

Rebuilding a 1999-2005 Mazda Miata Shifter Assembly

As performed and authored by John Adamczyk of 5X Racing on a 1999 Mazda Miata (5X Racing [Project Streetfighter](#)) with a gen1 6-speed transmission

Recommended Parts needed for Rebuild:

- 1 OEM Mazda Upper Shifter Boot
- 1 OEM Mazda MX-5 Lower Shifter Boot
- 1 OEM Mazda Tabbed Wave Washer
- 1 OEM Mazda Upper Plastic Change Bushing
- 1 OEM Mazda Lower Change Bushing
- 1 OEM Mazda Lower Wave Washer
- 1 5X Racing Bronze Shifter Bushing

All parts and the entire kit can be purchased from 5X Racing using this link:

<http://5xracing.com/i-18896895-5xr-race-spec-shifter-rebuild-kits-for-1999-2005-mazda-miata.html>

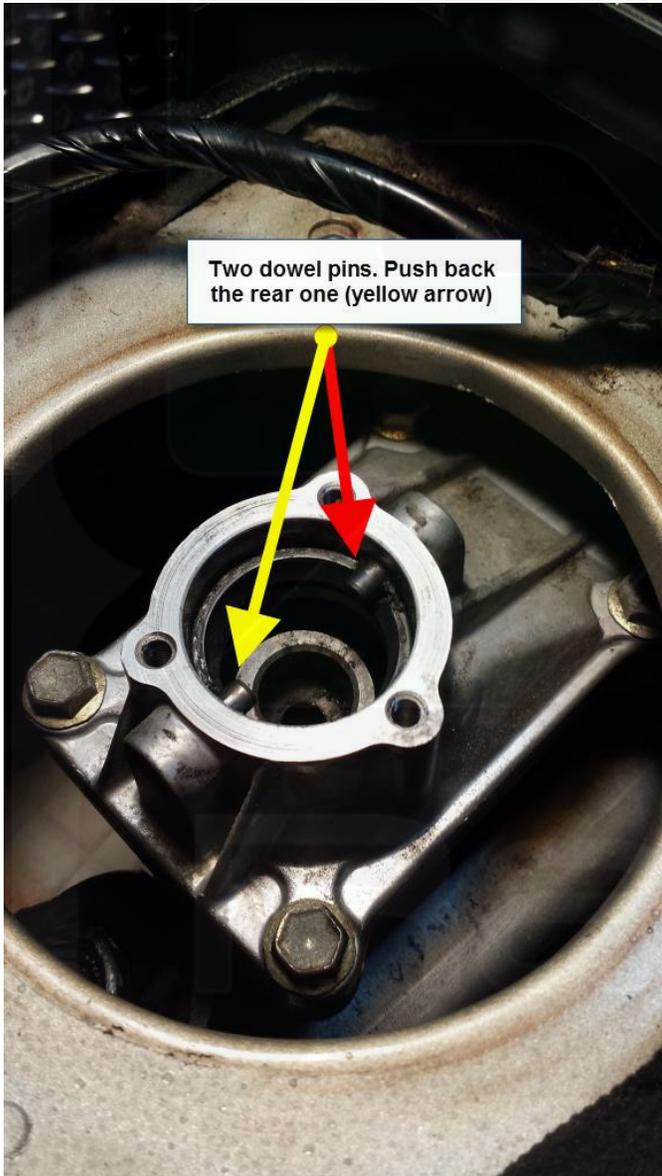
Tools Needed:

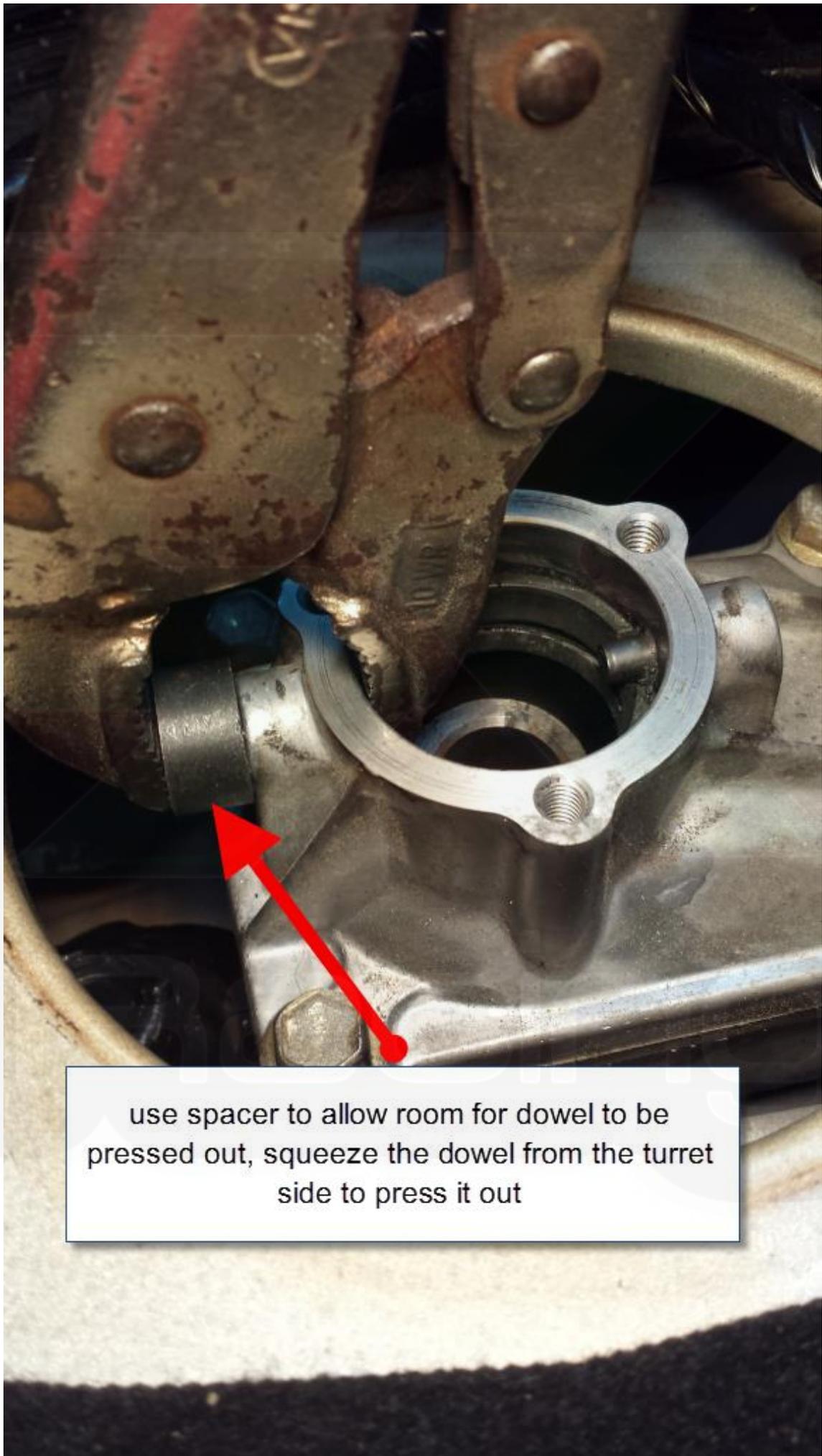
- 10mm socket with ¼ ratchet (or 10mm open end wrench)
 - Large Vise-Grips
 - Large flat blade screwdriver
- WD-40 or equivalent spray lubricant
- Basic wheel bearing grease

These instructions are designed to be used as a guide to help understand the procedure of rebuilding a Miata shifter assembly. 5X Racing nor any of its owners or employees will be held responsible for any damages or injuries incurred to the installer caused by improper installation or accidents which might occur while using any procedure outlined within this guide. Please use caution when working on your car - however simple the task may be – and ALWAYS consult with a professional mechanic when you feel uncomfortable with a task presented to you!

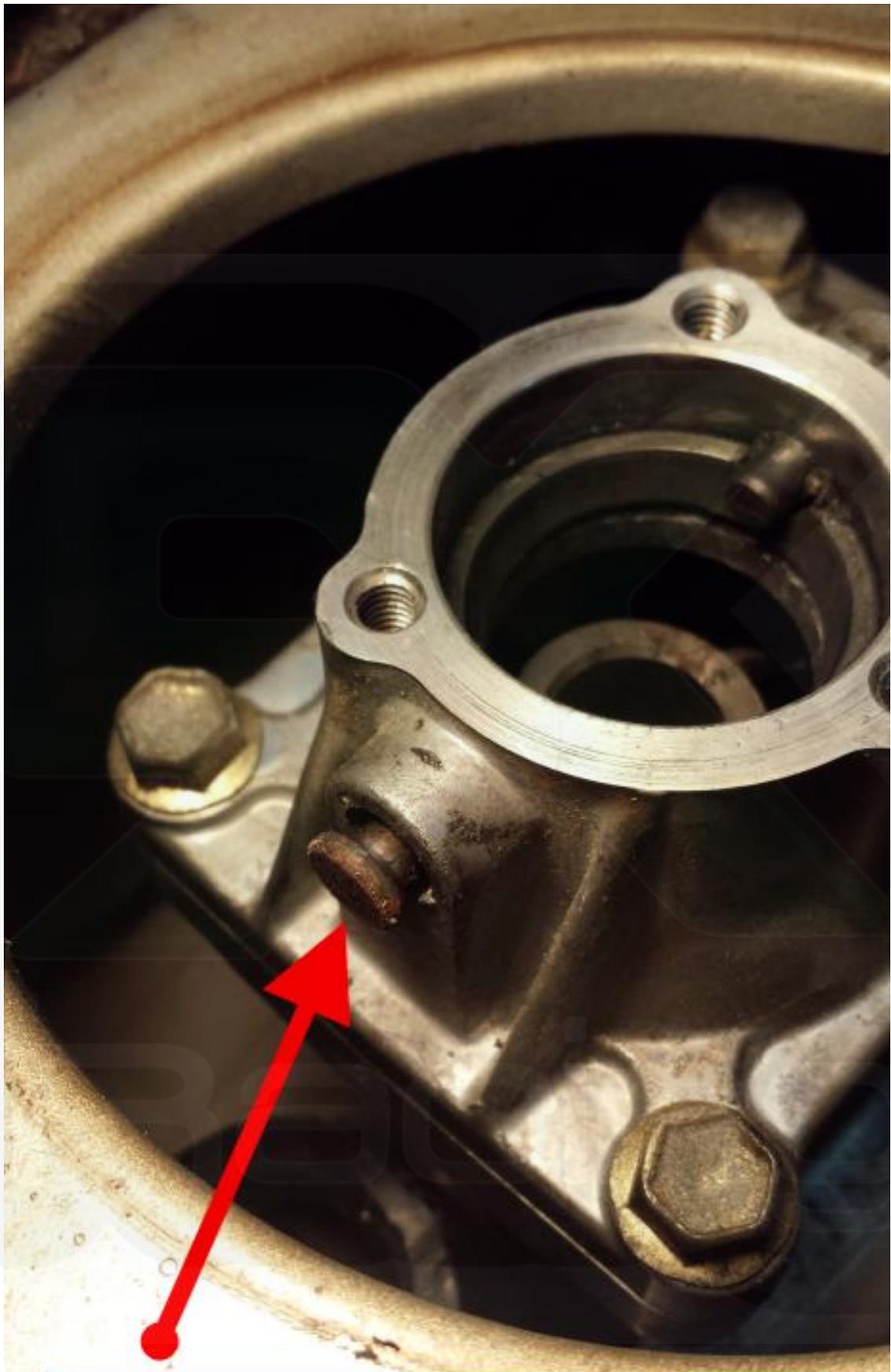
1. Begin by removing the shift knob and center console. This process is easy; the shift knob screws off, and the console involves removing the two screws on the sides adjacent to the shifter, one underneath the ashtray area, and two within the armrest compartment in front of the fuel door and trunk releases). If you need to see this process, please refer to any repair manual for a Miata
2. Once the console is removed, remove the four 10mm bolts for the upper shifter boot
3. Once the four shifter boot bolts have been removed, remove the upper shifter boot from the shifter at this time. To do this, simply spray WD-40 where the small part of the boot wraps around the shifter and work it up and off of the shifter by pulling from underneath the white plastic ring. Pulling just the rubber boot will certainly rip it, and if you didn't plan on replacing it, you will now!
4. Remove the three 10mm bolts fastening the lower shift boot to the transmission turret and lift the shifter assembly away from the transmission turret.
5. With the shifter assembly removed, you will now need to remove the lower change bushing (black plastic ring) and wave washer that sit on the ledge inside the shifter turret. There are two locating dowel pins that inhibit the bushing from being easily removed, so one of those bushings must be pushed back to allow removal. Here's how to do this:

- a. Using a large pair of Vise-Grips and a spacer/socket that can go over the backside of the dowel pin, press out the rear dowel



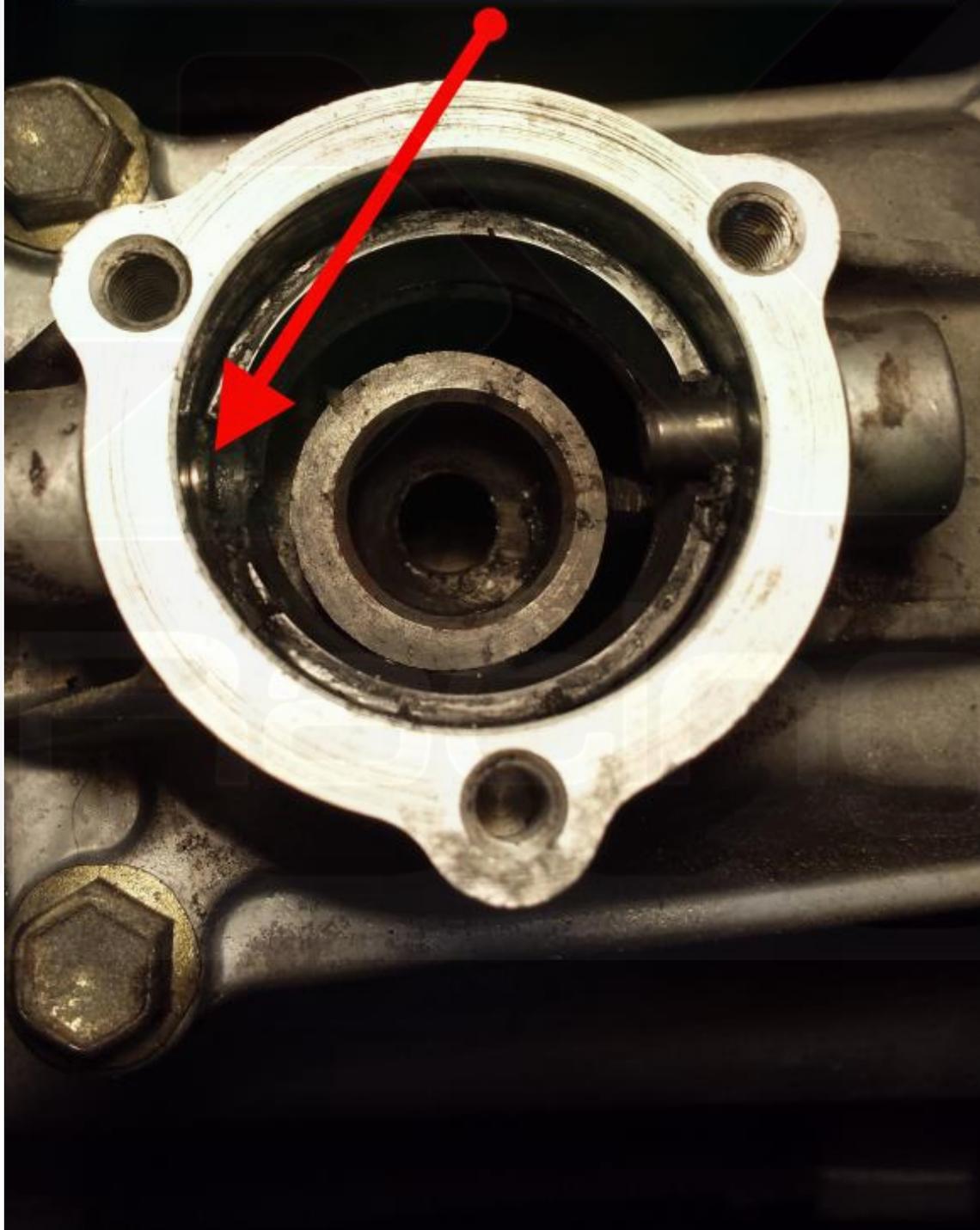


use spacer to allow room for dowel to be pressed out, squeeze the dowel from the turret side to press it out



back the dowel out far enough to expose the lip

The Vise-Grips will get the dowel 90% of the way cleared, but you'll need to get it all the way flush with the inside wall of the turret to be able to easily remove the change bushing and wave washer underneath





Using a flat tipped screwdriver, pry the dowel out further until it's flush on the inside of the turret wall

You can now remove the black change bushing and wave washer underneath it. Our wave washer was broken, so be careful not to drop any broken pieces into the transmission!

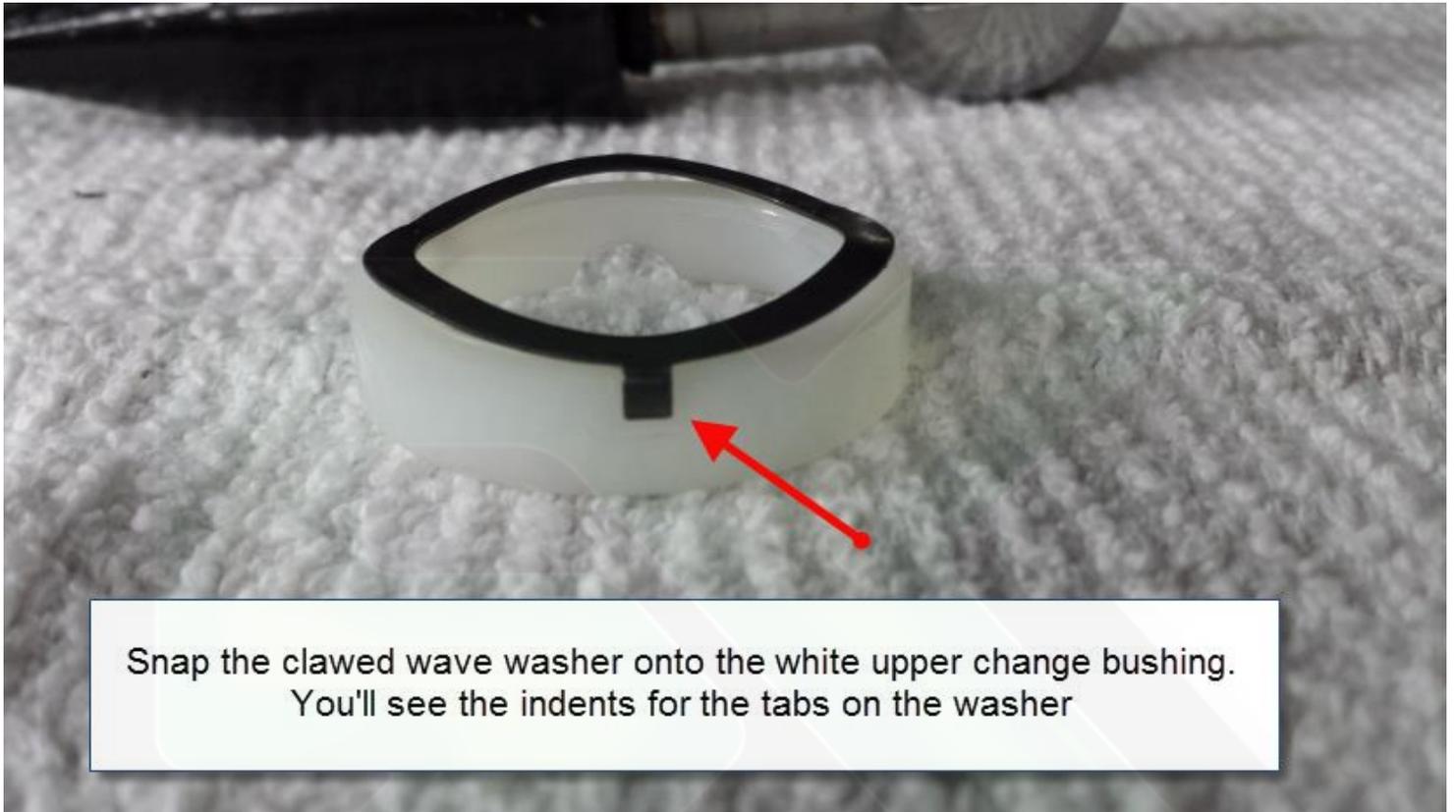


A comparison of our old change bushing and wave washer to the new ones. The wave washer was obviously broken, but the change bushing wasn't too bad. Being plastic, it should rarely fail – however - if you're replacing anything within the shifter assembly, you might as well replace everything while you're at it to fully restore the feel of the shifter!

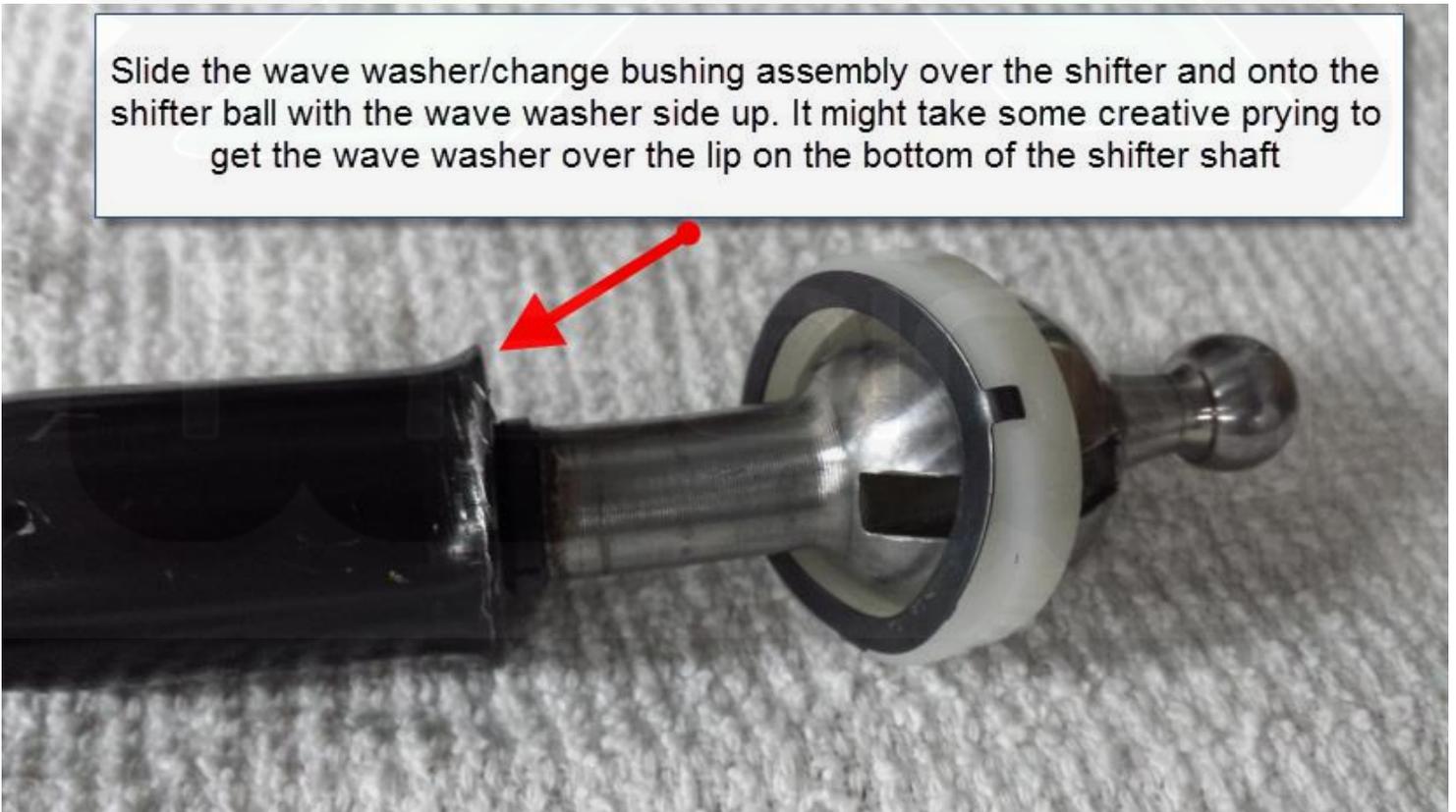


6. The next step once the lower wave washer and change bushing are removed is to go back to the shifter assembly and remove the old upper wave washer and white change bushing from the shifter. Simply remove them by sliding them upwards over the shifter shaft
7. We now want to rebuild our shifter assembly and prepare the shifter turret for reinstallation





Snaps the clawed wave washer onto the white upper change bushing. You'll see the indents for the tabs on the washer



Slide the wave washer/change bushing assembly over the shifter and onto the shifter ball with the wave washer side up. It might take some creative prying to get the wave washer over the lip on the bottom of the shifter shaft

1. Using WD-40, slide the lower shifter boot over the shifter shaft and down past the lip

2. We installed our upper shift boot at this time, but found later that it is easier to install when the shifter is installed first



*Note - despite it not looking like it will fit, the lower shifter boot WILL stretch and fit over the shifter shaft. Generous amounts of WD-40 help the boot slide over the thicker part of the shaft easier and without friction. Please be aware that once the lower shifter boot is slid into position under the shaft and on top of the shifter ball, it cannot be removed without damage or cutting. It is not necessary to align the lower shifter boot during this time, as more WD-40 can be used later to allow the boot to rotate into position during the final installation steps *



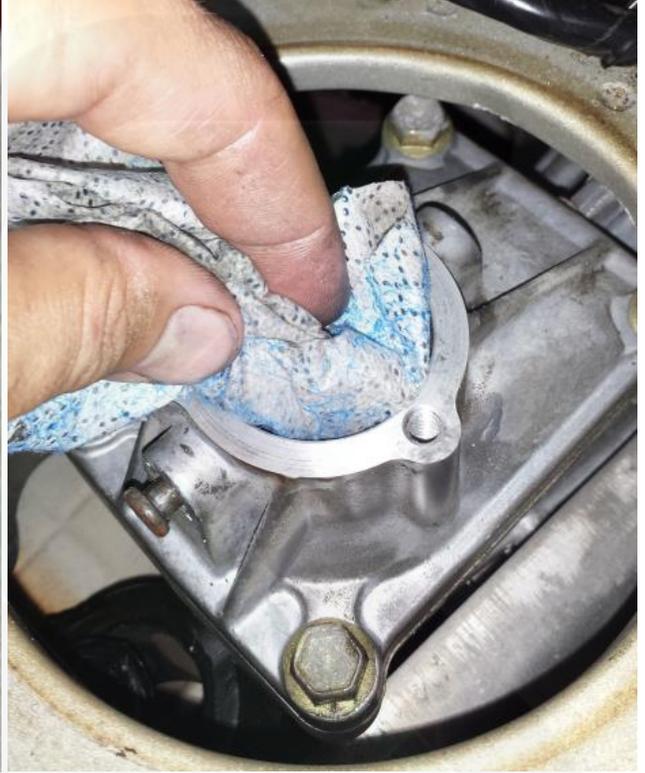
Hopefully you also purchased one of our awesome 5X Racing bronze shifter bushings :-)



Take some wheel bearing grease and lube the large shifter ball and tip well as they'll be contacting the plastic change bushing, shifter tip bushing, and lower change bushing respectively



Clean the inside of the shifter turret as best you can before installing the shifter assembly!



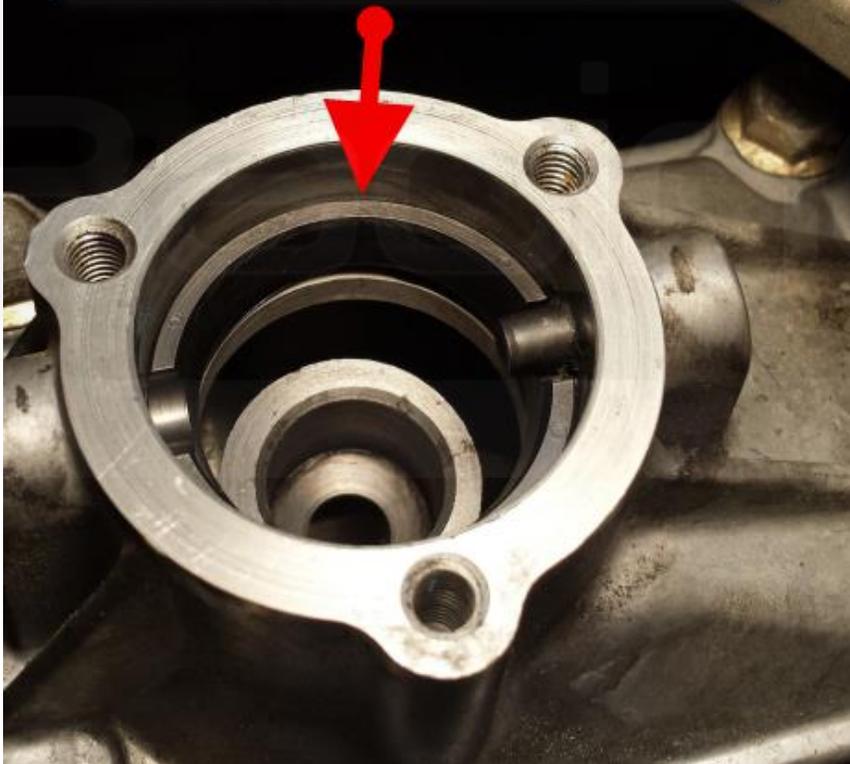
Nice and Clean!



Install lower (non-tabbed) wave washer on the shelf inside the turret.
It really only fits in one spot



Install lower (black) change bushing on top of wave washer observing the two divot spots for the dowels

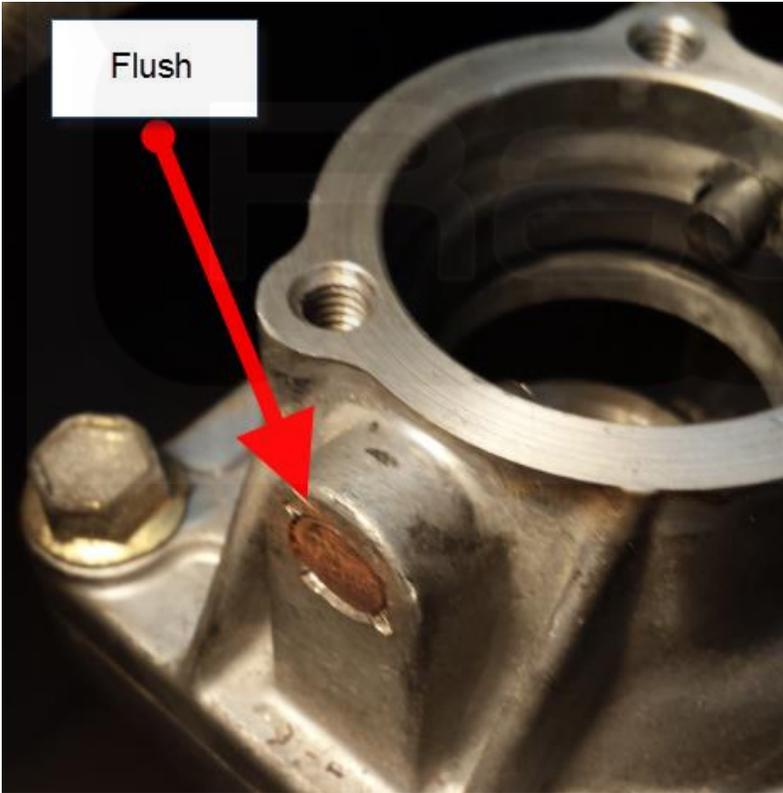


8. After the lower washer and bushing are installed, you're going to need to press the dowel pin back into the turret in the opposite way you pressed it out. Simply reverse the procedure used to press it out without the use of the spacer. Find an old piece of rubber hose or something soft to protect the inner wall of the turret from the jaws of the Vise-Grips, and use the inside lip of the turret above the dowel hole as a pressure point. We used an old Miata fuel hose and slid it onto the jaw of the Vise-Grip and pressed it back in:

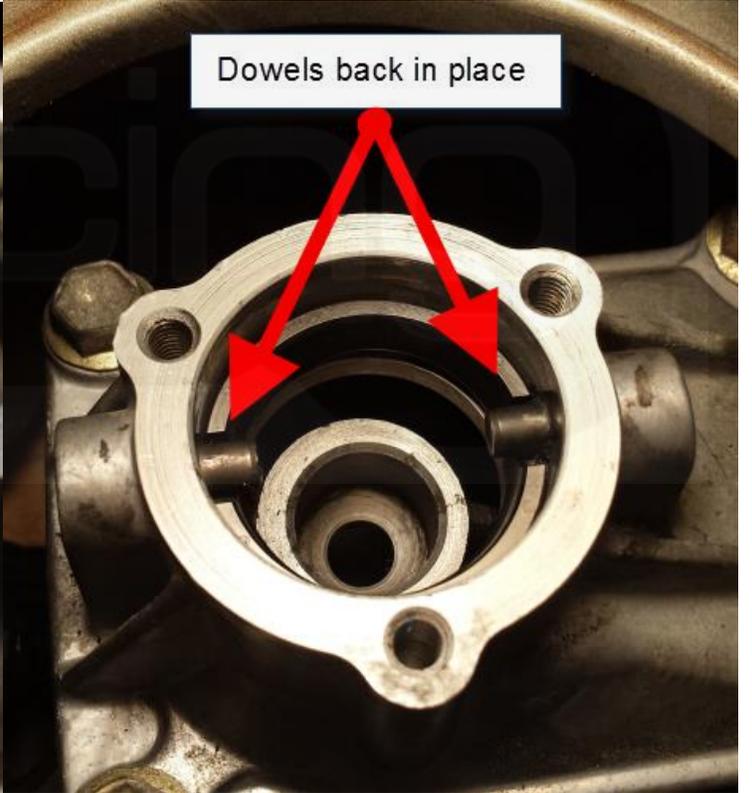




Press the dowel back in until it's sides are flush

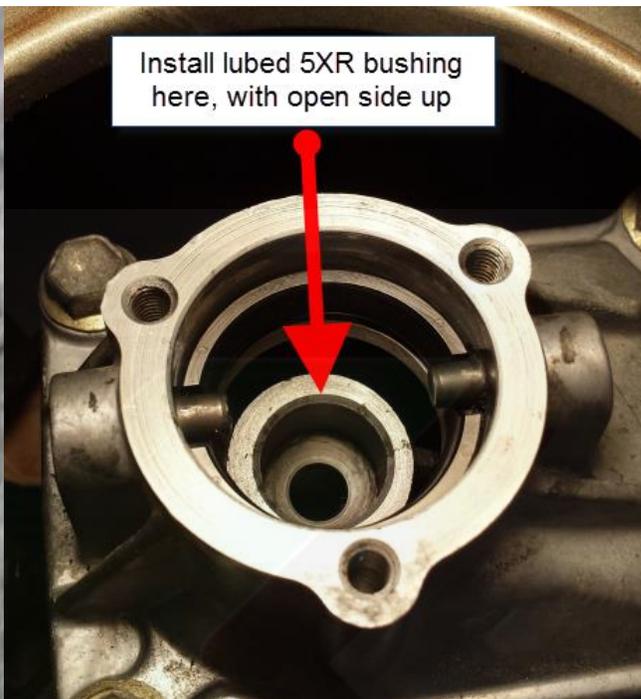


Flush

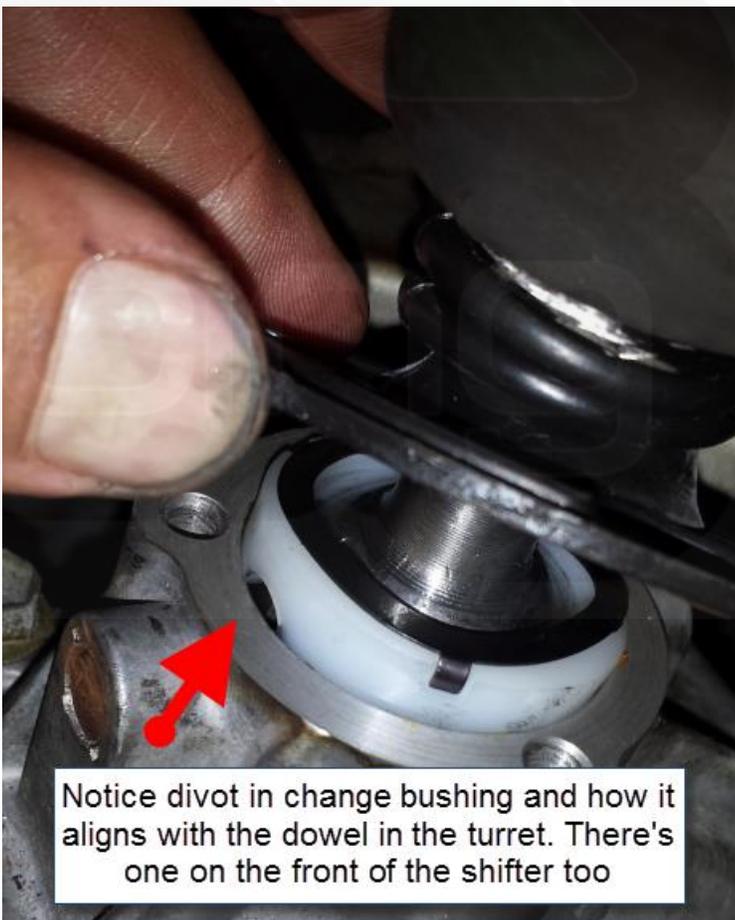


Dowels back in place

9. Now that the turret is restored to its original configuration, we will take our completed shifter assembly and reinstall it back into the turret:

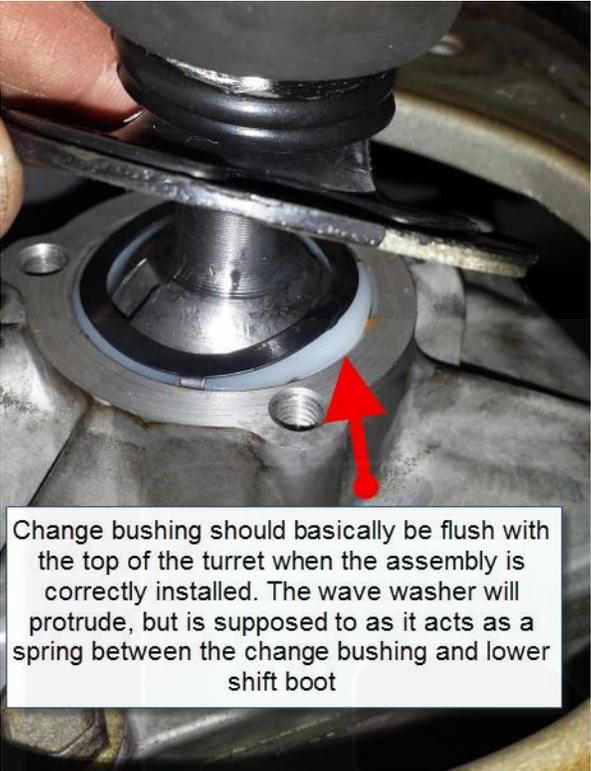


After greasing the 5X Racing shifter bushing and placing it into the turret, insert shifter assembly taking care to keep the divots in the white change bushing in alignment with the channels in the shifter ball, as well as with the dowels in the turret. This might take several “up’s and down’s” with the shifter assembly to make sure it settles correctly. Also take note of the orientation of the shifter itself, as it should have a slight bend in it. This bend should be leaning towards the rear of the car

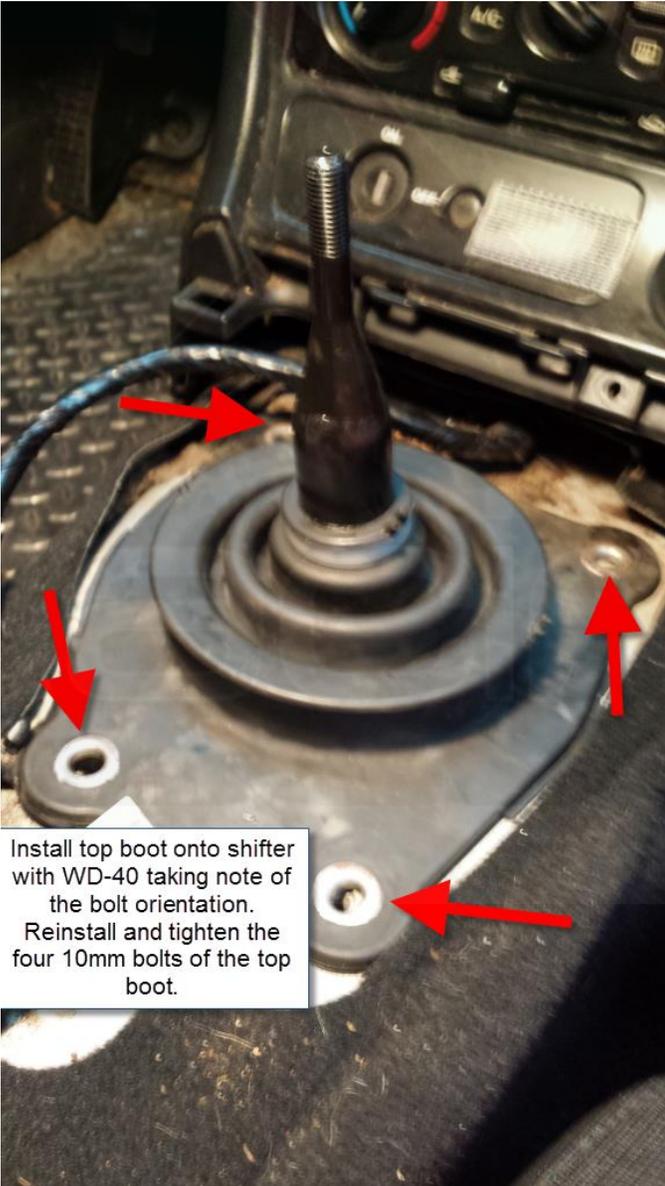




Lower the shift boot and align it with the bolt holes, then install and tighten the three 10mm bolts



Change bushing should basically be flush with the top of the turret when the assembly is correctly installed. The wave washer will protrude, but is supposed to as it acts as a spring between the change bushing and lower shift boot



Install top boot onto shifter with WD-40 taking note of the bolt orientation. Reinstall and tighten the four 10mm bolts of the top boot.

10. Reinstall the console and shift knob and this will mark the completion of your project! Congrats! Time to tear up the road course or on/off-ramps on that daily commute!



Your newly rebuilt shifter will feel more crisp than it did the day it left the factory because of the addition of the 5X Racing shifter bushing. Our bushings are designed to eliminate the weak factory plastic shifter bushing that will eventually become brittle and break into pieces within your transmission. It might take years for this to happen, but it eventually will for sure. Nearly every Miata that has been regularly driven will have this problem. The shifter assembly change bushings and wave washers will not wear out at the rate of the shifter tip bushing, however, they can eventually fail as you saw during our install when the lower wave washer was in fact broken in two. These wave washers provide pressure to keep the larger shifter ball “floating” within the turret and moving freely. If this pressure is not there, you will still be able to shift normally, but there will be excess play in your shifter and it could lead to a “notchy” shifter feel. Most drivers won’t know the difference of how the Miata shifter is supposed to feel until they’ve rebuilt their shifter assembly. Adding the race proven 5X Racing shifter bushing will add crispness and a more solid feel to your shifter beyond the OEM capabilities, as well as prepare you to tackle any track with continued 7000rpm shifts without worry of breaking the unreliable OEM plastic shifter bushing.

We hope you enjoy your newly restored shifter with the 5X Racing shifter bushing and also hope you explore our many other custom 5X Racing Miata products and variety of other offerings we have on our website. Please be safe and enjoy your Miata responsibly, and hopefully we’ll see you at the track one day!

Thank you!

The 5X Racing Team