

MONOCOQUE ASSEMBLY

INTRODUCTION

The monocoque assembly is self aligning with the major parts pre-cut and routed.

N.B. The routed areas on the seat back, F103-1, and the hull floor, F101, can fracture with excessive movements, therefore handle these parts with care.

The strength of the monocoque is dependant on the strength of the bonds - FOLLOW CAREFULLY the procedures in the PROCESS SHEETS.

METHOD

It is recommended that when applying Araldite you use a disposable gun applicator and you keep a continuous 'bead' of glue 3/16" to 1/4" along the bond line. After jointing, and while the glue is still wet, smooth off the glue fillet with a gloved finger.

Use strong packing tape (for example; 2" wide packing case type) and clamps to hold the components in position. Check for correct fitting and symmetry before leaving to cure.

All touching Fibrelam edges are to be similarly prepared prior to bonding.

Note that all bolts are fitted with the locknut INSIDE the cockpit for ease of inspection with the exception of the Seat Belt bolts at the bottom of the seat backs, and the Engine Bearer bolts outside and at the rear of the monocoque.

FIGURE 1.

MONOCOQUE ASSEMBLY

INSERTS
EPOXY FILLER

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F102-2	1	Monocoque side PORT	BOND	1.4
F102-1	1	Monocoque side STAR'BD	BOND	1.4
F103-1	1	Front seat back	BOND	1.4
F104-1	1	Rear seat back	BOND	1.4

Fit INSERTS CM1 and CM2 where indicated in FIGURES 1a and 1b.

8 inserts will later be drilled out to 1/4" when FULLY CURED, the other inserts (throttle, choke lever, flap lever and rudder stop cable inserts) will remain at 3/16".

Bear in mind the direction from which the inserts will be drilled and fit the COUNTERSUNK insert from that side.

Apply CM99, (REDUX), to Fibrelam edges as indicated in FIGURE 1c following instructions in PROCESS SHEET No. 5.

FIGURE 1A and 1B

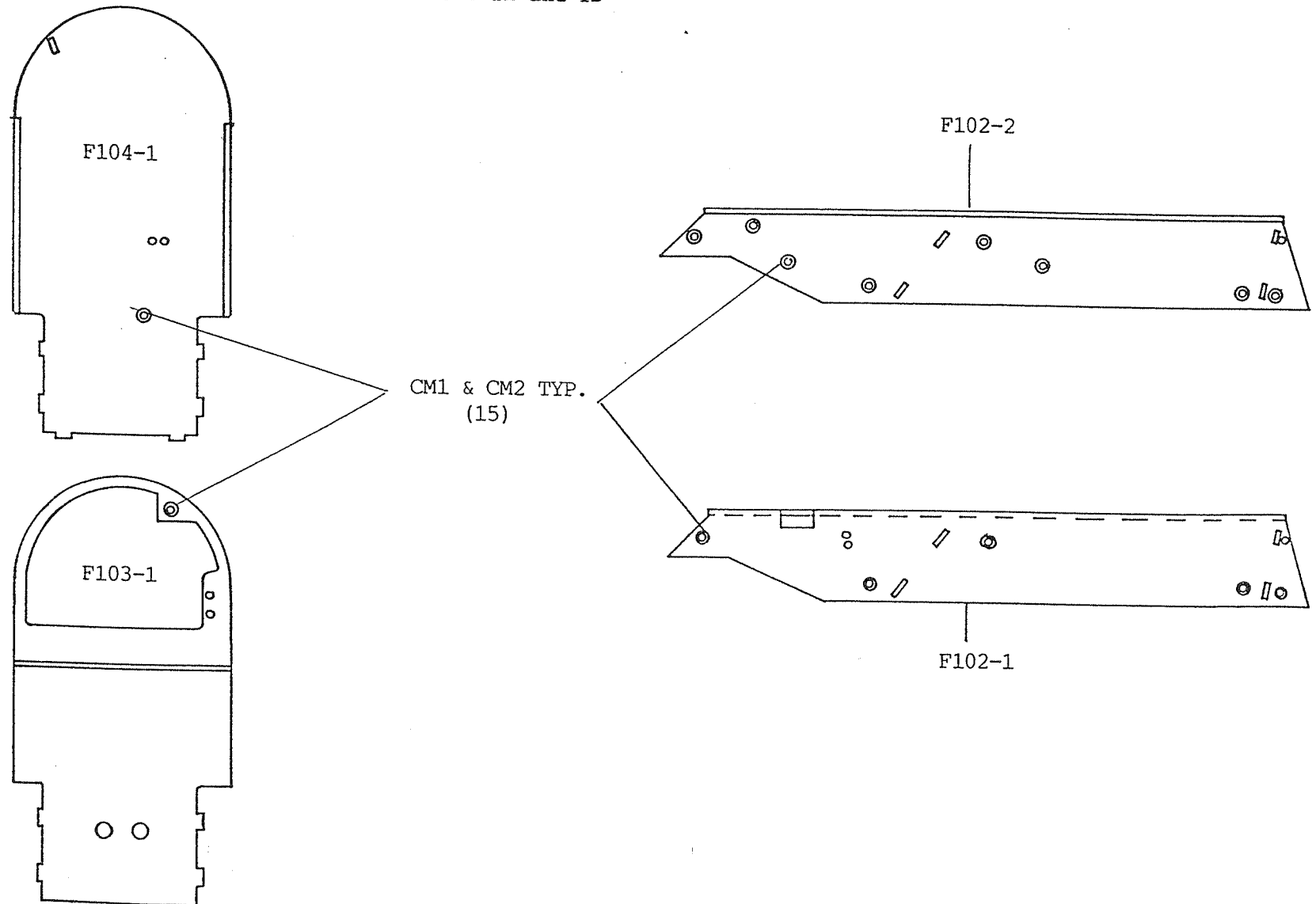


FIGURE 1C

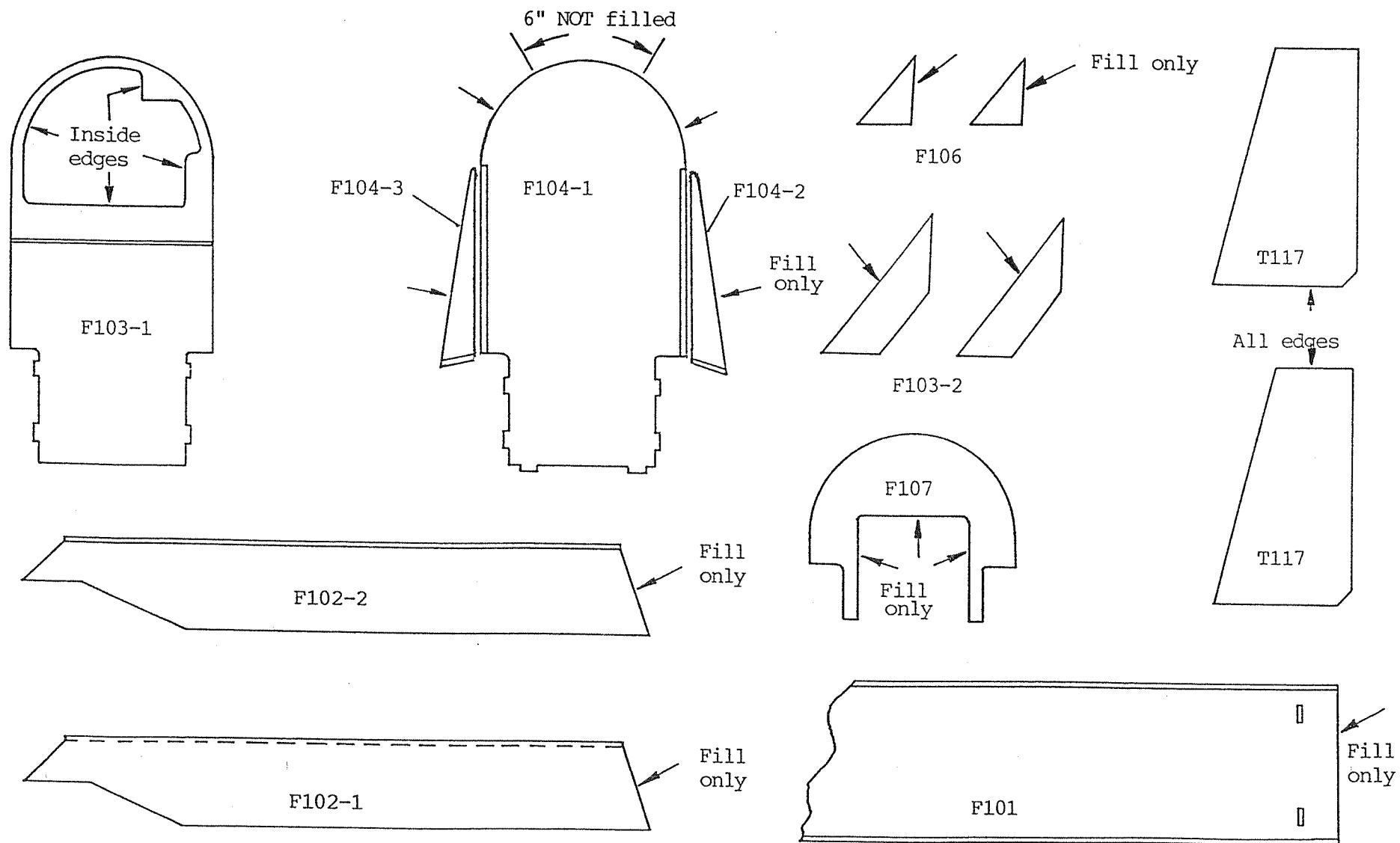


FIGURE 2.

MONOCOQUE ASSEMBLY

FLOOR
SIDES
SEAT BACKS
INSTRUMENT PANEL
GLASS ANGLES

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F101	1	Monocoque Floor	BOND	1.1
F102-1	1	Monocoque Side PORT	BOND	1.1
F102-2	1	Monocoque Side ST'BD	BOND	1.1
F103-1	1	Front Seat Back	BOND	1.1
F104-1	1	Rear Seat Back	BOND	1.1
F107	1	Instrument Panel	BOND	1.1
F280	4	Glass Angles	BOND	1.7
F322	2	Glass Angles	BOND	1.7
F281	2	Glass Angles	BOND	1.7
F106	2	Monocoque Gusset	BOND	1.1

Before applying Araldite to the Fibrelam surfaces to be bonded, ensure flush fitting of the surfaces and, if necessary, hand sand the edges at 45 degrees to remove excess paper core only.

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FIGURE 2A

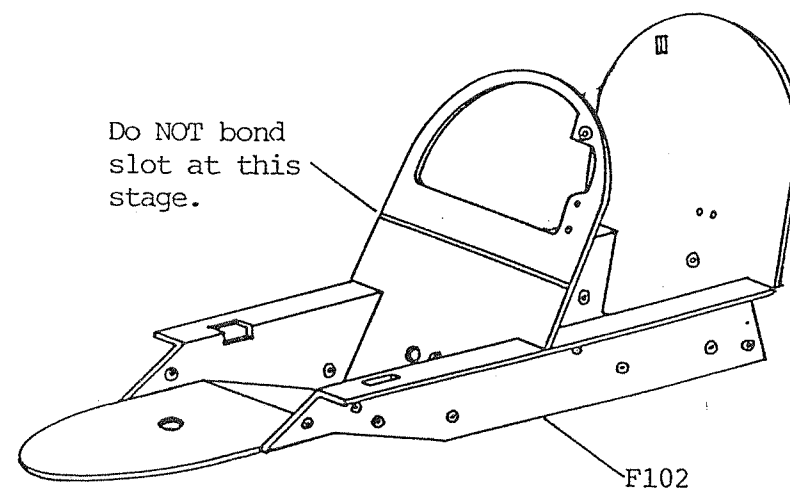
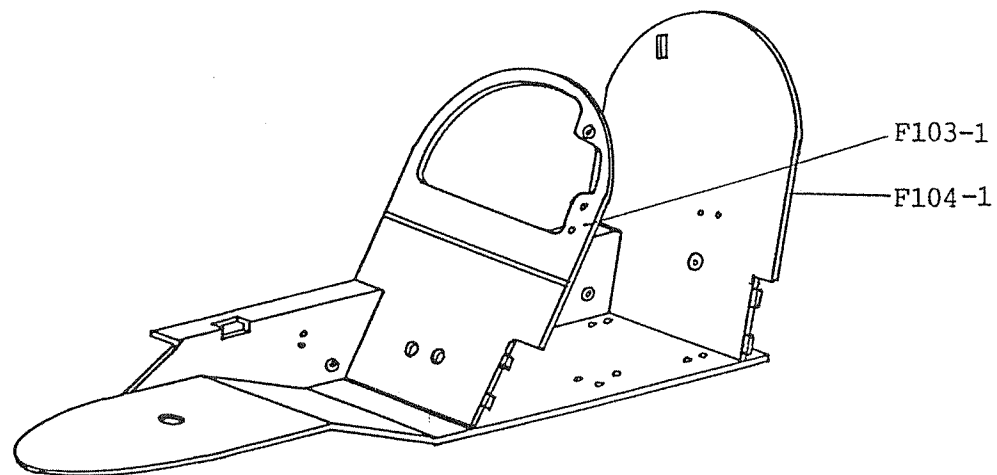
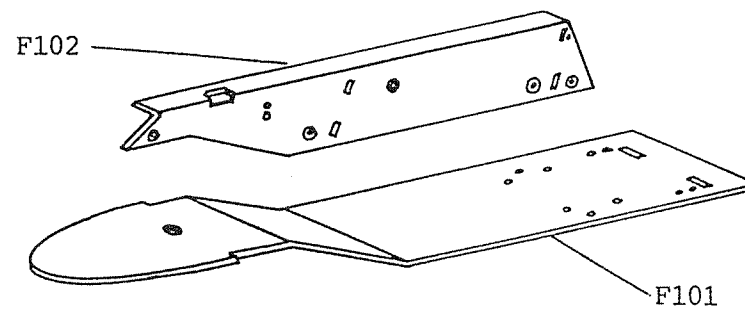


FIGURE 2B

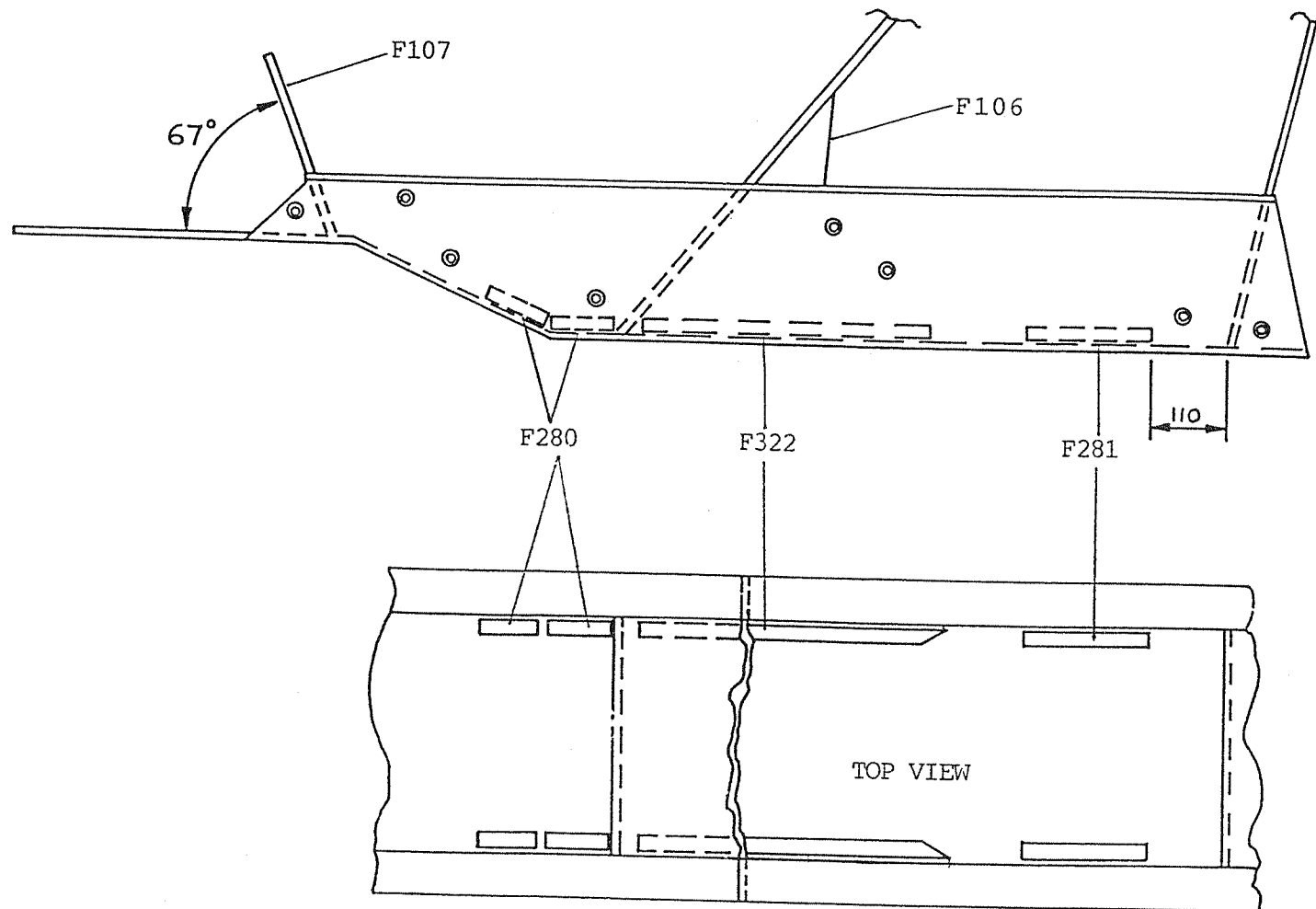


FIGURE 3

MONOCOQUE ASSEMBLY

RUDDER PULLIES
FLOOR WELL

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F289	1	Floor Well	BOND	1.1
F317	1	Pulley Block	BOND	1.2
F117	4	Rudder Cable Pulley		
F118	4pr.	Pulley Bracket	BOND	1.2
F291	2	Pulley		
F294	4	Spacer - Pulley		
F295	2	Spacer - Pulley		

Assemble and bond the Floor Well with the same precautions and preparartions as the monocoque.

Locate the two outer pulleys by the front seat back and position the Pulley Block, F317, using a straight thin rod through the three pulley assemblies. Bond and rivet the Pulley Block and the two outer Rudder Cable Pullies.

Similarly, rivet and bond the rear double pullies making sure they are in line.

Cut out marked area in monocoque floor for Foot Well.

FIGURE 3

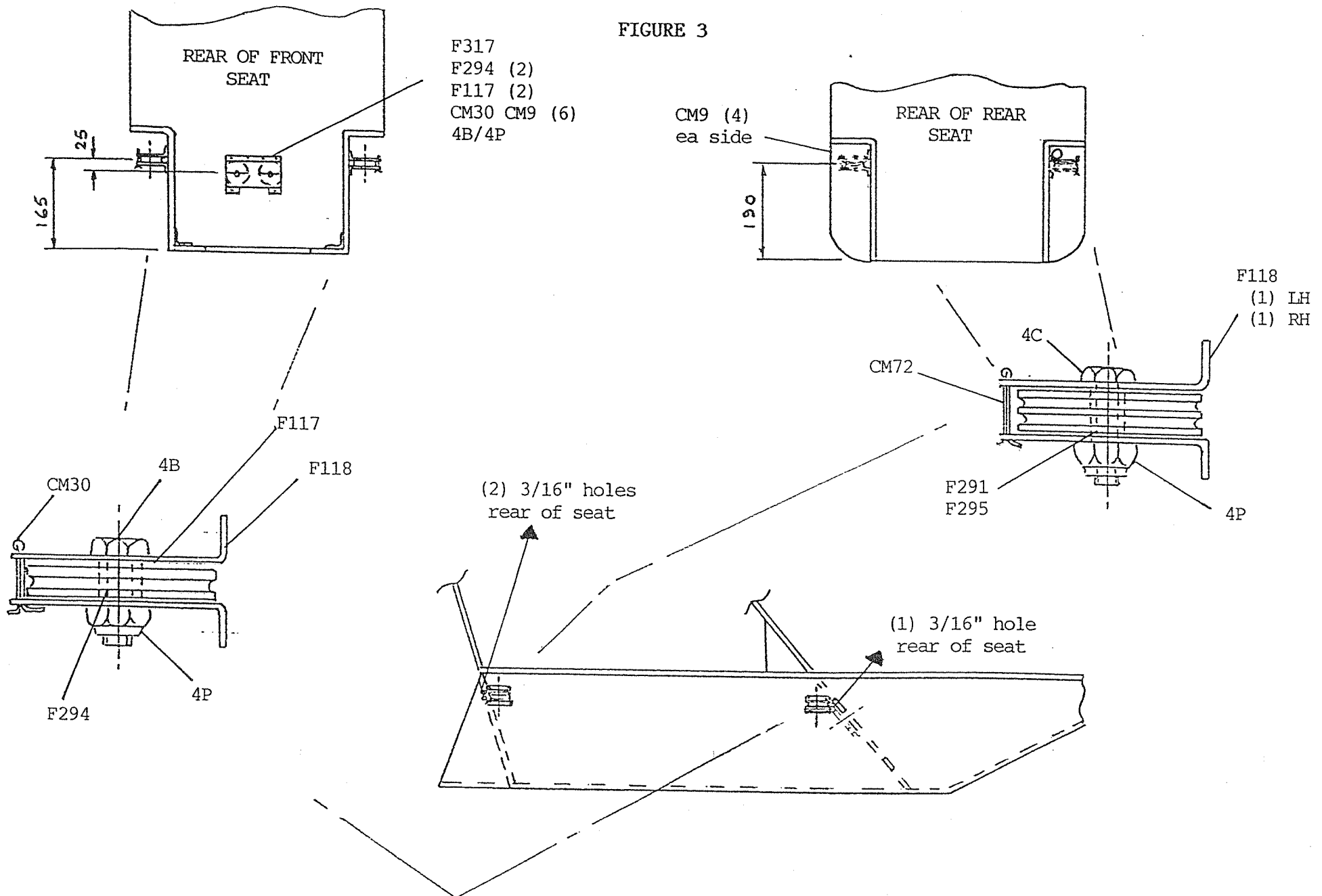


FIGURE 4

MONOCOQUE ASSEMBLY

FOOTWELL
NOSELEG SUPPORTS/GUSSETS
GLASS ANGLES
REAR RUDDER PEDALS

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F105	2	Noseleg Webs	BOND	1.1
F253	1	Noseleg Support	BOND	1.1
F167	2	Gusset - Hull	BOND	1.1
F254	1	Noseleg Support	BOND	1.1
F289	1	Floor Well	BOND	1.1
F146	2	Rudder Pedal		
F318	2	Spacer - Rudder Pedal		
F163	2	Hinge Rudder Pedal	BOND	1.2
F164	4	Backing Plate	BOND	1.2
F320	2	Glass Angles	BOND	1.7
F321	2	Glass Angles	BOND	1.7
F134	1	Nose Leg	*	
F148	1	Nose Leg Support	BOND	1.1

* Use F134 for a temporary fit to ensure alignment and symmetry. DO NOT bond F134 in place at this stage, ensure it can be removed after noseleg supports are cured.

FIGURE 4A

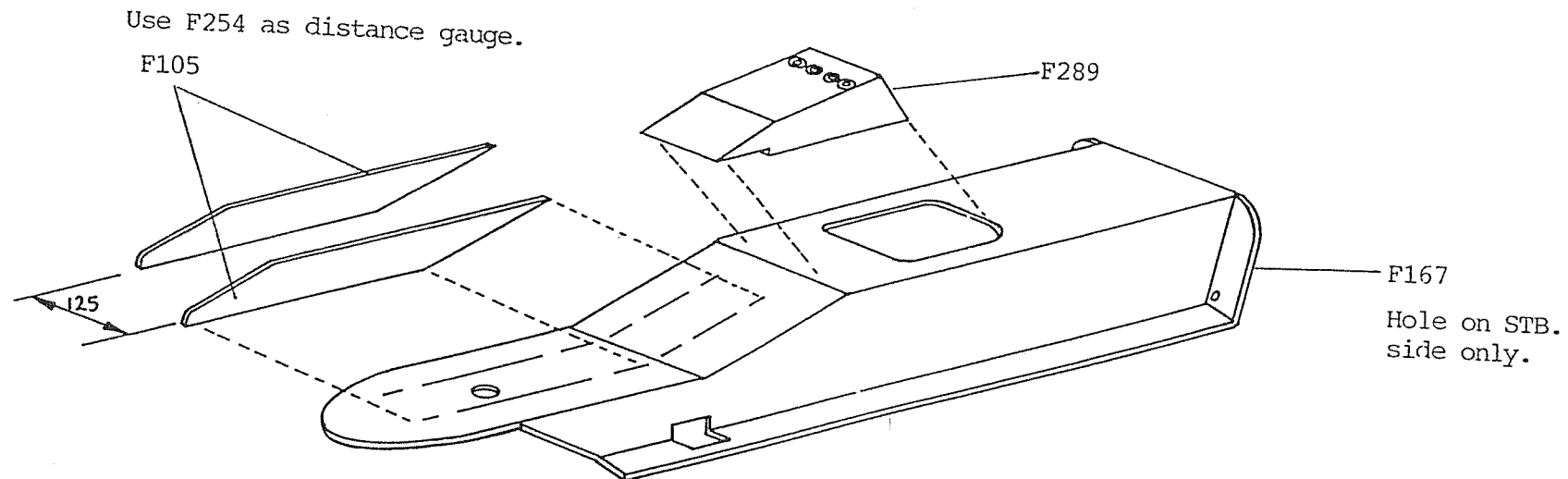
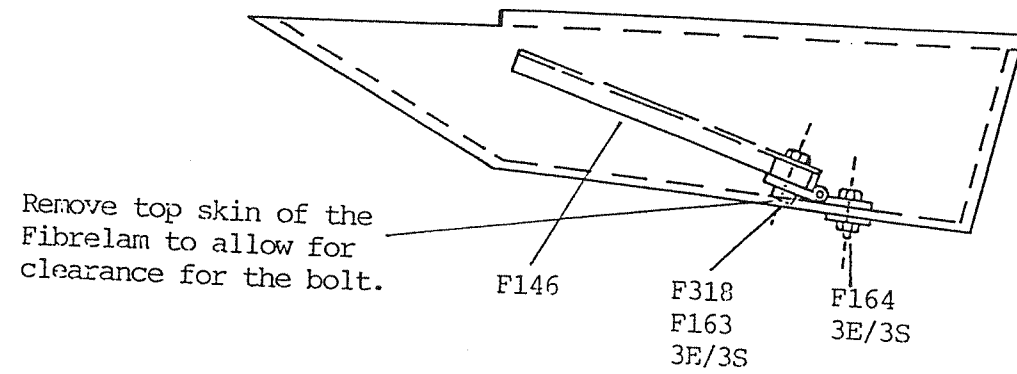


FIGURE 4B

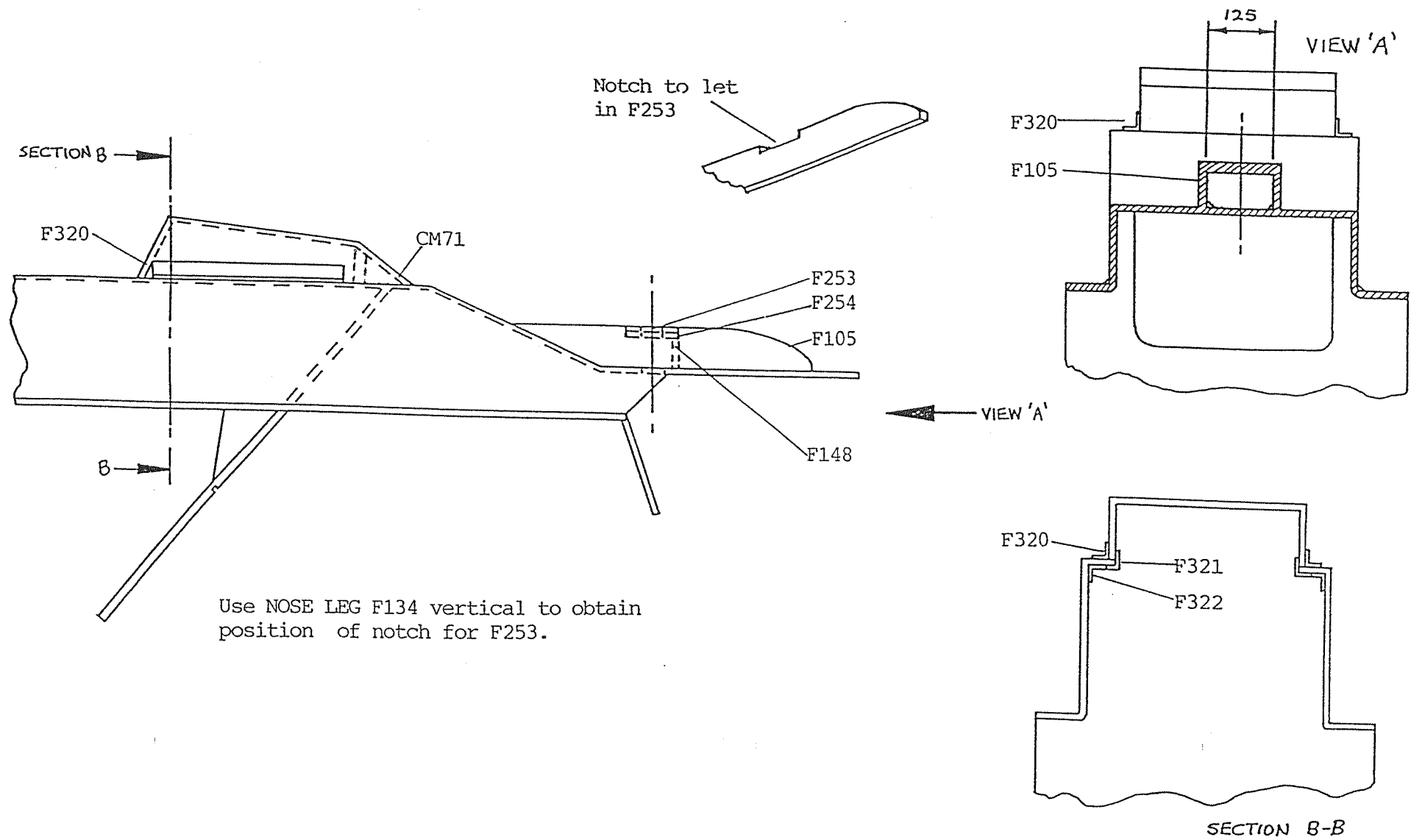


FIGURE 5

MONOCOQUE ASSEMBLY

AILERON TORQUE TUBE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F287	2	Bracket Control Stick		
F165	1	Torque Tube		
F168	4	Gusset Torque Tube	BOND	1.1
F256	3	Bearing Torque Tube	BOND	1.1

ASSEMBLY SEQUENCE

Bond together the two pairs F168 and bond F256, Bearing, into each pair and into the Hull Gusset F167, after fitting.

Lightly grease the Torque Tube F165, (to prevent any glue bonding to it), and pass the Torque Tube through assembly as shown in FIGURE 5.

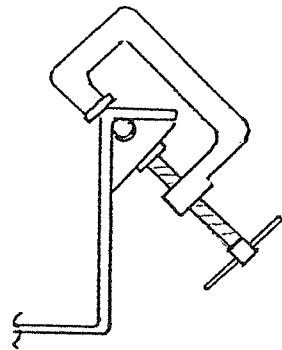
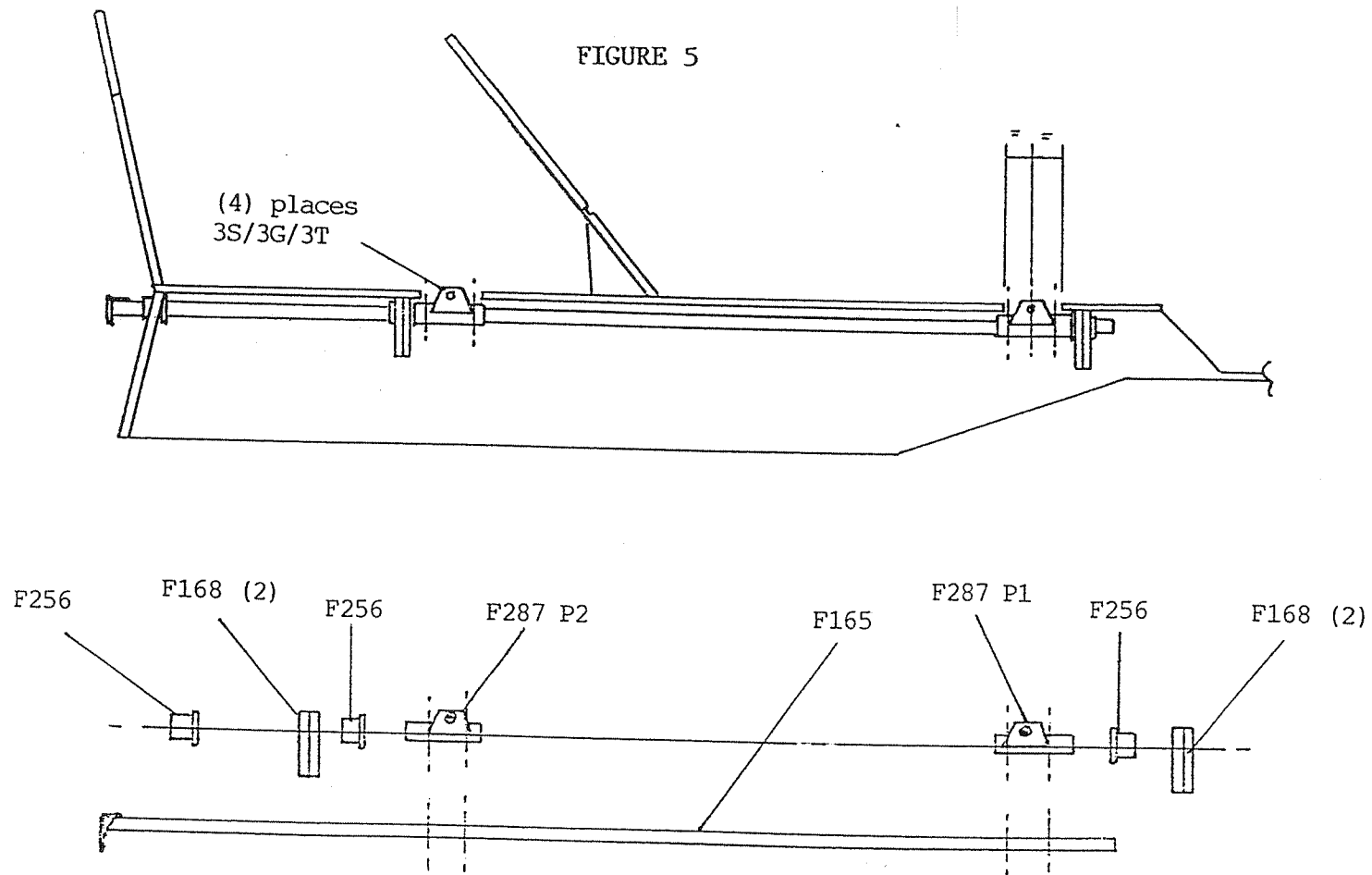
N.B. F287 P2 has the longest end towards the rear.
F287 P1 has the longest end to the front.

Butt assembly F168/F256 to F287 P1 and clamp.

Butt assembly F168/F256 to F287 P2 and clamp.

Leave Torque Tube in position, ensuring free movement of the tube, until assemblies are cured.

FIGURE 5



Adjust 'G' clamp pressure to suit.
F165 Torque Tube MUST rotate freely.

FIGURE 6

HANGER TUBE ASSEMBLY

SYMMETRY - MONOCOQUE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F213	1	Boom Tube		
F216	2	Backing Plate		
F217	2	Backing Plate		
F141	2	Front Hanger Tube		
F142	2	Rear Hanger Tube		
F143	2	Hanger Diagonal		
F153	2	Bracket Hanger Tube		
F144	1	Spacer Stud		
F111	1	Stud Boom/Hanger		

The symmetry of the primary structure is achieved during this operation.

Take your time and be very sure of ALIGNMENTS.

* The Boom, F213, is only temporary fitted at this stage to achieve the symmetry of the structure - it is only finally fitted after attachment to the Wing Centre Section when the wings have been built.

SEQUENCE

Assemble the Boom complete with the backing plates, ensuring the Boom is the right way up. Assemble the Hanger and Diagonal Tubes, N.B. the rear Hanger Tubes will not clear the bottom rear of the seat back, cut out a recess, one skin deep, in the Fibrelam for clearance. Tidy with Araldite later. Ensure all components are secure and bolts snug. Make sure the rear Hanger Tubes are snug to the hull side, after the rear seat back has been painted the Engine Mount Strut will attach to this common bolt.

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FIGURE 6

Clamp rear Hanger Tubes to seat back.
Ensure that the tubes are the correct way up :
F142 has the 3/16" hole uppermost,
F141 has the 1/4" hole at the lowest point.

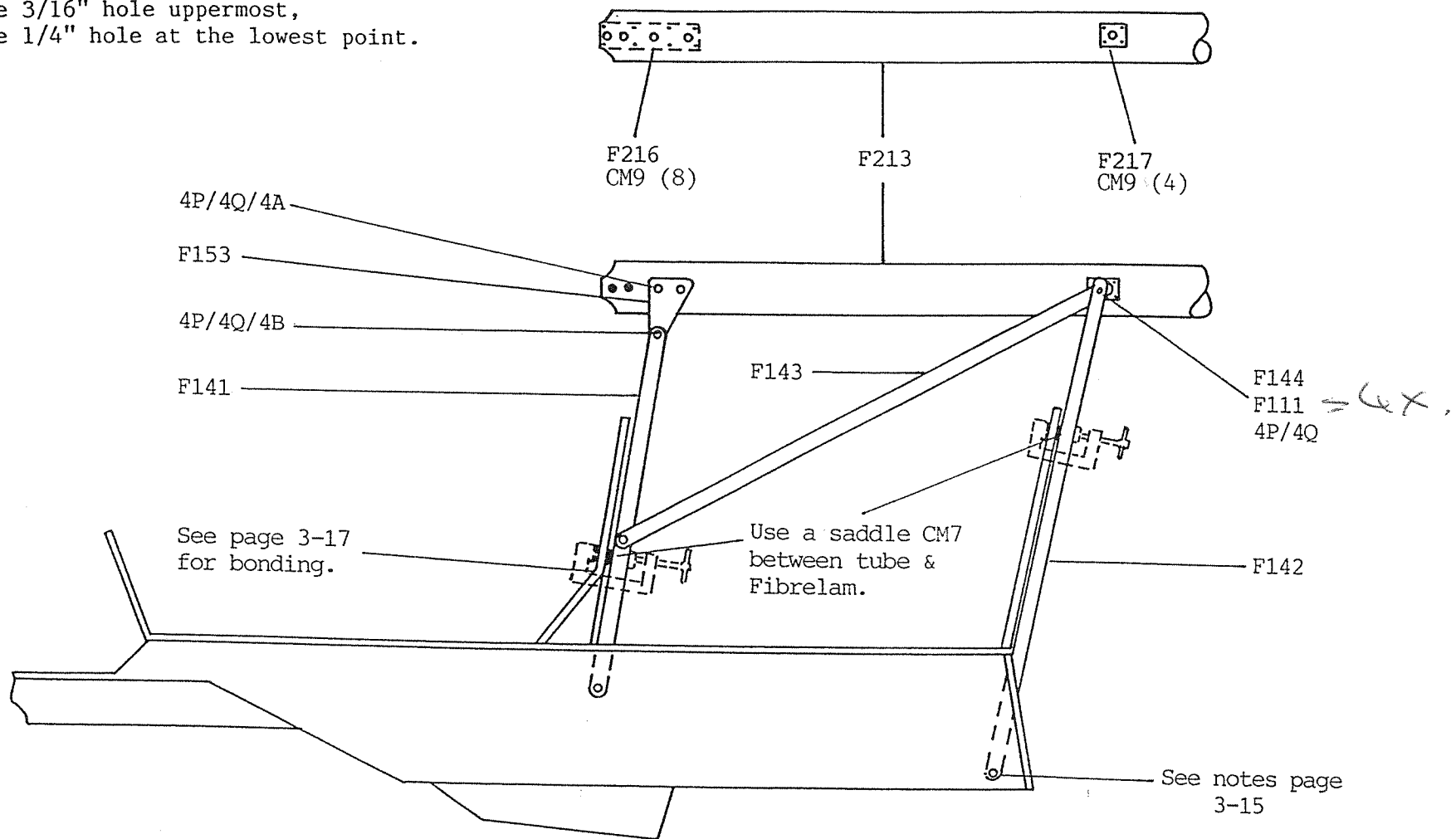
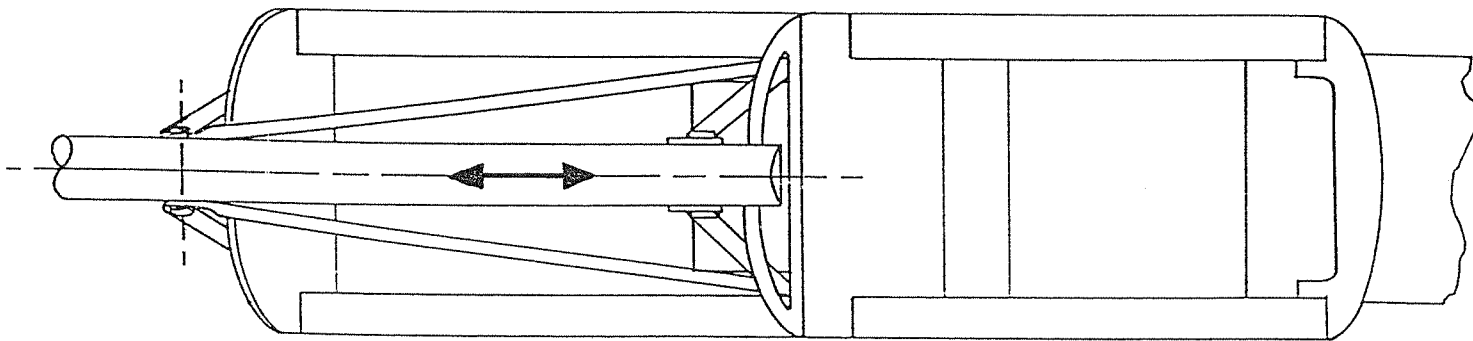


FIGURE 6B

Check ALIGNMENT and SYMMETRY of the assembly, Boom Tube parallel to the hull sides when viewed from above. Clamp front seat back to front Hanger Tubes.



When symmetry has been established, drill through Hanger Tube holes, through Fibrelam, (6 on rear seat and 2 on front seat back) from Hanger Tube through Fibrelam.

Disassemble Hanger Tubes and Boom.

Drill out 6 holes to 7/16" and BOND inserts CM1 and CM2 in place. The 2 x 1/4" holes for the rear seat belts DO NOT have inserts and remain at 1/4" diameter.

When the inserts have FULLY CURED, drill out the 2 bottom inserts in each seat back to 1/4".

Reassemble primary structure and BOND slot in front seat back in position. Note: the boom tube can finally be removed after completion of page 3-19.

FIGURE 7

FINAL HANGER TUBE ASSEMBLY .

BACKING PLATES U/C
HANGER GUSSETS
HULL GUSSETS

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F175	1	Gusset Hanger Tube		
F176	1	Gusset Hanger Tube		
F177	1	Gusset Hanger Tube		
F178	1	Gusset Hanger Tube		
F103-2	2	Gusset	BOND	1.1
F155	2	Backing Plate	BOND	1.2
F127	2	Fitting Drag Strut	BOND	1.2
F158	2	Backing Plate U/C	BOND	1.2
F157	2	Backing Plate	BOND	1.2
W237	2	Backing Plate	BOND	1.2
F104-2	1	Gusset LH	BOND	1.1
F104-3	1	Gusset RH	BOND	1.1

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FIGURE 7

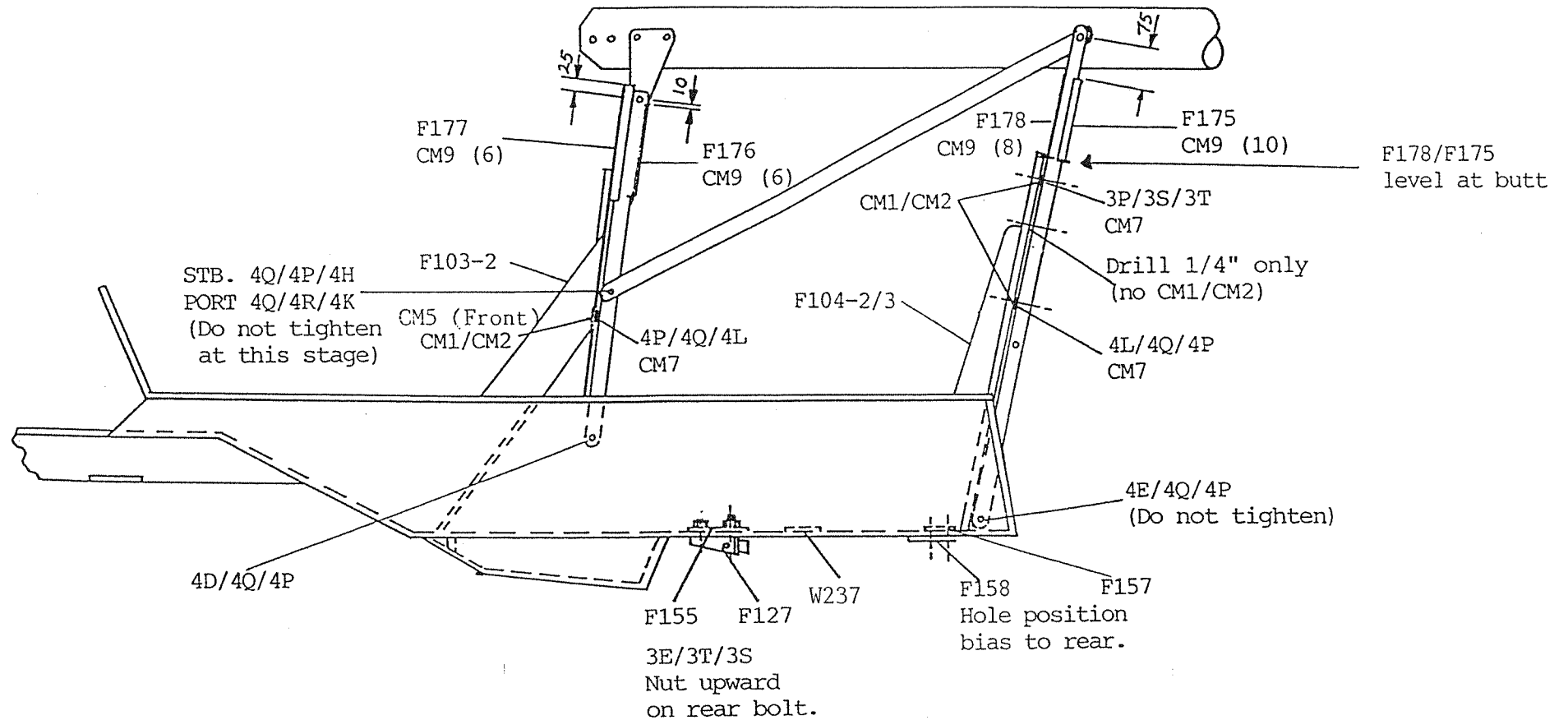


FIGURE 8

MONOCOQUE COMPONENTS

RUDDER PEDALS
ELEVATOR TELEFLEX
PANNIER SUPPORTS
SHROUD

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F250	1	Shroud Hoop	BOND	1.2
F249	1	Shroud	BOND	1.8
F268	2	Shim	BOND	1.2
F248	8	Pannier Support	BOND	1.9
F164	4	Backing Plates	BOND	1.2
F163	2	Hinge Rudder Pedal	BOND	1.2
F146	2	Rudder Pedal		
F173	2	Brake Pedal		
F311	2	Bush Brake Lever		
F312	2	Brake Pivot		
F264	2	Spacer - Shim		

Cut out PANNIER SUPPORTS (foam) to allow clearance for Torque Tube, Teleflex, Wiring Loom and Brake Cables. Use 1.2mm ply flush to Pannier Supports to cover any cut-outs. Similarly, Pannier Supports for Port side.

When fitting TELEFLEX ensure correct seating of Teleflex Collar in clamp CM50.

FIGURE 8

Drill 2 x 3/8" holes in front of the gussets where the shroud hoop will fit - hoop flush with hull edge. Line up hoop with seat back and glue SHROUD in position (back of shroud flush with seat back) using tape and flat edges to ensure symmetry.

Rivet shroud to hoop from the top down the sides and cut off excess hoop protruding below the hull side. Leave any surplus shroud ply below the level of the hull side to half thickness of the hull material to eventually form a butt joint with the panniers.

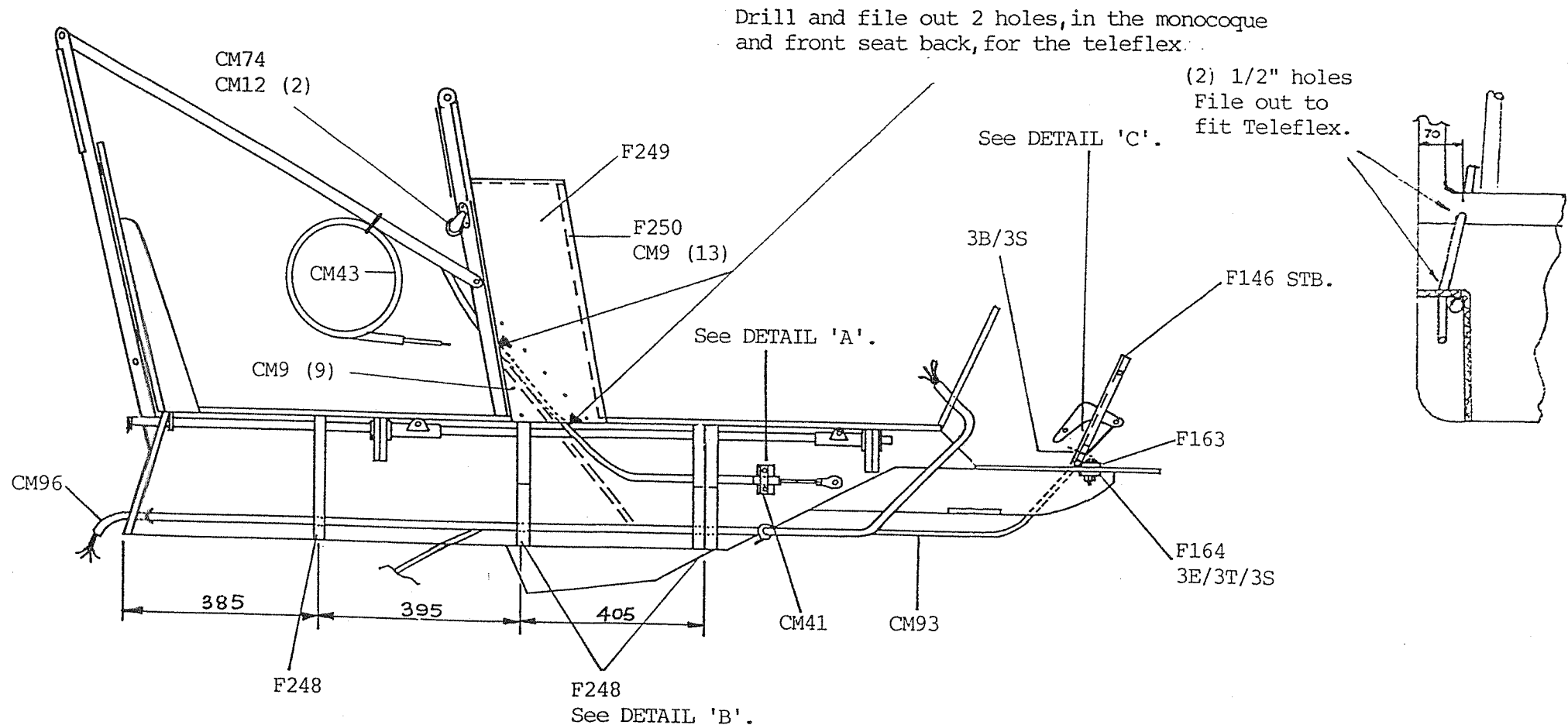
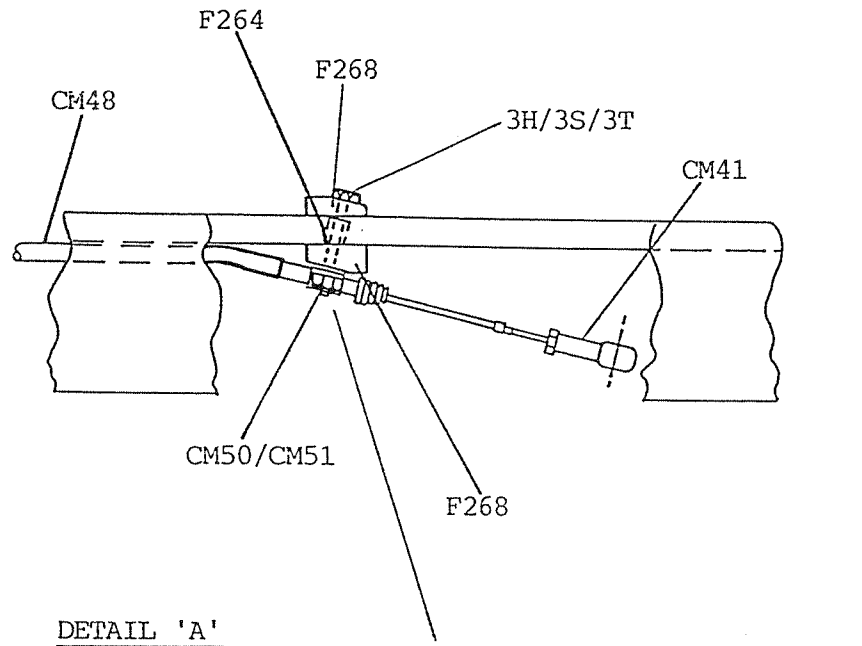
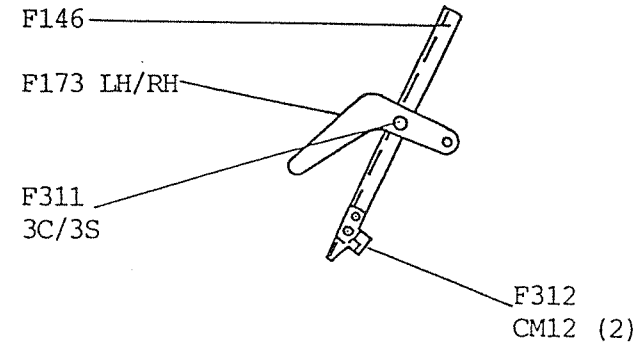


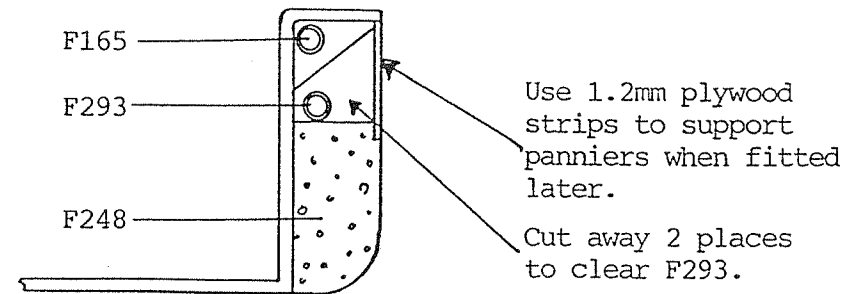
FIGURE 8



File off protruding thread of bolt level with locknut (lower) to prevent fouling of F293, Connect Tube - Stick.



DETAIL 'C'. (PORT Pedal)



DETAIL 'B'.

FIGURE 9

CONTROL STICK LINKAGE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F293	1	Conn. Tube - Stick		
F290	2	Control Stick		
F298	2	Spacer Conn. Tube		

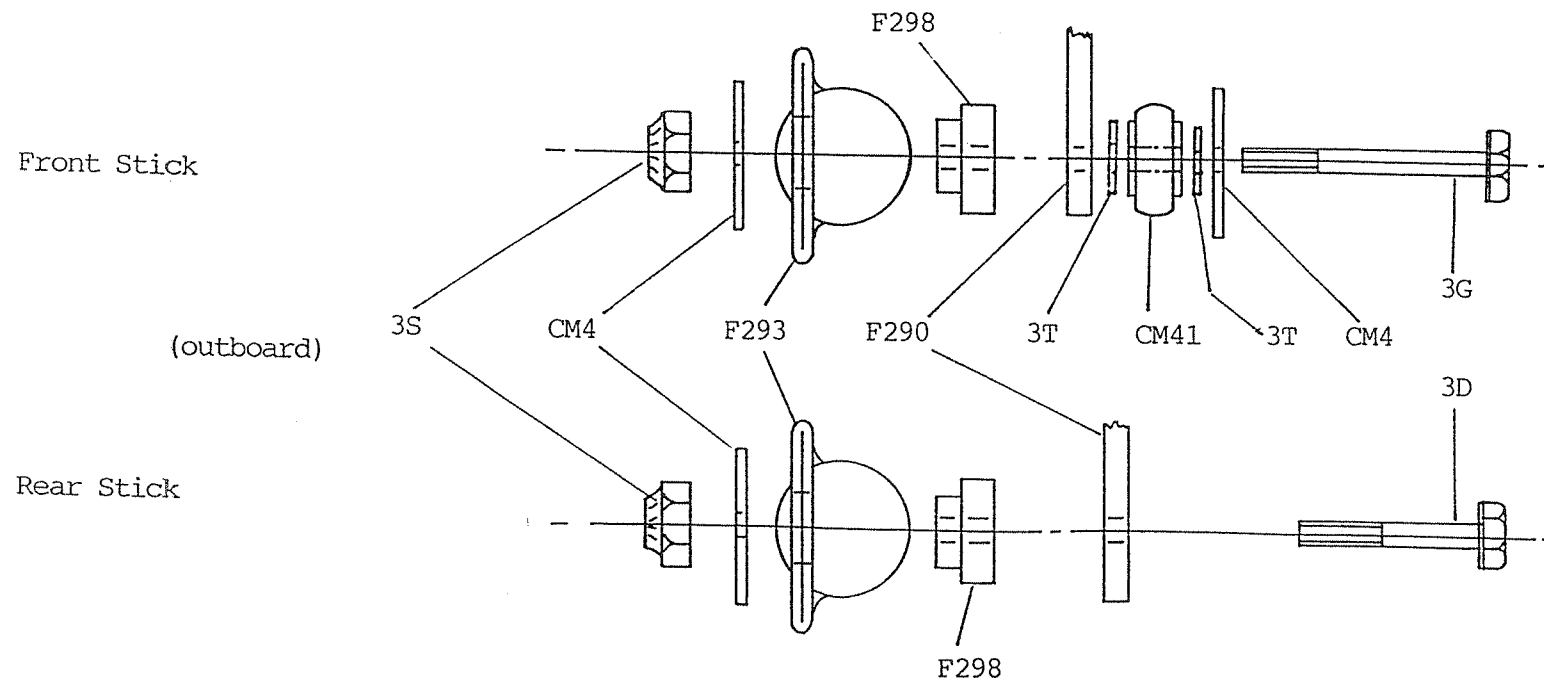


FIGURE 9

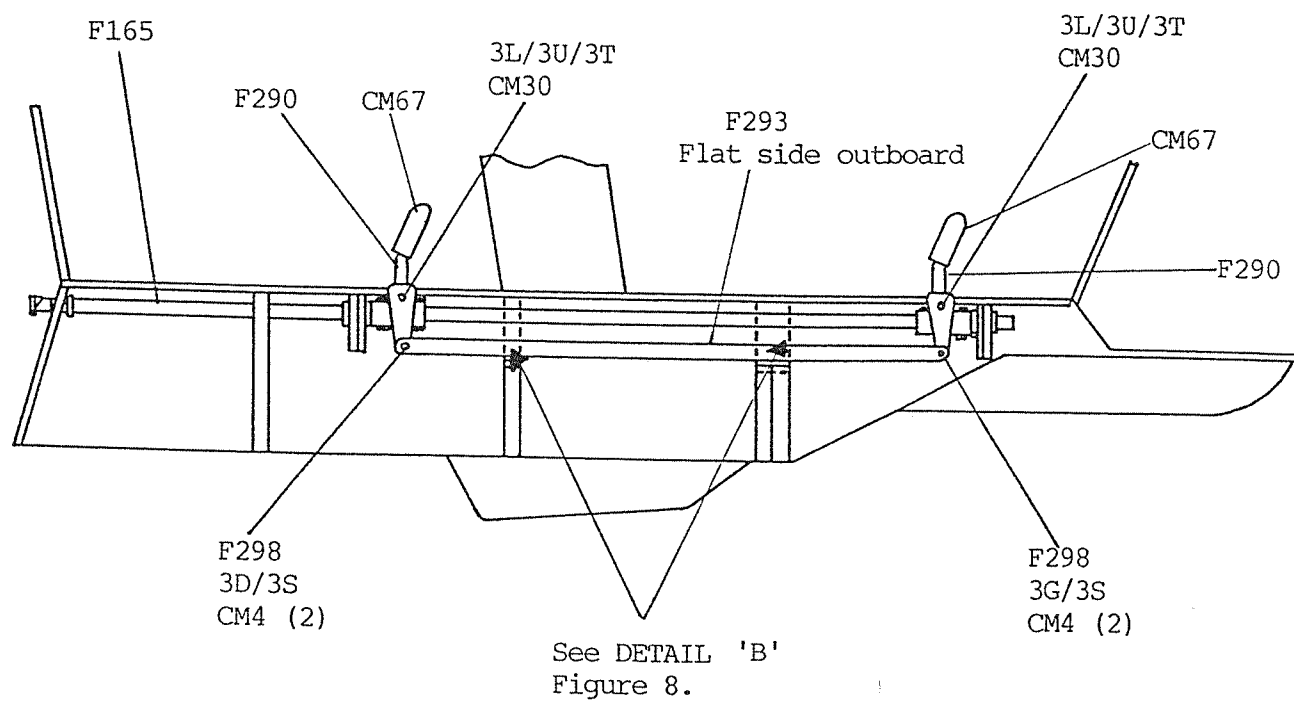
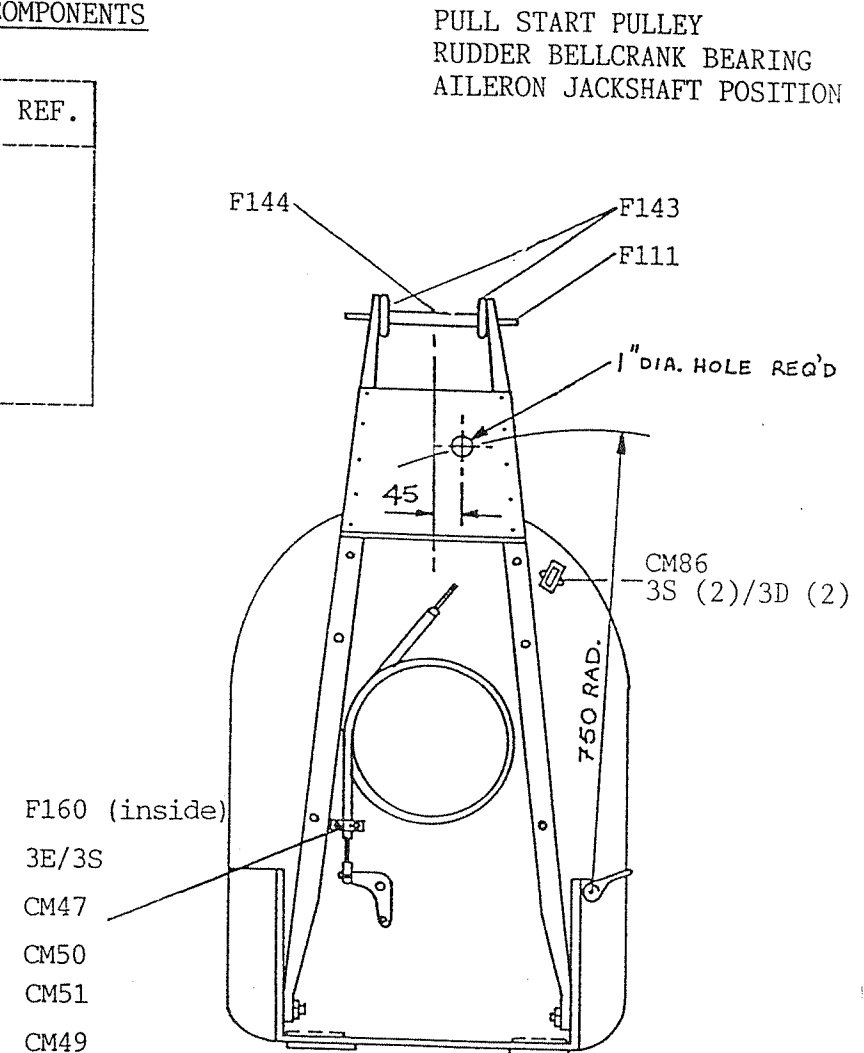
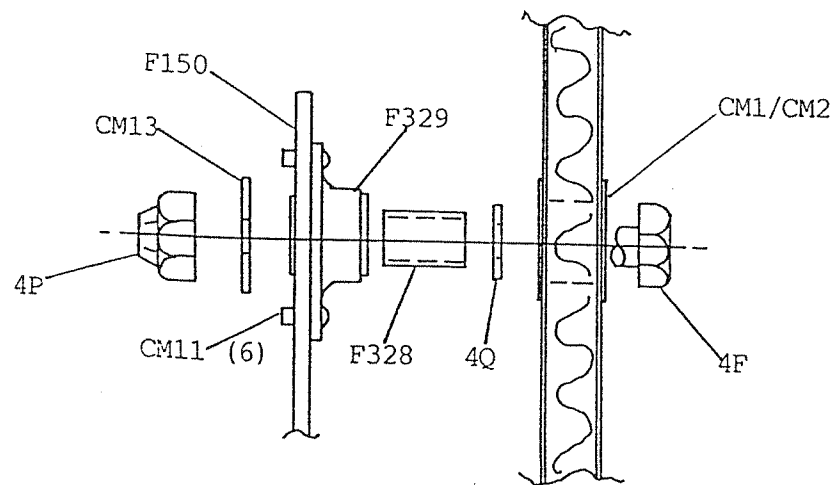


FIGURE 10

MONOCOQUE CONTROL COMPONENTS

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F160	1	Backing Plate Teleflex	BOND	1.2
F150	1	Bellcrank Rudder		
F329	1	Bearing Bellcrank		
F328	1	Spacer Bellcrank		



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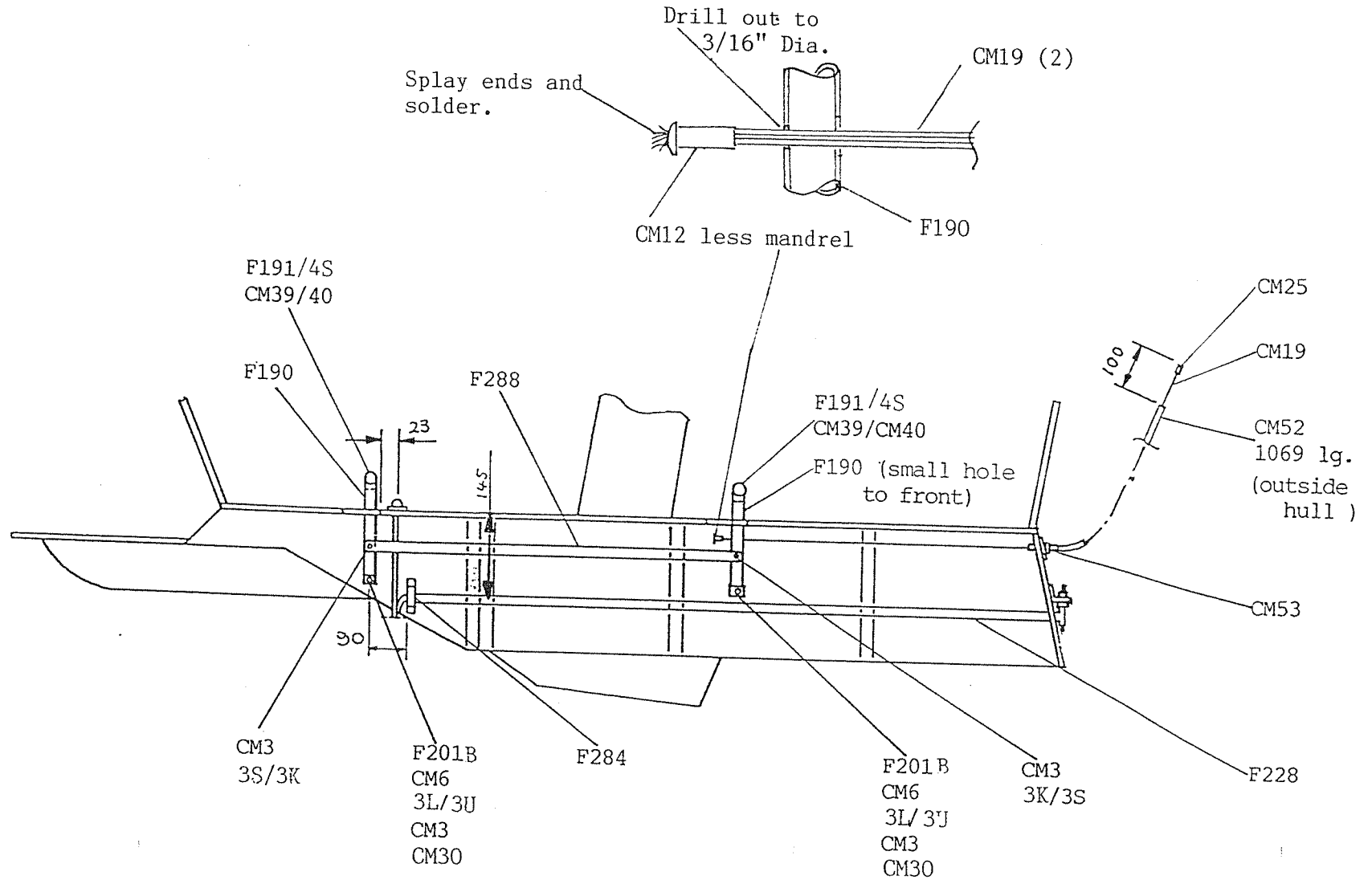
FIGURE 11

MONOCOQUE POWERPLANT CONTROLS

THROTTLE
FUEL ON/OFF VALVE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F191	2	Handle Throttle Lever		
F201	2	Throttle Pivot Collar		
F190	2	Tube Throttle Lever		
F288	1	Conn. Tube Throttle		
F284B	1	Support Valve Tube	BOND	1.1
F228	1	Fuel Valve Torque Tube		
F230	1	Lever Arm Fuel on/off		
F229B	1	Lever Arm Fuel on/off		
F251	1	Lever Guide		
F282B	1	Fuel Valve MTG Plate	BOND	1.2

FIGURE 11



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FIGURE 11

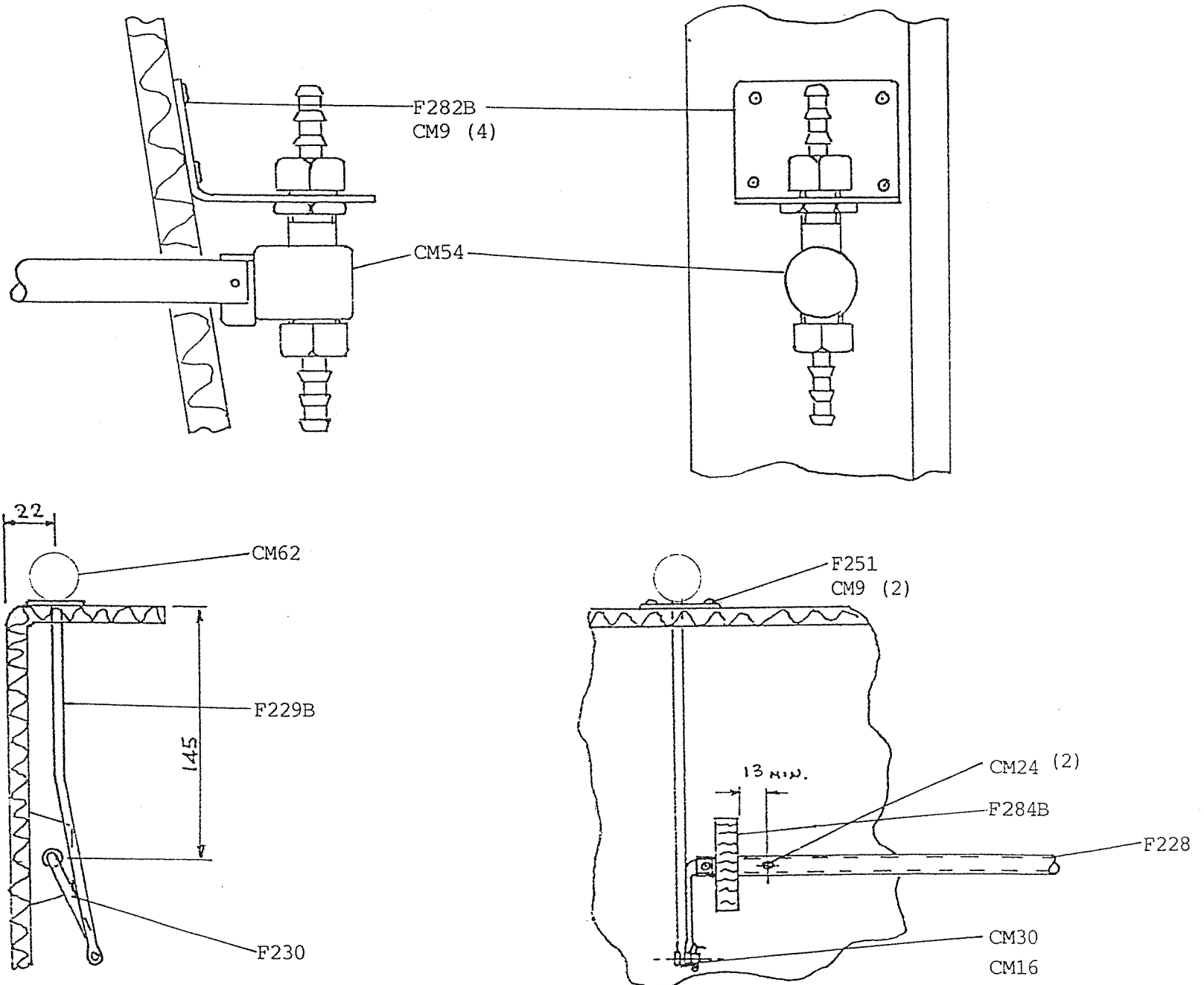


FIGURE 12

MONOCOQUE CONTROL COMPONENTS

RUDDER CABLES

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F225	4	Tang Rudder Pedal		
F319	2	Channel - Cable		

Make sure that the Cable Channel is kept forward towards the single pulley to prevent cable kinking with any slop.

Route cable through the system from the rear seat rudder pedals to the front in a continuous run each side. Block up the rear rudder pedals at 90mm vertically from the floor to the top end of the pedal. Place a weight on the pedals and ensure they cannot move either up or down. Nicopress the cable at the rear rudder pedals.

Set the Rudder Bellcrank on the rear seat back to the NEUTRAL position, vertically down and pull the cables taut and nicopress at the Bellcrank.

Nicopress the nico joining the two cables at the half way point between the pannier support and the rear pulley.

Set the front rudder pedals at neutral (recommended 5 to 10 degrees angled forwards) and with the cable taut, nicopress.

STARBOARD RUDDER CABLE SCHEMATIC. (Refer to page 7-14)

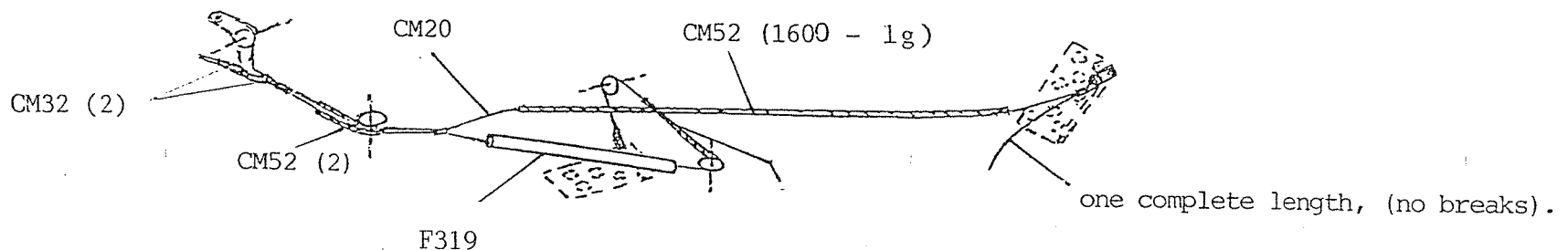


FIGURE 12 - STARBOARD

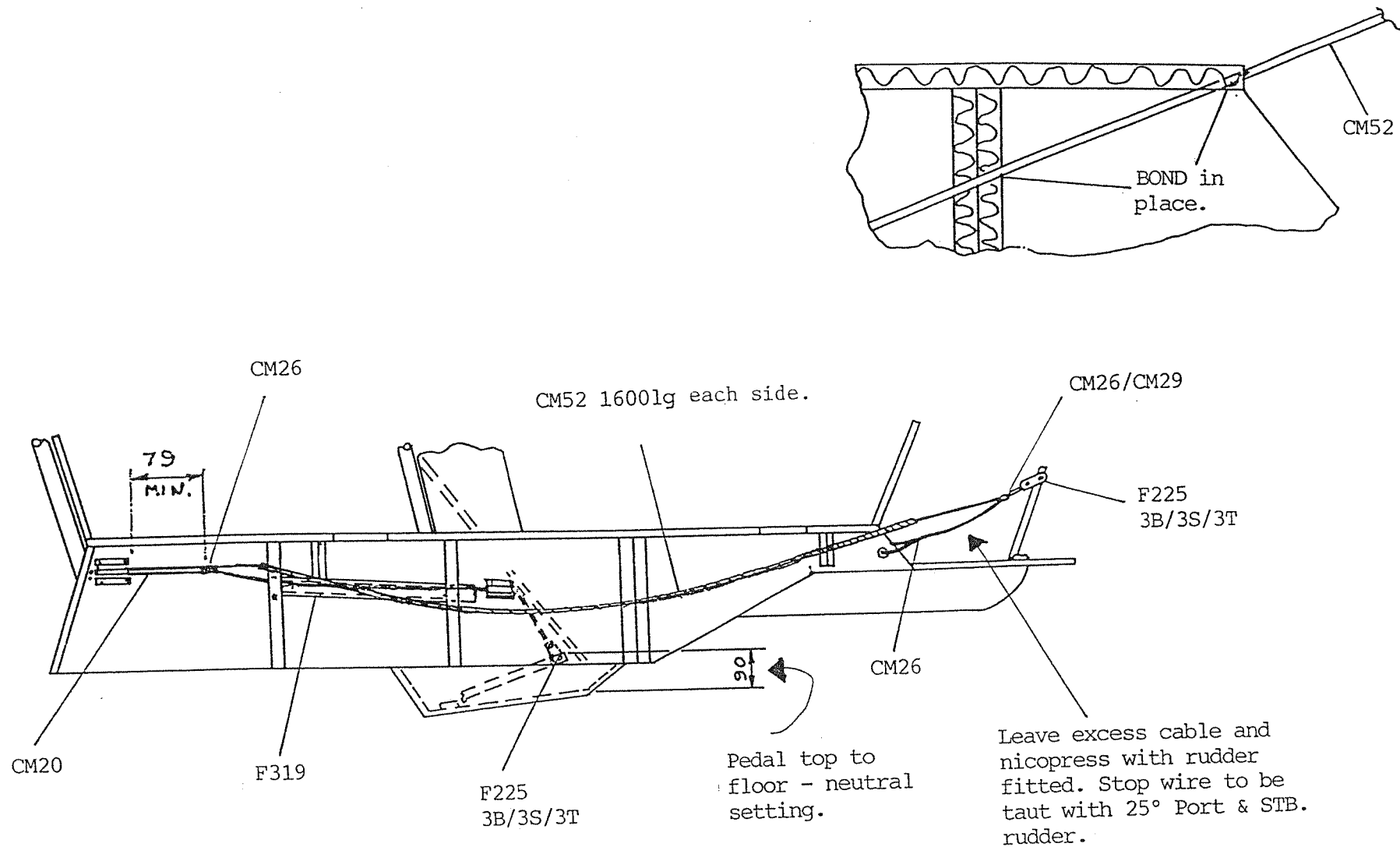


FIGURE 12 - PORT

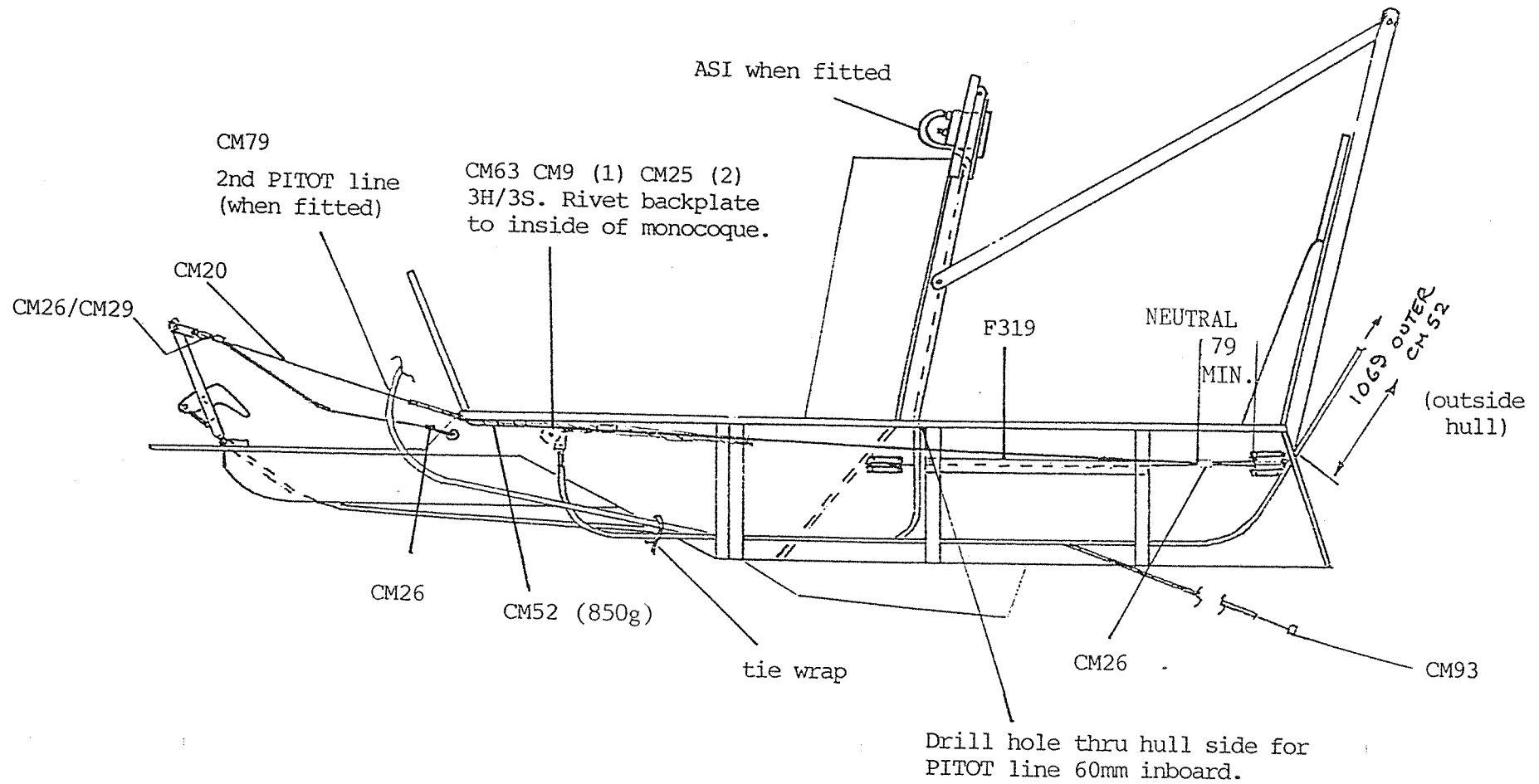


FIGURE 13

FUEL TANK

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F206	1	Fuel Tank Side Port	BOND	1.1
F207	1	Fuel Tank Side St'Bd	BOND	1.1
F209	1	Fuel Tank Bottom	BOND	1.1
F208	1	Fuel Tank Top	BOND	1.1
F210	1	Fuel Tank Front	BOND	1.1
F211	1	Fuel Tank Back	BOND	1.1
F205	1	Fuel Outlet	BOND	1.2
F285	1	Fuel Drain Plate	BOND	1.2
F269	1	Fuel Vent Backing Plate	BOND	1.2
F204	1	Fuel Strainer	BOND	1.1
F265	1	Fuel Sender	BOND	1.2
F266	1	Fuel Spout	BOND	1.1
F145	1	Bracket - Fuel Tank	BOND	1.2

THE FUEL TANK IS ASSEMBLED IN THE SAME MANNER AS THE MONO-COQUE, OBSERVING THE SAME CAREFUL PREPARATIONS.

Carefully rout out one skin and alloy core with a stanley knife from the edges of the fuel tank front, floor, top and back so that when assembled exterior surfaces are butted flush. The two sides are NOT routed.

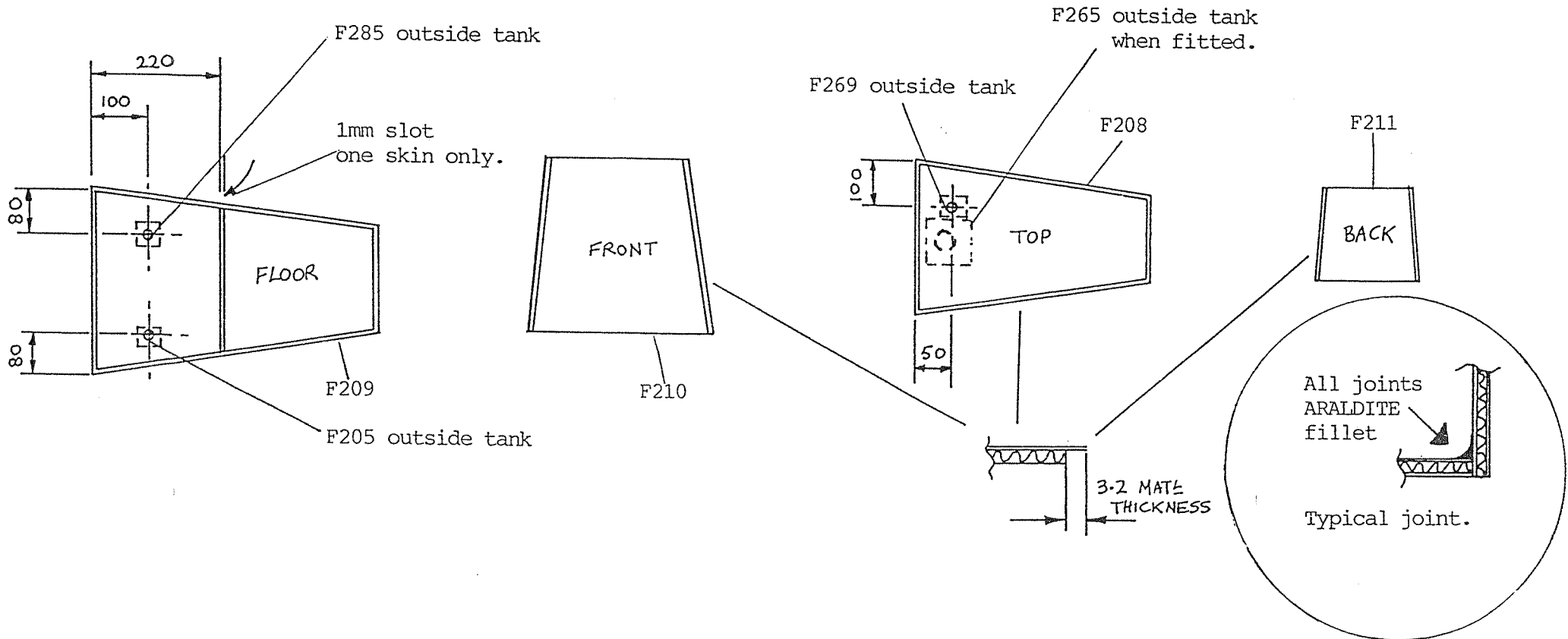
Bond backing plates F285, F205 and F265 to the tank, keeping all threads clear of glue.

Bond together all fuel tank structure EXCEPT for the top of the tank. Retain and ensure symmetry. When cured bond on F266, spout, and seal ALL exposed alloy core with Araldite. Ensure that there is NO exposed alloy core ANYWHERE.

When all bonding is FULLY CURED, coat inside of tank with SAFE-TII-POXY (fuel proof lining), paying special attention around the holes to ensure they are sealed but not blocked. When resin has cured, bond on F204.

Bond on tank top F208 and when cured pour a small amount of resin into the tank and turn upside down and let the resin run around the top fuel joint. Keep resin away from strainer F204.

Leave upside down to cure.



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FIGURE 13

When fuel tank has cured, place it on a flat surface, ensure it is level, and bond into place the fuel tank Brackets, F145.

Install the fittings, CM55, CM84 and CM56 with RED HERMATITE sealer when the fuel tank has been painted AFTER INSPECTION. DO NOT OVERTIGHTEN.

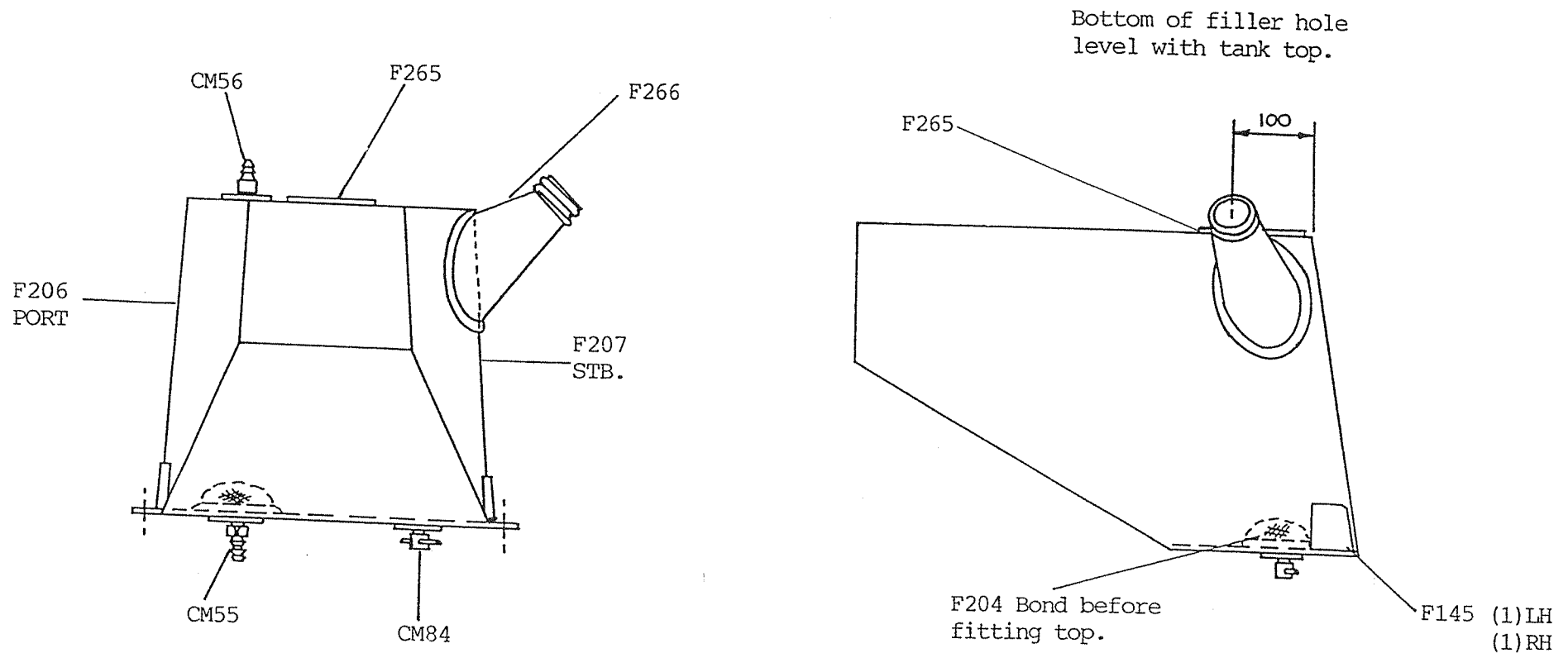


FIGURE 14

NOSELEG ASSEMBLY

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F203	1	Bearing Nosewheel		
F135	1	Nosewheel S/Assy		
F136	2	Trailing Link		
F140	2	Spacer Nosewheel		
F159	1	Spacer Nosewheel		
F139B	2	Spacer Nosewheel		

THE NOSELEG IS ONLY FITTED
TO THE MONOCOQUE AFTER
INSPECTION AND THE POD IS
ON.

Determine the length of CM20 at final assembly after inspection and pod installation. (Page 3-43).

FIGURE 14

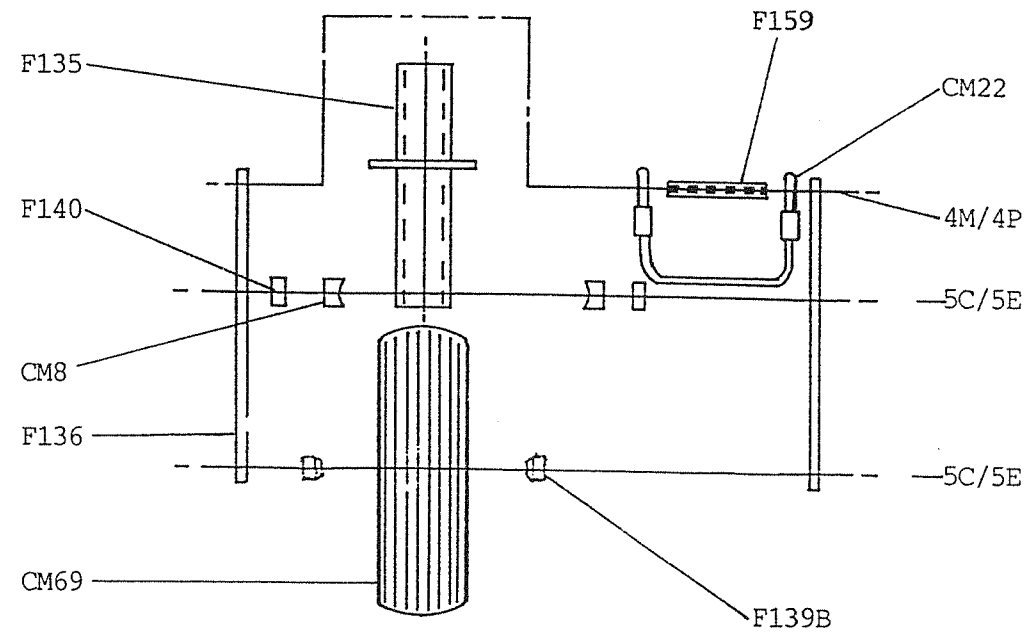
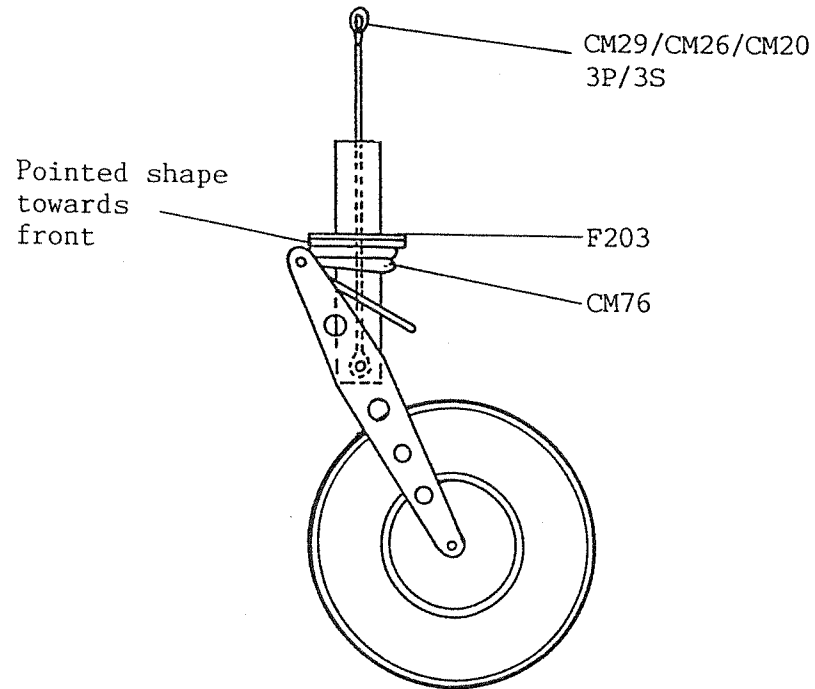


FIGURE 15

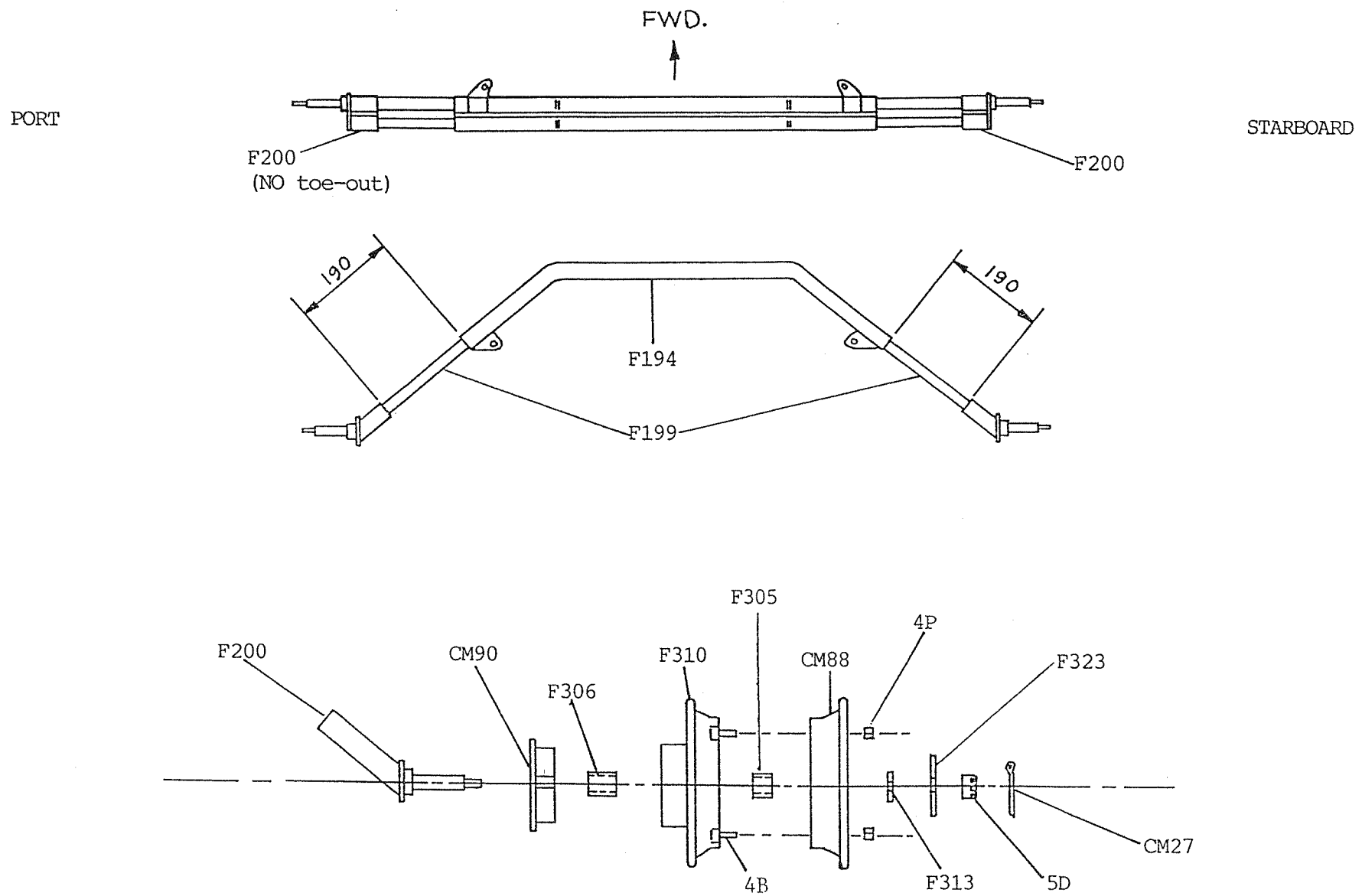
MAIN UNDERCARRIAGE ASSEMBLY

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F200	2	Axle s/Weld Assy.	BOND	1.3
F194	1	Main U/C Assy.	BOND	1.3
F199	4	Pultrusion Rod	BOND	1.6
F306	2	Spacer - Brake		
F310	2	Hub - Drum Brake		
F305	2	Spacer - Bearing Wheel		
F313	2	Washer - Axle		
F323	2	Washer - Axle		

THE UNDERCARRIAGE IS ONLY
FITTED TO THE HULL AFTER
INSPECTION AND PAINTING.

Bond EXCESSIVE Araldite into Axle/Pultrusion assemblies, F199/F194 and F199/F200 to ensure a strong bond. Clean off surplus glue afterwards.

FIGURE 15



INSPECTION

Before proceeding beyond this stage to completion of Section 3, ensure inspection is effected and recorded as detailed on page F.

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FIGURE 16

MONOCOQUE SKIN

PANNIERS
POD
NOSELEG
PITOT TUBE

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F246	2	Panniers	BOND	1.8
F247	1	Pod	BOND	1.7
F134	1	Leg Nosewheel	BOND	1.2
F258	2	Pitot	BOND	1.2

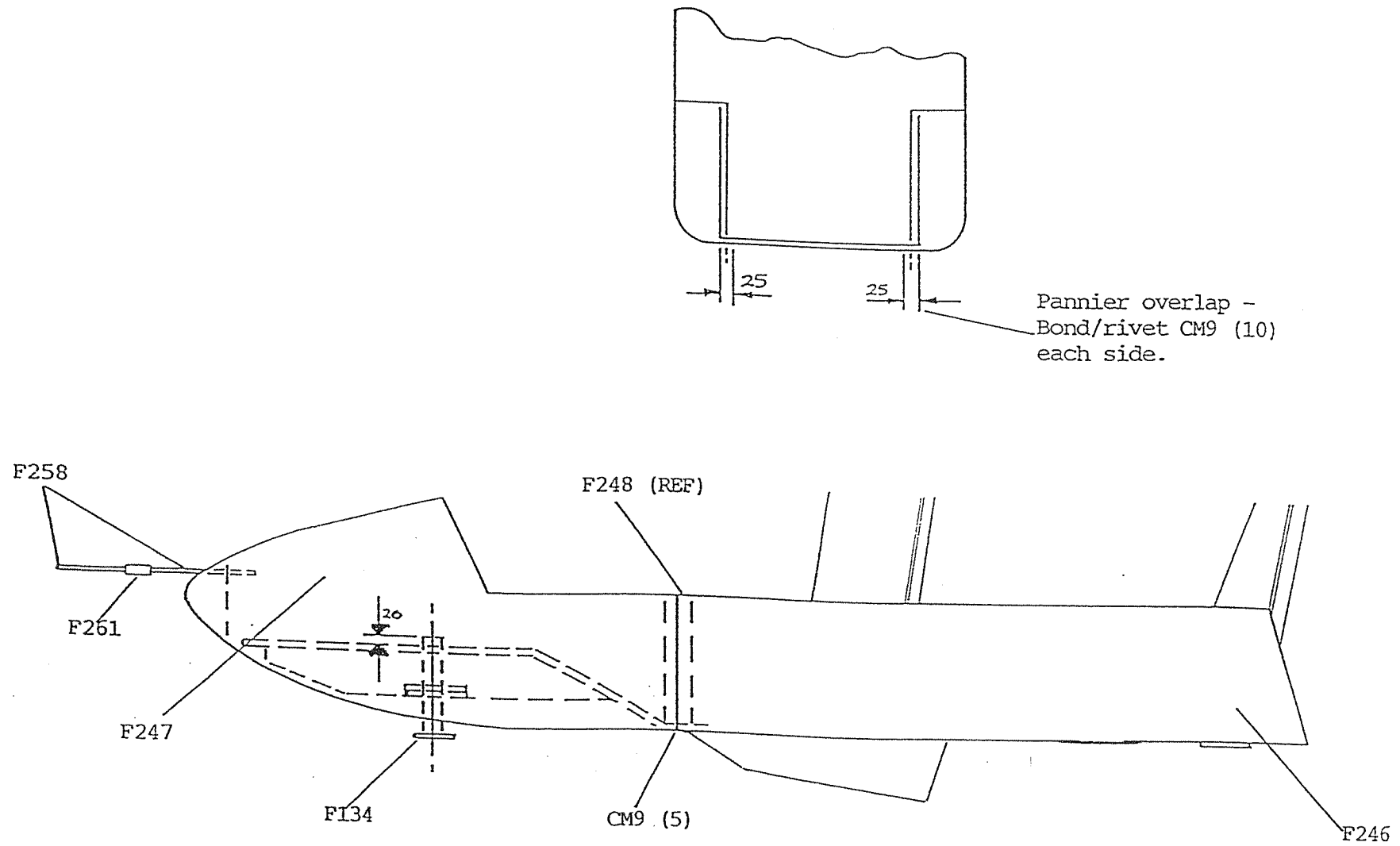
Prepare Fibrelam for bonding, bond and rivet underside of panniers to monocoque bottom. Pull brake cables through the cut-out in the panniers. Pulling into position, draw panniers up to join the monocoque hull side. Glue contact areas well and secure panniers.

Temporarily fit Pod to hull. Mark and trim off excess pod material where it makes a butt join with the panniers and overlays the hull sides. Locate and make hole for Nose Leg F134. Remove and prepare hull floor for Nose Leg and Nose leg itself. N.B. ensure a strong bond - your landing gear relies upon this bond. Bond Pitot into position, bond on Pod and bond in Nose Leg.

Retain with plenty of tape while curing.

When cured, trim off surplus Pod material from around the Instrument Panel.

FIGURE 16



PAINT

Boom, except for the front 430mm.
Outside Hull.
Inside Hull.
Fuel Tank.

(Use Polyester Filler to fill in and cover rough surfaces
prior to painting)

FIGURE 17

LANDING GEAR INSTALLATION

MAIN UNDERCARRIAGE
NOSE LEG

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F227	2	Insert Drag Strut		
F112	2	Drag Strut U/C		
F156	2	U Bolt U/C		
F327	4	Spacer - U/C		

As illustrated, drill out to 3/8" the holes in the Backing Plates F157 only to accomodate Spacers F327.

Install Undercarriage and fit drag strut on Main Undercarriage.

Position the other end in the Drag Strut Bracket and trim for length, ensuring at least 10mm excess from hole.

Fit and rivet Inserts. N.B. Check rivets do not interfere with the Strut Brackets with strut installed.

Drill drag strut ends for bolts after ensuring axle's symmetry to hull

NOSE WHEEL ASSEMBLY:

Determine the length of CM20 retaining cable after bolting through in monocoque with bolts 3S/3P and nicopress.

THE NOSE WHEEL LEG F134, MUST BE GREASED BEFORE BEING INSERTED INTO THE MONOCOQUE LEG, F135.

N.B. If the cable is too slack, add additional bearings F203. The Nose Wheel Assembly can be rotated to slightly shorten the retaining cable CM20 and provide 21b - 41b of friction. The Nose Wheel will SHIMMY if this is not done.

CM76, Shock/bungee cord, must be wrapped around the nose leg 3 times to prevent the nose leg from grounding.

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FIGURE 17

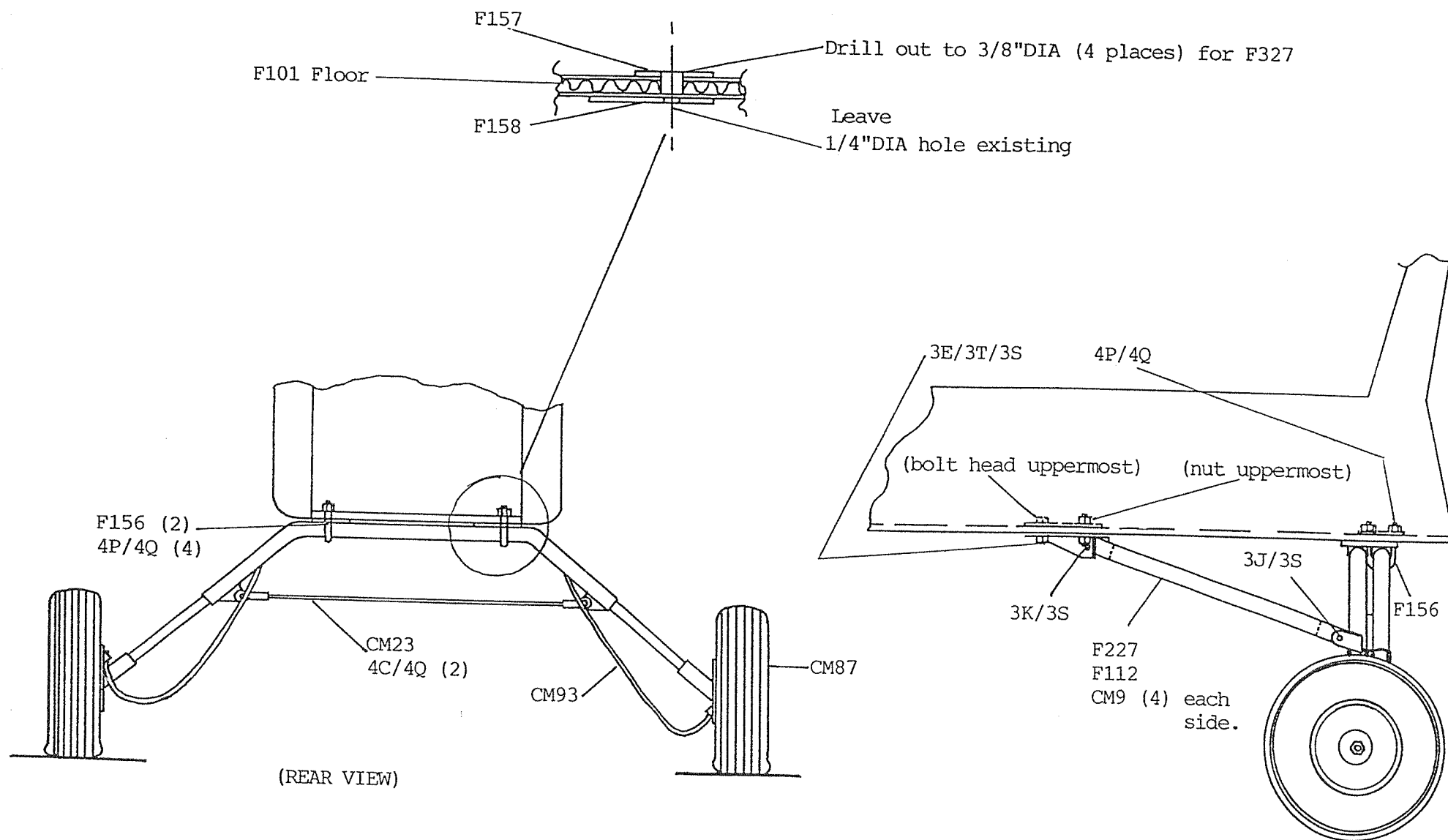


FIGURE 18

MONOCOQUE FITTINGS

SEAT BELTS
FLAP LEVER

PART No.	QTY.	PART DESCRIPTION	NOTE	PROCESS REF.
F181	1	Bracket Flap Lever	BOND	1.2
F122	1	Bracket Flap Position		
F202	1	Nylon Wear Pad		
F123	1	Lever Flap		
F124	1	Bracket Flap Lever		
F271	1	Plate Flap Tension Spring		
F125	1	Detent Flap		
F126	1	Flap Lever Channel		
F214	2	Seat Belt Attach. Plate		

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FIGURE 18

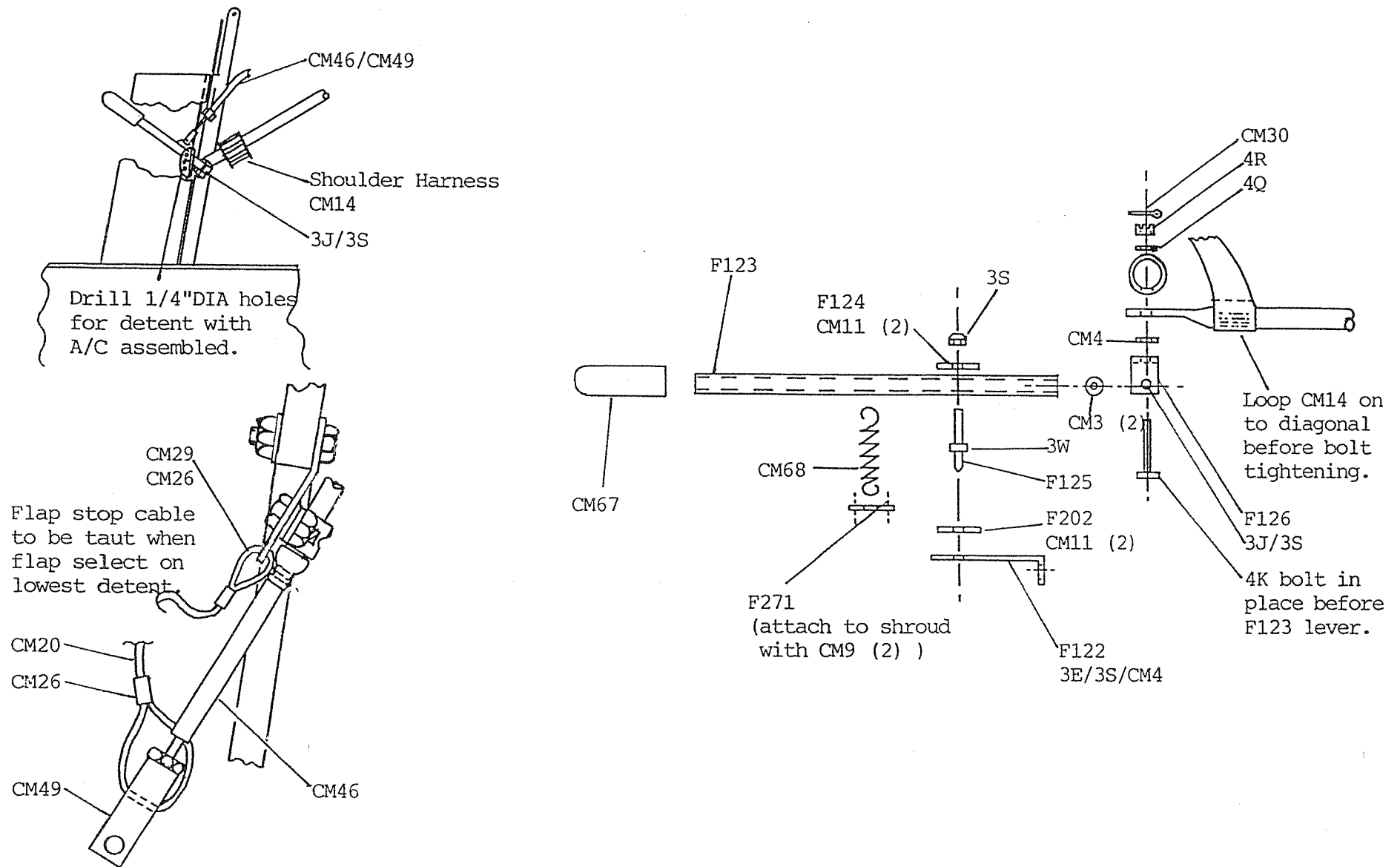


FIGURE 18

