

Differentials - 2002 and 320I

Early 1600's and 2002's came with a long neck differential. These were phased out in early 1969. They were either 4.11 to 1 (1600) or 3.64 to 1 (2002). They are very rugged and easy to come by, but not rebuildable. There are not really any parts available. If you want to switch to the later short neck type diff, you must replace the entire subframe and rear suspension. This sounds tough but is actually fairly easy and the parts are usually not expensive.

All later 2002's and all 320I's used the short neck differential. These came in several ratios:

3.36 to 1 2002 turbo; 3.45 to 1 some euro Tii's and 6 cyl E21's ; 3.64 to 1 most 2002's and all 4 speed E21's; 3.9 to 1 some 1976 2002's and all 5 speed E21's, 4.11 to 1 all 1600's

There are several variations in the short neck differentials. All of these can be transplanted into a 2002.

Variations and how to recognize them:

All 2002/1600 diffs have 4 bolts holding the side covers and the output flanges are held in by a large central bolt. CV's are attached the output flanges with 6 - 8mm bolts.

Early E21 ('77 and '78) 320I's have 4 bolts holding the side covers, but the output flanges are held in by a C-clip inside the diff. These diffs usually have 8mm bolts for the CV joints but some use the later 10mm bolts. These diffs are the same width as the 2002 diff so no spacers are necessary if you are putting one in a 2002.

Later E21's have 6 bolts holding the side covers and the output flanges are held by a snap ring just above the splines. You can easily pop out the flanges with a screw driver. These diffs nearly all use the 10mm bolts for the CV joints. These diffs are also narrower than the earlier diffs. If you want to put these into a 2002 you should use spacers to bring them to the proper width. Billet aluminum spacers and the proper bolts are available from Ireland Engineering.

It's common to put E21 diffs into 2002's either to get the 3.90 ratio or the easily available 320I's limited slip. The E21 diffs will bolt right onto the subframe and drive shaft. Just remove the 320I rear cover and install your 2002 cover. I already covered the width difference above. The other problem is 8mm bolts vs. 10mm bolts. If your new diff takes 10mm bolts for the CV joints, you have a couple of choices. Put 320I CV joints on the inboard end of the 2002 axle. Or drill and tap 6 new 8mm bolt holes in the output flanges.

Limited Slips and Gear Ratios

The gear ratio is stamped on the driver side of these diffs on the flat area in front of the side cover. It will show the number of teeth on the gears. For example: 11 40 is 11 on the pinion and 40 on the ring gear for a ratio of 3.64 to 1. If there is also a S stamped there the diff is a limited slip. Often the S is also painted on as well.

The 2002 was available with a limited slip diff but very few were sold with them. So it's not likely that you'll find one. If you do it may be marked "S 40" meaning 40% lockup. E21 320i's that were sold with the S (sport) package have limited slip diffs. All E21 limited slips are 25% lockup. Cars with 4 speeds had the 3.64 to 1 ratio and 5 speed cars had the 3.9 to 1 ratio. The 3.64 limited slip is nice for 4 speed 2002's and the 3.9 is preferred for 5 speed cars.

Modifications

Besides the ratios discussed there are a number of other gear sets available. Some of these are 4.22, 4.27, 4.37, 4.44, 4.75, 5.00 and others. Most of these are hard to find as BMW no longer will sell gear sets. We have sources for some of these gear sets. If you're going racing you may need one. We can adjust the factory limited slip up to 50-60% lock up. Or we can prepare welded (no slip) race diffs.