RELAY UNIT MODEL 2TU

1. DESCRIPTION

This unit enables the direction-indicator flasher unit on a vehicle to control also the direction-indicator lamp(s) on an associated trailer in such a way that the lamps on towing vehicle and trailer flash in unison, but without placing extra electrical load on the flasher unit. It also provides indication of bulb failure in the trailer direction-indicator lamp(s). Further, when the towing vehicle is equipped with an hydraulically operated brake lamp switch (12-volt systems only), provision is made for feeding the trailer brake lamps simultaneously without overloading the switch.

The unit is brought into operation automatically when the plug and socket connexion between towing vehicle and trailer is made.

1 P.v.c. cover
2 Fuse
3 Terminal compartment
4 Moulded body

Fig. 1 Relay unit, with p.v.c. cover removed

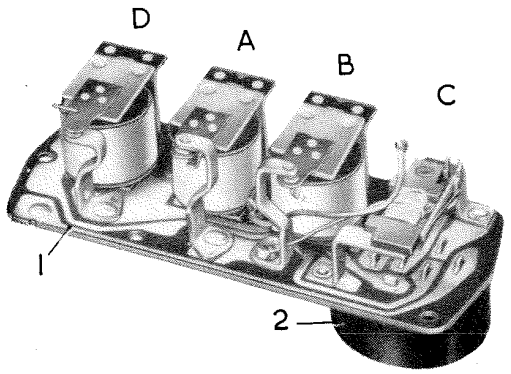
(a) Construction

Model 2TU unit is illustrated in Figs. 1 and 2, while Fig. 3 shows a diagram of the internal connexions and terminal arrangement. Fig. 4 shows the complete circuit connexions. The relays are marked A, B, C and D in the illustrations for ease of reference. The terminals are grouped and numbered as shown in Fig. 3, connexions being made by 'Lucar' connectors.

Relays A and B are identical, and have normally-closed contacts connected in series with the trailer left and right-hand direction indicator lamp(s) respectively.

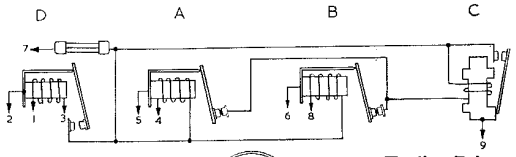
Relay C is a current-operated relay, having normally-open contacts connected in series with the pilot warning lamp for the trailer direction-indicator lamp(s).

Relay D, when fitted, has normally-open contacts in series with the trailer brake lamps.



1 Printed circuit
2 Terminal compartment
A Relay for trailer direction-indicator lamps (left hand)
B Relay for trailer direction-indicator lamps (right hand)
C Relay for trailer pilot warning lamp
D Relay for trailer brake lamps (when fitted)

Fig. 2 Internal construction



1 Earth
2 Trailer brake lamps
3 Vehicle brake lamps
4 Vehicle D.I. lamp(s) L.H.

Terminal layout

5 Trailer D.I. lamp(s) L.H.
6 Trailer D.I. lamp(s) R.H.
7 Ignition switch
8 Vehicle D.I. lamp(s) R.H.
9 Trailer pilot lamp

Fig. 3 Diagram showing internal connexions and terminal arrangement

(b) Operation (Refer to Fig. 4)

(i) Direction-Indicators

When the ignition switch is closed, current flows from the battery, through the fuse and operating coils of relays A and B to earth via the filaments of the vehicle direction-indicator lamps: the value of this current is too small to cause these lamps to be illuminated. The relays are energised and their contacts open to prevent illumination of the trailer direction-indicator lamp(s).

Relay Unit Model 2TU

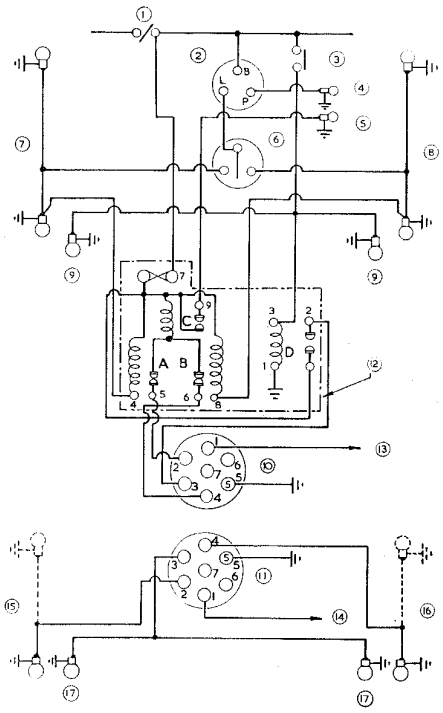


Fig. 4(a)

1 Ignition switch
2 Flasher unit
3 Brake lamp switch
4 Pilot warning lamp for vehicle direction-indicator lamps
5 Pilot warning lamp for trailer direction-indicator lamps
6 Direction-indicator switch
7 Direction-indicator lamps on towing vehicle (left hand)
8 Direction-indicator lamps on towing vehicle (right hand)
9 Brake lamps on towing vehicle
10 Socket (on towing vehicle)
11 Plug (on trailer)
12 2TU relay unit
13 To side-and-tail lamps' circuit on towing vehicle
14 To side-and-tail lamps' circuit on trailer
15 Direction-indicator lamps on trailer (left hand)
16 Direction-indicator lamps on trailer (right hand)
17 Brake lamps on trailer

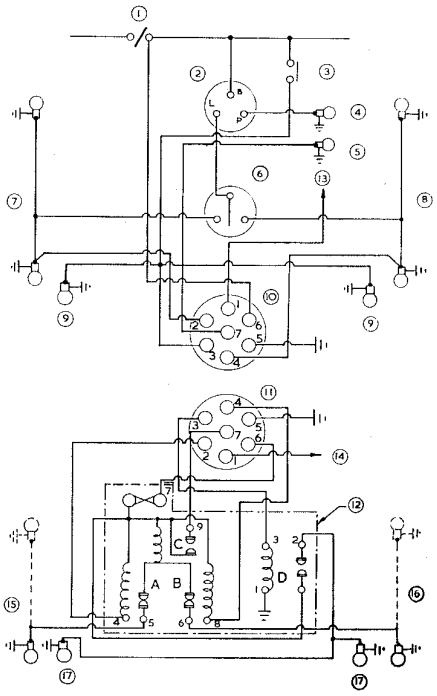


Fig. 4(b)

Wiring diagrams for relay unit mounted (a) on towing vehicle and (b) on trailer

Turning the direction-indicator switch to left or right causes the vehicle flasher unit and direction-indicator lamps to function in the normal manner. Each time the vehicle lamps are 'on', a voltage is applied at the earthed end of relay coil A or B equal to that at the feed end, so that the winding is de-energised. Its associated contacts close to connect the trailer direction-indicator lamp(s) direct to the supply through the operating coil of relay C. Conversely, when under normal flasher action the vehicle direction-indicator lamps are 'off', the relay is again energised and the contacts open to disconnect the trailer direction-indicator lamp(s). In this way, simultaneous flashing of vehicle and trailer direction-indicator lamps is achieved.

Provided the correct load current is taken by the trailer direction-indicator lamp(s), relay C becomes energised and its contacts close, illuminating a second pilot warning lamp in the towing vehicle. In the event of bulb failure leading to zero or reduced current, the relay will not operate, giving warning to the driver in the normal manner.

(ii) Brake Lamps

Operation of the brake lamp switch illuminates the brake lamps on the towing vehicle and also energises relay D (when fitted). Its associated contacts close to feed the trailer brake lamps direct from the supply via the fuse and ignition switch.

This fourth relay is usually only necessary when an hydraulically-operated brake lamp switch is used on a 12-volt system. On 24-volt systems employing this type of switch, it is normal practice to employ a relay in the vehicle brake lamp circuit, while mechanically-operated switches on either 12 or 24 volt systems are usually able to carry the additional current loading of the extra lamps with safety.

When relay D is omitted, a direct feed to the trailer brake lamps is made via the plug and socket connector.

2. ROUTINE MAINTENANCE

None required apart from ensuring that the terminal connexions are secure.

3. TECHNICAL DATA

Part Number	33275	33276	33288	33278	33289
(i) Nominal voltage	12	12	12	24	24
(ii) Used when trailer has direction-indicator lamp(s) at	Rear only	Rear only	Front and rear	Rear only	Front and rear
(iii) Fuse rating (amps)	10	10	10	5	5
(iv) Nominal resistance of coil (ohms):					
Relays A and B	76	76	76	258	258
Relay D (when applicable)	76	—	76	—	—
(v) Cut-in voltage:					
Relays A and B	6–8	6–8	6–8	12–16	12–16
Relay D (when applicable)	6–8	—	6–8	—	—
(vi) Drop-off voltage:					
Relays A and B	4	4	4	4	4
Relay D (when applicable)	4	—	4	—	—
(vii) Relay C:					
Contacts must close with coil current (amps) of	1.5	1.5	3.0	0.85	1.75
Contacts must not close with coil current (amps) of	1.0	1.0	2.1	0.5	1.2

4. SERVICING

The moulded body, retaining screws, p.v.c. cover and fuse are available as spares. Otherwise, servicing is by replacement of the complete unit, ensuring that the Part Number of the replacement is the same as that of the original fitment.

(i) A blown fuse on Model 2TU unit will be indicated by complete failure of all trailer direction-indicator and brake lamps.

(ii) In the event of any one trailer lamp not lighting, first check the particular bulb for filament failure. Also see that all connexions in the particular circuit are properly made.

(iii) Non-operation of a relay due to its winding having become open-circuited for any reason will result in the following symptoms:

Relay A. On switching on the ignition, the trailer left-hand direction-indicator lamp(s) will be permanently lit, as also will the trailer pilot warning lamp in the towing vehicle, due to the relay contacts remaining closed.

Relay B. As above, except right-hand instead of left-hand.

Relay C. The trailer direction-indicator lamp(s) will not be illuminated, since their feed is through the operating coil of this relay. The trailer pilot warning lamp will not light as the relay contacts will remain open.

Relay D. The trailer brake lamps will not be illuminated, since the relay contacts will remain open.