RESTRICTED

TECHNICAL ORDER
No. 11-5-38

HANDBOOK OF INSTRUCTIONS

WITH

PARTS CATALOG

FOR THE

TYPE A-2 BOMB RACK RELEASE

MANUFACTURED BY

SPARKS-WITHINGTON COMPANY

JACKSON, MICHIGAN

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Spec. 93-24699

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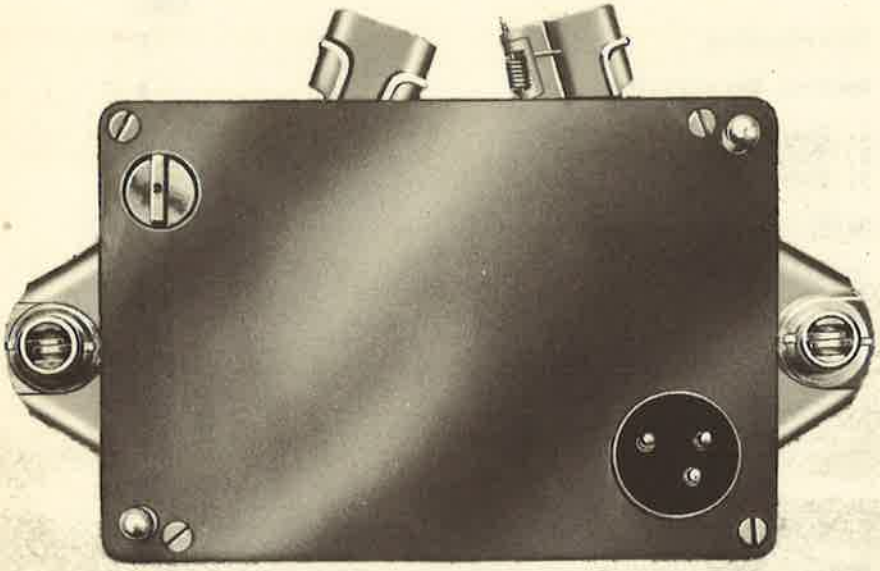

FIGURE 1

BOMB RACK RELEASE

TYPE A-2
24V. D.C. R.H.

SECTION I

INTRODUCTION

1. This Handbook is issued as the general basic Technical Order for the equipment involved.

2. This Handbook contains descriptive data and instructions for the operation and maintenance of the bomb rack release - right-hand C-5756, and bomb rack release - left-hand C-5757 (type A-2) 24 volts D.C.

3. The information contained in this Handbook relates to the right-hand release only. The operation of the left-hand unit is identical with the right-hand, but is opposite in construction.

SECTION II

GENERAL DESCRIPTION

1. Description.

The bomb rack release type A-2 24 volts D.C. is an electrically operated mechanical device designed to arm and release bombs from their rack. A bomb may be armed and released by manual operation at the unit itself. By operation of the salvo coupling, the unit may be locked or a bomb may be released in an unarmed condition.

2. Specification.

The equipment described in this Handbook is fabricated in accordance with Army Spec. 93-24699.

3. Characteristics.

a. The bomb rack release is housed in a cadmium-plated, pressed steel case which is dust tight. It is located in the rack by two dowel pins and held in position by two Simmond's Snap Fasteners.

b. The release is designed to operate from a 24 to 28-1/2 volt D.C. Source. The maximum current drawn is 6 amperes at 24 volts of 7.125 amperes at 28-1/2 volts. The solenoid is capable of carrying 7.125 amperes for a period of 30 seconds without being damaged in any way.

c. The release mechanism is designed to operate without lubrication at temperatures from 200°F (93.3°C) to -70°F (-56.7°C).

d. The maximum weight of the bomb rack release type A-2, 24 volts D.C. is 2.7 pounds.

SECTION III

DETAILED DESCRIPTION

1. Two movable arms are mounted on the front of the type A-2 release; one for the arming of the bomb, and one for releasing the bomb from the rack. The release arm is equipped with a hinged ear, which permits the releasing of a bomb by prying the shackle lever over with a screw driver or similar tool, as shown in figure 3 and figure 4.

2. A slotted manual trip stud is located at the front of the case for manually tripping the release, causing the bombs to be armed and dropped, and the internal switch to be placed in the same position as if the release were tripped electrically.

3. The salvo coupling is located on the rear of the case, as shown in figure 1. When the bomb rack release is mounted into the rack, this coupling mates with linkage controlled manually from bombardier's compartment.

4. A three prong plug is located in the corner diagonally opposite from the salvo coupling. All electrical connections between the airplane's wiring and the release, with the exception of the ground circuit, which is made through the metal to metal contact of the release with its rack, are made through this plug.

5. Two dowel pins in the remaining corners are provided to locate the bomb rack release in the rack properly.

6. Two Simmond's type A-126, or equal, snap fasteners are located at the extreme ends of the release for holding it securely against the bomb rack. Two Simmond's A-132, or equal, clip socket rings are furnished for each bomb rack release. These are staked into receiving holes in the bomb rack, and are shipped assembled to the fasteners in the complete assembly.

Figure 2

Position of levers

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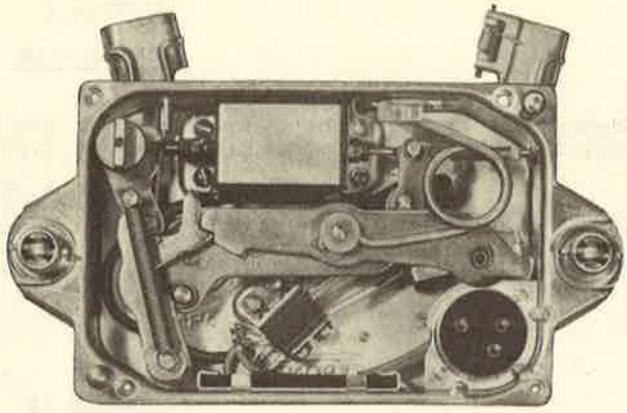
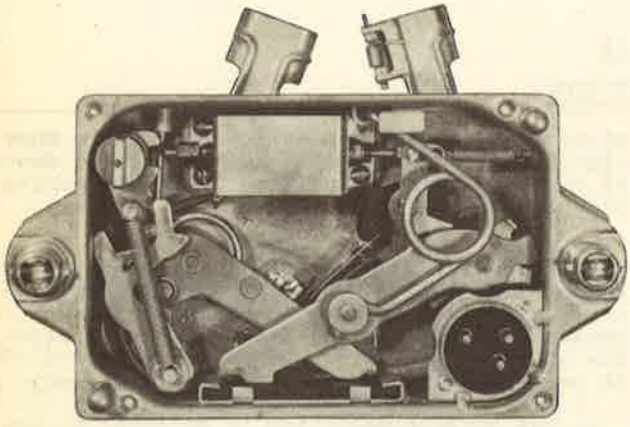
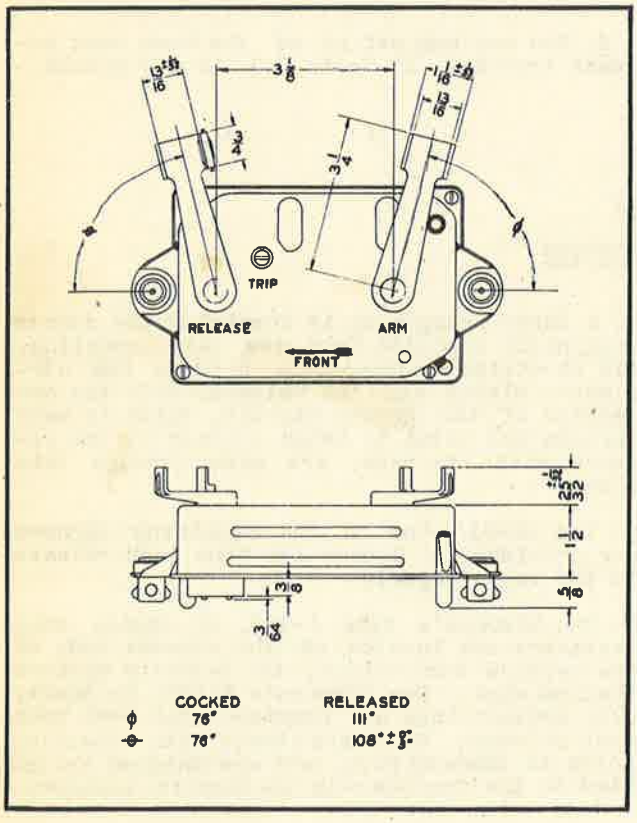
Cocked Position

Released Position







SECTION IV

INSTALLATION

1. Set bombardier's release handle to "selective" position. This sets the slot in the salvo coupling in the rack approximately at a vertical position.

2. Set the tongue of the salvo coupling approximately vertical allowing it to slip into the notch in the salvo coupling of the rack.

3. Overall and mounting dimensions and positions of release and arming arms, when released and cocked, are shown in figures 2, 4, and 5.

4. Mate dowel pins on bomb rack release with holes in the rack, and push release firmly against the rack. At times the unit will enter more easily if the Simmond's Fastener Buttons are depressed before attaching the release.

Figure 3 - Dimensional Drawing - Right-Hand

5. Make sure that the wings of the Simmond's Fasteners, snap out to hold the bomb rack release securely to the rack. If necessary use a screw driver or other pointed tool to move the button of the fasteners a little, to permit latching.

6. With the point of a screw driver inserted between the cover of the release and the rack, pry slightly to determine that the fasteners are holding properly.

7. With the bomb rack release mounted in the above manner, all electrical and mechanical connections are automatically made.

8. A small switch in the auxiliary box station on the bomb rack breaks the circuit to the next rack station when a bomb rack release is places in position. The breaking of this circuit automatically places the installed release in the electrical circuit.

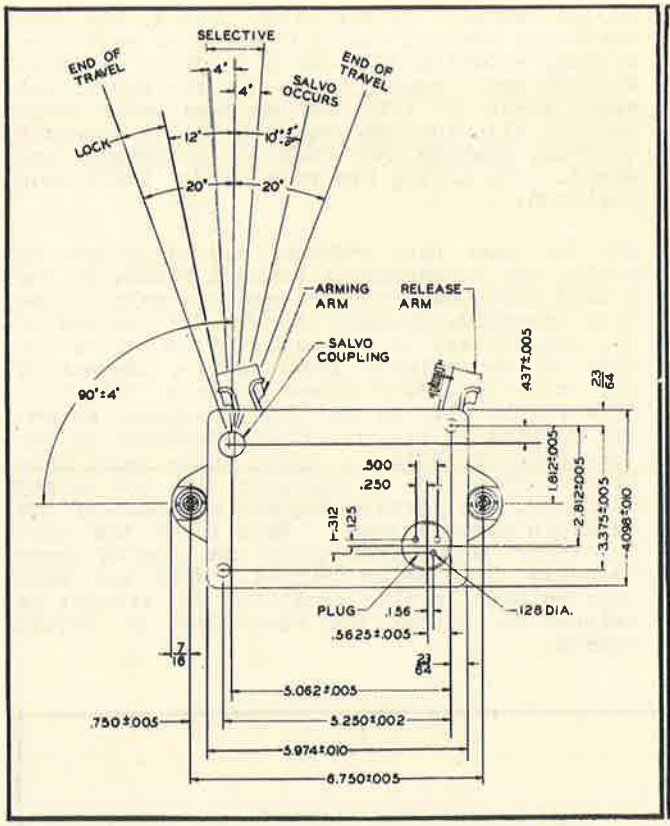


Figure 4 - Dimensional Drawing and Salvo Coupling Movements - Right-Hand

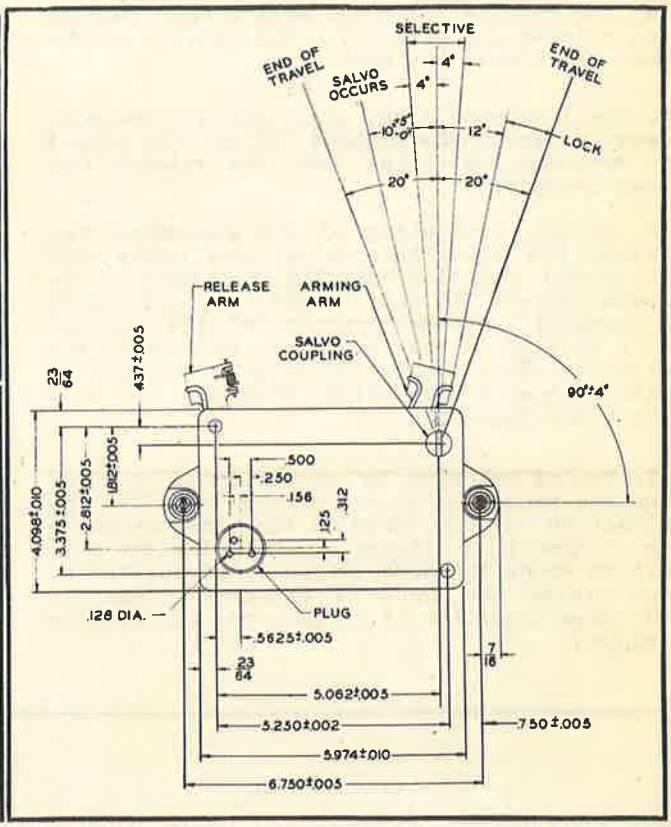


Figure 5 - Dimensional Drawing and Salvo Coupling Movements - Left-Hand

SECTION V

OPERATION

1. To cock or place the bomb rack release type A-2 in an operating position, pull outward on both arms. The arming arm should be advanced slightly ahead of the release arm assembly. The arming lever latch B-9430, hooks under the latch surface of the arming lever assembly B-9443. As the arming lever assembly is raised, the release lever latch B-9431 is pulled into position and hooks under latch surface of release lever assembly B-9445, as shown in figure 2 and figure 14.

2. When the arms are in a cocked position, the contact spider A-17044 located beneath the release lever assembly, causes contact "D" to be connected with the ground through contact "E", as shown in figure 15. This causes an indicator light to burn indicating a particular bomb rack release is in the cocked position.

3. The action of the release lever assembly against the contact lever A-17062 breaks the connection between contact "B" and contact "A", and makes a connection between contact "A" and contact "C", which makes a circuit through the solenoid coil.

4. When both arms are cocked, the bombardier's control handle is moved to a locked position. The bombs, with shackle attached, are hoisted into position, and levers of the shackles fall into the channels of their respective arms.

5. To drop a bomb the bombardier's control handle must be moved to the selective position.

6. Upon receiving an electrical impulse from the interval control or by the operation of the release button, the impulse enters the bomb rack release on No. 2 wire, passing through the winding of the solenoid coil to the ground. This impulse is completed only when the bomb bay doors are open.

7. This energizes the solenoid, causing the movable core assembly A-17205 to move ahead and pull the arming lever latch B-9430, allowing the arming lever assembly B-9443 to fall.

8. After the arming lever assembly moves far enough to arm the bomb, a pin in this lever contacts the release lever latch B-9431, allow-

ing the release lever assembly to fall causing the release arm assembly on the outside of the case to release the bomb.

9. The indicator light goes out as the connection between the contact "D" and the ground is broken, indicating that the release has been tripped.

10. At the termination of the electrical impulse, the solenoid movable core moves back to normal position breaking the circuit between contact "B" and contact "C", and making a connection between contact "A" and contact "B", placing the next bomb rack release in the circuit. This completes one cycle of the bomb rack release by electrical tripping. See figure 6 and figure 15.

11. Manual tripping is accomplished by turning the manual trip stud marked "Trip" in the direction of the arrow on the case, as shown in figure 1 or figure 3. Tripping by this method drops the bomb in an armed condition, and places the contacts and arms in exactly the same condition as if it were electrically tripped.

12. In tripping by the salvo method, the bombardier's control handle is moved to salvo position, rotating the salvo coupling assembly A-17068 and causing a pin in the end of the salvo lever to trip the release lever latch B-9431, allowing the release lever assembly to fall, causing the bomb to be dropped unarmed. The arming arm remains in the cocked position.

13. The bomb rack release may be locked by moving the bombardier's control handle to the locked position, which rotates the salvo coupling assembly, causing the pin in the end of the salvo lever to come against one leg of the fork on the release lever latch, preventing the release lever assembly from tripping. (See figure 2). As the salvo coupling assembly rotates in response to the movement of the bombardier's control a notch in the salvo lever is turned out of register with the safety stop nut, thus preventing any movement of the solenoid movable core. This locks the arming lever latch preventing the arming lever assembly from being tripped. With the bomb rack release in this condition it can not be tripped by either the electrical or manual method.

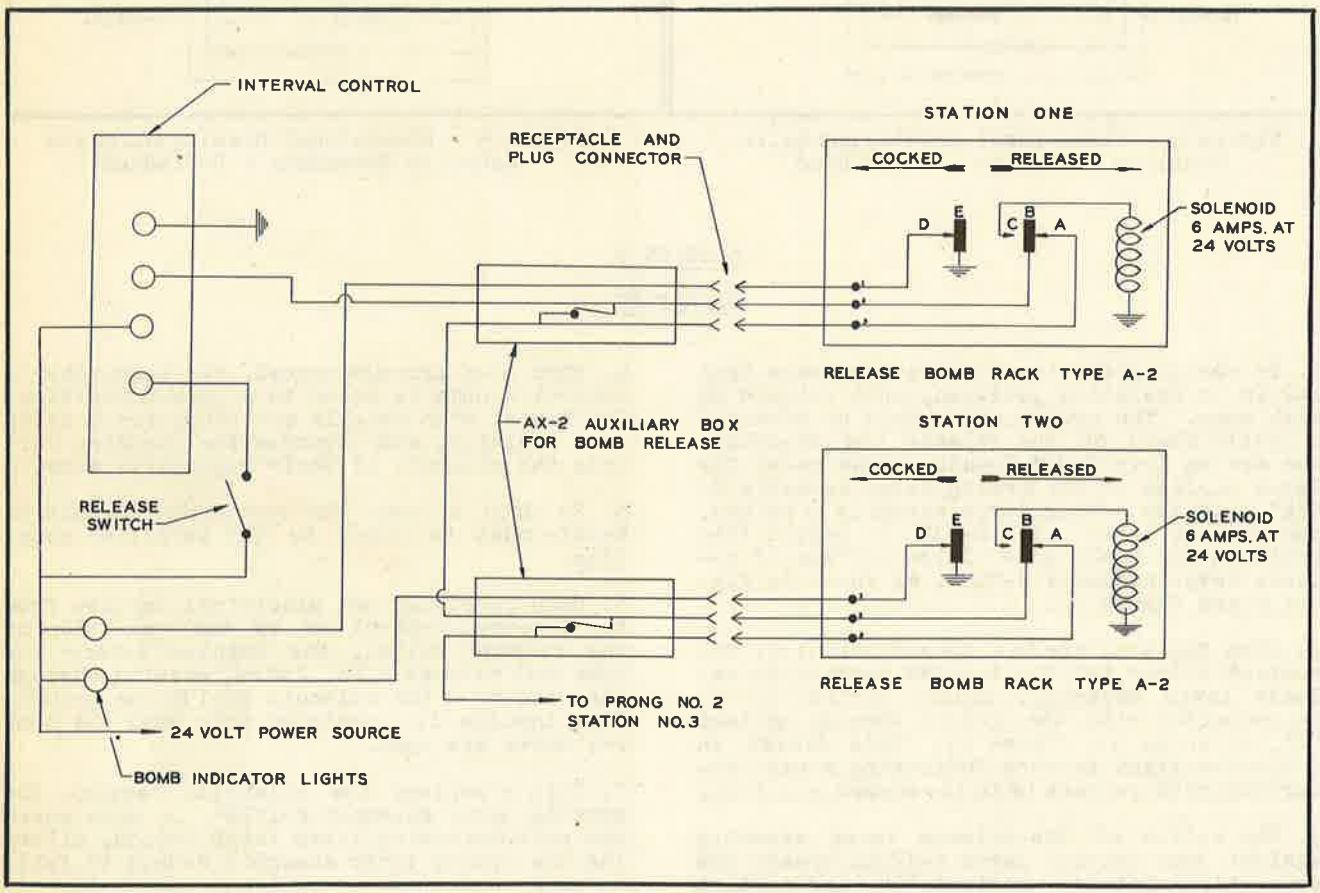


Figure 6 - Wiring Diagram

SECTION VI

INSPECTION AND MAINTENANCE

1. Inspection.

Column No. 11 - Bombing Equipment

Preflight

Before loading the bomb racks for the accomplishment of bombing missions, the operation of the A-2 bomb release will be tested as follows:

Check the releases for cleanliness, removing any dirt with a clean dry cloth. Kerosene or any other cleaning fluids will not be used on the releases, for they will be injurious to the solenoid.

Attach releases to all bomb positions on the racks that will be used, and see that the fasteners are holding the release securely to the racks. Cock both arming and release arms on all releases to be used. Close bombardier's firing switch, and inspect each release to see that both arms have operated. If all releases in position have operated, it automatically has checked the correct functioning of the auxiliary switches in the box stations of the racks not having releases installed.

Cock every alternate release in the order of firing and again close bombardier's firing switch. See that all cocked releases operate. Then cock every alternate release, testing those releases left uncocked the previous time. Again close bombardier's firing switch and note that all cocked releases operate. This checks that all releases transfer the impulse to the next releases.

Cock the releases to be used and place the bombardier's handle in the "Lock" position and close the bombardier's firing switch. This checks whether releases are locked against electrical release.

With the releases cocked, place the bombardier's handle in the "Salvo" position and check that all release arms are tripped and the arming arms untripped.

Releases found to be faulty, or whose condition is questionable will be replaced.

50-Hour

The following inspection will be accomplished at each 50-hour inspection period:

Before removing the release from the bomb rack, check the Simmond's fasteners and rings for excessive wear.

Arm tension can be checked by either of two methods, - spring scale method or weight method. The scale method is preferred, since the latest type A-2 releases have sheet metal cases which are liable to be damaged if clamped in a vise for the weight test method. Clamp the ring of the scale in a vise, or hook over a nail or some other projection. Place the hook of the scale over the arm to be tested and, holding the release in the hands, pull straight away from the scales as shown in figures 7 and 8. Figure 7 illustrates the test of the arming arm tension, and figure 8, the position of the scales for testing the release arm tension. A minimum force of 5 pounds should be required to cock the arming arm and a minimum force of 22 pounds to cock the release arm. The arming arm shall require a minimum force of 3 pounds to move it in the direction of the cocked position and the release arm shall requird a minimum force of 4 pounds to move it in the direction of the cocked position.

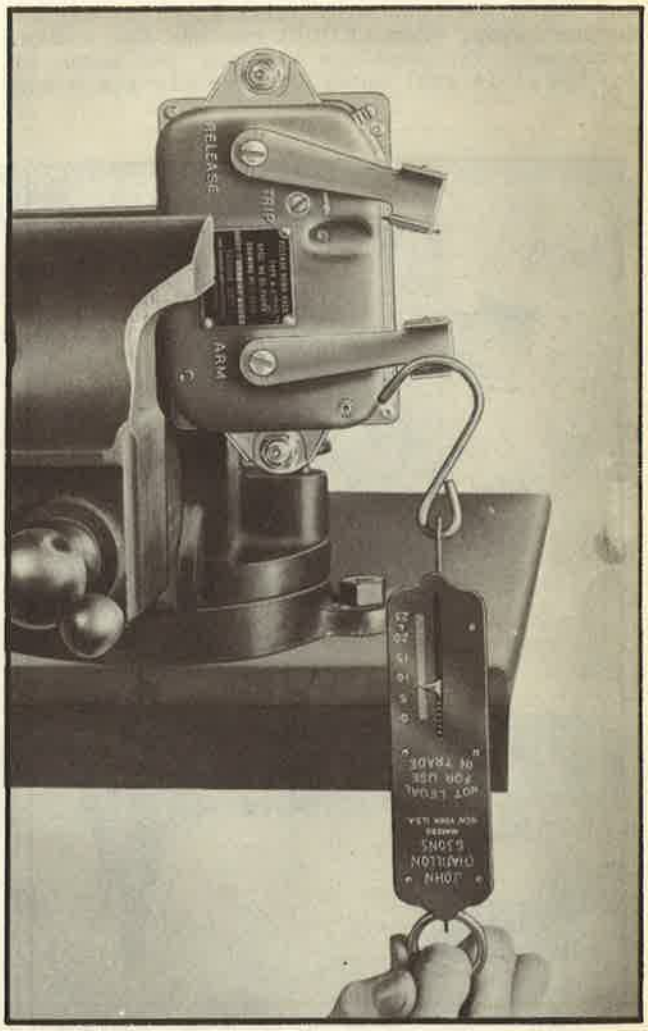


Figure 7 - Arming Arm Test - Spring Scale Method

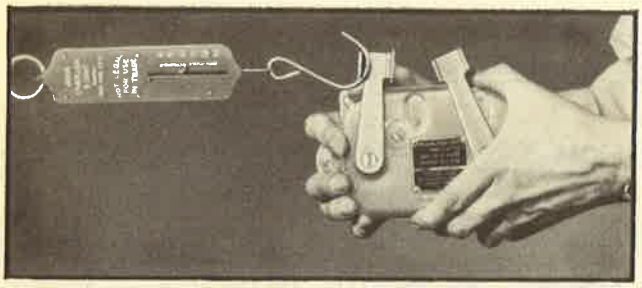


Figure 8 - Release Arm Test - Spring Scale Method

Testing by the weight method will be performed as follows: - Hold a piece of metal or hard wood across the cover at the point where the vise jaws clamp the release. Set the release well down in the vise jaws and allow the case of the release to bear against the vise so that only a minimum of clamping will be required to hold the release. Attach the weights to the lever with loops of wire and check that the wire pulls at right angles to the lever, when it just reaches the cocked position. The poundage test is the same as for the scale test method. (See figures 9 and 10).

Hinge ear tension may be tested by either a scale or weight method. A minimum force of 4 pounds normal to the extremity of the hinged ear on the release arm shall be required to rotate the ear 60° in a direction away from the solid ear. It is necessary that the point of contact on the ear be at the extreme outer edge, and that the pull is at right angles to the surface of the ear as the ear reaches the 60° angle, as shown in figure 11 and figure 12.

Check the trip stud bearing surface for wear by cocking the release, then tripping with the trip stud while applying pressure to the axis of the stud. With a few pounds of pressure on the stud a worn bearing surface will permit the attached arming lever latch to assume a position directly over the contact spider. A malfunction of this type is indicated by failure of the release to trip, since the bottom of the latch will strike against the arm of the contact spider.

Check the engagement of the arming lever latch with the arming lever. If the latch does not fully engage with the lever, a premature release of the bomb in the armed condition is likely to occur the instant the positive lock is released by the bombardier.

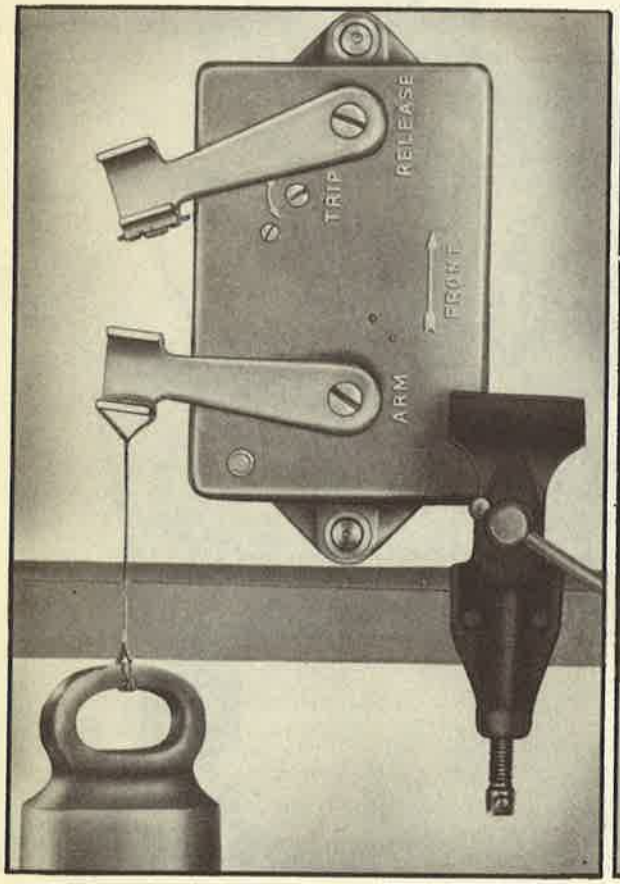


Figure 9 - Arming Arm Test - Weight Method

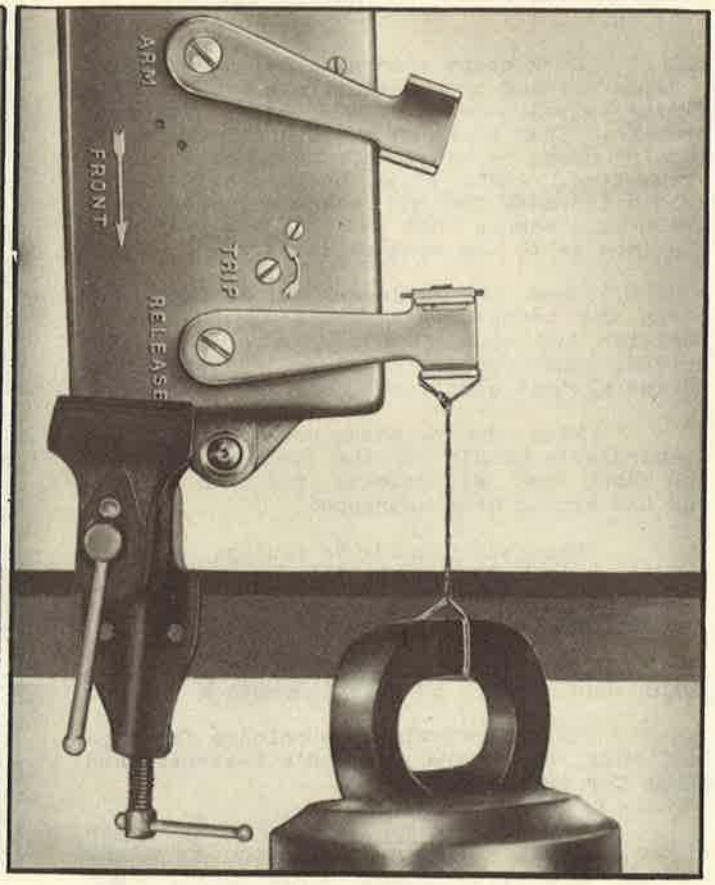


Figure 10 - Release Arm Test - Weight Method

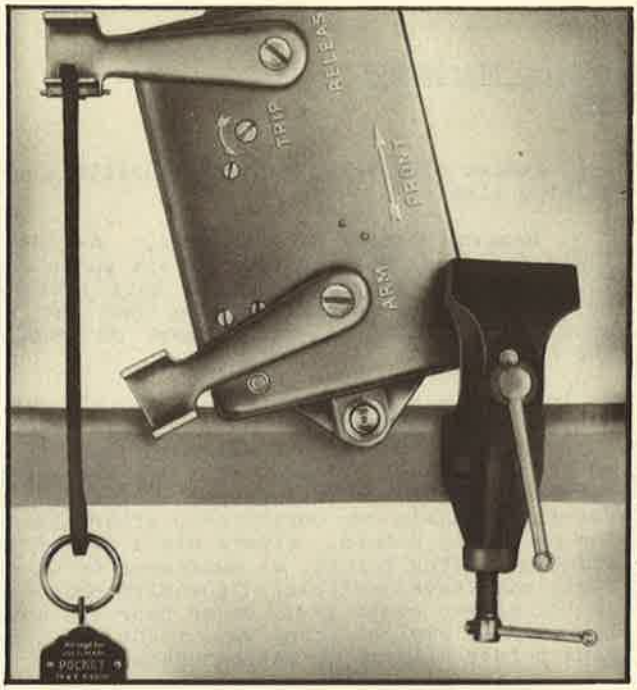


Figure 11 - Release Arm Ear Test - Spring Scale Method

Figure 12 - Release Arm Ear Test - Weight Method

With the release installed in the airplane, make the following test:

Test the releases for speed of operation by setting the bomb release interval control for the minimum bomb spacing for train release and the counter for the number of releases corresponding to the number of A-2 releases on the rack. Start the interval control and check whether all releases operate successively without interruption. When the counter reaches zero, all releases should have tripped.

Releases found to be faulty, as outlined in the preceding paragraphs, will be returned to stock properly marked for the repair and accompanied by a description of the defect.

Check the condition of the electrical contacts in the plug on the release and socket on the bomb rack to see if they are clean and free of foreign matter. For cleaning off oil, dirt, grease, and water, use only a dry cloth, as more harsh cleaning will ruin the protective coating of nickel. If corrosion exists, it will be necessary to use emery cloth or a more severe cleaner.

Follow the procedure outlined in Preflight Inspection.

2. Maintenance and Repair.

a. Few repairs should be necessary on this release. The following is a list of minor failures which are likely to occur and corrective remedies:

Failure	Remedy
(1) Defective spring on movable ear of release lever.	Replace ear spring and possibly insert new hinge pin.
(2) Defective fasteners which hold the release on receptacle switch plate.	Replace fasteners (Simmond's) (Type A-12-6 or equal).
(3) Corrosion or dirt on connector plug.	Clean plug with emery cloth.
(4) Dirty contacts in the internal switching arrangements.	Slight wiping of contacts with emery cloth.
(5) Levers trip hard. Inspect to see if ends of levers or their corresponding trips have rough surfaces.	Polish rough surfaces with very fine emery or crocus cloth.

b. Defective releases beyond the scope of the minor repairs outlined above will be returned to stock properly marked for repairs and accompanied by a description of the defect.

3. Lubrication.

The A-2 release is designed to operate without periodic lubrication and must be kept free of oil, dirt, or other foreign matter.

SECTION VII

DISASSEMBLY, INSPECTION AND REPAIR, REASSEMBLY AND FINAL TEST

1. Disassembly. (refer to figures 1, 2, 13, 14 and 15).

a. Remove four cover screws A-1145-6-2GD2 and plainwashers A-17257. Remove cover.

b. Remove release spring, A-17114. First trip release, then unhook free end of spring from lever and remove from anchor bracket.

c. Remove salvo spring A-17132, release lever latch stud A-17045, and latch stud set screw A-145-10-4.

d. Remove release lever latch B-9431, and release lever latch spring A-17109.

e. Remove "C" washer A-11264-N. This washer must be spread open. Remove coupling assembly A-17068.

f. Remove arm mounting screws A-17089, release arm A-17059 and arming arm A-17065, fit tightly on flatted shafts. Loosen screws and tap with hammer on head of screws, until arms are loose. Remove screws and arms.

g. Remove levers. Lift out release lever, B-9435 and then the arming lever B-9432 and arming lever spring A-17124.

h. Remove arming lever latch B-9430. First unhook arming lever latch spring A-17111 and remove solenoid coupling screw A-17090. The latch is staked to the arming lever trip stud, and a punch must be used to drive out the trip stud. Remove contact lever A-17062.

i. Remove switch assembly A-17083 by removing two switch mounting screws, A-1108-8-3 1/2CD2. Unsolder switch lead only when necessary for repairs.

j. Remove solenoid assembly B-9447. Remove three solenoid mounting screws and unsolder coil lead from switch.

k. Remove rubber bumper A-17129 and bumper plate A-17130. First bend out holding lugs slightly at front edge of the bracket so plate will slide out.

l. Disassemble solenoid. Remove safety stop nut A-17106, lock nut A-17127, elastic stop nut A-128B-5-N, and the movable core assembly, A-17205. Unless the coil is burned out, disassembly of this unit is not required.

m. Remove solenoid coil, B-9450. Solenoid stationary core is riveted to one end of the frame. Drive out with a punch, then remove the slotted brass solenoid sleeve, A-17107. After unsoldering ground lead from solenoid frame, A-17098, coil can be removed and replaced.

n. Remove plug base, A-17085 by drilling out holding rivets.

o. Remove Simmond's Fasteners, A-17093. These fasteners are staked in at six spots and it is first necessary to remove this staking by filing. Then carefully press them out of case being careful not to distort or damage the case.

2. Inspection and Repair.

a. Switch. Note if contact points are burned or excessively pitted. If so, check gap between points so that proper relation of points may again be established after cleaning or filing points. Always use a very fine file for filing points, as sandpaper or emery cloth may leave particles of abrasive embedded in the silver contacts and cause poor contact. See that clamping screws are tight and contact points align with mating contacts.

b. Inspect lever shafts and bearings to see that they are clean and smooth. If shafts are galled they should be polished, and if excessively worn, they should be chrome plated. These shafts are originally chrome plated, and a reasonable amount of looseness will not impair their operation. In emergency bushings can be replaced.

c. Inspect shaft of coupling assembly for excessive wear. The bearing originally is fitted .007 inch loose to allow for misalignment of the bomb rack connection. Unless the bearing is excessively loose, the operation of the release will not be affected.

d. Inspect the trip surfaces of the levers and their latches. These surfaces are hardened, polished and hard chrome plated. In case these surfaces are rough, or the plating is checked or peeled, it is better to replace them with new parts. In emergency, the chrome can be stripped, surfaces carefully polished and hard chrome plated.

e. Inspect solenoid assembly. This assembly will rarely show any wear. The movable core is nickel plated and can be replated if worn or rough. This core should have .010 inch to .020 inch loose clearance for good operation. Examine the brass sleeve for corrosion, and clean with emery cloth, if necessary. Replace if wear is excessive. Slotting of sleeve results in faster operation of the solenoid.

f. Inspect screws and nuts for worn or stripped threads and replace if necessary. Elastic stop nuts having fibre bushings should be replaced. These nuts do not lock on the threads very well after being used once.

g. Tolerances. It should always be remembered that tightly fitting parts are more dan-

gerous to the operation of the A-2 release than are loosely fitting parts.

3. Reassembly.

Clean all parts thoroughly in some liquid such as gasoline, then dry well. Moisten a clean cloth with oil, Army Spec. 2-27 and wipe all wearing parts before assembling, taking care that no free oil is left on the parts. Excessive oil holds dirt and foreign matter and slows up the operation at low temperatures at high altitudes.

a. Assemble solenoid completely before mounting into case. If coil requires replacement first slip new coil into frame, then insert brass sleeve. Next, insert stationary core into brass sleeve, and with a rod push it to the opposite end. It should extend beyond the frame member sufficiently for riveting over. Make sure that the size of the hole in core is not decreased so as to interfere with the free movement of rod attached in the end of the movable core.

b. Insert movable core into brass sleeve and thread elastic stop nut first on threaded rod; then regular lock nut; and lastly the safety stop nut. Screw solenoid screw eye with lock nut and lock washer into the large end of the movable core. Leave all nuts loose for adjustment.

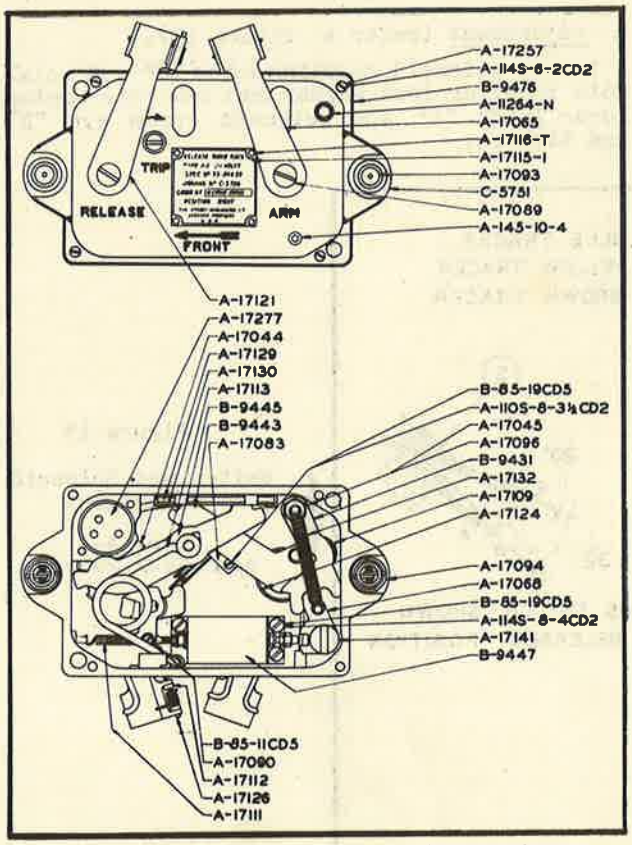


Figure 13 - Detailed Assembly Drawing - Left-Hand

c. Assemble keeper for brass sleeve up against solenoid frame and insert solenoid assembly into case. Screw tightly into place using three screws with lock washers.

d. If plug assembly, A-17133 requires replacement it should be riveted in at this time, while there is plenty of room for riveting block to slide under plug bracket.

e. Assemble manual trip stud and the associated parts, contact lever A-17062 and arming lever latch B-9430 in order shown in figure 13. It will be necessary to rivet over the end of trip stud.

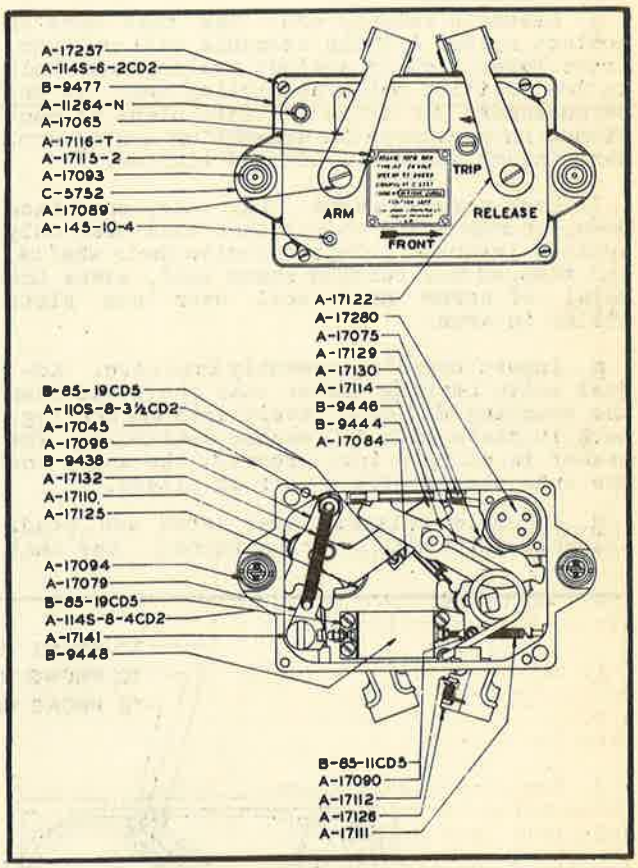


Figure 14 - Detailed Assembly Drawing - Right-Hand

f. Assemble the switch assembly using two screws and lock washers. Screws should not be tightened.

g. Solder all connections. Solder flexible coil lead to ground lug; solder insulated coil lead to the center contact in the group of three of the switch. Solder other leads to the plug and switch as indicated in figure 15. Only rosin or rosin-alcohol flux should be used.

h. Assemble arming lever and spring. These springs are made in right and left-hand. Be sure the correct hand for the release being assembled is used. First insert end of spring in hole of arming lever spring keeper attach-

ed to side of case. Permit free end of lever to overhang the case until end of its shaft has entered the bearing hole, then swing lever into place.

i. Assemble arming arm to shaft of arming lever. It may be necessary to hold a support under the shaft while driving arm on to it. Next, insert screw A-17089 and tighten.

j. Assemble release lever. Lay contact spider A-17044 with its long tail extending downward and its center hole directly over the bearing hole, then insert shaft lever into bearing.

k. Assemble release arm. See that ears on contact spider A-17044 straddle tail on lever. Press lever tightly against bearing and hold in this position while assembling arm. It may be necessary to drive arm into place as mentioned in paragraph for assembling arming arm. Next insert screw A-17089 and tighten.

l. Lock screws in arms. Lay case, open face down, on some solid object that will bear only against levers at points opposite their shafts, and then, with a punch or sharp tool, stake the metal of screw heads well over into slots milled in arms.

m. Insert coupling assembly into case. Adjust salvo bearing washer onto shaft and then the coupling will drop freely into its bearing. Lock in place with "C" washer A-11264-N. The washer is slipped into groove in the shaft and the ends closed with a pair of pliers.

n. Assemble release lever latch and stud. Assemble latch with spring attached. See that the loop in the end of the spring fits over the pin on arming lever. Insert stud A-17045 through latch, then washer A-17096, and screw into place. The latch must swing freely. In later models there is an adjustment provided for this stud, and when screwed in to the proper position it is locked by a screw inserted into the support from the front side of the case.

o. Cock both arms and insert rubber bumper into bracket from the top side, bending the rubber to shorten its length. Slide plate A-17130 in from the front, and over the two locking lugs. When in place bend lugs to a vertical position to prevent plate from moving.

p. Insert springs. Release levers using trip stud. Release lever springs are made both right and left-hand, so be sure the correct hand for the release is being assembled. The tail of the spring slips into the release lever spring keeper riveted to the top of the case and swings back under hold-down lug. The hooked end of the spring fits over stud on release lever and between lever and washer. (See figure 2). Arming lever latch spring hooks in hole in stud attached to end of case and into hole in latch.

q. The loops in the ends of salvo spring slip over grooved pins in coupling assembly and latch stud A-17045.

4. Adjustment (refer to figure 15).

Insert solenoid coupling screw "J" and solenoid coupling lock washer that connects arming lever latch "I" and solenoid screw eye "K" and tighten.

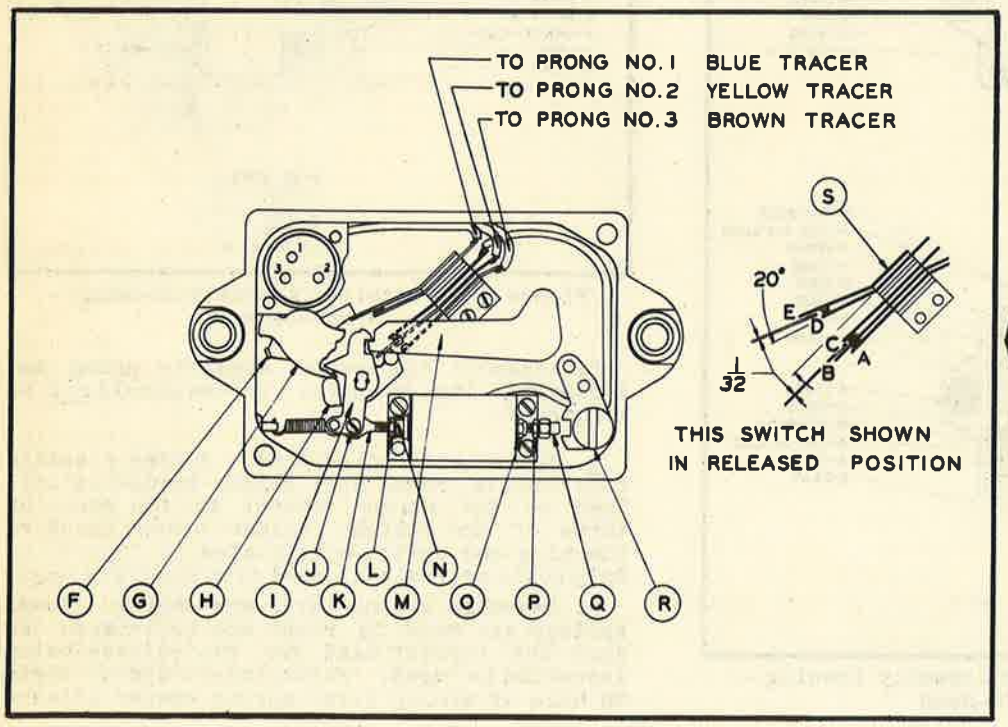


Figure 15

Switch and Solenoid Adjustment

Type A-2 Bomb Rack Release

a. To adjust the stroke of the solenoid the bomb rack release should be in the uncocked position. Move the movable core assembly "N" in toward the coupling assembly until it stops against the stationary core, so that the safety stop nut "Q" enters the notch in the salvo lever, and does not bump against bottom of notch. With the solenoid movable core assembly held in this position adjust the elastic stop nut "O" leaving 9/64 inch between the nut and the face of the solenoid frame. This nut is of the type which remains in position and needs no locking. To adjust the safety stop nut "Q" allow the solenoid movable core "N" to return to its resting position. Adjust the stop nut "Q" allowing from .010 inch to .015 inch between end of nut and circular part of the salvo lever on each side of the notch. Then with another wrench lock the lock nut "P" against safety stop nut "Q". The arming lever "M" should now be cocked. If the arming lever latch "I" fails to engage the arming lever "M" properly, it must be adjusted by turning the solenoid movable core "N" in a direction which will move the arming lever latch "I" to the correct position. When turning the solenoid movable core "N", the elastic stop nut "O" must be allowed to rotate with the movable core, so that the stroke of the solenoid will not be affected. After the arming lever latch has been adjusted properly, lock the lock nut "L" tightly against solenoid movable core "N" using two wrenches.

b. Adjust the switch assembly "K". With release in released position, the end of contact spring "B" stands about .015 inch from contacting end of contact lever "L". Now, tighten switch mounting screws tight. This adjustment is usually accomplished without bending spring "B". Adjust contact "A" so that it will exert sufficient pressure against contact "B" so that as "B" is moved away from "A" that "A" will follow "B" for a distance of 1/64 inch before it breaks contact. Adjust space between "B" and "C" to 1/32 inch. Adjust spring carrying contact "D" to about 20° as shown, and then adjust contact spring "E" so that there is 1/32 inch clearance between its contact and contact "D".

c. Cock both levers and check for contact between "B" and "C" and between "D" and "E". See that contacts "A" and "B" are open.

d. Wipe all rubbing surfaces with oily cloth and make sure all moving parts move easily. Be sure the levers and their respective latches lay in the same plane without overlapping each other. Then, assemble cover, fastening it on with four screws A-1114-S-62CD2.

5. Final Test.

a. Cock both levers of release. Connect a 3.5 ohm resistor in series with one wire of a 24 volt battery and plug prong No. 2, and then touch the case with the other wire from the battery. The solenoid should operate and trip both arms of the release.

b. The current consumed by the solenoid should not exceed 6 amperes at 24 volts. It shall be possible to energize the solenoid with 28 1/2 volts for 30 seconds without damage in any way.

c. With release in released position, the circuit should be closed between plug prongs No. 2 and No. 3, and open between No. 1 and No. 2, and No. 1 and No. 3; also open between all three prongs and the case. With both arms cocked there should be a closed circuit between No. 2 and the case (ground), and No. 1 and the case; and open between No. 3 prong and the case, and the prongs No. 1 and No. 2. Use continuity meter or a light in series with test wire for making these tests. (See figure 5).

d. Cock both arms of release with tip of screw driver, rotate trip screw in direction of arrow and note if it takes undue pressure to trip the release. Both arms of the release should operate and place electrical contacts and levers in same position as if tripped electrically.

e. The coupling assembly terminates on outside of case as shown in figures 1, 4, and 5, and must be capable of mechanically locking and unlocking the bomb rack release and tripping the release lever only. The position of the mechanism for each operation must conform with figures 4 and 5. The moment required to turn the mechanism must not exceed 4 inch pounds for the release position, and 2 inch pounds for the lock position.

(1) The salvo coupling shall be checked to determine that its resting position for electrical release is 90 degrees plus or minus 4 degrees from the horizontal mounting centerline with "selective" existing 4 degrees on each side of the resting position.

(2) When viewing the left-hand assembly from the shackle side, the salvo coupling shall be checked to determine that it will salvo unarmed somewhere between 10 degrees and 15 degrees clockwise rotation from the vertical reference line.

(3) When viewing the left-hand assembly from the shackle side, the salvo coupling shall be checked to determine that it will mechanically lock the solenoid and release lever through the entire angle between 12 degrees counterclockwise rotation from the vertical reference line.

(4) When viewing the right-hand assembly from the shackle side, the salvo coupling shall be checked to determine that it will salvo unarmed somewhere between 10 degrees and 15 degrees counterclockwise rotation from the vertical reference line.

(5) When viewing the right-hand assembly from the shackle side, the salvo coupling shall be checked to determine that it will mechanically lock the solenoid and release lever

through the entire angle between 12 degrees and 20 degrees clockwise rotation from the vertical reference line.

(6) The salvo coupling shall be checked to determine that it will move 20 degrees in either direction from the vertical reference line without jamming or binding in any way.

f. Check A-2 release for all points as given under 50-hour inspection.

SECTION VIII

STORAGE

1. Preparation for Storage.

No special preparations for storage are necessary for the bomb rack release type A-2 24 volts D.C.

2. Preparation for Use after Storage.

Bomb rack releases should require only preflight inspection listed in section VI of this Handbook, when being removed from storage.

PARTS CATALOG

FOR THE

TYPE A-2 BOMB RACK RELEASE

MANUFACTURED BY

THE SPARKS - WITHINGTON CO.

JACKSON, MICHIGAN

NOTE: Figures 1 and 2 are for a right hand assembly. Left hand assembly parts are either alike or exactly opposite to those that are shown. The Assembly Parts Lists make clear which parts are common to both assemblies and which parts are common to one assembly only.

AUGUST 1, 1942

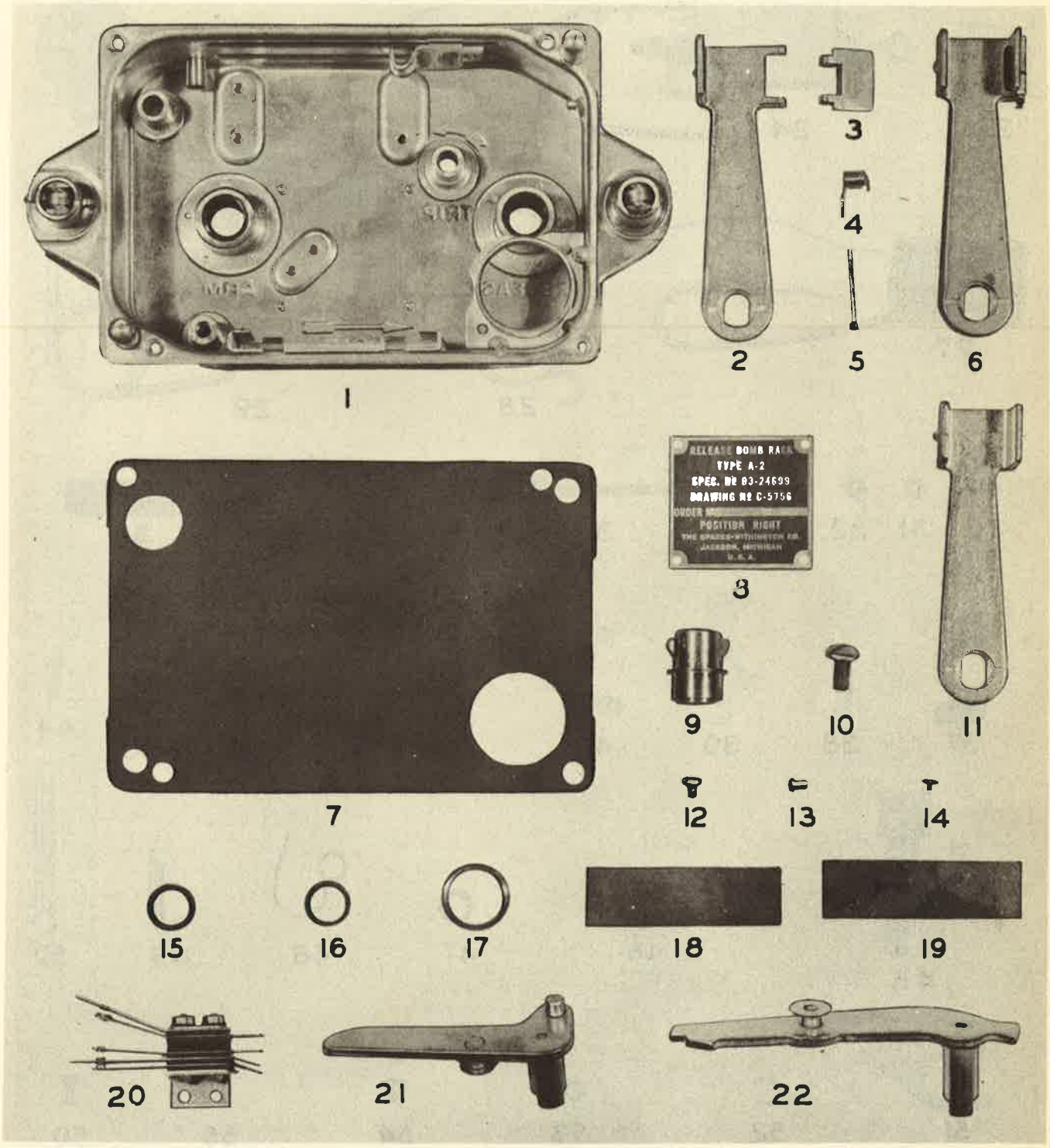


Figure 1 - Disassembled View - Type A-2 Bomb Rack Release

ASSEMBLY PARTS LISTS

Type A-2 Bomb Rack Release Assembly
24 Volts D.C. Right-Hand
(Sparks - Withington) (Cont. W535 ac-20880)

Ind. No.	Part No.		Qty. Req.
	C-5756	Release Assembly, bomb rack type A-2 24 volts D.C. right-hand	1
1	C-5751	Case Assembly	1
	C-5749	Case	1
	A-17078	Bracket, plug	1
	A-17102	Pin, dowel	2
	A-17095-2	Rod, welding	6
	A-17095-1	Rod, welding	3
	A-17080	Keeper, arming lever spring	1
	A-17073	Keeper, release lever spring	1
	A-837-3-T	Rivet, spring keeper	2
13	A-17119	Pin, arming lever latch spring	1
	B-9449	Housing, bumper	1
	A-17050	Bearing, salvo	1
	A-17051	Support, release lever latch	1
	A-17049	Support, arming lever latch	1
	A-17048	Support, release lever bearing	1
	A-17046	Support, arming lever bearing	1
16	A-17070	Bushing, release lever	1
15	A-17069	Bushing, arming lever	1
9	A-17093	Fastener, Simmond's	2
8	A-17115-1	Plate, name	1
14	A-17116-T	Rivet, name plate	4
38	A-17108	Stud, manual trip	1
37	A-17062	Lever, contact	1
39	B-9430	Latch, arming lever	1
49	A-17111	Spring, arming lever latch	1
	B-9451	Switch and Plug Assembly	1
25	A-17277	Plug and Wire Assembly	1
	A-17133	Plug Assembly	1
	A-17085	Base, plug	1
	A-17087	Prong, plug	3
	A-17135	Wire, white, br. and o tracer	1
	A-17136	Wire, white, bl. and o tracer	1
	A-17137	Wire, white, yl. and o tracer	1
	A-4692	Sleeving	2 in.
	A-16968	Solder	.0012#
20	A-17083	Switch Assembly	1
	A-17273-A	Solder	.0019#
24	B-9447	Solenoid Assembly	1
26	A-17098	Frame, solenoid	1
27	B-9450	Coil, solenoid	1
33	A-17101	Core, solenoid stationary	1
36	A-17107	Sleeve, solenoid	1
34	A-17205	Core Assembly, movable	1
	A-17100	Core, solenoid movable	1
	A-17088	Screw, solenoid adjusting	1
35	A-17082	Eye, solenoid screw	1
31	A-17127-N	Nut, lock	2
32	A-128B-5-N	Nut, elastic stop	1
30	A-17106	Nut, safety stop	1
54	A-17117-T	Rivet, plug base	2
55	A-110S-8-3 1/2 CD2	Screw, switch mounting	2
	B-85-19CD5	Washer, switch mounting lock	2
23	A-17105	Retainer, solenoid	1
56	A-114S-8-4CD2	Screw, solenoid mounting	3
53	B-85-19CD5	Washer, solenoid mounting lock	3
44	A-17090	Screw, solenoid coupling	1
43	B-85-11CD5	Washer, solenoid coupling lock	1
18	A-17129	Bumper, rubber	1
19	A-17130	Plate, bumper	1
28	A-17124	Spring, arming lever	1
21	B-9443	Lever Assembly, arming	1
	B-9432	Lever, arming	1
	A-17058	Lever Blank, arming	1
	A-17052-2	Stud, arming lever shaft	1

Ind. No.	Part No.		Qty. Req.
	A-17081	Stud, arming lever spring	1
	A-17091	Stud, arming lever trip	1
	A-17128	Washer, arming lever spring stud	1
51	A-17044	Spider, contact	1
52	B-9445	Lever Assembly, release	1
	B-9434	Lever, release	1
	A-17057	Lever Blank, release	1
	A-17052-1	Stud, release lever shaft	1
	A-17081	Stud, release lever spring	1
	A-17097	Washer, release lever spring stud	1
29	A-17113	Spring, release lever	1
11	A-17065	Arm, arming	1
10	A-17089	Screw, arm mounting	1
6	A-17121	Arm Assembly, release	1
2	A-17059	Arm, release	1
3	A-17112	Ear, hinged	1
4	A-17123	Spring, release arm hinge	1
5	A-17126	Pin, release arm hinge	1
10	A-17089	Screw, arm mounting	1
48	A-17109	Spring, release lever latch	1
40	B-9431	Latch, release lever	1
42	A-17096	Washer, latch spacer	1
41	A-17045	Stud, release lever latch	1
	A-145-10-4	Screw, latch stud set	1
45	A-17068	Coupling Assembly	1
	A-17067	Shaft, salvo	1
	A-17066	Lever, salvo	1
	A-17043	Stud, salvo spring	1
	A-17042	Stud, salvo latch	1
47	A-17141	Washer, salvo bearing	1
	A-17249	Washer, shim	As Req'd.
52	A-11264-N	Washer, "C"	1
50	A-17132	Spring, salvo	1
46	A-17199	Gasket, salvo coupling	1
7	B-9476	Cover	1
12	A-114-6-2CD2	Screw, cover	4
	A-17257	Washer, plain thin	8
17	A-17094	Ring, Simmond's fastener	2

NUMERICAL PARTS LIST

Release, Bomb Rack Type A-2
24 Volts D.C. Left-Hand
(Cont. W535-ac-20880)

Part No.	Assy. List Page No.	Qty. Req.	Part No.	Assy. List Page No.	Qty. Req.
B-85-11CD5	7	1	A-17086	7	1
B-85-19CD5	7	5	A-17087	7	3
A-110S-8-3 1/2CD2	7	2	A-17088	7	1
A-114S-6-2CD2	8	4	A-17089	8	2
A-114S-8-4CD2	7	3	A-17090	7	1
A-128B-5-N	7	1	A-17091	8	1
A-45-10-4	8	1	A-17093	7	2
A-837-3-T	7	2	A-17094	8	2
A-4692	7	2 in.	A-17095-1	7	3
C-5750	7	1	A-17095-2	7	6
C-5752	7	1	A-17096	8	1
C-5757	7	1	A-17097	8	1
B-9430	7	1	A-17099	7	1
B-9433	7	1	A-17100	7	1
B-9435	8	1	A-17101	7	1
B-9438	8	1	A-17102	7	2
B-9442	7	1	A-17105	7	1
B-9444	7	1	A-17106	7	1
B-9446	8	1	A-17107	7	1
B-9448	7	1	A-17108	7	1
B-9449	7	1	A-17110	8	1
B-9452	7	1	A-17111	7	1
B-9477	8	1	A-17112	8	1
A-11264-N	8	1	A-17114	8	1
A-16968	7	As Req.	A-17115-2	7	1
A-17042	8	1	A-17116-T	7	4
A-17043	8	1	A-17117-T	7	2
A-17045	8	1	A-17119	7	1
A-17046	7	1	A-17122	8	1
A-17048	7	1	A-17123	8	1
A-17049	7	1	A-17125	7	1
A-17050	7	1	A-17126	8	1
A-17051	7	1	A-17127-N	7	2
A-17052-1	8	1	A-17128	8	1
A-17052-2	7	1	A-17129	7	1
A-17063	7	1	A-17130	7	1
A-17464	8	1	A-17132	8	1
A-17065	8	1	A-17134	7	1
A-17066	8	1	A-17135	7	1
A-17067	8	1	A-17136	7	1
A-17069	7	1	A-17137	7	1
A-17070	7	1	A-17141	8	1
A-17074	7	1	A-17199	8	1
A-17075	8	1	A-17205	7	1
A-17078	7	1	A-17206	8	1
A-17079	8	1	A-17207	7	1
A-17080	7	1	A-17249	8	As Req.
A-17081	8	2	A-17257	8	8
A-17082	7	1	A-17273	7	As Req.
A-17084	7	1	A-17280	7	1

ASSEMBLY PARTS LIST

Release, Bomb Rack Type A-2
(24 Volts D.C. Left-Hand)
(Cont. W535 ac-20880)

Ind. No.	Part No.		Qty. Req.
	C-5757	Release Assembly, bomb rack type A-2, 24 volts D.C. left-hand	1
	C-5752	Case Assembly	1
	C-5750	Case	1
	A-17078	Bracket, plug	1
	A-17102	Pin, dowel	2
	A-17095-1	Rod, welding	3
	A-17095-2	Rod, welding	6
	A-17080	Keeper, arming lever spring	1
	A-17074	Keeper, release lever spring	1
	A-837-3-T	Rivet, spring keeper	2
13	A-17119	Pin, arming lever latch spring	1
	B-9449	Housing, bumper	1
	A-17050	Bearing, salvo	1
	A-17051	Support, release lever latch	1
	A-17049	Support, arming lever latch	1
	A-17048	Support, release lever bearing	1
	A-17046	Support, arming lever bearing	1
16	A-17070	Bushing, release lever	1
15	A-17069	Bushing, arming lever	1
9	A-17093	Fastener, Simmond's	2
	A-17115-2	Plate, name	1
14	A-17116-T	Rivet, name plate	4
38	A-17108	Stud, manual trip	1
	A-17063	Lever, contact	1
39	B-9430	Latch, arming lever	1
49	A-17111	Spring, arming lever latch	1
	B-9452	Switch and Plug Assembly	1
	A-17280	Plug and Wire Assembly	1
	A-17134	Plug Assembly	1
	A-17086	Base, plug	1
	A-17087	Prong, plug	3
	A-17135	Wire, white, brown and orange tracer	1
	A-17136	Wire, white, black and orange tracer	1
	A-17137	Wire, white, yellow and orange tracer	1
	A-4692	Sleeving	2 in.
	A-16968	Solder	.0012#
	A-17084	Switch Assembly	1
	A-17273	Solder	.0019#
	B-9448	Solenoid Assembly	1
	A-17099	Frame, solenoid	1
	B-9442	Coil, solenoid	1
33	A-17101	Core, solenoid stationary	1
36	A-17107	Sleeve, solenoid	1
34	A-17205	Core assembly, movable	1
	A-17100	Core, solenoid movable	1
	A-17088	Screw, solenoid adjusting	1
35	A-17082	Eye, solenoid screw	1
31	A-17127-N	Nut, lock	2
32	A-128B-5-N	Nut, elastic stop	1
30	A-17106	Nut, safety stop	1
54	A-17117-T	Rivet, plug base	2
55	A-110S-8-3 1/2CD2	Screw, switch mounting	2
	B-85-19CD5	Washer, switch mounting lock	2
23	A-17105	Retainer, solenoid sleeve	1
56	A-114S-8-4CD2	Screw, solenoid mounting	3
53	B-85-19 CD5	Washer, solenoid mounting lock	3
44	A-17090	Screw, solenoid coupling	1
43	B-85-11CD5	Washer, solenoid coupling lock	1
18	A-17129	Bumper, rubber	1
19	A-17130	Plate, bumper	1
	A-17125	Spring, arming lever	1
	B-9444	Lever Assembly, arming	1
	B-9433	Lever, arming	1

ASSEMBLY PARTS LIST

Release, Bomb Rack Type A-2
(24 Volts D.C. Left-Hand)
(Cont. W535 ac-20880)

Ind. No.	Part No.		Qty. Req.
	A-17207	Lever Blank, arming	1
	A-17052-2	Stud, arming lever shaft	1
	A-17081	Stud, arming lever spring	1
	A-17091	Stud, arming lever trip	1
	A-17128	Washer, arming lever spring stud	1
	A-17075	Spider, contact	1
	B-9446	Lever Assembly, release	1
	B-9435	Lever, release	1
	A-17206	Lever Blank, release	1
	A-17052-1	Stud, release lever shaft	1
	A-17081	Stud, release lever spring	1
	A-17097	Washer, release lever spring stud	1
	A-17114	Spring, release lever	1
11	A-17065	Arm, arming	1
10	A-17089	Screw, arm mounting	1
	A-17122	Arm Assembly, release	1
	A-17064	Arm, release	1
3	A-17112	Ear, hinged	1
4	A-17123	Spring, release arm hinge	1
5	A-17126	Pin, release arm hinge	1
10	A-17089	Screw, arm mounting	1
	A-17110	Spring, release lever latch	1
	B-9438	Latch, release lever	1
42	A-17096	Washer, latch spacer	1
41	A-17045	Stud, release lever latch	1
	A-145-10-4	Screw, latch stud set	1
	A-17079	Coupling Assembly	1
	A-17067	Shaft, salvo	1
	A-17066	Lever, salvo	1
	A-17043	Stud, salvo spring	1
	A-17042	Stud, salvo latch	1
47	A-17141	Washer, salvo bearing	1
	A-17249	Washer, shim	As req.
52	A-11264-N	Washer, "C"	1
50	A-17132	Spring, salvo	1
46	A-17199	Gasket, salvo coupling	1
7	B-9477	Cover	1
12	A-114S-6-2CD2	Screw, cover	4
	A-17257	Washer, plain thin	8
17	A-17094	Ring, Simmond's fastener	2