



Instructions for replacing throttle actuator motor gears BMW S65/S85

If you have one of our older kits (included a drill bit and two roll pins) these are no longer required! Please follow these instructions.

All instructions are suggestions, as in do NOT use someone else's FAQ to install our gears!!! READ and follow ALL instructions and you will not have any concerns now or in the future. If you know better and don't need this FAQ, please don't call us for help! If you have any questions and are willing to listen, call us 24/7. We want to help you.

Time required: I did two in 30 mins while on the phone with the owner and also took these photos. The actuators were already off the vehicle.

Tools needed:

13mm box end wrench

Feeler gauge

Channel lock pliers or large press

Hammer

12mm deep socket

A hard surface

Flat metal bar 1"x1" or something similar. (Described below in step #9)

Extra info: On the mechanical side, I could not find any difference between either actuator other than the angle of the linkage arm. All the internals were the same between the two units I was working with. The electronics may be different between L/R and M3/M5/M6. I don't claim to know anything about the electronics.





Step #1: Use a feeler gauge to measure the space between the locking washing and the housing. You will need this when pressing the parts back together later.



Step #2: Use channel lock pliers on the lever arm to keep the half gear off the metal stop. A box end wrench, 13mm, will take the locking nut off the top of the shaft. Yes, we don't care about the original gear since it is worn but this will be good practice on reassembly to not put pressure on the new gear when tightening the nut.



Step #3: Use the flat side of the channel lock pliers to lay flat across the top of the shaft and strike hard with a hammer to drive out the shaft. The idea is to not mess up the threads. If you have a large enough press, use that over a hammer please!!

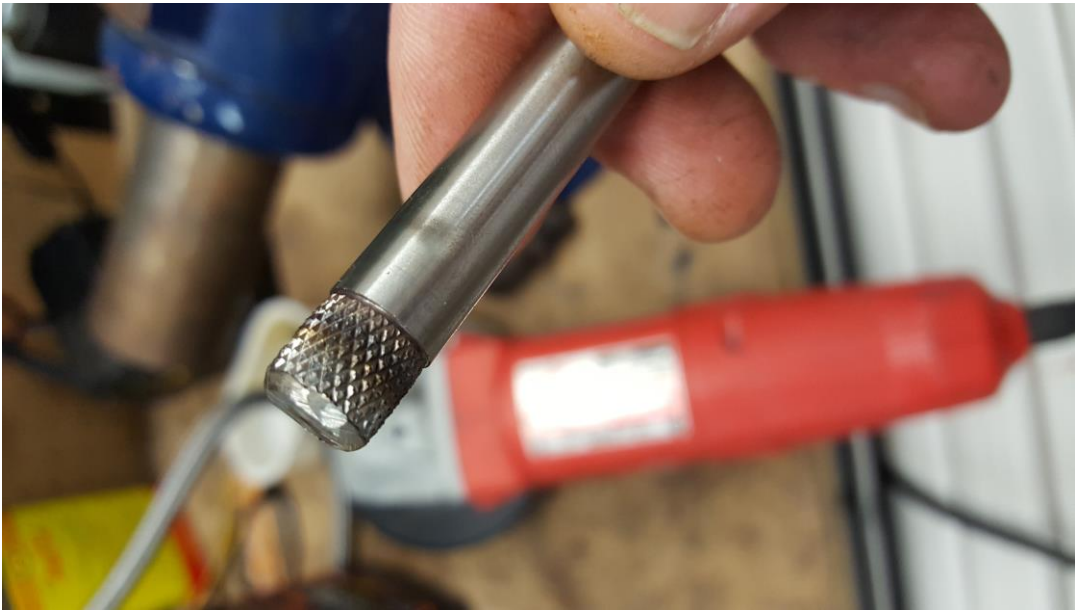


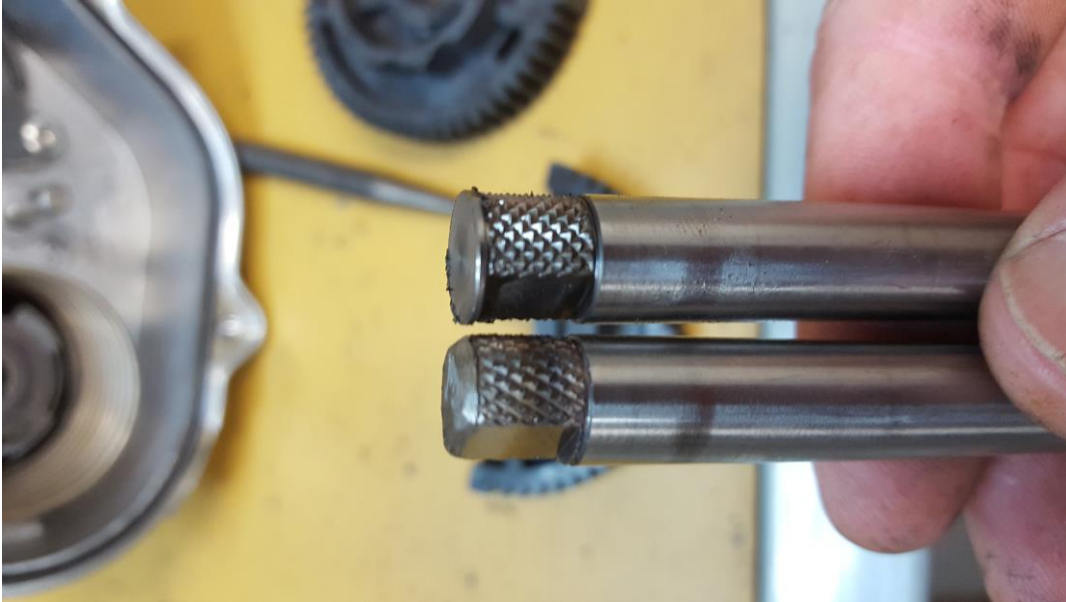


Step #4: Remove the shaft and take note of the washer that needs to go back on during reassembly. Use an angle grinder or Dremel style tool to carefully cut the old gear off the shaft. It was encapsulated on when originally molded. This was to prevent the shaft from backing out while in use.



Step #5: Once you have the old gear removed, you will grind the mushroom head of the shaft down to the knurled diameter or less. It is very important to grind the ENTIRE TOP smooth. If not, you will crack the gear during installation. The new gear is not defective and most cases of breakage are a result from the installer not grinding down the mushroom head completely on the end of the shaft!!

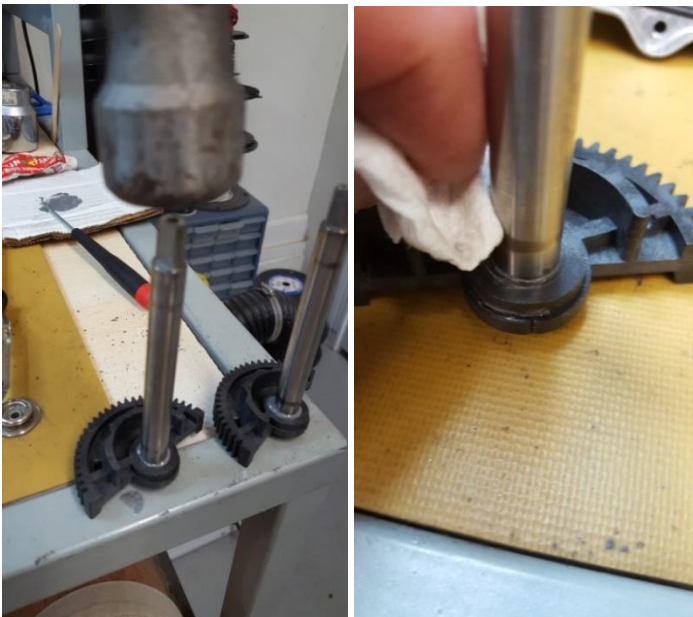




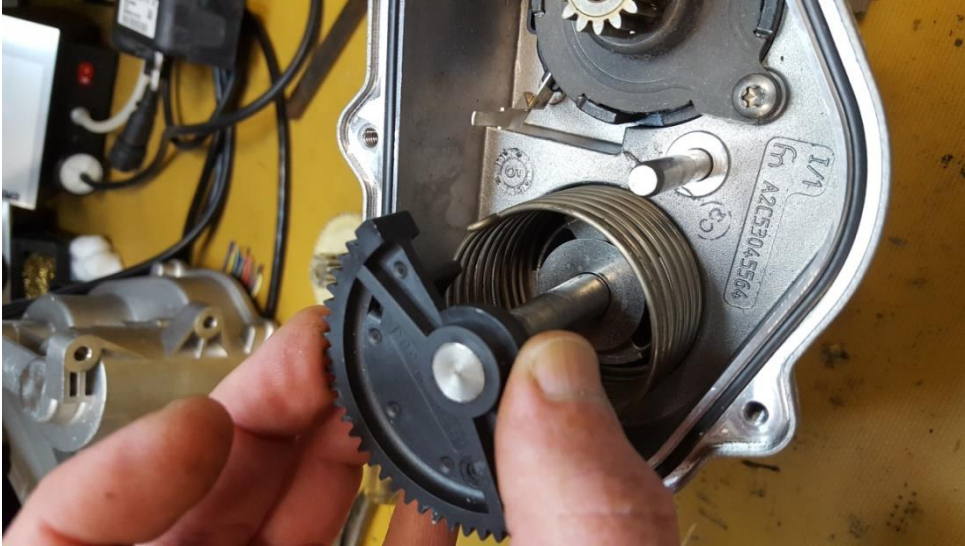
Step #6: Mix up a small batch of JB Weld or similar product. We strongly suggest J-B Weld “The Original Cold Weld two-part epoxy system. “ It is proven to hold up under the temperature and stress where the actuators are located on the engine. Please don’t ask about Elmer’s Glue or another brand of epoxy or glue. Do not try to short cut this repair by using the JB Weld KwikWeld as this is untested and not recommended. You can find it at any hardware store. Roll the end of the shaft in the JB Weld and press it into the half gear. Gently tap the shaft into the gear until it bottoms out. Wipe up any extra JB Weld before it sets up. You want to be sure that the washer that was removed earlier will sit flush against the new gear.



Take notice, we are only using JB Weld epoxy. NO DRILLING!!!!



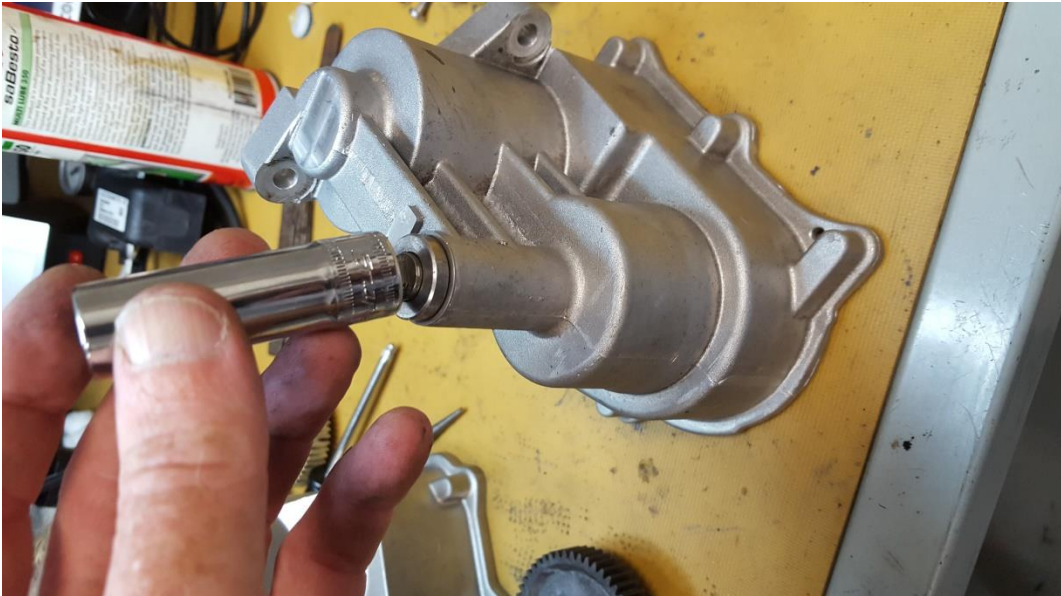
Step #7: Remember to put the washer on at this time so you don't forget. Insert the shaft back into the housing and hook the return spring into the slot of the half gear. Spin the gear one revolution to tension the return spring properly. Fully seat the shaft and gear into the housing allowing the gear to rest on the internal metal stop.

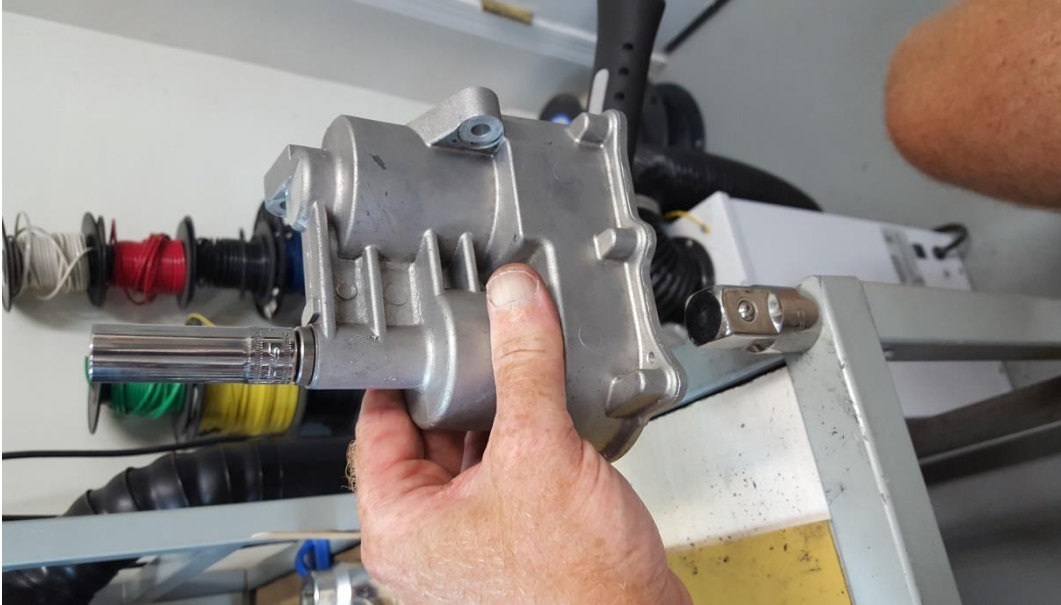


Step #8: Place the thin washer and the locking washer back on the top portion.



Step #9: This is where having a second set of eyes and hands will help but it can be done by one person if you are careful. Use a metal bar to support the bottom of the shaft and a 12mm deep socket over the threads on top. Place everything on a solid surface and hammer the locking washing into position. Remember your feeler gauge measurement. At this point, if you have a press, it will work much better than how I describe this step. I use a ½" to 1" socket adapter for the lower portion. Notice the shaft stands proud of the gear so you are not putting pressure on the gear. Constantly check that you are applying pressure to the shaft and not on the gear. You will crack it if you are not paying attention.





Step #10: Tap the arm back on to the shaft. If you have a burr, it may need a little encouragement. I chose not to file anything for fear of messing with the threads.





Step #11: Same picture as step #2 just tightening the nut. Biggest part is to use your channel locks to move the gear off the internal stop so you aren't putting any stress on the gear.



Step #12: Reinstall the actuators on the engine, clear codes and function test the actuators.