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256
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695
Posts

Drives: '08 128i
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Location: Orlando, FL

iTrader: ([0](#))

Garage List
2008 BMW 128i [5.00]

3.23 to 3.73 differential swap DIY AKA poor man's supercharger

This only applies if you have manual transmission!!

So the manuals for N52s all come with a 3.23 ratio diff, but the autos have a 3.73 in the exact same case. The 330i's have a 3.15/3.64 (respectively) and I'm told you can swap them all around. But the the easiest thing to do is buy a 3.73 out of a 2007-2013 328i from a junkyard. You can find them for \$100-\$300, depending on age and condition.

We need to remove (2) 18mm, (1) 21mm and (16) E12 bolts, so get the right size bits. It's a bit cumbersome so I had to use short and medium length extensions, a 3/8" and 1/2" breaker bar, 18/21mm box wrenches and various socket adapters.



I sourced mine from eBay from an '06 325i. Mine didn't have the axle flanges for whatever reason, but those swap right over from the old diff. Just grab a crowbar (a giant flathead won't work sadly), get some leverage and pop them out. They're held in with a C clip (p/n below and you should replace them). They go back in even easier, just oil it up well, line the splines up and either hit it with a rubber mallet or step on it, it'll pop into place.

Since the diff is old, it leaked, so I had to drop the diff a second time. Don't be me lol.



Grab some RTV, new seals and threadlocker (if you wish for the driveshaft). These seals have to be taken out carefully so you don't score the sealing surface, and pushed in at a certain depth. Too far deep and you wasted that seal, since you can't really remove it without ruining it. I just brought my diff to a local BMW tuner and had them deal with it.

Driveshaft seal **31507609535**

Output flange seals **33107505604**

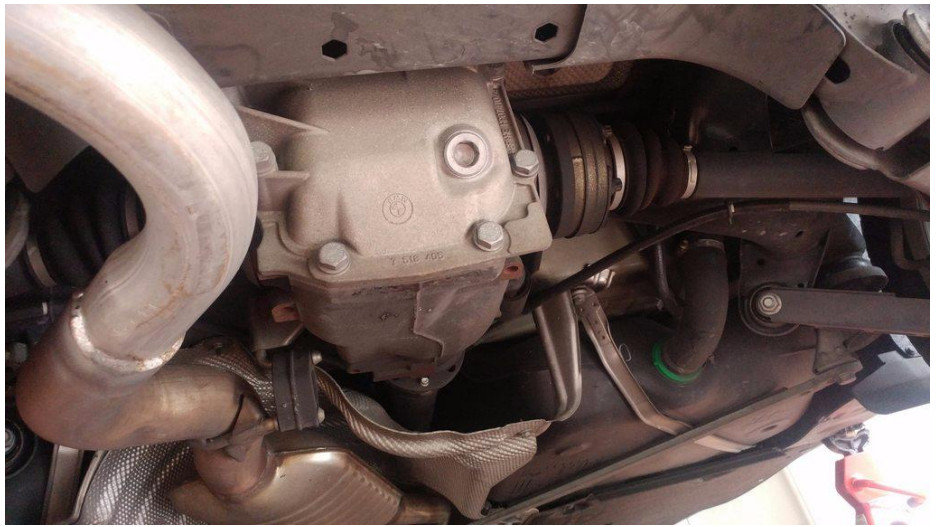
Lock ring for the output flange **33131214961**

I chose to apply new RTV to the cover as well. There's a million guides on how to do this, I torqued my cover to 30ft/lbs. **edit: service manual says 40lbs, but I've had no issues**



Looked good in here! No chewed gears or bearings. Let's install it.

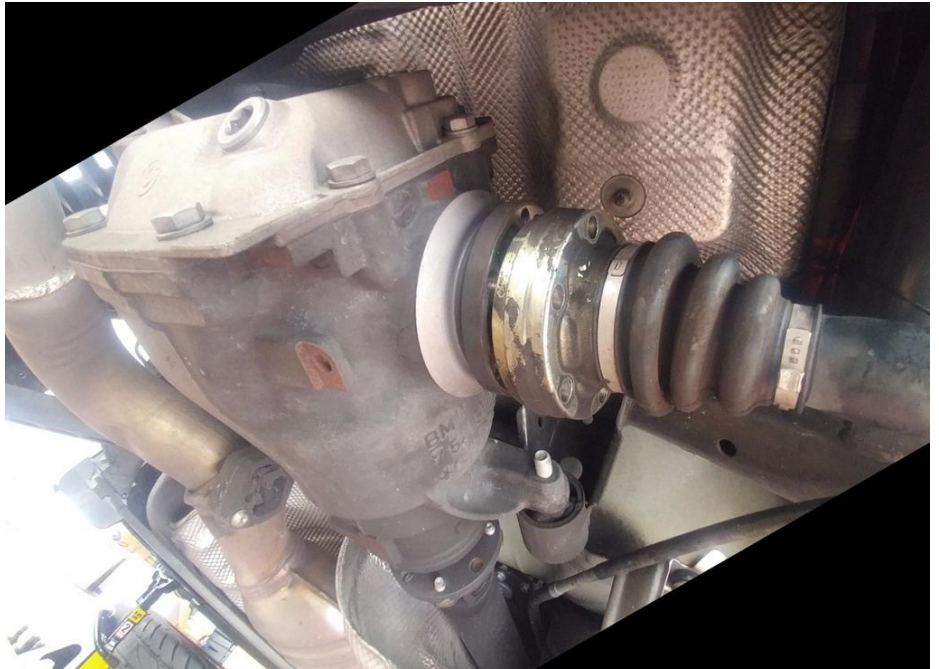
First, jack up the car, get the rear as high as you're comfortable with and take off the rear wheels. Pull the e-brake and put it in gear.



The slow 3.23 we need to remove.



Remove the 10mm bolt and bend the heatshield away from the driveshaft. Remove the E12 bolts. Grab a friend to sit in the car operating the e-brake so you can break a bolt loose, turn the shaft, then break another bolt loose.



Use the E12 and remove the axle bolts. One axle will sit on the exhaust but the other will hang, so I just held it up with zipties. Same deal as the driveshaft, but there's a lot more bolts lol. The E12 bit gets squished right next to the CV boot, so this part is a pain in the ass.



There are 3 bolts holding the diff into the rear end. 2 in front (18mm) and 1 in back (21mm). Also circled the heatshield bolt.



Doesn't really matter which bolt you remove first but, once you take the first one out, break the others loose and hold the diff up with the jack, then remove them. Definitely get a friend to operate the jack as you guide the diff out. It's heavy but balances well if you put the jack in the right spot. This part is mostly finesse. 2 of the bolts have nuts so you're gonna need both a box and socket wrench.



It's out!

And now the new diff goes in just like the old one came out. Jack it up, thread in a bolt, adjust the jack and thread in the others. Just take your time. Edit: for the torque specs I just made them all "gutentite" but if you can fit a torque wrench up there the specs are:

Tightening torques	
Differential to subframe <ul style="list-style-type: none"> • Front mounting bolts (M12) • Rear mounting bolts (M14) 	100 Nm (74 ft-lb) 165 Nm (122 ft-lb)
Rear driveshaft to differential (flex-disc) <ul style="list-style-type: none"> • M10x10.9 (replace ZNS fasteners) • M12x10.9 (replace ZNS fasteners) 	20 Nm (15 ft-lb) + 90° 55 Nm (41 ft-lb) + 90°
Rear driveshaft to differential (universal joint) <ul style="list-style-type: none"> • M10x10.9 (bolt with ribbed teeth) (replace ZNS fasteners) • M10x10.9 (and M3 models) (replace ZNS fasteners) 	40 Nm (30 ft-lb) + 45° 20 Nm (15 ft-lb) + 90°
Rear driveshaft to differential (flange nut)	75 Nm (55 ft-lb)
Drive axle to differential flange: <ul style="list-style-type: none"> • Torx M8 (replace bolts and washers) • Torx M10 (replace bolts and washers) • Torx M12 (replace bolts and washers) 	52 Nm (38.3 ft-lb) 70 Nm (51.6 ft-lb) 120 Nm (88.5 ft-lb)

<https://www.ecstuning.com/b-genuine-...s/33207572716/>

<https://www.ecstuning.com/b-genuine-...h/26117571956/>

The diff uses 75w-90 API-GL5 oil, just over 1qt of it. Easiest to fill 1 full qt while it's out, then top it off when you install it. The drain plug is a 14mm hex.

Now go rip it! This swap is a lot of fun for not a ton of cash. It really wakes up 3rd gear.

BMW 128i 3.73 diff acceleration runs



In action

PM me if you're selling 1-series rear mudflaps or side/rear sunshades!