

Front CV joints service

By Alejandro Gabatel, for <http://www.ladaniva.co.uk/>

The new front diff bracket won't allow the front CV's to be removed as easily as with the stock configuration. That's why I decided to take some time to do a bit of maintenance on them before putting the front end together.

This is the stuff I used for doing one shaft:



In the upper row: Bucket and parts-cleaning brush, gasoline (or the solvent of your preference) and old rags... Middle row: Cable ties (I use ties instead of those tuna-can-like steel clamps), two new CV boots, a tube of good-quality grease (I'm using Mobil 1 synthetic for this job), one 57x40x10 oil seal for the inner CV bearing retainer plate and one NTN 6306ZNRC3 bearing. Tools: side cutting pliers, needle-nose pliers, conventional mechanic's pliers, Vise-Grips (two are better than one as well see later on), small flathead screwdriver, ball peen hammer (also called mechanic's hammer), Vinyl gloves (for washing the parts) and Latex gloves (to save time cleaning your fingernails after work ☺).

Start work by removing the boots. Guess the bloke who rebuilt my CVs three years ago liked to keep it cheap... He used wire instead of plastic ties or clamps:



Use the small screwdriver to pry the wire retainer/circlip out of its groove and pull the joint out of its housing:



This is one of the reasons why I like to do this kind of work myself. I found out -much to my surprise- that the cage was installed backwards... The tapered portion needs to point towards the shaft (not towards the joint housing as shown in the picture). What I can't figure out is how this CV didn't knock and grind its own way to self-destruction... Well, at least I'll get to do it right this time...

Remove the balls and cage from the inner joint race and toss everything in a bucket:



...After which the old grease is removed from the joint housing cavity. This is where the Latex gloves prove to be a good investment:



Next, put on the Vinyl gloves and give those bits a good cleaning. I like to set the parts over some newspaper after the usual scrubbing:





I'm not knocking the holder/race off the shaft so it gets the brush too:



Since I'm putting in new ones, the old boots are knifed for good:



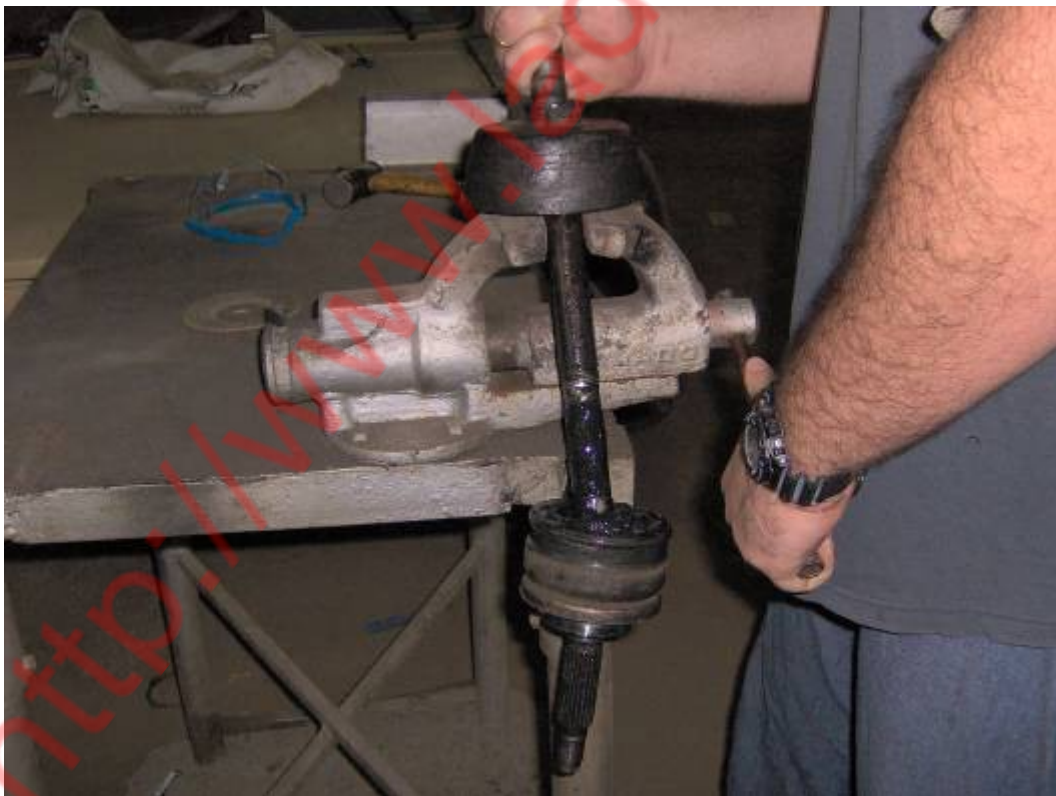
The tie/clamp holding the outer boot shield is cut before cutting the boot itself:



...Peel off the old boots and it's ready to go...



Clamp the shaft firmly on the vice:



I've removed some of the grease to show the striking point:



Then it's just a matter of giving the holder a single good smack while pulling the joint down with your remaining free hand and off it goes (**WARNING:** Make sure you hit right on the holder. Hit the cage and BAM!, it's naffed...):



Remove the wire retainer/circlip:



The thrust ring is then removed (this is where two Vise-Grips come in handy)



Clamp the outer joint in the vice and remove the steel balls by pushing the holder and cage with a piece of broomstick or other bit of wood. Some of them might be easier to remove than others, but we can use the screwdriver to gently pry the bastard ones out:



With the balls out now it's time to withdraw the cage/holder assembly from the outer joint cavity. The cage has two elongated and diametrically opposed holes which must be aligned with the straight protrusions of the cavity (located between any two adjacent semicircular slots) before it can come off. I reckon the rather vague explanation might not make much sense, but the following pics should give you a better idea of what we're after here:





If you have an air compressor cleaning the parts is a breeze... Here, I'm using the cleaning gun to blast some Diesel fuel on those bits (you wouldn't believe how much dirt, mud and grease came off the outside of those housings):



After washing and air-blasting the parts it's time for a little inspection. All balls, cages and races shouldn't show any signs of heavy wear. No single joint

parts are sold separately, so if any of the joints are knobby and their bits look severely worn there's no way around but getting a new joint -or worse- a whole new shaft ☹:



This cage didn't look too good on the outside...



This outer joint holder didn't look too good either. I'm surprised this CV didn't make the slightest knock ... Since it was dead quiet in operation, and also since I'm on a very limited budget at this moment (and won't be doing much if any hardcore off-road stuff after), I'm putting it back together as is and pray it lasts for at least two more years...



The housing slots show some contact marks, but once I rubbed my finger on them I couldn't notice any significant wear (well lucky me):



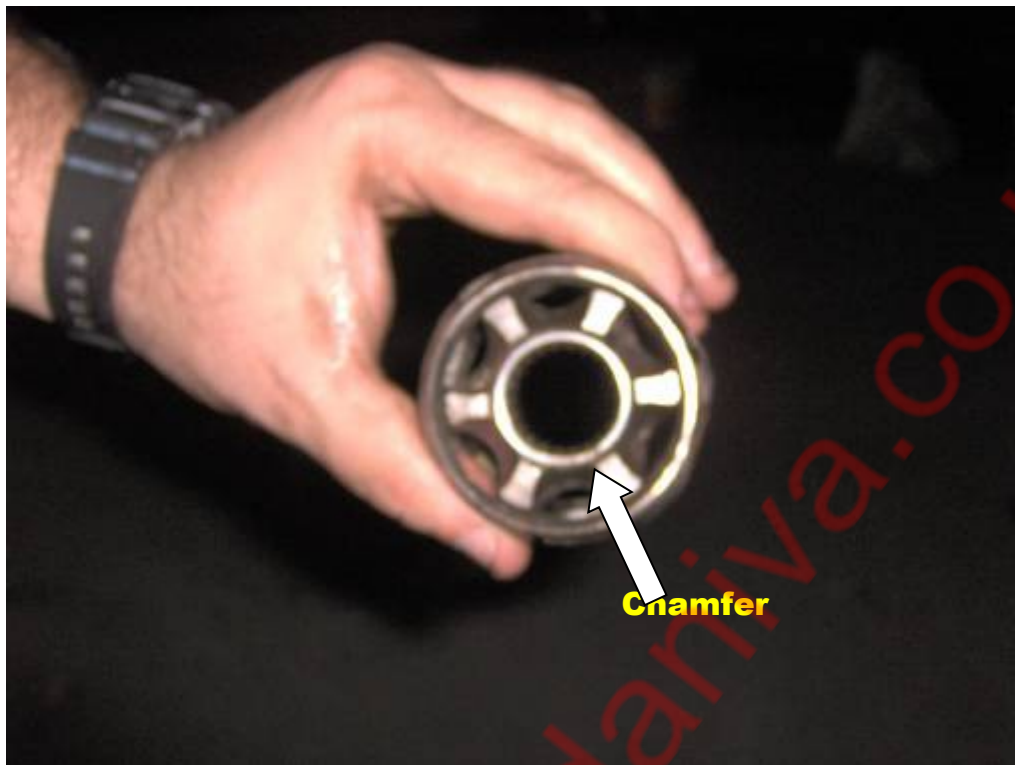
Since Diesel fuel is kinda oily, all parts get a good spray of carb cleaner and an airblast before the final assembly:



Put together the cage/holder assembly:



This is how it should look... Rule of thumb: The bevel/chamfer must always face the shaft, not the joint housing ...



The parts won't be greased at this moment for demonstrative purposes only. Remember? The elongated cage holes must line up with the straight inner joint wall protrusions:



Now it's time to get messy again... Toss some grease inside that housing:



Coat the cage and holder with a thin layer of grease...



...Before installing the assembly into the housing cavity:



Followed by the six steel balls...



The three first ones are a piece of cake, usually the remaining three are the ones that need a lil' persuasion (as with a piece of brass rod) to snap back in place:



Once all the balls are in, pack some more grease until it comes out of in between the balls and the housing inner walls:



Apply some grease to the new boots:



...And simply slide them over the shaft. The internal one goes in first, the stock internal boots have a different shape but I'm using external ones on either side since I found the internal type breaks more easily::



...Followed by the outer boot shield ...



...And followed by the outer boot itself:



Install the thrust ring onto the shaft (here I'm using a $\frac{3}{4}$ " NPT pipe ring fitting as a driver):



... Followed by the retainer ring/wire circlip. This is how they look once installed on the shaft:



Insert the splined end of the shaft on the holder and simply push it down. The pushing action compresses the retainer/circlip into its groove as it passes through the holder's beveled chamfer and splines; once the end of the shaft comes out of the other side the circlip springs back and keeps the shaft from parting ways with the holder. After doing so, it's a good idea to give the shaft a good yank to ensure it's retained properly on the holder...



Now pack some more grease (just in case)...

Something to have a think about before you do the final version. As the suspension flexes up and down the CV's go in and out like giant syringe pistons. If there's too much grease you can actually burst the CV boots.



Slide the boot over the joint and fit one of the cable ties. Pliers are used to zip it on real tight...



Also use a tie to hold the boot and shield together:



...This is how it looks after some trimming. Nice:



Knock the old seal off the bearing retainer plate and install a new one (I used a 1 1/4" NPT pipe cap to drive the new seal in and it works perfectly)



Apply some grease to the seal lip:



...And then slide the bearing retainer plate over the housing stub shaft.
Use a rag to clean all grease from the bearing's landing place:



Since these NTN bearings have a shield facing the inner side of the diff (which will keep the bearing from getting any oil), I packed them with lots of grease before installing them on the inner CV housing:



Since I didn't have any other appropriate tool handy, I used a piece of 1 1/2" PVC pipe I had lying on the shop's floor to drive the bearing into place:



Slide the thrust washer in, followed by the bearing snap ring and fit the latter into its corresponding groove with the aid of external snap ring pliers:



...Looking good so far...



Fill about one third of the inner CV housing cavity with grease:



This is the moment when reality struck me badly... ☹



Turns out I forgot to install the inner CV cage before sliding the new boots in (insert lots of bad words in Spanish language here), and since my lovely wife stopped by the shop to take the camera for a while I couldn't take

any pics of the procedure, but basically what I did involved clamping the shaft back in the vice and smacking the crap out of that holder until it finally came out... With the holder out, it's just a matter of sliding the cage in (smaller end first, please) and refitting the holder to the shaft.

I couldn't help but thinking that the bloke who rebuilt my CVs evidently made the same mistake I did, only that he slacked out and chose to leave it be. "Who is gonna find out once everything is assembled, covered with all that grease and hidden behind that boot???" Were, most likely, the thoughts that crossed his pea-size brain back in that moment.

It is because of people like this chap that I try to do everything myself. If it ends up working fine I get this satisfying feeling of knowing I hit the nail on the head; and if something breaks... Well, there's always the experience and a lesson learned the hard way, a lesson which is not forgotten easily...

Once the cage is installed THE RIGHT WAY it's time to coat the balls with some grease and snap them on their holes in the cage:



...Then slide everything inside the inner CV...



Fit the big wire circlip into its groove in the joint housing cavity:



...And finish work by fitting the inner joint boot just like we did with the outer joint a few pages back.

I hope you all find this write-up useful. As you can see there isn't any rocket science involved, it only takes some tools, a little time and some patience to nail it.

See you around,

Alejandro Gabatel, August 2007.-

<http://www.ladaniva.co.uk>