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DSTL, AVIA 18/4491, 5 Aug 2008; DSTL, AVIA 18/4491, 5 Aug 2008

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1st Part of No. AAEE/894

MINISTRY OF SUPPLY

**AEROPLANE AND ARMAMENT
EXPERIMENTAL ESTABLISHMENT**

BOSCOMBE DOWN

FAIREY E10/47. WX.350
(DEPARTMENT 3)

HOOD JETTISON TESTS IN THE BLOWER TUNNEL

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AUTH *Exp. Order 10601*
BY *R.C. Sutton*
DATE MAY 12 1954

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1st Part of Report No. AAE/894

10. DEC. 1953

AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT
BOSCOMBE DOWN

Fairey E10/47. VX.350
(Derwent 8)

Hood Jettison Tests in the Blower Tunnel

A. & A.E.E. Ref.: AAE/6225/T/19/MJJ
Period of Test : 14/8/51 to 16/8/51.

Summary

The jettison characteristics of the hood fitted to the Fairey E10/47 are good and it should jettison safely in flight at speeds between 135 knots and 200 knots. It is possible that it may jettison safely at higher speeds although no tests were carried out at speeds in excess of 200 knots.

The use of explosive cartridges calls for careful servicing and regular replacement, as the failure of one or both cartridges will be dangerous.

This Report is issued with the authority of



Air Commodore,
Commanding, A. & A.E.E.

/Introduction.....

1. Introduction

Tests were required to assess the jettison characteristics of the hood fitted to the Fairey E10/47 aircraft, and the possibility of injury to the pilot, or damage to the aircraft in the event of an emergency jettison being made in flight.

2. Description of the hood and jettison mechanism

2.1. The hood was of broad 'U' section, and was constructed of light alloy, with three windows of transparent material. It slid fore and aft on two rails to facilitate entrance to the cockpit. These rails were jettisoned with the hood.

2.2. For normal entry to the cockpit the hood could be moved on its rails by a hand winding gear. When the hood was jettisoned, two meshing gears disengaged, one remaining on the aircraft, and the other going with the rail. Each rail was held to the aircraft by two catches. These catches were connected to bellcranks by push-pull rods. The bellcranks were attached to electrically fired hood jettison guns. Each gun consisted of a breech block, which housed the explosive cartridge, and a piston in a cylinder.

2.3. When the pilot's jettison button was pressed the cartridge in each jettison gun fired. This forced the piston up the cylinder. The pistons, prevented from returning to their original position by two pairs of tapered collets which jammed them in the extended position, moved the bellcranks, which pulled the push-pull rods, and disengaged the two catches on each hood rail. The hood and rails were then free to pivot about the hinge pins on the fuselage, and leave the aircraft.

2.4. Fig. 1 shows details of the jettison mechanism, and jettison guns.

3. Condition of aircraft relative to tests

3.1. The tailplane was removed, and a guard built to protect the leading edge of the fin, to prevent any possible damage to the tail surfaces.

3.2. Rescue slings were fitted to the hood for all tests.

3.3. All the tests were made using the pilot's jettison button.

3.4. The 6 ft. diameter nozzle was fitted to the blower tunnel for all tests.

4. Conditions of the tests

4.1. The aircraft was set up in front of the tunnel nozzle at the correct flying attitude for the test airspeed, with the tunnel set level to direct the airflow over and around the hood.

4.2. Tests were carried out under the following conditions:-

Test	Speed	Datum angle to airflow	Yaw
1	200 kts.	+7° 18'	Zero
2	135 kts.	+16° 30'	Zero
3	200 kts.	+7° 18'	10° to Port

4.3. High speed cine records of each test were taken from two positions, one from the beam which incorporated a spark time base, and the other from the upper frontal position.

5. Results of Tests

5.1. Test 1 200 knots, No Yaw

5.1.1. Immediately the jettison button was pressed the front of the hood commenced to rise, until the rails became detached from their rear pivot pins after pitching through approximately 22° . The hood then continued to pitch and rise until it passed high over the fin in the inverted position.

5.1.2. Fig. 2 shows several positions of the hood on being jettisoned, and the times taken to assume those positions from the instant of operating the jettison button.

5.2. Test 2 135 knots, No Yaw

5.2.1. The results were similar to Test 1, except that the release angle was approximately 45° .

5.2.2. Fig. 3 shows several positions of the hood on being jettisoned, and the times taken to assume those positions from the instant of operating the jettison button.

5.3. Test 3 200 knots 10° Yaw to Port.

5.3.1. The hood released from the airframe at approximately 30° . The hood then commenced to roll to starboard whilst continuing to pitch and rise, until it passed high over the fin.

5.3.2. Fig. 4 shows several positions of the hood on being jettisoned, and the time taken to assume those positions from the instant of operating the jettison button.

6. Conclusions

6.1. The hood will jettison safely in flight at speeds between 135 knots and 200 knots.

6.2. Small angles of yaw do not adversely effect the jettison characteristics.

6.3. It is possible that the hood will jettison safely at higher speeds although no tests were carried out at speeds in excess of 200 knots.

6.4. The jettison mechanism is simple, and operated satisfactorily for all the tests.

7. Recommendations

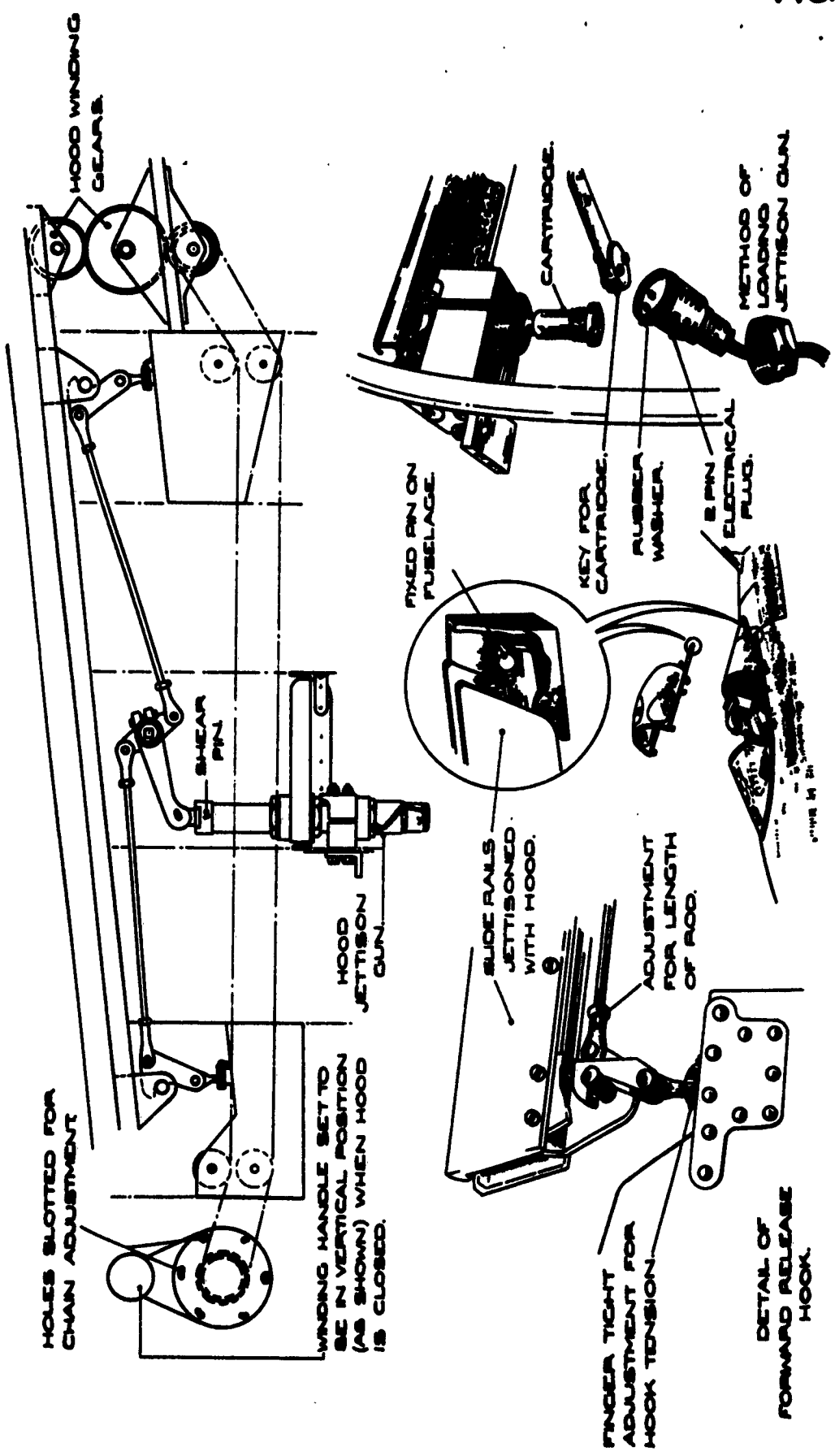
7.1. It is strongly recommended that the jettison gun cartridges be replaced at regular intervals. Should both cartridges fail to fire the hood will fail to jettison, or if only one cartridge fails, the jettison may be very bad, resulting in injury to the pilot or damage to the aircraft.

7.2. The electric circuit to the cartridge must be carefully maintained and checked at frequent intervals.

7.3. The push-pull rods must be carefully adjusted to ensure that all four rail catches disengage simultaneously.

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DETAILS OF HOOD MECHANISM.

FIG. 1

SK. 174-363 (PART OF REPORT N92A.EE/894) FAIRLEY E104-77X150 TR. 77.2 CH. M. JENNINGS APP. for SofE 15.3.9

FIGS. 2 & 3

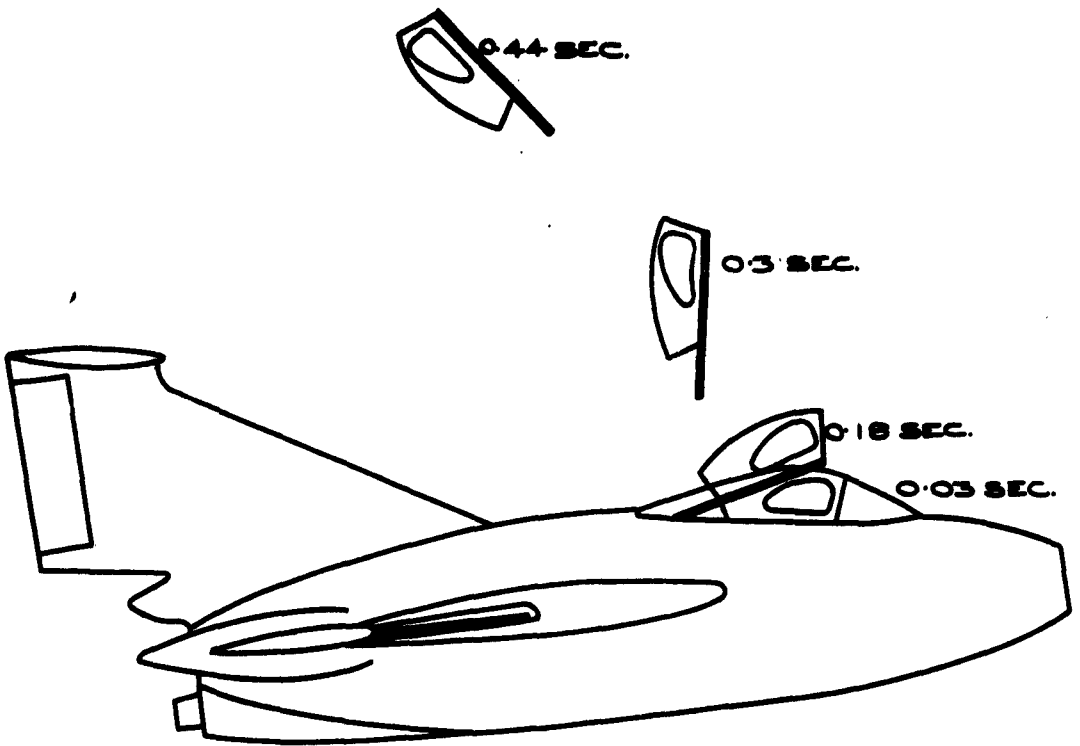


FIG. 2 TEST 1 200 KTS. NO YAW.

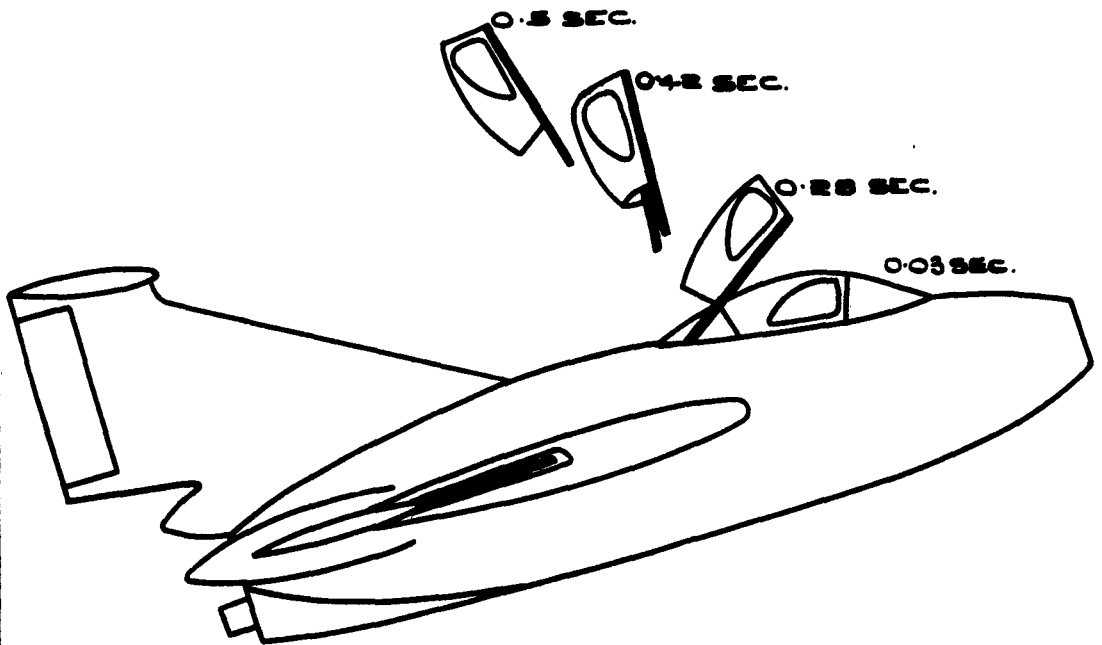


FIG. 3 TEST 2 135 KTS. NO YAW.

HOOD JETTISON TESTS.

FIG. 4

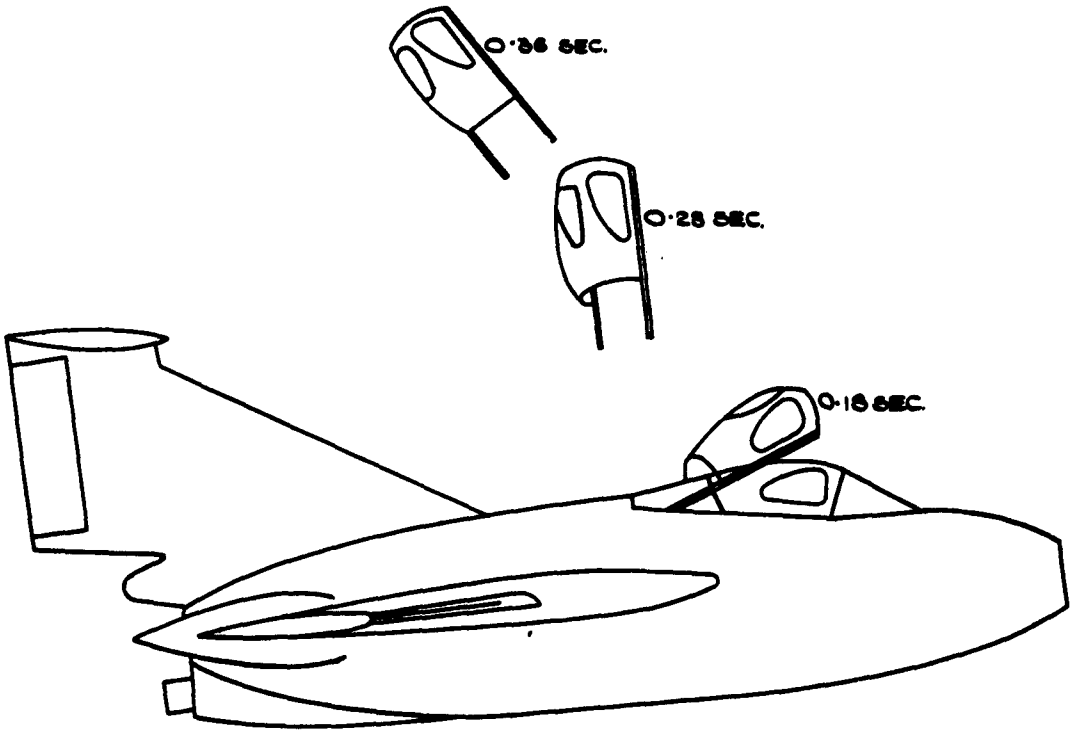


FIG. 4. TEST 3. 200 KNOTS. 10° YAW TO PORT.
(TIMES TAKEN FROM INITIAL MOVEMENT OF HOOD)

HOOD JETTISON TESTS

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Date of Search: 5 August 2008

Record Summary: AVIA 18/4491

Title: Fairey E10/47 VX.350 (Derwent 8): hood jettison tests in the Blower Tunnel
Availability Open Document, Open Description, Normal Closure before FOI Act: 30 years
Former reference (Department) 894 Pt 1
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