

Chapter Thirty-one

EXHAUST SYSTEM

RENEWALS, RECONDITIONING, REPAIR AND SALVAGE

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THIS CHAPTER contains instructions for reconditioning and repairing worn or damaged exhaust system components including the propelling nozzle. Instructions for dismantling and reassembling these components are not given unless they are an essential part of the repair instructions; reference should be made to chapters 18, 23, 24, 33 and 34, as appropriate, for further information on dismantling or reassembling individual items before, or after, reconditioning or repair. The information given in chapter 32 should be read in conjunction with all repair schemes dealing with the fitting of "Cross" wire inserts. Most of the information contained in this chapter is based on the manufacturer's turbine repair (T.R.) schemes and process specifications, and, in each instance, the relevant drawing (T.R.) number and issue number, or specification number, is quoted; turbine repair schemes are introduced under the cover of a modification and this modification number is quoted also. After any repair has been completed, an entry should be made in the appropriate record book of the engine in accordance with British Air Registration Board Inspection Procedures, Section ML, Leaflet 1-1; refer also page 3 of chapter 32.

It must be appreciated, of course, that these

repairs can be carried out only under the supervision of an Inspection Organisation approved for such repair work by the British Air Registration Board, or an equivalent authority, or under the supervision of an appropriately licensed aircraft engineer. It is assumed also that personnel having the requisite skill and experience will be employed and that the necessary tools and equipment will be available. Reference should be made also to the notes on preparation for welding, argon-arc and oxy-acetylene welding, and stress relieving after welding, and to the combined material identification and fusion welding code contained in chapter 30.

Normally, where special tools and equipment are available for carrying out the renewals and repairs described in this chapter, they are listed at the beginning of the relevant repair instructions and are referred to in the text as they are used. In some cases, even though no list is given, the tools are referred to in the text as they are used. Where special tools are not mentioned, reference should be made either to the relevant Part and Section of the separate publication entitled "de Havilland Gas Turbine Tools and Equipment for Servicing and Overhaul", or to The Service Department of The de Havilland Engine Company.

SUPPORT TUBES T.R.217 issue 3—Mod. 311

Any exhaust cone support tube (Ghost 48 Mk. 1, 48 Mk. 2 or 53 Mk. 1) which, as a result of fretting and indentation at the approximate positions shown in Fig. 1, has become damaged beyond the maximum permissible depth of 0.010 inch, may be repaired by re-building the worn diameters by the argon-arc welding process.

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

The sequence of welding operations described in the next paragraph is intended to ensure the minimum distortion of the tube, and is illustrated diagrammatically in Fig. 2.

To carry out this repair proceed as follows.

1. Remove any oil or grease from the tube, and using a rotary wire brush, thoroughly clean the worn diameters ready for welding.
2. Using the argon-arc welding process with filler rod to specification D.T.D.549, or stabilized D.T.D.571, and working lengthwise along the

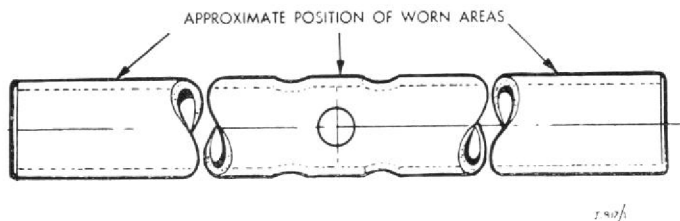
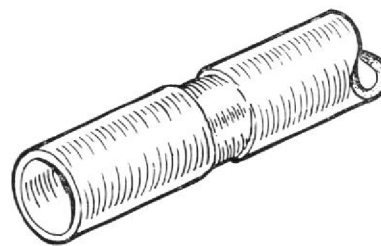


Fig. 1. Location of indentation and fretting of front support tube.

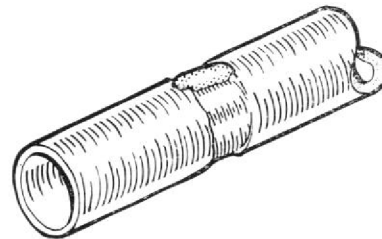
DIAMETER OF TUBE	
Front support tube	Rear support tube
1 inch	$\frac{5}{8}$ inch

tube, build up a small area (approximately one-sixteenth of the circumference) at each worn position; shown as area 1 in the welding sequence diagram, Fig. 2.

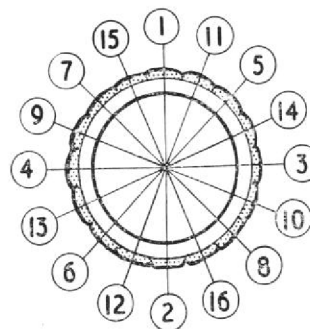
3. Similarly build up small areas at diametrically opposite positions on the tube; shown as area 2 in the welding sequence diagram.
4. Refer to the welding sequence diagram, and, taking each area in numerical order, continue to build up the worn positions until the whole of each damaged diameter has been rectified.
5. The tube must be perfectly straight before the application of the next operation, and any distortion which exists as a result of the welding must be corrected. This is carried out by supporting the tube across two blocks of wood, and correcting the distortion by applying blows



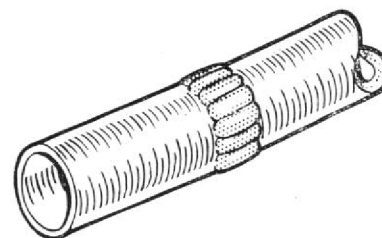
CLEAN WORN POSITIONS READY FOR WELDING



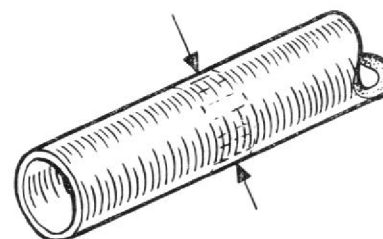
WORKING LENGTHWISE, BUILD UP SMALL AREAS BY WELDING



BUILD UP AREAS IN SEQUENCE SHOWN



CORRECT DISTORTION: TUBE MUST BE PERFECTLY STRAIGHT



GRIND BUILT UP POSITIONS TO RESTORE ORIGINAL DIAMETER

Fig. 2. Diagram showing sequence of operations.

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with a rubber mallet; the tube should then be checked with a straightedge, or on a surface table.

6. Carefully grind the deposited filler rod to restore the diameter of the tube, and, on the front support tube only, the 0.375 inch diameter of the air holes.

If this is the first time that this repair has been applied, lightly etch T.R.217 adjacent to the existing part number on the tube. Make the appropriate entry in the engine log book.

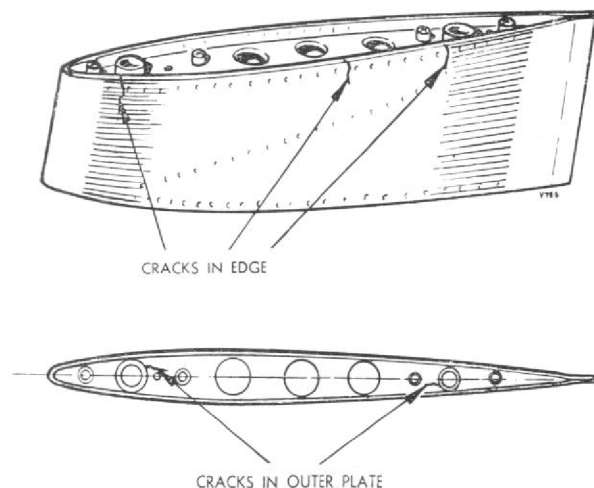


Fig. 3. Location of repairable cracks in exhaust cone fairing.

FAIRINGS, No. 1 AND 2, CRACKS. T.R.241 issue 4—Mod. 311

Any exhaust cone fairing (Ghost 48 Mk. 1, 48 Mk. 2 or 53 Mk. 1) in which cracks exist in its edges, or in its outer plates, at the approximate positions indicated in Fig. 3, may be repaired by the argon-arc welding process, provided that no crack exceeds 1.000 inch in length.

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

To carry out this repair proceed as follows.

1. Remove any oil or grease, and using a rotary wire brush, thoroughly clean in and around the crack until bright metal is exposed.
2. Weld the crack by the argon-arc process, using filler rod to specification D.T.D.549.
3. Grind and polish the weld to produce a smooth finish, ensuring that the fusion point of the weld is not removed.
4. If this is the first time that this repair has been applied, lightly etch T.R.241 adjacent to the existing part number on the fairing. Make the appropriate entry in the engine log book.

INNER EXHAUST CONE, CRACKS T.R. 226 issue 3—Mod. 311

This repair may be applied to all Ghost inner cones. No replacement parts are required.

Inner cones cracked in approximately the positions indicated by 'A' and 'B' on Fig. 4 may be repaired by argon-arc welding, provided that the cracks do not exceed 5.000 inches in length at positions indicated by 'A' and 1.250 inches in length at positions at 'B'; see Fig. 4.

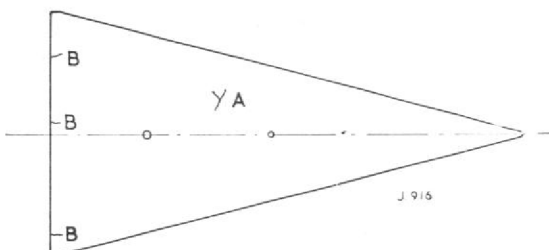


Fig. 4. Possible positions of repairable cracks in inner cone indicated by letters A and B.

Inner cones previously salvaged by this repair scheme can be identified by T.R.226 etched adjacent to the part number.

To carry out this repair proceed as follows:

Clean off any grease or oil, and using a rotary wire brush, thoroughly clean in and around the crack on both sides, until bright metal is exposed.

Weld the crack by the argon-arc process, using filler rod NC.82 (supplied by H. Wiggin & Co.). On completion, the weld may be cleaned by wire brushing, to facilitate inspection.

Lightly etch T.R.226 adjacent to the part number of the inner cone, and make an entry in the appropriate record book of the engine.

PROPELLING NOZZLE, SPACER STRIP T.R.304 issue 4—Mod. 751

Any propelling nozzle, pre-mod. 740 (fixed) (Ghost 48 Mk. 1 or 48 Mk. 2), in which the spacer-strip has become cracked at any of the positions indicated in Fig. 5, overleaf, may be repaired by fitting a complete new spacer-strip.

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

To carry out this repair proceed as follows.

1. Cut out the complete spacer-strip and, where necessary, grind off any portions of the strip which remain attached to the parallel nozzle (venturi cuff) and to the propelling nozzle.
2. Thoroughly clean the surfaces to which the new spacer-strip is to be welded.

3. Refer to the table below, and select the spacer-strip appropriate to the assembly part number. Take four sections of the selected strip, and ensure that the surfaces to be welded are thoroughly clean. If a replacement strip is not available, suitable sections may be made up from local resources by using 18 S.W.G. steel sheet 0.900 inch wide, to Specification D.T.D.571, formed to the dimensions shown in Fig. 5.

Assembly Part No.	Spacer-strip Part No.
603422	96428
603420	94690
603418	601531
603907	601531

4. Locate the four sections of the strip in position, so that the serrations are in contact with material that has not been subjected previously

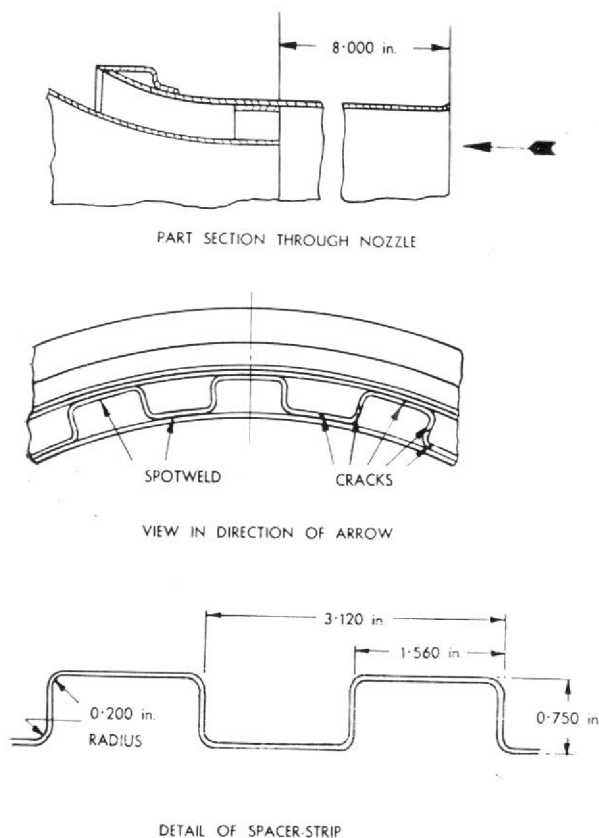


Fig. 5. Location of cracks in spacer-strip; positions for spot-welding replacement sections, and dimensions for making replacement sections.

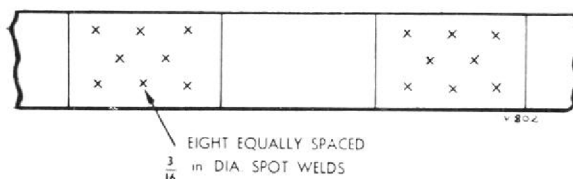


Fig. 6. Details for spot welding of spacer-strip.

to welding, and ensuring that the dimension of 8.000 inch, shown in Fig. 5 is maintained.

5. Using a resistance welding machine, spotweld each of the mating surfaces of the spacer-strip to the nozzle with eight $\frac{3}{16}$ inch diameter spots, spaced as shown on Fig. 6.
6. Clean up after welding.
7. Lightly etch T.R.304 adjacent to the existing part number on the nozzle. Make the appropriate entry in the engine log book.

FAIRINGS No. 1 AND 2 (PRE-MOD. 187) RENEWAL OF BOSSES T.R. 311 issue 1—Mod. 751

This repair may be applied to fairings Part No. 49308 and 49309.

The following new parts will be required:

Description	Part No.	No. off
Nut for outer plate	28247/2	As required
Stiffening plate	91139 91140 91141 91142	As required

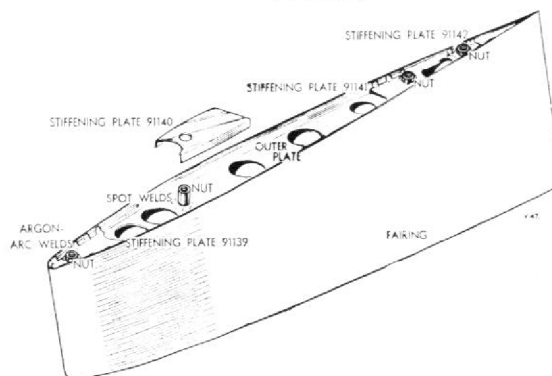


Fig. 7. Fairing with one of the stiffening plates removed to show the spot welds which secure the nut to the outer plate.

Fairings rejected as a result of damage to any of the outer plate nuts indicated in Fig. 7, may be salvaged by removing the damaged nut and its stiffening plate and argon-arc welding a replacement nut and stiffening plate in position.

Fairings previously salvaged by this repair scheme can be identified by T.R. 311 etched adjacent to the part number.

To carry out this repair proceed as follows:

Using a suitable power-driven grinder, carefully grind off the beads of argon-arc welding securing the damaged nut to the stiffening plate and also the stiffening plate to the edges of the fairing. Remove the stiffening plate.

Drill $\frac{5}{32}$ in. diameter holes through each spot weld securing the nut to the outer plate (see Fig. 7) and remove the nut.

Prepare the surrounding area of the vacated hole for welding, by cleaning off any oil or grease, followed by wire brushing until bright metal is exposed. Prepare the replacement nut and stiffening plate similarly.

Insert the nut through the hole from the inside and secure in position with a suitable clip or clamp. Using the argon-arc process and a filler rod to specification D.T.D.549, deposit a bead of filler rod into each drilled hole. Place the appropriate replacement stiffening plate into position and secure by tack welding at half inch intervals along both sides. Tack weld the protruding portion of the nut to the stiffening plate at four equal points. Ensure that the filler rod beads do not encroach on to the edges of the fairing, and where necessary, blend by careful grinding. Clean the finished weld by wire brushing.

Lightly etch T.R.311 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

flanges attached to the cone, may be repaired by fitting a new diaphragm.

The following tools will be required.

Tool No.	Description
T77262	Two alignment plugs
T78804	Four guide bushes

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

To carry out this repair proceed as follows.

To avoid damage to the skin, operations 1 to 3 must be carried out with extreme care.

1. Using oxy-acetylene welding equipment with the blowpipe adjusted to give an oxidizing flame, or using argon-arc welding equipment, detach the diaphragm from the inner cone by

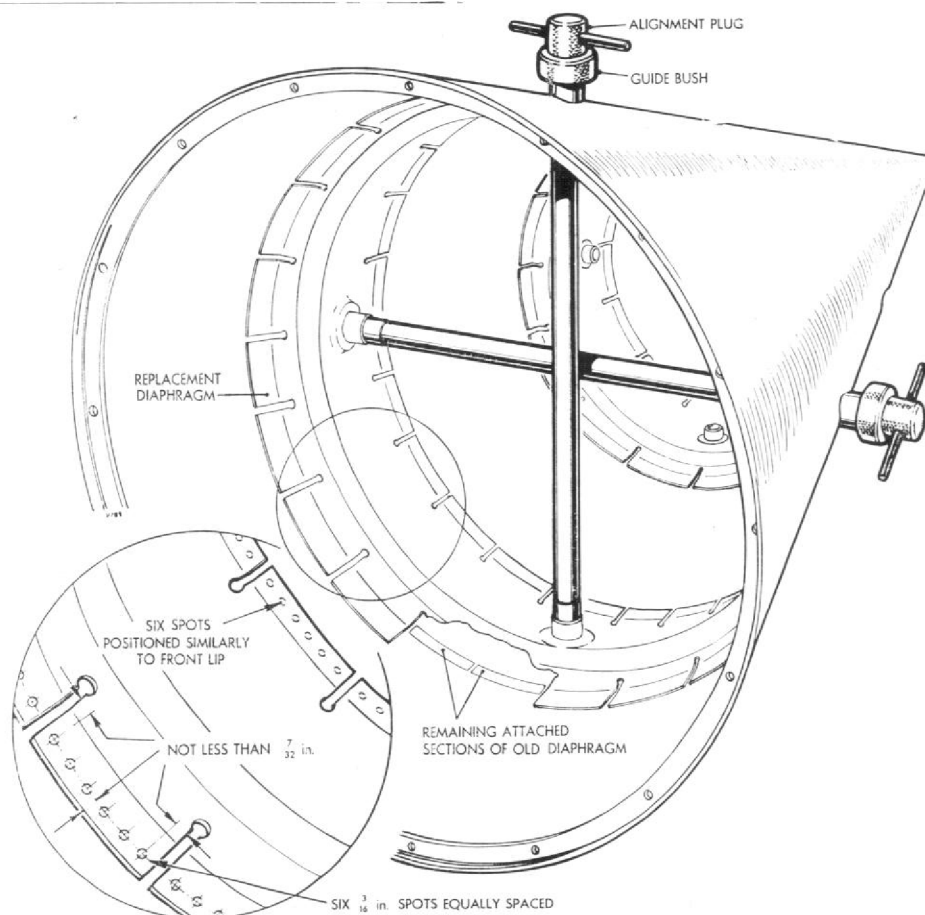


Fig. 8. Replacement front diaphragm positioned in inner cone.

INNER EXHAUST CONE, FRONT DIAPHRAGM

T.R.242 issue 2—Mod. 311

Any inner exhaust cone (Ghost 48 Mk. 1, 48 Mk. 2 or 53 Mk. 1) in which the front diaphragm has broken away, leaving part of the diaphragm

cutting through the diaphragm flanges as near as possible to the skin of the cone.

2. Using a portable rotary grinder, reduce the remaining attached portions of each of the flanges, Fig. 8, sufficiently to ensure that none

T.R.242 is continued on page 11

TOP TO BE ETCHED ON CENTRE LINE.

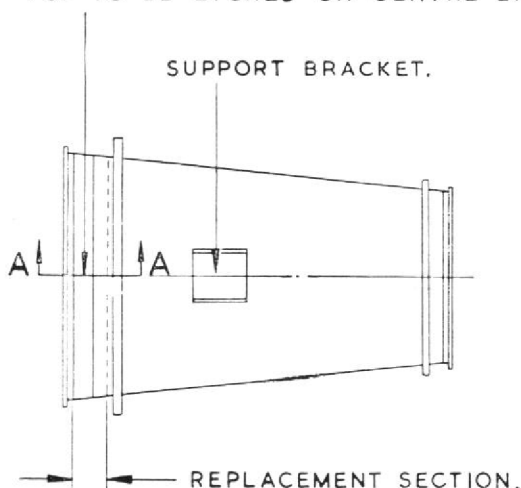
OUTER EXHAUST CONE, FRONT FLANGE T.R. 298 issue 4—Mod. 900

This repair may be applied to all Ghost Forty-eight outer exhaust cones Pre-mod. 1088.

Outer exhaust cones which have developed cracks or other damage in the front flange, may be rectified by fitting a replacement front flange section in accordance with these instructions.

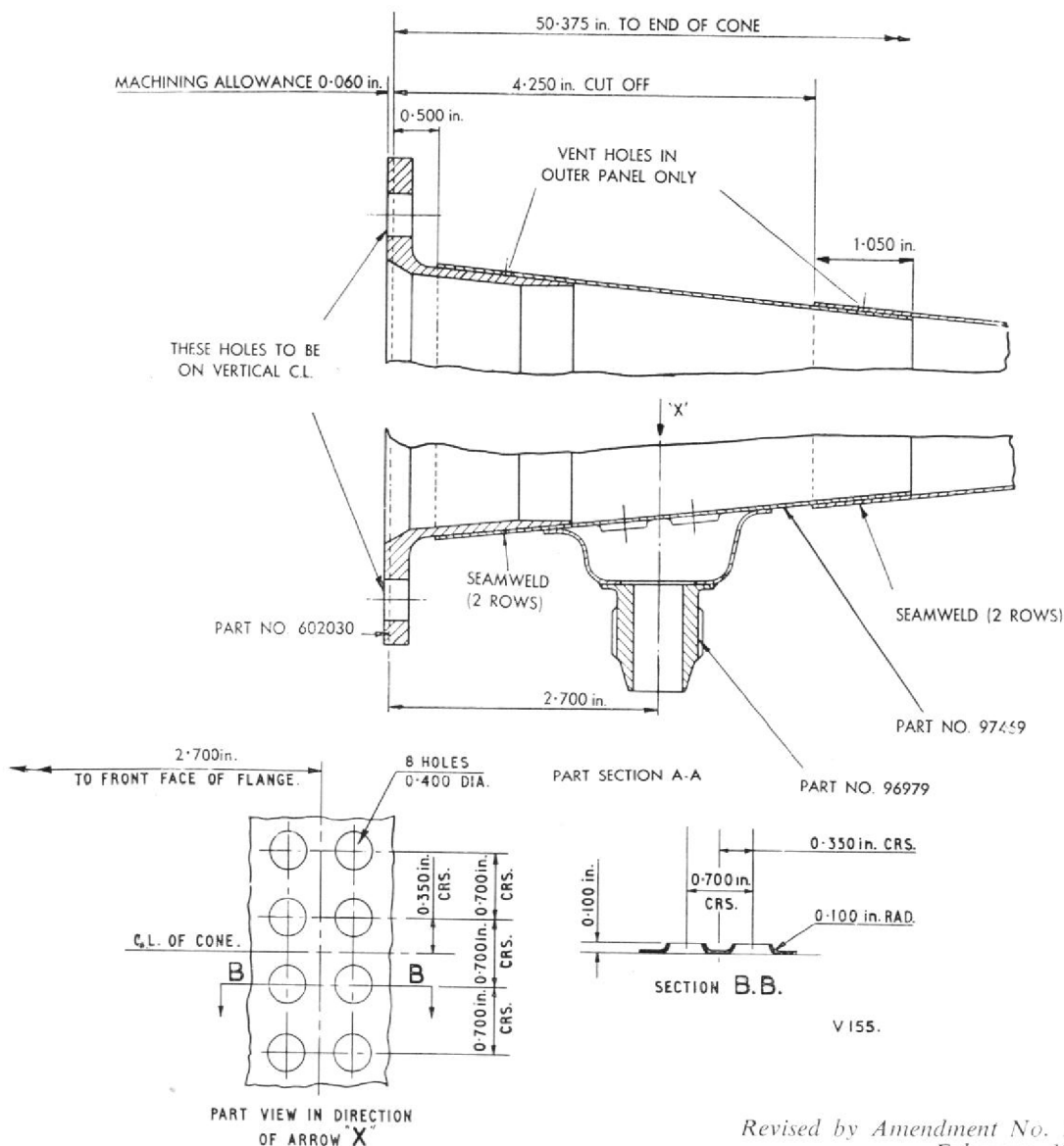
SEQUENCE OF OPERATIONS

1. Cut off the front section of the cone to the dimension shown.
2. Clean the surfaces to be welded. Prior to seamwelding, drill $\frac{1}{16}$ inch diameter vent holes central to the seamweld, approximately 1.500 inch on either side of all longitudinal joints.
3. Seamweld replacement front section Part No. 97469 to the cone at the position indicated.
4. Mark off and drill drain holes.
5. Seamweld new front flange in position.



PLAN VIEW.

V.146.



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6. Finish machine front flange.
7. Drill thirty holes $\frac{1}{8}$ inch diameter spaced equally on 33.200 inch pitch circle diameter in the front flange.
8. Seamweld drain trough in position.
9. Etch T.R.298 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

If the bosses only are damaged they may be renewed in accordance with T.R.378.

NOTE:

Operations 4, 5 and 6 must be applied in conjunction with the dimensions given in the fitting assembly drawing of the outer exhaust cone.

SEQUENCE OF OPERATIONS

1. Cut or blank-out the existing stiffening plate to the appropriate dimension indicated in the sketch.
2. Clean both surfaces adjacent to the hole.
3. Position the replacement stiffening plate (refer to table) central to the hole and seamweld round the circumference.
4. Drill a clearance hole in the stiffening plate, $1\frac{1}{2}$ inch diameter for the front top or bottom plate or $\frac{1}{8}$ inch diameter for the rear top or bottom plate, diametrically opposite on the centres shown.
5. Locate the new boss assembly in position and seamweld round the circumference.
6. Complete the drilling of the $\frac{1}{8}$ inch diameter bolt holes.
7. Etch T.R.333 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

OUTER EXHAUST CONE, DAMAGED
BOSSES

T.R. 333 issue 3—Mod. 1043

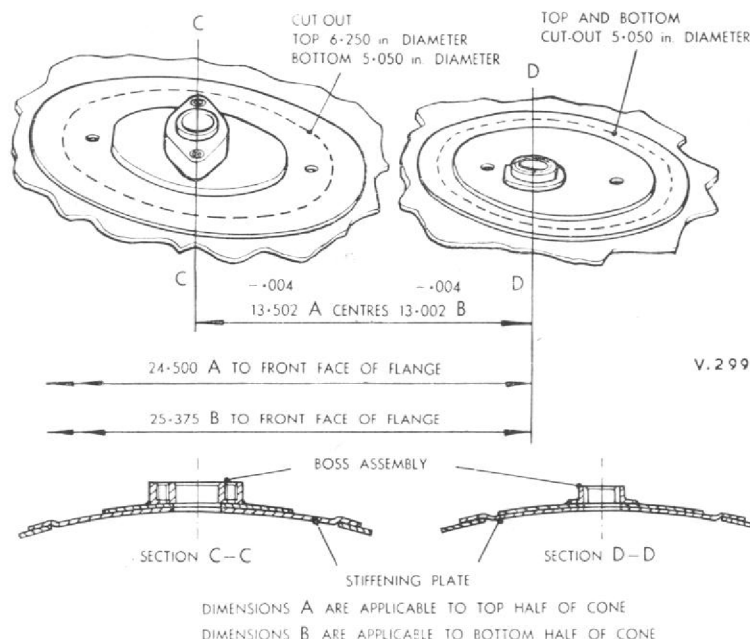
This repair may be applied to all Ghost outer exhaust cones, subsequent to mod. 151.

The following new parts will be required:—

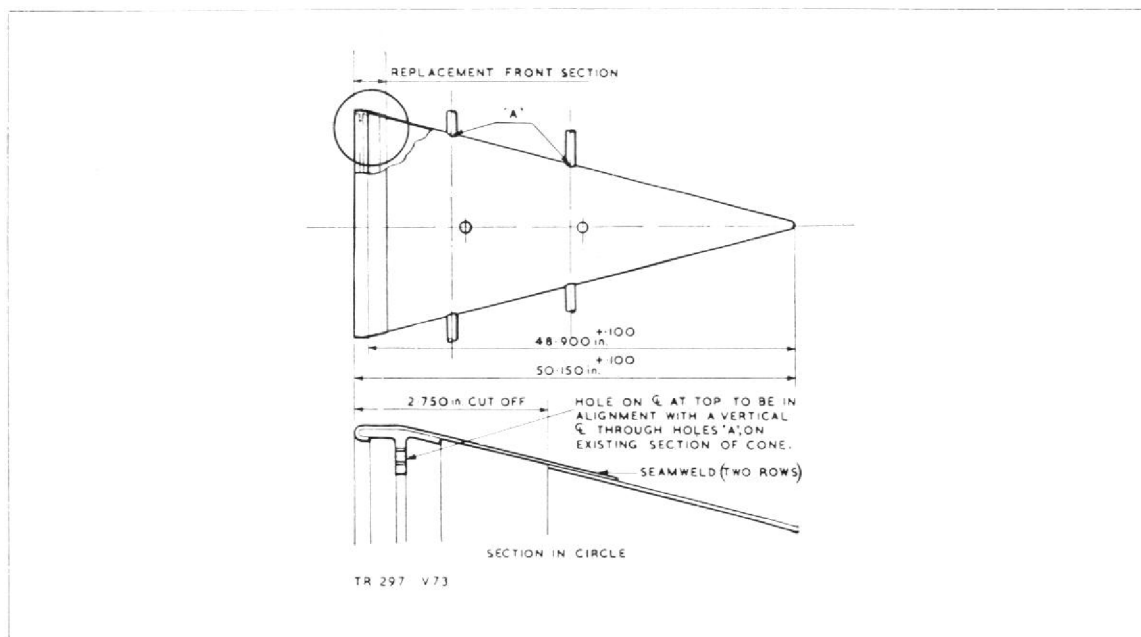
Description	Part No.	No. off
Stiffening plate:		
Front top	603296	As required
Front bottom	603297	
Rear top	603298	
Rear bottom	603298	
Boss assembly:		
Front top	92706	As required
Front bottom	92707	
Rear top	95945	
Rear bottom	96332	

Outer exhaust cones in which the threads of any of the support tube bosses have become damaged, may be rectified by renewing the damaged boss assembly in accordance with these instructions.

If cracking occurs at the bolt holes subsequent to this repair, the cracks may be repaired up to a maximum length of 0.500 inch by argon-arc welding; the weld should be blended on both surfaces sufficiently to obviate fouling of the bolt heads or fairings during assembly. Subsequent fretting at any of the bolt holes up to a depth of 0.015 inch on the inner surface of the exhaust cone, may be rectified by argon-arc welding the fretted area and blending the weld flush with the surrounding surface.



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INNER EXHAUST CONE, FRONT FLANGE T.R. 297 issue 5—Mod. 751

This repair may be applied to all Ghost inner exhaust cones.

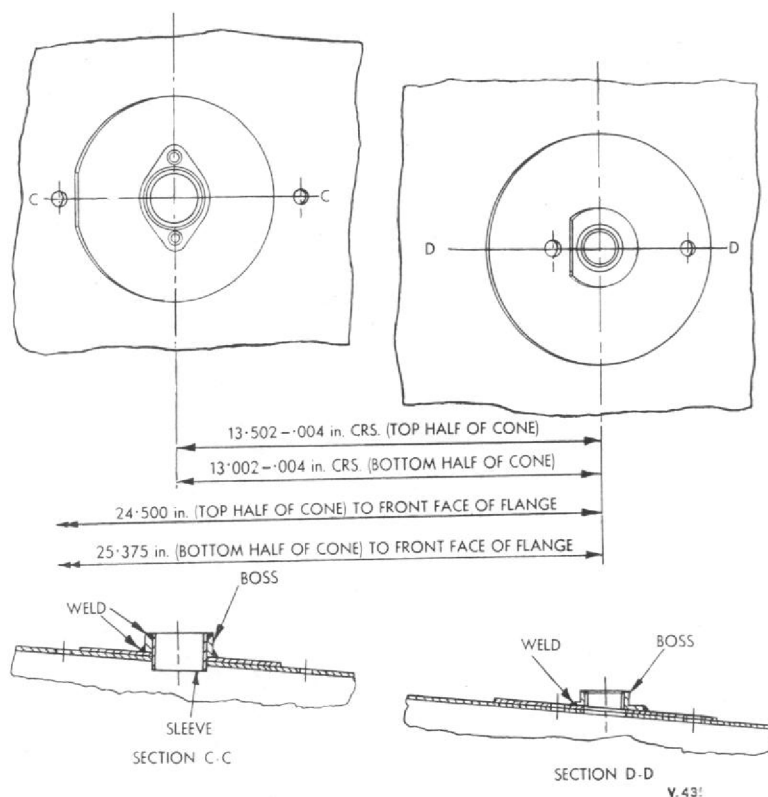
Inner exhaust cones which are excessively cracked, or damaged at the stiffening ring or threaded holes, may be rectified by fitting a replacement front flange section in accordance with these instructions. It should be noted that single cracks running inwards from any holes (up to a maximum of four) on the existing stiffening ring may be repaired by cleaning out and welding the cracks by the argon-arc process, re-threading the hole and machining the flange faces clean.

SEQUENCE OF OPERATIONS

1. Mark out and cut off the section at the front end of the inner cone to the dimension shown in the sketch.
2. Drill $\frac{1}{16}$ inch diameter vent holes through the centre of the inner panel of the seamweld overlap, at points approximately 1.500 inch on either side of all longitudinal welded joints; the overlap of the seamweld is to be 0.990 inch. Remove any burrs or sharp edges.
3. Clean the surfaces to be welded.
4. Using welding jig T.78594 and stand T.78640 in conjunction with four locating pins T.78595 (pre-mod. 261) or T.78596 (mod. 261), assemble the new front section, Part No. 98306, to the existing inner cone, check the position of the vent holes in relation to longitudinal welded joints, and tack spotweld sufficiently to hold the new front section in position. Remove the inner cone from the welding jig.

5. Seamweld the replacement front section to the inner cone as shown. Using a suitable tool, remove any welding flash.
6. Mark off and form the parallel section at the front end of the inner cone.
7. Trim the edge of the inner cone and clean the argon-arc welded joints in preparation for welding the butt joints of the replacement front section. (This, and operation 8, is only necessary when the replacement front section has been supplied in two parts.)
8. Buttweld the parallel section of the cone, by the argon-arc process, using filler rod N.C.82.
9. Clean the cone, on the inside and outside, for approximately 1 to 2 inches from the edge, in preparation for welding the stiffening ring in position. Clean the stiffening ring, Part No. 94001, on the inside and outside at the mating surface, in preparation for welding in position.
10. Assemble stiffening ring Part No. 603612, to the inner cone as shown and, using the welding jig, tack spotweld sufficiently to hold the stiffening ring in position. Remove the inner cone from the welding jig.
11. Seamweld the stiffening ring to the inner cone. Stitchweld the seam where missed by the seamwelding machine, on both the replacement front section and stiffening ring. Using a suitable tool, remove any welding flash from all seamweld joints.
12. Dress the skin of the replacement front section over the stiffening ring, as shown, using rollers T.78693.
13. Etch T.R.297 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

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OUTER EXHAUST CONE, BOSSES AND BOLT HOLES T.R. 378 issue 1—Mod. 1080

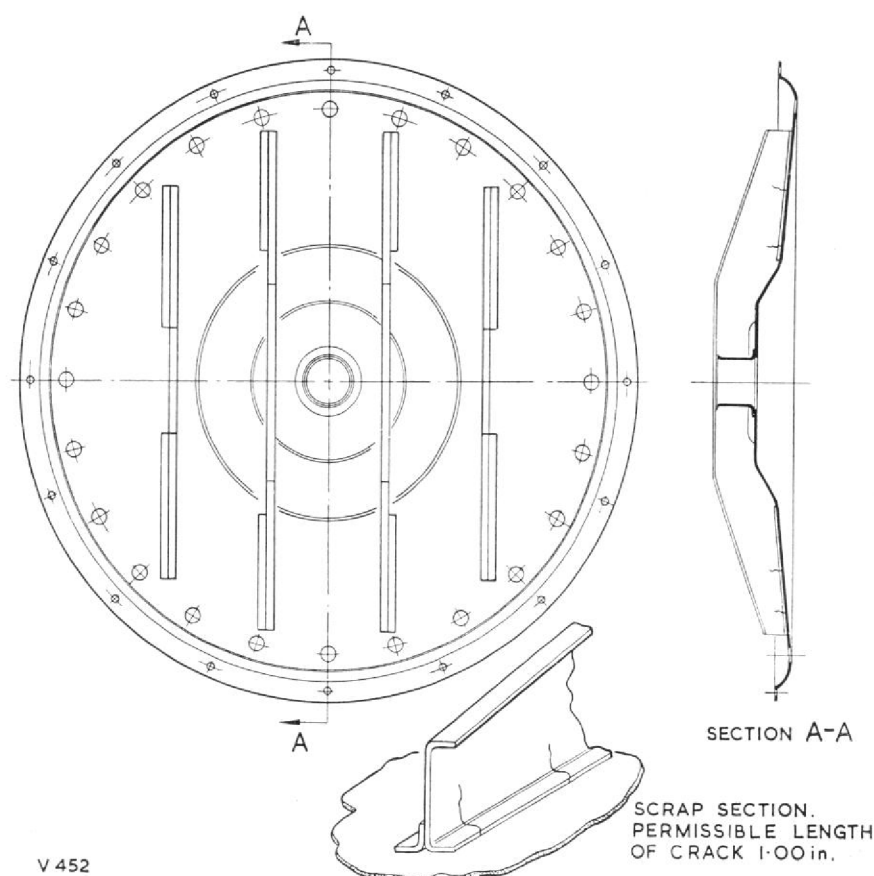
This repair may be applied to all Ghost outer exhaust cone assemblies which embody Mod. 151.

Outer exhaust cone assemblies on which the threaded holes in the bosses have become damaged, or in which cracking and fretting has occurred at the bolt holes, may be repaired in accordance with these instructions. For further stages of repair to the bosses refer to T.R.333.

SEQUENCE OF OPERATIONS

1. Remove the damaged boss, or boss and sleeve, by drilling through the weld. Scurf flush to the stiffening plate leaving the face smooth and clean. Wire brush the surfaces to be welded of the replacement parts.
2. Position replacement boss, Part No. 28223 (top or bottom) as shown in Section CC in sketch, or Part No. 95944 (top) or 96427 (bottom) as shown in Section DD; if applicable, position sleeve, Part No. 91576 (top or bottom), as shown in Section CC. Ensure that the replacement part is central to the existing hole in the exhaust cone. Argon-arc weld at the points indicated in the sketch, using filler rod D.T.D.549 or D.T.D.571 (stabilized).
3. Remove any welding flash and adjust any distortion.
4. Clean any cracks or fretting of the inner skin at the bolt holes in preparation for welding. Cracks at the bolt holes must not exceed 0.500 inch in length, and fretting of the inner skin at bolt holes must not exceed 0.015 inch in depth.
5. Weld the cracks or fretting damage, by the argon-arc process, using filler rod D.T.D.549 or D.T.D.571 (stabilized).
6. Remove any welding flash and adjust any distortion.
7. Etch T.R.378 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

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FRONT BAFFLE ASSEMBLY, CRACKED STIFFENERS

T.R. 382 issue 1—Mod. 1114

This repair may be applied to all Ghost Forty-eight front baffle assemblies which are pre-mod. 540.

Front baffle assemblies in which stiffeners have cracked may be repaired in accordance with these instructions.

SEQUENCE OF OPERATIONS

1. Clean the damaged area and ensure that the crack does not exceed 1.000 inch in length.
2. Weld the crack by the argon-arc process.
3. Clean the welded area.
4. Etch T.R.382 adjacent to the existing part number and make an entry in the appropriate record book of the engine.

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T.R. 242 continued from page 5

remains which might foul the new diaphragm when it is located in position for welding. As in the previous operation, damage to the skin of the cone must be avoided by exercising extreme care.

3. Remove the remains of any metal which, as a result of the cutting operation, may be adhering to the cone.
4. Remove any oil or grease from the welding surfaces of replacement diaphragm, Part No. 93881, and of the inner cone, and thoroughly clean these surfaces by wire brushing.
5. Locate the replacement diaphragm in position in the cone, so that the four bosses on the diaphragm are aligned with the four holes in the cone.
6. Insert guide bush T.78804 through each of the four holes in the cone until it abuts with the diaphragm.
7. Pass the ground end of alignment plug T.77262 through one of the guide bushes, and through the adjacent diaphragm boss, until it locates in the boss, and in the guide bush, which are diametrically opposite. Similarly pass the second alignment plug through the remaining two diametrically opposite guide bushes, and bosses, refer to Fig. 8, page 5. Rotate the plugs to ensure correct alignment of the components.
8. Working to the details and dimensions shown in Fig. 8, use an electric spot-welding machine, fitted with electrodes to give a spot $\frac{3}{16}$ inch diameter, to spot weld sufficient lips of the front, and the rear, flanges of the diaphragm to secure it firmly to the cone. Remove the alignment plugs, and the guide bushes, and spot weld the remaining lips of each of the flanges of the diaphragm.
9. Clean off any welding flash which may protrude from under the flanges.
10. If this is the first time that this repair has been applied, lightly etch T.R.242 adjacent to the existing part number on the cone. Make the appropriate entry in the engine log book.

FAIRINGS, DAMAGED THREAD IN BOSSES
T.R.381 issue 3—Mod. 1114

Exhaust cone fairings (Ghost 48 Mk. 1, 48 Mk. 2 or 53 Mk. 1) in which the threads in any of the bosses, Fig. 9, have become damaged, may be repaired by fitting Cross wire inserts in accordance with these instructions. Reference must be made also to chapter 32, page 2, which specifies the tools required, and contains general information essential to this repair.

It should be noted that the bosses in fairings pre-mod. 187 are threaded to $\frac{1}{4}$ inch B.S.F., and

that mod. 187 introduced strengthened fairings in which the bosses are threaded to $\frac{5}{16}$ inch B.S.F. This should be borne in mind when selecting the appropriate tools from those listed in chapter 32, page 2.

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

REPAIR TO PRE-MOD. 187 FAIRING

To carry out this repair proceed as follows.

1. Using a 0.257 inch diameter (letter F) drill, drill through the defective hole.

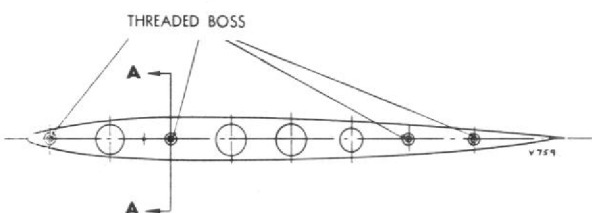


Fig. 9. Threaded bosses in exhaust cone fairing. For section A-A see Fig. 10 and 11.

2. Using a tap wrench with the appropriate taper, and plug taps, thread through the hole to 0.3012 inch diameter by 26 T.P.I. Whitworth form.
3. Remove any burrs from the edge of the hole, blow out the hole with compressed air, and using the appropriate inserting tool, screw in wire insert, Part No. N.4972, Fig. 10. Break off, and remove, the notched tang of the insert.

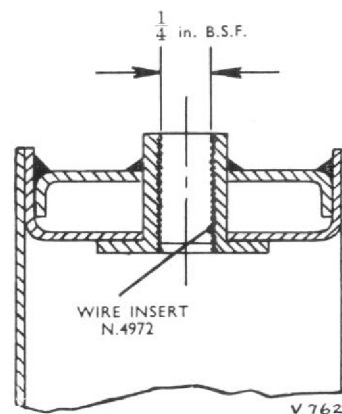


Fig. 10. Section A-A pre-mod. 187, showing wire insert fitted to boss.

4. Use a John Bull Intercheck small bore gauge in conjunction with the appropriate mandrel, and ring screw gauge, to check the thread of the insert.
5. Repeat operations 1 to 4 for each damaged hole.
6. If this is the first time that this repair has been applied, lightly etch T.R.381A adjacent to the

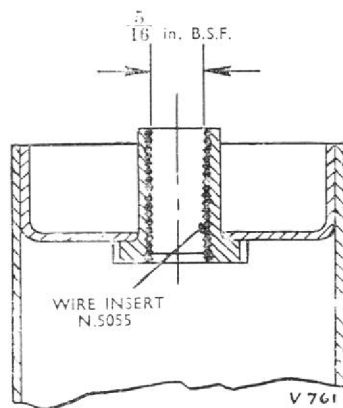


Fig. 11. Section A-A mod. 187, showing wire insert fitted to boss.

existing part number on the fairing. Make the appropriate entry in the engine log book.

REPAIR TO MOD. 187 FAIRING

To carry out this repair proceed as follows.

1. Using a 0.323 inch diameter (letter P) drill, drill through the defective hole.
2. Using a tap wrench with the appropriate taper, and plug taps, thread through the hole to 0.3727 inch diameter by 22 T.P.I. Whitworth form.
3. Remove any burrs from the edge of the hole, blow out the hole with compressed air, and

using the appropriate inserting tool, screw in wire insert, Part No. N.5055, Fig. 11. Break off, and remove, the notched tang of the insert.

4. Use a John Bull Intercheck small bore gauge in conjunction with the appropriate mandrel, and ring screw gauge, to check the thread of the insert.
5. Repeat operations 1 to 4 for each damaged hole.
6. If this is the first time that this repair has been applied, lightly etch T.R.381B adjacent to the existing part number on the fairing. Make the appropriate entry in the engine log book.

FIREGUARD, CRACKS, THERMOCOUPLE FLANGES, AND FRONT FLANGE

T.R.379 issue 3—Mod. 1114

Any fireguard assembly (Ghost 48 Mk. 1, 48 Mk. 2, or 53 Mk. 1) in which cracks, not exceeding 1.000 inch in length, have occurred in the skin, or in which any one, or more, of the thermocouple flanges has become damaged, may be repaired in accordance with these instructions. Furthermore, fireguard assemblies, pre-mod. 844, in which cracks, not exceeding 0.500 inch in length, have occurred in the front flange, Fig. 12, may be repaired by applying the appropriate section of these instructions.

On receipt of the component which is to be repaired, its part number and serial number should be checked against the accompanying documents.

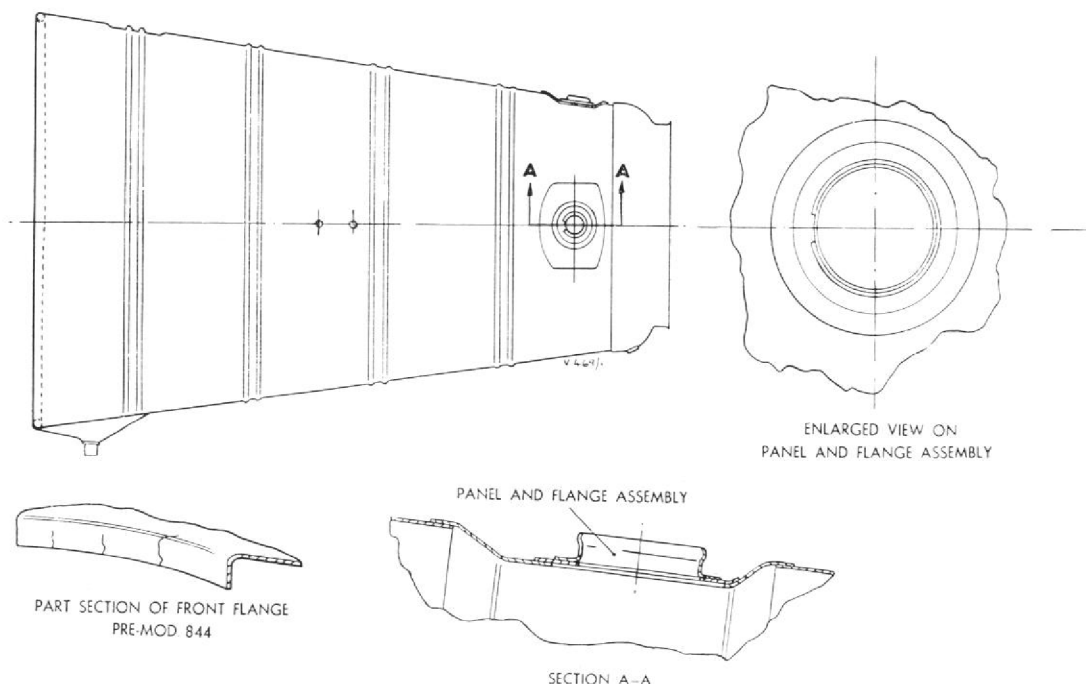


Fig. 12. View of the fireguard showing thermocouple flanges and location of cracks in front flange.

Revised by Amendment No. 131
February, 1957

REPAIR TO CRACKS IN THE SKIN

Provided that no crack exceeds 1.000 inch in length, this repair may be carried out as follows.

1. Remove any oil or grease, and using a rotary wire brush, thoroughly clean in and around the crack until bright metal is exposed.
2. Weld the crack by the argon-arc process, using filler rod to Specification D.T.D.489, or stabilized D.T.D.571.
3. Clean up after welding.

REPAIR TO THERMOCOUPLE FLANGE

To carry out this repair proceed as follows.

1. Cut out the damaged flange, ensuring that the resulting hole in the seating panel is left smooth and clean, and does not exceed 3.600 inches diameter.
2. Select the appropriate panel and flange assembly, from those listed below, according to the position in which it is to be fitted.

Assembly Part No.	No. off per fireguard	Position on fireguard
606074	1	Top
604277	2	Side

3. Remove any oil or grease, and using a rotary wire brush, thoroughly clean the surfaces of the fireguard, and of the replacement assembly, which are to be welded.
4. Position the replacement assembly central to the hole in the fireguard, ensuring that the slot in the flange is facing the front (large) end of the fireguard, refer to Fig. 12.
5. Electrically stitch weld all round the circumference of the panel of the assembly.

6. Clean up after welding.

When either one, or both, of the repairs described in the foregoing paragraphs has been carried out, and if this is the first time that this repair has been applied, lightly etch T.R.379 adjacent to the existing part number on the fireguard. Make the appropriate entry in the engine log book.

REPAIR TO CRACKS IN FRONT FLANGE, PRE-MOD. 844

Provided that no crack exceeds 0.500 inch in length, this repair may be carried out as follows.

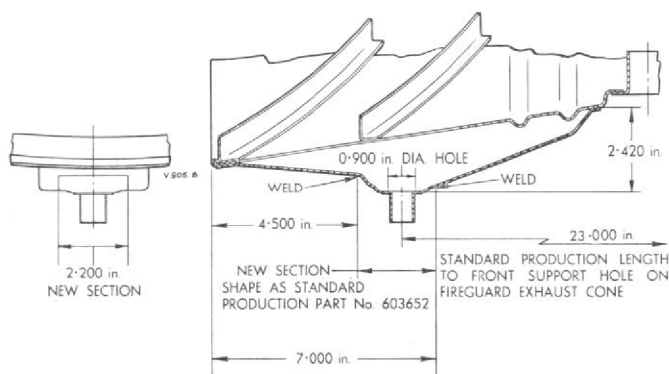
1. Remove any oil or grease, and using a rotary wire brush, thoroughly clean in and around the crack until bright metal is exposed.
2. Weld the crack by the argon-arc process, using filler rod to Specifications D.T.D.489, or stabilized D.T.D.571.
3. Grind and polish the weld to produce a smooth finish.
4. If this is the first time that this repair has been applied, lightly etch T.R.379A adjacent to the existing part number on the fireguard. Make the appropriate entry in the engine log book.

FIREGUARD DRAIN TROUGH T.R.375 issue 2

For Information Only

If the number T.R.375 is found on a Ghost 48 Mk. 1 or 48 Mk. 2 fireguard, adjacent to the existing part number, this indicates that the position of the drain trough has been altered to accord with production standard.

This rectification will not affect the interchangeability of the component nor does it affect its dismantling, inspection, repair or reassembly.



T.R.375. Fireguard drain trough.



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