SUPPLEMENT 1

WOMBAT ROLE

(Amdt. 7)

WOMBAT ROLE

Note: *Unless stated, the equipment is common to all marks of vehicle, so where illustrations depict the equipment fitted to a mark of vehicle not relevant, the background can be ignored.*

GENERAL

1. The WOMBAT MOUNTING for FV432 kit consists of equipment required to load and transport the Wombat gun with a supply of ammunition and also to provide a means of mounting the gun in a firing position on the roof of the vehicle.

2. The kit includes rearranged seating and a pannier sill stowage locker.

3. The procedure detailing the installation of the kit is described in EMER, Tracked Vehicles, E105/2, Installation Instruction No.2.

4. In the firing position the gun has an overall traverse of 533 mils (30 deg), a maximum elevation of 133 mils (7.5 deg (on vehicle centre line) and a maximum depression of 53 mils (3 deg).

5. The gun must be in the rear position with the venturi outboard when firing to prevent damaging the vehicle.

Warning: *If a tactical situation arises making it necessary for the vehicle to move with the gun mounted and loaded, the 'safety switch' must be 'safe' and the D.C. assisted by the No.2 will control the gun.*

6. When travelling, with the gun in the mount, the mount must be locked in the forward position and the barrel secured by the strap.

7. Unless stated the equipment is common to all marks of vehicle, so where illustrations depict the equipment fitted to a mark of vehicle not relevant, the vehicle background should be ignored.

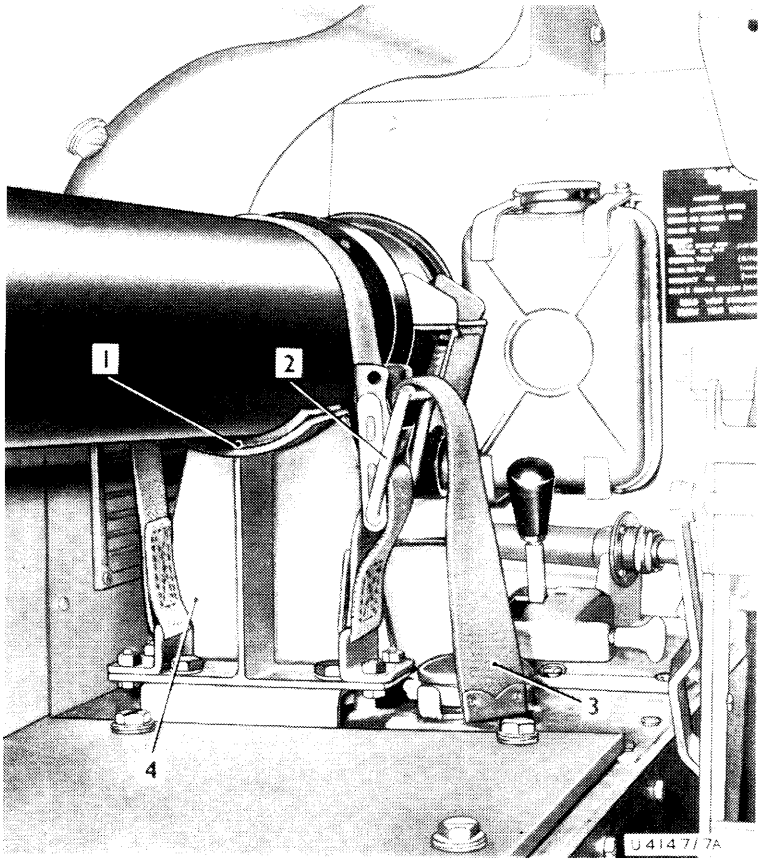
PEDESTAL

8. The pedestal (Fig 1) is fitted on the power pack compartment partition sill to support the front end of the barrel. The barrel rests on the curved, padded top (1) of the pedestal where it is secured by a webbing strap. The strap (3) has a quick-release buckle (2) and is attached at each end to the base of the pedestal (4).

AMMUNITION RACK

9. The rack (Fig 2(4)) is constructed of angle iron sections welded together to form three tiers, each tier holding four rounds. The rack is bolted to the left pannier sill.

10. The rounds rest on wooden cradles (3) in rubber padded recesses and held in position by rubber sleeved clamp bars. The clamp bars are operated by handles (2) secured to them by taper pins.



1 Pad
2 Quick-release buckle
3 Strap
4 Pedestal

Fig 1 Pedestal

11. The end crossmembers of the rack are rubber padded to protect the rounds should end movement occur.

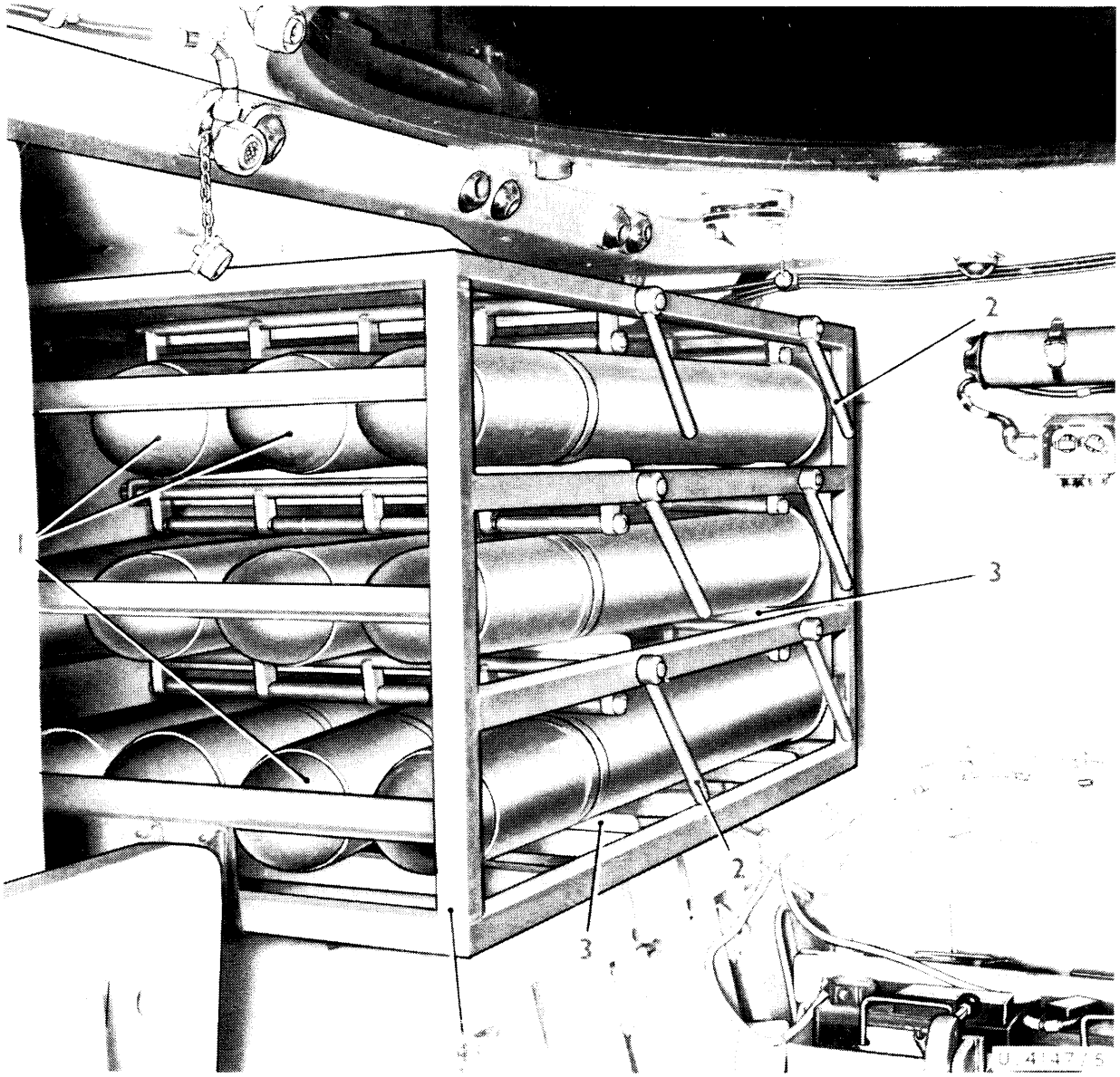
GUN CRUTCH

12. The gun crutch supports the Wombat carriage by the axle, taking the weight from the wheels for transportation.

13. The fabricated frame of the crutch consists of two angle iron side members connected at the forward end by a transverse angle iron member. An upright member each side carries a swivel plate and locking cam (Fig 3(1)).

14. The axle supports are pivoted on the base of the frame and are spring loaded against limit stops, which retain them at a suitable height to receive the carriage axle. When the Wombat is stowed in the vehicle, the axle contacts the ferodo lined pads (2) and swings the supports forward and raises the Wombat. The supports move forward over-centre and contact adjustable limit stops.

15. The swivel plates are spring loaded to remain open while the Wombat is stowed onto the crutch. When the Wombat is raised the plates are automatically swivelled and the axle is locked in the crutch when the cams are lowered. The wheels are then sufficiently clear of the floor to allow the loading ramps (3) to be stowed under them.

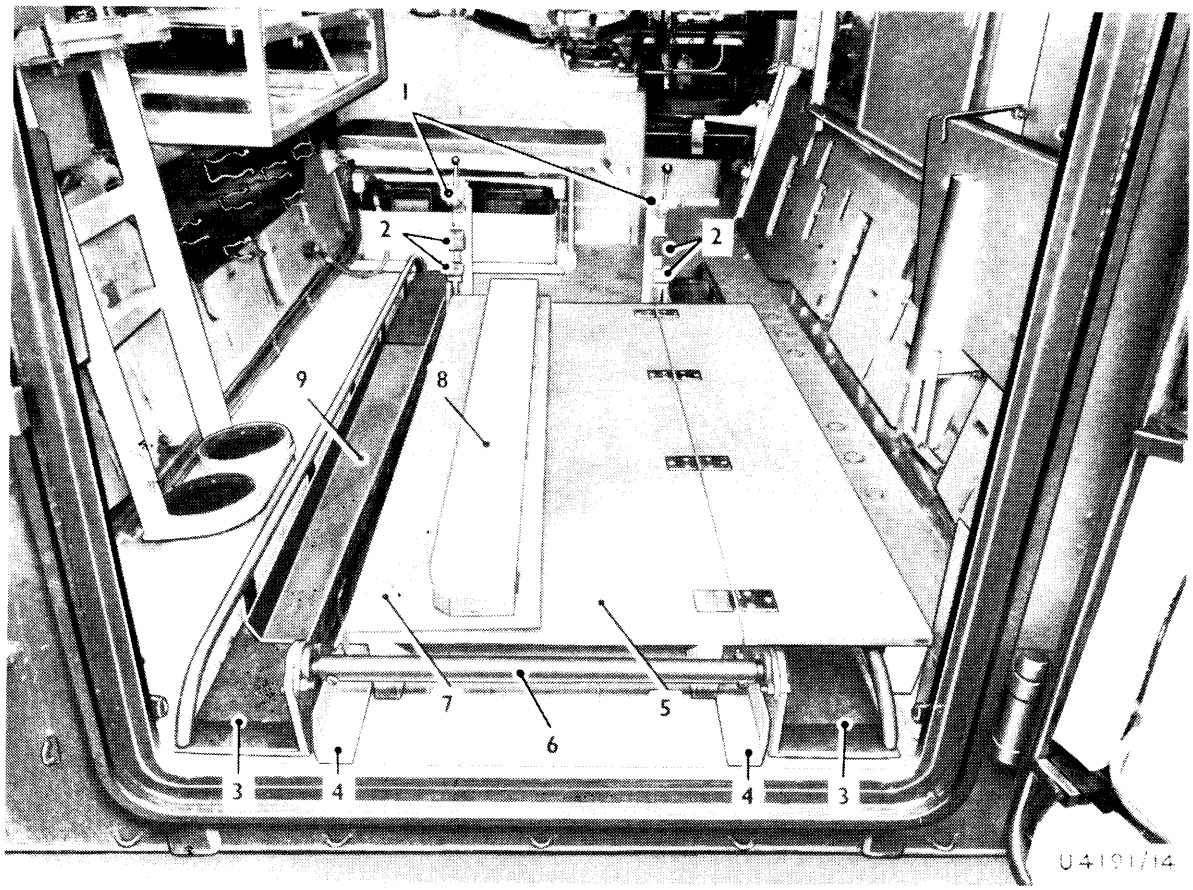


1 Ammunition
2 Clamp bar handles
3 Wooden cradles
4 Rack

Fig 2 Ammunition rack

GUIDE RAILS

16. The guide rails (4) are two lengths of angle iron which have the rear ends curved inwards to form a lead-in to the wheels as they leave the ramp and enter the vehicle. The rails are bolted to the floor plate in the rear of the crutch and guide the wheels until they engage the side members of the crutch frame.



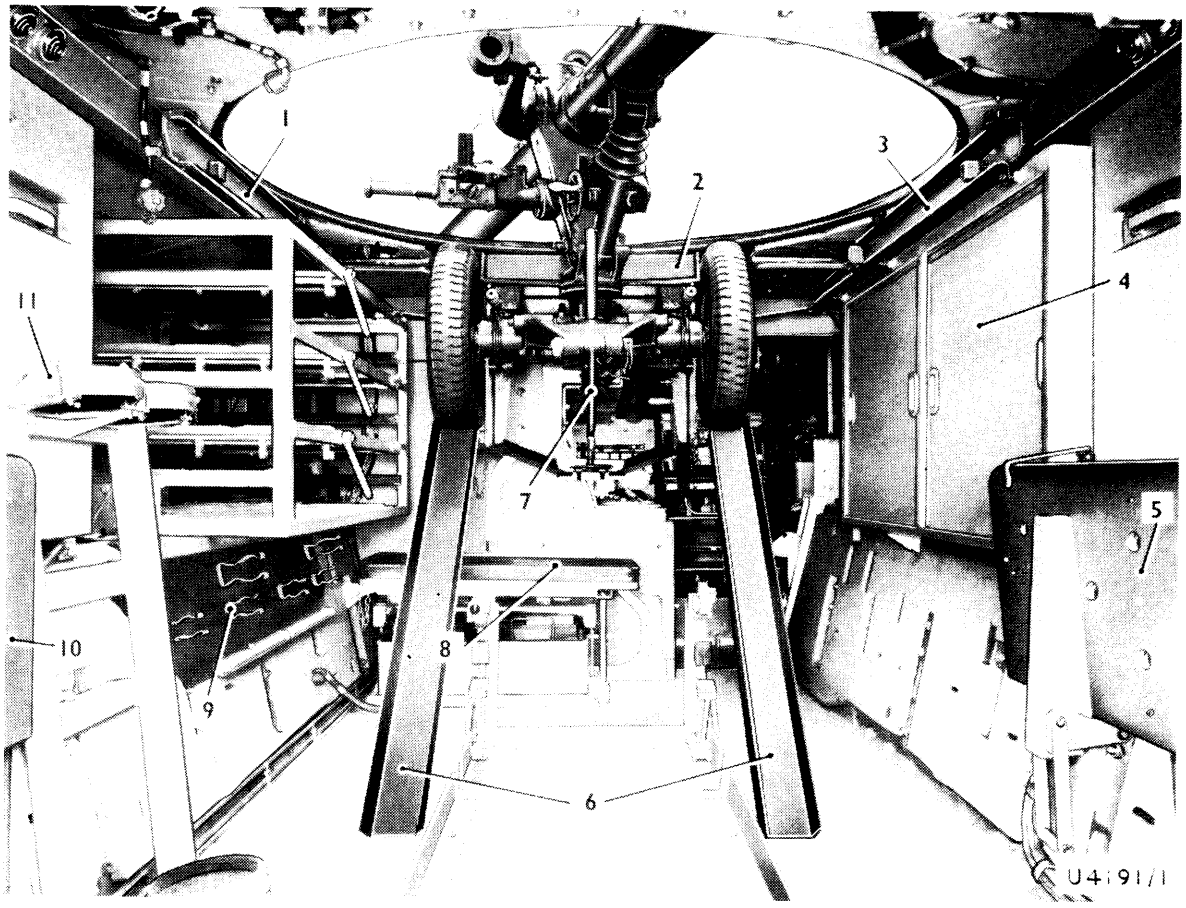
1	Locking cams	6	Tubular cross-member
2	Ferodo lined pads	7	Platform side section
3	Long ramps	8	Support leg
4	Guide rails	9	Short ramp
5	Platform, centre section		

Fig 3 Gun crutch, platform and ramps

LOADING RAMP

17. The loading ramp (long ramps) consists of two wheel track guides connected at the rear by a tubular cross-member (6) ball jointed at each end. The guides are welded fabrications each being braced by a tubular rail on the outer side and a rectangular section rail on the inner. At the forward end on each of the outer rails is a projecting pin which engages inside the vehicle doorway when the ramp is in the loading position.

18. The ball joints on the tubular cross-member allow the track guide ends to rest firmly on the ground despite any unevenness that may be present. The ball joints are bolted into the ends of the tube and secured to the track guides by bearing plates bolted to the inner rail end plates.

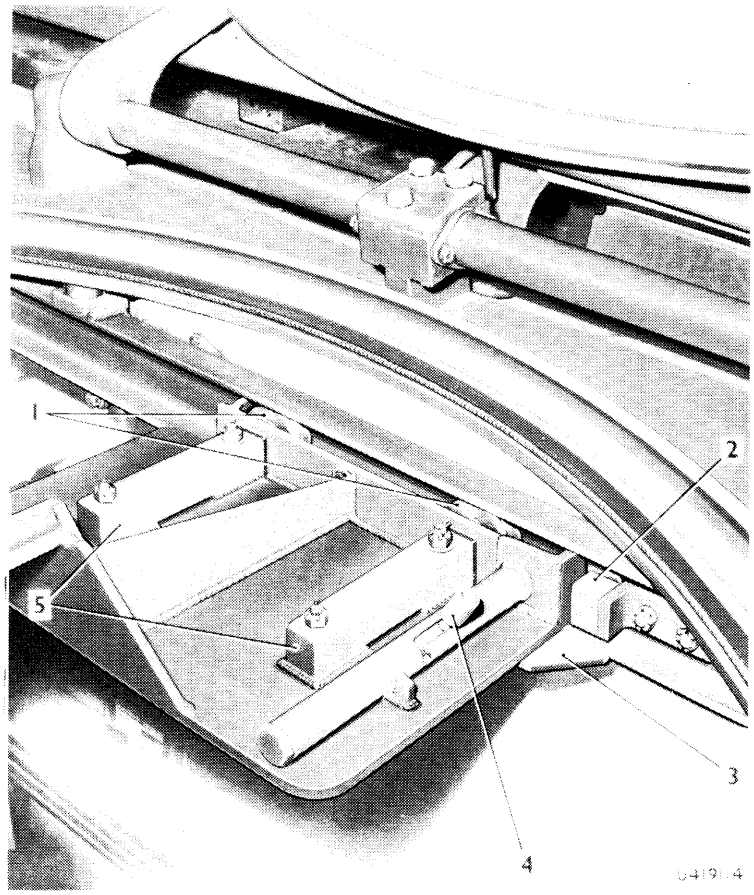


1	Guide rail	7	Hook
2	Mount	8	Double seat
3	Guide rail	9	Weapon and handling bar stowage place
4	Side locker	10	Single seat
5	Personnel seat	11	Ready round rack
6	Short ramps		

Fig 4 Mount with gun in position

MOUNT

19. The mount (Fig 4(2)) consists of a welded frame to which is fitted four bearing rollers, two spring loaded bolts, gun crutch axle clamps, a double reduction chain drive winch and a gun traverse stop.



1 Bearing rollers

2 Rear buffer

3 Guide plate

4 Locking bolt

5 Roller axle bars

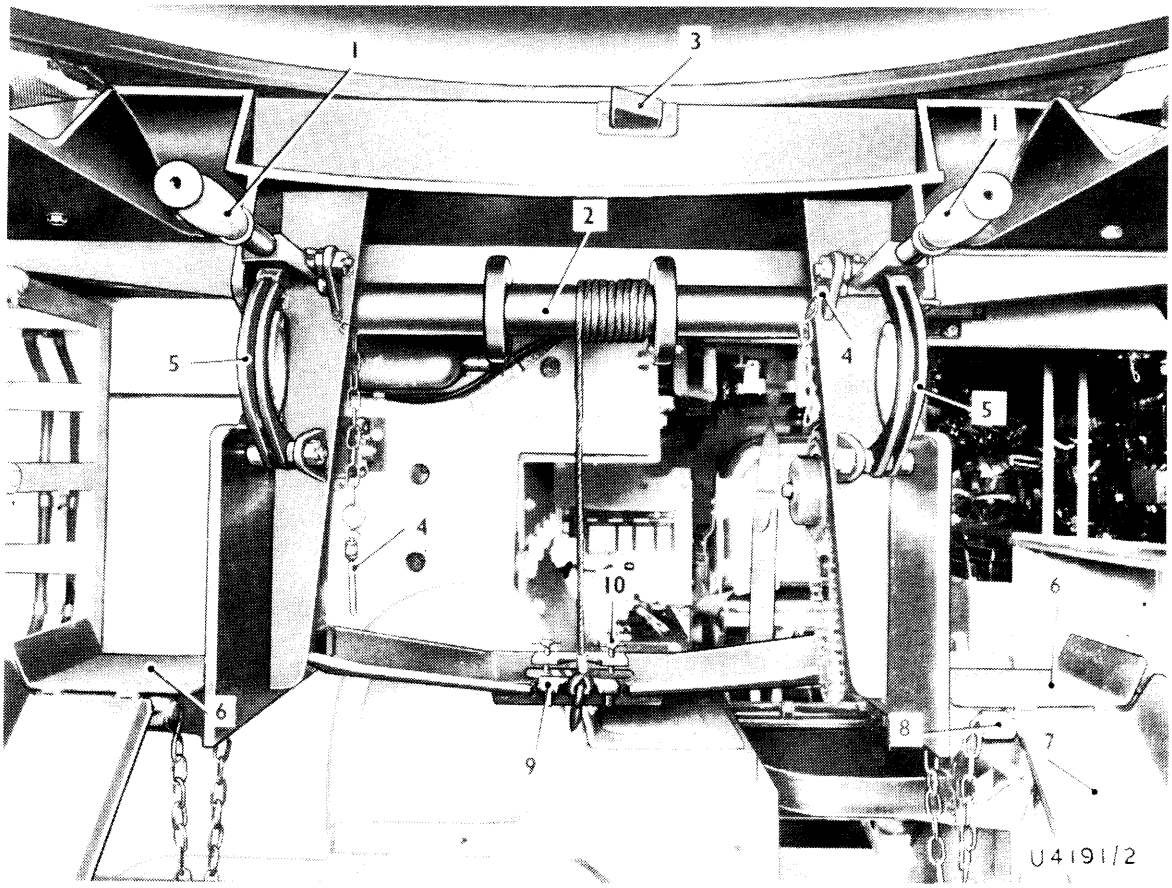
Fig 5 Bearing rollers and locking bolts

Bearing rollers

20. The bearing rollers (Fig 5(1)) are positioned two on each side of the frame top-plate. The roller axle bars (5) and frame guide plates (3) are set during manufacture to the correct gauge width for the mount to run freely when the equipment is installed in the vehicle. The bearings are prepacked with grease and do not require servicing between overhauls.

Locking bolts

21. The spring loaded locking bolts (4) are located one on each side of the frame top plate adjacent to the rear rollers. The bolt handle moves in an 'L' shaped slot and when the handle is in the bottom leg it is held out of engagement.



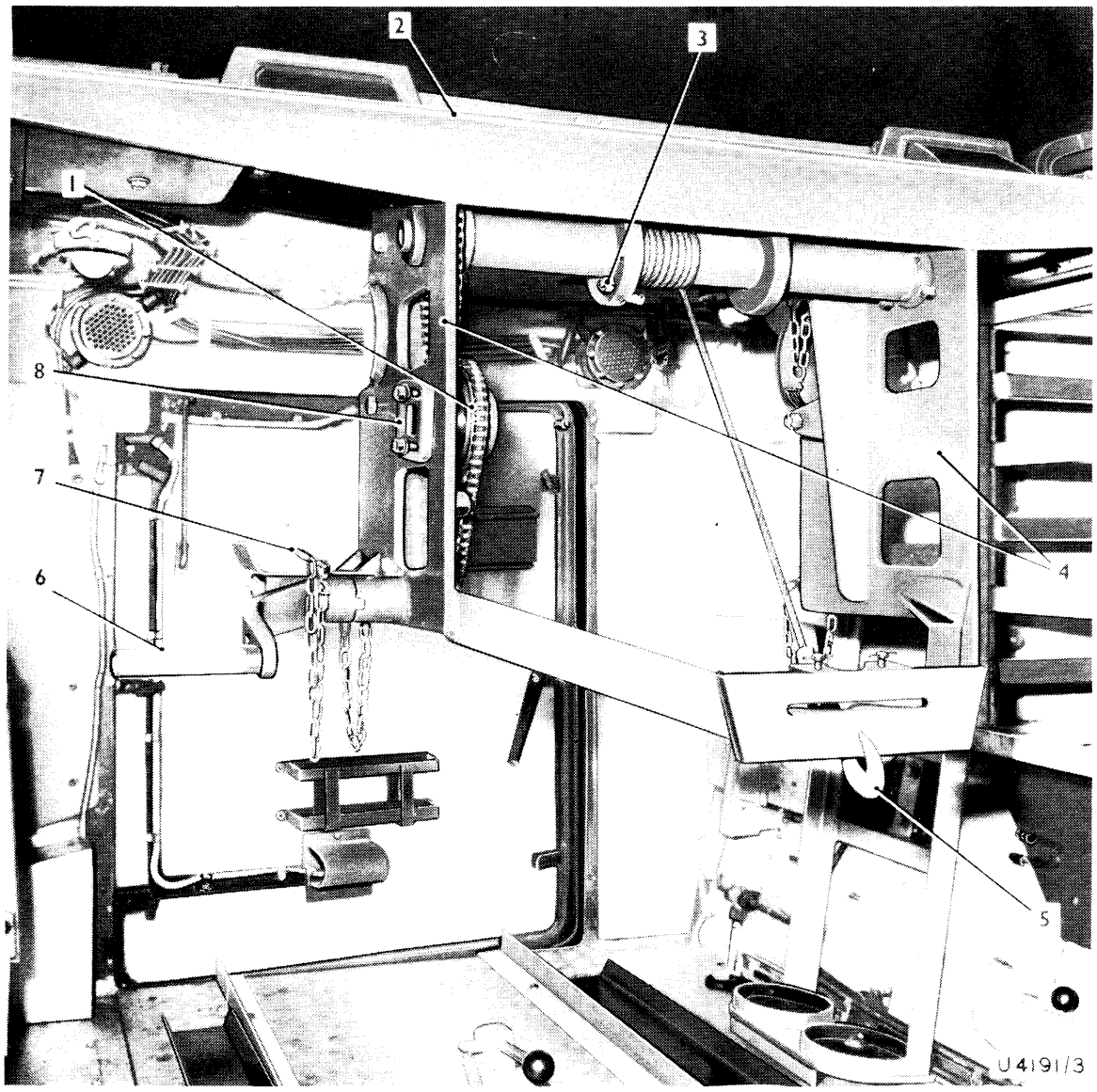
1	Axle clamp handle	6	Gun wheel platforms
2	Rope drum shaft	7	Short ramp
3	Left traverse stop	8	Pip pin
4	Pip pins	9	Gun leg support
5	Axle clamp segments	10	Front leg jack locking screws

Fig 6 Gun axle clamps and wheel platforms

Gun wheel platform and leg clamp

22. Attached to the lower edge of the vertical side plate members are the gun wheel platforms (Fig 6(6)) upon which the gun rests. Hinge brackets are welded to the rear of the platform for the short ramps (7) to be attached to when winching the gun onto the mount. The short ramps are connected to the hinge brackets by captive pip pins (8).

23. The side plates and platforms are braced by an angle section extension which provides a support (9) for the gun forward leg clamp, which is locked when in position by two thumb screws (10).



1	Double sprocket	5	Rope Hook
2	Mount top plate	6	Winch handle
3	Rope clamping bolt	7	Handle locking pip pin
4	Mount side plates	8	Cham tension adjustment bracket

Fig 7 Mount, front view

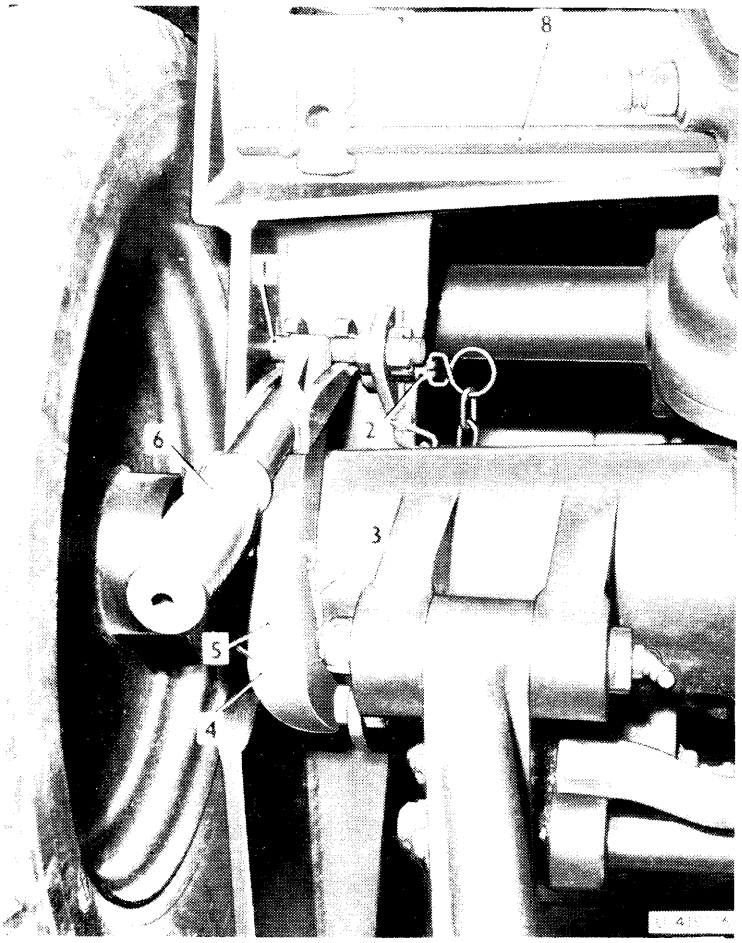
Winch

24. The right side plate incorporates the winch chain drive. The drive is transmitted from the hand driven sprocket to the rope drum shaft (2) via an intermediate double sprocket (Fig 7(1)). Each chain is connected by a spring link and the tension of both chains is effected by moving the double sprocket mounting bracket (8).

25. The rope is wound round the drum shaft between check plates welded to the shaft. One end of the rope is secured to the right cheek plate by a clamping bolt (3) and a hook (5) is attached to the free end.

26. When the winch is out of use the hook should be linked to the forward leg clamp support and the spare rope wound upon the drum.

27. The winch handle (6) is connected to the drive shaft by a dog clutch and secured in position by a captive pip pin (7). When not in use the handle can be reversed on the shaft and the captive pip pin passed through the handle arm and the frame side plate (see Fig 17).



1 Gun axle clamp

2 Pip pin

3 Pressure pad

4 Thumb screw

5 Clamp segments

6 Clamp handle

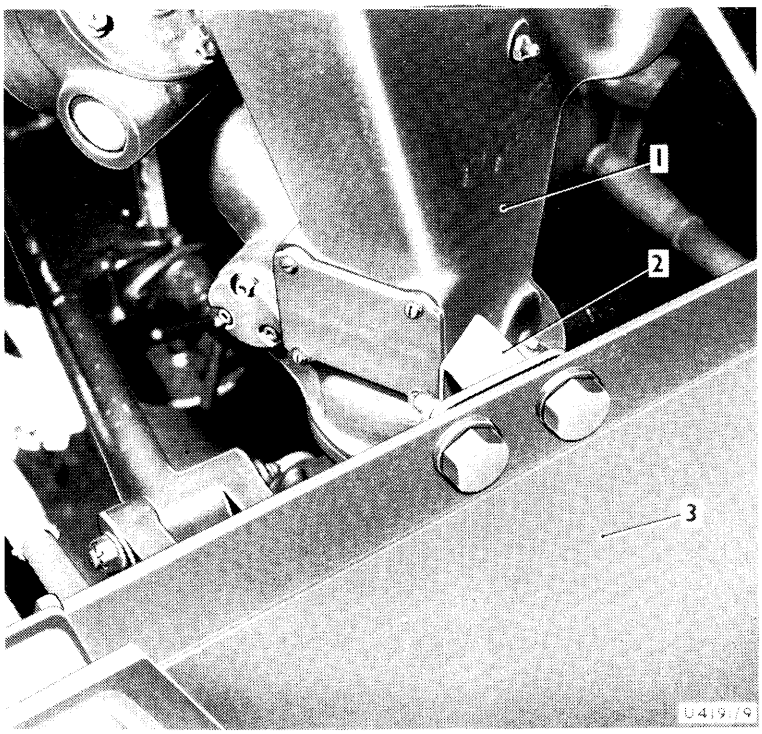
7 Box spanner

8 Tommy-bar

Fig 8 Gun axle clamp

Axle clamps

28. When the gun has been drawn onto the mount and the wheels located on the platforms the axle clamps lock the gun securely in position. Both the clamp segment pressure pads (Fig 8(3)) and the frame recesses are lined. The clamps are adjustable and lock with an over centre action When the clamp handles (6) are in the locked position, pip pins (2) on captive chains secure them against accidental release.



1 Saddle

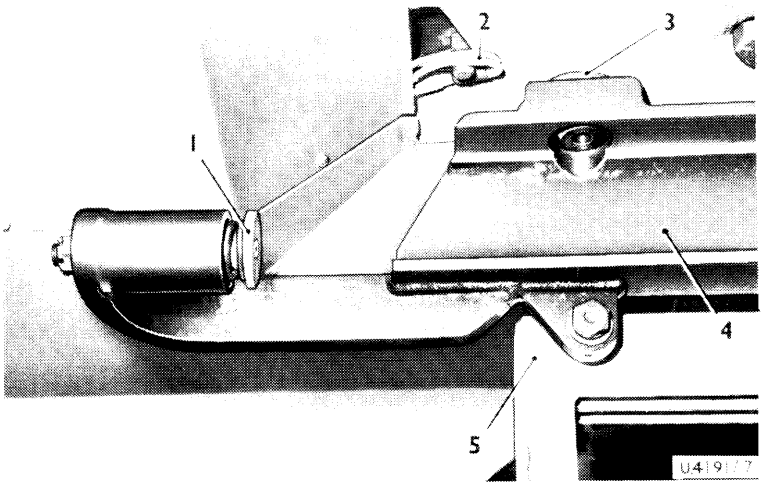
2 Traverse stop

3 Mount top plate

Fig 9 Left traverse stop

Traverse stop, left

29. The stop (Fig 9(2)) is mounted centrally on the rear face of the strengthening web between the wheel arches on the mount top plate (3). The front face of the saddle (1) abuts the stop when the gun is traversed left.



1 Spring buffer

2 Roof light cables

3 Roof boss

4 Guide rail

5 Side locker frame

Fig 10 Guide rail spring buffer

GUIDE RAILS

30. The mount is supported by two guide rails (Fig 4(1) and (3)) which are each bolted to three bosses (Fig 10(3)) on either side of the mortar hatch.

31. The rails are of fabricated channel section with the mount roller trackways machined for ease of travel of the mount.

32. The rails are fitted with two forward spring buffers (1) and two rear rubber buffers (Fig 5(2)). The buffers absorb the shock when the gun is run forward for loading and to the rear for firing. The rear buffers are bolted to the rails and their removal is necessary when installing or removing the gun mount.

33. Each rail has two drilled holes, which accept the mount spring loaded bolts (4) which lock the mount in either the forward or rear position. The holes are lightly countersunk to help the bolts into engagement.

34. The right guide rail has three lugs welded to the underside to provide attachment points for the side locker frame (Fig 10(5)).

35. A special box spanner (Fig 8(7)), provided for use when installing or removing the rails, is stowed in spring clips on the mount frame.

DEPRESSION AND RIGHT TRAVERSE STOP

36. The depression stop is a curved tubular rail (Fig 11(2)) supported by two posts bolted to pads welded to the vehicle roof plate. The right post which is extended above the rail forms the right traverse stop, it pivots about its securing bolt, when the securing pin (6) is removed, to allow increased traverse of the gun when mounting or dismounting it.

37. The depression stop rail is attached to the posts by two securing pins. The pins simplify removal of the rail to allow opening of the engine louvre for vehicle daily maintenance tasks. A curved plate (4), hinged to the rail is provided to support the gun barrel when it is strapped down for travelling; the plate must be swung clear when the gun is ready for action.

GUN TRAVELLING STRAP

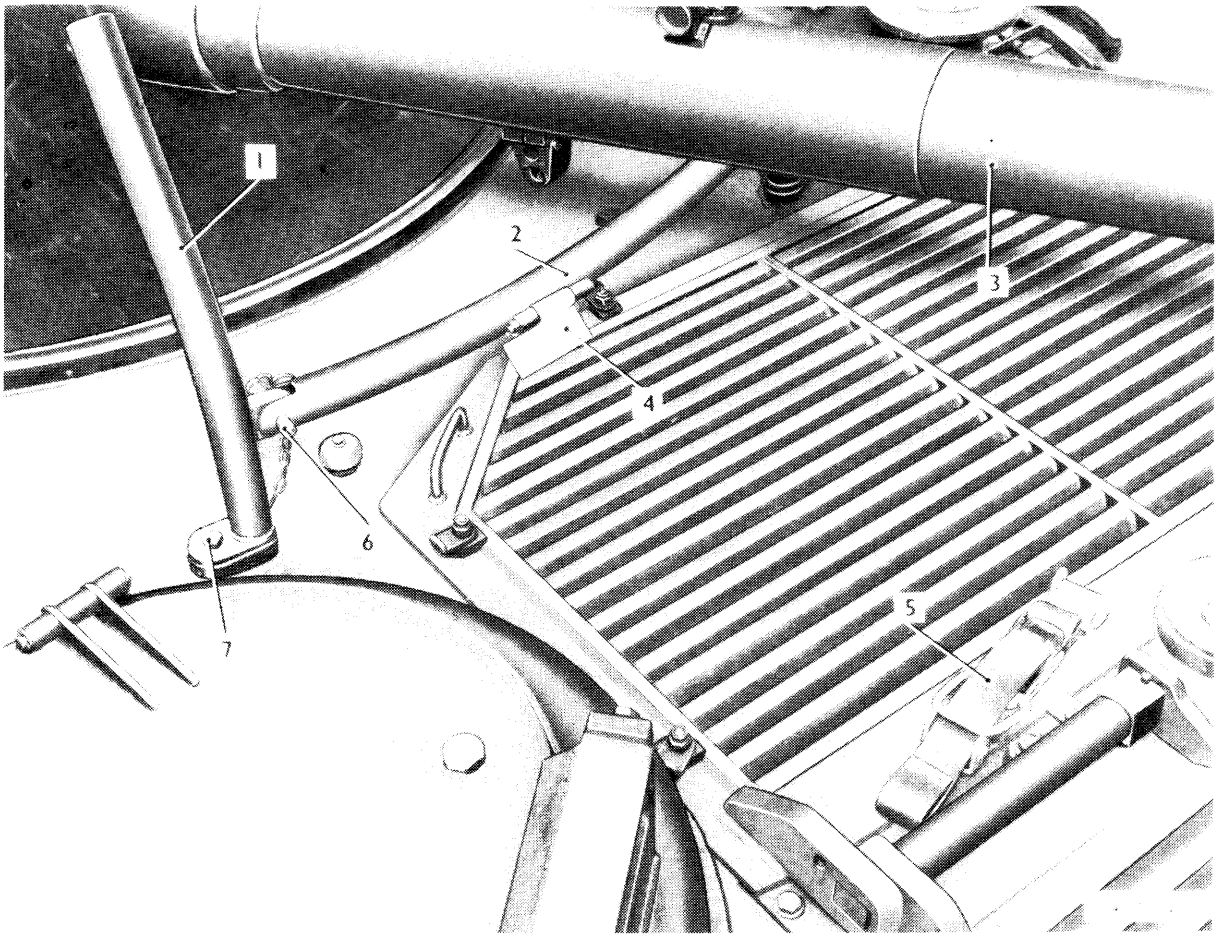
38. The gun travelling strap (5) is of nylon webbing with a buckle which incorporates a tensioning device and a quick release.

39. The buckled section is attached, by a pin, to a bracket welded to the vehicle roof and the plain strap section has a hooked end which links to a second bracket.

40. After the strap has been passed through the buckle, raising the handle will tension the strap. To release the barrel lower the handle and press the release plate then draw the strap through the buckle.

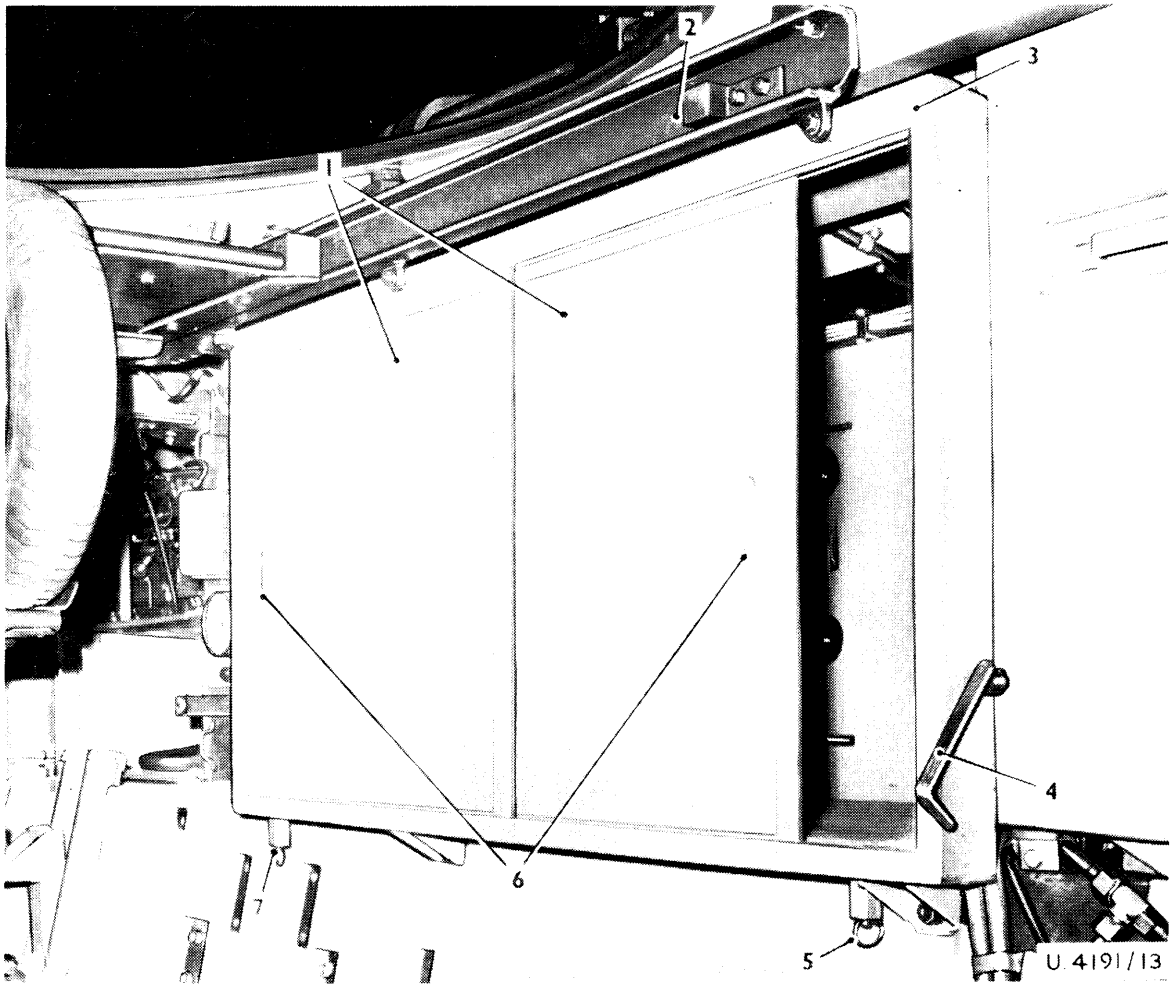
SIDE LOCKER

41. Sliding doors (Fig 12(1)) mounted in a rectangular frame (3), convert the pannier sill into a stowage locker. The doors are made of aluminium alloy sheet with the faces edged with rubbing strips. Each door has a single hand recess (6).



1 Traverse stop
2 Depression stop rail
3 Gun barrel
4 Barrel support plate
5 Gun travelling strap
6 Securing pin
7 Pivot bolt

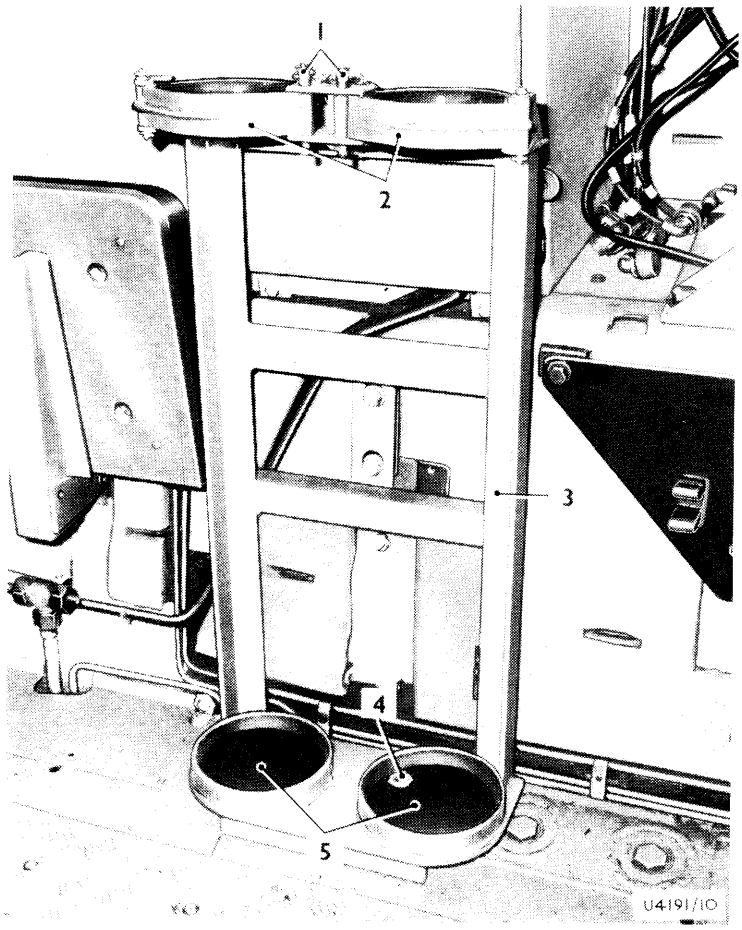
Fig 11 Gun depression rail and right traverse stop



1 Sliding doors
2 Right guide rail
3 Locker frame
4 Personnel seat stowage catch
5 Door catch
6 Hand recess
7 Door catch

Fig 12 Side locker

42. The rectangular frame extends the length of the pannier sill which is available for stowage and from the sill to the roof. Each door slides in a separate groove with a spring loaded catch (5) and (7) which secures it in the closed position.



1 Securing pip pins

2 Hinged straps

3 Rack

4 Special screw

5 Rubber lining

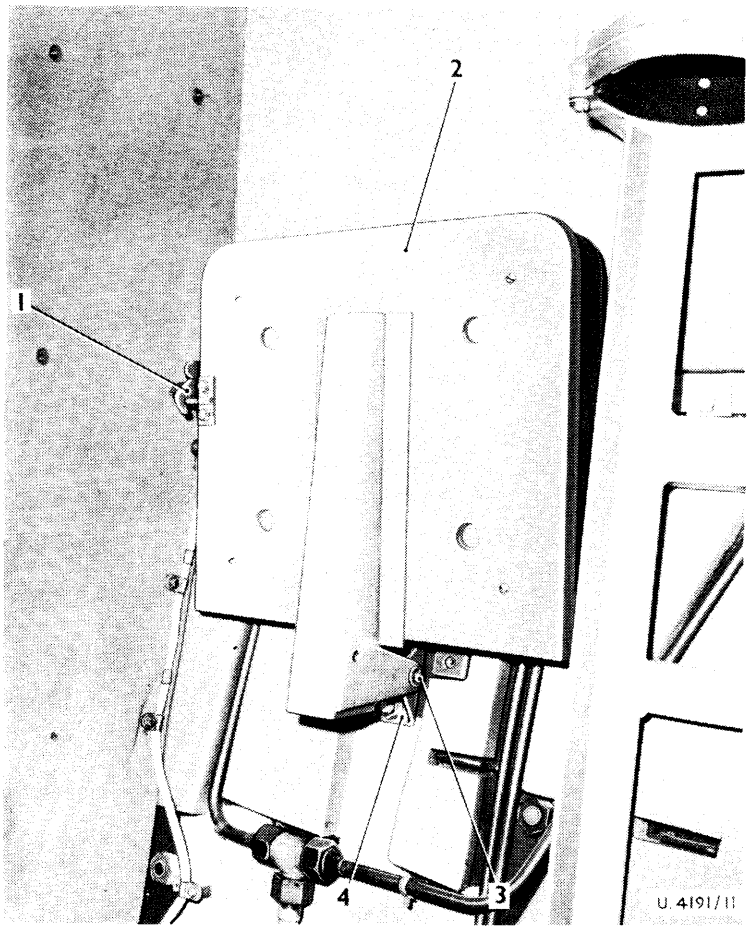
Fig 13 Ready round rack

READY ROUND RACK

43. The ready round rack (Fig 13(3)) is an angle iron upright frame with two circular recesses, rubber and ferodo lined, which hold the base of the cartridges and two hinged ferodo lined metal straps (2) which secure the top of the rounds. Withdrawal of the pip pins (1) releases the rounds.

SINGLE SEAT

44. The single seat (Fig 14(2)) is fitted in place of the rear left personnel seat. The seat is supported by a single hinge bracket (4) and can be retained in the stowed position by a catch (1) mounted on the hull rear plate.



1 Stowage catch

2 Seat

3 Hinge pin

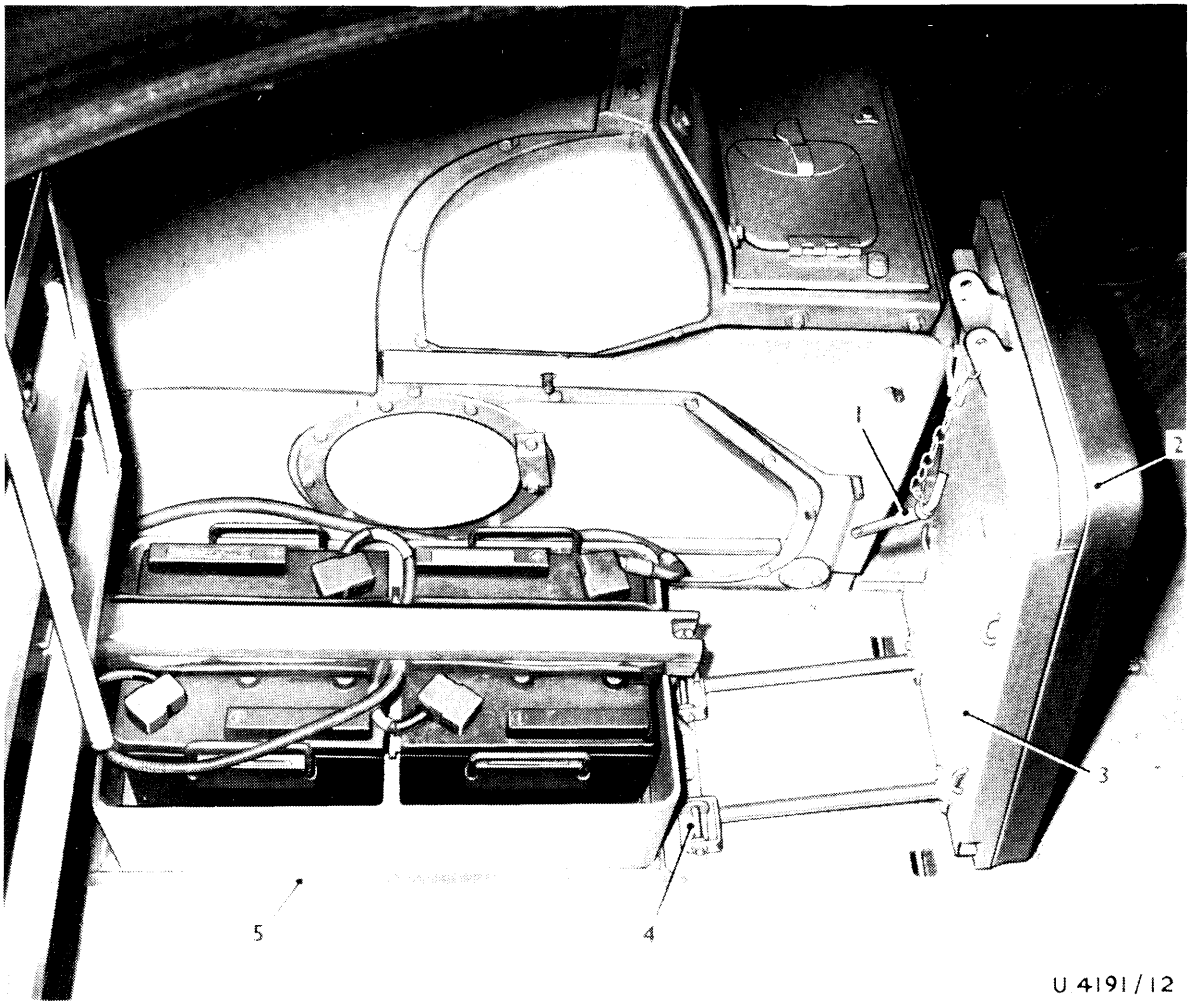
4 Hinge bracket

Fig 14 Single seat

DOUBLE SEAT

45. The double seat tray (Fig 15(3)) is supported by a bracket (Fig 13(3)) bolted to the hull lower side plate and two tubular legs hinged to the hull floor. A quick release pin (Fig 12(1)) is provided to connect the seat to the side plate bracket and when the pin is withdrawn the seat can be swung aside to give access to the ventilation batteries.

46. The seat, as issued with the kit, is not fitted with a squab and one of the discarded personnel seat squabs is used to complete the seat.



1 Quick release pin
2 Seat squab
3 Seat tray
4 Hinge bracket
5 Battery box container

Fig 15 Double seat

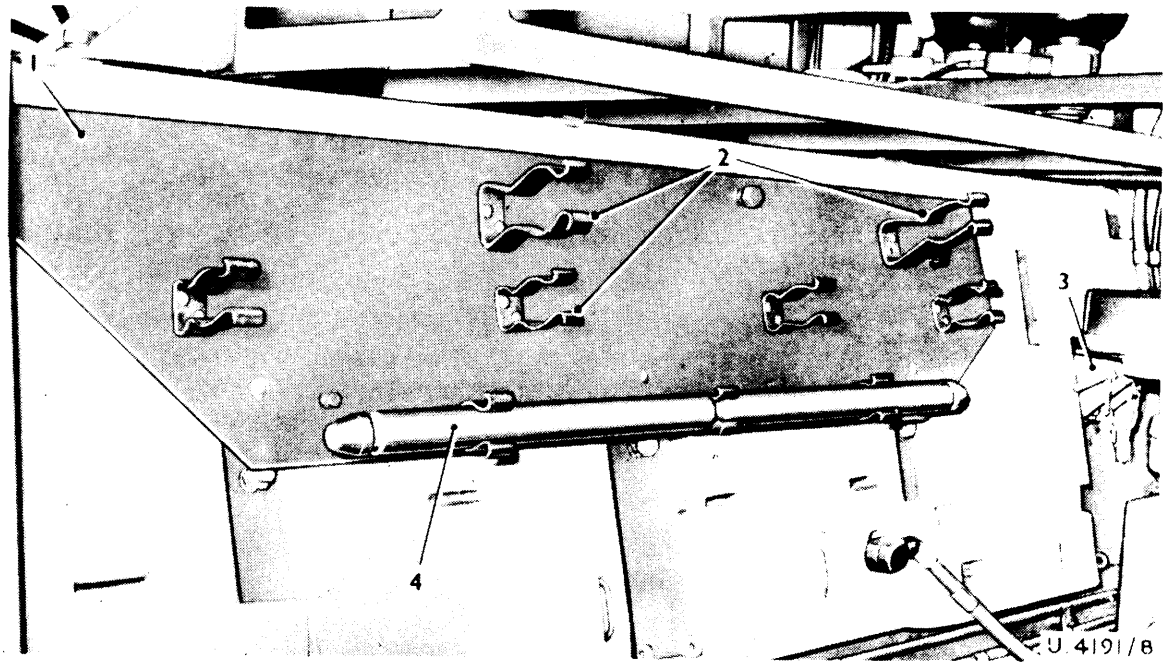
SHORT RAMPS

47. The short ramps (Fig 4(6)) are two channels which form a runway for the gun when mounting or dismounting the gun on to the mount. Each ramp has a tube welded to one end, the tube forms a hinge with the wheel platform brackets.

48. The ramps must be detached before attempting to move the mount.

HOOK

49. The hook (Fig 4(7)) is used to connect the gun barrel sling eye to the gun rear leg when the elevating gear has been disconnected during mounting and dismounting operations.



1 Stowage plate
2 Spring clips
3 Double seat bracket
4 Gun handling bar

Fig 16 Weapon and gun handling bar stowage plate

WEAPONS AND HANDLING BAR STOWAGE

50. Stowing facilities for personnel weapons and the gun handling bar (Fig 16(4)) are provided by spring clips (2) mounted on a plate (1) bolted to the hull side plate below the ammunition rack.

STOWAGE BIN COVERS (Mk 2 and 2/1 vehicles only)

51. The stowage bin covers are provided to shield the stowage bins against the effect of blast from the venturi, when the gun is fired at extreme traverse settings. Each cover is hinged to allow access to the bin door, and requires holding in the raised position when opening or shutting the door It's own weight holds it in position when it is lowered.

PLATFORM

52. The platform (Fig 3(5) and (7)) is designed to provide a level raised floor to assist the personnel in handling the gun. It is made of wood and the sections are hinged to enable it to be folded for loading and unloading the vehicle.

VEHICLE MODIFICATIONS

53. The installation of the kit involves several modifications to the basic vehicle.

(1) Removal of the two forward personnel compartment roof lights.

(2) Removal of the six forward air duct diffusers, which are located behind the guide rails, from each side.

(3) Mk 2 and 2/1 vehicles only. Removal of the exhaust pipe extension strut anchor bracket from the flotation screen platform. An alternative strut is supplied with the kit. This is anchored to the upper forward tapped boss, of the set of four, at the rear of the vehicle side plate using the captive bolts attached to the strut.

(4) Removal of vehicle literature box, commander's spare periscope stowage and the right pannier sill stowage bar or grille.

(5) Rearranged seating.

(6) Fitting of a cable clip and rubber cover to the ventilation batteries negative earth cable.

(7) Welding of a blast shield to the driver's periscope guard, and tapped bosses and strap attachment brackets to the roof plates.

OPERATION

Axle clamp adjustment

54. With the gun in position on the mount, release one of the clamps and retract the pressure pad (Fig 8(3)) by unscrewing the thumbscrew (4).

55. Return the clamp to the locked position and turn the thumbscrew until the pressure pad is firmly in contact with the gun axle. Unlock the clamp and tighten the pressure pad by one full turn of the thumbscrew then lock the clamp and insert the locking pin (2).

56. Adjust the other clamp similarly.

To stow the gun in the vehicle from the ground action position

57. (1) (a) Open and secure the rear door.

(b) Raise the personnel seats.

(c) Ensure the axle clamps and the pedestal strap are released.

(d) Extend the long ramps.

(e) Fit the manhandling bar to its bracket on the barrel.

(f) Disengage the traversing handle.

(g) Raise and lock both legs, ensure both jacks are fully raised.

(2) Manoeuvre the gun, muzzle first, up the ramps until the wheels rest on the vehicle floor plate.

(3) Remove the manhandling bar and push the gun fully forward.

(4) (a) Secure the axle clamps and lower the gun rear leg and jack.

(b) Stow the ramps.

(c) Secure the pedestal strap round the gun barrel.

(d) Lower the personnel seats.

(e) Close the rear door.

To dismount the gun from the vehicle to the ground action position

58. (1) (a) Open and secure the rear door.

(b) Raise the personnel seats.

(c) Extend the long ramps.

(d) Raise the gun rear leg and release the axle clamps.

(e) Release the pedestal strap securing the barrel.

(2) Move the gun to the top of the ramps and insert the manhandling bar.

(3) Lower the gun down the ramps.

(4) Move the gun clear of the ramps, unlock and lower both legs and engage the traversing handle.

(5) Stow the ramps.

(6) Close the rear door.

To mount the gun on top of the vehicle from ground action position

59. (1) Open and secure the rear door.

(2) Remove the platform and put it aside.

(3) Raise the side seats and extend the long ramps.

(4) Open the mortar hatch and close the driver's and commander's hatch doors.

(5) Ensure the mount is locked in the forward position and that the axle clamps and the front leg jack locking screws are released.

(6) Remove the pin securing the depression rail to the right traverse stop and turn the stop post to increase the traverse angle.

(7) Attach the short ramps to the mount.

(8) Rotate the gun through 180 degrees so that the rear leg becomes the front leg.

(9) Support the gun barrel, disconnect the elevating gear from the barrel and wind the elevating screw fully down.

(10) Link the elevating hook to the barrel sling eye and the rear leg.

Note: *Engage the hook end to the eye first then insert the pin.*

(11) Raise and lock the front leg. Raise the rear leg jack.

(12) Fit the manhandling bar to its bracket on the barrel.

(13) Maneouvre the gun, muzzle first, up the long ramps to the foot of the short ramps; passing the muzzle through the mortar hatch.

(14) Unlock and lower the front leg and move the jack to the lowest position, then clamp the jack.

(15) Position the winch handle ready for winching.

(16) Pass the winch cable round the lower part of the saddle and engage the hook onto the cable.

Note: *Care must be taken to avoid kinking the rope.*

(17) Wind the winch handle in a clockwise direction (ie the rope feeds on over the drum (see Fig 6)) to winch the gun up the short ramps, when the gun is clear of the floor lock the front leg.

Warning: *Do not leave the winch handle unattended until the axle clamps are locked, sub paragraph (19).*

(18) Guide the front leg jack into the support frame recess as the gun is drawn onto the wheel platforms.

(19) Lock the axle clamps and tighten the thumbscrews to secure the front jack foot.

(20) Support the barrel while the elevating hook is disengaged.

(21) Fully open the breech and traverse the gun right, then raise the venturi through the hatch.

(22) Close the venturi and reconnect the elevating gear.

(23) Reconnect the depression stop rail to the right traverse stop.

(24) Remove and stow the manhandling bar.

(25) Adjust each axle clamp in turn (see paragraph 55-6) if installing a different gun or one for the first time.

(26) Reverse the winch handle to the stowed position.

(27) Raise the barrel support plate, depress the gun barrel on to it and secure it with the strap.

(28) Disconnect the short ramps, then stow both pairs of ramps and replace the platform.

(29) Lower the seats.

(30) Close the rear door.

To dismount the gun from the mount to the ground action position

60. (1) Close and secure the driver's and commander's hatch doors.

(2) Fit the manhandling bar to its bracket on the barrel.

(3) Open the rear door and raise the side seats.

(4) Remove the platform, extend the long ramps and engage the short ramps to the mount.

(5) Fit the winch handle and check that the winch rope is secured round the gun saddle and the mount is locked in the forward position. Disengage the traversing handle.

(6) Release the gun travelling strap and elevate the gun.

(7) Remove the pin securing the depression rail to the right traverse stop and turn the stop post to increase the traverse angle.

(8) Support the gun barrel, disengage the elevating gear and wind the elevating screw fully down and fully open the breech.

(9) Traverse the gun right and lower the venturi through the mortar hatch.

(10) Close the venturi and link the elevating hook to the barrel sling eye and the rear leg.

(11) Release front leg jack clamping screws and the axle clamps.

(12) Lower the gun down the short ramps controlling the descent with the winch. Unlock and raise the front leg while the gun is descending the ramps.

Warning: *(1) The winch handle must not be left unattended after the axle clamps have been released until the gun reaches the ground at the bottom of the long ramps.*

(2) Ensure the spotting rifle does not foul the mortar hatch.

(13) Raise and lock the front leg jack and disconnect the winch cable.

(14) Move the gun to the top of the long ramps.

(15) Lower the gun down the long ramps to the ground.

(16) Lower the rear leg jack and lock it.

(17) Lower and lock the front leg and the jack.

(18) Remove the elevating hook and reconnect the elevating gear.

(19) Rotate the gun 180 degrees back to its original position.

(20) Detach the short ramps then stow both pairs of ramps, the platform and the elevating hook.

(21) Wind the cable on to the winch drum and link the hook to the leg support frame. Place the handle in the stowed position.

(22) Reconnect the depression rail to the right traverse stop and link the axle clamps in the locked position.

(23) Lower the seats and close the rear door.

To secure the gun in the travelling position

61. (1) Move the mount to the forward position and ensure that the locking bolts are engaged.

(2) Raise the hinged plate (Fig 11(4)) to rest on top of the depression stop rail and depress the gun barrel on to the plate.

(3) Engage the gun strap, secure and tension it.

Action before firing

62. (1) Remove any loose items or material from the roof of the vehicle.

(2) Remove the right rear aerial and the left driving mirror.

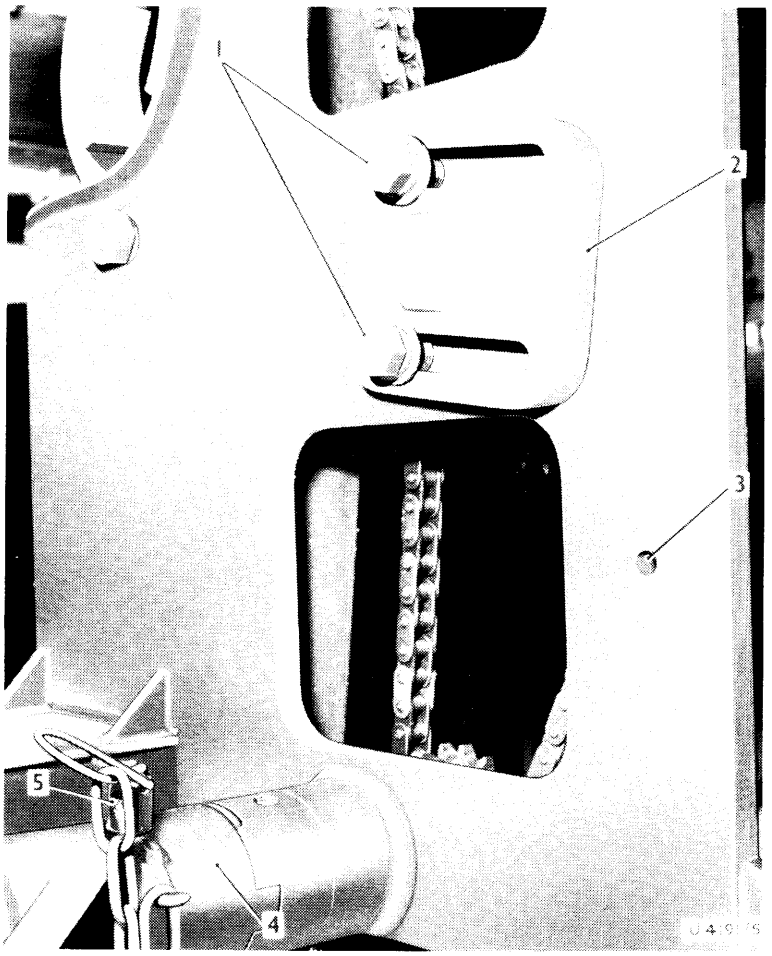
(3) Ensure that the commander's cupola is in the straight ahead position.

(4) Close and secure the driver's and commander's hatch doors.

(5) Check tightness of the buoyancy device clamping bolts.

SERVICING

63. Visually check the equipment to ensure it is in good condition, correctly assembled and secure.



1 Clamping bolts

2 Sprocket mounting bracket

3 Winch handle locking pin hole

4 Winch handle

5 Pip pin

Fig 17 Chain adjustment

64. Using an oil can, lightly lubricate all moving parts ie, clamps, locking bolts and the winch. The winch drive chains require just sufficient oil to prevent corrosion.

65. Clean and lightly grease the quick release pip pins and the guide rails.

66. Check the wire rope for flattened strands, kinks and signs of rust. Care must be taken in handling the rope in case of fraying and to avoid twisting, untwisting and kinking.

67. The wire must be lubricated at regular intervals to prolong its life. It must be cleaned thoroughly with a stiff brush before applying the lubricant with a brush or wiping with oil saturated waste.

Winch drive chain adjustment

68. The winch drive chains should be tensioned with a minimum of free play. To adjust the tension, slacken the clamping bolts (Fig 17(1)) and move the sprocket mounting bracket (2) to obtain the required tension, then re-tighten the clamping bolts.