Chapter 76

ACTUATOR, ROTAX, TYPE A1902

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Actuator, Type A1902	*Ref. No. 5W/1376*
Operating voltage	*28V d.c.*
Current rating	*2·8 amp.*
Normal load	*5 lb.*
Maximum working load	*50 lb.*
Maximum static load	*375 lb.*
Stall load at normal voltage	*1,000 lb.*
Rating	*10 cycles at 5 lb.*
Normal stroke	*0·9 in. in 9 sec.*
Maximum time of stroke	*15 sec.*
Minimum time of stroke	*8 sec.*
Brush grade	*Morganite DM4A*
Brush spring pressure	*2·5 to 3·5 oz.*
Minimum permissible brush length	*0·2 in.*
Overall dimensions—	
Length (extended) between shackle centres	*15·750 in.*
Length (retracted) between shackle centres	*14·850 in.*
Width	*1·750 in.*
Height	*3·484 in.*
Weight	*5 lb.*

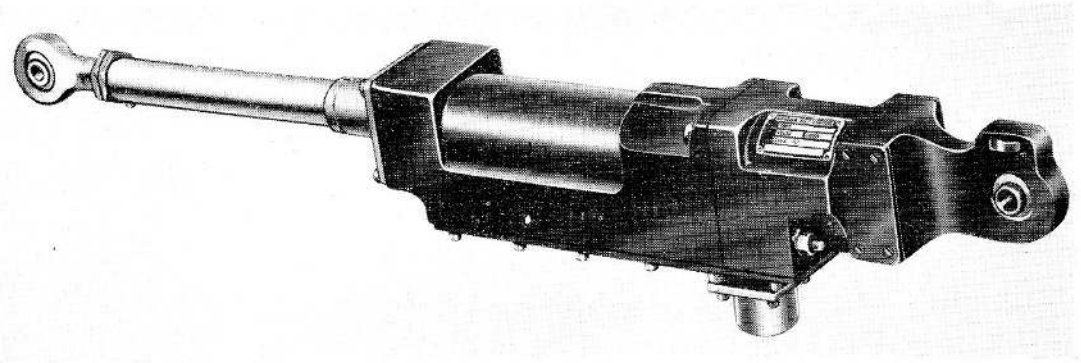

Fig. 1. Type A1902 actuator

Introduction

1. The Type A1902 linear actuator is a 28V d.c. machine designed for the operation of aircraft ancillary equipment.

DESCRIPTION

2. The unit comprises a reversible motor driving a screwshaft through an epicyclic gearbox. Snap action limit switches and a mid-position indicator switch are incorporated. The body assembly and the motor housing, which are bolted together, form the casing of the actuator.

Motor

3. The motor is a two pole brush, split series wound machine with laminated yoke and poleshoes. The armature is supported at the commutator end in a ball bearing. At the driving end the armature shaft is located in the driving plate which is in turn located in a ball bearing. Relative rotation between the armature and driving plate occurs only during clutch slip. Reversal of rotation is effective by changing the field connections.

Brake and clutch

4. Between the motor and its gearing, a disc type electro-magnetic brake and a single phosphor-bronze clutch plate are fitted. The brake coil, wound on a solid core, is connected in series with the armature. When the motor is operating, the brake coil is energized and attracts the brake disc against the face of the driving plate which is revolving at armature speed. The brake disc is faced with "Langite" and is prevented from rotating by three dowel pins locating in the brake solenoid shell. Interposed between the armature and the driving plate is the single plate, spring loaded phosphor-bronze clutch which dissipates the stored energy in the armature when the brake is applied.

Gearbox

5. The gearbox is of four stage epicyclic construction, having a ratio of 850 to 1, the final stage being integral with the base of the screwshaft.

Ram and screwshaft

6. The actuator is of in-line construction, the ram being driven by a high efficiency ball thread, having two tracks recirculating steel balls.

Limit switches

7. The stroke is controlled by two single pole snap action limit switches which are mounted on the ram housing. Slotted screw holes provide for adjustment. The mid-position indicator switch is located between the limit switches.

INSTALLATION

8. The actuator may be installed in any attitude: fixings may be made at each end of the machine as follows: —

(1) Fixed end, by a ballrace.

(2) Moving end, by a self aligning bush.

Electrical connections

9. Electrical connections to the unit are via a 5 pole plug (Ref. No. 5X/6016).

SERVICING

10. Give the unit a thorough visual inspection and ensure that it is functioning correctly and is free from damage.

Brushgear

11. Remove the brushgear covers and examine the brushes to ensure that they move freely in their boxes and that excessive wear has not taken place. For minimum permissible brush length and correct brush spring pressure see "Leading Particulars". Remove any carbon dust that may be present, with clean dry air from a pipe line or with bellows.

Insulation resistance test

12. Measure the insulation resistance between live parts and frame, using a 250V insulation resistance tester. A reading of at least 50,000 ohms should be obtained.

Note . . .

The value of insulation resistance given in para. 12 applies to the actuator being tested under normal workshop conditions. Due allowance should be made for the climatic conditions of the locality and those of the aircraft servicing area or dispersal point where the tests are being applied. In particularly damp climates, the readings obtained may be low enough to give apparently sufficient reason for rejection and, in these instances, discretion should be exercised.

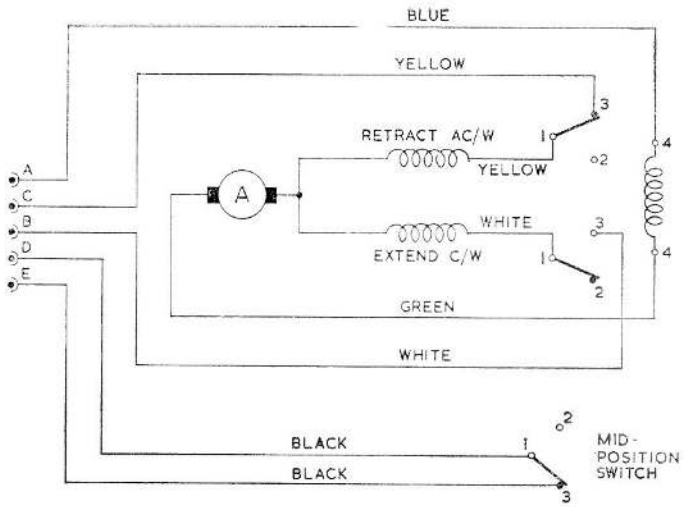

Fig. 2. Diagram of internal connections

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