

### WINGS - CENTRE SECTION - BOOM

#### GENERAL DESCRIPTION

The wings and centre section are supplied with the Main Spar and leading edge 'D' Section completed.

The trailing ribs and rear spar are constructed from foam covered fibreglass.

Flaps and Ailerons are fabricated from pre-cut and shaped aluminium parts which are then rivetted together. Wing tips are provided as moulded items.

The structure comprises a cantilever wing with the addition of struts.

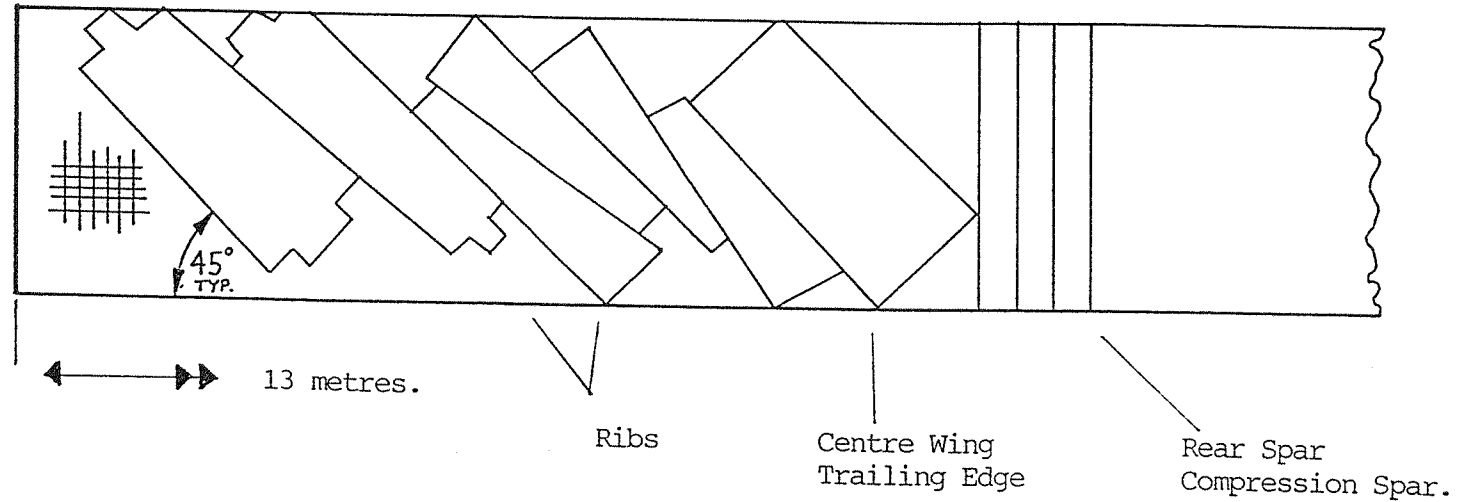
On completion it is covered with polyester fabric suitably doped.

The wings should be coloured only in a light shade (e.g. white) to eliminate heat build-up in high ambient temperatures. Remember paint is heavy so try to keep the colouring to a minimum.

When you have decided on the type of paint you require you MUST consult with CFM Metal-Fax Ltd. prior to proceeding with the covering and painting. (See page 5-13)

## GLASS FIBRE CUT-OUT PATTERN

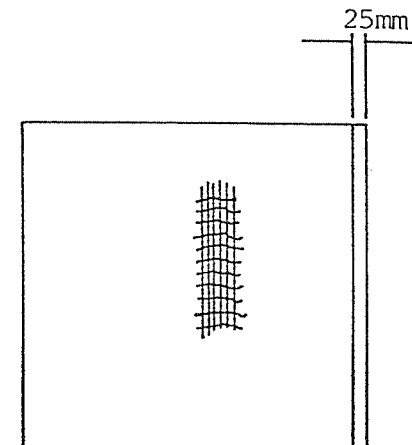
### BI-DIRECTIONAL GLASS CLOTH (BID)



(Keep all spare glass for corners and minor items.)

### UNI-DIRECTIONAL GLASS CLOTH (UND)

Pull one longitudinal strand out at 25mm and  
cut off with scissors.



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# WING - FIBREGLASSING PROCEDURES

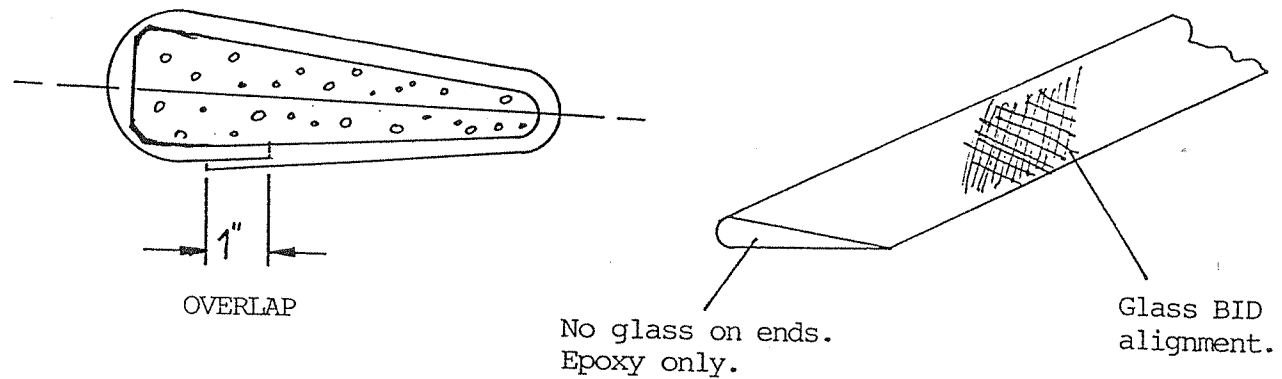
UNI-DIRECTIONAL CLOTH  
BI-DIRECTIONAL CLOTH

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W201	2	Drag Spar	BOND	1.9
W196	2	T/E Centre Wing		
W197	1	Compression Strut cut into 3 parts later	BOND GLASS	1.9 3

W201 - Drag Spar, W197 - Compression Strut Centre Wing and W196 -T.E. Centre Wing are glassed and cured before being fitted.

Cure on a flat surface,  
making sure the glass  
does not adhere to it.  
(eg. polythene surface)

## T/E CENTRE WING - W196 (Glass before fitting)



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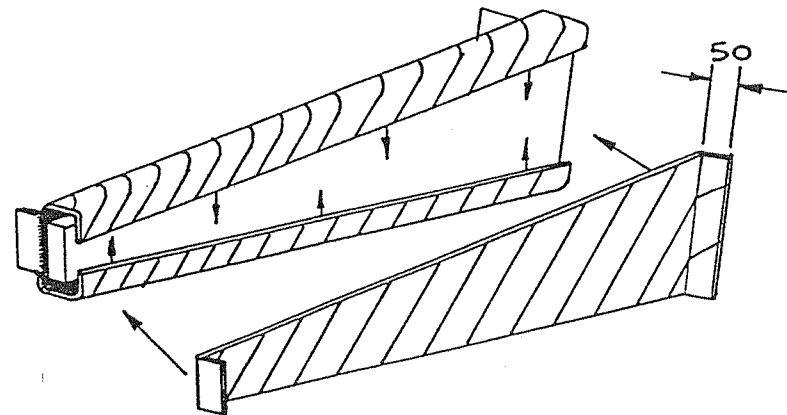
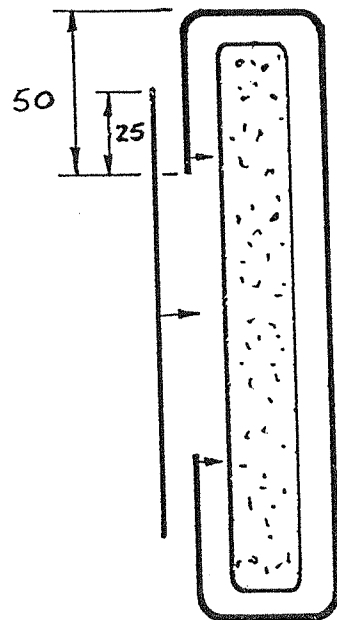
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## WING - FIBREGLASSING PROCEDURES

### RIBS - W195 and W199 (Bonded in place)

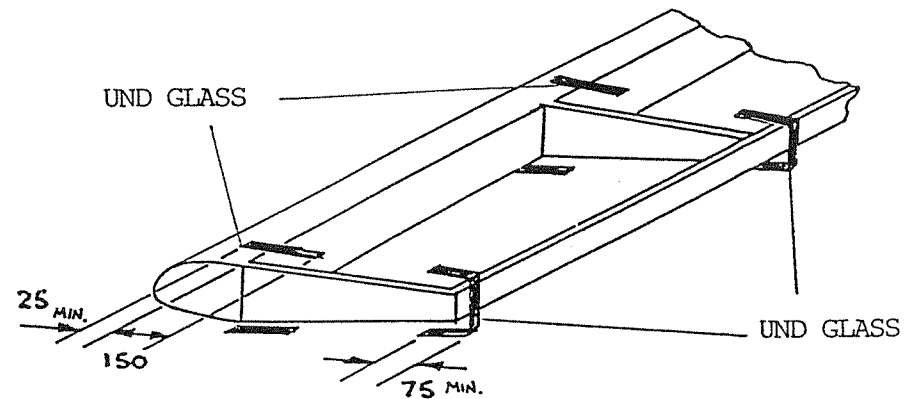
Lay-ups on each side of the ribs form a sandwich construction which gives the required strength and rigidity. BID is applied at 45 degrees to the vertical on the ribs and wrapped around as shown below. An additional layer is added to the other side, ensuring that at least 2" is overlapped onto the rear face of the SHEARWEB either side of the rib and well adhered. A 2" overlap is similarly applied to the underside of the rear spar.



## WING - FIBREGLASSING PROCEDURES

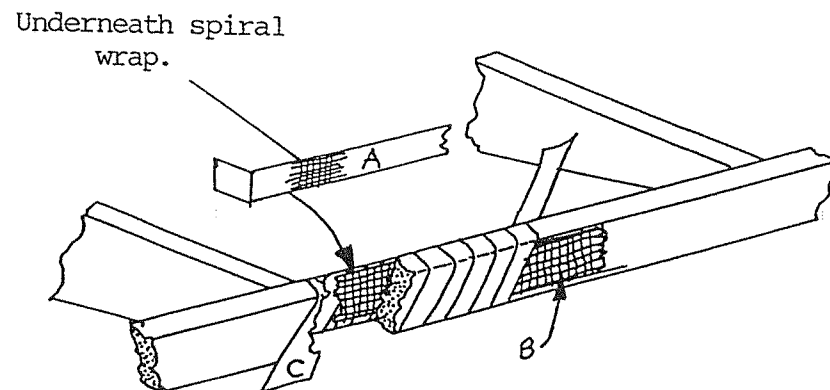
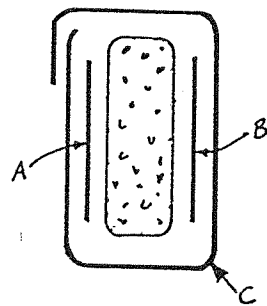
After curing, apply UNI-DIRECTIONAL cloth to the rib/shearweb as indicated.

Glass on two UND straps to W199-1 only after assembly has cured and where indicated on Page No. 4-17



## REAR SPAR - W200

After the ribs are glassed, the rear spar is spirally wrapped along its length with BID tape - CM91 - over a CAPPING of BID. This comprises of one lay-up of BID applied to the front and rear faces of the spar. The spar is then immediately wrapped spirally at 45 degrees to its length, overlapping by 60%.



## WING - FIBREGLASSING PROCEDURES

### DRAG SPAR - W201 and COMPRESSION STRUT - W197 (Before fitting)

Both the Drag Spar and the Compression Strut are spirally wrapped, at 45 degrees to their length, with BID tape - CM91, overlapping by 60%. See Rear Spar procedure for spiral wrap.

### DRAG SPAR BID REINFORCING STRIPS

#### INSTALLATION OF DRAG SPARS:

After main assembly has cured, cut out the obliquely marked holes in Rib W199-2.

Bond into position the drag spars.

When cured, glass on the BID reinforcement strips as illustrated.

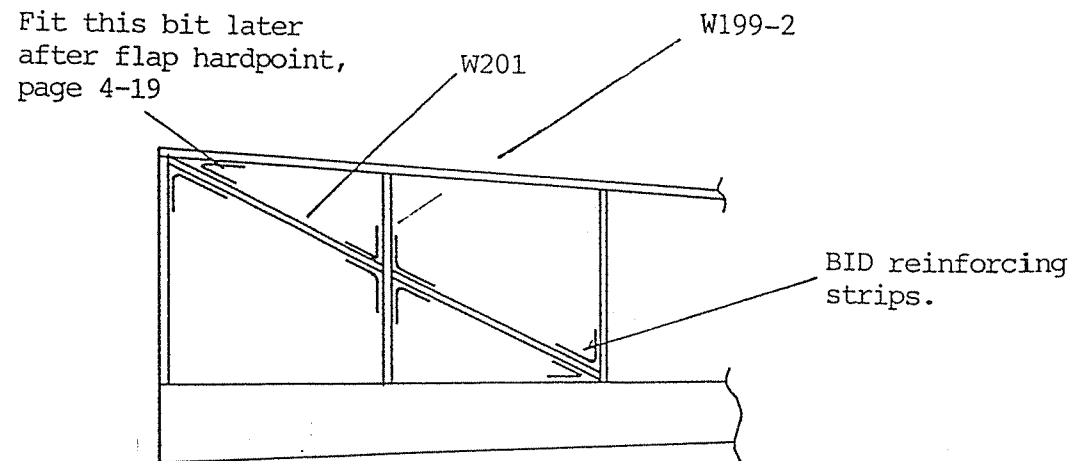


FIGURE 19

WING ASSEMBLYRIBS  
REAR SPAR

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W100	1	Wing Assy. Centre		
W101	2	Wing Assy. Outer		
W106	4	Wing Pin		
W195	4	Rear Rib Centre Wing	BOND	1.9
W199	12	Rear Rib Outer Wing	BOND	1.9
W200	2	Rear Wing Spar	BOND	1.9
W196	1	T.E. Centre Wing	BOND	1.9

THIS PROCEDURE DETERMINES THE  
SYMMETRY OF THE WINGS. TAKE YOUR  
TIME AND BE SURE OF ALIGNMENT.

W196, Centre Wing T.E., W197, Compression Strut Centre Wing and W201, Drag Spar are glassed and cured before being fitted. See PROCESS SHEET No. 3 and ensure ALL foam edges are radiiied to 6mm.

Attach the Centre Wing to the Outer Wing, making sure that they are flush at all touching points.

The Ribs are supplied cut to the exact size, fit these vertically from the 'D' section and check for alignment and symmetry.

Space the outer W195 and inner W199 at 4mm. When bonding, use a temporary jiggging strut to keep the outer W199 at 90 degrees to the Shear Web.

Bond on the Rear Spar, W200, and ensure that it is PARALLEL to the main spar CENTRELINE.

When cured, the Centre Wing will be glassed and the Boom installed to form a rigid structure. The outer wings will then be glassed and the Centre Wing mated to the outer wing to determine the length of the Drag Spar, which is then bonded into position. When the Drag Spar has cured, the Wing Tips, W203, are bonded on to the outer wings to complete the rigid structure of the outer wings.

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FIGURE 19

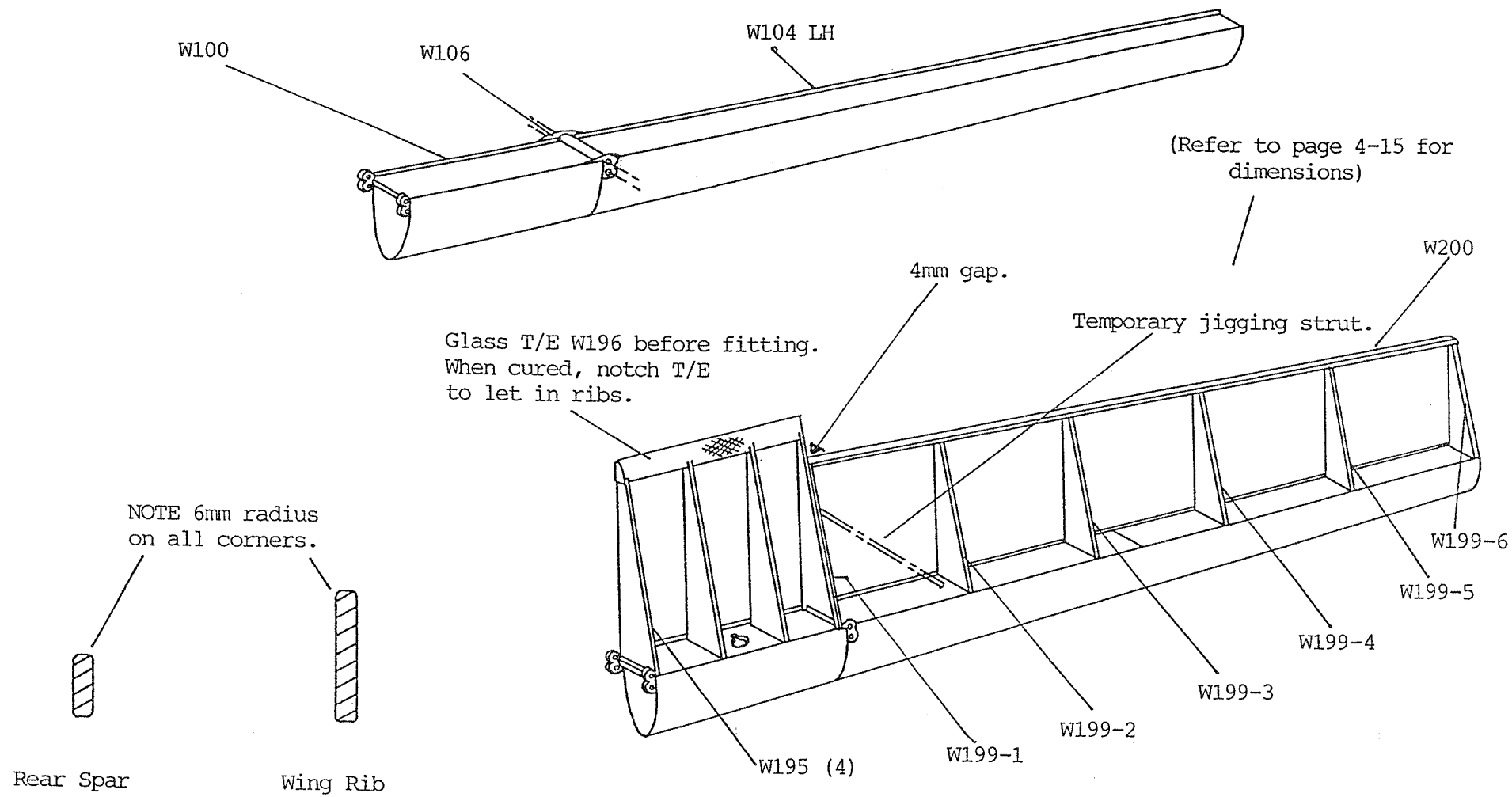




FIGURE 20

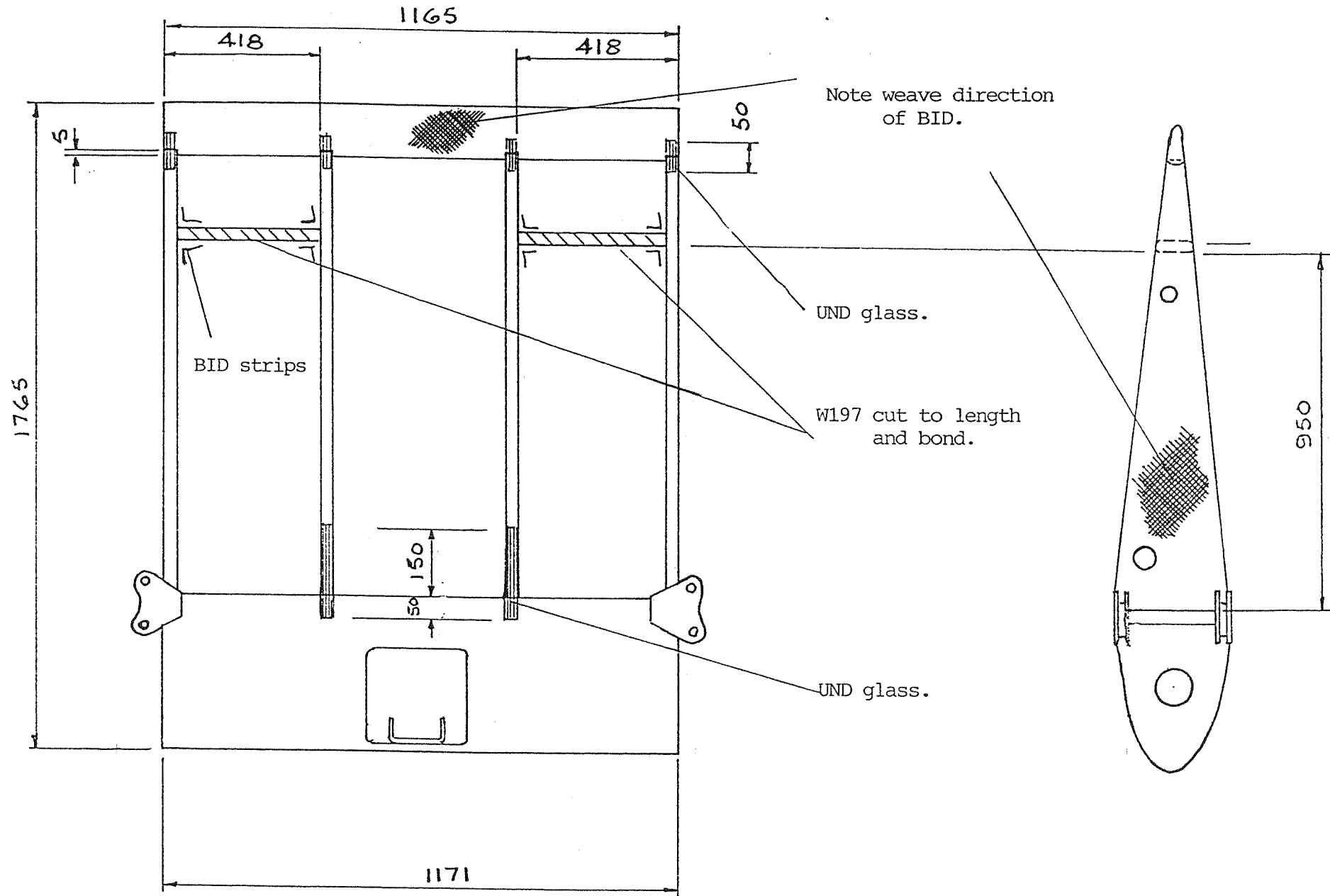


FIGURE 21

BOOM INSTALLATION

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W213	1	Cover Centre Wing	*1	
W125	2	Torque Plate Wing	BOND	1.2
W192	2	Torque Pin Wing	BOND	1.2
W106	4	Wing Pin		
F220	2	Boom/Key Stop		
W197	1	Compression Strut		
F263	1	Plate Boom Support	BOND	1.2
F262	1	Boom Support Rear	GLASS	3
W149	3	Horn Flap		
W191	4	Rib Cap Centre Wing	BOND	1.2
W144	1	Torque Tube Flap	GLASS	3
F213	1	Boom Tube		
F153	2	Bracket Hanger Tube		

PAINT BOOM BEFORE INSTALLATION.

(Do NOT paint the front 430mm)

NOTE \*1 - Bond on only after  
INSPECTIONBOOM/KEY STOPS

Trial fit boom to centre section, bolt and secure. Put a tube/straight edge through the tailplane location holes in the boom and from the front or rear of the assembly, ensure that the centre section is parallel to the tailplane location holes. Fit the upper Key stop and rivet, making sure it butts to the shearweb. Mark for the lower Key stop and remove boom and install and rivet the Key stop halfway through the shearweb. Fit lower Key halfway through shearweb drill/rivet rear holes. Remove boom, complete riveting.

Refit the boom for the final inspection.

FIGURE 21

BOOM INSTALLATION

Make two holes through the centre section inner ribs either side of the location for the boom stud, for spanner/socket access in the future.

Bond together W197 (which is glassed) and F263. When cured spiral wrap with BID.

When cured rivet Boom Support Bracket F262 central on compression strut W197/F263.  
Bond assembly in position onto ribs. When cured centralise rear ribs/trailing edge to boom and rivet F262 to boom.  
Glass compression strut to ribs using BID strips - see page 4-9.

After bonding in place the bearings CM36, drill and bolt the (3) flap horns, W147, in line with each other.

Position bond and when cured, lay-up BID cloth over the Rib Caps, W191.

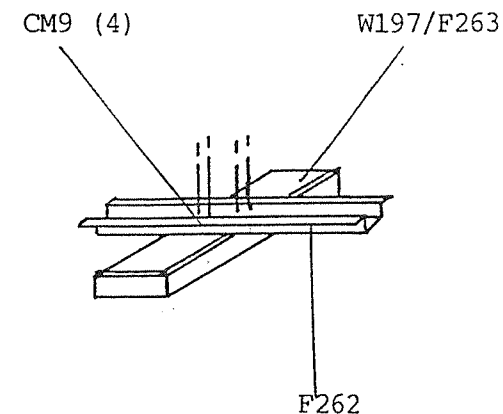
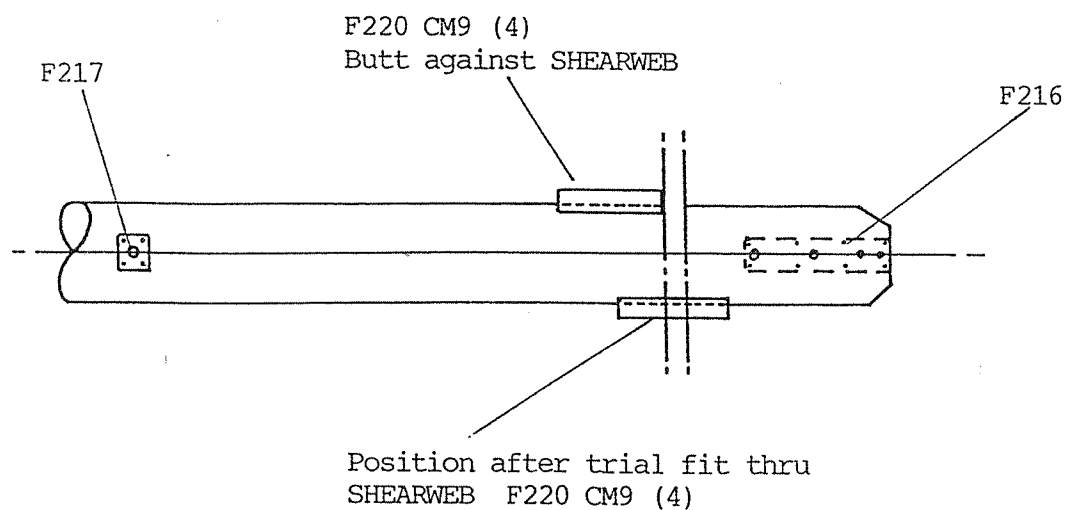
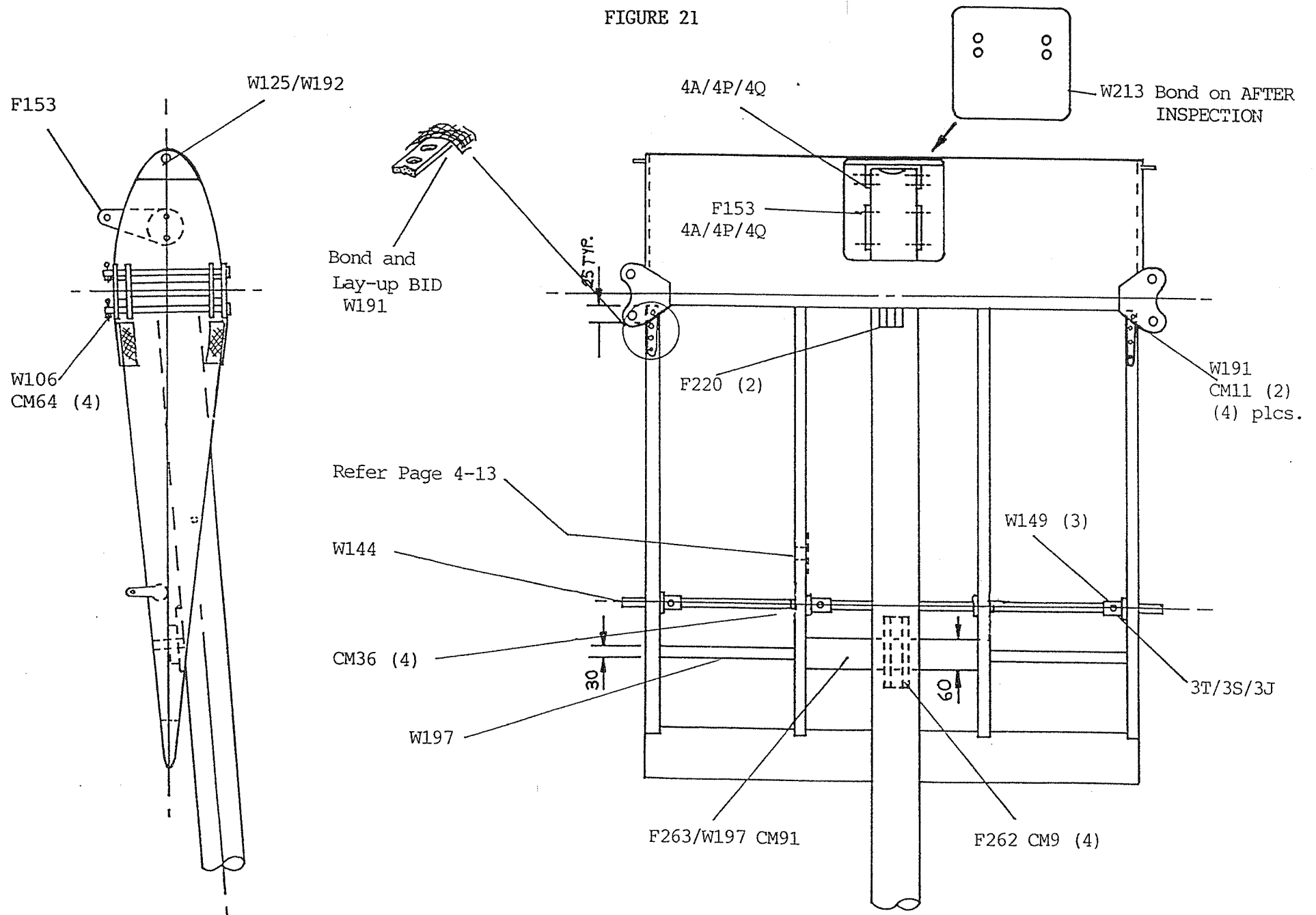


FIGURE 21



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FIGURE 22

WING ASSEMBLY COMPONENTS

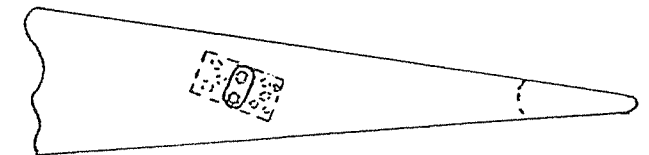
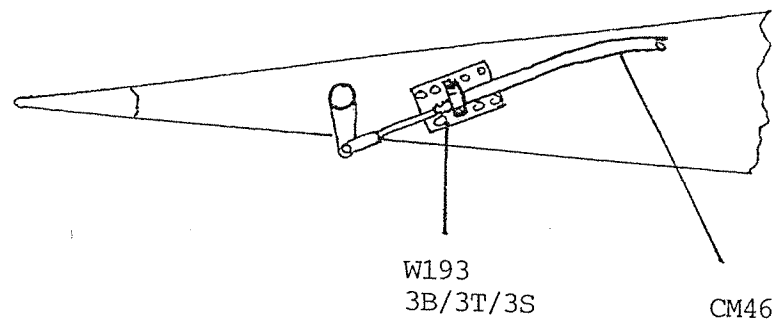
FLAP/TELEFLEX BRACKET

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W193	1	Bracket, Flap/Teleflex	BOND	1.2

Using the TEMPLATE on the next page, find the location of W193 and bond in place.

Remove rib glass and foam from the area behind teleflex clamp for bolt access.

Bolt together making sure of seating of teleflex collar in clamp.



(REF. 7-14)

FIGURE 22

FLAP/TELEFLEX BRACKET TEMPLATE

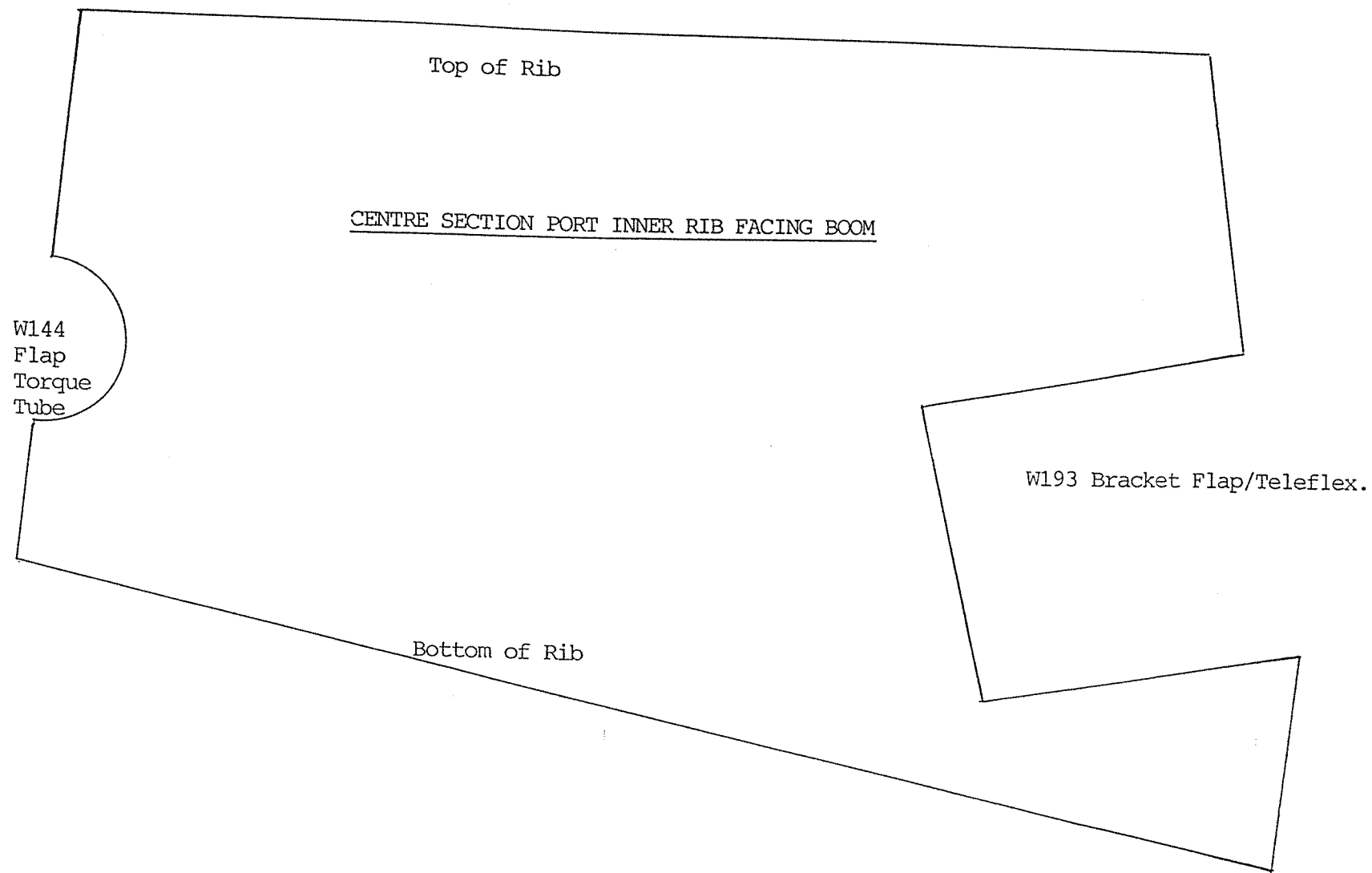
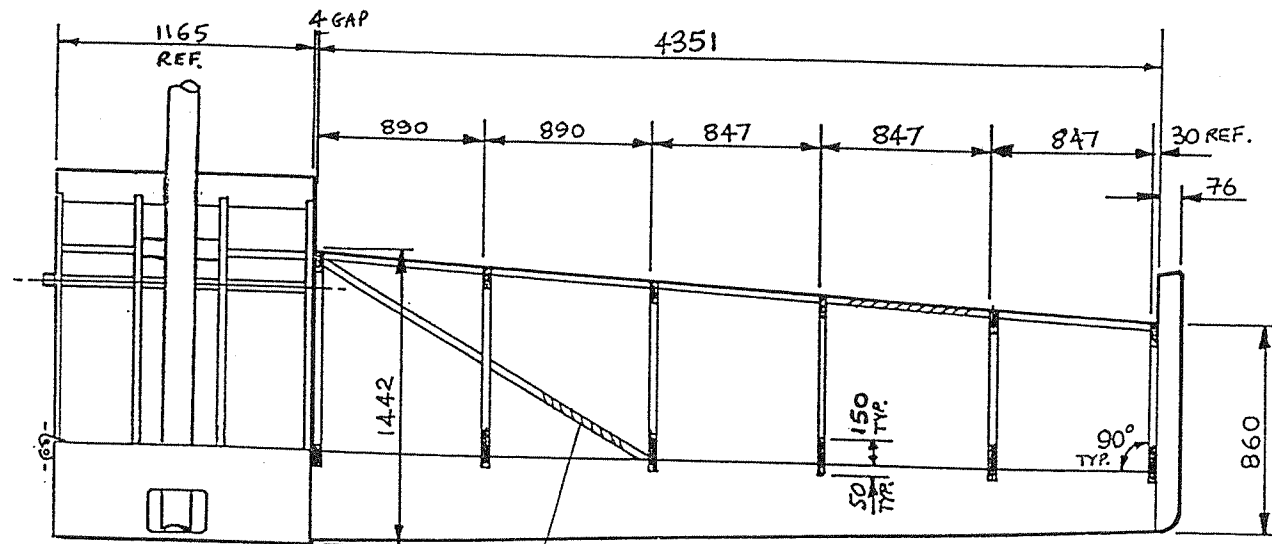


FIGURE 23



W201  
Bond in AFTER main structure has cured.  
Add BID reinforcing strips, page 4-6.

FIGURE 24

WING ASSEMBLY COMPONENTS

AILERON BELLCRANK  
 AILERON BEARINGS  
 DRAG PLATE - FLAP TORQUE TUBE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W182	2	Bearing Push/Pull	BOND	1.7
W185	2	Drag Plate Wing	BOND	1.2
W151	2	Bracket Wing Bellcrank		
W161	2	Bellcrank Bracket Support		
F328	2	Spacer Bellcrank		
F329	2	Bearing Bellcrank	GREASE	
W218	2	Bellcrank		
W152	2	Tube Aileron	*	
W154	6	Insert Aileron Tube	LOCTITE	4.1
W153	2	Tube Aileron		

NOTE\* - DO NOT fit W154 to the inboard end of the aileron tube, W152, which connects inside the centre section. When the aircraft is rigged this tube may be cut to length for setting up the control.

Bond the aileron push/pull tube bearings into the ribs where indicated, ensuring free movement of the tube.

Cut out hole for the flap torque tube bearings, CM36. Rig the outer wings to the centre section and install the wing pins. Align centre section to outer wings and ensure the wing pins can be removed and refitted with free movement. Providing the flap torque tube centralizes in the bearing, CM36, derig wings and bond bearing and drag plate W185 in position. If necessary, enlarge bearing hole in rib to allow for alignment, mark bearing position. Derig and bond in bearing using foam chippings mixed with the Araldite to pack the bearing out.



FIGURE 24

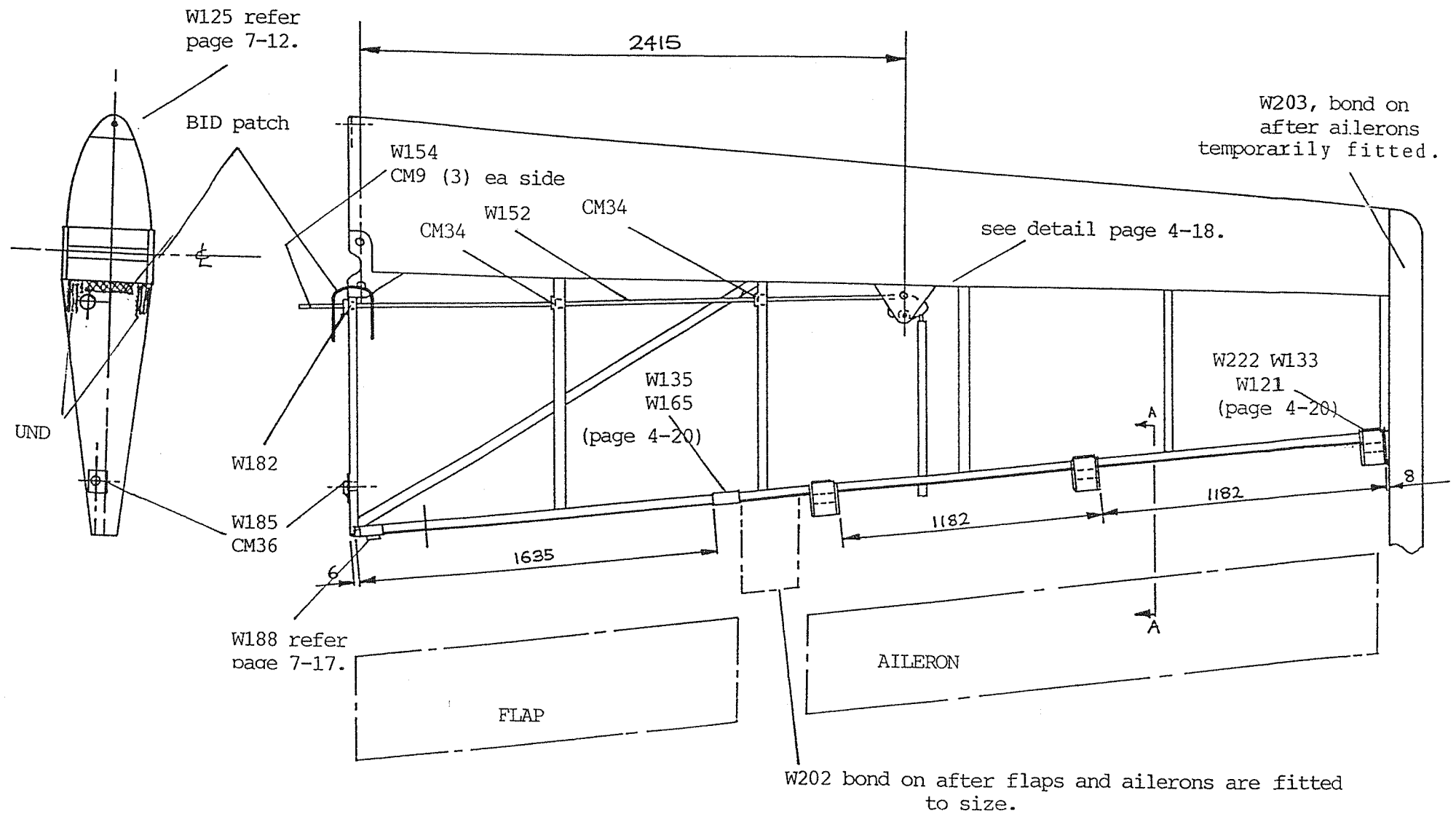


FIGURE 24

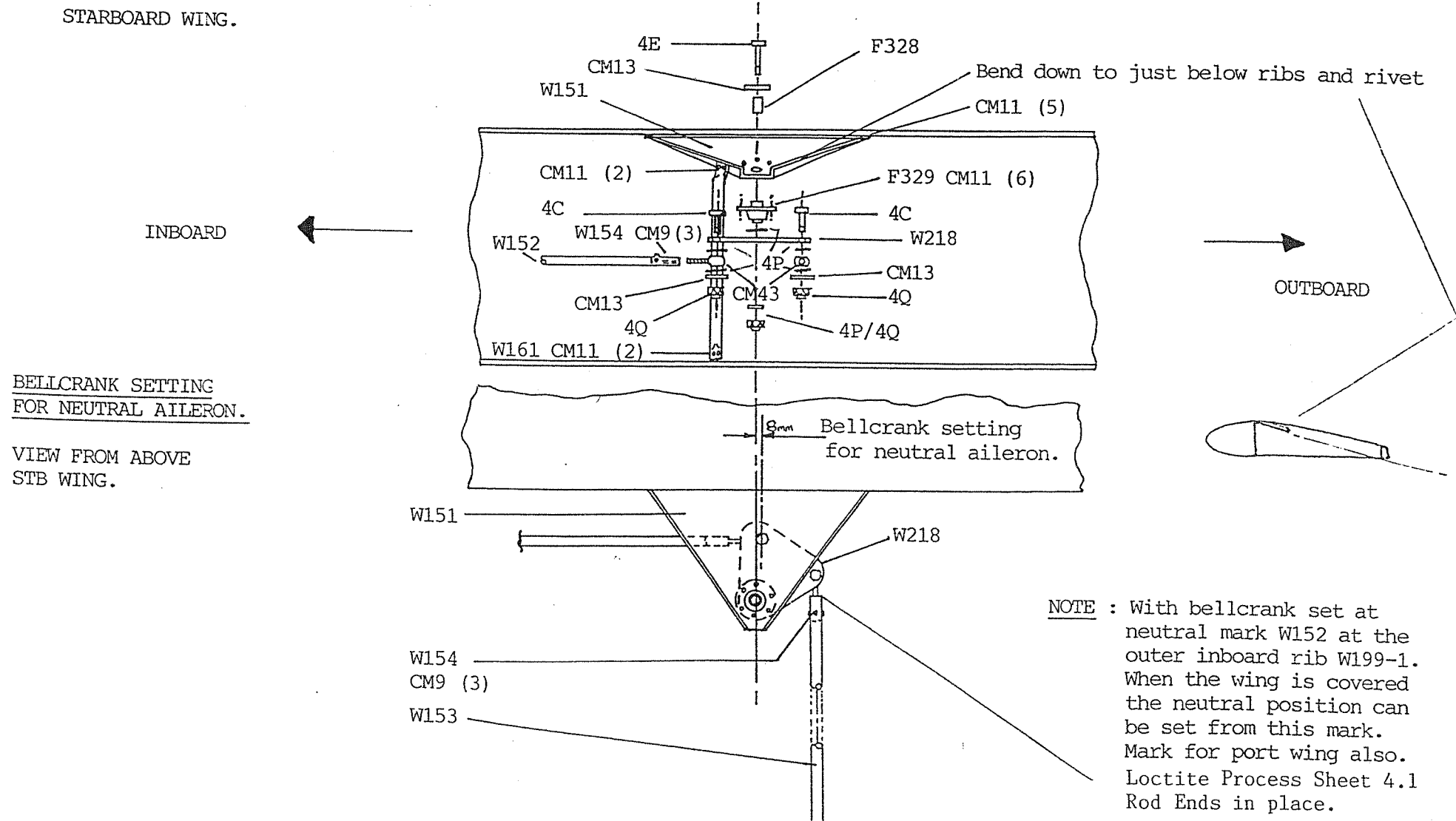


FIGURE 24

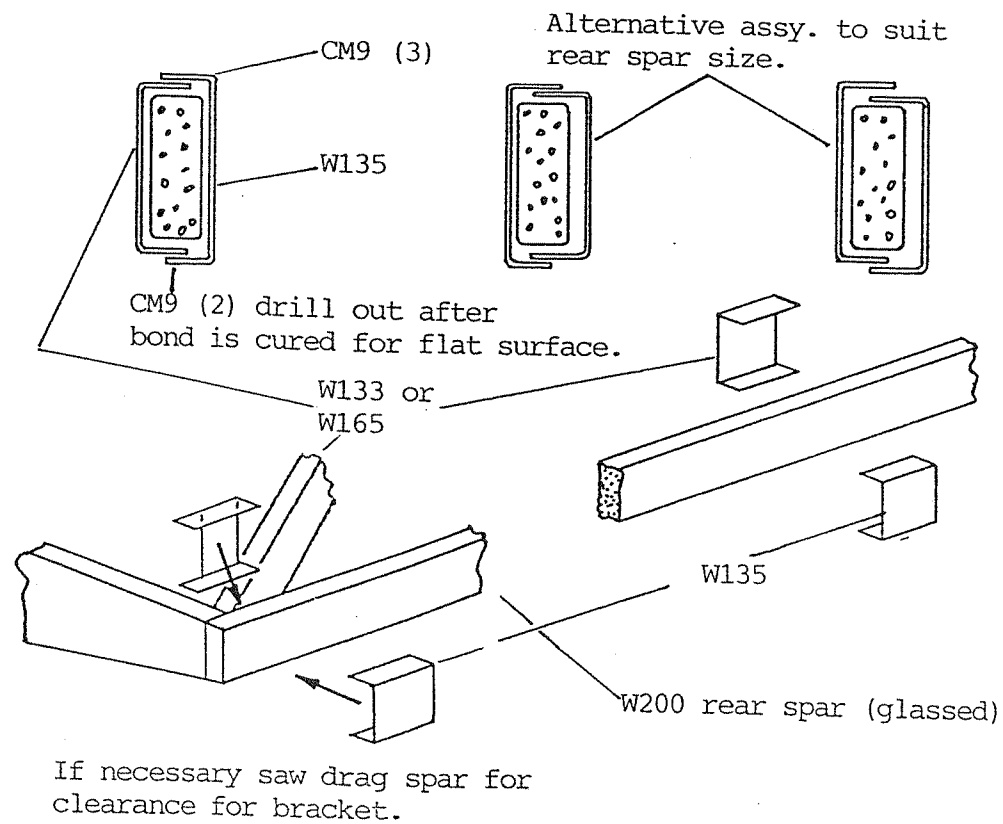
WING - REAR SPAR HARDPOINTSAILERON HARDPOINTS  
FLAP HARDPOINTS

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W131	4	Bracket Aileron	BOND	1.2
W183	2	Bracket Aileron	BOND	1.2
W121	6	Bracket Aileron	BOND	1.2
W220	6	Bracket Aileron Hinge		
W222	6	Gusset Aileron Bracket		
W133	2	Hinge Bracket Flap	BOND	1.2
W165	2	Hinge Bracket Flap	BOND	1.2
W135	4	Hinge Bracket Flap	BOND	1.2
W202	2	Foam Spacer Rear Spar	*	

NOTE\* - Bond on Spacer after  
determining width after  
fitting Flap and Aileron  
surfaces.  
Glass and cover.

The top surface of the bracket assembly, W131/W121 x 2 and W183/W121, at the hinge point MUST follow in line with the upper surface of the rear ribs. Ensure that the three brackets are in line with each other along the rear spar.

FIGURE 24



FLAP HARD POINTS ON REAR WING SPAR.

AILERON HARD POINTS ON REAR SPAR.

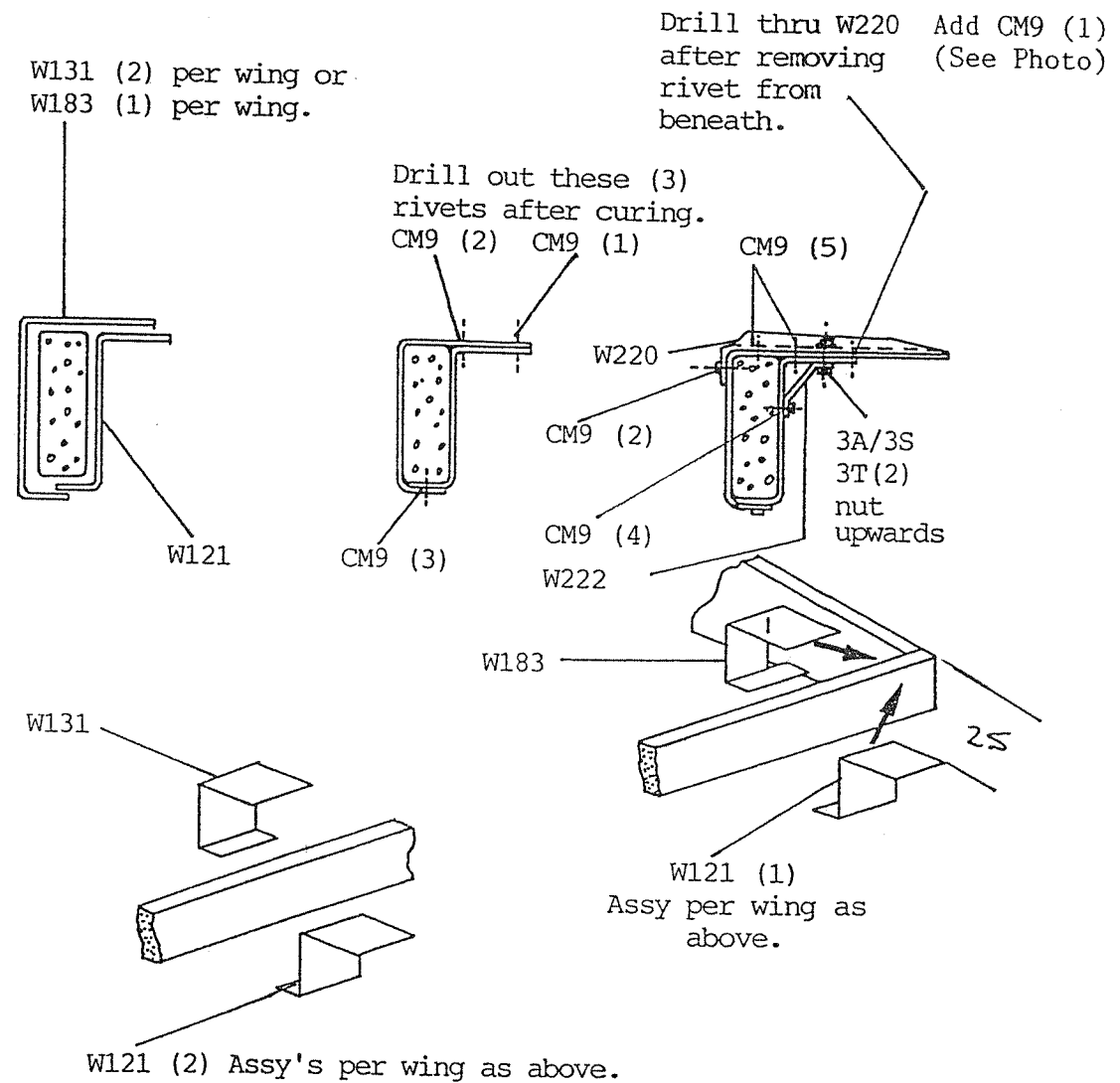


FIGURE 25

WING - FLAP ASSEMBLY

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W177	2	Flap L.E.	*1	
W178	2	Flap T.E.	*1	
W179	8	Flap Rib		
W180	2	Flap Rib		
W181	4	Flap Rib		
W173	4	Flap Gusset		
W174	4	Flap Gusset		
W175	4	Flap Gusset		
W176	4	Flap Gusset		
W132	4	Hinge		

NOTE \*1 - are provided over length to assist in determining offset angle of surface.

NOTE \*2 - fit only after INSPECTION and COVERING.

Wide edge of flap T.E., W178, uppermost on top of surface.

FIGURE 25

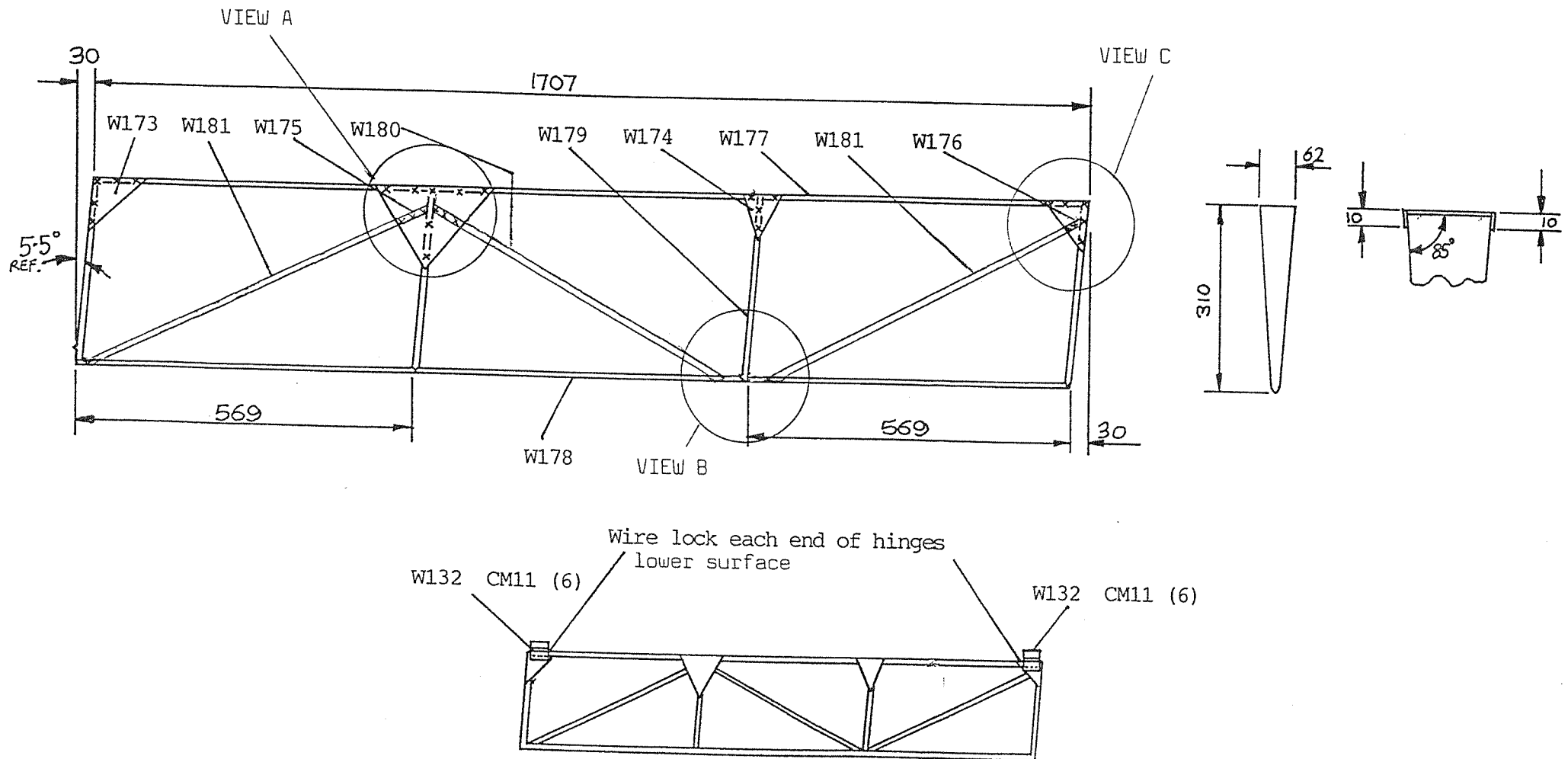
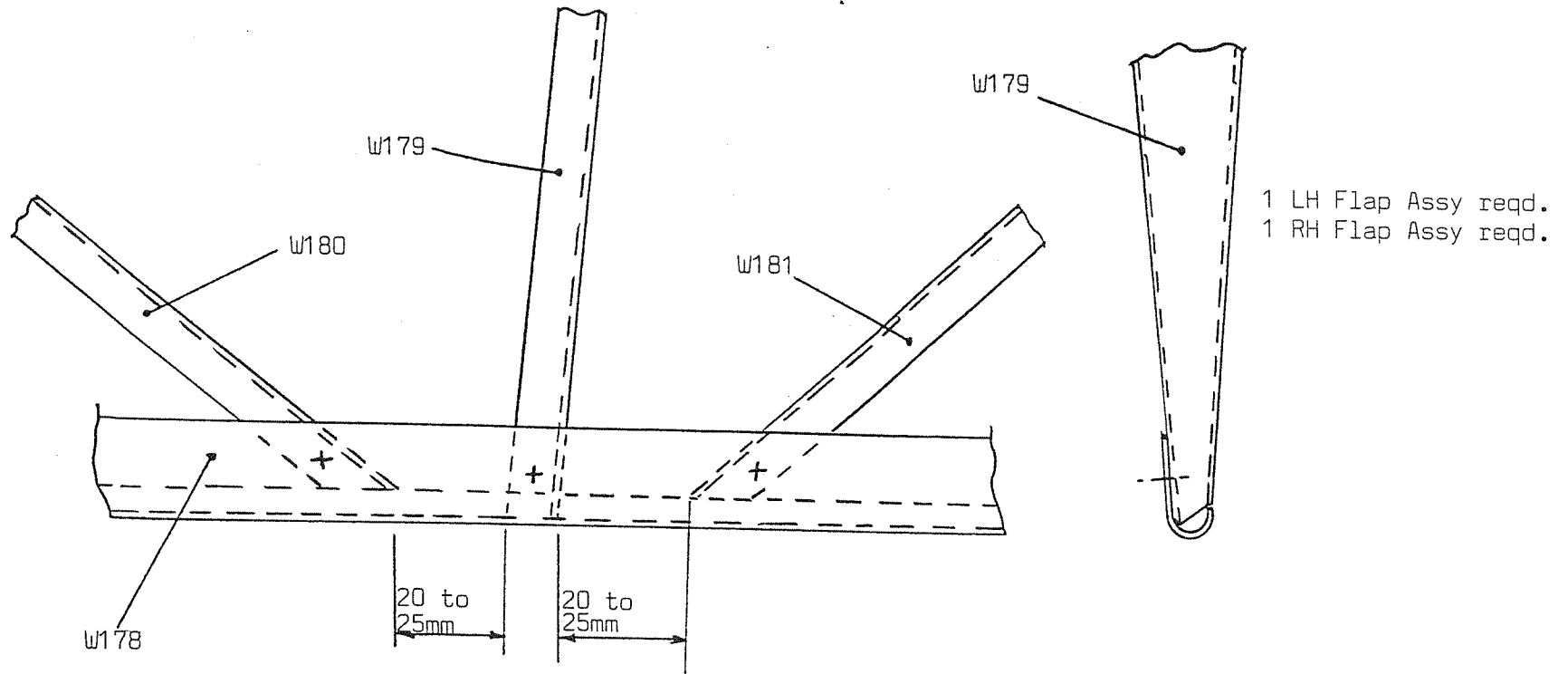
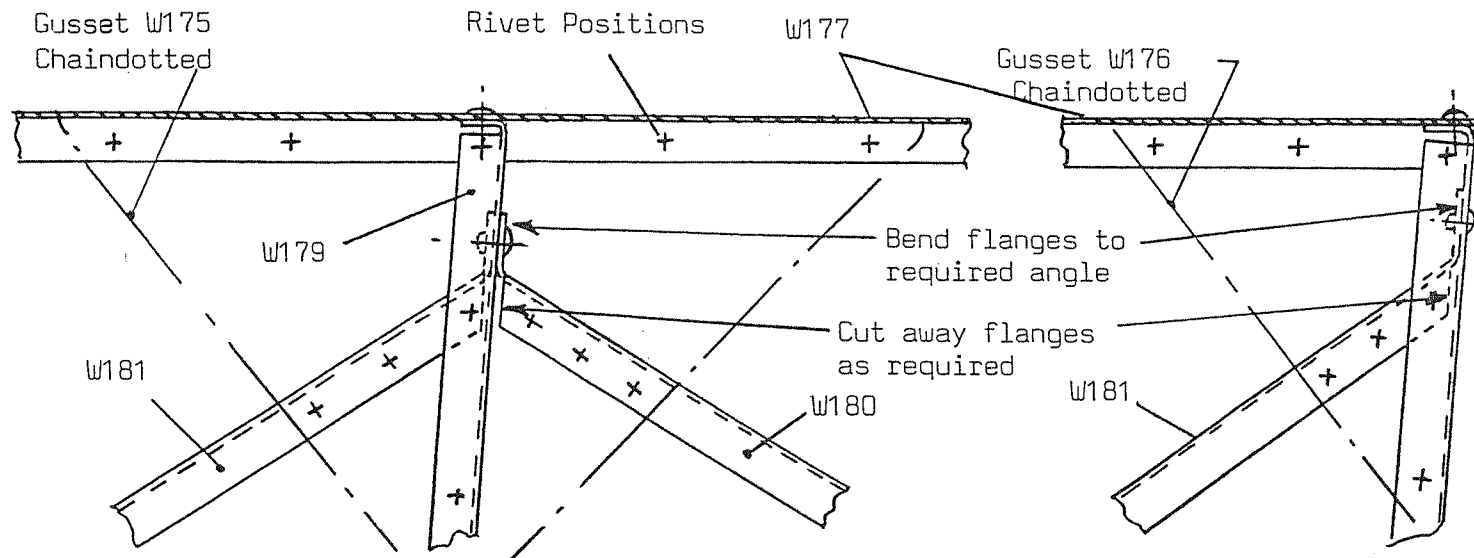


FIGURE 25

VIEW B



VIEW A



VIEW C

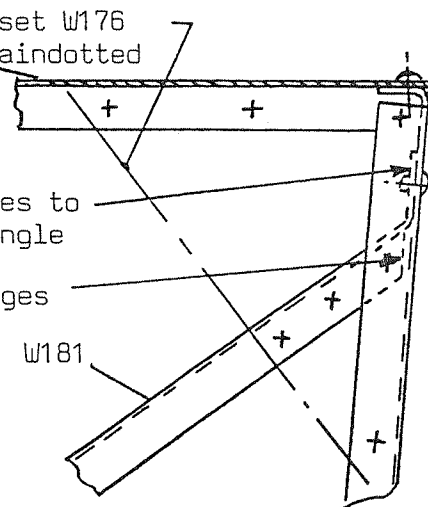


FIGURE 26

WING - AILERON ASSEMBLY

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
W231	2	L.E. Aileron	*1	
W232	2	T.E. Aileron	*1	
W219	8	Spine Angle		
W221	2	Horn Aileron		
W223	10	Rib Aileron		
W224	2	Gusset Aileron		
W225	2	Gusset Aileron		
W226	6	Gusset Aileron		
W227	2	Gusset Aileron		
W228	6	Gusset Aileron		
W229	2	Gusset Aileron		
W132	6	Hinge	*2	

NOTE \*1 - are provided slightly overlength to assist in determining angle offset of surface.

NOTE \*2 - fit only AFTER INSPECTION and COVERING with fabric.

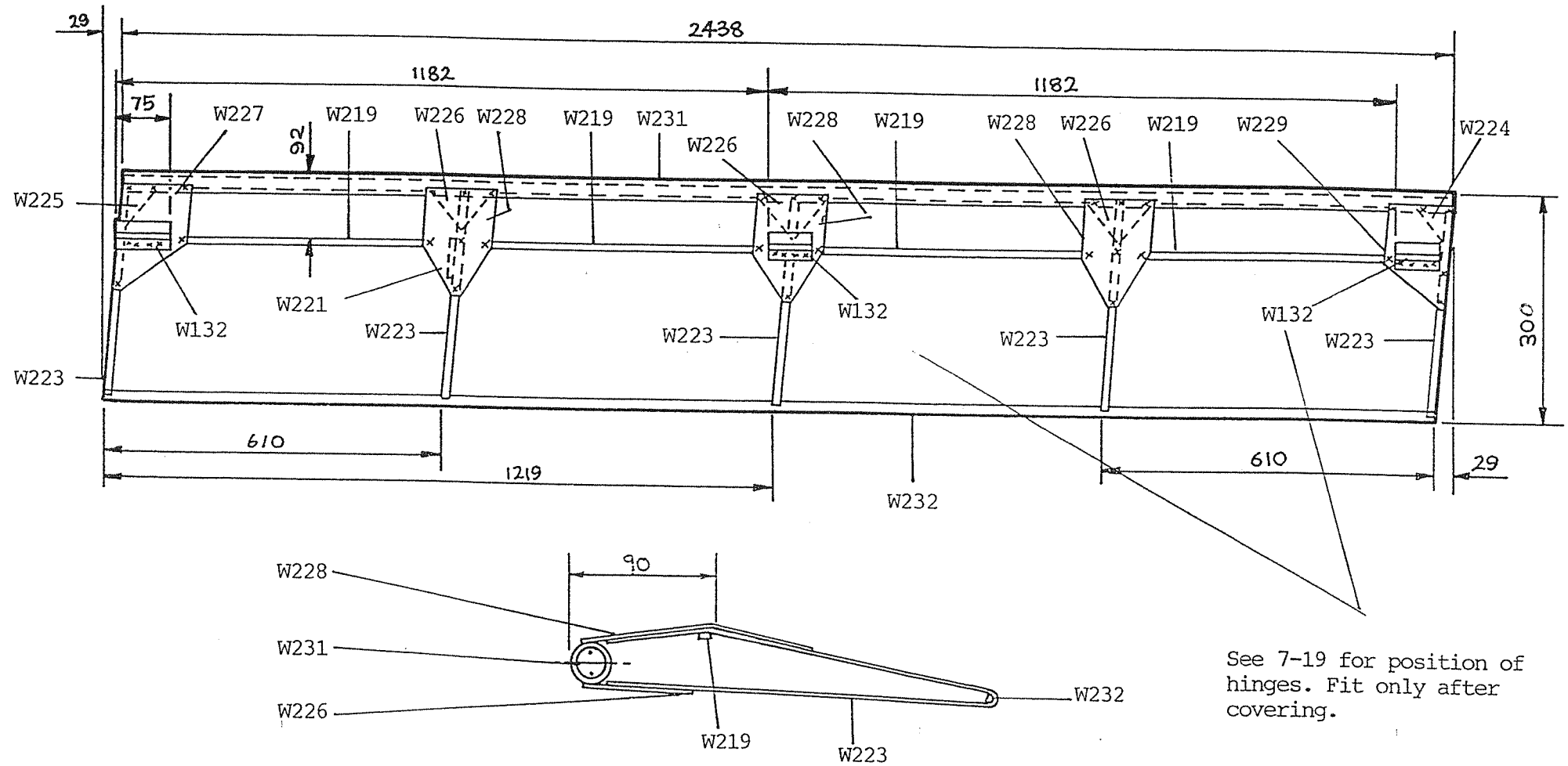
Wide edge of aileron T.E., W232, uppermost on top surface.

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FIGURE 26



Fit Aileron Horn W221, REF 7-19

#### INSPECTION

Ensure this inspection is effected and recorded on page F  
before proceeding with covering and painting.

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PAINT

'D' sections.  
Wing Tips.

(Use Polyester filler to improve the appearance of the 'D' section over the UND glass strips prior to painting).