Appendix 10

PLESSEY, CUB PUMA SERIES

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LIST OF ILLUSTRATIONS

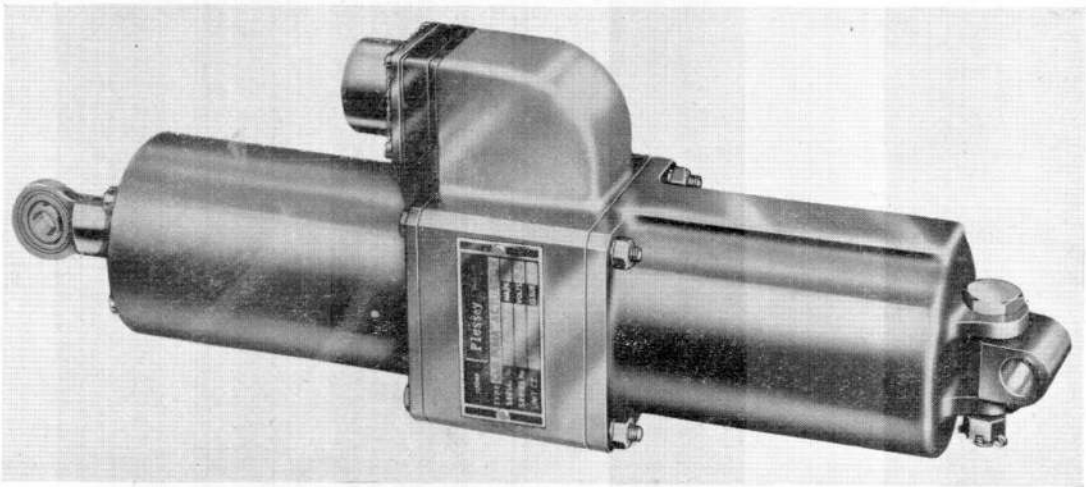

Fig. 1. Typical Cub Puma actuator

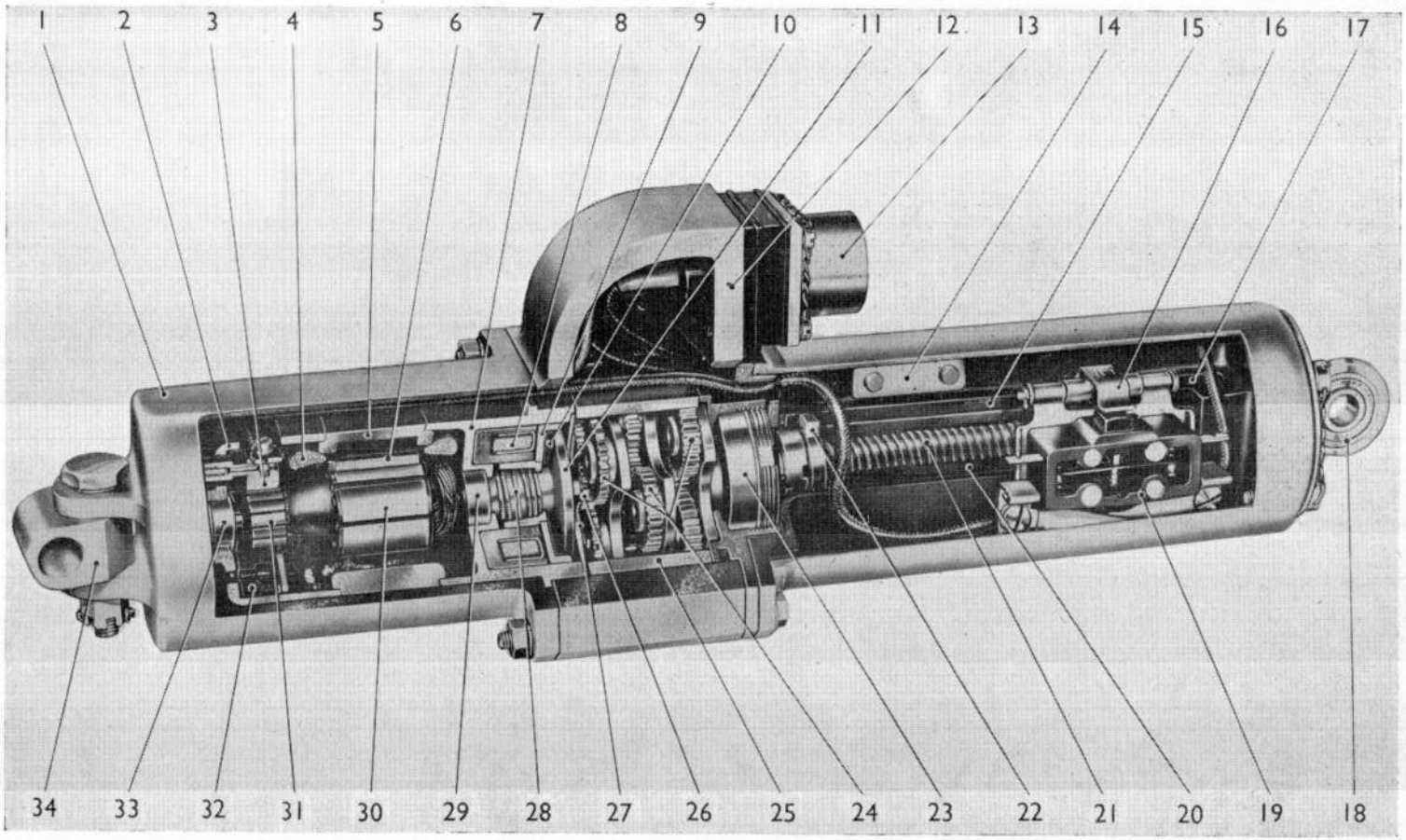

Fig. 2. Sectional view of actuator

KEY TO FIG. 2
SECTIONAL VIEW OF ACTUATOR

1 MOTOR HOUSING
2 COMMUTATOR AND PLATE
3 BRUSH ROCKER ASSEMBLY
4 FIELD COIL WINDINGS
5 YOKE
6 POLE-PIECE
7 BRAKE HOUSING
8 BRAKE COIL
9 BRAKE SHOE
10 FRICTION DISC
11 FRICTION PLATE
12 GEARBOX HOUSING
13 PLUG ASSEMBLY
14 GUIDE PLATE ASSEMBLY
15 PLUNGER HOUSING
16 LIMIT SWITCH TRIGGER
17 TORQUE EAR GUIDE SLOT
18 PLUNGER END FITTING
19 LIMIT SWITCH ASSEMBLY ("OUT")
20 PLUNGER
21 LEAD SCREW
22 PLUNGER TORQUE EARS
23 LEAD SCREW BEARING
24 THREE-STAGE EPICYCLIC GEAR TRAIN
25 ANNULUS
26 MOTOR DRIVE PINION
27 GREASE GUARD
28 BRAKE SPRING
29 MOTOR DRIVE BEARING
30 WOUND ARMATURE
31 COMMUTATOR
32 INSULATING SLEEVE
33 COMMUTATOR END BEARING
34 UNIVERSAL END FITTING

Introduction

1. Plessey linear actuators of the Cub Puma series follow the general design described in this Appendix; the machine illustrated, the CZ64250, is typical of the series, and specific details of individual actuators will be found in A.P.4343D, Vol. 1, Sect. 14. They vary in such details as the working load, the type of end fittings and the length and time of plunger travel.

2. The actuators of the Cub Puma series are designed to provide remotely controlled linear motion against either compressive or tensile loads. Motive power is provided by a small reversible fractional horse power motor, the drive shaft of which engages a train of gears. Snap action limit switches are fitted; these automatically switch off the motor supply when the actuator reaches the end of its travel.

DESCRIPTION

Motor

3. The motor (*fig.* 2) is a reversible split-field series type with an integral electro-magnetic brake. The motor is located by a spigot in the gear housing; the motor pinion is part of an assembly and is pin-driven by the armature shaft. The armature is dynamically balanced to eliminate vibration.

Gearbox

4. The gearbox assembly (*fig.* 2) comprises the main housing (enclosing the toothed annulus) with the three-stage epicyclic gear train. The lead screw is extended into the gearbox, where it is supported in a bearing. One stage of the gearing is supported on a carrier integral with the lead screw extension; the other two gear stage carriers, for support and bearing purposes, are freely located on the lead screw extension, where they are retained by a circlip.

5. Each of the planet gears has two small holes for lubrication of the gear support pins, and from the motor end each gear stage has increased tooth face width. The annulus for the epicyclic gears is keyed and positioned in the gearbox housing.

Plunger

6. The plunger assembly comprises a chromium finished tube and eye end, screwed and pinned together. At the gearbox end is fitted the detachable torque reaction and switch operating key (plunger ears) with locking washer and ring nut.

Plunger housing

7. The plunger housing, when assembled to the unit, encloses the lead screw and plunger. It is bolted to the gearbox by its end flange plate which registers against the lead screw bearing housing.

Limit switches

8. These are micro snap-action lever-operated type, on which the moulding of the switch housing completely shrouds the contacts and micro-break mechanism. Two electrical connections are made to each switch; these are screwed to the threaded lugs located on each side of the moulding.

9. One arm of the switch-operating lever depresses the switch button when the other arm is actuated by the plunger ear as the plunger moves through its stroke.

INSTALLATION

10. Before coupling the actuator to the installation, it must be ascertained that all the links and joints, bearing pivots, etc., of the component being actuated are free to move.

11. The installation centres must be checked against the relevant installation drawing for the actuator concerned, and the fixing bolts should be passed through the location holes to make certain that a free fit results.

12. To install the actuator, first couple the rear end fitting to the fixed fork end of the installation. The unit should be rocked slightly to check the fitting of the fixing bolt before and after the attachment of washer and nut, etc. The actuator should then be coupled to the moving link, checking that the front (plunger) end fitting enters the fork end of the linkage freely, i.e., without touching the sides of the form arm.

13. While the fixing bolts should be well lubricated with the approved grease, no lubricant should be applied to the actuator plunger as this is adequately lubricated on assembly.

14. After installation, the actuator should be given a test to ensure that it functions correctly.

SERVICING

Lubrication

15. As the actuators are lubricated during manufacture, they require no attention during normal service other than the application of a smear of approved grease to the pivot pins at each end of the actuator.

Brush gear

16. The brush gear of the actuator is accessible when the cast end cover of the motor housing is removed. The condition of the brushes may be tested with the use of a suitable resistance meter, when an abnormal reading will indicate the presence of brush dust.

Note . . .

During the normal operational life of the actuator no adjustment to the brush spring pressure should be required, nor should it be necessary to renew the brushes. Should any such action become necessary, it must only be carried out by qualified personnel acting on competent authority, and when adequate servicing gear is available.

Final check

17. Check all external screws and the locknuts on the plunger end fitting for tightness and security. Ensure that all pivot pins are secure and that the miniature plug and socket connection is tight.

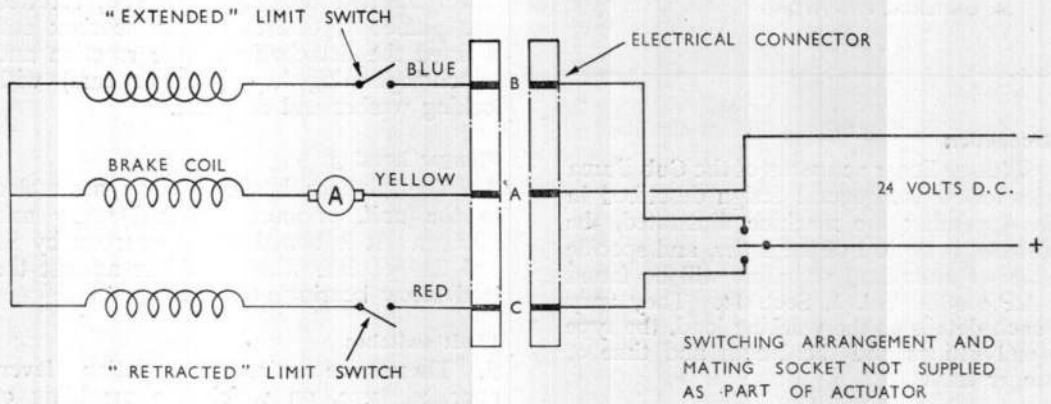

Fig. 3. Circuit diagram

36392 445309 5309 7/54 3250 CWSLtd864 Gp539-2