# Adding New Clutches to an R200 LSD
## (Clutch Type Limited Slip Differential)

Here is a step by step guide on rebuilding the clutch packs in the z31 R200 LSD. (Clutches = friction discs)

In summary a large problem with the Nissan CLSD was that from the factory, presumably to save money, they only installed two clutches and filled the extra space in the clutch pack with two spacers. This, along with wear over time, makes many of these LSD's very weak with almost no breakaway torque. These spacers can be removed and replaced with extra clutches, to make the unit have a total of 6 clutches, how it should have come from the factory. (The Nismo unit came with 4 clutches)  Shims are then added to adjust the breakaway torque. You can no longer get replacement clutches, as the stock units are now NLA.

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Start by removing the rear differential cover and the main bearing caps. This will alow the LSD unit to be pulled out. Its take a good bit of wiggling and working but will eventually come free, I used a wooden dowel and taped it easily through the axles holes to get it started.

KEEP TRACK OF THE SPACERS, the LSD unit is aligned in the case with spacers on both side. Take pictures and/or mark which side they go on.
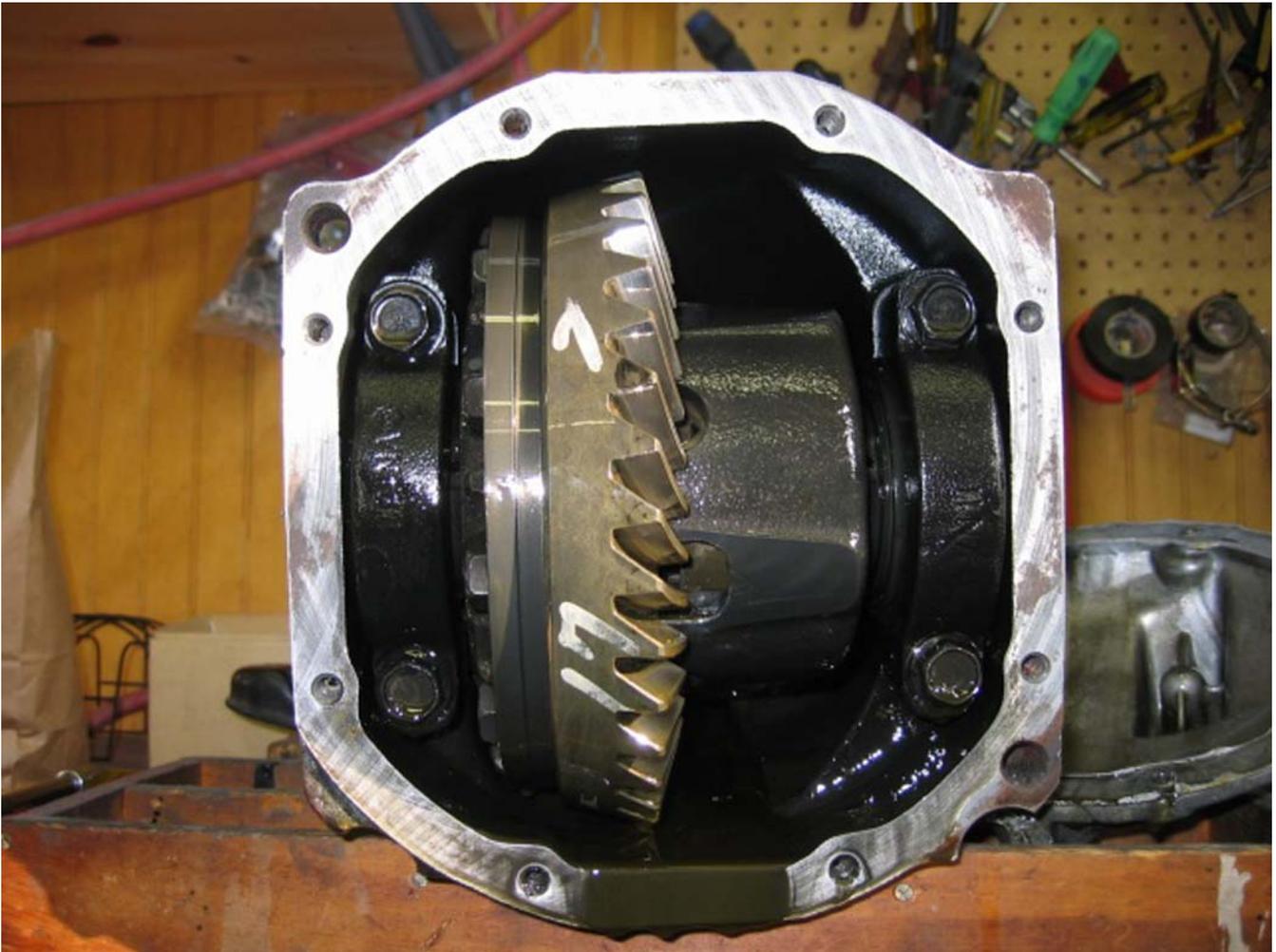
Here is the LSD unit and the spacers laid out on the bench:



Next remove the ring gear. Once the bolts are removed, tt should slide off fairly easy with a few taps from a rubber mallet. I marked the position of mine relative to the LSD housing for safe measures. Once the ring gear is removed you will gain access to the four phillips screws that hold the unit together.

These can be a pain to get out as the unit is loaded. Grab a couple spare bolts and nuts and put them through the ring gear holes to take pressure off the screws. Once you get the screws out you can open the LSD housing and take out the internals. You will see:

spacer (which will be removed)
spring disc
spring disc
plate
clutch
plate
center section
plate
clutch
plate
spring disc
spring disc
spacer (which will be removed)

Heres a picture of the contents laid out on the work bench (sans spacers):



The discs with internal tabs are the clutches. The discs on the ends that look like plates are springs they are dished (kinda hard to see in the picture)

With the new clutches the unit will be assembled as follows:

spring disc
spring disc
clutch
plate
clutch
plate
clutch
center section
clutch
plate
clutch
plate
clutch
spring disc
spring disc

I bought .004 SS shim stock from Mcmaster. I use the spacer as a template and cut the stock using a good pair of scissors.

The shim will look like this:                    Picture of my testing apparatus using r200 stub axles:




I used a cheap ($10) beam style torque wrench from autozone to make the measurements. It was placed on the bar at the welded nut you see in the picture. All differentials are going be give slightly different results based on the wear of the clutches and the thickness of the new clutches along with the amount of friction provided by the type of oil you use,

However here are my results which may help as a baseline, I used Mobil 1 sythetic gear lube (75w-90) and Tran X LSD additive. I mixed up approximatly the amount that you would have in the differential to get the right ratio for testing.

A base line test without shims netted me 45 lb/ft for breakaway...

(.004 SS shims)
4 Shims - 60 ft-lbs
5 Shims - 75 ft-lbs
6 Shims - 90 ft-lbs

From research on this board and other sites, it seem that 60-75 ft-lbs is best suited for a street/autocross car perhaps you may want a little tighter for the track, its all your preference.  (Note: several diffs done with this mod and using a .020 shim with 2" I.D. & 3.5" O.D. netted a breakaway between 75-80 ft-lbs)

Putting it back together is the same as disasembly, make sure the case marking on the LSD unit align and you get your bolts torque down to spec. Its a good idea to replace the axle seals as well while youve got the unit apart. Torque specs for the rear main caps are 65-72 ft-lbs.

Credit: Thanks to 240hoke at Hybridz.org for putting together this article!!