Chapter 1
GROUND HANDLING

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LIST OF ILLUSTRATIONS

WARNING . . .
Before entering or leaning over the cockpit for any purpose, personnel must ensure the ground safety of the ejection seats by applying the instructions given in the ejection seat warning in Sect.1, Chap.1 of this handbook.

JET WARNING . . .
When the aircraft is being manoeuvred on the ground with the engines running, or when an engine is being run for any purpose, it is essential that personnel are given strict instructions to keep well clear of the air intakes and jet exhausts, as to remain in proximity is to hazard their safety.

Fig.1 shows the danger area for all Mk.1 aircraft. Personnel and mechanical transport must not enter the shaded area when an engine or engines are running. Buildings must be at least 800 ft. from the rear of the aircraft. Personnel may walk with safety beneath the air intakes during engine running, the danger areas being confined to a 15 ft. radius in the same horizontal plane as the intakes.

Introduction

1. Information on the general handling of the aircraft is given in this chapter. The equipment necessary for ground handling is listed in Chapter 4 of this section.

TOWING

NOTE...
During ground handling of the aircraft the following precautions must be observed:-

(1) When moving the aircraft by any method all engine doors must be closed.

(2) A competent person must be detailed to occupy the pilot's seat and apply the brakes when told to do so.

(3) SUFFICIENT PRESSURE IS STORED IN THE BRAKE ACCUMULATORS, WHEN FULLY CHARGED, FOR A MAXIMUM OF EIGHT FULL APPLICATIONS OF THE BRAKES. A CHECK SHOULD BE MADE ON EITHER:-

(a) THE ACCUMULATOR PRESSURE GAUGES IN THE NOSE WHEEL BAY.

(b) THE TRIPLE PRESSURE GAUGE ON THE PILOTS' CENTRE INSTRUMENT PANEL.

BEFORE THIS NUMBER IS REACHED AND, IF THE PRESSURE IS BELOW 3,000 p.s.i. THE ACCUMULATORS SHOULD BE RECHARGED.

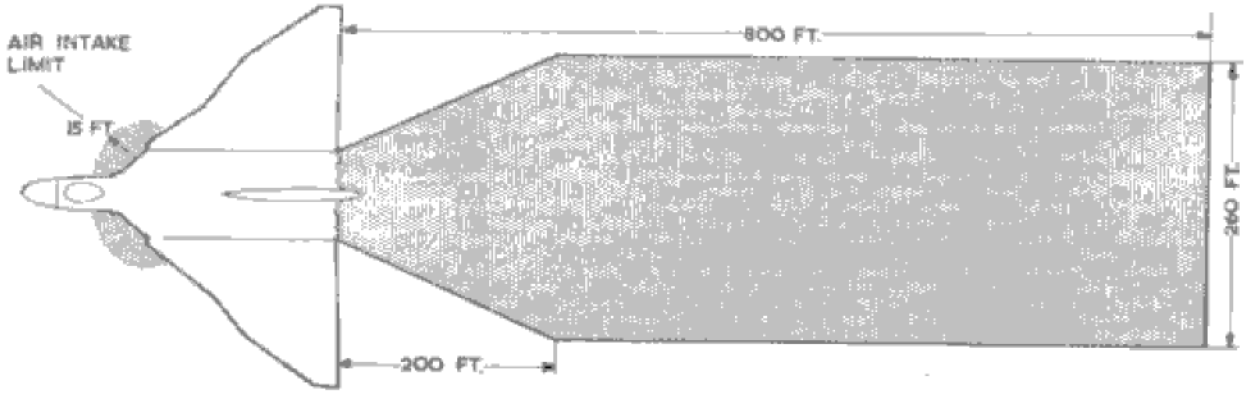


Fig. 1. Danger areas

2. Normally the aircraft is towed forward (fig.2) from a lug on the nose-wheel unit body, with a steering adapter attached to the nose-wheel axle using a towing bar Ref.No.26DC/95000. The towing arm can also be used to push the aircraft rearward provided the following conditions are strictly adhered to:-

(1) Aircraft all-up weight not to exceed 160,000 lb.

(2) On hard ground with gradients not exceeding 1 in 66.

(3) The towing arm angle to the aircraft centre line must not exceed 5 deg. each side of the aircraft.

(4) The towing vehicle speed must not exceed 2 m.p.h.

NOTE . . .
When pushing the aircraft rearward the movement from the 'rest' position must be smooth, care must be exercised to ensure that no jerking occurs.

3. The aircraft is towed backwards (fig.3) by attaching a V-type bridle (Ref.No.26DC/95003), fitted with link plates and quick-release pins, to the inboard eye-end on each main-wheel strut; when towing from the main wheels, the aircraft is steered with a steering arm (Ref.No.26DC/95001) attached to the nose-wheel axle.

4. Intercommunication between the pilot's position and the towing vehicle may be used by means of an intercommunication cable, one end of which is plugged into the socket provided on the nose-wheel unit, and the other to the towing vehicle. The tractor driver will decide when the aircraft brakes are to be applied and will instruct the person in the cockpit seat through the intercommunication system. Only in an emergency may the aircraft brakes be applied without prior instructions from the tractor driver or applied before the aircraft has ceased to move.

5. The steering arm must not be turned through an angle greater than 47·25 deg. as indicated by a red line on each side of the fuselage nose; the minimum turning circle has a radius of 28 ft. measured between the aircraft centre line and the centre point of the circle.

6. Provided that the requirements in in para.5 are fulfilled, the aircraft may be manoeuvred using a bridle (Ref.No.26DC/95002) attached to both lugs on each main-wheel leg. Attach the bridle to one leg which is towed forward or rearward and a similar bridle to the opposite leg which is towed in the same direction, the inner leg being towed more slowly to maintain the required turning angle.

PICKETING

7. When an aircraft is being picketed after landing, the parking brake must not be left in the ON position until the temperature of the wheels has fallen to approximately that of the surrounding atmosphere.

8. Equipment provided for picketing the aircraft is as follows:-

Item	Ref.No.
Chocks, main wheels	4GB/5890
Locking bar, main wheels	4GB/5891

Item	Ref.No.
Chocks, nose wheels	4GB/5892
Locking bar, nose wheels	4GB/5893
Locking bar, nose picketing	26DC/95203
Bracket attachment picketing main undercarriage port and stbd.	26DC/95243
Cables picketing, main undercarriage	26DC/95240

9. The aircraft must, where possible, be picketed facing into wind with all wheels chocked and interlocked fore and aft. It is permissible to park nose to wind with all wheels chocked and interlocked at all weights, at wind speeds up to 80 knots. To park the aircraft other than nose into wind in wind speeds above 40 knots, or, if a fall of snow is anticipated, it is recommended that the aircraft be secured to a picketing base as shown in fig.5.

10. When parking the aircraft off the picketing base when snow is falling, or is imminent, the following information is given: with the aircraft empty the depth

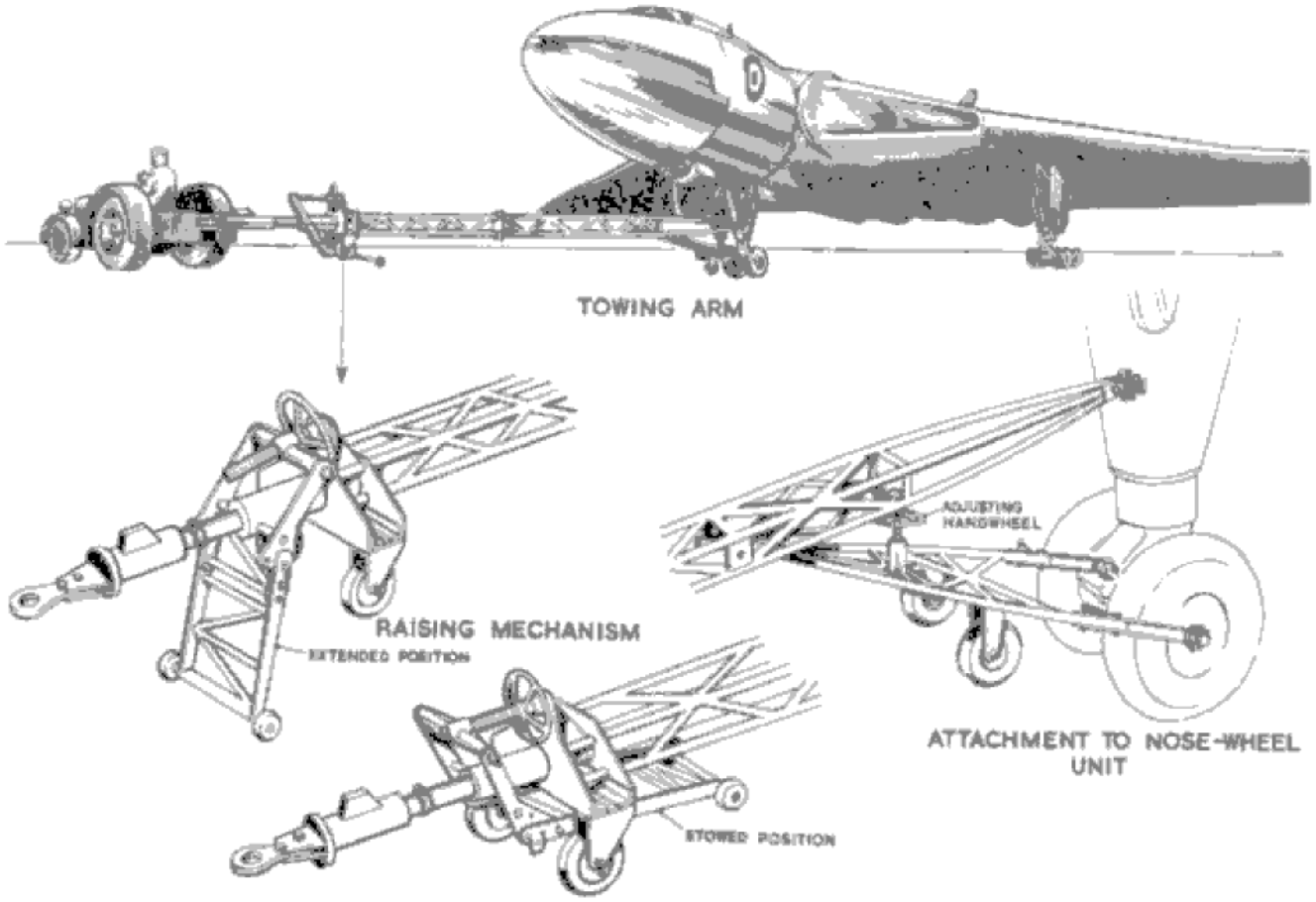


Fig.2 Forward towing

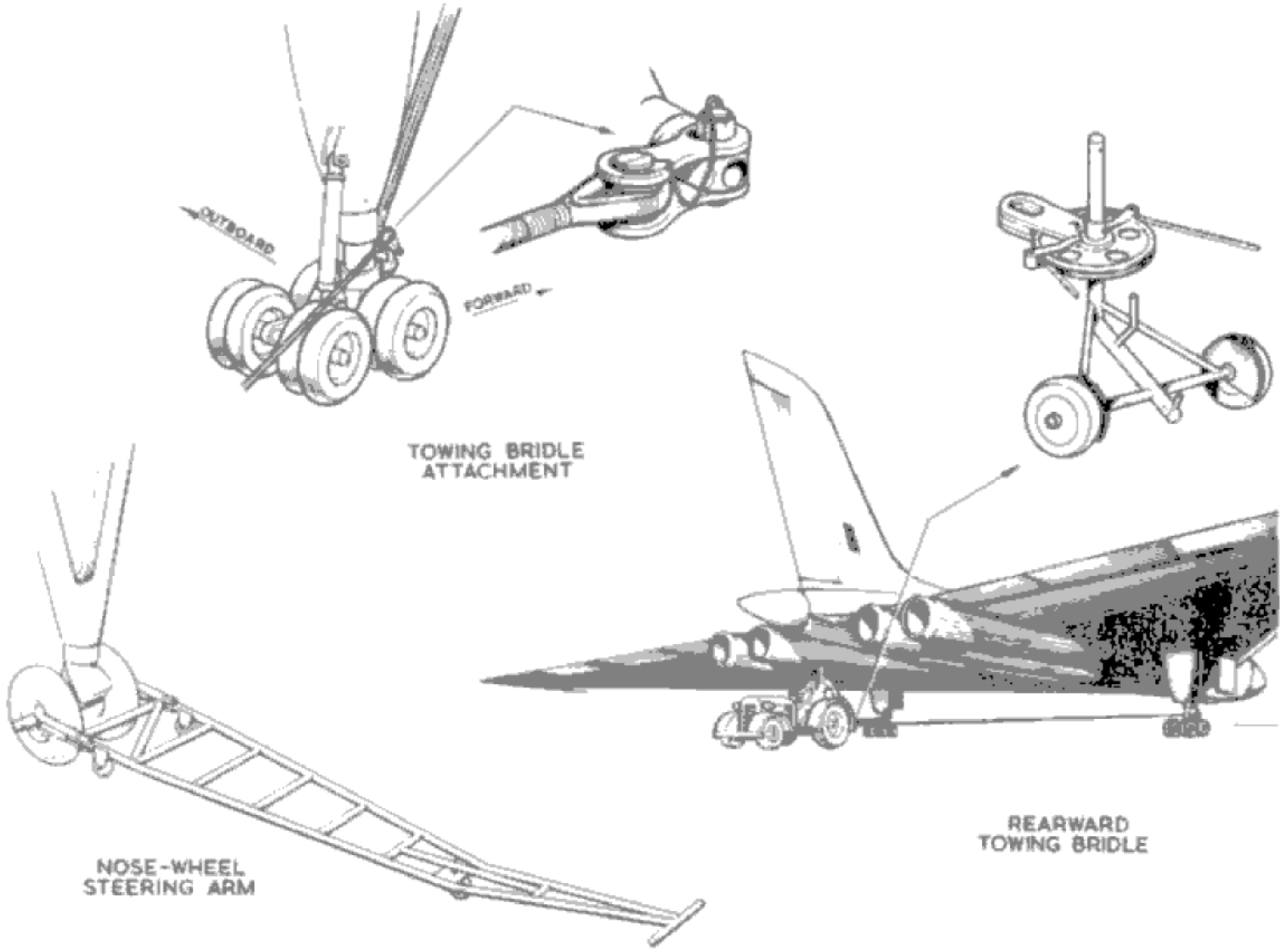


Fig. 3. Rearward towing

of snow over the surface of the wing must not exceed 6 in. wet or 18 in. dry. With a full fuel load the depth must not exceed 10 in. wet or 26 in. dry. Allowances must be made for the effects of, the snow drifting rearwards and the wind speed when the snow is falling.

11. For windspeeds in excess of, 45 knots in icy conditions, 70 knots on wet concrete or asphalt and 80 knots on dry concrete, the main-wheel and nose-wheel units must be secured to a picketing base as shown in Fig.5. Careful manoeuvring of the aircraft will be necessary to position the aircraft correctly over the picketing points. The hook on the nose wheel unit may be positioned on either side of the jacking block, whichever is directly above the picketing point, and the locking bar tightened until it is just in tension. Sufficient slack should be left in the cables to permit the aircraft to ride to the full extension of its alighting gear. When the alighting gear is fully extended the picketing attachment on the main alighting gear is approximately four feet above the ground.

CONTROL SURFACE LOCKS

12. No control surface locks are provided. A valve incorporated in the power control unit forms a closed circuit across the hydraulic ram, this, combined with the action of the damper valve sufficiently dampens the power control units to prevent excessive flying control surface movement.

GROUND SAFETY LOCKS AND STRUTS

13. Before any ground handling is commenced, the alighting gear ground safety locks and struts must be in position and must only be removed immediately prior to flight. The alighting gear locking arrangements, illustrated on fig.6, consist of a hinged tubular strut (Ref.No.26DC/95084) fitted over the nose-wheel unit retracting jack piston between the jack body and the piston rod end fitting, and a jury strut (Ref.No.26DC/95081) fitted and held in position with quick-release pip-pins between lugs on the main-wheel unit body casting and the universal joint at the lower end of the bracing tube assembly.

14. When the aircraft is being serviced, the engine bay centre doors only may be opened. Before opening any doors, jury struts (Ref.No.26DC/95006) must be positioned in the main-wheel bays as illustrated on fig.6.

15. Stowage brackets are provided in each main-wheel bay for the wheel and the bay jury struts, and in the nose-wheel bay for the nose wheel strut.

LOCKING GUARD - BOMB DOORS

16. To prevent inadvertent closing of the bomb doors, a removable guard (Ref.No.26DC/95054) is provided for the bomb door selector switch; before the guard is fitted the bomb door emergency switch must be set to NORMAL and the bomb door selection switch to OPEN. The guard must be fitted immediately after opening the bomb doors when the aircraft is on the ground and must remain in position at all times when personnel are working in the vicinity of the bomb bay.

17. When not in use, the guard is stowed in brackets on the starboard side of the cabin above the main entrance door.

CANOPY RELEASE HANDLE

18. On each side of the canopy rail, a quick-release pip-pin is stowed adjacent to the control lever. To avoid inadvertent opening of the canopy, the pin is to be removed, when the aircraft is on the ground, and inserted into the hole in the control lever quadrant.

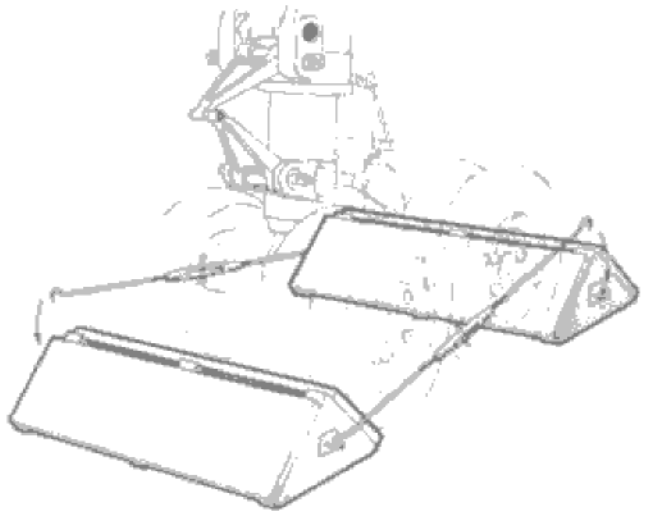


Fig.4. Main-wheel chocks

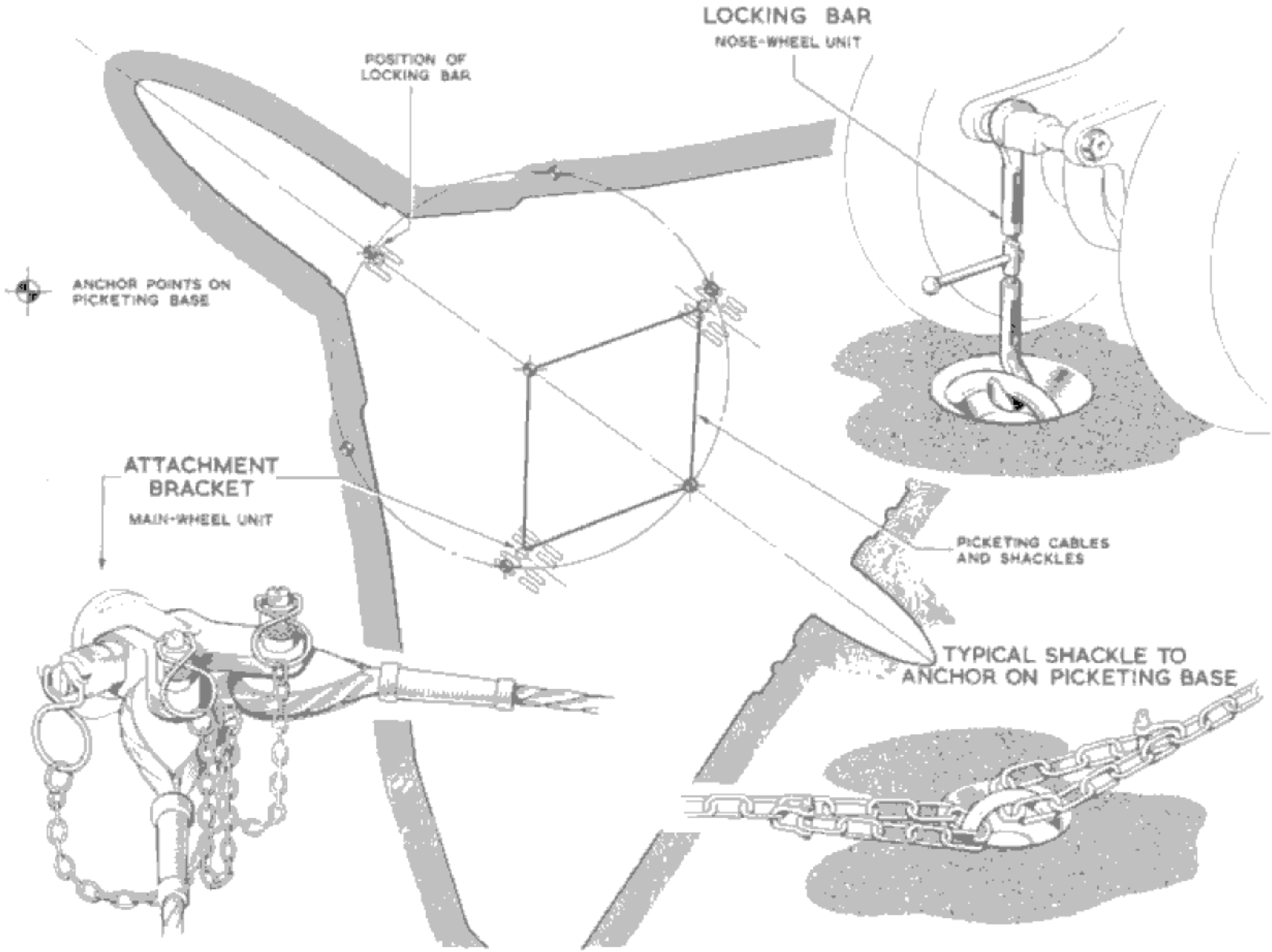


Fig. 5. Picketing

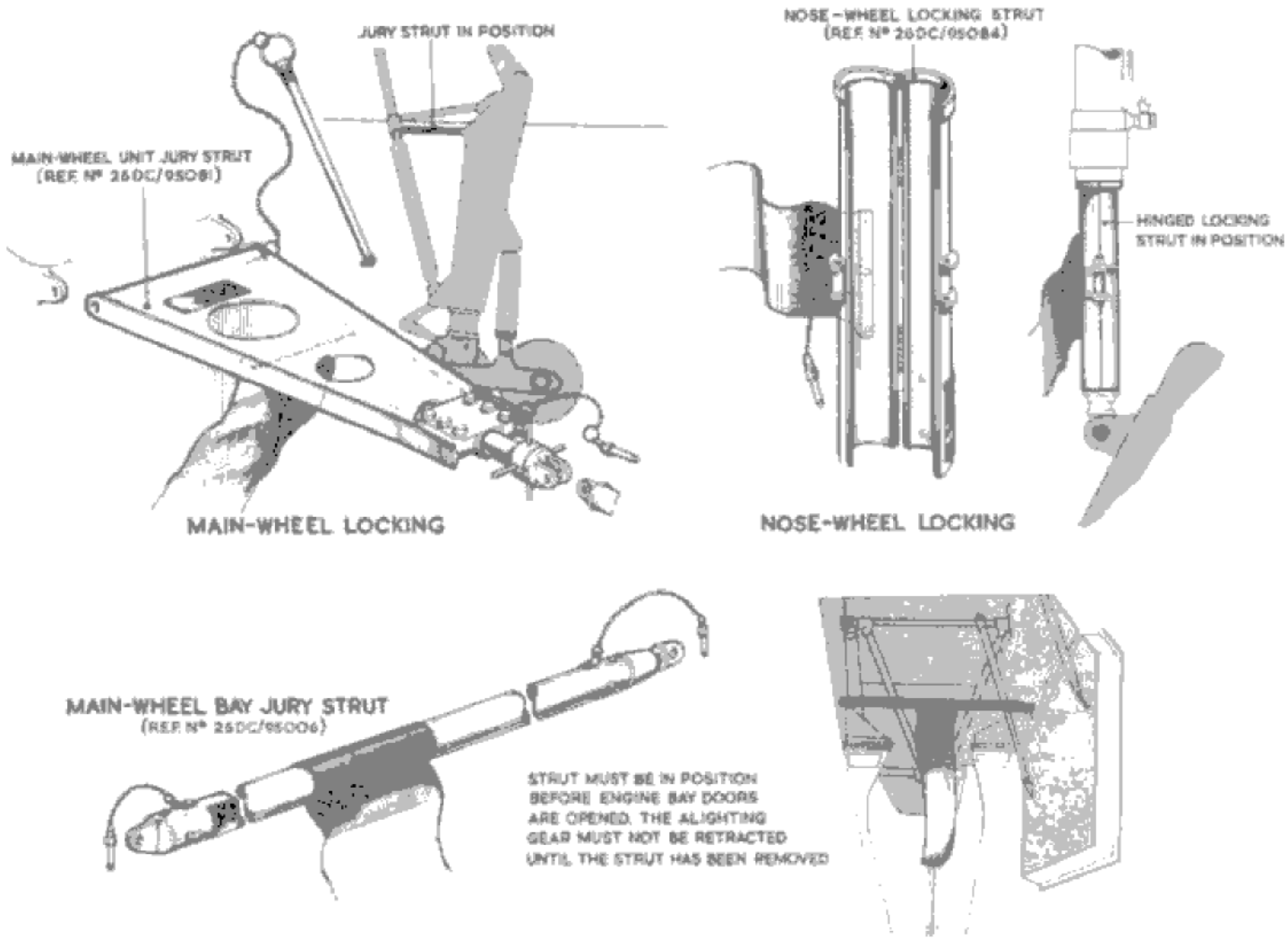
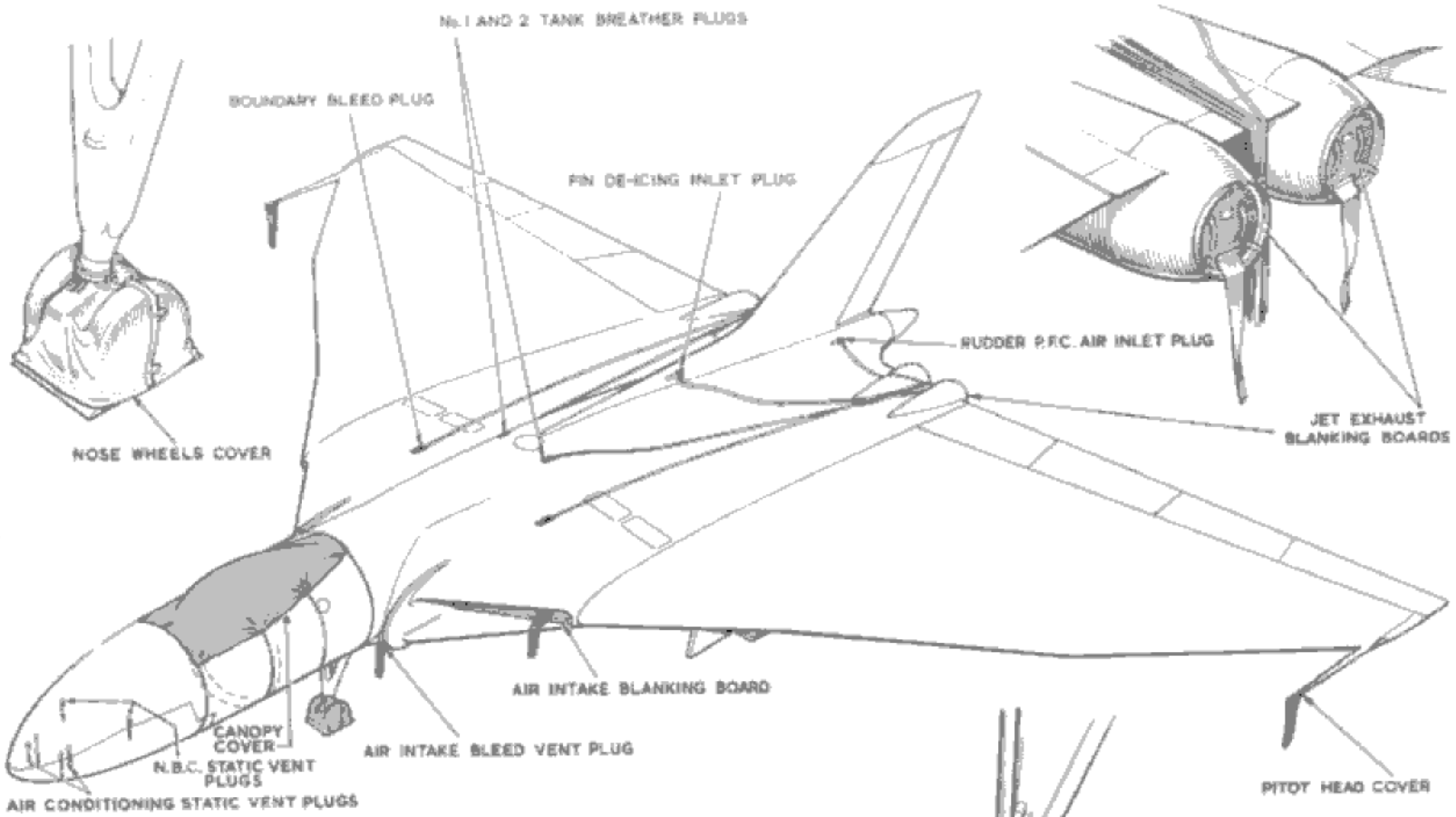


Fig.6. Ground safety locks and struts



COVER	REF.No.	PART No.
CANOPY	27D/2994	Z8252
NOSE WHEELS	27D/3000	Z7102
MAIN WHEEL BOGIES	27D/3001	Z8279
PITOT HEADS	27D/2963	-
AIR INTAKE (PORT)	28DC/95371	1/Z9501
AIR INTAKE (STBD)	28DC/95388	2/Z9509
JET EXHAUSTS (OLYMPUS 101)	28DC/95051	Z7572
JET EXHAUSTS (OLYMPUS 102 AND 104)	28DC/95267	Z9581
AIR INTAKE BLEED VENTS	27D/2995	Z7575
BOUNDARY BLEEDS	27D/3034	Z8594
NO.1 AND 2 TANK BREATHERS	27D/3037	Z8595
FIN DE-ICING INLET	27D/3035	Z8596
CABIN PRESSURISATION STATIC VENT PLUGS	6A/2879	-
N.B.C. CALCULATOR STATIC VENT PLUGS	28DC/95364	Z9628
RUDDER P.F.C. AIR INLET	27D/3038	Z8918

Fig.7. Arrangement of covers

COVERS

19. The canopy and pressure head covers must always be fitted when the aircraft is picketed. Covers or plugs must also be fitted to the openings indicated on fig.7 as soon as possible after stopping the engines and should only be removed prior to starting.

20. Protective mats are to be fitted to the inside of the window in the bomb aimers blister when a bomb-sight is being fitted or removed, or during servicing operations involving entry into the blister.

ENTRANCE TO A CRASHED AIRCRAFT

21. In the event of entry being impossible, using the entrance door, an attempt should be made to release the canopy by pulling the red-painted external handle on the port side of the fuselage nose. If the jettison mechanism is intact, the canopy will be forced up and rearwards, pivoting about the rear attachments to the fuselage; personnel should therefore remain well clear of the canopy when the external handle is selected. Failing this the canopy will have to be carefully removed by hand. Should this prove non-effective, the aircraft may be entered by cutting away with an axe or another suitable implement, the area marked with red segmental lines below the canopy coaming on the port and starboard sides of the aircraft.

22. A break-in point, to check the security of the armament stores in the bomb bay, is provided on the upper surface of the fuselage and is indicated by a red segmental line. It is situated on the port side, approximately two thirds along the fuselage just below the aircraft centre line. Entry is effected using an axe or another suitable implement.