

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL
SUPPORT, AND DEPOT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS)

CRIMPING OUTFIT, HYDRAULIC,
VOICEMITTER-OUTLET VALVE ASSEMBLY,
ABC-M1

This copy is a reprint which includes current
pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1968

CHANGE

No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 April 1973

Operator's Organizational, Direct Support, General Support

and Depot Maintenance Manual

Including Repair Parts and Special Tool Lists

CRIMPING OUTFIT, HYDRAULIC,

VOICEMITTER-OUTLET VALVE ASSEMBLY, ABC-M1

FSN 5180-911-1366

TM 3-5180-210-15, 12 June 1968, is changed as follows:

Pages 35 through 37, appendix B. Appendix is superseded as follows:

APPENDIX B

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED

OR AUTHORIZED LIST

Section I. INTRODUCTION

Not required.

Section II. BASIC ISSUE ITEMS LIST

There are no basic issue items for the ABC-M1 crimping outfit.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

There are no items troop installed or authorized for the ABC-M1 crimping outfit.

By Order of the Secretary of the Army:

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Distribution:

To be distributed in accordance with DA form 12-28, Section I (qty rqr block No. 69) Operator's Maintenance requirements for Maintenance requirements for Maintenance equipment.

CHANGE

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 12 January 1971

**Operator's, Organizational, DS, GS, and Depot Maintenance Manual
Including Repair Parts and Special Tool Lists
CRIMPING OUTFIT, HYDRAULIC,
VOICEMITTER-OUTLET VALVE ASSEMBLY, ABC-M1
FSN 5180-911-1366**

TM 3-5180-210-15, 12 June 1968, is changed as follows:

Title is changed as shown above.

Page 4, figure 1. In legend, "3 Rocket shaft" is changed to read "3 Rocker shaft."

Page 8. Figure 4 is superseded as follows:

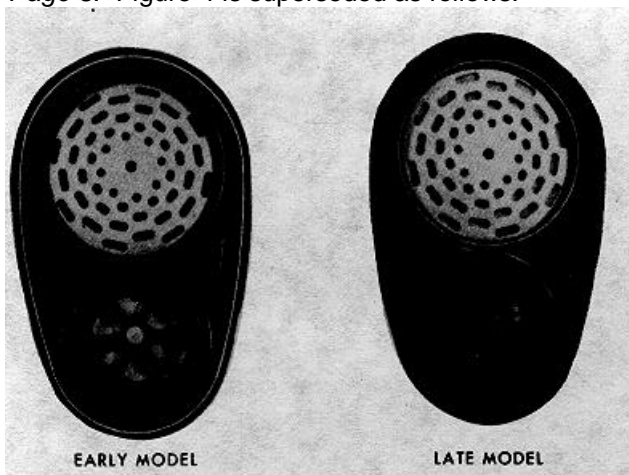


Figure 4. ABC-M17 voicemitter-outlet valve assemblies.

Page 10, paragraph 18. In lines 1 and 2, "M14 protective mask leakage tester" is changed to read "M14 DOP protective mask leakage tester (TM 3-6665-257-15)."

Page 12, figure 9. In the title, "Expanded" is changed to read "Expander."

Page 19, paragraph 28d. In line 2, "lease (2, fig.

1)" is changed to read "lease lever (2, fig. 1)."

Page 25. Paragraph 37 is superseded as follows:

37. Maintenance

(fig. 17)

Crimping die assemblies are replaced as a set, never singly.

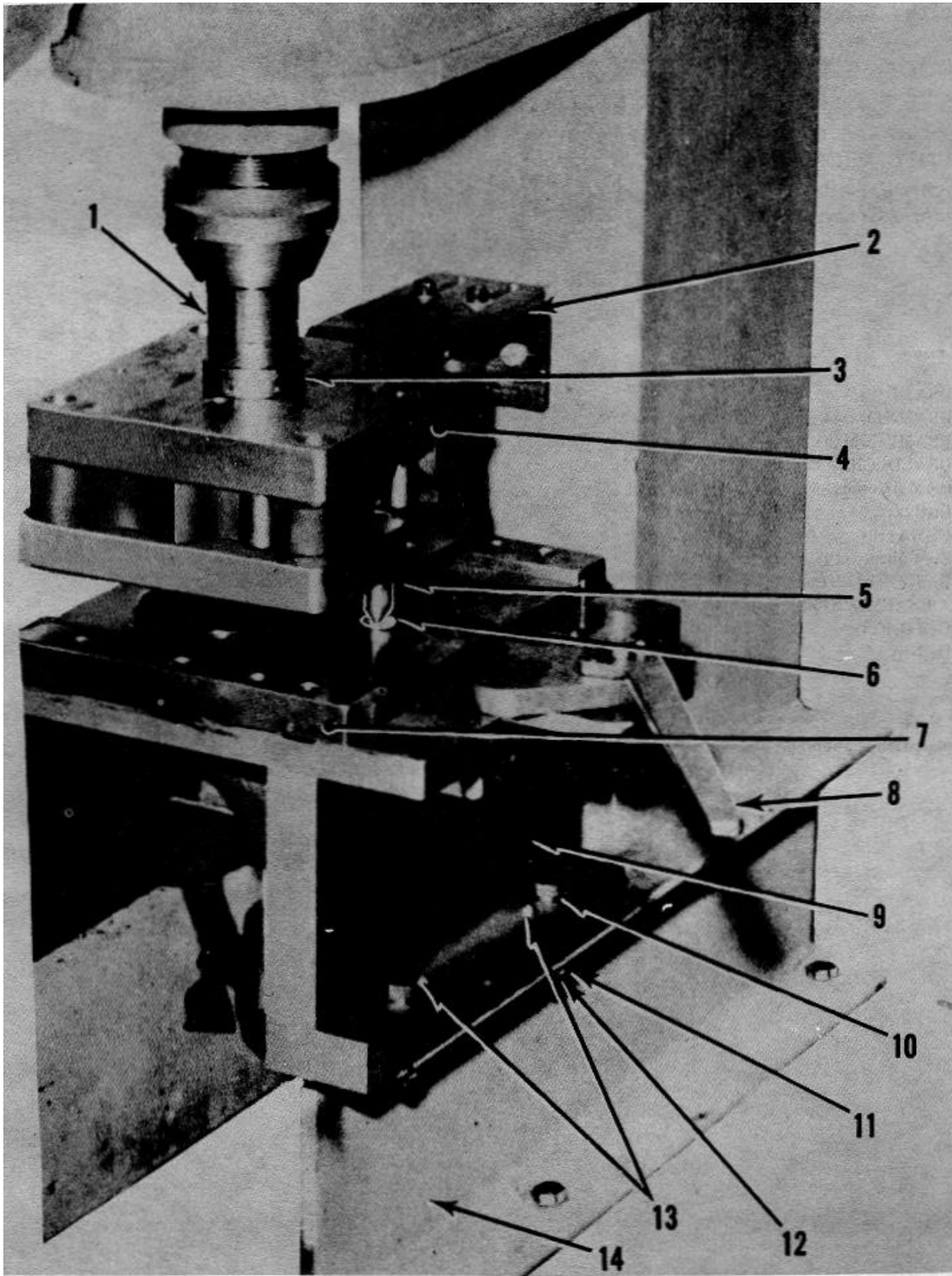
a. Removal.

- (1) Raise the upper die assembly (4); close the lower die assembly (7).
- (2) Using a blunt punch and hammer, remove the four dowel pins (13) from the support plates (9). Discard the dowel pins.
- (3) Remove the four nuts (12), washers (11), and capscrews (10) that hold the lower die to the press base (14). Remove the lower die from the press.
- (4) Lower the upper die until it is below the adjustable guide (2).
- (5) Unscrew the upper die from the adapter (3). Remove the upper die from the press.

b. Installation and Alinement.

- (1) Unpack the replacement crimping die set. See that serial numbers on upper and lower die assemblies are identical.
- (2) Screw the upper die fully onto the press ram. Position the serial number toward the front of the press. Raise the upper die and reposition the adjustable guide as necessary.

- (3) See that the lower die is closed. Place lower die on the press base as shown in figure 17.
 - (4) Lower the upper die until its alignment pins are within one-sixteenth inch of the lower die.
 - (5) Position the lower die so that its alignment holes are directly beneath the alignment pins. Check position by sighting from side and front of the dies.
 - (6) Lower the upper die until its surface is within one-sixteenth inch of the lower die. Alignment pins should mate with alignment holes without side interference.
 - (7) See that facing surfaces of the dies are parallel. If surfaces are not parallel, shim up the lower assembly as required. Place shims within one-eighth inch of capscrew holes, between the press base and support plates (9).
 - (8) Clamp the lower die to the press base with two C clamps.
 - (9) Make three or four trial crimps (para 17c), but use only the crimping ring, not the mask, to assure that alignment is correct. A crimp is satisfactory when all tabs are fully and evenly flattened.
 - (10) If crimp is not satisfactory, die surfaces are not parallel. Remove C clamps and repeat (4) through (9) above until satisfactory crimps are made.
 - (11) If crimps are satisfactory, see if capscrew holes in the support plates are aligned with holes in the press base. If holes are not aligned, elongate holes in press base or drill new holes as required. Locate new holes through the support plates. Remove lower die from press and drill holes. Return lower die to press base. Repeat (4) through (10) above.
 - (12) Close lower die. Lower upper die onto lower die. Fasten lower die to the press base with capscrews, washers, and nuts removed in a(3) above.
 - (13) Remove C clamps and repeat 9) above.
- Page 26.* Figure 17 is superseded as follows:
Page 27, section III, In line 1, "TB 750-109" is changed to read "TB 750-236."
Page 33, appendix A. TB 750-109 is rescinded.
- The following references are added:
- | | |
|------------------|--|
| TB 750-236 | Calibration Requirements
for the Maintenance of
Army Materiel |
| TM 3-6665-257-15 | Operator's, Organizational,
DS, GS, and Depot
Maintenance Manual:
Tester, Leakage, Protec-
tive Mask, DOP, M14,
FSN 6665-911-3552 |



- 1 Ram
- 2 Guide
- 3 Adapter
- 4 Upper die assembly
- 5 Alinement pin

- 6 Alinement hole
 - 7 Lower die assembly
 - 8 Die handle
 - 9 Support plate
- Figure 17. Crimping die set installation.**

- 10 Capscrew
- 11 Washer
- 12 Nut
- 13 Dowel pins
- 14 Press base

By Order of the Secretary of the Army:

Official:

KENNETH G. WICKHAM,
*Major General, United States Army,
The Adjutant General*

W. C. WESTMORELAND,
*General, United States Army,
Chief of Staff.*

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Arsenals (3) except
 Edgewood (75)
USAAPSA (25)
Ft Knox FLDMS(10)

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 310-50.

**OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT,
GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL
(INCLUDING SPARE PARTS AND SPECIAL TOOL LISTS)**

**CRIMPING OUTFIT, HYDRAULIC
VOICEMITTER-OUTLET VALVE ASSEMBLY, ABC-M1**

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the use of depot maintenance facilities, and those general support maintenance facilities authorized by the Commanding General, U.S. Army Ammunition Procurement and Supply Agency, that are equipped with the ABC-M1 voicemitter-outlet valve assembly hydraulic crimping outfit.

b. This manual contains instructions for the operation and maintenance of the ABC-M1 crimping outfit, a description of the outfit, and information on limited storage. Procedures are included in the operating instructions for using the crimping outfit in maintenance of the ABC-M17 field proactive mask (TM 3-4240202-15) and the M17A1 field proactive mask (TM 3-4240-258-14).

2. Record and Report Forms

a. Refer to TM 38-750 for information on required record and report forms.

b. Report of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding Officer, Edgewood Arsenal, ATTN: SMUEA-TSE-TP, Edgewood Arsenal, Md. 21010.

3. Allocation of Maintenance

Refer to maintenance allocation chart (Appendix C) to determine maintenance services to be performed by the operator, organizational, general support, and depot maintenance personnel.

4. Repair Parts

Appendix D lists repair parts available for performing maintenance on the crimping outfit.

Section II. DESCRIPTION AND DATA

5. General

The ABC-M1 crimping outfit consists of a hydraulic press fitted with a pressure gage and a set of crimping dies, roundnose pliers, glass pliers, a can of hydraulic fluid, and a tube of gasket-forming compound. The outfit is designed to provide adequate and equalized pressure on the crimping ring tabs when installing voicemitter-outlet valve assemblies and nose cups on ABC-M17 and M17A1 masks.

6. Hydraulic Press

(fig. 1)

a. The hydraulic press is a hand-operated single-column hydraulic arbor press, which is modified by the addition of crimping dies and a pressure gage. A pump

handle (4) on the press provides the means for applying pressure to the dies. A release lever (2) permits the upper die to be raised or lowered manually. A hinged top oiler (11) serves as a filling point for hydraulic fluid and also as a breather cap. The press is preset to operate at approximately 1200 pounds per square inch (psi) pressure, which is the required pressure for crimping voicemitter-outlet valve assemblies and nose cups to the mask faceblanks.

b. A pressure gage (1) that registers 0 to 3000 psi is installed on the press. The 3-1/2-inch dial is graduated clockwise at regular intervals of 25, with 0 and each interval of 500 numbered (0, 500, 1000, 1500, etc.).

The case of the gage is black; the dial face is white with black figures and graduation lines.

c. The serialized, matched crimping die set consists of a lower die (7) and an upper die (8). Components of a die set are not interchangeable.

(1) The lower die is a two-part holding fixture mounted on the base of the press. The left half is stationary; the right half moves horizontally by operating the die handle. When closed, the lower die holds a crimping ring in position for the crimping operation.

(2) The upper die is screwed onto an adapter on the press ram and moves vertically with the press ram. The upper die is aligned with the lower die by means of a guide and two alignment pins. The upper die is also movable within itself and performs a two-part operation. Initial crimp is made by the bottom portion of the upper die as pressure begins and tabs are bent partially inward. Final crimp is made as increased pressure compresses the rubber spacer and forces the final crimping die to contact and flatten the crimping ring tabs.

7. Pliers

a. Roundnose pliers (fig. 11) are supplied for grasping and bending tabs on the crimping ring.

b. Glass pliers (fig. 6) with wide, flat jaws are supplied to make an initial bend in the large tabs on the crimping ring.

8. Hydraulic Fluid

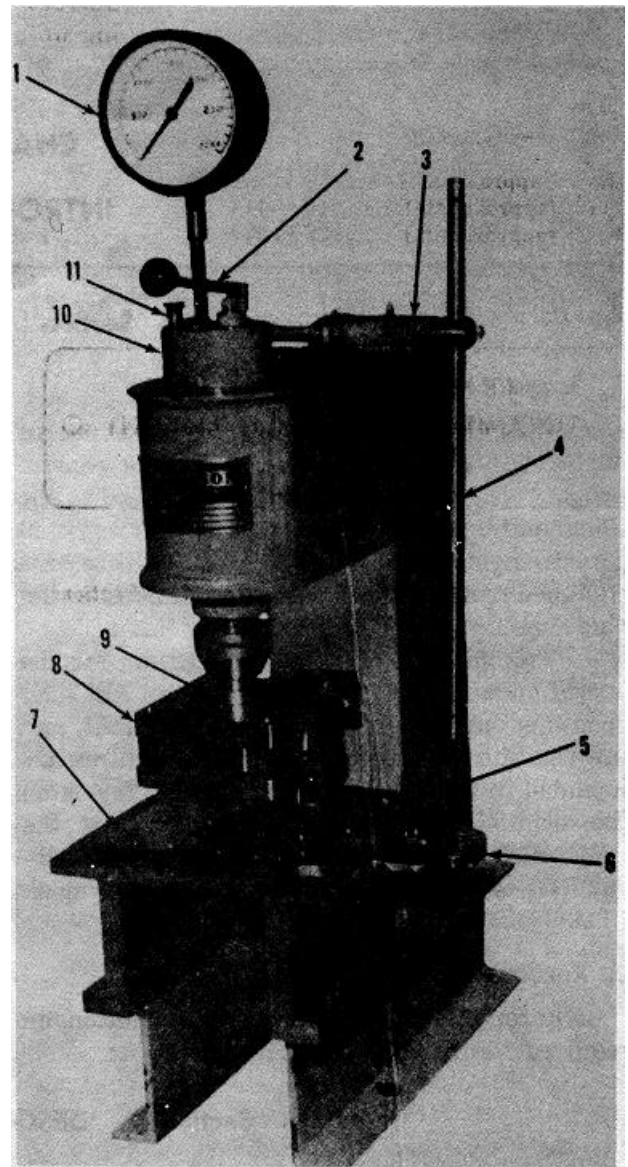
The hydraulic fluid is a corrosion-resistant oil used to restore the oil level in the hydraulic reservoir when required.

9. Gasket-Forming Compound

The gasket-forming compound is a pliable, oil-resistant paste. It is used when installing the pressure gage and pipe nipple.

10. Identification

a. *ABC-M1 Crimping Outfit.* An identification plate (fig. 2) is attached to the left side of the hydraulic press. The plate records the outfit's nomenclature, model number, and serial number.



- | | |
|-----------------|------------------|
| 1 Pressure gage | 7 Lower die |
| 2 Release lever | 8 Upper die |
| 3 Rocket shaft | 9 Ram |
| 4 Pump handle | 10 Cylinder head |
| 5 Die handle | 11 Oiler |
| 6 Cam | |

Figure 1. Hydraulic press with pressure gage and crimping dies.

b. *Hydraulic Press.* An identification plate (fig. 3) on the front of the press records manufacturer, specification, Federal stock number, and other information for the hydraulic press.

c. *Crimping Dies.* Identical serial numbers are stamped on the front edge of matching upper and lower dies.

11. Tabulated Data

Height (approximate)42 inches
Width (approximate)14 inches
Depth (approximate)22 inches

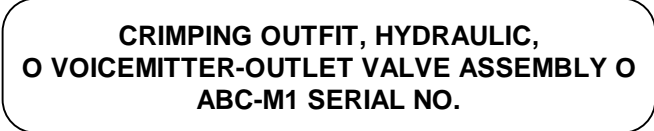


Figure 2. ABC-M1 crimping outfit identification plate.

Weight (crated) 309 pounds
Cubage (crated) 8 cubic feet
Rated pressure of hydraulic press. 10 tons
Pressure used for crimping operation. 1200 pounds per square inch

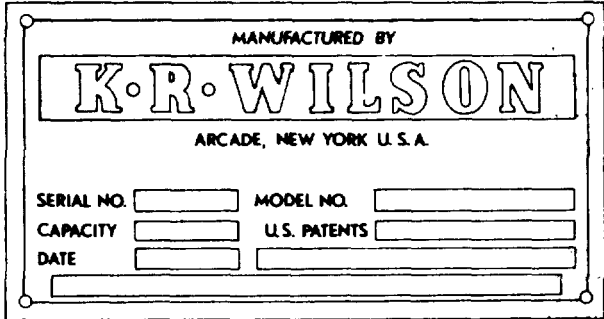


Figure 3. Hydraulic press identification plate.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

12. General

This section gives the location and purpose of controls and instruments used to operate the M1 crimping outfit. Left and right sides of the press are the operator's left and right as he face the press.

13. Controls

a. Pump Handle. The pump handle (4, fig. 1) is installed through the right end of the rocker shaft (3) that extends across the top rear of the press frame. Operating the handle with an up and down pumping motion applies pressure to the ram.

b. Release Lever. The release lever (2) is mounted on the press cylinder head (10). Pulling the lever down releases the ram (9) so the upper die (8) can be raised and lowered.

c. Handle Assembly. The handle assembly is attached to the right side of the lower die. When the handle (5) is pulled toward the operator, the cam (6) closes the movable part of the lower die (7).

14. Instruments

The pressure gage (1) is connected to the cylinder head. The gage registers pressure in pounds per square inch, when the pump handle is operated.

Section II. OPERATION

15. General

a. This section gives instructions for operating the ABC-M1 crimping outfit. Maintenance procedures are included for replacing voicemitter-outlet valve assemblies and nosecups in ABC-M17 and M17A1 masks, using the expander-ring technique.

b. Assemble materials and tools required for making the repair, and place them within easy reach of the press.

Note. Avoid interchanging mask parts. Only one model mask and parts should be in the immediate work area at one time.

16. Preparation of Mask for Repair

a. The voicemitter-outlet valve cover (including drinking tube, if applicable) must be removed from the mask. For easier handling during repair, remove the inlet valve caps, filter elements, and head harness from the mask.

b. Follow instructions given in the appropriate technical manual (para 1) for removing and installing mask components mentioned in a above. Inspect removed parts for damage. If they are undamaged, set them aside for reuse. Discard damaged parts.

17. Repair Procedures*a. Disassembly.*

(1) Grasp one of the small tabs on the crimping ring with a pair of roundnose pliers. Use the pliers to lift and twist the tab away from the voicemitter-outlet valve assembly frame and to tear the crimping ring. Pull the torn crimping ring from around the frame and discard it.

(2) Lift the voicemitter-outlet valve assembly from the facepiece.

(a) When repairing ABC-M17 masks, check the assembly frame. If the back surface

of the frame has a curled flange around the edge (fig. 4), it is an early model assembly that must be discarded. If the back surface of the frame is smooth (fig. 4), it is a late model assembly. Check all late model assemblies removed from masks for damage to the frame or diaphragm; if undamaged, they may be reused.

Note. Only late model voicemitter-outlet valve assemblies will be used in the repair procedure.

(b) When repairing M17A1 masks, check the voicemitter-outlet valve assembly (fig. 5) for damage to the frame, diaphragm, or drinking and resuscitation device. If undamaged, assembly may be reused.

(3) If the mask has an expander ring installed in the nosecup opening, remove and retain the ring for use during assembly.

(4) Remove and inspect the nosecup assembly. Discard the nosecup if the rubber is torn, split,, or deformed, or if the inlet valves on the sides of the nosecup are separated from the nosecup rubber. If the nosecup is undamaged, set it aside for reuse.

b. Assembly.

(1) Obtain a new crimping ring. Use a pair of glass pliers to grasp and prebend the two large tabs toward the center of the ring (fig. 6). Grasp the tab approximately 1/8 inch from the edge. Bend the tabs inward so they are slightly (about 5 degrees) out of alignment with the small tabs.

(2) Insert the nosecup assembly into the cavity of the facepiece. Aline the opening in the nosecup with the matching opening in the facepiece. Pull the flange around the nosecup opening through the facepiece opening. Position the nosecup so that the mold lines at both top and bottom of the nosecup flange are alined with the mold lines at the top and bottom of the facepiece opening. Arrange the nosecup flange so that it lies flat over the facepiece flange beneath it.

(3) Seat a prebent crimping ring ((1) above) around the voicemitter-outlet valve opening in the facepiece (fig. 7). Fit the two rubber flanges over the metal flange on the bottom of the crimping ring.

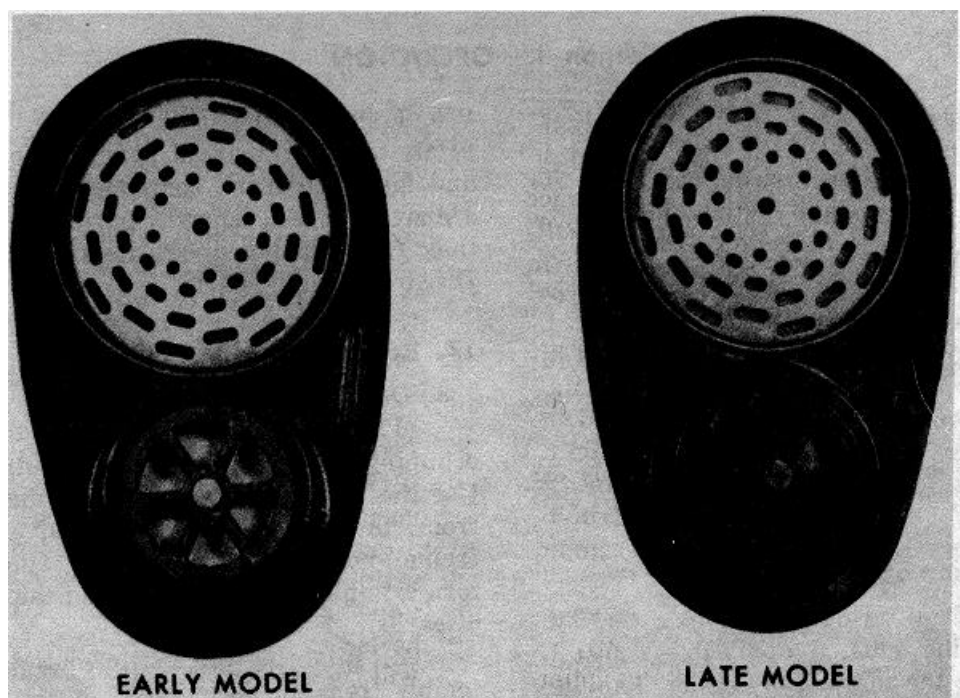
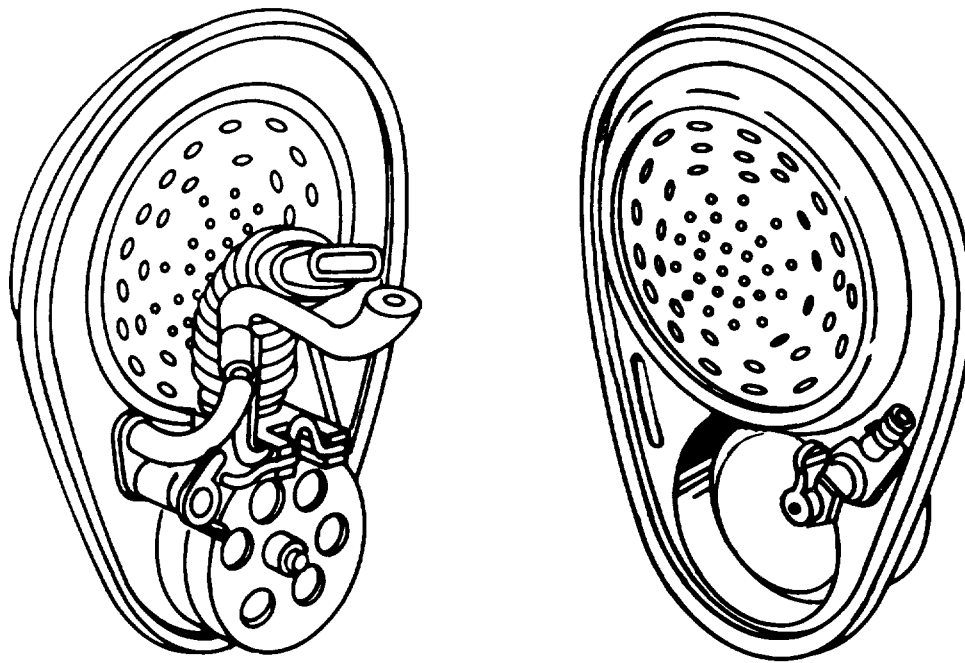


Figure 4. ABC-M17 voicemitter-outlet valve assemblies



REAR VIEW

FRONT VIEW

Figure 5. M1 7A1 voicemitter-outlet valve assembly.

(4) Install an expander ring (fig. 8) in the voicemitter-outlet valve assembly opening in the nosecup. The ring holds the nosecup and facepiece openings in proper alignment and position for crimping. Position the expander ring so that its smaller recess is toward the front of the mask and its outer edge is even with or just slightly below the surface of the nosecup flange. The small notch (1, fig. 9) on the expander ring must be aligned with the mold line (2) at the top of the nosecup flange. Make sure that the notch on the ring, the mold line on the nosecup flange, and the mold line on the facepiece are aligned, and that the flanges on both facepiece and nosecup are seated in the bottom of the crimping ring (fig. 9). Crimping ring tabs must extend above the flanges.

(5) Install a voicemitter-outlet valve assembly within the crimping ring (fig. 10).

(6) Using a pair of roundnose pliers, bend one small tab at the top and one small tab at the bottom of the crimping ring (fig. 11) to hold the assembled parts in position for crimping.

c. Crimping.

(1) Pull down on the release lever with one hand to release the upper die. With the other hand, raise the die to its highest position.

(2) Unlock the lower die by pushing the lower-die handle rearward.

(3) Hold the mask assembly under the lower die. Fit the crimping ring in the die, and position the ring against the fixed (left) side of the die. Lock the crimping ring in position (fig. 12) by pulling the handle forward, while observing that the right side of the die engages the crimping ring correctly.

(4) With the crimping ring locked in position, pull down on the release lever with one hand to release the upper die (fig. 13). At the same time, with the other hand, press down on the upper die until it touches the crimping ring in the lower die. Alignment pins in the upper die will enter corresponding holes in the lower die.

(5) Pump the pump handle (fig. 14) until the pressure gage indicates the preset pressure (para 6).

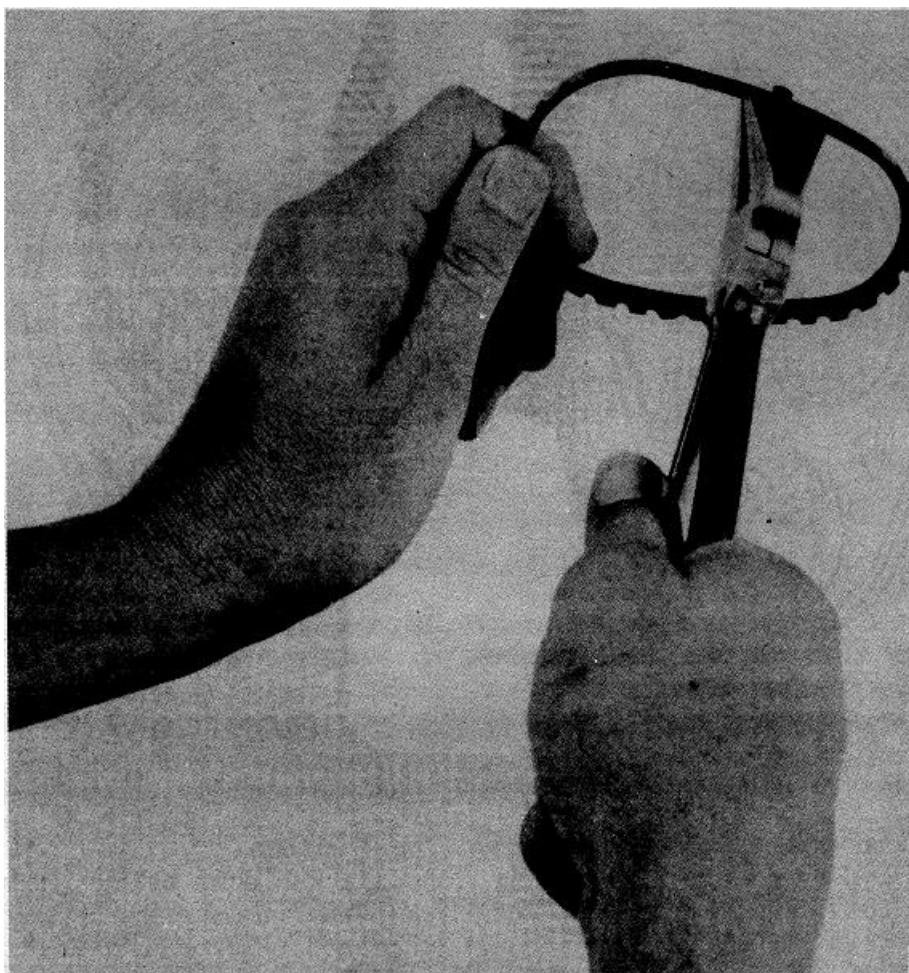


Figure 6. Bending large tabs with glass pliers.

Note. When the press reaches the preset pressure, it will automatically release. This adjustment prevents applying too much pressure for the crimp. Visual check of the gage provides assurance that the correct amount of pressure is being applied.

(6) Release and raise the upper die. Unlock the lower die, and remove the mask from the crimping outfit.

d. Checking.

(1) Check to make sure that the nosecup assembly and the voicemitter-outlet valve assembly have been crimped to the facepiece satisfactorily. Reach into the cavity of the mask between the facepiece and the top of the nosecup. Elongate the nosecup (approximately 1/4 inch) -with the middle finger by pressing the nosecup as close as possible to the voicemitter-Outlet valve frame. Hold the nosecup in

this elongated position for approximately 5 seconds. If the nosecup does not separate from the facepiece (a popping sound is usually heard if the nosecup does separate from the facepiece), the crimp is satisfactory. If the crimp is not satisfactory, rework the mask.

(2) Install mask components necessary for testing.

(3) Test the mask for leakage (para 18).

(4) Install mask components that were removed (para 16) as applicable.

(5) Install the head harness.

18. Testing Masks for Leakage

Test the mask for leakage using the M14 protective mask leakage tester.

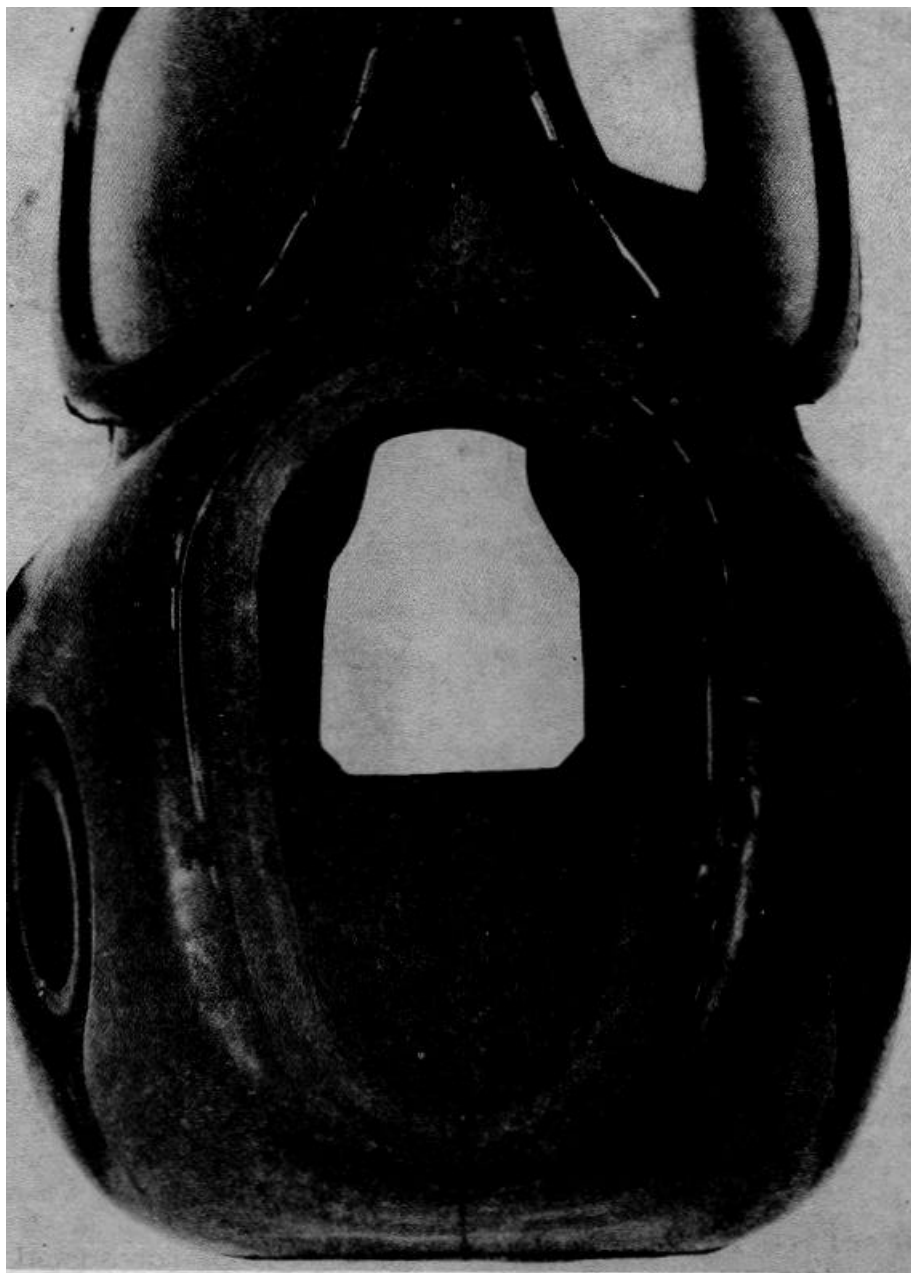


Figure 7. Crimping ring seated around the voicemitter-outlet valve assembly opening.

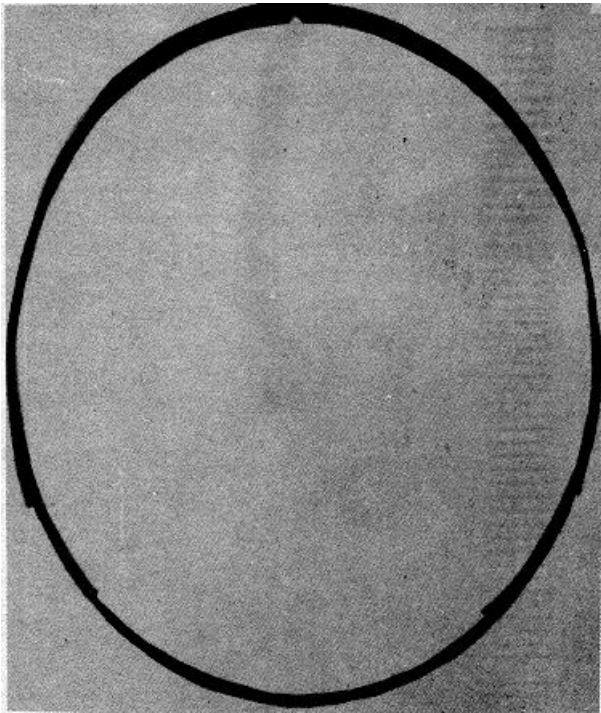
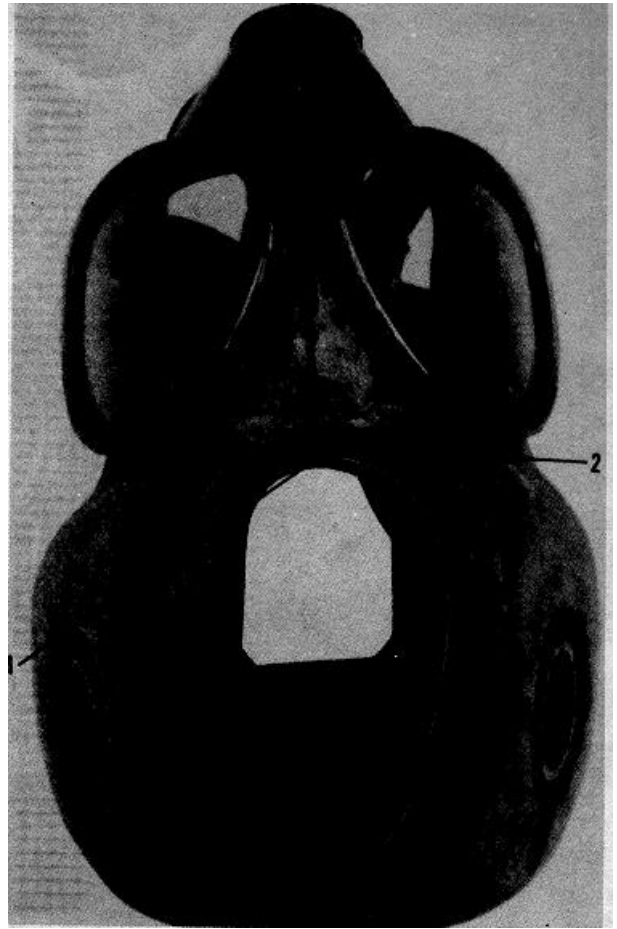


Figure 8. Expander ring.



1 Notch 2 Mold line

Figure 9. Expanded ring installed in nosecup.

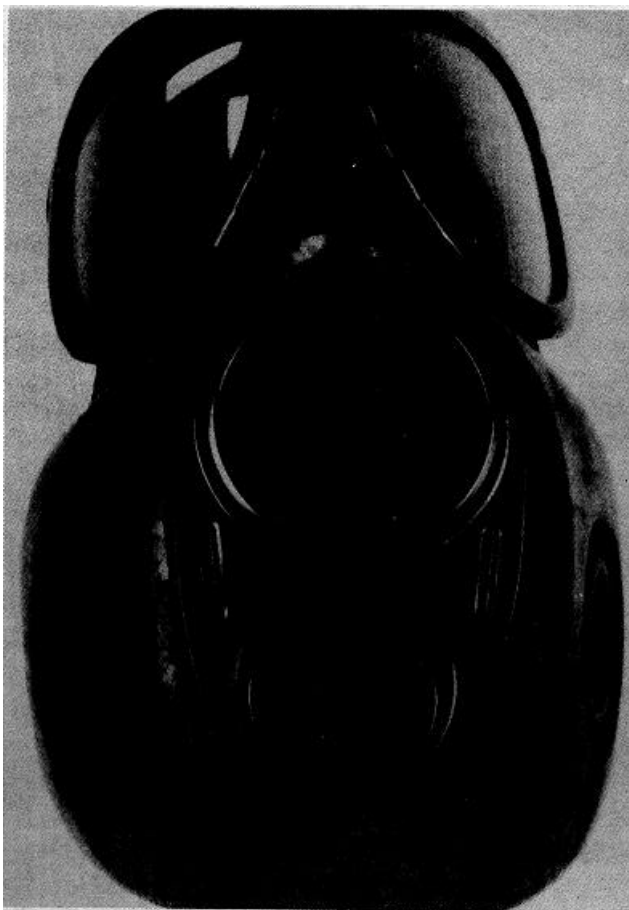


Figure 10. Voicemail-outlet valve assembly in position.

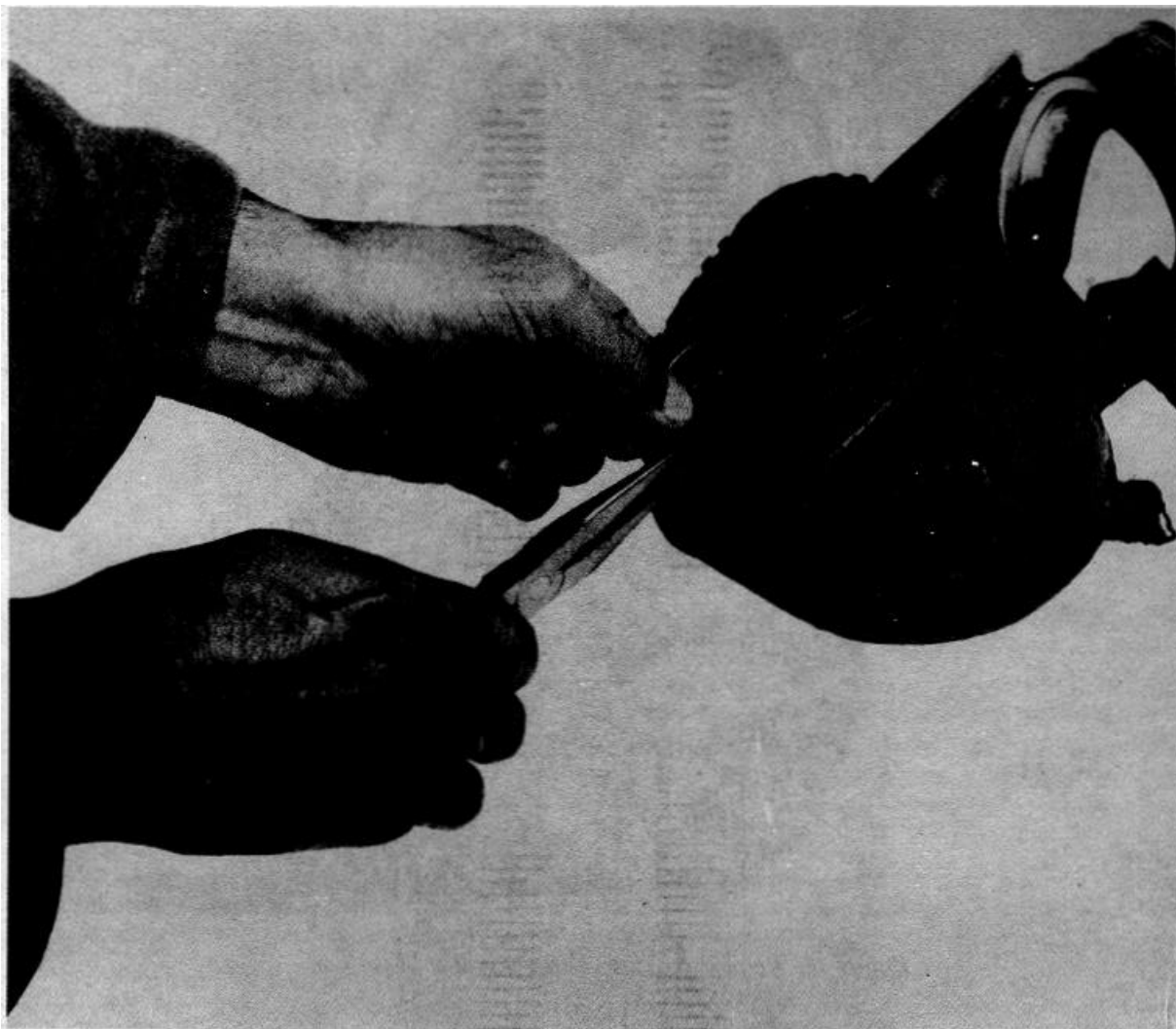


Figure 11. Bending small tabs with roundnose pliers.

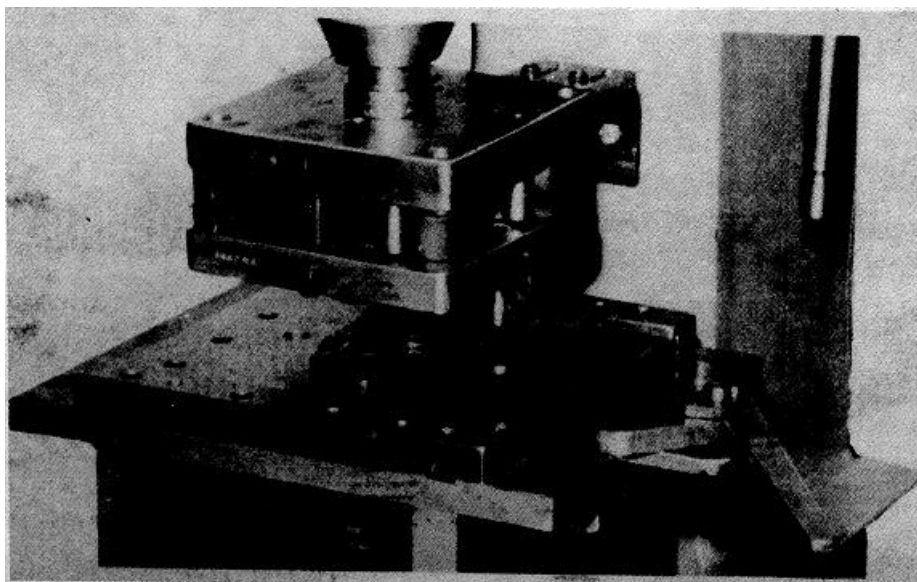


Figure 12. Crimping ring locked in position.

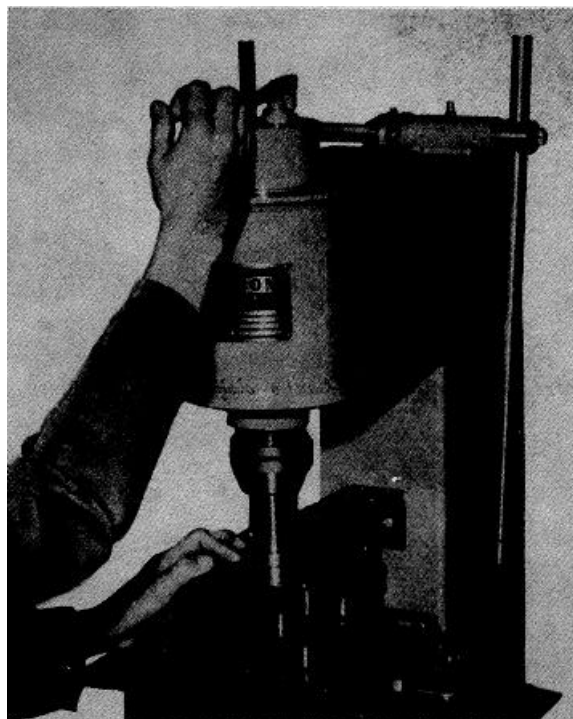


Figure 13. Releasing and lowering upper die.

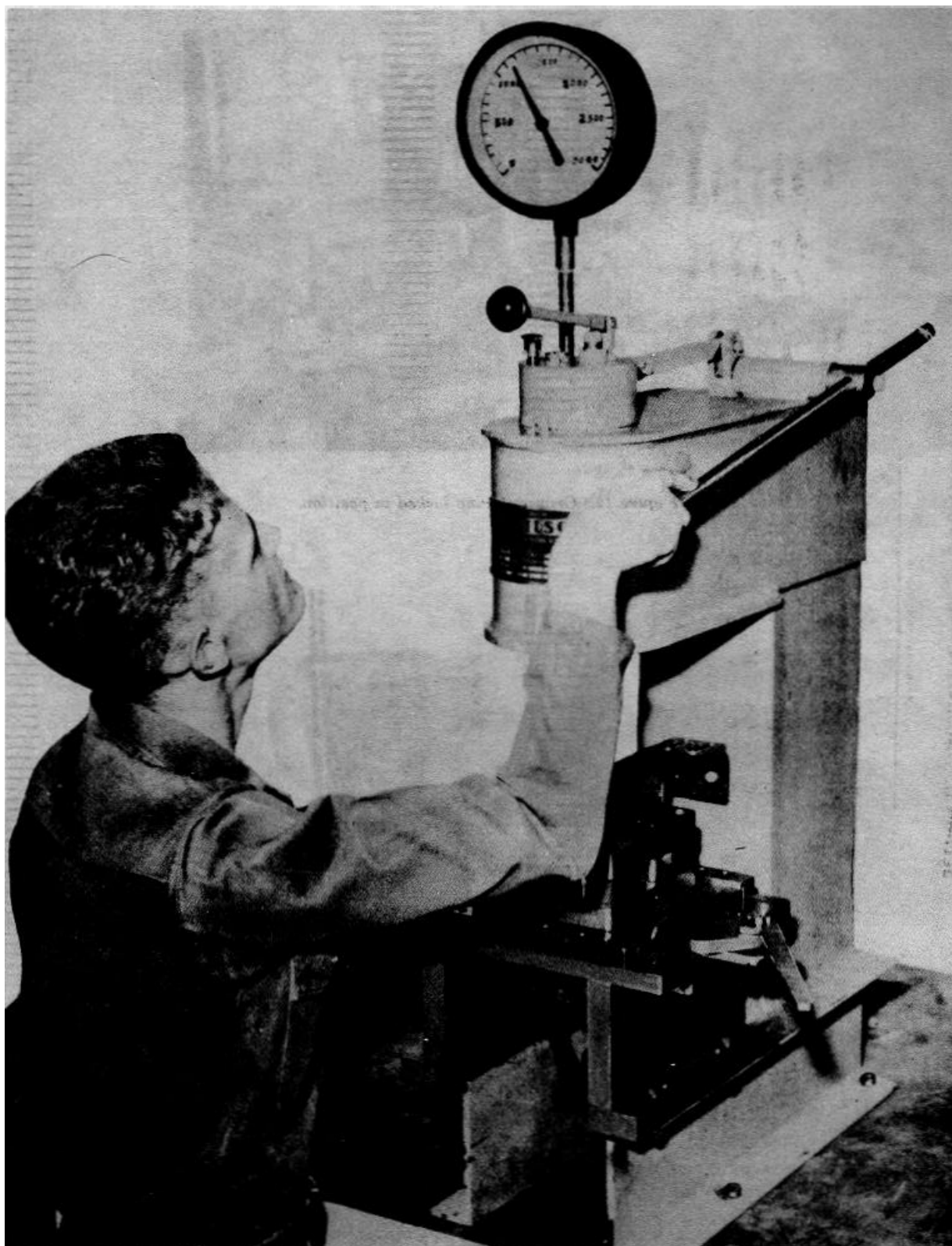


Figure 14. Pumping the pump handle to apply pressure.

CHAPTER 3 OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. SPECIAL TOOLS AND EQUIPMENT

Special tools and equipment are not required for operator maintenance of the ABC-M1 crimping outfit.

Section II. LUBRICATION

19. General

There are two lubrication points on the ABC-M1 crimping outfit. One is located on the top of the rocker shaft (3, fig. 1); the other is the lower-die handle cam.

20. Lubricating

- a. To lubricate the rocker shaft, wipe the fitting

with a clean cloth, and apply automotive and artillery grease (GAA) with a lubricating gun.

- b. To lubricate the cam, wipe the cam and mating edge of the lower die with a clean cloth. Apply a light film of general-purpose grease (FSN 9150-057-8976 or equal) to both surfaces.

Section III. OPERATOR'S PREVENTIVE MAINTENANCE SERVICES

21. General

The operator is responsible for keeping the ABC-M1 crimping outfit clean, ready for use, and in proper working order. Deficiencies must be corrected or reported to organizational maintenance personnel. Table 1 lists preventive maintenance checks and services.

22. Before-Operation Services

- a. Wipe the crimping dies with a clean, dry cloth to remove dust, grit, and oil. Be sure to remove foreign matter from all machined crevices on the working surfaces.

- b. Inspect the upper and lower dies for damage to working surfaces.

- c. Wipe entire outfit with a cloth to remove dust and oil.

- d. Check hydraulic action of the press.

- (1) With the lower die closed, operate the pump handle. If the press ram does not travel full

length of the stroke so that the dies meet, hydraulic fluid is low and more fluid must be added. To bring fluid in the hydraulic reservoir to the proper level open the hinged top oiler (11, fig. 1) and add hydraulic fluid until the fluid shows in the bottom of the oiler.

- (2) Observe the reading on the pressure gage when pump handle is operated to ensure that a dial reading of approximately 1200 psi is obtained and that pressure is automatically released at this point.

23. During-Operation Services

- a. Keep the dies free of all foreign matter.

- b. If the pump action has a cushioning effect when handle is pumped, bleed air from the hydraulic chamber.

- (1) Pump the handle to build approximately 60 psi pressure in the chamber.

- (2) Loosen the pipe plug (5, fig. 16) in the cylinder-head opening marked "I". Loosen the plug just enough to release the trapped air and permit fluid to ooze out.

(3) When fluid oozes out with no air bubbles present, tighten the pipe plug.

(4) Wipe excess fluid from the press.

24. After-Operation Services

a. Keep the M1 crimping outfit clean. Wipe all metal surfaces with a clean, dry cloth.

Note.

Do not use abrasives on the dies as this will damage the plated surfaces.

b. Move the upper die away from the lower die.

Note.

The entire M1 crimping outfit may be covered with canvas or plastic material to keep out dust and grit.

Table 1. Preventive Maintenance Checks and Services

Operator's daily schedule					
Before operation	Interval and sequence No.	After operation	Item to be inspected	Procedure	Paragraph reference
1			ABC-M1 outfit	Wipe dies and press with clean, dry cloth. Inspect for damage.	22a, b, c
2		6	Press	Check hydraulic action; add hydraulic fluid if required.	22d(1)
3		7	Pressure gage	Check pressure reading; report malfunctions.	22d(2)
	4		Dies	Keep dry and free from foreign matter.	23a
	5		Pump action	Check hydraulic action; bleed air from system if required.	23b
		8	Metal surfaces	Wipe with a clean, dry cloth.	24a

Section IV. TROUBLESHOOTING

25. General

This section provides information on locating and correcting possible malfunctions.

26. Troubleshooting Table

Table 2 lists possible malfunctions of the ABC-M1 crimping outfit. Probable cause and corrective action to be taken are included.

Table 2. Troubleshooting

Malfunction	Probable cause	Corrective action
Dies do not provide adequate crimp	Foreign matter on working surfaces	Clean die surfaces
Press ram will not travel full stroke	Hydraulic fluid is low	Fill hydraulic reservoir (para 22)
Pump action has cushioning effect	Air in hydraulic chamber	Bleed air from chamber (para 23)
Press gage does not function	Defective gage	Report malfunction to organizational maintenance

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

27. General

- a. Organizational maintenance personnel are authorized to unpack, assemble, and install the ABC-M1 crimping outfit (para 28 and 29).
- b. Perform before-operation services (para 22) before putting any equipment into service.

28. Unpacking

- a. Open the box and remove intermediate packages.
- b. Remove the four bolts anchoring the hydraulic press to the base of the box.
- c. Use a hoist to remove the press from the box and to position it on the workbench.
- d. Remove block and tie down from the release (2, fig. 1). Rotate the lever 180 degrees clockwise to move the knob to the front of the press.
- e. Pull down on the release lever with one hand. With the other hand, raise the upper die (8) of the crimping die set.
- f. Remove the shipping block from the lower die.
- g. Unpack the contents of intermediate packages.
- h. Using solvent, remove the trust-preventive coating from the various parts.

29. Assembly and Installation

Note.

Do not remove the bolt (3, fig. 15), nut (1), and washer (2) that hold the two spring-loaded parts of the lower die (10) together until after the handle assembly has been installed.

- a. *Handle Assembly* (fig. 15).
 - (1) Remove and discard the two nuts that hold the handle assembly together.

- (2) Using the capscrews (7) as a guide, align the handle bracket (5) with the spacer block (4) and the two threaded holes near the top of the right vertical support plate (9).

- (3) Tighten the capscrews as tight as possible using a 3/8-inch socket-head screw key.

- (4) Pull the handle (6) forward until the edge of the cam (8) engages the die.

- (5) Remove and discard the bolt (3), nut (1), and washer (2) that hold the two spring-loaded sections of the lower die (10) together.

b. Pressure Gage.

- (1) Remove the pipe plug (7, fig. 16) from the opening marked "G" in the top of the cylinder head.

- (2) Apply a thin coating of gasket-forming compound to the threads on the bottom of the pipe nipple (8) that is attached to the pressure gage (1).

- (1) Screw the nipple handtight into the opening marked "F".

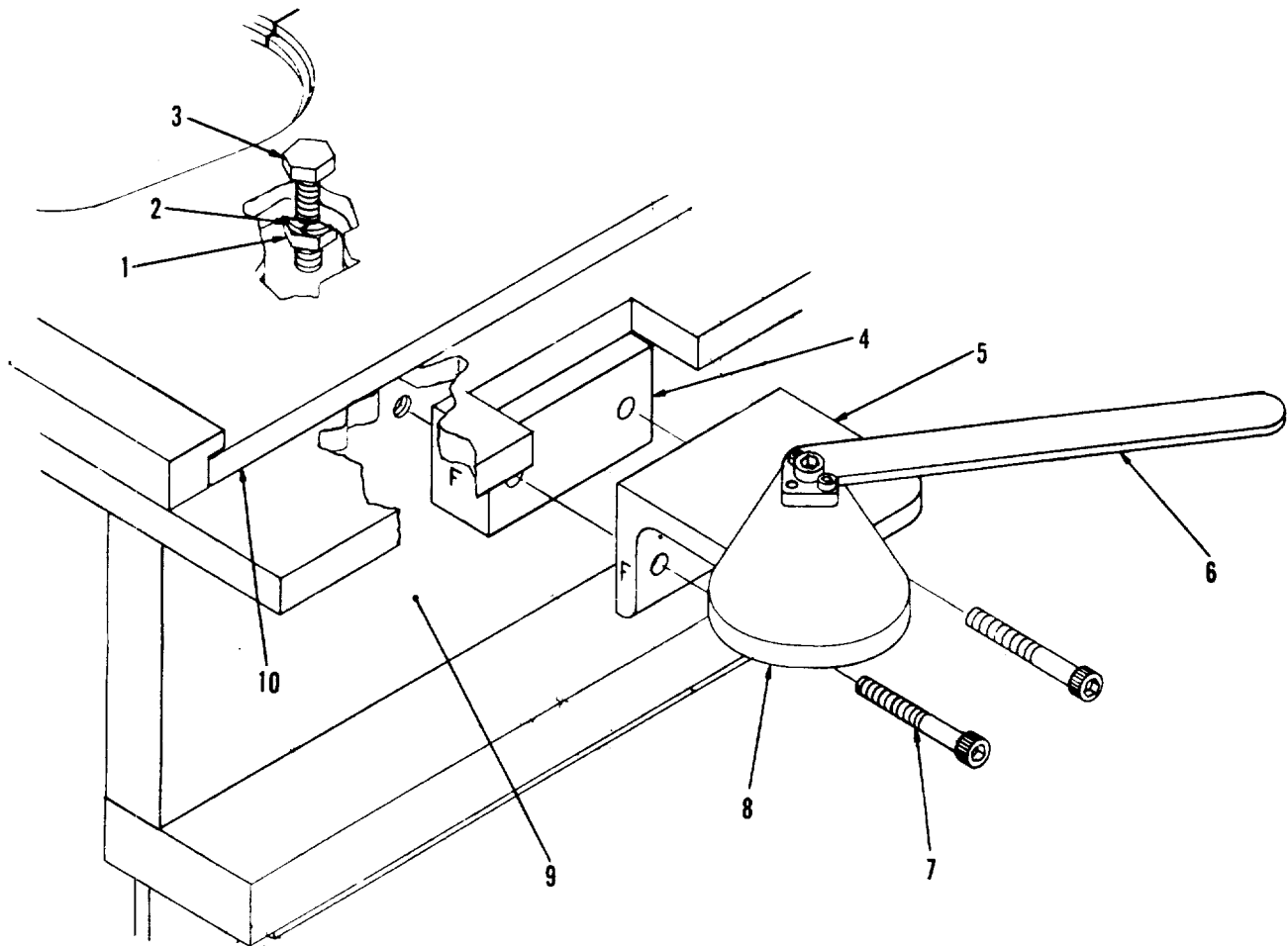
- (4) Grasp the flat surfaces on the stem of the pressure gage with a wrench, and turn the gage one full turn plus that part of a second turn that is required to make the dial face front.

c. Hinged Top Oiler.

- (1) Remove the pipe plug (3, fig. 16) from the opening marked "F".

- (2) Screw the hinged top oiler (4) finger-tight into the opening.

- d. Pump Handle.* Insert the pump handle (4, fig. 1) through the hole in the rocker shaft as shown in figure 1. Tighten the handle in position with the setscrew located in the end of

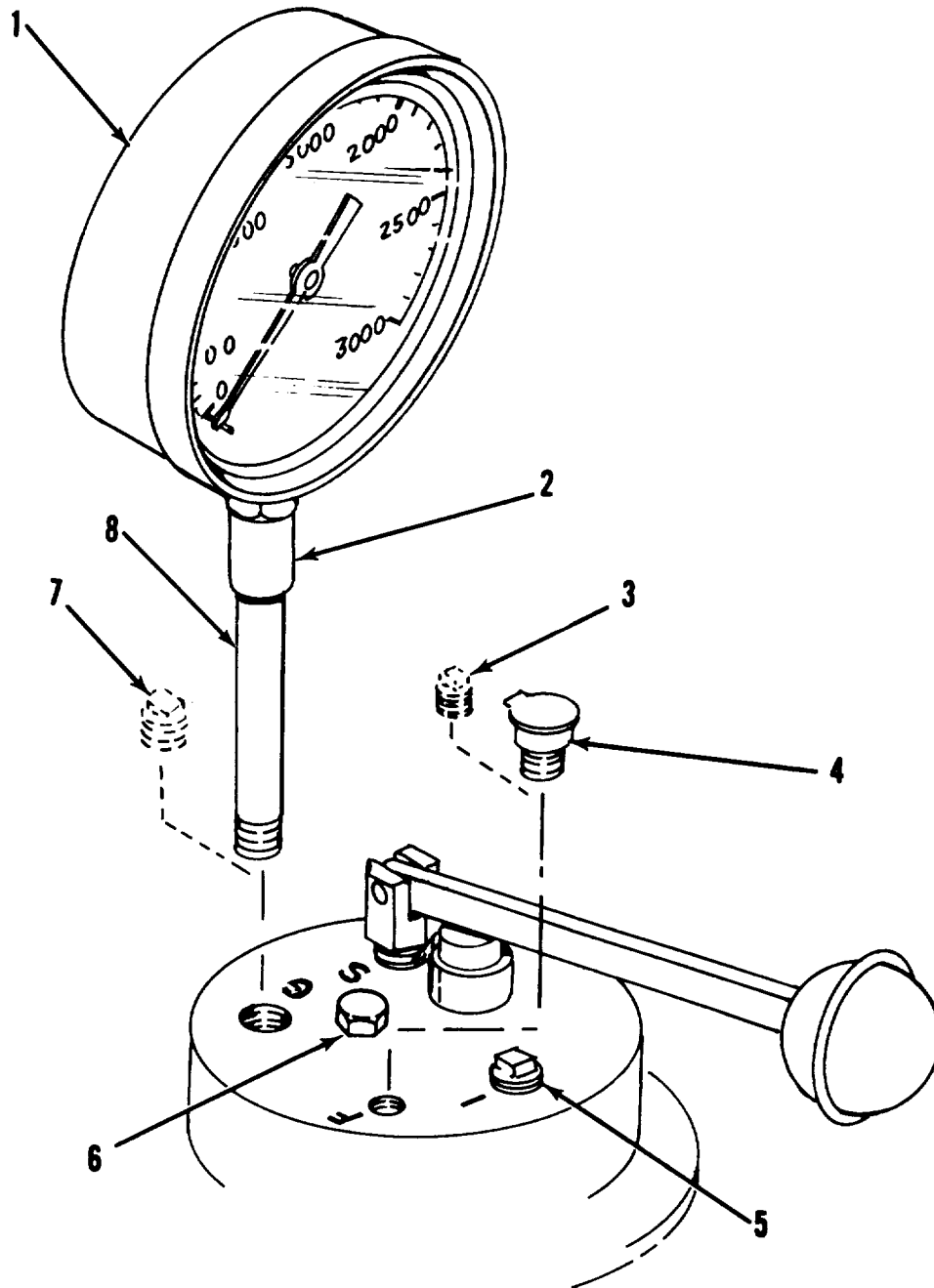


- | | |
|------------------|-----------------|
| 1 Nut | 6 Handle |
| 2 Washer | 7 Capscrew |
| 3 Bolt | 8 Cam |
| 4 Spacer block | 9 Support plate |
| 5 Handle bracket | 10 Lower die |

Figure 15. Handle assembly, exploded view.

the shaft. The pump handle's position may be adjusted to suit the operator.

e. Installation. Bolt the base of the hydraulic press to the workbench.



- 1 Pressure gage
- 2 Pipe coupling
- 3 Pipe plug (F)
- 4 Hinged top oiler

- 5 Pipe plug (I)
- 6 Pipe plug (S)
- 7 Pipe plug (G)
- 8 Pipe nipple

Figure 16. Pressure gage, hinged top oiler, and top of cylinder head.

Section II. PAINTING

30. Retouching

Organizational maintenance personnel are authorized to retouch the paint on the crimping outfit as required.

- a. Thoroughly clean all surfaces to be painted.
- b. Prime all surfaces that are cleaned to expose bare metal.

- c. Retouch with a matching shade of lusterless enamel.

31. Instructions

Refer to TM 9-213 for general cleaning instructions and methods of painting.

Section III. ORGANIZATIONAL PREVENTIVE MAINTENANCE SERVICES

32. Hydraulic Press

a. Organizational maintenance personnel are authorized to remove and install the cylinder assembly.

b. If repairs are required, notify general support maintenance personnel.

33. Pressure Gage

a. *Description.* The pressure gage is described in paragraph 6. The gage is installed, using a pipe coupling and a pipe nipple, in the opening marked "G" on the top of the press cylinder head.

b. *Maintenance.* Organizational maintenance personnel are authorized to replace a defective or-damaged pressure gage.

(1) *Removal.*

(a) Hold the pipe coupling (2, fig. 16) with a pipe wrench. With an open-end wrench, grasp

the flat surfaces on the gage stem and unscrew the gage from the coupling.

(b) As the gage is unscrewed, brush away any loose dirt, grit, or paint that may accumulate around the top of the coupling so foreign matter will not fall into the opening.

(c) Remove the gage from the press.

(2) *Installation.*

(a) Unpack the new pressure gage.

(b) Apply a thin coating of gasket-forming compound to the gage-stem threads.

(c) Screw the gage handtight into the coupling.

(d) Grasp the flat surfaces of the gage stem with a wrench. Turn the gage one full turn plus that part of a second turn that is required to make the dial face front.

CHAPTER 5
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Direct support maintenance is not authorized for the ABC-M1 voicemitter-outlet valve assembly hydraulic crimping outfit.

CHAPTER 6
GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. GENERAL

34. General

General support maintenance personnel are authorized to repair the hydraulic press, replace and align the crimping die set, and calibrate the pressure gage.

35. Hydraulic Press

Repairs on the hydraulic press will be performed in accordance with the instruction manual supplied and packaged with the outfit.

Section II. CRIMPING DIE SET

36. General

The crimping die set is described in paragraph 6. The upper die screws onto the threaded adapter on the press ram. The lower die, including two vertical support plates, is bolted to the base of the press.

37. Maintenance (fig. 14)

Crimping dies are replaced as a set, never singly.

a. Removal.

(1) Raise the upper die (4); close the lower die (7).

(2) Using a blunt punch and hammer, remove the four dowel pins (13) from the support plates (9).

(3) Remove the four nuts (12), washers (11), and capscrews (10) that hold the support plates to the base of the press (14).

(4) Remove the lower die, with support plates attached, from the press.

(5) Lower the upper die until it is below the adjustable guide (2).

(6) Unscrew the upper die from the adapter (3) on the press ram (1), and remove the upper die from the press.

b. Installation.

(1) Unpack the new set of dies. Check to be sure that the serial numbers on the upper and lower dies are identical.

Note.

Do not remove the bolt (3, fig. 15), nut (1), and washer (2) that hold the two spring-loaded parts of the lower die (10) together until after the handle assembly has been installed.

(2) Screw the upper die fully onto the press ram, and position the serial number toward the front of the press. Raise the upper die, and reposition the adjustable guide as necessary.

(3) Place the lower die on the base of the press. The serial number must face forward.

(4) Align bolt holes, and bolt the support plates loosely to the base of the press with four capscrews, washers, and nuts.

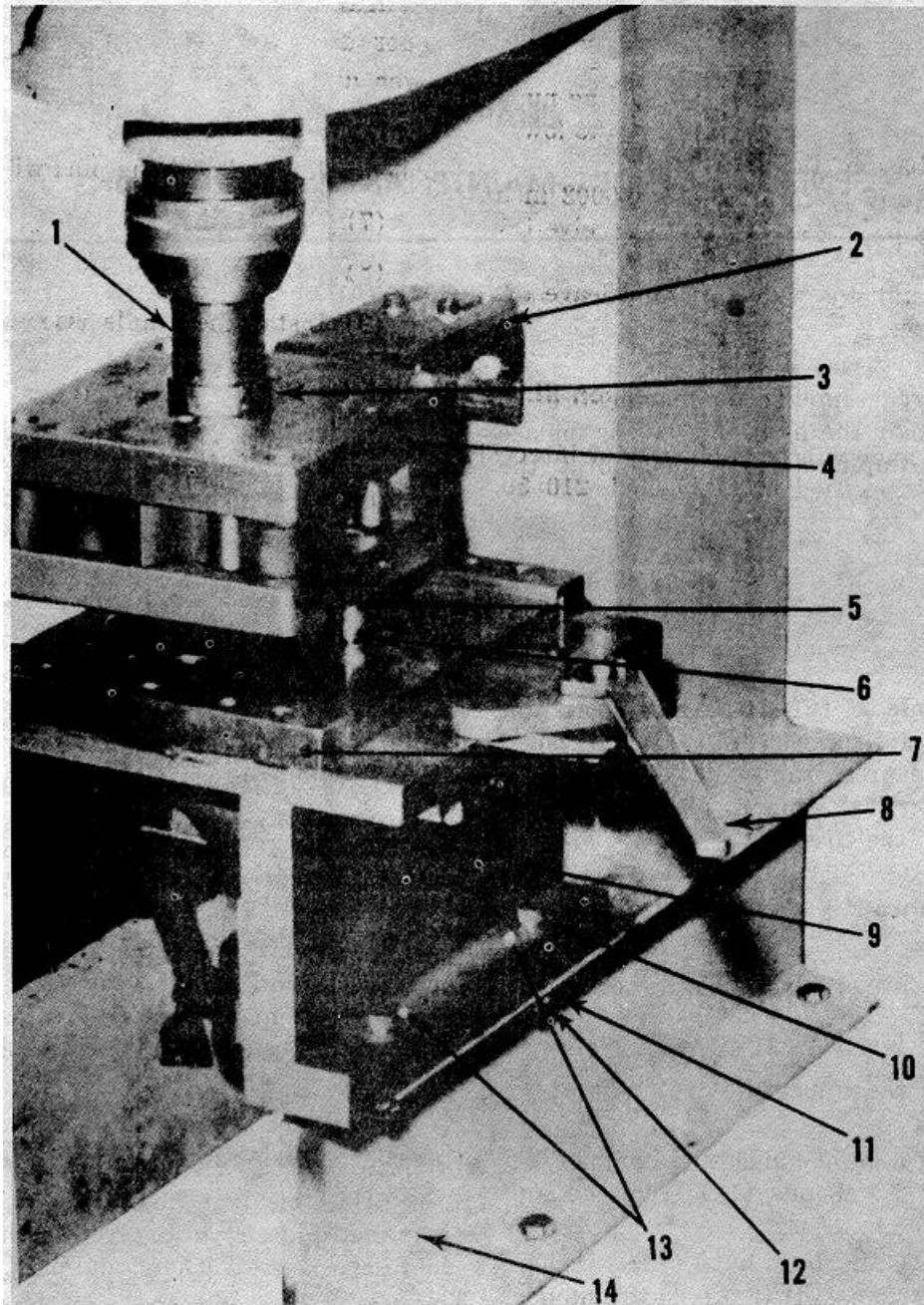
(5) Lower the upper die onto the lower die. Be sure that alignment pins (5, fig. 17) on the upper die fit smoothly into corresponding alignment holes (6) in the lower die.

(6) Tighten the capscrews.

c. Alinement

Note.

Support plates of the replacement lower die have not been drilled to receive the four dowel pins.



- 1 Ram
- 2 Guide
- 3 Adapter
- 4 Upper die
- 5 Alinement pin
- 6 Alinement hole
- 7 Lower die

- 8 Die handle
- 9 Support plate
- 10 Capscrew
- 11 Washer
- 12 Nut
- 12 Dowel pins
- 14 Press base

Figure 17. Crimping die set installation.

(1) After capscrews have been tightened (b(6) above), mark the bottom of the support plate for drilling. Marking is done up through the pin holes in the base of the press.

(2) Raise the upper die, remove the nuts, washers, and capscrews, and remove the lower die from the base of the press.

(3) Drill and ream 0.2494 + 0.0003 inch diameter holes in support plates to receive the dowel pins.

(4) Reinstall the lower die, and leave the capscrews loose.

(5) Lower the upper die onto the lower die; again be sure that the alinement pins of the upper die fit smoothly into the holes in the lower die.

(6) Insert the dowel pins in the newly drilled holes, and seat the pins with a hammer.

(7) Tighten the capscrews.

(8) Raise the upper die.

(9) Install the handle assembly (para 29).

Section III. PRESSURE GAGE

The pressure gage will be calibrated at intervals specified in TB 750-109. Calibration will be performed as specified in TB 9-6685-210-50.

CHAPTER 7
DEPOT MAINTENANCE INSTRUCTIONS

38. General

Depot maintenance consists of repairing and rebuilding components of the M1 crimping outfit in a manner that will restore them to their original condition.

39. Maintenance

When depot maintenance is required that is beyond the scope of this manual or the manufacturer's instruction

manual, use DA Form 2407 (Maintenance Request) to report the deficiency. Forward the request direct to Commanding Officer, Edgewood Arsenal, ATTN: SMUEA-TSE-TP, Edgewood Arsenal, Md. 21010; send an information copy to Commanding General, U. S. Army Ammunition Procurement and Supply Agency, ATTN: SMUAP-FG, Joliet, Ill. 60436.

CHAPTER 8
LIMITED STORAGE

40. Preparation

Coat all unpainted or unplated metal surfaces, such as the pump handle and press cylinder head, with preserving oil. Cover the outfit with a protective sheet of canvas or plastic material to keep out dust and grit.

41. Storage

Store the outfit in a location where the pressure gage will not be subjected to impact by heavy tools or machinery.

**APPENDIX A
REFERENCES**

TB 750-109	Calibration and Maintenance Calibration Requirements for Test and Measuring Equipment Used to Support U.S. Army Munitions Command Materiel.
TB 9-6685-210-50	Calibration Procedure for Dial Indicating Pressure Gages (0 to 10,000 PSI).
TM 3-4240-202-15	Organizational, DS, GS, and Depot Maintenance Manual: Mask, Protective, Field, ABC-M17.
TM 3-4240-258-14	Operator, Organizational, Direct Support and General Support Maintenance Manual: Mask, CBR: Field M17A1 and Accessories.
TM 9-213	Painting Instructions for Field Use.
TM 38-750	Army Equipment Record Procedures.

**APPENDIX B
BASIC ISSUE ITEMS**

Section I. INTRODUCTION

1. Scope

This appendix lists items which accompany the ABC-M1 crimping outfit, or are required for installation, operation or operator's maintenance.

2. General

This Basic Issue Items List is divided into the following sections:

a. Basic Issue Items-Section II. A list of items which accompany the ABC-M1 crimping outfit and are required by the operator/crew for installation, operation, or maintenance.

b. Maintenance and Operating Supplies-Section III. "NOT APPLICABLE."

3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items, Section II.

a. Source, Maintenance and Recoverability Codes (SMR), Column 1.

(1) Source code, indicates the selection status and source for the listed item. Source codes are:

Code	Explanation
A	Assemblies which are not procured or stocked as such but are made up of two or more units, each of which carry individual stock numbers and descriptions and are procured and stocked and can be assembled by units at indicated maintenance categories.
M	Repair parts which are not procured or stocked but are to be manufactured at indicated maintenance categories.
P	Repair parts which are stocked in or supplied from the GSA/DSA, or Army sup-

Code

Explanation

	ply system, and authorized for use at indicated maintenance categories.
X	Parts and assemblies which are not procured or stocked; the mortality of which normally is below that of the applicable end item; and the failure of which should result in retirement of the end item from the supply system.
X1	Repair parts which are not procured or stocked, the requirement for which will be supplied by use of next higher assembly or component.
X2	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through supply channels.
C	Repair parts authorized for local procurement. If not obtainable from local procurement, such repair parts will be requisitioned through normal supply channels with a supporting statement of nonavailability from local procurement.
G	Major assemblies that are procured with PEMA funds for initial issue only to be used as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DSU and GSU level or returned to depot supply level.
	(2) Maintenance code, indicates the lowest category of maintenance authorized to install the listed item. The maintenance level code is:

Code

Explanation

C	Operator/crew
---	---------------

(3) Recoverability code, indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	Explanation
R	Repair parts and assemblies which are economically reparable at DSU , and GSU activities and normally are furnished by supply on an exchange basis.
T	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value reusable casings or castings.
S	Repair parts and assemblies which are economically reparable at DSU and GSU activities and normally are furnished on an exchange basis. When determined to be uneconomically reparable by DSU and GSU activities, they will be returned to the depot for evaluation and analysis prior to final disposition.

b. *Federal Stock Number, Column 2.* This column indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. *Description, Column 3.* This column indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

d. *Unit of Measure (U/M), Column 4.* A two character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowance is based, e.g., ft., ea., pr., etc.

e. *Quantity Incorporated in Unit, Column, 5.* This column indicates the quantity of the item used in the functional group. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated (e.g., shims, spacers, etc.).

f. *Quantity Furnished with Equipment, Column 6.* This column indicates the quantity of an item furnished with the equipment.

g. *Illustration, Column 7.* This column is divided as follows:

(1) *Figure Number, Column 7a.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item Number, Column 7b.* Indicates the callout number used to reference the item in the illustration.

4. Explanation of Columns in the Tabular List of Maintenance and Operating Supplies Section III

Not applicable.

5. Special Information

Not applicable.

6. Abbreviations

Abbreviation	Explanation
tu	Tube

7. Federal Supply Code for Manufacturers

Code	Manufacturer
77247	Permatex Co., Brooklyn, N. Y.
81348	Federal Specification
81349	Military Specification

Section II. BASIC ISSUE ITEMS LIST

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) ILLUSTRATION	
						(a) FIG NO.	(b) ITEM NO.
		GROUP 400-TOOLS					
P-C	5120-224-1535	PLIERS, GLASS, type VIII GGG-P-471 (81348)	ea	-	1	4	1
P-C	5120-240-6172	PLIERS, SHORT ROUND NOSE, type X1 GGG-P-471 (81348)	ea	-	1	4	2

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) QTY FURN WITH EQUIP	(7) <u>ILLUSTRATION</u> (a) FIG NO. (b) ITEM NO.	
		GROUP 500-MAINTENANCE MATERIAL					
P-C	8030-252-3391	GASKET-FORMING COMPOUND PERMATEX #2 (77247)	tu	-	1		
P-C	9150-252-6383	HYDRAULIC FLUID, 1-qt. can MIL-H-5606 (81349)	qt	-	1		
		PUBLICATIONS TM 3-5180-210-15, OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL			2		

APPENDIX C MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. The maintenance allocation chart (sec II) lists the authorized maintenance functions assigned the maintenance levels to ensure complete maintenance support of the ABC-M1 crimping outfit.

b. This chart assigns organizational, general, and depot maintenance levels, in order to reflect the degree of skills required for maintenance operations.

2. Maintenance Functions

Maintenance functions authorized are limited to and defined as follows:

a. *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. *Test.* To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

c. *Service.* To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air.

d. *Adjust.* To rectify to the extent necessary to bring into proper operating range.

e. *Align.* To adjust specified variable elements of an item to bring to optimum performance.

f. *Calibrate.* To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is certified standard of known accuracy to detect and adjust any discrepancy in the accuracy of the instrument compared with certified standard.

g. *Install.* To set up for use in an operational environment such as an emplacement, site, or vehicle.

h. *Replace.* To replace unserviceable items with serviceable assemblies, subassemblies, or parts.

i. *Repair.* To restore an item to serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.

j. *Overhaul.* To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards using the Inspect and Repair Only as Necessary (IROAN) technique.

k. *Rebuild.* To restore an item to a standard as nearly as possible to the original or new condition in appearance, performance, and life expectancy. This is accomplished through complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

l. *Symbols.* Single letter symbol placed in a maintenance function column designates the level of maintenance responsible for performing that particular function.

3. Explanation of Format

The purpose and use of the format are as follows:

a. *Column (1), Group Number.* Lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column (2), Functional Group. Column (2) lists the groups, sections, noun names of components, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Column (3), Maintenance Function. Column (3) lists the maintenance categories, designated by single letter entered under the maintenance function subcolumn heading, authorized to perform the indicated function.

d. Use of Symbols. Single letter (symbols) used in Column (3) are as follows:

Maintenance function number codes:

- (1) C-Driver, Operator, or Crew Maintenance
- (2) O-Organizational Maintenance
- (3) F-Direct Support Maintenance
- (4) H-General Support Maintenance
- (5) D-Depot Maintenance

e. Column (4), Tools and Equipment. Column (4) lists the special tools and test equipment, if required, used in performing the authorized maintenance function.

f. Column (5), Remarks. Column (5) contains supplemental information.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional Group	(3) Maintenance Function										(4) Tools and Equipment	(5) Remarks			
		I n s p e c t	T e s t	S e r v i c e	A d j u s t	A l i n e	C a l i b r a t e	I n s t a l l	R e p l a c e	R e p a i r	O v e r h a u l			R e b u i l d		
100	CRIMPING OUTFIT, ABC-M1 PRESS, HYDRAULIC	C		C												a. See Chapter 7 b. This equipment is only authorized for depot use; therefore, all maintenance functions allocated would be performed by depot maintenance personnel.
200	DIE SET ASSEMBLY	C		C		H			O	H	D			*		
300	PRESSURE INDICATOR ASSEMBLY	C		C			H		O	O						

**APPENDIX D
 COMBINED ORGANIZATIONAL, AND DEPOT MAINTENANCE
 REPAIR PARTS AND SPECIAL TOOL LISTS
 FOR CRIMPING OUTFIT, HYDRAULIC, VOICEMITTER-OUTLET
 VALVE ASSEMBLY, ABC-M1 (FSN 5180-911-1366)**

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Section I. INTRODUCTION

1. Scope

This appendix lists the repair parts required for performance of organizational, direct support, general support and depot maintenance of the ABC-M1 Crimping Outfit.

2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Prescribed Load Allowance (PLA)-Section II. Not applicable.

b. Repair Parts-Section III. A list of repair parts authorized for performance of maintenance at the organizational level in figure and item number sequence.

c. Special Tools, Test and Support Equipment-Section IV. Not applicable.

d. Repair Parts-Section V. A list of repair parts authorized for performance of maintenance at direct support, general support and depot level in figure and item number sequence.

e. Special Tools, Test and Support Equipment-Section VI. Not applicable.

f. Federal Stock Number and Reference Number Index-Section VII. A list of Federal stock numbers in ascending numerical sequence, followed by reference numbers appearing in all the listings, in ascending alphanumeric sequence, cross-referenced to figure number and item number.

3. Explanation of Columns

The following provides an explanation of columns in the tabular lists in sections III, V, and VII:

a. *Source, Maintenance, and Recoverability Codes (SMR).*

(1) *Source Code.* Indicates the selection status and source for the listed item. Source codes used are:

Code	Explanation
A	Assemblies which are not procured or stocked as such but are made up of two or more units, each of which carry individual stock numbers and descriptions and are procured and stocked and can be assembled by units at indicated maintenance categories.
	Repair parts which are not procured or stocked but are to be manufactured at indicated maintenance categories.
P	Repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
X	Parts and assemblies which are not procured or stocked; the mortality of which normally is below that of the applicable end item; and the failure of which should result in retirement of the end item from the supply system.
X1	Repair parts which are not procured or stocked, the requirement for which will be supplied by use of next higher assembly or component
X2	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with supporting justification through supply channels.
C	Repair parts authorized for local procurement. If not obtainable from local procurement, such repair parts will be requisitioned through normal supply channels with a supporting statement of nonavailability from local procurement.
G	Major assemblies that are procured with PEMA funds for initial issue only to be used as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DSU and GSU level or returned to depot supply level.

(2) *Maintenance Code.* Indicates the lowest category of maintenance authorized to in-

stall the listed item. The maintenance level codes are:

Code	Explanation
C	Operator/crew
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(3) *Recoverability Code.* Indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are:

Code	Explanation
R	Repair parts and assemblies which are economically reparable at DSU and GSU activities and normally are furnished by supply on an exchange basis.
T	High dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value reusable castings or castings.
S	Repair parts and assemblies which are economically reparable at DSU and GSU activities and normally are furnished on an exchange basis. When determined to be uneconomically reparable by DSU and GSU activities, they will be returned to the depot for evaluation and analysis prior to final disposition.

b. *Federal Stock Number.* Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. *Description.* Indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

d. *Unit of Measure (U/M).* A 2 character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based e.g., ft, ea, pr, etc.

e. *Quantity Incorporated in Unit.* Indicates the quantity of the item used in the functional group. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated (e.g., shims, spacers, etc).

f. 15-Day Organizational Maintenance Allowances.

(1) The allowance columns are divided into four subcolumns. Indicated in each subcolumn opposite the first appearance of each item is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

(2) The quantitative allowances for organizational level of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the density column to obtain the total quantity of repair parts authorized.

(3) Organizational units providing maintenance for more than 100 of these equipments shall determine the total quantity of parts required by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example, authorized allowance for 51-100 equipments is 40; for 150 equipments multiply 40 by 1.50 or 60 parts required.

(4) Subsequent changes to allowances will be limited as follows: No change in the range of items is authorized. If additional items are considered necessary, recommendation should be forwarded to: Commanding Officer, Edgewood Arsenal, ATTN: SMUEA-TSE-TP, Edgewood Arsenal, Maryland 21010, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by Edgewood Arsenal based upon engineering experience, demand data, or TAERS information.

g. 30-Day DS/GS Maintenance Allowances.

Note. Allowance in GS column are for GS maintenance only.

(1) The allowance columns are divided into three subcolumns. Indicated in each subcolumn, opposite the first appearance of each

item, is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in the allowance column.

Items authorized for use as required but not for stockage are identified with an asterisk in the allowance column.

(2) The quantitative allowances for DS/ GS levels of maintenance will represent initial stockage for a 30-day period for the number of equipments supported.

(3) Determination of the total quantity of parts required for maintenance of more than 10 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example, authorized allowance for 51-100 equipment is 40; for 150 equipments, multiply 40 by 1.50 or 60 parts required.

h. 1-Year Allowance Per 100 Equipments/ Contingency Planning Purposes. Indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

i. Depot Maintenance Allowance Per 100 Equipments. Indicates opposite the first appearance of each item, the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use but not for initial stockage are identified with an asterisk in the allowance column.

j. Illustration.

(1) *Figure number.* Indices the figure number of the illustration in which the item is shown.

(2) *Item number.* Indicates the callout number used to reference the item in the illustration.

4. Special Information

a. This equipment is issued to Depot Maintenance organizations. However, maintenance

functions are listed for other categories to reflect the degree of skill required to perform the function.

b. Press FSN 3444-163-4338 repair parts are authorized for local procurement from the manufacturer. The manufacturer's parts list is provided with each press. The press is delivered filled with hydraulic fluid FSN 9150-252-6383, MIL-H-5606.

5. How to Locate Repair Parts

a. *When Federal Stock Number or Reference Number, is Unknown.*

(1) *First.* Using the table of contents, determine the functional group, i.e., within which the repair part belongs. This is necessary since illustrations are prepared for functional groups, and listings are divided into the same groups.

(2) *Second.* Find the illustration covering the functional group to which the repair part belongs.

(3) *Third.* Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(4) *Fourth.* Using the Repair Parts Listing, find the functional group to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. *When Federal Stock Number or Reference Number is Known.*

(1) *First.* Using the Index of Federal Stock Numbers and Reference Numbers, find the pertinent Federal stock number or reference number. This index is in ascending FSN sequence followed by the reference numbers in alpha-numeric sequence, cross-referenced to illustration figure number.

(2) *Second.* Using the Repair Parts Listing, find the functional group of the repair part and the illustration figure number and item number referenced in the Index of Federal Stock Numbers and Reference Numbers.

6. Abbreviations

Abbreviation	Explanation
C/O	Consisting of
N.P.T.	National Pipe Thread
P.S.I.....	Pounds Per Square Inch
tu	Tube
W/O	Without

7. Federal Supply Codes for Manufacturers

Code	Manufacturer
38056	Manning Maxwell and Moore, Inc. Stratford, Conn.
65966	Wilson K.R. Buffalo, N. Y.
77247	Permatex Co, Inc. Brooklyn, N. Y.
81348	Federal Specification
81349	Military Specification

Section III. REPAIR PARTS LIST ORGANIZATIONAL MAINTENANCE

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 15 DAY ORGANIZATIONAL MAINTENANCE ALW				(7) ILLUSTRATION	
					(a)	(b)	(c)	(d)	(a)	(b)
					1-5	6-20	21-50	51-100	FIGURE NO.	ITEM NO.
	5180-911-1366	CRIMPING OUTFIT, HYDRAULIC VOICEMITTER-..... OUTLET VALVE ASSEMBLY, ABC-M1 D77-1-30 (81361)	ea	1						
		GROUP-100 PRESS								
P-O	9150-252-6383	HYDRAULIC FLUID 1-qt. can..... MIL-H-6606 (81349)	ea	-	*	*	*	*		
		GROUP-300 PRESSURE								
P-O	6685-806-4584	GAGE, PRESSURE, DIAL INDICATING 1/4 N.P.T. bottom connection 3000 P.S.I. 1056S (38056)	ea	1	*	*	*	*	3	1
P-O	8030-252-3391	GASKET-FORMING COMPOUND..... Permatex #2 (77247)	tu	AR	*	*	*	*		
		GROUP-400 TOOLS								
P-O	5120-224-1535	PLIERS, GLASS type VII 7/8-in. jaw..... GGG-P-471 (81348)	ea	1	*	*	*	*	4	1
P-O	5120-240-6172	PLIERS short rd. nose W/O cutter type XI class 2, style B GGG-P-471 (81348)	ea	1	*	*	*	*	4	2

**Section V. REPAIR PARTS LIST DIRECT SUPPORT,
GENERAL SUPPORT, AND DEPOT MAINTENANCE**

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30 DAYS DS MAINT ALLOWANCE			(7) 30 DAYS GS MAINT ALLOWANCE			(8) 1-YR ALW PER 100 EQUIP CNTGCV	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATION	
					(a)	(b)	(c)	(a)	(b)	(c)			(a)	(b)
					1-20	21-50	51-100	1-20	21-50	51-100			FIGURE NO.	ITEM NO.
	5180-911-1366	CRIMPING OUTFIT, HYDRAULIC VOICE-MITTER OUTLET VALVE ASSEMBLY, ABC-M1 D77-1-30 (81361) GROUP-100 PRESS	ea	1										
P-H-R	3444-163-4338	PRESS, HYDRAULIC, 10 ton, (modified) D77-1-31 (81361)	ea	1				*	*	*	1.50		1	
P-O	9150-252-6383	HYDRAULIC FLUID 1-qt. can MIL-H-5606 (81349) GROUP-200 DIE	ea	-	*	*	*	*	*	*	AR			
P-H-T	5110-940-7181	CRIMPING DIE SET C/O upper and lower die leg and anchorplate D77-1-1(1) (81361)	ea	1				*	*	*	1.50		2	
X1-H		UPPER CRIMPING DIE ASSEMBLY C77-1-14 (81361)	-	1							-		2	1
X1-H		LOWER CRIMPING DIE ASSEMBLY D77-1-1(2) (81361) GROUP-300 PRESSURE	-		1						-		2	2
P-O	6685-806-4584	GAGE, PRESSURE, DIAL INDICATING 1/4 N.P.T. bottom connection 3000 P.S.I. 1056S (38056)	ea	1	*	*	*	*	*	*	0.53		3	1
P-H	4730-078-9815	NIPPLE, PIPE type 1, steel 1/4 N.P.T. x 2-in. lg WW-N-351 (81348)	ea	1				*	*	*	0.08		3	2
P-H	4730-277-2020	COUPLING, PIPE type 11, 150 lb., 1/4 N.P.T. WW-P-521 (81348)	ea	1				*	*	*	0.08		3	3
P-O	8030-252-3391	GASKET-FORMING COMPOUND Permatex #2 GROUP-400 TOOLS	tu	1	*	*	*	*	*	*	AR			
P-O	5120-224-1535	PLIERS, GLASS type VII, 7/8-in. jaw GGG-PH71 (81348)	ea	1	*	*	*	*	*	*	5.00		4	1
P-O	5120-240-6172	PLIERS short rd, nose W/O cutter type XI, class 2, style B GGG-P-471 (81348)	ea	1	*	*	*	*	*	*	5.00		4	2

**Section VII. INDEX-FEDERAL STOCK NUMBER AND REFERENCE
NUMBER CROSS-REFERENCE TO FIGURE AND ITEM NUMBER**

Stock No.	Figure No.	Item No.	Reference No.	Mfg. Code.	Figure No.	Item No.
3444-163-4338	1	-	C77-1-14	81361	2	1
4730-078-9815	3	2				
4730-277-2020	3	3	D77-1-1(1)	81361	2	-
5110-940-7181	2	-	D77-1-1(2)	81361	2	2
5120-224-1535	4	1	D77-1-30	81361	-	-
5120-240-6172	4	2	D77-1-341	81361	1	-
5180-911-1366	-	-	GGG-P-471	81348	4	1
6685-806-4584	3	1	Type VII			
8030-252-3391	-	-	GGG-P-471	81348	4	2
9150-252-6383	-	-	Type XI			
			MIL-H-5606	81349	-	-
			Permatex #2	77247	-	-
			WW-P-521	81348	3	2
			WW-N-351	81348	3	3
			1056S	38056	3	1

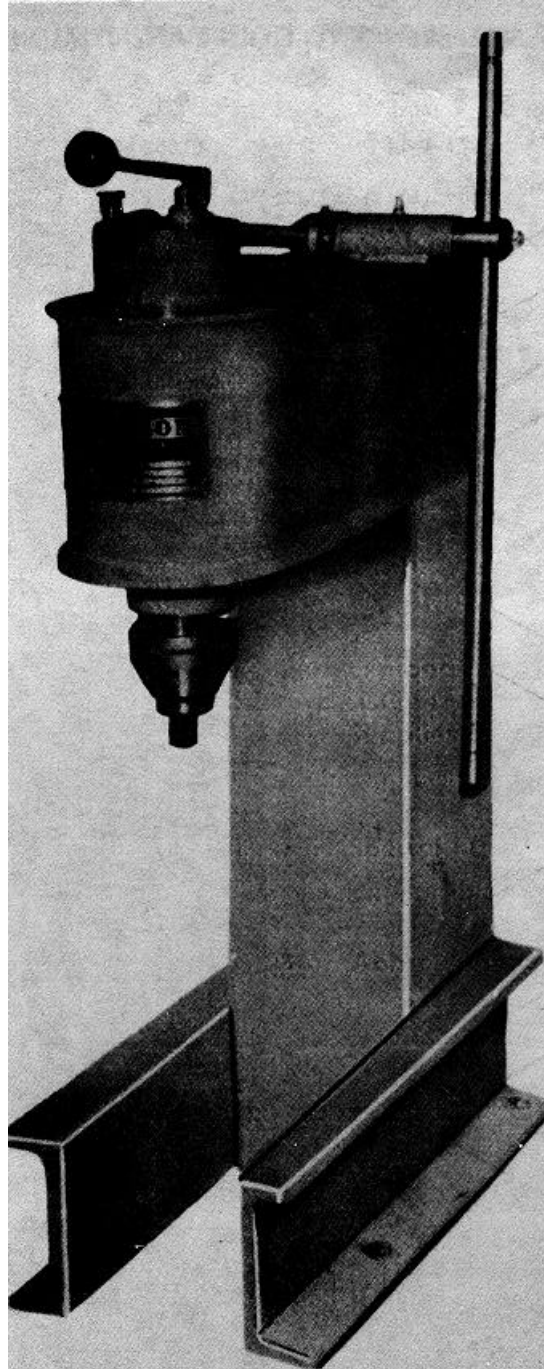


Figure 1. Press (app D).

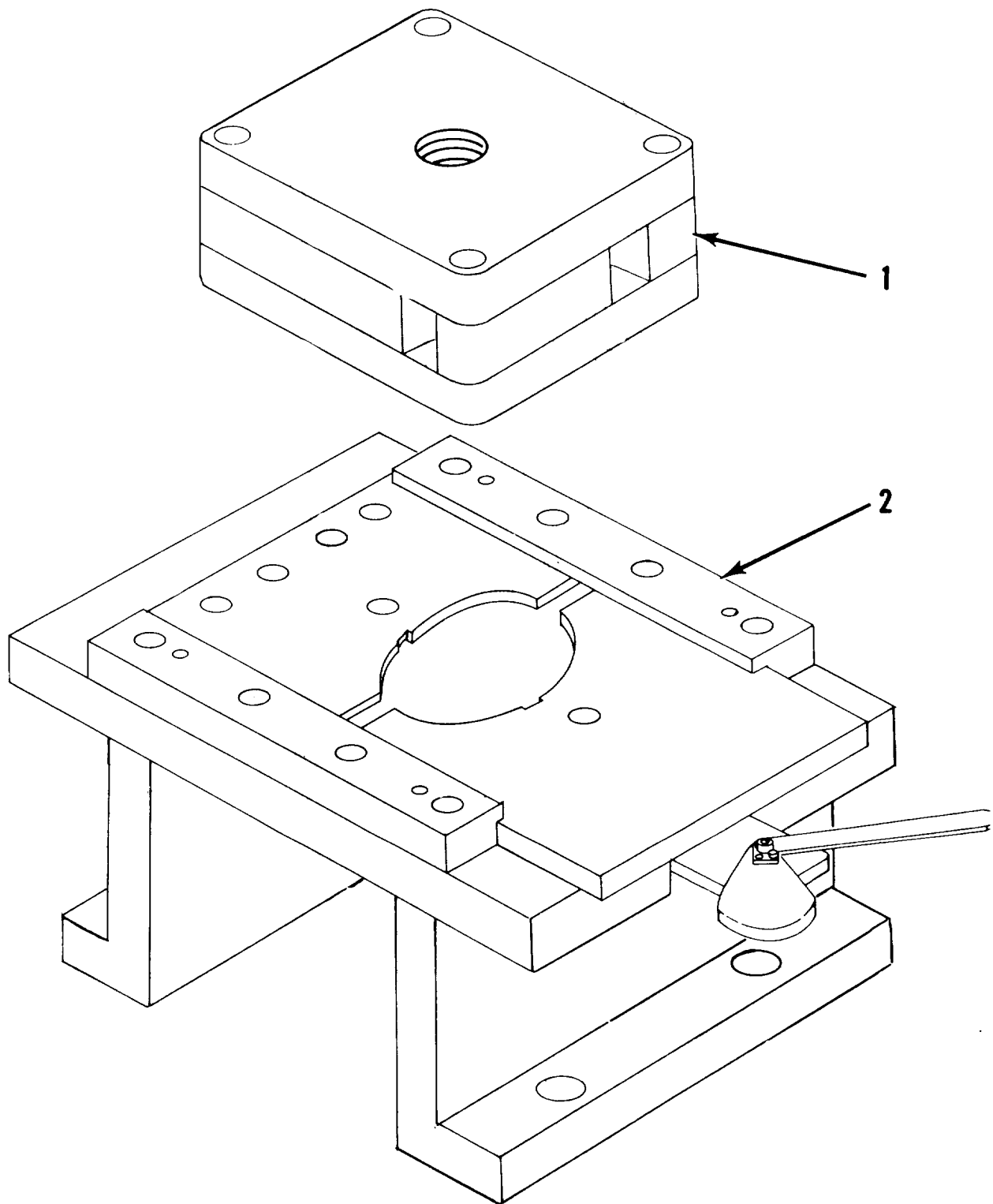


Figure 2. Dies (app D).

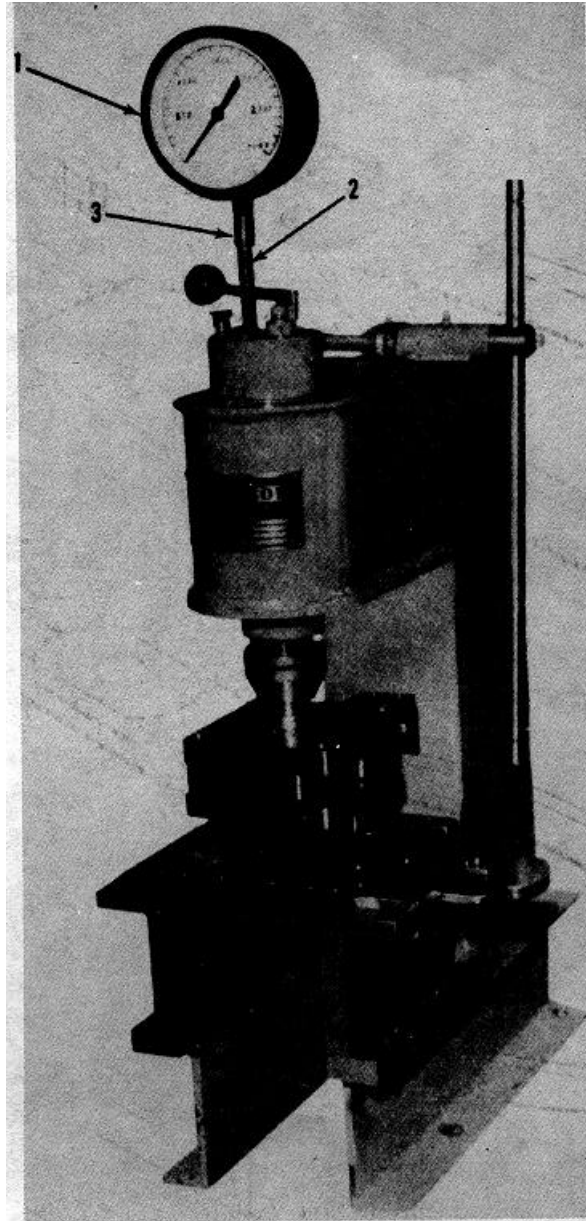


Figure 3. Pressure (app D).

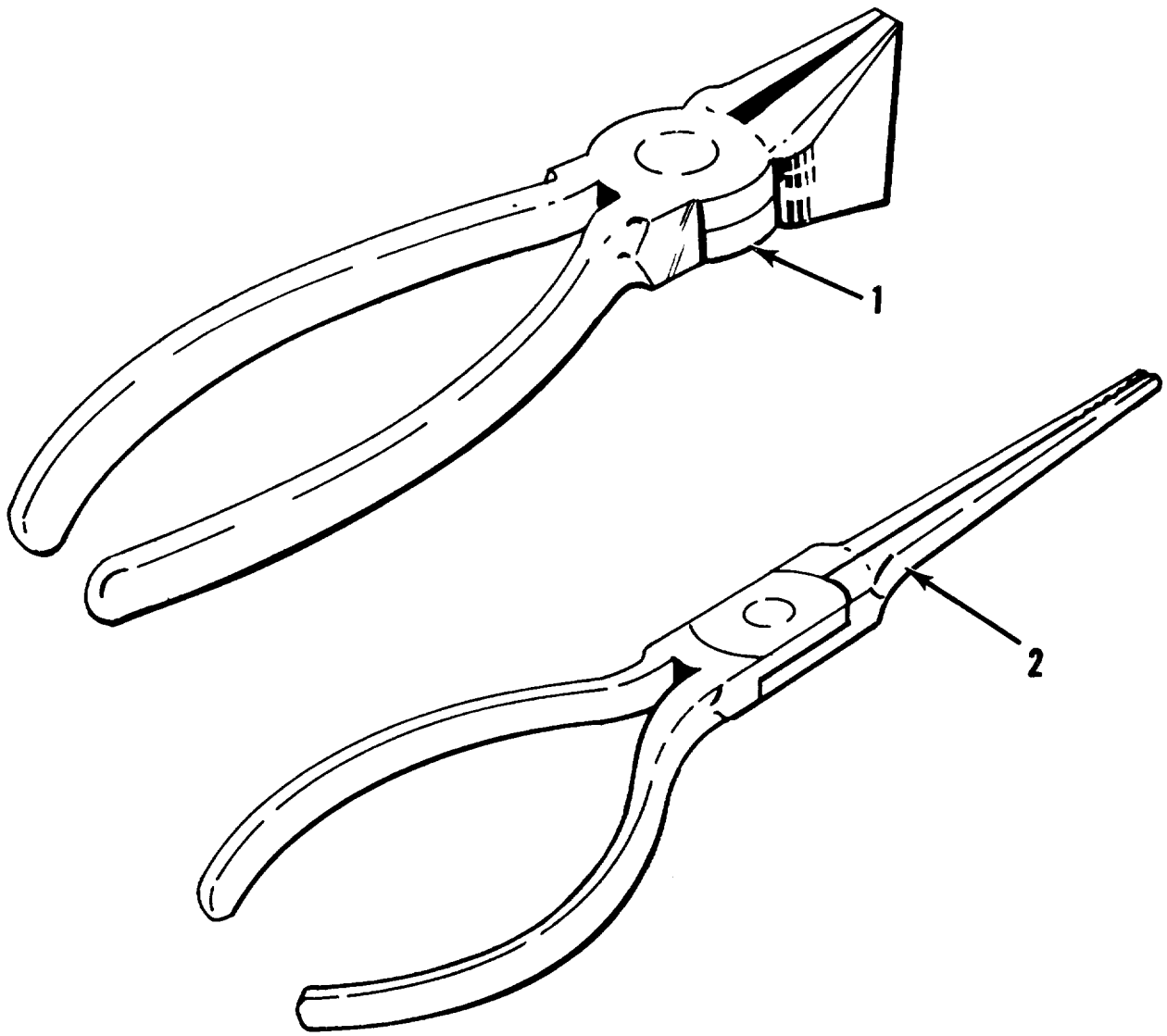


Figure 4. Tools (app D).

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
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OS Maj Comd (5)	MOTBY (1)
Instl (2)	MOTKI (1)
USMA (10)	MOTSU (1)
Svc Colleges (10)	PG (5)
Br Svc Sch (10)	Arsenals (3)
Gen Dep (5)	USAAPSA (10)
Dep (5)	Ft Knox FLDMS (10)

ARNG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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