CHAPTER 5 - EXHAUST SYSTEM

Contents

Illustrations

1. General

A. When working on an engine, observe the precautions listed in Chap.1. Lubricants for assembling and torque loading data are also detailed in Chap.1. A list of special tools and equipment is detailed in Sect.1.

2. Exhaust unit

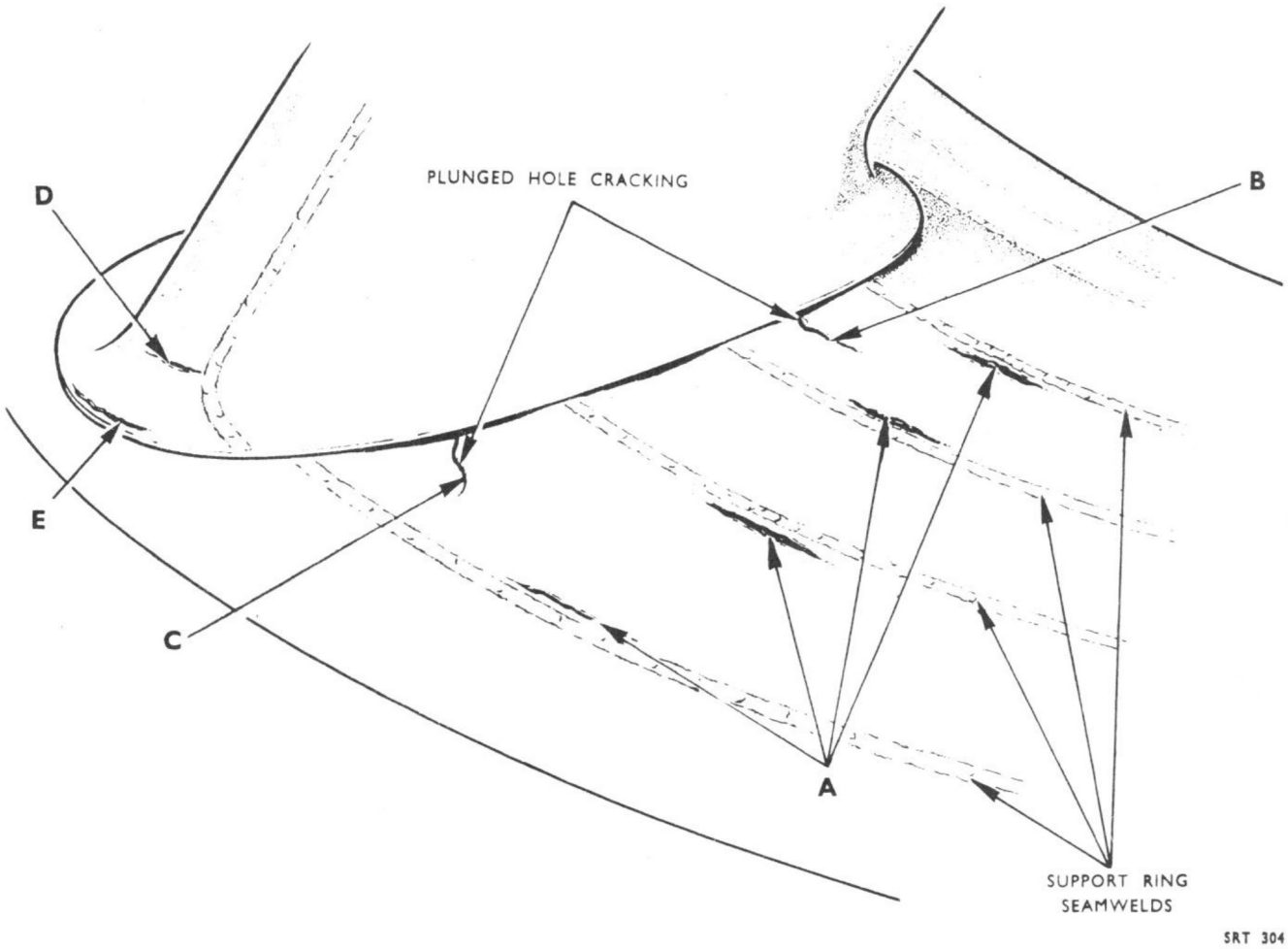
A. Inspection

(1) Enter the jet pipe as far as possible and, using a powerful spotlight, inspect the exhaust unit for cracks, rippling or dents. If the limits given in (a) to (c) are exceeded, reject the exhaust unit.

(a) Inspect the skins of the inner and outer cones.

(i) Accept small transverse cracks which are wholly contained within a weld track.

(ii) Accept cracks along or adjacent to the four outer cone support ring circumferential seamwelds (A, Fig.1) to a cumulative length (i.e. the sum of the lengths of the individual cracks) of 5.0in.



Outer cone skin and fairing - typical cracking
Fig.1

(iii) Accept cracks along or adjacent to the inner cone circumferential seamwelds, to a cumulative length of 4.0in.

NOTE: The limits given in (ii) and (iii) above apply to only those seamwelds which are intersected by the exhaust unit fairing soleplates. Cracking at any circumferential seamweld not contained within the axial length of the fairing soleplates is not acceptable.

(iv) Cracks may emanate from the plunged holes adjacent to the fairing support tube sleeves and extend circumferentially under the soleplates (B, Fig.1). Accept two cracks per hole provided that there is no axial propagation (C, Fig.1) and that they do not encroach within 0.250in of a circumferential seamweld, and that any individual crack is not longer than 0.500in on the inner cone or 1.0in on the outer cone.

(v) Accept slight rippling of the inner cone skin, provided that there are no cracks.

(vi) Accept rippling of the outer cone skin, provided that the height of the crests is not greater than 0.125in above the normal surface of the skin and there are no cracks.

(b) Inspect the fairings and soleplates. Accept cracks in the fairing adjacent to the soleplate weld (D, Fig.1), and across the leading and trailing edges of the soleplates (E, Fig.1), provided that they are not longer than 0.625in.

(c) Inspect the insulation casing.

(i) Accept isolated instances of sheared rivets.

(ii) If there is an area of sheared rivets (indicative of outer cone support ring failure), reject the exhaust unit.

B. Removing

(1) Remove the engine from the aircraft as described in the appropriate aircraft Air Publication.

NOTE: Five setscrews are fitted in the exhaust unit flange; only the top one, which is a blanking setscrew to prevent possible gas leakage from the top extractor hole should be removed.

(2) Apply penetrating oil or kerosine to the exhaust unit retaining stud ends to facilitate removal of the retaining nuts.

(3) Unlock and remove the top setscrew from the exhaust unit flange.

(4) Bend back the locking tabs and unscrew the retaining nuts, leaving the top nuts until last; discard all tabwashers and remove the fire extinguisher rail.

(5) Fit suitable setscrews to the four extractor holes positioned at 90° intervals from the top centre position of the flange.

(6) Support the weight of the exhaust unit, remove the top retaining nuts and tabwashers and with the aid of the extractor screws withdraw the unit from the locating spigot.

C. Replacing

(1) Before replacing the exhaust unit, inspect the retaining studs in the nozzle box flange; renew any which are damaged and/or fractured.

NOTE: Three different lengths of studs are used to secure the unit; ensure that any new stud fitted is identical to that removed.

(2) Using grease ZX-28 (Ref. No.34B/942873) as thread lubricant, torque tighten new studs to between 40 lbf in. and 60 lbf in. to achieve the correct projection given in the following table:

Stud length	Projection	
	Minimum	Maximum
1.025in - 1.035 in	0.625in	0.685in
1.125in - 1.135in	0.725in	0.785in
1.850in - 1.860in	1.450in	1.510in

(3) Ensure that the extractor setscrews are removed from the exhaust unit flange. Fit the exhaust unit, correctly aligned, over the nozzle box studs; fit the fire extinguisher rail and new tabwashers, then the retaining nuts.

(4) Using grease ZX-28 as thread lubricant, tighten the retaining nuts to 40 lbf in, then tab-lock the nuts.

(5) Fit the blanking setscrew and new tabwasher to the top extractor hole. Tab-lock the setscrew.

(6) Install the engine in the aircraft as described in the appropriate aircraft Air Publication. JK Mth

D. Serviceability check

(1) When the jet pipe has been coupled up to the exhaust unit, run the engine as instructed in A.P.102C-1512 to 1517-1, Part 2 and check for hot-air leaks from the exhaust unit/jet pipe joint, and, for signs of 'Alfol' lining having been blown from the insulation casing. Accept a hot-air leak if the back of the hand can be held 6.000in from the exhaust unit/jet pipe joint at governed rev/min.

3. Jet pipe and final nozzle

A. Removing/Replacing

(1) The method of removing and replacing the jet pipe and final nozzle assembly depends upon the features of the aircraft in which the e.c.u. is installed. Refer to the appropriate aircraft Air Publication for detailed instructions.