

# T4B diff drop installation instructions

(I've plagiarized heavily from the instructions by StarChild & from the MechaTech CV boot install instructions – refer there for pix)

Probably the most difficult part of the installation for me was removal of the steering center link. Those ball joints were designed with too shallow of a taper so they get stuck in the mating feature very tightly. The metal on the stud is fairly soft so it can be deformed by too much hammering. What worked on mine was a pitman arm removal tool (basically a fixed jaw puller). I would suggest that you tackle this part first ... before you do ANYTHING else since you won't be able to complete the job unless this is done. Start with applying liberal amounts of PB Blaster numerous times for several days before you begin the installation. Remove the cotter pin and castle nut. Put the castle nut back on upside down to help guide the pitman arm removal tool and to keep from damaging the threads on the stud. Put the tool on the ball joint & tighten. Strike the end of the tool with a BFH like you mean business. Tighten the tool and repeat. Liberal use of colorful language is acceptable at this point. If and when it finally releases, it'll sound like a gunshot so don't be concerned that you broke something – it's normal. The surface of the tapered shaft may even have a white powdery finish from corrosion which didn't help with the removal process. Now would be a good time to clean it and apply a coating of anti-seize so that you don't forget later.

Look in the shop manual, page 2A-4 (page 175 of the pdf). What I refer to as the center link, they call the center track rod assembly.

Tip: Take your VX to an alignment shop and have them break the ball joints free & apply the anti-seize for you. It shouldn't be too expensive and will probably save you from giving up in frustration before you even get started.

Tip (Courtesy of CSTYLES): If you can't get the one on the passenger side loose, you can remove the 4 bolts from the part that the 'relay lever' attaches to (see shop manual reference above) and leave the ball joint in place.

Tip: I basically followed the MechaTech CV Boot installation instructions up to the point where you pull the CV out of the outer race (green cup). Then I shifted to the Diff Drop instructions provided by StarChild.

Step 1: Jack up the front of the VX & remove both front wheels and place on jack stands. Put your jack under the lower control arm and lift just enough to relieve pressure.

Step 2: Remove the 4 17mm bolts from the lower control arm & lower jack.

Step 3: Reposition the ball joint bracket to the top of the lower control arm.

Step 4: Careful with this step if you are re-using your CV boots. Remove the bands from the INNER CV BOOT. Move boot off of CV Joint.

Tip: I was able to cut the bands with a pair of wire cutters but it took a while & I even managed to not cut the boot in the process. A small flat screwdriver helps to hold the band away from the boot whilst cutting. Heavy duty zip ties can be used in place of the bands during re-install (not endorsing this but it worked for me).

Step 5: Locate the wire ring just inside the inner lip and slide a screw driver under it. Pop the ring out. This is the retainer ring that holds your CV joint and axle shaft in.

Step 6: Pull the CV joint out by pulling the brake assembly outward. Cover the CV joint with plastic bag.

At this point, we are abandoning the first set of instructions so put them away and get out the other.

Step 7: Drain the differential fluid. Try to get as much out as possible, because everything that's left will be on the ground before it's over.

Tip (I think etlSport gets credit for this tip): Remove the fill plug first. If you can't remove the fill plug you won't be able to refill later.

Tip: Once the drain plug is removed, try probing the drain with a small zip tie or piece of wire. The drain is easily clogged by gunk & there is more fluid in there than you think. (I had to do this several times during the draining process).

Step 8: Support the front axle under the differential, and loosen the four bolts (two in each bracket) that mount the differential bracket upward to the frame. The two rear bolts are captive, and the two front ones have nuts on top, that can be accessed through the wheel well.

Tip (Courtesy of StarChild): The nut and bolt are 22mm, the same as the tie rods, ball joints and center link connections. A 7/8" wrench works great for these, since a 22mm wrench can be difficult to find.

Step 9: Disconnect the axle breather

Tip (I think circmand gets credit for this tip): You should be able to feed 2-3 inches of breather tube down from the top to compensate for the diff drop.

Step 10: Before removing the bolts, loosen the four bolts that connect the passenger side diff bracket to the axle housing. The lower two bolts are easy enough to get to, but I had to remove the frame mounting bolts and lower the diff in order to get to the upper two bolts on each side. I ended up having to use a socket, multiple extensions, and a universal joint to get to the upper two bolts through the control arms.

Tip: Personal opinion here, loosen the bolts that you can reach now but wait till the diff is on the ground to loosen the ones that you can't reach. The diff will want to move when you 'lean' on those bolts so it helps to have a second pair of hands available to steady it.

Tip (Courtesy of Zeus): These are the bolts that should have thread lock applied during reinstall (they have a tendency to work loose).

Step 11: This is where I diverged from StarChild's instructions. Once the 4 bolts that mount the diff brackets to the frame have been removed, lower the diff until the CV outer race on both sides rest on the lower control arms. I was able to shift the diff towards the driver's side enough to have the passenger (short) side drop past the control arm without too much friendly persuasion.

Tip (Important): Although the axle dropped past the control arm on the way down, it would not get past it on the way back up. I trimmed about ¼ inch off of the control arm which provided enough clearance. You may want to do that before you drop the diff in step 11. You only need to cut or grind that ¼ inch strip long enough for the CV outer race to clear.

The following steps are the same for both sides.

Step 12: Remove the bolts connecting the diff brackets to the axle housing (there are 4 on each side). The axle will slide right out of the differential but the diff bracket is still on it because of the bearing.

Step 13: Remove the snap ring retaining the bearing on the axle shaft. The bearing is pressed onto the shaft, and can be easily removed with an adjustable puller.

Tip: Mine weren't that tight. Gentle prying with 2 large screwdrivers easily worked it off the shaft.

Tip: Note the orientation of the bearing. There is a ring on the outside of the bearing that is offset. That ring needs to be positioned OUTBOARD during reinstall. If you get this wrong, you won't damage anything but the diff brackets won't bolt back up to the differential.

Step 14: Behind the bearing is another snap ring retaining the oil seal. Removing both will allow the bracket to be removed.

Tip: Note the orientation of the oil seal (it's directional). Put it back on the same way or it may leak.

Step 15: Set aside the old diff bracket so that it can be returned to tom4bren. Slide the modified bracket over the shaft and start working backwards on steps 14 through 12.

Tip: I used a piece of PVC pipe like a slide hammer to (gently) seat the bearings back onto the axle shafts.

Step 16: Bolt the differential brackets to the differential (don't forget the thread lock (I recommend loctite)).

Step 17: With the new brackets in place, you can re-install the axle housing the same way it came out. Lining up the bolts to the frame can be tricky. It's best to start the two rear captive bolts, but leave them loose. Then you can maneuver things to get the fronts started. Torque the mounting bolts and brackets to axle bolts to spec.

Step 18: Now you can put everything back together, being sure to torque bolts to spec, and replace the cotter pins in the steering linkage and ball joints. Don't forget to put some anti-seize on the shafts of the ball joints.

Step 19: The Diff Drop kit came with brackets that will relocate the cross member down about 2" to clear the differential. You'll have to supply your own bolts (I think 3 ½ inch long, ½ inch carriage bolts will work).