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PART 2 : SECTION 1

CHAPTER 1

TOWING AND PICKETING OF AIRCRAFT

METHODS OF TOWING

Introduction

1. Detailed instructions for the towing of individual aircraft will be found in Vol. 1 of the Aircraft Handbook. The following paragraphs deal with the basic factors involved in towing.

Towing Bar

2. The normal method of towing either nose-wheel or tail-wheel type aircraft is by a towing arm (Fig. 1) connecting the towing vehicle with the aircraft. One end of the towing arm has two hooks which can be secured to extension lugs on the nose/tail wheel fork by spring-loaded locking pins ; at the other end it has a spring hook for attachment to the towing vehicle. The spring hook is designed so that an excessive pull releases it automatically.

3. This type of towing equipment has the advantage of :—

(a) Rigidity, thus reducing any possibility of the aircraft overrunning the towing vehicle.

(b) The steering being directly controlled by the driver of the towing vehicle, since the towing arm is connected to the tail or nose wheel of the aircraft.

These advantages permit more precise parking than the bridle gear described in para. 4.

Bridle Towing Gear

4. On soft or uneven ground, aircraft should be towed by a towing bridle or wire cable attached to the main undercarriage legs. This distributes the towing load more evenly and imposes less strain on the nose or tail wheel. The bridle is attached to lugs on the main undercarriage oleo struts. The aircraft is prepared for towing (on propeller driven aircraft, the propellers are turned to the most suitable position) by linking the towing vehicle to the aircraft by the towing bridle, and attaching a steering arm to the tail or nose wheel (Fig. 1). The towing bridle has a weak link which normally consists of a length of cable designed to snap before reaching a load which would damage the aircraft.

Manhandling

5. When no towing vehicle is available the towing cable can be manned by a party of airmen, or the aircraft can be manhandled into the required position. The latter method needs careful supervision to ensure that the airmen push on strong parts of the aircraft structure only. Damage would be caused by pushing on vulnerable parts such as ailerons, elevators, or lightly made fairings.

Precautions

6. The airman in charge of an aircraft handling party should pay particular attention to the following points :—

(a) Ejection seats must be checked to ensure that they are safe.

(b) Aircraft must never be taxied into or out of hangars.

(c) The correct handling procedure for the type of aircraft to be moved, if not already known, should be obtained from Vol. 1 of the Aircraft Handbook.

(d) The Form 700 should be examined to see if there is any reason why the aircraft should not be moved ; e.g. unserviceability of brakes or undercarriage.

(e) The aircraft itself should be examined before it is moved. Tyres should be correctly inflated, oleo leg extension checked, and undercarriage locked down.

(f) The ground over which the aircraft is to be moved should be examined. Soft ground and slippery tarmac should, if possible, be avoided ; but if an aircraft has to be moved over a slippery surface the area should be well sanded beforehand. The path must be free from obstructions, with additional attention given to possible overhead obstructions such as engine hoists and electrical cables during manœuvres in or close to the hangar.

(g) When an aircraft is moved by night the navigation lights must be on, and the towing vehicle must carry the towing signal in addition to normal vehicle lights. This signal is an equilateral triangle of red lights shining forward and a single white light shining to the rear.

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Procedures

7. Handling Party. When an aircraft is to be moved, a handling party must be detailed for the task. Each member must be familiar with his part. The party should consist of :—

(a) An N.C.O. or experienced aircraftman in charge. He must position himself so that all members of the team can see him throughout the whole operation. His responsibilities are given in para. 6.

(b) An airman in the cockpit to operate the brakes, who should check that the brake pressure is sufficient for the operation, that the

undercarriage is locked down, and that the tail wheel is unlocked and free to move directionally.

(c) An airman at each wing tip to ensure safe obstacle clearance.

(d) A suitably qualified airman to drive the towing vehicle.

(e) When bridle towing gear is used, an airman to control the steering arm attached to tail or nose wheel. This airman should not push or pull on the steering arm but should steer according to the instructions and signals passed to him.

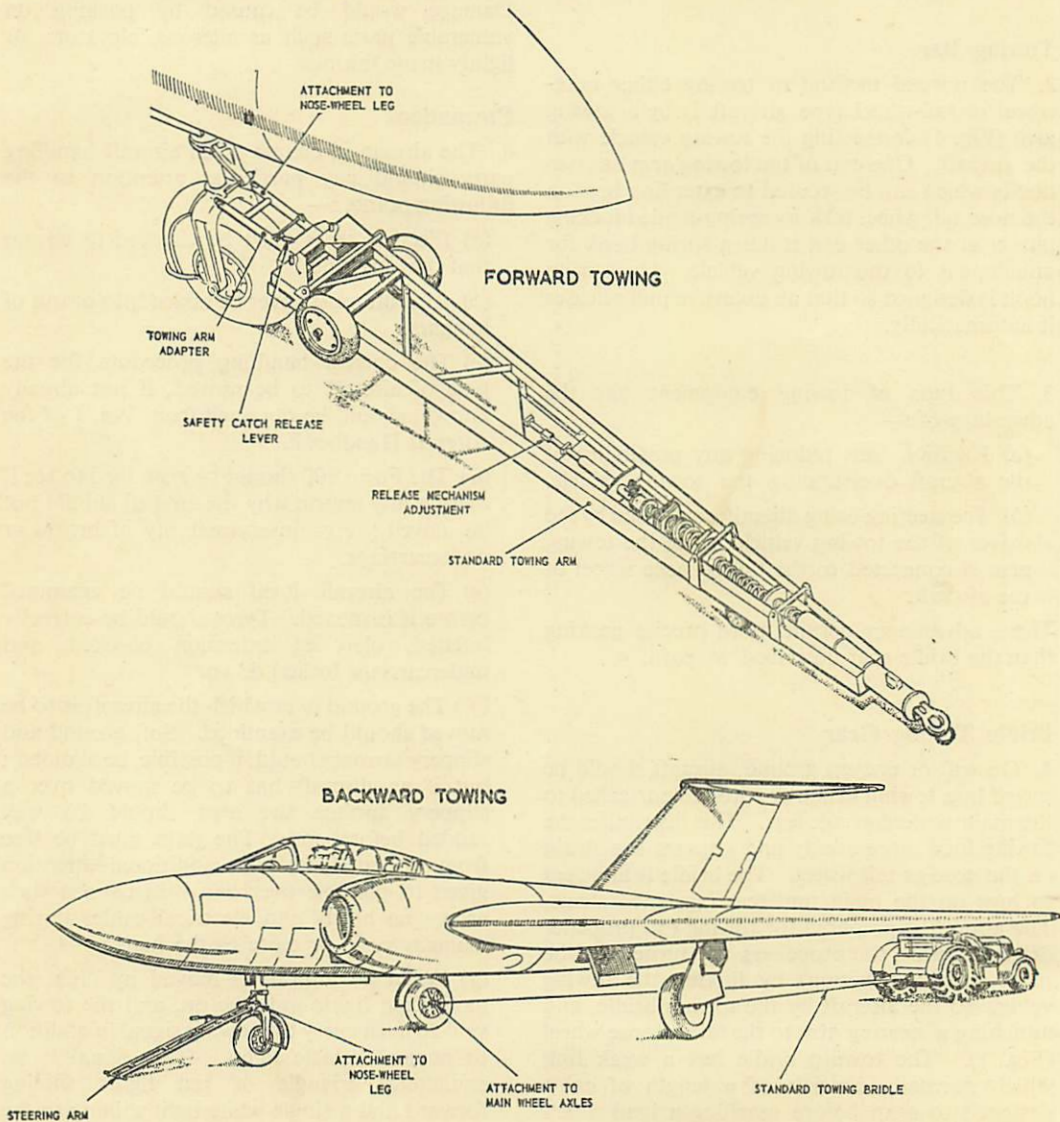


Fig. 1. Typical Towing Arm and Towing Bridle

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TOWING AND PICKETING OF AIRCRAFT

8. **Considerations when Towing.** The following precautions must be taken when towing :—

- (a) The speed must not exceed walking pace.
- (b) Sudden jerks on the towing apparatus must be avoided, or the aircraft may be damaged.
- (c) Turns must be smooth and of such a radius that the inside wheel is not brought to a standstill, as this strains the structure of the tyre and leg. Also the aircraft should be moved straight forward for the last few feet to avoid parking the aircraft with tyres distorted. When a towing bar is attached to the tail wheel, care must be taken not to damage the tail surfaces.

Parking of Aircraft

9. When practicable, aircraft should be parked facing into wind so that no part of one aircraft overlaps any part of another ; small aircraft must not be parked under the wings of larger ones. If aircraft are parked between flights, the wheels should be chocked fore and aft ; the brakes, if hot, should be released to prevent damage and, in any case, pneumatic brakes should be released to avoid loss of air pressure ; the cockpit canopy should be closed ; and the pitot and static vent covers put on. Aircraft parked for longer periods should, if possible, also have doors and canopies locked, wheels covered, and drip trays positioned ; intake and jet pipe orifices should be covered.

10. After parking, a check must be made to ensure that electrical services, ignition switches, and fuel cocks are turned off. Normally, before aircraft are parked on completion of a day's flying they should be disarmed and, unless their serviceability renders it impracticable, refuelled. Aircraft parked in the open at night should be outlined with red obstruction lights.

PICKETING OF AIRCRAFT

Introduction

11. Aircraft are normally parked in hangars to facilitate servicing and to protect them from the weather. However, when hangar space is not available, the aircraft should be picketed in the open. Such picketing can be of a permanent or temporary nature, but the general principles outlined below are applicable to both. The main reason for picketing is to prevent the aircraft being moved by strong winds. Before any aircraft is picketed, the correct method should be studied in Vol. 1 of the Aircraft Handbook. This

volume shows the position of the various anchorage attachment points. It is important to note that an aircraft must not be picketed with its wings folded, since the wings are then least capable of supporting abnormal stresses.

General Principles of Picketing

12. The following are the general principles of picketing applicable to all aircraft :—

(a) Place the aircraft in the most sheltered position available, *e.g.* by the side of hangars, buildings, hedges, or other wind breaks. When there is no shelter available, aircraft should be picketed nose into wind.

(b) Lock the control surfaces. If no control locking device is fitted, it is preferable to fit external clamps to the ailerons, elevator, and rudder, to prevent them being forced against their stops. Alternatively the control column and rudder bar may be lashed in the neutral position. Whenever control locks are used, whether improvised or not, prominent red danger pennants must be fitted to indicate their presence. On aircraft fitted with a lockable tail wheel, this should be locked in the fore-and-aft position.

(c) Place chocks in front of and behind the wheels. Brakes alone are insufficient safeguard against backward or forward movement of the aircraft, as the brake pressure may fall owing to a leak in the system. If enough chocks are not available, mounds of earth should be used as a substitute or, alternatively, the wheels placed in hollows dug in the ground.

(d) Lash the aircraft to the picketing points. The latter may be screw or spiked pickets, permanent picketing points set in the ground, or concrete blocks fitted with iron ring attachments. Failing these, stout wooden stakes, or lengths of steel bar or tubing may be used. Lashings should be of wire or rope, the former being fitted with turnbuckles to allow for adjustment of the tension. When dry rope is used, sufficient slack should be left to allow for tightening when it becomes damp. Lashings should be connected to the aircraft only at the main anchorage attachment points (Fig. 2).

Protection of Aircraft Picketed in the Open

13. When an aircraft is picketed in the open, it should be protected against the weather by fitting

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covers to the canopy, engines, tyres, turrets, and pressure heads (Fig. 2). Too much snow should not be allowed to accumulate on the aircraft because of its weight and because, on bright days, the sun may partly melt the snow which, when re-frozen, is extremely difficult to remove and may jam moving parts such as control hinges.

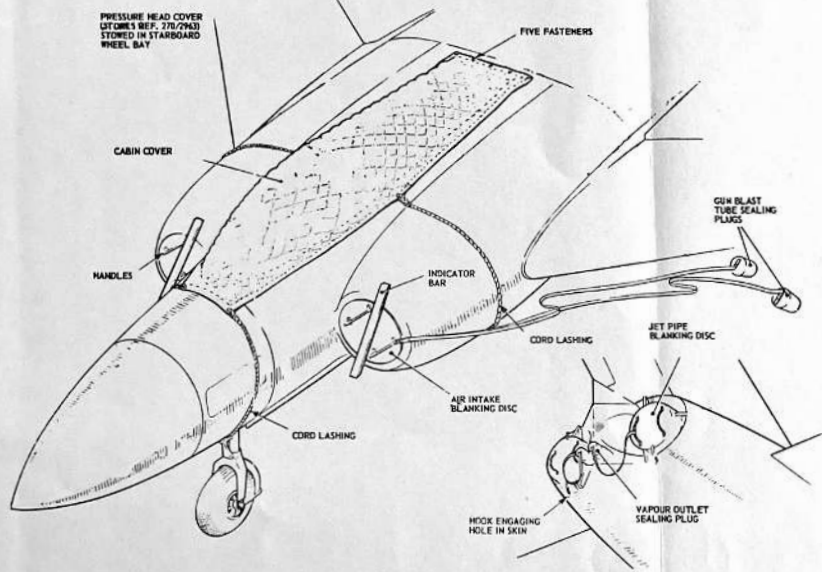
Unpicketing

14. When preparing an aircraft for flight after it has been picketed in the open, all covers, control locks, picketing lines and detachable picketing rings are to be removed. The covers, control locks, and picketing rings should be stowed in the aircraft if space is provided. Snow, hoar frost, and ice must be removed from all surfaces.

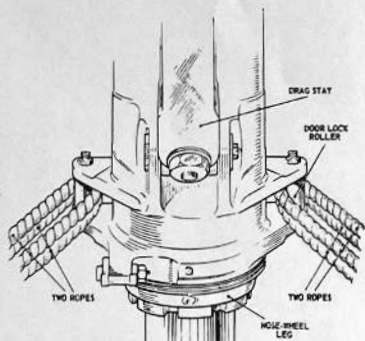
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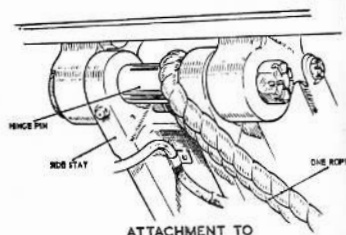


Covers and sealing discs

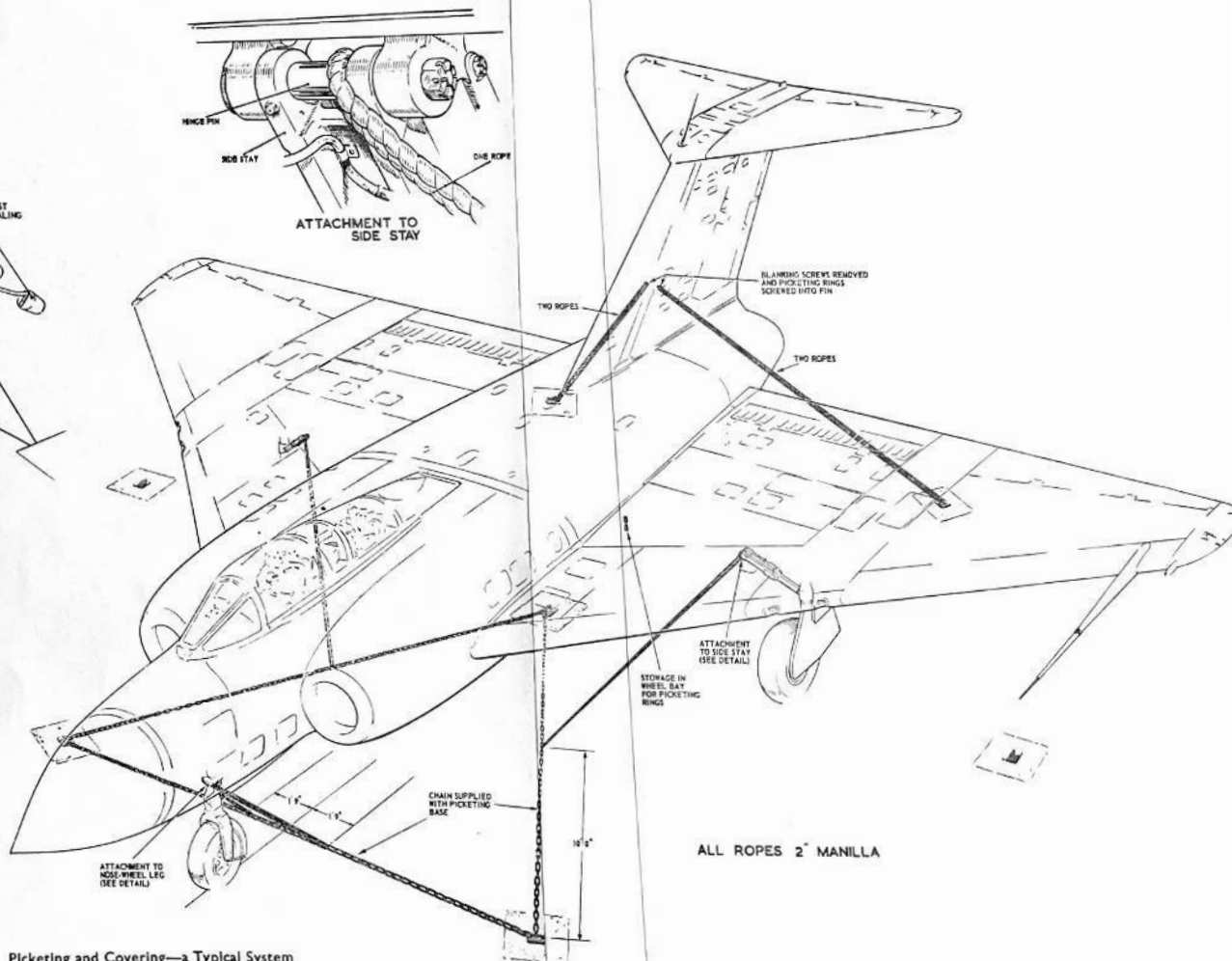


ATTACHMENT TO NOSE-WHEEL LEG

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ATTACHMENT TO SIDE STAY



ALL ROPES 2" MANILLA

Fig. 2. Picketing and Covering—a Typical System

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