

## GROUP D.11

## PARACHUTE BRAKE (CODE TC)

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TABLE 1

Equipment type and Air Publication

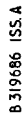
Equipment Type	Air Publication
Control switch, Rotax Type D.10007	A.P.113D-1113-1
Test switch, N.S.F. Type 7675/B.102	A.P.113D-1110-1
Micro switches, Type 4A	A.P.113D-1200 series
Circuit breaker, B.T.H. Type L.G.A.6-B1/1	A.P.113D-0903-1
Door solenoid, Rotax Type D.5320	A.P.113F-0101-16
Jettison release unit, Vickers A.5931	
Modified to Vickers Drg. No. 92574, Sheet 71	A.P.113F-1100 series
Warning lamp, H.S.A. Design	

## Introduction

1. This group contains the description and operation of the parachute brake circuit, with information on the servicing required to maintain the equipment in an operating condition. Routeing and theoretical diagrams are included. Detailed information on the standard items of equipment used in this circuit will be found in the Air Publications listed in Table 1.

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## DESCRIPTION

### General

2. The parachute brake is installed in a fairing above the tail cone of the fuselage with its cable attached to a shackle which is held in the jaws of an electro-magnetic release unit bolted to the top of frame 57. The parachute is streamed and jettisoned by the operation of a switch located in the cockpit. A twin filament warning lamp, which is controlled by a micro switch operated by the parachute doors, is provided to indicate that the parachute has been streamed. The electrical control circuit is designed so that, should the parachute doors open inadvertently in flight or during take-off, and stream the parachute without operation of the control switch, the parachute release unit will be automatically energized, by a further micro switch, and jettison the parachute, so preventing an emergency arising due to the drag of the parachute.

3. Access to the release unit for parachute attachment is made through an access door in the tail cone fillet. When opened, this door releases a micro switch which isolates the electrical supply to the release unit so preventing any possible damage to the unit, due to an electrical overload, when inserting the parachute shackle. A small two-pole plug, located adjacent to the release unit, is provided for testing the release unit for correct cocking.

4. The continuity of the control circuit may be checked by the operation of a test switch situated in the cockpit. When this switch is in the TEST position, the filaments in the warning

lamp are connected in series with the parachute door release solenoid, the release unit operating coil, through the micro switches and the lamp filaments will illuminate to indicate that the circuit is complete.

### Control switch and warning lamp

5. The control switch is situated on a bracket attached to the port glare shield in the cockpit and is marked JETTISON OFF and STREAM. The switch is a three position, spring-return to centre from one side only type, but on this aircraft the spring-return side is not used, as the switch is restricted to two positions only by a guard plate. The parachute warning lamp is mounted above the control switch and consists of a H.S.A. lamp housing containing two filaments. The lamp is controlled by a door indicator micro switch, which is situated in the tail cone and operated by the parachute door when open. Both filaments of the lamp illuminate to indicate that the parachute is streaming and will remain lit after the parachute has been jettisoned.

### Door solenoid and parachute release unit

6. The parachute doors are spring-loaded and are opened to stream the parachute by a solenoid-operated release mechanism located in the tail cone. The solenoid is controlled by the control switch and a door micro switch. The door micro switch is operated when the doors open to isolate the supply to the door release solenoid and then complete the circuit from the control switch to the parachute release unit, via the fillet door micro switch. It is, therefore, impossible to jettison the parachute until it has been streamed.

### Test switch and cocking test plug

7. The test switch is situated on the rear portion of the cockpit port shelf and is marked TAIL CHUTE TEST. The switch is used in conjunction with the parachute warning lamp to check the continuity of the control circuit, door release solenoid and release unit. The rear portion of the cabin port shelf also contains the parachute circuit breaker and supply fuses. A further 0.5 amp. fuse, which protects the test circuit, is contained in a Belling Lee fuse-holder situated on the port side of the tail cone front former. Access to this latter fuse may be obtained when the parachute doors are open. The cocking test plug is situated in the tail cone adjacent to the release unit, access being obtained through a door in the port side of the tail cone. The plug is used to connect a test circuit to the release unit circuit to check that the unit is serviceable and correctly cocked. The fillet access door must be open when using this test plug to allow the fillet micro switch to complete the test circuit to the release unit.

### Operation

#### Normal stream and jettison

8. The theoretical diagram of the circuit (fig.1) is drawn in the condition found when the parachute is stowed with its doors closed, the control switch in the JETTISON OFF position and the automatic parachute jettison circuit ready to operate i.e., normal flight conditions. If during landing, the control switch is placed in the STREAM position, a supply is fed to contact C of the door micro switch, which is in the un-operated condition, because the doors are closed. In this condition, contacts C and B of the micro switch are made and complete the circuit to the door solenoid.

9. When the door solenoid is energized, it allows the door locks to release the doors, which open and stream the parachute. With the doors open, contacts D and E of the door micro switch are made to complete the circuit from the control switch to the parachute release unit through the fillet door micro switch. When the control switch is returned to the JETTISON OFF position, a supply is fed to contact E of the door micro switch and, as the doors are open, a supply is fed to the parachute release unit through contacts A, D and E of the fillet door micro switch. When the release unit is energized, its jaws open and so jettison the parachute.

#### *Indication*

10. When the parachute doors open to stream the parachute, the door indicator micro switch is operated and makes contacts A, B and C. Contacts A and B of the micro switch complete a supply to both filaments of the warning lamp. This supply is obtained from the circuit fuse through contacts 10 and 11 of the test switch and also passes through a 5 amp. fuse before reaching contact B of the micro switch. One filament is supplied through contacts 7 and 8 of the test switch and the other is fed direct from contact A of the micro switch. The return from both filaments passes to earth through contacts 1 and 2 of the test switch. The warning lamp will, therefore, illuminate when the doors open to give an indication that the parachute is streaming. The lamp remains illuminated after the parachute has been jettisoned, but is extinguished when the battery master switch is placed in the OFF position.

#### *Automatic jettison*

11. The operation of the automatic safety jettisoning of the parachute on inadvertent release, is such that when the doors open and allow the parachute to stream, the door micro switch is operated and makes contacts D and E. With these contacts made, a supply is immediately available from the control switch to the parachute release unit, via the fillet door micro switch. The release unit is, therefore, energized immediately and jettisons the parachute.

#### *Release unit overload precaution*

12. When the fillet door is opened to gain access to the release unit for parachute attachment, the fillet door micro switch is released and makes contacts A, B and C, thus isolating the supply to the release unit and completing the circuit of the cocking test plug. The isolation of the supply is necessary, because, with the parachute doors open, a supply is available at the release unit through the door micro switch. Under these conditions, the release unit would be energized immediately the shackle was inserted into the jaws and if the shackle was held in the jaws manually for any length of time, the release unit's solenoid coil and feed switches would be damaged by the electrical overload.

13. After insertion of the shackle, the release unit may be tested for correct cocking by use of the cocking test plug, (*para.15*). When the parachute doors are closed after the parachute has been stowed, the door micro switch is released and makes contacts A, B and C to

isolate the circuit to the release unit. When the fillet door is closed the fillet door micro switch is operated and makes contacts A, D and E to complete the circuit to the release unit ready for further operation.

#### *Control circuit test*

14. The door release solenoid, release unit and control circuit are tested for continuity when the test switch is placed in the TEST position. With the switch in this position, one filament of the warning lamp is connected in series with the parachute door release solenoid through the door micro switch and the other filament is connected in series with the operating coil of the release unit through the door indicator and fillet door micro switches. Both filaments will, therefore, illuminate to indicate that the circuit is complete.

#### *Release unit test*

15. The cocking test plug is used to connect a test circuit, consisting of a lamp and low voltage battery, to the release unit circuit to check that the unit is serviceable and correctly cocked. The fillet access door must be open when using this test plug to allow the fillet micro switch to complete the test circuit (*para.12*); the test lamp will light, when the release unit is serviceable and correctly cocked, as a circuit is then completed through the release unit feed switches, solenoid coil and test circuit.

### SERVICING

#### *General*

16. For general servicing of the electrical system, reference should be made to Group A.1. All the components must be kept

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1301A-1B, Sect.5, Chap.1, Group D.11  
A.L.252, Sept.75

clean and inspected periodically for signs of damage and to ensure that they are securely mounted. The standard routine bench testing of the components, are described in the appropriate Air Publications listed in para.1, and no further servicing is required.

*Adjustment of micro switches*

17. For the adjustment of the parachute door, fillet access door, and the door indicator micro switches refer to A.P.101-<sup>1301</sup>  
1301A-1A, Sect.3,  
Chap.1.

**REMOVAL AND ASSEMBLY**

**General**

18. Once access has been obtained, the removal and assembly of the components forming the parachute brakes require no special instructions. The location and access to all the components is given in Group A.3.

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