CHAPTER 8

MISCELLANEOUS REPAIRS

Chapter 8

MISCELLANEOUS COMPONENTS
(Completely revised)
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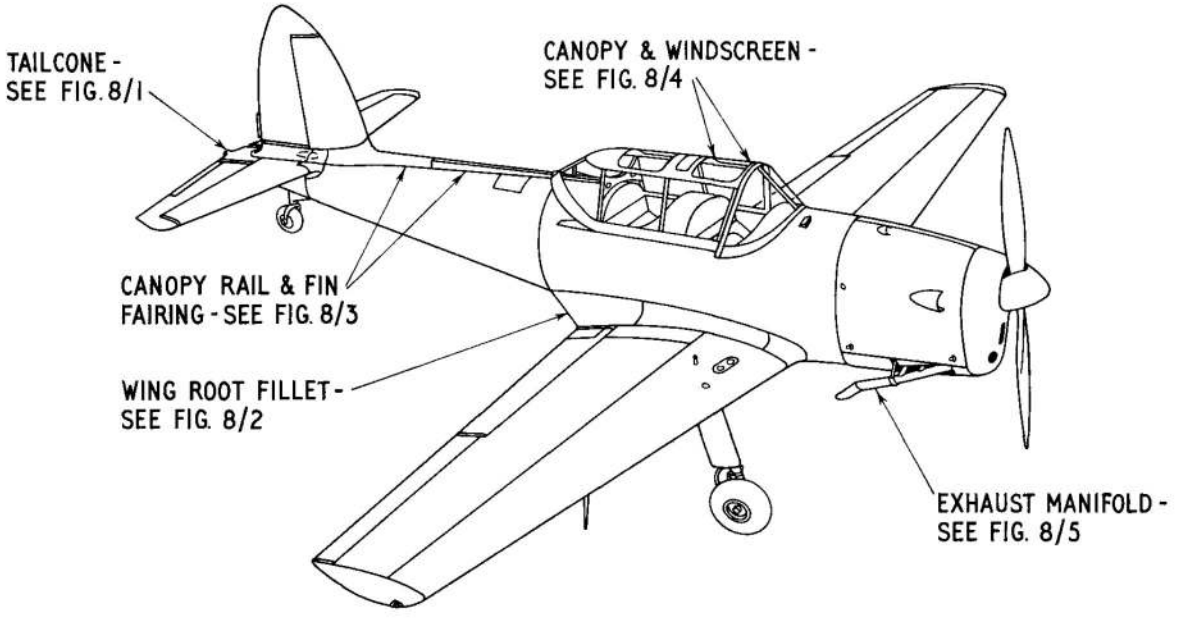


Components index diagram

TABLE 1

Definitions of negligible and repairable damage

Component	Negligible damage	Repairable damage	Repair fig. No.	Key fig. No.
TAIL CONE				8/1
Skin	Any smooth dents without cracks	Damage up to 5.0 in. dia.	8/6	
Ribs, angles, etc	Any smooth dents without cracks	Damage in excess of negligible, renew item		
WING ROOT FILLET				8/2
Nose skin	Any dents not more than 0.25 in. deep	Larger dents or torn areas	8/7	
Main skin	Any dents not more than 0.25 in. deep	Damage up to 5.0 in. dia.	8/6	
Rib, lap strips, reinforcings	Any dents not more than 0.25 in. deep	Damage in excess of negligible, renew item		
CANOPY RAIL AND FIN FAIRING				8/3
Rail	Small dents 0.02 in. deep, provided canopy runs freely	Damage in excess of negligible, renew item		
Channel	Smooth dents 0.05 in. deep 2.0 in. long	Damage in excess of negligible, renew item		
Side skin	Smooth dents 0.05 in. deep 2.0 in. long	Damage in excess of negligible, renew item		
Fin front fairing	Smooth dents 0.25 in. deep.	Cracks or tears	8/7	
WINDSCREEN AND CANOPY				8/4
Canopy Perspex	Areas of crazing up to 4 sq. in.	Cracks of any length	8/8*	
Canopy tubular frame	Dents up to 0.05 in. deep and bowing as in Chap. 1, para. 4B			
Metal skin	Any smooth dent.	Damage up to 2.0 in. dia.	8/6	
Masks	Any smooth dent	By renewal only		
Diaphragm	Any smooth dent	Damage up to 1.5 in. dia.	8/6	
Windscreen Perspex		Cracks and crazing	8/8*	
Tubular arch and strut	Smooth dents 0.02 in. deep and bowing of strut as in Chap. 1 para. 4B			
EXHAUST MANIFOLD				8/5
Main manifold	All smooth dents	Cracks and damage up to 1.5 in. dia.	8/9	
Branch pipes	All smooth dents	Cracks and damage up to 1.5 in. dia.		
Stay tube	Smooth dents 0.02 in. deep			

NOTE * A check must be made to ensure that vision is not obscured by repair.

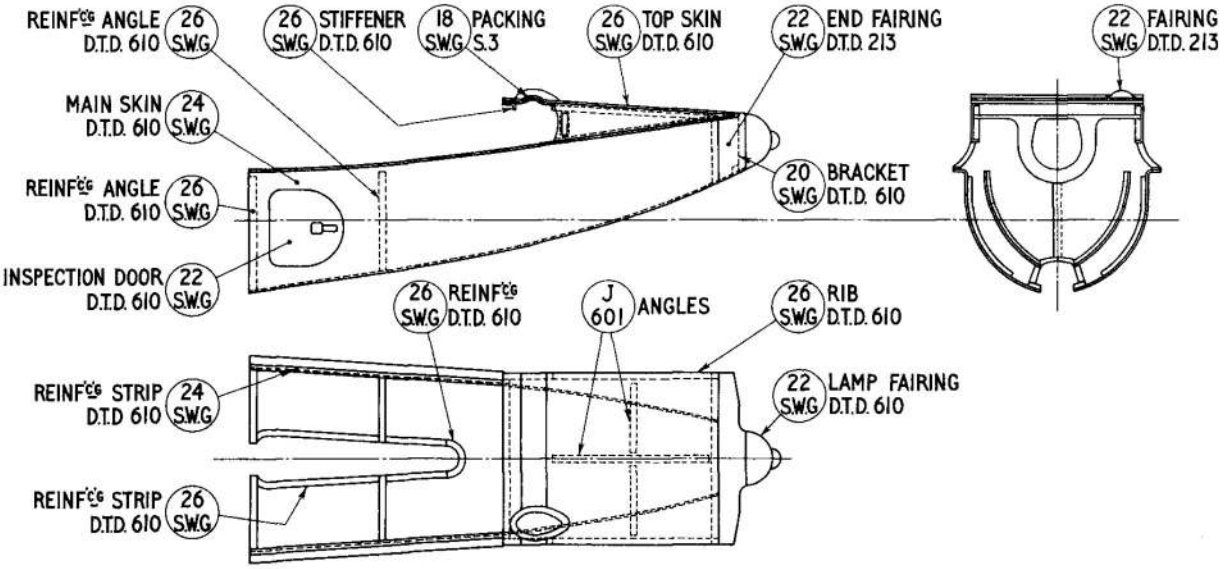


Fig. 8/1. Tail cone

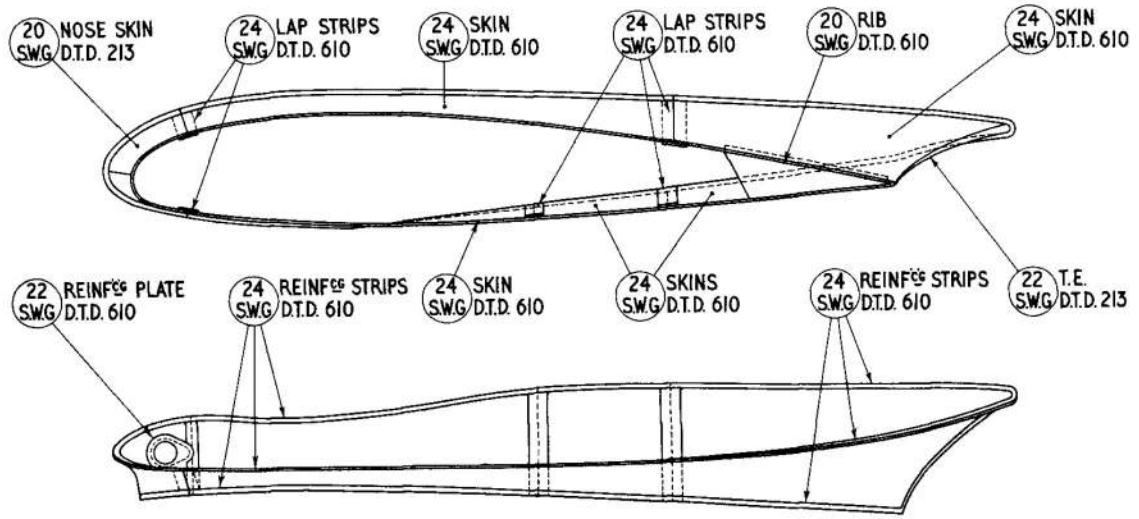


Fig. 8/2. Wing root fillet

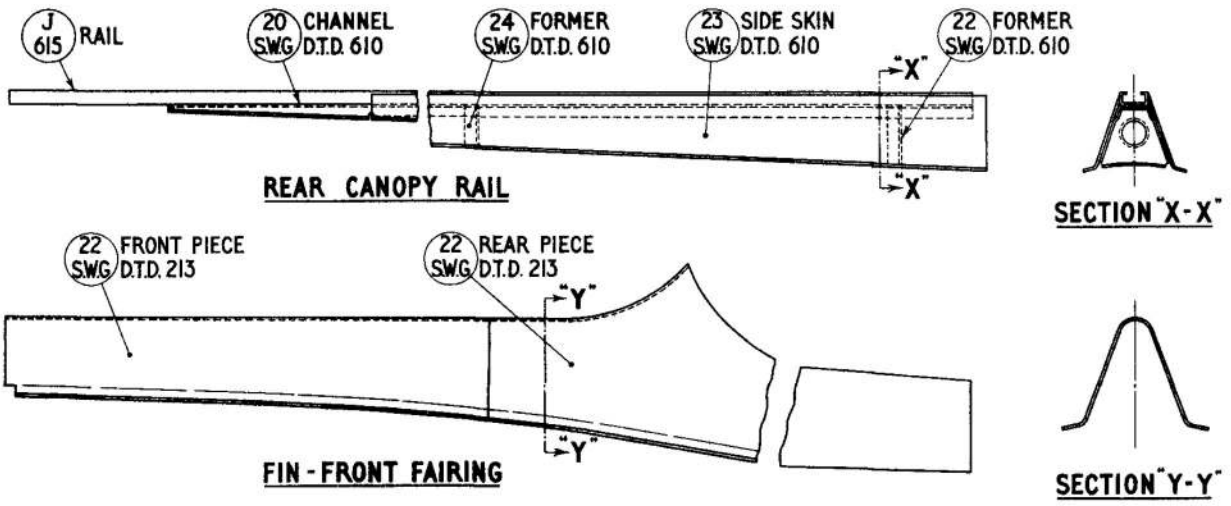


Fig. 8/3. Canopy rail and fin fairing

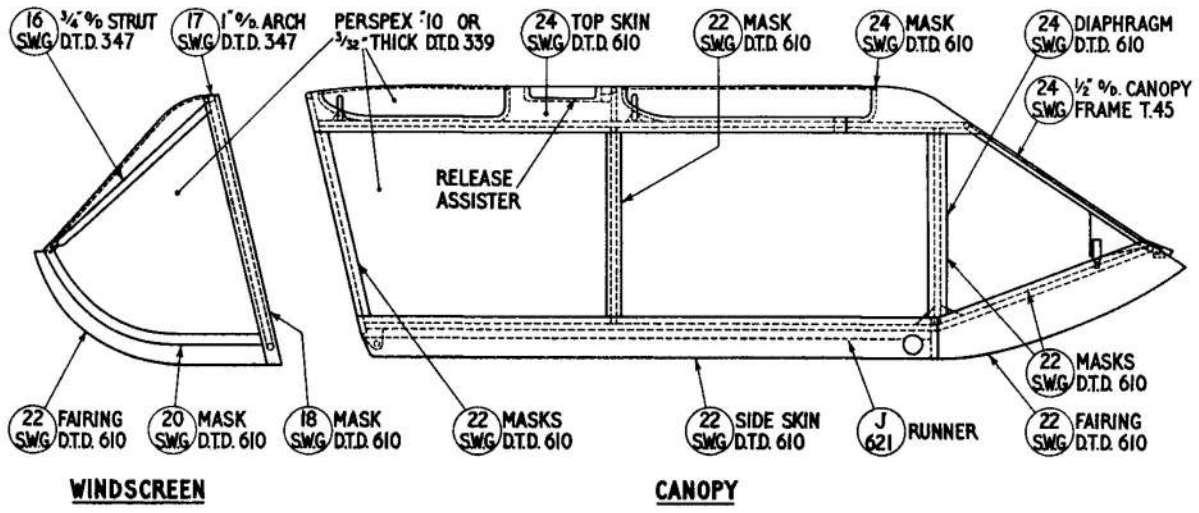


Fig. 8/4. Windscreen and canopy

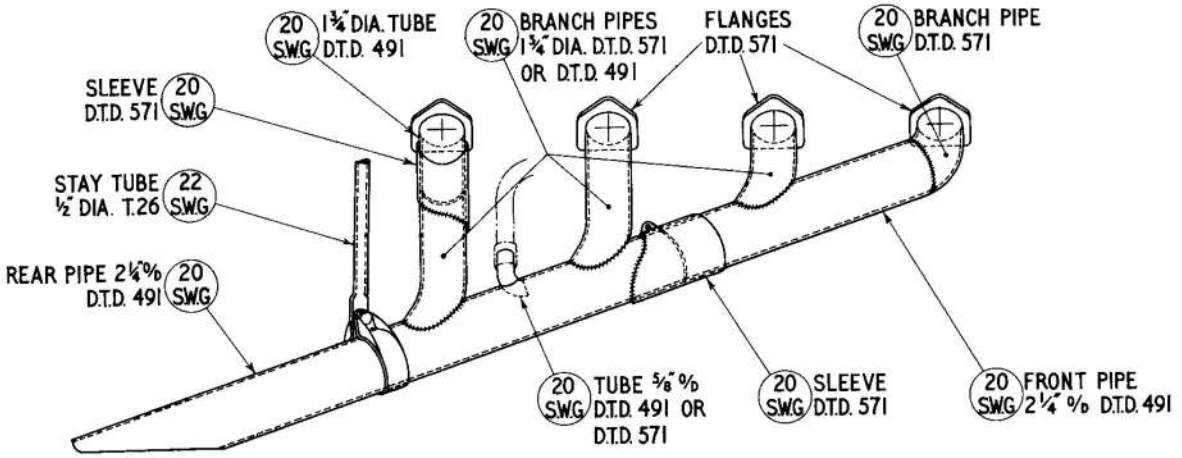
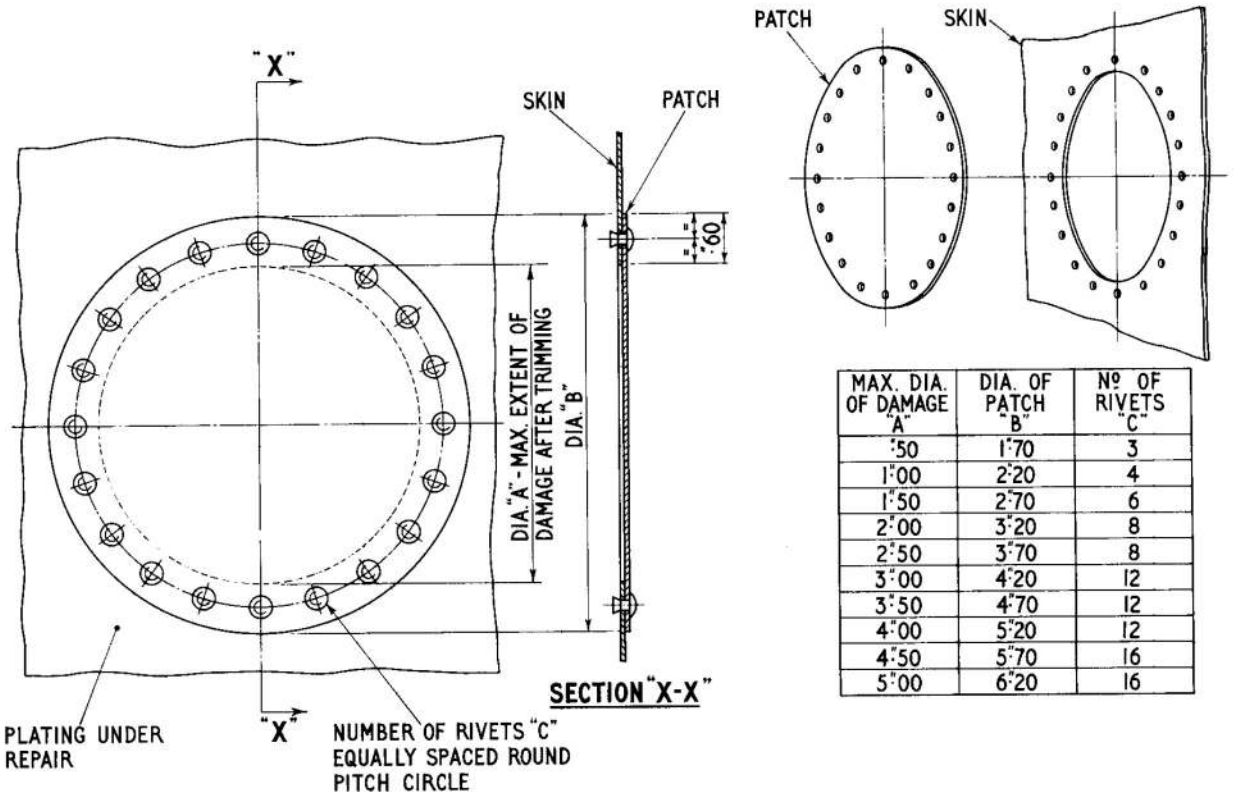


Fig. 8/5. Exhaust manifold



MAX. DIA. OF DAMAGE "A"	DIA. OF PATCH "B"	Nº OF RIVETS "C"
.50	1.70	3
1.00	2.20	4
1.50	2.70	6
2.00	3.20	8
2.50	3.70	8
3.00	4.20	12
3.50	4.70	12
4.00	5.20	12
4.50	5.70	16
5.00	6.20	16

Fig. 8/6. Patch repairs

Patch repairs

1. Patch material to be same gauge and material as existing skin. Rivets to be 3/32 in. dia. mushroom head AS2228/303 or where it is not possible to use solid rivets, $\frac{1}{8}$ in. dia. dome head pop rivets to A. G. S. 2050.

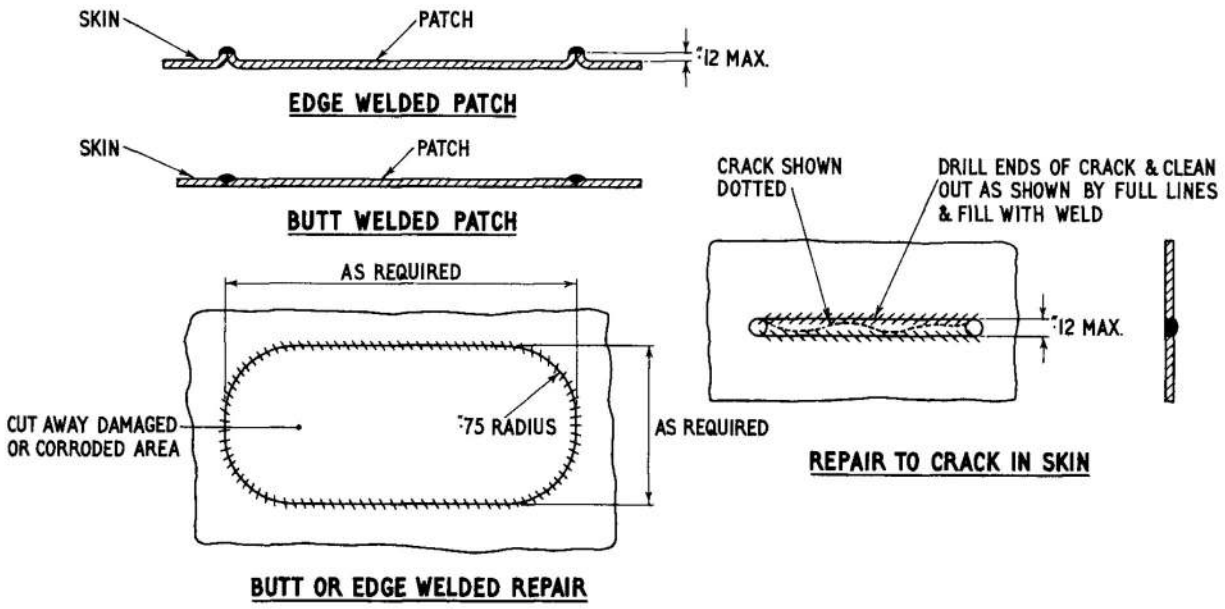


Fig. 8/7. Welded skin repairs

Welded repairs to skin

2. The damaged material should be trimmed to a symmetrical shape and the patch made to fit. Small areas can be repaired with a butt welded patch but with larger damaged areas the edge welded scheme should be used.

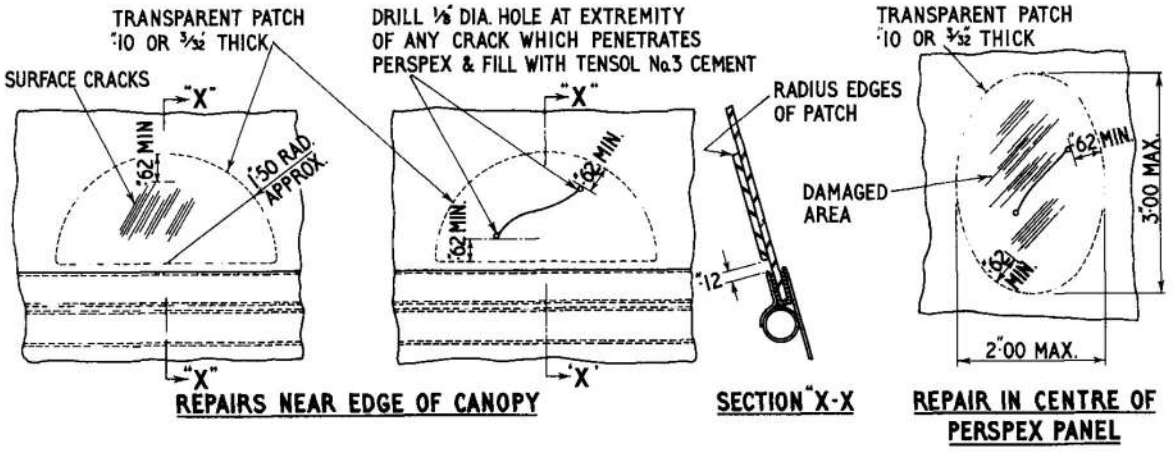


Fig. 8/8. Perspex repairs

Windscreen and canopy panel repairs

3. Patches must be made of Perspex and be performed or trimmed to suit contour of the canopy. Edges should be filed to a smooth finish. Patch should be cemented in position with Tensol No. 6 cement and clamped in position whilst setting. Overlap of patches must be as shown. All repairs to Perspex should be considered as temporary only. The damaged panel should be renewed as soon as possible (A. P. 1464B, Vol. 1, Part 2, Sect. 4, Chap. 5).

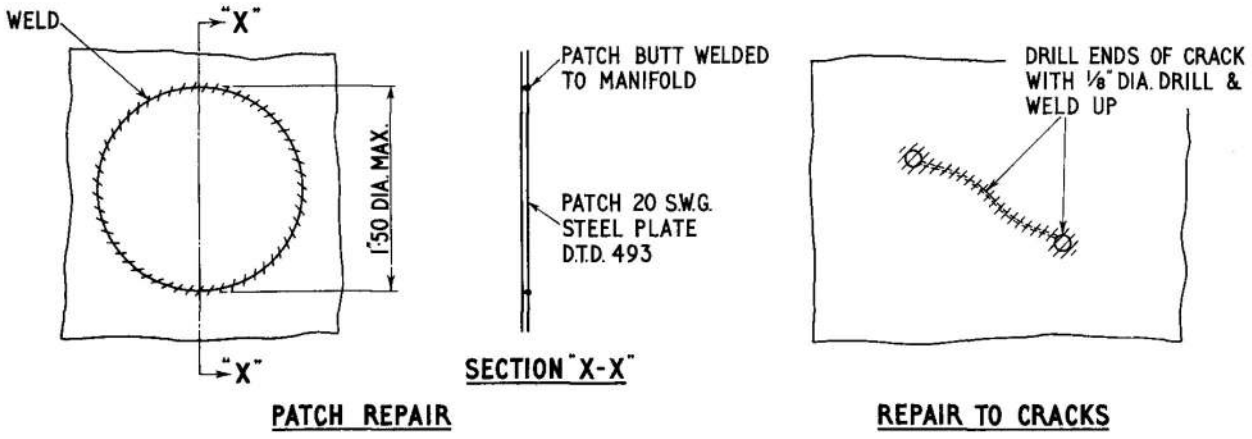


Fig. 8/9. Repairs to exhaust manifolds

Welded repairs to exhaust manifolds

4. . Welding should be carried out as described in A. P. 880 A by approved personnel only, using welding rod to Specification BS. 1453 and Monotectic or Botectic welding flux and avoiding a "carburizing" flame. Heat treat repaired manifold at between 1000 and 1150 deg. C. for a period of 10 minutes after welding. The treatment oven temperature must be within the limits specified both before loading and during the treatment period and timing is not to commence until the oven regains the specified temperature after loading.

After welding and heat treatment a check must be made to ensure that all exhaust port flanges are level and correctly spaced to mate with ports on the engine. If a manifold is distorted such that these conditions are not met, the portion affected must be replaced and the assembly re-checked. Flanges may be ground to obtain alignment provided their thickness is not reduced to less than 0. 2 in.

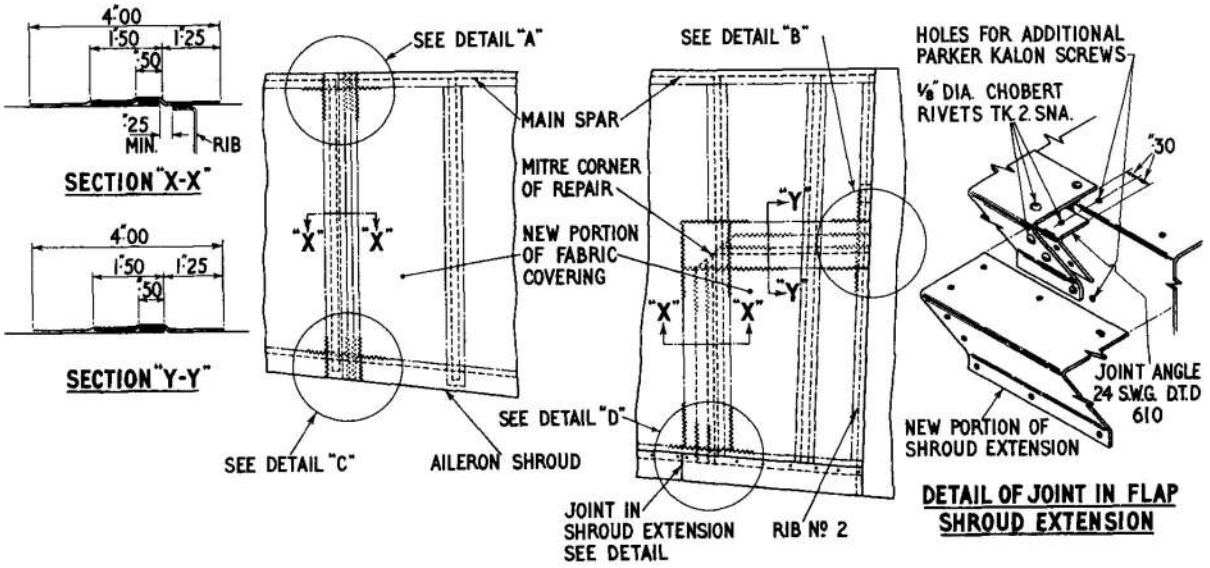


Fig. 8/10. Repairs to main plane fabric covering

Fabric repairs to main plane

5.. Repairs shown on fig. 8/10 are typical, and may be applied anywhere on the main plane. For details "A", "B", "C" and "D", see fig. 8/11. Fabric patches to be F. 1 or D. T. D. 540 with warp spanwise. Serrated tape is to D. T. D. 540. For stitching see fig. 8/15. Undamaged Parker Kalon screws can be replaced in undamaged holes. If holes are enlarged a size larger screw must be used. Drain washers must be fitted in bottom surface new fabric in some positions as in original fabric. Fabric tape to overlap existing tape 1.5 in. minimum.

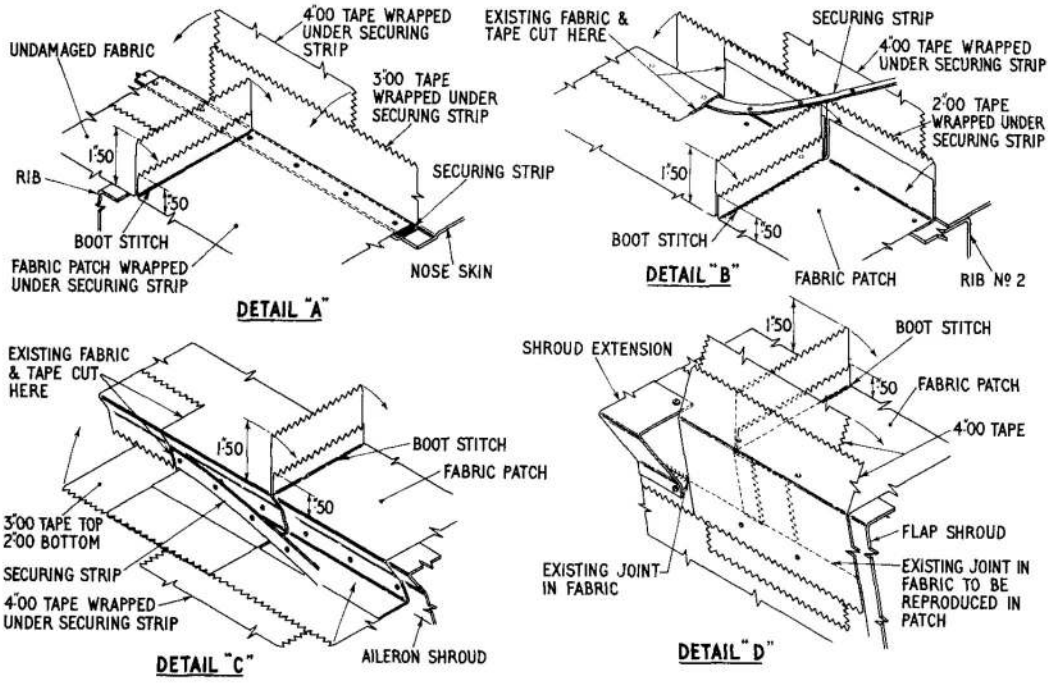


Fig. 8/11. Details of main plane fabric repairs

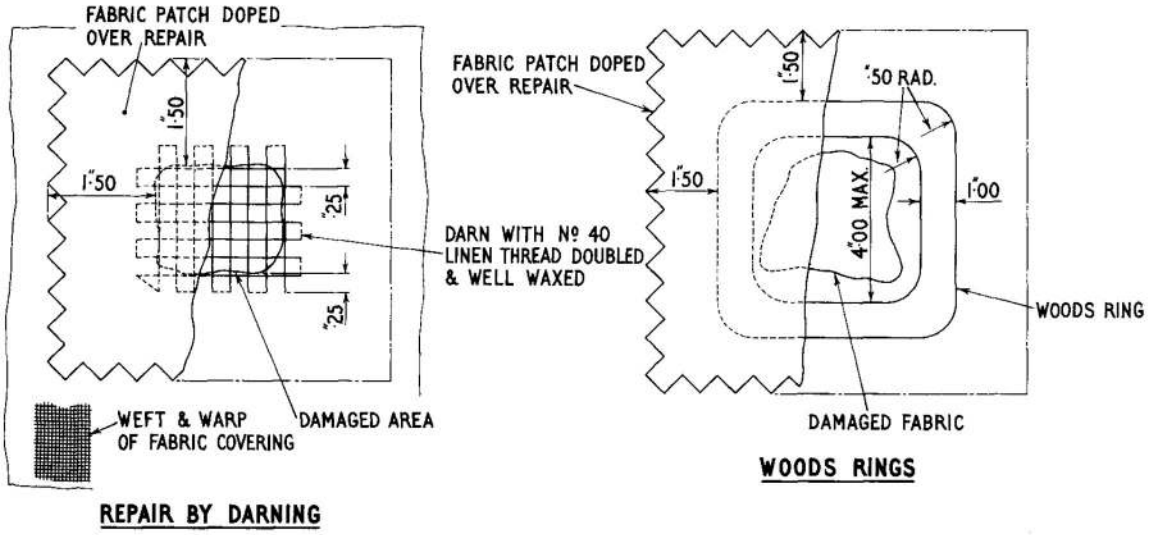


Fig. 8/12 Fabric repairs for small holes

Repairs for small holes in fabric

6. Damage up to 2 in., square may be repaired by darning; up to 4 in. square by doping a ring to fabric, cutting away fabric inside ring and doping on a fabric patch. Rings can be made from cellulose acetate at least 0.03 thick and can be circular or square (as shown) if a suitable Woods ring is not available. This repair provides, in effect, an inspection hole obtained by slitting patch inside ring and ripping off outwards. After inspection dope on new patch.

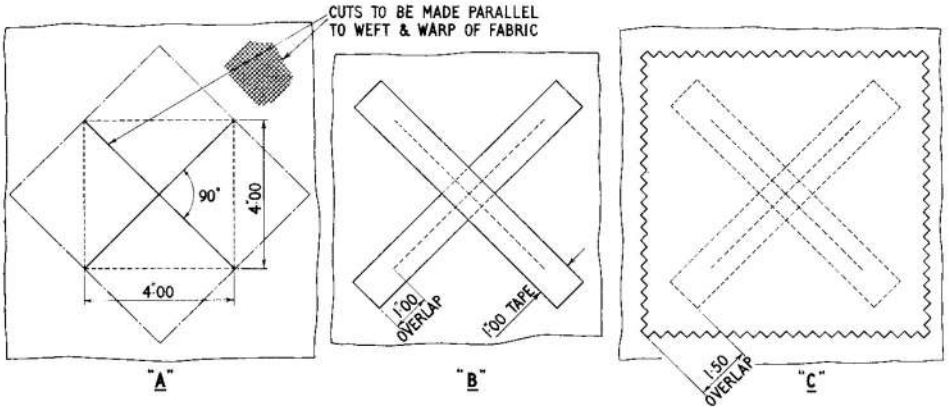


Fig. 8/13. Inspection hole in fabric

Inspection holes in fabric

7. When it is required to inspect the structure under the fabric a hole may be cut and repaired in the following manner.

(1) Cut fabric as shown by full lines in view "A" and fold back as shown by chain dotted lines.

(2) After completing internal work, fold fabric back to original position and stitch along cuts using herringbone stitch (fig. 8/15).

(3) Dope 1 in. wide fabric strips in position over stitching, as shown in view "B".

(4) Dope a serrated edge fabric patch over repair as shown in view "C".

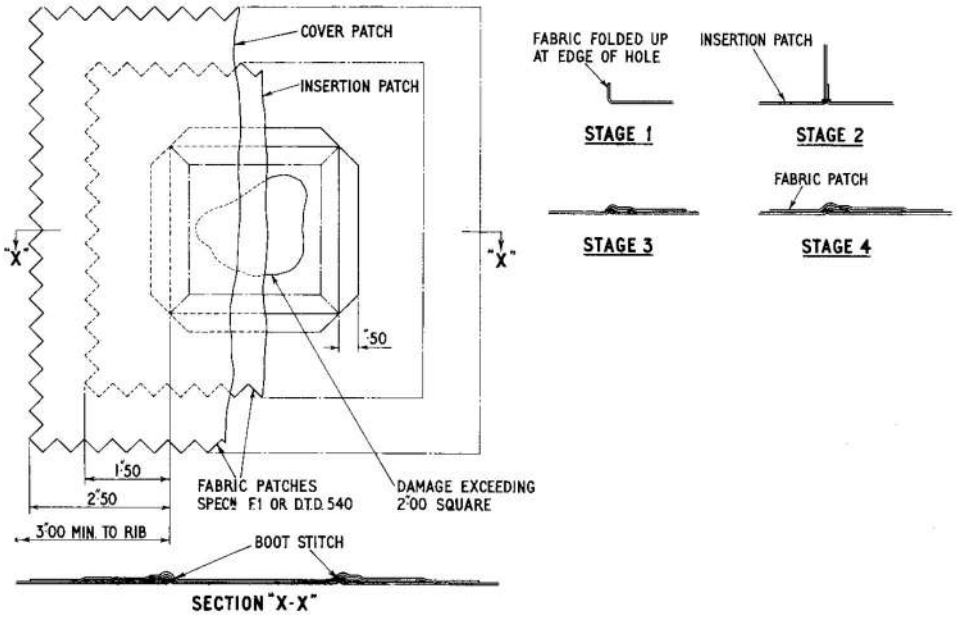


Fig. 8/14. Fabric insertion repair

Insertion repair of fabric

8. (1) Cut away damaged fabric in form of a square (sides parallel to weft and warp of fabric). Mitre the corners as shown and fold up.

(2) Stitch insertion patch to fabric using boot stitch.

(3) Dope down edges of insertion patch and fabric.

(4) Dope on cover patch.

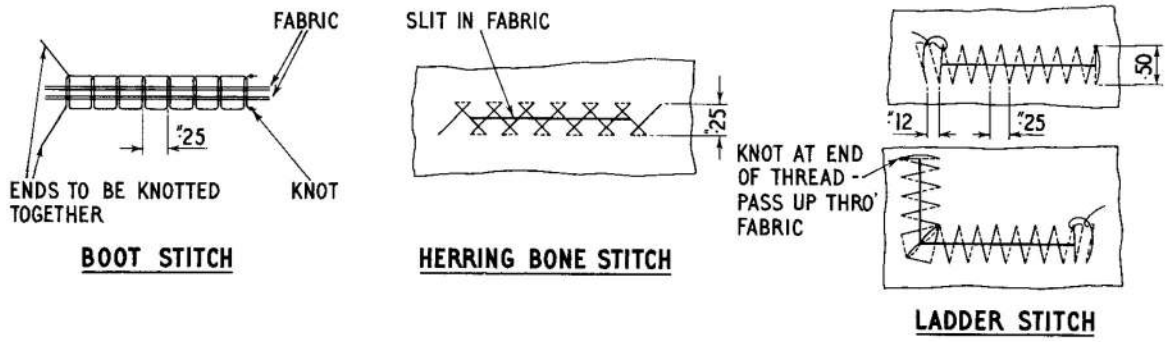


Fig. 8/15. Stitching for fabric repairs

Stitching methods.

Boot stitching

9. Used for insertion patches as shown in fig. 8/11 and 8/14.

Herringbone stitching

Used in repairing an inspection hole as shown in fig. 8/13

Ladder stitching

Used for cuts and tears which are at least 2.0 in. from a rib, for stitching a serrated fabric patch or for tape overlapping slit by at least 1.0 in. all round

Adjustment of aileron mass balance weight

10. Incidental to the repair of an aileron it may become necessary to adjust the mass balance weight. This should be done as shown in fig. 8/16.

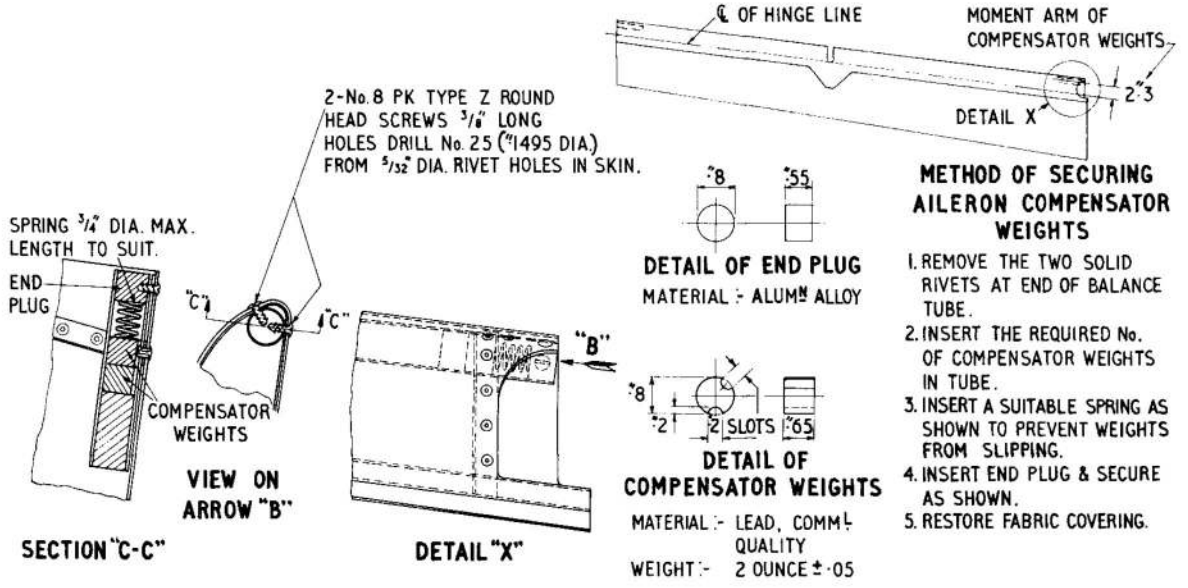


Fig. 8/16. Method of securing aileron compensator weights