Chapter 92

TOGGLE SWITCHES, HONEYWELL CONTROLS SERIES

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Introduction

1. This chapter describes ranges of Honeywell Controls toggles switches which are used on aircraft. Details of individual types are given in appendices to this chapter.

DESCRIPTION

2. These switches, of which representative types are illustrated in fig. 1 to 3, may be either two-position or three-position. Some are designed for single-hole mounting, being secured to the panel by a hexagon nut, lock washer and locking ring. The locking ring may be used to lock the switch against rotation by means of a keyway tab and a tab which projects into a hole or slot in the panel. Others are secured to the panel by two screws.

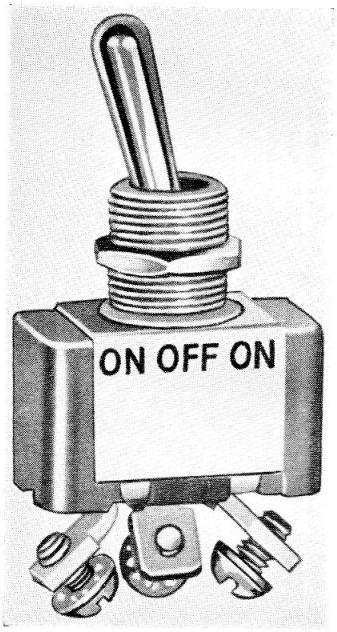

Fig. 1. Switch, Type 11TS1-1

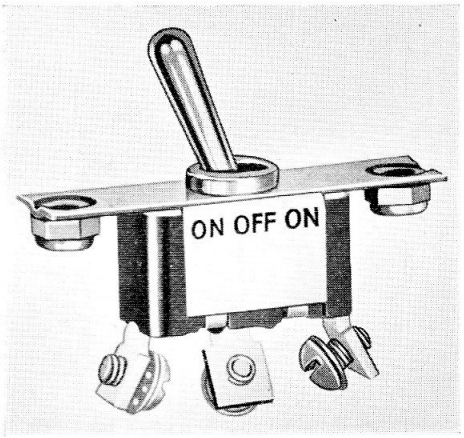

Fig. 2. Switch, Type 31TS1-1

3. The mechanism of these switches is fully enclosed and the toggle lever is sealed to prevent the ingress of moisture and foreign matter.

4. The contact arrangements for the various toggle positions are given in appendices to this chapter. The terminal of the closed circuit, if any, is always at the opposite end to the toggle throw. The terminal which is not used on two-position switches is omitted.

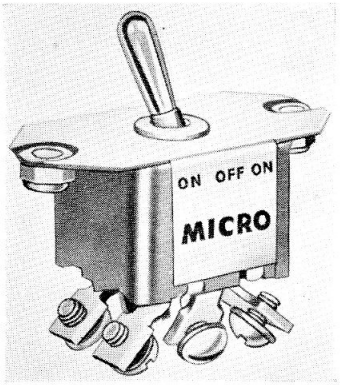

Fig. 3. Switch, Type 32TS1-1

5. Some switches have momentarily contact, either to the ON or OFF position. Others are for applications where the position is maintained over longer periods. ▶ Information on the "TL" series of toggle switches is contained in Appendices 4, 5 and 6 to this chapter. ▶

6. Electrical connection to these switches is made by means of terminal screws.

SERVICING

7. Little servicing is possible with these switches, apart from testing for security of connections and positive action. A faulty switch must be renewed.

Millivolt drop test

8. An indication as to the condition of the contacts can be obtained from a millivolt drop test. The resistance should not exceed 0·010 ohms when the contacts are carrying the rated current at 30V d.c., e.g., the maximum drop for Type TS1–1 switch should be $20 \times 0{\cdot}010 = 200$mV.

Appendix 1

11 TS SERIES

LEADING PARTICULARS

No. of poles ... ... *Single*
Fixing ... ... *Hexagon nut*
Overall dimensions (in.) ... ... 2·24 × 1·12 × 0·62
Weight (max.) ... ... 1·5 *oz.*

Type	A.N. No.	Ref. No.	Rating (amp.)				Contact arrangements Toggle position		
			30V d.c.	125V d.c.	125V a.c.	250V a.c.	One side	Centre	Keyway side
11TS1–1	3021–1	5CW/6903	20	0·75	15	6	On	Off	On
11TS1–2	3021–2	5CW/7895					On	None	Off
11TS1–3	3021–3						On	None	On
11TS1–4	3021–9		15	0·75	15	6	On	None	*Off
11TS1–5							On	Off	*On
11TS1–6	3021–8						Off	None	*On
11TS1–7	3021–7	5CW/7082					*On	Off	*On
11TS1–8							On	None	*On
11TS1–21	3021–10		20	0·75	15	6	On	Off	None
11TS1–41	3021–12		15	0·75	15	6	On	*Off	None
11TS1–61	3021–11						None	Off	*On
†11TS2–5	3021–6						On	Off	*On

* Denotes momentary contact
† Denotes two end terminals strapped together.

Appendix 2

31 TS SERIES

LEADING PARTICULARS

No. of poles ... ... *Single*

Fixing ... ... 2 *panel screws*

Overall dimensions (in.) ... ... 1·937 × 2·125 × 0·62

Weight (max.) ... ... 1·6 *oz.*

Type	A.N. No.	Ref. No.	Rating (Amp.)				Contact arrangement Toggle position		
			30V d.c.	125V d.c.	115V a.c.	230V a.c.	One side	Centre	Other side
31TS1–1	3022–1						On	Off	On
31TS1–2	3022–2	5CW/7405	25	0·75	20	7·5	On	None	Off
31TS1–3	3022–3						On	None	On
31TS1–4	3022–9						On	None	*Off
31TS1–5							On	Off	*On
31TS1–6	3022–8	5CW/7407	20	0·75	20	7·5	Off	None	*On
31TS1–7	3022–7						*On	Off	*On
31RS1–8	3022–11						On	None	*On
31TS1–21			25	0·75	20	7·5	On	Off	None
31TS1–61			20	0·75	20	7·5	None	Off	*On
†31TS52–5	3022–6						On	Off	*On

* Denotes momentary contact.

† Denotes two end terminals strapped together.

Appendix 3

32 TS SERIES

LEADING PARTICULARS

No. of poles ... ... *Double*
Fixing ... ... 2 *panel screws*
Overall dimensions (in.) ... ... 2·25 × 2·125 × 1·12
Weight (max.) ... ... 2·0 *oz.*

Type	A.N. No.	Ref. No.	Rating (amp.)				Contact arrangements Toggle position		
			30V d.c.	125V d.c.	125V a.c.	250V a.c.	One side	Centre	Other side
32TS1–1	3023–1		40	0·75	25	8	On	Off	On
32TS1–2	3023–2						On	None	Off
32TS1–3	3023–3						On	None	On
32TS1–4	3023–9		30	0·75	20	7	On	None	*Off
32TS1–5	3023–5						On	Off	*On
32TS1–6	3023–8						Off	None	*On
32TS1–7	3023–7						*On	Off	*On
32TS1–8	3023–10						On	None	*On
32TS1–21	3023–11		40	0·75	25	8	On	Off	None
32TS1–61	3023–12		30	0·75	20	7	None	Off	*On
†32TS2–5	3023–6						On	Off	*On

* Denotes momentary contact.
† Denotes two end terminals strapped together.

APPENDIX 4

1TL1 SERIES

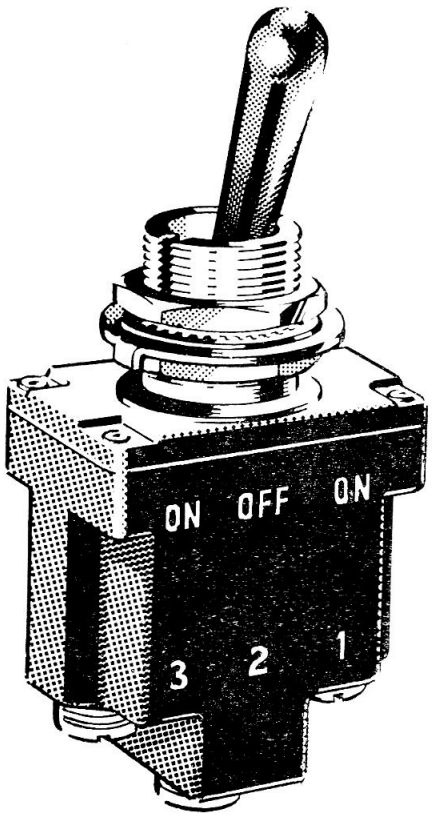

Fig. 1. Switch, Type 1TL1

LEADING PARTICULARS

No. of poles	*Single*
Mounting fixing	*Hexagon nut, lock washer and ring*
Overall dimensions (in.)	1·12 × 0·62 × 2·21
Weight	0·07 *oz.*

Type	"MS" No.	Ref. No.	Current rating (amps)									
				Resistive load					Lamp load		Inductive load	
1TL1/	24523/	5CW/	Continuous rating	Volts d.c.			Volts a.c.		V.d.c.	V.a.c.	V.d.c.	V.a.c.
				30	115	250	115	230	30	115	30	115
1	21		45	20	0·75	0·5	15	6	5	3	15	10
2	22											
3	23											
21	24											
31	33											
4	29		45	15	0·75	0·5	15	6	4	2	10	7
5	31											
6	30											
7	27											
8	26											
41	41											
51	32											
61	28											

Type	Contact arrangement		
1TL1/	One side	Centre	Other side
1	On	Off	On
2	On	None	Off
3	On	None	On
21	On	Off	None
31	On	On	None
4	On	None	Off*
5	On	Off	On*
6	Off	None	On*
7	On*	Off	On*
8	On	None	On*
41	On	Off*	None
51	On*	On	None
61	None	Off	On*

* These toggle positions are momentary; all others are maintained

Appendix 5

2TL1 SERIES

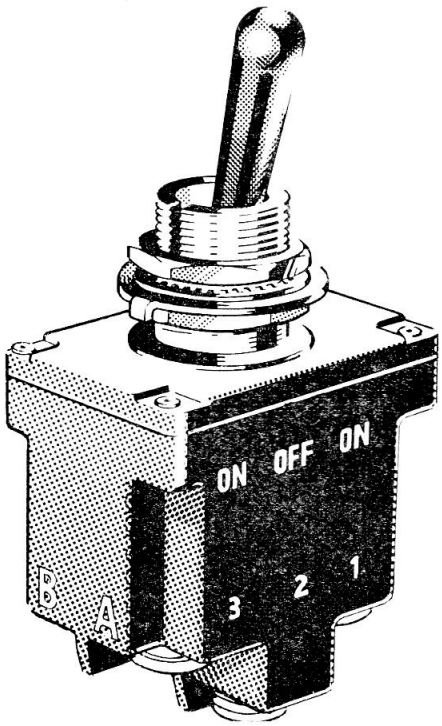

Fig. 1. Switch, Type 2TL1

LEADING PARTICULARS

No. of poles	*Double*
Mounting fixing	*Hexagon nut, lock washer and ring*
Overall dimensions (in.)	1·32 × 0·89 × 2·50
Weight	0·1 *oz.*

Type	"MS" No.	Ref. No.	Current rating (amps)									
				Resistive load					Lamp load		Inductive load	
2TL1/	24524/	5CW/	Continuous rating	Volts d.c.			Volts a.c.		V.d.c.	V.a.c.	V.d.c.	V.a.c.
				30	115	250	115	230	30	115	30	115
1	21	9115	40	20	0·75	0·5	25	9	7	4	15	15
2	22											
3	23											
21	24											
31	33											
4	29											
5	31											
6	30	8034	40	18	0·75	0·5	15	6	5	2	10	8
7	27											
8	26											
41	25											
51	32											
61	28											

Type	Contact arrangement		
2TL1/	One side	Centre	Other side
1	On	Off	On
2	On	None	Off
3	On	None	On
21	On	Off	None
31	On	On	None
4	On	None	Off*
5	On	Off	On*
6	Off	None	On*
7	On*	Off	On*
8	On	None	On*
41	On	Off*	None
51	On*	On	None
61	None	Off	On*

* These toggle positions are momentary; all others are maintained.

Appendix 6

4TL1 SERIES

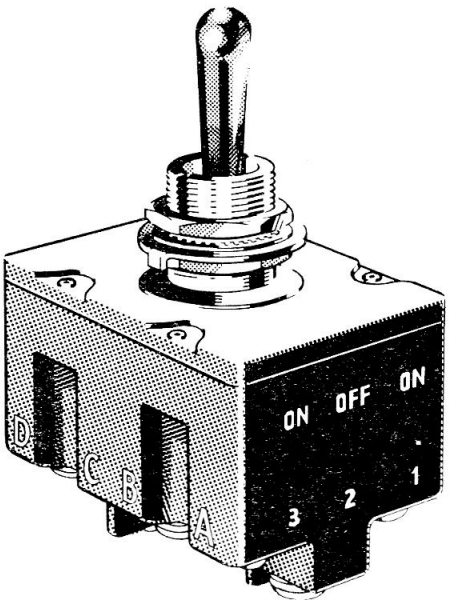

Fig. 1. Switch, Type 4TL1

LEADING PARTICULARS

No. of poles	*Four*
Mounting fixing	*Hexagon nut, lock washer and ring*
Overall dimensions (in.)	1·64 × 1·32 × 2·50
Weight	0·17 *oz.*

Type	"MS" No.	Ref. No.	Current rating (amps)									
				Resistive load					Lamp load		Inductive load	
4TL1/	24525/	5CW/	Continuous rating	Volts d.c.			Volts a.c.		V.d.c.	V.a.c.	V.d.c.	V.a.c.
				30	115	250	115	230	30	115	30	115
1	21		40	20	0·75	0·5	20	9	5	4	12	15
2	22											
3	23											
21	24											
31	33											
4	29		40	18	0·75	0·5	11	6	4	2	10	8
5	31											
6	30											
7	27											
8	26											
41	25											
51	32											
61	28											

Type	Contact arrangement		
4TL1/	One side	Centre	Other side
1	On	Off	On
2	On	None	Off
3	On	None	On
21	On	Off	None
31	On	On	None
4	On	None	Off*
5	On	Off	On*
6	Off	None	On*
7	On*	Off	On*
8	On	None	On*
41	On	Off*	None
51	On*	On	None
61	None	Off	On*

* These toggle positions are momentary; all others are maintained.

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