Chapter 9

PUMPS, DE-ICING, DUNLOP, TYPE AH8020 AND AH8029

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Pump, de-icing, Dunlop, Type AH8020	Stores Ref. 5UE/2
Pump, de-icing, Dunlop, Type AH8029	Stores Ref. 5UE/218
Motor, Delco-Remy-Hyatt, Type 11335 (Dunlop, Type AH016083)	Stores Ref. 5UE/411
Pump delivery :	
AH8020 twin delivery at 24-volt d.c.	30 pints per hour
AH8029 single delivery at 24-volt d.c.	15 pints per hour
Nominal voltage	24-volt d.c.
Torque at normal voltage	1·62 oz. in. at 3,600 r.p.m.
Current consumption	0·7 amp.
Continuity resistance :	
Armature winding	2·4 to 2·9 ohms
Field winding	4 to 5 ohms

Introduction

1. The de-icing pump units, Dunlop, Type AH8020 and AH8029 are similar in design and appearance and are fitted with identical electric motors. The AH8020 pump unit has a twin delivery outlet for the distribution of de-icing fluid for application in aircraft.

2. The AH8029 pump unit is identical in design with the AH8020 pump unit, except that the former is fitted for single delivery outlet only, its application in the aircraft serving the same purpose as the twin delivery outlet pump unit.

3. In instances where a single line delivery

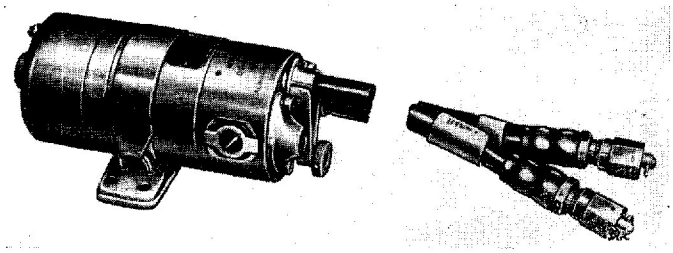

Fig. 1. De-icing pump and motor, Dunlop, Type AH8029

of de-icing fluid is required, one or the other of the delivery outlet hoses must be removed, and the outlet from the pump unit sealed with a sealing ring and a blanking plug.

4. The actual delivery of either pump can be varied by an adjustable series resistance in the electrical supply to the motor ; this resistance, (which is preset by Dunlops) will vary the speed of the machine, and therefore, the speed and rate of delivery of the pump unit, within the range of 7 pints to 16 pints per hour, at a back pressure of 12 lb. per sq. in.

DESCRIPTION

General

5. Each pump unit comprises an electric motor to which the pump assembly is secured. The complete unit is anchored to a pressed steel cradle, or base, by a strap. The ends of the strap are secured to ' U ' bolts with threaded ends. These threaded ends pass through the base and are anchored with nuts which can be tightened, so as to secure the motor firmly to the base.

Pump

6. The pump assembly comprises a cylindrical light alloy body, within which the two-cylinder pump mechanism is accommodated. One end of the pump body is machined to seat over a spigot on the drive-end of the motor. The other end of the pump body is machined to receive the inlet and delivery hose assemblies. Each delivery hose assembly is secured by two bolts which pass through the pump body and screw into the end of the motor, securing the complete pump to the motor. The inlet hose is retained by a forked lever and a knurled screw. This allows easy removal of the inlet connection when it is necessary to change the filter housed in the inlet port of the body.

7. The pump is driven by an eccentric pinned on to the drive shaft of the motor. The two pistons rest directly on the eccentric and will oscillate in their cylinders when the motor shaft rotates the eccentric. A complete description, and servicing instructions for the pump is contained in A.P.1803S, Vol. 1, Sect. 2, Chap. 1.

Motor

8. The two pole, series wound, d.c. motor is designed for 24-volt operation and is fully screened and flameproof. A part section of the motor is shown (*fig.* 2).

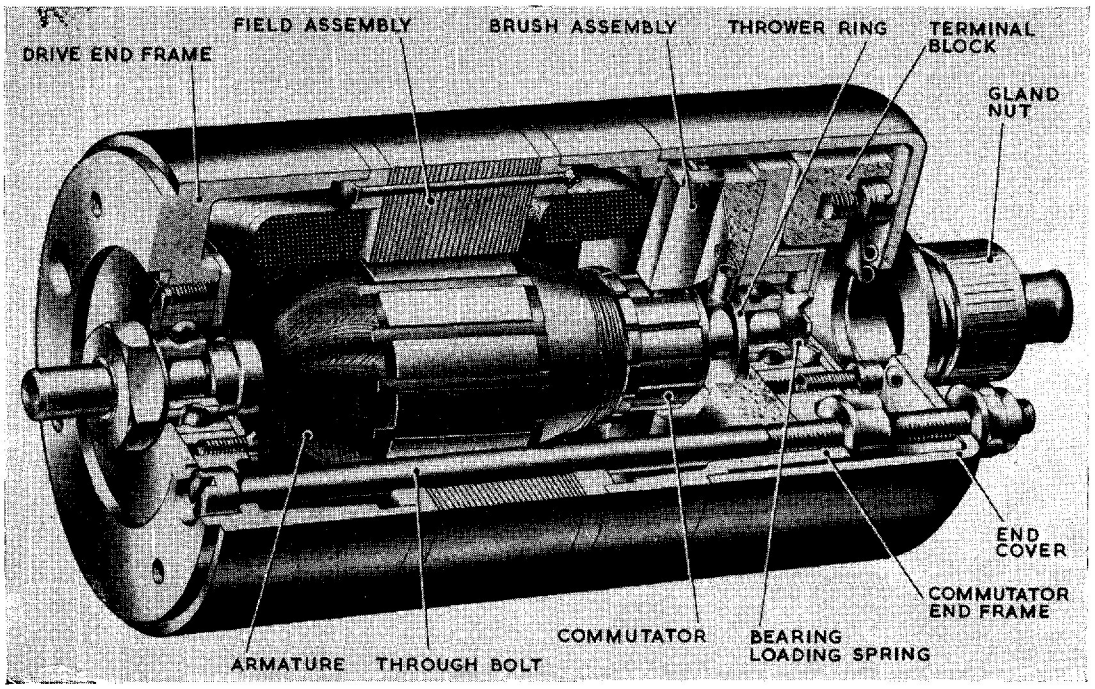

Fig. 2. Electric motor, part section

9. The laminated field assembly is riveted between two metal rings on to which the drive-end and commutator-end frames are spigoted. The complete assembly is secured by two through bolts which pass through the drive-end frame and field assembly and screw into tapped holes in the commutator-end frame where they are locked by two nuts.

10. The brushgear is secured to the inside face of the frame at the commutator-end, and comprises two diametrically opposite brush holders secured to an insulated disc. The brushes are held against the commutator by springs, the top of each spring being located in the top of the brush holder by a split pin. The leads from the brush boxes are connected to terminals on an insulated terminal block secured to the outside face of the commutator-end frame.

11. The armature is supported and rotates between two ball bearings, one in each end frame ; the driving shaft being an extension of the armature shaft projecting through the drive-end frame. A spring behind the commutator-end bearing takes up bearing end play. Both bearings are packed with grease, and an oil thrower on the inside face of the bearing at the commutator-end, prevents grease leaking on to the commutator itself.

12. The commutator-end cover is secured by nuts on extensions of the through bolts, and is fitted with a cable gland through which the electrical supply passes to the terminal block. The cable gland and the end cover have to be removed when connecting the motor, or when servicing the brushes and commutator. There are three terminal screws on the terminal block. The supply cable is connected to the two outside screws (*fig.* 3).

INSTALLATION

13. The unit is held by four screws through holes in the base. Once the unit is firmly secured, the commutator-end cover should be removed and the gland and gland nut removed from the end cover. Pass the cable through the gland and gland nut and end cover, connecting to the appropriate terminals on the terminal block. Replace the end cover, gland and gland nut.

14. Remove the blanking plugs from the flexible hoses and connect them to the appropriate unions. Further details of the pump and de-icing installations are contained in A.P.1803S, Vol. 1, Sect. 2, Chap. 1.

SERVICING

15. Comprehensive servicing instructions on d.c. electric motors are contained in A.P.4343, Vol. 1, Sect. 18, Chap. 1. The App. 1 to that chapter gives a detailed fault finding chart.

Insulation resistance test

16. Before installation in the aircraft the insulation resistance between live parts and the frame shall be measured, using a 250-volt insulation resistance tester and must not be less than 2 megohms.

17. After installation in the aircraft the measured insulation resistance must not be less than 50,000 ohms.

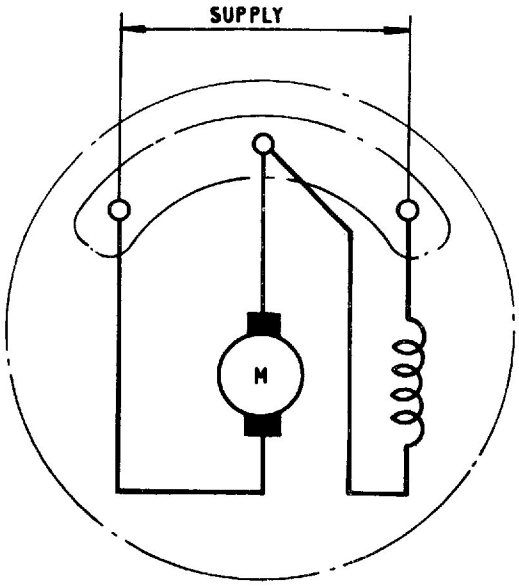

Fig. 3. Circuit diagram

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