Appendix 8

WESTERN, OFF-SET, TYPE EOJ 150 SERIES

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Voltage range	25 to 29 volts d.c.
Nominal working load	150 lb.
Maximum working load	255 lb.
Maximum static load	450 lb.
Weight	2 lb. 12 oz.

Introduction

1. Western linear actuators of the EOJ 150 series are used to operate the Harley landing lamp and for oil cooler shutter control. The different tasks necessitate some variations of actuator mounting, length of stroke and internal wiring. Details of variants in this series are given in A.P.4343D, Vol. 1, Sect. 14.

DESCRIPTION

General

2. The EOJ 150 series of actuators have the motor and reduction gearing off-set from the piston assembly. The overall length is therefore less than actuators having the motor and piston assemblies in line.

3. Referring to fig. 1, the components are mounted on an end plate, to which is bolted a trunnion which forms the fixed mounting. Details of this trunnion differ as between marks of actuator. The piston is in line with the trunnion. The gearbox, housing the reduction gearing and clutch unit, is mounted on the end plate and lies parallel to the piston assembly. The motor and brake mechanism is in a cylindrical case attached to the end cap having three lugs enabling the motor to be secured to the gearbox assembly. The whole assembly is enclosed in a rectangular box cover through the end of which the sealing gland of the piston protrudes. The elec-

trical plug connector is mounted on this end and the cover is secured by two, wire-locked 6 B.A. nuts.

Motor

4. The open-ventilated, two-pole, series motor is rated at nominal power, at 15° C., for 1 minute when operating at 24V d.c. Only one pole winding is energized at any one time dependent upon the direction of rotation selected. The armature rotates at approximately 10,000 r.p.m. supported in ball bearings. The armature shaft has a pinion drive to the gearing and is extended at the commutator end to pass through the brake assembly and carries the rotating brake disc. The brush gear assembly can be rocked radially to equalise speeds in each direction of rotation. Brush pressure is adjustable by slotted hexagon bolts which engage the brush springs.

Brake

5. The electro-magnetic brake is housed in the motor assembly and operates against a spring-loaded, friction-lined brake shoe. The brake coil is connected in series with the motor. When power is switched off, the motor comes to rest within ten revolutions.

Reduction gear and clutch

6. The drive from the motor is transmitted to a driving spur wheel through a 3-stage epicyclic reduction gear train ratio of 118:1. A slipping clutch is incorporated in the gear train to prevent the motor stalling when subjected to an excessive load. The driving spur wheel is internally tapered to accommodate a similarly tapered phosphor bronze clutch plate which is spring loaded. The clutch pressure adjustment is set to maximum working load of the actuator during manufacture. In certain marks of actuators in this series the clutch is rendered inoperative by being set up solid. The driving spur wheel meshes in a 1:1 ratio with the final spur wheel located on the piston assembly.

Piston assembly

7. The piston assembly consists of a piston screw driven by the final spur wheel and is supported in ball bearings. The piston is hollow and threaded to accept the piston screw at one end. A screwed plug is pinned to the piston at the load end. To this plug is fitted the end eye as necessary for a particular application. This assembly is contained in the piston housing which is slotted to permit operation of the limit switches and provides a sealing gland around the piston.

Limit switches

8. The limit switches are of the snap action type and have double-pole change-over contacts. These are connected as single-pole switches in those applications where remote indication of operation is not required and involves varying internal electrical connections. The circuit diagrams for each mark in this series will be found in the appropriate chapter of A.P.4343D, Vol. 1, Sect. 14.

SERVICING

General

9. The actuator is adequately lubricated during manufacture so that lubrication in service is normally unnecessary. It should be inspected for security of electrical connections and indications of mechanical damage.

10. The cover can be removed by first removing the circular nuts and washer holding the connection plug and then removing the two 6 B.A. nuts located between the plug and the piston gland. The brush gear will then be accessible. The limit switches are set during manufacture and must not be removed or the setting altered in any way.

Brushes

11. Inspect the brush gear and check for freedom of movement in the brush boxes. The minimum brush length is 0·15 in. and if it is likely that this minimum length will be reached before the next servicing inspection, they should be renewed.

12. New brushes should be bedded down by running the motor on no load until 80 per cent of the width and the whole of the circum-

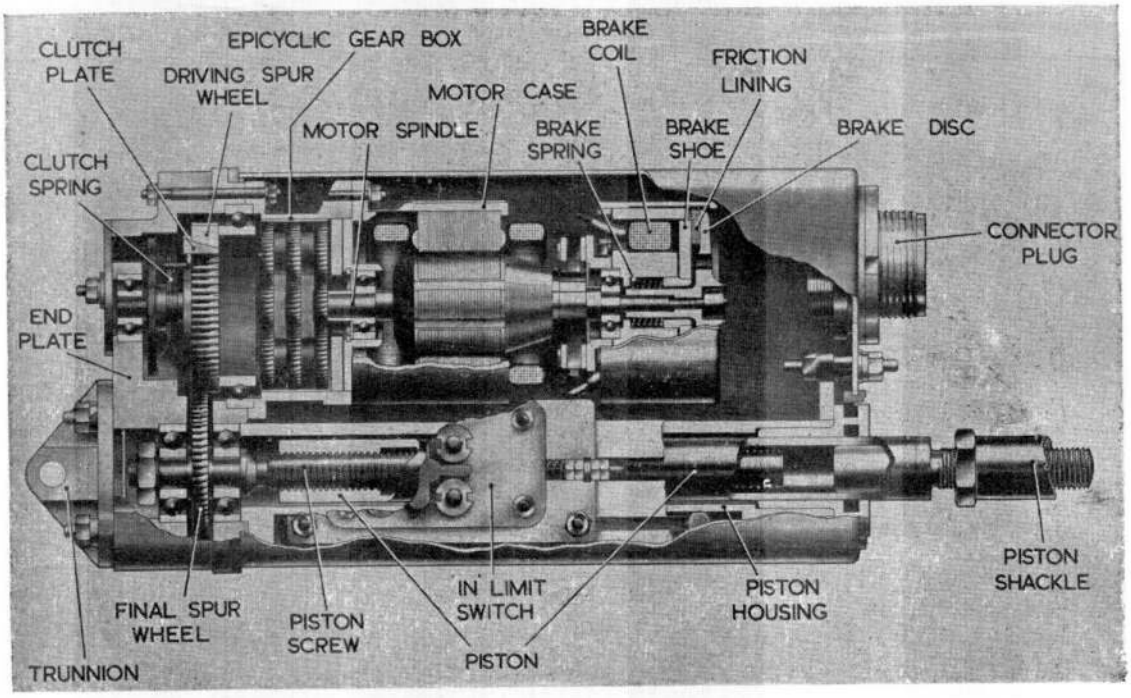

Fig. 1. Sectional view of typical actuator

ferential thickness is bedding. To do this the motor should be removed by unscrewing the three nuts which secure the spigoted flange of the motor to the gearbox housing. To avoid excessive no-load speed the bedding down run must be restricted to 18 volts. The brush pressure should be between 1·3 and 1·7 oz. After bedding brushes check for freedom of movement in the brush boxes and blow out all carbon dust.

Resistance measurements

13. Insulation resistance can be checked, using a 250-volt insulation tester, by testing between each pin of the connection plug and the body of the actuator. Continuity testing and functional checks are detailed in A.P.4343D, Vol. 1, Sect. 14 together with the diagram of electrical circuits applicable to the particular mark of actuator.

53346 566502 7246 12/55 3500 CWSLtd1577 Gp539-2