

Chapter 7

SIMSTART TROLLEY, Mk. 1, TYPE 1C (VULCAN)

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LEADING PARTICULARS

Trolley Simstart Mark 1, Type 1C		Ref. No. 4F/4205
Start panel (Rotax Type U2602)....		Ref. No. 5CZ/5304
Switch/magnetic Type A		Ref. No. 5CW/4381

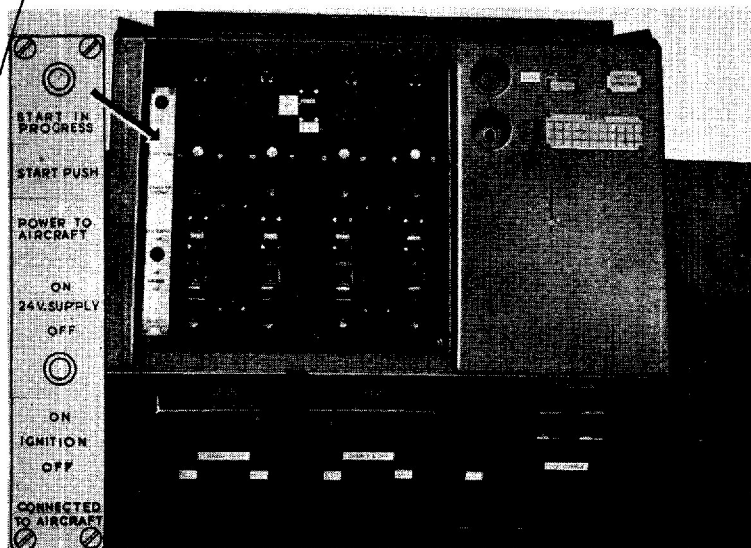


Fig. 1. Control panel

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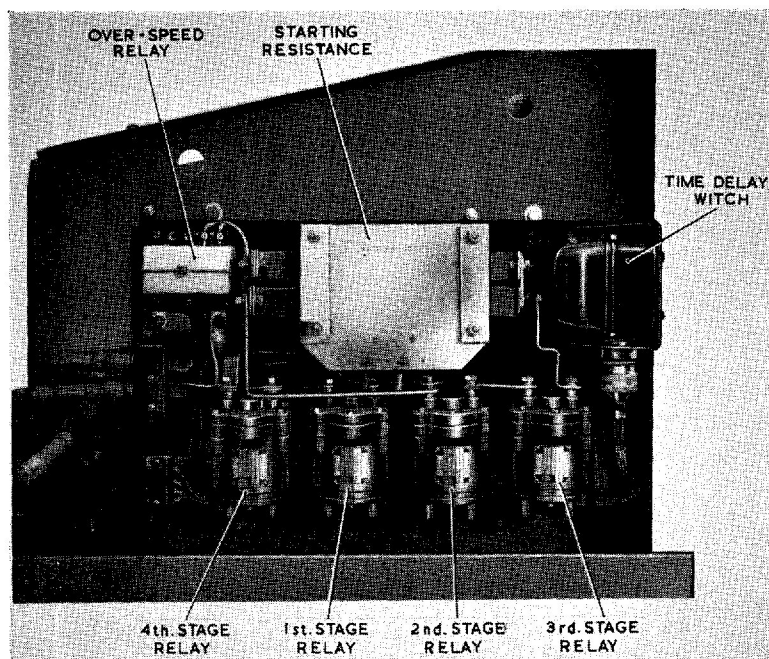


Fig. 2. Start panel

Introduction

1. The Simstart trolley which is designed to provide the necessary starter control circuits and the electrical power for the simultaneous starting of all four engines fitted to the Vulcan Mark 1 and 1A aircraft, is fully described in Section 1, Chap. 2 of this publication. The present chapter refers only to the engine starting circuit including the control and start panels. Simultaneous engine starting can only be achieved when the aircraft is fitted with four additional N.A.T.O. plugs, to accommodate the Simstart trolley sockets, under the provisions Bomber Command Vulcan modification 60. The trolley is then connected directly to the starter motors and ignition units.

DESCRIPTION

Control panel

2. The control panel which is fully described in Section 1, Chap. 2 is illustrated in fig. 1. It replaces the aircraft control panel during simultaneous engine starting. Its operation in conjunction with the start panel is referred to later in the chapter.

Start panel (Rotax Type U2602)

3. The start panels, one of which is illustrated in fig. 2, carry the time delay switches, overspeed relays, starting resist-

ances, engaging, second, third and fourth stage relays. Four start panels are fitted to each trolley, these are situated on the console immediately behind the control panel. A complete description of the start panel, together with servicing instructions appears in A.P.4343C, Vol. 1, Book 3, Sect. 8.

OPERATION

Starting

4. The procedure required to bring a trolley to the stand-by condition in preparation for a four engine start is referred to in Sect. 1, Chap. 2, Para. 15 to 20 of this Air Publication.

5. The following sequence of events should follow the operation of the start push buttons: which should be pressed at one second intervals,

(1) The high energy ignition units to be supplied via the master switch, 15A circuit breakers, 24V supply control switches, start push buttons, ignition switches and the small poles of the N.A.T.O. plugs and sockets.

(2) The first stage engaging relay should close, being supplied via time delay switch terminal B and the normally closed contacts No. 1.

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- (3) The starter motors should now begin to run being supplied from the 120V battery bank via the isolating contactors, the coils of the overspeed relays, first stage engaging relays, full starting resistances and N.A.T.O. sockets.
- (4) The POWER TO AIRCRAFT indicators should also be illuminated.
- (5) Starter motor current flowing through the overspeed relays coils will close their contacts, followed by:
 - (a) The time delay switch winding operation. The coil is supplied initially through the time delay switch contacts B, after three seconds A contacts close and B open, winding is completed via A contacts which should then open.
 - (b) The START IN PROGRESS indicators should light.
 - (c) The start pushes should be held in the depressed position by their energized coils.
6. Due to the subsequent closing of contacts 2, 3 and 4 of the time delay switches, the timing of which may be seen in A.P. 4343C, Vol. 1, Book 2, Sect. 3, the value of the resistance connected in series with the motor is progressively reduced by the closing of the second, third and fourth stage relays. The motor speeds are thus accelerated until the self sustaining speeds of the engines are reached.
7. The starting cycle is terminated by one of the following:
 - (1) Opening of the overspeed relays due to the high motor speeds reducing the current in the overspeed relay coils to a point where the contacts open; so causing the start push buttons to be reset to normal due to the de-energizing of their coils. The 24V supplies to the start panels will now be cut off, which will de-energize the stage relays. Supply to the high energy ignition units will also terminate when the start push contacts open.
 - (2) Opening of time delay switch contacts No. 4 will cause the overspeed relays to open, so terminating the starting cycles as in para. 7 (1).
8. The time delay switches will continue to unwind, finally coming to rest with the contacts reset to the positions shown in the circuit diagram.
9. The general servicing of the trolley and chassis is referred to in Sect. 1, Chap. 2, of this publication. Control panel servicing is given in A.P.4343C, Vol. 1, Book 3, Sect. 8, Chap. 9.

SERVICING

