

Introduction to the Trailing Arm Replacement Procedure

I had been noticing some strange behaviour in my 1979 Corvette for at least a year or so. It is difficult to describe but the rear end felt “loose”, like it wiggled at times, but only occasionally. It was one of those intermittent problems we all tend to shrug off to another day I guess?

In September of 2013 we joined the CCC at the McEwan's gas station to begin the road tour to Lanark. Everything seemed fine; the car was wandering a bit but I thought perhaps it needed an alignment? At the four-way stop sign at Flewellyn and Dwyer Hill Roads I turned left and accelerated moderately.

Within the first 25 meters we felt the rear end kick out, as if we hit a patch of sand? From that point on the car seemed to have a steering mind of its own. If you kept the steering wheel aligned with the road, the rear end had different ideas when hitting bumps or ruts in the road. It was like the car had rear end steer? I knew there was definitely something wrong and it needed to be fixed in order to be safe. This is where this trailing arms replacement story begins ...

Tools Required:

- Ideally a hoist
- Air tools including
 - Impact gun and SAE and Metric sockets
 - Air impact punch
 - Air nozzle to blow out dirt and debris
- SAE and Metric box wrenches
- Normal SAE and Metric sockets and ratchets (both 3/8” and 1/2” drive)
- Large ball-peen hammer
- Long needle-nose pliers
- 18” pry bar
- Flare wrenches for disk caliper brake line fittings
- Reciprocating saw with 8” – 18 TPI Bi-metal blades (we used Dewalt)
- Penetrating fluid like Releasall or PB Blaster
- Trouble light and flash light
- Safety glasses and gloves
- An eclectic mix of background music including 1980's disco, 1960's Jimi Hendrix and when things aren't going well, some calming tunes by America or The Eagles.

Step 1: Preparing the rear end of the car for the trailing arm replacement.

For purposes of clarity I will describe the procedure of the replacement of the passenger side trailing arm only. The photographs will mainly be from the passenger side. Both sides were done though over the course of a few nights.

- Using a bottle jack, carefully decompress the spring on the passenger side of the car, allowing the removal of the spring adjustment nut.
- Slowly release the bottle jack, allowing the spring to relax.
- Remove the rear spring adjustment bolt and bushings from the trailing arm.
- Remove the rear shock from the car.
- Remove the shock mount from the spindle carrier. Use care when removing in order to not damage the spline shaft on the shock mount. Use a shock mount removal tool if available.
- Carefully swing the strut rod away from the spindle carrier.
- Disconnect the half shaft from the spindle flange. In our case we carefully removed the French Lock brackets in order to reuse. Swing the half shaft downwards and away from the spindle carrier.
- Disconnect the hydraulic brake line and plug the brake line to minimize fluid loss.
- Disconnect the emergency brake cable.
- Remove the brake caliper and carefully set aside.
- Remove the brake rotor and rear emergency brakes if you will be reusing them.



Original passenger side trailing arm, almost ready to remove



Close up of the passenger side trailing arm box shape. Note the apparent deformation of the two halves of the box shape

Step 2: Removal of the existing trailing arms

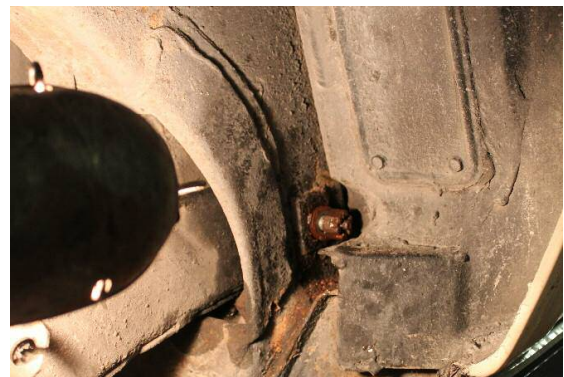
- Apply a generous amount of penetrating fluid to the trailing arm pivot bolt, shims, castle nut and cotter pin and then wait for a few minutes.
- Remove the cotter pin through the castle nut, or cut if necessary.
- Remove the large cotter pin that passes through the holes in the shims. Note the illustration below which shows the shims, the two sizes of cotter pins and other associated hardware used in this procedure.



- Gently work the castle nut back and forth to get it moving. If possible, remove the nut using a wrench on the bolt head and a wrench or ratchet on the castle nut. Worst case scenario, cut off the castle nut with a reciprocating saw.
- Using various “persuasive” hand-held tools and lots of penetrating fluid, loosen and remove the inboard and outboard shims, noting the thickness and location of each shim. These will be replaced by identical thickness and number of shims on each side of the trailing arm when the new trailing arm is installed.
- Support the trailing arm as it is heavy and it will fall if not supported when the pivot bolt is cut. We used a bottle jack as shown in the photograph below.
- Next, either cut the pivot bolt or using an impact chisel, get the bolt to move toward the inboard side of the car. If it does move, you will be able to wiggle it back and forth until it is free. In some cases the pivot bolt may need to be cut with a reciprocating saw.
- Carefully remove the trailing arm and set aside for the moment.



Use of bottle jack to support trailing arm and allow clear access to shims



Loosened rusted trailing arm castle nut minus the cotter pin



Close up of the trailing arm with the castle nut removed and the pivot bolt still in place.

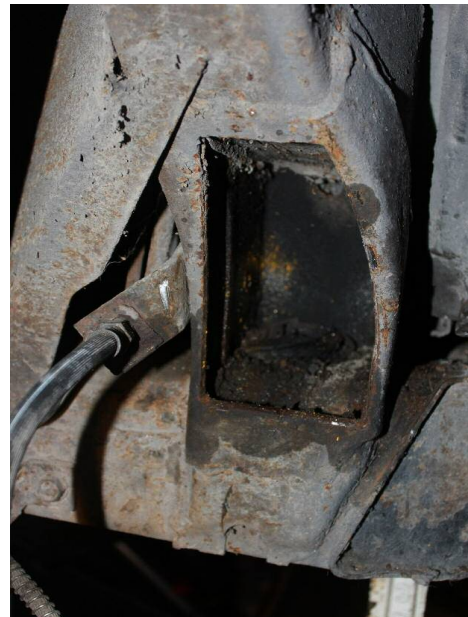
Note the vertical alignment skew of the trailing arm even with the shims still there.



Close up of the first shims to be removed.



Close up of the trailing arm with the shims removed.



Close up of the trailing arm mount with the trailing arm removed. Look closely to see bushing bits lying in the frame.



Passenger side inboard shims and bushing remnants



Passenger side trailing arm removed



Note the "little bit" of play in the passenger's side pivot bolt and bushing.



Close up of the passenger side bushings, notice one side bushing has deteriorated and is missing.

Note:

- As the new trailing arm did not come with a replacement spindle flange and nut, the old spindle flange and nut must be removed and reused.
- With the trailing arm on a bench, use a large impact gun to remove the old spindle nut and flange.
- Install the old spindle flange and nut on the new trailing arm using 100 ft-lbs of torque.



Close up of the old trailing arm showing the spindle nut and flange.



Close up of the old trailing arm with the spindle nut and flange removed.



New trailing arm with the old spindle nut and flange installed and tightened to 100 ft-lbs.

Step 3: Installation of the new trailing arms

- The installation of the new trailing arms is just a reversal of the process described to this point, but it should be much easier of course.
- Ron has a good policy whenever he installs new parts, or reinstalls used but still serviceable parts. In the past when Ron has worked on my car he has used anti-seize compound on parts that assemble together. This enabled us to disassemble much of the suspension components on this repair with little or no trouble.
- Prior to installing the new stainless steel shims we taped the appropriate shims together. This made the handling of multiple shims in a confined space much easier.



New shims taped together for ease of installation.



Old shims on the right, new matching thickness shims on the left.

- One tricky part we encountered was how to pass the trailing arm pivot bolt from the inside of the frame mount, through the new trailing arm bushing and to the outside of the mount. Having two sets of hands definitely makes this job easier.
- With one person supporting and aligning the arm in place, the other person uses a fine wire attached to the threaded portion of the pivot bolt, and passes the wire through the mount and bushing. Think of it as threading a needle.
- Once the wire has passed through the path the bolt needs to take, then it is a matter of carefully pulling the wire and bolt through the bushing.
- Once the bolt is in place, the castle nut can be put in place finger tight.
- The shims are then placed in the same order as the old ones came out. Then a large cotter pin is passed through the trailing arm mount and holes pre-drilled in the shims to hold them in place.
- Once this is done, the castle nut can be tightened and secured with its own cotter pin.
- This procedure will closely replicate the previous toe-in alignment, but a professional alignment should be done at a later date.

Step 4: Finally Assembly and Check

- Reattach the brake rotor and brake line.
- Connect the emergency brake cable and adjust the emergency brake tension if necessary.
- Swing up the half shaft up and connect with the spindle flange using original or new French Lock brackets.
- Swing up the strut rod and connect with the spindle carrier.
- Install the shock mount to the spindle carrier. Carefully tighten the shock mount bolt in order to avoid damage to the spindle carrier.
- Install the shock.

- Install the spring adjustment bolt and bushings in the trailing arm.
- Using a bottle jack, compress the spring upwards and thread on the spring adjustment nut.
- Bleed the brake lines and test drive to determine if all is OK.
- Finally check all connections to ensure all bolts and/or nuts are tight.
- Arrange for 4-wheel alignment at the earliest opportunity.



New passenger side trailing arm in place.
Elapsed time 3.5 hours.



New drivers side trailing arm in place.
Elapsed time 2.5 hours.

Total time for both sides was 7.0 hours before bleeding the brakes and doing the final check and test drive.

Acknowledgements

This job was one that I worried one day might become an issue. It's probably a job many C3 drivers don't even want to talk about! When the repair became necessary it was late in the season and I wasn't quite sure what to do? Put the car away in storage and worry about it all winter, or deal with it now? I worried about which garage would be prepared to do it, how competent they were and how much would it cost?

I really didn't want to inconvenience Ron so late in the year, but his repeated calls to bring the car over encouraged me enough to do so, at least to have a look. There was some concern about "opening a can of worms" and discovering other problems and difficulties associated with dismantling the rear suspension. We all stood around and looked at each other, brought up worse case scenarios and did some ball park estimates on the cost and labour.

Ron likes a challenge and he accepted to do the job, a job he had never done before. In the end all went **very** well, in less time than the GM "book time". I would like to thank Ron for his outstanding work and making my life less worrisome knowing the repair is complete, and I can sit here in January dreaming of summer CCC tours to come in 2014. Job well done Ron!

P.S There were no "adult beverages" consumed during the duration of this repair, as a result there were no reported injuries!



The master at work while his “assistant” takes pictures