

TECHNICAL MANUAL

DIRECT SUPPORT AND

GENERAL SUPPORT MAINTENANCE

CONCRETE-MOBILE® MIXER BODY

M919, MODEL 8CM-24/F

NSN 3895-01-028-4391

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

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1980

WARNING

Operation of a deadlined vehicle without a preliminary examination can cause further damage to a disabled component and possible injury to personnel. By careful inspection and troubleshooting, such damage and injury can be avoided. In addition, the causes of faulty operation of a vehicle or component can often be determined without extensive disassembly.

Particles blown by compressed air are hazardous. Make sure the air stream is directed away from yourself and other personnel.

Any time there is cement dust in the air take precautions to avoid direct inhalation of the dust. If you must be in the immediate vicinity of the dust, wear a dust mask or if none are available, cover your nose and mouth with a cloth. CEMENT DUST CAN CAUSE SERIOUS LUNG PROBLEMS.

Change

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 29 October 1990

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TM 5-3895-372-34, 20 September 1980, is changed as follows:

1. Remove old pages and insert new pages.
2. New or changed material is indicated by a vertical bar in the margin and by a vertical bar adjacent to the TA number.

Remove Pages

i and ii
1-1 and 1-2
2-1 thru 2-6
2-15 and 2-16
A-1 thru A-4

Insert Pages

i and ii
1-1 and 1-2
2-1 thru 2-6
2-15 and 2-16
A-1 thru A-3/(A-4 Blank)

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

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Technical Manual

No. 5-3895-372-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D C, 20 September 1980

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

M919 CONCRETE-MOBILE MIXER® BODY
DAFFIN MOBILE PRODUCTS DIVISION OF BARBER-GREENE COMPANY
(MODEL 8CM-24/F)
NSN 3895-01-028-4391

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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, MI 48397-5000. A reply will be furnished to you.

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*This manual supersedes draft TM 5-3895-372-34, 14 December 1979.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope.

a. This technical manual contains instructions for Direct Support and General Support Maintenance of the M919 Concrete-Mobile®Mixer Body.

b. Appendix A contains a list of current references, including supply manuals, forms, technical manuals, and other available publications applicable to the Concrete-Mobile.®

1-2. Maintenance Forms, Records, and Reports. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by DA Pam 738-750.

1-3. Quality Assurance/Quality Control (QA/QC).

a. No particular quality assurance or quality control technical manuals pertain specifically to the M919 Concrete-Mobile®Mixer Body. Use standard QA/QC procedures.

b. Defective material received through the supply system should be reported on a Quality Deficiency Report (QDR), SF 368. The prepared QDR's should be mailed direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MVB, Warren, Michigan 48397-5000. A reply will be furnished direct to you.

1-4. Calibration Procedures. There are no calibration requirements applicable to the Direct Support and General Support maintenance level.

1-5. Reporting Equipment Improvement Recommendations (EIR). If your mixer needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MP, Warren, MI 48397-5000. We'll send you a reply.

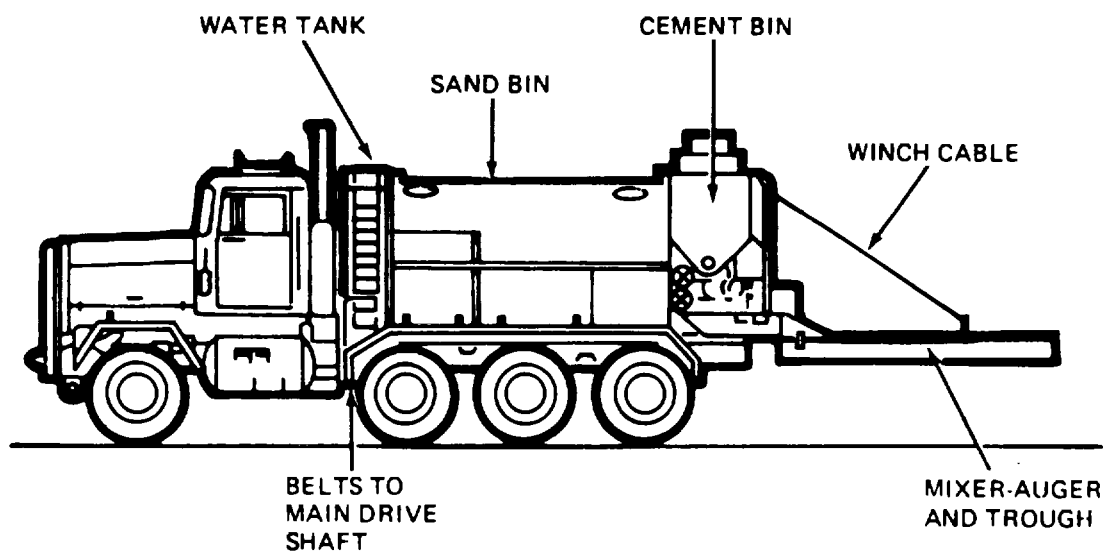
1-6. Destruction of Army Materiel to Prevent Enemy Use. Procedures outlined in TM 750-244-6 (Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use) are applicable to this equipment.

Section II. DESCRIPTION AND DATA

1-7. Description. The M919 Concrete-Mobile®Mixer Body (hereafter referred to as the mixer body) is a chassis-mounted concrete mixing unit. Ingredients are stored in separate bins and tanks, to be mixed into concrete at the job site. The mixer body carries enough material to produce 6-8 yards of concrete with a discharge time of 150-200 seconds per yard (depending on the mix design).

Major components of the mixer body are shown in figures 1-1 thru 1-3. The maintenance paragraphs of this manual contain detailed descriptions of these components.

If you need a detailed description of any component of the mixer body, ask your supervisor to see TM 5-3895-372-20.



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Figure 1-1. Mixer Body, Left Side.

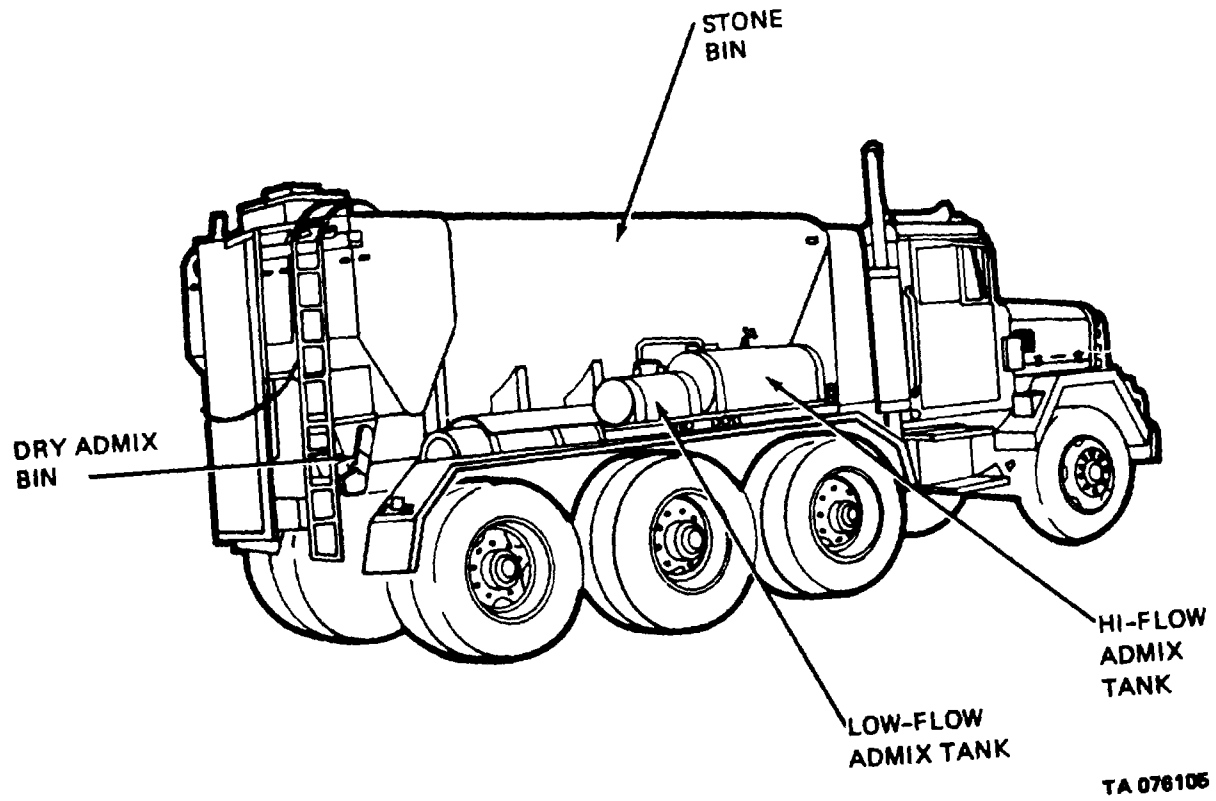
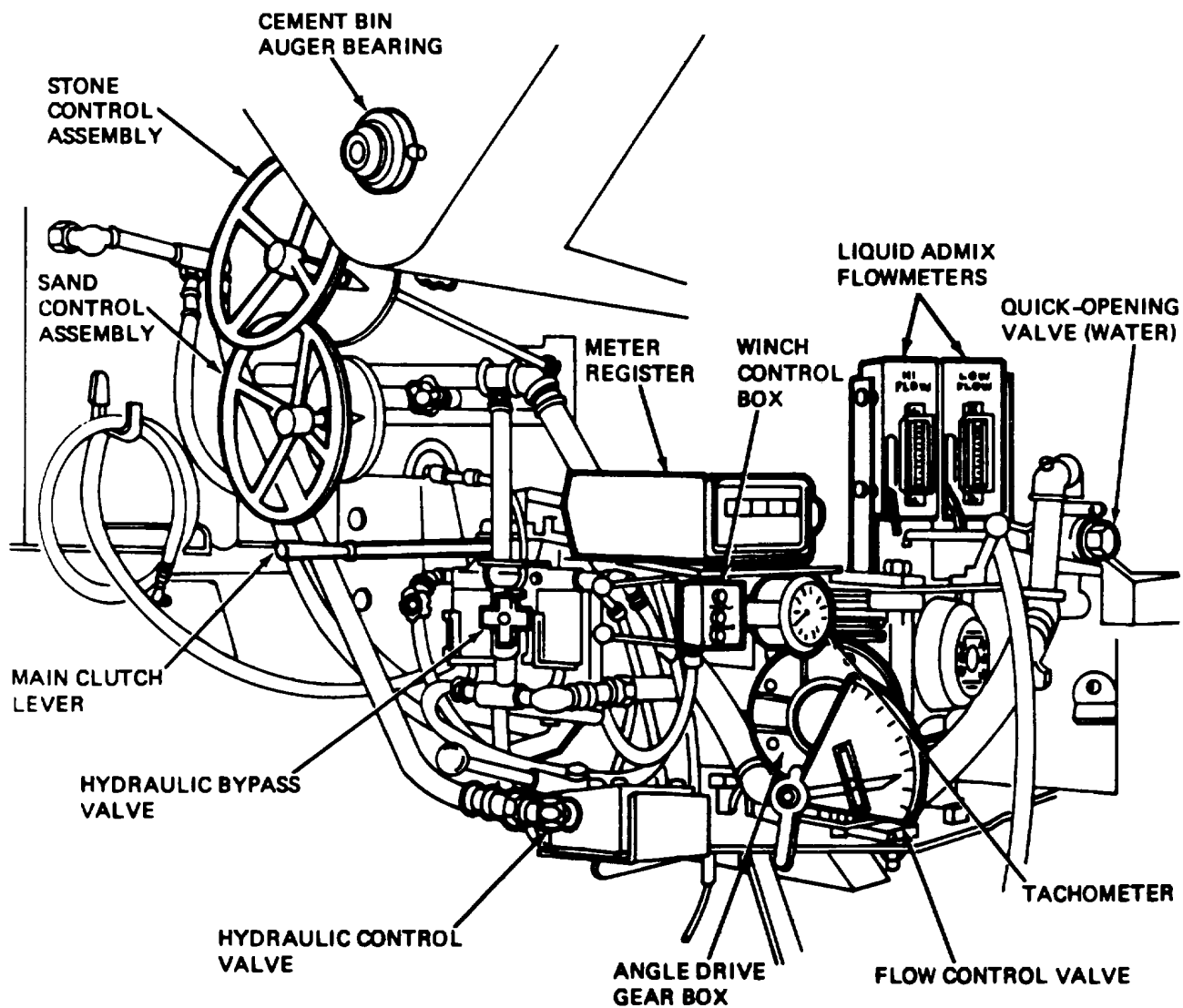


Figure 1-2. Mixer Body, Right Side.



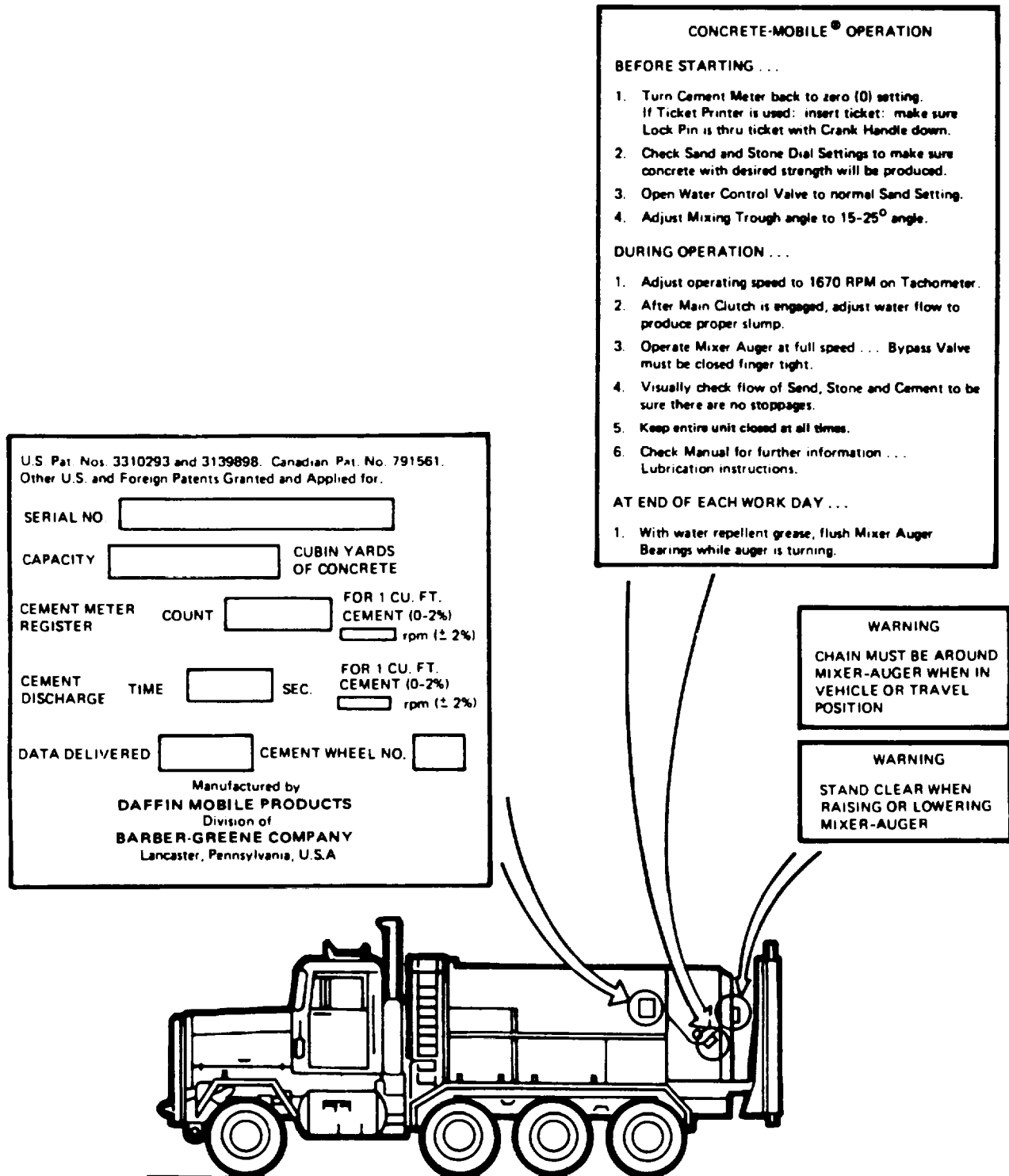
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Figure 1-3. Mixer Body, Control Area.

Table 1-1. Equipment Data

Manufacturer	Daffin Mobile Products Division of Barber-Greene Company
Model	8CM-24/F
Dimensions:	
Length	374.4 in. (9.510 m)
Width	98 in. (2.489 m)
Height	142 in. (3.607 m)
Capacities:	
Sand Bin	128 cu ft (3.58 m ³)
Stone Bin	182 cu ft (5.10 m ³)
Cement Bin	63 cu ft (1.76 m ³)
Water Tank	400 gal (1514 l)
Hi-Flow Liquid Admix Tank	42 gal (159 l)
Low-Flow Liquid Admix Tank	12 gal (45 l)
Dry Admix Bin	3.35 cu ft (0.0938 m ³)
Auxiliary Cement Bin	27 cu ft (0.76 m ³)
Weights:	
Empty (w/Chassis)	34,813 lb (15805 kg)
Loaded (w/Chassis)	71,633 lb (32521 kg)
Empty (Mixer Body Only)	9,200 lb (4177 kg)
Center of Gravity Location (Mixer Body Only)	
Vertical (Distance from Frame):	
Empty	32 in. (81 cm)
Loaded	46 in. (117 cm)
Horizontal (Distance from Front of Sand and Stone Bin):	
Empty	88 in. (224 cm)
Loaded	72 in. (183 cm)
Hydraulic System:	
Capacity	32 gal (121 l)
Hydraulic Pump	Single Vane
Pump Speed (Normal)	1470-1870 rpm
Pressure (Normal)	1900-1950 psi (13100-13450 kPa)
Hydraulic Motor	25 hp and 10 gal at 1500 rpm
Water System:	
Pump	Centrifugal
Pressure (Normal)	50-60 psi (345-414 kPa)

1-8. **Data and Instruction Plates.** Figure 1-4 identifies mixer body data and instruction plates.



TA 076107

Figure 1-4. Data and Instruction Plates.

CHAPTER 2

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

- 2-1. Special Tools and Equipment.** Special tools, and test and support equipment are listed in the Repair Parts and Special Tools List covering Direct Support and General Support maintenance for this equipment (TM 5-3895-372-34P).
- 2-2. Repair Parts.** Repair parts for the mixer body are listed in the Repair Parts and Special Tools List for Direct Support and General Support maintenance (TM 5-3895-372-34P).
- 2-3. Fabricated Tools and Equipment.** The specially designed tools and equipment illustrated in figures 2-1, 2-2, and 2-3, listed in table 2-1, are for Direct Support and General Support Maintenance personnel performing maintenance on the mixer body. The tools and equipment listed in table 2-1 are not available for issue, but must be fabricated by qualified Direct Support and General Support maintenance personnel.

Table 2-1. Fabricated Tools and Equipment

Item	NSN	References		Use
		Fig	Para	
Seal installation thimble	*9510-00-228-6257 (FSCM 81346)	2-1	3-19	Installation of seals in hydraulic motor
Seal installation sleeve	*9510-00-228-6257 (FSCM 81346)	2-2	3-19	Installation of seals in hydraulic motor
Shaft seal driver	*9510-0&228-6257 (FSCM 81346)	2-3	3-8	Installation of shaft seal in hydraulic pump
*1.75 inch cold roll bar stock; C-1018; 18-20 feet long. Do not harden after tool is fabricated.				

Change 1 2-1

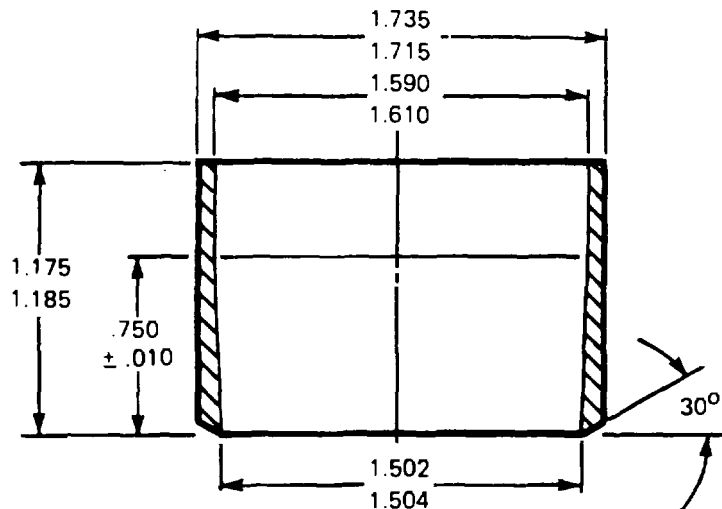


Figure 2-1. Seal Installation Thimble.

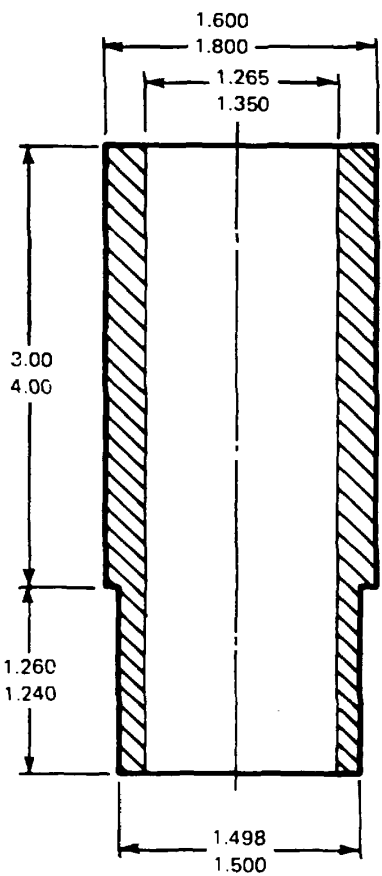


Figure 2-2. Seal Installation Sleeve.

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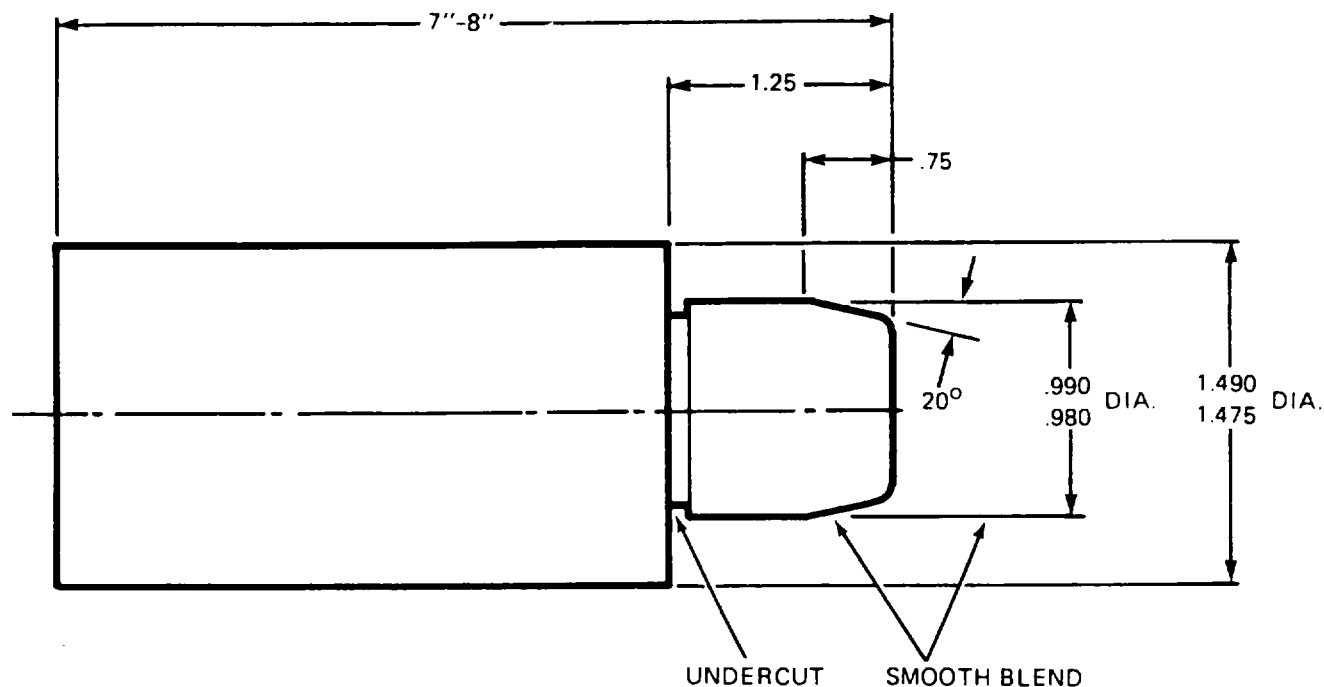


Figure 2-3. Shaft Seal Driver.

Section II. TROUBLESHOOTING

2-4. Introduction. Information on this chapter is for use of supporting maintenance personnel in conjunction with and as a supplement to the troubleshooting procedures in TM 5-3895-372-20. It provides a continuation of instructions given in TM 5-3895-372-20.

WARNING

Operation of a deadlined vehicle without a preliminary examination can cause further damage to a disabled component and possible injury to personnel. By careful inspection and troubleshooting, such damage and injury can be avoided. In addition, the causes of faulty operation of a vehicle or component can often be determined without extensive disassembly.

2-5. Using the Troubleshooting Table. Table 2-2 lists possible malfunctions of the mixer body which are covered in this manual. These malfunctions are grouped according to the mixer body system in which they occur. Each malfunction is followed by a list of steps you should take to find the cause of the problem. When you have found the cause, perform the corrective action listed under that step.

Change 1 2-3

Table 2-2. Troubleshooting Procedures

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. HYDRAULIC OIL PUMP IS LEAKING OIL:		
Step 1.	Check for seal breakdown.	Replace the seal (para 3-6).
Step 2.	Check for porosity in pump body and cover.	Replace the pump body and cover (para 3-6).
Step 3.	Check for seal damage between the pump body and cover.	Replace the shaft seal (para 3-).
2. HYDRAULIC OIL PUMP IS LEAKING OIL AT FITTINGS:		
Step 1.	Check for damaged flange or fittings.	Replace the flange or fittings (para 2-13).
Step 2.	Check for damaged flange threads.	Replace flange (para 2-13).
Step 3.	Check the O-ring seal for damage.	Replace the O-ring seal (para 2-13).
Step 4.	Check for burr on mating surfaces.	Remove the burr (para 2-13).
3. HYDRAULIC OIL PUMP IS NOT DELIVERING OIL:		
Step 1.	Check for proper priming.	Bleed air from system.
Step 2.	Check the hydraulic fluid level.	If too low, add fluid. (Refer to LO 5-3895-372-12.)
Step 3.	Check for air leakage in suction line.	Tighten and seal connections. Replace seals (para 2-13).

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. HYDRAULIC OIL PUMP IS NOT DELIVERING OIL (Continued):		
Step 4.	Check that oil is proper for climate.	Use correct oil. (Refer to LO 5-3895-372-12.)
Step 5.	Check for broken pump shaft or internal parts.	Replace damaged parts (para 2-13).
4. HYDRAULIC OIL PUMP NOT DEVELOPING PRESSURE:		
Step 1.	Check whether relief valve is set too low.	Test per TM 5-3895-372-20 and set if too low.
Step 2.	Check whether the relief valve is sticking open.	Test per TM 5-3895-372-20 and, if necessary, repair damaged valve (para 3-9 thru 3-12).
Step 3.	Check whether vane holdout pins are loading vanes. Disassemble and check pins and pin bores for burrs or damage.	Check for foreign material (para 3-6 and 3-7).
Step 4.	Check if a free recirculation of fluid to tank is being allowed.	Ensure directional control valve is not in neutral position and that bypass valve is closed (refer to TM 5-3895-372-10). Clean or replace bypass valve as necessary (refer to TM 5-3895-372-20). Repair control valve as necessary (refer to para. 3-14 thru 3-16).
5. THE HYDRAULIC OIL PUMP IS NOISY OR OPERATION ERRATIC:		
Step 1.	Check for air leak at pump inlet or suction lines.	Find leaks by pouring system fluid around joints and listening for change in sound level. Tighten as required.
Step 2.	Check for pump body and cover separation.	Make sure bolts are torqued properly (para 2-13).
Step 3.	Check for worn vanes, cam ring, or port plates.	Disassemble according to overhaul instructions and replace worn parts (para 3-6).
Step 4.	Check for worn vane hold out pins or clogged oil feed holes in pins.	Replace pins if worn or clean if clogged (para 3-6).
Step 5.	Check for worn bearings.	Disassemble and replace (para 3-6 thru 3-8).

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. CONTROL VALVE HAS HIGH HANDLE LOAD:		
Step 1.	Check for restriction "return" port or pressure on the return port due to valve being installed incorrectly.	Remove the restriction or install valve correctly (para 3-14).
Step 2.	Check for bent detent disk gouging into top of housing.	Remove and flatten detent disk (para 3-13 and 3-14).
Step 3.	Check for dirt under thrust washer which lifts and cocks rotor.	Disassemble and clean valve (para 3-14 and 3-15).
Step 4.	Check for worn or missing stop pin on shaft which allows rotor to gouge into housing.	Disassemble and replace shaft pin (para 3-14).
Step 5.	Check for worn or brinelled or corroded groove in rotor and thrust washer causing balls to bind.	Turn thrust washer over and surface grind worn side of rotor. Put shim under thrust washer equal to material ground off rotor (fig. 3-3).
Step 6.	Check for pressure in excess of valve rating.	Adjust relief valve. (Refer to TM 5-3895-372-20.)
Step 7.	Check for worn lip off shear seal seat which would increase friction load.	Replace shear seal seat (para 3-13 thru 3-16).
Step 8.	Check for galling between the shear seal seat and rotor.	Grind and lap face of rotor and shear seal seat. Put shim under thrust washer equal to material ground off rotor (para 3-13 thru 3-16).
7. EXTERNAL LEAKAGE AROUND SHAFT OF CONTROL VALVE:		
Step 1.	Check for worn shaft O-ring.	Replace shaft O-ring (para 3-13 thru 3-16).

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7. EXTERNAL LEAKAGE AROUND SHAFT OF CONTROL VALVE (Continued):		
Step 2.	Check for enlarged shaft hole caused by side load on shaft.	Replace housing. Temporarily, string packing can be used for seal (para 3-13 thru 3-16).
8. EXTERNAL LEAKAGE AROUND SHEAR SEAL SEATS OF CONTROL VALVE:		
Step 1.	Check for worn shear seal seat O-ring.	Replace shear seal seat O-ring and leather backup ring (para 3-13 thru 3-16).
9. LEAKAGE ACROSS FACE OF SHEAR SEAL SEATS OF CONTROL VALVE:		
Step 1.	Check for scratch or other damage to lip of shear seal seat.	Either replace shear seal seat (para 3-13 thru 3-16) or lap face on No. 600 grit carborundum paper which has been taped to a surface plate or a piece of plate glass.
Step 2.	Check for scratch or damage to rotor.	Lap out scratch on No. 600 paper or if too deep, surface grind rotor, then lap out as outlined above.
Step 3.	Check for incorrect positioning of rotor in relation to shear seal seat.	Replace detent disc or stop pin, whichever is causing the trouble (para 3-13 thru 3-16).
Step 4.	Check for extreme wear on face of shear seal seat which will normally occur only after millions of cycles. Such wear reduces spring tension in shear seal seat and may thus cause leakage.	Replace shear seal seat (para 3-13 thru 3-16).
Step 5.	Check if shear seal seat spring fails by breaking or taking a permanent set which in turn, may allow fluid to pass between shear seal seat and rotor.	Replace spring (para 3-13 thru 3-16).
2-7		

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
10. EXTERNAL LEAKAGE AROUND PORTS OF CONTROL VALVE:		
Step 1.	Check for scratches or other physical damage to threads.	If thread compound fails to effect a solder so that when the pipe is screwed back into valve it will in effect re-cut the threads. Use Litharge and glycerin for a thread seal any time the piping is changed.
11. EXTERNAL LEAKAGE BETWEEN BODY AND HOUSING OF CONTROL VALVE O-RING:		
Step 1.	Check for improperly installed body O-ring.	Replace body O-ring and install properly (para 3-13 thru 3-16).
Step 2.	Check for excessive back pressure in the housing caused by restricted return flow or valve being connected with pressure on return port. This back pressure may cause bolts to stretch and allow fluid to leak out between body and housing.	Check return pressure with pressure gage and remove restriction. Install valve according to port markings. (Refer to TM 5-3895-372-20.)
Step 3.	Check for high velocity caused by extreme volume of fluid being forced through valve. With fluid velocities greater than 30 feet per second, a jet of fluid hits the body O-ring when the valve is in an intermediate or inter flow position. This high velocity jet goes past the O-ring and through the crack between body and housing castings	Install a velocity shield ring which will correct this condition, or replace old style housing with a new one which has a fully contained O-ring groove (para 3-13 thru 3-16).
12. HYDRAULIC MOTOR LEAKS:		
Step 1.	Check for leaking hose fittings.	Tighten fittings.
Step 2.	Check for leaking oil seals.	Disassemble motor and replace seals (pare 3-18).
Step 3.	Check for leakage at special bolts.	Torque leaking bolt to 50 lb-ft (68 N-m). Replace bolt.

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
12. HYDRAULIC MOTOR LEAKS (Continued):		
Step 4.	Check for faulty seal around coupling shaft.	Disassemble motor and replace seal (para 3-18 and 3-19).
Step 5.	Check for worn coupling shaft or seal.	Disassemble motor. Replace shaft and seal as required (para 3-18 and 3-19).
13. HYDRAULIC MOTOR SLOWS GREATLY UNDER LOAD:		
Step 1.	Check oil supply.	Adjust or replace relief valve. (Refer to TM 5-3895-372-20.) Check that oil type is right for climate. (Refer to LO 5-3895-372-12.) Repair worn pump (para 3-6 thru 3-8).
Step 2.	Check for leakage inside motor.	Replace worn rotor set (para 3-17 thru 3-19).
14. LOW MECHANICAL EFFICIENCY UNDULY HIGH PRESSURE REQUIRED FOR OPERATION OF HYDRAULIC MOTOR:		
Step 1.	Check for blocked oil line.	Replace blocked oil line.
Step 2.	Check clearance of rotor set.	Replace worn rotor set (para 3-17 thru 3-19).
15. WINCH GEAR BOX LEAKING OIL:		
Step 1.	Check mounting bolts and filler plug for looseness.	Tighten as necessary.
Step 2.	Check gasket and oil seal in gear box for wear or damage.	Replace as required (para 4-8 and 4-9).

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
16. WINCH OPERATION SLOW OR ERRATIC:		
Step 1.	Check brushes in motor for excessive wear.	Replace as necessary (para 4-8 and 4-9).
Step 2.	Check bushings in motor for wear.	Replace as necessary (para 4-8 and 4-9).
17. WINCH FAILS TO HOLD:		
Step 1.	Check brake disk for excessive wear.	Replace as necessary (para 4-8 and 4-9).
18. ANGLE DRIVE GEAR BOX OVERHEATS:		
Step 1.	Check for clogged oil passages.	Make sure all oil passages are clear and permit free flow of lubricant (para 6-3).
Step 2.	Check shaft end play.	Shim bearings to obtain recommended fit (para 6-8).
19. ANGLE DRIVE GEAR BOX VIBRATES, IS NOISY:		
Step 1.	Check loose foundation bolts.	Tighten loose bolts. Replace missing lockwashers.
Step 2.	Check for excessive shaft end play.	Replace worn bearings or gears. Shim bearings to obtain recommended fit (para 6-8).
Step 3.	Check bearing wear. Wear will cause dullness of balls, rollers, and raceways.	Replace worn bearings. Clean and flush with reducer, install clean oil (para 6-8).
Step 4.	Check for broken parts, or loose bolts, nuts, and screws. Be sure lockwire is not broken.	Tighten loose bolts, nuts, or screws. Replace broken parts (para 6-4 thru 6-8).

Table 2-2. Troubleshooting Procedures (Continued)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
19. ANGLE DRIVE GEAR BOX VIBRATES, IS NOISY (Continued):		
Step 5.	Be sure keys are of correct size.	Replace improperly fitted keys (para 6-3 thru 6-7).
Step 6.	Check for excessive wear on gears and pitting of tooth surfaces.	Replace gears (para 6-3 thru 6-10).
20. REVERSING GEAR BOX OVERHEATING AND NOISY:		
Step 1.	Check for proper oil level.	Replenish as required. (Refer to LO 5-3895372-12.)
21. REVERSING GEAR BOX LEAKS:		
Step 1.	Check for loose bolts.	Tighten all bolts and nuts.
Step 2.	Check for broken gaskets.	Replace as necessary (para 6-13 thru 6-15).
22. MAIN CLUTCH SLIPS:		
Step 1.	Check clutch for proper adjustment.	Adjust main clutch. (Refer to TM 5-3895372-20.)
Step 2.	Check that lockpin is engaged.	Engage lockpin.

Section III. GENERAL MAINTENANCE

2-6. Introduction. This section contains general procedures for cleaning, inspecting, repairing, and assembling the mixer body and its components. Any procedures which are unique to a particular component will be detailed in the section, or paragraph relating to that component.

2-7. Descaling Procedures. Normally the mixer body will be kept clean by washouts after each use. Any deposits will be chipped away during weekly and monthly preventive maintenance inspections.

If large masses of concrete do harden on the unit, use an air chisel to remove them.

2-8. Cleaning of Components. When you repair mixer body components you must remove all dirt and foreign substances. Dirty parts usually fail within a short period. Follow these instructions during all cleaning operations.

- a. Clean all parts before inspection, after repair, and before assembly.
- b. Keep your hands free of grease. Grease can collect dust and grit.
- c. After cleaning, wrap parts in plastic or paper, or cover them to keep off dust and dirt.

WARNING

Particles blown by compressed air are hazardous. Make sure the air stream is directed away from yourself and other personnel.

CAUTION

Do not allow drycleaning solvents to come in contact with seals on flexible hoses. These cleaners cause leather, rubber, and synthetic materials to dry out, rot, and lose pliability.

d. *Castings.*

(1) Use drycleaning solvent to clean inner and outer surfaces of castings, and all areas subject to oil and grease.

(2) Use a stiff brush to remove sludge and gum deposits from castings.

(3) Use clean, dry, compressed air to blow out and dry all tapped holes in castings.

e. *Oil Passages.* Pay special attention to oil passages in castings and machined parts. All oil passages must be clean and free of obstructions.

(1) Use a wire or other suitable probe to break up any sludge or gum deposits.

(2) Flush passages with drycleaning solvent.

(3) Dry passages by blowing them out with compressed air.

f. *Oil Seals and Flexible Hoses.* Clean seals and flexible hoses with soap and water.

g. *Bearings.*

(1) Bearings require special cleaning. After removing surface oil and gum deposits, place bearings in hot oil (140°F) to loosen congealed oil and grease. Wipe bearings dry. Do not use compressed air. After cleaning, coat bearings with a light film of oil. Wrap them in paper until you need them for inspection and assembly.

(2) Refer to TM 9-214 for information on care and maintenance of bearings.

2-9. Inspection.

a. Introduction. To avoid repetition of instructions, general procedures for inspection of mixer body parts are given below. Inspection procedures unique to a specific item will be covered in the section relating to that item.

b. Castings.

(1) Using a magnifying glass in strong lights, inspect for cracks. Check carefully around studs, pipe plugs, threaded inserts, sharp corners, and fillets.

(2) Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair.

(3) Use a straightedge or surface plate to check for warping of mating flanges. Inspect for discoloration from oil leakage.

(4) Inspect all threaded openings for damaged or stripped threads.

c. Ball Bearings. Refer to TM 9214 for inspection of bearings.

d. Studs. Inspect studs for stripped or damaged threads, looseness, or evidence of stretching.

e. Gears.

(1) Using a magnifying glass in strong light, inspect for cracks.

(2) Inspect all gear teeth for wear, sharp fins, burrs, and galled or pitted surfaces.

f. Bushing and Bushing-Type Bearings.

(1) Inspect all bushings and bushing-type bearings for secure fit in their castings on mating parts. Check for discoloration from heating on bushing or bearing surface.

(2) Inspect bushings and bushing-type bearings for wear, burrs, nicks, and out-of-round condition.

(3) Check for dirt in lubrication holes or grooves. Holes and grooves must be clean and free from damage.

g. Oil Seals. Do not replace metal-encased oil seals unless inspection indicates damage.

(1) Inspect feather edge of seal for damage.

(2) Check for loss of flexibility and resilience.

h. Core Hole Plugs. Inspect core hole plugs for evidence of leakage. Replace seals if they are damaged or if leakage is evident.

2-10. Repair.

a. Introduction. To avoid repetition, general procedures for repair are outlined below. Repair procedures and tolerances unique to a specific item will be covered in the section or paragraph relating to that item.

b. Castings.

(1) Replace all cracked castings.

(2) Repair minor damage to machined surfaces with a fine file, emery cloth, or crocus cloth dipped in drycleaning solvent. Replace all castings on which machined surfaces are burred or nicked to the point of interfering with assembly or operation.

(3) Repair minor warpage of mounting flanges and gasket surfaces by working the surface across a sheet of emery cloth held tightly on a surface plate or other flat surface. Finish similarly with crocus cloth. Replace castings having flanges which are warped to the point of impairing assembly or operation.

(4) Repair damaged pipe or capscrew threads in tapped holes with a tap.

NOTE

Pipe plug threads in castings must be in good condition to prevent oil or water leakage.

c. Ball Bearings.

(1) Replace all galled, pitted, or damaged ball bearings.

(2) Refer to TM 9-214 for maintenance of bearings.

d. Studs. Replace all bent or loose studs and studs showing evidence of stretching. Repair minor thread damage with a thread chaser. Replace all studs having stripped or damaged threads. Procedures for removing and replacing studs are outlined below.

(1) *Removal.* Using a stud extractor, back the studs out slowly to avoid heating and possible seizure. If a stud is broken off too short to use a stud extractor, drill the stud and extract it with any easy out.

(2) *Replacement.* Only standard studs are supplied for replacement. If threaded openings are damaged and retapping will not clean up threads, drill and tap opening in casting and install a threaded insert.

NOTE

All replacement studs have a special coating and must have a small amount of mica-base antiseize compound (MIL-A-13881) applied on the threads before the stud is installed in the casting.

Change 1 2-15

e. Gears.

(1) Replace all cracked gears.

(2) Replace gears having worn, pitted, or galled teeth. Use a crocus cloth dipped in drycleaning solvent to remove sharp fins and burrs from gear teeth.

f. Bushings and Bushing-Type Bearings. When bushings and bushing-type bearings are damaged or worn beyond specified limits, the parts with which they are used must usually be replaced as well.

g. Oil Seals. Oil seals must be replaced when the thin feather edge is damaged or when the seal material has become hard or brittle.

(1) *Removal.* Press or pry a damaged oil seal from the casting or adapter, being careful not to damage the bore in the casting or adapter.

(2) *Repair.* When a casting oil seal bore or adapter is burred so that an oil-tight seal is impossible, replace the casting or adapter. Remove slight nicks, burrs, and scratches from the casting bore or adapter with crocus cloth dipped in drycleaning solvent.

(3) *Installation.* Install a new oil seal in the bore of the casting or adapter using a proper oil seal installation tool.

2-11. Assembly Instructions.

a. General. Extreme care in component assembly operations will ensure satisfactory performance from the mixer body. Rules for assembly are outlined below. Step-by-step procedures for assembly of various components are covered in the paragraph relating to the specific component.

b. Precautionary Rules.

(1) Cleanliness is essential in all component assembly operations. Dirt and rust, even in minute quantities, are abrasive. Parts must be cleaned as specified and kept clean. Wrap or cover parts and components when assembly procedures are not immediately completed.

(2) Coat all bearings and all contact surfaces with engine oil OE/HDO-10 (MIL-L-2104C) to ensure lubrication of parts during initial startup.

(3) Replace all gaskets and preformed packings during assembly.

c. Teflon-Wrapped Pipe Plugs. Certain pipe plugs have a thin coat of Teflon applied to the pipe threads before installation of the plug. This is done to provide better seal and also to permit easier removal of the pipe plug. Those pipe plugs requiring a Teflon coating are identified in the particular assembly procedure calling for the installation of such plugs. The method of coating these particular plugs with Teflon is as follows:

(1) Be sure the pipe plug is thoroughly clean and dry before applying the liquid Teflon. All dirt, grease, oil, and scale must be removed.

- (2) Start coating one or two threads from the small or leading edge of the plug.
- (3) Torque the pipe plugs to their specified torque. Do not use power tools.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

2-12. Introduction. This section provides you with procedures for replacing major component parts of the mixer body. Organizational level replacement procedures described in TM 5-3895-372-20 are not repeated. Following is a list of replacement procedures given in this section.

- a. Oil pump
- b. Sand and Stone Bin Assembly
- c. Main Clutch
- d. Cement Feeder
- e. Cement Bin Assembly

2-13. Hydraulic Oil Pump.

- a. *Removal.*
 - (1) Raise and prop access door in the open position.
 - (2) Remove tachometer cable housing bracket retaining bolt and nut (2, fig. 2-4).
 - (3) Loosen setscrew (1) and remove tachometer cable and bracket.

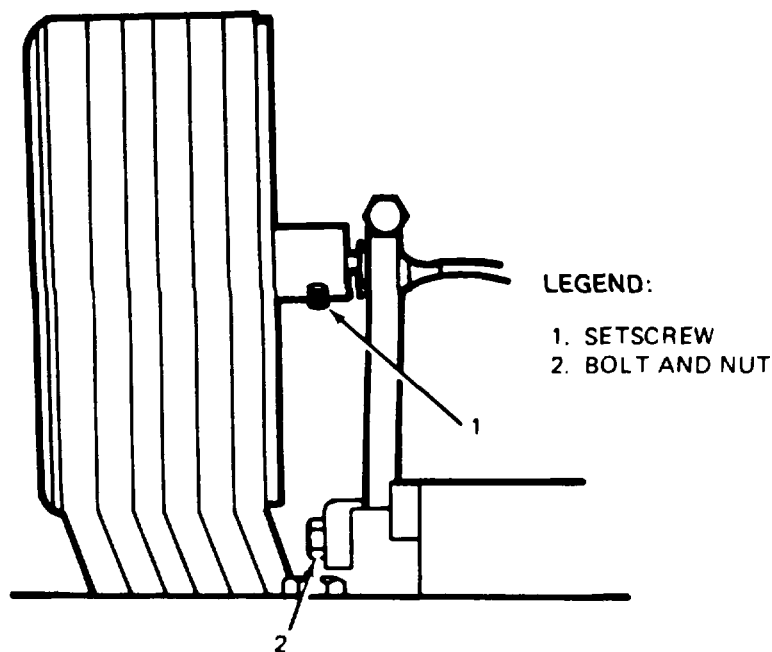


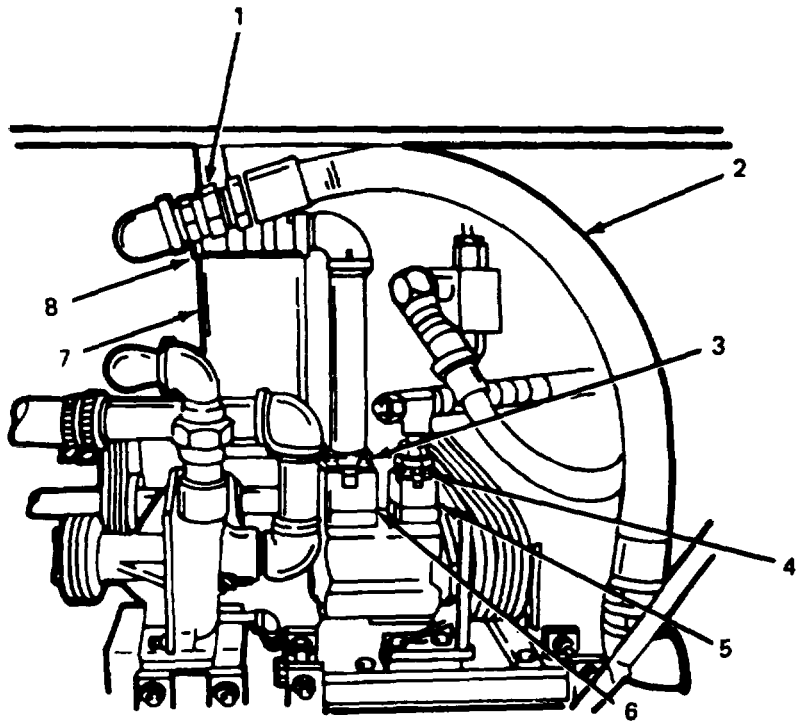
Figure 2-4. Removal of Tachometer Cable and Housing.

TA076111

- (4) Disconnect oil filter inlet hose (2, fig. 2-5) at swivel nut (1).
- (5) Remove four screws (3) from cap (6) and remove oil filter assembly (8) with piping attached.
- (6) Remove four screws (4) from cap (5) and disconnect pump outlet from the oil pump.
- (7) Tie return line, relief valve and bypass line out of the way.
- (8) Loosen the four base plate bolts (9 and 19, fig. 2-7), six flatwashers (10), four lockwashers (12) and four nuts (15). Do not remove.
- (9) Loosen the two adjusting lock screws (13) and back them off the maximum distance.

LEGEND:

1. SWIVEL NUT
2. INLET HOSE
3. SCREW (4)
4. SCREW (4)
5. CAP
6. CAP
7. ELEMENT
8. OIL FILTER ASSEMBLY



TA 076112

Figure 2-5. Oil Filter and Return Line Disconnect.

(10) Push the pump (1) inward as far as it will go and remove the six drive belts (1, fig. 2-6) from the sheaves (4, fig. 2-7).

(11) Remove four pump bracket mounting bolts (21) and lockwashers (12). Remove pump (1), bracket (3), and spacers (20).

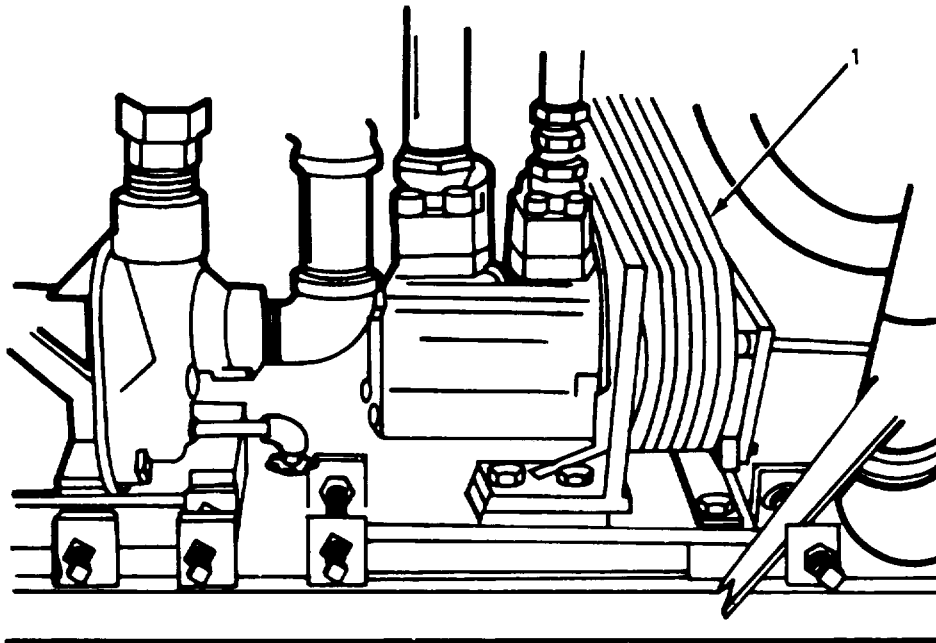
(12) Remove six screws (7) and flat washers (6) removing bushing (8).

(13) Insert three screws (7) in the tapped removal hole of bushing (5). Tighten evenly, while holding sheaves with a strap wrench, until the sheaves is loose on the bushing (5) and remove sheaves (4).

(14) Remove bushing (5). If the bushing (5) will not slip off the pump shaft, wedge a screwdriver blade in the saw cut to overcome tightness.

(15) Remove two bolts (23) and lockwashers (22) removing bracket (3) from pump (1).

(16) Remove key (2).

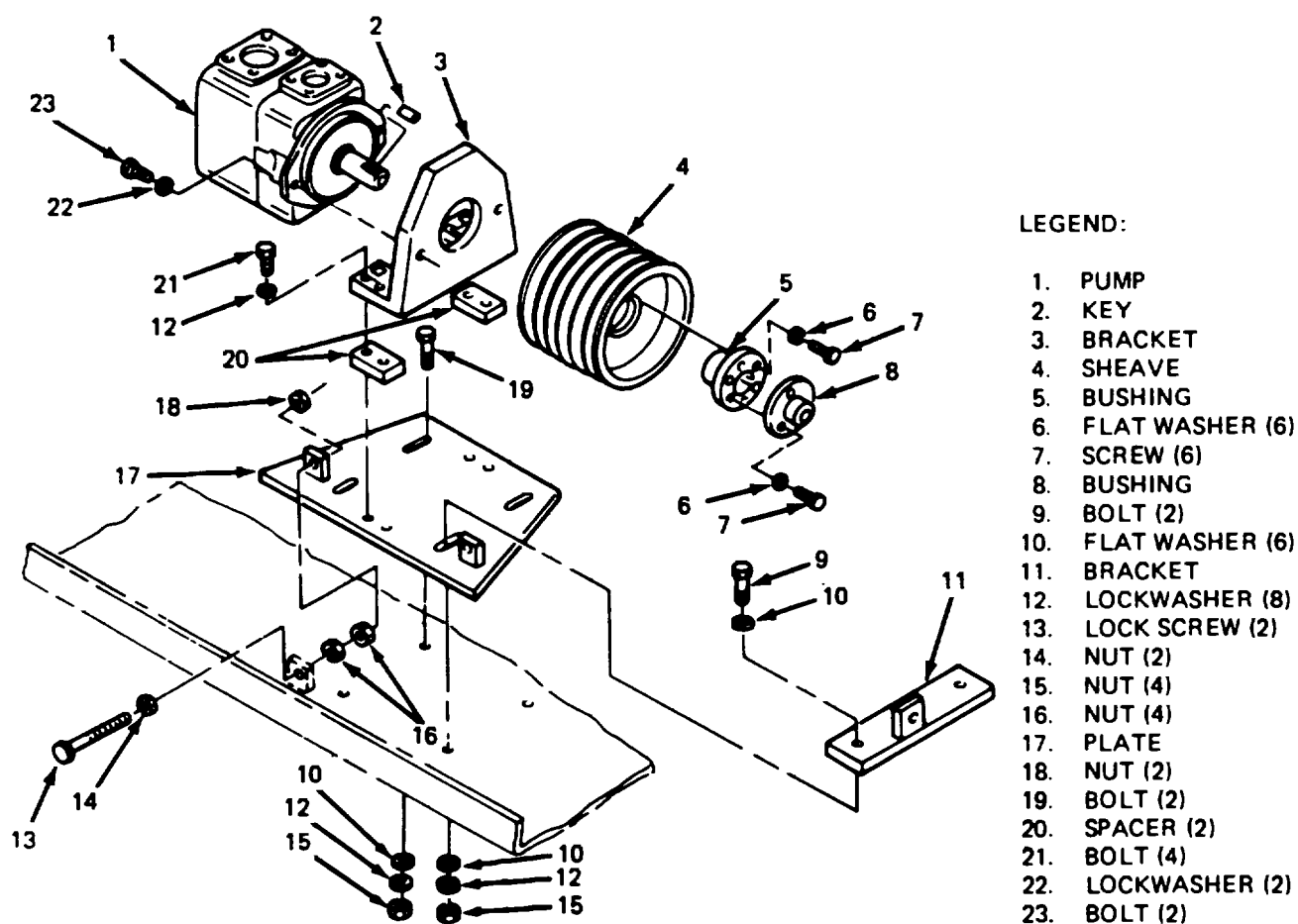


LEGEND:

1. DRIVE BELT (6)

TA 078113

Figure 2-6. Removal of Hydraulic Oil Pump Drive Belts.



TA 078114

Figure 2-7. Removal/Installation of Hydraulic Oil Pump.

- (17) Remove the four base plate bolts (19 and 9), six flat washers (10), four lockwashers (12) and four nuts (15), removing bracket (11).
- (18) Remove the two adjusting lock screws (13), two nuts (14), four nuts (16), and two nuts (18). Remove plate (17).
- (19) Inspect all fittings and mating flanges for crossed threads or burr. Replace fittings as necessary and remove burrs with fine sandpaper before assembly.

b. Installation.

CAUTION

Use no lubricants during this installation.

- (1) Aline plate (17, fig. 2-7) with frame and install two bolts (19), two flat washers (10), two lockwashers (12), and two nuts (15). Do not tighten.
- (2) Aline bracket (11) with plate (17) and install two bolts (9), four flat washers (10), (one washer on both sides of brackets), two lockwashers (12) and two nuts (15). Do not tighten.
- (3) Secure bracket (3) to pump (1) with two bolts (23) and two lockwashers (22).
- (4) Install key (2).
- (5) Install bushing (5) in sheaves (4), loosely installing three mounting screws (7) and flat washers (6).
- (6) Line up bushing (5) with key (2) on pump shaft and slide sheaves on the pump shaft until resistance is felt. Do not tighten screws.
- (7) Install bushing (8) with three screws (7), and flat washers (6).
- (8) Aline two spacers (20) with plate (17).
- (9) Install pump (1) with bracket (3) on vehicle, installing and tightening the four mounting bolts (21) and lockwashers (12).
- (10) Aline the sheaves. (Refer to TM 5-3895-372-20.)
- (11) Tighten the three screws (7) and flat washers (6) to bushing (5) and sheaves (4).
- (12) Install six drive belts (1, fig. 2-6). Make sure pump is all the way toward the center of the vehicle.
- (13) Install two nuts (14, fig. 2-7) on lock screws (13) and insert lock screws through holes on frame. Install four nuts (16) on lock screws and insert the lock screws through the holes in plate (17).
Install two nuts (18) on the end of the lock screws (13).
- (14) Adjust the belts (1, fig. 2-4). (Refer to TM 5-3895-372-20.)
- (15) Before installing caps (5 and 6, fig. 2-5), install new O-rings.
- (16) Install return line with relief valve and bypass line attached. Torque four screws (4) to 28 lb-ft (38 N-m).
- (17) Change the oil filter element (7). (Refer to TM 5-3895-372-10.)
- (18) Install oil filter assembly (8) with piping attached. Torque four screws (3) to 68 lb-ft (92 N-m)
- (19) Install oil filter inlet hose (2) and tighten swivel nut (1).
- (20) Fill oil reservoir. (Refer to LO 5-3895-372-12.)
- (21) Start engine and engage PTO. (Refer to TM 9-2320-273-10.)
- (22) Operate mixing auger, (refer to TM 5-3895-372-10) and check for leaks. Correct any leaks that are found

- 2-14 Sand and Stone Bins.
a. Preparation.

NOTE

Prior to the removal of the sand and stone bins, the following must be completed: (Refer to TM 53895-372-10.)

- (1) Empty sand and stone bin.
- (2) Drain liquid admix tanks.
- (3) Empty cement bin.
- (4) Drain water tank.
- (5) Empty dry admix bin.
- (6) Remove auger mixer extension chutes.
- (7) Remove quick loading hopper.

In your TM 92320-273-10 the following tasks must be completed:

- (8) Lower pusher axle.
- (9) Drain air tanks.

In your TM 5-3895-372-20 the following tasks must be completed:

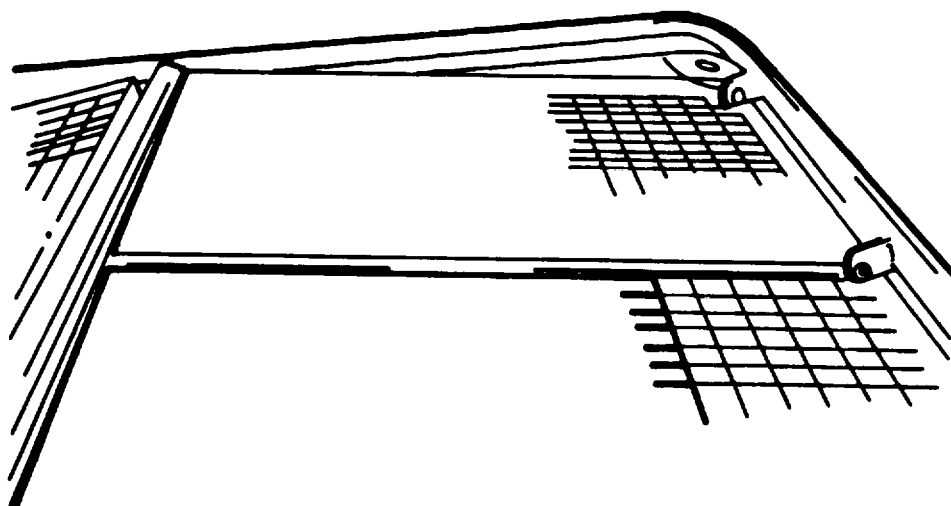
- (10) Remove conveyor belt.
- (11) Remove oil tank reservoir.
- (12) Remove oil filter.
- (13) Remove bypass valve.
- (14) Remove hydraulic relief valve.
- (15) Remove tachometer cable.
- (16) Remove control valve.
- (17) Remove four vibrators.
- (18) Remove air lubricator.
- (19) Remove air lines and valves.
- (20) Remove air filter.
- (21) Remove fluffier valve.
- (22) Remove winch cable.
- (23) Remove winch assembly.
- (24) Remove wiring harness.
- (25) Remove marker lamps.

- a. Preparation (continued).
 - (26) Remove tachometer.
 - (27) Remove hydraulic lines.
 - (28) Remove water pump.
 - (29) Remove valves and water lines.
 - (30) Remove main drive system from the upper PTO belt pulley to main clutch.
 - (31) Remove right angle gear box.
 - (32) Remove cement drive system.
 - (33) Remove dry admix bin.
 - (34) Remove sand and stone screens.
 - (35) Remove flowmeters.
 - (36) Remove liquid admix valves, lines, and fittings.
 - (37) Remove admix injector.
 - (38) Remove rubber guides.
 - (39) Remove metal guides and sand deflector.
 - (40) Remove front seals.
 - (41) Remove belt wiper.
 - (42) Remove chain oiled.
 - (43) Remove sand and stone gates.
 - (44) Remove sand and stone gates controls
 - (45) Remove cement meter register cable.
 - (46) Remove cement meter register.
 - (47) Remove dry admix hopper.
 - (48) Remove rear blackout lamps and tail and stoplights.

b. Removal.

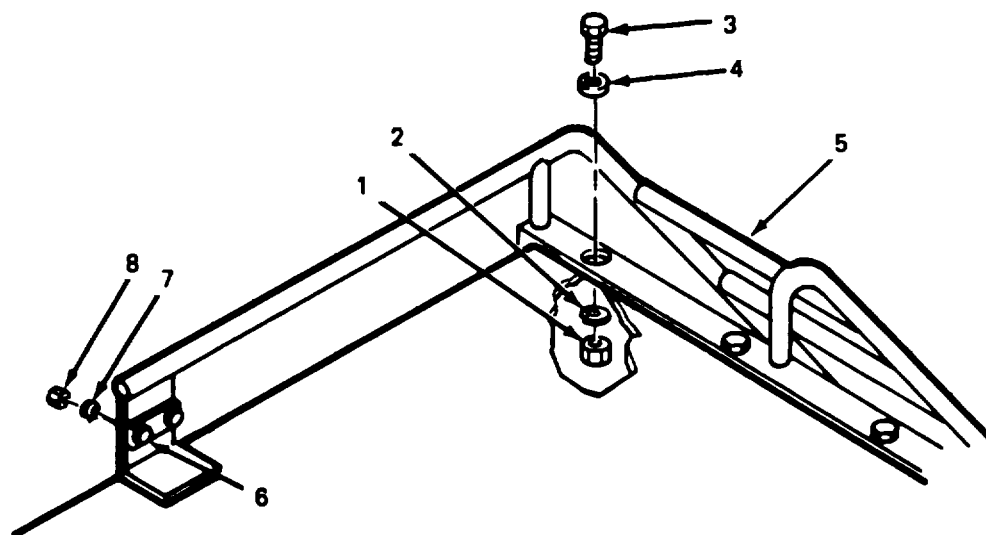
- (1) Remove hydraulic oil pump. (Refer to para 2-13.)
- (2) Remove main clutch assembly. (Refer to para 2-15).
- (3) Drill 19/32 inch hole in each of the four corner gussets (fig. 2-8) and install four 9/16 inch shank shoulder eyebolts and nuts.
- (4) Remove four bolts (3, fig. 2-9), flat washers (4), lockwashers (2), and nuts (1).

RIGHT FRONT
CORNER GUSSET;
DRILL ON CENTER



TA 076115

Figure 2-8. Drill Holes in Corner Gussets.



LEGEND:

- 1. NUT (4)
- 2. LOCKWASHER (4)
- 3. BOLT (4)
- 4. FLAT WASHER (4)
- 5. LADDER
- 6. CAPSCREW (2)
- 7. LOCKWASHER (2)
- 8. NUT (2)

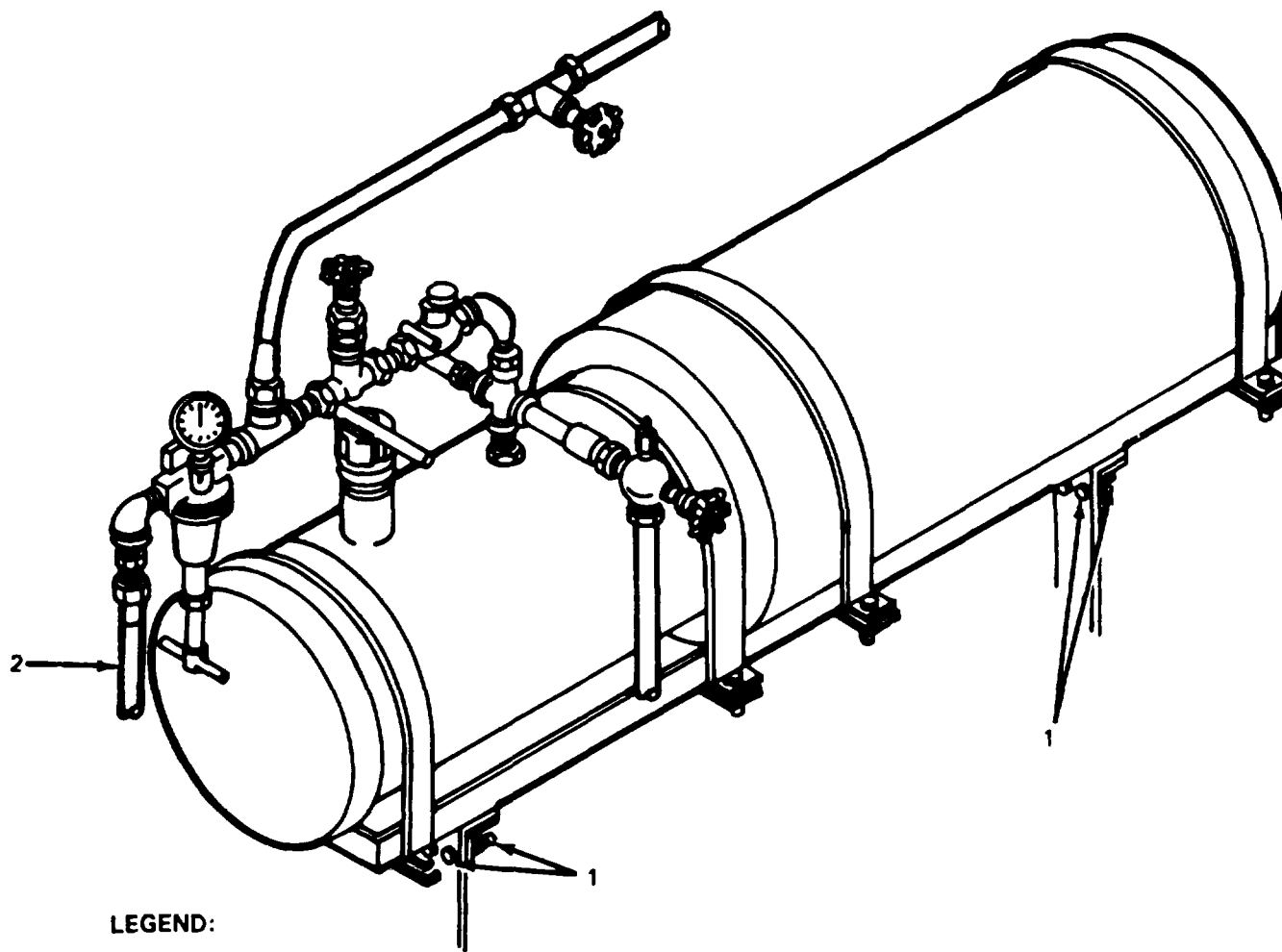
TA 076116

Figure 2-9. Remove /Install Rear Ladder.
2-24

- (5) Remove two capscrews (6), lockwashers (7), and nuts (8).
- (6) Remove ladder (5) from vehicle.
- (7) Remove four bolts, nuts, and lockwashers (1, fig. 2-10) and air supply line (2).
- (8) Remove tanks.
- (9) Remove four screws (2, fig. 2-11) and remove winch control box cover (1).

NOTE

Steps (9) and (10) should be worked in conjunction.

**LEGEND:**

- 1. BOLT, NUT AND LOCKWASHER (4)
- 2. AIR SUPPLY LINE

TA 076117

Figure 2-10. Remove/Install Liquid Admix Tanks.

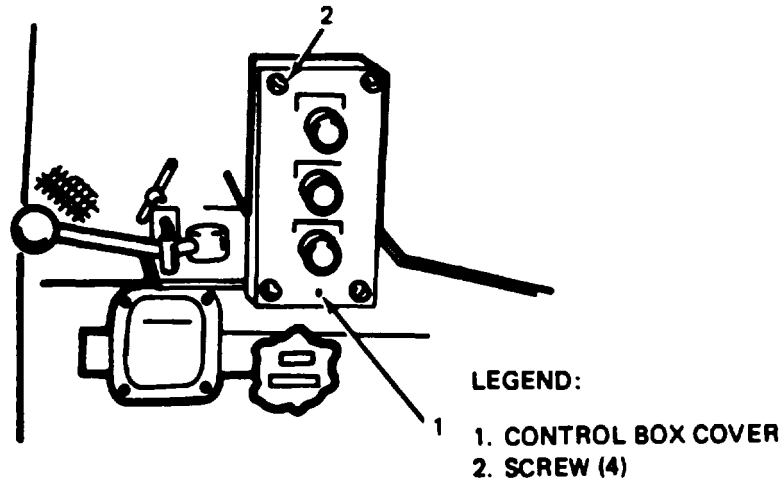


Figure 2-11. Remove/Install Winch Control Box Cover.

- (10) Remove four capscrews and lockwashers (2, fig. 2-12). Cut cable ties (1) and remove microswitch (3).
- (11) Remove two bolts, nuts and lockwashers (1, fig. 2-13) and remove box (3) and wiring cable (2) from vehicle.
- (12) Remove two hex bolts, lockwashers and nuts (1, fig. 2-14).
- (13) Remove four hex bolts, lockwashers, and nuts (2).
- (14) Remove one hex bolt, lockwashers, and nut (3).
- (15) Remove frame (4).
- (16) Remove left and right rear fender by removing twenty-one bolts, lockwashers and nuts on each fender.

NOTE

Removal of left and right side belt tensioning devices is identical. Remove both tensional

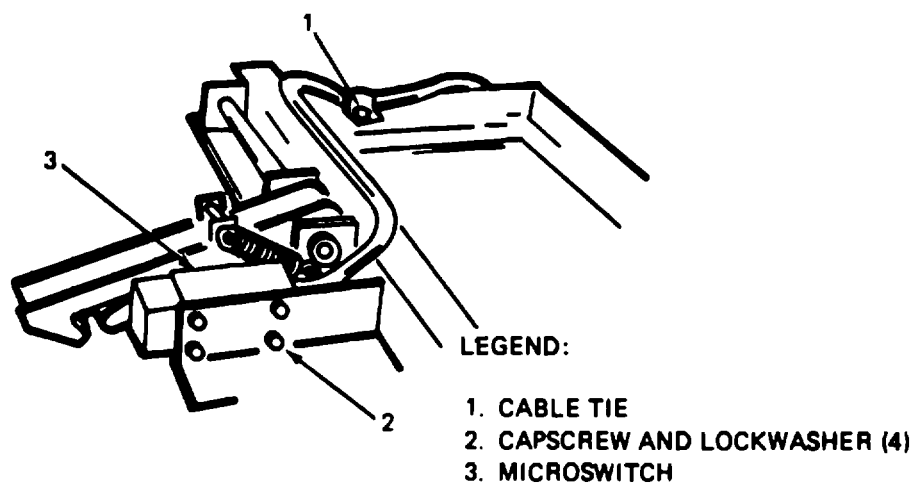


Figure 2-12. Remove/Install Microswitch.

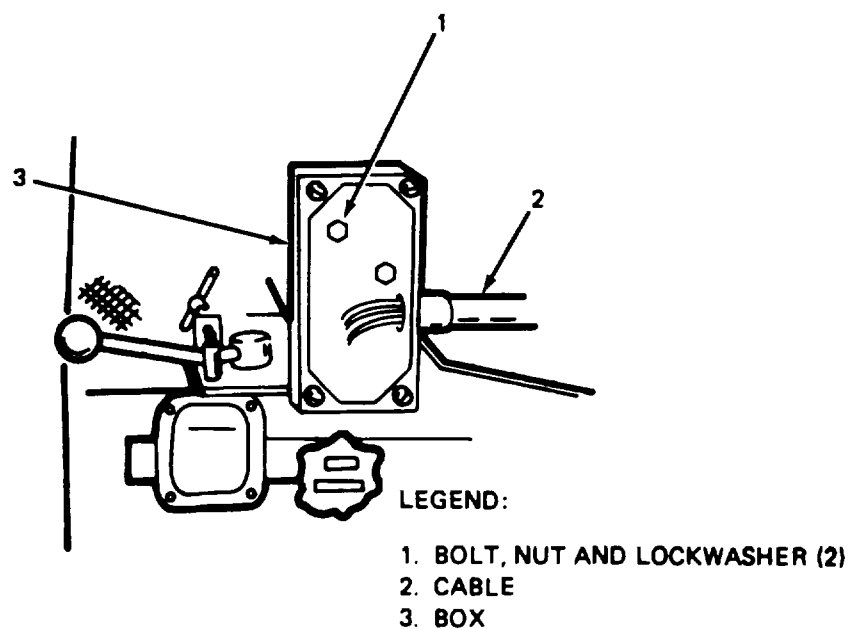


Figure 2-13. Remove/Install Control Box.

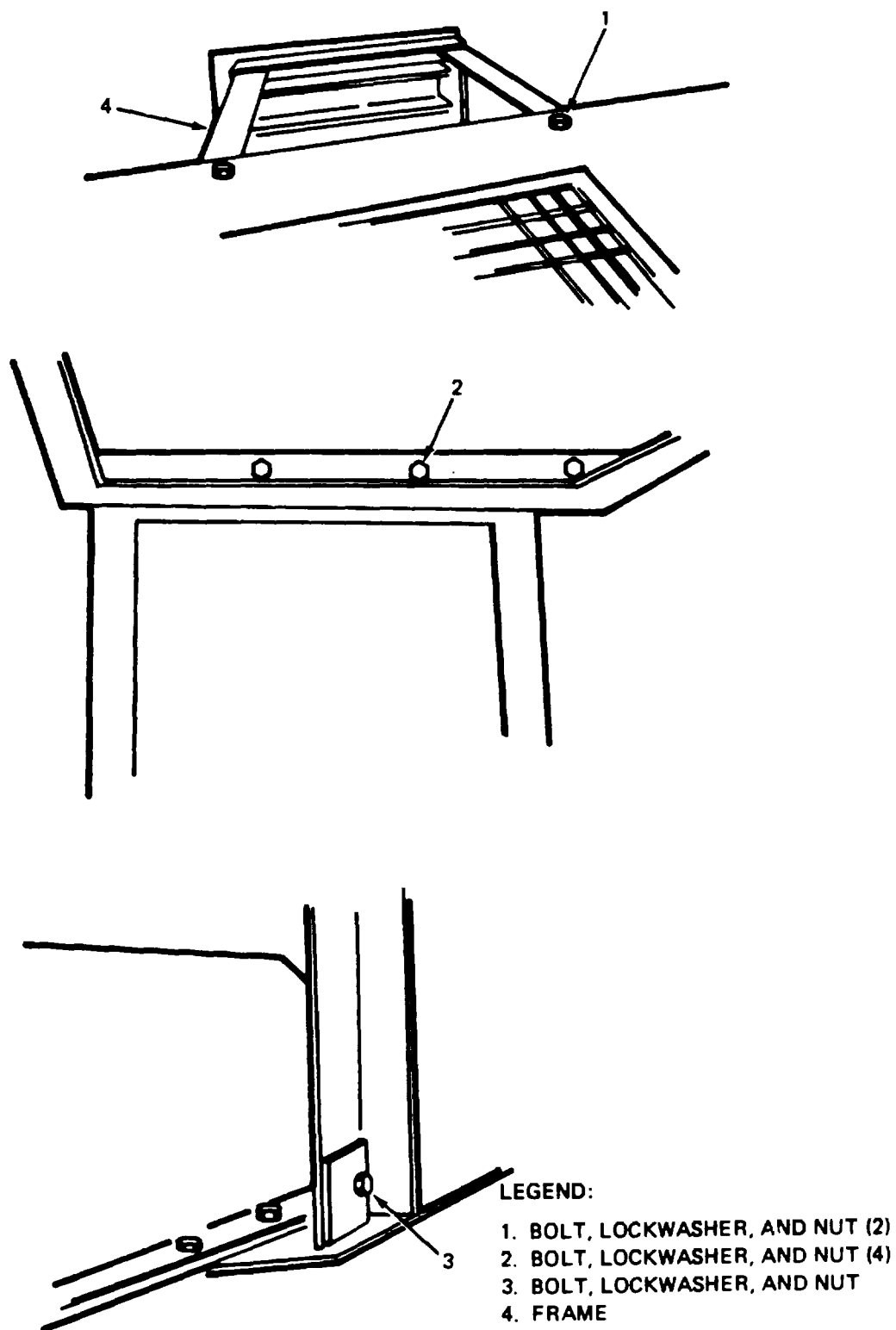
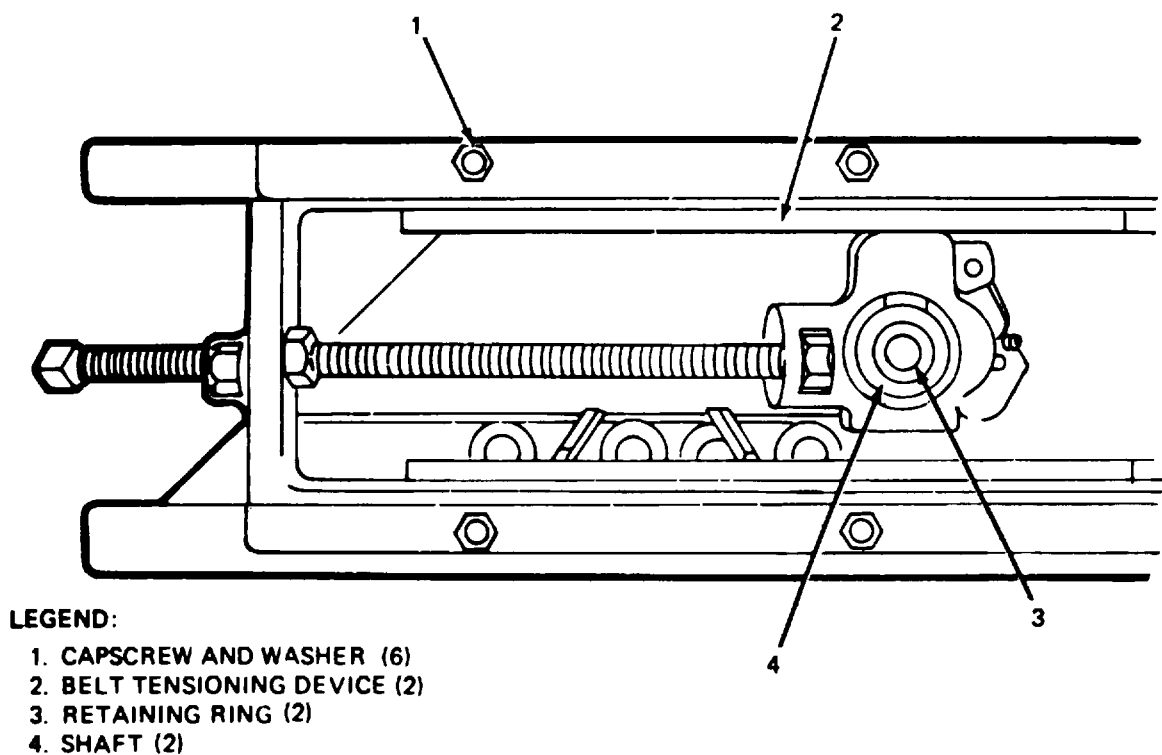


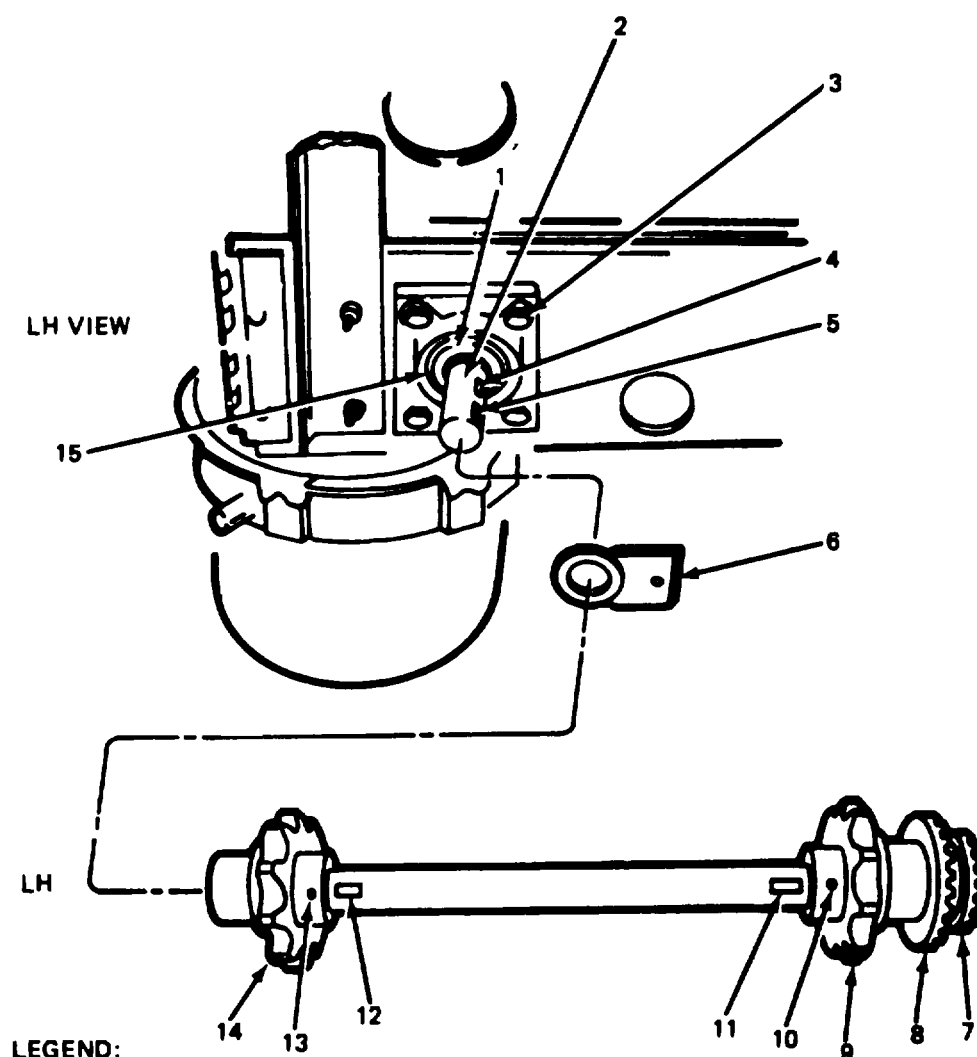
Figure 2-14. Remove/Install Rear Accessory Frame.

- (17) Loosen setscrew and turn retaining ring (3, fig. 2-15) counterclockwise and remove from shaft. Remove six capscrews and washers (1) and remove belt tensioning device (2) from vehicle.
- (18) Remove shaft (4) from vehicle. (19) Loosen two setscrews and remove retaining ring (15, fig. 2-16).
- (20) Remove right angle drive coupling (6).
- (21) Remove two keys (4) and (5).
- (22) Loosen four set screws (10) and (13).
- (23) Remove two keys (11) and (12).
- (24) Slide two sprockets (9) and (14) inward.
- (25) Remove two sprockets (7) and (8).



TA 076122

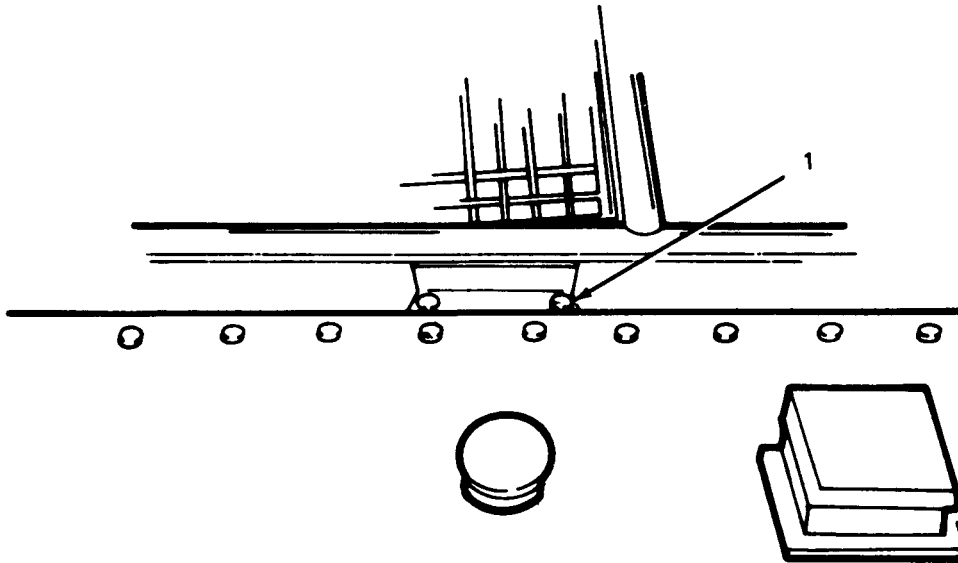
Figure 2-15. Remove/Install Belt Tensioning Device.



TA 076123

Figure 2-16. Remove/Install Conveyor Belt Bearings and Shaft.

- (26) Remove eight capscrews and washers (3), two bearings (1), and shaft (2).
- (27) Remove nine bolts, nuts, lockwashers and remove pump access covers.
- (28) Cut any cable ties located in the frame and clear all cables.
- (29) Remove two bolts, lockwashers and nuts (1, fig. 2-17).
- (30) Remove four bolts, nuts and lockwashers (1, fig. 2-18).
- (31) Remove four bolts, nuts and lockwashers (1, fig. 2-19).
- (32) Remove twenty bolts, lockwashers and nuts (1, fig. 2-20).

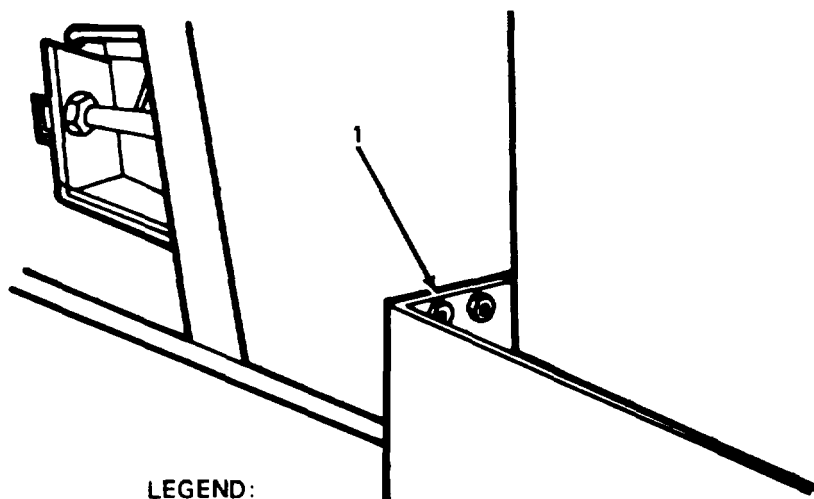


LEGEND:

1. BOLT, LOCKWASHER, AND NUT (2)

TA 076124

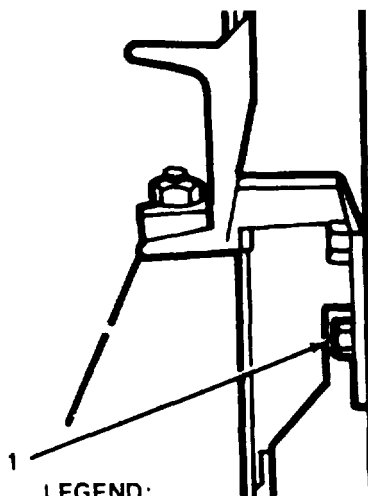
Figure 2-17. Upper Bin to Water Tank Bolts.
2-31



LEGEND:

1. BOLT, NUT, AND LOCKWASHER (4)

Figure 2-18. Bin to Water Tank Frame Bolts.



LEGEND:

1. BOLT, NUT, AND LOCKWASHER (4)

Figure 2-19. Bin to Water Tank Bolts.

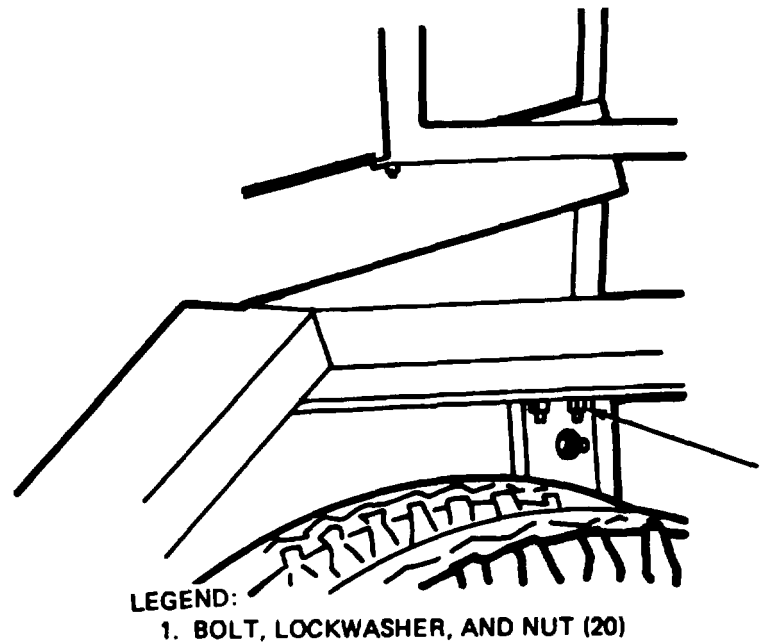


Figure 2-20. Bin to Chassis Frame Bolts.

(33) Using a suitable hoist, lift bins off of vehicle (fig. 2-21).

c. Installation.

- (1) Using a suitable hoist set bins in place on vehicle (fig. 2-21).
- (2) Install twenty bolts, lockwashers and nuts (1, fig. 2-20). Tighten bolts securely.
- (3) Install four bolts, nuts, and lockwashers (1, fig. 2-19). Tighten securely.
- (4) Install four bolts, nuts, and lockwashers (1, fig. 2-18). Tighten securely.
- (5) Install two bolts, lockwashers, and nuts (1, fig. 2-17). Tighten securely.
- (6) Secure any cables to frame with ties that were removed.
- (7) Set pump access covers in place and install nine bolts, nuts, lockwashers and tighten securely.
- (8) Install shaft (2,
- (9) Install keys (11 and 12) and tighten four setscrews (10 and 13).
- (10) Install two bearings (1), shaft (2), eight capscrews and washers (3). Tighten securely.
- (11) Install two keys (4 and 5) and right angle drive coupling (6).
- (12) Install chain drive sprocket (8) and admix drive sprocket (7).
- (13) Install retaining ring (15) and tighten setscrew.
- (14) Install shaft (4, fig. 2-15), belt tensioning device (2), six capscrews and washers (1), retaining ring (3), and spacers. Tighten setscrew and six capscrews securely.

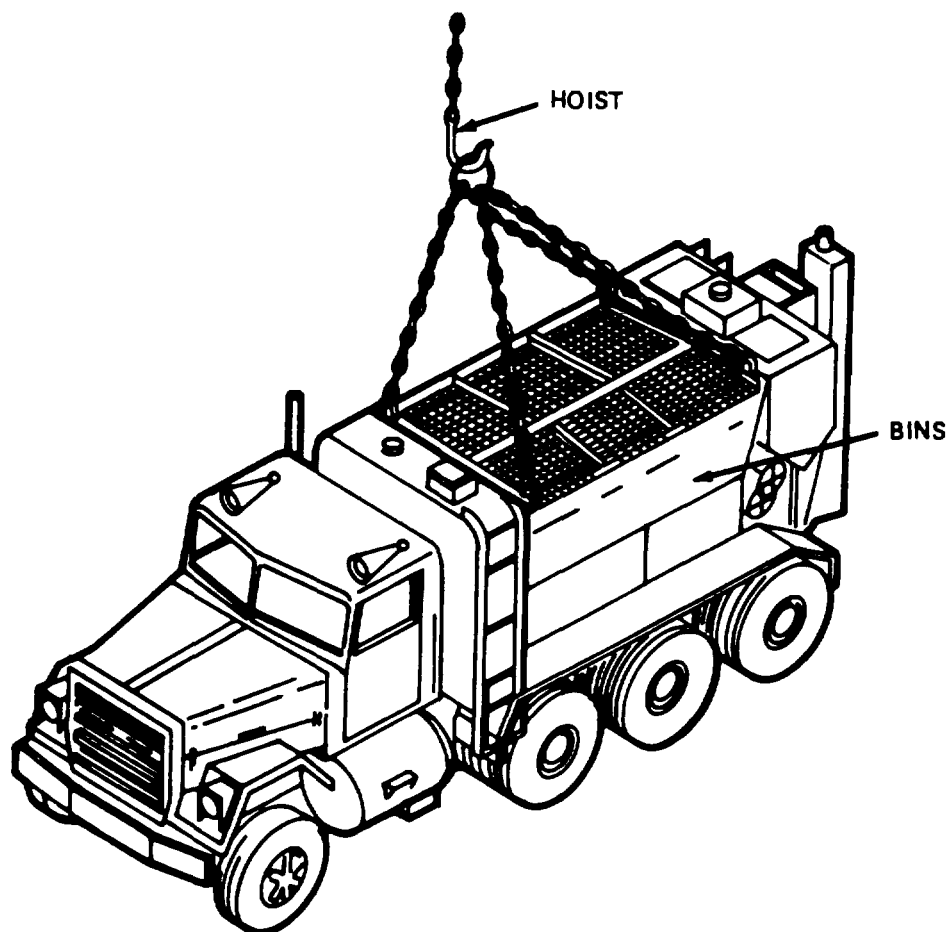


Figure 2-21. Lifting Bins.

- (15) Set left and right rear fenders in place. Install twenty-one bolts, lockwashers and nuts on each fender and tighten bolts securely.
- (16) Set rear accessory frame in place and secure with hexagon bolt, lockwashers, and nut (3, fig. 2-14).
- (17) Install four hexagon bolts, lockwashers, and nuts (2) and tighten securely.
- (18) Install two hexagon bolts, lockwashers, and nuts (1) and tighten securely.
- (19) Install cable (2, fig. 2-13), box (3) and secure with two bolts, nuts, lockwashers (1) and tighten securely.
- (20) Install microswitch (3, fig. 2-12) and secure with four capscrews and lockwashers (2). Install cable ties (1).
- (21) Install control box cover (1, fig. 2-11) and secure with four screws (2).

- (22) Set liquid admix tanks in place and secure with four bolts, nuts, and lockwashers (1, fig. 2-10). Install air supply line (2) and swivel nut.
- (23) Set ladder (5, fig. 2-9) in place and install two capscrews (6), lockwashers (7) and nuts (8). Tighten capscrews securely.
- (24) Install four bolts (3), flatwashers (4), lockwashers (2), and nuts (1) and tighten securely.
- (25) Install main clutch assembly. (Refer to pare 2-15.)
- (26) Install hydraulic oil pump. (Refer to pare 2-13.)
- (27) Remove four 9/16 inch shank shoulder eyebolts and nuts from four corner gussets (fig. 2-8).

d. Follow on steps required:

NOTE

The following items must be completed. (Refer to TM 5-3895-372-20.)

- (1) Install cement meter register.
- (2) Install cement meter register cable.
- (3) Install sand and stone gates controls.
- (4) Install sand and stone gates.
- (5) Install chain oiled.
- (6) Install belt wiper.
- (7) Install front seals.
- (8) Install metal guides and sand deflector.
- (9) Install rubber guides.
- (10) Install admix injector.
- (11) Install liquid admix valves, lines, and fittings.
- (12) Install flowmeters.
- (13) Install sand and stone screens.
- (14) Install dry admix bin.
- (15) Install cement drive system.
- (16) Install right angle gear box.
- (17) Install main drive system from the upper PTO belt pulley to main clutch.
- (18) Install valves and water lines.
- (19) Install water pump

- (20) Install hydraulic lines.
- (21) Install tachometer.
- (22) Install marker lamps.
- (23) Install wiring harness.
- (24) Install winch assembly.
- (25) Install winch cable.
- (26) Install flutter valve.
- (27) Install air filter.
- (28) Install air lines and valve.
- (29) Install air lubricator.
- (30) Install four vibrators.
- (31) Install control valve.
- (32) Install tachometer cable.
- (33) Install hydraulic relief valve.
- (34) Install bypass valve.
- (35) Install oil filter.
- (36) Install oil tank reservoir.
- (37) Install conveyor belt.
- (38) Install dry admix hopper.
- (39) Install rear blackout lamps and tail and stoplights.

In your TM 5-3895-372-10 manual complete the following tasks:

- (40) Install quick loading hopper.
- (41) Install auger mixer extension chutes.
- (42) Fill dry admix bin.
- (43) Fill water tank.
- (44) Fill cement bin.
- (45) Fill liquid admix tanks.
- (46) Fill sand and stone bin.

In your TM 9-2320273-10 manual complete the following tasks:

- (47) Start engine and build up air pressure.
- (48) Raise pusher axle.

2-15. Main Clutch.**a. Removal.**

- (1) Remove two access covers (1, fig. 2-22).
- (2) Clean, polish, and lubricate drive shaft (4, fig. 2-23) just forward of U-joint (3).
- (3) Mark the rear U-joint (3) and drive shaft (4) on both ends of the U-joint to aid in reassemble. The U-joint and shafts are line drilled for roll pins during initial assembly and can only be assembled in one position.
- (4) Remove two roll pins (2) and grease fitting from U-joint cross.

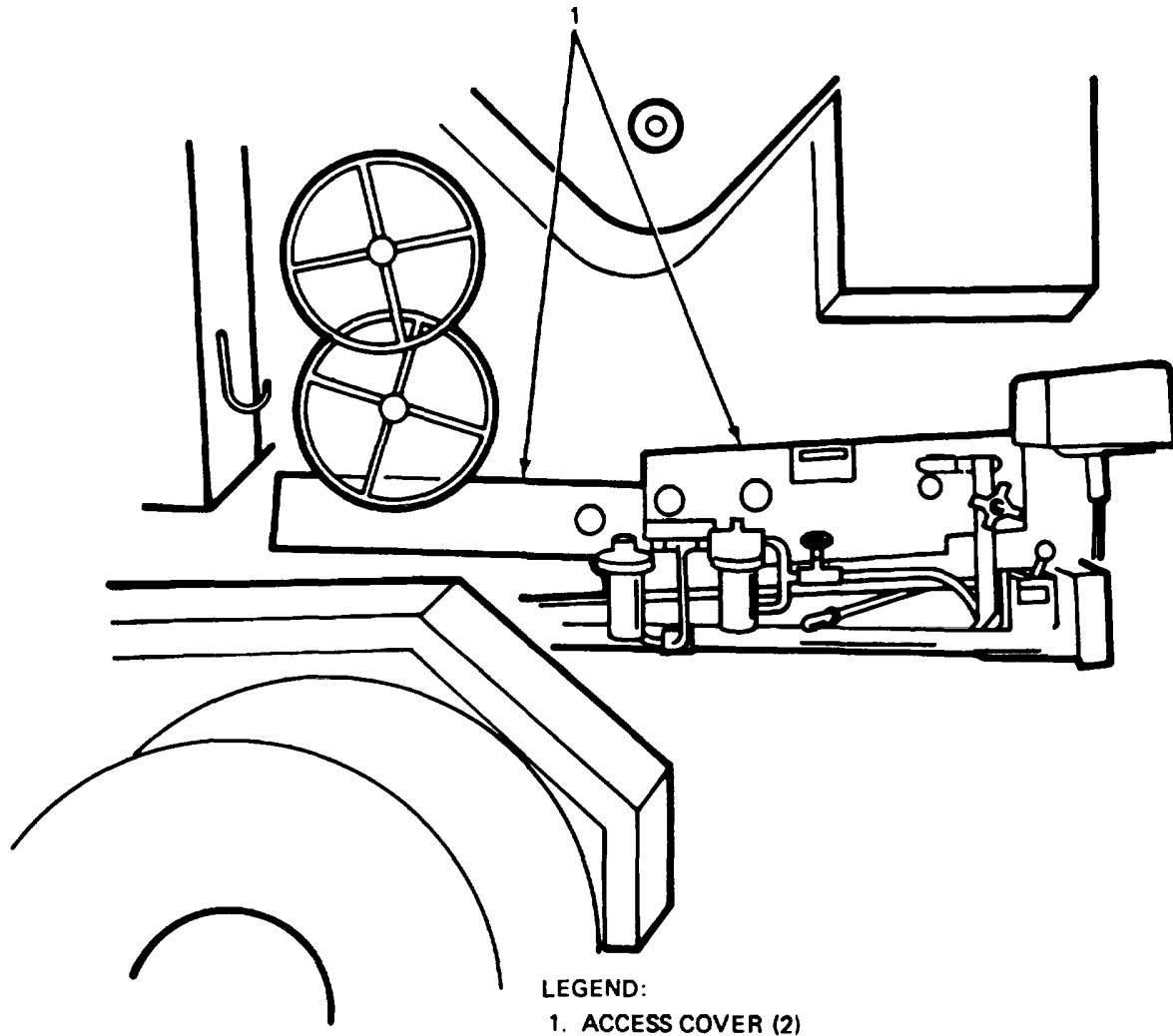
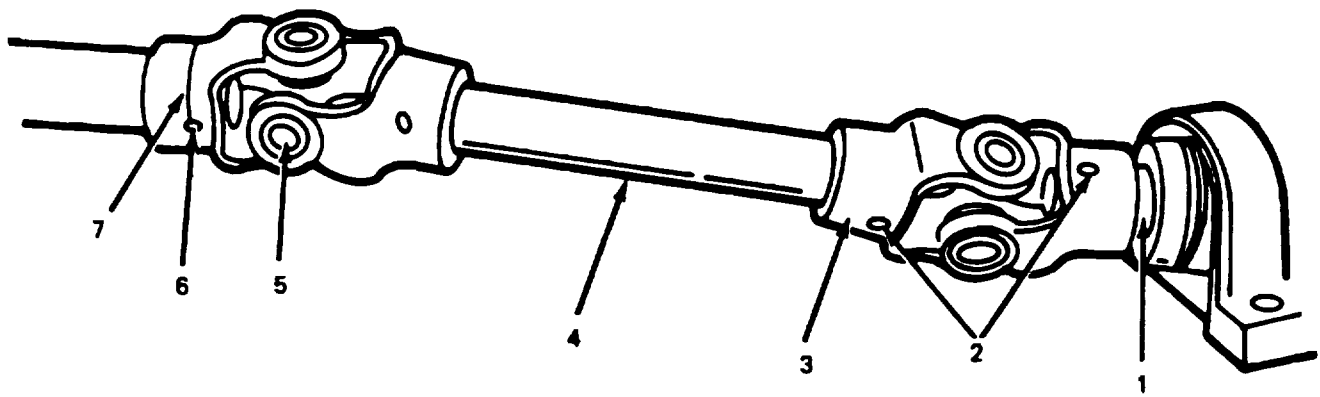


Figure 2-22. Remove/Install Access Covers.

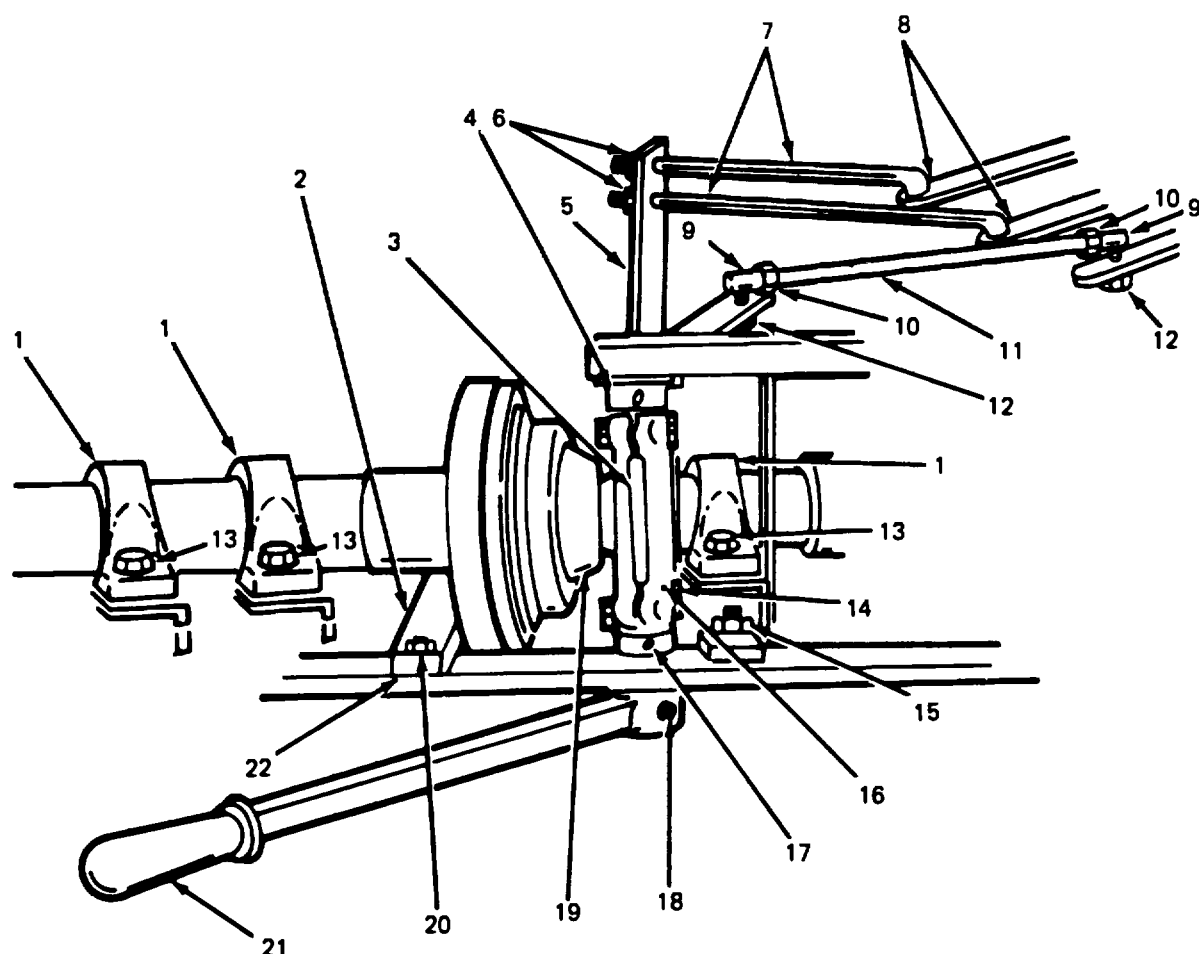
**LEGEND:**

- 1. CLUTCH SHAFT
- 2. ROLL PIN (2)
- 3. REAR U-JOINT
- 4. DRIVE SHAFT
- 5. FORWARD U-JOINT
- 6. SETSCREW
- 7. LOCKWIRE

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Figure 2-23. Disconnect/Connect Main Clutch U-Joint.

- (5) Using a hammer and brass drift, tap the rear U-joint (3) forward on the drive shaft (4) and off the clutch shaft (1). In some cases the U-joint may not slide forward far enough to allow the U-joint to slide off the clutch shaft. (The shaft contacts the U-joint cross.) In this case, the drive shaft (4) must be cleaned, polished, and lubricated, and the forward U-joint (5), lockwire (7), and setscrew (6) removed, then tap the shaft forward until the rear U-joint (3) slips off the clutch shaft (1).
- (6) Remove the six bolts, washers, and nuts (13, fig. 2-24) that mount the three bearing blocks (1) (two per bearing block).
- (7) Remove bolt and washer (18) and remove clutch lever (21).
- (8) Remove two cotter pins and washers (8). Remove nuts (6) only if replacing rods (7).
- (9) Remove two nuts and washers (12). Remove two ball joints (9) and nuts (10) only if replacing rod (11).
- (10) Remove bolts, washers, and nuts (15 and 20) from brace (2) and support rail (22).
- (11) Lower brace (2) off vehicle with shaft (3), retainer ring (4), bracket (5), fork assembly (16), and attached linkages.
- (12) Slide main clutch assembly (19) forward far enough to disengage drive coupling (1, fig. 2-25) from right angle gear box (2) and remove assembly.
- (13) Loosen two bolts and washers (14, fig. 2-24) and setscrews (17); using hammer and brass drift, tap out shaft (3) and remove two retainer rings (4) and fork assembly (16) with attached linkages.

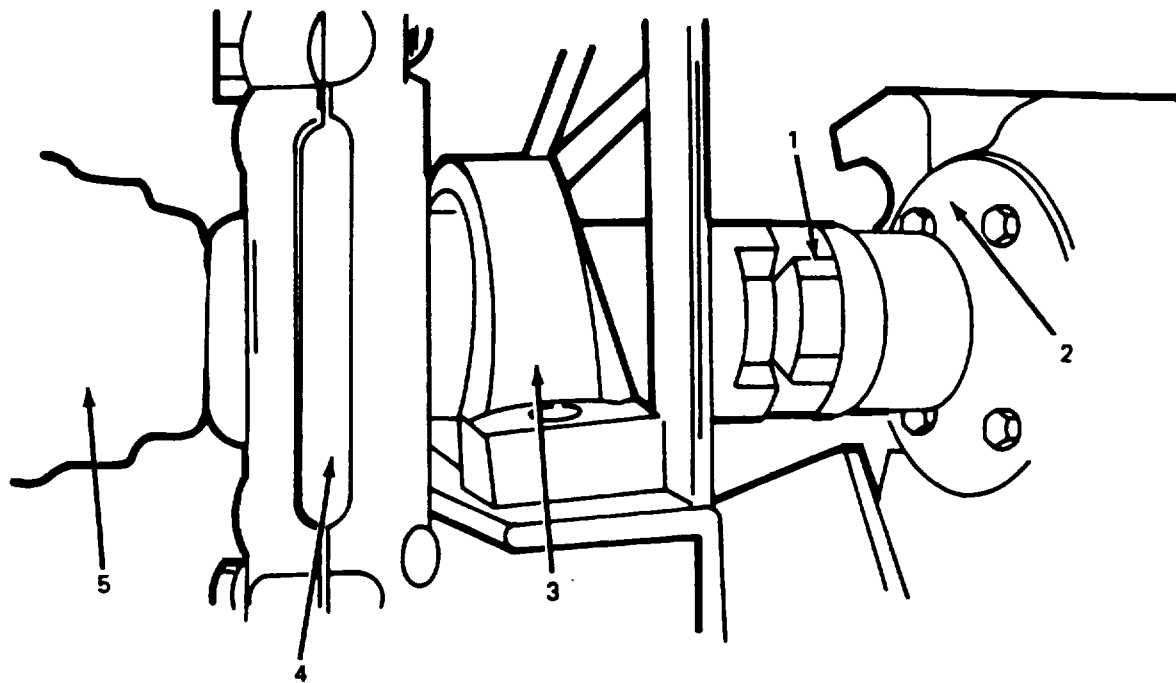


LEGEND:

- | | |
|------------------------------|------------------------------|
| 1. BEARING BLOCK (3) | 12. NUT AND WASHER (2) |
| 2. BRACE | 13. BOLT, WASHER AND NUT (6) |
| 3. SHAFT | 14. BOLT AND WASHER (2) |
| 4. RETAINER RING (2) | 15. BOLT, WASHER AND NUT (2) |
| 5. BRACKET | 16. FORK ASSEMBLY |
| 6. NUT (2) | 17. SETSCREW (2) |
| 7. ROD (2) | 18. BOLT AND WASHER |
| 8. WASHER AND COTTER PIN (2) | 19. MAIN CLUTCH ASSEMBLY |
| 9. BALL JOINT (2) | 20. BOLT, WASHER AND NUT |
| 10. NUT (2) | 21. CLUTCH LEVER |
| 11. ROD | 22. SUPPORT RAIL |

TA 076131

Figure 2-24. Remove/Install Main Clutch and Bearing Block Hardware.

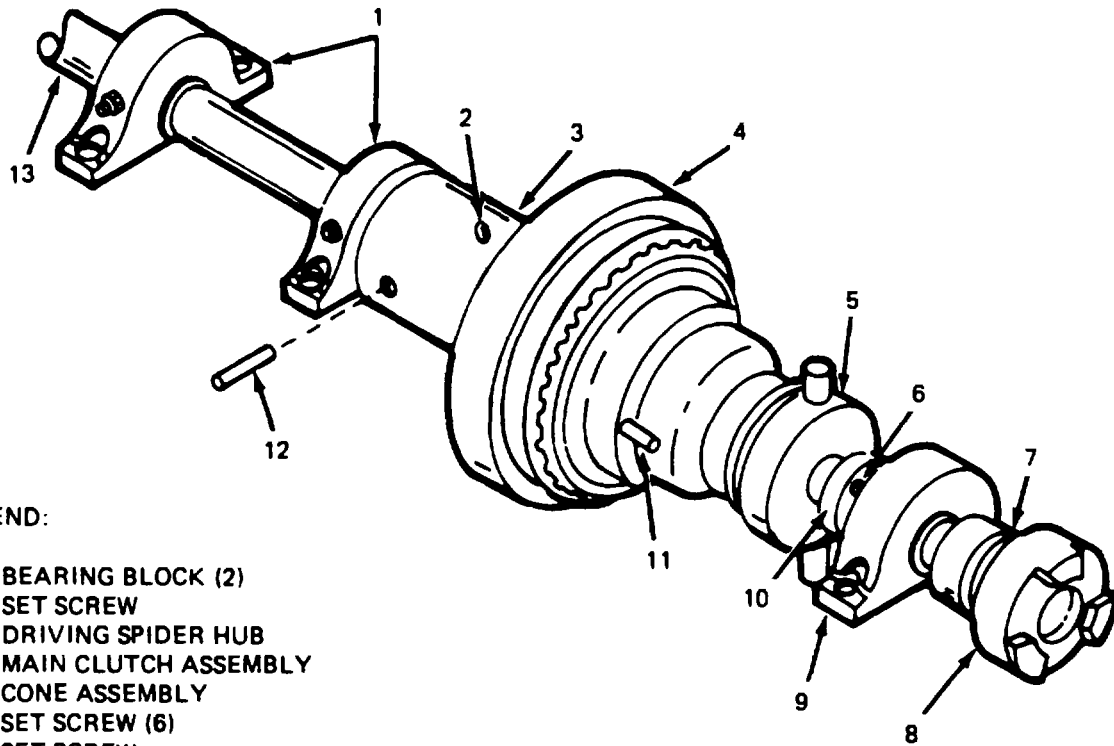
**LEGEND:**

- 1. DRIVE COUPLING
- 2. RIGHT ANGLE GEAR BOX
- 3. BEARING BLOCK (3)
- 4. SHIFTING FORK
- 5. MAIN CLUTCH

TA 076132*Figure 2-25. Disengage/Engage Drive Coupling.*

b. Installation.

- (1) Position the main clutch assembly (4, fig. 2-26) in vehicle and slide to the rear and engage the drive coupling (8) with right angle gear box (2, fig. 2-25).
- (2) Line up the mounting holes for the three bearing blocks (1 and 9, fig. 2-26) and install the mounting bolts and nuts (15 and 20, fig. 2-24) and tighten securely.
- (3) Line up the marks on the clutch shaft (4, fig. 2-23) and rear U-joint (3) and assemble U-joint to the shaft, aligning the roll pin holes on both ends of the U-joint.
- (4) Install roll pins (2) (roll pins should only be replaced if they were damaged during removal).
- (5) Install setscrew (6) and lockwire (7) on forward U-joint (5) (if removed).
- (6) Install fork assembly (16, fig. 2-24) and retaining rings (4).
- (7) Install shaft (3) and tighten setscrew (17) and bolts and washers (14).

**LEGEND:**

- 1. BEARING BLOCK (2)
- 2. SET SCREW
- 3. DRIVING SPIDER HUB
- 4. MAIN CLUTCH ASSEMBLY
- 5. CONE ASSEMBLY
- 6. SET SCREW (6)
- 7. SET SCREW
- 8. DRIVE COUPLING
- 9. BEARING BLOCK
- 10. LOCKING COLLAR (3)
- 11. ADJUSTING LOCKPIN
- 12. ROLL PIN
- 13. MAIN CLUTCH SHAFT

TA 076133*Figure 2-26. Remove /Install Access Panels*

- (8) Install brace (2, fig. 2-24) to support rail (22) with bolts, washers, and nuts (15 and 20).
- (9) Install nuts (10) and ball joints (9) on rod (11), if removed.
- (10) Install nuts and washers (12); tighten.
- (11) Install nuts (6) on rods (7), if removed.
- (12) Install two washers and cotter pins (8).
- (13) Install clutch lever (21) and bolt and washer (18). Tighten bolt.
- (14) Adjust clutch. (Refer to TM 5-3895-372-20.)
- (15) Install access covers (1, fig. 2-22).

2-16. Cement Feeder.**NOTE**

Remove all covers and disconnect feeder shaft at chain coupling. (Refer to TM 5- 3895-372-20.)

a. Removal.

(1) Remove two access panels (1, fig. 2-27) on right side of vehicle by loosening two retaining clips (2) and slide panels out.

(2) Lower rear access panel (3).

LEGEND:

- 1. ACCESS PANEL (2)
- 2. RETAINING CLIP (2)
- 3. REAR ACCESS PANEL

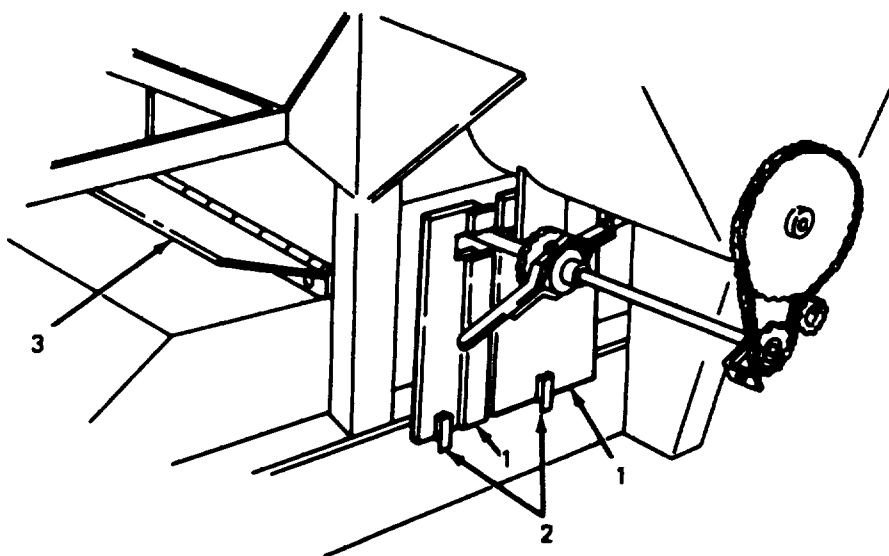
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Figure 2-27. Remove/Install Access Panels.

- (3) Loosen two retaining clips (2, fig. 2-28) and raise upper access panel (1) and prop open.
- (4) Remove lower access panel (4) by removing three bolts (6) and star washers (5).
- (5) Loosen setscrew (1, fig. 2-29) and disconnect meter register cable (5).
- (6) Disconnect electrical cable (3, fig. 2-28) to winch.
- (7) Remove cotter pin (4, fig. 2-29) and washer (3). Slide manual handle (2) out of way.
- (8) Remove two bolts (7) securing valve mounting bracket (8) to cement feeder (1, fig. 2-30). Place valve mounting bracket (8, fig. 2-29) out of the way for access to cement feeder (1, fig. 2-30) mounting bolts (3).
- (9) Support cement feeder (1) using a pry bar.
- (10) For ease of removal of cement feeder (1), remove the four bolts (10) and washers (11) securing the hammer assembly (12) to the cement feeder (1). Remove hammer assembly (12).
- (11) Remove ten bolts (3), washers (17) and nuts (18) securing cement feeder to cement bin (16).
- (12) Place two 1" X 2" boards (13) across frame rails (14) to support cement feeder (1).
- (13) Lower cement feeder (1) with pry bar.
- (14) Drop a suitable rope (2) down through the cement bin (16) and tie to left end of cement feeder (1); one mechanic holds rope (2) secure at top while second and third mechanics guide cement feeder (1) out from right side of vehicle.
- (15) Remove gasket (15) from vehicle.

LEGEND:

1. UPPER ACCESS PANEL
2. RETAINING CLIP (2)
3. ELECTRICAL CABLE
4. LOWER ACCESS PANEL
5. STAR WASHER (3)
6. BOLT (3)

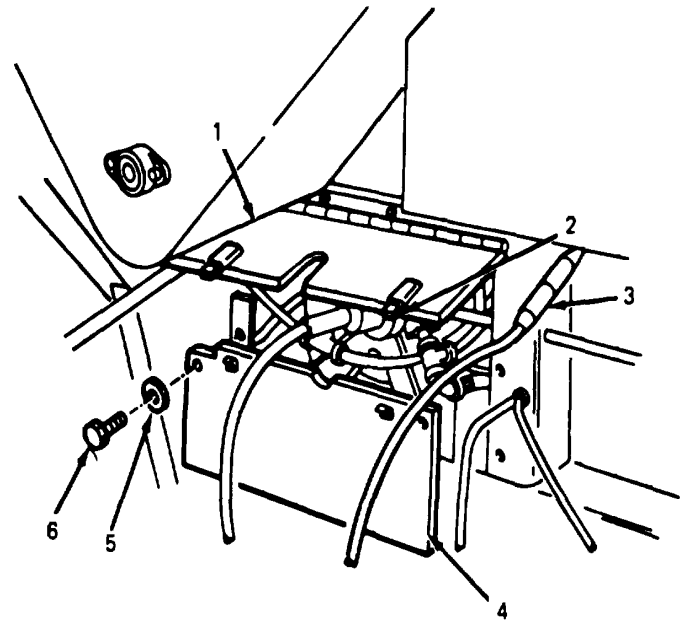


Figure 2-28. Disconnect/Connect Winch Electrical Cable.

LEGEND:

1. SET SCREW
2. MANUAL HANDL
3. WASHER
4. COTTER PIN
5. METER REGISTER CABLE
6. LOCKWASHER (2)
7. BOLT (2)
8. VALVE MOUNTIN BRACKET

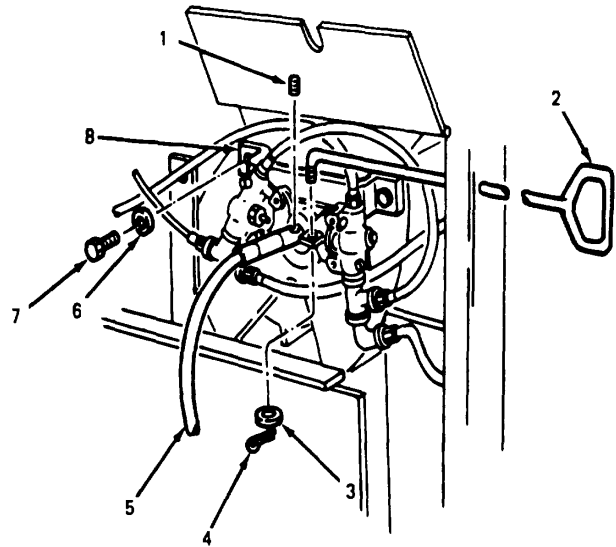


Figure 2-29. Remove/Install Meter Register Cable and Valve Bracket.

LEGEND:

1. CEMENT FEEDER
2. ROPE
3. BOLT (10)
4. NUT (4)
5. SET SCREW (2)
6. COUPLING COV
7. BOLT (4)
8. SPROCKET CHA
9. MASTER LINK
10. BOLT (4)
11. WASHER (4)
12. HAMMER ASSEMBLY
13. 1" x 2" BOARD
14. FRAME RAIL
15. GASKET
16. CEMENT BIN
17. LOCKWASHER (10)
18. NUT (10)

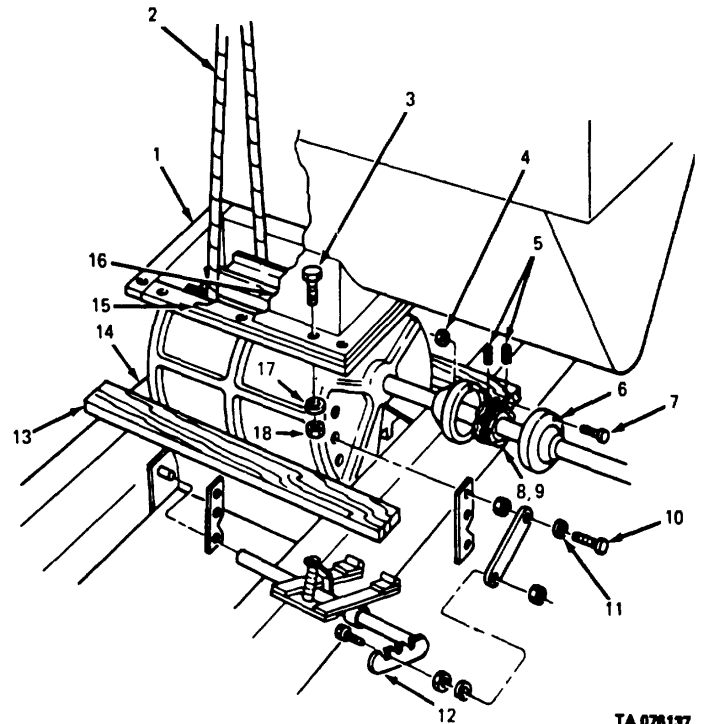


Figure 2-30. Remove/install Cement Feeder.

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b. Installation.

- (1) Tie a suitable rope (2) to the left end of cement feeder (1, fig. 2-30), routed up through the cement bin to the first mechanic. Second and third mechanics lift and guide cement feeder onto two 1" X 2" boards (13); remove rope.
- (2) Using a prybar, raise cement feeder (1) into position and align mounting holes. Ensure gasket (15) is in position and secure with ten bolts (3), lockwashers (17), and nuts (18).
- (3) Reconnect cement feeder shaft. (Refer to TM 5-3895-372-20.)
- (4) Reconnect sprocket chain (8) with master link (9). (Refer to TM 5-3895-372-20.)
- (5) Position hammer assembly (12) and insert hammers through dust shield and secure hammer assembly (12) to cement feeder (1) with four bolts (10), and washers (11).
- (6) Position valve mounting bracket (8, fig. 2-29) and secure to cement feeder with two bolts (7).
- (7) Reconnect electrical cable (3, fig. 2-28).
- (8) Install meter register cable (5, fig. 2-29) and tighten setscrew (1).
- (9) Install lower access panel (4, fig. 2-28) and secure with three bolts (6) and star washers (5).
- (10) Lower upper access panel (1) and secure with retaining clips (2).
- (11) Raise rear access panel (3, fig. 2-27).
- (12) Replace two access panels (1) on right side of vehicle and secure with retaining clips (2).

2-17. Cement Bin Removal and Installation.*a. Preparation.***NOTE**

Prior to the removal of the cement bin, the following operations and tasks must be performed.

- (1) Empty cement bin. (Refer to TM 5-3895-372-10.)
- (2) Lower mix auger assembly and support with two saw horses. (Refer to TM 53895372-10.)
- (3) Remove quick-loading hopper. (Refer to TM 53895-372-10.)
- (4) Disconnect batteries. (Refer to TM 5-3895372-20.)
- (5) Remove electric winch. (Refer to TM 5-3895372-20.)
- (6) Remove winch cable from pulleys. (Refer to TM 5-3895-372-20.)
- (7) Remove dry admix bin. (Refer to TM 5-3895372-20.)
- (8) Remove cement drive system. (Refer to TM 53895-372-20.)
- (9) Remove cement bin vibrators. (Refer to TM 5-3895-372-20.)
- (10) Remove clearance lights. (Refer to TM 5-3895-372-20.)
- (11) Remove cement feeder. (Refer to para 2-16.)

b. Removal.

- (1) Grind the weld from the sand and stone bin side of the reinforcement plate located at the top of the cement bin (fig. 2-31).
- (2) Drill two 17/32 inch holes in bin located as shown in figure 2-32.
- (3) Install four 1/2 inch forged eyebolts with nuts at locations marked with an "X".
- (4) Remove the six bolts and nuts (2 and 3, fig. 2-33) attaching the ladder (11) to the top of
- (5) Remove the two bolts and nuts (4) attaching the ladder (11) to the dry admix hopper.
- (6) Remove dry admix hopper by removing two bolts and nuts (2, fig. 2-34) and two bolts
- (7) Remove winch cable pulley by removing four capscrews (8, fig. 2-33).

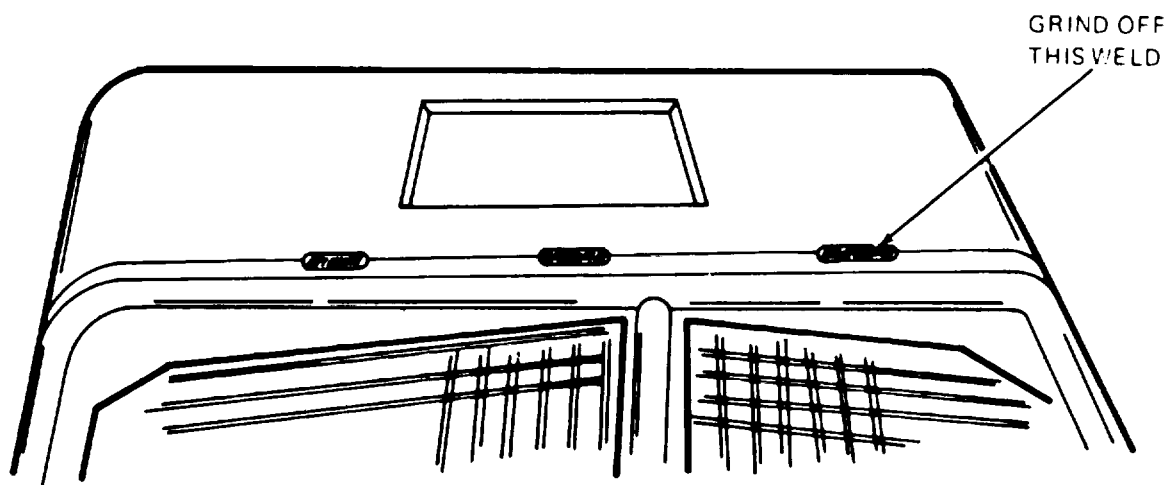


Figure 2-31. Removal of Reinforcement Plate Weld.
TOP VIEW OF CEMENT BIN

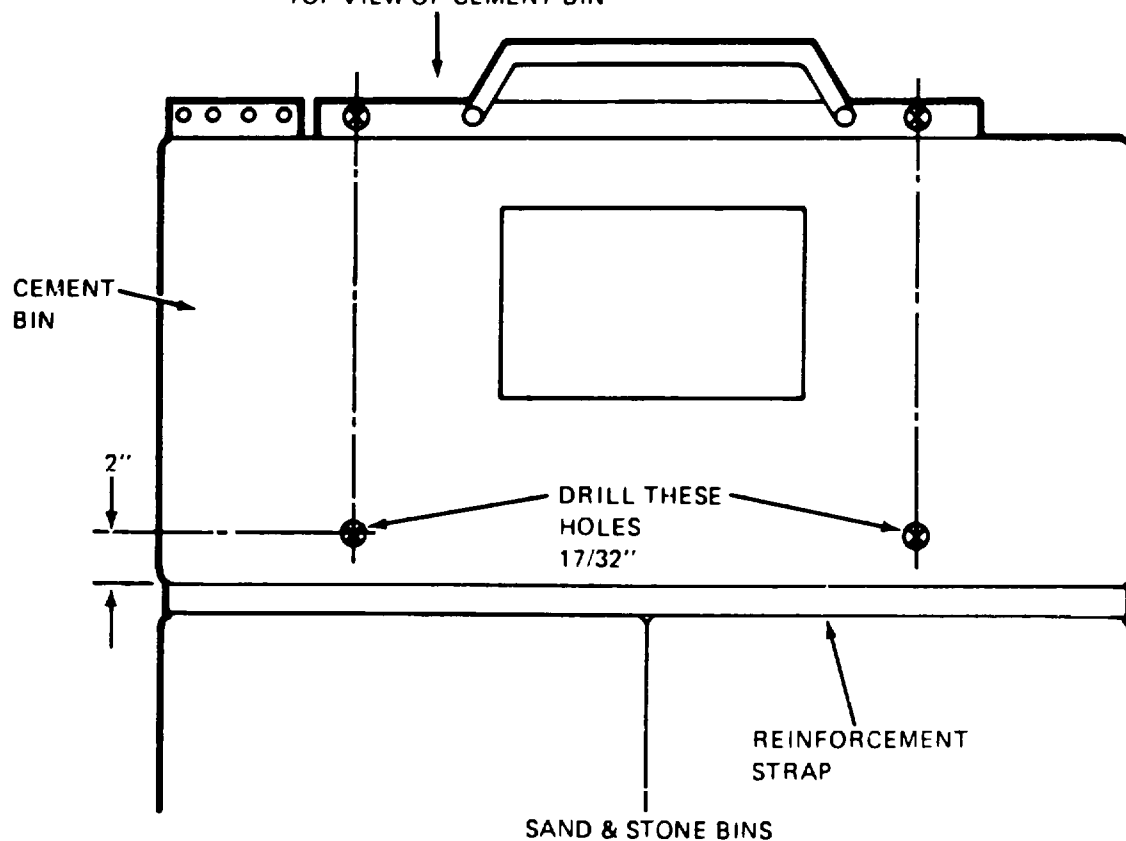
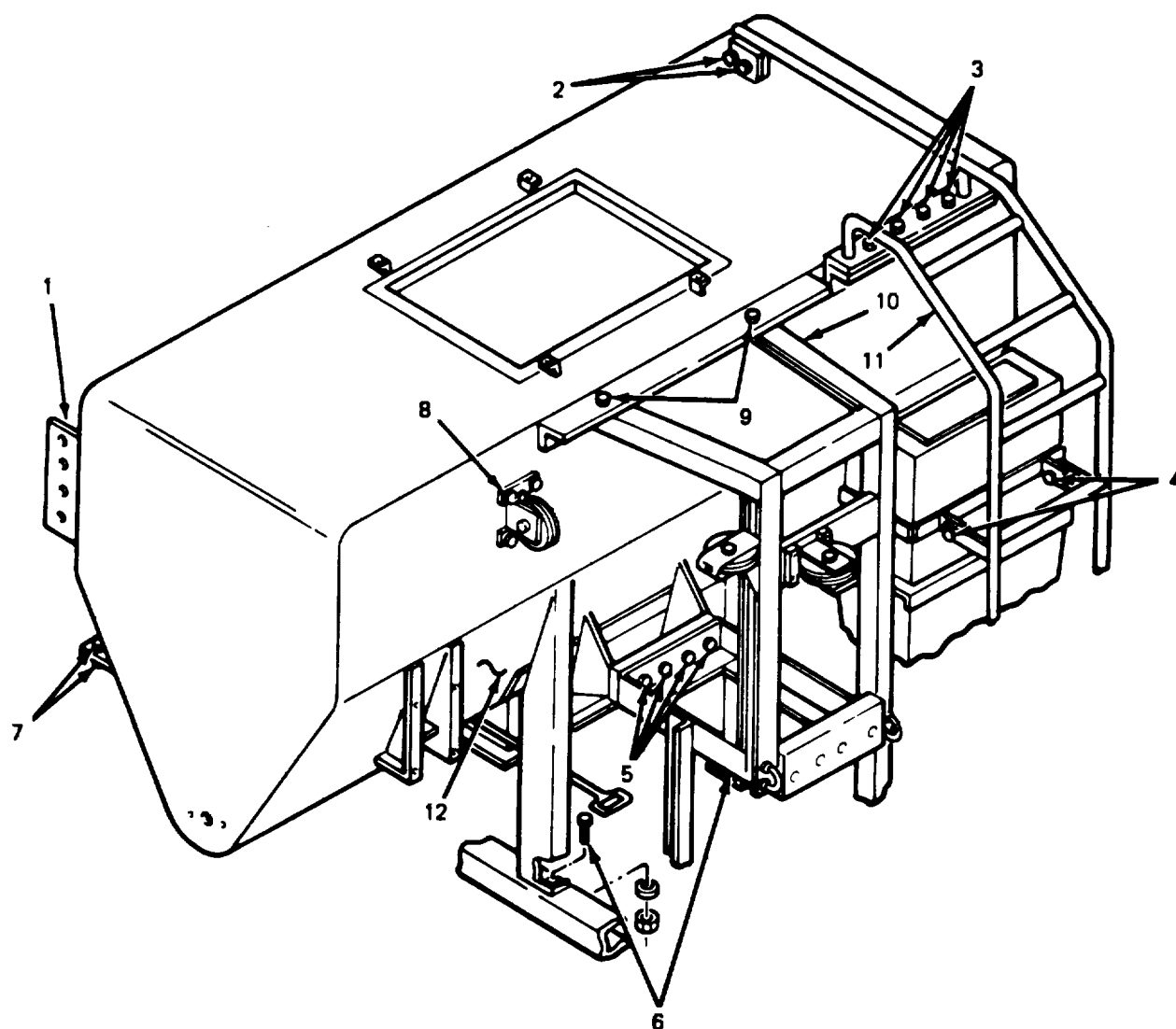


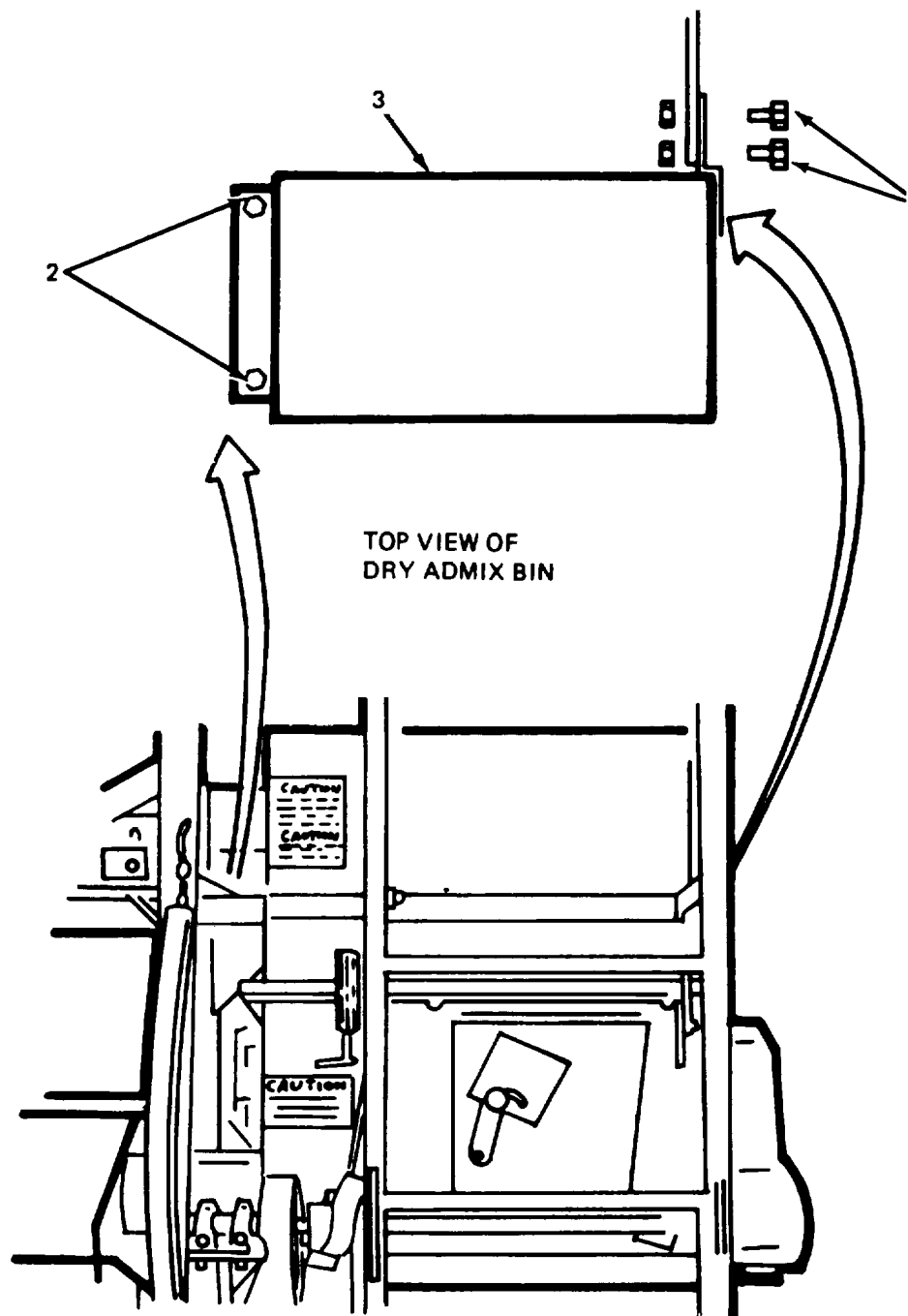
Figure 2-32. Drill Holes in Bin.

**LEGEND:**

- 1. BRACKET (2)
- 2. BOLT & NUT (2)
- 3. BOLT & NUT (4)
- 4. BOLT & NUT (2)
- 5. BOLT & NUT (4)
- 6. CAPSCREW (4)
- 7. BOLT & NUT (4)
- 8. CAPSCREW (4)
- 9. BOLT & NUT (2)
- 10. ACCESSORY MOUNTING FRAME
- 11. LADDER
- 12. CEMENT BIN

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Figure 2-33. Cement Bin.



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LEGEND:

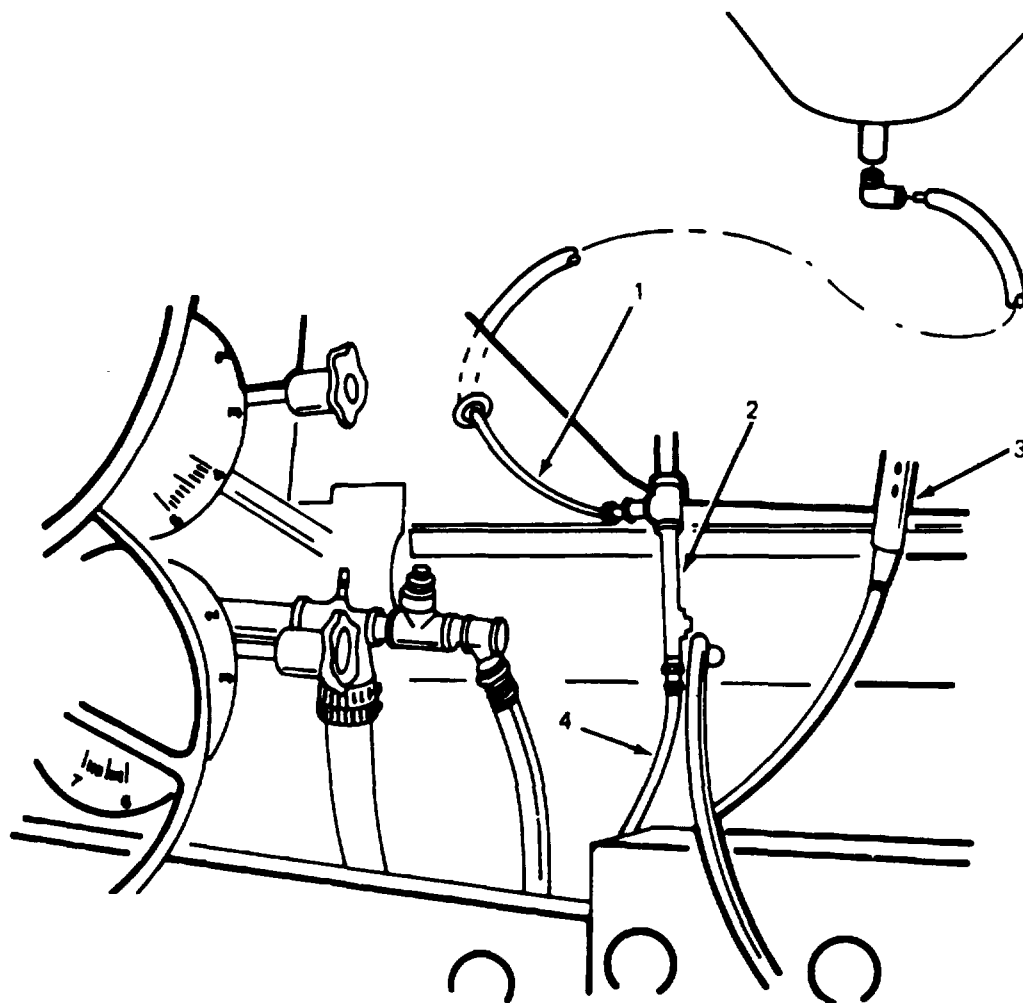
1. BOLT & NUT (2)
2. BOLT & NUT (2)
3. DRY ADMIX HOPPER

Figure 2-34. Removal of Hopper Hardware.

- (8) Remove fluffer air hose (1, fig. 2-35) at both ends, piping (2), and fluffer hose (4).
- (9) Disconnect electrical power cable (3).
- (10) Remove the six bolts and nuts (5 and 9, fig. 2-33) attaching the rear accessory mounting frame (10) to the cement bin (12).
- (11) Attach a suitable four point cable or chain sling (minimum capacity 700 lbs) to the four eyebolts installed in step 3.
- (12) Using a suitable lifting device, raise sling until taut, but not lifting any weight.
- (13) Using a suitable acetylene torch, cut spot welds at the edges of bracket (1, fig. 2-36) on both sides of the cement bin (12, fig. 2-33).
- (14) Remove four bolts and nuts (7) (two on each side).
- (15) Remove four capscrews (6) (two on each side) retaining bin uprights to subframe.
- (16) Remove cement bin (12) from vehicle.

c. *Installation.*

- (1) Set cement bin (12) in place on vehicle.
- (2) Install four capscrews (6) (two on each side) retaining cement bin uprights to subframe. Tighten capscrews securely.
- (3) Install four bolts and nuts (7) (two on each side). Tighten securely.
- (4) Weld brackets on both sides of bin that were cut at time of removal (1). (Refer to TM 9-237.)
- (5) Remove sling and lifting device.
- (6) Install the six bolts and nuts (5 and 9) that attach the rear accessory mounting frame to the cement bin (12) and tighten securely.
- (7) Connect electrical power cable (3, fig. 2-35).
- (8) Install fluffer air hoses (1 and 4) and piping (2).
- (9) Install winch cable pulley with four capscrews (8, fig. 2-33). Tighten capscrews securely.
- (10) Install the dry admix hopper and secure with two bolts and nuts (2, fig. 2-34) and two bolts and nuts (1). Tighten all bolts securely.
- (11) Install the ladder (11) and secure with two bolts and nuts (4, fig. 2-33). Tighten bolts securely. (12) Install six bolts and nuts (2 and 3) attaching the ladder to the top of the cement bin (12). Tighten bolts securely.
- (13) Weld brackets (1) to the cement bin (12). (Refer to TM 9-237.)
- (14) Install cement feeder. (Refer to para 2-16.)
- (15) Install clearance lights. (Refer to TM 5-3895-372-20.)



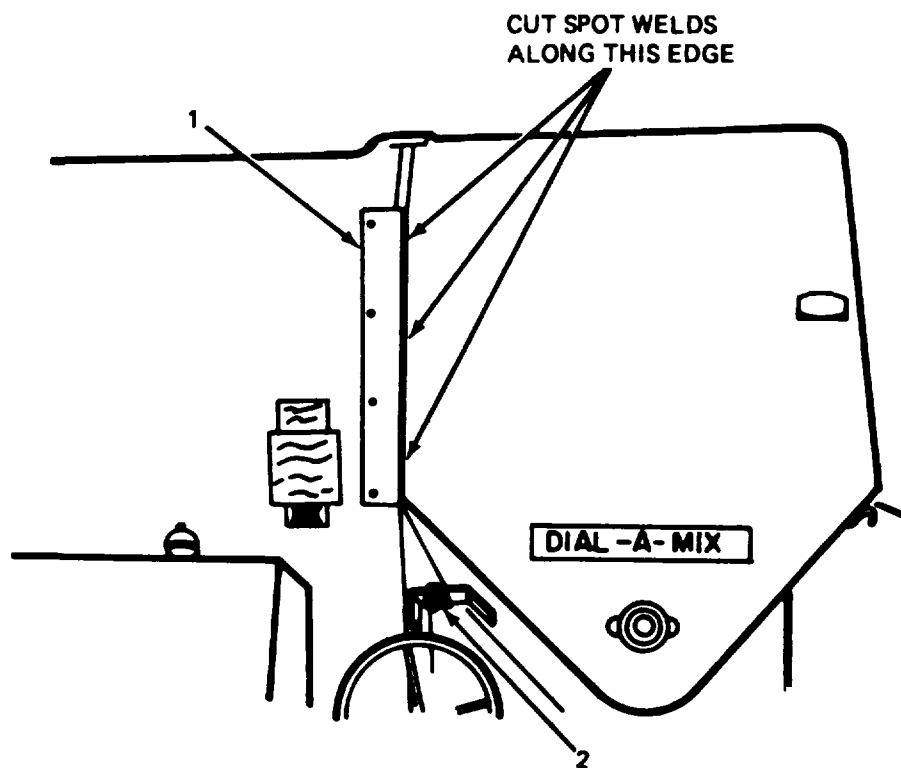
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LEGEND:

- 1. FLUFFER AIR HOSE
- 2. PIPING
- 3. POWER CABLE
- 4. FLUFFER AIR HOSE

Figure 2-35. Remove Fluffer Air Hoses and Piping.

- (16) Install cement bin vibrators. (Refer to TM 5-3895-372-20.)
- (17) Install cement drive system. (Refer to TM 5-3895-372-20.)
- (18) Install dry admix bin. (Refer to TM 5-3895-372-20.)
- (19) Install winch cable on pulleys. (Refer to TM 5-3895-372-20.)
- (20) Install electric winch. (Refer to TM 5-3895-372-20.)
- (21) Connect batteries. (Refer to TM 5-3895-372-20.)
- (22) Install quick-loading hopper. (Refer to TM 5-3895-372-10.)



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LEGEND:

- 1. BRACKET
- 2. BOLT AND NUT (4)
- 3.

Figure 2-36. Cut Bracket Spot Welds.

CHAPTER 3

REPAIR OF HYDRAULIC SYSTEM

Section I. GENERAL INSTRUCTIONS

3-1. Introduction. This section contains general instructions for repair of the hydraulic system. Special instructions for each component are given in later sections of this chapter.

3-2. Preparation for Disassembly.

- a. Before disconnecting hoses, clean off all dirt around fittings.
- b. As soon as hoses are disconnected, plug port holes.
- c. Clean and dry assembly before placing it on the bench.

3-3. Work Conditions. Dirt in the hydraulic system will quickly cause failures of the pump, valves and motor. Clean working conditions are important.

- a. Use a clean bench or table covered with a piece of clean paper.

WARNING

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

CAUTION

Do not allow drycleaning solvents to come in contact with seals or flexible hoses. These cleaners cause leather, rubber, and synthetic materials to dry out, rot, and lose pliability.

- b. Clean all metal parts separately in clear, clean, drycleaning solvent. Blow dry with air to avoid nicks and burrs.

CAUTION

Avoid wiping parts with cloth, as lint may cause binding and sticking of the closely fitted parts. Do not force or abuse closely fitted parts, as damage may result.

Section II. REPAIR OF HYDRAULIC OIL PUMP

3-4. Description. Pumps in this series are used to develop hydraulic fluid flow for the operation of mobile equipment. The positive displacement pumping cartridges are of the rotary vane type with shaft side loads hydraulically balanced. The flow rate depends on the pump size and the speed at which it is driven. The unit consists principally of an inlet cover, outlet body, driveshaft and pumping cartridge.

3-5. Preparation for Disassembly. The instructions contained in this section cover a complete disassembly, inspection and assembly of the hydraulic pump. Sometimes a malfunction can be corrected without removing the pump from the vehicle by replacing the cartridge assembly. This can be accomplished by removing the four housing screws and removing the rear housing.

Drain all fluid from the pump and thoroughly clean the exterior surface. Prepare a clean, lint free surface on which to place the internal parts for inspection and repair. Support the pump on blocks or clamp the body in a vise. If a vise is used, use protective jaws to avoid damage to the body and its machined surfaces.

3-6. Disassembly.

- a. Remove hydraulic oil pump. (See para 2-13.)
- b. Place pump body (9, fig. 3-1) in a vise to support during disassembly.
- c. Mark pump body (9) and cover (16) for proper alinement at assembly.
- d. Remove four bolts (17) from the cover (16) and remove.
- e. Remove two screws (19) and remove nameplate (18).
- f. Remove O-rings (13 and 15) and back-up ring (14) from pump body (9).
- g. Grasp the cartridge (12) and pull from pump body (9).
- h. Remove back-up ring (10) and packing (11) from cartridge (12).
- i. Remove lock ring (1) and shaft (4).
- j. Drive washer (6), seal (7) and wiper (8) from shaft end of pump body (9).
- k. Remove snap ring (2) and press shaft (4) from bearing (3) while supporting Inner race.

NOTE

Cartridge (12) is replaced only as an assembly.

3-7. Clean and Inspect.

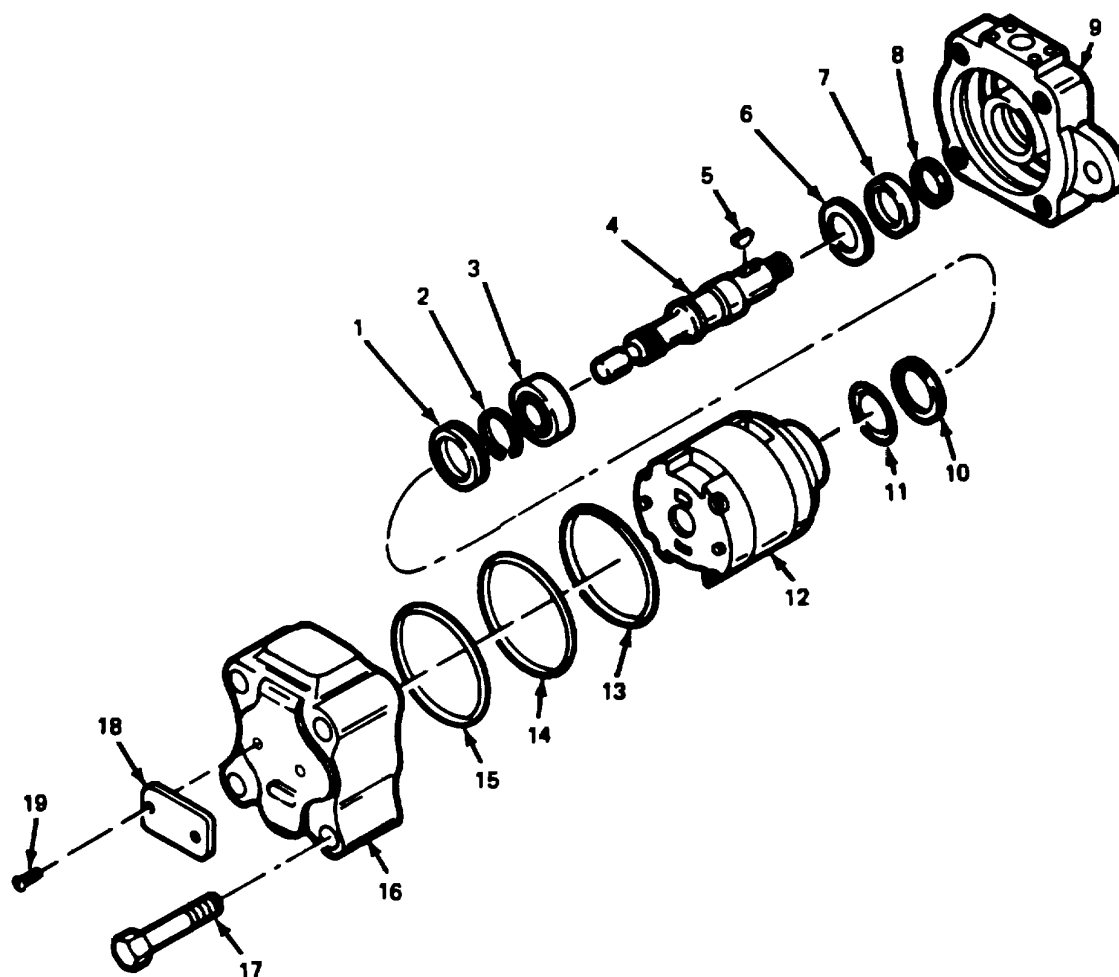
- a. Clean all parts in SD-2 drycleaning solvent.
- b. Inspect all parts for damage and replace as necessary.

3-8. Assembly.

NOTE

Use a suitable seal installation tool to prevent damaging seal (7). Ensure the seal OD is below the chamfer in pump body (9).

- a. Soak a new wiper (8) in hydraulic fluid and install into the shaft end of pump body (9), along with seal (7) and washer (6).
- b. Clamp the pump body (9) in a vise.
- c. Using a suitable press, install shaft (4) into bearing (3) while supporting bearing inner race.
- d. Install snap ring (2).
- e. Tap shaft (4) with bearing (3) gently into pump body (9); install lock ring (1).



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LEGEND:

- | | |
|------------------|------------------|
| 1. LOCK RING | 11. PACKING |
| 2. SNAP RING | 12. CARTRIDGE |
| 3. BEARING | 13. O-RING |
| 4. SHAFT | 14. BACK-UP RING |
| 5. KEY | 15. O-RING |
| 6. WASHER | 16. COVER |
| 7. SEAL | 17. BOLT (4) |
| 8. WIPER | 18. NAME PLATE |
| 9. PUMP BODY | 19. SCREW (2) |
| 10. BACK-UP RING | |

Figure 3-1. Repair of Hydraulic Oil Pump.

- f.* Install O-rings (13 and 15) and back-up ring (14) into pump body (9).
- g.* Install back-up ring (10) and packing (11) to cartridge (12).
- h.* Install cartridge (12) in pump body (9) so that one of the chamfers or flats on the ring will align with the inlet port when the inlet housing is installed.
- i.* Install cover (16) and secure with four bolts (17). Torque bolts to 55 lb-ft (75 N-m).
- j.* Install sheave and key. (Refer to para 2-13.)

Section III. REPAIR OF RELIEF VALVE

3-9. Removal. Refer to TM 5-3895372-20.

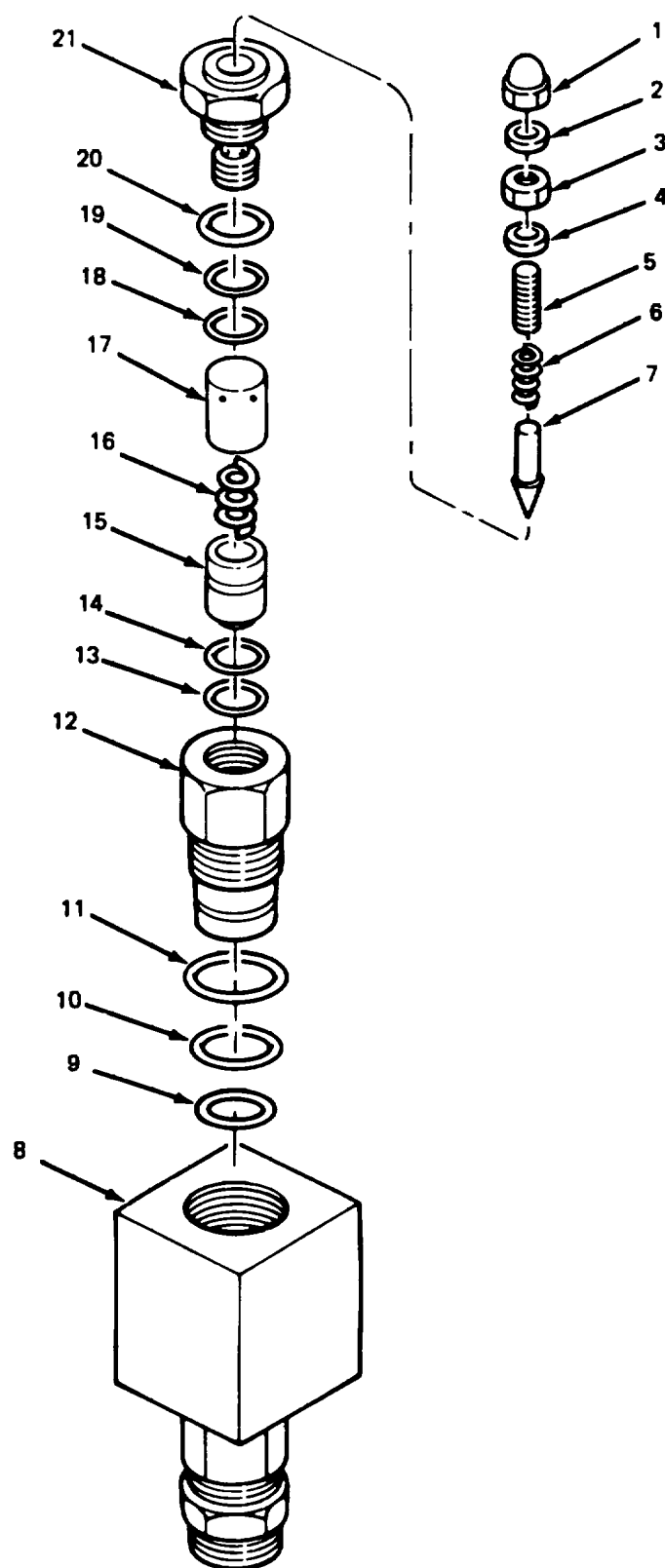
3-10. Disassembly.

- a.* Remove acorn nut (1, fig. 3-2) and seal washer (2).
- b.* Loosen and remove jam nut (3). Count threads above jam nut and note for reassembly.
- c.* Remove seal washer (4).
- d.* Loosen and remove setscrew (5), poppet (7), and spring (6) from cap (21).
- e.* Unscrew and remove cap (21) from cap (12).
- f.* Remove tube (17) from cap (21).
- g.* Remove O-ring (20), back-up ring (19), and O-ring (18) from cap (21) and discard.
- h.* Remove poppet (15) and spring (16) from tube (17).
- i.* Remove O-ring (13) and back-up ring (14) from poppet (15) and discard.
- j.* Remove O-ring (11), back-up ring (14), and O-ring (9) from cap (12) and discard.

3-11. Clean and Inspect. Clean all parts in drycleaning solvent and inspect for damage or wear.

3-12. Assembly.

- a.* Install new O-ring (11, fig. 3-2), back-up ring (10), and O-ring (9) on cap (12) and install into relief valve (8).
- b.* Install new O-ring (13) and back-up ring (14) on poppet (15).
- c.* Install spring (16) and poppet (15) in tube (17) and insert into cap (12).

**LEGEND:**

1. ACORN NUT
2. SEAL WASHER
3. JAM NUT
4. SEAL WASHER
5. SETSCREW
6. SPRING
7. POPPET
8. RELIEF VALVE
9. O-RING
10. BACK-UP RING
11. O-RING
12. CAP
13. O-RING
14. BACK-UP RING
15. POPPET
16. SPRING
17. TUBE
18. O-RING
19. BACK-UP RING
20. O-RING
21. CAP

Figure 3-2. Relief valve.

- d.* Install O-ring (20), back-up ring (19), and O-ring (18) on cap (21) and screw into cap (12).
- e.* Install spring (6) over poppet (7) and insert into cap (21).
- f.* Install setscrew (5) into cap (21).
- g.* Install seal washer (4) on setscrew (5) and install jam nut (3).
- h.* Install screw seal washer (2) and acorn nut (1) on setscrew (5) and tighten.
- i.* For installation refer to TM 5-3895-372-20.

Section IV. EPAIR OF CONTROL VALVE

3-13. Removal. Refer to TM 5-3895372-20.

3-14. Disassembly.

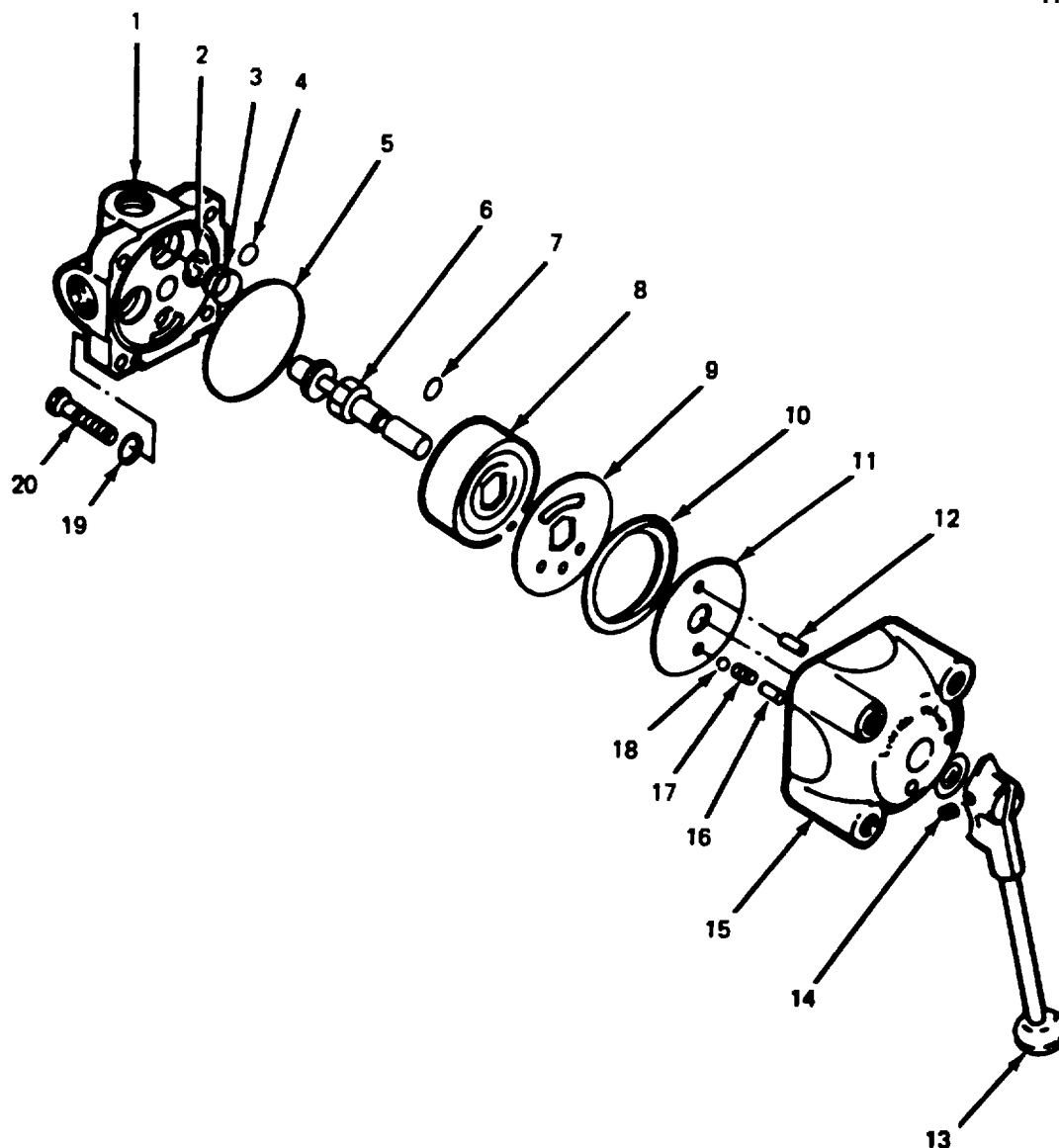
- a.* Remove handle (13, fig. 3-3) by loosening two setscrews (14).
- b.* Remove four bolts (20) and lockwashers (19) securing the body (1) to the housing (15). Separate body (1) and housing (15).

NOTE

Mark shaft, rotor, and housing at disassembly for correct reassembly location.

- c.* Remove shaft (6), rotor (8), and detent disc (9) from housing (15).
- d.* Remove O-ring (7) from shaft and discard.
- e.* Remove bearing (10) and thrust washer (11).
- f.* Remove detent ball (18), spring (17), and sleeve (16) from housing (15).
- g.* Remove stop pin (12) from housing (15).
- h.* Remove O-ring (5) from body (1) and discard.
- i.* Remove three shear seal seats (3) from body (1) and remove three O-rings (4) from shear seal seats.
- j.* Remove three washers (2) from body.

3-15. Clean and Inspect. Clean all parts in drycleaning solvent and inspect for damage or wear.

**LEGEND:**

- | | |
|------------------------|--------------------|
| 1. BODY | 11. THRUST WASHER |
| 2. WASHER (3) | 12. STOP PIN |
| 3. SHEAR SEAL SEAT (3) | 13. HANDLE |
| 4. O-RING (3) | 14. SETSCREW (2) |
| 5. O-RING | 15. HOUSING |
| 6. SHAFT | 16. SLEEVE |
| 7. O-RING | 17. SPRING |
| 8. ROTOR | 18. DETENT BALL |
| 9. DETENT DISC | 19. LOCKWASHER (4) |
| 10. BEARING | |

Figure 3-3. Control Valve.

3-16. Assembly.

- a.* Install three washers (2, fig. 3-3) in body (1).
- b.* Install three O-rings (4) on three shear seal seats (3); position in body (1).
- c.* Install new O-ring (5) on body (1).
- d.* Insert stop pin (12), sleeve (16), spring (17), and detent ball (18) into housing (15).
- e.* Position thrust washer (11) and bearing (10) in housing (15).
- f.* Install new O-ring (7) on shaft (6).
- g.* Install rotor (8) per alinement marks made prior to disassembly and detent disc (9) on shaft (6) and insert into housing (15).
- h.* Install shaft (6) into housing (15).
- i.* Aline casting marks on body (1) and housing (15) and install four bolts (20) and lockwashers (19). Tighten bolts.
- j.* Position handle (13) on shaft (6) and secure with two setscrews (14).

Section V. REPAIR OF HYDRAULIC MOTOR

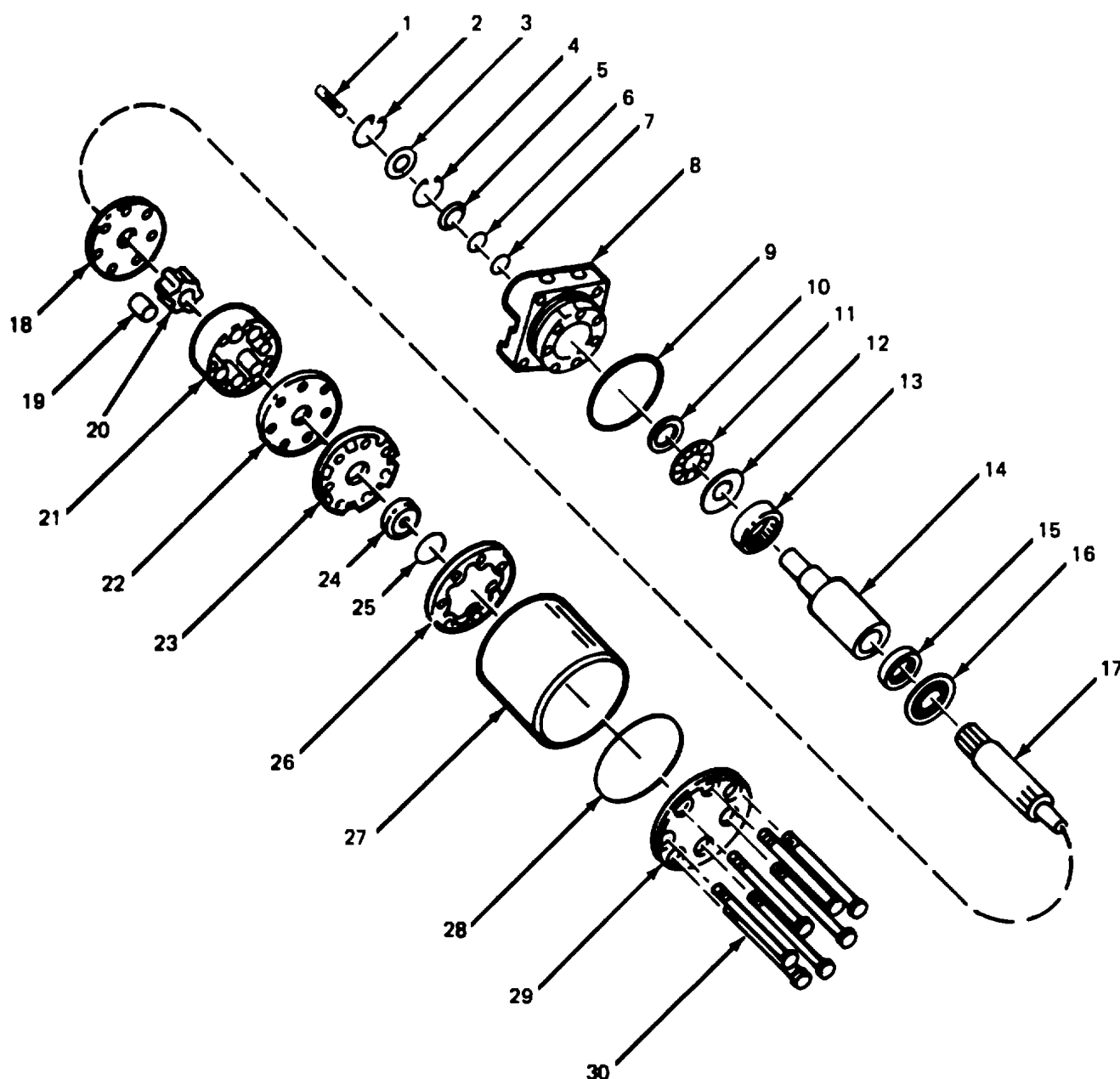
3-17. Removal. Refer to TM 5-3895-372-20.

3-18. Disassembly.

- a.* In a vise, clamp down on the housing (8, fig. 3-4) port bosses with the coupling shaft (14) pointed down.
- b.* Using wrench with a thin wall socket, remove seven bolts (30).
- c.* Remove cover assembly (29) and seal ring (9) by inserting screwdriver between cover assembly (29) and sleeve (27). Pry up cover assembly (29) and lift from unit with seal ring (9) attached.
- d.* Remove seal ring (28) from cover assembly (29) and discard seal ring (28).
- e.* Remove commutator ring (26), commutator (24), seal ring (25), and manifold (23) by using two of the bolts (30) as a lifting tool - insert the two bolts (30) into two holes and lift out the previously mentioned parts.
- f.* Remove seal ring (25) from commutator (24) by using an air hose - blow air into ring groove until seal ring (25) is lifted out, and discard seal ring (25).
- g.* Inspect manifold (23) for cracks. Replace it if cracks are visible.
- h.* Remove manifold plate (22) by using two bolts (30) as a lifting tool.
- i.* Remove rotor set consisting of stator and ring assembly (21), rotor (20), vanes (19) along with wear plate (18), and drive link (17), using two bolts (30).

CAUTION

Do not drop vanes (19) or rotor (20).



LEGEND:

- | | | |
|--------------------|------------------------------|---------------------|
| 1. KEY | 12. THRUST WASHER | 22. MANIFOLD PLATE |
| 2. RETAINING RING | 13. BEARING | 23. MANIFOLD |
| 3. DIRT SEAL | 14. COUPLING SHAFT | 24. COMMUTATOR |
| 4. RETAINING RING | 15. BEARING | 25. SEAL RING |
| 5. BACK-UP WASHER | 16. THRUST BEARING | 26. COMMUTATOR RING |
| 6. SHIM | 17. DRIVE LINK | 27. SLEEVE |
| 7. SEAL | 18. WEAR PLATE | 28. SEAL RING |
| 8. HOUSING | 19. VANES | 29. COVER ASSEMBLY |
| 9. SEAL RING | 20. ROTOR | 30. BOLT (7) |
| 10. THRUST WASHER | 21. STATOR AND RING ASSEMBLY | |
| 11. THRUST BEARING | | |

Figure 3-4. Hydraulic Motor.

- j.* Remove vanes (19, fig. 3-4), rotor (20), and stator and ring assembly (21).
- k.* Inspect rotor (20) outside lobes for pits and wear marks. If pits or wear marks are visible, dies-card and replace rotor set consisting of the vanes (19), rotor (20), and the stator and ring assembly (21).
- l.* Remove thrust bearing (16).
- m.* Remove retaining ring (2) and key (1).
- n.* Remove coupling shaft (14).
- o.* Remove sleeve (27) by inserting screwdriver between sleeve (27) and housing (8) and pry up. Remove rust from ends of sleeve by sanding lightly.
- p.* Remove seal ring (9) from housing (8) and discard seal ring (9).
- q.* Remove housing (8) from vise, turn over and reclamp in vise with dirt seal (3) end pointed up.
- r.* Remove dirt seal (3), retaining ring (4), back-up washer (5), shim (6), and seal (7) from housing (8). Discard dirt seal (3) and seal (7). Remove burrs from retaining ring groove with a scraping tool.
- s.* DO NOT REMOVE thrust washers (10), thrust bearing (11), and bearings (13) and (15) unless there is evidence of damage. Bearings should be free to rotate and not show signs of surface breakdown. If bearing (13) requires replacement, use a 1.490 in. (37.85 mm) maximum diameter shaft and press out thrust washers (10 and 12), thrust bearing (11), and bearings (13 and 15). The housing face should be placed on a block of wood during the pressing operation to protect it. Discard thrust washers (10 and 12), thrust bearing (11), and bearings (13 and 15) - replace with new parts, as parts may have been damaged when being pressed out. If bearing (15) needs replacement, use a bearing puller to remove bearing - care must be taken to not damage housing (8) face with bearing puller.

3-19. Assembly.

- a.* During assembly, be careful to follow these general instructions.

WARNING

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

- (1) Before assembly, use drycleaning SD-2 solvent to wash all metal parts. Blow dry with air.
- (2) Be sure all paint chips have been removed.
- (3) Unless otherwise indicated, do not oil or grease parts before assembly.
- (4) Lubricate all seals before assembly. Use OE/HDO 10W40 oil or clean grease (GAA).

b. If it was necessary to remove thrust washers (10 and 12, fig. 3-4), thrust bearing (11), or bearings (13 and 15), the following procedure must be followed.

- (1) Assemble new thrust washers (10 and 12) and new thrust bearing (11), in this order, into housing (8).
- (2) Press in new bearing (13) with suitable tools to a 2.365 ± 0.030 in. (60.07 ± 0.76 mm) dimension into housing (8).

NOTE

Bearing should indicate which side to press against.

- (3) Press in new bearing (15) with suitable tools to a 0.18 ± 0.03 in. (4.57 ± 0.76 mm) dimension into housing (8).

NOTE

Bearing should indicate which side to press against.

- c.* Apply cellophane tape around splines or keyway on coupling shaft (14) to prevent damaging seal (7).
- d.* Assemble coupling shaft (14).
- e.* Install retaining ring (2) and key (1).
- f.* Assemble thrust bearing (16).
- g.* Assemble drive link (17).
- h.* Assemble wear plate (18).
- i.* Assemble and install rotor set consisting of the vanes (19), rotor (20), and the stator and ring assembly (21) with counterbore in rotor (20) down.
- j.* Assemble manifold plate (22), manifold (23), and commutator ring (26).
- k.* Assemble commutator (24) and new seal ring (25). Be sure to assemble new seal ring (25) with flat side out.
- l.* Assemble new seal rings (9 and 28) on housing (8) and cover assembly (29).
- m.* Apply a generous amount of MI L-L-2104C Grade 50 to both ends of sleeve (27) and assemble onto housing (8). Make sure sleeve (27) is setting in a non-cocked position.
- n.* Assemble cover assembly (29) onto sleeve (27) in a non-cocked position.
- o.* Assemble seven bolts (30) and screw in finger-tight. Alternately and progressively tighten seven bolts to pull cover assembly (29) and sleeve (27) into place. Torque seven bolts to 50 ± 5 lb-ft (67.8 ± 6.8 N-m).

p. Remove assembly from vise. If end of coupling shaft (14) is 1-1/4" diameter, do the following to install high pressure seal (7).

(1) Set assembled motor, coupling shaft (14) facing upward, on a clean bench.

(2) Place seal compression ring over coupling shaft (14); push seal protective sleeve onto coupling shaft. Apply clean GAA to new seal (7) and assemble with lip side inward, onto protective sleeve. Insert seal driver into seal compression ring and push new seal (7) into housing.

(3) Hold shim (6) between thumb and index finger and slightly collapse shim (6) to facilitate assembly into housing (8). Assemble shim (6) and back-up washer (5).

(4) Compare old retaining ring (4) with the two new retaining rings (4). Use the new ring of the same thickness. Assemble the retaining ring (4); be sure rounded edge of retaining ring is facing inward.

(5) Apply a small amount of GAA to the backside of new dirt seal (3) and assemble into housing (8).

3-20. Checking for Leaks. Pressurize the motor with 1000 psi dry nitrogen. Submerge in solvent to check for external leaks.

CHAPTER 4 REPAIR OF ELECTRIC WINCH ASSEMBLY

Section I. REPAIR OF WINCH

4-1. Preparation.

- a. Remove winch cable. (Refer to TM 5-3895-372-20.)
- b. Remove winch assembly. (Refer to TM 5-3895372-20.)
- c. Remove motor and gear box. (Refer to TM 5-3895-372-20.)

4-2. Disassembly.

- a. Disconnect master link (6, fig. 4-1) and remove drive chain (7).
- b. Loosen setscrew (3), slide spool (10) over far enough to gain access to roll pin (2) and tap roll pin (2) out with hammer and brass drift.
- c. Remove shaft (1), spool (10), thrust collar (4), drive sprocket (9) and flange bearings (8 and 5).

4-3. Clean and Inspect.

- a. Clean all parts in SD-2 drycleaning solvent.
- b. Inspect all parts for damage or wear.

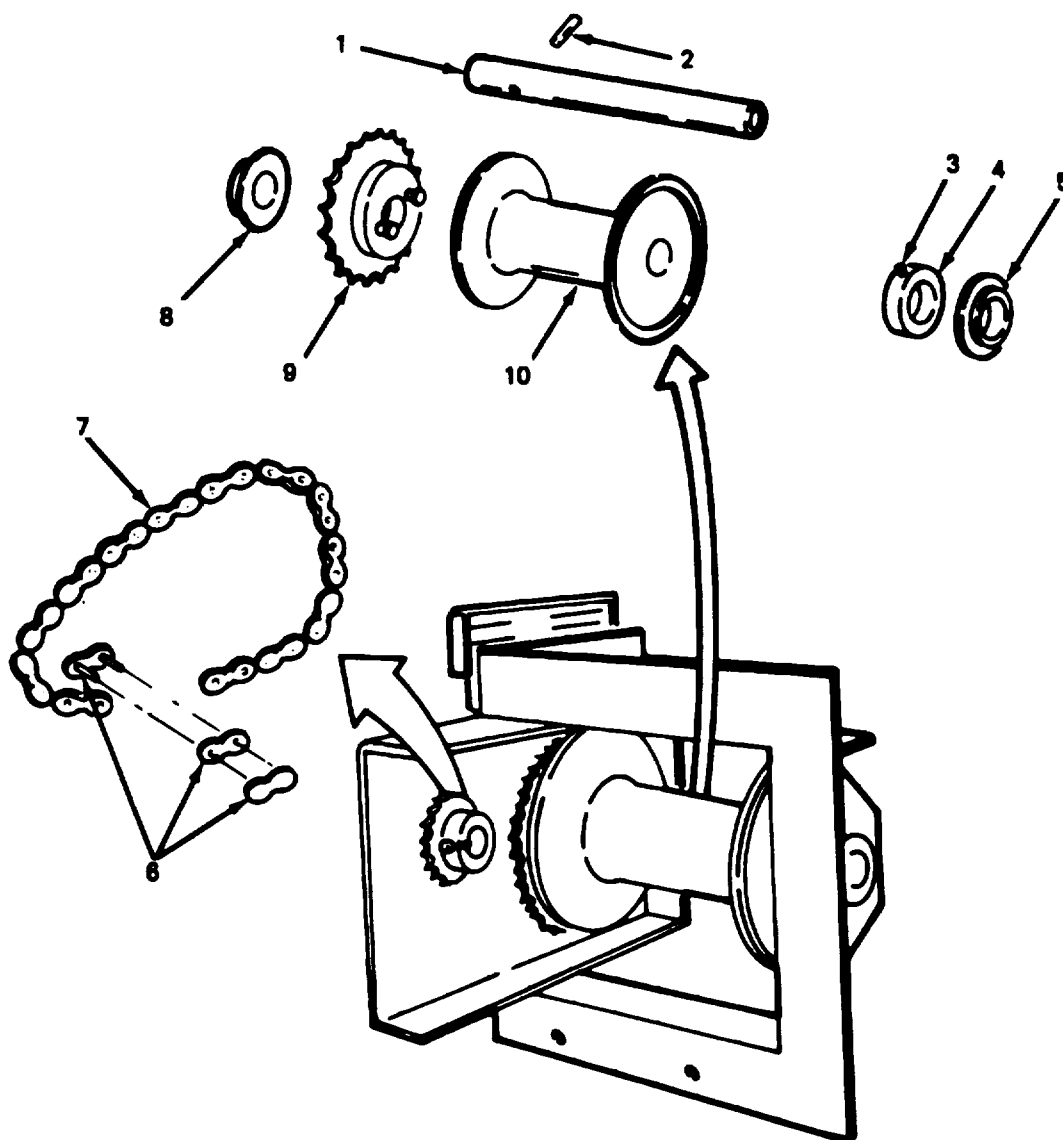
4-4. Assembly.

- a. Install flange bearings (5 and 8).
- b. Install drive sprocket (9), spool (10) and thrust collar(4) and insert shaft (1); then tighten setscrew (3).
- c. Install roll pin (2).
- d. Slide spool (10) into position, against drive sprocket (9).
- e. Install drive chain (7) and secure with master link (6).

4-5. Install Winch Assembly. (Refer to TM 53895372-20.)

4-6. Install Winch Cable. (Refer to TM 5-3895372-20.)

4-7. Check Operation. (Refer to TM 5-3895-372-10.)



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LEGEND:

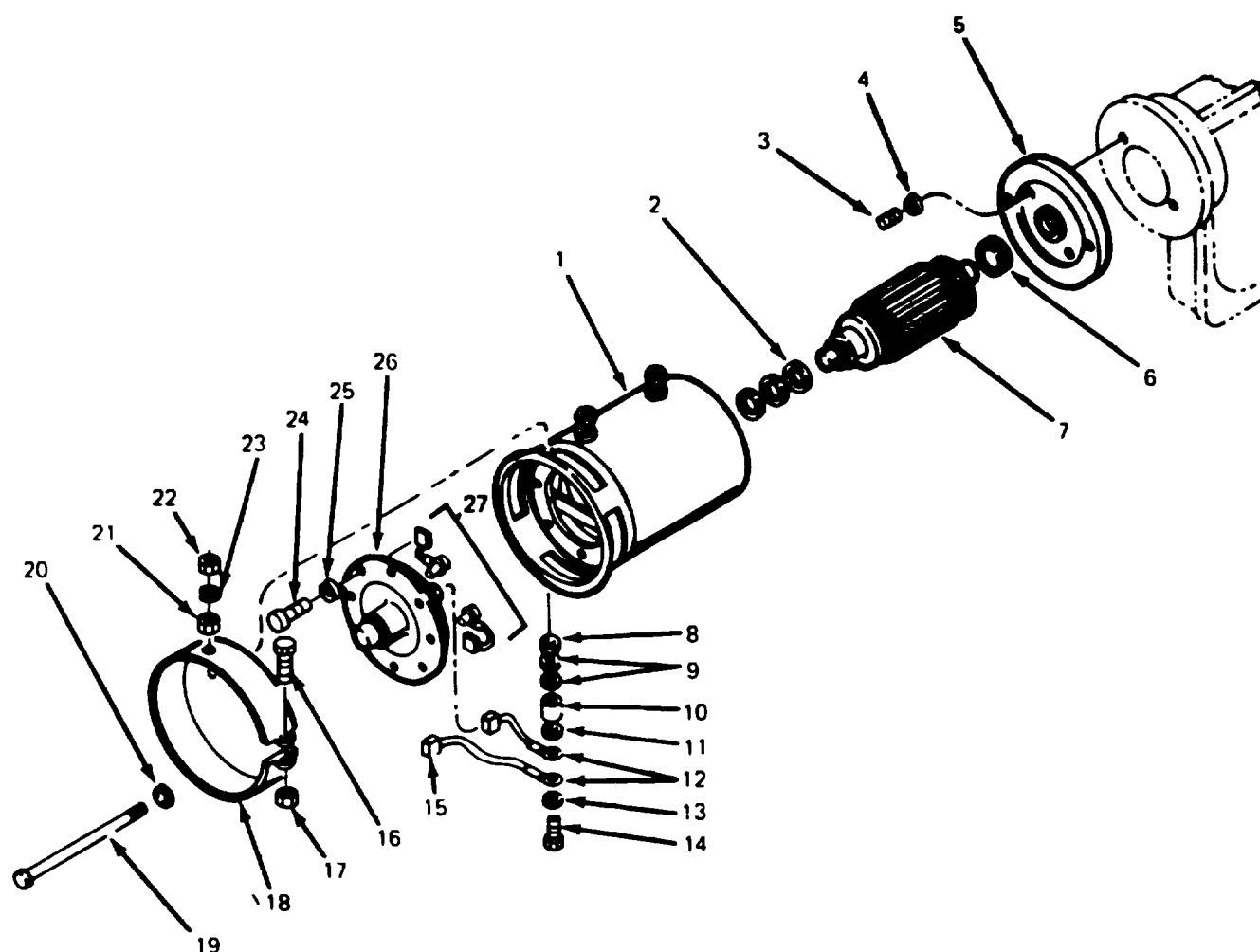
- | | |
|-------------------|-------------------|
| 1. SHAFT | 6. MASTER LINK |
| 2. ROLL PIN | 7. DRIVE CHAIN |
| 3. SET SCREW | 8. FLANGE BEARING |
| 4. THRUST COLLAR | 9. DRIVE SPROCKET |
| 5. FLANGE BEARING | 10. SPOOL |

Figure 4-1. Disassemble/Assemble Electric Winch.

Section II. REPAIR OF MOTOR AND GEAR BOX

4-8. Disassembly.

- a.* Remove motor and gear box from mixer body. (Refer to TM 53895-372-20.)
- b.* Remove two screws (19, fig. 4-2) and lockwashers (20) at commutator end cap (26) and re-move motor casing (1).
- c.* Remove armature (7), bearing (6) and shim(s) (2) from motor casing.
- d.* Remove two setscrews (3) and lockwashers (4) securing drive end cap (5) to gear box; remove drive end cap (5).
- e.* Press out bearing (6).
- f.* Remove screw (16) and nut (17) securing sleeve (18) to commutator end cap (26) and remove sleeve.
- g.* Remove six screws (24) and lockwashers (25) securing commutator end cap (26) to motor casing and remove commutator end cap.
- h.* Lift commutator end cap (26) enough to pull back on springs and release two brushes (15) with leads attached.
- i.* Remove terminal nut (21), lockwasher (8), two flat washers (9), bushing (10), flat washer (11), two electrical leads (12), flat washer (13) and terminal (14) and remove brushes (15).
- j.* Remove brush set (27) by drilling out rivets.
- k.* Remove woodruff key (9, fig. 4-3), bearing (12), and loosen collar setscrews (14) and remove collar (13).
- l.* Remove base plate (15) and gasket (16) from gear box (1).
- m.* Remove thrust bearing (17), brake spring (18), brake plate (19), and brake disk (20) from worm gear and shaft assembly (21).
- n.* Remove worm gear and shaft assembly (21, fig. 4-3), shim washer (22), and thrust bearing (23) from gear box.
- o.* Remove worm gear shaft (8), spacer (4), and flange bearing (3) from gear box.
- p.* Press out oil seal (11) from base plate (15).
- q.* Remove bushing (2) from gear box.
- r.* Remove lock ring (5) from gear shaft and remove gear (6), bearing (10), and woodruff key _ (7).
- s.* Clean all parts in SD-2 drycleaning solvent and inspect for wear or damage.



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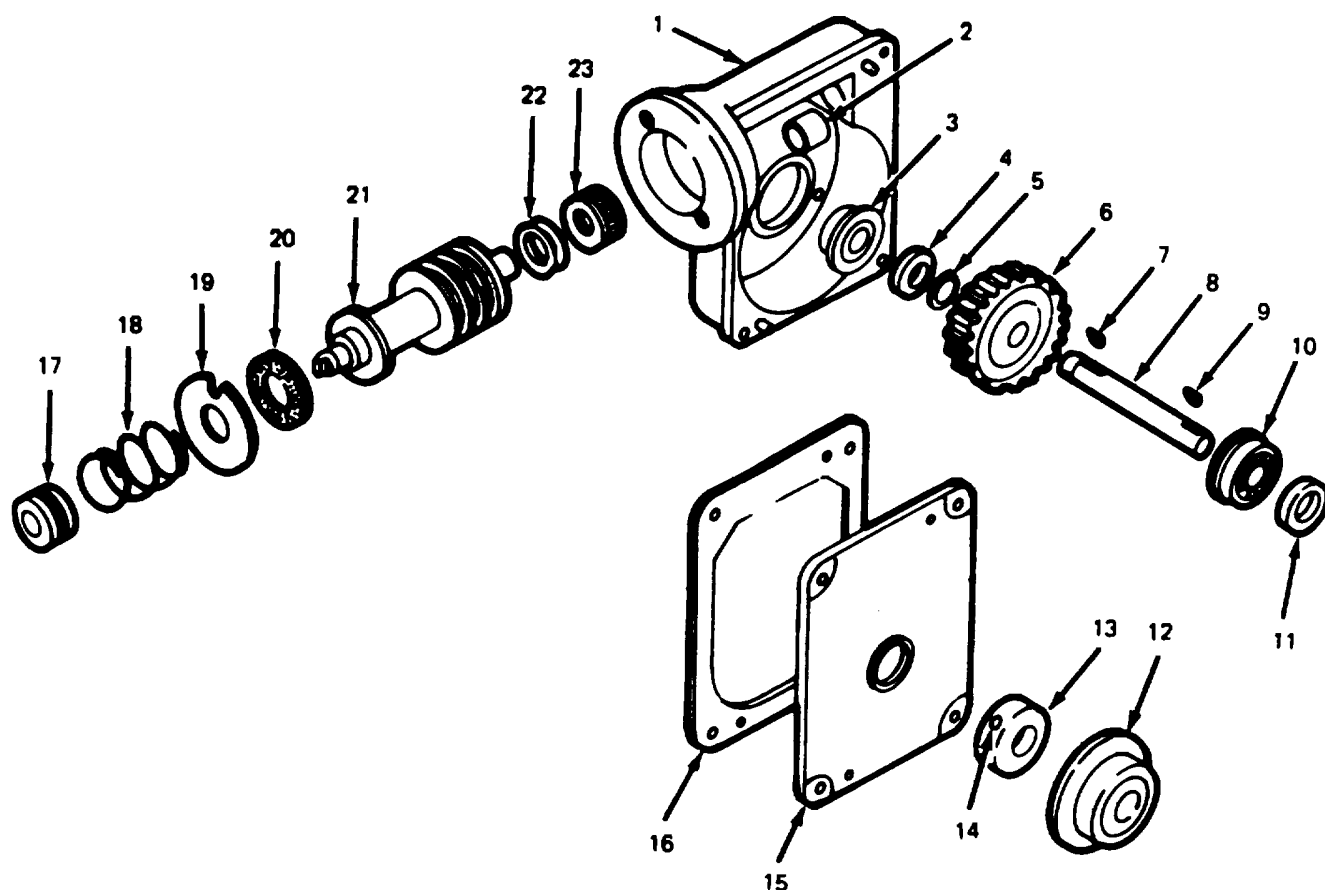
LEGEND

- | | |
|-------------------------|------------------------|
| 1. MOTOR CASING | 15. BRUSH |
| 2. SHIM (5) | 16. SCREW |
| 3. SET SCREW (2) | 17. NUT |
| 4. LOCKWASHER (2) | 18. SLEEVE |
| 5. DRIVE END CAP | 19. SCREW |
| 6. BEARING | 20. LOCKWASHER (2) |
| 7. ARMATURE | 21. NUT |
| 8. LOCKWASHER | 22. NUT (3) |
| 9. FLAT WASHER | 23. LOCKWASHER (3) |
| 10. BUSHING | 24. SCREW (6) |
| 11. FLATWASHER | 25. LOCKWASHER (6) |
| 12. ELECTRICAL LEAD (2) | 26. COMMUTATOR END CAP |
| 13. FLAT WASHER | 27. BRUSH SET |
| 14. TERMINAL | |

Figure 4-2. Winch Motor.

4-9. Assembly.

- a. Install bushing (2, fig. 4-3) and flange bearing (3) in gear box.
- b. Install woodruff key (7), gear (6), lock ring (5), and spacer (4) on worm gear shaft (8) and position in gear box.
- c. Install thrust bearing (23) and shim washers (22) on worm gear and shaft assembly (21) and position in gear box.
- d. Install brake disk (20), brake plate (19), brake spring (18), and thrust bearing (17) on worm gear and shaft assembly (21).
- e. Install oil seal (11) in base plate (15).
- f. Install bearing (10) on shaft.
- g. Position base plate (15) and gasket (16) on gear box and install collar (13) and bearing (12) on shaft.
- h. Position drive end cap (5, fig. 4-2) and secure to gear box with two setscrews (3) and lock-washers (4).
- i. Install shims (2) and bearing (6) on armature (7), then position in motor casing (1).
- j. Install brush set (27) and secure to commutator end cap (26) with screws.
- k. Install terminal (14), flat washer (13), two electrical leads (12), flat washer (11), bushing (10), two flat washers (9), and lockwasher (8) in motor casing (1), then secure with nut (21).
- l. Pull spring back on brush holders and insert brushes; then release spring gently.
- m. Position commutator end cap (26) and secure to motor casing (1) with six screws (24) and lockwashers (25).
- n. Install sleeve (18) on motor casing and secure with screw (16) and nut (17).
- o. Position gear box on motor and secure with two screws (19) and lockwashers (20); install woodruff key (9, fig. 4-3).
- p. Install motor and gear box. (Refer to TM 53895-372-20.)
- q. Fill gear box with oil. (Refer to TM 53895-372-20.)



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LEGEND:

- | | |
|--------------------|----------------------------------|
| 1. GEAR BOX | 13. COLLAR |
| 2. BUSHING | 14. COLLAR SETSCREW (2) |
| 3. FLANGE BEARING | 15. BASE PLATE |
| 4. SPACER (V) | 16. GASKET |
| 5. LOCK RING | 17. THRUST BEARING |
| 6. GEAR | 18. BRAKE SPRING |
| 7. WOODRUFF KEY | 19. BRAKE PLATE |
| 8. WORM GEAR SHAFT | 20. BRAKE DISK |
| 9. WOODRUFF KEY | 21. WORM GEAR AND SHAFT ASSEMBLY |
| 10. BEARING | 22. SHIM WASHER (V) |
| 11. OIL SEAL | 23. THRUST BEARING |
| 12. BEARING | |

Figure 4-3. Winch Gear Box.

CHAPTER 5

REPAIR OF SAND AND STONE BINS

5-1. Preparation.

- a.* Remove all sand and stone from the bins.
- b.* Clean the inside of the bins thoroughly by scraping and brushing *a* necessary.
- c.* Inspect bins for cracks, breaks, holes, rust or areas that are worn thin enough to require repair.

5-2. Repair.

NOTE

The sand and stone bins are repaired by welding and patching. For welding and patching repairs, refer to TM 9237.

CHAPTER 6

REPAIR OF MAIN DRIVE ASSEMBLY

Section I. REPAIR OF ANGLE DRIVE GEAR BOX

6-1. Introduction. The angle drive gear box is a worm gear type speed reducer. Disassembly and assembly can be accomplished using normal shop techniques like those *used* in servicing transmission equipment. Ordinary tools will fit the hexhead capscrews and other hardware.

62. Removal. Refer to TM 5-3895-372-20.

6-3. Disassembly.

a. Drain oil before disassembly. (Refer to LO 5-3895-372-12.)

b. Remove the shaft keys (5 and 12, fig. 6-1) by indenting the end of the key with a center punch and tapping the punch with a hammer.

c. Be sure to note the arrangement of all internal parts, including shims, so that they can be reassembled as originally installed.

d. When the gear box is disassembled, clean and protect the parts from dirt and moisture.

6-4. Removing Internal Parts. The method of parts removal is dependent upon the location of the part to be replaced. Drain all oil from the housing (38) base. Refer to figure 6-1 for arrangement of parts.

6-5. Removal of Worm Gear and Supporting Bearings (fig. 6-1).

a. Match-mark the housing (38) and the housing covers (17 and 41) and bearing retainers (2 and 33) to facilitate reassembly.

b. Remove the eight capscrews, (16) which fasten the housing cover (17) to the housing (38).

c. Remove the housing cover (17) and shim (18).

d. Lift the lowspeed shaft assembly (11) with *bearings* (19 and 23), spacers (20 and 22), and worm gear (21) as a unit from the housing (38).

e. Remove bearings (19 and 23) and spacers (20 and 22) from the low-speed shaft (11) with a bearing puller; install puller to outer flange of spacer.

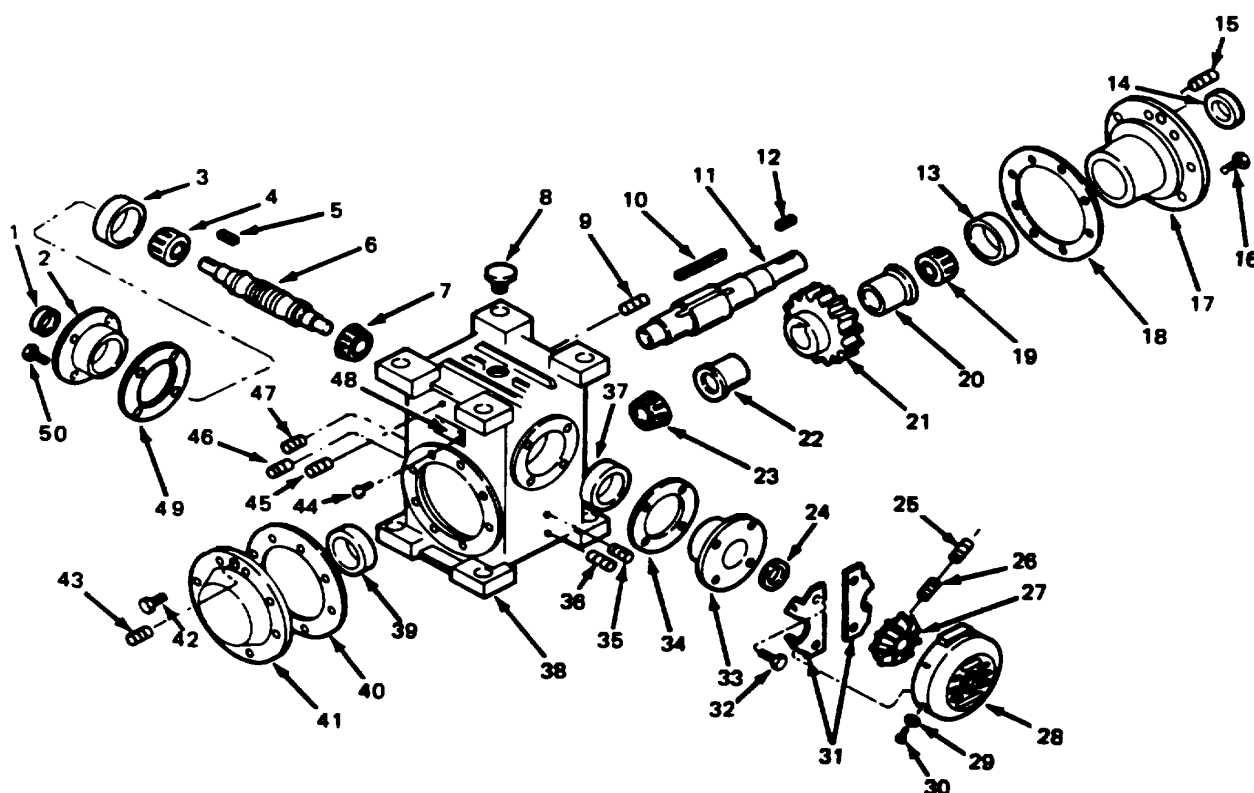
f. Press the low-speed shaft (11) out of worm gear (21) and remove key (10).

g. Remove the eight capscrews (42) which fasten the housing cover (41) to the housing (38). Remove cover and shim (40).

h. Remove bearing cup (39) from housing cover (41) if necessary.

i. Remove bearing cup (13) from housing cover (17) if necessary.

j. Remove oil seal (14) from housing cover (17) if necessary.



LEGEND

- | | | |
|---------------------|----------------------|---------------------|
| 1. OIL SEAL | 18. SHIM | 35. PLUG |
| 2. BEARING RETAINER | 19. BEARING | 36. PLUG |
| 3. BEARING CUP | 20. SPACER | 37. BEARING CUP |
| 4. BEARING | 21. WORM GEAR | 38. HOUSING |
| 5. KEY | 22. SPACER | 39. BEARING CUP |
| 6. WORM SHAFT | 23. BEARING | 40. SHIM |
| 7. BEARING | 24. OIL SEAL | 41. HOUSING COVER |
| 8. BREATHER | 25. SETSCREW | 42. CAPSCREW (8) |
| 9. PLUG | 26. SETSCREW | 43. PLUG |
| 10. KEY | 27. FAN | 44. DRIVE SCREW (4) |
| 11. LOW-SPEED SHAFT | 28. FAN HOUSING | 45. PLUG |
| 12. KEY | 29. WASHER (4) | 46. PLUG |
| 13. BEARING CUP | 30. SCREW (4) | 47. PLUG |
| 14. OIL SEAL | 31. BRACKET | 48. NAMEPLATE |
| 15. PLUG | 32. CAPSCREW (4) | 49. SHIM |
| 16. CAPSCREW (8) | 33. BEARING RETAINER | 50. CAPSCREW (4) |
| 17. HOUSING COVER | 34. SHIM | |

Figure 6- 1. Angle Drive Gear Box internal Parts

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6-6. Removal of Worm Shaft and Supporting Bearings (fig. 6-1).

- a. Remove the fan housing (28) by removing four screws (30) and washers (29). Remove the two locking setscrews (25 and 26) from the fan hub and remove the fan (27).
- b. Remove four capscrews (32) and bracket (31).
- c. Remove bearing retainer shims (34).
- d. Remove four capscrews (50) and bearing retainer (2).
- e. Remove shim (49) and remove worm shaft (6) and bearings (4 and 7) as a unit.
- f. Remove bearings (4 and 7) from the worm shaft (6) with a bearing puller.
- g. Remove oil seal (1) and bearing cup (3) from bearing retainer (2).
- h. Remove oil seal (24) and bearing cup (37) from bearing retainer (33).
- i. Plugs (9, 15, 35, 36, 43, 45, 46, and 47) may be removed if necessary.
- j. Four drive screws (44) may be removed with a chisel if the nameplate (48) must be removed.

6-7. Assembly.

CAUTION

Avoid heavy hammer blows when mounting couplings or gears on shaft extensions to prevent damage to the speed reducer gears and bearings. When tight fits occur, preheat these components in oil at 150°F to 200°F to expand bores.

- a. Assure housing oil tightness by cleaning the housing joints and using an acceptable sealing compound on all
- b. Obtain proper adjustment of the worm and gear shaft bearings. Hold axial end play to the limits shown in table 6-1.
- c. Assure oil tightness along the shaft by replacing the oil seals with new oil seals. Follow installation instructions in paragraph 6-9.
- d. Press bearings (4 and 7, fig. 6-1) onto worm shaft (6).
- e. Press bearing cups (3 and 37) into bearing retainers (2 and 33), respectively.
- f. Install worm shaft (6) into housing (38) and push in bearing retainers (2 and 33) with shims (34 and 49) and secure with four capscrews (50), four capscrews (32) and bracket (31).
- g. Install fan (27) and tighten alien setscrews (25 and 26).
- h. Install fan housing (28) and secure with four screws (30) and washers (29).

- i. Press bearing cup (39) in housing cover (41).
- j. Install housing cover (41) with shim (40) and secure with eight capscrews (42).
- k. Install key (10) on low-speed shaft (11).
- l. Press worm gear (21) onto low-speed shaft (11) with grooved side of gear toward coupling end of shaft.
- m. Install spacers (20 and 22) on each side of worm gear (21).
- n. Press bearings (19 and 23) on each end of low speed shaft (11).
- o. Install shaft assembly into housing (38) and housing cover (41).
- p. Press bearing cup (13) in housing cover (17).
- q. Install housing cover (17) with shim (18) and secure with eight capscrews (16).
- r. Install keys (12 and 5).
- s. Install plugs (9, 15, 35, 36, 43, 45, 46, and 47) if removed.
- t. If the nameplate (48) was removed, drill out the old drive screws (44) and install nameplate (48) using new drive screws (44).

6-8. **Bearing Adjustment.** Mount dial indicator from housing (38, fig. 6-1) to low-speed shaft (11) to check end play. The angle drive gear box uses roller bearings which do not require adjustment. However, when gear box is disassembled for replacement of parts, bearings require axial end play adjustment to the value shown in table 6-1. If axial end play of shaft exceeds this value, remove equal thickness of shims from each bearing retainer, thus adjusting bearings.

NOTE

Excessive end play may result from worn bearings. If rollers and raceways have a dull appearance, replace bearings. Clean and flush reducer and install clean oil.

Table 6- 1. Allowable Axial End Play of Shafts

Reducer Size	End Play	
	Input Shaft	Output Shaft
2-1/2 to 4 in.	.003 to .007 in.	.003 to .005 in.

6-9. Shaft Seals (fig. 6-2). Lip type shaft seals are provided on all shaft openings at the factory and are maintenance free under normal conditions. When operating *conditions require replacement* of seal for repairs, take these precautions in reassembling new seal:

- a. Make sure seal shaft contacting surfaces are smooth and free of corrosion, scratches, or rough spots.
- b. In fitting seal over shaft projection with sharp keyway edges, protect sealing element from scoring.
- c. Eliminate burrs and sharp edges. Lubricate seals and shaft to permit free passage of shaft. Hold seal away from shaft or cover keyway with cellophane tape to protect seal.
- d. Apply lubricant between seal lips of high-speed shaft seal prior to installation.

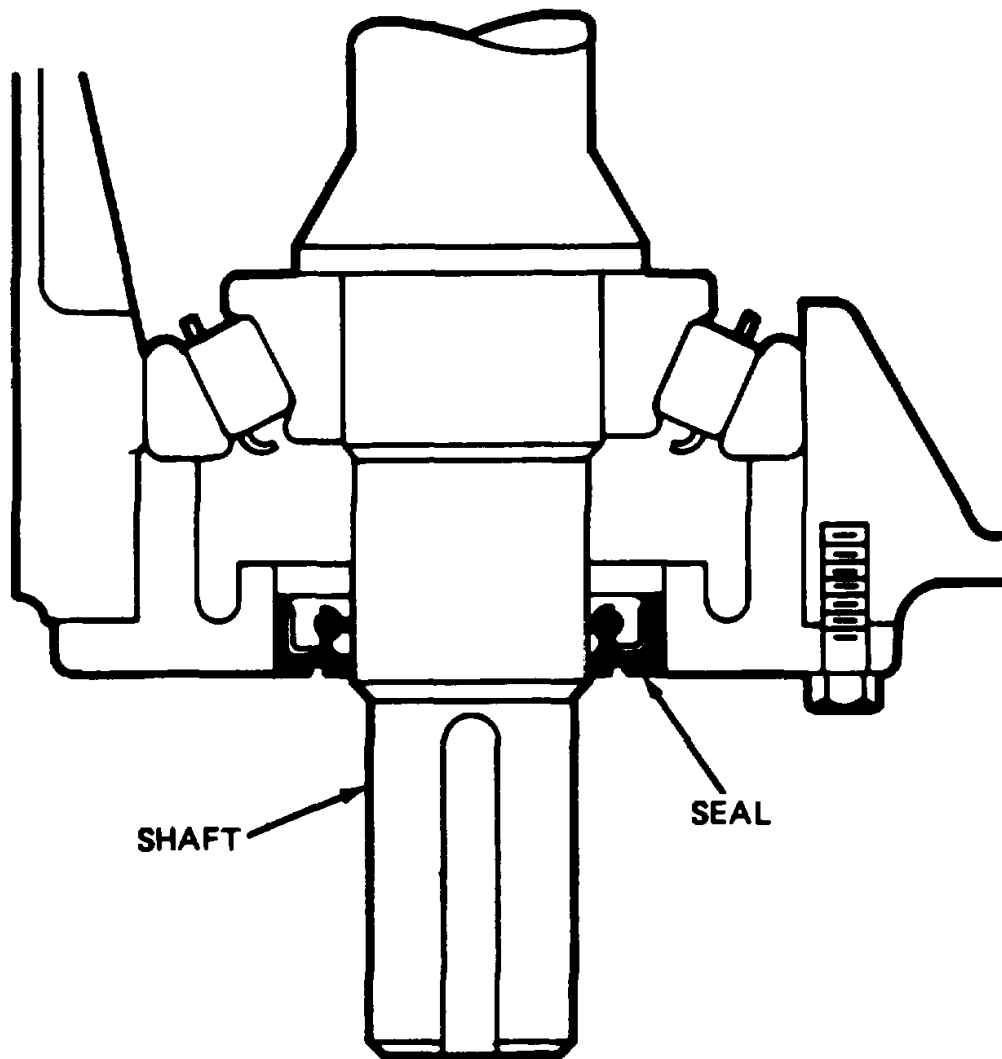


Figure 6-2. Shaft Assembly.

TA 076152

6-10. Assembly of Worm and Gear Set (fig. 6-3). The gear box is made to provide an entry gap for lubricant on the entering side of the gear teeth; consequently, contact is required on the leaving side of the gear tooth driving face. To properly align the worm and gear set, use the following procedures:

- a. Before reassembly of the worm shaft, apply prussian blue or lamp black to the threads of worm shaft.
- b. Reassemble the gear box in accordance with instructions in paragraph 6-7.
- c. After reassembly, turn worm shaft so that low-speed shaft makes one complete revolution in each direction of rotation.
- d. Observe the markings on the teeth of the worm gear. If required, adjust the markings by changing shims from one side of housing to the other.
- e. Recheck per instructions in c and d above. If the marking is on entering side of worm gear tooth driving face, move the entering side away from the center by shimming. This will cause the contact to move to the leaving side of the gear.
- f. When reassembling, use new oil seals, washers and shims.
- g. After reassembly, fill gear box with oil. (Refer to LO 5-3895-372-12.)

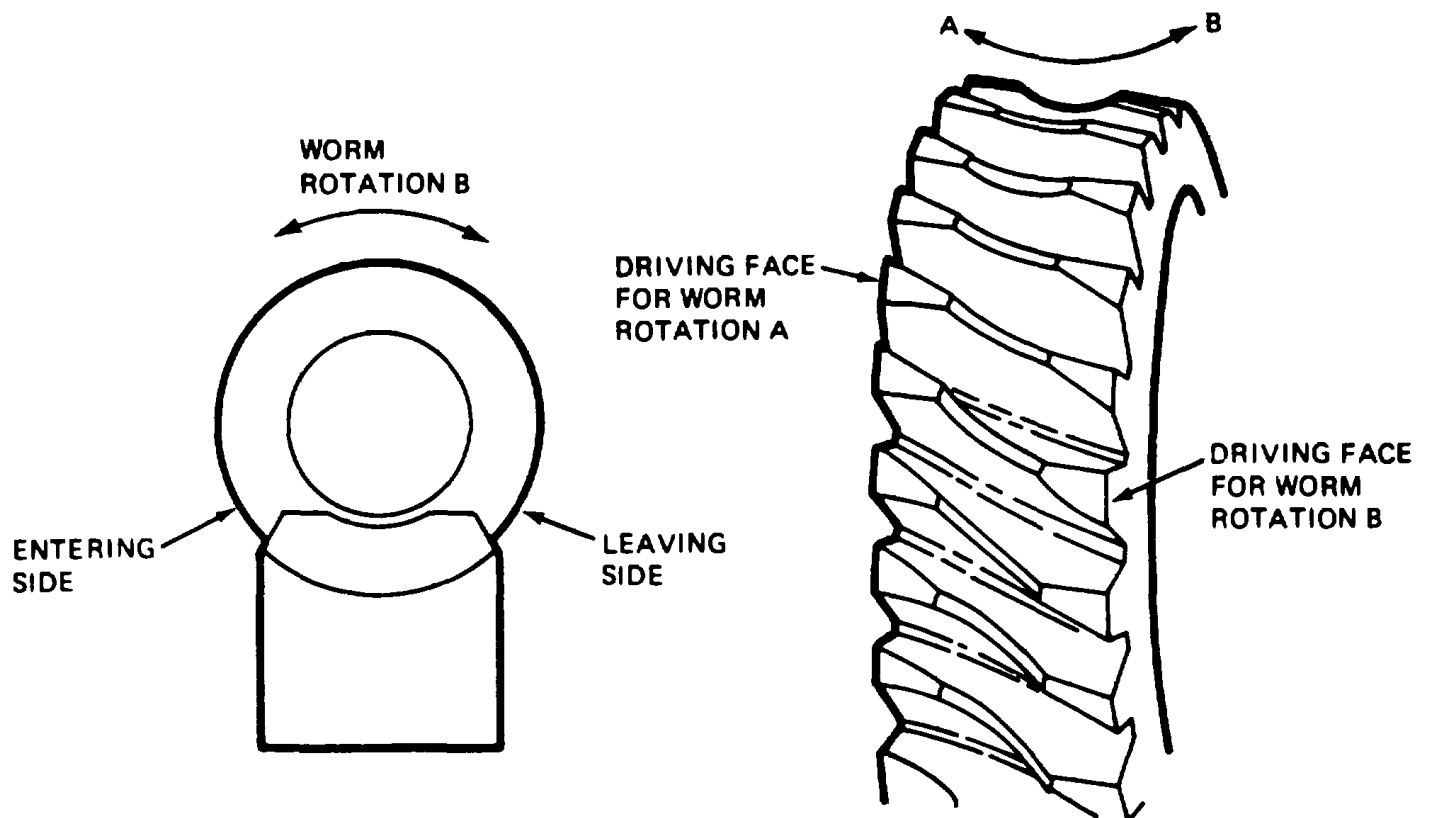


Figure 6-3. Worm and Gear Assembly

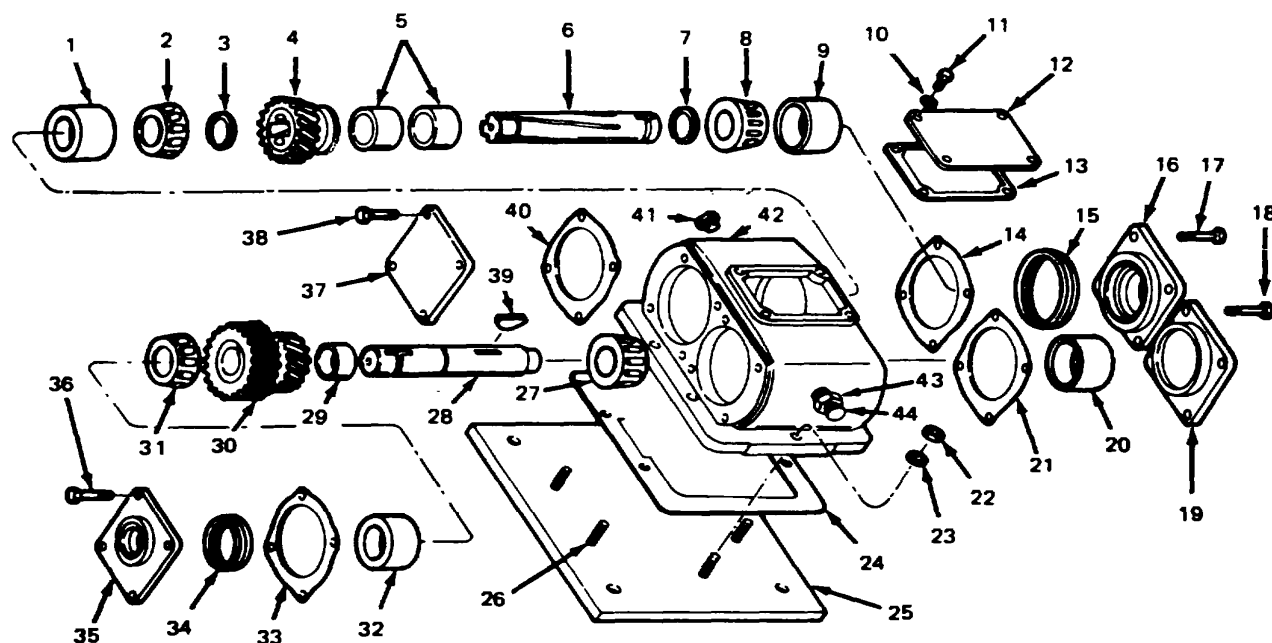
Section II. REPAIR OF REVERSING GEAR BOX

6-11. Introduction. The reversing gear box of the mixer body reverses shaft rotation at a 1:58 speed ratio.

6-12. Removal. Refer to TM 53895-372-20.

6-13. Disassembly.

- a. Remove drain plug (41, fig. 6-4) and drain oil from gear box.
- b. Remove four bolts (11) and washers (10) securing top cover (12) and gasket (13) to gear box housing (42).
- c. Remove four bolts (38) securing bearing cap (37) and gasket (40) to rear input side of housing (42).
- d. Remove four bolts (17) securing bearing cap (16) and gasket (14) to front input side of housing.
- e. Remove gear (4) and shaft assembly from housing.
- f. Using a bearing puller, remove bearings (2 and 8) from input shaft (6).
- g. Remove snaprings (3 and 7) from input shaft (6).
- h. Slide gear (4) and two spacers (5) off shaft.
- i. Remove four bolts (18) securing bearing cap (19) and gasket (21) to front drive side of housing.
- j. Remove four bolts (36) securing bearing cap (35) and gasket (33) to rear drive side of housing.
- k. Remove bearings (27 and 31) from drive shaft (28).
- l. Tap drive shaft (28) out of drive gear (30) and remove drive gear (30) and spacer (29) from housing (42). To remove drive gear (30) from housing, pull through top access opening in housing.
- m. Remove key (39) from drive shaft (28).
- n. Remove six hex nuts (22) and lockwashers (23) securing mounting plate (25) and gasket (24) to housing (42).
- o. If necessary, six studs (26) may be removed from mounting plate (25) by unscrewing.
- p. Remove bearing cup (9) from bearing cap (16) using a suitable puller. Remove seal (15) from bearing cap (16).
- q. Remove bearing cup (20) from bearing cap (19) using a suitable puller.
- r. Remove bearing cup (32) from bearing cap (35) using a suitable puller. Also, remove seal (34) from bearing cap (35).
- s. If necessary, fitting (44) and plug (43) may be removed.



LEGEND

- | | |
|-----------------|--------------------|
| 1. BEARING CUP | 23. LOCKWASHER (6) |
| 2. BEARING | 24. GASKET |
| 3. SNAPRING | 25. MOUNTING PLATE |
| 4. GEAR | 26. STUD (6) |
| 5. SPACER (2) | 27. BEARING |
| 6. INPUT SHAFT | 28. DRIVE SHAFT |
| 7. SNAPRING | 29. SPACER |
| 8. BEARING | 30. DRIVE GEAR |
| 9. BEARING CUP | 31. BEARING |
| 10. WASHER (4) | 32. BEARING CUP |
| 11. BOLT (4) | 33. GASKET |
| 12. COVER | 34. SEAL |
| 13. GASKET | 35. BEARING CAP |
| 14. GASKET | 36. BOLT (4) |
| 15. SEAL | 37. BEARING CAP |
| 16. BEARING CAP | 38. BOLT (4) |
| 17. BOLT (4) | 39. KEY |
| 18. BOLT (4) | 40. GASKET |
| 19. BEARING CAP | 41. DRAIN PLUG |
| 20. BEARING CUP | 42. HOUSING |
| 21. GASKET | 43. PLUG |
| 22. HEX NUT (6) | 44. FITTING |

TA 076154

Figure 6-4. Reversing Gear Box

6-14. Inspection. Inspect all components of the reversing gear box for excessive heat, scoring, wear, and deterioration. Replace any component that is damaged or worn which would affect the operation of the gear box.

6-15. Assembly.

- a. Install seals (15 and 34) in bearing caps (16 and 35), respectively. (Refer to para 6-9.)
- b. Press bearing cup (9) into bearing cap (16), bearing cup (1) into bearing cap (37), bearing cup (20) into bearing cap (19), bearing cup (32) into bearing cap (35).
- c. Press bearing (27, fig. 6-4) on drive shaft (28).
- d. Slide spacer (29) over drive shaft (28).
- e. Install key (39) on drive shaft (28).
- f. Position drive gear (30) in housing (42) and insert drive shaft (28) through drive gear (30) and align keyway.
- g. Press bearing (31) on drive shaft (28).
- h. Position bearing cap (35) and gasket (33) on housing and secure with four bolts (36).
- i. Position bearing cap (19) and gasket (21) on housing and secure with four bolts (18).
- j. Install snap ring (7) on input shaft (6).
- k. Press bearing (8) on input shaft (6).
- l. Slide two spacers (5) and gear (4) on input shaft (6).
- m. Install snap ring (3).
- n. Press bearing (2) on input shaft (6).
- o. Install input shaft assembly in housing (42).
- p. Position bearing cap (37) and gasket (40) on housing (42) and secure with four bolts (38).
- q. Position bearing cap (16), seal (15), and gasket (14) on housing (42) and secure with four bolts (11).
- r. Position top cover (12) and gasket (13) and secure to housing (42) with four bolts (11) and washers (10).
- s. If removed, install six studs (26) in mounting plate (25).
- t. Align mounting plate (25) and gasket (24) and secure to housing (42) with six hex nuts (22) and lockwashers (23).
- u. Mount a dial indicator from housing (42) to drive shaft (28) to check end play. The axial end play should be .006 in. to .010 in. (.153 mm). If axial end play of shaft exceeds this value, remove or add equal thickness of gaskets (21 and 33) from bearing caps (19 and 35), thus adjusting bearings. Likewise, adjust axial end play for input shaft (6).
- v. Refill gear box. (Refer to LO 5-3895-372-12.)

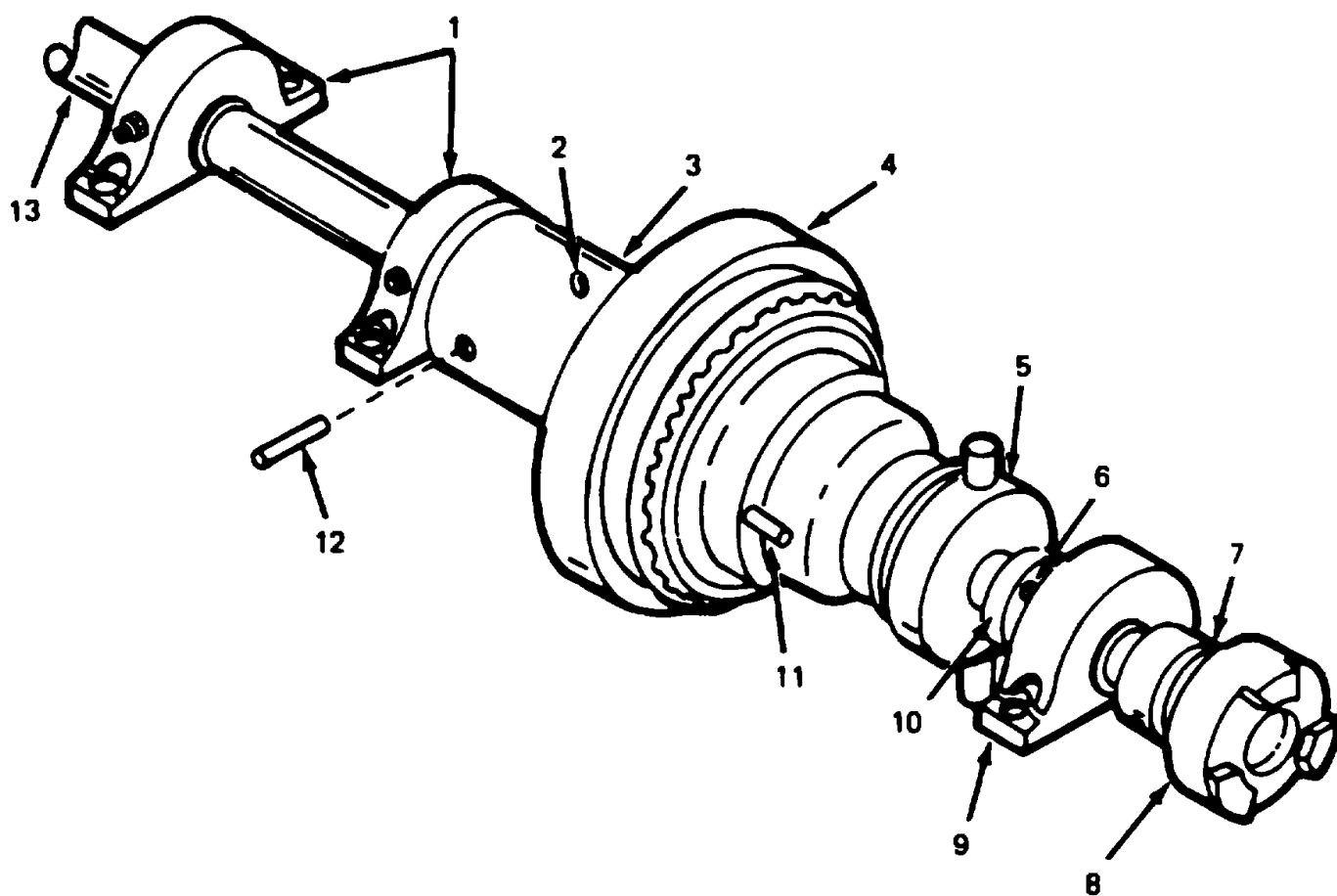
Section III. REPAIR OF MAIN CLUTCH

6-16. Introduction. The main clutch of the mixer body is a heavy-duty, enclosed-type clutch with gear tooth driving plates.

6-17. Removal. (Refer to para 2-15.)

6-18. Disassembly.

- a. Loosen setscrew (7, fig. 6-5) on drive coupling (8); remove coupling and key.
- b. Punch mark shaft, directly adjacent to the bearing locking collars (10, fig. 6-5), to ensure proper alignment of bearing blocks (1 and 9) at assembly.
- c. Clean, polish and lubricate main clutch shaft (13).
- d. Loosen six setscrews (6) on bearing locking collars (10) (2 on each collar) and remove three bearing blocks (1 and 9) and locking collars (10).
- e. Remove cone assembly (5).
- f. Loosen setscrew (2) in driving spider hub (3); tap out roll pin (12) with hammer and brass drift.
- g. Pull out adjusting lockpin (11) and insert a wire through a hole in it to hold it out
- h. Remove adjusting yoke assembly (12, fig. 6-6) and separate cover (13) by turning counter-clockwise and remove lockpin (33) and spring (34).
- i. Remove collar cone snapping (20) from collar (16). Washer (19) will come off.
- j. Press bearing (18) and cone (21) out of collar (16).
- k. Remove snapping (17) and press bearing (18) off of cone (21).
- l. Remove the three machine screws (14) and separate cover (13) and yoke assembly (12).
- m. Remove roller disc (11) and lift out floating plate (10).
- n. Remove three section driving clutch plate (9).
- o. Remove four springs (23) and pins (24).
- p. Remove six capscrews (6), washers (5) and driving ring (4).
- q. Pry hub plate (8) out of driving spider hub (3).
- r. Loosen setscrew (7) and press shaft (15) out of bearing (25) and hub plate (8).
- s. Loosen setscrew (2) and push roll pin (26) out of driving spider hub (3); press shaft (1) out of driving spider hub (3).



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LEGEND:

1. BEARING BLOCK (2)
2. SET SCREW
3. DRIVING SPIDER HUB
4. MAIN CLUTCH ASSEMBLY
5. CONE ASSEMBLY
6. SET SCREW (6)
7. SET SCREW
8. DRIVE COUPLING
9. BEARING BLOCK
10. LOCKING COLLAR (3)
11. ADJUSTING LOCKPIN
12. ROLL PIN
13. MAIN CLUTCH SHAFT

Figure 6-5. Main Clutch Assembly.

- t. Remove three cotter pins (30) on yoke (31).

NOTE

Exercise care as levers (28) are under tension of lever springs (29).

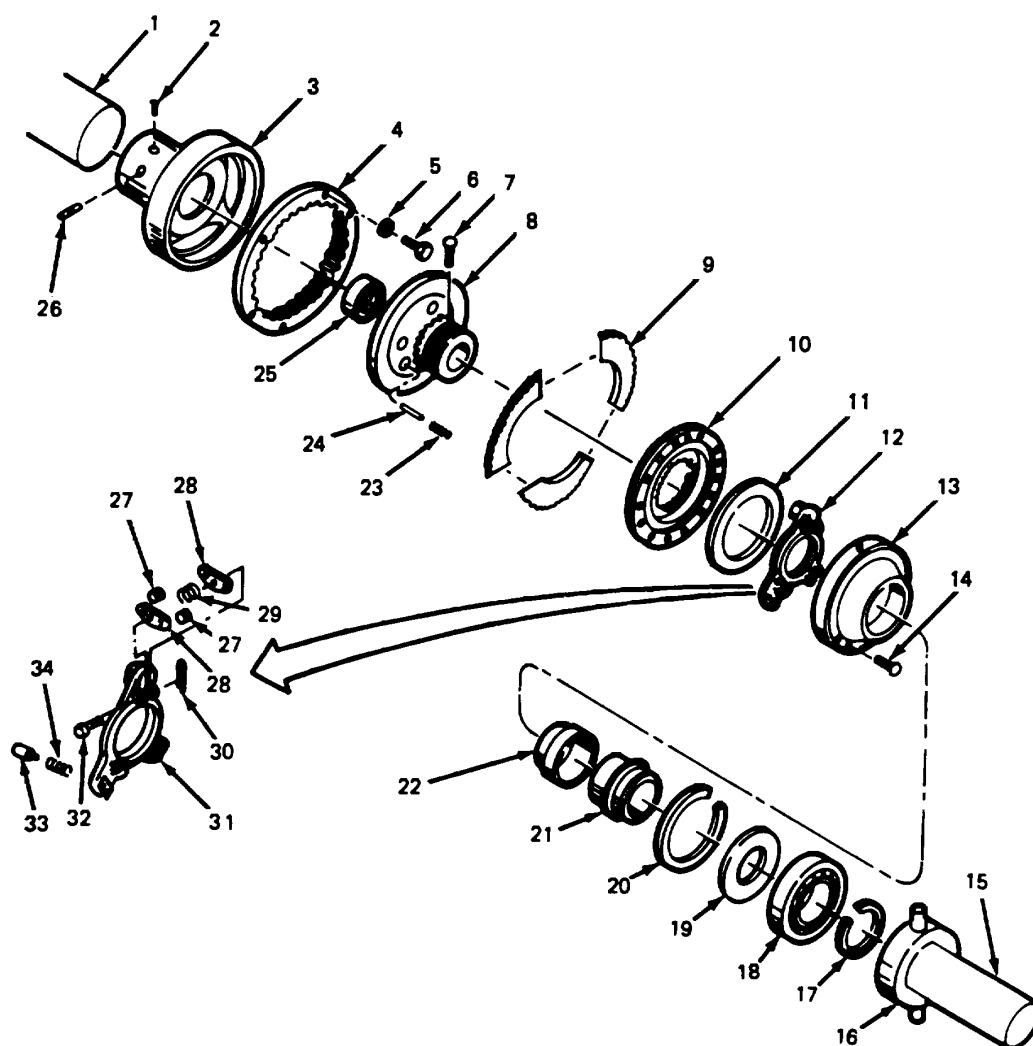
- u. Cup your hand over six levers (28), six rollers (27), three lever springs (29), and remove three lever pins (32).
- v. Remove levers (28), rollers (27), and lever springs (29) from yoke (31).

6-19. Clean and Inspect. Clean all parts in dry cleaning solvent and inspect for damage or wear.

6-20. Assemble.

- a. Position six levers (28), rollers (27), and three lever springs (29) onto yoke (31); install three lever pins (32).
- b. Lock lever pins (32) in place with cotter pins (30).
- c. Press shaft (1, fig. 64) into driving spider hub (3) and tighten setscrew (2).
- d. Press shaft (15) thru hub plate (8) and bearing %25); tighten setscrew (7).
- e. Install hub plate (8) into driving spider hub (3). Install driving ring (4), six washers (5) and capacrews (6). Tighten capscrows securely.
- f. Install four springs (23) and pins (24) and hub plate (8). Tighten setscrew (7).
- g. Install three section driving clutch plate (9), floating plate (10) and roller disk (11).
- h. Place yoke assembly (12) in separate cover (13) and install three machine screws (14) and tighten.
- i. Press bearing (18) onto cone (21) and install snapring (17).
- j. Press bearing (18) and cone (21) into collar (16).
- k. Install cone snapring (20).
- l. Place lockpin (33, fig. 6-6) and spring (34) in position, pull pin out and install wire to hold it out.
- m. Install separate cover (13) and yoke assembly (12) by turning clockwise.
- n. Install cone assembly (5, fig. 6-5).
- o. Install bearing blocks (1 and 9) and locking collars (10). Aline locking rings with punch marks and tighten setscrews (6).
- p. Install key and drive coupling (8) onto shaft (15, fig. 6-6); tighten setscrew (7, fig. 6-5).

6-21. Install Clutch Assembly. (Refer to para 2-15.)



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LEGEND:

- | | |
|---------------------------|----------------------|
| 1. SHAFT | 18. BEARING |
| 2. SETSCREW | 19. WASHER |
| 3. DRIVING SPIDER HUB | 20. CONE SNAPRING |
| 4. DRIVING RING | 21. CONE |
| 5. WASHER (6) | 22. SLEEVE |
| 6. CAPSCREW (6) | 23. SPRING (4) |
| 7. SETSCREW | 24. PIN (4) |
| 8. HUB PLATE | 25. BEARING |
| 9. CLUTCH | 26. ROLL PIN |
| 10. FLOATING PLATE | 27. ROLLER (6) |
| 11. ROLLER DISK | 28. LEVER (6) |
| 12. YOKE ASSEMBLY | 29. LEVER SPRING (3) |
| 13. SEPERATE COVER (YOKE) | 30. COTTER PIN (3) |
| 14. SCREW (3) | 31. YOKE |
| 15. SHAFT | 32. LEVER PIN (3) |
| 16. COLLAR | 33. LOCK PIN |
| 17. SNAPRING | 34. SPRING |

Figure 6-6. Disassembly/Assembly Main Clutch.

CHAPTER 7

REPAIR OF CEMENT BIN ASSEMBLY

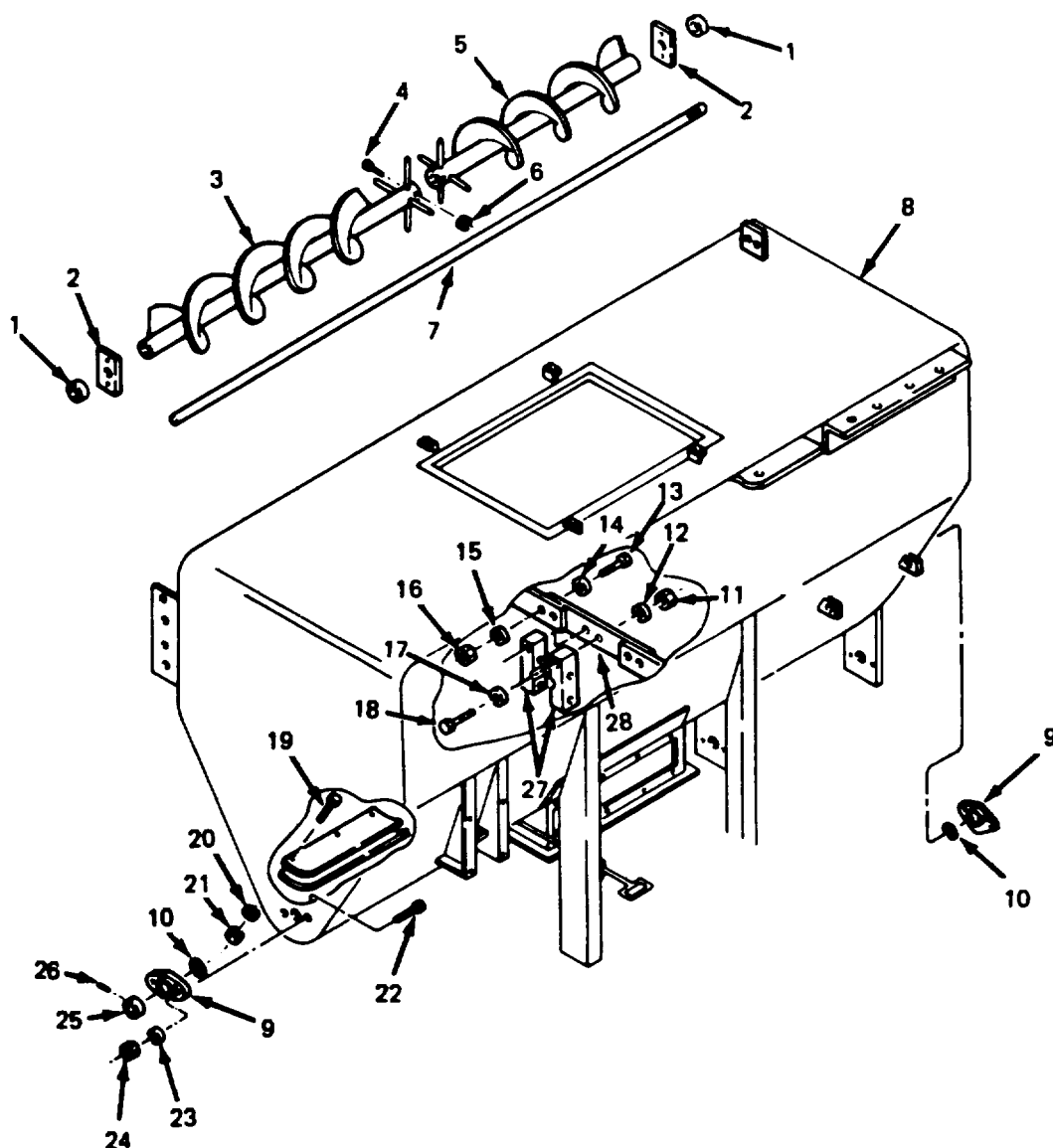
Section I. REPAIR OF CEMENT BIN

7-1. Disassembly.

- a. Remove sprocket cover (34, fig. 7-1) from right hand side by removing three capscrews (36) and washers (35).
- b. Remove master link (33) from sprocket chain (32); remove chain.
- c. Remove three capscrews and washers (37) from split flange (38).
- d. Install three capscrews (37) into other three holes in split flange (38) to back sprocket (40) off of split flange (38). Remove split flange (38), key (29), and sprocket (40) from auger shaft (7).
- e. Loosen two setscrews (26 and 30) from two collars (25 and 39) and slide off auger shaft (7).
- f. Remove four bolts (22), nuts (24), and washers (23) from two flange bearings (9); slide bearings off of auger shaft (7) and remove two O-rings (10).
- g. One mechanic inside bin to unscrew bolt while second mechanic holds nut with washer on outside.
- h. Remove two bolts (4) and nuts (6) through augers (3 and 5) and auger shaft (7).
- i. Remove four bolts (18), eight washers (12 and 17), and four nuts (11) from wood bearing (27) and support bar (28); remove wood bearing.
- j. Remove four bolts (13), eight washers (14 and 15) and four nuts (16) attaching support bar (28) to weldments in bin; remove support bar (28).
- k. Drive auger shaft (7) from two augers (3 and 5) from either end, using mallet and brass drift; remove auger shaft (7) from end and lift out the two augers (3 and 5). Two seals (1) and plates (2) will drop down.
- /. Remove twelve nuts (21) and washers (20) from outside bottom of bin; from inside, lift out twelve bolts (19).
- m. For maintenance of filter cloths refer to TM 5-3895-372-20.
- n. If end support bars, auger blades, or mixing pegs are bent, heat and straighten. If auger blades are broken install new auger.

7-2. Assembly.

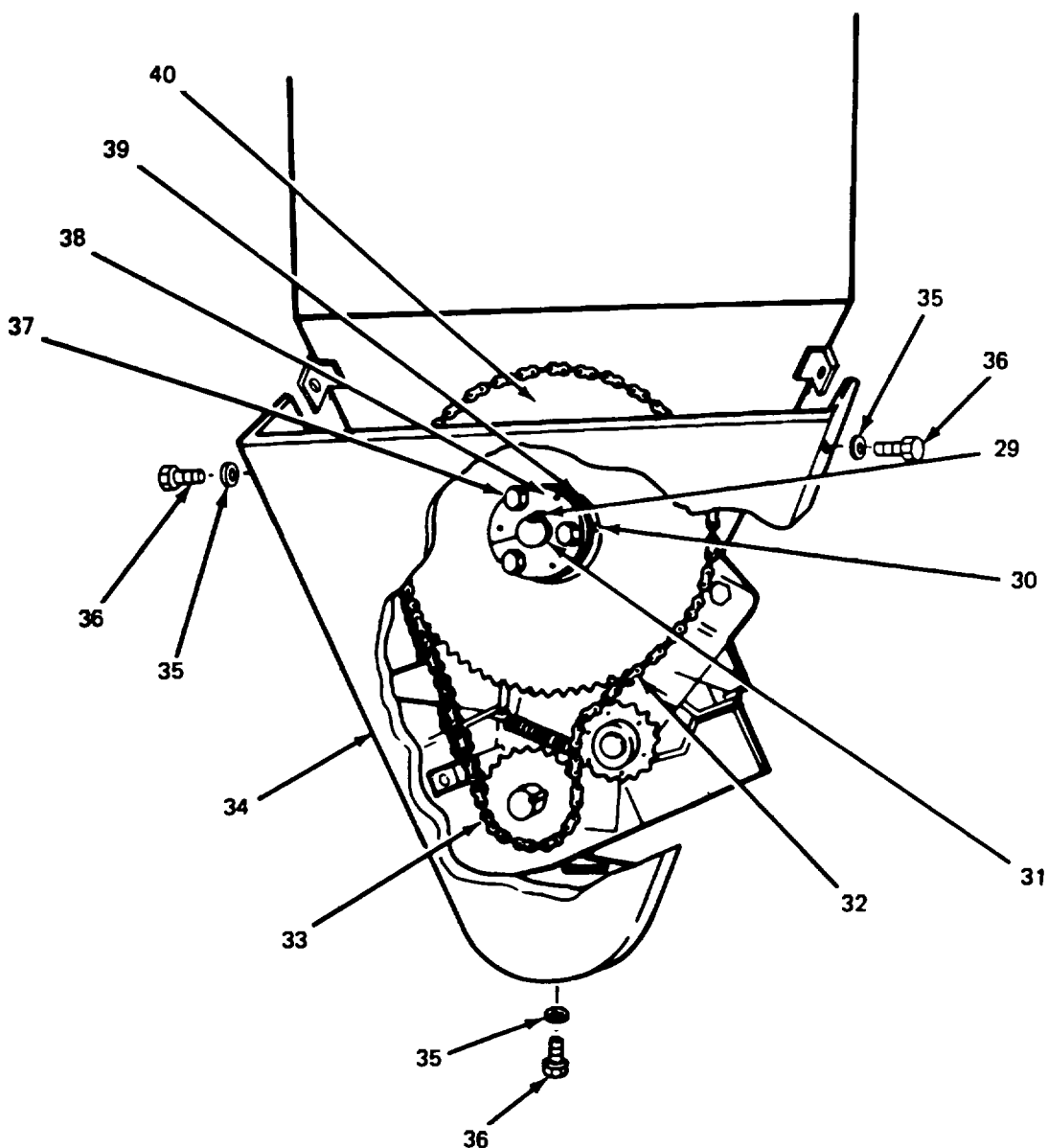
- a. Install filter cloth per TM 5-3895-372-20.
- b. Position two augers (3 and 5) and two plates (2) inside bin (8); drive auger shaft (7) through two augers (3 and 5) using mallet and brass drift; as auger shaft (7) comes through the last auger, position one seal (1) and drive auger shaft (7) through the seal and bin wall until the driven end is inside the bin.



LEGEND

- | | | |
|-----------------------|-----------------|------------------|
| 1. SEAL (2) | 11. NUT (4) | 21. NUT (12) |
| 2. PLATE (2) | 12. WASHER (4) | 22. BOLT (4) |
| 3. AUGER | 13. BOLT (4) | 23. WASHER (4) |
| 4. BOLT (2) | 14. WASHER (4) | 24. NUT (4) |
| 5. AUGER | 15. WASHER (4) | 25. COLLAR |
| 6. NUT (21) | 16. NUT (4) | 26. SETSCREW |
| 7. AUGER SHAFT | 17. WASHER (4) | 27. WOOD BEARING |
| 8. BIN | 18. BOLT (4) | 28. SUPPORT BAR |
| 9. FLANGE BEARING (2) | 19. BOLT (12) | |
| 10. O-RING (2) | 20. WASHER (12) | |

Figure 7-1. Cement Bin Disassembly/Assembly (Sheet 1 of 2).



LEGEND

- | | |
|--------------------|-----------------------------|
| 29. KEY | 36. CAPSCREW (3) |
| 30. SETSCREW | 37. CAPSCREW AND WASHER (3) |
| 31. AUGER SHAFT | 38. SPLIT FLANGE |
| 32. SPROCKET CHAIN | 39. COLLAR |
| 33. MASTER LINK | 40. SPROCKET |
| 34. SPROCKET COVER | |

Figure 7- 1. Cement Bin Disassembly/Assembly (Sheet 2 of 2).

TA 07534

- c. Position the second seal (1) between plate (2) and bin (8) and drive auger shaft (7)-back through the seal and bin wall.
- d. Install four bolts (13), eight washers (14 and 15), and nuts (16) through center support bar (28) and bin weldments; tighten.
- e. Install wood bearing (27) around shaft (7), bolt halves together and mount to center support bar with four bolts (18), eight washers (12 and 17) and four nuts (11).
- f. Install two bolts (4) and nuts (6) through two augers (3 and 5) and auger shaft (7).
- g. Install two flange bearings (9) with four bolts (22), washers (23), and nuts (24); one each end of bin (8).
- h. Slide collar (25) on left hand shaft end and tighten setscrew (26).
- i. Slide collar (39) on right hand shaft end and tighten setscrew (30).
- j. Install sprocket (40) and key (29) to auger shaft (7); secure with split flange (38) and three capscrews and washers (37).
- k. Set sprocket chain (32) in place and install master link (33).
- l. Set sprocket cover (34) in place, align mounting holes, and secure with three capscrews (36) and washers (35).

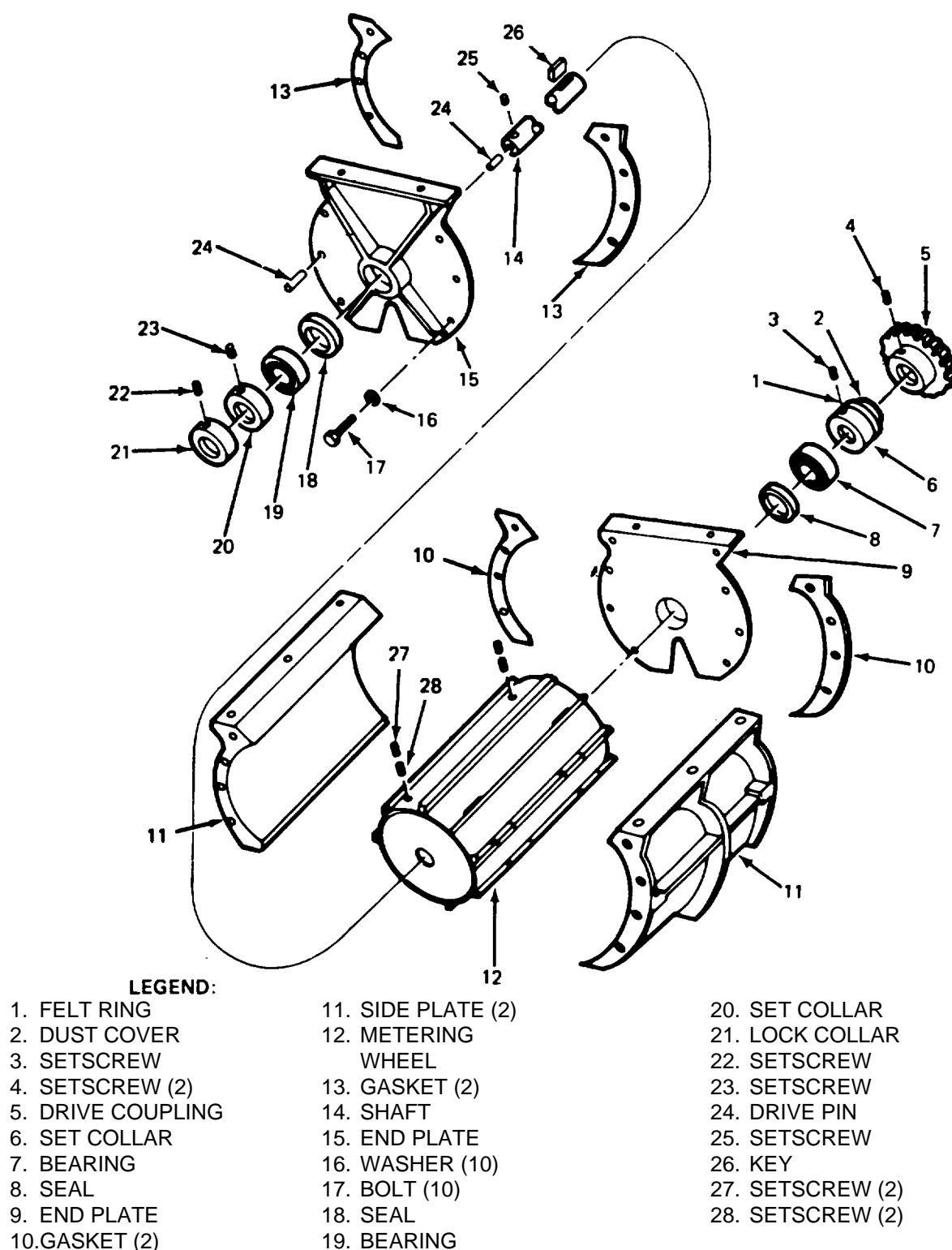
Section II. REPAIR OF CEMENT FEEDER

7-3. Introduction. The cement feeder consists of a cylinder with radial fins that rotate in a close tolerance housing located under the midpoint of the cement bin. Cement enters the top of the housing and is carried by the metering wheel and dropped onto the aggregates as they are carried to the mixing trough by the main conveyor belt. A precise amount is carried between the fins and recorded on the cement meter register through the cable pickup at the end of the shaft.

If moisture has gotten into the cement bin, the cement may have hardened and blocked the rotation of the metering wheel. In such cases the cement feeder must be removed, disassembled and cleaned.

7-4. Disassembly and Cleaning.

- a. Loosen two setscrews (4, fig. 7-2) and remove drive coupling (5).
- b. Remove dust cover (2) and felt ring (1) from shaft (14).
- c. Loosen setscrew (3) and slide set collar (6) off shaft (14). It may be necessary to use emery paper or stiff bristled brush to remove any paint or hardened cement on shaft (14) to remove set collar (6) and bearings.
- d. Loosen setscrew (22) and remove the lock collar (21) from shaft (14).
- e. Loosen setscrew (25) and remove meter register drive pin (24).



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Figure 7-2. Cement Feeder Exploded View.

- f.* Loosen setscrew (23) and remove set collar (20) from shaft (14).
- g.* Remove the ten remaining bolts (17) and washers (16) securing end plates (9 and 15) and gaskets (10 and 13) to side plates (11).
- h.* Remove end plates (9 and 15) from shaft (14).
- i.* Press bearings (7 and 19) out of end plates (9 and 15).
Remove seals (8 and 18) from end plates (9 and 15).
- k.* Remove two setscrews (27) from top of metering wheel (12).
- l.* Loosen two setscrews (28) from inside metering wheel securing shaft (14).
- m.* Remove flat key (26) from metering wheel (12).

CAUTION

Do not strike the end of the metering wheel to remove from shaft as damage to wheel may result.

- n.* Press shaft (14) from metering wheel (12).
- o.* Clean the cement feeder, removing all hard cement from the pockets and ends. Clean the inner sides of the cement feeder housings thoroughly.

7-5. Assembly.

- a.* Set metering wheel (12, fig. 7-2) on end, keyway end up and press in shaft (14).
- b.* Insert flat key (26) on shaft (14) and align with keyway. Continue pressing shaft (14) until countersunk hole on shaft (14) is visible through setscrew opening on cement wheel.
- c.* Install two inner setscrews (28) and tighten.
- d.* Install two setscrews (27) on metering wheel (12) and tighten.
- e.* Install new end plate seals (8 and 18). If bearings (7 and 19) are worn, replace bearings also.
- f.* Slide end plates (9 and 15) on shaft (14).
- g.* Secure end plates and new 0.015 in. (0.4 mm) thick end gaskets (10 and 13) to side plates (11) with ten bolts (17) and washers (16). Tighten bolts finger tight.
- h.* Tighten bolts (17) on end plates. Use a feeler gage to check for 0.015-0.030 in. (0.4-0.75 mm) clearance between the ends of the metering wheel (12) and the end plates (9 and 15) on each side. Clearance must be the same on both sides.
- i.* Install bearing (19) and set collar (20) on shaft and tighten setscrew (23).

- j.* Install cam lock collar (21) on shaft (14) and tighten setscrew (22).
- k.* Install meter register drive pin (24) and tighten setscrew (25).
- l.* Install bearing (7) and slide set collar (6) on shaft (14) and tighten setscrew (3).
- m.* Position felt ring (1) and dust cover (2) on shaft (14) and install drive coupling (5). Tighten setscrews (4).

7-7/7-8 (Blank)

CHAPTER 8**MAINTENANCE OF AUXILIARY EQUIPMENT**

8-1. General. The open-topped auxiliary bin is a 26 cu ft (0.73 ^{m3}) capacity unit which fits on top of the mixer body's quick-loading cement hopper. When the sliding door in the bottom is removed, cement falls from the auxiliary bin into the cement bin.

8-2. Repair. Dents should be hammered straight. Repair cracks and holes by welding. Refer to TM 9237 for welding repair guidance.

8-1/8-2 (Blank)

APPENDIX A

REFERENCES

A-1. Publication Index.

The following index should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms.....DA Pam 25-30

A-2. Forms.

The following forms pertain to this material. (Refer to DA Pam 25-30 for index of blank forms.)

Standard Form 91, Operator Report of Motor Vehicle Accident

Recommended Changes to DA Publications and Blank Forms, DA Form 2028

Refer to DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

A-3. Other Publications.

The following publications contain information pertinent to the major item materiel and associated equipment.

a. Operating Vehicle.

Operator's Manual for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919.....	TM 9-2320-273-10
Operator's Manual for M919 Concrete Mobile Mixer Body.....	TM 5-3895-372-10
Army Motor Transport Units and Operations.....	FM 55-30
Manual for the Wheeled Vehicle Driver.....	FM 21-305
Prevention of Motor Vehicle Accidents.....	AR 385-55
Accident Reporting and Records.....	AR 38540

b. Maintenance and Repair.

Organizational Maintenance for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	TM 9-2320-273-20
Organizational Maintenance Repair Parts and Special Tools Lists for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	TM 9-2320-273-20P
Lubrication Order for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	LO 9-2320-273-12
Lubrication Order for M919 Concrete Mobile Mixer Body	LO 5-3895-372-12
Organizational, Direct Support and General Support Care, Maintenance and Repair of Pneumatic Tires and Inner Tubes.....	TM 9-2610-200-24
Description, Use, Bonding Techniques, and Properties of Adhesives.....	TB ORD 1032
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials, Including Chemicals.....	TM 9-247

Metal Body Repair and Related Operations	FM 43-2
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Packaging of Materiel: Preservation (Vol I)	TM 38-230-1
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Shipment and Limited Storage	MIL-V-62038

Storage Serviceability Standard: Tracked Vehicles, Wheeled Vehicles, and Component Parts	SB 740-98-1
g. Warranty.....	TB 9-2300-295-15/17

Change 1 A-3/A-4 (Blank)

APPENDIX B

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

B-1. Scope. This appendix lists expendable supplies and materials you will need to operate and maintain the mixer body. These items are authorized to you by CTA 50-970, expendable items (except medical, class V, repair parts, and heraldic items).

B-2. Explanation of Columns.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O - Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

c. Column 3 - National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/MI). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) UNIT OF MEAS.
1	C	9150-00-065-0029 9150-00-935-1017 9150-00-190-0904 9150-00-190-0905 9150-00-190-0907	Grease, Automotive and Artillery GAA (MI L-G-10924C) 2%-oz tube 14hz cartridge 1-lb can 5-lb can 35-lb can	oz oz lb lb lb
2	C	9150-00-234-5197 9150-00-261-7891	Oil, Lubricating, Exposed Gear, CW (VV-L-751C) 5-b can 35-lb pail	lb lb
3	O	9150-00-261-7904 9150-00-257-5440 9150-00-257-5443	Oil, Lubricating, Gear Subzero, GOS (MI L-L-10324) qt can 5-gal drum 55-gal drum	qt gal gal
		9150-00-265-9425 9150-00-265-9428 9150-00-265-9429 9150-00-265-9430	Oil, Lubricating, OE/DHO 10 (MI L-L-2104C) 1 qt can 5-gal drum 55-gal drum, 16 gage 55-gal drum, 18 gage	qt gal gal gal
5	C	9150-00-265-9433 9150-00-265-9435 9150-00-265-9436 9150-00-265-9437	Oil, Lubricating, OE/HDO 30 1 -qt can 5-gal drum 55-gal drum, 16 gage 55-gal drum, 18 gage	qt gal gal gal

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) UNIT OF MEAS.
6	C	9150-00-265-9440 9150-00-265-9442 9150-00-265-9441	Oil, Lubricating, OE/HDO 50 (MI L-L-2104C) 1 t can 5-gal drum 55-gal drum, 16 gage	qt gal gal
7	0		Oil, Lubricating, OHT, (MI L-H-6083)	
8	0		Oil, Lubricating, OES, ICE, Subzero, (MI L-L-10295)	
9	0		Lubricant, Gear, Universal, (MI L-L-2106)	
10	0		Oil, Hydraulic (HO) (MIL-H46001B)	
11	0		Lubricant, Gear, Universal (GO) (MIL-L-2105C) 140	
12	C	9140-00-286-5286 9140-00-286-5287 9140-00-286-5288 9140-00-286-5289	Oil, Fuel, Diesel DF-1 Winter (VV-F-800) Bulk 5gal can 55-gal drum, 16 gage 55gal drum, 18 gage	gal gal gal gal
13	C	9140-00-286-5294 9140-00-286-5295 914000-286-5296 9140-00-286-5297	Oil, Fuel, Diesel DF-2 Regular (VV-F-800) Bulk 5-gal can 55-gal drum, 16 gage 55-gal drum, 18 gage	gal gal gal gal

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) UNIT OF MEAS.
14	C	6850-00-64-5685 6850-00-281-1985	MISCELLANEOUS Solvent, Dry Cleaning, SD-2 (P-D-680) 1qt can 1-gal can	qt gal
15	C	6850-00-243-1992	Antifreeze, Permanent, Glycol, Inhibited (MI L-A-46153)	1 gal
16	0		Liquid Teflon	
17	0		Soap Solution	
18	0		Lubriplate	
19	0		Alcohol (for evaporator)	
20	0		Penetrating Oil	
21	0		No. 320 Emery Paper	
22	0		Lube Oil, Ice, Arctic, OEA (MIL-L-46167)	
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To be distributed in accordance with DA Form 12-25B, direct support and general support maintenance requirements for concrete-mobile mixer-body (M919).

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

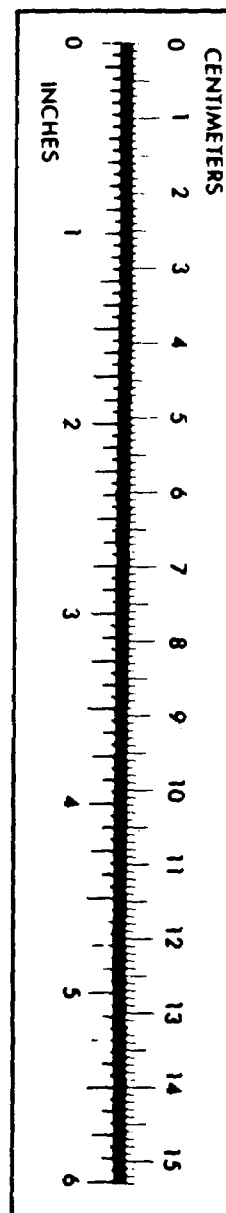
$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
 $9/5 ^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

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



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