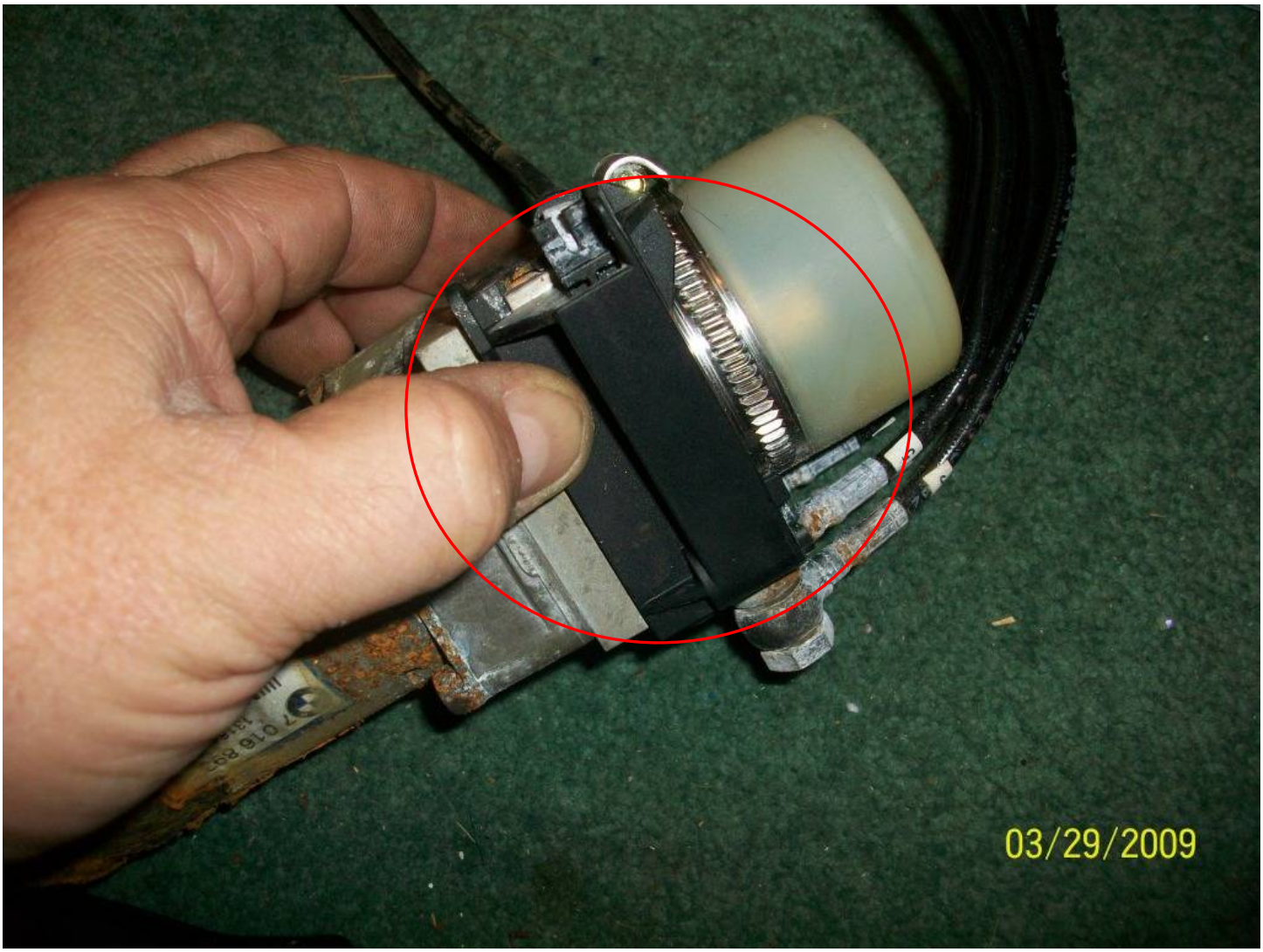




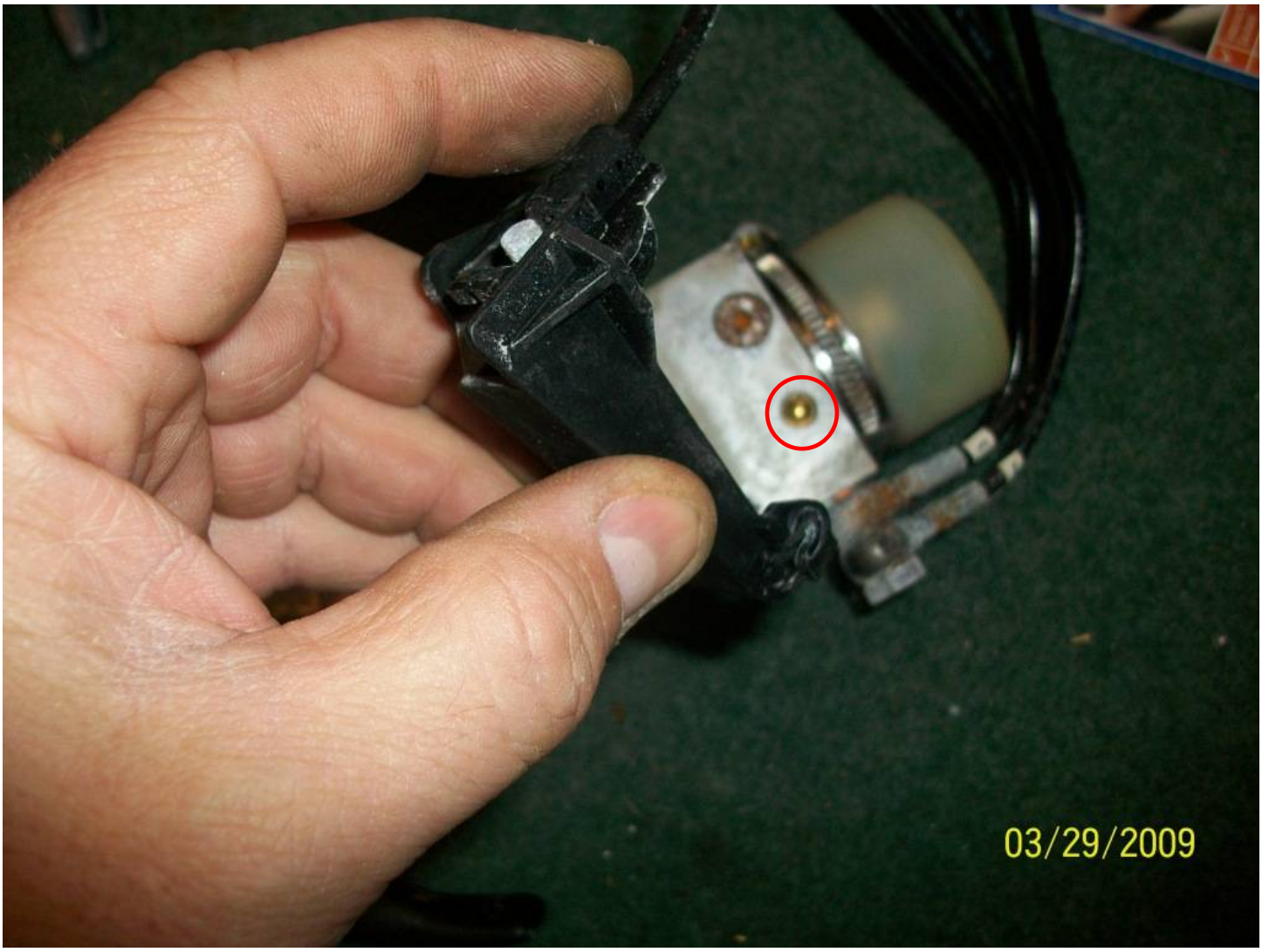
Remove the electrical connectors and clean them up. Use Q-Tips, Pipe Cleaners, whatever. I removed the boots and cleaned them up also. Carefully note which way the wires connect and what terminals they go on. If you put them on backward, the top will operate in reverse and you will have to remove the soft top and redo.



The black assembly is the Bowden Cable. It is the manual top release. Remove the three screws from the assembly, noting it's position. This is where pictures help……

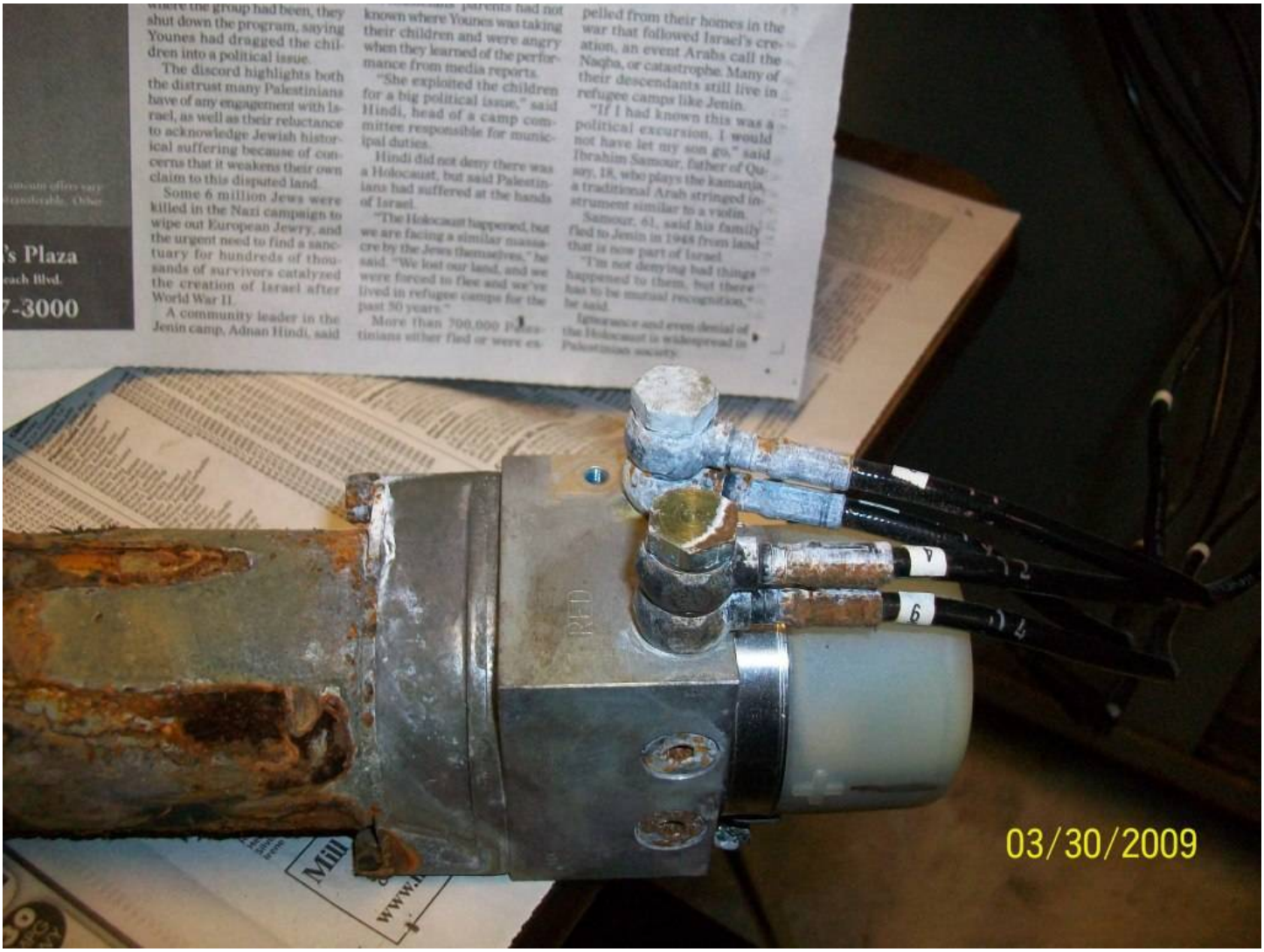


The Bowden Cable Assembly. Looking at the motor, the brass button on the bottom is the actual hydraulic by-pass plunger. This shifts the internal spool allowing oil to flow freely, without the motor driving it.

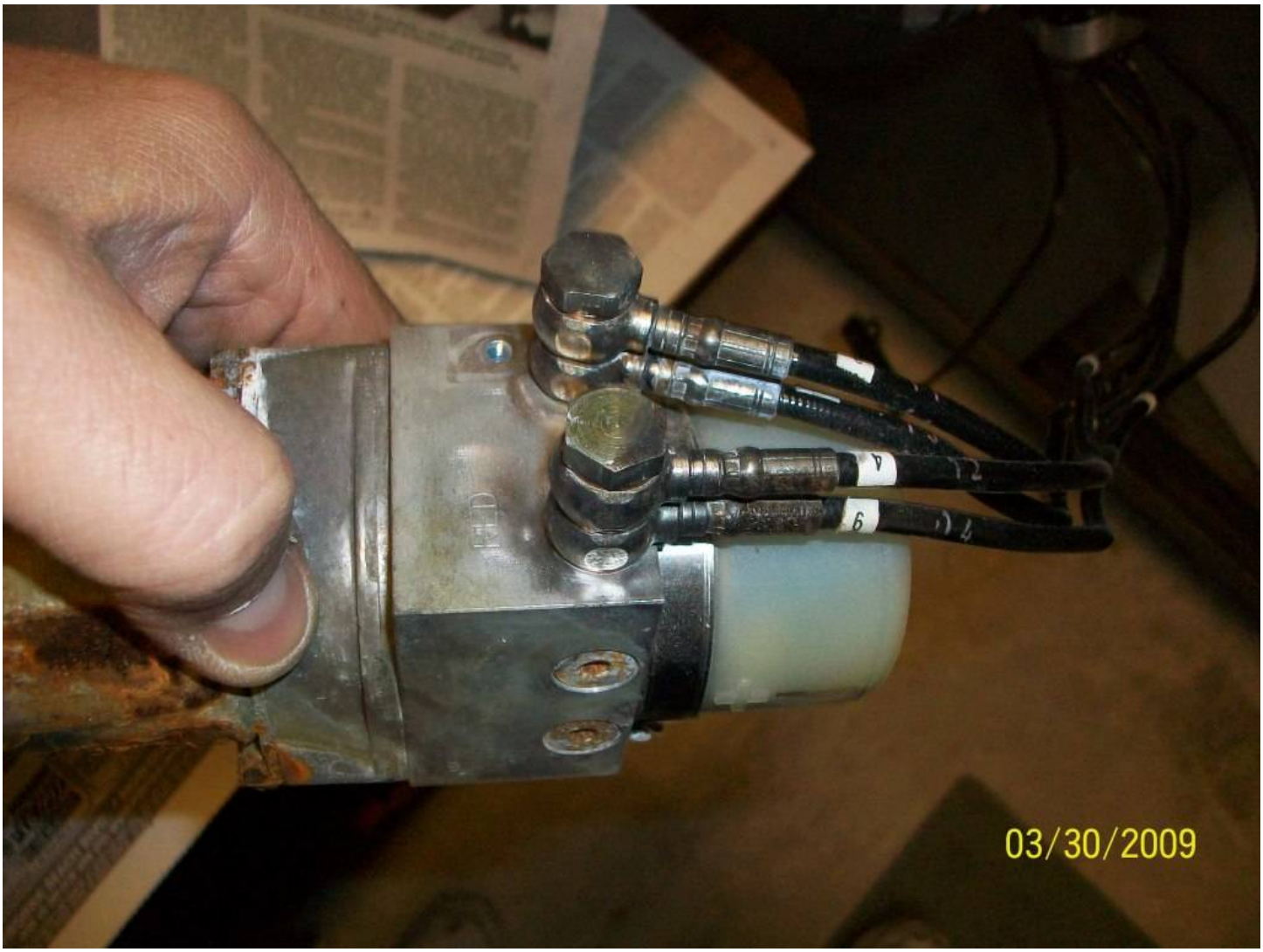


I now used a Dremel Tool to clean up the hydraulic fittings. This is not just a anal move. Hydraulics REQUIRE cleanliness...

To illustrate the point. On US Naval submarines, they use the same oil for hydraulic fluid and for main turbine/reduction gear lubrication. The only difference is the cleanliness standard is **higher** for the oil used in the hydraulic systems.



Now clean. Not perfect, but much better.

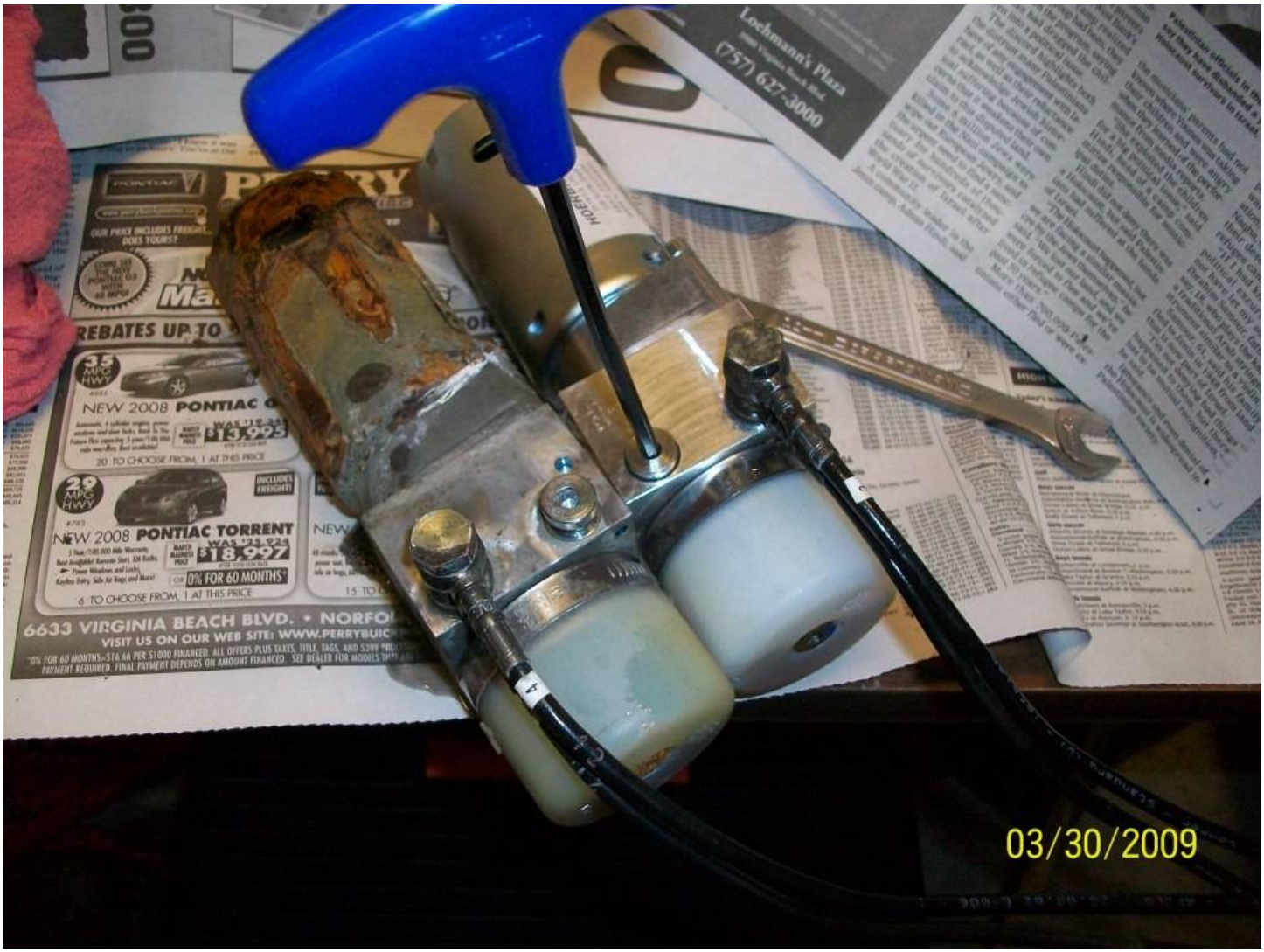


If you are to do this properly, you should replace the copper sealing washers, but I just plain forgot to order them.
I think they come in the 'Hydraulic Repair Kit'. Number nine in the RealOEM drawing.
http://www.realoem.com/bmw/showparts.do?model=BT33&mospid=47798&btnr=54_0313&hg=54&fg=10

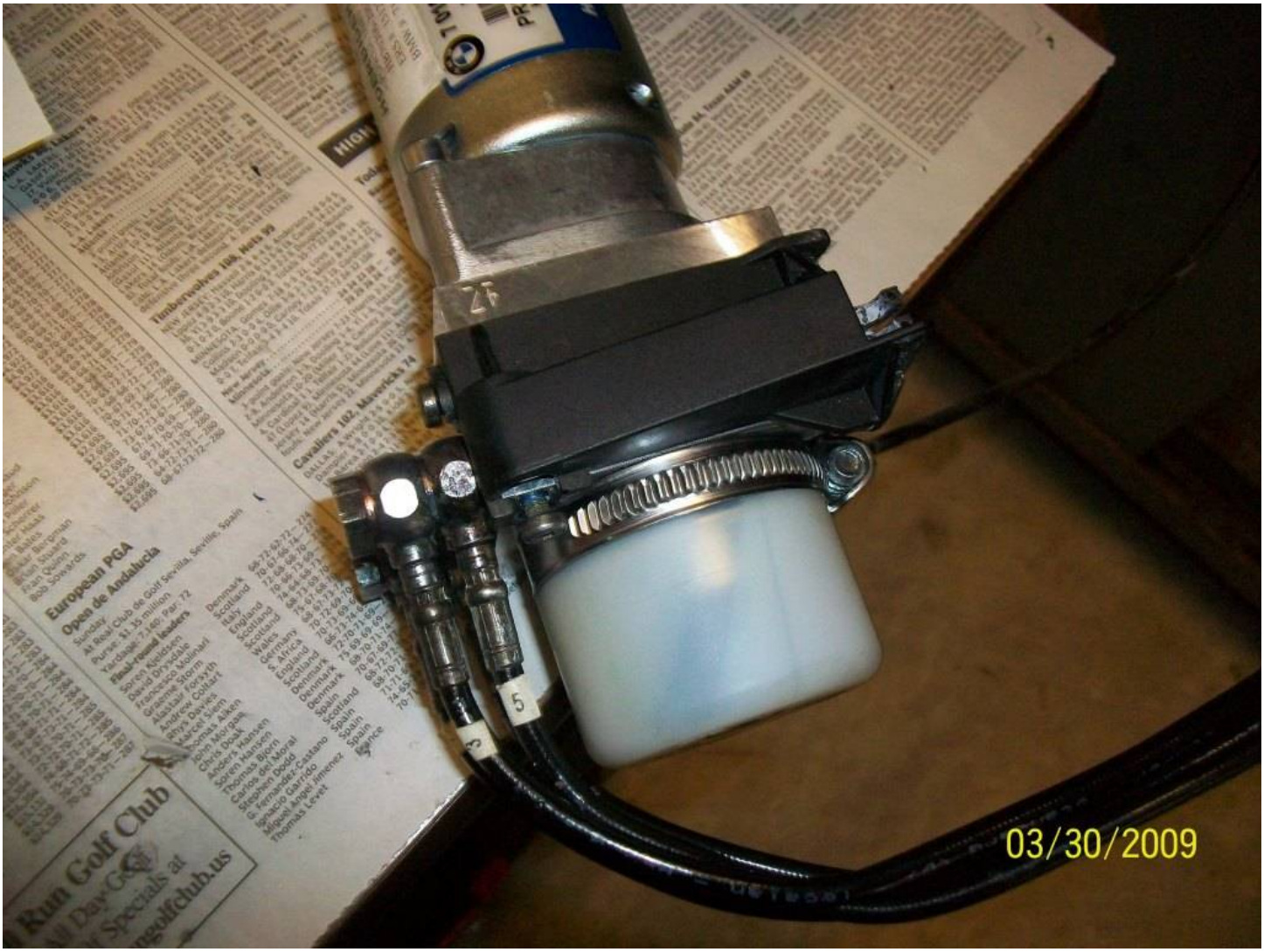
Now I transfer the hydraulic lines a set at a time. The new pump is labeled with the BMW line numbers. 11,12,13,14 as stated previously. Transferring them as a set, you can't screw it up.

Do this quickly to reduce the amount of oil loss from the line.

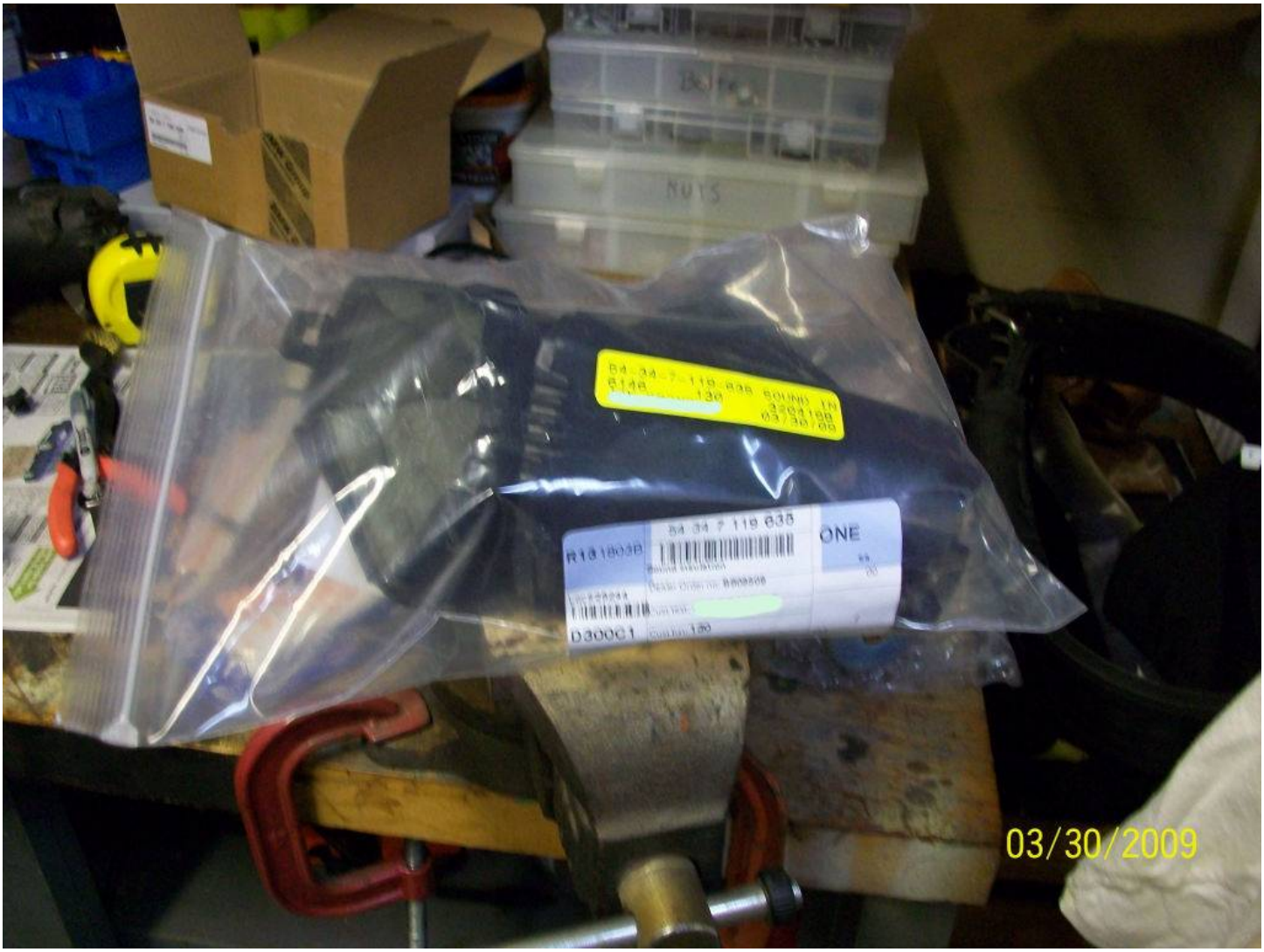
I put the dust screws from the new pump back into the old pump. I plan on draining the oil and saving it. It does not appear to be contaminated.



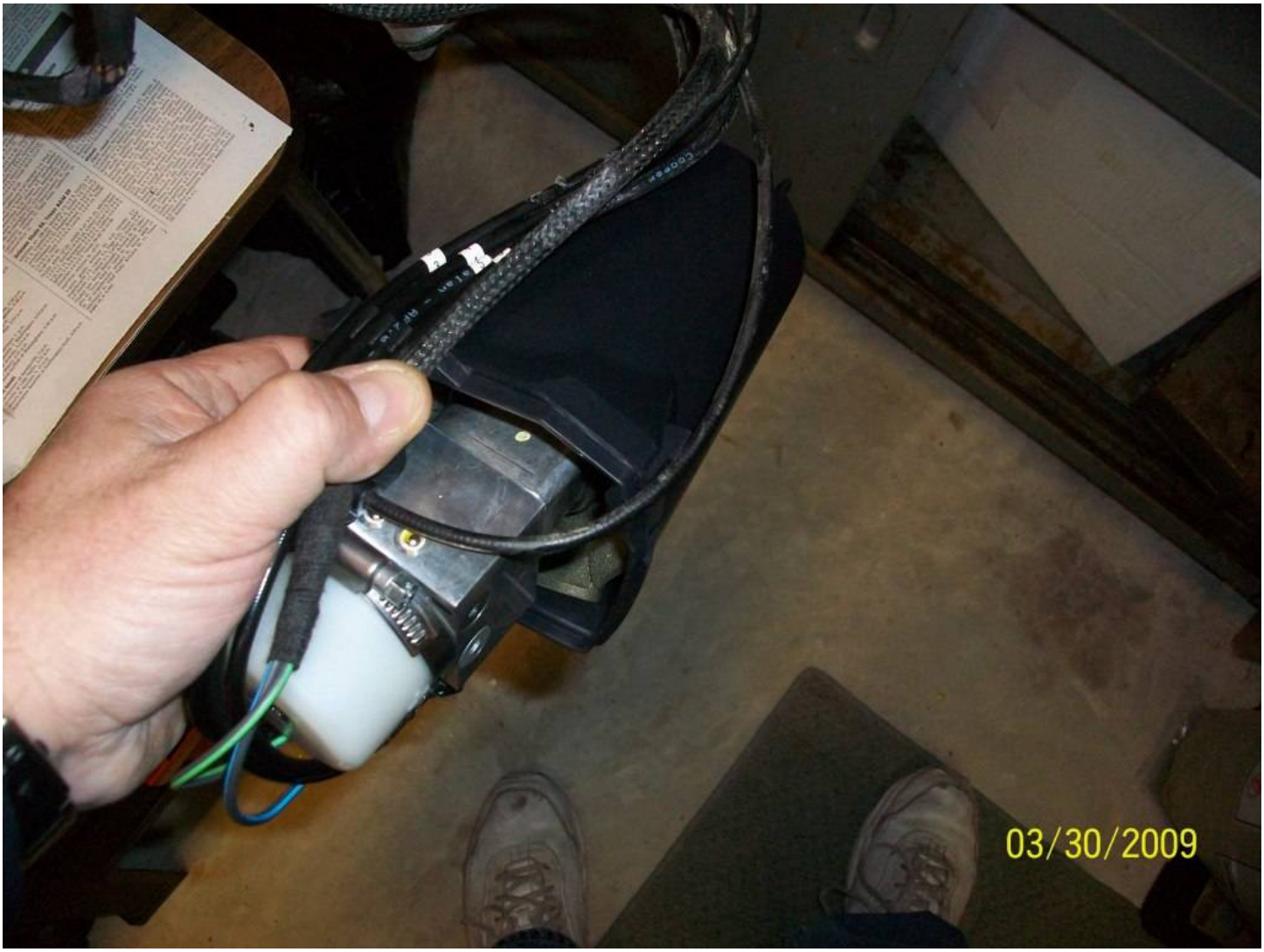
Now replace the Bowden Cable assembly.



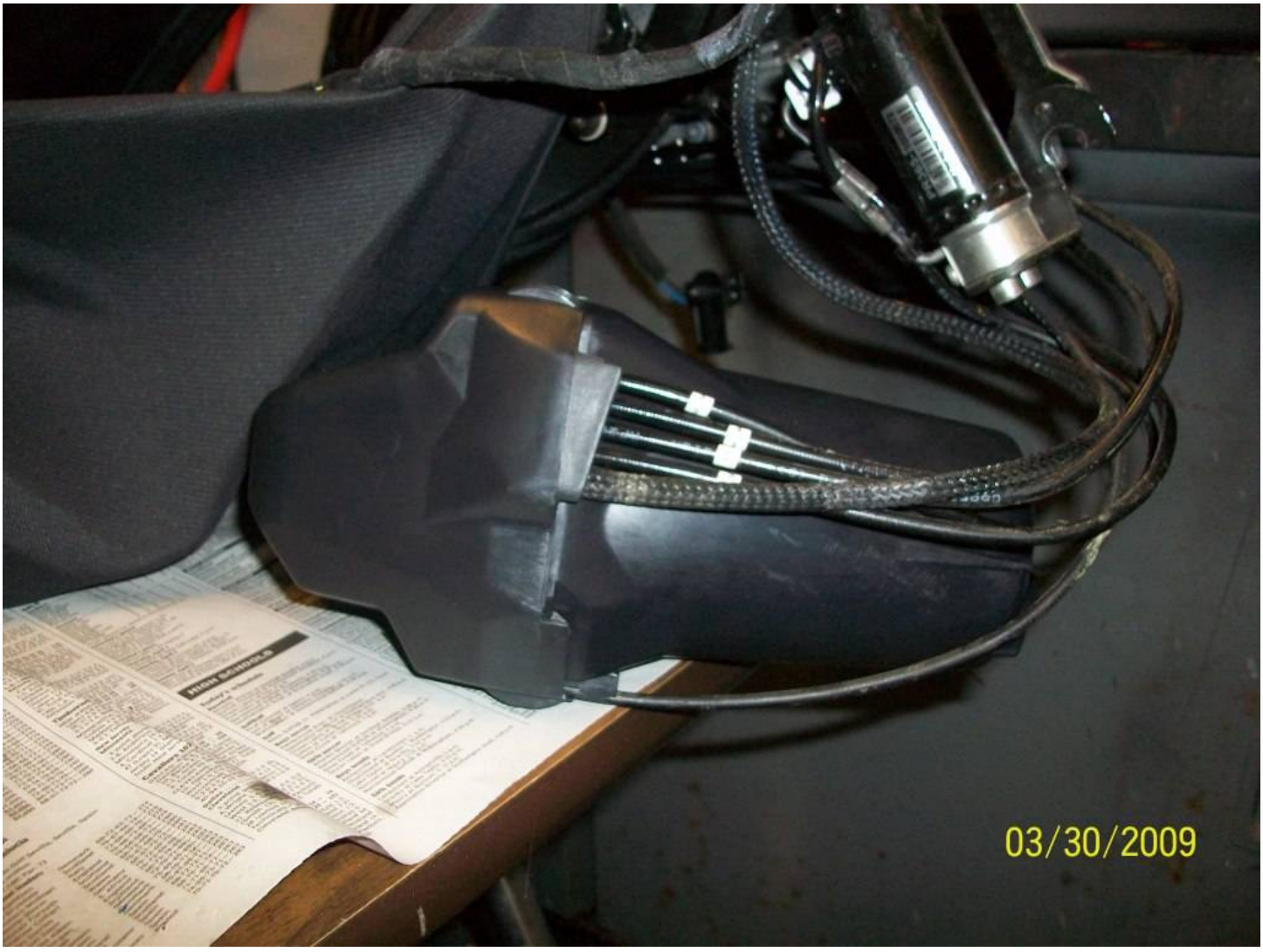
Now comes the new motor housing. Nicely, clean and dry.



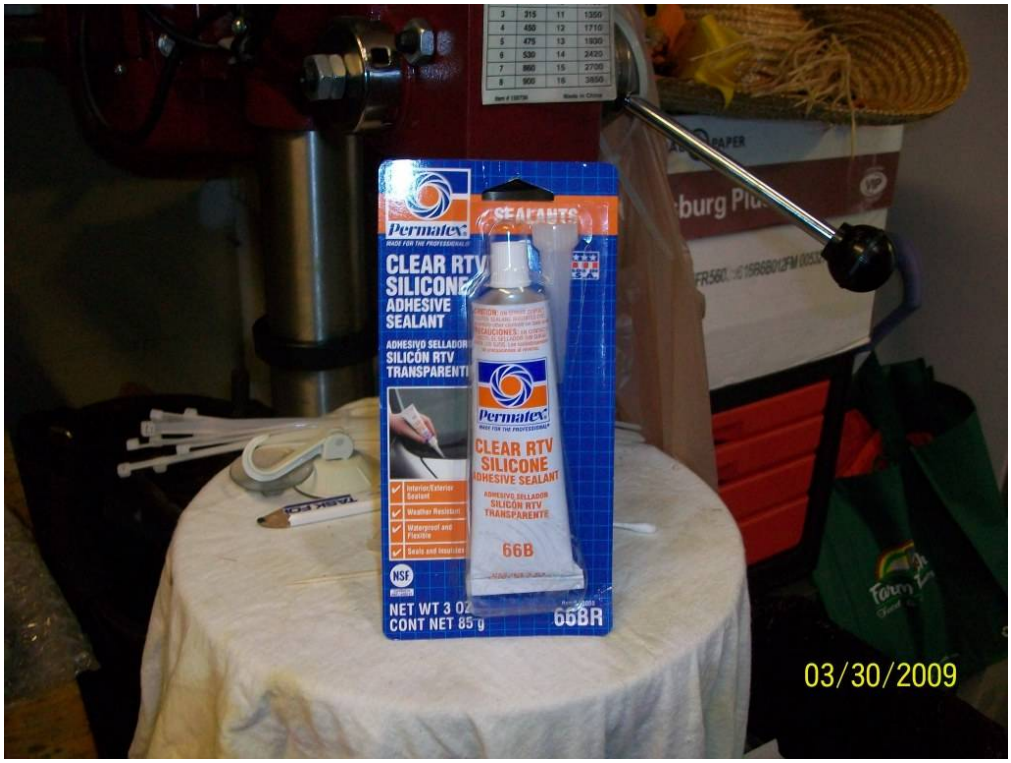
Reattach the electrical leads to the motor, wipe up any oil on the motor and place in the new housing.



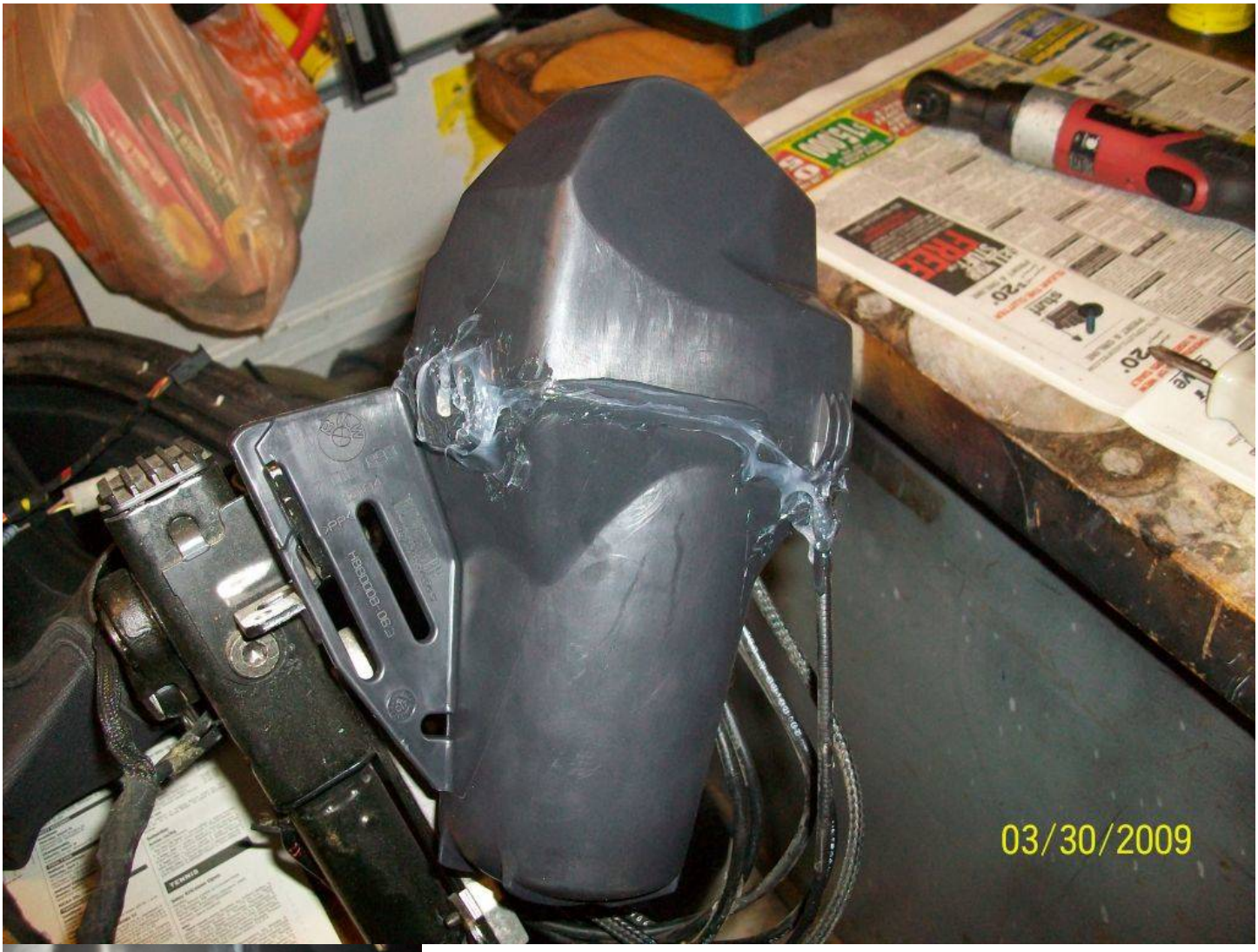
Doing a test fit before sealing it up.

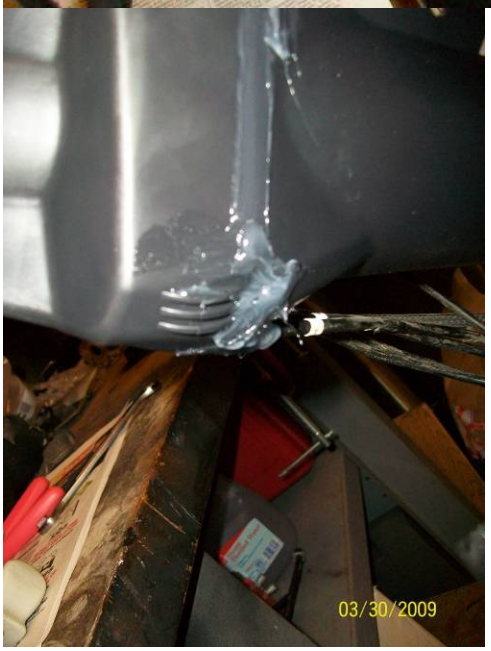


Here's where the RTV comes in, if you use it.



I placed RTV all along the inner housing seam, in and around the wire and piping penetrations, ***then*** put the cover on then put more RTV on the outside seam. Sealing it up.
Four hours after doing all this, I had a nagging feeling about the electrical wire positions so I took it all apart. It was not hard even with all that RTV..... The wiring was correct.... Sealed it back up..





Now using the pictures I took, and remounted the unit to the frame making sure all the cables and hydraulic lines were running properly, additionally putting tie-wraps where needed.

Now you are done. Put the top back in the car and test. Cycle a few times to purge the system of any unwanted air.