IMT 1717/1725
CRANES

IOWA MOLD TOOLING CO., INC.

INSTRUCTIONS PARTS LISTS

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1-1. INTRODUCTION

This manual is provided to acquaint you with the operation of your IMT truck mounted, articulating, hydraulic crane and supply you with the information necessary for proper equipment maintenance.

Three means are used throughout this manual to gain the attention of operating and service personnel. They are NOTES, CAUTIONS, and WARNINGS and are defined as follows:

NOTES

A NOTE is used to either convey additional information or to provide further emphasis for a previous point.

CAUTIONS

A CAUTION is used when there is the strong possibility of damage to the equipment or premature equipment failure.

WARNINGS

A WARNING is used when there is the potential for personal injury or a fatality.

Treat this equipment with respect and service it regularly. These two things can add up to a safer working environment and a longer equipment life.

1-2. ORDERING INFORMATION

When placing orders or requesting assistance, refer to the information below.

TO BE COMPLETED BY DEALER

Chassis Information:

Make:_____ Model:_____ Serial No.:_____

Transmission Model:_____ Serial No.:_____

PTO Ratio:_____ Make:_____

Crane and Pump Information:

Serial No.:_____ Model:_____ Selector Valve:_____

Pump Make:_____ Model:_____ Serial No.:_____

Accessories and Options:_____

_____

SECTION 2. OPERATION

2-1. CRANE IDENTIFICATION

Every IMT crane has an identification placard (Figure B-1) attached to its mast assembly. When ordering parts, communicating warranty information or referring to the unit in correspondence always include the assigned serial and model numbers. All inquiries should be addressed to Iowa Mold Tooling Co., Inc.; Garner, Iowa; 50438 or telephone (515) 923-3711.

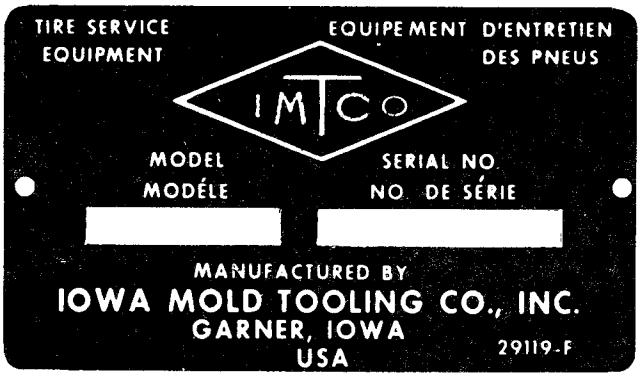


Figure B-1. Identification Placard

2-2. CONTROL INFORMATION

2-2-1. Vehicle Controls

POWER TAKE-OFF MANUAL SHIFT CONTROL - Transmission mounted manual PTO's are usually installed with the shifting control knob located near the steering column. To **engage** the PTO, the knob is pulled **out**. To **disengage** the PTO, the knob is **pushed** in.

NOTE

In order to shift the PTO in either direction, the truck must be in neutral and the clutch pedal depressed.

CAUTION

The power take-off should always be disengaged before moving the vehicle.

AUTOMATIC SPEED CONTROL - an electric switch control that regulates vehicle engine speed for proper operating pressure requirement (refer to Paragraph 2-3-2-1).

HAND BRAKE - securely set the vehicle hand brake prior to unit operation.

2-2-2. Unit Controls

The unit is equipped with dual controls located on the base. Control operation is as follows:

1. MAIN BOOM - control lever located at the operator's station. **Pull** to **raise** or **push** to **lower**.
2. SECONDARY BOOM - control levers located at the operator's station. **Pull** to **raise** or **push** to **lower**.
3. ROTATION - control lever located at the operator's station. Incorporates a flow control valve which may be adjusted to increase or decrease the speed of rotation. **Push** for **counterclockwise** rotation or **pull** for **clockwise**.
4. EXTENSION BOOM - control lever located at the operator's station. **Push** to **extend** or **pull** to **retract**.
5. LEFT/RIGHT STABILIZER - control lever located on the crane base. **Push** to **lower** or **pull** to **raise**.
6. HAND THROTTLE - rotate knob counterclockwise to increase engine speed and clockwise or push to lower engine speed to idle.

CAUTION

Prior to operating the crane, stabilizers must be extended and lowered to firm footing. The main boom must be raised to allow adequate clearance before any other crane function may be initiated.

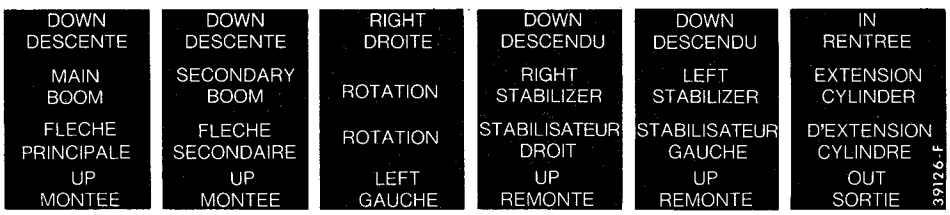


Figure B-2. Control Placard

2-3. OPERATION

The crane is relatively simple to operate. However, prior to any work at job sites, the operator should thoroughly familiarize himself with the control operations, load limitations, prescribed operating procedures and safety precautions applicable to the unit. In addition, simulated job operations should be performed by the operator before putting the unit to a work task. The operator's understanding of emergency measure execution is essential; he should be prepared to take remedial action at any time.

2-3-1. Safety Factors

Three important factors in the safe operation of the unit are: a competent operator, mechanical soundness of the unit and absolute assurance that the unit is not loaded to exceed its maximum specified capacities. The safety precautions contained in this section should be read carefully and observed at all times during unit operation.

2-3-1-1. Load Limits

The crane is designed to give satisfactory service if operated within maximum allowable load specifications stated on the unit's capacity placard. The placard should be studied before lifting operations are carried out. Overloading may result in potentially serious safety hazards and shortened service life of the unit—exceeding the stated load limit for a given radius can cause tipping or structural failure.

Warranty of the unit will be void on any part of the unit subjected to misuse due to overloading, abuse or lack of maintenance. No warranty—verbal, written or implied—other than the official published IMT new machinery and equipment warranty will be valid with this unit.

2-3-1-2. Equipment Inspection

Before operating the unit, always perform the safety checks outlined below. These procedures are vital to the detection of equipment malfunction and damage which may be potential safety hazards.

STRUCTURAL SOUNDNESS - Inspect the unit for damaged members and loose nuts or bolts.

HYDRAULIC OIL SUPPLY - Check oil level in hydraulic oil reservoir and fill if required.

LEAKAGE - Examine all visible hydraulic hoses for frays and blisters. Look for signs of lubricating or hydraulic oil leakage.

CONTROLS - Make a short test for proper operation.

REPAIRS - Before putting the unit into service, correct all observed defects and malfunctions.

This equipment check should be performed before every operation and as a periodic preventive maintenance check.

2-3-1-3. Work Station Positioning

The best location for the working unit is on firm, level and dry pavement or ground close to the job. Overhead obstructions on the work side of the unit should be avoided as much as possible.

Wheel chocks should be used when parking unit on a slope. If parking on a curbed roadway, turn front wheels toward curb when parked with the front of truck downgrade, and away from curb with rear of truck downgrade. At the work site, the vehicle should be parked with the grade. When cross-grade parking is necessary, restricted operation will be required to compensate for increased tipping risk.

2-3-1-4. Power Line Proximity

Except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the crane have been erected to prevent physical contact with the lines, cranes shall be operated proximate to, under, over, by, or near power lines only in accordance with the following:

1. For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

2. For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or use twice the length of the insulator but never less than 10 feet.

3. In transit with no load and boom lowered, the clearance shall be a minimum of four feet.

4. It is recommended that a person be designated to observe the clearance and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.

In addition to the above mentioned safety measures, the operator must take into account sag, sway, and deflection factors in allowing for proper clearances.

2-3-2. Beginning Operation

Listed below are important points to remember while operating this unit:

1. ALWAYS depress the clutch pedal before engaging or disengaging the PTO.
2. NEVER swing a load so it passes over people.
3. ALWAYS stabilize the unit before attempting any lifting operation.
4. NEVER rotate the crane too fast with a load.
5. ALWAYS cycle the controls a few times to purge the air trapped in the cylinders and hoses before attempting a lifting operation.
6. NEVER operate the crane too close to power lines.
7. ALWAYS have a clear view of the work area.
8. NEVER operate the crane prior to checking for proper operation of the rotational brake.
9. ALWAYS repair any defects before using the unit.

10. NEVER exceed the rated lifting capacity of the unit.

11. ALWAYS disengage the PTO before moving unit.

12. NEVER Leave the operator's station with a load suspended in the air.

Unit operation is accomplished as follows:

1. Choose a unit operating location with two factors considered: vehicle position should permit, if possible, total task performance without repositioning and the terrain should be firm, dry and level for proper stabilization throughout the operation.

2. Securely set the truck hand brake and set any auxiliary device, if supplied. Adjacent to curbing, turn front wheels to further secure the vehicle. Wheel chocks should be firmly placed.

3. Shift truck into neutral, keep clutch depressed if transmission is mechanical and pull out the power take-off knob to engage the system.

4. Accelerate engine to proper operating speed using the hand throttle control.

5. Allow the system to idle at operating speed with all controls at neutral until the hydraulic system reaches operating temperature. Hydraulic reservoir should be warm to the touch.

6. Outriggers should be extended until firm ground contact is made. Do not hold controls open to point of jacking action. When stabilizing the unit on soft ground, bearing pads should be used to retard sinking and provide blocks to ensure firm contact when operating on sloping terrain.

WARNING

DO NOT operate crane until the vehicle is firmly stabilized.

7. Several precautions should be taken in actuating the hydraulic controls on the unit. Before actual work begins, put each control through one complete test cycle. To prevent shock loading, no control operation should begin with a full open position. Sudden stops and starts stresses equipment unduly and can shorten equipment life. When maximum speed is desired, controls should be actuated slowly and acceleration achieved smoothly.

2-3-2-1. Engine Speed Regulation

The speed of the hydraulic pump dictates the speed of the operating unit. In order for the unit to function at speeds stated in the specifications, the pump must operate at optimum speed.

To determine the engine speed required for operation, the pump requirement - optimum - is divided by engine to PTO ratio of the truck. When the engine to PTO ratio is not known, this information may be obtained from a local IMT dealer or distributor or Iowa Mold Tooling Co., Inc. direct. To find the ratio, it will be necessary to know the PTO and transmission model numbers as well as the make, model and year of the truck. When this information is obtained, compute the proper engine speed as shown in the following examples:

Efficient-operation of the unit is dependent upon proper pump speed. When operation is too slow always check the pump speed when diagnosing the cause. An electric tachometer with accurate calibration may be used to check engine speed.

TABLE B-1. ENGINE SPEED REGULATION

Pump Model	Recommended PTO Ratio	Engine Speed
73051291 P31-1½" gear	100-110%	$\frac{\text{Optimum Speed (1400 RPM)}}{100\%} = 1400 \text{ RPM}$
73051027 P31-1¾" gear	80-90%	$\frac{\text{Optimum Speed (1200 RPM)}}{80\%} = 1500 \text{ RPM}$
73051246 P31-2" gear	60-75%	$\frac{\text{Optimum Speed (1050 RPM)}}{60\%} = 1750 \text{ RPM}$

Any pump can be used that will supply 16 GPM optimum flow at 2350 PSI.

The formula used to determine the proper engine speed is as follows:

$$\frac{\text{Optimum Pump Speed (RPM)}}{\text{Engine to PTO Ratio (\%)}} = \text{Required Engine Speed (RPM)}$$

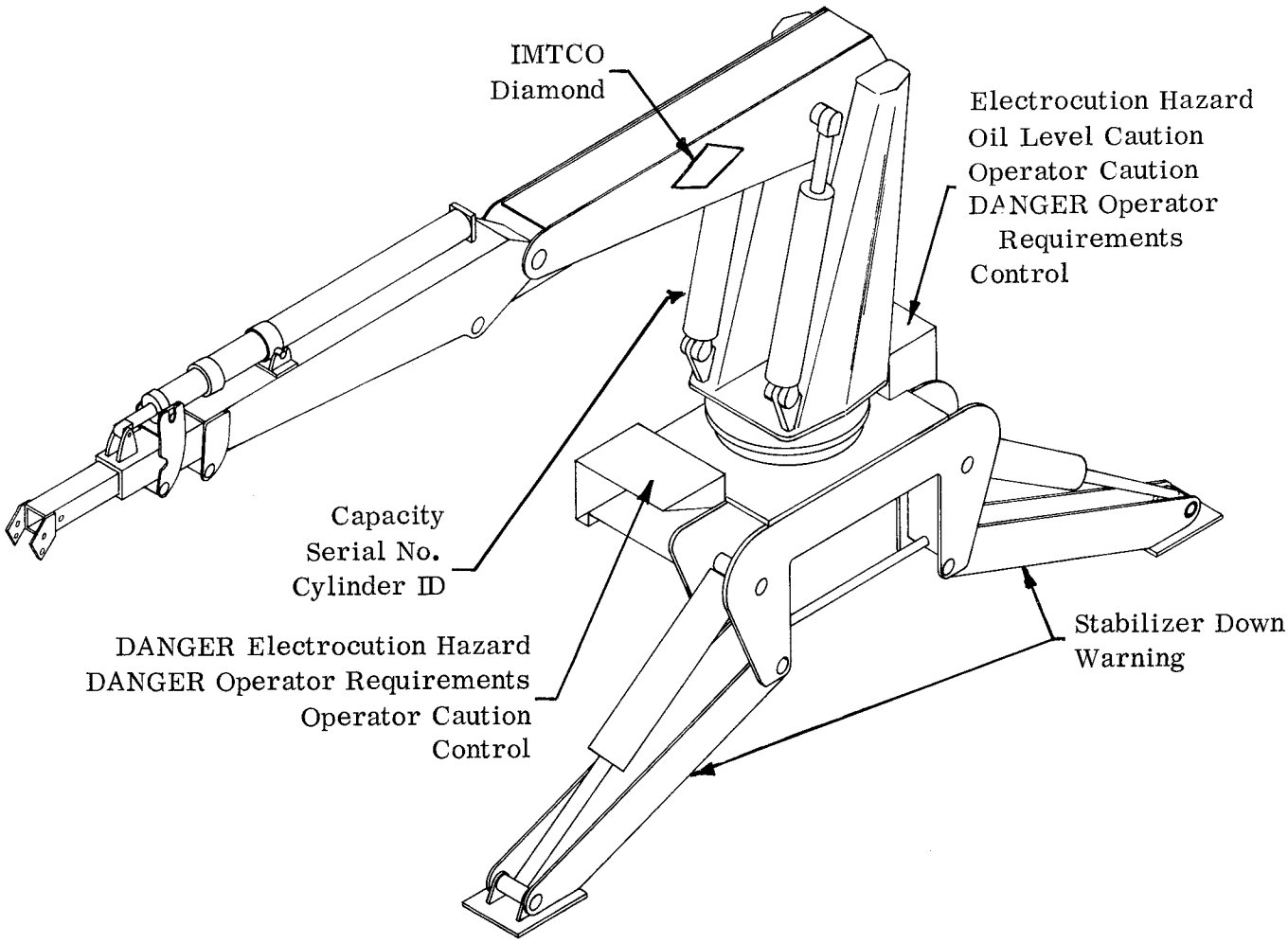


Figure B-3. Placard Placement

2-3-2-2. Load Lifting

Capacity placards are located on the main boom near the operator stations. The structural capacities and permissible radii of operation stated on these placards should be carefully studied and strictly adhered to during equipment operation. All indicated placard loads include weight added by optional equipment - rotors, winches, etc. - and consideration must be given to this weight in load assessment.

NOTE

Capacity placards are intentionally located near the operator to assure ready reference in determining when a load can or cannot be handled.

Load limit information given on the capacity chart is formulated on 85% of tipping.

It is implicit in all load ratings that the following conditions have been met:

1. The unit has been correctly installed on a factory approved truck.
2. A satisfactory stability test has been performed.
3. The intended operation is to be carried out on level solid footing with proper outrigger placement.

It should be understood that each stated capacity is directly related to the radius of a given operation. The radius is measured from center of rotation to load line on the horizontal plane.

2-3-2-3. Stability Ratings

Capacity ratings project unit stability to no more than 85% of tipping provided:

1. The vehicle on which the unit is mounted complies with factory specifications.
2. Factory installation instructions are followed when unit is mounted on vehicle.
3. Counter weight sufficient to supplement vehicle weight has been installed and meets factory requirements.
4. Tire inflation pressures meet requirements stipulated in "TIRE INFLATION TABLE" in the appendix.
5. The outriggers are in use, making proper contact with firm, level footing.

The LOAD CAPACITY CHART ratings depend upon compliance with the curb weights coupled with truck size. Adherence to minimum chassis specifications and/or requirements is necessary to maintain safe stabilization.

WARNING

The minimum curb weights shown do not ensure the unit will be stable. Actual stability ratings will be obtained from the initial start-up and testing procedures.

2-3-2-4. Conventional Cab

Stability ratings for the crane mounted on a conventional chassis with a 220" (558.8 cm) wheel base and a 156" (396.2 cm) cab-to-axle dimension are shown below. These specifications will provide complete 355° rotation stability based upon 85% tipping factor without capacity chart restrictions. Required axle weights are listed in Table B-2.

TABLE B-2. AXLE WEIGHTS

Front Axle	(4,990 kgs) 11,000#
Rear Axle	(7,439 kgs) 16,400#
Total	(12,429 kgs) 27,400#

2-3-3. Operation Shutdown

Proper shutdown procedure is as follows:

1. Stow the crane in folded position.
2. Retract the outriggers.
3. Disengage throttle control.
4. Disengage PTO prior to travel.

2-3-4. Swing Brake

A brake is provided at the base of the crane swing motor. Its function is to provide positive stopping action of the crane swing when the control lever is released. When the SWING lever is actuated, both the brake and swing motor are pressurized which engages the motor and disengages the brake. When the lever is released, internal spring pressure engages the brake.

The counter balance sequence valve on the hoses to the swing motor provides back pressure which causes the smooth functioning of the brake and eliminates brake "grabbing".

CAUTION

Do not tamper with the settings of the counter balance sequence valve. Closing the valve may result in damaging the swing motor seals. Opening the valve too much reduces back pressure and causes the brake to "grab".

WARNING

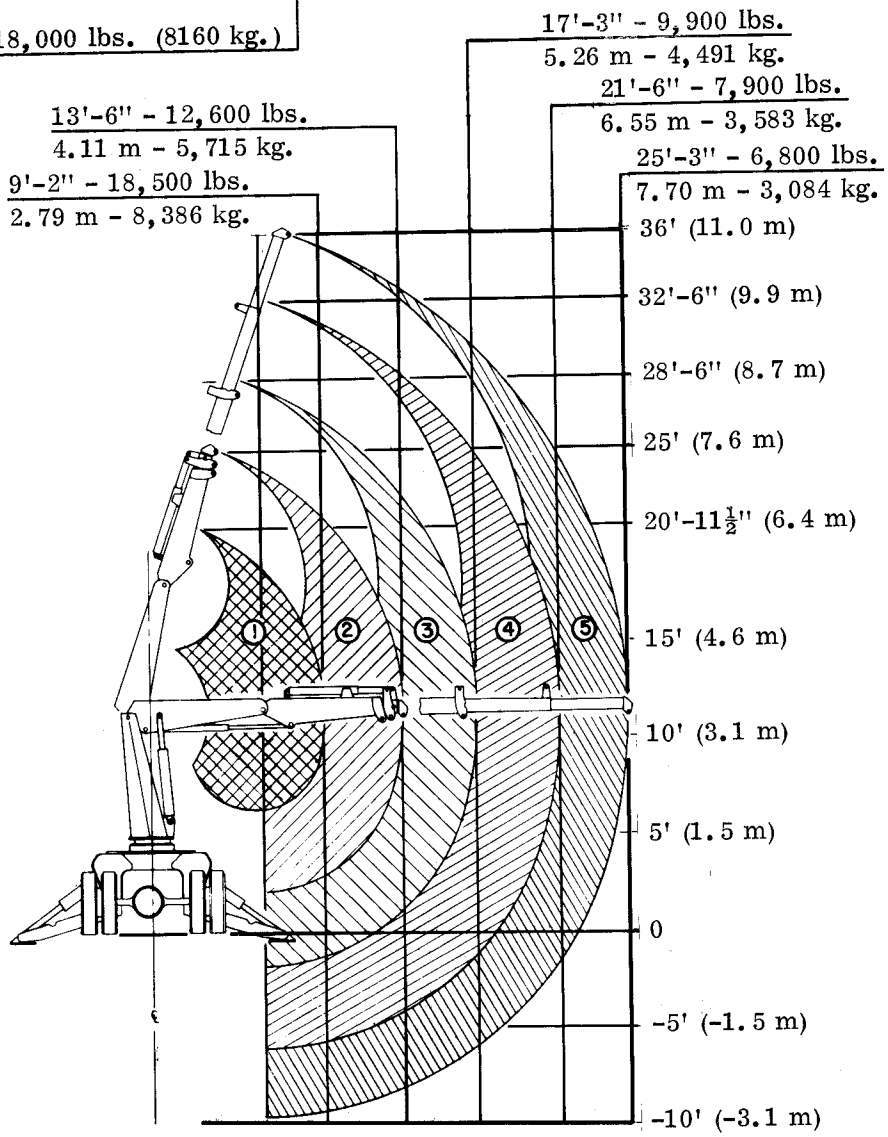
Always check the brake for proper functioning prior to attempting to swing a load. Brake failure will allow the swing to continue unchecked.

CAUTION

Fast stops will severely shorten the service life of the brake.

Winch lifting capacity is limited to loads when boom tip is at horizontal reaches shown. For loads over 9000 lbs. (4080 kg.) use 2-part line.

MAXIMUM WINCH CAPACITY - 18,000 lbs. (8160 kg.)



Live Load at Boom Position

When operating the unit, the load will be limited to those shown within their geometric ranges		
Range	Description	Capacity
①	Secondary Hook	18,500 lbs. (8386 kg.)
②	Secondary Boom	12,600 lbs. (5715 kg.)
③	1st Extension Out	9,900 lbs. (4491 kg.)
④	2nd Extension Out	7,900 lbs. (3583 kg.)
⑤	3rd Extension Out	6,800 lbs. (3084 kg.)

Figure B-4. Load Capacity Chart

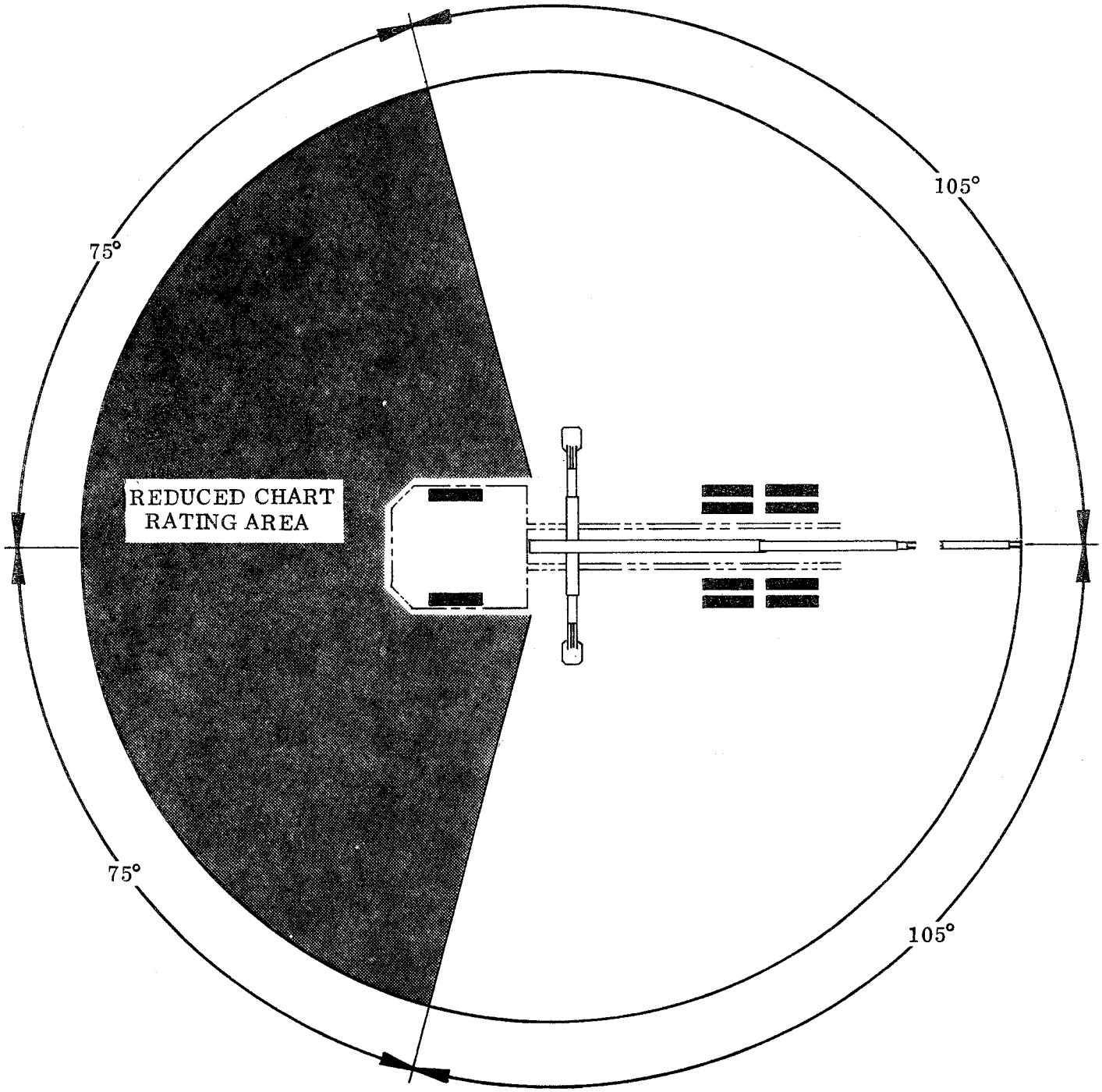


Figure B-5. Stability Chart

SECTION 3. SPECIFICATIONS

3-1. GENERAL

REACH (From Centerline Rotation)	(7.70 m)	25' 3"
EXTENSION	(114.3 cm/129.5 cm/114.3 cm)	45"/51"/45"
LIFTING HEIGHT	(11.0 m)	36'-0"
WEIGHT OF CRANE	(3450 kg)	7600 Lbs.
OUTRIGGER SPAN	(4.5 m)	15'-0"
OPTIMUM PUMP CAPACITY	(60.6 liters/min)	16 U.S. Gal./Min.
OIL RESERVOIR CAPACITY	(94.6 liters)	25 U.S. Gal.
MOUNTING SPACE REQUIRED	(98.96 cm)	* 39"
STORAGE HEIGHT	(3.53 m)	* 11'-7"

* (Based on 41" (104.1 cm) truck frame height & allowing 9"(22.8 cm) clearance behind trucks cab.)

3-2. PERFORMANCE CHARACTERISTICS

ROTATION (355°) (6.19 rad.)	30 Sec.
MAIN BOOM ELEVATION (-47° to +70°) (-.82 Rad. to +1.22 Rad.)	32 Sec.
SECONDARY BOOM ELEVATION (125°) (2.18 Rad.)	24 Sec.
EXTENSION (45" - 51") (114.3 - 127.5 cm)	14 & 7 Sec.
OUTRIGGER EXTENSION	16 Sec.

3-3. LIFTING CAPACITY (From Centerline Rotation)

(2.79 m)	9' - 2"	8386 kg	18,500 lbs.
(4.11 m)	13' - 6"	5715 kg	12,600 lbs.
(5.26 m)	17' - 3"	4491 kg	9,900 lbs.
(6.55 m)	21' - 6"*	3583 kg	7,900 lbs.
(7.70 m)	25' - 3"*	3084 kg	6,800 lbs.

* 1725 Crane only

3-4. HYDRAULIC SYSTEM

Open centered, full pressure system that requires 16 GPM (60.6 liters/min) optimum oil flow @ 2350 psi (165.2 kg/sq. cm.). Six spool stack type control valve with dual operational handles located at both sides for convenient operation. System includes hydraulic oil reservoir, suction line filter, pump, control valve, return line filter.

3-5. CYLINDER HOLDING VALVES

The holding sides of all cylinders are equipped with integral mounted counter balance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure. The counter balance serves several functions. First, it is a holding valve. Secondly, it is so constructed that it will control the lowering function and allow that motion to be feathered while under load. Finally, if a hose breaks the only oil loss will be that in the hose only.

3-6. POWER SOURCE

Integral-Mounted hydraulic pump and PTO application. Other standard power sources may be utilized.

3-7. CYLINDERS

MAIN (15.2 cm)	6"	Bore	(87.6 cm)	34½" Stroke
SECONDARY (17.8 cm)	7"	Bore	(95.6 cm)	37 5/8" Stroke
EXTENSION (10.2 & 6.4 cm)	5"& 3"	Bore	(114.3 & 129.5 cm)	45" & 51" Stroke
OUTRIGGERS (16.5 cm)	6½"	Bore	(74.3 cm)	29¼" Stroke

The boom extension cylinder is a double-acting dual extension cylinder with strokes of 45" (114.3 cm) and 51" (129.5 cm).

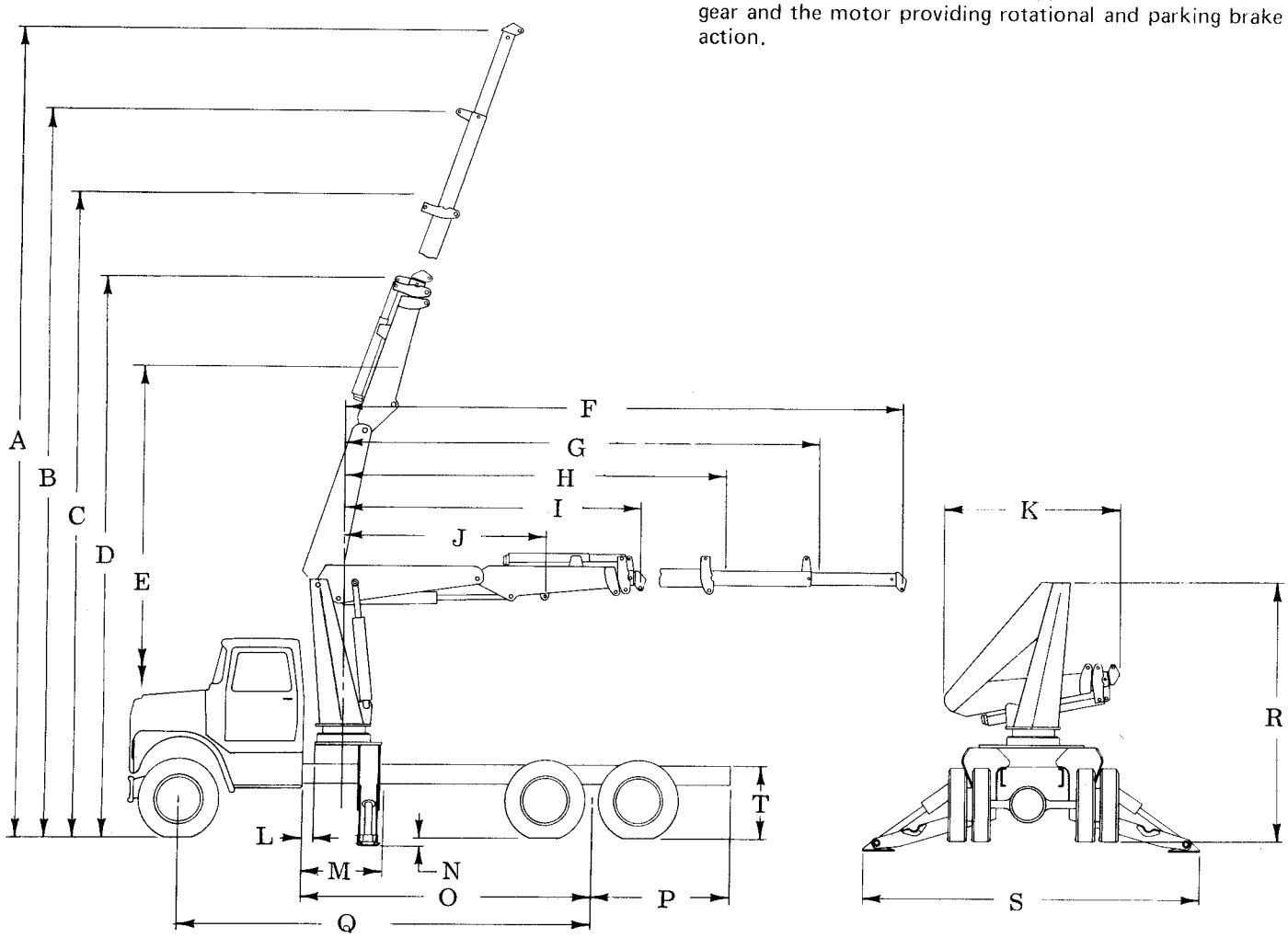
3-8. MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	CONVENTIONAL CAB	
Wheel Base	(558.8 cm)	220"
Cab to Axle	(396.2 cm)	156"
Frame Section Modulus	(426 cc)	26 cu. in.
R B M	(30224 kg-m)	2,622,512 in.lbs.
Front Axle	(5440 kg)	12,000 lbs.
Rear Axle	(15442 kg)	34,000 lbs.
Transmission		5 Speed

In addition to these specifications, heavy duty electrical and cooling systems and dual, tandem rear wheels are required. It is recommended that the vehicle be equipped with an electrical engine tachometer, auxiliary brake lock, and power steering.

3-9. ROTATION SYSTEM

Turntable bearing powered with a high torque hydraulic motor through a ring-and-pinion type spur gear train. A fail-safe spring-loaded brake is supplied between the drive gear and the motor providing rotational and parking brake action.



LOCATION	DIMENSION	LOCATION	DIMENSION
A	36'-0" (11.0 m)	K	94" (238.8 cm)
B	32'-6" (9.91 m)	L	9" (22.8 cm)
C	28'-6" (8.69 m)	M	46" (116.8 cm)
D	25'-0" (7.62 m)	N	4"-6" (10.2 to 15.2 cm)
E	20'-1½" (6.39 m)	O	156" C.T. (396.2 cm)
F	25'-3" (7.70 m)	P	75" (190.5 cm)
G	21'-6" (6.55 m)	Q	222" W.B. (563.9 cm)
H	17'-3" (5.26 m)	R	11'-7" (3.53 m)
I	13'-6" (4.11 m)	S	15'-0" (4.57 m)
J	9'-2" (2.79 m)	T	41" (104.1 cm)

Figure C-1. Geometric Configuration

SECTION 4. OPTIONAL EQUIPMENT

4-1. INTRODUCTION

Table D-1 lists the standard components and options available with the 1725/1717 cranes. It lists the assembly number and page for the parts drawing.

TABLE D-1. STANDARD AND OPTIONAL EQUIPMENT

Description	Part Number	Page
Standard Equipment		
Base and Outrigger	41702140	6-2
Mast	41702053	6-5
Main Boom	41702054	6-6
Installation Kit	41702054	6-18
Manual Hydraulic Controls	91702058	6-16
1717 Secondary Boom	41702432	6-11
1717 Extension Boom	41702433	6-14
1725 Secondary Boom	41702055	6-9
1725 Extension Boom	41702056	6-12
Optional Equipment		
Auxiliary Outrigger	91702478	6-19
Tirehand 12 Mounting Kit (1717 Crane only)	91702643	6-20
Tirehand 12 (1717 Crane only)	24900012	6-21

4-2. HAND THROTTLE

A vernier type hand throttle control can be mounted so that an operator will have access from control valve side of the crane. Counterclockwise adjustment of the control knob slowly increases truck engine speed to the desired level. Deactivation is accomplished by pushing the button located at the knob's center.

4-3. BEARING REMOVAL TOOL

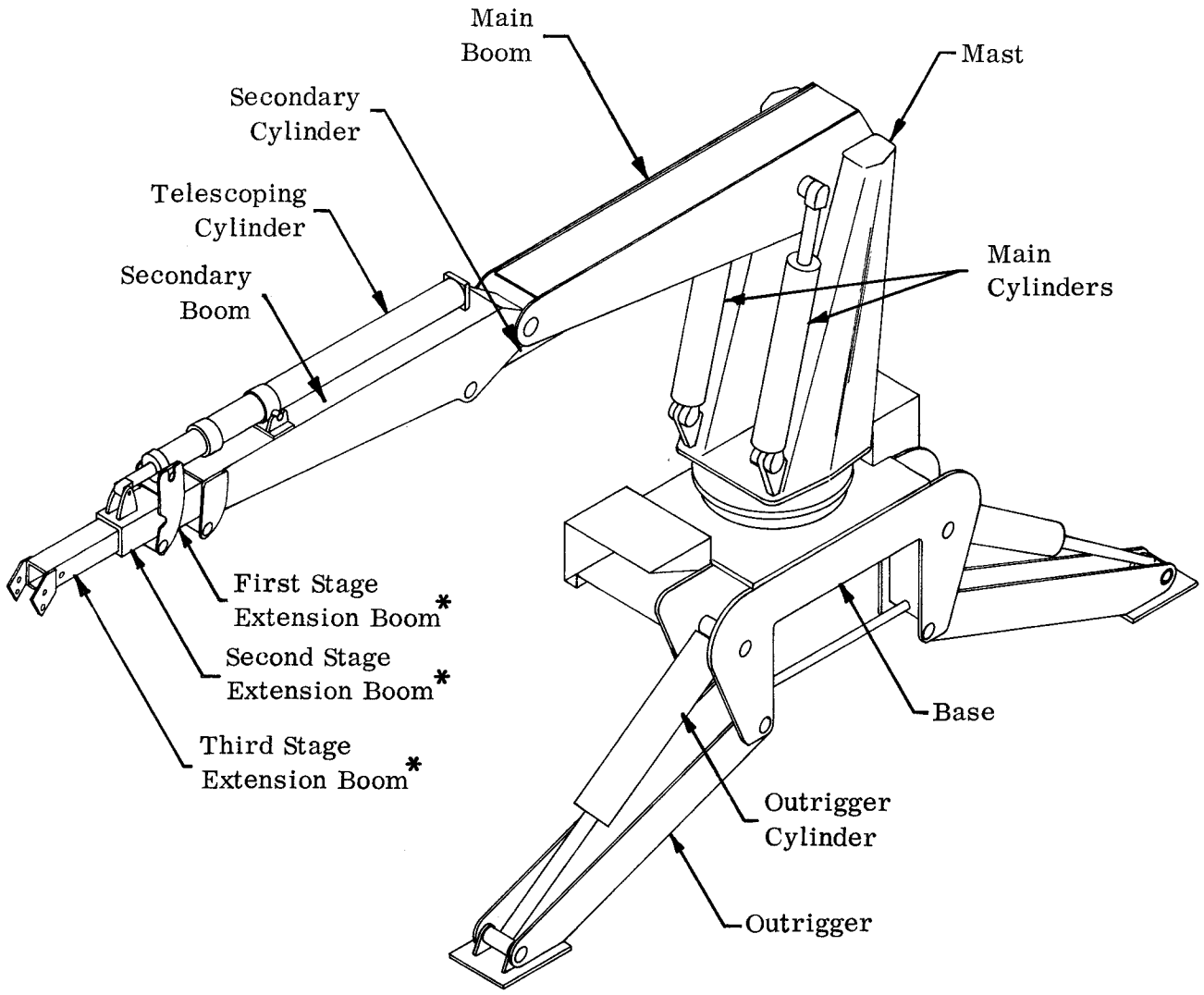
This tool aids in the removal of the pinion and drive gear bearings. It's use is demonstrated in paragraph 7-2-2.

4-4. AUXILIARY OUTRIGGERS

Power down and out outriggers are shown in the PARTS section. These may be field or factory installed.

4-5. TIREHAND 12

Available only with the IMT 1717 crane. Handles tires up to and including 33.00 x 51.



* IMT 1725 only. IMT 1717 uses a single stage extension.

Figure D-1. Crane Group

SECTION 5. PERIODIC MAINTENANCE

5-1. GENERAL

Proper maintenance on a regular schedule is essential to keep your unit operating at peak efficiency. This section outlines required maintenance information and service intervals. Personnel responsible for care of the unit should familiarize themselves with the frequency and type of lubrication and maintenance operations to be performed.

5-2. LUBRICATION

Maintaining the proper lubrication schedule will vary with climatic conditions and use frequency. The lubrication table (Table E-1) is intended to serve as a schedule for a normal work load and moderate weather variance. Periods of heavy use would shorten service intervals.

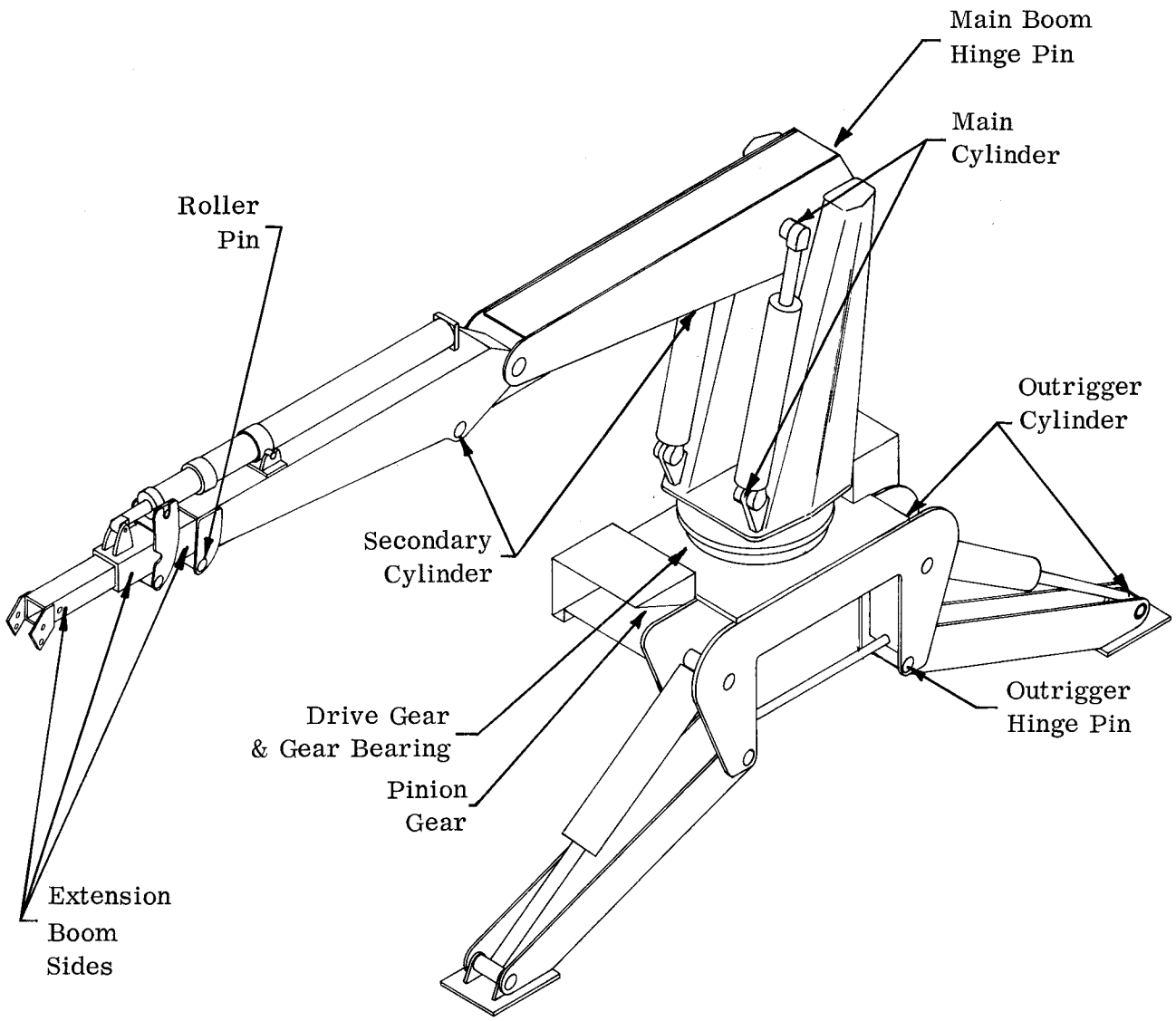


Figure E-1. Lubrication Points

TABLE E-1. LUBRICATION INFORMATION

APPLICATION POINT	LUBRICATION PRODUCT	APPLICATION MEANS	INTERVAL
TURN TABLE BEARING	Shell Alvania 2EP or Shell Retinax "A" or Equivalent	Hand Grease Gun or Pneumatic Pressure Gun	Monthly
MAIN CYLINDER			
MAIN & SECONDARY BOOM PINS			
EXTENSION BOOM ROLLERS			
SECONDARY CYLINDER			
ROTATION PINION & MOTOR DRIVE GEARS			
POWER TAKE-OFF OR TRANSMISSION	EP 90 Gear Oil	Fill to Check Plug	Monthly

5-3. HYDRAULIC SYSTEM

OIL SELECTION: Minimum viscosity specifications for hydraulic oil to be used in the crane are given in table E-2. Any major oil company can supply products which meet these requirements.

Oils selected by user for this class of equipment, in addition to meeting viscosity requirements, should have the following additives:

1. Antifoam inhibitors
2. Antioxidant inhibitors
3. Rust resistant additives
4. Antiwear additives

OIL SPECIFICATIONS: Table E-2 provides oil specifications for a full range of operating temperatures encountered in the temperate zones. Arctic conditions present special requirements which are not within the scope of the table and must be given special consideration and individual analysis. Consult your oil supplier for the proper fluid for working under these severe conditions. In addition, electric hydraulic oil reservoir heaters are available to improve operation at extremely low temperatures.

5-3-1. Hydraulic Oil Deterioration

Contamination of the hydraulic oil by solvents, water, dust or other abrasives will result in a premature breakdown of the oil's antifoam, lubrication, anti-rust and viscosity properties. Prolonged exposure to water or high operating temperatures (above 180°F) will cause an increase in the oxidation rate, producing varnish forming materials and sludge in the oil.

Periodically a sample of the hydraulic oil in the system should be drawn off and its condition checked for breakdown. To check oil quality:

1. Place oil sample in a clean glass.
2. Smell oil to detect a burnt or rancid odor.
3. Examine the oil for a cloudy or dark color.
4. Allow the sample to stand for several minutes and inspect it for water which will settle to the bottom. Water can result from a leak in the system or condensation due to temperature extremes.

When any of these conditions is observed, the system should be purged and filled with new oil.

In addition, the oil should be changed in the reservoir and complete system after 800 hours of operation (or every six months which ever occurs first) and after pump or other major hydraulic component failure.

5-3-2. Hydraulic System Purging

Purging the system requires a new oil supply sufficient to completely fill the reservoir, lines, cylinders, etc., and an extra quantity for loss during this procedure. To minimize oil loss during this process, operate the truck engine at low speed.

During purging, new oil is supplied to the pump suction line via the reservoir and old oil is drained from the reservoir return line.

Two operators are required during the purging operation: one to operate the controls and the other to regulate pump flow (engine speed).

TABLE E-2. HYDRAULIC OIL SPECIFICATIONS				
Ambient temperature range	0-90	Below 32	32-90	Above 90
Min. Pour Point, ° F	-30	-25	+10	+10
Max. Viscosity, SSU @ 0° F	4000	4000	-	-
Min. Viscosity, SSU @ 100° F	140-195	100-130	150-200	200-315
Min. Viscosity, SSU @ 210° F	48	41 43	43	47
Min. Viscosity Index	139	90	90	90

CAUTION

DO NOT allow reservoir to drop below 1/3 capacity during purging.

1. Locate the unit in an area which provides solid, level footing and space to accomodate the full range of the crane.

2. Extend the outriggers out and down to full stroke. Move the crane to maximum extended, horizontal position on either side. Kill the engine.

3. Disengage the PTO, drain the hydraulic oil reservoir, remove the suction line filter cartridges and drain all hoses. Disconnect the pressure hoses from the pump, drain and reassemble. Replace the suction line filter cartridges (refer to Paragraph 5-3-3-1) and reassemble.

NOTE

The method of waste oil disposal is left to the discretion of the service personnel.

4. Disconnect the return hose at the return filter inlet and direct the flow into a sump or waste container. Close the return line ball valve and plug the drain port on the reservoir. Refill the reservoir with new oil.

NOTE

Be thoroughly familiar with the following steps and be prepared to perform them in an uninterrupted sequence or stop the engine at the end of each step. If this is not done, excessive oil waste will occur.

5. Start the truck engine and engage the PTO. Rotate the crane 90° of travel horizontally, retract the extension boom, elevate the main boom to full height, lower the secondary boom to the lowest position.

6. Rotate crane toward rear center of vehicle, raise outriggers and kill engine.

7. All components of the system are now purged. Replace return line filter cartridge and reinstall return line on reservoir.

8. Check oil level and add oil to "full" mark.

5-3-3. Hydraulic Components

5-3-3-1. Filter Replacement

This unit's hydraulic system contains two filters: a 25-micron suction line filter (Figure E-2) to remove large contaminating particles and a 25-micron return line filter (Figure E-3) for removal of system particles. To avoid residue accumulation in the reservoir and to protect hydraulic components—valves, pump, cylinders, etc.—these filters must be serviced on a regular basis.

The filters should be replaced after the first 50 hours of new-unit operation and approximately every 200 hours thereafter. In addition to this service schedule, the suction line filters are equipped with a danger coded vacuum gauge. This gauge should be checked daily while operating the unit. If it reads 8 inches of mercury pull, the suction line filter cartridge must be replaced to be effective. When the suction line filter cartridges require changing, the return line filter cartridge should also be replaced.

To change filter cartridges:

1. Kill the engine.

2. Shut the gate valves and remove the filter cartridges.

3. Replace with new cartridges ensuring proper rubber seal seating and tighten as much as possible with both hands.

4. Open the gate valves and test the system for leaks.

CAUTION

Failure to open the shut-off valves may result in pump failure.

5-3-3-2. Counter Balance Holding Valves

There are two types of counter balance holding valves used on the crane: the large one (Figure E-4) is used on the main, secondary and 1725 extension cylinders and the small one (Figure E-5) is used on the outrigger and the 1717 extension cylinders.

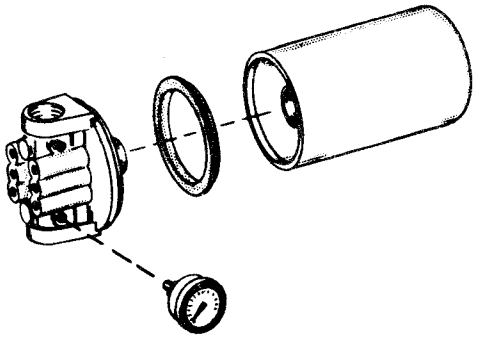


Figure E-2. Suction Line Filter

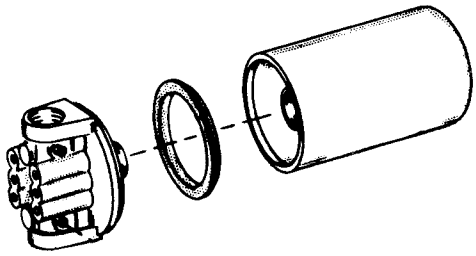


Figure E-3. Return Line Filter

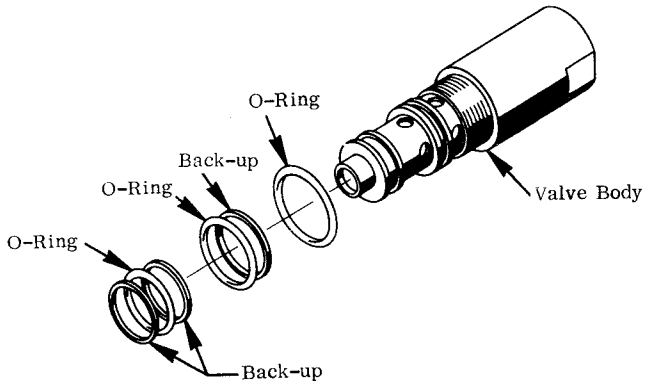


Figure E-4. Large Counter Balance Holding Valve

The valve serves as a holding valve which allows a feathered motion when lowered under load.

The counter balance holding valves can be checked for holding capabilities by:

1. Extend the cylinder and kill the engine. Check to see if the cylinder "creeps". If it "creeps", replace the valve.

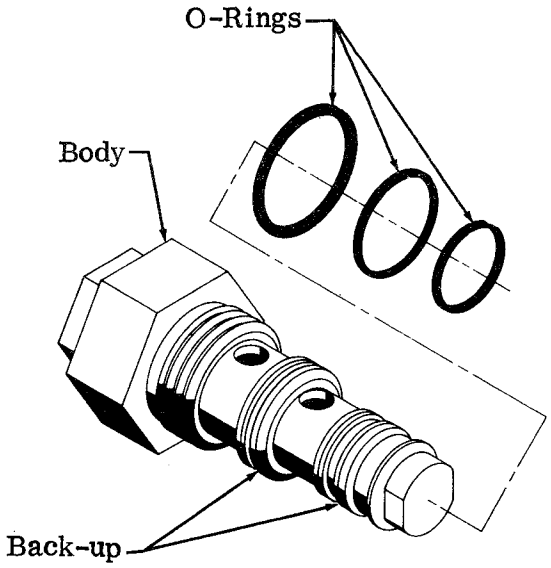
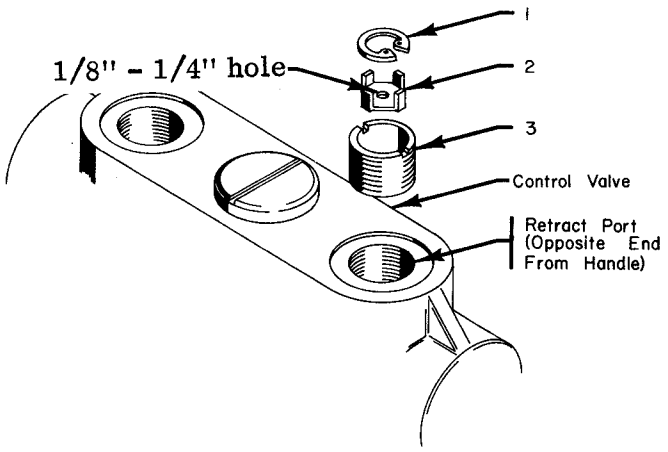


Figure E-5. Small Counter Balance Holding Valve

5-3-3-3. Valve Port Orifices

A valve port orifice (Figure E-6) may be installed on the retract side of the control valve. The purpose of the orifice is to slow retraction of the cylinder. Back pressure is maintained to prevent erratic holding valve action. Orifice size is usually 1/8" to 1/4" and is used for main, secondary and extension cylinders.



Item No.	Part No.	Description
1.	72066019	RING, retaining
2.	73141591	PLATE, orifice
3.	73141590	BODY, orifice

Figure E-6. Valve Port Orifice

5-3-3-4. Relief Valve Adjustment

The relief valve is used to prevent the user from placing too much strain on the hydraulic components. If the function pressure is less than 2350-2400 PSI, the following procedure is recommended:

1. Engage the PTO and set the engine speed at a rate required to provide 16 gallons per minute (refer to Paragraph 2-3-2-1).

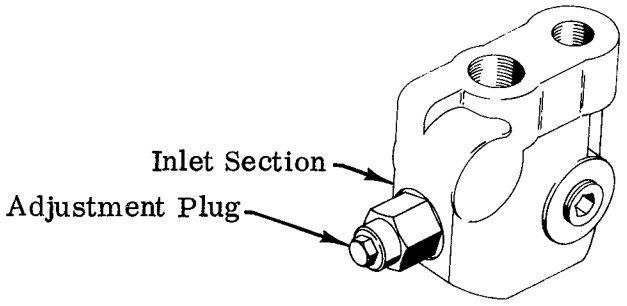


Figure E-7. Relief Valve Adjustment

2. Activate one of the controls until the cylinder is either fully extended or retracted.

CAUTION

Do not fully extend the outrigger. If you choose to use the outrigger for testing purposes, it must be fully retracted.

3. Check the reading on the pressure gauge located near the valve bank. The control valve must be held open while taking the reading.

4. If pressure is too low, the relief valve is adjusted by removing the adjustment plug and turning the adjustment screw—clockwise to increase and counterclockwise to decrease.

5. Start the engine and recheck the relief valve setting. If it hasn't changed, the malfunction indicates pump slippage.

6. If pressure has increased, continue adjusting until the pressure setting is correct.

5-3-3-5. Power Beyond Plug

Hydraulic power for an auxiliary function can be obtained by insertion of a power beyond adapter (Figure E-8). Install the adapter making certain that the two gasket seals are in place or function pressure will be lost. Install a high pressure hose to the auxiliary function control valve. Order part number 73054385.

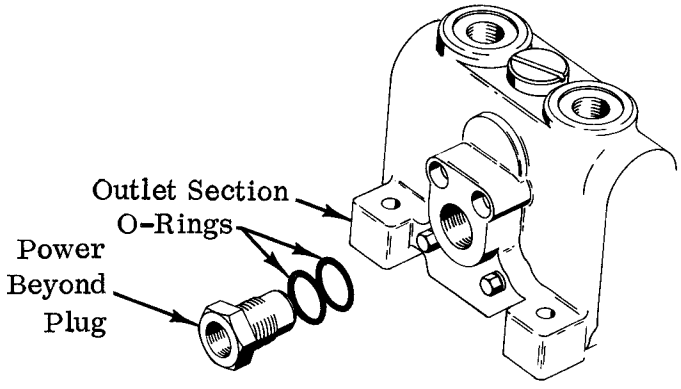


Figure E-8. Power Beyond Plug

5-4. PREVENTIVE MAINTENANCE

The following inspection check list is designed to assist you in keeping the vehicle and crane unit in safe operating condition. Items which apply to the unit should be checked before unit operation and the carrying vehicle should be inspected before moving the equipment.

CAUTION

Failure to comply with these instructions may result in excessive wear and premature failure of the unit, resulting in expensive repairs and down-time.

TABLE E-3. INSPECTION CHECK LIST

ITEM	DESCRIPTION	FREQUENCY		
		Daily	Weekly	Monthly
VEHICLE CHECK LIST				
Battery	Inspect for correct fluid level. In hot, dry weather increase inspection frequency.		■	■
Engine Oil	Check for proper level. Make sure oil level on dip stick is above "add" mark.	■		
Brakes (Service and Parking)	Operate both systems to assure positive, efficient functioning.	■		
Radiator	Inspect coolant level. Check for antifreeze protection in cold weather.	■		
Safety Equipment Warning Signals and Lights	Inspect all devices and lights for proper operation.	■		
Suspension	Check for broken or weak springs.	■		
Tires and Wheels	Inspect tires for bruises, cuts and proper inflation. Check for loose wheel stud nuts, bent wheels and mud lumps or stones between dual wheels.	■		
UNIT CHECK LIST				
Walk Around Inspection	Visually inspect unit on all sides for hydraulic leaks, loose parts and obvious damage to external structural members.	■		
Cylinders	Check securing pins on cylinders and booms for proper installation. Check for proper installation of pins securing outrigger cylinders.			■
Hydraulic Hoses and Fittings	Inspect hose surfaces and metal end coupling junctions for oil leakage. Check outer hose coverings for blistering, excessive wear or flattening.	■		
Hydraulic Reservoir	With all cylinders retracted, check fluid level in reservoir.	■		
Mounting Bolts	Inspect and check torque. Refer to the Torque Data Table in the Appendix for the torque values for a particular grade and size of bolt.			■
Rotation System	Check for excessive back lash (play) in horizontal rotation stops. Normal variation at the mast location is not to exceed 1/8 - 3/16 inch. Check gear mesh and bolt torque of turntable bearing		■	
Oil Leaks	Inspect all valves and cylinders for signs of leakage.			■

TABLE E-4. INSPECTION CHECK LIST (cont.)				
UNIT CHECK LIST (cont.)				
ITEM	DESCRIPTION	FREQUENCY		
		Daily	Weekly	Monthly
Power Take-off	Check for sufficient transmission lubrication. Check security of mounting bolts, leakage and correct alignment.		■	
Structural Damage	Inspect all structural members for broken welds or fatigue cracks. Check booms for structural defects such as bends, weld cracks or dents.			■
Holding Valve	Conduct a holding test with loaded boom to assure proper operation of holding valve.		■	

5-4-1. Regular Inspection

Every three months or more often when equipment is subjected to heavy use, the following inspections should be performed in addition to the preceding routine Inspection Check List.

5-4-1-1. Main and Secondary Booms

1. Check structural defect evidenced in weld cracks, dents or bends.
2. Check boom rollers for wear.
3. Check main and secondary boom cylinder pins for proper installation and worn pivot pin bushings.

5-4-1-2. Mainframe

1. Check control valve and all other fittings for oil leaks and tightness.
2. Check all roll pins and lock rings on main pin assemblies for proper installation.
3. Check torque on all unit mounting bolts to range of 740 ft. lbs.
4. Check for loose bolts, fatigue cracks or corroded structural members.

5-4-1-3. Mast and Rotation System

1. Check mast housing for cracks.
2. Check for proper rotation function by making several start-stop operations. Maximum allowable free-play at mast front should be 1/8" to 3/16".
3. Check for proper gear mesh in turntable bearing. Check motor and gear mounting bolts for tightness.

5-4-1-4. Hydraulic System

1. Cylinders
   - A. Check rods for damage such as scarring, nicks, dents and rust on out of service units.
   - B. Check for leaks at weld joints and rod seals. Check for drift indicating leakage around piston.
   - C. Check cylinder barrel for dents.
2. Hydraulic Pump
   - A. Check for leaks at shaft seal and section joints.
   - B. Check for drop in operating speed.
   - C. Check hydraulic oil for excessive heating.
   - D. Check bolts and fasteners for tightness and note unusual vibration or noise.
3. Hydraulic Control Valves
   - A. Check spools for sticking and failure to return to a neutral position.
   - B. Inspect for leaks at joints and spools.
   - C. Inspect valve housing for cracks.
   - D. Make sure relief valve reaches correct pressure setting.

5-4-1-5. Underdrive and Pump

1. Inspect for proper transmission gear to PTO engagement.
2. When supplied, inspect drive line U-joints for securing cap tightness and adequate lubrication.
3. Check mounting bolts on pump and PTO for tightness.

SECTION 6. PARTS

6-1. CYLINDER IDENTIFICATION

Every crane has a cylinder identification tag as shown in Figure F-1 attached to the mast assembly.

To ensure proper replacement part procurement, it is necessary to specify a complete number/letter sequence for any part request. Part numbers may be cross checked by comparing the stamped identification of cylinder base porting blocks with corresponding placard cylinder identification.

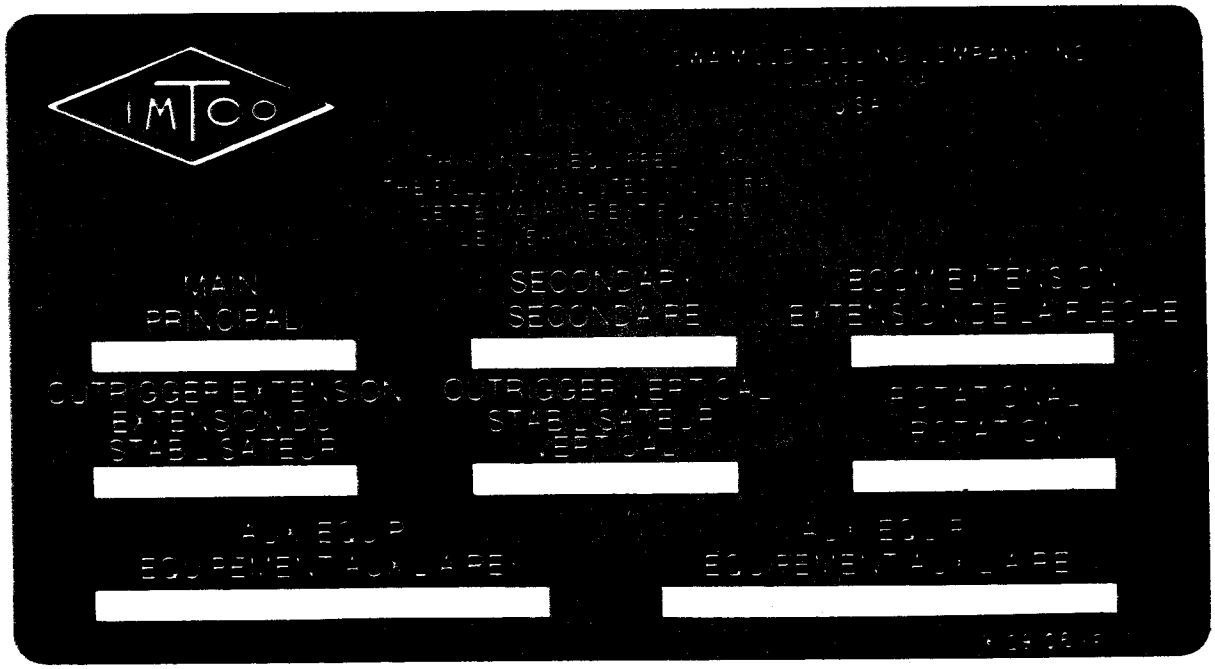


Figure F-1. Cylinder ID Placard

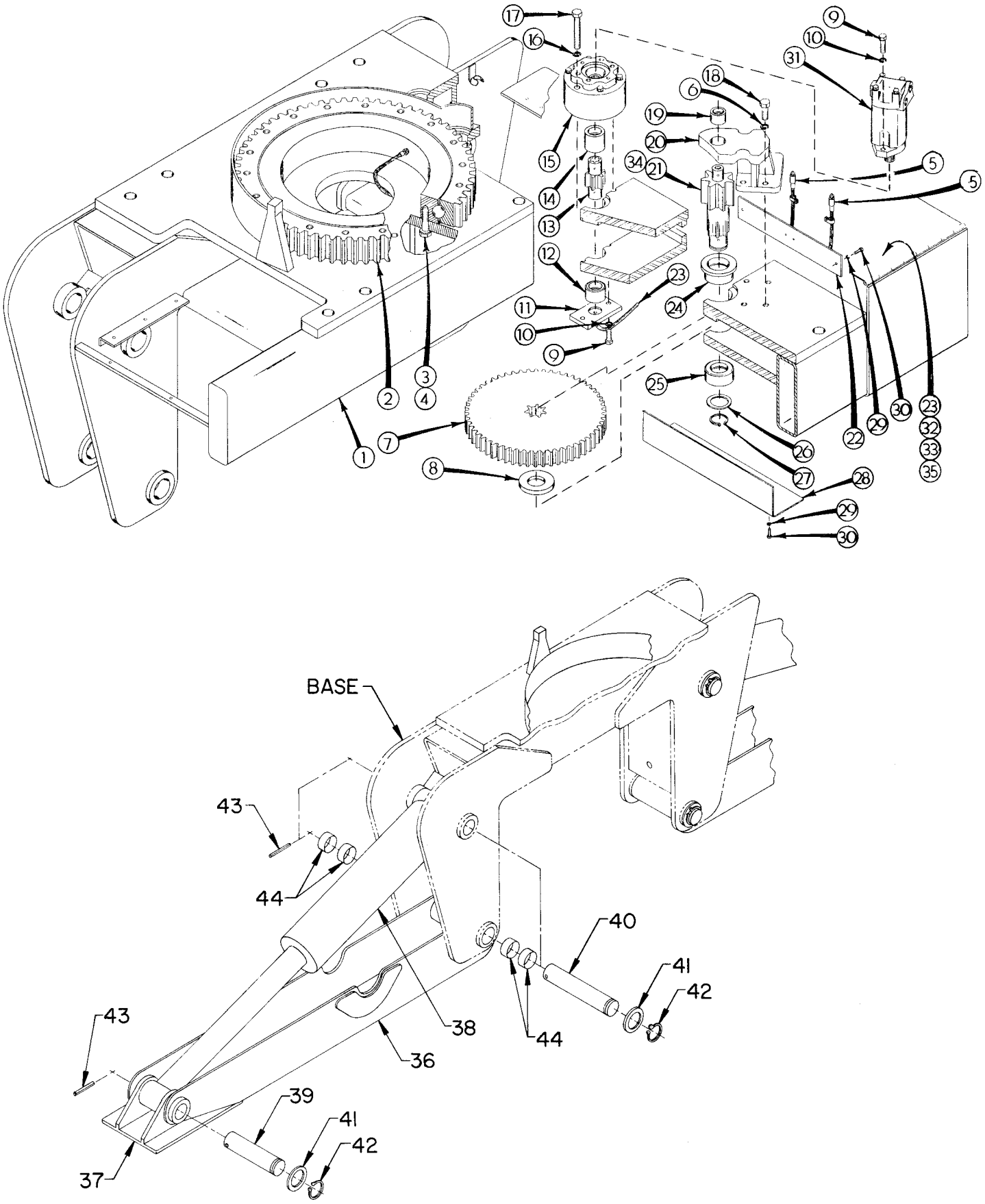


Figure F-2. Base and Outrigger (Part Number 41702140)

Item No.	Part No.	Description	Qty
1.	52702141	BASE	1
2.	71056188	GEAR-BEARING, turntable	1
3.	72060208	BOLT; 3/4-10 x 2-1/2" gr. 8	23
4.	72066428	LOCK WASHER; 3/4" Del Lock	23
5.	51701379	EXTENSION, grease fitting; 18"	2
6.	72063055	LOCK WASHER; 5/8"	4
7.	71056072	GEAR, intermediate	1
8.	60020123	WASHER, thrust	1
9.	72060093	BOLT; 1/2-13 x 1-1/2"	4
10.	72063053	LOCK WASHER; 1/2"	4
11.	60010844	PLATE, gear cover	1
12.	60020121	BUSHING, drive gear, bottom	1
13.	71056074	GEAR, drive	1
14.	60020120	BUSHING, drive gear, top	1
15.	71056088	BRAKE, hydraulic	1
16.	72063054	LOCKWASHER; 9/16"	2
17.	72601037	BOLT; 9/16-12 x 4-1/2" gr. 8	2
18.	72060179	BOLT; 5/8-11 x 1-3/4" gr. 8	4
19.	60020144	BUSHING, pinion gear support	1
20.	52702138	SUPPORT, pinion gear	1
21.	71056073	GEAR, pinion	1
22.	60103728	COVER, access hole	1
23.	71039129	PLACARD, stabilizer down	2
24.	60020124	BUSHING, pinion gear, top	1
25.	60020122	BUSHING, pinion gear, bottom	1
26.	72063039	BUSHING, machy.; pinion gear	1
27.	72066136	RING, retaining	1
28.	60103729	GUARD, gear	1
29.	72063049	LOCK WASHER; 1/4"	4
30.	72060006	BOLT; 1/4-20 x 1-1/2"	4
31.	73051223	MOTOR	1
32.	71391390	PLACARD, danger	2
33.	71391391	PLACARD, electrocution hazard	2
34.	72053508	ZERK; 1/8" npt	3
35.	71391392	PLACARD, caution operation	2
36.	52701024	LEG, outrigger	2
37.	52701412	PAD, outrigger	2
38.	3C263511	CYLINDER, outrigger	2
39.	60102226	PIN, outrigger pad	2
40.	60102227	PIN, outrigger frame	4
41.	72063040	BUSHING, machy	6
42.	72066103	RING, retaining	6
43.	72066317	PIN, spring	6
44.	7BF81225	BUSHING; 2-1/2"	8

NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

DIMENSIONS	
Bore	6-1/2"
Stroke	29-1/4"
Rod Diameter	3-1/2"
Pin Diameter	2-1/2"

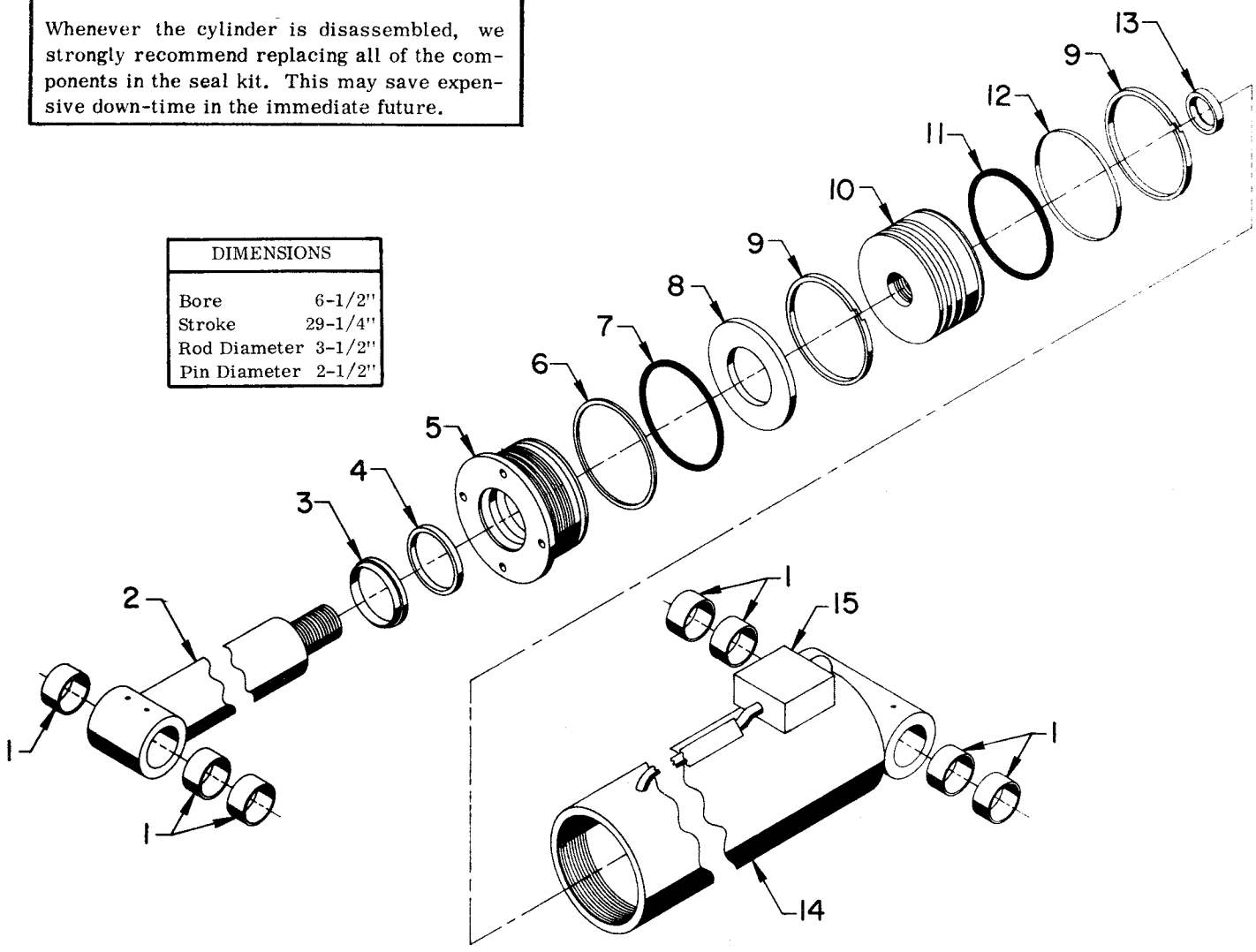


Figure F-3. Outrigger Cylinder (Part Number 3C263513)

Item No.	Part No.	Description	Qty
1.	7BF81225	BUSHING	7
2.	4G263510	ROD	1
3.	7R14P035	*WIPER, rod	1
4.	7R546035	*SEAL, rod	1
5.	6H065035	HEAD	1
6.	7Q10P361	*RING, back-up	1
7.	7Q072361	*O-RING	1
8.	6A025035	*WAFER LOCK	1
9.	7T66I065	*RING, piston	2
10.	6I065200	PISTON	1
11.	7Q072257	*O-RING	1
12.	7T66P065	*SEAL, piston	1
13.	7T61N200	*SEAL, lock ring	1
14.	4C263513	CASE, cylinder	1
15.	73054304	VALVE, safety holding	2
16.			

*Part of seal kit - Part Number 9C262832.

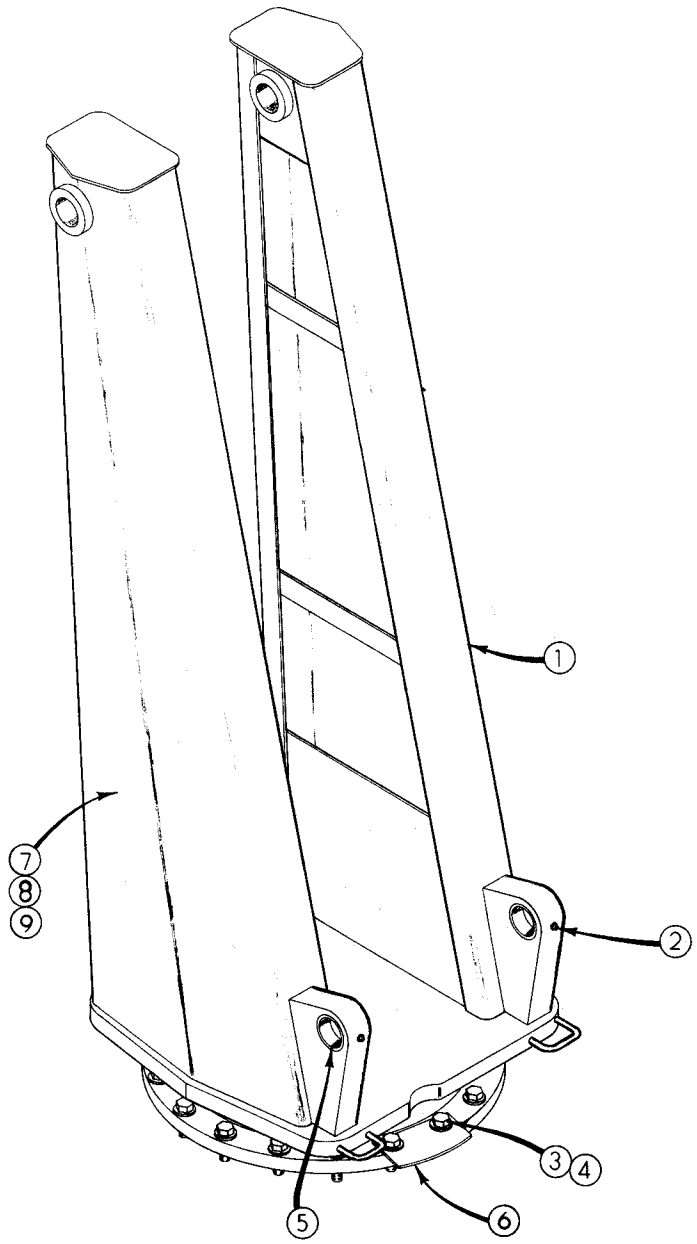


Figure F-4. Mast Assembly (Part Number 41702053)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702059	MAST	1	6.	60104246	COVER, pinion gear notch	1
2.	72053508	ZERK; 1/8" npt	2	7.	71029106	PLACARD, cylinder identification	1
3.	72060208	BOLT; 3/4-10 x 2-1/2" gr. 8	18	8.	71029115	PLACARD, serial number	1
4.	72066428	LOCK WASHER, Del Lock; 3/4"	18	9.	71029182	PLACARD, capacity	1
5.	7BF81225	BUSHING	4				

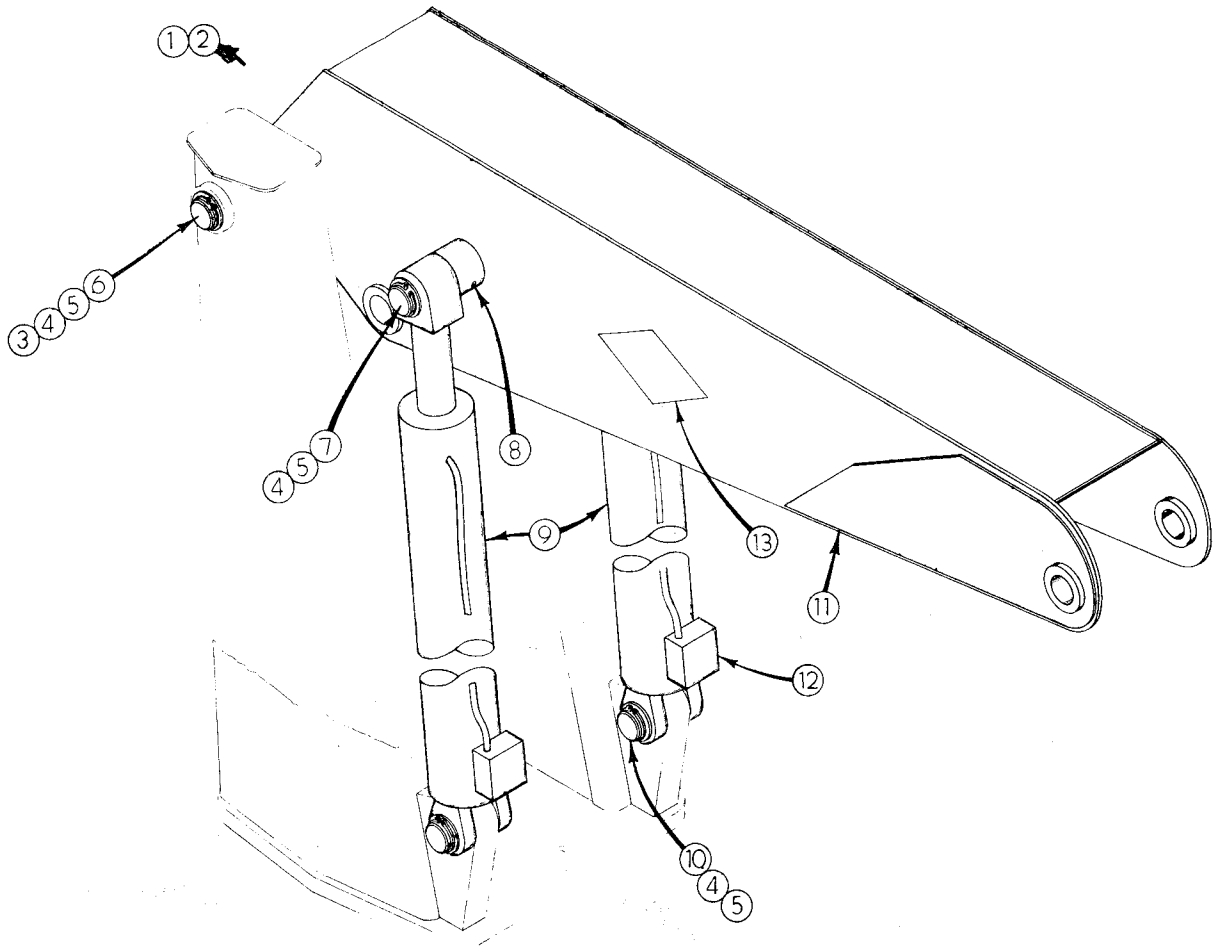


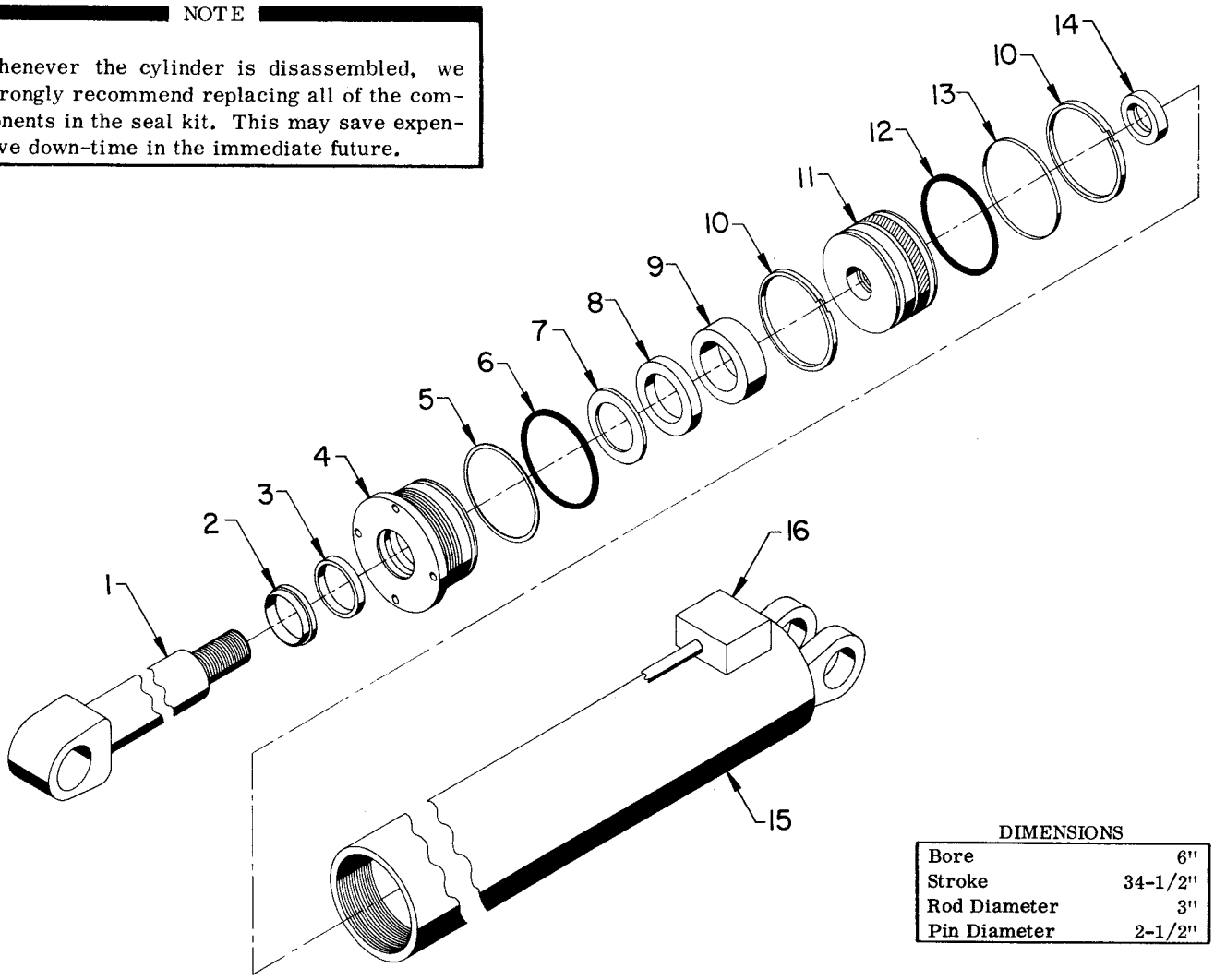
Figure F-5. Main Boom Assembly (Part Number 41702054)

Main Boom Assy (Part Number 41702054)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	72053508	ZERK; 1/8" npt	1	8.	72060572	SCREW, set; 5/16-18 x 3/4"	2
2.	7BF81225	BUSHING	8	9.	3C284710	CYLINDER, main	2
3.	60104022	PIN, main/mast	1	10.	60104020	PIN, main cylinder base end	2
4.	72063040	BUSHING, machy.; 2-1/2" x 10 ga.	7	11.	52702061	BOOM, main	1
5.	72066103	RING, retaining	7	12.	73054242	VALVE, counter balance	2
6.	72066317	PIN, spring; 1/2" x 4" lg.	1	13.	71039305	PLACARD; 12" IMTCO diamond	2
7.	60104021	PIN, main cylinder rod end	1				

NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

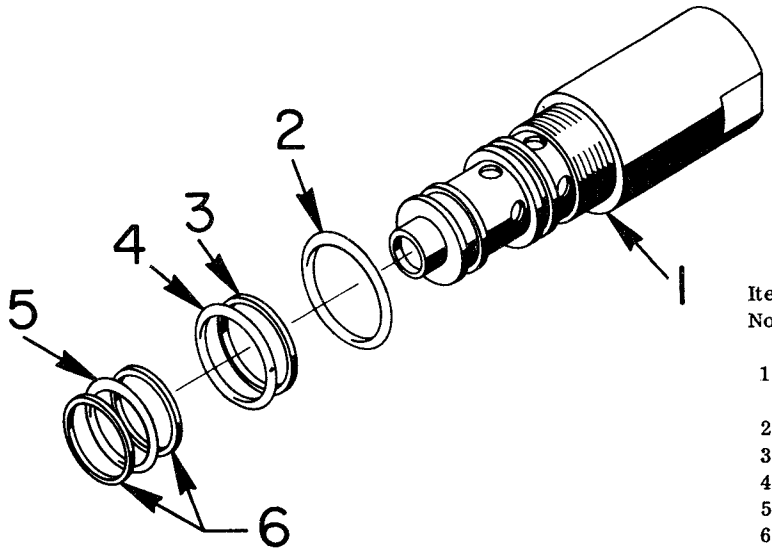


DIMENSIONS	
Bore	6"
Stroke	34-1/2"
Rod Diameter	3"
Pin Diameter	2-1/2"

Figure F-6. Main Cylinder (Part Number 3C284710)

Item No.	Part No.	Description	Qty
1.	4G284710	ROD	1
2.	7R14P030	*WIPER, rod	1
3.	7R546030	*SEAL, rod	1
4.	6H060030	HEAD	1
5.	7Q10P358	*BACK-UP	1
6.	7Q072358	*O-RING	1
7.	6A025030	*WAFER LOCK	1
8.	6C075030	TUBE, stop	1
9.	6C150030	TUBE, stop	1
10.	7T65I060	*RING, piston	2
11.	6I060200	PISTON	1
12.	7Q072253	*O-RING	1
13.	7T66P060	*SEAL, piston	1
14.	7T61N200	*SEAL, lock ring	1
15.	4C284710	CASE, cylinder	1
16.	73054242	VALVE, cartridge	1

*Part of seal kit (Part Number 9C242432)



Item No.	Part No.	Description	Qty
1.	--	BODY, valve (not a replacement part)	1
2.	7Q072215	O-RING	1
3.	7Q10P021	RING, back-up	1
4.	7Q072021	O-RING	1
5.	7Q072020	O-RING	1
6.	7Q10P020	RING, back-up	1

Figure F-7. Large Counter Balance Holding Valve (Part Number 73054242)

Item No.	Part No.	Description	Qty
1.	73054304	VALVE, complete (includes item 2 thru 6)	1
2.	7Q073912	O-RING	1
3.	7Q072018	O-RING	1
4.	7Q072016	O-RING	1
5.	7Q10P018	RING, back-up	1
6.	7Q10P016	RING, back-up	2

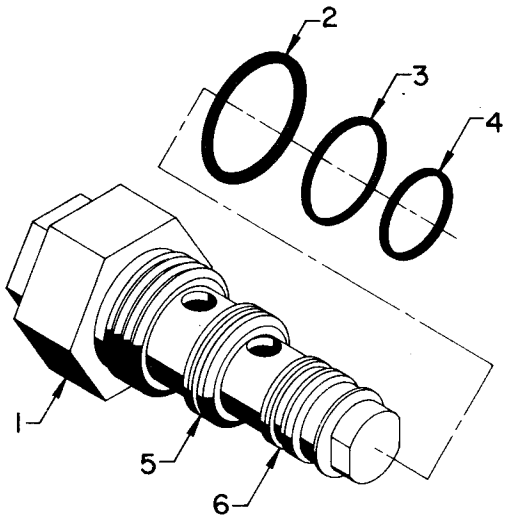


Figure F-8. Small Counter Balance Holding Valve (Part Number 73054304)

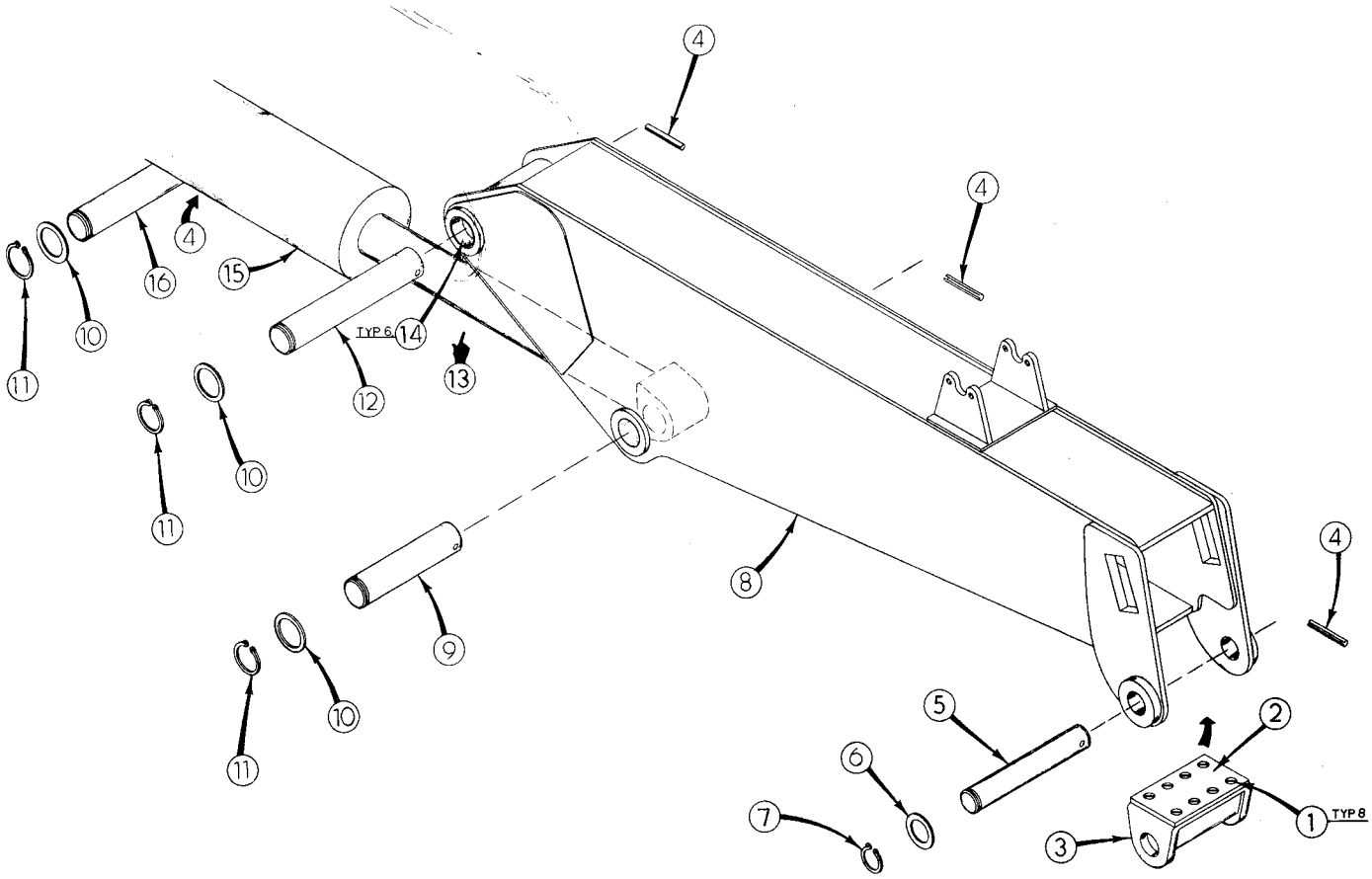
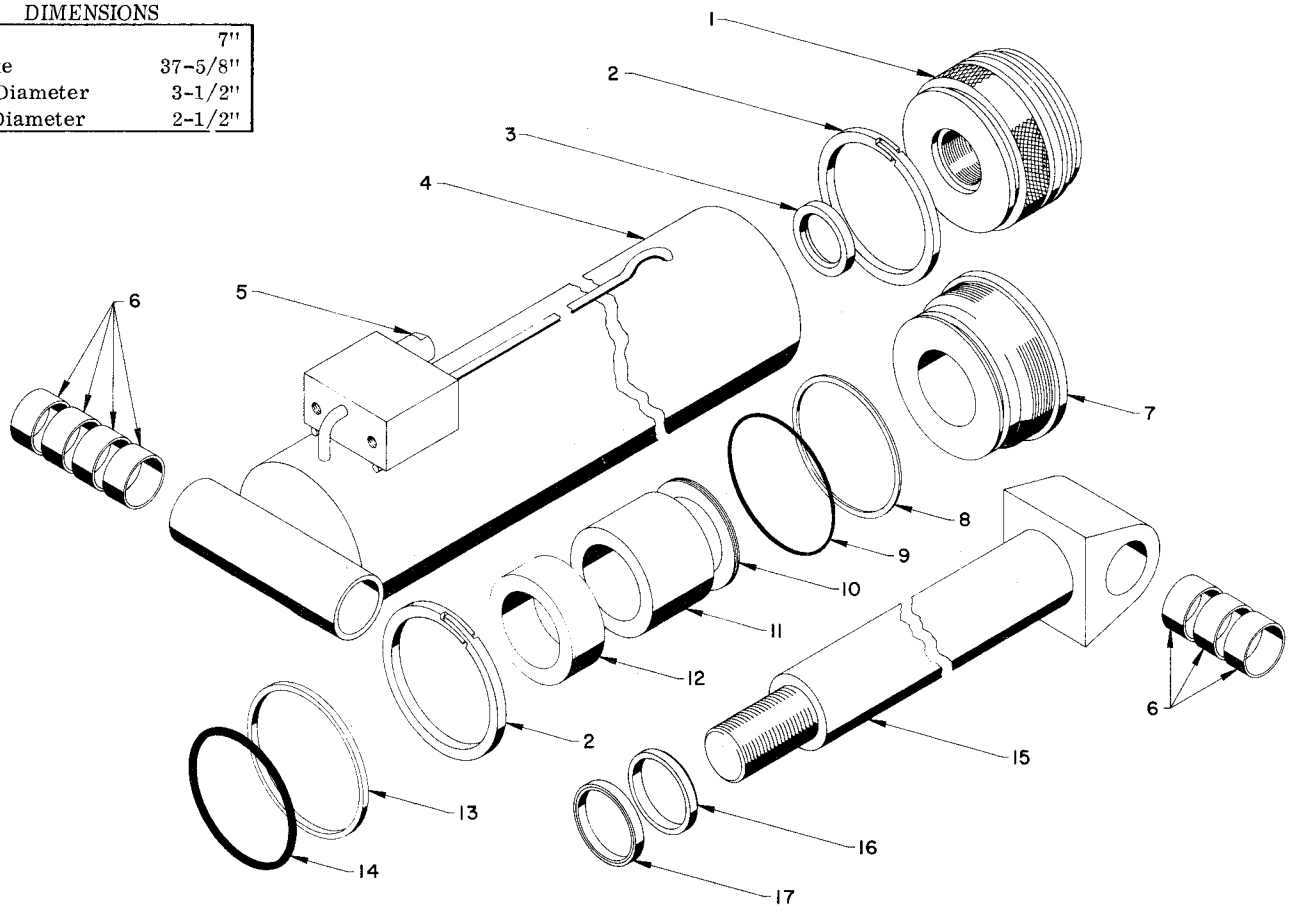


Figure F-9. 1725 Secondary Boom Assembly (Part Number 41702055)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	72060972	SCREW; 3/8-16 x 3/4" brass	8	9.	60104025	PIN	1
2.	60030022	PAD, trunnion	1	10.	72063040	BUSHING, machy; 2-1/2" x 10 ga.	3
3.	52702079	TRUNNION	1	11.	72066103	RING, retaining; 2-1/2"	3
4.	72066317	PIN, spring; 1/2" x 4" lg.	4	12.	60104023	PIN	1
5.	60104026	PIN, trunnion	1	13.	72053508	ZERK; 1/8" npt	1
6.	72063039	BUSHING, machy.; 2" x 10 ga.	1	14.	7BF81225	BUSHING	6
7.	72066136	RING, retaining; 2"	1	15.	3C291712	CYLINDER, secondary	1
8.	52702062	BOOM, secondary	1	16.	60104024	PIN, secondary cylinder base end	1

DIMENSIONS	
Bore	7"
Stroke	37-5/8"
Rod Diameter	3-1/2"
Pin Diameter	2-1/2"



NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

Figure F-10. Secondary Cylinder (Part Number 3C291712)

Item No.	Part No.	Description	Qty
1.	6J070218	PISTON	1
2.	7T65I070	*RING, piston	2
3.	7T61N218	*SEAL, lock ring	1
4.	4C291710	CASE, cylinder	1
5.	73054242	VALVE, cartridge	1
6.	7BF81225	BUSHING	1
7.	6H070035	HEAD	1
8.	7Q10P363	*BACK-UP, static	1
9.	7Q072363	*O-RING, static	1
10.	6A025035	*WAFER LOCK	1
11.	6C300035	TUBE, stop	1
12.	6C150035	TUBE, stop	1
13.	7T66P070	*SEAL, piston, dynamic	1
14.	7Q072259	*O-RING, companion	1
15.	4G291710	ROD	1
16.	7R14P035	*WIPER, rod	1
17.	7R546035	*SEAL, rod, dynamic	1

*Part of seal kit (Part Number 9C282835)

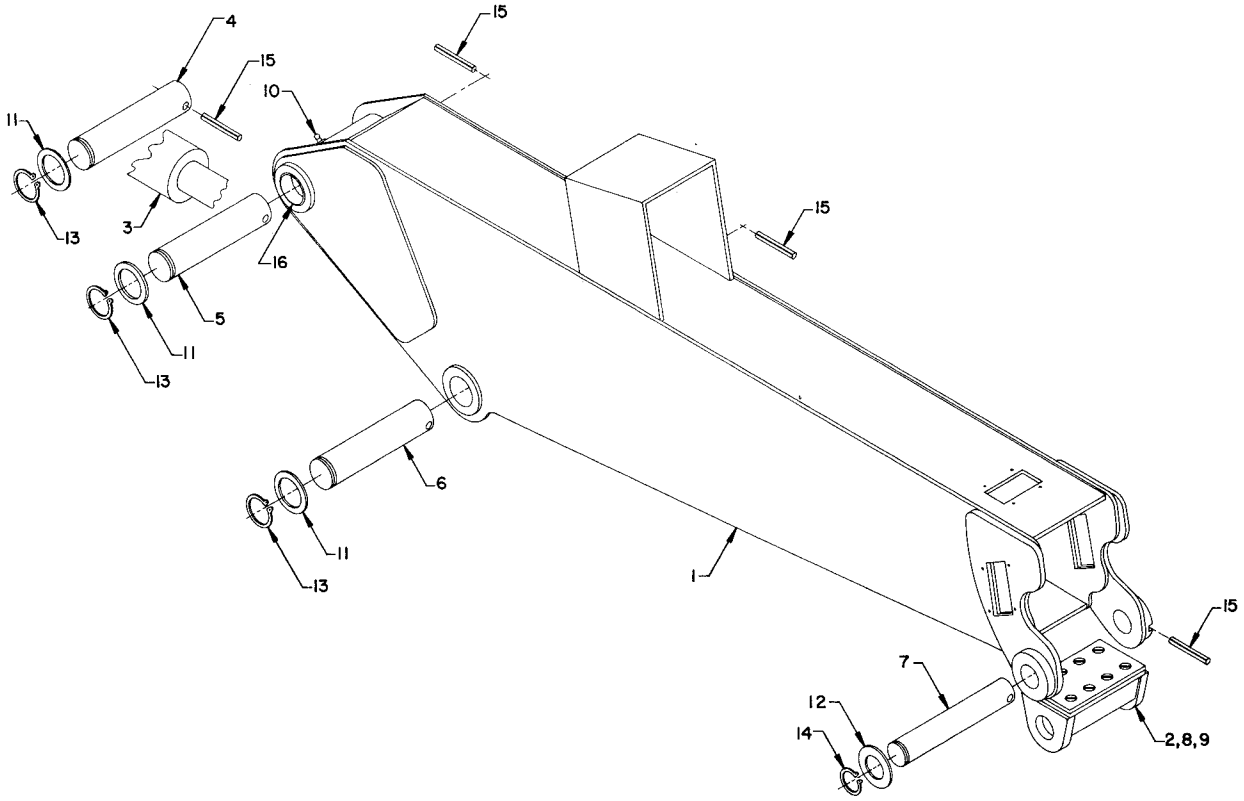


Figure F-11. 1717 Secondary Boom Assembly (Part Number 41702432)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702429	BOOM, secondary	1	9.	72060972	SCREW, brass; 3/8-16 x 3/4"	8
2.	52702079	TRUNNION	1	10.	72053508	ZERK; 1/8" npt	1
3.	3C291710	CYLINDER	1	11.	72063040	BUSHING, machy; 2-1/2" x 10 ga.	3
4.	60104024	PIN, cylinder base	1	12.	72063039	BUSHING, machy.; 2" x 10 ga.	1
5.	60104023	PIN, main/secondary	1	13.	72066103	RING, retaining	3
6.	60104025	PIN, cylinder rod end	1	14.	72066136	RING, retaining	1
7.	60104026	PIN, trunnion	1	15.	72066317	PIN, spring; 1/2" x 4" lg.	4
8.	60030022	PAD, trunnion	1	16.	7BF81225	BUSHING	6

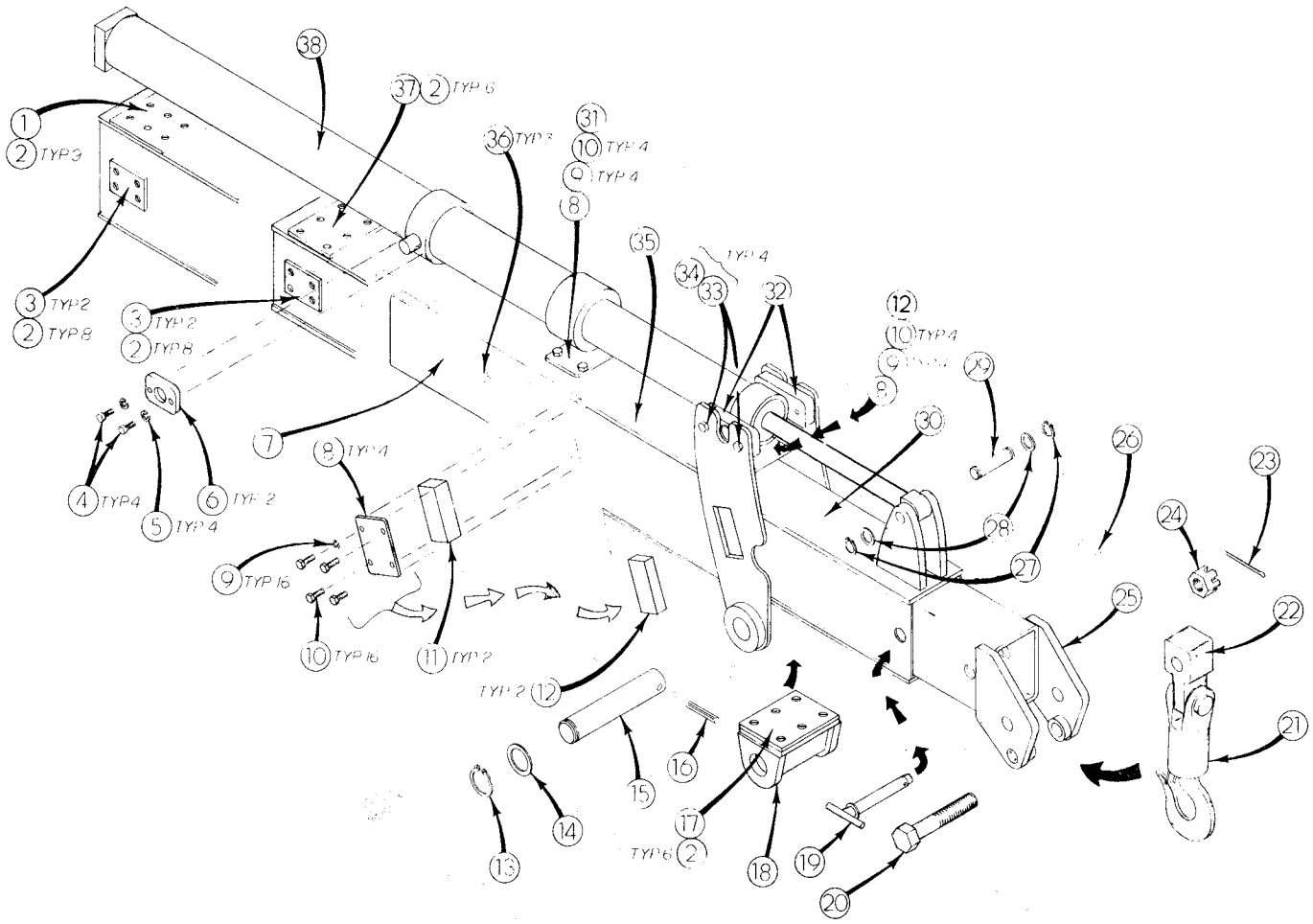


Figure F-12. 1725 Extension Boom (Part Number 41702056)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	60030025	PAD,top, 1st stage extension	1	20.	72601123	BOLT, hook	1
2.	72060972	SCREW, brass; 3/8-16 x 3/4"	37	21.	71073647	HOOK	1
3.	60030024	PAD, extension, sides	4	22.	60105291	LINK, swivel	1
4.	72060026	BOLT; 5/16-18 x 1-1/4"	4	23.	72066197	PIN, cotter; 3/16" x 2-1/2"	1
5.	72063050	LOCK WASHER; 5/16"	4	24.	72062135	NUT, hook bolt	1
6.	60102341	LOCK PLATE, cylinder	2	25.	52702065	STINGER, 3rd stage	1
7.	60102656	STUD	1	26.	72066145	PIN, hair; 3/16"	1
8.	60102654	PLATE, retainer	6	27.	72066125	RING, retaining; 1"	2
9.	72063051	LOCK WASHER; 3/8"	24	28.	72063034	BUSHING, machy.; 1" x 10 ga.	2
10.	72060047	BOLT; 3/8-16 x 1-1/4"	24	29.	60104028	PIN, extension cylinder rod end	1
11.	60030027	BAR, rub, side, first stage ext.	2	30.	52702064	BOOM, 2nd stage extension	1
12.	60030029	BAR, rub, 2nd stage extension	3	31.	60030028	BAR, rub, top, 1st stage ext.	2
13.	72066136	RING, retaining; 2"	1	32.	60104029	BLOCK, cylinder retainer	2
14.	72063039	BUSHING, machy.; 2" x 10 ga.	1	33.	72060093	BOLT; 1/2-13 x 1-1/2"	4
15.	60104027	PIN, trunnion	1	34.	72063053	LOCK WASHER; 1/2"	4
16.	72066317	PIN, spring; 1/2" x 4" lg.	1	35.	52702063	BOOM, 1st stage extension	1
17.	60030023	PAD, extension trunnion	1	36.	72062004	NUT, hex; 1/2-13	3
18.	52702080	TRUNNION	1	37.	60030026	PAD, top, 2nd stage extension	1
19.	52702082	PIN	1	38.	3K032810	CYLINDER, extension	1

NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

DIMENSIONS	
Bore, 1st stage	5"
Bore, 2nd stage	4"
Stroke, 1st stage	45"
Stroke, 2nd stage	51"
Rod Dia., 1st stage	4"
Rod Dia., 2nd stage	1-3/4"
Pin Diameter	1"
C - C, 1st stage	29-3/4"
C - C, 2nd stage	4-11/16"

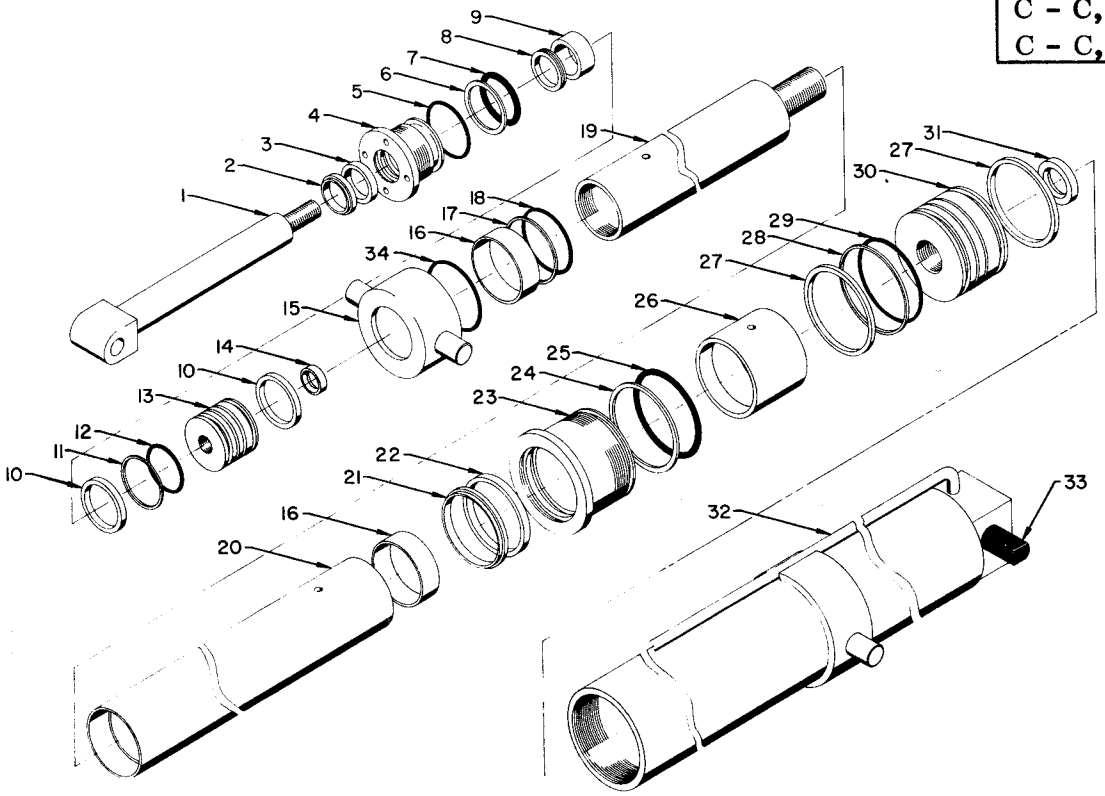


Figure F-13. 1725 Extension Cylinder (Part Number 3K032810)

Item No.	Part No.	Description	Qty
1.	4G032810	ROD	1
2.	7R14P017	*WIPER, rod	1
3.	7R546017	*SEAL, rod	1
4.	6H032820	HEAD	1
5.	7Q092233	*O-RING	1
6.	7Q10P334	*RING, back-up	1
7.	7Q072334	*O-RING	1
8.	6A025017	*WAFER LOCK	1
9.	6C175017	TUBE, stop	1
10.	7T65I030	*RING, piston	2
11.	7T66P030	*SEAL, piston	1
12.	7Q072145	*O-RING, companion	1
13.	6I030106	PISTON	1
14.	7T61N106	*SEAL, lock ring	1
15.	5FG03282	**RING	1
	5FGP2710	**PIN	2
16.	6M032810	RING, adaptor	2
17.	7Q10P043	*RING, back-up	1
18.	7Q092149	*O-RING	1
19.	4H032811	CASE, inner	1
20.	6J032810	CASE, outer	1
21.	7R14P040	*WIPER, rod	1
22.	7R546040	*SEAL, rod	1
23.	6H032810	HEAD	1
24.	7Q10P350	*RING, back-up	1
25.	7Q072350	*O-RING	1
26.	6C032810	TUBE, manifold	1
27.	7T65I050	*RING, piston	2
28.	7T66P050	*SEAL, piston	1
29.	7Q072157	*O-RING, companion	1
30.	6I050181	PISTON	1
31.	7T61N181	*SEAL, lock ring	1
32.	4C032810	CASE, cylinder	1
33.	73054242	VALVE, counter balance	2
34.	7Q072240	*O-RING	1

*Part of seal kit 9X032810.

**Order both the pins and ring for replacement parts.

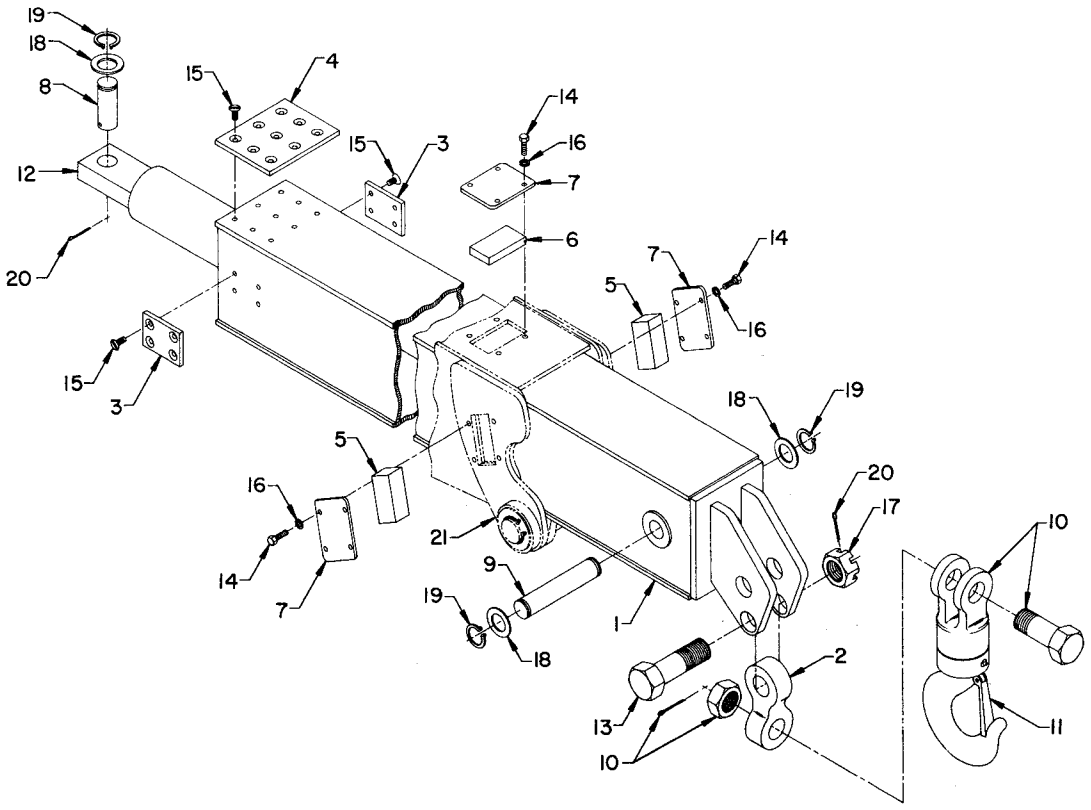
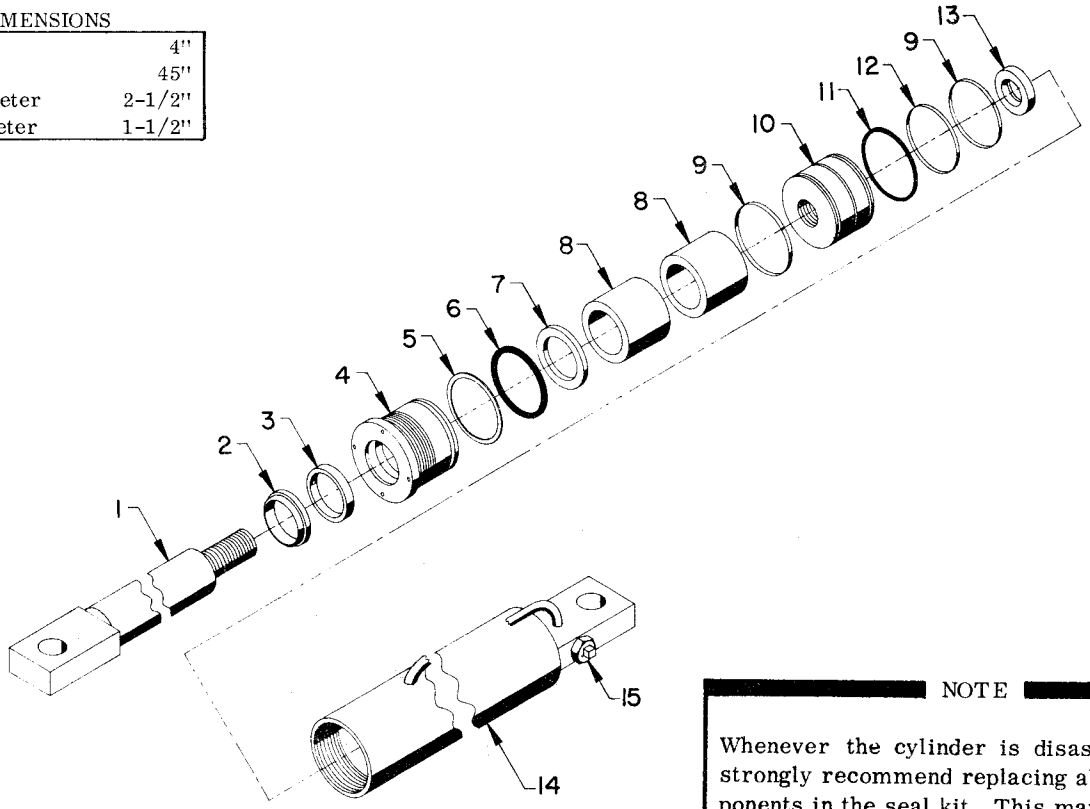


Figure F-14. 1717 Extension Boom (Part Number 41702433)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702426	BOOM, extension	1	12.	3B243017	CYLINDER, extension	1
2.	60105291	LINK, swivel	1	13.	72601123	BOLT; 1-3/4 - 5 x 5-1/2"	1
3.	60030024	PAD, side	2	14.	72060047	BOLT; 3/8-16 x 1-1/4"	12
4.	60030025	PAD, top	1	15.	72060972	SCREW; 3/8-16 x 3/4" flat hd.	17
5.	60030027	BAR, rub, side	2	16.	72063051	LOCK WASHER; 3/8"	12
6.	60030028	BAR, rub, top	1	17.	72062135	NUT, 1-3/4 - 5, Castled	1
7.	60102654	PLATE, cover	3	18.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	3
8.	60102096	PIN, cylinder base end	1	19.	72066088	RING, retaining; 1-1/2"	3
9.	60105321	PIN, cylinder rod end	1	20.	72066197	PIN, cotter; 3/16" x 2-1/2"	2
10.	70073647	HOOK	1	21.	41702432	BOOM, secondary	Ref.
11.	70074005	LATCH, hook	1				

DIMENSIONS	
Bore	4"
Stroke	45"
Rod Diameter	2-1/2"
Pin Diameter	1-1/2"



NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

Figure F-15. 1717 Extension Cylinder (Part Number 3B243017)

Item No.	Part No.	Description	Qty
1.	4G243017	ROD	1
2.	7R14P025	*WIPER, rod	1
3.	7R546025	*SEAL, rod	1
4.	6H040025	HEAD	1
5.	7Q10P342	*RING, back-up	1
6.	7Q072342	*O-RING	1
7.	6A025025	*WAFER LOCK	1
8.	6C300025	TUBE, stop	2
9.	7T65I040	RING, piston	2
10.	6I040143	PISTON	1
11.	7Q072153	*O-RING	1
12.	7T66P040	*SEAL, piston	1
13.	7T61N143	*SEAL, lock ring	1
14.	4C243017	CASE, cylinder	1
15.	73054304	VALVE, cartridge	2

*Part of seal kit (Part Number 9C162023)

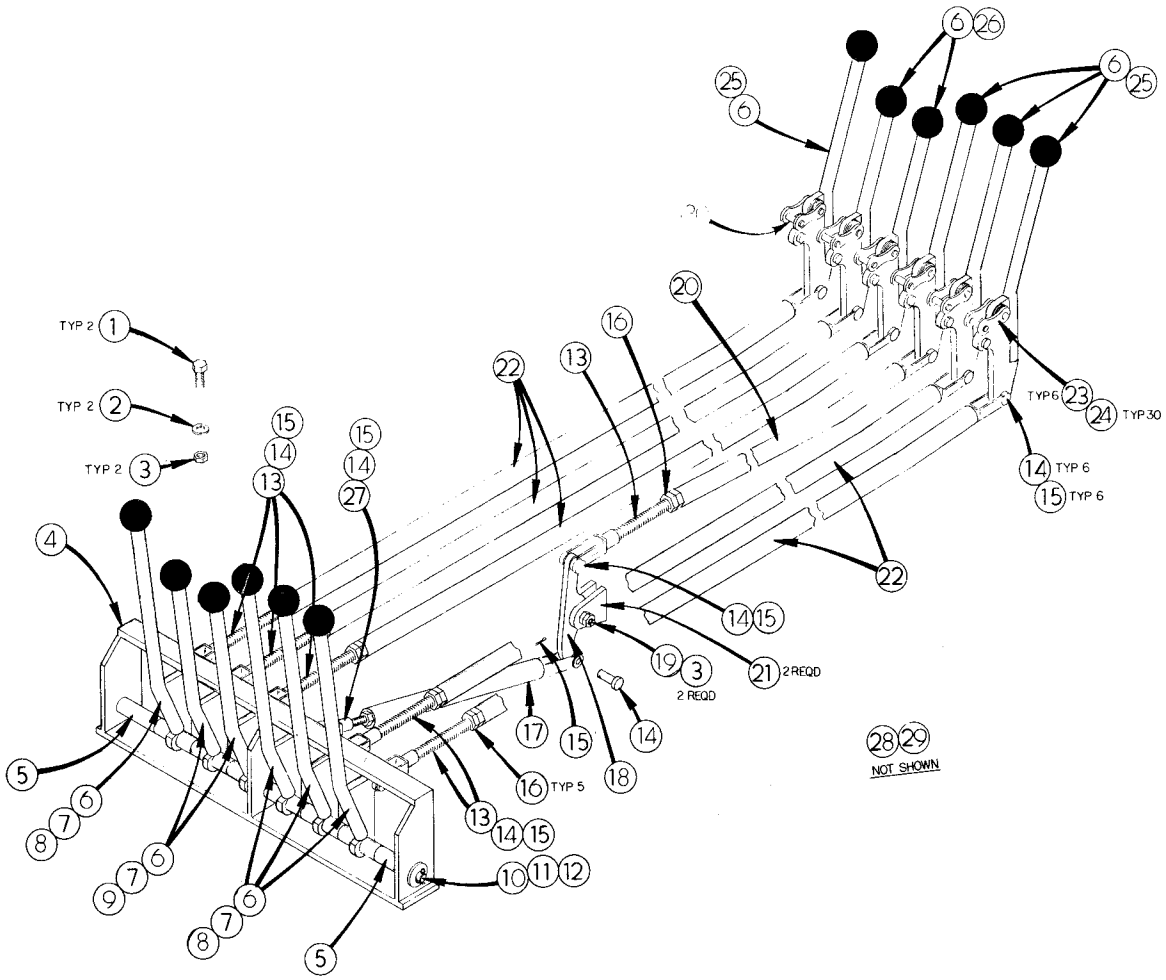


Figure F-16. Manual Control Assembly (Part Number 41702253)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	72060023	BOLT; 5/16-18 x 3/4"	2	16.	72062003	NUT, hex; 7/16-14	6
2.	72063050	LOCK WASHER; 5/16"	2	17.	52702250	LINK, slewing	1
3.	72062001	NUT, hex; 5/16-18	4	18.	60104460	PLATE, pivot	1
4.	52702251	VALVE BANK, dummy; 8-spool	1	19.	72060027	BOLT; 5/16-18 x 1-1/2"	1
5.	60010360	SPACER, dummy valve bank	2	20.	52702249	LINK, long slewing	1
6.	71039096	KNOB, black plastic; 1-1/2" dia.	12	21.	60104464	EAR	2
7.	72053506	ZERK; 3/16" press fit	6	22.	52702016	LINK, female end	5
8.	52702247	LEVER, dummy valve bank; long	4	23.	71058003	LINK, connecting	6
9.	52702248	LEVER, dummy valve bank; short	2	24.	72063001	WASHER, wrt.; 1/4"	30
10.	60101412	ROD, dummy valve bank	1	25.	52702119	LEVER, valve; long	4
11.	72063003	WASHER, wrt.; 3/8"	2	26.	52702120	LEVER, valve; short	2
12.	72066185	PIN, cotter; 5/32" x 1" lg.	2	27.	71058002	CLEVIS, female end yoke	1
13.	52702018	LINK, control, male end	6	28.	71039126	DECAL, RH control (not shown)	1
14.	72066338	PIN, link; 5/16" x 1" lg.	14	29.	71039127	DECAL, LH control (not shown)	1
15.	72066168	PIN, cotter; 3/32" x 3/4" lg.	14	30.	72066337	PIN, lever/valve bank	6

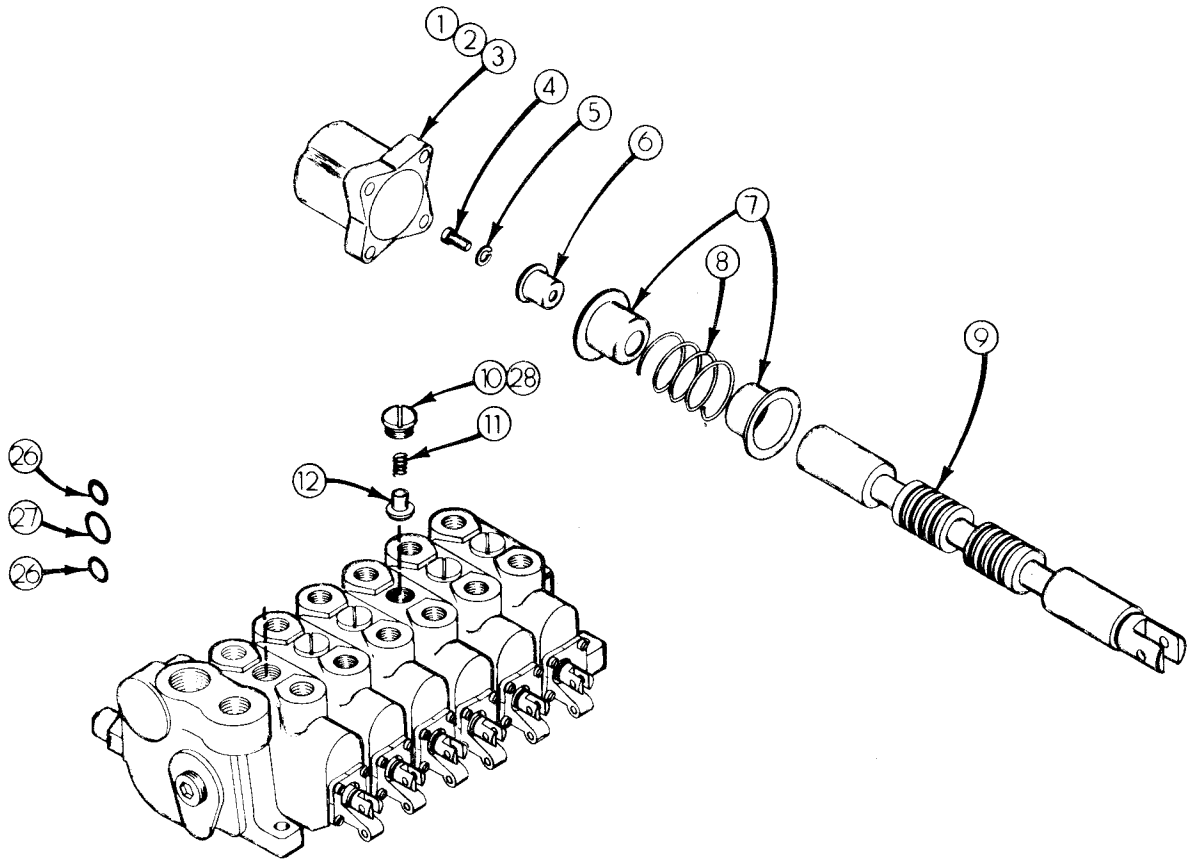


Figure F-17. Crane Control Valve

Item No.	Part No.	Description	Qty
1.	73029144	BONNET	1
2.	72060821	SCREW	4
3.	72063063	LOCK WASHER	4
4.	72060822	SCREW, cap	1
5.	72063064	LOCK WASHER	1
6.	73141015	COLLAR, spool	1
7.	73141016	COLLAR, stop	2
8.	73141017	SPRING, centering	1
9.	73141018	SPOOL; .001" over	1
10.	73141019	PLUG, check	1
11.	73141020	SPRING	1
12.	73141021	POPPET, check	1
26.	7Q092021	O-RING	2
27.	7Q092024	O-RING	1
28.	7Q072214	O-RING	1

Item No.	Part No.	Description	Qty
1.	72066150	RING, retaining	1
2.	72066140	RING, retaining	1
3.	70055115	BEARING, ball	1
4.	71141891	HOUSING	1
5.	7Q072165	O-RING	1
6.	71141881	SPRING, compression	8
7.	71141880	SPRING, compression	8
8.	71141882	PIN, torque	2
9.	71141883	SHAFT, splined	1
10.	71141884	DISC, primary	1
11.	71141805	DISC, rotation	4
12.	71141886	DISC, stationary	4
13.	71141887	SPRING, compression	8
14.	71141888	PISTON	1
15.	7Q10P236	RING, back-up	1
16.	7Q072236	O-RING	1
17.	7Q10P248	RING, back-up	1
18.	7Q072248	O-RING	1
19.	71141889	SCREW, bleeder	1
20.		NOT USED	
21.	71141890	PLATE, power	1
22.	72063004	LOCK WASHER	4
23.	72060066	BOLT	4
24.	76391497	GASKET	1
25.	76391498	GASKET	1

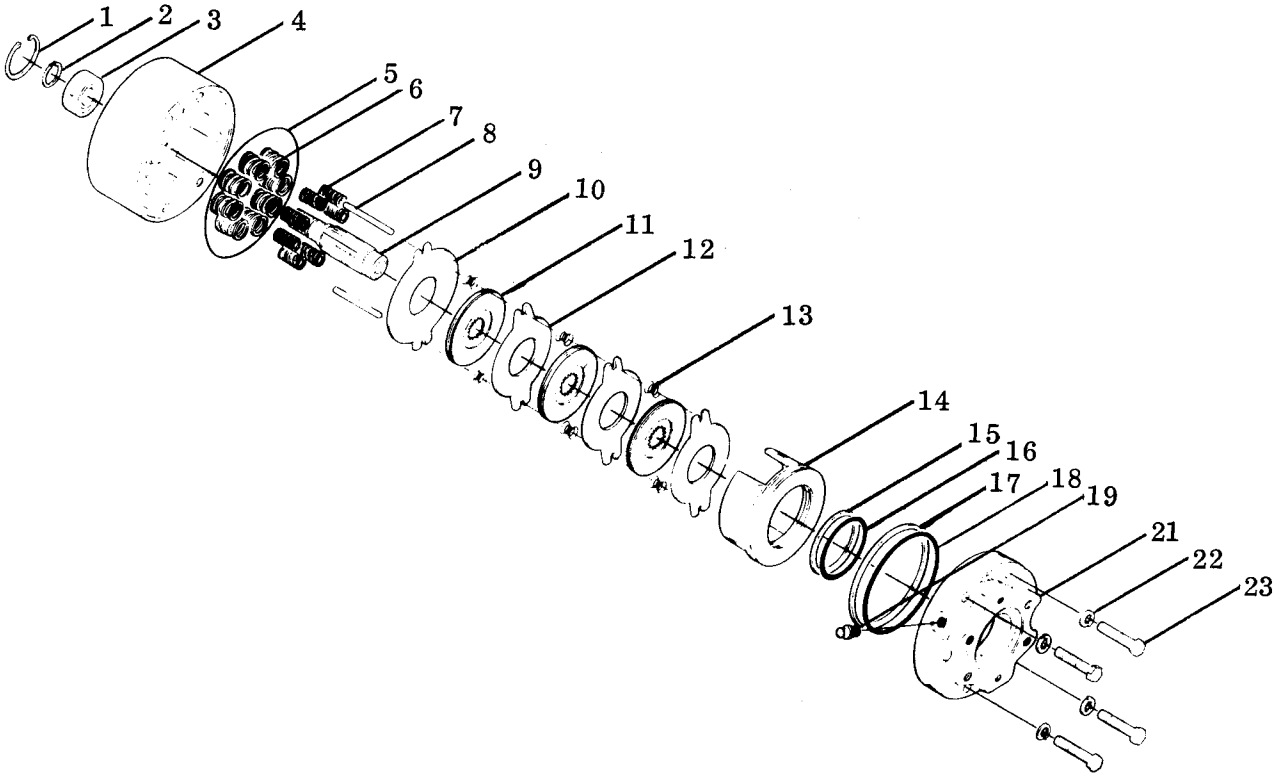


Figure F-18. Rotation Brake (Part Number 71056088)

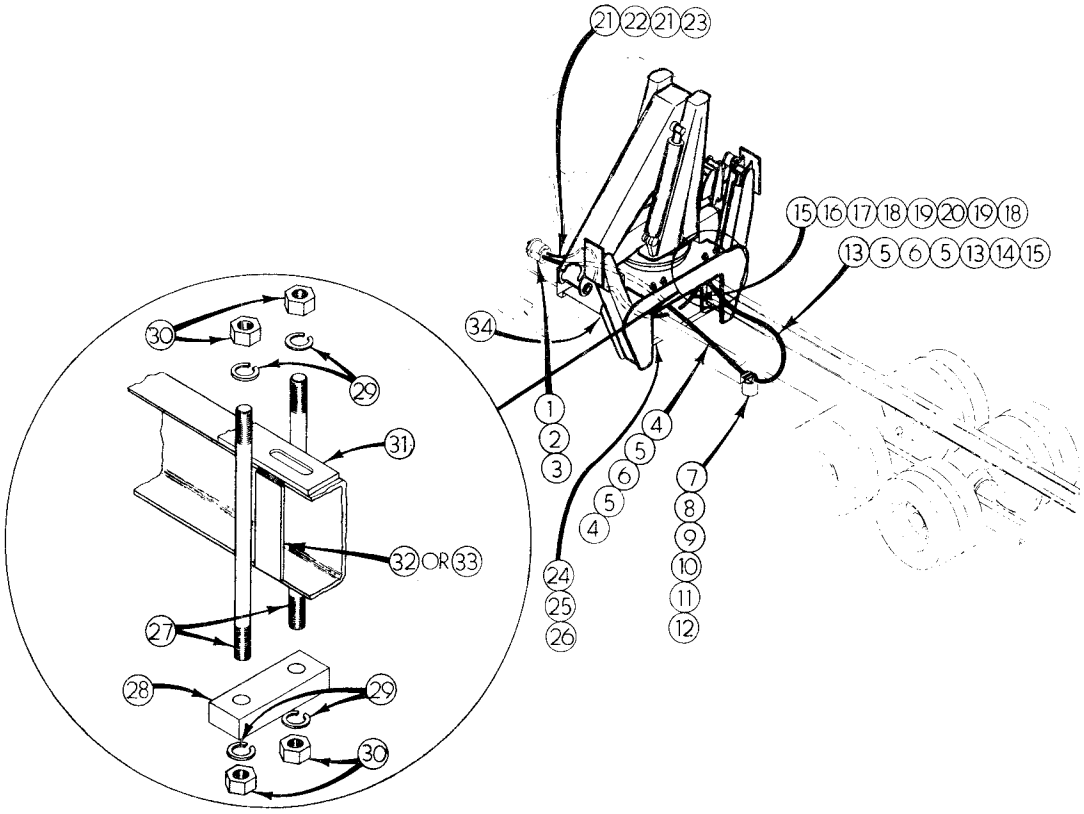


Figure F-19. Installation Kit (Part Number 93702057)

Item No.	Part No.	Description	Qty
1.	73051XXX	PUMP	1
2.	72053XXX	ADAPTER; small	1
3.	72053XXX	ADAPTER; large	1
4.	72531550	NIPPLE, barbed; 1-1/4"	2
5.	72066516	CLAMP, hose	4
6.	60035XXX	HOSE; 1-1/4" ID	As Required
7.	73052012	FILTER, suction	1
8.	60103870	BRACKET, filter mounting	2
9.	72060025	BOLT; 5/16-18 x 1"	6
10.	72063050	LOCK WASHER; 5/16"	6
11.	72053533	ELBOW, street, 45°; 1/4" npt	1
12.	73054003	GAUGE, pressure; 0-5000 PSI	1
13.	72532346	NIPPLE, barbed, 90°; 1-1/4"	2
14.	73054225	VALVE, gate; 1-1/4"	1
15.	72053211	NIPPLE, close; 1-1/4"	2
16.	73052012	FILTER, return	1
17.	72531836	BUSHING, red.; 1-1/4" npt(m) x 3/4" npt(f)	1
18.	72053458	NIPPLE, barbed; 3/4"	2
19.	72066000	CLAMP, hose; #12	2
20.	60035XXX	HOSE; 3/4" ID	As Required
21.	72531185	FITTING, hose, swivel; 1/2"	2
22.	60035XXX	HOSE; 1/2" ID	As Required
23.	72531817	BUSHING, red.; 3/4" npt(m) x 1/2" npt(f)	1
24.	60103204	BAR, tension	1
25.	72062009	NUT, hex; 1"-8	4
26.	72063058	LOCK WASHER; 1"	2
27.	71014847	STUD, hold down	8
28.	60010665	PLATE, clamp	4
29.	72063060	LOCK WASHER; 1-1/4"	16
30.	72062076	NUT, hex; 1-1/4-7	16
31.	60103563	SPACER, chassis frame	As Required
32.	60103561	BAR, flange reinforcing	As Required
33.	60103562	BAR, flange reinforcing	As Required
34.	60105107	PLATE, reinforcement	2
35.	70391393	PLACARD, electrocution hazard warning (not shown)	4

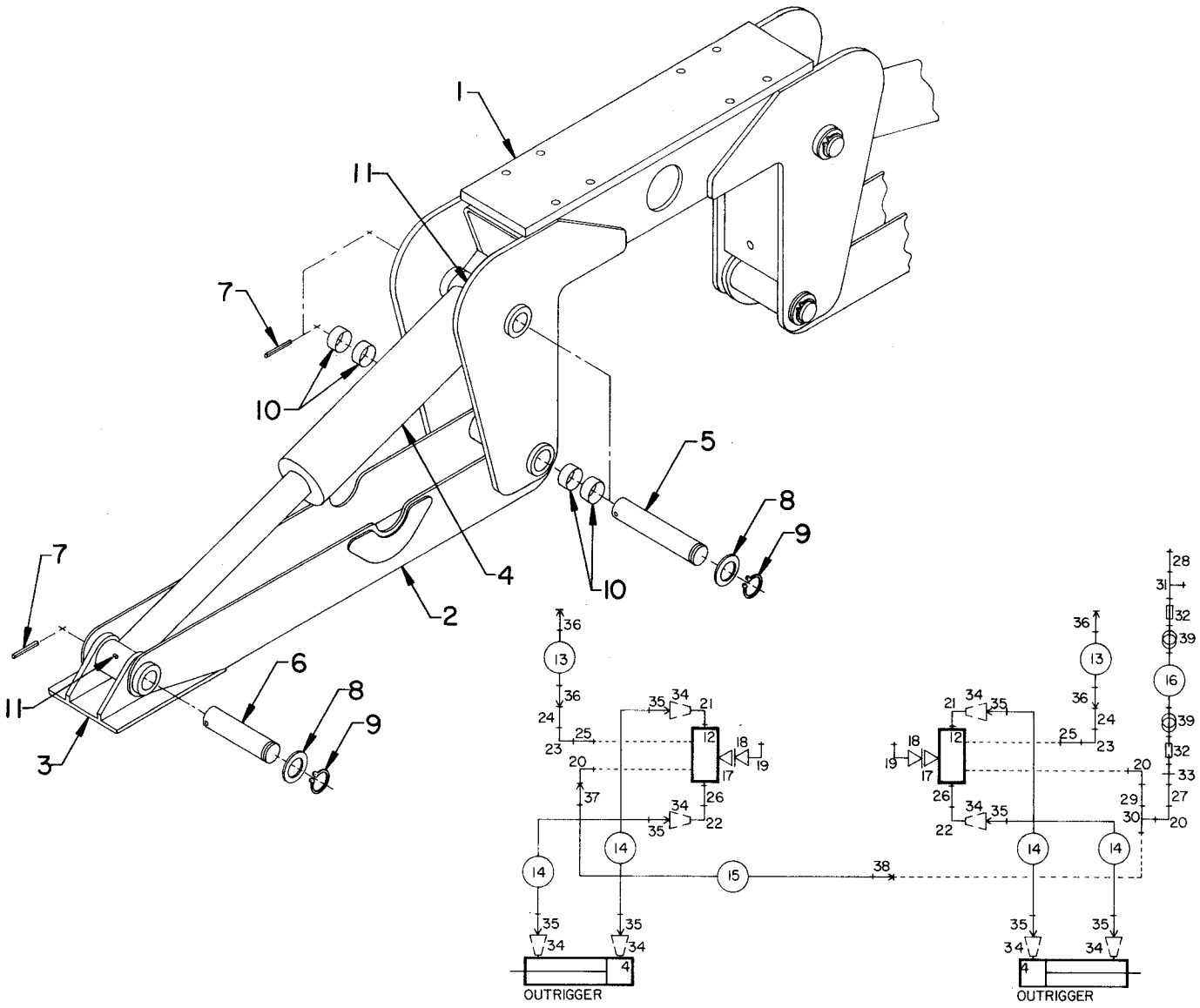


Figure F-20. Auxiliary Outrigger (Part Number 91702478)

Item No.	Part No.	Description	Qty
1.	52702476	FRAME	1
2.	52701024	LEG	2
3.	52701412	PAD	2
4.	3C263513	CYLINDER	2
5.	60102227	PIN	4
6.	60102226	PIN	2
7.	72066317	PIN, spring	6
8.	72063040	BUSHING, machy.; 2-1/2" x 10 ga.	6
9.	72066103	RING, retaining	6
10.	7BF81225	BUSHING	8
11.	72053508	ZERK; 1/8" npt	4
12.	73073273	VALVE BANK; 1-spool	2
13.	60035XXX	HOSE; 1/2" ID	As Required
14.	60035XXX	HOSE; 3/8" ID	As Required
15.	60035XXX	HOSE; 3/4" ID	As Required
16.	60035XXX	HOSE; 1-1/4" ID	As Required
17.	73073023	ADAPTER, power beyond	2
18.	72531835	BUSHING, red.; 1" npt(m) x 1/2" npt(f)	2
19.	72531133	ELBOW, street, 90°; 1/2" npt	2
20.	72053556	ELBOW, street, 90°; 3/4" npt	3
21.	72531132	ELBOW, street, 90°; 3/8" npt	2
22.	72531100	ELBOW, 90°; 3/8" npt	2
23.	72531101	ELBOW, 90°; 1/2" npt	2
24.	72053725	NIPPLE, hex; 1/2" npt	2
25.	72053726	NIPPLE, hex, red.; 1/2" x 3/4" npt	2
26.	72053051	NIPPLE, pipe; 3/8" npt x 2" lg.	2
27.	72053141	NIPPLE, close; 3/4" npt	1
28.	72053211	NIPPLE, close; 1-1/4" npt	1
29.	72053558	NIPPLE, hex; 3/4" npt	1
30.	72053555	TEE; 3/4" npt	1
31.	72053615	TEE; 1-1/4" npt	1
32.	72532346	NIPPLE, barbed, 90°; 1-1/4"	2
33.	72053489	COUPLING, red.; 1-1/4" x 3/4" npt	1
34.	72053642	SWIVEL, pipe; 3/8" npt	8
35.	72531151	FITTING, hose; 3/8"	8
36.	72531185	FITTING, swivel hose; 1/2"	4
37.	72531187	FITTING, swivel hose; 3/4"	1
38.	72531168	FITTING, hose; 3/4"	1
39.	72066516	CLAMP, hose; 1-1/4"	2

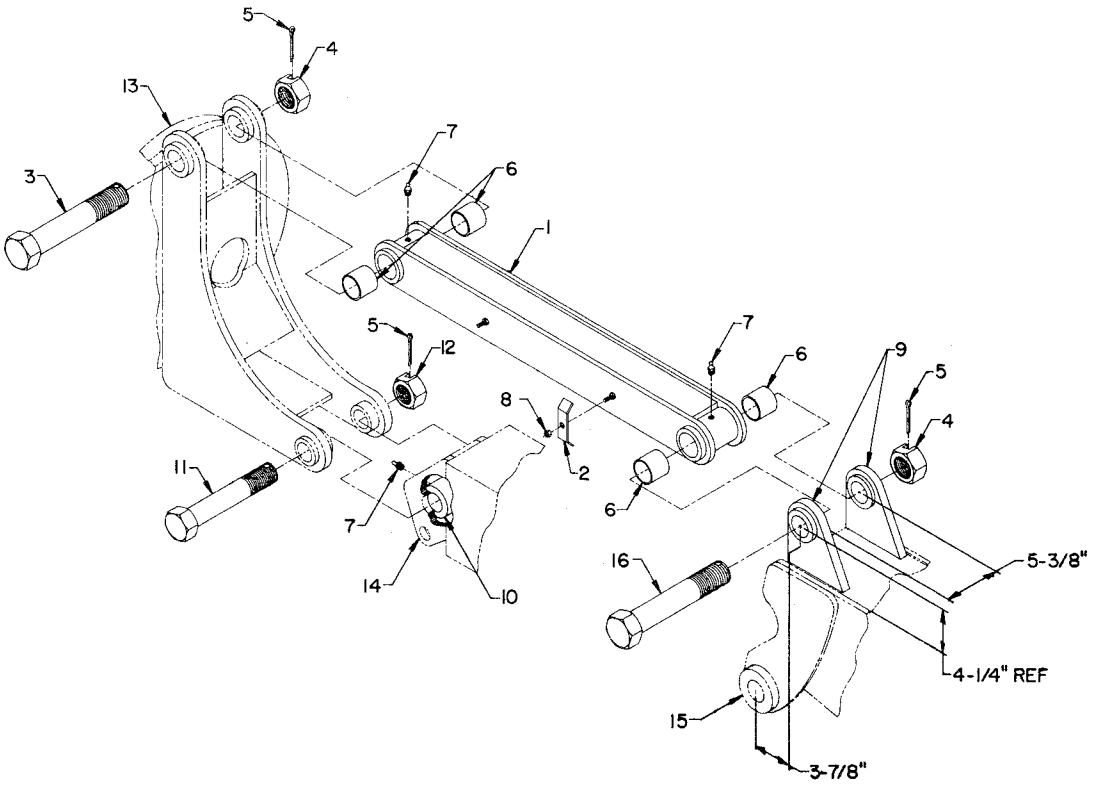


Figure F-21. Tirehand 12 Linkage (Part Number 40702437) and Mounting Kit (Part Number 91702643)

Item No.	Part No.	Description	*Qty	Item No.	Part No.	Description	*Qty
1.	52702457	LINK	1	10.	60105322	TUBE, reinforcement	*(1)
2.	60010118	CLAMP, hose	2	11.	72060235	BOLT; 1-3/4-5 x 10"	*(1)
3.	72601023	BOLT; 2-4½ x 11"	1	12.	72062135	NUT, slotted; 1-3/4-5	1
4.	72062015	NUT, slotted; 2-4½	1 *(1)	13.	40702436	YOKE	Ref.
5.	72066197	PIN, cotter; 3/16" x 2-1/2"	1 *(2)	14.	91702433	BOOM, extension	Ref.
6.	7BF82020	BUSHING	4	15.	41702432	BOOM, secondary	Ref.
7.	72053508	ZERK; 1/8" npt	3	16.	72601022	BOLT; 2-4½ x 10"	*(1)
8.	72062001	NUT; 5/16-18	2				
9.	52702458	EAR	*(2)	*Quantity in ( ) part of Mounting Kit.			

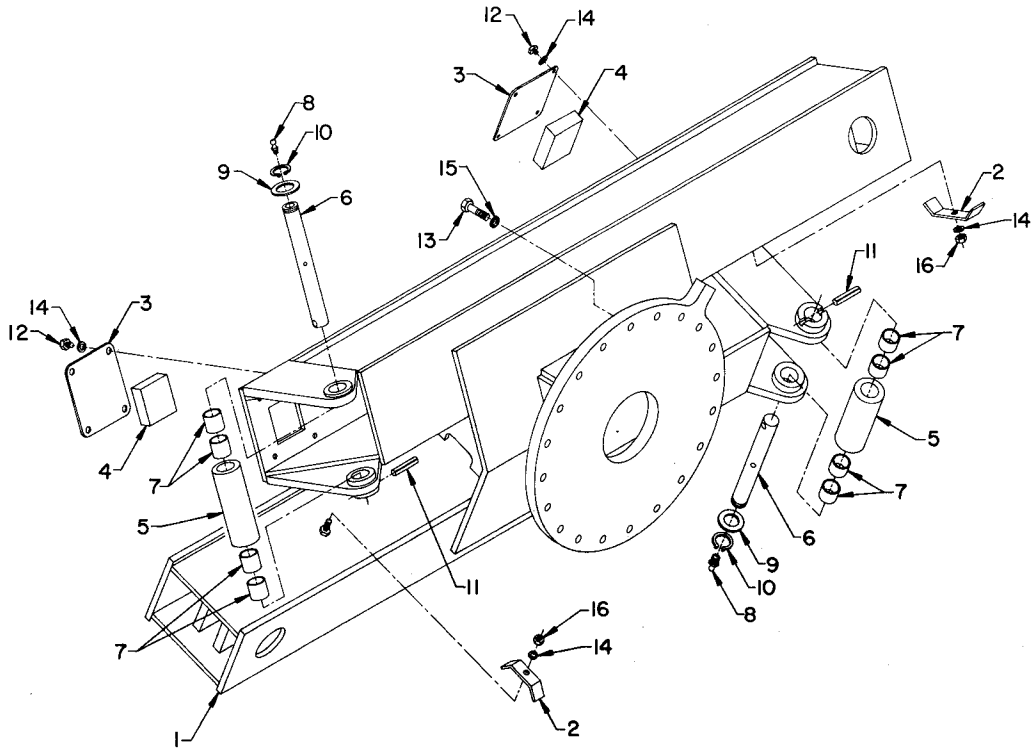


Figure F-22. Tirehand 12 Base (Part Number 40702435)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702443	BASE	1	9.	72063037	BUSHING, machy.; 1-1/2" x 10 ga.	2
2.	60010118	CLAMP, hose	2	10.	72066088	RING, retaining; 1-1/2"	2
3.	60105231	PLATE, retainer	2	11.	72066315	PIN, roll; 1/2-3	2
4.	60030041	PAD, rub	2	12.	72060042	BOLT; 3/8-16 x 1/2"	8
5.	60105293	ROLLER	2	13.	72060151	BOLT; 5/8-11 x 2" gr. 8	20
6.	60105261	PIN, roller	2	14.	72063051	LOCK WASHER; 3/8"	10
7.	7BF81215	BUSHING	8	15.	72066427	WASHER, Del Lok; 5/8"	20
8.	72053508	ZERK; 1/8" npt	2	16.	72062002	NUT; 3/8-16	2

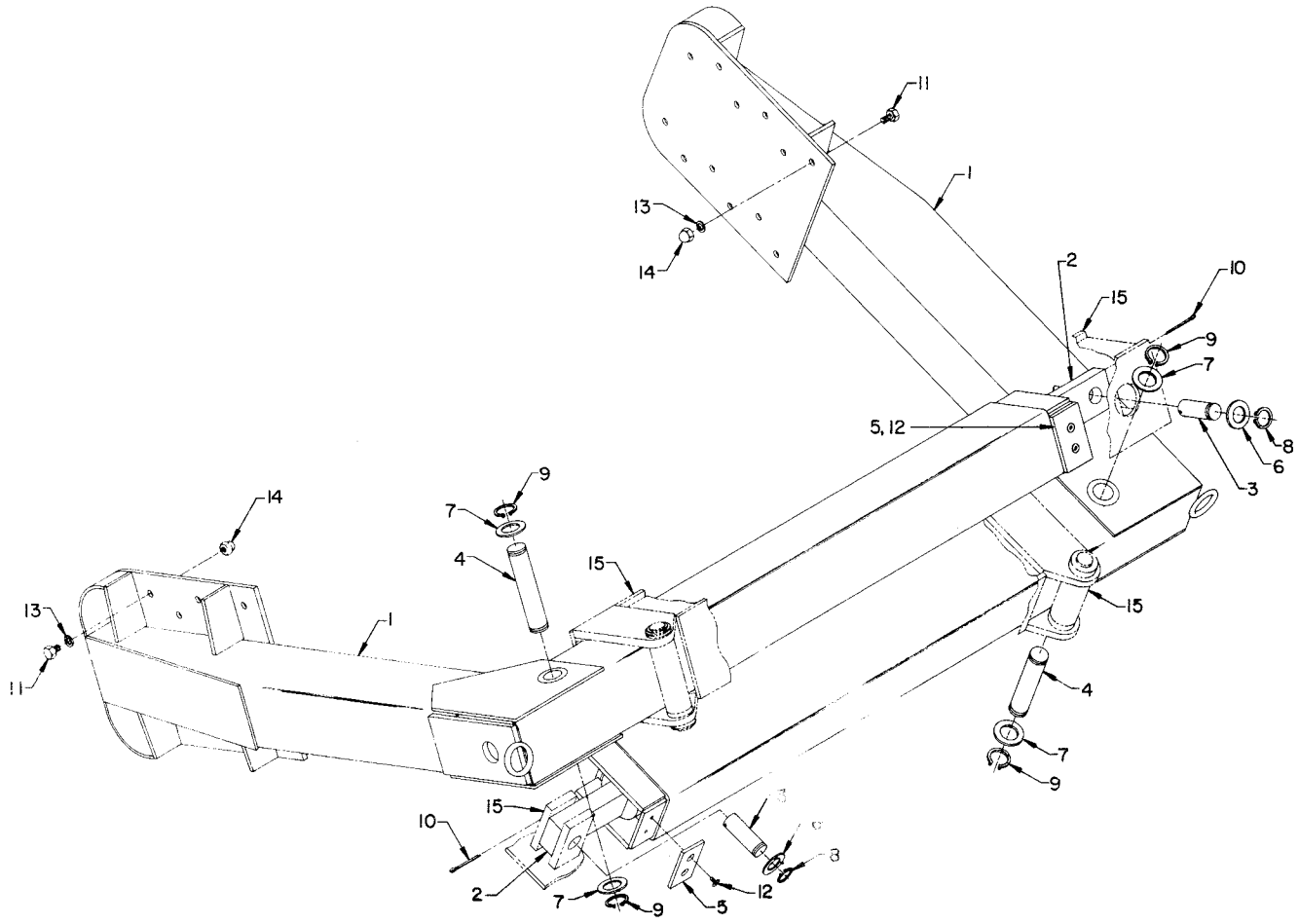


Figure F-23. Tirehand 12 Arm (Part Number 40702438)

Item No.	Part No.	Description	Qty	Item No.	Part No.	Description	Qty
1.	52702454	ARM	2	9.	72066095	RING, retaining; 2"	4
2.	3B234312	CYLINDER, clamping	2	10.	72066189	PIN, cotter; 5/32" x 3" lg.	2
3.	60102096	PIN, cylinder base end	2	11.	72060090	BOLT; 1/2-13 x 7/8"	24
4.	60105292	PIN, cylinder rod end	2	12.	72060916	BOLT; 5/16-18 x 3/4"	4
5.	60030013	BAR, rub	2	13.	72063053	LOCK WASHER; 1/2"	24
6.	72063037	BUSHING, machy; 1-1/2" x 10 ga.	2	14.	72062079	NUT, acorn; 1/2-13	24
7.	72063039	BUSHING, machy; 2" x 10 ga.	4	15.	40702435	BASE	Ref.
8.	72066088	RING, retaining; 1-1/2"	2				

DIMENSIONS	
Bore	4"
Stroke	34-1/2"
Rod Diameter	2"
Pin Diameter - Base	1-1/2"
Pin Diameter - Rod	2"

NOTE

Whenever the cylinder is disassembled, we strongly recommend replacing all of the components in the seal kit. This may save expensive down-time in the immediate future.

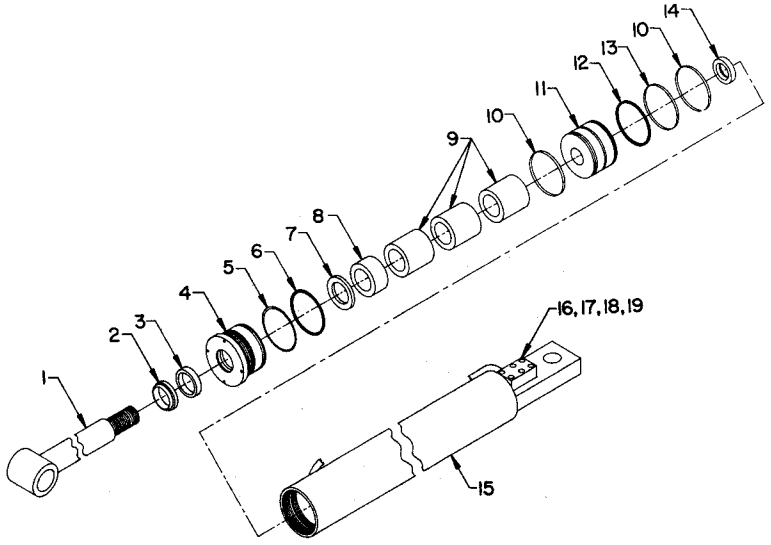


Figure F-24. Tirehand 12 Clamp Cylinder (Part Number 3B234312)

Item No.	Part No.	Description	Qty
1.	4G308410	ROD	1
2.	7R14P020	*WIPER, rod	1
3.	7R546020	*SEAL, rod	1
4.	6R040020	HEAD	1
5.	7Q10P342	*RING, back-up	1
6.	7Q072342	*O-RING	1
7.	6A025020	*WAFER LOCK	1
8.	6C150020	TUBE, stop	1
9.	6G300020	TUBE, stop	3
10.	7T65I040	*RING, piston	2
11.	6I040143	PISTON	1
12.	7Q072153	*O-RING	1
13.	7T66P040	*SEAL, piston	1
14.	7T61N143	*SEAL, lock ring	1
15.	4B308410	CASE, cylinder	1
16.	73054004	VALVE, safety locking	1
17.	72060708	SCREW, soc. hd.; 1/4-20 x 1-1/4"	6
18.	7Q072012	*O-RING; small	1
19.	7Q072113	*O-RING, large	2

*Part of seal kit (Part Number 9C161623)

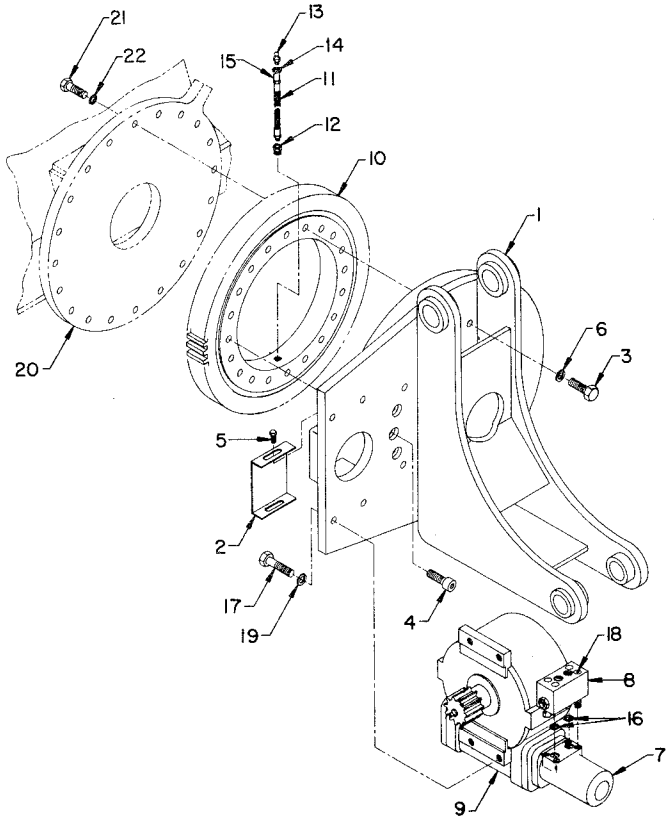


Figure F-25. Tirehand 12 Rotation (Part Number 40702439) and Yoke (Part Number 40702436)

Item No.	Part No.	Description	Qty
		Rotation Assembly (Part Number 40702439) (Includes items 1 through 6)	
1.	52702441	YOKE	1
2.	60010235	COVER, pinion gear	1
3.	72060151	BOLT, gr. 2; 5/8-11 x 2" lg.	13
4.	72060814	BOLT, soc. hd.; 5/8-11 x 2" lg.	3
5.	72060833	SCREW, self-tap; 5/16-18 x 3/4" lg.	2
6.	72066427	WASHER; Del Lok; 5/8"	13
		Yoke Assembly (Part Number 40702436) (Includes items 7 through 19)	
7.	73051001	MOTOR, hydraulic	1
8.	73054015	VALVE, cushion	1
9.	71057000	REDUCER, gear	1
10.	71056001	GEAR-BEARING, turntable	1
11.	72073101	EXTENSION, grease fitting	1
12.	72531826	BUSHING, red.; 1/4" npt(m) x 1/8" npt(f)	1
13.	72053508	ZERK; 1/8" npt	1
14.	72063003	WASHER, wrt.; 3/8"	1
15.	72063301	COUPLING, pipe; 1/8"	1
16.	7Q072112	O-RING	2
17.	72060173	BOLT, gr. 8; 5/8-11 x 2-3/4" lg.	4
18.	72060740	BOLT, soc. hd.; 5/16-18 x 2-3/4"	4
19.	72063055	LOCK WASHER	4
20.	40702435	BASE	Ref.
21.	72060151	BOLT, gr. 8; 5/8-11 x 2" lg.	Ref.
22.	72066427	WASHER, Del Lok; 5/8"	Ref.

Cranes configured as shown within the dotted line should be changed in accordance with Paragraph 6-2.

LEGEND
NIPPLE
COUPLER
ELBOW (90°)
ELBOW (45°)
TEE
FITTING, HOSE
NIPPLE, BARBED
BUSHING, REDUCER
ADAPTER
SWIVEL
CLAMP, HOSE
FILTER
GAUGE
VALVE, COLOR FLOW
VALVE, GATE

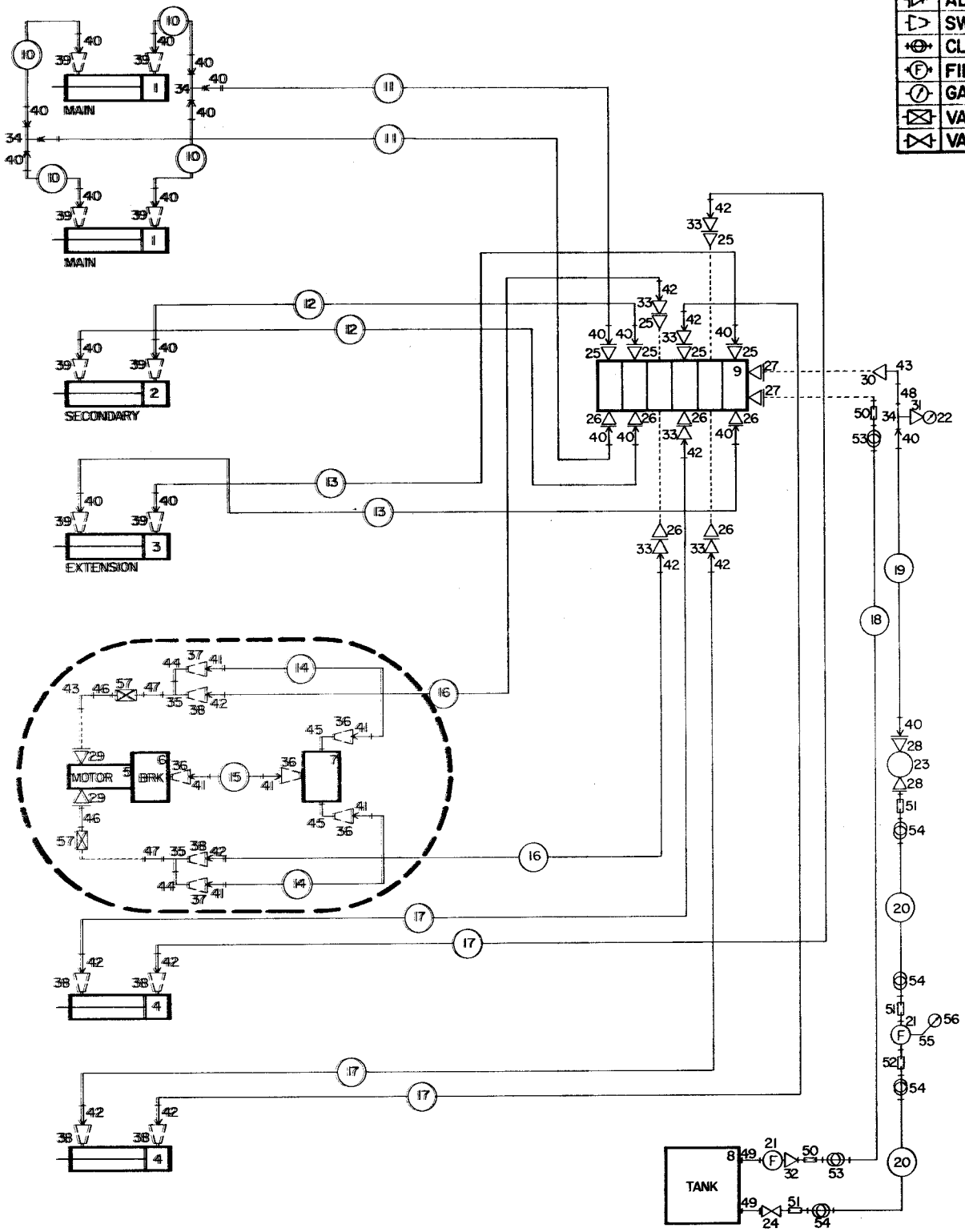


Figure F-26. Hydraulic Schematic (Cranes manufactured before Jan. 1, 1979)

Item No.	Part No.	Description	Qty
1.	3C284710	CYLINDER, main	2
2.	3C291710	CYLINDER, secondary	1
3.	3K271513	CYLINDER, extension (1725)	1
	3B243017	CYLINDER, extension (1717)	1
4.	3C263511	CYLINDER, outrigger	2
5.	73051223	MOTOR, hydraulic	1
6.	71056088	BRAKE, hydraulic	1
7.	73054290	VALVE, shuttle	1
8.	52702081	RESERVOIR	1
9.	73073575	VALVE BANK	1
10.	60035403	HOSE; 1/2" ID x 39" lg.	4
11.	60035404	HOSE; 1/2" ID x 45" lg.	2
12.	60035405	HOSE; 1/2" ID x 14'-6" lg.	2
13.	60035265	HOSE; 1/2" ID x 258" (1725)	2
	60035260	HOSE; 1/2" ID x 246" (1717)	2
14.	60035131	HOSE; 1/4" ID x 12" lg.	2
15.	60035162	HOSE; 1/4" ID x 14" lg.	1
16.	60035116	HOSE; 3/8" ID x 15'-6" lg.	2
17.	60035402	HOSE; 3/8" ID x 80" lg.	4
18.	60035XXX	HOSE; 3/4" ID	As Required
19.	60035XXX	HOSE; 1/2" ID	As Required
20.	60035XXX	HOSE; 1-1/4" ID	As Required
21.	73052012	FILTER	2
22.	73054003	GAUGE, pressure; 0-5000 PSI	1
23.	73051XXX	PUMP, hydraulic	1
24.	73054225	VALVE, gate; 1-1/4"	1
25.	72531116	ADAPTER, elbow, 90°, w/o-ring	6
26.	72053755	ADAPTER, elbow, 90° w/o-ring	6
27.	72053744	ADAPTER, w/o-ring; 7/8-14 x 3/4" npt	2
28.	72053XXX	ADAPTER, pump	2
29.	72532154	ADAPTER; 7/8-14 x 1/2" npt	2
30.	72531833	BUSHING, red.; 3/4" npt(m) x 1/2" npt(f)	1
31.	72531830	BUSHING, red.; 1/2" npt(m) x 1/4" npt(f)	1
32.	72531836	BUSHING, red.; 1-1/4" npt(m) x 3/4" npt(f)	1
33.	72531823	BUSHING, red.; 1/2" npt(m) x 3/8" npt(f)	6
34.	72053612	TEE; 1/2" npt	3
35.	72053611	TEE; 3/8" npt	2
36.	72053640	SWIVEL, pipe; 1/4" npt	4
37.	72053537	SWIVEL, pipe; 3/8" npt x 1/4" npt	2
38.	72053642	SWIVEL, pipe; 3/8" npt	6
39.	72053643	SWIVEL, pipe; 1/2" npt	8
40.	72531161	FITTING, hose; 1/2"	22
41.	72531142	FITTING, hose; 1/4"	6
42.	72531151	FITTING, hose; 3/8"	12
43.	72531133	ELBOW, street, 90°; 1/2" npt	2
44.	72531132	ELBOW, street, 90°; 3/8" npt	2
45.	72531151	ELBOW, street, 1/4" npt	2
46.	72053629	NIPPLE, hex; 1/2" x 3/8" npt	2
47.	72053723	NIPPLE, hex; 3/8" npt	2
48.	72053725	NIPPLE, hex; 1/2" npt	1
49.	72053211	NIPPLE, close; 1-1/4" npt	2
50.	72053458	NIPPLE, barbed; 3/4"	2
51.	72531550	NIPPLE, barbed; 1-1/4"	3
52.	72531196	NIPPLE, barbed, 45°; 1-1/4"	1
53.	72066000	CLAMP, hose; #12	2
54.	72066516	CLAMP, hose; 1-1/4"	4
55.	72053533	ELBOW, street, 45°; 1/4" npt	1
56.	73048031	GAUGE, filter	1
57.	73054139	VALVE, flow control	2

Items 3 and 13 are the only differences between the IMT 1725 and the IMT 1717.

LEGEND	
	NIPPLE
	COUPLER
	ELBOW (90°)
	ELBOW (45°)
	TEE
	FITTING, HOSE
	NIPPLE, BARBED
	BUSHING, REDUCER
	ADAPTER
	SWIVEL
	CLAMP, HOSE
F	FILTER
	GAUGE
	VALVE, COLOR FLOW
	VALVE, GATE

Cranes manufactured prior to January 1, 1979 should be changed to conform to the configuration contained within the dotted line - refer to Paragraph 6-2.

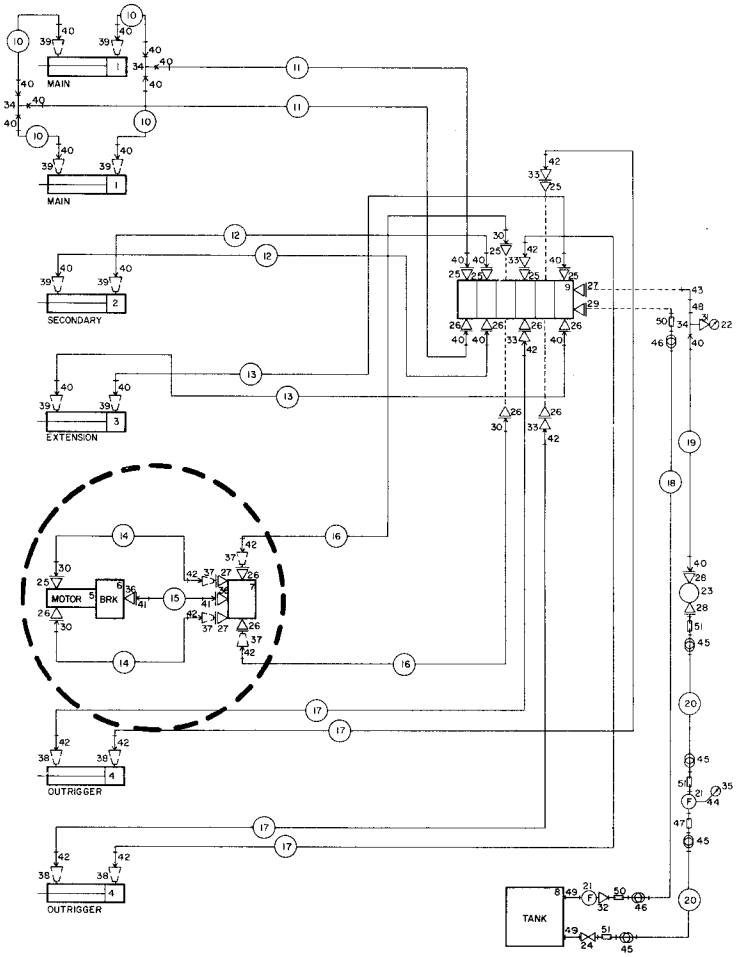
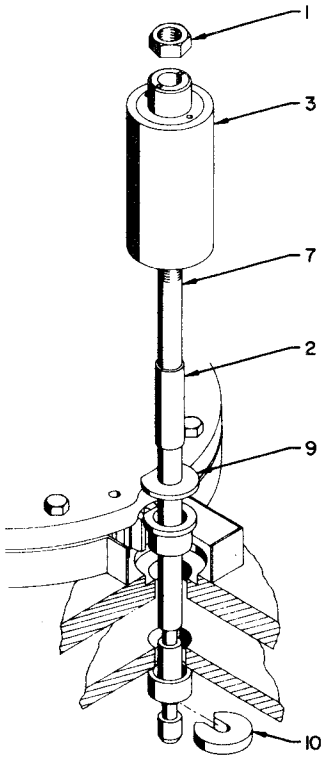


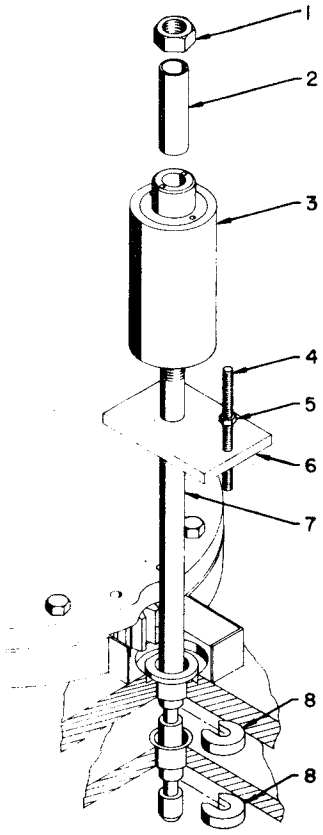
Figure F-27. Hydraulic Schematic (Cranes manufactured after January 1, 1979)

Item No.	Part No.	Description	Qty
1.	3C284710	CYLINDER, main	2
2.	3C291710	CYLINDER, secondary	1
3.	3K032810	CYLINDER, extension (1725)	1
	3B243017	CYLINDER, extension (1717)	1
4.	3C263511	CYLINDER, outrigger	2
5.	73051223	MOTOR, hydraulic	1
6.	71056088	BRAKE, hydraulic	1
7.	73054370	VALVE, proportional flow divider	1
8.	52702081	RESERVOIR	1
9.	73073575	VALVE BANK	1
10.	60035403	HOSE; 1/2" ID x 39" lg.	4
11.	60035404	HOSE; 1/2" ID x 45" lg.	2
12.	60035405	HOSE; 1/2" ID x 168" lg.	2
13.	60035265	HOSE; 1/2" ID x 258" lg.	2
	60035260	HOSE; 1/2" ID x 246" lg.	2
14.	60035407	HOSE; 3/8" ID x 12" lg.	2
15.	60035127	HOSE; 1/4" ID x 19" lg.	1
16.	60035116	HOSE; 3/8" ID x 186" lg.	2
17.	60035402	HOSE; 3/8" ID x 80" lg.	4
18.	60035XXX	HOSE; 3/4" ID	As Required
19.	60035XXX	HOSE; 1/2" ID	As Required
20.	60035XXX	HOSE; 1-1/4" ID	As Required
21.	73052012	FILTER	2
22.	73054003	GAUGE, pressure; 0-5000 PSI	1
23.	73051XXX	PUMP, hydraulic	1
24.	73054225	VALVE, gate; 1-1/4"	1
25.	72531116	ADAPTER, long, 90°; 7/8-14 x 1/2" npt	7
26.	72053755	ADAPTER, 90°; 7/8-14 x 1/2" npt	9
27.	72053744	ADAPTER; 7/8-14 x 1/2" npt	3
28.	72053XXX	ADAPTER, pump	2
29.	72053745	ADAPTER; 7/8-14 x 3/4" npt	1
30.	72531160	SWEDGE; 3/8" hose x 1/2" npt(m)	4
31.	72531830	BUSHING, red.; 1/2" npt(m) x 1/4" npt(f)	1
32.	72531836	BUSHING, red.; 1-1/4" npt(m) x 3/4" npt(f)	1
33.	72531823	BUSHING, red.; 1/2" npt(m) x 3/8" npt(f)	4
34.	72053612	TEE; 1/2" npt	3
35.	73048031	GAUGE, filter	1
36.	72532149	ADAPTER, swivel, 90°; 7/16-20 x 1/4" npt(f)	2
37.	72053644	ADAPTER, swivel; 1/2" npt(m) x 3/8" npt(f)	4
38.	72053642	ADAPTER, swivel; 3/8" npt	4
39.	72053643	ADAPTER, swivel; 1/2" npt	8
40.	72531161	SWEDGE; 1/2"	22
41.	72531142	SWEDGE; 1/4"	2
42.	72531151	SWEDGE; 3/8"	12
43.	72531133	ELBOW, street, 90°; 1/2" npt	1
44.	72053533	ELBOW, street, 45°; 1/4" npt	1
45.	72066516	CLAMP, hose; 1-1/4"	4
46.	72066000	CLAMP, hose; #12	2
47.	72531196	NIPPLE, barbed, 45°; 1-1/4"	1
48.	72053725	NIPPLE, hex; 1/2" npt	1
49.	72053211	NIPPLE, close; 1-1/4" npt	2
50.	72053458	NIPPLE, barbed; 3/4"	2
51.	72531550	NIPPLE, barbed; 1-1/4"	3

Items 3 and 13 are the only differences between the IMT 1717 and the IMT 1725.



installation



removal

Parts list for pinion gear bushing removal and installation.

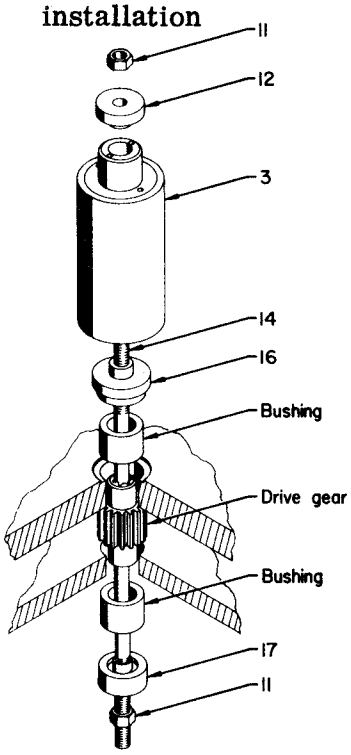
Item No.	Part No.	Description	Qty
1.	72062011	NUT; 1-1/4 - 7	1
2.	60105358	SPACER	1
3.	73073134	JACK, hydraulic	1
4.	60105497	ROD; 1/2-13 x 6" lg.	1
5.	72062004	NUT; 1/2-13	1
6.	60105496	PLATE	1
7.	60102775	ROD	1
8.	60102779	RING, slotted	2
9.	60102778	RING, installation	1
10.	60102780	RING, slotted	1

Pinion Gear

Drive Gear

Parts list for drive gear bushing removal and installation.

Item No.	Part No.	Description	Qty
3.	73073134	JACK	1
11.	72062007	NUT; 3/4-10	2
12.	60102782	RING, alignment	1
13.	60102776	SPACER, cupped	1
14.	60102777	ROD	1
15.	60102781	RING, pull	1
16.	60102783	RING, upper bushing	1
17.	60102784	RING, lower bushing	1



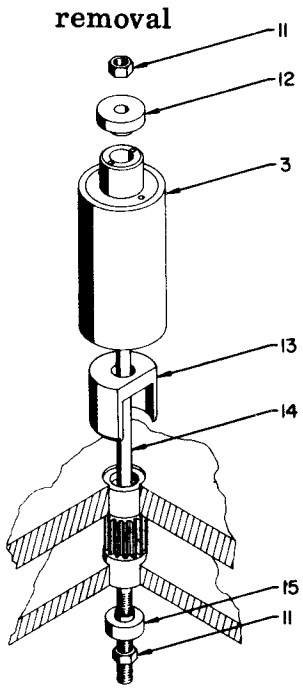


Figure F-28. Bushing Removal Tool (Part Number 92091200)

6-2. ROTATION CONVERSION KIT

Cranes manufactured after January 1, 1979 have the new-style rotation motor/brake arrangement. To install the kit on a crane manufactured prior to that date, proceed as follows:

1. Remove the old shuttle valve and flow control valves (Figure F-22).

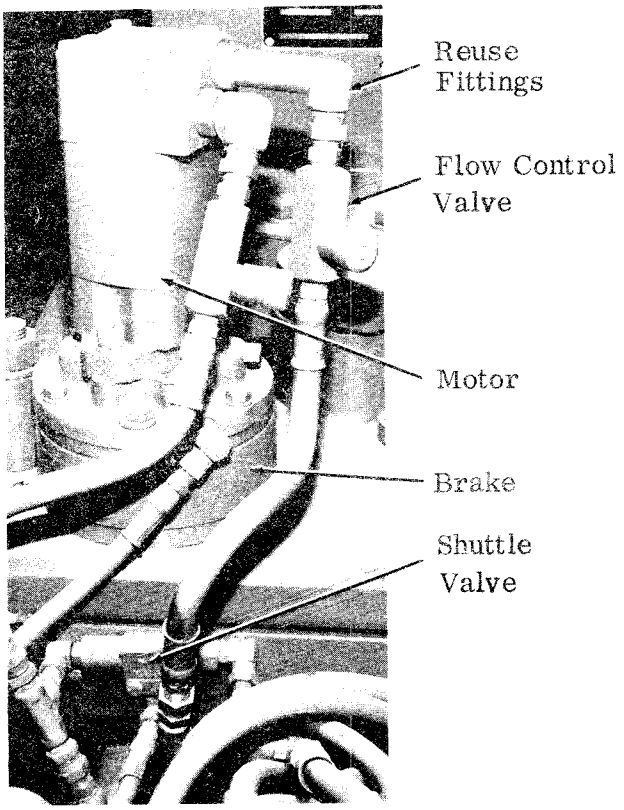


Figure F-29. Old-Style Rotation Assembly

2. Remove the inspection plate.

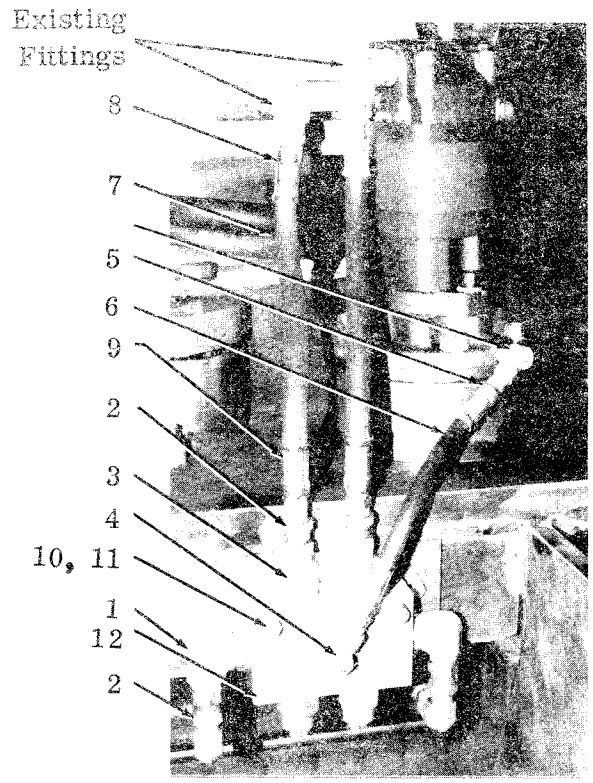
3. Using the new proportional flow divider valve as a template, locate and drill two (2) 3/8" diameter holes in the inspection plate.

4. Bolt the valve to the inspection plate. The heads of the bolts must be on the back side of the plate to prevent interference with the intermediate gear. Install the inspection plate on the crane base.

NOTE

Treat all hose fittings with a good thread sealer and tighten them to prevent leaks.

5. Install the new hose from the control valve to the proportional flow divider valve inlet. Connect the existing hose from the control valve to the proportional flow divider valve's other inlet. The inlets are located on the sides of the valve (Figure F-23).



Item No.	Part No.	Description	Qty
1.	72053755	ADAPTER, 90°; 7/8-14 x 1/2" npt(f)	2
2.	72053644	ADAPTER, swivel; 3/8" npt(f) x 1/2" npt(m)	4
3.	72053744	ADAPTER; 7/8-14 x 1/2" npt(f)	2
4.	72532149	ADAPTER; 7/16-20 x 1/4" npt(f)	2
5.	72531142	SWEDGE; 1/4"	2
6.	60035228	HOSE; 1/4" ID x 10" lg. (brake to valve)	1
7.	60035407	HOSE; 3/8" ID x 12" lg. (motor to valve)	2
8.	72531160	SWEDGE; 3/8" hose ID x 1/2" npt(m)	2
9.	72531151	SWEDGE; 3/8"	2
10.	72060051	SCREW, hex hd.; 3/8-16 x 2-1/2" lg.	2
11.	72062103	NUT, hex, nylon locking; 3/8-16	2
12.	72054370	VALVE, proportional flow divider	1
13.	60035358	HOSE; 3/8" ID x 16" lg (flow divider valve to control valve - not shown)	1

Figure F-30. New-Style Rotation Assembly Parts List

6. Connect the hoses between the motor and the swivel fittings on the top ports of the flow divider valve. Use existing fittings on the motor ports.

NOTE

If the hoses are too short, unbolt the motor from the brake and rotate it 180°.

7. Install the brake hose between the brake and the front port on the valve.

8. Start the engine, engage the PTO and test actuate the system—check for hydraulic leaks. If the crane rotates in a direction opposite to that shown on the control placard, reverse the hoses on the side ports of the valve.

SECTION 7. REPAIR

This section includes disassembly, repair and assembly instructions for many of the components on the crane.

7-1. HYDRAULIC SYSTEM

Certain procedures involving the hydraulic system require special consideration for proper functioning and service life of the unit. These steps are to be taken whenever a hydraulic component is disconnected.

1. ALWAYS relieve internal hydraulic pressure before proceeding with the repair.

2. NEVER allow foreign matter - dirt, water, metal particles, etc. - to enter the hydraulic system through the open connection. Seal the connection as completely as possible. If dirt does get in, a filter change is required after about 50 hours of operation.

3. ALWAYS cycle all of the controls after completing a repair. This will eliminate air that is trapped in the cylinders, hoses, spool valves, etc., and avoid erratic bumpy behavior during actual working conditions.

4. ALWAYS check for hydraulic leaks after a repair. A high pressure leak is hazardous and must be repaired before putting the unit to work.

7-1-1. Cylinders

The main and secondary cylinders are of the same type; therefore, the same disassembly and repair instructions apply to both. Check the PARTS section for specific information. The following list of tools will be a definite asset in the disassembly and repair of all IMT cylinders:

1. Spanner wrench - IMT Part Number 3Y140510. Fits all IMT cylinders.

2. Needle-nose pliers - For removal and replacement of seals.

3. Ice pick or sharp awl - For removal and replacement of seals.

4. Plastic hammer - Used with the spanner wrench for head and piston installation

7-1-1-1. Cylinder Removal

1. Support the crane with the mast and boom at a 90° angle and the secondary and extension booms fully extended.

2. Kill the engine.

3. Relieve the internal hydraulic pressure (cycle the controls a few times.).

4. Disconnect the hydraulic hoses from the cylinder.

WARNING

Get help when removing the cylinder. Avoid dropping the cylinder and causing an injury or damaging the cylinder.

5. Remove the rod end pin.

   A. Remove the retainer and bushing.

   B. Hold the cylinder up and drive out the rod end pin.

6. Remove the butt end pin in the same manner as the rod end pin.

7. Carefully lower the cylinder.

7-1-1-2. Cylinder Disassembly

CAUTION

If solvent is used to clean the internal cylinder components, all traces of solvent must be removed. Any residual will damage the seals.

WARNING

Do not use compressed air to assist in withdrawing the piston/rod assembly. The use of compressed air may result in propelling the piston/rod assembly out of the cylinder and may cause serious injury or death.

NOTE

If the cylinder is being repaired due to a worn seal, we recommend replacing all components found in a repair kit. The small additional expense may save you expensive equipment down-time in the future. Refer to the PARTS section for seal kit part numbers.

1. Thoroughly wash the exterior of the cylinder case.

NOTE

After the case has been washed, proceed with disassembly in a clean environment, i.e. one that is free of dust and dirt.

2. Remove the six allen head screws and lift off the holding valve.

3. Place the cylinder on a flat surface near a vise. Slip a pin through the pin boss and clamp the pin in a vise (Figure G-1).

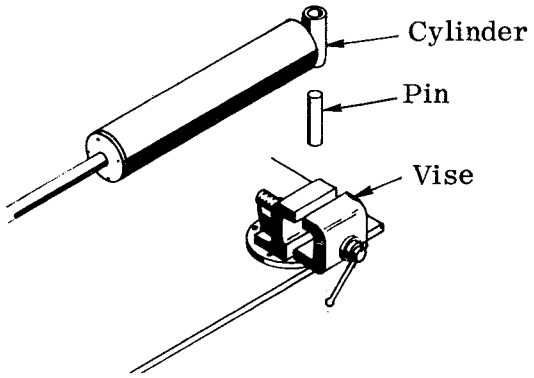


Figure G-1. Securing Cylinder

CAUTION

Do not clamp the cylinder in a vise. It may damage the cylinder.

4. Unscrew the head (No. 4, Figure G-2) in a counter-clockwise direction with the spanner wrench. Withdraw the head from the cylinder case.

5. Secure the rod pin boss in the same manner as the cylinder pin boss (Figure G-1).

6. Unscrew the piston (No. 8, Figure G-2) from the rod with a spanner in the same manner as the head.

CAUTION

Do not clamp the machined surface of the rod in a vise. Damage to the rod will result.

7. Remove the wafer-lock (No. 13) and the stop tubes (No. 7) from the rod. The wafer-lock was crushed to secure it and will have to be broken to remove it.

CAUTION

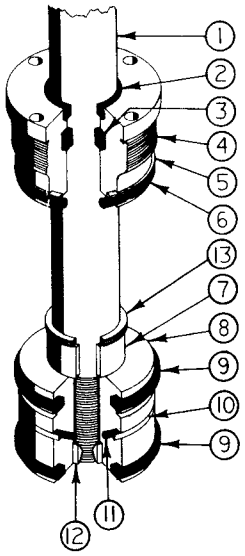
Make certain that the rod isn't damaged during removal of the wafer lock.

8. Slide the head (No. 4) off the rod.

9. Inspect the cylinder interior and the rod for dents, nicks, scratches, etc. and replace if necessary.

CAUTION

Failure to replace a damaged rod or cylinder may result in leaks and poor performance. Further equipment down-time will occur to remedy this problem.



1. Rod
2. Wiper
3. Dynamic Rod Seal
4. Head
5. Static Back-up
6. Static O-Ring
7. Stop Tube
8. Piston
9. Piston Rings
10. Dynamic Piston Seal
11. Companion O-Ring
12. Lock Ring
13. Wafer Lock

Figure G-2.. Cylinder Layout

NOTE

Further work should be done in a warm environment (70°F or warmer). This makes the seals easier to work with.

10. Work a slack section into the head seal static o-ring (No. 6) and pick it up out of the groove (Figure G-3). Lift the static back-up out of its groove with the needle-nose pliers.

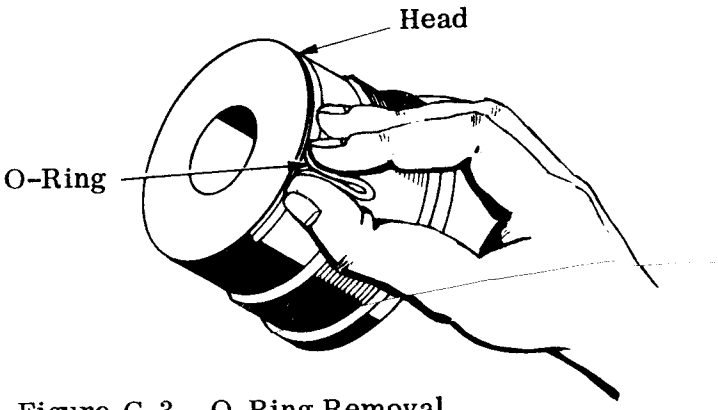


Figure G-3. O-Ring Removal

11. Pinch the lip of the rod wiper (No. 2) with the needle-nose pliers and pull it out of the head.

12. Position the head with the top of the head up and puncture the dynamic rod seal (No. 3) with the ice pick. Pry it out of the groove and push it on through the head (Figure G-4).

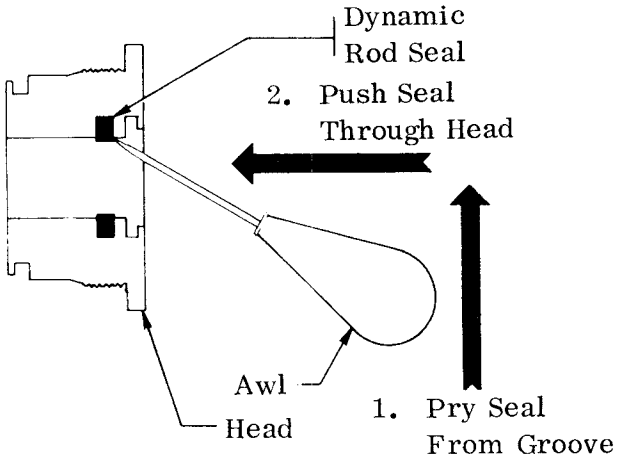


Figure G-4. Dynamic Rod Seal Removal

13. Spread the piston rings (No. 9), slip them over the land and off the end of the piston nearest to the ring.

14. Carefully lift the dynamic piston seal (No. 10) out of the groove with a thin blade such as a putty knife blade. Take care not to nick the edges of the groove. Twist and break the seal.

CAUTION

Damaging the edges of the groove is likely to cause premature seal failure.

15. Prick the companion o-ring with a pin or needle and lift it out of the groove. Roll it off the end of the piston.

16. Pry the lock ring (No. 12) from its seat in the bottom of the piston.

17. Clean the piston, head, rod and cylinder. Dress any nicks and gouges in the head and piston that may have occurred during disassembly.

7-1-1-3. Cylinder Assembly

CAUTION

Use all of the seals in the seal kit. It may save you expensive down-time in the future.

1. Install the companion o-ring (No. 11, Figure G-2). Make certain it is free of twists.

2. Slide the piston seal (No. 10) carefully into position.

CAUTION

Work the piston seal carefully into position from the top of the piston using the assembly groove. Do not attempt it from the bottom of the piston – you may stretch the seal and render it useless.

3. Slide the piston rings (No. 9) over the lands and allow them to snap into the grooves.

4. Carefully press the lock ring (No. 12) into position.

5. Install the static back-up (No. 5) and the o-ring (No. 6). Make certain there are no twists.

6. Position the head with the rod wiper pocket up. Grasp the dynamic rod seal (No. 3) with the needle-nose pliers (Figure G-5).

CAUTION

Do not apply too much pressure to the rod seal or you may cut it with the needle-nose pliar.

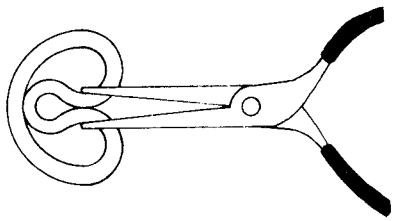


Figure G-5. Rod Seal Installation

7. Insert the dynamic rod seal into the head and allow it to snap into position. Use your fingers to help it if necessary.

8. Install the rod wiper (No. 2).

9. Generously lubricate the inside diameter of the head with a non-fibrous bearing grease such as Lubriplate.

10. Carefully slide the head onto the rod. Make certain that the rod wiper (No. 2) does not catch on the rod when it is first started. Slide the head all of the way onto the rod and up to the pin boss.

11. Slide the wafer-lock (No. 13) and stop tubes (No. 7 - if applicable) onto the rod.

12. Lubricate the entire threaded area of the rod and the inside diameter of the piston with non-fibrous bearing grease.

13. Secure the rod as shown in Figure G-1 and screw the piston onto the rod by hand. You should be able to get the piston almost all the way onto the rod before using the spanner wrench.

CAUTION

Check to make certain that the lock ring (No. 12) stays in position. It must remain in position or leaks may occur resulting in poor performance.

14. Torque the piston onto the rod at 250 ft. lbs. of torque. Impact the wrench three times with a heavy plastic hammer while maintaining the torque (Figure G-6).

15. Generously lubricate the outside diameter of both the head and piston with non-fibrous bearing grease. Also lubricate the threads and beveled area of the top of the cylinder case.

16. With a side-to-side or up-and-down motion, work the piston into the cylinder and past the threads and beveled area of the top of the cylinder case.

17. Slide the piston into the cylinder. With a rotating motion, work the o-ring (No. 6) and the back-up (No. 5) past the threads and hand tighten the cylinder head.

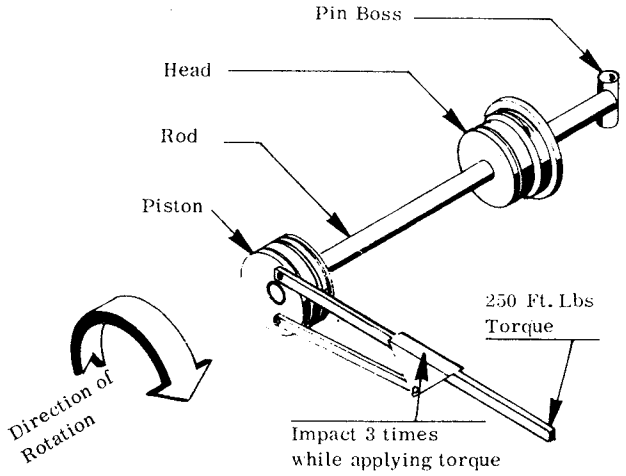


Figure G-6. Piston/Rod Assembly

18. Secure the cylinder (Figure G-1) and torque the head in the same manner as the piston (Step 14, Figure G-6).

19. Install the holding valves and their o-rings. Make certain that the o-rings are in good condition and properly positioned.

7-1-1-4. Cylinder Installation

1. Raise the cylinder until one of the pin bosses lines up with its hole on the crane boom. Drive a pin through the pin boss.

2. Raise the other end of the cylinder until it lines up and insert the pin.

3. Install the bushings and retaining rings.

4. Connect the hydraulic hoses.

5. Start the engine and engage the PTO.

6. Cycle the controls until the crane operates smoothly. This will evacuate the air in the system.

7. Check for hydraulic leaks and repair if necessary.

7-1-1-5. Outrigger Cylinder Removal and Installation

1. Start the truck engine and engage the PTO. Extend the affected outrigger out and down until the pad is resting on an 8-inch thick block. Kill the engine.

2. Remove the rod end pin.

CAUTION

It may be necessary to retract the cylinder slightly to relieve the pressure exerted on the pin. Any attempt to force the pin at this time may damage the pin or bushings.

3. Wrap a chain hoist or cable around the rod between the cylinder case and the pin boss. Wrap the chain or cable in a rag to protect the plated, machined surfaces on the rod. Slowly retract the rod.

4. Raise the rod end of the cylinder to a vertical position. Disconnect the hydraulic hoses from the cylinder port block.

5. Wrap a second chain or cable around the cylinder case just in front of the port block (between the port block and the cylinder head).

6. Take up the slack in both hoists, remove the butt end pin and lift the cylinder.

To install the cylinder:

1. Lower the cylinder into position until the butt end pin boss lines up with the hole on the base. Make certain the port block is toward the base and not facing upward. Install the pin, bushing and roll pin.

2. Raise the rod end to a vertical position and connect the hydraulic hoses to the port block.

3. Lower the cylinder to a horizontal position. Extend and retract the rod one complete cycle to evacuate air in the system. Check for leaks.

4. Lower the cylinder and extend the rod until the pin boss lines up with the hole on the outrigger leg. Install the pin, bushing and roll pin.

7-1-2. Hydraulic Brake Repair

To repair the hydraulic brake:

1. Disconnect and cap the hydraulic hoses to the motor and brake.

2. Remove the bolts (2) securing the motor to the brake and remove the motor. The motor must be lifted straight up off the brake and may require the use of a pry bar or large common screwdriver.

3. Remove the bolts (2) securing the brake to the base of the crane. Lift the brake straight up off the drive gear.

4. Plug the hydraulic port on the brake and thoroughly wash the exterior of the brake with warm soapy water. Blow it dry with compressed air.

CAUTION

If the hydraulic port isn't plugged, the brake must be serviced immediately. Failure to comply may result in rust inside the brake.

5. Remove the bolts holding the brake housing together.

CAUTION

The brake is spring-loaded. When the bolts are removed, it may separate by itself and parts may be lost.

6. Lift the piston, rotation discs and stationary discs out of the brake housing.

7. Remove the large retaining ring and push the shaft and bearing out of the bottom housing.

8. Replace any excessively worn discs and all o-rings and back-up rings.

To assemble the brake:

1. Install the springs and torque pins in the bottom of the brake housing.

CAUTION

Make certain that the discs are clean and oil free.

2. Install a stationary disc, spring and rotation disc in the sequence specified. The springs slide over the torque pins as do the slots in the stationary discs. Continue until all discs and springs are in position.

NOTE

Due to spring pressure, the stack of discs is higher than the walls of the brake housing. A second person will be needed for the following operations.

3. Bend a coat hanger or other stiff wire as shown in Figure G-7. Insert the tips of the hanger through the shaft opening in the bottom housing until the tips of the hanger extend above the stack of discs. Spread the tips and pull the stack of discs down into the bottom housing. This will keep the springs and stationary discs aligned on the torque pins.

4. Have another person install the piston and top housing while holding tension on the hanger. Start all four bolts before releasing the hanger tension. Do not tighten the bolts.

5. Install the shaft and bearing through the bottom housing. Wiggle the shaft back and forth while rotating it back and forth until the rotation discs are lined up and will slide over the shaft.

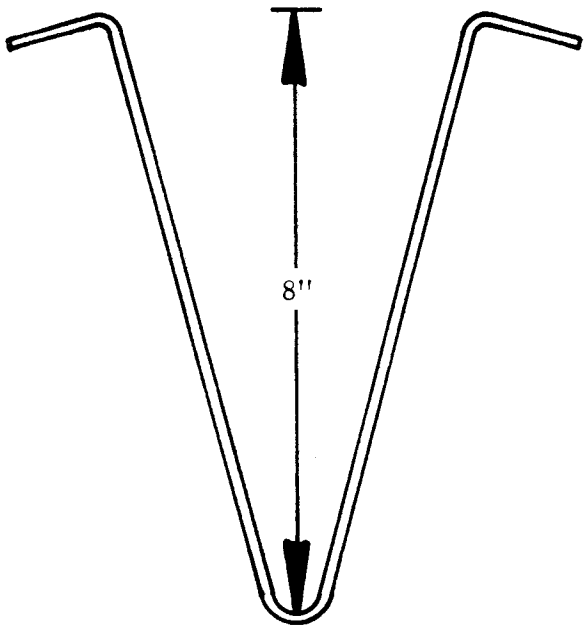


Figure G-7. Brake Assembly Tool

NOTE

If the bolts were over-tightened in step 4, it will make alignment of the shaft more difficult.

6. Install the large retaining ring to secure the bearing.

7. Evenly tighten the four bolts and torque to the appropriate value (Table I-2).

8. Install the brake and rotation motor on the crane base. Connect the hydraulic hoses.

9. Start the engine, engage the PTO and make several start/stop operations. Swing the crane completely at least five times in both directions to purge the air in the system. Check for leaks and repair them if any are found.

10. Check the hydraulic reservoir level with all cylinders retracted and fill if necessary.

7-1-3. Non-repairable Components

The following components are considered to be non-repairable and must be replaced if defective.

1. Hydraulic rotation motor.

2. Spool valves.

3. Hydraulic pump.

7-2. BEARINGS

7-2-1. Turntable Gear Bearing

1. Raise the secondary boom to a 90° angle relative to the mast. Support the crane in this position.

WARNING

If you use a hoist to support the crane, make certain that the hoist is capable of lifting the crane

2. With power off, cycle the controls a few times to relieve internal hydraulic pressure.

3. Disconnect the hydraulic hoses at the spool valves. Mark the hoses to identify their location on the spool valves for later assembly.

4. With crane in a fully supported position, remove the eighteen bolts around the base of the mast.

5. Carefully lift the crane while simultaneously feeding the hydraulic hoses through the base. Set the crane aside where it won't be damaged.

CAUTION

Do not lift the crane too quickly or damage to the hoses may result.

6. The turntable gear bearing is now exposed. Turn the base upside down after unbolting it from the truck frame.

CAUTION

Hydraulic hoses from the PTO must be disconnected before attempting to turn the base upside down.

7. Disconnect the lubrication line from the gear-bearing.

8. Remove the twenty-three bolts fastening the turntable gear bearings to the base. Support the gear during this operation to make certain the gear doesn't fall out.

9. Replace the gear-bearing and assemble the crane the reverse of disassembly.

NOTE

A new gear-bearing is available from Iowa Mold Tooling Co. Inc.; 500 Highway 18 West; Garner; Iowa; 50438; Attn: Customer Service. Be sure and specify, model number and serial number of crane.

10. Torque all of the gear-bearing bolts to the proper torque value (refer to Table I-2).

11. Start the unit and slowly cycle all of the controls to evacuate air trapped in the hydraulic system. Simultaneously, check for hydraulic leaks.

7-2-2. Pinion Gear and Drive Gear Bushings

To remove the pinion gear:

1. Rotate the crane until the notch on the mast base plate is positioned over the pinion gear.

2. Remove the pinion gear cover.

3. Locate and remove the retaining ring on the bottom of the pinion gear.

4. Lift the pinion gear up and out of the intermediate gear. Slide the intermediate gear out of the way.

5. Install the bearing removal tool as shown in Figure G-8.

NOTE

The new cranes have the top bushing machined flat on one side. If the top bushing is not flat on one side as is the case on older cranes, it will have to be notched. Use a chisel to cut it.

6. Apply power to pull the bushings up and out of the base.

NOTE

Power may be supplied by a simple hand pump or by an air-over-hydraulic intensifier pump.

7. To install the bushings, assemble the tool as shown in Figure G-9. The flat side of the ring bushing set and top bushing fits against the gear-bearing. A spacer is installed and then the hydraulic jack.

8. Apply power to press the bushings into place.

9. Install the pinion gear and intermediate gear. Install the retaining ring on the bottom of the pinion gear. Lubricate the pinion gear.

10. Install the pinion gear cover.

To remove the drive gear:

1. Disconnect the hydraulic hoses and remove the rotation motor.

2. Remove the grease plate on the bottom of the drive gear.

3. Install the tool as shown in Figure G-8. Apply power to pull the bushings and gear upward.

4. Reassemble the tool as shown in Figure G-9. Press the new gear and bushings into place.

5. Install the grease plate and rotation motor. Lubricate the drive gear.

6. Connect the hydraulic hoses to the motor.

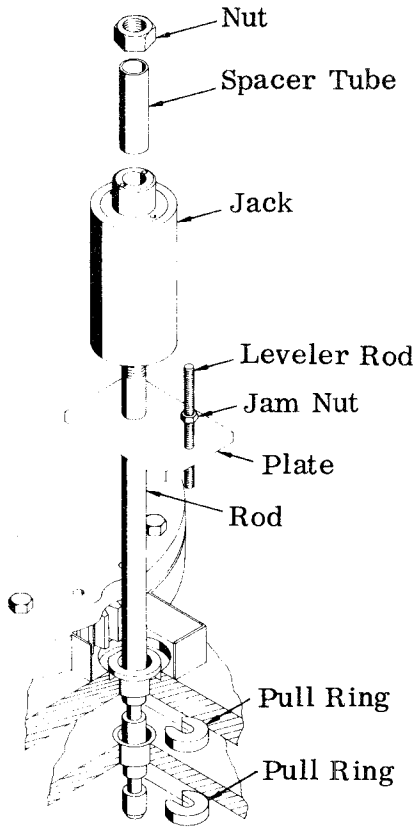
7. Start the engine, engage the PTO and test actuate the rotation motor. Check for leaks.

8. Rotate the crane at least five times in both directions to purge the air trapped in the rotation motor.

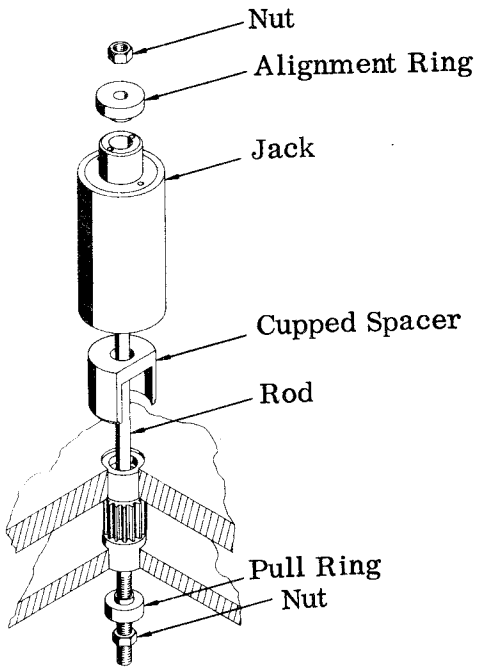
7-2-3. Cylinder Pin Bushings

1. Remove the cylinder (refer to paragraph 7-1-1, Cylinders)

2. Remove the boom hinge pins in the same manner as the cylinder pins.

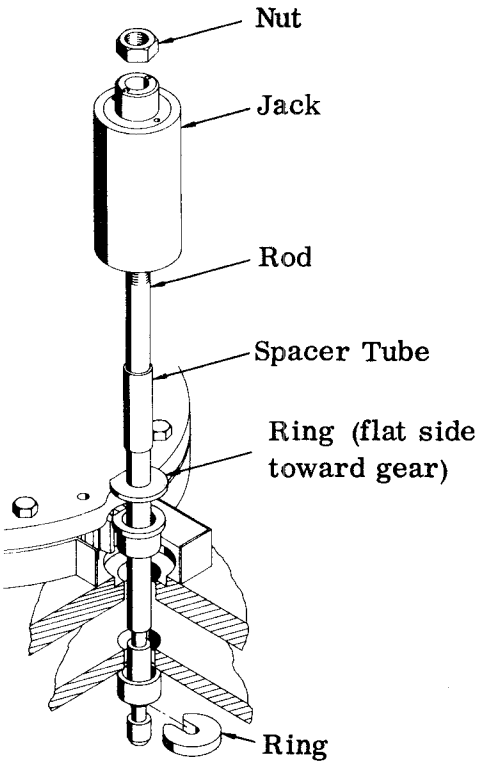


Pinion Gear

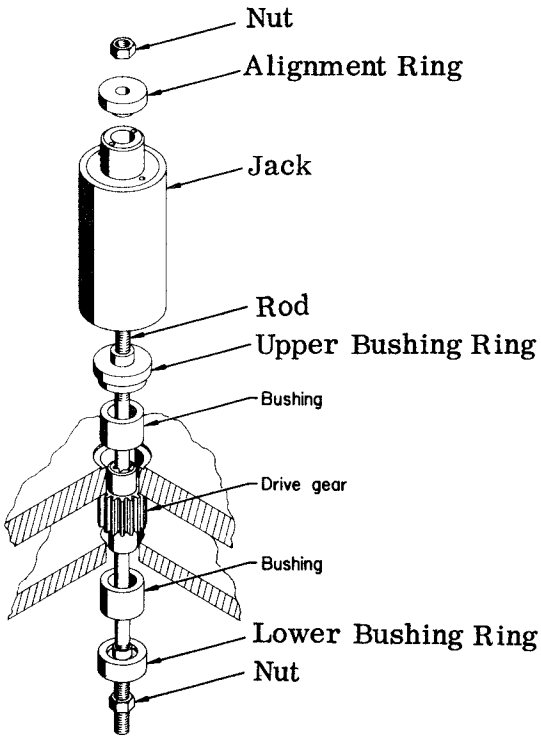


Drive Gear

Figure G-8. Bushing Removal



Pinion Gear



Drive Gear

Figure G-9. Bushing Installation

3. Press the bushings out of the hole with a hydraulic press and install new bushings.

4 Assemble the crane the reverse of disassembly.

7-2-4. Boom Hinge Pins and Bushings

Follow the same procedure listed in paragraph 7-2-3 in this section.

7-3. TROUBLESHOOTING

Table G-1 is intended for quick reference in diagnosing on-the-job malfunctions. Care has been taken to list the possible causes in the most likely order of occurence.

TABLE G–1. TROUBLESHOOTING CHART

MALFUNCTION	POSSIBLE DEFECT
Controls fail to respond	1. Standard unit A. The PTO is not engaged. B. Hydraulic oil supply is low. C. Hydraulic pressure line is ruptured. D. Hydraulic pump is faulty. E. Relief valve is set incorrectly.
Operation slow down	1. Hydraulic oil supply is low. 2. Hydraulic pump is operating at a reduced speed. 3. Relief valve is set too low. 4. Pump or cylinder is worn. 5. Pump is slipping due to excessive oil temperature. This is a factor which will increase with worn components. 6. Filters are dirty. 7. Valve spools are inoperative. 8. Obstruction has occurred in boom holding valve.
Boom drifts when loaded and controls neutralized	1. Hydraulic oil is bypassing at piston seal. 2. Main or secondary cylinder holding valves are defective or contaminated.
Unusual noise in operation	1. Cavitation is occurring due to low hydraulic oil supply. 2. Loading is excessive. 3. Restriction or collapse of suction line has occurred. 4. Suction line filter is clogged and requires replacement. 5. Bypass settings on relief valve are too low. 6. Relief valve is damaged. 7. Valve closure is obstructed due to particle accummulation.

TABLE G–1. TROUBLESHOOTING CHART (cont.)

MALFUNCTION	POSSIBLE DEFECT
Outriggers fail to retract	1. Control valve spool is inoperative. 2. Cylinder or check valve is defective. 3. Hydraulic lines are restricted or ruptured.
Outriggers yield or drift	1. Hydraulic lines are ruptured. 2. Internal bypass is occurring in cylinders.
Boom jumps or bounces when lowered under load	1. Check cylinder base side port of control valve and install orifice (see Section 5, Valve Port orifice).

8-1. GENERAL

These instructions are intended as a guide to assist you with your particular installation. Obviously, we cannot cover every make, model and year of truck manufactured world wide, so these instructions will provide only general information. Use this section for what it was intended - a guide.

8-2. CHASSIS PREPARATION

1. Inspect the carrier vehicle to assure compliance with the requirements listed in paragraph 3-8, MINIMUM CHASSIS SPECIFICATIONS.

2. Chassis frame must be clear of all obstructions immediately behind the cab for a distance of 36" (91.4 cm). Space will be available for gas tanks, etc. after crane is installed.

3. Install the PTO according to the manufacturer's instructions (refer to paragraph 8-3-2 or 8-3-3).

4. Install the pump. Ensure that correct pump rotation is employed and tighten the pump mounting bolts (Figure H-4).

5. Replace the transmission grease and check for leaks.

6. Install the suction line filter below the top of the frame and within 48" of the pump (Figure H-2). Locate it in such a way as to make it easily accessible for service.

7. If rivets protrude through the top of the frame flange, install a 3/8" x 3" (0.95 cm x 7.6 cm) flat bar strip on top of frame flange to provide a flat mounting surface. Tack weld along the edge of the frame.

WARNING

Do not weld across the frame. This can seriously damage a frame and render it structurally unsound.

8. Spray paint all unpainted surfaces.

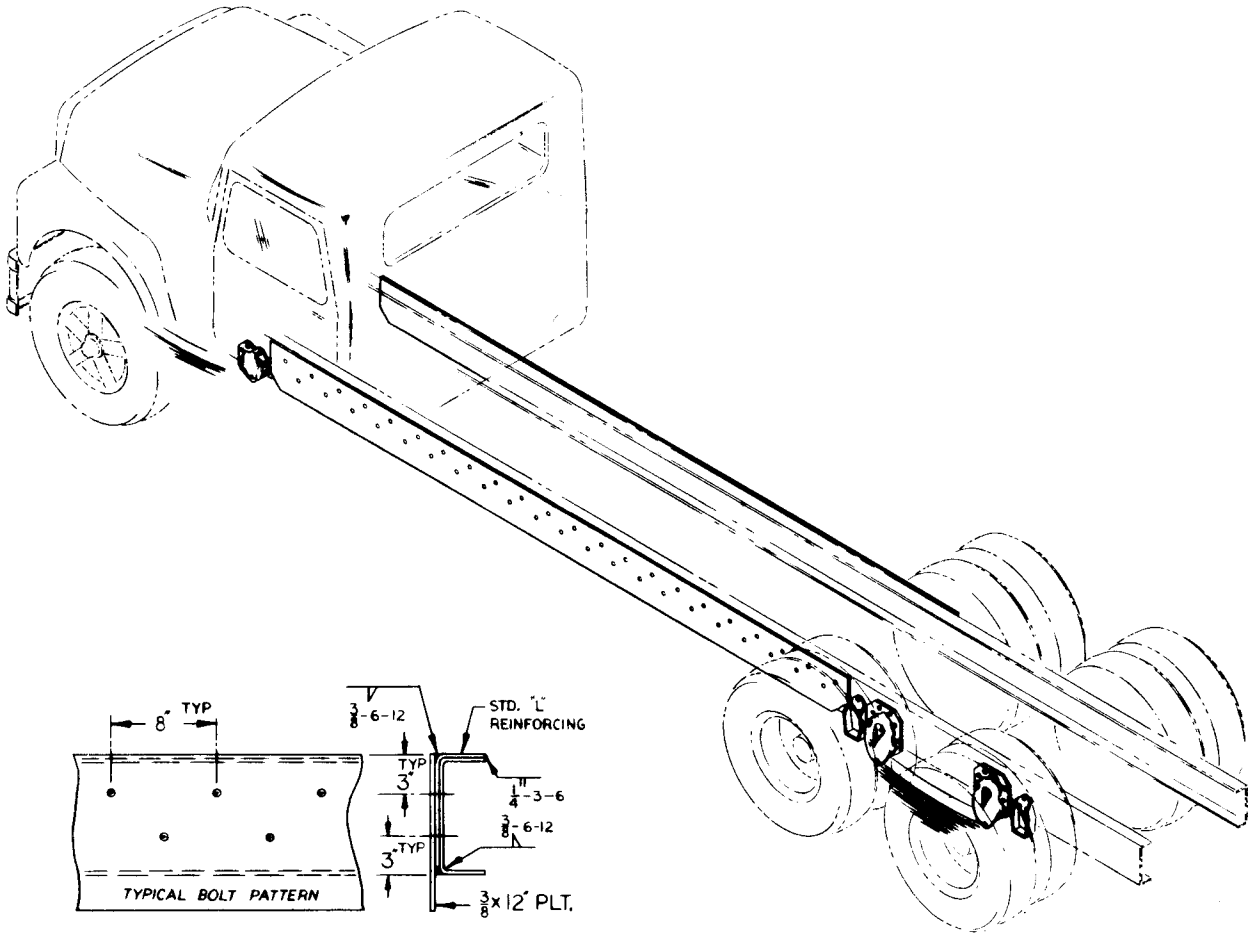


Figure H-1. Frame Reinforcement

8-2-1. Frame Reinforcement

If chassis frame does not meet minimum section modulus or RBM requirements, it must be fishplated.

NOTE

Use the same type of materials as in the truck frame

1. Strip frame of all steps, tanks, etc. which are attached between the front of the rear-spring hanger and the back of the front-spring hanger.

2. Clamp 3/8" x 12" plate to both sides from a point immediately behind the front-spring hanger and directly ahead of the rear-spring hanger. Use heavy-duty C-clamps to secure the plates tight against the frame.

3. Where possible, drill and reinstall the original bolts.

4. Weld fishplate to "L" reinforcing angles (Figure H-1).

WARNING

Do not weld on high-tensile frames. The heat generated by welding can cause structural damage to the truck frame resulting in a frame failure. Bolt fishplate utilizing pattern in Figure H-1. Use 3/4-8 NC Grade 6 or 8 bolts, hardened washers both sides and self-locking nuts. Torque according to Torque Data Table in the Appendix.

5. Reinforce frame flange by tack welding four flat bar strips vertically as shown in Figure H-2. The front pair should be centered 6" (15.24 cm) behind the cab and another pair centered 30" (76.20 cm) behind those. These bars will prevent frame flange collapse.

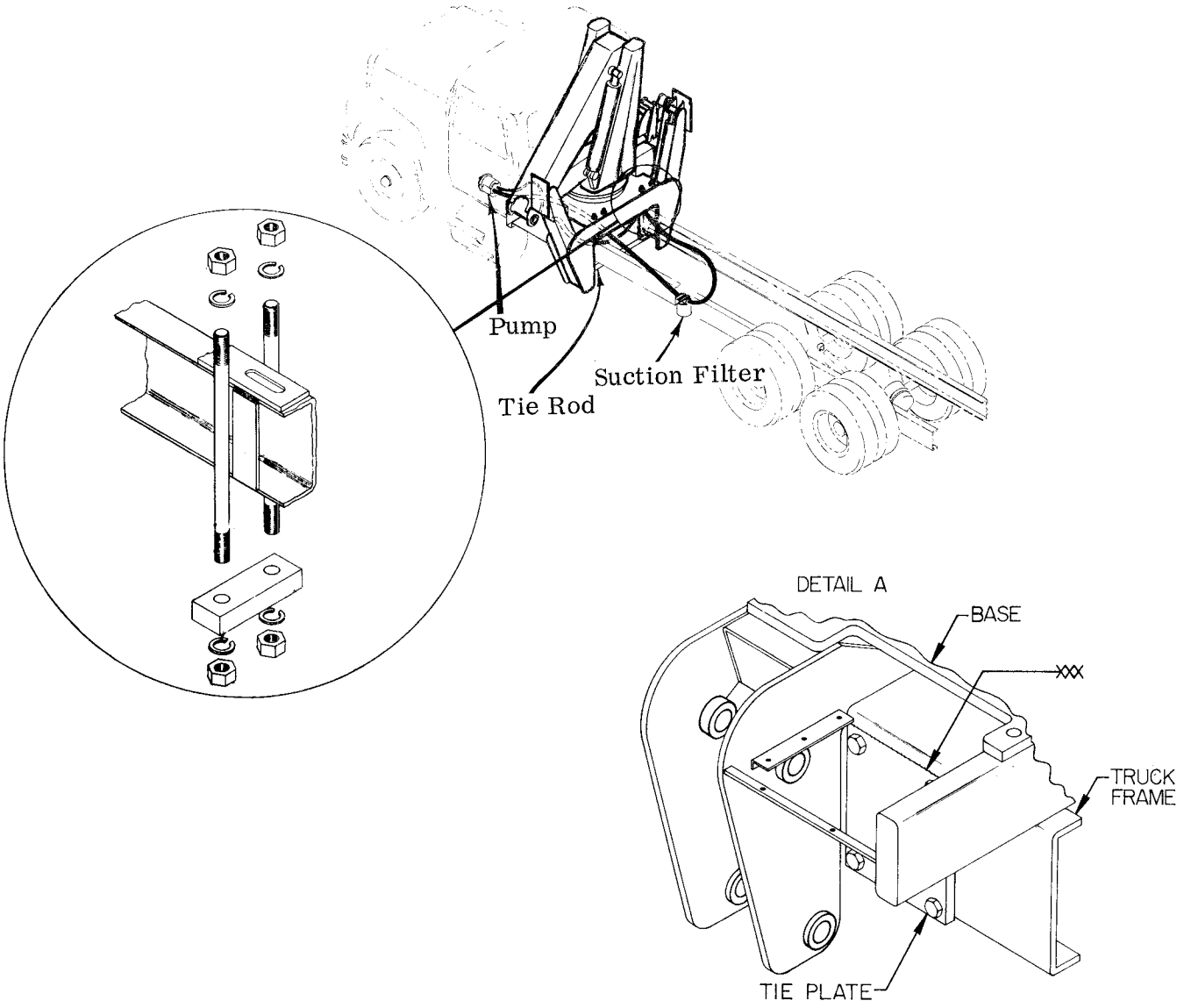


Figure H-2. Installation

8-3. INSTALLATION OF CRANE ASSEMBLY

1. Use a lifting device capable of lifting the weight of the crane. Attach the lifting hook to lift bracket welded to top of main boom. Lift crane, move chassis under crane and lower crane into desired position. Check for front to rear alignment.

2. Install mounting bolts, clip bars, lock washers and nuts to secure crane base to chassis (Figure H-2). Torque mounting bolts (refer to Table I-2).

3. Bolt the tie plate (detail "A", Figure H-2) to the truck frame and weld it to the crane base. Use 3/8" steel plate, 10" x 12" for the tie plate. The bolts should be 3/4"-8, Grade 8. Torque to the proper value (refer to Table I-2).

8-3-1. Hydraulic Connections

Install the hydraulic connections as follows:

1. Install the 1¼" ID suction hose, barbed nipples (2) and hose clamps (2) between the reservoir and the suction filter (Figure H-2). Cut hose to suit.

2. Install the 1¼" ID suction hose, barbed nipples (2) and hose clamps (2) between the filter and pump.

3. Install the ½" ID pressure hose and swivel hose fittings (2) between the pump and valve bank.

NOTE

All fittings should be properly treated with a good sealant material and adequately tightened to prevent leaks.

4. Fill reservoir with oil. See Table E-2, Oil Specifications.

5. Check the unit for leaks.

6. Start engine, engage PTO and charge system with oil.

7. Check oil reservoir and refill as necessary.

8. Test unit according to Structural and Stability Test form in the Appendix.

9. At the conclusion of test procedures, re-inspect, check for leaks and completely check all lubrication points (refer to Figure E-1 and Table E-1).

10. Make all final adjustments and corrections.

11. Paint unit as required.

12. Ensure all placards are in place (refer to Figure B-4).

13. Install "Electrocution" placards (Figure H-3).

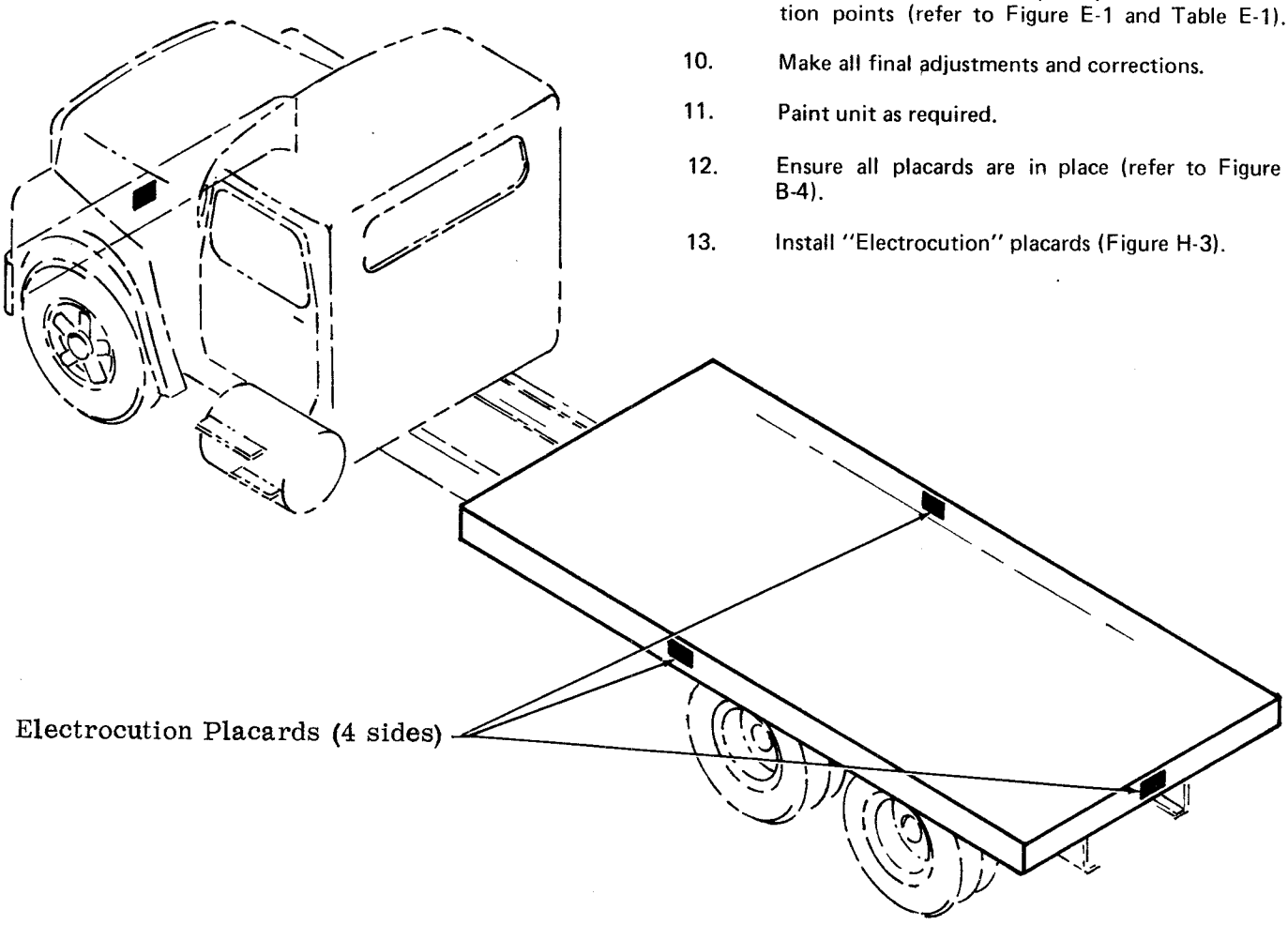


Figure H-3. Electrocution Placard Placement

8-3-2. Power Take-Off Installation

Power take-off manufacturers provide specific installation instructions on their products. These instructions should be followed when installing a PTO. The following steps are a guide in this application.

1. If the vehicle is new, drain the transmission oil into a clean container for reuse. If the vehicle is used, dispose of the oil.

2. Temporarily install the PTO with the proper gaskets and only two studs. Snug the PTO down and check the backlash for a maximum allowance of 1/32" to 1/16". If the backlash exceeds this amount, remove gaskets and check backlash again until it is correct.

NOTE

It may be necessary to remove and modify the exhaust pipe to provide adequate clearance for the PTO.

3. Remove PTO and apply Permatex to gaskets. If the holes for the studs are tapped through, apply Permatex to the studs and tighten them down. Make certain the studs do not interfere with transmission gears.

CAUTION

Avoid contact of Permatex with automatic transmission fluid.

4. Install PTO and gaskets. Tighten nuts to 30–35 ft. lbs. (4.14–4.84 kg-m) for a 6 bolt PTO, 45–50 ft. lbs. (6.22–6.91 kg-m) for 8 bolt PTO's. Recheck backlash.

5. Install shifter cable to suit conditions. Always allow a slight overshift on lever or knob to ensure PTO is fully engaged.

CAUTION

Avoid sharp bends in the shifter cable. All bends should have a minimum 6" radius. Tighter bends will cause difficult operation of the shifter knob.

6. Replace transmission oil. If PTO is below oil level, an additional quantity of oil will be required.

7. Start engine, engage PTO and allow it to run for 5–10 minutes. Check for leaks, unusual noise and proper operation.

8. Retorque mounting bolts.

NOTE

The application shown is the one normally used by IMTCO. If a driveline is used, refer to paragraph 8-3-3.

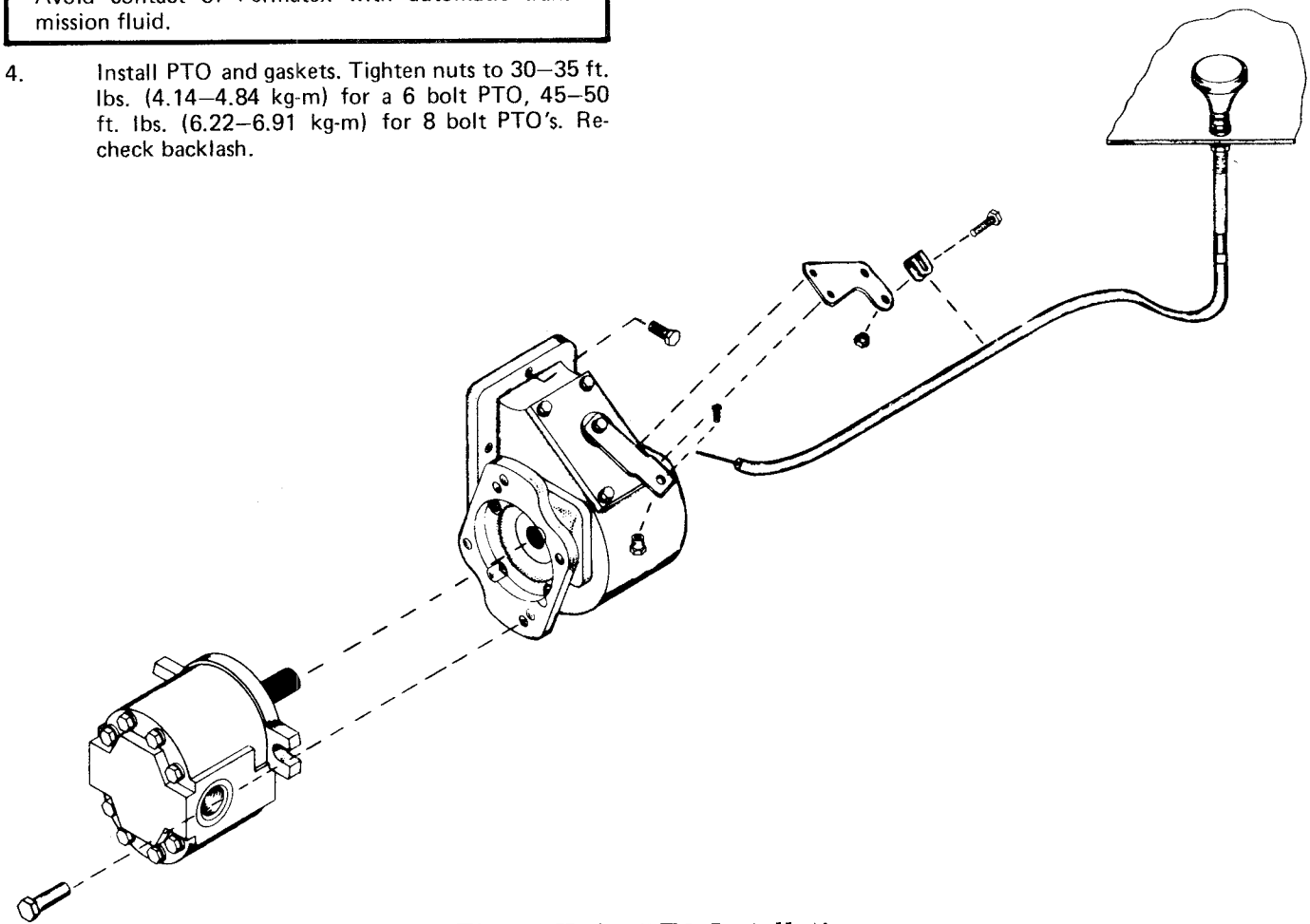


Figure H-4. PTO Installation

8-3-3. Driveline Power Application

The pump can be driven as shown below as an optional method to the one given in paragraph 8-3-2. The following steps are a guide in this application.

1. Install the PTO (refer to paragraph 8-3-2).
2. Loosely bolt the pump mounting bracket to the adjustable bracket.
3. Bolt the adjustable bracket to the frame at a point that will not exceed 48" (122 cm) from the PTO and will not cause a joint angle greater than 8°.
4. Check pump rotation and install pump, pump end yoke and PTO end yoke.
5. Size, cut and weld the driveline to the necessary length. Ensure driveline balance. Allow 1" (2.54 cm) extra for PTO end yoke.
6. Install driveline, lock set screws and lubricate u-joints.
7. Ensure all mounting bolts are tight.

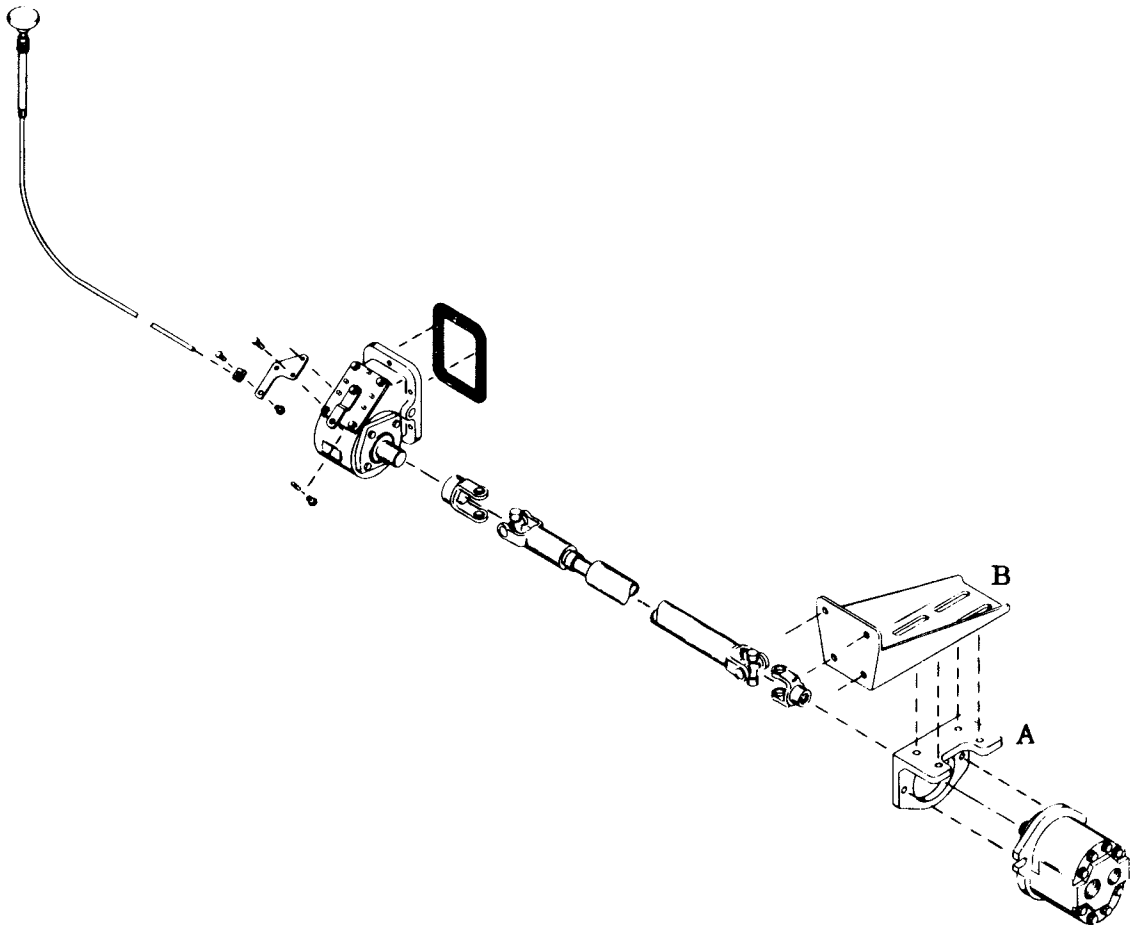


Figure H-5. Driveline Application

SECTION 9. APPENDIX

Definite tire inflation pressures are established for each tire size depending upon the load imposed on the tires. For greater stability, riding comfort and prolonged tire life, tires should be inflated for the loads carried. The "Load and Inflation Table" shown below, indicates the proper inflation pressures.

TABLE I-1. TIRE LOAD AND INFLATION PRESSURE

SINGLE TIRES FOR TRUCKS IN HIGHWAY SERVICE

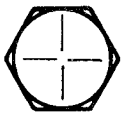
Tire Size	Load Range	TIRE LOAD LIMITS AT VARIOUS INFLATION PRESSURES										
		50	55	60	65	70	75	80	85	90	95	
7.00-20	D	2100	2260	2390	2530	2670	2790					
7.00-20	E	2100	2260	2390	2530	2670	2920	3030	3150			
7.50-20	D	2360	2530	2680	2840	2990	3140					
7.50-20	E	2360	2530	2680	2840	2990	3140	3270	3410	3530		
8.25-20	E	2800	3010	3190	3370	3560	3730	3890	4050			
8.25-20	F	2800	3010	3190	3370	3560	3730	3890	4050	4210	4350	4500
9.00-20	E		3560	3770	4000	4210	4410	4610				
9.00-20	F		3560	3770	4000	4210	4410	4610	4790	4970	5150	
10.00-20	F			4290	4530	4770	4990	5220	5430			
10.00-20	G			4290	4530	4770	4990	5220	5430	5640	5840	6040
11.00-20	F			4670	4940	5200	5450	5690	5920			
11.00-20	G			4670	4940	5200	5450	5690	5920	6140	6370	6590
11.00-22	F			4960	5240	5520	5790	6040	6290			
11.00-22	G			4960	5240	5520	5790	6040	6290	6530	6770	7000

DUAL TIRES FOR TRUCKS IN HIGHWAY SERVICE

Tire Size	Load Range	TIRE LOAD LIMITS AT VARIOUS INFLATION PRESSURES										
		40	45	50	55	60	65	70	75	80	85	90
7.00-20	D	1840	1980	2100	2220	2340	2450					
7.00-20	E	1840	1980	2100	2220	2340	2450	2560	2660	2760		
7.50-20	D	2070	2220	2350	2490	2620	2750					
7.50-20	E	2070	2220	2350	2490	2620	2750	2870	2990	3100		
8.25-20	E	2460	2640	2800	2960	3120	3270	3410	3550			
8.25-20	F	2460	2640	2800	2960	3120	3270	3410	3550	3690	3820	3950
9.00-20	E		3120	3310	3510	3690	3870	4040				
9.00-20	F		3120	3310	3510	3690	3870	4040	4200	4360	5420	
10.00-20	F			3760	3970	4180	4380	4580	4760			
10.00-20	G			3760	3970	4180	4380	4580	4760	4950	5120	5300
11.00-20	F			4100	4330	4560	4780	4990	5190			
11.00-20	G			4100	4330	4560	4780	4990	5190	5390	5590	5780
11.00-22	F			4350	4600	4840	5080	5300	5520			
11.00-22	G			4350	4600	4840	5080	5300	5520	5730	5940	6140

Tire and Rim Association Standard Tire Loads at Various Inflation Pressures. Load range letters and corresponding ply rating (D=8 ply, E=10 ply, F=12 ply and G=14 ply).

TABLE I-2. TORQUE DATA

Grade Bolt	SAE GRADE 1 OR 2		SAE GRADE 5		SAE GRADE 6		SAE GRADE 8	
Marking								
Definition	Indeterminate Quality		Minimum Commercial Quality		Medium Commercial Quality		Best Commercial Quality	
Material	Low Carbon Steel		Medium Carbon Steel Tempered		Medium Carbon Steel Q & T		Med. Carbon Alloy Steel Q & T	
Min. Tensile Strength	64,000 psi (44,998,400 kgs/sq m)		105,000 psi (73,835,500 kgs/sq m)		133,000 psi (93,512,300 kgs/sq m)		150,000 psi (105,465,000 kgs/sq m)	
Bolt Size	RECOMMENDED TORQUE VALUES							
Frac. mm	Ft. lbs.	kg-m	Ft. lbs.	kg-m	Ft. lbs	kg-m	Ft. lbs.	kg-m
1/4" 6.35	5	.69	7	.96	10	1.38	10.5	1.45
5/16 7.92	9	1.24	14	1.93	19	2.62	11	3.04
3/8 9.52	15	2.07	25	3.45	34	4.7	37	5.11
7/16 11.09	24	3.31	60	8.29	55	7.6	60	8.29
1/2 12.7	37	5.11	60	8.29	85	11.75	92	12.72
9/16 14.27	53	7.32	88	12.17	120	16.59	132	18.25
5/8 15.87	74	10.23	120	16.59	167	23	180	24.89
3/4 19.05	120	16.59	200	27.66	280	38.72	296	40.93
7/8 22.22	190	26.27	302	41.76	440	60.85	473	65.41
1 25.4	282	39	466	64.45	660	91.27	714	98.74

In using the torque data in the chart above, the following rules should be observed:

1. Manufacturer's particular specifications should be consulted when provided.

2. When multiple tapered tooth (shakeproof) are employed, the torque should be increased by 20%.

3. All torque measurements are given in foot-pounds.

4. The information in the chart is pertinent to lightly lubricated coarse and fine thread fasteners.

5. To convert measurement to inch-pounds, multiply by 12.

STRUCTURAL AND STABILITY TEST FORM

CHASSIS INFORMATION

Make_____ Model_____ Serial No._____

W/B_____ C/A_____ Transmission_____

GAWR-FRT_____ GAWR-REAR_____ GVWR_____

PTO Model_____ PTO %_____

Pump Model_____ Pump Rotation_____

Unit Model_____ Unit Serial No._____

Order No._____ Date_____

Prior to placing unit into service, the following tests must be performed:

INSPECTION AND TEST CHECK

1. Power Take-Off shifting cable for efficient operation.
2. PTO mounting bolts.
3. Transmission grease.
4. Underdrive hoses for breaks.
5. Routing of hoses - no kinks, muffler or tailpipe contact.
6. All pins and retainer parts.
7. Mounting bolts for tightness.
8. Lubricate all necessary lube points - check chart.
9. Fill oil reservoir.
10. Shut-off valve open.

OPERATING TEST

1. Slowly operate unit through all motions. Check hoses, cylinders, and all structural parts for proper operation.
2. Check placards to ensure correctness.
3. With full rated load - 9000# (4491 kgs) @ 17' 1-3/8" (5.22 m) - and booms at 30° above horizontal position, check holding valves. Shut engine off and open control valves, one at a time, starting with secondary down, main down and extension out. No function drift should occur.
4. Restart engine and retract the extension boom five times for proper operation.
5. Raise and lower secondary boom five times.
6. Raise and lower main boom five times.

7. Check stability by lowering the rated load - 9000# (4491 kgs) @ 17' 1-3/8" (5.22 m) to a low practical position. Rotate crane very slowly while constantly observing vehicle wheels for contact with ground.

   a. Note % rated stability.

   b. Position of stability (355° or portion thereof.

8. If unit is stable, rotate complete cycle five times.

9. Time the unit function for speed. Record and compare with times shown in ( ) below:

Main	(32 Sec.)
Secondary	(24 Sec.)
Extension	(14 & 7 Sec.)
Rotation	(30 Sec.)
Outrigger	(16 Sec.)

10. Give the unit a final inspection, note and correct deficiencies.

Dealer or Installation Agent

I have tested this unit as described above and hereby release it for service.

Date_____ S/N_____

Name_____

Signed_____