30. Fuel system

Overview

The second part of the fuel system will be installed at this stage. The choice of engine will influence the remainder of the system, which is described in the engine installation manual. Refer to the fuel system illustration found at the end of this chapter whilst reading the following description.

The engine is fed from either the port “main” or the starboard “reserve” side of the fuel tank, controlled by a selector valve. After the fuel has passed through the valve the line runs to one or two electric fuel pumps, depending on the engine chosen, and then to the engine. Installation of the latter items and the positioning of the fuel filters is covered in the engine manual.

Installation

Fuel filler

Cut out a hole 70 mm (2 3/4”) in diameter centred in the circular rebate on the upper starboard side of the fuselage for the fuel filler (part no. SPRL/GS).

Scuff sand the underside of the fuel filler receptacle’s flange and also the flange of the fuselage in preparation for bonding. Before bonding, though, make and prepare the two fuel system vent tubes for bonding also.

Fuel system vents

Two separate vents are required for the fuel system; one for the fuel tank, the other for the fuel level sight gauge. The vent tubes are made from ductile stainless steel tubing and are located on the top fuselage 38 cm (15") behind the back of the door recess and approximately 19 mm (3/4") either side of the centreline.

Cut two lengths of the stainless steel tubing (part no. EUR054) and bend them through 90º so that they will face the airflow then bend the straight portion so that the connections lie along the inside of the top fuselage - they will be covered in later when upholstery is fitted.

As a precaution against the vents becoming blocked by an insect, ice or whatever, and to minimise any pitot effects, drill 2 holes each 1/8” diameter at the back of each vent, one above the other, the lower hole being arranged to be just above the surface of the fuselage when the vents are fitted.

Drill two holes in the fuselage top for them to pass through. Push the exposed foam between the skins back a little for flox to fill upon installation of the tubes.

Scuff sand the vent tubes where they will pass through the fuselage skins and, filling the edges of the holes in the fuselage between the skins with Araldite 420 and flox, insert the two tubes. Arrange the vent openings to be approximately 25 mm (1") above the fuselage skin. Build up a generous fillet of flox on the inside of the fuselage around the tubes to give added support.

Apply an Araldite 420/ flox mixture between the skins around the fuel filler receptacle opening then bond the receptacle in place, aligning it so the cap opening lever will fold downwards. Leave to cure undisturbed.

Vent lines

Connect a length of 6.5mm bore clear polyurethane flexible tubing (part no. TU23RM) to the vent fitting of the fuel tank and one of the vent pipes in the fuselage roof. Use hose clamps (part no. 291-600) to secure the tubing.

The sight gauge tubing, already connected to the tank outlet fitting, should now be routed through the holes in the thigh support, along the floor next to the centre console, then vertically up the front corner. The vertical section is the sight gauge part where fuel will be visible.

At the point the tube will become hidden behind the instrument module, route it outboard then aft to the windscreen frame. Route it up along the frame to the centre, and then aft along the centre section of the fuselage moulding. Attach the tubing to the vent with a hose clamp and fasten it to the fuselage at appropriate points with cable ties (part no. 622-177) and adhesive backed mounts (part no. 227-996).

To aid vision of the fuel level in the sight gauge a suggestion is to place a card with angled stripes of alternating light and dark colours behind the tube. Diffraction through the liquid filled tube distorts the appearance of the stripes and so shows up the level more clearly.

Fuel filler tube

The fuel filler tube (part no. F18) is roto-moulded polyurethane similar to the fuel tank.

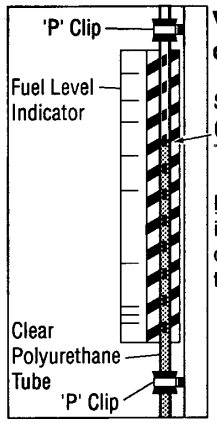
Cut the large diameter boss down to 6 mm (1/4”) long then, using a file, open the bore diameter. You should increase the bore diameter as required until the filler cap can be just slid in.

Next cut the end of the boss at the opposite end to open it up. Clean all the cutting debris out before you continue, to ensure none enters the fuel system. Slide the longer leg of the rubber hose elbow (part no. XFS07) onto the lower boss and then offer up the fuel filler tube assembly to the filler receptacle and the fuel tank filler boss. The filler tubwe should slide over the threaded portion of the filler receptacle. You may need to trim the hose to get the filler tube moulding to align with the door aperture. Use two hose clips (part no. Clip 3) to secure the XFS07 elbow.

After installing the filler moulding (part no. F18), it will be fastened to the fuselage side with 75 mm (3”) wide glass fibre straps; one just below the inlet bowl and the other at the bottom just above the rubber hose. Scuff sand the fuselage side where the straps will attach.

Immediately before installing the filler tube, coat the threaded portion of the filler cap receptacle with Araldite 420/flox which will act as a sealant. Any other fuel proof sealant may be used. Now slide the filler tube over the receptacle, and smear a fillet of sealant around the joint.

Make up a 2 ply 'bid' layup on plastic sheeting 30 cm x 20 cm, (12" x 8") then cut it to make two straps 30 x 7.5 cm (12" x 4"). apply the straps around the filler tube, lapping onto the fuselage side then, ensuring the tube will not move, allow to cure.



View Looking Forward on Sight Gauge

Sight Gauge (Indicating Fuel Level in Tank)

Note: Diagonal lines on indicator distort with diffraction behind fuel filled tube