

Chapter 2

EJECTION GUN AND DROGUE FIRING GUN

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EJECTION GUN

Function

1. The ejection gun (*fig. 1*), which provides the power for the ejection of the seat and occupant from the aircraft, consists of a pair of telescopic tubes with a stroke of 42 in. The outer or cylinder tube is attached at its lower end to the bottom mounting block fixed in the guide rail; the inner or piston tube is attached at its upper end to the top cross-beam of the seat frame. The explosive is contained in two cartridges; a primary cartridge (Stores Ref. 12D/1170) which is percussion fired by the action of pulling out the face screen, and a secondary cartridge (Stores Ref. 12D/1183) which is fired by the flame of the primary cartridge. The primary cartridge is housed in the firing body at the upper end of the piston tube, and the secondary cartridge is housed towards the lower end of the cylinder tube.

2. When the face screen has been withdrawn approximately 12 in., the firing cable attached to the face screen pulls the wedge-shaped sear out of the firing body. The movement of the sear first compresses the firing spring and then releases the firing pin to strike the percussion cap of the primary cartridge.

3. The gas pressure developed by the primary cartridge presses down the release piston, thus freeing the piston tube from the cylinder tube, and as the gas pressure rises, it propels the piston tube upwards until, after 10 in. of travel, the piston skirt uncovers a port in the cylinder tube wall, through which the flame passes to ignite the secondary cartridge which assists in the propulsion. After 42 in. of travel, the cylinder and piston tube separate, the cylinder tube remaining attached to the guide rail in the aircraft, and the piston tube remaining attached to the ejected seat.

Cylinder tube

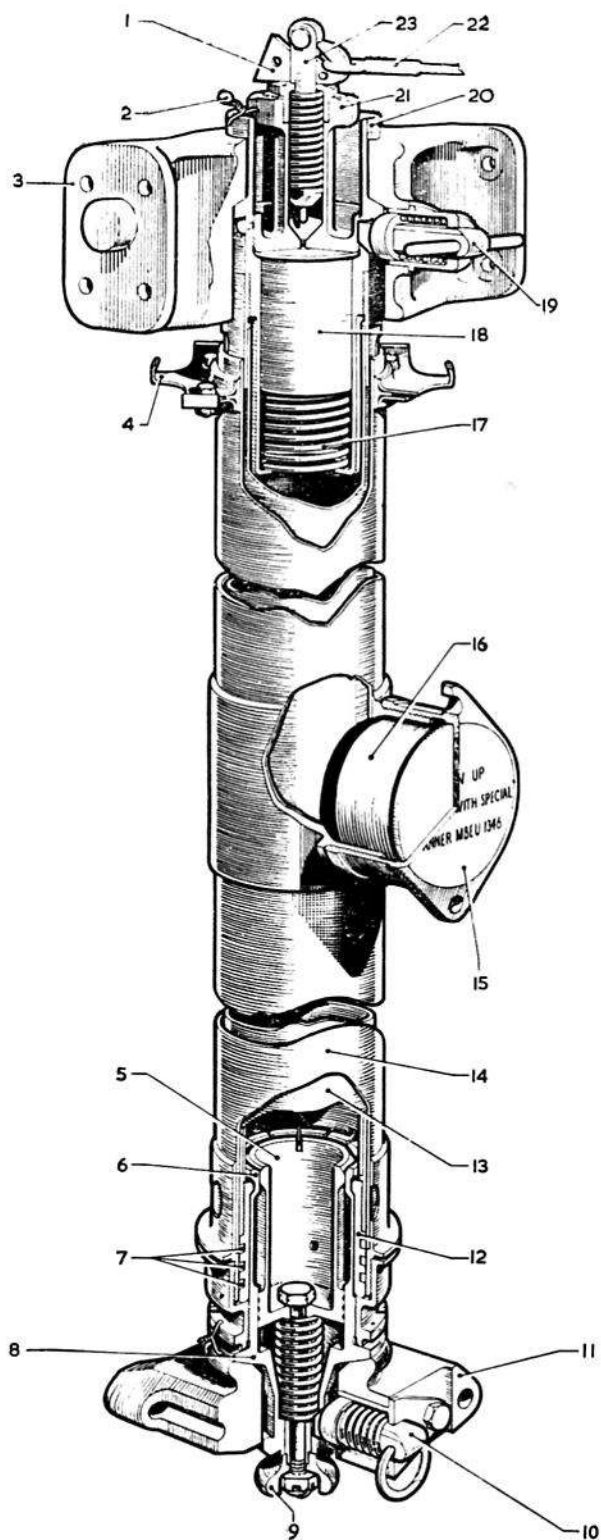
4. This is a thin-walled steel tube with an accurately lapped bore. When dismantled, it must be handled carefully. Towards its upper end is a centralising clip to keep the gun central in the guide rail when the seat frame is installed in the aircraft. The secondary cartridge is retained in its housing by the secondary cartridge cover (15, *fig. 1*), locked by a sealed locking wire, and is accessible through a sliding panel in the seat pan when the latter is in its lowest position.

5. The release mechanism at the bottom end of the cylinder tube consists of the release piston (5), the cylinder head (8) and the piston skirt (12). The two latter are locked together by the release piston which is retained in position by a spring below it. The external ring of the release piston expands the spring tabs (6) of the slotted portion of the cylinder head so that they engage an internal collar in the piston skirt. The initial gas pressure causes the release piston to move downwards, thus allowing the locking tabs of the cylinder head to close inwards and disengage the piston skirt. The piston skirt may be unlocked manually by pulling out the release button (9). Similarly the piston tube can only be returned to the locked position after the release button has been withdrawn.

6. The ejection gun is retained at the bottom mounting block (11) by the bottom latch (10) and can be released by a pull on the ring provided.

Piston tube

7. This is of similar construction to the cylinder tube and when dismantled must be handled carefully. At its lower end is the piston skirt, provided with three rings, and at its upper end is the breech into which is screwed the firing body.



- 1 SEAR
- 2 FIRING BODY LOCKED TO BREECH
- 3 TOP BEAM
- 4 CENTRALISING CLIP
- 5 RELEASE PISTON
- 6 LOCKING TABS
- 7 PISTON RINGS
- 8 CYLINDER HEAD
- 9 RELEASE BUTTON
- 10 BOTTOM LATCH
- 11 BOTTOM MOUNTING BLOCK
- 12 PISTON SKIRT
- 13 PISTON TUBE
- 14 CYLINDER TUBE
- 15 SECONDARY CARTRIDGE COVER
- 16 SECONDARY CARTRIDGE
- 17 CARTRIDGE SPRING
- 18 PRIMARY CARTRIDGE
- 19 TOP LATCH
- 20 BREECH
- 21 FIRING BODY
- 22 FIRING CABLE ATTACHMENT
- 23 FIRING PIN
- 24 SECONDARY CARTRIDGE COVER LOCKING

Fig. 1. Ejection gun assembly

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Firing body

8. The breech is permanently screwed into the piston tube; it is locked by peening and should not be removed. The breech houses the primary cartridge spring and cartridge which are held in position by the firing body. When unscrewed, the firing body gives access to the primary cartridge, which is then pushed upwards by the spring to facilitate removal.

DROGUE GUN

Function

9. The drogue gun (*fig. 2*) is attached to the port side beam of the seat structure by two quick-release clamps and, when the delay mechanism is operated by the static line, after approximately ^{8.5}one second's delay, the gun is fired and ejects the drogue piston; this draws the drogue out of its container and enables it to develop freely without becoming entangled with the seat. The ejection of the piston is effected by a small cartridge which is fired by a striker pin.

Firing mechanism

10. As the seat ascends the guide rail, the static line withdraws the sear and the release plunger,

which allows the gear train to operate under pressure from the spring. After ^{0.5}one second's delay, ^{A-23}a rack is disengaged from the spur wheel, thus freeing the striker pin which detonates the cartridge.

Barrel and piston

11. The barrel contains the cartridge (Stores Ref. 12D/1171) which is lightly held in place for convenience by a retaining clip. The barrel, complete with cartridge, screws into the gun body and is secured by 20 S.W.G. non-corrodible steel wire.

12. The drogue piston, to which the drogue withdrawal line is attached by the quick-release pin, is retained in the barrel by a $\frac{1}{16}$ in. split pin which is sheared by the explosion of the cartridge. This shear pin is an essential part of the mechanism of the drogue gun, as the shearing force required allows a definite predetermined pressure to be built up in the gun before the piston starts to leave the barrel. If it were omitted, the drogue gun would not be withdrawn correctly from the container.

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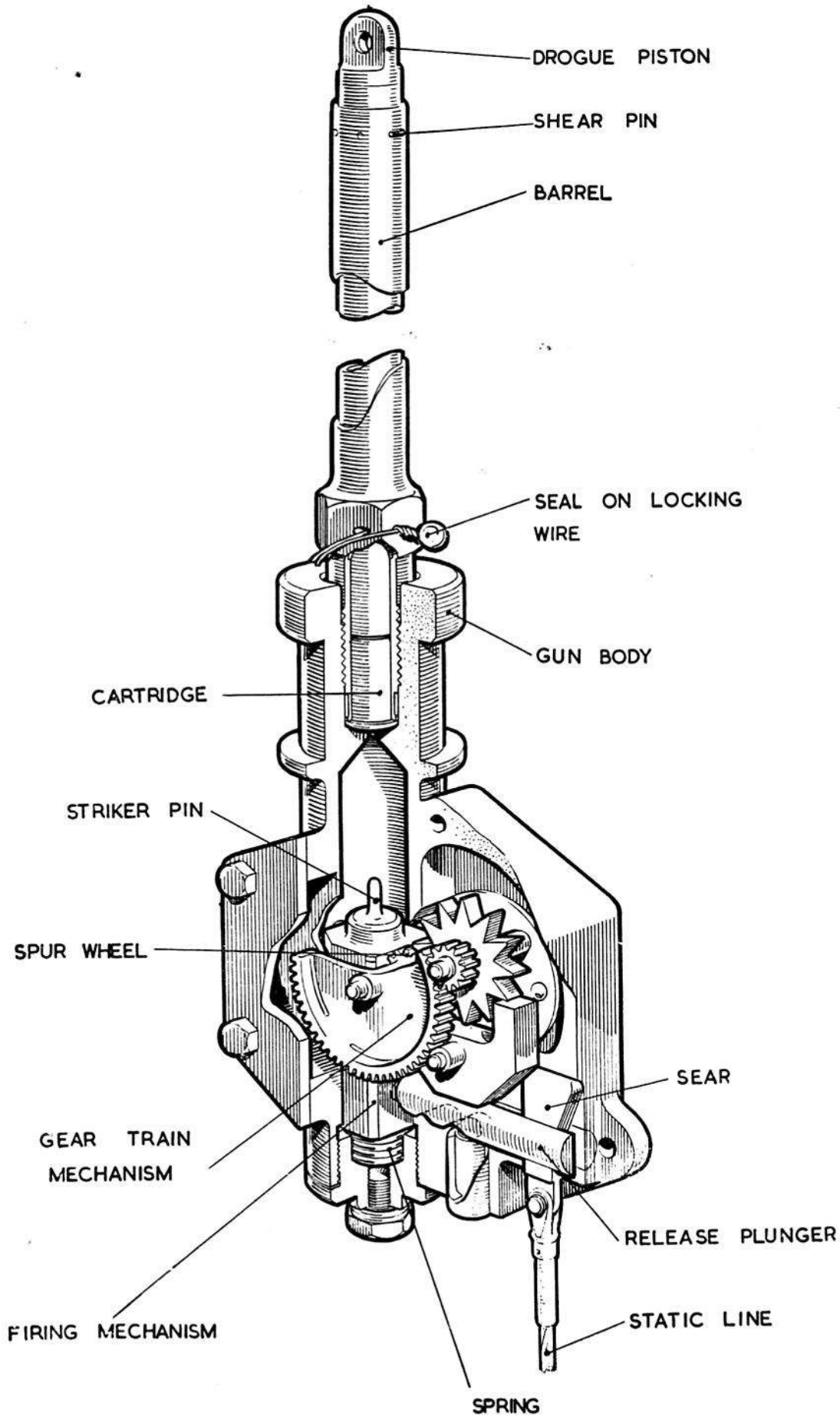


Fig. 2. Drogue gun assembly

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