

Chapter 3

◀ JET PROVOST T Mk. 3 AND Mk. 4 ▶

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◀ Introduction

1. This chapter deals with aircrew equipment assemblies incorporating ejection seats embodying modification E.S.2730 which introduces a downward pull negative-G restraining strap. Ejection seats embodying modification E.S.2179 which introduces an upward pull negative-G restraining strap are dealt with in Chap. 1. ▶

2. Two aircrew equipment assemblies are installed in these aircraft, the sole difference being that the port and starboard ejection seats are handed. Reference will therefore be made to one assembly only throughout this chapter except where the handing causes variations in the information.

COMPOSITION OF THE ASSEMBLY

3. The assembly consists of the following items:—

- Ejection seat ▶ T Mk. 3 aircraft

- Type 4P/1 (port)
- Type 4P/2 (starboard)
- T Mk. 4 aircraft ▶
- Type 4PA/1 (port)
- Type 4PA/2 (starboard)
- Parachute assembly Back type Mk. 30
- Personal survival pack Type R Mk. 2 complete with glass fibre insert
- Emergency oxygen set Mk. 7E
- Flying clothing See Appendix 1

The Type 4PA ejection seat

4. The seat is ejected from the aircraft by a cartridge-operated gun and slides in two guide rails attached to the ejection gun cylinder. Brackets attached to the ejection gun provide means for bolting the gun to the airframe structure.

5. ◀ A combined safety and parachute harness is used in conjunction with the seat, the harness being attached at three points. The personal survival pack is housed in the seat pan and an auxiliary cushion is provided for additional comfort. A negative-G restraining strap is secured at the rear by being looped over the bottom harness anchorages (fig. 5); it then passes under the personal survival pack, through brackets attached to the floor of the seat pan and is looped over the harness lap straps at the front (fig. 8). Tightening the negative-G strap holds the occupant down in the seat and prevents movement when he is subjected to negative-G forces. ▶

6. An emergency supply of oxygen is provided by a cylinder clamped to the rear of the seat. The end-fitting of the supply tube is clamped to the starboard side of the seat pan and an upper oxygen tube assembly conveys the oxygen to the user's mask. A stirrup quick-release is fitted to the upper oxygen tube assembly to disconnect it from the seat as the occupant is separated after ejection. The emergency oxygen supply is turned on automatically during ejection. If the main oxygen supply in the aircraft fails during flight, the emergency oxygen supply can be used by pulling the knob on the starboard side of the forward face of the seat pan.

7. Leg restraint cords, fitted through snubbing units on the seat pan, ensure that the occupant's legs are drawn back to the seat and restrained there during ejection, thereby preventing injury due to flailing.

8. Seat height adjustment is achieved by a lever on the outboard side of the seat pan; the plunger in the end of the lever must be depressed before the seat can be raised or lowered.

9. The harness 'go-forward' lever is fitted at the forward end of the outboard side of the seat pan, the lever being pushed forward to disengage the harness snubbing unit and allow the occupant to lean forward without disconnecting the harness. A small lever, just forward of the harness 'go-forward' lever, releases the leg restraint cords; this lever must be pulled back to free the cords.

10. Two firing handles are fitted to each seat. The face screen handle projects from the front of the drogue container and has an integral face screen which protects the face from air blast during ejection. The seat pan handle is partially recessed into the top front edge of the seat pan and is intended for use when the occupant

is unable to reach the face screen handle, e.g. when subjected to high 'G' forces.

11. As the seat is ejected, all connections to the aircraft are broken automatically and the emergency oxygen supply is turned on.

12. Fully automatic facilities are provided to withdraw the parachute and separate the occupant from the seat after ejection. Two manual override controls are also provided, one on the combined harness disconnects the parachute automatic withdrawal device from the seat and the other, a lever on the left-hand side of the seat pan, disconnects the combined harness attachment points from the seat. Both override controls must be operated if the occupant is forced to (a) make a manual bale-out or (b) make a manual separation from the seat after ejection.

13. A full description of the ejection seat will be found in A.P.4288D, Vol. 1, detailed information concerning the Mk. 30 parachute assembly and the Type R Mk. 2 personal survival pack will be found in A.P.1182A, Vol. 1 (2nd Edtn.) and A.P.1182C, Vol. 1, Book 2, respectively.

Connections to the aircraft

14. When the seat is installed in the aircraft and is properly equipped the following items are connected to the airframe:-

(1) *Left-hand side of seat:-*

- (a) Mic/tel lead.
- (b) Static rod from drogue gun.

(2) *Right-hand side of seat:-*

- (a) Main oxygen supply hose.
- (b) Static rod from barostatic time-release unit.

(3) *Front of seat:-*

- (a) Leg restraint cords.

(4) *Top of seat:-*

- (a) Canopy jettison unit operating cable.

EQUIPPING THE SEAT

15. Before equipping the seat make sure that it is 'safe for servicing' in accordance with current instructions.

16. The following procedure is to be adopted, referring to fig. 1 to 7 as necessary:-

- (1) Fit the emergency oxygen cylinder into its clamping brackets on the rear of the seat. Secure the supply tube

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end-fitting in the clamp on the right-hand side of the seat pan and fit the tube into the clip on the rear of the seat pan.

- (2) Ensure that the emergency oxygen supply manual control is pushed fully down; connect the cylinder operating cable to the actuating arm on the rear of the seat pan (*fig. 3*).
- (3) Ensure that the manual separation lever is in the operated (upward) position. Place the parachute pack on its support bracket on the seat structure and ensure that the harness straps are not twisted.
- (4) Operate the harness 'go-forward' lever and pull out the centre ('go-forward') strap. Pass the strap upwards through the D-shackle on the harness shoulder straps, taking care that the fitting is in its natural position and that the straps are not twisted. Pass the O-rings of the pack restraint straps over the lug of the centre strap, lift the parachute pack forward and fit the lug into the attachment point on the seat (*fig. 4*). Place the manual separation lever in the locked (down) position and ensure that the lug is secure by attempting to pull the harness away from the anchorage.
- (5) Replace the parachute pack on its support bracket.
- (6) Position the headrest cushion on the parachute pack, ensuring that it fits correctly under the drogue container.
- (7) Pass the left-hand pack restraint strap over the parachute withdrawal line, through the buckle on the short strap at the left-hand side of the drogue container and then forward through the buckle on the left-hand side of the headrest cushion.

Note . . .

When passing the strap through the buckle on the short strap at the side of the drogue container, ensure that the strap passes through the buckle from the outside inwards.

- (8) Pass the right-hand pack restraint strap through the buckle on the short strap at the right-hand side of the drogue container (refer to the note following sub-para. (7)) then forward through the buckle on the right-hand side of the headrest cushion.
- (9) Tighten the left-hand pack restraint strap and then the right-hand strap so that the pack and headrest cushion are held firmly in position.
- (10) Connect the two halves of the link line coupling ensuring that the line passes under the left-hand pack restraint strap and UNDER THE DROGUE WITHDRAWAL LINE (*fig. 7*).
- (11) ◀ Fit the negative-G restraining strap as follows:—
 - (a) Thread the white straps through the front bracket on the floor of the seat pan from front to rear. The white straps are marked PORT and STARBOARD and it is essential that they are so positioned to ensure correct installation.
 - (b) Pass the straps rearwards, and thread each strap through its rear bracket on the floor of the seat pan.
 - (c) Engage the looped end of each strap over its bottom lock harness lug and insert the lugs into their bottom locks (*fig. 5*). It may be necessary to partially depress the harness release lever beneath the barostatic time release unit to facilitate insertion of the lugs. Check that they have locked correctly by pulling on the lugs.
 - (d) Drape the blue Y-section of the negative-G strap OVER THE TOP of the seat pan firing handle. ▶
- (12) Lift the harness clear of the seat pan and insert the personal survival pack into the pan, first lowering the rear of the pack and then sliding it to the rear.
- (13) Place the comfort cushion on the top of the personal survival pack and secure it to the harness straps.

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- (14) Fit the harness sticker straps into the clips on the inside of the seat pan.
 - (15) Connect the side quick-release connectors of the personal survival pack to the parachute harness. Ensure that the harness straps are positioned inside the quick-release connectors.
 - (16) Drape the personal survival pack lowering line over the front, port side of the seat pan. ▶ ◀
 - (17) Fit the stirrup quick-release fitting of the upper oxygen assembly to its bayonet fitting in the clamp block at the right-hand side of the seat pan. Pull lightly on the upper oxygen tube assembly to check security of attachment. Ensure that the operating strap is attached to the parachute harness sticker strap.
 - (18) Remove and retain the safety pin from the emergency oxygen cylinder operating head.
17. ◀ After the seat has been equipped, leave the safety pins in position in the ejection gun firing unit sear, canopy jettison firing unit sear and the time delay unit trip lever pawl; report the position of the pins to the N.C.O. i/c Aircraft Servicing. ▶

STRAPPING-IN PROCEDURE

18. The following procedure is to be adopted when strapping into the seat; refer to fig. 8 to 10 for detail as necessary:-

- (1) Ensure that the seat has been made 'safe for parking' in accordance with current instructions.
- (2) Sit in the seat.
- (3) Adjust the seat height ideally, to bring the head to the centre of the headrest cushion.
- (4) Connect the personal survival pack lowering line to the life-jacket ensuring that the line passes outside the left leg.
- (5) Pass the left leg restraint cord through the right leg garter D-ring and then insert the end-plug into the left socket on the front of the seat pan.
- (6) Pass the right leg restraint cord through the left leg garter D-ring and then

insert the end-plug into the right socket on the front of the seat pan.

- (7) Pull sharply on each leg restraint cord in turn to check security in the sockets.
- (8) Adjust the leg restraint cords in their snubbing units to achieve sufficient freedom of leg movement.
- (9) Position the harness waist belt against the body. Draw up the blue Y-section of the negative-G restraining strap and pass the appropriate looped end over each lap strap; ensure that the adjustment buckle and free end of the strap face forward and that the Y-section lies flat against the inside of the thighs. Insert the lugs of the lap straps into the quick-release fitting.
- (10) Pass the left leg loop of the harness through the D-ring on the left lap strap (from the inside outwards). Bring down the left shoulder strap of the harness, pass the lug through the leg loop (from the outside inwards) and insert the lug into the quick-release fitting.
- (11) Pass the right leg loop of the harness through the D-ring on the right lap strap (from the inside outwards). Bring down the right shoulder strap of the harness, pass the lug through the leg loop (from the outside inwards) and insert the lug into the quick-release fitting.
- (12) Fit the safety clip behind the disc-knob of the quick-release fitting.

Note . . .

- ◀ (1) When an inertia-proof quick-release fitting is incorporated in the harness, turn the disc knob in an anti-clockwise direction until the yellow line passes the dots on the body, hold it in this position and insert the first lug. Repeat this operation as each of the remaining lugs are inserted.
- (2) Operation (12) is not applicable when an inertia-proof quick-release fitting is incorporated. ▶
- (13) Tighten the harness lap straps.
- (14) ◀ Adjust the negative-G restraining

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strap as tight as possible. To tighten the strap, pull **DOWNWARDS** on the running free end; to loosen the strap, pull **DOWNWARDS** on the yellow tab attached to the buckle. ▶



- (15) ◀ Ensure that the harness shoulder straps pass under the folds of the life-jacket stole. Tighten the blue and khaki shoulder straps in that order; do not overtighten these straps, since this action may produce an arched back which is unsuitable in an ejection. ▶
- (16) Put on the flying and protective helmets and fasten the chin straps.
- (17) Connect the main oxygen supply hose to the oxygen mask tube assembly.
- (18) Connect the upper oxygen tube assembly to the oxygen mask tube assembly and clip the oxygen mask tube locating chain to the D-ring on the life-jacket.
- (19) Connect the Mic/tel lead.
- (20) Remove the safety pin from the seat pan firing handle and hand it to the ground crew member who, having removed the safety pins from the face screen firing handle and canopy jettison unit sear, stows all the pins in the appropriate stowages in the cockpit.

EMERGENCIES

19. ◀ Instructions for dealing with emergencies

are contained in A.P.4560C or D-P.N., as appropriate. ▶

LEAVING THE AIRCRAFT AFTER LANDING

20. After landing proceed as follows:—

Ground crew member

- (1) Remove the safety pins from their stowage on the starboard wall of the cockpit and hand the appropriate pin to the seat occupant who fits it through the seat pan firing handle. Fit the other pins through the face screen firing handle and canopy jettison sear.

Note . . .

If a ground crew member is not available the seat occupant MUST fit all pins before leaving the cockpit.

Seat occupant

- (2) Fit the seat pan firing handle safety pin.
- (3) Disconnect the main and emergency oxygen supply from the oxygen mask tube assembly.
- (4) ◀ Release the harness and negative-G strap; return the quick-release fitting to the locked position. ▶
- (5) Operate the leg restraint cord release lever and free the cords.
- (6) Disconnect the personal survival pack lowering line from the life-jacket.
- (7) Vacate the seat.

SAFETY PIN FITTED THROUGH
FACE SCREEN FIRING HANDLE

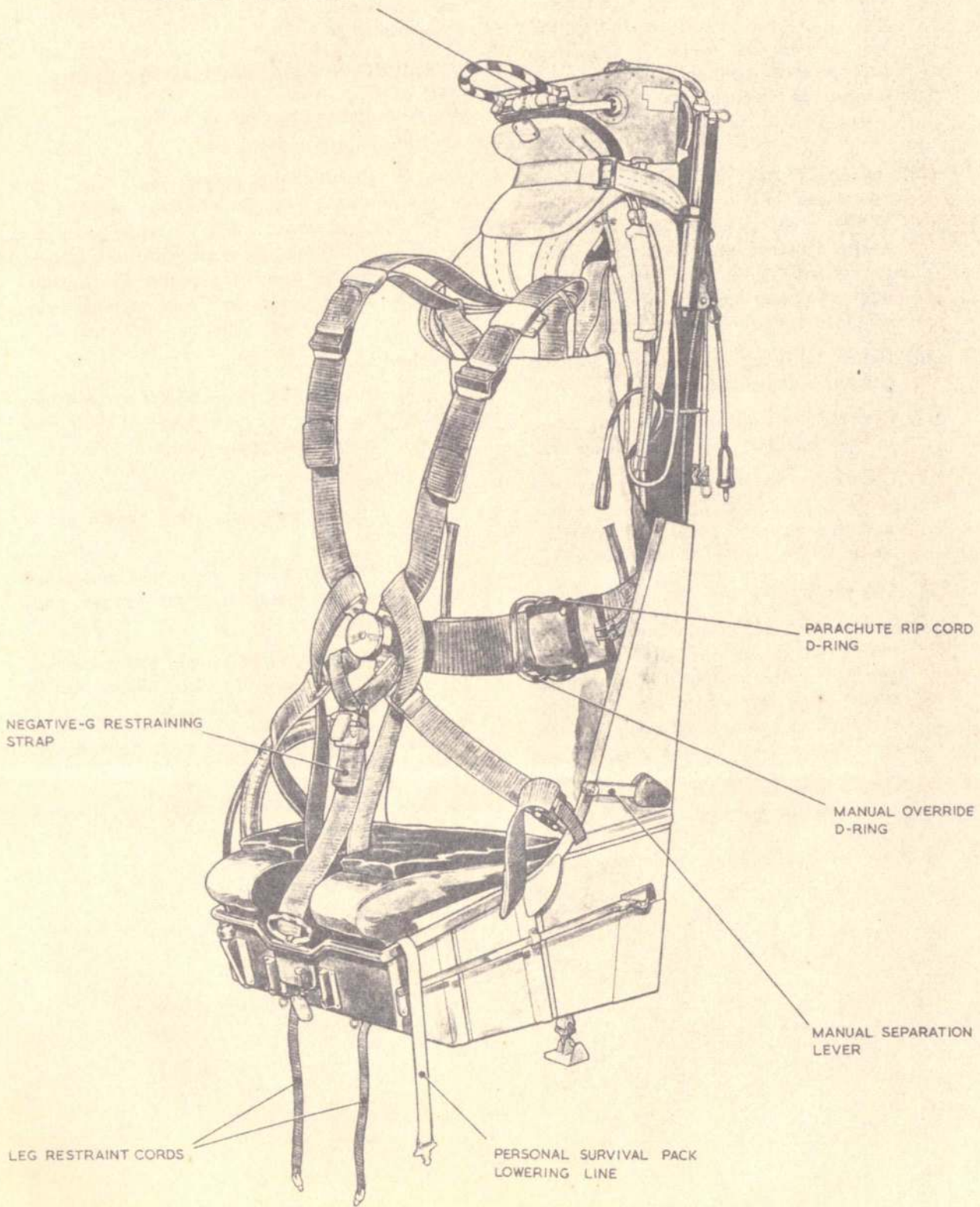


Fig. 1. The seat equipped (port)

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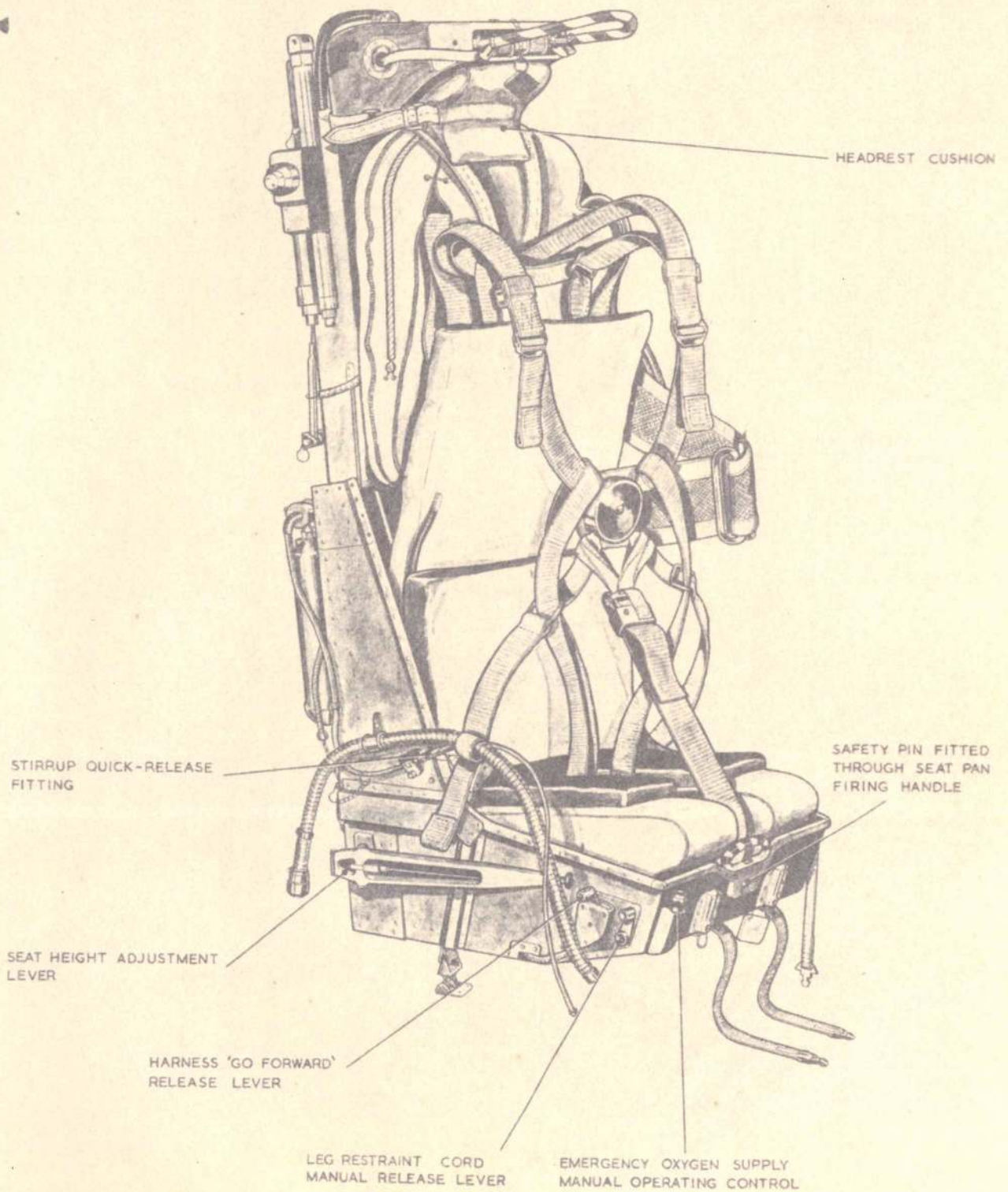


Fig. 2. The seat equipped (starboard)

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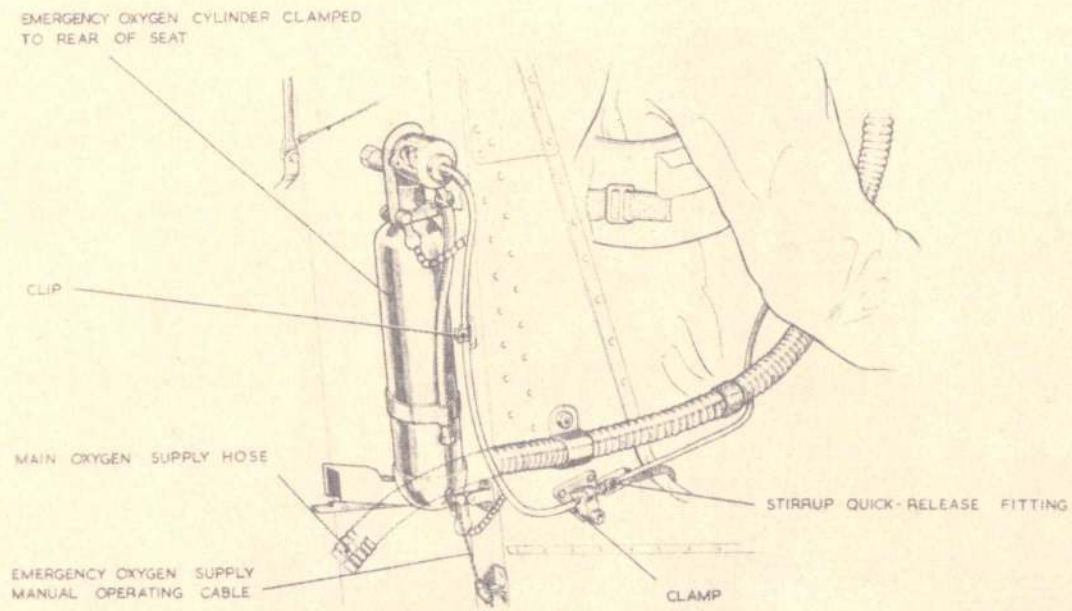


Fig. 3. Arrangement of oxygen supply

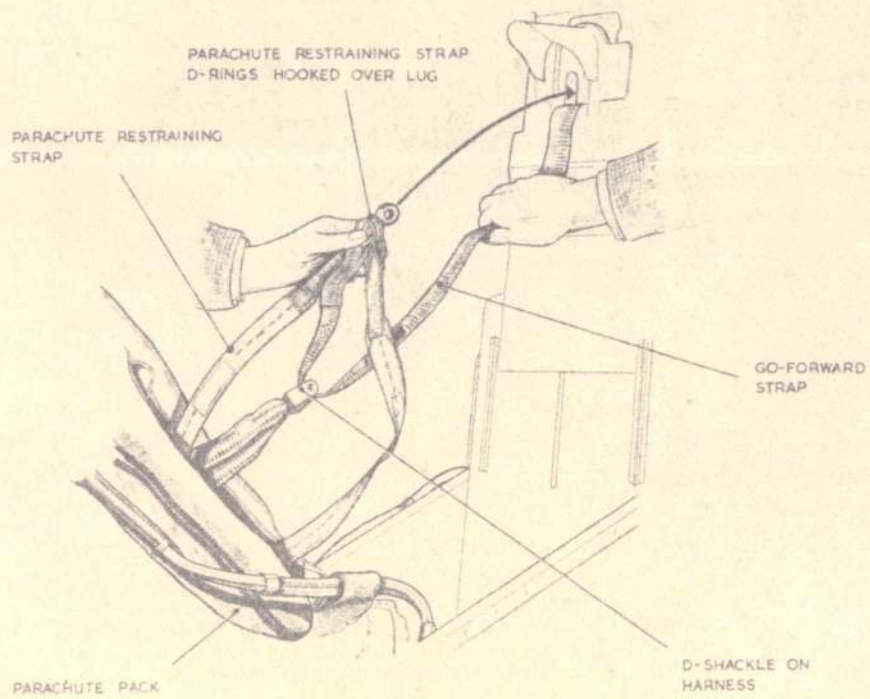


Fig. 4. Insertion of top harness lock

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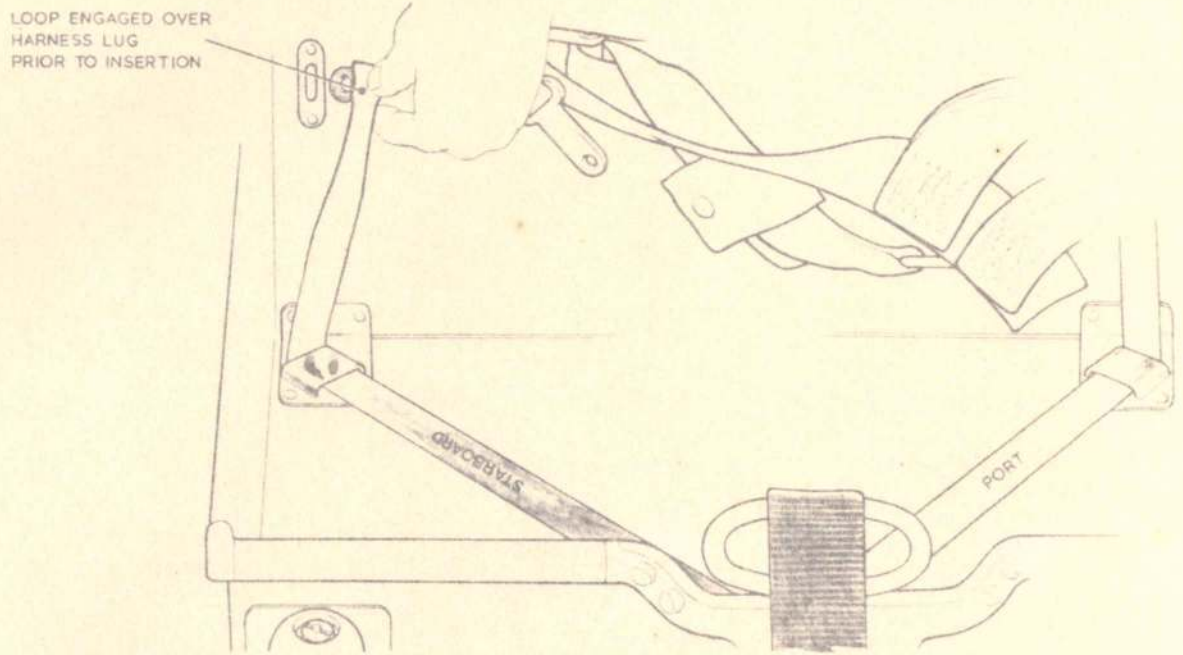


Fig. 5. Inserting the starboard bottom harness lock (port similar)

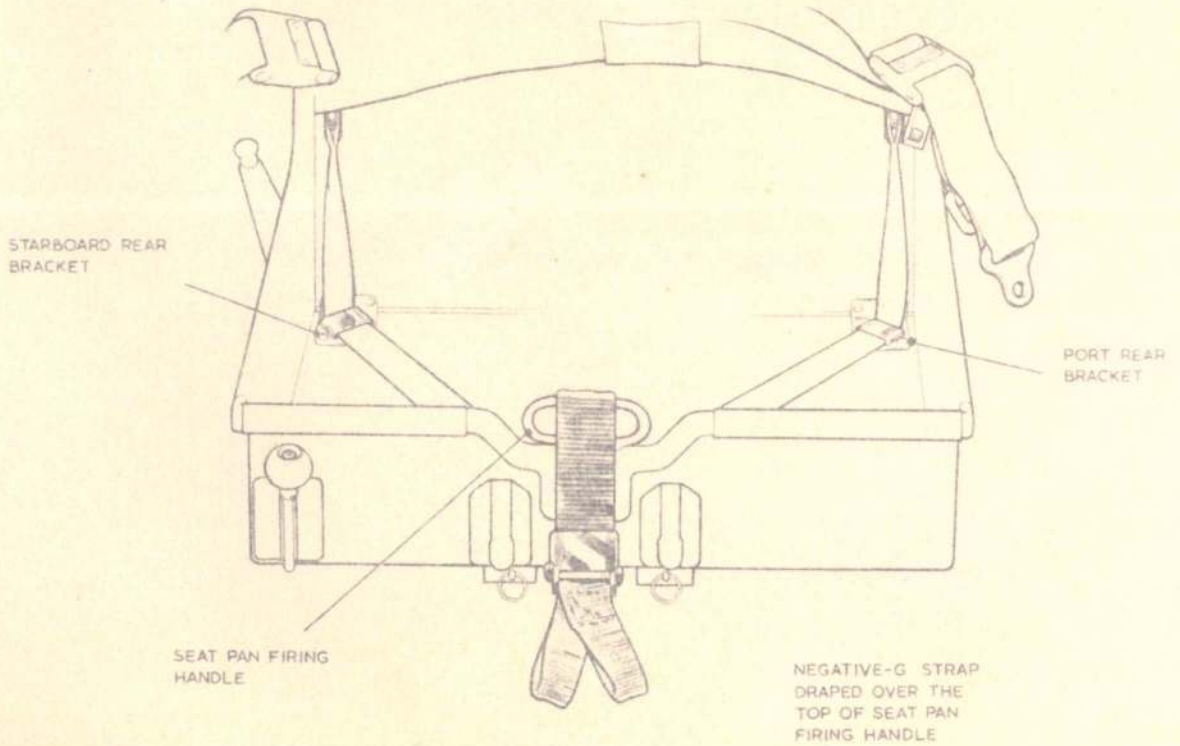


Fig. 6. Both harness locks, and negative-G restraining strap installed

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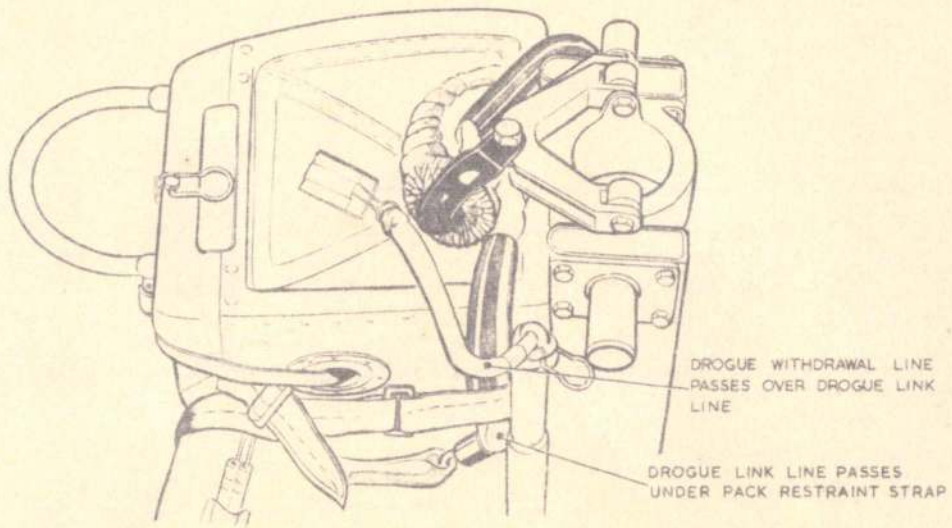


Fig. 7. Arrangement of drogue withdrawal and link lines

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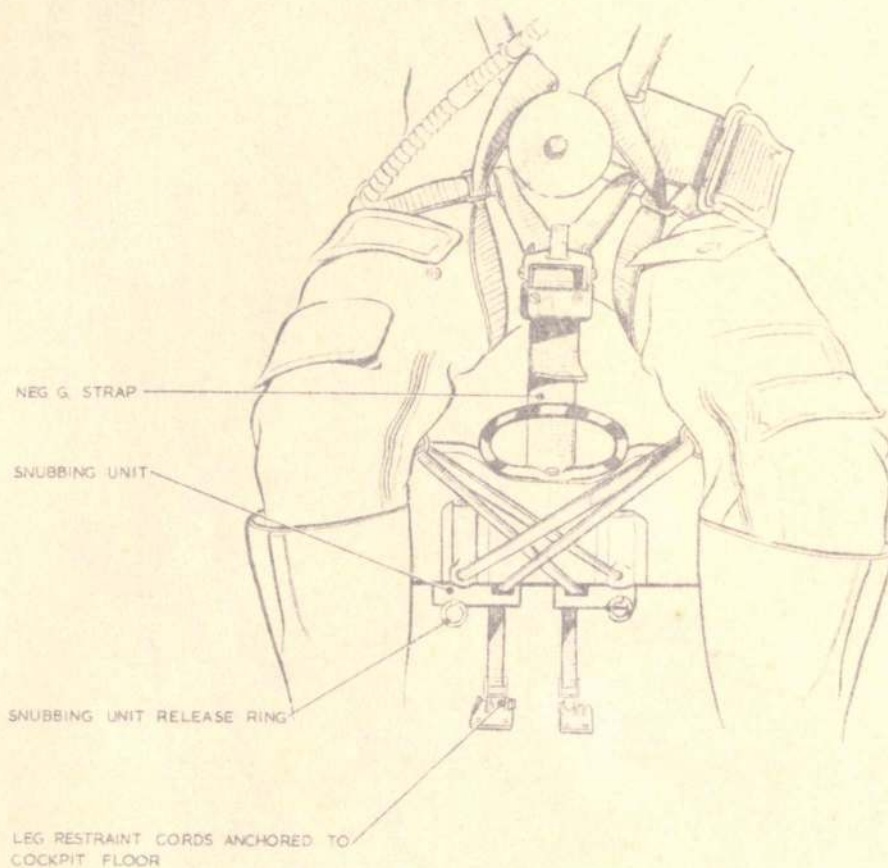


Fig. 8. Arrangement of leg restraint cords, harness and negative-G restraining strap

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Fig. 9. The seat occupied (port)

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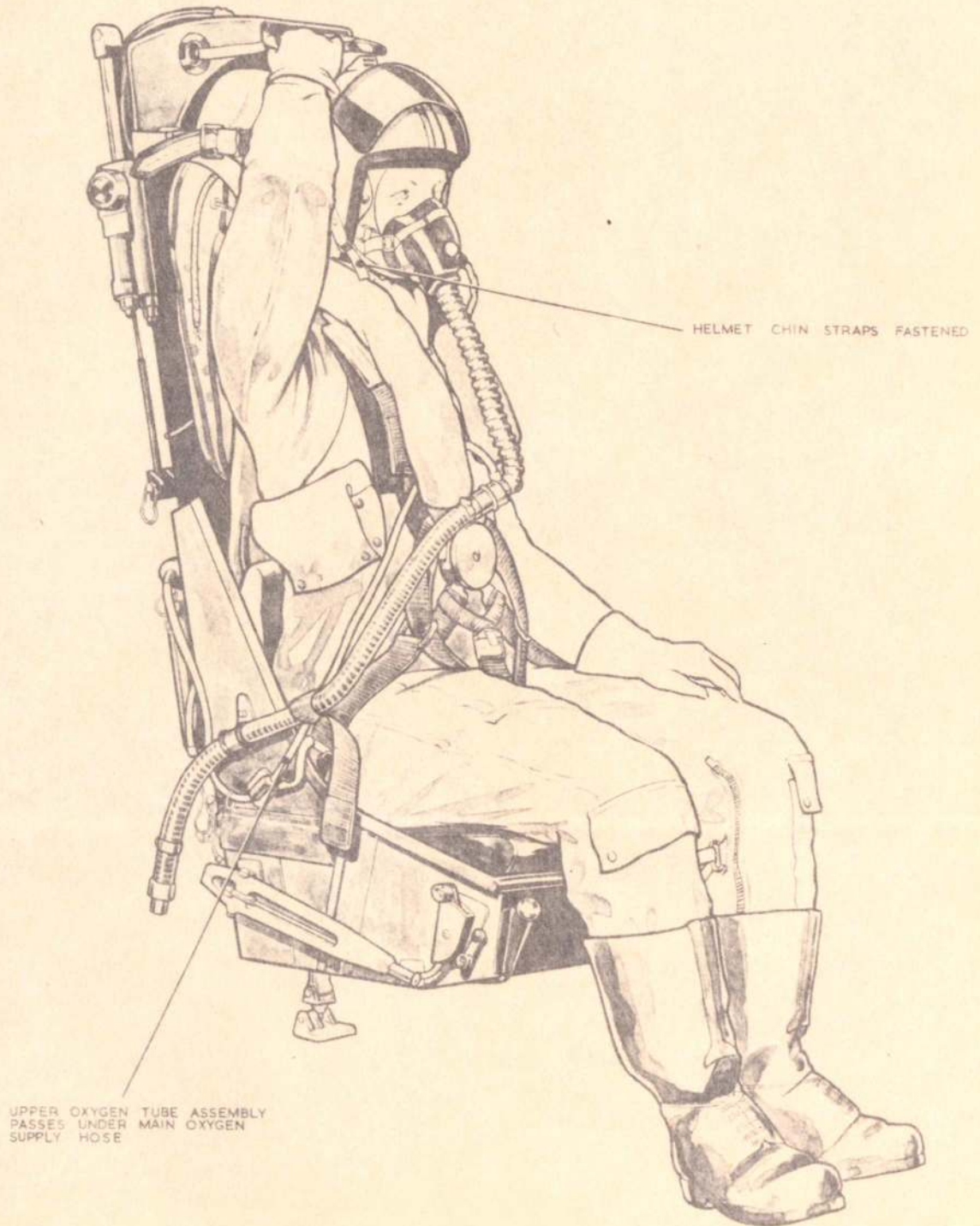


Fig. 10. The seat occupied (starboard)

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