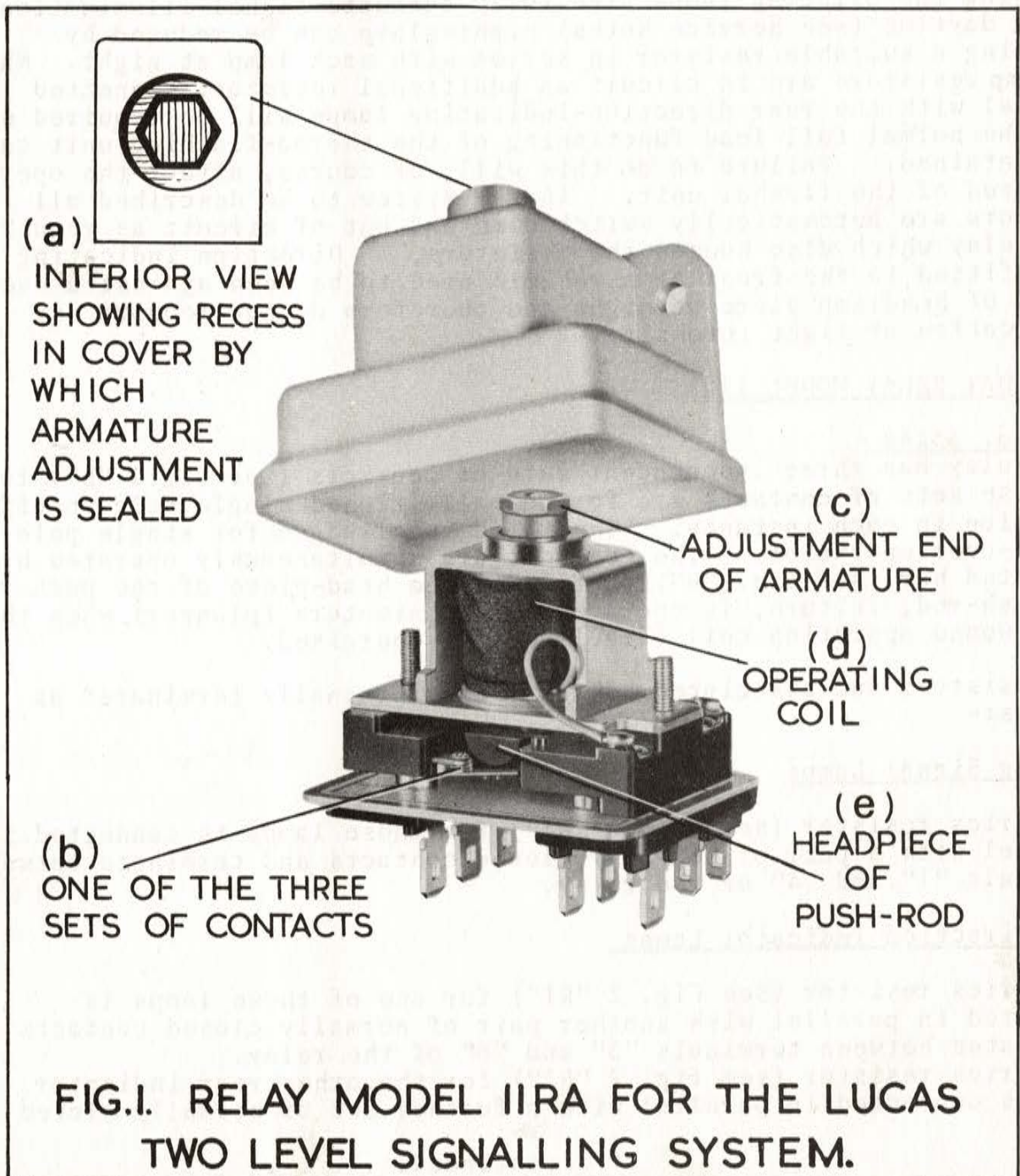


SB/LP/62
JULY 1964

LUCAS NIGHT-DAY SIGNALLING SYSTEM



GENERAL

The Lucas Night-Day signalling system is designed to reduce the amount of night glare normally given by braking signals and rear direction-indicating lamps, yet still provide effective signal illumination by day. The Aston Martin model DB5 saloon car includes night-day signalling as a standard fitment. It is expected that this refinement will be included in the signalling systems of other cars at a later date.

Providing the existing lamps give fully adequate signal illumination during daytime (see Service Notes) night-glare can be reduced by switching a suitable resistor in series with each lamp at night. When the lamp resistors are in circuit an additional resistor, connected in parallel with the rear direction-indicating lamps will be required so that the normal full load functioning of the thermo-flashing unit can be maintained. Failure to do this will, of course, affect the operating speed of the flasher unit. In the system to be described all resistors are automatically switched in and out of circuit as required by a relay which also houses the resistors. Direction indicating lamps fitted to the front of a vehicle need to be seen against a background of headlamp glare at night and therefore do not require any modification of light intensity.

NIGHT-DAY RELAY MODEL IIRA

Part No. 33248

This relay has three independent sets of contacts (see fig.1 "b") two of these sets of contacts are for normally closed single pole on-off operation in each instance. The third is arranged for single pole change-over operation. The contacts are simultaneously operated by an insulated bar (see fig.1 "e") that forms the head-piece of the push rod. The push-rod, in turn, is operated by the armature (plunger) when the shunt wound operating coil (fig.1 "d") is energised.

The resistors and associated contacts are internally terminated as follows:-

Braking Signal Lamps

The series resistor (see Fig. 2 "R4") for these lamps is connected in parallel with a pair of normally closed contacts and terminate between terminals "1" and "4" of the relay.

Rear Direction Indicator Lamps

The series resistor (see Fig. 2 "RI") for one of these lamps is connected in parallel with another pair of normally closed contacts and terminates between terminals "3" and "6" of the relay.

The series resistor (see fig. 2 "R2") for the other rear indicator lamp is connected in parallel with a further set of normally closed

continued.

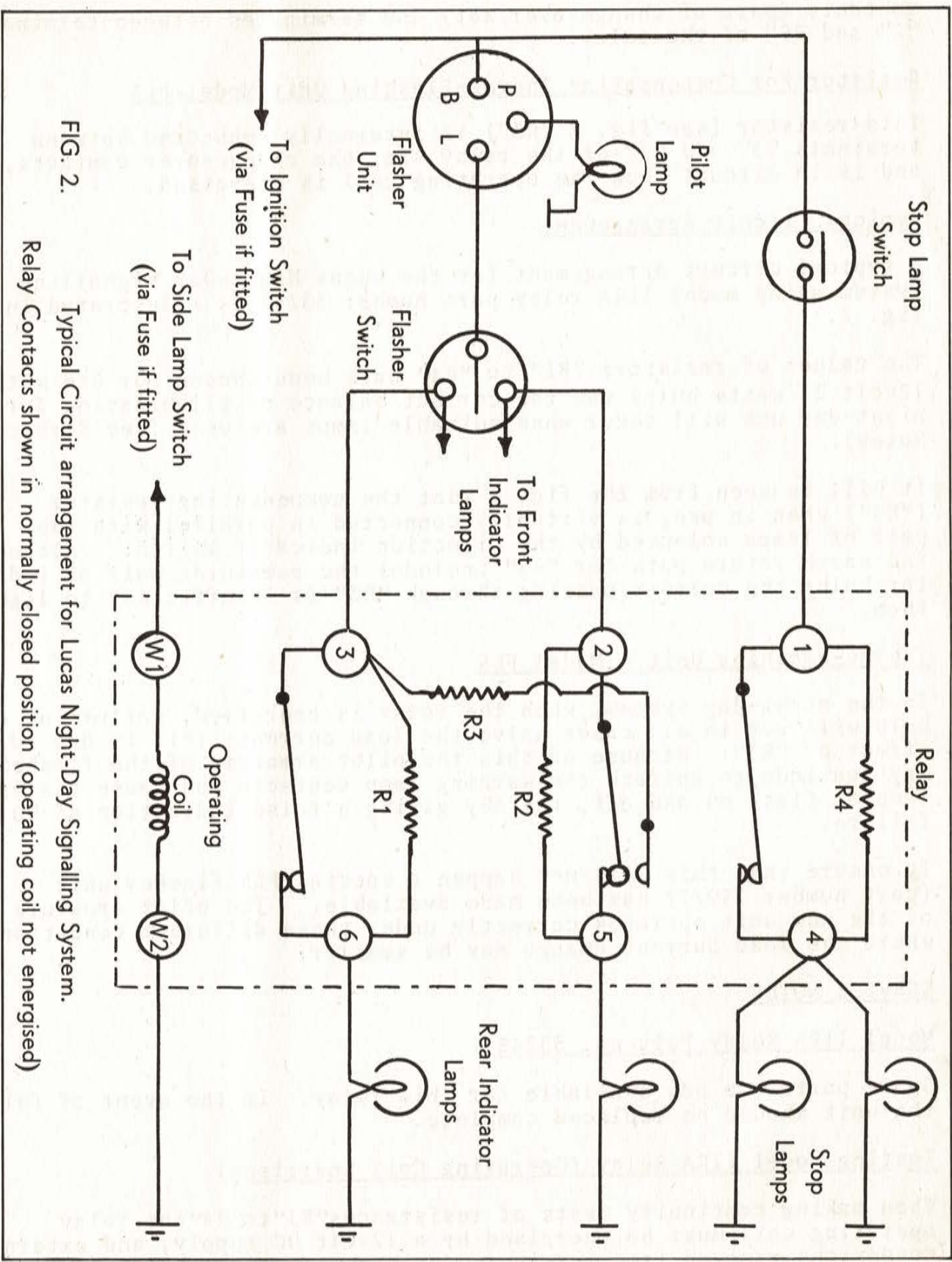


FIG. 2. Typical Circuit arrangement for Lucas Night-Day Signalling System. Relay Contacts shown in normally closed position (operating coil not energised)

contacts (part of change-over set) and terminates between terminals "2" and "5" of the relay.

Resistor For Compensating Thermo-Flashing Unit Model FL5

This resistor (see fig. 2 "R3") is internally connected between terminals "3" and "2" of the relay via, the change-over contacts, and is in circuit when the operating coil is energised.

Typical Circuit Arrangement

A typical circuit arrangement for the Lucas Night-Day signalling system using model IIRA relay part number 33248 is illustrated in fig. 2.

The values of resistors "R1" to "R4" have been chosen for use with 12volt 21 watts bulbs and the correct balance of illumination for night-day use will occur when suitable lamps are used (see Service Notes).

It will be seen from the fig. 2 that the compensating resistor ("R3") when in use, is virtually connected in parallel with the pair of lamps selected by the direction indicator switch. Although the earth return path for "R3" includes the remaining pair of indicator bulbs the current passing through "R3" is insufficient to light them.

Thermo-Flashing Unit - Model FL5

In the night-day system, when the relay is energised, failure of one bulb will not in all cases halve the load current: this is due to the effect of "R3". Because of this the pilot armature of the flasher unit may continue to operate the warning lamp contacts and cause the warning lamp to flash on and off, thereby giving a false indication of bulb failure.

To ensure that this will not happen a special FL5 flasher unit (part number 35027) has been made available. The pilot armature of the new unit operates correctly under these different conditions where the load current change may be smaller.

SERVICE NOTES

Model IIRA Relay Part no. 33248

Spare parts are not available for this relay. In the event of failure the unit should be replaced complete.

Testing Model IIRA Relay (Operating Coil Energised)

When making continuity tests of resistances "R1" to "R4" the relay operating coil must be energised by a 12volt DC supply, and external connexions removed from terminals "1" to "6". When checking the resistance of the operating coil external connexions must be removed from

continued.

terminals "W1" and "W2".
The Following conditions should now exist:-

Operating Coil

Resistance of coil measured between terminals "W1" and "W2" 36 ohm \pm 7½%

Stop Lamp Resistor "R4"

Resistance of "R4" measured between terminals "I" and "4" 0.42 ohm \pm 5%

Rating of "R4" 6 watts

Direction Indicating Lamps Series Resistors "R1" and "R2"

Resistance of "R1" measured between terminals "3" and "6" 1.36 ohm \pm 5%

Resistance of "R2" measured between terminals "2" and "5" 1.36 ohm \pm 5%

Rating of "R1" and "R2" 2.5 watts

Direction Indicating Lamps Shunt Resistor "R3"

Resistance of "R3" measured between terminals "3" and "2" 70 ohm \pm 10%

Rating of "R3" 2 watts

Testing Model 11RA Relay (Operating Coil Not Energised)

With external connexions removed from terminals "I" to "6" and with the operating coil not energised the following conditions should exist:-

Resistance Between terminals	"I" and "4"	Short Circuit
" " " " " " " "	"3" " " "6"	" "
" " " " " " " "	"2" " " "5"	" "
" " " " " " " "	"3" " " "2"	Open "

Setting Contact Movement

Adjustment of contact movement will not be necessary unless the relay cover has been removed and the adjustment tampered with.

Where this has occurred proceed as follows:-

1. Remove Cover.
2. Turn hexagonal end of armature (fig.1 "c") in a clockwise direction until air gap is closed and push-rod is pulled back to its full extent.

continued.

3. Ensure that the closed contacts are making a good connexion. If the contact blades have been distorted and a good contact is not being made, the relay must be replaced.
4. Apply 12volt D.C. to terminals "WI" and "W2" to energise operating coil.
5. With an ohm meter connected between terminals "2" and "3" (to indicate when "R3" comes into circuit and therefore show that the relay has cut in), turn hexagonal end of the armature in an anti-clockwise direction until the headpiece of the push rod lifts the three contact blades and finally just closes the normally open pair of contacts (part of change over contacts).
6. Turn the hexagonal end of the armature a further 90° (to ensure good contact) plus the amount required to line up the flats with the cover (see fig. 1 "a").
7. Fit cover.
8. Ensure that the relay is operating correctly by applying appropriate tests first with the operating coil energised and then not energised.

Operating Coil Voltage Test

1. Ensure that the relay cover is in position and connect terminals "WI" and "W2" to a good quality moving coil 0-20 voltmeter.
2. Connect terminals "WI" and "W2" to a D.C. supply, capable of being varied from zero to 12volts.
3. Connect an ohm meter between terminals "2" and "3" to indicate when "R3" comes into circuit, and therefore show that the relay has cut in.
4. Slowly increase the applied voltage, when the relay should cut in between 5 and 10 volts.
5. Increase the applied voltage to 12 volts and then slowly decrease, when the relay should drop off at a minimum of 1 volt.

Insulation Tests

Using a 12 volt D.C. supply and a good quality moving coil 0-20 voltmeter as a circuit tester, check that a conductive path does not exist between the following:-

- a. The outer surface of the metal base and terminals "WI", "I", "2", "3".
- b. Between any two of the three terminals "I", "2" and "3".

Continued.

Lamps Suitable for use with Model IIRA Relay Part No. 33248

This relay is not available at the present time, as a General Sales item. It is, however, intended that stocks will be held for replacement purposes.

For your interest we include a list of most of the lamps, and vehicles to which they are fitted, that are suitable for use with relay part no. 33248.

Lamp Model

L616 Austin A40
L621 Austin A55
L703 Austin A60
L640 Austin A105
L641 Austin Princess
L676 Austin Sprite
L629 Morris Oxford
L704 Morris Oxford
L635 Wolseley 15/60
L702 Wolseley 15/60
L646 M.G.
L676 M.G. Midget
L646 Riley
L695 Riley Elf
L657 B.M.C. Mini Van
L691 Various
L692 Various

Lamp Model

L620 Rover 3 Litre
L631 Standard Vanguard
L636 Triumph Herald
L642 Sunbeam Alpine
L654 Hillman Minx
L651 Jaguar "E" type
L687 Jaguar Mk.X
L668 Vauxhall Cresta
L684 Vauxhall Victor
L685 Vauxhall VX 4/90
L711 Vauxhall
L718 Vauxhall Viva
L671 Jenson-Valvo
L701 Rolls Royce & Bentley
L723 CAV
L708 CAV And General Sales