CHAPTER 1

INTRODUCTORY REPAIR INFORMATION

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LIST OF CONTENTS

	Para.
Presentation of repair information	101
Structural classification	103
Keys to illustrations	104
General repairs	106
Glossary	107
Construction	108
Repair materials	111
Riveting	112
Use of bolts	114
Repair practices	115
Skin repairs	116
Reproduction of structural members	117
Heat treatment and bending	118
Marking off	121
Drainage holes	122
Lagging of hot air ducts	123
Spraytex coating in cabin	124
Neoprene coating - radome and similar plastic components	
Limitations of repair	125
Mixing of Neoprene top coat cement	127
Method of repair	128
Materials required	129
Protective value of Neoprene coatings	130
Repairs to insulation blankets ...	131
Honeycomb sandwich panels ...	133
Protective treatments	
General	134
Weatherproofing	136
Skin corrosion	139
Repair material	140
B.A., B.S.F., and B.S.P. wire thread inserts	
General	141
B.S.P. inserts, Type AS.4948 to AS.4959	
Choice of length	142
Materials	143
Tapping holes	144
Tools	145
Installation	146
Assembly of wire thread inserts ...	147

LIST OF TABLES

	Table
Standard material	1
Rivets	2
Bolts, nuts, screws	3
Rolled and extruded sections ...	4
Tools for B.A., and B.S.F. wire thread inserts	5
Tools for B.S.P. wire thread inserts	6
Installation data for B.A. and B.S.F. wire thread inserts from	7
and inclusive up to	11
Installation data for B.S.P. wire thread inserts from	12
and inclusive up to	15
Bend radii	
Aluminium alloy sheets	16
Magnesium alloy sheets	17
Steel sheets	18

LIST OF ILLUSTRATIONS

	Fig.
Insulation blanket repairs	101
Honeycomb sandwich panel repair	102
Skin repairs - non-pressurised - holes up to 2·5 in. dia.	103
Skin repairs - non-pressurised - inaccessible holes (not air intake duct skinning)	104
Repairs to flanged lightening holes	105
Repairs to dished lightening holes	106
Former insertion repairs - large channel sections	107
Flange and web repairs to channel members	108
Patch repair "T" section stringer	109
"T" section stringers - insertion repairs	110
Patch and insertion repairs to "Z" section stringers	111
Patch and insertion repairs - top hat section stringers	112
Patch and insertion repairs to small rolled section stiffeners ...	113
Patch and insertion repairs to small rolled section stiffeners	114
Repairs to riblets and intercostals	115
Repairs to skin at top hat and "Z" section stringers unpressurised	116
Repairs to skin at "T" stringer - unpressurised	117
Method of repairing cracked flanges in lightening holes	118
Method of repairing cracked diaphragms	119
Repairs to riblets - elevators, ailerons, rudder	120
Installation data for wire thread inserts	121
Assembly of wire thread inserts ...	122

LIST OF ILLUSTRATIONS (Cont'd.)

	Fig.
Typical repairs for damaged Dzus fastener holes	123

PRESENTATION OF REPAIR INFORMATION

101. General information and standard repairs have been covered, as far as possible, in this chapter, subsequent chapters dealing with the respective repair schemes of the major component units.

102. For easy referencing, the paragraph numbers in each chapter are prefixed by the number of that chapter, e.g., the first paragraph in Chapter 2 is numbered 201 and Chapter 3 starts with 301. The figure numbers are prefixed in a similar manner.

Structural classification

103. The 3-colour system of structural classification is used in subsequent chapters to indicate the degree of strength restoration required for each part of the structure.

RED denotes PRIMARY structure.

YELLOW denotes SECONDARY structure.

GREEN denotes TERTIARY structure.

These classifications are defined in A.P. 2662B, Sect.1, Chap.1,2. To facilitate identification of the structural assemblies, a thumbnail sketch of the aircraft is included in each illustration with the location of the assembly indicated.

Keys to illustrations

104. Keys to the structure illustrations give the material,gauge or standard section used in the manufacture of each member, also the limits of negligible damage. The pitch ratio of holes governs the minimum distance between two negligible holes, e.g., a pitch ratio of 4:1 means that two holes of say 0·5 inch. diameter must be at least 2 inches apart, measured between their centres. The distance between centres of negligible holes and the edge of the plate or the edges of flanged lightening holes must be at least twice the diameter of the damage. The distance between a negligible hole and a riveted or bolted joint, however, must conform to the limits quoted in the keys under pitch ratio. Holes must be cleaned out before classification.

105. In the case of negligible dents, the depth quoted in the keys to structure illustrations is the maximum allowable for dents of any size. The distance apart quoted in the keys applies only to dents up to 1 inch diameter, measured between centres. For dents larger than this, the minimum allowable distance apart increases in direct proportion to the increase in diameter of the dent.

General repairs

106. Repairs illustrated in this chapter may be applied to any similar component classed as repairable. The methods of combining the simple repairs to deal with damage involving several different kinds of component are also given. Exceptional cases, which cannot be repaired by the standard methods, are dealt with by specific repair illustrations in the appropriate chapters.

Glossary

107. The following definitions explain the terms used throughout the book to describe repair parts:-

(1) Filler plate:- An inserted piece of sheet carrying no load, which ensures continuity of profile.

(2) Handling hole:- A hole cut in a seating plate to facilitate handling and location.

(3) Insert:- A new load bearing portion replacing the damaged portion of a member.

(4) Landing:- The distance between a rivet centre and the adjacent edge of the material.

(5) Patch:- A load bearing portion of sheet overlapping the cleaned out damage.

(6) Seating plate:- A load bearing plate supporting the filler plate.

CONSTRUCTION

108. The airframe is built up of the following detachable components:-

(1) Nose fairing, the upper portion of which is of orthodox metal construction and the lower a one-piece composite moulding.

(2) Front fuselage, constituting the crews' pressurised compartment.

(3) Rear fuselage, supporting the jet pipe detachable end caps and the composite tail cone.

(4) Main plane, comprising the following:-

(a) Centre section, embodying the nose-wheel unit, No.1 and No.2 fuel tank compartments, bomb compartment, air brakes, air intakes and engine bays.

(b) Outer wings, complete with main wheel units, fuel tank compartments, elevators and ailerons.

(5) Tail unit, comprising the fin and rudder.

109. The engines are lifted into position through the engine bay door openings on the underside of the centre section. Each engine is mounted in the main plane at three attachment points, being supported in the mounting blocks on the engine bay

ribs by two trunnions, one on each side of the H.P. compressor casing and steadied at the forward end by a single adjustable supporting link. The front link is bolted to a forked bracket provided on top of the L.P. compressor casing, and at its upper end to the engine bay roof structure.

110. The hydraulically-operated alighting gear consists of two independent main-wheel units which retract forward and upward into their main plane housings outboard of the power units, and a steerable, castering nose-wheel unit which retracts upward and backward into the nose-wheel bay under the forward portion of the centre section.

REPAIR MATERIALS

111. Unless otherwise stated, the repair material must be of the same gauge and specification as the damaged part. Where applicable, alternative materials will be given in the table of repair materials or in the keys to structure illustrations.

RIVETING

112. Rivets of the correct type and specification must be used for all repairs. Normally solid rivets are used, these being snap-head for internal structure or countersunk for external skinning. Rivets with 120 deg., 100 deg., 90 deg., or 60 deg., countersunk heads are used and particular care must be taken to ensure that the materials involved are countersunk to the correct angle and depth. Where inaccessibility makes the use of solid rivets impossible, Avdel or pop rivets may be used, but it should be noted that use of the latter is prohibited in pressure bulkheads and external skinning in the pressurised part of the aircraft. General information on rivets and riveting technique is contained in Air Publications 1464, 2662 and 3042. A list of rivets used on this aircraft is given in Table 2, General Repair Materials in this chapter. It should be noted that rivets to specification L.58 must always be used in contact with Magnesium alloy. All external pop rivets must be sealed with metallic pop rivet filler to D.T.D.900/4291. (Ref.No.33B/9428897).

113. Rivet spacing is to be the same as the original spacing where holes are picked up. Other spacing is detailed on each repair illustration. Where existing rivet holes have been elongated they should be re-drilled 1/32 in. larger in diameter than the original size, provided that sufficient material is available to satisfy the original landing requirements.

Use of bolts

114. Bolts may be specified for certain repairs; they may also be used in place of rivets where there is no access for riveting. In all cases where bolts are used, the holes must be drilled undersize and reamed to obtain a good fit.

REPAIR PRACTICES

115. The general instructions for the repair of airframes given in A.P.2662A and A.P.2662B should be followed. Where special procedure is required for a particular repair it will be detailed in the relevant chapter. Particular attention should be paid to the preliminary examination of damage to ascertain its extent, especially where this is not immediately apparent as in the case of buckled or wrinkled skins, which may indicate failure or distortion of primary or secondary structural members. Where necessary, adequate support must be given to the structure under repair to avoid distortion and subsequent malalignment.

Skin repairs

116. In order to preserve the high aerodynamic efficiency of the aircraft, it is essential that the external finish is maintained to a very high standard. Permanent repair of damage to the skin must always be by flush patching and countersunk-head rivets.

Reproduction of structural members

117. All original structural members and riveting must be reproduced in repaired areas. This will sometimes necessitate varying the disposition of the rivets from that shown in the repair illustration in order to pick up existing rivet holes or for the attachment of stiffeners or other members. This is permissible provided that the following conditions are fulfilled:-

(1) The number of rivets must not be less than that specified in the repair figure. Additional rivets may be used subject to conditions (2) and (3).

(2) The distance between any two rivets must not be less than four times the rivet diameter.

(3) Rivet landings must not be less than twice the rivet diameter.

Heat treatment and bending

118. Aluminium alloys L.59, L.72, L.73 and D.T.D.687 may be bent in one plane without heat treatment provided the bend radii are not less than those given in Table 16 in this chapter. This table also includes the minimum bend radii permitted with heat treatment.

119. Refer to Table 17 in this chapter for the recommended radii for bending Magnesium alloy sheet, to specifications D.T.D.118, D.T.D.732 and D.T.D.742, in the cold condition.

120. Refer to Table 18 in this chapter for the recommended radii for bending

steel sheet to specifications S.510, S.511, and S.514.

Marking off

121. Marking off should be done in pencil, the use of scribers or similar tools being prohibited, except when the markings would be removed completely when shaping the repair.

Drainage holes

122. Drainage or vent holes must be reproduced in repaired areas. Where this is not possible, new holes must be provided as near as possible to the original positions. Refer to A.P.4505A and C, Vol.1, Book 1, Sect.2, Chap.4 for the location of these holes. Additional drainage holes must be provided where a repair would form a moisture trap.

Lagging of hot air ducts

123. The hot air conditioning pipes are lagged with, either fibreglass CF/white wool specification FG/CF/WW/10/4/¾ (Ref.No.32B/1237) or Fibreglass lagging, Superfine 0·5 in. thick (Ref.No.32B/1236), and wrapped with P.V.C. covered glass cloth sheet specification Y001/173/01. Damage, such as rents in the covering, which does not warrant replacement of the lagging may be repaired by stitching the sides of the rent together using fireproof thread. A No.2 glass tie cord is recommended for this operation. The repair should then be covered with P.V.C. covered glass cloth glued in position with Bostik Adhesive 1768 (Ref.No.33H/9).

Spraytex coating in cabin

124. When repairs have been effected to the pressure cabin skin structure, the flock adhesive sprayed covering (Spraytex) on the inner surface of the skin must be renewed in the disturbed area. The Spraytex is applied on top of the normal finish of one coat of Etching Primer (Ref.Nos. Accelerator 33B/9429195 and Base 33B/9429196) and one coat of E.L.R. Cellulose finish (Ref.No.33B/1136). Depending on original colour scheme, first apply one coat of either Spraytex Black Adhesive Type B or Spraytex Grey Adhesive Type B, and then spray on one matching coat of either Spraytex Matt Black Fibre Type S.R.9 or Spraytex Grey Fibre Type S.R.16. The fibre must be sprayed on within 10 minutes of the application of the adhesive, using a Spraytex Miser fibre gun. Should it be required to remove Spraytex coating from a surface at any time, this may be done with acetone or cellulose thinners.

NOTE...

Spraytex should not be applied to front and rear bulkhead faces in the cabin. Similarly, all items which are made from Magnesium Alloy are not to be covered with Spraytex, but are to be protected by one brush coat of Bostik Primer 1752 (Ref.No.33H/9450627) followed by two brush coats of a mixture of Bostik Primer 1752 and Bostik Sealing Compound 1790 (Ref.No.33H/2202125). In this category are all stringer brackets at front and rear pressure bulkheads and at former stations 75, 428 and the forward bulkhead of the power bay compartment. Note: Mod.1338 introduces stringer brackets made from aluminium alloy. The 5 in. ground conditioning connection, all valves, etc. which are mounted on the inside wall of the pressure cabin, and the base plate and front frame member to which the canopy seal is attached, are also included in this category. Where any doubt exists, the original protective covering may be taken as a guide to the treatment required.

NEOPRENE COATING - RADOME AND SIMILAR PLASTIC COMPONENTS

Limitations of repair

125. Repair to the Neoprene finish alone is only permitted if the damage is confined to the Neoprene coating. Any erosion or mechanical damage to the resin glasscloth laminate must first be rectified as laid down in the appropriate repair schemes for radomes in A.P.2662B, Sect.7. Minor repairs are dealt with in Chapter 2 of this volume.

126. Where the damaged area is too large to effect a local repair, or the failure of the coating appears due to it having been badly applied in the first instance, then the entire radome should be stripped, using Stripalene 395, and the coating renewed. Care must be taken after using Stripalene 395 to ensure that all wax deposit is removed from the radome surface by means of Toluol or Toluene before attempting to re-prime.

CAUTION...

Immediately the Neoprene has been removed, all traces of Stripalene 395 must be cleaned off with Toluol or Toluene.

Mixing of Neoprene top coat cement

127. The top coat cement for application as detailed in the following paragraph should be prepared as follows:-

(1) To one pint of Neoprene A.C. solution 1801C add 47·5 c.c. Accelerator Cement 983C, and stir thoroughly, but the formation of air bubbles should be avoided. For any further information refer to A.P.2662B, Sect.9.4.1.

NOTE...

The accelerator is usually supplied in pre-measured packages containing 47·5 c.c.

(2) When mixed with the accelerator, the top coat base cement has a limited pot-life of 8 hours. Any material remaining after this period must be discarded.

Method of repair

128. For repair of the Neoprene coating proceed as follows:-

(1) Remove the Neoprene from the damaged and surrounding areas by careful scraping with a sharp knife to produce a regular shape with chamfered edges, taking care not to damage the resin/glasscloth laminate.

(2) The area to be coated should then be lightly smoothed to an even matt finish by the use of No.00/100 Garnet paper.

(3) Thoroughly clean the area with a clean, lint-free cloth damped with Toluol or Toluene. Allow to dry completely.

(4) Apply one coat of Boscolite Primer 9252 evenly by brush, avoiding the formation of streaks, air bubbles, and pin holes. The primer should be thinned before use. Equal volumes of primer and Toluol or Toluene will normally give the required consistency for smooth application. The primer should just overlap the chamfered edges. Allow to dry at a temperature of not less than 18 deg.C.for one hour.

(5) Apply a second coat of Boscolite Primer 9252 and again allow to dry at a temperature of not less than 18 deg.C.for one hour.

(6) Not less than 1 hour and not more than 48 hours after application of the second coat of primer, apply the first coat of mixed Neoprene top coat cement (para.127). This should be brushed on carefully, again avoiding the formation of streaks, air bubbles and pin-holes. It should be noted that brushing over undried cement will result in dragging.

(7) Allow to dry at a temperature of 25±5 deg.C. for between 1 and 1.1/2 hours.

(8) After one hour and not more than 1.1/2 hours a second coat should be applied and allowed to dry.

(9) The remaining coats may be applied by brush or spray, each coat being allowed to dry for one hour and not more than 1.1/2 hours.

(10) Sufficient coats should be applied in this manner to build up the Neoprene to its original thickness and present a smooth appearance. In the case of a complete re-coat the thickness should be 0·011 ±0·001 inch., checked by means of a guide plate which is coated along with the radome. The guide plate can be checked with a micrometer.

NOTE...

The minimum and maximum permissible times for application of the finish are approximately 10 and 15 hours respectively. Since the finishing cannot be left half-completed overnight, the repair procedure should be planned accordingly.

(11) Allow to dry and cure in a dust-free atmosphere at a temperature of 25±5 deg.C.for not less than seven days, unless a shorter period is authorised by the appropriate technical officer. In an emergency the curing schedule could be cut to 36 hours.

(12) Brushes and other equipment used should be cleaned in acetone (Ref. No.33C/1156) immediately after use.

Materials required

129. The following are the materials required to carry out the process detailed in the preceding paragraphs 125-128:-

Ref.No.	Part No.	Description
33C/9429259	Stripalene 395	Stripper
33C/1436	Toluol	Diluting Medium
33C/1392	Toluene	Diluting Medium
33H/161	1801C	Solution Neoprene A.C.
33H/160	983C	Accelerator Cement
33H/9429604	9252	Boscolite Primer
33J/12	00-100	Garnet paper
33J/13	0-80	Garnet paper

The Neoprene top coat base cement, as supplied by the makers, is a light tan colour, but the coating will develop a deep brown or black colour on natural ageing in approximately 2 to 3 days.

Protective value of Neoprene coatings

130. The main causes which adversely affect the protective value of Neoprene coatings are as follows:-

(1) Use of fillers, stoppers and paints - application of these materials to resin/glasscloth structures, either unwittingly or as a means of filling and smoothing minor imperfections will cause failure, usually of a delayed nature, of the external Neoprene coating.

(2) Insufficient preparation - low adhesion of the Neoprene coating can also be attributed to insufficient scuffing with suitable grade Garnet paper to produce a smooth matt surface.

(3) Primer coat of Boscolite 9252 - thick coats of primer will give poor adhesion of the Neoprene top

coat base cement. The Boscolite 9252 should be suitably thinned with Toluol or Toluene to enable a wet coat to penetrate all pinholes and imperfections, and not bridge across.

NOTE...
The forward six feet only of the radome is finished with a Neoprene coating.

REPAIRS TO INSULATION BLANKETS

131. The insulation blankets are made up from two layers of fine fibreglass material, each 1/2 in. thick, completely enveloped in a covering of waterproof Craypac (Ref. No.32B/1235). In cases of damage to a blanket, where the damage is not considered extensive enough to warrant changing the item, simple but effective repairs can be made.

132. The following procedure, which is illustrated in Fig.101, may be used for the repair of holes in blankets:-

(1) Cut out the damaged area to a regular shape, preferably circular.

(2) Enlarge the hole in one layer of fibreglass so that it is approximately one inch larger all round than the one made at (1).

(3) Cut inserts of fibreglass, complete with Craypac covering, to fit the holes made at (1) and (2).

(4) Secure a patch of the Craypac PVC/E120F. D.T.D. 900/4504 material on each side to cover completely the repaired area. The Craypac material should be secured with Bostik Adhesive 321 (Ref. No.33H/4).

Slight damage on the edge of a blanket may be repaired by trimming off the damaged edge, and binding it completely with waterproof Craypac secured with Bostik Adhesive 321.

HONEYCOMB SANDWICH PANELS

133. Repairs to light alloy honeycomb sandwich panels are permitted, with certain restrictions. These restrictions, which vary from one panel to another, are detailed on the illustrations of the panels which appear in Chapter 3 of this volume. Where repairs are permitted the procedure, which is illustrated in Fig.102, is as follows:-

(1) An area, circular for preference and completely encompassing the damage, is cut from the panel through both skins.

(2) Trepan out the inner skin so that the hole on that side is approximately one inch greater in diameter than the original hole. Remove any core immediately below the larger hole and clean any surplus resin off inside the face where core has been removed.

(3) Cut three skins to size, one to fit accurately in the smaller hole, and one approximately one inch larger in diameter. The third to be approximately one inch greater in diameter than the larger hole in the inner skin.

(4) The areas to be bonded should now be cleaned with fine grade aluminium wool (Ref.No.33J/43) until of a bright, shiny appearance. The areas are then rendered grease-free by swabbing with acetone (Ref.No.33C/1156) or carbon tetrachloride (Ref.No.33C/1030). A substantial layer of cold-setting Araldite A.V.121 (Ref.No. 33H/39) with 5 per cent of Hardener H.Y.951 (Ref.No.33H/2202078) added is applied in turn to all surfaces to be bonded, at the rate of approximately 2 ounces per square foot.

(5) The sequence of bonding operations is now as follows:-

(a) Bond together the two discs making the repair patch for the outer skin. Leave under light pressure approximately 24 hours.

(b) Cut the required depth and type of core to fit accurately the excavated area of core in the panel.

(c) Bond the new piece of core to the larger of the two bonded discs making the repair patch.

(d) Bond this repair assembly to the outer skin of the panel.

(e) Finally, bond the largest repair patch plate to the panel inner skin.

It should be noted that the seating plate (ref. on fig.102) is to be made from material one gauge less in thickness than the panel skin, in order to compensate for the thickness of Araldite applied. The completed repair should be kept under light pressure for approximately 24 hours before being put into service.

PROTECTIVE TREATMENTS

General

134. When making repairs it is most important that the high standard of protection be maintained, and that the repaired areas be made good by the application of the original protective. The finishing scheme for the aircraft is to Specification D.T.D.899. For general guidance on protective coverings and their restoration reference may be made to A.P.'s 2662A, 2662B and 2656A.

135. Wet assembly is essential, i.e., all metal joints not involving a rubber seal are to be assembled wet after the application of sufficient Celloseel D.T.D.900/4301 (Ref.No.33H/113) to produce a fillet at each joint. All rivets, bolts, washers, etc., must also be coated with Celloseel where they are in contact with Magnesium Alloy.

Weatherproofing

136. It is important that great care must be taken to prevent water leaking or being driven into covered components either on the ground or in flight. Extensive information on weatherproofing practice and materials is given in A.P.1464B, Vol.1, Part 2, Sect.4, Chap.7. The following general rules are given for weatherproofing this aircraft:-

(1) In all external riveted joints use Celloseel as described in para.135.

(2) In all fuselage transport joints use a mixture of equal parts of Bostik 1752 (Ref.No.33H/9450627) and 1790 (Ref.No.33H/2202125). A bead of this mixture is inserted in each joint before bolting up.

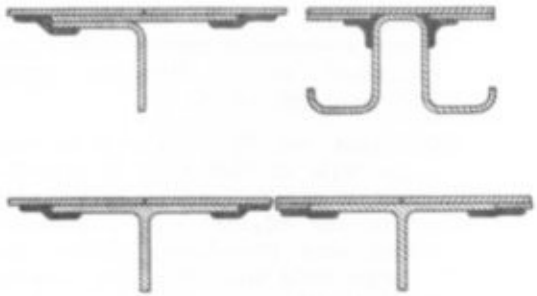
(3) A mixture of Bostik 1752 and 1790 is applied as a joint between the centre section rib booms and the outer wing rib booms.

(4) A mixture of Bostik 1752 and 1790 is applied as a joint at the fairing between the fuselage and the fin skins.

(5) Angular joints or crevices where moisture is likely to enter are sealed internally with a mixture of Bostik 1752 and 1790.

(6) All skin butt joints are waterproofed internally at T-section stringers or butt straps with a mixture of Bostik 1752 and 1790 to form a bead between the skin and the edge of the member.

(7) Repairs to prevent the ingress of moisture through the airframe structure, can be carried out by following the instructions as laid down for pressure cabin sealing in Chap.2, para.210 to para.216 inclusive. Refer to illustrations below for application of sealing.



137. On the upper skin of the outer wing all gaps between skins are filled with cold setting Araldite A.V.121 (Ref.No. 33H/39) and finished flush with the outer surface. The filler is prepared by adding six parts by weight of Hardener H.Y.951 (Ref.No.33H/2202078) to 100 parts by weight of Araldite A.V.121 and mixing thoroughly. This filling mixture remains usable for approximately 1 to 1.1/2 hours, and should therefore be used immediately after mixing.

138. Further information on the application of sealing compounds at typical joints in the pressurised part of the aircraft is given in Chapter.2.

Skin corrosion

139. If corrosion has taken place on any skins, prompt action as stated in the following paragraphs must be taken at once:-

(1) Clean out the affected part by polishing, using aluminium wool on light alloy skins but on no account must it be used on magnesium alloy skins. On magnesium skins a stiff nylon brush must be used.

(2) Check the depth of the cleaned out part of the skin, by laying a thin piece of spring steel, or a flexible steel rule, across the cavity and checking with feeler gauges to the following tolerances.

S.W.G.	Depth allowances below normal surface of skin
20	0·004 in.
18	0·005 in.
17	0·006 in.
16	0·007 in.
14	0·008 in.

If the affected part exceeds the above dimensions, the skin must be replaced by local repair, or renewal of panel, depending on the extent of damage.

(3) Pre-treatment primer is to be applied on the affected skin after applying instructions in sub-para. (1) and (2).

If corrosion has affected any of the rivet holes, action as detailed below must be taken:-

(1) Drill out the affected rivets.

(2) Open out the hole, and countersink, to the next size.

(3) All new replacement rivets to be

coated with Celloseel D.T.D.900/4301 (Ref.No.33H/113) before fitting.

For final protective treatments refer to the text in Chapter 1, para.134 to 138.

The following treatments must be applied when magnesium-alloy skins and components are affected. After removal of the corrosion, and provided that the affected skin is within the tolerance stated, a solution in water containing 10 per cent by weight of selenious acid must be used. The solution must be applied by swabbing with cotton wool or a soft rag until a permanent brown to brown-black colour is obtained on the exposed metal. The treated surface must then be washed thoroughly in clean water and dried immediately. Precautions should be taken to ensure that the solution does not come into contact with the hands or any part of the skin. See also A.P.2662B, Sect.9. Painting of the affected parts should be carried out as instructed in D.T.D.911B, para.4.1 and 4.2, and D.T.D.899A.

REPAIR MATERIAL

140. The following tables list the materials required to effect the repairs described throughout this volume.

TABLE 1 (Standard material)

Aluminium Sheet B.S.1470

30 s.w.g.	20 s.w.g.	16 s.w.g.
22 s.w.g.	18 s.w.g.	

Aluminium Sheet L.16

30 s.w.g.	18 s.w.g.	1/8 in.
20 s.w.g.	10 s.w.g.	3/16 in.

Aluminium Sheet L.17

30 s.w.g.	18 s.w.g.	1/8 in.
22 s.w.g.	10 s.w.g.	3/16 in.

Light Alloy Sheet L.72

30 s.w.g.	16 s.w.g.	7 s.w.g.
28 s.w.g.	15 s.w.g.	6 s.w.g.
27 s.w.g.	14 s.w.g.	5 s.w.g.
26 s.w.g.	13 s.w.g.	3 s.w.g.
24 s.w.g.	12 s.w.g.	2 s.w.g.
22 s.w.g.	11 s.w.g.	1 s.w.g.
20 s.w.g.	10 s.w.g.	1/8 in.
18 s.w.g.	9 s.w.g.	1/4 in.
17 s.w.g.	8 s.w.g.	3/8 in.

Light Alloy Sheet L.73

24 s.w.g.	17 s.w.g.	10 s.w.g.
22 s.w.g.	16 s.w.g.	8 s.w.g.
20 s.w.g.	14 s.w.g.	
18 s.w.g.	12 s.w.g.	

Light Alloy Sheet D.T.D.687A

24 s.w.g.	14 s.w.g.	8 s.w.g.
22 s.w.g.	13 s.w.g.	6 s.w.g.
20 s.w.g.	12 s.w.g.	5 s.w.g.
18 s.w.g.	11 s.w.g.	3 s.w.g.
17 s.w.g.	10 s.w.g.	
16 s.w.g.	9 s.w.g.	

Light Alloy Sheet L.59

24 s.w.g.	18 s.w.g.	14 s.w.g.
22 s.w.g.	17 s.w.g.	12 s.w.g.
20 s.w.g.	16 s.w.g.	10 s.w.g.

Mag. Alloy Sheet D.T.D.118

26 s.w.g.	16 s.w.g.	6 s.w.g.
24 s.w.g.	14 s.w.g.	5 s.w.g.
22 s.w.g.	13 s.w.g.	4 s.w.g.
20 s.w.g.	12 s.w.g.	3 s.w.g.
18 s.w.g.	10 s.w.g.	1/4 in.
17 s.w.g.	8 s.w.g.	

Mag. Alloy Sheet D.T.D.626

20 s.w.g.	14 s.w.g.	5 s.w.g.
18 s.w.g.	12 s.w.g.	4 s.w.g.
17 s.w.g.	10 s.w.g.	3 s.w.g.
16 s.w.g.	6 s.w.g.	

Mag. Alloy Sheet D.T.D.732 Soft D.T.D.742 Half Hard

24 s.w.g.	22 s.w.g.	20 s.w.g.

Steel Sheet S.510

33 s.w.g.	17 s.w.g.	8 s.w.g.
26 s.w.g.	16 s.w.g.	6 s.w.g.
24 s.w.g.	14 s.w.g.	1/8 in.
22 s.w.g.	13 s.w.g.	5/16 in.
20 s.w.g.	12 s.w.g.	3/8 in.
18 s.w.g.	10 s.w.g.	

Steel Sheet S.511

26 s.w.g.	22 s.w.g.	18 s.w.g.
24 s.w.g.	20 s.w.g.	16 s.w.g.

Steel Sheet S.514

22 s.w.g.	16 s.w.g.	11 s.w.g.
20 s.w.g.	14 s.w.g.	10 s.w.g.
18 s.w.g.	13 s.w.g.	9 s.w.g.
17 s.w.g.	12 s.w.g.	

Spring Steel Strip S.513

24 s.w.g.	22 s.w.g.	

Stainless Steel Sheet S.520

28 s.w.g.	20 s.w.g.	12 s.w.g.
26 s.w.g.	17 s.w.g.	10 s.w.g.
24 s.w.g.	16 s.w.g.	
22 s.w.g.	14 s.w.g.	

Stainless Steel Sheet S.521

28 s.w.g.	18 s.w.g.	10 s.w.g.
26 s.w.g.	16 s.w.g.	6 s.w.g.
22 s.w.g.	14 s.w.g.	
20 s.w.g.	12 s.w.g.	

Titanium Sheet A.V.R.49 and A.V.R.50

28 s.w.g.	22 s.w.g.	20 s.w.g.
26 s.w.g.		

TABLE 2 (Rivets)

Snap-head rivets SP.77
Aluminium L.36

1/16 3/32 1/8 1/4

▶ ◀

Snap-head rivets SP.79
Mag. Al. Alloy L.58

1/16 3/32 1/8 5/32 3/16 1/4

Snap-head rivets SP.80
◀ Al. Alloy L.86 ▶

1/16 3/32 1/8 5/32 3/16 1/4

Snap-head rivets SP.76
Mild Steel B.S.1109

1/16 3/32 1/8 5/32 3/16 1/4

Snap-head rivets SP.81
Monel Metal D.T.D.204

3/32 1/8

Snap-head rivets AS.459
Copper

1/16 3/32

Mushroom-head rivets SP.85
◀ Al. Alloy L.86 ▶

1/16 1/8 3/16 1/4
3/32 5/32 7/32

Mushroom-head rivets SP.84
5% Mag. Al. Alloy L.58

1/16 3/32 1/8 5/32 3/16

120 deg. countersunk-head rivets AS.163
Aluminium L.36

1/16 3/32 1/8

120 deg. countersunk-head rivets AS.465
Monel Metal D.T.D.204

3/32 1/8

120 deg. countersunk-head rivets AS.2230
◀ Al.Alloy L.86 ▶

1/16 3/32 1/8 5/32 3/16

120 deg. countersunk-head rivets close tolerance SS.4141
◀ Al.Alloy L.86 ▶

3/32 1/8 5/32 3/16 1/4

120 deg. countersunk-head rivets AS.165
5% Mag. Al.Alloy L.58

1/16 3/32 1/8 5/32 3/16

120 deg. countersunk-head rivets AS.463
Mild Steel BS.1109

1/16 3/32 1/8 5/32 3/16

90 deg. countersunk-head rivets AS.160
Aluminium L.36

3/32 1/8

90 deg. countersunk-head rivets AS.162
5% Mag. Al. Alloy L.58

3/32 1/8 5/32 3/16

Snaphead Avdel rivets A.G.S.2065
Al. Alloy L.86

1/8 5/32 3/16

120 deg. countersunk-head Avdel rivets SS.4398
Al. Alloy L.86

1/8 5/32 3/16

120 deg. countersunk-head Avdel rivets SS.5358
Al. Alloy L.65

0·244 in.

100 deg. countersunk-head Avdel rivets AGS.2066 Al. Alloy L.86

1/8 5/32 3/16

0.01 in. oversize shank and head x 90 deg. countersunk-head Avdel rivets SS.5361
Al. Alloy L.65

3/16

60 deg. countersunk-head Avdel rivets SS.4654
Al. Alloy L.86

3/16

60 deg. countersunk-head Avdel rivets SS.4864
Al. Alloy L.86

5/32

0.01 in. oversize shank x 60 deg. countersunk-head Avdel rivets SS.5227
Al. Alloy L.86

3/16

Oversize head 60 deg. countersunk-head Avdel rivets SS.5303
Al. Alloy L.86

3/16

Snaphead Chobert rivets A.G.S.2040
Mild Steel D.T.D.720

1/8 5/32 3/16

Snaphead Chobert rivets A.G.S.2045
Al. Alloy L.86

1/8 5/32 3/16

TABLE 2 (Continued)

120 deg. countersunk-head Chobert rivets A.G.S.2041
Mild Steel D.T.D.720

1/8 5/32 3/16

120 deg. countersunk-head Chobert rivets A.G.S.2046
Al. Alloy L.86

1/8 5/32 3/16

100 deg. countersunk-head Chobert rivets A.G.S.2067
Mild Steel D.T.D.720

1/8 5/32 3/16

100 deg. countersunk-head Chobert rivets A.G.S.2068
Al. Alloy L.86

1/8 5/32 3/16

90 deg. countersunk-head rivets AS.2229
◀ Al. Alloy L.86 ▶

1/16 3/32 1/8 3/16

90 deg. countersunk-head rivets SS.4212
◀ Al. Alloy L.86 ▶

3/32 1/8 5/32 3/16

90 deg. countersunk-head rivets AS.460
Mild Steel BS.1109

1/16 3/32 1/8 5/32 3/16

90 deg. countersunk-head rivets AS.462
◀ Monel Metal D.T.D.204 ▶

1/8 3/16

60 deg. countersunk-head rivets SS.4111
◀ Al. Alloy L.86 ▶

3/32 1/8 5/32 3/16

60 deg. countersunk-head rivets SS.4207
5% Mag. Al. Alloy L.58

1/8 3/16

Dome-head pop rivets A.G.S.2048
5% Mag. Al. Alloy L.58

1/8 5/32 3/16

Dome-head pop rivets A.G.S.2050
Monel Metal D.T.D.10

3/32 1/8 5/32 3/16

Dome-head pop rivets SS.3790
18% Nickel Silver

1/8 3/16

120 deg. countersunk-head pop rivets A.G.S.2049
5% Mag. Al. Alloy L.58

1/8 5/32 3/16

120 deg. countersunk-head pop rivets A.G.S.2051
Monel Metal D.T.D.10

3/32 1/8 5/32 3/16

◀ 120 deg. ▶ countersunk-head pop rivets SS.3791
18% Nickel Silver

1/8 3/16

90 deg. countersunk-head Jo-bolts SS.4506

3/16 1/4 5/16

100 deg. countersunk-head Jo-bolts SS.4507

3/16 1/4 5/16

100 deg. countersunk-head Jo-bolts SS.5226

3/16

Hexagonal head Jo-bolts SS.4837

3/16 1/4 5/16

TABLE 3 (Bolts, nuts, screws)

High Tensile Steel Bolts

A.25	6.B.A.	
1A	3A	11A
2A	5A	

A.25	4.B.A.	
1/2B	6B	13B
1B	7B	14B
1.1/2B	8B	15B
2B	9B	20B
3B	10B	28B
4B	11B	33B
5B	12B	

A.25	2.B.A.	
1/2C	14C	28C
1C	15C	29C
2C	17C	30C
3C	18C	31C
4C	19C	32C
6C	20C	33C
7C	21C	36C
8C	22C	39C
9C	23C	40C
10C	24C	41C
11C	25C	42C
12C	26C	43C
13C	27C	53C

A.25	1/4 in. B.S.F.	
1E	15E	29E
2E	16E	30E
3E	17E	31E
4E	18E	32E
5E	19E	33E
6E	20E	34E
7E	21E	38E
8E	22E	40E
9E	23E	43E
10E	24E	44E
11E	25E	45E
12E	26E	47E
13E	27E	48E
14E	28E	

A.25	5/16 in. B.S.F.	
1/2G	8G	22G
1G	9G	23G
2G	10G	24G
3G	11G	27G
4G	12G	28G
5G	14G	30G
6G	16G	31G
7G	21G	50G

A.25	3/8 in. B.S.F.	
2J	11J	20J
3J	12J	21J
4J	13J	22J
5J	14J	24J
6J	15J	27J
7J	16J	29J
8J	17J	30J
9J	18J	34J
10J	19J	35J
		48J

A.25	7/16 in. B.S.F.
6L	40L

A.25	1/2 in. B.S.F.	
2N	10N	13N
4N	11N	22N
6N		

A.25	5/8 in. B.S.F.
19Q	

High Tensile Steel Bolts
Cadmium coated. Close tolerance.

A.59	2.B.A.	
1C	6C	11C
2C	7C	12C
3C	8C	13C
4C	9C	14C
5C	10C	20C

A.59	1/4 in. B.S.F.	
1E	10E	19E
2E	11E	20E
3E	12E	21E
4E	13E	22E
5E	14E	23E
6E	15E	24E
7E	16E	25E
8E	17E	26E
9E	18E	29E

A.59	5/16 in. B.S.F.	
4G	11G	20G
5G	12G	22G
6G	13G	24G
7G	14G	27G
8G	15G	34G
9G	16G	
10G	17G	

A.59	3/8 in. B.S.F.	
3J	9J	21J
4J	10J	22J
5J	11J	25J
6J	17J	29J
7J	19J	32J
8J	20J	38J

A.59	7/16 in. B.S.F.	
3L	9L	28L
4L	12L	36L
6L	21L	38L
7L	22L	39L
8L	24L	40L

A.59	1/2 in. B.S.F.	
5N	9N	13N
6N	10N	14N
7N	11N	15N
8N	12N	16N

High Tensile Stainless Steel Bolts

A.26	4.B.A.	
1B	3B	12B
2B	8B	

TABLE 3 (Continued)

High Tensile Stainless Steel Bolts

A.26	2.B.A.	
1C	4C	9C
2C	5C	10C
3C	8C	

A.26	1/4 in. B.S.F.
7E	10E
9E	13E

A.26	5/16 in. B.S.F.
2G	50G

A.26	3/8 in. B.S.F.
11J	

Al. Alloy Bolts. Hexagon Head

A.28	4.B.A.	
1B	2B	3B

A.28	2.B.A.	
1C	5C	10C
2C	6C	
3C	7C	

High Tensile Shear Bolts

A.60	1/4 in. B.S.F.	
2E	7E	15E
4E	8E	20E
5E	13E	24E
6E	14E	

A.60	5/16 in. B.S.F.	
3G	7G	11G
4G	8G	12G
5G	9G	18G
6G	10G	26G

A.60	3/8 in. B.S.F.	
3J	8J	20J
4J	10J	21J
5J	11J	25J
6J	14J	34J
7J	15J	35J

A.60	7/16 in. B.S.F.	
6L	9L	11L
7L	10L	

A.60	1/2 in. B.S.F.	
5N	8N	11N
6N	9N	12N
7N	10N	

Steel Cheese Head Screws

A.31	6.B.A.	
A6	A14	A24
A8	A16	A32
A10	A18	
A12	A20	

A.31	4.B.A.	
B6	B16	B32
B8	B18	B36
B10	B20	B44
B12	B24	B48
B14	B28	

A.31	2.B.A.	
C8	C18	C36
C10	C20	C44
C12	C24	C48
C14	C28	
C16	C32	

Steel Round Head Screws

A.32	6.B.A.	
A4	A12	A20
A6	A14	A24
A8	A16	
A10	A18	

A.32	4.B.A.	
B1	B12	B20
B6	B14	B24
B8	B16	B26
B10	B18	B32

A.32	2.B.A.	
C8	C20	C36
C12	C24	
C14	C28	

Stainless Steel Cheese Head Screws

A.35	2.B.A.
C16	C20

Stainless Steel Round Head Screws

A36	4.B.A.
B16	

Stainless Steel Countersunk Screws

A.37	2.B.A.	
C12	C16	C24

Steel Countersunk Screws

A.33	6.B.A.	
A6	A16	A24
A10	A18	A28
A12	A20	

A.33	4.B.A.	
B6	B16	B32
B8	B18	B40
B10	B20	B44
B12	B24	
B14	B28	

A.33	2.B.A.	
C6	C12	C20
C8	C14	C24
C10	C16	

TABLE 3 (Continued)

Stainless Steel Raised Head Countersunk Screws

A.38	6.B.A.
A16	A20
A.38	**4.B.A.**
B12	B24
A.38	**2.B.A.**
C36	

Light Alloy Roundhead Screws

A.40	6.B.A.	
A4	A8	A10
A.40	**4.B.A.**	
B6	B10	
A.40	**2.B.A.**	
C10		

Light Alloy Countersunk Screws

A.41	6.B.A.
A4	
A.41	**4.B.A.**
B6	

High Tensile Steel Nuts A.24

	4.B.A.	
BP	BT	
	2.B.A.	
CP	CT	
CS	CTL	
	1/4 in. B.S.F.	
EC	ES	ETL
EP	ET	
	5/16 in. B.S.F.	
GC	GT	
GP	GS	
	3/8 in. B.S.F.	
JC	JP	JS
	7/16 in. B.S.F.	
LC		
	1/2 in. B.S.F.	
NS	NT	
	9/16 in. B.S.F.	
PC	PS	
	5/8 in. B.S.F.	
QP	QS	QT
	3/4 in. B.S.F.	
SS		
	7/8 in. B.S.F.	
US		
	1 in. B.S.F.	
WS		

High Tensile Steel Nuts A.58

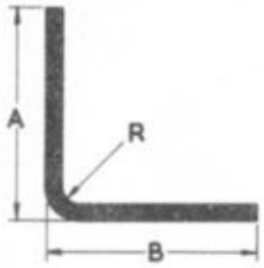
1/4 in. B.S.F.	
ES	
5/16 in. B.S.F.	
GS	GT
3/8 in. B.S.F.	
JS	JT
7/16 in. B.S.F.	
LT	
1/2 in. B.S.F.	
NS	NT

Medium Tensile Steel Nuts A.27

	6.B.A.	
AP	AT	
	4.B.A.	
BT	BP	BTL
	2.B.A.	
CP	CT	
CS	CTL	
	1/4 in. B.S.F.	
EC	ES	ETL
EP	ET	
	5/16 in. B.S.F.	
GC	GS	GTL
GP	GT	
	3/8 in. B.S.F.	
JC	JS	JTL
JP	JT	
	7/16 in. B.S.F.	
LC	LS	
LP	LT	
	1/2 in. B.S.F.	
NC	NS	NTL
NP	NT	
	9/16 in. B.S.F.	
PC	PS	
PP	PT	
	5/8 in. B.S.F.	
QC	QT	
	3/4 in. B.S.F.	
SC	ST	
SS	STL	
	7/8 in. B.S.F.	
UC	US	
	1 in. B.S.F.	
WC		

TABLE 4 (Rolled and extruded sections)

Section A



STANDARD ROLLED SECTIONS

RIGHT ANGLE

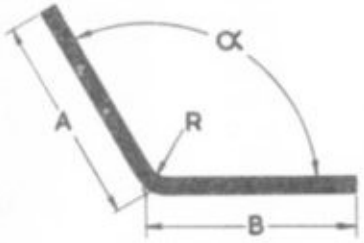
S.S.No.	A in.	B in.	R in.	S.W.G.	Material
12A/1793	3/4	3/4	3/32	20	L.72
12B/1793	3/4	3/4	3/32	18	L.72
12C/1793	3/4	3/4	9/64	16	L.72
12D/1793	3/4	3/4	3/64	22	L.72
13A/1793	3/4	5/8	3/32	16	L.72
13B/1793	3/4	5/8	3/32	16	L.72
27/1793	9/16	9/16	1/16	20	L.72
60/1793	5/8	1/2	1/16	20	L.72
65/1793	7/8	1/2	1/16	20	L.72
66/1793	1.0	3/4	3/32	16	L.72
73/1793	5/8	5/8	1/16	16	L.72
88/1793	1.0	1.0	9/64	16	L.72
112/1793	1.0	3/4	5/64	20	L.72
133/1793	5/8	5/8	3/32	22	L.72
183/1793	5/8	5/8	3/32	18	L.72
198A/1793	1.25	0.55	5/64	20	L.72
199/1793	15/16	19/32	5/64	16	L.72
200/1793	1.0	0.55	5/64	20	L.72
207B/1793	1.125	3/4	1/8	16	L.72
239/1793	1.75	1.0	9/64	16	L.72
247/1793	7/8	3/4	9/64	16	L.72
249/1793	1.24	0.82	0.1	18	L.72
253/1793	1.25	7/16	9/64	16	L.72
311/1793	7/8	5/8	5/32	16	L.72
313/1793	1.0	3/4	11/64	14	L.72
314/1793	1.0	5/8	5/64	20	L.72
315/1793	1.187	1.0	5/32	14	L.72
318/1793	7/16	1/4	3/64	18	L.72
349/1793	2.0	1.25	11/64	14	L.72
352/1793	1.0	1.0	5/32	14	L.72
421/1793	1.0	1.0	5/64	22	L.72
425/1793	1.0	1.0	7/64	18	L.72
446/1793	1.0	1.0	7/64	18	L.72
470/1793	1.5	1.0	13/64	14	L.72
515/1793	1/2	1/2	3/32	18	L.72
529/1793	3/4	3/4	7/64	14	L.72
530/1793	1.0	1.0	3/32	16	L.72
531/1793	1.0	1.0	3/16	10	L.72
536/1793	1.25	1.25	7/64	14	L.72
537/1793	1.25	1.25	3/16	10	L.72
557/1793	1.25	7/8	7/64	14	L.72
601/1793	2.0	3/4	0.093	20	L.72
620/1793	3/4	1/2	3/32	20	L.72
625/1793	7/8	1/2	0.12	18	L.72
663/1793	3/4	5/8	5/64	22	L.72
713/1793	1.5	3/4	3/32	16	D.T.D.687
715/1793	1.0	3/4	3/32	16	D.T.D.687
725/1793	1.24	0.82	1/8	20	L.72
727/1793	1.187	1.25	0.16	16	L.72
728/1793	1.0	1.25	3/16	10	L.72
729/1793	1.0	3/4	7/64	18	L.72
737/1793	1.0	1.0	3/32	20	L.72
747/1793	0.7	1/2	1/16	24	L.72
751/1793	0.1	0.47	5/64	22	L.72
753/1793	1/2	0.55	1/8	20	L.72
761/1793	5/8	5/8	3/32	22	L.72
762/1793	0.6	0.6	7/64	20	L.72
763/1793	0.6	0.6	7/64	18	L.72
764/1793	5/8	5/8	1/16	16	L.72
768/1793	5/8	1/2	1/16	20	L.72
777/1793	3/8	3/4	1/16	22	S.521
785/1793	1/2	1/2	3/32	22	L.72
786/1793	1/2	1/2	3/32	20	L.72
787/1793	0.6	0.7	3/32	20	L.72
788/1793	0.62	0.73	0.07	18	L.72
796/1793	0.62	0.62	3/32	22	S.521
797/1793	0.6	0.6	1/16	24	L.72
812/1793	0.7	1/2	1/32	26	S.521 or S.520
819/1793	0.6	0.55	0.06	24	L.72
820/1793	0.6	0.6	1/32	26	S.521
837/1793	3/4	0.7	5/32	14	D.T.D.687
838/1793	1/2	0.9	5/32	16	L.72
839/1793	0.73	0.62	0.07	18	L.72
840/1793	1.5	1.5	5/32	14	L.72
841/1793	0.8	0.6	5/64	24	L.72
844/1793	0.55	0.55	3/16	24	D.T.D.118
845/1793	1/2	1/2	3/16	24	D.T.D.118
846/1793	0.15	0.6	0.08	22	L.72
850/1793	0.3	0.6	1/8	20	L.72

TABLE 4 (continued)

Section A (continued)

SS.No.	A in.	B in.	R in.	S.W.G.	Material	SS.No.	A in.	B in.	R in.	S.W.G.	Material
853/1793	1/2	1/2	5/64	24	L.72	925/1793	0.65	0.65	0.087	29	L.72
854/1793	0.9	5/8	1/8	20	L.72	976/1793	1.187	0.63	11/64	18	L.72
888/1793	0.15	0.6	0.08	22	L.72	986/1793	1.125	0.63	1/8	18	L.72
912/1793	1.25	3/4	3/32	20	L.72	987/1793	0.88	0.63	1/8	18	L.72

Section B

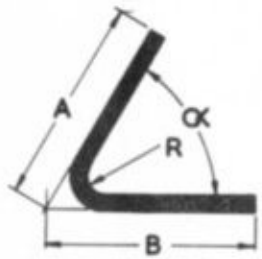


OBTUSE ANGLE

SS.No.	A in.	B in.	R in.	Angle	S.W.G.	Material
97/1793	5/8	5/8	3/32	97° 17′	22	L.72
99/1793	1.0	3/4	5/64	97° 17′	20	L.72
280/1793	1.0	3/4	5/64	95° 25′	20	L.72
447/1793	1.0	1.0	7/64	95° 29′	18	L.72
448/1793	1.0	1.0	7/64	92° 36′	18	L.72
736/1793	1.675	5/8	7/64	122° 00′	22	L.72
759/1793	1.25	1.25	7/64	120° 00′	14	L.72
770/1793	1.0	1.0	9/64	95° 00′	16	L.72
798/1793	0.6	0.6	1/8	90° 30′	18	L.72
800/1793	0.6	0.6	3/32	91° 00′	20	L.72
802/1793	0.6	1.0	3/32	90° 30′	18	L.72
804/1793	0.65	1.0	3/32	91° 00′	18	L.72
811/1793	1.25	2.0	11/64	110° 00′	14	L.72
858/1793	1.1875	1.5	5/32	99° 00′	14	L.72
909/1803	5/8	5/8	5/64	95° 00′	24	L.72
911/1793	0.6	1.3	1/8	98° 00′	20	L.72
950/1793	3/4	3/4	3/32	93° 05′	20	L.72
999/1793	1.25	0.63	1/8	92° 00′	18	L.72
1084/1793	3.35	1.37	5/32	93° 00′	16	L.72

TABLE 4 (continued)

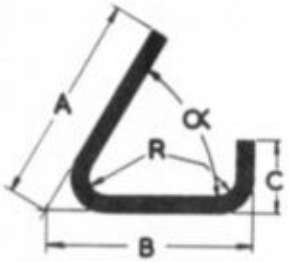
Section C



ACUTE ANGLE

SS.No.	A in.	B in.	R in.	Angle	S.W.G.	Material
115/1793	3/4	3/4	3/32	87° 34′	18	L.72
281/1793	1.0	3/4	0.078	84° 35′	20	L.72
347/1793	3/4	3/4	3/32	87° 00′	20	L.72
401/1793	3/4	3/4	3/32	73° 00′	18	L.72
450/1793	1.0	1.0	7/64	87° 24′	18	L.72
539/1793	1.1875	1.1875	3/32	75° 30′	16	L.72
792/1793	1.6	0.6	3/16	88° 30′	24	D.T.D.118
799/1793	0.6	0.6	1/8	89° 30′	18	L.72
801/1793	0.6	0.6	3/32	89° 00′	20	L.72
803/1793	0.6	1.0	3/32	89° 30′	18	L.72
908/1793	5/8	5/8	5/64	85° 00′	24	L.72
949/1793	0.76	0.76	3/32	83° 42′	20	L.72
951/1793	0.78	0.64	5/64	70° 00′	22	L.72
998/1793	1.25	0.63	1/8	88° 00′	18	L.72
1000/1793	1.275	0.65	1/8	78° 00′	18	L.72
1085/1793	1.0	1.0	9/64	81° 00′	16	L.72

Section D



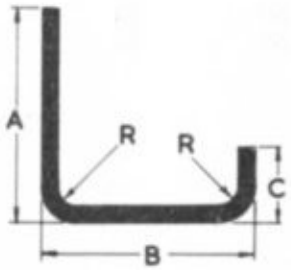
LIPPED ACUTE ANGLE

SS.No.	A in.	B in.	C in.	R in.	Angle	S.W.G.	Material
527/1793	0.65	1.0	0.096	5/64	81° 32′	18	L.72
806/1793	1.0	3/4	1/4	9/64	89° 30′	20	L.72
808/1793	1.0	3/4	1/4	9/64	89° 30′	18	L.72
810/1793	1.0	3/4	1/4	9/64	89° 30′	16	L.72

TABLE 4 (continued)

LIPPED RIGHT ANGLE

Section E



SS.No.	A in.	B in.	C in.	R in.	S.W.G.	Material
67/1793	1.0	1.0	3/16	1/32	22	L.72
155/1793	3/4	1/2	3/8	7/64	18	L.72
213/1793	5/8	0.6	9/64	3/32	16	L.72
289/1793	0.505	0.505	7/32	0.08	20	L.72
337/1793	1/2	0.67	1/4	7/64	20	L.72
385/1793	0.8	1.0	0.3	0.13	16	L.72
386/1793	0.8	1.0	0.3	0.07	20	L.72
406/1793	0.95	1.25	0.4	0.19	14	L.72
410/1793	0.8	1.0	0.3	7/64	18	L.72
431/1793	0.88	0.99	0.31	0.13	22	L.72
522/1793	1/2	0.6	9/64	3/32	16	L.72
523/1793	5/8	1.0	7/64	3/32	16	L.72
524/1793	1.25	1.25	0.142	3/32	16	L.72
525/1793	1.25	1.25	1/4	7/32	12	L.72
528/1793	3/4	3/4	3/16	3/32	16	L.72
602/1793	1.25	1.75	1/2	5/16	10	L.72
619/1793	1.25	1.06	0.23	3/32	14	L.72
664/1793	3/4	3/4	0.18	3/32	20	L.72
665/1793	5/8	5/8	0.18	3/32	20	L.72
678/1793	1.0	5/8	0.3	3/32	16	L.72
688/1793	1.25	1.25	0.146	7/32	12	L.72
712/1793	1.0	1.5	1/4	9/64	16	L.72
746/1793	1.75	1.0	5/16	1/4	12	L.72
752/1793	0.65	3/4	0.15	1/8	20	L.72
758/1793	3/4	3/4	0.188	3/32	16	S.521
779/1793	1.0	1.12	0.3	7/32	16	L.72
789/1793	0.57	0.54	0.17	3/32	24	L.72
794/1793	0.58	0.57	0.18	7/64	22	L.72
834/1793	1.0	0.88	1/4	0.23	18	L.72
852/1793	3/4	3/4	0.15	3/32	18	L.72
863/1793	1.1	1.0	0.2	1/8	18	L.72
874/1793	5/8	1.0	0.187	1/32	22	L.72
875/1793	0.85	1.5	1/4	1/8	20	L.72
937/1793	1.375	1.25	0.33	1/4	12	L.72
983/1793	0.63	0.88	0.3	9/64	16	L.72
984/1793	0.63	0.88	0.3	1/8	18	L.72
985/1793	0.63	0.88	0.3	3/32	20	L.72
995/1793	1.0	1.0	0.3	1/8	16	L.72
20/7000	1.0	0.552	1/2	1/16	20	L.72
23/7000	3/4	0.998	1/2	1/8	20	L.72

Section F

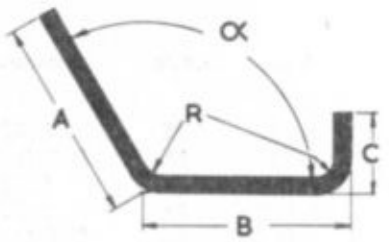
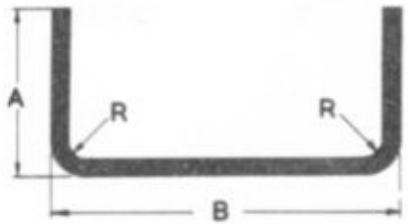


TABLE 4 (continued)

LIPPED OBTUSE ANGLE

SS.No.	A in.	B in.	C in.	R in.	Angle	S.W.G.	Material
304/1793	1.0	1.0	0.35	0.14	96° 18′	16	L.72
732/1803	0.88	1.12	1/4	5/32	91° 00′	16	L.72
735/1793	1.0	1.0	0.4	0.187	97° 30′	14	D.T.D.687
805/1793	1.0	3/4	1/4	9/64	90° 30′	20	L.72
807/1793	1.0	3/4	1/4	9/64	90° 30′	18	L.72
809/1793	1.0	3/4	1/4	9/64	90° 30′	16	L.72

Section G



CHANNEL SECTION

SS.No.	A in.	B in.	R in.	S.W.G.	Material
2/1793	1/2	3/4	1/16	20	L.72
54/1793	1/2	1.375	1/16	18	L.72
68/1793	1/4	3/4	1/32	20	L.72
72/1793	13/32	2.375	1/32	20	L.72
100/1793	5/8	2.0	5/64	20	L.72
102/1793	3/4	2.0	5/64	20	L.72
110/1793	1.5	1.0	9/64	16	L.72
136/1793	5/8	1.0	5/64	22	L.72
150/1793	3/4	31/32	9/64	16	L.72
157/1793	5/8	0.553	5/64	20	L.72
194/1793	1/4	1.7	7/64	20	L.72
206/1793	5/8	5/8	7/64	18	L.72
233/1793	1.0	3.0	5/32	16	L.72
238/1793	5/8	2.0	7/64	18	L.72
264/1793	0.6	1.85	7/64	18	L.72
275/1793	3/4	1.1	0.078	20	L.72
278/1793	0.65	2.25	11/64	18	L.72
297/1793	3/4	1.25	0.11	20	L.72
334/1793	7/32	1.0	5/32	18	L.72
348/1793	9/16	1.5	3/32	18	L.72

CHANNEL SECTION (continued)

SS.No.	A in.	B in.	R in.	S.W.G.	Material
381/1793	3/4	1.0	7/64	18	L.72
413/1793	3/4	1.5	0.156	20	L.72
455/1793	3/4	3.0	7/64	18	L.72
477/1793	1.0	1.0	3/32	20	L.72
516/1793	0.53	0.6	3/64	22	L.72
573/1793	3/4	0.6	5/64	22	L.72
593/1793	5/8	1.0	5/64	22	L.72
667/1793	3/4	1.25	1/8	18	L.72
742/1793	1.76	2.947	1/8	20	L.72
744/1793	0.2	3/4	1/16	28	S.520 or S.521
745/1793	1.15	2.35	7/32	16	D.T.D.687
748/1793	0.7	2.0	0.1	18	L.72
754/1793	1/4	3.0	1/8	20	L.72
769/1793	1/4	1.116	1/8	18	D.T.D.687
780/1793	1.0	1.5	11/64	18	L.72
791/1793	0.63	3/4	1/8	20	L.72
813/1793	1/2	2.136	1/32	26	S.521 or S.520
851/1793	0.65	0.9	3/32	18	L.72

TABLE 4 (continued)

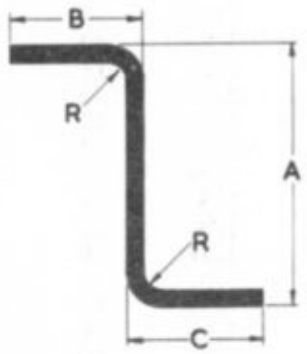
CHANNEL SECTION (continued)

SS.No.	A in.	B in.	R in.	S.W.G.	Material
864/1793	0.73	0.844	0.29	22	L.72
865/1793	0.8	0.865	0.29	20	D.T.D.118A
876/1793	0.78	0.86	0.07	22	L.72
878/1793	0.78	0.89	0.09	20	L.72
881/1793	1/4	2.4	1/8	18	L.72
882/1793	0.65	0.85	3/32	20	L.72
883/1793	0.7	0.88	3/32	18	L.72
884/1793	0.73	0.87	3/32	20	L.72
893/1793	1.0	1.19	5/32	16	L.72
903/1793	1/2	1/4	1/32	20	S.521
907/1793	0.84	0.91	1/8	20	L.72

CHANNEL SECTION (continued)

SS.No.	A in.	B in.	R in.	S.W.G.	Material
938/1793	1/8	0.6	3/32	20	L.72
939/1793	2.75	2.6	7/32	16	D.T.D.687
940/1793	5/8	2.062	7/64	22	L.72
967/1793	1.0	3/4	0.327	18	L.72
968/1793	1.0	3/4	0.311	16	D.T.D.687
969/1793	0.95	0.65	0.325	18	L.72
990/1793	3/4	2.093	5/64	20	L.72
26/7000	3/4	0.998	17/64	14	L.72
27/7000	1.0	0.998	1/8	20	L.72
29/7000	1.0	1.498	3/32	20	L.72

Section H



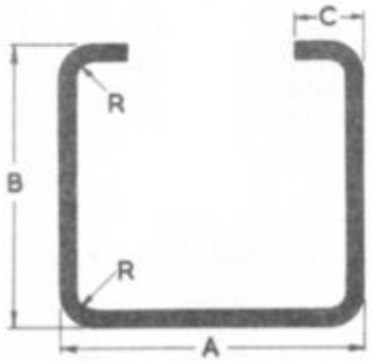
Z SECTION

SS.No.	A in.	B in.	C in.	R in.	S.W.G.	Material
192/1793	0.6	1/4	1.25	3/64	22	L.72
419/1793	0.336	0.246	0.74	0.09	20	L.72
428/1793	1.048	0.8	1.25	7/64	18	L.72
451/1793	0.648	7/8	7/8	7/64	18	L.72
743/1793	0.7	0.902	1.0	1/16	26	S.520 or S.521
767/1793	0.736	0.386	0.6	3/32	20	L.72
817/1793	1.1875	1.0	1.0	7/64	18	L.72
895/1793	0.55	0.6	1.185	7/64	22	L.72
896/1793	0.55	0.6	1.4	7/64	22	L.72
980/1793	3/4	0.62	1.198	1/8	18	L.72
19/7000	0.552	1/2	3/4	1/16	20	L.72
21/7000	0.564	0.63	1.17	7/64	18	L.72
22/7000	0.944	3/4	1.2	3/32	20	L.72
24/7000	1.063	0.666	0.62	1/8	20	L.72
28/7000	1.584	1.0	1.0	5/32	16	L.72
30/7000	1.556	1.0	1.0	3/32	20	L.72
35/7000	0.994	3/4	1.35	3/32	20	L.72
36/7000	0.559	0.62	2.0	1/8	20	L.72

TABLE 4 (continued)

LIPPED CHANNEL SECTION

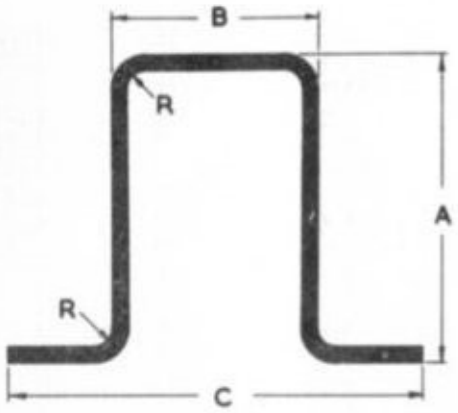
Section I



SS.No.	A in.	B in.	C in.	R in.	S.W.G.	Material
15/1793	1.75	3/4	5/32	3/32	16	L.72
74/1793	3.9	1.0	5/16	13/64	16	L.72
77/1793	5.9	1.0	5/16	13/64	16	L.72
93/1793	1.0	3/4	0.223	5/64	20	L.72
95/1793	3.0	7/8	1/4	5/32	20	L.72
108/1793	2.0	1.375	3/8	11/64	14	L.72
122/1793	3.0	3/4	1/4	5/64	20	L.72
129/1793	1.0	3/4	0.215	5/64	22	L.72
132/1793	2.0	3/4	0.215	5/64	22	L.72
153/1793	2.0	1.5	5/16	9/64	16	L.72
158/1793	2.8125	3/4	1/4	5/64	20	L.72
224/1793	3.04	1.09	5/16	9/64	16	L.72
244/1793	2.0	1.5	5/16	7/64	18	L.72
285/1793	1.7	1.51	0.26	0.15	16	L.72
308/1793	2.5	0.88	1/4	0.13	18	L.72
394/1793	3.0	0.88	1/4	0.13	18	L.72
414/1793	1.75	1.75	1/4	3/16	16	L.72
420/1793	3.04	1.09	0.312	0.13	18	L.72
429/1793	3.0	1.05	5/16	11/64	14	L.72
486/1793	2.0	1.0	0.15	7/64	18	L.72
495/1793	1.378	0.908	0.439	0.09	16	L.72
513/1793	1.5	1.5	1/4	7/64	18	L.72
558/1793	1.0	3/4	0.095	5/64	18	L.72
559/1793	1.0	3/4	0.142	3/32	16	L.72
579/1793	3.0	3/4	0.31	7/64	18	L.72
589/1793	4.5	1.0	0.3	5/32	16	L.72
590/1793	4.5	1.0	0.3	1/8	18	L.72
594/1793	3.0	1.05	1/4	7/64	18	D.T.D.687
595/1793	3.0	1.05	5/16	11/64	14	D.T.D.687
596/1793	2.0	3/4	1/4	7/64	20	L.72
600/1793	2.0	1.0	0.31	9/64	16	L.72
606/1793	2.0	2.0	0.38	0.171	18	L.72
613/1793	2.0	3/4	1/4	1/8	18	L.72
677/1793	1.5	3/4	0.22	1/8	18	L.72
692/1793	2.0	1.375	3/8	11/64	14	L.73
703/1793	2.6	0.88	0.2	7/64	22	L.72
721/1793	2.6	3.0	1/2	0.372	10	L.72
749/1793	2.6	1.0	0.2	1/8	20	L.72
750/1793	2.6	3/4	0.2	1/8	20	L.72
766/1793	2.75	1.09	5/16	9/64	16	L.72
775/1793	1.73	3/4	1/4	5/64	22	L.72
776/1793	1.73	3/4	1/4	1/8	20	L.72
816/1793	1.25	3/4	0.31	7/64	18	L.72
829/1793	2.0	1.5	0.35	0.3	12	L.72

TABLE 4 (continued)

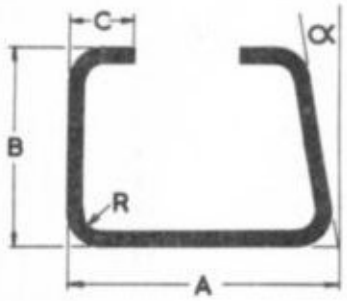
Section J



TOP HAT SECTION J

SS.No.	A in.	B in.	C in.	R in.	S.W.G.	Material
83/1793	1.58	1.0	2.375	11/64	14	L.72
84/1793	1.564	1.0	2.375	9/64	16	L.72
182/1793	1.584	1.0	2.375	9/64	18	L.72
186/1793	0.6	1/2	1.65	7/64	22	L.72
196/1793	1.75	1.0	2.375	11/64	14	L.72
221/1793	2.0	1.0	2.375	7/64	18	L.72
376/1793	0.598	0.592	2.52	1/16	20	L.72
377/1793	0.556	0.592	3.02	1/16	20	L.72
382/1793	1.0	1.116	2.52	0.11	18	L.72
405/1793	1.022	0.783	1.647	1/16	18	L.72
412/1793	1.0	0.721	1.875	5/64	18	L.72
427/1793	1.048	1.596	3.0	7/64	18	L.72
482/1793	1.0	0.685	1.875	1/32	22	L.72
507/1793	0.596	0.528	1.65	0.08	20	L.72
510/1793	3/4	0.656	1.75	0.06	22	L.72
512/1793	3/4	0.732	1.9	0.1	20	L.72
581/1793	2.5	1.128	2.5	9/64	16	L.72
599/1793	2.0	1.0	2.375	3/32	20	L.72
842/1793	1.7	1.062	2.375	9/64	18	L.72
917/1793	0.56	0.6	1.72	1/16	20	L.72

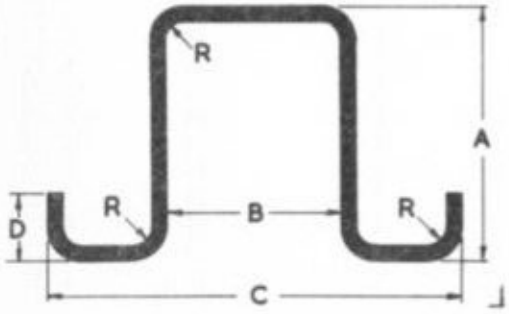
Section K



LIPPED CHANNEL K

SS.No.	A in.	B in.	C in.	R in.	Angle	S.W.G.	Material
887/1793	1.5	1.0	0.15	7/64	5° 00′	18	L.72
890/1793	1.25	1.0	0.15	7/64	5° 00′	18	L.72
891/1793	1.0	1.0	0.15	7/64	5° 00′	18	L.72

Section L

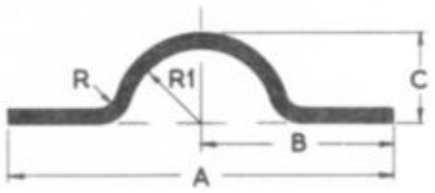


LIPPED TOP HAT SECTION L

SS.No.	A in.	B in.	C in.	D in.	R in.	S.W.G.	Material
85/1793	1.0	5/8	1.875	3/16	7/64	18	L.72
91/1793	1.0	5/8	1.875	3/16	3/64	24	L.72
92/1793	1.0	5/8	1.875	3/16	3/64	22	L.72
146/1793	5/8	0.944	2.25	3/16	5/64	24	L.72
211/1793	1.0	5/8	1.875	3/16	5/64	20	L.72
219/1793	1.1875	5/8	1.875	3/16	7/64	18	L.72
220/1793	1.1875	5/8	1.875	3/16	5/64	24	L.72
294/1793	0.64	1.2	2.6	1/4	5/64	20	L.72
379/1793	1/2	0.319	1.25	0.175	1/16	22	L.72
500/1793	1/2	3/4	2.25	1/4	7/64	18	L.72

TABLE 4 (continued)

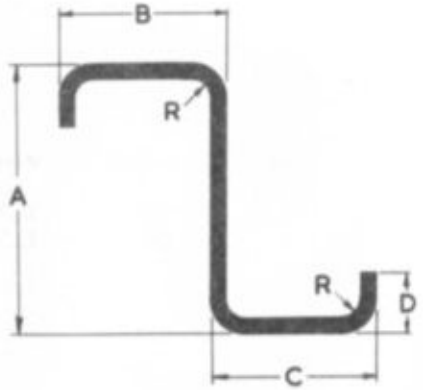
Section M



DISHED SECTION M

SS.No.	A in.	B in.	C in.	R1	R2	S.W.G.	Material
6A/1793	1.8	0.9	0.536	1/4	1/4	20	L.73
14/1793	1.5625	25/32	5/16	5/16	1/16	18	L.72
17/1793	1.125	9/16	0.153	5/32	5/32	22	L.72
18/1793	1.5	3/4	0.278	3/32	5/32	22	L.72
140/1793	1.375	11/16	0.466	1/4	3/64	22	L.72
843/1793	1.5	3/4	0.187	1/4	0.05	22	L.72
981/1793	1.13	0.565	0.153	5/32	1/8	24	S.510
849/1793	1.0	1/2	0.38	3/32	3/32	22	L.72

Section N



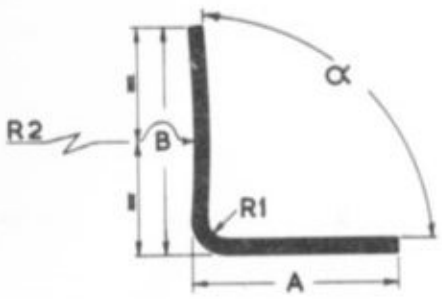
LIPPED Z SECTION N

SS.No.	A in.	B in.	C in.	D in.	R in.	S.W.G.	Material
164/1793	1.5	3/4	3/4	1/4	3/32	18	L.72
582/1793	3/4	0.6	0.6	1/8	3/32	20	D.T.D.687
583/1793	1.0	0.6	0.6	1/8	3/32	20	D.T.D.687
586/1793	2.6	0.65	0.65	0.2	7/64	22	L.72
828/1793	1.19	0.64	0.65	0.2	3/32	20	L.72
830/1793	1.0	0.636	0.625	0.187	3/32	20	L.72
979/1793	1.37	0.4	0.55	0 17	3/32	18	L.72

TABLE 4 (continued)

MISCELLANEOUS ROLLED SECTIONS

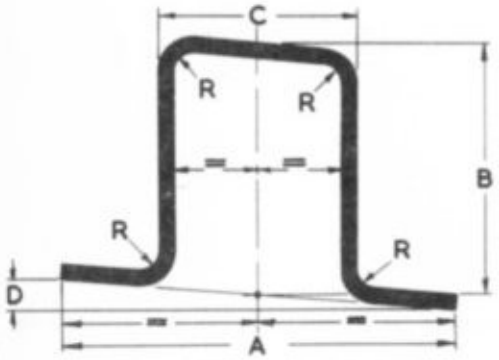
Section O



ANGLE SECTION O

SS.No.	A in.	B in.	R1 in.	R2 in.	Angle	S.W.G.	Material
741/1793	1.5	1.5	1/4	8.3	90° 00′	12	L.72
739/1793	1.5	1.5	1/4	8.3	80° 00′	12	L.72

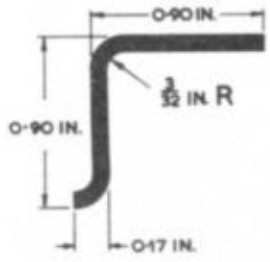
Section P



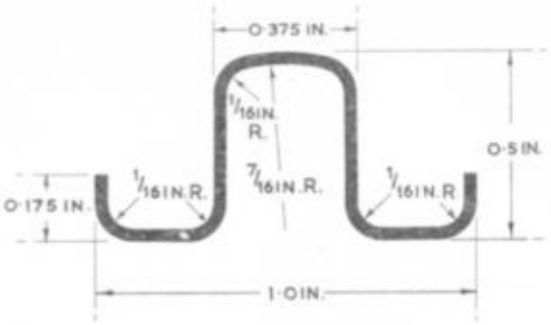
TOP HAT SECTION P

SS.No.	A in.	B in.	C in.	D in.	R in.	S.W.G.	Material
825/1793	2.37	2.2	1.12	0.08	1/8	20	L.72
25/7000	2.37	1.05	1.12	0.08	1/8	20	L.73

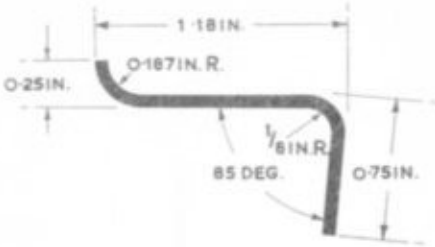
Section Q



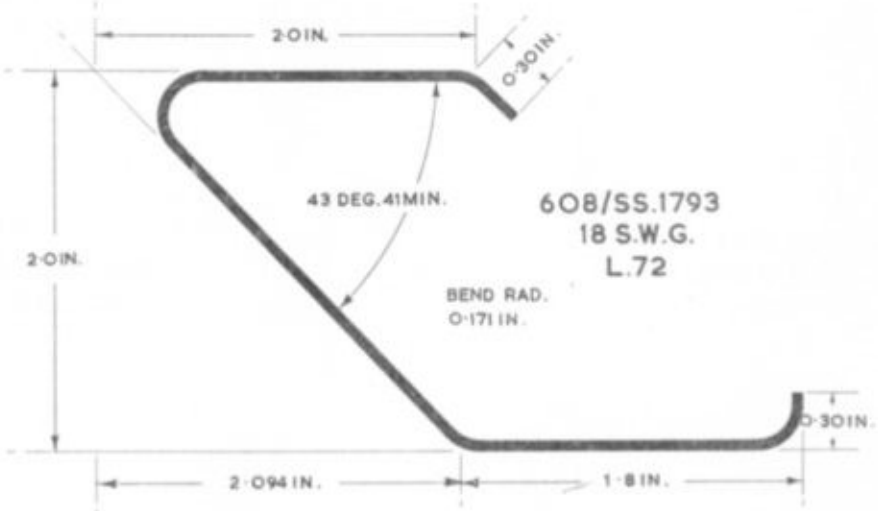
696/SS.1793
18 S.W.G.
L.72



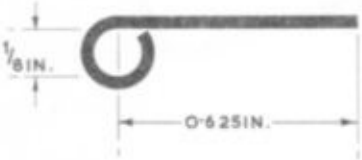
367/SS.1793
22 S.W.G.
L.72



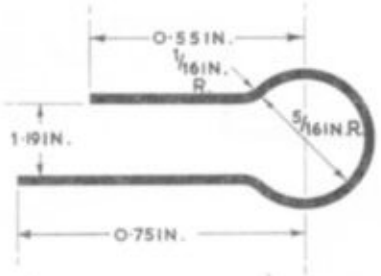
690/SS.1793
16 S.W.G.
L.72



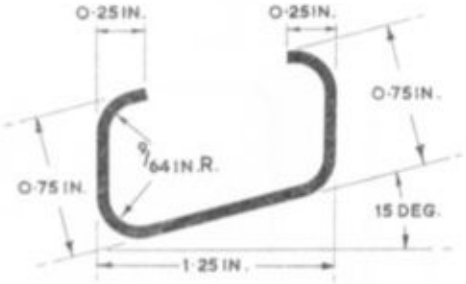
608/SS.1793
18 S.W.G.
L.72



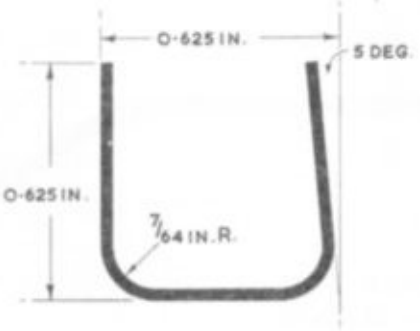
702/SS.1793
20 S.W.G.
L.72



718/SS.1793
22 S.W.G.
L.72



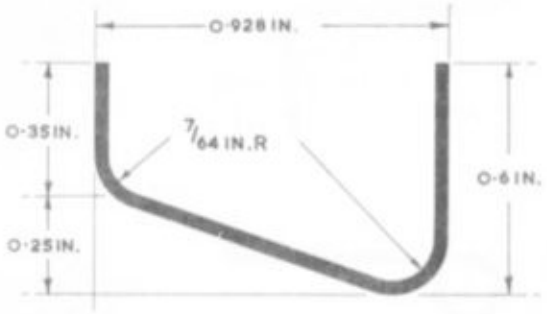
666/SS.1793
16 S.W.G.
L.72



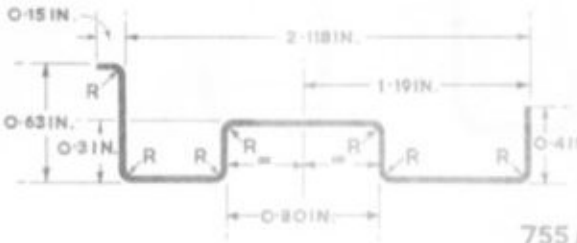
892/SS.1793
18 S.W.G.
L.72

TABLE 4 (Continued)

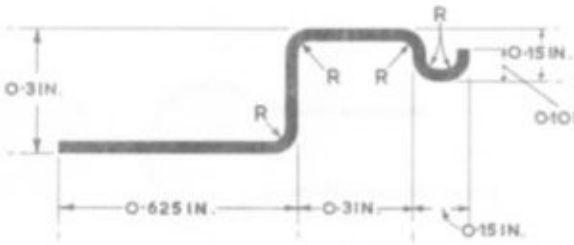
Sections S



822/SS.1793
22 S.W.G.
L.72

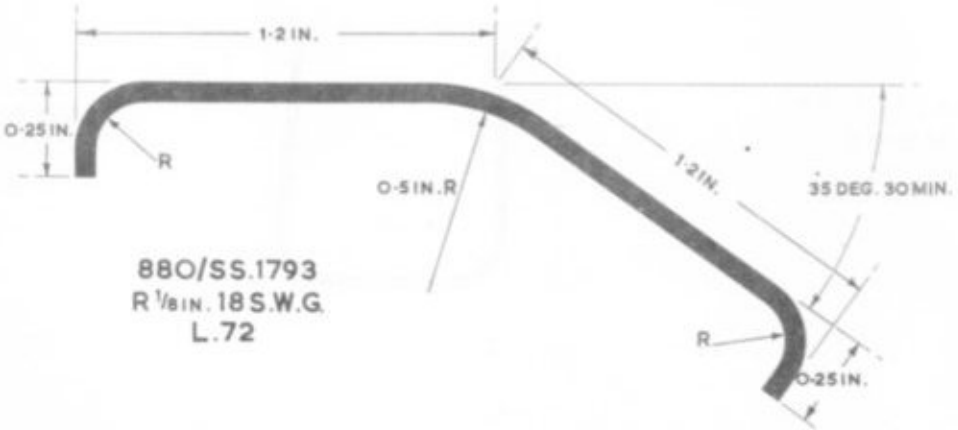


755/SS.1793
R 1/32 IN. 26 S.W.G.
S.521

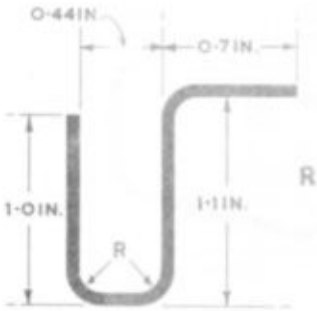


868/SS.1793
R 1/64 IN. 22 S.W.G.
S. 510

910/SS.1793
20 S.W.G.
L.72

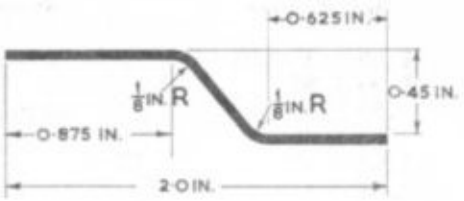


880/SS.1793
R 1/8 IN. 18 S.W.G.
L.72

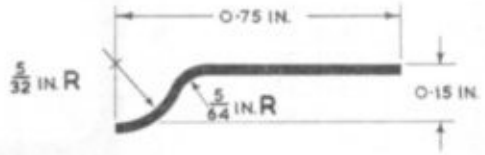


920/SS.1793
R 0·12 IN. 16 S.W.G.
L.73

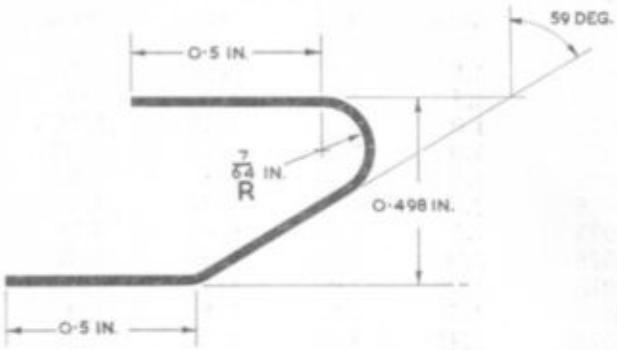
RESTRICTED



943/SS.1793
18 S.W.G.
L.72

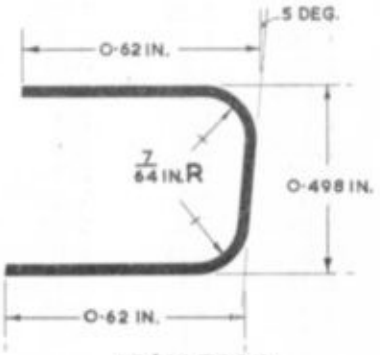


914/SS.1793
22 S.W.G.
L.72

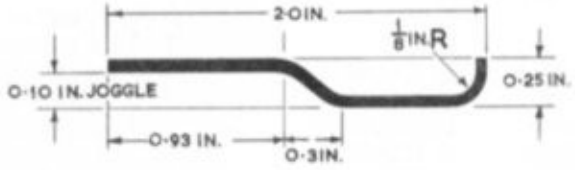


39/SS.7000
22 S.W.G.
L.72

929/SS.1793
18 S.W.G.
L.72



37/SS.7000
22 S.W.G.
L.72



978/SS.1793
16 S.W.G.
L.72

TABLE 4 (continued)

RIGHT ANGLE Item No.	A in.	B in.	T1 in.	T2 in.	R in.	R1 in.	R2 in.	Specification	Remarks
67/SS3075	1.5	1.5	3/16	3/16	3/16	3/32	3/32	L.65/D.T.D.5074	1/16 in. radius at all corners
121/SS3075	1.5	1.5	1/8	1/8	5/16	1/8	1/8	L.65/L.85	
163/SS3075	1.0	3/4	1/16	1/16	1/16	1/32	1/32	L.65	
176/SS3075	1.0	1.0	3/32	3/32	3/32	3/64	3/64	L.65/L.85	
213/SS3075	1.5	3/4	1/8	1/8	1/8	1/16	1/16	L.65	
214/SS3075	2.0	7/8	5/32	3/32	1/8		-	L.65	
222/SS3075	1.5	1.0	0.19	0.19	0.2	0.05	0.05	L.65	
249/SS3075	3/4	3/4	3/32	3/32	3/32	3/64	3/64	L.65/L.85	
250/SS3075	1.0	1.0	1/16	1/16	1/16	1/32	1/32	L.65/L.85	
251/SS3075	1.0	1.0	1/8	1/8	1/8	1/16	1/16	L.65/L.85	
256/SS3075	1.25	1.25	3/32	3/32	3/32	3/64	3/64	L.65/L.85	
272/SS3075	1.5	3/4	1/8	1/8	1/8	1/16	1/16	L.65/L.85	
273/SS3075	1.5	1.0	1/8	1/8	5/32	1/8	1/8	L.65/L.85	
274/SS3075	2.0	1.0	1/8	1/8	1/8	-	-	L.65/L.85	
277/SS3075	1.25	7/8	3/32	3/32	3/64	3/64	3/64	L.65/L.85	
293/SS3075	1.0	1.0	1/8	1/8	1/8	1/16	1/16	L.65	
294/SS3075	1.25	1.0	1/8	1/8	1/8	1/16	1/16	L.65	
300/SS3075	2.0	2.0	3/16	3/16	1/4	3/32	3/32	L.65	
304/SS3075	1.25	1.25	3/16	3/16	7/32	5/32	5/32	L.65	
305/SS3075	2.0	2.0	1/4	1/2	1/4	-	-	L.65	
306/SS3075	1.25	1.25	3/32	3/32	3/32	1/32	1/32	L.65	1/32 in. radius at all corners
307/SS3075	1.25	1.25	1/8	1/8	3/16	1/16	1/16	L.65	1/32 in. radius at all corners
314/SS3075	1.5	1.5	0.08	0.08	1/8	1/32	1/32	L.65	1/32 in. radius at all corners
324/SS3075	1.625	1.5	1/8	1/4	3/16	1/8	1/16	L.65	
333/SS3075	1.5	1.0	1/8	1/8	5/32	1/8	1/8	L.65	
340/SS3075	1.0	1.0	1/8	1/8	1/8	1/16	1/16	L.65	
341/SS3075	1.25	1.25	1/4	1/4	3/16	1/8	1/8	L.65	
343/SS3075	1.0	1.0	3/32	3/32	3/32	3/64	3/64	L.65	
356/SS3075	1.25	7/8	3/32	3/32	3/32	3/64	3/64	L.65	
361/SS3075	1.5	1.25	1/8	1/8	1/8	1/16	-	L.65	
362/SS3075	3.25	1.5	3/16	3/16	1/8	3/32	3/32	L.65	
376/SS3075	1.0	1.0	1/16	1/16	1/16	1/32	1/32	L.65	
394/SS3075	1.75	1.0	0.19	0.19	3/16	-	-	L.65	0.03 in. radius at all corners
395/SS3075	2.5	1.0	0.19	0.19	3/16	-	-	L.65	0.03 in. radius at all corners
396/SS3075	1.0	1.0	1/8	1/8	1/8	1/16	1/16	D.T.D.5074	0.03 in. radius at all corners
397/SS3075	1.0	1.0	3/16	3/16	7/64	1/16	1/16	D.T.D.5074	0.03 in. radius at all corners
398/SS3075	1.5	1.0	3/16	7/64	7/64	1/16	1/16	D.T.D.5074	0.03 in. radius at all corners
399/SS3075	1.0	1.0	3/32	3/32	3/32	3/64	15/64	D.T.D.5074	
404/SS3075	2.0	2.0	1/4	1/4	1/4	1/32	1/32	L.65	1/32 in. radius at all corners
405/SS3075	2.0	2.0	3/8	1/4	1/4	1/32	1/16	L.65	1/16 in. radius at X and Y 1/32 in. radius at Z
411/SS3075	3.54	1.63	1/2	0.54	1/4	-	-	D.T.D.5074	0.03 in. radius at all corners
429/SS3075	1.25	0.9	0.08	0.08	7/64	-	-	D.T.D.5074	
469/SS3075	3/4	3/4	1/16	1/16	1/16	1/32	1/32	L.65	

Section U

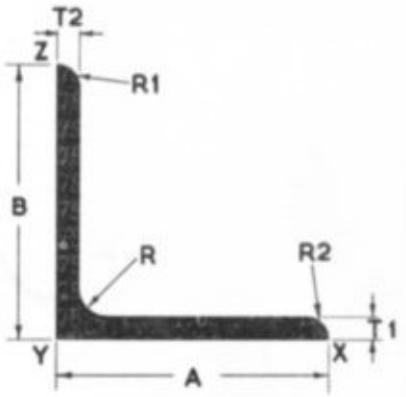
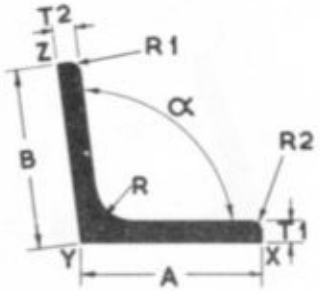


TABLE 4 (continued)

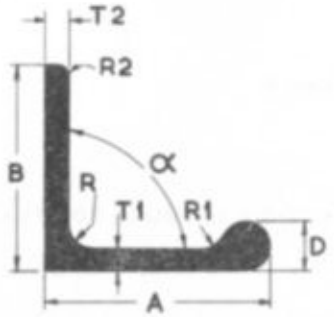
Section V



OBTUSE ANGLE

Item No.	A in.	B in.	T1 in.	T2 in.	R in.	R1 in.	R2 in.	Angle	Specification	Remarks
254/SS3075	1.0	1.0	1/8	1/8	1/8	0.067	0.067	97°30′	L.65 or L.85	
269/SS3075	1.25	1.25	1.25	1/8	3/16	1/16	1/16	93°00′	L.65/L.85	
276/SS3075	1.5	1.0	1/8	1/8	5/32	1/8	1/8	93°05′	L.65/L.85	
295/SS3075	1.375	1.3125	3/16	1/4	3/16	1/16	1/16	97°30′	L.65	1/32 in. radius at all corners
299/SS3075	1.5	1.5	3/16	3/16	3/16	3/32	3/32	93°00′	L.65	1/32 in. radius at X, Y and Z
313/SS3075	2.0	1.0	0.1	0.1	3/32	1/32	1/32	100°00′	L.65	1/32 in. radius at all corners
329/SS3075	1.5	1.25	1/8	1/8	3/16	1/16	1/16	99°20′	L.65	1/32 in. radius at all corners
331/SS3075	1.5	1.25	1/8	1/8	3/16	1/16	1/16	101°00′	L.65	Chamfer at x 0.125 in. x 0.093 in.
338/SS3075	1.25	1.25	1/8	1/8	3/16	1/16	1/16	95°00′	L.65	
353/SS3075	1.1875	1.0	0.08	0.08	0.08	0.08	0.08	102°30′	L.65	
354/SS3075	2.093	1.312	3/16	0.234	3/16	-	-	105°00′	L.65	
355/SS3075	1.25	7/8	1/8	1/8	5/32	-	-	93°00′	L.65	1/32 in. radius at all corners
359/SS3075	3/4	5/8	1/16	1/16	1/16	-	-	95°00′	L.65	1/32 in. radius at all corners
390/SS3075	1.2	0.9	0.1	0.1	0.1	-	-	100°00′	L.65	0.03 in. radius at Y
486/SS3075	1.5	1.0	0.19	0.19	1/8	-	-	126°30′	L.65	

Section W

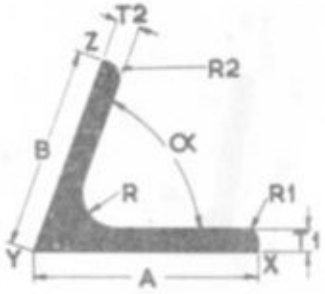


BEADED ANGLE

Item No.	A in.	B in.	T1 in.	T2 in.	D in.	R in.	R1 in.	R2 in.	Angle	Specification
248/SS3075	3/4	3/4	1/16	1/16	3/16	0.15	3/32	1/16	90°00′	L.65/L.85
347/SS3075	1.25	1.25	0.104	0.104	1/4	1/8	1/8	1/16	90°00′	L.65
402/SS3075	1.25	1.25	1/16	1/16	5/32	1/8	0.071	1/16	90°00′	L.65

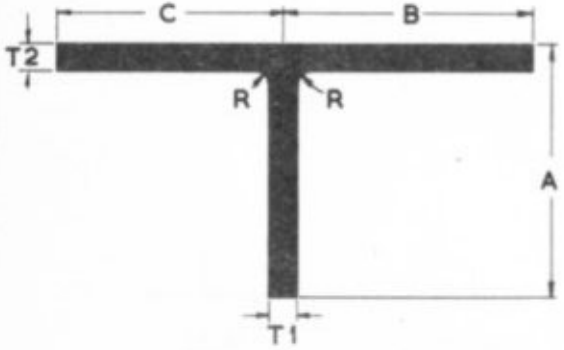
TABLE 4 (continued)

Section X



ACUTE ANGLE

Item No.	A in.	B in.	T1 in.	T2 in.	R in.	R1 in.	R2 in.	Angle	Specification	Remarks
182/SS3075	1.5	1.25	1/8	1/8	3/16	-	1/16	79°00′	L.65	0.125 in. radius at X
221/SS3075	1.25	1.25	1/8	1/8	3/16	1/16	1/16	70°00′	L.65	
255/SS3075	1.0	1.0	1/8	1/8	0.1	1/16	1/16	80°00′	L.65/L.85	
259/SS3075	1.187	1.187	0.08	0.08	0.08	0.08	0.08	75°00′	L.65/L.85	
298/SS3075	1.5	1.5	3/16	3/16	3/16	-	-	85°30′	L.65	1/32 in. radius on all corners
316/SS3075	1.25	7/8	1/8	1/8	1/8	-	-	85°00′	L.65	1/32 in. radius on all corners
317/SS3075	1.5	7/8	1/8	1/8	1/8	-	-	83°30′	L.65	1/32 in. radius on all corners
323/SS3075	1.5	1.5	1/8	1/8	3/16	1/16	1/16	66°00′	L.65	1/32 in. radius on all corners
330/SS3075	1.25	1.25	1/8	1/8	3/16	1/16	1/16	85°00′	L.65	1/32 in. radius on all corners
344/SS3075	1.25	1.0	1/8	1/8	3/16	1/16	1/16	85°00′	L.65	1/32 in. radius on all corners
348/SS3075	2.1	1.625	3/16	3/16	3/16	-	-	58°30′	L.65	1/16 in. radius at Y
352/SS3075	2.1	1.625	3/16	3/16	3/16	-	-	70°00′	L.65	1/16 in. radius at Y
358/SS3075	3/4	5/8	1/16	1/16	1/16	-	-	85°00′	L.65	1/32 in. radius at all corners
415/SS3075	1.5	0.86	5/16	0.22	0.1	-	-	84°00′	D.T.D.5074	1/32 in. radius at all corners
428/SS3075	3/4	3/4	0.08	0.08	0.1	-	-	78°44′	D.T.D.5074	0.015 in. radius at all corners



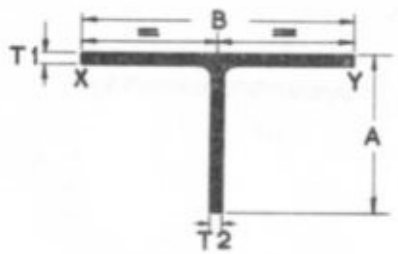
Section Y

TEE SECTION, UNEQUAL TOP FLANGES, 90°

Item No.	A in.	B in.	C in.	T1 in.	T2 in.	R in.	Specification
23/SS3075	1.375	1.375	1.25	0.15	0.15	0.06	L.65/L.85

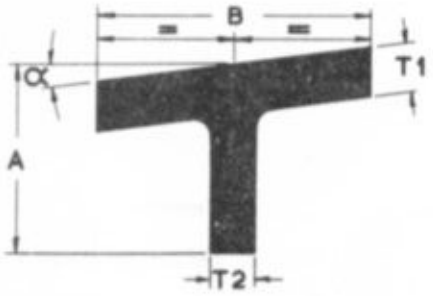
TABLE 4 (continued)

Section Z



TEE SECTIONS

Item No.	A in.	B in.	T1 in.	T2 in.	R in.	Specification	Remarks
58/SS3075	1.125	1.5	1/16	1/16	1/16	L.65/L.85	0.031 in. radius at all corners
165/SS3075	7/8	1.5	1/16	1/16	1/16	L.65	
180/SS3075	1.25	1.6	5/32	5/32	1/16	L.65	
192/SS3075	1.0	2.0	7/64	7/64	7/64	L.65	
292/SS3075	1.0	2.0	7/64	7/64	7/64	L.65	
301/SS3075	1.0	2.0	7/64	7/64	7/64	D.T.D.5054	
309/SS3075	0.6	1.1	0.05	0.05	0.05	L.65	
315/SS3075	7/8	1.5	1/16	1/16	1/16	L.65	0.031 in. radius at all corners
375/SS3075	0.6	1.1	0.05	0.05	0.05	L.65	
406/SS3075	2.25	2.6	5/32	0.07	1/8	L.65	0.03 in. radius at all corners
416/SS3075	1.0	1.8	7/64	7/64	7/64	D.T.D.5074	
419/SS3075	1/2	1.0	0.05	0.05	0.05	L.65	0.025 in. radius at all corners



Section AA

TEE SECTION, EQUAL TOP FLANGES, ANGLED

Item No.	A in.	B in.	T1 in.	T2 in.	R in.	Angle	Specification
139/SS3075	1.25	1.95	5/32	5/32	1/16	1° 40′	L.65
199/SS3075	2.06	3.0	0.55	1/2	3/16	7° 0′	L.65

TEE SECTION, UNEQUAL TOP FLANGES ANGLED

Item No.	A in.	B in.	C in.	T1 in.	T2 in.	R in.	Angle	Specification	Remarks
326/SS3075	1.5	1.406	1.044	3/16	3/16	3/16	3° 00′	L.65	1/32 in. radius at all corners
414/SS3075	1.1	0.835	0.815	0.13	0.13	0.13	4° 40′	D.T.D.5074	

Section AB

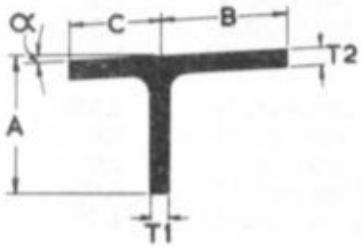
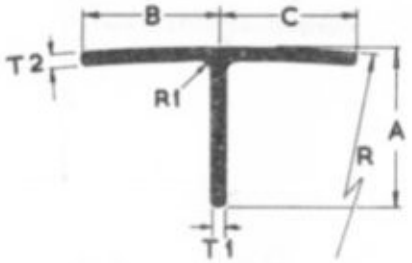


TABLE 4 (continued)

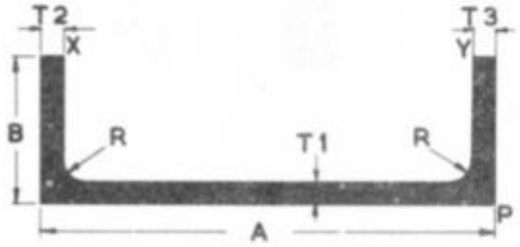
Section AC



TEE SECTION, EQUAL TOP FLANGES, CURVED

Item No.	A in.	B in.	C in.	T1 in.	T2 in.	R in.	R1 in.	Specification	Remarks
297/SS3075	1.0	1.125	1.125	1/2	1/8	55.0	1/8	L.65	0.031 in. radius at all corners
318/SS3075	7/8	3/4	3/4	1/16	1/16	25.0	1/16	L.65	0.031 in. radius at all corners
325/SS3075	1.0	1.0	1.0	0.1	0.1	44.0	0.1	L.65	0.031 in. radius at all corners
337/SS3075	0.6	0.55	0.55	0.05	0.05	18.25	0.05	L.65	0.025 in. radius at all corners

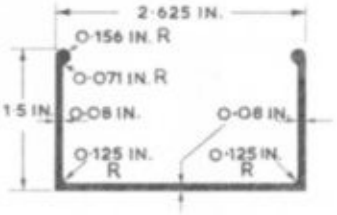
Section AD



CHANNEL SECTION

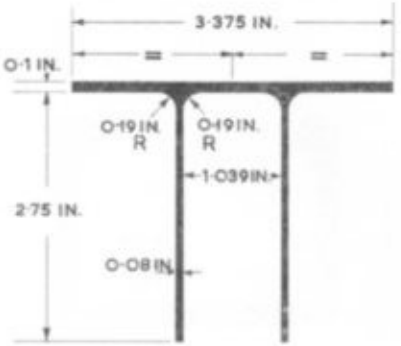
Item No.	A in.	B in.	T1 in.	T2 in.	T3 in.	R in.	Specification	Remarks
225/SS3075	1.5	1.5	0.15	0.15	0.15	0.15	L.65	0.06 in. radius at X and Y
283/SS3075	2.5	13/16	1/8	1/8	1/8	1/8	L.65/L.85	
284/SS3075	3.0	1.5	1/8	1/8	1/8	3/16	L.65/L.85	
311/SS3075	3.0	2.0	0.313	1/4	1/4	1/4	L.65	1/32 in. radius at all corners
357/SS3075	3.0	1.5	1/8	1/8	1/8	3/16	L.65	
368/SS3075	1.5	1.5	1/8	1/8	1/8	1/8	L.65	0.06 in. radius at X and Y
385/SS3075	1.5	1.5	1/8	1/8	1/8	1/8	L.65	0.062 in. radius at X and Y 0.25 in. radius at P
408/SS3075	2.375	1.31	1/4	1/4	1/4	3/16	D.T.D.5054	1/32 in. radius at all corners
409/SS3075	3.0	2.0	3/8	3/8	3/8	1/4	L.65	1/16 in. radius at all corners
410/SS3075	2.0	1.25	0.2	0.2	0.2	0.19	L.65	1/16 in. radius at all corners
450/SS3075	0.498	0.88	0.064	0.064	0.064	0.109	D.T.D.622	
91/SS3075	1.25	11/16	3/32	3/32	3/32	1/16	L.65/L.85	

Sections A E

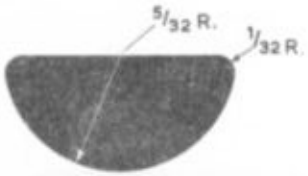


64/SS.3075
L.83

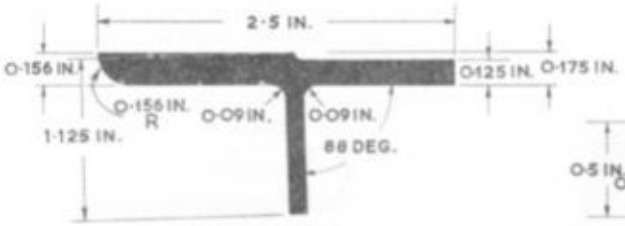
D.R.D. 59 AND 83/SS.3075
L.85



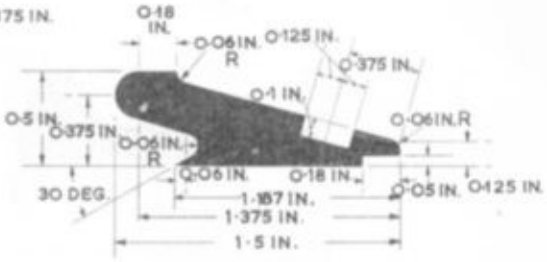
42/SS.3075
L.83



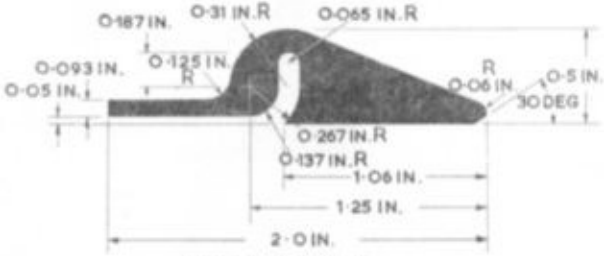
107/SS.3075
L.83



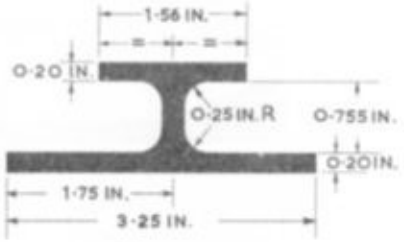
159/SS.3075
L.84



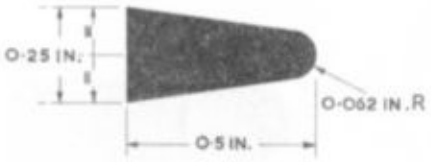
178/SS.3075
L.84



179/SS.3075
L.84



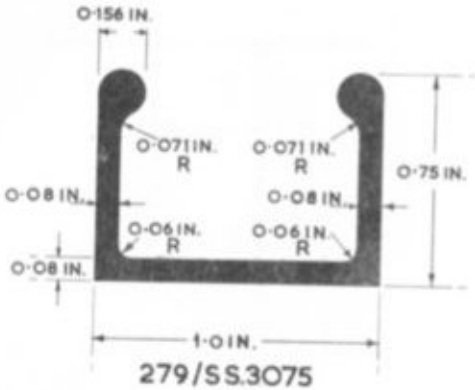
193/SS.3075
L.85



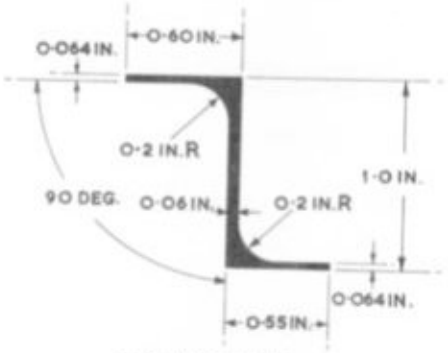
L.83

TABLE 4 (Continued)

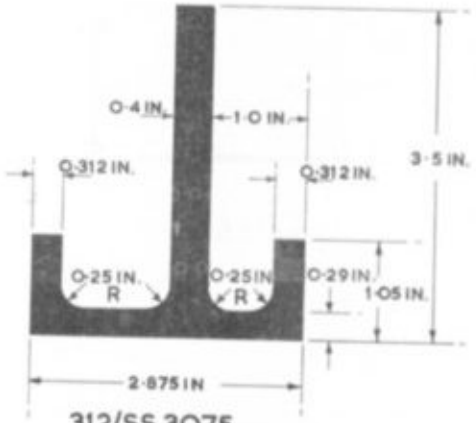
Sections A F



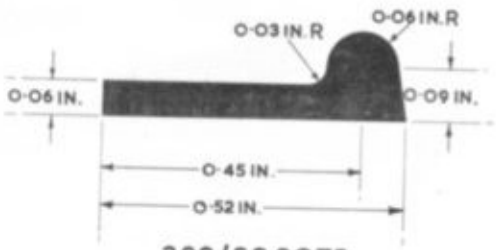
279/SS.3075
L.65



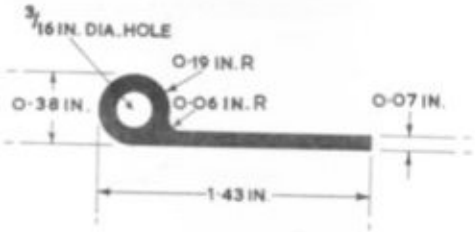
302/SS.3075
D.T.D. 5054



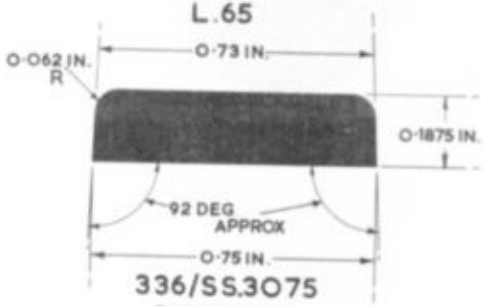
312/SS.3075
L.65



322/SS.3075
L.65

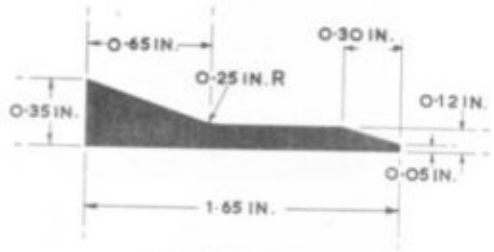


332/SS.3075
D.T.D. 372

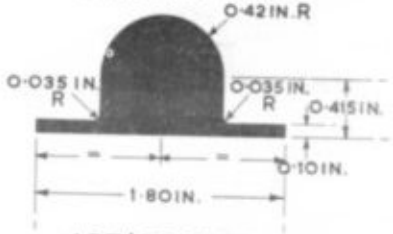


336/SS.3075
D.T.D. 259

380/SS.3075
D.T.D. 259A



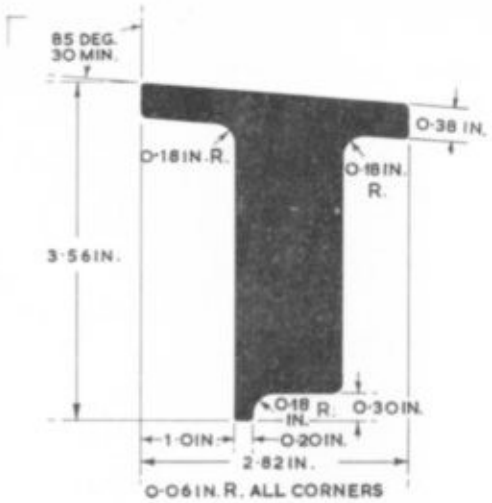
383/SS.3075
D.T.D. 259A



407/SS.3075
L.65

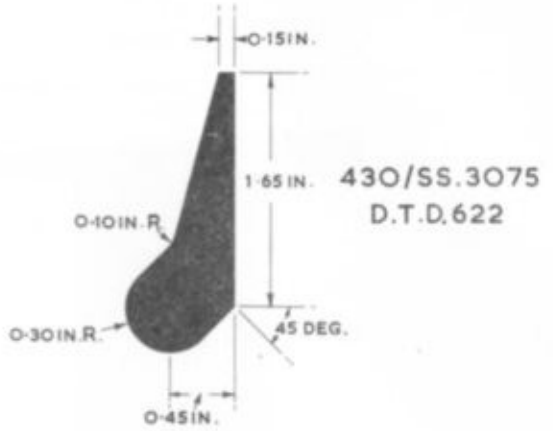
TABLE 4 (Continued)

Sections AG

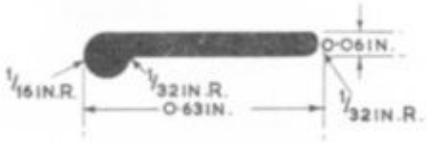


412/SS.3075
D.T.D. 5074

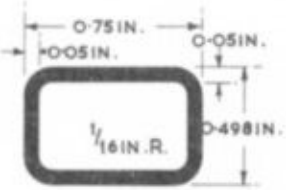
413/SS.3075
D.T.D. 5074



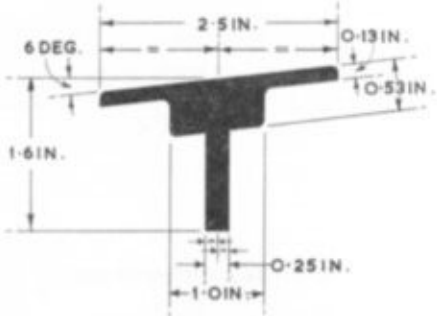
430/SS.3075
D.T.D.622



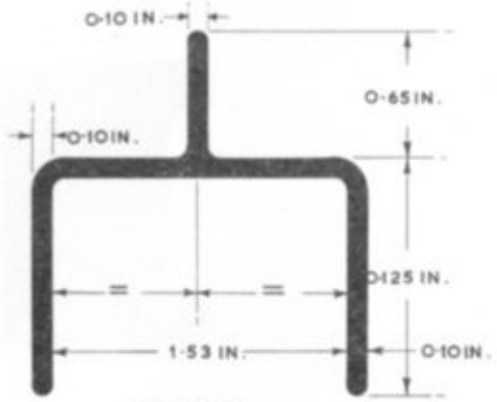
447/SS.3075
D.T.D. 297 OR L44



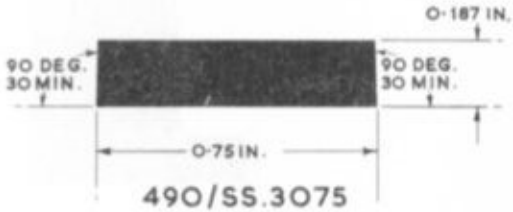
458/SS.3075
D.T.D.622



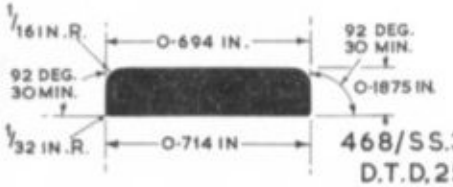
431/SS.3075
D.T.D. 5074



D.257
HIGH DUTY ALLOYS L.75



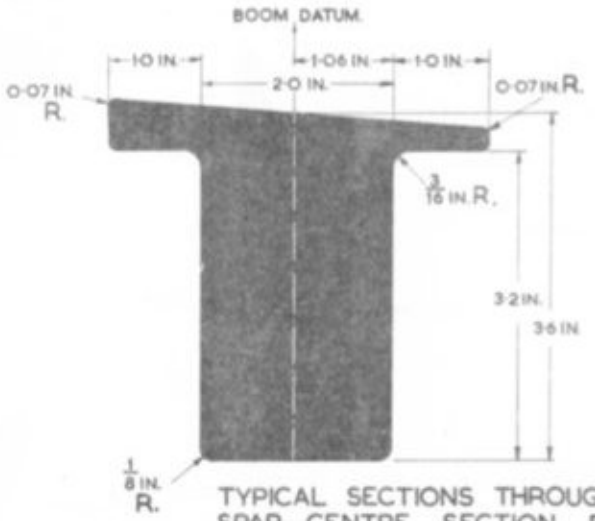
490/SS.3075
D.T.D.259



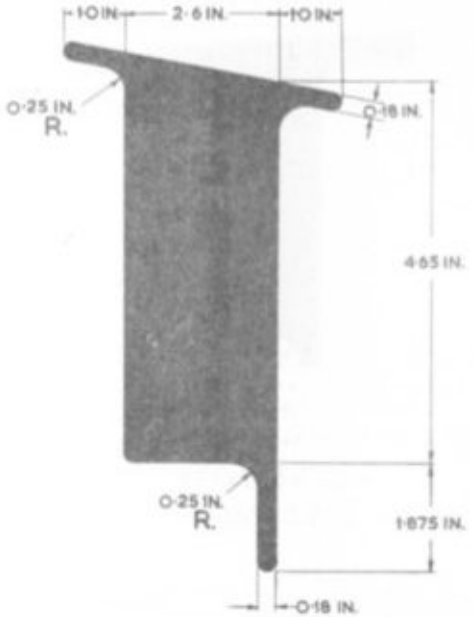
468/SS.3075
D.T.D.259

TABLE 4 (Continued)

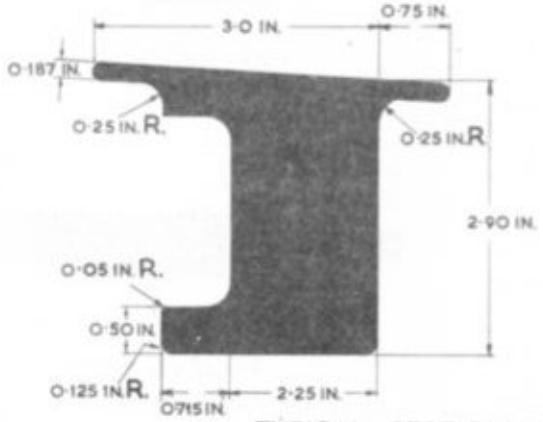
Sections AH

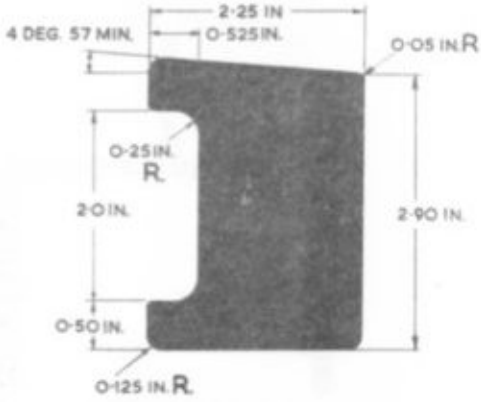


TYPICAL SECTIONS THROUGH FRONT SPAR CENTRE SECTION BOOMS MADE FROM EXTRUSIONS 1&2/B 1824 D.T.D. 5074

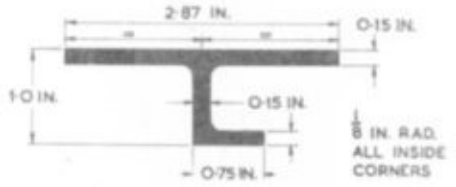


FRONT SPAR OUTER WING BOOMS MADE FROM EXTRUSIONS 13&14/B1824 D.T.D. 5074





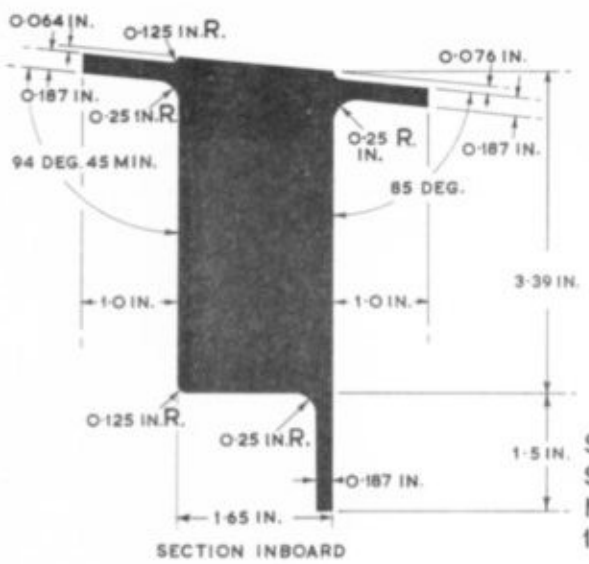
TYPICAL SECTIONS THROUGH REAR SPAR CENTRE SECTION BOOMS MADE FROM EXTRUSIONS 8 & 9/B1824 D.T.D. 5074



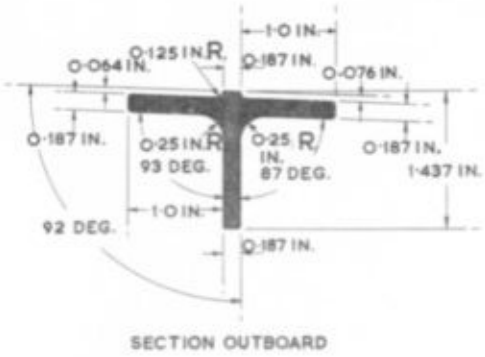
ANGLED 'T' SECTION MADE FROM A.L. ALLOY EXTRUSION 588/S.S. 3075 SPEC. D.T.D. 5054

TABLE 4 (Continued)

Sections A I

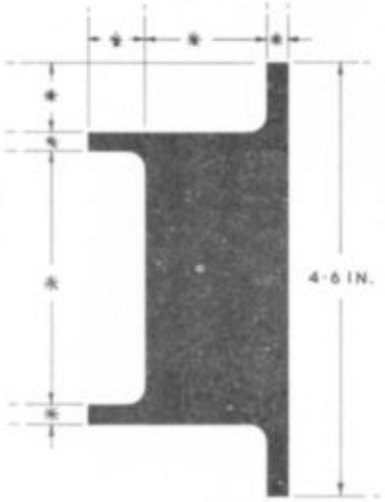


SECTION INBOARD

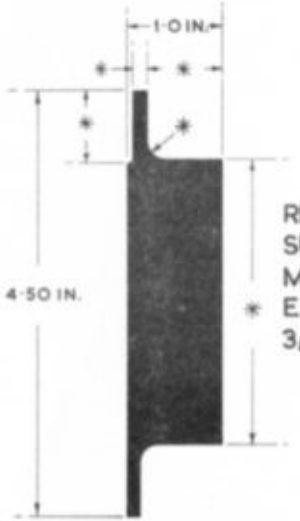


SECTION OUTBOARD

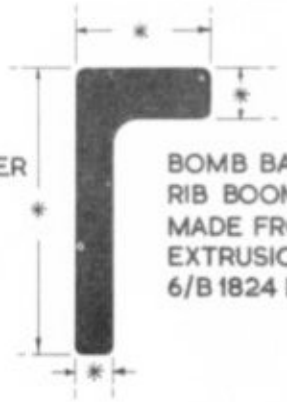
SECTION THROUGH REAR SPAR BOOM · OUTER WING · MADE FROM EXTRUSIONS 11 & 12/B1824 D.T.D. 5074



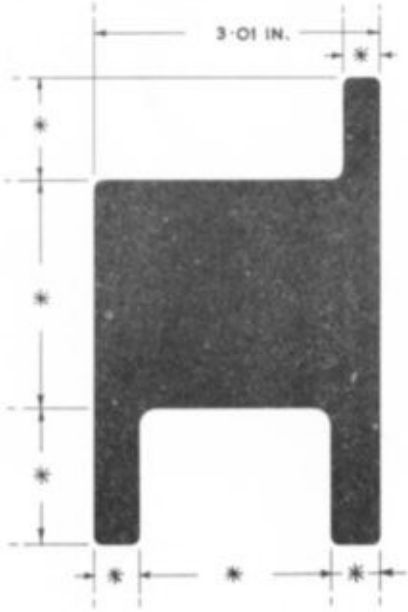
FRONT FIN POST SUPPORT MEMBER MADE FROM EXTRUSION 2/B1836 L.65



REAR FIN POST SUPPORT MEMBER MADE FROM EXTRUSION 3/B1836 L.65



BOMB BAY RIB BOOM MADE FROM EXTRUSION 6/B 1824 D.T.D. 5074



INBOARD ALIGHTING GEAR RIB BOOMS MADE FROM EXTRUSION 4/B1824 D.T.D. 5074

NOTE :- THESE ARE TYPICAL BOOM SECTIONS AT THEIR INBOARD END.
DIMENSIONS MARKED * FLUCTUATE OVER BOOM LENGTH

B.A., B.S.F., AND B.S.P. WIRE THREAD INSERTS

General

141. Wire thread inserts Type AS.4947, and AS.4948 to AS.4959 are made from stainless steel spec. D.T.D.734, cadmium plated to D.T.D.904. Insert Type AS. 4947 when correctly assembled provides a B.A. thread to B.S.93, and a B.S.F. thread to BS.84 (Medium class). Insert type series AS.4948 to AS.4959 will provide a B.S.P. thread to B.S.2779 (Medium class) when correctly assembled in tapped holes of specified dimensions. Insert type series AS.4947 are manufactured in 12 different thread sizes from 4 B.A. to 1 in. B.S.F., and each thread size is obtainable in 5 different lengths to cover the tensile strength required. The appropriate length of insert required can be obtained from the formula:-

$$\text{Length required} = 1/2D \times \frac{\text{Bolt stress required}}{\text{U.T.S. of tapped material}}$$

but for general use of this type of insert (AS.4947) the following is recommended.

Material	Insert length
Steel S.94	1 x D
Alum. Alloy L.65	1½ x D
Mag. Alloy D.T.D.622	2 x D

NOTE...
'D' = O/Dia. of bolt thread size.

The insert lengths quoted above ensure that the full strength of 55 tons/sq.in. steel bolts will be met in the materials stated above.

B.S.P. INSERTS TYPE AS.4948 TO AS.4959

Choice of length

142. Inserts are manufactured in various sizes from 1/8 in. B.S.P. to 1.1/2 in. B.S.P. and lengths in increments of 0·1 in. within a limited range to cover all contingencies which may be met as regards length of thread in the mating part i.e., union, valve etc.

Materials

143. Inserts can be used in steels, aluminium, and magnesium alloys with the exception of 'through' holes in magnesium alloy components in which case they must not be used. Inserts can, however, be used in 'blind' holes in magnesium alloys subject to applying the approved protective treatments called for in the assembly instructions.

WARNING...
Due to the importance of each component requiring repair, confirmation from the contractor should be obtained for permission to fit inserts in each case.

Tapping holes

144. For each component to be repaired there is a choice of two drill depths for 'blind' holes. In each case the depth of full thread is the same, but the thread run-out varies with the type of tap used. The 'finish' tap has a thread run-out of approximately 4 pitches, the 'bottom' tap one of approximately 2 pitches. Wherever possible the longer run-out should be used, but it is permissible to use the shorter run-out in holes where the depth is very important. 'Through' holes should be opened out the full length of the hole to the tapping drill size required.

Material	*Type of Hole*	*Tap Required*
Magnesium Alloy	Blind 2 x P	Rough and Bottom
Magnesium Alloy	Blind 4 x P	Finish
Alum. Alloy	Blind 2 x P	Rough and Bottom
Alum. Alloy	Blind 4 x P	Finish
Alum. Alloy	Through	Finish
Steel	Blind 2 x P	Rough and Bottom
Steel	Blind 4 x P	Rough and Finish
Steel	Through	Rough and Finish

Tools

145. The following tables contain a comprehensive list of tools necessary for the fitment of wire thread inserts. The wire insert tool kit No.1, (Ref.No.1C/7068) provides a complete set of tools for the removal or replacement of wire thread inserts.

TABLE 5

Tools for B.A. and B.S.F. threads

Thread Size	Tapping Drill	Rough Tap	Finish Tap	Bottom Tap	Thread Gauge *	Insert Tool	Tang Break-Off Tool	Extract Tool
4.B.A.	No.27	4.B.A.R.	4.S.B.P.	4.S.B.B.	4.S.B.G.	B.A.I.P.4	B.A.T.B.4	1227-06
2.B.A.	3/16 in.	2.B.A.R.	2.S.B.P.	2.S.B.B.	2.S.B.G.	B.A.I.P.2	B.A.T.B.2	1227-6
1/4 in. B.S.F.	F	4.X.R.	4.S.X.P.	4.S.X.B.	2004-4	X.I.P.-4	X.T.B.4	1227-6
5/16 in. B.S.F.	O	5.X.R.	5.S.X.P.	5.S.X.B.	2004-5	X.I.P.-5	X.T.B.5	1227-6
3/8 in. B.S.F	V	6.X.R.	6.S.X.P.	6.S.X.B.	2004-6	X.I.P.-6	X.T.B.6	1227-6
7/16 in. B.S.F.	29/64 in.	7.X.R.	7.S.X.P.	7.S.X.B.	2004-7	X.I.P.-7	X.T.B.7	1227-16
1/2 in. B.S.F.	33/64 in.	8.X.R.	8.S.X.P.	8.S.X.B.	2004-8	X.I.P.-8	X.T.B.8	1227-16
9/16 in. B.S.F.	37/64 in.	9.X.R.	9.S.X.P.	9.S.X.B.	2004-9	X.I.P.-9	X.T.B.9	1227-16
5/8 in. B.S.F.	41/64 in.	10.X.R.	10.S.X.P.	10.S.X.B.	2004-10	X.I.P.-10	X.T.B.10	1227-16
3/4 in. B.S.F.	49/64 in.	12.X.R.	12.S.X.P.	12.S.X.B.	2004-12	X.I.P.-12	X.T.B.12	1227-16
7/8 in. B.S.F.	57/64 in.	14.X.R.	14.S.X.P.	14.S.X.B.	2004-14	X.I.P.-14	X.T.B.14	1227-16
1·0 in. B.S.F.	1.1/64 in.	16.X.R.	16.S.X.P.	16.S.X.B.	2004-16	X.I.P.-16	X.T.B.16	1227-24

* Thread gauge for tapped hole only.

NOTE . . .
These tools are for use with Armstrong S.E.A.C. type inserts, and are not to be used for Helicoil type.

TABLE 6

Tools for B.S.P. Threads

Thread Size	Tapping Drill	Rough Tap	Finish Tap	Bottom Tap	Thread Gauge *	Insert Tool	Tang Break-Off Tool	Extract Tool
1/8 in. B.S.P.	W	2.P.R.	2.S.P.P.	2.S.P.B.	2005-2	P.I.P-2		1227-6
1/4 in. B.S.P.	17/32 in.	4.P.R.	4.S.P.P.	4.S.P.B.	2005-4	P.I.P-4		1227-16
0·6 in. dia.	39/64 in.	62.P.R.	62.S.P.P.	62.S.P.B.	2005-62	P.I.P-62		1227-16
3/8 in. B.S.P.	43/64 in.	6.P.R.	6.S.P.P.	6.S.P.B.	2005-6	P.I.P-6		1227-16
0·75 in. dia.	49/64 in.	77.P.R.	77.S.P.P.	77.S.P.B.	2005-77	P.I.P-77	Use	1227-16
1/2 in. B.S.P.	53/64 in.	8.P.R.	8.S.P.P.	8.S.P.B.	2005-8	P.I.P-8	Pliers	1227-16
5/8 in. B.S.P.	29/32 in.	10.P.R.	10.S.P.P.	10.S.P.B.	2005-10	P.I.P-10		1227-16
3/4 in. B.S.P.	1.3/64 in.	12.P.R.	12.S.P.P.	12.S.P.B.	2005-12	P.I.P-12		1227-24
7/8 in. B.S.P.	1.13/64 in.	14.P.R.	14.S.P.P.	14.S.P.B.	2005-14	P.I.P-14		1227-24
1·0 in. B.S.P.	1.5/16 in.	16.P.R.	16.S.P.P.	16.S.P.B.	2005-16	P.I.P-16		1227-24
1.1/4 in. B.S.P.	1.21/32 in.	20.P.R.	20.S.P.P.	20.S.P.B.	2005-20	P.I.P-20		1227-24
1.1/2 in. B.S.P.	1.57/64 in.	24.P.R.	24.S.P.P.	24.S.P.B.	2005-24	P.I.P-24		-

* Thread gauge for tapped hole only.

NOTE...
These tools are for use with Armstrong S.E.A.C. type inserts, and are not to be used for Helicoil type.

Installation

146. All inserts should be installed ½ pitch below the surface, or, where the tapped hole has previously been counter-bored, the insert should be wound down to the bottom of the counter-bore to give clearance for the bolt shank, or thread run-out of the male component. When opening out the hole for the insert the counter-bore should be taken into account when arriving at the depth for the insert.

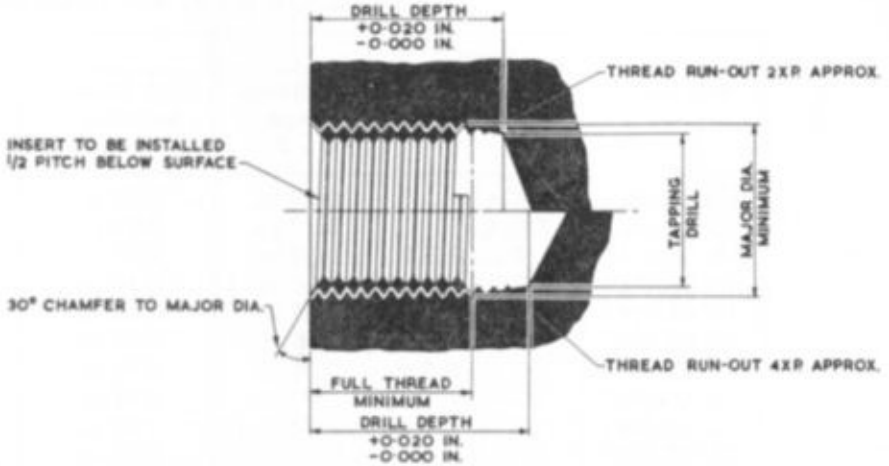


Fig.121. Installation Data for Wire Thread Inserts

TABLE 7

Installation Data

(1 x D) B.A. & B.S.F. Wire Thread Inserts

Insert				Tapped Hole in Member			
Part No.	Thread Size	Installation Length 1 x D	Major dia.	Full Thread Including c'sk.	Tapping Drill	2 x P Case Drill Depth	4 x P Case Drill Depth
1/AS.4947	4.B.A	0·13 in.	0·1749 in.	0·15 in.	No.27	0·20 in.	0·25 in.
2/AS.4947	2.B.A	0·18 in.	0·2252 in.	0·20 in.	3/16 in.	0·28 in.	0·35 in.
3/AS.4947	1/4 in. B.S.F.	0·24 in.	0·3012 in.	0·26 in.	F	0·34 in.	0·41 in.
4/AS.4947	5/16 in. B.S.F.	0·30 in.	0·3727 in.	0·33 in.	O	0·43 in.	0·53 in.
5/AS.4947	3/8 in. B.S.F.	0·37 in.	0·441 in.	0·40 in.	V	0·50 in.	0·60 in.
6/AS.4947	7/16 in. B.S.F.	0·43 in.	0·5107 in.	0·46 in.	29/64 in.	0·59 in.	0·71 in.
7/AS.4947	1/2 in. B.S.F.	0·49 in.	0·582 in.	0·52 in.	33/64 in.	0·65 in.	0·77 in.
8/AS.4947	9/16 in. B.S.F.	0·55 in.	0·6445 in.	0·58 in.	37/64 in.	0·72 in.	0·84 in.
9/AS.4947	5/8 in. B.S.F.	0·61 in.	0·7184 in.	0·65 in.	41/64 in.	0·80 in.	0·95 in.
10/AS.4947	3/4 in. B.S.F.	0·73 in.	0·8588 in.	0·78 in.	49/64 in.	0·96 in.	1·13 in.
11/AS.4947	7/8 in. B.S.F.	0·86 in.	0·9934 in.	0·91 in.	57/64 in.	1·11 in.	1·31 in.
12/AS.4947	1·0 in. B.S.F.	0·98 in.	1·130 in.	1·04 in.	1.1/64 in.	1·24 in.	1·44 in.

NOTE...

Figures quoted under column headings 'Major Dia.' and 'Tapping Drill' are omitted from tables 8, 9, 10 and 11, because they are identical to the figures quoted under the same headings in Table 7.

TABLE 8

(1½ x D) B.A. & B.S.F. Wire Thread Inserts

	Insert		Tapped Hole in Member		
Part No.	Thread Size	Installation Length 1½ x D	Full Thread Including c'sk.	2 x P Case Drill Depth	4 x P Case Drill Depth
13/AS.4947	4.B.A	0·20 in.	0·22 in.	0·27 in.	0·32 in.
14/AS.4947	2.B.A	0·27 in.	0·29 in.	0·37 in.	0·44 in.
15/AS.4947	1/4 in. B.S.F.	0·37 in.	0·39 in.	0·47 in.	0·54 in.
16/AS.4947	5/16 in. B.S.F.	0·46 in.	0·49 in.	0·59 in.	0·69 in.
17/AS.4947	3/8 in. B.S.F.	0·55 in.	0·58 in.	0·68 in.	0·78 in.
18/AS.4947	7/16 in. B.S.F.	0·65 in.	0·68 in.	0·81 in.	0·93 in.
19/AS.4947	1/2 in. B.S.F.	0·74 in.	0·77 in.	0·90 in.	1·02 in.
20/AS.4947	9/16 in. B.S.F.	0·83 in.	0·86 in.	0·99 in.	1·11 in.
21/AS.4947	5/8 in. B.S.F.	0·93 in.	0·97 in.	1·12 in.	1·27 in.
22/AS.4947	3/4 in. B.S.F.	1·10 in.	1·15 in.	1·33 in.	1·50 in.
23/AS.4947	7/8 in. B.S.F.	1·29 in.	1·34 in.	1·54 in.	1·74 in.
24/AS.4947	1·0 in. B.S.F.	1·48 in.	1·54 in.	1·74 in.	1·94 in.

TABLE 9

(2 x D) B.A. & B.S.F. Wire Thread Inserts

Insert			Tapped Hole in Member		
Part No.	Thread Size	Installation Length 2 x D	Full Thread Including c'sk.	2 x P Case Drill Depth	4 x P Case Drill Depth
25/AS.4947	4.B.A	0·27 in.	0·29 in.	0·34 in.	0·39 in.
26/AS.4947	2.B.A	0·36 in.	0·38 in.	0·46 in.	0·53 in.
27/AS.4947	1/4 in. B.S.F.	0·49 in.	0·51 in.	0·59 in.	0·66 in.
28/AS.4947	5/16 in. B.S.F.	0·61 in.	0·64 in.	0·74 in.	0·84 in.
29/AS.4947	3/8 in. B.S.F.	0·74 in.	0·77 in.	0·87 in.	0·97 in.
30/AS.4947	7/16 in. B.S.F.	0·87 in.	0·90 in.	1·03 in.	1·15 in.
31/AS.4947	1/2 in. B.S.F.	0·99 in.	1·02 in.	1·15 in.	1·27 in.
32/AS.4947	9/16 in. B.S.F.	1·11 in.	1·14 in.	1·27 in.	1·39 in.
33/AS.4947	5/8 in. B.S.F.	1·24 in.	1·28 in.	1·43 in.	1·58 in.
34/AS.4947	3/4 in. B.S.F.	1·48 in.	1·53 in.	1·71 in.	1·88 in.
35/AS.4947	7/8 in. B.S.F.	1·73 in.	1·78 in.	1·98 in.	2·18 in.
36/AS.4947	1·0 in. B.S.F.	1·98 in.	2·04 in.	2·24 in.	2·44 in.

TABLE 10

(2½ x D) B.A. & B.S.F. Wire Thread Inserts

Insert			Tapped Hole in Member		
Part No.	Thread Size	Installation Length 2½ x D	Full Thread Including c'sk.	2 x P Case Drill Depth	4 x P Case Drill Depth
37/AS.4947	4.B.A	0·34 in.	0·36 in.	0·41 in.	0·46 in.
38/AS.4947	2.B.A	0·45 in.	0·47 in.	0·55 in.	0·62 in.
39/AS.4947	1/4 in. B.S.F.	0·61 in.	0·63 in.	0·71 in.	0·78 in.
40/AS.4947	5/16 in. B.S.F.	0·77 in.	0·80 in.	0·90 in.	1·00 in.
41/AS.4947	3/8 in. B.S.F.	0·93 in.	0·96 in.	1·06 in.	1·16 in.
42/AS.4947	7/16 in. B.S.F.	1·08 in.	1·11 in.	1·24 in.	1·36 in.
43/AS.4947	1/2 in. B.S.F.	1·24 in.	1·27 in.	1·40 in.	1·52 in.
44/AS.4947	9/16 in. B.S.F.	1·40 in.	1·43 in.	1·56 in.	1·68 in.
45/AS.4947	5/8 in. B.S.F.	1·55 in.	1·59 in.	1·74 in.	1·89 in.
46/AS.4947	3/4 in. B.S.F.	1·86 in.	1·91 in.	2·09 in.	2·26 in.
47/AS.4947	7/8 in. B.S.F.	2·17 in.	2·22 in.	2·42 in.	2·62 in.
48/AS.4947	1·0 in. B.S.F.	2·48 in.	2·54 in.	2·74 in.	2·94 in.

TABLE 11

(3 x D) B.A. & B.S.F. Wire Thread Inserts

Insert			Tapped Hole in Member		
Part No.	Thread Size	Installation Length 3 x D	Full Thread Including csk.	2 x P Case Drill Depth	4 x P Case Drill Depth
49/AS.4947	4.B.A	0·42 in.	0·44 in.	0·49 in.	0·54 in.
50/AS.4947	2.B.A	0·54 in.	0·56 in.	0·64 in.	0·71 in.
51/AS.4947	1/4 in. B.S.F.	0·74 in.	0·76 in.	0·84 in.	0·91 in.
52/AS.4947	5/16 in. B.S.F.	0·93 in.	0·96 in.	1·06 in.	1·16 in.
53/AS.4947	3/8 in. B.S.F.	1·11 in.	1·14 in.	1·24 in.	1·34 in.
54/AS.4947	7/16 in. B.S.F.	1·30 in.	1·33 in.	1·46 in.	1·58 in.
55/AS.4947	1/2 in. B.S.F.	1·49 in.	1·52 in.	1·65 in.	1·77 in.
56/AS.4947	9/16 in. B.S.F.	1·68 in.	1·71 in.	1·84 in.	1·96 in.
57/AS.4947	5/8 in. B.S.F.	1·86 in.	1·91 in.	2·06 in.	2·21 in.
58/AS.4947	3/4 in. B.S.F.	2·23 in.	2·28 in.	2·46 in.	2·63 in.
59/AS.4947	7/8 in. B.S.F.	2·60 in.	2·65 in.	2·85 in.	3·05 in.
60/AS.4947	1·0 in. B.S.F.	2·98 in.	3·04 in.	3·24 in.	3·44 in.

TABLE 12

Installation Data for B.S.P. Wire Thread Inserts

Insert			Tapped Hole in Member				
Part No.	Thread Size	Install. Length	Major Dia.	Full Thread Including csk.	Tapping Drill	2 x P Case Drill Depth	4 x P Case Drill Depth
AS.4948/2	1/8 in. B.S.P.	0·2 in.	0·4308 in.	0·22 in.	W	0·30 in.	0·37 in.
AS.4948/3	1/8 in. B.S.P.	0·3 in.	0·4308 in.	0·32 in.	W	0·40 in.	0·47 in.
AS.4948/4	1/8 in. B.S.P.	0·4 in.	0·4308 in.	0·42 in.	W	0·50 in.	0·57 in.
AS.4948/5	1/8 in. B.S.P.	0·5 in.	0·4308 in.	0·52 in.	W	0·60 in.	0·67 in.
AS.4949/3	1/4 in. B.S.P.	0·3 in.	0·5874 in.	0·34 in.	17/32 in.	0·44 in.	0·54 in.
AS.4949/4	1/4 in. B.S.P.	0·4 in.	0·5874 in.	0·44 in.	17/32 in.	0·54 in.	0·64 in.
AS.4949/5	1/4 in. B.S.P.	0·5 in.	0·5874 in.	0·54 in.	17/32 in.	0·64 in.	0·74 in.
AS.4950/3	0·6 in. dia.	0·3 in.	0·6694 in.	0·34 in.	39/64 in.	0·44 in.	0·54 in.
AS.4950/4	0·6 in. dia.	0·4 in.	0·6694 in.	0·44 in.	39/64 in.	0·54 in.	0·64 in.
AS.4950/5	0·6 in. dia.	0·5 in.	0·6694 in.	0·54 in.	39/64 in.	0·64 in.	0·74 in.
AS.4950/6	0·6 in. dia.	0·6 in.	0·6694 in.	0·64 in.	39/64 in.	0·74 in.	0·84 in.

TABLE 13

Installation Data for B.S.P. Wire Thread Inserts

Insert			Tapped Hole in Member				
Part No.	Thread Size	Install. Length	Major Dia.	Full Thread Including c'sk.	Tapping Drill	2 x P Case Drill Depth	4 x P Case Drill Depth
AS.4951/3	3/8 in. B.S.P.	0·3 in.	0·7254 in.	0·34 in.	43/64 in.	0·44 in.	0·54 in.
AS.4951/4	3/8 in. B.S.P.	0·4 in.	0·7254 in.	0·44 in.	43/64 in.	0·54 in.	0·64 in.
AS.4951/5	3/8 in. B.S.P.	0·5 in.	0·7254 in.	0·54 in.	43/64 in.	0·64 in.	0·74 in.
AS.4951/6	3/8 in. B.S.P.	0·6 in.	0·7254 in.	0·64 in.	43/64 in.	0·74 in.	0·84 in.
AS.4952/4	0·75 in. dia.	0·4 in.	0·8434 in.	0·45 in.	49/64 in.	0·60 in.	0·75 in.
AS.4952/5	0·75 in. dia.	0·5 in.	0·8434 in.	0·55 in.	49/64 in.	0·70 in.	0·85 in.
AS.4952/6	0·75 in. dia.	0·6 in.	0·8434 in.	0·65 in.	49/64 in.	0·80 in.	0·95 in.
AS.4952/7	0·75 in. dia.	0·7 in.	0·8434 in.	0·75 in.	49/64 in.	0·90 in.	1·05 in.
AS.4953/4	1/2 in. B.S.P.	0·4 in.	0·9184 in.	0·45 in.	53/64 in.	0·60 in.	0·75 in.
AS.4953/5	1/2 in. B.S.P.	0·5 in.	0·9184 in.	0·55 in.	53/64 in.	0·70 in.	0·85 in.
AS.4953/6	1/2 in. B.S.P.	0·6 in.	0·9184 in.	0·65 in.	53/64 in.	0·80 in.	0·95 in.
AS.4954/4	5/8 in. B.S.P.	0·4 in.	0·9954 in.	0·45 in.	29/32 in.	0·60 in.	0·75 in.
AS.4954/5	5/8 in. B.S.P.	0·5 in.	0·9954 in.	0·55 in.	29/32 in.	0·70 in.	0·85 in.
AS.4954/6	5/8 in. B.S.P.	0·6 in.	0·9954 in.	0·65 in.	29/32 in.	0·80 in.	0·95 in.
AS.4954/7	5/8 in. B.S.P.	0·7 in.	0·9954 in.	0·75 in.	29/32 in.	0·90 in.	1·05 in.

TABLE 14

Installation Data for B.S.P. Wire Thread Inserts

Insert			Tapped Hole in Member				
Part No.	Thread Size	Install Length	Major Dia.	Full Thread Including c'sk.	Tapping Drill	2 x P Case Drill Depth	4 x P Case Drill Depth
AS.4955/4	3/4 in. B.S.P.	0·4 in.	1·1344 in.	0·45 in.	1.3/64 in.	0·60 in.	0·75 in.
AS.4955/5	3/4 in. B.S.P.	0·5 in.	1·1344 in.	0·55 in.	1.3/64 in.	0·70 in.	0·85 in.
AS.4955/6	3/4 in. B.S.P.	0·6 in.	1·1344 in.	0·65 in.	1.3/64 in.	0·80 in.	0·95 in.
AS.4955/7	3/4 in. B.S.P.	0·7 in.	1·1344 in.	0·75 in.	1.3/64 in.	0·90 in.	1·05 in.
AS.4955/8	3/4 in. B.S.P.	0·8 in.	1·1344 in.	0·85 in.	1.3/64 in.	1·00 in.	1·15 in.
AS.4956/4	7/8 in. B.S.P.	0·4 in.	1·2824 in.	0·45 in.	1.13/64 in.	0·60 in.	0·75 in.
AS.4956/5	7/8 in. B.S.P.	0·5 in.	1·2824 in.	0·55 in.	1.13/64 in.	0·70 in.	0·85 in.
AS.4956/6	7/8 in. B.S.P.	0·6 in.	1·2824 in.	0·65 in.	1.13/64 in.	0·80 in.	0·95 in.
AS.4956/7	7/8 in. B.S.P.	0·7 in.	1·2824 in.	0·75 in.	1.13/64 in.	0·90 in.	1·05 in.
AS.4956/8	7/8 in. B.S.P.	0·8 in.	1·2824 in.	0·85 in.	1.13/64 in.	1·00 in.	1·15 in.

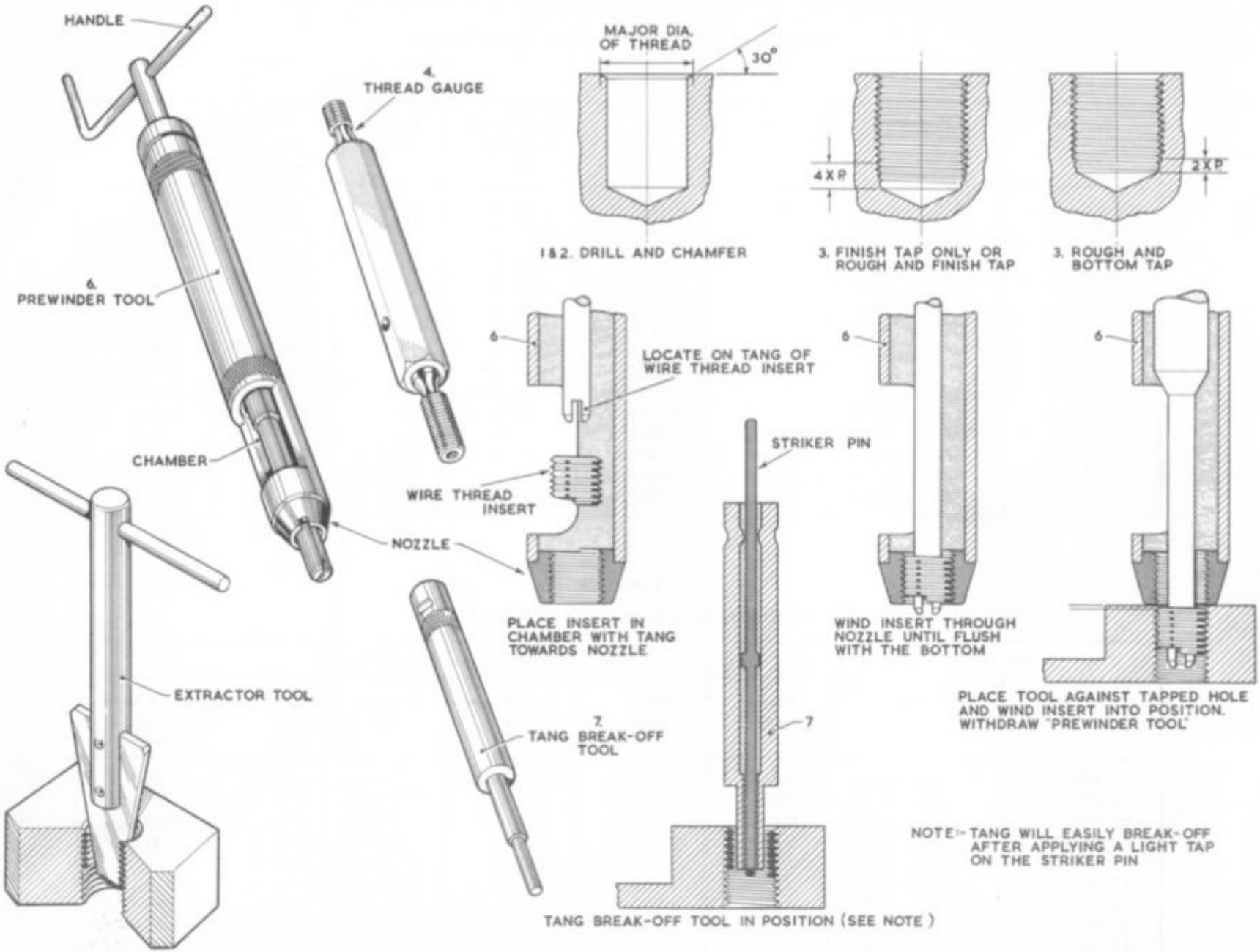


Fig. 122. Assembly of wire thread inserts

RESTRICTED

TABLE 15

Installation Data for B.S.P. Wire Thread Inserts

Insert			Tapped Hole in Member				
Part No.	Thread Size	Install. Length	Major Dia.	Full Thread including csk.	Tapping Drill	2 x P Case Drill Depth	4 x P Case Drill Depth
AS.4957/5	1·0 in. B.S.P.	0·5 in.	1·4274 in.	0·55 in.	1·5/16 in.	0·75 in.	0·95 in.
AS.4957/6	1·0 in. B.S.P.	0·6 in.	1·4274 in.	0·65 in.	1·5/16 in.	0·85 in.	1·05 in.
AS.4957/7	1·0 in. B.S.P.	0·7 in.	1·4274 in.	0·75 in.	1·5/16 in.	0·95 in.	1·15 in.
AS.4957/8	1·0 in. B.S.P.	0·8 in.	1·4274 in.	0·85 in.	1·5/16 in.	1·05 in.	1·25 in.
AS.4958/5	1¼ in. B.S.P.	0·5 in.	1·7684 in.	0·55 in.	1·21/32 in.	0·75 in.	0·95 in.
AS.4958/6	1¼ in. B.S.P.	0·6 in.	1·7684 in.	0·65 in.	1·21/32 in.	0·85 in.	1·05 in.
AS.4958/7	1¼ in. B.S.P.	0·7 in.	1·7684 in.	0·75 in.	1·21/32 in.	0·95 in.	1·15 in.
AS.4958/8	1¼ in. B.S.P.	0·8 in.	1·7684 in.	0·85 in.	1·21/32 in.	1·05 in.	1·25 in.
AS.4959/5	1½ in. B.S.P.	0·5 in.	2·0004 in.	0·55 in.	1·57/64 in.	0·75 in.	0·95 in.
AS.4959/6	1½ in. B.S.P.	0·6 in.	2·0004 in.	0·65 in.	1·57/64 in.	0·85 in.	1·05 in.
AS.4959/7	1½ in. B.S.P.	0·7 in.	2·0004 in.	0·75 in.	1·57/64 in.	0·95 in.	1·15 in.
AS.4959/8	1½ in. B.S.P.	0·8 in.	2·0004 in.	0·85 in.	1·57/64 in.	1·05 in.	1·25 in.
AS.4959/9	1½ in. B.S.P.	0·9 in.	2·0004 in.	0·95 in.	1·57/64 in.	1·15 in.	1·35 in.

Assembly of wire thread inserts

147. The following instructions (refer to fig.122) should be strictly adhered to when fitting a wire thread insert.

(1) The tapped hole in the component to be repaired is to be opened out with a standard twist drill, to the diameter and depth, required for the insert.

(2) Chamfer the hole slightly to ease the tapping operation. This only applies if the existing hole has not been previously counter-bored for clearance.

(3) Using the special taps called up, tap the hole to the correct depth required. Paraffin can be used as a lubricant.

NOTE...
The depth is determined by the length of insert to be fitted.

(4) Remove all the swarf etc. from the hole and check the thread with the 'go' and 'no go' thread gauge, also ensure that the thread has been tapped to the correct depth.

(5) Thoroughly coat the hole with Celloseel D.T.D.900/4301 (Ref. No.33H/113) (See notes after sub-para.8).

(6) Using the 'Prewinder tool' the insert should be assembled in the tapped hole. Great care should be exercised when starting to wind the insert into the tapped hole to ensure that the insert is not cross-threaded.

(7) After assembly of the insert, break off the insert tang with the special punch provided for the operation. Remove the broken tang from the hole, either by air blast or small tweezers.

(8) Prior to final assembly, coat the insert, and hole with Celloseel. Great care should be exercised to ensure that all excess Celloseel is removed from the bore of repaired components involving liquid and air systems.

NOTE...
When repairing magnesium alloy components it is essential that Selenious acid treatment is applied after tapping the hole before coating with Celloseel. If the insert has to be removed use the

'Extractor' tool provided. To remove the insert press 'in' and 'turn' the extractor tool at the same time.

WARNING...

Refer to the appended lists for the correct type of insert to be used in various temperature conditions. Cadmium plated inserts are only to be used where conditions will not exceed 200°C. Unplated inserts must be used where temperature conditions are likely to exceed 200°C. All other dimensions, tools required, and item numbers are identical.

Unplated Inserts for conditions above 200°C.		Cadmium plated Inserts for conditions below 200°C.
AS.4736	Alternative for	AS.4947
AS.4737	" "	AS.4948
AS.4738	" "	AS.4949
AS.4739	" "	AS.4950
AS.4740	" "	AS.4951
AS.4741	" "	AS.4952
AS.4742	" "	AS.4953
AS.4743	" "	AS.4954
AS.4744	" "	AS.4955
AS.4745	" "	AS.4956
AS.4746	" "	AS.4957
AS.4747	" "	AS.4958
AS.4748	" "	AS.4959

TABLE 16

Aluminium Alloy Sheet Specifications L.59, L.72, L.73 and D.T.D.687 Bend Radii

S.W.G.	Cold working Radius in.		Normalised and used within 1 hr. Radius in.		Fully annealed Radius in.	
	L.59, L.72 and L.73	D.T.D.687	L.59, L.72 and L.73	D.T.D.687	L.59, L.72 and L.73	D.T.D.687
26	5/64	5/64	3/64	3/64	3/64	3/64
24	5/64	3/32	1/16	1/16	3/64	3/64
22	7/64	1/8	5/64	5/64	1/16	1/16
20	9/64	5/32	3/32	3/32	5/64	5/64
18	11/64	13/64	1/8	1/8	7/64	7/64
16	15/64	17/64	11/64	11/64	9/64	9/64
14	9/32	21/64	13/64	13/64	11/64	11/64
12	3/8	27/64	17/64	17/64	7/32	7/32
10	29/64	33/64	21/64	21/64	17/64	17/64
8	9/16	41/64	13/32	13/32	21/64	21/64
6	43/64	25/32	31/64	31/64	25/64	25/64

TABLE 17

Magnesium Alloy Sheet. Specifications D.T.D.118, D.T.D.732 and D.T.D.742
Bend Radii

S.W.G.	D.T.D.118, D.T.D.732 and D.T.D.742 Radius in.	S.W.G.	D.T.D.118, D.T.D.732 and D.T.D.742 Radius in.
26	5/32	16	33/64
24	3/16	14	41/64
22	15/64	12	27/32
20	19/64	10	1.1/32
18	25/64		

TABLE 18

Steel Sheet. Specifications S.510, S.511 and S.514
Stainless Steel Sheet Specifications S.520, S.521 and D.T.D.712
Titanium Sheet Specification A.V.R.50
Bend Radii

S.W.G.	S.510 and S.511 Radius in.	S.514 Radius in.
26	1/64	3/64
24	1/64	3/64
22	1/64	1/16
20	1/32	5/64
18	1/32	7/64
16	3/64	13/64
14	3/64	1/4
12	1/16	5/16

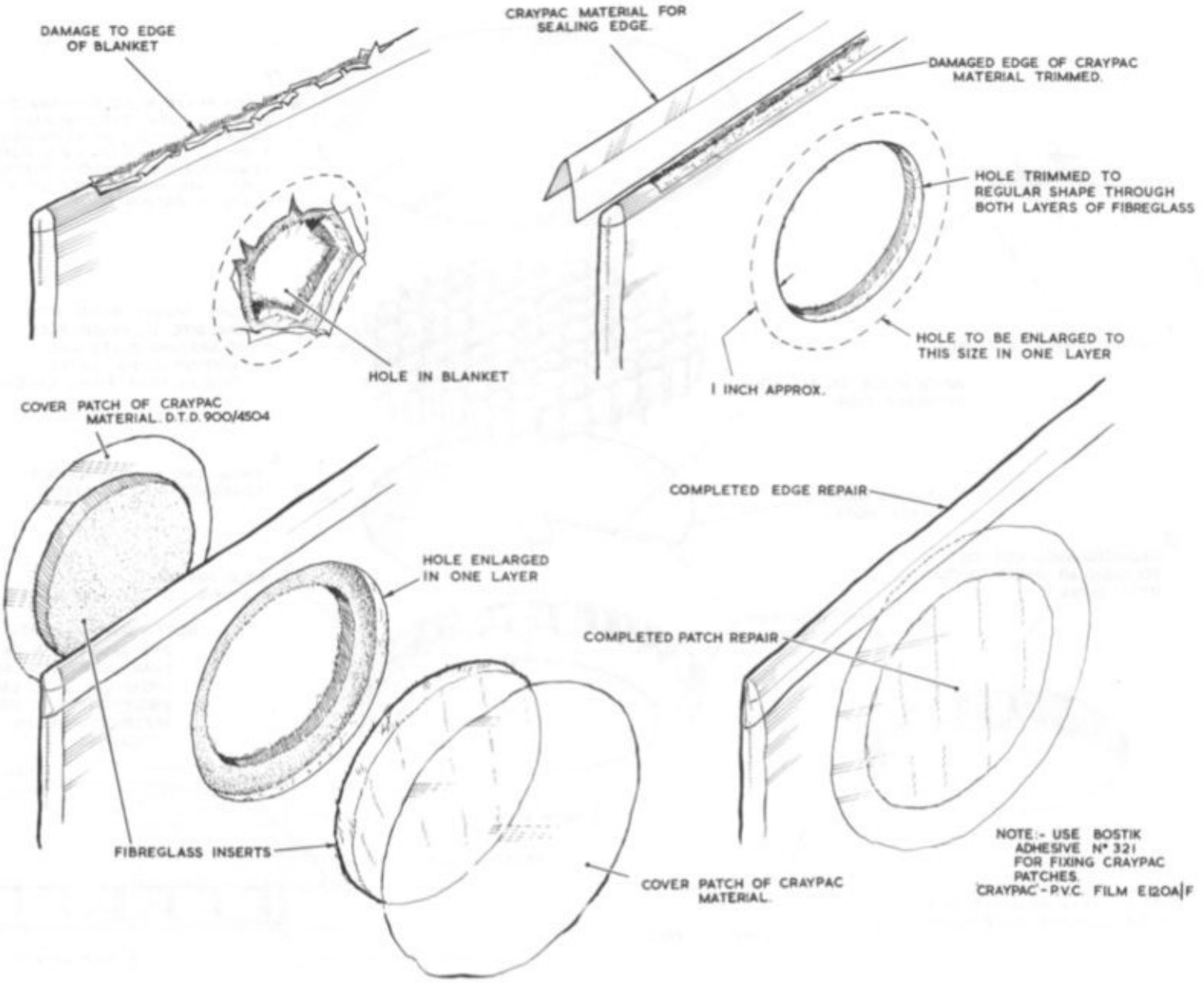


Fig.101. Insulation blanket repairs

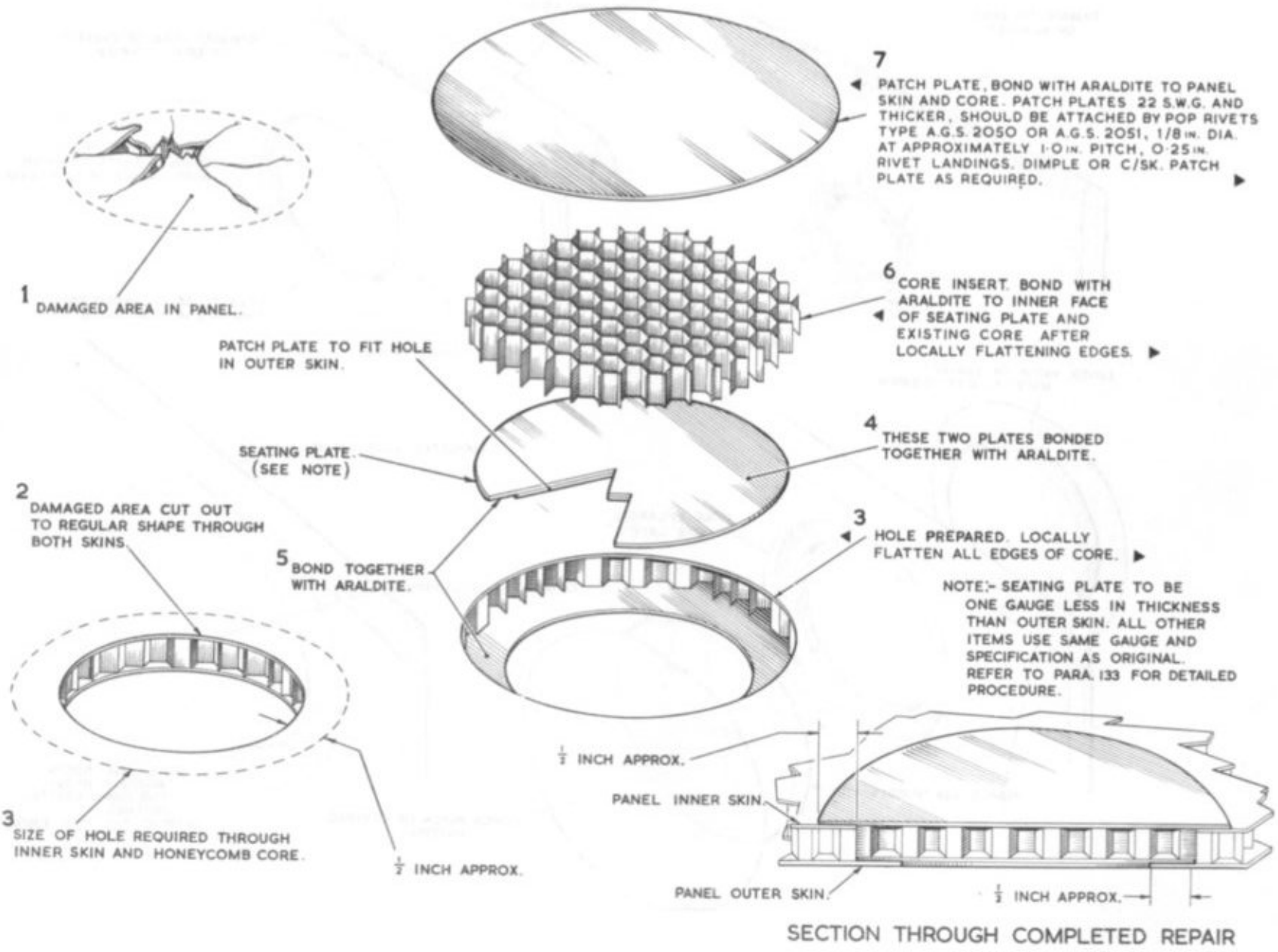
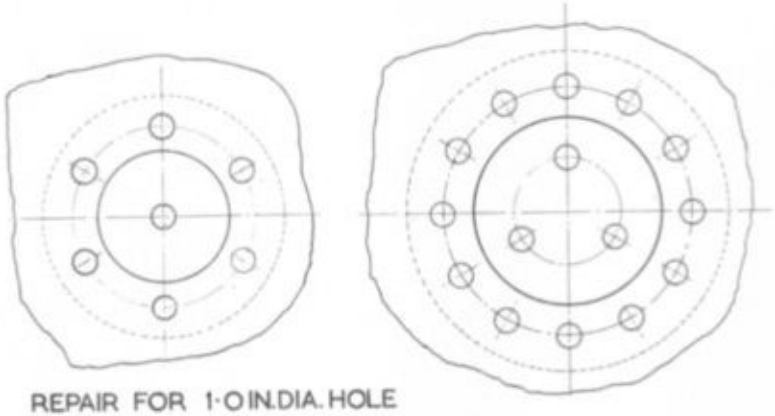


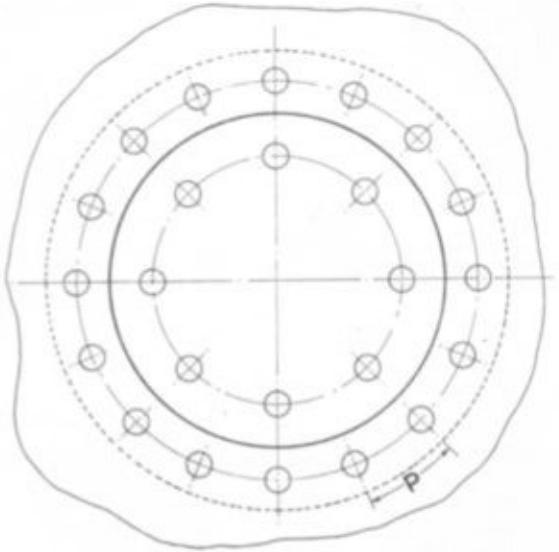
Fig. 102. Honeycomb sandwich panel repair

FILLER PLATE SHOULD BE AN ACCURATE FIT ANY DEVIATIONS IN CONTOUR SHOULD NOT EXCEED 0·03IN. AT ANY ONE POINT.

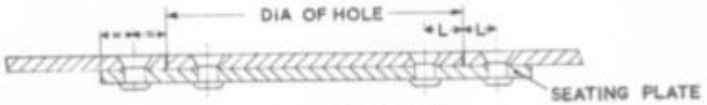


REPAIR FOR 1·0 IN.DIA. HOLE

REPAIR FOR 1·5 IN.DIA. HOLE



REPAIR FOR 2·5 IN.DIA. HOLE



TYPICAL SECTION

RIVETS MUST BE THE SAME TYPE AS THOSE USED IN THE SURROUNDING STRUCTURE.

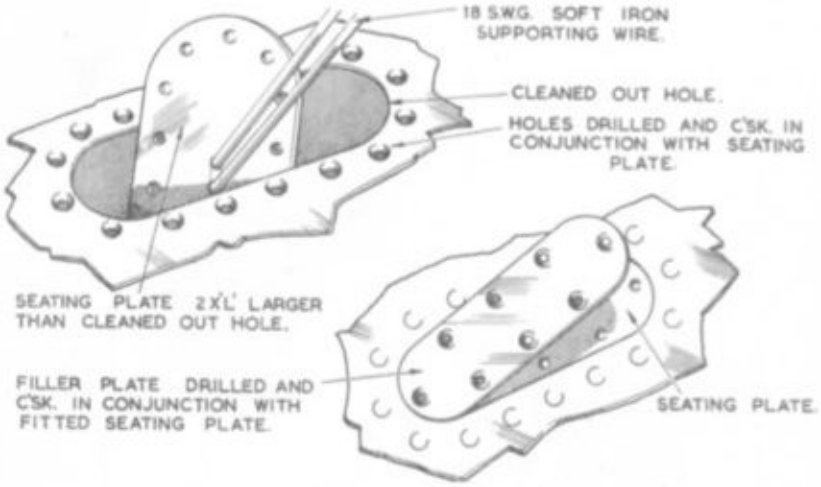
FILLER PLATE TO BE OF SAME GAUGE AND SPECIFICATION AS EXISTING SKIN. SEATING PLATE TO BE TWO GAUGES THICKER.

USE JOINTING COMPOUND ON ASSEMBLY PARA. 134–137

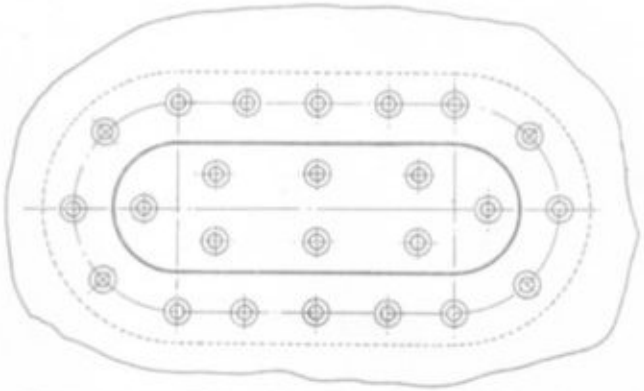
GAUGE	RIVET	L.	P.
22	0·125 IN. DIA.	0·3 IN.	0·5 IN.
20	0·125 IN DIA.	0·3 IN.	0·5 IN.
18	0·156 IN. DIA.	0·35 IN.	0·6 IN.
16	0·187 IN.DIA.	0·4 IN.	0·7 IN.
14	0·187 IN.DIA.	0·4 IN.	0·7 IN.

L AND P DIMENSIONS ARE APPROX.
PITCH RATIO NOT TO EXCEED 6 X RIVET DIA.
MINIMUM DIMENSIONS OF 'L' 2 X RIVET DIA.

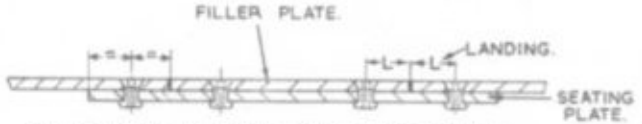
Fig. 103. Skin repairs - non pressurised - holes up to 2·5 in. dia.



USE JOINTING COMPOUND ON ASSEMBLY (PARA. 134-137)



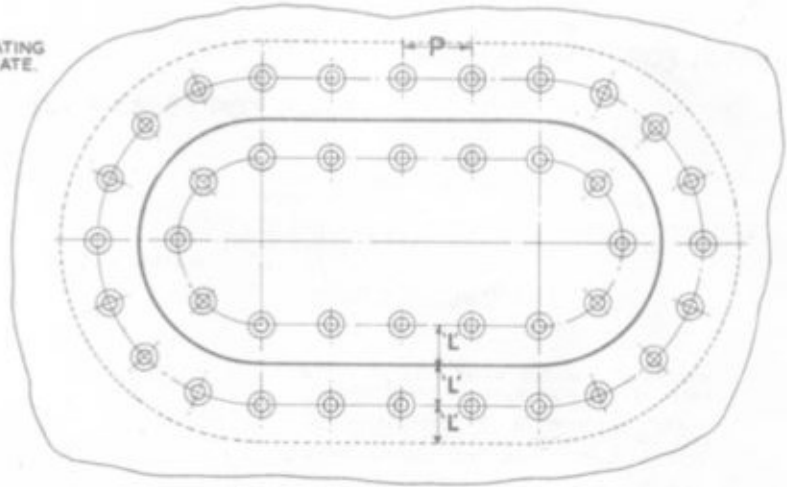
← DIRECTION OF STRINGERS AND INTERCOSTALS →



FILLER PLATE TO BE OF SAME GAUGE AS SKIN.
SEATING PLATE TO BE TWO GAUGES THICKER THAN SKIN.
RIVETS MUST BE THE SAME TYPE AS THOSE USED IN THE SURROUNDING STRUCTURE

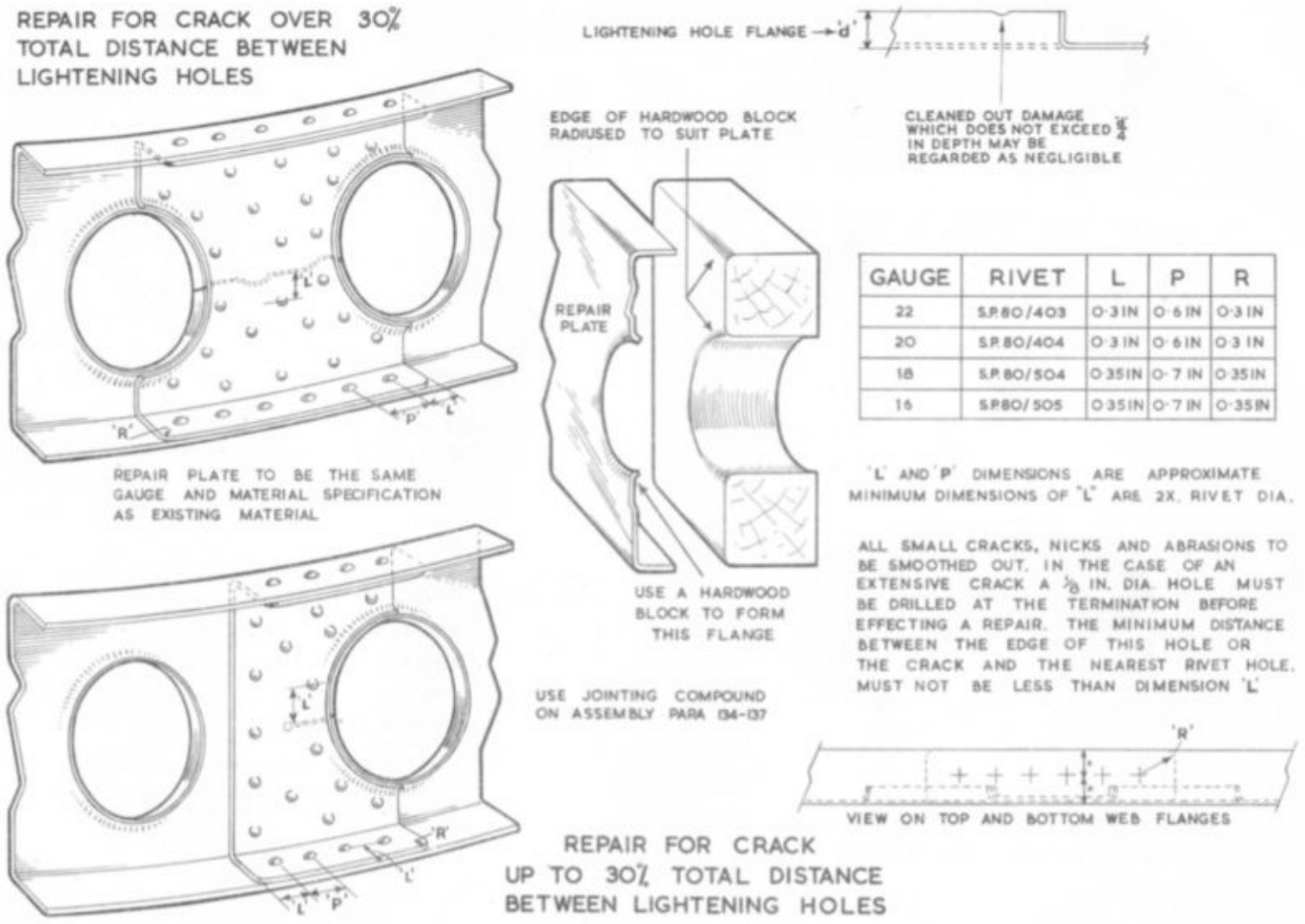
GAUGE	RIVET	L	P
22	0·125 IN. DIA.	0·3 IN.	0·5 IN.
20	0·125 IN. DIA.	0·3 IN.	0·5 IN.
18	0·156 IN. DIA.	0·35 IN.	0·6 IN.
16	0·187 IN. DIA.	0·4 IN.	0·7 IN.
14	0·187 IN. DIA.	0·4 IN.	0·7 IN.

L. AND P. DIMENSIONS APPROX.
MINIMUM DIMENSION OF 'L' 2X. DIA. OF RIVET.



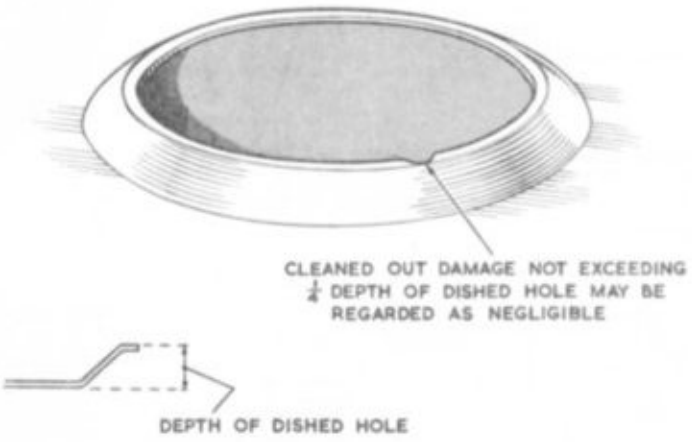
MAX. SIZE OF HOLE 6·0 IN. X 3·5 IN.

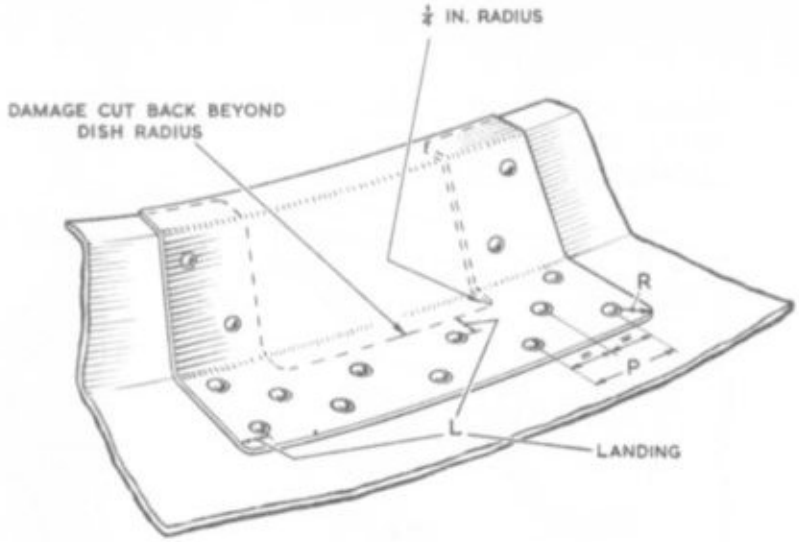
Fig. 104. Skin repairs - non-pressurised - inaccessible holes (not air intake duct skinning)



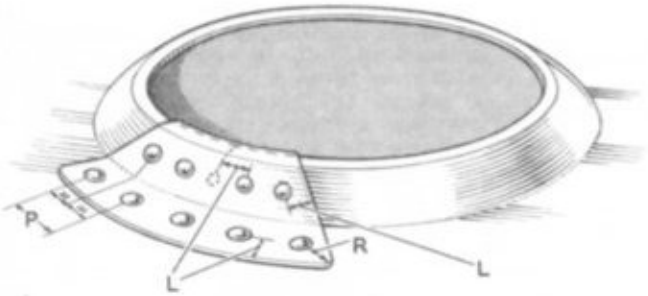
GAUGE	RIVET	L	P	R
22	S.P.80/403	0·3 IN	0·6 IN	0·3 IN
20	S.P.80/404	0·3 IN	0·6 IN	0·3 IN
18	S.P.80/504	0·35 IN	0·7 IN	0·35 IN
16	S.P.80/505	0·35 IN	0·7 IN	0·35 IN

Fig. 105. Repairs to flanged lightening holes





REPAIR FOR PARTIAL REPLACEMENT
OF LARGE DISHED FLANGE



REPAIR TO CRACK NOT EXTENDING
BEYOND THE DISH RADIUS

GAUGE	RIVET	L	P	R
22	S.P. 80/403	0·3 IN.	0·6 IN.	0·3 IN.
20	S.P. 80/404	0·3 IN.	0·6 IN.	0·3 IN.
18	S.P. 80/504	0·35 IN.	0·7 IN.	0·4 IN.
16	S.P. 80/505	0·35 IN.	0·7 IN.	0·4 IN.

'L' LANDING DIMENSIONS ARE MINIMUM

REPAIR PLATES TO BE SAME GAUGE
AND SPECIFICATION AS EXISTING MEMBER

USE JOINTING COMPOUND ON
ASSEMBLY (PARA. 134 - 137)

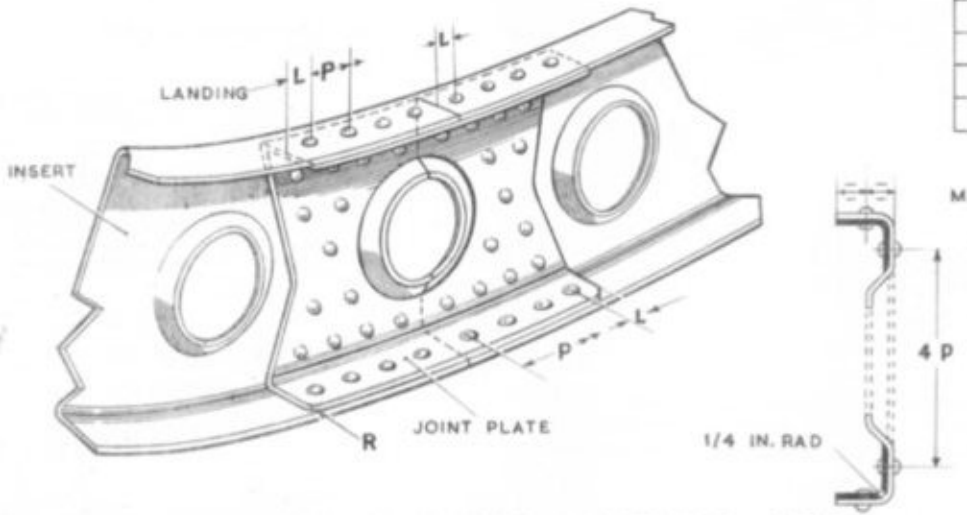
Fig. 106. Repairs to dished lightening holes

GAUGE		RIVET.	P.	L.	R.
FORMER	JOINT PLATE				
22	20	S.P.80/404	0·5 IN.	0·3 IN.	0·25 IN.
20	18	S.P.80/404	0·5 IN.	0·3 IN.	0·25 IN.
18	16	S.P.80/505	0·6 IN.	0·3 IN.	0·3 IN.
16	14	S.P.80/505	0·6 IN.	0·3 IN.	0·3 IN.

"P" DIMENSIONS ARE APPROX.

MINIMUM DIMENSIONS OF "L" ARE 2X RIVET DIA.

REPAIRS ILLUSTRATED ARE FOR CHANNEL SECTION 455/551793.



REPAIR TO FORMER INVOLVING LIGHTENING HOLES.

REPAIR MATERIAL TO BE SAME SPECIFICATION AS EXISTING MATERIAL AND MUST ACCOMMODATE EXISTING LIGHTENING HOLES.
RIVETS TO BE AS STATED IN TABLE WHERE PRACTICABLE.
CORNERS OF REPAIR PLATE TO BE RADIUSED 'R'

USE JOINTING COMPOUND ON ASSEMBLY PARA. 134 - 137.

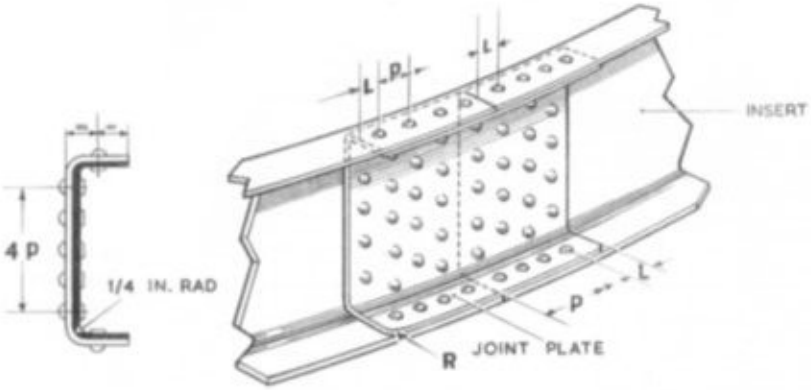
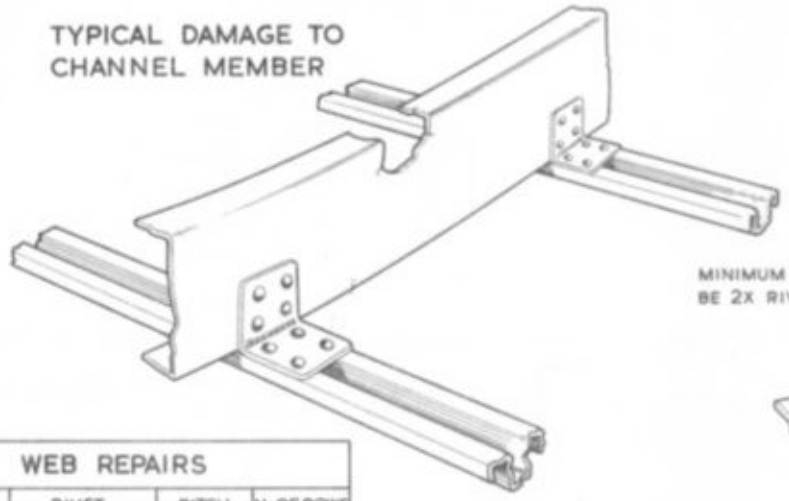
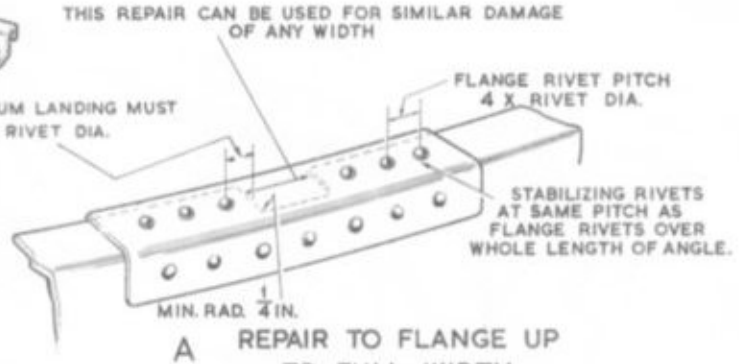


Fig. 107. Former insertion repairs — large channel sections



NOTE - REPAIR MATERIAL MUST BE OF SAME GAUGE AND SPECIFICATION AS DAMAGED MEMBER. ALL CORNERS AND SHARP EDGES MUST BE REMOVED.
EXISTING RIVET PITCHES IN A DAMAGED MEMBER MUST BE EMBRACED WHEN EFFECTING REPAIR.
REPAIR PLATES MAY BE FITTED ON EITHER SIDE OF CHANNEL.
WHEN REPAIRING LIPPED CHANNEL MEMBERS. THE REPAIR MATERIAL MUST BE EXTENDED AND BENT TO FORM A NEW LIP.

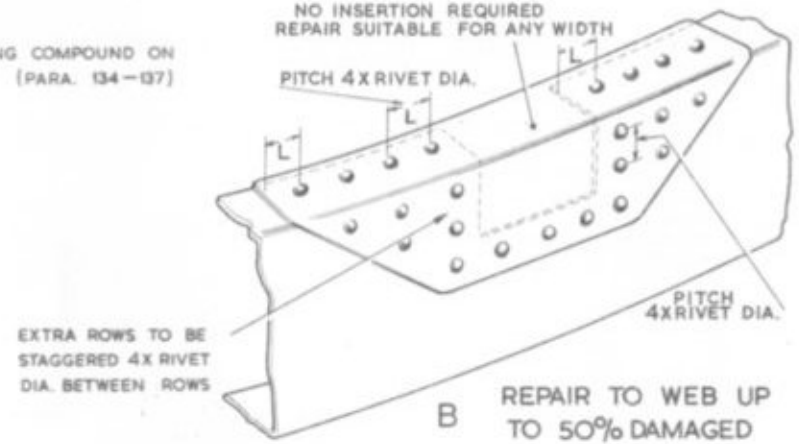


A REPAIR TO FLANGE UP TO FULL WIDTH

WEB REPAIRS			
GAUGE	RIVET	PITCH	No OF ROWS
22	S.P.80/404	0·5 IN.	2+
20	S.P.80/404	0·5 IN.	2+
18	S.P.80/505	0·6 IN.	2+
16	S.P.80/505	0·6 IN.	2
14	S.P.80/606	0·7 IN.	2

DAMAGED PORTION MUST BE CLEANED OUT TO A REGULAR SHAPE BEFORE TYPE OF REPAIR TO BE EFFECTED CAN BE DETERMINED

USE JOINTING COMPOUND ON ASSEMBLY (PARA. 134–137)



B REPAIR TO WEB UP TO 50% DAMAGED

FLANGE REPAIRS					
DEPTH OF DAMAGE IN INCHES	NUMBER OF RIVETS EACH SIDE OF DAMAGE				
	22 SWG	20 SWG	18 SWG	16 SWG	14 SWG
LESS THAN 0·4	3	3	4	3	4
0·4 TO 0·5	3	3	4	3	4
0·5 TO 0·6	4	4	5	4	4
0·6 TO 0·7	4	4	5	5	5
0·7 TO 0·9	5	6	6	6	6
0·9 TO —	5	6	6	6	7

Fig. 108. Flange and web repairs to channel members

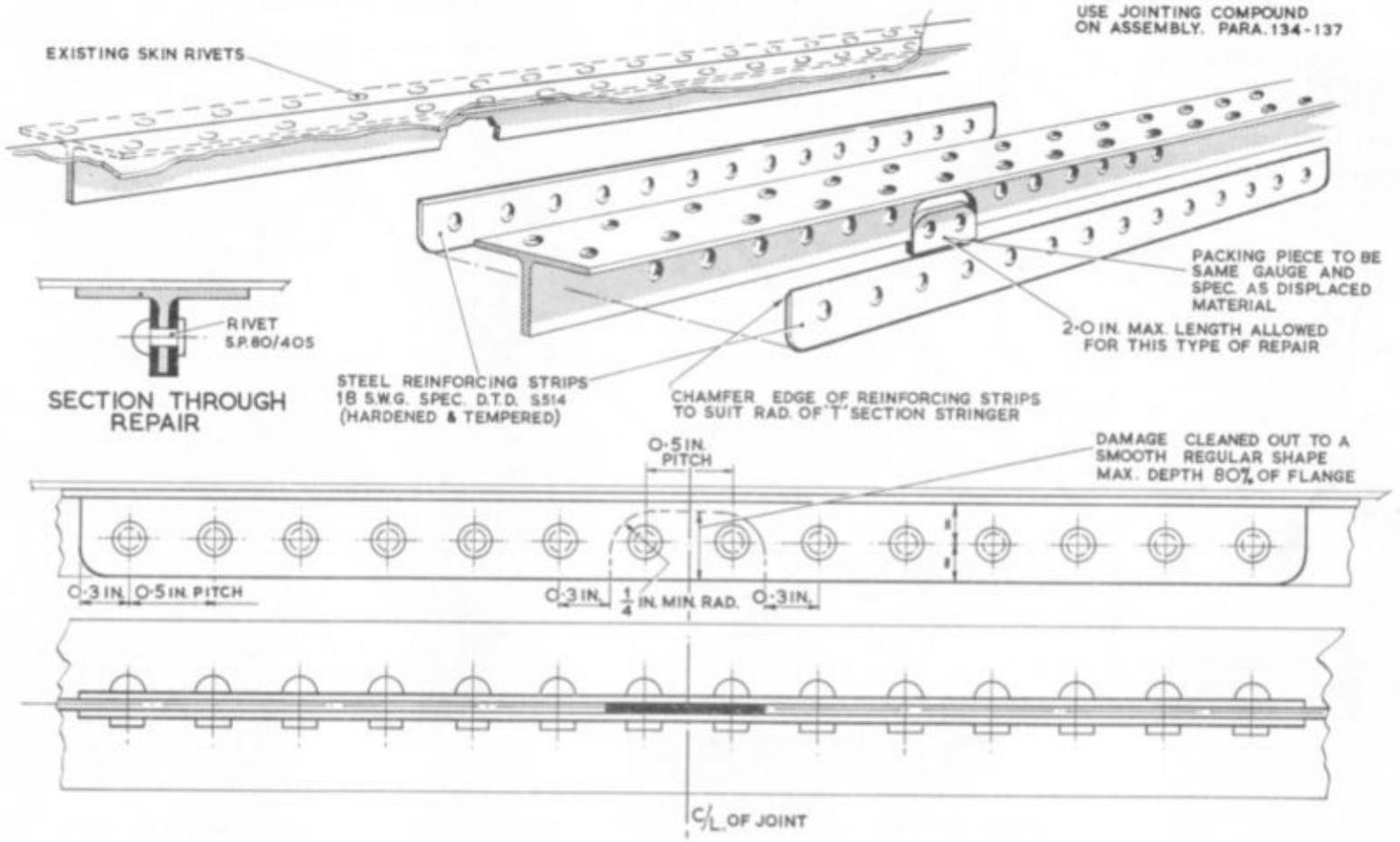


Fig. 109. Patch repair 'T' section stringer (309, 375 and 419 SS. 3075)

RESTRICTED

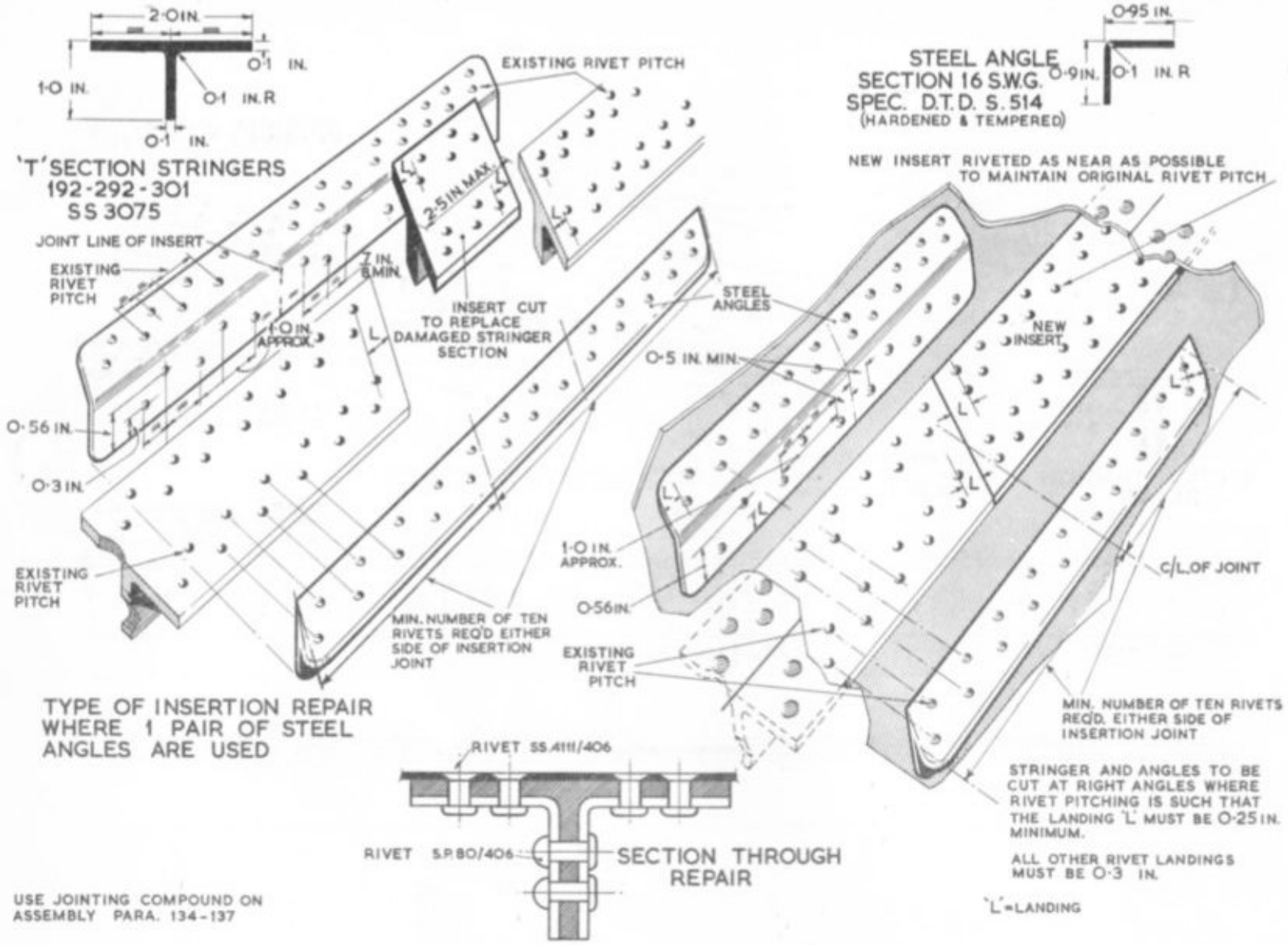


Fig. 110. 'T' – section stringers – insertion repairs.

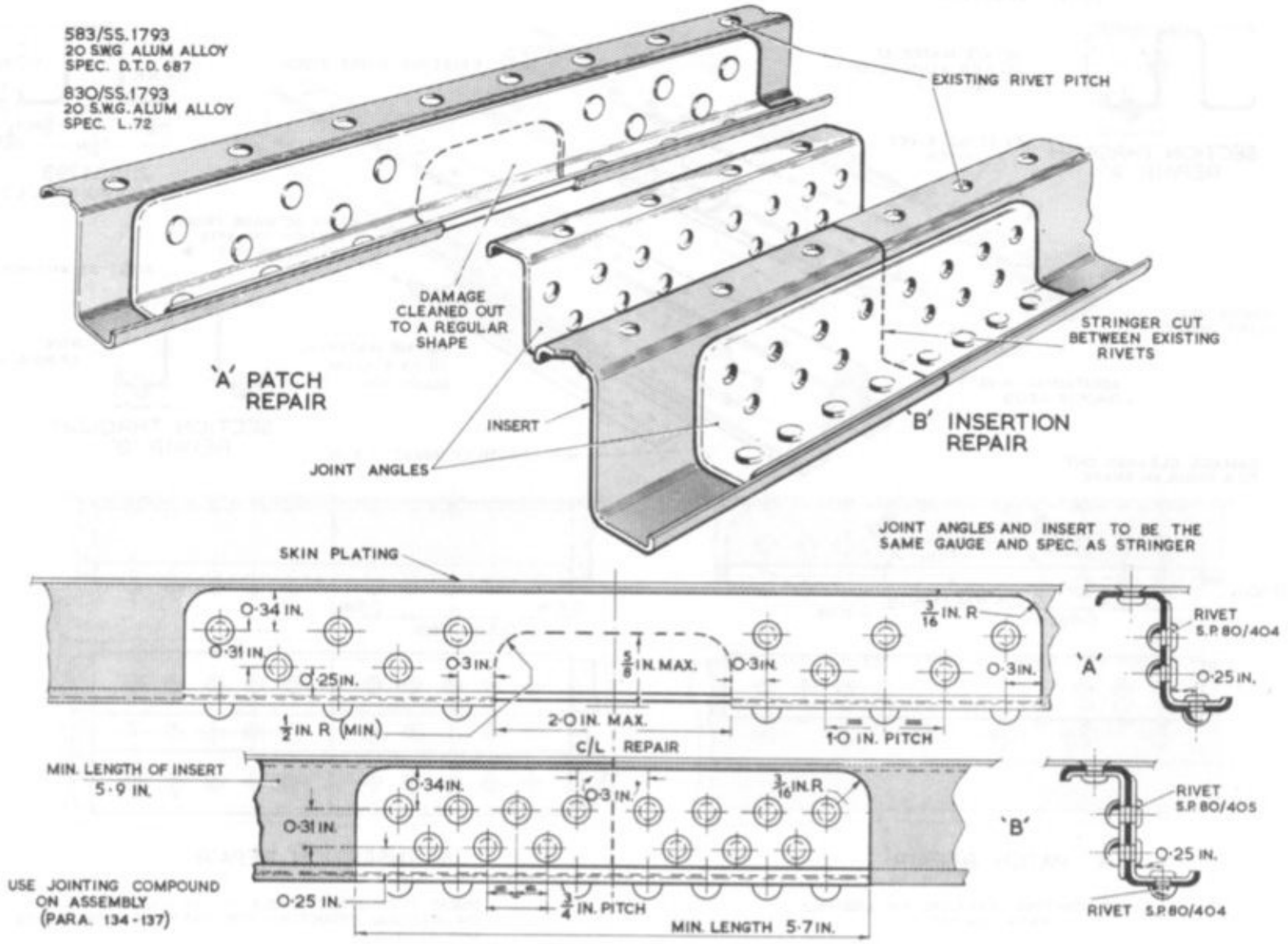


Fig. 111 Patch and insertion repairs to 'Z' section stringers

RESTRICTED

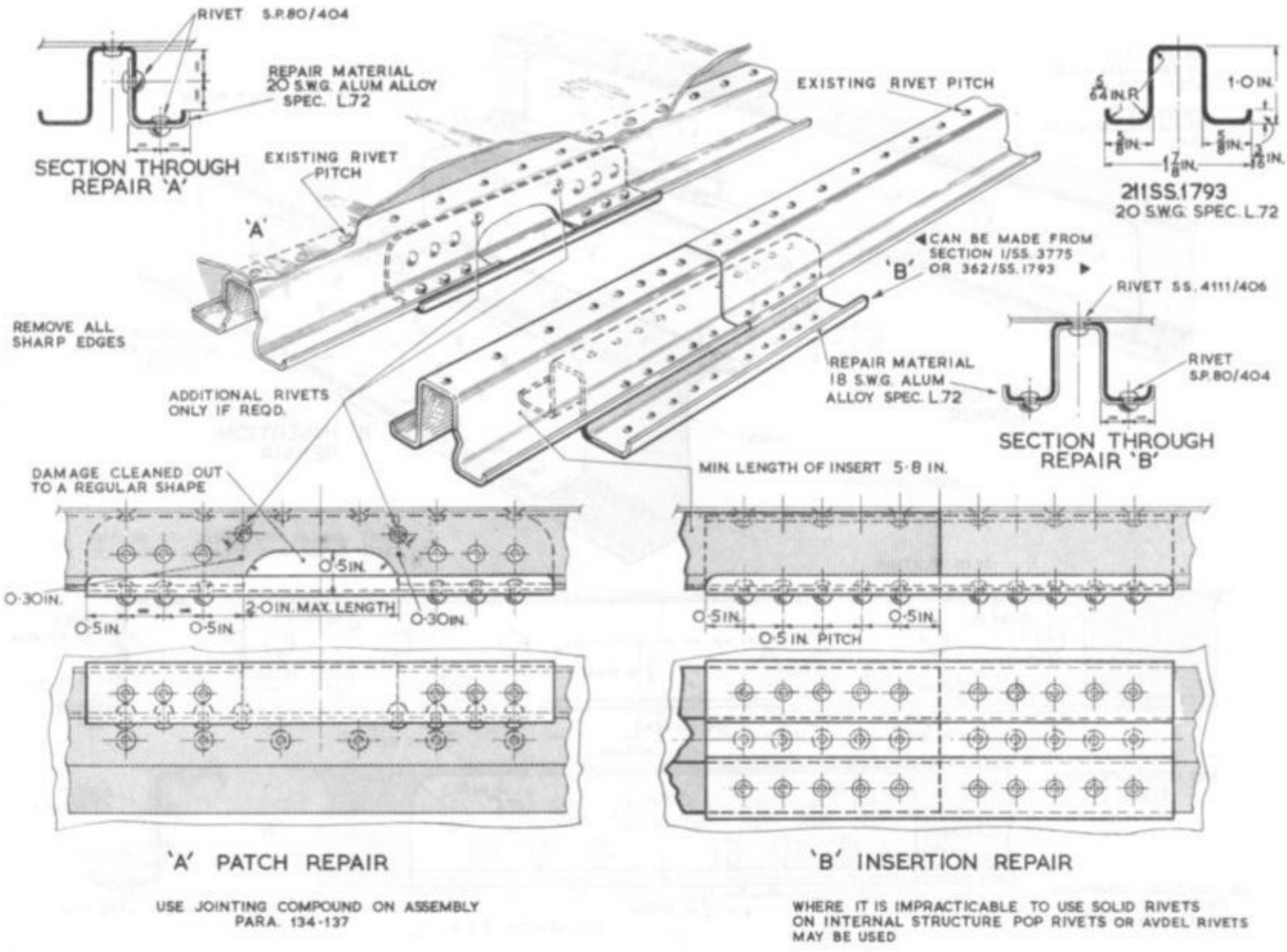
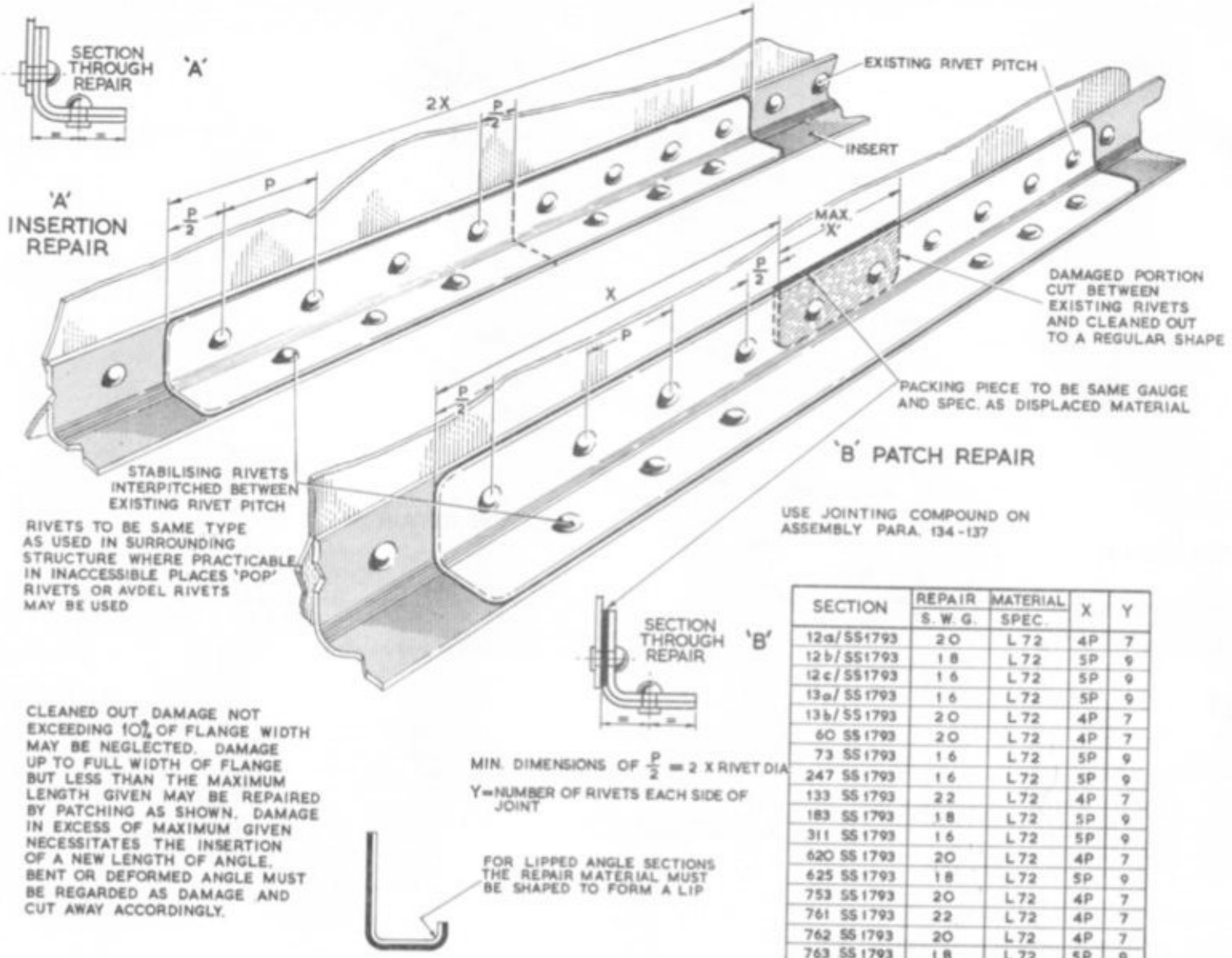
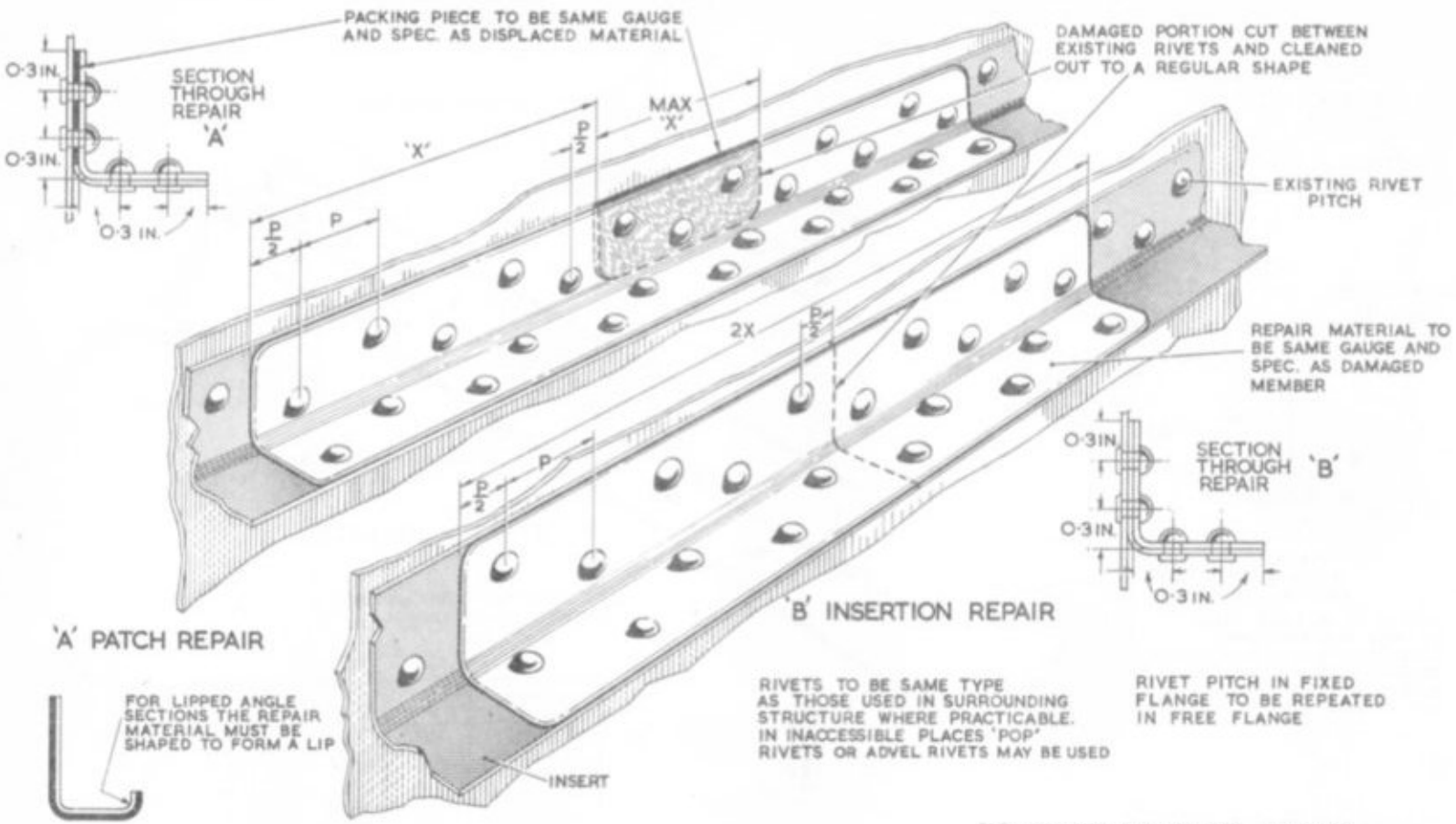


Fig.112 Patch and insertion repairs – top hat section stringers (211 SS.1793)



SECTION	REPAIR S.W.G.	MATERIAL SPEC.	X	Y
12a/SS1793	20	L72	4P	7
12b/SS1793	18	L72	5P	9
12c/SS1793	16	L72	5P	9
13a/SS1793	16	L72	5P	9
13b/SS1793	20	L72	4P	7
60 SS1793	20	L72	4P	7
73 SS1793	16	L72	5P	9
247 SS1793	16	L72	5P	9
133 SS1793	22	L72	4P	7
183 SS1793	18	L72	5P	9
311 SS1793	16	L72	5P	9
620 SS1793	20	L72	4P	7
625 SS1793	18	L72	5P	9
753 SS1793	20	L72	4P	7
761 SS1793	22	L72	4P	7
762 SS1793	20	L72	4P	7
763 SS1793	18	L72	5P	9

Fig. 113. Patch and insertion repairs to small rolled section stiffeners.



SECTION	REPAIR S.W.G.	MATERIAL SPEC.	X	Y
470/SS1793	14 S.W.G.	L.72	5P	10
349/SS1793	14 S.W.G.	L.72	5P	10
446/SS1793	18 S.W.G.	L.72	6P	12

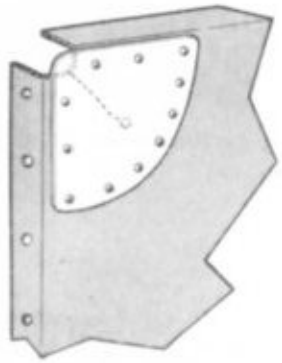
MIN. DIMENSIONS OF $\frac{P}{2}$ = 2 X RIVET DIA.

Y = NUMBER OF RIVETS EACH SIDE OF JOINT

USE JOINTING COMPOUND ON ASSEMBLY PARA. 134-137

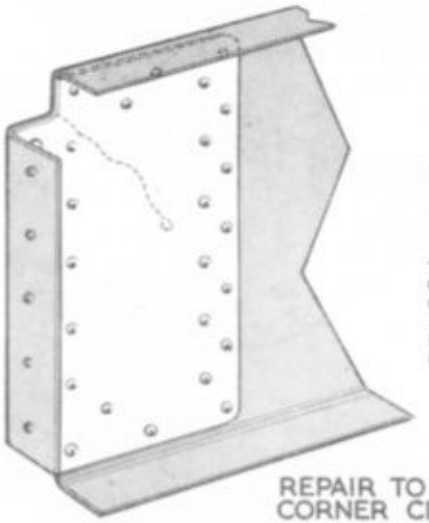
CLEANED OUT DAMAGE NOT EXCEEDING 10% OF FLANGE WIDTH MAY BE NEGLECTED. DAMAGE UP TO FULL WIDTH OF FLANGE BUT LESS THAN THE MAXIMUM LENGTH GIVEN MAY BE REPAIRED BY PATCHING AS SHOWN. DAMAGE IN EXCESS OF MAXIMUM GIVEN NECESSITATES THE INSERTION OF A NEW LENGTH OF ANGLE. BENT OR DEFORMED ANGLE MUST BE REGARDED AS DAMAGE AND CUT AWAY ACCORDINGLY

Fig. 114. Patch and insertion repairs to small rolled section stiffeners



REPAIR PLATES MAY BE FITTED ON THE MOST CONVENIENT FACE OF THE DAMAGED MEMBER

REPAIR TO CORNER CRACK



GAUGE AND SPECIFICATION OF REPAIR MATERIAL TO BE THE SAME AS THE DAMAGED MEMBER

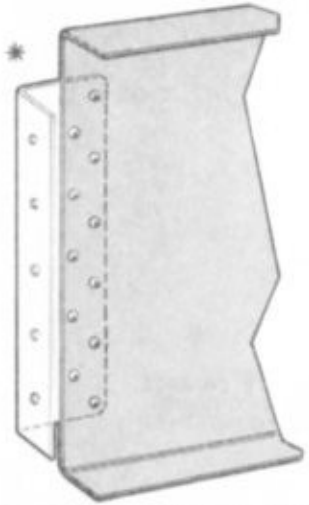
MINIMUM LANDING BETWEEN THE RIVET CENTRES AND EDGE OF THE MATERIAL TO BE 2 X RIVET DIA.

DISTANCE BETWEEN RIVET ROWS TO BE THE SAME AS THE RIVET PITCH

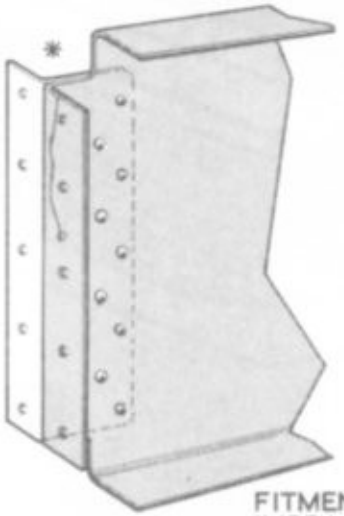
TERMINATE CRACKS WITH 0·125 IN. DIA. HOLES IN FLANGES, 0·375 IN. DIA. HOLES IN WEB

REMOVE SHARP EDGES FROM REPAIR PLATES, ETC.

REPAIR TO SEVERE CORNER CRACK



REPLACEMENT OF FLANGE



FITMENT OF NEW FLANGE WHERE IT IS IMPRACTICABLE TO REMOVE DAMAGED FLANGE

GAUGE	RIVET	PITCH	NO. OF ROWS *
22	SP.85/404	0·5 IN.	2
20	SP.85/404	0·5 IN.	2
18	SP.85/505	0·6 IN.	3
16	SP.85/606	0·7 IN.	3

* FOR REPLACEMENT FLANGES

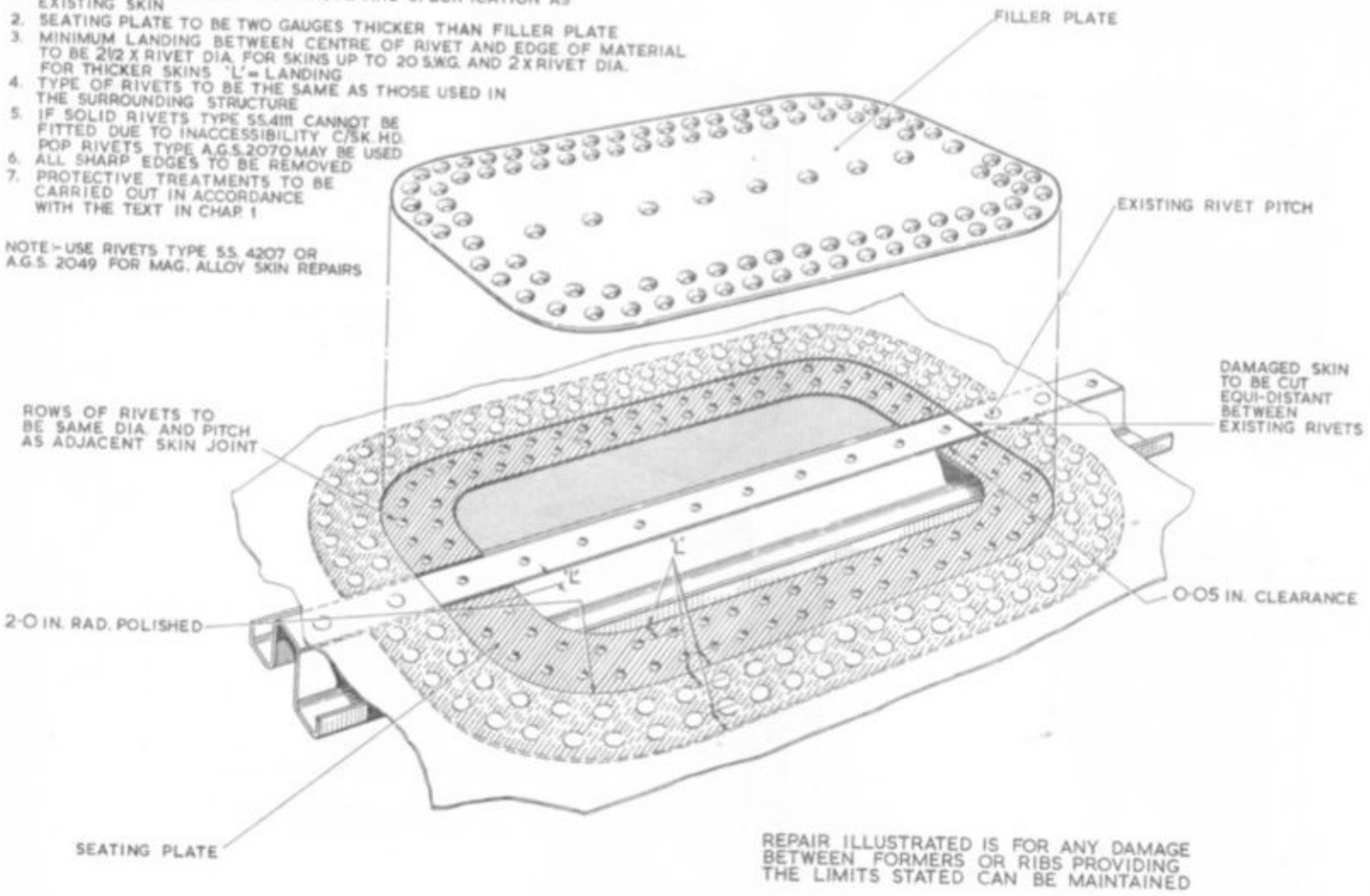
NOTE:-
USE RIVETS TYPE SP.84 FOR MAG. ALLOY COMPONENTS

Fig. 115. Repairs to riblets and intercostals

REPAIR INSTRUCTIONS

1. FILLER PLATE TO BE SAME GAUGE AND SPECIFICATION AS EXISTING SKIN
2. SEATING PLATE TO BE TWO GAUGES THICKER THAN FILLER PLATE
3. MINIMUM LANDING BETWEEN CENTRE OF RIVET AND EDGE OF MATERIAL TO BE 2½ X RIVET DIA. FOR SKINS UP TO 20 S.W.G. AND 2 X RIVET DIA. FOR THICKER SKINS 'L' = LANDING
4. TYPE OF RIVETS TO BE THE SAME AS THOSE USED IN THE SURROUNDING STRUCTURE
5. IF SOLID RIVETS TYPE S5.4111 CANNOT BE FITTED DUE TO INACCESSIBILITY C/SK. HD. POP RIVETS TYPE A.G.S.2070 MAY BE USED
6. ALL SHARP EDGES TO BE REMOVED
7. PROTECTIVE TREATMENTS TO BE CARRIED OUT IN ACCORDANCE WITH THE TEXT IN CHAP. 1

NOTE :- USE RIVETS TYPE S.S. 4207 OR A.G.S. 2049 FOR MAG. ALLOY SKIN REPAIRS



REPAIR ILLUSTRATED IS FOR ANY DAMAGE BETWEEN FORMERS OR RIBS PROVIDING THE LIMITS STATED CAN BE MAINTAINED

Fig. 116. Repairs to skin at top hat and 'Z' section stringer - unpressurised

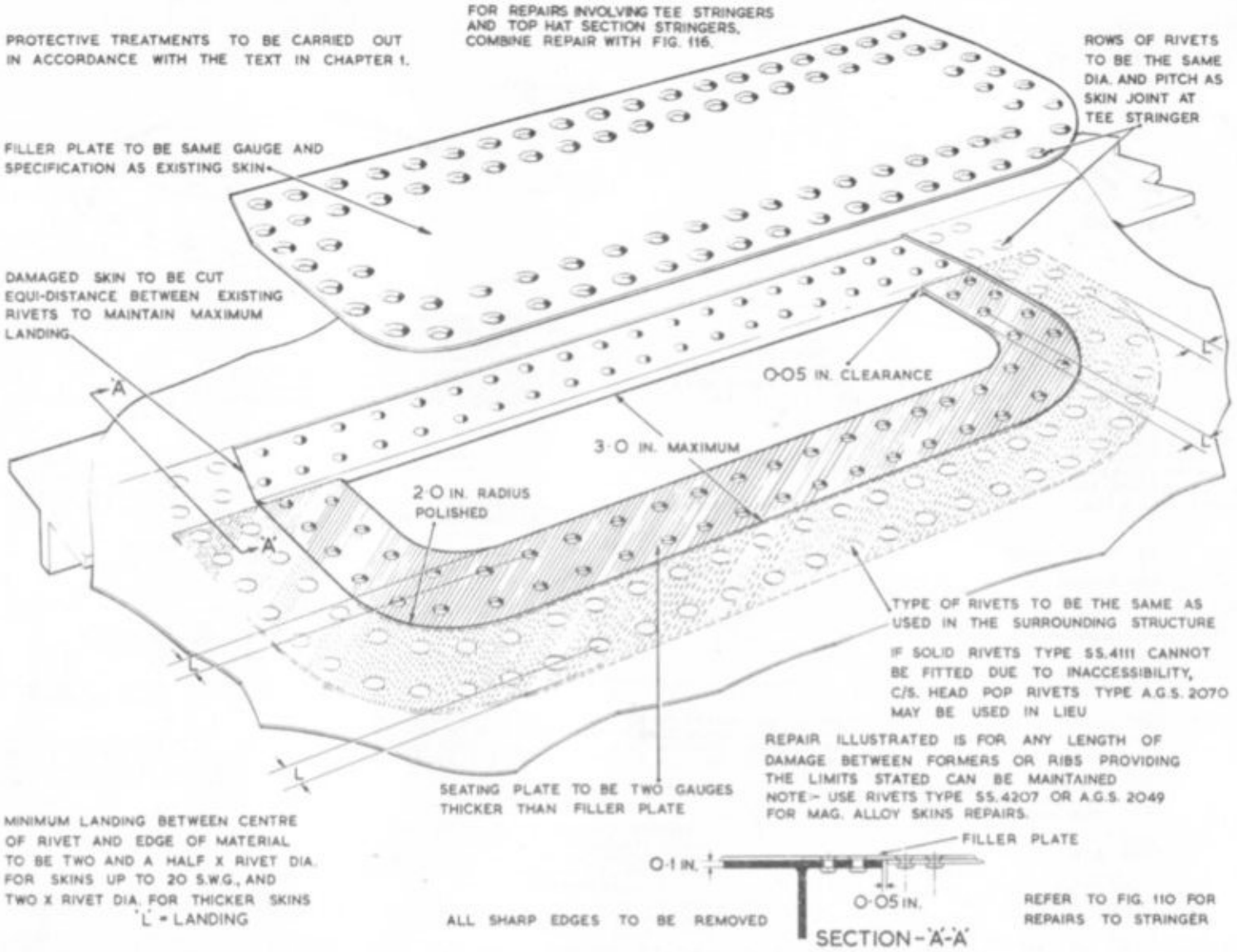


Fig. 117. Repairs to skin at 'T' stringer - unpressurised

RESTRICTED

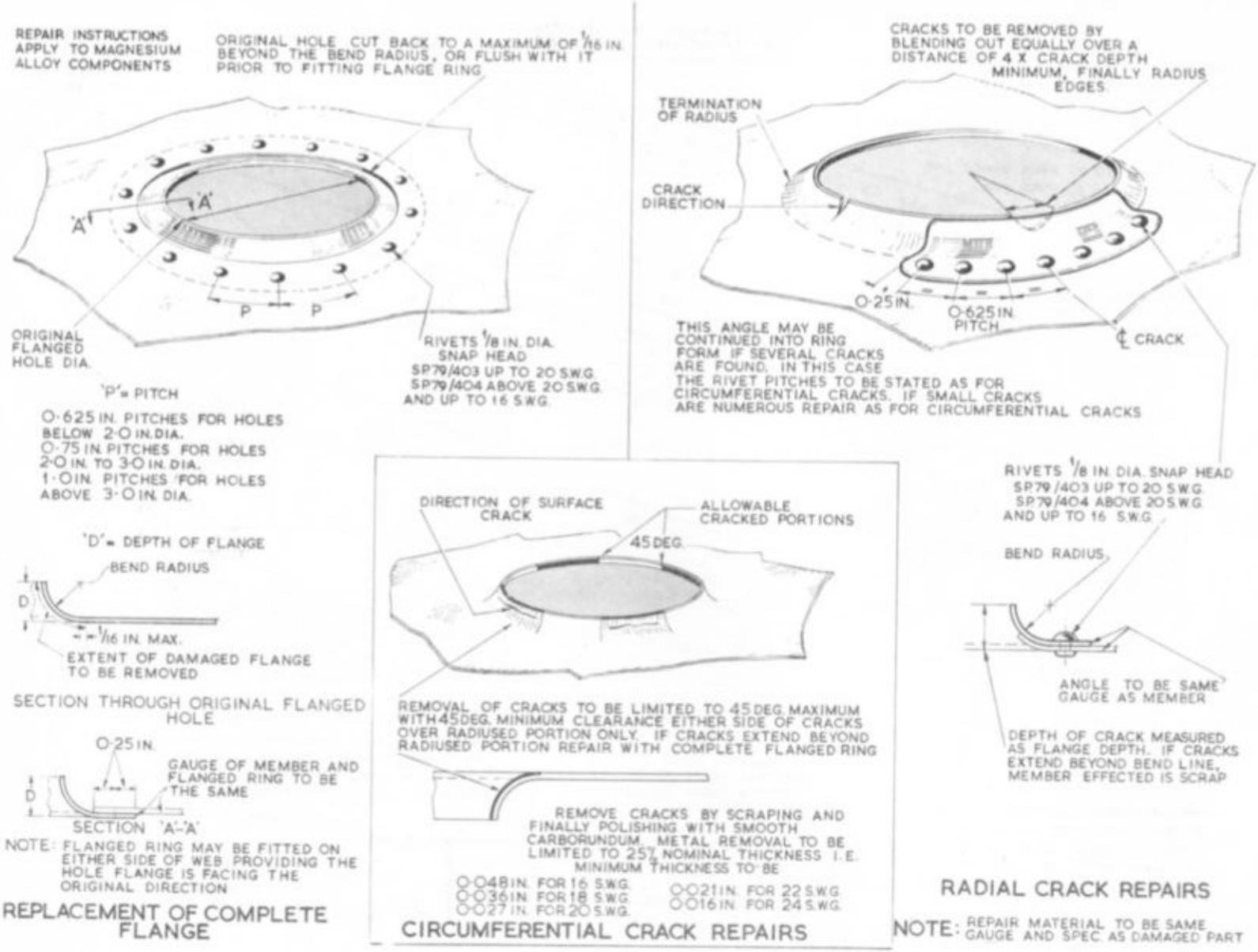
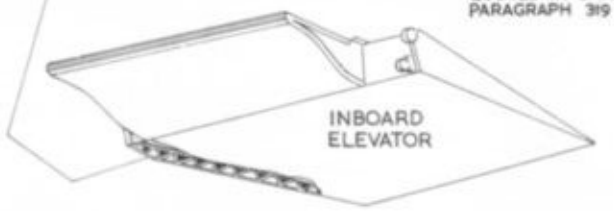
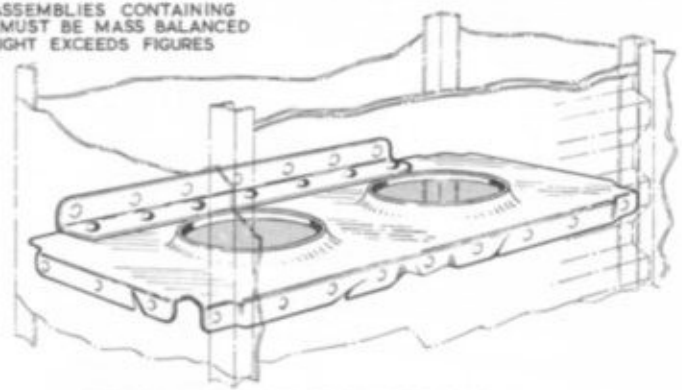


Fig. 118 Method of repairing cracked flanges in lightening holes

LOCATION OF DIAPHRAGMS IN END RIB ASSEMBLY



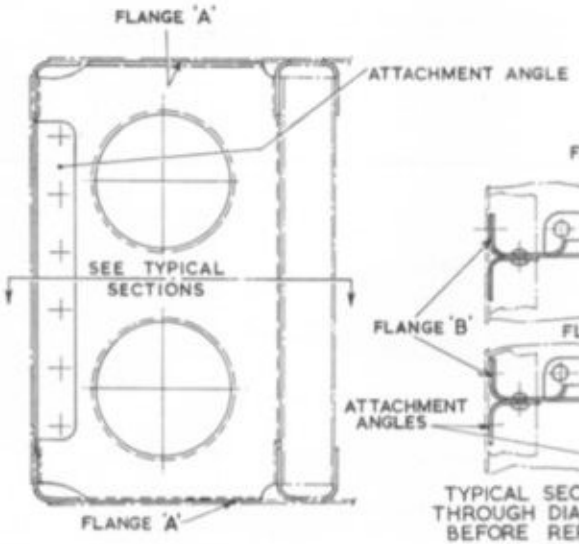
ALL CONTROL SURFACE ASSEMBLIES CONTAINING REPAIRED COMPONENTS MUST BE MASS BALANCED IF THE REPAIR EXCESS WEIGHT EXCEEDS FIGURES QUOTED IN CHAPTER 3, PARAGRAPH 319 – 323.

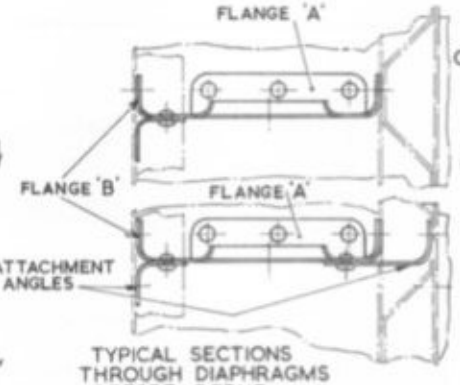


TYPICAL DAMAGE TO DIAPHRAGMS

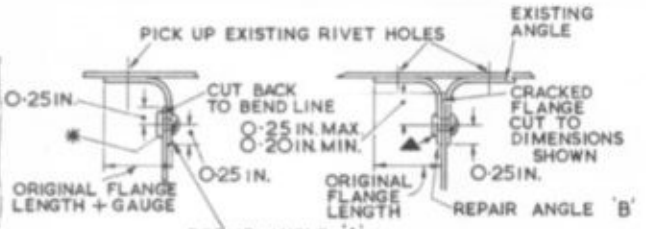
TO REPAIR CRACKED FLANGES, CUT AWAY FLANGE AND REPLACE BY A LOOSE ANGLE AS SHOWN IN METHOD OF REPAIR. IF AFTER CUTTING FLANGES AWAY TO DIMENSIONS GIVEN, CRACKS STILL EXIST, THE ITEM MUST BE SCRAPPED. THIS ALSO APPLIES IF ADJACENT FLANGES ARE CRACKED. ONLY 4 DIAPHRAGMS MAY BE REPAIRED AND IF POSSIBLE SHOULD BE EVENLY SPACED OVER LENGTH OF END RIB. LOOSE ANGLES SHALL BE THE SAME LENGTH AS THE FLANGES CUT OFF AND THE SAME GAUGE. REPAIR ANGLES MADE FROM MATERIAL SPEC. D.T.D. 118 A

NOTE: WHERE CRACKS EXIST IN FLANGED HOLES, C/SK.HD. RIVETS TO BE USED UNDER ATTACHMENT ANGLES IF THEY INTERFERE WITH ANY REPAIRS THAT HAVE BEEN CARRIED OUT AS SHOWN IN DETAIL 'C'. IF RING FOULS WHERE 2 ANGLES EXIST AFTER REPAIR, TRIM SO THAT MINIMUM DISTANCE OF RIVET FROM EDGE OF RING IS 0·20 IN. THE COMPONENT MUST BE SCRAPPED IF THIS CANNOT BE ACHIEVED.



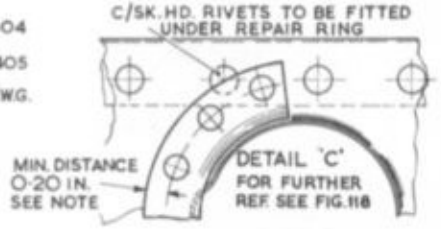


TYPICAL SECTIONS THROUGH DIAPHRAGMS BEFORE REPAIR



SECTION SHOWING METHOD OF REPAIR

▲ RIVETS S.P.79/404 UP TO 20 S.W.G. RIVETS S.P.79/405 ABOVE 20 S.W.G. AND UP TO 16 S.W.G.



FLANGES 'A' – FIT RIVETS MARKED ✱ PITCHED AS EXISTING SKIN
RIVETS S.P.79/403 UP TO 20 S.W.G.
RIVETS S.P.79/404 ABOVE 20 S.W.G. AND UP TO 16 S.W.G.

FLANGES 'B' – PICK UP EXISTING RIVETS MARKED ▲, AND ADD ONE RIVET EACH SIDE OF EXISTING ANGLE AT 0·30 IN. FROM ITS TERMINATION.

Fig.119. Method of repairing cracked diaphragms - end rib assembly of inboard elevators

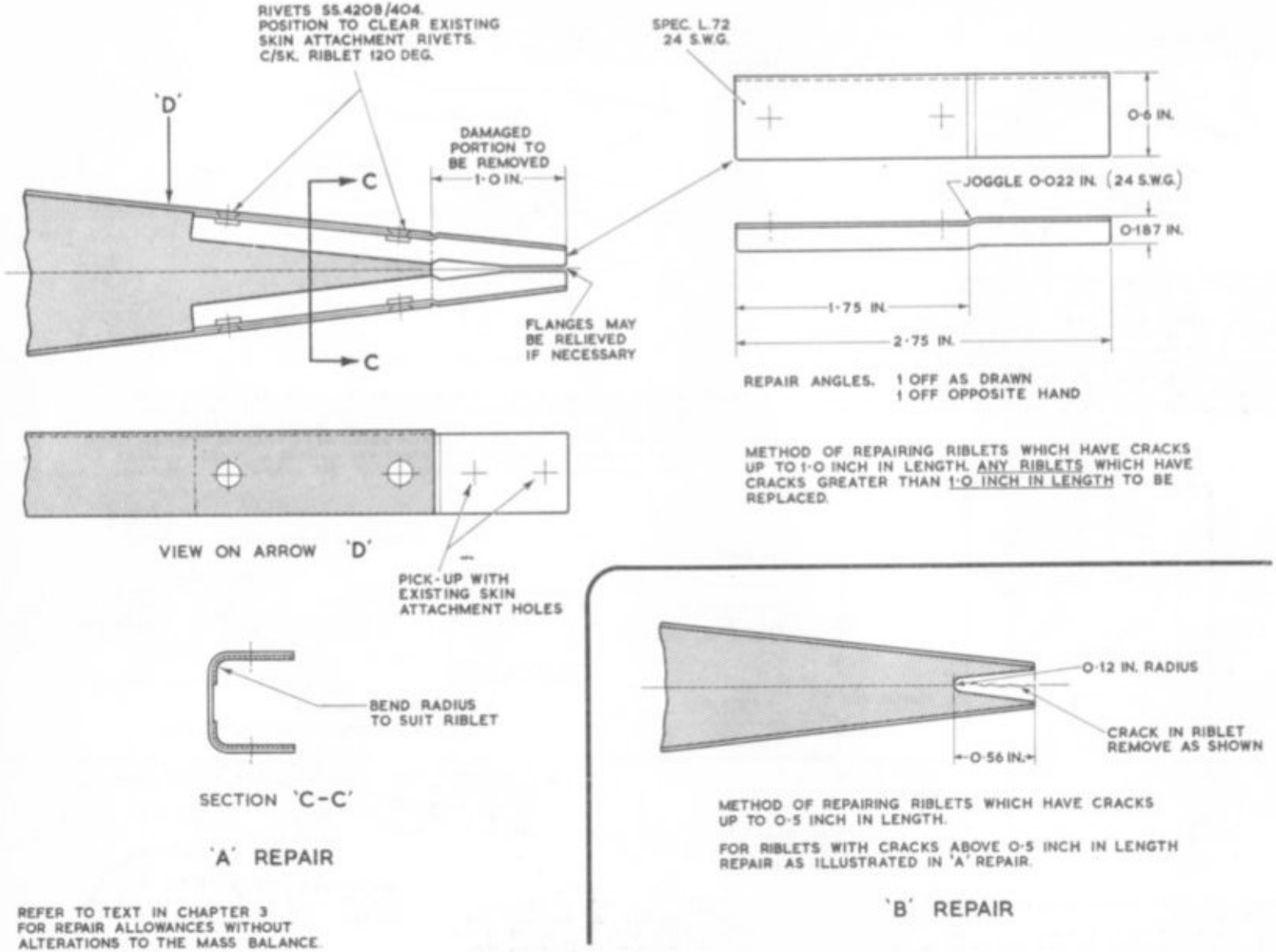
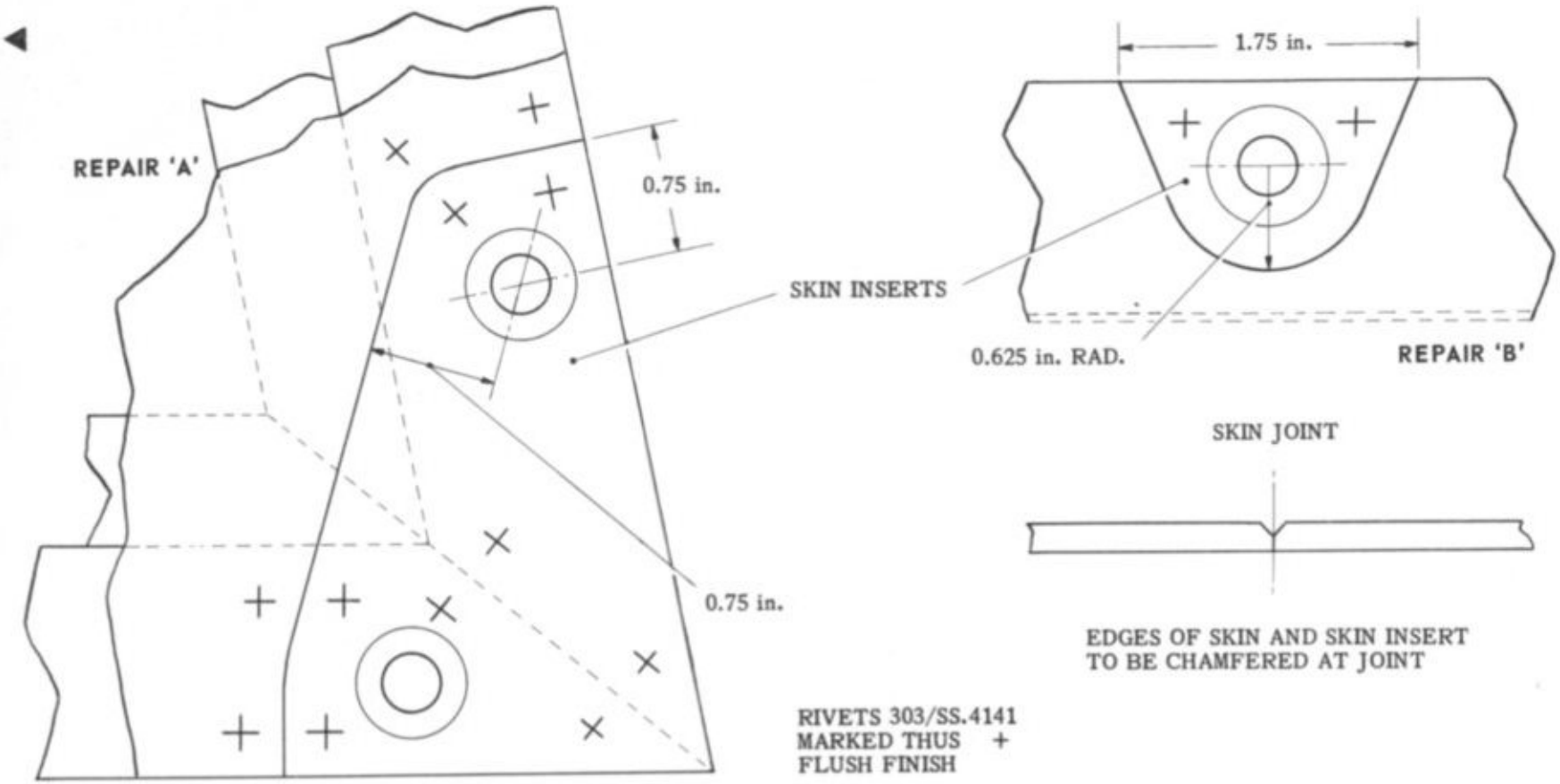


Fig.120. Repairs to riblets - elevators, ailerons, rudder



REPAIR INSTRUCTIONS

1. Remove damaged skin and clean off old Araldite etc.
2. Make skin insert, same s.w.g. and specification as original skin. Dimple for Dzus fastener(s).
3. Holes for rivets to be drilled to suit repair with landings approximately 0.25 in. using a 2.45 mm. drill, countersink 120 deg. both sides.
4. Remove skin insert, deburr all holes, edges and degrease.
5. Position and attach skin insert with cold setting Araldite A.V.121 (Ref. No. 33H/39) mixed with the correct proportions of Hardener HY.951 (Ref. No. 33H/2202078).
6. Fit rivets and wipe off any exuded Araldite
7. Clamp or apply light pressure on the repair until the bonding is cured.
8. Assemble Dzus fastener(s).
9. Apply protective treatment as required.

Fig.123. Typical repairs for damaged Dzus fastener holes