Chapter 19

TRIM SWITCH, WESTERN, TYPE LS1611

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Trim switch, Type LS1611, Mk. 8/2 ...	*Stores Ref. 5CW/4682*
Operating voltage	*24V d.c.*
Current rating	*5 amp.*
Temperature range	*+90 to −55 deg. C*
Overall dimensions—	
Length	*4·06 in.*
Width	*2·75 in.*
Depth	*3·62 in.*
Weight	*13 oz.*

Introduction

1. The Western, Type LS1611, trim switch is used for switching the aileron and rudder actuators "on" and "off". When the control knob is turned in a clockwise direction the rudder is trimmed to turn the nose of the aircraft to starboard, and when the knob is turned anti-clockwise the rudder is trimmed to turn the nose of the aircraft to port. Trimming of the aileron is brought about by pushing the control knob over to the right or to the left; pushing the knob to the right trims the port wing up, and pushing the knob to the left trims the starboard wing up. When the control knob is released, it

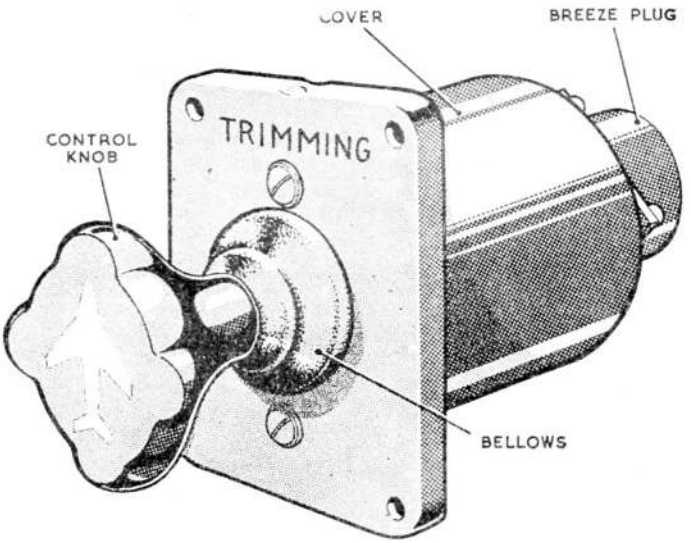

Fig. 1. Trim switch, Western, Type LS1611

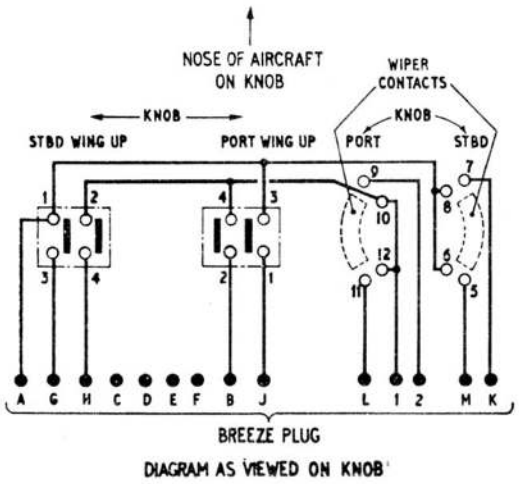

Fig. 2. Internal wiring diagram

automatically returns to its neutral position in all instances.

DESCRIPTION

2. The trim switch (*fig.* 1) consists of two separate switching assemblies contained inside a cover and operated by one control knob. Distance tubes are fastened to a base plate, and a top plate with a sealing ring fits over the open end of the cover and the tops of the distance tubes. The switching assemblies fit inside the cover and are secured to the distance tubes and the top plate. The control knob is fastened to a shaft which operates the switches, and a bellows between the knob and the top cover of the switch prevents the ingress of dirt.

3. A plan view of an aircraft is painted on the face of the control knob (facing the pilot), and when the control knob is operated, this image indicates the resulting movement that the aircraft will make; e.g., when the control knob is turned in a clockwise direction the nose of the image turns to starboard and this is the direction in which the nose of the aircraft turns.

4. Internal electrical connections of the switch are brought out to a Breeze plug secured to the end of the switch. A wiring diagram (*fig.* 2) illustrates the relative positions of the internal switches when the trim switch is viewed with the nose of the aircraft on the control knob pointing upwards.

Aileron trim switches

5. Two micro snap switches (*fig.* 3) are fitted in the trim switch for operating the aileron. The snap switches are secured to the top plate of the trim switch, one each side of the control shaft. An operating plate is attached to the control shaft and this contacts the toggles of the snap switches. When the control knob is pushed sideways, the operating plate pushes the toggle over and closes the switch.

6. While the knob is pushed sideways, a spring-loaded riser assembly prevents rotary movement of the knob. Automatic return of the knob to its neutral position is brought about by flat plungers in slots on each side of the control shaft, and leaf springs pushing

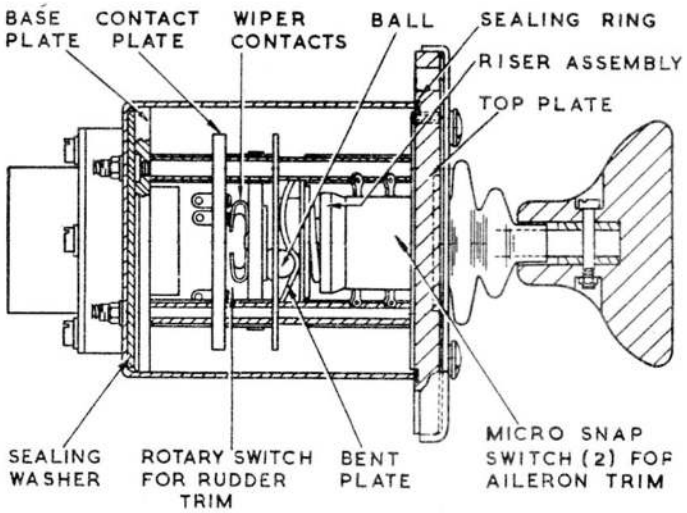

Fig. 3. Sectional view of trim switch

on the end of each plunger. When the control knob is pushed sideways, the corresponding plunger is pushed against a spring which is forced into a state of tension. When the knob is released, the spring moves the plunger and returns the knob to its neutral position.

Rudder trim switch

7. A rotary switch assembly (*fig.* 3) is used for operating the rudder. This consists of stud contacts in a plate fixed to the distance tubes inside the trim switch, and wiper contacts attached to the end of the control shaft. Rotary movement of the control knob turns the wiper contacts to engage with the stud contacts. With reference to fig. 2, anti-clockwise movement closes contacts 7 and 8, and 11 and 12; clockwise movement closes contacts 5 and 6, and 9 and 10.

8. While the knob is turned, the spring loaded riser assembly prevents side movement of the knob. Automatic return of the knob to its neutral position is brought about by part of the riser assembly. When the control knob is rotated, a bent plate with a flat coil spring behind it rotates and rides on fixed balls. Owing to its inclined face the plate is forced back and places the spring in a state of compression, and when the knob is released, the plate is forced by the spring to return down the incline to its original position.

INSTALLATION

9. The trim switch must be mounted so that the image of the aircraft has its nose pointing upwards, and the method of securing is by screws or studs passing through four 0·189 in. dia. holes in the top plate of the switch.

SERVICING

10. To gain access to the inside of the switch, remove the seal, nuts and washers from the end studs, and draw the cover away from the mechanism. If the contacts of the rotary switch are dirty, clean them with a piece of non-fluffy rag moistened with lead-free gasoline, then lightly smear the rotary switch contacts, balls and bent plate with protective PX–7 (Stores Ref. 34B/190). Ensure that the connections to the switches are securely soldered.

11. Using a 250-volt insulation resistance tester, check the insulation resistance between the terminals of any two separate circuits, and between all the terminals connected together and the frame of the switch. A reading of not less than 20 megohms should be obtained for each test.

12. On completion of the servicing, refit the cover, secure it by the washers and nuts, and attach the seal by means of a piece of 24 S.W.G. locking wire.