

Chapter 36

ACTUATOR, WESTERN, TYPE EJ50, Mk. 25

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LEADING PARTICULARS

Actuator, Type EJ50, Mk. 25	Ref. No. 5W/348
<i>Voltage (nominal 28)</i>	22 to 29 V d.c.
<i>Current consumption (normal load)</i>	1.0 A
<i>Output of motor</i>	0.008 h.p. at 5,800 rev/min
<i>Rating</i>	1 minute at normal load
<i>Nominal working load</i>	50 lb.
<i>Maximum working load</i>	120 lb.
<i>Maximum static load</i>	1,000 lb.
<i>Stroke</i>	2 in.
<i>Fixing centres (piston extended)</i>	9.57 in. +0 -0.01
<i>Fixing centres (piston retracted)</i>	8.67 in. +0.01 -0
<i>Brush spring pressure</i>	1½ to 2 oz.
<i>Brush length (new)</i>	0.25 in.
<i>Minimum brush length</i>	0.20 in.
<i>Resistance of field coils (together)</i>	3 ohms
<i>Weight</i>	2 lb. 2 oz.
<i>Operating temperature range</i>	-55° to +90° C.

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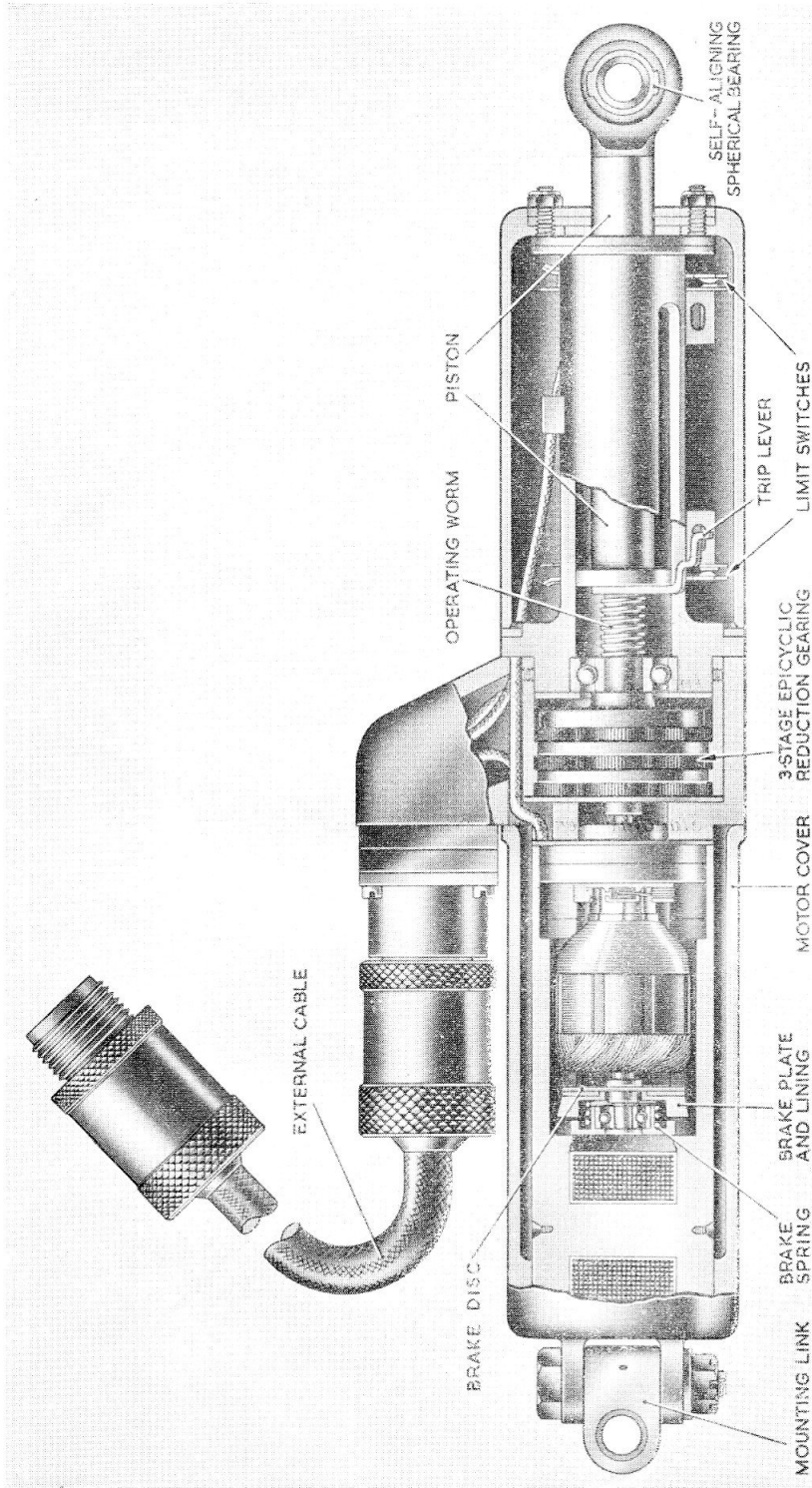


Fig. 1. Sectional view of actuator, Western, Type EJ50, Mk. 25

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Brake

9. When the field coils are energized, there should be a gap of 0.012 in. $+0.03$ in. -0.02 in. allowing the motor to rotate freely on no load.

Brushgear

10. Carbon dust should be removed with a blast of dry air and the brushes and commutator examined for serviceability. New brushes should be fitted at the intervals detailed in the relevant Servicing Schedule and whenever examination reveals that they may reach the minimum permissible length before the next servicing. Information on brush bedding is contained in A.P.4343, Vol. 1, Sect. 1, Chap. 2.

Lubrication

11. The bearings should be washed with lead-free gasoline and dried with a blast of dry air. After examination for serviceability, grease XG.275 should be pressed into the

space between the inner and outer races for a distance of one-third of their circumference. The bearings should be rotated by hand to distribute the grease evenly over the ball tracks.

Testing

12. A functional test can be made by connecting the actuator to a 24V supply and applying loads of 50 and 100 lb. The time taken to complete the 2 in. stroke, and the current consumption should not exceed the following values—

No load	1.1A	7.5 sec.	} ± 3 sec.
50 lb. load	1.4A	9.5 sec.	
100 lb. load	1.9A	12.0 sec.	

Further testing details are contained in Appendix A to this chapter.

13. On completion of the servicing of the motor, refit the cover and lock the securing screws with 24 S.W.G., cadmium plated, soft iron wire.

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Appendix A

STANDARD SERVICEABILITY TEST FOR ACTUATOR, WESTERN, TYPE EJ50, Mk. 25

Introduction

1. The tests detailed in this appendix may be applied to this actuator immediately prior to installation in an aircraft, or whenever its serviceability is suspect.

Test equipment

2. The following test equipment is required :—

- (1) Linear actuator test rig (Ref. No. 4G/5420)
- (2) Tension gauge, Mk. 3 (Ref. No. 1A/56)
- (3) 250V d.c. insulation resistance tester, Type C (Ref. No. 5G/152) or equivalent.
- (4) A d.c. supply, variable between 18 and 29V d.c.

TEST PROCEDURE

Brushgear

3. Using a tension gauge, Mk. 3 or equivalent, check the brush spring pressure; this should be within 43 and 57 grammes inclusive. A defective spring must be replaced with new.

4. The minimum permissible brush length is 0.20 in., if below, or very near this figure, the brushes must be replaced by new.

Note . . .

Before commencing actuator tests, ensure that the travel of the loading arm on the test rig is not restricted by stop bolts. When fitting front end fitting and tie bar to the vernier carriage, care should be exercised not to allow the end fitting or tie bar end fitting to drop on the vernier carriage assembly, or damage will result.

Functional tests

No-load test

5. The linear actuator test rig is described and illustrated in A.P.4343S, Vol. 1, Book 2, Sect. 8. To test the actuator loading at no-load, 50 lb and 100 lb. on the test rig, proceed as follows :—

- (1) Fit the fixed end fitting, code letter 'D' to the test bench.
- (2) Fit the moving end fitting, code letter 'Z' to the loading carriage.
- (3) Fit the actuator to the test bench, using selected shackle pins.
- (4) Fit adjustable rod to the loading carriage.
- (5) Connect the actuator to the test bench d.c. supply and adjust the voltage to 24 volts, ensuring that the actuator worm is in the fully retracted position.

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(6) Set the test bench clock and vernier scale to zero.

(7) Run the actuator to its fully extended position and check that the load current does not exceed 0.9 amperes.

(8) Check the length of the piston travel on the test bench vernier scale, this should be 0.6 in., adjusting as necessary by means of the 'OUT' limit switch.

(9) Check the time on the test bench clock; the time should not exceed 28 seconds.

(10) Set the test bench clock to zero.

6. Run the actuator to its fully retracted position and ensure that the current consumption does not exceed 0.9 amperes.

(1) Check the reading on the test bench vernier scale; this should be zero inches.

(2) Check that the time on the test bench clock does not exceed 28 seconds.

Normal load test

7. Load the compression arm to 10 lb., this is equivalent to a 50 lb. actuator load.

(1) Set the test bench clock to zero.

(2) Run the actuator to its fully extended position and ensure that the load current does not exceed 1.0 ampere.

(3) Check the time on the test bench; this is not to exceed 30 seconds.

(4) Transfer weights to tension arm and set the test bench clock to zero.

8. Repeat the normal load test as described in previous paragraph, running the actuator to its fully retracted position.

(1) The time taken for the actuator to reach its fully retracted position and the current consumption should remain the same.

(2) Remove weights.

Max load test

9. Load the compression arm to 24 lb., this is equivalent to a 100 lb. actuator load.

(1) Set the test bench clock to zero.

(2) Run the actuator to its fully extended position and ensure that the load current does not exceed 1.1 ampere.

(3) Check the time on the test bench clock; this is not to exceed 32 sec.

(4) Transfer weights to the tension arm and set test bench clock to zero.

10. Repeat the maximum load test as described in previous paragraph, running the actuator to its fully retracted position.

(1) Remove weights.

(2) Disconnect the test bench d.c. supply and remove the actuator from the test bench.

Insulation resistance test

11. Using a 250V d.c. insulation resistance tester, Type C, or equivalent, measure the insulation resistance between each pin of the Breeze plug and the frame. The reading should not be less than 50,000 ohms.

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