Chapter 12

ROTARY INVERTER, TYPE RC1

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Rotary inverter, Type RC1 (12-volt) ...	... Stores Ref. 5UB/110
Input	12-volt d.c., 75 watts
Output	... 230-volt a.c., 50 c/s single-phase
D.C. brushes, $\frac{3}{8}$ in. wide	Stores Ref. 5UB/403
A.C. brushes, $\frac{1}{4}$ in. wide	Stores Ref. 5UB/404
Weight	10·5 lb.
Rotary inverter, Type RC1 (24-volt) ...	... Stores Ref. 5UB/111
Input	24-volt, d.c., 75 watts
Output	230-volt, a.c., 50 c/s, single-phase
D.C. brushes, $\frac{1}{4}$ in. wide	... Stores Ref. 5UB/416
A.C. brushes, $\frac{1}{4}$ in. wide	... Stores Ref. 5UB/404
Weight	10·5 lb.

Introduction

1. The rotary inverter, Type RC1, is designed to supply 230-volt, 50 c/s, single-phase alternating current from a 12- or 24-volt d.c. input, and is capable of continuous operation at all altitudes. Only one armature is employed, the input and output windings being carried in common armature slots. At one end of the machine is a commutator and at the opposite end, mounted on the same shaft, are a pair of slip-rings.

DESCRIPTION

2. The inverter is of orthodox, two-pole construction and is shunt-wound. Each of the laminated pole-pieces is secured to the yoke by two hexagonal-headed screws. The ends of the input lead to the field coils are fitted with attachment lugs and are brought out to terminals on the brush holder caps at the commutator end. The output terminals are located on the two brush caps at the slip ring end of the machine.

3. The combined d.c. motor and a.c. generator are housed in a common yoke and, as may be seen from fig. 2, the respective a.c. rotor and slip rings and d.c. armature and commutator are assembled on the same shaft. At the input or commutator end of the converter the windings are secured by binding wires at their point of juncture with the commutator riser, whilst at the output end the windings are bound immediately behind the slip rings. In addition to this the windings are wrapped at each end of the armature by two tin bands, extending from the armature stampings to the inside of the end plate. The bands at the commutator end have six vanes attached so that a cooling flow of air is provided as the armature rotates.

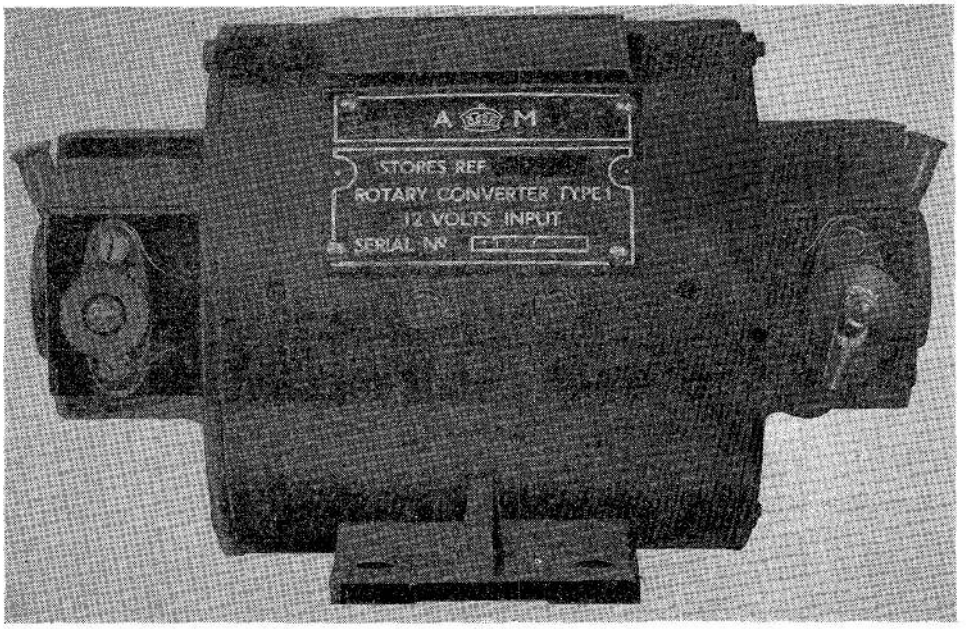

Fig. 1. Rotary inverter, Type RC1

4. The cast end plates are secured to the yoke by two 5 $\frac{13}{16}$ in. long bracket rods with 2 B.A. hexagon nuts and spring washers. As shown in fig. 2 the end plates cover the slip rings and commutator and are bossed to house the bearing races. Ball bearings are employed at both ends of the machine, each bearing being held in position by a metal washer and two countersunk 4 B.A. screws. Before despatch from the manufacturers the bearings are packed with grease and the boss is drilled obliquely to provide a greaseway. A Rotherham R.5 lubricator is fitted.

5. Four Bakelite brush holders with brass inserts are secured to the end frame by two screws. In these fit the carbon brushes to which are attached pigtail connections and tension springs.

SERVICING

6. For general instructions on the servicing of these machines the text of A.P.4343, Vol. 1, Sect. 8, Chap. 2 is substantially applicable.

7. The tension on the brushes is set at the manufacturers and is calculated to remain constant throughout the life of the brush. Do not allow any of the brushes to wear down to less than $\frac{3}{8}$ in. When replacing brushes after a routine inspection, they should be returned to the same holder from which they were extracted and also inserted the correct way round. A simple method of assuring that this is carried out is to identify each brush and brush holder with a distinctive marking. If the brushes are moved from one holder to another bad bedding and consequent sparking will result.

8. To renew a brush holder disconnect the lead on the terminal, unscrew the brush holder cap and take out the brush and tension spring. The two 4 B.A. fixing screws should be removed, the faulty brush holder replaced by a new one, and the components reassembled.

9. Over-lubrication should be avoided and only two or three turns of the lubricator need be given at the appropriate inspection period. The grease to be used with this machine is XG–275 (Stores Ref. 34B/9100512).

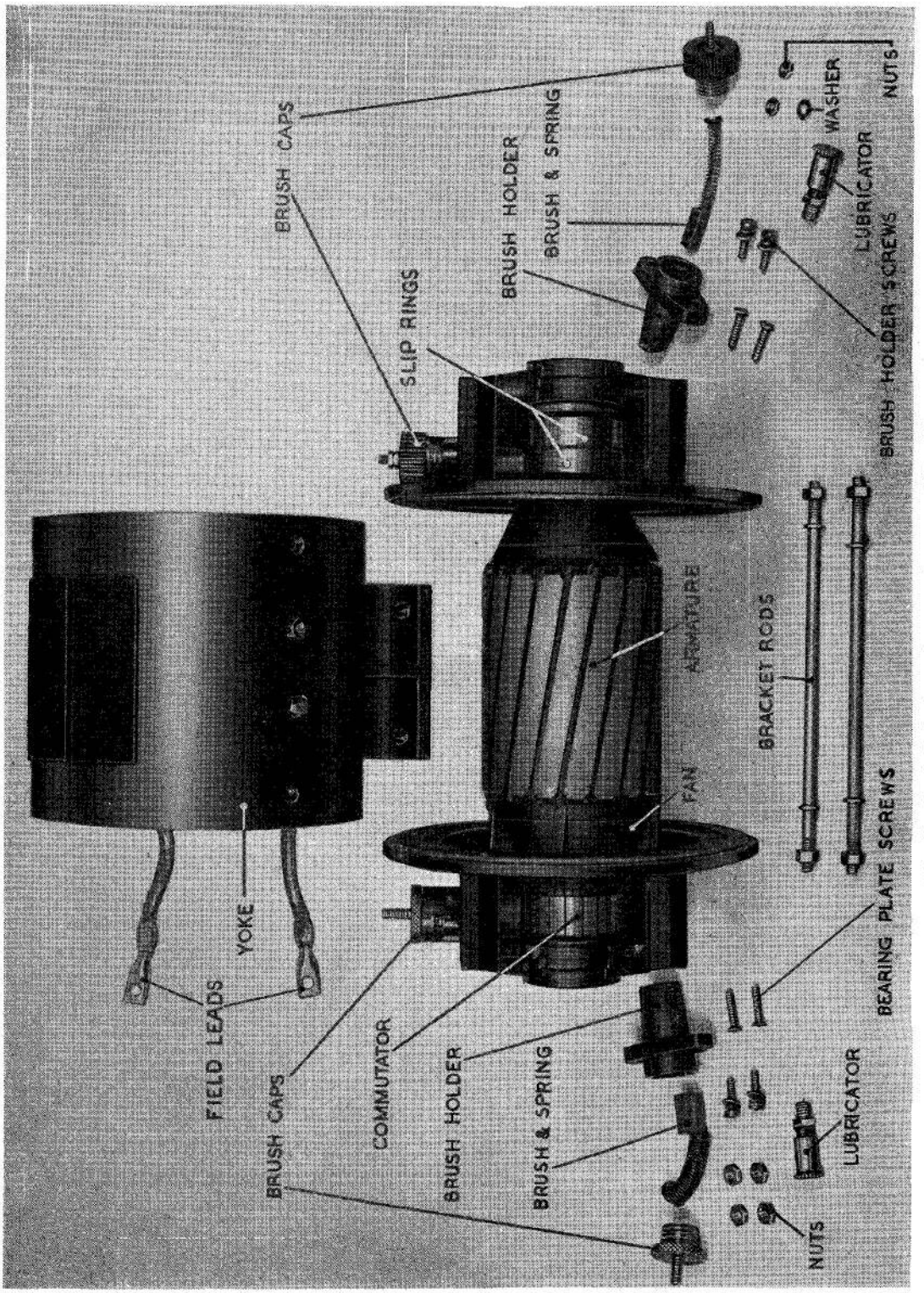

Fig. 2. Exploded view of rotary inverter (12-volt)