

Fuel Tank Replacement

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Custom Flight Creations

The fuel tank of the Europa is prone to cracking. Many different reasons abound but essentially it is not braced well enough on the bottom. Cracks have been temporarily repaired but the only tried and true solution is to remove and replace the tank.

Tools necessary:

Sawzall or air saw, (or a Dremel tool with metal diamond cutters and tungsten bits), prying bars, hack saw, file, drill, hole saw of one inch and 7/8", 1", and 1.75".

Normally you should need:

1 foot 1 inch hose for fuel (like at the filling station).

1 foot 2 inch hose

One small tube of Pro Seal or CHEMSEAL B2 TANK SEALANT CS3204 3.5 Oz.

New clamps as required.

Tank

1-2 yd bid

Pint of epoxy.

Pint of filler like Expand Cell to make a tank bed.

3M 90 or 77 contact cement for reapplying the upholstery.

Paint and filler to make it pretty.

Steps to remove the tank:

1. Remove all fuel,
2. Flush with water if you can.
3. Drain and dry the tank by removing hoses and bosses, tilt the plane to make this happen.
4. Remove the interior from the area using care.
5. Cut the top of the cockpit module tank cover support at the break in the front with a fine Dremel blade.
6. Remove the wires from the top and sides of the tank area or secure them from being cut or damaged.
7. Using a straight saw with fine blades cut the sides of the tank area as close to the inside of the fuselage as possible. At least within 1/2 inch/12 mm.
8. Remove top of tank cover.
9. Cut the top of the tank out using a reciprocating air saw or similar.
10. Segment the tank top and sides and remove carefully.
11. On the saddle area and bottom area where glued, the tank may stick very hard to the glass. Work slowly and pry the tank from the glass without damaging the structure. Small relief cuts will probably be necessary on the newer XS tanks as epoxy really sticks to the PTFE tanks.
12. Once the tank is removed. Place the new tank across the sides. Yes it is wider and holds a bit more gas.

Tank insertion notes:

The tank support and fuselage structure will need more cutting to get the tank in the hole for a temporary fit and extra reinforcing depending on your Europa type, whether Classic or XS. Cut the overhanging door sills to allow a slight squeeze fit of the new tank. Keep in mind you have to be able to remove it also during the trial fittings so measure twice and cut once.

During the cutting of the old tank, the bosses of the tank often are long enough that the pitch tube must be loosened and sometimes removed to get the tank in. However, normally only shortening the boss of the tank is all that is necessary unless during your build you didn't get the dimensions perfect..

Tank install.

1. Install the new tank temporarily.
2. Measure and mark where the tank fits and where lower support and existing supports need work or installation. Sand off any bumps and humps still there from the old supports which may interfere with the install. Pay attention to the flight controls and make sure the bosses clear the tube. I always disconnect the lateral tube at the ends to get an extra half inch. Move the flight controls to get the lateral tube as far forward as possible.
3. Supports may be constructed from foam or by troweling in a ribbon of expand cell or similar to match the shape of the bottom of the tank. Only the tank inboard and forward lower surfaces need new supports. If you were lucky the aft supports will still be intact. If not, the aft end of the tank will need supports on the floor and to the rear bulkhead also. Once your tank supports are roughly marked trowel in your expand cell or tack your foam in place. Place release plastic on the tank and set in place and check for fit and clearance again. The tank should be withing 15-20mm of the floor. A thin layer of cork or other good padding may be placed on the contact surfaces of the tank for cushion and support, but has to be planned for so as not to raise the tank too high...
4. After supports are shaped, reinforced and fit and support perfectly, cover with 2 layers of bid. One may find it easier to fill the aft area of the tank bulkhead support with expand cell to make a solid easy to work with support.
5. Plan sight gauge mods, wire conduits and other tank options at this time.
6. Start planning and prepping your cockpit module / tank cover re-glassing.
7. Small two layer tape flanges may be prebuilt on a table and peel plied. When cured, these may be cut and installed with an inch of overlap with flox or Redux to allow a reinforced inside as well as the two layers of bid on the outside of the cockpit module.
8. Drop the tank into position and secure from movement with polyurethane foam tacked in place with 5 minute. Once installed and wedged in, plan the cockpit module top reinstallation. Often times installing the tank first before the inside flanges in 7 above can be done more efficiently as the tank becomes a wedge to hold the flanges in place. Just don't glue in the tank.
9. Place the cockpit module top back in place and flox the flanges and area liberally, then fill all gaps and glass the tank in.
10. Install all remaining hoses and check the tank for leaks and site gauge operation.
11. Reglass in the door sills and any wire conduits to suite. Fill sand prime paint, and reinstall the interior.



Figure 1 Ready to start cutting



Figure 2 Initial cut along front of the cockpit just above the break in the cockpit. I could have gone lower in the front to within 1/2 inch of the break and still had ample room for the flange later to be added during the top reinstallation.



Figure 3 Cutting with a fine hand saw on the sides.



Figure 4 Tank top now exposed



Figure 5 Cutting the top out of the tank.



Figure 6 Carefully cutting around the controls.



Figure 7 The side rails need to be cut out for the new tank just a bit. I recommend cutting out about half the flange.

Please reference my posts on fuel tank structural analysis and fuel tank supports.