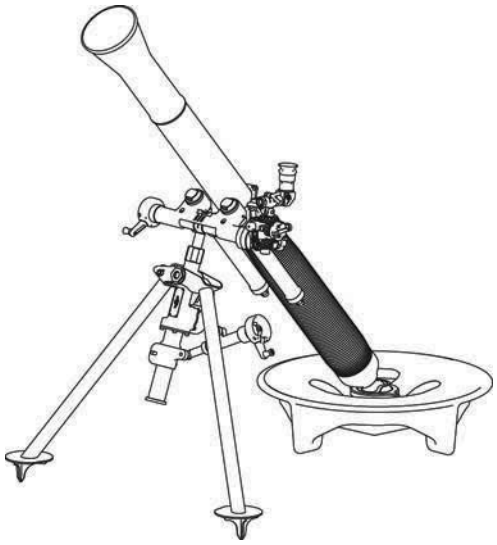
TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR

81-MM MORTAR, M252A1
NSN 1015-01-586-2135 (EIC: 4SU)



SUPERSEDURE NOTICE- This manual supersedes TM 9-1015-257-23&P dated 31 January 2012.

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HEADQUARTERS, DEPARTMENT OF THE ARMY
25 AUGUST 2014

WARNING SUMMARY

This warning summary contains general safety warning and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the technical manual.

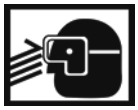
FIRST AID

For first aid information, refer to FM 4-25.11, First Aid.

EXPLANATION OF SAFETY WARNING ICONS

EXPLOSION- rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure

FLYING PARTICLES- arrows bouncing off face shows that particles flying through the air will harm face.



EYE PROTECTION - person with goggles shows that the material will injure the eyes.

HEAVY PARTS- hand with heavy object on top shows that heavy parts can crush and harm.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

EXPLOSION

Before starting an inspection or performing maintenance procedures, be sure to clear the weapon. Inspect the bore to ensure it is empty and free of obstructions. Keep live ammunition out of the area during maintenance operations. Failure to comply may result in injury of personnel. Seek medical attention if injury occurs.

WARNING

EXPLOSION

Dented cannons must be replaced as they are unsafe for firing. Failure to comply may result in injury of personnel. Seek medical attention if injury occurs.

WARNING SUMMARY – Continued

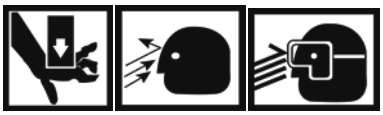
GENERAL SAFETY WARNINGS DESCRIPTION – Continued

WARNING

FLYING PARTICLES

Handling of spring under spring tension can result in flying particles. Use extreme caution and wear eye protection when removing and installing parts which are under spring tension. Failure to comply can result in injury to personnel. Seek medical attention if injury occurs.

WARNING

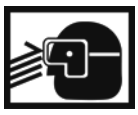


HAND TOOLS

To avoid personnel injury, exercise caution when using hand tools. Flying debris or injured fingers can result. Personnel using hand tools should were eye protection. Seek medical attention if injury occurs.

EXPLANATION OF HAZARDOUS MATERIALS ICONS

CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EYE PROTECTION - person with goggles shows that the material will injure the eyes.

FIRE - flame shows that a material will ignite and cause burns.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

RADIATION - three circular wedges shows that the material emits radioactive energy and can injure human tissue.

VAPOR - human figure in a cloud shows that material vapors present danger to life or health.

WARNING SUMMARY – Continued

HAZARDOUS MATERIALS DESCRIPTION

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

CLP may be irritating to the eyes and skin. Excessive inhalation can cause respiratory irritation, dizziness, weakness, fatigue, nausea, headaches, and possible unconsciousness. Use protective gloves and goggles. Use in a well-ventilated area away from open flames. First aid measures:

- If excessive concentrations are inhaled, move to fresh air. If breathing stops, give mouth-to-mouth resuscitation.
- If swallowed, do not induce vomiting. If conscious, drink large quantities of water.
- Eyes: Flush for at least 15 minutes with potable water.
- Skin: Wash with plenty of soap and water.
- Seek immediate medical attention.

Failure to comply may result in serious injury to personnel or death.

WARNING

RIFLE BORE CLEANING COMPOUND (RBC)
GENERAL PURPOSE LUBRICATING OIL (GPL)

RBC/ GPL can irritate skin, eyes, and breathing passages. Wear gloves and eye protection. Use only with adequate ventilation. Wash exposed skin thoroughly after handling. Keep away from sources of heat or ignition. Keep container tightly closed when not in use. Failure to comply may result in serious injury to personnel.

WARNING

SEALING COMPOUND

Use sealing compound in well ventilated areas away from open flame. Sealing compound is harmful to skin and clothing, can burn easily, and may give off a harmful vapor. If compound contacts eyes, flush immediately with water. Wash with soap and water if compound contacts skin. Failure to comply may result in serious injury to personnel.

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

WARNING SUMMARY – Continued

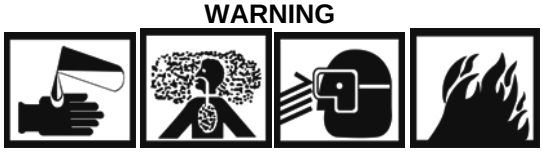
HAZARDOUS MATERIALS DESCRIPTION – Continued

WARNING

SOLID FILM LUBRICANT

To avoid inhalation of harmful vapor, be sure the area is well-ventilated when using solid film lubricant. Failure to comply may result in serious injury to personnel. Seek medical attention if injury occurs.

WARNING



ALCOHOL

Alcohol is volatile, flammable, and toxic. Keep away from open flames or other sources of ignition. Use only with adequate ventilation and avoid prolonged breathing of vapors. Avoid contact with skin and eyes by wearing gloves and eye protection. Failure to comply may result in serious injury to personnel.

WARNING

RADIATION HAZARD – TRITIUM (^{3}H) GAS

The M67 Sight Unit and M58/M59 Aiming Post Lights contain radioactive tritium gas in sealed source form. Exposure to tritium gas is a potential ionizing radiation hazard.

- Eating, drinking, or smoking is NOT allowed in tritium device maintenance areas.
- Arms rooms are not authorized work areas for any radioactive mortar component.
- All personnel who operate and/or maintain fire control equipment must be aware of the special precautions to control exposure to tritium. See "Safety, Care and Handling" in WP 0001.
- Immediately report any suspected lost or damaged items to your Local Radiation Safety Officer (LRSO). If your LRSO cannot be reached, contact the TACOM LCMC Safety Office during regular duty hours at DSN 786-0891/7635, Commercial (586) 282-0891/7635.

  LRSO: _____ Phone:_____

WARNING SUMMARY – Continued

WARNING

CHEMICAL AGENT RESISTANT COATING (CARC) PAINT

CARC paint contains isocyanate, a constituent that can cause respiratory effects during and after the application of the material. During the application of CARC paint, coughing, shortness of breath, pain on respiration, increased sputum, and chest tightness may occur. CARC paint also produces itching and reddening of the skin, a burning sensation of the throat and nose, and watering of the eyes.

An allergic reaction may occur after initial exposure (ranging from a few days to a few months later), producing asthmatic symptoms including coughing, wheezing, tightness in the chest, or shortness of breath.

The following precautions must be observed to ensure the safety of personnel when CARC paint is applied.

- For brush/roller painting in confined spaces, an airline respirator is required, unless an air sampling shows exposure to be below standards. If the air sampling is above standards, either chemical cartridge or airline respirator is required.
- Spot painters applying CARC paint by brush or roller must wear clothing and gloves affording full coverage.
- Do not use water, alcohol, or amine-based solvents to thin or remove CARC paints. Use of these solvents with CARC paints can produce chemical reactions resulting in nausea, disease, burns, or severe illness to personnel.
- Do not use paint solvents to remove paint/coating from skin.
- Mix paint/coating in a well-ventilated mixing room or spraying area away from open flames. Personnel mixing paint/coating should wear eye protection.
- Use paint/coating with adequate ventilation.
- Personnel grinding or sanding on painted equipment should use high efficiency air-purifying respirators.
- Do not weld or cut CARC-coated metal because substances causing skin or respiratory irritation may be released. Before applying any heat, sand or grind the paint down to bare metal 4 inches on either side of the area where the heat is to be applied. Remove paint from the other side of the metal, if it is painted.

For further information, refer to TM 43-0139, Painting Instructions for Army Materiel.

Unusable CARC mixtures (as well as items, such as cleaning rags, contaminated with these substances) may be considered hazardous waste and may require disposal in accordance with federal, state, DoD, and DA hazardous waste regulations. Consult the installation environmental office for proper disposal guidance. Failure to comply may result in serious injury to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the “Change No.” column indicates an original page or work package.

Date of issue for the original manual is:

Original 25 August 2014

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 30 AND TOTAL NUMBER OF WORK PACKAGES IS 34 CONSISTING OF THE FOLLOWING:

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Warning Summary	0	WP 0023 (8 pages)	0
i-iv	0	WP 0024 (34 pages)	0
Chapter 1 Title Page	0	WP 0025 (4 pages)	0
WP 0001 (8 pages)	0	WP 0026 (4 pages)	0
WP 0002 (4 pages)	0	WP 0027 (4 pages)	0
WP 0003 (2 pages)	0	WP 0028 (4 pages)	0
Chapter 2 Title Page	0	Chapter 5 Title Page	0
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WP 0020 (4 pages)	0		
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WP 0022 (4 pages)	0		

HEADQUARTERS, DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 25 August 2014

TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR 81-MM MORTAR, M252A1 NSN 1015-01-586-2135 (EIC: 4SU)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the Internet on the TACOM Unique Logistics Support Applications (TULSA) Web site. The Internet address is https://tulsa.tacom.army.mil. Access to all applications requires CAC authentication, and you must complete the Access Request form the first time you use it. The DA Form 2028 is located under the TULSA Applications on the left-hand navigation bar. Fill out the form and click on SUBMIT. Using this form on the TULSA Web site will enable us to respond more quickly to your comments and to better manage the DA Form 2028 program. You may also mail, e-mail, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-IM/ TECH PUBS, MS 727, 6501 E. 11 Mile Road, Warren, MI 48397-5000. The e-mail address is tacomlcmc.daform2028@us.army.mi l. The fax number is DSN 786-1856 or Commercial (586) 282-1856. A reply will be furnished to you.

Current as of 15 July 2014

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TABLE OF CONTENTS

HOW TO USE THIS MANUAL

The safest, easiest, and best way to do maintenance on the M252A1 81-mm mortar is to use this manual. Learning to use this Technical Manual (TM) is as easy as reading through the next few pages. Knowing what is in this manual, and how to use it, will save you time and work and will help you to avoid exposing yourself to unnecessary hazards while you do your job.

So Where Do You Start?

Start right here, if this is the first time you are using this TM, by completely reading this section first. There is a lot of information you will need to know.

How is the Manual Organized?

Basically, the manual is divided into two types of maintenance activities. These are: (1) Troubleshooting or location of faults by symptoms you can detect and (2) Maintenance Procedures that are used to correct faults or repair failed parts. You will be using the procedures in this manual to do one of these types of maintenance. Within this manual, you will find the material organized in functional group code order as it appears in the Maintenance Allocation Chart (MAC), found in WP 0031 of this manual. This allows the TM to be aligned with its applicable Repair Parts and Special Tools List (RPSTL). For information on how to use the RPSTL, refer to the introduction in WP 0023.

How Are Procedures or Symptoms Found?

If you're using the manual to perform troubleshooting, go to troubleshooting index (WP 0004). Read the troubleshooting instructions and proceed according to the instructions. If you are using the manual to repair or replace a part you already know is defective, start by locating the part to be replaced or repaired in the Index located in the back of the manual.

How is the Correct Maintenance Procedure Found?

Once you have located the correct procedure, read it to determine if you have everything you need to perform the task. Make sure all Equipment Conditions have been met before beginning. Familiarize yourself with the potential hazards, if any, described by any WARNINGs or CAUTIONs. You should familiarize yourself with the entire maintenance procedure before beginning the maintenance task.

How is a Maintenance Procedure Used?

The first page of a maintenance procedure lists everything you will need to perform the task. The following paragraphs describe the blocks of information you will encounter.

a. TOOLS AND SPECIAL TOOLS. Individual tools from your small arms repairman tool kit will not be listed under this heading. If any tools from a kit are required, the tool kit itself will be listed. Special tools, fabricated tools, and tools from any other source will be listed with a reference to a specific item and work package number. The referenced work package will provide you with the necessary information to find the tool.

b. MATERIALS/PARTS. If any expendable or consumable supplies are needed to perform the task, they will be listed under this heading along with the quantity in parentheses and with a reference to the appropriate item and work package. The referenced work package will give you detailed information to requisition the item. Replacement parts are not normally listed under this heading. The inspection steps in the removal or disassembly procedures will tell you which parts to replace. Mandatory repair parts (parts that are destroyed during disassembly or not normally re-used, such as gaskets and lockwashers) are listed under this heading.

HOW TO USE THIS MANUAL – Continued

c. PERSONNEL REQUIRED. The number of personnel necessary to perform the task will be listed here. You will find this heading only in procedures that require more than one person.

d. REFERENCES. These are other technical publications you will need in order to do the task. Full titles of these publications are found in WP 0029. Other maintenance work packages may also be listed. This heading will only appear when other references are required.

e. EQUIPMENT CONDITIONS. This heading will list the special conditions which must be met prior to performing your task. In many cases, the condition has already been identified in another procedure. In these cases, the equipment condition will refer to that maintenance procedure for details in performing the preliminary task.

How is the Maintenance Task Organized?

The maintenance procedure is arranged so it will be performed in the most logical and recommended manner. Besides the information already discussed, categories such as inspection, service, disassembly, lubrication, repair, and assembly will be listed. Specific instructions will be given to perform that part of the maintenance procedure. Be sure to follow all the steps given and do not skip any categories unless you are absolutely sure that they are not required for the completion of your maintenance task.

Am I Ready To Use This TM?

If you have taken the time necessary to read this section, and are sure of the location and arrangement of the different sections of the TM, then you are ready to begin. Remember, this TM has been arranged with you, the user, in mind. Your safety and ability to perform the necessary tasks in the most efficient manner possible are most important. Finally, always check with your supervisor for approval that you are fully prepared to use this manual. If you follow all of the above guidelines and suggestions given in this section, you will have no trouble when using this manual and it will provide the maintenance information necessary to keep this weapon system operating in the manner for which it was designed.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION FOR 81-MM MORTAR, M252A1

FIELD MAINTENANCE
GENERAL INFORMATION

SCOPE

Type of Manual

Field maintenance manual.

Model Number and Equipment Name

M252A1 81-mm Mortar

Purpose of Equipment

The M252A1 mortar provides high-angle fire for close range support of ground troops.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M252A1 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. All non-Aviation/Missile EIRs and Product Quality Deficiency Reports (PQDR) must be submitted through the Product Data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: https://www.pdrep.csd.disa.mil/. If you do not have Internet access, you may submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 using email, regular mail, or fax using the addresses/fax numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

HAZARDOUS WASTE DISPOSAL INFORMATION

When servicing this weapon, performing maintenance, or disposing of materials such as: cleaning fluids, dry cleaning solvents, lubricants, waste thread locking compounds, and waste CARC mixtures (or items, such as cleaning rags, contaminated with these substances) consult your unit/local hazardous waste disposal center or safety office for local regulatory guidance. If further information is needed, please contact The Army Environmental Hotline at 1-855-846-3940 / OCONUS: 210-466-1590 or online at http://aec.army.mil/ContactUs.aspx. Accidental or intentional introduction of contaminants into the environment violates military, state, and federal regulations. Failure to comply may adversely affect the public or environment.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion prevention and control of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. The term “corrosion” means the deterioration of a material or its properties due to a reaction of that material with its chemical environment. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastics, composites, and rubbers can also degrade (also considered to be corrosion based on the above definition of corrosion). Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically ultraviolet) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. The US Army has defined the following nine (9) forms of corrosion used to evaluate the deterioration of metals. These shall be used when evaluating and documenting corrosion.

UNIFORM (or general attack): Affects a large area of exposed metal surface, like rust on steel or tarnish on silver. It gradually reduces the thickness of the metal until it fails.
CREVICE: Occurs in crevices created by rubber seals, gaskets, bolt heads, lap joints, dirt or other surface deposits. It will develop anywhere moisture or other corrosive agents are trapped and unable to drain or evaporate.
SELECTIVE LEACHING: One element, usually the anodic element of an alloy, corrodes away, leaving the cathodic element. This can create holes in metal.
INTERGRANULAR: Metal deterioration caused by corrosion on the bonds between or across the grain boundaries of the metal. The metal will appear to be peeling off in sheets, flaking, or being pushed apart by layers. A particular type of intergranular corrosion is exfoliation.
PITTING: This can result from conditions similar to those for crevice corrosion. Pits can develop on various materials due to their composition. Rifle boxes are big victims of pitting.
EROSION: Results when a moving fluid (liquid or gas) flows across a metal surface, particularly when solid particles are present in the fluid. Corrosion actually occurs on the surface of the metal, but the moving fluid washes away the corrosion and exposes a new metal surface, which also corrodes.
FRETTING: Occurs as a result of small, repetitive movements (e.g., vibration) between two surfaces in contact with each other. It’s usually identified by a black powder corrosion product or pits on the surface.
GALVANIC: Occurs when two different types of metal come in contact with each other, like steel bolts on aluminum, for example. This is a common problem on aircraft because of their mix of metals.
STRESS: Term used to describe corrosion cracking and corrosion fatigue.

Where an item is not ready/ available due to one of these forms of corrosion, it shall be recorded as a corrosion failure in the inspection record and the appropriate code (170) for corrosion shall be used when requesting/performing maintenance.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Procedures and materials used for the destruction of the mortar to prevent enemy use will be found in TM 750-244-7.

PREPARATION FOR STORAGE AND SHIPMENT

For storage or shipment requirements, see WP 0021.

NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
Annual Repair Parts Kit	Gun Parts Kit
Barrel Wrench	Box Wrench (Barrel)
Bipod	Mortar Mount
Buffer Clamp Assembly	Recoil Mechanism Buffer
Buffer Wiper Seal	Nonmetallic Seal
Clear Coat	Surface Sealer
Cotter Pin	Splint Pin
Elevating Mechanism	Mechanical Housing
Elevation Housing Assembly	Mechanical Housing
Elevation Shaft Assembly	Straight Shaft Assembly
Handle Body	Body Handle
Leg Mounting Nut	Extended Plain Nut
Leg Mounting Nut Stow	Extended Plain Nut
Mortar Bipod Leg	Mortar Mount Leg
Outer Recoil Spring	Compression Helical Spring
Plug Wrench	Box Wrench (Plug)
Recoil Endcap	Dust Protective Cap
Recoil Housing	Recoil Mechanism Buffer
Recoil Mechanism	Recoil Mechanism Buffer
Recoil Spring Assembly	Recoil Mechanism Buffer
Retainer Nut	Round Plain Nut
Rod End Connector	Grooved Headed Pin
Rubber Washer	Flat Washer
Secondary Recoil Spring	Compression Helical Spring
Slotted Nut	Helical Plain Nut
Special Nut Assembly	Round Plain Nut
Spring Housing Assembly	Mechanical Drive Housing
Support Tool Kit	Support Kit Tool
Traverse Screw Retainer	Panel Fasten Washer

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	
ALSC	American Lumber Standards Committee
AMCOM	Aviation and Missile Command
CBRN	Chemical, Biological, Radiological, and Nuclear
CECOM	Communication-Electronics Command
CPC	Corrosion Prevention and Control
DPM	Disintegrations Per Minute
DR	Deficiency Report
EIR	Equipment Improvement Recommendations
FGC	Functional Group Code
Ft	Feet
I.D.	Inside Diameter
In.	Inch
ISPM	International Standards for Phytosanitary Measures
IUID	Item Unique Identification
JDRS	Joint Deficiency Reporting System
lb	Pound
LCMC	Life Cycle Management Command
M	Meter
NHA	Next Higher Assembly

LIST OF ABBREVIATIONS/ACRONYMS - Continued

Abbreviation/Acronym

NRC	Nuclear Regulatory Commission
NSN	National Stock Number
O.D.	Outside Diameter
PQDR	Product Quality Deficiency Report
RSO	Radiation Safety Officer
SF	Standard Form
SMR	Source, Maintenance, and Recoverability
SOP	Standard Operating Procedure
TAMMS	The Army Maintenance Management System
TM	Technical Manual
TMDE	Test, Measurement and Diagnostic equipment
TULSA	TACOM Unique-Logistics Support Applications
US	United States
UOC	Usable On Code
UUT	Unit Under Test
UV	Ultraviolet
WCA	Warranty Claim Action
WPM	Wood Packing Material
yd	Yard

QAULITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this TM 9-1015-257-23&P. If quality of material requirements are not stated in this TM 9-1015-257-23&P, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

TRITIUM (^{3}H) SAFETY, CARE, AND HANDLING

Radioactive Tritium Devices

1. **Purpose:** These precautions implement mandatory license requirements for use and maintenance of tritium radioluminous fire control devices used on mortars.

2. **Hazard Description:** Radioactive tritium gas is contained in the following mortar components: M67 Sight Unit and M58/M59 Aiming Post Lights. Provided are some facts about tritium exposure:

   - Tritium is a potential ionizing radiation hazard.
   - The tritium gas is hermetically sealed into glass tubes or vials like miniature florescent lamps.
   - No external radiation is emitted by the vial itself since the glass effectively stops the beta particles.
   - The beta radiation emitted by tritium is only a hazard if the tritium vial is broken and contaminates personnel or work areas.
   - The tritium gas will quickly disperse into the surrounding air if a vial is broken. It becomes more hazardous when released into a confined space such as an arms room or unventilated room. Tritium gas converts to tritiated water vapor which can be readily absorbed into the body by absorption through the skin if direct contact is made with a contaminated surface or device.

3. **Identification:** Mortar devices containing radioactive self-luminous vials are identified by means of radioactive warning labels. These labels should not be defaced or removed during maintenance and should be replaced immediately when lost.

4. **Control:** Control of this radioactive material is mandated by Federal Regulation. Immediately report any suspected lost or damaged items to your Radiation Safety Officer (RSO). If your local Radiation Safety Officer cannot be reached, contact TACOM LCMC Safety Office during regular hours at DSN 786-0891/7635, or Commercial (586) 282-0891/7635.

   LOCAL RSO: _____ PHONE: _____

5. **Procedures for Handling Damaged Tritium Lamps:** The following procedures shall be followed when a tritium lamp contained in a mortar component is broken or does not show illumination.

   a. If a tritium lamp is broken, cracked, or there is no illumination, immediately wrap the device in two clear plastic bags, seal with tape, and mark the bag “Broken Tritium Device – Do Not Open”. Personnel handling the tritium device should wear impermeable gloves. If gloves are not available, use the inverted bag method in picking up the device. Place the potentially contaminated gloves between the first and second plastic bag prior to sealing.

   b. If skin contact is made with any device or area potentially contaminated with tritium, wash immediately (within 3 minutes) with nonabrasive soap and cold water for at least 1 minute.

   c. Notify your local RSO immediately to report the incident. Contact the base safety office for the name and telephone number of the local RSO.

   d. Broken tritium sources indoor may result in tritium contamination of the areas, such as work bench table tops, ceilings, floors, etc. Personnel need to inform other persons to vacate the immediate area and secure the immediate area from entry until the local RSO has determined the extent of contamination. This can only be determined by the RSO performing a wipe test survey of the potentially contaminated work surfaces/areas.

   e. Your local RSO will perform a leak test on the damaged device and related work area to determine the extent of tritium contamination. If test results are in excess of 1,0000 disintegrations per minute (DPM), the TACOM LCMC license RSO, who will direct the decontamination effort, must be contacted immediately.

6. **Maintenance Precautions:** This procedure is applicable to all personnel working with tritium devices, including depot and field maintenance levels.

   a. Only authorized personnel can repair a known broken device after the RSO has determined the device is free of tritium contamination. It may or may not be economically feasible to repair mortar components. Due to expired shelf-life, not all non-illuminated devices will have evidence of tritium contamination, but will still be handled as if they were contaminated.

   b. Check for illumination prior to maintenance in a low light or dark room. Check the luminosity of each lamp in each device to determine the condition. If any lamp is not illuminated, do not repair. Wrap the entire device in plastic bag as outlined above and notify your RSO immediately.

   c. Wear protective gloves and perform work in a well-ventilated designated area.

   d. Wash hands immediately (within 3 minutes) with nonabrasive soap and cold water after handling a broken mortar fire control device that contains tritium modules.

   e. When mortar tritium module components are replaced during maintenance, they must be placed into a clear plastic bag, labeled radioactive tritium component, the NSN, and activity present in millicuries. The maintainer must turn in the fire control component immediately to the unit RSO for proper radioactive waste disposal and security.

TRITIUM (^{3}H) SAFETY, CARE, AND HANDLING - Continued

Radioactive Tritium Devices - Continued

f. Spare parts to include modules containing tritium lamps must be stored in the shipping container, as received, until installation into the mortar component. Storage of radioactive items is required to be in a secure, well-ventilated area that is designated by the RSO.

g. To avoid violation of NRC license conditions, tritium lamps shall not be removed from modules for any reason.

h. Additional guidance for safe handling and maintenance is located in TM 9-254, General Maintenance Procedures for Fire Control Materiel.

7. **Maintenance Levels**:

a. Modules containing tritium lamps can be replaced at the field maintenance level. The module encloses the tritium lamp, e.g., level vials are considered to be modules. Maintenance of mortar components containing tritium fire control involving module replacement ONLY will be performed in a controlled area designated by the installation or mission/unit RSO.

b. Any repair requiring the removal of the tritium lamp itself from the module is prohibited by TACOM-Warren NRC license. Depot level maintenance repair facilities have been established to perform more difficult repairs on fire control devices. All mortar tritium fire control devices requiring replacement of the tritium lamp(s) contained INSIDE the module will be evacuated to the appropriate Tritium Instrument Repair Facility designated by the TACOM LCMC senior health physicist as indicated below. Severely damaged devices (not economically feasible to repair) must be turned in to installation or local RSO immediately for radioactive waste disposal. The following is an approved list of depot level repair Tritium Repair Facilities:

- Anniston Army Depot, AL
- Fort-Lewis-McChord, WA
- MCLB Albany, GA

8. **Posting Requirements:** In accordance with Title 10CFR Section 19.11, the following rules and regulations shall be posted in work areas where tritium fire control devices are repaired. Copies may be requested or further information obtained by contacting the TACOM-Warren LCMC RSO/Licensee, ATTN: AMSTA-MSP-Z, Warren, MI 48397-0001.

NOTE

Postings a, e and f (below) may be filed in the installation safety office for review, rather than posting them in the work areas.

a. NRC License (TACOM license BML 21-32838-01).

b. Standard Operating Procedures specifying maintenance procedures.

c. NRC Form 3 (May 1999) and Reorganization Act of 1974, Section 206.

d. Emergency contact information (local RSO and license RSO).

e. 10 CFR Part 19- Notices, Instructions, and Reports to Workers.

f. 10 CFR Part 20- Standards for Protection against Radiation.

Mortar Components

1. All of the major components must be handled carefully, especially during storage and local transporting.

2. Dropping the cannon could dent the tube or cause it to be out-of-round.

3. Dropping or mishandling the bipod could:

    a. Damage the legs and/or damage the traversing mechanism and elevating mechanism.

    b. Damage the recoil mechanism buffers.

    c. Damage or break the buffer clamp assembly.

ITEM UNIQUE IDENTIFICATION

This equipment and/or its components/parts are marked with item unique identification (IUID) markings such as data plates, decals, or etchings. These markings must be scanned during performance of procedures to remove and replace the items marked or when turning in items or receiving them from supply or another unit. For information on location of the IUID marking for the end item, refer to the decal/data plate guide contained in the operator manual for the equipment.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Common Tools and Equipment

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE); CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items); CTA 50-909, Field and Garrison Furnishings and Equipment; or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

Special Tools, TMDE, and Support Equipment

Tools and test equipment are listed in WP 0031. Special tools authorized at field level are listed in WP 0026.

Repair Parts

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (WP 0024).

END OF WORK PACKAGE

FIELD MAINTENANCE
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Characteristics

The M252A1 81-mm mortar provides high-angle fire for close range support of ground troops.

Capabilities and Features

1. Smooth bore barrel is muzzle loaded and has a removable firing pin.
2. Mortar breaks down into sections that are portable.
3. Mortar is capable of delivering various types of cartridges with a variety of fuzes at a rapid rate of fire.
4. M67 sight unit gives indirect fire capability.

Major Weapon System Components

NOTE

- M252 components, except for the M253 Cannon and M67 Sight Unit, are not to be used in the M252A1 81-mm Mortar system.
- The M177A1 Mortar Mount does not require any lubrication. Interior components are made of non-metallic materials; grease or other lubricants will damage these components and may render the Mortar Mount unserviceable.

1. M253 81-mm Cannon
2. M177A1 Mortar Mount (Bipod)
3. M3A2 Baseplate
4. M67 Sight Unit

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Table.1 Major Components of 81-mm Mortar.

Item No.	Nomenclature	Description
1	Mortar Mount, M177A1	Provides firm support for elevating, traversing, and cross-leveling of the cannon. Shock is absorbed by mortar mounting buffers.
2	Cannon, M253	Used to fire projectiles. Muzzle end has an integrated blast attenuator device and breech end is finned for better cooling. Mortar serial number is engraved on the lower barrel stop end of the cannon above the cooling fins.
3	Sight Unit, M67	Consists of an elbow telescope and a telescope mount. The sight unit is used to lay the mortar.
4	Baseplate, M3A2	Supports breech plug of cannon and absorbs recoil shock.

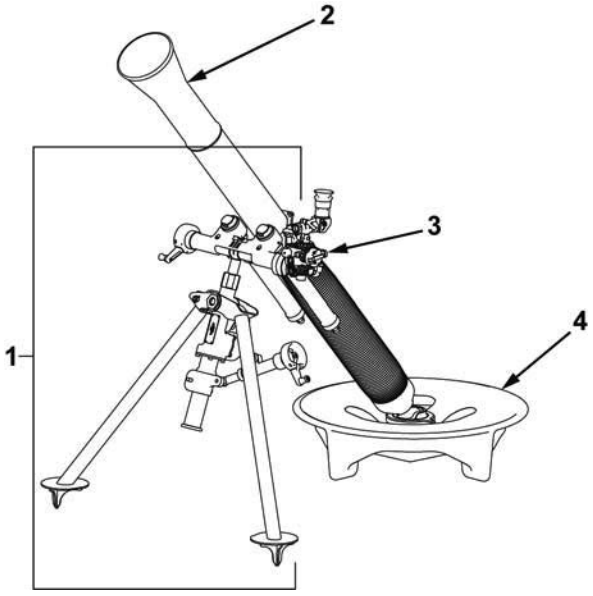


Figure 1. M252A1 81-mm Mortar.

EQUIPMENT DATA

WEAPON ASSEMBLED	
Range	
Min	63m (69 yd)
Max	5792m (6334 yd)
CANNON M253	
Weight	30.5 lb (13.83 kg)
Overall Length	55.0 in (1.4 m)
MORTAR MOUNT (BIPOD) M177A1	
Weight	21.3 lbs (9.6 kg)
Azimuth adjustment	200 mils
Elevation adjustment	800 to 1515 mils
BASEPLATE M3A2	
Weight	23 lb (10.43 kg)
SIGHT UNIT M67	
Weight	2.9 lb (1.3 kg)
Field of View	10 degrees
Magnification	4.0 X nominal 3.5 effective
Illumination	Self-contained Radioactive tritium, 6 to 8 years life

END OF WORK PACKAGE

FIELD MAINTENCE
THEORY OF OPERATION

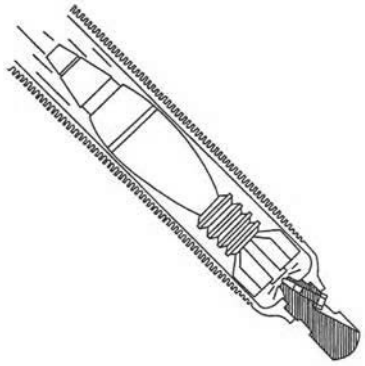
INITIAL SETUP:

References
FM 3-22.90

M252A1 81-MM MORTAR

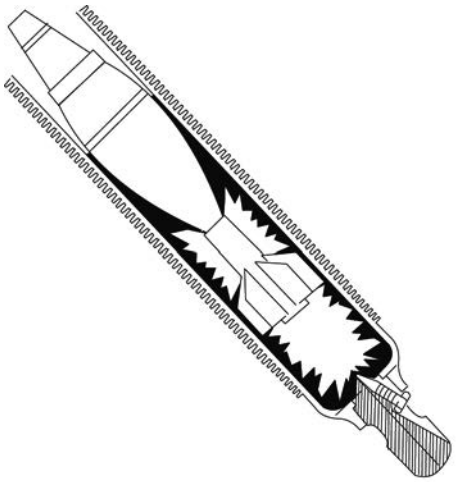
1. Mortar is fired by loading the cartridge into the cannon, fin-end first.

2. Cartridge slides down the cannon under its own weight and strikes the firing pin at the bottom.

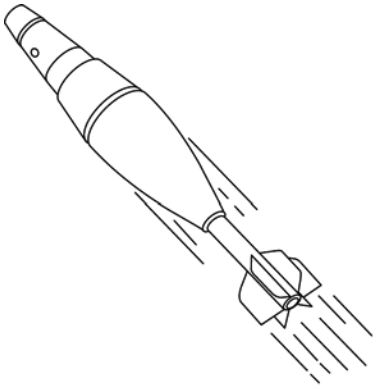


M252A1 81-MM MORTAR- Continued

3. The primer/ignition cartridge functions. The propelling charge is ignited by the ignition cartridge. Expanding gases force the cartridge up and out of the cannon.



4. Cartridge travels down range. Fins provide stability in flight until impact with ground/target.



Refer to FM 3-22.90, Mortars, for further information.

END OF WORK PACKAGE

CHAPTER 2

FIELD TROUBLESHOOTING PROCEDURES FOR 81-MM MORTAR, M252A1

FIELD MAINTENANCE
TROUBLESHOOTING INDEX

GENERAL

Field level troubleshooting information is provided for locating and correcting most of the operating troubles which may develop in the M252A1 81-mm Mortar. Each malfunction for the individual part or assembly is followed by a list of tests or inspections which will help the maintainer to determine the corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, see individual repair sections in the maintenance procedures for each major assembly.

See troubleshooting procedures (WP 0005) for malfunctions, tests, and corrective actions. The symptom index is provided for a quick reference to the malfunctions covered in the troubleshooting procedures.

MALFUNCTIONS/SYMPTOM INDEX

NOTE

If sight unit controls do not operate, refer to TM 9-1240-409-23&P.

END OF WORK PACKAGE

FIELD MAINTENANCE
TROUBLESHOOTING PROCEDURES

INTIAL SETUP

Tools and Special Tools

Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
- Caps, Vise Jaw (WP 0033, Table 1, Item 1)
- Vise, Machinist's (WP 0033, Table 1, Item 2)
- Wrench, Torque (WP 0033, Table 1, Item 3)
- Wrench, Torque (WP 0033, Table 1, Item 4)

Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts

Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Rifle bore cleaning compound (RBC) (WP 0032, Item 10)
General purpose lubricating oil (GPL) (WP 0032, Item 14)
Wiping rag (WP 0032, Item 20)

References

TM 9-1000-202-14
TM 9-1240-409-23&P
WP 0009
WP 0010
WP 0012
WP 0013
WP 0015
WP 0017
WP 0020

TROUBLESHOOTING PROCEDURE
81-MM MORTAR, M252A1

WARNING

Make sure that cannon tube is clear before performing troubleshooting tasks. Failure to follow instruction may cause personnel injury or death. Seek medical attention if injury occurs.

WARNING

CLEANING SOLVENT (RBC)

NOTE

Refer to TM 9-1000-202-14, Evaluation of Cannon Tubes, for borescope and pullover gaging requirements.

SYMPTOM

Mortar fails to fire.

MALFUNCTION

Firing pin is worn, damaged, or improperly seated.

CORRECTIVE ACTION

STEP 1. Replace firing pin if worn or damaged (WP 0010).

STEP 2. Reseat firing pin properly.

MALFUNCTION

Cannon is dirty.

CORRECTION ACTION

STEP 1. Clean cannon bore thoroughly with RBC.

STEP 2. Inspect in accordance with TM 9-1000-202-14.

MALFUNCTION

Cannon is damaged.

CORRECTION ACTION

Repair or condemn cannon.

SYMPTOM

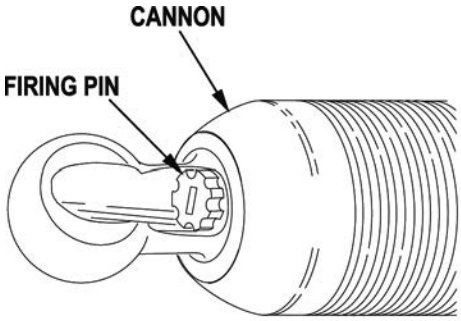
Mortar fires consecutive short rounds.

MALFUNCTION

Cannon does not meet criteria in TM 9-1000-202-14.

CORRECTIVE ACTION

Evacuate to next higher maintenance.



TROUBLESHOOTING PROCEDURE
81-MM MORTAR, M252A1- Continued

SYMPTOM

Buffer clamp assembly will not secure cannon, or allows cannon tube to slip in buffer clamp assembly.

MALFUNCTION

Buffer clamp assembly has missing, damaged, or broken parts.

CORRECTIVE ACTION

Repair or replace buffer clamp assembly as required (WP 0013).

MALFUNCTION

Slack between eyebolt and spring housing assembly exceed 1/16 in. (0.64 cm).

CORRECTIVE ACTION

Adjust buffer clamp assembly as required (WP 0013).

SYMPTOM

Bipod will not traverse properly.

MALFUNCTION

Traversing hand crank is damaged.

CORRECTIVE ACTION

Repair or replace traversing hand crank (WP 0012).

MALFUNCTION

Traversing mechanism has worn, damaged, or missing parts.

CORRECTIVE ACTION

Replace parts as required (WP 0012).

SYMPTOM

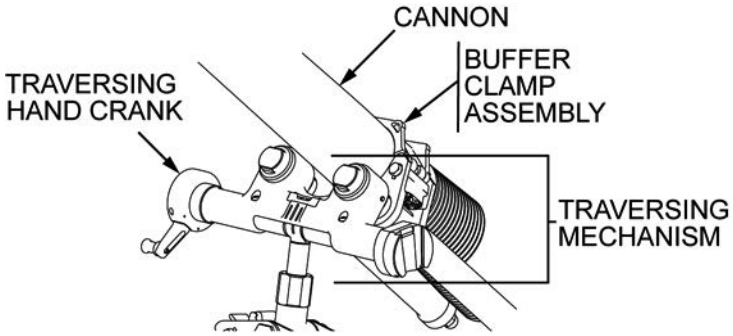
Backlash in traversing mechanism exceeds 1/8 turn.

MALFUNCTION

Crank handle and/or internal parts of traversing mechanism are worn.

CORRECTIVE ACTION

Replace worn parts (WP 0012).



TROUBLESHOOTING PROCEDURE
81-MM MORTAR, M252A1- Continued

SYMPTOM

Bipod will not elevate or depress properly.

MALFUNCTION

Elevating hand crank is damaged.

CORRECTIVE ACTION

Repair or replace elevating hand crank (WP 0017).

MALFUNCTION

Elevating mechanism has worn, damaged, or missing parts.

CORRECTIVE ACTION

Replace parts as required (WP 0017).

SYMPTOM

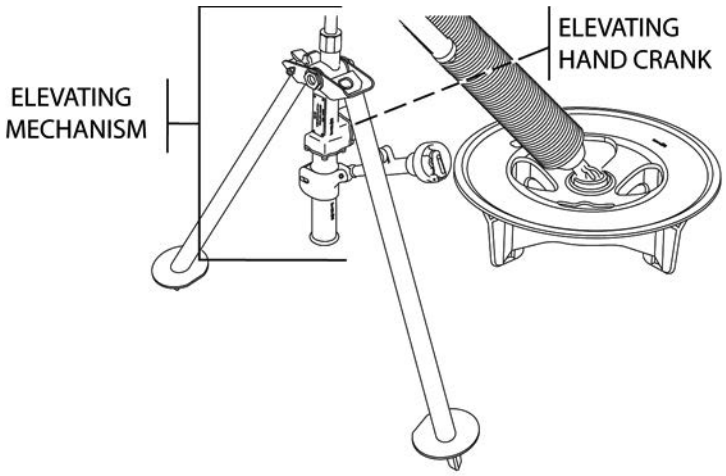
Backlash in elevating mechanism exceeds 1/8 turn.

MALFUNCTION

Crank handle and/or internal parts of elevating mechanism are worn.

CORRECTIVE ACTION

Replace worn parts (WP 0017).



SYMPTOM

Cross leveling assembly is binding.

MALFUNCTION

Cross leveling hand crank is damaged.

CORRECTIVE ACTION

Repair or replace cross leveling hand crank (WP 0015).

MALFUNCTION

Cross leveling assembly has worn, damaged, or missing parts.

CORRECTIVE ACTION

Replace parts as required (WP 0015).

SYMPTOM

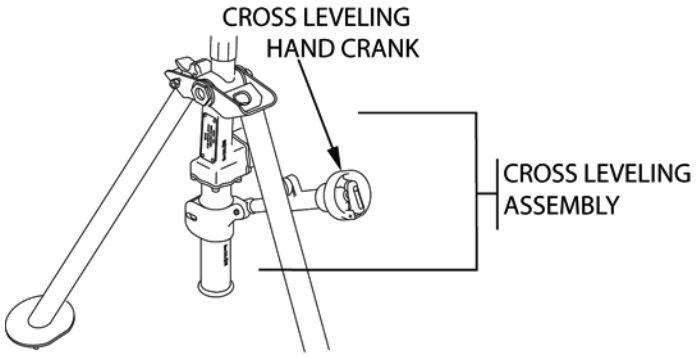
Backlash in cross leveling assembly exceeds 1/8 turn.

MALFUNCTION

Crank handle and/or internal parts of cross leveling assembly are worn.

CORRECTIVE ACTION

Replace worn parts (WP 0015).



TROUBLESHOOTING PROCEDURE
81-MM MORTAR, M252A1 – Continued

SYMPTOM

Recoil mechanism buffers bind, do not recoil properly, or do not return to original position when released.

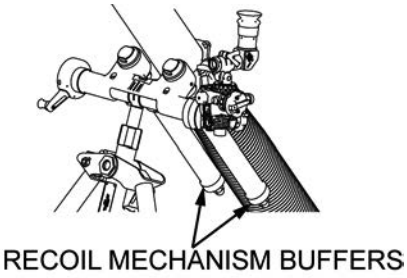
MALFUNCTION

Internal parts of recoil mechanism buffers are bent, worn, damaged, or missing.

CORRECTIVE ACTION

STEP 1. Replace worn parts (WP 0014).

STEP 2. Test function of recoil mechanism buffers by pulling down (recoil) and pushing up (counter-recoil) on both of them at the same time.



SYMPTOM

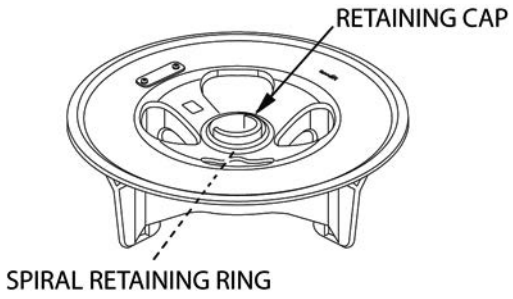
Retaining cap on M3A2 baseplate will not secure cannon or is binding.

MALFUNCTION

Retaining cap is dirty or obstructed by foreign matter.

CORRECTIVE ACTION

Clean retaining cap (WP 0020).



MALFUNCTION

Movement of retaining cap is restricted.

CORRECTIVE ACTION

Replace missing or damaged retaining cap or spiral retaining ring (WP 0020).

MALFUNCTION

Baseplate socket is damaged.

CORRECTIVE ACTION

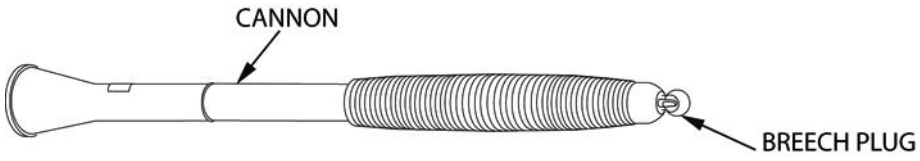
Replace baseplate (WP 0020).

MALFUNCTION

Breech plug of cannon is damaged.

CORRECTIVE ACTION

Repair or replace breech plug (WP 0010).



TROUBLESHOOTING PROCEDURE
81-MM MORTAR, M252A1 – Continued

SYMPTOM

Sight unit will not seat in sight adapter.

MALFUNCTION

Sight adapter has burrs or nicks.

CORRECTIVE ACTION

Repair burrs or nicks on sight adapter (WP 0009).

MALFUNCTION

Sight adapter is bent or broken.

CORRECTIVE ACTION

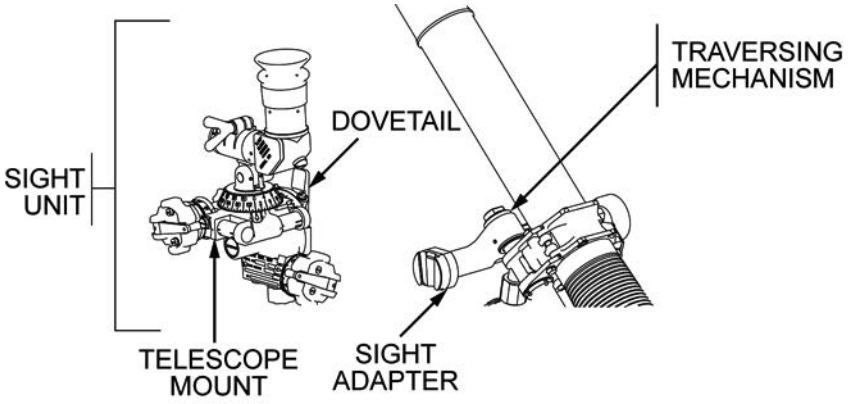
Replace traversing mechanism (WP 0012).

MALFUNCTION

Dovetail on sight unit is bent or broken.

CORRECTIVE ACTION

Replace telescope mount. Refer to TM 9-1240-409-23&P.



END OF TASK

END OF WORK PACKAGE

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS FOR 81-MM MORTAR, M252A1

FIELD MAINTENANCE
SERVICE UPON RECEIPT

INTIAL SETUP

Tools and Special Tools

Basic Pullover Gage Accessories Outfit (WP 0030, Table 2, Item 1)
M3 Borescope (WP 0030, Table 2, Item 2)
Cannon Bore Erosion Gage Set (WP 0030, Table 2, Item 3)
81mm Pullover gage (WP 0030, Table 2, Item 4)

References

AR 735-11-2
DA Form 2408-4
DA PAM 750-8
SF 361
SF 364
TM 9-1000-202-14
TM 9-1015-257-10
TM 9-1240-409-23&P
WP 0002

SERVICE UPON RECEIPT OF MATERIEL

Unpacking

When a new or reconditioned component of the M252A1 81-mm Mortar is received, be aware of any shipping damage to packaging materiel. Report any damage on SF 364, Supply Discrepancy Report (SDR), as prescribed in DoD 4000-25-2-M. Retain packaging materiel for future use.

SERVICE UPON RECEIPT OF MATERIEL - Continued

Unpacking - Continued

WARNING

Before inspection, be sure to clear the weapon. Inspect the cannon tube to make sure it is empty. Avoid having live ammunition in the vicinity during maintenance operations. Failure to follow instructions may cause personnel injury or death. Seek medical attention if injury occurs.

WARNING

RADIATION HAZARD - TRITIUM (^{3}H) GAS

Table 1. Service upon Receipt for 81-mm Mortar, M252A1

Location	Item	Action	Remarks
1. Container	Mortar System	Remove mortar system from container. Ensure that Item Unique Identification (IUID) decals are present on bipod, baseplate, and cannon.	Ensure that all components are present.
2. Container	Basic Issue Items	Check for missing items.	Refer to TM 9-1015-257-10.
3. Cannon	Cannon Tube	Make sure cannon is properly assembled, cleaned, and lubricated. Copy serial number from cannon onto DA Form 2408-4.	Refer to TM 9-1015-257-10 for proper assembly and lubrication.
4. Cannon	Cannon Tube	Perform borescope and pullover gaging of cannon tube prior to firing.	Refer to TM 9-1000-202-14. Annotate results on electronic gun card at TACOM Unique Logistics Support Applications (TULSA) (https://tulsa.tacom.army.mil/guncard).
5. Sight Unit Case	M67 Sight Unit	Check for missing or damaged parts. Verify that cross-level and elevation vial bubbles fit within center of red markings.	Refer to TM 9-1240-409-23&P.

Checking Unpacked Equipment

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions, see DA PAM 750-8).

Check to see whether the equipment has been modified per WP 0002.

Ensure that Weapons Record Data, DA Form 2408-4, is present. Refer to TM 9-1000-202-14.

END OF TASK

INSTALLATION INSTRUCTIONS

NOTE

Wipe excess oil or preservative from cannon tube.

1. Clean all items; lubricate all items except mortar mount. Refer to TM 9-1015-257-10.
2. Match mortar mount and baseplate to specific cannon tube. Mark (i.e., stencil, paint) mount and baseplate to facilitate and confirm scheduled service on assembly.
3. Assemble mortar system. Refer to TM 9-1015-257-10.
4. Check for proper system operation. Refer to TM 9-1015-257-10.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES INTRODUCTION

GENERAL

Preventive Maintenance Checks and Services (PMCS) (WP 0008) must be performed by field maintenance personnel to be sure the mortar is in good operating condition and ready for its primary mission.

To ensure maximum operational readiness, it is necessary that the mortar is inspected at regular intervals so that any defects can be discovered and corrected before serious damage or failure occurs.

Always observe the WARNINGs and CAUTIONs before and during operation. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged. If the equipment fails to operate refer to troubleshooting procedures in WP 0005. Report any deficiencies using the proper forms. See DA PAM 750-8.

EXPLANATION OF COLUMN ENTRIES

The INTERVAL column tells you when to do the check or service in the PROCEDURE column. BEFORE checks and services are performed prior to the mortar leaving its containment area or performing its mission. DURING checks begin when the mortar is being used and AFTER checks and services begin when the mortar is taken out of its mission mode or is returned to its containment area.

The ITEM TO BE CHECKED OR SERVICED column tells you the component of the mortar to be checked. The amount of time required is indicated in the MAN-HOUR column.

When recording results of PMCS, entries in the PMCS ITEM NO. column will be used for the TM Item No. column on DA Form 5988-E, Equipment Inspection and Maintenance Worksheet - Electronic, or DA Form 2404, Equipment Inspection and Maintenance Worksheet.

The EQUIPMENT NOT READY/AVAILABLE IF column indicates deficiencies which must be corrected before the mortar can be operated.

END OF WORK PACKAGE

FIELD MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES, INCLUDING LUBRICATION INSTRUCTIONS

INTIAL SETUP

Tools and Special Tools
Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts
Gun Parts Kit, (WP 0025, Item 1)
Cleaner, lubricant, and preservative (CLP) (WP 0031, Item 8)
Solid film lubricant (SFL) (WP 0031, Item 13)
General purpose lubricating oil (GPL) (WP 0031, Item 16)
Weapons lubricating oil (LAW) (WP 0031, Item 17)
Polyurethane coating (WP 0031, Item 21)
Wiping rag (WP 0031, Item 22)

References
TM 9-1000-202-14
TM 9-1015-257-10
TM 9-1240-409-23&P
WP 0010

GENERAL

The required Preventive Maintenance Checks and Services (PMCS) procedures are listed in Table 1. These services should be performed by field maintenance. Perform PMCS every 180 days if the weapon has not been used during that time.

NOTE

Ensure that electronic gun card is present at TACOM Unique Logistics Support Applications (TULSA) (https://tulsa.tacom.army.mil/guncard) and is properly updated. If gun card is lost, send an e-mail to usarmy.detroit.tacom.mbx.ilsc-mortar-gun-cards@mail.mil.

Ensure that cannon bore requirements in TM 9-1000-202-14 are followed.

PREVENTIVE MAINTENANCE INSPECTION

WARNING

Before starting an inspection, inspect the cannon tube to make sure it is empty. Failure to follow instruction may cause personnel injury or death. Seek medical attention if injury occurs.

WARNING

RADIATION HAZARD – TRITIUM (^{3}H) GAS

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

CAUTION

To prevent damage to the finish of the mortar mount, do not use cleaning solvents. Cleaner, Lubricant, and Preservative (CLP) is the only item approved for cleaning. After use of CLP, the mortar mount must be wiped dry with a clean, dry wiping rag.

Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Semiannually		Cannon, M253	a. Check cannon for unusual wear and damage in bore or corrosion and damage to external surface. Check for loose, missing, or damaged parts on cannon. Check for damaged cooling fins.	Cannon has cracks, dents, bulges, unusual wear, loose, missing, or damaged parts.

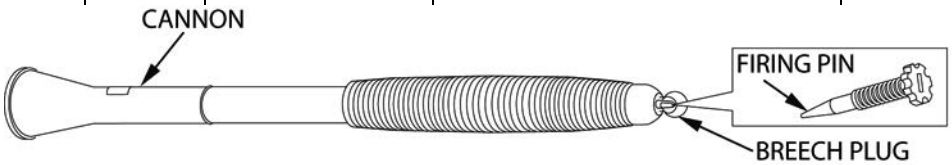


Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1 - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1 (Cont)	Semiannually		Cannon, M253 (Cont)	b. Perform borescope and pullover gage requirements. Refer to TM 9-1000-202-14. Annotate results on electronic gun card in TULSA (https://tulsa.tacom.army.mil/guncard).	Borescope and pullover gage requirements have not been met.
				c. Remove breech plug. Check firing pin for damage and correct protrusion. Check breech plug for erosion and for tightness when reassembled.	Firing pin is damaged or fails protrusion test. Breech plug has condemning erosion or will not stay tight.
				d. Check for bulges, dents, and visible cracks. Check for evidence of gas leakage around firing pin or breech plug (visible discoloration).	Cannon is bulged, dented, or visibly cracked, or shows evidence of gas leakage around firing pin or breech plug (visible discoloration).
				e. Inspect exterior finish of cannon tube for unprotected/reflective surface. Solid film lubricant (SFL) is the authorized touch up for the M253 cannon tube. See WP 0010.	Exterior finish of cannon tube shows unprotected or reflective surface.
2	Semiannually		Sighting and Fire Control Instruments	Check equipment and operation of instruments. Refer to TM 9-1240-409-23&P (M67 Sight Unit).	Instruments are not operational.

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1 - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Annually		Baseplate, M3A2	a. Check baseplate for cracks; loose, missing, or damaged parts; or reflective surfaces.	Baseplate has cracks; loose, missing, or damaged parts; or reflective surfaces.
				b. Ensure that retaining cap rotates smoothly through 360 degrees.	Retaining cap does not rotate smoothly 360 degrees.
				c. Ensure that spiral retaining ring is present and secures retaining cap.	Spiral retaining ring is missing or does not secure retaining cap.
				d. Disassemble and clean baseplate and all components.	
				e. Spot paint baseplate as required not to exceed one third of baseplate body. Do not paint inside socket.	Missing protective coating.

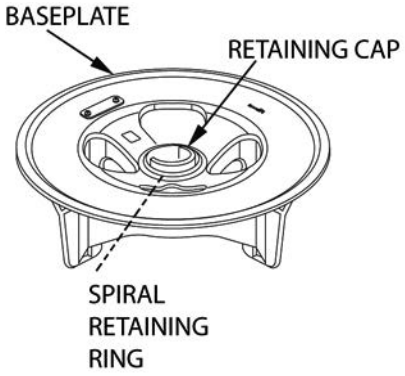
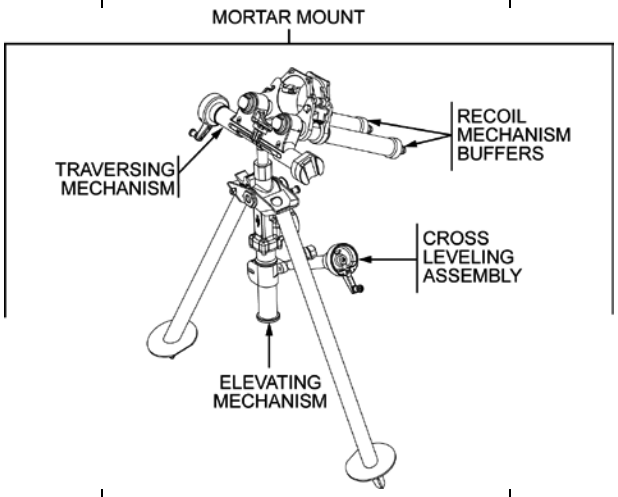


Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1 - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			NOTE If mortar mount is immersed in liquid, perform annual service.		
4	Annually		Mortar Mount, M177A1	a. Check mortar mount (including mortar mount legs) for cracks, broken welds, rust, and loose, missing, or damaged parts.	Mortar mount has cracks, broken welds, loose, missing, or damaged parts.
				b. Traversing mechanism, cross leveling assembly, and elevating mechanism must operate smoothly and without binding through entire range of travel, with less than 1/8 turn of backlash.	Traversing mechanism, cross leveling assembly, or elevating mechanism is inoperative or binding. Backlash exceeds 1/8 turn.

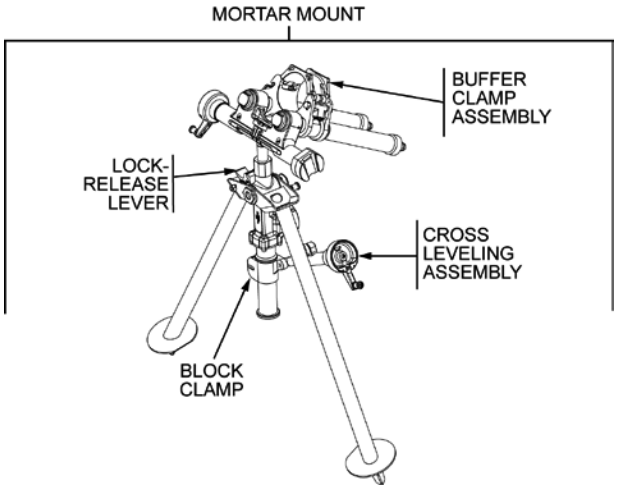
PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1 - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4 (Cont)	Annually (Cont)		Mortar Mount, M177A1 (Cont)	c. Test function of recoil mechanism buffers by pulling down or pushing up on both of them at the same time; they should return to the original position when released. Check that buffers recoil and counter-recoil without any free play or slackness.	Recoil mechanism buffers are inoperative, binding, or do not recoil properly.
						
				d. Assemble mortar mount, baseplate, and cannon. Refer to TM 9-1015-257-10. Repeat steps b and c.	
				e. Buffer clamp assembly must operate properly and hold cannon securely.	Buffer clamp assembly is inoperative or does not hold cannon securely.
				f. Ensure that block clamp moves freely and will lock in place.	Block clamp does not move freely or does not lock in place.

PREVENTIVE MAINTENANCE INSPECTION - Continued

Table 1. Preventive Maintenance Checks and Services for 81-mm Mortar, M252A1 - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				g. Test function of lock-release lever to ensure that legs will open and close securely.	Lock-release lever does not secure legs in open or closed position.
				h. Check mortar mount to ensure annual service has been performed.	Mortar mount has not had annual service.
				NOTE Cannon removed for clarity of illustration.  	
				i. Disassemble mortar mount to a level which allows complete cleaning and inspection for repair of each part. Replace parts as necessary with Annual Repair Parts Kit, 12901850.	Mount's operational effectiveness is reduced by any repairable deficiency.

END OF TASK

LUBRICATION INSTRUCTIONS

Refer to TM 9-1015-257-10. Under arctic conditions, use weapons lubricating oil (LAW) for lubrication of cannon instead of general purpose lubricating oil (GPL).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
GENERAL MAINTENANCE

INTIAL SETUP

Tools and Special Tools
Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

References
TM 9-1015-257-10

GENERAL

WARNING

Before starting an inspection or performing maintenance procedures, be sure to clear the weapon. Inspect the bore to ensure it is empty and free of obstructions. Keep live ammunition out of the area during maintenance operations. Personnel injury could result. Seek medical attention if injury occurs.

Dented cannons must be replaced as they are unsafe for firing. Personnel injury could result. Seek medical attention if injury occurs.

1. Before beginning maintenance operations, ensure that TM 9-1015-257-10, Operator's Manual for Mortar, 81-mm, M252A1, is available for use.

2. Complete disassembly of a unit is not always necessary in order to make a required repair or replacement. Good judgment should be exercised to keep disassembly and assembly to a minimum.

3. Damaged surfaces should be restored using materials and tools consistent with tolerances of item being restored.

    a. Various methods and materials are used for removing corrosion. These should be carefully selected in order that surfaces being processed will not be damaged beyond serviceability.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
M253 81-MM CANNON MAINTENANCE

INTIAL SETUP

Tools and Special Tools

Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
- Striker protrusion gage (WP 0026, Item 2)
- Box wrench (plug) (WP 0026, Item 3)
- Box wrench (barrel) (WP 0026, Item 4)

Basic Pullover Gage Accessories Outfit (WP 0031, Table 2, Item 1)
M3 borescope (WP 0031, Table 2, Item 2)
Cannon Bore Erosion Gage Set (WP 0031, Table 2, Item 3)
81mm pullover gage assembly (WP 0031, Table 2, Item 4)
Firing pin wrench (WP 0031, Table 2, Item 8)

Materials/Parts

Adhesive (WP 0032, Item 1)
Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Rifle bore cleaning compound (RBC) (WP 0032, Item 10)
Clear coat (Surface Sealer) (WP 0032, Item 11)
Gloves, chemical and solvent resistant (WP 0032, Item 12)
Solid film lubricant (WP 0032, Item 13)
General purpose lubricating oil (WP 0032, Item 14)
Wiping rag (WP 0032, Item 20)

Personnel Required

Two

References

TM 9-1000-202-14
TM 9-4933-258-13&P
TM 9-4933-274-23&P
TM 9-6650-235-13&P
WP 0024

DISASSEMBLY

1. Position firing pin wrench (Figure 1, Item 1) on firing pin (Figure 1, Item 2). Unscrew and remove firing pin.

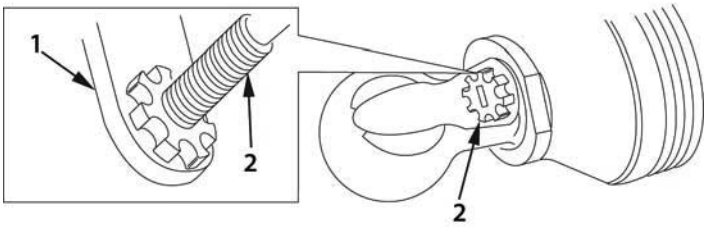


Figure 1. Removal of Firing Pin.

2. Place open end of cannon (Figure 2, Item 2) on flat surface and have one mechanic hold it securely.

NOTE

Barrel wrench is the wrench with the larger opening.

3. Position barrel wrench (Figure 2, Item 3) on cannon (Figure 2, Item 2) and position plug wrench (Figure 2, Item 4) on breech plug (Figure 2, Item 1) as shown.

4. Turn barrel wrench (Figure 2, Item 3) clockwise while turning plug wrench (Figure 2, Item 4) counterclockwise.

5. Unscrew breech plug (Figure 2, Item 1) and remove from cannon (Figure 2, Item 2).

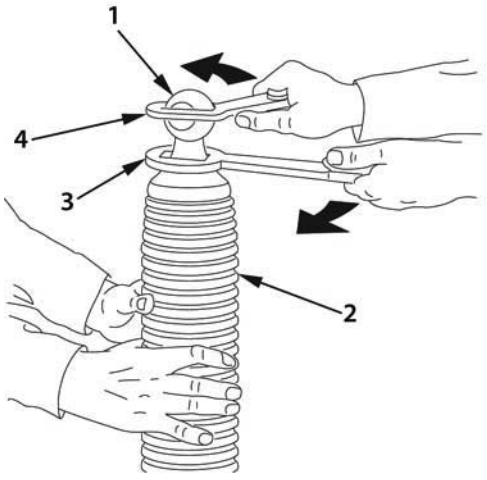


Figure 2. Removal of Breech Plug.

WARNING

HAND TOOLS

To avoid personnel injury, exercise caution and wear eye protection when using hand tools. Flying debris or injured fingers can result. Seek medical attention if injury occurs.

CAUTION

Be careful not to damage cannon when cutting thrust washer bearing.

6. If there is evidence of gas leakage (visible discoloration), remove and discard thrust washer bearing (Figure 3, Item 1) from breech plug (Figure 3, Item 2). It may be necessary to carefully cut it with a chisel and hammer in order to remove it.

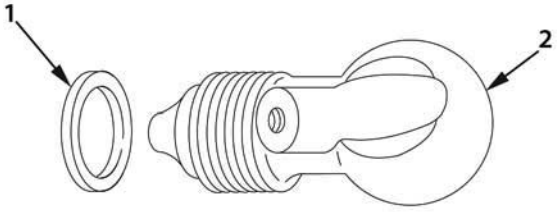


Figure 3. Removal of Thrust Washer Bearing.

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

7. If damaged or illegible, remove Item Unique Identification (IUID) label (Figure 4, Item 1) from cannon (Figure 4, Item 2). Discard label. Remove adhesive residue with CLP.

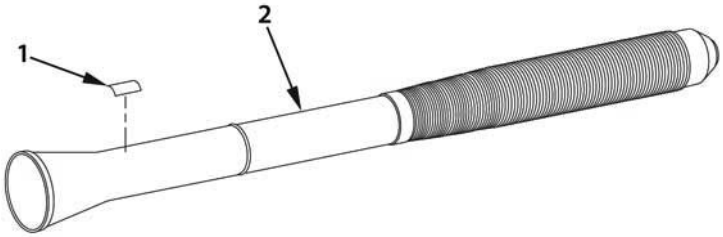


Figure 4. Removal of Item Unique Identification Label.

END OF TASK

REPAIR

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

1. Clean parts with CLP and wipe dry with wiping rag.
2. Replace thrust washer bearing if evidence of gas leakage was found during disassembly. See WP 0024.
3. Replace firing pin if it is chipped, cracked, or deformed.
4. Install firing pin (Figure 5, Item 2) in breech plug (Figure 5, Item 3) and check protrusion using striker protrusion gage (Figure 5, Item 1).
5. Hold striker protrusion gage (Figure 5, Item 1) over the firing pin (Figure 5, Item 2) with the gage held perpendicular to, and in contact with, the front face of the breech plug (Figure 5, Item 3).

NOTE

The minimum recess 0.080 in. (2.032 mm) should not clear the firing pin and the maximum recess 0.130 in. (3.302 mm) should clear the firing pin.

6. Replace firing pin (Figure 5, Item 2) if it clears low notch on gage or does not clear high notch. Repeat protrusion test on new firing pin.
7. Replace breech plug (Figure 5, Item 3) if defective or damaged. See WP 0024.
8. Lubricate parts with general purpose lubricating oil before reassembly.
9. Clean cannon with RBC and wipe dry with wiping rag.

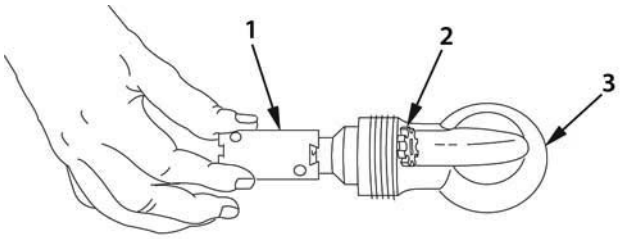


Figure 5. Protrusion Test.

WARNING

EXPLOSION

Dented cannons must be replaced as they are unsafe for firing. Failure to comply may result in injury of personnel. Seek medical attention if injury occurs.

NOTE

- Refer to TM 9-6650-235-13&P for operation of the M3 borescope.
- Refer to TM 9-4933-258-13&P for operation of pullover gage or TM 9-4933-274-23&P for use of Cannon Bore Erosion Gage Set. Cannon Bore Erosion Gage Set is the preferred method for bore inspection.

10. Use borescope and pullover gage or cannon bore erosion gage set to inspect cannon bore according to instructions in TM 9-1000-202-14.

11. Inspect cannon in accordance with TM 9-1000-202-14. The cannon will be condemned if bore diameter reaches 3.227 in. (8.197 cm).

12. Lubricate cannon with cleaner, lubricant, and preservative (CLP) or general purpose lubricating oil (GPL) when inspection is complete.

END OF TASK

ASSEMBLY

1. If label was removed, apply adhesive to new IUID label (Figure 6, Item 1) and place on cannon (Figure 6, Item 2) 6” + 2” in. (20.32 cm) from muzzle end. When adhesive is dry, apply protective clear coat to label.

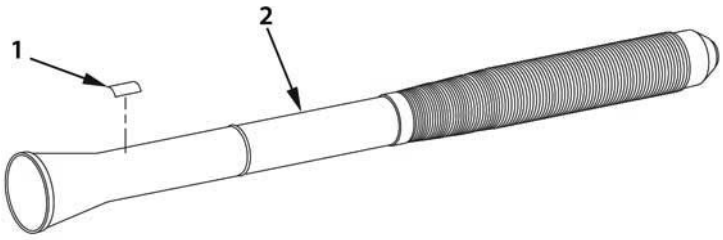


Figure 6. Installation of Item Unique Identification Label.

2. If removed, install new thrust washer bearing (Figure 7, Item 1) on breech plug (Figure 7, Item 2).

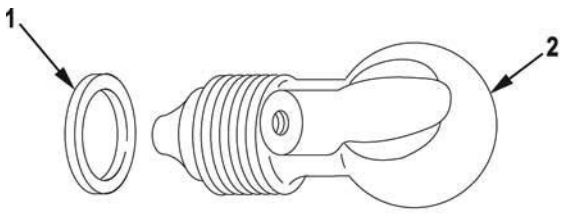


Figure 7. Installation of Thrust Washer Bearing.

ASSEMBLY – Continued

3. Place open end of cannon (Figure 8, Item 2) on flat surface and have one mechanic hold it securely.

NOTE

Barrel wrench is the wrench with the larger opening.

4. Screw breech plug (Figure 8, Item 1) onto cannon (Figure 8, Item 2), using barrel wrench (Figure 8, Item 3) and plug wrench (Figure 8, Item 4) as shown. Tighten as much as possible without using extensions or hammering on wrenches.

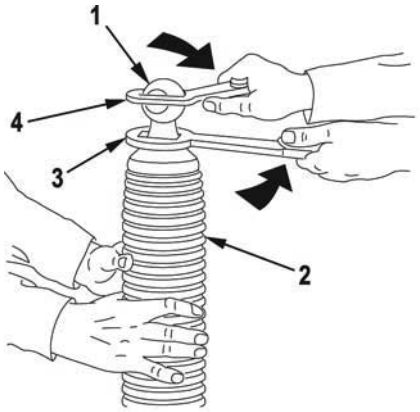


Figure 8. Installation of Breech Plug.

5. Using firing pin wrench (Figure 9, Item 1), install firing pin (Figure 9, Item 2) until seated.

6. If necessary, touch up exposed surfaces using solid film lubricant.

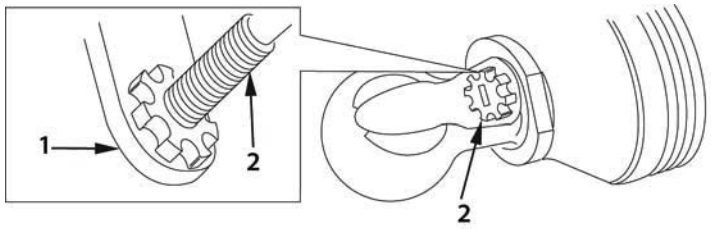


Figure 9. Installation of Firing Pin.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
M177A1 81-MM MORTAR MAINTENANCE

INTIAL SETUP

Tools and Special Tools

Electric Heat Gun (WP 0031, Table 2, Item 5)
Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
- Caps, Vise Jaw (WP 0033, Table 1, Item 1)
- Vise, Machinist's (WP 0033, Table 1, Item 2)
- Wrench, Torque (WP 0033, Table 1, Item 3)
- Wrench, Torque (WP 0033, Table 1, Item 4)

Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts

Adhesive (WP 0032, Item 1)
Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Clear coat (WP 0032, Item 11)
Wiping rag (WP 0032, Item 22)
Sealing compound: blue (WP 0032, Item 22)
Sealing compound: purple (WP 0032, Item 23)

Personnel Required

Two

References

TM 9-1015-257-10
WP 0008
WP 0024

DISASSEMBLY

WARNING

FLYING PARTICLES

Handling of spring under spring tension can result in flying particles. Use extreme caution when removing and installing parts which are under spring tension. Failure to comply can result in injury to personnel. Seek medical attention if injury occurs.

1. Remove two recoil endcaps (Figure 1, Item 1) from recoil mechanism buffer (Figure 1, Item 4).

2. Remove recoil mechanism buffer (Figure 1, Item 4) from traversing mechanism (Figure 1, Item 3).

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

CAUTION

It may be necessary to use a vise for this step. Use a soft-jawed vise or vise with vise caps to prevent equipment damage.

NOTE

To aid in the disassembly of the M177A1 Mortar Mount, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

3. Fully extend elevation shaft assembly (Figure 1, Item 5) (TM 9-1015-257-10) and secure in vise. Rotate traversing mechanism (Figure 1, Item 3) to unscrew from elevation shaft assembly.

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

4. If damaged or illegible, remove Item Unique Identification (IUID) label (Figure 1, Item 2) from traversing mechanism (Figure 1, Item 3). Discard label. Remove adhesive residue with CLP.

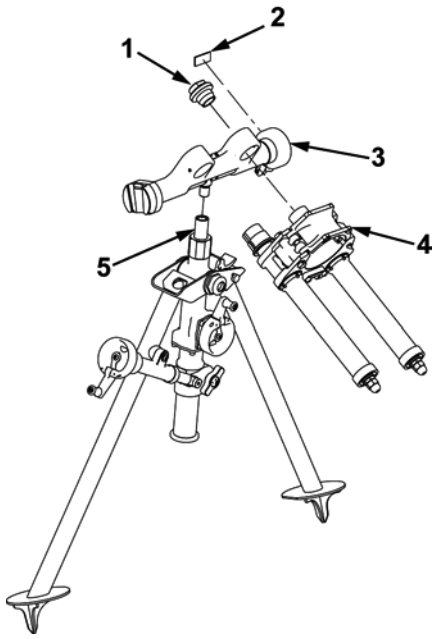


Figure 1. Disassembly of Recoil Mechanism Buffer and Traversing Mechanism.

DISASSEMBLY- Continued

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the mortar legs, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

5. Remove shoulder screw (Figure 2, Item 7) from rod end of cross leveling assembly (Figure 2, Item 4).

NOTE

Orientation of mortar legs is identified as seen from rear of mortar.

***NOTE**

If present between cross leveling assembly and left mortar bipod leg, remove shim(s) and retain for use in reassembly.

6. Remove socket head capscrew (Figure 2, Item 6) and flat washer (Figure 2, Item 5) and remove cross leveling assembly (Figure 2, Item 4) from left mortar bipod leg (Figure 2, Item 3).

7. Depress lock-release lever (Figure 2, Item 1) to release right mortar bipod leg (Figure 2, Item 9).

8. Remove leg mounting nut stow (Figure 2, Item 2) and leg mounting nut (Figure 2, Item 10).

9. Remove right mortar bipod leg (Figure 2, Item 9) and lift left mortar bipod leg (Figure 2, Item 3) from elevation housing assembly (Figure 2, Item 8).

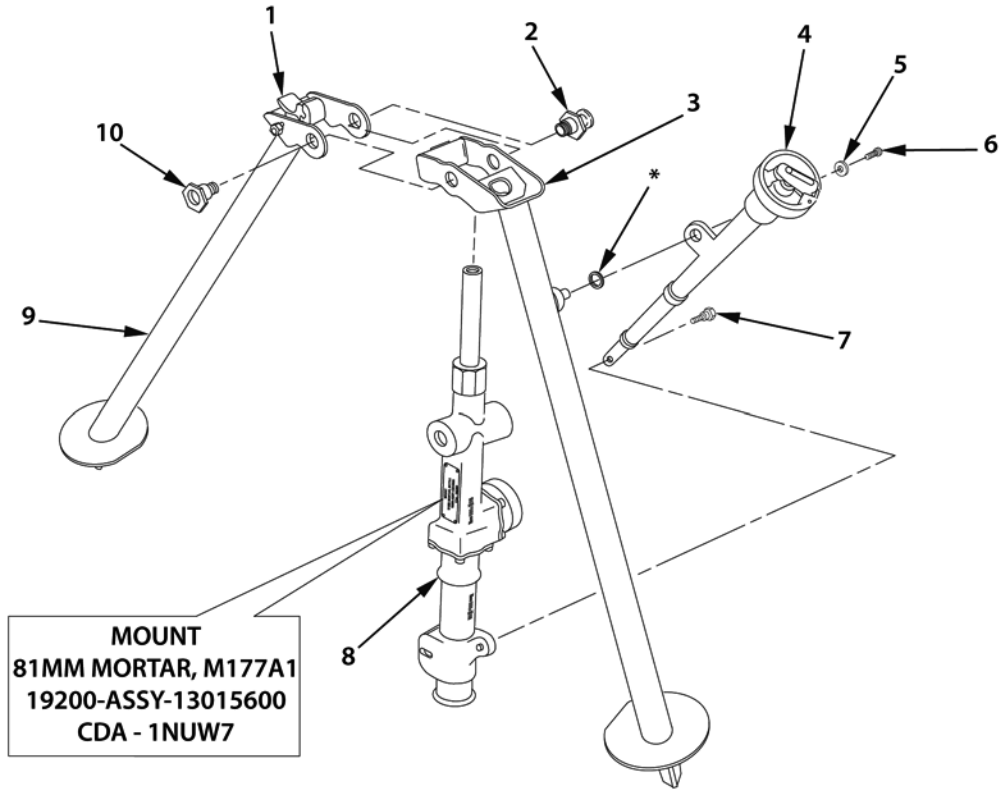


Figure 2. Disassembly of Mortar Legs.

END OF TASK

REPAIR

Clean parts with wiping rag.

Replace damaged of defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

NOTE

Orientation of mortar legs is identified as seen from rear of mortar.

1. Align holes in left mortar bipod leg (Figure 3, Item 3) with holes in right mortar bipod leg (Figure 3, Item 11).

NOTE

See illustration to ensure proper orientation of elevation housing assembly.

2. Slide elevation housing assembly (Figure 3, Item 10) between tops of aligned legs. Center elevation leg mounts in circular holes in legs.

WARNING

SEALING COMPOUND

3. Apply sealing compound (WP 0032, Item 23) to threads of leg mounting nut stow (Figure 3, Item 2) and leg mounting nut (Figure 3, Item 12).

4. Install leg mounting nut stow (Figure 3, Item 2) into hand crank side of elevation housing assembly (Figure 3, Item 10).

5. Install leg mounting nut (Figure 3, Item 12) into opposite side of elevation housing assembly (Figure 3, Item 10). Torque leg mounting nut and leg mounting nut stow (Figure 3, Item 2) to 43.5 – 52.5 ft•lb (65 N•m).

6. Depress lock-release lever (Figure 3, Item 1) and ensure that legs open and close easily.

NOTE

See illustration to ensure proper orientation of cross leveling assembly.

7. Align lug of cross leveling assembly (Figure 3, Item 5) upwards with cant stud (Figure 3, Item 4) on left mortar bipod leg (Figure 3, Item 3) and install flat washer (Figure 3, Item 6) and socket head capscrew (Figure 3, Item 7). Tighten until snug.

***NOTE**

A maximum of 0.1 mm (0.004 in.) axial play is permissible. If maximum is exceeded, retained or new shim(s) will be installed.

8. Check for axial play at cant stud (Figure 3, Item 4).

9. Remove socket head capscrew (Figure 3, Item 7) and flat washer (Figure 3, Item 6). Add shim(s) if needed. Apply sealing compound (WP 0032, Item 23) to threads of capscrew and reinstall flat washer and socket head capscrew. Tighten capscrew until seated.

10. Align hole in rod end of cross leveling assembly (Figure 3, Item 5) with hole in block clamp (Figure 3, Item 9). It may be necessary to move block clamp.

11. Apply sealing compound (WP 0032, Item 22) to threads of shoulder screw (Figure 3, Item 8).

12. Install shoulder screw (Figure 3, Item 8) to secure cross leveling assembly (Figure 3, Item 5) to block clamp (Figure 3, Item 9). Torque to 13.5 – 16.0 ft•lb (20 N•m).

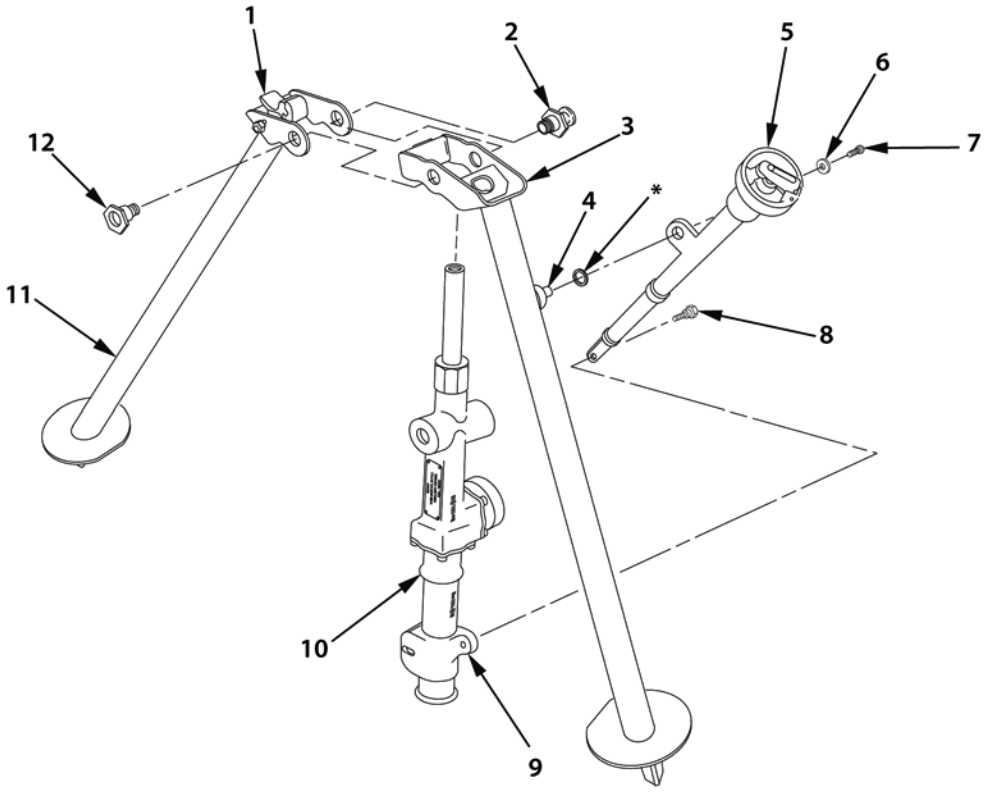


Figure 3. Assembly of Mortar Legs.

ASSEMBLY- Continued

13. If label was removed, apply adhesive to new IUID label (Figure 4, Item 2) and place on traversing mechanism (Figure 4, Item 3). When adhesive is dry, apply protective clear coat to label.

CAUTION

It may be necessary to use a vise for the following steps. Use a soft-jawed vise or vise with vise caps to prevent equipment damage.

14. Fully extend elevation shaft assembly (Figure 4, Item 7) and secure in vise.

15. Thread flange tee (Figure 4, Item 8) into elevation shaft assembly (Figure 4, Item 7). Tighten firmly by hand.

16. Fully extend two recoil mechanisms (Figure 4, Item 4). Ensure that groove in each recoil mechanism aligns with headless straight pin (Figure 4, Item 9) in traversing mechanism (Figure 4, Item 3).

WARNING

SEALING COMPOUND

17. Apply sealing compound (WP 0032, Item 22) to threads of two recoil endcaps (Figure 4, Item 1).

18. Install recoil mechanism buffer (Figure 4, Item 5) to traversing mechanism (Figure 4, Item 3) and install two recoil endcaps (Figure 4, Item 1). Ensure that recoil mechanism buffer aligns with hand crank on elevation housing assembly (Figure 4, Item 6).

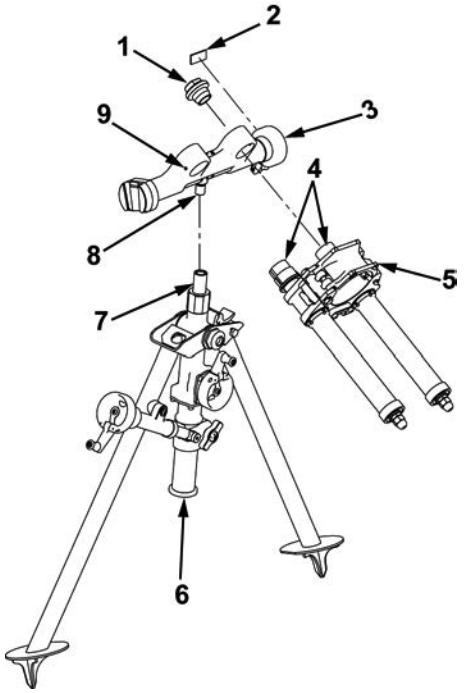


Figure 4. Assembly of Traversing Mechanism and Recoil Mechanism Buffer.

Perform Step 4 (b) through (g) of annual inspection procedure in accordance with WP 0008.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

TRAVERSING MECHANISM MAINTENANCE

INTIAL SETUP

Tools and Special Tools

Electric Heat Gun (WP 0031, Table 2, Item 5)
Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
- Caps, Vise Jaw (WP 0033, Table 1, Item 1)
- Vise, Machinist's12-1 (WP 0033, Table 1, Item 2)
- Wrench, Torque (WP 0033, Table 1, Item 3)
- Wrench, Torque (WP 0033, Table 1, Item 4)

Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
Spanner wrench (WP 0026, Item 5)
Spanner attachment (WP 0026, Item 6)
Face wrench socket (WP 0026, Item 7)

Materials/Parts

Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Clear coat (Surface Sealer) (WP 0032, Item 21)
Wiping rag (WP 0032, Item 20)
Sealing compound: blue (WP 0032, Item 22)
Sealing compound: purple (WP 0032, Item 23)
Flat washer (WP 0034, Item 17)
Sleeve bearing (WP 0034, Item 18)

References

TM 9-1015-257-10
WP 0019
WP 0024

Equipment Condition

Traversing mechanism removed from mortar mount (WP 0011).

DISASSEMBLY

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

- To aid in the disassembly of the traversing mechanism, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.
- If damage to hand crank is evident, see WP 0019 for repair.
- Flat spring is a component of hand crank and may come loose during disassembly.

1. Remove socket head capscrew (Figure 1, Item 1) and hand crank (Figure 1, Item 2).
2. If damaged, remove two headless straight pins (Figure 1, Item 8) from traversing yoke (Figure 1, Item 5).
3. If damaged, remove two socket head capscrews (Figure 1, Item 6) and level (Figure 1, Item 7) from traversing yoke (Figure 1, Item 5).
4. Using face wrench socket, remove mounting plate (Figure 1, Item 3).

***NOTE**

If shims are present, note location to aid in assembly. Remove and retain for possible reuse.

5. Remove sleeve bearing (Figure 1, Item 4) from mounting plate (Figure 1, Item 3). Discard sleeve bearing.
6. Unscrew shoulder screw (Figure 1, Item 12) from flange tee (Figure 1, Item 9) and remove from traversing yoke (Figure 1, Item 5). Remove shim(s) if present. Remove traverse screw retainer (Figure 1, Item 10) and flat washer (Figure 1, Item 11) from shoulder screw (Figure 1, Item 12). Discard flat washer.

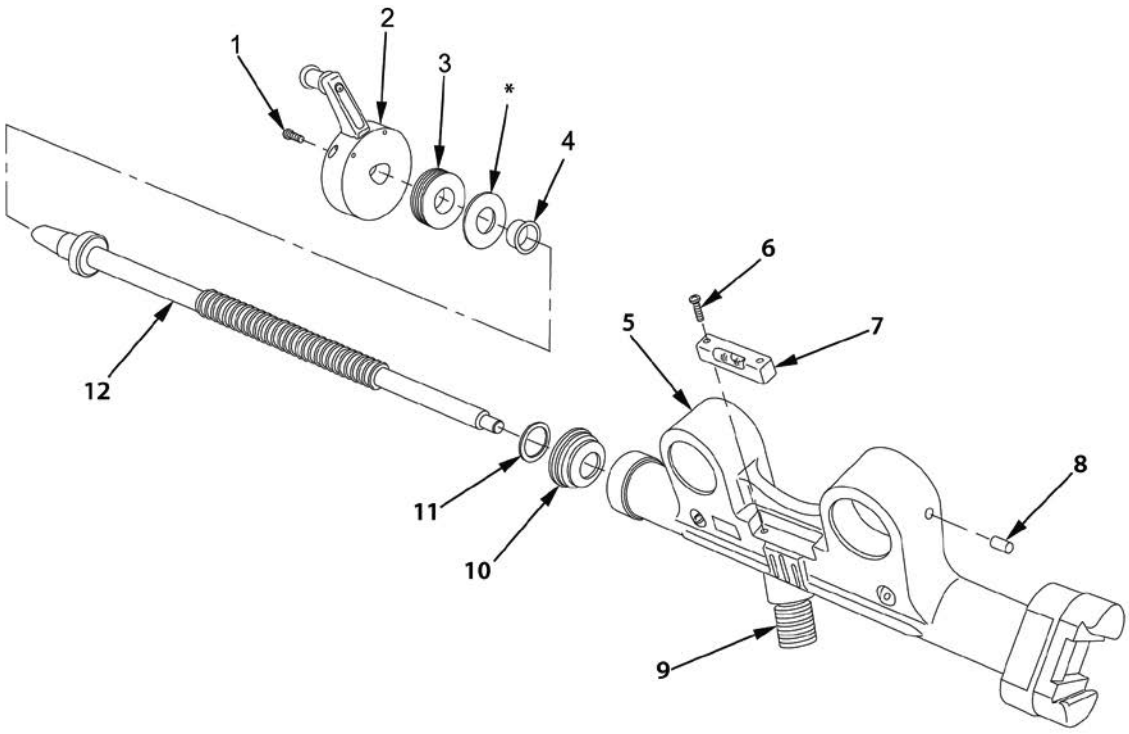


Figure 1. Removal of Shoulder Screw from Traversing Yoke.

7. Remove two socket head capscrews (Figure 2, Item 9) from traversing yoke (Figure 2, Item 1).

CAUTION

To prevent equipment damage, use soft-jawed vise.

8. Secure traversing yoke (Figure 2, Item 1) in vise.

9. Using spanner wrench and spanner attachment, remove retainer nut (Figure 2, Item 8) from flange tee (Figure 2, Item 6). Slide sleeve bushing (Figure 2, Item 7) from traversing yoke (Figure 2, Item 1).

10. Lift flange tee (Figure 2, Item 6) with second sleeve bushing (Figure 2, Item 5) from traversing yoke (Figure 2, Item 1).

11. Using spanner wrench and spanner attachment, remove retainer nut (Figure 2, Item 4) from flange tee (Figure 2, Item 6). Remove sleeve bushing (Figure 2, Item 5).

NOTE

Do not remove socket head capscrews (Figure 2, Item 2) or sight adapter (Figure 2, Item 3) from traversing yoke (Figure 2, Item 1).

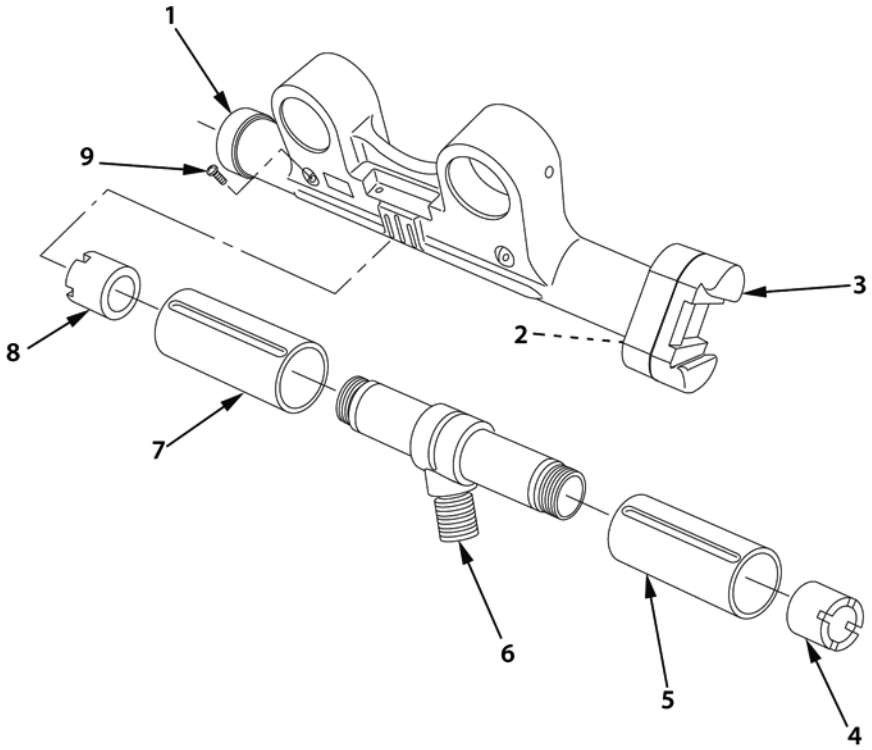


Figure 2. Removal of Flange Tee.

END OF TASK

INSPECTION

1. Ensure sleeve bearing (Figure 3, Item 2) is installed into bottom of sight adapter (Figure 3, Item 3). If loose or missing, replace traverse yoke assembly.

END OF TASK

REPAIR

1. Clean parts with wiping rag.
2. Ensure four socket head capscrews (Figure 3, Item 1) are present. If missing, replace capscrews.
3. Replace damaged or defective parts as authorized by WP 0024.

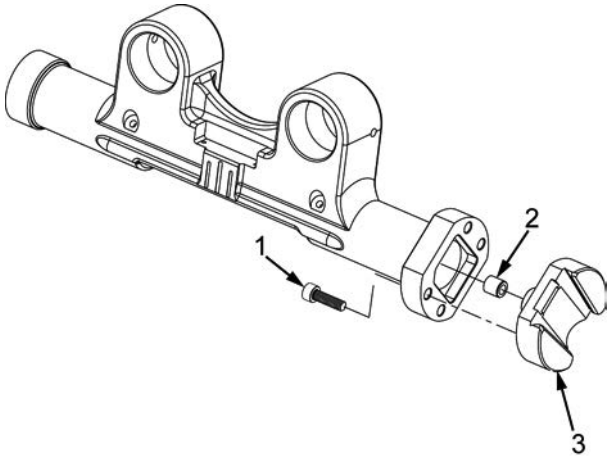


Figure 3. Traversing Yoke Inspection.

END OF TASK

ASSEMBLY

WARNING

SEALING COMPOUND

1. If any of four socket head capscrews (Figure 4, Item 2) is missing, apply sealing compound (WP 0032, Item 22) to threads of socket head capscrew(s).

2. Install socket head capscrew(s) (Figure 4, Item 2). Torque to 7.0 - 8.0 ft•lb (10 N•m).

3. Install sleeve bushing (Figure 4, Item 4), with lip first, onto flange tee (Figure 4, Item 5). Using spanner attachment and spanner wrench, install retainer nut (Figure 4, Item 3) and torque to 13.0 -15.0 ft•lb (19 N•m).

4. Install flange tee (Figure 4, Item 5) into traversing yoke (Figure 4, Item 1). Slide sleeve bushing (Figure 4, Item 6) onto flange tee from the end and install retainer nut (Figure 4, Item 7). Torque nut to 13.0 - 15.0 ft•lb (19 N•m) using spanner attachment and spanner wrench.

5. Apply sealing compound (WP 0032, Item 23) to threads of two socket head capscrews (Figure 4, Item 8).

6. Align slot in sleeve bushing (Figure 4, Item 6) with hole in traversing yoke (Figure 4, Item 1) and install socket head capscrew (Figure 4, Item 8). Tighten until seated. Ensure that sleeve bushing moves freely.

7. Repeat previous step for sleeve bushing (Figure 4, Item 4).

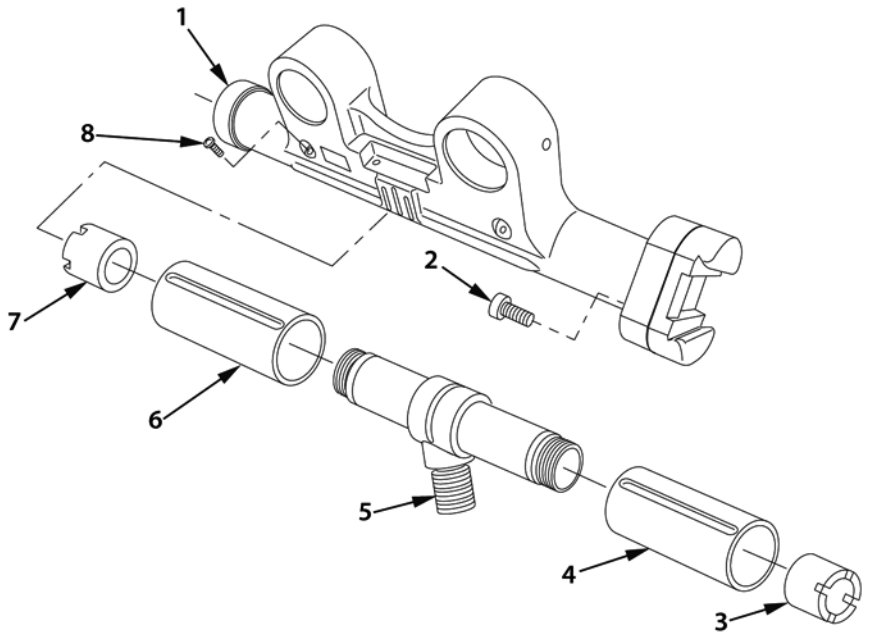


Figure 4. Installation of Flange Tee.

ASSEMBLY - Continued

8. Install new flat washer (Figure 5, Item 11) and traverse screw retainer (Figure 5, Item 10) to shoulder screw (Figure 5, Item 12). Install shoulder screw into traversing yoke (Figure 5, Item 5) until fully seated.

***NOTE**

Maximum tolerance allowed for shims is not to exceed 0.004 in. (0.1 mm).

The addition of shims reduces backlash; removal of shims allows hand crank to turn more freely.

9. Install new sleeve bearing (Figure 5, Item 4) to mounting plate (Figure 5, Item 3).

10. Apply sealing compound (WP 0032, Item 22) to mounting plate (Figure 5, Item 3). Install mounting plate to traversing yoke (Figure 5, Item 5). Using face wrench socket, torque to 13.0 - 15.0 ft•lb 19 N•m).

11. Install hand crank (Figure 5, Item 2). Check for backlash. If backlash exceeds 1/8 of turn, install shim(s) between mounting plate (Figure 5, Item 3) and shoulder screw (Figure 5, Item 12) until desired backlash is achieved.

12. Apply sealing compound (WP 0032, Item 23) to threads of socket head capscrew (Figure 5, Item 1).

NOTE

Ensure flat spring of hand crank is in place before installation of capscrew.

13. Secure hand crank (Figure 5, Item 2) with socket head capscrew (Figure 5, Item 1). Tighten until seated.

14. If level (Figure 5, Item 7) was removed, apply sealing compound (WP 0032, Item 23) to threads of two socket head capscrews (Figure 5, Item 6).

15. Align level (Figure 5, Item 7) on traversing yoke (Figure 5, Item 5) and install two socket head capscrews (Figure 5, Item 6). Tighten until seated.

16. If removed, install two new headless straight pins (Figure 5, Item 8) to traversing yoke (Figure 5, Item 5). Adjust to approximate depth of 1/8 in. (0.32 cm). Check for binding against recoil assembly. Loosen headless straight pins if binding occurs.

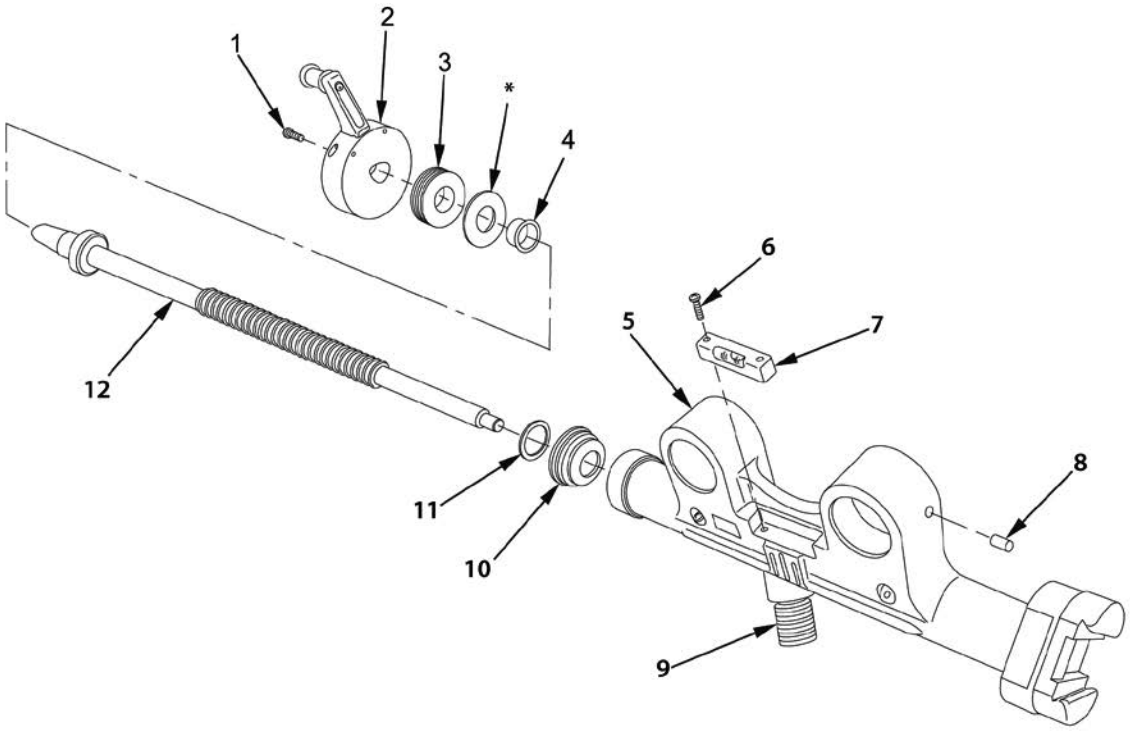


Figure 5. Installation of Shoulder Screw.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
RECOIL MECHANISM BUFFER (CLAMP) MAINTENANCE (13015780)

INTIAL SETUP

Tools and Special Tools
- Electric Heat Gun (WP 0031, Table 2, Item 5)
- Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
  - Caps, Vise Jaw (WP 0033, Table 1, Item 1)
  - Vise, Machinist's (WP 0033, Table 1, Item 2)
  - Wrench, Torque (WP 0033, Table 1, Item 3)
  - Wrench, Torque (WP 0033, Table 1, Item 4)
- Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
  - Spanner wrench (WP 0026, Item 5)
  - Face wrench socket (WP 0026, Item 7)
  - Seal inserter (WP 0026, Item 9)
  - Seal inserter (WP 0026, Item 10)

Materials/Parts
- Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
- Wiping rag (WP 0032, Item 20)
- Sealing compound (WP 0032, Item 22)
- Sealing compound (WP 0032, Item 23)
- Slotted spring pin (WP 0034, Item 2)
- Splint pin (2) (WP 0034, Item 3)
- Parallel pin (WP 0034, Item 4)
- Key washer (1) (WP 0034, Item 8)
- Key washer (2) (WP 0034, Item 9)
- Torsion helical spring (WP 0034, Item 20)

Personnel Required
- Two

References
- WP 0014
- WP 0024

Equipment Condition
- Recoil mechanism buffer removed from mortar mount (WP 0011).

DISASSEMBLY

NOTE

- Steps 1 through 10 apply to clamp assembly. Removal of buffer clamp assembly from recoil mechanism buffer is not required. To disassemble recoil assembly, proceed to WP 0014.
- Ensure hinge pin is secure during extraction of pivot pins and key washers.

1. Straighten tabs on two key washers (Figure 1, Item 3). Remove two machine bolts (Figure 1, Item 4) and two key washers. Discard key washers.
2. Open clamping catch (Figure 1, Item 1). Remove upper clamp (Figure 1, Item 2), with spring housing assembly (Figure 1, Item 5) and clamping catch from lower clamp (Figure 1, Item 6).
3. Remove headless straight pin (Figure 1, Item 7) from upper clamp (Figure 1, Item 2) and spring housing assembly (Figure 1, Item 5).

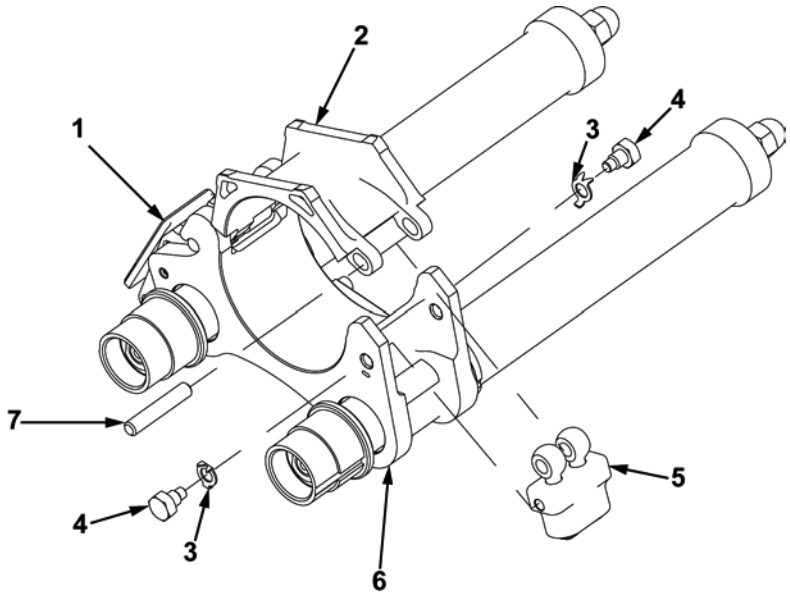


Figure 1. Removal of Spring Housing Assembly.

4. Remove slotted spring pin (Figure 2, Item 1) from parallel pin (Figure 2, Item 3). Discard slotted spring pin.

5. Using punch, remove parallel pin (Figure 2, Item 3) and discard from upper clamp (Figure 2, Item 2). Separate clamping catch (Figure 2, Item 4) from upper clamp.

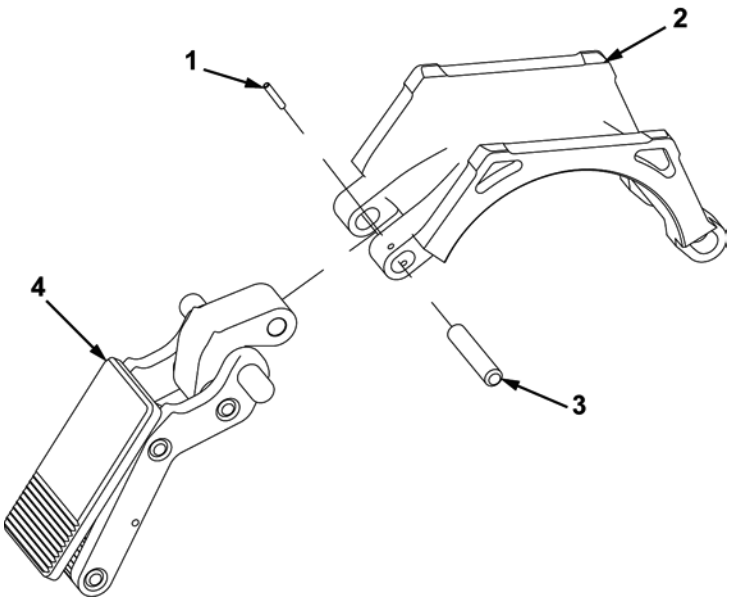


Figure 2. Disassembly of Clamp Assembly.

DISASSEMBLY- Continued

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

- Take note of position of torsion helical spring prior to removal to ensure accurate position at assembly.
- To aid in the disassembly of the clamping catch, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

6. If torsion helical spring (Figure 3, Item 6) is worn or damaged, remove socket head capscrew (Figure 3, Item 5), socket head capscrew (Figure 3, Item 7), and torsion helical spring from clamping catch (Figure 3, Item 1). Discard torsion helical spring.

7. If damaged, remove setscrew (Figure 3, Item 4) and buffer latch pin (Figure 3, Item 3) from lower clamp (Figure 3, Item 2).

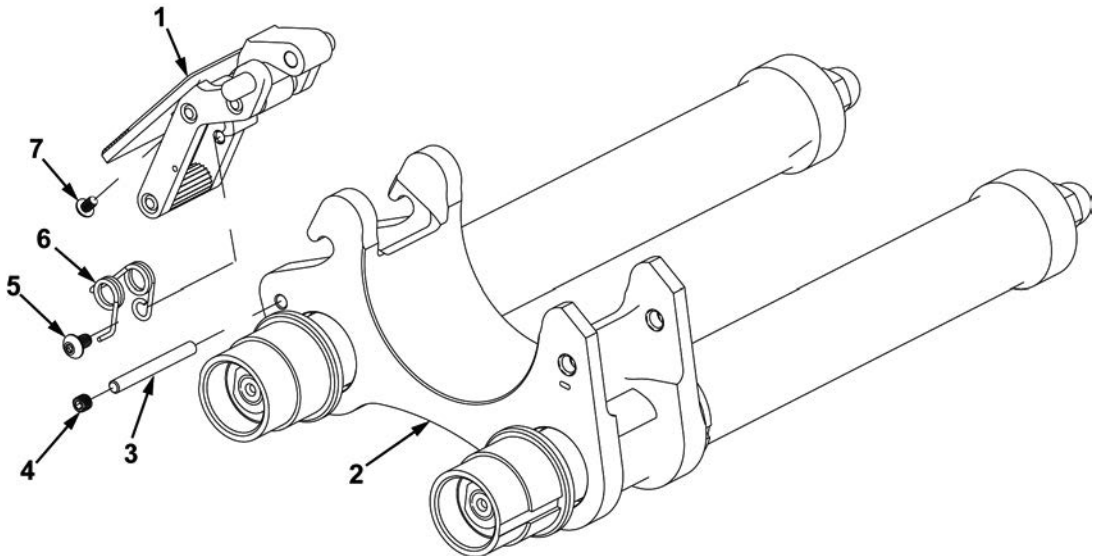


Figure 3. Disassembly of Clamping Catch.

NOTE

To aid in proper adjustment during assembly, retain spring tension washer set with its associated eyebolt.

8. Remove two cotter pins (Figure 4, Item 5). Remove two slotted nuts (Figure 4, Item 4), two eyebolts (Figure 4, Item 1), and two spring tension washer sets (Figure 4, Item 3) from belleville housing (Figure 4, Item 2). Discard cotter pins.

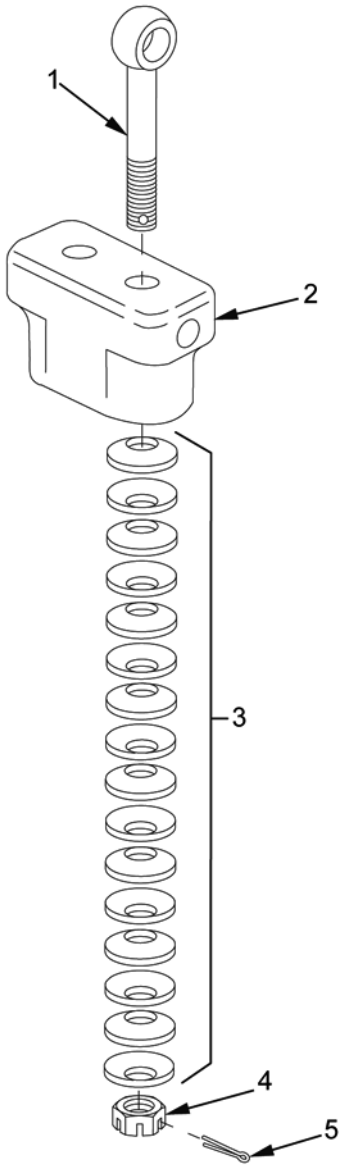


Figure 4. Disassembly of Spring Washer Assembly.

DISASSEMBLY- Continued

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the stowage bracket, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

9. Remove two socket head capscrews (Figure 5, Item 4) and mounting bracket (Figure 5, Item 2) from lower clamp (Figure 5, Item 1).

10. Straighten tab on key washer (Figure 5, Item 6). Remove hexagon head capscrew (Figure 5, Item 5), key washer, and sleeve spacer (Figure 5, Item 3) from mounting bracket (Figure 5, Item 2). Discard key washer.

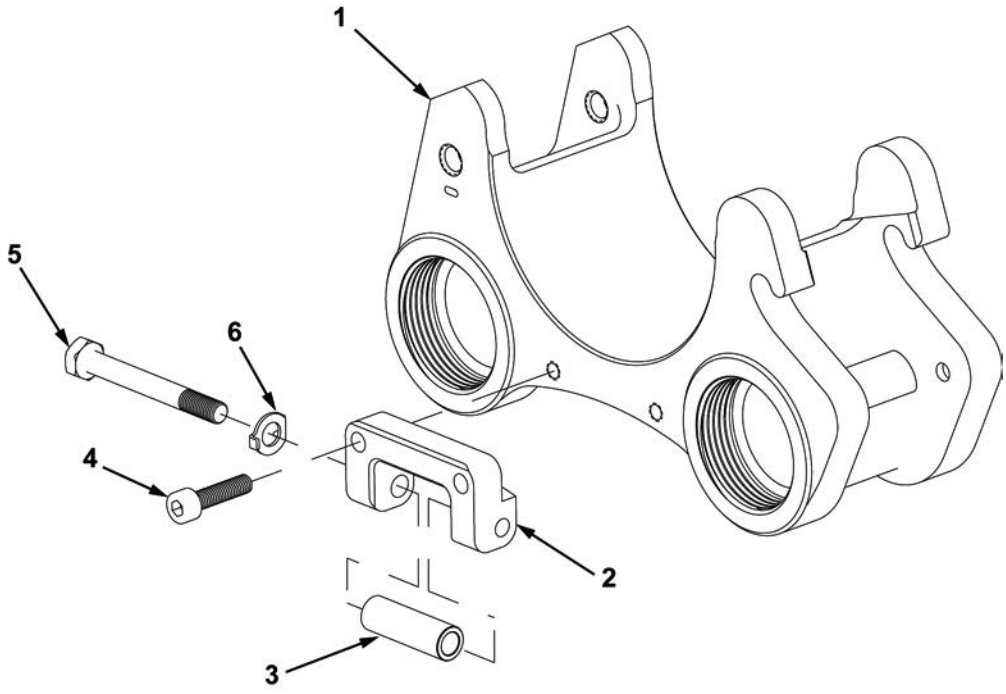


Figure 5. Disassembly of Stowage Bracket.

END OF TASK

REPAIR

1. Clean parts with wiping rag.
2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

NOTE

Steps 1 through 3 apply to stowage bracket.

1. Align sleeve spacer (Figure 6, Item 3) in mounting bracket (Figure 6, Item 2) and install new key washer (Figure 6, Item 6) and hexagon head capscrew (Figure 6, Item 5). Tighten screw until seated with no axial play. Bend key washer tab to secure.

WARNING

SEALING COMPOUND

2. Apply sealing compound (WP 0032, Item 22) to threads of two socket head capscrews (Figure 6, Item 4).
3. Align holes in mounting bracket (Figure 6, Item 2) with holes in lower clamp (Figure 6, Item 1) and install two socket head capscrews (Figure 6, Item 4). Tighten until seated.

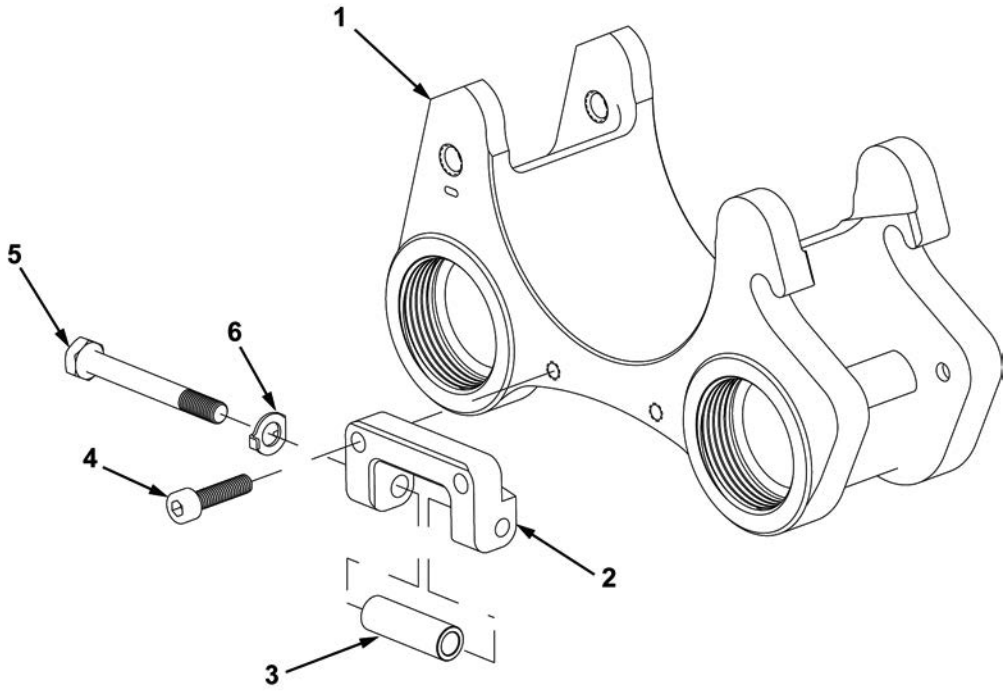


Figure 6. Assembly of Stowage Bracket.

ASSEMBLY – Continued

WARNING

SEALIING COMPOUND

NOTE

Steps 4 through 12 apply to clamp assembly.

4. If removed, apply sealing compound (WP 0032, Item 22) to new setscrew (Figure 7, Item 4).
5. If removed, install buffer latch pin (Figure 7, Item 3) and new setscrew (Figure 7, Item 4) into lower clamp (Figure 7, Item 2).
6. If removed, apply sealing compound (WP 0032, Item 23) to threads of socket head capscrew (Figure 7, Item 7) and socket head capscrew (Figure 7, Item 5).
7. If removed, position new torsion helical spring (Figure 7, Item 6) in clamping catch (Figure 7, Item 1). Align loop of spring with hole in side. Install socket head capscrew (Figure 7, Item 5) through loop. Tighten until seated.
8. Push center of torsion helical spring (Figure 7, Item 6) into slot in clamping catch (Figure 7, Item 1). Install socket head capscrew (Figure 7, Item 7). Tighten until seated. Install straight end of spring into small hole in side of clamping catch.

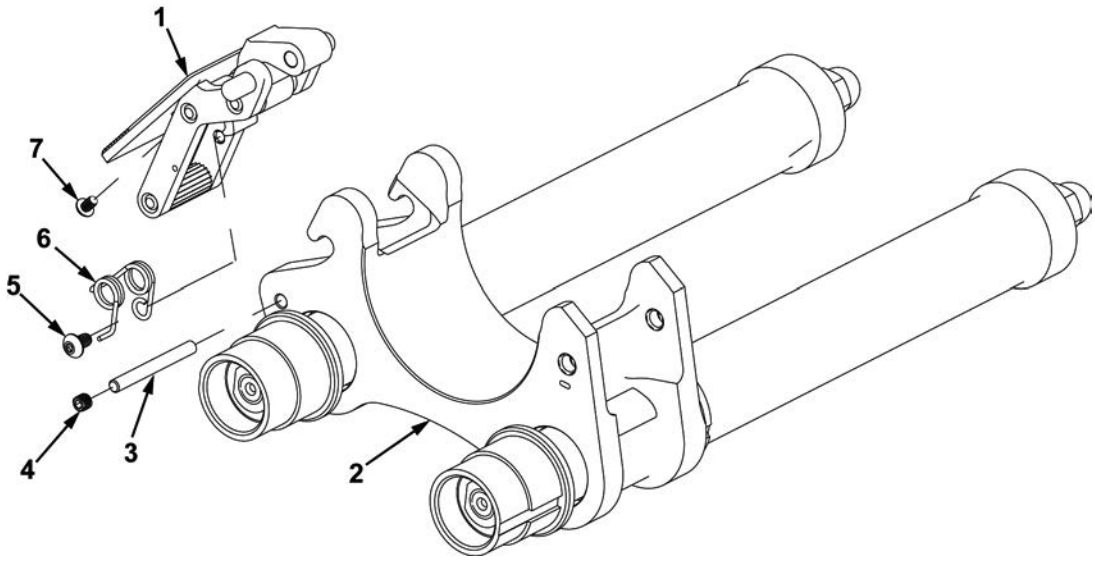


Figure 7. Assembly of Clamping Catch.

9. Align hole in clamping catch (Figure 8, Item 4) with holes in upper clamp (Figure 8, Item 2).
10. Install new parallel pin (Figure 8, Item 3) through clamping catch (Figure 8, Item 4) and upper clamp (Figure 8, Item 2).
11. Install new spring pin (Figure 8, Item 1) through upper clamp (Figure 8, Item 2).

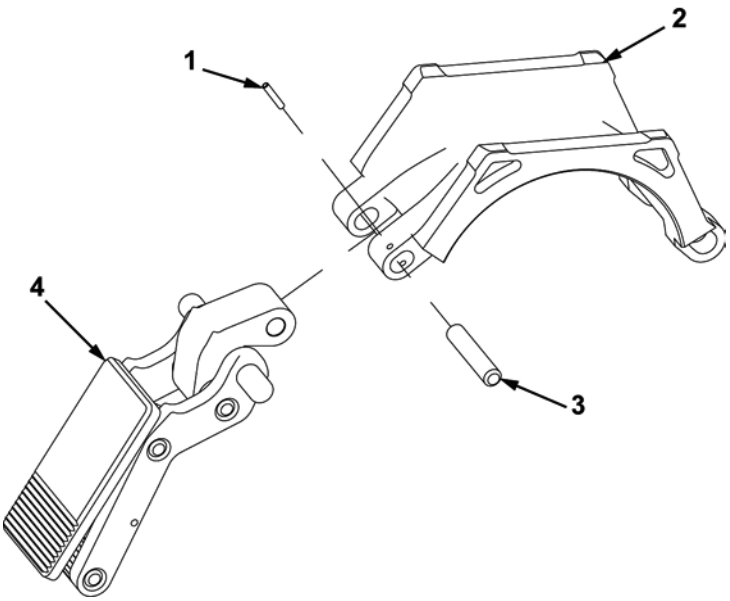


Figure 8. Assembly of Clamp Assembly.

ASSEMBLY – Continued

12. Install two eyebolts (Figure 9, Item 3) into belleville housing (Figure 9, Item 4).

13. Align eyebolts (Figure 9, Item 3) with holes in upper clamp (Figure 9, Item 1). Install headless straight pin (Figure 9, Item 6) in upper clamp.

14. Align holes in belleville housing (Figure 9, Item 4) with holes in lower clamp (Figure 9, Item 5). Temporarily install two machine bolts (Figure 9, Item 2).

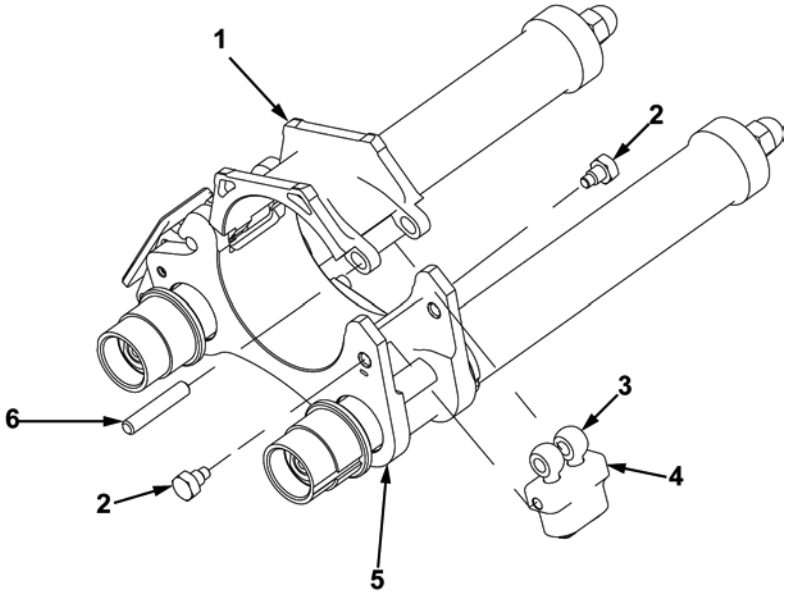


Figure 9. Temporary Install of Spring Pack Housing.

NOTE

Ensure cannon is centered and aligned in buffer clamp assembly for proper clamping. Clamping catch should hang off and not rest on work surface. Refer to Figure 10 for proper orientation.

15. Place cannon (Figure 10, Item 1) into buffer clamp assembly (Figure 10, Item 2) and close clamping catch (Figure 10, Item 3).

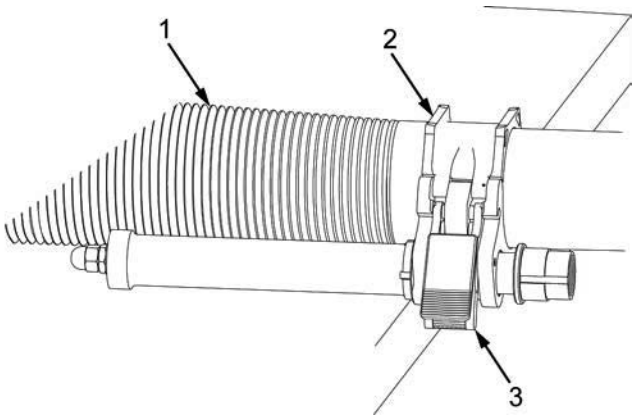


Figure 10. Centering of Cannon.

16. Push two eyebolts (Figure 11, Item 3) into belleville housing (Figure 11, Item 4), eliminating all possible slack between head of eyebolts and the top of belleville housing.

17. Mark both shafts of eyebolts (Figure 11, Item 3) parallel to top of belleville housing (Figure 11, Item 4).

18. Open clamping catch (Figure 11, Item 1). Remove two machine bolts (Figure 11, Item 7) from lower clamp (Figure 11, Item 6).

19. Remove headless straight pin (Figure 11, Item 5) from upper clamp (Figure 11, Item 2).

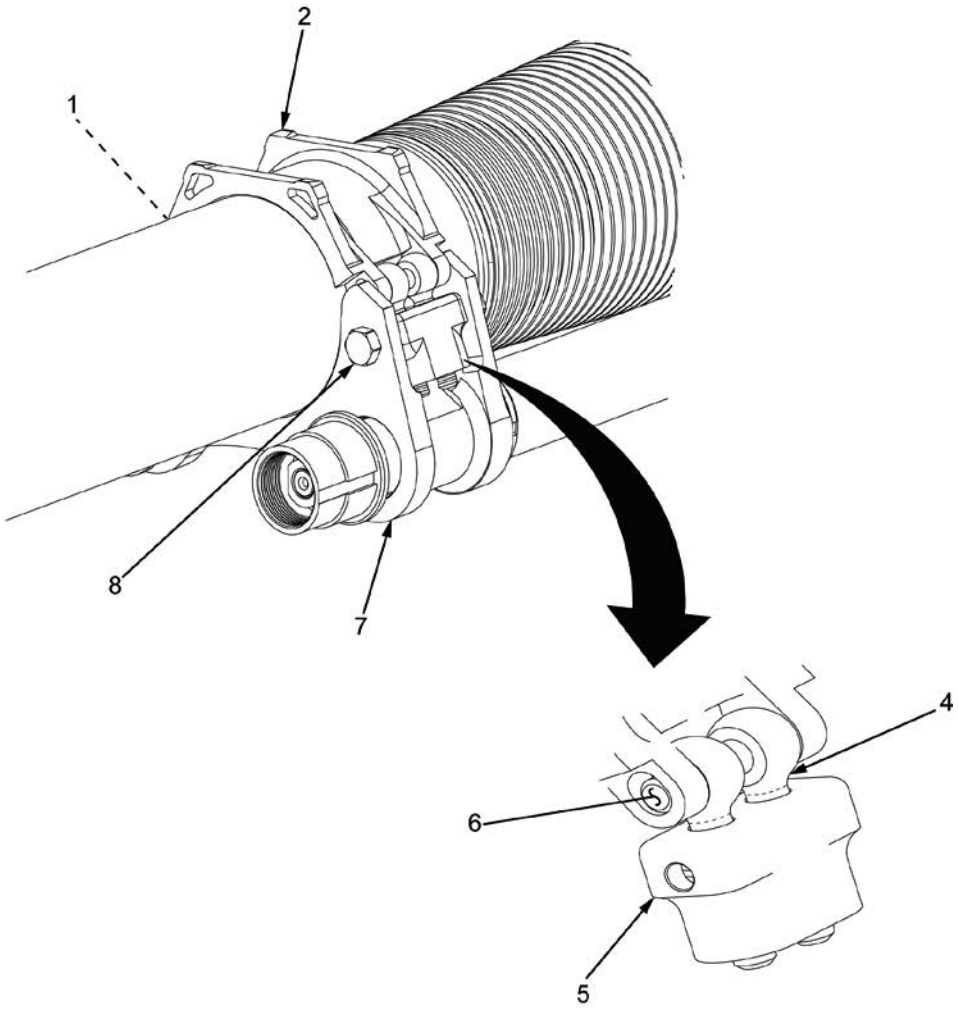


Figure 11. Marking of Eyebolt Shaft.

ASSEMBLY – Continued

20. Temporarily install headless straight pin (Figure 12, Item 4) through eyebolts of belleville housing (Figure 12, Item 3).

NOTE

- Each spring tension washer set contains 16 washers. If one set is replaced, also replace other set.
- Allow eyebolts to suspend freely during install of washers and nut.
- See illustration to ensure proper orientation of spring tension washers during installation.

21. Install spring tension washer set (Figure 12, Item 2), ensuring that washers are installed convex surface to concave surface.

22. Install slotted nut (Figure 12, Item 1) to retain washers (Figure 12, Item 2). While holding belleville housing (Figure 12, Item 3), turn nut until mark on eyebolt (Figure 12, Item 5) is aligned to top of spring housing as shown in Figure 12.

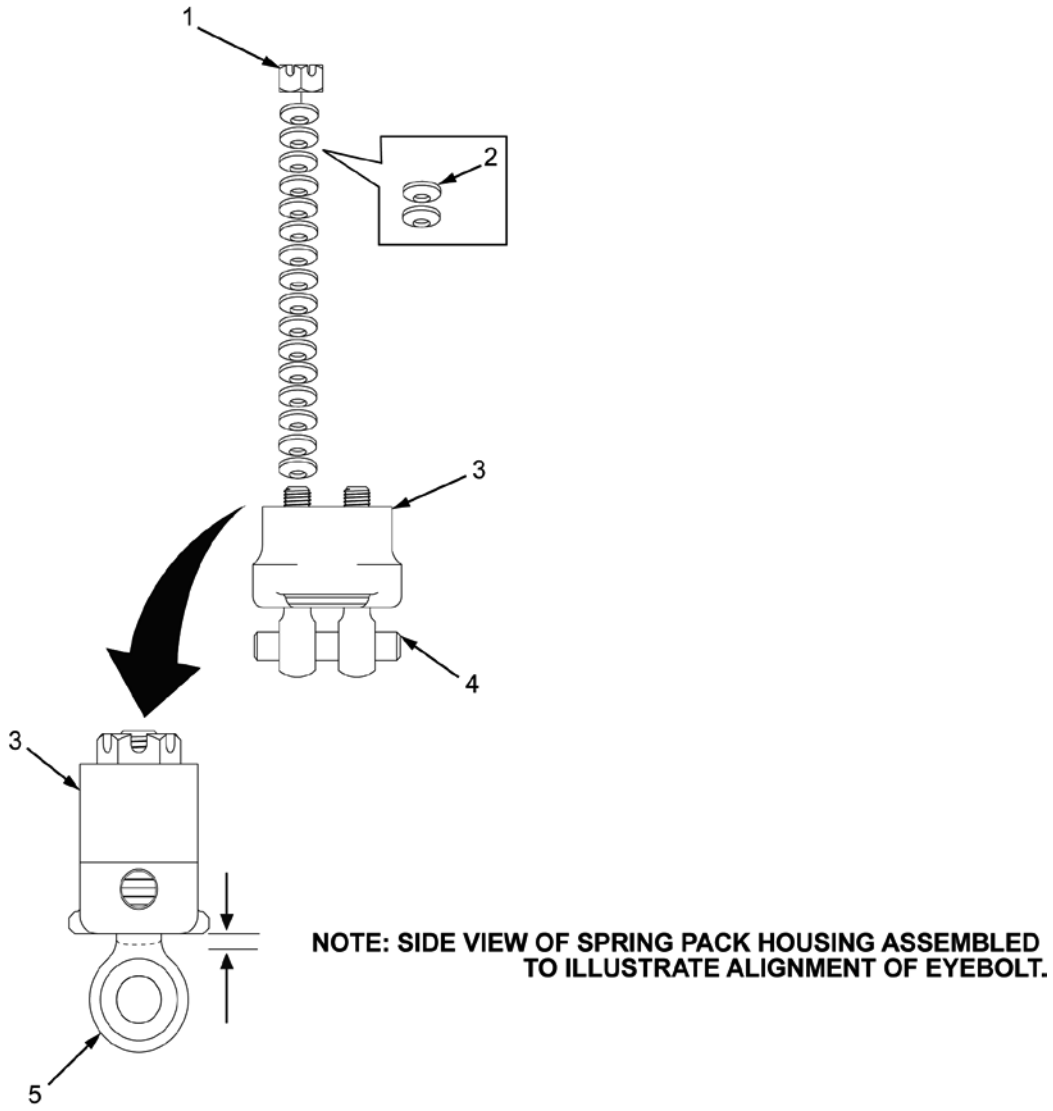


Figure 12. Installation of Spring Washer Assembly.

NOTE

- To obtain an accurate adjustment, spring tensions washers will be assembled one eyebolt at a time.
- Ensure nut is marked to identify number of turns in step 23.
- Record and retain number of turns for future referencing.

23. Count number of turns required to remove slotted nut (Figure 13, Item 2) from eyebolt (Figure 13, Item 4). Subtract 2.25 turns, record value.

24. Remove spring tension washers (Figure 13, Item 3) from spring housing (Figure 13, Item 5).

NOTE

See illustration to ensure proper orientation of spring tension washers.

25. Reinstall spring tension washers (Figure 13, Item 3), ensuring that they are installed concave surface to concave surface.

26. Install slotted nut (Figure 13, Item 2) on eyebolt (Figure 13, Item 4) using recorded number of turns recorded in step 23.

27. Install cotter pin (Figure 13, Item 1).

28. Repeat steps 23 through 27 for installing spring tension washers (Figure 13, Item 3) on second eyebolt (Figure 13, Item 4).

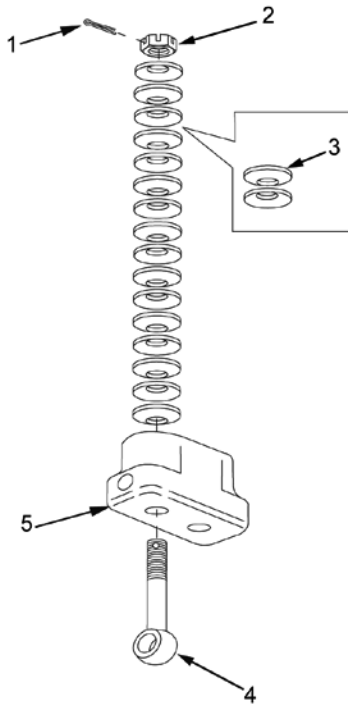


Figure 13. Assembly of Spring Washer Assembly.

29. Align eyebolts (Figure 14, Item 5) of spring housing assembly (Figure 14, Item 6) with holes in upper clamp (Figure 14, Item 2). Install hinged pin (Figure 14, Item 8) in upper clamp.

30. Align holes in spring housing assembly (Figure 14, Item 6) with holes in lower clamp (Figure 14, Item 7). Install two new key washers (Figure 14, Item 3) and two machine bolts (Figure 14, Item 4). Torque bolts to 22.5 - 27.5 ft•lb (34 N•m). Bend tabs of two key washers to secure.

31. Install clamping catch (Figure 14, Item 1) into lower clamp (Figure 14, Item 7) and close.

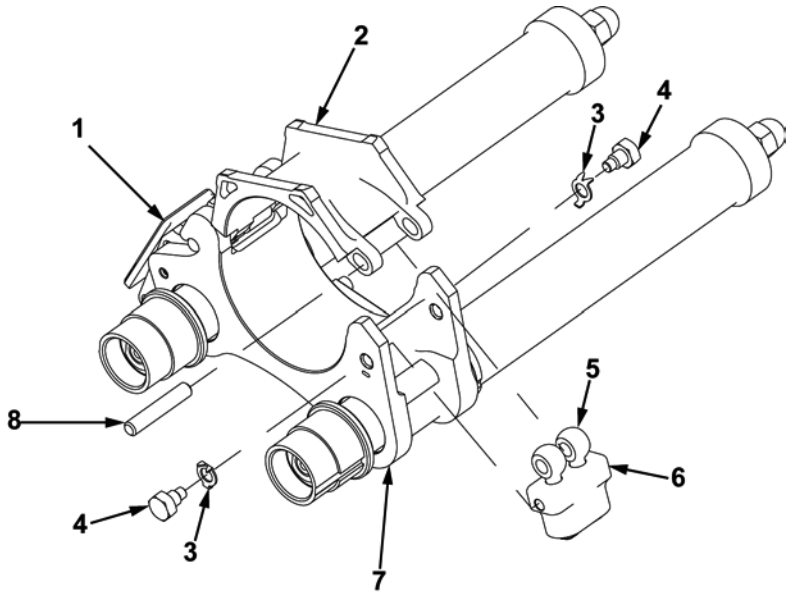


Figure 14. Installation of Spring Washer Assembly.

END OF WORKPACKAGE

FIELD MAINTENANCE
RECOIL MECHANISM BUFFER (RECOIL) MAINTENANCE (13015880)

INTIAL SETUP

Tools and Special Tools
- Electric Heat Gun (WP 0031, Table 2, Item 5)
- Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
  - Caps, Vise Jaw (WP 0033, Table 1, Item 1)
  - Vise, Machinist's (WP 0033, Table 1, Item 2)
  - Wrench, Torque (WP 0033, Table 1, Item 3)
  - Wrench, Torque (WP 0033, Table 1, Item 4)
- Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
  - Spanner wrench (WP 0026, Item 5)
  - Face wrench socket (WP 0026, Item 7)
  - Seal inserter (WP 0026, Item 9)
  - Seal inserter (WP 0026, Item 10)

Materials/Parts
- Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
- Wiping rag (WP 0032, Item 20)
- Sealing compound: blue (WP 0032, Item 22)
- Spring Pin (2) (WP 0034, Item 7)
- Buffer wiper seal (2) (WP 0034, Item 10)
- Rubber flat washer (4) (WP 0034, Item 21)
- Bumper (2) (WP 0034, Item 22)

Personnel Required
- Two

References
- WP 0024

Equipment Condition
- Recoil mechanism buffer removed from mortar mount (WP 0011).

DISASSEMBLY

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

- Steps 1 through 11 apply to the recoil assembly.
- Recoil assembly will we disassembled on at a time.
- To aid in the disassembly of the Recoil Mechanism Buffer, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

WARNING

FLYING PARTICLES

Handling of spring under spring tension can result in flying particles. Use extreme caution and wear eye protection when removing and installing parts which are under spring tension. Failure to comply can result in injury to personnel. Seek medical attention if injury occurs.

1. Extend recoil mechanism, temporarily install recoil endcap (Figure 1, Item 1) to recoil mechanism (Figure 1, Item 2).
2. Remove cap plain nut (Figure 1, Item 8), hexagon plain nut (Figure 1, Item 7), and flat washer (Figure 1, Item 6).
3. Using spanner wrench, unscrew and remove recoil housing (Figure 1, Item 4) from buffer clamp assembly (Figure 1, Item 3).

CAUTION

It may be necessary to use a vise for this step. Use a soft-jawed vise or vise with vise caps to prevent equipment damage.

4. If damaged, use face wrench socket to remove mounting plate (Figure 1, Item 5) from recoil housing (Figure 1, Item 4).
5. Remove recoil mechanism (Figure 1, Item 2) from buffer clamp assembly (Figure 1, Item 3).
6. Remove bumper (Figure 1, Item 10) from spring housing (Figure 1, Item 2). Discard bumper.
7. Remove and discard buffer wiper seal (Figure 1, Item 9)

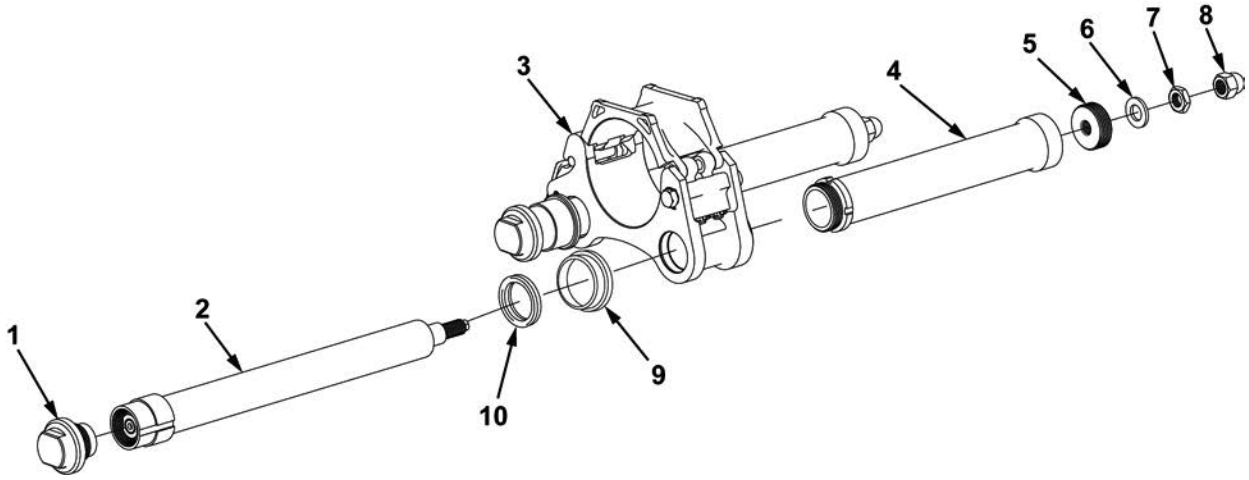
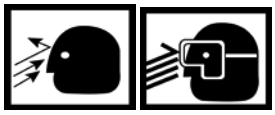


Figure 1. Disassembly of Recoil Mechanism Buffer.

WARNING



FLYING PARTICLES

Handling of spring under spring tension can result in flying particles. Use extreme caution and wear eye protection when removing and installing parts which are under spring tension. Failure to comply can result in injury to personnel. Seek medical attention if injury occurs.

8. Retaining pressure on recoil endcap (Figure 2, Item 1), slowly unscrew recoil endcap and release pressure on recoil spring assembly (Figure 2, Item 2).

9. Remove recoil spring assembly (Figure 2, Item 2) and outer recoil spring (Figure 2, Item 3) from spring housing (Figure 2, Item 7).

10. Remove flat washer (Figure 2, Item 4), rubber flat washer (Figure 2, Item 5), and sleeve bushing (Figure 2, Item 6) from spring housing (Figure 2, Item 7). Discard rubber flat washer.

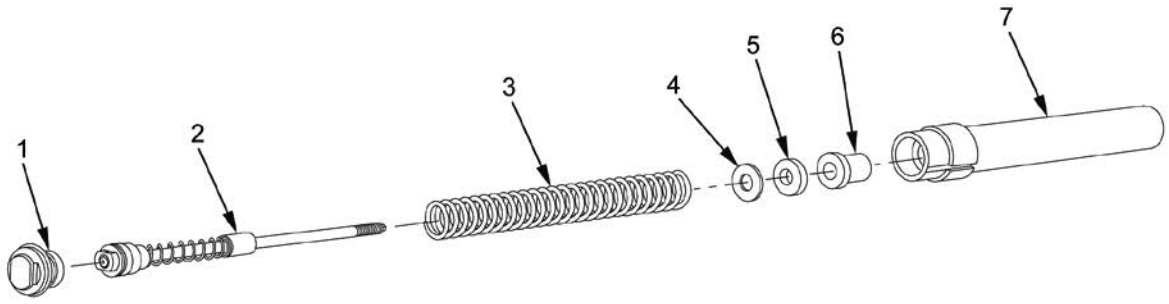


Figure 2. Disassembly of Recoil Mechanism.

DISASSEMBLY- Continued

11. Remove spring pin (Figure 3, Item 6) from round plain nut (Figure 3, Item 7). Discard spring pin.

NOTE

Round plain nut and threaded rod end are a matched set, keep both items together after disassembly.

12. Remove round plain nut (Figure 3, Item 7), flat washer (Figure 3, Item 1), rubber flat washer (Figure 3, Item 2), helical compression retainer (Figure 3, Item 3) and secondary recoil spring (Figure 3, Item 4) from threaded end rod (Figure 3, Item 5). Discard rubber flat washer.

13. Repeat steps 1 through 11 for second recoil assembly.

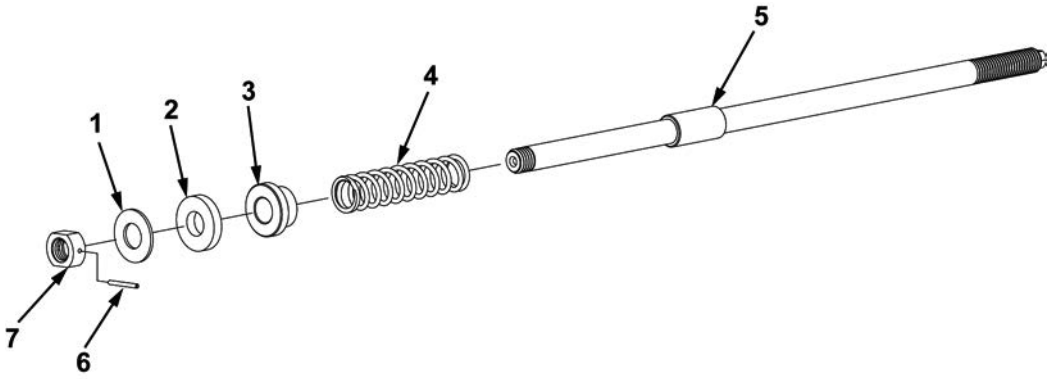


Figure 3. Disassembly of Recoil Spring Assembly.

END OF TASK

INSPECTION

1. Inspect length of two outer recoil springs. Free-resting length of each spring must be between 11.5 in (292.1mm) and 14.75in (375mm).

2. Compare free-resting length of two outer recoil springs. Length of springs must be within 1 in (25.4mm) of each other to be acceptable for reuse.

3. If either of the outer recoil springs does not meet the length conditions, both outer recoil springs must be replaced.

4. Measure two secondary recoil springs. Free-resting length of each spring must be between 3.15 in. (80.0 mm) and 3.75 in. (95.25 mm).

5. Compare free-resting length of two secondary recoil springs. Length of springs must be within 0.25 in. (6.4 mm) of each other to be acceptable for reuse.

6. If either of the secondary recoil springs does not meet the length conditions, both secondary recoil springs must be replaced.

REPAIR

1. Clean parts with wiping rag.

2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

NOTE

Steps 1 through 18 apply to the recoil assembly. To assemble clamp assembly, refer to WP 0013.

WARNING

FLYING PARTICLES

Handling of spring under spring tension can result in flying particles. Use extreme caution and wear eye protection when removing and installing parts which are under spring tension. Failure to comply can result in injury to personnel. Seek medical attention if injury occurs.

NOTE

Round plain nut and threaded rod end are a matched set. Order next higher assembly if replacement of either part is necessary.

1. Install secondary recoil spring (Figure 4, Item 4), helical compression retainer (Figure 4, Item 3), new rubber flat washer (Figure 4, Item 2), and flat washer (Figure 4, Item 1) on threaded rod end (Figure 4, Item 5).

2. Install round plain nut (Figure 4, Item 7) onto threaded rod end (Figure 4, Item 5) and tighten until hole in round plain nut aligns with hole in threaded rod end.

3. Install new spring pin (Figure 4, Item 6) to round plain nut (Figure 4, Item 7). Insert pin until flush with surface of nut.

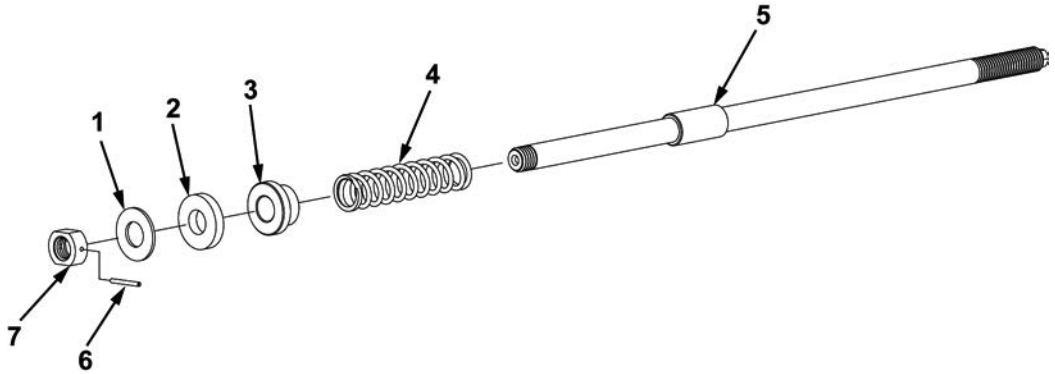


Figure 4. Assembly of Recoil Spring Assembly.

ASSEMBLY - Continued

4. Install outer recoil spring (Figure 5, Item 3) to recoil spring assembly (Figure 5, Item 2).

5. Install sleeve bushing (Figure 5, Item 6), new rubber flat washer (Figure 5, Item 5), and flat washer (Figure 5, Item 4) into spring housing (Figure 5, Item 7).

6. Install recoil spring assembly (Figure 5, Item 2) with outer recoil spring (Figure 5, Item 3) into spring housing (Figure 5, Item 7).

7. Using recoil endcap (Figure 5, Item 1), compress outer recoil spring (Figure 5, Item 3). Tighten recoil endcap to retain spring compression.

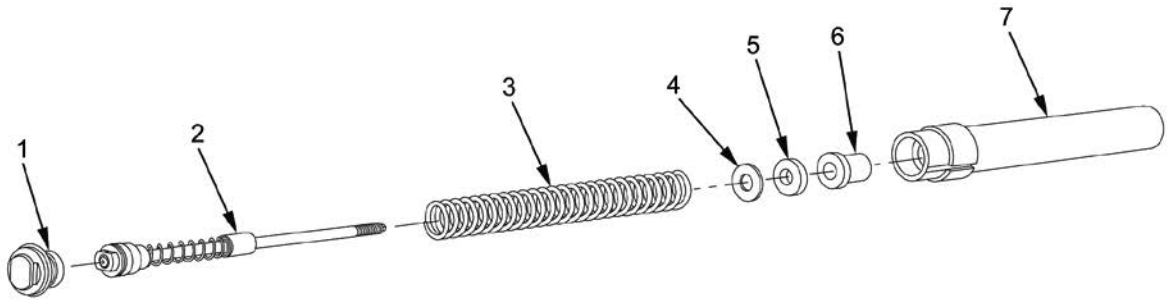


Figure 5. Assembly of Recoil Mechanism.

NOTE

Ensure that flange of buffer wiper seal is turned opposite of lower clamp. Refer to Figure 6 for correct orientation.

8. Install new bumper (Figure 5, Item 5) to spring housing (Figure 5, Item 1). Position bumper against collar of housing.

9. Using seal inserter (WP 0026, Item 9) and seal inserter (WP 0025, Item 10), install new buffer wiper seal (Figure 6, Item 6) to lower clamp (Figure 6, Item 2).

10. Insert seal inserter (WP 0026, Item 10) onto end of recoil mechanism (Figure 6, Item 1).

11. Install recoil mechanism (Figure 6, Item 1) to lower clamp (Figure 6, Item 2).

WARNING

SEALING COMPOUND

12. Apply sealing compound to threads of recoil housing (Figure 6, Item 3).

13. Install recoil housing (Figure 6, Item 3) to lower clamp (Figure 6, Item 2). Using spanner wrench, torque to 13.0 -15.0 (19 N•m).

14. If removed, thread mounting plate (Figure 6, Item 4) onto end of recoil mechanism (Figure 6, Item 1). Using face wrench socket, continue installation of mounting plate into recoil housing (Figure 6, Item 3). Torque to 13.0 -15.0 ft•lb (19 N•m).

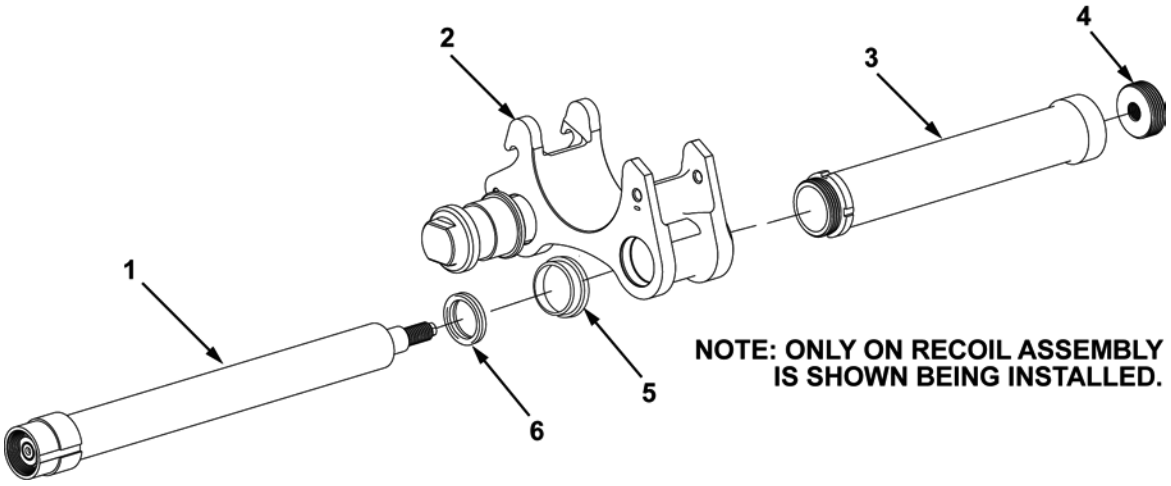


Figure 6. Assembly of Recoil Mechanism Buffer.

ASSEMBLY - Continued

15. Adjust threaded rod end (Figure 7, Item 5) to achieve 18±0.5 mm (0.71±0.02 in.) spacing.

    a. Ensure that recoil endcap (Figure 7, Item 1) is installed on end of recoil mechanism (Figure 7, Item 2). Tighten endcap by hand until snug.

    b. Using wrench, rotate threaded end rod (Figure 7, Item 5) counterclockwise until resistance can be felt.

    c. Grasp recoil mechanism (Figure 7, Item 2) with one hand and recoil housing (Figure 7, Item 4) with other hand and firmly pull apart. Allow recoil mechanism to return to resting position. Verify recoil mechanism is in full return position by applying hand pressure toward barrel clamp (Figure 7, Item 3).

    d. Slowly rotate threaded end rod (Figure 7, Item 5) clockwise to adjust. Measure gap between recoil mechanism (Figure 7, Item 2) and barrel clamp (Figure 7, Item 3) while making adjustments until 18 mm (0.71 in.) gap is achieved. The 18 mm (0.71 in.) gap should only be met while making adjustments in the clockwise direction. If adjustments are made beyond 18 mm (0.71 in.), return to step b and repeat steps.

    e. When 18 mm (0.71 in.) gap is achieved, repeat step c and verify measurement.

16. Install flat washer (Figure 7, Item 6), hexagon plain nut (Figure 7, Item 7), and cap plain nut (Figure 7, Item 8). Counter tighten to lock in place.

17. Remove recoil endcap (Figure 7, Item 1).

18. Repeat steps 4 through 19 for second recoil assembly.

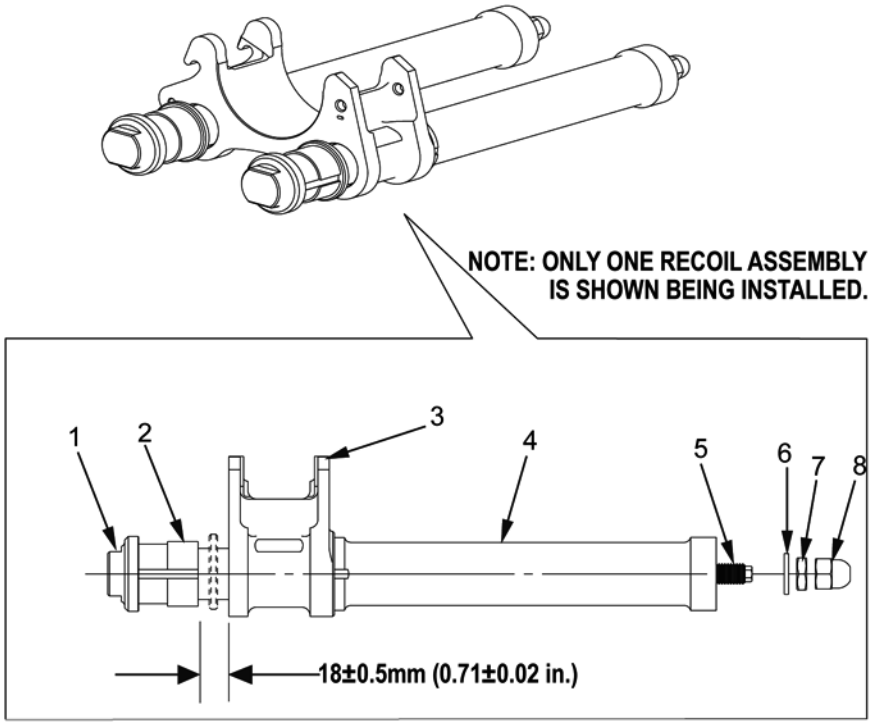


Figure 7. Adjustment of Recoil Mechanism Buffer.

END OF WORKPACKAGE

FIELD MAINTENANCE
CROSS LEVELING ASSEMBLY MAINTENANCE

INTIAL SETUP

Tools and Special Tools

Electric Heat Gun (WP 0031, Table 2, Item 5)
Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
- Caps, Vise Jaw (WP 0033, Table 1, Item 1)
- Vise, Machinist's (WP 0033, Table 1, Item 2)
- Wrench, Torque (WP 0033, Table 1, Item 3)
- Wrench, Torque (WP 0033, Table 1, Item 4)

Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
- Face wrench socket (WP 0026, Item 7)
- Seal inserter (WP 0026, Item 9)

Materials/Parts

Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Wiping rag (WP 0032, Item 20)
Sealing compound: blue (WP 0032, Item 22)
Sealing compound: purple (WP 0032, Item 23)
O-ring (WP 0034, Item 1)
Sleeve bearing (WP 0034, Item 23)
Plain seal (WP 0034, Item 24)
Wearing ring (2) (WP 0034, Item 26)
Sleeve bearing (WP 0034, Item 27)
Thrust washer bearing (WP 0034, Item 28)

References

WP 0019
WP 0024

Equipment Condition

Recoil mechanism buffer removed from mortar mount (WP 0011).

DISASSEMBLY

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the Cross Leveling Assembly, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

NOTE

If damage to hand crank is evident, see WP 0019 for repair.

Flat spring is a component of hand crank and may come loose during disassembly.

1. Remove socket head capscrew (Figure 1, Item 1) and hand crank (Figure 1, Item 2).

***NOTE**

Shims may be present upon disassembly. Note location to aid in assembly. Remove and retain for possible reuse.

2. Using face wrench socket, remove sleeve nut (Figure 1, Item 3) from mechanical housing (Figure 1, Item 12).
3. Remove sleeve bearing (Figure 1, Item 4) from sleeve nut (Figure 1, Item 3). Discard sleeve bearing.
4. Remove rod end connector (Figure 1, Item 10) and shoulder screw (Figure 1, Item 6) from mechanical housing (Figure 1, Item 12).
5. Unscrew shoulder screw (Figure 1, Item 6) from rod end connector (Figure 1, Item 10). Remove flat washer (Figure 1, Item 13) and thrust washer bearing (Figure 1, Item 14) from shoulder screw. Discard thrust washer bearing.
6. Remove two wear rings (Figure 1, Item 7) from cross leveling rod (Figure 1, Item 8). Discard wear rings.
7. Remove O-ring (Figure 1, Item 5) from shoulder screw (Figure 1, Item 6). Discard O-ring.
8. Remove plain seal (Figure 1, Item 11) and sleeve bearing (Figure 1, Item 12) from mechanical housing (Figure 1, Item 9). Discard plain seal and sleeve bearing.

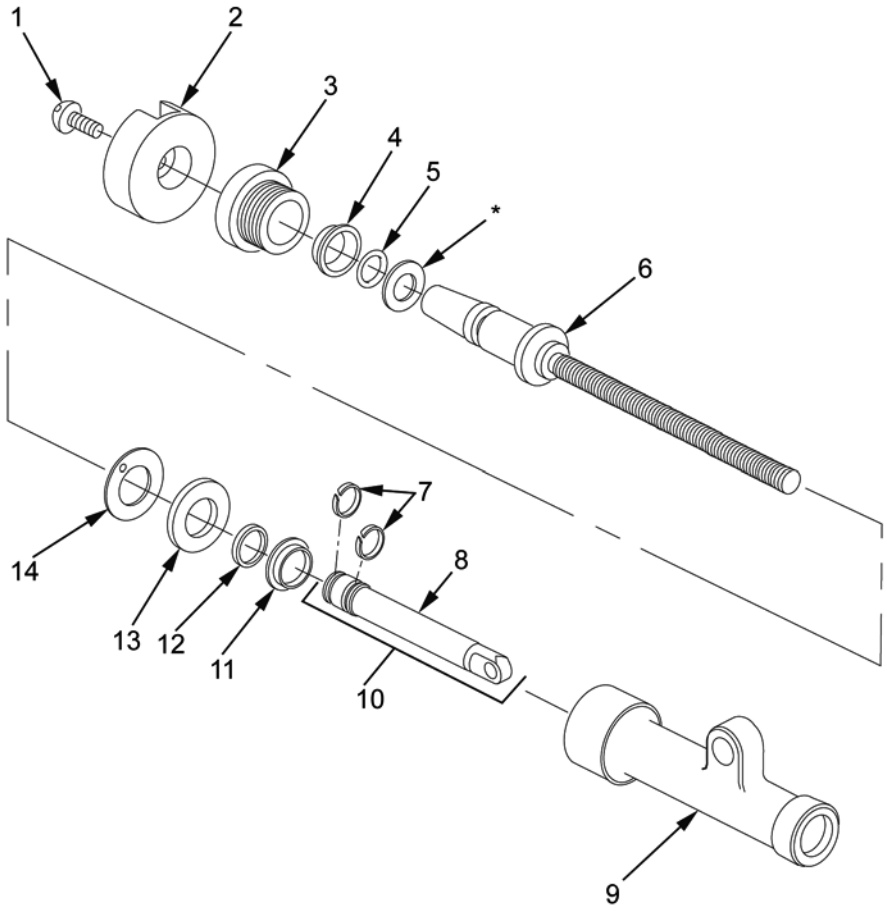


Figure 1. Disassembly of Cross Leveling Assembly.

END OF TASK

REPAIR

1. Clean parts with wiping rag.
2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

1. Using seal inserter, install new sleeve bearing (Figure 2, Item 12) and new plain seal (Figure 2, Item 11) in mechanical housing (Figure 2, Item 9).

2. Install two new wear rings (Figure 2, Item 7) to cross leveling rod (Figure 2, Item 8).

3. Install new O-ring (Figure 2, Item 5) onto shoulder screw (Figure 2, Item 6).

4. Install rod end connector (Figure 2, Item 10) into mechanical housing (Figure 2, Item 9). Exercise caution to avoid damage to plain seal (Figure 2, Item 11) and sleeve bearing (Figure 2, Item 12).

5. Install new thrust washer bearing (Figure 2, Item 14) and flat washer (Figure 2, Item 13) under flange of shoulder screw (Figure 2, Item 6). Insert shoulder screw into mechanical housing (Figure 2, Item 9) and thread onto rod end connector.

6. Install new sleeve bearing (Figure 2, Item 4) into sleeve nut (Figure 2, Item 3).

7. Using face wrench socket, install sleeve nut (Figure 2, Item 3) to mechanical housing (Figure 2, Item 12). Torque to 13.0 - 15.0 ft•lb (19 N•m).

***NOTE**

Maximum tolerance allowed for shims is not to exceed 0.004 in. (0.1 mm).

The addition of shims reduces backlash; removal of shims allows hand crank to turn more freely.

8. Install hand crank (Figure 2, Item 2). Check for backlash. If backlash exceeds 1/8 of turn, partially disassemble to allow installation of shim(s) between sleeve nut (Figure 2, Item 3) and shoulder screw (Figure 2, Item 6) until desired backlash is achieved.

9. Remove hand crank (Figure 2, Item 2) and, using face wrench socket, remove sleeve nut (Figure 2, Item 3).

WARNING

SEALING COMPOUND

10. Apply sealing compound (WP 0032, Item 22) to threads of sleeve nut (Figure 2, Item 3).

11. Using face wrench socket, reinstall sleeve nut (Figure 2, Item 3) to mechanical housing (Figure 2, Item 9). Torque to 13.0 - 15.0 ft•lb (19 N•m).

12. Apply sealing compound (WP 0032, Item 23) to threads of socket head capscrew (Figure 2, Item 1).

NOTE

Ensure flat spring of hand crank is in place before installation of capscrew.

13. Install hand crank (Figure 2, Item 2) and secure with socket head capscrew (Figure 2, Item 1). Tighten until seated.

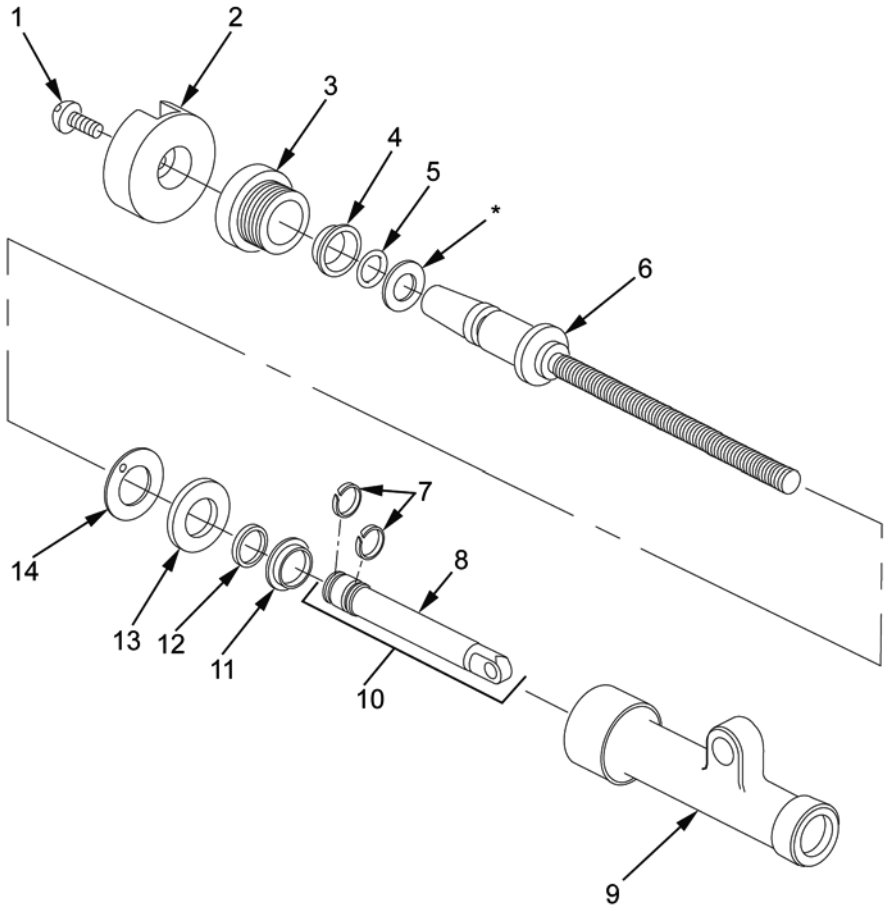


Figure 2. Assembly of Cross Leveling Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
MORTAR BIPOD (RIGHT) LEG MAINTENANCE

INTIAL SETUP

Tools and Special Tools
- Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
  - Caps, Vise Jaw (WP 0033, Table 1, Item 1)
  - Vise, Machinist's (WP 0033, Table 1, Item 2)
- Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts
- Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
- Wiping rag (WP 0032, Item 20)
- Key washer (2) (WP 0034, Item 9)
- Torsion helical spring (WP 0034, Item 19)

References
- WP 0024

Equipment Condition
- Mortar bipod leg removed from mortar mount (WP 0011).

DISASSEMBLY

1. Straighten tabs on two key washers (Figure 1, Items 5 and 8).

2. Remove hexagon plain nut (Figure 1, Item 4) and key washer (Figure 1, Item 5). Discard key washer.

3. Remove machine bolt (Figure 1, Item 7), key washer (Figure 1, Item 8), sleeve spacer (Figure 1, Item 9), torsion helical spring (Figure 1, Item 2), lock-release lever (Figure 1, Item 1), and sleeve spacer (Figure 1, Item 3) from right bipod leg (Figure 1, Item 6). Discard key washer and torsion helical spring.

END OF TASK

REPAIR

1. Clean parts with wiping rag.

2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

1. Install new key washer (Figure 1, Item 8) on machine bolt (Figure 1, Item 7).

2. Start machine bolt (Figure 1, Item 7) into hole in right bipod leg (Figure 1, Item 6) and install sleeve spacer (Figure 1, Item 9).

NOTE

Observe Figure 1 for proper orientation of torsion helical spring.

3. Align new torsion helical spring (Figure 1, Item 2) behind long tab of lock-release lever (Figure 1, Item 1). Install machine bolt (Figure 1, Item 7) through torsion helical spring and lock-release lever and install sleeve spacer (Figure 1, Item 3). Push machine bolt through hole in bipod leg (Figure 1, Item 6).

NOTE

Ensure tab end of key washers are inserted in holes of leg.

4. Install new key washer (Figure 1, Item 5) and hexagon plain nut (Figure 1, Item 4). Tighten nut until snug against key washer with no axial play on machine bolt (Figure 1, Item 7).

5. Bend tabs of two key washers (Figure 1, Items 8 and 5) to secure machine bolt (Figure 1, Item 7).

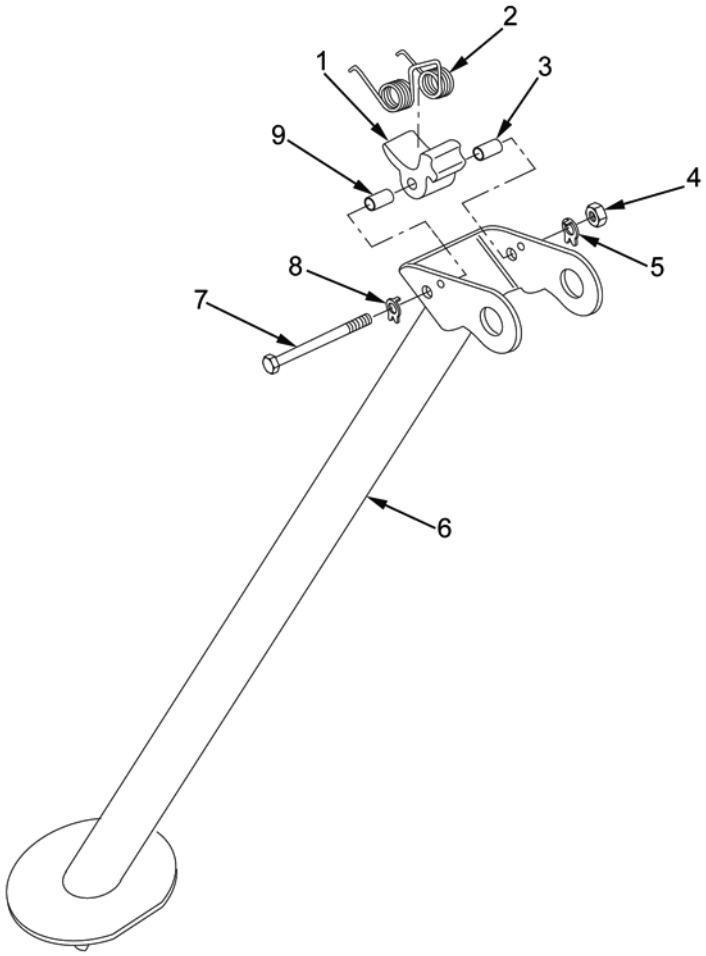


Figure 1. Disassembly/Assembly of Right Mortar Bipod Leg.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
MECHANICAL HOUSING (ELEVATION) MAINTENANCE

INTIAL SETUP

Tools and Special Tools
- Electric Heat Gun (WP 0031, Table 2, Item 5)
- Shop Set, Small Arms: Field Maintenance, Basic, Less Power (WP 0031, Table 2, Item 6)
  - Caps, Vise Jaw (WP 0033, Table 1, Item 1)
  - Vise, Machinist's (WP 0033, Table 1, Item 2)
  - Wrench, Torque (WP 0033, Table 1, Item 3)
  - Wrench, Torque (WP 0033, Table 1, Item 4)
- Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)
  - Face wrench socket (WP 0026, Item 7)
  - Seal inserter (WP 0026, Item 8)
  - Seal inserter (WP 0026, Item 9)

Materials/Parts
- Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
- Wiping rag (WP 0032, Item 20)
- Sealing compound: blue (WP 0032, Item 22)
- Sealing compound: purple (WP 0032, Item 23)
- Sleeve bushing (WP 0034, Item 11)
- Plain seal (WP 0034, Item 12)
- Plain seal (WP 0034, Item 13)
- Sleeve bearing (WP 0034, Item 14)
- Sleeve bearing (WP 0034, Item 15)
- Thrust washer bearing (WP 0034, Item 16)
- Sleeve bearing (2) (WP 0034, Item 23)

References
- WP 0018
- WP 0019
- WP 0024

Equipment Condition
- Mechanical housing elevation removed from mortar mount (WP 0011).

DISASSEMBLY

1. If damaged, remove two sleeve nuts (Figure 1, Item 4) using face wrench socket.

2. Unscrew special nut assembly (Figure 1, Item 6) and remove from elevation housing assembly (Figure 1, Item 12).

NOTE

Observe orientation of plain seals (Figure 1, Items 8 and 9) to aid in assembly.

3. Remove plain seal (Figure 1, Item 8), plain seal (Figure 1, Item 9), and sleeve bushing (Figure 1, Item 10) from special nut (Figure 1, Item 7). Discard seals and bushing.

4. Unscrew elevation shaft assembly (Figure 1, Item 11) and remove from straight shaft (Figure 1, Item 5).

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

CAUTION

It may be necessary to use a vise for this step. Use a soft-jawed vise or vise with vise caps to prevent equipment damage.

NOTE

- To aid in the disassembly of the Hand Crank and Special Nut Assembly, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.
- If damage to hand crank is evident, see WP 0019 for repair.
- Flat spring (Figure 1, Item 3) is a component of hand crank and may come loose during disassembly.

5. Remove socket head capscrew (Figure 1, Item 2) and hand crank (Figure 1, Item 1).

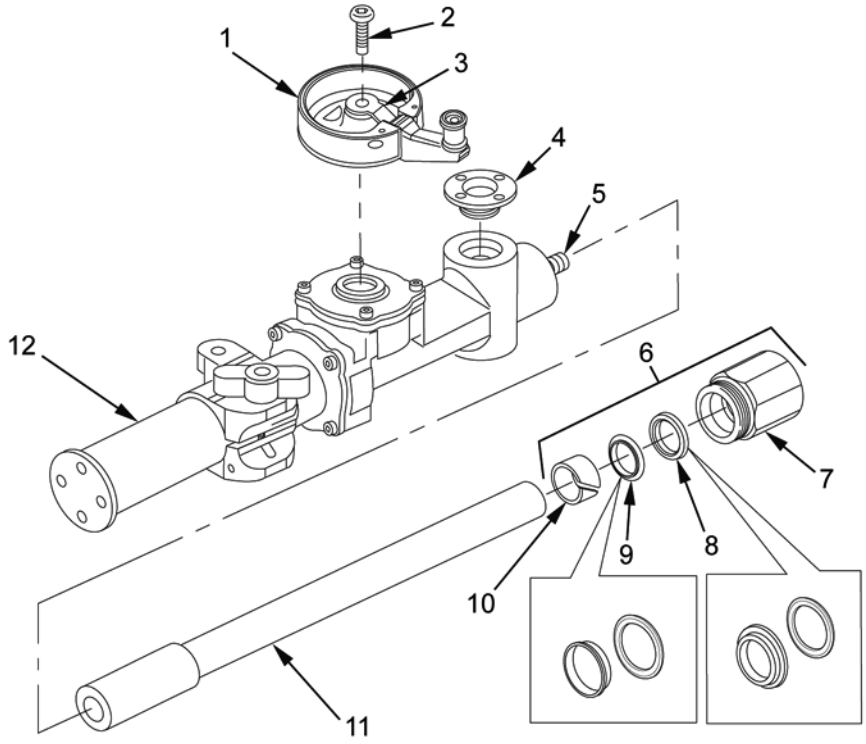


Figure 1. Removal of Hand Crank and Special Nut Assembly.

DISASSEMBLY - Continued

CAUTION

To prevent equipment damage, use soft-jawed vise.

***NOTE**

To aid in assembly, note location of shim(s) if present. Remove and retain for possible reuse.

6. Using face wrench socket, remove machine thread plug (Figure 2, Item 8), thrust washer bearing (Figure 2, Item 9), and shims if present. Discard thrust washer bearing.

NOTE

If block clamp is damaged, see WP 0017 for repair.

7. Loosen wing nut and remove block clamp (Figure 2, Item 10) from lower mechanical housing (Figure 2, Item 1).

8. Remove straight shaft (Figure 2, Item 11) from lower mechanical housing (Figure 2, Item 1).

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the Upper and Lower Mechanical Housings, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

9. Remove four socket head capscrews (Figure 2, Item 6) and remove lower mechanical housing (Figure 2, Item 1) from upper mechanical housing (Figure 2, Item 7).

10. Remove spur gearshaft (Figure 2, Item 4) from mechanical housing (Figure 2, Item 2).

11. Remove and discard sleeve bearing (Figure 2, Item 3) from mechanical housing (Figure 2, Item 2).

12. Remove sleeve bearing (Figure 2, Item 5) from spur gearshaft (Figure 2, Item 4). Discard sleeve bearing.

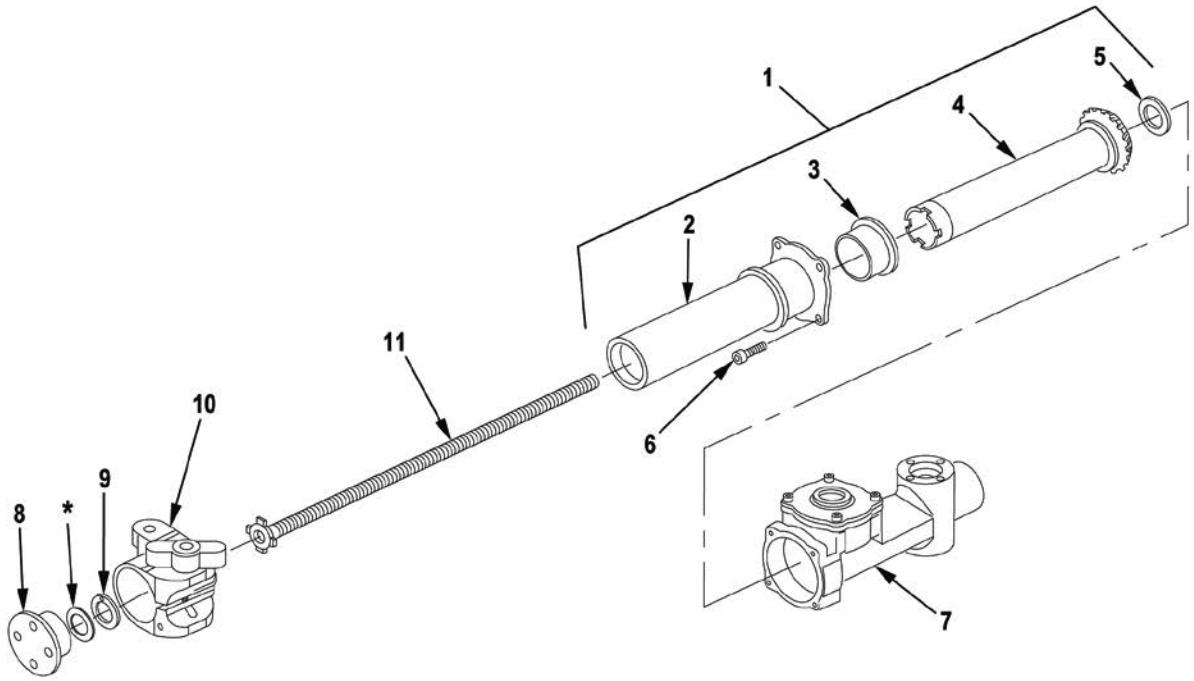


Figure 2. Disassembly of Upper and Lower Mechanical Housings.

DISASSEMBLY - Continued

13. Remove four socket head capscrews (Figure 3, Item 2) and access cover (Figure 3, Item 1) from upper elevation housing (Figure 3, Item 3).

14. Remove sleeve bearing (Figure 3, Item 6) from access cover (Figure 3, Item 1). Discard sleeve bearing.

15. Remove bevel gear (Figure 3, Item 5) from upper elevation housing (Figure 3, Item 3).

16. Remove sleeve bearing (Figure 3, Item 4) from upper elevation housing (Figure 3, Item 3). Discard sleeve bearing.

END OF TASK

REPAIR

1. Clean parts with wiping rag.

2. Inspect bevel gear (Figure 3, Item 5) for wear or missing teeth.

3. Replace damaged or defective parts as authorized by WP 0024.

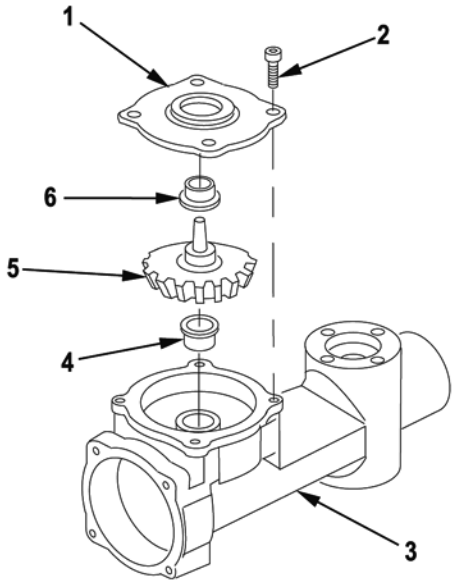


Figure 3. Disassembly of Upper Mechanical Housing.

END OF TASK

ASSEMBLY

NOTE

Binding can result if proper torque is not observed.

1. Install new sleeve bearing (Figure 4, Item 4) into upper elevation housing (Figure 4, Item 3).
2. Install bevel gear (Figure 4, Item 5) into upper elevation housing (Figure 4, Item 3).
3. Install new sleeve bearing (Figure 4, Item 6) into access cover (Figure 4, Item 1).

WARNING

SEALING COMPOUND

4. Apply sealing compound (WP 0032, Item 23) to threads of four socket head capscrews (Figure 4, Item 2).
5. Install access cover (Figure 4, Item 1) to upper elevation housing (Figure 4, Item 3) and secure with four socket head capscrews (Figure 4, Item 2). Torque capscrews to 4.5 - 6.0 ft•lb (10 N•m).

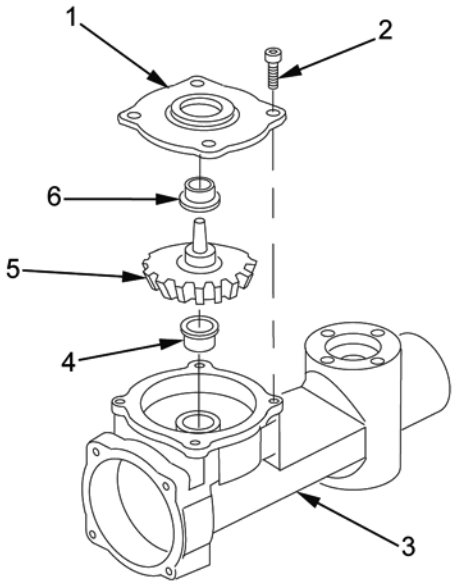


Figure 4. Assembly of Upper Mechanical Housing.

ASSEMBLY – Continued

6. Using seal inserter (WP 0026, Item 8), install new sleeve bearing (Figure 5, Item 5) into spur gearshaft (Figure 5, Item 4).

7. Install new sleeve bearing (Figure 5, Item 3) into mechanical housing (Figure 5, Item 2).

8. Install spur gearshaft (Figure 5, Item 4) into mechanical housing (Figure 5, Item 2).

WARNING

SEALING COMPOUND

9. Apply sealing compound (WP 0032, Item 23) to threads of four socket head capscrews (Figure 5, Item 6).

10. Align holes in lower mechanical housing (Figure 5, Item 1) with holes in upper mechanical housing (Figure 5, Item 7). Install four socket head capscrews (Figure 5, Item 6). Torque capscrews to 4.5 - 6.0 ft•lb (10 N•m).

11. Install straight shaft (Figure 5, Item 13) into lower mechanical housing (Figure 5, Item 1). Insert tabs on end of straight shaft into cutouts on edge of spur gearshaft (Figure 5, Item 4).

NOTE

Observe Figure 5 for proper orientation of block clamp.

12. Install block clamp (Figure 5, Item 12) on lower mechanical housing (Figure 5, Item 1). Ensure that clamp is installed with tab with threaded hole closest to elevating hand crank. Tighten wing nut to secure clamp in desired position.

***NOTE**

If shims were retained during disassembly, do not install until backlash is measured.

13. Install new thrust washer bearing (Figure 5, Item 11) and machine thread plug (Figure 5, Item 10). Using face wrench socket, torque to 37.0 - 45.0 ft•lb (56 N•m).

14. Check for backlash. If backlash exceeds 1/8 of turn, install shim(s) between machine thread plug (Figure 5, Item 10) and thrust washer bearing (Figure 5, Item 11) until desired backlash is achieved.

15. Remove machine thread plug (Figure 5, Item 10) and apply sealing compound (WP 0032, Item 22) to threads of plug.

16. Install machine thread plug (Figure 5, Item 10) and torque to 37.0 - 45.0 ft•lb (56 N•m), using face wrench socket.

17. Remove socket head capscrew (Figure 5, Item 9) and hand crank (Figure 5, Item 8).

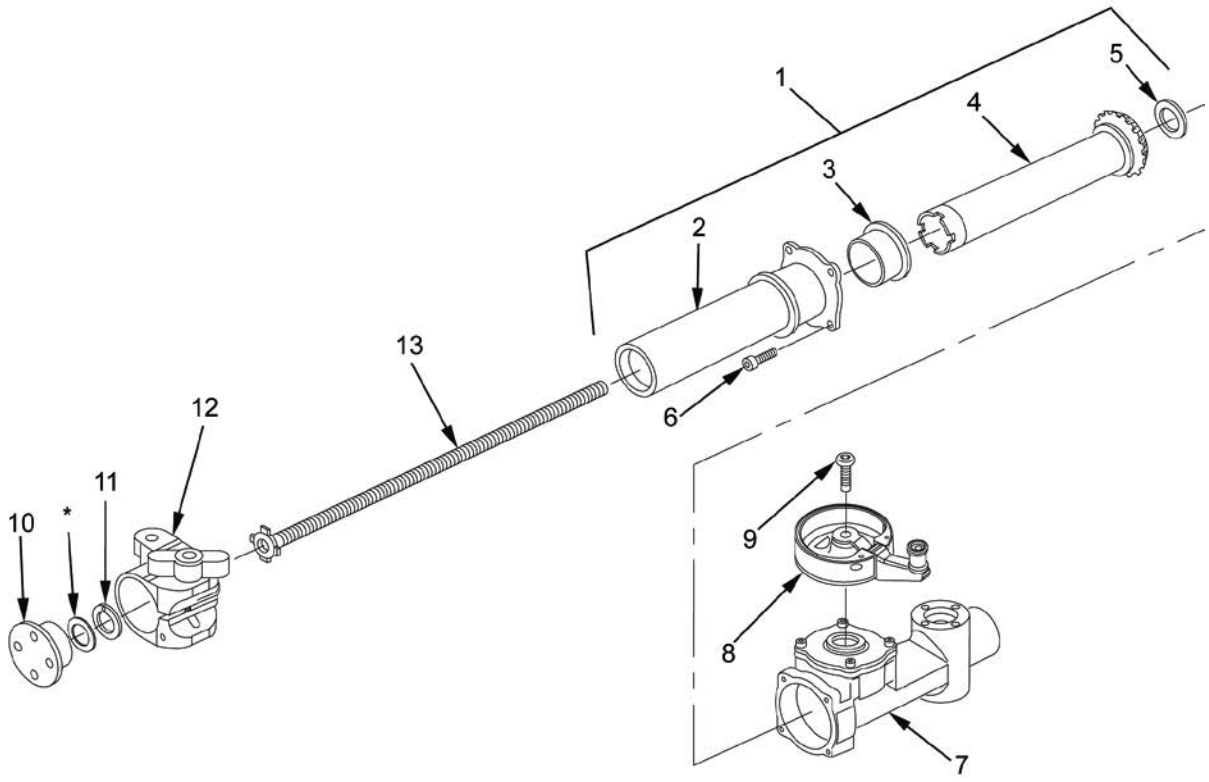


Figure 5. Assembly of Upper and Lower Mechanical Housings.

ASSEMBLY – Continued

18. Screw elevation shaft assembly (Figure 6, Item 11) onto straight shaft (Figure 6, Item 5) a minimum of 10 turns.

NOTE

Ensure that O-ring of plain seal (Figure 6, Item 8) is facing away from special nut.

19. Using seal inserter (WP 0026, Item 9), install new sleeve bushing (Figure 6, Item 10), new plain seal (Figure 6, Item 9), and new plain seal (Figure 6, Item 8) into special nut (Figure 6, Item 7).

WARNING

SEALING COMPOUND

20. Install hand crank (Figure 6, Item 1), ensuring flat spring (Figure 6, Item 3) is in place, and secure with socket head capscrew (Figure 6, Item 2). Tighten until seated.

NOTE

Ensure elevation housing assembly is standing upright, with housing opening on top for installation of special nut assembly.

21. Insert seal inserter (WP 0026, Item 9) into elevation shaft assembly (Figure 6, Item 11). Using seal inserter, slide special nut (Figure 6, Item 6) over seal inserter and elevation shaft assembly.

22. Apply sealing compound (WP 0032, Item 22) to threads of special nut (Figure 6, Item 7). Install special nut assembly (Figure 6, Item 6) to elevation housing assembly (Figure 6, Item 12). Tighten.

23. Thread special nut (Figure 6, Item 7) onto elevation housing assembly (Figure 6, Item 12.

24. Apply sealing compound (WP 0032, Item 23) to threads of socket head capscrew (Figure 6, Item 2).

25. Install hand crank (Figure 6, Item 1) and secure with socket head capscrew (Figure 6, Item 2). Hand tighten capscrew.

26. If sleeve nuts were removed, apply thread locking compound (WP 0032, Item 22) to threads of two sleeve nuts (Figure 6, Item 4).

27. Install two sleeve nuts (Figure 6, Item 4) to elevation housing assembly (Figure 6, Item 12). Using face wrench socket, torque to 49.5 - 60.5 ft•lb (75 N•m).

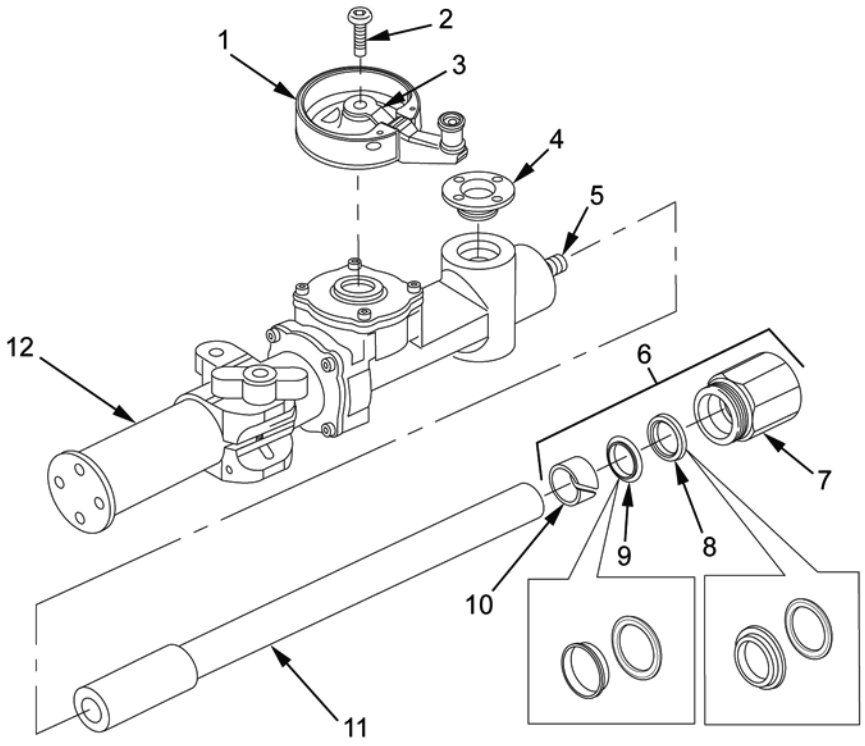


Figure 6. Installation of Hand Crank and Special Nut Assembly.

FOLLOW-ON MAINTENANCE

Install mechanical housing elevation onto mortar mount (WP 0011).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BLOCK CLAMP MAINTENANCE

INTIAL SETUP

Tools and Special Tools
Electric Heat Gun (WP 0031, Table 2, Item 5)
Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts
Wiping rag (WP 0032, Item 20)
Sealing compound: blue (WP 0032, Item 22)
Spring pin (WP 0034, Item 5)

References
WP 0024

Equipment Condition
Block clamp removed from mortar mount (WP 0016).

DISASSEMBLY

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the Block Clamp, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

1. Remove spring pin (Figure 1, Item 1) from slotted nut (Figure 1, Item 2). Discard spring pin.
2. Remove slotted nut (Figure 1, Item 2), flat washer (Figure 1, Item 3), and plain wing nut (Figure 1, Item 4) from eyebolt (Figure 1, Item 8).
3. Remove setscrew (Figure 1, Item 7) and headless straight pin (Figure 1, Item 6) from clamp (Figure 1, Item 5).
4. Remove eyebolt (Figure 1, Item 8) from clamp (Figure 1, Item 5).

END OF TASK

REPAIR

1. Clean parts with wiping rag.
2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

WARNING

SEALING COMPOUND

1. Install eyebolt (Figure 1, Item 8) into clamp (Figure 1, Item 5).
2. Apply sealing compound to threads of setscrew (Figure 1, Item 7).
3. Install headless straight pin (Figure 1, Item 6) and setscrew (Figure 1, Item 7) into clamp (Figure 1, Item 5). Torque setscrew to 6.0 - 7.0 ft•lb (9 N•m).
4. Install plain wing nut (Figure 1, Item 4) onto eyebolt (Figure 1, Item 8) and tighten until nut is lightly seated against clamp (Figure 1, Item 5).
5. Install flat washer (Figure 1, Item 3) and slotted nut (Figure 1, Item 2) to eyebolt (Figure 1, Item 8). Tighten slotted nut until lightly seated against wing plain nut (Figure 1, Item 4).

6. Turn slotted nut (Figure 1, Item 2) counterclockwise until slot in nut aligns with hole in eyebolt (Figure 1, Item 8). Install new spring pin (Figure 1, Item 1). Ensure spring pin is flush with flat of nut.

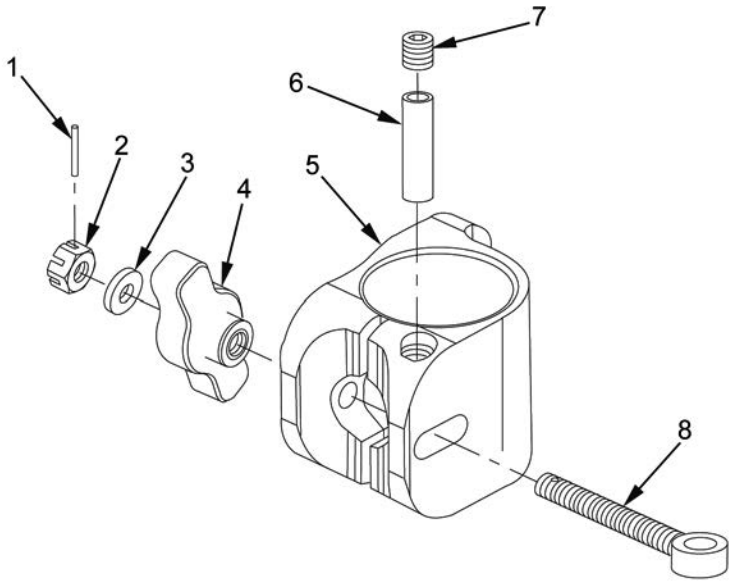


Figure 1. Disassembly/Assembly of Block Clamp.

END OF TASK

FOLLOW-ON MAINTENANCE

Install block clamp to lower mechanical housing (WP 0016).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HAND CRANK MAINTENANCE

INTIAL SETUP

Tools and Special Tools
Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts
Wiping rag (WP 0032, Item 20)
Spring pin (2) (WP 0034, Item 5)

References
WP 0024

Equipment Condition
Hand crank removed from traversing mechanism (WP 0012), cross leveling assembly (WP 0015), or mechanical housing (elevation) (WP 0017)

DISASSEMBLY

1. Remove flat spring (Figure 1, Item 4) from handle body (Figure 1, Item 3).
2. Remove two spring pins (Figure 1, Item 5) from handle body (Figure 1, Item 3). Discard spring pins.
3. Remove headless straight pin (Figure 1, Item 2). Separate hand crank arm (Figure 1, Item 1) from handle body (Figure 1, Item 3).

END OF TASK

REPAIR

1. Clean parts with wiping rag.
2. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

1. Align hole in handle crank arm (Figure 1, Item 1) with holes in handle body (Figure 1, Item 3) and install headless straight pin (Figure 1, Item 2).
2. Install two new spring pins (Figure 1, Item 5) to secure headless straight pin (Figure 1, Item 2). Install pins until flush or below flush with top surface.
3. Press square end of flat spring (Figure 1, Item 4) under handle arm assembly (Figure 1, Item 1) and align hole in spring with hole in center of handle body (Figure 1, Item 3).

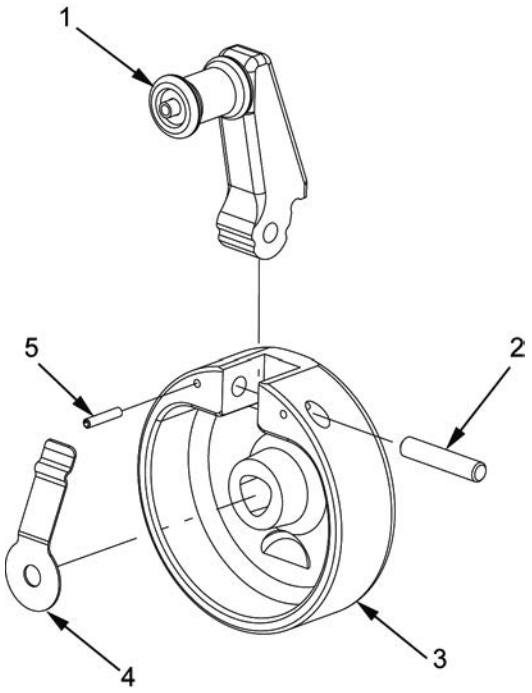


Figure 1. Disassembly/Assembly of Hand Crank.

END OF TASK

FOLLOW-ON MAINTENANCE

Install hand crank to traversing mechanism (WP 0012), cross leveling assembly (WP 0015), or mechanical housing (elevation) (WP 0017).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
M3A2 81-MM MORTAR BASEPLATE MAINTENANCE

INTIAL SETUP

Tools and Special Tools
Electric Heat Gun (WP 0031, Table 2, Item 5)
Small Arms Repairmen's Tool Kit (WP 0031, Table 2, Item 7)

Materials/Parts
Adhesive (WP 0032, Item 1)
Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
Wiping rag (WP 0032, Item 20)
Clear coat (Surface Sealer) (WP 0032, Item 21)
Sealing compound (WP 0032, Item 22)

References
WP 0024

Equipment Condition
Cannon removed from baseplate (TM 9-1015-257-10).

DISASSEMBLY

WARNING

HEATED COMPONENTS

Heated components may cause serious burns. Do not touch hot surfaces. Wear protective gloves when handling. Failure to comply may result in serious injury to personnel.

NOTE

To aid in the disassembly of the M3A2 Mortar Baseplate, an electric heat gun may be used to break-free the sealing compound by heating hardware before removing.

1. Remove spiral retaining ring (Figure 1, Item 1) and retaining cap (Figure 1, Item 2) from baseplate (Figure 1, Item 3).

2. If nameplate (Figure 1, Item 5) is damaged, remove two button head screws (Figure 1, Item 4). Remove and discard nameplate.

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

3. If damaged or illegible, remove Item Unique Identification (IUID) label (Figure 1, Item 6) from baseplate (Figure 1, Item 3). Discard label. Remove adhesive residue with CLP.

END OF TASK

REPAIR

1. Clean parts with wiping rag.

2. Inspect baseplate for cracks, breaks, or damaged socket.

3. Inspect spiral retaining ring and retaining cap for burrs and damage.

4. Replace damaged or defective parts as authorized by WP 0024.

END OF TASK

ASSEMBLY

1. If removed, apply adhesive to new IUID label (Figure 1, Item 6) and place on baseplate (Figure 1, Item 3). When adhesive is dry, apply protective clear coat to label.

WARNING

SEALING COMPOUND

2. If nameplate (Figure 1, Item 5) was removed, apply sealing compound to threads of two button head screws (Figure 1, Item 4).

3. Align holes in nameplate (Figure 1, Item 5) with holes in baseplate (Figure 1, Item 3). Install two button head screws (Figure 1, Item 4) to secure nameplate.

4. Position retaining cap (Figure 1, Item 2) in socket of baseplate (Figure 1, Item 3) and secure with spiral retaining ring (Figure 1, Item 1).

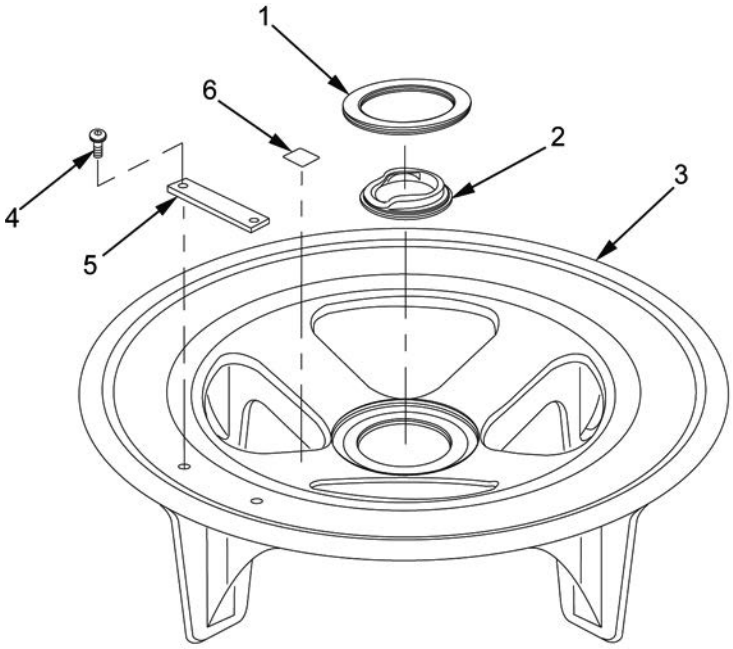


Figure 1. Disassembly/Assembly of Mortar Baseplate.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREPARATION FOR STORAGE AND SHIPMENT

INTIAL SETUP

Tools and Special Tools
- Cleaning head section (TM 9-1015-257-10)
- Gun bore brush (TM 9-1015-257-10)

Materials/Parts
- Denatured alcohol (WP 0032, Item 2)
- Barrier material (WP 0032, Item 4)
- Artist's brush (WP 0032, Item 5)
- Cleaner, lubricant, and preservative (CLP) (WP 0032, Item 8)
- Optical lens cleaning compound (WP 0032, Item 9)
- Rifle bore cleaning compound (RBC) (WP 0032, Item 10)
- Cushioning material (WP 0032, Item 11)
- Solid film lubricant (WP 0032, Item 13)
- General purpose lubricating oil (GPL) (WP 0032, Item 14)
- Lens paper (WP 0032, Item 16)
- VCI-treated paper (WP 0032, Item 17)
- Wrapping paperboard (WP 0032, Item 18)
- Wiping rag (WP 0032, Item 20)
- Water resistant tape (WP 0032, Item 24)
- Pressure sensitive tape (WP 0032, Item 25)

References
- AR 190-11 AR 740-26
- DA Form 2408-4
- DA Form 2408-9
- MIL-DTL-117
- MIL-STD-129
- MIL-STD-2073-1
- TM 9-1015-257-10
- TM 43-0197

PREPARATION FOR STORAGE OR SHIPMENT

General Requirements

1. Storage of Radioactive Components.

WARNING

RADIATION HAZARD – TRITIUM (^{3}H) GAS

   a. The mortar, aiming posts, and fire control system, which contain radioactive components, must be stored in a secure area that conforms with the requirements of AR 190-11.

   b. Bulk storage of the radioactive fire control instruments must be in accordance with TM 43-0197.

   c. Storage of radioactive fire control instruments is limited to 1000 curies in each storage area. Not more than twenty (20) M252A1 fire control systems can be stored together unless special measuring devices and a good ventilation system are in use. This limit is required by Federal Law 10CFR and is established by US. Army TACOM-Warren Nuclear Regulatory Commission license 21-23838-01.

   d. Questions related to the handling or storage of fire control instruments should be referred to the local Radiation Safety Officer (RSO). If the problem cannot be resolved, contact the TACOM-Warren RSO, DSN 786-0891/7635, Commercial (586) 282-0891/7635.

2. Preservation (Storage or Shipment).

   a. Items shall be cleaned and dried by any process or processes that is not injurious to the components.

   b. Directly after cleaning and drying of the components the required preservative shall be uniformly applied by any appropriate procedure that permits the preservative to coat all necessary surfaces.

   c. When bags or containers are used, preliminary wrapping, cushioning, or other dunnage material shall be applied as necessary to protect the item, the bag, and the container from all projections or sharp edges of the item as well as to restrict movement of the item within the package.

   d. All materials used shall be as clean and dry as practicable to minimize item susceptibility to corrosion and contaminants.

   e. Components with handles, knobs, and other protrusions shall be wrapped or otherwise protected and secured to facilitate equal distribution of shock.

   f. When flexible bags are used, the volume of trapped air within the bag shall be kept to a minimum. Caution shall be taken to prevent rupture of the bag, or damage to the item, due to excessive vacuum of the excess air.

   g. Preliminary wrapping of items requiring VCI-treated material is not required.

NOTE

For further information, refer to MIL-STD-2073-1.

3. Packing.

   a. Item shall be disassembled, in accordance with applicable technical manuals, into component parts to provide overall saving in storage space or shipping costs. Disassembly and reassembly shall be limited to common hand tools by trained personnel. Each disassembled part shall be preserved and identified separately. Hardware removed during disassembly shall be secured and identified with associated components.

   b. Components with moveable external parts that might become damaged by shock or vibration during movement shall have these parts secured by blocking, bracing, cushioning, wrapping, tie-downs, disassembly, or other techniques.

   c. Unit containers shall be of minimum size and of an acceptable type, grade, and class to protect the item.

NOTE

For further information, refer to MIL-STD-2073-1.

4. Marking. All unit, intermediate, and exterior packs shall be marked in accordance with local and unit standard operating procedures and MIL-STD-129 for shipment and storage.

5. Palletization. The preferred commercial expendable pallet is a 40 x 48 inch, 4-way entry pallet although variations may be permitted as dictated by the characteristics of the items being unitized. The load shall be contained in a manner that will permit safe handling during shipment and storage.

Specific Requirements

CAUTION

Do not use cleaning solvent on any components.

1. M253 Cannon.

   a. Preservation

WARNING

SOLID FILM LUBRICANT

   (1) Touch up all scratched or marred surfaces with solid film lubricant.

WARNING

RIFLE BORE CLEANING COMPOUND (RBC)
GENERAL PURPOSE LUBRICATING OIL (GPL)

   (2) Clean cannon with RBC using gun bore brush attached to the cleaning head section.

   (3) Apply a light coat of GPL to all external surfaces of the cannon tube and firing pin. Refer to TM 9-1015-257-10 for proper assembly and lubrication. Wipe excess oil or preservative from cannon tube with wiping rag.

PREPARATION FOR STORAGE OR SHIPMENT – Continued

Specific Requirements – Continued

(4) Place a rolled up sheet of VCI-treated paper in barrel. VCI-treated side shall be facing outward.

(5) Wrap cannon with VCI-treated paper and secure in place with water resistant tape.

(6) Wrap cushioning material around each end of the cannon tube. Double thickness shall be applied to the breech cap end.

(7) Place cushioned cannon in a water vapor-proof barrier bag. Bag will be fabricated using water-proof barrier material, in accordance with MIL-DTL-117.

b. Packing.

(1) Wrap bagged cannon in wrapping paperboard and secure with water resistant tape.

(2) Place cushioned item in a close fitting water resistant fiberboard container and close container with water resistant tape.

c. Documentation. Obtain and update most recent forms from TACOM Unique Logistics Support Applications (TULSA) (https://tulsa.tacom.army.mil). Enclose DA Form 2408-4, Weapon Record Data, and, when applicable, DA Form 2408-9, Equipment Control Record, in a waterproof bag and secure to the cannon tube. Bag will be fabricated using water-proof barrier material, in accordance with MIL-DTL-117. Secure with a strip of water resistant tape on each end of the bag for 1.5 turns. Be sure that the markings on the bag are clearly visible after securing to the tube.

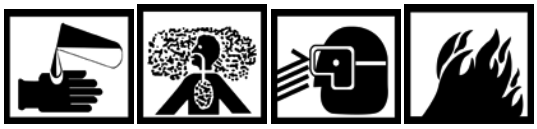
2. M67 Sight Unit.

a. Preservation.

(1) Cleaning of optics.

(a) Loose particles of dust shall be removed from the surface of the optical elements with artist's brush.

WARNING



ALCOHOL

(b) The surfaces shall be wiped with a circular motion using lens paper which is saturated with denatured alcohol or optical lens cleaning compound. The cleaning operation shall begin at the center of the polished surfaces. With a circular motion gradually increase the radius of area being cleaned until no trace of dirt, lint, or smears is perceptible.

(2) Wrap. Cover optical surface with a double thickness of lens paper and secure with pressure sensitive tape.

(3) Cushion. Wrap sight unit with one layer of cushioning material and secure with pressure sensitive tape.

b. Packing. Place wrapped sight unit in optical instrument case and secure latches.

WARNING

RADIATION HAZARD – TRITIUM (^{3}H) GAS

Do not ship more than thirty (30) M67 sight units together so that radioactivity levels are below 200 curies. Under no circumstances will parcel post shipments of this item be made.

3. M177A1 Mortar Mount (Bipod).

   a. Preservation.

WARNING

CLEANER, LUBRICANT, AND PRESERVATIVE (CLP)

   (1) Fully extend traversing mechanism, elevating mechanism, and cross leveling assembly of mortar mount to clean exposed services with CLP. Wipe with clean, dry wiping rag to remove all CLP.

   (2) The feet of the mortar mount shall be covered with cushioning material. Secure cushioning material in place with water resistant tape.

   (3) Place cleaned and cushioned mortar mount inside a heat-sealed barrier bag. Bag will be fabricated using water-proof barrier material, in accordance with MIL-DTL-117.

   b. Packing. Place bagged mortar mount in a close-fitting weather-resistant fiberboard container and close with water resistant tape.

4. M3A2 Baseplate.

   a. Cushioning. Wrap baseplate with cushioning material and secure in place with water resistant tape.

   b. Packing. Place cushioned baseplate in a close-fitting weather-resistant fiberboard box and close with water resistant tape.

5. Basic Issue Items (BII).

   a. When applicable, place BII in their respective cases (e.g., mortar cleaning staff components in mortar cleaning staff carrying bag).

   b. Protect each BII item in accordance with general requirements above and consolidate into the fiberboard container with the M3A2 mortar baseplate. Utilize any cushioning material to immobilize contents and seal container with water resistant tape.

PREPARATION FOR STORAGE OR SHIPMENT – Continued

Specific Requirements – Continued

6. Shipping Container.

   a. Construct a cleated panel wood box of 3/4 in. plywood with an outside dimension of 60 in. x 24 in. x 24 in. (152 cm x 61 cm x 61 cm) with three skids. Cleats shall be constructed of 1 in. x 4 in. lumber and are required on all faces of container. Place all fiberboard containers into exterior shipping container. Cartons containing the cannon and mount shall be secured with wooden blocks. The baseplate container shall be on top of these items and secured with two wooden blocks on top of carton and nailed to side of box. Nail top to box and apply two metal girth straps prior to shipping. Container skids shall be constructed of 4 in. x 4 in. lumber and have a 45 degree bevel on skid ends.

   b. Heat Treatment and Marking of Wood Packaging Materials. In accordance with the requirements of International Standards for Phytosanitary Measures (ISPM) 15, the following commercial heat treatment process has been approved by the American Lumber Standards Committee (ALSC) and is required for all Wood Packaging Material (WPM). WPM is defined as wood pallets, skids, load boards, pallet collars, wooden boxes, reels, dunnage, crates, frames, and cleats. Packaging materials exempt from the requirements are materials that have undergone a manufacturing process such as corrugated fiberboard, plywood, particleboard, veneer and oriented strand board. All WPM shall be constructed from Heat Treated (heat-treated to 56 degrees Centigrade for 30 minutes) lumber and certified by an accredited agency recognized by the ALSC in accordance with Wood Packaging Material Policy and Wood Packaging Material Enforcement Regulations (see URL: http://www.alsc.org). All materials must include certification markings in accordance with ALSC standards and be placed in an unobstructed area that will be readily visible to inspectors. Pallet markings shall be applied to the stringer or block on diagonally opposite sides and ends of the pallet and be contrasting and clearly visible. All dunnage used in configuring and/or securing the load shall also comply with ISPM 15 and be marked with an ALSC approved DUNNAGE stamp. Failure to comply with the requirements of this restriction may result in refusal, destruction, or treatment of materials at the point of entry.

7. Transportation and Handling.

NOTE

A sensitive item is defined as an item which, because of its vulnerability to theft and potential use in civil disturbances, requires a high degree of protection and control during the material life cycle.

   a. The M252A1 mortar system is a sensitive item and will be transported in accordance with provisions of sensitive cargo cited in AR 740-26.

   b. The shipper is responsible for ensuring that a Report of Shipment (RESHIP) is transmitted by electronic means to the consignee setting forth name of carrier, conveyance identification number, bill of lading number, and estimated time of arrival. The receiving transportation officer is required to initiate tracer action if the shipment has not arrived within 48 hours of the estimated time of arrival.

   c. The receiving activity is responsible for ensuring that protective measures are taken to protect the sensitivity of the item in accordance with applicable regulations.

   d. Associated support parts, tools, and equipment may be shipped utilizing standard transportation and handling procedures.

e. Packaging of end item and associated support parts, tools, and equipment must, as a minimum, conform to applicable rail and motor rules, regulations, and specifications as appropriate.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREEMBARKATION INSPECTION
OF MATERIEL IN UNITS ALERTED FOR OVERSEAS MOVEMENT

INTIAL SETUP

References

TM 9-1000-202-14
TM 9-1015-257-10
TM 43-0139
WP 0008

GENERAL

This inspection is conducted on materiel in alerted units scheduled for overseas duty to be sure that such materiel will not become unserviceable in a relatively short time. It prescribes a higher percentage of remaining usable life in serviceable materiel to meet a specific need beyond minimum serviceability.

PREINSPECTION POINTS

WARNING

Before performing inspection procedures, inspect the cannon barrel to ensure it is clear.

1. Equipment must be considered "ready" under the criteria established in Preventive Maintenance Checks and Services (PMCS) procedures in this publication and in the PMCS work package in TM 9-1015-257-10.

2. Operator publications applicable to the equipment log book must accompany the equipment. All log book entries must be complete and up-to-date including those covering any repairs, replacements, or adjustment.

3. Weapons must be complete with all items required by applicable Department of the Army publications, including those in the Basic Issue Items list of TM 9-1015-257-10.

4. Weapons and/or fire control equipment which do not qualify for shipment or issue will either be redistributed, repaired, or overhauled, or will become candidates for cannibalization or other disposition as required by existing regulations.

INSPECTION POINTS

1. Damaged surfaces should be restored using materials and tools consistent with tolerances of item being restored.

    a. Methods and materials used for removing corrosion should be carefully selected in order that surfaces being processed will not be damaged beyond serviceability.

2. All markings must be legible.

3. Complete disassembly of a unit is not always necessary in order to make a required repair or replacement. Good judgment should be exercised to keep disassembly and assembly to a minimum.

4. Exercise caution when removing and installing spring pins and headless grooved pins to prevent damage to the mechanism or component.

5. When assembling a unit, replace all spring pins and headless grooved pins with new pins. Self-locking screws and nuts must be replaced if they were removed.

6. Springs that are kinked and/or fail to function properly must be replaced.

SPECIFIC CRITERIA

1. Surfaces. A worn or shiny surface is objectionable from the standpoint of visibility when it is capable of reflecting light, as a mirror does. A weapon with a distinct shine on exterior parts will be rejected for overseas shipment.

2. M252A1 Mortar. The mortar must meet the requirements of the final inspections in Table 1.

3. M253 81-mm Cannon. The cannon tube must have a bore diameter of 3.205 to 3.221 in. to be acceptable for overseas shipment.

Table 1. Final Inspection.

Point To Be Inspected	Final Inspection
Mortar cannon	Cannon is free of dirt, grit, and rust. Meets requirements of TM 9-1000-202-14. All components present and in serviceable condition.
Barrel clamp assembly	Functions smoothly. All components present and in serviceable condition.
Traversing mechanism	Functions smoothly. Backlash not in excess of 1/8 turn. All components present and in serviceable condition.
Mortar mounting buffers	Test in accordance with Preventive Maintenance Checks and Services (PMCS) (WP 0008). All components present and in serviceable condition.
Cross leveling assembly	Functions smoothly. Backlash not in excess of 1/8 turn. All components present and in serviceable condition.
Mortar mount leg assembly	All components present and in serviceable condition.
Mechanical housing (elevation)	Functions smoothly. Backlash not in excess of 1/8 turn. All components present and in serviceable condition.
Baseplate	Baseplate not deformed or cracked. Retaining cap rotates freely. All components present and in serviceable condition.
Painted surfaces	In serviceable condition. Touch up bare spots and scratches (baseplate and Basic Issue Items only). Refer to TM 43-0139.

END OF WORK PACKAGE

CHAPTER 4

PARTS INFORMATION
FOR
81-MM MORTAR, M252A1

FIELD MAINTENANCE
INTRODUCTION TO REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

INTRODUCTION

Scope

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of field maintenance of the M252A1 81-mm Mortar. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

General

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed at the end of the individual work packages. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

2. **Kits work package.** This work package lists all repair kits and their component parts.

3. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

4. **Cross-Reference Indexes Work Packages.** There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

Explanation of columns in the repair parts list and special tools list work packages

ITEM NO. (Column 1). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column 2). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, one for each service.

INTRODUCTION – Continued

Explanation of columns in the repair parts list and special tools list work packages – Continued

Table 1. SMR Code Explanation.

Source Code XX	Maintenance Code XX		Recoverability Code X
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair on the item.	5th position: Who determines disposition action on unserviceable items.

NOTE

Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Table 2. Source Code Explanation

Source Code	Application/Explanation
PA PB PC PD PE PF PG PH PR PZ	**NOTE** Items coded PC are subject to deterioration. Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.
KD KF KB	Items with these codes are not to be requested/ requisitioned individually. They are part of a kit that is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MF- Made at maintainer class MH- Made at below depot sustainment class ML- Made at SRA MD- Made at depot MG- Navy only	Items with these codes are not to be requisitioned/ requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND USABLE ON CODE (UOC) entry and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.

Table 2. Source Code Explanation - Continued

Source Code	Application/Explanation
AF- Assembled by field AH- Assembled by below depot sustainment level AL- Assembled by SRA AD- Assembled by depot AG- Navy only	Items with these codes are not to be requested/ requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an “XA” coded item. Order the next higher assembly. (Refer to NOTE below.)
XB	If an item is not available from salvage, order it using the CAGEC and part number.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.
XD	Item is not stocked. Order an “XD” coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance Code	Application/Explanation
C-	Crew
F-	Maintainer maintenance can remove, replace, and use the item.
H-	Below Depot Sustainment maintenance can remove, replace, and use the item.
L-	Specialized repair activity can remove, replace, and use the item.
G-	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K-	Contractor facility can remove, replace, and use the item
Z-	Item is not authorized to be removed, replace, or used at any maintenance level
D-	Depot can remove, replace, and use the item.

INTRODUCTION – Continued

NOTE

Army will use C in the third position. However for joint service publications, other services may use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance class with the capability to do complete repair (perform all authorized repair functions).

Maintenance Code	Application/Explanation
C-	Crew (operator) is the lowest class that can do complete repair.
F-	Maintainer is the lowest class that can do complete repair of the item.
H-	Below Depot Sustainment is the lowest class that can do complete repair of the item.
L-	Specialized repair activity (enter specialized repair activity designator) is the lowest class that can do complete repair of the item.
D-	Depot is the lowest class that can do complete repair of the item.
G-	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only)
K-	Complete repair is done at contractor facility
Z-	Nonreparable. No repair is authorized.
B-	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z-	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level.
H-	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment.
D-	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot.

Table 2. Source Code Explanation- Continued

Recoverability Code	Application/Explanation
L-	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A-	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G-	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K-	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column (3)). The NSN(s) for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
2. Part numbers of any bulk materials required if the item is to be locally manufactured or fabricated.
3. Hardness Critical Item (HCI). Items that require special handling or procedures to ensure protection against electromagnetic pulse (EMP) damage are marked with the letters ‘HCI.’
4. The statement END OF FIGURE appears below the last item description in column (6) for each Figure in the repair parts list, special tools repair parts, kits, bulk items, and special tools list work packages.
5. Refer to Usable on Code details presented later in this work package under SPECIAL INFORMATION.

QTY (Column (7)). The QTY (quantity per Figure) column indicates the quantity of the item used in the breakout shown on the illustration/Figure. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

INTRODUCTION – Continued

Explanation of Cross-Reference Indexes Work Packages Format and Columns

1. **National Stock Number (NSN) Index Work Package.** NSNs in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the Figure where the item is identified/located. The Figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. This column identifies the item associated with the Figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. **Part Number (P/N) Index Work Package.** Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. This column indicates the part number assigned to the item.

FIG. Column. This column lists the number of the Figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the Figure referenced in the adjacent Figure number column.

Special Information

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:" in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Examples of the UOCs used in the RPSTL are:

Code	Use On
BY5	Model M252A1

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk materials are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in the appropriate maintenance work packages of this manual.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

Associated Publications. The publication(s) listed below pertain to the M252A1, 81mm Mortar:

Publication	Short Title
TM 9-1015-257-10	Operators Manual for Mortar, 81-MM M252A1 NSN 1015-01-586-2135 (EIC:4SU)

Illustrations List. The illustrations in this RPSTL contain field authorized items. Illustrations published in TM 9-1015-257-23&P that contain field authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded "F" in the third position of the SMR code, therefore, there may be a break in the item number sequence.

How To Locate Repair Parts

1. **When NSNs or Part Numbers Are Not Known.**

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since Figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the Figure covering the functional group or the sub functional group to which the item belongs.

Third. Identify the item on the Figure and note the number(s).

Fourth. Look in the repair parts list work packages for the Figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. **When NSN Is Known.**

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the Figure and item number next to the NSN.

Second. Turn to the Figure and locate the item number. Verify that the item is the one for which you are looking.

3. **When Part Number Is Known.**

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the Figure and item number.

Second. Look up the item on the Figure in the applicable repair parts list work package.

END OF WORK PACKAGE

FIELD MAINTENANCE
M252A1 81-MM MORTAR 12901504
REPAIR PARTS LIST

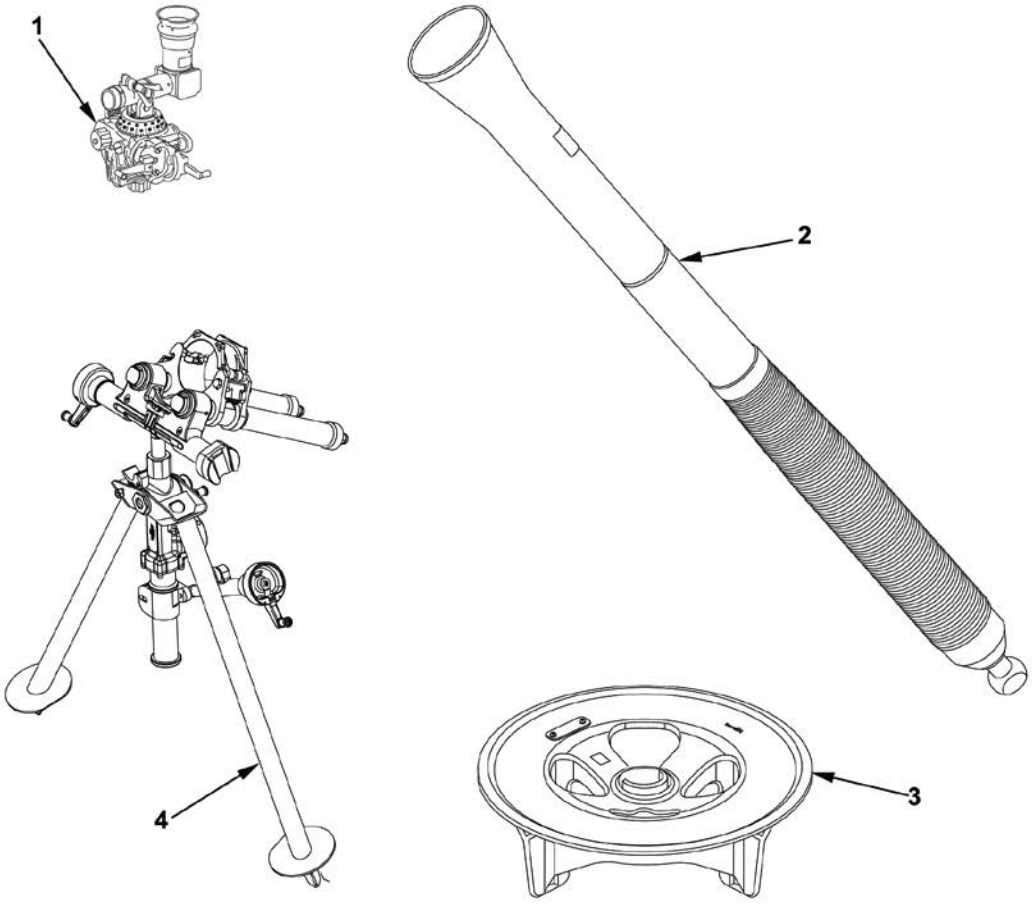


Figure 1. Mortar, 81-mm, M252A1 12901504.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 00	
					Figure 1. Mortar, 81-mm, M252A1 12901504	
1	AFCDA		19200	9356182	Sight Unit, M67 (Refer to TM 9-1240-409-23&P for Assembly Breakdown	1
2	PACDD	1015-01-528-2773	1NUW7	12901300	Cannon, 81-mm, M253 (For Assembly Breakdown See Fig. 2).....	1
3	PAFFF	1015-01-552-9883	19200	13015570	Baseplate, Mortar: M3A2 (Lightweight) (For Assembly Breakdown See Fig. 16).....	1
4	PAFFF	1015-01-561-6067	19200	13015600	Mount, Mortar: M177A1 (For Assembly Breakdown See Fig. 3).....	1

END OF FIGURE

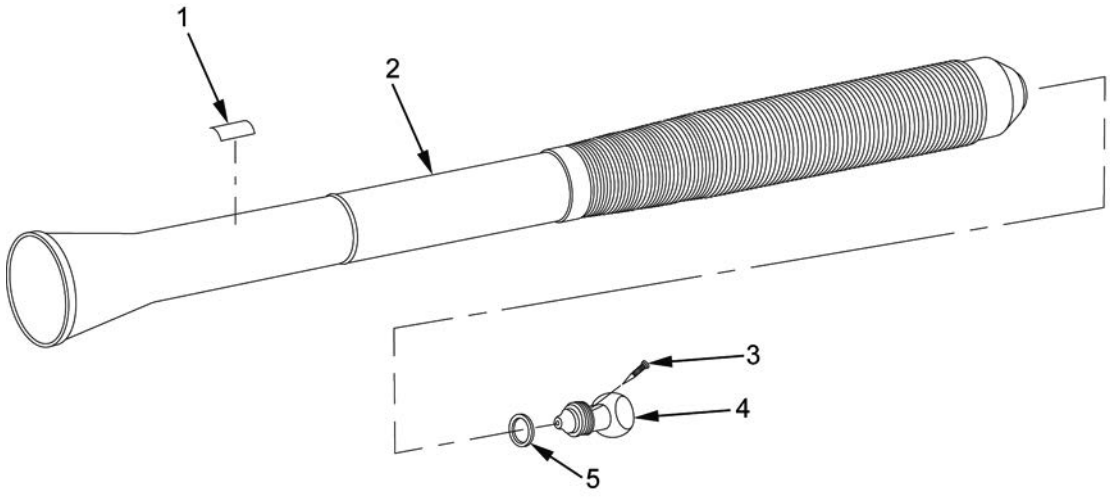


Figure 2. M253 81-mm Cannon 12901300.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 01	
					Figure 2. Cannon, 81-mm, M253 12901300	
1	PAFZZ	7690-01-628-0561	1NUW7	12901382	Label, IUID	1
2	XAFZZ		1NUW7	12901301	Cannon	1
3	PACZZ	1015-01-441-4160	19206	11580037	Pin, Firing	1
4	PAFZZ	1015-01-441-5502	19206	11580045	Plug, Breech	1
5	PAFZZ	3120-01-442-2307	19206	11580044	Bearing, Washer, Thrust	1

END OF FIGURE

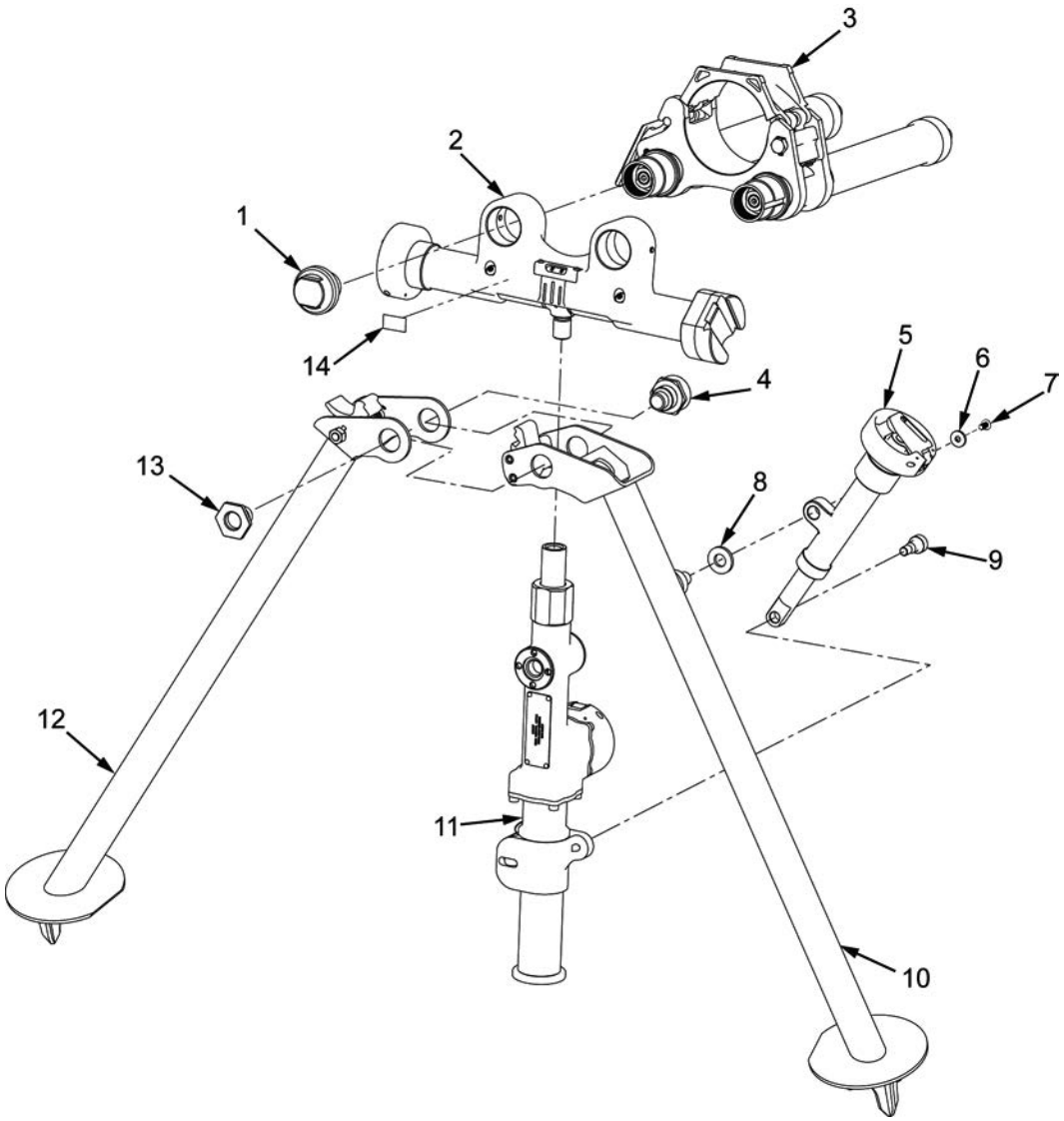


Figure 3. M177A1 81-mm Mortar Mount 13015600.

NOTE

Mortar legs are identified as seen from rear of mortar.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 02	
					Figure 3. Mortar Mount, 81-mm M177A1 13015600	
1	PAFZZ	5340-01-562-7405	19200	13015604	Cap, Protective, Dust	2
2	PAFFF	1015-01-561-6068	19200	13015720	Traversing Mechanism (For Assembly Breakdown See Fig. 4)	1
3	PAFFF	1015-01-562-1130	19200	13015780	Buffer, Recoil Mechanism (For Assembly Breakdown See Fig. 5)	1
4	PAFZZ	5310-01-562-6588	19200	13015603	Nut, Plain, Extended	1
5	PAFFF	1015-01-562-5915	19200	13015900	Cross Leveling Assembly (For Assembly Breakdown See Fig. 9)	1
6	PAFZZ	5310-12-343-8283	D8286	DIN7349-6, 4 A2-50	Washer, Flat	1
7	PAFZZ	5305-01-563-6208	I9008	ISO7380-M5X10-A2	Screw, Cap, Socket Head	1
8	PAFZZ	5365-01-588-7444	ILBL6	TL1-G3811616	Shim Set	1
9	PAFZZ	5305-01-570-2322	I9008	ISO7379-10X10-A2	Screw, Shoulder	1
10	PAFZZ	1015-01-562-4384	19200	13015760	Leg, Mortar Bipod (Left)	
11	PAFFF	3040-01-561-9947	19200	13015610	Housing, Mechanical (Elevation) (For Assembly Breakdown See Fig. 11)	1
12	PAFFF	1015-01-562-5917	19200	13015770	Leg, Mortar Bipod (Right) (For Assembly Breakdown See Fig. 10)	1
13	PAFZZ	5310-01-562-6589	19200	13015602	Nut, Plain, Extended	1
14	PAFZZ	7690-01-625-2403	1NUW7	12901392	Label	1

END OF FIGURE

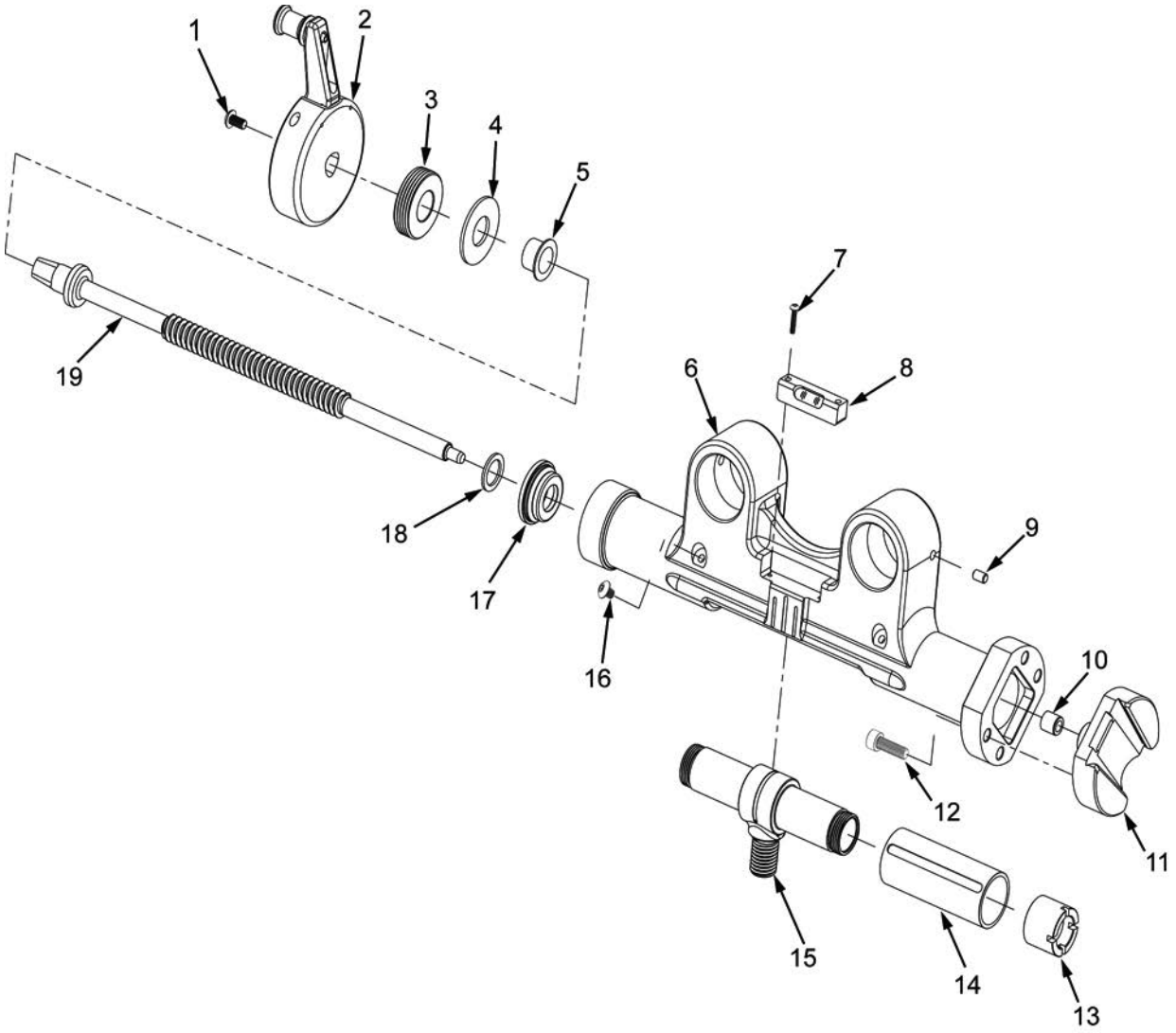


Figure 4. Traversing Mechanism 13015720.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 0201	
					Figure 4. Traversing Mechanism 13015720	
1	PAFZZ	5305-01-563-6208	I9008	ISO7380-M5X10-A2	Screw, Cap, Socket Head	1
2	PAFFF	5340-01-561-6070	19200	13015700	Crank, Hand (For Assembly Breakdown See Fig. 15)	1
3	PAFZZ	5340-01-561-7847	19200	13015729	Plate, Mounting	1
4	PAFFF	5365-01-626-8745	1NL91	2JHC9	Shim	1
5	PAFZZ	3120-01-561-7851	19200	13015731	Bearing, Sleeve	1
6	XAFZZ		19200	13015721	Yoke, Traversing	1
7	PAFZZ	5305-01-563-4642	I9008	ISO7380-M3X14-A2	Screw, Cap, Socket Head	2
8	PAFZZ	1015-01-561-7187	19200	13015750	Level, Mortar Mount	1
9	PAFZZ	5315-01-563-6758	I9008	ISO2338-5M6X8-A1	Pin, Straight, Headless	2
10	XAFZZ		19200	13015725	Traverse Sleeve Bearing	1
11	XAFZZ		19200	13015724	Sight Adapter End	1
12	PAFZZ	5305-01-563-7972	I9008	ISO4762-M6X20-A2	Screw, Cap, Socket He	4
13	PAFZZ	5310-01-562-7399	19200	13015723	Nut, Plain, Round	2
14	PAFZZ	3120-01-561-7845	19200	13015722	Bushing, Sleeve	2
15	PAFZZ	4730-01-561-7849	19200	13015740	Tee, Flange	1
16	PAFZZ	5305-01-561-7846	19200	13015732	Screw, Cap, Socket He	2
17	PAFZZ	5310-01-561-7843	19200	13015726	Washer, Panel, Fasten	1
18	PAFZZ	5310-01-561-9235	19200	13015727	Washer, Flat	1
19	PAFZZ	5305-01-561-7844	19200	13015728	Screw, Shoulder	1

END OF FIGURE

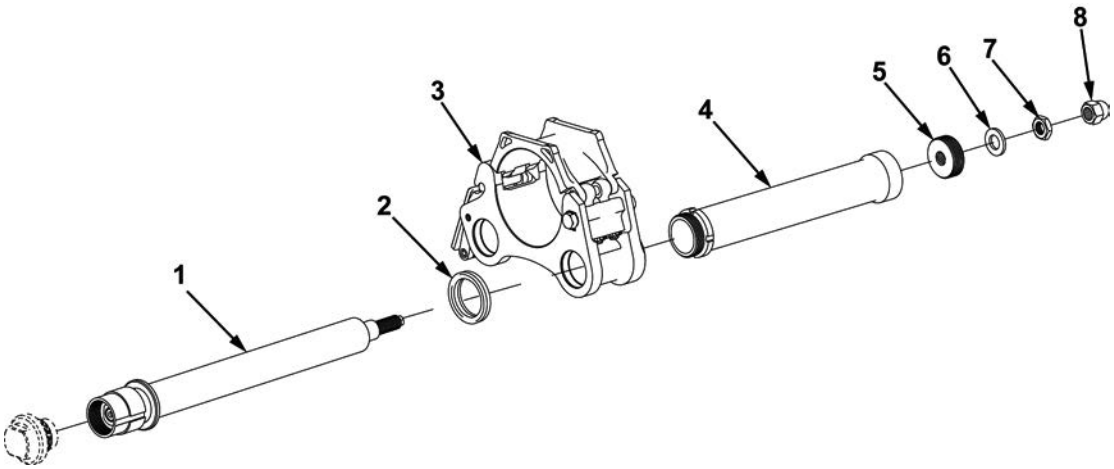


Figure 5. Recoil Mechanism Buffer 13015780.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 0202	
					Figure 5. Recoil Mechanism Buffer 13015780	
1	PAFFF	1015-01-562-1870	19200	13015880	Buffer, Recoil Mechanism (For Assembly Breakdown See Fig. 8)	2
2	PAFZZ	5330-01-570-9247	19200	13015591	Seal, Nonmetallic Sp	2
3	PAFFF	1015-01-624-6519	1NUW7	12901600	Buffer, Recoil Mechanism (For Assembly Breakdown See Fig. 6)	1
4	PAFZZ	1015-01-625-2555	1NUW7	12901589	Buffer, Recoil Mechanism	2
5	PAFZZ	5340-01-561-7854	19200	13015782	Plate, Mounting	2
6	PAFZZ	5310-12-356-5430	I9008	ISO7089-12-200 HV-A2	Washer, Flat	2
7	PAFZZ	5310-14-573-3356	I9008	ISO4035-M12-A2	Nut, Plain, Hexagon	2
8	PAFZZ	5310-12-375-2439	D8286	DIN1587-M12-SW18-A2	Nut, Plain, Cap	2
					END OF FIGURE	

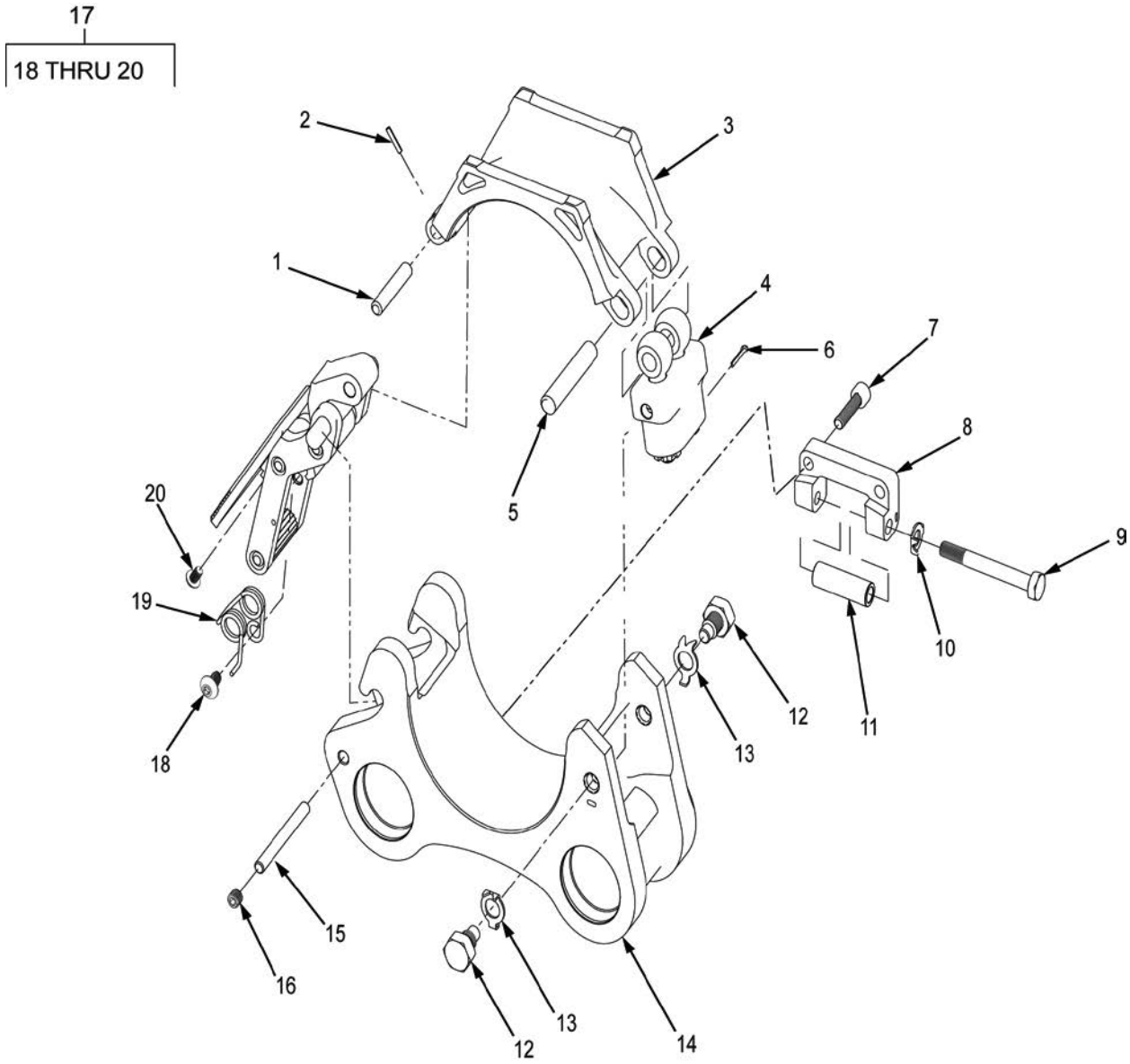


Figure 6. Recoil Mechanism Buffer 12901600 and Clamping Catch 13015840.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020201, 02020102	
					Figure 6. Buffer, Recoil Mechanism 12901600; Clamping Catch 13015840	
1	PAFZZ	5315-01-625-3713	1NUW7	ISO8734-6X32-A-ST	Pin, Parallel	1
2	PAFZZ	5315-01-625-6248	05047	B18.8.4M-2X10	Pin,Spring	1
3	XAFZZ		1NUW7	12901593	Clamp, Upper	1
4	PAFFF	3950-01-625-6159	1NUW7	12901599	Housing, Mechanical Drive (For Assembly Breakdown See Fig. 7)	1
5	PAFZZ	5315-01-625-6133	1NUW7	12901595	Pin, Straight, Headless	1
6	PAFZZ	5315-01-625-3715	1NUW7	ISO1234-2X20-ST	Splint Pin, Steel	2
7	PAFZZ	5305-01-625-3711	1NUW7	ISO4762-M5X20-A2	Screw, Cap, Hexagon H	2
8	PAFZZ	5340-01-570-9249	19200	13015786	Bracket, Mounting	1
9	PAFZZ	5305-01-570-7083	19200	13015788	Screw, Cap, Hexagon H	1
10	PAFZZ	5310-00-969-4466	81343	MS9276-10	Washer, Key	1
11	PAFZZ	5365-01-570-9242	19200	13015787	Spacer, Sleeve	1
12	PAFZZ	5306-01-561-7855	19200	13015791	Bolt, Machine	2
13	PAFZZ	5310-00-835-2041	96906	MS9276-11	Washer, Key	2
14	XAFZZ		1NUW7	12901581	Barrel Clamp, Lower	1
15	PAFZZ	5315-01-561-9950	1NUW7	13015792	Pin, Straight, Headle	1
16	PAFZZ	5305-01-563-2354	I9008	ISO4026-M6X6-A2	Setscrew	1
17	PAFFF	5340-01-562-1100	19200	13015840	Catch, Clamping	1
18	PAFZZ	5305-01-571-5898	I9008	ISO7380-M5X8-A2	. Screw, Cap, Socket He	1
19	PAFZZ	5360-01-562-4383	19200	13015846	. Spring, Helical, Tors	1
20	PAFZZ	5305-01-569-8841	I9008	ISO7380-M4X6-A2	. Screw, Cap, Socket He	1

END OF FIGURE

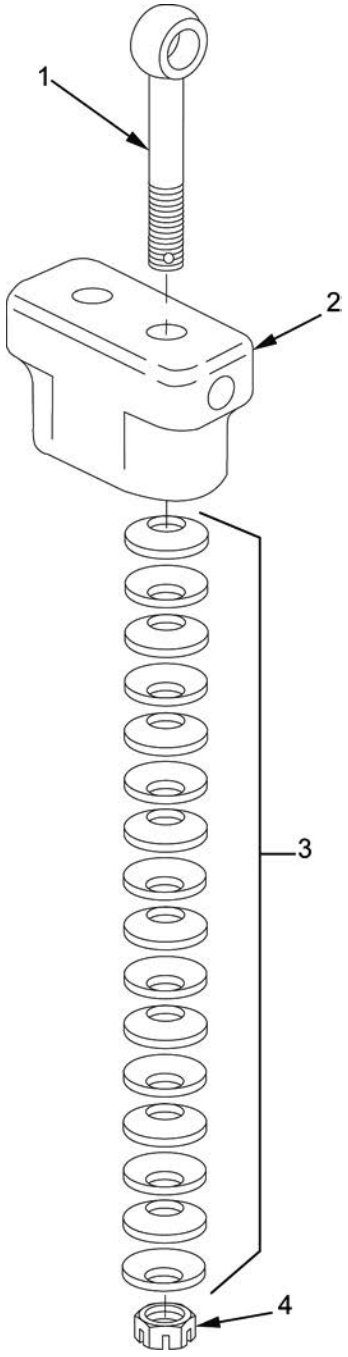


Figure 7. Mechanical Drive Housing 12901599.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 02020101	
					Figure 7. Housing, Mechanical Drive 12901599	
1	PAFZZ	5306-01-624-6866	1NUW7	12901594	Bolt, Eye	2
2	XAFZZ		1NUW7	12901636	Belleville Housing	1
3	PAFZZ	5310-01-623-8974	1NUW7	12901597	Washer Set, Spring Te (Set of 16)	2
4	PAFZZ	5310-01-623-4884	1NUW7	B18243B08	Nut, Plain, Slotted	2
					END OF FIGURE	

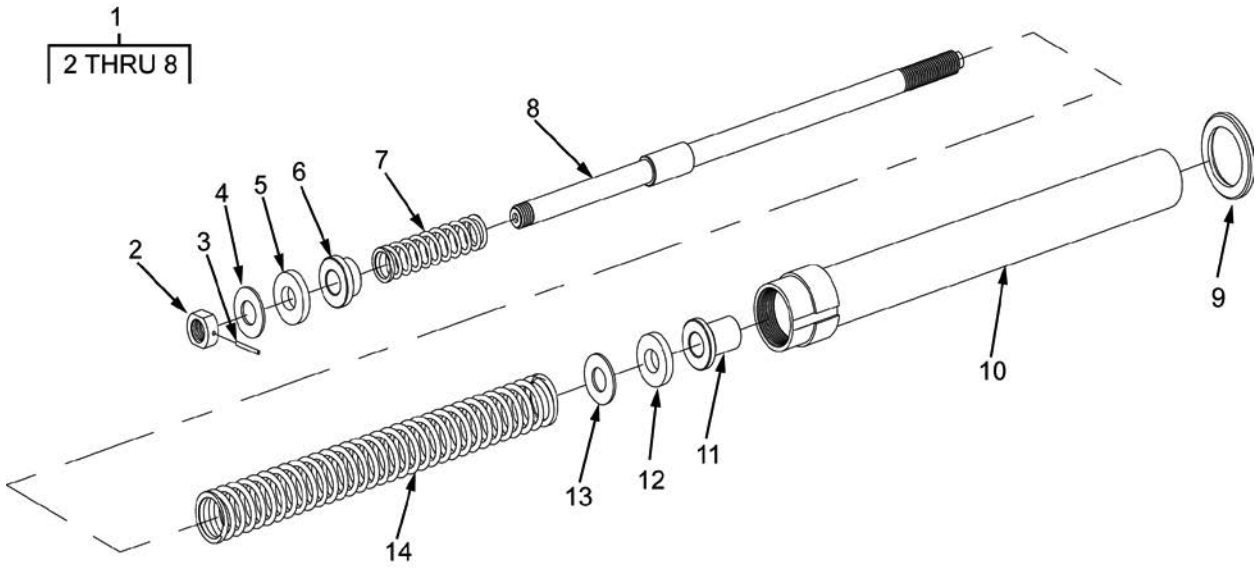


Figure 8. Recoil Mechanism Buffer 13015880 and Recoil Mechanism Buffer 13015890.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020202, 02020201	
					Figure 8. Recoil Mechanism Buffer 13015880; Recoil Mechanism Buffer 13015890	
1	PAFZZ	1015-01-562-1872	19200	13015890	Buffer, Recoil Mechanism	1
2	XAFZZ		19200	13015895	. Nut, Plain, Round	1
3	PAFZZ	5315-01-563-6197	I9008	ISO8752-2X20-A2	. Pin, Spring	1
4	PAFZZ	5310-01-592-7936	19200	13015887	. Washer, Flat	1
5	PCFZZ	5310-01-562-1101	19200	13015883	. Washer, Flat (Rubber)	1
6	PAFZZ	5340-01-562-7411	19200	13015894	. Retainer, Helical Co	1
7	PAFZZ	5360-01-562-1110	19200	13015893	. Spring, Helical, Comp	1
8	XAFZZ		1NUW7	12901590	. Recoil Guide Rod, Extended	1
9	PCFZZ	5340-01-562-1108	19200	13015886	Bumper	1
10	XAFZZ		1NUW7	12901585	Recoil Spring Housing	1
11	PAFZZ	3120-01-561-9948	19200	13015882	Bushing, Sleeve	1
12	PCFZZ	5310-01-562-1101	19200	13015883	Washer, Flat (Rubber)	1
13	PAFZZ	5310-01-592-7936	19200	13015887	Washer, Flat	1
14	PAFZZ	5360-01-624-6915	1NUW7	12901591	Spring, Helical Compression	1
					END OF FIGURE	

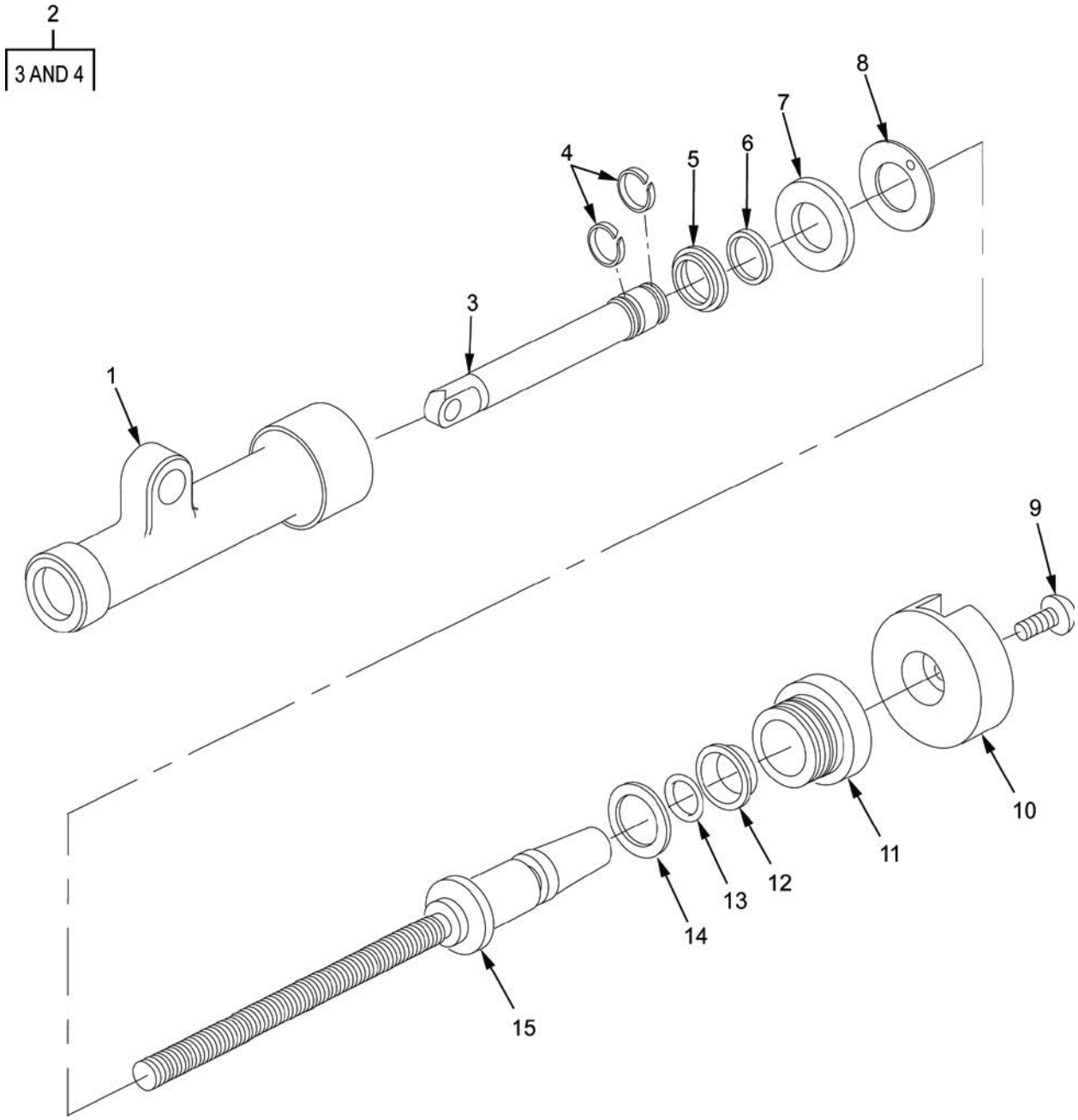


Figure 9. Cross Leveling Assembly 13015900 and Rod End Connector 13015920.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 0203, 020302	
					Figure 9. Cross Leveling Assembly 13015900; Rod End Connector 13015920	
1	XAFZZ		19200	13015901	Housing, Mechanical	1
2	PAFFF	5315-01-604-6496	19200	13015920	Pin, Grooved, Headed	1
3	XAFZZ		19200	13015921	. Connector, Rod End	1
4	PAFZZ	4320-01-605-5868	19200	13015924	. Ring Wearing	2
5	PCFZZ	5330-01-562-5912	19200	13015904	Seal, Plain	1
6	PAFZZ	3120-01-604-6492	19200	13015925	Bearing, Sleeve	1
7	PAFZZ	5310-01-561-7193	19200	13015906	Washer, Flat	1
8	PAFZZ	3120-01-562-8092	0JFH8	13017365	Bearing, Washer, Thrust	1
9	PAFZZ	5305-01-563-6208	I9008	ISO7380-M5X10-A2	Screw, Cap, Socket He	1
10	PAFFF	5340-01-561-6070	19200	13015700	Crank, Hand (For Assembly Breakdown (See Fig. 15))	1
11	PAFZZ	5310-01-562-1876	19200	13015902	Nut, Sleeve	1
12	PCFZZ	3120-01-561-7850	19200	13015903	Bearing, Sleeve	1
13	PCFZZ	5331-00-935-9269	81343	AS568B-111	O-Ring	1
14	PAFZZ	5365-01-626-8743	4DZ54	98126A132	Shim	1
15	PAFZZ	5305-01-562-3523	19200	13015905	Screw, Shoulder	1

END OF FIGURE

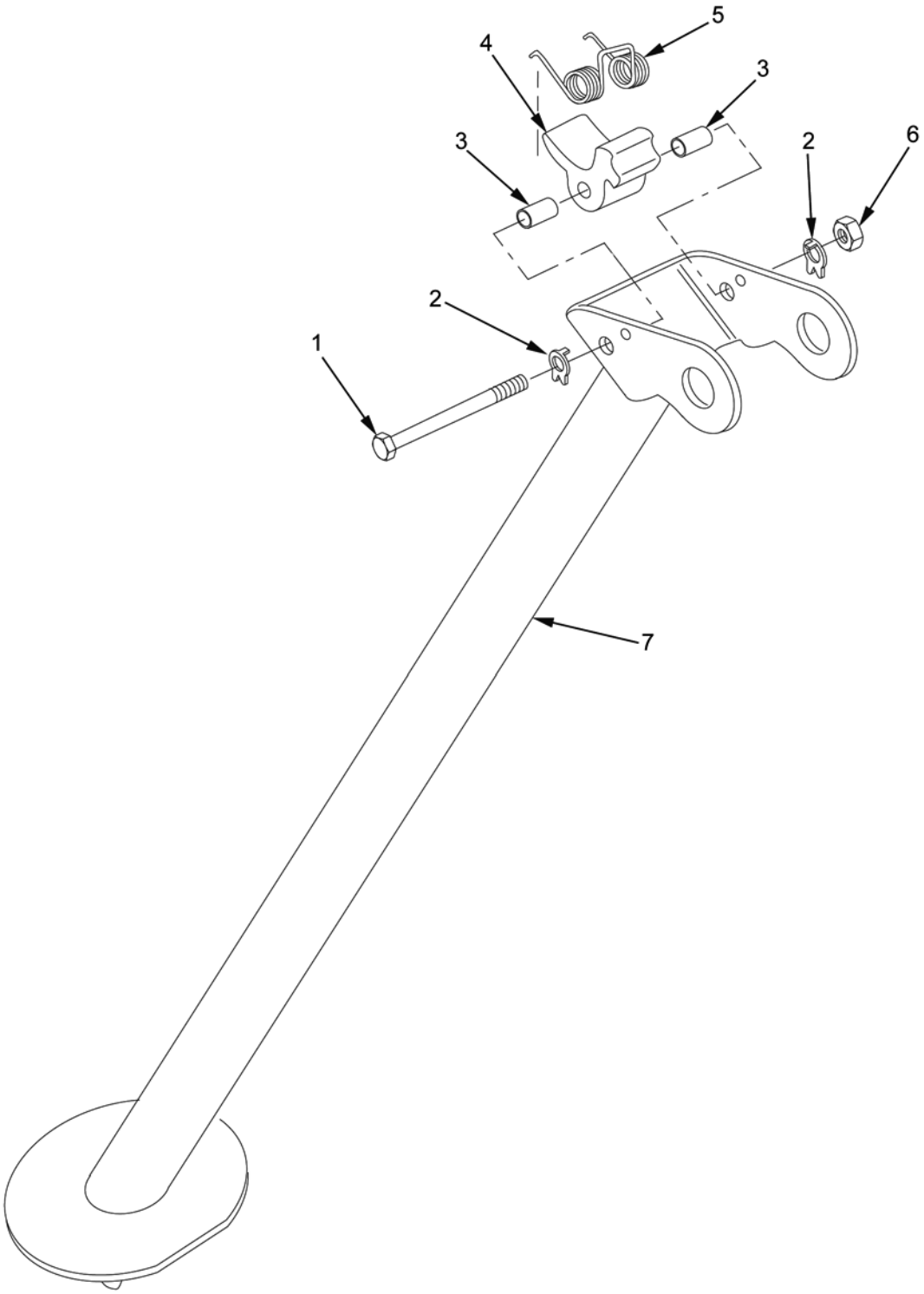


Figure 10. Mortar Bipod Leg (Right) 13015770.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 0204	
					Figure 10. Mortar Bipod Leg (Right) 13015770	
1	PAFZZ	5306-01-561-7859	19200	13015774	Bolt, Machine	1
2	PAFZZ	5340-00-835-2041	96906	MS9276-11	Washer, Key	2
3	PAFZZ	5365-01-562-4382	19200	13015773	Spacer, Sleeve	2
4	PAFZZ	5330-01-562-4379	19200	13015772	Lever, Lock-Release	1
5	PAFZZ	5360-01-562-4380	19200	13015775	Spring, Helical, Torsion	1
6	PAFZZ	5310-01-563-4613	I9008	ISO4032-M8-A2	Nut, Plain, Hexagon	1
7	XAFZZ		19200	13015761	Leg, Bipod	1

END OF FIGURE

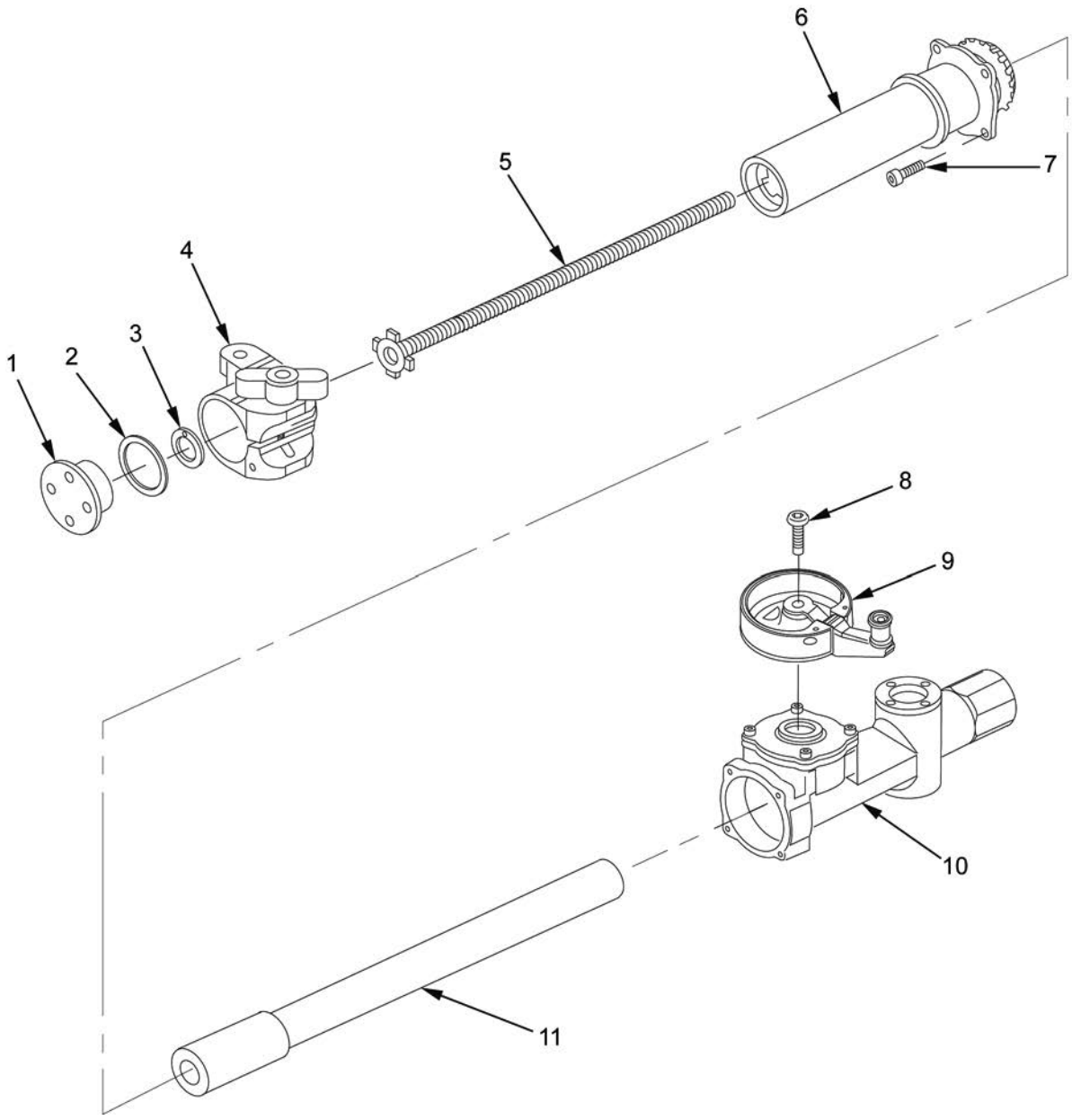


Figure 11. Mechanical Housing (Elevation) 13015610.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 0205	
					Figure 11. Mechanical Housing (Elevation) 13015610	
1	PAFZZ	5365-01-562-1089	19200	13015651	Plug, Machine Thread	1
2	PAFZZ	5340-01-588-7443	1LBL6	TL1-G3811936	Shim Set	1
3	PAFZZ	3120-01-561-9228	19200	13015652	Bearing, Washer, Thrust	1
4	PAFFF	5340-01-562-1092	19200	13015680	Clamp, Block (For Assembly Breakdown See Fig. 14)	1
5	PAFZZ	1015-01-624-0986	1NUW7	12901564	Shaft, Straight	1
6	PAFFF	3040-01-572-7063	19200	13015640	Housing, Mechanical (Lower) (For Assembly Breakdown See Fig. 12)	1
7	PAFZZ	5305-01-563-8697	I9008	ISO4762-M5X8-A2	Screw, Cap, Socket He	4
8	PAFZZ	5305-01-563-6208	I9008	ISO7380-M5X10-A2	Screw, Cap, Socket He	1
9	PAFFF	5340-01-561-6070	19200	13015700	Crank, Hand (For Assembly Breakdown See Fig. 15)	1
10	PAFFF	3040-01-572-7704	19200	13015620	Housing, Mechanical (Upper) (For Assembly Breakdown See Fig 13.)	1
11	PAFZZ	3040-01-562-1125	19200	13015611	Shaft Assembly, Stra	1
					END OF FIGURE	

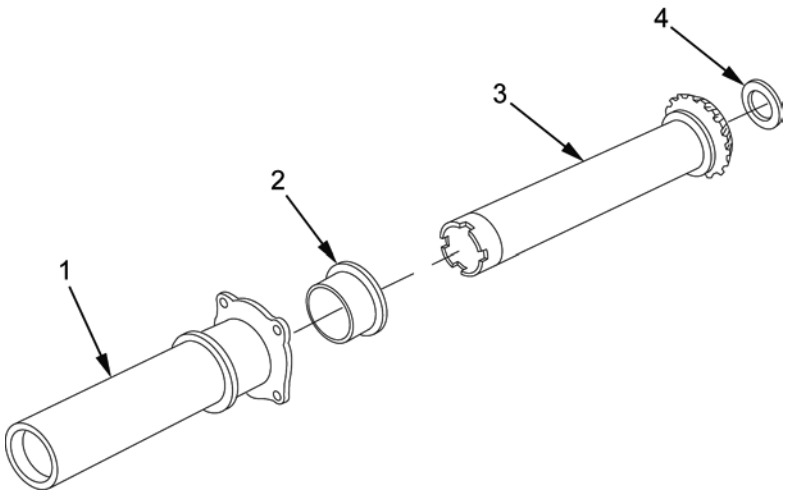


Figure 12. Mechanical Housing (Lower) 13015640.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020501	
					Figure 12. Mechanical Housing (Lower) 13015640	
1	XAFZZ		19200	13015641	Housing, Mechanical	1
2	PAFZZ	3120-01-561-9229	19200	13015643	Bearing, Sleeve	1
3	PAFZZ	3040-01-562-3500	19200	13015642	Gearshaft, Spur	1
4	PAFZZ	3120-01-561-9224	19200	13015645	Bearing, Sleeve	1
					END OF FIGURE	

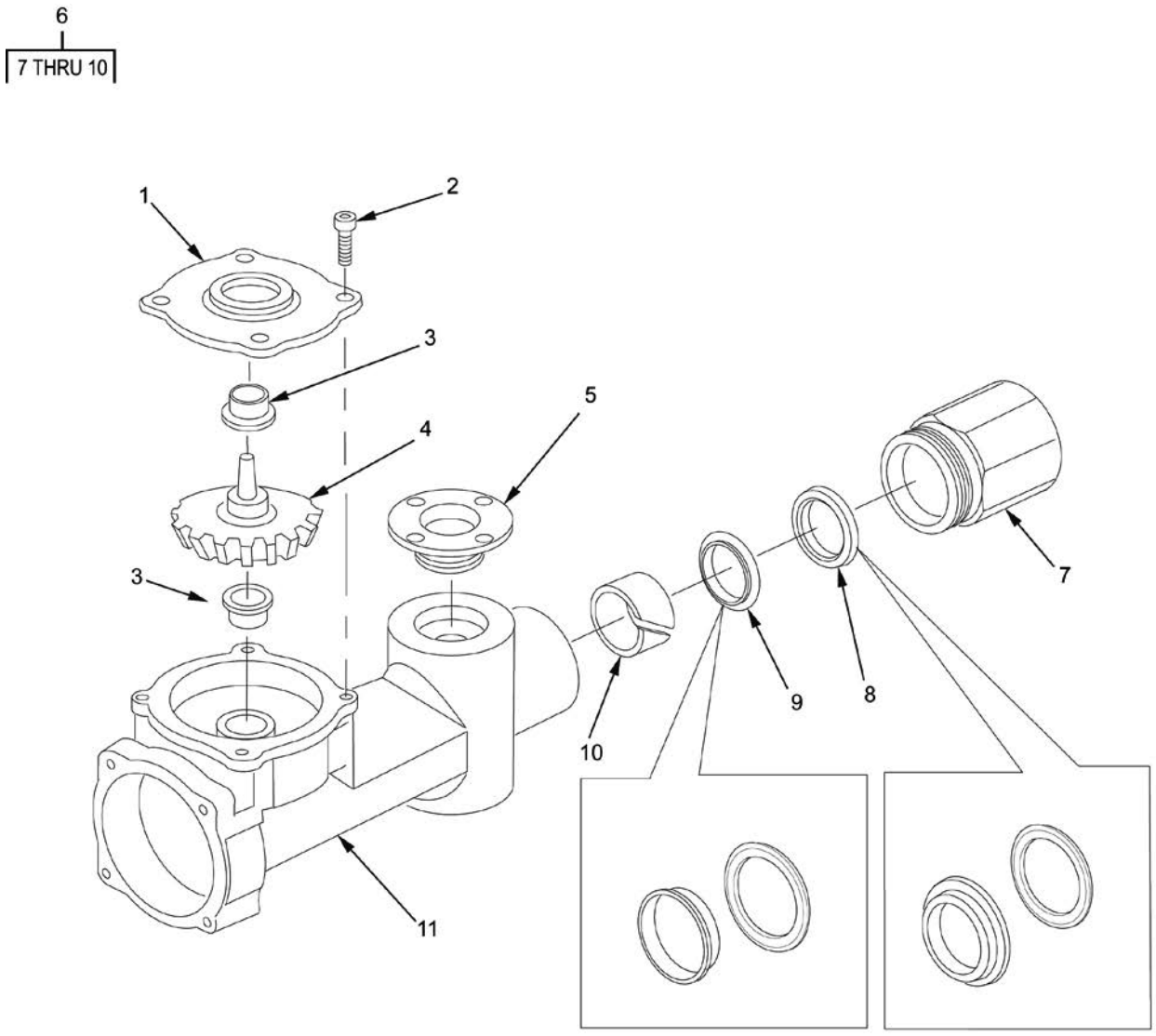


Figure 13. Mechanical Housing (Upper) 13015620 and Round Plain Nut 13015630.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020502, 02050201	
					Figure 13. Mechanical Housing (Upper) 13015620; Round Plain Nut 13015630	
1	PAFZZ	5315-01-562-1117	19200	13015624	Cover, Access	1
2	PAFZZ	5305-01-563-8697	I9008	ISO4762-M5X8-A2	Screw, Cap, Socket Head	4
3	PAFZZ	3120-01-561-7850	19200	13015903	Bearing, Sleeve	2
4	PAFZZ	3020-01-572-7067	19200	13015623	Gear, Bevel	1
5	PAFZZ	5310-01-562-1864	19200	13015622	Nut, Sleeve	2
6	PAFFF	5310-01-562-7410	19200	13015630	Nut, Plain, Round	1
7	XAFZZ		19200	13015631	. Nut, Special	1
8	PCFZZ	5330-01-562-1120	19200	13015634	. Seal, Plain	1
9	PAFZZ	5330-01-562-1123	19200	13015633	. Seal, Plain	1
10	PCFZZ	3120-01-561-7852	19200	13015632	. Bushing, Sleeve	1
11	XAFZZ		19200	13015621	Elevation Housing U	1
					END OF FIGURE	

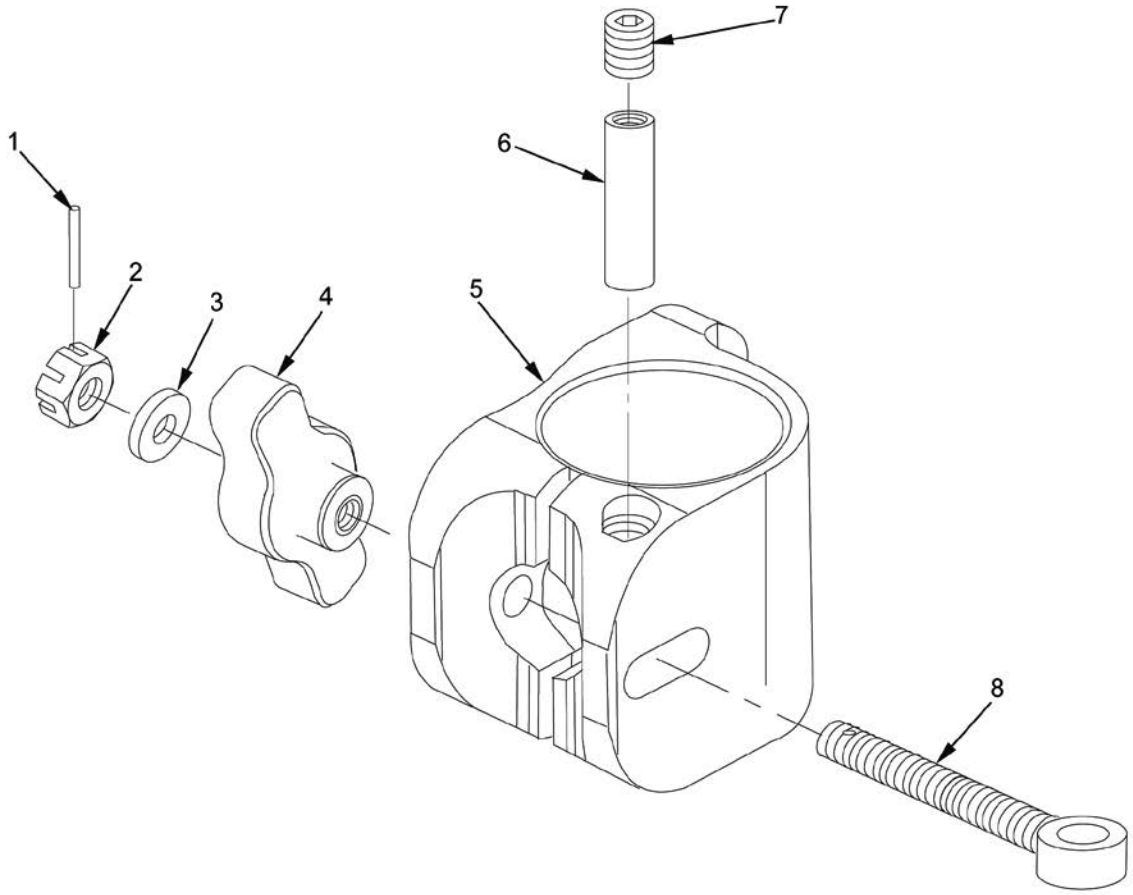


Figure 14. Block Clamp 13015680.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020503	
					Figure 14. Block Clamp 13015680	
1	PAFZZ	5315-12-154-5805	I9008	ISO8752-2X10-A2	Pin, Spring	1
2	PAFZZ	5310-12-377-7476	D8286	DIN935-M6-A2	Nut, Plain, Slotted He	1
3	PAFZZ	5310-12-343-8283	D8286	DIN7349-6, 4-A2-50	Washer, Flat	1
4	PAFZZ	5310-01-561-9225	19200	13015690	Nut, Plain, Wing	1
5	XAFZZ		19200	13015681	Clamp	1
6	PAFZZ	5315-01-563-4591	I9008	ISO2338-6M6X28-A2	Pin, Straight, Headless	1
7	PAFZZ	5305-01-570-3084	I9008	ISO4026-M8X8-A2	Setscrew	1
8	PAFZZ	5306-01-561-7848	19200	13015682	Bolt, Eye	1
					END OF FIGURE	

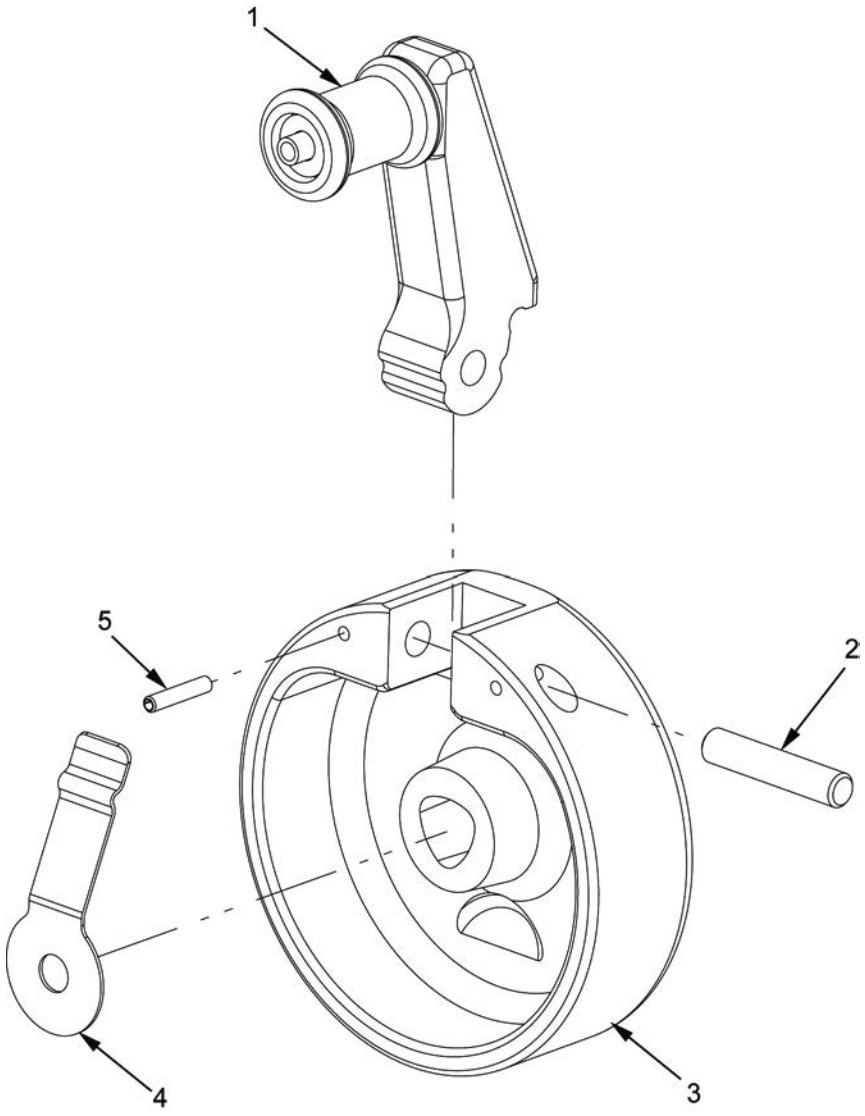


Figure 15. Hand Crank 13015700.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 020101, 020301, 020504	
					Figure 15. Hand Crank 13015700	
1	PAFZZ	5340-01-625-5791	1NUW7	12901529	Arm, Hand Crank	1
2	PAFZZ	5315-01-563-6760	I9008	ISO2338-5M6X24-A2	Pin, Straight, Headless	1
3	XAFZZ		19200	13015701	Handle, Body	1
4	PAFZZ	5360-01-561-9226	19200	13015705	Spring, Flat	1
5	PAFZZ	5315-14-425-1217	I9008	ISO8752-2X12-A2	Pin, Spring	2
					END OF FIGURE	

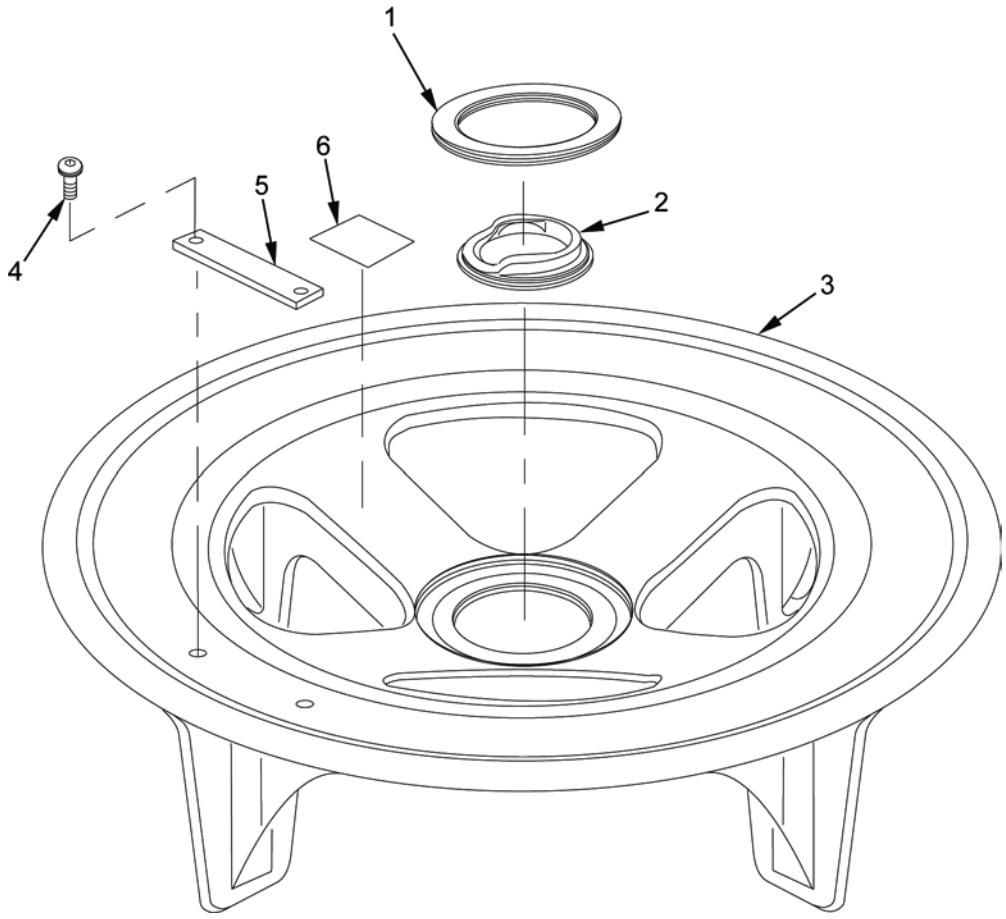


Figure 16. M3A2 81-mm Mortar Baseplate 13015570.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 03	
					Figure 16. Mortar Baseplate, 81-mm, M3A2 13015570	
1	PAFZZ	5325-01-592-9506	19200	13015592	Ring, Retaining, Spiral	1
2	PAFZZ	5340-01-592-9650	19200	13015577	Cap, Protective, Dust	1
3	XAFZZ		19200	13015571	Baseplate	1
4	PAFZZ	5305-01-602-2660	I9008	ISO 7380-M4X8-A2	Screw, Cap, Socket Head	2
5	PAFZZ	9905-01-604-6969	19200	13015576	Plate, Identification	1
6	PAFZZ	7690-01-628-1809	1NUW7	12901391	Plate, Identification	1

END OF WORK PACKAGE

FIELD MAINTENANCE
M252A1 81-MM MORTAR 12901504
KIT PARTS LIST

KITS NOT ILLUSTRATED

Figure KITS. KITS NOT ILLUSTRATED

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 9501	
					Figure KITS. KITS NOT ILLUSTRATED	
1	PAFZZ	1015-01-629-1675	1NUW7	12901850	Parts Kit, Gun	1
					Bearing, Sleeve (1) 4-5	
					Bearing, Sleeve (1) 9-6	
					Bearing, Sleeve (1) 9-12	
					Bearing, Sleeve (1) 12-2	
					Bearing, Sleeve (1) 12-4	
					Bearing, Sleeve (2) 13-3	
					Bearing, Washer, Thrust (1) 9-8	
					Bearing, Washer, Thrust (1) 11-3	
					Bumper (2) 8-9	
					Bushing, Sleeve (1) 13-10	
					O-Ring (1) 9-13	
					Pin, Parallel (1) 6-1	
					Pin, Spring (1) 6-2	
					Pin, Spring (2) 8-3	
					Pin, Spring (1) 14-1	
					Pin, Spring (6) 15-5	
					Ring, Wearing (2) 9-4	
					Seal, Nonmetallic, Sp (2) 5-2	
					Seal, Plain (1) 9-5	
					Seal, Plain (1) 13-8	
					Seal, Plain (1) 13-9	
					Splint Pin, Steel (2) 6-6	
					Spring, Helical Torsion (1) 10-5	
					Spring, Helical, Torsion (1) 6-9	
					Washer, Flat (1) 4-18	
					Washer, Flat (1) 9-7	
					Washer, Flat (Rubber) (2) 8-5	
					Washer, Flat (Rubber) (2) 8-12	
					Washer, Key (1) 6-10	
					Washer, Key (2) 6-13	
					Washer, Key (2) 10-2	
					END OF FIGURE	

FIELD MAINTENANCE
M252A1 81-MM MORTAR 12901504
SPECIAL TOOLS LIST

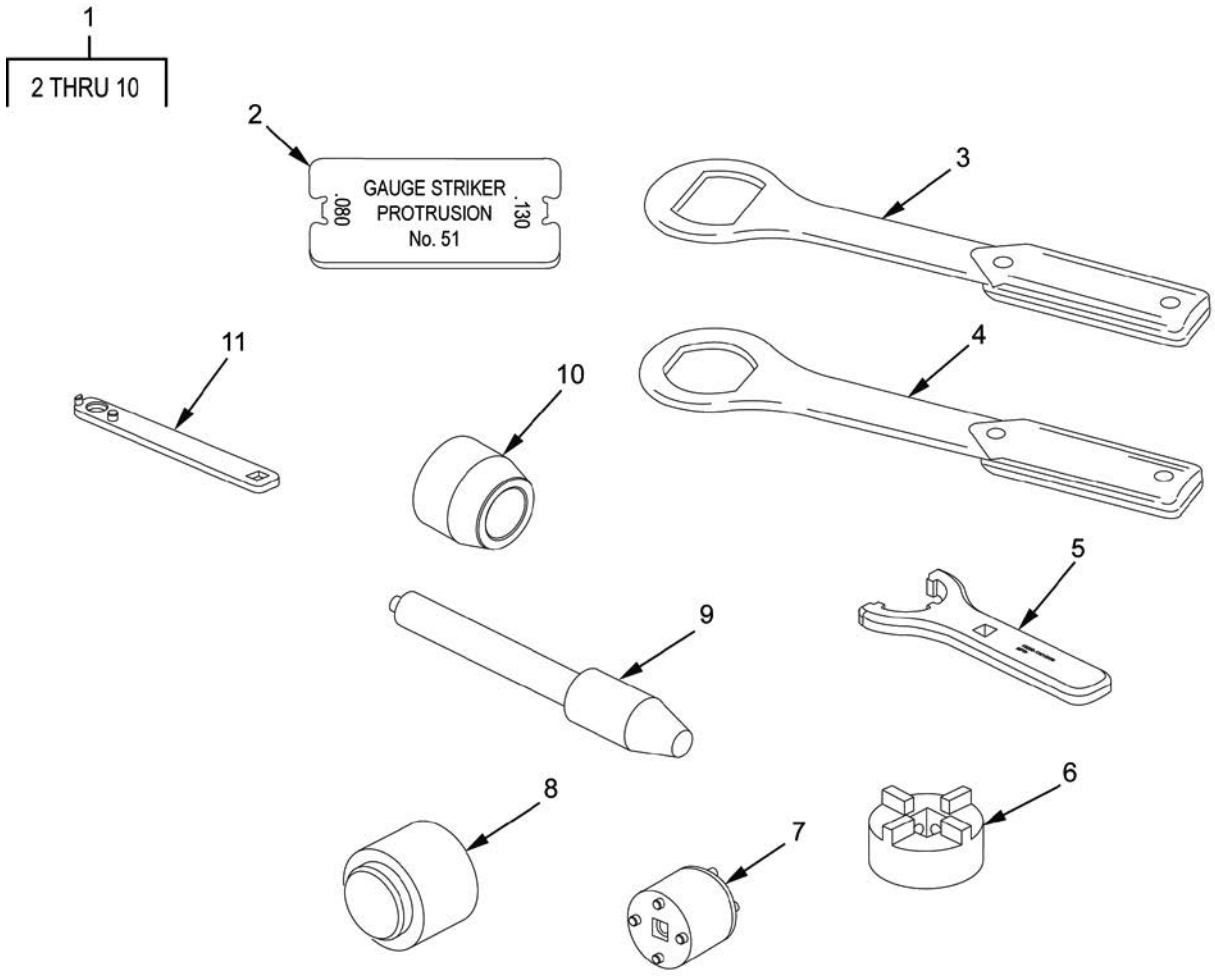


Figure 17. Special Tools.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE	(7) QTY
					GROUP 9500	
					Figure 17. Special Tools	
1	PAFZZ	1015-01-588-7447	19200	13028844	Tool, Support Unit Kit	1
2	PAFZZ	5220-01-441-4158	19206	11580237	. Gauge, Profile (BOI: 1 per Field Support Unit)	EA
3	PAFZZ	5120-01-442-2312	19206	11580256	. Wrench, Box (Plug) (BOI: 1 per Field Support Unit)	EA
4	PAFZZ	5120-01-442-2309	19206	11580259	. Wrench, Box (Barrel) (BOI: 1 per Field Support Unit)	EA
5	PAFZZ	5120-01-562-1077	19200	13015956	. Wrench, Spanner (BOI: 1 per Field Support Unit)	EA
6	PAFZZ	5120-01-562-4386	19200	13015957	. Spanner Attachment (BOI: 1 per Field Support Unit)	EA
7	PAFZZ	5120-01-562-1113	19200	13015958	. Socket, Wrench, Face (BOI: 1 per Field Support Unit)	EA
8	PAFZZ	5120-01-567-7308	19200	13015578	. Inserter, Seal (BOI: 1 per Field Support Unit)	EA
9	PAFZZ	5120-01-567-7312	19200	13015579	. Inserter, Seal (BOI: 1 per Field Support Unit)	EA
10	PAFZZ	5120-01-567-7309	19200	13015580	. Inserter, Seal (BOI: 1 per Field Support Unit)	EA
11	PACZZ	5120-01-442-2311	19206	11580236	Wrench, Firing Pin	1
					END OF FIGURE	

END OF WORK PACKAGE

FEILD MAINTENANCE
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-835-2041	6	13	3120-01-561-9224	12	4
	10	2	5310-01-561-9225	14	4
5331-00-935-9269	9	13	5360-01-561-9226	15	4
5310-00-969-4466	6	10	3120-01-561-9228	11	3
5220-01-441-4158	17	2	3120-01-561-9229	12	2
1015-01-441-4160	2	3	5310-01-561-9235	4	18
1015-01-441-5502	2	4	3040-01-561-9947	3	11
3120-01-442-2307	2	5	3120-01-561-9948	8	11
5120-01-442-2309	17	4	5315-01-561-9950	6	15
5120-01-442-2312	17	3	5120-01-562-1077	17	5
1015-01-528-2773	1	2	5365-01-562-1089	11	1
1015-01-552-9883	1	3	5340-01-562-1092	11	4
1015-01-561-6067	1	4	5310-01-562-1098	6	17
1015-01-561-6068	3	2	5340-01-562-1100	8	5
5340-01-561-6070	4	2	5310-01-562-1101	8	12
	9	10	5340-01-562-1108	8	9
	11	9	5360-01-562-1110	8	7
1015-01-561-7187	4	8	5120-01-562-1113	17	7
5310-01-561-7193	9	7	5340-01-562-1117	13	1
5310-01-561-7843	4	17	5330-01-562-1120	13	8
5310-01-561-7844	4	19	5330-01-562-1123	13	9
3120-01-561-7845	4	14	3040-01-562-1125	11	11
5305-01-561-7846	4	16	1015-01-562-1130	3	3
5340-01-561-7847	4	3	5310-01-562-1864	13	5
5306-01-561-7848	14	8	1015-01-562-1870	5	1
4730-01-561-7849	4	15	1015-01-562-1872	8	1
3120-01-561-7850	9	12	5310-01-562-1876	9	11
	13	3	3040-01-562-3500	12	3
3120-01-561-7851	4	4	5305-01-562-3523	9	15
3120-01-561-7852	13	10	5340-01-562-4379	10	4
5340-01-561-7854	5	5	5360-01-562-4380	10	5
5310-01-561-7855	6	12	5365-01-562-4382	10	3
5306-01-561-7859	10	1	5360-01-562-4383	6	19

NATIONAL STOCK NUMBER INDEX - Continued

STOCK NUMBER	FIG.	ITEM
1015-01-562-4384	3	10
5340-01-562-4385	9	2
5120-01-562-4386	17	6
5330-01-562-5912	9	5
1015-01-562-5915	3	5
1015-01-562-5917	3	12
5310-01-562-6588	3	4
5310-01-562-6589	3	13
5310-01-562-7399	4	13
5340-01-562-7405	3	1
5310-01-562-7410	13	6
5340-01-562-7411	8	6
3120-01-562-8092	9	8
5305-01-563-2354	6	16
5315-01-563-4591	14	6
5310-01-563-4613	10	6
5305-01-563-4642	4	7
5315-01-563-6197	8	3
5305-01-563-6208	3	7
	4	1
	9	9
	11	8
5315-01-563-6758	4	9
5315-01-563-6760	15	2
5305-01-563-7972	4	12
5310-01-563-8611	15	2
5305-01-563-8697	11	7
	13	2
5120-01-567-7308	17	8
5120-01-567-7309	17	10
5120-01-567-7312	17	9
5305-01-569-8841	6	20
5305-01-570-2322	3	9
5305-01-570-3084	14	7
5305-01-570-7083	6	9
5365-01-570-9242	6	11
5330-01-570-9247	5	2
5340-01-570-9249	6	8
5305-01-571-5898	6	18
3040-01-572-7063	11	6
3020-01-572-7067	13	4
3040-01-572-7704	11	10
5310-01-575-2815	10	6
5365-01-588-7443	11	2
5365-01-588-7444	3	8
1015-01-588-7447	17	1
5310-01-592-7936	8	4
	8	13
5325-01-592-9506	16	1
5340-01-592-9650	16	2
5305-01-602-2660	16	4
3120-01-604-6492	9	6
5315-01-604-6496	9	2
9905-01-604-6969	16	5
4320-01-605-5868	9	3
5310-01-623-4884	7	4
5310-01-623-4887	6	2
5310-01-623-8974	7	3
1015-01-624-0986	11	5
1015-01-624-6519	5	2
5306-01-624-6866	7	1
5360-01-624-6915	8	14
7690-01-625-2403	3	14
1015-01-625-2555	5	4
5305-01-625-3711	6	7
5315-01-625-3713	6	1
5315-01-625-3715	6	6
5340-01-625-5791	15	1
5315-01-625-6133	6	5
3950-01-625-6159	6	4
5315-01-625-6248	6	2
5365-01-626-8743	9	14

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5365-01-626-8745	4	4			
7690-01-628-0561	2	1			
7690-01-628-1809	16	6			
1015-01-629-1675	KITS	1			
5315-12-154-5805	14	1			
5310-12-343-8283	3	6			
	14	3			
5310-12-356-5430	5	6			
5310-12-375-2439	5	8			
5310-12-377-7476	14	2			
5315-14-425-1217	15	5			
5310-14-573-3356	5	7			

END OF WORK PACKAGE

FEILD MAINTENANCE
PART NUMBER INDEX

PART NUMBER	FIG.	ITEM
13015577	16	2
13015578	17	8
13015579	17	9
13015580	17	10
13015591	5	2
13015592	16	1
13015600	1	4
13015602	3	13
13015603	3	4
13015604	3	1
13015610	3	11
13015611	11	11
13015620	11	10
13015621	13	11
13015622	13	5
13015623	13	4
13015623	13	1
13015630	13	6
13015631	13	7
13015632	13	10
13015633	13	9
13015634	13	8
13015640	11	6
13015641	12	1
13015642	12	3
13015643	12	2
13015645	12	4
13015651	11	1
13015652	11	3
13015680	11	4
13015681	14	5
13015682	14	8
13015690	14	4
13015700	4	2
	9	10
	11	9
13015701	15	3
13015705	15	4
13015720	3	2
13015721	4	6
13015722	4	14
13015723	4	13
13015724	4	11
13015725	4	10
13015726	4	17
13015727	4	18
13015728	4	19
13015729	4	3
13015731	4	4
13015732	4	16
13015740	4	15
13015750	4	8
13015760	3	10
13015761	10	7
13015770	3	12
13015772	10	4
13015773	10	3
13015774	10	1
13015775	10	5
13015780	3	3
13015782	5	5
13015786	6	8
13015787	6	11
13015788	6	9
13015791	6	12
13015792	6	15
13015840	6	17
13015846	6	19
13015880	5	1
13015882	8	11
13015883	8	5
13015883	8	12

PART NUMBER INDEX - Continued

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
13015886	8	9			
13015887	8	4			
	8	13			
13015890	8	1			
13015893	8	7			
13015894	8	6			
13015895	8	2			
13015900	3	5			
13015901	9	1			
13015902	9	11			
13015903	9	12			
	13	3			
13015904	9	5			
13015905	9	15			
13015906	9	7			
13015920	9	2			
13015921	9	3			
13015924	9	4			
13015925	9	6			
13015956	17	5			
13015957	17	6			
13015958	17	7			
13017365	9	8			
13028844	17	1			
2JHC9	4	4			
98126A132	9	14			

END OF WORK PACKAGE

CHAPTER 5

SUPPORTING INFORMATION FOR 81-MM MORTAR, M252A1

FIELD MAINTENANCE
REFERENCES

SCOPE

This work package lists all field manuals, forms, miscellaneous publications, technical bulletins, and technical manuals referenced in this manual.

FIELD MANUALS

FM 3-22.90	Mortars
FM 4-25.11	First Aid

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2408-4	Weapon Data Record
DA Form 2408-9	Equipment Control Record
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet - Electronic
NRC Form 3	Notice to Employees
SF 361	Transportation Discrepancy Report
SF 364	Supply Discrepancy Report (SDR)
SF 368	Product Quality Deficiency Report

MISCELLANEOUS PUBLICATIONS

AR 190-11	Physical Security of Arms, Ammunition and Explosives
AR 735-11-2	Reporting of Supply Discrepancies
AR 740-26	Physical Inventory Control
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items)

MISCELLANEOUS PUBLICATIONS - Continued

DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual
DoD 4000.25-2-M	Military Standard Transaction Reporting and Accounting Procedures
DoD Directive 5230.25	Withholding of Unclassified Technical Data from Public Disclosure
MIL-DTL-117	Bags: Interior Packaging, Waterproof, Greaseproof
MIL-STD-129	Department of Defense Standard Practice - Military Marking for Shipment and Storage
MIL-STD-2073-1	Standard Practice for Military Packaging
SC 4933-95-A11	Shop Set, Small Arms: Field Maintenance, Basic, Less Power
SC 5180-95-B76	Small Arms Repairmen's Tool Kit
10CFR Part 19	Notices, Instructions, and Reports to Workers; Inspections
10CFR Part 20	Standards for Protection against Radiation

TECHNICAL MANUALS

TM 9-254	General Maintenance Procedures for Fire Control Materiel
TM 9-1000-202-14	Evaluation of Cannon Tubes
TM 9-1015-257-10	Operator's Manual for Mortar, 81-mm, M252A1
TM 9-1240-409-23&P	Unit, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List (Including Depot Repair Parts) for M67 Sight Unit (NSN 1240-01-366-7322) (EIC:N/A)
TM 9-4933-258-13&P	Operator's, Unit, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Pullover Gage Kit PN 7242997
TM 9-4933-274-23&P	Field Maintenance Manual Including Repair Parts and Special Tools List for Cannon Bore Erosion Gage Set (NSN 5280-01-560-1762)
TM 9-6650-235-13&P	Operator's, Organizational, and Direct Support Maintenance Manual Including Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Borescope, M3 (NSN 6650-01-063-0035)

TECHNICAL MANUALS - Continued

TM 43-0139	Painting Instructions for Army Materiel
TM 43-0197	Instructions for Safe Handling, Maintenance, Storage, and Transportation of Radioactive Items under License 12-00722-06
TM 750-244-7	Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090 and 1095 To Prevent Enemy Use

END OF WORK PACKAGE

FIELD MAINTENANCE
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of the maintenance and repair functions.

The MAC (immediately following this introduction) designates overall authority and responsibility for the performance of maintenance tasks on the identified end item or component. The application of the maintenance tasks to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels/classes, which are shown in the MAC in column (4). Column (4) is divided into two secondary columns. These columns indicate the maintenance levels/classes of 'Field' and 'Sustainment'. Each maintenance level column is further divided into two sub-columns. These sub-columns identify the maintenance classes and are as follows:

1. Field level maintenance classes:

    a. Crew (operator) maintenance. This is the responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. Items with a "C" ("O" for joint service reporting) in the third position of the Source, Maintenance, and Recoverability (SMR) code may be replaced at the crew(operator) class. A code of "C" ("O" for joint service) in the fourth position of the SMR code indicates complete repair is authorized at the crew (operator) class.

    b. Maintainer maintenance. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion by field level units. This maintenance is performed either on the system or after it is removed. An "F" in the third position of the SMR code indicates replacement of assemblies, subassemblies, or other components is authorized at this level. An "F" in the fourth position of the SMR code indicates complete repair of the identified item is allowed at the Maintainer class. Items repaired at this level are normally returned to the user after maintenance is performed.

2. Sustainment level maintenance classes:

    a. Below depot sustainment. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The item subject to maintenance has normally been forwarded to a maintenance facility away from the field level supporting units. An "H" in the third position of the SMR code indicates replacement of assemblies, subassemblies, or other components is authorized at this class. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at this class. Items are normally returned to the supply system after maintenance is performed at this class.

    b. Depot. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. Assets to be repaired at this class are normally returned to an Army Depot or authorized contractor facility. The replace function for this class of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this class.

INTRODUCTION - Continued

The Army Maintenance System MAC- Continued

The tools and test equipment requirements table (immediately following the (MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance task as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance task.

Maintenance functions (tasks)

Maintenance functions are limited to and defined as follows:

1. Inspect. A function to determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards, e.g., load testing of lift devices or hydrostatic testing of pressure hoses.

3. Service. Operations required periodically to keep an item in proper operating condition such as replenishing fuel, lubricants, chemical fluids, or gases.

4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. It consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

7. Remove. The act of taking a component off an asset to facilitate other maintenance on a different component or on the same component (except for replace and repair.)

8. Install. The act of placing, positioning, or otherwise locating a component to make it part of a higher level end item. The install task is authorized by the LMI/MAC and the assigned maintenance level is shown as the third position code of the SMR code.

9. Replace. The act of taking off an unserviceable component and putting a serviceable component in its place. The replace task is authorized by the LMI/MAC and the assigned maintenance level is shown as the third position code of the SMR code.

10. Repair. The act of restoring an item to a completely serviceable or fully mission capable status. The repair task is authorized by the LMI/MAC and the assigned maintenance level is shown as the fourth position code of the SMR code.

11. Paint. This is a function to prepare and apply coats of paint. When used with munitions, the paint is applied so the ammunition can be identified and protected.

NOTE

The following definitions are applicable to the “repair” maintenance task: Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

12. Overhaul. This is the maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in the appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like new condition.

13. Rebuild. This consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

14. Lubricate. The act of applying a material (e.g., oil or grease) to reduce friction and allow a component to operate in a more efficient manner.

15. Mark. The process of restoring obliterated identification on an asset.

16. Pack. To place an item into a container for either storage or shipment after service and other maintenance operations have been completed.

17. Unpack. The act or removing an asset from a storage or shipping container in preparation to perform further maintenance (e.g., repair or install).

18. Preserve. The action required to treat systems and equipment whether installed or stored, to ensure a serviceable condition.

19. Prepare for use. Those steps required to make an asset ready for other maintenance (e.g., remove preservatives, lubricate, etc.).

20. Assemble. The step-by-step instructions to join the component pieces of an asset together to make a complete serviceable asset.

21. Disassemble. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

22. Clean. Step-by-step instructions on how to remove dirt, corrosion or other contaminants from equipment. Refer to appropriate painting, lubrication, and preservation methods to restore original corrosion prevention and control methods when removed as a result of cleaning and/or when using cleaning to remove corrosion from the item.

23. Non destructive inspection. Step-by-step instructions on preparation and accomplishment inspections which do not destroy or damage the equipment.

24. Radio interference suppression. Step-by-step instructions to ensure installed equipment, either communication or other electronics, does not interfere with installed communication equipment.

INTRODUCTION – Continued

Maintenance functions (tasks) – Continued

25. Place in service. Step-by-step instructions required to place an item into service that are not covered in the service upon receipt work package.

26. Towing. The step-by-step instructions to connect one vehicle to another for the purpose of having one vehicle moved through the motive power of the other vehicle.

27. Jacking. The step-by-step instructions to mechanically raise or lift a vehicle to facilitate maintenance on the vehicle.

28. Parking. Step-by-step instructions to safely place a vehicle in a lot, ramp area or other designated location.

29. Mooring. Step-by-step instructions to secure a vehicle by chains, ropes or other means to protect the vehicle from environmental conditions or secure for transportation.

30. Covering. Step-by-step instructions to place a protective wrapping over a vehicle to protect it from environmental conditions or to hide (e.g., camouflage) it.

31. Hoisting. Step-by-step instructions to allow a vehicle to be raised by cables or ropes through attaching points.

32. Sling loading. Step-by-step instructions to place a sling around a vehicle to allow it to be raised.

33. External power. Step-by-step instructions on how to apply electrical power from any authorized power source (e.g., external generator or facility power).

34. Preparation for storage or shipment. Step-by-step instructions for preparing the equipment for placement into administrative storage or for special transportation requirements.

35. Arm. Detailed instructions on activating munitions prior to use.

36. Load. This may be one of two tasks:

    a. For transportation, the act of placing assets onto a transportation medium (e.g., pallet, truck, container).

    b. For weapons/weapons systems, the act of placing munitions into the weapon/weapons system.

37. Unload. This may be one of two tasks:

    a. For transportation, the act of removing assets from a transportation medium (e.g., pallet, truck, container).

    b. For weapons/weapons systems, the act of removing munitions from the weapon/weapons system.

38. Software maintenance. Step-by-step instructions for software maintenance (e.g., installing, un-installing, etc.).

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to maintenance functions (tasks) outlined previously.)

Column (4) Maintenance Level. Column (4) specifies each level/class of maintenance authorized to perform each function listed in column (3), by indicating work time required in the appropriate sub-column. This work time figure represents the active time required to perform that maintenance task at the indicated level/class of maintenance. If the number or complexity of the tasks within the listed maintenance task varies at different maintenance classes, appropriate work time figures are to be shown for each class.

The work time figure represents the average time required to perform the prescribed task (assembly, subassembly, component, module, end item, or system) on the item under typical operating conditions for that maintenance level/class. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance tasks authorized in the MAC. The symbol designations for the various maintenance levels/classes and classes are as follows:

Field:
- C Crew maintenance
- F Maintainer maintenance

Sustainment:
- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

NOTE

The “L” maintenance class is not included in column (4) of the MAC. Functions to this class of maintenance are identified by work time figure in the “H” column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by a number code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this Column (6) contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

INTRODUCTION – Continued

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest class of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance task being performed as indicated in the MAC.

END OF WORK PACKAGE

FIELD MAINTENANCE
MAINTENANCE ALLOCATION CHART (MAC)

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC for M225A1 81-mm Mortar.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REFERENCE CODE	(6) REMARKS CODE
			FEILD		SUSTAINMENT			
			CREW (C)	MAINTAINER (F)	BELOW DEPOT (H)	DEPOT (D)		
00	M252A1 81-mm Mortar 12901504	Service	0.2					
		Replace		0.1			5, 6	
		Repair		0.2			5, 6	
01	M253 81-mm Cannon 12901300	Inspect	0.1	0.2			1, 2, 3, 4	A, B, C D
		Service	0.2				8	
		Replace		0.1			5, 6, 7, 8	
		Repair		0.2			5, 6, 7, 8	
02	M177A1 81-mm Mortar Mount 13015600	Inspect	0.2	0.1				
		Service	0.2	0.1				
		Repair		0.4			5, 6	
0201	Traversing Mechanism 13015720	Inspect	0.1	0.1				
		Replace		0.1			5, 6	
		Repair		0.4			5, 6, 7	
020101	Hand Crank 13015700	Inspect		0.1				
		Replace		0.1			5	
		Repair		0.7			5, 6	
0202	Recoil Mechanism Buffer 13015780	Inspect	0.1	0.5				
		Replace		0.5			5, 6	
		Repair		1.5			5, 6, 7	
020201	Buffer Clamp Assembly 13015790	Inspect		0.1				
		Replace		0.3			5, 6	
		Repair		0.6			5, 6	
02020101	Spring Washer Assembly 129011599	Inspect		0.1				
		Replace		0.2			5, 6	
		Repair		0.4			5, 6	
02020102	Clamping Catch 13015840	Inspect		0.1				
		Replace		0.1			5, 6	
		Repair		0.2			5, 6	

MAINTENANCE ALLOCATION CHART (MAC) - Continued

Table 1. MAC for M225A1 81-mm Mortar - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REFERENCE CODE	(6) REMARKS CODE
			FEILD		SUSTAINMENT			
			CREW (C)	MAINTAINER (F)	BELOW DEPOT (H)	DEPOT (D)		
020202	Recoil Mechanism Buffer 13015880	Inspect Replace Repair		0.1 0.1 0.4			 5, 6, 7 5, 6, 7	
02020201	Recoil Mechanism Buffer 13015890	Inspect Replace Repair Inspect		0.1 0.1 0.4			 5, 6 5, 6	
0203	Cross Leveling Assembly 13015900	Inspect Replace Repair	0.1	0.1 0.1 0.3			 5, 6, 7 5, 6, 7	
020301	Hand Crank 13015700	Inspect Replace Repair		0.1 0.1 0.2			 5, 6 5, 6	
020302	Rod End Connector 13015920	Inspect Replace Repair		0.1 0.1 0.2			 5, 6 5, 6	
0204	Mortar Bipod Leg 13015770	Inspect Replace Repair	0.1	0.1 0.1 0.2			 5, 6 5, 6	
0205	Mechanical Housing (Elevation) 13015610	Inspect Replace Repair	0.1	0.4 0.4 0.6			 5, 6, 7 5, 6, 7	
020501	Mechanical Housing (Lower) 13015640	Inspect Replace Repair		0.1 0.1 0.2			 5, 6 5, 6	
020502	Mechanical Housing (Upper) 13054620	Inspect Replace Repair		0.1 0.1 0.2			 5, 6 5, 6	
02050201	Round Plain Nut 13015630	Inspect Replace Repair		0.1 0.1 0.2			 5, 6, 7 5, 6, 7	

Table 1. MAC for M225A1 81-mm Mortar - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS & EQUIP REFERENCE CODE	(6) REMARKS CODE
			FEILD		SUSTAINMENT			
			CREW (C)	MAINTAINER (F)	BELOW DEPOT (H)	DEPOT (D)		
020503	Block Clamp 13015680	Inspect		0.1				
		Replace		0.1			5, 6	
		Repair		0.2			5, 6	
020504	Hand Crank 13015700	Inspect		0.1				
		Replace		0.1			5, 6	
		Repair		0.2			5, 6	
03	M3A2 81-mm Mortar Baseplate 13015570	Inspect	0.1	0.1				
		Replace		0.1			5, 6	
		Repair		0.2			5, 6	
9500	Special Tools							

Table 2. Tools and Test Equipment for M252A1 81-mm Mortar.

TOOLS OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	F	Accessories Outfit, Pullover Gages, Basic	4933-00-348-8652	7242998
2	F	Borescope, M3	6650-01-063-0035	11584701
3	F	Cannon Bore Erosion Gage Set	5210-01-560-1762	12901228
4	F	Gage Assembly, Pullover, 81-mm	5210-01-343-0996	12520694
5	F	Heat Gun, Electric	4940-01-028-7493	4933-95CLA12
6	F	Shop Set, Small Arms: Field Maintenance, Basic, Less Power	4933-00-754-0664	4933-95-A11 W51499
7	F	Small Arms Repairmen's Tool Kit	5180-01-559-5981	5180-95-B76 W51910
8	F	Tool Kit, Support	1015-01-588-7447	13028844
9	C	Wrench, Firing Pin	5120-01-442-2311	11580236

Table 3. Remarks for M252A1 81-mm Mortar.

Remarks Codes	Remarks
A	Refer to TM 9-1000-202-14.
B	Refer to TM 6650-235-13&P.
C	Refer to TM 9-4933-258-13&P.
D	Refer to TM 9-4933-274-23&P.

END OF WORK PACKAGE

FIELD MAINTENANCE
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the M252A1 81-mm Mortar. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use plastic bag (WP 0031, Item 3)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (include as applicable: C = Crew, O = AMC, F = Maintainer or ASB, H = Below Depot or TASMG, D = Depot).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc."

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	F	8040-01-626-8722	Adhesive 12901296 (1NUW7)	QT
2	C	6810-00-201-0906	Alcohol, Denatured 837015 (19203)	PT
3	C	8105-00-269-4662	Bag, Plastic Pkg of 100 MIL-B-117 (81349)	EA
4	F	8135-00-282-0565	Barrier Material 36 in. wide, 200 yd roll MIL-PRF-131 (81349)	RO

EXPENDABLE AND DURABLE ITEMS LIST - Continued

Table 1. Expendable and Durable Items List - Continued.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
5	C	8020-00-201-1870	Brush, Artist's 8020-00-201-1870 (80244)	EA
6	C	7920-00-205-2401	Brush, Cleaning Tool and Parts 7920-00-205-2401 (80244)	EA
7	C	8020-00-242-7266	Brush, Paint A-A-3192 (58536)	EA
8	C	9150-01-193-6376	Cleaner, Lubricant, and Preservative (CLP) CLP-9ME (65983)	CN
9	C	6850-00-227-1887	Cleaning Compound, Optical Lens: Liquid 1 qt Bottle AA59199-1 (58536)	QT
10	C	6850-00-224-6657	Cleaning Compound, Rifle Bore (RBC): Solution Type 8 oz Can MIL-PRF-372 (81349)	CN
11	F	8315-00-300-4905	Cushioning Material PPP-C-1797 (81348)	FT
12	C	8415-00-266-8675	Gloves, Rubber Industrial MIL-DTL-32066 (81349)	PR
13	F	9150-01-360-1906	Lubricant, Solid Film 16 oz Black MIL-PRF-46147 (81349)	CN
14	C	9150-00-231-2361	Lubricating Oil, General Purpose 1 gal. Can M3150-02-PL-M (81349)	GL
15	C	9150-00-292-9689	Lubricating Oil, Weapons (LAW) 1 qt (0.95 l) Can MIL-PRF-14107 (81349)	QT

Table 1. Expendable and Durable Items List - Continued.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
16	C	6640-00-240-5851	Paper, Lens: Tissue, Sheet Form NSN6640-00-240-5851 (25518)	EA
17	F	8135-00-985-7242	Paper, Volatile, Packaging 36 in. wide, 100 ft roll MIL-P-3420 (81349)	FT
18	F	8135-00-281-3920	Paperboard, Wrapping 24 in. Wide, 250 ft Long A-A-1051 (58536)	FT
19	C	8010-01-229-7546	Polyurethane Coating, Green 1 qt (0.95 L) Can M53039-1-001Q-34094 (81349)	QT
20	C	7920-00-205-1711	Rag, Wiping 50 lb (23 Kg) Bale 7920-00-205-1711 (80244)	LB
21	F	8010-01-627-6184	Sealer, Surface 11581018 (1NUW7)	OZ
22	F	8030-01-088-8140	Sealing Compound: Blue ASTM D5363 AN0231 P12 (81346)	BX
23	F	8030-01-069-3046	Sealing Compound: Purple ASTM D5363 AN0311 (81346)	BT
24	F	7510-00-297-6655	Tape, Pressure Sensitive Adhesive: Paperback, Water Resistant 2 in. wide x 120 yd roll ASTM D5486/D5486M (80244)	YD
25	F	7510-00-266-6712	Tape, Pressure Sensitive Adhesive: 1 in. wide x 60 yd roll 8783476 (19203)	YD
26	C	8010-00-181-8080	Thinner, Paint Product 1 pt (473.18 ml) Can M81772-1-001G (81349)	PT

END OF WORK PACKAGE

FIELD MAINTENANCE
TOOL IDENTIFICATION LIST

Scope

This work package lists common tools and supplements and special tools/fixtures needed to maintain the M252A1 81-mm Mortar.

Explanation of Columns in the Tool Identification List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Extractor (WP 0090, item 32)).

Column (2) Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Gauge, belt tension).

Column (3) National Stock Number (NSN). This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) Part Number/(CAGEC). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) Reference. This column identifies the authorizing supply catalog, components list, or RPSTL for items listed in this work package.

Table 1. M252A1 81-mm Mortar Tool Identification List

(1) Item No.	(2) Item Name	(3) National Stock Number (NSN)	(4) Part Number/ (CAGEC)	(5) References
1	Caps, Vise Jaw	5120-00-221-1506	01570 (50171)	SC-4933-95-CLA11
2	Vise, Machinist's	5120-00-293-1439	01432 (50171)	SC-4933-95-CLA11
3	Wrench, Torque	5120-00-640-6364	A-A-2411 (58536)	SC-4933-95-CLA11
4	Wrench, Torque	5120-00-221-7947	A-A-1274 (58536)	SC-4933-95-CLA11

END OF WORK PACKAGE

FIELD MAINTENANCE
MANDATORY REPLACEMENT PARTS

MANDATORY REPLACEMENT PARTS LIST

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not.

Table 1. Mandatory Replacement Parts for M252A1 81-mm Mortar.

(1) Item No.	(2) Part Number/ (CAGEC)	(3) National Stock Number (NSN)	(4) Nomenclature	(5) Qty
1	AS568B-111 (81343)	5331-00-935-9269	O-Ring	1
2	B18.8.4M-2X10 (1NUW7)	5315-01-625-6248	Pin, Spring	1
3	ISO1234-2X20-ST (1NUW7)	5315-01-625-3715	Splint Pin, Steel	2
4	ISO8734-6X32-A-ST (1NUW7)	5315-01-625-3713	Pin, Parallel	1
5	ISO8752-2X10-A2 (I9008)	5315-12-154-5805	Pin, Spring	1
6	ISO8752-2X12-A2 (I9008)	5315-14-425-1217	Pin, Spring	6
7	ISO8752-2X20-A2 (I9008)	5315-01-563-6197	Pin, Spring	2
8	MS9276-10 (81343)	5310-00-969-4466	Washer, Key	1
9	MS9276-11 (96906)	5310-00-835-2041	Washer, Key	4
10	13015591 (19200)	5330-01-570-9247	Seal, Nonmetallic Special Shaped Section	2
11	13015632 (19200)	3120-01-561-7852	Bushing, Sleeve	2
12	13015633 (19200)	5330-01-562-1123	Seal, Plain	1
13	13015634 (19200)	5330-01-562-1120	Seal, Plain	1

MANDATORY REPLACEMENT PARTS LIST – Continued

Table 1. Mandatory Replacement Parts for M252A1 81-mm Mortar - Continued.

(1) Item No.	(2) Part Number/ (CAGEC)	(3) National Stock Number (NSN)	(4) Nomenclature	(5) Qty
14	13015643 (19200)	3120-01-561-9229	Bearing, Sleeve	1
15	13015645 (19200)	3120-01-561-9224	Bearing, Sleeve	1
16	13015652 (19200)	3120-01-561-9228	Bearing, Washer Thrust	1
17	13015727 (19200)	5310-01-561-9235	Washer, Flat	1
18	13015731 (19200)	3120-01-561-7851	Bearing, Sleeve	1
19	13015775 (19200)	5360-01-562-4380	Spring, Helical Torsion	1
20	13015846 (19200)	5360-01-562-4383	Spring, Helical Torsion	1
21	13015883 (19200)	5310-01-562-1101	Washer, Flat (Rubber)	4
22	13015886 (19200)	5340-01-562-1108	Bumper	2
23	13015903 (19200)	3120-01-561-7850	Bearing, Sleeve	3
24	13015904 (19200)	5330-01-562-5912	Seal, Plain	1
25	13015906 (19200)	5310-01-561-7193	Washer, Flat	1
26	13015924 (19200)	4320-01-605-5868	Ring, Wearing	2
27	13015925 (19200)	3120-01-604-6492	Bearing, Sleeve	1
28	13017365 (OJFH8)	3120-01-562-8092	Bearing, Washer Thrust	1

END OF WORK PACKAGE

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INDEX - Continued

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

For use of this form, see AR 25-30; the proponent agency is OAASA.

Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

DATE
Date you filled out this form.

TO *(Forward to proponent of publication or form) (Include ZIP Code)*
U.S. Army TACOM Life Cycle Management Command
ATTN: AMSTA-LCL-IM/TECH PUBS
6501 E. 11 Mile Road, Warren, MI 48397-5000

FROM *(Activity and location) (Include ZIP Code)*
Your mailing address

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 9-1015-257-23&P	*October 2014*	*Field Maintenance Manual Including Repair Parts and Special Tools List for 81-mm Mortar, M252A1 (NSN 1015-01-586-2135) (EIC:*4SU*)*

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
	0007-3					*Figure 2, Item 9 should show a lockwasher. Currently shows a flat washer.*
	0018-2					*Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be change to (12).*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IM/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	*Your Address*	*Date you filled out this form*

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 9-1015-257-23&P	*October 2014*	*Field Maintenance Manual Including Repair Parts and Special Tools List for 81-mm Mortar, M252A1 (NSN 1015-01-586-2135) (EIC: 4SU)*

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

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TO *(Forward to proponent of publication or form) (Include ZIP Code)* U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IM/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	**FROM** *(Activity and location) (Include ZIP Code)*	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 9-1015-257-23&P	*25 August 2014*	*Field Maintenance Manual Including Repair Parts and Special Tools List for 81-mm Mortar, M252A1 (NSN 1015-01-586-2135) (EIC: 4SU)*

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-IM/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000		

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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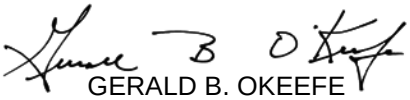
TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

APD V4.00

By Order of the Secretary of the Army:

RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:



GERALD B. OKEEFE
Acting Administrative Assistant
to the Secretary of the Army
1420305

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THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

Weights

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Pounds
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

Liquid Measure

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

Square Measure

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.0386 Sq Miles

Cubic Measure

1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

Temperature

9/5 C° +32 = F°
5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius

APPROXIMATE CONVERSION FACTORS

To Change	To	Multiply By
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Sq Inches	Sq Centimeters	6.451
Sq Feet	Sq Meters	0.093
Sq Yards	Sq Meters	0.836
Sq Miles	Sq Kilometers	2.590
Acres	Sq Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

To Change	To	Multiply By
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Sq Inches	0.155
Sq Meters	Sq Feet	10.764
Sq Meters	Sq Yards	1.196
Sq Kilometers	Sq Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

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