CHAPTER 1

AIR PRODUCER INTERIM SERVICE

CONTENTS

CONTENTS (continued)

AIR PRODUCER

INTRODUCTION

1 Upon receipt of the Air Producer confirm that the reason for removal is an interim service. Record any damage and deficiencies and blank off all apertures with protective covers.

DISMANTLE

2 The procedures for dismantling the Air Producer are detailed in Paras 3 to 12 and with reference to Figures 1 and 2.

Special tools

3 The following special tools are required:

(1)	Support, Air producer	007-01M1
(2)	Screws, Extractor	60290-01-24M1

Key to Figures 1 and 2

1	Grille	19	Screw	37	Nut
2	Starter	20	Screw	38	Stud
3	Screw	21	Air Producer- Sub-Assy	39	Cone
4	Washer - Lock	22	Valve	40	Shim
5	Pipe Assy - Left	23	Seal	41	Holder
6	Fitting	24	Bracket	42	Screw
7	Nut	25	Screw	43	Plate
8	Ring – Seal	26	Washer – Flat	44	Holder
9	Pipe Assy – Right	27	Backplate and Liner Assy	45	Plate
10	Bracket	28	Screw	46	Plug
11	Screw	29	Plug, Ignitor A	47	Cap
12	Washer – Flat	30	Screw	48	Cap
13	Bracket	31	Washer - Lock	49	Cap
14	Housing Assy	32	Clamp	50	Cap
15	Screw	33	Plug	51	Cap
16	Sleeve	34	Blanket	52	Cap
17	Ring – Bleed	35	Duct	52A	Casket
18	Shim	36	Screw		

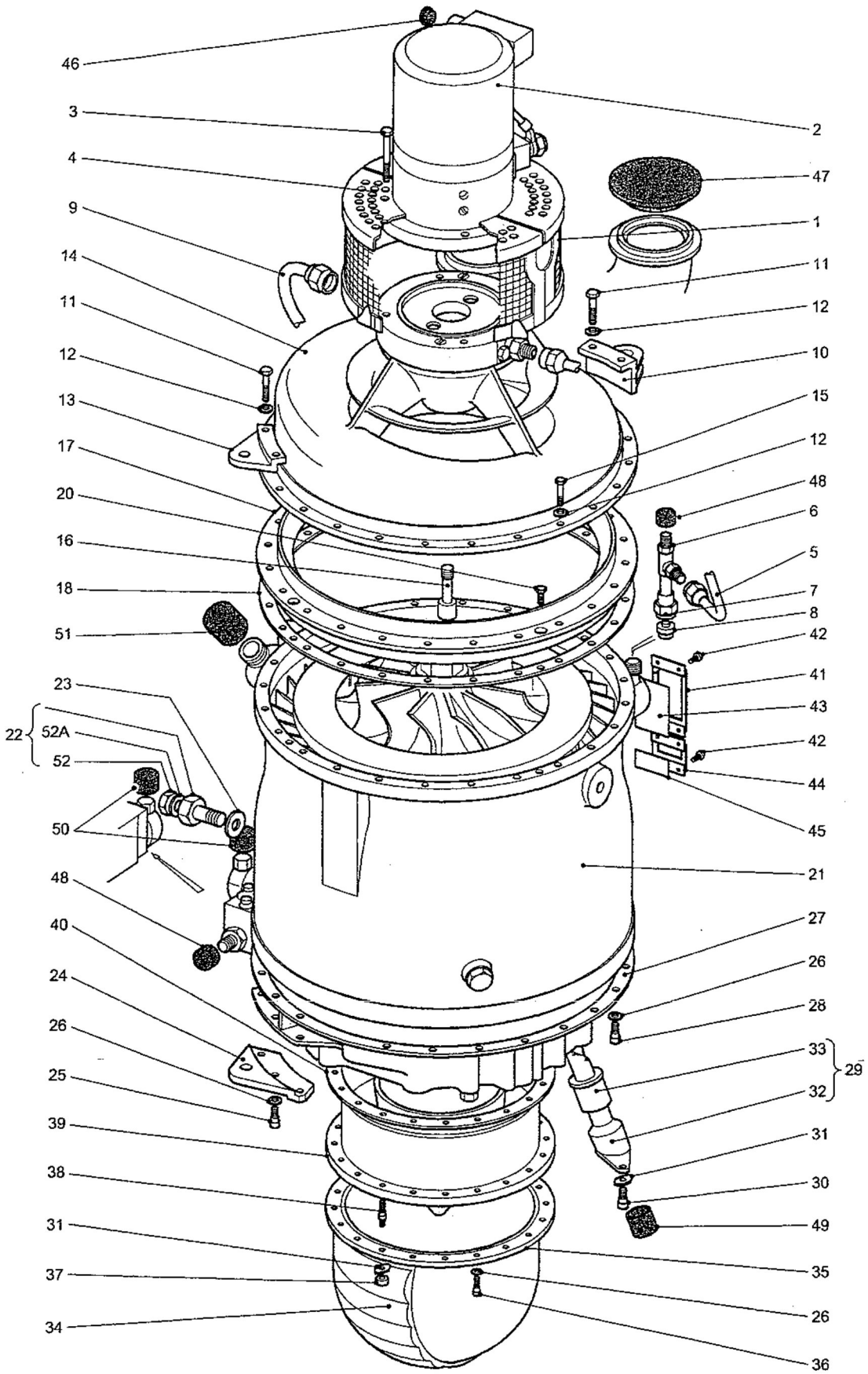


Fig 1 Air producer general view

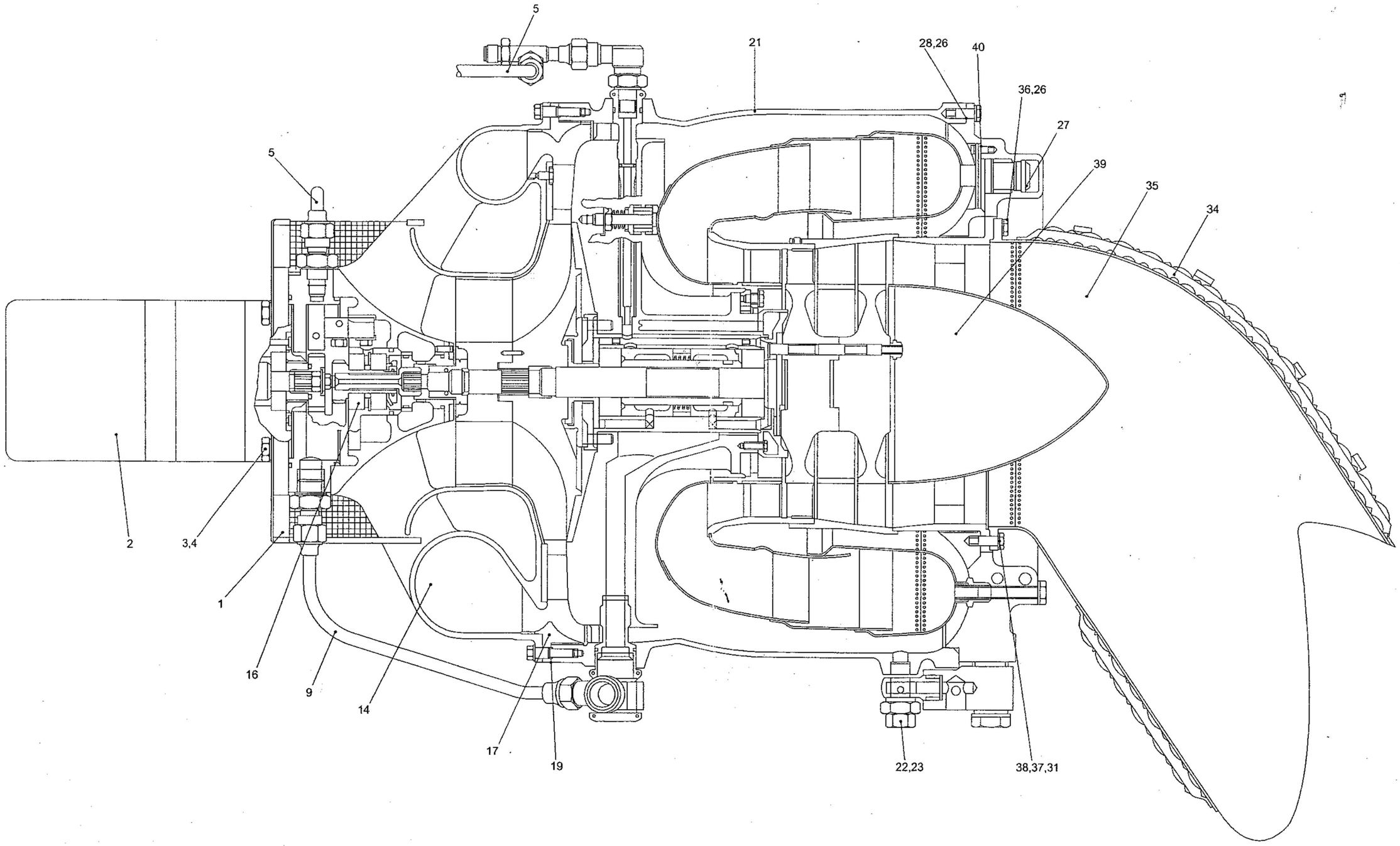


Fig 2 Air producer sectional view

NOTES

(1) 'O' ring seals, washers, nuts, and screws are to be rejected after dismantling.

(2) Where applicable, wire locking is to be cut, removed and discarded before the removal of screws and fittings.

Preparation

4 The following preparatory stages must be completed before dismantling the air producer.

4.1 Clean exposed surface with white spirit (or equivalent)

4.2 Dry with lint free cloth or by blowing with moisture free compressed air.

4.3 Mount on the servicing clamp (Part No. 007-01-0M1).

4.4 Fit blank to the air outlet.

Exhaust duct blanket

5 The removal procedure for the exhaust duct blanket (Item 34) is as follows.

5.1 Using cutting pliers, cut and remove locking wire securing exhaust duct blanket (34) to exhaust duct (35).

5.2 Remove exhaust duct blanket (34).

Exhaust duct (Fig 3)

6 The removal procedure for the exhaust duct (Item 35) is as follows:

6.1 Unlock four lockwashers (31) and using a 7mm ring spanner, unscrew and remove four nuts (37) and four lockwashers (31).

6.2 Using a 7mm ring spanner and a 7mm socket spanner, unscrew and remove 14 screws (36) and 14 flat washers (26).

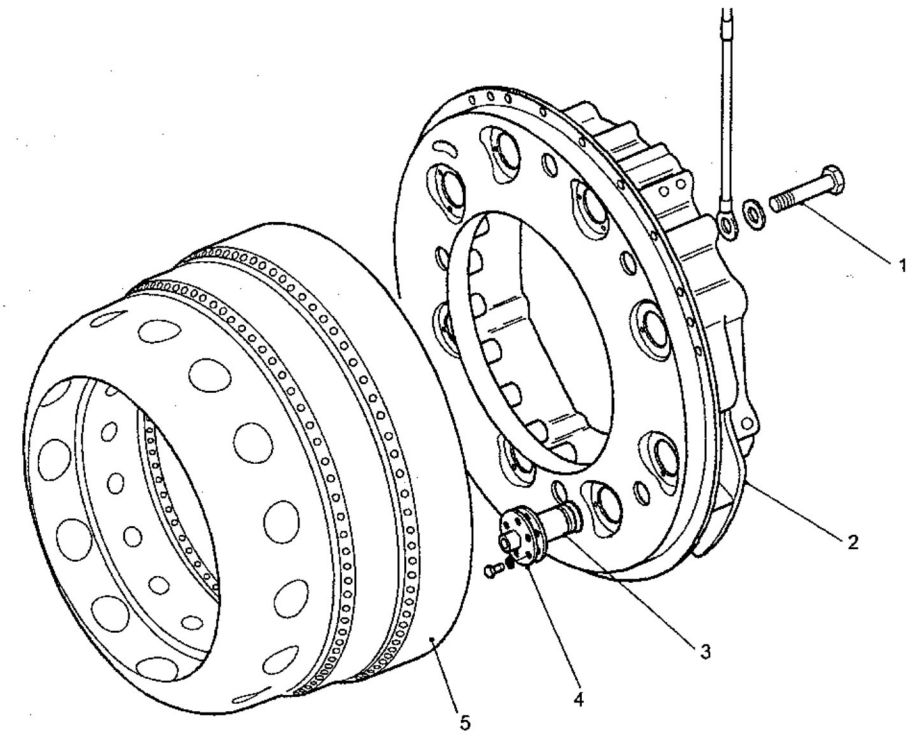
6.3 Remove exhaust duct (35).

Turbine casing drain valve

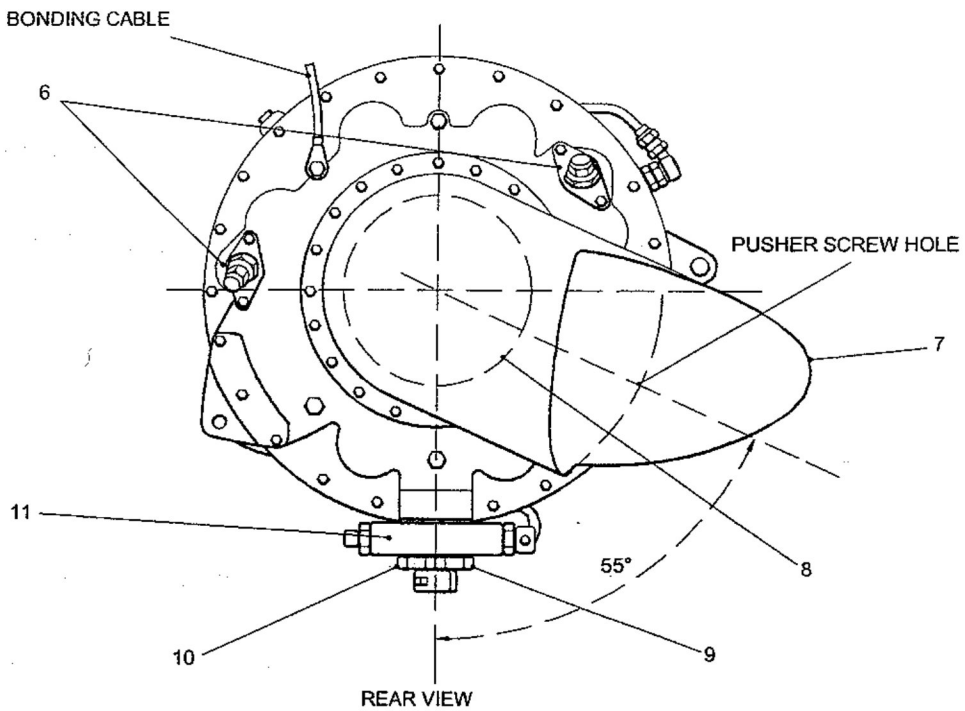
7 The removal procedure for the casing drain valve (Item 22) is as follows.

7.1 Cut locking wire and remove.

7.2 Using a 17mm flat spanner, unscrew and remove the drain valve (22) and 2 seals (23).



FRONT VIEW



REAR VIEW

1	Liner attaching screws	7	Exhaust duct
2	Backplate	8	Exhaust cone
3	Fuel burners (8)	9	Fuel supply pillar bolt
4	Fuel burner caps	10	Fuel spill pillar bolt
5	Combustion liner	11	Fuel block
6	Igniter plugs	12	Bonding cable

Fig 3 Backplate and exhaust assemblies

Exhaust cone (Fig 3)

8 The removal procedure for the exhaust cone (Item 39) is as follows.

8.1 Using two 7mm flat spanners, lock a 4mm nut with a 4mm lock nut on four flanged studs (38).

8.2 Using a 7mm flat spanner, unscrew and remove four flanged studs (38).

8.3 Remove exhaust cone (39) and shimming (40).

Backplate and liner assembly (Fig 3)

9 The removal procedure for the backplate and liner assembly (Item 27) is as follows.

9.1 Cut locking wire and remove. Using a 7mm flat spanner and 7mm socket spanner, unscrew and remove 21 screws (28) and 21 flat washers (26).

9.2 Using four extractor screws (Part No. 60290-01-24M1), withdraw the backplate and liner assembly (27) from the air producer sub-assembly (21).

9.3 Examine the turbine assembly in accordance with Para 34. If serviceable continue dismantling procedure, if defective reassemble and return to the manufacturers.

Igniter plug assembly (Fig 3)

10 The removal procedure for the igniter plug assembly (Item 27) is as follows.

10.1 Unlock four lockwashers (31) and using a 7mm socket spanner, unscrew and remove four screws (30).

10.2 Remove igniter plug assembly (29).

Starter motor and protection grill (Fig 4)

11 The removal procedure for the starter motor (Item 2) and protection grill (Item 1) is as follows.

11.1 Remove the air producer from the air producer support (Part No. 007-01-0M1) and position air producer on flat surface with starter motor (2) uppermost.

11.2 Unlock four lockwashers (4).

11.3 Using an 8mm socket spanner, unscrew and remove four screws (3) and four lockwashers (4).

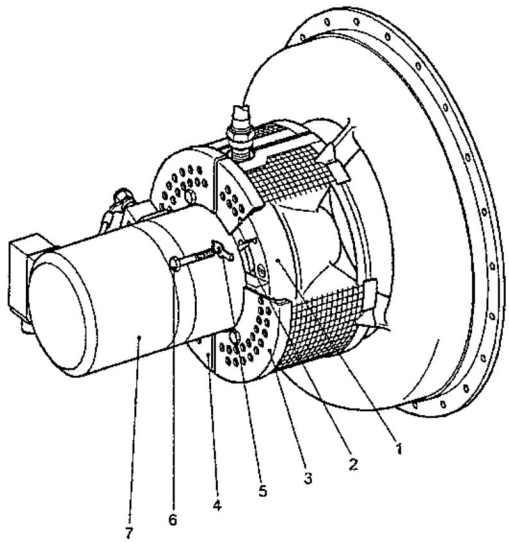
11.4 Remove protection grille (1) and starter motor (2).

Combustion chamber and bonding cable

12 The removal procedure for the combustion chamber is as follows.

12.1 Using a 10mm flat spanner, unscrew and remove six screws, six flat washers and the bonding cable.

12.2 Remove the combustion chamber from backplate and liner sub-assembly.



1 Starter motor mounting pad
2 O-ring seal
3 LH half guard
4 RH half guard
5 Tab washers
6 Screws
7 Starter motor

Fig 4 Starter motor and protection grille

CLEANING PROCESSES

13 Two methods of cleaning the individual parts of the air producer using Ardrox 185L or Ardrox 1900B are provided. Tables 1 and 2 list the parts to be cleaned by each type of Ardrox.

Method 1

14 Ardrox 185L is to be diluted, one volume of Ardrox to three volumes of distilled water and used at a working temperature of 60 to 80°C.

TABLE 1 ARDROX 185L CLEANING PROCESS

Material	Condition/part	Immersion time	Rinsing	Drying	Storage
Steel alloys of: - carbon – chrome – chrome-molybdenum. – nickel-chrome-molybdenum - silicon Spring steel. Stainless steel.	Sheet metal or Machined parts Combustion chambers Exhaust duct Exhaust cone Igniter plugs Drain valve	 20 to 25 minutes 30 to 45 minutes	Immerse in warm water at 40°C Wash with cold water spray from compressed air operated spray gun.	Dry compressed air.	 WD-40 254 TRO kerosene + 5% ESSO Rust Ban (R1504)

NOTES

(1) Immersion times are not critical and may be varied as required to clean the part.

(2) Avoid immersion of threaded (alloy) portion of IGNITERS in ARDROX 185L. Immerse to shoulder of igniter only.

Method 2

15 Ardrox 1900B or equivalent is to be used undiluted and at ambient temperature.

CAUTION

Avoid inhalation of harmful cleaning fluid vapours. Care must be taken to avoid cleaning fluid coming into contact with any bonded materials.

TABLE 2 ARDROX 1900B OR EQUIVALENT, CLEANING PROCESS

Material	Condition/part	Immersion time	Rinsing	Drying	Storage
Copper and Copper alloys of: - zinc. – tin. – nickel. – aluminium. – beryllium – lead		Soak in bath of fluid and clean by brushing.	None.	Dry compressed air.	
Aluminium and aluminium alloys Steels	Backplate and Lightly soiled parts.				WD-40 for ground parts.

NOTES

(1) Housing assembly, air producer mounting brackets should be cleaned in situ with white spirit or equivalent.

(2) Immersion times are not critical and may be varied as required to clean the part.

NON-DESTRUCTIVE TESTING (NDT)

16 Ensure that Non-Destructive Testing (NDT) checks using Zyglo or its equivalent are carried out on the following items.

(1) Exhaust cone.

(2) Casing, air intake.

(3) Chamber, combustion.

Standard method

17 The procedure is as follows:

17.1 Immerse the part in a bath of Ardrox PR50A (or equivalent) until it is clean and free from grease. Large parts or items which cannot be dismantled, apply the Ardrox PR50A with a brush.

17.2 Blow dry the part using a jet of moisture free compressed air.

17.3 Apply Zyglo ZL60C or equivalent liquid penetrant to the part by means of immersion, brushing or spray.

17.4 Allow time (Table 4) for the penetrant to soak into cracks and the surplus to drain off.

17.5 Wash off the surface to be inspected with a coarse water spray. Refer to Table 4 for times and temperatures.

17.6 Check, by placing the part under UV lighting, that all the surface deposits have been cleaned off under UV lightening.

17.7 Dry the part for maximum time necessary to dry the surface to be inspected. To prevent evaporation of the penetrant the drying temperature should not exceed 50°C (120°F).

17.8 Apply Zyglo ZP4A or equivalent developer powder to the part. (Refer to Table 4 for development times). The developer powder must not be applied until the part is completely dry.

17.9 Examine the part for cracks under UV lighting. Any cracks will be evident by the emission of a yellow glow.

Post emulsified method

18 The procedure is as follows:

18.1 Immerse the part in a bath of Ardrox PR50A until it is clean and free from grease. Large parts or items which cannot be dismantled; apply Ardrox PR50A with a brush.

18.2 Blow dry the part using a jet of moisture free compressed air.

18.3 Apply Zyglo ZL37 or equivalent liquid penetrant to the part by means of immersion, brushing or spray.

18.4 Allow time (Table 4) for the penetrant to soak into cracks and the surplus to drain off. These products do not contain an emulsifier and cannot be removed by water alone.

18.5 Initial rinse. Wash of excess penetrant with coarse water spray.

18.6 Apply Zyglo ZR10 or equivalent emulsifier to the part, by immersion or brushing, to remove surface deposits but not the liquid penetrant which has penetrated into any cracks. (Refer to Table 4 for times).

18.7 Final rinse. Wash off the surface to be inspected with a coarse water spray. (Refer to Table4 for times and temperatures).

18.8 Check, by placing the part under UV lighting, that all the surface deposits have been cleaned off.

18.9 Dry the part for maximum time necessary to dry the surface to be inspected. To prevent evaporation of the penetrant the drying temperature should not exceed 50°C (120°F).

18.10 Apply Zyglo ZP4A or equivalent developer powder to the part. (Refer to Table 4 for development times). The developer powder must not be applied until the part is completely dry.

18.11 Examine the part for cracks under UV lighting. Any cracks will be evident by the emission of a yellow glow.

TABLE 3 FLUORESCENT CRACK DETECTION METHOD

Component	Process (Table 4)	Method to be used (or equivalent)
Sheet metal work and welded assemblies	P1	Zyglo standard. Sensitivity Level 2.
Combustion chamber liner	P2	Zyglo post emulsified method. Sensitivity Level 4.

TABLE 4 FLOURESCENT PENETRANT PROCESSES TIMES AND TEMPERATURES

Operation		P1 SENSITIVTY LEVEL 2	P2 SENSITIVITY LEVEL 4
Cleaning		Clean thoroughly to remove all traces of grease.	
Penetration Application and draining **Note:** If the maximum penetration time is exceeded a fresh application should be made	Material Time	Zyglo ZL 60C or equivalent Minimum Contact Time 15 minutes Maximum Contact Time 30 minutes.	Zyglo ZL 37B or equivalent Minimum Contact Time 15 minutes Maximum Contact Time 30 minutes.
Application of emulsifier or remover Application and draining	Material Time		Zyglo ZR 10 or equivalent 2 minutes max. depending on concentration.
Washing and Rinsing	Material Time	Warm water 10 to 38°C 10 minutes maximum	Warm water 10 to 38°C 10 minutes maximum
Drying	Time	Dry for a minimum time necessary to dry the surface to be inspected.	
Development Application of developer and time for development. If the times between application of developer and inspection is exceeded, the process should be re-started.		Zyglo ZP 4A or equivalent Minimum – 6 minutes Maximum – 60 minutes.	Zyglo ZP 4A or equivalent Minimum – 6 minutes Maximum – 60 minutes.

EXAMINATION

Exhaust blanket

19 Examine the blanket for damage, cracking, deterioration, porosity and corrosion. If visible cracks present, replace blanket.

Exhaust duct (Fig 5)

20 Visually examine the exhaust duct for knocks, burrs, scratches or deformation. Deformation is not acceptable particularly on Diameter B and Face A. Inspect the duct for overheating and corrosion, burnt areas or marked deformation are not acceptable.

21 The limits when performing a crack inspection are detailed below.

(1) Flange weld: No more than 2 cracks are acceptable, 3mm maximum in length are separated by 90° maximum.

(2) Exhaust duct weld: Cracks less than 3mm in length may be stopped by drilling a 2mm hole.

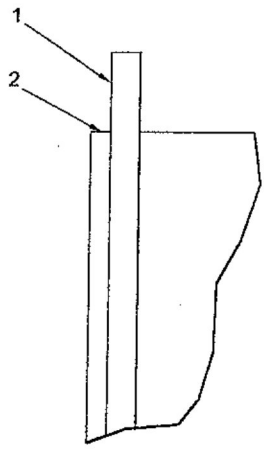
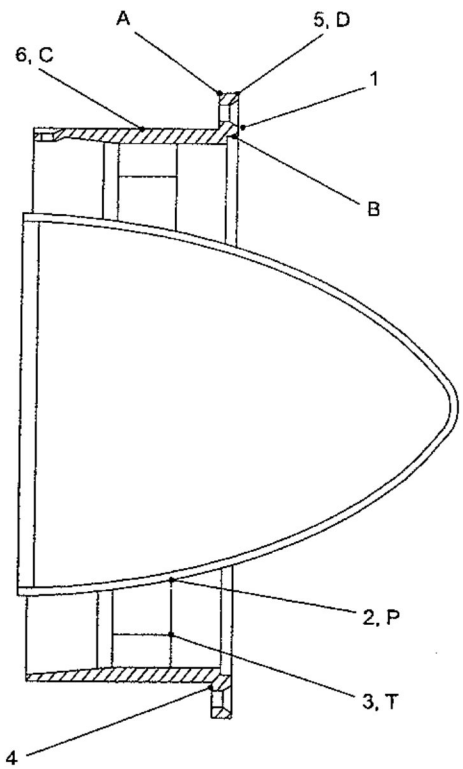


Fig 5 Exhaust duct examination

Exhaust cone (Fig 6)

22 Visually examine the exhaust cone for knocks, burrs, scratches or deformation. These are not acceptable particularly on Diameter C, D and faces A, B.



1	Flange rear face	4	Flange front face
2	Strut weld seams	5	Periphery of mounting flange
3	Struts	6	Periphery of forward edge

Fig 6 Exhaust cone examination

23 When performing a dimensional check, if the ovality of diameters C and D (Fig 6) exceeds the limits detailed below then the parts must be reworked on a lathe.

(1)	Diameter D Minimum diameter	167.80mm	(6.606in)
(2)	Ovality diameter C Maximum	0.3mm	(0.012in)
(3)	Ovality diameter D Maximum	0.2mm	(0.008in)

24 Crack detection is carried out using the Ardrox or Zyglo method. Cracks at P or T (Fig 6) are limited to one crack per strut not exceeding 1mm (0.039in) in length. Cracks in excess of the given criteria can be repaired by Argon welding. Traces of corrosion on the cone are not a criteria for rejection unless the sheet metal is perforated.

Protection grille

25 Visually examine the protection grille for distortion, cracks and damage to the wire mesh. Replace if unserviceable.

Air producer mounting brackets

26 Visually examine the mounting brackets for distortion, cracks and wear in bores and bushes. Replace if unserviceable.

Oil pipes

27 Visually examine the oil pipes for distortion, deterioration and cracks. Inspect the condition and security of the pipe sleeves. Ensure that the metering orifice in the "Tee" fitting is free from obstruction. Replace if unserviceable.

Air intake casing (Fig 7)

28 Visually examine the air intake casing for the following:

(1) Air intake for knocks, burrs, scratches or deformation.

(2) Corrosion.

(3) Damage to Starter motor mounting pad and Seal groove.

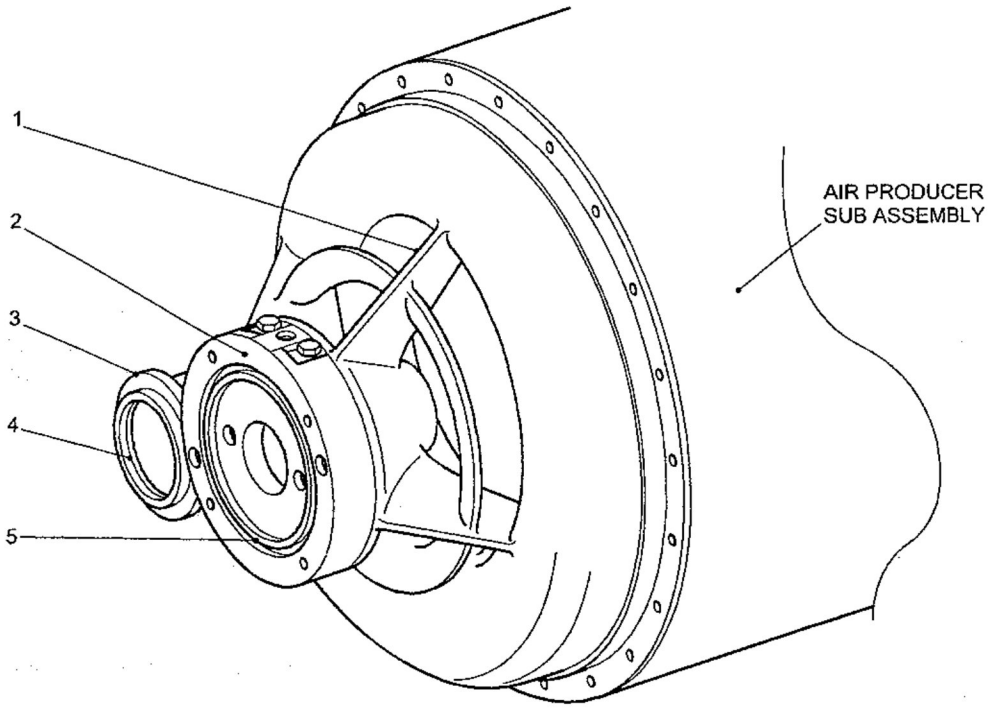
(4) Security of front gear carrier and diffuser.

(5) Condition of bleed air outlet spigot and flange.

(6) Cracks in Struts:

Type A are not acceptable.
Type B cracks are acceptable on four ribs if not more than 8mm (0.315in) long and if the cracks do not extend into the volute.

(7) Foreign object damage.



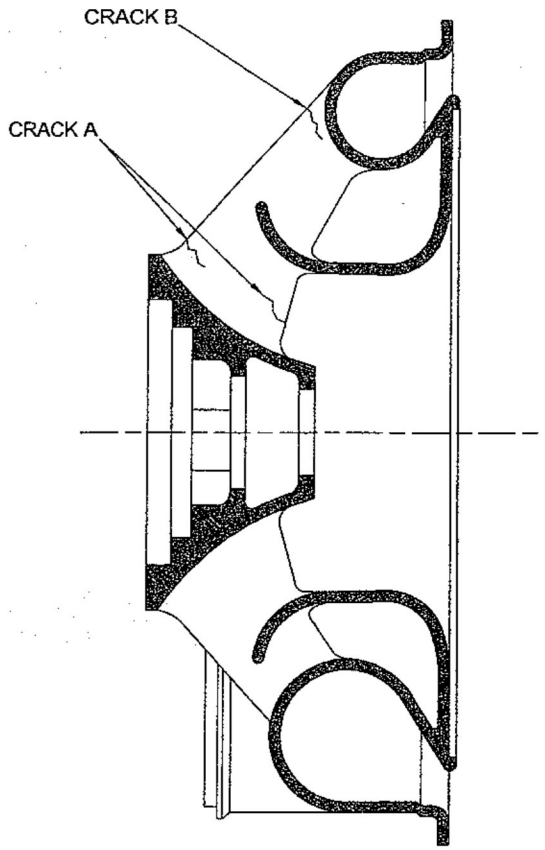
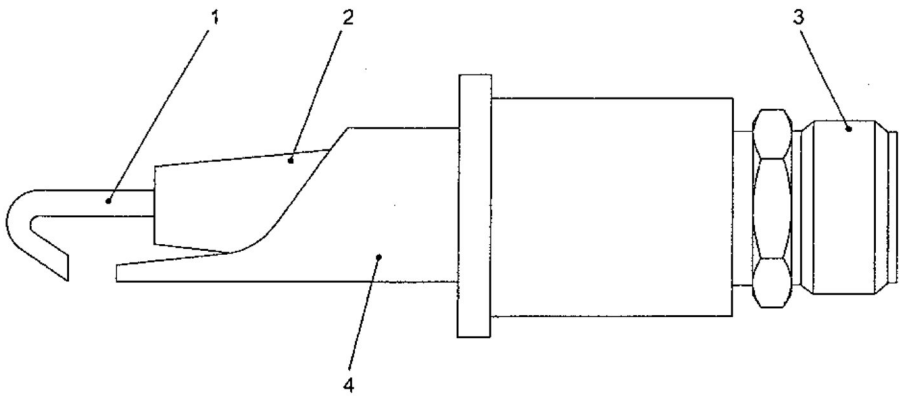


Fig 7 Air intake assembly examination

Igniter plugs (Fig 8)

29 Visually examine the condition of electrodes, insulator and connector. Check the security of attachment of the centre electrode. Perform a functionality test and measurement of the electrode gap (Refer to Section 1).



1	Centre electrode	3	Connector
2	Insulator	4	Outer electrode

Fig 8 Igniter plug examination

Turbine casing drain valve (Fig 9)

30 Visually examine the drain valve for corrosion, condition of thread wire locking and hexagon flats. Ensure that the parts are free from obstruction. Check for free movement of ball.

31 Perform a drainage and leakage test (Refer to Section 1).

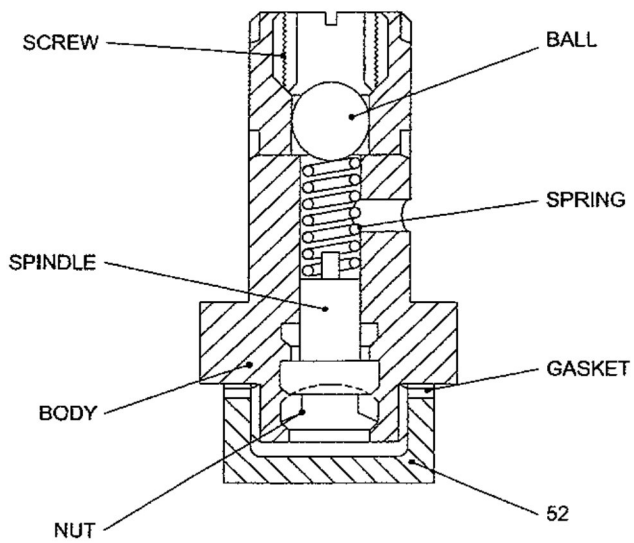


Fig 9 Casing drain valve examination

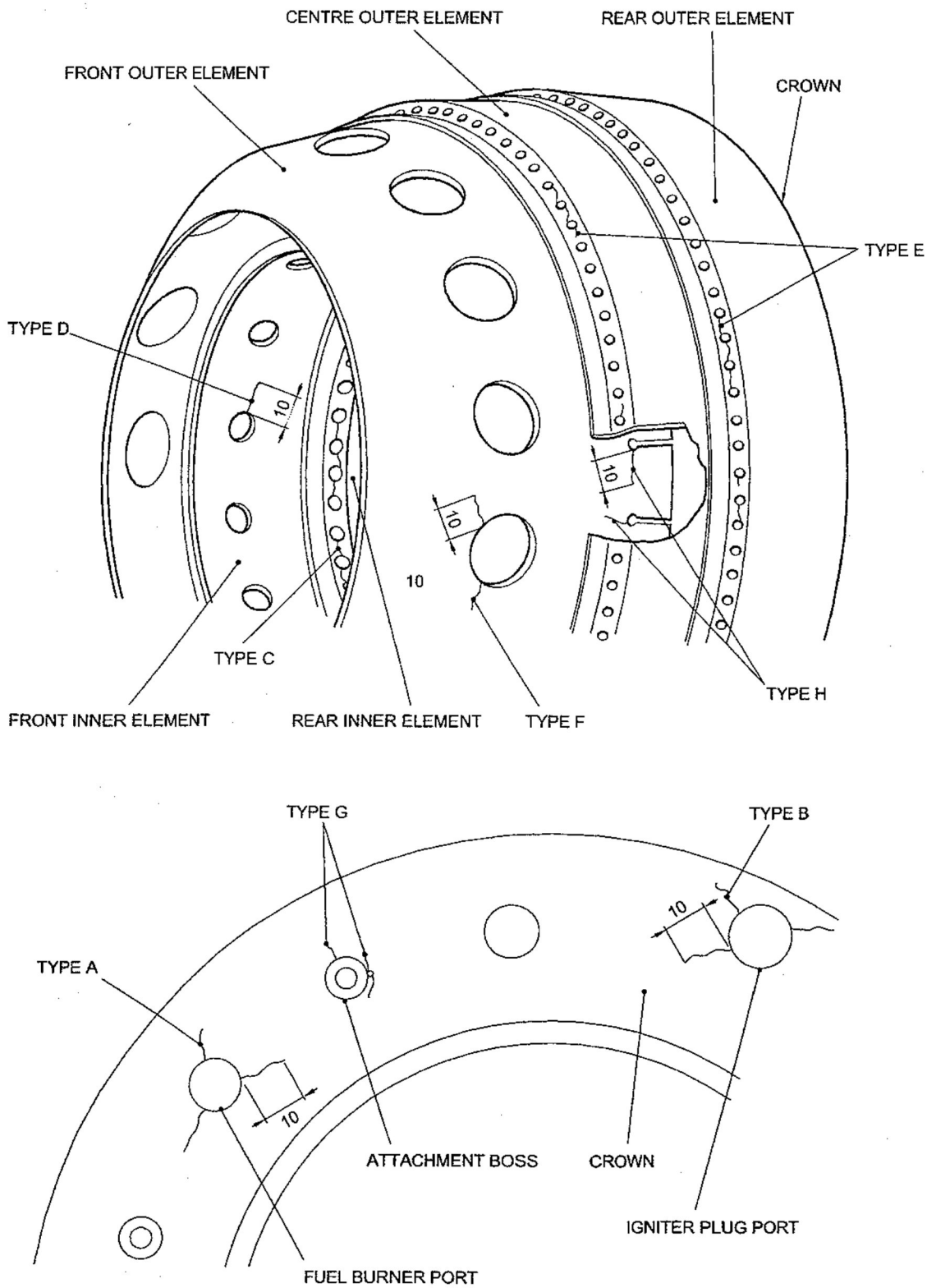


Fig 10 Combustion chamber acceptable cracks

Backplate and fuel burners (Fig 10)

32 Visually examine screw threads, renew loose or damaged wire inserts. Inspect the attachment flange, peripheral surface of spigot, the centre and igniter plug bores. Examine the burners when fitted for visual damage.

33 Carry out a backplate fuel flow and leakage test (Refer to Section 1).

Combustion chamber liner (Fig 10 and 11)

34 Visually examine the combustion chamber liner for the following:

(1) Burns and localised torching. Torching of the inner elements indicates faulty fuel burner operation, a burner spray test should be carried out on the backplate. (Refer to Section 1).

(2) Distortion or denting.

(3) Damage to attachment bosses and their threads.

(4) Damage to fuel burner and igniter plug ports.

(5) Cracks and deterioration in welded seams.

35 Using crack detection techniques carefully examine for cracks in the liner assembly. Tolerances for all types of cracks except Type G are admissible only if there is no risk of one crack running into an adjacent crack or no defect which may cause part of the liner to break away. The cracks are categorised as follows:

35.1 Type A cracks radiating from the eight 11.5mm (0.453in) diameter fuel burner ports and Type B cracks radiating from the two 15mm (0.59in) diameter igniter plug ports in the crown are acceptable provided they:

(1) Do not exceed 3 per port.

(2) Do not exceed 10mm (0.394in) long.

(3) Are 'Stopped' by drilling 1.5mm (0.06in) diameter hole at the end of the crack.

35.2 Type C cracks are acceptable linking the 6mm (0.236in) diameter perforations in the rear inner element, provided they:

(1) Do not run for more than 3 perforations and do not affect more than 15 perforations.

35.3 Type D cracks radiating from the 10mm (0.394in) diameter holes in the front inner element, are acceptable provided they:

(1) Do not exceed 1 per hole.

(2) Do not exceed 10mm (0.394in) long.

(3) Do not affect more than 8 holes.

(4) Are 'Stopped' as for Type A cracks.

35.4 Type E cracks linking the 4mm (0.157in) diameter perforations in the outer, rear and centre elements, are acceptable provided they:

(1) Do not run for more than 3 perforations.

(2) Do not affect more than 30 perforations.

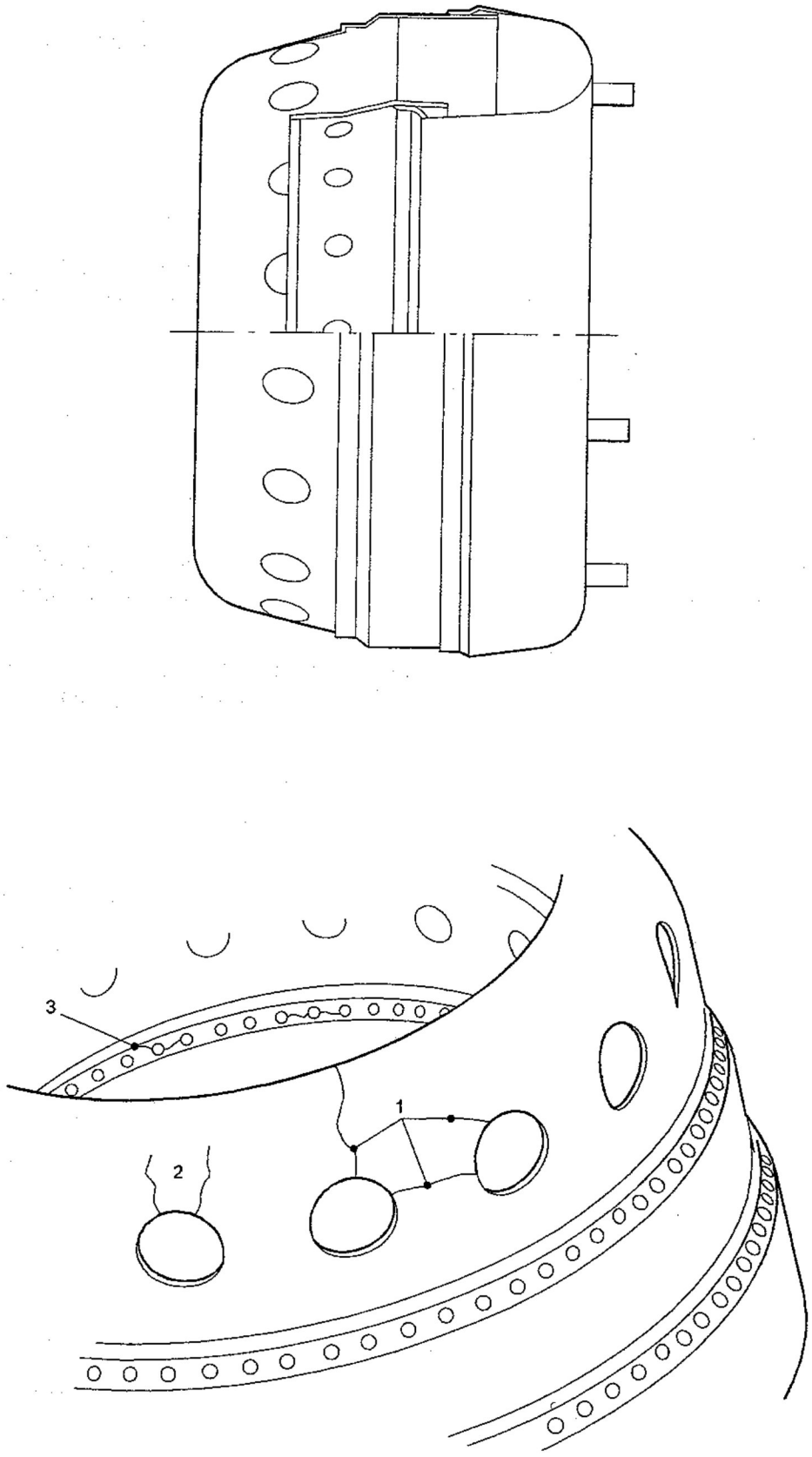


Fig 11 Unacceptable cracks in combustion chamber

35.5 Type F cracks radiating from the 21mm (0.827in) diameter holes in the front element are acceptable provided they:

(1) Do not exceed 3 per hole.

(2) Do not exceed 10mm (0.394in) long.

(3) Do not affect more than 10 holes.

(4) Are 'Stopped' by drilling 1.5mm (0.06in) diameter hole at the end of the crack.

35.6 Type G cracks in the welds around the 6mm attachment bosses on the crown of the liner are not acceptable and must be repaired by Argon welding.

35.7 Type H cracks emanating from the 3mm stop holes at the end of the formation slots in the front outer element through perforations in the centre outer element, are acceptable provided that they:

(1) Do not exceed 1 per hole.

(2) Do not exceed 10mm (0.394in) long.

36 The following are critical defects and render the liner unserviceable (Fig 11):

(1) Linking to adjacent holes.

(2) Linking or likely to link a hole with an element edge.

(3) Cracks in the Liner Assembly seams.

(4) Likely to lead to the breakaway of any part of the liner.

Air producer sub-assembly

37 The air producer sub-assembly is comprised of the turbine casing and the impeller.

37.1 Visually examine the turbine casing for the following:

(1) Security of oil inlet and outlet fittings.

(2) Security of identification and modification plates.

(3) Damage to wire thread inserts in rear face of casing (for backplate attaching screws).

(4) Damaged or loose inserts must be replaced.

37.2 Visually examine the impeller as far as possible whilst it is installed for the following:

(1) Cracks (visual check). Any crack renders impeller unserviceable and turbine will require dismantling, reassembly and balancing.

(2) Distortion of blades and scratches.

(3) Scoring of any area.

(4) Impact damage on blade leading edges. Limited damage is acceptable.

NOTE

Any rework will require the impeller to be re-balanced and the air producer must be returned to the manufacturer.

38 With the Air producer sub assembly vertical, open end uppermost, ensure that the notches in the second stage turbine nozzle are correctly seated on the dowels of the first stage (Fig 12 refers).

NOTE

The second stage nozzle, when not retained by the exhaust cone, is free to move between the two turbine wheels.

39 Visually examine as far as possible for the following:

(1) Ensure rotor rotates freely, without rubs or hard spots.

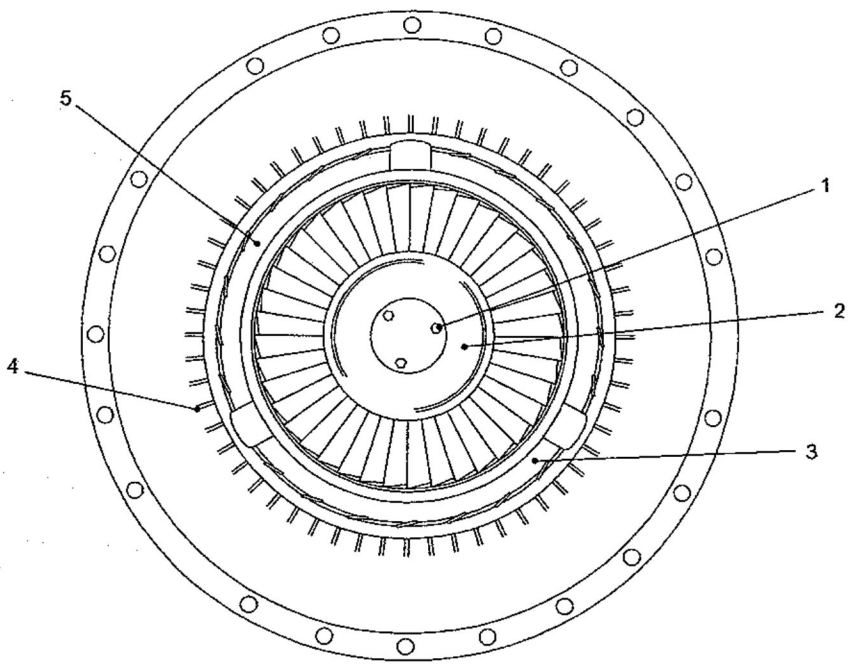
(2) Visually examine turbine wheel nuts for security. Loose nuts are not acceptable and the air producer sub assembly must be rejected as unserviceable.

(3) Visually examine first and second stage turbine wheel blades for cracks and signs of torching. If found, Air producer sub assembly must be rejected as unserviceable.

(4) Examine first and second stage turbine nozzle vanes visually as far as possible for cracks by turning rotor.

NOTE

Discoloration of turbine components caused by overheating, particularly localised is indicative of faulty fuel burner operation and requires that a burner spray test be carried out on the backplate. (Refer to Section 1).



1 Turbine wheel nuts
2 Second Stage turbine wheel
3 Combustion chamber dome
4 Straightener blade trailing edges
5 Second Stage nozzle shroud

Fig 12 Turbine assembly examination

ASSEMBLY

40 The procedures for assembly of the air producer are detailed in Paras 41 to 48 and with reference to Figures 1 and 2.

Combustion chamber on backplate

41 The installation procedure for the combustion chamber on the back plate is as follows:

41.1 Position the combustion chamber flat with the screwed bosses uppermost and remove fuel burner protectors.

41.2 Install backplate on the combustion chamber ensuring the igniter plug bosses in the backplate line up with the corresponding holes in the combustion chamber.

NOTE

Ensure that the combustion chamber bosses are correctly located and bottom in their counter-bores.

41.3 Lightly smear the threads of six screws with grease (Aeroshell –08).

41.4 Using one screw and washer fit the bonding lead to the backplate at approximately 10 o'clock position when viewed from the rear.

41.5 Fit the remaining five screws and washers.

41.6 Tighten all six screws using a torque wrench to $1 \pm \frac{0.2}{0.0}$ m.daN (7.38lbf/ft).

41.7 Lock the screws in pairs using double twisted locking wire.

Igniter plug assembly (Fig 13)

42 The installation procedure for the igniter plug assembly (Item 29) is as follows:

42.1 Install the igniter plug assembly (29) consisting of two igniter plugs and two igniter plug clamps. Ensure the Igniter plugs are located in the appropriate seating in the backplate and liner assembly (27) and are correctly positioned as defined by the anchoring pins.

42.2 Using a 7mm socket spanner, secure igniter plug assembly (29) with four screws (30) and four lockwashers.

42.3 Using flat nose pliers, lock four screws (30) by bending the tabs on the lockwashers (30).

Backplate and liner assembly

43 The installation procedure for the backplate and liner assembly (Item 27) is as follows:

43.1 Secure the air producer to air producer support (007-01M1).

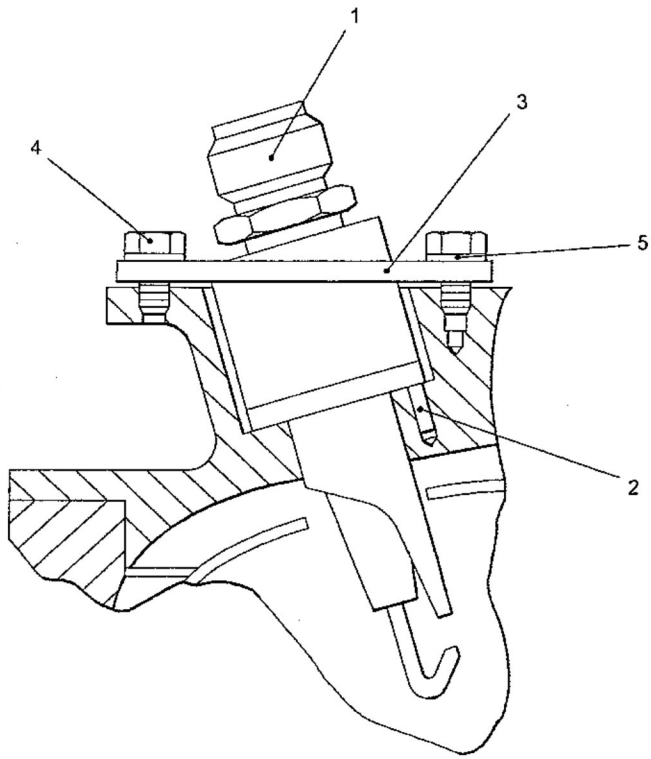
43.2 Turn the turbine nozzles to align the location notch and peg on turbine nozzles with oil outlet union on the air producer assembly (21). The Nozzle assembly can be rotated by 90°, 180° or 270° to even out any areas of burning.

43.3 Press firmly into position ensuring turbine is free to rotate.

43.4 Apply Hylomar jointing compound to backplate and turbine casing. Install backplate to liner assembly (27).

43.5 Using a torque wrench, set to 0.4m.daN (3.6875lbf.ft), a 7mm socket spanner and a 7mm flat spanner, secure backplate and liner assembly (27) with 21 screws (28) and 21 flatwashers (26).

43.6 Wirelock screws in groups of two and one of three with double twisted locking wire.



1 Igniter plug
2 Locating dowel
3 Clamp
4 Capscrews
5 Tab washers

Fig 13 Igniter plug assembly

Drain valve

44 The installation procedure for the drain valve (Item 22) is as follows:

44.1 Remove protective caps/plugs, from air producer sub-assembly (21) and fuel block banjo drain fitting to make way for drain valve (22).

44.2 Assemble first seal (23) to drain valve (22). With second seal (23) interposed between banjo drain fitting and air producer sub-assembly (21) boss, insert and screw drain valve (22) into its seating in air producer sub-assembly.

44.3 Tighten drain valve using torque wrench set to 0.7m.daN (5.166lbf.ft).

Exhaust cone

45 The installation procedure for the exhaust cone (Item 39) is as follows:

NOTE

Ensure the turbine nozzle is correctly positioned as detailed in Para 43.

45.1 Using a depth gauge measure dimension A and B at four equidistant points on the backplate and liner assembly (27) and exhaust cone (39), calculate average for each as detailed below:

(1) Calculate the thickness of shimming (40) required as follows:
A – B = E (Fig 14 refers).

(2) E = clearance between exhaust cone (39) and turbine nozzle.
Calculate shimming required to obtain a value of E + 0.5 ± 0.05mm.
(0.0197 ± 0.00198in).

45.2 Select shimming from shims (40) as calculated above, and install shimming on the backplate and liner assembly.

45.3 Install exhaust cone (39) ensuring the anchoring slot is correctly engaged in the corresponding slot in the turbine nozzle.

45.4 Secure exhaust assembly (39) with four flanged studs (38). Tighten studs as follows:

(1) Using two 7mm flat spanners, lock a 4mm nut with a 4mm locknut on four flanged studs (38).

(2) Using a 7mm flat spanner, tighten four flanged studs (38). Remove four nuts and four locknuts on completion.

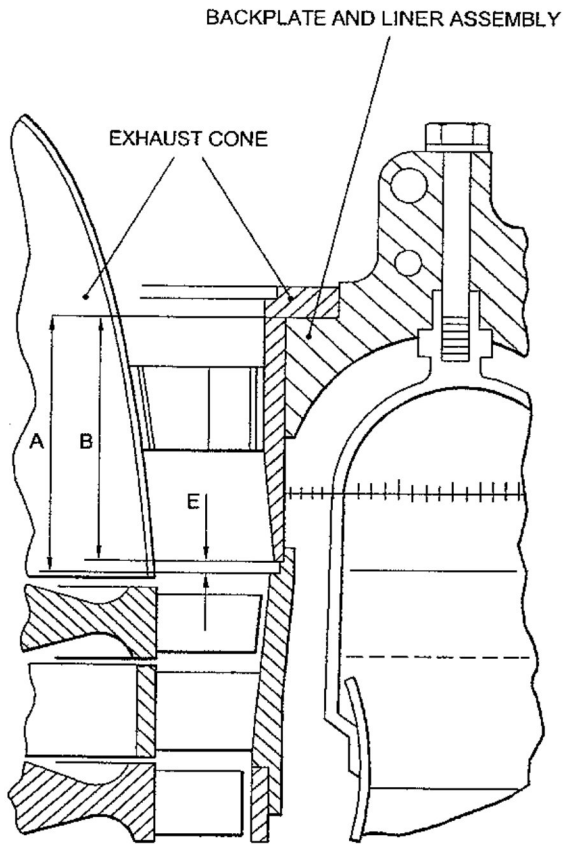


Fig 14 Exhaust cone gap adjustment

Exhaust duct (Fig 15)

46 The installation procedure for the exhaust duct (Item 35) is as follows:

46.1 Install exhaust duct (35) to exhaust cone (39) ensuring it is correctly positioned on the four flanged studs (38). (Refer to Fig 3).

46.2 Secure exhaust duct (35) using four lockwashers and four nuts, 14 screws and 14 flat washers. Tighten nuts and screws to 0.4m.daN.

NOTE

Use a suitable 7mm ring spanner to tighten screws and nuts which have limited access.

46.3 Using flat nosed pliers, lock four nuts by bending the tabs of lockwashers.

46.4 Lock screws with single locking wire.

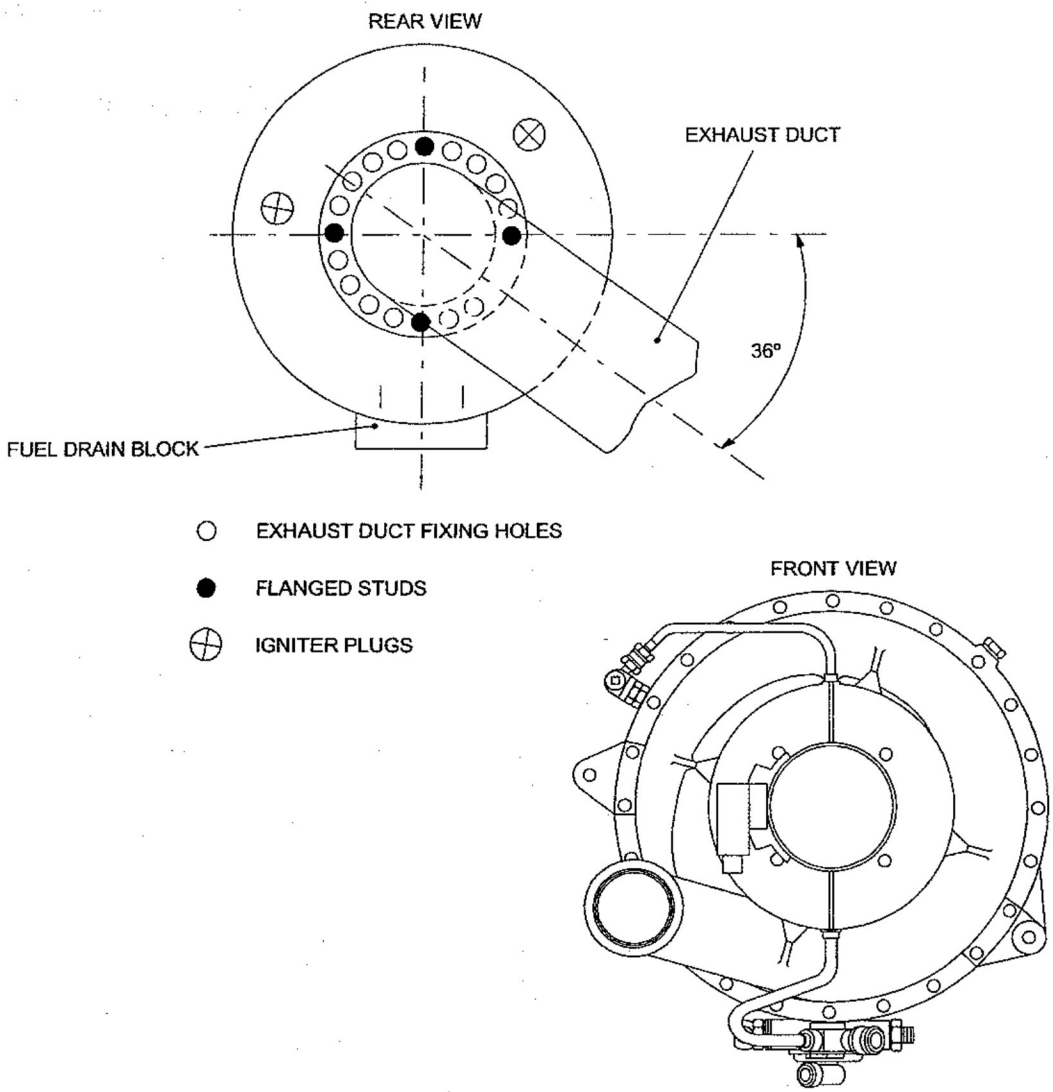


Fig 15 Exhaust duct installation

Exhaust blanket

47 The installation procedure for the exhaust blanket (Item 34) is as follows:

47.1 Position exhaust blanket over the exhaust duct.

47.2 Secure exhaust blanket in six places with locking wire.

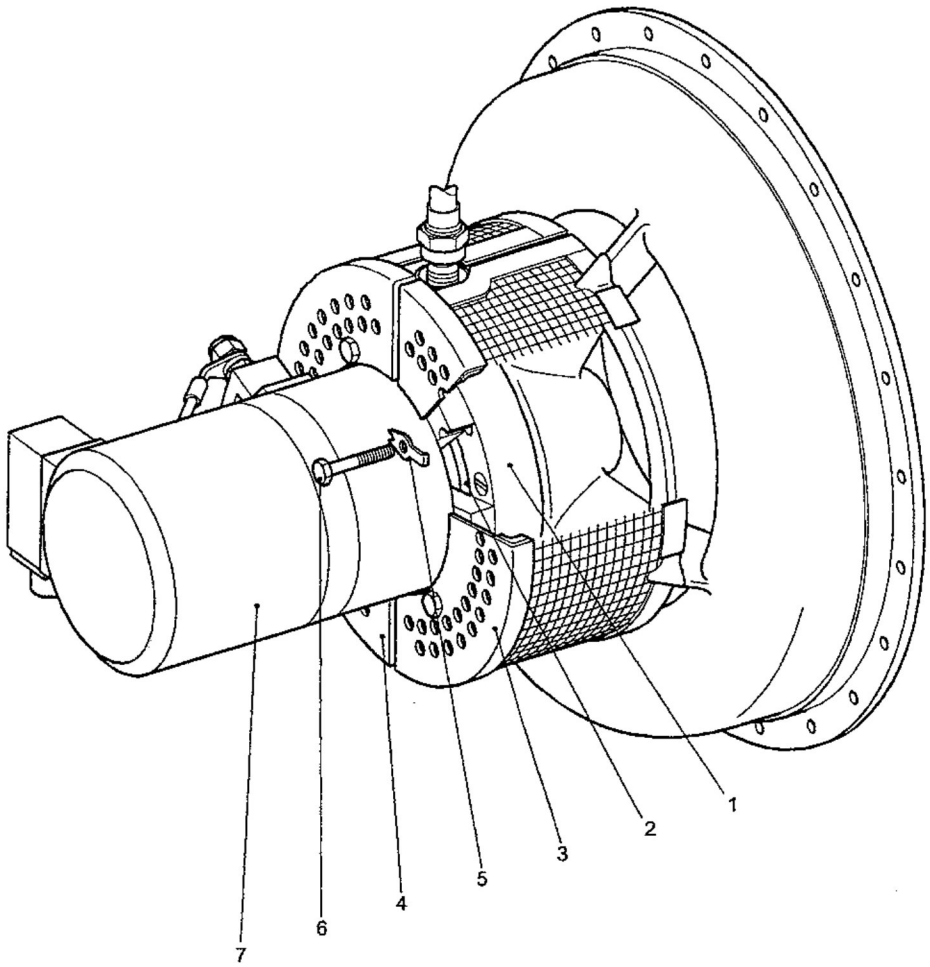
Starter motor

48 The installation procedure for the starter motor (Item 2) is as follows:

48.1 Position air producer with air intake facing upwards and remove blanks.

48.2 Fit new 'O' ring in groove of the gear carrier assembly.

48.3 Install starter motor (2) with terminals in the position shown on Fig 16.



1	Starter-motor mounting pad	5	Tab washers
2	O-ring seal	6	Capscrews
3	LH half guard	7	Starter-motor
4	RH half guard		

Fig 16 Starter motor and protection grille

48.4 Install protection grille.

48.5 Secure protection grille (1) and starter motor (2) with four screws (3) and four lock washers (4). Tighten screws (3) using torque wrench set at 0.7m.daN (5.166lbf.ft).

48.6 Using flat nose pliers, lock four screws (3) by bending the tabs of lock washers.

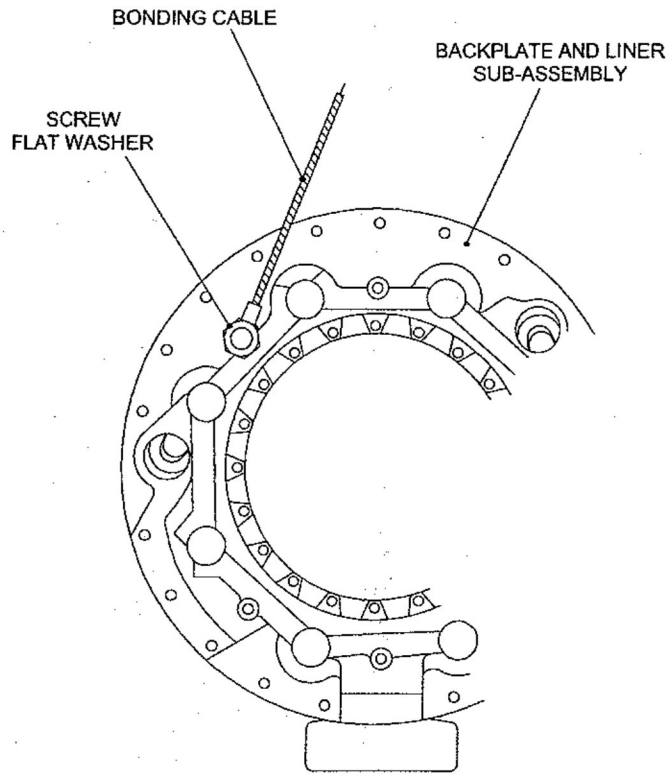


Fig 17 Bonding cable location