

Chapter 3 GUNNERY EQUIPMENT

LIST OF CONTENTS

DESCRIPTION	Para.	SERVICING	Para.
Introduction	1		
Front mountings	2	General	16
Rear mountings	3	Servicing creeper	17
Ammunition tanks	4	Door fasteners	18
Ammunition feed	6	Harmonization	19
Ejection	7		
Firing circuits	8		
Cocking	9		
Blast tubes	10		
Magazine carrier tie-rods	11		
Gun sight	12	General	20
Ciné camera	13	Blast tube seal	21
Gun heating	14	Left-hand forward blast panel	22
Access to guns	15	Gun recoil check	23
		Gun over-run check	24

LIST OF ILLUSTRATIONS

DESCRIPTION	Fig.	DESCRIPTION	Fig.
Gun mountings	1	Gun heating	5
Ammunition tanks and feed	2	Gun installation	6
Gun bay doors and nose fairings	3	Harmonization	7
Blast tube seal assembly	4		

DESCRIPTION

Introduction

1. The four No. 3, Mk. 5* Hispano 20 mm. guns are housed, together with their Mk. 5 belt feed mechanisms, in the fuselage beneath the cabin floor. The outboard guns are situated approximately $9\frac{1}{2}$ in. farther aft than the inboard guns. The guns are mounted in pairs and the gun bay is heated; access to the bay is gained via the port and starboard gun bay doors. Gun safety breaks are located in the ammunition bay aft of No. 2 bulkhead and access is gained via the starboard ammunition door. These gun safety break plugs are to be stowed in their respective stowages during all servicing and re-arming. Safety lock solenoids, mounted on the guns, prevent the forward move-

ment of the breech blocks. The locks are retracted when the armament master switch and guns safety switch are 'made' and the gun firing trigger pressed (*Sect. 5, Chap. 1*). Descriptive details for the guns and belt feed mechanisms are contained in A.P.1641F, and, for the firing gear, in A.P.1641E. Instructions for harmonizing, arming, re-arming and butt testing are given in A.P.(N) 1023 (7) and A.P.(N) 1024.

Front mountings

2. Fig. 1 illustrates one of the four front mountings. An inner and outer eccentric provides alignment for the guns. The inner eccentric has 20 equally spaced slots around

its periphery, and is screwed on to a buffer unit, which is housed in a recoil bearing housing bolted to the cannon beam. The outer eccentric screws into the recoil bearing housing and fits over the inner eccentric. When the gun has been correctly aligned, the inner eccentric is secured to a lock plate by two screws. Locking of the inner eccentric to the outer eccentric is effected by the leg of a locking tab engaging in one of the periphery slots. The locking tab is held in position by a clamp plate and two bolts, the heads of which are wire-locked. An alignment indicator, secured by a Jubilee clip, has its pointer coinciding with the centre-line on the clamp plate.

Rear mountings

3. Each rear mounting (*fig. 1*) consists of an inverted 'U' shaped bracket hinged on an attachment fitting on the cannon floor, and capable of free reciprocal movement when the recoil takes place. Attached to each rear mounting is a gun lowering lanyard which operates the magazine catch when the gun is lowered.

Ammunition tanks

4. Two ammunition tanks (*fig. 2*) are mounted above the guns between No. 2 and 3 bulkheads. Each tank is partitioned transversely to form a forward compartment for the inboard gun and rear compartment for the outboard gun. Each compartment will hold approximately 150 rounds of ammunition making a total of approximately 600 rounds in all. The ammunition belt is fed over rollers at the top of each compartment and thence, down vertical chutes to the B.F.Ms.

5. Hinged doors in the port and starboard sides of the fuselage immediately aft of No. 2 bulkhead, give access for ammunition loading. A hinged tubular frame, secured by quick-release catches over each compartment, retains the ammunition in the tanks.

Ammunition feed

6. After passing over the roller at the top of each ammunition compartment, the belt is fed down a vertical chute (*fig. 2*), integral with the compartment, through a detachable chute to the B.F.M. on each gun. Incorporated in each detachable chute is a hinged flap which allows the belt to be made or broken as required during re-arming.

Ejection

7. The gun bay doors (*fig. 3*) incorporate empty case chutes which are aligned with the ejection openings on the guns. Separate ejector chutes, also built into the gun bay doors and adjacent to the empty case chutes, are aligned with the empty link chutes from the B.F.Ms.

Firing circuits

8. Full details of the electrical firing circuits are given in Sect. 5, Chap. 1.

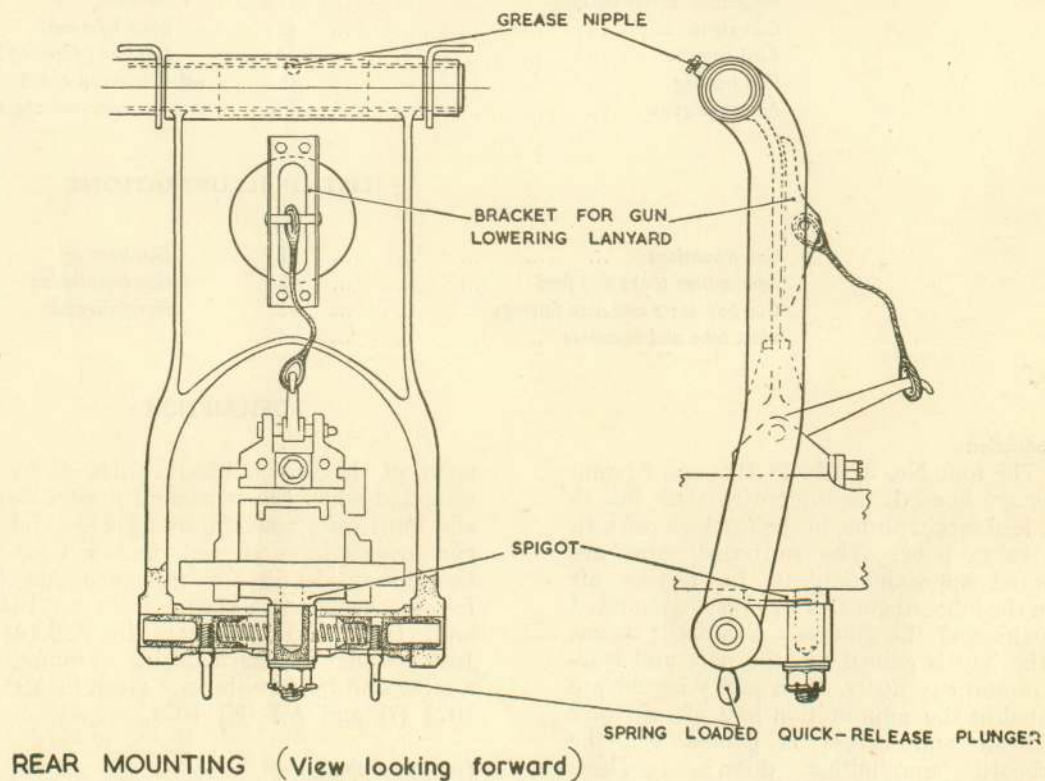
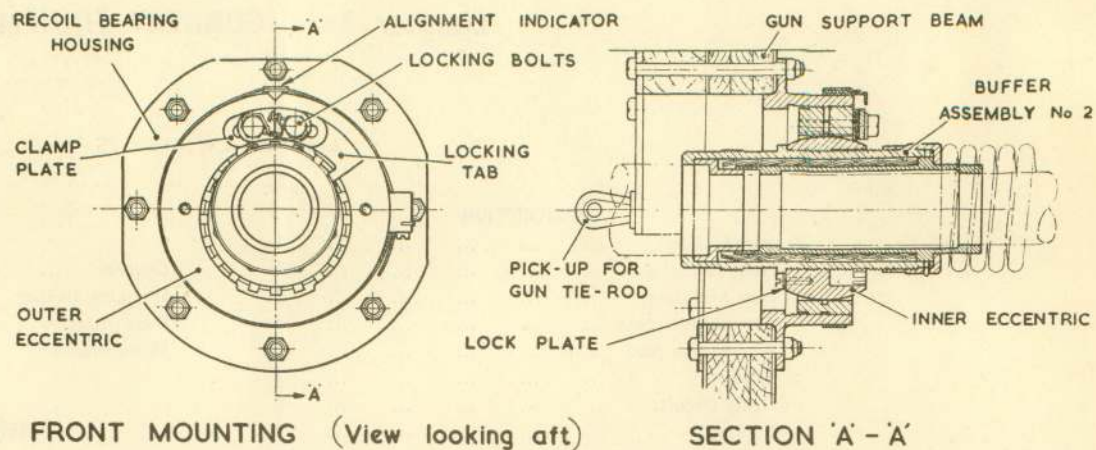


Fig. 1. Gun mountings

The tie-rod should be adjusted to obtain the correct clearance between the rack operating lever and the rack. The forward attachment fork end bolt of each tie-rod passes through the gun beam and constitutes one of the front mounting attachments bolt (fig. 1 and 6).

Gun sight

12. The Mk. 5 gyro gun sight is positioned on the port side of the cabin immediately above the instrument panel. Its mounting can be electrically-retracted, the selector switch being positioned to the right of the gun sight unit. An emergency retraction control is fitted adjacent to the selector switch. The G.G.S. datum line is parallel to the aircraft datum and the gun centre lines, and also laterally level, within the permitted tolerance in each case. Installation details of the G.G.S. are fully described in Sect. 5 and a description of the Mk. 5 gun sight together with servicing instructions, are given in A.P.1275E, Vol. 1.

Ciné camera

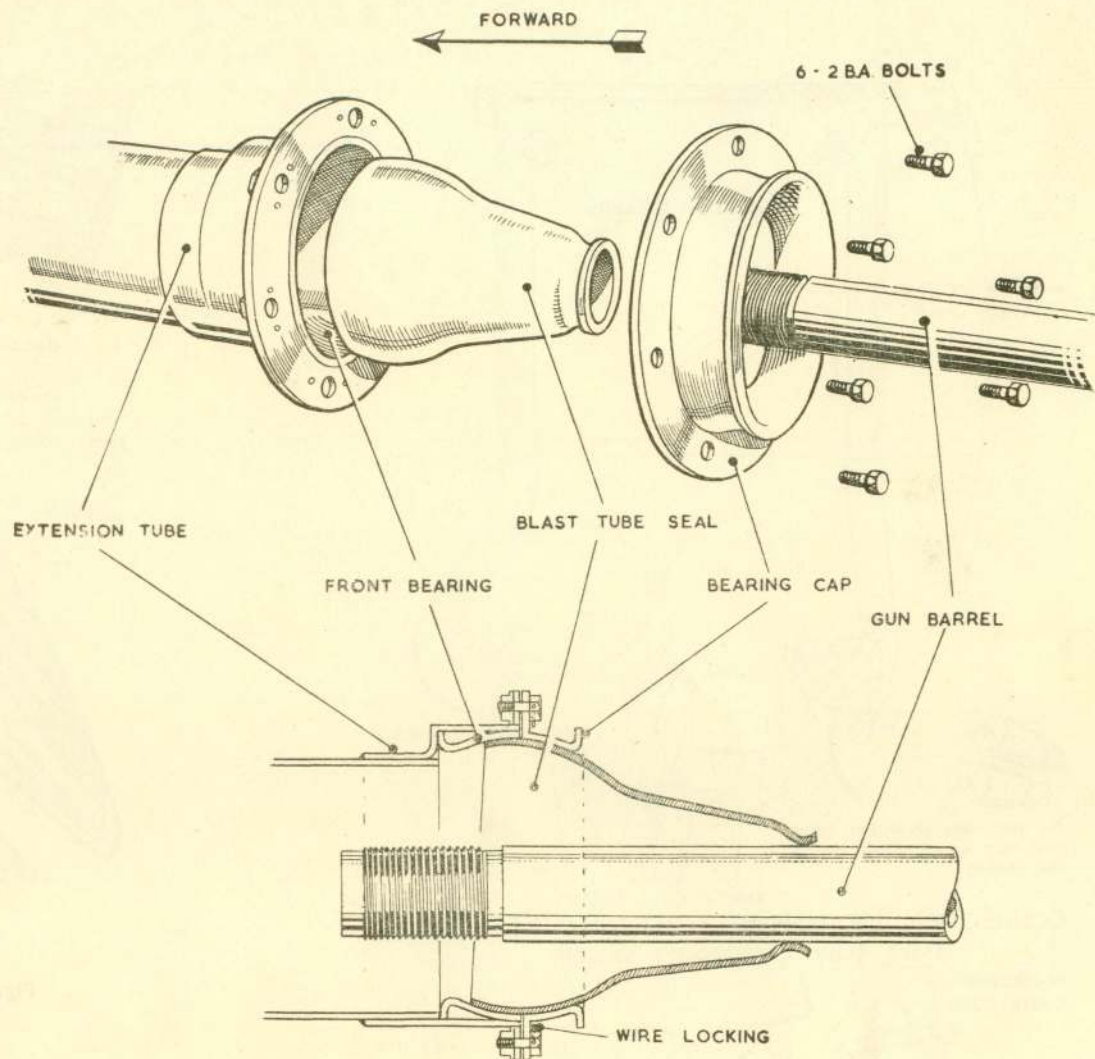
13. The G.45 ciné camera is mounted on a pylon beneath the port main plane inboard of the port undercarriage leg. It is operated electrically, and may be operated independently or when the guns are fired. The circuit is illustrated in Sect. 5 and the camera and its associated components are described in A.P.1355D, Vol. 1. For harmonization of the camera with the guns and gun sights, refer to A.P.(N) 1023 (7) and A.P. (N) 1024.

Gun heating

14. The gun bay is heated with warm air supplied from the engine diffuser casing. From a tapping off the front starboard side of the casing, the air is directed through a duct on the starboard side of the gun bay to distributors and thence to the guns (fig. 5).

Access to guns

15. Access to the guns is gained from the underside of the aircraft by opening the two gun bay doors. Each door is hinged at its outboard edge by three hooks which engage with hinge brackets fitted to the fuselage. The doors are secured by three de Havilland type toggle fasteners mounted on the star-



SECTION THROUGH ASSEMBLY

Fig. 4. Blast tube seal assembly

board door which engage with corresponding stirrups on the port door. Access to the gun muzzles and front mounting units is gained by removal of the nose fairings.

Note . . .

It is possible for the fasteners on the gun bay doors to appear to be secured, without in fact the hooks being engaged over the stirrups. It is

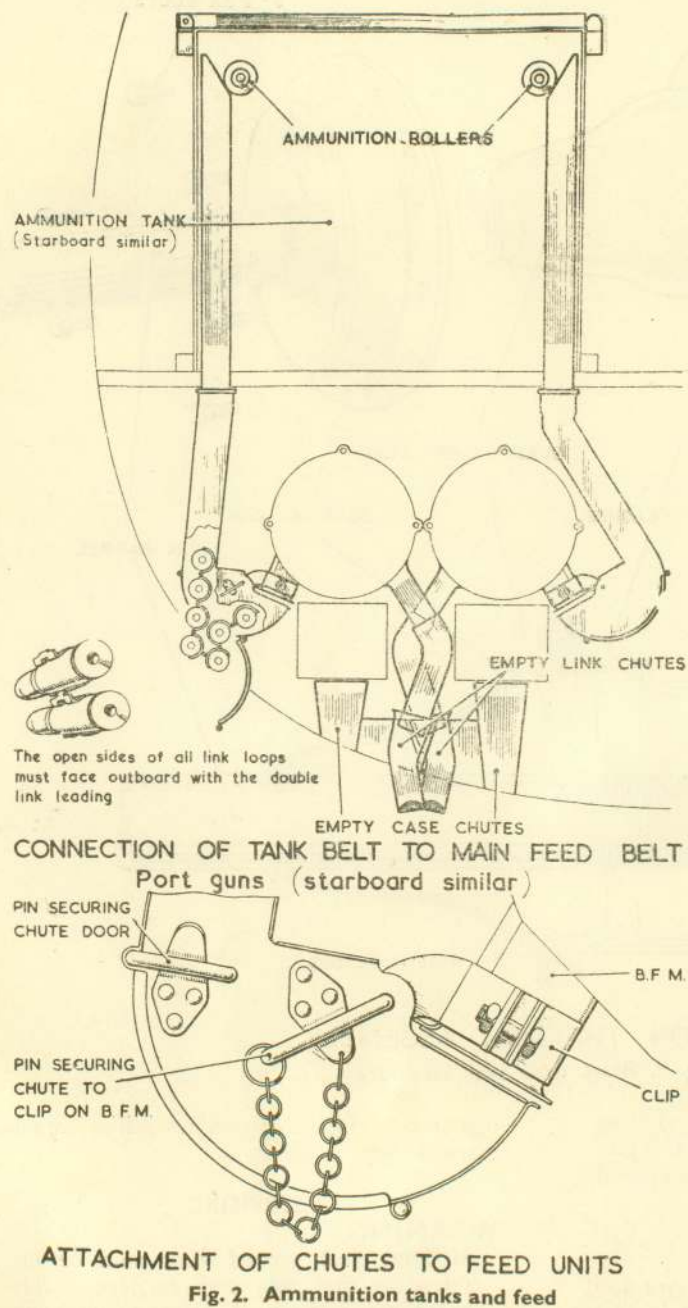
essential to follow the proper fitting sequence given in Sect. 2, Chap. 4.

SERVICING

WARNING

Alighting gear ground locks must be inserted in the main undercarriage radius rods (Sect. 2, Chap. 1), before commencing work beneath the fuselage. To minimise the

RESTRICTED



The open sides of all link loops must face outboard with the double link leading

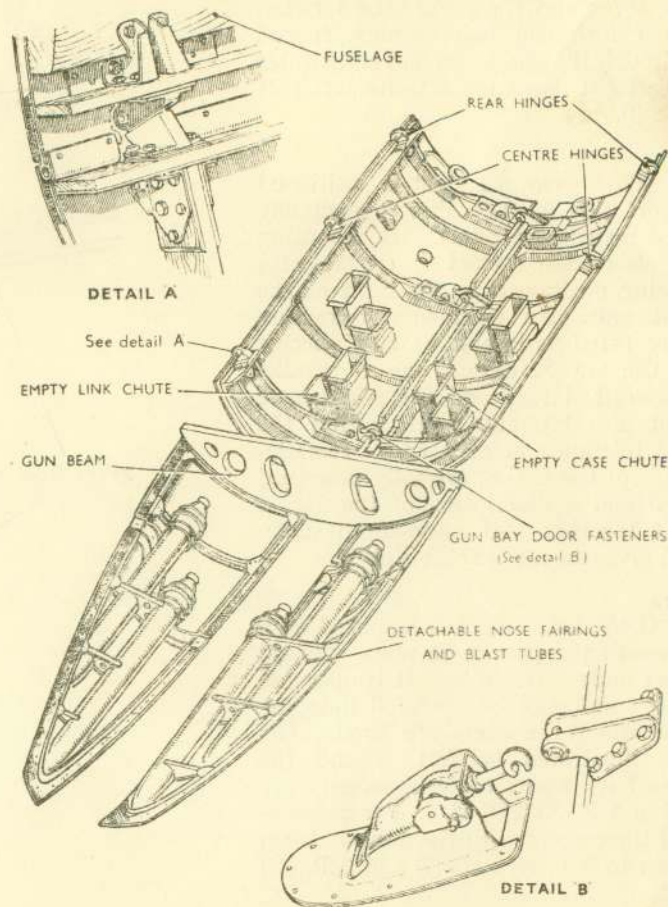


Fig. 3. Gun bay doors and nose fairings

Cocking

9. The guns are cocked with a No. 11 hand cocking unit. Details of its application are given in A.P. (N)1024.

Blast tubes

10. The blast tubes are built integral with the detachable nose fairings (fig. 3); extension tubes,

incorporating eccentric blast tube seals, fit over the forward ends of the gun barrels (fig. 4).

Magazine carrier tie-rods

11. A tie-rod is fitted to each gun, the forward end being attached to a fork end on the gun beam and the rear end to the magazine carrier; it maintains the B.F.M. in a rigid position during recoil of the gun. In each case, the tie-rod is mounted on the outboard side of the gun and is adjustable.

(A.L.60, Mar. 58)

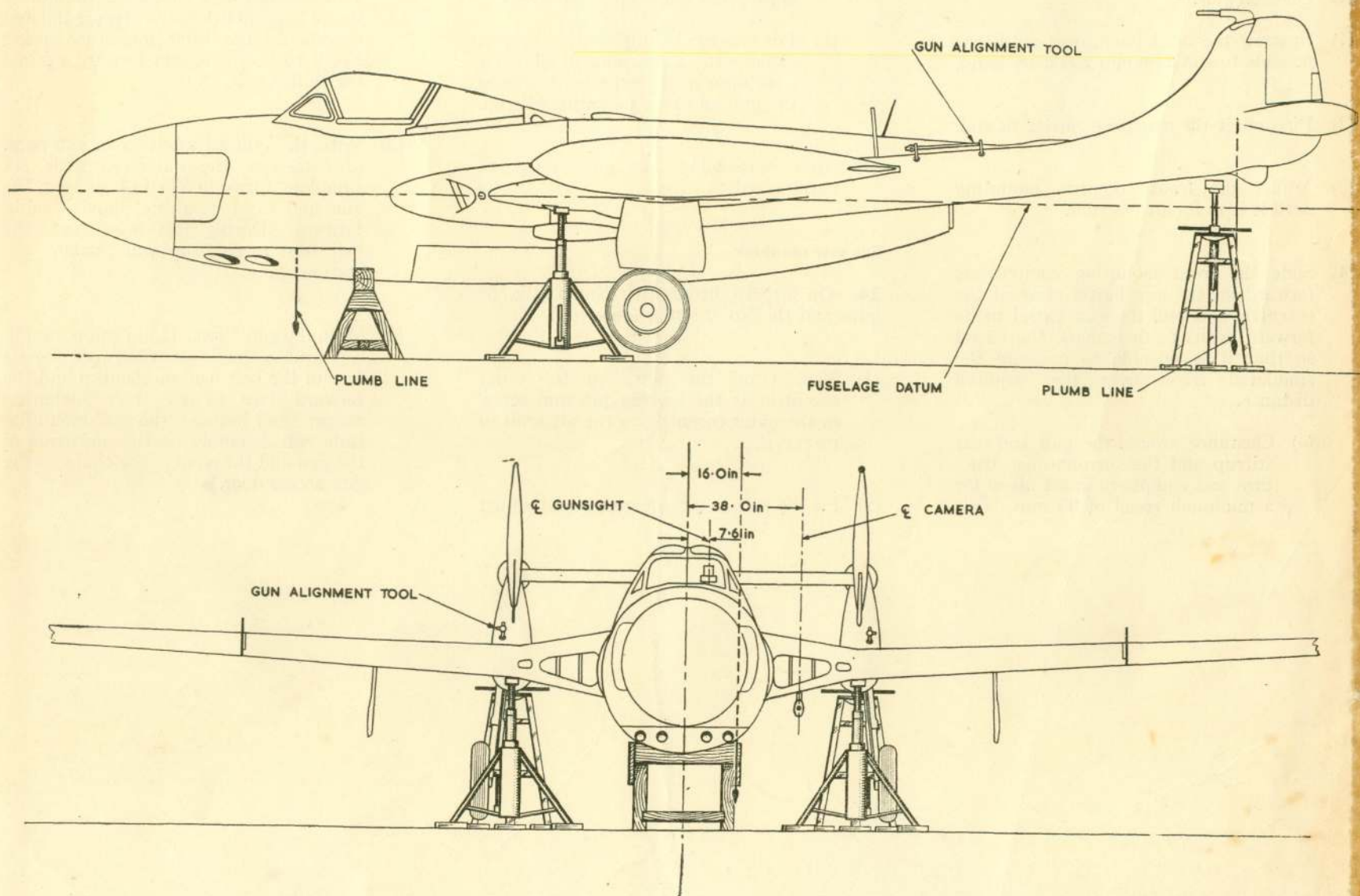


Fig. 7. Harmonization

RESTRICTED

◀ **Gun recoil check**

23. On each gun:—

- (1) Unscrew the front mountings until it is possible to simulate gun recoil by hand.
- (2) Disconnect the magazine carrier tie-rod.
- (3) Adjust the front eccentric mounting until it is in its aft position.
- (4) Slide the front mounting components forward on the gun barrel clear of the eccentric and pull the gun barrel to its forward position, then mark the barrel so that it is possible to measure the simulated recoil over the required distance.
 - (a) Clearance around the gun and rear stirrup and the surrounding structure and equipment must allow for a minimum recoil of 35 mm. This

check must be made on the port and starboard guns separately with the appropriate gun bay door *closed*.

- (b) For non-rigid equipment, i.e., pipes, cables, etc., a clearance to allow for a 45 mm. recoil must exist around the gun and rear mounting stirrup.
- (5) After reassembly, the guns must be harmonized.

Gun over-run check

24. On aircraft fitted with No. 3, Mk. 5* guns and the No. 2 buffer unit:—

- (1) Slacken off the bolts on the outer eccentric at the locking tab and screw in the outer eccentric to the aft limit of its travel.
- (2) Fit the belt feed mechanisms and adjust

the magazine carrier tie-rods to give a rack operating clearance of 0.085 in. When setting this clearance, the gun is to be assembled fully with sufficient tension on the front mounting spring No. 3 to keep the gun forward against the buffer unit.

- (3) With the gun adjusted as in sub-para. (2), unscrew the outer eccentric six complete turns (0.375 in.) so that the gun and front mounting moves bodily forward. During this movement, the belt feed mechanism will remain stationary.
- (4) With the gun forward as in sub-para. (3), a clearance should exist between the aft face of the belt feed mechanism and the forward face of the rear mounting stirrup, and between the rear mounting slide bolt assembly on the underside of the gun and the empty case chute on the gun access door. ▶

RESTRICTED

This file was downloaded
from the RTFM Library.
Link: www.scottbouch.com/rtfm

Please see site for usage terms,
and more aircraft documents.

