Chapter 4 BOMBING EQUIPMENT

LIST OF CONTENTS

APPENDICES

Introduction

1. GA Mk. 11 aircraft (*Pre Mod. 229*) can carry practice bomb carriers on the inboard pylons only. GA Mk. 11 aircraft (*Post Mod. 229, 1221 and 1223*) and PR Mk. 11 aircraft (*Post Mod. 1221 and 1223*) can carry practice bomb carriers on both the inboard and outboard pylons. The practice bomb carriers are provided with their own release mechanisms and auto selectors which permit the bombs to be released individually. A description of the electrical installation and the operation of the release mechanisms is contained in Sect. 5, Chap. 1.

DESCRIPTION

Controls

2. Before releasing the bombs the pylon selector switch must be set according to the pylon to be used—INBOARD or OUTBOARD—the BOMB/R.P. switch set for bombing and the fuzing selector switch set to FUZE. The bombs are released by depressing the push switch on the top of the control column handgrip.

3. When necessary, the stores on the inboard and outboard pylons may be jettisoned by operating the clear aircraft stores jettison switch after the fuzing selector switch has been set to DEFUZE. The stores on the outboard pylons only may be jettisoned by operating the outboard pylon stores jettison switch without selecting DEFUZE on the fuzing selector switch. In each case the practice bombs, if fitted, are jettisoned complete with their carriers.

Pylon and bomb attachment

4. The pylons which are described and illustrated in Sect. 3, Chap. 2 are bolted to the wings and are, therefore, not capable of being jettisoned. They can, however, be removed and cover plates are provided to seal the holes in the wings which are left exposed when removal is effected.

5. The inboard pylons contain an ejector release unit and the outboard pylons contain an E.M. release unit, by which the practice carrier is attached to the pylon. These units are provided with a crutching device with which the practice carrier is finally tightened up against the sole plate of the pylon during loading. The units are electrically operated to jettison the practice carriers, in an emergency, during flight. The outboard pylons are also fitted with a mechanical jettison and reset mechanism, provided for operation of the E.M. release unit during servicing and is operated by a pair of press buttons, the port button being for jettison and the starboard for reset. The jettison and re-set mechanisms are illustrated in Sect. 2, Chap. 2. For details of the release units and practice carrier reference should be made to A.P.1664A.

SERVICING

Armament safety break

6. An armament safety plug, located in the port stub wing, is accessible via a small hinged door fitted in a panel under the wing, just forward of the main spar pin joint. The door is provided with a toggle fastener to facilitate access. The plug, attached to a bracket by a nylon cord on which is fitted a bag and a red warning pennant, must be removed before stores are fitted and should only be put back immediately prior to take-off. When the plug is removed, place the plug in the stowage bag and allow the bag and pennant to hang below the door. On replacing the armament safety plug, stow the pennant and when fitting the plug ensure that the red paint mark on the body of the plug is aligned with a similar mark on the body of the socket. If this precaution is not observed damage will be caused to the plug.

Note . . .

The pennant must not be removed from the stowage bag.

Fitting and removal of practice carriers

7. The procedure for fitting and removing practice carriers on the inboard pylons is described in Sect. 2, Chap. 2. The procedure for fitting the practice carriers on the outboard pylons is as follows :—

(1) Remove the armament safety break in the port wing, remove the pylon rear door and disconnect the pylon safety break.

(2) Position the practice carrier under the pylon and lubricate the front and rear locating spigots with anti-seize compound ZX-28.

(3) Remove the Chekaleke plugs from the port and starboard sides of the pylon and check that the gap between the top of the release housing and the bottom of the plungers does not exceed 0·10 in. (Sect. 2, Chap. 2, fig. 5).

Note . . .

To avoid damage to the jettison and reset mechanism it is essential that only a tool similar to that illustrated in Sect. 2, Chap. 2, fig. 6 is used to operate the jettison and reset buttons. After operation, an inspection must be made to ensure that the buttons have returned to their normal position, which is 0·10 in. below the skin level of the pylon.

(4) If the electro-mechanical release is not open, press the jettison button on the port side of the pylon and then reset by pressing the reset button on the starboard side of the pylon. (*Should the electro-mechanical release be already open, only the reset button need be used*).

(5) Remove the access panel (*complete with locking tube*) from the wing top skin and place a crutching spanner (*Ref. 26FX/95426*) over the hanger bolt and ensuring that the annular groove on the spanner is flush with the wing skin, unscrew the special nut and lower the hanger bolt to which is attached the E.M. Release Unit.

(6) Raise the practice carrier sufficiently to allow the forward type 'R' socket on the practice carrier to be connected to the type 'R' plug on the port side of the release housing. Ensure that the practice carrier rear electrical cable and socket is securely stowed in the carrier.

(7) Raise the practice carrier further until the suspension lug is engaged by the electro-mechanical release and check that the release is fully cocked by means of the cocking test socket and test set (*Sect. 5, Chap. 1*).

(8) By means of the crutching spanner, raise the carrier until the fore and aft spigots on the carrier are engaged in the sole plate. Care must be taken not to trap the electrical cables between the carrier and the sole plate of the pylon.

(9) Apply the final crutching load by using a torque wrench (*Ref. 1L/171*) set to 20 ± 2 lb. ft., attached to the adapter on the crutching spanner and again check through the sighting holes in the pylon that the gap between the top of the release housing and the bottom of the plungers does not exceed 0·10 in. Replace the Chekaleke plugs.

(10) Re-check that the release unit is fully cocked by means of the cocking test plug and test set. If stores are not to be immediately loaded on the carrier, refit the pylon servicing break and close the rear door.

(11) Remove the torque wrench and crutching spanner and replace the access panel (*complete with locking tube*) in the wing.

(12) Immediately before flight, replace the armament safety break.

8. To remove a practice carrier from an outboard pylon, support the carrier and press the jettison button on the port side of the pylon.

Loading the practice carriers

9. The carriers should be loaded with bombs in accordance with A.P.1664A, Vol. 1, Book 1.

Testing and arming ejector release units—inboard pylons

10. The procedure for testing and arming the ejector release units in the inboard pylons is described in Vol. 1, Book 2, Sect. 5, Chap. 1, Group G.1.

Testing release units—outboard pylon

11. The procedure for testing the release units in the outboard pylons is described in Vol. 1, Book 2, Sect. 5, Chap. 1, Group G.1.

Appendix I

BOMBING INSTALLATION POST MOD. 1211, 1254, 1255 & 1256

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. The practice bomb installation on the G.A. Mk. 11 and P.R. Mk. 11 aircraft post Mod. 1211, 1254, 1255 and 1256 has been designed to enable the carriage of eight 25 lb or 28 lb practice bombs and two 100 gallon drop tanks. Two installations are provided, one for aircraft pre. Mod. 228 and 229 and one for aircraft post Mod. 228 and 229.

DESCRIPTION

General

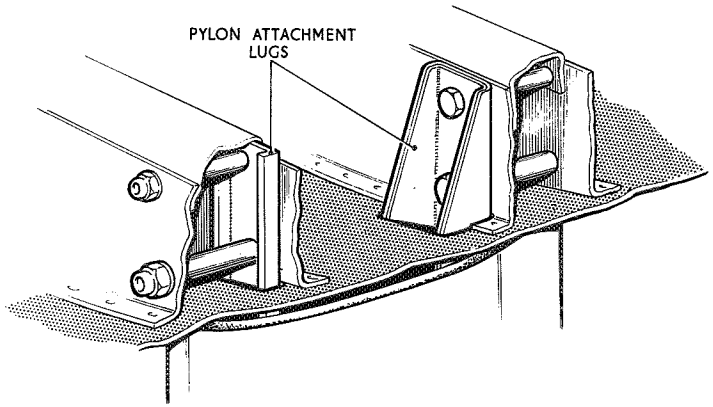
2. On aircraft pre. and post Mod. 228 and 229 four small pylons are fitted on a bomb pack in the fuselage and on aircraft pre. Mod. 228 and 229 two small pylons are also fitted outboard on each mainplane. Each of these small pylons is a permanent fit on the aircraft and carries one bomb on an E.M.R.U. On aircraft post Mod. 228 and 229 a standard twin practice bomb carrier is fitted to each normal outboard pylon.

Bomb pack (fig. 1)

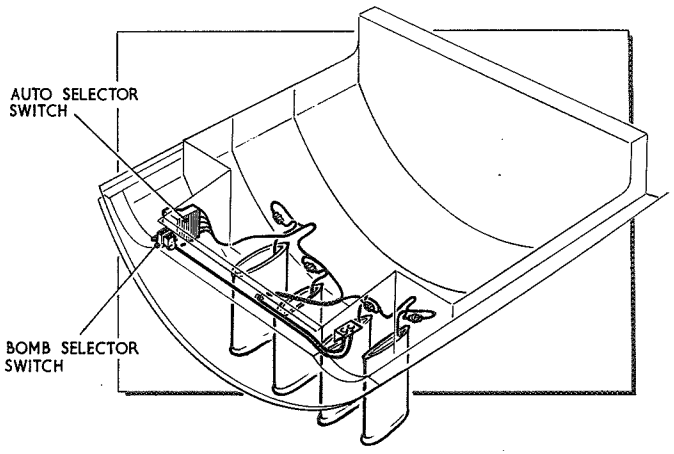
3. The bomb pack consists of a large structure which replaces the access panel (*E.258847—G.A. Mk. 11 or F.264181—P.R. Mk. 11*) on the underside of the fuselage The pack is fitted with four small pylons and housed within the pack, on the starboard forward side, is a 4-way auto-selector switch and a 25 lb/28 lb selector switch. Access to both switches is through a detachable panel immediately forward of the bomb pack. A cable assembly, cleated to the inside of the pack, terminates in two connectors on the port side which connect to the aircraft circuit and four connectors, one above each pylon, to which the pylon cables are connected.

Pylons

4. The pylons are not interchangeable between positions, they are similar in construction but vary in length and method of attachment to suit their positions on the pack. Each pylon consists of a housing to which fore and aft attachment lugs are bolted. The housing contains a bridge sub-assembly, a release unit straps sub-assembly, a crutching screw and a release unit. Attached to the base of the bridge sub-assembly is a sole plate for the carriage of 28 lb bombs; when loading with 25 lb bombs this sole plate must be removed and a crutching block, special bolt and special screw fitted. The pylon housing and components are enclosed within an aerofoil section fairing, a detachable panel on the outboard side of the fairing giving access to the crutching nut and cocking test plug. A split pin ($\frac{1}{32}$ *in.* $\times$ $1\frac{3}{4}$ *in.*) is fitted through the pylon, below the E.M.R.U., to prevent the crutching screw becoming disengaged from the crutching nut when lowering the E.M.R.U. A manual release lever, secured by a clip, is situated at the rear of the pylon;



ATTACHMENT OF INBOARD PYLON



INSTRUCTIONS FOR LOADING STORE

UNSCREW CRUTCHING MECHANISM UNTIL KEY HOLE IN E.M.R.U. LINES UP WITH HOLE IN PYLON SKIN. ENGAGE LUG ON STORE WITH REAR JAW OF RELEASE UNIT WHILST PUSHING UP INTO LOCKED POSITION. LOCK JAWS WITH 3/16IN ALLEN KEY (TURN ANTI-CLOCKWISE). TEST COCKING WITH SUITABLE TEST SET. CRUTCH UP STORE TO 50LB IN TORQUE LOADING.

WARNING
DURING STORE CRUTCHING WITH TORQUE SPANNER, CARE MUST BE TAKEN TO ENSURE THAT SPANNER IS NOT TURNED BEYOND THE POSITION OF THE 1ST BREAK, WHICH IS INDICATED BY AN AUDIBLE CLICK. THIS INDICATES THAT THE REQUIRED TORQUE LOADING HAS BEEN REACHED.

REPLACE ACCESS DOOR IN PYLON.

WHEN LOADING WITH 25LB PRACTICE BOMB, REMOVE FORWARD SPIGOT AND FIT SCREW WE A 54476, REMOVE REAR SPIGOT AND FIT CRUTCHING BLOCK WE A 54474 AND ENSURE, LUG WE A 54473 IS FITTED TO 25LB BOMB.

◀ WHEN BOMBS ARE NOT CARRIED FIT SOLE PLATE COVER TO E.M.R.U. AND CRUTCH UP HAND TIGHT ▶

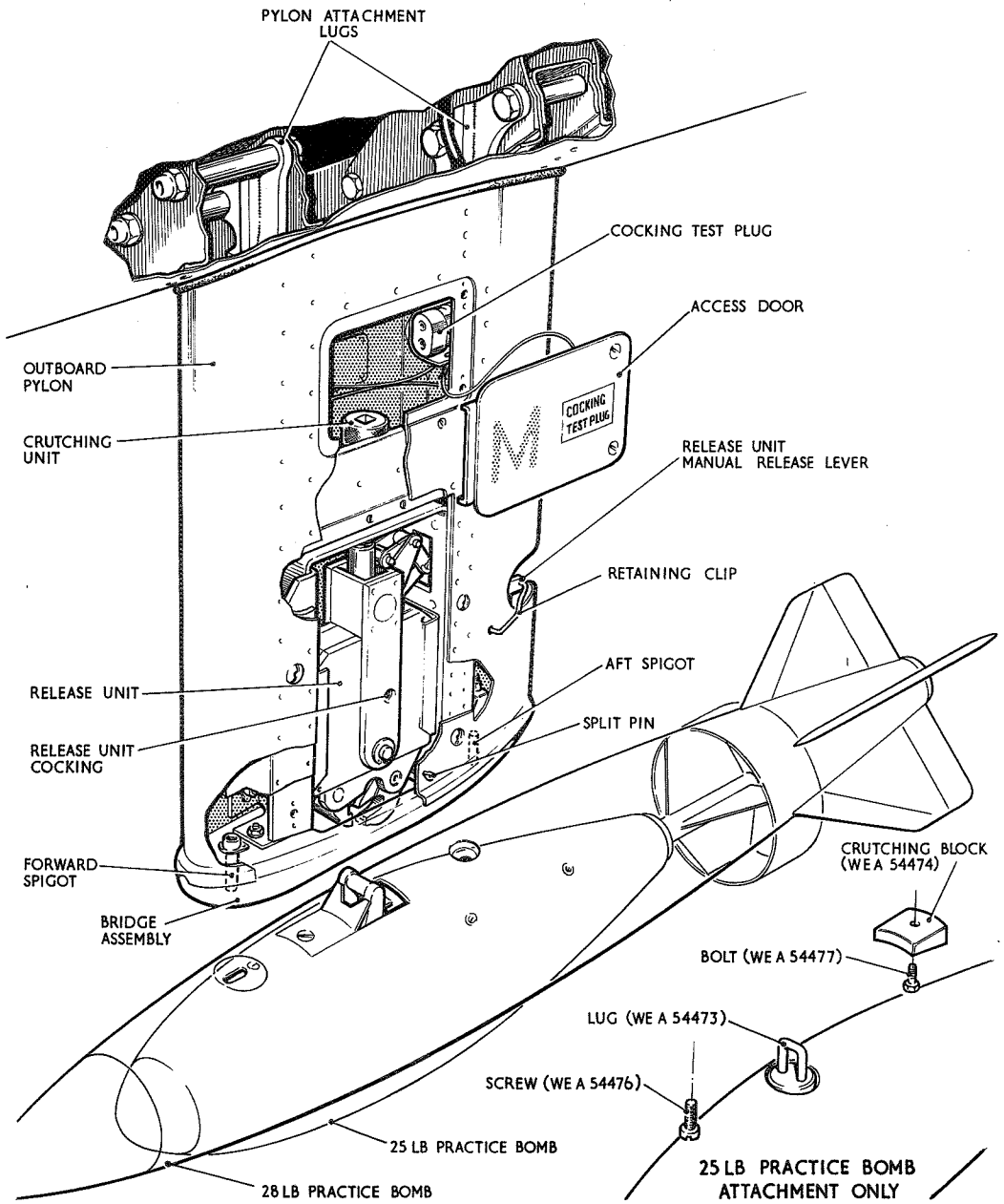


Fig. 1 Loading store on bomb pack pylon

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with the clip disengaged, rearward movement of the lever operates a linkage which, in turn, operates the manual release button of the E.M.R.U.

Locking mechanism (fig. 4)

5. The pack locking mechanisms are located one on each side at the forward end of the pack. Each assembly consists of a control box containing a tool-operated shaft-driven pinion in engagement with racks at the ends of the locking rack bolt and rack bar which enter the forward and rear faces of the control box respectively. These racks are held in contact with the pinion by small rollers and the top cover of the control box carries the package guide spigot. The pinion shaft, which is machined to a square section with a spherical end, extends to a keyhole bracket assembled to the skin of the pack. The shaft carries a spring-loaded lock ring which engages the keyhole bracket in both the locked and unlocked positions. The rack extends forward and is shaped to pass through the mounting socket and spigot at the forward end of the package, while the rack bar extends aft and carries the locking bolts which pass through the mounting sockets and spigots at formers C and E.

6. To lock or unlock the bomb pack, the locking tool is inserted into the keyhole in the pack and pressed in against the action of the spring to release the lock ring from engagement with the keyway in the keyhole bracket. Subsequent rotation of the locking tool will turn the pinion, which in turn drives the rack bolt and rack bar to either insert or withdraw the locking bolts from the mounting spigots. Releasing the locking tool at the limit of its travel will allow the lock ring to engage with the other keyway in the keyhole bracket.

Wing pylons (fig. 2)

7. The wing pylons are similar in construction to those on the bomb pack except that they are attached to the wing by two spigots which pass through mounting blocks within the wing and are secured by castellated nuts and split pins. Two access panels are provided in the top surface of each mainplane to give access to the securing nuts and electrical plugs and sockets.

Sole plate cover

8. A sole plate cover is provided for each pylon to protect the E.M.R.U. when the aircraft is flying without bombs. The cover is secured by a suspension lug attached to the cover which engages in the jaws of the E.M.R.U. and the crutching unit hand tightened.

Bombing controls

9. The bombing control switches which are grouped together on a panel on the port side of the cabin consist of a BOMB/R.P. selector switch, a stores selector switch, a fuzing selector switch and a stores jettison switch.

Bomb release

10. To effect a normal release the BOMB/R.P. switch is set to BOMB, the stores selector switch set to IN'BD (*for release of bombs from the bomb pack*) or OUTB'D (*for release of bombs from the mainplanes*) and the fuzing selector switch set to FUZE, the release button on the control column is then pressed. There is no selective jettison of stores on aircraft pre. Mod. 228 and 229, operation of the jettison switch will immediately release all stores from the bomb pack and inboard pylons, followed, after a short delay, by the release of stores from the mainplanes four outer pylons. The fuzing selector switch must be set to DEFUZE before jettisoning stores. On aircraft post Mod. 228 and 229 selective jettisoning of stores is provided, there being a separate switch for the outboard pylons and a CLEAR A/C switch which will release stores from the inboard pylons and bomb pack together with stores from the outboard pylons if not already released; as in the case of Pre Mod. 228 and 229 aircraft the fuzing selector switch must be set to DEFUZE. For more details on the electrical circuits refer to Book 2.

SERVICING

Functional tests

11. The functional tests of this installation is detailed in A.P.4347H, N, Q & L, Vol. 5, Flexible Servicing, Book 3, Tests 63, 64, 65 and 66.

REMOVAL AND ASSEMBLY

Removing the bomb pack (fig. 3)

12. The following operations for the removal of the bomb pack will require three men to handle the hoists when lowering the pack and it is desirable that the lowering instructions be given by the man handling the forward hoist :—

(1) Remove the access panel forward of the bomb pack and disconnect the electrical supply cables from the pack.

(2) Fit the tail strut (*Part No. B.199253*).

Note . . .

The tail strut must be allowed to hang freely. Under no circumstances is the strut to be used as a permanent support by fitting blocks between the base of the strut and the ground. The strut must not be removed until the bomb pack is reinstalled or until the aircraft has been adequately ballasted to compensate for the weight of the pack.

(3) Insert the lifting spigots (*Part No. B.177142*) into the port and starboard sides of the fuselage.

(4) Attach one type 'C' hoist (*Ref. No. 4GC/3360*) to each lifting spigot and one to the hoist attachment bracket forward of the bomb pack.

INSTRUCTIONS FOR LOADING STORE

UNSCREW CRUTCHING MECHANISM UNTIL KEY HOLE IN E.M.R.U. LINES UP WITH HOLE IN PYLON SKIN. ENGAGE LUG ON STORE WITH REAR JAW OF RELEASE UNIT WHILST PUSHING UP INTO LOCKED POSITION. LOCK JAWS WITH $^{3}/_{16}$ IN ALLEN KEY (TURN ANTI-CLOCKWISE). TEST COCKING WITH SUITABLE TEST SET. CRUTCH UP STORE TO 50 LB IN TORQUE LOADING.

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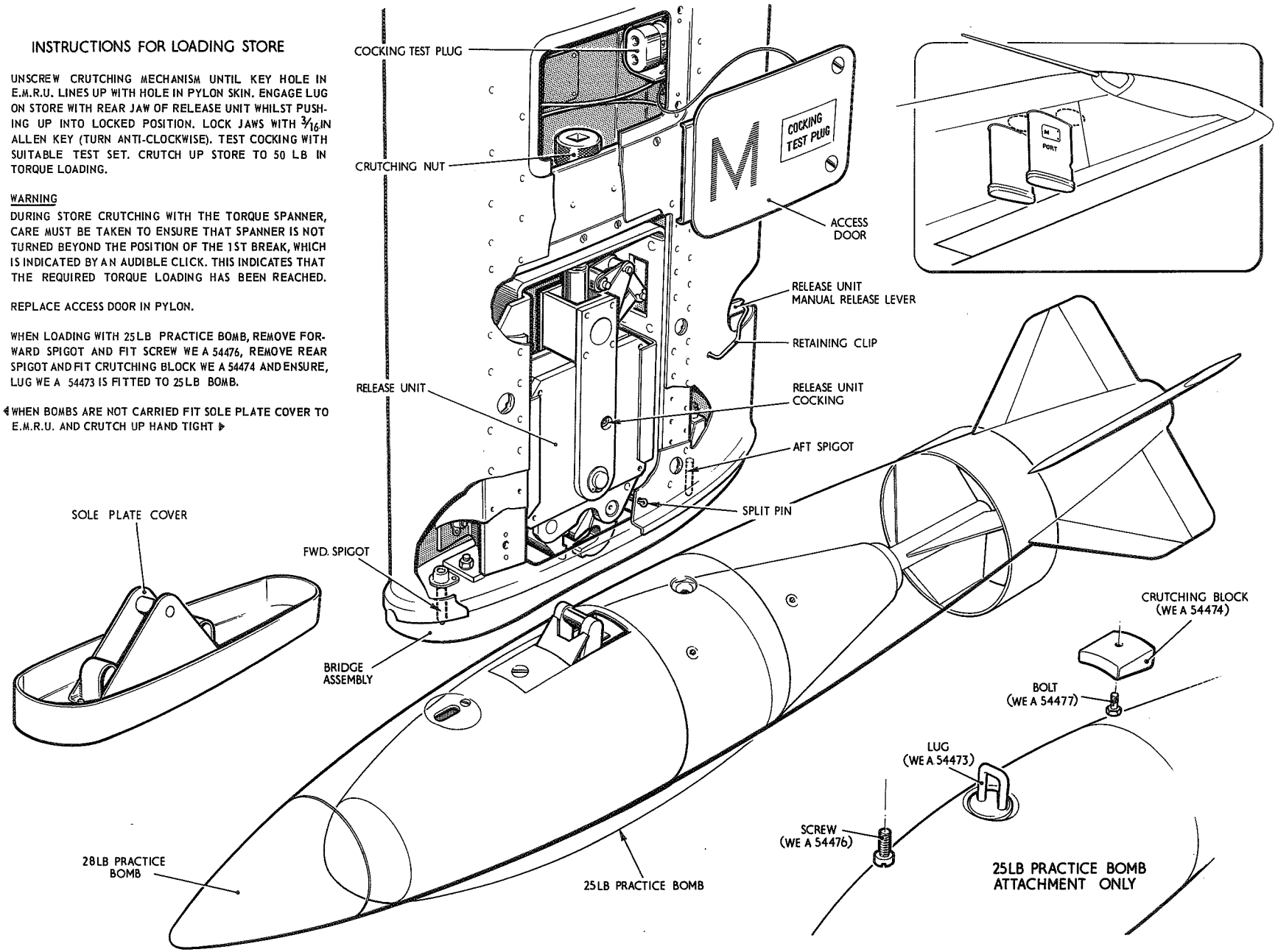

Fig. 2 Loading store on wing pylon

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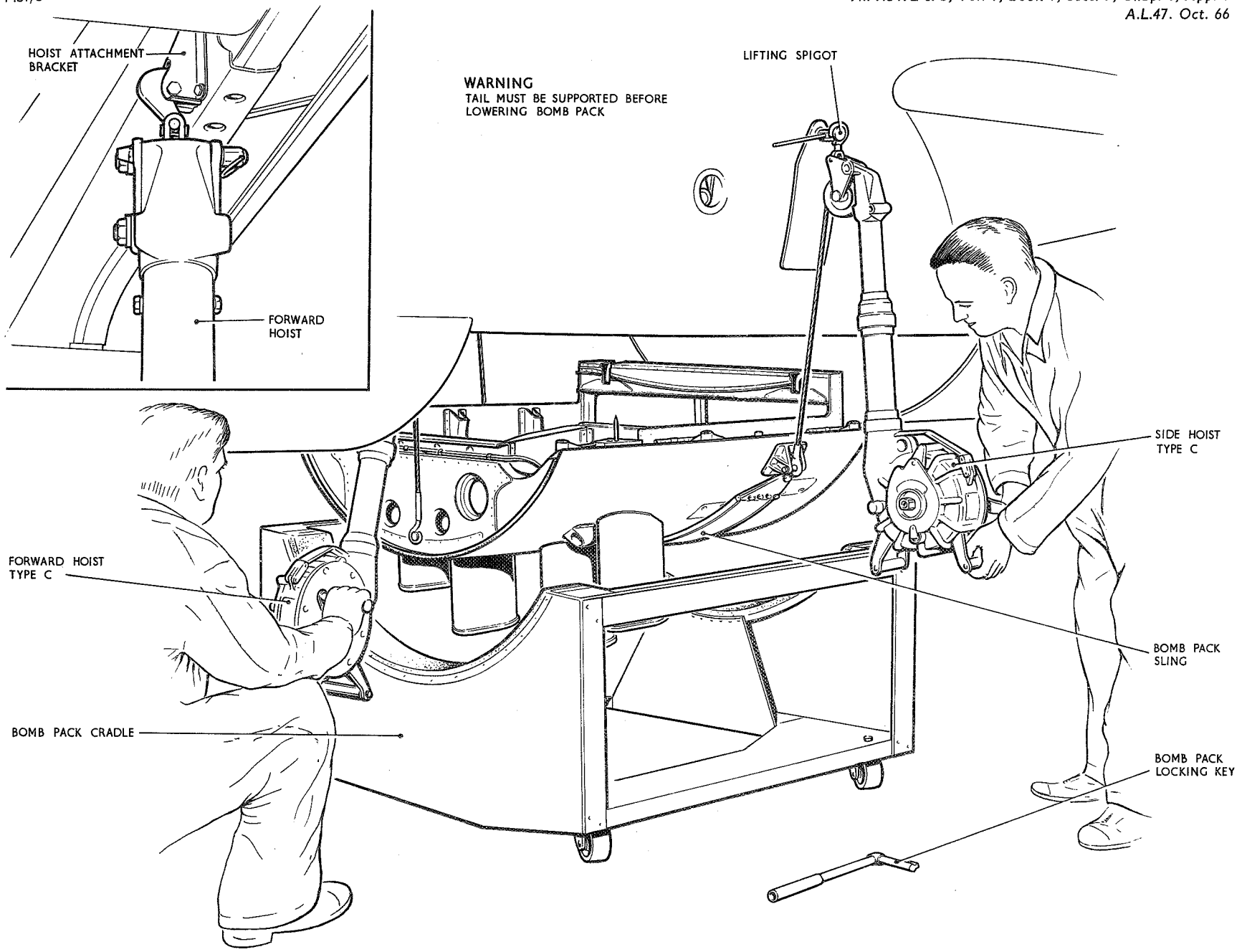

Fig. 3 Removal of bomb pack

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(5) Place the sling (*Part No. C.177141*) under the bomb pack at the marked positions and attach the hoist cable hooks to the sling. Attach the cable hook of the forward hoist to the attachment point on former 'A' of the bomb pack.

(6) Place a suitable trolley under the pack and winch up all hoists tight.

(7) Unlock the bomb pack with the locking tool (*Part No. B.183954*), remove the locking tool and lower the pack on to the trolley.

(8) Disconnect the hoist cables from the bomb pack. Remove the hoists and lifting spigots from the aircraft.

Installing the bomb pack (fig. 3)

13. Three men are required to handle the hoists when raising the bomb pack into position and it is desirable that the hoisting instructions should be given by the man handling the forward hoist. The procedure for installing the bomb pack is as follows :—

(1) Fit lifting spigots (*Part No. B.177142*) to each side of the fuselage and attach a type 'C' hoist (*Ref. No. 4GC/3360*) to each lifting spigot and to the hoist attachment bracket on the fuselage, forward of the bomb pack position.

(2) Position the trolley bearing the bomb pack under the fuselage, place a sling (*Part No. C.177141*) under the bomb pack at the marked position and attach the hoist cable hooks to the sling. Attach the cable hook of the forward hoist to the attachment point on the bomb pack.

(3) Check that the bomb pack locking mechanisms (*fig. 4*) are serviceable, lightly greased and in the unlocked position.

(4) Operate the three hoists together, under the control of the operator of the forward hoist and raise the bomb pack ensuring that the pack locating spigots enter the spigot holes in the fuselage. During hoisting make sure that fouling of electrical cables or structure does not occur.

(5) When the bomb pack is in the fully raised position, lock it in this position

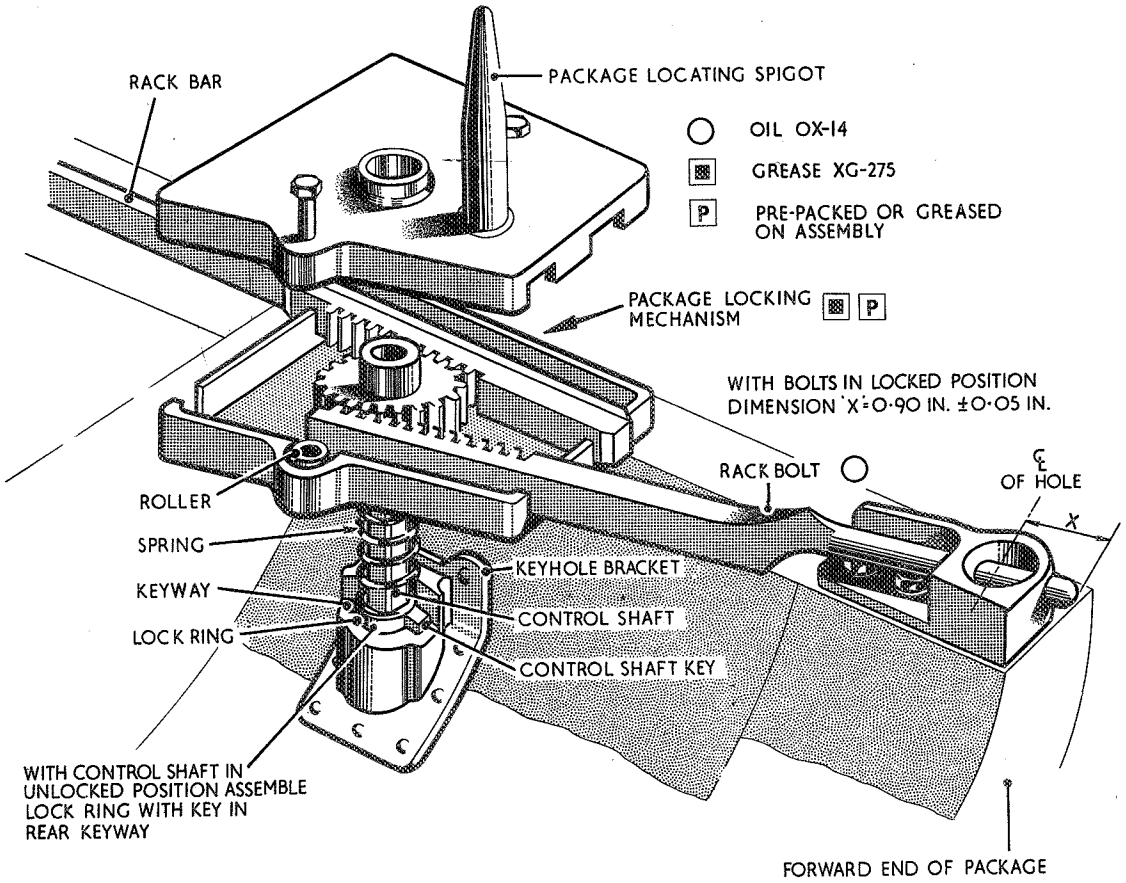

Fig. 4 Bomb pack lock mechanism and lubrication

with the locking tool (*Part No. B.183954*). Remove the locking tool and connect the electrical supply plugs.

Check that the bomb pack is correctly positioned and locked.

Note . . .

This operation can be checked by viewing and/or feeling by hand to ensure that the pins pass through the holes in the front and rear mounting spigots and sockets on both sides of the fuselage. When the bomb pack is correctly locked to the fuselage, the front end of the rack operating pins protrude approximately 0·30 in. through the longitudinal hole in the sockets of the bomb pack. The locking tool can only be inserted into or removed from the control boxes when the bomb pack is either fully unlocked or fully locked to the fuselage.

(6) Remove the hoists, sling, hoisting spigots and trolley.

(7) Remove the tail strut.

Loading and unloading

14. The instructions for loading and unloading practice bombs to and from this installation are detailed in A.P.4347H, N, Q & L, Vol. 5, Flexible Servicing, Book 1, Section 2(o).