

Replacing Audi C4 Flexible brake lines Or All the “gotchas” of this “oughta be simple” repair

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The following are my notes – and findings – after the ordeal of replacing the seemingly easy and cheap rear flexible brake lines on a 1995 Audi A6 quattro.

Flexible brake lines are at all 4 corners of all cars. They connect the brake calipers to the hard steel brake lines, allowing the wheels to move up and down. Over time they can become cracked and even develop bulges, indications of possible weakness and failure.

New OEM brake lines can be purchased from a wide range of internet and physical parts stores for between \$12 and \$25 each. In most cases they have SUPERIOR longevity to the fancy stainless braided lines sold as performance add-ons, and are rarely the culprit in bad brake feel. Below are pictures of a new flexible brake line and the old one, in place.



New Flexible Brake Lines. Caliper fitting at right, receptacle for Flare fitting at left.



Picture of flexible brake line, in place, on 1995 C4 – Right Rear

On the surface, this job looks easy. But a few gotchas exist. That's why I wrote this piece. The key "gotchas" are:

1. Flare nuts and flare nut wrenches – more complicated than it looks!
2. Frozen nuts of various kinds
3. Poor documentation in Audi (Robert Bentley) "official repair manuals". In fact, its often completely absent
4. The mess.

First let's look at the overall layout. Refer to the picture above.

- a. The flexible brake line begins at the caliper, where it screws directly into the caliper. This can be removed with a 14mm open end or combo wrench. Typically, it does not seize, and a flare nut wrench is not required. In fact, you often could not fit a flare nut wrench over the reinforced shoulder of the brake line anyway.



*Flexible brake line where it screws into rear caliper
(14mm wrench)*

- b. The flexible brake line continues, about 10", to a point where it joins the fixed steel brake line. This is often hard to see, being partly behind a metal flange. The hex body of the flexible brake line slips into a hex-shaped hole in a metal hanger (welded to the underbody). This hanger holds the line in place, and prevents it from spinning. A flare nut on the steel brake line threads into the end of the flexible brake line ("hose") and secures the flared compression fitting of the steel brake line to the flexible one. A spring clip completely encircles the flare nut's body, pressing against the flare nut on one side and the hanger on the other, holding the brake line in the hanger. The spring clip can only be removed once the two lines are separated



*The Flare Nut (11mm) – where the steel and flexible brake lines meet.
note: hanger and spring clip securing them to underbody of car*

- c. This flare nut (shown in the picture immediately above) is the primary cause of difficulties in this job. It is very, very soft metal. Worse, the flare nut can seize due to corrosion. Consequently it is highly susceptible to rounding, leaving you in a bit of a pickle, since once it rounds, it is almost impossible to get out without destroying both the flexible line (brake hose) and the steel line. My advice – don't get into that pickle in the first place. Use lots of penetrating fluid ahead of time, do some tapping, and above all, get a rally good flare nut wrench, They are not all created equal.
- d. If you do wind up in this pickle, you can buy modular brake mine form most good auto parts stores and bend it yourself with a tube bending machine. After vice grips and all the other “sure sire” solutions failed, I cut the old line off, flush with the spring clip, with a sawzall and a bi-metal blade. I bent the new line (it took me two lines, one destroyed to get it right) and all was well. But as said above, a \$20 top-quality flare nut wrench would have solved all this anguish.



*Ugly, ugly, ugly.
Nothing's taking this nut off without a fight and likely a destroyed brake line.*

Once rounded, this nut began to literally disintegrate as pressure was applied with channel locks and vice-grips



The old flare nut, cut by Sawzall



The new brake line, bent to fit. Expect to, ahem, practice (aka, wreck stuff)

Flare Nut Wrenches

The flare nut is a typical 11mm nut, as it also is on VWs, BMWs and Porsches, among others. Seems pretty simple, right? Wrong.

Since it is so soft, a special wrench is needed to turn it, called a flare nut wrench. This is commonly available, and looks like 7/8ths of a six-point box end wrench, with just enough opening to get around the brake line. Flare nut wrenches are far better than open-end wrenches - - of any quality - - at turning the flare nut without rounding it off. But that's not the whole story.

Flare nut wrenches are good, but on a particularly difficult nut, they can fail too. I had a flare nut socket (on a 6" extension) round off a flare nut, causing me tons of agony – once they round, they may disintegrate as you try to grab and turn them with channel locks or vice-grips – not fun. Don't get there in the first place.

Two wrench manufacturers have metric flare nut wrenches with patented head designs that drive the flats instead of the points/ tips. They both claim to be able to exert 50%-100% more torque without damage to the flare nut. In practice they work. Snap-on makes an 11mm "flank drive®" flare nut wrench for between \$30-50 (ouch). S-K makes an 11mm SureGrip® flare nut wrench that sells for between \$11-16 (much better). Get one

of the two. I bought the S-K and it works great. I would avoid the “well made” tools, even from prestigious names, that don’t have these patented designs. It’s the design, not the pretty mirror polish nor the precision forging, that makes these tools stand-outs.



Close-up of (3) 11mm wrenches. If you look closely, you can clearly see the difference between a normal and a flare nut wrench, and the difference between a flat-sided wrench (the socket) and a SureGrip® wrench (the S-K).

I believe that a little penetrating oil, and a really good wrench would have spared me lots of trouble, and will spare you trouble.

The Mess.

When you open up brake lines, you can make a mess. And brake fluid is somewhat messy. The best advice I have is:

- a. Before you start, put a piece of cellophane under the brake fluid reservoir top. This makes a seal and the vacuum will minimize brake fluid flow.
- b. Put rags under the openings. You will get only drips and small dribbles, or at least that’s all I got
- c. Have some plastic baggies and a rubber band or twist tie to close off the end. You might also stuff a golf tee in the line

Bleed me.

Don't forget to bleed the lines. Better yet, flush out that old, water-absorbing brake fluid.

I hope this was helpful,

Grant