

## Chapter I

### CUT-OUTS

#### LIST OF CONTENTS

	Para.		Para.
Introduction ... ..	1	Construction ... ..	13
Types of cut-out ... ..	3	Servicing	
Reverse current cut-outs		Testing	
Principle of operation ... ..	4	Precautions ... ..	15
Construction ... ..	8	General ... ..	16
Voltage differential cut-outs			
Principle of operation ... ..	12		

#### LIST OF ILLUSTRATIONS

	Fig.		Fig.
Simplified representation of cut-out connected in charging circuit ... ..	1	Reverse current cut-out, Type G ... ..	5
Wiring diagram—cut-out, Type C ... ..	2	Differential cut-out, Type A ... ..	6
Wiring diagram—cut-out, Type E ... ..	3	Sectional view of differential cut-out, Type A ... ..	7
Reverse current cut-out, Type E ... ..	4	Circuit incorporating a differential cut-out ... ..	8

#### Introduction

1. This chapter deals with aircraft battery cut-outs. Only general information is given here; individual cut-outs are described in A.P.4343B, Vol. 1, Sect. 10 and 11.

2. In an aircraft electrical installation in which a generator is used to supply the electrical energy during flight, and a battery is carried to provide a supplementary supply, the battery is normally connected to the generator (fig. 1) and is on charge. In the event of the generator voltage becoming less than that of the battery, the circuit must be broken in order to prevent a discharge current from the battery passing through the generator. It is the function of the cut-out to do this automatically.

#### TYPES OF CUT-OUT

3. The "reverse current" and the "voltage differential" are the two types at present in

use. The principle of operation of each type is different and consequently they are described under separate headings in the following text. It should be noted that several different designs of each of these types are, or will be, produced and that each design may be available in different sizes.

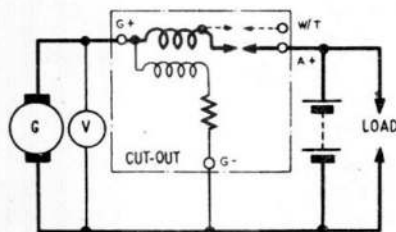


Fig. 1. Simplified representation of cut-out connected in charging circuit

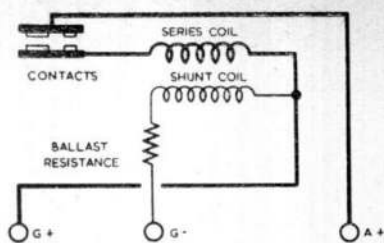


Fig. 2. Wiring diagram—cut-out, Type C

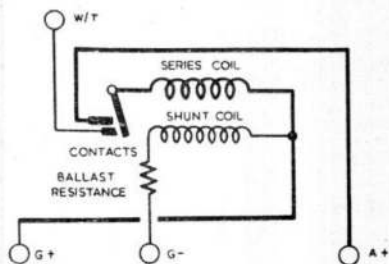


Fig. 3. Wiring diagram—cut-out, Type E

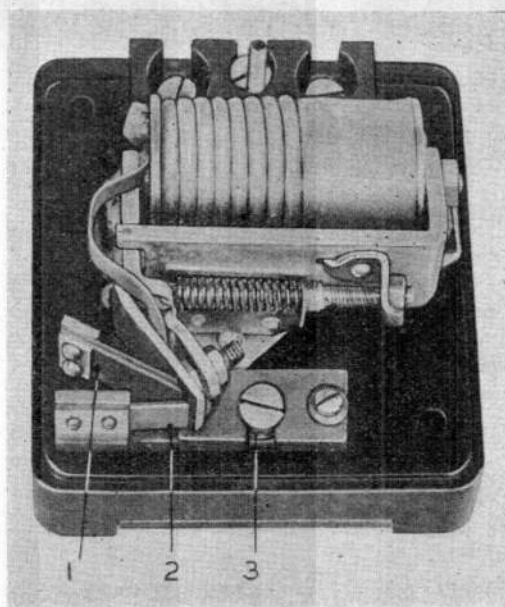
#### Reverse current cut-outs

##### Principle of operation

4. This cut-out is an electro-magnetic switch with two windings on the operating magnet, a voltage winding and a current winding. The voltage, or shunt, winding is connected, in series with a resistance, across the generator main output leads. The current, or series, winding is connected in series with the generator. The arrangement is illustrated in fig. 2 and 3.

5. With the generator at rest, the cut-out contacts are held open by a spring and no current passes through either winding, but with the generator running a current passes through the shunt winding, the adjustment of the contacts being such, that, at a pre-determined voltage, the pull of the operating magnet will overcome the tension of the spring, close the contacts, and connect the generator to the battery and to the load. Current will now pass through the series winding of the cut-out which is wound to assist the shunt winding in holding the contacts in the closed position.

6. If the generator voltage falls below that of the battery, current will flow in a reverse direction through the series winding. The magneto-motive force so produced will



1 LAMINATED CONTACTS 2 W/T CONTACTS  
3 W/T TERMINAL

Fig. 4. Reverse current cut-out, Type E

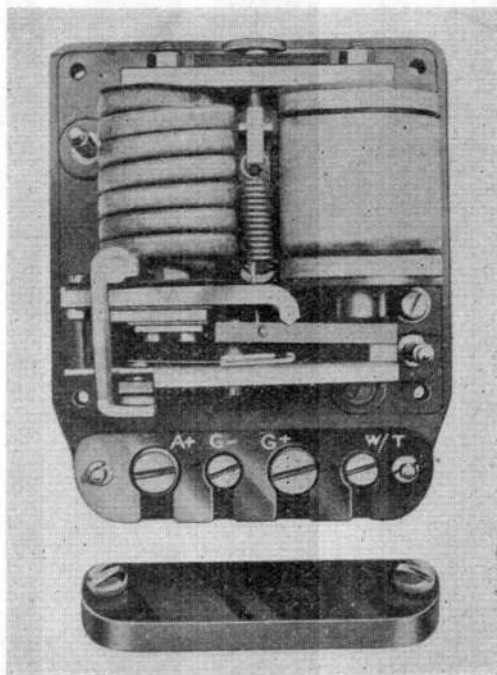


Fig. 5. Reverse current cut-out, Type G

RESTRICTED

(2) When setting, or checking pull-in voltages, always reduce the voltage to zero between individual checks and increase the closing voltage gradually when making a check. The contacts should close smartly without hesitation or sticking at the specified voltage.

(3) When testing cut-outs fitted with W/T contacts, the main contacts should close after the closing of the W/T contacts and without the application of additional voltage.

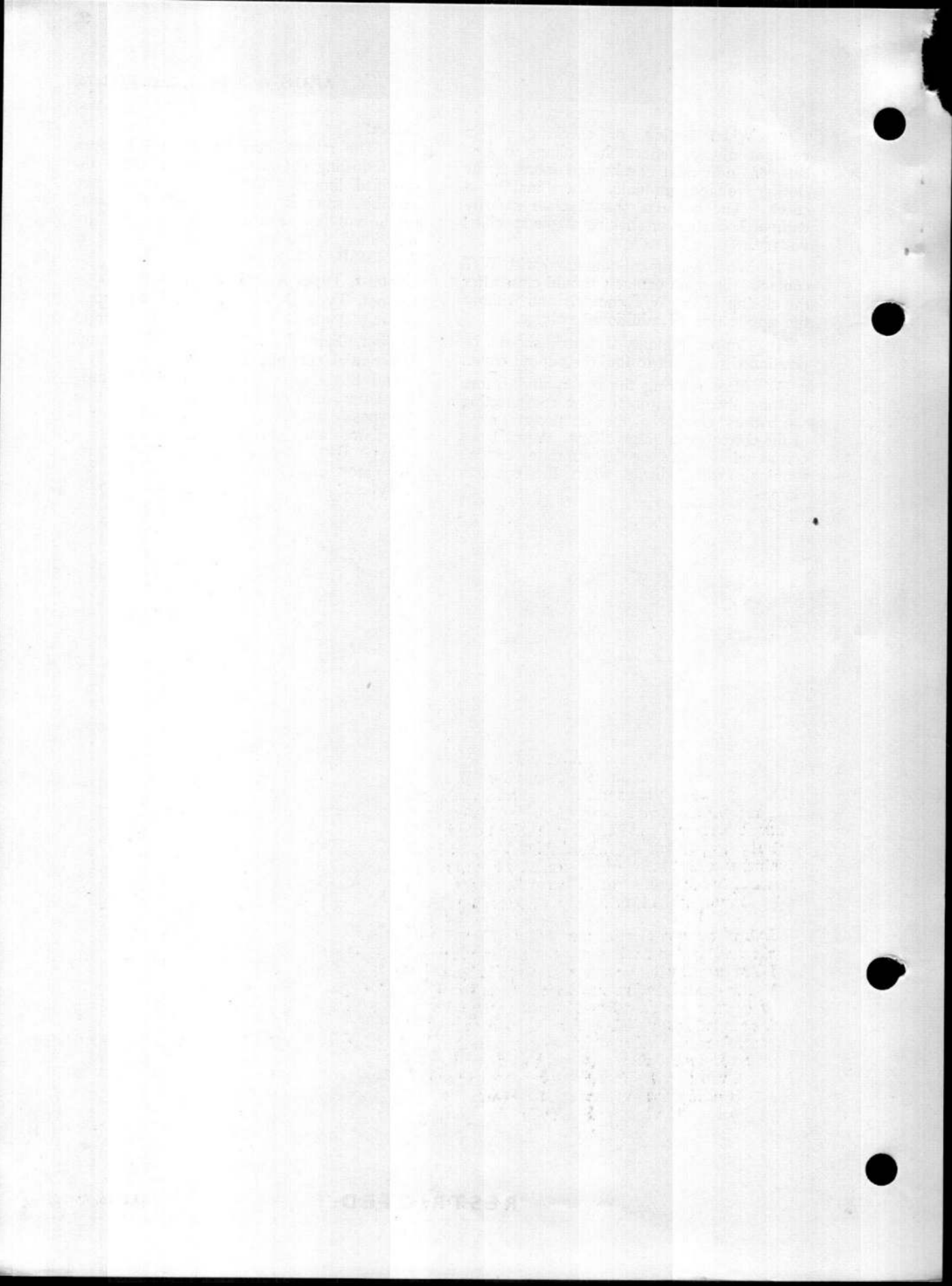
(4) Copper pigtails, if fitted, should be positioned so as not to foul the cut-out cover.

(5) After refitting the cover, and before refitting the generator fuse or reconnecting the battery, check that the contacts still close at the correct operating voltage. A test lamp connected across the appropriate cut-out terminals will indicate when the contacts close.

#### General

◀ 16. The reverse current required to open the following cut-outs should be within the specified limits; a lower figure is not permissible, since it would lead to chattering of the cut-out. Further details of tests for individual types of cut-out are given in A.P.4343B, Vol. 1, Sect. 10 and 11.

Cut-outs, Types A and B ...	0-8 amp.
Cut-out, Type D ... ..	5-10 amp.
Cut-out, Type G ... ..	12-25 amp.
Cut-out, Type J ... ..	90-130 amp.
Differential cut-outs, Types A and B ... ..	15-25 amp.
Regulator and cut-out units, Types A and A2 ... ..	5-10 amp.
Regulator and cut-out unit, Type B ... ..	12-25 amp.
Regulator and cut-out unit, Type C ... ..	0-4 amp.



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