Chapter 1

EJECTION SEATS, Type 2CA/1 and 2CA/2

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Introduction

1. Ejection seats, Type 2CA/1 and 2CA/2 (Ref. No. 27L/50123 and 50124 respectively) are modified forms of the Type 1CN seat and are installed in Canberra B Mk. 6, PR Mk. 7, B Mk. 15 and B Mk. 16 aircraft. The principal difference between the two marks of seat is that the Type 2CA/1 seat has a bifurcated firing cable, one leg of which is connected to the trip lever of the time-delayed firing unit and the other to the canopy jettison gun sear; the Type 2CA/2 seat only has a single firing cable connected direct to the ejection gun sear. In both arrangements, provision is made for the upper attachment of the alternative firing cable. Since the two types of seat are otherwise similar, only the Type 2CA/1 will be fully described in this chapter.

General description

2. The seat structure (*fig.* 1) slides during ejection on four rollers in a guide rail bolted to the aircraft structure. It is propelled by the ejection gun which is located within the hollow guide rail.

3. The canopy is jettisoned and the ejection gun is fired by the action of pulling the main firing handle right down over the face. This handle draws out from the headrest a flexible screen which covers the occupant's face and protects it from the effects of the airstream. It also holds his head back against the headrest pad and prevents it from jerking forward during ejection. Attached to the face screen is a cable connected to the canopy jettison and time-delayed firing unit. When the face screen is pulled down over the face, the cable withdraws the sear from the canopy jettison firing body and the gun is fired; at the same time the cable operates the time-delay mechanism trip lever and after 1 sec. the ejection gun is fired. The face screen and firing cable are proportioned in such a manner that the ejection gun will be fired whether the occupant is wearing a protective helmet or not.

4. The seat pan accommodates a seat type parachute assembly and a personal survival pack containing a dinghy and other survival aids. The seat pan can be adjusted for height by means of a handle on the starboard side of the seat structure. The seat pan moves relative to the headrest and can thus accommodate different body lengths, at the same time ensuring that the occupant's head will always be correctly located on the headrest pad whatever the position of the seat pan. Mounted at the front of the seat pan is an alternative firing handle which is used only if it is impossible to reach the main firing handle, e.g., in conditions of high 'g'.

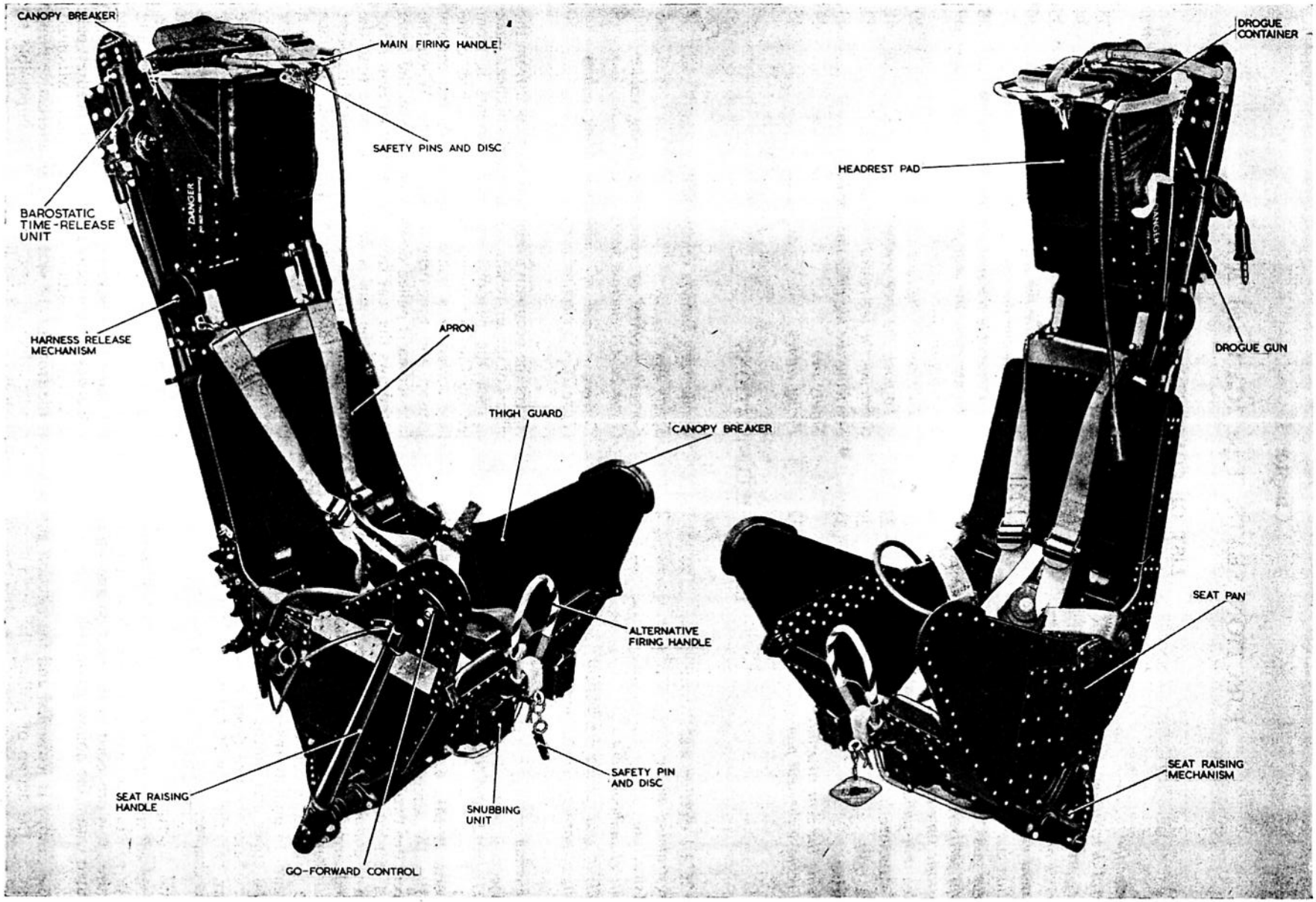

Fig. 1. Type 2CA/1 ejection seat

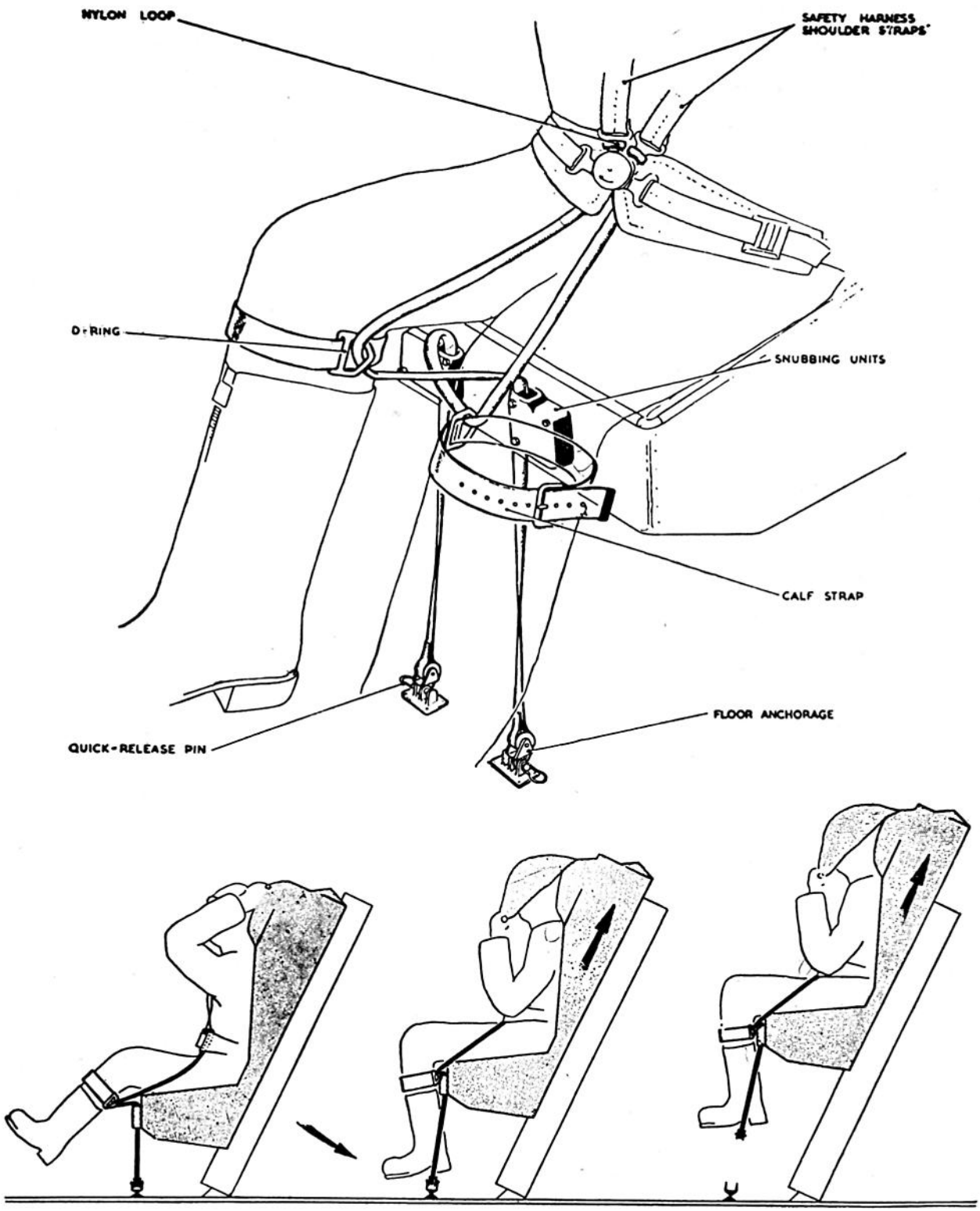

Fig. 2. Leg restraining device

5. A leg restraining device (fig. 2) is incorporated to ensure that the occupant's legs are drawn back automatically and restrained close to the seat pan; this provides leg clearance during ejection and also prevents the legs from flailing in the airstream after ejection.

6. The seat is provided with Type ZA safety harness having the two shoulder straps attached to spring-loaded ratchet locks on the seat beams. The locks may be released by the movement of the go-forward control mounted on the starboard thigh guard, thus permitting the occupant to lean forward in the seat when necessary; the mechanism automatically re-locks when the normal position is resumed.

7. The automatic system comprises a barostatic time-release unit which controls the opening of a scissor shackle at the top of the seat structure and the operation of the safety harness quick-release fitting. An apron, to which the parachute withdrawal line is attached, is provided to pitch the occupant forward and open his parachute.

8. An emergency oxygen set is mounted on the starboard seat beam and the main oxygen supply and Mic/Tel lead are connected to the aircraft services by quick-release connections. When the seat is ejected, the main oxygen and Mic/Tel services disconnect automatically, and further quick-release connections are provided for disconnecting these services when the occupant leaves the seat subsequent to ejection. A further quick-release connection is provided to operate the emergency oxygen bottle and then to disengage automatically.

Safety precautions

9. Safety pins complete with red discs are provided for rendering the seats safe for parking or servicing. A fabric strap is attached to the front edge of the drogue container. When this strap is passed through the firing handle and locked by the safety pin, the face screen is locked against the possibility of inadvertent withdrawal. When a separate safety pin is inserted in the alternative firing handle, the seat is safe for parking.

10. Before any work is done in the aircraft cockpit on or near the ejection seats, safety pins are to be inserted in the firing mechanism sears in accordance with current authorized instructions.

Principle of operation

11. Although these seats embody canopy breakers, single lever ejection is being introduced to both marks; the canopy breakers, therefore, are virtually redundant. Furthermore, the frangible hatch at the rear station is being replaced by a metal hatch and the Mk. 2CA/2 seats will eventually have the means of initiating canopy jettison. For the purpose of this description, it will be assumed that single lever ejection applies to all seats, and that one of the rear crew members has initiated canopy/hatch jettison action. Thereupon the following sequence of events applies to all ejection seats in the aircraft.

12. On ejection, the leg restraining cords are freed from the cockpit floor anchorages by the light-alloy rivets being sheared, the barostatic time-release unit is actuated by its static rod and the emergency oxygen supply is turned on automatically. Assuming an ejection has been necessary above an altitude of 10,000 ft., a steadied free fall occurs until this height is reached. Thereupon, after 1·25 sec., the barostatic time-release unit operates, the scissor shackle opens, the drogues and safety harness are released, the apron straightens and the occupant is pitched forward. A withdrawal line attached to the apron withdraws the main parachute from its pack and the escapee is lowered in the normal manner.

13. If an ejection occurs below 10,000 ft., the same sequence occurs, except that the barostatic time-release unit operates after an interval of 1·25 sec., subject however to the overriding influence of the G-controller switch if the speed is excessive for safe parachute deployment.

COMMON COMPONENTS

14. These components are fully described in A.P.4288A, Vol. 1, but the general details are being included in this chapter for guidance.

Ejection gun

15. The type 3, ◄ Mk. 1 ► ejection gun has a stroke of 72 in., with an ejection velocity of 80ft. per sec. and consists of three telescopic tubes. The outer or cylinder tube is attached at its lower end to the bottom mounting block fitted in the guide rail and the inner or piston tube is attached to the upper end of the top cross-beam of the seat frame; the intermediate piston tube is situated between the other two and its purpose is to lengthen the stroke and to offer restraint against bending loads imposed on the gun by the airstream. The explosive is contained in five cartridges; a primary cartridge and four secondary cartridges.

16. At the upper end of the inner piston tube is a breech containing the firing body and the primary cartridge. When the firing cable is pulled it withdraws the wedge-shaped sear; the movement of the sear first compresses the firing pin spring and then releases the firing pin to strike the percussion cap of the primary cartridge. The gas pressure frees a release piston and the two piston tubes are propelled upwards, so uncovering two pairs of ports in turn so that the secondary cartridges are ignited by the flame of the primary cartridge.

Drogue gun

17. The Type ◄ 5 ► drogue gun is bolted to the port side beam of the seat structure and consists of a time-delay mechanism, a barrel and a piston. As the seat ascends the guide rail during ejection, a static rod withdraws a sear and the time-delay mechanism is tripped. After 0·5 sec. delay, a small cartridge is denoted, the gas pressure shears a split pin which holds the piston in position in the

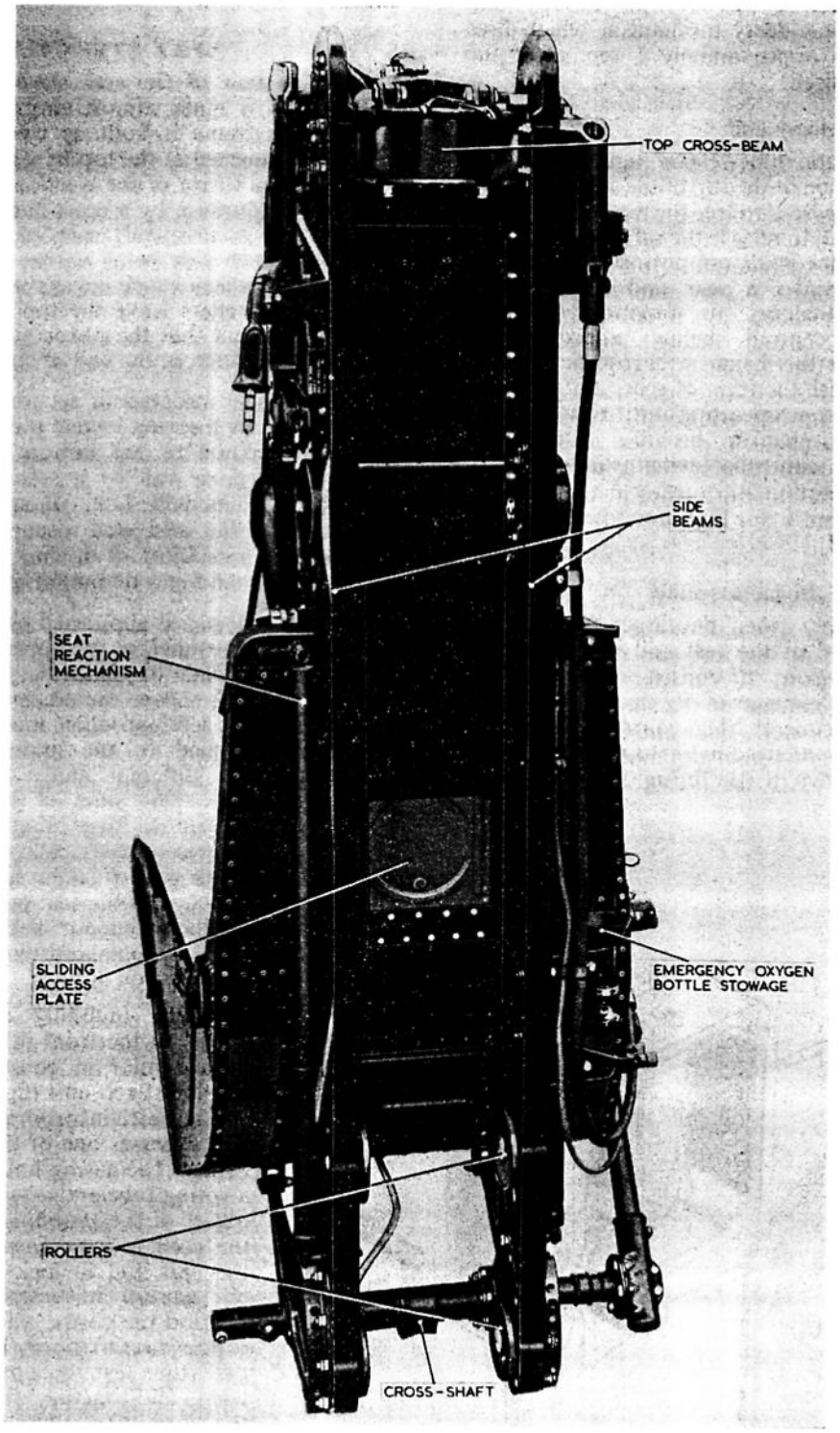

Fig. 3. Seat structure

barrel and the piston is ejected. Attached to the upper end of the piston is the drogue withdrawal line which deploys the drogues.

Canopy jettison and time-delayed firing unit

18. This is the standard unit which provides the power for jettisoning the cockpit canopy and incorporates a time-delay mechanism which fires the ejection gun approximately 1 sec. after the canopy gun has fired.

Barostatic time-release unit

19. The barostatic time-release unit, Type ◄1, Mk. 1 ► is mounted at the top of the starboard seat beam and its purpose is to free the drogues from the scissor shackle and to release the safety harness. As the seat ascends the guide rail during an ejection, a static line withdraws a sear and a time-delay mechanism commences to function provided ejection has occurred below approximately 10,000 ft. Above this height a barostatic remains in engagement with the train of gears and prevents the mechanism from operating until this height is reached. The mechanism provides a delay of 1·25 sec., but a G controller switch is incorporated which delays operation still further if the speed at the time of ejection is too high for safe parachute deployment.

Duplex anti-squid drogue assembly

20. This assembly when developed first checks the forward speed of the seat and then stabilizes the seat and occupant. It consists of a controller drogue with a diameter of 22 in. and a main drogue 5 ft. in diameter. The controller drogue is connected to the main by a nylon tape and the main drogue is connected to the lifting lines by nylon shroud lines.

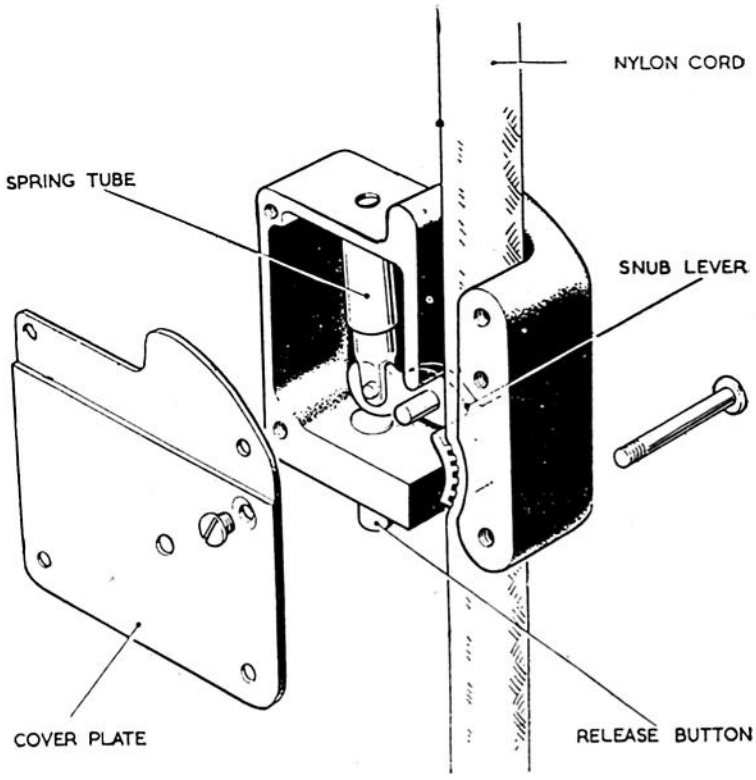

Fig. 4. Details of snubbing unit

21. In the centre of the controller drogue is an anti-squid line which is made slightly shorter than the shroud lines. The object of this arragement is to relieve the shroud lines of the initial shock, so enabling the canopy to develop fully without any danger of "squidding" (a condition in which a canopy is fully deployed but will not develop).

SEAT STRUCTURE

22. The rear of the seat structure is shown in fig. 3 and is made almost entirely of light alloy. The main frame is built up from a pair of side beams connected at the top by a cross-beam which receives the thrust of the ejection gun piston tube, and at the bottom by a cross-shaft through which passes the countershaft carrying the seat raising handle. Each side beam carries at its lower end two of the rollers which engage with the guide rail. The upper rollers leave the top of the guide rail at the moment that the piston tube emerges from the cylinder tube at the end of the ejection stroke.

23. The seat structure is secured to the ejection gun piston by a spring-loaded plunger and the gun itself is secured to the bottom mounting block within the guide rail by a second spring-loaded plunger. When both latch plungers are correctly positioned, the seat and occupant are secured against the possibility of moving up the guide rail during inverted flight or similar manoeuvres.

24. The seat pan is supported on two seat raising levers and restrained at its upper corners by two blocks which slide in guides machined in the side beams. By this means the adjustment provided is confined to the seat pan which moves relative to the headrest attached to the main frame so that occupants of different body lengths can be accommodated. The sides of the seat pan are shaped to form thigh guards, which at present carry canopy breakers. The lower pair of safety harness straps are attached to the seat pan and the weight of the occupant and his equipment is counterbalanced by two direct acting compression springs.

25. The snubbing units which are borne on the front of the seat pan are both similar in construction but are handed. Each unit (fig. 4) consists of a casing which incorporates a slot through which passes one of the leg restraining cords. The casing houses a snub lever, a spring tube and a release button. The object of the snubbing unit is to allow the cord to pass freely *down* through the unit, but to lock the cord against any *upward* movement. Thus, during ejection the cords, which are anchored to the aircraft floor, become taut and pull the seat occupant's legs backwards and together. The lower ends of the cords are anchored by means of deadeyes and brackets; the deadeyes are held in the brackets by light alloy rivets which are stressed to shear at approximately 400 lb. Since the cords cannot pass upwards through the snubbing units, the occupant's legs are prevented from flailing in the airstream and are

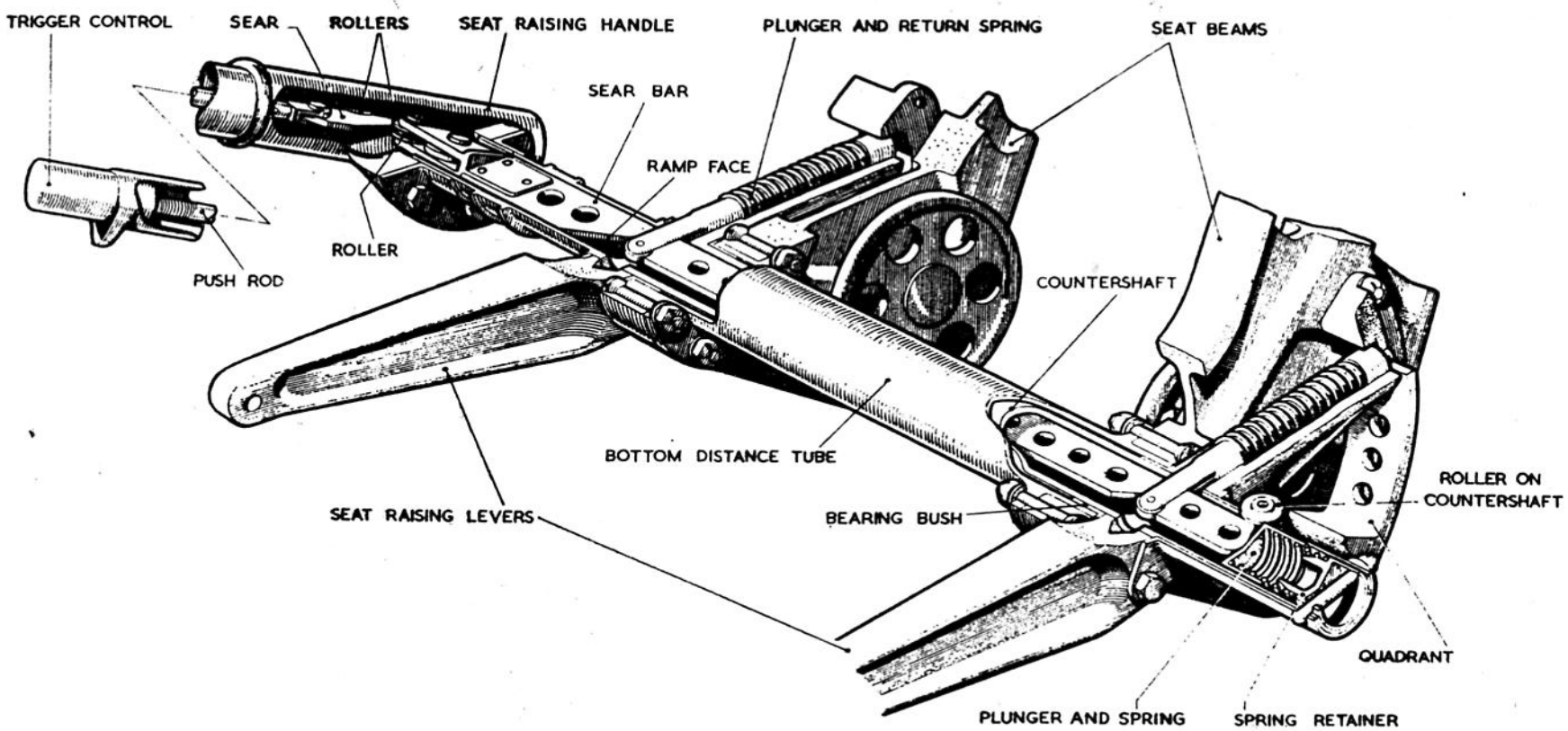

Fig. 5. Details of seat raising mechanism

restrained in this position until the safety harness is released by the time-release unit. When this occurs, the upper loops of the cords are pulled through the leg garter D-rings, so freeing the legs. The release button is provided to allow the occupant to adjust the cords to give comfortable leg movement.

26. The seat raising mechanism (*fig.* 5) is operated by the handle of the starboard side of the seat. The trigger control by means of the sear and the roller displaces axially the sear bar which in turn withdraws the pair of spring-loaded plungers from engagement with the quadrants and allows the seat raising levers attached to the countershaft to be rotated by the seat raising handle. On releasing the trigger control the two plungers, under the action of their return springs, engage adjacent holes in the quadrants to lock the seat in the new position.

27. The drogue container is a riveted metal box mounted at the top of the seat frame, and at the front it embodies a leather covered pad for the occupant's head. Above the pad is the main firing handle which is normally retained in position by spring-loaded locking plungers. The firing handle is attached to the front edge of the face screen, the rear edge of which is riveted to the drogue container. The face screen, which is folded in the front compartment of the drogue container, is made of lined canvas and is specially shaped to protect the occupant's face from the airstream and to provide support for the head. The firing cable is attached to the centre of the face screen by a sewn nylon cord loop and then passed through a conduit and connected to the firing mechanism. The top of the drogue container is closed by four fabric flaps which retain the drogues.

28. The harness release mechanism (*fig.* 6) is mounted at the upper end of each side beam and receives the steel cables which extend from the upper pair of safety harness straps. The port and starboard locks are identical but handed. The cable passes three times round the pulley wheel which is carried in plain bearings in the two halves of the casing, and spring loaded by the spiral spring, the ends of which engage with slots in the wheel axle and outer casing. A separator plate is interposed between the spiral spring and the pulley wheel. About one-third of the periphery of each wheel is provided with ratchet teeth. The pawls which engage the ratchet teeth are controlled by the cross-shaft arms and return spring and operated (via the control cable) by the lever mounted on the starboard thigh guard. Each pulley axle has a squared end which projects from the outer casing

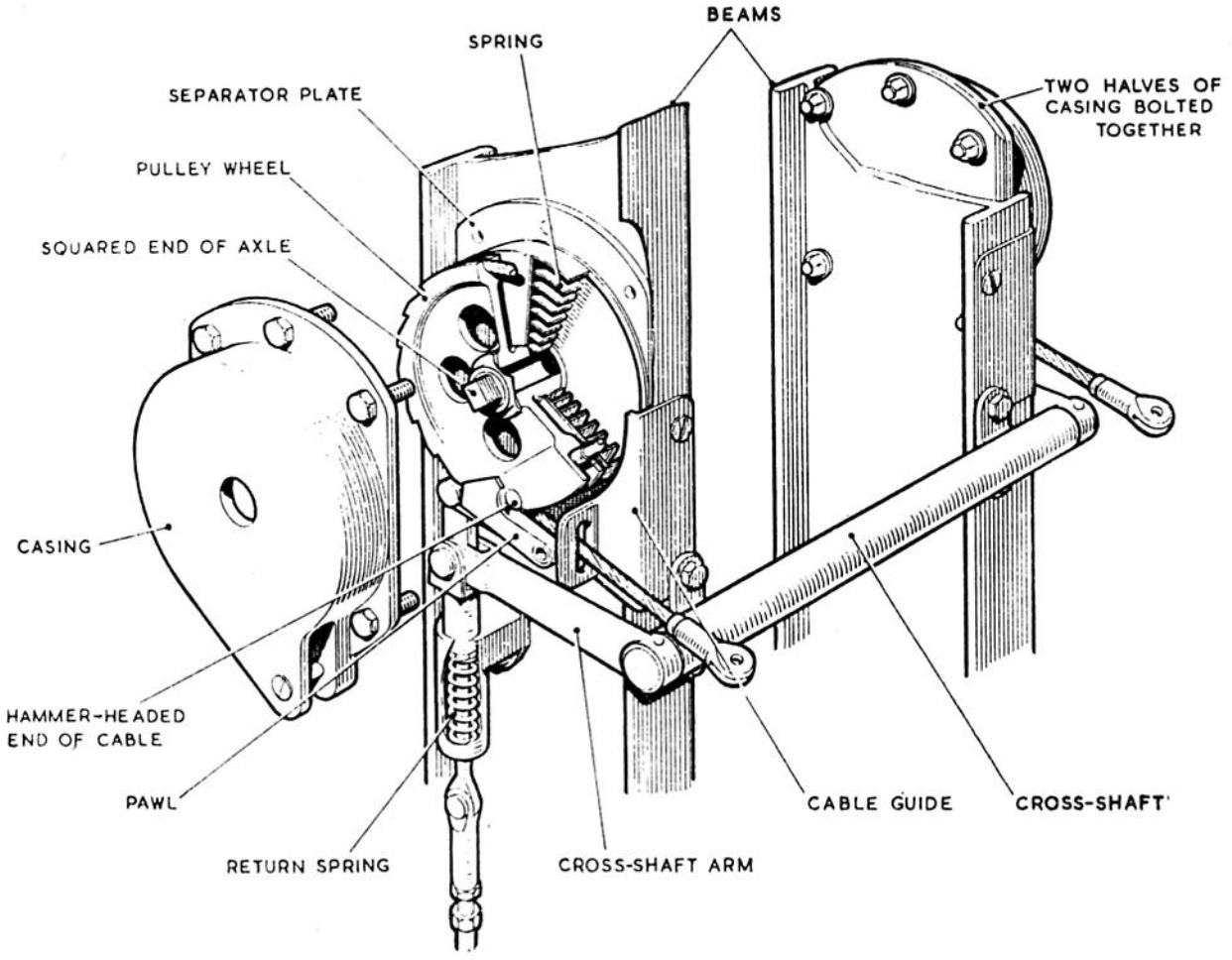

Fig. 6. Details of harness release mechanism

to enable the spiral springs to be pre-loaded. The harness cable passes through fairleads mounted on the sides of the drogue container to enable the harness to provide a reasonable degree of sideways restraint.

GUIDE RAIL

29. Each guide rail consists of a single extrusion and normally it is not necessary to remove it. A block, which receives the thrust of the ejection gun cylinder, is built into it towards its lower end. Slots in the upper end of the guide rail receive the top cross-beam of the seat structure and restrain the forward impulse of the seat in the event of a crash landing.

30. Bolted to the rear of the guide rails are brackets to which the static line for the time-release unit and the static rod for the drogue gun are attached by quick-release pins.

SERVICING

31. At the six-monthly and annual servicing of the ejection seat, service the ejection gun, drogue gun, canopy jettison and time-delayed firing unit, barostatic time-release unit and Duplex anti-squid drogue assembly in accordance with A.P.4288B, Vol. 5 and A.P.4288A, Vol. 1. The following instructions apply to the Bay servicing of the seat structure.

Servicing the seat structure

To remove the seat pan

32. (1) Adjust the pan to its top position whilst sitting in the seat to counteract the load of the seat reaction springs.

(2) Remove the harness control cable from the bracket on the side beam by unscrewing the two 2 B.A. bolts; detach the cable from the harness release mechanism.

(3) Press the seat pan back to relieve the reaction spring load on the sliding blocks and slide outwards simultaneously the two spring-loaded plungers. Allow the seat pan to hinge forward under the reaction spring load until the springs are relaxed. Release the plunger and lift out the springs.

(4) Remove the bolts from the ends of the seat raising levers and remove the seat pan.

Note . . .

These bolts must not be removed until the seat reaction springs have been removed.

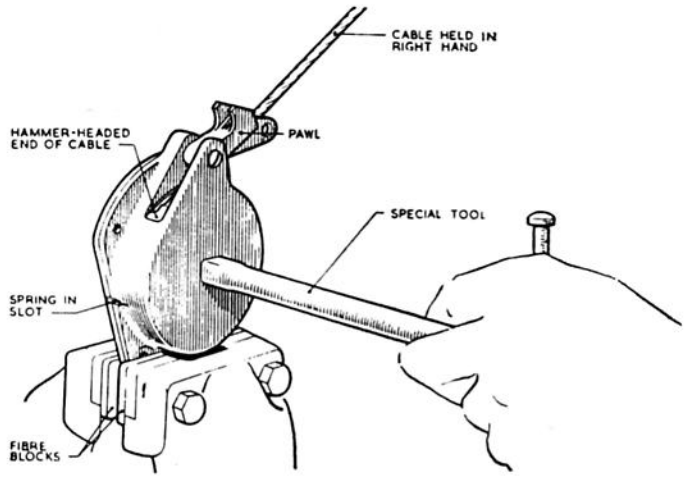

Fig. 7. Dismantling harness release unit

To remove and dismantle the manual harness release units

33. (1) First remove the starboard unit. Remove the bolts holding the fairlead and the pin attaching the cross-shaft arm to the pawl and pawl spring; remove the harness from the cables.

(2) Remove the five 2 B.A. bolts from the flange of the unit and lift off the unit without allowing the halves of the casing to separate.

(3) Lightly grip the casing flange between fibre blocks in the vice jaws (fig. 7). Pull out the cable to its full extent against the spring and prevent the spring from unwinding by holding the squared end of the wheel axle with the special box spanner (Ref. No. 27L/97). The hammer-headed end of the cable can now be lifted out of engagement with the slot in the pulley wheel and the cable withdrawn. Relieve the spring tension gradually by use of the box spanner.

(4) Separate the two halves of the casing, remove the wheel and separator plate and disengage the spring from the slot in the casing.

(5) Dismantle the pawl return spring by unscrewing the lower eye end whilst holding the top fork end.

(6) The port unit has no return spring; otherwise dismantle it in a similar manner.

To examine the harness release units

34. (1) Examine each harness cable for damage and fraying; if they are not serviceable renew them.

(2) Examine the pulley wheel for damage to ratchet teeth or spring locking slot in the axle.

(3) Examine the spring for general condition. The precise resilience is not important, provided that the spring functions satisfactorily.

(4) Examine the pawl teeth and check that the return spring (starboard unit only) is free from corrosion and is working freely.

To assemble the harness release units

Note . . .

Lubricate all parts during assembly with grease XG-275 (Ref. No. 34B/9100512 or 3).

35. (1) Insert each pulley wheel into its respective outer casing (both handed), followed by the separator plate.

(2) Insert the spring (not handed) with its outer hooked end on the same side as the pawl pivot; engage the hooked end of the spring with the slot in the casing and the inner coil end with the slot in the wheel axle.

(3) Place the back plate in position but do not insert the bolts.

(4) Grip the flange of the casing lightly between fibre blocks in the vice then, using the special box spanner, rotate the wheel axle three complete revolutions; this gives an approximate initial poundage of $3\frac{1}{2}$ lb. building up to $6\frac{1}{2}$ lb. when extended. Turn anti-clockwise for the starboard unit and clockwise for the port unit.

(5) Thread the harness cable between the pawl and the casing and engage the hammer-headed end of the cable in the slot in the pulley wheel.

(6) Allow the cable to be drawn slowly into the casing by the spring, until the hammer-headed end engages with the slot in the pawl and press into full engagement with the fingers.

(7) Secure the unit to the side beams by the five 2 B.A. bolts. Replace the pins connecting the cross-shaft arm to the pawl and pawl spring and lock with a new split pin. Connect the safety harness to the cables.

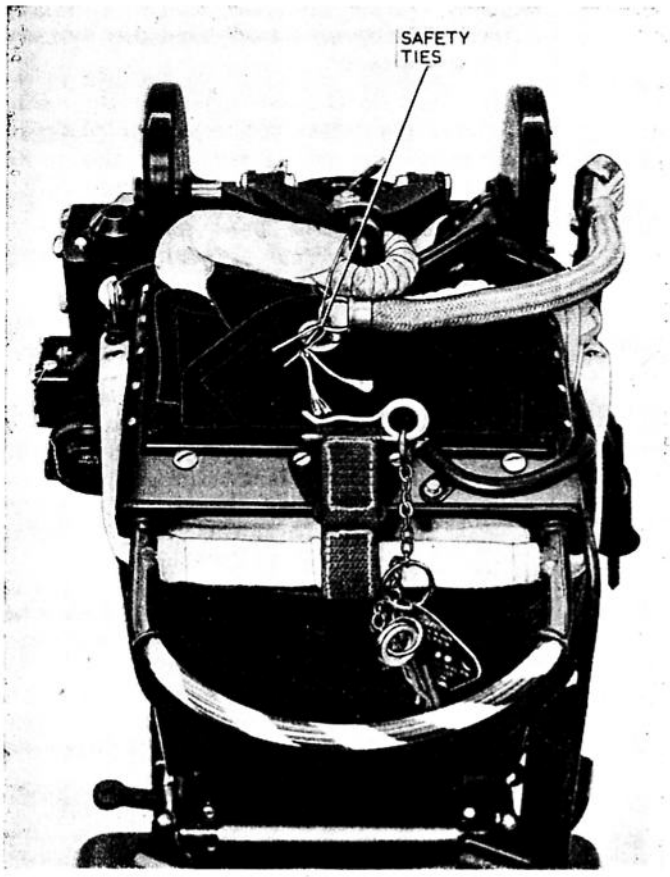

Fig. 8. Safety ties

To dismantle the seat raising mechanism

36. (1) Remove the 2 B.A. lock-nut and tap out the taper pin from the port end of the countershaft. Remove the roller from the countershaft fitting (fig. 2). Do not remove the $\frac{1}{4}$ in. B.S.F. bolts from the faces of the seat raising lever bosses.

(2) Remove the two quadrants by removing the four lock-nuts on each quadrant and depressing the trigger control on the seat raising handle to free the plungers as the quadrant is withdrawn; the four bolts remain in position.

(3) Remove the seat raising handle by removing the four $\frac{1}{4}$ in. bolts securing it to the flange.

(4) Push up both plungers simultaneously and pull out the sear bar.

(5) Withdraw both plungers and springs and withdraw the countershaft out from the port seat raising lever and frame bearings. Remove the spring retainer, spring and plunger from the countershaft.

To examine the seat raising mechanism

37. (1) Check that all components are free from corrosion and that all rollers rotate freely but without excessive slackness on their pins.

(2) Check that the sear bar is straight in both planes and free from wear on the ramp faces.

(3) Check that the locking plungers and springs move freely in their housings in the seat raising levers.

To assemble the seat raising mechanism

Note . . .

Lubricate all parts during assembly with grease XG-275.

38. (1) Pass the shaft with the starboard seat raising lever attached through the bearings in the side beams, and pass the port seat raising lever with the countershaft end fitting attached on to the shaft. Assemble the roller and secure with a split pin.

(2) Insert the locking plungers and springs into the seat raising levers and, while depressing each plunger in turn, insert the sear bar into the countershaft, passing it through the slots in the locking plungers.

(3) Replace the cap, spring and plunger into the end of the countershaft and insert the taper pin and lock-nut.

(4) Replace the quadrants and seat raising handle.

to enable the spiral springs to be pre-loaded. The harness cable passes through fairleads mounted on the sides of the drogue container to enable the harness to provide a reasonable degree of sideways restraint.

GUIDE RAIL

29. Each guide rail consists of a single extrusion and normally it is not necessary to remove it. A block, which receives the thrust of the ejection gun cylinder, is built into it towards its lower end. Slots in the upper end of the guide rail receive the top cross-beam of the seat structure and restrain the forward impulse of the seat in the event of a crash landing.

30. Bolted to the rear of the guide rails are brackets to which the static line for the time-release unit and the static rod for the drogue gun are attached by quick-release pins.

SERVICING

31. At the six-monthly and annual servicing of the ejection seat, service the ejection gun, drogue gun, canopy jettison and time-delayed firing unit, barostatic time-release unit and Duplex anti-squid drogue assembly in accordance with A.P.4288B, Vol. 5 and A.P.4288A, Vol. 1. The following instructions apply to the Bay servicing of the seat structure.

Servicing the seat structure

To remove the seat pan

32. (1) Adjust the pan to its top position whilst sitting in the seat to counteract the load of the seat reaction springs.

(2) Remove the harness control cable from the bracket on the side beam by unscrewing the two 2 B.A. bolts; detach the cable from the harness release mechanism.

(3) Press the seat pan back to relieve the reaction spring load on the sliding blocks and slide outwards simultaneously the two spring-loaded plungers. Allow the seat pan to hinge forward under the reaction spring load until the springs are relaxed. Release the plunger and lift out the springs.

(4) Remove the bolts from the ends of the seat raising levers and remove the seat pan.

Note . . .

These bolts must not be removed until the seat reaction springs have been removed.

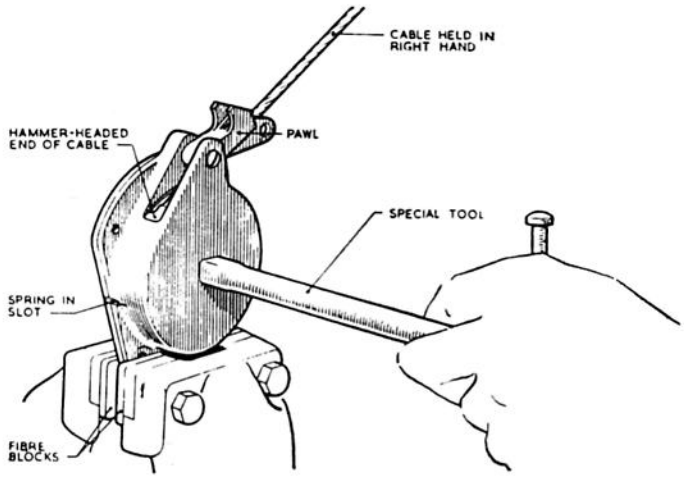

Fig. 7. Dismantling harness release unit

To remove and dismantle the manual harness release units

33. (1) First remove the starboard unit. Remove the bolts holding the fairlead and the pin attaching the cross-shaft arm to the pawl and pawl spring; remove the harness from the cables.

(2) Remove the five 2 B.A. bolts from the flange of the unit and lift off the unit without allowing the halves of the casing to separate.

(3) Lightly grip the casing flange between fibre blocks in the vice jaws (fig. 7). Pull out the cable to its full extent against the spring and prevent the spring from unwinding by holding the squared end of the wheel axle with the special box spanner (Ref. No. 27L/97). The hammer-headed end of the cable can now be lifted out of engagement with the slot in the pulley wheel and the cable withdrawn. Relieve the spring tension gradually by use of the box spanner.

(4) Separate the two halves of the casing, remove the wheel and separator plate and disengage the spring from the slot in the casing.

(5) Dismantle the pawl return spring by unscrewing the lower eye end whilst holding the top fork end.

(6) The port unit has no return spring; otherwise dismantle it in a similar manner.

To examine the harness release units

34. (1) Examine each harness cable for damage and fraying; if they are not serviceable renew them.

(2) Examine the pulley wheel for damage to ratchet teeth or spring locking slot in the axle.

(3) Examine the spring for general condition. The precise resilience is not important, provided that the spring functions satisfactorily.

(4) Examine the pawl teeth and check that the return spring (starboard unit only) is free from corrosion and is working freely.

To assemble the harness release units

Note . . .

Lubricate all parts during assembly with grease XG-275 (Ref. No. 34B/9100512 or 3).

35. (1) Insert each pulley wheel into its respective outer casing (both handed), followed by the separator plate.

(2) Insert the spring (not handed) with its outer hooked end on the same side as the pawl pivot; engage the hooked end of the spring with the slot in the casing and the inner coil end with the slot in the wheel axle.

(3) Place the back plate in position but do not insert the bolts.

(4) Grip the flange of the casing lightly between fibre blocks in the vice then, using the special box spanner, rotate the wheel axle three complete revolutions; this gives an approximate initial poundage of 3½ lb. building up to 6½ lb. when extended. Turn anti-clockwise for the starboard unit and clockwise for the port unit.

(5) Thread the harness cable between the pawl and the casing and engage the hammer-headed end of the cable in the slot in the pulley wheel.

(6) Allow the cable to be drawn slowly into the casing by the spring, until the hammer-headed end engages with the slot in the pawl and press into full engagement with the fingers.

(7) Secure the unit to the side beams by the five 2 B.A. bolts. Replace the pins connecting the cross-shaft arm to the pawl and pawl spring and lock with a new split pin. Connect the safety harness to the cables.

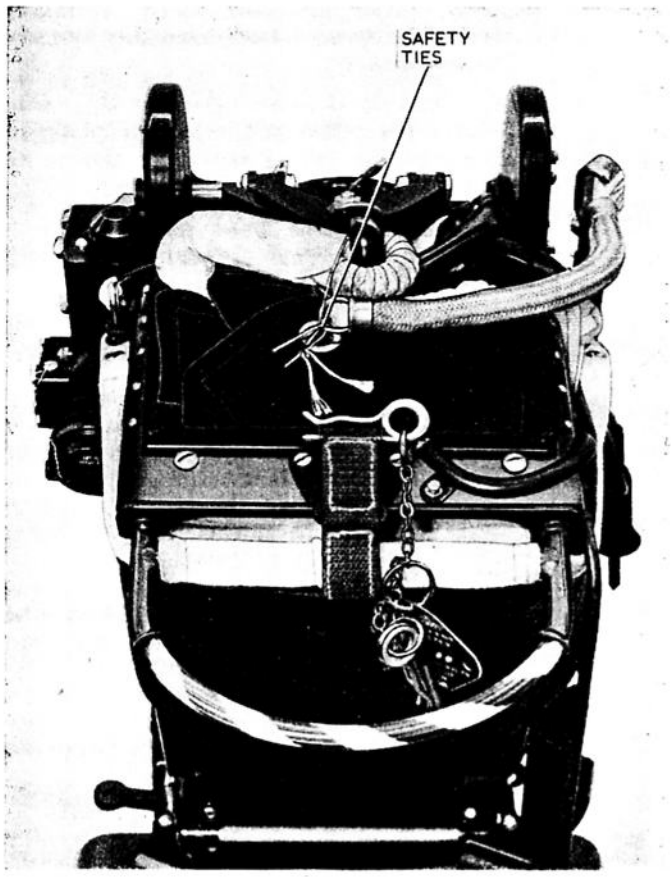

Fig. 8. Safety ties

To dismantle the seat raising mechanism

36. (1) Remove the 2 B.A. lock-nut and tap out the taper pin from the port end of the countershaft. Remove the roller from the countershaft fitting (fig. 2). Do not remove the ¼ in. B.S.F. bolts from the faces of the seat raising lever bosses.

(2) Remove the two quadrants by removing the four lock-nuts on each quadrant and depressing the trigger control on the seat raising handle to free the plungers as the quadrant is withdrawn; the four bolts remain in position.

(3) Remove the seat raising handle by removing the four ¼ in. bolts securing it to the flange.

(4) Push up both plungers simultaneously and pull out the sear bar.

(5) Withdraw both plungers and springs and withdraw the countershaft out from the port seat raising lever and frame bearings. Remove the spring retainer, spring and plunger from the countershaft.

To examine the seat raising mechanism

37. (1) Check that all components are free from corrosion and that all rollers rotate freely but without excessive slackness on their pins.

(2) Check that the sear bar is straight in both planes and free from wear on the ramp faces.

(3) Check that the locking plungers and springs move freely in their housings in the seat raising levers.

To assemble the seat raising mechanism

Note . . .

Lubricate all parts during assembly with grease XG-275.

38. (1) Pass the shaft with the starboard seat raising lever attached through the bearings in the side beams, and pass the port seat raising lever with the countershaft end fitting attached on to the shaft. Assemble the roller and secure with a split pin.

(2) Insert the locking plungers and springs into the seat raising levers and, while depressing each plunger in turn, insert the sear bar into the countershaft, passing it through the slots in the locking plungers.

(3) Replace the cap, spring and plunger into the end of the countershaft and insert the taper pin and lock-nut.

(4) Replace the quadrants and seat raising handle.

To assemble the seat pan

39. (1) Place the seat pan on the seat raising levers (which must be in the top position) and insert the bolts.

(2) Lean the pan back against the seat frame. Insert the two seat reaction springs, slide back the two spring-loaded plungers and press the pan back against the spring load to allow the blocks to engage in the slots in the side beams. Release the plungers and ensure that the blocks have engaged correctly.

(3) Connect the harness release control cables.

Servicing the face screen

To examine the face screen

40. (1) Pull out the firing handle and withdraw the face screen to its fullest extent.

(2) Examine the fabric for damage and deterioration. Check the security of the front edge to the firing handle and of the rear edge to the drogue container.

(3) Examine the attachment of the firing cable to the face screen for security and damage.

To pack the face screen

41. (1) Stretch the face screen to its full extent.

(2) Push the fullness up into convex form.

(3) Form a longitudinal crease just right of the centre line. Fold the centre bulk to lie on the right edge of the screen so that the edges are roughly parallel and the cable anchorage is proud. The face screen is now in three thicknesses on the right and one on the left.

(4) Carefully retaining this fold, roll the face screen over the lower edge of the slot in the container and press it down into its compartment.

WARNING . . .

Whenever a face screen is repacked (or the firing cable is connected to the sear) ensure that the exposed firing cable is kept as short as possible between the sear and the drogue container, i.e., only leave sufficient cable to reach the sear. If not, there is a serious danger of snagging of the cable when the firing handle is pulled, possibly resulting in non-firing of the ejection gun.

(5) Insert the firing handle into its socket and press it home into the spring clips. The firing handle should emerge from the compartment behind the firing handle cross-bar and pass through the conduit to the firing mechanism.

Servicing the leg restraining device

42. (1) Examine the cords for fraying or deterioration, particularly at the ends.

(2) Check the cords for freedom of movement through the snubbing units in a downward direction but complete restraint in the upward direction.

(3) Check the release buttons for correct operation.

◀ Servicing the leg restraint cords

43. Suspend each leg cord by one end and attach a dead weight of 5 lb. to the other end, taking care that the load is applied without producing a snatch on the cord. Measure the length of the cord from the centre of the shear rivet at one end of the cord to the end of the fabric loop at the other end. The length should be 40 in. $\pm$ 2 in., and any cords exceeding the upper limit are to be renewed. ▶

Safety ties

44. After the drogues have been packed (A.P.4288A, Vol. 1, Sect. 5, Chap. 4), and the retaining pin tie has been made, proceed as follows:—

(1) Lower the scissor shackle and secure the drogue shackle by a length of No. 8 cord passed through the drogue shackle and under the securing pin (fig. 8); tie off with a reef knot and one or two half-hitches.

Caution . . .

It is of the utmost importance that the cord passes under the securing pin, otherwise the drogues could not be withdrawn without obstruction.

(2) Ensure that the drogue withdrawal line is routed *above* the link lines and is thus able to withdraw the drogues without entanglement.

Firing cables

45. Fig. 9 and 10 show the correct method of connecting the firing cables. It is essential that, for the Type 2CA/1 ejection seat, the eye end of the alternative firing cable is threaded over the cable which leads to the trip lever of the time-delay mechanism. For the Type 2CA/2 ejection seat, both eye ends are fed over the sear of the ejection gun firing unit.

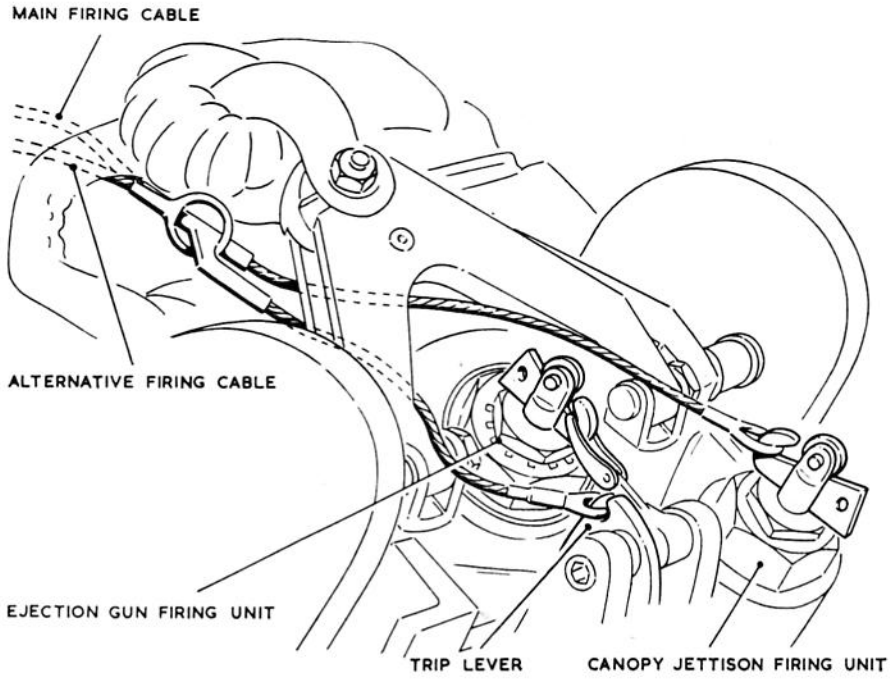

Fig. 9. Correct method of connecting firing cables (Type 2CA/1 ejection seat)

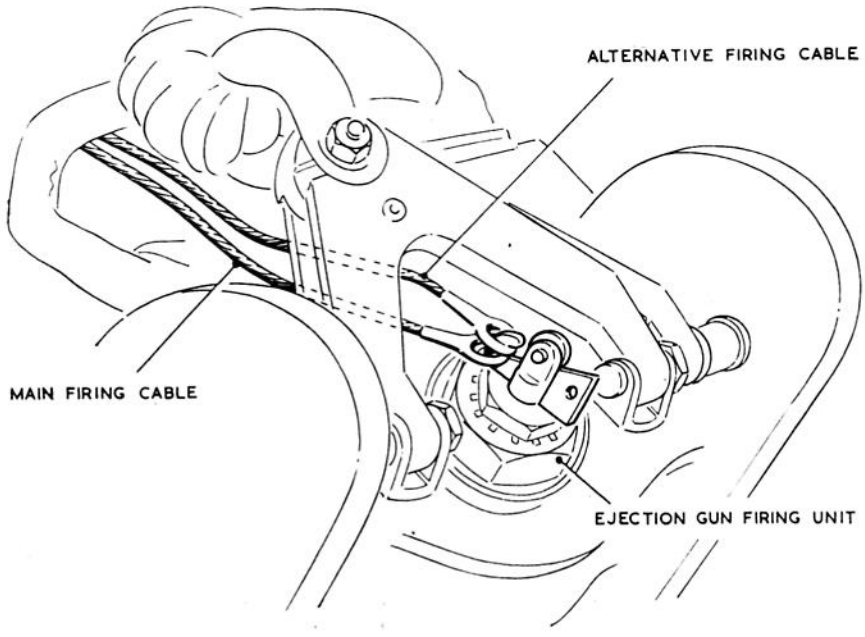

Fig. 10. Correct method of connecting firing cables (Type 2CA/2 ejection seat)

Appendix 1

MOD. No. E.S. 2958

**(Ejection seat, Type 2CA/1, Mk. 1 -
Introduction of new face screen firing handle assembly)**

1. The present droop 'B' handle introduced by Mod. No. E.S. 2732 has been adversely criticised as it restricts head movement to an unacceptable degree. This modification introduces a straight 'B' handle which will overcome this criticism.

Appendix 2

MOD. No. E.S. 2733

**(Ejection seat, Type 2CA/2, Mk. 1 -
Introduction of 'B' shaped face screen firing handle and a new safety strap and bracket)**

1. It is an Air Staff requirement that a new face screen with a 'B' shaped handle be provided, as it is found that aircrew members with a long sitting height are unable to reach the existing face screen which has a 'D' shaped handle.
2. This modification introduces a new face screen with a 'B' shaped handle to satisfy the requirement, and to accommodate the new face screen, a new face screen restraint strap and bracket are also introduced.