



BMW 5-Speed Manual Transmission Shifter Bushing Installation



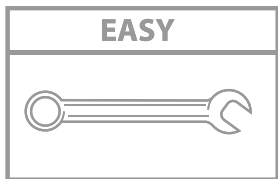
Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

INTRODUCTION

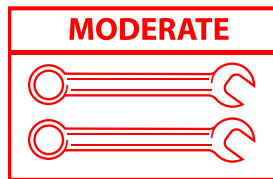
BMW 5-Speed Transmission Shifter Rebuild and Upgrade Kit ES#2587713

The ECS Tuning Shifter Rebuild and Upgrade Kit offers the following features and benefits:

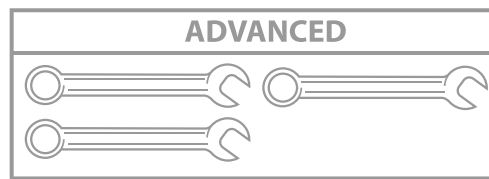
- Includes the most commonly wearing parts in your BMW shifter
- Includes or ECS Tuning teflon shifter console bushings
- Provides a complete shifter overhaul
- Eliminates loose and sloppy shifter feel



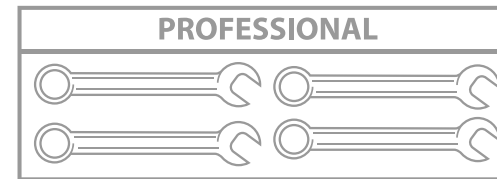
**BASIC SKILLS
REQUIRED**



**SOME EXPERIENCE
RECOMMENDED**



**ADVANCED SKILLS &
EXPERIENCE REQUIRED**



**PROFESSIONAL SKILLS &
SPECIALTY TOOLS REQUIRED**

Performing a shifter rebuild on your 5-speed equipped BMW is a weekend project that results in smooth, crisp shifting. Replace all the worn components in your original shifter and get back the new feeling that makes the driving experience what it should be. Normally a fairly routine process, there are a couple things that may be difficult to tackle. Read these instructions and plan your time accordingly based on your experience level. Thank you for looking to ECS Tuning for all your performance and repair needs. We appreciate your business!

TABLE OF CONTENTS

Kit Contents.....	pg.4
Additional Recommendations.....	pg.5
Required Tools and Equipment.....	pg.7
Shop Supplies and Materials.....	pg.8
Installation Notes	pg.9
Preparation and Safety.....	pg.9
Accessing the Shifter.....	pg.10
Rebuilding the Shifter.....	pg.16
Final Installation Steps.....	pg.37
Torque Specifications.....	pg.38
Schwaben Tools	pg.39

KIT CONTENTS



Dowel Pin



Shift Lever Retaining Ring/
Pivot



Shifter Rod Retaining Clips



Shift Console Retaining Pin



Shifter-to-Body Seal



Selector Shaft Joint



Teflon Shift Console Bushings



Shift Console Rear Bushing

ADDITIONAL RECOMMENDATIONS

A replacement shift lever is available on our website as [ES#47246](#)

While these are generally reusable, the pivot ball tends to wear slightly over time and the bushing at the base of the shifter can wear considerably. Neither of these components are available separately, the shift lever must be replaced as a complete assembly.

If your shifter feels sloppy, most likely these components are as worn as the rest of the bushings. Order a shift lever now, prevent down time when your car is apart, and eliminate all excessive shifter play.



ADDITIONAL RECOMMENDATIONS



For a nice touch, visit ecstuning.com and select a new shift knob, shifter boot, or shift knob emblem



REQUIRED TOOLS

Note: The tools required for each step will be listed by the step number throughout these instructions.

Below is a list of the tools we used to install the BMW 5-speed shifter bushings. Additional tools may be required for any issues that arise during installation such as rust, corrosion, or broken and stripped fasteners. Tools with a part number listed are available on our website.

- 3/8" Drive Ratchet [ES#2765902](#)
- 3/8" Drive Torque Wrench..... [ES#2221245](#)
- 3/8" Drive Sockets: 10, 13, 14, 16, 17, 18mm [ES#2763772](#)
- 3/8" Drive Extensions
- Open/Boxed End Wrenches: 16mm, 18mm [ES#2765907](#)
- Flat Blade Screwdriver(s) [ES#2225921](#)
- Non-marring Trim Tool [ES#517779](#)
- Jack Post or similar equipment
- Needle Nose Pliers
- Small Hook Tool [ES#2778980](#)
- 1/2" Drive Sockets: 16, 17, 18mm
- 1/2" Drive Ratchet
- 1/2" Drive Extensions
- 1/2" Drive Torque Wrench [ES#2221244](#)
- 1/2" Drive Breaker Bar [ES#2776653](#)

SHOP SUPPLIES AND MATERIALS

Below is a list of standard shop supplies which we like to keep on hand during all repairs and services. Shop supplies with a link are available on our website.

Hand Cleaner/Degreaser - [Click Here](#)

Aerosol Brake/Parts Cleaner - for cleaning and degreasing parts

Shop Rags - used for wiping hands, tools, and parts

Pig Mats - for protecting your garage floor and work area from spills and stains - [Click Here](#)

Penetrating oil - for helping to free rusted or stuck bolts and nuts

Mechanics wire - for securing components out of the way

Silicone spray lube - for rubber components such as exhaust hangers

Spray detailer - for rapid cleaning of anything that comes into contact with your paint such as brake fluid - [Click Here](#)

Paint Marker - for marking installation positions or bolts during a torquing sequence

Micro Fiber Towels - for cleaning the paint on your car - [Click Here](#)

Latex Gloves - for the extra oily and dirty jobs - [Click Here](#)

Medium and High Strength Loctite Thread lock compound - to prevent bolts from backing out - [Click Here](#)

Plastic Wire Ties/Zip Ties - for routing and securing wiring harnesses or vacuum hoses

Anti-Seize Compound - to prevent seizing, galling, and corrosion of fasteners - [Click Here](#)

Electrical tape - for wrapping wiring harnesses or temporary securing of small components

INSTALLATION NOTES

- **RH** refers to the passenger side of the vehicle.
- **LH** refers to the driver side of the vehicle.
- Always use the proper torque specifications.
- If applicable to this installation, torque specifications will be listed throughout the document and at the end as well.
- Please read all of these instructions and familiarize yourself with the complete process **BEFORE** you begin.

GENERAL PREPARATION AND SAFETY INFORMATION

ECS Tuning cares about your health and safety. Please read the following safety information. This information pertains to automotive service in general, and while it may not pertain to every job you do, please remember and share these important safety tips.

- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- If using an automotive lift, be sure and utilize the factory specified lift points. Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear.
- When lifting a vehicle using a jack, always utilize the factory specified lift points. Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear. **ALWAYS** support the vehicle with jack stands.
- Always read and follow all safety information and warnings for the equipment you are using.



Never get underneath a vehicle that is supported only by a jack. Always make sure that the vehicle is securely supported on jack stands.

ACCESSING THE SHIFTER

Step 1: 16mm Socket, Ratchet

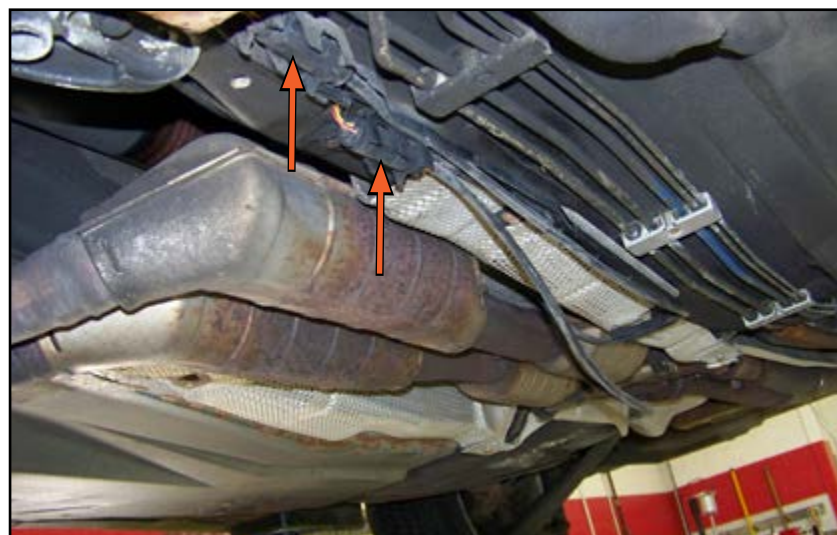
In order to access the shifter for removal, the exhaust system and driveshaft will need to be removed.

Begin by removing the body cross brace in the front, just below the engine oil pan. Two bolts secure it in place (arrows).



Step 2:

Disconnect both post-cat O2 sensor connectors and pull the wires out of the body channels so the sensors can be removed with the exhaust system. The connectors are located on the LH side underbody, just behind the transmission cross member.



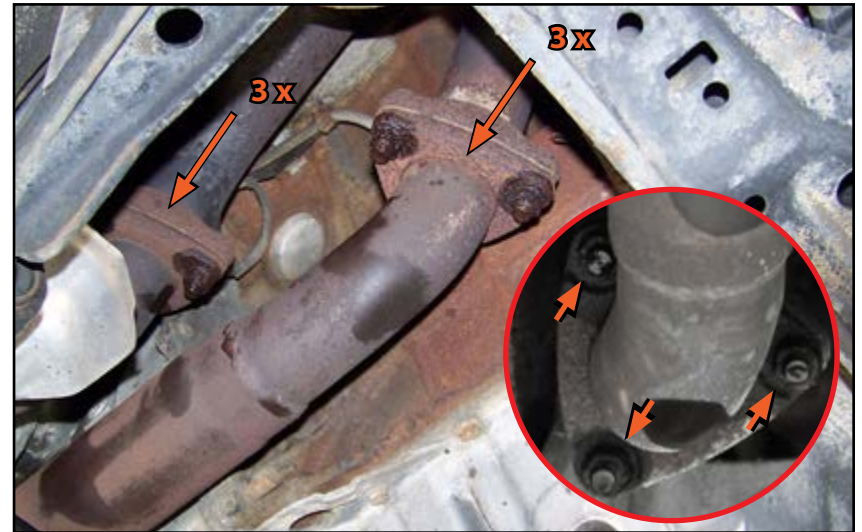
ACCESSING THE SHIFTER

Step 3:

Support the front of the exhaust system with a jack post or similar equipment, then remove the three nuts on each of the downpipes flanges.

NOTE

These nuts are commonly rusted in place. You may have to use an oxygen-acetylene torch to heat them up before removal and penetrating oil to help them along.

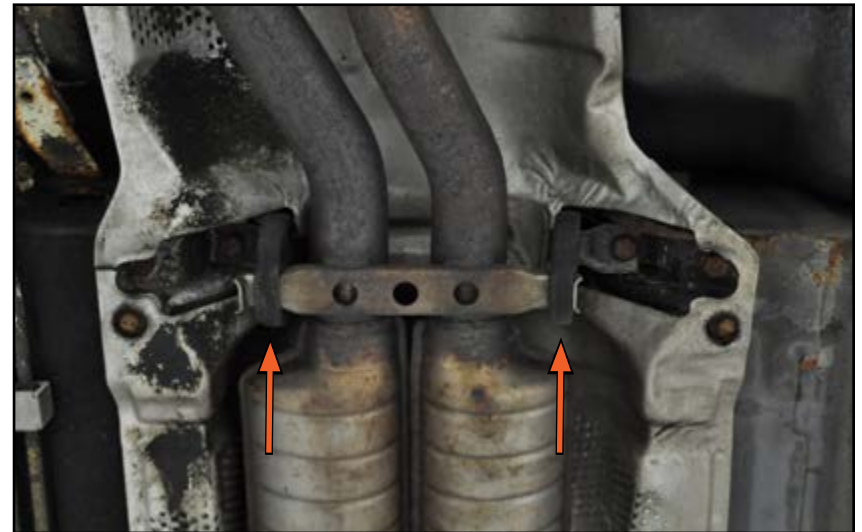


Step 4:

Pull the two rubber exhaust hangers off the of center of the exhaust.

CAUTION

Enlist the help of a couple friends before proceeding. The exhaust system is very heavy and will require more than one person for removal.



ACCESSING THE SHIFTER

Step 5:

At this point, you have two options for removing the exhaust.

1. Unbolt the exhaust at the center flanges and remove just the center section (highlighted in the picture). This is easier because there is less weight, but the flanges can be very rusty and difficult to separate.
2. Unbolt the muffler hangers in the rear and lower the entire system as one. This eliminates trouble with the center flanges, but the entire system is very heavy. If you choose this method, don't forget to disconnect the vacuum line at the actuator on the tailpipe.



Step 6: 10mm Socket, Ratchet

Once you have removed the exhaust, remove the screws securing the aluminum heat shield to the underside of the car, and pull the heat shield off. You may have to twist the rubber exhaust hangers slightly so the shield will clear them.



ACCESSING THE SHIFTER

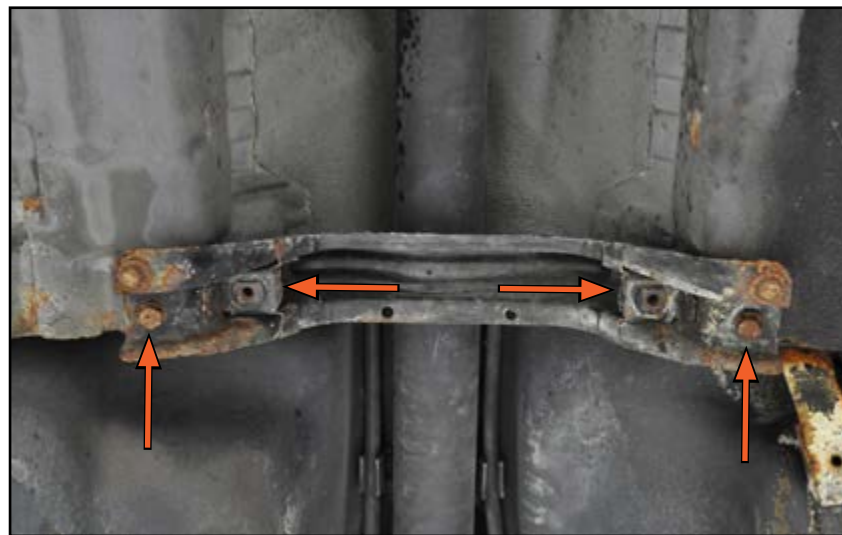
Step 7: 13mm Socket, Ratchet

Remove the two bolts, then remove the two rubber exhaust hangers along with their brackets.



Step 8: 13mm Socket, Ratchet

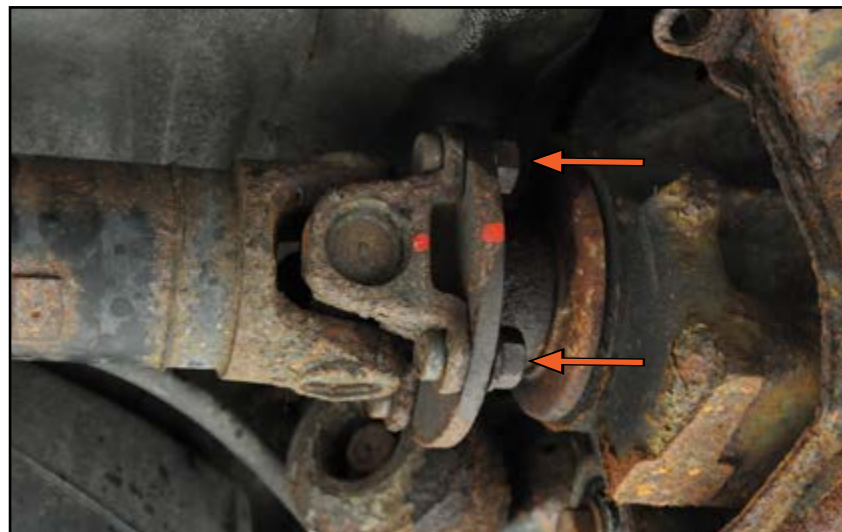
Remove the four bolts securing the tunnel cross brace to the underbody and remove it. Two of the bolts are hidden above the exhaust hanger mounts.



ACCESSING THE SHIFTER

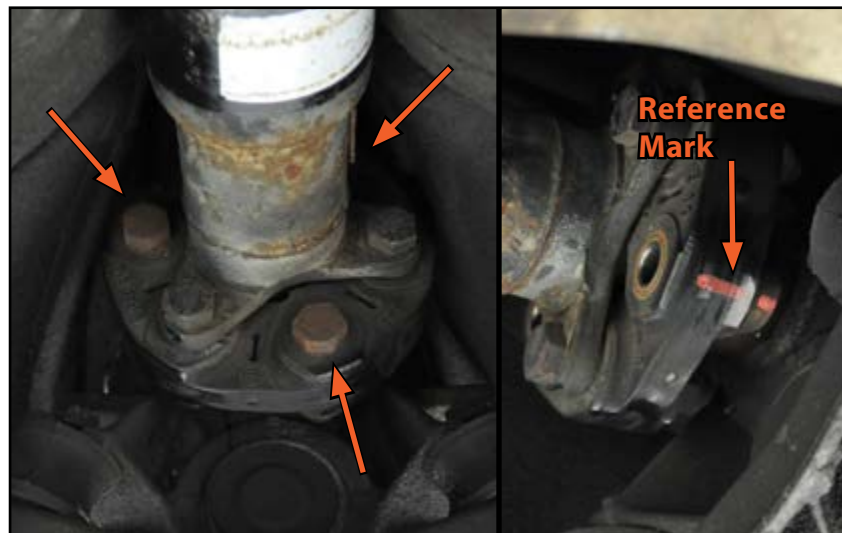
Step 9: 16mm Boxed End Wrench

Make a reference mark on the rear u-joint and differential input flange, then remove the four rear driveshaft nuts.



Step 10: 18mm Socket, Ratchet, 18mm Boxed End Wrench

Make a reference mark on the front driveshaft flex disc and transmission output flange, then remove the three driveshaft bolts.



ACCESSING THE SHIFTER

Step 11: 13mm Socket, Ratchet

Remove the two driveshaft center support nuts, then slide the rear u-joint studs out of the differential flange, lower the driveshaft in the rear and slide it off of the transmission output flange.

NOTE

The transmission output flange has an extended shaft which centers the driveshaft flex disc. The rear of the driveshaft must be lowered before sliding the flex disc off of the output flange.



Step 12:

While you have the driveshaft removed, it is a good opportunity to remove the flex-disc and inspect it for cracks and wear. A replacement flex-disc is available at ecstuning.com.

You are now ready to rebuild the shifter!



REBUILDING THE SHIFTER

Step 1:

Pull the shift knob straight up to remove it from the shift lever. This may take considerable effort if the shift knob has never been off.



Step 2:

Pull up on the edges of the shift boot to release it, then lift it off of the shift lever.



REBUILDING THE SHIFTER

Step 3:

Lift the shifter insulator out from around the shift lever.

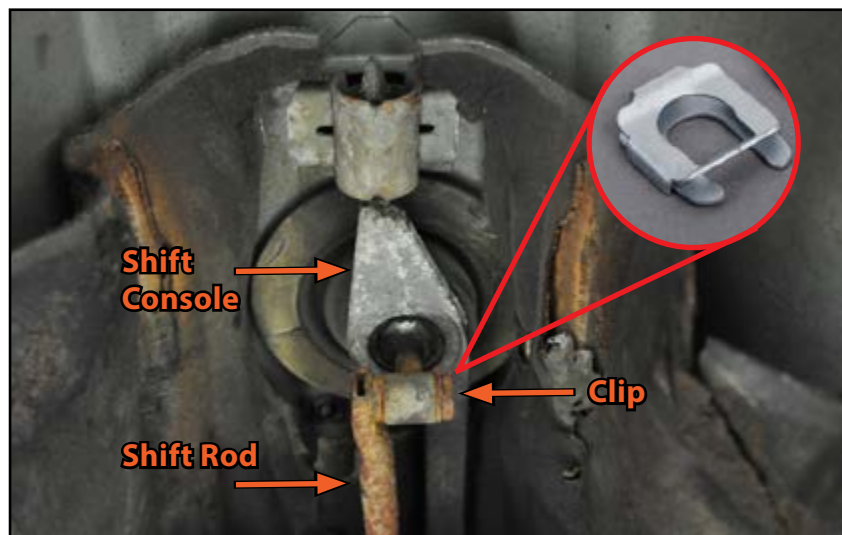


Step 4: Flat Blade Screwdriver or Pliers

Back underneath the car, remove the clip securing the shift rod to the bottom of the shift lever.

NOTE

If this clip is very rusty you can break it to get it off. New clips are included with the kit.



REBUILDING THE SHIFTER

Step 5:

Slide the shift rod out of the bottom of the shift lever. Normally it should slide right out, however you may find as we did here that you will have to lubricate it and pry it out due to rust buildup.

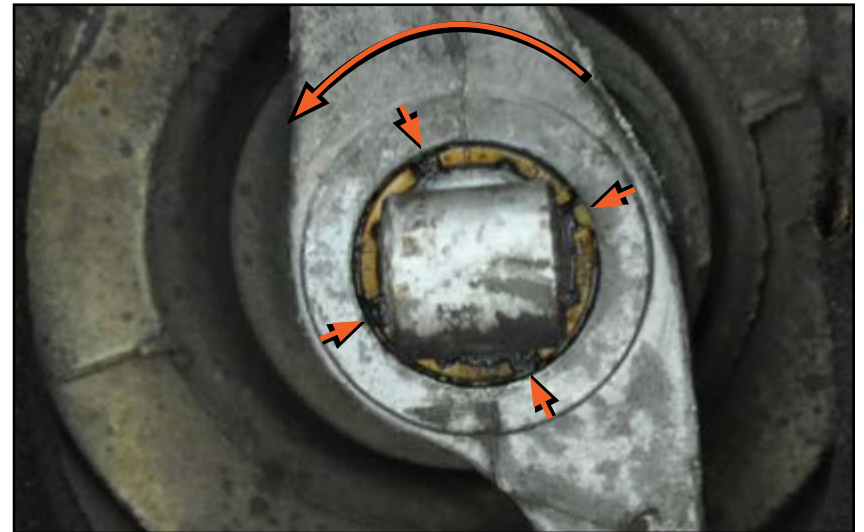


Step 6:

Look directly at the bottom of the shift console, where the shift lever pivots, and you will see the bottom of the pivot ball and the shift lever retaining ring.

The retaining ring has four notches in it (arrows).

BMW has a special tool designed specifically to fit into these notches, but it is not necessary to have this tool. Using a pair of needle nose pliers, engage two opposing notches and rotate the retaining ring 90 degrees in a counter clockwise direction. This will release the retaining ring from the shift console. You will be able to push the shifter upward, indicating that it has been properly released.



REBUILDING THE SHIFTER

Step 7:

Pull the shifter-to-body seal off the body tunnel, and lift the shift lever out of the car. If you have purchased a new shift lever, skip to [step 10](#). If you are reusing the original shift lever, continue with step 8.

NOTE

Note the position (angle) of the shift lever during removal. Both the top and bottom angle slightly to the left.

Step 8:

Pull the shifter-to-body seal up off the shift lever.

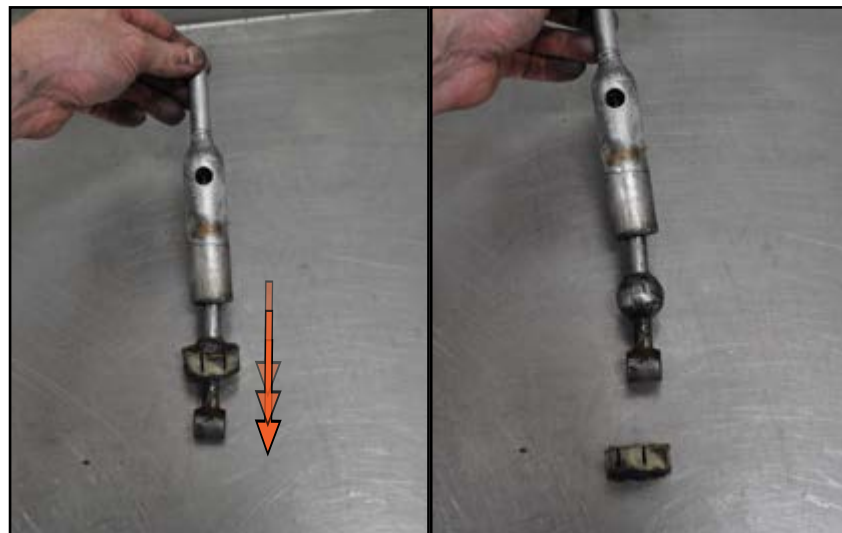


REBUILDING THE SHIFTER

Step 9:

Pull the shift lever retaining ring off the bottom of the shifter. You will find that you can do this by hand, it will simply “pop” off.

Clean the shift lever thoroughly.



Step 10:

Grease the inside of the new shift lever retaining ring and install it onto the pivot ball of the shift lever.



REBUILDING THE SHIFTER

Step 11:

Inspect the new shifter-to-body seal. On the top side near the edge you will see an arrow (highlighted in this picture). This arrow indicates the forward direction of the boot when it is installed in the car.



Step 12:

Slide the boot down onto the shift lever, making sure the arrow is pointing toward the front of the vehicle in relation to the installation position of the shift lever.

TECH TIP

Silicone spray lubricant will make boot installation easier.



REBUILDING THE SHIFTER

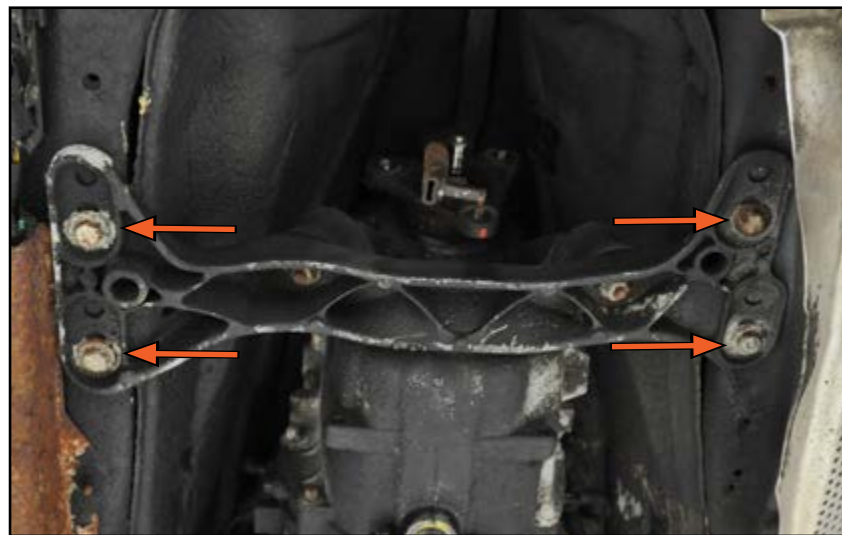
Step 13: Transmission Jack or Jack Post

Support the transmission from underneath.



Step 14: 13mm Socket, Ratchet

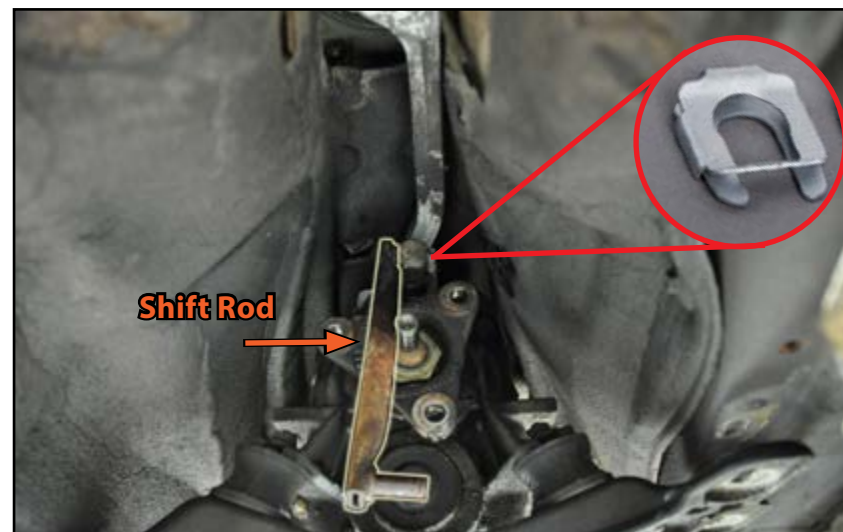
Remove the four transmission cross member bolts.



REBUILDING THE SHIFTER

Step 15: Flat Blade Screwdriver or Pliers

Lower the transmission by about one inch, then remove the clip securing the shift rod to the selector shaft joint.



Step 16:

Remove the shift rod from the selector shaft joint, then thoroughly clean both ends using a wire brush or emery paper.



REBUILDING THE SHIFTER

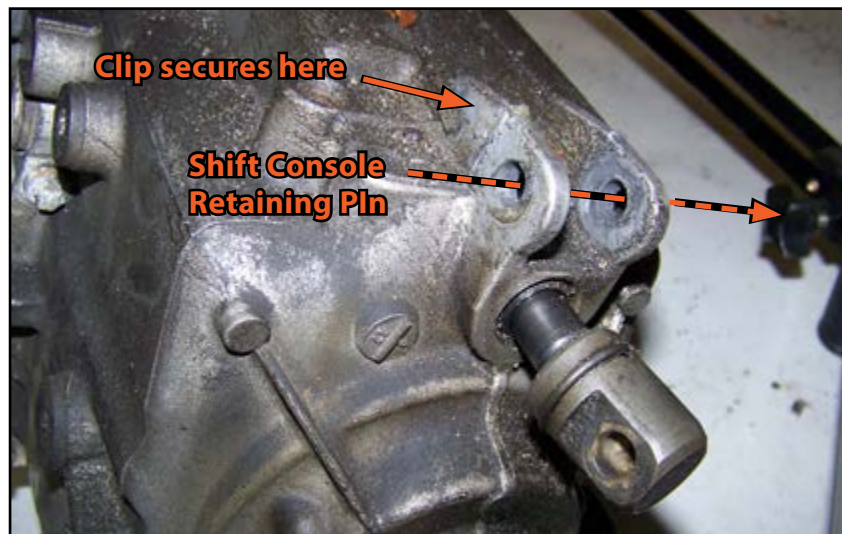
Step 17:

The shift console is secured to the transmission by a retaining pin with a built in clip on the end. (See kit components, a new one is included).



Step 18:

This close up view of the transmission tail shaft shows the mounting point for the shift console. The retaining pin slides through the shift console, then pivots over and the clip secures it to a rib on top of the transmission.



REBUILDING THE SHIFTER

Step 19:

Pull the clip off of the rib on the transmission, then pivot it around and slide the pin out. You can normally pull the clip off by hand, however if it is stuck you may need to use a small pick or screwdriver to release it.

We have highlighted the retaining pin/clip in this picture with it slid part of the way out so you can see it's location.



Step 20:

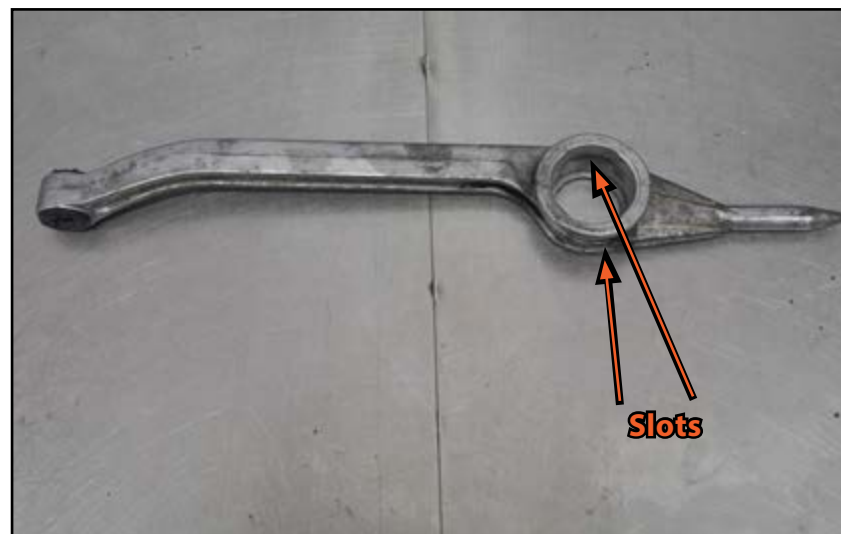
Once you have removed the retaining pin, slide the shift console forward along the top of the transmission until it slides out of the rear bushing, then pull it back and remove it from the car.



REBUILDING THE SHIFTER

Step 21:

Thoroughly clean and degrease the shift console. Note the slots that are located in the retaining ring bore. These slots are what the retaining ring will lock into when installed.



Step 22: Flat Blade Screwdriver

Remove the original rubber bushing from the end of the shift console by prying/pushing it out.



REBUILDING THE SHIFTER

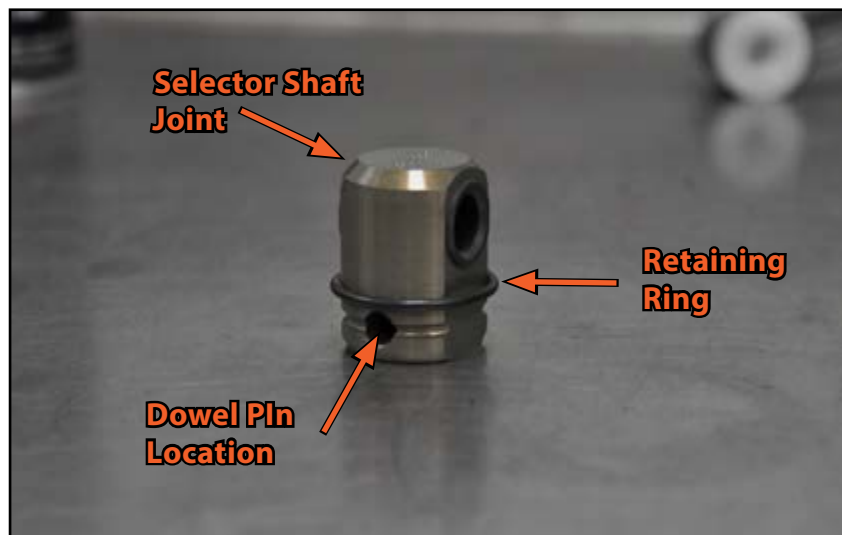
Step 23:

Slide the two new teflon bushings into the end of the shift console.



Step 24:

Inspect the new selector shaft joint and dowel pin that are included with the kit, then continue with the next step. The selector shaft joint comes with the retaining ring around the body, not in the groove, to allow for easy installation.



REBUILDING THE SHIFTER

Step 25: Small Hook or Pick Tool

Hook the retaining ring on the selector shaft joint and pull it off, either completely or just far enough to access the dowel pin. Push the dowel pin completely out and pull the selector shaft joint off the end of the selector shaft.

NOTE

You may have to push in or wiggle the selector shaft joint slightly in order to slide the dowel pin out.

Step 26:

Start the new dowel pin into one side of the new selector shaft joint.



REBUILDING THE SHIFTER

Step 27:

Slide the new selector shaft joint into place on the selector shaft, then slide the dowel pin into place.



Step 28:

Slide the retaining clip into the groove, locking the dowel pin in place.



REBUILDING THE SHIFTER

Step 29: Flat Blade Screwdriver

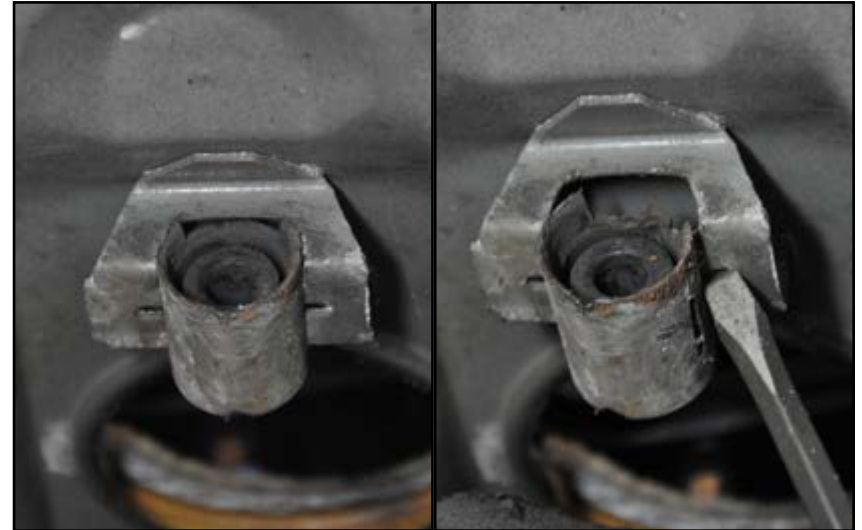
Insert a flat blade screwdriver into one of the grooves on the side of the shift console rear bushing. Push the screwdriver handle towards the outside of the car and the bushing will release and roll out of the body bracket.

NOTE

Note the installation position of this bushing, particularly the cut-out.

Step 30:

Orient the new shift console bushing so the cut-out is located in the top rear, then hook one of the slots in the side onto the body bracket and push the other side up until both slots are hooked into the bracket.



REBUILDING THE SHIFTER

Step 31:

Grease the new teflon bushings in the end of the shift console.



Step 32:

Slide the shift console forward above the top of the transmission until you are able to insert it into the rear bushing. Pull it back until it is seated in the rear bushing, then slide the front into place on the transmission and install the new retaining pin/clip.



REBUILDING THE SHIFTER

Step 33:

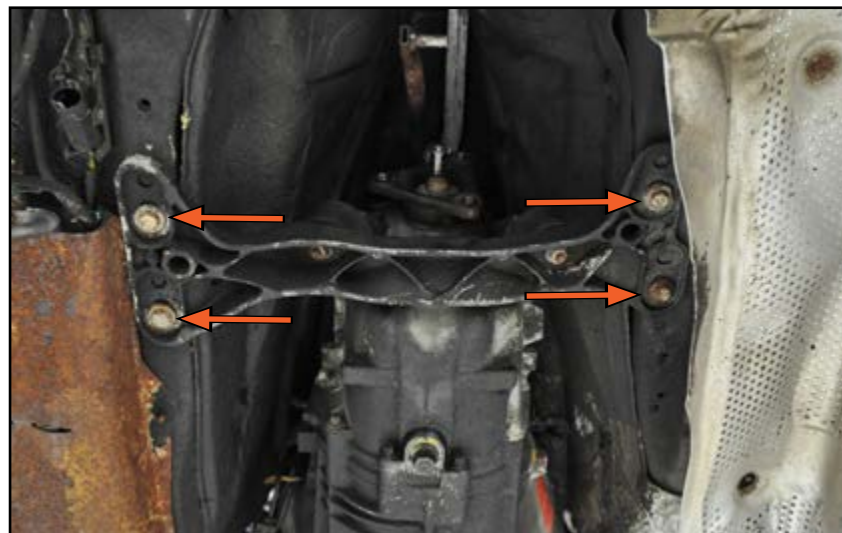
Grease the end of the shift rod, then slide it into the selector shaft joint and install a new retaining clip.



Step 34:

13mm Socket, Torque Wrench

Raise the transmission into place and install the four crossmember bolts. Torque them to 21 Nm (17 Ft-lbs).



REBUILDING THE SHIFTER

Step 35:

Inspect the shift lever retaining ring and note the two fingers which protrude out at the top. These are the fingers that will lock into the slots in the shift console.



Step 36:

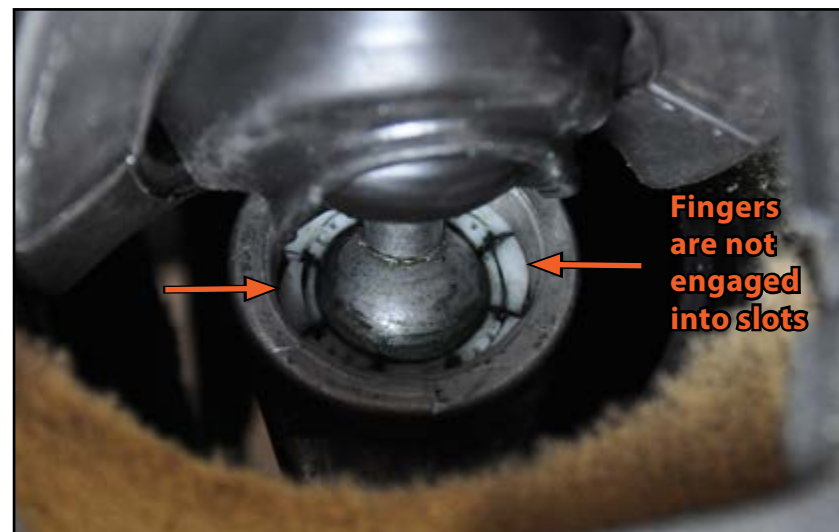
Install the shift lever into place, making sure the two fingers on the retaining ring are lined up with the slots in the shift console.



REBUILDING THE SHIFTER

Step 37:

Push the shifter down into the console until it is fully seated. In some cases, the fingers of the retaining ring will not completely snap into the slots as you can see here. You will be able to tell because the upper edge of the retaining ring will appear as a uniform thickness all the way around except where the fingers are located, it will appear thicker.



Step 38: Flat Blade Screwdriver

To engage the fingers into the slots, lightly tap on the top of each finger using a flat blade screwdriver and they will easily “snap” into place.



REBUILDING THE SHIFTER

Step 39:

Push the shifter-to-body seal through the hole in the floor.



Step 40:

Slowly pull up on the plastic lanyard around the seal and it will help guide the lip of the seal into place. The lanyard will normally pull off, if not, remove and discard it.



REBUILDING THE SHIFTER

Step 41:

Make sure the shifter-to-body seal is properly seated, then reinstall the shift insulation, the shift boot and shift knob.



Step 42:

Grease the end of the shift rod, slide it into the base of the shift lever, and install a new clip.



FINAL INSTALLATION STEPS

Reinstall all of the remaining components in the following order, making sure to torque fasteners to the proper specification listed on page 38.

Install the driveshaft, making sure to line up the reference marks.

Install the tunnel cross brace.

Install the two rubber exhaust hangers.

Install the aluminum heat shield.

Install the exhaust system.

Install the body cross brace.










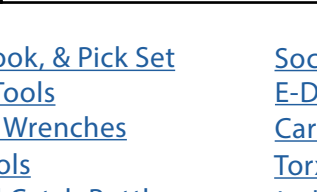
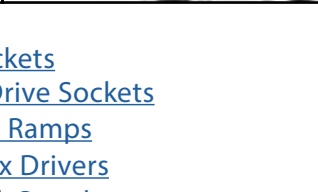


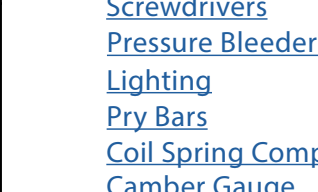


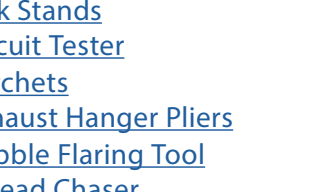


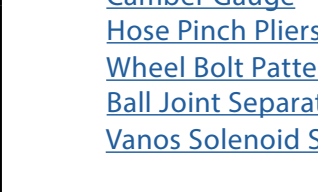
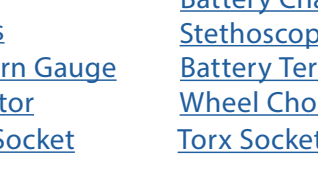
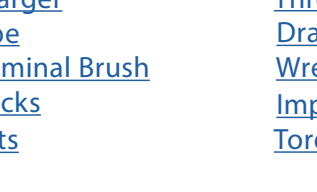
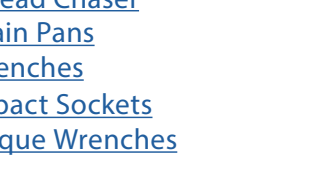







TORQUE SPECIFICATIONS

Driveshaft Center Support.....	21 Nm (16 Ft-lbs)
Driveshaft to Final Drive w/ CV Joint	32 Nm (23 Ft-lbs)
Driveshaft to Final Drive w/ U-Joint and Ribbed Nut	80 Nm (59 Ft-lbs)
Driveshaft to Final Drive w/ U-Joint and Compressed Nut	60 Nm (44 Ft-lbs)
Flex Disc to Driveshaft or Trans Flange M10 8.8 Grade	48 Nm (35 Ft-lbs)
Flex Disc to Driveshaft or Trans Flange M10 10.9 Grade	64 Nm (47 Ft-lbs)
Flex Disc to Driveshaft or Trans Flange M12 8.8 Grade	81 Nm (60 Ft-lbs)
Flex Disc to Driveshaft or Trans Flange M12 10.9 Grade	100 Nm (74 Ft-lbs)
Flex Disc to Driveshaft or Trans Flange M12 10.9 Grade M3	115 Nm (85 Ft-lbs)
Front Cross Brace to Chassis	21 Nm (17 Ft-lbs)
Transmission Cross Member.....	21 Nm (17 Ft-lbs)

• A note about torque to yield or “stretch” bolts: Many bolts will have a torque specification listed in the format - xx Nm (xx Ft-lbs) + xx degrees). These bolts are torque to yield bolts, commonly referred to as “stretch” bolts. The correct procedure for torquing these bolts is: **Stage One** - torque them to the Nm or Ft-lb specification. **Stage Two** - tighten each one the additional specified number of degrees. To prevent over torquing it is important to mark each fastener with paint **immediately** after performing the second stage or “stretching” of the bolts. Note that some bolts may have two or more stages of torquing before the final stage of “stretching” the bolts.

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[Wheel Bolt Pattern Gauge](#)

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[Tubing Cutter](#)

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[Ratchets](#)

[Exhaust Hanger Pliers](#)

[Bubble Flaring Tool](#)

[Thread Chaser](#)

[Drain Pans](#)

[Wrenches](#)

[Impact Sockets](#)

[Torque Wrenches](#)

Your BMW 5-Speed Shifter Bushing Installation is complete!



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Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

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