AP 107B-0526-1

(Formerly AP 4340, Vol.1,
Sect.9, Chap.3)

HUNTER

WATER EXTRACTOR
GODFREY TYPE WE-15 Mk.1B and Mk.3

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

FOR USE IN THE

ROYAL AIR FORCE

Prepared by the Procurement Executive, Ministry of Defence

WATER EXTRACTOR WE-15 Mk.1B & Mk.3

CONTENTS

TABLE

ILLUSTRATIONS

LEADING PARTICULARS

Ref. No.	27UA/55s (Mk. 1B) 27UA/ (Mk. 3)
Dimensions	
Length	13·700 in.
Diameter*	5·500 in.
Diameter of flanges	2·750 in.
Weight	3·7 lb.
Test pressure	20 lbf/in^2

*excluding drain boss

INTRODUCTION

1. Water extractors are installed in aircraft air conditioning systems to remove free moisture from the pressurising and ventilating air before it enters the aircraft cabin. Water Extractors Type WE-15 Mk.1B and Mk.3 are described in this Air Publication; the Mk.3 is treated externally with a special finish, the variants are otherwise identical.

DESCRIPTION

2. The Water Extractor Type WE-15 consists of a coalescer, a collector and a relief valve contained in two cylindrical shells: the coalescer shell and the collector shell. The two shells are flanged and bolted together; each has a centrally disposed port with a bevelled flange.

3. The cylindrical coalescer consists of layers of monel gauze and fibre-glass cloth between two layers of stainless steel gauze all permanently assembled to aluminium rings, one at each end. A diffuser cone assembly supports the coalescer and both are retained by the relief valve assembly when the shells are bolted together. A rubber joint ring, between the coalescer and the diffuser cone assembly, is compressed on assembly.

4. The tube bank assembly consists of a number of tubes in a cylindrical support casing. The tubes are disposed normal to the air flow and are retained by pinch sealing the ends. One end of the support casing is turned back to seat in the shoulder of the collector shell, the other is belled to accept the locating lugs of the valve body support.

5. The relief valve is enclosed in a conical valve housing, which is bolted to the valve body support; four holes in the housing communicate air pressure to the head of the valve. A rubber ring is bonded to the face of the valve which is located on a guide spindle secured to the valve seat.

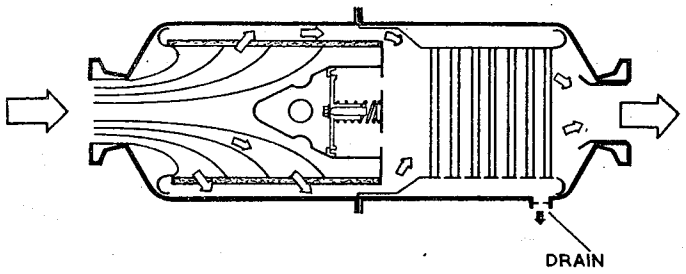

Fig. 1 Functional diagram - Mk.1A

OPERATION

6. Charge air enters the water extractor inlet and passes through the coalescer where free moisture coalesces into relatively large droplets which are carried by the air and deposited on the tubes in the collector. Water runs down the tubes through holes in the collector support casing then out through the drain adapter.

7. Should the coalescer become obstructed, the relief valve opens to ensure a continuous flow of air through the water extractor.

SERVICING

GENERAL

8. Refer to the relevant Air Publication for installation details and for the type of drain adapter to be fitted. Before returning an unserviceable water extractor, fit blanking covers to the inlet and outlet ports and a blanking plug (Pt. No. AGS 948/C) in the drain connection.

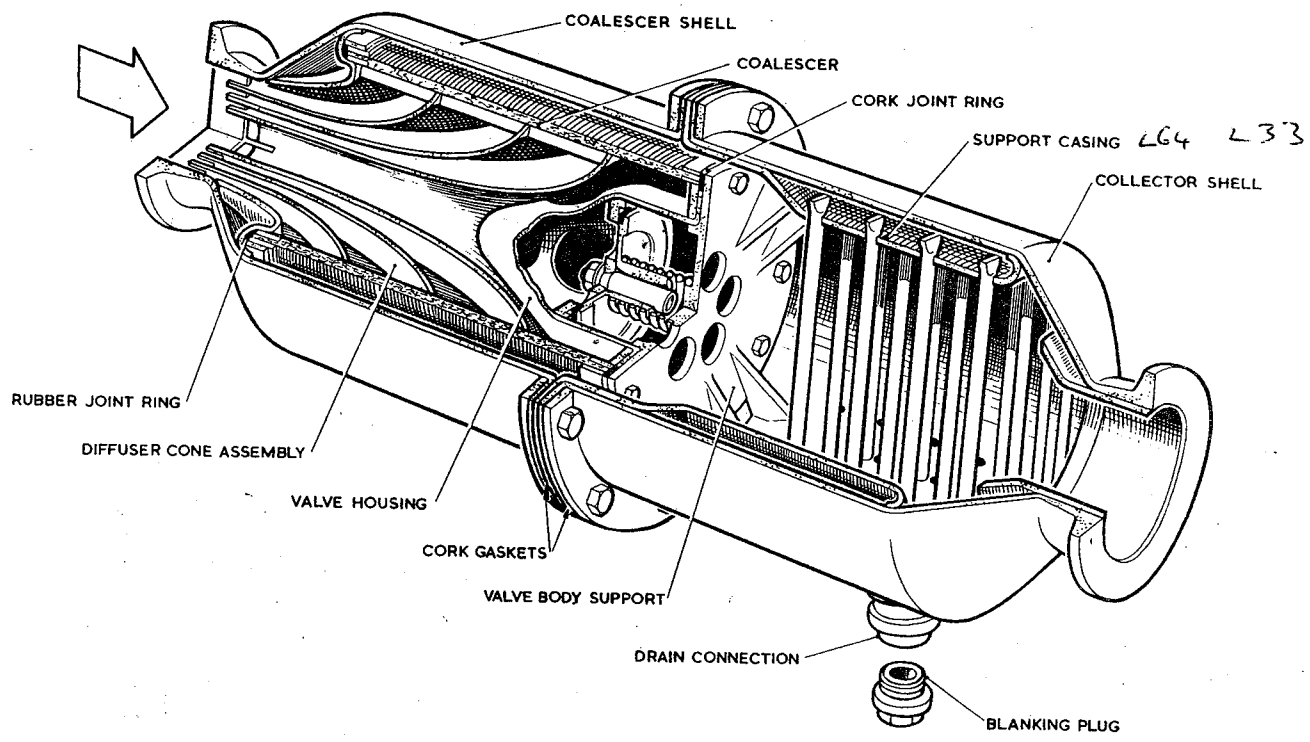

Fig. 2 Sectional view

DISMANTLING

9. (1) Remove the bolts, nuts and washers securing the two shells; carefully separate the two shells.

(2) Remove the coalescer, the diffuser cone assembly and the rubber joint rings, the relief valve assembly and the collector from the collector shell.

(3) Discard the coalescer, gaskets, rubber joint ring and cork joint rings.

EXAMINATION

10. (1) Examine the relief valve generally for condition; check the valve for freedom of movement. Should the serviceability be in doubt, a new relief valve assembly, pre-set by the manufacturers must be fitted.

(2) Clean all other parts, removing all traces of jointing compound.

(3) Examine the diffuser cones for damage and both shells for cracks or damaged seams.

(4) Examine the collector tubes for damage and ensure they have a free vertical movement of approximately 0.1 in. in the support casing.

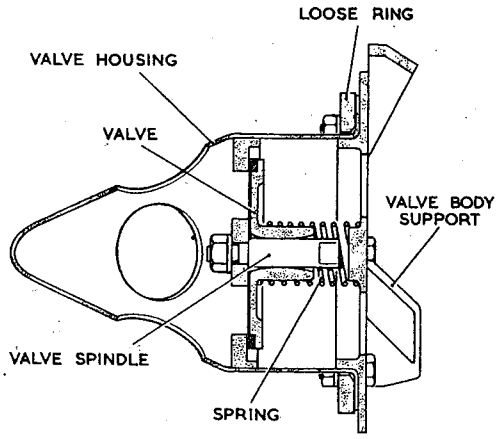

Fig. 3 Relief valve

ASSEMBLING

11. (1) Insert the diffuser cone assembly into the coalescer shell, seating it on the shoulder in the shell. Place a rubber joint ring (Pt. No. 23775) in the recess of the diffuser cone assembly. Position the new coalescer on the flanged locating ring of the diffuser cone assembly, seating it on the rubber joint ring.

343/9429676 D.T.D. 900/4901 WELLSEAL NON FLAMMABLE JOINTING COMPOUND

(2) Apply sealing compound (Ref. No. ~~34B/1104~~) to both sides of a gasket (Pt. No. 23772) and place it over the support casing flange. Insert the collector into the collector shell, ensuring that the tubes are arranged vertically in relation to the drain connection, that the drain holes in the support casing are at the bottom and that the holes in the support casing flange align with the bolt holes in the collector shell flange and the gasket.

(3) Hold the collector shell upright and place the valve assembly in the mouth of the collector shell, seating the lugs of the valve body support in the belled portion of the support casing.

(4) Place a laminated cork joint ring (0·093 in. thick, Pt. No. 23774/C) on the valve body support. Assemble both shells but do not tighten the securing nuts and bolts, and check the clearance between the flanges; the clearance should be between 0·081 in. and 0·051 in. If the clearance is outside these limits fit a combination of joint rings (Pt. No. 23774/A to C) in place of the existing joint ring (Pt. No. 23774/C), then re-check the clearance.

(5) Apply sealing compound to both sides of the gasket (Pt. No. 23772) and place it on the coalescer flange. Secure the two shells with 2BA bolts, nuts, spring washers and plain washers.

TESTING

12. (1) Fit blanking plates to the ports; the plate fitted to the inlet must have an adapter to connect to a source of air pressure.

(2) Fit a plug (Pt. No. AGS 948/C) with a joint washer (Pt. No. AGS 568/C) to the drain connection.

(3) Immerse the water extractor in clean water in a test tank and apply air pressure, gradually increasing it to 20 lbf/in^2. Examine the joint between the shells for leaks. Release the air pressure gradually.

(4) Repeat the test three times.

(5) Remove the water extractor from the test tank and dry it thoroughly.

EXAMINATION BEFORE INSTALLATION

13. (1) Remove the covers from the ports and the plug from the drain connection.

(2) Ensure that the bore of the drain adapter (aircraft part) is clean then fit it in the drain connection; wirelock the adapter.

(3) Clean the port flanges and examine them for damage.

(4) Fit the lagging gaiter (if required).

INSTALLATION

14. When installing the unit, ensure that the arrow on the coalescer shell points downstream and that the drain adapter is at the bottom.

TABLE 1 - SERVICING SPARES

Ref. No.	Part No.	Description	No. off
28W 9454066	AGS 568/C	Washer (transport only)	1
	AGS 948/C	Plug (transport only)	1
	A27/CP	Nut, 2BA, shell securing	13
	SP47/C	Washer, spring, shell securing	13
	V8052	Washer, plain, shell securing	13
	23790	Bolt, shell securing	13
27UA 632	23772	Gasket, cork 27UA 4611980	2
" 634-636	23774/A-C	Ring, joint, cork 27UA 6458836 4611982A/R	
" 633	23775	Ring, joint, rubber 27UA 4611981	1
" 561	103138	Coalescer 27UA 6452777	1
27UA 566	103187	Valve, relief, assembly 27UA 4611974	1
27UA 715	23762-8	DIFFUSER CONE ASSY.	1