

Chapter 1-2

AIRCREW EQUIPMENT ASSEMBLY
EJECTION SEATS
TYPE 9B Mk 3, 9B1 Mk 3 and 9B2 Mk 3

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INTRODUCTION

- 1 The Type 9B Mk 3 ejection seat is installed in the Jaguar GR1 aircraft; The Type 9B1 Mk 3 and Type 9B2 Mk 3 seats are installed in the front and rear positions respectively in Jaguar T2 aircraft.
- 2 The seats incorporate a nuclear, biological and chemical (NBC) defence system equipment tray which is mounted in the rear starboard recess of the seat pan, the delivery hose being attached to the seat pan starboard side. A moulded rigid back pad is fitted to cover the seat pan rear recess and to provide comfort for the occupant.
- 3 The emergency escape parachute is pressure packed, with the duplex drogue system, into a light alloy pack which attaches to the upper front face of the seat structure. On ejection the drogues are automatically deployed and, when the seat and occupant have descended to 10 000 ft, the drogue shackle is released from the scissor shackle on top of the seat structure, the harness locks, negative-g lock and leg restraint line locks are released and the emergency escape parachute deploys. The deployed parachute lifts the occupant from the seat and a normal parachute descent occurs.
- 4 In the unlikely event of failure of the automatic release system, operation of the manual separation handle initiates a gas operated system which restarts the sequence from the point of failure.
- 5 This chapter is primarily concerned with the removal and installation of the aircrew equipment assembly (AEA), the strapping in procedure and the drill to be followed when leaving the aircraft after landing. A brief description of the various components of the AEA and their function is included.

COMPOSITION OF THE ASSEMBLY

6 The aircrew equipment assembly comprises the following items of equipment which are described in the listed publications:

<u>Equipment</u>	<u>AP No</u>	<u>Contractor</u>
Ejection seat, Type 9B, Mk 3 or Type 9B1 Mk 3 or Type 9B2 Mk 3	AP 109B-0139-1B5F	Martin-Baker
Parachute assembly Type H4 Mk 1	AP 108C-0152-12	Martin-Baker
Quick-release fitting Mk 17	AP 108D-0504-12	AML
Personal survival pack Type ZJ Mk 2	AP 108E-0539-12	Martin-Baker
Emergency oxygen system	AP 107D-0602-13A	Negretti and Zambra
Regulator, oxygen, man-mounted Type 417A, Mk 1 or	AP 107D-0214-12	Normalair-Garratt
Regulator, oxygen, man-mounted Type 317A, Mk 1 (Only used with Command authority AP 108B-0001-1, Chap 1-1, Sch 37)	AP 107D-0205-12	Normalair-Garratt
NBC equipment	AP 108F-0915-12	Richmond Electronics

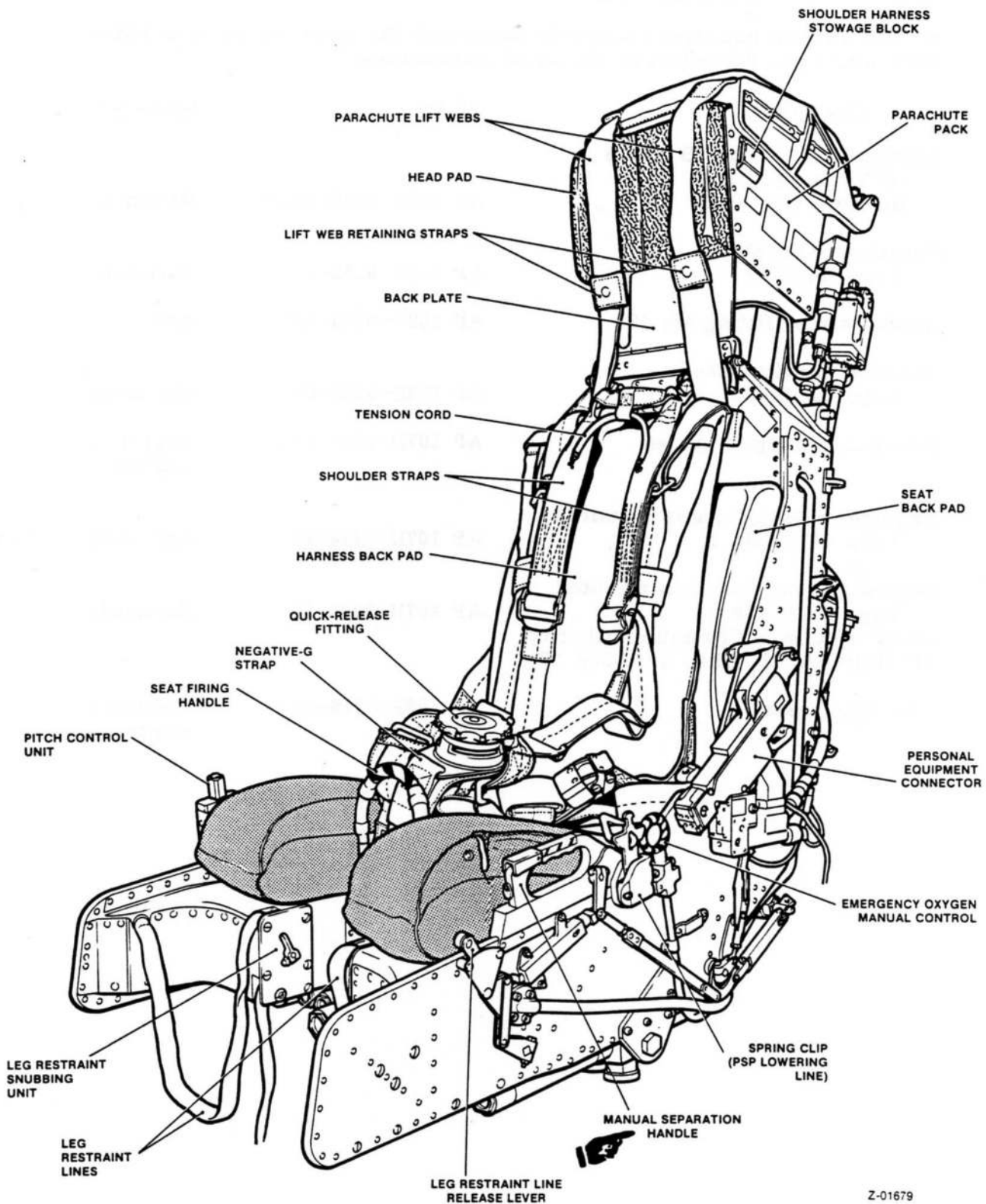


Fig 1 The seat equipped, port view
(Post-mod ES 7183)

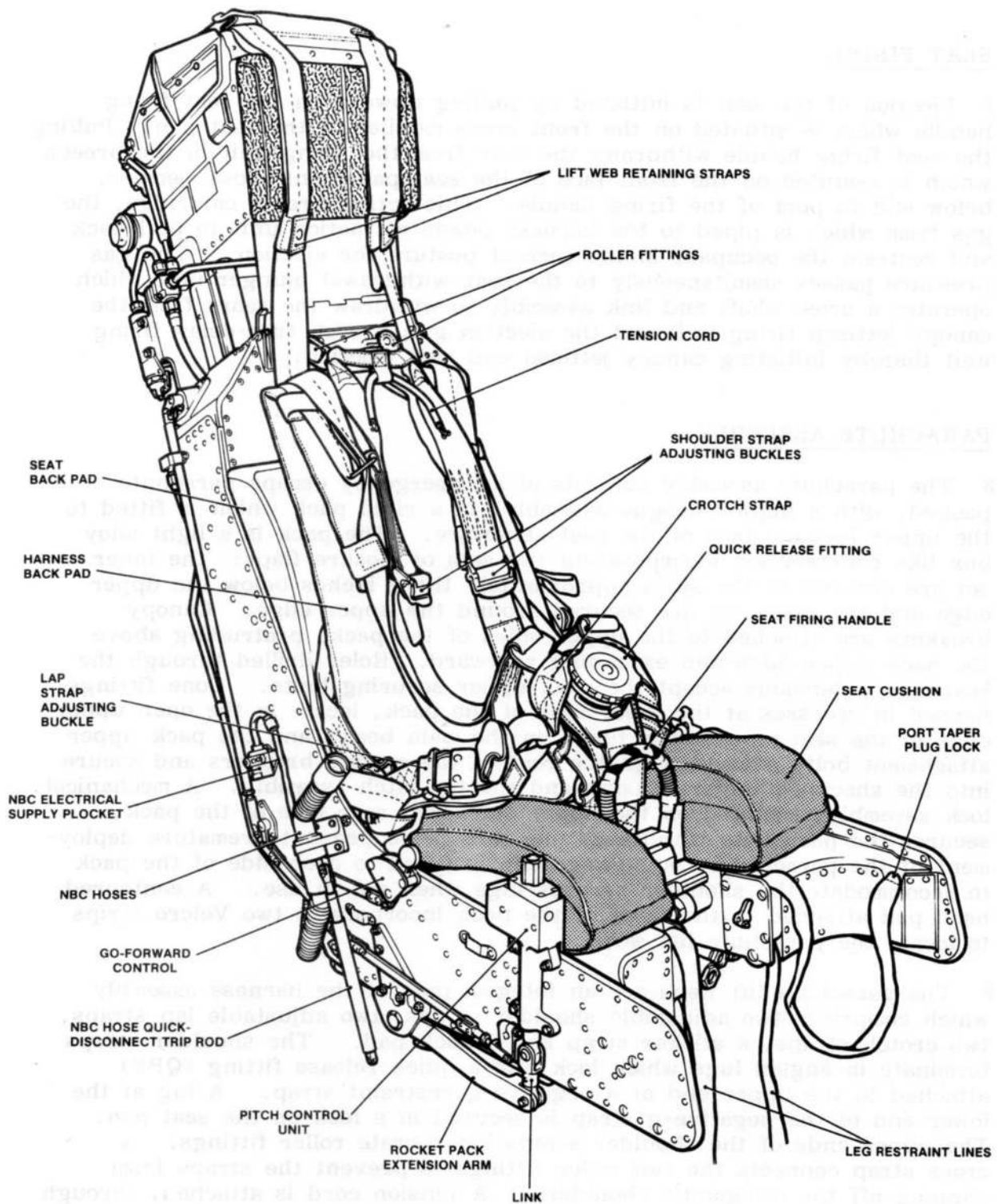


Fig 2 The seat equipped - starboard view

DESCRIPTION AND OPERATIONSEAT FIRING

7 Ejection of the seat is initiated by pulling upward on the seat firing handle which is situated on the front cross member of the seat pan. Pulling the seat firing handle withdraws the sear from the firing unit in the breech which is mounted on the front face of the seat pan front cross member, below and to port of the firing handle. This action fires a cartridge, the gas from which is piped to the harness power retraction unit to pull back and restrain the occupant in the correct posture for ejection. The gas pressure passes simultaneously to the sear withdrawal plunger unit which operates a cross shaft and link assembly to withdraw the sears from the canopy jettison firing unit and the ejection gun breech time-delay firing unit thereby initiating canopy jettison and seat ejection.

PARACHUTE ASSEMBLY

8 The parachute assembly consists of an emergency escape parachute packed, with a duplex drogue assembly, in a rigid pack which is fitted to the upper forward face of the seat structure. The pack is a light alloy box like construction incorporating two sets of closure flaps: the inner set are secured to the sides approximately three inches below the upper edge and the outer set are secured around the upper edge. Canopy breakers are attached to the upper sides of the pack, protruding above the pack upper edge and extending rearward. Holes drilled through the rearward extensions accept the pack upper securing bolts. Cone fittings housed in recesses at the lower rear of the pack, locate in the open upper ends of the seat pan runner tubes on the main beams and the pack upper attachment bolts pass through the rear of the canopy breakers and secure into the shackle plunger housing and the top latch assembly. A mechanical lock assembly, mounted on the upper starboard rear face of the pack, secures the parachute withdrawal line safe tie to prevent premature deployment of the parachute. A stowage clip is fitted to each side of the pack to accommodate the shoulder harness lugs when not in use. A contoured head pad attached to the front of the pack incorporates two Velcro strips to locate the parachute lift webs.

9 The parachute lift webs are an integral part of the harness assembly which comprises two adjustable shoulder straps, two adjustable lap straps, two crotch straps, a sticker strap and a back pad. The shoulder straps terminate in angled lugs which lock into a quick-release fitting (QRF) attached to the upper end of a negative-g restraint strap. A lug at the lower end of the negative-g strap is secured in a lock on the seat pan. The upper ends of the shoulder straps incorporate roller fittings. A cross strap connects the two roller fittings to prevent the straps from slipping off the occupant's shoulders. A tension cord is attached, through a bucket at the centre of the cross strap, to the port and starboard shoulder straps. When equipping the seat, the harness power retraction unit straps are passed up through the appropriate roller fitting before the taper plug ends are inserted into the seat pan upper harness locks. The sticker strap, which incorporates a lug at each end, is stitched across the lower harness, extending each side beyond the width of the harness. The lugs engage in spring sticker clips fitted to the inner faces of the seat pan sides.

10 The looped lower port and starboard harness straps and the lower ends of the lap straps are attached to lugs which secure into the port and starboard lower harness locks located in the lower rear of the seat pan. Each lap strap incorporates a D ring and an adjusting buckle. Two quick-release connectors are fitted to the port and starboard lower rear harness to engage the arrowhead connectors of the personal survival pack (PSP) single-handed release line. The back pad is attached by beackets to the harness and serves to locate the straps, making fitting of the harness easier and providing comfort for the occupant. A padded apron attached to the lower harness serves the same purpose.

11 When strapping in, the crotch straps are drawn up between the legs and passed through the D-rings of the lap straps. The looped ends are then passed over the lugs of the shoulder straps before the lugs are locked into the QRF (fig 3).

12 The shoulder straps are tightened by pulling down on the free ends and loosened by lifting up the release lever on the buckle. The lap straps are tightened by pulling inward on the free ends and loosened by lifting the release lever on the outer end of the buckle. The lap strap free ends are to be folded and secured by the Velcro tabs.

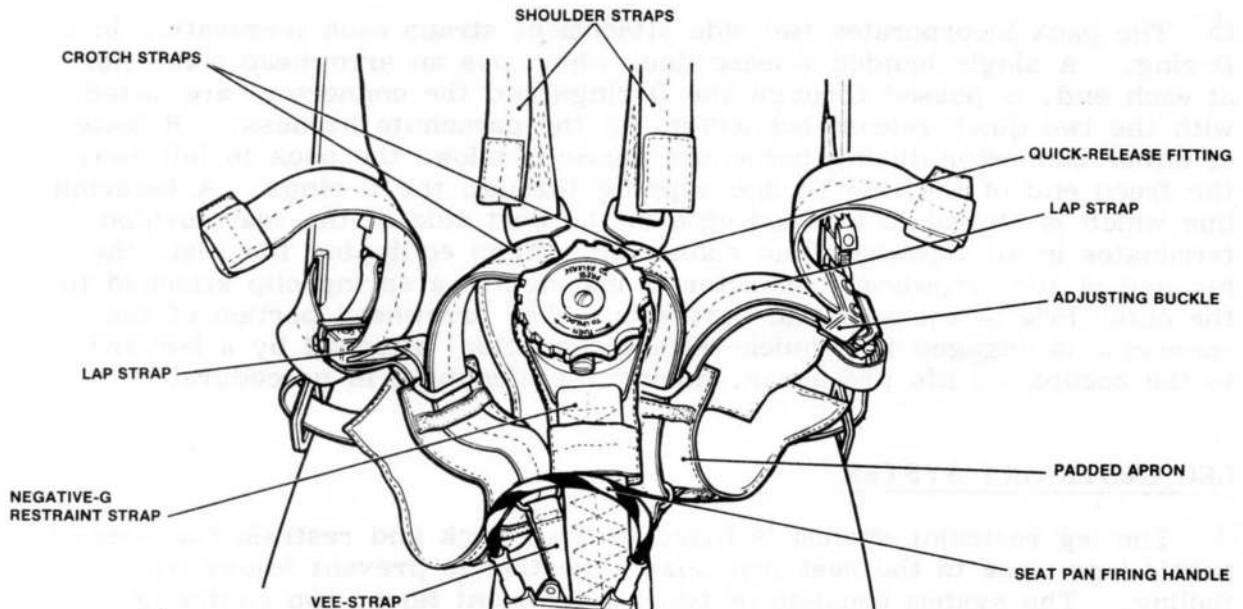


Fig 3 Securing the harness straps

NEGATIVE-G RESTRAINT

13 Negative-g restraint is provided by a fixed length negative-g strap and a Vee strap. The lower end of the negative-g strap terminates in a lug which engages in the harness lock mounted on the rear face of the seat pan front cross member just right of centre. Attached to the upper end of the strap is a Mk 17 quick-release fitting (QRF) into which the lugs of the parachute harness shoulder straps are secured. The two upper arms of the Vee strap terminate in metal rings and an attachment bracket is sewn into the strap at the base of the V. With the QRF and the plate of the Vee strap attachment bracket facing forward, the lug of the negative-g strap is passed down through the Vee strap attachment bracket to engage in the harness lock on the seat pan cross member. The harness crotch straps are withdrawn from the end beackets on the padded apron, passed up through the end ring on the appropriate leg of the Vee strap and repositioned through the end beackets of the apron (fig 3).

PERSONAL SURVIVAL PACK, TYPE ZJ Mk 2

14 The Type ZJ Mk 2 personal survival pack (PSP) is a rigid pack complete with a cushion and is housed in the seat pan, serving the dual purpose of seat cushion and container for a liferaft and survival equipment. The cushion is designed and shaped to give maximum support and comfort to the seat occupant. The padding, although resilient, is slow to return to its original form after compression, thereby helping to absorb acceleration loads imposed during ejection. The pack and cushion are extended forward in the shape of two horns to give support to the thighs.

15 The pack incorporates two side attachment straps each terminating in a D-ring. A single-handed release line, which has an arrowhead connector at each end, is passed through the D-rings and the connectors are mated with the two quick-release connectors on the parachute harness. Release of either connector during parachute descent, allows the pack to fall away, the freed end of the release line slipping through the D-rings. A lowering line which is stowed in a rolled case in the port side of the seat cushion terminates in an arrowhead/lug connector. When equipping the seat, the lug end of the arrowhead connector is inserted in a spring clip attached to the outer face of the seat pan port side. The arrowhead portion of the connector is engaged in a quick-release connector, attached by a lanyard to the occupant's life preserver, during the strapping-in procedure.

LEG RESTRAINT SYSTEM

16 The leg restraint system is fitted to draw back and restrain the occupant's legs close to the seat pan during ejection to prevent injury by flailing. The system consists of two leg restraint lines, two snubbing units, two taper plug housings and two leg restraint garters.

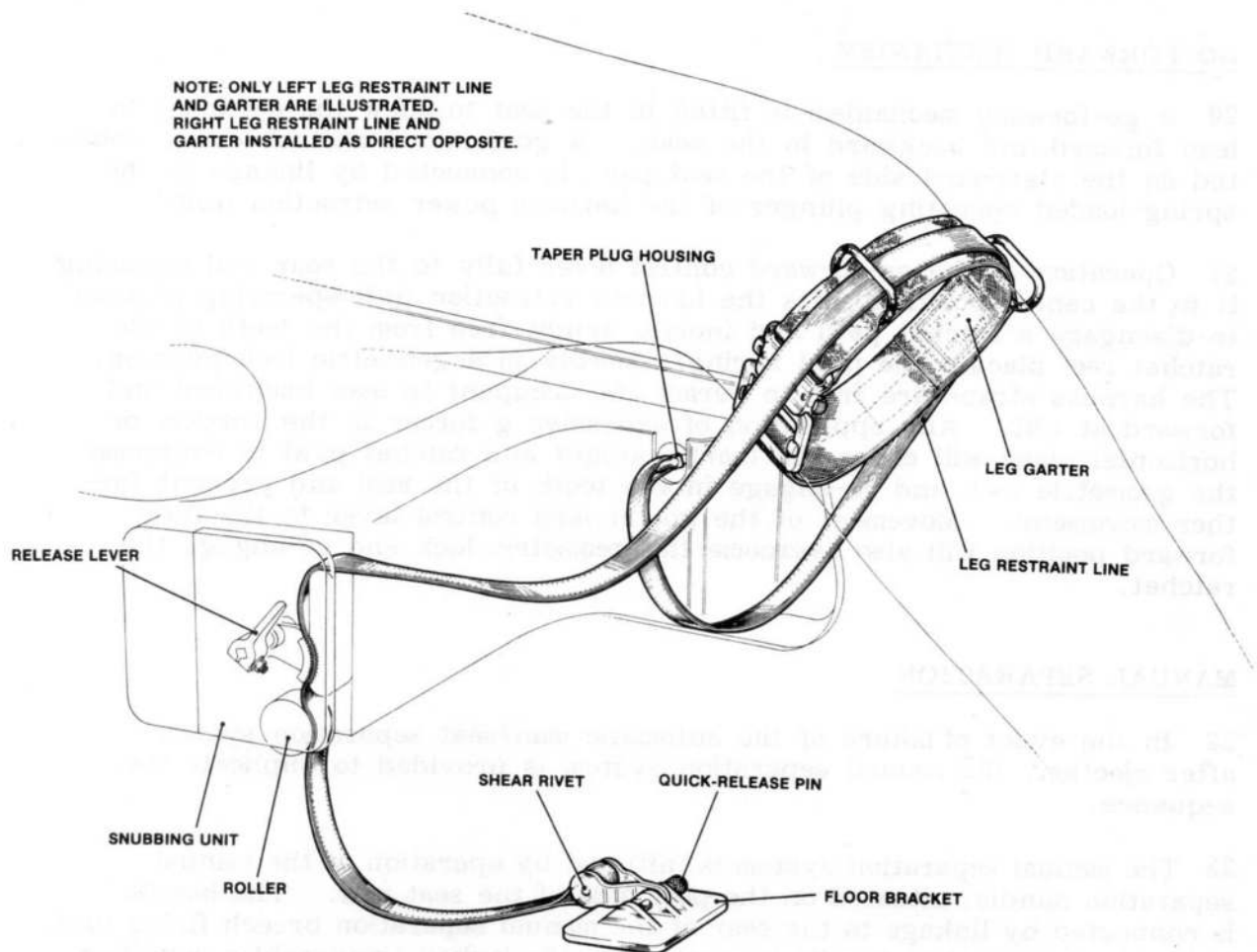


Fig 4 The leg restraint system

17 Each leg restraint garter consists of a webbing strap which incorporates a quick-release connector at one end, the other end being passed through a slider bar buckle which incorporates an arrowhead connector. Two D-rings are stitched into the webbing. The garters are worn below the knees with the two D-rings positioned forward, one either side of the shin bone, and the quick-release connector securing the arrowhead connector, at the rear inboard position. The garters are tightened by pulling outboard on the free end which then secures to the garter by Velcro fastener.

18 The looped lower end of each leg restraint line is secured to an end fitting by a shear rivet which is designed to fail at a pre-determined load. A taper plug is attached to the upper end of each line. The lower end fitting is secured by a quick-release pin to a bracket secured to the aircraft floor. Each line is routed up through a snubbing unit which allows the line to be drawn downward but prevents upward movement of the line. To release the snubbing unit to permit adjustment of the leg restraint line it is necessary to depress the lever on the inboard face of the snubber unit.

19 When strapping in, the occupant passes the free end of each line from inboard to outboard through the D-rings of the leg restraint garters and inserts the taper plugs into the taper plug housings on the inboard faces of the extended seat pan thigh guards.

GO-FORWARD MECHANISM

20 A go-forward mechanism is fitted to the seat to allow the occupant to lean forward and backward in the seat. A go-forward control lever, mounted on the starboard side of the seat pan, is connected by linkage to the spring-loaded operating plunger of the harness power retraction unit.

21 Operation of the go-forward control lever fully to the rear and releasing it to the centre position, lifts the harness retraction unit operating plunger to disengage a ratchet pawl and inertia weight free from the teeth of the ratchet reel placing the pawl spring assembly in a geometric lock position. The harness straps are free to permit the occupant to lean backward and forward at will. Any application of excessive g forces in the vertical or horizontal plane will cause the inertia weight and ratchet pawl to overcome the geometric lock and re-engage in the teeth of the reel and prevent further movement. Movement of the go-forward control lever to the fully forward position will also overcome the geometric lock and re-engage the ratchet.

MANUAL SEPARATION

22 In the event of failure of the automatic man/seat separation system after ejection, the manual separation system is provided to duplicate the sequence.

23 The manual separation system is initiated by operation of the manual separation handle, situated on the port side of the seat pan. The handle is connected by linkage to the sear of the manual separation breech firing unit. The manual separation handle is retained in the locked (inoperable) condition by a mechanical lock system which ensures that the seat firing handle must be withdrawn before the manual separation handle can be operated.

24 Operation of the separation handle withdraws the sear from the manual separation breech firing the cartridge. The resultant gas pressure is piped through a manifold assembly to the drogue gun to fire the secondary cartridge (if not already fired) ensuring that the drogues are deployed. The gas passes simultaneously to a piston unit which releases the mechanical lock and permits the emergency escape parachute to deploy, and to the shackle plunger housing to drive the piston down on the barostatic time-release unit shackle release plunger, overriding the time-release mechanism, to release the drogue shackle from the seat scissor shackle. The descending harness release plunger of the barostatic time-release unit fires the cartridge in the auxiliary breech; the resultant gas charge passes through the manifold valve to duplicate the actions initiated by the manual separation breech charge and operates the harness release mechanism to ensure the release of all harness locks and the PEC man portion.

PERSONAL EQUIPMENT CONNECTOR

25 The personal equipment connector (PEC) is fitted to the port side of the seat pan. It enables main oxygen, emergency oxygen, mic/tel and anti-g suit to be connected or disconnected in one action. The PEC comprises three components:

25.1 Aircraft portion. Connected by the main oxygen hose and oxygen flow sensor and pressure warning switch cables to the Intertechnique controller and including a mic/tel lead which is connected to a socket on the side of the seat pan. This portion of the PEC makes the Intertechnique equipment compatible with standard British flying clothing.

25.2 Seat portion. Bolted to the seat pan and connected to the emergency oxygen supply. Fitted with valves on the oxygen connections to close when the man portion or aircraft portion are disconnected. Latch plungers and springs are fitted to retain the aircraft and man portions. Connected by linkage to the harness release mechanism.

25.3 Man portion. Attached to the flying clothing by personal supply lines and released from the seat portion by operation of the harness release mechanism or by an upward pull on the handle lanyard.

26 On ejection, personal supplies are disconnected at a quick-disconnect and the aircraft portion remains attached to the seat portion. On operation of the harness release mechanism the man portion is released from the seat portion.

EMERGENCY OXYGEN SYSTEM

27 The emergency oxygen system consists of an oxygen cylinder fitted to an Intertechnique controller mounted on the port rear of the seat pan. The main oxygen supply and oxygen flow sensor and pressure warning switch cables also pass through the controller. From the bottom of the controller an emergency oxygen supply hose is connected to the seat portion of the PEC. A second hose, to supply main oxygen and anti-g requirements is connected to the aircraft portion of the PEC. Operation of the emergency oxygen supply is accomplished by withdrawal of the operating cable from the controller.

28 When the assembly is installed on the seat the operating cable is connected to a trip lever on the rear of the seat pan. On ejection, the main oxygen supply is broken at the quick-disconnect and the emergency supply is initiated. In the event of failure of the main oxygen supply, the emergency oxygen may be used by operating the emergency oxygen manual control located on the port side of the seat pan forward of the PEC. The handle is connected by a bowden cable to the trip lever at the rear of the seat pan.

NBC DEFENCE SYSTEM

29 A seat mounted NBC equipment tray is installed in the starboard rear recess of the seat pan. The system consists of two filter canisters connected to a blower unit motor which delivers filtered air to the seat occupant through a two part flexible hose. The seat portion of the hose connects at one end to the blower unit outlet at the lower rear of the seat pan and terminates at the other end in a quick-disconnect assembly. The man portion of the hose has a bayonet socket connector at its free end and an angled quick-disconnect at the other. The two parts of the hose quick-disconnect assembly are secured through a mounting bracket on the starboard side of the seat pan. A disconnect rod is attached at its upper end to a lug on the locking sleeve of the hose quick-disconnect assembly; the lower end of the rod is secured to a bracket on the cockpit floor by a quick-release pin.

30 Electric power for the system is supplied from the aircraft circuit through a pocket which connects to a matching pocket secured to the starboard side of the seat pan. A voltage regulator and a hazard warning are incorporated in the system.

31 As the seat rises on ejection, the disconnect rod withdraws the locking sleeve from the quick-disconnect assembly, freeing the man portion of the hose from the seat. The electric supply cable from the aircraft tightens and withdraws the aircraft pocket from the seat pocket.

ROCKET PACK

32 A multi-tubed rocket pack is fitted under the seat pan to sustain the thrust of the ejection gun giving a higher trajectory to the seat enabling a safe ejection to be made from zero altitude at 30 knots minimum forward speed.

33 An extension arm extends forward from the starboard end of the rocket pack centre body and is attached to a link on the pitch control unit fitted to the starboard side of the seat pan. Rotation of the control knob on top of the pitch control unit rotates the rocket pack about its attachment bolts, thus varying the direction of the thrust of the efflux nozzles to compensate for the effects of the occupant's weight upon the seat centre of gravity. A system of pinions connects an indicator drum to the control knob. The indicator drum is calibrated in lbs (mass) and the seat occupant must set the indicator to his boarding weight when strapping in.

34 Two types of rocket pack are provided: the No 5 Mk 4 pack is fitted to Type 9B Mk 3 and Type 9B1 Mk 3 seats installed in single seat aircraft and the front position in two seat aircraft respectively. The starboard outer efflux nozzle is slightly enlarged to impart a trajectory to port on ejection. A decal under the pack centre body indicates the seat position to which the pack is applicable.

35 The No 6 Mk 4 rocket pack is fitted to Type 9B2 Mk 3 seats installed in the rear position in two seat aircraft. The port outer efflux nozzle is enlarged to impart a divergent trajectory to starboard on ejection. A decal under the pack centre body indicates the seat position to which it is applicable.

SEAT PAN HEIGHT ADJUSTMENTCAUTION ...

Operation of the seat pan actuator is limited to one minute in any 10 minute period due to the danger of overheating.

36 The seat pan is adjusted for height by means of an electrically operated actuator located between the seat main beams. The bearing in the actuator motor housing is secured to the bottom seat pan runner and the piston end bearing is attached to the seat structure fixed centre cross beam. The actuator is controlled by a three position switch mounted on the aircraft console. The seat pan may be adjusted vertically to any position within a range of 5.0 in, thus catering for different aircrew heights and enabling the seat occupant's head to be correctly positioned in relation to the head-rest.

SEQUENCE OF EVENTS DURING EJECTION

37 On pulling the seat firing handle, the sear is withdrawn from the firing unit in the seat firing breech; this action fires a cartridge, the gas pressure from which is piped to the harness retraction unit to pull back and restrain the occupant in the correct posture for ejection. The gas pressure passes to the sear withdrawal plunger unit which operates a cross-shaft assembly to remove the sears from the canopy jettison firing unit and the ejection gun breech time-delay firing unit, thereby initiating canopy jettison and, after a short delay, seat ejection. As the seat rises up the guide rails, the following sequence occurs:

37.1 The NBC defence system two-part hose disconnects at the seat pan mounting bracket and the electric supply pocket disconnects.

37.2 The seat actuator electrical lead and personal supplies from the aircraft systems disconnect.

37.3 The emergency oxygen system trip lever trips, initiating the supply

37.4 The leg restraint lines tighten, drawing the occupant's legs back to the seat pan. At the predetermined load, the shear rivets fail freeing the lines from the aircraft.

37.5 The drogue gun trip rod withdraws the sear to actuate the time-delay mechanism.

37.6 The barostatic time-release unit trip rod withdraws the firing pin to actuate the time-delay mechanism.

37.7 As the seat leaves the aircraft, the remote rocket firing unit static line becomes taut withdrawing the sear to fire the cartridge. The resultant gas charge operates the rocket pack firing unit to fire a cartridge; the heat and pressure generated ignites the rocket pack to sustain the thrust of the ejection gun.

37.8 Approximately 0.55 s after ejection, the drogue gun fires ejecting the piston and deploying the drogues which stabilize and retard the seat. If ejection occurs above 10 000 ft, the seat will fall in a near vertical attitude with the occupant restrained by the harness and breathing emergency oxygen.

37.9 When the conditions of height set on the barostat (10 000 ft) are met, the barostatic time-release unit will commence to function; after a delay of approximately 2.0 s the unit will operate releasing the four harness locks, the leg restraint lines, the negative-g strap and the PEC man portion. The only restraint will then be provided by the sticker strap clips. The scissor shackle will be released, freeing the drogues from the seat and the parachute mechanical lock operates releasing the parachute withdrawal line permitting the parachute to deploy. The deployed parachute lifts the occupant from the seat, pulling the sticker strap lugs and the PSP lowering line arrowhead connector from their clips; this precludes the possibility of collision between the seat and occupant after separation. A normal parachute descent then follows.

38 On two seat aircraft the seats are ejected on divergent trajectories to prevent possible collision.

CONNECTIONS TO THE AIRCRAFT

39 On an installed seat, the following items are connected to the airframe or fixed portion of the seat.

39.1 Port side of the seat:

39.1.1 Trip rod from drogue gun to ejection gun cross beam.

39.1.2 Remote rocket initiator static cable to drogue gun trip rod.

39.1.3 Personal supplies and seat actuator electrical supply quick-disconnect to cockpit floor.

39.2 Starboard side of seat:

39.2.1 Trip rod from barostatic time-release unit to ejection gun cross beam.

39.2.2 NBC defence system electrical supply lead to pocket.

39.2.3 NBC defence system two part hose disconnecting rod to aircraft floor.

39.3 Under the seat:

39.3.1 Leg restraint lines to aircraft floor.

EQUIPPING THE SEAT

PREPARATION

40 Prepare the seat as follows:

40.1 Ensure that the seat has been made 'Safe for Servicing' in accordance with current instructions.

40.2 The emergency oxygen system must be fitted to the ejection seat before the seat is equipped.

40.3 Ensure that the seat pan is clean, that the leg restraint lines are clear of the seat pan and that the seat pan is in its lowest position.

40.4 Ensure that all harness lock plungers are fully home.

40.5 Ensure that the manual separation handle is locked in the fully down position.

40.6 Ensure that the barostatic time-release unit is correctly cocked.

40.7 Assemble the necessary items of equipment; parachute assembly, personal survival pack, negative-g restraint strap and Vee strap. Ensure that all items are serviceable.

40.8 Ensure that the back plate is located between the rear face of the head pad and the front face of the parachute pack.

EQUIPPING

41 The following procedure must be used when installing the equipment in the seat. The seat may be equipped before installation in the aircraft if this is advantageous.

41.1 Pass the lug of the negative-g strap down through the attachment bracket of the Vee strap so that the quick-release fitting (QRF) is facing forward and the Vee strap lays behind the negative-g strap. Engage the negative-g strap lug in the lock on the rear face of the seat pan front cross member, pull on the strap to ensure correct engagement (fig 5). Lay the negative-g strap over the front edge of the seat pan with the Vee strap behind it.

41.2 Lay the single-handed release line on top of the personal survival pack (PSP) cushion and route the arrowhead connectors through the D-rings on the PSP side attachment straps.

41.3 Place the PSP in the seat pan ensuring that the lowering line stowage is not disturbed and that the negative-g Vee strap is not trapped under the pack. Insert the lug end of the lowering line arrowhead connector into the spring clip on the port outer face of the seat pan side plate.

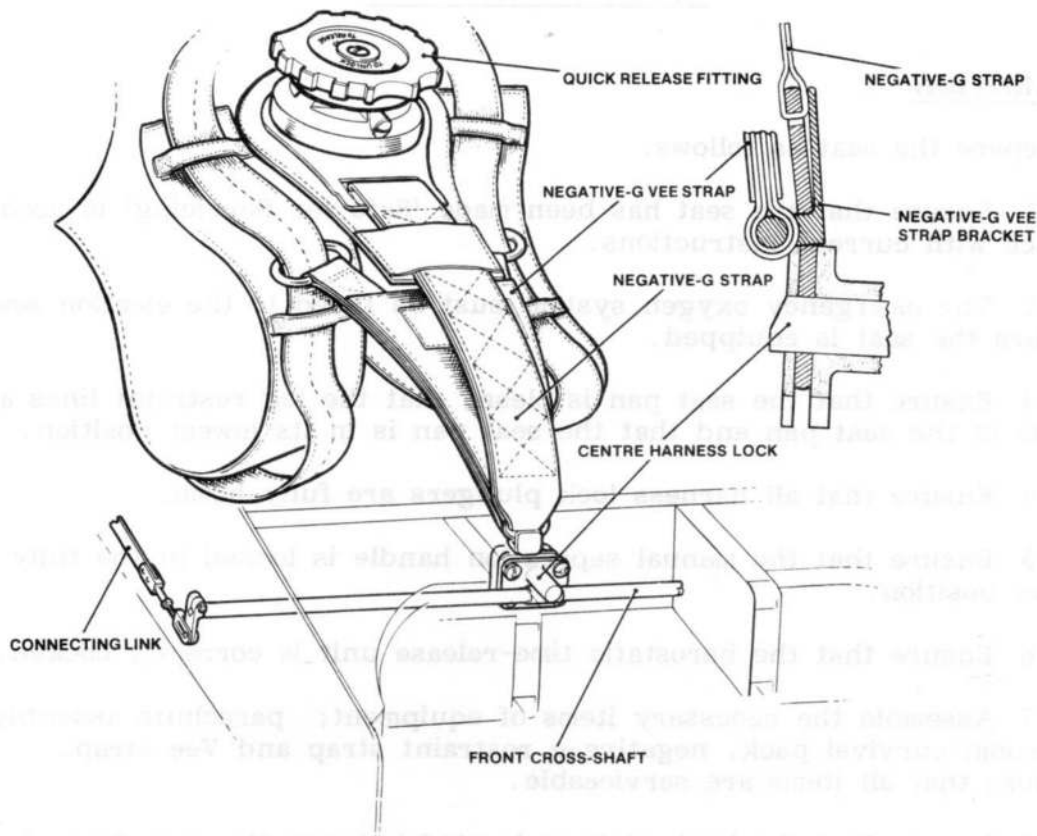


Fig 5 Installation of the negative-g strap and Vee strap

41.4 Remove the parachute pack securing bolts from the top latch housing and the shackle plunger housing on the upper seat structure. Locate the parachute pack cone fittings on the lower rear face, in the open upper ends of the seat pan runner tubes on the main beams. Align the pack attachment holes in the rear of the canopy breakers with the holes in the shackle plunger housing and top latch housing. Secure the pack with the two bolts and wirelock using 24 SWG stainless steel wire. Ensure that the piston end of the pipe and piston unit assembly is correctly aligned with the plunger of the parachute mechanical lock.

41.5 Withdraw the back plate from the front of the parachute pack and secure the lower brackets to the anchor brackets at the front upper frame of the seat pan using the two quick-release pins.

Note ...

The drogue shackle bolt is to be fitted so that the nut is uppermost when the scissor shackle is rotated forward.

41.6 Remove the nut and bolt from the drogue shackle. Ensure that the parachute withdrawal line is located under the extender strap on the lower arm of the shackle when it is fitted. Locate the drogue shackle over the closed jaws of the scissor shackle, pass the bolt up through

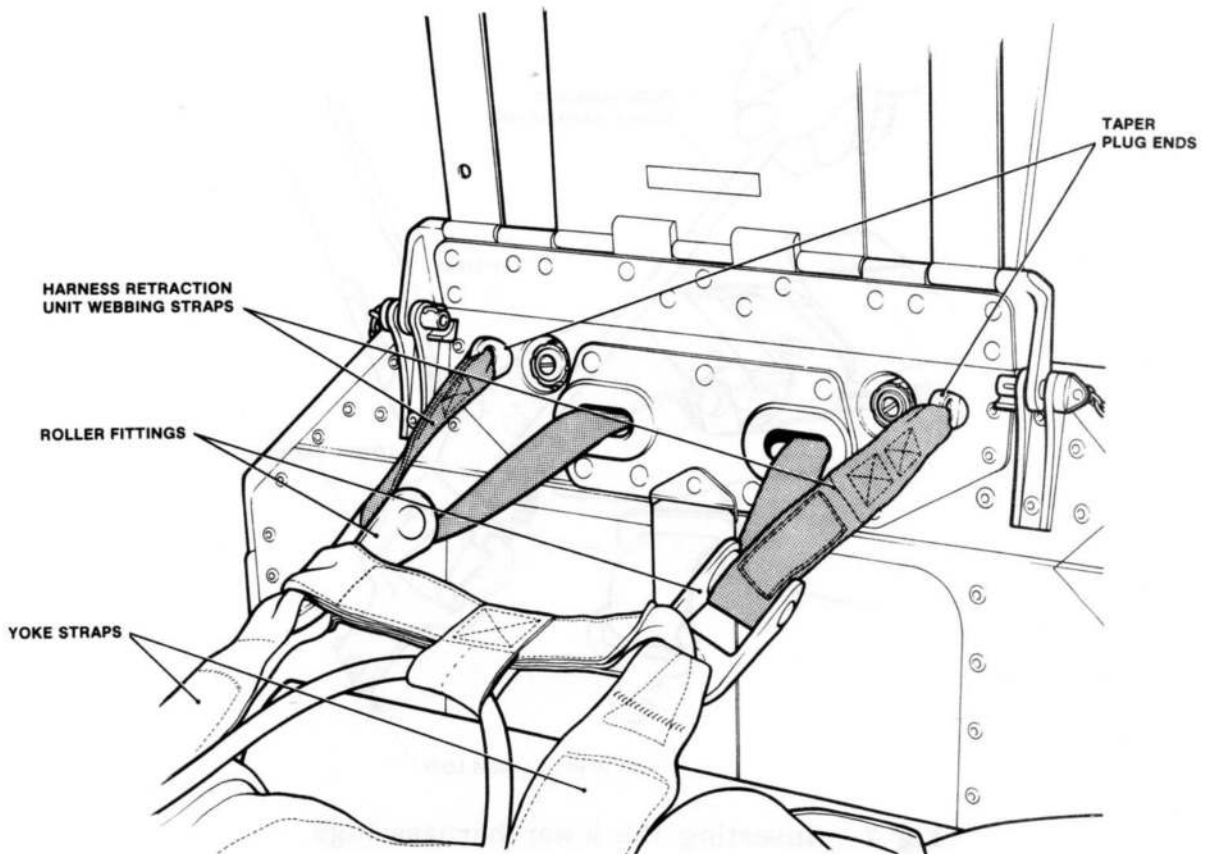


Fig 6 Routeing the harness power retraction unit webbing straps

the drogue and scissor shackles, then secure with a self locking nut.

41.7 Operate the go-forward control to the free position. Withdraw the straps of the harness retraction unit and pass the taper plug ends up through the appropriate roller fittings of the harness shoulder straps, then engage the taper plugs in their respective upper harness locks on the upper front face of the seat pan. Pull outward on the shoulder straps and ensure that the harness straps and the retraction unit straps are not twisted. Return the go-forward control to the locked position.

41.8 Ensure that the back pad is securely attached to the harness and locate it against the front face of the seat pan back rest. Lay the lower harness on the PSP cushion. Using the lug insertion tool engage the lower harness lugs in the lower harness locks. Pull on the harness to ensure the lugs are securely engaged (fig 7).

41.9 Route the ends of the PSP single-handed release line outboard of the harness lap straps and engage the arrowhead connectors in the quick-release connectors on the parachute harness (fig 8).

41.10 Pass the sticker straps around and outside the harness lap straps and the PSP attachment strap. Secure the lugs into the spring clips on the inside faces of the seat pan (fig 8).

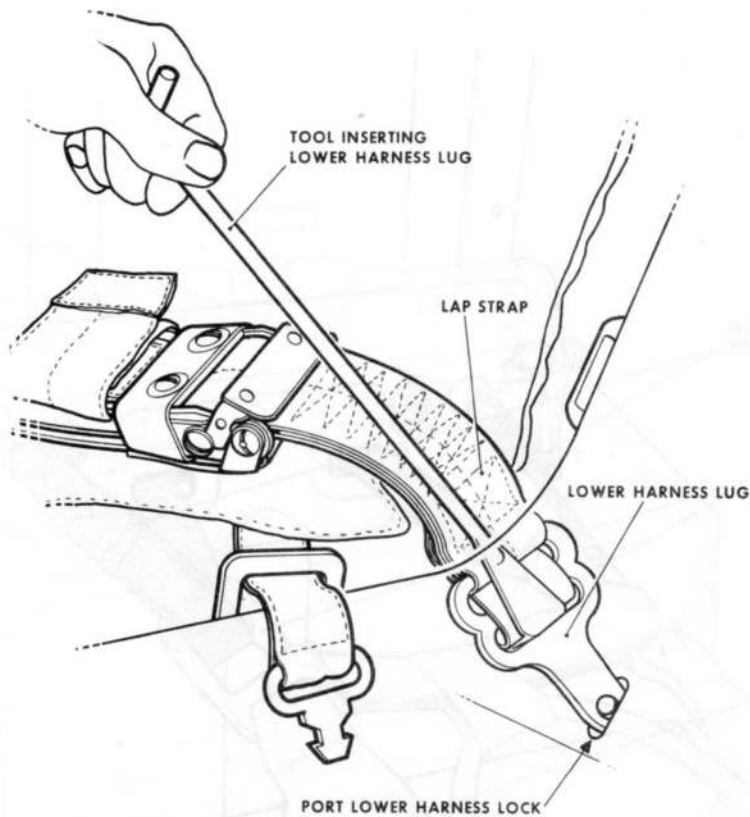


Fig 7 Inserting the lower harness lugs

41.11 Withdraw the crotch straps from the end becketts on each side of the padded apron. Pass the looped end of each crotch strap through the appropriate ring of the negative-g Vee strap and then back through the end beckett. The Vee strap rings are now located over the crotch straps between the fixed becketts (fig 5).

41.12 Ensure that the lift webs are located smoothly over the head pad and are secured by the Velcro strip.

41.13 Pass the lift web retaining straps forward through the slots in the seat back plate. Pass the retaining straps around the lift webs and secure with the press stud fastener (fig 6).

41.14 Fold the scissor shackle forward. Take one end of the previously prepared No 8 parachute thread safe tie, which emerges through an eyelet in the pack front closure flap, and pass it through the drogue extender strap loops and the drogue shackle. Press the scissor shackle hard down onto the forward stops, tighten the thread and tie off using a reef knot. Secure the free ends of the thread in a half hitch at each end of the reef knot (fig 9).

41.15 Stow the excess lift webs in a U shape between the harness back pad and the seat back rest. Enclose the lift webs, back pad and yoke strap in the lift web retaining straps (fig 10).

41.16 Extend all harness straps to their full extent, centralise the padded apron on the PSP seat cushion. Ensure that the PSP lowering line arrow-

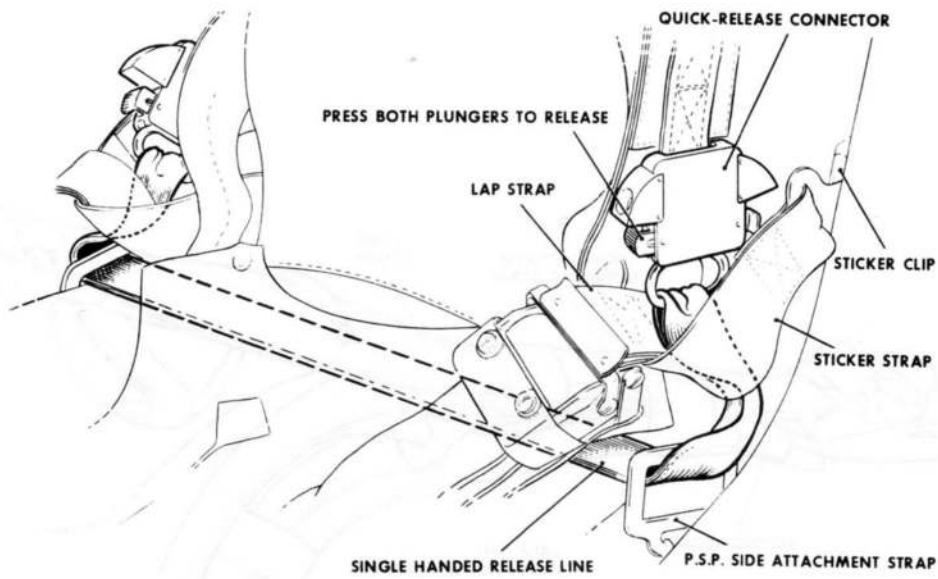


Fig 8 Routing the single-handed release line and sticker straps

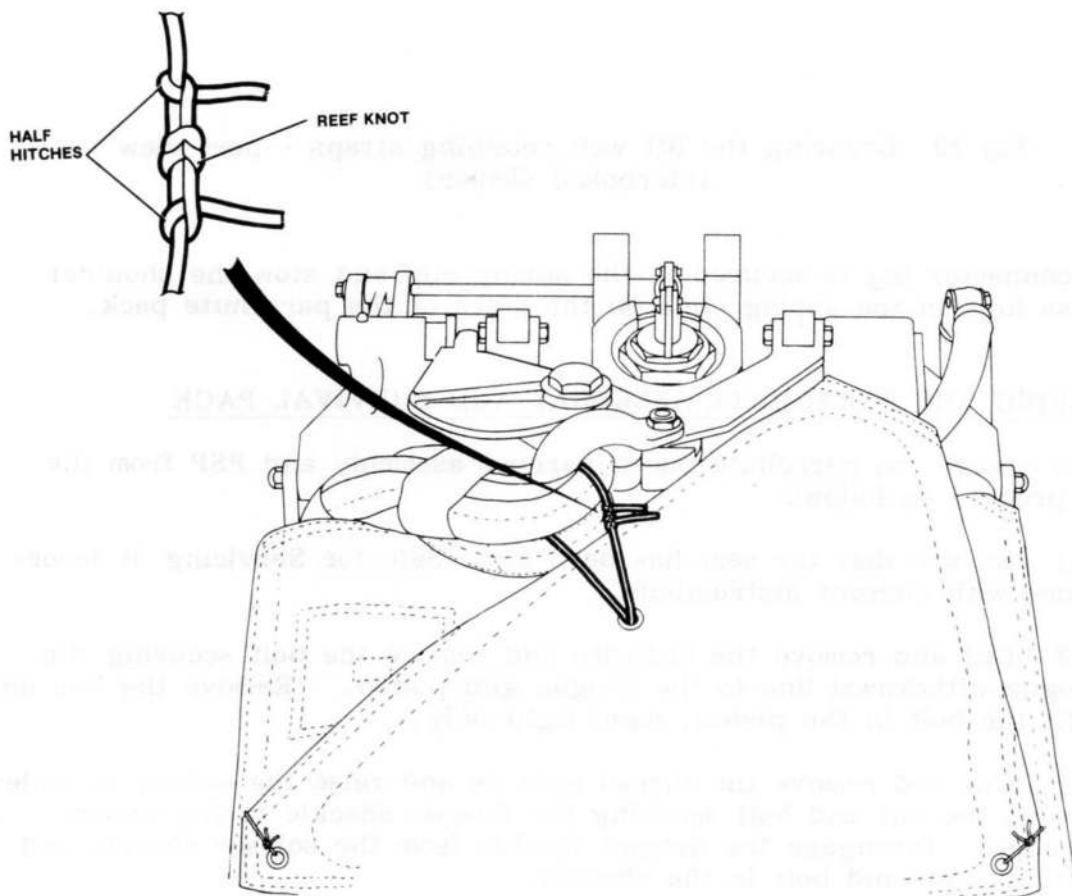


Fig 9 Securing the drogue shackle safe tie

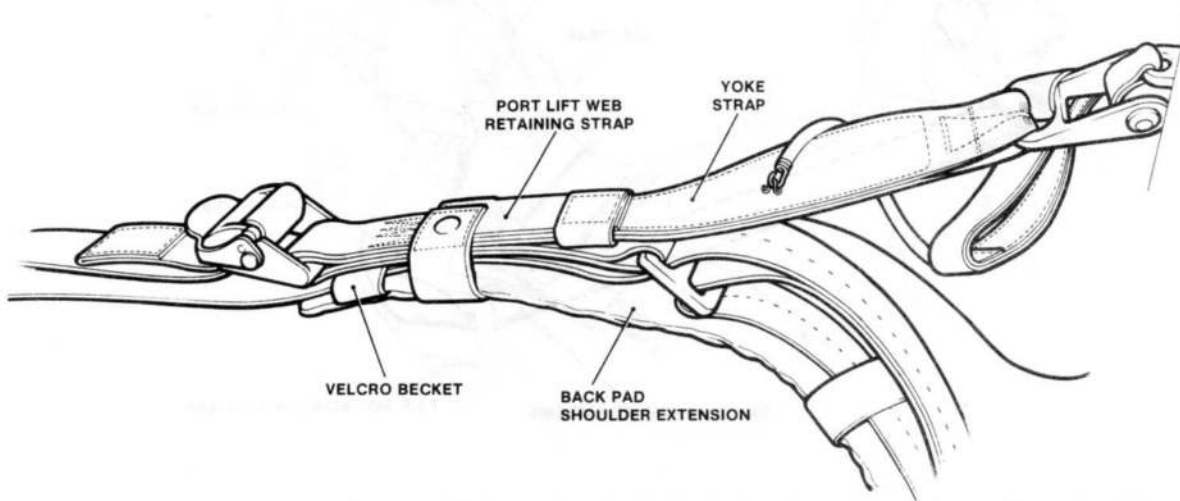


Fig 10 Securing the lift web retaining straps - port view
(starboard similar)

head connector lug is secured in the spring clip and stow the shoulder harness lugs in the spring clips on the sides of the parachute pack.

REMOVING THE PARACHUTE ASSEMBLY AND SURVIVAL PACK

42 To remove the parachute pack, harness assembly and PSP from the seat, proceed as follows:

- 42.1 Ensure that the seat has been made Safe for Servicing in accordance with current instructions.
- 42.2 Cut and remove the lockwire and remove the bolt securing the drogue withdrawal line to the drogue gun piston. Remove the line and refit the bolt in the piston, hand tight only.
- 42.3 Cut and remove the thread safe tie and raise the scissor shackle; remove the nut and bolt securing the drogue shackle to the scissor shackle. Disengage the drogue shackle from the scissor shackle and refit the nut and bolt to the shackle.

42.4 Operate the two quick-release connectors on the lower harness to release the PSP single-handed release line connectors. Fold the ends of the release line inward under the lower harness apron and over the PSP cushion.

42.5 Open the press studs on the port and starboard lift web retaining straps, then pass the straps rearward through the slots on the seat back plate. Remove the two quick-release pins securing the lower edge of the back plate to the seat pan, then slide the plate up into the aperture between the parachute pack and the head pad.

42.6 Withdraw the sticker strap lugs from the spring clips on the inner faces of the seat pan sides; withdraw the lug of the PSP lowering line arrowhead connector from the clip on the port outer face of the seat pan. Fold the sticker strap ends over the lower harness and the lowering line under the lower harness apron and over the PSP cushion.

Note ...

Restrain the PEC dust cover when releasing the harness locks.

42.7 Apply a spanner to the squared port end of the upper harness lock cross shaft and rotate the shaft counter clockwise to operate the harness release mechanism releasing the upper and lower harness lock, the negative-g strap lock and the PEC dust cover. Remove the lower harness and negative-g strap lugs from the locks; remove the harness retraction unit webbing straps from the roller fittings on the upper harness. Refit the PEC dust cover.

42.8 Cut and remove the lockwire from the two bolts securing the parachute pack to the seat structure; remove the bolts, lift the pack free from its lower attachment points and place it on the lower harness in the seat pan. Refit the bolts in the seat structure, hand tight only.

42.9 Remove the parachute and harness assembly, the negative-g strap and Vee strap and the PSP from the seat, then convey to the Survival Equipment Bay.

STRAPPING IN PROCEDURES

PREPARATION

43 The leg restraint garters are to be fitted before entering the aircraft. Ensure that the crank in the arrowhead connector follows the curve of the leg. The garters are to be fitted around the legs below the knee with the D-rings to the front on either side of the shin bone and the quick-release connectors to the inside of the legs. The free end of the garter, when secured by the Velcro fastener, must be at least one inch from the outboard D-ring. If necessary, the excess strap is to form a loop to the rear of the leg.

STRAPPING IN PROCEDURE - GENERAL

44 The procedure for strapping in is as follows:

WARNING ...ENSURE THE SEAT SAFETY PINS ARE FITTED IN THE SAFE FOR PARKING POSITIONS.

- 44.1 Enter the cockpit, taking care not to stand on the seat firing handle.
- 44.2 Sit in the seat. Ensure that the oxygen and anti-g supply are turned off at the PEC. Remove and stow the dust cover from the seat portion of the PEC.
- 44.3 Remove the cover from the man portion of the PEC. Insert the front end of the man portion in an inclined attitude into the front of the PEC seat portion and press down until it locks in place. Test for correct fitment by checking the mic/tel system.
- 44.4 Adjust the height of the seat pan to the normal in-flight position.
- 44.5 Pass the leg restraint line, emerging from the port snubbing unit, around the front of the left leg, routing it from inboard to outboard through the two D-rings on the leg garter and insert the taper plug end into the taper plug housing on the inner side of the port thigh guard. Pull on the line to check correct engagement. Similarly route the starboard leg restraint line through the D-rings of the right leg garter and insert the taper plug into the starboard housing. Adjust the lines to permit the required leg movement.
- 44.6 Engage the quick-release connector on the life preserver with the PSP lowering line arrowhead connector held in a spring clip on the port side of the seat pan, adjusting the life preserver strap as required.
- 44.7 Adjust the rocket pack pitch control unit to indicate the occupant's boarding weight.
- 44.8 Ensure that the go-forward control lever is in the locked position, then bring down the shoulder straps.

WARNING ...ENSURE THAT THE NEGATIVE-G STRAP IS ROUTED BEHIND, NOT THROUGH, THE SEAT FIRING HANDLE.

- 44.9 Bring the negative-g strap and QRF up between the legs ensuring that it does not pass through the seat firing handle.
- 44.10 Place the lap straps to lay over the thighs ensuring that the left strap passes OVER the life preserver PSP attachment strap.

Note ...

To fit the shoulder harness lugs into the QRF, turn the face plate until the yellow line passes the dots on the body, hold in that position and insert the lug. Release the face plate. Repeat the procedure for the second lug.

44.11 Draw the left crotch strap upward between the legs, ensuring that it is not twisted and laying the padded apron against the left thigh. Route the looped end of the crotch strap up, inboard to outboard, through the D-ring of the left lap strap, fold the strap over to the right using a forward 90° twist, pass the lug of the left shoulder strap down through the looped end of the crotch strap and secure the lug in the QRF. Carry out a similar operation for the right hand harness straps. Re-check that the life preserver PSP attachment strap is under the left lap strap.

44.12 Fully tighten the lap straps ensuring that the QRF remains central. Roll up the free ends of the lap straps and secure with the Velcro fastener.

44.13 Fully tighten the shoulder straps ensuring that the QRF remains central. Operate the go-forward lever to the free position and lean fully forward. Return the go-forward lever to the locked position, sit well back in the seat and retighten the shoulder straps.

44.14 Obtain ground crew assistance, pull the excess lift webs to the rear, ensure they are stowed in the lift web restraint straps on the rear of the harness back pad and secured by the Velcro fasteners (fig 10).

44.15 Don the flying helmet and fasten the chin straps. Connect the oxygen mask hose. Connect the mic/tel lead locating it inboard of the left hand stole of the life jacket, with the connector tucked behind the left hand edge of the mini regulator.

44.16 Carry out the following functional checks.

CAUTION ...

Operation of the seat pan actuator is limited to one minute in any 10 minute period.

44.16.1 Raise and lower the seat pan over its full range. Reposition to the desired height.

44.16.2 Carry out oxygen flow checks and test the mic/tel circuit.

44.16.3 Ensure that the leg restraint lines are securely locked in their housings.

44.16.4 Move the go-forward control lever to the rear position, release it to the central position and check that forward movement is free. Lean fully forward, return the lever to the forward position and sit back checking at intervals that all forward movement is restricted.

45 With assistance remove and stow the safety pins. Ensure that a full complement of safety pins are present in their stowages.

STRAPPING IN PROCEDURE - NBC DEFENCE SYSTEM IN USE

46 When the aircraft is flown in the NBC defence role, the strapping in procedure is as follows:

► Before cockpit entry

47

47.1 With groundcrew assistance remove the overboots at the top of the ladder.

47.2 Hook the portable ventilator on to the aircraft sill.

Strapping-in procedure

48

48.1 Adjust the seat pan height to the correct in-flight eye line.

48.2 Turn ON the oxygen supply and check that the contents are sufficient.

48.3 Remove and stow the PEC dust cover.

48.4 Remove the rubber cover from the man portion of the PEC, connect the man portion to the seat portion (fig 15) and stow the rubber cover in pocket of the g-suit trousers.

48.5 Check that the oxygen magnetic indicator indicates constant white.

48.6 Whilst holding the breath disconnect the portable ventilator from the respirator supply manifold. Remove the blanking plug from the end of the S6 cannister hose and connect the manifold supply hose to the S6 cannister hose.

48.7 Resume breathing and insert the blanking plug into the end of the portable ventilator supply hose and hand to groundcrew.

48.8 Hold breath and check oxygen flow across the face.

48.9 Carry out the remainder of the normal strapping-in drills. ◀

EMERGENCY PROCEDURE

49 Instructions for dealing with emergencies are contained in Aircrew Manual AP 101B-3101-15.

LEAVING THE AIRCRAFT AFTER LANDING - GENERAL

50 The following procedure is to be adhered to when leaving the aircraft after landing.

- 50.1 With the assistance of a ground crew member, remove the safety pins from their stowages and place in the 'Safe for Parking' positions.
- 50.2 Remove the oxygen mask, turn OFF the oxygen supply at the PEC.
- 50.3 With the right hand, rotate the harness QRF face plate through 90° and press to release the parachute harness. At the same time, using the left hand, operate the leg restraint line manual release lever to free the lines.
- 50.4 Using the left hand, press the plungers of the PSP lowering line quick-release connector to release the lowering line arrowhead connector.
- 50.5 With the left hand release the man portion of the PEC from the seat portion. Fit a dust cover to the seat portion of the PEC and a rubber protective cover to the man portion.
- 50.6 Vacate the aircraft.

LEAVING THE AIRCRAFT AFTER LANDING - NBC DEFENCE SYSTEM IN USE

- ▶ 51 When the aircraft is flown in the NBC defence role, the procedure for leaving the aircraft is as follows:
 - 51.1 Place the seat in the Safe for Parking condition as detailed in sub-para 50.1.
 - 51.2 A portable ventilator is to be hung from the cockpit sill by a ground crew member.
 - 51.3 Release the harness, leg restraint and PSP lowering line as detailed in sub-para 50.3 and 50.4.
 - 51.4 Whilst holding the breath, remove blanking plug from the portable ventilator hose and disconnect air hose from cannister hose.
 - 51.5 Connect portable ventilator hose to the manifold hose and purge by exhalation.
 - 51.6 Fit blanking plug to cannister hose.
 - 51.7 Check airflow across face from portable ventilator.
 - 51.8 Disconnect the man portion of the PEC and fit the rubber protective cover; fit the dust cover to the PEC seat portion and turn OFF the main oxygen supply.
 - 51.9 Carrying the portable ventilator, vacate the aircraft.
 - 51.10 Don overboots before stepping off the ladder. ◀

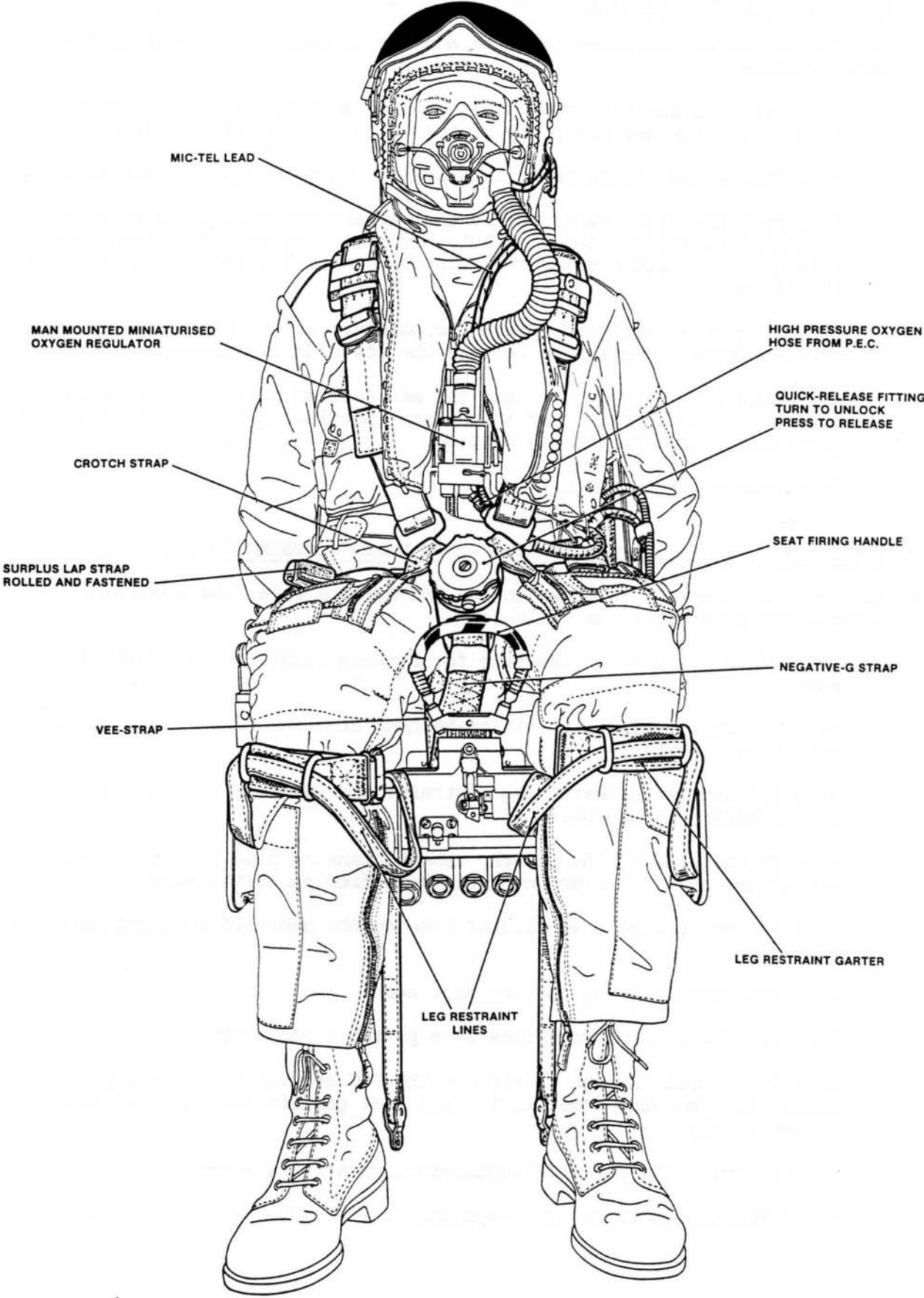


Fig 11 The seat occupied - front view



Fig 12 The seat occupied - port view
(Post-mod ES 7183)

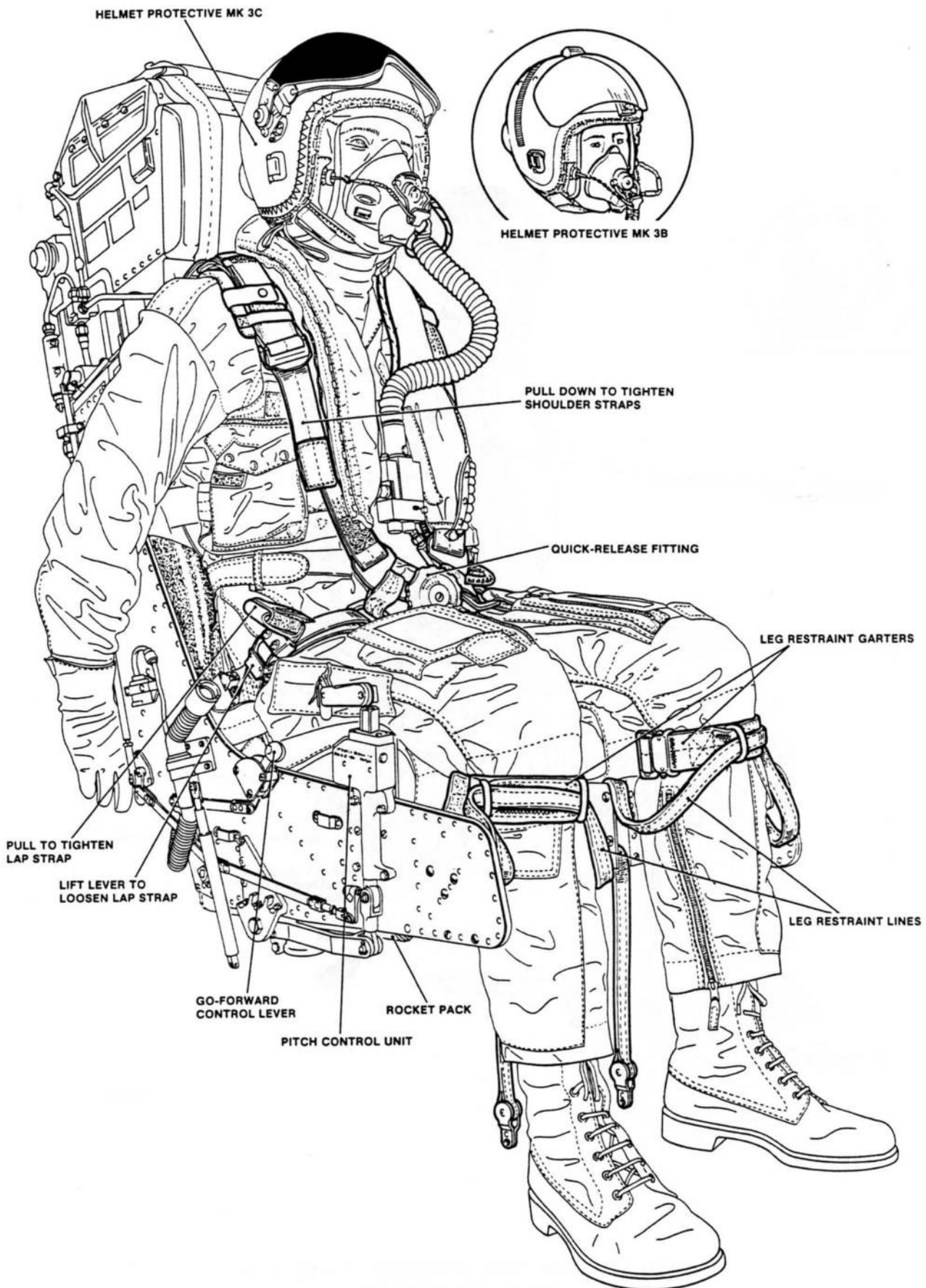


Fig 13 The seat occupied - starboard view

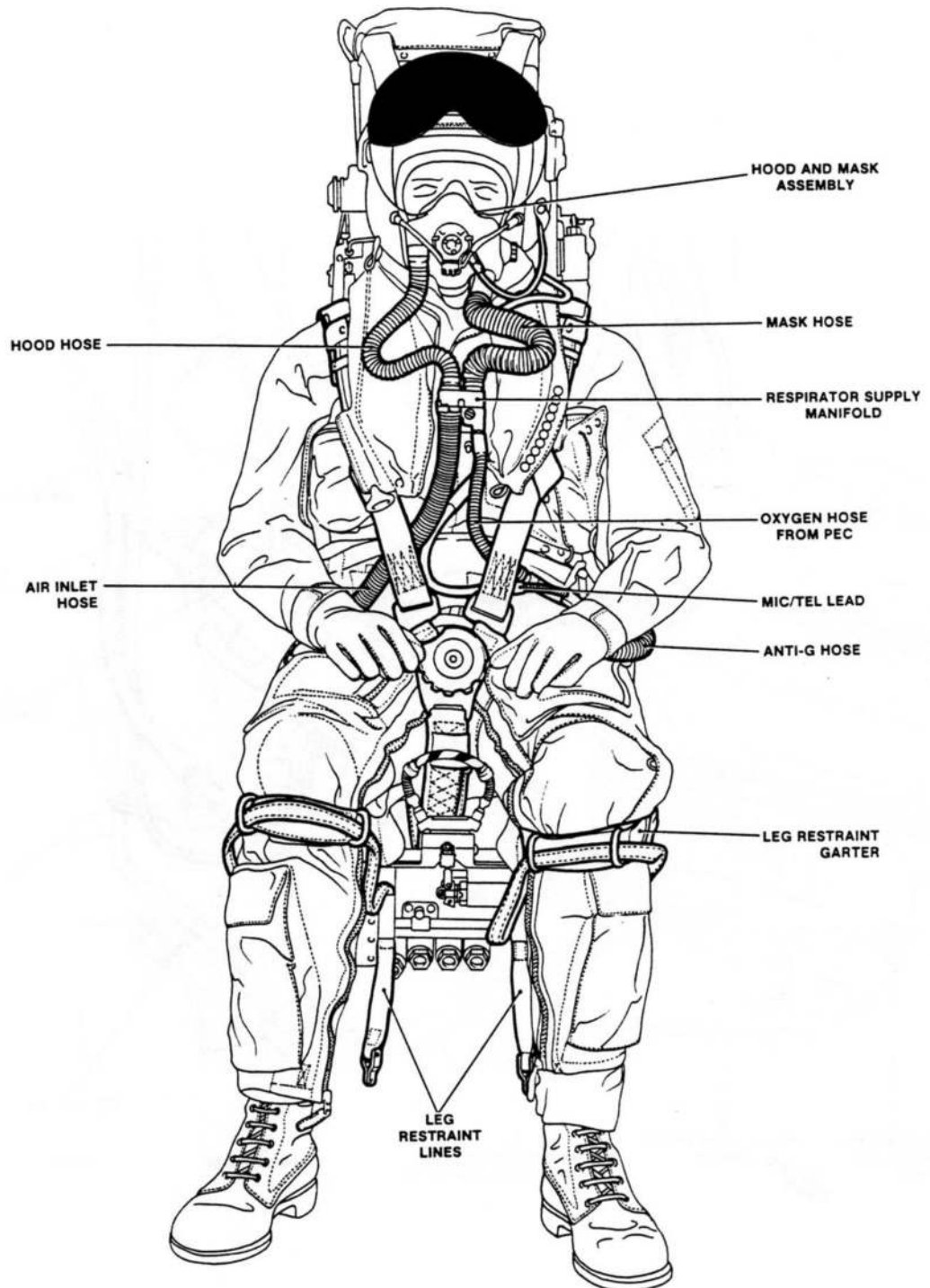


Fig 14 The seat occupied - NBC defence system in use - front view

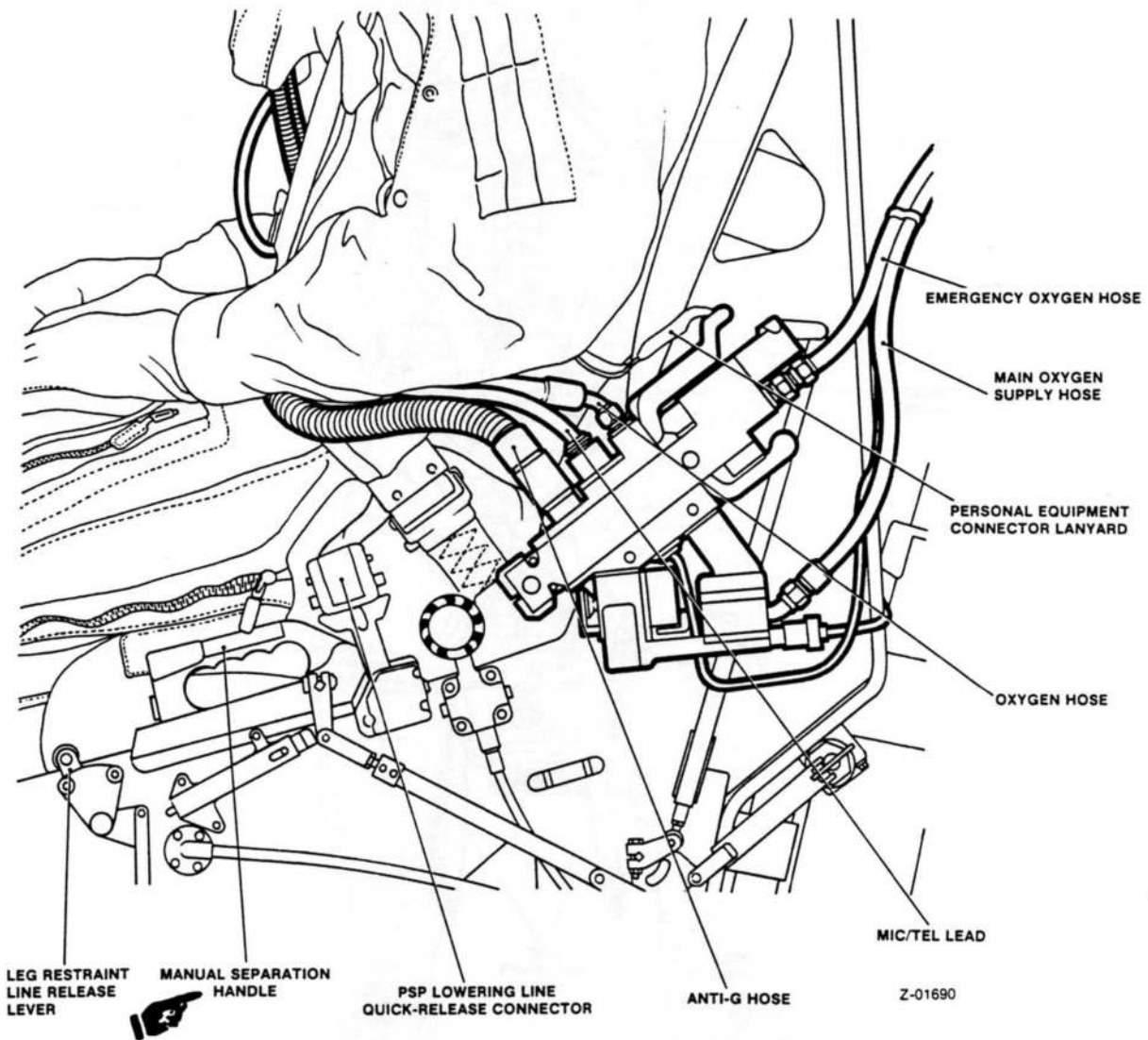


Fig 15 The seat occupied - NBC defence system equipment - port view
(Post-mod ES 7183)

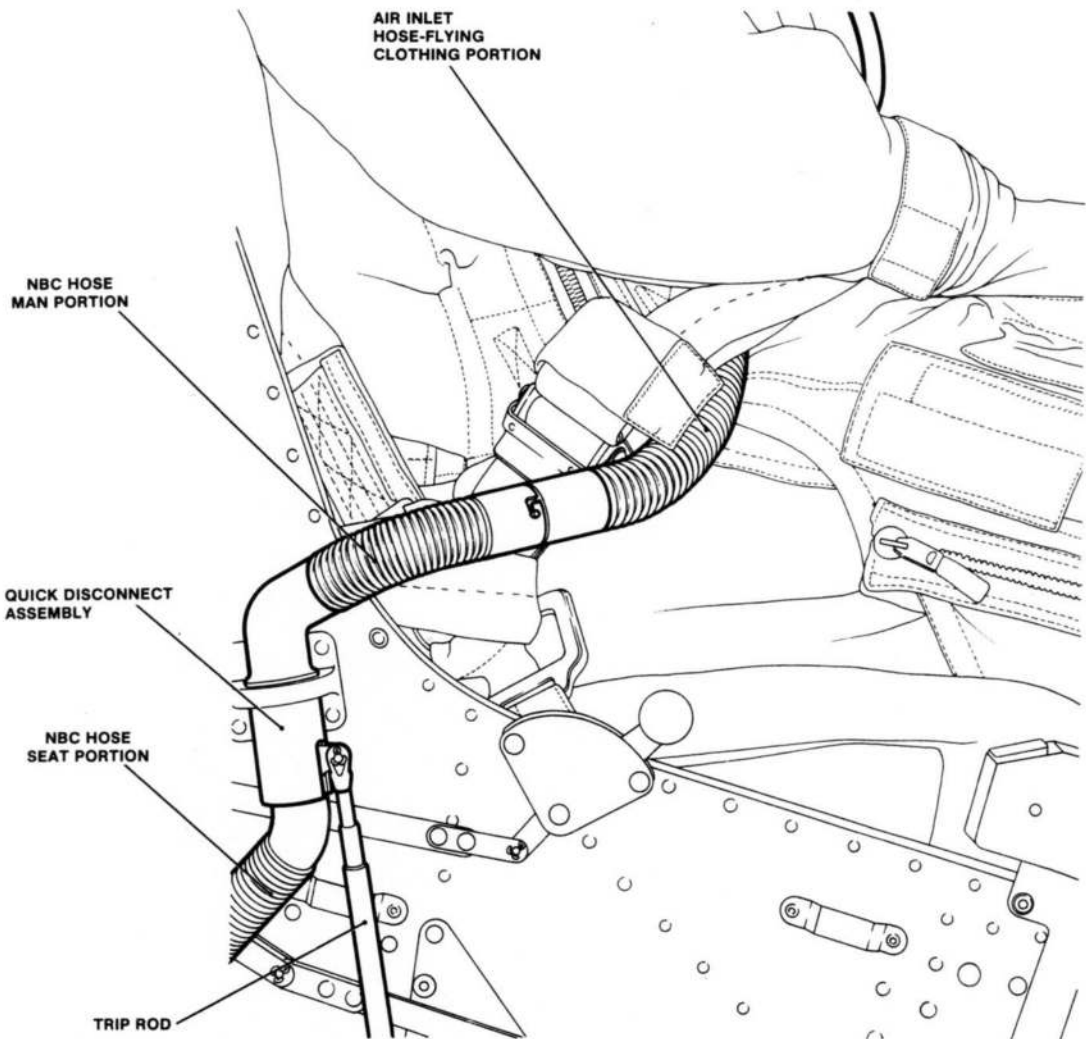


Fig 16 The seat occupied - NBC defence system - routing the hoses - starboard view

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