Technical Manual

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)

BACKHOE, 2 YARDS CAPACITY
NSN 3815-01-153-1867

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1990

List of Warnings

Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use In a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F 1380F (38°C 590C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Compressed air, used for cleaning purposes will not exceed 301 psi. Use only with effective chip guarding and personnel protective equipment (goggles / s field / gloves, ect.).

Before operating in the vicinity of electrical power lines, refer 1 3 TB 385-101.

Never allow a loaded boom to compress the backstop springs. I1 this minimum clearance is not maintained, tension within the boom hoist may collapse the gantry over the backstops.

Keep hands and clothing clear of the rotating drum.

The live end of the rope must be In a straight line through the socket.

Make sure the rope is not kinked at the point where it leaves the socket.

Wear approved leather gloves when working with wire rope.

TM 5-3815-221-14&P
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CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 11 September 1992

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)

BACKHOE, 2 YARDS CAPACITY
NSN 3815-01-153-1867

Current as of 1 May 1992

TM 5-3815-221-14&P, dated 12 September 1990, is changed as follows:

1. Remove old pages and insert new pages.

2. New or changed material is indicated by an asterisk in the margin of the page.

Remove Pages	Insert Pages
2-1 and Figure 3	2-1 and Figure 3
4-1 through 6-1	4-1 through 6-1
I-1 through I-8	I-1 through 1-8

3. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
02895

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TECHNICAL MANUAL

NO. 5-3815-221-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 12 September 1990

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

BACKHOE, 2 YARDS CAPACITY
NSN 3815-01-153-1867

Current as of 14 March 1990

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, Ml 48397-5000. A reply will be furnished to you.

This technical manual is an authentication of the manufacturers commercial literature and does not conform with the format and contents specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

TABLE OF CONTENTS

GENERAL INFORMATION

Figure 1 illustrates the backhoe attachment for the Model 5060 Crane. This manual is confined to lubrication, installation and removal, adjustments, and general information concerning operation and maintenance of the backhoe attachment. It will also contain repair parts information

BACKHOE WORKING RANGES

The working ranges and other pertinent specifications are tabulated in Figure 2

OPERATION

Positioning the Crane. Position the crane so that most of the work will be over the front or rear of the crawler. Dumping or unloading should be done over the sides of the crawler, if possible. Set the propel brakes. See Crane Operator's Manual.

Operating Cycle. The backhoe operating cycle consists of four steps; filling the dipper, hoisting, swinging, and dumping. During backhoe operation, tension must be maintained in both the left and the right drum lines at all times, since they are interdependent. Start the crane engine and operate the backhoe as given in the next steps

The function of the drums during backhoe operation are tabulated below. The numbers in the column "controls" correspond to the items in Figure 2-1 of TM 5-3810-303-14.

Drum	Function	Controls
Left	Dipper Stick	5, 6, 23, 25
Right	Backhoe Boom	4, 8, 24, 26
Boom Hoist	Backhoe Boom Line	11

During backhoe operation install the planetary lowering lockouts(see Figure 2-4, Item48 of TM5-3810-303-14).

INSTALLING BACKHOEATTACHMENT

GENERAL

The Truck Crane may be converted to backhoe operation by removing the crane boom and installing the backhoe front end attachment. The components necessary for the equipment conversion are: backhoe boom, backhoe bucket, auxiliary gantry mast, auxiliary gantry backstop assembly, digging cable, and boom hoist cable.

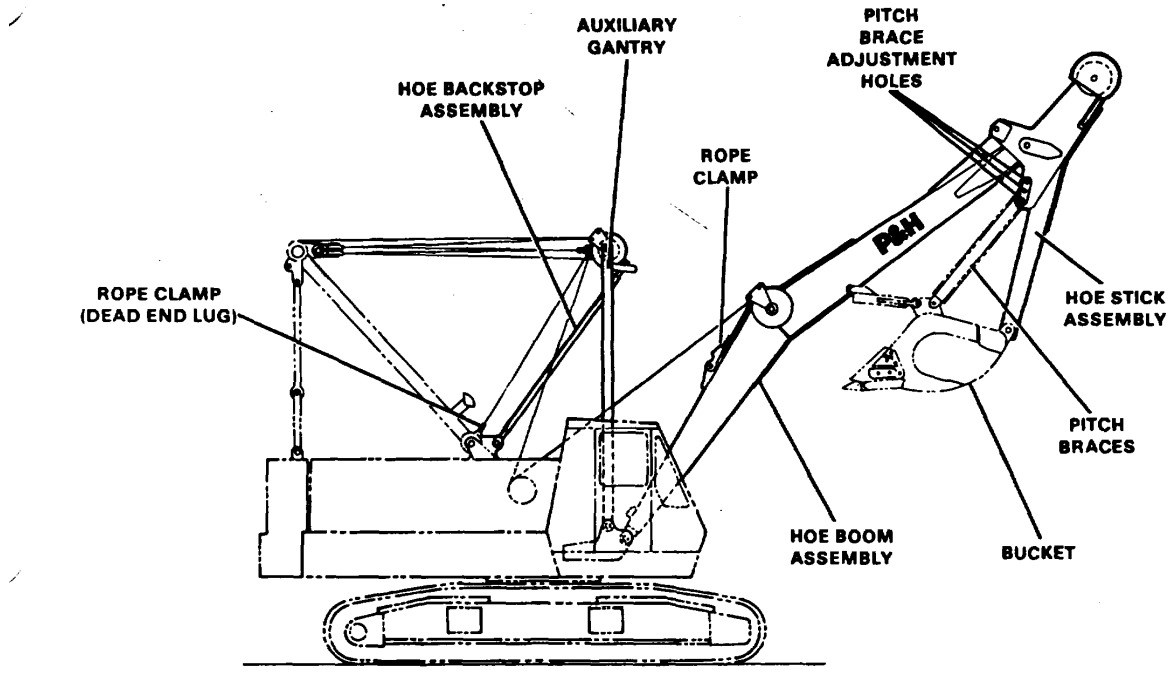


Figure 1. Backhoe Assembly

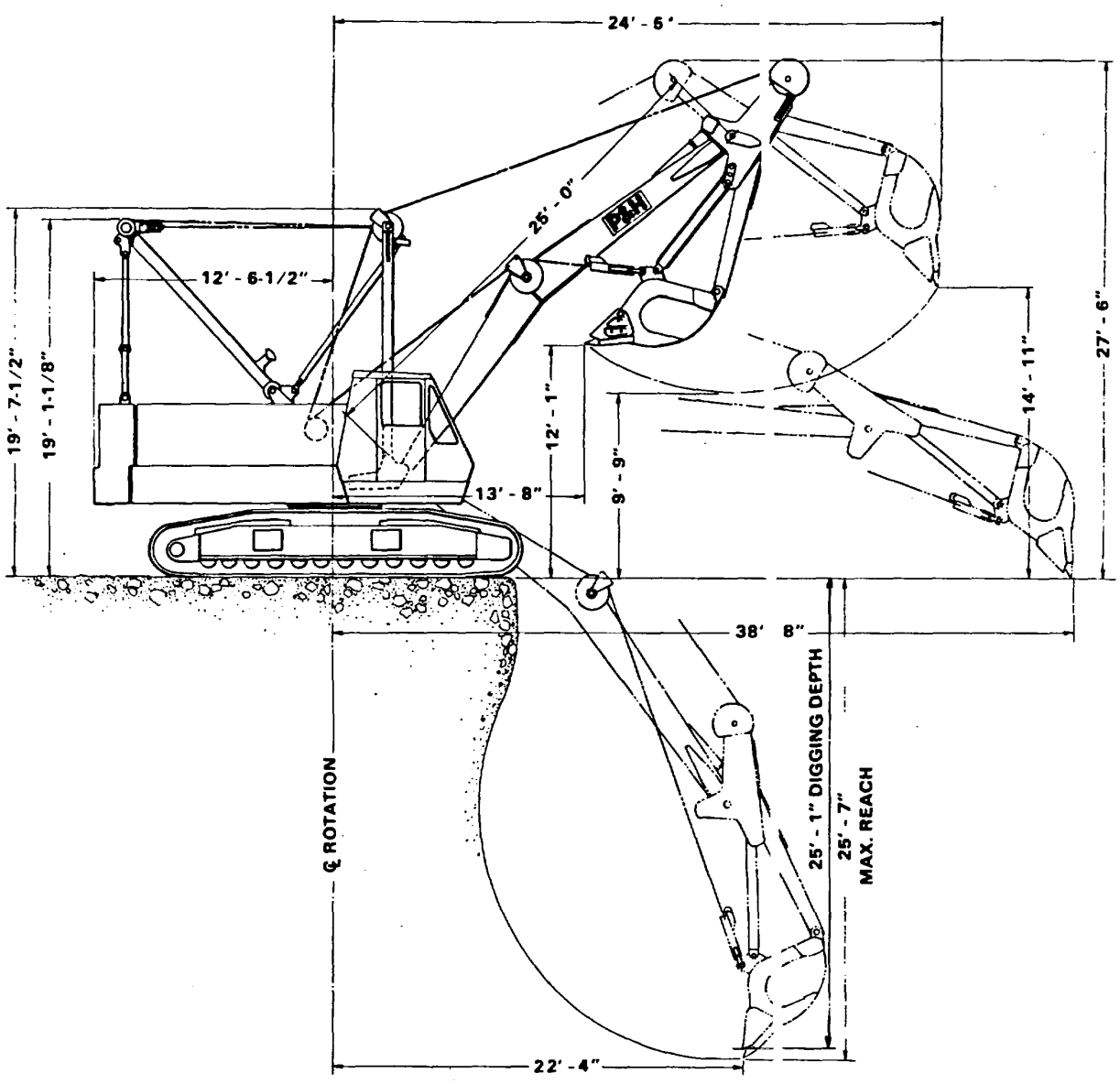


Figure 2. Trench Hoe Range Diagram

To install the Backhoe Attachment the auxiliary gantry must be installed first. then the backstop installed. Next the boom hoist is reeved and the gantry is raised to allow Installation of the backhoe boom. Finally the hoist and digging drum cable is installed. The following paragraphs will cover the topics of gantry backstops. reeving and backhoe boom.

GANTRY

To install the auxiliary gantry, proceed as follows

1. Support the gantry on cribbing high enough to bring gantry foot pins into position with the gantry foot lugs on the revolving frame

CAUTION

Use care when swinging the revolving frame without boom attached. It will tend to be unbalanced toward the counterweight end.

2. Swing the revolving frame and carefully move crawler unit up to cribbed up gantry so that bore in gantry foot lugs line up with foot pin holes in auxiliary gantry.
3. Attach auxiliary gantry to revolving frame with pins and washers (2 on each side revolving frame bore).
4. Secure pins with rod ends, capscrews and lockwashers.

NOTE

Final gantry positioning is done when the backhoe boom is installed. Take up slack with the boom hoist drum to support the auxiliary gantry in the VERTICAL position.

WARNING

Never allow a loaded boom to compress the backstop springs. If this minimum clearance is not maintained, tension within the boom hoist lines may collapse the gantry over the backstops.

HOE BACKSTOP

Backstops are used as a safety and warning device. They are not intended to stop the boom during operation. The primary purpose of the backstops is to give the operator a means of judging when to stop raising the boom.

One point should be kept in mind by the operator when using the backstops. If a load is picked up at a time when the backstops are nearly bottomed, the weight of the load will stretch the boom hoist cables, causing the backstops to extend, thus giving the impression that the backstop clearance has been increased. If the operator should then raise the boom still further, in line with the apparent increased backstop clearance, releasing the load will allow the stretched boom hoist lines to contract. This contraction will force. se the boom against the backstops and major damage can result.

To install the hoe backstop assembly, proceed as follows (see Figure 3):
1. Lay the backstop assembly on the auxiliary gantry. Secure to the auxiliary gantry with the pipe spacers, capscrews, lockwashers and nuts.
2. Lift the machine end of the backstop assembly into position against the machine. Install the backstops with base pin and secure with cotter pins.
3. Reeve the boom hoist cable. See REEVING later.
4. Raise the gantry to allow installation of the backhoe boom.

BACKHOE BOOM

To install the backhoe boom, proceed as follows:
1. Support the base of the backhoe boom assembly on cribbing. Use cribbing high enough to bring the boom foot pin holes into position with the boom foot lugs on the revolving frame.
2. Carefully move the crawler up to the cribbed up boom so the bores in the boom foot lugs on the revolving frame are aligned with the boom foot holes.
3. Attach the backhoe boom to the revolving frame with the boom foot pins and cotter pins. Use washer between boom foot and revolving frame lugs.

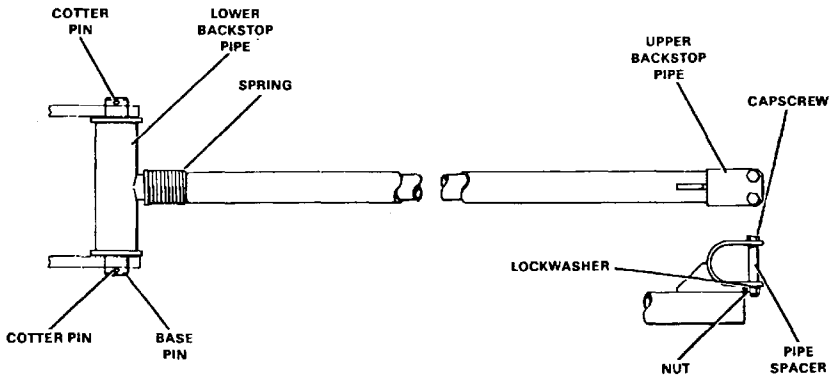


Figure 3. Back Stop (2100N520)

REEVING

BOOM HOIST REEVING. The reeving of the boom hoist cable is shown in Figure 4. Before reeving the boom hoist drum lines, spool out he rope so as to prevent any possibility of kinking during the reeving process. The rope is over-spooled onto the boo i hoist drum.

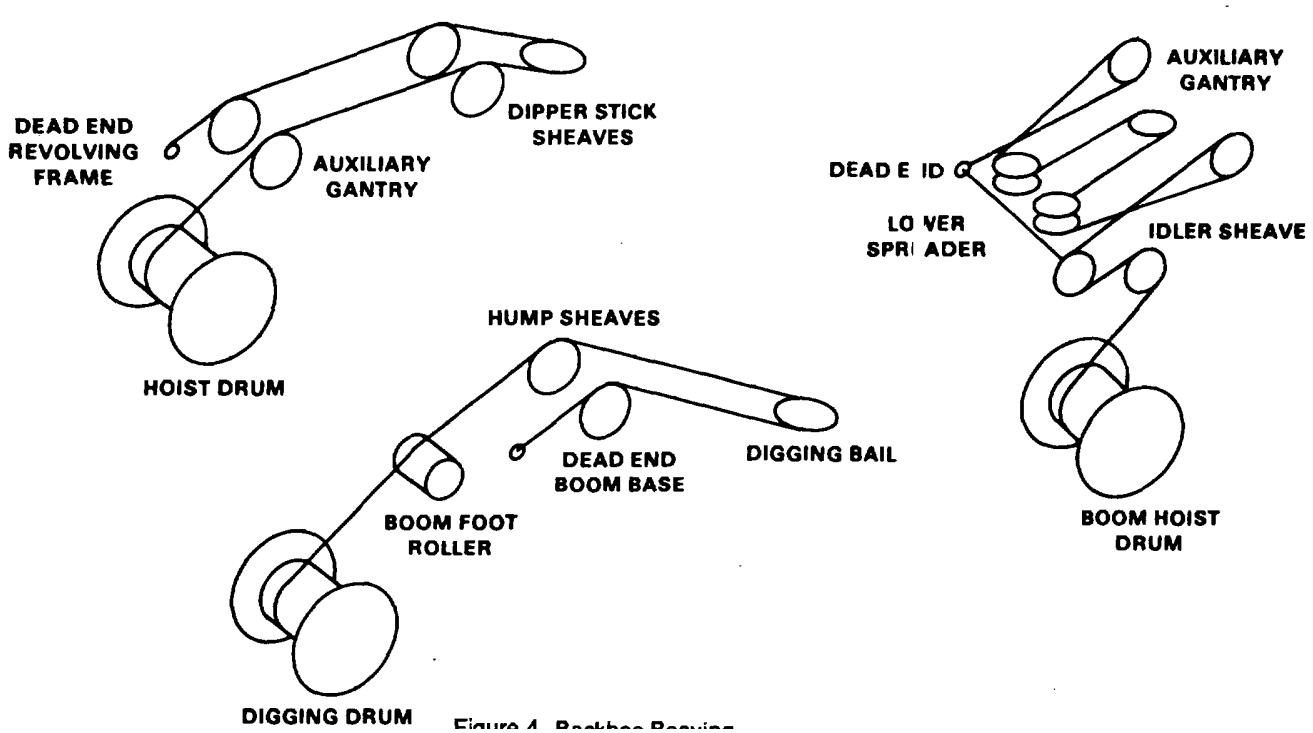


Figure 4. Backhoe Reeving

Right Hand Load Hoist Drum			
	Trench Hoe (Hoist)		
Boom Length	Rope Size	Rope Type	2 Parts
22’			
25’			125’
50’			
60’			
70’			
80’			
90’			
100’	3/4"	25	
110’			
120’			
130’			
140’			
150’			
160’			

Left Hand Load Hoist Drum			
	Trench Hoe (Digging)		
Boom Length	Rope Size	Rope Type	1 Part
25’			85’
50’			
60’			
70’			
80’			
90’			
100’	7/8		
110’			
120’			
130’			
140’			
150’			

Constant Length Ropes			
Location	Rope Size	Rope Type	Length
Boom Hoist	1/2"	27D	230’

Table 1. Rope Data

WARNING

Wear approved leather gloves when working with wire rope.

LOAD LINE REEVING The reeving of the dipperstick and digging ball lines are shown in Figure 5. Table 1 gives rope length and type information. Both drums are over spooled as shown in Figure 4.

NSTALLING ROPE ON DRUMS. The manner in who new or replacement wire rope is installed on the drum to a large measure, determine the service life of that Improperly wound ropes will cause undue crushing of the rope, doglegs, kinks, excessive abrasion and cutting of the individual wires. Bad spooling also causes uneven application tion of force and motion. *This results in fast fatiguing of the rope from the boom to the drum.*

The following five precautionary steps should be taken particularly with a replacement wire rope, before starting the actual installation of the rope.

1. A check should be made of the drum to determine condition. size and shape of the drum grooves, if equipped.
2. Drum flanges should be checked to determine extent, if any, of undercutting at the base of the flange
3. Dirt, grit or any other type of debris should be cleaned the drum.
4. Bearings should be checked.
5. Cracks or breaks in the drum should be reported.

Whenever any of these conditions are observed, the drum should be removed from service and properly cleaned repaired or replaced. This recommendation is made only to improve or maintain good rope life, but to eliminate potential hazard.

After establishing the satisfactory condition of the drum mount the reel of wire rope on suitable jacks. Reeve boom hoist or load line and attach the rope to the drum shown in Figure 5.

NOTE

A tension should be induced into the rope by providing some means of braking the shipping reel while installing the rope on the drum. A tight winding imperative.

WARNING

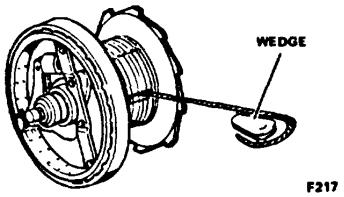


Figure 5. Securing Rope to Drum.

Establish a means of communicating with the operator and have him slowly wind the rope onto the drum by moving the appropriate drum lever to the raise position. A lead or brass hammer may be useful in tapping the rope over as it is being wound on the drum. *Do not use a steel hammer or pinch bar. These can readily cause damage to the rope.*

USE OF WEDGES. The dead end of the rope is attached with a wedge type rope socket. The rope socket should be

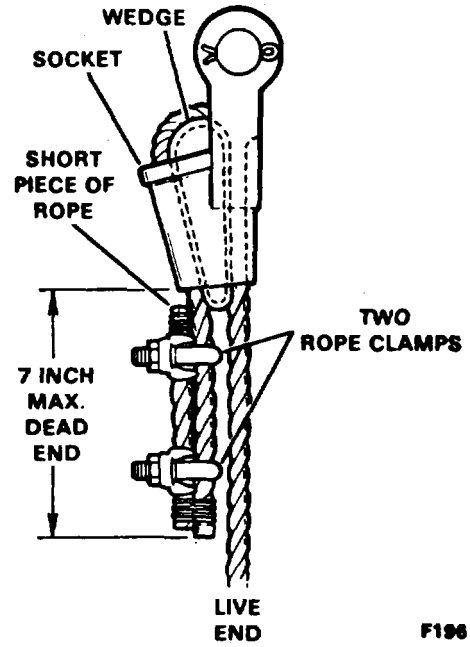


Figure 6. Installing a Rope Socket.

1. Thread the rope through the socket and bring it around in an easy to handle loop. Allow the rope to assume its natural lay; do not twist the rope.

WARNING

The live end of the rope must be in a straight line through the socket.

2. The dead end of the rope must not extend more than 7 inches past the end of the socket. Insert the wedge in the rope loop and pull the wedge and rope loop tight enough to hold the wedge in position during handling. Final wedge positioning will take place under full operating loads.

WARNING

Make sure the live end of the rope is not kinked at the point where it leaves the socket.

3. After the socket is pinned to the boom point or hook block, apply gradually increasing loads until the wedge is seated in the socket. Avoid any sudden shock loads before

the wedge is in its final position. When seated properly wedge will just protrude beyond the end of the socket
4. Cut a piece of rope and secure it to the end of the with two clamps as shown in Figure 6.

PITCH BRACES

Install the pitch braces as follows:
1. Note that three holes have been provided in the d stick for dipper pitch adjustment (Figure 1). Position back hoe boom over rear of crawlers and extend dipper ha until dipper teeth are in the vertical position.
2. Lower dipper to ground and remove hardware v secures brace to dipper handle.
3. To shorten braces, move crawler backward slowly holes in braces are aligned with holes in dipper hand
4. To lengthen braces, move crawler forward slowly.
5. When the holes are aligned, install the pin, washer cotter pins.

REMOVING BACKHOE ATTACHMENT

To remove the backhoe attachment, proceed as folloows
1. Pull dipper in under boom and lower dipper to ground Provide blocking between dipper and dipperstick.
2. Remove cable from both drums. Roll cable into a coil secure with wire. Label the cable for future use.
3. Crib backhoe boom to support it for removal from the revolving frame.
4. Drive a wedge between cribbing and boom to remove weight of boom from boom foot pins.
5. Remove boom foot pins. Slowly back machine away boom.
6. Slack off on boom hoist cable and lower auxiliary gantry onto blocking on both ends.
7. Remove backstop assembly from auxiliary gantry and machine.
8. Crib auxiliary gantry to support it for removal from the revolving frame.
9. Unreeve boom hoist cable from gantry. Slowly take boom hoist drum to unreeve cable.
10 Drive a wedge between cribbing and gantry to remove weight of gantry from gantry foot pins.
11. Remove gantry foot pins. Slowly back machine from gantry.

DIPPER TOOTH REPLACEMENT

Dipper teeth must be replaced when worn to one-third original length. To replace the teeth, proceed as follow Figure 7):
1. Drive the tooth lock keeper and tooth point keeper out of the tooth shank
2 Remove the tooth from the shank.
3. Install a new tooth on shank.

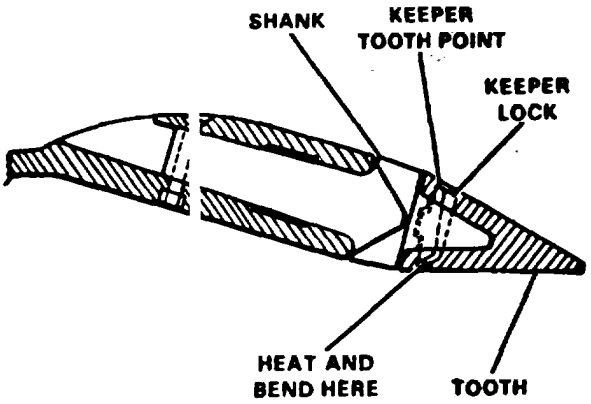


Figure 7. Dipper Tooth Replacement

4. Install the tooth point keeper and wedge in with lock keeper. Heat section of lock keeper indicated to glowing red, then bend tang as shown

GANTRY ASSEMBLY

If the gantry is disassembled for sheave or pin replacement, install sheave (see Figure 8) so grease fitting is facing toward center line of gantry.

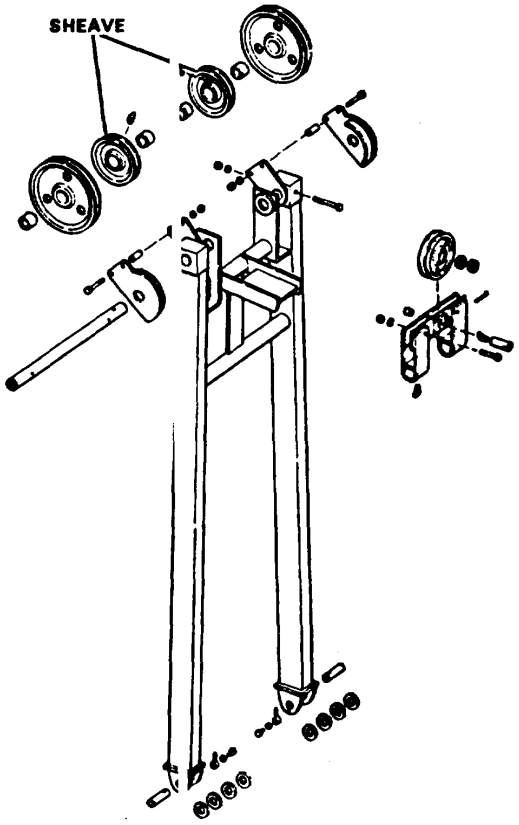


Figure 8. Gantry (2100N522)

BUMPER SPRING ADJUSTMENT

The bumper springs should be adjusted to 14-/8: **us**ing the hex nuts and jam nuts (Figure 9):

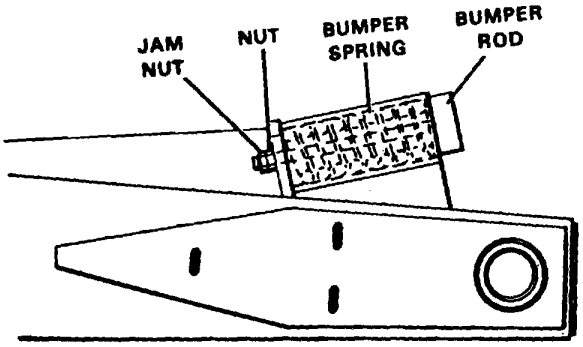


Figure 9. Bumper Spring Adjustment.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists Army regulations, forms, field manuals, technical manuals and other publications referenced in this manual and which apply to Operator, Unit, DS and GS maintenance of the Backhoe.

A-2. ARMY REGULATIONS

Reporting of Transportation Discrepancies in Shipments ..... AR 55-38
Department of the Army Information Security Program ..... AR 380-5

A-3. DEPARTMENT OF THE ARMY PAMPHLETS

Consolidated Index of Army Publications and Blank Forms..... DA Pam 25-30
The Army Maintenance Management System (TAMMS)..... DA Pam 738-750
U.S. Army Equipment Index of Modification Work Orders ..... DA Pam 750-10

A-4. FORMS

U.S. Army Accident Investigation Report ..... DA Form 285
Equipment Operator's Qualifications Record (Except Aircraft) ..... DA Form 348
Recommended Changes to Publications and Blank Forms..... DA Form 2028
Recommended Changes to Equipment Technical Manuals ..... DA Form 2028-2
Organizational Control Record for Equipment..... DA Form 2401
Equipment Inspection and Maintenance Worksheet..... DA From 2404
Maintenance Request..... DA Form 2407
Preventive Maintenance Schedule and Record ..... DD Form 314
Processing and Deprocessing Record for Shipment, Storage, and Issue
of Vehicles and Spare Engines..... DD Form 1397
DOD Fire Incident Report..... DD Form 2324
U.S. Government Motor Vehicle Operator's Identification Card..... OF Form 346
Operator's Report on Motor Vehicle Accident ..... SF Form 91
Transportation Discrepancy Report..... SF Form 361
Report of Discrepancy (ROD) ..... SF Form 364
Product Quality Deficiency Report (7540-00-105-0078)..... SF Form 368

A-5. FIELD MANUALS

Camouflage ..... FM 5-20
Vehicle Recovery Operations ..... FM 20-22
First Aid for Soldiers ..... FM 21-11
Visual Signals ..... FM 21-60
Basic Cold Weather Manual ..... FM 31-70
Northern Operations ..... FM 31-71
Desert Operations ..... FM 90-3

A-6. TECHNICAL BULLETINS

Occupational and Environmental Health: Hearing Conversation ..... TB MED 501
Solder and Soldering ..... TB SIG 222
Equipment Improvement Report and Maintenance Digest (U.S. Army Tank-Automotive Command) Tank-Automotive Equipment ..... TB 43-0001-39 series
Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment ..... TB 43-0209
Maintenance in the Desert ..... TB 43-0239
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling System ..... TB 750-651

A-7. TECHNICAL MANUALS

Operator, Unit, Direct Support and General Support Maintenance Manual ..... N
(Including Repair Parts and Special Tools List): Shovel Front, 2 Yards Capacity (3815-01-153-1855) ..... TM 5-3815-222-14&P
Operator, Unit, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List): Fairlead And Laggings (3815-01-153-1861) ..... TM 5-3815-223-14&P
Operator, Unit, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List): Inserts and Jib (3815-01-153-1847) and (3815-01-153-1853) ..... TM 5-3815-224-14&P
Operator Maintenance Manual for 40 Ton Crane Crawler, Model 5060 ..... TM 5-3810-303-10
Unit, Direct Support and General Support Maintenance Manual for 40 Ton Crane, Crawler. Model 5060 ..... TM 5-3810-303-24
Repair Parts and Special Tools List (Including Depot) for 40 Ton Crane Crawler Model 5060 ..... TM 5-3810-303-24P
Organizational Maintenance Manual: Night Vision Goggles, AN/PVS-5 and AN/PVS-5A (5855-00-150-1820) ..... TM 11-5855-238-20
Organizational, Direct support and General Support Maintenance Manual, Including Depot Maintenance Repair Parts And Special Tools), Night Vision Goggles AN/PVS-5 and AN-PVS-5A (5855-00-150-1820) ..... TM 11-5855-238-24&P
Operator's, Organizational, Direct Support and General Support Maintenance Manual, Multimeter, Digital AN/PSM-45 (6625-01-139-2512) ..... TM 11-6625-3052-14
Army Equipment Data Sheets: Chemical Defense Equipment (Reprinted with Basic INCL-1) ..... TM 43-0001-26-1
Painting Instructions for Field Use ..... TM 43-0139
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy U. e ..... TM 750-244-6
Cooling Systems: Tactical Vehicles ..... TM 750-254

A-8. OTHER PUBLICATIONS

Army Medical Department Expendable/Durable Items ..... CTA 8-100
Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)..... CTA 50-970
Cataolg of Audiovisual Productions, Army Productions, Volume I (PA).....DOD5040.2-C-1

APPENDIX B. - SUPPLEMENTAL OPERATING AND MAINTENANCE INSTRUCTIONS

MAINTENANCE

1. MAINTENANCE CONCEPT: Operators shall possess an MOS of 62F and maintenance will be performed by a 62B MOS. This is a Non-Developmental Item (NDI) and as such, there is no maintenance engineering effort on the part of the Army. However, consistent with maintenance policy and procedures of Preventive Maintenance Checks and Services (PMCS) and Maintenance Allocation Charts (MAC), the level of repair assigned to maintenance and associated tasks identified in the MAC should be reflective of training and repair part support for similar items of equipment in the inventory for unit through depot maintenance. Maintenance will be performed at the level authorized by the MAC and TOE/MTOE mission statements.

2. MAINTENANCE PLAN: Maintenance capabilities will be governed by the MAC and will be tailored to accommodate the complexity of the maintenance requirement.

a. UNIT MAINTENANCE: Unit Maintenance is performed by the operator, a crew or unit maintenance personnel as shown in the MAC of the appropriate TM, commercial manual or this publication. Unit Maintenance normally includes inspection by sight and touch of easily accessible components including; lubrication, cleaning, preserving, tightening, repair/replacement of parts (generally within two hours) and fault isolation using Built in Test/Built in Test Equipment (BIT/BITE), modularity and discard of components and selected items.

b. DIRECT SUPPORT (DS): Direct Support Maintenance is characterized by highly mobile forward orientation to remove, repair/replace unserviceable major assemblies and components. Direct support will provide contact maintenance teams for local support of unit maintenance support. DS personnel shall be capable of diagnosing causes of equipment failures, repairing specified components and repair parts, and returning the serviceable asset to the supply or reparable exchange (RX) system. DS may maintain a supply support system which allows unit maintenance to obtain repair parts through Reparable Exchange (RX) or requisitions. DS may operate an Operational Readiness Float system (ORF) for support units.

3. MAINTENANCE ALLOCATION CHART (MAC): Maintenance will be performed by the category (level) indicated on the Maintenance Allocation Chart to restore equipment to a fully mission capable serviceable condition. Higher levels of maintenance will perform lower level maintenance functions when required by appropriate commanders. Using/support maintenance activities may exceed their authorized lev!1 of maintenance when authorized by higher maintenance level. commanders.

4. MODIFICATION: Modifications will be accomplished by the end item manufacturer after TACOM approves the field campaign or modification plan. Modification Work Orders (MWOs) will be complied with IAW AR 750-1, Paragraph 3-6.

5. EQUIPMENT IMPROVEMENT RECOMMENDATIONS EIR), AND QUALITY DEFICIENCY REPORT (QDR): An EIR or QDR will 1 be submitted IAW AR 750-1, Paragraph 3-42, and DA PAM 738-7' Chapter 12, Paragraph 12-1.

6. SHIPMENT AND STORAGE: Refer to the manufacturer's operating instructions, service manual and TB 740-97-2.

7. DESTRUCTION TO PREVENT ENEMY USE. refer to TM 750-244-3, for instructions governing destruction of equipment to prevent enemy use.

8. SPECIAL TOOLS, BASIC ISSUE ITEMS, ADDITIONAL AUTHORIZED ITEMS AND MAINTENANCE AND OPERATING SUPPLIE9 LISTS MAY BE FOUND IN THE APPENDIXES.

9 MAINTENANCE FORMS AND RECORDS:

a. Equipment Record Folder, NSN 7510-0L-065-0166

b. SF 91 and DD 518, Accident Forms

c. DD 1970, Motor Equipment Utilization Record (Dispatch)

d. DA 2401, Organizational Control Record for Equipment

e. DA 2402, Exchange Tag

f. DD 314, Preventive Maintenance Schedule and Record

g. DA 2404, Equipment Inspection and Maintenance Worksheet.

h. DA 2405, Maintenance Request Register

i. DA 2407 and DA 5504, Maintenance Request

j. DA 2407-1, Maintenance Request Extension Sheet

k. DA 2408-14, Uncorrected Fault Record

l. DA 3999-4, Maintenance Work Request Envelope

m. DA 5409, Inoperative Equipment Report

n. DA 5410, Unit Level Deadlining Parts Report

o. DA 5504, Maintenance Request

p. DA 5504-1, Maintenance Request continuation sheet

10. HISTORICAL RECORDS:

a. DA 2408-5, Equipment Modification Record

b. DA 2408-9, Equipment Control Record

c. DA 2408-20, Oil Analysis Log

d. DA 2409, Equipment Maintenance Log

e. Equipment Log Book Binder, NSN 7510-00-889-3494

11. LUBRICATION: To insure proper operation of this equipment, all points requiring lubrication must be serviced with correct lubrication, at the time interval specified on the Lubrication Chart.

12. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS): Perform PMCS IAW Appendix B.

13. MIXTURE OF INCH AND METRIC FASTENERS:

a. The use of world wide sources for components has made it possible to have a mixture of inch and metric fasteners. For example, metric fasteners may be used on some parts of a component, while not used on other parts of a component. It is possible that the internal bolts on a component may be metric, while the mounting bolts may be inch size.

b. To help mechanics know when metric fasteners are used on a product, future service publications ;such as parts books and operation/maintenance manuals will use a notice similar to the one that follows:

NOTICE

CAUTION MUST BE TAKEN TO AVOID MIXING METRIC AND INCH (CUSTOMARY) FASTENERS. MISMATCHED OR INCOERECT FASTENERS CAN RESULT IN EQUIPMENT DAMAGE OR MALFUNCTI1N, OR POSSIBLE PERSONAL INJURY. ORIGINAL FASTENERS REMOVED FROM THE VEHICLE SHOULD BE SAVED FOR ASSEMBLY WHEN POSSIBLE. IF NEW FASTENERS ARE REQUIRED, CAUTION MUST BE TAKEN TO REPL%CE THE FASTENER WITH ONE THAT IS OF THE SAME SPECIFICATIONS (SIZE/GRADE) AS THE ORIGINAL.

c. To convert inches to millimeters, o' millimeters to inches, see The Metric System And Equivalents (inside back cover).

MAINTENANCE ALLOCATION CHART
FOR
BACKHOE, 2 CUBIC YARD
USED ON
HARNISHFEGER MODEL 560
CRANE, 40 TON

1. General: This Maintenance Allocation Chart designates responsibility for performance of Maintenance functions to specific Maintenance categories.

2. Maintenance Functions:

a. Inspect: To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test: To verify serviceability and detect incipient failures by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service: Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

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

e. Align: To adjust specified variable elements of an item to bring about optimum or desired performance. f. Calibrate: To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install: The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace: The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair: The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

3. Column Entries: Columns used in the Maintenance Allocation Chart are explained below:

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

b. Column 2, Component/Assembly: Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions: Column 3 lists the functions to be performed on the item listed in Column 2.

d. Column 4, Maintenance Category: Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn (s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If **t'** e number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time' figures will be shown for each category. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This: time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart.

e. Column 5, Tools and Equipment: Column 5 specifics by code, those common tool sets (not individual tools) and special tool, test, and support equipment required to perform the designated function.

f. Column 6, Remarks: Column 6 contains an alphabetic code which leads to the remark in Section IV, Remarks, which is pertinent to the item opposite the particular code.

MAINTENACE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
74	Backhoe Attachment								
7412	Boom Assy							1, 2, 3, & 4 Used for Replace/Repair functions.	
	Sheaves, Rollers and Bushings	Inspect	0.2						
		Replace		2.0					
		Repair		1.0					
	Weldment	Inspect	0.2						
		Replace							
		Repair		1.0					
	Hoe Stick and Boom	Inspect	0.2						
		Replace		2.0					
		Repair		1.0					
	Gantry Assy								
	Gantry	Inspect	0.2						
		Replace			2.0				
		Repair	1.0						
	Backstop	Inspect	0.2						
		Replace		1.0					
		Repair		1.0					
	Dipper Assy								
	Dipper	Inspect	0.2						
		Replace		2.0					
		Repair		1.0					
	Teeth	Inspect		1.0					
		Replace	0.2						
		Repair		2.0					
	Dipper Bail	Inspect	0.2						
		Replace		1.0					
		Repair		1.0					
	Wire Rope Assy Rope, and Sockets and Wedges	Inspect	0.2						
		Replace		2.0					
		Repair		1.0					

MAINTENANCE CATEGORIES.
C - OPERATOR/CREW F - DIRECT SUPPORT D - DEPOT
O - ORGANIZATIONAL H - GENERAL SUPPORT

STA FORM 668-1
1 NOV 83

UNIT
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

GENERAL

To make sure that your vehicle is ready for operation at all times, inspect it systematically so you can discover Any defects and have them corrected before they result in serious damage or failure. The charts on the next few pages contain your unit PMCS. The item numbers indicate the sequence of minimum inspection requirements. If you're operating the vehicle and notice something wrong which could damage the equipment if you continue operation, stop operation immediately.

Record all deficiencies and shortcomings, along with the corrective action taken on a DA Form 2404. The Item Number, column is the source for the numbers used on the TM Number column on DA Form 2404.

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES

1. The item numbers of the table indicate the :sequence of the PMCS. Perform at the intervals shown below:

   a. Do your (Q) PREVENTIVE MAINTENANCE quarterly (every three months).

   b. Do your (S) PREVENTIVE MAINTENANCE semiannually (every six months).

   c. Do your (A) PREVENTIVE MAINTENANCE annually (once every year).

   d. Do your (B) PREVENTIVE MAINTENANCE biennially (one every two years).

   e. Do your (H) PREVENTIVE MAINTENANCE at the, hour interval listed.

   f. Do your (MI) PREVENTIVE MAINTENANCE at the mile interval listed.

2. If something doesn't work, troubleshoot it according to the instructions in this manual or the commercial manual or notify your supervisor.

3. Always do your preventive maintenance in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

4. If anything looks wrong and you can't fix it, write it down on your DA Form 2404. If you find something seriously wrong, report it to direct support as soon as possible.

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near 8pen flame or excessive heat. The flash point is 100°F 138 F (38 C 590C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

Compressed air, used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personnel protective equipment (goggles/shield/gloves, etc.).

a. Keep it clean: dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (P-D-680) to clean metal surfaced. Use soap and water when you clean rubber or plastic material.

b. Bolts, nuts and screws: check that they are not loose, missing, bent, or broken. You can't try them all with a tool, of course, but look for chipped paint, bare metal or rust around bolt heads. Tighten any bolt, nut, or screw that you find loose.

c. Welds: look for loose or chipped paint, rust or gaps where parts are welded together. If you find a bad weld, report it to intermediate direct support.

d. Electric wires and connectors: look for cracked or broken insulation, bare wires and loose or broken connectors. Tighten loose connections and make sure the wires are in good condition.

e Hoses and fluid lines: look for wear, damage and leaks. Make sure clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If leakage comes from a loose fitting or connector, tighten the fitting or connector. If something is broken or worn out, either correct it or report it to intermediate direct support (refer to the Maintenance Allocation Chart).

5. It is necessary for you to know how fluid leaks affect the status of your equipment. The following are definitions of the types/classes of leakage you need t) know to be able to determine the status of your equipment. Learn and be familiar with them and REMEMBER - when in doubt, notify your supervisor.

LEAKAGE DEFINITIONS FOR UNIT PMCS

CLASS I	Seepage of fluid as indicated by wetness or discoloration) not great enough to form drops.
CLASS II	Leakage of fluid great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
CLASS III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakage (Class I or II). Of course consideration must b(given to the fluid capacity in the item/system being check, inspected. When operating with Class I or II leaks, continue to check fluid levels as required on your PMCS. Class II leaks should be reported to your supervisor or unit maintenance.

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-QUARTERLY S-SEMIANNUALLY A-ANNUALLY B-BIENNIALLY H-HOURS MI-MILES

ITEM NO	INTERVAL						ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED
	Q	S	A	B	H	MI	
							PERFORM ALL OPERATOR PMCS FIRST
1			X				Hoist Drum: Check drum for cracks or breaks.
2			X				Bumper Spring: Adjust bumper springs for proper tension (Commercial Manual Page 8)

MAINTENANCE AND OPERATING SUPPLY LIST (CCE)

NOMENCLATURE:	MAKE:	MODEL:
BACKHOE	HARNISCGEGER	5060

MFR PART NO.:	NSN:	SERIAL NO. RANGE:	DATE
5704984 (19207)	3815-01-153-1867	CRANE 52728 TO 52742	Oct 88

(1) COMPONENT APPLICATION	(2) MFR PART NO OR NAT'L STOCK NO.	(3) DESCRIPTION	(4) QTY REQ F/INITIAL OPN	(5) QTY REQ F/8 HRS OPN	(6) NOTES
Wire Rope	8415-00-274-2433	Gloves .-Leather KK-G- 476	2 Pr,	2 Pr	Used when working with rope.
Cleaning	6850-00-264-9038	5 Gal. Can	N/A	N/A	May use for initial and subsequent cleaning
Lubrication	9150-00-190-0907	Grease, GAA	5LB	varied	
Cleaning	7920-00-148-9666	Rags, Wiping oil 50 lb bale	1	1	Use as required

EQUIPMENT PUBLICATIONS

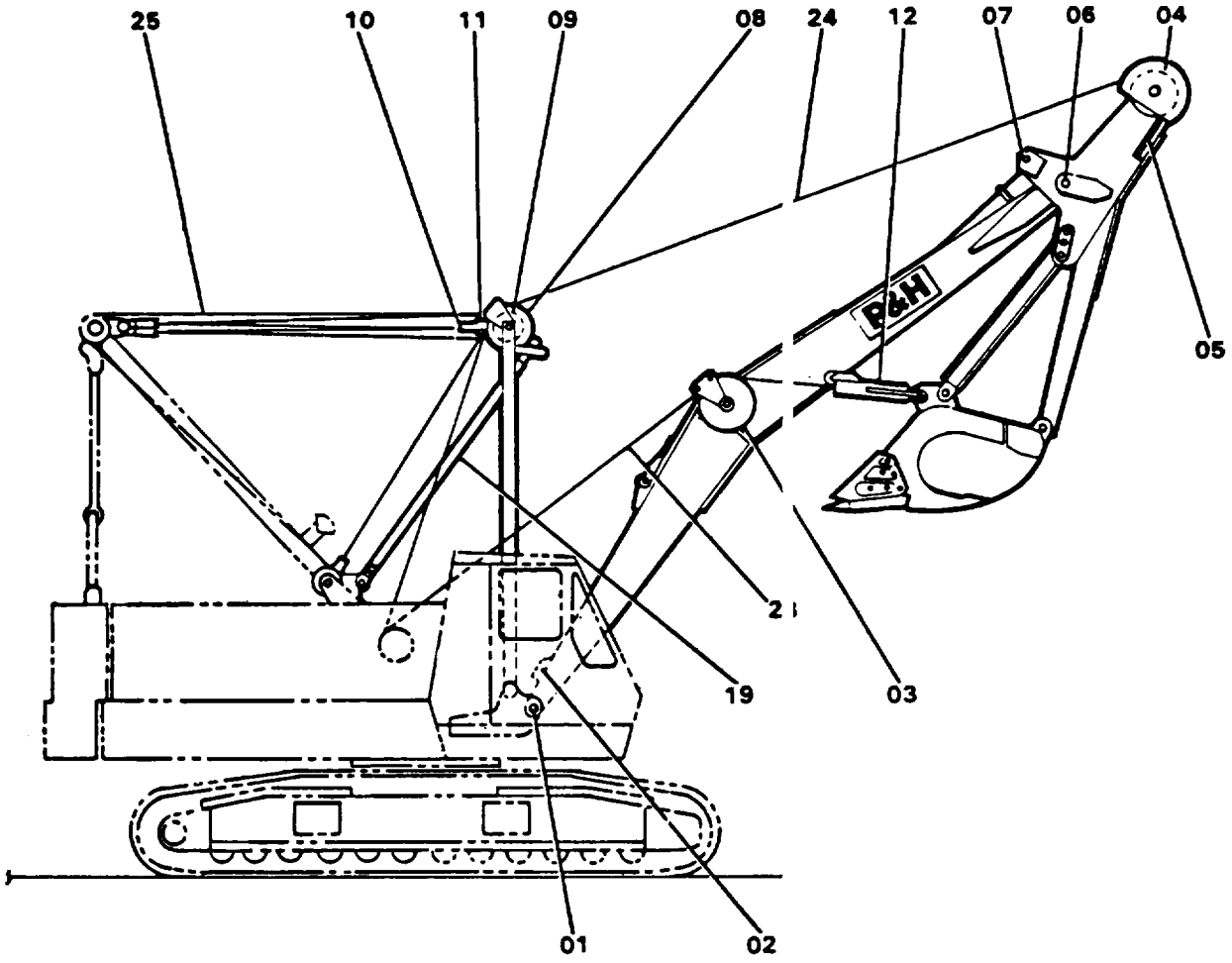
DA EQUIPMENT PUBLICATIONS

NOMENCLATURE	EQUIPMENT PUBLICATION NUMBER	DATE
Utilization of Construc-tion Equipment	TM5-331B	May 68
Safe Use of Cranes, Crane Shovel, and Draglines	TB 385-101	Jan 71
Procedures for Licensing Operators of Construct-ion Equipment	TB 600-2	Sep 78

OTHER THAN OFFICIAL DA EQUIPMENT PUBLICATIONS

NOMENCLATURE	EQUIPMENT PUBLICATION NUMBER OR TYPE	DATE	SOURCE OF SUPPLY

LUBRICATION POINTS



MODEL 5060 TRENCH HOE ATTACHMENT LUBRICATION CHART					
TIME INTERVAL	SERVICE POINT	IDENTIFICATION	REQUIRED SERVICE	LUBRICANT MIL ABBREVIATION	NUMBER OF SERVICE POINTS
8 HOURS OR DAILY	01	Boom Foot Pins	Lube	GAA	2 Fittings, 1 Each Pin
	02	Roller - Cable Guide	Lube	GAA	2 Fittings,
	03	Hump Sheave	Lube	GAA	2 Fittings, 1 Each Sheave
	04	Hoe Stick Point Sheave	Lube	GAA	2 Fittings, 1 Each Sheave
	05	Hoe Stick Return Sheave	Lube	GAA	1 Fitting
	06	Boom Point Pin	Lube	GAA	1 Fitting
	07	Hoe Stick Roller	Lube	GAA	2 Fittings, 1 Each Roller
	08	Aux Gantry Main Hoist Sheave	Lube	GAA	2 Fittings, 1 Each Sheave
	09	Aux Gantry Boom Hoist Sheave	Lube	GAA	2 Fittings, 1 Each Sheave
	10	Aux Gantry Upper Spreader Sheave	Lube	GAA	1 Fitting
	11	Aux Gantry Upper Spreader	Lube	GAA	2 Fittings
	12	Dipper Bail Sheave Pin	Lube	GAA	1 Fitting
1000 HOURS OR SEMI-ANNUALLY	19	Boom Backstops	Lube	CW-11	O. D. of Male Tubes
	20	All Pins w/o Grease Fittings	Lube	OE	
SEE NOTE	23	Digging Wire Rope	Lube	CW-11	
	24	Main Hoist Wire Rope	Lube		
	25	Boom Hoist Wire Roper	Lube		

*LUBRICATION IDENTIFICATION CHART	
SAE ABBREVIATIONS	LUBRICANT TYPE AND TEMPERATURE RANGE
OE	Engine Oil
GAA	Multipurpose Type Grease G-10924 -12°C TO 52°C
CW-11	Open Gear Lubricant FED SPEC WL751

NOTE: THE TIME INTERVAL DEPENDS ON HOW THE ROPE IS USED. THE LOADS IT HANDLES, FREQUENCY OF OPERATION AND EXPOSURE TO CORROSIVE INFLUENCES.

APPENDIX C. - REPAIR PARTS AND SPECIAL TOOLS LIST OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST)

SECTION I. INTRODUCTION

1. Scope.

This RPSTL lists and authorizes spares and rep parts, special tools, special test, measurement, a diagnostic equipment (TMDE), and other spec support equipment required for performance Operator, Unit, Direct Support and General Supply Maintenance of the Backhoe. It authorizes the requisitioning, issue, and disposition of spares, rep parts and special tools as indicated by the sour maintenance and recoverability (SMR) codes.

2. General.

In addition to Section I. Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. *Section IL. Repair Parts List.* A list of spares a repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of 1 authorized parts. Parts lists are composed of functiol groups in ascending alphanumeric sequence, with 1 parts in each group listed in ascending figure and itE number sequence. Bulk materials are listed in itE name sequence. Repair kits are listed separately their own functional group within Section II. Rep parts for repairable special tools are also listed in 1 section. Items listed are shown on the associate illustration(s)/figure(s).

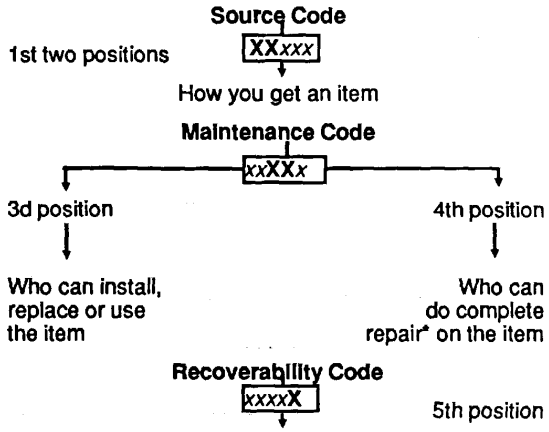
b. *Section* 111. *Special Tools List.* A list of spec tools, special TMDE, and other special supp equipment authorized by this RPSTL (as indicated Basis of Issue (BOI) information in DESCRIPTI(AND USABLE ON CODE column) for the performance of maintenance.

c. *Section IV. Cross-reference Index.* A list, National Item Identification Number (NIIN) sequence of all National stock numbered items appearing in t listing, followed by a list in alphanumeric sequence all part numbers appearing in the listings. National stock numbers and part numbers are cross-reference to each illustration figure and item number appearance

The figure and item number index lists figure and item numbers in alphanumeric sequence and cross-references NSN, CAGE, and part numbers.

3. Explanation of Columns (Sections II and **III**). a. *ITEM NO. (Column (1)).* Indicates the number used to identify items called out in the illustration.

b. *SMR CODE (Column (2)).* The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the



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

(*1) Source Code.* The source code tell how to get an item needed for maintenance, rep overhaul of an end item/equipment. Explanation source codes follows:

Code	Application/Explanation
*P*A	Stocked items; use the applicable NSN
*P*B	request/requisition items with these source
*P*C**	codes. They are authorized to the category
*P*D	indicated by the code entered in the 3d
*P*E	position of the SMR code.
PF	
*P*G	*Items coded PC are subject to deteriora tion.
*K*D	Items with these codes are not to be re-
*K*F	quested/requisitioned individually .The
*K*B	part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.
MO-(Made at Org Level)	Items with these codes a to be requested/requisitioned individually. They must be
MF-(Made at DS/ AVUMLevel)	made from bulk material is identified by the part
MH-(Made at GS *Level*	ber in the DESCRIPTION AND USABLE ON CODE (UOC) column and list
ML-(Made at Specialized Repair Act (SRA))	the Bulk Material group repair parts list in this RF If the item is authorized to you by the 3d position code
MD-(Made at Depot)	SMR code, but the s code indicates it is made at a higher level, order the from the higher level of maintenance.
AO-(Assembled by Org Level)	Items with these codes a to be requested/requisitioned individually. The parts
AF-(Assembled by DSIA VIM Level)	make up the assembled item must be requisitioned or
AH-(Assembled by G*S Category*	cated and assembled; level of maintenance indicated by the source code. If the 3d
AL-(Assembled by SRA)	position code of the SMR authorizes you to replace the item, but the source code
FAD- (Assembled by Depot)	cates the item Is assembled at a higher level, order the item from the higher level of main tenance.
XA -	Do not requisition an "XA"-coded Order its next higher assembly. (Also to the NOTE below.)
XB -	If n "XB" item is not available from salvage, order it using the CAGE and part number given.
*X*C -	Installation drawing, diagram, instruction sheet, field service drawing, that is identified : by the manufacturer's part number.
	XD - Item is not stocked. Order an "XD"-coded item through normal supply channels using the CAGE and part number given, if no NS 4 is available.

NOTE: Cannibalization or controlled exchange, when authorized, ma) be used as source of supply for items with the above ;source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

(*2) Maintenance Code.* Maintenance codes tell you the level(s))of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the bird and fourth positions of the SMR Code as follows

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

Coda	Application/Explanation
C -	Crew, or operator maintenance done within unit maintenance or aviation unit maintenance.
O-	Organizational maintenance or aviation unit category can remove, replace, and use 'e item.
F-	Direct support or aviation intermediate level can remove, replace, and use the item
H-	General support level can remove, replace, and use the item.
L-	Specialized repair activity can remove, replace, and use the item.
D -	Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions.) (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (AAC) and SMR codes.) This position will contain one of the following maintenance codes:

Code	Application/Explanation
O-	Organizational maintenance or aviation Is the lowest level that can do complete repair of the item.
F-	Direct support or aviation is the lowest level that can do complete repair of item.
H-	General support is the lowest level t can do complete repair of the item.
L-	Specialized repair activity is the low level that can do complete repair of 1 item.
D-	Depot is the lowest level that can do complete repair of the item.
Z-	Nonreparable. No repair is authorized. No repair is authorized.
B-	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item). However the item may be reconditioned by adjusting, lubrication, etc., at the user level.

(3) Recoverability Code. Recoverability cod are assigned to items to indicate the disposition act on unserviceable items. The recoverability code entered in the fifth position of the SMR Code follows:

Code	Application/Explanation
z-	Nonreparable item. When unserviceable condemn and dispose of the item at 1 level of maintenance shown in 3d posit of SMR Code.
O-	Reparable item. When uneconomically reparable, condemn and dispose of I item at unit maintenance or aviation u level.
F-	Reparable item. When uneconomically reparable, condemn and dispose of 1 item at the intermediate direct support aviation intermediate level.
H-	Reparable item. When uneconomically reparable, condemn and dispose of t item at the Intermediate general support level
D-	Reparable item. When beyond lower level' repair capability, return to depot. Condemnation and disposal of item not authorize below depot level.
L-	Reparable item. Condemnation and d postal of item not authorized below specified repair activity (SRA).
A-	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. CAGE (Column (3)). The Commercial and Government Entity (CAGE) Code (C) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc;, that supplies the item.

d. PART NUMBER (Column (4)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.
NOTE: When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5)). This column includes the following Information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) Physical security classification. Not applicable

(3) Items that are included in kits and sets are listed below the name of the kit or set on Figure KIT.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(6) When the item Is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC). Not applicable.

(7) The usable on code, when applicable (see paragraph 5, Special information)

(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement "END OF FIGURE" appears just below the last item description In Column 5 for a given figure in both Section II and Section III.

f. QTY (Column (6)). The QTY (quantity per figure column) 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 the quantity is variable and the quantity may vary from application to application.

4. Explanation of Columns (Section IV).

a. NATIONAL STOCKNUMBER (NSN) INDEX.

(1) STOCK NUMBER column. This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine

NSN

digits of the NSN (i.e., 5305-01-674-1467.) When using

NIIN

this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) FIG. column This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section 111.

(3) ITEM column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PART NUMBER INDEX. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order.)

(1) CAGE column. The Commercial and Government Entity (CAGE) Code (C) is a 5 digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

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

(3) STOCK NUMBER column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGE columns to the left.

(4) FIG. column. This column lists the number of the figure where the item is identified/located in Section II and III.

(5) ITEM column. The item number is that number assigned) the item as it appears in the figure referenced in the adjacent figure number column.

c. FIGURE AA 9 ITEM NUMBER INDEX.

(1) FIG. column. This column lists the number of the figure where the item is identified/located in Section II and III.

(2) ITEM ;column. The item number is that number assigned t the item as it appears in the figure referenced in the adjacent figure number column.

(3) STOCK NUMBER column. This column lists the NSN for the item.

(4) CAGE column. The Commercial and Government Entity (CAGE) Code (C) is a 5-digit numeric code use d to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

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

5. Special Information.

Use the following subparagraphs as applicable:

a. USABLE ON CODE. Not applicable.

b. FABRICATION INSTRUCTIONS. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column o the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items ;source coded to be manufactured or fabricated are found in TM5-3810-303-24.

c. KITS. Line it em entries for repair parts kits appear in group 9401 in Section II.

d. INDEX NUMB :RS. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in Section II.

e. ASSOCIATED PUBLICATIONS. publications listed below pertain to the Backhoe components:

Publication	Short Title
TM 5-3810-303-10	40 Ton Crane Crawler
TM 5-3810-303-24	40 Ton Crane Crawler
TM 5-3810-303-24P	40 Ton Crane Crawler
TM 5-3815-222-14&P	Shovel Front, 2 Yards (
TM 5-3815-223-14&P	Fairlead and Lagging
TM 5-3815-224-14&P	Inserts and Jabs

6. How to locate Repair Parts.

a. When National Stock Number or Part Not Known.

(1) First. Using the table of contents, de the assembly group or subassembly group to w item belongs. This is necessary since figure prepared for assembly groups and subassembly, groups, and listings are divided into the same groups.

(2) Second. Find the figure cover assembly group or subassembly group to which item belongs

(3) Third. Identify the item on the figure and use the Figure and Item Number Index to find the NSN.

b. When National Stock Number or Part Number Is Known:

(1) First Using the National Stock Number or the Part Number Index, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence (see 4.a(1)). The part numbers in the Part Number Index are listed in ascending alphanumeric sequence (see 4.b). Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.

(2) Second Turn to the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

7. **Abbreviations.**

For standard abbreviations see MIL-STD-12D, Military Standard Abbreviations For Use On Drawings, Specifications, Standards And In Technical Documents.

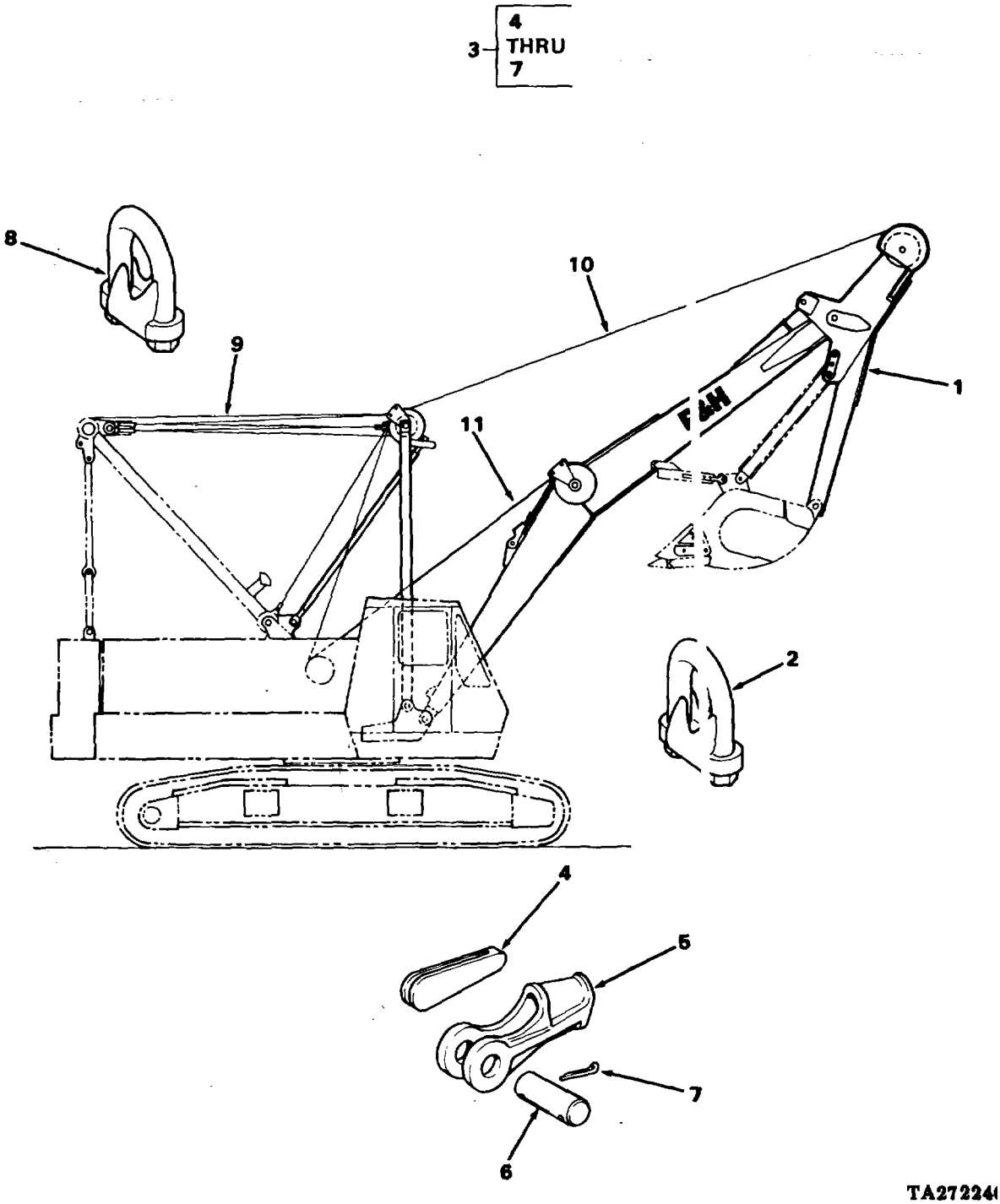


Figure 1. Backhoe assembly.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 74 CRANE ATTACHMENTS GROUP 7412 BACKHCE ATTACHMENTS FIG.1 BACKHOE ASSEMBLY	
1	PFODD	19207	5104984	BACKHOE,CRANE-SHOVE	1
2	XOOZZ	02280	G450-7/8	CLIP	V
3	PFOZZ	27315	8P168	SOCKET,EDGE	V
4	PFOZZ	27315	8P89C2	. WEDGE ,IRE ROPE SOC.....	3
5	PFOZZ	27315	2P35	. CLEV1StROO END.....	1
6	XDOZZ	27315	19F63011	. PINSIRAIGHT.HEAOLE.....	1
7	PAOZZ	46717	L6451-95	. PIN,COTTER	2
8	PFOZZ	02280	G450-3/4	CLIP	V
9	MOOZZ	80967	08511-230	HIRE ROPE MAKE FROH WIRE RCPE P/N..... 08511-1500, 230-FEET LONG	V
10	MOOZZ	80967	12401-125	WIRE ROPE MAKE FROM WIRE RCPE P/N ..... 12401-500, 125-FEET LONG	V
11	MOOZZ	80967	14321-85	WIRE ROPE MAKE FROM WIRE ROPE P/N ..... 14321-500, 85-FEET LONG	V

END OF FIGURE

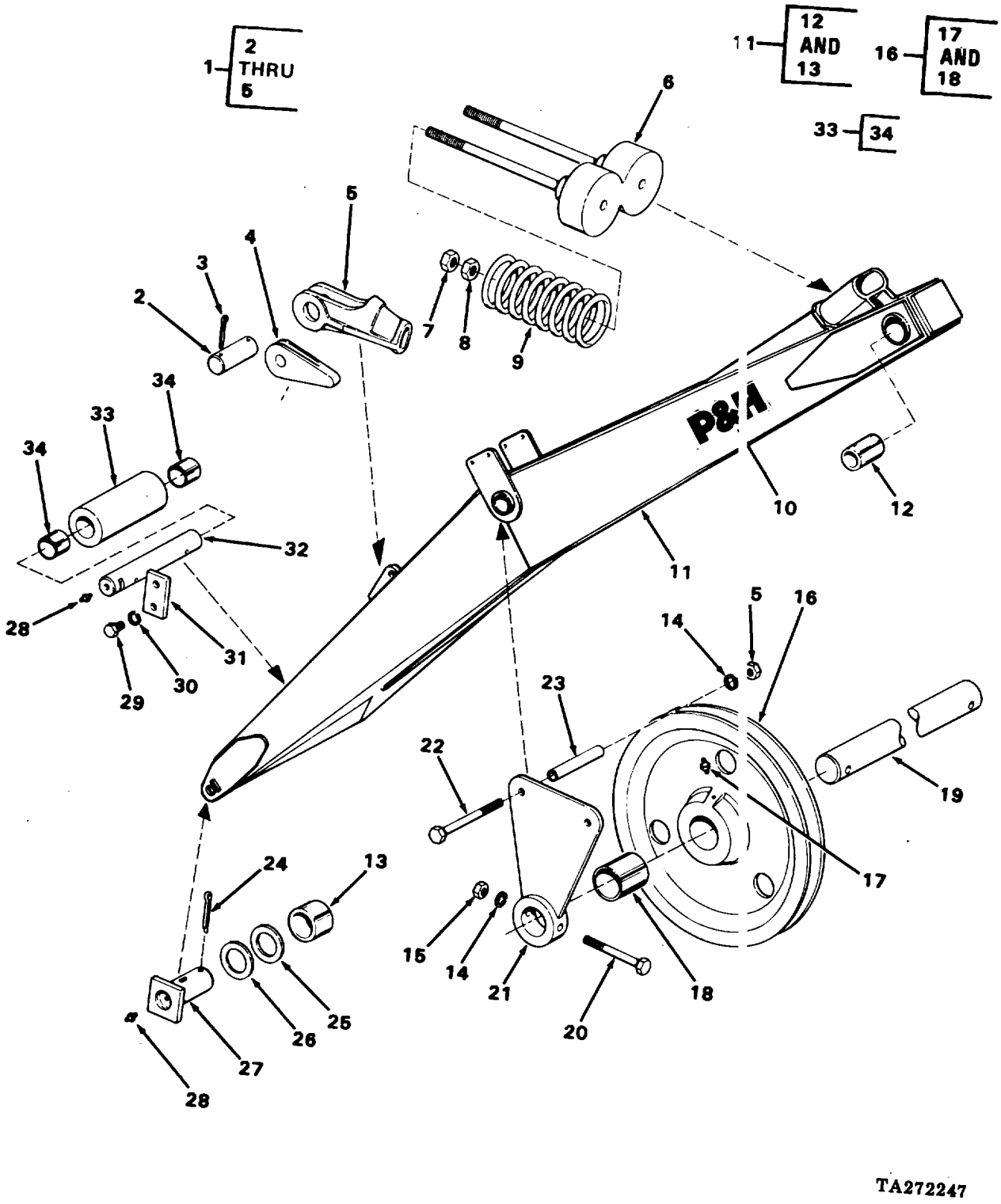


Figure 2. Backhoe boom.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 7412 BACKHOE ATTACHMENTS	
				FIG.2 BACKHOE BOOM	
1	PFOZZ	27315	908P39-5	SOCKET,WIRE ROPE	1
2	PFOZZ	27315	19F66D58	. PIN,STRAIGHT,HEADLE	1
3	PAOZZ	96906	MS24665-687	. PIN,COTTER	1
4	XDOZZ	27315	8T87C1	. WEDGE,WIRE ROPE SOC	1
5	PFOZZ	27315	8P239	. SOCKET,WIRE ROPE	1
6	PFOZZ	27315	16P1409	BUMPER,VEHICULAR	1
7	PAOZZ	96906	MS35691-73	NUT,PLAIN,HEXAGON	2
8	PAOZZ	96906	MS51967-29	NUT,PLAIN,HEXAGON	2
9	PFOZZ	27315	17T313	SPRING,HELICAL,COMP	2
10	PFOZZ	27315	32U1297	MARKER,IDENTIFICATI	2
11	PFOZZ	27315	211J488F1	BOOM,CRANE	1
12	PFOLZ	27315	5T2308	. BEARING,SLEEVE	2
13	PFOZZ	27315	205T115	. BUSHING,SLEEVE	4
14	PAOZZ	96906	MS35340-51	WASHER,LOCK	6
15	PAOZZ	96906	MS51967-23	NUT,PLAIN,HEXAGON	6
16	PFOZZ	27315	207P161D2F2	PULLEY,GROOVE	2
17	PFOZZ	96906	MS15004-1	FITTING,LUBRICATION	1
18	PFOZZ	27315	5T2961	SEARING,SLEEVE	1
19	PFOZZ	27315	219T653	ROD,STRAIGHT,HEADLE	1
20	PFOLZ	27315	202646D141	SCREW,CAP,HEXAGON H	2
21	PFOZZ	27315	14P1861	GUARD,MECHANICAL DR	2
22	PFOZZ	27315	20Z646D147	SCREW,CAP,HEXAGON H	4
23	XDOZZ	27315	18P934D230	SPACER,SLEEVE	4
24	PAOZZ	96906	MS24665-905	PIN,COTTER	2
25	XDOZZ	27315	18H3892D49	WASHER,FLAT	4
26	PFO'ZZ	27315	18H3892083	WASHER,FLAT	4
27	PFOZZ	27315	219T654F1	PIN,GROOVED,HEADED	2
28	PAOZZ	96906	MS15003-1	FITTING,LUBRICATION	2
29	PAOLZ	96906	MS90728-183	SCREW,CAP,HEXAGON H	2
30	PAOZZ	96906	MS35340-51	WASHER,LOCK	2
* 31	XDOZZ	27315	18T13	SPACER,PLATE	1
32	PFOZZ	27315	219T242	ROD,STRAIGHT,HEADLE	1
33	PFOZZ	27315	213T28F1	ROLLER,LINEAR-ROTAR	1
* 34	XDOZZ	27315	5Z3	. BUSHING,SLEEVE	2

END OF FIGURE

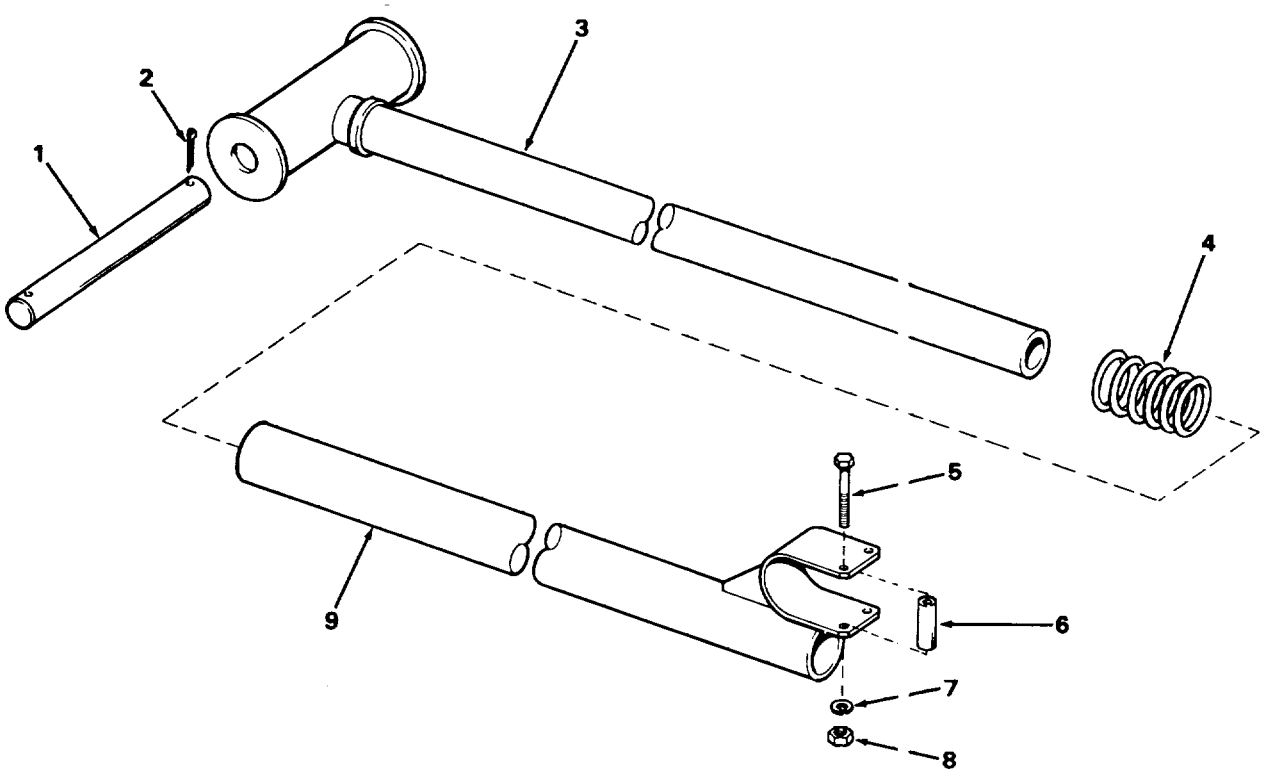


Figure 3. Backhoe backstop.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 1412 BACKHOE ATTACHMENTS FIG.3 BACKHOE BACKSTOP	
1	PFOZZ	27315	219T648	ROD,STRAIGHT,HEADLE.....	1
2	PAOZZ	96906	MS24665-846	PIN,COTTER	2
3	PFOZZ	27315	220N57	PIPE,METALLIC.....	1
4	PFOZZ	27315	17Z218	SPRING,HELICAL,COMP.....	1
5	PAOZZ	96906	MS90728-201	SCREW,CAP,HEXAGON H.....	2
6	PFOZZ	21315	1BP933)132	SPACER,SLEEVE.....	2
7	PAOZZ	96906	NS35340-51	WASHER2LOCK.....	2
8	PAOZZ	96906	MS51967-23	NUT,PLAIN,HEXAGCON.....	2
9	PFOZZ	27315	220P470	PIPE,BACKHOE GANTRY.....	1

END OF FIGURE

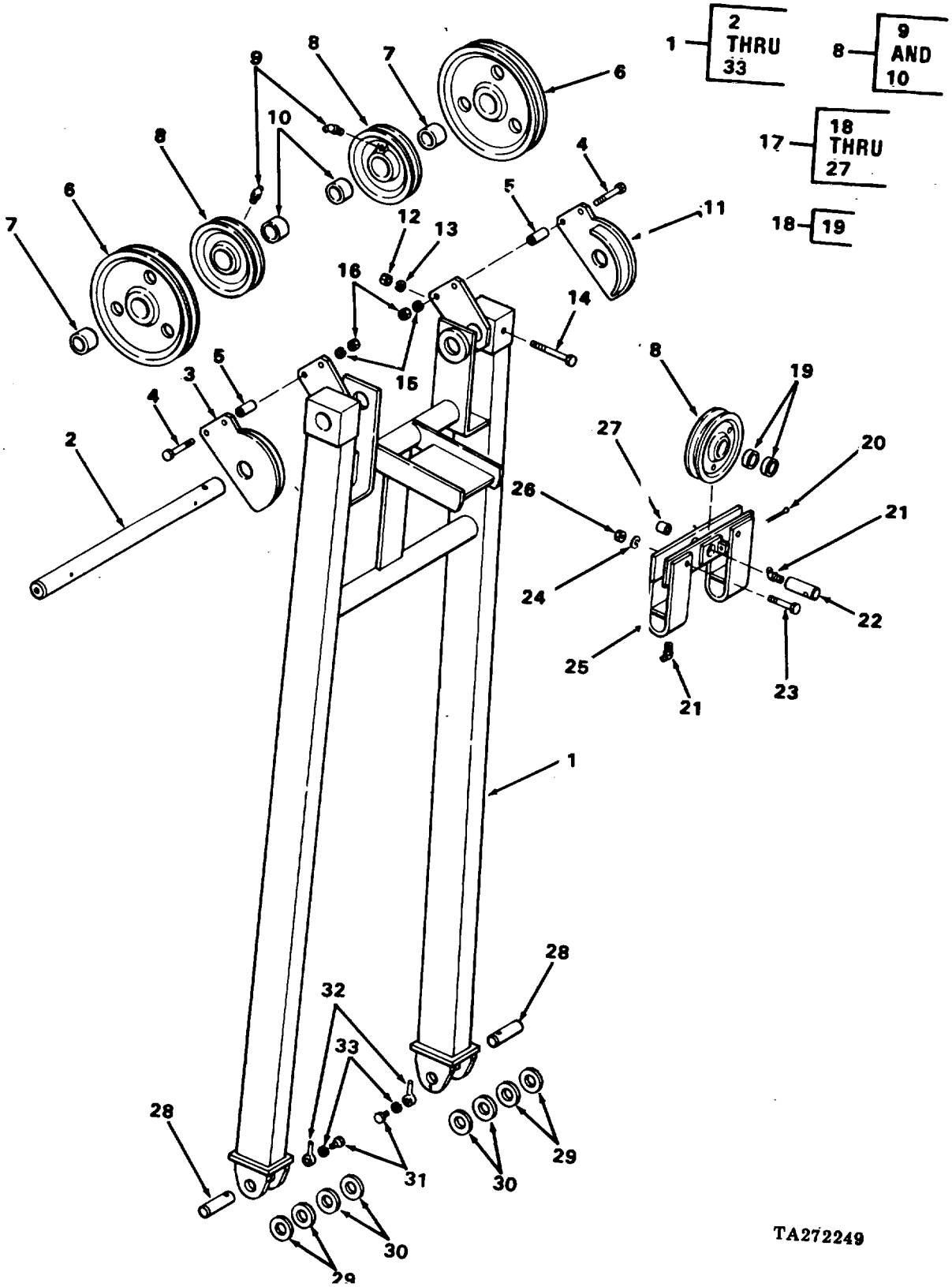


Figure 4. Auxiliary gantry.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 7412 BACKHOE ATTACHMENTS FIG.4 AUXILIARY GANTRY	
1	PFOFF	27315	211J487	GANTRY	1
2	PFOZZ	27315	210T102	ROD,SHEAVE	1
3	XDOZZ	27315	209P60D2	GUARD,MECHANICAL DR	1
4	PAOZZ	96906	MS90728-197	SCREW,CAP,HEXAGON H,	4
5	PFOZZ	27315	18P933084	SPACER,SLEEVE	4
6	PFOZZ	27315	207P159F1	PULLEY,GROOVE,	2
7	PFOZZ	27315	5T891	BEARING,SLEEVE	1
8	PFOZZ	27315	207P158F1	PULLEY,GROOVE	2
9	PAOZZ	96906	MS15004-1	FITTING,LUBRICATION	1
10	PFOZZ	27315	5T2927	BEARING,SLEEVE	1
11	PFOZZ	27315	208P60D1	GUARD,MECHANICAL DR	1
12	PAOZZ	96906	MS51967-23	NUT,PLAIN,HEXAGON	1
13	PAOZZ	96906	MS35340-51	WASHER,LOCK	1
14	PFOZZ	27315	20Z646D144	BOLT,MACHINE	1
15	PAOZZ	96906	MS35340-51	WASHER,LOCK	4
16	PAOZZ	96906	MS51967-23	NUT,PLAIN,HEXAGON	4
17	PFOLZ	27315	2100P169F1	FAIRLEAD,SHEAVE	1
18	PFOZZ	27315	207P125F1	FAIRLEAD,SHEAVE	1
19	PFOZZ	51588	SJ7354	BEARING,ROLLER,NEED	2
20	PAOZZ	96906	MS24665-903	PIN,COTTER	1
20	PAOZZ	96906	MS15003-1	FITTING SLUBRICATION	3
22	PFOZZ	27315	219T650	PIN,STRAIGHT,HEADLE	1
23	PAOZZ	96906	MS90728-127	SCREW,CAP,HEXAGON H,	2
24	PAOZZ	96906	MS35340-48	WASHER,LOCK	2
25	XDOZZ	27315	229P99	FRAME	1
26	PAOZZ	96906	MS51967-14	NUT,PLAIN,HEXAGON	2
27	PFOZZ	27315	18P932D68	SPACER,SLEEVE	2
28	PFOZZ	27315	219T651	PIN,STRAIGHT,HEADLE	2
29	XDOZZ	27315	18H3892D193	SPACER	4
30	XDOZZ	27315	18H38920196	SPACER	4
31	PAOZZ	96906	MS18154-60	SCREW,CAP,HEXAGON H	2
32	PFOZZ	27315	220T776	CONNECTOR,ROD ENDD	2
33	PAOZZ	96906	MS35340-46	WASHER,LOCK	2

END OF FIGURE

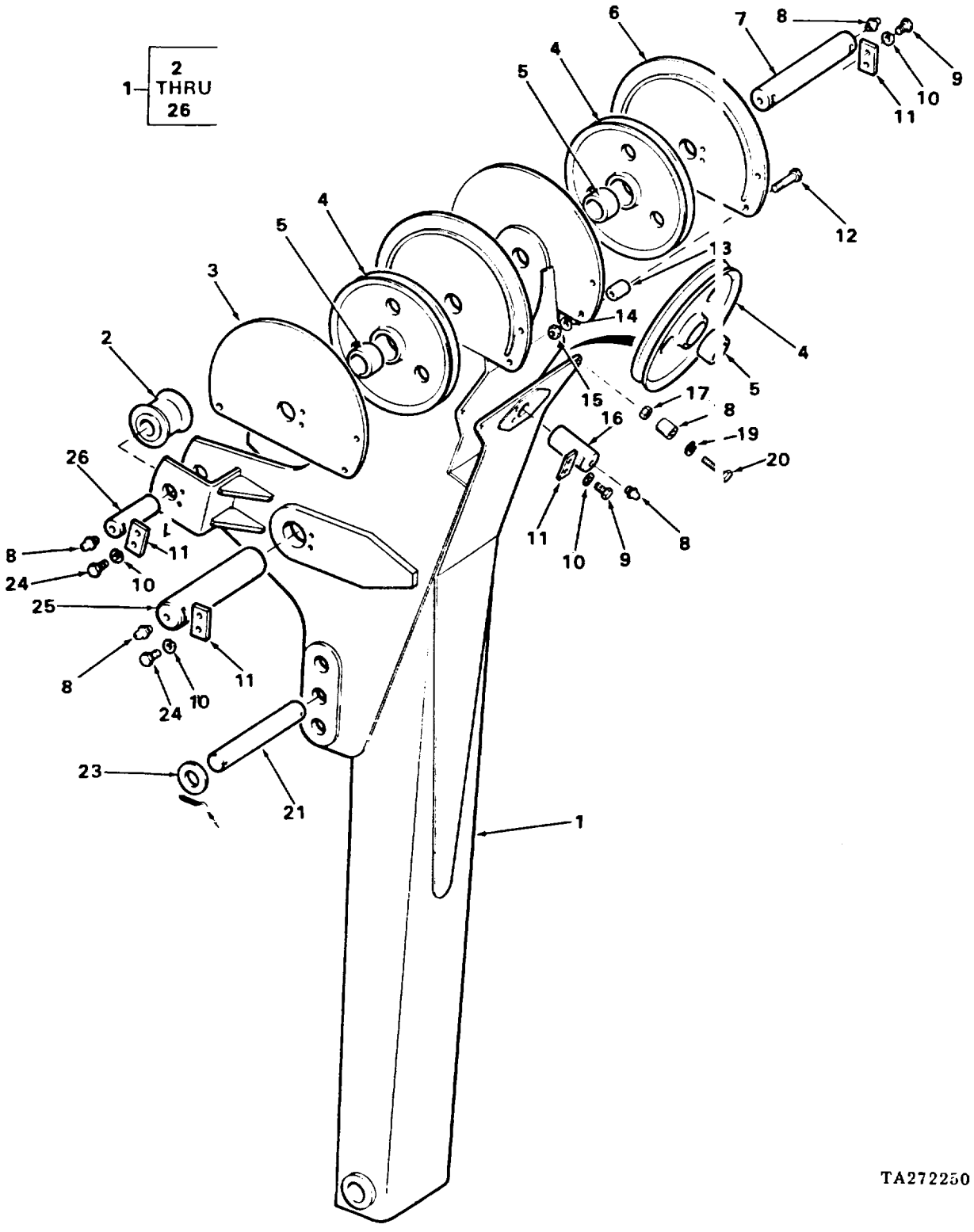


Figure 5. Backhoe stick.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 7412 BACKHOE ATTACHMENTS FIG.5 BACKHOE STICK	
1	PFOFF	27315	211J112	TRENCH HOE STICK	1
2	PFOZZ	27315	13P469	. ROLLER,HOE STICK	2
3	PFOZZ	27315	208P49802	. GUARO,MECHANICAL DR	1
4	PFOZZ	27315	207P159F1	. PULLEY,GROOVE	3
5	PFOZZ	27315	5T891	. BEARING,SLEEVE	1
6	PFOZZ	27315	208P49301	. GUAROD,MECHANICAL DR	1
7	PFOZZ	27315	219T244	. SHAFT,STRAIGHT	1
8	PAOZZ	96906	MS15003-1	. FITTING,LUBRICATION	6
9	PFOZZ	96906	MS90728-181	. SCREW,CAP,HEXAGON H	6
10	PAOZZ	96906	MS35340-51	. WASHER,LOCK	12
11	XDOZZ	27315	18T13	. SPACER PLATE	6
12	PAOLZ	96906	MS90728-197	. SCREW,CAP,HEXAGON H	6
13	PFOZZ	27315	218T521	. SPACER,SLEEVE	6
14	PAOZZ	96906	MS35340-51	. WASHERRLOCK	6
15	PAOZZ	96906	MS51967-23	. NUTIPLAIN,HEXAGONGON	6
16	PFOZZ	27315	219T245	. SHAFT,STRAIGHT	1
17	PAOZZ	96906	MS51967-23	. NUT,PLAIN,HEXAGON	2
18	PFOZZ	27315	18P933D84	. SPACER,SLEEVE	2
19	PAOZZ	96906	MS35340-51	. WASHER,LOCK	2
20	PAOZZ	96906	MS90728-197	. SCREW,CAP,HEXAGON H	2
21	PFOZZ	27315	19T4725	ROD,STRAIGHT,HEADLE	1
22	PAOZZ	96906	MS24665-846	PIN,COTTERR	2
23	PFOZZ	27315	18H3892055	WASHER,FLAT	2
24	PAOZZ	96906	MS90728-183	SCREW,CAP,HEXAGON H	6
25	PFOZZ	27315	19T4726	SHAFT,STRAIGHT	1
26	PFOZZ	27315	19T4728	PIN	2

END OF FIGURE

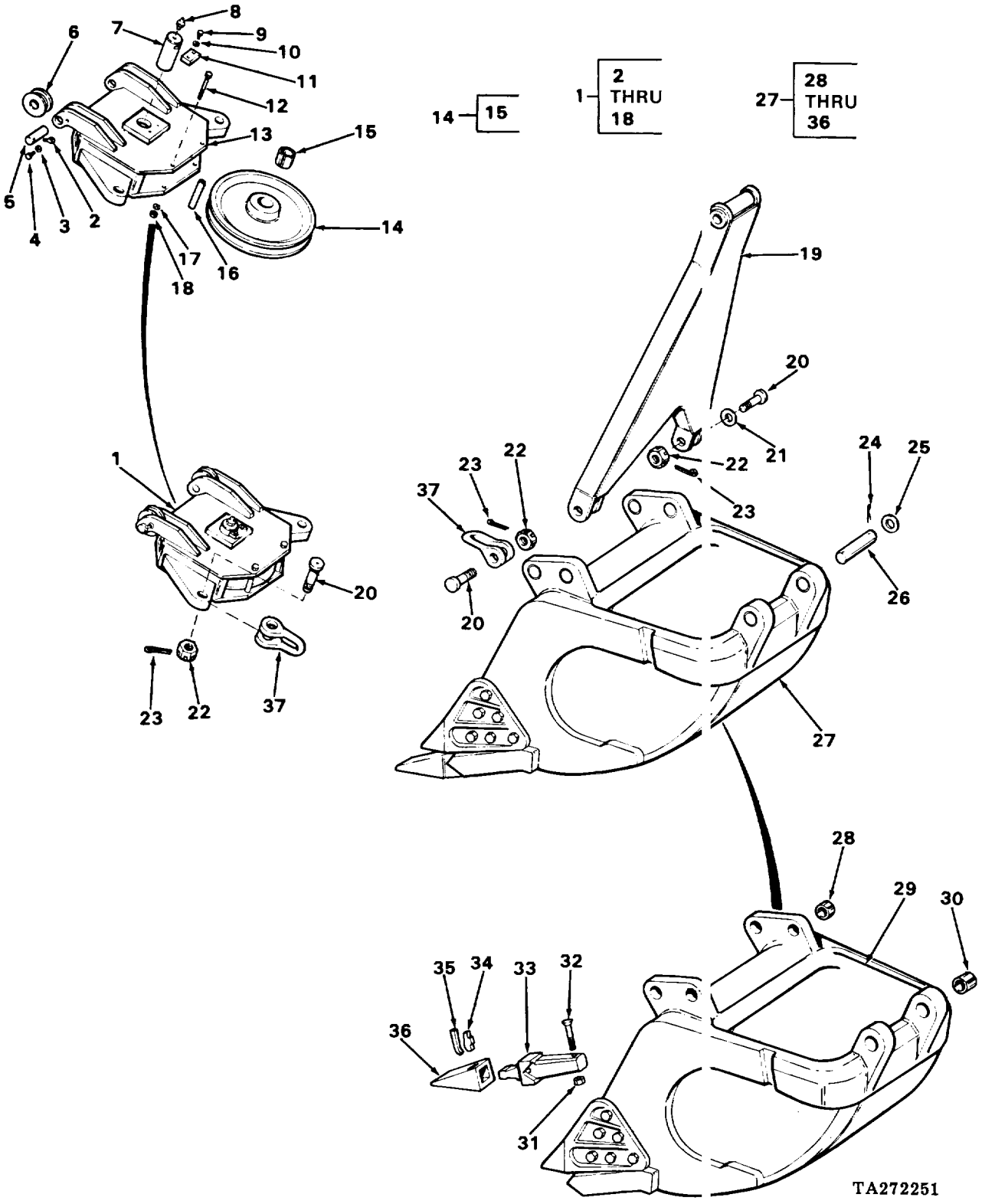


Figure 6. Backhoe dipper.

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 7412 BACKHOE ATTACHMENTS FIG.6 BACKHOE DIPPER	
1	PFOZZ	27315	2100N523F1	DIPPER BAIL ASSEMBL	1
2	PFOZZ	27315	20T1221	. CONNECTOR,ROD END	2
3	PAOZZ	96906	MS35340-48	. WASHER,LOCK	2
4	PAOZZ	96906	MS90725-109	. SCREW,CAP,HEXAGON H	2
5	PFOZZ	27315	19T2556	. PIN,STRAIGHT,HEADLE	2
6	PFOZZ	27315	213T25F1	. ROLLER,LINEAR-ROTAR	2
7	PFOZZ	27315	19P195	. PIN,SHEAVE	1
8	PAOZZ	96906	MS15004-1	. FITTING,LUBRICATION	1
9	PAOZZ	96906	MS90728-185	. SCREW,CAP,HEXAGON H	2
10	PAOZZ	96906	M535340-51	. WASHER,LOCK	2
11	XDOZZ	27315	18T13	. SPACER,PLATE	1
12	XDOZZ	27315	202646D142	. SCREW,CAP1HEXAGON H	2
13	PFOZZ	27315	212J31	. DIPPER,SHOVEL	1
14	PFOZZ	27315	207P161DlFl	. PULLEY,GROOVE	1
15	PFOZZ	27315	5T2458	.. BEARING,SLEEVE	1
16	PFOZZ	27315	18P933D0159	. SPACER,SLEEVE	2
17	PAOZZ	96906	MS35340-51	. WASHER,LOCK	2
18	PAOZZ	96906	MS51967-23	. NUT,PLAIN,HEXAGON	2
19	PFOZZ	27315	212J25	DIPPER BRACE,WIDE	1
20	PFOZZ	27315	20T5702	PIN,GROOVED,HEADED	6
21	PAOZZ	96906	MS27183-36	WASHER,FLAT	2
22	XDOZZ	27315	2029V018	NUT,PLAIN,SLOTTED H	6
23	PAOZZ	96906	MS24665-754	PIN,COTTER	6
24	PAOZZ	96906	MS24665-906	PIN,COTTER	2
25	PAOZZ	27315	18H3892D30	WASHER,FLAT	2
26	PFOZZ	27315	219T659	ROD,STRAIGHT,HEADLE	1
27	XDOZZ	27315	2100524F1	DIPPER,SHOVEL	1
28	PFOZZ	27315	205T119	. BUSHING,SLEEVE	2
29	PFOZZ	27315	12R70	. DIPPER,BACKHOE	1
30	XDOZZ	27315	5T2121	. BEARING,SLEEVE	4
31	PFOZZ	35843	1-005-0023	. NUT,PLAIN,SQUARE	6
32	PFOZZ	27315	2022332D1	. SCREW,CAP,SOCKET HE	6
33	PFOZZ	97403	13213E6856-3	. SHANK-TOOTH,SURFACE	6
34	PFOZZ	88853	13213E6855-2	. KEEPER,TOOTH	6
35	PFOZZ	97403	13213E6858-2	. LOCK,KEEPER	6
36	PFOZZ	97403	13213E6854-3	. TOOTH,SURFACE RIPPI	6
37	PFOZZ	27315	20T7643	CLEVIS,ROD END	4

END OF FIGURE

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
				GROUP 95 GENERAL USE STANCARDILZE PARTS	
				GROUP 9501 BULK MATERIEL	
				FIG. BULK	
1	PFOZZ	80967	08511-1500	ROPE,WIRE..... UOC :COM.....	V
2	PAOZZ	80967	1240L-5CC	ROPE,WIRE..... UOC :CCP.....	V
3	PAOZZ	80967	14321-50C	ROPE,WIRE..... UOC :CCP	V
				END OF FIGURE	

CROSS- REFERENCE-INDEXES
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5305-00-044-4153	6	4	5305-00-947-4366	3	5
4730-00-050-4208	2	28	5310-00-959-4675	4	33
	4	20	5310-00-982-6571	6	21
	5	8	3815-01-153-1867	1	1
5310-00-052-6454	2	14	7690-01-166-1815	2	10
	2	30	3020-01-167-7140	2	21
	3	7	3815-01-167-9276	2	11
	4	13	3020-01-167-9277	2	16
	4	15	4030-01-168-9303	1	4
	5	10	3815-01-168-9601	6	13
	5	14	3120-01-169-0128	6	28
	5	19	5315-01-169-0168	6	20
	6	10	5310-01-169-2090	2	26
	6	17	5315-01-169-2175	2	2
5305-00-071-2083	4	23	5340-01-169-2260	6	2
4030-00-125-2807	2	5	5365-01-169-2979	4	27
4730-00-172-0040	2	17	5365-01-169-2980	5	13
	4	9	3815-01-169-3814	4	11
	6	8	3815-01-169-4949	4	1
5315-00-187-9589	2	3	3020-01-169-4990	6	14
5315-00-187-9600	6	23	2590-01-169-7694	6	19
5315-00-234-1672	1	7	2540-01-169-7747	2	6
3810-00-411-5718	1	3	5315-01-169-8339	3	2
3815-00-421-9522	6	34		5	22
5315-00-491-5159	6	35	5340-01-169-8384	5	21
3120-00-661-5470	4	7	5315-01-169-8519	2	27
	5	5	3815-01-169-8700	6	1
5310-00-762-6248	2	8	5315-01-169-8701	6	7
5310-00-763-8921	2	15	3815-01-169-8730	6	36
	3	8	3815-01-169-8769	4	18
	4	12	5360-01-169-9806	2	9
	4	16	5365-01-170-1374	4	5
	5	15		5	18
	5	17	5365-01-170-1375	6	16
	6	18	5340-01-170-3857	4	32
5310-00-768-0318	4	26	5340-01-170-3878	2	19
5340-00-786-1663	1	8	5340-01-170-4742	6	37
5310-00-834-7606	4	24	5340-01-170-4820	6	26
	6	3	3020-01-170-5447	4	8
5310-00-891-3426	2	7	3020-01-170-5448	4	6
5305-00-900-1118	6	9		5	4
3110-00-903-1493	4	19	5305-01-170-6183	2	22
5310-00-919-2244	6	31	5305-01-170-9093	2	20
5305-00-942-2196	4	31	3815-01-170-9291	6	29
5305-00-947-4351	5	9	5305-01-171-0541	6	32
5305-00-947-4352	2	29	5340-01-171-3766	1	5
	5	24	3040-01-171-4016	5	25
5305-00-947-4360	4	4	3815-01-171-5046	5	1
	5	12	5340-01-171-6970	2	32
	5	20	5306-01-171-8072	4	14

CROSS- REFERENCE-INDEXES
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5315-01-172-0096	6	5			
5315-01-172-2108	4	20			
5315-01-172-2695	2	24			
5315-01-172-2696	6	24			
3120-01-173-0705	2	33			
4010-01-174-2787	BULK	3			
3120-01-174-4653	6	6			
3815-01-175-6455	6	33			
3040-01-177-3944	5	16			
3120-01-183-4100	2	18			
4010-01-184-0847	BULK	2			
3120-01-184-3556	4	10			
3120-01-184-3557	6	15			
3120-01-184-3563	2	13			
3020-01-184-4587	5	6			
3020-01-184-4588	5	3			
3120-01-185-7290	2	12			
3815-01-186-3749	4	17			
5315-01-186-5631	4	22			
5315-01-186-5632	4	28			
5310-01-186-8646	5	23			
5340-01-186-9616	3	1			
5360-01-187-5845	3	4			
4710-01-192-8265	3	9			
4010-01-194-0786	BULK	1			
5365-01-194-3066	3	6			
2590-01-196-1287	4	2			
4710-01-196-7393	3	3			
4030-01-198-8642	2	1			
3895-01-202-0341	5	2			
3040-01-202-8533	5	7			
5315-01-209-6997	5	26			
5310-01-211-3045	6	25			

CROSS-REFERENCE INDEXES
PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
02280	G450-3/4	5340-00-786-1663	1	8
02280	G450-7/8		1	2
46717	L6451-95	5315-00-234-1672	1	7
96906	MS15003-1	4730-00-050-4208	2	28
			4	20
			5	8
96906	MS15004-1	4730-00-172-0040	2	17
			4	9
			6	8
96906	MS18154-60	5305-00-942-2196	4	31
96906	MS24665-687	5315-00-187-9589	2	3
96906	MS24665-754	5315-00-187-9600	6	23
96906	MS24665-846	5315-01-169-8339	3	2
			5	22
96906	MS24665-903	5315-01-172-2108	4	20
96906	MS24665-905	5315-01-172-2695	2	24
96906	MS24665-906	5315-01-172-2696	6	24
96906	MS27183-36	5310-00-982-6571	6	21
96906	MS35340-46	5310-00-959-4675	4	33
96906	MS35340-48	5310-00-834-7606	4	24
			6	3
96906	MS35340-51	5310-00-052-6454	2	14
			2	30
			3	7
			4	13
			4	15
			5	10
			5	14
			5	19
			6	10
			6	17
96906	MS35691-73	5310-00-891-3426	2	7
96906	MS51967-14	5310-00-768-0318	4	26
96906	MS51967-23	5310-00-763-8921	2	15
			3	8
			4	12
			4	16
			5	15
			5	17
			6	18
96906	MS51967-29	5310-00-762-6248	2	8
96906	MS90725-109	5305-00-044-4153	6	4
96906	MS90728-127	5305-00-071-2083	4	23
96906	MS90728-181	5305-00-947-4351	5	9
96906	MS90728-183	5305-00-947-4352	2	29
			5	24
96906	MS90728-185	5305-00-900-1118	6	9
96906	MS90728-197	5305-00-947-4360	4	4
			5	12
			5	20
96906	MS90728-201	5305-00-947-4364	3	5

CROSS-REFERENCE INDEXES
PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
51588	SJ7354	3110-00-903-1493	4	19
80967	08511-1500	4010-01-194-0786	BULK	1
80967	08511-230		1	9
35843	1-005-0023	5310-00-919-2244	6	31
27315	12R70	3815-01-170-9291	6	29
80967	12401-125		1	10
80967	12401-500	4010-01-184-0847	BULK	2
27315	13P469	3895-01-202-0341	5	2
97403	13213E6854-3	3815-01-169-8730	6	36
88853	13213E6855-2	3815-00-421-9522	6	34
97403	13213E6856-3	3815-01-175-6455	6	33
97403	13213E6858-2	5315-00-491-5159	6	35
27315	14P1861	3020-01-167-7140	2	21
80967	14321-500	4010-01-174-2787	BULK	3
80967	14321-85		1	11
27315	16P1409	2540-01-169-7747	2	6
27315	17T313	5360-01-169-9806	2	9
27315	17Z218	5360-01-187-5845	3	4
27315	18H3892D193		4	29
27315	18H3892D196		4	30
27315	18H3892D30	5310-01-211-3045	6	25
27315	18H3892D49		2	25
27315	18H3892055	5310-01-186-8646	5	23
27315	18H3892D83	5310-01-169-2090	2	26
27315	18P932D68	5365-01-169-2979	4	27
27315	18P9330132	5365-01-194-3066	3	6
27315	18P933D159	5365-01-170-1375	6	16
27315	18P933084	5365-01-170-1374	4	5
			5	18
27315	18P9340230		2	23
27315	18T13		2	31
			5	11
			6	11
27315	19F63D11		1	6
27315	19F66D58	5315-01-169-2175	2	2
27315	19P195	5315-01-169-8701	6	7
27315	19T2556	5315-01-172-0096	6	5
27315	19T4725	5340-01-169-8384	5	21
27315	19T4726	3040-01-171-4016	5	25
27315	19T4728	5315-01-209-6997	5	26
27315	20T1221	5340-01-169-2260	6	2
27315	20T5702	5315-01-169-0168	6	20
27315	20T7643	5340-01-170-4742	6	37
27315	20Z2332D1	5305-01-171-0541	6	32
27315	20Z646D141	5305-01-170-9093	2	20
27315	20Z646D142		6	12
27315	20Z646D144	5306-01-171-8072	4	14
27315	20Z646D147	5305-01-170-6183	2	22
27315	2029V018		6	22
27315	205T115	3120-01-184-3563	2	13
27315	205T119	3120-01-169-0128	6	28

CROSS-REFERENCE INDEXES
PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
27315	207P125F1	3815-01-169-8769	4	18
27315	207P158F1	3020-01-170-5447	4	8
27315	207P159F1	3020-01-170-5448	4	6
			5	4
27315	207P161DlF1	3020-01-169-4990	6	14
27315	207P161D2F2	3020-01-167-9277	2	16
27315	208P498D1	3020-01-184-4587	5	6
27315	208P498D2	3020-01-184-4588	5	3
27315	208P60D1	3815-01-169-3814	4	11
27315	208P6002		4	3
27315	210T102	2590-01-196-1287	4	2
27315	2100N523F1	3815-01-169-8700	6	1
27315	2100P169F1	3815-01-186-3749	4	17
27315	2100524F1		6	27
27315	211J112	3815-01-171-5046	5	1
27315	211J487	3815-01-169-4949	4	1
27315	211J488F1	3815-01-167-9276	2	11
27315	212J25	2590-01-169-7694	6	19
27315	212J31	3815-01-168-9601	6	13
27315	213T25F1	3120-01-174-4653	6	6
27315	213T28F1	3120-01-173-0705	2	33
27315	218T521	5365-01-169-2980	5	13
27315	219T242	5340-01-171-6970	2	32
27315	219T244	3040-01-202-8533	5	7
27315	219T245	3040-01-177-3944	5	16
27315	219T648	5340-01-186-9616	3	1
27315	219T650	5315-01-186-5631	4	22
27315	219T651	5315-01-186-5632	4	28
27315	219T653	5340-01-170-3878	2	19
27315	219T654F1	5315-01-169-8519	2	27
27315	219T659	5340-01-170-4820	6	26
27315	220N57	4710-01-196-7393	3	3
27315	220P470	4710-01-192-8265	3	9
27315	220T776	5340-01-170-3857	4	32
27315	229P99		4	25
27315	32U1297	7690-01-166-1815	2	10
27315	5T2121		6	30
27315	5T2308	3120-01-185-7290	2	12
27315	5T2458	3120-01-184-3557	6	15
27315	5T2927	3120-01-184-3556	4	10
27315	5T2961	3120-01-183-4100	2	18
27315	5T891	3120-00-661-5470	4	7
			5	5
27315	5Z3		2	34
19207	5704984	3815-01-153-1867	1	1
27315	8P168	3810-00-411-5718	1	3
27315	8P239	4030-00-125-2807	2	5
27315	8P35	5340-01-171-3766	1	5
27315	8T87C1		2	4
27315	TB89C2	4030-01-168-9303	1	4
27315	908P39-5	4030-01-198-8642	2	1

CROSS REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
BULK	1	4010-01-194-0786	80967	08511-1500
BULK	2	4010-01-184-0847	80967	12401-500
BULK	3	4010-01-174-2787	80967	14321-500
1	1	3815-01-153-1867	19207	5704984
1	2		02280	G450-7/8
1	3	3810-00-411-5718	27315	8P168
1	4	4030-01-168-9303	27315	8T89C2
1	5	5340-01-171-3766	27315	8P35
1	6		27315	19F63011
1	7	5315-00-234-1672	46717	L6451-95
1	8	5340-00-786-1663	02280	G450-3/4
1	9		80967	08511-230
1	10		80967	12401-125
1	11		80967	14321-85
2	1	4030-01-198-8642	27315	908P39-5
2	2	5315-01-169-2175	27315	19F66D58
2	3	5315-00-187-9589	96906	MS24665-687
2	4		27315	8T87C1
2	5	4030-00-125-2807	27315	8P239
2	6	2540-01-169-7747	27315	16P1409
2	7	5310-00-891-3426	96906	MS35691-73
2	8	5310-00-762-6248	96906	MS51967-29
2	9	5360-01-169-9806	27315	17T313
2	10	7690-01-166-1815	27315	32U1297
2	11	3815-01-167-9276	27315	211J488F1
2	12	3120-01-185-7290	27315	5T2308
2	13	3120-01-184-3563	27315	205T1115
2	14	5310-00-052-6454	96906	MS35340-51
2	15	5310-00-763-8921	96906	MS51967-23
2	16	3020-01-167-9277	27315	207P16102F2
2	17	4730-00-172-0040	96906	MS15004-1
2	18	3120-01-183-4100	27315	5T2961
2	19	5340-01-170-3878	27315	219T653
2	20	5305-01-170-9093	27315	2026460141
2	21	3020-01-167-7140	27315	14P1861
2	22	5305-01-170-6183	27315	20Z646D147
2	23		27315	18P934D230
2	24	5315-01-172-2695	96906	MS24665-905
2	25		27315	18H3892D49
2	26	5310-01-169-2090	27315	18H3892D83
2	27	5315-01-169-8519	27315	219T654F1
2	28	4730-00-050-4208	96906	MS15003-1
2	29	5305-00-947-4352	96906	MS90728-183
2	30	5310-00-052-6454	96906	MS35340-51
2	31		27315	18T13
2	32	5340-01-171-6970	27315	219T242
2	33	3120-01-173-0705	27315	213T28F1
2	34		27315	5Z3
3	1	5340-01-186-9616	27315	219T648
3	2	5315-01-169-8339	96906	MS24665-846
3	3	4710-01-196-7393	27315	220N57

CROSS REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
3	4	5360-01-187-5845	27315	17ZZ18
3	5	5305-00-947-4364	96906	MS90728-201
3	6	5365-01-194-3066	27315	18P9330132
3	7	5310-00-052-6454	96906	MS35340-51
3	8	5310-00-763-8921	96906	MS51967-23
3	9	4710-01-192-8265	27315	220P470
4	1	3815-01-169-4949	27315	211J487
4	2	2590-01-196-1287	27315	210T102
4	3		27315	208P60D2
4	4	5305-00-947-4360	96906	MS90728-197
4	5	5365-01-170-1374	27315	18P933D84
4	6	3020-01-170-5448	27315	207P159F1
4	7	3120-00-661-5470	27315	5T891
4	8	3020-01-170-5447	27315	207P158F1
4	9	4730-00-172-0040	96906	MS15004-1
4	10	3120-01-184-3556	27315	5T2927
4	11	3815-01-169-3814	27315	208P6001
4	12	5310-00-763-8921	96906	MS51967-23
4	13	5310-00-052-6454	96906	MS35340-51
4	14	5306-01-171-8072	27315	20Z6460144
4	15	5310-00-052-6454	96906	MS35340-51
4	16	5310-00-763-8921	96906	M551967-23
4	17	3815-01-186-3749	27315	2100P169F1
4	18	3815-01-169-8769	27315	207P125F1
4	19	3110-00-903-1493	51588	SJ7354
4	20	4730-00-050-4208	96906	MS15003-1
4	20	5315-01-172-2108	96906	MS24665-903
4	22	5315-01-186-5631	27315	219T650
4	23	5305-00-071-2083	96906	MS90728-127
4	24	5310-00-834-7606	96906	MS35340-48
4	25		27315	229P99
4	26	5310-00-768-0318	96906	MS51967-14
4	27	5365-01-169-2979	27315	18P932D68
4	28	5315-01-186-5632	27315	219T651
4	29		27315	18H3892D193
4	30		27315	18H3892D196
4	31	5305-00-942-2196	96906	MS18154-60
4	32	5340-01-170-3857	27315	220T776
4	33	5310-00-959-4675	96906	MS35340-46
5	1	3815-01-171-5046	27315	211Jl12
5	2	3895-01-202-0341	27315	13P469
5	3	3020-01-184-4588	27315	Z08P498D2
5	4	3020-01-170-5448	27315	207P159F1
5	5	3120-00-661-5470	27315	5T891
5	6	3020-01-184-4587	27315	208P49801
5	7	3040-01-202-8533	27315	219T244
5	8	4730-00-050-4208	96906	MS15003-1
5	9	5305-00-947-4351	96906	MS90728-181
5	10	5310-00-052-6454	96906	MS35340-51
5	11		27315	18T13
5	12	5305-00-947-4360	96906	MS90728-197

CROSS REFERENCE INDEXES

FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
5	13	5365-01-169-2980	27315	218T521
5	14	5310-00-052-6454	96906	MS35340-51
5	15	5310-00-763-8921	96906	MS51967-23
5	16	3040-01-177-3944	27315	219T245
5	17	5310-00-763-8921	96906	MS51967-23
5	18	5365-01-170-1374	27315	18P933D84
5	19	5310-00-052-6454	96906	MS35340-51
5	20	5305-00-947-4360	96906	MS90728-197
5	21	5340-01-169-8384	27315	19T4725
5	22	5315-01-169-8339	96906	MS24665-846
5	23	5310-01-186-8646	27315	18H3892D55
5	24	5305-00-947-4352	96906	MS90728-183
5	25	3040-01-171-4016	27315	19T4726
5	26	5315-01-209-6997	27315	19T4728
6	1	3815-01-169-8700	27315	2100N523F1
6	2	5340-01-169-2260	27315	20T1221
6	3	5310-00-834-7606	96906	MS35340-48
6	4	5305-00-044-4153	96906	MS90725-109
6	5	5315-01-172-0096	27315	19T2556
6	6	3120-01-174-4653	27315	213T25F1
6	7	5315-01-169-8701	27315	19P195
6	8	4730-00-172-0040	96906	MS15004-1
6	9	5305-00-900-1118	96906	MS90728-185
6	10	5310-00-052-6454	96906	MS35340-51
6	11		27315	18T13
6	12		27315	2026460142
6	13	3815-01-168-9601	27315	212J31
6	14	3020-01-169-4990	27315	207P161D1F1
6	15	3120-01-184-3557	27315	5T2458
6	16	5365-01-170-1375	27315	18P933D0159
6	17	5310-00-052-6454	96906	MS35340-51
6	18	5310-00-763-8921	96906	MS51967-23
6	19	2590-01-169-7694	27315	212J25
6	20	5315-01-169-0168	27315	20T5702
6	21	5310-00-982-6571	96906	MS27183-36
6	22		27315	2029V018
6	23	5315-00-187-9600	96906	MS24665-754
6	24	5315-01-172-2696	96906	MS24665-906
6	25	5310-01-211-3045	27315	18H3892D30
6	26	5340-01-170-4820	27315	219T659
6	27		27315	2100524F1
6	28	3120-01-169-0128	27315	205T119
6	29	3815-01-170-9291	27315	12R70
6	30		27315	5T2121
6	31	5310-00-919-2244	35843	1-005-0023
6	32	5305-01-171-0541	27315	202233201
6	33	3815-01-175-6455	97403	13213E6856-3
6	34	3815-00-421-9522	88853	13213E6855-2
6	35	5315-00-491-5159	97403	13213E6858-2
6	36	3815-01-169-8730	97403	13213E6854-3
6	37	5340-01-170-4742	27315	20T7643

* U S GOVERNMENT PRINING OFFICE 1993. 746017/ 80039

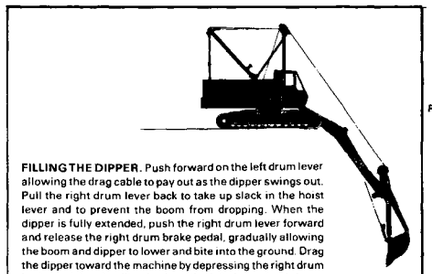
By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

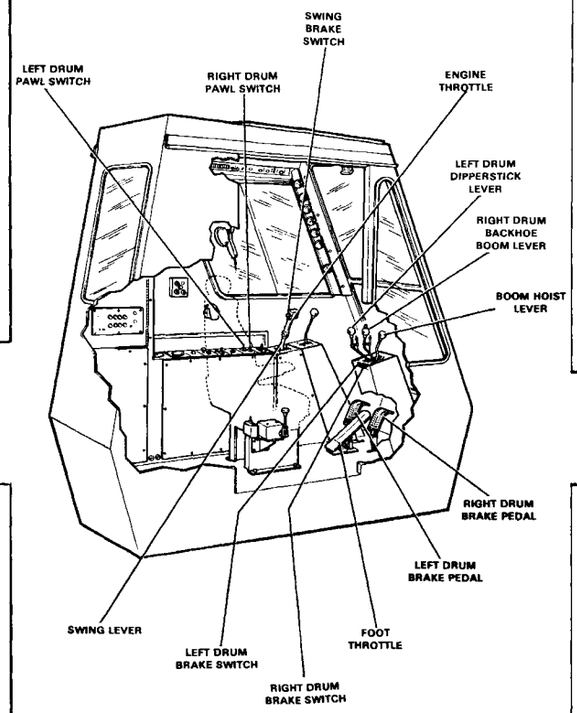
Official:

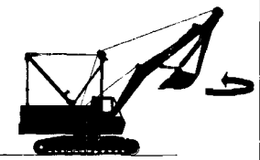
THOMAS F. SIKORA
Brigadier General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25-E, Block 3750, Operator, Unit, and Direct Support and General Support maintenance requirements for TM 5-3815-221-14&P.



FILLING THE DIPPER. Push forward on the left drum lever allowing the drag cable to pay out as the dipper swings out. Pull the right drum lever back to take up slack in the hoist lever and to prevent the boom from dropping. When the dipper is fully extended, push the right drum lever forward and release the right drum brake pedal, gradually allowing the boom and dipper to lower and bite into the ground. Drag the dipper toward the machine by depressing the right drum brake pedal and pulling back on the left drum clutch lever. The depth of bite is controlled with the right drum pedal; easing up on the pedal will cause the dipper to bite deeper, while holding the pedal will cause the dipper to raise. When the dipper is full, apply both brake pedals and push the left drum lever forward (to neutral) to stop the dragging action.





SWINGING. With both drum brake pedals applied, pull the swing clutch lever back to swing right (away from the boom), push the swing lever forward to swing left (into the boom). To stop or reverse the swing motion, slowly move the swing lever in the opposite direction (plugging the swing motion). Swing the dipper to the dump point.

NOTE

When dumping into a truck, always spot truck so dipper swings over tailgate of truck. Never swing dipper over truck cab.

RAISING THE FILLED DIPPER (HOISTING). Pull the right drum lever back and release the right drum brake pedal. As the boom raises, ease up on the left drum brake pedal, but keep enough tension in the drag cable to hold the dipper level under the boom. When the dipper has raised enough to clear the excavation area, push the right drum lever forward to neutral and simultaneously depress the right drum brake pedal.

DUMPING. When the dipper is over the dumping point, release the left drum brake pedal and simultaneously pull back on right drum lever while releasing the right drum brake pedal. When the dipper is almost fully extended, depress both brake pedals and release the right drum clutch lever. Swing dipper back over excavation and repeat the cycle.

Backhoe Operating Cycle

FO-1 (FO-2 Blank)

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS 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:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches

1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches

1 Kilometer = 1,000 Meters = 0.621 Miles

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 = 1,000 Cu Millimeters = 0.06 Cu Inches

1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces

1 Liter = 1,000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

5/9 (°F -32) = °C

212° Fahrenheit is equivalent to 100° Celsius

90° Fahrenheit is equivalent to 32.2° Celsius

32° Fahrenheit is equivalent to 0° Celsius

9/5 C° +32 = F°

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces

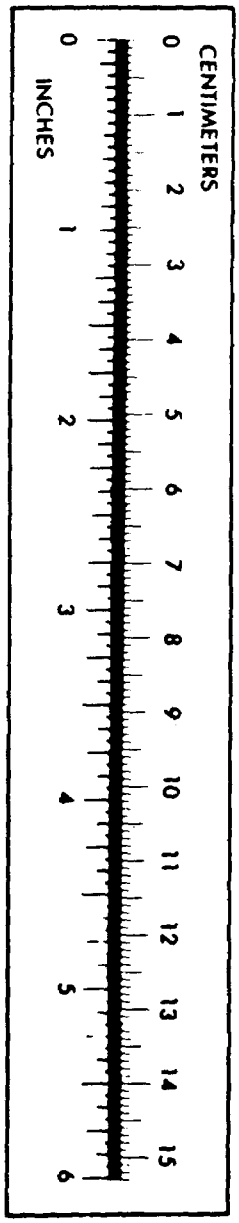
1 Kilogram = 1,000 Grams = 2.2 Lb.

1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

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
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per 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
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621



PIN: 068005-00