



INSTALLATION INSTRUCTIONS



AXLE MODIFICATION INSTRUCTIONS

PART #: 24300

24300

PART #	DESCRIPTION	QUANTITY
24303	4340 Axle shaft	1
1000-125	C-Clip	1
16300024	Oetiker Clamp 33.6mm-40mm	1
16300046	Oetiker Clamp 106mm-114mm	1

REQUIRED TOOLS

- Mallet / Hammer
- Snap ring pliers
- Oetiker clamping pliers
- Rubber gloves (lots)
- CV joint grease
- Chop saw
- Pick
- 30 Ton Hydraulic Press
- Chisel / large flat blade screw
- Driver
- Putty knife
- Duct Tape
- Paper bowl

IMPORTANT

Note: You will be modifying the DRIVERS side front axle, this must be the 6-Ball style inner axle (There is a Toyota sticker on the factory shaft that will have part# 42420-AK020). This modification does NOT apply to the Tripod style inner joint axle.

6-BALL CV JOINT



TRI-POD CV JOINT



STEP 1

With the axle removed, make yourself a clean work area free of any metal particles that could contaminate the grease or parts that you will be working with.



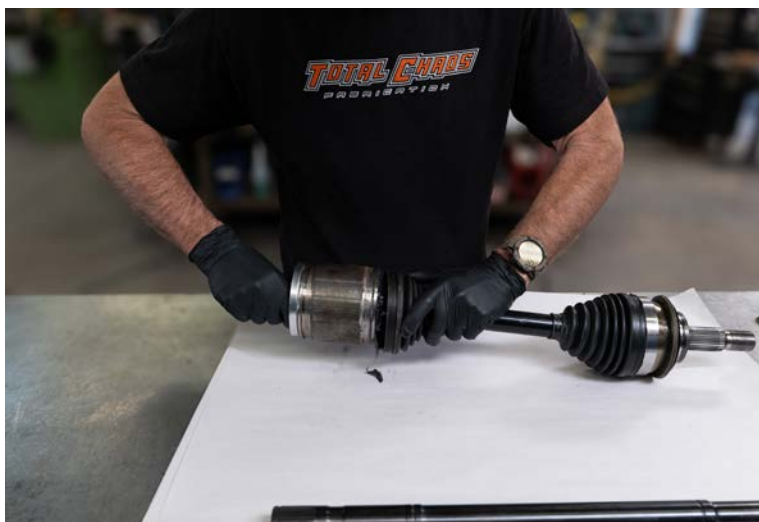
STEP 2

The first step in the process is going to be using a chisel or flat blade screw driver to remove all 4 of the factory Oetiker CV boot clamps.



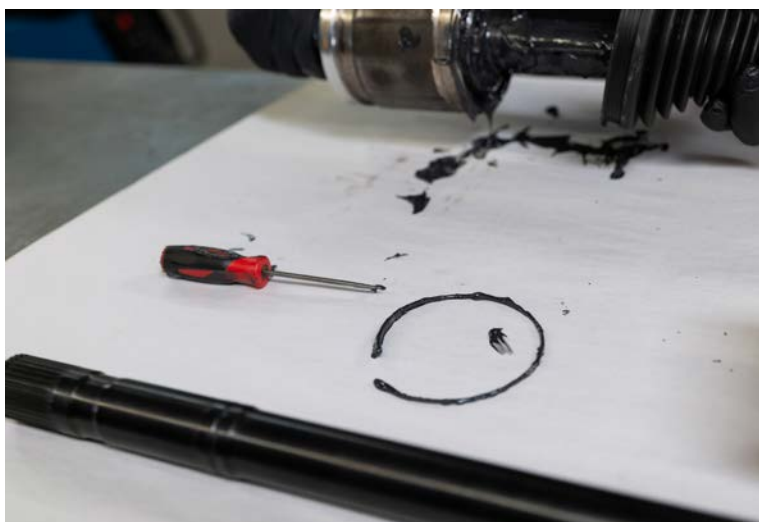
STEP 3

Working on the inner CV side first, use your fingers to pull the large side of the boot free from the 6-ball inner CV housing.



STEP 4

With the boot pulled back onto the shaft, you will notice that the joint will not pull out of the CV housing, this is because there is a thin large diameter wire snap ring that is just inside the lip of the CV housing. You will need a small pick to reach inside that lip and pick out and remove the snap ring.



STEP 5

With the boot pulled back and snap ring removed, you can pull the joint out of the housing. Be careful as you pull the joint out of the housing as the balls on the bottom of the joint will fall onto the workbench and have a tendency to roll away.



STEP 6

Remove all of the balls, keeping them clean and set aside.

**STEP 7**

You will now be left with just the cage hanging on the star.

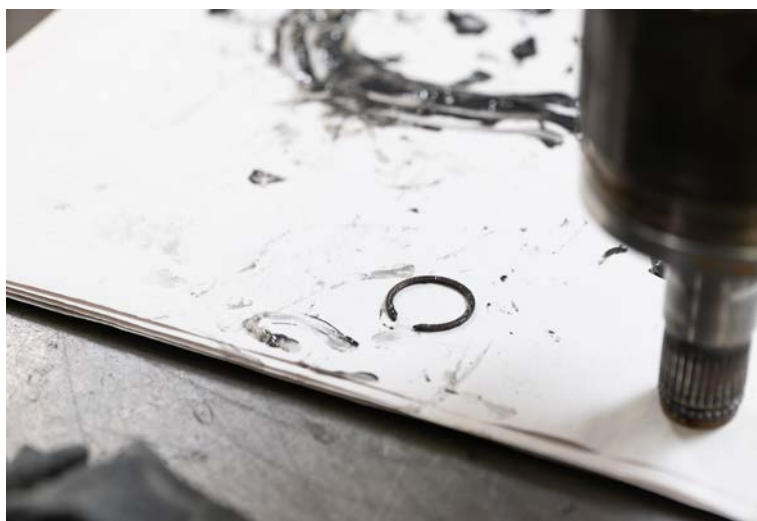
**STEP 8**

Slide the cage off of the star and down, next to, or into the boot.



STEP 9

Clamp the axle shaft in a vise so the shaft is vertical with the star facing upward and clean the grease off the end of the shaft where you will find the snap ring that holds the star onto the shaft. We use a pair of flat nosed snap ring pliers and a pick to remove the snap ring.



STEP 10

With the snap ring removed, slide the cage and boot further down the axle shaft so that you can slide the axle down into the vice jaws until the star is sitting on the top of the vice (do not tighten the jaws on the shaft, leave the vice just loose enough so it isn't grabbing the shaft). Use a hammer to strike the axle shaft downward to free it from the star being careful to not damage the splines on the inside of the star. Be ready to catch the axle assembly as you tap the axle through the star. Finally remove the inner CV boot from the shaft and wipe any grease from the shaft.



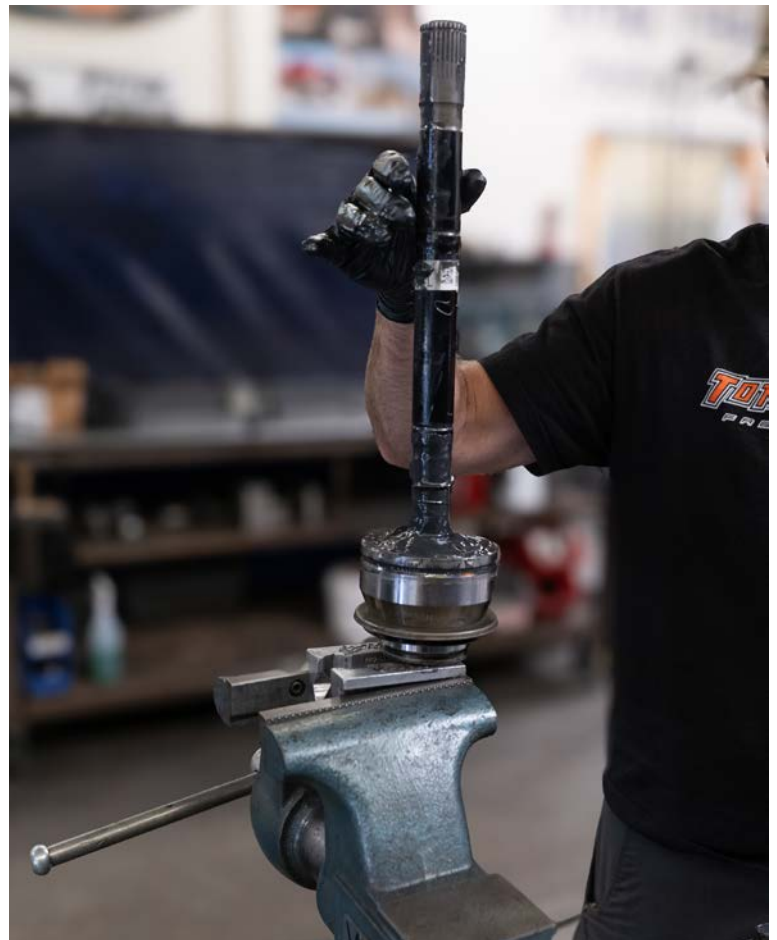
STEP 11

With the inboard side of the axle now bare, clamp the splined side of the outer joint in the vice with the bare side of the axle sticking up. Carefully using a pick, break the boot seal on the small side of the boot by running the pick in between the shaft and boot working your way all the way around the shaft being careful to NOT poke a hole in the boot.



STEP 12

Use your fingers to break the seal on the larger side of the boot, then work the boot upward all the way off of the shaft.



STEP 13

Using a putty knife and your fingers try and scoop as much of the factory grease out of the joint as possible and save it in a paper bowl.

**STEP 14**

Clean all of the grease off of the outside of the CV housing and axle shaft, then use duct tape to cover the opening of the CV, wrapping the tape around the shaft and making the joint completely sealed.

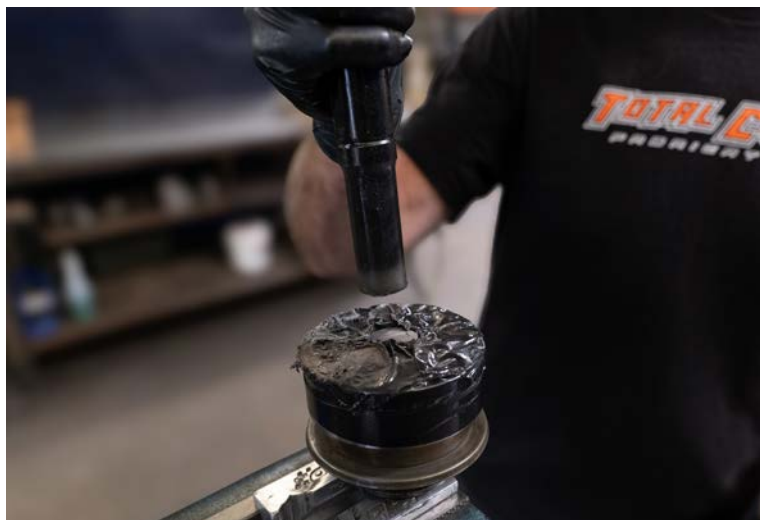


STEP 15

Using a Chop saw, situate the axle and CV as close to the CV housing as possible without cutting through the tape that covers the housing or cutting into the housing itself.

**STEP 16**

Now that the axle is cut, set the axle in a vice with the spline side being held and the duct taped side facing up.

**STEP 17**

Remove the duct tape and carefully wipe inside of the cv, getting any abrasive debris that may have gotten into the grease.



STEP 18

With the CV mounted back in the vice, use a hammer to tap the left over CV stub all the way to one side, this will free up one or more balls on the opposite side. Use a pick or small flat blade screw driver to pick out the balls that are able to be removed. Continue tapping the a cut off stub from side to side basically working it in a 360° motion until all of the 6 balls have been removed.



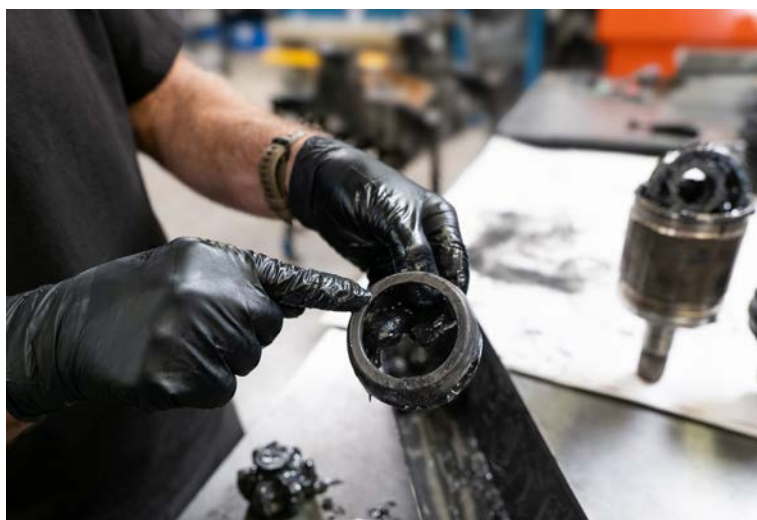
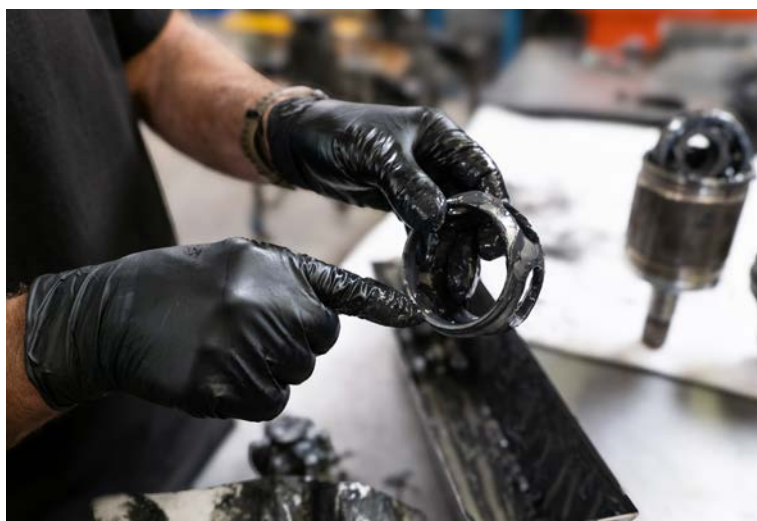
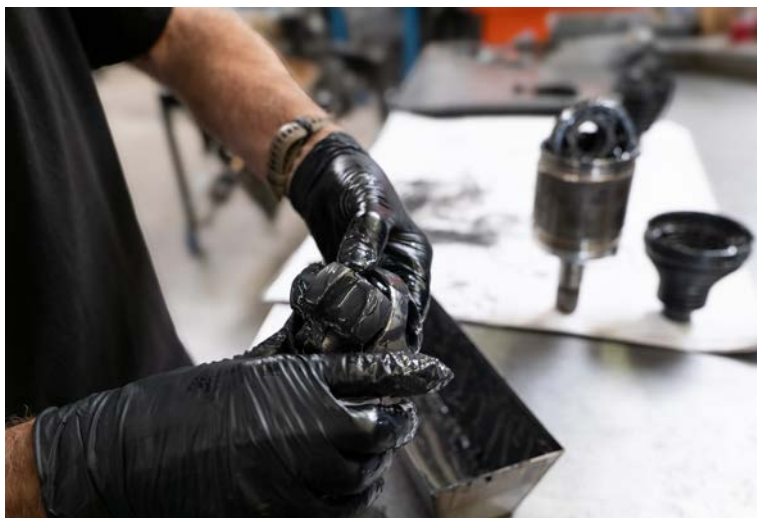
STEP 19

Once all the balls are removed, the star should spin freely in the cage. Maneuver the cage where it is upright with the star still inside it, then orient 2 openings of the windows with 2 high spots of the CV housing and the cage will slide out of the housing with the star still inside the cage.



STEP 20

Play with the star inside the cage working it around orienting the star perpendicular to the cage, trying a few different configurations until the star is able to be removed from the cage. Once the star is removed note the orientation of the cage, it has one side with a flat lip and one side with a sharp lip (pictured). the flat lip goes toward the wheel side of the CV housing when its re-assembled.



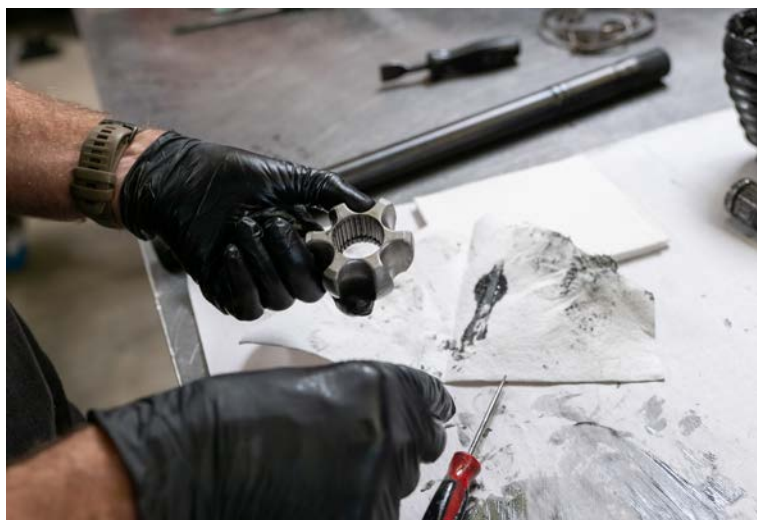
STEP 21

Clean the star and left over axle stub then use a large diameter tube to set the cut off side of the axle side into, then get ready to press the cut off stub out of the star. The reason this has to be done is because Toyota assembled these axle shafts with the outer joint star snap ring hidden in the star so once its assembled they only way to remove it is to press the axle through the star which when under 20-30 tons will basically cut the snap ring in half. You will be pushing the axle shaft downward out of the star.



STEP 22

Once the snap ring breaks, you'll be left with the stub that gets thrown away, and you'll have to pick any remaining parts of the broken snap ring out of the star making sure there aren't any metal pieces that are still stuck in the star.



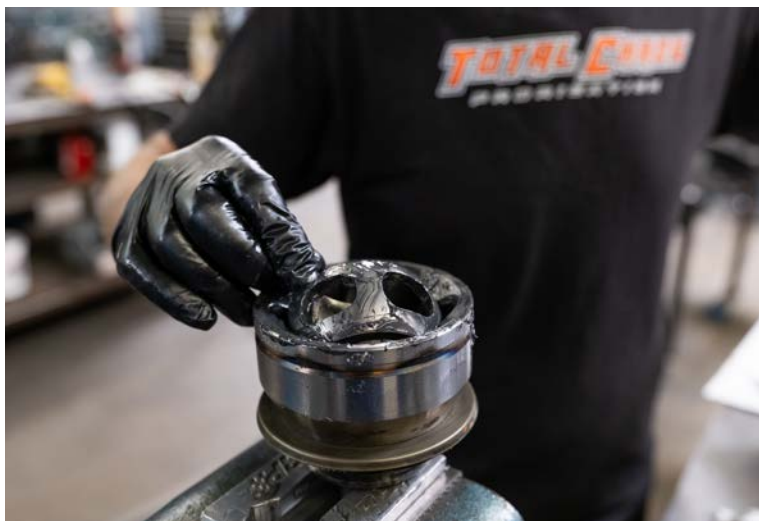
STEP 23

Its now time to orient the star back into the cage. Note that the snap ring side of the star will be on the flat side of the cage (reference image on step 20).



STEP 24

Once the star is in the cage, line up 2 slotted holes in the cage with the CV housing just like when it was removed from the housing.



STEP 25

Once the star and cage are back in the CV housing, line up the valleys of the star with the windows of the cage, then line up the windows of the cage with the valleys of the CV housing and angle the cage and star so that you can start tapping the balls back into place. Start with two balls on the high side then tap the cage down using a brass punch and make the balls go to the bottom of the housing which will open up two windows on the opposing side of the cv housing.

Continue this process until all 6 balls are in place, **MAKE SURE** all 6 balls are in because once the axle is tapped into the star and the new snap ring pops into the snap ring groove of the star there is no way to remove the axle without cutting it and starting all over again.



STEP 26

Using a putty knife, pack a generous amount of grease into the splined hole of the star. When the axle is forced into the star, this will force the grease into the bottom of the housing and should push grease up through the cage when the axle is tapped into the star.



STEP 27

With the star snap ring side down and cage flat side down, balls inserted, and grease pushed down into the star hole its now time to install the axle. Grab the new axle with the round snap ring (pre-installed by TOTAL CHAOS) and insert the splines into the star. You will notice that the starter splines will slide down until the snap ring contacts the star. Once the snap ring contacts the star you will need to use a small flat tip screw driver or pick to compress the snap ring in a circular motion around the shaft while maintaining downward pressure until you feel the snap ring compress and slide into the star. Once it begins the slide into the star, use a hammer to tap the axle down until you feel the snap ring expand into the groove in the star. Once you feel the snap ring expand, tug upward on the shaft to make sure it is set and cannot pull out of the star.



STEP 28

With axle set in the star, use a putty knife to add extra grease to the top of the joint, building the grease up somewhat like an ice cream cone.



STEP 29

Slide the outer CV boot onto the axle, then clip the large side of the boot onto the CV housing, you will feel the boot snap onto the groove in CV housing. Next clip the small side of the boot onto the axle shaft, again you will feel the boot find the groove in the axle shaft.



STEP 30

Slide the smaller clamp onto the small side of the boot and use Oetiker clamping pliers to clamp the boot to the shaft, then repeat the process for the large boot side.



STEP 31

With the outer CV side finished, its now time to reassemble the inner side. Start by sliding the smaller clamp onto the axle shaft, then slide the inner boot onto the shaft.



STEP 32

Slide the inner CV star and cage (without balls) onto the shaft, remembering that the flat side of the inner cage will be facing the CV housing and the star should be oriented so that the Taper leading to the splines faces the shaft. Use a hammer and punch to tap the star down far enough so that you can see the snap ring groove in the shaft.



STEP 33

Use flat face snap ring pliers to install the factory snap ring onto the axle shaft and make sure that the snap ring fully seats.



STEP 34

Set up the inner CV housing spline down and fill the inner CV housing roughly $\frac{1}{2}$ way with CV grease.

STEP 35

Its now time to assemble the balls into the star and cage. Start with the star assembly facing up and inset all 6 balls into their slots making sure none fall out. This is easiest if you dip each ball in grease first so that the grease can act as a suction against the star holding the balls in place. It may also be necessary to use your hand to hold them in place.



STEP 36

Keep the axle clamped in the vice with the star, cage and balls facing upward, then take the inner CV stub (making sure the grease is packed into the housing) and flip the housing up side down, guiding the stars into the grooves in the CV housing keeping all the balls in place.



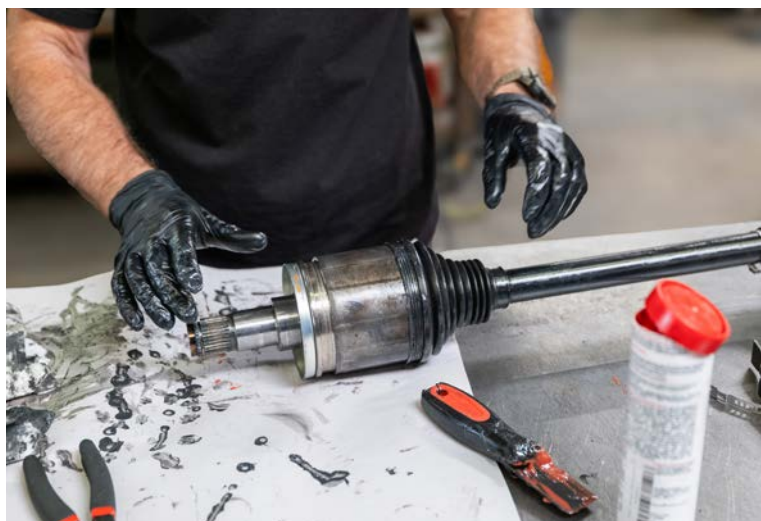
STEP 37

Take the axle out of the vise and lay it flat on the bench. Now pull the boot back slightly and re-install the large snap ring that goes in the end of the CV housing that keeps the assembly from pulling out of the housing, this should not require any tools, as the snap ring is easy to install with your fingers.



STEP 38

With the snap ring now installed, pull the large side of the boot over the CV housing and make sure the boot snaps into the groove in the CV housing.



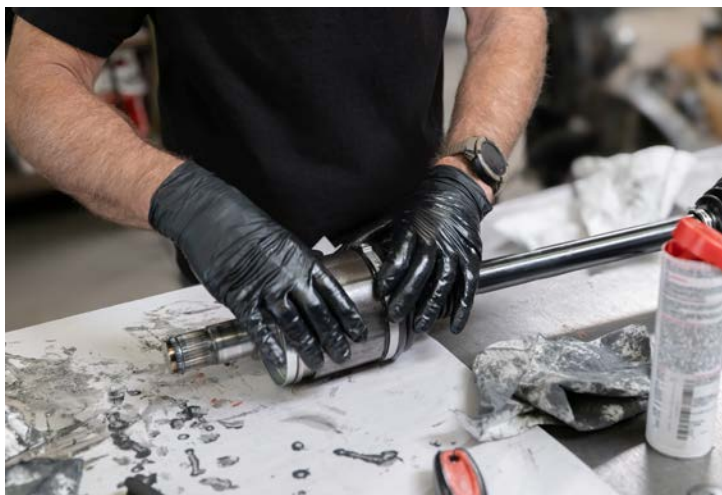
STEP 39

Slide the small Oetiker clamp over the boot making sure the boot is in the groove of the axle and use Oetiker pliers to clamp the boot.



STEP 40

Now open the last large clamp and wrap it around the large side of the boot making sure the boot is still in the groove in the CV housing. Then use the Oetiker clamp pliers to clamp the large clamp to the CV housing.



STEP 41

Wipe any grease from the boots and axle and install the axle in the passenger side of the vehicle.



FOR INSTALL QUESTIONS OR CUSTOMER SERVICE INQUIRIES:

Call 951.737.9682 or email info@chaosfab.com