

E30 Limited Slip Clutch Disc Replacement

Disclaimer: The instructions that follow were compiled by amateur mechanics, with input from a few engineers. There is no guarantee that your differential will function properly after the rebuild. If you are hesitant about taking this approach, take it to a professional to have it rebuilt. The instructions do not include bearing or seal replacement, but we recommend inspecting these parts for damage and replacing if needed. If you do want to replace bearings and seals, see <http://forums.bimmerforums.com/forum/showthread.php?t=931518>.

The purpose of this guide is to provide the amateur racer with an affordable method to regain stock limited slip differential performance.

Step 1. Remove the differential from the car.

Step 2. Drain gear oil from the differential.

Step 3. Prepare a clean work area. You don't want any trash getting into the internal diff parts.

Step 4. Gather tools/materials. You will need to following: 13 mm socket, 17 mm socket, 6 mm socket hex bit, curved-end mechanics pick, small pry bar or medium sized flat blade screwdriver, a dead blow hammer, 75-90W gear oil (Redline, or other off-the-shelf, with LSD additive), compressed air, impact wrench, torque wrench.



Step 5. Remove the rear cover (17 mm hex head bolts).



Step 6. Remove the output shafts. These should just pop out with a little tugging, but you may need to use a pry bar to get them out. They are splinned shafts and held in by a small circlip.





Step 7. Remove the outer bearing races/housings (13 mm hex head bolts). The differential housing should be lying horizontally, as it is when in the car, before you start this part of disassembly. You may have to give these a tap with a dead blow to get them loose and use a pry bar on the tab (facing up in installed position) to get them loose enough to remove. Keep track of the spacing disks since these determine bearing clearance (i.e., right and left may be different, so make sure you replace as removed). Carefully lower the internal assembly to the bottom of the case as these are removed to avoid damaging the ring gear and pinion.





Step 8. Pull the limited slip assembly from the housing. Stand it on end so that the bearing with the cover plate side is facing up. Remove the 6 mm half-height socket head screws. Be careful as you may strip out the heads (as we did).



Step 9. Remove the cover plate. This may require to gentle prying with a pry bar or screw driver. Move around prying small amounts around the surface. This will require some patience. As the cover is released pay careful attention the washers underneath. These will need to be reinstalled in the same order. In addition, there is a larger convex washer. This will need to be reinstalled later in the same direction.





Step 10. Remove the internal parts – friction surfaces, clutch discs, gear clusters. One of the clutch discs will be one side of the center gear cluster, the other one on the other side. As you remove the parts, it may be helpful to stack them as you remove them so you can reinstall in the same in order.







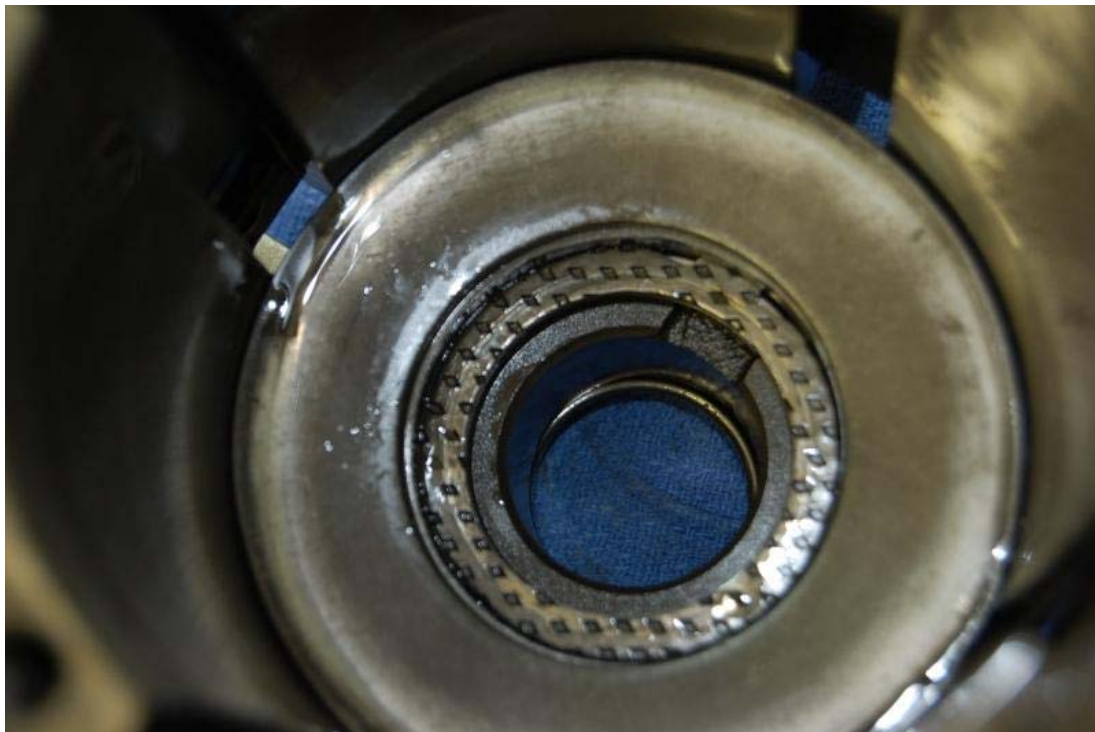




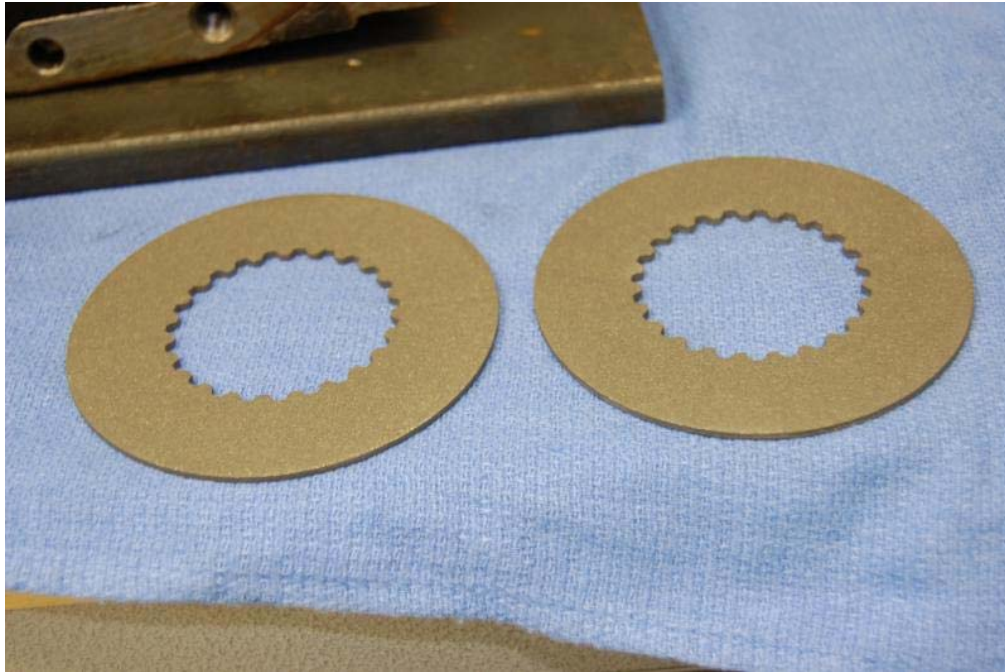






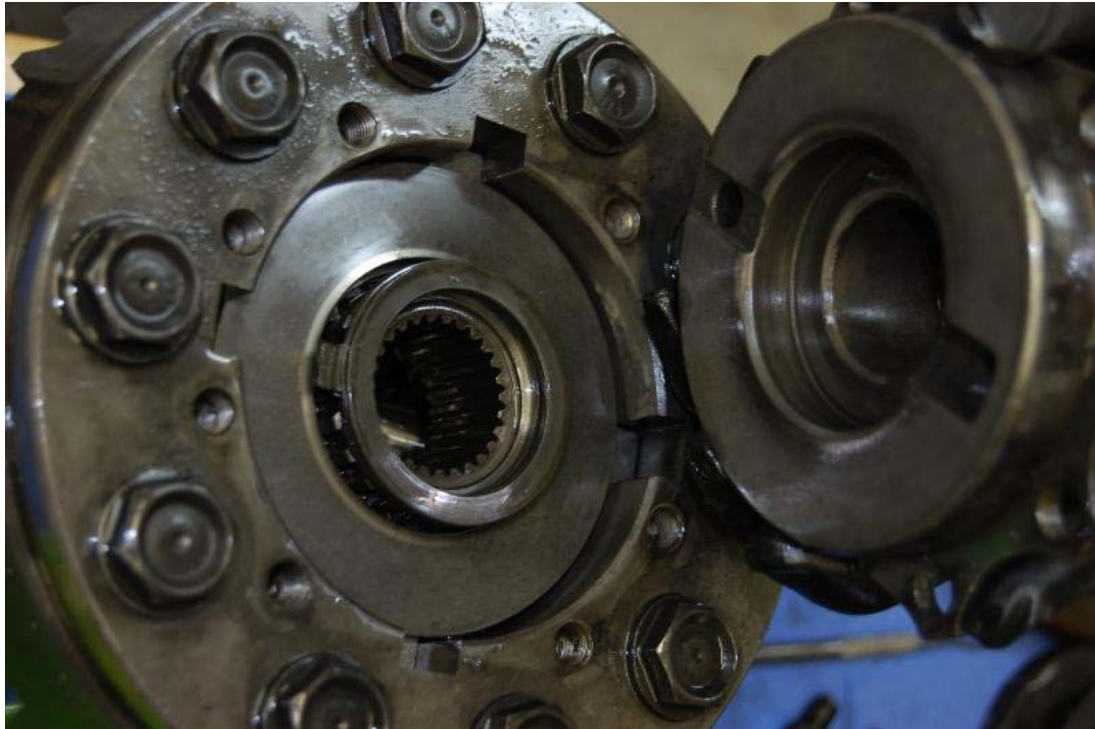


Step 11. Install clutch discs. Adjacent to each disc is a dog ring friction disc. These should be flipped to provide a fresh friction surface.





Step 12. Reinstall internal components by reversing order of removal. Replace cover. This will require some finesse to make sure everything is in alignment. Threading bolts in several holes make help with keeping appropriate alignment of the cover and the bolt holes. Torque the 6 mm socket head screws to 10 ft-lbs. Lock-tite is not required, but we used it. It may be helpful to use one of the output shafts to align the washers that go inside the cover. Note the location of the tab on the lower washer and the notch in the cover.







Step 13. Replace the internal assembly into the case. This can be done alone, however having a second person may help. You will need to hold the assembly and rotate in input shaft to mesh it with the ring gear. This will need to be done as the outer bearing race covers are placed back into the sides of the case. Replace the 13 mm hex head bolts and snug down.



Step 14. Replace the cover with 17 mm hex head bolts. RTV may help prevent leaks. Snug down and fill with gear oil.

