TITLE :	Direct Vision Panel

AIRCRAFT TYPE : (*eg : Pitts S2A*)	Europa Classic & XS	
Mod Type : (*Delete as required*)	New Build	Retro-fit

1. Introduction

1.1 The standard Europa perspex moulded side screens, whether tinted or clear provide excellent visibility from the cockpit. However under certain conditions some aircraft are known to have experienced condensation forming on the windows, mostly on the inside, but occasionally on the outside.

1.2 The modification introduces a triangular shaped direct vision panel (DVP) at the lower, forward part of the port side screen just below the Captains horizontal sight line. The DVP uses part of the original side screen which is locally reinforced to form a frame for the DVP. This is hinged along its lower edge, and when closed the DVP sits flush with the original window. When open the DVP lies horizontally across the cockpit about 160 mm above the top of the PI control column. A simple locking mechanism protects the security of the cockpit and prevents inadvertent opening of the DVP in flight. A flange at the leading and trailing edge of the DVP ensures that draughts and water are prevented from entering the cockpit. The DVP has the secondary benefit of enabling cooler air to enter the cockpit when parked or taxiing in high ambient temperatures.

2. Parts List

List any new manufactured or procured parts:

Qty	Part No.	Description	Source
1		Curved DVP	Cut from side screen
2		16 gauge aluminium triangle (as pattern)	Hardware store
1	MS20001-3	Hinge 170 mm long	Standard hardware
1	AN525 lOR12	Screw	Standard hardware
1	MS21042-3	Nut	Standard hardware
2	AN960-10L	Washer	Standard hardware
6		Soft aluminium pop rivets 3.2 dia x10 mm long	Hardware store

List of related drawings / photos

Drawing No.	Title / Description	Issue
11324/1	**Reinforcing Plates drawing**	
11324/2	**Cross Section, drawing**	
11324/3	**General view, picture**	

3. Action

3.1 Cut from the 16 gauge aluminium sheet 2 no. triangular shaped reinforcing panels as per the attached drawing. Note that whilst both triangular reinforcing panels have the same external dimensions the interior dimensions differ. One has a larger hole - this is the inner reinforcing plate - the smaller hole panel is used on the outside so as to provide a reveal for the DVP to fit into.

3.2 Take the inner panel and with 80 grit paper scuff-sand both sides. Bend the panel to fit both the leading edge and the inner curve of the side screen. Note that the curves are of a different radius and the inner plate will change its overall size as the curves are formed. When the curving process is finished the panel will drop neatly into the side screen rebate in the door.

3.3 Affix the inner reinforcing plate to the rebate of the door using Araldite 420. 3 no. 3.2 mm diameter soft aluminium pop rivets are used to hold the panel in place while the adhesive cures.

3.4 When the adhesive has cured carefully remove the rivet heads and tails using a sharp chisel. Offer up the Europa sidescreen and mark the perspex with a felt tip pen along the leading edge of the curved section of the reinforcing plate and mask up the area to prevent scratching. Using a perspex cutting blade in a jigsaw, lubricated with oil, carefully cut the sidescreen along the marked line. The sidescreen must be properly supported during this process.

3.5 Apply Araldite 420 mixed with flox to the rebate in the door and to the curved outer side of the reinforcing panel. Carefully offer up the sidescreen which should be masked to limit adhesive adhering to anywhere but the outer 15 mm of the perspex. Leave to cure thoroughly.

3.6 Once cured fair in the sidescreen edges to the door as per the Europa instruction manual. Scuff-sand the inside of the outer reinforcing plate (the one with the smaller hole) and glue to the inner panel and the curved edge of the DVP using Araldite 420. Masking tape can be used to hold the outer reinforcing panel in place whilst the adhesive cures. The rebate formed between the inner and outer reinforcing panels provides a draught and waterproof lip to the DVP.

3.7 Using a jigsaw, an angle grinder or a Black and Decker finger file, carefully shape the triangular piece of perspex to fit just inside the inner reinforcing plate with a gap of 1 mm on all 3 sides. Scuff-sand the lower edge and one face of the hinge and apply Araldite 420 mixed with flox. Clamp this joint until cured.

3.8 The hinge can be either glued (with Araldite 420 flox mix), bolted or riveted to the lower inside edge of the outer reinforcing panel as required. A glued joint provides better overall security although it makes the DVP very difficult to remove.

3.9 To form the locking mechanism in the DVP carefully drill a 5 mm hole, 25 mm in from the upper tip of the triangle of perspex. Make up a locking tongue from a scrap of 3 mm thick aluminium strip about 12 mm wide and 30 mm long. Drill one end to make a 5 mm hole. Insert from the outside the AN525 lOR12 screw with AN960-lOL washers either side of the perspex. Glue the 12 mm x 30 mm tongue in position on the inside of the DVP and carefully tighten the MS 21042-3 nut until the mechanism can just turn but is not loose. With a further scrap of 3 mm thick aluminium make up a simple abutment in which the locking tongue can slide and fix with Araldite 420 adhesive to the inside reveal of the door frame.

3.10 Finally fill the screwdriver slot in the AN525 screw with Araldite and flox in order to prevent the mechanism being operated from the outside.

4. Flight Test and Special Inspections

4.1 The DVP modification was incorporated in the first homebuilt Europa and was flight-tested in the closed position at speeds up to the VNE of 165 knots. It was tested in the open position upto 130 knots. In 777 hours flying time the DVP proved to require no maintenance and was effective in operation.

List of related analysis or test reports

Report No.	Title / Description	Issue
	None	

5. Weight and Balance Effects

5.1 This modification is designed to be installed during the construction of the aircraft. Any marginal increase in weight over the standard aircraft will be recorded during the weight and balance calculations prior to granting of a permit to test.

5.2 Retrofitting of this modification is possible. In these circumstances the aircraft be weighed both before and after the installation of the modification and a new weight and balance calculation prepared for inspection by the PFA Inspector.

- *Amend weight and balance records by calculation to reflect the following changes :*

Weight Change	Moment arm	Moment Change
0.5lb	*-4.0in*	*-2.0*

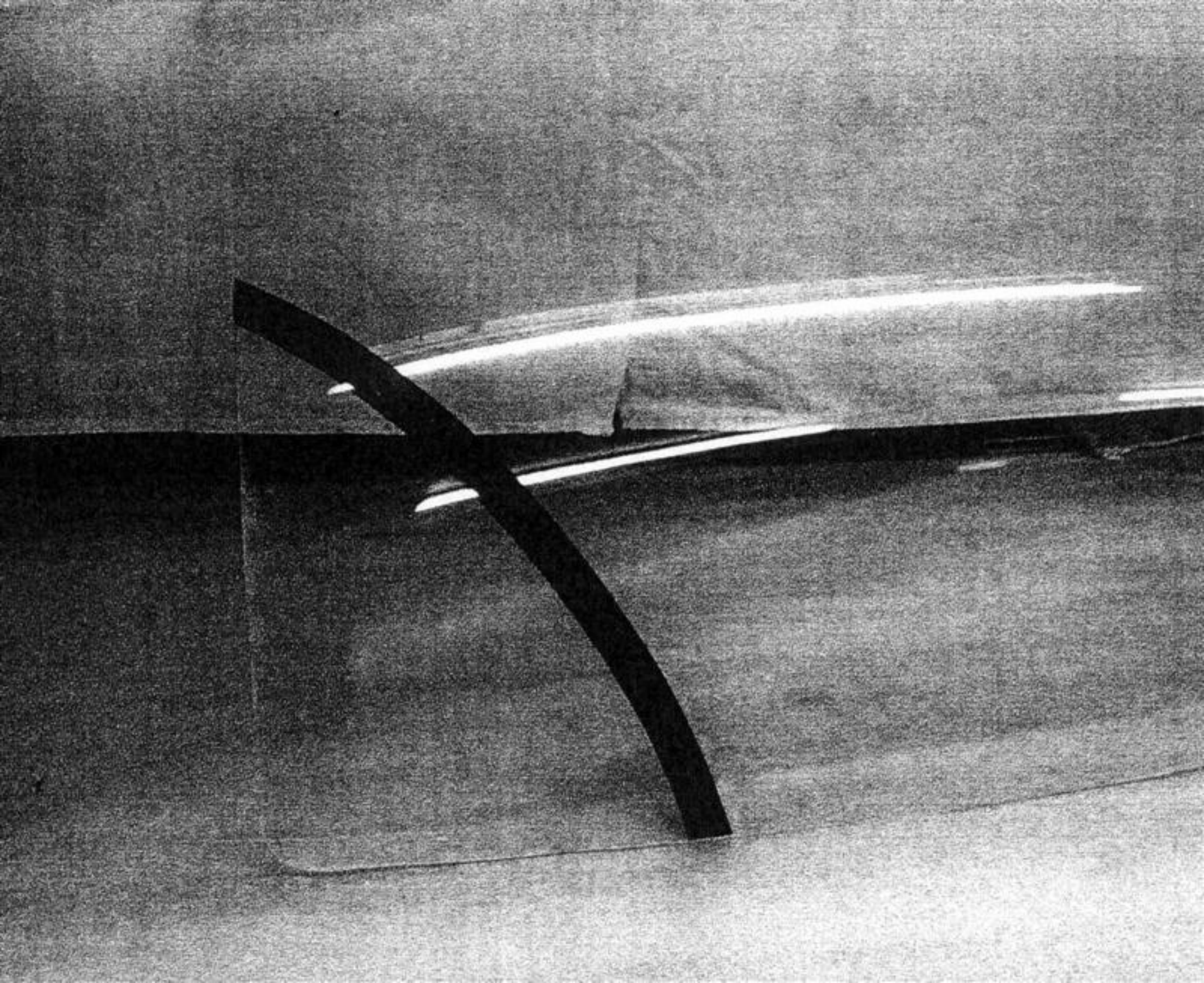
6 Certification

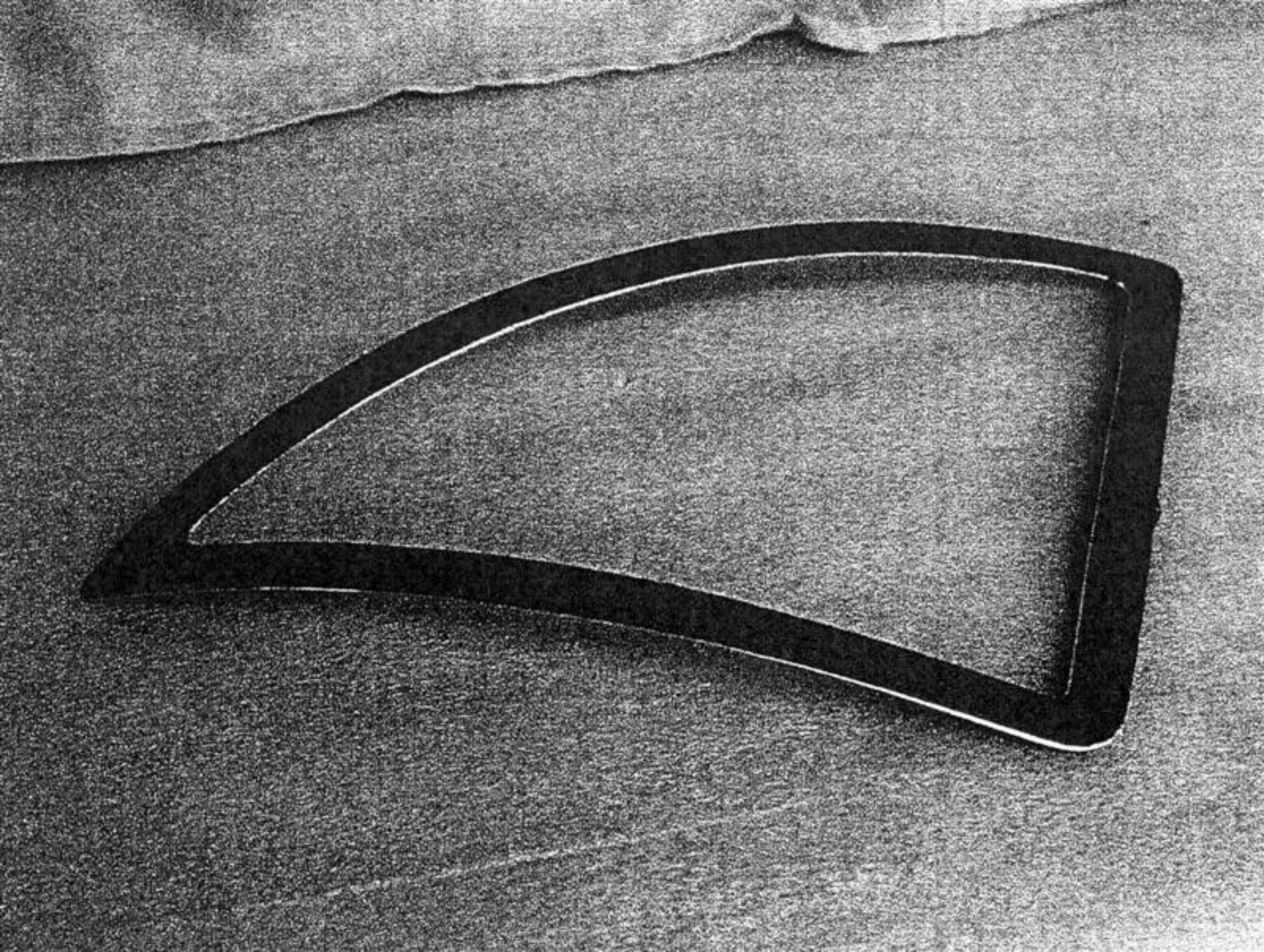
Your PFA inspector should make the appropriate logbook entry for this modification

6. Applicant's Declaration

I Declare that the foregoing information is correct and I agree to abide by any conditions pertaining to this modification. I agree that this modification and all ideas contained within are the property of PFA (Ulair) Ltd and can be used in any way for the benefit of the PFA and it's members.

Signed _____ Applicant Date _____





PFA MODIFICATION APPLICATION

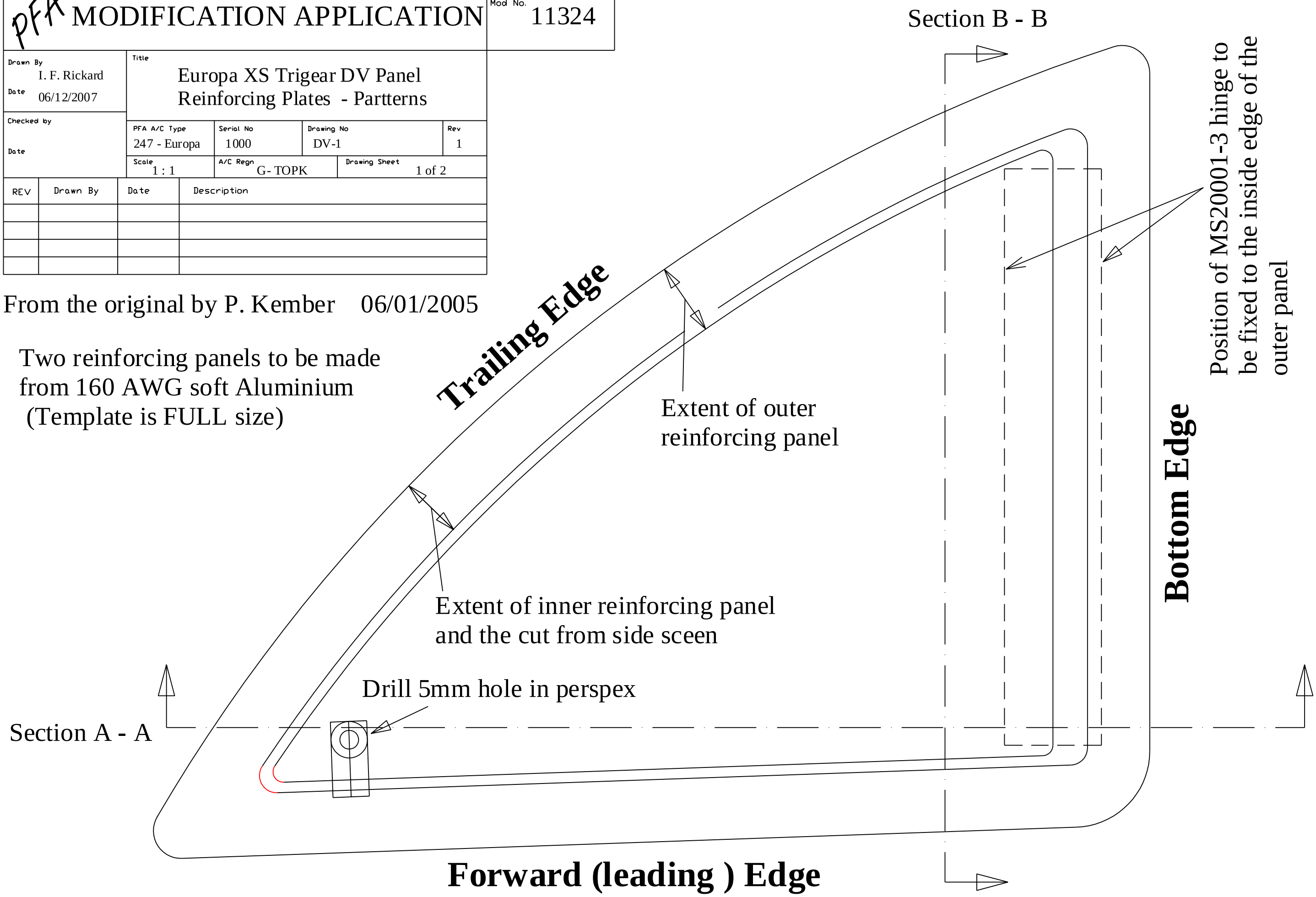
Mod No. 11324

Drawn By: I. F. Rickard Date: 06/12/2007	Title: Europa XS Trigear DV Panel Reinforcing Plates - Partterns			
Checked by Date	PFA A/C Type: 247 - Europa	Serial No: 1000	Drawing No: DV-1	Rev: 1
	Scale: 1 : 1	A/C Regn: G- TOPK	Drawing Sheet: 1 of 2	

REV	Drawn By	Date	Description

From the original by P. Kember 06/01/2005

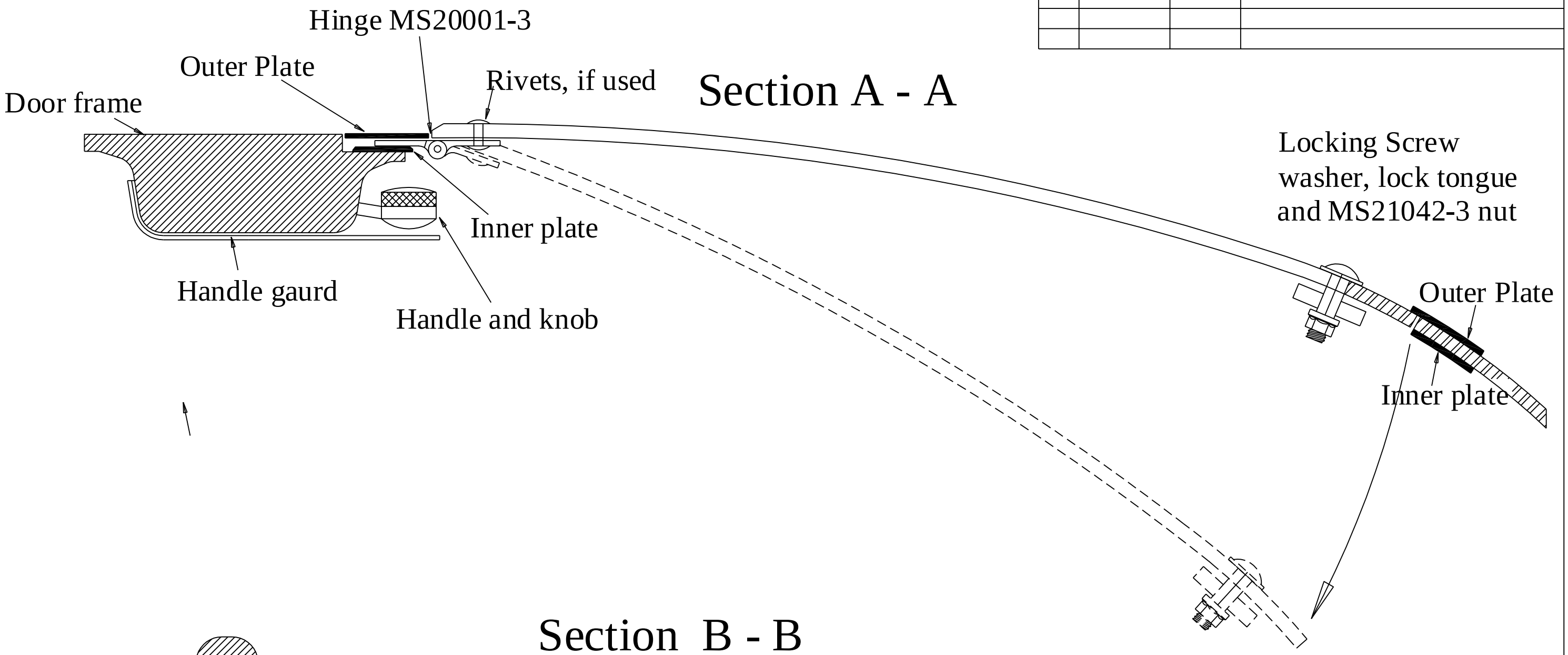
Two reinforcing panels to be made from 160 AWG soft Aluminium (Template is FULL size)



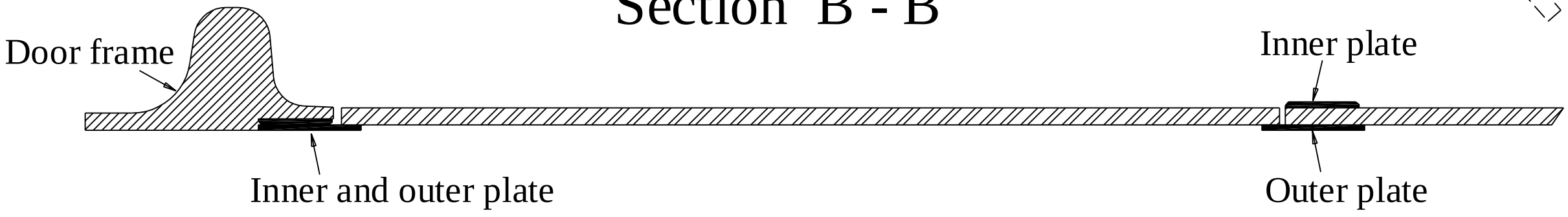
Mod No.
11324

REV	Drawn By	Date	Description

Section A - A



Section B - B



From the original by P. Kember 06/01/2005

PFA MODIFICATION APPLICATION

Drawn By: I. F. Rickard Date: 06/12/2007	Title: Europa XS Trigear DV Panel Sections A - A and B - B
Checked by Date	PFA A/C Type: 247 - Europa Serial No: 1000 Drawing No: DV-2 Rev: 1 Scale: 1 : 1 A/C Regn: G-TOPK Drawing Sheet: 2 of 2