Fabricating a (new) Gas Tank and Fuel Line

by Neil Maken

I purchased a car recently, and I was told that the car had been rear-ended in an accident several years before. Repairs were made at the time, and the car was back on the road.

Crawling around under the car, I did see that the gas tank was leaking. There were spots of 'alligatored' paint, indicative of the gas leaks. Virtually the first thing that I did was drop the gas tank. The tank is set into a 'well' just forward of the rear bumper. Once I had the tank out I was able to see the evidence of the damage. The side panels were 'bellied' out, and the seam ribs were obliterated in several areas.

Once the paint was scraped away, plastic body filler was very evident.

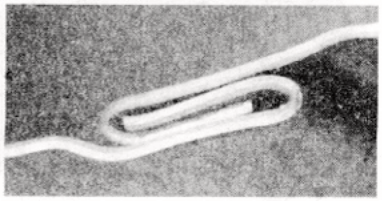
Rather than just clean the tank and trying to re-seal it with a chemical sealer, I brought the tank to Andy Elsener, owner of Elsener Metal Fabricating. To better examine the seams, Andy stripped some of the paint off one end of the tank. The clouds of white dust indicated a lot of plastic body filler.

Andy explained that many old tanks were made of 'leaded steel.' Edges of steel sections were coated with lead and the seams soft soldered. Trying to weld the tank would cause the soft solder to melt making some really big problems. He suggested that building a new tank would take a lot less time than repairing the old one. I have a lot of faith in Andy's work, and he is an honest businessman. I trusted – justifiably – that he would do a good job and would charge me a fair price based on the hours invested in the job plus materials.

All the time that he was building the tank I haunted his shop, attempting to photograph every step of the process. Here's how a gas tank was fabricated.

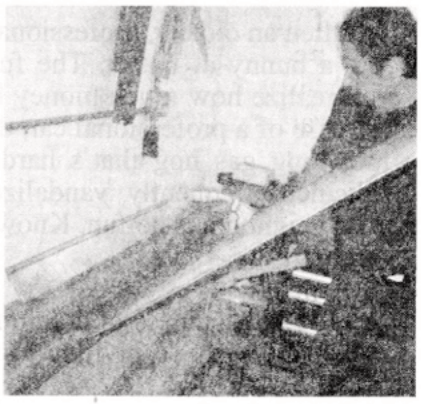
First, measurements were taken and logged. The length, the circumference, and even the profile of the tank was traced onto a sheet of paper. The tank was not symmetrical – not perfectly round, not oval. The bottom was almost flat while the top was contoured to fit into the well in the car.

A sheet of steel was cut to the correct width, and to one inch longer than the measured circumference. This one inch was to accommodate the special crimped seal. I've mentioned this before – I love watching Andy work with metal. He knows what he is doing, and it is a pleasure to watch a pro work. He told me that he was going to put a Pittsburgh lock seam on each end. This would act like a latch, locking the two edges together and making them leak-proof. But instead of merely folding a lip onto each end, Andy put an offset into the metal so that the seam, once locked together and crimped, would not cause a bulge in the surface.

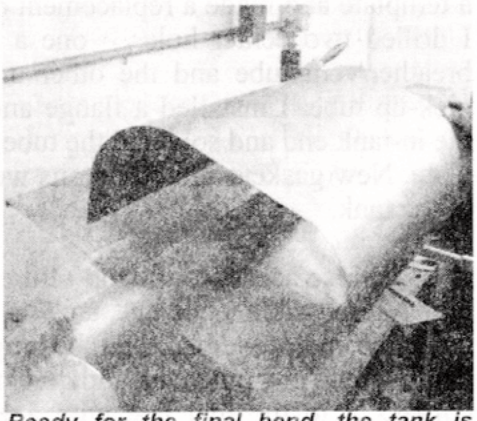


A Pittsburgh lock seam was put onto each end of the sheet metal to lock them together once bent. Not merely a fold in the metal, an offset was made to keep the seam from being too bulky.

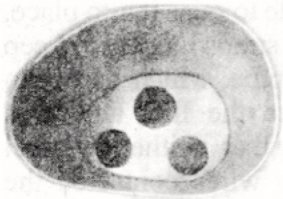
The sheet of metal was marked for the first bend and then put into a roller press. Slowly, slowly Andy increased the pressure forcing the metal into a bend. Two, three, maybe even



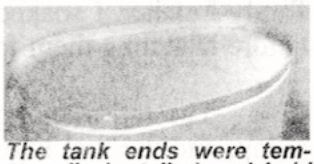
four times, the metal was removed and the radius of the bend checked against the original. When satisfactory, he marked and proceeded with the second bend. This process took place four times until the contours and radii matched the original. At this point he had an open-ended cylinder. Again, the profile was transferred to a piece of paper, and from this the two ends were formed. He also fabricated a baffle (the original tank did not have a baffle). We decided that since it is a big, heavy car, unlikely to be making tight turns, a single baffle was enough to reduce 'sloshing.' Each end piece was designed with a ½" lip, and the end was set into the ends of the cylinder. The ends were temporarily screwed to the cylinder. At this point, it looked like a gas tank.



Ready for the final bend, the tank is beginning to take shape.

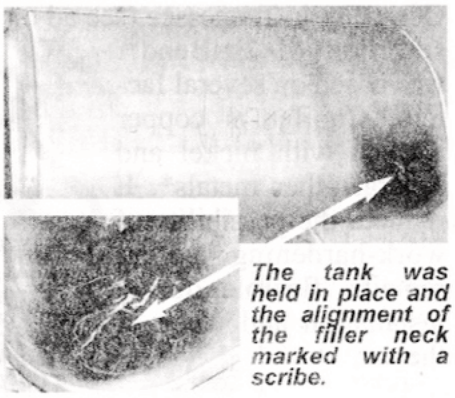


Although the original tank did not have a baffle, we decided to install one.



The tank ends were temporarily installed and held in place with sheet metal screws.

Rather than merely relying on measurements, Andy gave the temporary tank to me to install and mark the exact location of the filler neck. In this way any variation in the tank's contours, or any distortion caused by the previous accident would be accommodated and the filler neck would be perfect.



The tank was held in place and the alignment of the filler neck marked with a scribe.

The original tank had four openings: the filler neck, the sender gauge hole, the pick-up tube hole and the drain plug on the bottom. There were also a couple of brackets welded onto the original tank. Instead of making new flanges and filler tubes, Andy decided to cut out the original parts and install them in the new tank.

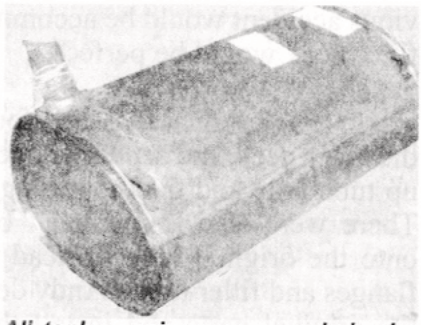
Because the gas tank removed from the car had been filled with gas – and even though it was thoroughly washed with soap and plenty of water – Andy continuously blew air into the tank as he cut into it. Those gas fumes still lingered and were still explosive. All that was needed was a spark....

The holes were cut into the new tank for the four fittings. The filler neck had been riveted into place; new rivets were ordered, and the filler neck was riveted into place. Seams were then welded, the drain plug, pick-up hole flange and sender unit flange were welded, and then the filler neck was soldered to prevent leakage.

Andy filled the tank with water – right up to overflow – and each and every seam was checked for leakage. Not a drop of water could be found on the outside of the tank. The water was drained, the bill paid and the tank was mine.

I let the tank dry thoroughly and then poured in a pint bottle of Bill Hirsch Gas Tank Etch. I decided to use the etch to eliminate any flash rusting that may have occurred internally, and to prepare the seams for the sealer to follow. The etch was poured in, all openings sealed with tape, and the etch sloshed around in an effort to cover all portions of the tank, especially the seams. I followed instructions and let the etch sit in the tank for 30 minutes, and then sloshed it around again. This time I allowed it to remain for an hour before draining the etching material. I then removed the tape over the openings

and allowed the tank to dry thoroughly.



All tank openings were sealed prior to pouring in tank etch. Tape was later removed and etch poured out. The tank was re-taped prior to putting in sealer.

The next day, when the tank was thoroughly dry, I again taped the openings, coated the threads on the drain plug with Vaseline® so that they wouldn't seize, and poured the entire quart of sealer into the tank. I concentrated on getting the sealer to coat all of the seams, but I also tried to coat all internal surfaces with the sealer. I poured out the sealer (the Hirsch sealer can be reused, whereas some competitive brands must be discarded after exposure to air) and put it back into the can. I removed the tape (and the plastic zip-top baggie that I used on the filler neck). Using a small flashlight I examined the inside of the tank to see if the interior was completely coated. I did give it a second sealer treatment.

I have very little patience, but because of a swap meet the following days, I was forced to allow the tank coating to cure for almost three days. When I returned to the job the sealer was fully cured, and it was time to paint the tank prior to installation. The entire tank was washed with Eastwood's PRE, a cleaner, degreaser and surface prep. I then sprayed the tank with a two-part polyurethane gloss black paint. Although not specifically gasoline-proof, since it was being used on the exterior of a brand new tank the polyurethane offered the best option.

After the paint had set up, it was time to install the sender unit and gasoline pick-up tubes. Originally the car had a King-Seeley hydrostatic gas gauge. Sometime, in the car's long history, the dashboard gauge was removed and a Stewart-Warner electric gauge was installed. A matching float sender unit was installed in the tank. Because an original gauge is so difficult to locate, I decided to continue with the Stewart-Warner electric unit. The gas tank still had the King-Seeley combination pick-up tube and sender unit. I used the original mounting plate as a template and made a replacement out of brass. I drilled two center holes – one a 3/16" for a breather/vent tube and the other a ¼" for the pick-up tube. I installed a flange and screen on the in-tank end and soldered the tube to the brass plate. New gaskets and both units were installed in the tank.

Since access to the top of the tank is virtually impossible once the tank is installed, I made the end of the pick-up tube long enough so that it would clear the tank and give me access to connect it to the fuel line with a compression connector. I connected the fuel gauge sender wires to the sender unit and placed the tank on a floor jack. Slowly I was able to raise it into place, and I secured the two steel straps loosely to keep the tank in place. The tailpipe, which had been removed to give access to the fuel tank was replaced and I made sure that neither the fuel line, the gas tank nor any wires contacted the tailpipe. The original 'padding' that fit between the two straps and the tank had been discarded. I made new ones out of strips of leather from Tandy Leather. I soaked the leather strips in oil before installing them for water protection.

The car, when I got it, had an electric fuel pump, and the fuel line was cut and the electric pump fitted into a crevice out of the way. I decided to replace the entire fuel line – it was also patched and bent from the accident. I used Cunifer – EziBend® from the BrakeQuip Company in Tennessee (see ad on page 46). My selection of EziBend® was based on several factors. Cunifer is copper alloyed with nickel and several other metals*. It reduces the possibility of work-hardening so it remains flexible during installation and when in the car.

EziBend® Cunifer line is a copper-nickel alloy. It is extremely easy to shape and form and does not work-harden or crack as all-copper line does.

Because EziBend® is so flexible, no special tools were required to work the line into place, around obstacles and around corners. Any water-moisture in the line would not promote internal rusting. The finished fuel line is now one-piece with the only joints at the connection to the gas pick-up and at the mechanical fuel pump. Finally the Cunifer is easy to flare, or it can be used with compression fittings (as I did), as well.

The EziBend® arrived in a loose coil so it was a simple task to unroll it, removing the bend as I did so. Since the previous steel fuel line was ¼" diameter, I used the same size for the new Cunifer line. At first I thought it would be necessary to run a string or wire along the route that I planned to install the line so that I could 'fish' the line through, but it bent so easily that that step was not necessary. We started at the engine compartment, with me on my back under the car and a friend feeding the line to me as I worked. I snaked the EziBend® through the frame to the rear of the car. I then clamped it down – as the previous fuel line had been. Concerned that I may have scooped up some grease or debris while working the line through the frame, I blew a blast of compressed air from the carburetor end just to clear the line.

Cushioned clamps were used to keep the fuel line in place.

The EziBend® is as easy to work as is plain copper line; easier actually. It can be cut with a tube cutter, and tight bends are possible carefuly by hand or with a tube-bender. With plain copper a mistake means straightening the tube and re-bending it, risking work-hardening. Work-hardening can mean cracks in the line - not a good thing with either fuel lines or brake lines. The Cunifer - EziBend® - does not work harden the way that copper does. It is much safer. I opted to use compression fittings, but the EziBend® can be flared or double-flared, too.

Refurbishing the entire fuel system included, of course, rebuilding of the original mechanical fuel pump**. The supplemental electric fuel pump mentioned previously was discarded (actually when I first saw the car it didn't work either, although it was the primary pump since the mechanical pump didn't work. Hitting the electric pump with a hammer got it to click but it still wouldn't transfer gas from the tank to the carburetor). The carburetor***, too, a Stromberg U3, was removed from the car, disassembled, all of the jets removed, everything thoroughly chemically cleaned, the housing painted and reassembled.

Well, a brand new gas tank, new fuel lines, a rebuilt AC fuel pump and a rebuilt carburetor. With fresh gas, a fresh battery, ignition switch on, and the starter button pushed, ...

S.K.

* For a complete description of Cunifer see the October 2007 issue of *Skinned Knuckles* magazine.

, * Articles on the rebuilding of both fuel pumps and carburetors can be found in past issues of *Skinned Knuckles.*

Please see note at bottom of page 39.

As mentioned on page 2, we are extremely proud of the quality of the products supplied by our advertisers. What better endorsement than to use their products on our own projects? Our thanks to the advertisers who supplied product for our tank fabrication and installation.

Andy Elsener Metal Fabricating, 15561 Producer Ln. Unit P, Huntington Beach, CA 92649. 714-379-9555

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