CHAPTER 4

TAIL UNIT

Chapter 4 TAIL UNIT

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

APPENDIX

Description

1. The tail unit, mainly of light alloy construction, comprises a single tail plane and elevator with twin fins and rudders. It is supported by two cantilever tail booms which project from the stub booms on the main planes. The fins, which are built integrally with the aft portions of the tail booms, support the rudders, the interposed tail plane, the tail-plane extensions (except Mk.3), and the elevator. Differences in structure or contour exist between the tail units of all Marks of Venom. Consequently a separate key diagram is presented for each Mark.

Negligible and repairable damage

2. Definitions of damage, with references to relevant repair illustrations, are listed in the tables which supplement the structure diagrams of the various components.

Rudder and elevator mass balance

3. Before repair, check whether adjustment of the balance weight can be made to counteract the effect of the proposed repair. No provision is made for adjustment to the balance weights on Venom Mk.1, 2, and 4 rudders. The Venom Mk.3 rudder and all elevators have adjustable balance weights but these should be checked prior to repair to ensure that all available space has not already been filled with lead.

4. When adjustment of the weight is not possible, balance the rudder or elevator to check that the limits quoted on *Fig.* 4/51 will not be exceeded if an insert or an external patch repair is applied. If the limits would be exceeded due to the added moment from an insert or an external patch, repair by replacement is necessary. After any repair which affects the balance and after the restoration of the protective finish, rebalancing procedure as on *Fig.* 4/51 must be applied.

Wear limits

5. Wear limits for male and female parts of the principal fittings in the tail unit will be introduced in this chapter at a later date.

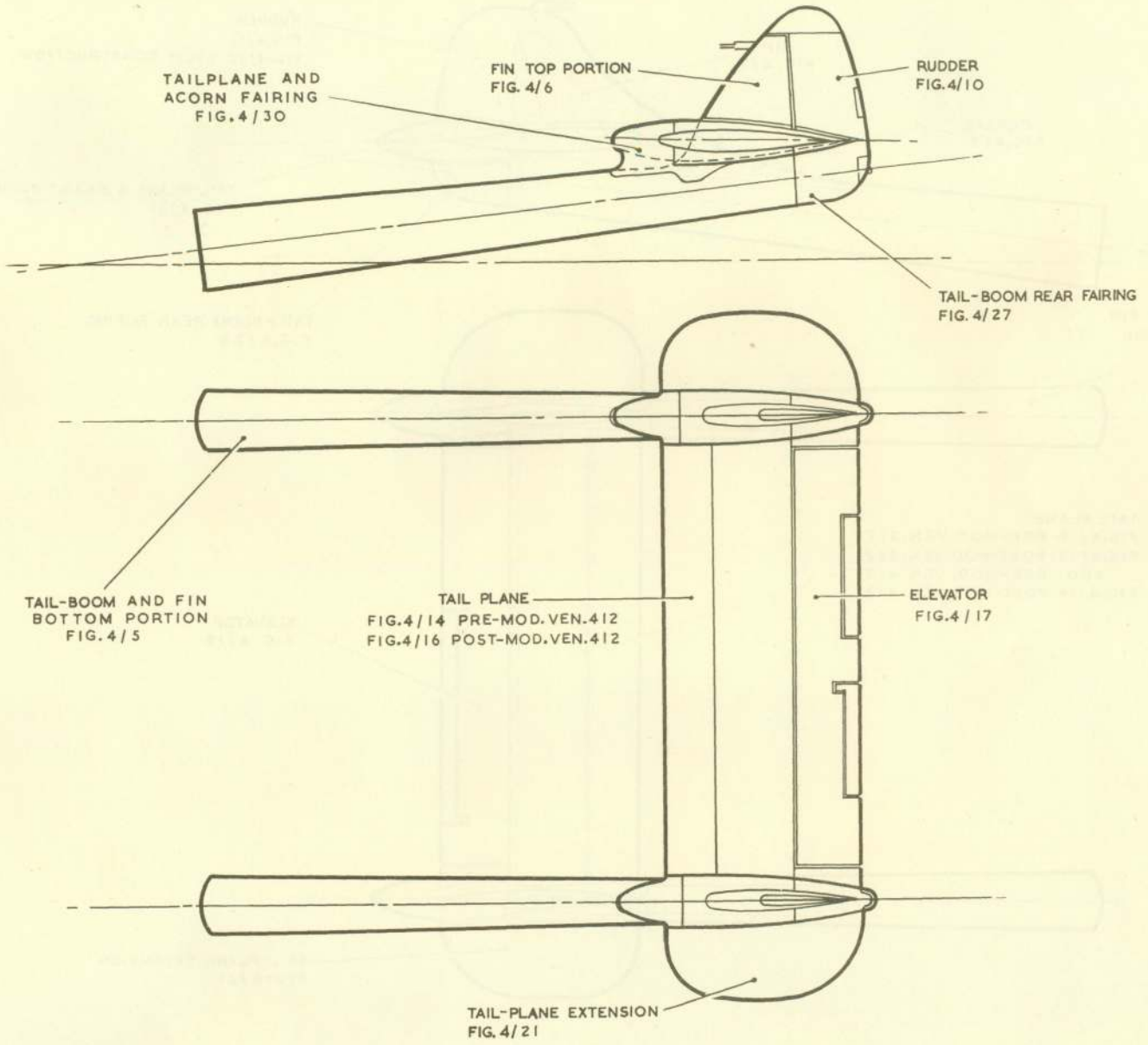

Fig. 4/1. Tail unit key diagram, Mk.1

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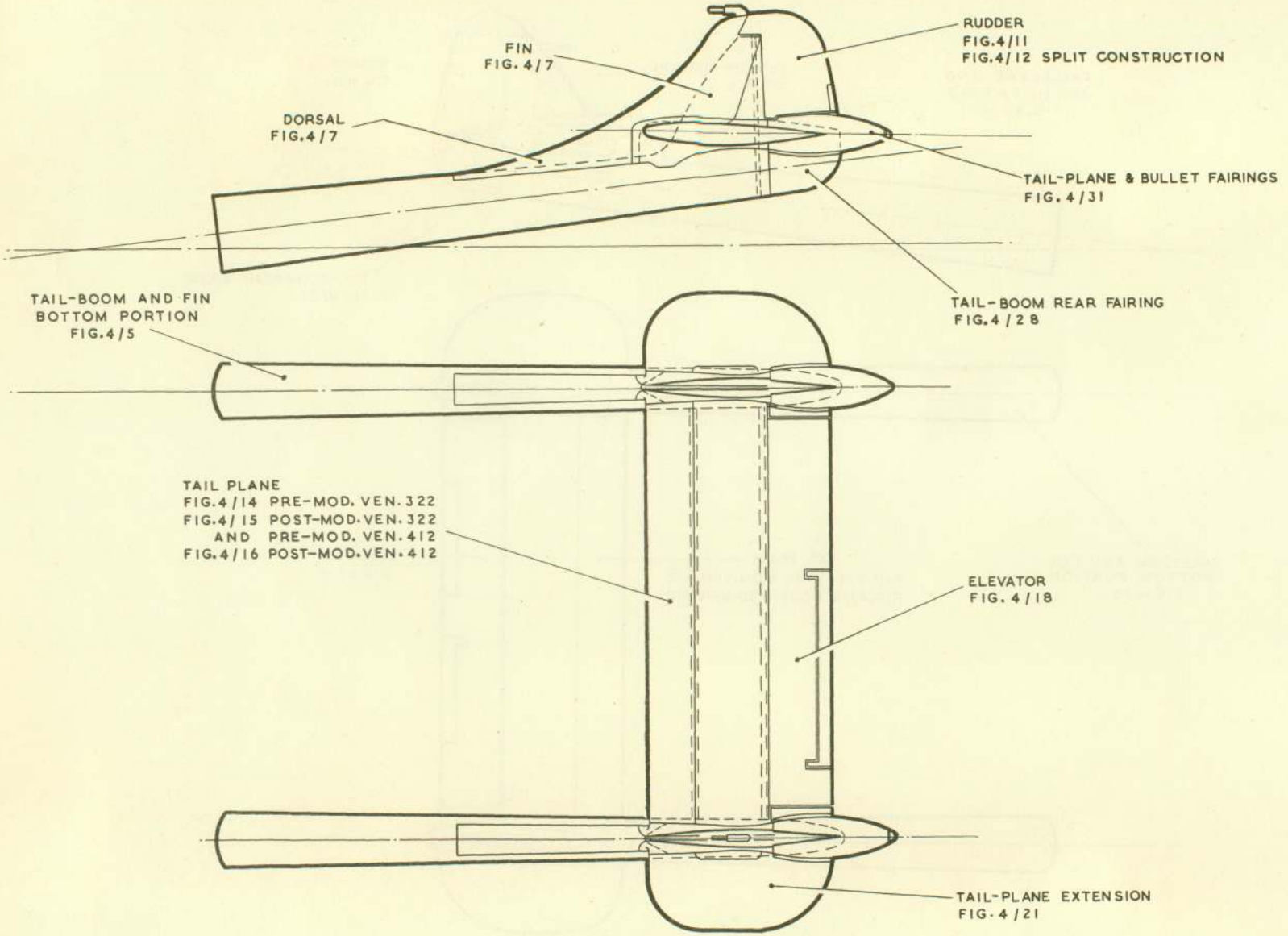

Fig.4/2. Tail unit key diagram, Mk.2

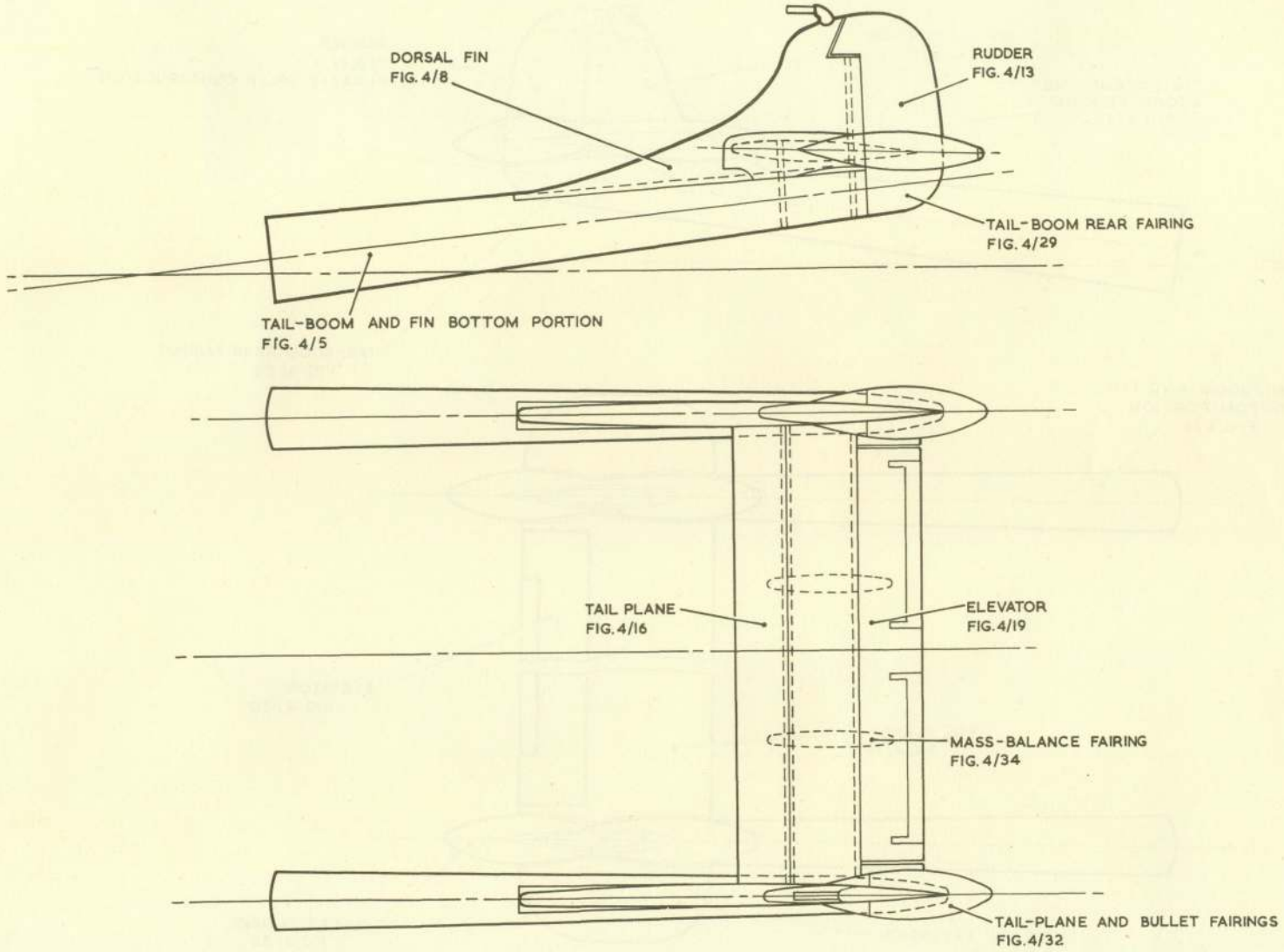

Fig. 4/3. Tail unit key diagram, Mk. 3

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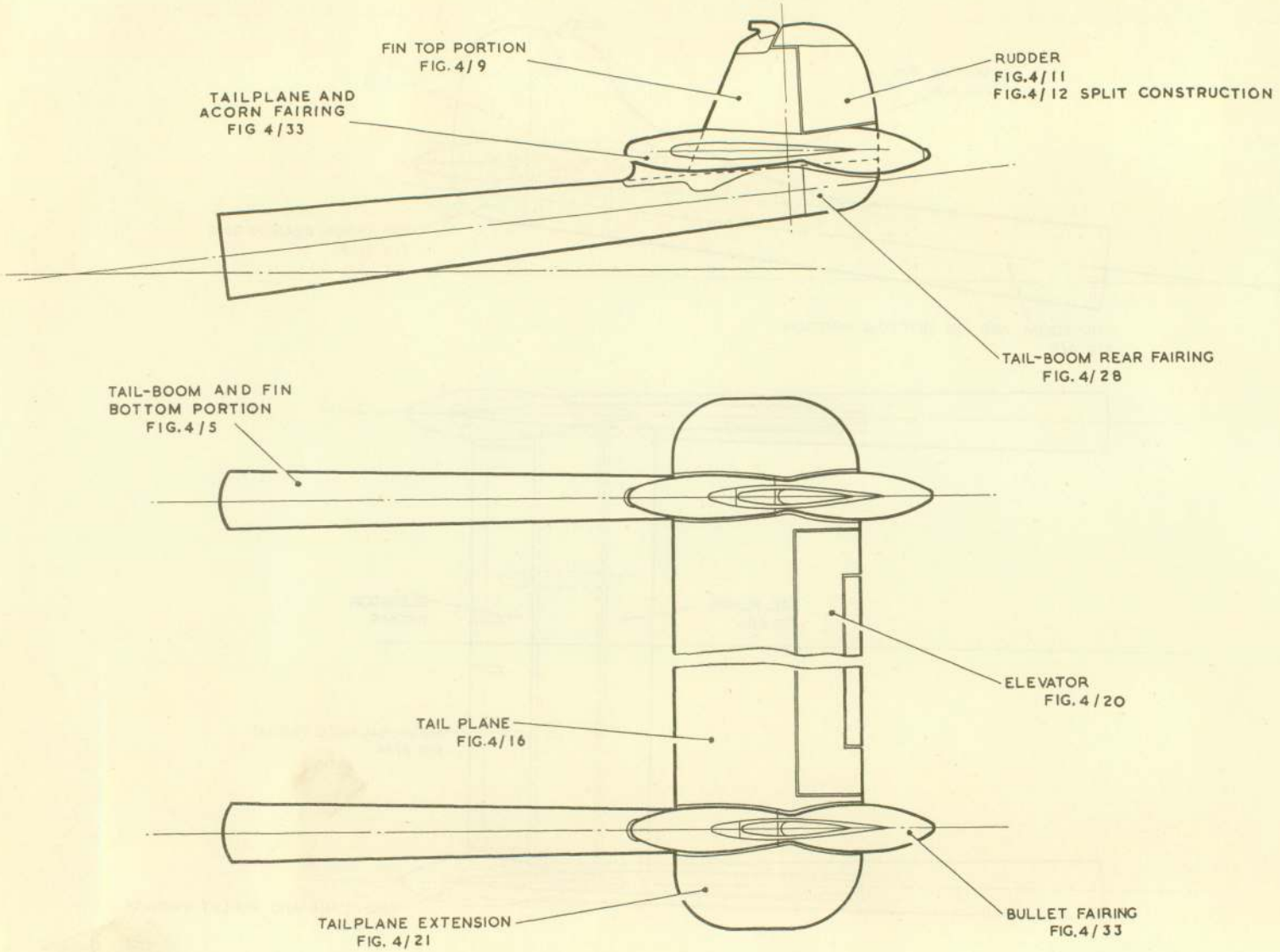


Fig. 4/4. Tail unit key diagram, Mk.4

FIG. 4/5 OVERLEAF

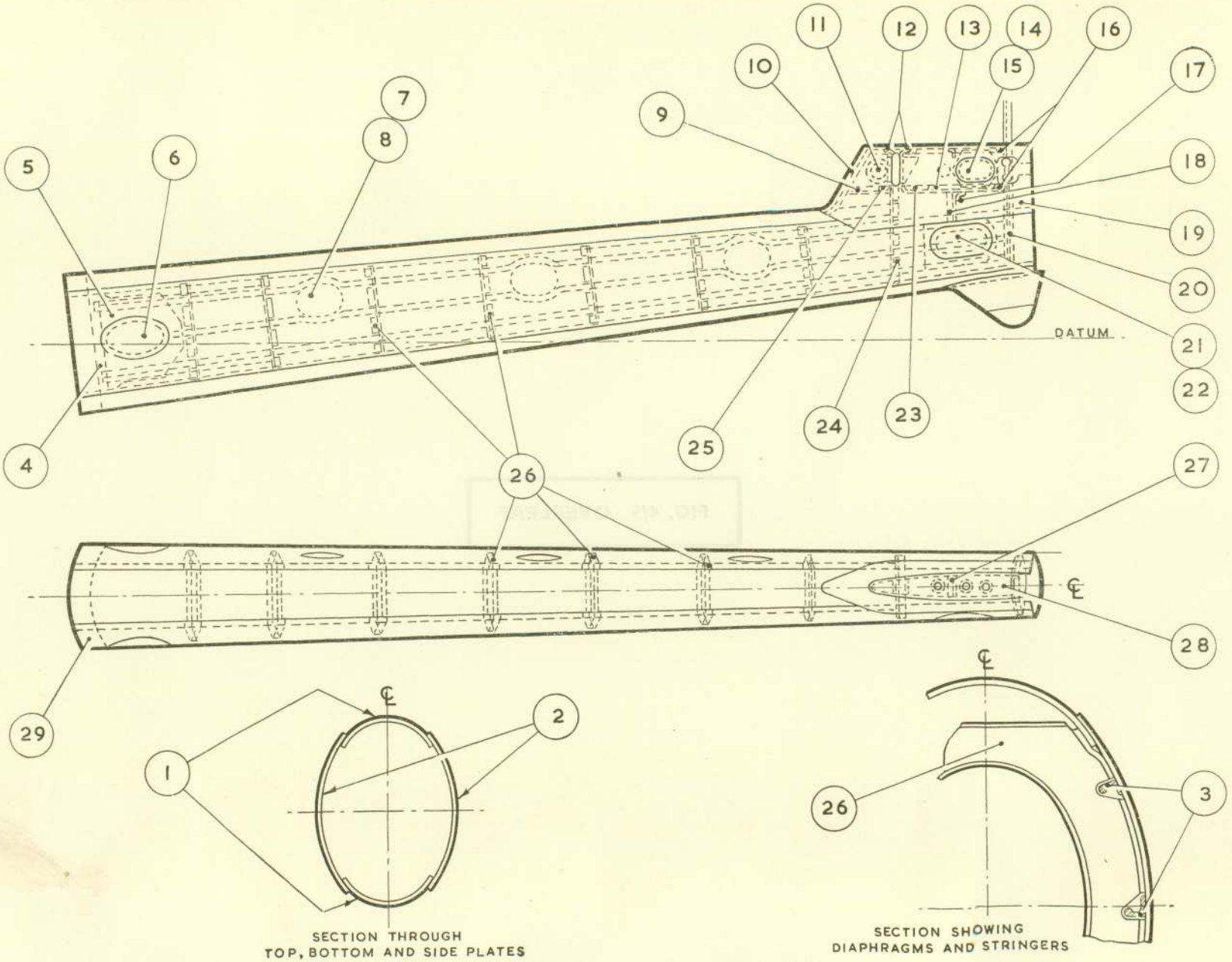


Fig. 4/5. Tail boom and fin bottom portion, all Marks

KEY TO FIG. 4/5 (TAIL BOOM AND FIN BOTTOM PORTION, ALL MARKS)

Ref. No.	Description of Part	Material or Section		Ref. No.	Description of Part	Material or Section	
		Spec.	S.W.G.			Spec.	S.W.G.
1	TOP AND BOTTOM PLATES	D.T.D.610	10	16	BRACKET	S.3	20
2	SIDE PLATES	D.T.D.610	16	17	STIFFENER	D.T.D.610	20
3	STRINGERS, STANDARD SECTION	J.723		18	DIAPHRAGM	D.T.D.610	20
4	PACKING PLATE	D.T.D.610	18	19	SKIN	D.T.D.610	20
5	REINFORCING PLATE	D.T.D.610	14	20	FIN SPAR, REAR (MK.1 & 2, FIG. 4/23 MK.3 & 4, FIG. 4/24)	—	—
6	DOOR	D.T.D.610	16	21	REINFORCING PLATE	D.T.D.610	18
7	COVER PLATES	D.T.D.610	16	22	COVER PLATE	D.T.D.610	16
8	NUT PLATES	D.T.D.610	18	23	BRACKET	S.3	20
9	NOSE RIB	D.T.D.610	22	24	FRONT SPAR AND REAR FRAME (FIG. 4/22)	—	—
10	BUTT STRAP	D.T.D.610	20	25	BRACKET	S.3	20
11	PATCH PLATE, INBOARD	D.T.D.610	20	26	DIAPHRAGMS	D.T.D.610	20
12	FRONT AND REAR FORMERS	D.T.D.610	20	27	STIFFENER	D.T.D.610	16
13	CENTRE RIB	D.T.D.610	20	28	RIB	D.T.D.610	20
14	COVER PLATE, OUTBOARD	D.T.D.610	16	29	JOINT RING	L.40 or D.T.D.364	—
15	NUT PLATE	D.T.D.610	18				

Definitions of negligible and repairable damage (Fig. 4/5)

Item	Negligible damage—dents			Repairable damage	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
TOP AND BOTTOM PANELS, BOOM	0·03	1·0	12·0	4·0 dia., 12·0 spacing	4/46
SIDE PANELS, BOOM	0·05	2·0	12·0	0·5 dia., to 2·0 dia., 12·0 spacing	4/36
				8·0×4·0, 24·0 spacing	4/47
				8·0×2 stringers, 24·0 spacing	4/48
				16·0×3 stringers, 24·0 spacing	4/49
				4·0×2·5 at panel joints, 18·0 spacing	4/50
SKINS, FIN	0·03	1·0	6·0	0·5 dia., to 2·0 dia., 12·0 spacing	4/36
RIBS, FIN — Webs	0·03	1·0	6·0	0·5 dia., 9·0 spacing	4/36
				1·0 dia., at lightening holes, one per rib	4/45(A)
RIBS, FIN — Flanges	0·03	0·5	6·0	1·0×0·35 one each flange	4/45(C)
DIAPHRAGMS, BOOM	0·03	1·5	12·0	0·5 dia., 12·0 spacing	4/36
				Renewal of flange between stringers 12·0 spacing	4/45(D)
STRINGERS, BOOM	0·02	0·5	12·0	4·4 long, 18·0 spacing	4/42(A)
				Insertion repair	4/42(B)

Note:—*All dimensions given in the above table are in inches*

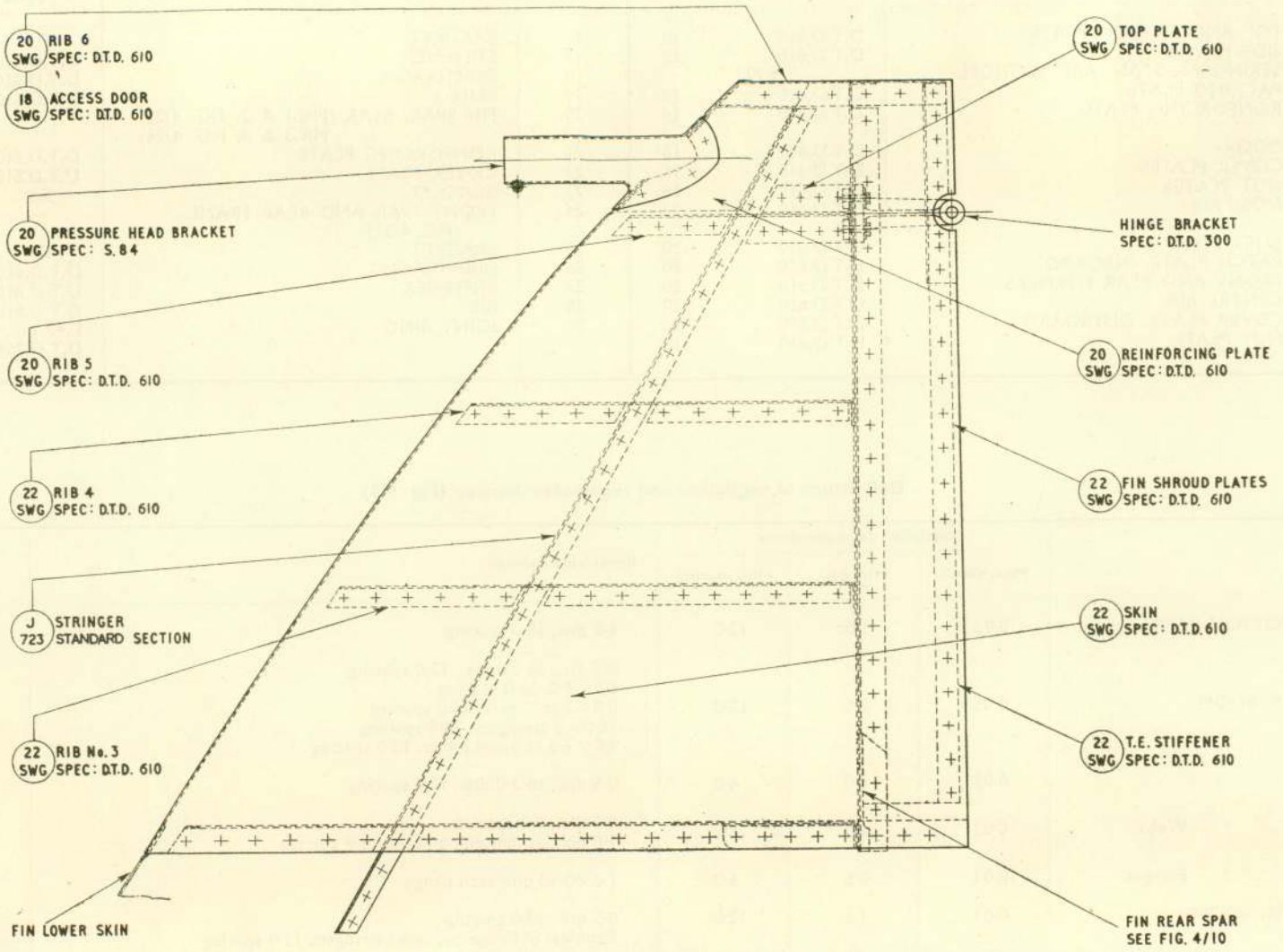


Fig. 4/6. Fin, top portion, Mk.1

Definitions of negligible and repairable damage (Fig. 4/6. Fin, top portion, Mk.1)

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKINS		0·03	1·0	12·0	Cracks at rivet holes, 12·0 spacing } *Not forward of a line 6·0 aft of the leading edge* 0·5 to 2·0 dia., 12·0 spacing } *Not forward of a line 6·0 aft of the leading edge* Insertion repairs ◀ Insertion repairs, leading edge	4/35 4/36 4/38 & 4/39 4/52 ▶
RIBS AND DIAPHRAGMS	Webs	0·03	1·0	6·0	0·5 dia., one per item	4/36
	Flanges	0·03	0·5	6·0	1·0×0·35, one per side of item	4/45(C)
STRINGERS		0·02	0·5	9·0	4·4 long, one per stringer Insertion repair, one per stringer	4/42(A) 4/42(B)

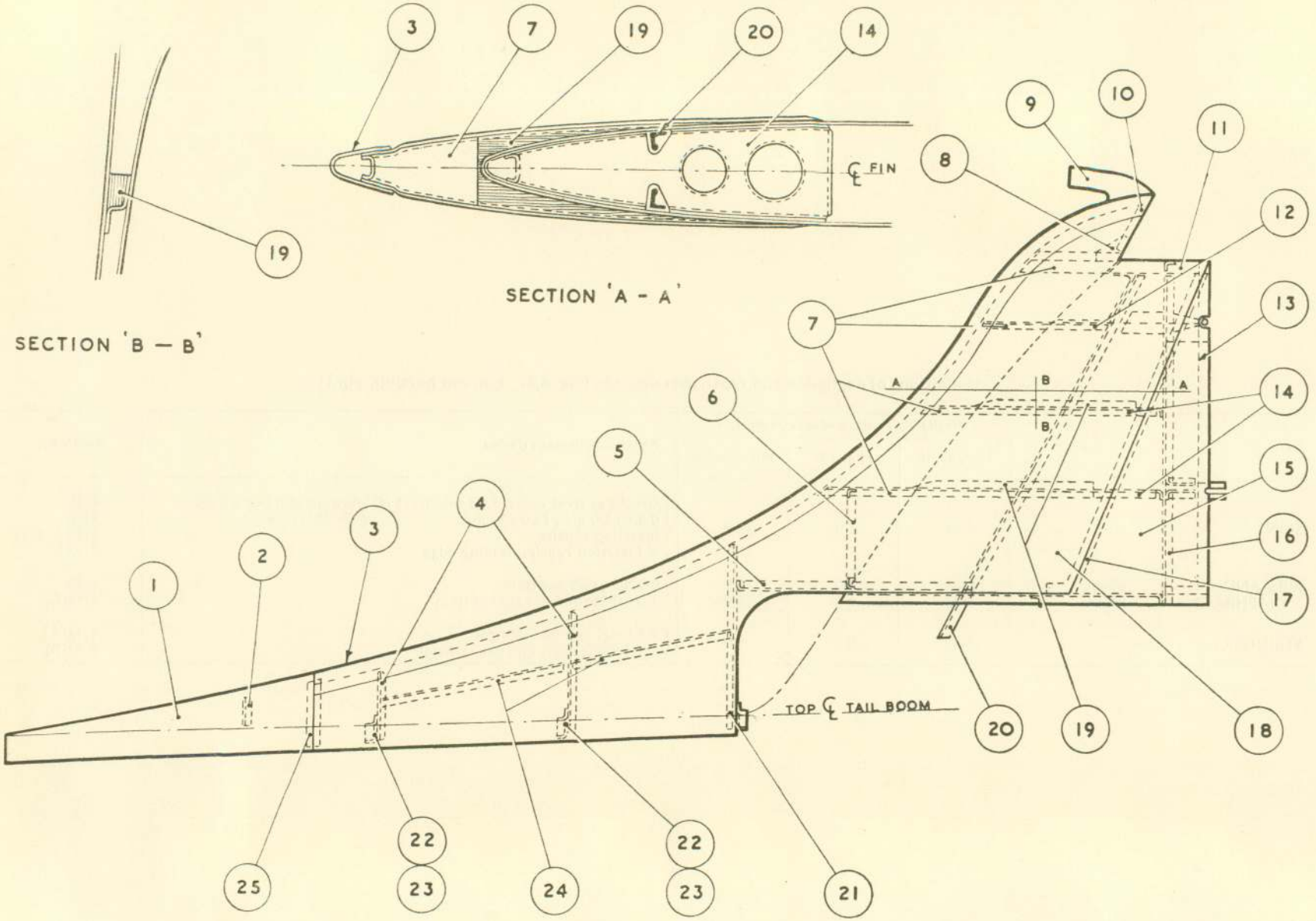


Fig. 4/7. Fin, dorsal and top portion, Mk.2

KEY TO FIG. 4/7 (FIN, DORSAL AND TOP PORTION, MK.2)

Ref. No.	Description of Part	Material or Section		Ref. No.	Description of Part	Material or Section	
		Spec.	S.W.G.			Spec.	S.W.G.
1	NOSE PRESSING	D.T.D.610	20	14	FIN RIBS NUMBERS 3 AND 4	D.T.D.610	22
2	FORMER	D.T.D.610	20	15	FIN SKIN	D.T.D.610	22
3	EDGE MEMBER	D.T.D.610	18	16	FIN REAR SPAR (FIG. 4/23)	—	—
4	FRAME DIAPHRAGM	D.T.D.610	20	17	REINFORCING STRIP	D.T.D.610	22
5	DORSAL RIB	D.T.D.610	20	18	DORSAL SKIN	D.T.D.610	20
6	DIAPHRAGM	D.T.D.610	20	19	PACKING BLOCKS	L.F.S. J.723	—
7	DORSAL RIBS	D.T.D.610	20	20	STRINGER, STANDARD SECTION	D.T.D.610	20
8	GUSSET PLATE	D.T.D.610	20	21	DORSAL FRAME	D.T.D.610	18
9	PRESSURE HEAD PORT ONLY	—	—	22	ANGLE	D.T.D.610	16
10	DIAPHRAGM	D.T.D.610	18	23	SADDLE PLATE	D.T.D.610	20
11	FIN RIB NO. 6	D.T.D.610	20	24	STIFFENER	D.T.D.610	22
12	FIN RIB, NO. 5	D.T.D.610	20	25	BUTTSTRAP		
13	SHROUD PLATE	D.T.D.610	22				

Definitions of negligible and repairable damage (Fig. 4/7)

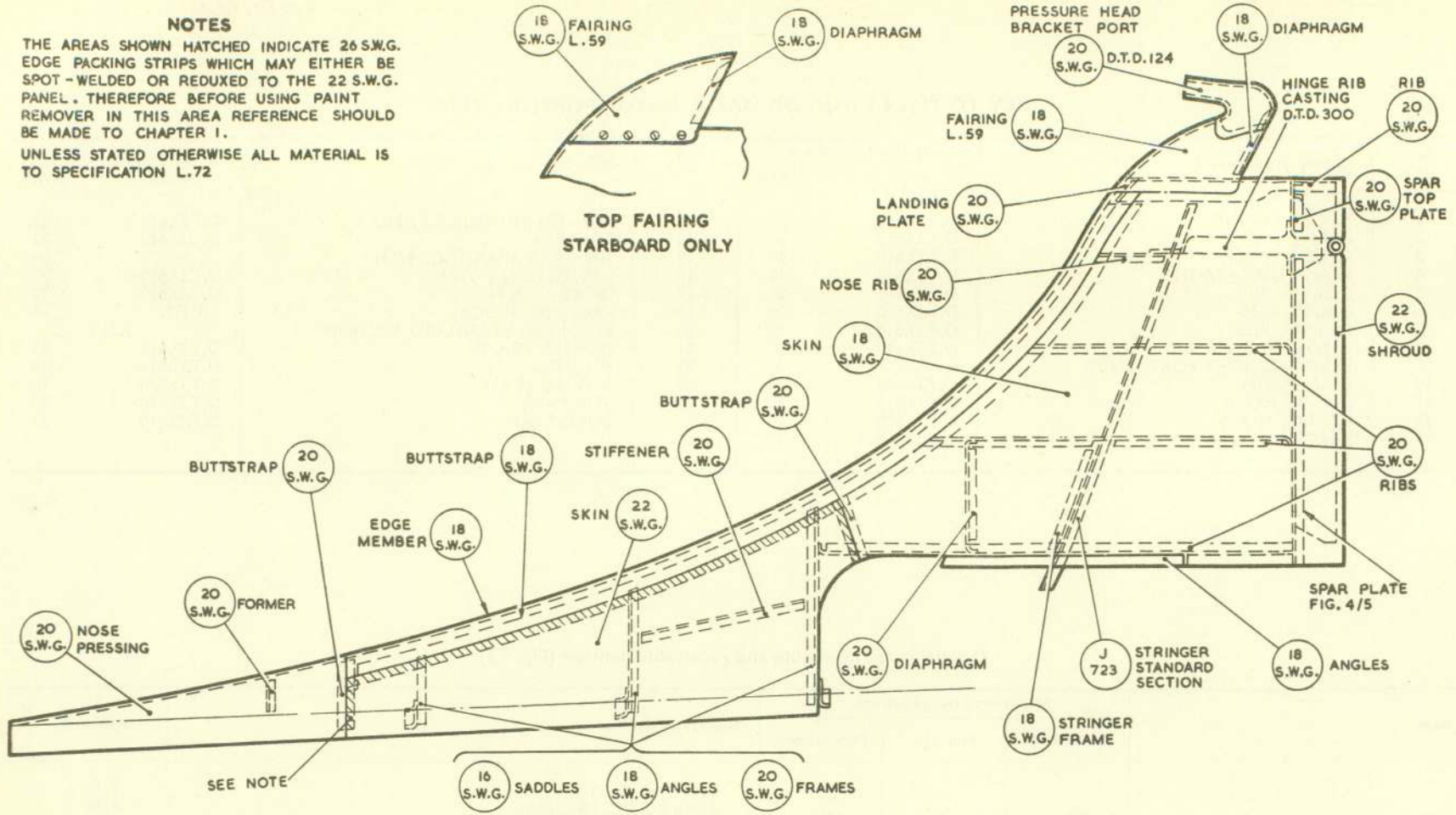
Item	Negligible damage—dents			Repairable damage		Repair fig.
	Max. depth	Min. dia.	Min. spacing			
SKINS, FIN	0·03	1·0	12·0	Cracks at rivet holes		4/35
				0·5 to 2·0 dia., 12·0 spacing		4/36
				3·0 and 5·0 dia., 18·0 spacing		4/36
				Insertion repairs		4/38 & 4/39
SKINS, DORSAL	0·03	1·0	12·0	Cracks at rivet holes	Not forward of a line 6·0 aft of leading edge	4/35
				0·5 to 2·0 dia., 18·0 spacing		4/36
				Insertion repair, one per side		4/37(A)
				Insertion repair, leading edge		4/53
RIBS AND DIAPHRAGMS — Webs	0·03	1·0	6·0	0·5 dia., one per item		4/36
Flanges	0·03	0·5	6·0	1·0×0·35, one per side of item		4/45(C)
STRINGERS	0·02	0·5	9·0	4·4 long, one per stringer		4/42(A)
				Insertion repair, one per stringer		4/42(B)

Note:—*All dimensions given in the above table are in inches*

NOTES

THE AREAS SHOWN HATCHED INDICATE 26 S.W.G. EDGE PACKING STRIPS WHICH MAY EITHER BE SPOT-WELDED OR REDUXED TO THE 22 S.W.G. PANEL. THEREFORE BEFORE USING PAINT REMOVER IN THIS AREA REFERENCE SHOULD BE MADE TO CHAPTER 1.

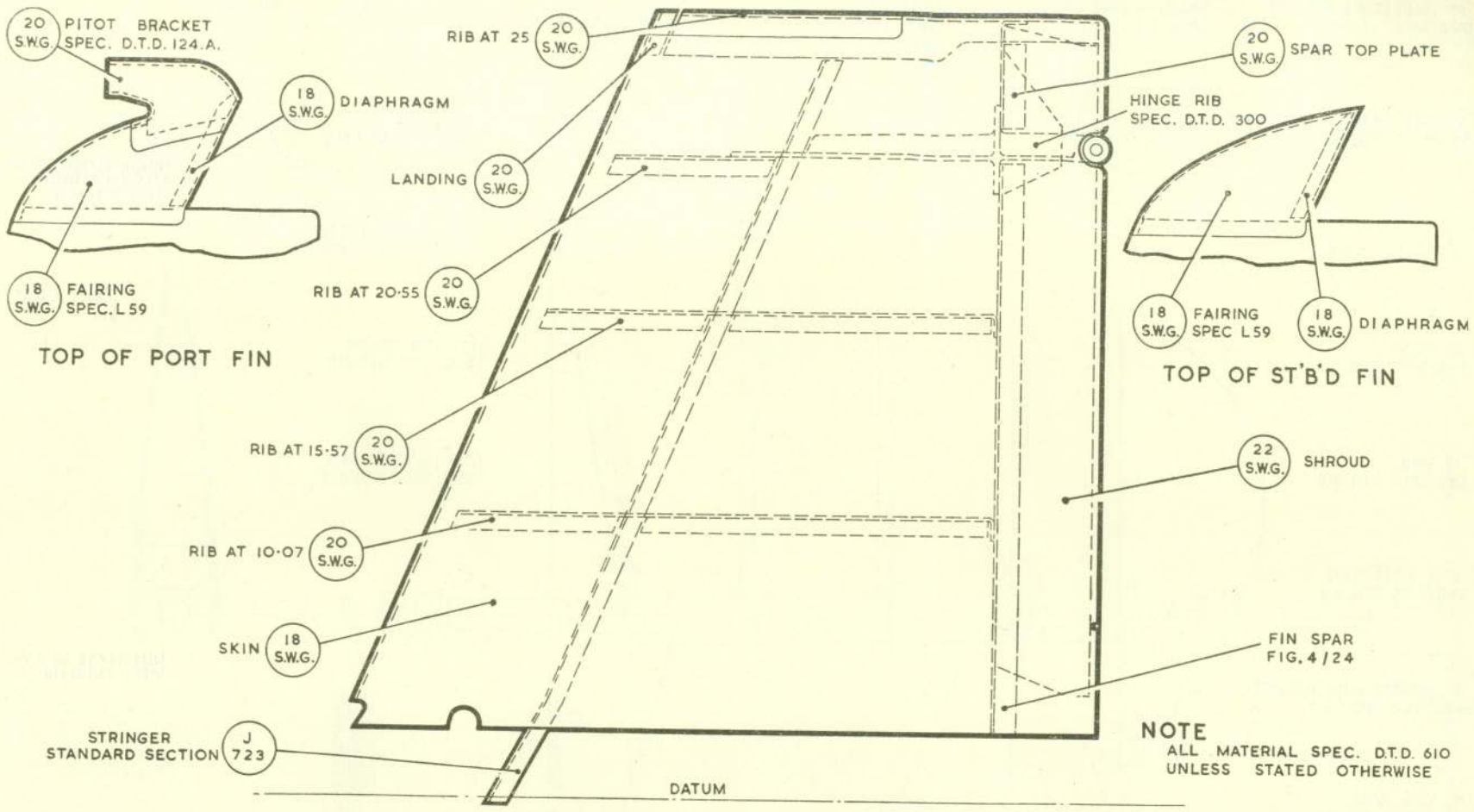
UNLESS STATED OTHERWISE ALL MATERIAL IS TO SPECIFICATION L.72



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches) Max. depth	Min. dia.	Min. spacing	Repairable damage (inches		Repair fig.
SKINS		0·03	1·0	12·0	Cracks at rivet holes, 12·0 spacing 0·5 to 2·0 dia., 12·0 spacing Insertion repairs ◀ Insertion repairs, leading edge	*Not forward of a line 6·0 aft of the leading edge*	4/35 4/36 4/38 & 4/39 4/53 ▶
RIBS AND DIAPHRAGMS	Webs	0·03	1·0	6·0	0·5 dia., one per item		4/36
	Flanges	0·03	0·5	6·0	1·0×0·35, one per side of item		4/45(C)
STRINGERS		0·02	0·5	9·0	4·4 long, one per stringer Insertion repair, one per stringer		4/42(A) 4/42(B)

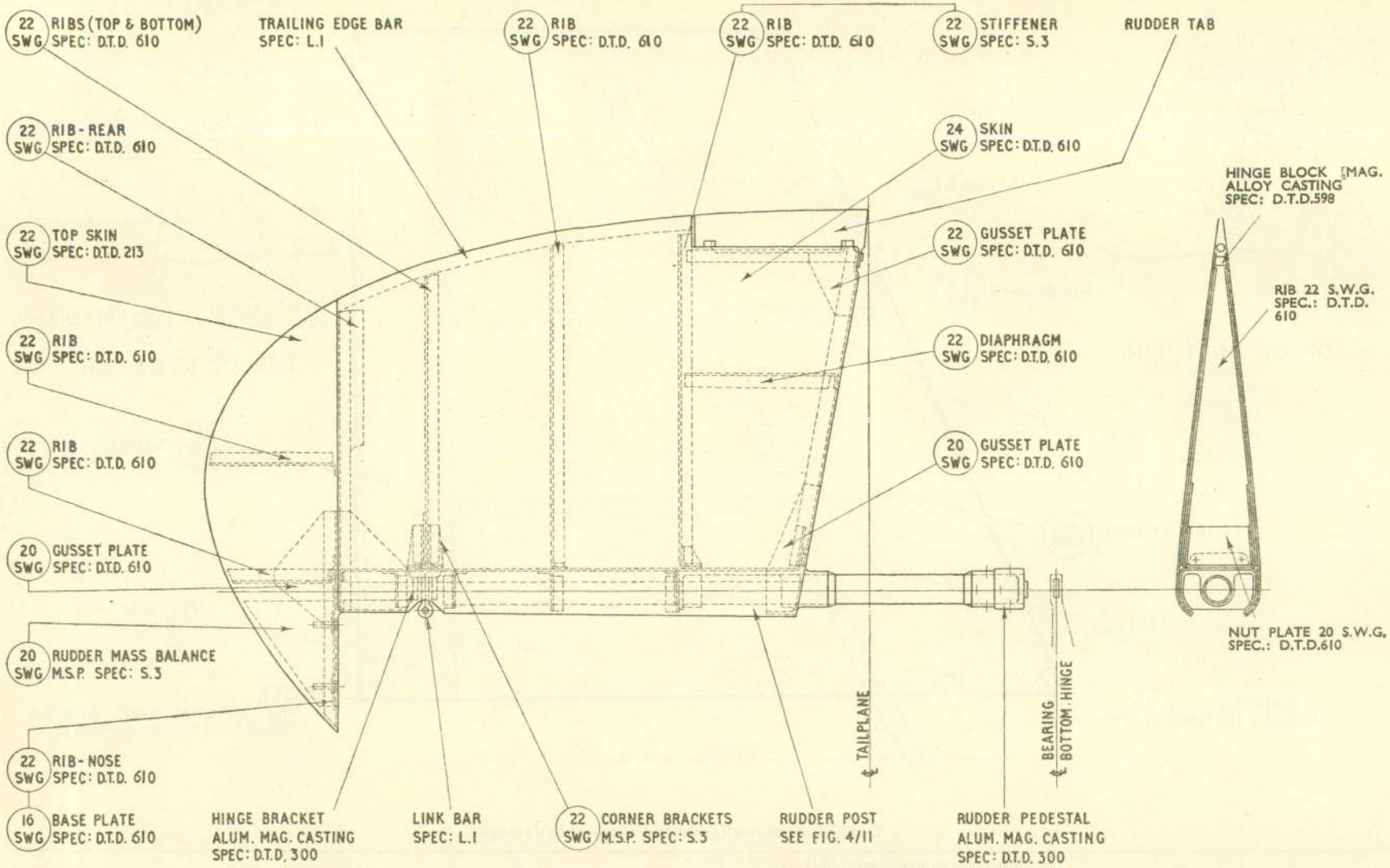
Fig. 4/8. Dorsal fin, Mk.3



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKINS		0·03	1·0	12·0	Cracks at rivet holes, 12·0 spacing } *Not forward of a line 6·0 aft*	4/35
					0·5 to 2·0 dia., 12·0 spacing } *of the leading edge*	4/36
					Insertion repairs	4/38 &4/39
					◀ Insertion repairs, leading edge	4/52 ▶
RIBS AND DIAPHRAGMS	Webs	0·03	1·0	6·0	0·5 dia., one per item	4/36
	Flanges	0·03	0·5	6·0	1·0×0·35, one per side of item	4/45(C)
STRINGERS		0·02	0·5	9·0	4·4 long, one per stringer	4/42(A)
					Insertion repair, one per stringer	4/42(B)

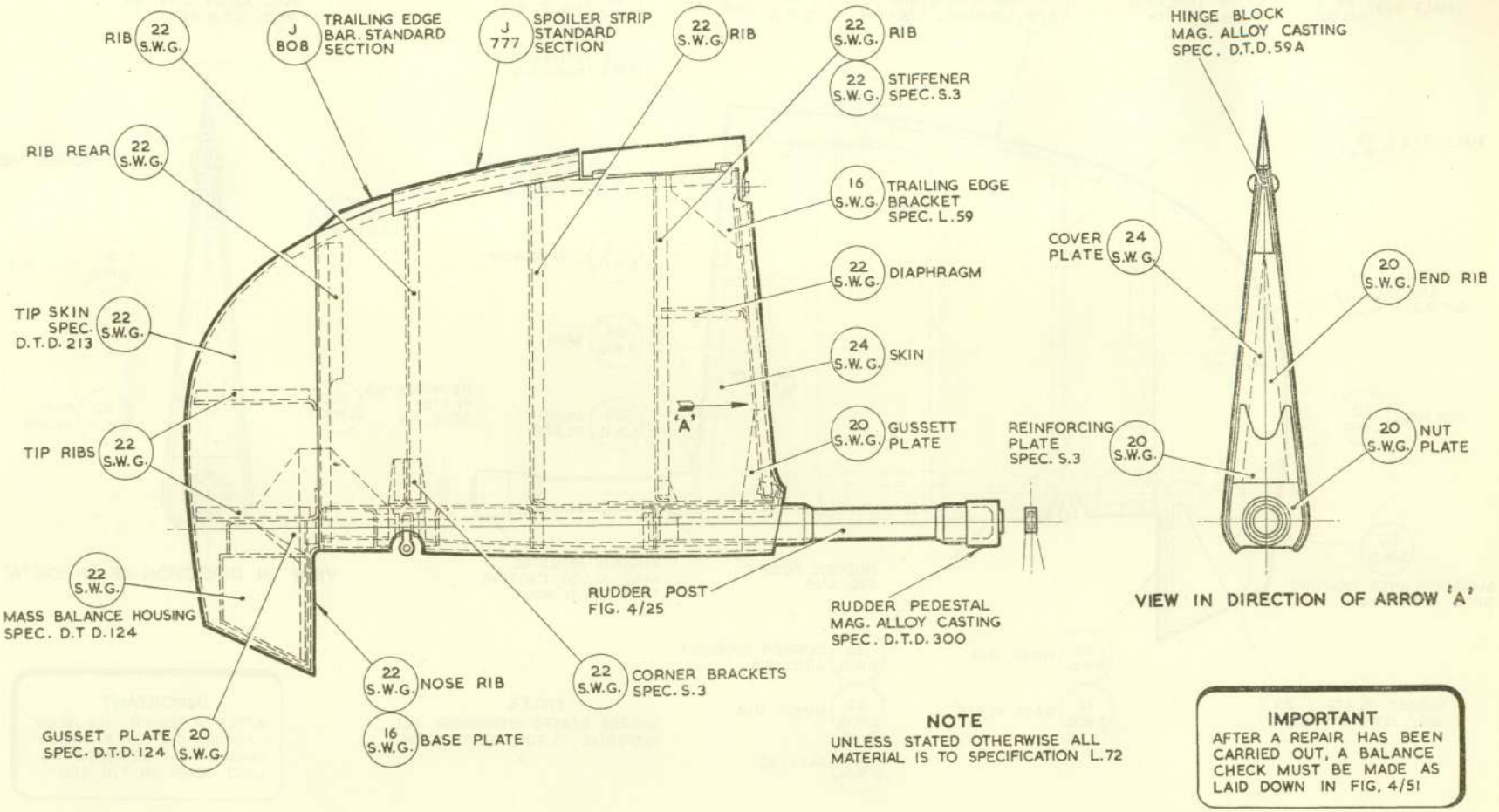
Fig. 4/9. Fin, top portion, Mk.4



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Holes up to 2·0 dia., 12·0 spacing Insertion repairs **Note:**—*The above repairs are not to be applied over the area covered by the gusset plate adjacent to the link arm*	4/36 4/37
RIBS	Web	0·03	1·0	6·0	0·5 dia., one per rib	4/36
	Flange	0·03	0·5	6·0	1·0 × 1·0 or 1·0 × 0·35, one per flange	4/45(B) or (C)

Fig. 4/10. Rudder, Mk.1



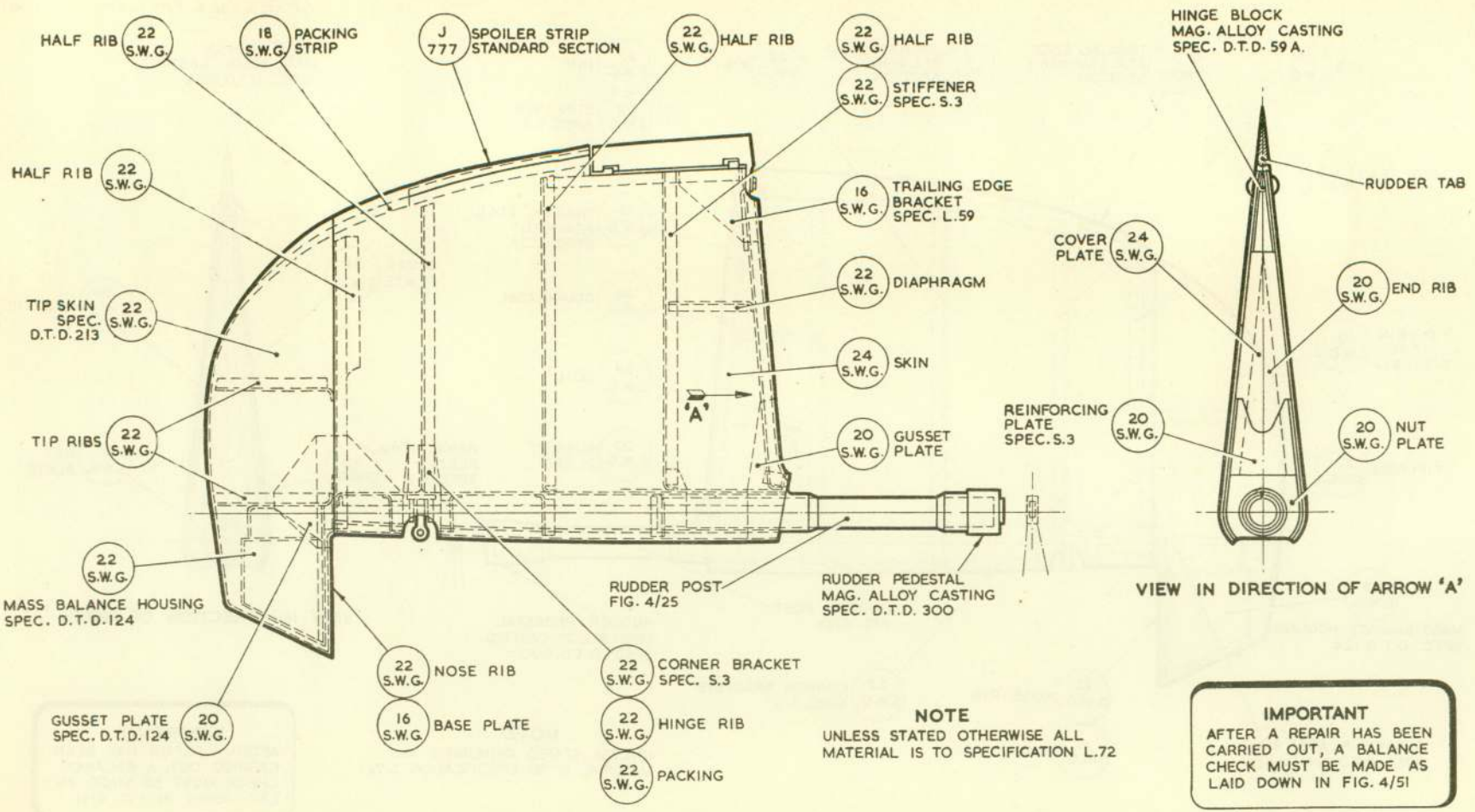
NOTE
UNLESS STATED OTHERWISE ALL MATERIAL IS TO SPECIFICATION L.72

IMPORTANT
AFTER A REPAIR HAS BEEN CARRIED OUT, A BALANCE CHECK MUST BE MADE AS LAID DOWN IN FIG. 4/51

Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches) Max. depth	Min. dia.	Min. spacing	Repairable damage (inches)	Repair fig.
SKIN		0·03	1·0	12·0	Holes up to 2·0 dia., 12·0 spacing Insertion repairs **Note:**—*The above repairs are not to be applied over the area covered by the gusset plate adjacent to the link arm*	4/36 4/37
RIBS	Web	0·03	1·0	6·0	0·5 dia., one per rib	4/36
	Flange	0·03	0·5	6·0	1·0×1·0 or 1·0×0·35, one per flange	4/45(B) or (C)

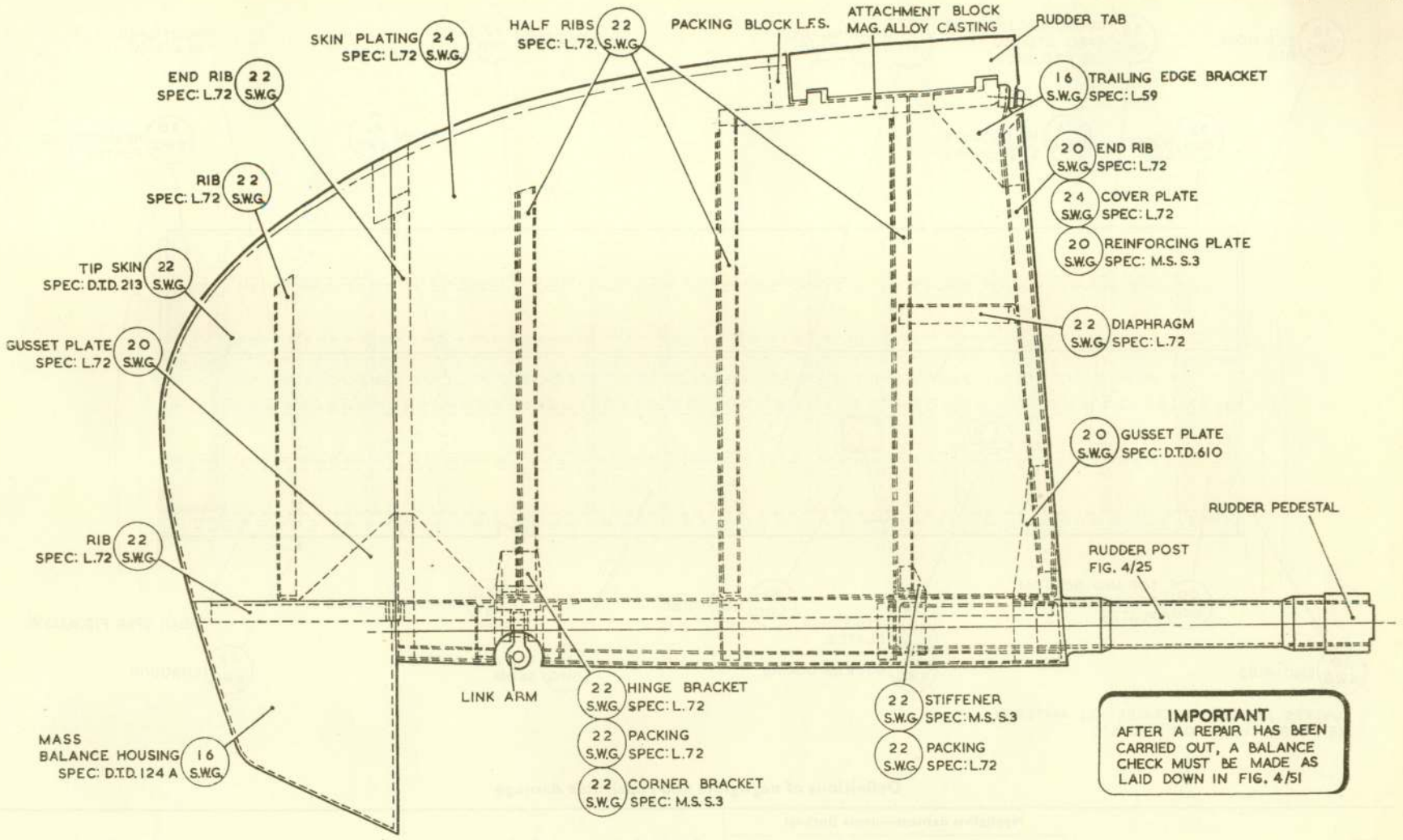
Fig. 4/11. Rudder, Mk.2 and 4



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Holes up to 2·0 dia., 12·0 spacing Insertion repairs **Note:**—*The above repairs are not to be applied over the area covered by the gusset plate adjacent to the link arm*	4/36 4/37
RIBS	Web	0·03	1·0	6·0	0·5 dia., one per rib	4/36
	Flange	0·03	0·5	6·0	1·0 × 1·0 or 1·0 × 0·35, one per flange	4/45(B) or (C)

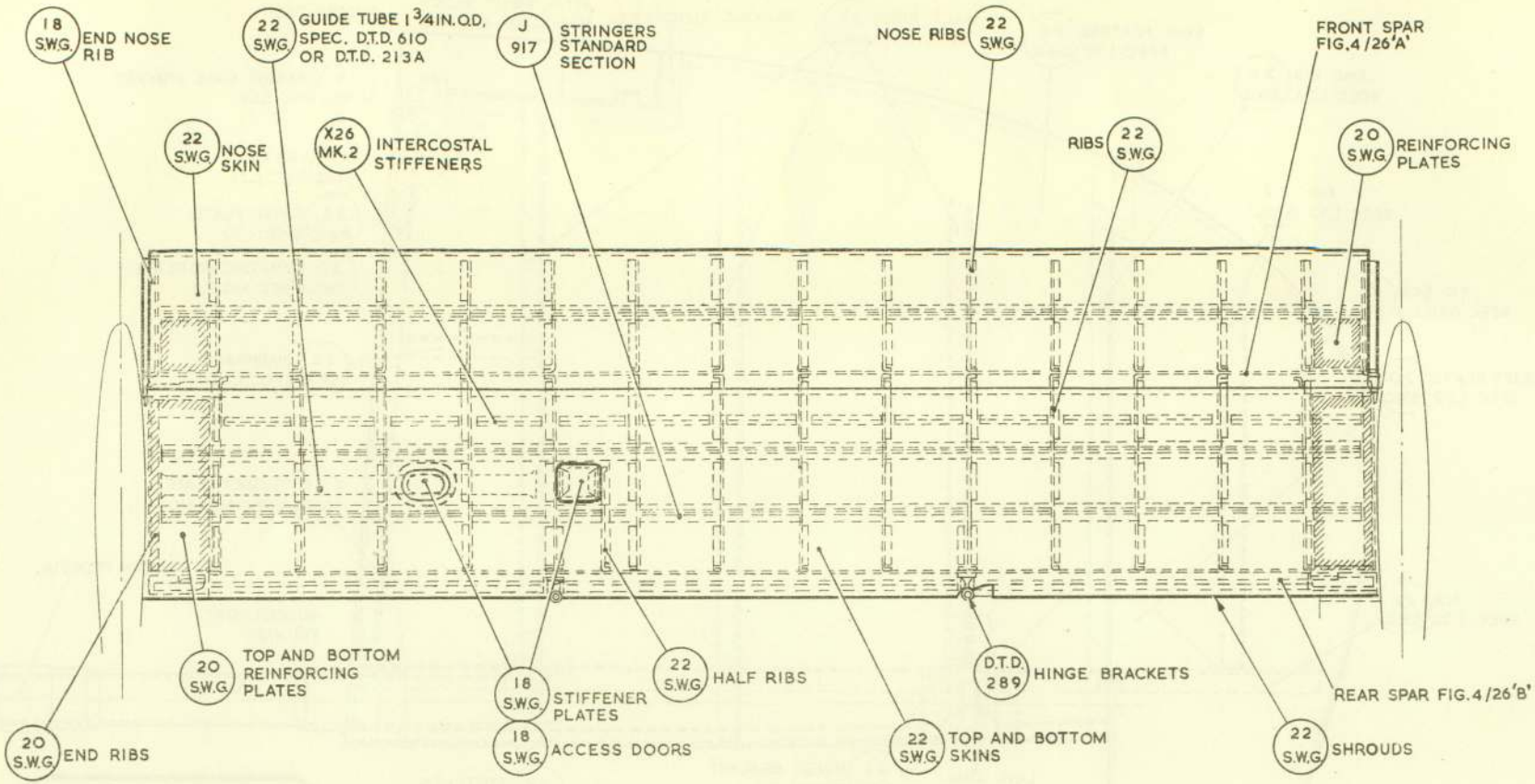
Fig. 4/12. Rudder (split construction) Mk.2 and 4



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Holes up to 2·0 dia., 12·0 spacing Insertion repairs **Note:**—*The above repairs are not to be applied over the area covered by the gusset plate adjacent to the link arm*	4/36 4/37
RIBS	Web	0·03	1·0	6·0	0·5 dia., one per rib	4/36
	Flange	0·03	0·5	6·0	1·0 × 1·0 or 1·0 × 0·35, one per flange	4/45(B) or (C)

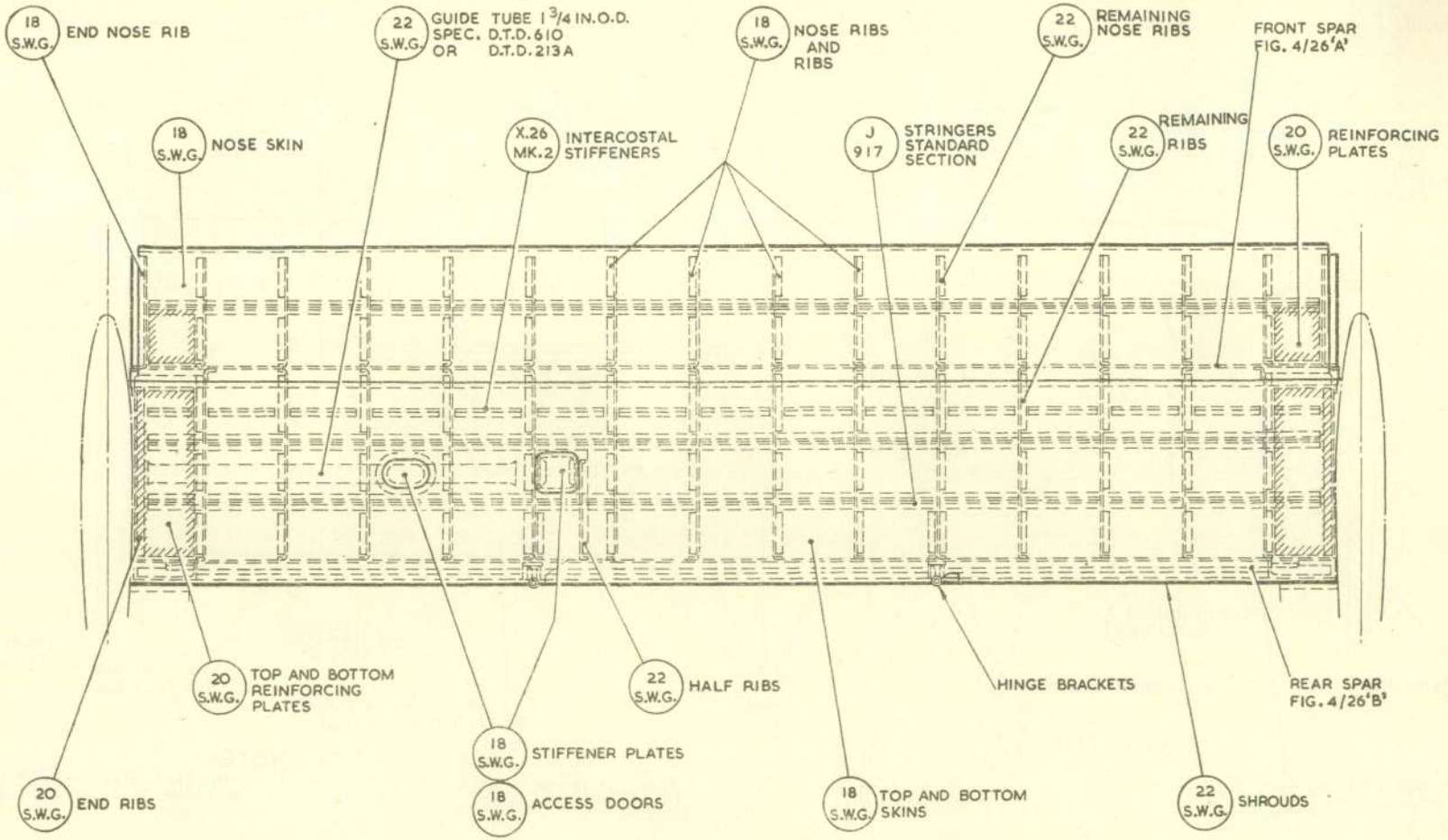
Fig. 4/13. Rudder, Mk.3



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing } Aft of front spar only Holes up to 2·0 dia., 18·0 spacing } Aft of front spar only Insertion repairs, leading edge Insertion repairs, between spars	4/35 4/36 4/40 4/41
RIBS	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 6·0 spacing 1·0 dia., at lightening holes, 6·0 spacing	4/36 4/46(A)
	Flanges	0·03	0·5	6·0	1·0×0·35, buckles and cracks between stiffener cut-outs	4/46(C) & (D)
STRINGERS		0·02	0·5	9·0	Insertion repairs	4/43

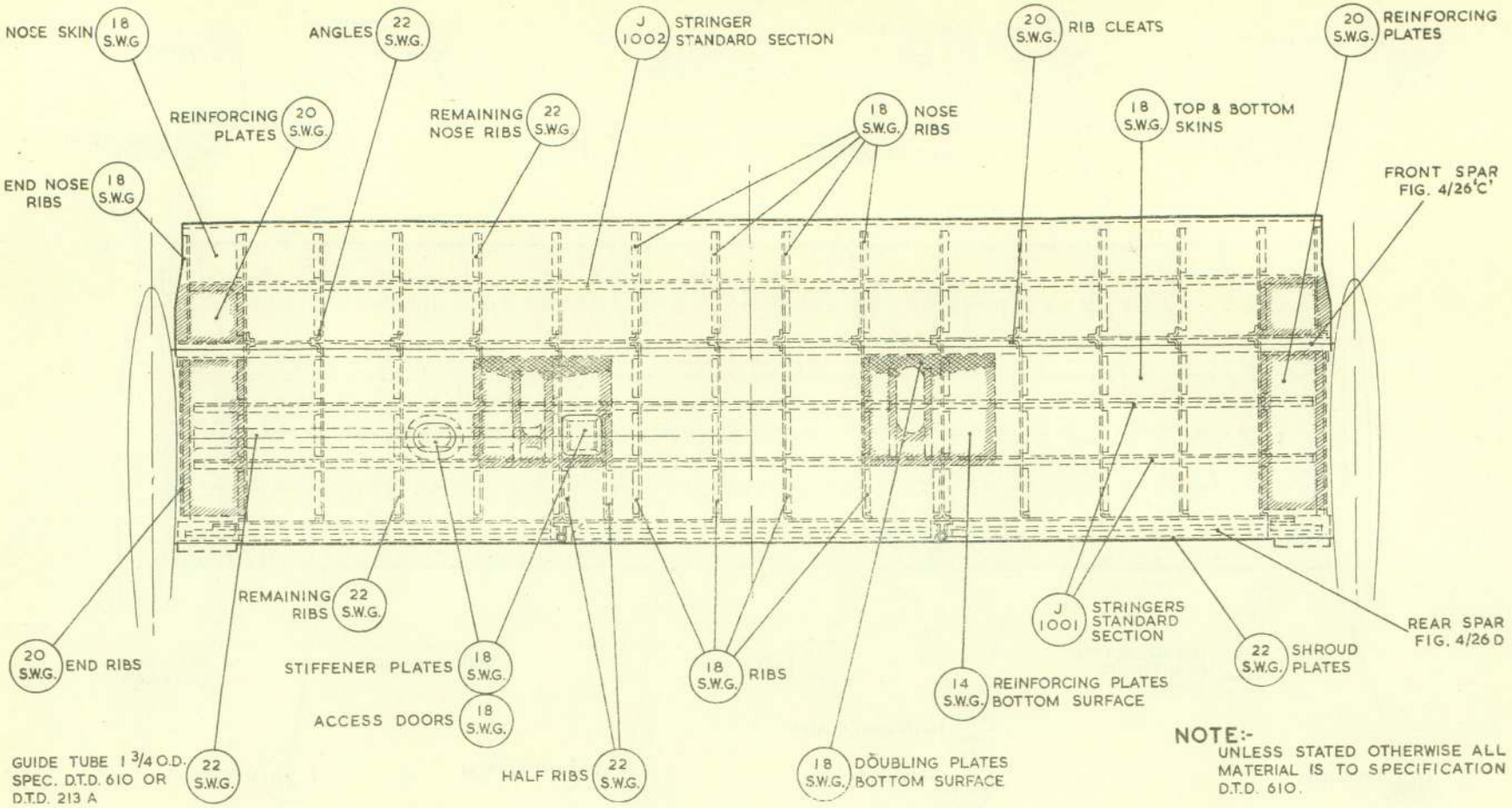
Fig. 4/14. Tail plane, Mk.1 pre-Mod. Ven.412 and Mk.2 pre-Mod. Ven.322



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing } Aft of front spar only Holes up to 2·0 dia., 18·0 spacing } Aft of front spar only Insertion repairs, leading edge Insertion repairs, between spars	4/35 4/36 4/40 4/41
RIBS	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 6·0 spacing 1·0 dia., at lightening holes, 6·0 spacing	4/36 4/46(A)
	Flanges	0·03	0·5	6·0	1·0×0·35, buckles and cracks between stiffener cut-outs	4/46(C) & (D)
STRINGERS		0·02	0·5	9·0	Insertion repairs	4/43

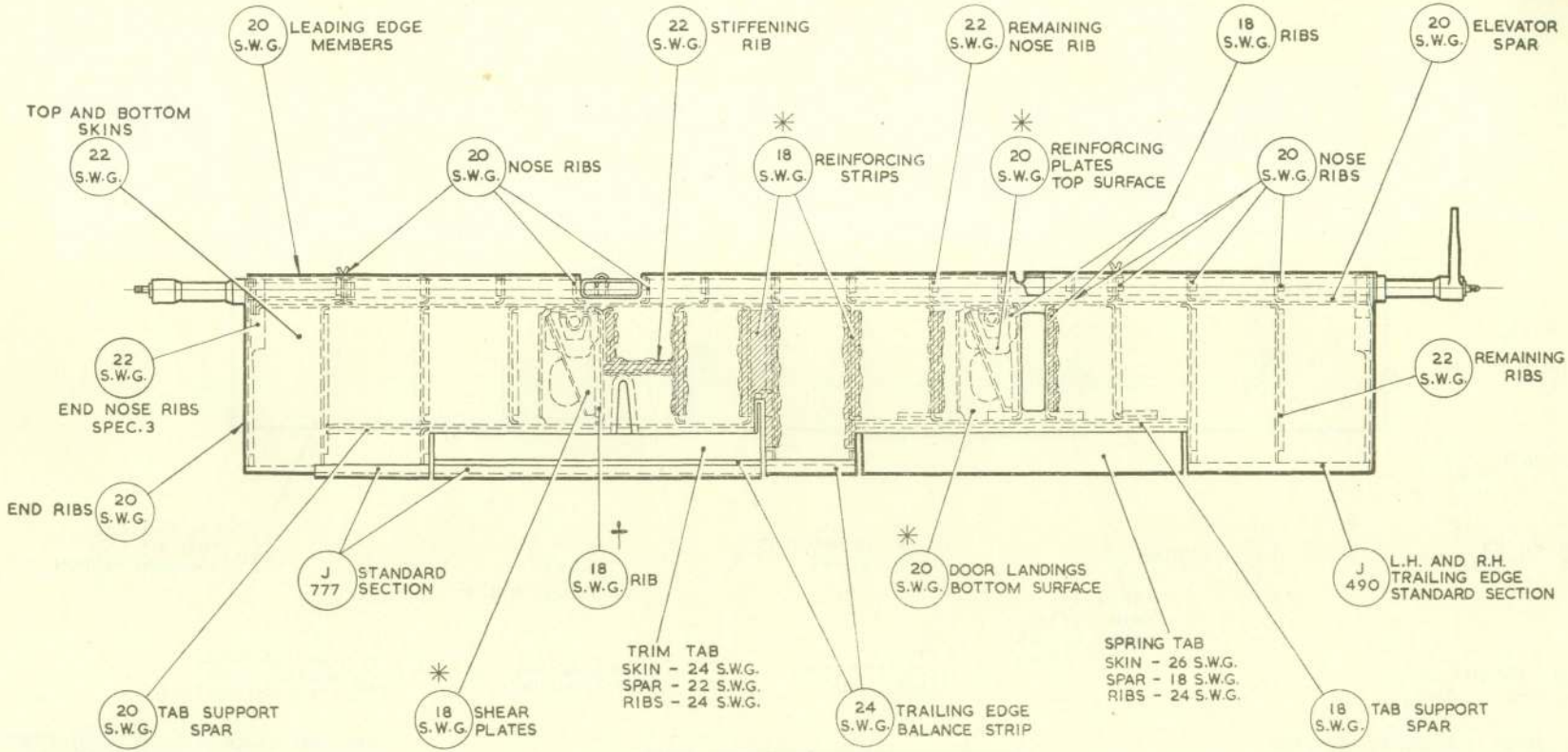
Fig. 4/15. Tail plane, Mk.2 post-Mod. Ven. 322 and pre-Mod. Ven. 412



Definitions of repairable and negligible damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing } Aft of front spar only	4/35
					Holes up to 2·0 dia., 18·0 spacing } Aft of front spar only	4/36
					Insertion repairs, leading edge	4/40
					Insertion repairs, between spars	4/41
RIBS	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 6·0 spacing	4/36
					1·0 dia., at lightening holes, 6·0 spacing	4/46(A)
	Flanges	0·03	0·5	6·0	1·0 × 0·35, buckles and cracks between stiffener cut-outs	4/46(C) or (D)
STRINGERS		0·02	0·5	9·0	Patch repairs, 24·0 spacing	4/44(A)
					Insertion repairs	4/44(B)

Fig. 4/16. Tail plane, Mk.1 and 2, post-Mod. Ven. 412, and Mk.3 and 4



THE ELEVATOR ILLUSTRATED IS FITTED TO A/C EMBODYING MOD. VEN. 262 AND 321. ON A/C WITH MOD. VEN. 262 AND 321 NOT EMBODIED ITEMS MARKED THUS ✳ ARE OMITTED AND THOSE MARKED THUS † ARE 20 S.W.G.

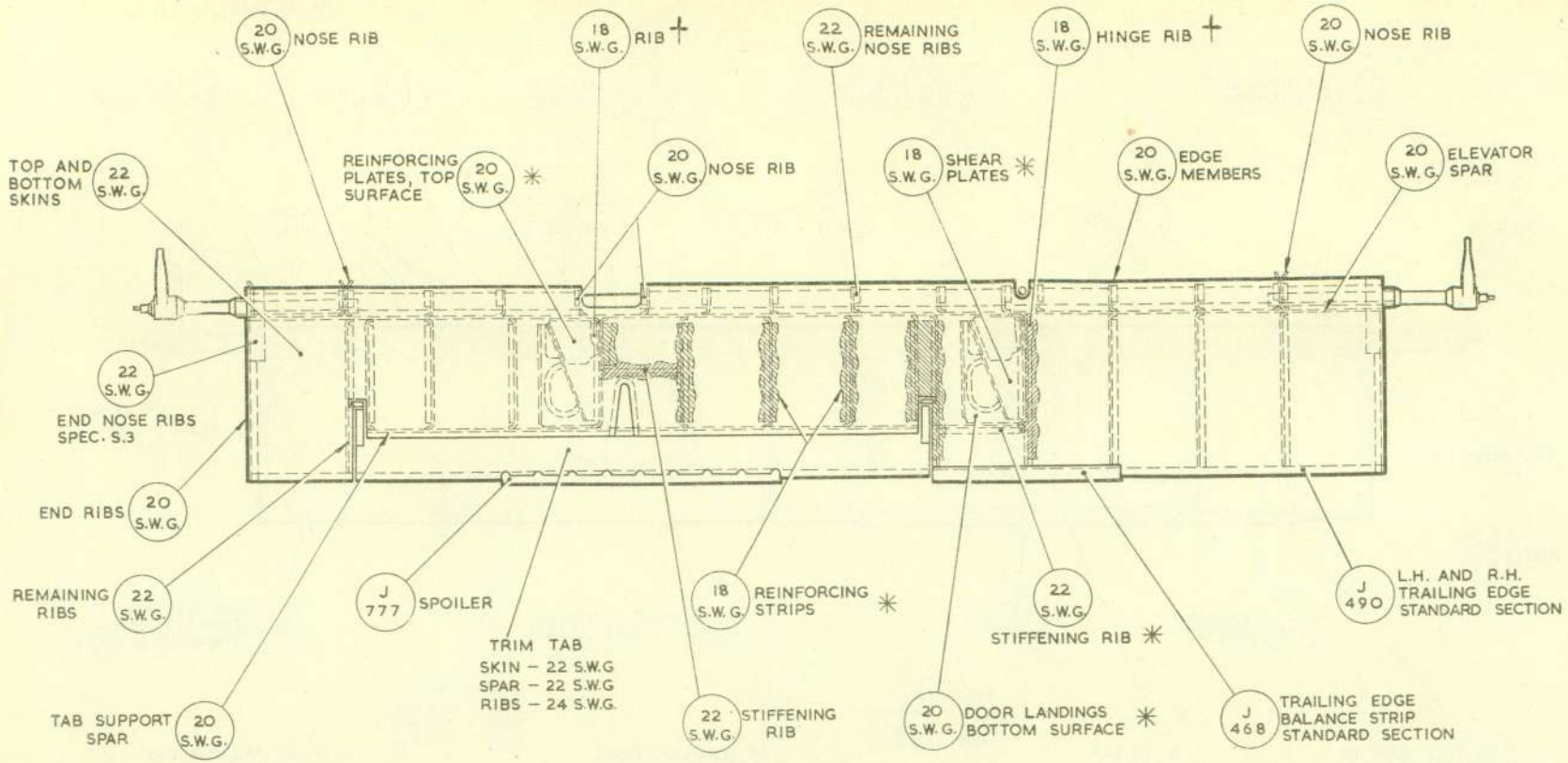
IMPORTANT
AFTER A REPAIR HAS BEEN CARRIED OUT A BALANCE CHECK MUST BE MADE AS LAID DOWN IN FIG. 4/51

HATCHING INDICATES LIGHT ALLOY STRIPS REDUXED TO TOP AND BOTTOM SKINS. REFER TO CHAP. 1 BEFORE USING PAINT REMOVER NEAR THESE AREAS.
UNLESS STATED OTHERWISE ALL MATERIAL IS TO SPECIFICATION L.72.

Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing Holes up to 2·0 dia., 18·0 spacing Insertion repairs	4/35 4/36 4/37
RIBS	Webs	0·03	0·5	6·0	Exceeding negligible	Replace rib
	Flanges	0·03	0·5	6·0	1·0 × 0·35, one per rib	4/45(C)

Fig. 4/17. Elevator, Mk.1



THE ELEVATOR ILLUSTRATED IS FITTED TO A/C EMBODYING MOD. VEN. 269 & 367. ON A C WITH MOD. VEN. 269 & 367 NOT EMBODIED, ITEMS MARKED THUS ✳ ARE OMITTED AND THOSE MARKED THUS + ARE 20 S.W.G.

IMPORTANT

AFTER A REPAIR HAS BEEN CARRIED OUT A BALANCE CHECK MUST BE MADE AS LAID DOWN IN FIG.4/51

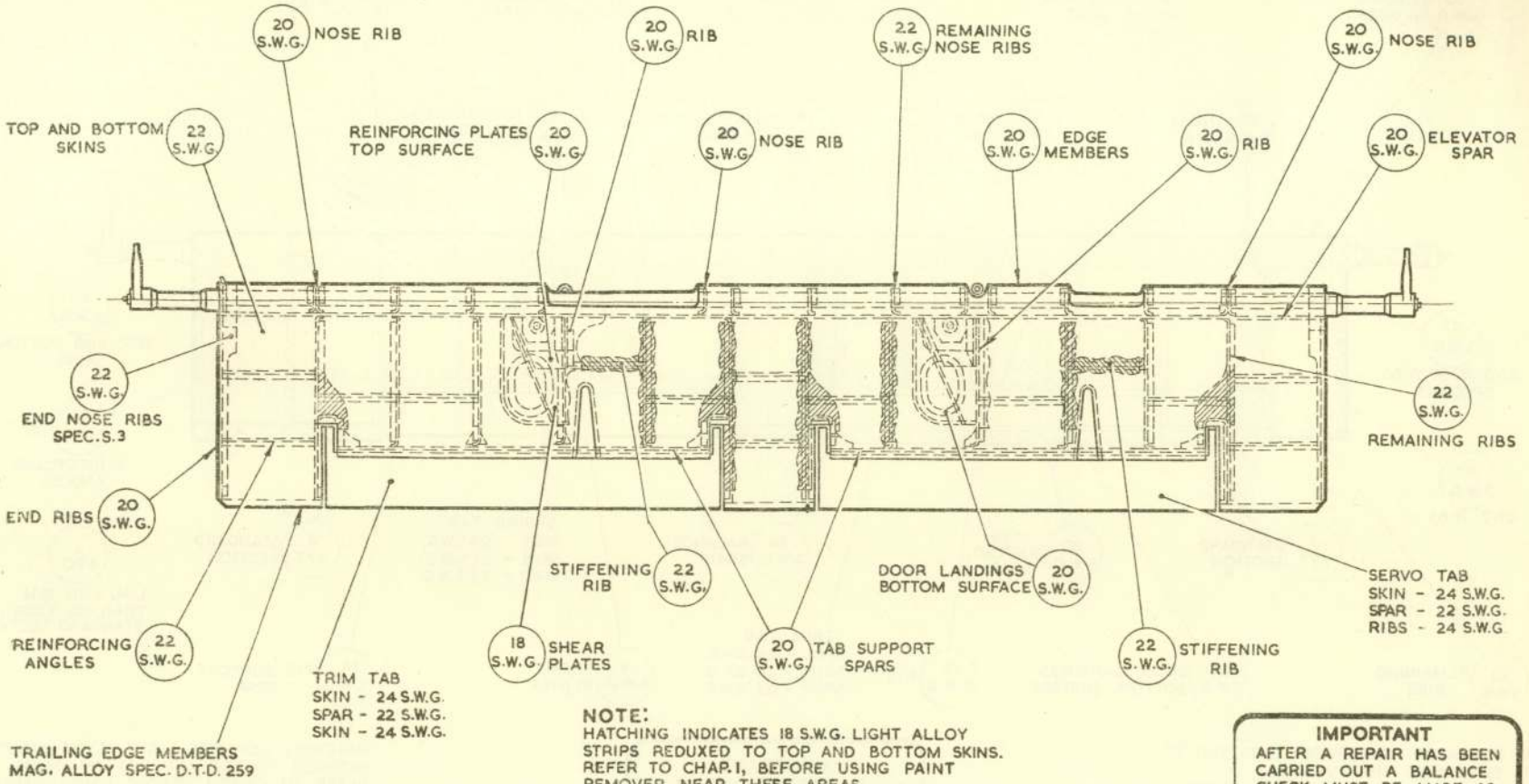
HATCHING INDICATES LIGHT ALLOY STRIPS REDUXED TO TOP AND BOTTOM SKINS. REFER TO CHAP. 1 BEFORE USING PAINT REMOVER NEAR THESE AREAS.

UNLESS STATED OTHERWISE ALL MATERIAL IS TO SPEC. L.72.

Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing Holes up to 2·0 dia., 18·0 spacing Insertion repairs	4/35 4/36 4/37
RIBS	Webs	0·03	0·5	6·0	Exceeding negligible	Replace rib
	Flanges	0·03	0·5	6·0	1·0×0·35, one per rib	4/45(C)

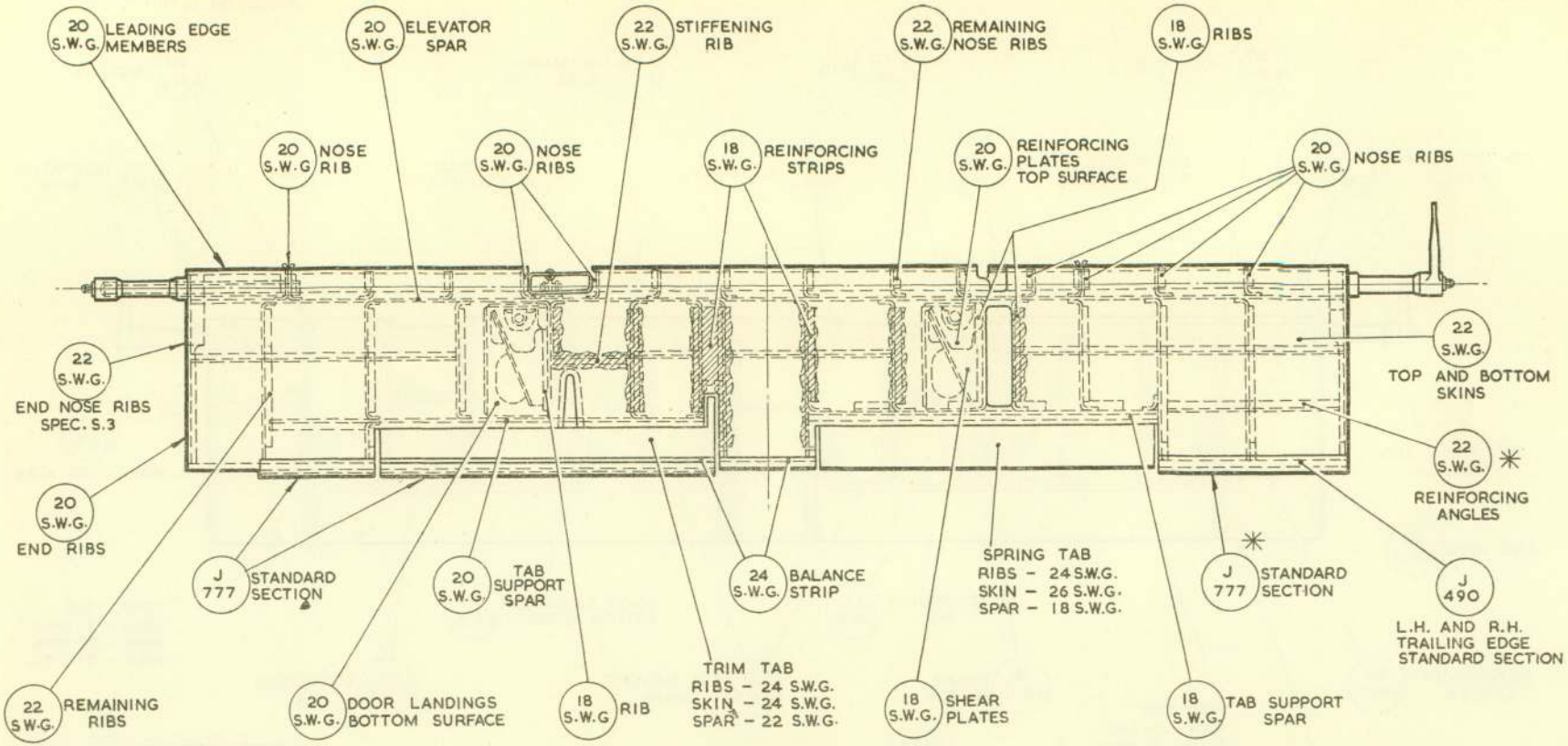
Fig. 4/18 Elevator, Mk.2



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing Holes up to 2·0 dia., 18·0 spacing Insertion repairs	4/35 4/36 4/37
RIBS	Webs	0·03	0·5	6·0	Exceeding negligible	Replace rib
	Flanges	0·03	0·5	6·0	1·0×0·35, one per rib	4/45(C)

Fig. 4/19. Elevator, Mk.3



THE ELEVATOR ILLUSTRATED IS FITTED TO A/C EMBODYING MOD. VEN. 844.
ON A/C WITH MOD. 844 NOT EMBODIED ITEMS MARKED THUS ✳ ARE OMITTED

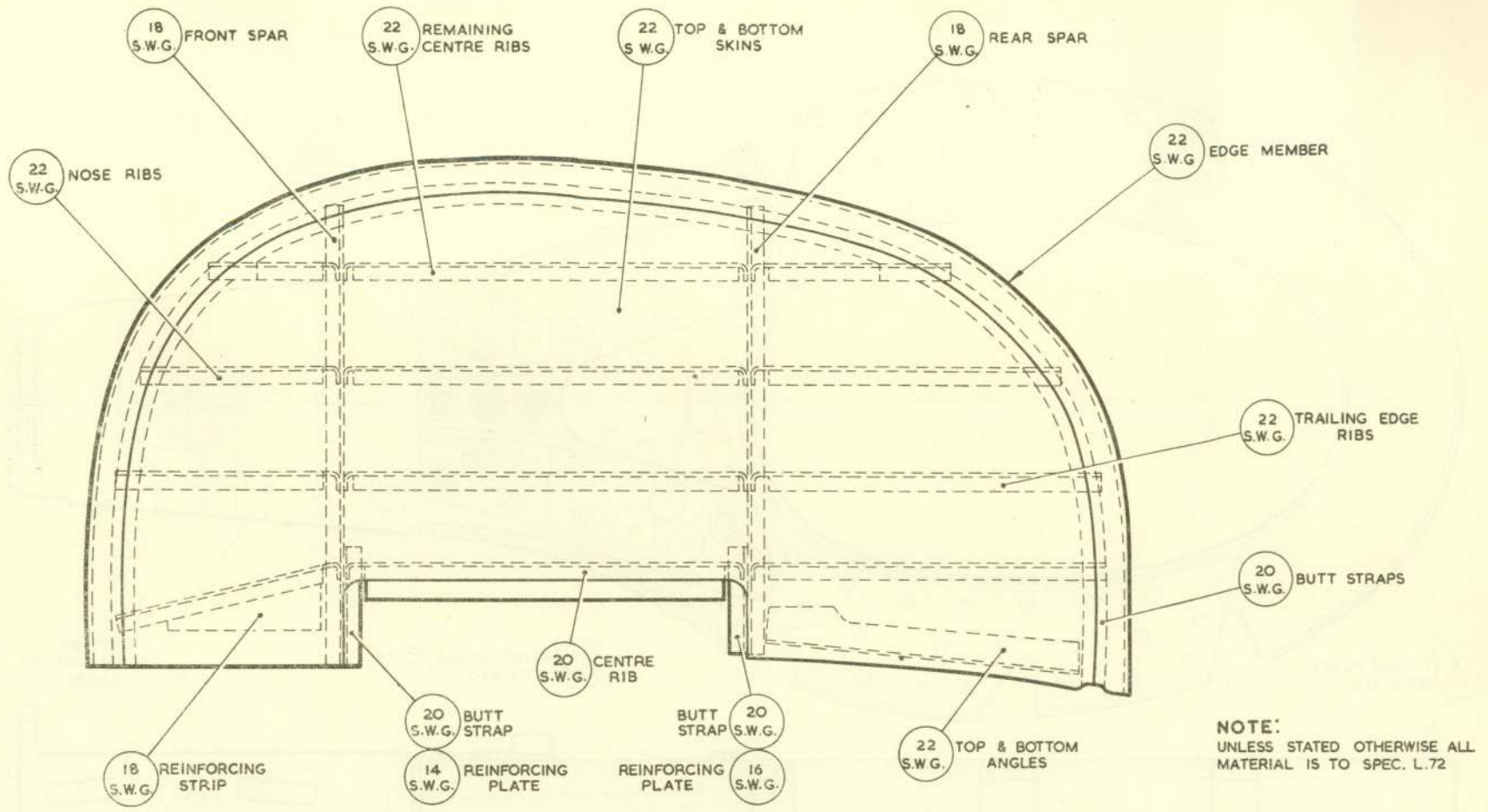
IMPORTANT
AFTER A REPAIR HAS BEEN CARRIED OUT A BALANCE CHECK MUST BE MADE AS LAID DOWN IN FIG. 4/51

HATCHING INDICATES LIGHT ALLOY STRIPS REDUXED TO TOP AND BOTTOM SKINS. REFER TO CHAP. I BEFORE USING PAINT REMOVER NEAR THESE AREAS.
UNLESS STATED OTHERWISE ALL MATERIAL IS TO SPECIFICATION L.72.

Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	12·0	Cracks up to 1·0 long, 12·0 spacing Holes up to 2·0 dia., 18·0 spacing Insertion repairs	4/35 4/36 4/37
RIBS	Webs	0·03	0·5	6·0	Exceeding negligible	Replace rib
	Flanges	0·03	0·5	6·0	1·0×0·35, one per rib	4/45(C)

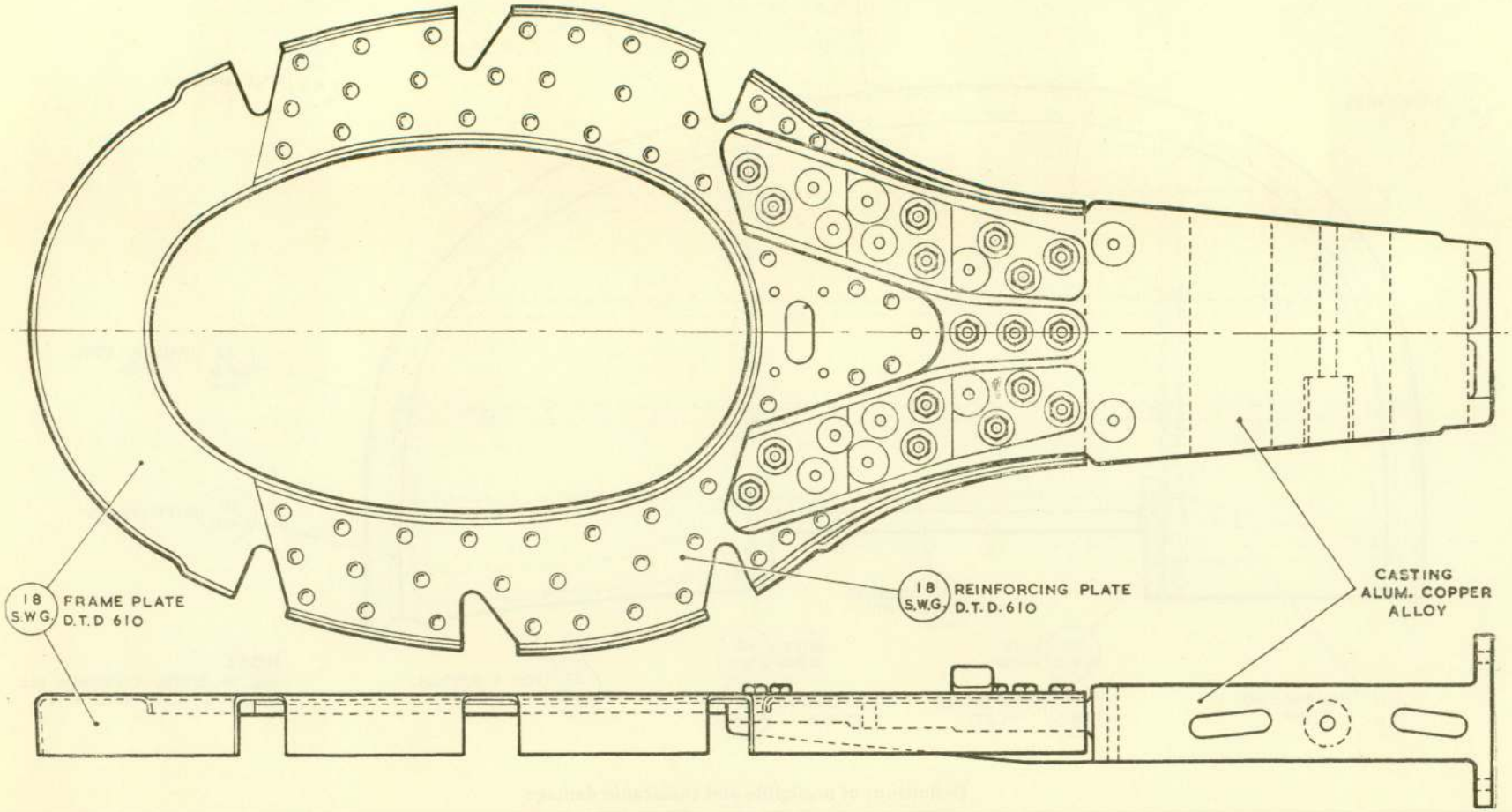
Fig. 4/20. Elevator, Mk.4



Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SKIN		0·03	1·0	6·0	Holes up to 2·0 dia., 12·0 spacing 3·0 and 5·0 dia., 18·0 spacing Insertion repairs	4/36 4/36 4/41
SPARS AND RIBS	Webs	0·03	1·0	6·0	0·5 dia., 6·0 spacing 1·0 dia. at lightening holes	4/36 4/45(A)
	Flanges	0·03	0·5	6·0	Exceeding negligible	4/45

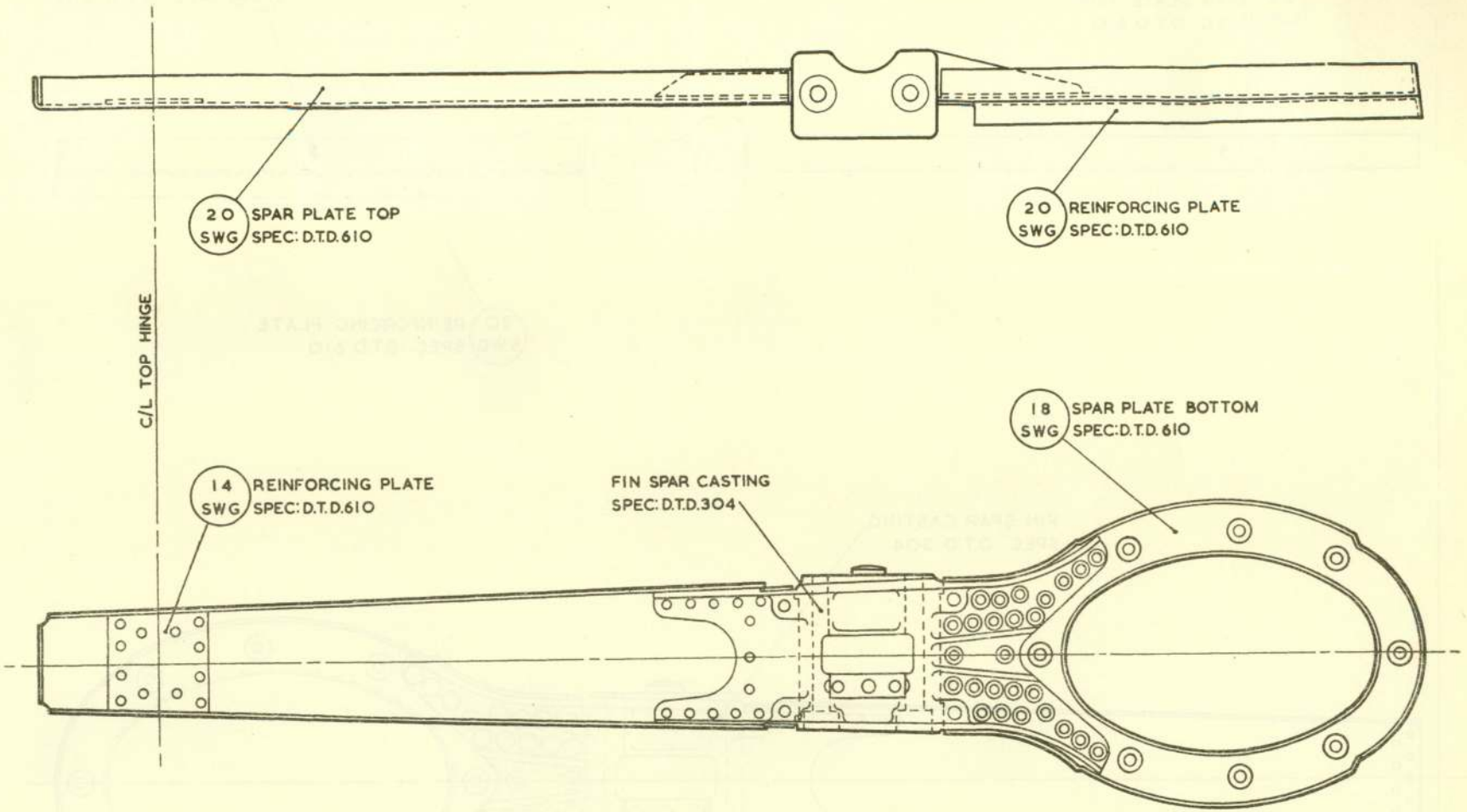
Fig. 4/21. Tail-plane extension, Mk.1, 2 and 4



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
FRAME PLATE AND REINFORCING PLATE	0·03	1·0	6·0	Damage exceeding negligible	S.A.

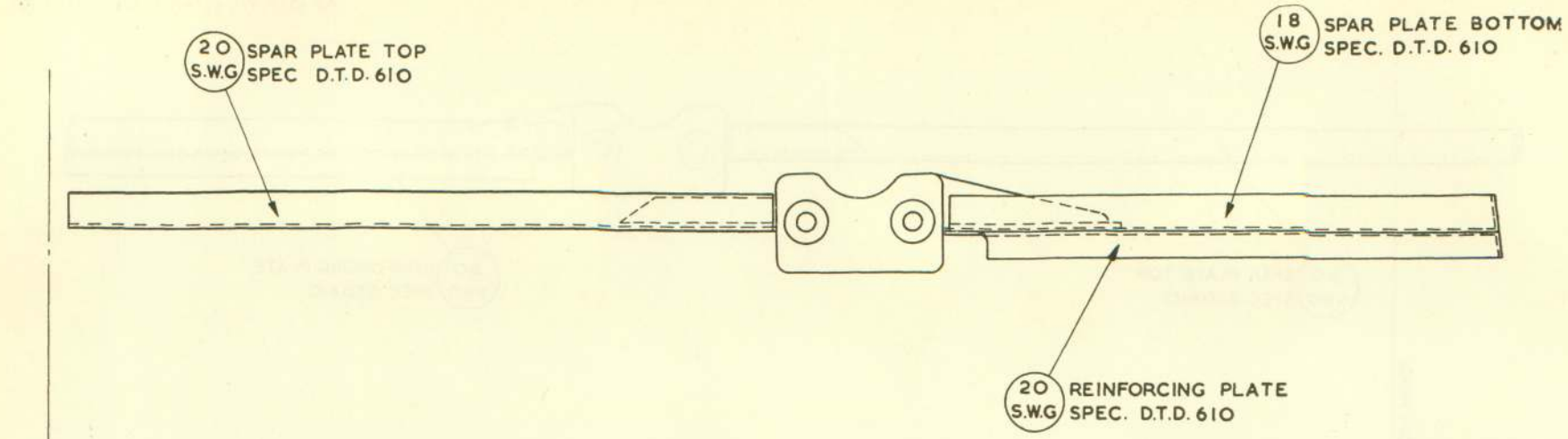
Fig. 4/22. Fin front spar and rear frame

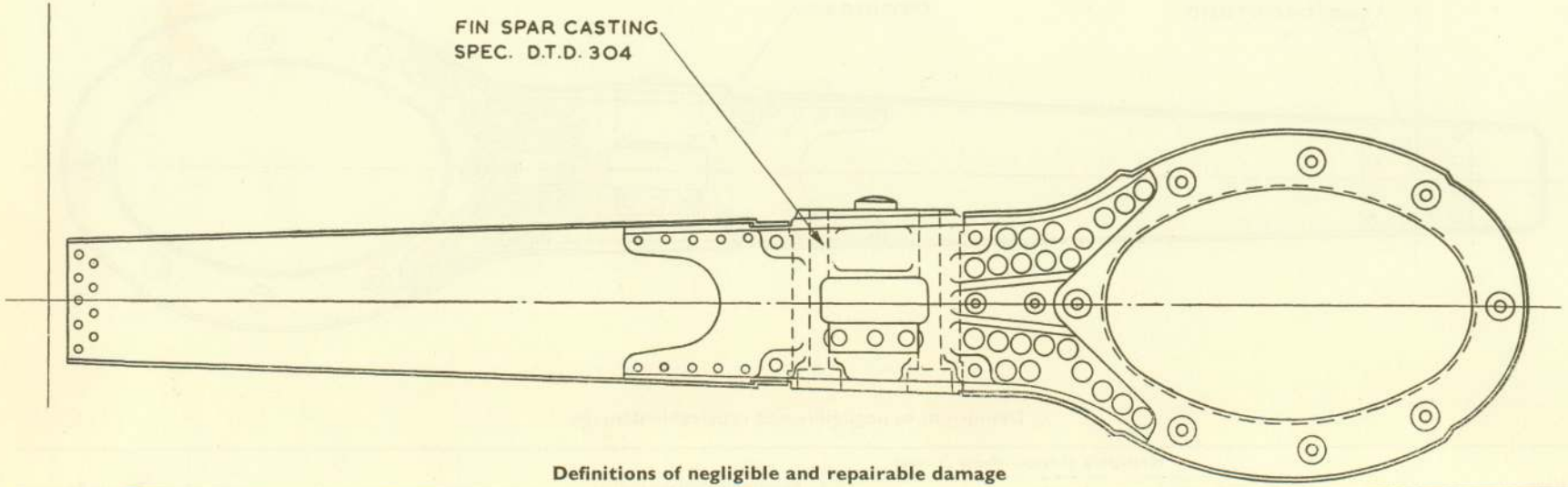


Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SPAR PLATES	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 12·0 spacing	4/36
	Flanges	0·03	0·5	6·0	1·0×1·0 or 1·0×0·35, one only per flange	4/45(B) or (C)

Fig. 4/23. Fin spar, rear, Mk.1 and 2

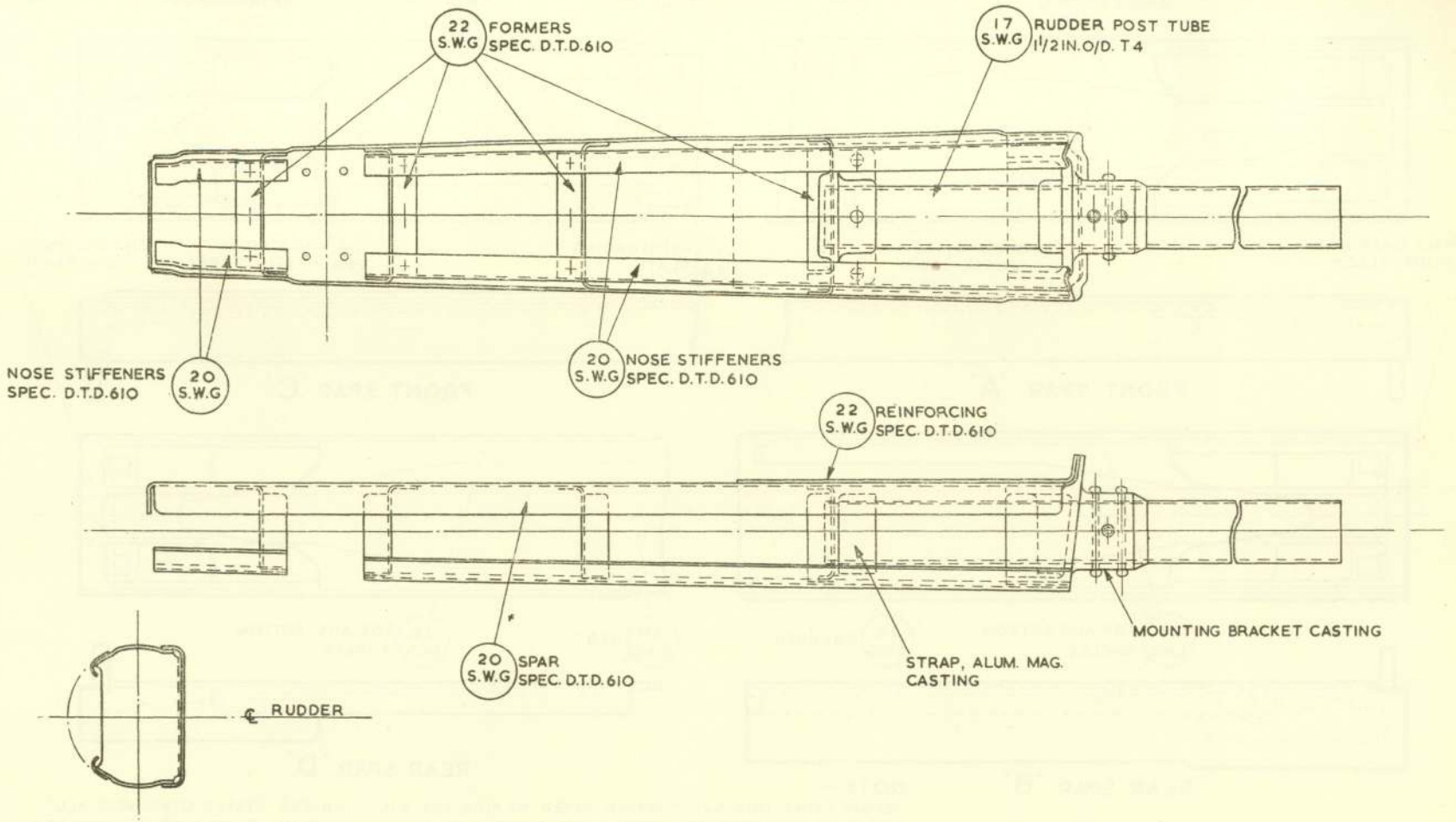




Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SPAR PLATES	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 12·0 spacing	4/36
	Flanges	0·03	0·5	6·0	1·0×1·0 or 1·0×0·35, one only per flange	4/45(B) or (C)

Fig. 4/24. Fin spar, rear, Mk.3 and 4

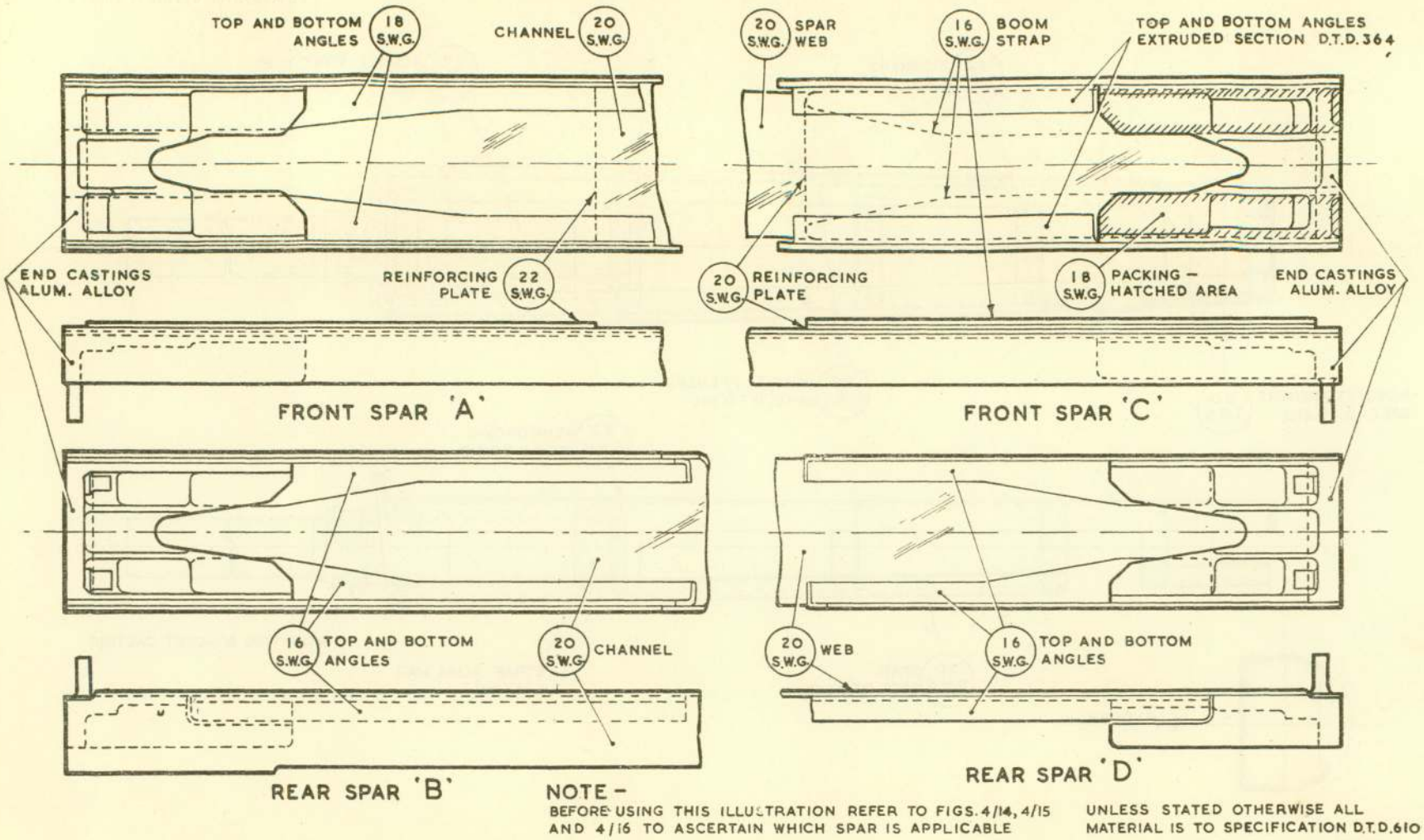


TYPICAL SECTION

Definitions of negligible and repairable damage

Item		Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
		Max. depth	Min. dia.	Min. spacing		
SPAR	Webs	0·03	1·0	6·0	0·5 and 1·0 dia., 12·0 spacing	4/36
	Flanges	0·03	0·5	6·0	1·0 × 1·0 or 1·0 × 0·35, one only per flange	4/45(B) or (C)
FORMERS		0·03	0·5	One per former	Damage exceeding negligible	Replace

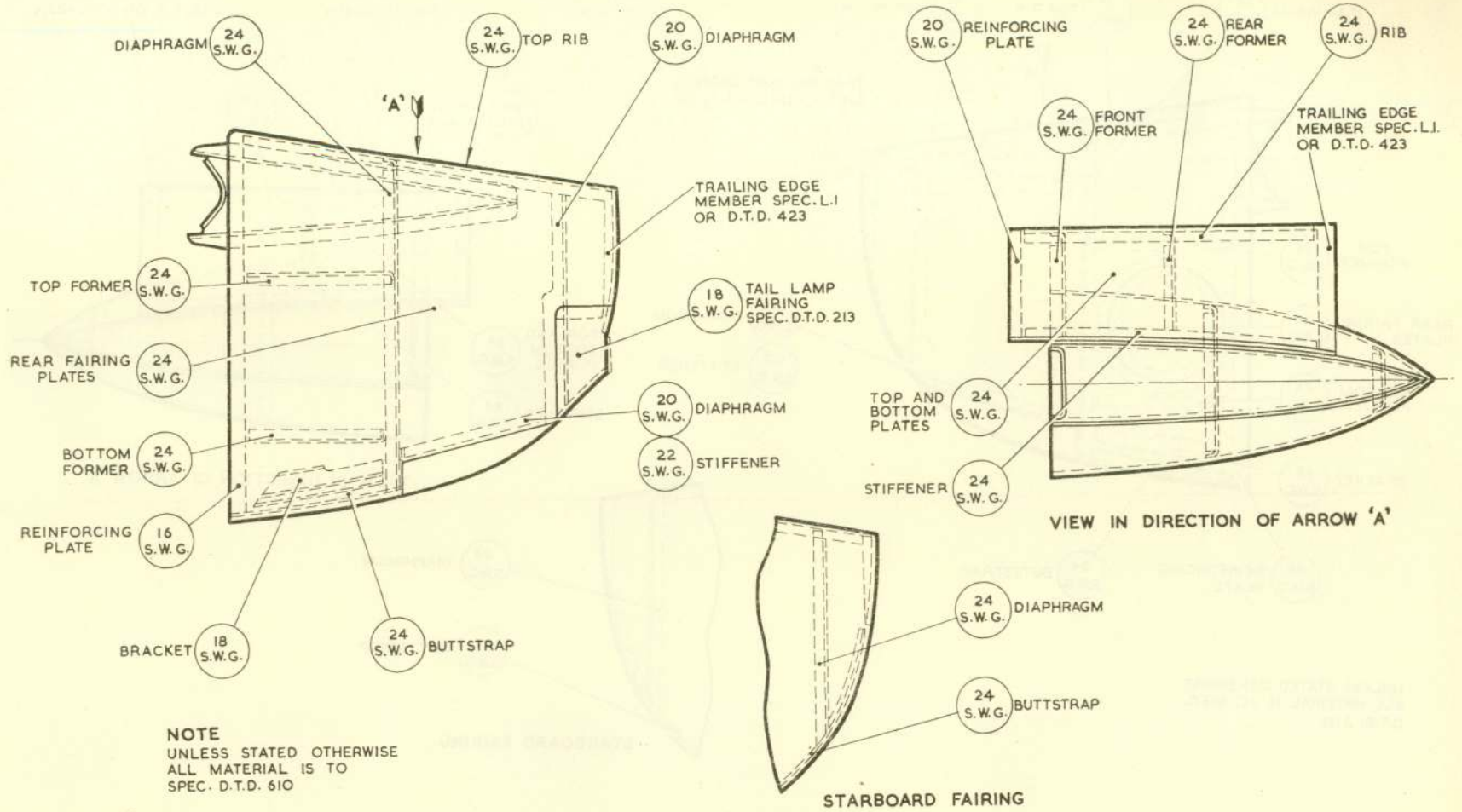
Fig. 4/25. Rudder post, all Marks



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
WEBS	0·03	1·0	12·0	0·5 and 1·0 dia., 12·0 spacing	4/36
FLANGES AND TOP AND BOTTOM ANGLES	0·03	0·5	6·0	Damage exceeding negligible	S.A.

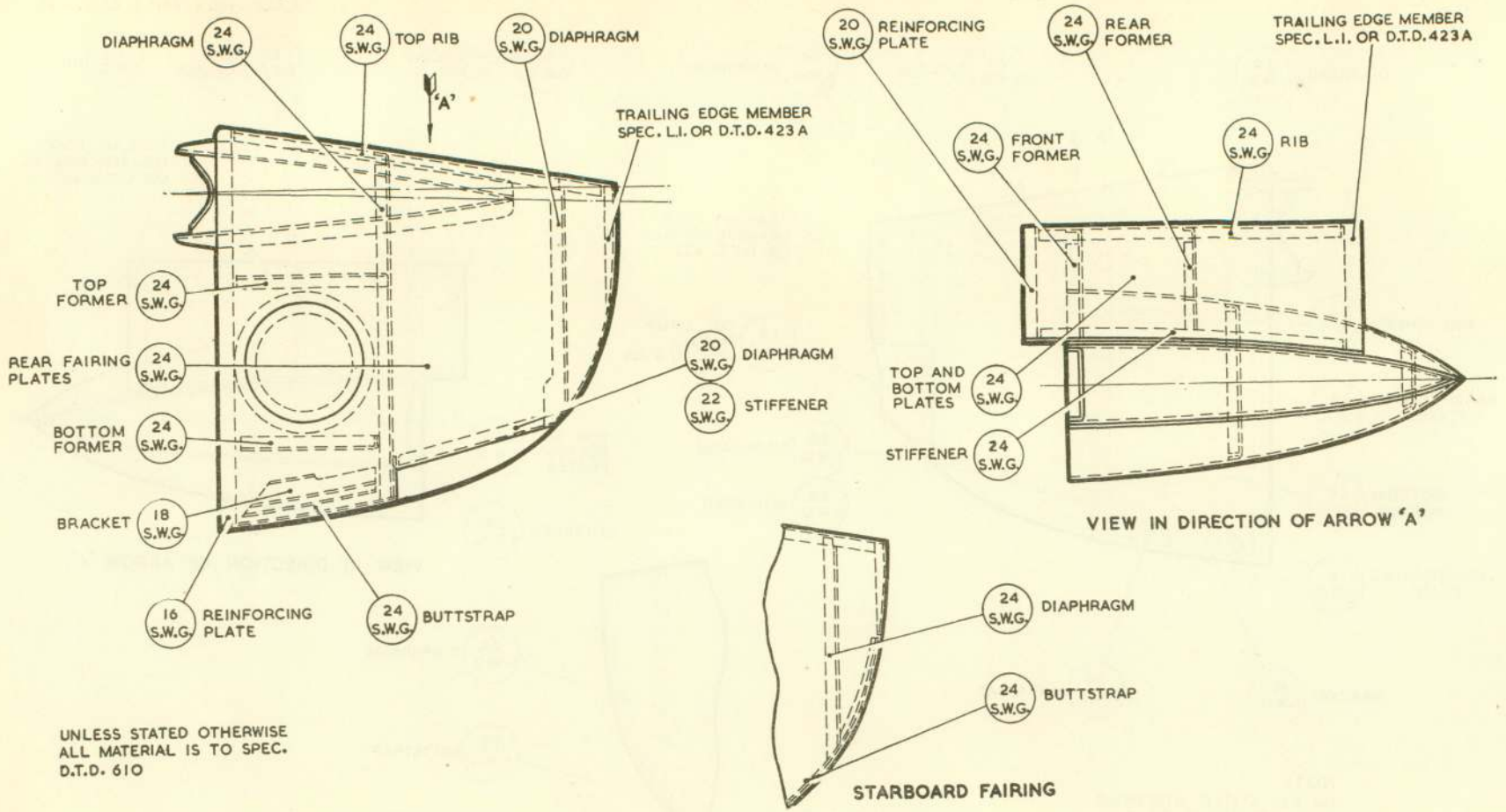
Fig. 4/26. Tail-plane spars



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKINS	0·05	1·0	6·0	0·5 to 2·0 dia., 12·0 spacing	4/36
DIAPHRAGMS	0·03	0·5	6·0	1·0×0·35 at flanges, 12·0 spacing	4/45(C)
RIBS AND FORMERS Webs	0·03	1·0	6·0	0·5 dia., 6·0 spacing 1·0 dia., one per item	4/36 4/36
Flanges	0·03	0·5	6·0	Exceeding negligible	4/45

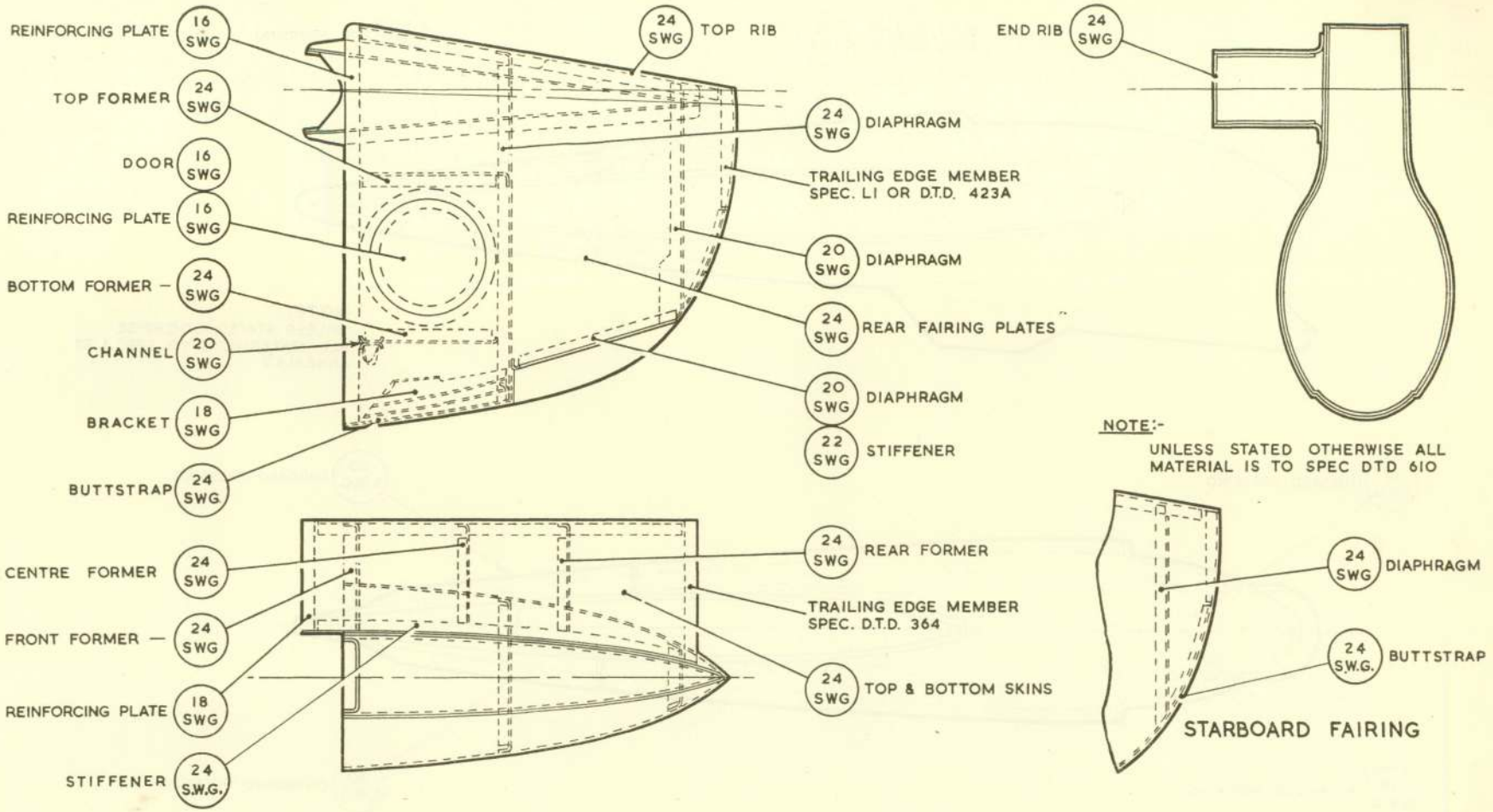
Fig. 4/27. Tail-boom rear fairing, Mk.1



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKINS	0·05	1·0	6·0	0·5 to 2·0 dia., 12·0 spacing	4/36
DIAPHRAGMS	0·03	0·5	6·0	1·0×0·35 at flanges, 12·0 spacing	4/45(C)
RIBS AND FORMERS Webs	0·03	1·0	6·0	0·5 dia., 6·0 spacing 1·0 dia., one per item	4/36 4/36
Flanges	0·03	0·5	6·0	Exceeding negligible	4/45

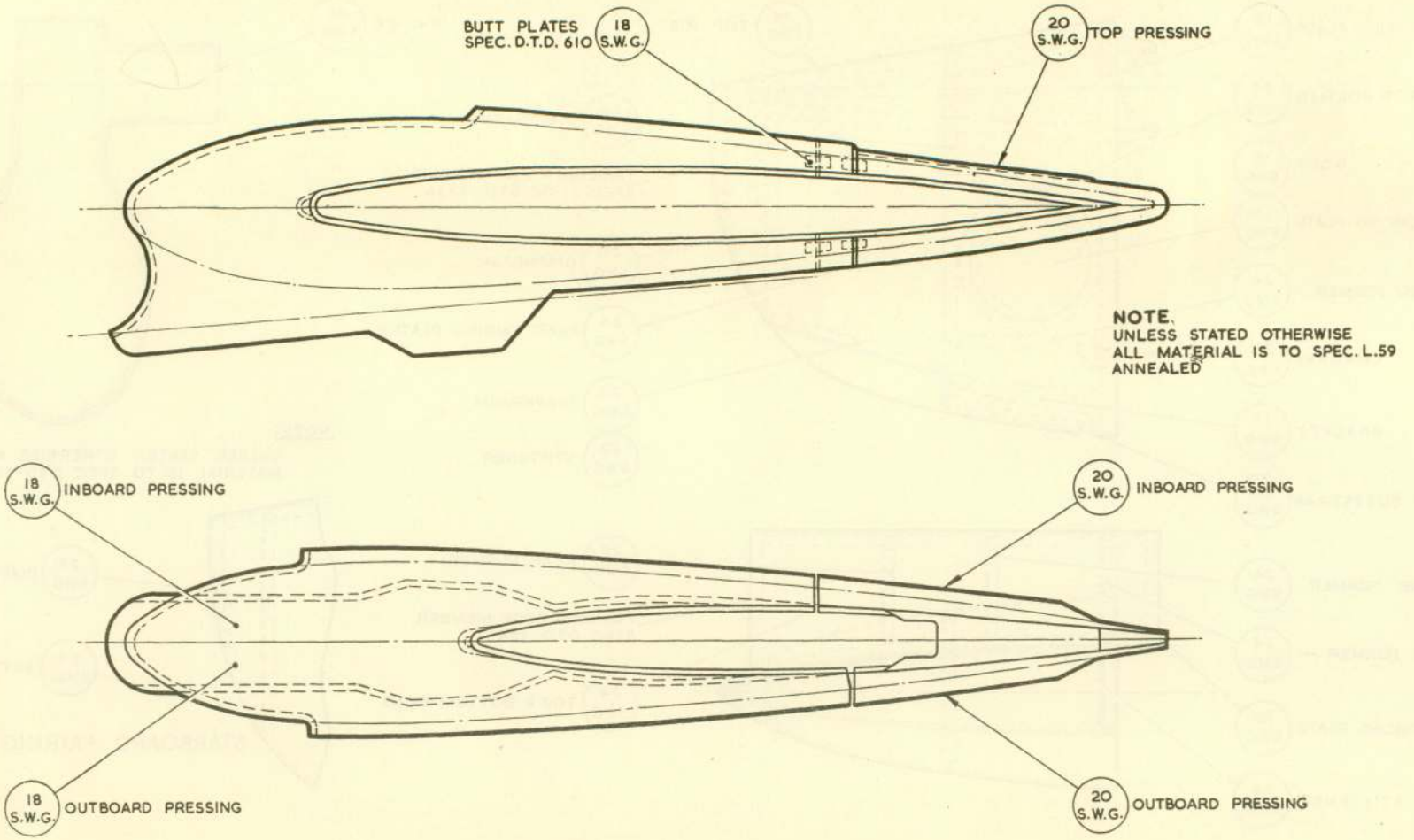
Fig. 4/28. Tail-boom rear fairing, Mk.2 and 4



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKINS	0·05	1·0	6·0	0·5 to 2·0 dia., 12·0 spacing	4/36
DIAPHRAGMS	0·03	0·5	6·0	1·0×0·35 at flanges, 12·0 spacing	4/45(C)
RIBS AND FORMERS Webs	0·03	1·0	6·0	0·5 dia., 6·0 spacing 1·0 dia., one per item	4/36 4/36
Flanges	0·03	0·5	6·0	Exceeding negligible	4/45

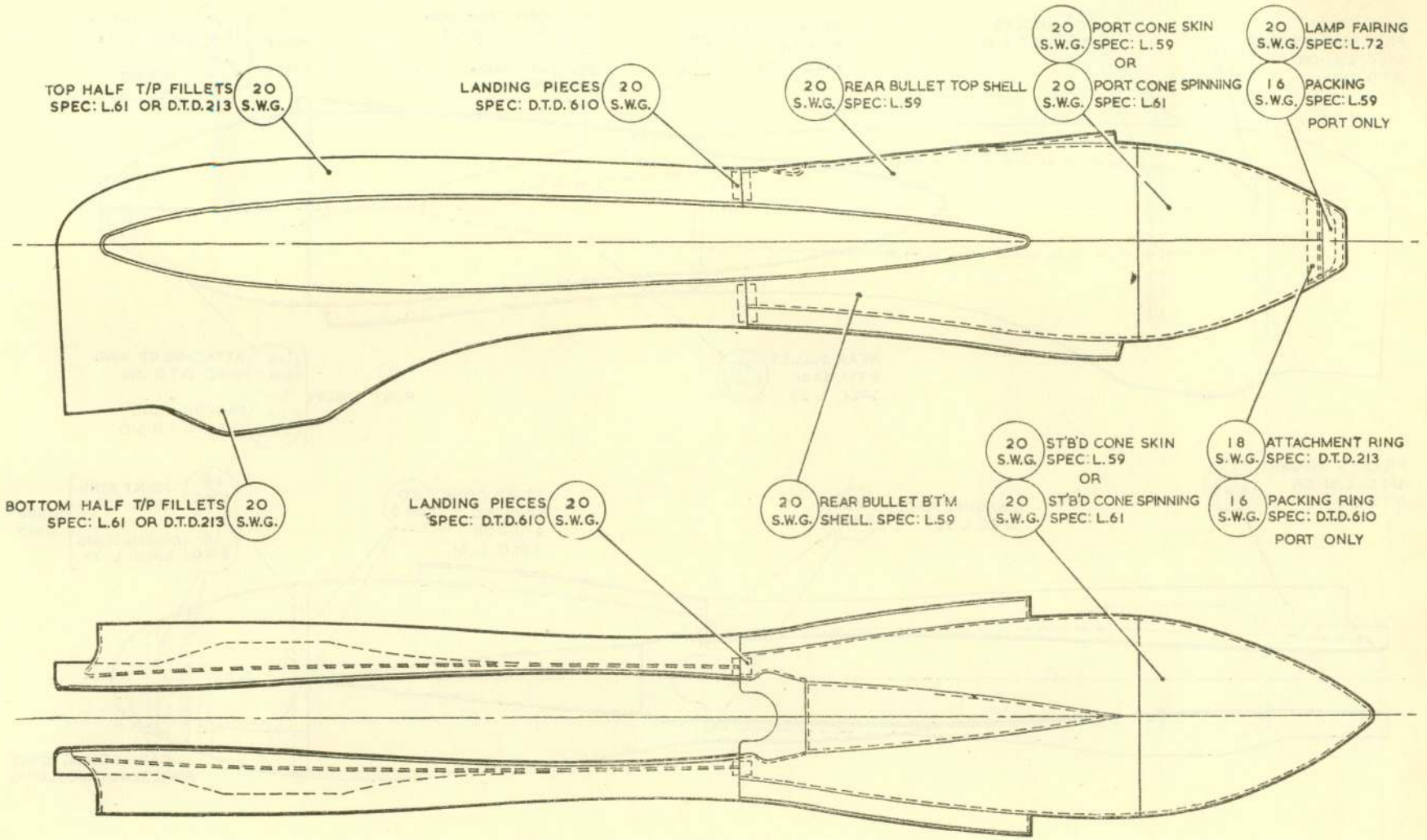
Fig. 4/29. Tail-boom rear fairing, Mk.3



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKIN	0·05	0·5	6·0	0·5 to 2·0 dia., 12·0 spacing Welded repairs may be carried out when suitable materials are available	4/36

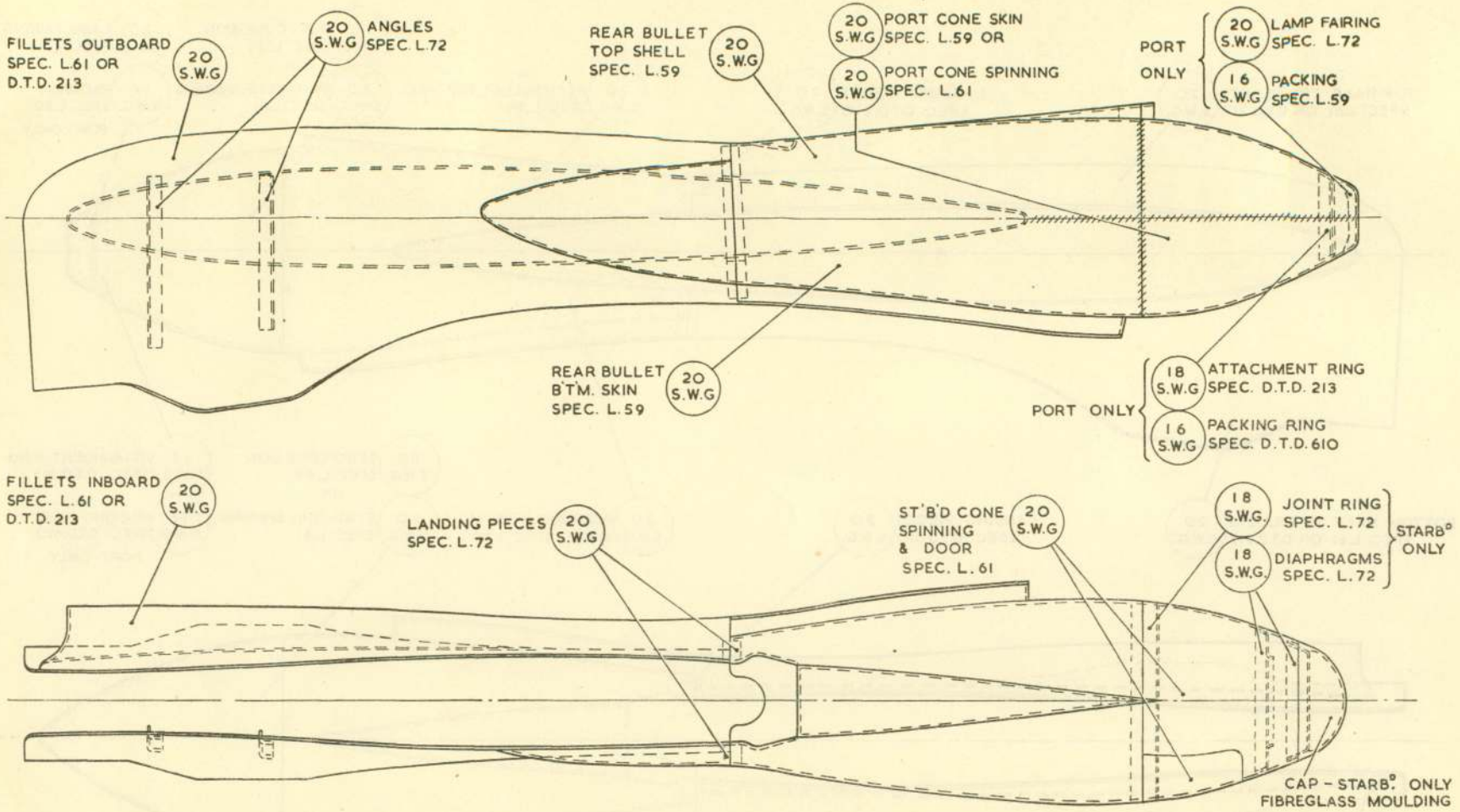
Fig. 4/30. Tail-plane and acorn fairings, Mk.1



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKIN	0·05	0·5	6·0	0·5 to 2·0 dia., 12·0 spacing Welded repairs may be carried out when suitable materials are available	4/36

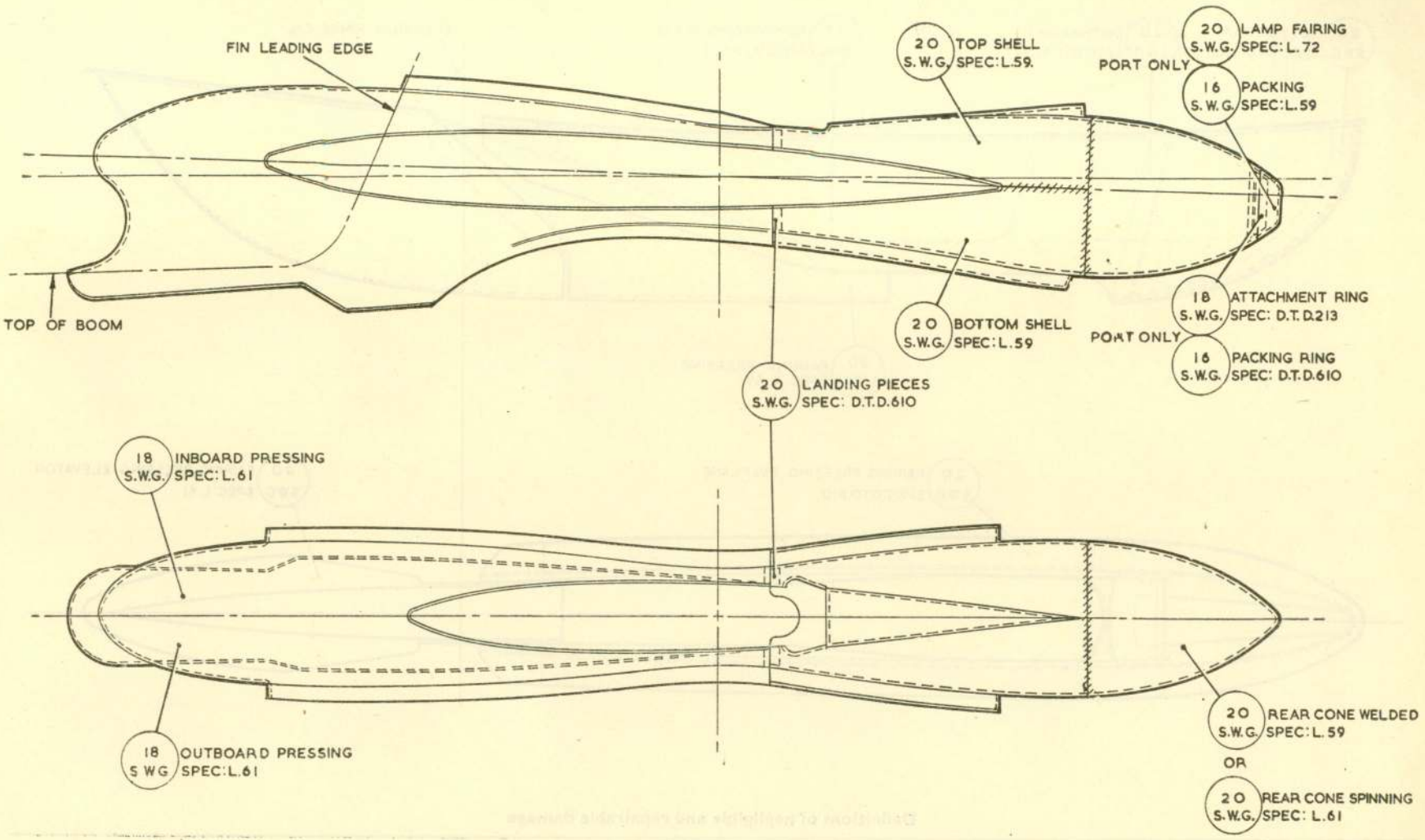
Fig. 4/31. Tail-plane and rear-bullet fairings, Mk.2



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKIN	0·05	0·5	6·0	0·5 to 2·0 dia., 12·0 spacing Welded repairs may be carried out when suitable materials are available	4/36

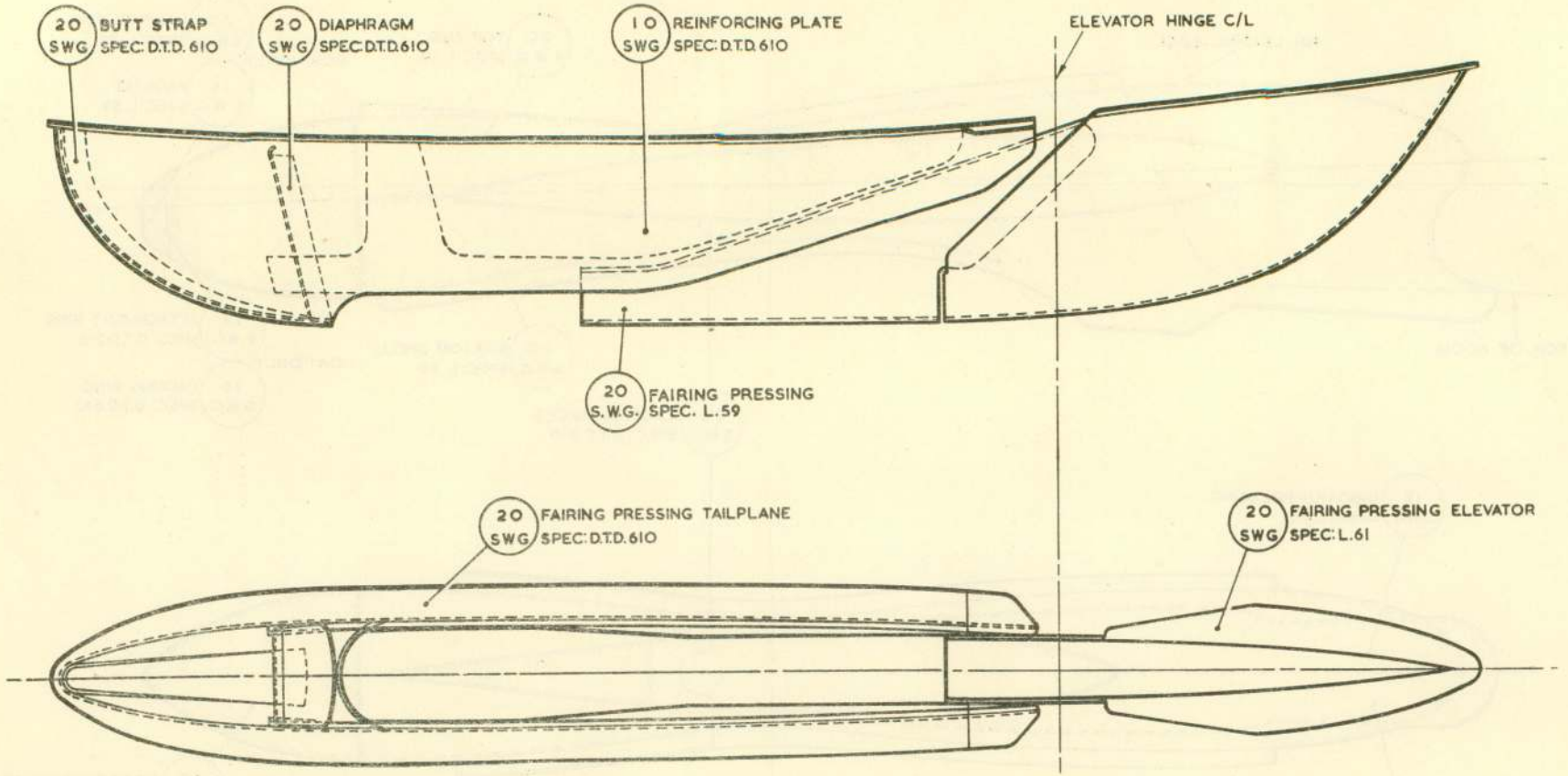
Fig. 4/32. Tail-plane and rear-bullet fairings, Mk.3



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
SKIN	0·05	0·5	6·0	0·5 to 2·0 dia., 12·0 spacing Welded repairs may be carried out when suitable materials are available	4/36

Fig. 4/33. Tail-plane, acorn and rear-bullet fairings, Mk.4



Definitions of negligible and repairable damage

Item	Negligible damage—dents (inches)			Repairable damage (inches)	Repair fig.
	Max. depth	Min. dia.	Min. spacing		
PRESSINGS, TAIL PLANE ELEVATOR	0·03	0·5	6·0	0·5 dia., one per pressing Welded repairs may be carried out on elevator pressings when suitable materials are available	4/36
DIAPHRAGM	0·05	0·5	6·0	Exceeding negligible	Replace

Fig. 4/34. Mass-balance fairing, Mk.3

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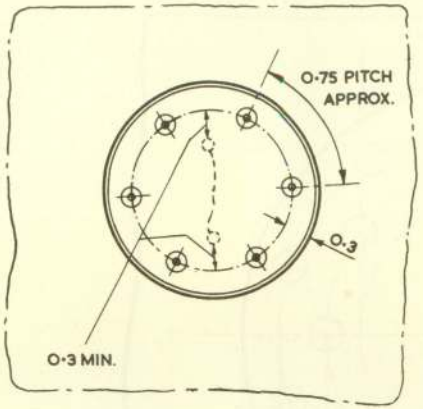
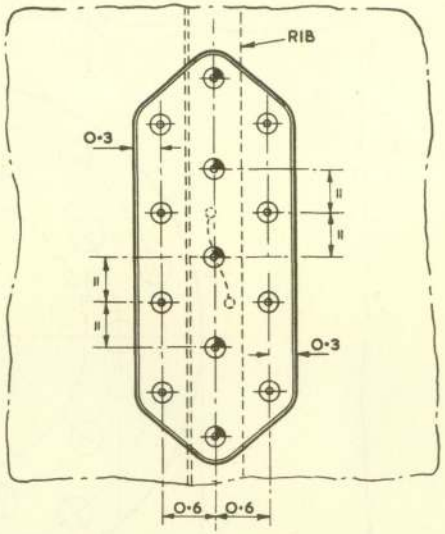
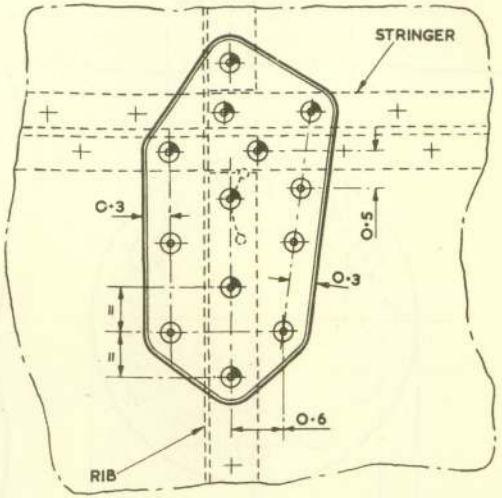


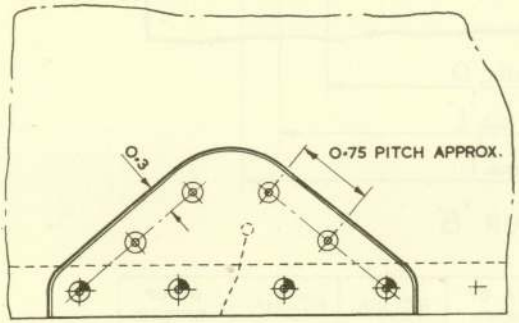
IN CLEAR AREAS



OVER RIB OR STRINGER FLANGES



ADJACENT TO RIB-STRINGER INTERSECTION



AT AN EDGE

CRACKS TO BE TERMINATED BY AN 1/8 DIA. DRILLED HOLE.

NOTES

THE REPAIRS SHOWN AT VARIOUS LOCATIONS ARE TYPICAL FOR SINGLE CRACKS WHICH DO NOT EXCEED 1·0 IN LENGTH, OR A COLLECTION OF CRACKS THE LENGTHS OF WHICH WHEN ADDED TOGETHER DO NOT EXCEED 1·0. THE SHAPE OF A PATCH MAY VARY SLIGHTLY WITH THAT ILLUSTRATED, DEPENDING ON THE DIRECTION AND LENGTH OF THE CRACK, AND THE NECESSITY TO MAINTAIN AT LEAST 0·6 MIN. DIMENSION FROM THE EDGE OF THE PATCH TO THE CRACK.

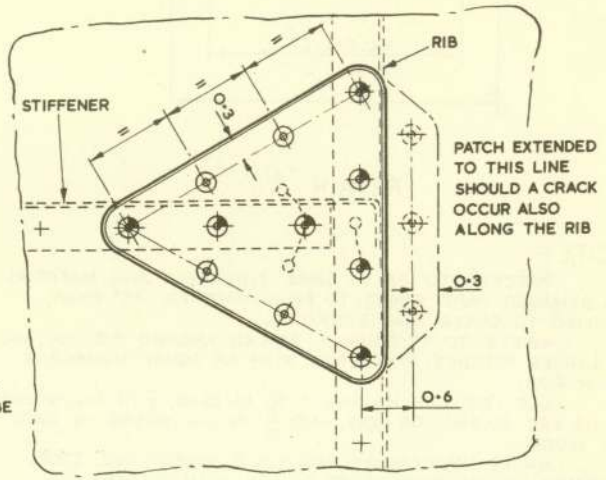
THE PATCHES SHOULD BE OF THICKNESS 18 S.W.G. FOR TAIL PLANE AND FINS, AND 22 S.W.G. FOR ELEVATOR AND RUDDERS, AND OF SPECIFICATION D.T.D.610. CHAMFER ALL EDGES 45°

USE 1/8 DIA. CSK HEAD STEEL CHOBERT RIVETS TO A.G.S. 2041, UTILIZING EXISTING HOLES AS SHOWN THUS ⊕. THE NEXT OVERSIZE MAY BE USED WHERE NECESSARY.

NO RIVET SHOULD BE POSITIONED CLOSER THAN 0·5 TO ANOTHER.

ALL RIVET HEADS TO BE FILLED WITH FILLER.

ALL CORNER RADII TO BE 0·3 MIN.



ADJACENT TO RIB-STIFFENER JOINT

ALL DIMENSIONS GIVEN ABOVE ARE IN INCHES

Fig. 4/35. Patch repairs to skin cracks

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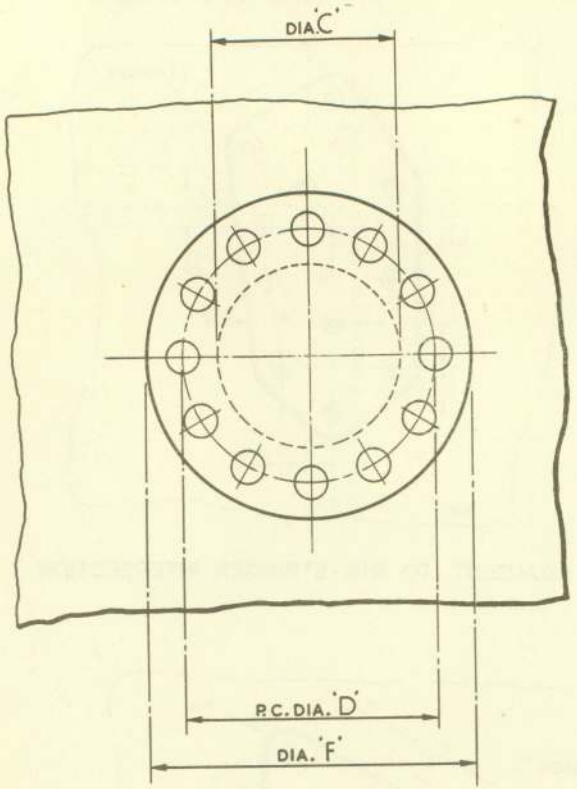
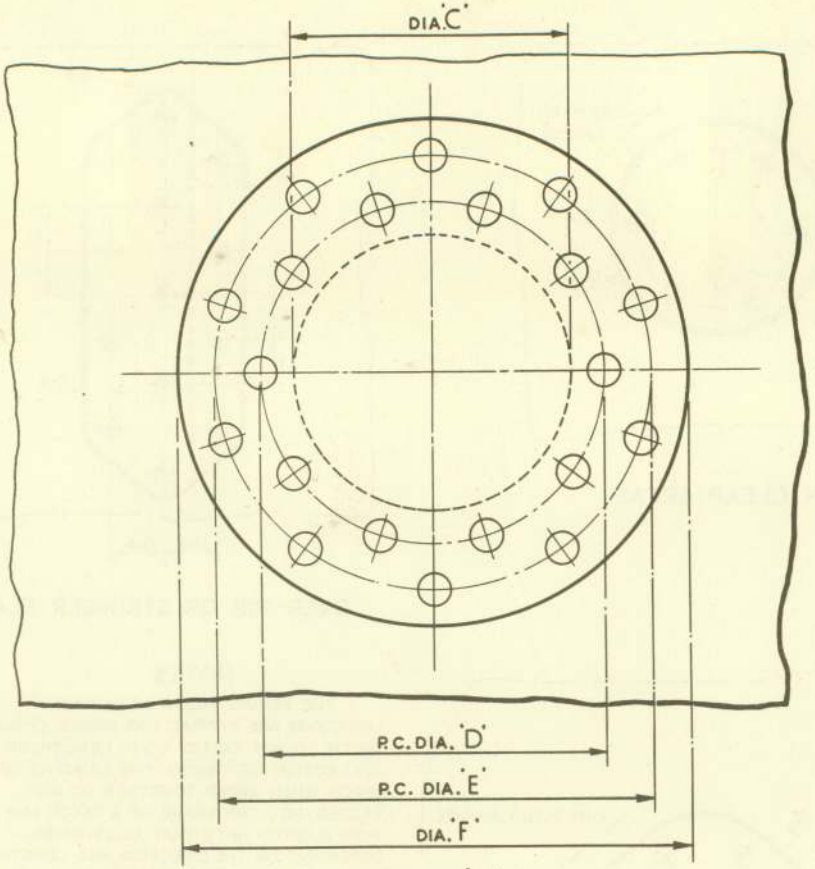


REPAIR 'A'



REPAIR 'B'

NOTE:-

PATCHES TO BE OF SAME THICKNESS AND MATERIAL AS DAMAGED PART. EDGES TO BE CHAMFERED 45° WHEN APPLIED TO OUTER SKIN SURFACES.

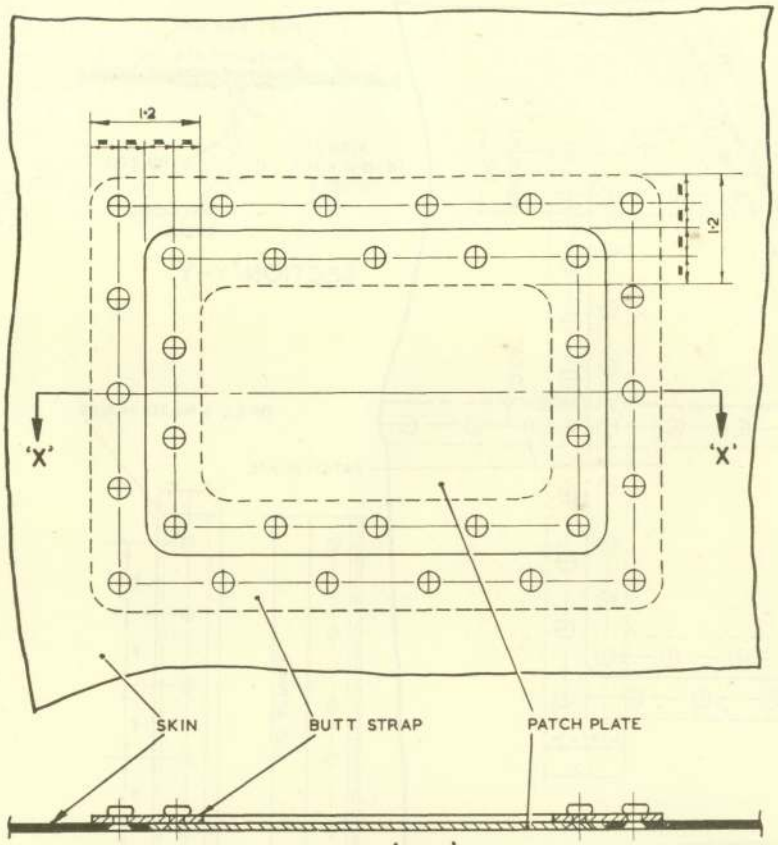
RIVETS TO BE EQUALLY SPACED AROUND P.C. DIA., AND IN LARGER PATCHES STAGGERED WITH AN EQUAL NUMBER IN EACH ROW.

USE 120° CSK. HD. RIVETS TO AS. 2230, $\frac{1}{8}$ IN. DIA. WHERE SKINS ARE 20 S.W.G. OR LESS, AND $\frac{5}{32}$ IN. DIA. WHERE 18 S.W.G. OR MORE.

WHERE INACCESSIBLE FOR SOLID RIVETS USE STEEL CHOBERT RIVETS WITH HEADS FILLED WITH FILLER.

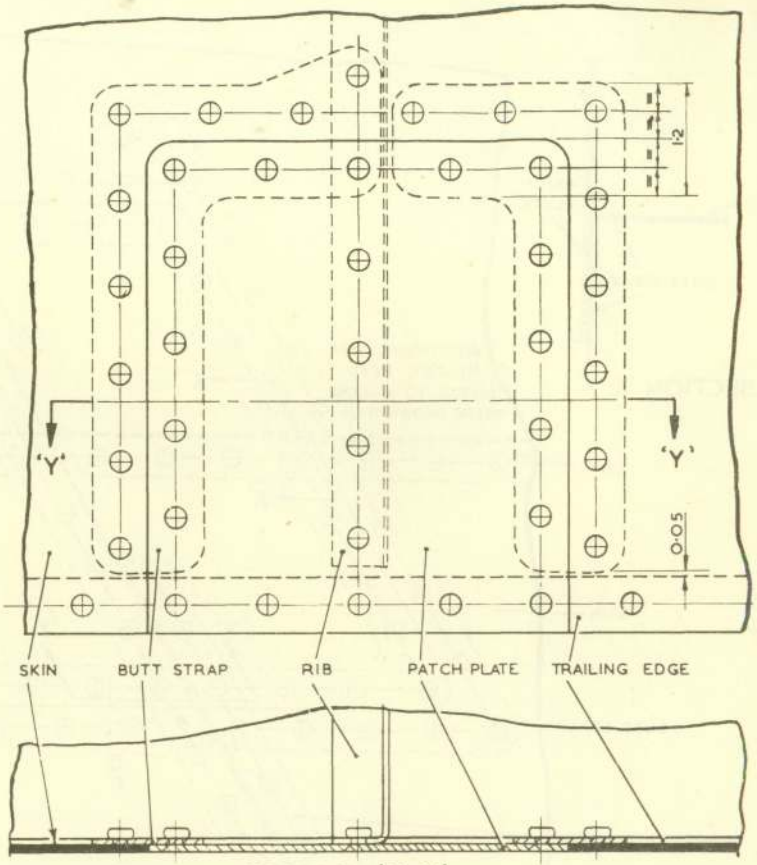
DIA. OF DAMAGE 'C' IN.	REPAIR	DIA. OF PATCH 'F' IN.	P.C. DIA. 'D' IN.	P.C. DIA. 'E' IN.	NO. OF RIVETS IN PATCH
0·5	A	1·9	1·2		6
1·0	A	2·4	1·7		8
2·0	A	3·4	2·7		12
3·0	B	5·4	3·7	4·7	20
5·0	B	7·4	5·7	6·7	28

Fig. 4/36. Patch repairs



SECTION 'X–X'

(A) PATCH IN CLEAR AREAS



SECTION 'Y–Y'

(B) PATCH IN AREAS ADJACENT TO RIBS

NOTES

MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS EXISTING SKIN AND BUTT STRAPS FROM 20 S.W.G. LIGHT ALLOY SHEET TO SPECIFICATION D.T.D. 610.

JOGGLE BUTT STRAPS OVER FLANGES OF MEMBERS AND WHERE NECESSARY ENLARGE LOCALLY TO PICK UP EXISTING RIVETS AS SHOWN IN REPAIR 'B'.

USE 1/8 DIA. 120° C'S'K HEAD RIVETS TO A.S.2230 AT AN EQUAL PITCH OF BETWEEN 0·75 AND 1·0 UTILISING EXISTING RIVET HOLES WHERE NECESSARY.

WHERE INACCESSIBLE FOR SOLID RIVETING 1/8 DIA. STEEL CHOBERT RIVETS TO A.G.S.2041 MAY BE USED, THE HEADS BEING PLUGGED WITH FILLER.

SHOULD EXISTING HOLES BECOME ELONGATED THE NEXT OVERSIZE RIVETS MAY BE USED.

UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 MINIMUM.

WHEN REPAIRING A RUDDER AS IN 'B' THE ATTACHMENT RIVETS IN THE TRAILING EDGE SHOULD BE POSITIONED MIDWAY BETWEEN THE SPOTWELDS.

ALL DIMENSIONS ARE IN INCHES

Fig. 4/37. Skin insertion repairs

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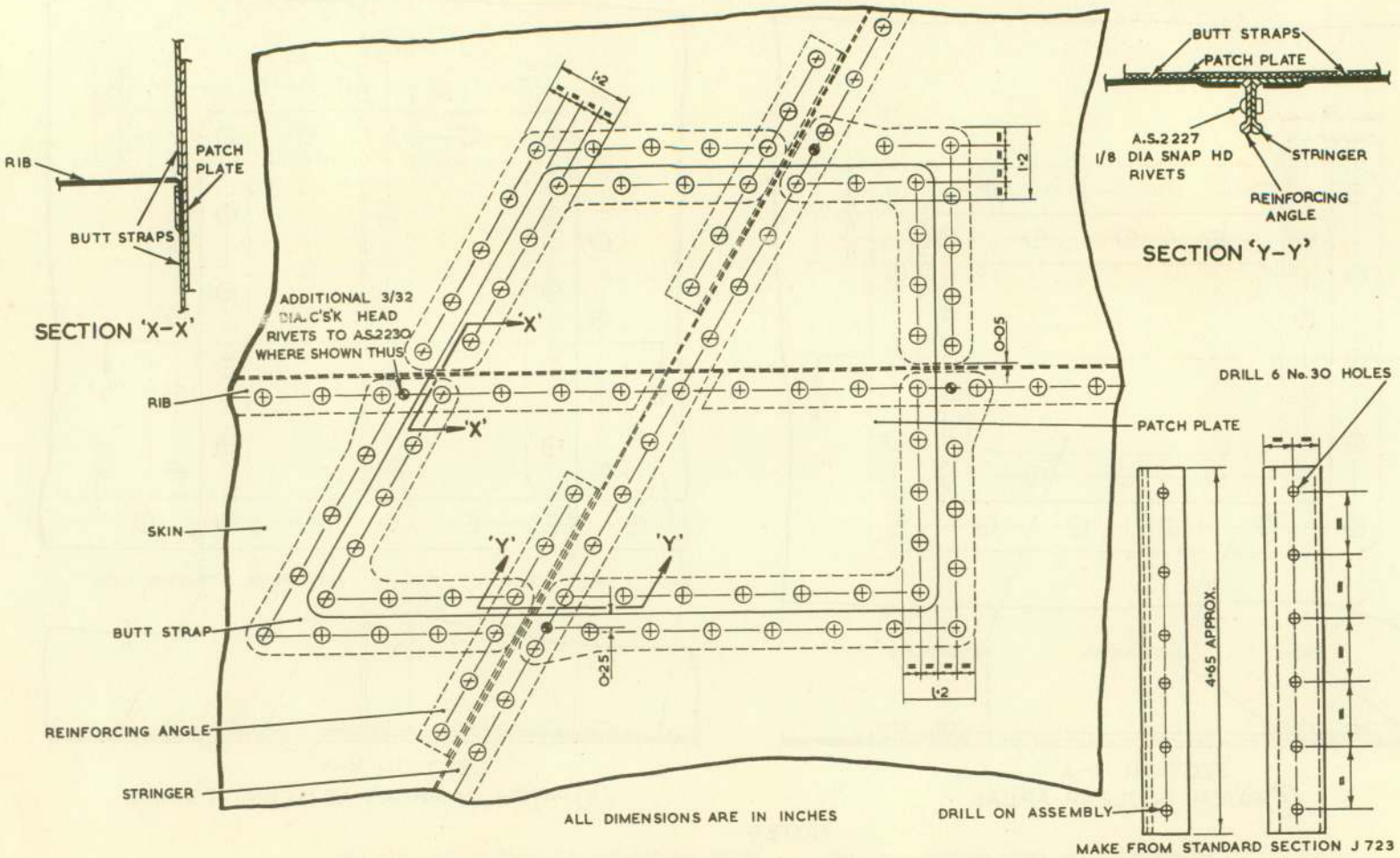


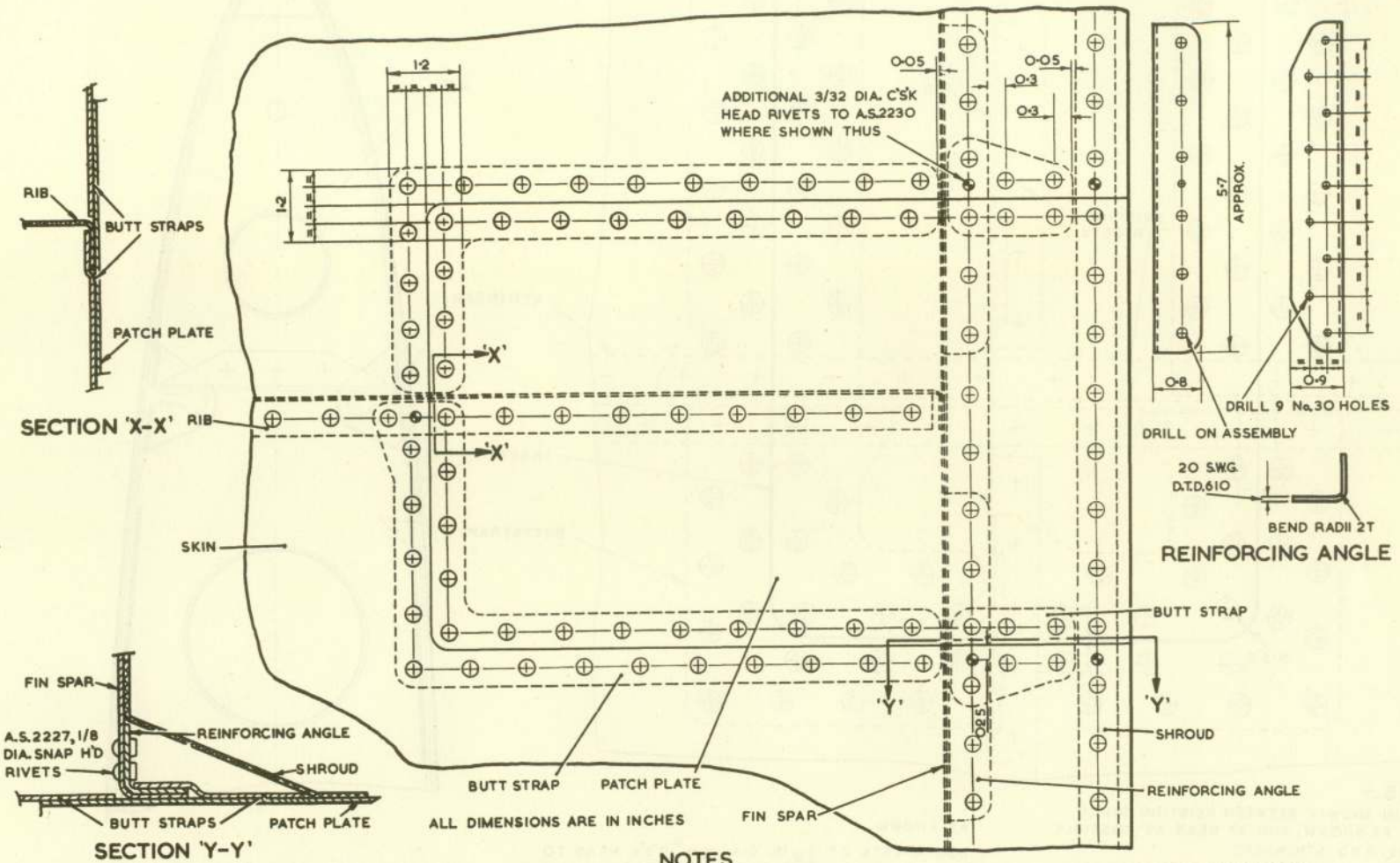
NOTES

CUT AWAY DAMAGED SKIN TO A MINIMUM DISTANCE OF 0·3 FROM ANY EXISTING RIVET HOLE.
MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS EXISTING SKIN AND BUTT STRAPS FROM 18 S.W.G. LIGHT ALLOY SHEET TO SPECIFICATION D.T.D. 610.
JOGGLE BUTT STRAPS OVER FLANGES OF MEMBERS AS SHOWN AND WHERE NECESSARY ENLARGE LOCALLY TO PICK UP EXISTING RIVETS.

ATTACH PATCH PLATES AND BUTT STRAPS WITH 1/8 DIA. 120° C'SK HEAD RIVETS TO A.S.2230 AT BETWEEN 0·75 & 1·0 PITCH, UTILISING EXISTING RIVET HOLES WHERE NECESSARY.
WHERE INACCESSIBLE FOR SOLID RIVETING USE 1/8 DIA. STEEL CHOBERT RIVETS TO A.G.S.2041, THE HEADS BEING PLUGGED WITH FILLER.
IF EXISTING HOLES ARE ELONGATED THE NEXT OVERSIZE RIVETS MAY BE USED.

THE LENGTH OF THE REINFORCING ANGLE IS DEPENDANT UPON THE EXISTING RIVET PITCH AS AT LEAST 3 RIVETS EITHER SIDE OF THE JOINT MUST BE PICKED UP.
ATTACH REINFORCING ANGLES TO STRINGER WITH 12 1/8 DIA. SNAP HEAD RIVETS TO A.S.2227 AS SHOWN IN SECTION 'Y-Y'.
UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 MINIMUM.

Fig.4/38. Skin insertion repair, fin



NOTES

CUT AWAY DAMAGED SKIN TO A MINIMUM DISTANCE OF 0·3 FROM ANY EXISTING RIVET HOLE.
MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS EXISTING SKIN AND THE BUTT STRAPS FROM 18 S.W.G. LIGHT ALLOY SHEET SPECIFICATION D.T.D. 610.
JOGGLE BUTT STRAPS OVER FLANGES OF MEMBERS AS SHOWN AND WHERE NECESSARY ENLARGE LOCALLY TO PICK UP EXISTING RIVETS.

ATTACH PATCH PLATE AND BUTT STRAPS WITH 1/8 DIA. 120° C'S'K HEAD RIVETS TO A.S.2230 AT BETWEEN 0·75 & 1·0 PITCH UTILISING EXISTING RIVET HOLES WHERE NECESSARY.
WHERE INACCESSIBLE FOR SOLID RIVETING USE 1/8 DIA. STEEL CHOBERT RIVETS TO A.G.S.2041, THE HEADS BEING PLUGGED WITH FILLER.
IF EXISTING HOLES ARE ELONGATED THE NEXT OVERSIZE RIVETS MAY BE USED.

THE LENGTH OF THE REINFORCING ANGLE IS DEPENDANT UPON THE EXISTING RIVET PITCH AS AT LEAST 3 RIVETS EITHER SIDE OF THE JOINT MUST BE PICKED UP.
ATTACH REINFORCING ANGLES TO FIN SPAR WITH 18 1/8 DIA. SNAP HEAD RIVETS TO A.S.2227 AS SHOWN IN SECTION 'Y-Y'.
UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 MINIMUM.

Fig. 4/39. Skin insertion repair, fin trailing edge

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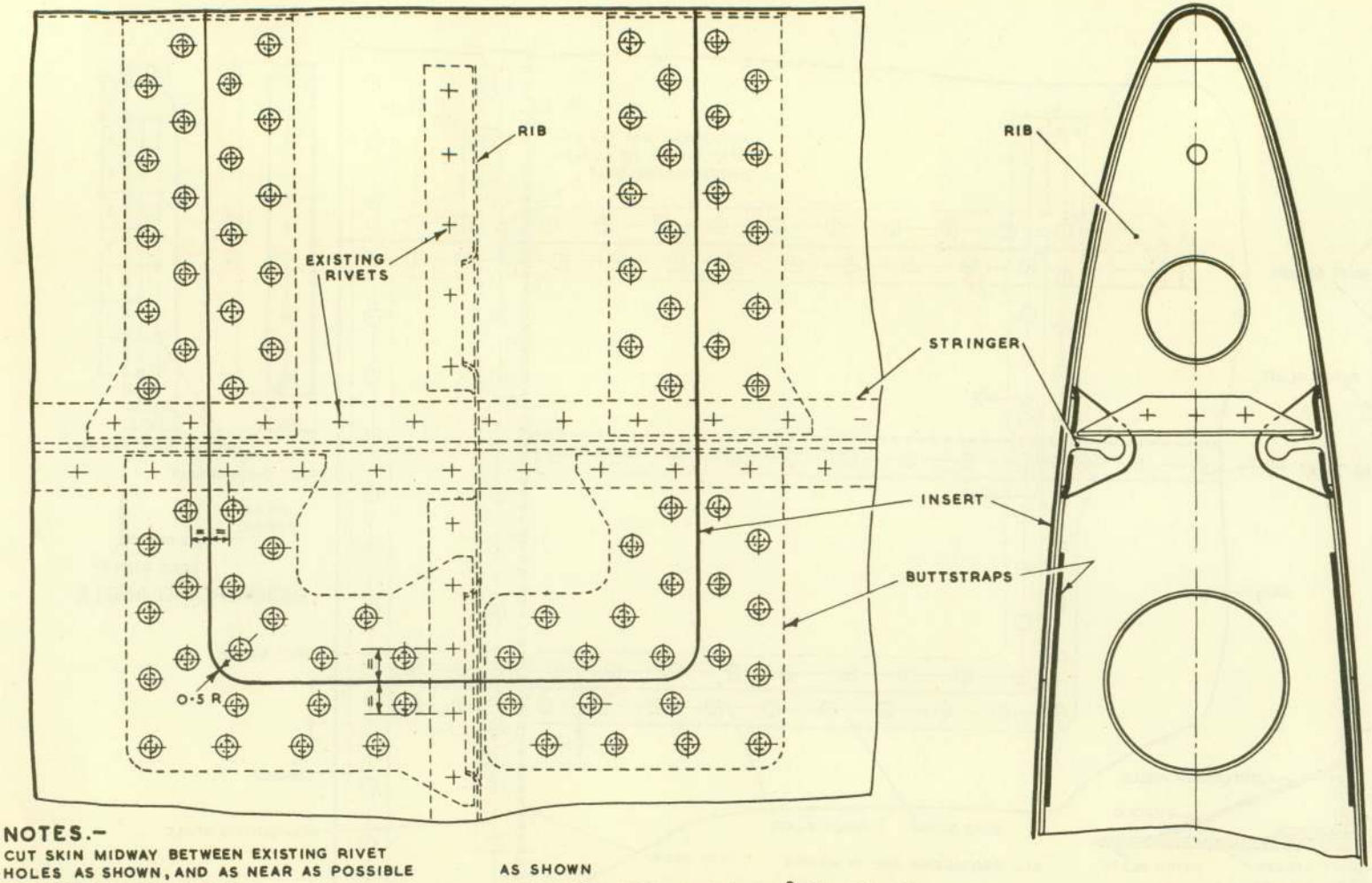


NOTES.–

CUT SKIN MIDWAY BETWEEN EXISTING RIVET HOLES AS SHOWN, AND AS NEAR AS POSSIBLE TO RIBS AND STRINGERS

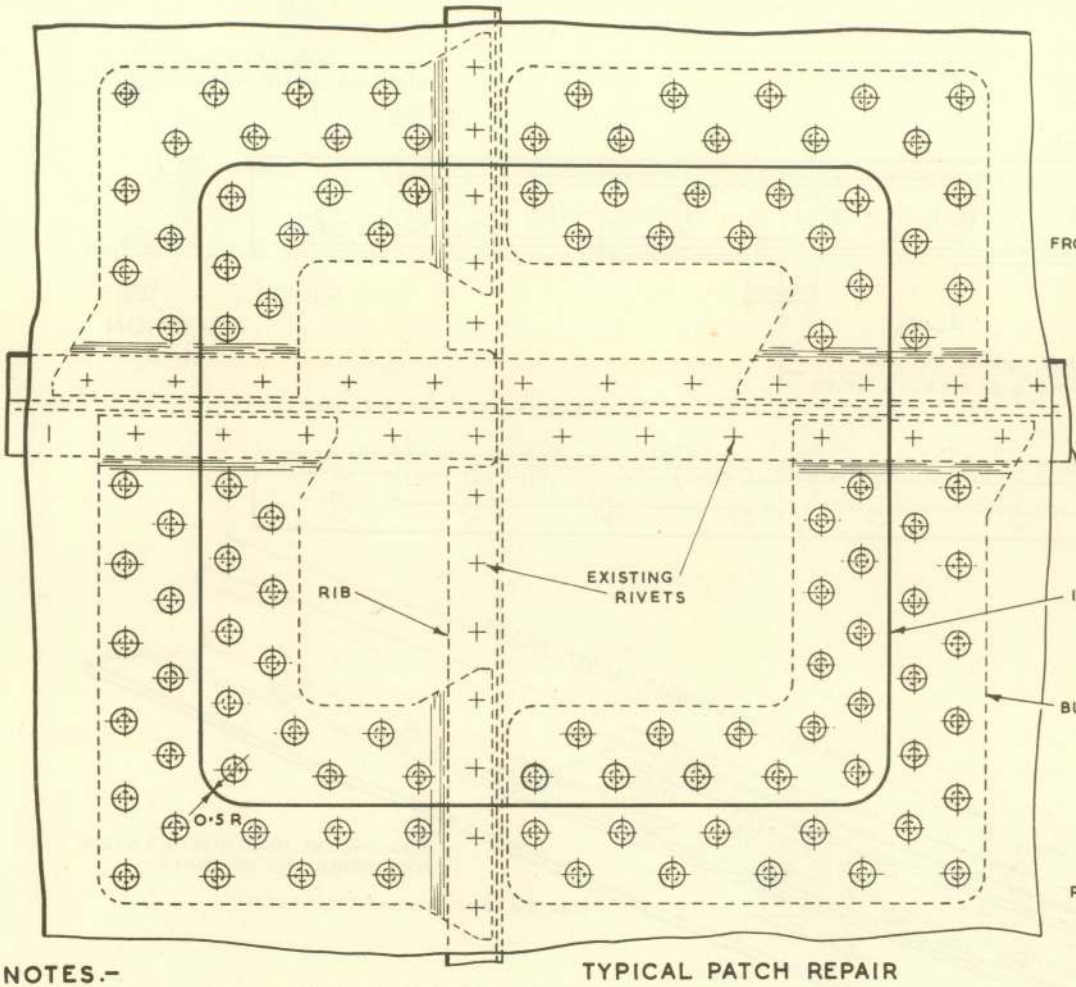
MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS EXISTING SKINS AND THE BUTTSTRAP FROM 18 S.W.G. LIGHT ALLOY SHEET TO SPECIFICATION D.T.D. 610, JOGGLING OVER STRINGER AND RIB FLANGES, AND WIDENING LOCALLY AS NECESSARY TO PICK UP EXISTING RIVETS AS SHOWN

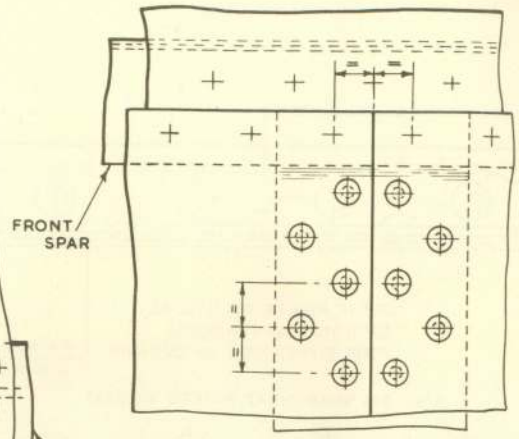
USE RIVETS OF 1/8 IN. DIA. 120° C'S'K HEAD TO A.S. 2230 AT AN EQUAL PITCH OF BETWEEN 0·75 IN. AND 1·0 IN. UTILIZING EXISTING RIVET HOLES. THE NEXT OVERSIZE MAY BE USED IF NECESSARY. WHERE INACCESSIBLE FOR SOLID RIVETING, USE STEEL CHOBERT RIVETS TO A.G.S. 2041 1/8 IN. DIA. FOR 22 S.W.G. SKINS AND 5/32 IN. DIA. FOR 18 S.W.G. SKINS

UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 IN., AND THE DISTANCE BETWEEN DOUBLE ROW RIVETING TO BE 0·5 IN.

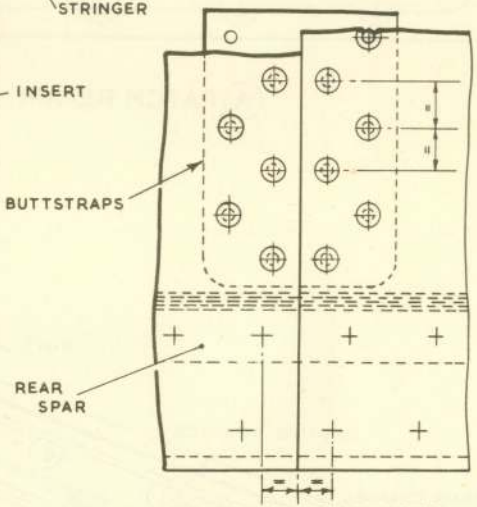
ALL HEADS OF CHOBERT RIVETS TO BE PLUGGED WITH FILLER

Fig.4/40. Skin insertion repair, tail-plane leading edge





JOINT AT FRONT SPAR



JOINT AT REAR SPAR

NOTES.–

CUT SKIN MIDWAY BETWEEN EXISTING RIVET HOLES AS SHOWN, AND AS NEAR AS POSSIBLE TO RIBS AND STRINGERS

MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS EXISTING SKINS AND THE BUTTSTRAP FROM 18 S.W.G. LIGHT ALLOY SHEET TO SPECIFICATION D.T.D. 610, JOGGLING OVER STRINGER AND RIB FLANGES, AND WIDENING LOCALLY AS NECESSARY TO PICK UP EXISTING RIVETS

TYPICAL PATCH REPAIR

AS SHOWN

USE RIVETS OF 1/8 IN. DIA. 120° C'S'K HEAD TO A.S.2230 AT AN EQUAL PITCH OF BETWEEN 0·75 IN. AND 1·0 IN. UTILIZING EXISTING RIVET HOLES. THE NEXT OVERSIZE MAY BE USED IF NECESSARY. WHERE INACCESSIBLE FOR SOLID RIVETING, USE STEEL CHOBERT RIVETS TO A.G.S. 2041, 1/8 IN. DIA. FOR 22 S.W.G. SKINS AND 5/32 IN. DIA. FOR 18 S.W.G. SKINS

UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 IN. AND THE DISTANCE BETWEEN DOUBLE ROW RIVETING TO BE 0·5 IN.

ALL HEADS OF CHOBERT RIVETS TO BE PLUGGED WITH FILLER

Fig. 4/41. Skin insertion repair, tail plane

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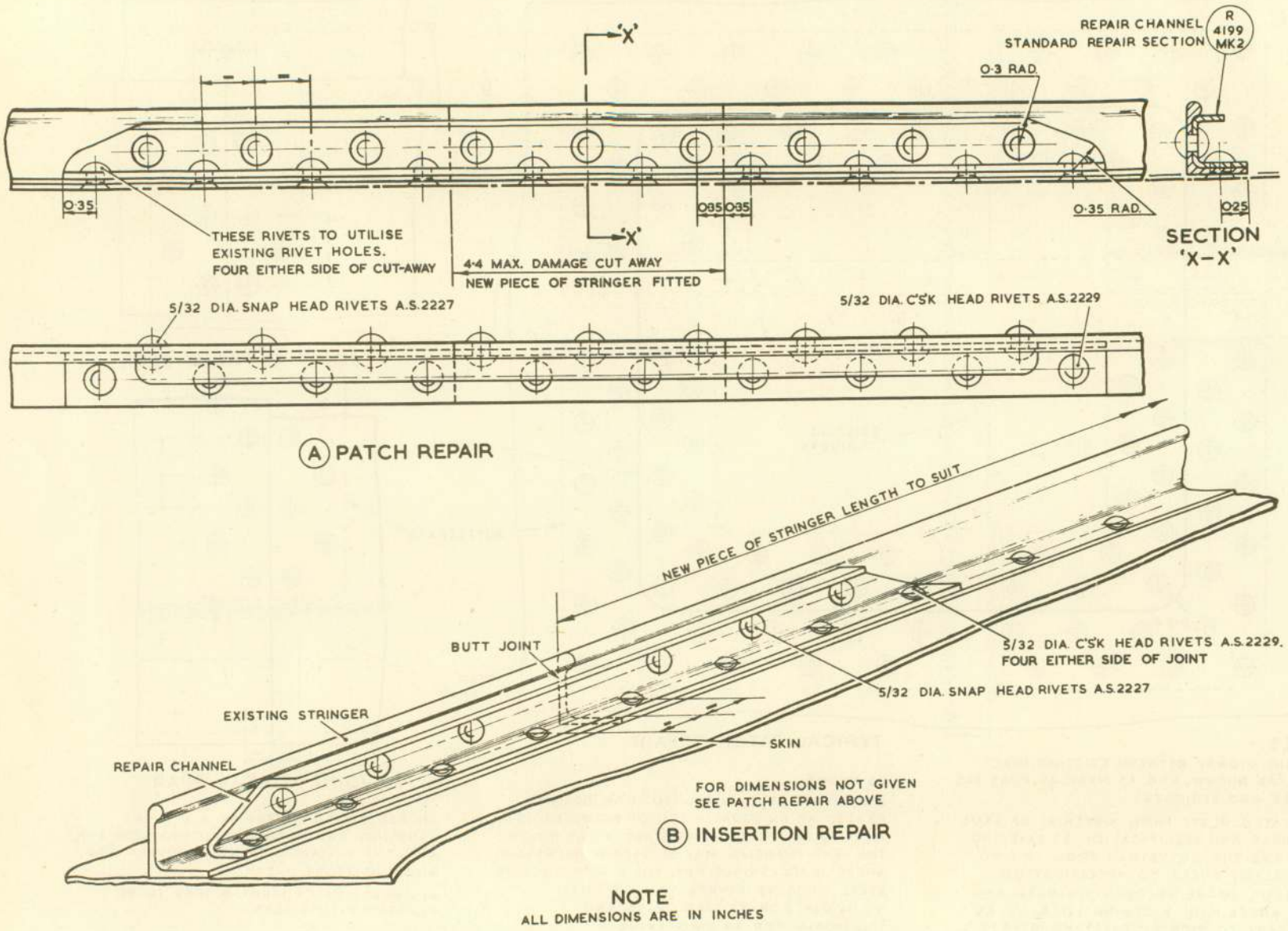

Fig.4/42. Stringer repair, extruded section

RESTRICTED

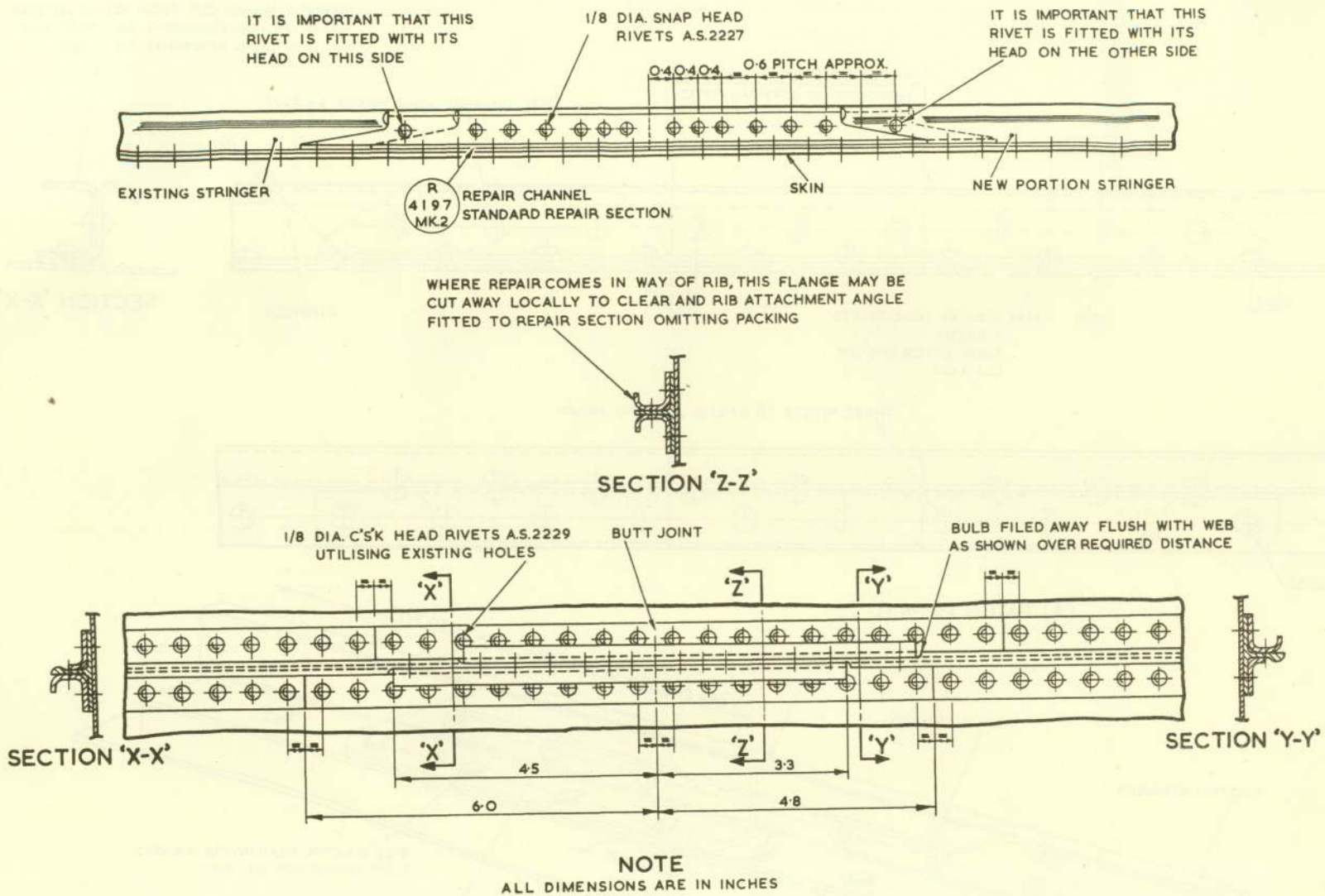

Fig. 4/43. T-stringer repair

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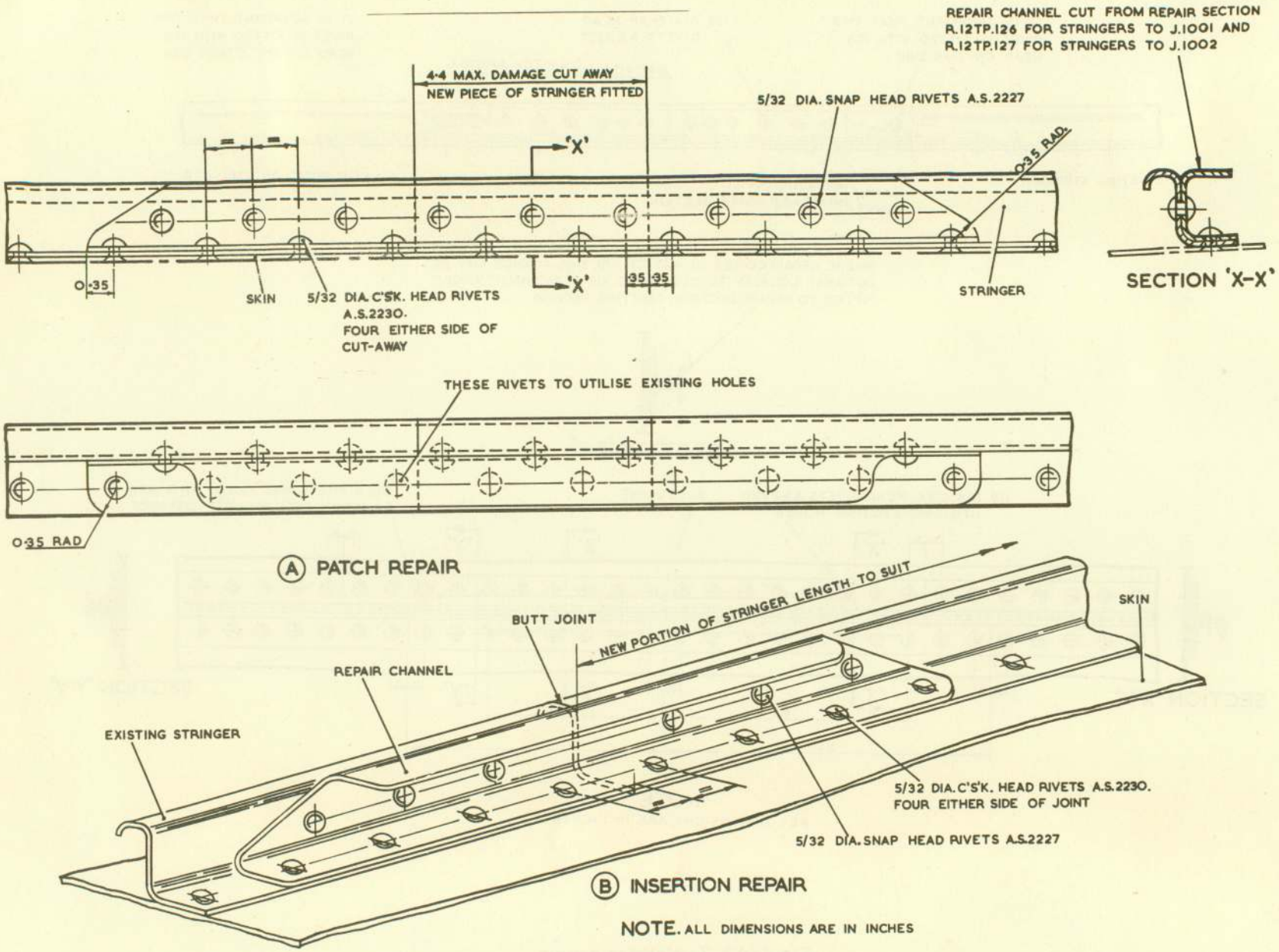
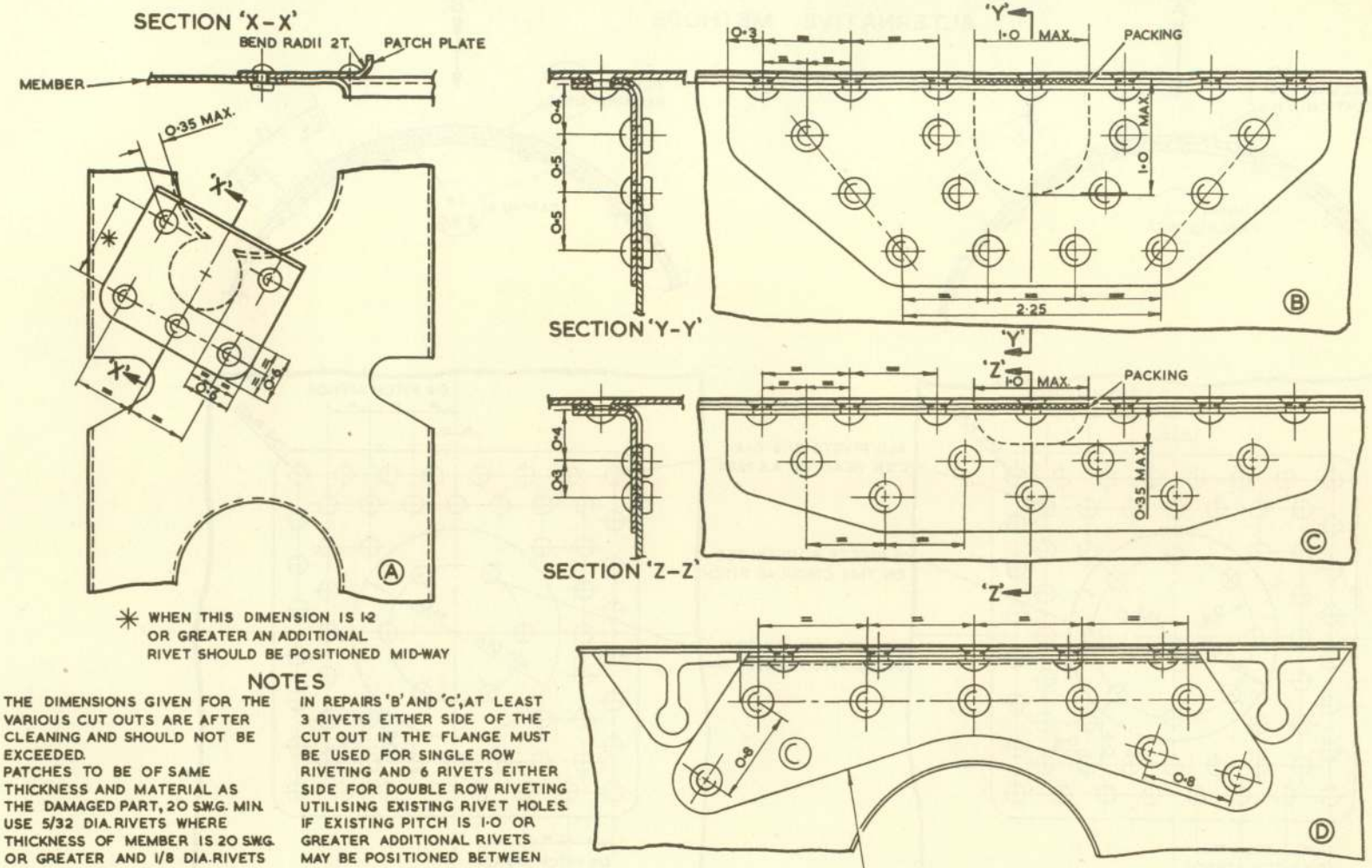


Fig.4/44. Stringer repair

RESTRICTED



NOTES

THE DIMENSIONS GIVEN FOR THE VARIOUS CUT OUTS ARE AFTER CLEANING AND SHOULD NOT BE EXCEEDED.

PATCHES TO BE OF SAME THICKNESS AND MATERIAL AS THE DAMAGED PART, 20 S.W.G. MIN.

USE 5/32 DIA. RIVETS WHERE THICKNESS OF MEMBER IS 20 S.W.G. OR GREATER AND 1/8 DIA. RIVETS WHERE 22 S.W.G. OR LESS, BOTH BEING C'SK HEAD TO A.S.2229 IN ATTACHED FLANGE AND SNAP HEAD TO A.S.2227 ELSEWHERE.

WHERE INACCESSIBLE FOR SOLID RIVETING STEEL CHOBERT RIVETS OF THE SAME DIA. MAY BE USED PROVIDING THE 5/32 DIA. RIVETS ARE PINNED.

IN REPAIRS 'B' AND 'C', AT LEAST 3 RIVETS EITHER SIDE OF THE CUT OUT IN THE FLANGE MUST BE USED FOR SINGLE ROW RIVETING AND 6 RIVETS EITHER SIDE FOR DOUBLE ROW RIVETING UTILISING EXISTING RIVET HOLES. IF EXISTING PITCH IS 1·0 OR GREATER ADDITIONAL RIVETS MAY BE POSITIONED BETWEEN THEM.

RIVET LANDINGS AND RADII NOT DIMENSIONED ABOVE ARE TO BE A MINIMUM OF 0·3.

FLANGES AND SKINS TO BE DIMPLED WHERE MATERIAL IS 20 S.W.G. OR LESS.

ALL DIMENSIONS ARE IN INCHES

Fig. 4/45. Rib web and flange repair

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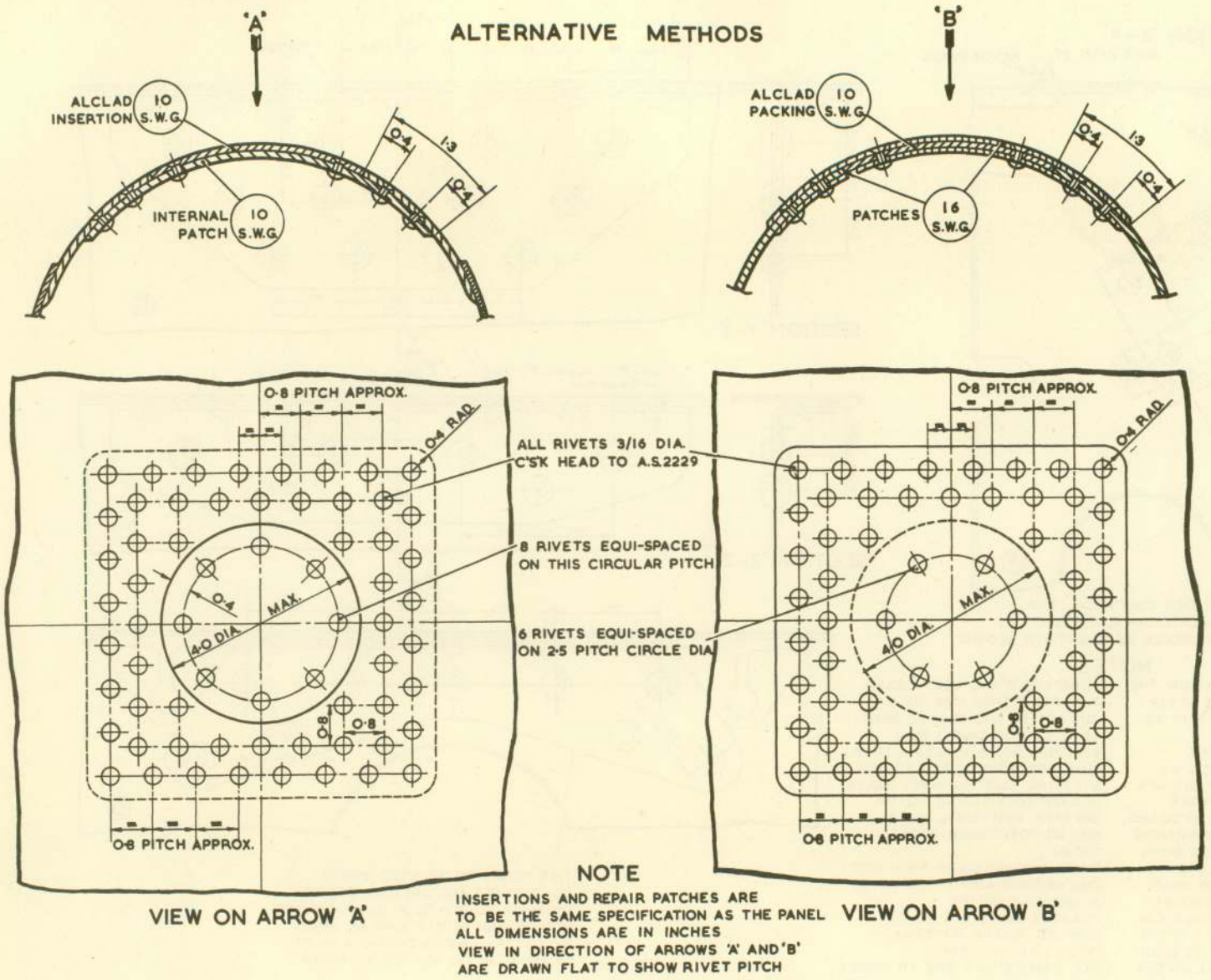
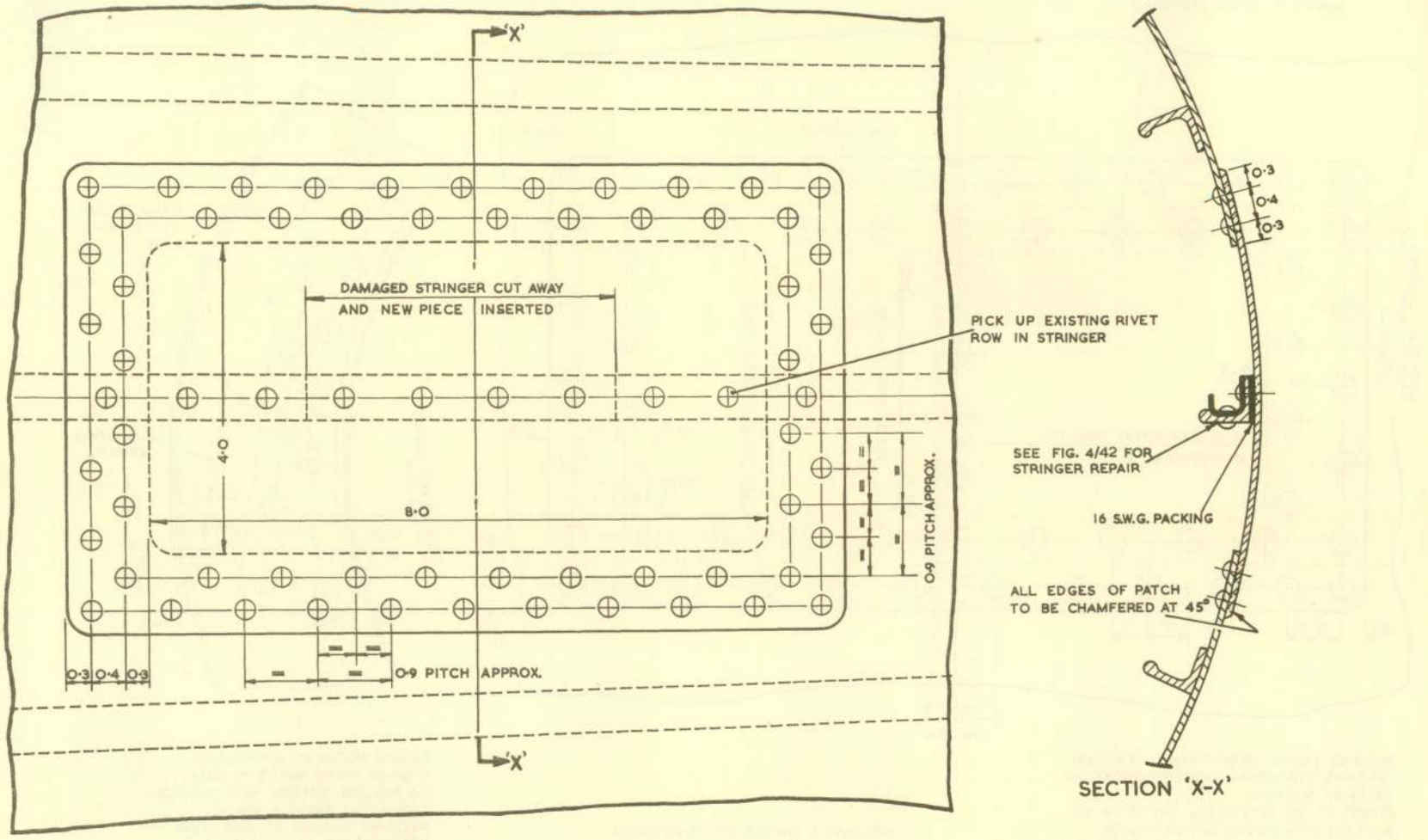


Fig.4/46. Repair to top and bottom panels, tail boom



PATCHES TO BE MADE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS THE EXISTING PANEL.
RIVETS ARE TO BE 5/32 DIA. 90° C'S'K HEAD TO A.S.2229.

ALL DIMENSIONS GIVEN ABOVE ARE IN INCHES.
NO RIVET SHOULD BE POSITIONED CLOSER THAN 0·5 TO ANOTHER RIVET.

Fig. 4/47. Boom repair (1)

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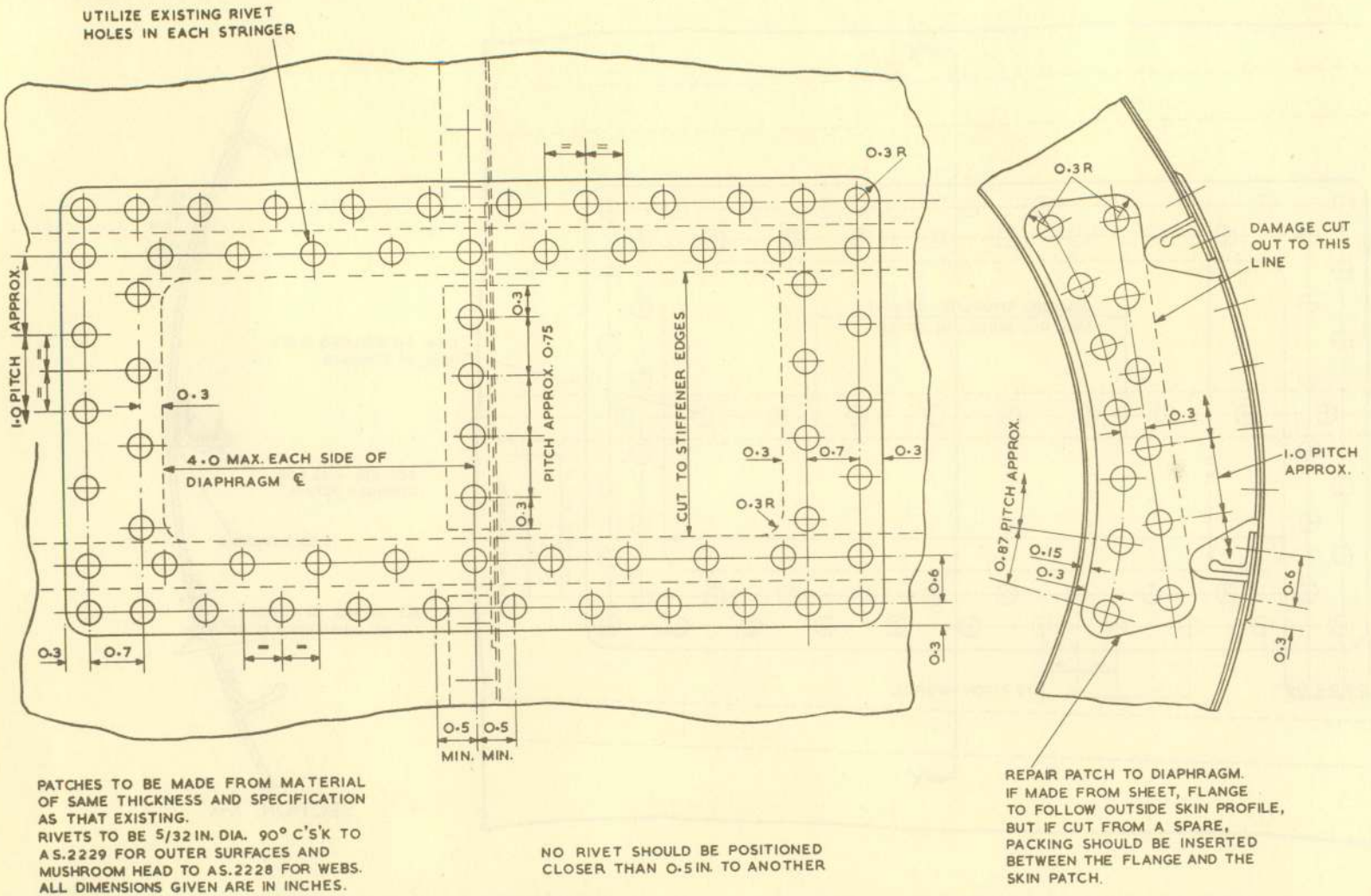
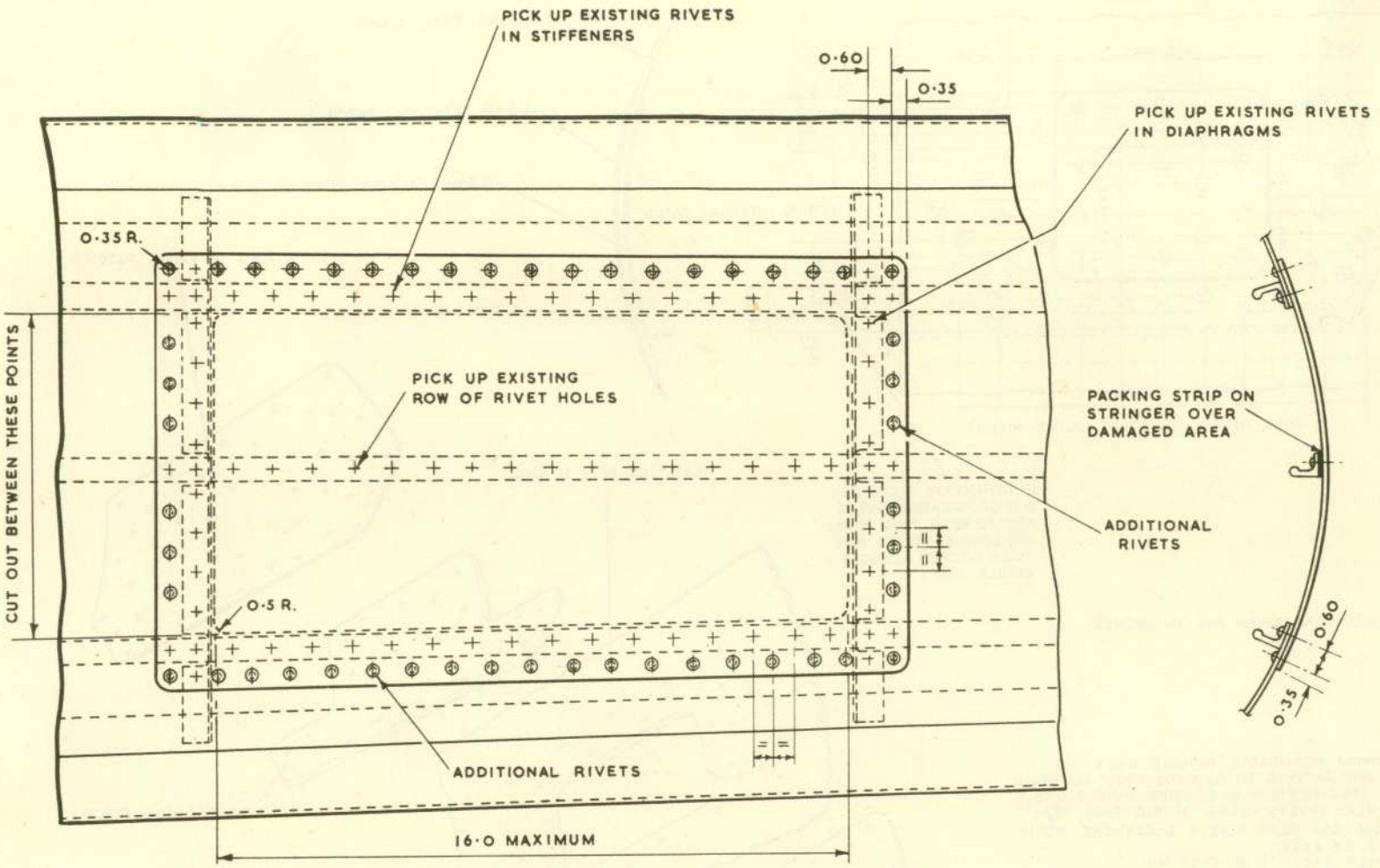


PATCHES TO BE MADE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS THAT EXISTING.
RIVETS TO BE 5/32 IN. DIA. 90° C'S'K TO A.S.2229 FOR OUTER SURFACES AND MUSHROOM HEAD TO A.S.2228 FOR WEBS.
ALL DIMENSIONS GIVEN ARE IN INCHES.
CHAMFER ALL EDGES OF PATCH 45°.

NO RIVET SHOULD BE POSITIONED CLOSER THAN 0·5 IN. TO ANOTHER

REPAIR PATCH TO DIAPHRAGM.
IF MADE FROM SHEET, FLANGE TO FOLLOW OUTSIDE SKIN PROFILE, BUT IF CUT FROM A SPARE, PACKING SHOULD BE INSERTED BETWEEN THE FLANGE AND THE SKIN PATCH.

Fig. 4/48. Boom repair (2)



NOTES.—

ALL DIMENSIONS GIVEN ABOVE ARE IN INCHES.

NO RIVETS SHOULD BE POSITIONED CLOSER THAN 0·5 IN. PITCH.

RIVET HOLES MARKED THUS + ARE EXISTING.

PATCHES TO BE MADE FROM MATERIAL OF SAME THICKNESS AND SPECIFICATION AS THAT EXISTING.

RIVETS TO BE 5/32 IN. DIA. 90° C'S'K HEAD TO A.S. 2229.

Fig. 4/49. Boom repair (3)

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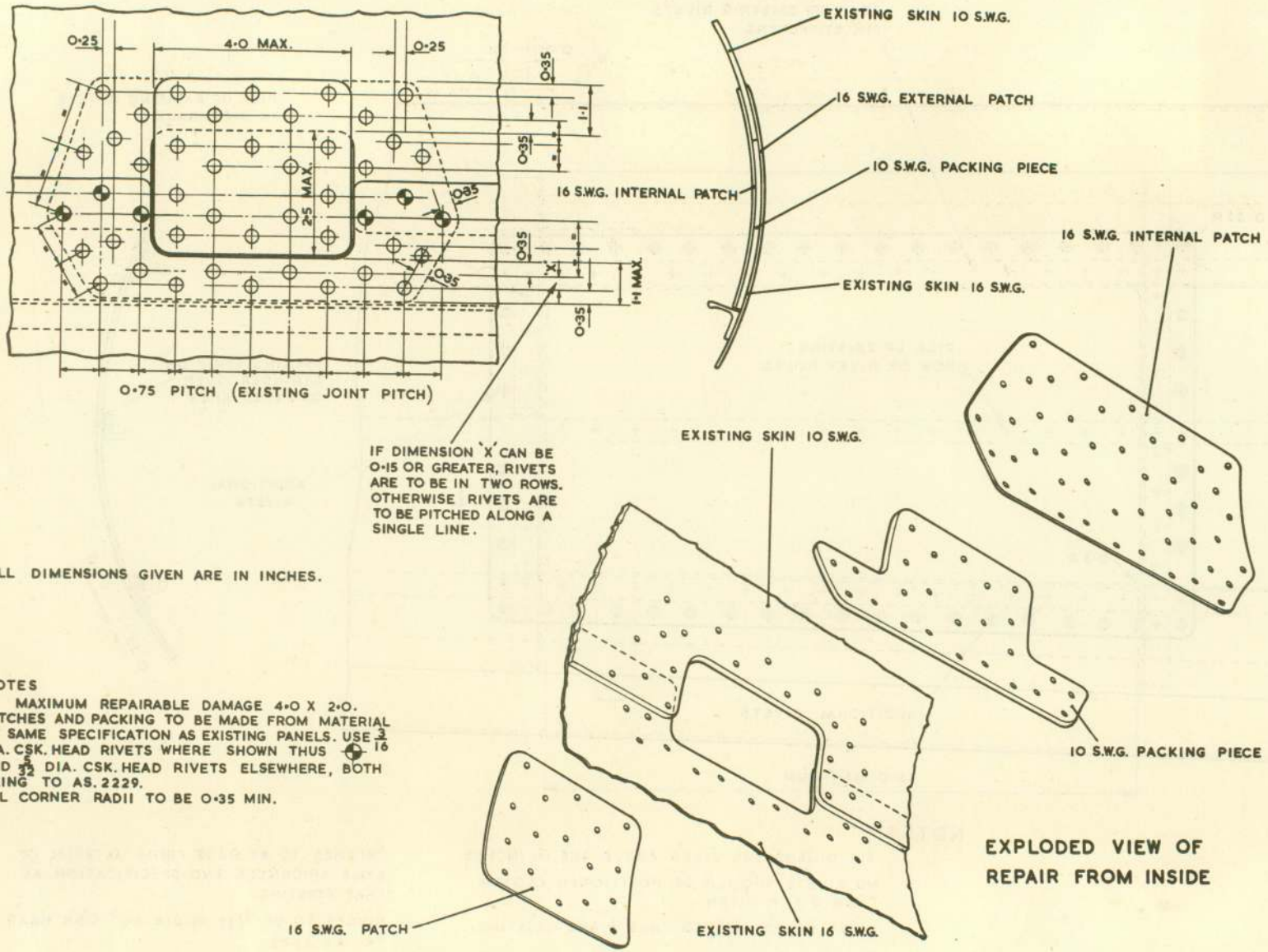


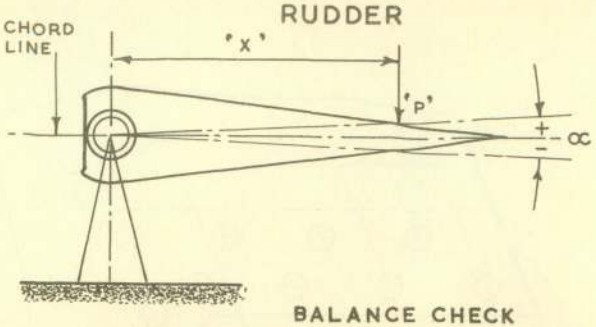
ALL DIMENSIONS GIVEN ARE IN INCHES.

NOTES

MAXIMUM REPAIRABLE DAMAGE 4·0 X 2·0.
PATCHES AND PACKING TO BE MADE FROM MATERIAL OF SAME SPECIFICATION AS EXISTING PANELS. USE $\frac{3}{16}$ DIA. CSK. HEAD RIVETS WHERE SHOWN THUS ⊕ AND $\frac{5}{32}$ DIA. CSK. HEAD RIVETS ELSEWHERE, BOTH BEING TO AS. 2229.
ALL CORNER RADII TO BE 0·35 MIN.

Fig. 4/50. Boom repair (4)

RUDDER



BALANCE CHECK

SUPPORT AT TOP HINGE AND END OF TORQUE TUBE WITH HINGE CENTRE LINE HORIZONTAL SO THAT IT PIVOTS FREELY.
THE RUDDER MUST BALANCE WITH ITS CHORD LINE WITHIN THE ANGULAR TOLERANCE ∝ WHEN A LOAD 'P' IS APPLIED AT DISTANCE 'X' FROM THE HINGE CENTRE LINE [SEE TABLE]

AIRCRAFT TYPE	ANGULAR TOLERANCE '∝'	LOAD IN OUNCES 'P'	DISTANCE 'X' INCHES
MK.1	± 2°	24 ± 6	17·7 ✳
MK.2 AND 4	± 2°	3 ± 2	12·0
MK.3	NIL	3·5 ± 3	12·0

✳ LOAD 'P' MAY BE SUSPENDED FROM THE TRAILING EDGE AT A POINT WHERE THE RUDDER CHORD IS 17·7 IN. = 'X'

WEIGHT ADJUSTMENT

RUDDERS MK. 1, 2 AND 4

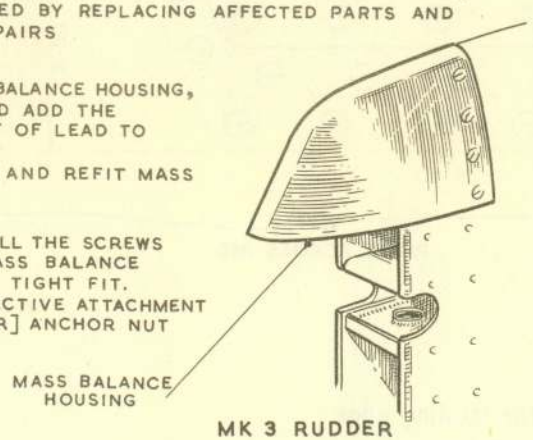
NO WEIGHT ADJUSTMENT IS POSSIBLE ON THESE RUDDERS, DAMAGED RUDDERS WHICH WHEN REPAIRED EXCEED OR WOULD EXCEED THE ANGULAR TOLERANCE [CHECK BY CALCULATION] SHOULD BE REPAIRED BY REPLACING AFFECTED PARTS AND NOT BY PATCH REPAIRS

RUDDER MK.3

REMOVE MASS BALANCE HOUSING, RUN OUT RESIN AND ADD THE NECESSARY AMOUNT OF LEAD TO ACHIEVE BALANCE.
REFILL WITH RESIN AND REFIT MASS BALANCE HOUSING

IMPORTANT

ENSURE THAT ALL THE SCREWS ATTACHING THE MASS BALANCE HOUSING ARE OF A TIGHT FIT. REPLACE ANY DEFECTIVE ATTACHMENT I.E. SCREW AND [OR] ANCHOR NUT AS NECESSARY

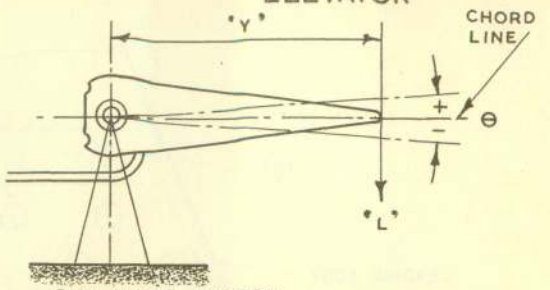


MK 3 RUDDER

GENERAL NOTE

AFTER A REPAIR HAS BEEN CARRIED OUT TO A RUDDER OR AN ELEVATOR, A BALANCE CHECK SHOULD BE MADE IN THE MANNER GIVEN ON THIS ILLUSTRATION. THE COMPONENTS SHOULD BE COMPLETE WITH TABS, TAB CONNECTING RODS, IF FITTED, AND THE FINAL PAINT SCHEME

ELEVATOR



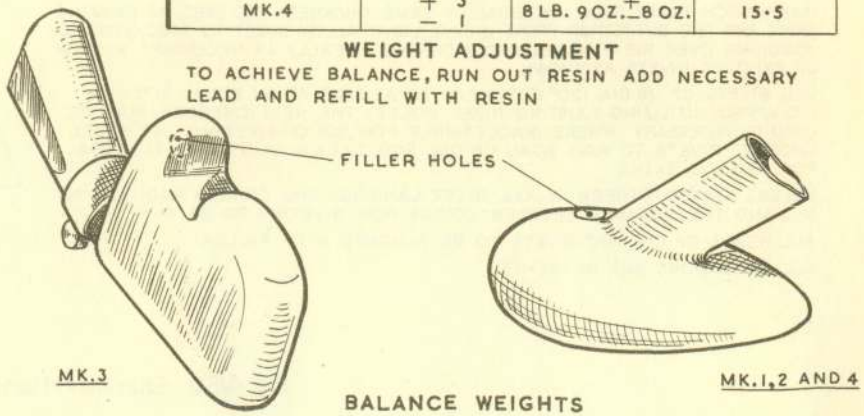
BALANCE CHECK

SUPPORT AT TORQUE TUBE ENDS WITH HINGE CENTRE LINE HORIZONTAL SO THAT IT PIVOTS FREELY.
THE ELEVATOR MUST BALANCE WITH ITS CHORD LINE WITHIN THE ANGULAR TOLERANCE 'Θ' WHEN A LOAD 'L' IS APPLIED AT DISTANCE 'Y' FROM THE HINGE CENTRE LINE [SEE TABLE]

AIRCRAFT TYPE	ANGULAR TOLERANCE 'Θ'	LOAD 'L'	DISTANCE 'Y' INCHES
MK.1 PRE. MOD. 262 AND 321	+ 3° − 1°	8 LB. 0 OZ. ± ½ OZ.	15·5
MK.1 POST MOD. 262 AND 321	+ 3° − 1°	8 LB. 9 OZ. ± 8 OZ.	15·5
MK.2 PRE. MOD. 269 AND 367	± 2°	7 LB. 1 OZ. ± 15 OZ.	15·5
MK.2 POST MOD. 269 AND 367	± 2°	8 LB. 9 OZ. ± 6 OZ.	15·5
MK.3	NIL	8 LB. 12 OZ. ± 7 OZ.	18·5
MK.4	+ 3 − 1	8 LB. 9 OZ. ± 8 OZ.	15·5

WEIGHT ADJUSTMENT

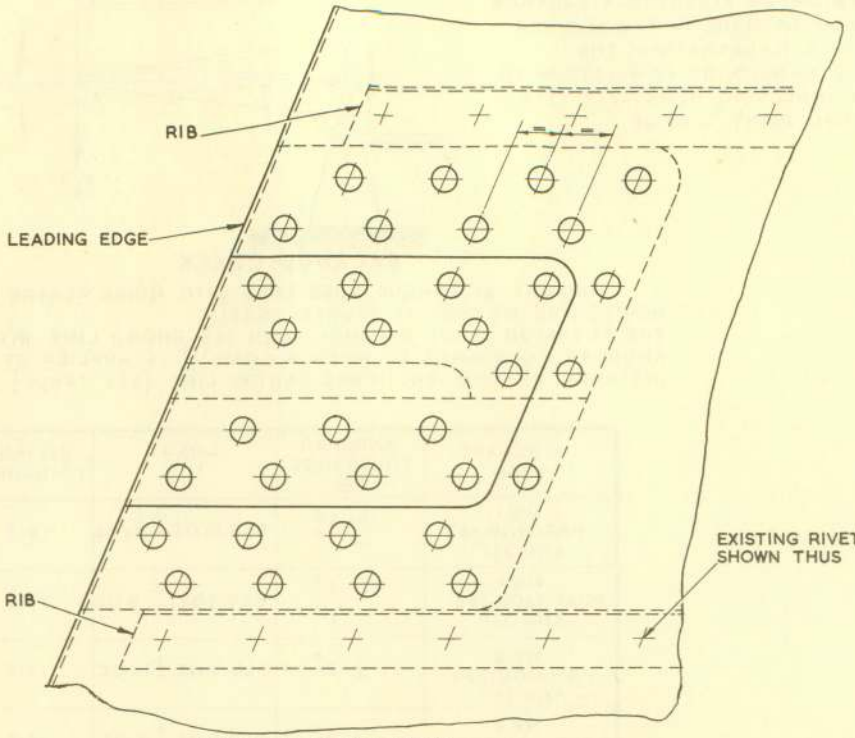
TO ACHIEVE BALANCE, RUN OUT RESIN ADD NECESSARY LEAD AND REFILL WITH RESIN



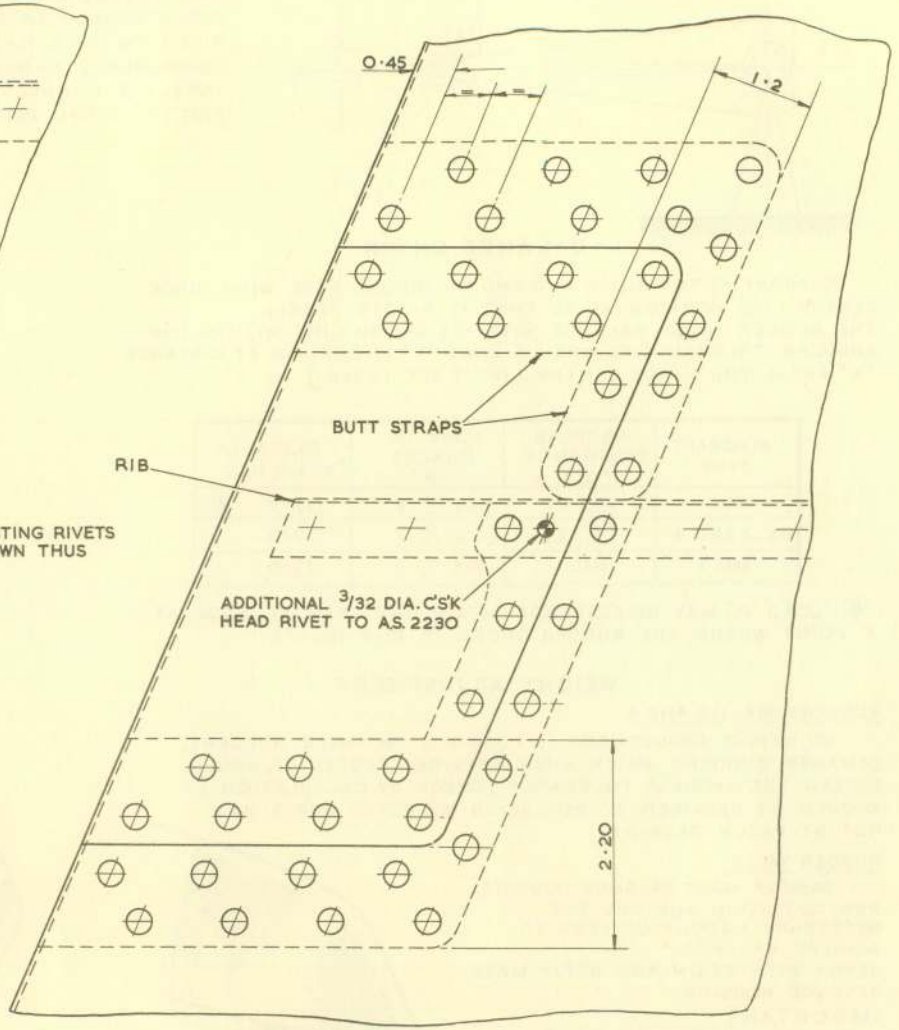
BALANCE WEIGHTS

Fig. 4/51. Rudder and elevator balancing

169337 / 5066 375 2/57 B.B.Ltd. Gp. 979



PATCH IN CLEAR AREA



PATCH ACROSS RIB

NOTES

MAKE PATCH PLATE FROM MATERIAL OF SAME THICKNESS AND SPEC. AS EXISTING SKINS AND THE BUTTSTRAP FROM 18 S.W.G. LIGHT ALLOY SHEET TO SPEC. D.T.D. 610 JOGGLING OVER RIB FLANGES AND WIDENING LOCALLY AS NECESSARY TO PICK UP EXISTING RIVETS AS SHOWN

USE RIVETS OF 1/8 DIA. 120° C'S'K HEAD TO A.S. 2230 AT AN EQUAL PITCH OF 1·0 APPROX UTILIZING EXISTING RIVET HOLES. THE NEXT OVERSIZE MAY BE USED IF NECESSARY. WHERE INACCESSIBLE FOR SOLID RIVETING, USE STEEL CHOBERT RIVETS TO A.G.S. 2041, 1/8 DIA. FOR 22 S.W.G. SKINS AND 5/32 DIA. FOR 18 S.W.G. SKINS

UNLESS STATED OTHERWISE ALL RIVET LANDINGS AND CORNER RADII TO BE 0·3 AND THE DISTANCE BETWEEN DOUBLE ROW RIVETING TO BE 0·5

ALL HEADS OF CHOBERT RIVETS TO BE PLUGGED WITH FILLER

ALL DIMENSIONS ARE IN INCHES

Fig. 4/52. Skin insertion repair fin leading edge

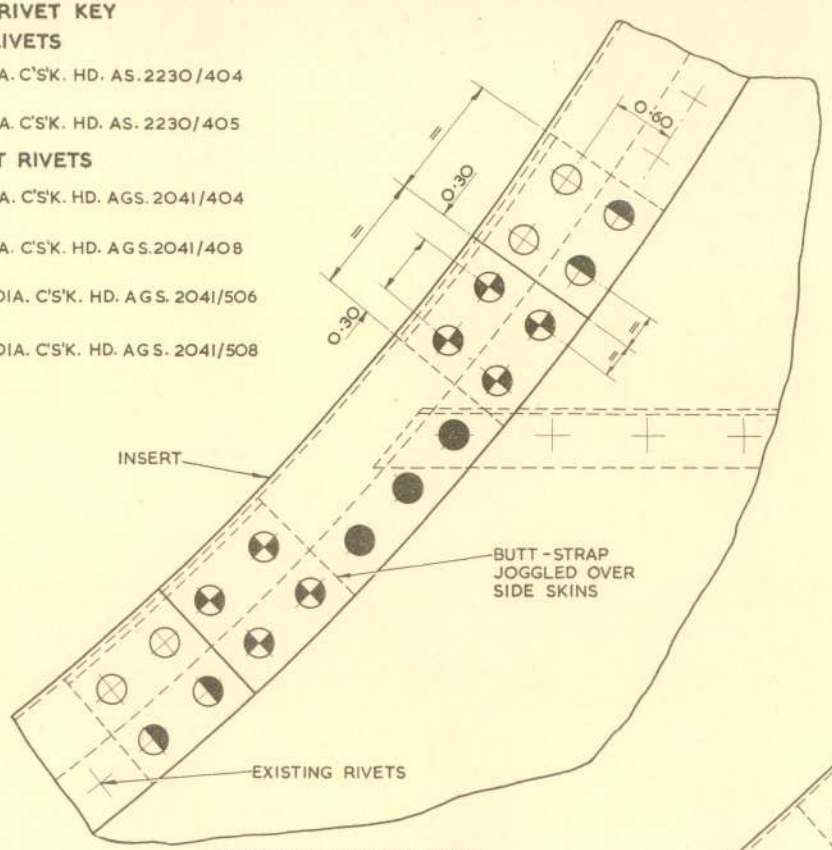
RIVET KEY

SOLID RIVETS

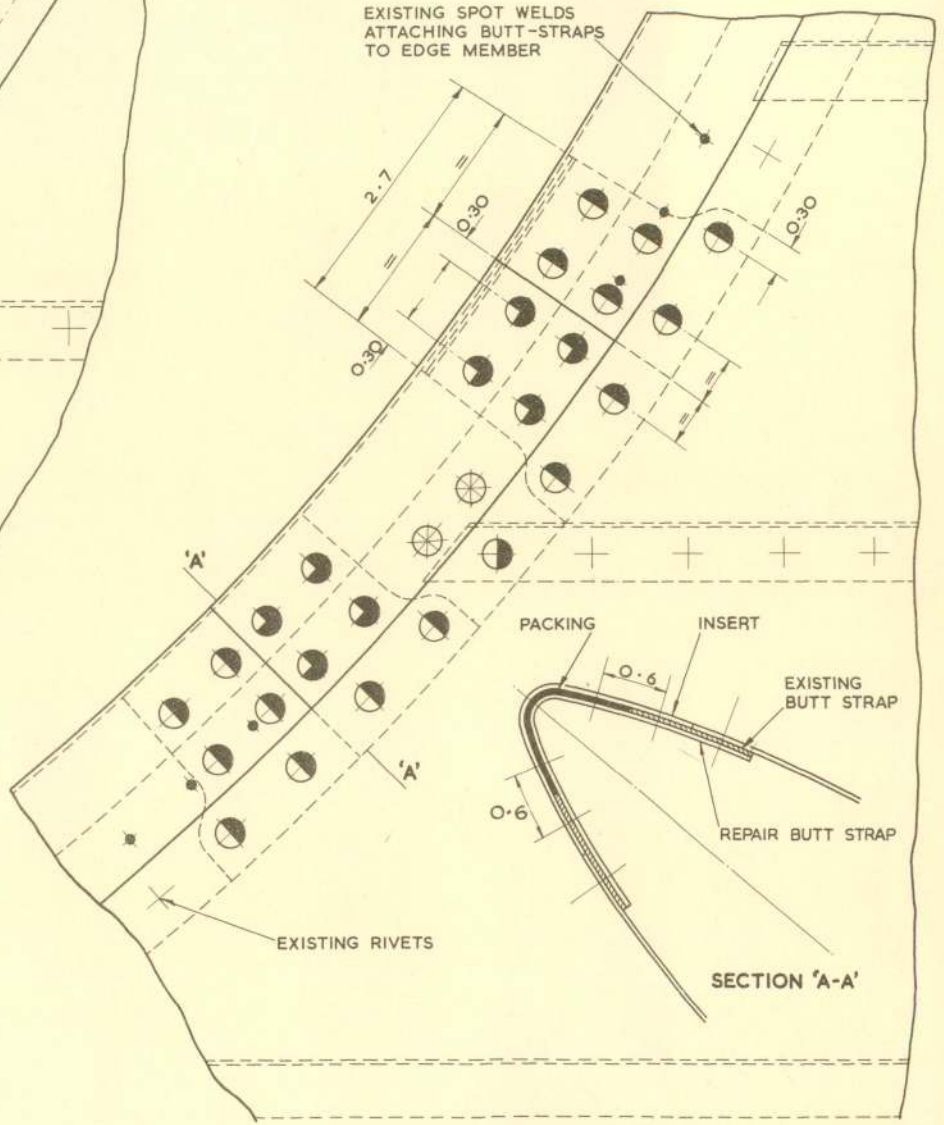
- 1/8 DIA. C'S'K. HD. AS.2230/404
- 1/8 DIA. C'S'K. HD. AS. 2230/405

CHOBERT RIVETS

- 1/8 DIA. C'S'K. HD. AGS. 2041/404
- 1/8 DIA. C'S'K. HD. AGS.2041/408
- 5/32 DIA. C'S'K. HD. AGS. 2041/506
- 5/32 DIA. C'S'K. HD. AGS. 2041/508



REPAIR TO EARLY TYPE



REPAIR TO LATER TYPE

NOTES

REMOVE THE DAMAGED AREA BY CUTTING THROUGH MID-WAY BETWEEN EXISTING RIVETS AS SHOWN. ON THE LATER TYPE THE POSITION OF THE CUT SHOULD BE SUCH THAT WILL ALSO LEAVE A DISTANCE OF 0·3 MIN. BETWEEN A SPOT-WELD AND AN ADDITIONAL RIVET.

MAKE THE INSERTS BUTT STRAPS AND PACKING FROM 18 S.W.G. LIGHT ALLOY SHEET SPECIFICATION L.72

THE HEADS OF CHOBERT RIVETS SHOULD BE FILLED WITH FILLER.

IF EXISTING HOLES BECOME ELONGATED, THE NEXT OVERSIZE RIVETS MAY BE USED

ALL DIMENSIONS GIVEN ARE IN INCHES

Fig. 4/53. Repair to edge member, dorsal fin

169337 / 5066 375 2/57 B.B.Ltd. Gp. 979

APPENDIX F CHAPTER 4 TAIL UNIT

FITTING INSTRUCTIONS FOR REPLACEMENT COMPONENTS

APPENDIX F Chapter 4 TAIL UNIT

—FITTING INSTRUCTIONS FOR REPLACEMENT COMPONENTS

LIST OF CONTENTS

ILLUSTRATION

Scope of Appendix F

1. The fitting instructions supplied in this appendix supplement the *assembly* information in the relevant Vol. 1 and basically apply to NEW tail unit replacement components. When reconditioned components or those transferred from other aircraft are to be fitted, the full instructions will not apply as the components will have been already trimmed when fitted to previous aircraft. Hence only very limited trimming will be possible. If several similar replacement items are available, much time and trouble will be saved by initial selection of the most suitable item for the aircraft concerned.

Rudder top hinge rib, fin; Mk.3 and 4

2. Damaged hinge ribs should be removed and, referring also to fig. 4/F1, replacements fitted in the following manner:—

(1) Remove the top fairing.

(2) Mark the position of the hole centre-line (A *in fig.* 4/F1) on each of the fin skins and pencil a line parallel to the top edge of the skin. The distance from this edge is 4·0 in.

(3) Take off the top diaphragm by removing the rivets through the skins and the spar diaphragm top flange.

(4) Take out the spar diaphragm by removing the rivets through the skins, shroud and the hinge rib upper rear attachment flange.

(5) Detach the hinge rib by removing first the rivets through the spar, then the three rivets through the nose riblet and, finally, those through the skins. Withdraw the rib by carefully raising the rear end over the spar.

(6) Trim sufficient of the shroud plates (B *in fig.* 4/F1) adjacent to the hinge rib to enable the appropriate riveting tools to be applied to rivets through the spar and at the ends of the upper and lower rear attachment flanges of the hinge rib.

(7) Position the hinge rib with the forward tongue resting on the nose riblet and the aft portion protruding through the shroud. Endeavour to push the rib

forward sufficiently to allow the lower rear attachment flange to slip over the spar. Should the skin stiffeners foul the rib side flanges and prevent this forward movement, the rib flanges may be trimmed (C *in fig.* 4/F1).

(8) Align and clamp the hinge rib in position (A *in fig.* 4/F1); drill for the attachment holes and, finally, secure the rib using $\frac{1}{8}$ in. dia. rivets to AS.2227/406 (*Chap.* 1, *Table No.* 1) through the nose riblet, AS.2230/405 through the flanges, and $\frac{5}{32}$ in. dia. Chobert rivets to A.G.S.2045/508 with pins to A.G.S.2047/508 through the lower rear attachment flange.

(9) Place the spar diaphragm inside the fin so that it lies loosely on the hinge rib and in such a way that its final location (*sub-para.* 11) can be achieved.

(10) Replace the top diaphragm and secure it with $\frac{1}{8}$ in. dia. rivets to AS.2230/404.

(11) Pull the spar diaphragm up into place, and secure it with $\frac{1}{8}$ in. dia rivets to AS.2230/404 through the skins, AS.2230/404 (2 off) and 405 (1 off) through the top diaphragm, Chobert rivets to A.G.S.2045/406 (2 off) through the shroud, and $\frac{5}{32}$ in. dia. pinned Chobert rivets (*sub-para.* 8) through the hinge rib upper rear attachment flange.

(12) Refit the top fairing.

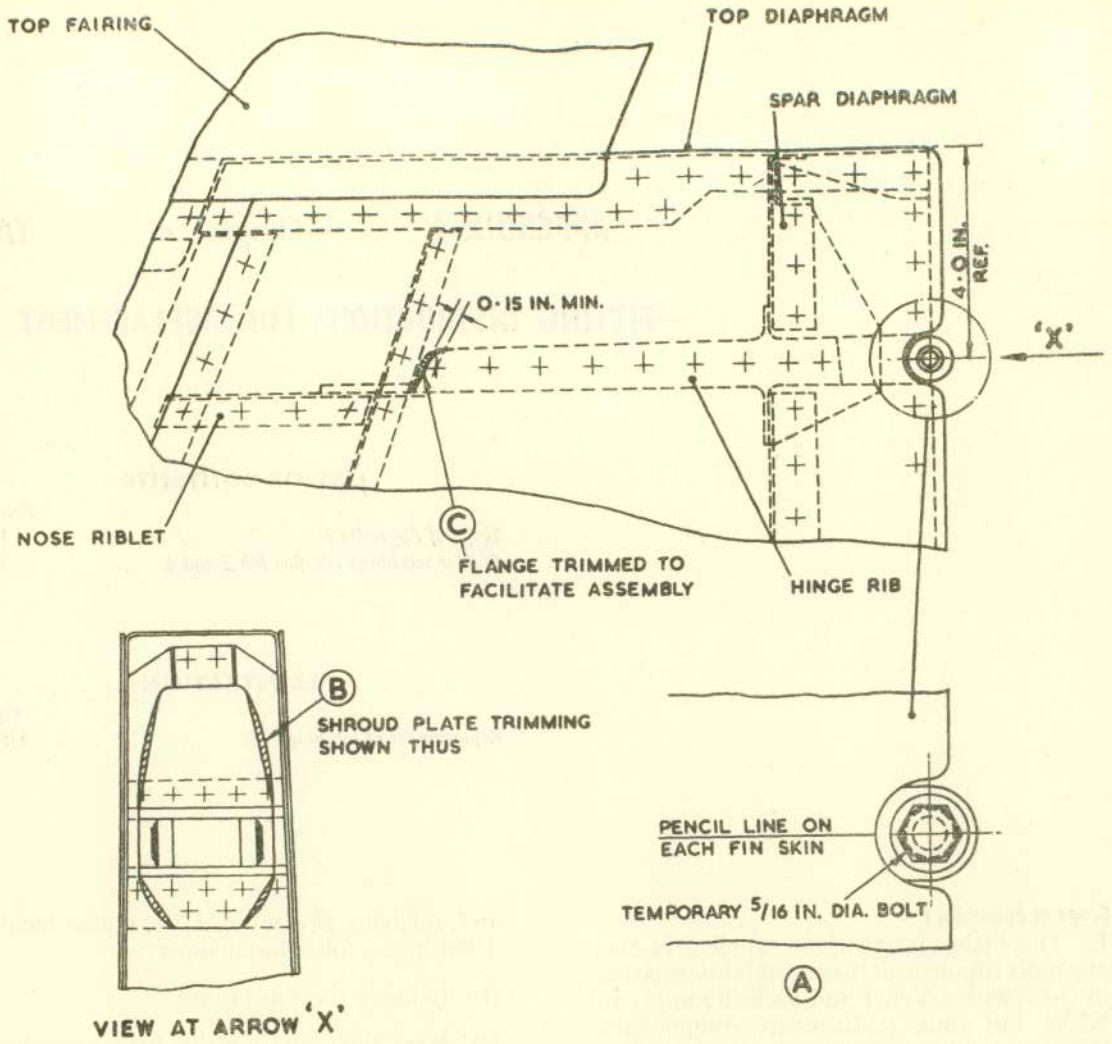


Fig. 4/F1. Replacement of top hinge rib

H5389 255920/8220 375 4/58 B. & S. Ltd. Gp.589/4