BMW E46M Greasable FCAB Monoball Upgrade

Introducing the new Turner Front Control Arm Bushing Monoball Upgrade! The Turner engineering team set out to design a no-compromise solution that requires no modification and offers instantaneous cornering and braking response. Our control arm bearings utilize a unique greasable spherical bearing that is both serviceable and replaceable, with integrated dust seals to help keep dirt and moisture out. This bearing offers considerable improvement in both precision and durability compared to other unsealed poly and delrin bushing inserts previously available, which can wear prematurely due to contamination. The bearing assembly utilizes the highest quality materials, precision machining, and components to ensure a perfect fit and longest lasting component life possible.

The result is exceptional steering precision, turn-in response, and direct braking feedback with a minimal increase in NVH. These spherical bearings are a must have for any track car, but they can also be a great upgrade for any enthusiast that enjoys spirited driving in their daily commute.

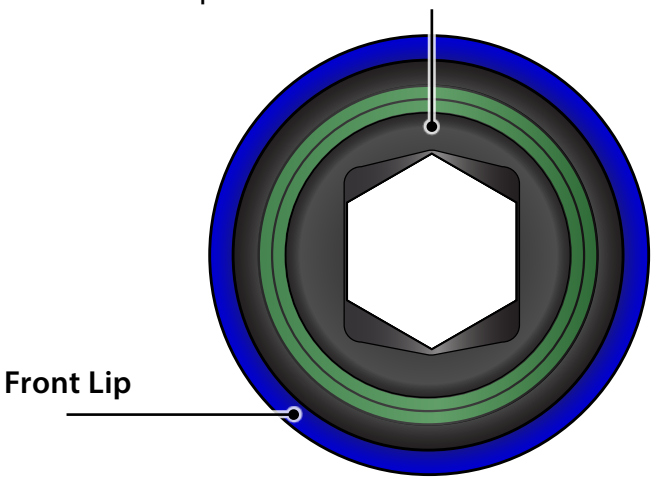
Installation time: ½ hour with the control arms removed

These installation instructions have been broken up into several sections:

Section 1: The Bushings

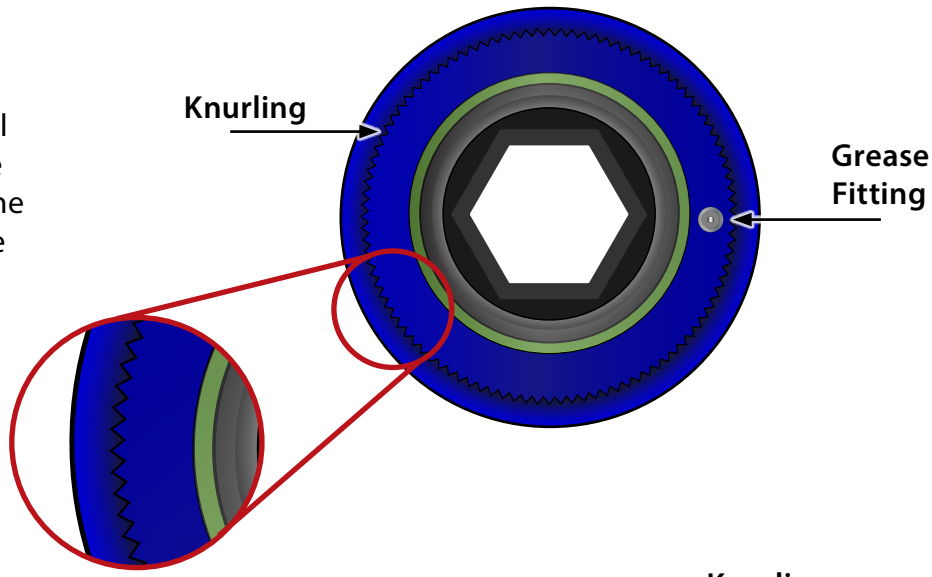
A high quality Moly grease must be used to grease these bushings after installation, and at a standard service interval of every oil change.

Note that the spherical bearing in the center of each bushing rotates smoothly. It is important to make sure this same feel is present after installation.

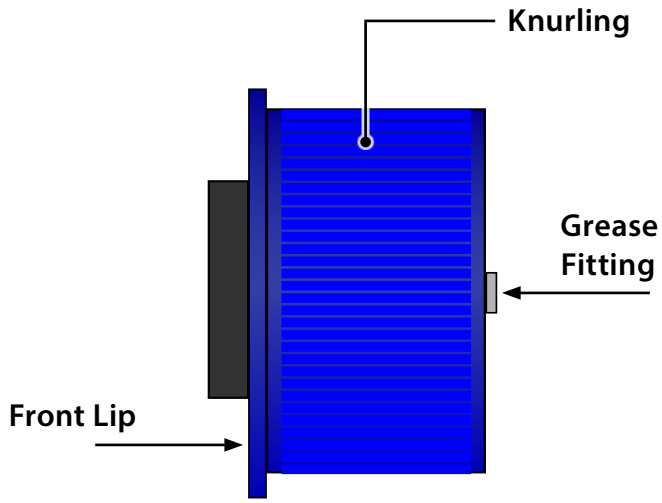


The left and right bushings are the same, and the front of each bushing has a lip that is a larger diameter than the body. On the vehicle, this side of the bushing will face towards the front of the car.

The rear of each bushing is quickly identified by the grease fitting. You will also see the knurled section around the entire circumference of the body. On the vehicle, this side will face the rear of the car.



Looking at the side view, you can see the larger diameter lip on the front side, the knurling around the circumference, and the grease fitting on the rear.



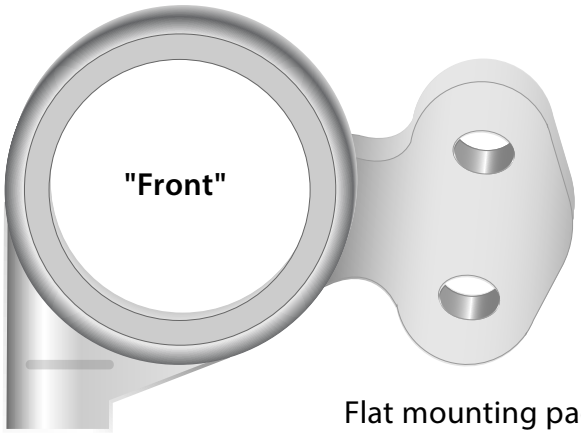
Section 2: The Control Arm Brackets

In order to properly install the bushings, a "front" and "rear" position must be identified for each of the control arm brackets.

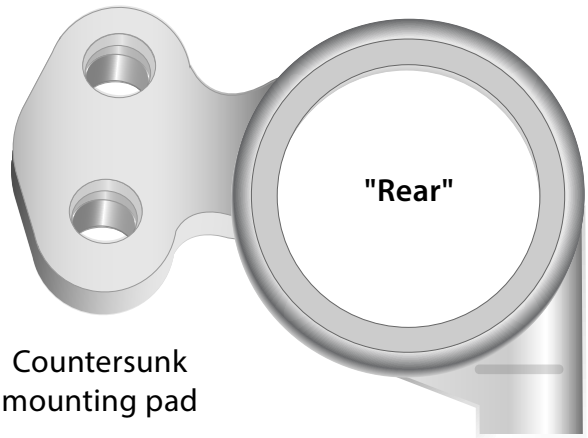
The left and right control arm brackets are different and are generally marked with an "L" or an "R", in many cases as a letter at the end of the part number. In order to determine the "front" and "rear" positions, lay them flat on a table.

The primary difference is the mounting pad of the bracket. The flat side faces downward when installed, and the side with the counter sunk holes faces upward, fitting over the locating dowels on the body. When mounted, the angle of the pad results in the bushing bore being in a vertical position, allowing you to determine which side of the bracket faces the front of the vehicle, and which side faces the rear.

Left Control Arm Bracket:

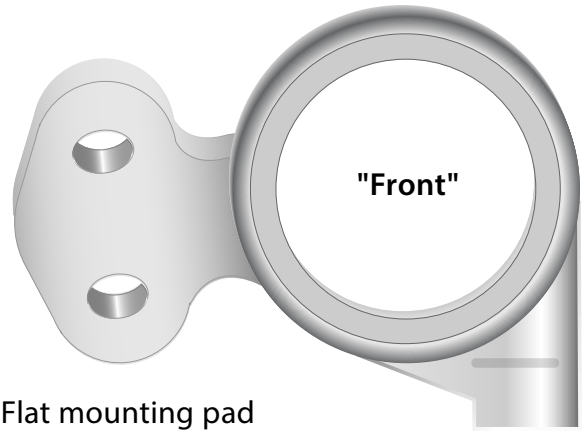


Flat mounting pad

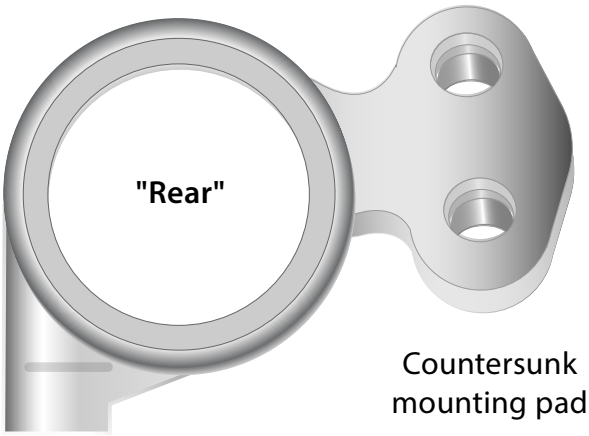


Countersunk mounting pad

Right Control Arm Bracket:



Flat mounting pad



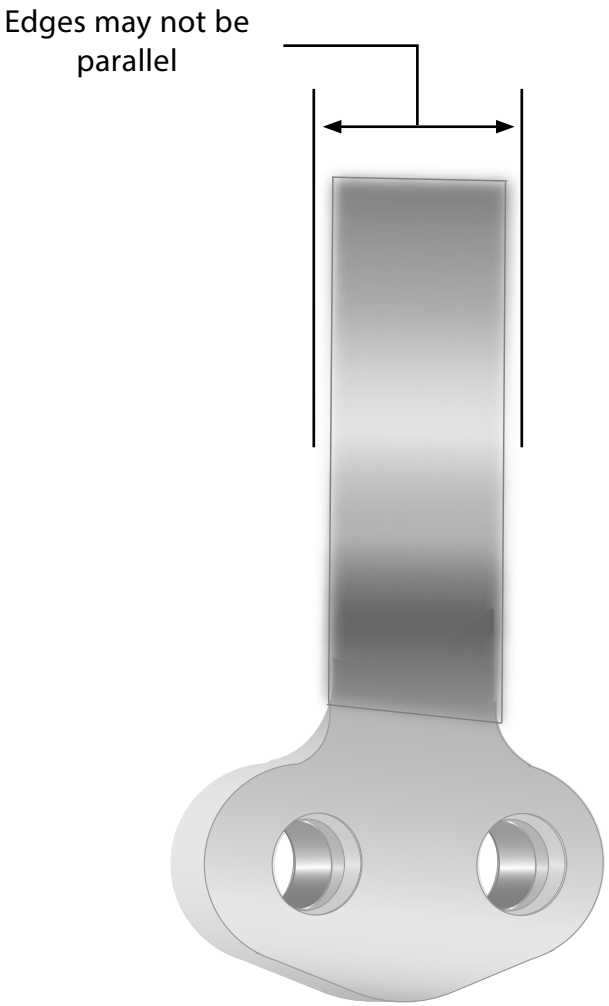
Countersunk mounting pad

Section 3: Preparing for Installation

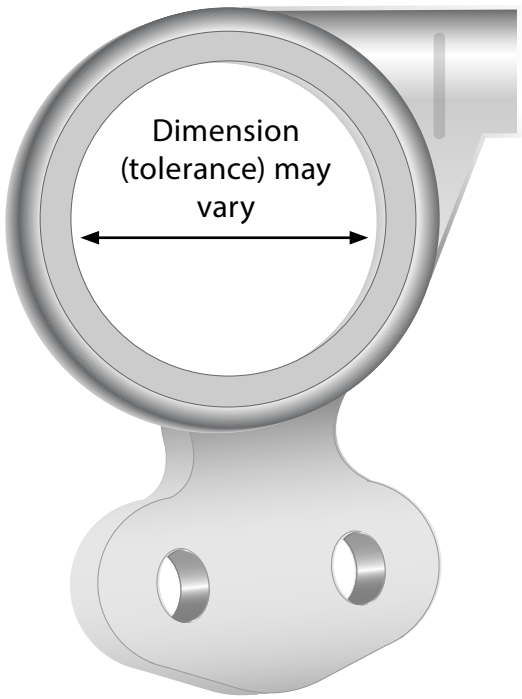
The bushings must be pressed into the control arm brackets, however you must first observe a critical design feature of these brackets.

When these brackets are made, the machined surfaces and angles are the only critical dimensions. As a result the castings themselves are made with somewhat "loose" tolerances. The factory bushings do not rely on the edge of the brackets for position, so these tolerances vary, and the edges may not be parallel. Also, since the factory bushings are rubber inside a steel cage and can withstand a varying amount of crush during installation, the bore dimension in the bracket carries a loose tolerance as well.

Side View of Bracket:



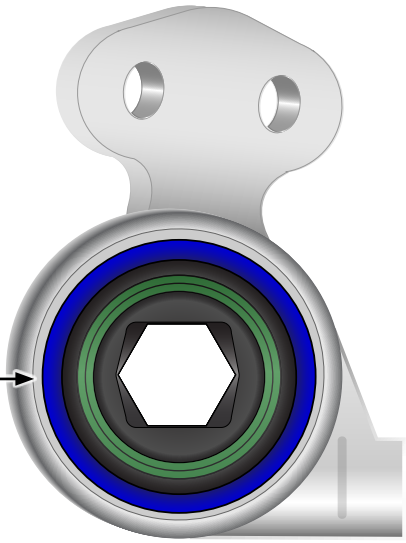
Front view of Bracket:

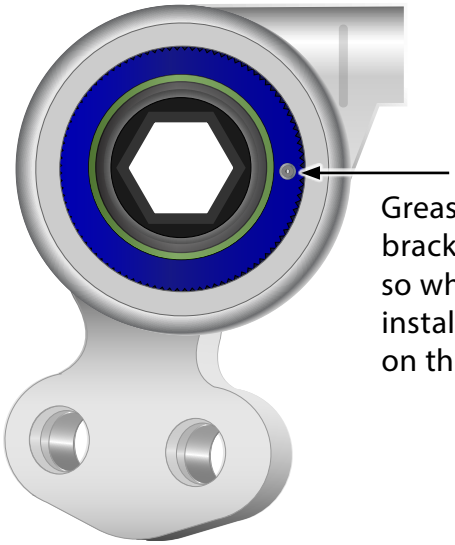


Section 4: Installing the Bushings

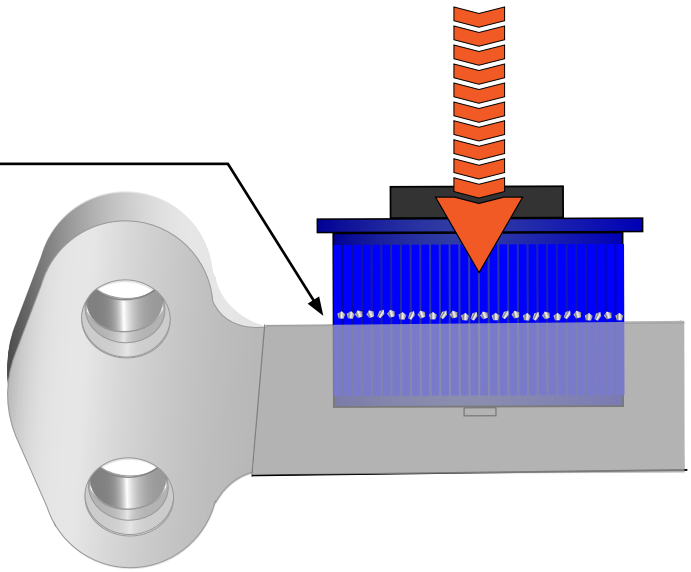
The installed position of the bushings is shown below. The lip of each bushing should be located at the "front" of the control arm bracket, which puts the grease fitting at the "rear". Also note that the grease fitting should be oriented at a 90° angle to the centerline of the bracket, and positioned so that when the brackets are installed on the car, the grease fitting is located on the bottom.

Installed Position of Bushings (LH Bracket Shown)

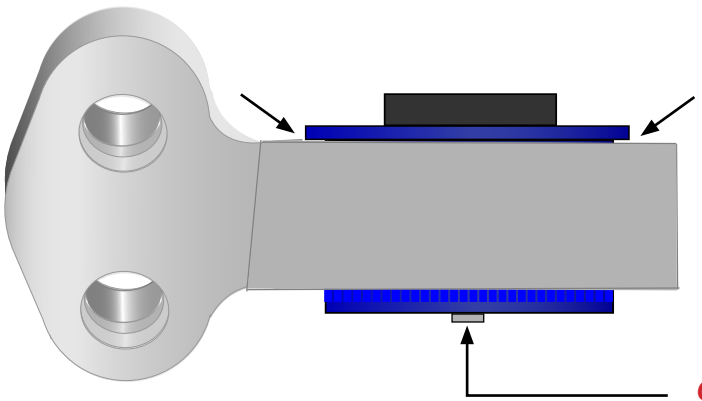




While pressing the bushings into the brackets, burrs may form at the edge of the bracket. Be sure to remove these completely as you go.



If the edge of the bracket is not parallel and one side of the bushing lip contacts before the other, **STOP!** This is normal, and a small gap on one side is **OK**. Pressing this flush will cause the spherical bearing to bind.



If the spherical bearing is binding after installation, press it back out, thoroughly clean all burrs from the bushing and bushing bore, then press the bushing back into place. In some cases, you may have to do this more than once, depending on variations in bracket tolerance.

Grease bearings before use. See page 2 for grease type.

Section 4: Installing the Bushings

When installing the upgraded brackets onto the control arms, be sure to align the wider edges inside the bearing hex with the wider edges of the hex on the control arm. Also be sure that the bracket is installed onto the control arm with the tapered side of the bearing hex facing as shown below.