

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL,
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST AND
DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)
FOR
JACK, DOLLY-TYPE, HYDRAULIC:
16-INCH-LIFT, TWO-SPEED, 10-TON-CAPACITY
(WEAVER DIVISION OF DURA CORPORATION
MODEL NO. WA-75-A) (4910-289-7233)

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CHAPTER I INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. This manual is for use in operating and maintaining the hydraulic dolly-type jack.

b. Appendix A contains a list of current references, including supply catalogs, forms, technical manuals, and other available publications applicable to the hydraulic dolly-type jack.

c. Appendix B contains the Maintenance Allocation Chart for the jack, listing all maintenance and repair operations authorized by maintenance echelons.

d. Appendix C contains the Basic Issue Items List, Items Troops Installed or Authorized List, and Repair Parts and Special Tools List (including Depot maintenance repair parts and special tools) for operating and performing organizational Direct Support, and General Support maintenance on the hydraulic dolly-type jack.

1-2. Maintenance Forms and Records.

Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting of Errors.

You can improve this manual by calling attention to errors and by recommending improvements, using DA Form 2028 (Recommended Changes to Publications), or by a letter, and mail directly to: Commanding General, Headquarters, U.S. Army Weapons Command, ATTN: AMSWE-MAP, Rock Island, IL 61201. A reply will be furnished directly to you.

1-4. Equipment Serviceability Criteria (ESC).

This equipment is not covered by an ESC.

1-5. Destruction of Army Materiel to Prevent Enemy Use.

Refer to DOD 4160.21-M-1, Destruction of Materiel to Prevent Enemy Use.

1-6. Administrative Storage.

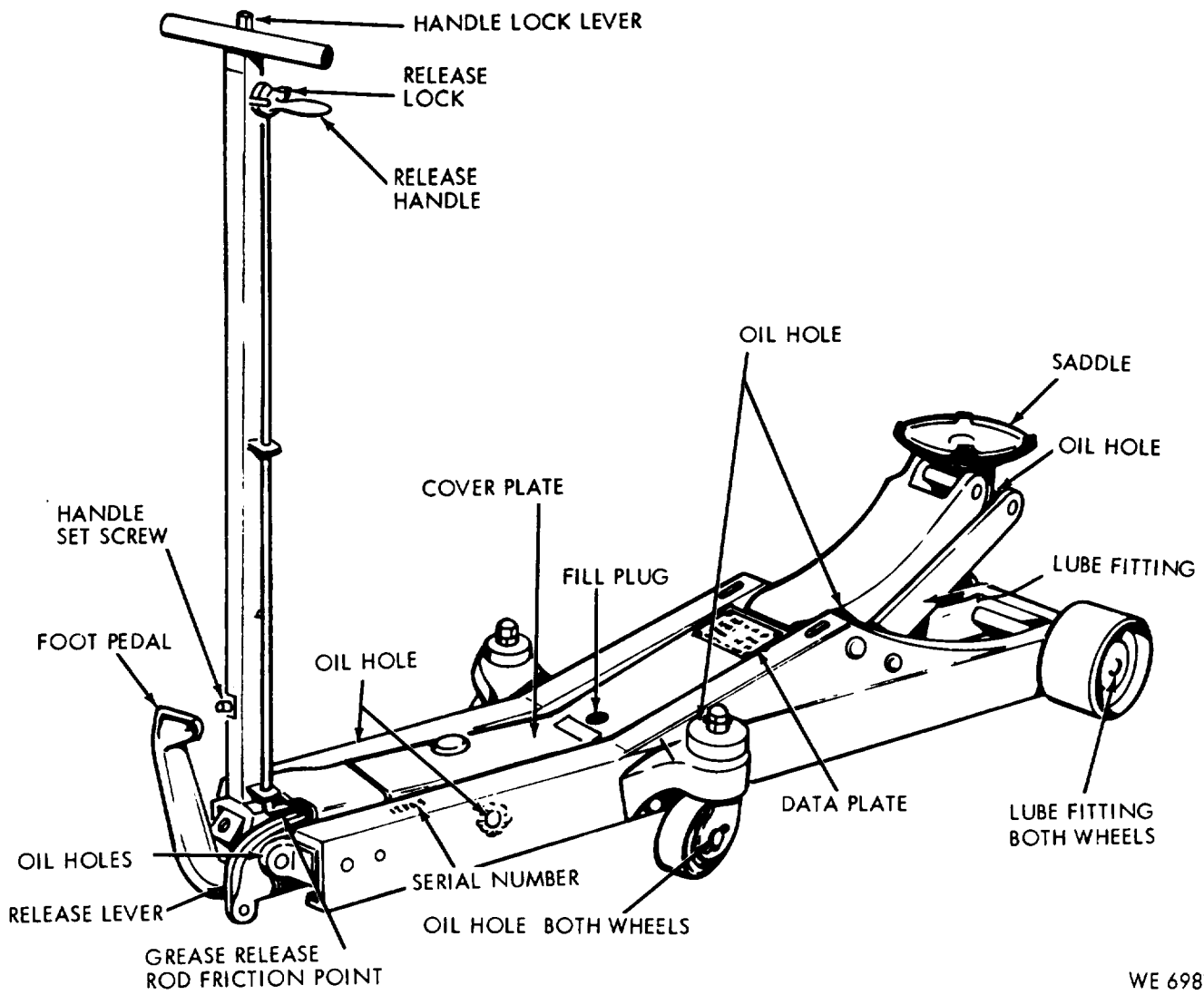
Refer to TM 740-90-1, Administrative Storage.

Section II. DESCRIPTION AND DATA

1-7. Description.

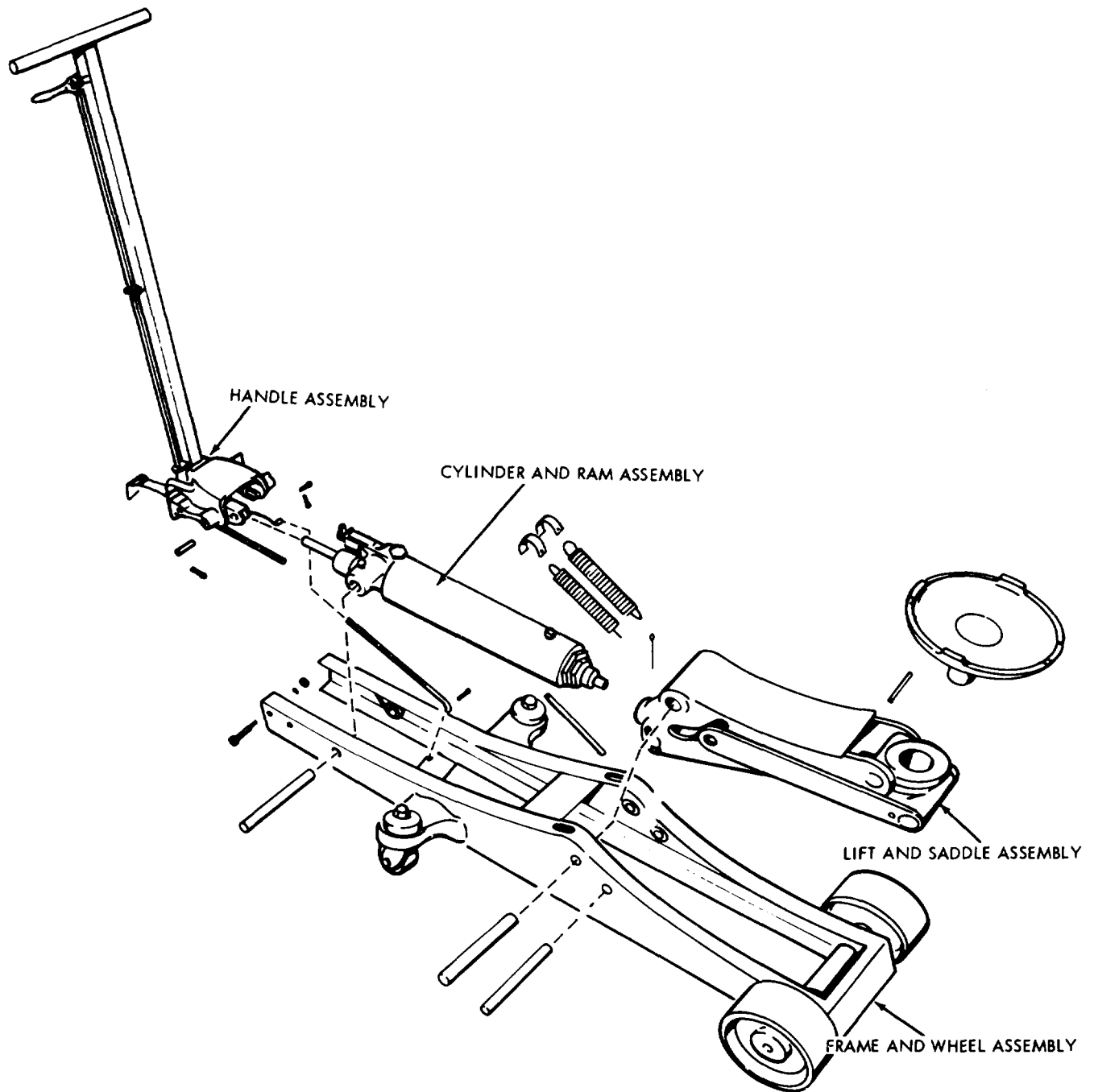
The hydraulic jack (Fig. 1-1) is a dolly-type, portable automotive lifting device, with swivel-type rear

casters, rotating type cap, and two speeds (foot pedal or handle). The jack consists of four main assemblies: (Fig. 1-2)



WE 69874

Figure 1-1. The hydraulic jack



WE 69875

Figure 1-2. Exploded view of main assemblies.

a. *Handle Assembly* (Fig. 5-1). This assemblies provides the means for maneuvering the jack and also provides the necessary leverage for operating the hydraulic pump built within the cylinder and ram assembly.

b. *Cylinder and Ram Assembly* (Fig. 5-2). The ram cylinder of this assembly is anchored in a stationary position in the frame and wheel assembly. The ram itself can move freely and is forced out of the ram

cylinder by pressure created hydraulically by operating this assembly's pump. The ram contracts within the cylinder when the hydraulic pressure is released through operation of the assembly's release valve.

c. *Lift and Saddle Assembly* (Fig. 5-3). This assembly is connected to the ram and raises or lowers with the action of the ram.

d. *Frame and Wheel Assembly* (Fig. 5-4). This assembly serves the two-fold purpose of serving as a base for mounting the other three assemblies and providing the jack's maneuverability.

e. The maintenance paragraphs of this manual contain detailed descriptions of the jack's components.

1-8. Identification and Tabulated Data.

a. *Identification.*

(1) *Data plate.* The data plate is attached to the surface of the cover plate (Fig. 1-1) and specifies nomenclature, FSN, manufacturer, model, and contract number.

(2) *Serial number.* The manufacturer's serial number is located on the right rear corner of the top surface of the frame and wheel assembly (Fig. 1-1).

b. *Tabulated Data.*

(1) *Characteristics of jack.*

Lifting capacity. 10 ton
Number of speeds. Two
Type base. Dolly
Type cap. Rotating

Type lift. Hydraulic
Lift distance. 16 in.
Type rear wheels. Swivel-type casters

(2) *Dimensions and weight.*

Minimum saddle
elevation from
floor level. 7-5/8 in.
Maximum saddle
elevation from
floor level. 23-5/8 in.
Width at front
wheels. 18 in.
Frame width. 9-1/2 in.
Overall height with
handle perpendicular
to floor. 44-1/2 in.
Front wheel diameter. . . . 7-1/2 in.
Caster wheel diameter. . . . 4 in.
Saddle diameter. 9-1/4 in.
Weight. 400 lb.
Volume. 16.00 cu ft

(3) *Manufacturer's name and model.*

Manufacturer. Weaver Division of
Dura Corporation
Model. WA-75-A

CHAPTER 2

OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer to troubleshooting procedures in chapter 3.

Section I. OPERATING PROCEDURES

Note: Refer to Fig. 1-1.

2-1. Lifting Vehicle.

CAUTION

Always use stands to support vehicle before attempting under vehicle repairs or inspections.

a. Place jack in position so that saddle engages proper lifting point of vehicle.

(1) *Maneuvering.* To maneuver jack, depress handle lock lever until lock rod engages one of two detents which lock the handle to the frame, then pivot jack on its rear casters.

(2) *Working surface.* The surface on which the jack rests should be relatively flat to prevent twisting of frame.

b. Making certain release lever and release lock are in closed position, operate jack by pumping foot pedal with hand and watching saddle to insure proper engagement.

c. Raise saddle to point of contact and make certain load is centered in saddle.

d. *Loads*

(1) Light loads are then raised by pumping foot pedal with foot. The foot pedal has quicker lift action than the handle.

(2) Heavier loads require pumping with handle for easy lifting.

e. Do not attempt to raise jack beyond its travel stops.

f. Always use release lever lock to prevent unintentional operation of release lever.

2-2. Lowering Vehicle.

a. Be certain that area beneath vehicle is clear before lowering.

b. To lower load, flip up release lever lock and pull back gently on release lever.

Section II. OPERATION OF AUXILIARY EQUIPMENT

2-4. Auxiliary Equipment.

There is no auxiliary equipment to be used with the jack.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-5. Operating Instructions.

There are no other operating instructions in addition to those contained in 2-1 and 2-2.

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. Lubrication.

Refer to LO 9-4910-262-12.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-2. General.

a. *Responsibility and Intervals.* The primary function of preventive maintenance is to prevent breakdowns and, therefore, the need for repair. Preventive maintenance checks and services are the responsibility of the using organization. These checks and services, as applied to the jack, are of a before-operation, during-operation, or after-operation nature.

b. *Definition of Terms.* The general inspection of each item applies also to any supporting member or connection and is generally a check to see whether the item is in good condition, correctly assembled, secure, and not excessively worn.

(1) The inspection for "good condition" is usually an external visual inspection to determine whether the unit is damaged beyond serviceable limits. The term "good condition" is explained further by the following: Not bent or twisted, not chafed or burred, not broken or cracked, not dented or collapsed, not torn or cut, or not deteriorated.

(2) The inspection of a unit to see that it is "correctly assembled" is usually an external visual inspection to see whether it is in its normal assembled position.

(3) Inspection of a unit to determine if it is "secure" is usually an external visual examination or an examination by hand or wrench for looseness. Such an examination must include any brackets, lock-washers, lock nuts, or cotter pins used.

(4) By "excessively worn" is meant worn beyond serviceable limits or to a point likely to result in failure if the unit is not replaced before the next scheduled inspection.

3-3. Cleaning.

a. *General.* Any special cleaning instructions required for specific components or parts are contained in the pertinent section. General cleaning instructions are outlined in (1) and (2) below.

(1) *Metal parts.*

(a) Use self-emulsifying decreasing solvent compound, mineral spirits paint thinner, or dry-cleaning solvent to clean or wash grease or oil from all unpainted metal parts of the jack.

(b) To clean ferrous metal parts, use alkali-type cleaning compound, or paint remover (alkali-type).

(c) To clean nonferrous metal parts, use paint remover (alkali-type), or cleaning compound.

(d) Use clean water or a solution of ¼ pound of soap chips or 6 ounces of painted surface detergent to 1 gallon of hot water for all parts and overall general cleaning of painted surfaces.

(e) After parts are clean, dry them thoroughly. Apply a light film of special preservative lubricating oil to all parts having a polished surface, to prevent misting.

(f) Before installing new parts, remove any rust-preventive compound, protective grease, etc. Prepare as required (bearings, etc.) and lubricate those parts requiring lubrication.

(2) *Neoprene Parts.* Clean neoprene parts with soap and warm water. Apply a light film of oil after cleaning.

b. *General Cleaning Precautions.*

(1) Mineral spirits paint thinner, self-emulsifying decreasing solvent compound, and dry-cleaning solvent are flammable and should not be used near an open flame. Fire extinguishers should be readily available when these materials are being used. Use only in well ventilated places. These cleaners evaporate quickly and have a drying effect on the skin. If used without gloves, they may cause cracks in the skin and, in the case of some individuals, a mild irritation and inflammation.

(2) Avoid getting petroleum products, such as mineral spirits paint thinner, dry-cleaning solvent, engine fuels, or lubricants, on rubber parts, as they will deteriorate the rubber.

(3) The use of diesel fuel oil, gasoline, or benzene (benzol) for cleaning is prohibited.

(4) Alkali-type paint remover and alkali-organic-solvent-type paint remover contain caustic soda which is very destructive to the body and dissolves woolen clothing. Wear rubber apron, gloves, and goggles while handling this alkali. Special care must be taken to avoid getting any in the eyes. Precautions must be taken to prevent inhalation of small parti-

cles when handling in dry form. Solutions must be kept in containers of iron, glass, or in emergency, in a wooden container. Do not use aluminum or galvanized containers. If taken internally, give large dosage of vinegar or lemon juice, followed by butter, olive oil, or cottonseed oil. Call a doctor. When the skin has been exposed to caustic soda, wash thoroughly with water, then with vinegar or a five percent solution of acetic acid. Bandage after applying an emollient such as petroleum jelly or olive oil.

(5) When using acid compounds for cleaning, pour acid into water, do not pour water into acid. Avoid contact with skin and eyes. Avoid breathing vapor. In case of contact, immediately flush skin and bathe the eyes with plenty of water for at least 15 minutes; for eyes, get medical attention.

c. *Rust Removal.* Remove rust or corrosion from all parts of the materiel. To remove rust or corrosion from unfinished surfaces, use steel wire cleaning brushes, abrasive cloth, sandblast or vaporblast equipment, and one of the following corrosion removing compounds: phosphoric acid, wash-off (type I), wipe-off (type II), or hydrochloric acid with inhibitor (pickling acid). The treated metal must be coated with a corrosion preventive compound or painted as soon as possible. On finished surfaces,

remove rust or corrosion by buffing with a rotary wheel wire brush constructed of steel wire between 0.0100 and 0.0250 inch in diameter. On highly polished surfaces, remove rust or corrosion by buffing with a cloth buffing wheel charged with buffing compound. Apply very light buffing pressure. Crocus cloth may be used manually when removing rust or corrosion by hand.

3-4. Preventive Maintenance Checks and Services.

a. *Purpose.* To insure efficient operation, it is necessary that the jack be systematically inspected at intervals each day it is operated, so defects may be discovered and corrected before they result in serious damage or failure. Certain scheduled maintenance services will be performed at these designated intervals. The correction of any defect or unsatisfactory operating characteristics beyond the scope of the operator must be reported at the earliest opportunity to organization maintenance personnel for correction.

b. *Services.* Operator's preventive maintenance services are listed in table 3-1. Every operator equipped with the jack must be thoroughly familiar with maintenance procedures for the materiel.

Table 3-1. Operator's Preventive Maintenance Services

Item No.	Procedures	Paragraphs Reference	Intervals		
			Before Operation	During Operation	After Operation
1	<i>Visual inspection.</i> Inspect jack for cracked, broken, distorted, or missing parts, and for loose mountings, nuts, bolts, screws, and cotter pins. Check jack for excessive wear of any parts.	3-2 b(1), (2), (3), and (4)	X	X	X
2	<i>Assemblies.</i> a. inspect the cylinder and ram assembly (Fig. 5-2) for oil leaks. b. Inspect the handle assembly (Fig. 5-1), cylinder and ram assembly (Fig. 5-2), and lift and saddle assembly (Fig. 5-3) for excessive play at the hinged points. c. Inspect the casters and front wheels of the frame and wheel assembly (Fig. 5-4).	—	X	X X	
3	<i>Cleaning.</i> Clean jack and parts as necessary.	3-3	x		x
4	<i>Operating faults.</i> Investigate, correct, or report any operating faults noted during lifting and lowering of vehicles.	3-6, 3-7		x	x

Section III. TROUBLESHOOTING

CAUTION

Operation of materiel without a preliminary examination can cause further damage to a disabled component. Be careful during inspection and troubleshooting so that damage can be avoided.

3-5. Purpose.

This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the hydraulic jack. Close adherence to the procedures covered herein will materially reduce the time required to locate trouble and restore the jack to normal operation.

3-6. Scope.

- a. This section covers troubleshooting which is

peculiar to the operator's (first echelon) maintenance operations.

- b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

3-7. Procedure.

Each malfunction is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed. The malfunctions, probable causes, and corrective actions that can be performed by the operator/crew are listed in table 3-2.

Table 3-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Load will not rise.	<ul style="list-style-type: none"> a. Release lever and release lock are in open position (Fig. 1-1). b. Load is too heavy to raise with foot pedal. c. Load is too heavy to raise with handle, and relief valve is releasing. d. Other causes. 	<ul style="list-style-type: none"> a. Place release lever and lock in closed position (par. 2-1b). b. Pump handle instead of foot pedal (par. 2-1d(2)). c. Obtain heavier duty jack. d. Refer other causes to higher echelon maintenance personnel for correction.
2. Load is unsteady on jack.	<ul style="list-style-type: none"> a. Load is not centered in saddle (Fig. 1-1). b. Surface on which jack is resting is not relatively flat. c. Other causes. 	<ul style="list-style-type: none"> a. Lower load and maneuver jack so that saddle makes proper engagement with load (par. 2-1a). b. Operate jack on flattest possible surface (par. 2-1a(2)). c. Refer other causes to higher echelon maintenance personnel for correction.
3. Load will not lower.	<ul style="list-style-type: none"> a. Release lever lock (Fig. 1-1) is in down position. b. Other causes. 	<ul style="list-style-type: none"> a. Flip up release lever lock and pull back gently on release lever (par. 2-2). b. Refer other causes to higher echelon maintenance personnel for correction.
4. Load lowers on its own.	<ul style="list-style-type: none"> a. Unintentional operation of release lever (Fig. 1-1). b. Load is beyond 10-ton capacity of jack. c. Other causes. 	<ul style="list-style-type: none"> a. Place release lever lock in down position (par. 2-1f). b. Obtain heavier duty jack. c. Refer other causes to higher echelon maintenance personnel for correction.

Section IV. MAINTENANCE PROCEDURES

3-8. General.

This section contains brief instructions covering those maintenance functions which the operator/crew can perform as allocated by the MAC (Appendix B, Section II) and which are not covered elsewhere in this manual. Those maintenance functions for which the operator/crew is required to assist the organizational maintenance personnel are not included.

3-9. Inspections.

The operator/crew is authorized visual inspection of the lift and saddle and frame and wheel assemblies.

3-10. Tests.

The operator/crew is authorized to test the operation of all four assemblies of the jack prior to use.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Unpacking.

a. *Procedure.* The hydraulic jack is shipped in a heavy-duty wooden shipping carton. Aside from normal precaution against damage to the jack in opening the carton and removing the jack, no special procedures are required. The carton should be placed on the floor and opened immediately upon receipt and the contents inspected for shipping damage, such as deformed, broken, or missing parts. Inspect all components of the jack. Any literature packed in the carton should be removed and held for reference in operating the equipment.

b. *Responsibility.* When a new or reconditioned jack is first received, it is the responsibility of the officer in charge to determine whether the materiel has been properly prepared for service by the supply organization and to be sure it is in condition to perform its function. For this purpose, inspect assemblies and parts to be sure they are properly assembled, secured, cleaned, adjusted, and/or lubricated. Check all repair parts, tools and support equipment with the listing in Appendix C to be sure every item is present and in good condition. Make a record of any missing equipment or malfunctions. Correct any deficiencies as quickly as possible.

4-2. Installation.

a. *General.* After removing the jack from its carton, the following actions must be taken in order to place the jack in operating condition:

b. *Handle Installation.*

(1) Place the hollow handle of the handle assembly (31, Fig. 5-1) over the square handle stub of the handle yoke (27, Fig. 5-1) with setscrew (26, Fig. 5-1) to the rear.

(2) Loosen the setscrew until the handle drops in place, with the lock rod (30, Fig. 5-1) fitting in the hole in the handle stub.

(3) Tighten the setscrew.

c. *Vent Hole Screw Removal.* Cylinder must be vented before operating jack. The vent hole must always be kept open so the jack can "breathe". To vent, remove and discard vent screw (43, Fig. 5-2) from the top of the filler plug (Fig. 1-1; 44, Fig. 5-2).

d. *Installation of Handle Grips.* Place the white rubber grips on each end of the handle's bar.

4-3. Inspecting and Servicing the Equipment.

a. Keep all working parts thoroughly lubricated. (Refer to table 4-1).

b. Check hydraulic oil level and replenish if low. Use MIL-L-17672 hydraulic oil (9150-985-7234), which comes in 5-gallon cans.

Section II. MOVEMENT TO A NEW WORKSITE

4-4. Dismantling For Movement.

Remove the handle by loosening setscrew (26, Fig. 5-1) and pulling off the handle (31, Fig. 5-1) from the

square handle stub of the handle yoke (27, Fig. 5-1).

4-5. Reinstallation After Movement.

Refer to par. 4-2.

Section III. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

4-6. General.

Repair parts, tools, and equipment over and above those available to the operator are supplied to the using organization for maintaining the jack. Tools and equipment should not be used for purposes other than prescribed and, when not in use, should be properly stored.

4-7. Tools and Equipment.

Common tools and equipment having general application to this materiel are authorized by tables of allowances and tables of organization and equipment.

4-8. Special Tools and Equipment.

No tools or equipment specially designed for organizational maintenance are supplied or required for the jack.

4-9. Maintenance Repair Parts.

Repair parts are supplied to the using organization for replacement of those parts most likely to become worn, broken, or otherwise unserviceable, providing replacement of these parts is within the scope of organizational maintenance functions. Repair parts and equipment are listed and illustrated in Appendix C.

Section IV. LUBRICATION INSTRUCTIONS

4-10. Lubrication.

a. Lubricate in accordance with LO-9-4910-262-12. Specifications are as follows:

Table 4-1. Lubricants and Oils

LUBRICANT	SPECIFICATION	FSN	U/I
Lubricating oil	MIL-L-664	9150-231-6689	qt
Hydraulic oil	MIL-L-17672	9150-985-7234	5-gal
Grease	MIL-G-18709	9150-249-0908	35-lb pl

b. Organizational maintenance is limited to lubricating the handle assembly and the frame and wheel assembly. Refer to Chapter 9 for rear wheel and caster disassembly, and Chapter 6 for handle disassembly.

Section V. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-11. General.

Refer to paragraphs 3-2 through 3-4 for preventive maintenance services for the operator. These instructions apply equally to maintenance personnel of the using organization.

4-12. Organizational Preventive Maintenance Checks and Services.

The using organization is further responsible for services listed in table 4-2 and must thoroughly train its personnel in performing the maintenance procedures for this materiel.

Table 4-2. Organizational Preventive Maintenance Services

Item No	Procedures	Intervals			
		Paragraph References	Weekly	Monthly	Quarterly
1	Lubrication. Keep all working parts thoroughly lubricated. Lubricate in accordance with instructions contained in the lubrication order. Jack should be lubricated at least every 50 cycles. Use pressure gun lubricant at lube fittings and SAE 10 weight oil at all other points.	4-10	—	X	—
2	Publications and forms. Check if technical manual, lubrication order, and other forms are with jack.	Appendix A	—	—	X
3	Other checks.	3-4(6)	—	—	—

Section VI. TROUBLESHOOTING

4-13. Troubleshooting Procedures.

There are no troubleshooting procedures peculiar to

second echelon maintenance. Refer to paragraphs 3-5 through 3-7 for operator/crew troubleshooting.

Section VII. MAINTENANCE OF ASSEMBLIES

4-14.

Organizational maintenance of the jack is limited to inspecting and testing all assemblies, and to ser-

ving the handle and frame and wheel assemblies. There are no major disassembly functions to be performed by organizational maintenance personnel.

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

5-1. General.

Repair parts, tools, and equipment over and above those available to the using organization are supplied to direct support and general support maintenance units for repairing the jack. Tools and equipment should not be used for purposes other than prescribed and, when not in use, should be properly stored.

5-2. Tools and Equipment.

Common tools and equipment having general application to this materiel are authorized by tables of allowances and tables of organization and equipment.

5-3. Special Tools and Equipment.

No special tools or equipment are supplied or required for direct support and general support maintenance of jack.

5-4. Maintenance Repair Parts.

Repair parts are supplied to direct support and general support maintenance units for replacement of those parts most likely to become worn, broken, or otherwise unserviceable, providing replacement of these parts is within the scope of direct support and general support maintenance functions. Repair parts are listed and illustrated in Appendix C.

Section II. TROUBLESHOOTING

CAUTION

Operation of materiel without a preliminary examination can cause further damage to a disabled component. Be careful during inspection and troubleshooting so that damage can be avoided.

5-5. Purpose.

This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the hydraulic jack. Close adherence to the procedures covered herein will materially reduce the time required to locate trouble and restore the jack to normal operation.

5-6. Scope.

a. This section covers troubleshooting which is peculiar to direct support (third echelon) and general support (fourth echelon) maintenance operations.

For troubleshooting procedures performed by lower echelons of maintenance, refer to chapters three and four.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

5-7. Procedure.

Each malfunction is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed. The malfunctions, probable causes, and corrective actions that can be performed by direct support and general support maintenance personnel are listed in table 5-1.

Table 5-1. Troubleshooting

CAUTION

Be sure vent screw is out of filler plug (par. 5-14b)

<i>Malfunction</i>	<i>Probable cause</i>	<i>Corrective action (Repair, adjust, or replace when necessary.)</i>
<p>1. Jack settles under load.</p>	<p>a. Leak at weld or ball chamber plug (38, Fig. 5-2).</p> <p>b. Valve discharge ball (40, Fig. 5-2) (larger ball) not seating properly.</p> <p>c. Release valve (26, Fig. 5-2) not seating properly.</p> <p>d. Ram cup (9, Fig. 5-2) not holding.</p>	<p>a. Place jack under load and visually inspect for leak (par. 5-14 b(7)). Refer to higher echelon maintenance personnel for correction, if necessary.</p> <p>b. To check valve discharge ball, place jack under load. Pull handle toward you about twelve inches. If the lowering of the load pulls the handle away from you (more than spring return), valve discharge ball is not seating properly (par. 5-16b).</p> <p>c. Put additional pressure on release valve by applying leverage to needle extension (24, Fig. 5-2):</p> <p>(1) If lowering stops it indicates a bind in the alignment of the release valve or release packing nut (33, Fig. 5-2) adjusted too tight. Packings should be just tight enough to stop leak under load release (par. 5-15a, b).</p> <p>(2) If lowering does not stop, raise the jack under load full height and open release valve wide to wash seat of foreign particles. Repeat if necessary.</p> <p>d. (1) If a new jack, or one that has had little use, place the jack under load and release and catch the load with the release several times, as cup may not yet be seated to the cylinder wall properly.</p> <p>(2) If an old jack with much service, cup may be worn out (par. 7-4b, 7-5).</p>
<p>2. Jack will not lift load.</p>	<p>a. No hydraulic oil.</p> <p>b. Intake (lower) ball bearing (42, Fig. 5-2) not seating properly.</p> <p>c. Pump cup leather (20, Fig. 5-2) worn or not holding</p>	<p>a. Check for proper oil level in cylinder (par. 5-9a).</p> <p>b. Check to see if handle is spongy when pressure is applied.</p> <p>c. Check to see if handle is spongy when pressure is applied. (It is difficult to tell the difference between a lower ball not holding and a pump cup leather not holding. If b (above) does not correct malfunction, replace pump cup leather).</p>
<p>3. Pump only effective for partial stroke of the foot pedal or handle.</p>	<p>a. Low on oil.</p> <p>b. Improper adjustment of release valve linkage.</p> <p>c. Loose pump packing nut (15, Fig. 5-2).</p> <p>d. Loose release packing nut (33, Fig. 5-2).</p>	<p>a. Check for proper oil level. If low on oil, pump may only partially fill (par. 5-16c).</p> <p>b. Check release valve linkage adjustment. It must be free under complete handle movement and complete range of lifting arm (par. 5-15b.). Adjust the clevis (15, Fig. 5-1) until maximum stroke is obtained.</p> <p>c. Loose pump packing nut may cause partial intake of air. Tighten pump packing tight. Loosen slightly until foot pedal returns properly. (par. 5-15a).</p> <p>d. Loose release packing nut may cause partial intake of air. Release valve packing should be just tight enough to prevent leak under release of load (par. 5-15a).</p>

Section III. GENERAL MAINTENANCE

5-8. General.

Special repair procedures required for specific components or parts are contained in chapter 6. Bolts, nuts, screws, spacers, washers, springs, and other small common parts will be replaced if mutilated in any way.

5-9. Lubrication.

a. *Hydraulic Oil Supply.* Check hydraulic oil level and replenish with hydraulic fluid MIL-L-17672 (FSN 9150-985-7234), if low. To fill, clean filler plug (44, Fig. 5-2) and surrounding area. Remove filler plug and, with saddle *down*, add fluid to within 1/4 to 3/8 inch below filler hold. Overfilling causes oil to spurt out vent holes as jack is lowered, or may prevent jack from lowering properly. Operate the cylinder and ram assembly to distribute the oil within the assembly.

b. *Lubricating Oil.* Refer to LO 9-4910-262-12. Current specifications call for MIL-L-664 (FSN 9150-231-6689).

c. *Grease.* Refer to LO 9-4910-262-12. Current specifications call for MIL-G-18709 (FSN 9150-249-0908).

d. *Preservatives.* Use any light preservative oil to protect the jack against corrosion and deterioration during shipment and intervals when jack is not in use.

5-10. Cleaning.

Any special cleaning instructions required for specific components or parts are contained in pertinent sections. Refer to paragraph 3-3 for general cleaning instructions and precautions. Additional instructions for cleaning and paint and rust removal are given in a through c below.

a. *Paint Removal.* To remove paint from ferrous parts, use paint remover, alkali-type, class 1; from nonferrous parts, use paint remover, alkali-type, class 2.

CAUTION

Refer to paragraph 3-3b(4).

b. *Cleaning Antifriction Type Bearings.* Clean anti-friction type bearings (if not of the sealed type) by rotating them in mineral spirits paint thinner or dry-cleaning solvent. If the bearings are covered with grease or heavy oil, immerse them in SAE No. 10 lubricating oil to remove the bulk of old lubricant, allowing sufficient time for the oil to drain from the bearings after removal from the oil container, and then rotate them in mineral spirits paint thinner or dry-cleaning solvent for final cleaning. Dry the bearings with clean, dry, compressed air from an air line equipped with special moisture filter traps; do not

spin. Lubricate the bearings immediately after drying.

c. *Rust Removal.* Refer to paragraph 3-3c.

5-11. Painting.

Preparation for painting and painting procedures are described in detail in TM 9-213. Bearing surfaces, sliding surfaces, mating surfaces, highly polished surfaces, screw threads, and all other critical surfaces must not show traces of paint or primer.

5-12. Welding.

Welding is authorized for parts that may be satisfactorily welded in accordance with standards set forth in TM 9-237.

CAUTION

Welding is not to be attempted unless the welding party is thoroughly familiar with the physical characteristics of the metal to be welded.

5-13. Fabrication.

Parts such as pins, rods, special bolts, etc., may be fabricated from stock material when it is considered economically practicable. When fabricating, adhere to all specified tolerances on drawings.

5-14. Final Inspection.

Final inspection is performed to insure that the jack is in operational condition after all repairs have been completed and the jack has been reassembled.

a. *Visual Inspection.* Visually inspect the jack to insure that it is properly and securely assembled.

(1) There must be no signs of oil leakage.

(2) The vent screw (43, Fig. 5-2) must be replaced in the filler plug (44, Fig. 5-2).

(3) Inspect for cracked, broken, distorted, or missing external parts.

(4) All bolts, screws, cotter pins, etc., must be secure.

(5) Check Appendix C to be sure every item is present and in serviceable condition.

b. *Performance Inspection.*

(1) If necessary, remove the vent screw (43, Fig. 5-2) from the filler plug (44, Fig. 5-2). This screw should have already been removed (par. 4-2c) and should not be reinstalled until overhaul.

(2) Raise the saddle by operating the quick lift (foot pedal) lever (Fig. 1-1). There should be no binding at the pump link assembly (8, Fig. 5-1) and lift and saddle assembly (Fig. 5-3) should rise freely.

(3) Turn the release handle (Fig. 1-1) to the release position. There should be no binding at the release lever (Fig. 1-1) or at the release rod (36, Fig.

5-1) and clevis (15, Fig. 5-1), and the saddle should return freely to its lowest position (par. 1-8 b(2)).

(4) Push the lock rod (30, Fig. 5-1) down and check to be sure the rod enters either of the two locking holes in the handle yoke (27, Fig. 5-1). Release the handle and then check the lock rod in the other locking hole. The handle must be released from either locking position by the lock rod spring (28, Fig. 5-1).

(5) Operate the handle to raise the saddle to its highest position (par. 1-8 b(2)). The handle should operate freely on its hinged points and the saddle should rise to its highest position without binding.

(6) Maneuver jack on its frame and wheel assembly (Fig. 5-4). The wheels and casters should operate freely, permitting the jack to move with ease to any desired position.

WARNING

Personnel performing the following tests must stand clear of the test load at all times during testing operations to avoid possible injury.

(7) Test the hydraulic jack under a test load of 10 tons. Raise the test load to the maximum lift (par. 1-8b(2)) of the jack. Allow the test load to remain on the jack for 15 minutes. The jack must hold the test load at the maximum lift. Check the cylinder and ram assembly during this period for oil leaks at the welded seams of the pump cylinder (45, Fig. 5-2), packing nuts (25, Fig. 5-2), and cylinder head. There must be no indication of oil leaks.

(8) Lower the test load by turning the release handle (Fig. 1-1). The test load must return to the floor and the saddle assembly should return to its lowest position (par. 1-8b(2)).

(9) Test the jack under a test load of 10.5 tons. The release valve (26, Fig. 5-2) must open and prevent the test load from rising.

(10) Install the vent screw (43, Fig. 5-2) in the filler plug (44, Fig. 5-2).

5-15. Adjustment.

Perform the following adjustments as necessary during test procedures.

a. Adjust the piston packing nut (1, Fig. 5-2), the pump packing nut (15, Fig. 5-2), or the release packing nut (33, Fig. 5-2) by tightening, to eliminate oil leaks around the packings of these nuts.

Note: Do not tighten the release valve nut too

tight, as this will cause release valve (26, Fig. 5-2) to bind.

b. Adjust the release valve for correct releasing tension by tightening or loosening the two hexagon plain nuts (25, Fig. 5-2). Tighten the nuts against the release valve spring (31, Fig. 5-2) for increased tension on the valve, or loosen the nuts to decrease the tension. The valve should be set when any lift over 10 tons is attempted. The valve must be adjusted using a dead-weight. Load the saddle at 9 inches above floor level with 20,000 pounds. If jack will not raise load, tighten nuts and increase spring tension until operation is possible. When position for spring compression is found, the nuts should be adjusted so as to allow release valve to operate when 1,250 pounds are added to load.

WARNING

Relief valve should open and lower load between a loading of 20,000 and 21,250 pounds. Setting valve above this range may result in equipment failure or damage and/or personal injury.

c. Install the vent screw (43, Fig. 5-2) into the filler plug (44, Fig. 5-2). Remove when putting jack back into use.

5-16. General Maintenance and Service Instructions.

a. *Packing Nuts.* Packing nuts (1, 15, Fig. 5-2) at piston and pump plunger (17, Fig. 5-2) should be kept moderately tight. These packings are not under pressure and should be only tight enough to prevent leakage.

b. *Ball Valves.* Ball valves (40, 42, Fig. 5-2) may be removed for inspection and cleaning by removing ball chamber plug (38, Fig. 5-2) and turning jack on its side, allowing balls to roll out. Whenever it is necessary to loosen or remove ball chamber plug, gasket (39, Fig. 5-2) should be replaced with a new one. Oil leakage at this, point is usually due to re-use of old gasket.

c. *Oil Supply.* Should oil supply run low, or in case of air leakage at plug (44, Fig. 5-2), jack may become air-bound and work on only a half stroke of handle. Fill jack with oil, raise saddle; then lower saddle while holding foot pedal depressed. This will flush out any air in system and excess oil may run out vent. Be certain jack is properly filled with oil before putting it back into service.

Section IV. REMOVAL AND INSTALLATION OF ASSEMBLIES

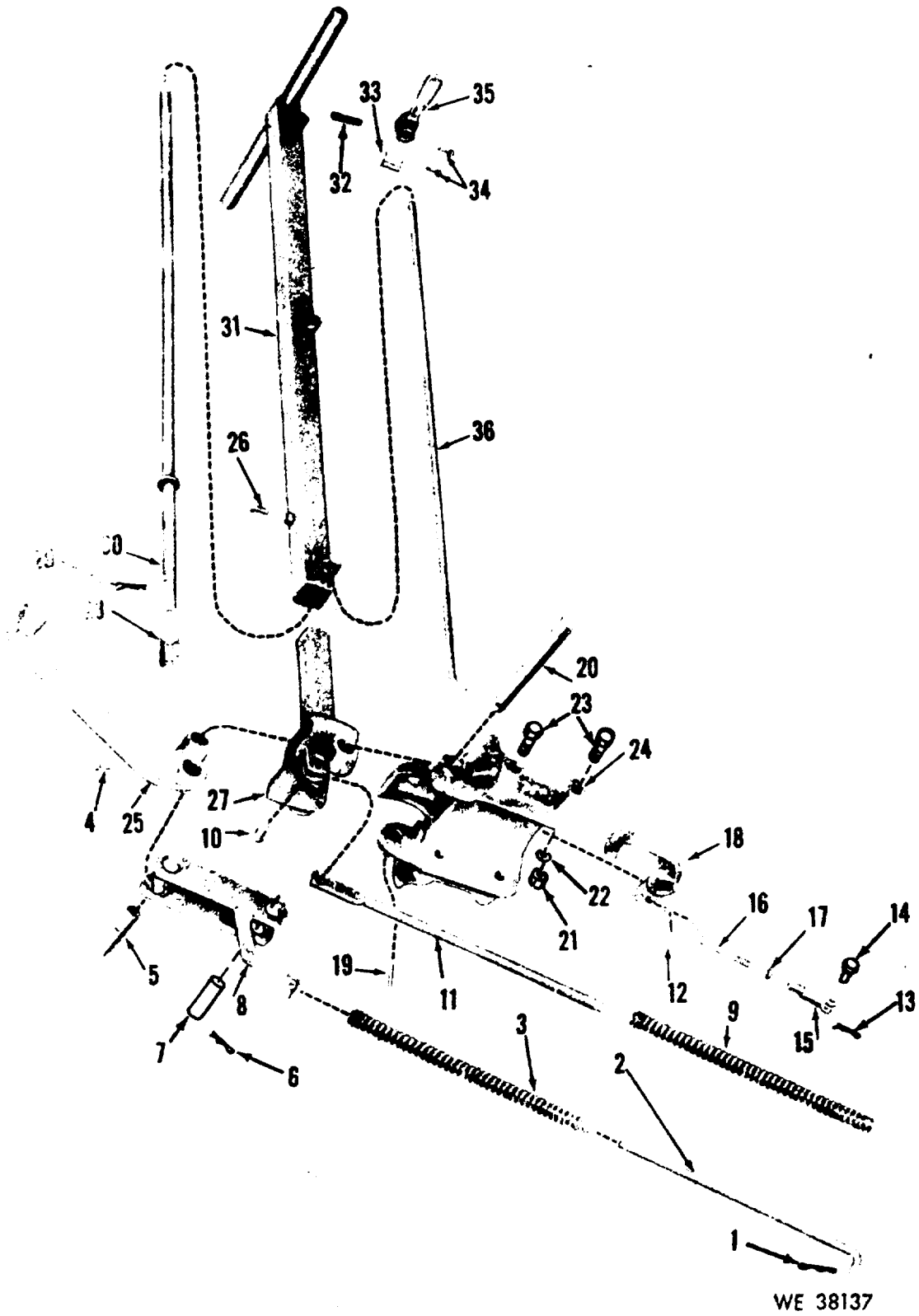
5-17. General.

This section contains procedures for removal and installation of the four assemblies of the jack. Paragraphs are arranged in the order in which the components and assemblies should logically be removed. For disassembly and reassembly instructions refer

to chapters 6, 7, 8, and 9.

5-18. Removal and Installation of Handle Assembly.

Note: The key numbers in parentheses refer to figure 5-1 unless otherwise indicated.



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Figure 5-1. Handle assembly - exploded view.

KEY to Fig. 5-1:

1. Pin, cotter, 1/8 in. X 1 in.
2. Plunger return rod
3. Plunger return spring
4. Setscrew, 1/4NC X 5/8 in.
5. Foot lever pin
6. Pin, cotter, 1/8 in. X 1 in.
7. Clevis pin
8. Pump link assembly
9. Spring, lifting arm
10. Handle return pin
11. Return guide assembly
12. Release lever pin
13. Pin, cotter, 1/16 in. X 3/4 in.
14. Release yoke pin
15. Clevis
16. Release pull rod
17. Nut, plain, hexagon, 5/16-24UNF
18. Lever, jack release
19. Roll pin
20. Pin, straight, headless, 3/4 in. X 6-1/2 in.
21. Nut, plain, hexagon, 1/2-13NC
22. Washer, lock, 1/2 in.
23. Bolt, machine, 1/2-13NC X 2-3/4 in.
24. Tie frame end
25. Lever, quick lift
26. Setscrew
27. Handle yoke
28. Spring, lock rod
29. Pin, cotter, 1/16 in. X 3/4 in.
30. Lock rod assembly
31. Handle assembly
32. Roll pin
33. Lock, release
34. Setscrew, 1/4UNC X 3/4 in.
35. Handle, release
36. Release rod

a. Removal.

(1) To remove handle assembly (31), loosen set-screw (26) and remove. The handle assembly (31) includes the release lock (33), two setscrews (34), release rod (36), cotter pin (29), lock rod spring (28), roll pin (32), lock rod assembly (30), and setscrew (26).

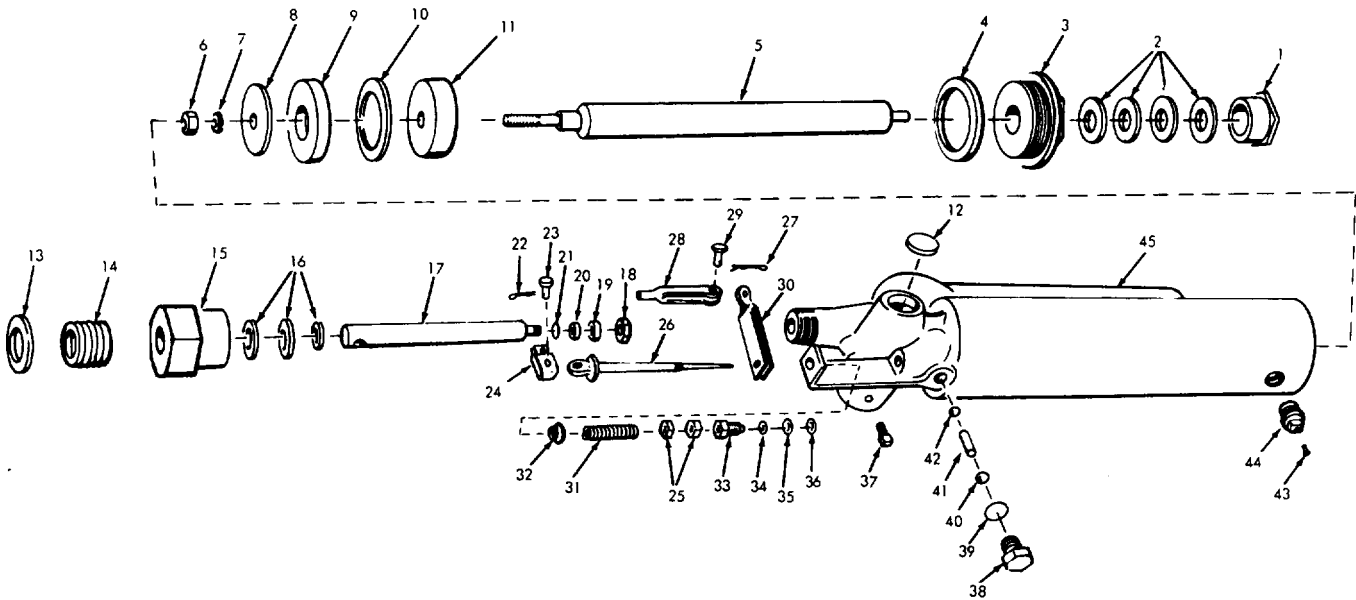
(2) To remove release handle (35), unscrew two setscrews (34) and slide release rod (36) out of release handle (35).

(3) To remove tie frame end (24), remove cover plate (32, Fig. 5-4). Then remove cotter pin (13) from release yoke pin (14) and slide release yoke pin (14) out of clevis (15). Remove cotter pin (6) from clevis pin (7), and slide clevis pin (7) from pump link assembly (8). Unscrew four machine bolts (23) with their respective lock washers (22) and hexagon plain nuts (21). Pull out tie frame end (24) from frame assembly (10).

b. Installation. Use reverse procedure of removal.

5-19. Removal and Installation of Cylinder and Ram Assembly.

Note: The key numbers in parentheses refer to figure 5-2 unless otherwise indicated.



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KEY to Fig. 5-2:

- | | | | |
|---|--|--|---|
| <ol style="list-style-type: none"> 1. Piston packing nut 2. Piston rod packing 3. Cylinder cap 4. Gasket 5. Piston rod 6. Nut, plain, hexagon 7. Washer, lock 8. Ram cup washer 9. Ram cup 10. Ring 11. Ram head | <ol style="list-style-type: none"> 12. Plug, expansion 13. Lever spring washer 14. Lever friction spring 15. Pump packing nut 16. Plunger packing 17. Pump plunger 18. Nut, plain, hexagon, 5/16-24UNF 19. Pump leather - washer 20. Pump cup leather 21. Ring 22. Pin, cotter, 1/16 in. X 3/4 in. 23. 5/16 inch headed straight pin | <ol style="list-style-type: none"> 24. Needle extension 25. Nut, plain, hexagon, 3/8-16UNC 26. Release valve assembly 27. Pin, cotter, 1/16 in. X 3/4 in. 28. Release link 29. Pin 30. Plunger rod yoke 31. Release spring 32. Release valve guide 33. Release packing nut 34. O-ring 3/8 inch 35. Packing housing | <ol style="list-style-type: none"> 36. O-ring 1/4 inch 37. Setscrew 38. Ball chamber plug 39. Gasket, plug ball 40. Valve discharge ball 41. Intake ball weight 42. Ball bearing 7/16 inch dia 43. Vent screw 44. Filler plug 45. Pump assembly (complete unit) |
|---|--|--|---|

Figure 5-2. Cylinder and ram assembly-exploded view.

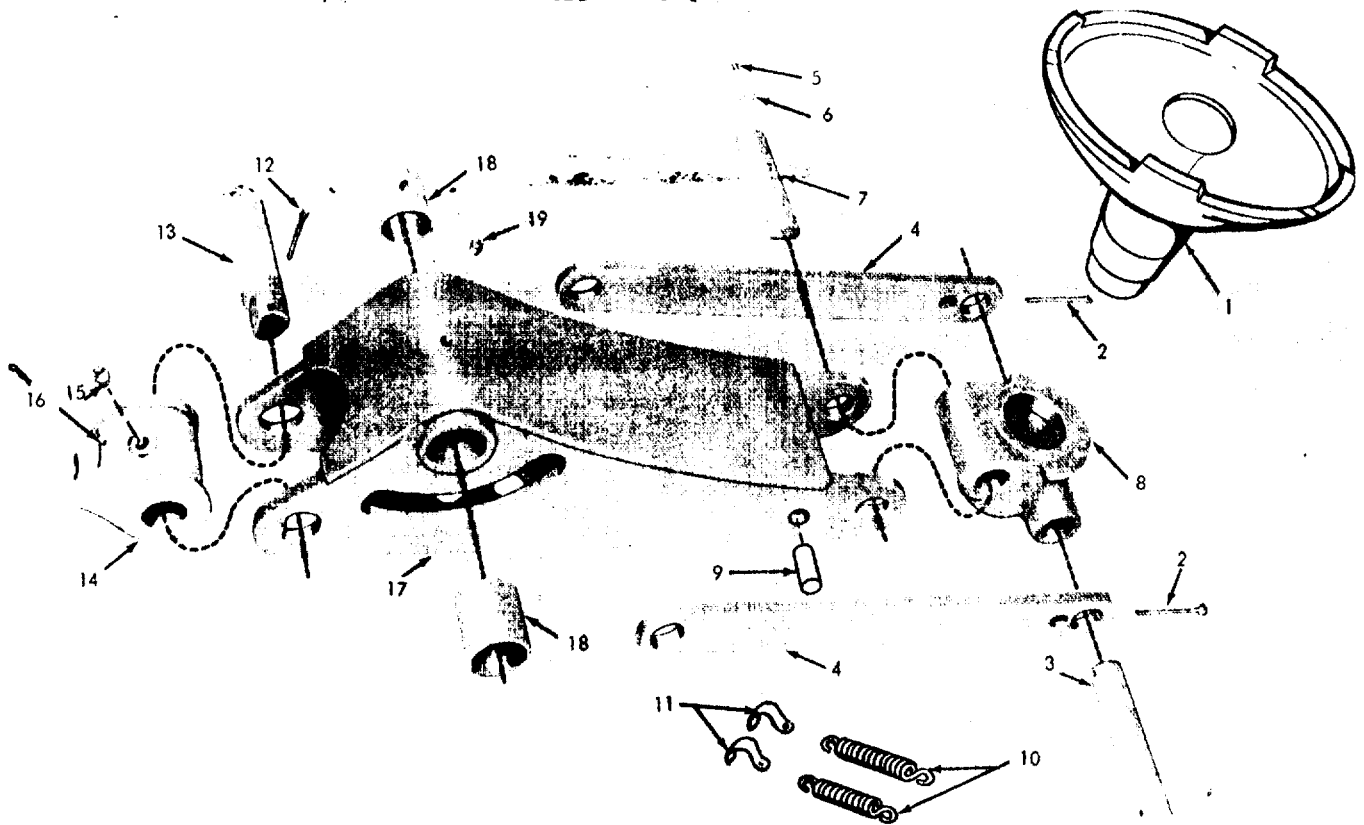
a. *Removal.* Remove saddle (1, Fig. 5-3) from lifting arm and place aside. Remove cotter pin (16, Fig. 5-3) in crosshead jack (14, Fig. 5-3). Remove setscrew (37) at cylinder pivot. Remove cotter pin (13, Fig. 5-1) and release yoke pin (14, Fig. 5-1) in extension linkage, and cotter pin (27) and pin (29) in limit rod linkage of release valve. Remove cotter pin (6, Fig. 5-1) and clevis pin (7, Fig. 5-1) in pump. Raise lifting arm by picking up lifting arm assembly (17, Fig. 5-3) and insert a steel rod through slotted hole in side

of arm to prevent lowering. Remove cylinder pin (33, Fig. 5-4), This releases cylinder at both ends so it may be removed as a complete unit for service or replacement.

b. *Installation.* Use reverse procedure of removal.

5-20. Removal and Installation of Lift and Saddle Assembly.

Note: The key numbers in parentheses refer to figure 5-3 unless otherwise indicated.



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KEY to Fig. 5-3:

1. Saddle
2. Pin, cotter, 3/16 X 2-1/4 in.
3. Pin, straight, headless
4. Parallel arm
5. Screw, cap, hexagon, 1/4-20NC X 3/8 in
6. Washer, lock, 1/4 in.

7. Pin, lifting arm
8. Saddle bracket
9. Sector spring key
10. Spring, lifting arm
11. Spring hook
12. Pin, cotter, 3/16 X 2 in
13. Crosshead pin

14. Crosshead jack
15. Fitting, lubrication
16. Pin, cotter, 3/16 X 2-3/4 in.
17. Lifting arm assembly
18. Bushing
19. Fitting, lubrication

Figure 5-3. Lift and saddle assembly - exploded view.

a. *Removal.* Lift out saddle (1) from saddle bracket (8). With hydraulic ram, raise the lift and saddle assembly to its maximum height and loosen the two sector pin retainers (27, Fig. 5-4) by tapping with hammer and soft metal punch. Lower the assembly and pull the two sector pin retainers (27, Fig. 5-4) from the assembly. Remove sector spring key (9), thus releasing lifting arm spring (10), then drive out sector pin (29, Fig. 5-4) and parallel bar pin (28, Fig.

5-4). Remove cotter pin (16) from crosshead jack (14). Remove the lift and saddle assembly.

Note: If difficulty arises removing sector spring key (9), this may be accomplished with the lift and saddle assembly already removed from the frame and wheel assembly.

CAUTION

Sector pin (29, Fig. 5-4), parallel bar pin (28, Fig. 5-4), headless straight pin (3), lifting arm pin (7),

and crosshead pin (13) should only be removed with brass or other soft metal drift or punch.

b. *Installation.*

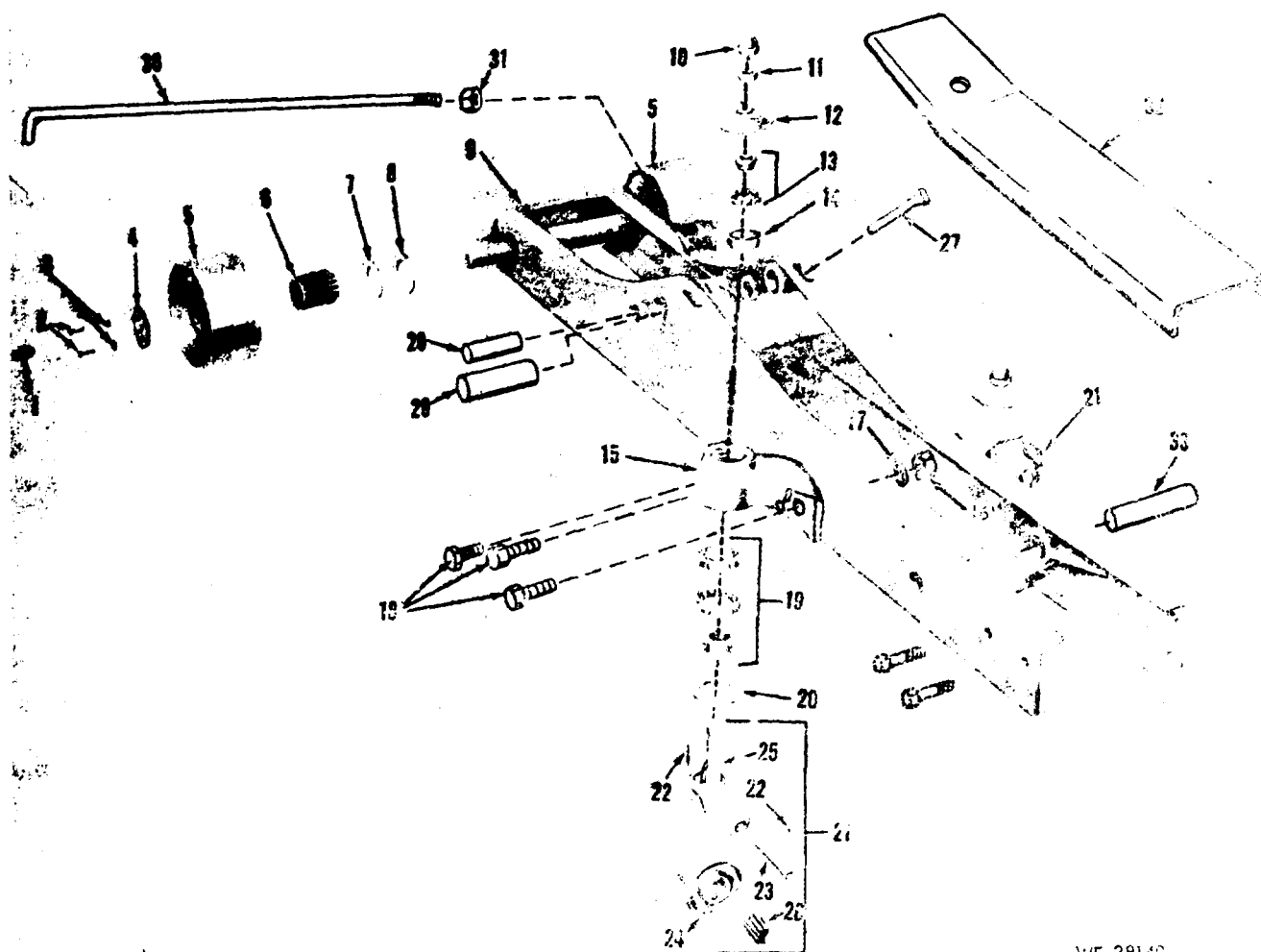
(1) If any parts have been removed beyond what is described above, replace them in reverse order of removal.

(2) Place assembly back in frame, sliding it back onto piston rod (5, Fig. 5-2). Replace cotter pin (16). Replace sector pin (29, Fig. 5-4), making sure that it is aligned with the two *sector pin retainers*' (27, Fig. 5-4) pin holes. Cover with a light coat of grease before putting in. Slide parallel bar pin (28, Fig. 5-4) through frame and wheel assembly, through parallel

arm (4) and lifting arm assembly (17), and make sure that spring hooks (11) are also attached to parallel bar pin (28, Fig. 5-4). It will be necessary to place the jack on its side to accomplish this, so secure jack firmly. With a hooked piece of stiff wire, grab lifting arm springs (10) and bring them through the holes in the lifting arm assembly (17). Then slide in the sector spring key (9). Replace saddle (1).

5-21. Removal and Installation of Frame and Wheel Assembly.

Note: The key numbers in parentheses refer to figure 5-4 unless otherwise indicated.



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KEY to Fig. 5-4:

1. Fitting, lubrication
2. Screw, cap, hexagon, 1/4-20NC X 3/4 in
3. Washer, lock, 1/4 in.
4. Front wheel retainer
5. Front wheel assembly
6. Front wheel bearing
7. Inside hub washer
8. Inside wheel washer
9. Frame assembly
10. Nut, plain, cap, 3/4-16UNF
11. Nut, plain, hexagon, 3/4-14UNF

12. Caster bearing cap
13. Cone and rollers
14. Cup, tapered roller
15. Closet assembly, pump
16. Nut, plain, hexagon, 1/2-20UNF
17. Washer, lock
18. Screw, cap, hexagon, 1/2-20UNFX 1-1/4 in.
19. Cone and rollers
20. Stamped closure
21. Caster assembly
22. Pin, cotter, 3/16 in. X 1 in.
23. Pin, straight, headless

24. Caster wheel
25. Caster yoke
26. Roller assembly
27. Sector pin retainer
28. Parallel bar pin
29. Sector pin
30. Limit rod
31. Nut, plain, hexagon, 1/4-28UNF
32. Cover plate
33. Cylinder pin

Figure 5-4. Frame and wheel assembly - exploded view.

a. *Removal.*

(1) *Front wheel assembly.* To remove front wheel assembly (5), turn jack on its side. Unscrew the two hexagon cap screws (2) and remove their lock washers (3). Lift out the front wheel retainer (4). Lift off the front wheel assembly (5). Lift off the front wheel bearing (6), inside wheel washer (8), and inside hub washer (7).

(2) *Caster assembly.* To remove caster assembly (rear, swivel wheels) (21), turn jack on its side. Unscrew cap plain nut (10) and hexagon plain nut (11). Remove caster bearing cap (12). Pull out caster as-

sembly (21), which includes roller assembly (26), caster wheel (24), headless straight pin (23), cotter pin (22), and caster yoke (25).

b. *Installation.*

(1) *Front wheel assembly.* Use reverse procedure of removal.

(2) *Caster assembly.* Replace caster assembly (21). Replace caster bearing cap (12) and hexagon plain nut (11), tightening nut until there is no play, but wheel still easily rotates. Replace cap plain nut (10).

CHAPTER 6

REPAIR OF HANDLE ASSEMBLY

Section I. DESCRIPTION

6-1. General.

The handle assembly (Fig. 5-1 and 1-2) consists primarily of a handle, lock rod, quick lift lever, release rod, and release handle.

6-2. Description of Main Components.

Note: The key numbers in parentheses refer to figure 5-1 unless otherwise indicated.

a. *Handle.* The handle (31) is used to facilitate moving or changing the position of the jack and for operating the pump of the cylinder and ram assembly.

b. *Lock Rod.* The lock rod (30) is used to lock the handle in a selection of two positions. After the jack is placed in position and the handle is let free, the lock rod will release from the locked position auto-

matically, thereby allowing free movement of the handle when used to operate the pump.

c. *Quick Lift Lever.* The quick lift lever (25) is used for fast operation of the pump of the cylinder and ram assembly. It is used to raise the lift and saddle assembly to the load or to lift a weight load. For heavy loads the handle (31) of the handle assembly is used to obtain greater leverage to operate the pump, thus lifting the load with ease to the desired level.

d. *Release Rod and Release Handle.* The release rod (36) and release handle (35) are used to operate the release valve (26, Fig. 5-2) of the cylinder and ram assembly, thereby releasing the hydraulic pressure in the assembly and allowing the load to return to floor level.

Section II. DISASSEMBLY

6-3. Removal.

Refer to paragraph 5-18a.

6-4. Disassembly Instructions.

Note: The key numbers in parentheses refer to figure 5-1 unless otherwise indicated.

a. *General.* This paragraph contains disassembly instructions for the handle assembly. Paragraphs are arranged in the order in which the parts should logically be removed. This is the responsibility of direct support and general support maintenance as

authorized by the Maintenance Allocation Chart.

b. *Disassembly of Handle Assembly.*

(1) To remove foot lever pin (5), loosen setscrew (1) and drive out with brass or suitable soft metal drift or punch.

(2) To remove headless straight pin (20), drive out roll pin (19), then drive out headless straight pin (20) from tie frame end (24) with a soft metal punch.

(3) Refer to paragraph 5-18 for additional disassembly.

Section III. REASSEMBLY

6-5. Reassembly Instructions.

To reassemble, use reverse procedure of disassembly.

6-6. Installation Instructions.

Refer to paragraph 5-18b. Note: If difficulty arises

in reassembly or disassembly of jack, frame assembly may be placed on its side, but should be supported by several four-by-four blocks to prevent falling.

CHAPTER 7

REPAIR OF CYLINDER AND RAM ASSEMBLY

Section I. DESCRIPTION

7-1. General.

The cylinder and ram assembly (Fig. 5-2 and 1-2) consists primarily of a piston rod, ram cylinder, pump, and release valve.

7-2. Description of Main Components.

Note: The key numbers in parentheses refer to figure 5-2 unless otherwise indicated.

a. *Ram Cylinder.* The ram cylinder (45) is anchored in position in the frame and wheel assembly.

b. *Pump.* Operation of the pump plunger (17) creates an hydraulic pressure against the movable piston rod (5) forcing it out of the ram cylinder.

c. *Piston Rod and Release Valve.* The piston rod (5) is returned to the original position by releasing the hydraulic pressure through the release valve (26).

Section II. DISASSEMBLY

7-3. Removal

Refer to paragraph 5-19a.

7-4. Disassembly Instructions.

Note: The key numbers in parentheses refer to figure 5-2 unless otherwise indicated.

a. *General.* This paragraph contains disassembly instructions for the cylinder and ram assembly. Paragraphs are arranged in the order in which the parts should logically be removed. This is the responsibility of direct support and general support maintenance as authorized by the Maintenance Allocation Chart.

b. *Disassembly of Cylinder and Ram Assembly.* Remove filler plug (44) and ball chamber plug (38) to drain oil. Place cylinder unit in vise with vise

jaws gripping forging and cylinder pointing up. Vise jaws must grip forging, not cylinder, to prevent damage to unit. Unscrew piston packing nut (1) and remove old piston rod packing (2). Unscrew cylinder cap (3) and remove piston rod (5) from cylinder. Turn cylinder in vise, pump end upward. Measure distance accurately that release spring (31) is compressed. This dimension is extremely important for proper operation and should be recorded for reassembly. Unscrew hexagon plain nuts (25) and remove release valve assembly (26). Remove release packing nut (33), packing housing (35), and O-ring 1/4 inch (36). Unscrew pump packing nut (15) and remove pump plunger (17) and plunger packing (16). Remove valve discharge ball (40), ball bearing 7/16 inch dia (42), and intake ball weight (41). Clean all parts and cylinder thorough}.

Section III. REASSEMBLY

7-5. Reassembly Instructions.

Note: The key numbers in parentheses refer to figure 5-2 unless otherwise indicated.

Assemble ring (21), pump cup leather (20), pump leather-washer (19), and hexagon plain nut (18) to pump plunger (17). Wet lightly with jack oil and insert into plunger bore. Assemble plunger packing (16) and pump packing nut (15) and tighten moderately. Insert new packing housing (35), O-ring end first, into bore. Assemble release valve assembly (26) and components and adjust release spring (31) to dimension recorded when disassembled. Insert new valve discharge ball (40), new ball bearing 7/16 inch dia (42), and intake ball weight (41). Install ball chamber plug (38) with new plug ball gasket (39). Reposition cylinder in vise, cylinder upward. Assemble ram head (11), ring (10), ram cup (9), ram

cup washer (8), lock washer (7), and hexagon plain nut (6). Tighten nut only enough to compress lock washer. Over-tightening may damage ram cup. Wet lightly with jack oil and insert assembly into cylinder. In fitting new cup into cylinder, use great care when cup passes filler plug hole not to cut or otherwise damage ram cup. Next, assemble cylinder cap (3) and gasket (4) to cylinder. Insert piston rod packing (2) and tighten piston packing nut (1) moderate.

7-6. Installation Instructions.

Refer to paragraph 5-19b.

Note: If difficulty arises in reassembly or disassembly of jack, frame assembly may be placed on its side, but should be supported by several four-by-four blocks to prevent falling.

CHAPTER 8

REPAIR OF LIFT AND SADDLE ASSEMBLY

Section I. DESCRIPTION

8-1. General.

The lift and saddle assembly (Fig. 5-3 and 1-2) consists primarily of a saddle, saddle bracket, lifting arm springs, parallel bar pins, and parallel arms.

8-2. Description of Main Components.

Note: The key numbers in parentheses refer to figure 5-3 unless otherwise indicated.

- a. *Saddle*. The saddle (1) seats in the saddle bracket (8).
- b. *Saddle Bracket*. The saddle bracket (8) is hinged by pins to the parallel bars (28, Fig. 5-4) and parallel

arms (4).

c. *Parallel Bar Pins and Parallel Arms*. The parallel bar pins and parallel arms (4) are hinged by pins to the frame and wheel assembly.

d. *Lifting Arm Springs*. The lifting arm springs (10) are connected in a manner to support the necessary tension to return the lift and saddle assembly to the lower position when the hydraulic pressure is released. Through this hinging and spring tension arrangement the lift and saddle assembly moves in the upward or downward directions by the operation of the cylinder and ram assembly.

Section II. DISASSEMBLY

8-3. Removal.

Refer to paragraph 5-20a.

8-4. Disassembly Instructions.

Refer to paragraph 5-20a.

Section III. REASSEMBLY

8-5. Reassembly Instructions.

Refer to paragraph 5-20b.

8-6. Installation Instructions.

Refer to paragraph 5-20b. Note: If difficulty arises

in reassembly or disassembly of jack, frame assembly may be placed on its side, but should be supported by several four-by-four blocks to prevent falling.

CHAPTER 9

REPAIR OF FRAME AND WHEEL ASSEMBLY

Section I. DESCRIPTION

9-1. General.

The frame and wheel assembly (Fig. 5-4 and 1-2) consists primarily of a one piece welded frame, a wheel axle, two casters and brackets, and two front wheels.

9-2. Description of Main Components.

Note: The key numbers in parentheses refer to figure 5-4 unless otherwise indicated.

a. *Frame.* The frame assembly (9) is made of heavy steel and is properly machined and constructed for mounting the main components and assemblies of the jack.

b. *Casters.* The two caster wheels (24) are mounted in the pump closet assemblies (15) located on each side of the rear of the frame, Each caster assembly. (20) consists of a caster yoke (25), headless straight pin (23), caster wheel (24), cotter pin (22), and caster yoke (25). There are upper cone and rollers (13) and lower cone and rollers (19). The casters facilitate transporting the jack and rotate on the bearings.

c. *Front Wheels.* The two front wheels (5) each consist of a front wheel retainer (4), front wheel (5), front wheel bearing (6), and washers. A wheel is mounted on the wheel axle on each side of the frame,

Section II. DISASSEMBLY

9-3. Removal.

Refer to paragraph 5-21a.

9-4. Disassembly.

Note: The key numbers in parentheses refer to figure 5-4 unless otherwise indicated.

a. *General.* This paragraph contains disassembly instructions for the frame and wheel assembly. Paragraphs are arranged in the order in which the parts should logically be removed. This is the responsibility of direct support and general support

maintenance as authorized by the Maintenance Allocation Chart.

b. *Disassembly of Frame and Wheel Assemble.*

(1) *Cone and rollers.* Remove cone and rollers (13), then remove stamped closure (20). Remove cone and rollers (19) and knock out tapered roller cup (14) with a soft metal punch.

(2) *Front wheel assembly.* Remove cotter pin (22). Slide headless straight pin (23) through wheel. Remove roller assembly (26).

(3) Refer to paragraph 5-21a for additional disassembly.

Section III. REASSEMBLY

9-5. Reassembly Instructions.

a. *Cone and Rollers.* Drive tapered roller cup (14) into place. Replace cone and rollers (13). Replace cone and rollers (19), then install new stamped closure (20).

b. *Front Wheel Assembly.* To reassemble, use reverse procedure of disassembly.

9-6. Installation Instructions.

Refer to paragraph 5-21 b.

Note: If difficulty arises in reassembly or disassembly of jack, frame assembly may be placed on its side, but should be supported by several four-by-four blocks to prevent falling.

APPENDIX A REFERENCES

A-1. Forms.

DA Form 2028, Recommended Changes to Publications
DA Form 2404, Equipment Inspection and Maintenance Worksheet

A-2. Supply Manuals.

Jack, Hand, Hydraulic, Roller Car Type, 10 Ton Capacity
(Weave Model WA-75) (41-J-154)..... SNL J-525

A-3. Army Regulations.

Control of COSMEC Material. AR 380-41
Intensive Management of Secondary Items. AR 710-50
Organization, Policies, and Responsibilities for
Maintenance Operation AR 750-5

A-4. Technical Manuals.

Administrative Storage of Equipment TM 740-90-1
Depot Maintenance: Lift Two-Speed, 10-Ton-Capacity, Hydraulic
Dolly-Type Jack (Weaver Model WA-75) (4910-289-7233) TM 9-4910-262-50
Inspection, Care, and Maintenance of Antifriction Bearings. TM 9-214
Operator's Manual: Welding Theory and Application. TM 9 -237
Painting Instructions for Field Use.. . . . TM 9-213
The Army Maintenance Managements Systems (TAMMS) TM 38-750

A-5. Publication Indexes.

Index of Blank Forms DA PAM 310-2
Index of Technical Manuals Technical Bulletins, Supply Manuals (types 7,8, and 9),
Supply Bulletins, and Lubrication Orders. DA PAM 310-4

A-6. Lubrication.

Jack, Dolly Type, Hydraulic 10 Ton Capacity, Two-Speed, 16-Inch Lift
(Weaver Mfg Co. Model WA-75). LO 9-4910-262-12
Grease (FSN 9150-249-0908). MIL-G-18709
Hydraulic Oil (FSN 9150-985-7234). MIL-L-17672
Lubricating Oil (FSN 9150-231-6689) MIL-L-664

A-7. Other Publications.

Defense Demilitarization Manual DOD 4160.21-M-1
Federal Supply Code for Manufacturers - United States and Canada -
Code to Name (Cataloging Handbook H4-2. SB 708-42
Storage Serviceability Standard for USA WECOM Materiel: Tools and Equipment. SB 740-95-501

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General.

a. The maintenance allocation chart assigns authorized maintenance functions to each maintenance category. Maintenance functions will be assigned to the lowest available maintenance category based on a past experience in skills available, time required, and tools and test equipment authorized.

b. The basic entries on the maintenance allocation chart will be a list of functional groups applicable to the end items which may require maintenance parts. The term functional group applies to assemblies and subassemblies, but not to piece parts.

B-2. Maintenance Functions.

Maintenance functions will be limited to and defined as follows:

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

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

c. *Service*. To clean, preserve, and lubricate.

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

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

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

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

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

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

j. *Overhand*. To restore an item to a completely serviceable condition as prescribed by maintenance

serviceability standards using the inspect and repair only as necessary (IROAN) technique.

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

l. *Symbols*. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. Explanation of Columns.

Purpose and use of the format are as follows:

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

b. *Functional Group, Column 2*. This column lists the noun names of components, assemblies, subassemblies, and items on which maintenance is authorized.

c. *Maintenance Functions, Column 3*. This column lists the lowest available maintenance category authorized to perform the maintenance functions, as indicated by the letters C, O, F, H, and D.

d. *Tools and Equipment, Column 4*. This column shall be used to specify, by code, those tools and test equipment required to perform the designated function.

e. *Remarks, Column 5*. Self-explanatory.

f. *Use of Letters*. Explanations of the use of letters in column 3 are as follows:

Code	Explanation
C	Operator crew
O	Organizational
F	Direct Support
H	General Support
D	Depot Maintenance

**MAINTENANCE ALLOCATION CHART
FOR
JACK, DOLL Y-TYPE, HYDRAULIC**

(1) Group No.	(2) Functional Group	(3) Maintenance Function										(4) Tools & Equip.	(5) Remarks	
		Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul			Rebuild
1	HANDLE ASSEMBLY	C	C	O	—	—	—	F	F	F	F	D		
2	CYLINDER AND RAM ASSEMBLY	O	C	F	H	—	—	H	H	H	H	D		
3	LIFT AND SADDLE ASSEMBLY	C	C	F	—	—	—	F	F	F	F	D		
4	FRAME AND WHEEL ASSEMBLY	C	C	O	—	—	—	F	F	F	F	D		

APPENDIX C

ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

Section L INTRODUCTION

C-1. Scope.

This appendix lists repair parts and special tools required by the operator/crew for operation and required for the performance of organizational, direct support, and general support maintenance of the hydraulic dolly-type jack test set.

C-2. General.

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

- a. *Basic Issue Items List*. Not applicable.
- b. *Items Troop Installed or Authorized List*. Not applicable.
- c. *Repair Parts List — Section II*. A list of repair parts authorized at the organizational level for the performance of maintenance in figure and item number sequence.
- d. *Special Tools List*. A list of special tools, test and support equipment authorized for the performance of maintenance at the organizational level. Not applicable.
- e. *Repair Parts List — Section III*. A list of repair parts authorized for the performance of maintenance at the direct support, general support, and depot levels.
- f. *Special Tools List*. A list of special tools, test and support equipment authorized for the performance of maintenance at the direct support, general support, and depot levels. Not applicable.
- g. *Federal Stock Number and Reference Number Index — Section IV*. A list, in ascending numerical sequence, of all Federal stock numbers appearing in the listings, followed by a list, in alphameric sequence, of all reference numbers appearing in the listings. Federal stock number and reference numbers are cross-referenced to each illustration figure and item number appearance.

C-3. Explanation of Columns.

The following provides an explanation of columns found in the tabular listings.

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

(1) *Source code*. Indicates the source for the listed items. Source codes are:

code	Explanation
P	Repair Parts, Special Tools and Test Equipment supplied from the GSA/DSA or Army supply system and authorized for use at indicated maintenance categories.
P2	Repair Parts, Special Tools and Test Equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COSMEC Logistic System and which are not subject to the provisions of AR 330-41.
PI0	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COSMEC support, which are accountable under the provisions of AR 380-41, and which are stocked and supplied by the Army COSMEC Logistic System.
M	Repair Parts, Special Tools and Test Equipment which are not procured or stocked as such in the supply system, but are to be manufactured at indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
x	Parts and assemblies that are not procured or stocked because the failure rate is normally below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
x1	Repair Parts which are not procured or stocked. The requirement for such items will be filled by the next higher assembly or component.
x2	Repair Parts, Special Tools, and Test Equipment which are not stocked and have no foreseen mortality. The indicated maintenance category requiring such repair parts will attempt to obtain the parts through cannibalization or salvage. The item may be requisitioned with exception data, from the end item manager for immediate use.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DS and GS level. These assemblies will not be stocked above the DS and GS level or returned to depot supply level.

Note: Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded X1 and aircraft support items as restricted by AR 700-42.

(2) *Maintenance code.* Indicates the lowest category of maintenance authorized to install the repair part and/or use the special tool or test equipment for each application. Capabilities of higher maintenance categories are considered equal or better. Maintenance codes are:

<i>Code</i>	<i>Explanation</i>
C	Crew/operator
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance
R	Repair parts (assemblies and components), special tools and test equipment which are considered economically repairable at direct and general support maintenance levels. When the item is no longer economically repairable, it is normally, disposed of at the GS level. When supply considerations dictate, some of these repair parts may be listed for automatic return to supply for depot level repair as set forth in AR 710-50. When so listed, they will be replaced by supply on an exchange basis.
S	Repair parts, special tools and test equipment, and assemblies which are economically repairable at DS and GS activities which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High dollar value recoverable repair parts, special tools and test equipment which are subject to special handling and are issued on an exchange basis. Such items will be repaired or overhauled at depot maintenance activities only. No repair may be accomplished at lower levels.
U	Repair parts, special tools and test equipment specifically selected for salvage by reclamation units because of precious metal content, critical materials, high dollar value, or reusable casings or castings.

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

c. *Description.* Indicates the Federal item name and a minimum description required to identify the item. The last line indicates the reference number followed by the applicable Federal Supply Code for Manufacturer (FSCM) in parentheses. The FSCM is used as an element in item identification to designate manufacturer or distributor or Government agency, etc., and is identified in SB 708-42. Items that are included in kits and sets are listed below the name of the kit or set with quantity of each item in the kit or set indicated in front of the item name.

d. *Unit of Measure (U/M).* Indicates the standard or basic, quantity by which the listed item is used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation. e. g., ea, in., pr, etc., and is the basis used to indicate quantities and allowances in subsequent columns. When the unit of measure differs

from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

e. *Quantity Incorporated in Unit.* Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, e.g., shims, spacers, etc.

f. *Maintenance Allowances.* All items are authorized for use as required.

g. *Illustration.* This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown.

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

C-4. Special Information.

Repair parts kits appear as the last entries in the repair parts listing for the group or assembly to which they apply.

C-5. How to Locate Repair Parts.

a. When Federal stock number or reference number is unknown:

(1) *First.* Find the illustration of the assembly to which the repair part belongs, i.e., handle, frame and wheel, cylinder and ram, or lift and saddle.

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

(3) *Third.* Using the Repair Parts Listing, find the assembly to which the repair part belongs and locate the illustration figure and item number noted on the illustration.

b. When Federal stock number or reference number is known:

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

(2) *Second.* Using the Repair Parts Listing, find the assembly of the repair part and the illustration figure number and item number reference in the index of Federal Stock Numbers and Reference Numbers.

C-6. Abbreviations.

<i>Abbreviation</i>	<i>Explanation</i>
c/o	consist of
er-pltd	chromium plated
int	internal
NC	American National Coarse Thread
UNC	Unified Coarse Thread
UNF	Unified Fine Thread

Section II. ORGANIZATIONAL REPAIR PARTS LIST

Act on code	(1) Source maint and recov code			(2) Federal stock NO.	(3) Description Reference Number & Mfr Code Usable on Code	(4) Unit of eas	(5) Qty req in unit	(6) 15 Day organizational maintenance allow				(7) Illustration	
	(a) Source	(b) Maint	(c) Recov					(a) -5	(b) -20	(c) 1-50	(d) 1-100	(a) Figure No.	(b) Item No.
P	0	I.	5305-054-9271	HANDLE ASSEMBLY SETSCREW MS-51955-36 (96906)	EA	1	*	*	*	*	S-1	26	
P	0		5305-054-9260	SETSCREW 1/4UNC X 3/4 IN. MS - 5 1 9 5 5 - 4 (96906)	EA	2	*	*	*	*	5-1	34	
P	0		5305-054-9271	CYLINDER AND RAM ASSEMBLY SETSCREW MS-51955-36 (96906)	EA	1	*	*	*	*	5-2	37	
P	0		4730-050-4208	LIFT AND SADDLE ASSEMBLY FITTING, LUBRICATION MS-15003-1 (96906)	EP	3	*	*	*	*	5-3	15	
P	0		4730-050-4208	FITTING, LUBRICATION MS-15003-1 (96906)	EA	3	*	*	*	*	5-3	19	
P	0		4730-050-4208	FRAME AND WHEEL ASSEMBLY FITTING, LUBRICATION MS-15003-1 (96906)	EA	3	*	*	*	*	5-4	1	
P	0		5310-261-7156	WASHER, LOCK 1/2 IN. MS-35333-78 (96906)	EA	6	*	*	*	*	5-4	17	

Section III. REPAIR PARTS LIST

(1) SMR code	(2) Federal stock No.	(3) Description Reference no. & mfr. code Usable on code		(4) Unit of meas	(5) Qty inc in unit	(6) 30-day DS maint allowance			(7) 30-day GS maint allowance			(8) 1-yr alw per 100 equip cntgey	(9) Illustration	
						(a) 1-20	(b) 21-50	(c) 51-100	(a) 1-20	(b) 21-50	(c) 51-100		(a) Figure no.	(b) Item No.
REPAIR PARTS FOR: HANDLE ASSEMBLY														
P F	5315-236-8357		PIN, COTTER 1/8 IN. X 1 IN. MS-24665-36 (96906)	EA	1	*	*	*	*	*	*	*	5-1	1
X2 F			PLUNGER RETURN ROD AS-9784 (64161)	EA	1								5-1	2
X2 F			PLUNGER RETURN SPRING S-9786 (64161)	EA	1								5-1	3
P F	5305-054-9259		SETSCREW 1/4NC X 5/8 IN. (MS-51955-3)	EA	1	*	*	*	*	*	*	*	5-1	4
X2 F			FOOT LEVER PIN S-24740 (64161)	EA	1								5-1	5
P F	5315-236-8359		PIN, COTTER 1/8 IN. X 1 IN. (MS-24665-370)	EA	2	*	*	*	*	*	*	*	5-1	6
X2 F			CLEVIS PIN S-24659 (64161)	EA	1								5-1	7
X2 F			PUMP LINK ASSEMBLY AS-9785 (64161)	EA	1								5-1	8
P F	5120-474-8973		SPRING, LIFTING ARM S-1365 (64161)	EA	1	*	*	*	*	*	*	*	5-1	9
X2 F			HANDLE RETURN PIN S-5263 (64161)	EA	1								5-1	10
X2 F			RETURN GUIDE ASSEMBLY AS-20415 (64161)	EA	1								5-1	11
X2 F			RELEASE LEVER PIN S-6586 (64161)	EA	1								5-1	12
P F	5315-013-7146		PIN, COTTER 1/16 IN. X 3/4 IN. MS-24665-816 (96906)	EA	4	*	*	*	*	*	*	*	5-1	13
X2 F			RELEASE YOKE PIN S-4710 (64161)	EA	1								5-1	14
X2 F			CLEVIS S-5123 (64161)	EA	1								5-1	15
X2 F			RELEASE PULL ROD S-6576 (64161)	EA	1								5-1	16
P F	5310-939-2655		NUT, PLAIN, HEXAGON 5/16-24UNF MS-51972-2 (96906)	EA	2	*	*	*	*	*	*	*	5-1	17

Section III. REPAIR PARTS LIST - Continued

(1) SMR code	(2) Federal stock No.	(3) Description Reference no. & mfr. code Usable on code		(4) Unit of meas	(5) Qty inc in unit	(6) 30-day DS maint allowance			(7) 30-day GS maint allowance			(8) 1-yr alw per 100 equip enrgy	(9) Illustration	
						(a)	(b)	(c)	(a)	(b)	(c)		(a) Figure no.	(b) Item No.
						1-20	21-50	51-100	1-20	21-50	51-100			
		REPAIR PARTS FOR: - Continued												
		HANDLE ASSEMBLY - Continued												
P F	5120-474-8098	LEVER, JACK RELEASE 1148 (64161)		EA	1	*	*	*	*	*	*	*	5-1	18
X2 F		ROLL PIN S-15694 (64161)		EA	1								5-1	19
X2 F		PIN, STRAIGHT, HEADLESS 3/4 IN. X 6-1/2 IN. S-6551 (64161)		EA	1								5-1	20
P F	5310-012-3274	NUT, PLAIN, HEXAGON (MSS-5310-23)		EA	5	*	*	*	*	*	*	*	5-1	21
P F	5310-584-5272	WASHER, LOCK INT, 1/2 IN., CR-PLTD MS-35338-10 (96906)		EA	5	*	*	*	*	*	*	*	5-1	22
P F	5306-426-3080	BOLT, MACHINE 1/2-13NC X 2-3/4 IN. C-1619 (35311)		EA	4	*	*	*	*	*	*	*	5-1	23
X2 F		TIE FRAME END 1423 (64161)		EA	1								5-1	24
P F	5120-474-8097	LEVER, QUICK LIFT 1416 (64161)		EA	1	*	*	*	*	*	*	*	5-1	25
P O	5305-054-9271	SETSCREW MS-51955-36 (96906)		EA	1	*	*	*	*	*	*	*	5-1	26
X2 F		HANDLE YOKE M-1414-1 (64161)		EA	1								5-1	27
X2 F	5120-474-8974	SPRING, LOCK ROD S-2329 (64161)		EA	1								5-1	28
P F	5315-013-7146	PIN, COTTER 1/16 IN. X 3/4 IN. MS-24665-816 (96906)		EA	4	*	*	*	*	*	*	*	5-1	29
X2 F		LOCK ROD ASSEMBLY AS-6550 (64161)		EA	1								5-1	30
X2 F		HANDLE ASSEMBLY AS-6660 (64161)		EA	1								5-1	31
X2 F		RELEASE HANDLE ASSEMBLY: C/O AS-22107 (64161)		EA	1								5-1	
X1 -		ROLL PIN S-23689 (64161)		EA	1								5-1	32
P F	5120-474-8100	LOCK, RELEASE S-7075 (64161)		EA	1								5-1	33

Section III. REPAIR PARTS LIST - Continued

(1) SMR code	(2) Federal stock No.	(3) Description Reference no. & mfr. code Usable on code	(4) Unit of meas	(5) Qty inc in unit	(6) 30-day D8 maint allowance			(7) 30-day G8 maint allowance			(8) 1-yr aw per 100 equip cntgy	(9) Illustration	
					(a) 1-20	(b) 21-50	(c) 51-100	(a) 1-20	(b) 21-50	(c) 51-100		(a) Figure no.	(b) Item No.
					REPAIR PARTS FOR: - Continued								
CYLINDER AND RAM ASSEMBLY - Continued													
X1		RAM CUP S-24649 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	9	
X1		RING S-24703 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	10	
X2	H	RAM HEAD M-1154-1 (64161)	EA	1							5-2	11	
P	H	5340-058-7951 PLUG, EXPANSION 587951	EA	1	*	*	*	*	*	*	5-2	12	
X2	F	LEVER SPRING WASHER S-19990 (64161)	EA	1							5-2	13	
X2	H	LEVER FRICTION SPRING S-8624 (64161)	EA	1							5-2	14	
X2	H	PUMP PACKING NUT 1167-A (64161)	EA	1							5-2	15	
X1		PLUNGER PACKING S-7412 (64161)	EA	3	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	16	
X2	H	PUMP PLUNGER ASSEMBLY: C/O AS-24498 (64161)	EA	1							5-2		
X2	H	PUMP PLUNGER S-24497 (64161)	EA	1							5-2	17	
P	F	5310-939-2655 NUT, PLAIN, HEXAGON 5/16-24UNF MS-51972-2 (96906)	EA	2							5-2	18	
P2	H	PUMP LEATHER - WASHER S-7413 (64161)	EA	1							5-2	19	
X1		PUMP CUP LEATHER S-24648 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	20	
X1		RING S-24690 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	21	
P	F	5315-013-7146 PIN, COTTER 1/16 IN. X 3/4 IN. MS-24665-816 (96906)	EA	4	*	*	*	*	*	*	5-2	22	
X2	F	5/16-INCH HEADED STRAIGHT PIN S-24805 (64161)	EA	1							5-2	23	
X2	F	NEEDLE EXTENSION S-7180 (64161)	EA	1							5-2	24	
P	H	5310-177-6768 NUT, PLAIN, HEXAGON 3/8-16UNC MS-35649-2384 (96906)	EA	2	*	*	*	*	*	*	5-2	25	

Section III. REPAIR PARTS LIST - Continued

(1) SMR code	(2) Federal stock No.	(3) Description Reference no. & mfr. code Usable on code	(4) Unit of meas	(5) Qty inc in unit	(6) 30-day DS maint allowance			(7) 30-day GS maint allowance			(8) 1-yr alw per 100 equip cntgry	(9) Illustration	
					(a) 1-20	(b) 21-50	(c) 51-100	(a) 1-20	(b) 21-50	(c) 51-100		(a) Figure no.	(b) Item No.
		REPAIR PARTS FOR: - Continued											
		CYLINDER AND RAM ASSEMBLY - Continued											
P2 H		RELEASE VALVE ASSEMBLY AS-24684 (64161)	EA	1	*	*	*	*	*	*	*	5-2	26
P F	5315-013-7146	PIN, COTTER 1/16 IN. X 3/4 IN. MS-24665-816 (96906)	EA	4	*	*	*	*	*	*	*	5-2	27
X2 F		RELEASE LINK S-24685 (64161)	EA	1								5-2	28
X2 F		PIN S-4632 (64161)	EA	1								5-2	29
X2 F		PLUNGER ROD YOKE S-4821 (64161)	EA	1								5-2	30
X2 H		RELEASE SPRING S2591 (64161)	EA	1								5-2	31
X2 H		RELEASE VALVE GUIDE S-5173 (64161)	EA	1								5-2	32
X2 H		RELEASE PACKING NUT S-5176 (64161)	EA	1								5-2	33
P2 H		PACKING ASSEMBLY: C/O AS-21052 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2		
X1		O-RING 3/8 INCH S-17829 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	34	
X1		PACKING HOUSING S-21051 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	35	
X1		O-RING 1/4 INCH S-15047 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	36	
P O	5305-054-9271	SETSCREW MS-51955-36 (96906)	EA	1	*	*	*	*	*	*	*	5-2	37
X2 H		BALL CHAMBER PLUG S-5171 (64161)	EA	1								5-2	38
P H	5120-357-6005	GASKET, PLUG BALL S-5125 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	39	
X2 H		VALVE DISCHARGE BALL S-5122 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	40	
X2 H		INTAKE BALL WEIGHT S-5355 (64161)	EA	1								5-2	41
X2 H	3110-277-0213	BALL BEARING 7/16 INCH DIAMETER S-3282 (64161)	EA	1	SEE REPAIR KIT, REBUILD AS-24744 (64161)						5-2	42	
P2 F		FILLER PLUG S-5178 (64161)	EA	1	*	*	*	*	*	*	*	5-2	44

Section III. REPAIR PARTS LIST - Continued

(1) SMR code	(2) Federal stock No.	(3) Description Reference no. & mfr. code Usable on code		(4) Unit of meas	(5) Qty inc in unit	(6) 30-day DS maint allowance			(7) 30-day GS maint allowance			(8) 1-yr allow per 100 equip cntgcy	(9) Illustration	
						(a)	(b)	(c)	(a)	(b)	(c)		(a) Figure no.	(b) Item No.
						1-20	21-50	51-100	1-20	21-50	51-100			
		REPAIR PARTS FOR: - Continued												
		CYLINDER AND RAM ASSEMBLY - Continued												
X2	F		PUMP ASSEMBLY (COMPLETE UNIT)	EA	1								5-2	45
P2	H		AS-24691 (64161) REPAIR KIT, REBUILD: C/O AS-24744 (64161)	EA	1	*	*	*	*	*	*	*	5-2	
			1 - PISTON PACKING NUT										5-2	1
			1 - GASKET										5-2	4
			1 - RAM CUP										5-2	9
			1 - RING										5-2	10
			3 - PLUNGER PACKING										5-2	16
			1 - PUMP CUP LEATHER										5-2	20
			1 - RING										5-2	21
			1 - PACKING ASSEMBLY: C/O										5-2	..
			1 - O-RING 3/8 INCH										5-2	34
			1 - PACKING HOUSING										5-2	35
			1 - O-RING 1/4 INCH										5-2	36
			1 - GASKET PLUG BALL										5-2	39
			1 - VALVE DISCHARGE BALL										5-2	40
			1 - BALL BEARING 7/16 INCH DIAMETER										5-2	42
			LIFT AND SADDLE ASSEMBLY											
X2	F		SADDLE 1159 (64161)	EA	1								5-3	1
P	F	5315-842-3045	PIN, COTTER 3/16 IN. X 2-1/4 IN. MS-24665-499 (96906)	EA	2	*	*	*	*	*	*	*	5-3	2
X2	F		PIN, STRAIGHT, HEADLESS S-5158 (64161)	EA	1								5-3	3
X2	F		PARALLEL ARM S-24651 (64161)	EA	2								5-3	4
P	F	5305-071-2508	SCREW, CAP, HEXAGON 1/4-20NC X 3/8 IN MS90728-1 (96906)	EA	1	*	*	*	*	*	*	*	5-3	5
P	F	5310-543-2740	WASHER, LOCK INT, 1/4 IN. MS-35333-74 (A2309)	EA	1	*	*	*	*	*	*	*	5-3	6
X2	F		PIN, LIFTING ARM S-6580 (64161)	EA	1								5-3	7
X2	F		SADDLE BRACKET M-1433-1 (64161)	EA	1								5-3	8
X2	F		SECTOR SPRING KEY S-6577 (64161)	EA	1								5-3	9
P	F	5120-474-8973	SPRING, LIFTING ARM S-6603 (64161)	EA	2	*	*	*	*	*	*	*	5-3	10

Section IV. FEDERAL STOCK NUMBER AND REFERENCE NUMBER INDEX

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3110-140-4110	5-4	40	5310-261-1100	5-4	14
3110-277-0213	5-2		5310-367-3697	5-4	10
3110-606-1839	5-4		5310-477-676	5-2	25
3110-606-1841	5-4	..	5310-543-2740	5-3	6
3110-606-1842	5-4	14	t-310-582-5965	5-4	3
4730-050-4208	5-3	15	5310-584-5272	5-1	22
	5-3	19		5-2	7
	5-4		3310-842-1190	5-4	11
5120-357-6005	5-2	39	5310-924-4218	5-4	31
5120-357-6102	5-1	35	5310-939-2655	5-1	17
51X1-474-8097	5-1	25		5-2	18
5120-474-8098	5-1	18	5310-989-5525	5-4	16
5120-474-8100	5-1	33	5315-013-7146	5-1	13
5120-474-8973	5-1	9		5-1	29
	5-3	10		5-2	22
5120-474-8974	5-1	28		5-2	27
5305-054-9259	5-1	4	5315-043-1782	5-2	16
5305-054-9260	5-1	34	5315-059-0206	5-3	22
5305-054-9271	5-1	26	5315-236-8357	5-4	
	5-2	37	53 15-236-8359	5-1	
53050712508	5-3		5315-449-9608	5-1	23
5305-921-0929	5-4	2	5315-842-3045	5-4	2
5305-923-2587	5-4	18	5315-849-9854	5-3	12
5306-426-3080	5-1	23	5340-058-7951	5-3	12
5310-012-3274	5-1	21		5-2	
	5-2	6			

Section IV. FEDERAL STOCK NUMBER AND REFERENCE NUMBER INDEX — Continued

<i>Reference No.</i>	<i>Mfg. code</i>	<i>Ftg. No.</i>	<i>Item No.</i>	<i>Reference No.</i>	<i>Mfg. code</i>	<i>Ftg. No.</i>	<i>Item No.</i>
AS-12393	64161	5-4	32	S-1365	64161	5-1	9
AS-20415	64161	5-1	11	S-15047	64161	5-2	36
AS-21052	64161	5-2	...	S-15429	64161	5-4	20
AS-22107	64161	5-1	...	S-15694	64161	5-1	19
AS-24494	64161	5-2	...	S-17829	64161	5-2	34
AS-24498	64161	5-2	...	S-19990	64161	5-2	13
AS-24621	64161	5-4	21	S-21051	64161	5-2	35
AS-24654	64161	5-3	17	S-22963	64161	5-2	4
AS-24658	64161	5-4	9	S-2329	64161	5-1	28
AS-24684	64161	5-2	26	S-23689	64161	5-1	32
AS-24691	64161	5-2	45	S-24497	64161	5-2	17
AS-24744	64161	5-2	...	S-24648	64161	5-2	20
AS-6545	64161	5-1	...	S-24649	64161	5-2	9
AS-6550	64161	5-1	30	S-24650	64161	5-4	12
AS-6660	64161	5-1	31	S-24651	64161	5-3	4
AS-9784	64161	5-1	2	S-24659	64161	5-1	7
AS-9785	64161	5-1	8	S-24685	64161	5-2	28
C-1619	35311	5-1	23	S-24687	64161	5-4	30
CNE7	93234	5-4	19	S-24690	64161	5-2	21
LM-11910	60038	5-4	14	S-24703	64161	5-2	10
LM-11949	60038	5-4	13	S-24704	64161	5-4	27
M-1152-1	64161	5-4	24	S-24705	64161	5-4	33
M-1154-1	64161	5-2	11	S-24706	64161	5-4	28
M-1414-1	64161	5-1	27	S-24707	64161	5-3	13
M-1433-1	64161	5-3	8	S-24708	64161	5-4	29
M-60357	...	5-4	10	S-24709	64161	5-2	5
MS-15003-1	96906	5-3	15	S-24740	64161	5-1	5
		5-3	19	S-24805	64161	5-2	23
		5-4	1	S-2591	64161	5-2	31
MS-18153-6	96906	5-4	2	S-3282	64161	5-2	42
MS-24665-36	96906	5-1	1	S-4632	64161	5-2	29
MS-24665-370	...	5-1	6	S-4710	64161	5-1	14
MS-24665-491	96906	5-4	22	S-4821	64161	5-2	30
MS-24665-498	96906	5-3	12	S-5122	64161	5-2	40
MS-24665-499	96906	5-3	2	S-5123	64161	5-1	15
MS-24665-501	96906	5-3	16	S-5125	64161	5-2	39
MS-24665-816	96906	5-1	13	S-5127	64161	5-3	11
		5-1	29	S-5158	64161	5-3	3
		5-2	22	S-5171	64161	5-2	38
		5-2	27	S-5173	64161	5-2	32
MS-35308-411	96906	5-4	18	S-5176	64161	5-2	33
MS-35333-74	A2309	5-3	6	S-5178	64161	5-2	44
MS-35333-78	96906	5-4	17	S-5181	64161	5-2	8
MS-35338-10	96906	5-1	22	S-5200	64161	5-4	7
		5-2	7	S-5261	64161	5-1	36
MS-35338-44	80045	5-4	3	S-5263	64161	5-1	10
MS-35649-2384	96906	5-2	25	S-5355	64161	5-2	41
MS-35691-61	96906	5-4	11	S-6551	64161	5-1	20
MS-3659-39	96906	5-4	16	S-6576	64161	5-1	16
MS-51955-3	...	5-1	4	S-6577	64161	5-3	9
MS-51955-36	96906	5-1	26	S-6580	64161	5-3	7
		5-2	37	S-6586	64161	5-1	12
MS-51955-4	96906	5-1	34	S-6592	64161	5-3	18
MS-51970-1	96906	5-4	31	S-6603	64161	5-3	10
MS-51972-2	96906	5-1	17	S-6615	64161	5-2	2
		5-2	18	S-7075	64161	5-1	33
MS-90728-1	96906	5-3	5	S-7111	64161	5-4	23
MSS-5310-23		5-1	21	S-7180	64161	5-2	24
		5-2	6	S-7412	64161	5-2	16
S-11103	64161	5-4	6	S-7413	64161	5-2	19
S-12588	64161	5-4	5	S-8624	64161	5-2	14

Section IV. FEDERAL STOCK NUMBER AND REFERENCE NUMBER INDEX – Continued

<i>Reference No.</i>	<i>Mfg code</i>	<i>Fig. No.</i>	<i>Item No.</i>	<i>REFERENCE No</i>	<i>Mfg code</i>	<i>Fig. No.</i>	<i>Item No.</i>
S-9147	64161	5-4	4	127891	24617	5-4	26
S-9149	64161	5-4	8	1416	64161	5-1	25
S-9786	64161	5-1	3	1423	64161	5-1	24
1148	64161	5-1	18	1426	64161	5-2	3
1157	64161	5-1	35	1427	64161	5-2	1
1158	64161	5-3	14	2028	64161	5-4	15
1159	64161	5-3	1	2030	64161	5-4	25
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By Order of the Secretary of the Army:

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

Official:

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

Distribution:

Active Army:

DCSLOG (1)
CNGB(1)
CofSpts (1)
Dir of Trans (1)
TSG (1)
USARADBBD (1)
USAARENBD (1)
USAMC (2)
CON ARC (3)
USACDCEC(10)
ARADCOM (2)
ARADCOM Rgn (2)
USAREUR (1)
USAS/TC&FG (3)
LOGCOMD (3)
Engr FLDMS (2)
Ft Knox FLDMS (10)
QM FLDMS (1)
USATCFE (2)
USAOC&S (1)
USACOMZEUR (3)
USAWECOM (10)
USAAPSA (4)
Armies (3) except
 Seventh (5)
 Eighth (5)
USARJ (2)
USARHAW (2)
Edgewood Arsenal(1)
RSA (1)

A Depots (2)
USAATC (2)
WSMR (5)
USSOUTHCOM (1)
USARYIS (3)
USARAL (1)
ARMISH/MAAG Iran (1)
Units org under fol TOE's
 (2copies each)
 7-100
 9-9
 9-198
 9-247
 9-357
 10-349
 17
 17-100
 29-11
 29-21
 29-25
 29-26
 29-35
 29-36
 29-75
 29-79
 29-137
 29-427
 37
 37-100

NC: State AC (3); Units, same as Active Army except allowance is one (1) copy to each unit

USAR: None

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

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE
DOPE ABOUT IT ON THIS FORM.
CAREFULLY TEAR IT OUT, FOLD IT
AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE
NO.

PARA-
GRAPH

FIGURE
NO.

TABLE
NO.

IN THIS SPACE, TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

THE METRIC SYSTEM AND EQUIVALENTS

WEIGHT 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 lb.
 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 = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

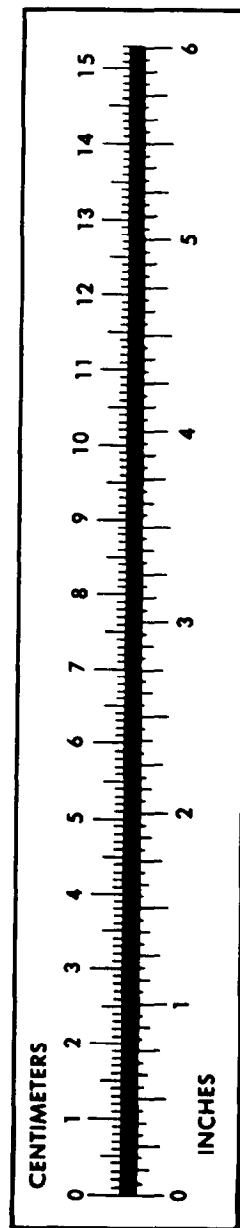
TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
its	Liters	0.473
arts	Liters	0.946
allons	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 Square 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
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square 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
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 022695-000