

Installation of a 4 3/4" aircraft fuel filler cap in a Midas Gold Convertible.

Introduction

This procedure describes how I installed a Newton aircraft fuel filler cap in my Midas Gold Convertible. These fuel filler caps come in a number of sizes. The smaller ones can be fitted directly at the bottom of the recess in the bodyshell. It's an improvement over the standard plastic cap, but the drawback is that it's not flush with the outer surface of the car.

There are 2 problems with the recess of the Midas Gold. The outer surface is curved and the hole is just too small for the 4 3/4" Newton fuel filler cap. If you're brave and talented, you can rework the ring of the fuel filler cap. Make the diameter smaller and bend it into a slight curve. The result is very impressive. Read Serge van Geffen's story on my website if you want to go this way.

I chose to rework the edge of the recess to make the cap fit as good as possible. With four simple brackets the fuel cap was bolted to the car. For further rework of the recess (paint job), the fuel cap can be removed easily.

The procedure below is just a guideline. It worked fine for me, but if you find an easier way of doing things, please do. For questions or remarks, email to hans.efde@hccnet.nl.

Parts needed

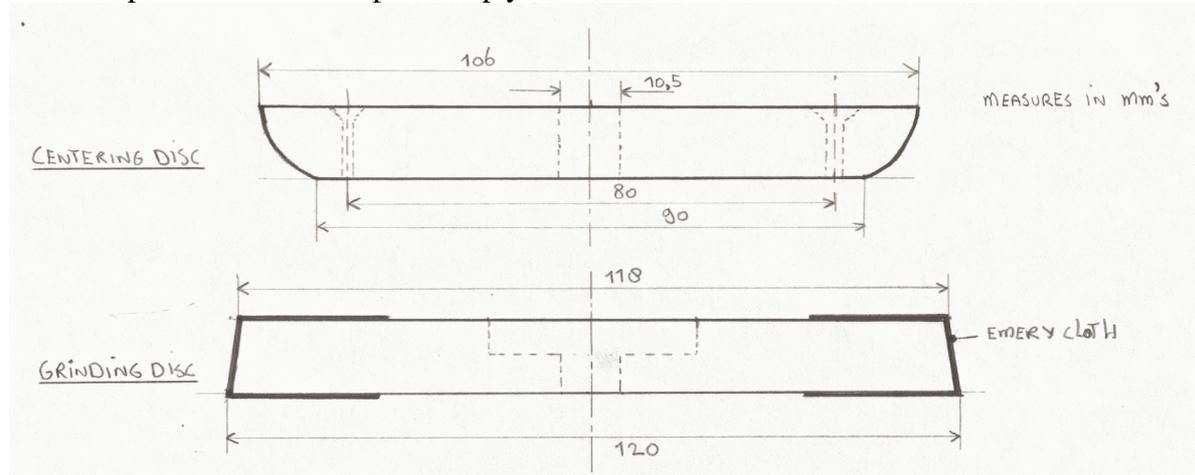
- Newton 4 3/4" aircraft fuel filler cap
- 2" funnel assembly
- 1,5 mm thick x 10 mm wide (stainless) steel strip
- 4 x 30 mm M5 bolts, self locking nuts and penny washers
- petrol hose from a Lada Samara
- 2 hose clamps
- (pur foam and GRP filler repair)
- (Mocal tank breather valve)

Tools needed

- drilling machine
- Dremel
- spanners, small socket wrench, screw driver etc.
- special tool: centering disc
- special tool: grinding disc
- lipstick

Rework of the body

Make 2 special discs from a piece of plywood, about 1cm thick. See the sketches for details.



Saw them roughly in shape with a jigsaw, drill the centre hole, fit a piece of M10 threaded rod with 2 selflocking nuts and clamp them in a vertical drill. With a piece of emery cloth (I use pieces from a sanding belt, used on parket sanding machines) or a fine wood file sand the discs to the correct size and shape. The centering disc should be 10,6 cm in diameter to make it fit flush at the bottom of the recess. Drill 2 small holes and countersunk.



The grinding disc is 11,8 cm in diameter. The disc is slightly cone shaped for improved self centering. Glue pieces of emery cloth to the disc. Now it should measure 12,0 cm in diameter or slightly less.

Fig.: Front of grinding disc, note recessed nut.

Mount the fuel filler cap on the funnel. Don't forget to put a cork gasket in between. Measure the height of the flanges. This is about 5 mm. So you'll need to grind this much into the body. Note that because of the curved body, the 5 mm depth is at the north and south position. At the west and east position the depth will be about 8 mm.



Install the centering disc in the recess. Use tape to find the best position. Check that the grinding disc touches all sides and is perpendicular to the body. **Take your time, it's critical to get this right!**

When you're satisfied, drill the small holes through and fasten the centering disc with 2 small parkers.

Fig.: Centering disc in place.



Use a drilling machine (about 950rpm) and the grinding disc to rework the edge of the recess. Check the depth frequently. At the correct depth, remove the centering disc. The hole you made is slightly cone shaped since the grinding disc is cone shaped. If necessary install the grinding disc the other way around in the drilling machine and carefully straighten the walls of the new hole.

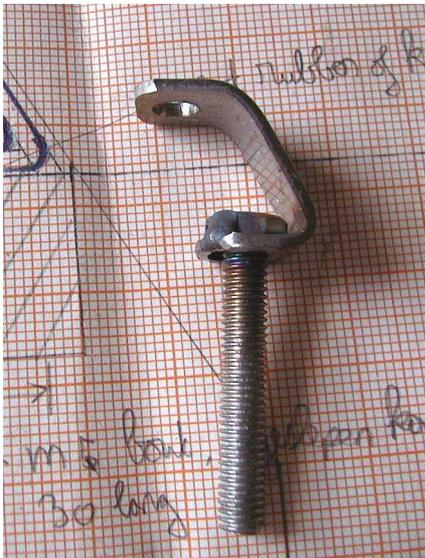
Fig.: Grinding it's way in.



It is possible that you grind through the body of the car and get a hole between the recess and the outer skin. To repair this, spray pur foam into the hole to get a backing. When it's swollen and hardened, cut it back slightly and close the hole with GRP filler repair. When that's hardened, use the grinding disc to smooth the surface.

Fig.: Edge repaired with GRP filler.

Preparation of the fuel filler cap



Make 4 brackets of steel strip 1,5 mm thickness and 10 mm width according the example on the photo. The total height must be less than 18 mm. **It is critical that they fit below the new edge of the recess!** Drill the holes in the brackets, but do not yet weld the bolts in.

Fig.: finished bracket.

Install the brackets on the funnel and fuel cap. Now you must get the fuel filler cap to seat properly and drill the 4 holes. "Paint" the brackets and nuts with lipstick. Insert the fuel filler cap into the recess, exactly the way you are going to drill the holes. If the cap wobbles or will not rest on the edge, remove it carefully. You'll see lipstick where the brackets or other parts interfere with the body. Use a Dremel to remove a bit of gelcoat or glassfibre on that spot and retry.

Remember that the brackets also must not touch the base of the recess. The clearance is needed to get a bit of tension in the mounting bolts. This way the fuel filler cap will be pulled in sufficiently against the body.



Stick a piece of cardboard on the bottom of the recess. Paint the "feet" of the brackets with lipstick and insert carefully. Mark the holes on the body with a sharp device, remove the cardboard and drill through with a 6 mm drill. Use a Dremel to flatten the surface inside the wheel well around the holes. Especially the upper aft hole is close to a curved area that will interfere with the penny washer and nut.

Fig.: Lipstick markings on cardboard.



The rework of the recess is ready and the edge can now be painted.

Fig.: Rework of recess finished.

Assembly

Remove the brackets from the fuel filler cap and put the M5 bolts in. It can be difficult getting the bolts into the lower hole, because the bolt head has to pass the upper bend of the bracket. I got round this by drilling the lower hole with a 7mm drill and slimming down the bolt head with a grinder. Weld the bolts to the brackets.



Assemble the fuel filler cap with the brackets. Install it in the recess and fasten it to the body with the penny washers and M5 self locking nuts.

Fig.: Fuel filler cap with funnel and brackets.



Trial fit the Lada Samara fuel filler hose. Obviously the end with the biggest diameter is installed on the funnel. The smaller diameter goes onto the neck of the fuel tank.

Fig.: Russian rubber.



It may be necessary to remove about an inch from the top end of the hose to get a good fit. Reinstall the hose and tighten the hose clamps.

Fig.: Lada fuel filler hose in place.

Since the Newton fuel filler cap is non breathing, you have to retain the fuel tank breather hose. On a coupé let it run to the possible highest point in the car (in the C-pillar) and back to the wheel well. To prevent fuel spillage during hard left cornering, on a Convertible fit a Mocal fuel tank breather valve on the hose.



Fig.: Fuel filler cap installed.



Fig.: Close up of fuel filler cap, note curved body.