CHAPTER 7 TRANSPORTERS AND PANNIERS

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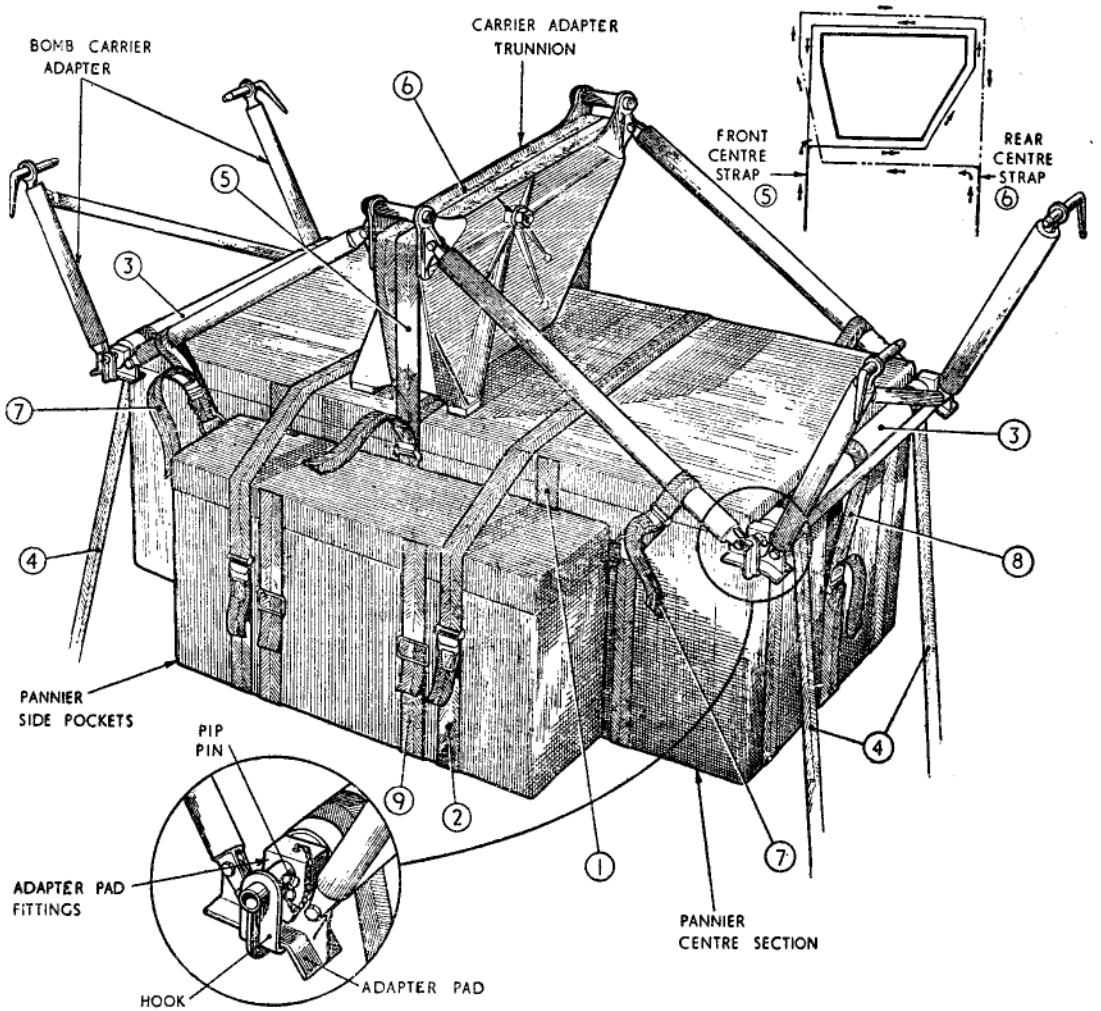

Fig. 1. Loose equipment pannier

PANNIER FOR PICKETING EQUIPMENT AND WEATHERPROOF COVERS (fig. 1)

1. The pannier assembly (Sect. 2, Chap. 1, para. 21) consists of four adapter pad fittings, two hoisting rollers and the pannier rack. To secure this assembly to the bomb carrier adapter proceed as follows :—

(1) Ensure that the panniers are packed with the soft covers on top and the air-intake seal cover centre sections packed one in each side pocket. The disposition of the remaining equipment is not important.

(2) Ensure that the centre section lid fastening straps (1) and side pocket bracing straps (2) are pulled up tight in their buckles before proceeding further.

(3) Attach the adapter pad fittings to the bomb carrier adapter by pulling out the

pip pins on the fittings, withdrawing the hooks fully and hooking the fittings over the pads of the adapter at the junction of the inner and outer struts and pushing the hooks forward.

(4) Fit the hoisting rollers (3) to the adapter pad fittings (noting the handing), engage the hooks and secure the assembly with the pip pins.

Note . . .

These rollers and pad fittings must be removed from the bomb carrier adapter when the pannier is not fitted.

(5) Pass the hoisting straps (4) over the inboard sides of the rollers and down between the longitudinal struts and the rollers.

(6) Hoist the pannier up to within approximately one inch of the bomb carrier adapter trunnion.

(7) Pass the pannier front centre straps (5) over the top of the pannier, up the aft end of the trunnion, over the top of the trunnion and down to the buckle on the forward side of the pannier.

(8) Treat the rear centre strap (6) in a similar manner but in the opposite direction.

(9) Hoist the pannier hard up against the trunnion, at the same time taking up the slack in the front and rear centre straps.

(10) Secure the pannier to the inner struts of the adapter by means of the four short straps (7) on the pannier centre section.

(11) Secure the pannier side straps (8) to the rollers.

(12) Check the security and tightness of all straps, stow the loose ends of the hoisting straps (4) inside the pannier side pockets and secure the pocket lid fastening straps (9).

BOMB-BAY PANNIER

2. Mod. 2293 introduces a suspension frame and a bomb-bay pannier for transporting special standard equipment, the pannier being common to all " V " bomber types, whilst each aircraft type has its own suspension frame.

Suspension frame (*fig.* 2)

3. The suspension frame is of light-alloy construction, comprising a box-section longitudinal boom which carries five transverse beams. It is secured to the bomb-bay roof at No. 2 and 5 bomb-hoist tunnels by suspension bolts, crutching pads being fitted on the second and fourth transverse beams. Provision is made for stowing the pannier support tubes on either side of the main boom.

Note . . .

If the aircraft is flown with the suspension frame less the pannier, the support tubes must be stowed.

Bomb-bay pannier (*fig.* 3)

4. The pannier is of light alloy, with a steel and plywood floor in the form of an open-top rectangular box, the sides of which slope outwards from the base. It is equipped with four main wheels, fitted in pairs on the centre line at each side, and a small central wheel at each end just inside the end frames. A tow bar is provided to facilitate movement.

Note . . .

Although detachable the main wheels need not be removed when the pannier is used on Valiant aircraft.

5. Four trunnions, two on the front end frame and two on a hoist beam on the rear end frame, enable the pannier to be hoisted up to the suspension frame by four Mini-hoists, a locating spigot at each corner of the pannier ensuring its correct positioning on the frame. These spigots also take forward and transverse shear loads.

6. Access panels are secured to the front and rear end frames by Dzus fasteners, one being fitted to the front and two to the rear. A canvas cover, for the open top of the pannier, is supplied for ground use only and is to be stowed inside the pannier before hoisting.

Suspension bolts (*fig.* 2)

7. Two suspension bolts secure the suspension frame to the bomb-bay roof at No. 2 and 5 loading point release unit housings. Each consists of an upper component, which is a tapered rod with a fork-end carrying a suspension block, and a thrust plate assembly which locks into an annular groove by a spring-loaded catch. The fork-end engages the eye-end of the suspension bolt (or lower component) and is secured by a shouldered bolt. Each suspension bolt carries at its lower end a special nut for securing the suspension frame.

Note . . .

The rear suspension bolt differs from the front, being machined with a stop flange on its upper bearing diameter.

Installing the suspension frame (*fig.* 4)

8. To install the frame proceed as follows:—

(1) Insert each suspension bolt into its appropriate release unit housing (*para.* 7), with the recessed ends of the suspension block fore-and-aft. Push the assembly upwards until the fork joint is just below the tunnel rollers. Turn the assembly through 90 deg. and pull it down to ensure that the block recesses have engaged the trunnions in the release housing.

(2) Slide the thrust plate assembly up until the catch engages the annular groove in the upper component; the catch can be heard to engage as it clicks into position. Remove the special nut from each suspension bolt lower end.

(3) With the suspension frame supported on suitable trestles, attach the four pannier support tubes to its corners and manhandle it into position on the suspen-

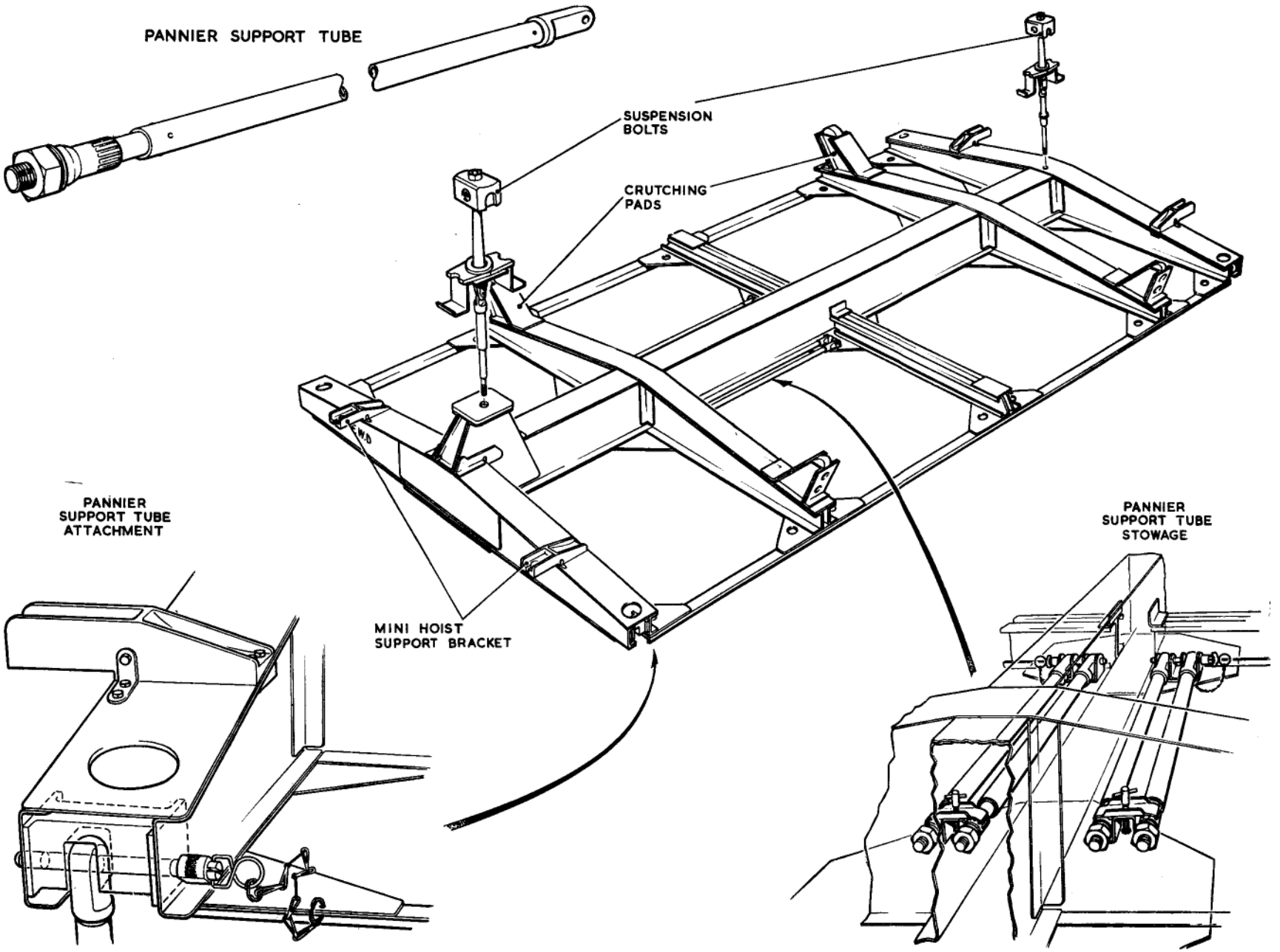

Fig. 2. Suspension frame

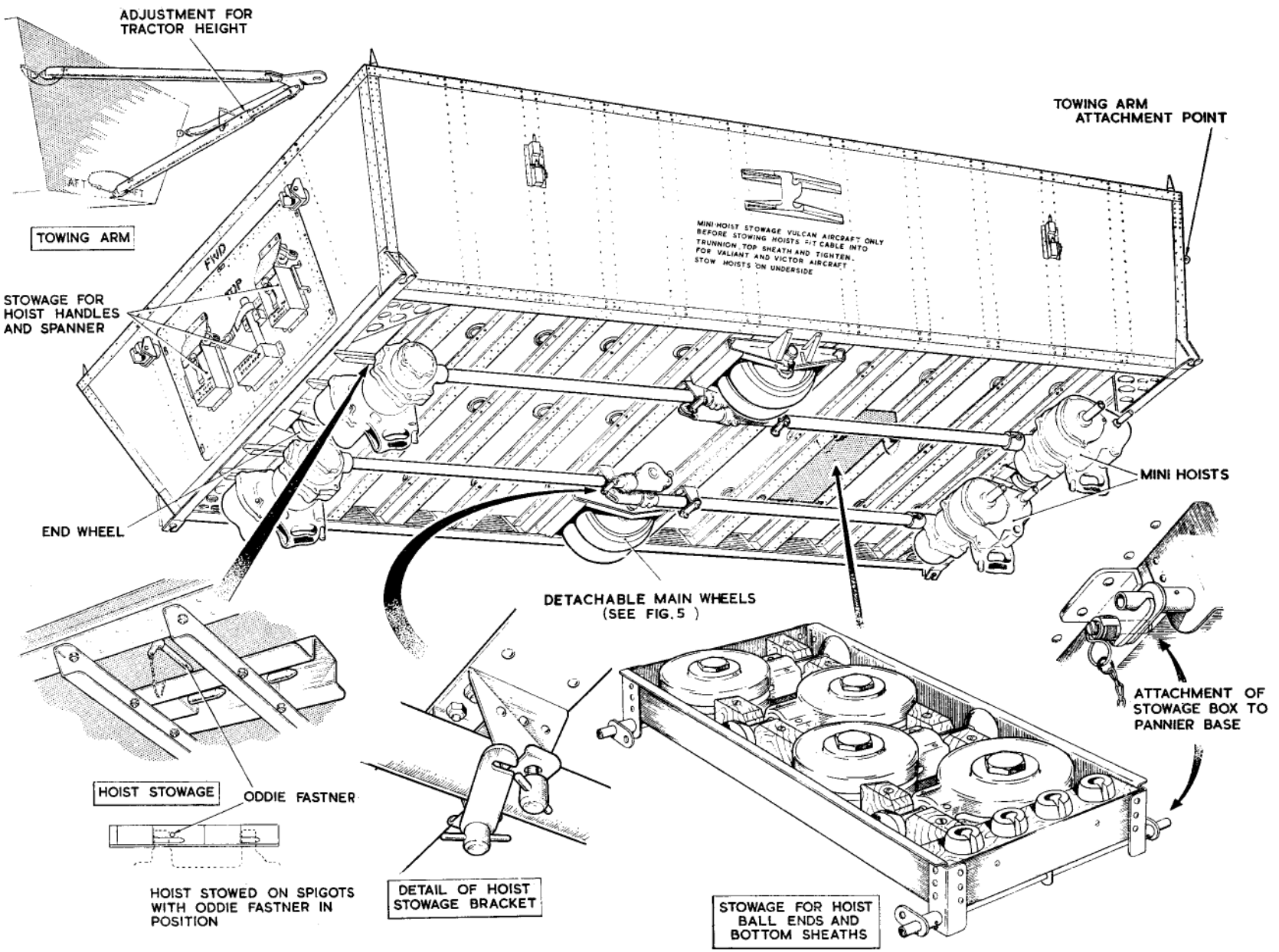

Fig. 3. Bomb-bay pannier and accessories

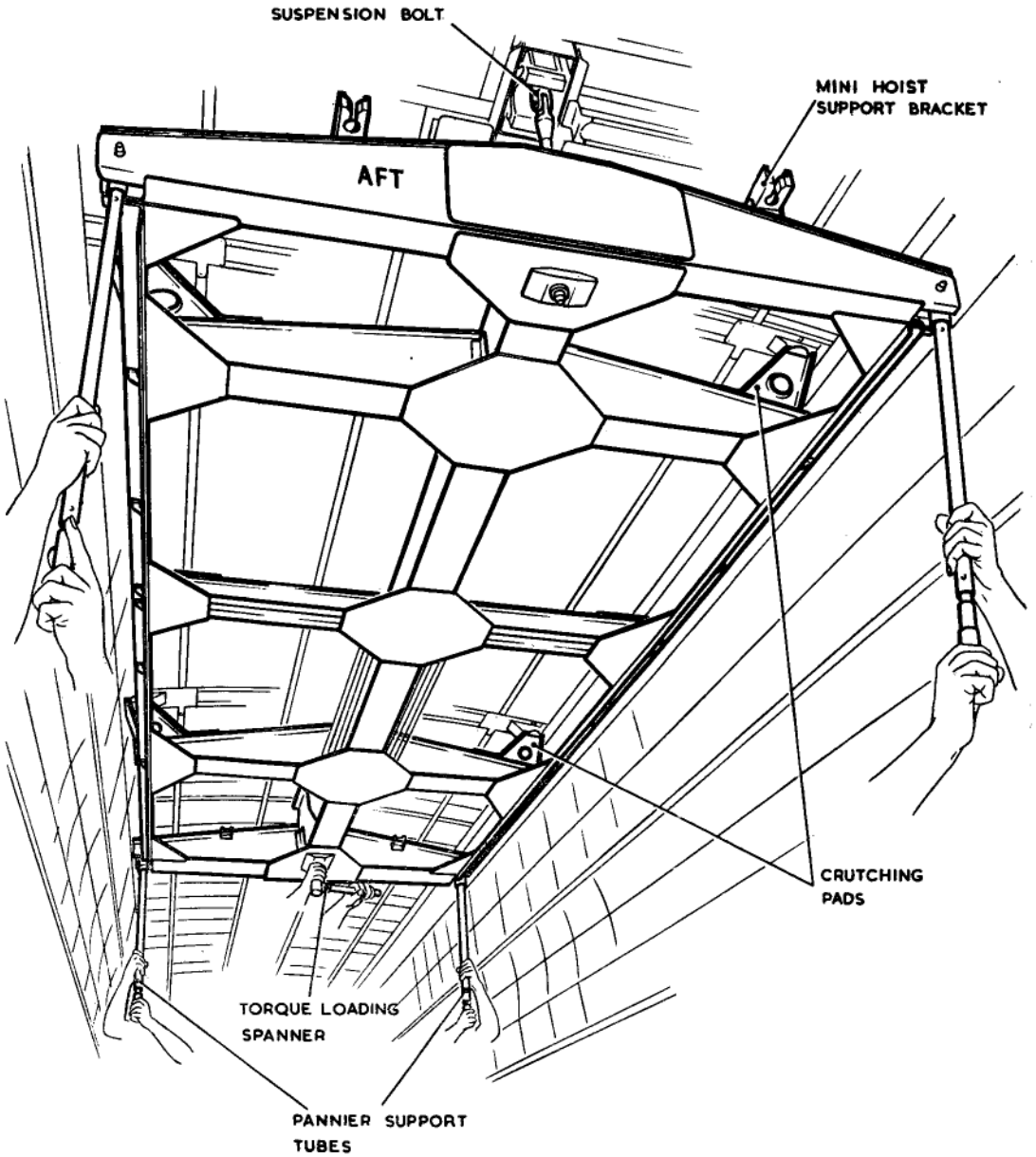

Fig. 4. Installing the suspension frame

sion bolts, a man lifting at each support tube.

(4) Fit the special nuts to the suspension bolts and torque load to 38 lb/ft. (dry), using the special spanner (*Table* 1).

Installing the pannier (*fig.* 5)

9. To install the pannier proceed as follows:—

(1) Prepare each Mini-hoist by feeding the cable through the bottom sheath and fitting the cable end to the trunnion in the top sheath, allowing sufficient cable to reach from the bomb-bay roof to the appropriate pannier-attachment point. Attach the four Mini-hoist top sheaths to their support brackets on the suspension frame.

(2) Wheel the pannier (which is marked FWD. and AFT) into position beneath the hoist points, and engage the bottom sheath ball-ends in the trunnions provided at the front and on the hoist beam at the rear, ensuring that they are securely seated.

Note . . .

Before hoisting, ensure that both the towing arm and the cover are stowed inside the pannier.

(3) With a man operating each Mini-hoist, raise the pannier evenly so that the spigots engage their housings simultaneously. Ensure that the pannier is hard home and that its side top members are butting the underside of the crutching pads on the second and fourth transverse members of the suspension frame.

(4) Engage the support tubes in the brackets at the pannier lower corners, and torque load the nuts to 38 lb/ft. (dry), using the special spanner (*Table* 1).

(5) Disengage and remove the Mini-hoist top and bottom sheaths from the suspension frame and pannier trunnions, and remove the bottom sheaths by withdrawing the cable (after removing the cable end

from the trunnion in the top sheath). Refit each cable end to the top sheath trunnion and wind in the cable.

(6) Referring to fig. 3 for details, stow the Mini-hoists and top sheaths under the pannier, and the bottom sheaths and ball ends in the removable stowage tray which is itself secured to the pannier underside. For the Mini-hoist handles and the torque spanner, stowages are provided at the pannier forward end.

Removing the pannier

10. To remove the pannier from the suspension frame, reverse the sequence of operations detailed in para. 9.

Removing the suspension frame

11. To remove the suspension frame from the bomb-bay roof, reverse the sequence of operations detailed in para. 8. Use the built-in spring-loaded lever to disengage the catch of the thrust plate assembly from the annular groove in the upper component of each suspension bolt.

Effect on C.G.

12. For the effect on the aircraft C.G. when the pannier is fitted, reference should be made to Sect. 2, Chap. 3.

Loading the pannier

13. The maximum floor loading of the pannier is 100 lb/ft² and the maximum all-up weight including hoists, tow bar, cover and spanners, but less the suspension frame, must not exceed two tons.

Note . . .

(1) *Every endeavour should be made to ensure that the load is evenly disposed in order to keep the pannier C.G. as close as possible to its central vertical axis. This will ensure that the load is shared equally between the four hoists.*

(2) *It is important that nothing protrudes above the top of the pannier over its entire length and width, and that at each end, space is allowed for the suspension bolt nuts, otherwise the pannier may not be satisfactorily crutched.*

Towing the pannier

14. The pannier towing arm consists of three tubular struts bolted through fork-ends to a towing lug. The other ends of the struts are fitted with fork-ends and captive pip-pins for attachment to eye-brackets at the pannier aft end. The lower strut is telescopic and can be locked, at the length to suit the height of the tractor attachment, by a pip-pin inserted in appropriate adjustment holes.

Note . . .

The speed limit for towing on good surfaces is 5 m.p.h.

15. Before hoisting the pannier, the towing arm should be disconnected and stowed inside the pannier. The three struts should be brought together, prior to stowage, and secured to each other by means of the pip-pins and captive chains.

Table 1

Bomb-bay pannier equipment

Ref. No.	Part No.	Description
27H/3346	67479 Sht. 1107	Pannier, bomb-bay, 4000 lb
26SR/95478	67479 Sht. 1109	Frame, suspension
27H/2776		Straps, lashing
4GC/5752		Hoist, heavy aircraft components, 10 cwt.
4GC/5754		Top sheath, with ball attachment
4GC/5755		Bottom sheath (ball)
4GC/5772		Cable end (ball), 1½ in. spher.
4GC/5444		Tube extension, 60 in.
4GC/5743		Winch handle, 9 in.
27H/3147		Cover, bomb-bay pannier
	Z.5191	Britool socket spanner (1·67 in. a/f, ½ in. sq. drive)

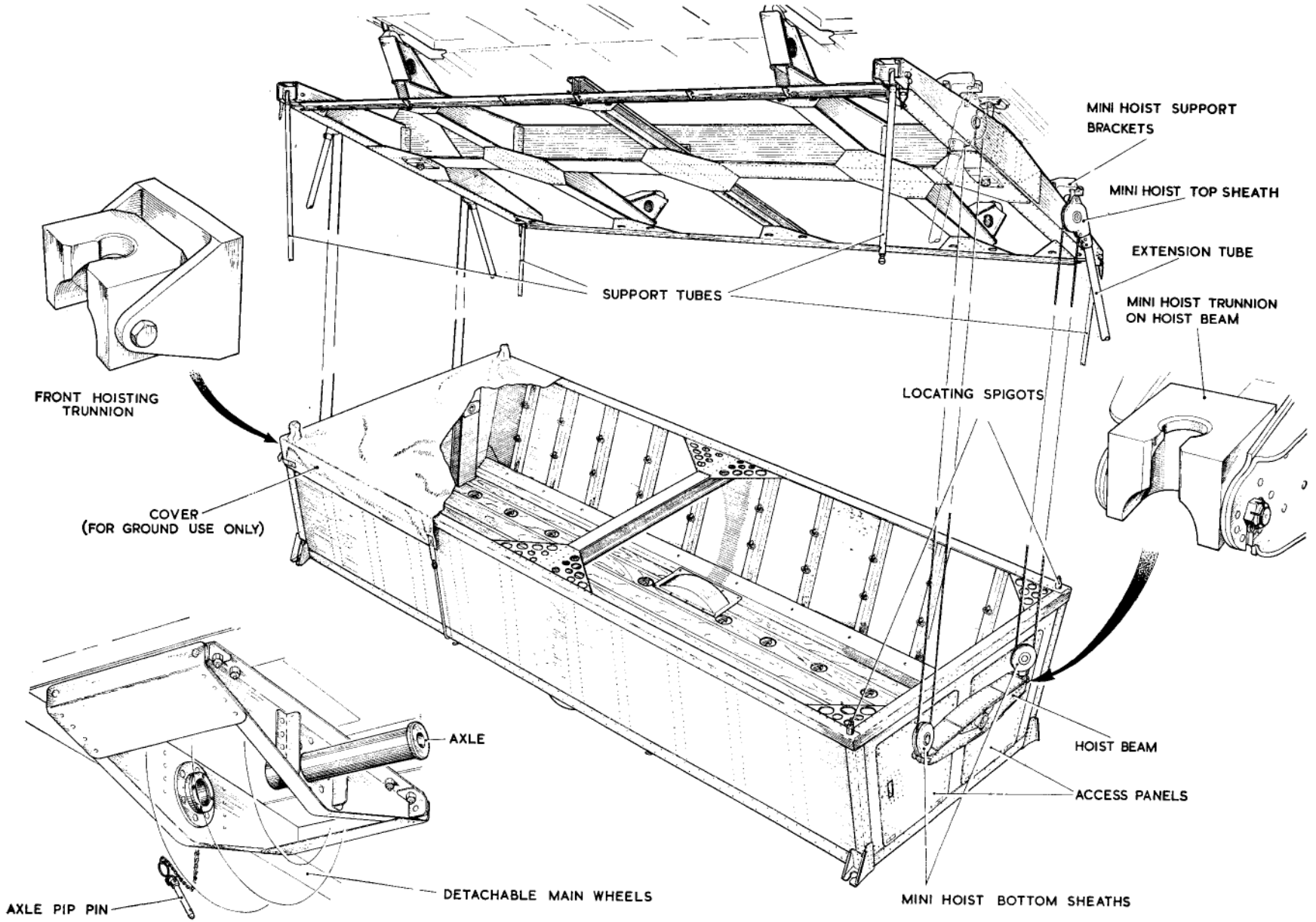

Fig. 5. Installing the bomb-bay pannier

E.C.U. CARRIER (*fig.* 6)

Introduction

16. To provide for the carriage of an E.C.U. in an airborne carrier trolley slung in the aircraft bomb bay, an adapter set is provided for fitment to the bomb-bay roof structure. The components of the set are secured to the existing fittings in the roof structure by ' pip ' pins fitted with handles to facilitate removal and assembly. Full details of the carrier and adapter set are contained in A.P.1464G, Vol. 1, Part 2, Sect. 6, Chap. 4.

Adapter set (*fig.* 7 *and Table* 2)

17. The adapter set consists of two adapter assemblies, one port and one starboard, designed for fitment to the bomb-bay roof to provide attachment points for the E.C.U. carrier upper portion, a centre spigot to take the fore and aft loads, a stowage rack for the carriage of the hoisting equipment and two hoist adapters to provide attachments for two of the Minilift hoists. Also forming part of the set is a mounting bracket for the fatigue meter, which must be moved to a new position before the carrier upper portion is hoisted into the bomb-bay.

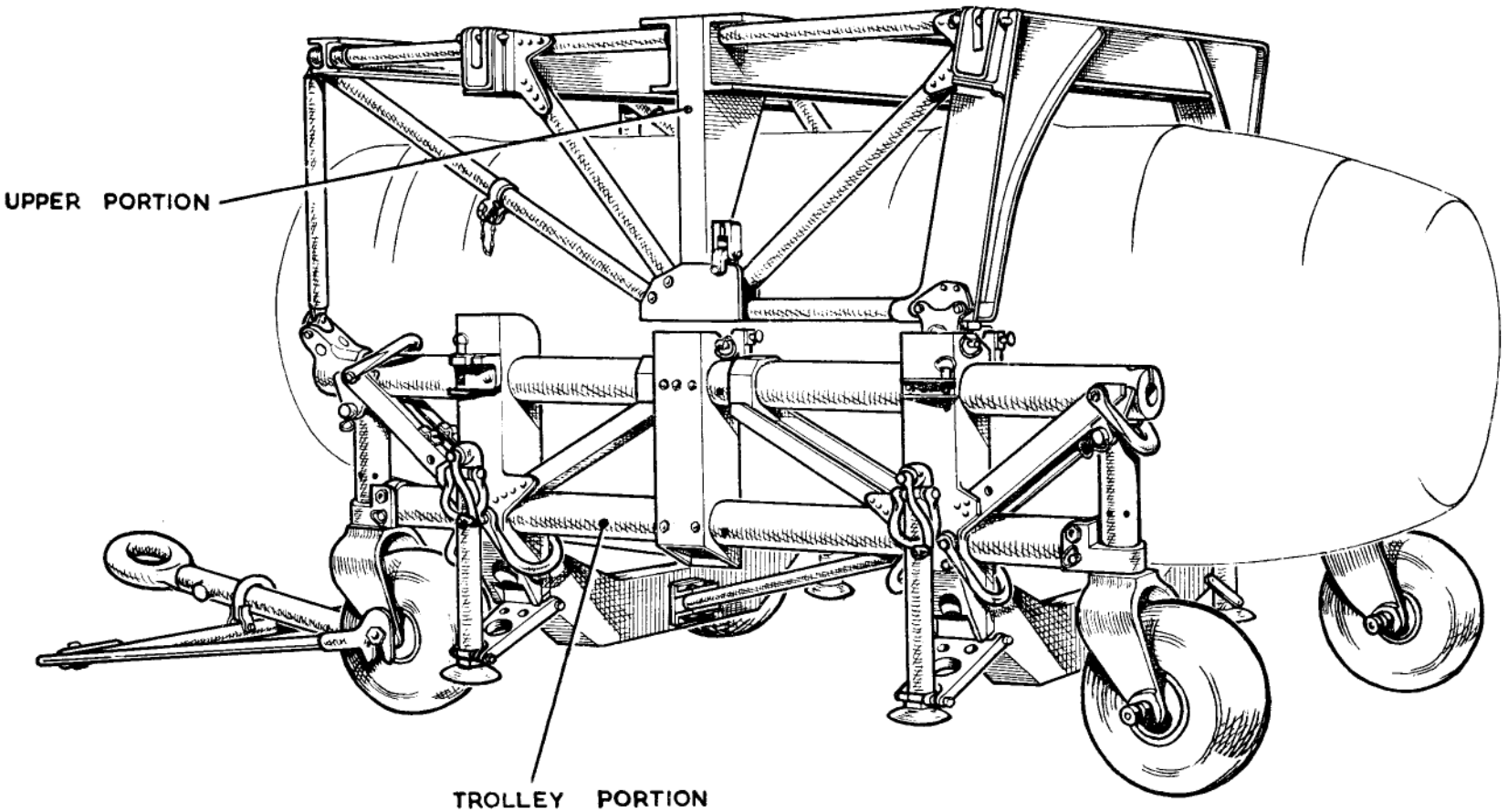

Fig. 6. E.C.U. carrier

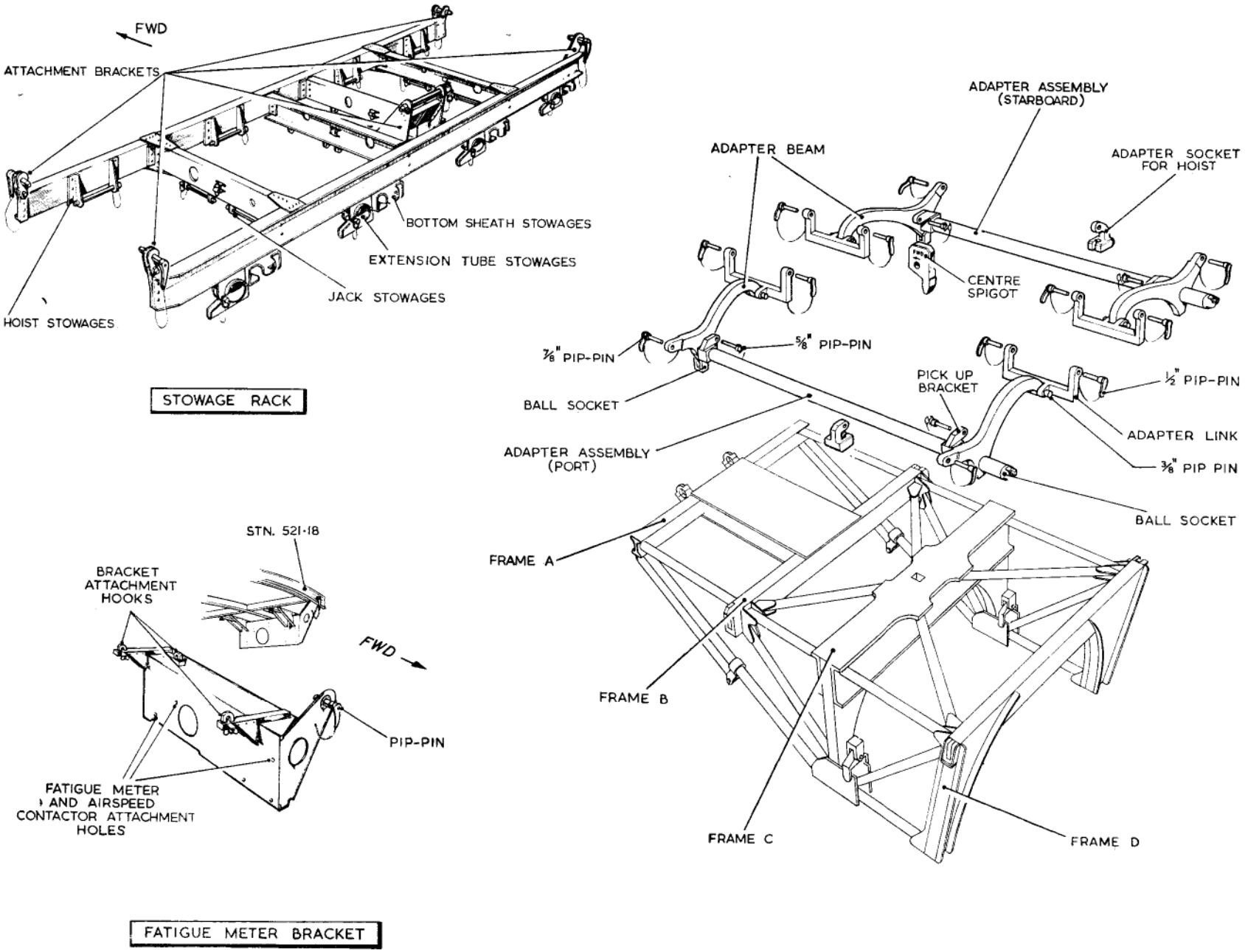

Fig. 7. Adapter set

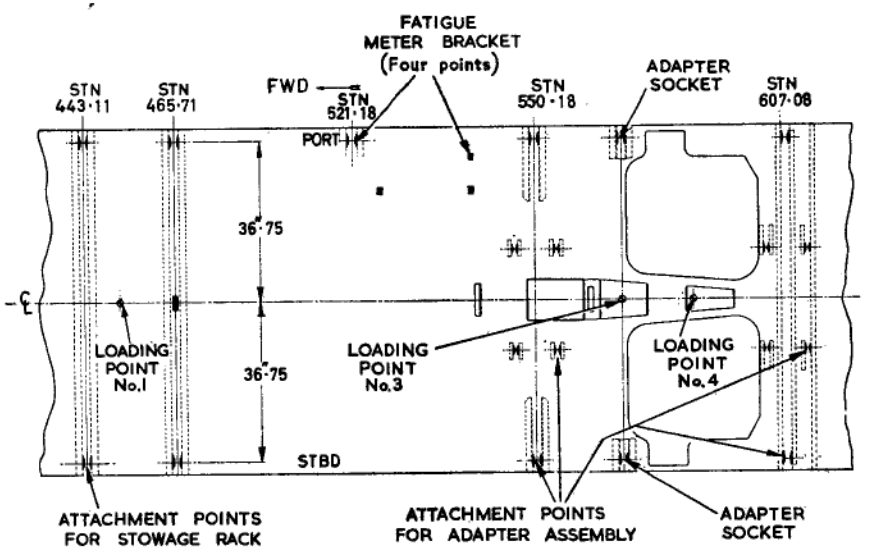

Fig. 8. Bomb-bay attachment fittings

18. The two adapter assemblies (*fig.* 7) differ only in handing and each consists of a tubular member to which are secured two swan-neck beams fitted at one end with a ' pip ' pin and at the other with a detachable link complete with two ' pip ' pins, for securing the adapter assemblies to the bomb-bay roof attachment fittings, and two pick-up brackets complete with ' pip ' pins for attaching the carrier upper portion at frames B and D. Four ball sockets for the attachment of Minilift hoists are provided, two on the forward swan-neck beams and two as plug fittings in the rear ends of the main tubular members.

Installation of adapter set

19. Before fitting the adapter set, reposition the fatigue meter and airspeed contactor as follows:—

(1) Remove the fatigue meter and airspeed contactor from the existing mounting and secure them to the fatigue meter bracket (*Table* 2).

(2) Attach this sub-assembly to the bomb-bay roof port side by means of a ' pip ' pin at Stn.521·18 and the three hook fittings as shown in fig. 7 and 8.

(3) Connect the pitot-static and electrical services to the instruments.

Fitting the adapter assemblies (*fig.* 7 *and* 8)

20. To fit the port and starboard adapter assemblies into the bomb bay, proceed as follows:—

(1) Remove the two crutch pads stowed at the outer ends of the roof frame at Stn.550·18.

(2) Remove the links from the adapter beams by withdrawing the $\frac{3}{8}$ in. dia. ' pip ' pins.

(3) Remove the $\frac{7}{8}$ in. dia. ' pip ' pins from the outboard ends of the adapter beams,

(4) Position the adapters in the bomb-bay roof, ensuring that the rear swan neck goes over the conduit, so that the short arms of the adapter beams are aligned with the attachment fittings at the outboard ends of the roof frames at Stn.550·18 and 607·08. Secure with the $\frac{7}{8}$ in. dia. ' pip ' pins removed in operation (3).

(5) Remove the $\frac{1}{2}$ in. dia. ' pip ' pins from the arms of the links, align the holes in the arms with the attachment fittings in the roof structure and attach the links by refitting the ' pip ' pins.

(6) Pivoting the adapter assembly about the $\frac{7}{8}$ in.dia. 'pip' pins, align the inboard end of the adapter beam with the links, and secure with the ' pip ' pins removed in operation (2).

Assembling the hoisting equipment

21. Assemble the hoist components (*Table* 2) as follows:—

(1) From each hoist drum (*fig.* 9), run a free length of cable and pass it through the extension tube and over the pulley of the top sheath.

(2) Secure the extension tube to the hoist and the top sheath.

(3) Run the hoist cables down from the top sheaths, under the bottom sheath pulleys, and secure them to their respective top sheath spigots.

Installing the carrier upper portion (*fig.* 9).

22. (1) Remove the release slip from loading point No. 3 release slip housing and fit the centre spigot (*Table* 2) in its place.

(2) To each end of the bomb-bay roof frame at Stn.575·88 fit an adapter socket (*Table* 2) and secure it to the attachment fittings with a ' pip ' pin.

(3) Using two assembled Minilift hoists (*para.* 21), engage the top sheaths in the adapter sockets.

(4) Engage each bottom sheath in the appropriate ball socket adjacent to frame C on the carrier upper portion.

(5) Remove the $\frac{5}{8}$ in. dia. ' pip ' pins from the four pick-up brackets on the adapter assemblies.

(6) Under the directions of a senior N.C.O., proceed to lift until the end attachments of the upper portion frames B and D engage the adapter assembly pick-up brackets.

(7) Align the holes in the attachment and pick-up brackets and secure with the ' pip ' pins removed in operation (5).

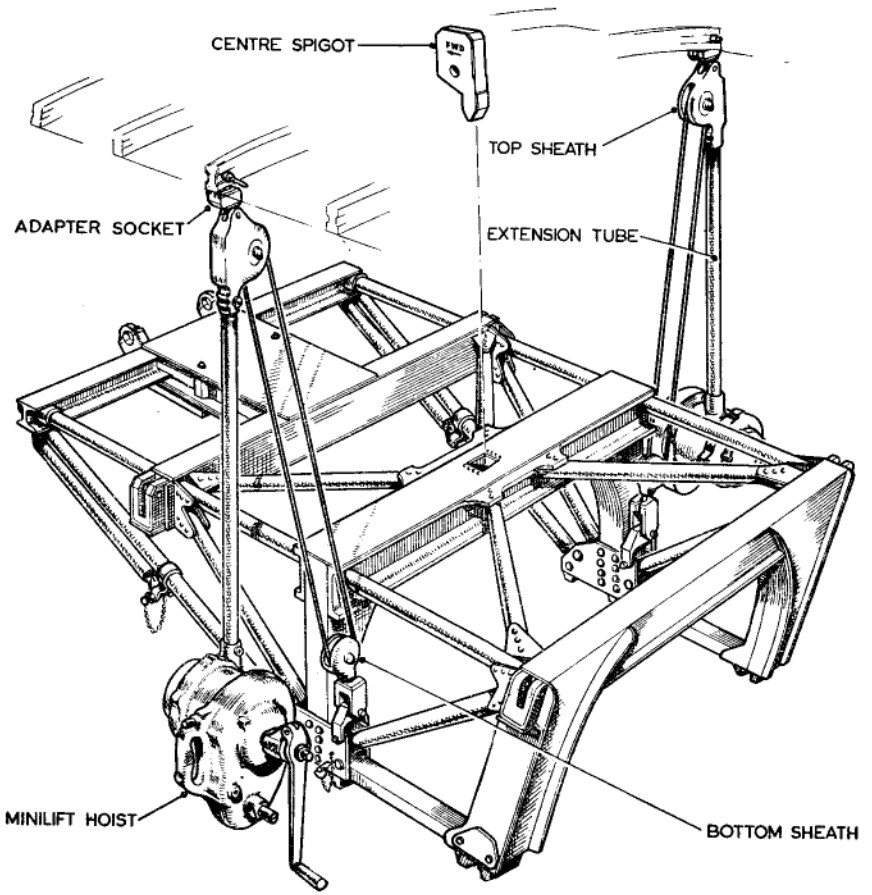

Fig. 9. Hoisting E.C.U. carrier, upper portion

Installing the carrier trolley (*fig.* 10)

23. To attach the carrier trolley complete with E.C.U. to the upper portion, proceed as follows:—

(1) Remove the ' pip ' pins from the base of the upper portion frame D.

(2) Release the lower end of each forward link strut pivoted at the upper portion frame A, by withdrawing the retaining pin from the stowage clip.

(3) Replace the pins in the stowage clips.

(4) From the trolley portion, remove the eight mooring shackles (two each port and starboard, at the base of frame L and N) and stow them around the trolley top tubular member by securing each with its own bolt and a stowage strap.

(5) At the shackle bolt original positions, fit the special pins and washers (Table 2) and secure with $\frac{5}{32}$ in. dia. split pins.

(6) Using four Minilift hoists, engage each top sheath in its ball socket on the adapter assembly in the bomb-bay roof.

(7) Engage two of the bottom sheaths in the ball sockets one on each side of trolley frame L, and the other two in the sockets in the trolley tube rear ends.

(8) Under the direction of a senior N.C.O., operate the four hoists simultaneously to lift the carrier.

(9) Continue to lift until the upper portion front struts align with the lower portion brackets, and secure at this position only.

(10) Slacken the forward Minilift hoists.

(11) Using the rear hoists to obtain alignment, secure the trunnion bearer assemblies at frame N to the feet of frame D.

(12) Remove the four Minilift hoists.

(13) Remove the jacks from the base of trolley portion frames L and N.

(14) Retract and rotate the wheel assemblies to their stowed position and stow the steering equipment.

Towing equipment stowage (*fig.* 11)

24. Special stowages are provided for the towing equipment when not in use. The towbar is secured along the trolley starboard side, the beam along the port side, and the steering forks are strapped to the trolley frames.

25. To stow the towbar:—

(1) Withdraw the pins from the clip on the trolley starboard side diagonal member and from the bracket on frame L outer face.

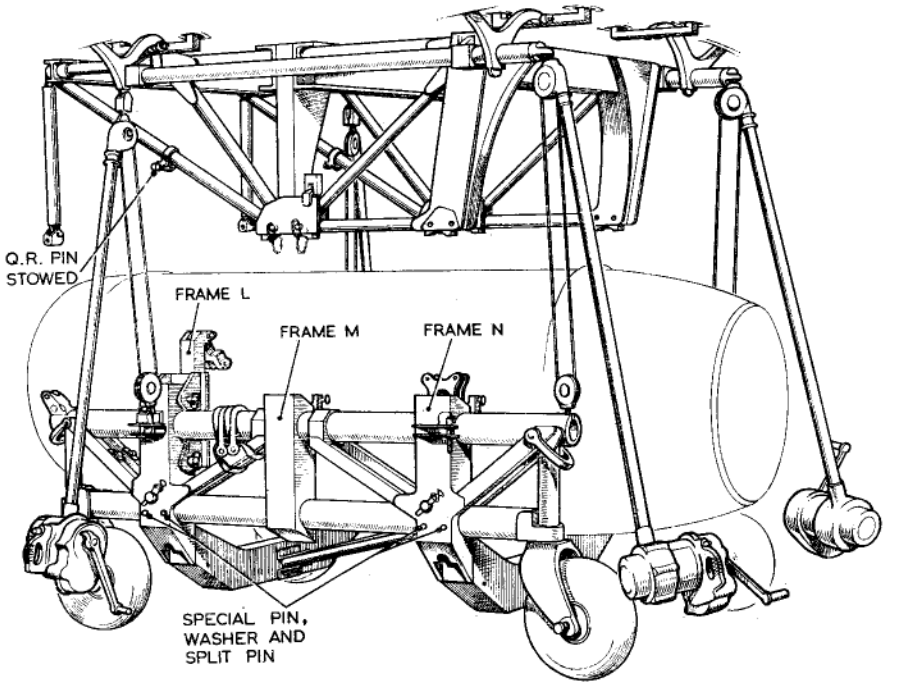

Fig. 10. Hoisting E.C.U. carrier, trolley portion

(2) Align the brackets on the towbar and frame L, and also the swivel-block bolt hole with the clip on the rear diagonal member.

(3) Secure with the pins removed in operation (1) and refit the towbar attachment pin in the swivel block.

26. The steering beam is stowed in the brackets at the top of port side frames L and N by withdrawing the pins, aligning the holes at each end of the beam with those in the brackets, and refitting the pins.

27. To stow the steering forks, lay them on top of the transverse members of frames L and N and secure with the straps provided.

Stowage rack (*fig.* 7)

28. The stowage rack for the Minilift hoists and trolley jacks is fitted in the bomb-bay roof at Stn.443·11 and 465·71, no provision being made for mechanical lifting of this rack. To secure it in position lift it to align with the attachment fittings under the roof and at the rear of loading point No. 1, and secure with the ' pip ' pins provided.

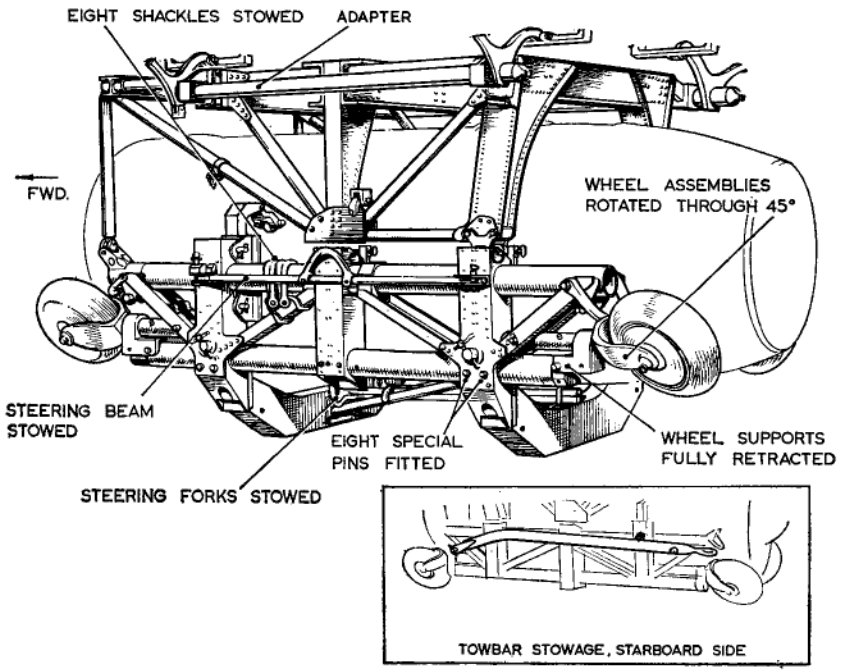

Fig. 11. E.C.U. carrier in bomb bay

Table 2. E.C.U. carrier equipment

Item	Ref. No.	Part No.	Description	Qty.	Remarks
1	4G/5711	—	Carrier, trolley portion	1	
2	4G/5712	—	Carrier, upper portion	1	
			Adapter set		
3	—	FS.1072-817A	E.C.U. adapter, port	1	
4	—	FS.1072-818A	E.C.U. adapter, starboard	1	
5	—	FS.1072-1150E	Stowage rack	1	For hoist equipment
6	—	FS.1072-819B	Centre spigot	1	
7	—	FS.1072-934B	Adapter socket	2	For Minilift hoist
8	—	FS.1072-1178H	Fatigue meter bracket	1	
9	—	FS.1072-668C	Pin, special	8	Fitted in place of shackle bolts when shackles are stowed
10	—	SP.13/Q	Washer	8	
11	—	SP.9/H16	Split pin	8	
			Hoisting equipment		
12	4GC/5752	—	Minilift hoist	4	
13	4GC/5753	—	Tube extension	4	
14	4GC/5754	—	Sheath, top	4	
15	4GC/5755	—	Sheath, bottom	4	

Stowing the hoist epuipment (*fig.* 12)

29. Stow the equipment on the stowage rack as follows:—

(1) Secure each hoist drum to its rack forward member by inserting the rack pin through the drum stowage lug. Then secure each hoist extension tube in the appropriate clamp on the rack rear member.

(2) Fit each hoist bottom sheath in the stowage case on the rack rear member, and tension the cables.

(3) Fit the hoist handles in the holes in the rack transverse members and secure with the captive straps provided.

(4) Secure the jacks, two port and two starboard, using the pins provided in the brackets at the jack head positions and the pins from the trolley at the lower arm attachment positions.

Effect on C.G.

30. For the effect on the aircraft C.G. when the E.C.U. carrier is installed in the bomb bay, refer to Sect. 2, Chap. 3.

Removal of E.C.U. carrier from bomb bay

Trolley portion

31. (1) Remove the steering equipment from the stowages on the trolley, and the hoist equipment and trolley jacks from the stowage rack.

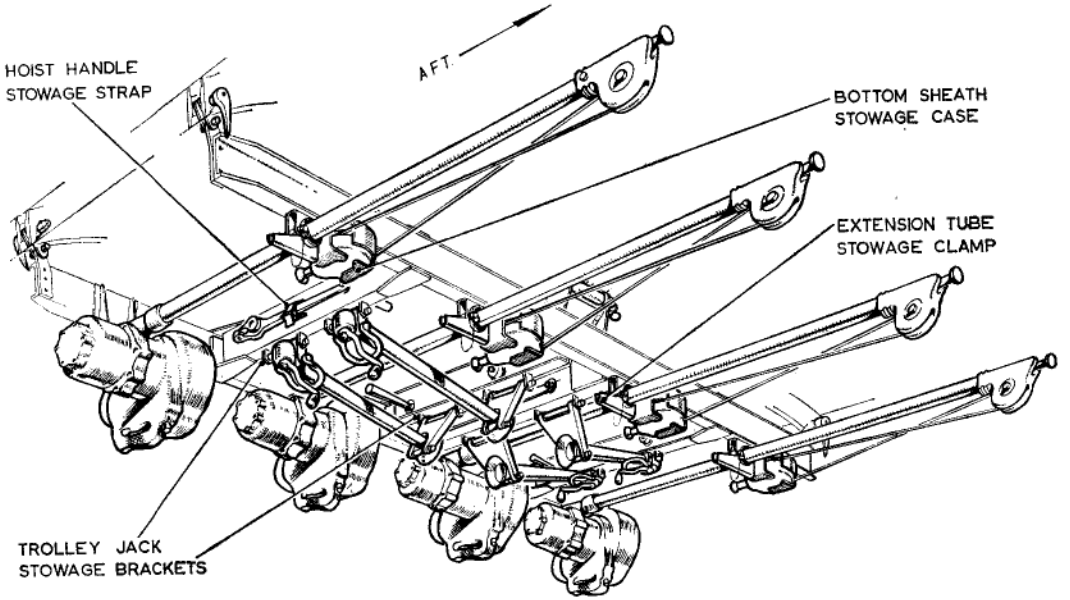

Fig. 12. Hoist equipment stowed

(2) Lower and align the trolley wheels.

(3) Engage the four Minilift hoists as for installing (*para.* 23(6) *and* (7)) and take the load.

(4) Remove the pins from the front strut attachment points and from the frame D attachments to the engine trunnion bearer assemblies.

(5) Lower the trolley by allowing the Minilift cables to run out steadily.

Note . . .

When lowering, the senior N.C.O. must ensure that all cables are taking equal load.

(6) Remove the hoists, and wheel the carrier lower portion clear of the bomb bay.

(7) Fit the jacks and steering equipment.

Upper portion

32. (1) Engage two Minilift hoists as for installing (*para.* 22(2), (3) *and* (4)) and take the load.

(2) Align the upper and lower portions.

(3) Remove the pins securing the upper portion to the adapter assemblies.

(4) Allow the hoist cables to run out, steadily lowering until the feet of frame D engage the engine trunnion bearer assemblies, and the front struts engage the brackets on the forward ends of the lower portion top tubular members.

(5) Align the holes and secure at these positions with the pins previously removed. Remove the hoists.

Removal of stowage rack

33. Take the weight manually, remove the attachment pins and carry the rack clear of the bomb bay.

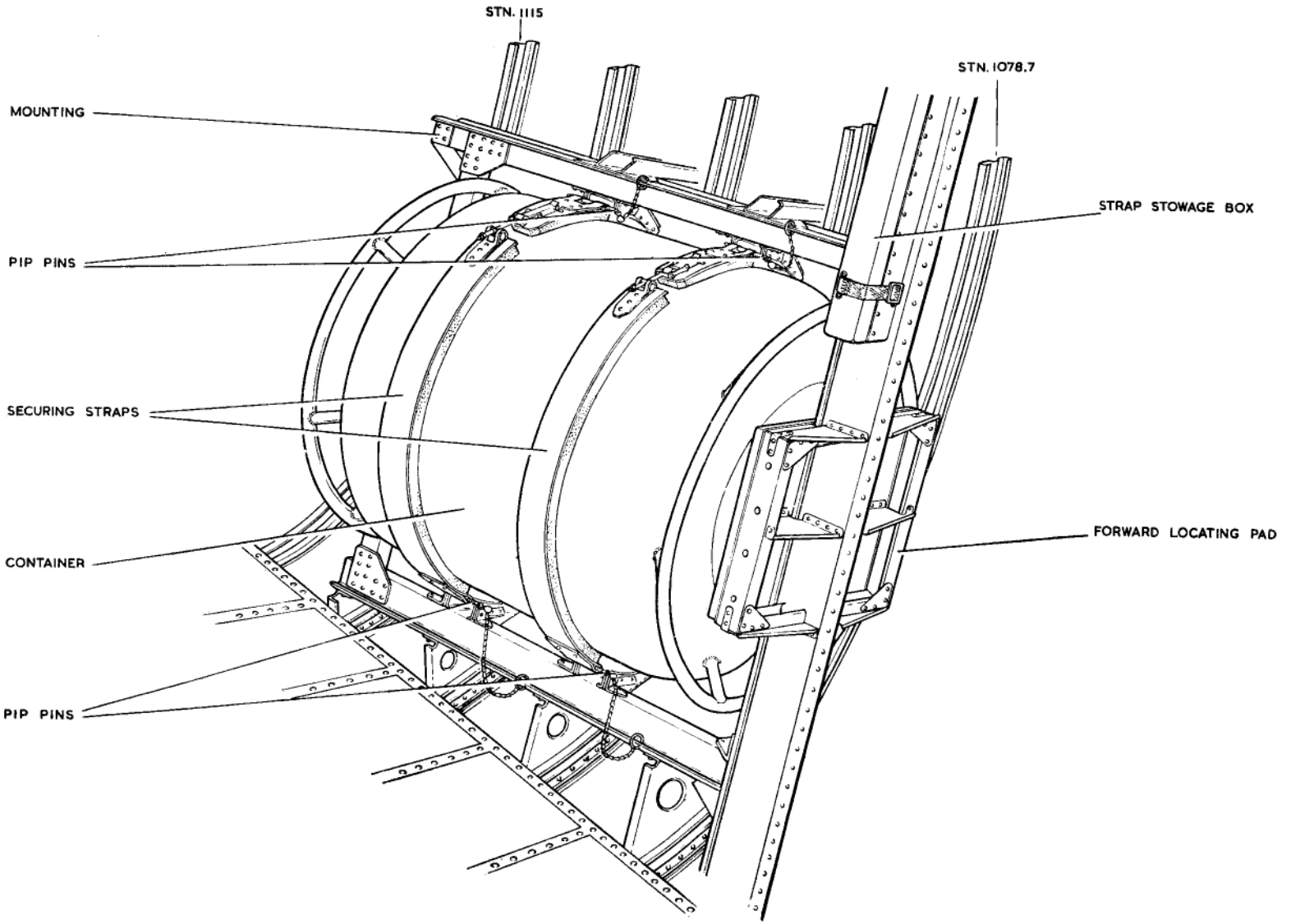

Fig. 13. Container A in mounting

CONTAINERS A AND B

General

34. Two special containers (Mod. 2755 and 2773) are fitted for the carriage of tools and spares when the aircraft is loaded with the 10 000 lb M.C. or certain other alternative stores. Container A is secured to a fixed mounting on the rear fuselage port side, and container B to a removable mounting in the bomb bay. The removable mounting is attached to the port side of the roof structure, using the existing fittings on the roof, and is secured by ' pip ' pins with handles to facilitate removal and assembly. When the 10 000 lb M.C. store is carried the mounting is attached to the roof, in line with loading point No. 1; with alternative stores, it is attached in line with loading point No. 6.

Fixed mounting (*fig.* 13)

35. The fixed mounting for container A (Mod. 2755) is attached to the rear fuselage port side, between Stn. 1078·7 and 1115. It is a built-up structure of channel-section members, with two neoprene-lined cradle members on which the container is supported; the ends of the container are located between two neoprene-lined pads. Two straps, each secured by a toggle fastener and attached to the cradle members by ' pip ' pins, secure the container in the mounting, the straps being braced one to the other. Attached to the forward vertical members of the mounting is a stowage box for the straps and braces when the container is not fitted.

Removable mounting (*fig.* 14)

36. The mounting for container B (Mod. 2773) is a plate diaphragm structure to which is attached a box-section cradle, the neoprene-lined ends of which locate the container. Two straps, each secured by a toggle fastener and attached to the cradle by ' pip ' pins, secure the container in the mounting. Four brackets for securing the mounting to the fittings in the bomb-bay roof are fitted to the top corners of the transverse diaphragm members, those at the outboard end being fitted with ' pip ' pins and those at the inboard with special bolts. A lifting lug, fitted centrally on the cradle provides attachment for a Minilift hoist when hoisting the container; no provision is made for hoisting the mounting which can be easily lifted into position. Attached to the mounting forward diaphragm is a stowage box for the straps when the container is not fitted.

Installing container A

37. The container can be manually lifted into the rear fuselage through the rearmost access hatch in the fuselage underside, or by using a sling and a Minilift hoist attached to the Green Satin hoist rail in the roof above the hatch. To install the container in the mounting proceed as follows:—

(1) Remove the straps and braces from the stowage.

(2) Using the captive ' pip ' pins, secure the straps to the brackets on the two cradle members.

(3) Position the containe. in the mounting cradle, fit the braces to the two straps and close the fasteners.

(4) Fit the locking pins to the fasteners.

Installing the removable mounting

38. Referring to para. 34 for the appropriate loading point, proceed as follows:—

(1) Remove the ' pip ' pins and special bolts from the outboard and inboard attachments, respectively.

(2) Lift the mounting into position on the port side of the loading point, align the outboard attachment brackets with the fittings on the bomb-bay roof, and secure with the ' pip ' pins removed in operation. (1).

(3) Align the inboard attachment brackets with the carrier adapter fittings fore and aft of the loading point, and fit the special and hollow bolts (*Table* 3) to secure the mounting.

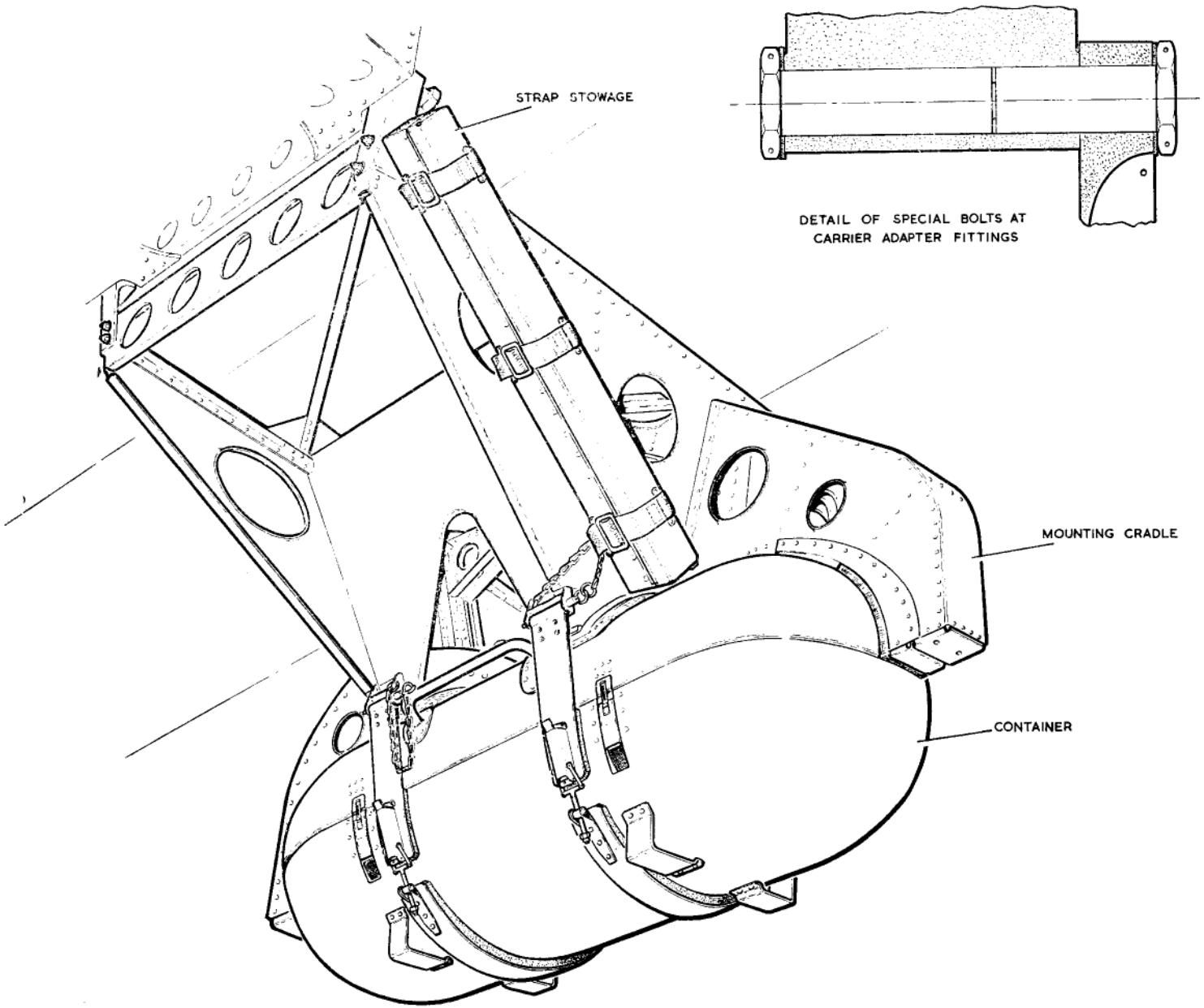

Fig. 14. Container B in mounting

(4) Tighten the bolts and secure with 22 s.w.g. D.T.D.189 locking wire.

Note . . .

There is a $\frac{1}{16}$ in. dia. hole in each mounting outboard attachment bracket to which the outboard bolts must be locked; the inboard bolts must be locked to a convenient point on the structure.

Installing container B

39. The container can be lifted manually or by means of a Minilift hoist. The hoist should be assembled and attached to the lifting lug on the removable mounting and the ball socket attachment on the container. To install the container, proceed as follows :—

(1) Remove the straps from the stowage and secure them to the fittings on the cradle, using the captive 'pip' pins.

(2) Lift the container into position in the cradle and secure by closing the strap toggle fasteners.

(3) Fit the fastener locking pins.

Effect on C.G.

40. For the effect on the aircraft C.G. when the containers are installed in the aircraft refer to Sect. 2, Chap. 3.

Removal of containers and removable mounting

41. Removal is essentially the reverse of the methods detailed for installation. When the containers are removed, the straps must be disconnected from the cradles and placed in their respective stowages.

Table 3. Container A and B equipment

Ref. No.	Part No.	Description	Qty.
	Arm.D.104374	Container A	1
	Arm.D.104428	Container B	1
26SR/14481	70679-Sht.987	Removable mounting	1
	70679-5779	Bolt, special	2
	70679-5809	Bolt, hollow	2

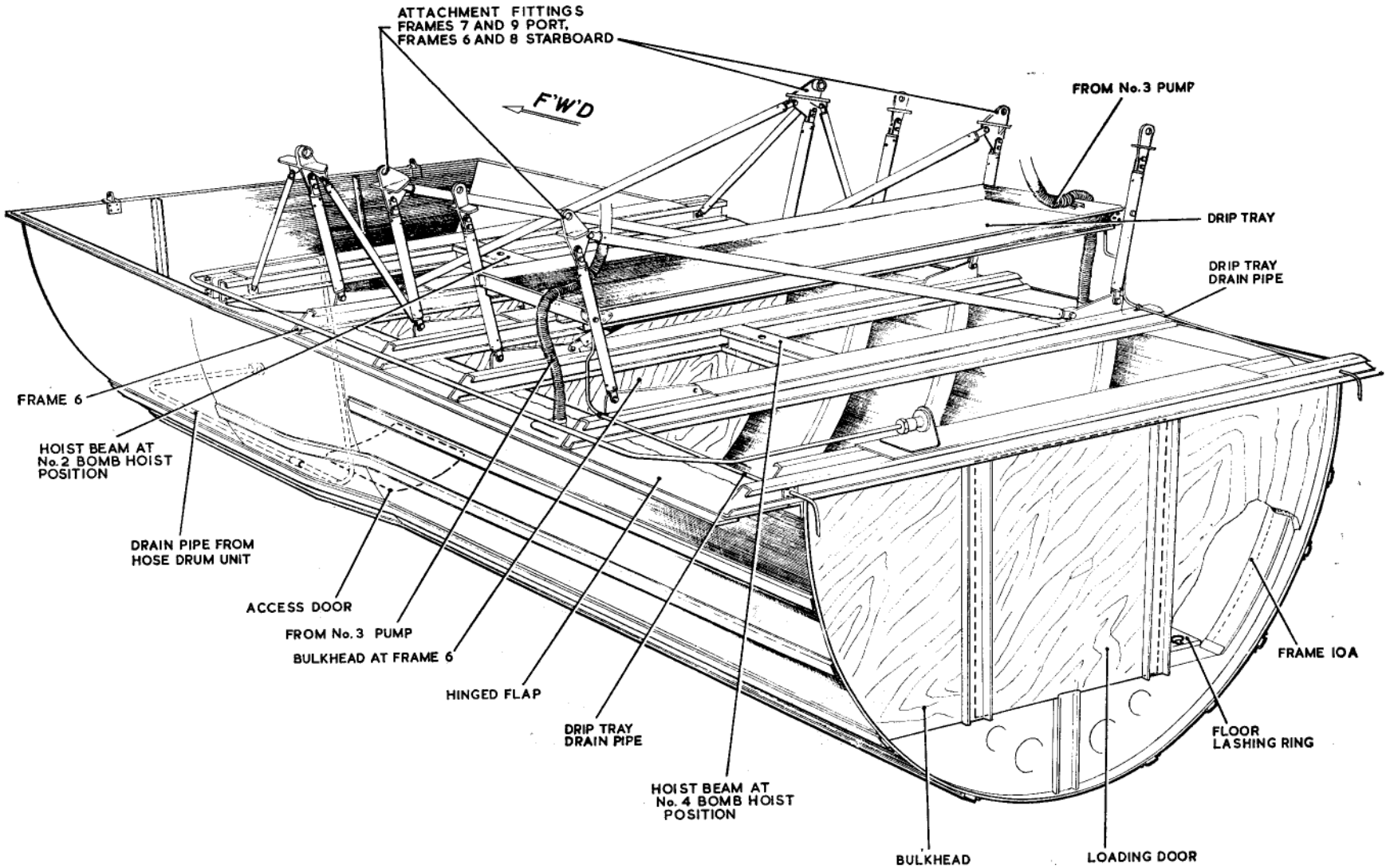

Fig. 15. 1000 lb pannier

1000 LB PANNIER

General

42. This pannier, which serves also as the bomb-bay fairing for tanker aircraft, is a modified version of that fairing (Sect. 2, Chap. 6, para. 23), the portion forward of the bulkhead at frame 6 enclosing the auxiliary fuel tank as before, and the portion aft of this bulkhead accommodating spares and equipment.

43. The strut assembly resembles but is stronger than that fitted to the original fairing. The load-bearing area is a metal-faced Mallite floor, equipped with 36 lashing rings, which extends from the bulkhead at frame 6 to the rear of the pannier, this being closed by a bulkhead at a new frame 10A immediately forward of frame 10. A door through which the pannier is loaded or unloaded forms part of the rear bulkhead and is attached by wing-type Dzus fasteners. A drip tray, with two drain pipes leading from the aft corners, prevents contamination of the pannier contents by fuel and is attached through brackets to the pannier support struts between frames 8 and 9. Air from the turbo fuel pumps is exhausted through flexible pipes, the front pipe terminating in a flanged outlet in the pannier undersurface and the two rear pipes through the hinged flaps. To avoid damage by freight, the H.D.U. drain pipe is routed externally on the port side to a point between frames 3 and 4, where it enters the pannier. A hinged door, between frames 1 and 2, gives access for servicing to the auxiliary tank and fuel system components.

Installing the pannier

Note . . .

The pannier must not be installed in the loaded condition.

44. After removal of the drip tray the sequence of operations detailed in Sect. 2, Chap. 6, para. 26 should be followed and the drip tray then refitted.

Removing the pannier

Note . . .

The pannier must be emptied before removal operations are commenced.

45. To remove the pannier from the aircraft, the sequence of operations referred to in para. 44 should be reversed.

Effect on C.G.

46. For the effect on the aircraft C.G. when the pannier is fitted, reference should be made to Sect. 2, Chap. 3.

Loading the pannier

47. The only restriction on the disposition of the load is that weight concentrations must not exceed 100 lb/ft². To avoid damage to the pannier contents, lashing rings not in use should be covered with a felt or ply underlay.

4000 LB PANNIER

General

48. This pannier installation is catered for by three inter-related modifications. Mod. 3065A introduces the pannier, a hoist beam and a forward fairing; Mod. 3176, which is embodied in all production panniers, provides castering wheels on the pannier to facilitate ground handling; Mod. 2960 provides fixed fittings in the bomb-bay roof, forming attachment points for the hoist beam and the fairing.

49. The pannier is constructed of light-alloy frames with longitudinal and transverse members to which the skin is riveted. Transverse beams support the light-alloy floor which is covered by $\frac{1}{4}$ in. plywood and equipped with 36 lashing rings to secure the pannier contents. Loading and unloading normally take place when the pannier is on the ground, but the aft bulkhead is detachable to facilitate the stowage or removal of the smaller items when the pannier is in the aircraft. Provision is made for transporting a spare aircraft wheel mounted on a carrier which runs on rails supported by the top cross beams of each frame. Fittings on the front and rear bulkheads provide attachment points for lifting equipment.

50. The pannier hoist beam is of light-alloy construction, comprising longitudinal and cross-braced transverse members. Attachment points are provided to mate with fittings in the bomb-bay roof; two crutching pads are positioned at the rear of the forward attachment point. (It is possible to service or remove No. 3 turbine pumps with the hoist beam fitted in the aircraft). Port and starboard drip trays are incorporated to prevent oil contamination of the pannier contents by the exhaust or overflow from No. 3 turbine pumps.

51. A light-alloy fairing is fitted forward of the pannier, under the auxiliary fuel tank. This fairing is supported by adjustable struts to facilitate alignment with the pannier. Doors (not illustrated) are provided in the fairing to provide access to the pannier hoist fittings, torque spanner adapter stowage, pump servicing points and the freight compartment at the forward port side. The exhaust from the pumps is ducted aft through a flexible hose coupled to an outlet in the fairing skin to prevent oil contamination locally.

Installing the hoist beam

52. (1) With the bomb doors open, remove and retain No. 2 hoist tunnel access cover.

(2) Using a safety raiser, or hoisting manually at the diagonal bracing intersection through No. 3 hoist tunnel, position the beam for attachment to the bomb-bay roof fittings.

(3) Engage the two rear attachment lugs in the roof fitting at Stn.622 so that the starboard lug is central in the mating fork-end.

(4) Shim both sides of the port lug to give 0·002 in. max., side float and secure the lugs with bolts, washers, nuts and split pins (Table 4).

(5) With a special bolt, Pt.No.70679-7319, nut Pt.No.70679-7317, and split pin, secure the front attachment lug to a No. 3 bomb slip adapter at No. 2 hoist tunnel.

Note . . .

With the hoist beam in position and resting normally in its supports before being pre-strained, the beam should just touch the crutching pads and there should be a nominal measurement of 1·375 *in. between the centre of the forward attachment bolt and the bomb-bay roof.*

(6) Using a bomb-loading truck, Ref. No. 16A/2303, prestrain the hoist beam with a gauge pressure of 100 lb/in² (equivalent to 1400 lb prestrain).

Note . . .

Alternatively, if a bomb hoisting gantry crane, Ref. No. 16*A*/1931, *is used for prestraining the hoist beam, reference should be made to A.P.*1664*D, Vol.* 1, *Chap.* 8 *and* 13, *for comparative gauge and jack effort information.*

(7) Remove the bomb-hoisting truck and replace the hoist tunnel access hatch.

Installing the fuel tank

53. (1) At. Stn.390·5 secure two adjustable drag stays to the roof fittings with pip-pins.

(2) At Stn.417·85 secure the two forward strut assemblies to the roof support structure and the strut attachment fitting with existing attachments.

(3) At. Stn.498·28 secure two adjustable rear attachment struts to the outboard lugs with pip-pins, and two similar struts to the inboard lugs with pins, washers and split pins.

(4) Assemble the rear attachment strut lower ends to the two strut attachment fittings, securing the outboard struts with pip-pins and the inboard struts with pins, washers and split pins.

(5) Raise the fairing into position, attaching drag stays and forward strut attachment fittings with pip-pins (stowed on the fairing cross beam) and the rear attachment fittings with pip-pins (stowed on the fairing rear bulkhead).

Installing the pannier

54. (1) With the pannier loaded and the casters fitted, from the rear of the aircraft, wheel the pannier into position beneath the hoist beam.

(2) With a standard Mini-hoist attached to the fittings at each corner of the hoist beam and the lifting ball-ends engaged in the lifting brackets on the pannier, hoist the pannier evenly, ensuring that the pannier spigots enter the holes in the hoist beam.

(3) Using the special bolts Pt.No.73379-2123, and washers Pt.No. 73379-2125, secure the pannier to the hoist beam and, using a torque spanner and special adapter (Table 4) tighten the bolts to 1700 lb/in. Wire-lock the bolt heads to the locking tabs on the pannier. Stow the torque spanner adapter in the fairing on the aft face of frame 2.

(4) Remove the pannier wheels and stow them inverted and lashed down in the pannier rear end. Refit the caster attachment nuts and replace the caster mounting access doors.

Note . . .

The bomb doors must not be lowered when, with the wheels fitted, the pannier is installed in the aircraft.

(5) Align the fairing with the pannier by adjusting the lengths of the adjustable struts, ensuring that the fairing is stepped not more than 0·05 in. below the pannier and that the rubber seal between the fairing and the pannier is compressed to leave a gap of 0.30 to 0·40 in.

Note . . .

If more than 0·25 *in. of any fork-end thread is exposed after adjustment of the fairing support struts, an additional locknut should be fitted.*

(6) At the fairing, couple the drain hose to the existing auxiliary fuel tank exhaust elbow and secure with a clip, Type A.G.S.605.

(7) Remove and store the items blanking the H.D.U. fuel drain pipe assembly and couple up the existing H.D.U. fuel drain pipe, using the existing fittings.

(8) At the fairing rear end, couple with a flexible hose the H.D.U. drain pipe to the corresponding pipe in the pannier and secure with two clips, Type A.G.S.605.

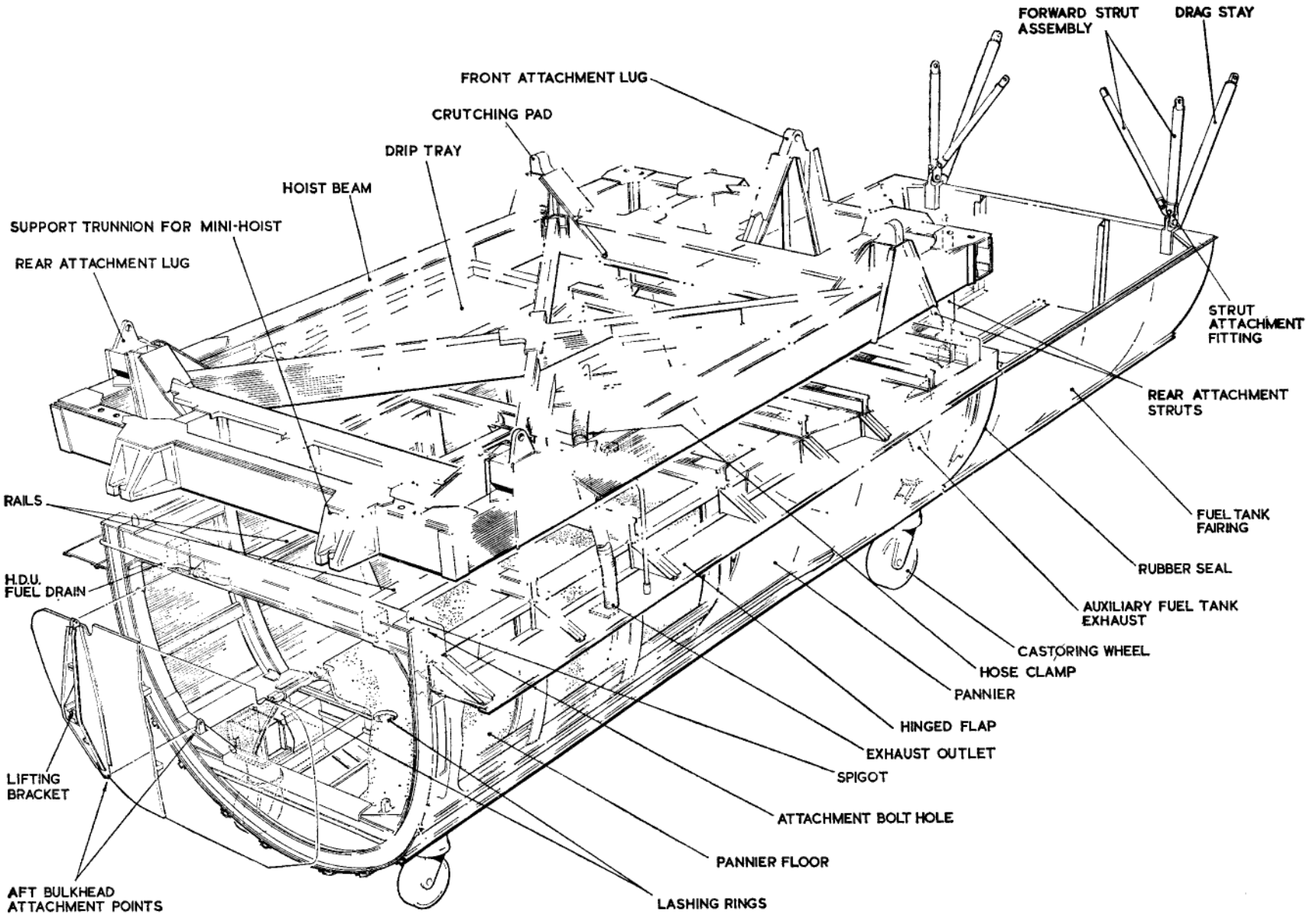

Fig. 16. 4000 lb pannier

(9) Secure the hose from the H.D.U. pump and control unit to the adapter mounted on the pannier port rear end.

(10) At the pannier, couple both flexible hoses to the No. 3 fuel pump exhaust outlets and secure with two clips, Type A.G.S.605.

(11) Loosen the hose clamp bolts at the rear ends of the drip trays, remove and retain the bolts securing the exhaust outlets to the lower surfaces of the pannier flaps and withdraw the outlets.

(12) Pull the hoses through the appropriate flap apertures and secure them to the exhaust outlets with two clips, Type A.G.S.605.

(13) Tighten the hose clamps at the drip trays.

Removal of pannier, fairing and hoist beam

55. To remove the pannier, fairing and hoist beam, reverse the installation procedure.

Note . . .

The pannier wheels must be fitted before lowering is commenced.

Effect on C.G.

56. For the effect on the aircraft C.G. when the pannier is fitted, reference should be made to Sect. 2, Chap. 3. ▶

Table 4. 4000 lb Pannier equipment

Ref. No.	Part No.	Description	Quantity	Remarks
	73379 Sht.579	Pannier, 4000 lb	1	
	73379 Sht.577	Fairing	1	
	73379 Sht.591	Beam, hoist	1	
16A/2303 or 16A/1931		Truck, bomb loading or Crane, gantry	1	
11A/4360		Pawl mechanism, load retaining (short) Mk. 2	1	For retaining and pre-straining hoist beam
11A/4111		Lifting eye assembly (short)	1	
11A/4134		Adapter, bomb slip No. 3	1	
11A/4294		'H' link, Mk. 2	1	
11A/4382		Rod, control, pawl operating	1	
28D/	A.25/17L	Bolt, $\frac{7}{16}$ in. dia.		As Reqd. For hoist beam attachment
28M/	A.27/LS	Nut, slotted		
28W/	SP13/L	Washer		
	SP9/G12	Pin, split, $\frac{1}{8}$ in. dia		
4GC/5752		Mini-hoist, heavy aircraft components	4	
IL/N.I.V.		Spanner, torque, $\frac{3}{4}$ in. square drive	1	For torque loading of pannier securing bolts
	73379-2401	Adapter, torque spanner	1