

**Volume 2**  
**Parts and Specifications**  
**Model 2815 Crane**

**IOWA MOLD TOOLING CO., INC.**

BOX 189, GARNER, IOWA 50438-0189

515-923-3711

PRODUCT SUPPORT FAX: 515-923-3674

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12-02-92  
03-11-93  
06-10-93  
10-15-93  
10-19-93

## Introduction - Read Carefully!

This volume deals with information applicable to your particular crane. For operating, maintenance and repair instructions, refer to Volume 1, OPERATION, MAINTENANCE AND REPAIR. Volume 1 contains the following information:

- SECTION 1. OPERATION
- SECTION 2. MAINTENANCE
- SECTION 3. REPAIR
- SECTION 4. INSPECTION & TEST REPORT
- SECTION 5. INSTALLATION - CHASSIS PREPARATION
- SECTION 6. APPENDIX

We recommend that Volume 2, PARTS AND SPECIFICATIONS be kept in a safe place in the office.

This manual is provided to assist you with ordering parts for your IMT truck-mounted articulating crane. It also contains additional instructions regarding your particular installation.

It is the user's responsibility to maintain and operate this unit in a manner that will result in the safest working conditions possible.

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

In addition, it is also the user's responsibility to be aware of existing Federal, State and Local codes and regulations governing the safe use and maintenance of this unit. Listed below is a publication that the user should thoroughly read and understand.

ANSI/ASME B30.22  
ARTICULATING BOOM CRANES  
The American Society of Mechanical  
Engineers  
United Engineering Center  
345 East 47th Street  
New York, NY 10017

Three means are used throughout this manual to gain the attention of personnel. They are NOTE's, CAUTION's and WARNING's and are defined as follows:

### NOTE

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

### CAUTION

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

### WARNING

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

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

# TABLE OF CONTENTS

PARAGRAPH	TITLE	PAGE
<b>Section 1. SPECIFICATIONS</b>		
1-1.	General	1-1
1-2.	Lifting Capacity	1-1
1-3.	Performance Characteristics	1-1
1-4.	Minimum Chassis Specifications	1-1
1-5.	Cylinders	1-2
1-6.	Power Source	1-2
1-7.	Cylinder Holding Valves	1-2
1-8.	Rotation System	1-2
1-9.	Hydraulic System	1-2
<b>Section 2. CRANE DESCRIPTION</b>		
2-1.	General	2-1
2-2.	Base	2-1
2-3.	Mast	2-1
2-4.	Inner Boom	2-1
2-5.	Outer Boom	2-1
2-6.	Extension Boom	2-1
2-7.	Controls	2-1
2-8.	Hydraulics	2-1
<b>Section 3. INSTALLATION</b>		
3-1.	General	3-1
3-2.	Crane Installation	3-1
3-3.	Hydraulic Installation	3-2
<b>Section 4. PARTS LISTS</b>		
4-1.	General	4-1
4-2.	Crane Identification	4-1
4-3.	Cylinder Identification	4-1
4-4.	Weldment Identification	4-2
4-5.	Ordering Repair Parts	4-2
<b>Section 5. REFERENCE</b>		

# LIST OF ILLUSTRATIONS

FIGURE	TITLE	PART NUMBER	PAGE
A-2	Geometric Configuration		1-3
A-2	Capacity Chart		1-4
B-1	2815 Crane Group		2-2
C-1	Crane Installation		3-1
C-2	Hydraulic Installation		3-2
D-1	Serial Number Placard		4-1
D-2	Cylinder Identification		4-1
D-3	Weldment Part Number Locations		4-2
D-4	Base and Outrigger Assembly (Previous Model)	41707989	4-3
D-4	Base and Outrigger Assembly (Current Model)	41711423	4-3A
D-5	Outrigger Cylinder (Previous Model)	3B090880	4-5
D-5A	Outrigger Cylinder (Current Model)	3B010930	4-5
D-6	Mast Assembly	41707990	4-6
D-7	Inner Boom Assembly	41707991	4-7
D-8	Inner Cylinder	3B092880	4-8
D-9	Outer Boom Assembly	41707992	4-9
D-10	Outer Cylinder	3B096880	4-10
D-11	Locking/Holding Valve	73054004	4-11
D-12	Counterbalance Valve	73054304	4-11
D-13	Extension Boom Assembly	41707993	4-12
D-14	Extension Cylinder	3B100880	4-13
D-15	Hydraulic Kit	91707996	4-14
D-16	Control Kit 6-Function Manual	90707995	4-15
D-17	Valvebank 6-Section	51704803	4-16
D-18	Installation Kit	93707994	4-17
D-19	Decal Kit	95708202	4-18
D-20	Throttle Control - Synchro Start	31705270	4-19
D-21	Throttle Control Kit - Manual 18'	31702746	4-20
D-22	Beacon Light Kit	51708392	4-21
D-23	Chrome Floodlight Kit	51708400	4-22
D-24	Aircraft Floodlight Kit	51709309	4-23
D-25	Halogen Floodlight Kit	51709311	4-24
D-26	Black Finish Floodlight Kit	51709310	4-25
D-27	Capacity Alert Kit - Audible	31705698	4-26
D-28	Beacon Light Kit - Low Mount	51710948	4-27
D-29	Beacon Light Kit - High Mount	51708392	4-28
D-30	Winch Kit with Manual Controls	31711131	4-29
D-31	Reservoir Assembly	70732577	4-30
E-1	Grease Zerk Locations and Lubricant Requirements		5-1
E-2	Torque Data Chart		5-2
E-3	Turntable Bearing Fastener Tightening Sequence		5-3
E-4	Turntable Bearing Inspection for Replacement		5-4
	Spare Parts List		5-5

## Section 1. SPECIFICATIONS

### 1-1. GENERAL

CRANE RATING	28,000 ft-lbs	(3 87 ton-meters)
REACH (from centerline of rotation)	15'-0"	(4 57m)
HYDRAULIC EXTENSION	36	(91.4cm)
* LIFTING HEIGHT	23'-4"	(7.11m)
CRANE WEIGHT	1825 lbs	(828 kg)
MAXIMUM OUTRIGGER SPAN	10'-3-1/2"	(3.14m)
CRANE STORAGE HEIGHT	73-1/2"	(186.7cm)
** MOUNTING SPACE REQUIRED	23-1/2"	(59.7cm)
OPTIMUM PUMP CAPACITY	4 GPM	(15.1 liters/min)
OIL RESERVOIR CAPACITY	10 U.S. gallons	(37.9 liters)
DESIGN FACTOR (Pins and Hydraulics)	4/1	4/1

\* Based on 34" (86.4cm) truck frame height.

\*\* Allow approximately 2" (5.1cm.) between the truck cab and crane base for swing clearance

### 1-2. LIFTING CAPACITY

6'-0" (1.83m)	4700 lbs	2132 kg
9'-0" (2.74m)	3100 lbs	1406 kg
12'-0" (3.66m)	2350 lbs	1066 kg
15'-0" (4.57m)	1850 lbs	839 kg

### 1-3. PERFORMANCE CHARACTERISTICS

ROTATION: 400° (6.98 rad.)	*70 seconds
INNER BOOM ELEVATION: -45° to +75° (-0.79 rad. to +1.31 rad.)	*20 seconds
OUTER BOOM ARTICULATION: 139° (2.48 rad.)	*21 seconds
EXTENSION: 36" (91.4cm)	*11 seconds
OUTRIGGERS: 28-3/4" (73cm)	* 6 seconds each

\*Speeds are based on 4 gpm (15.1 liters/minute) optimum oil flow.

### 1-4. MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	Conventional Cab	Conventional Cab
WHEELBASE	154"	(391cm)
CAB-TO-AXLE	84"	(213cm)
FRAME SECTION MODULUS	10 in <sup>3</sup>	(163.90cm <sup>3</sup> )
RBM	360,000 in-lbs	(4149 kg-meters)
FRONT AXLE RATING	5000 lbs	(2268 kg)
REAR AXLE RATING	9500 lbs	(4309 kg)
TRANSMISSION	4-speed	4-speed

### 1-5. CYLINDERS

	BORE	STROKE
INNER BOOM CYLINDER	2 -1/2" (6.4cm)	30-1/4" (76.8cm)
OUTER BOOM CYLINDER	3-1/2" (8.9cm)	33-9/16" (85.3cm)
EXTENSION CYLINDER	2-1/2" (6.4cm)	36" (91.4cm)
OUTRIGGER CYLINDER	2" (5.1cm)	28-3/4" (73cm)

## **1-6. POWER SOURCE**

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be used - minimum power required is 9 horsepower.

## **1-7. CYLINDER HOLDING VALVES**

The load holding side of all hydraulic cylinders are equipped with integral holding valves, or counter balance valves. Their function is to prevent sudden cylinder collapse in case of hose failure, or other hydraulic failure. The counter balance valve serves several functions. First, it is a holding valve. Secondly, it controls the retract, or lowering function, allowing controlled lowering of the load. Finally, if a hose breaks, the only oil loss will be that in the hose.

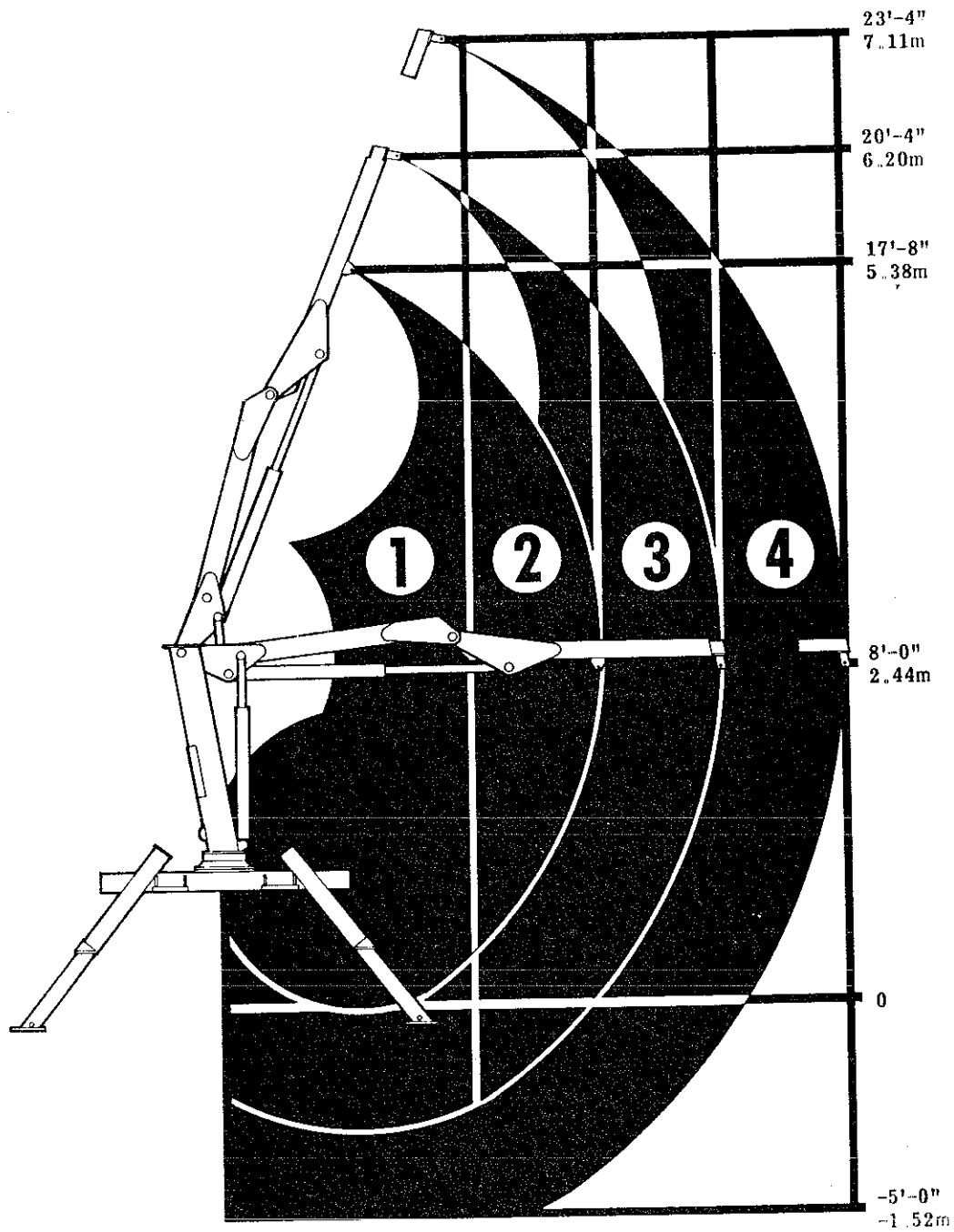
## **1-8. ROTATION SYSTEM**

Turntable bearing with external worm gear, powered by a high-torque hydraulic motor through a self-locking worm. Total gear reduction is 73:1.

## **1-9. HYDRAULIC SYSTEM**

The hydraulic system is an open center, full pressure system, requiring 4 gpm (15.1 lpm) oil flow, at 2500 psi (172.4 bar). Six-spool, stack-type control valves. Dual operational control handles located at both sides of the crane for convenient operation. System includes hydraulic oil reservoir, suction-line filter, pump, 6-section control valvebank, return-line filter and all hoses and fittings.

*IMT reserves the right to change design and specifications without notice.*



RANGE	REACH	CAPACITY
1	6'-0" (1.83 m)	4,700 lbs. (2,132 kg.)
2	9'-0" (2.74 m)	3,100 lbs. (1,406 kg.)
3	12'-0" (3.66 m)	2,350 lbs. (1,066 kg.)
4	15'-0" (4.57 m)	1,850 lbs. (839 kg.)

Figure A-1. Capacity Chart

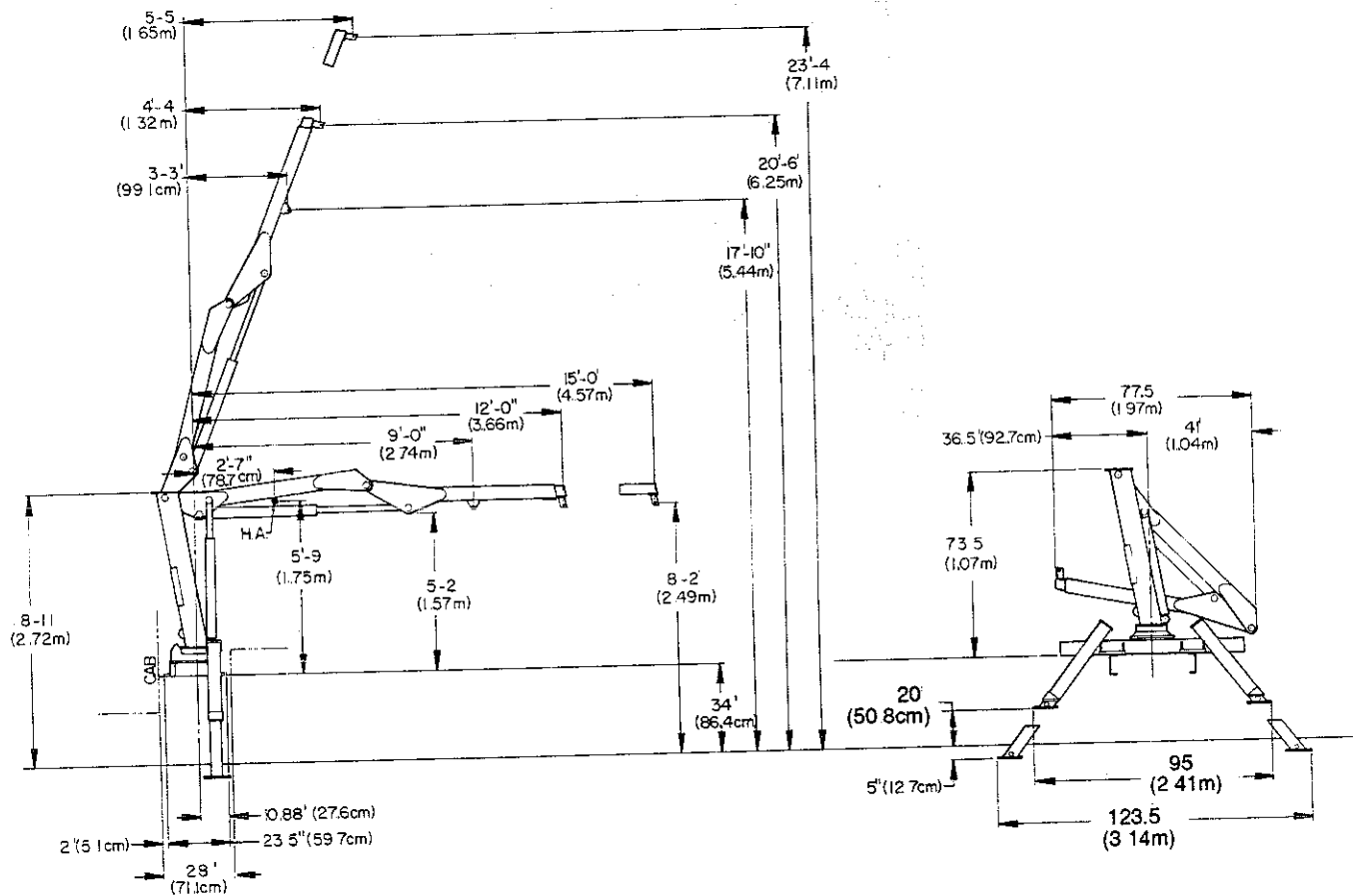


Figure A-2. GEOMETRIC CONFIGURATION



## Section 2. CRANE DESCRIPTION

### 2-1. GENERAL

The IMT 2815 Crane is designed primarily for use as a material-handling crane. This section describes the major assemblies on this crane and Figure B-1 illustrates their location.

### 2-2. BASE

The base provides a platform for mounting the crane to a truck. It incorporates the  $400^{\circ}$  ( $6.98 \text{ Rad.}$ ) rotation mechanism and outriggers. The outriggers are powered by double-acting hydraulic cylinders to provide stabilization during crane operation - maximum span is  $123\frac{1}{2}"$  ( $3.14\text{m}$ ).

### 2-3. MAST

The mast provides the necessary elevation for crane operation as well as a hinge point for the inner boom. The mast consists of two vertical tubes welded to a base plate which allows the crane to fold into a "figure-4" configuration for travel.

### 2-4. INNER BOOM

The inner boom will swing through a full  $120^{\circ}$  ( $2.10 \text{ Rad.}$ ) from  $-45^{\circ}$  to  $+75^{\circ}$  ( $0.79$  to  $+1.31 \text{ Rad.}$ ). It is raised and lowered through the use of twin, double-acting hydraulic cylinders.

### 2-5. OUTER BOOM

The outer boom is articulated through  $139$  ( $2.43 \text{ Rad.}$ ). The boom is raised and lowered with a double-acting hydraulic cylinder mounted under the inner and outer boom hinge point. It also provides storage for the extension boom in the retracted position.

### 2-6. EXTENSION BOOMS

The 1-stage hydraulic extension boom increases the operating range from  $12'-0"$  ( $3.66\text{m}$ ) to  $15'-0"$  ( $4.57\text{m}$ ).

### 2-7. CONTROLS

The crane is equipped with dual 6-function control stations, one on each side of the crane.

### 2-8. HYDRAULICS

The crane hydraulics consist of double-braided pressure hoses, return hoses, filters, 6-spool control valvebank and all necessary hydraulic fittings.

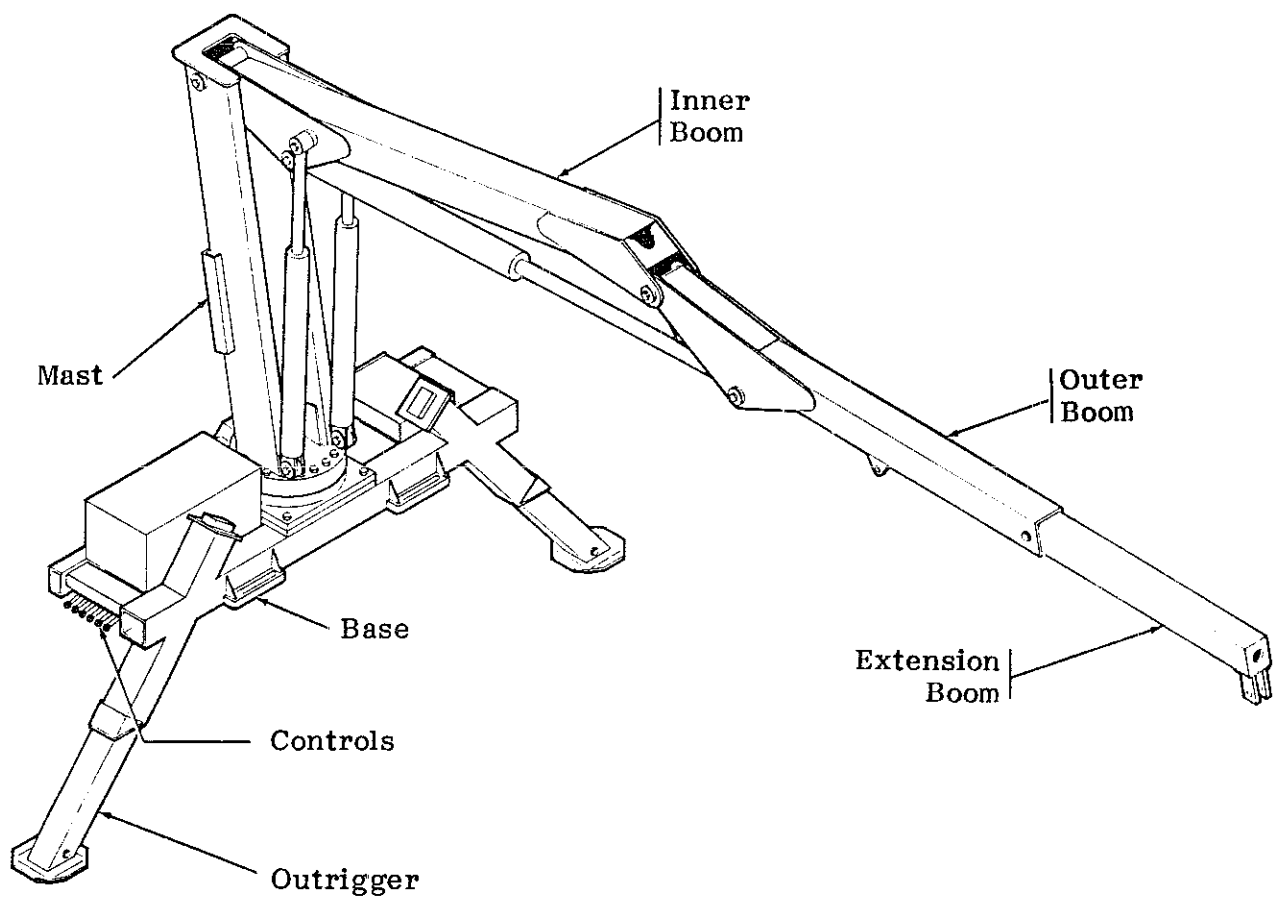


Figure B-1. 2815 Crane Group

## Section 3. INSTALLATION

### 3-1. GENERAL

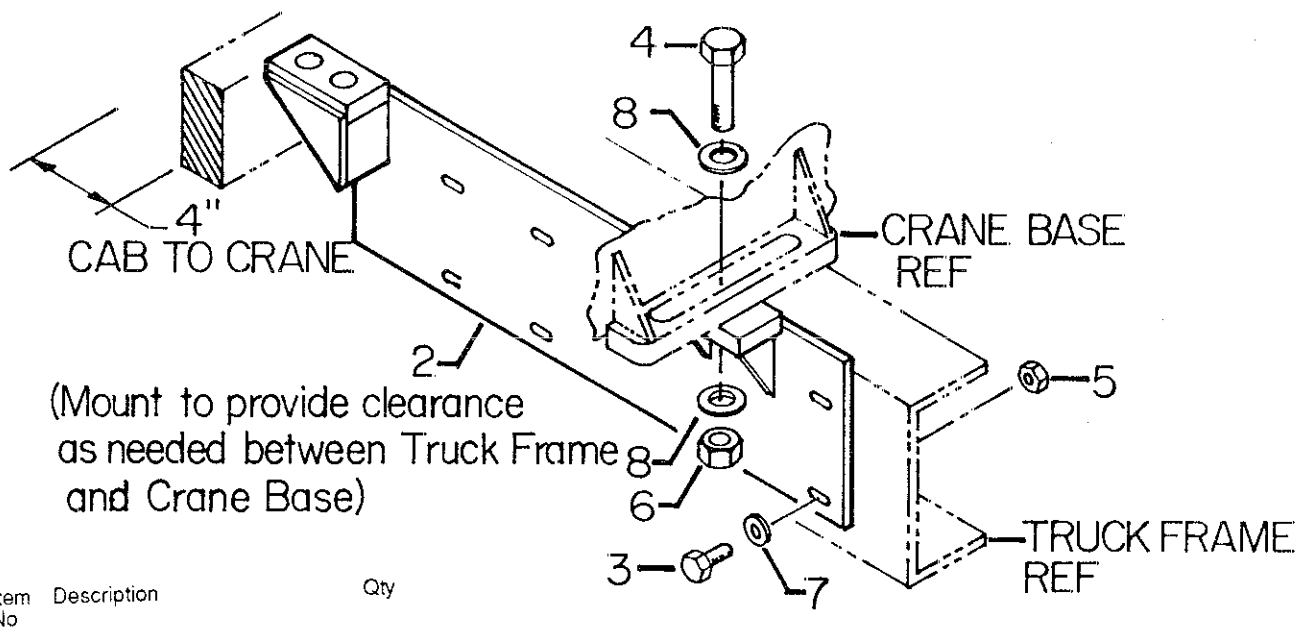
This section contains specific instruction for the installation of your crane. Prior to installing the crane and hydraulic components, make sure the chassis is ready to receive the crane (refer to Section 5, Installation - Chassis Preparation in Volume 1)

### 3-2. CRANE INSTALLATION

To install the crane on the chassis:

1. Use a lifting device capable of lifting the weight of the crane-1825 lbs. (828 kg). Use a sling or chain around the inner cylinder pin bosses on the inner boom. Secure the lifting device to prevent slippage and lift the crane. Move the carrier vehicle into position under the crane and lower the crane into position on the chassis.
2. Position the shear plates under the crane base and bolt them snugly to the crane base. Clamp the shear plates to the truck frame and drill the shear plate mounting holes using the shear plate as a template. Use a 1/4" drill for a pilot hole and then remove the shear plates. Finish drilling with a 9/16" drill.
3. Install the shear plates on the truck chassis - bolts should be only 1/2 turn more than finger tight. Install 3/4-10 x 3-1/2" hex head bolts through crane base and shear plate mounting blocks. Use 3/4" flat washers and locknuts. Torque to 226 ft-lbs.
4. Torque the 1/2-13 x 1-1/2" hex head bolts that secure the shear plates to the truck chassis at 90 ft-lbs.
5. See the installation kits in the Parts section for specific part numbers.

Allow sufficient room between the crane and cab for mast rotation - at least 2" (5.1cm). Check for front to rear alignment



Item No	Description	Qty
2	Shear Plate	2
3	Cap Screw 1/2-13 x 1-1/2	16
4	Cap Screw 3/4-10 x 3-1/2	4
5	Nut 1/2-13 Lock	16
6	Nut 3/4-10 Lock	4
7	Washer 1/2 Hardened	16
8	Washer 3/4 Hardened	8

Figure C-1. CRANE INSTALLATION

### 3-3. HYDRAULIC INSTALLATION

To install the hydraulic hoses, fittings, etc.:

1. Install the suction-line and return-line filters on the truck frame in a position that will provide relatively easy access to the filter elements. The filters must be located as close to the reservoir as possible - the suction-line filter uses a 17" hose and the return-line filter uses a 12" hose. The suction-line filter must be lower than the reservoir and higher than the pump, positioned to provide for readability of the vacuum gauge.
2. Install the plumbing on the suction-line filter as shown in Figure C-2. Install the 17" long 3/4" ID hose between the reservoir suction-line port and the suction-line filter.
3. Install the 32" long 3/4" ID suction hose between the suction-line filter and the pump inlet. Tighten the hose clamps.
4. Install the 84" long 3/8" ID pressure hose between the pump outlet and the pressure port on the valvebank.

5. Install the 22" long 1/2" ID hose between the valvebank and return filter.
6. Install the 12" long 1/2" ID return hose between the return filter and reservoir.
7. Fill the hydraulic reservoir to the "FULL" mark.
8. Open the gate valve at the suction-line filter.

#### CAUTION

Failure to open the gate valve will result in a dry running pump which may damage the pump.

9. Open the return gate valve.
10. Start the vehicle's engine and engage the PTO. Allow the system to run for about five minutes and then check the vacuum gauge on the suction-line filter (it should read 8" of mercury or less). If the vacuum reading is too high, check to make certain that the gate valve is open. If the valve is open, check for collapsed or restricted suction-line.

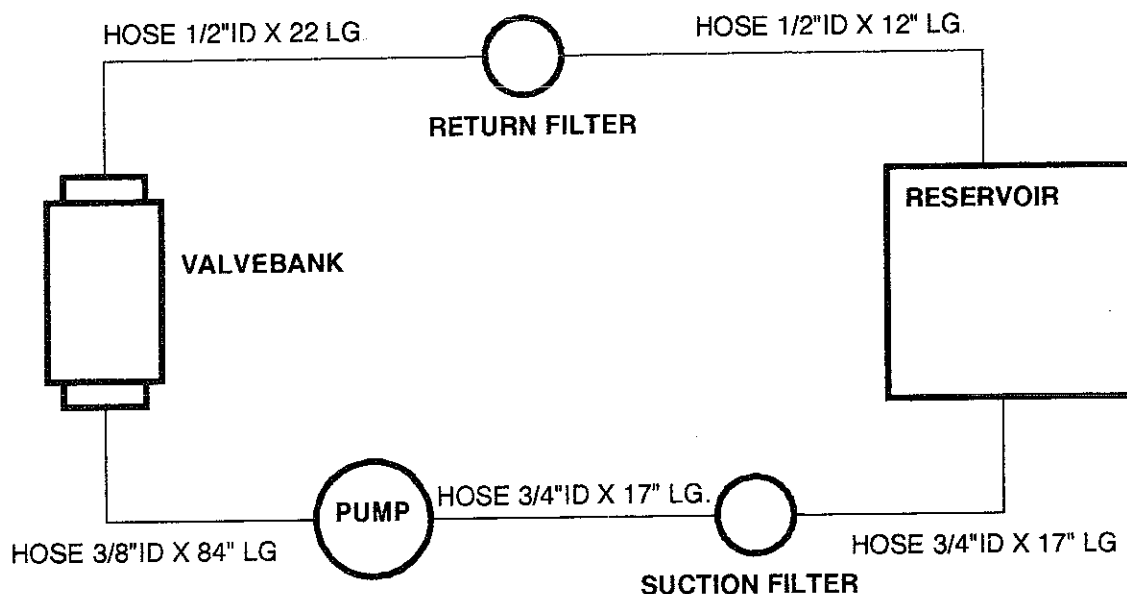


Figure C-2. Hydraulic Installation

## Section 4. PARTS LIST

### 4-1. GENERAL

This section contains the exploded parts drawings with the accompanying parts list for the assemblies used on this crane. These drawings are intended to be used in conjunction with the instructions found in the REPAIR section in Volume 1. For optional equipment such as winches and remote controls, refer to the appropriate service manual.

#### WARNING

DO NOT ATTEMPT TO REPAIR ANY COMPONENT WITHOUT READING THE INFORMATION CONTAINED IN THE REPAIR SECTION IN VOLUME 1. PAY PARTICULAR ATTENTION TO THE WARNING'S, CAUTION'S AND NOTE'S CONTAINED IN THAT SECTION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN DAMAGE TO THE EQUIPMENT, AN INJURY OR EVEN DEATH.

### 4-2. CRANE IDENTIFICATION

Every crane has an identification placard (Figure D-1) attached to the mast. 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.  
Box 189, Garner, IA 50438-0189  
Telephone: 515-923-3711  
Product Support Fax: 515-923-3674

or

IMT Cranes Canada, Ltd.  
385 West Street South  
Orillia, Ontario, L3V 5H2, Canada  
Telephone: 705-325-7458  
Fax: 705-325-7625


MODEL MODELO MODELE	SERIAL NUMBER NUMERO DE SERIE NUMERO DE SERIE
DRAWING NUMBER NUMERO DE PLANO NUMERO DE PLAN	FECHA DE FABRICACION DATE DATE
	
Iowa Mold Tooling Co., Inc. Garner, Iowa U.S.A.	IMT Cranes Canada, Ltd. Orillia, Ontario, Canada

Figure D-1. SERIAL NUMBER PLACARD

### 4-3. CYLINDER IDENTIFICATION

To ensure proper replacement parts are received, 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 on the cylinder case (Figure D-2) against the information contained in this manual. You must use the part number stamped on the cylinder case when ordering parts.

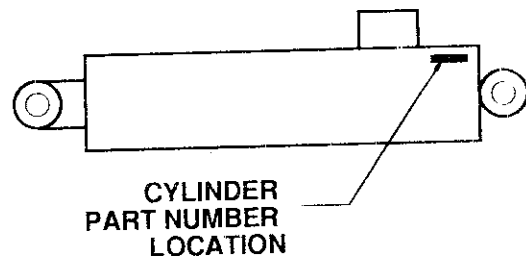


Figure D-2. CYLINDER PART NUMBER LOCATION

#### 4-4. WELDMENT IDENTIFICATION

Each of the major weldments - base, mast, inner boom, outer boom, extension boom and outrigger weldments bear a stamped part number. Any time a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are shown in Figure D-3.

#### 4-5. ORDERING REPAIR PARTS

When ordering replacement parts:

1. Give the model number of the unit.
2. Give the serial number of the unit.
3. Specify the complete part number. When ordering cylinder parts or one of the main weldments, always give the stamped part number.
4. Give a complete description of the part.
5. Specify the quantity required.

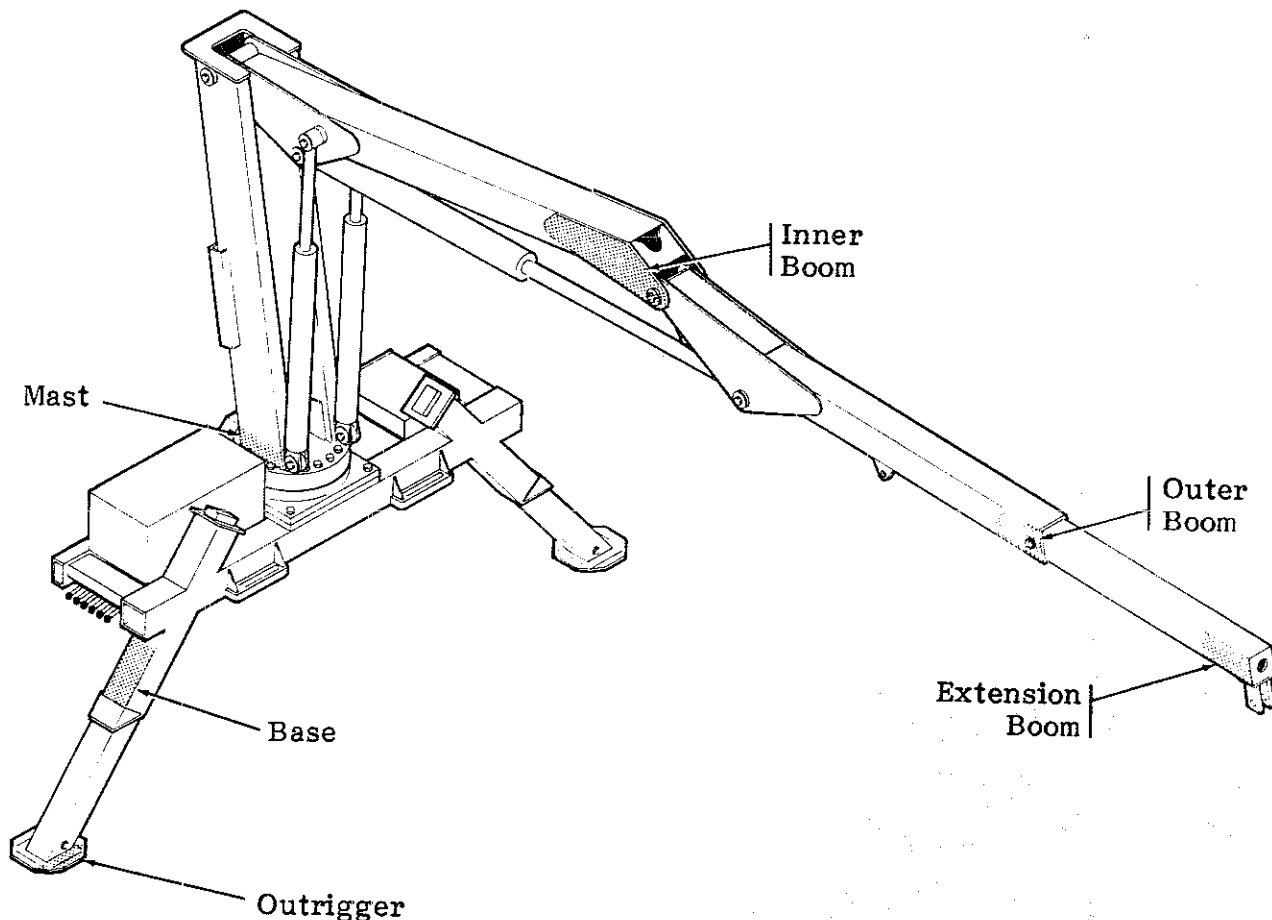


Figure D-3. Weldment Part Number Locations

## NOTE

THIS BASE AND OUTRIGGER ASSEMBLY (41707989) WAS LAST MANUFACTURED WITH SERIAL NUMBER 2815C0293171. FOR SERIAL NUMBERS 2815C1693172 OR LATER, SEE BASE AND OUTRIGGER ASSEMBLY 41711423 IN THIS MANUAL.

SEE PAGE 4-4 FOR DRAWING

## WARNING

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.

	ITEM	PART NO	DESCRIPTION	QTY
	1.	51707512	BASE (PART OF 27)	1REF
	2	52705551	LOCKNUT (PART OF 27)	1REF
	3	60030086	TUBING 1/4 X 6 (PART OF 27)	1REF
	4	60030116	THRUST BEARING (PART OF 27)	2REF
	5	60107543	WORM SUPPORT (PART OF 27)	1REF
	6	60111627	WORM COVER (PART OF 27)	1REF
	7	70055147	ROLLER BEARING (PART OF 27)	1REF
	8	70055148	ROLLER BEARING (PART OF 27)	1REF
	9	71056395	TURNTABLE BEARING (PART OF 27)	1REF
	10	71143165	ROTATION SLIDE (PART OF 27)	1REF
	11	72053301	COUPLING 1/8NPT (PART OF 27)	1REF
	12	72053508	ZERK 1/8NPT (PART OF 27)	2REF
	13	72060000	CAP SCR 1/4-20 X 1/2 HH GR5 (PART OF 27)	4REF
NOTE 1	14	72060795	CAP SCR 1/2-13 X 1-1/2 SH (PART OF 27)	2REF
	15	72060857	CAP 5/16-18 X 5/8 HH SLFTPG (PART OF 27)	2REF
NOTE 2	16	72062162	NUT 9/16-12 HEX GR8 (PART OF 27)	23REF
	17	72063049	WASHER 1/4 LOCK (PART OF 27)	4REF
	18	72063050	WASHER 5/16 LOCK (PART OF 27)	2REF
	19	72063117	WASHER 9/16 HARD (PART OF 27)	23REF
	20	72063161	WASHER 1-1/8 HARD (PART OF 27)	3REF
NOTE 3	21	72531731	ADAPTER 1/8MPT 1/4TUBE (PART OF 27)	1REF
	22	72531746	ELBOW 1/8MPT 1/4TUBE 90° (PART OF 27)	1REF
	23	72601510	CAP SCR 9/16-12 X 3-3/4 HH GR8 (PART OF 27)	23REF
	24	73051482	MOTOR (PART OF 27)	1REF
	25	70056397	WORM GEAR (PART OF 27)	1REF
	26	52707845	GUARD (PART OF 27)	1REF
NOTE 4	27	41707846	BASE ASM (INCL:1-26)	1
	28	52708003	BASE WLDMT	1
	29	3B090880	OUTRIGGER CYLINDER	2
	30	52707999	OUTRIGGER LEG	2
	31	60030097	WEAR PAD	2
	32	60106968	PIN	2
NOTE 5	33	72060102	CAP SCR 1/2-13 X 5-1/2 HH GR5	4
	34	72062107	NUT 1/2-13 LOCK	4
	35	72066125	RETAINING RING 1 HD EXT	4
	36	72060185	CAP SCR 3/4-10 X 2 HH GR5	4
	37	72063056	WASHER 3/4 LOCK	4
	38	72060044	CAP SCR 3/8-16 X 3/4 HH GR5	4
	39	72063051	WASHER 3/8 LOCK	4
	40	72063003	WASHER 3/8 WRT	4
	41	70732577	RESERVOIR ASM - 10 GALLON	1
	42	72531427	ELBOW 3/4MPT #12MJIC 90°	2
	43	72053376	REDUCER BUSHING 1NPT 3/4NPT	1

Figure D-4. BASE AND OUTRIGGER ASSEMBLY (41707989)

## NOTE

THIS BASE AND OUTRIGGER ASSEMBLY (41707989) WAS LAST MANUFACTURED WITH SERIAL NUMBER 2815C0293171. FOR SERIAL NUMBERS 2815C1693172 OR LATER, SEE BASE AND OUTRIGGER ASSEMBLY 41711423 IN THIS MANUAL.

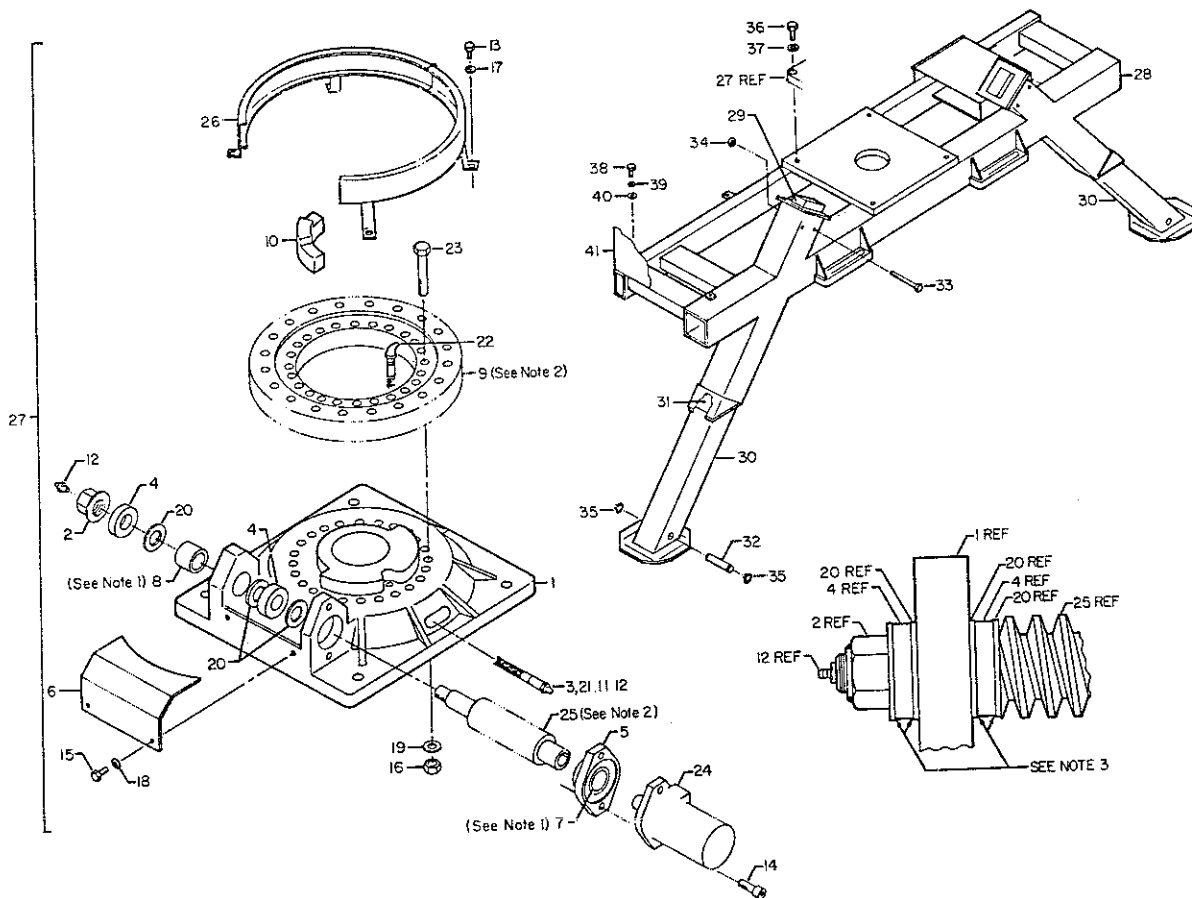


Figure D-4A. BASE ASSEMBLY (41707989)



## NOTE

THIS BASE AND OUTRIGGER ASSEMBLY (41711423) WAS FIRST MANUFACTURED WITH SERIAL NUMBER 2815C1693172. FOR SERIAL NUMBERS 2815C0293171 OR EARLIER, SEE BASE AND OUTRIGGER ASSEMBLY 41707989 IN THIS MANUAL.

SEE PAGE 4-4A FOR DRAWING

## WARNING

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.

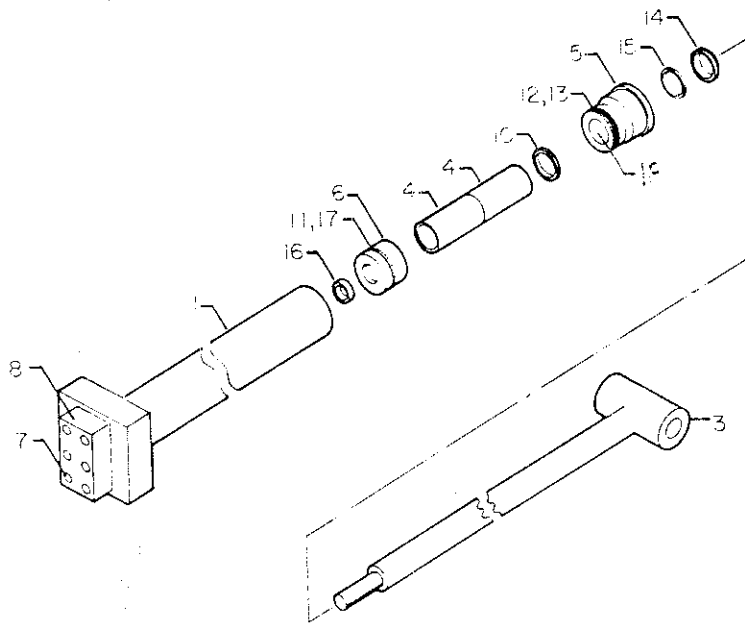
- NOTE 1. Bearings must be packed with grease at assembly.
- NOTE 2. Apply "MOLUB-ALLOY 936" to turntable bearing and worm gear at assembly.
- NOTE 3. Initial lubrication of both sides of thrust bearings (item 4) is required at time of installation. See note 4 for approved lubricants.
- NOTE 4. Approved lubricants are "Slip Plate", "Lubri-Plate" or other lubricants containing graphite or MSO<sub>2</sub>.
- NOTE 5. Install hydraulic fittings (items 42 & 43) into reservoir prior to installation onto the crane.

ITEM	PART NO	DESCRIPTION	QTY
1	51707512	BASE (PART OF 27)	1REF
2	52705551	LOCKNUT (PART OF 27)	1REF
3	60030086	TUBING 1/4 X 6 (PART OF 27)	1REF
4	60030116	THRUST BEARING (PART OF 27)	2REF
5	60107543	WORM SUPPORT (PART OF 27)	1REF
6	60111627	WORM COVER (PART OF 27)	1REF
7	70055147	ROLLER BEARING (PART OF 27)	1REF
8	70055148	ROLLER BEARING (PART OF 27)	1REF
9	71056395	TURNTABLE BEARING (PART OF 27)	1REF
10	71143165	ROTATION SLIDE (PART OF 27)	1REF
11	72053301	COUPLING 1/8NPT (PART OF 27)	1REF
12	72053508	ZERK 1/8NPT (PART OF 27)	2REF
13	72060000	CAP SCR 1/4-20 X 1/2 HH GR5 (PART OF 27)	4REF
14	72060795	CAP SCR 1/2-13 X 1-1/2 SH (PART OF 27)	2REF
15	72060857	SCR 5/16-18 X 5/8 HH SLFTPG (PART OF 27)	2REF
16	72062162	NUT 9/16-12 HEX GR8 (PART OF 27)	23REF
17	72063049	WASHER 1/4 LOCK (PART OF 27)	4REF
18	72063050	WASHER 5/16 LOCK (PART OF 27)	2REF
19	72063117	WASHER 9/16 HARD (PART OF 27)	23REF
20	72063161	WASHER 1-1/8 HARD (PART OF 27)	3REF
21	72531731	ADAPTER 1/8MPT 1/4TUBE (PART OF 27)	1REF
22	72531746	ELBOW 1/8MPT 1/4TUBE 90° (PART OF 27)	1REF
23	72601510	CAP SCR 9/16-12 X 3-3/4 HH GR8 (PART OF 27)	23REF
24	73051482	MOTOR (PART OF 27)	1REF
25	70056397	WORM GEAR (PART OF 27)	1REF
26	52707845	GUARD (PART OF 27)	1REF
27	41707846	BASE ASM (INCL:1-26)	1
28	52711414	BASE WLDMT	1
29	3B010930	OUTRIGGER CYLINDER	2
30	52711412	OUTRIGGER LEG	2
31	60030097	WEAR PAD	2
32	60106968	PIN	2
33	72060102	CAP SCR 1/2-13 X 5-1/2 HH GR5	4
34	72062107	NUT 1/2-13 LOCK	4
35	72066125	RETAINING RING 1" HD EXT	4
36	72060185	CAP SCR 3/4-10 X 2 HH GR5	4
37	72063056	WASHER 3/4 LOCK	4
38	72060044	CAP SCR 3/8-16 X 3/4 HH GR5	4
39	72063051	WASHER 3/8 LOCK	4
40	72063003	WASHER 3/8 WRT	4
41	70732577	RESERVOIR ASM - 10 GALLON	1
42	72531427	ELBOW 3/4MPT #12MJIC 90°	2
43	72053376	REDUCER BUSHING 1NPT 3/4NPT	1

Figure D-4. BASE AND OUTRIGGER ASSEMBLY (41711423)

THIS BASE AND OUTRIGGER ASSEMBLY (41711423) WAS FIRST MANUFACTURED WITH SERIAL NUMBER 2815C1693172. FOR SERIAL NUMBERS 2815C0293171 OR EARLIER, SEE BASE AND OUTRIGGER ASSEMBLY 41707989 IN THIS MANUAL.



**DIMENSIONS**

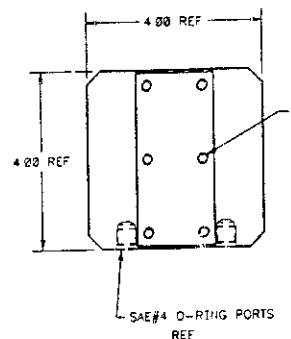
BORE	2"
STROKE	24"
ROD DIA	1-1/4"
PIN DIA	1"
C-C CLSD	38

**NOTE**

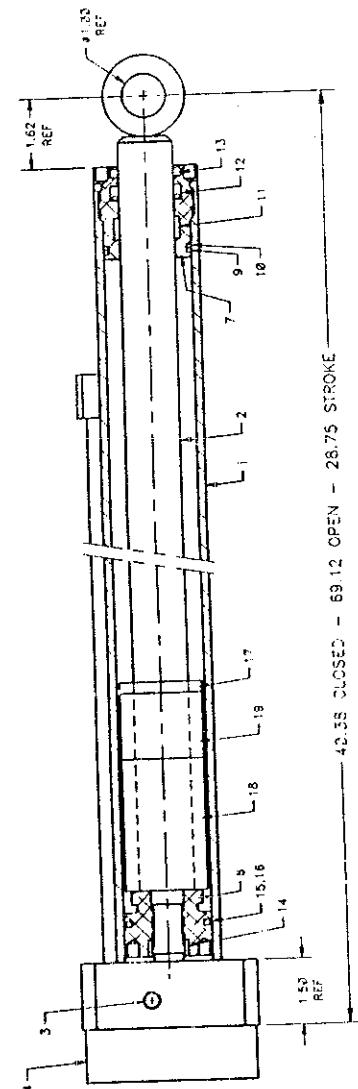
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

APPLY LUBRIPLATE #630-2 MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

USE NEVER-SEEZ OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.

**DIMENSIONS**

BORE	2
STROKE	28-3/4
ROD DIA	1-1/4
PIN DIA	1"
C-C CLSD	40-3/8

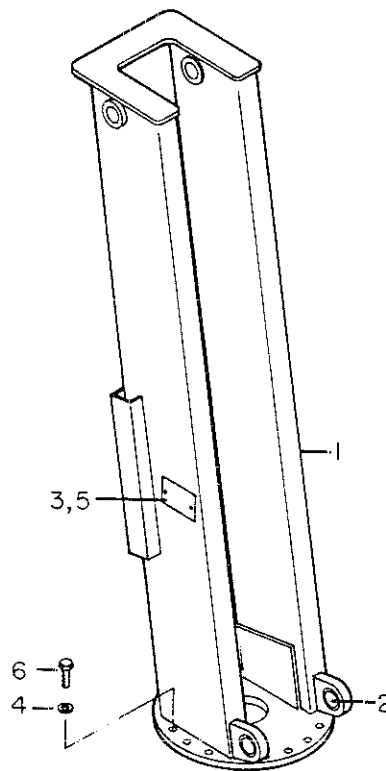


ITEM	PART NO.	DESCRIPTION	QTY
1.	4B090880	CASE (INCL: 2)	1
2.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	3REF
3.	4G090880	ROD	1
4.	6C300012	STOP TUBE	2
5.	6H020012	HEAD	1
6.	6I020075	PISTON	1
7.	72060708	SCR 1/4-20 X 1-1/4 SH	6
8.	73054004	VALVE - HOLDING	1
9.	9B081012	SEAL KIT (INCL:10-18)	1
10.	6A025012	WAFER LOCK (PART OF 9)	1REF
11.	7Q072129	O-RING (PART OF 9)	1REF
12.	7Q072224	O-RING (PART OF 9)	1REF
13.	7Q10P224	BACK-UP RING (PART OF 9)	1REF
14.	7R14P012	ROD WIPER (PART OF 9)	1REF
15.	7R546012	ROD SEAL (PART OF 9)	1REF
16.	7T61N075	LOCK-RING SEAL (PART OF 9)	1REF
17.	7T66P020	PISTON SEAL (PART OF 9)	1REF
18.	7T2N8012	WEAR RING (PART OF 9)	1REF

ITEM	PART NO.	DESCRIPTION	QTY
1	4B010930	CASE (INCL: 3)	1
2	4G010930	ROD	1
3	7PNPXT02	PLUG 1/8NPT (PART OF 1)	3REF
4	73054004	CHECK VALVE	1
5	72060708	CAP SCR 1/4-20X1-1/4 SH	6
6	6I020075	PISTON	1
7	6H020012	HEAD	1
8	9B081012	SEAL KIT (INCL:9-17)	1
9	7Q072224	O-RING (PART OF 8)	1REF
10	7Q10P224	BACKUP RING (PART OF 8)	1REF
11	7T2N8012	ROD WEAR RING (PART OF 8)	1REF
12	7R546012	U-CUP (PART OF 8)	1REF
13	7R14P012	ROD WIPER (PART OF 8)	1REF
14	7T61N075	LOCK RING (PART OF 8)	1REF
15	7Q072129	O-RING (PART OF 8)	1REF
16	7T66P020	PISTON SEAL (PART OF 8)	1REF
17	6A025012	WAFER LOCK (PART OF 8)	1REF
18	6C300012	STOP TUBE 3"	1
19	6C150012	STOP TUBE 1-1/2"	1

**Figure D-5.**  
**OUTRIGGER CYLINDER (3B090880)**

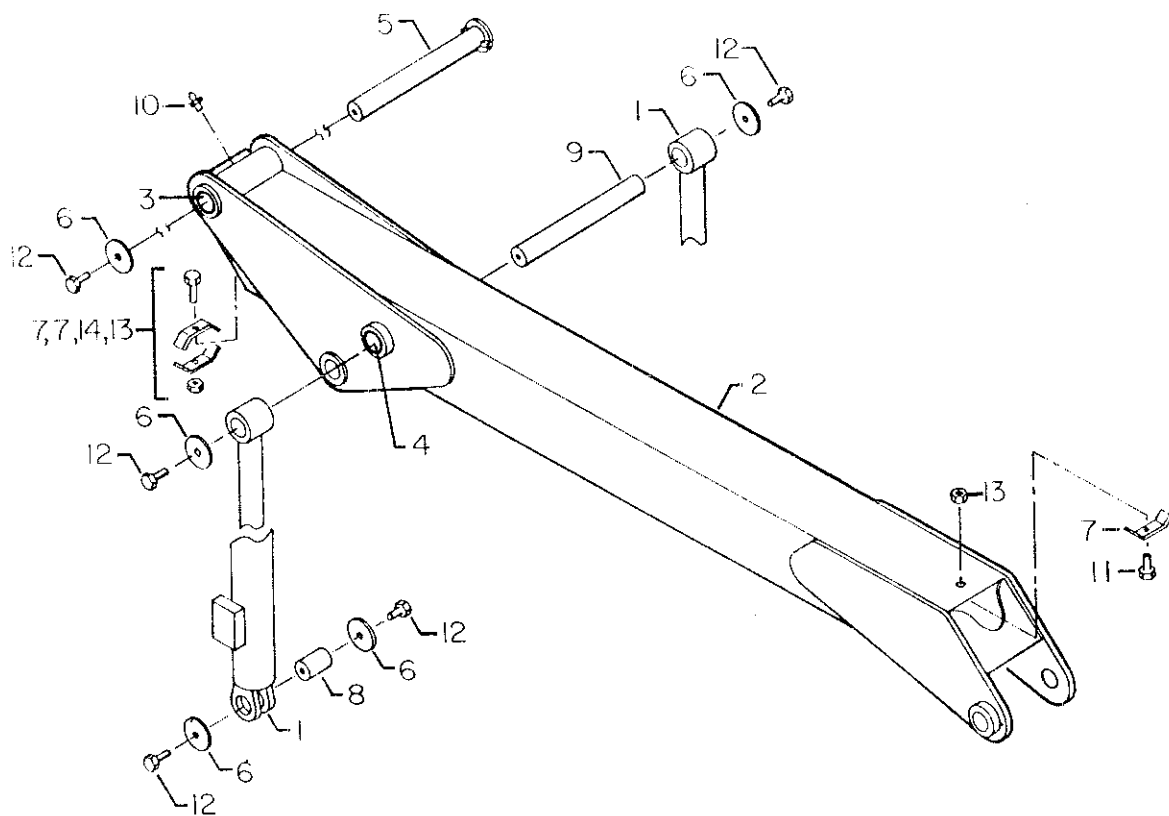
**Figure D-5A.**  
**OUTRIGGER CYLINDER (3B010930)**

**WARNING**

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.

Item No	Part No.	Description	Qty
1	52707985	MAST (INCL: 2)	1
2	7BF80715	BUSHING (PART OF 1)	2REF
3	70029119	SERIAL NUMBER PLACARD	1
4	72063117	WASHER 9/16 FLAT GR8	14
5	72066340	RIVET 1/8	2
6	72601144	CAP SCR 9/16-12 X 2 HH GR8	14

**Figure D-6. Mast Assembly (Part Number 41707990)**

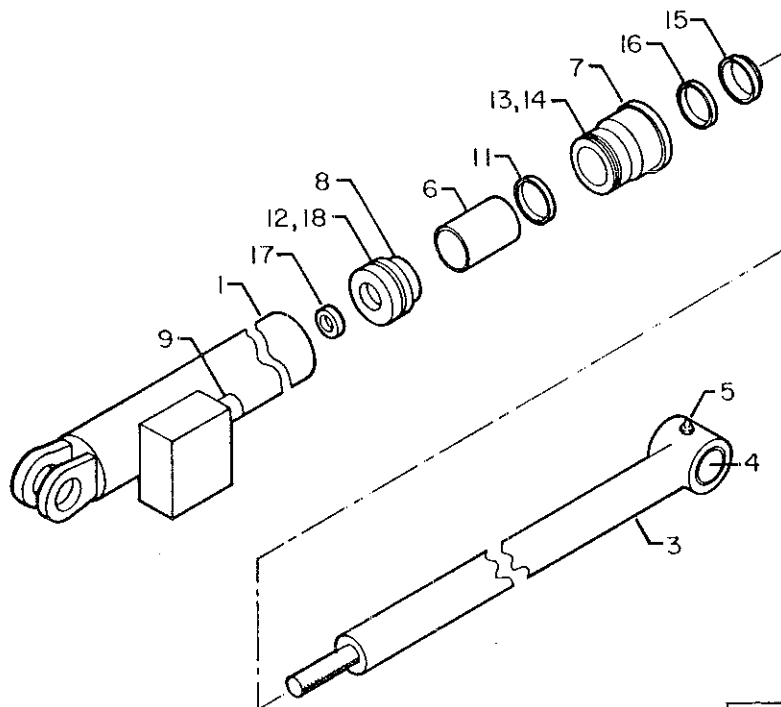


QTY	PART NO.	DESCRIPTION	QTY
2	3B092880	INNER CYLINDER	2
1	52708006	INNER BOOM (INCL: 3 & 4)	1
4REF	7BF81215	BUSHING (PART OF 2)	4REF
4REF	7BF81215	BUSHING (PART OF 2)	4REF
1	52708016	PIN	1
7	60106333	PIN RETAINER PLATE 2-1/2	7
3	60103278	HOSE CLAMP	3
2	60111934	PIN	2
1	60111935	PIN	1
1	72053508	ZERK 1/8NPT	1
1	72060006	CAP SCR 1/4-20X1-1/24 HH GR5	1
7	72060147	CAP SCR 5/8-11X1 HH GR5	7
2	72062104	NUT 1/4-20 LOCK	2
1	72060008	CAP SCR 1/4-20X2 HH GR5	1

**NOTE**

Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before reassembly

**Figure D-7. INNER BOOM ASSEMBLY (41707991)**



## DIMENSIONS

Bore	2-1/2"
Stroke	30-1/4"
Rod Diameter	1-3/4"
Pin Diameter	1-1/2"
C-C Closed	41-3/4"

## NOTE

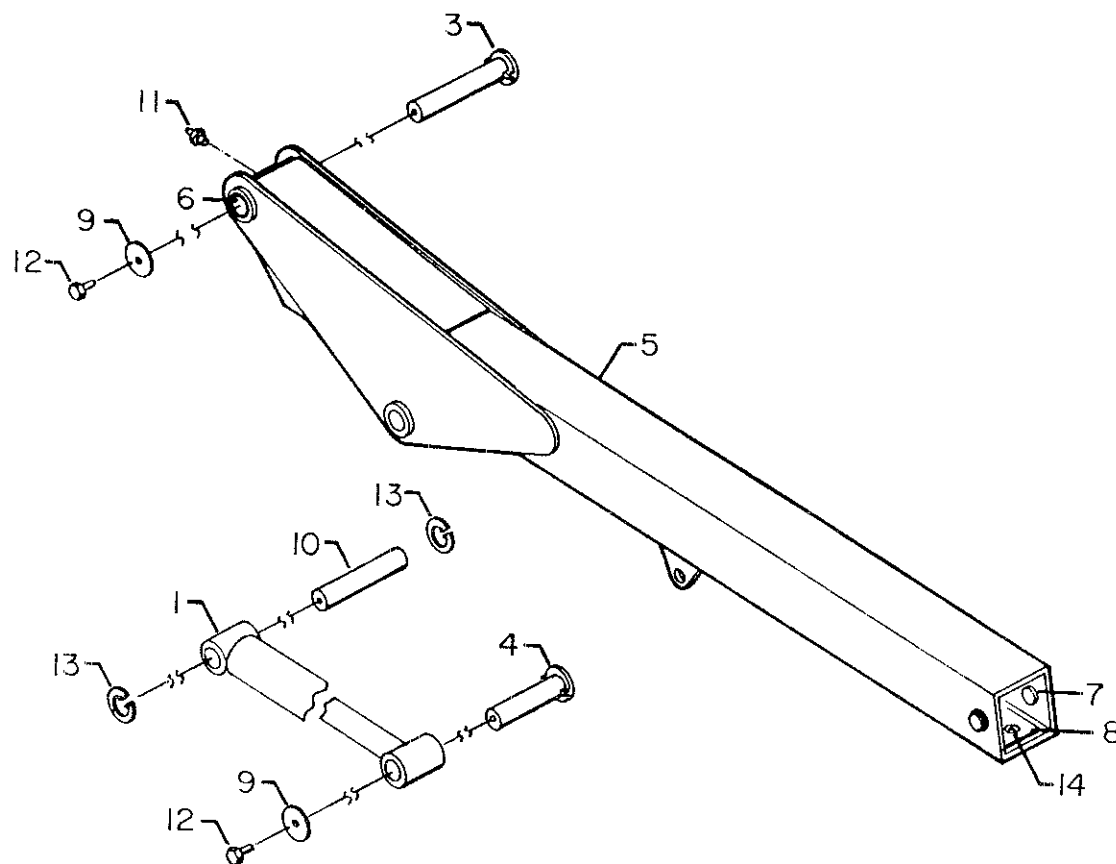
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.

ITEM	PART NO	DESCRIPTION	QTY
1	4B092880	CASE (INCL:2)	1
2	7PNPXT02	PLUG 1/8NPT (PART OF 1)	3REF
3	4G092880	ROD (INCL:4 & 5)	1
4	7BF81015	BUSHING (PART OF 4)	2REF
5	72053507	ZERK 1/4-28 (PART OF 4)	1REF
6	6C300017	STOP TUBE	1
7	6H025017	HEAD	1
8	6I025087	PISTON	1
9	73054304	COUNTERBALANCE VALVE	1
10	9B101414	SEAL KIT (INCL:11-18)	1
11	6A025017	WAFER LOCK (PART OF 10)	1REF
12	7Q072137	O-RING (PART OF 10)	1REF
13	7Q072228	O-RING (PART OF 10)	1REF
14	7Q10P228	BACK-UP RING (PART OF 10)	1REF
15	7R14P017	ROD WIPER (PART OF 10)	1REF
16	7R546017	ROD SEAL (PART OF 10)	1REF
17	7T61N087	LOCK-RING SEAL (PART OF 10)	1REF
18	7T66P025	PISTON SEAL (PART OF 10)	1REF

Figure D-8. Inner Cylinder (Part Number 3B092880)

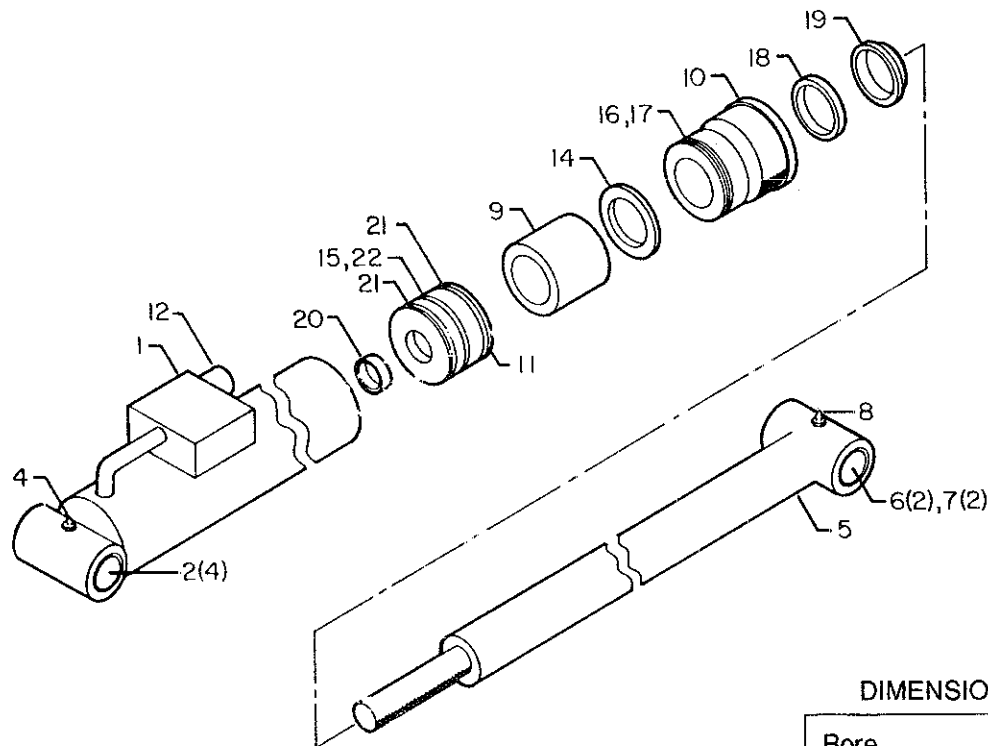


ITEM	PART	DESCRIPTION	QTY
1	3B096880	OUTER CYLINDER	1
3	52703765	PIN	1
4	52708100	PIN	1
5	52708101	OUTER BOOM (INCL: 6)	1
6	7BF81215	BUSHING (PART OF 5)	4REF
7	60030138	WEAR PAD	2
8	60030140	WEAR PAD	1
9	60106333	PIN RETAINER PLATE 2-1/2	2
10	60111937	PIN	1
11	72053508	ZERK 1/8NPT	1
12	72060147	CAP SCR 5/8-11 X 1 HH GR5	2
13	72661267	RETAINING RING 1-1/2 INT	2
14	72060915	CAP SCR 3/8-16 X 1 FLH SOC	2

**NOTE**

Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before reassembly.

**Figure D-9. Outer Boom Assembly (Part Number 41707992)**



## DIMENSIONS

Bore	3-1/2"
Stroke	33-9/16"
Rod Diameter	2-1/4"
Pin Diameter	1-1/2"
C-C Closed	47"

## NOTE

IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

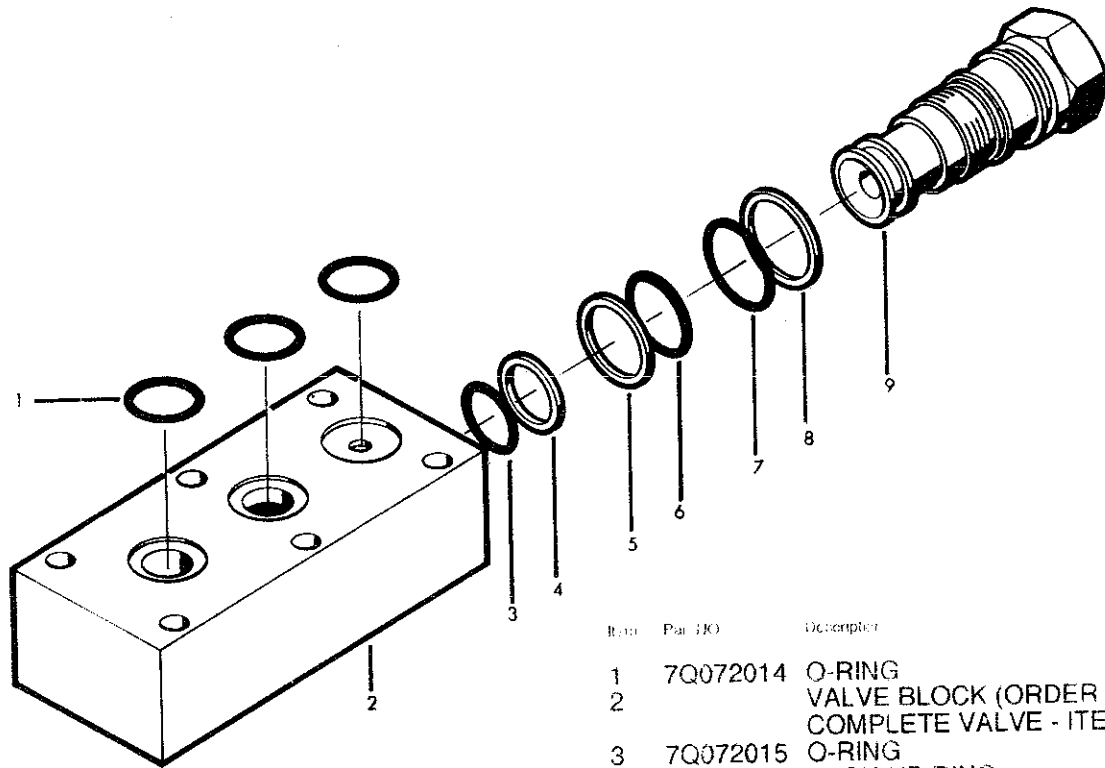
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER

ITEM	PART NO	DESCRIPTION	QTY
1	4B096880	CASE (INCL:2,3,4)	1
2	7BF81015	BUSHING (PART OF 1)	4REF
3	7PNPXT02	PLUG 1/8NPT (PART OF 1)	2REF
4	72053507	ZERK 1/4-28 (PART OF 1)	1REF
5	4G096880	ROD (INCL:6,7,8)	1
6	7BF80715	BUSHING (PART OF 5)	2REF
7	7BF81015	BUSHING (PART OF 5)	2REF
8	72053507	ZERK 1/4-28 (PART OF 5)	1REF
9	6C300022	STOP TUBE	1
10	6H035022	HEAD	1
11	6I035125	PISTON	1
12	73054304	COUNTERBALANCE VALVE	1
13	9C141820	SEAL KIT (INCL:14-22)	1
14	6A025022	WAFFER LOCK (PART OF 13)	1REF
15	7Q072151	O-RING (PART OF 13)	1REF
16	7Q072338	O-RING (PART OF 13)	1REF
17	7Q10P338	BACK-UP RING (PART OF 13)	1REF
18	7R546022	ROD SEAL (PART OF 13)	1REF
19	7R14P022	ROD WIPER (PART OF 13)	1REF
20	7T61N125	LOCK-RING SEAL (PART OF 13)	1REF
21	7T65I035	PISTON RING (PART OF 13)	2REF
22	7T66P035	PISTON SEAL (PART OF 13)	1REF

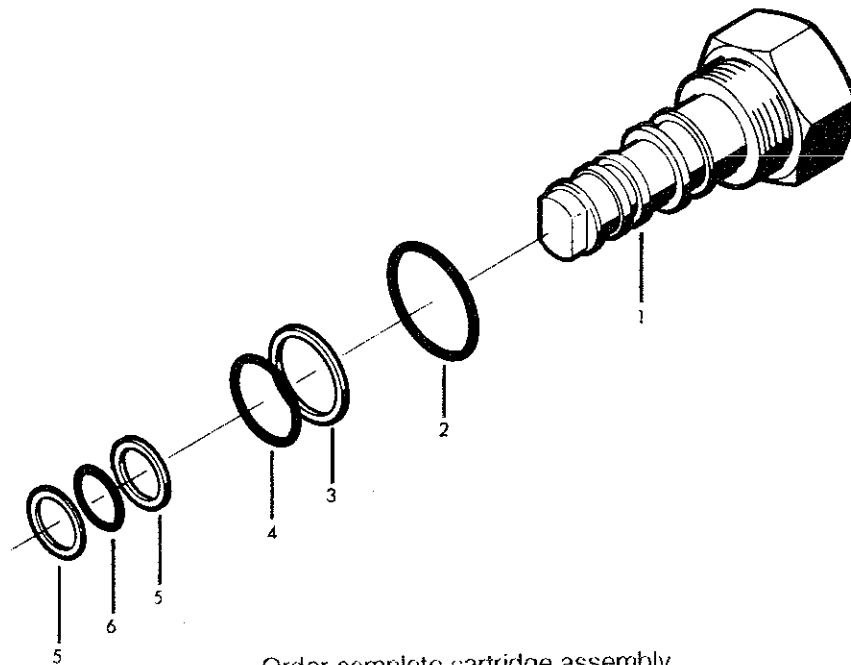
Figure D-10. Outer Cylinder (Part Number 3B096880)





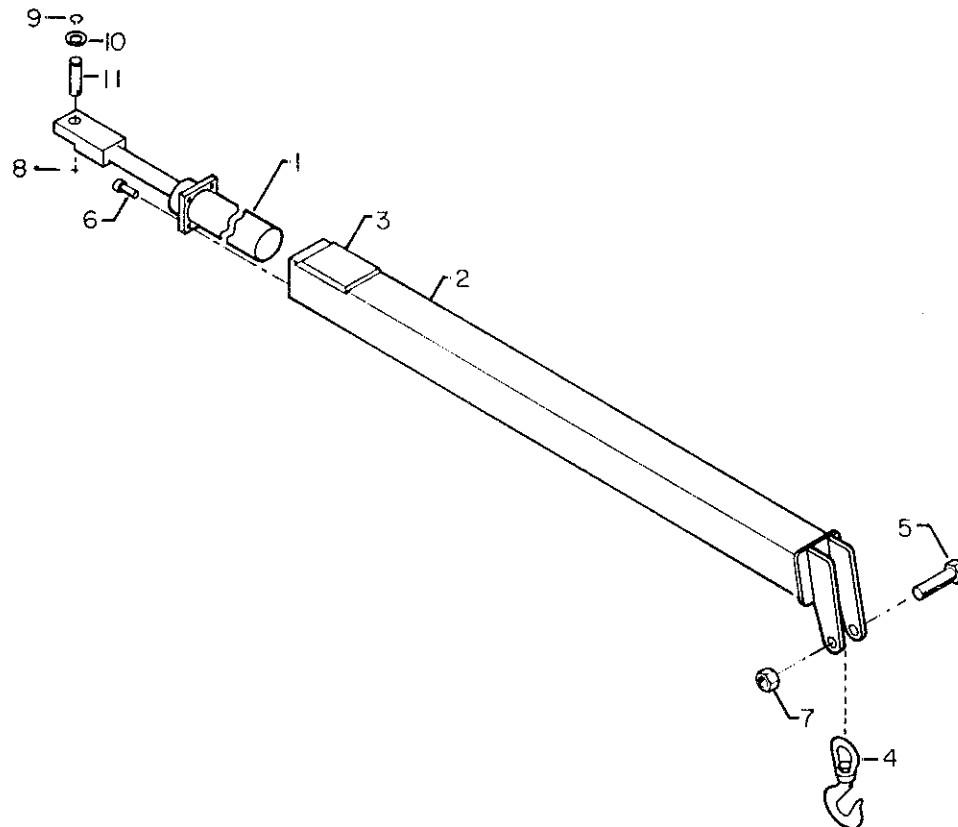
Item	Part NO	Description	Qty
1	7Q072014	O-RING	3
2		VALVE BLOCK (ORDER COMPLETE VALVE - ITEM 10)	1
3	7Q072015	O-RING	1
4	7Q10P015	BACK-UP RING	1
5	7Q10P017	BACK-UP RING	1
6	7Q072017	O-RING	1
7	7Q072018	O-RING	1
8	7Q10P018	BACK-UP RING	1
9		VALVE BODY (ORDER COMPLETE VALVE - ITEM 10)	1
10	73054004	VALVE (INCL: 1- 9)	1

Figure D-11. Locking/Holding Valve (Part Number 73054004)



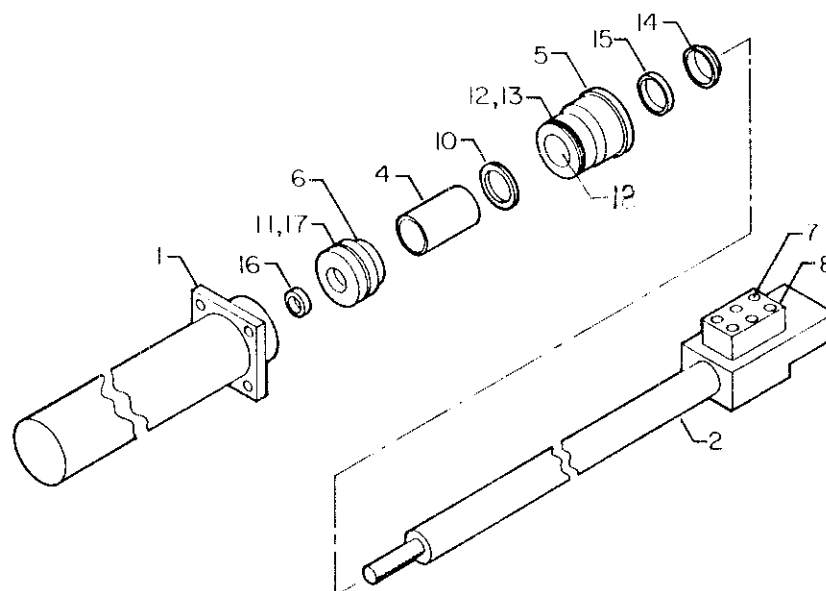
Order complete cartridge assembly

Figure D-12. Counter-Balance Valve (Part Number 73054304)



ITEM	PART NO	DESCRIPTION	QTY
1	3B100880	EXTENSION CYLINDER	1
2	52708102	EXTENSION BOOM	1
3	60030137	WEAR PAD	1
4	71073920	HOOK - 3TON	1
5	72060189	CAP SCR 3/4-10 X 4 HH GR5	1
6	72060793	CAP SCR 1/2-13 X 1 SH	4
7	72062114	NUT 3/4-10 LOCK	1
8	72066194	COTTER PIN 19 X 1-1/2	1
9	72066125	RETAINING RING 1" HD EXT	1
10	72063034	MACH BUSHING 1 X 10GA NR	1
11	60101905	PIN	1

**Figure D-13. Extension Boom Assembly (Part Number 41707993)**



## DIMENSIONS

Bore	2-1/2"
Stroke	36"
C-C Closed	8-1/8"
Rod Diameter	1-1/2"
Pin Diameter	1"

## NOTE

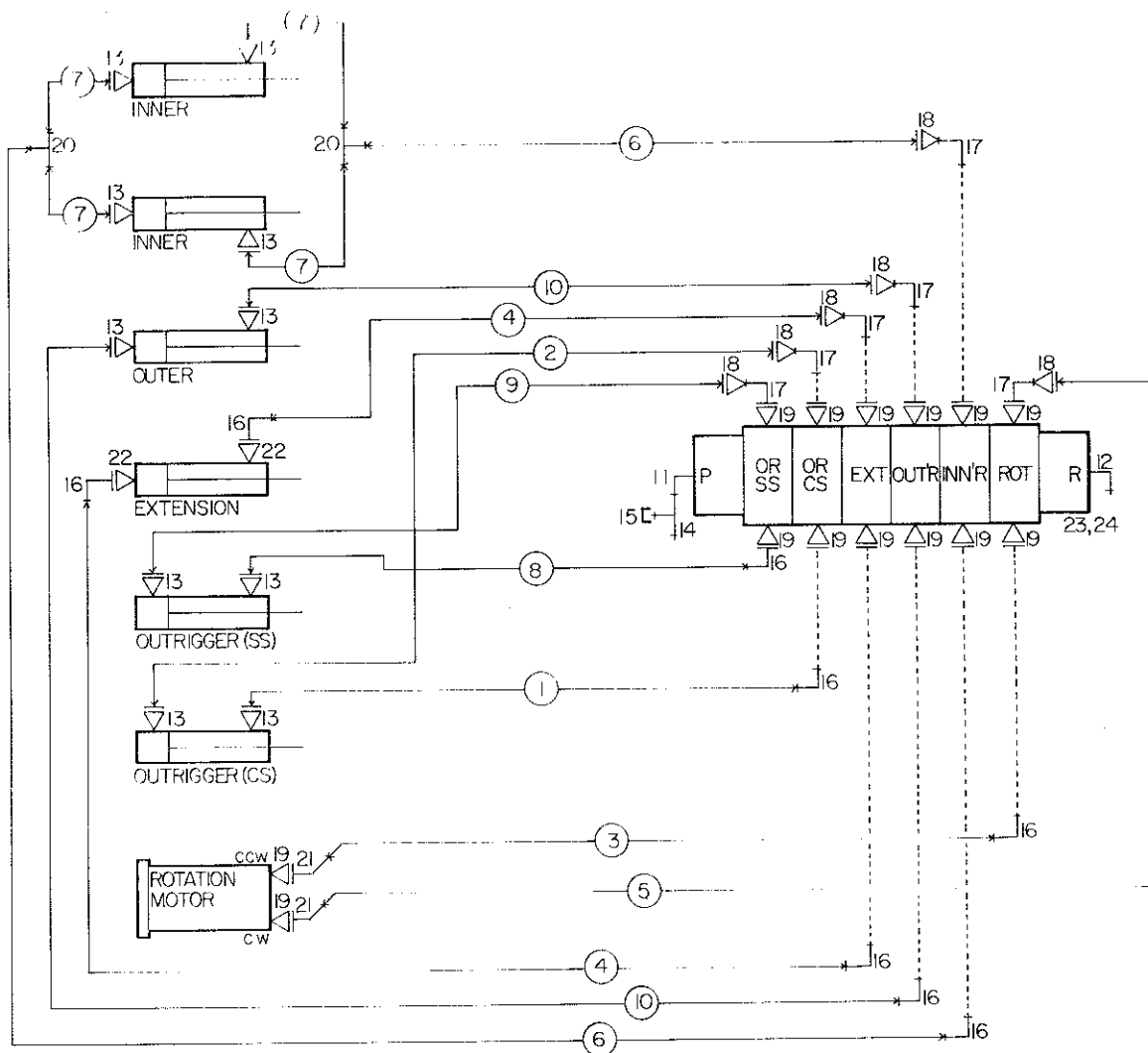
IT IS RECOMMENDED THAT ALL COMPONENTS OF THE SEAL KIT BE REPLACED WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME

APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY

USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER

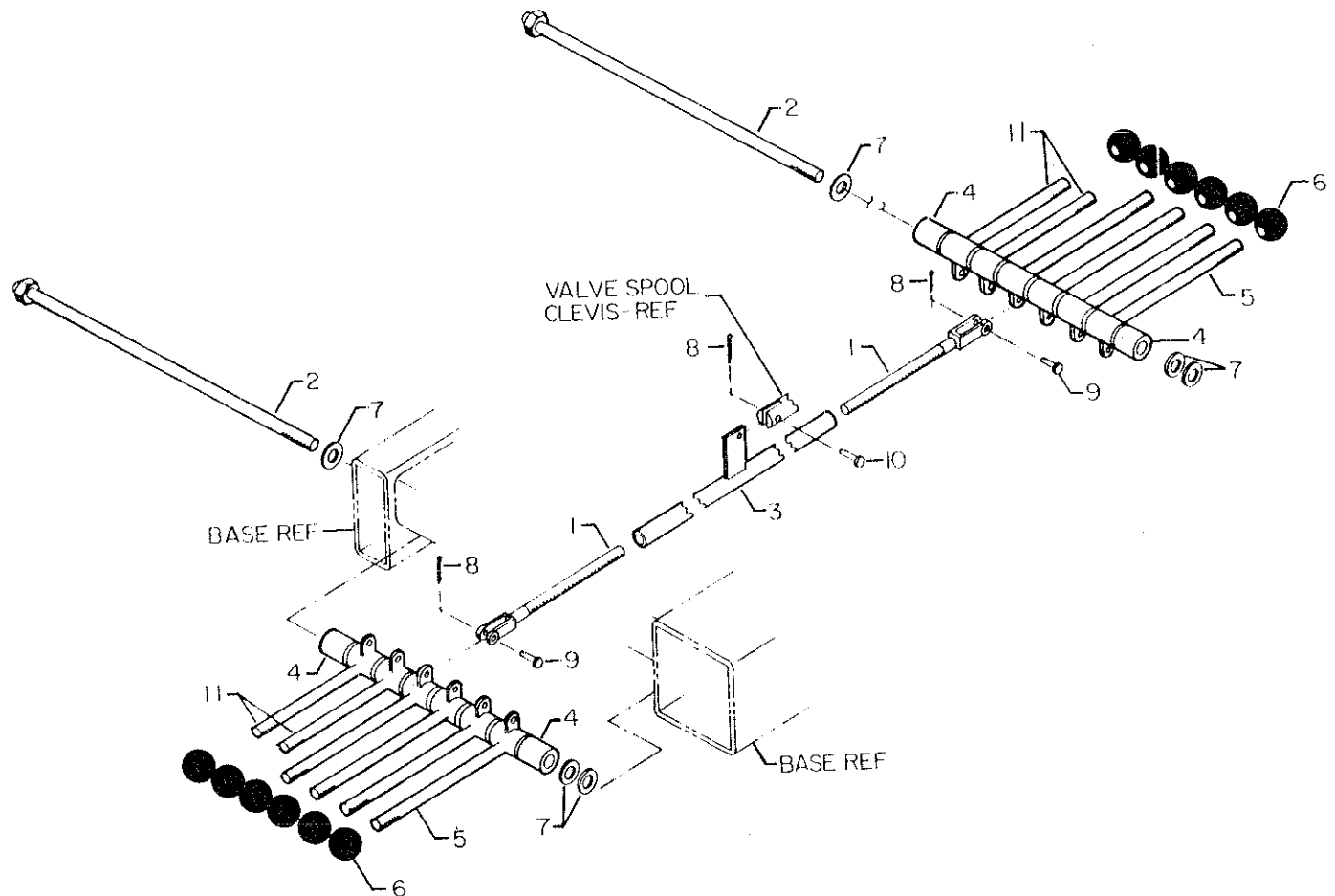
ITEM	PART NO	DESCRIPTION	QTY
1.	4B100880	CASE	1
2.	4H100880	ROD (INCL: 3)	1
3.	7PNPXT02	PLUG 1/8NPT (PART OF 2)	3REF
4.	6C309820	STOP TUBE	1
5.	6H025015	HEAD	1
6.	6IX02512	PISTON	1
7.	72060708	SCR 1/4-20 X 1-1/4 SH	6
8.	73054004	HOLDING VALVE	1
9.	9B101220	SEAL KIT (INCL: 10-18)	1
10.	6A025015	WAFFER LOCK (PART OF 9)	1REF
11.	7Q072137	O-RING (PART OF 9)	1REF
12.	7Q072228	O-RING (PART OF 9)	1REF
13.	7Q10P228	BACK-UP RING (PART OF 9)	1REF
14.	7R14P015	ROD WIPER (PART OF 9)	1REF
15.	7R546015	ROD SEAL (PART OF 9)	1REF
16.	7T61N125	LOCK-RING SEAL (PART OF 9)	1REF
17.	7T66P025	PISTON SEAL (PART OF 9)	1REF
18.	7T2N8015	WEAR RING (PART OF 9)	1REF

Figure D-14. EXTENSION CYLINDER (3B100880)



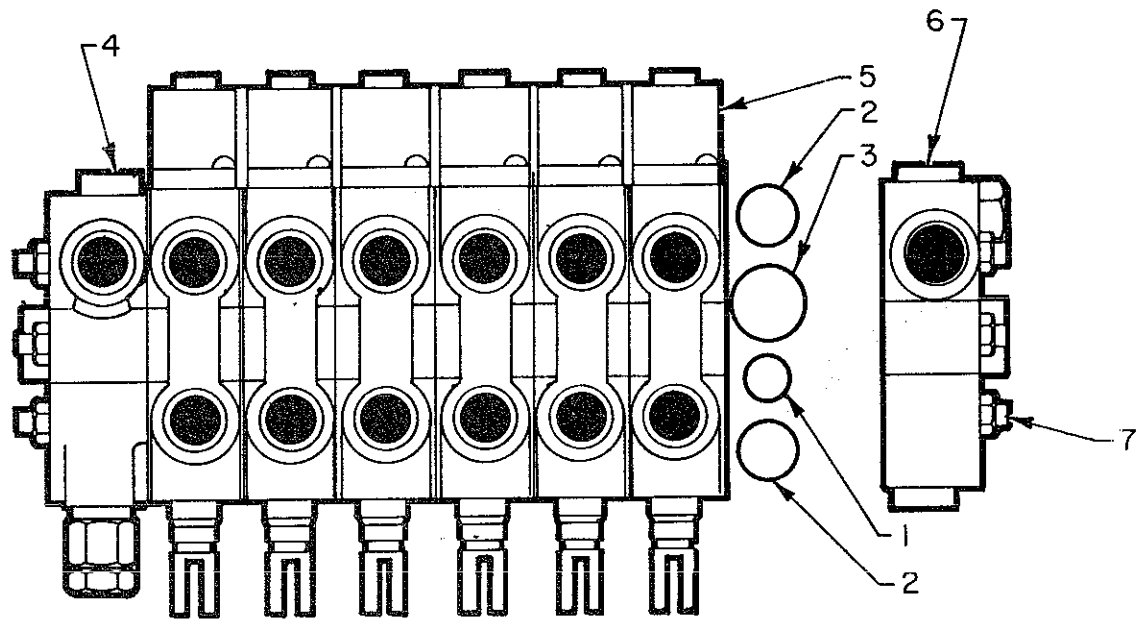
ITEM	PART NO	DESCRIPTION	QTY
1.	51704620	HOSE ASM 1/4 X 20	1
2	51704621	HOSE ASM 1/4 X 22	1
3	51704625	HOSE ASM 1/4 X 38	1
4	51704968	HOSE ASM 1/4 X 186	2
5	51705098	HOSE ASM 1/4 X 39	1
6	51706021	HOSE ASM 1/4 X 30	2
7	51707340	HOSE ASM 1/4 X 17	4
8	51708209	HOSE ASM 1/4 X 42	1
9	51708210	HOSE ASM 1/4 X 44	1
10	51708211	HOSE ASM 1/4 X 112	2
11	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	1
12	72053764	ELBOW 7/8MSTR 3/4MJIC 90°	1
13	72532351	ADAPTER 7/16MSTR 7/16MJIC	10
14	72532657	TEE 3/4JIC SWVL NUT RUN	1
15	72532675	CAP 3/4JIC	1
16	72532699	ELBOW 9/16MSTR 7/16MJIC 90°	8
17	72532700	ELBOW 9/16MSTR 9/16MJIC 90°	6
18	72532707	ADAPTER 7/16MJIC 9/16FJIC	6
19	72532722	ADAPTER 7/8MSTR 9/16FSTR	14
20	72532768	TEE 7/16JIC	2
21	72532985	ELBOW 9/16MSTR 7/16MJIC 45°	2
22	72533052	ADAPTER 3/4MSTR 9/16FSTR	2
23	72060026	CAP SCR 5/16-18 X 1-1/4 HH GR5	3
24	72062109	NUT 5/16-18 LOCK	3

Figure D-15. Hydraulic Kit (Part Number 91707996)



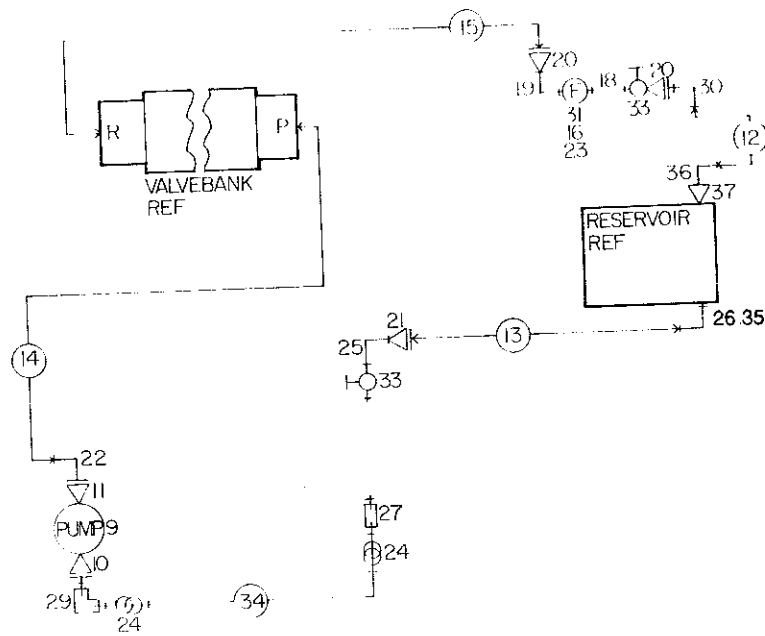
REF	PART NO.	DESCRIPTION	QTY
1	52704745	CONTROL ROD - MALE	12
2	52708022	CONTROL HANDLE ROD	2
3	52708023	CONTROL ROD - FEMALE	6
4	60030141	SPACER 1/2	4
5	70029451	CONTROL HANDLE - VB	8
6	71039096	CONTROL KNOB 1-1/2	12
7	72063119	WASHER 5/8 FLAT HARD GR8	6
8	72066168	COTTER PIN .09 X 1	18
9	72066338	CLEVIS PIN 5/16 X 1	12
10	72661169	CLEVIS PIN 5/16 X 3/4	6
11	60025254	CONTROL HANDLE - SHORT	4

Figure D-16. Control Kit 6-Function Manual (Part Number 90707995)



ITEM	PART NO	DESCRIPTION	QTY
1	7Q072017	O-RING	7
2	7Q072018	O-RING	14
3	7Q072021	O-RING	7
4	73054488	END CAP - LH	1
5	73054490	TANDEM VALVE SECTION	6
6	73731576	END CAP - RH	1
7	94731591	TIE ROD KIT	1

**Figure D-17. Valvebank 6-Section (Part Number 51704803)**



ITEM	PART NO	DESCRIPTION	QTY
1	52704965	SHEAR PLATE RH	1
2	52704966	SHEAR PLATE LH	1
3	72060117	CAP SCR 1/2-13 X 1-1/2 HH GR8	16
4	72060188	CAP SCR 3/4-10 X 3-1/2 HH GR5	4
5	72062232	NUT 1/2-13 TOP LOCK	16
6	72062140	NUT 3/4-10 LOCK	4
7	72063132	WASHER 1/2 FLAT HARDENED	16
8	72063116	WASHER 3/4 FLAT GR8	8
9		PUMP	1
10		ADAPTER (PER PUMP)	1
11		ADAPTER (PER PUMP)	1
12	51703866	HOSE ASM 1/2 X 12	1
13	51703945	HOSE ASM 3/4 X 17	1
14	51704030	HOSE ASM 3/8 X 84	1
15	51706041	HOSE ASM 1/2 X 22	1
16	60103870	OIL FILTER BRACKET	1
18	72053141	PIPE NIPPLE 3/4 X CLOSE	1
19	72053556	STREET ELBOW 3/4NPT 90°	1
20	72053671	ADAPTER 3/4MPT 3/4MJIC	2
21	72053676	ADAPTER 3/4MPT 1-1/16MJIC	1
22	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	1
23	72060025	CAP SCR 5/16-18 X 1 HH GR5	2
24	72066514	HOSE CLAMP 2-BOLT 3/4	2
25	72531087	STREET ELBOW 3/4NPT 45°	1
26	72531427	ELBOW 3/4MPT 1-1/16MJIC 90°	1
27	72531548	BARB NIPPLE 3/4BARB 3/4HOSE	1
29	72532344	BARB NIPPLE 3/4 3/4 90°	1
30	72532670	ELBOW 3/4MJIC 3/4FJIC 45°	1
31	73052000	RETURN FILTER	1
33	73054129	GATE VALVE 3/4NPT	2
34	89391285	HOSE 3/4 100R4	32"
35	72053376	REDUCER BUSHING 1NPT 3/4NPT	1REF
36	72532972	ADAPTER #8MJIC #12FJIC	1REF
37	72053375	REDUCER BUSHING 3/4 1/2NPT	1

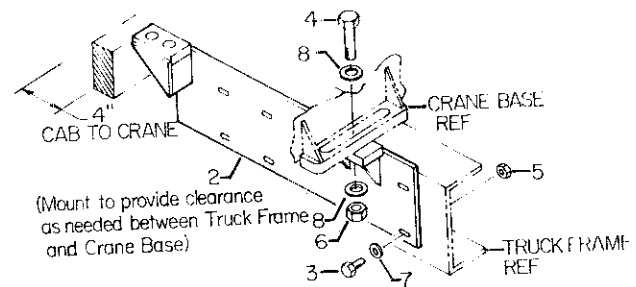
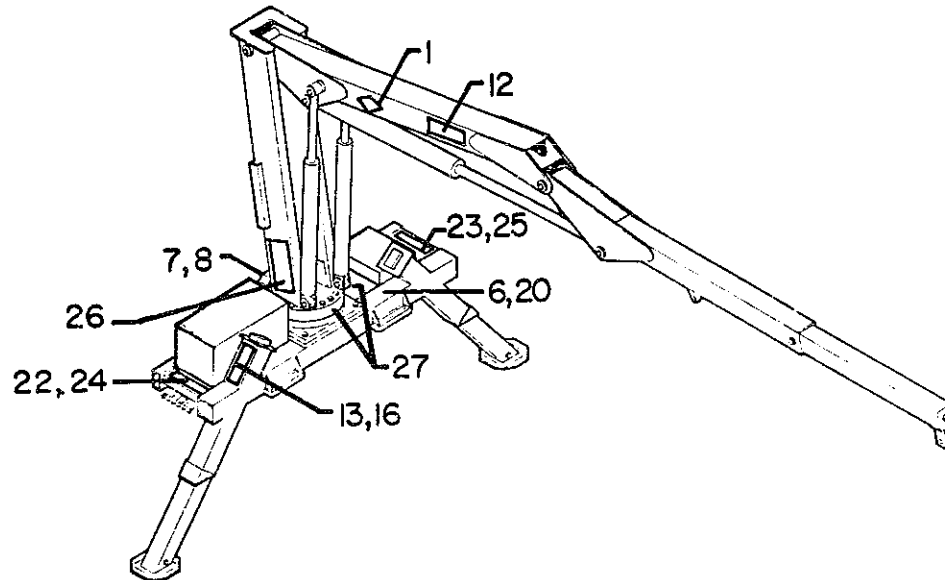


Figure D-18. INSTALLATION KIT (93707994)

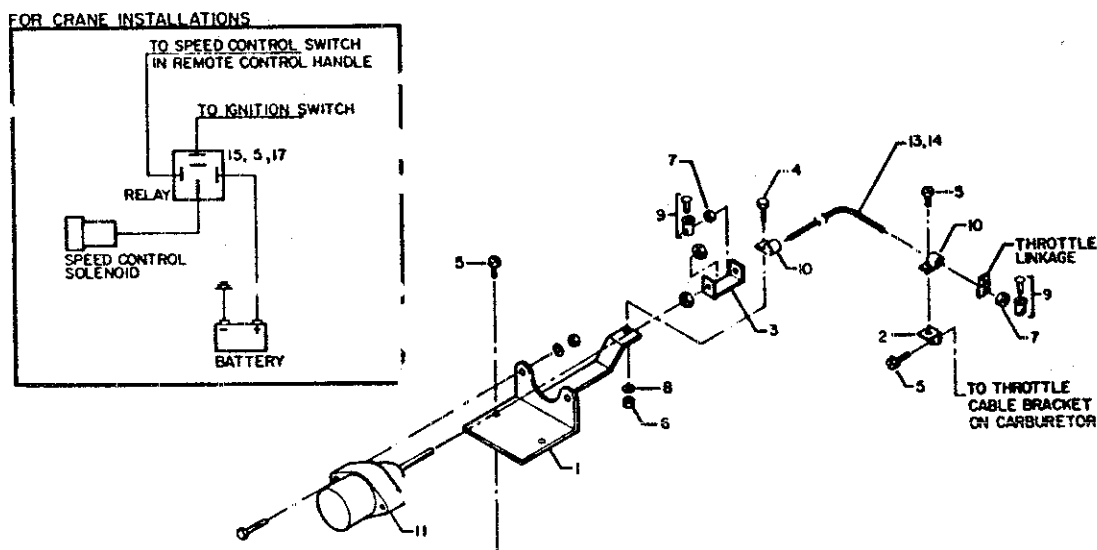


ITEM	PART NO.	DESCRIPTION	QTY
1.	70392887	PLACARD - IMT DIAMOND	2
2.	70391612	DECAL-GREASE WKLY LH	5
3.	70391613	DECAL-GREASE WKLY RH	3
4.	70392108	DECAL-SUCTION LINE	1
5.	70392109	DECAL-RETURN LINE	1
6.	70392213	DECAL-CAUTION WASH/WAX	1
7.	70392399	DECAL-LUBRICATE WORM	1
8.	70392524	DECAL-ROTATE/GREASE	1
9.	70392813	DECAL-DANGER ELECTROCUTION	2
10.	70392814	DECAL-DANGER OPER TRAINING	2
11.	70392815	DECAL-DANGER OPERATION	2
12.	70392817	DECAL-2815 IDENTIFICATION	2
13.	70392864	DECAL-DANGER OUTRG STD CLR	2
14.	70392865	DECAL-DANGER ELECTROCUTION	4
15.	70392866	DECAL-DANGER OPER CONDITIONS	2
16.	70392867	DECAL-DANGER OUTRG MOVING	2
17.	70392888	DECAL-DANGER OPER RESTRICTIONS	2
18.	70392890	DECAL-DANGER STOW/FOLD	2
19.	70392891	DECAL-DANGER DRIVELINE	2
20.	70392982	DECAL-CONTACT IMT	1
21.	71039134	DECAL-CAUTION OIL LEVEL	1
22.	71392255	DECAL-CONTROLS SS	1
23.	71392256	DECAL-CONTROLS CS	1
24.	71392257	DECAL-PWR DN OR SS	1
25.	71392258	DECAL-PWR DN OR CS	1
26.	71392816	CAPACITY PLACARD 2815	2
27.	71392365	DECAL-ALIGN CRANE	1
28.	70391583	DECAL-WARNING STD CLR	2

DECAL PLACEMENT	
ITEM NO.	LOCATION
9,10,11,15, 17,18,19,21, 26,28	AT OR NEAR NORMAL OPERATING STATIONS
13,16	ONE ON EACH OUTRIGGER
14	ONE ON EACH SIDE OF CARRIER VEHICLE
8	AT TURNABLE GREASE ZERK
2,3	AT ALL GREASE ZERKS
5	ON RESERVOIR AT RETURN LINE
4	ON RESERVOIR AT SUCTION LINE

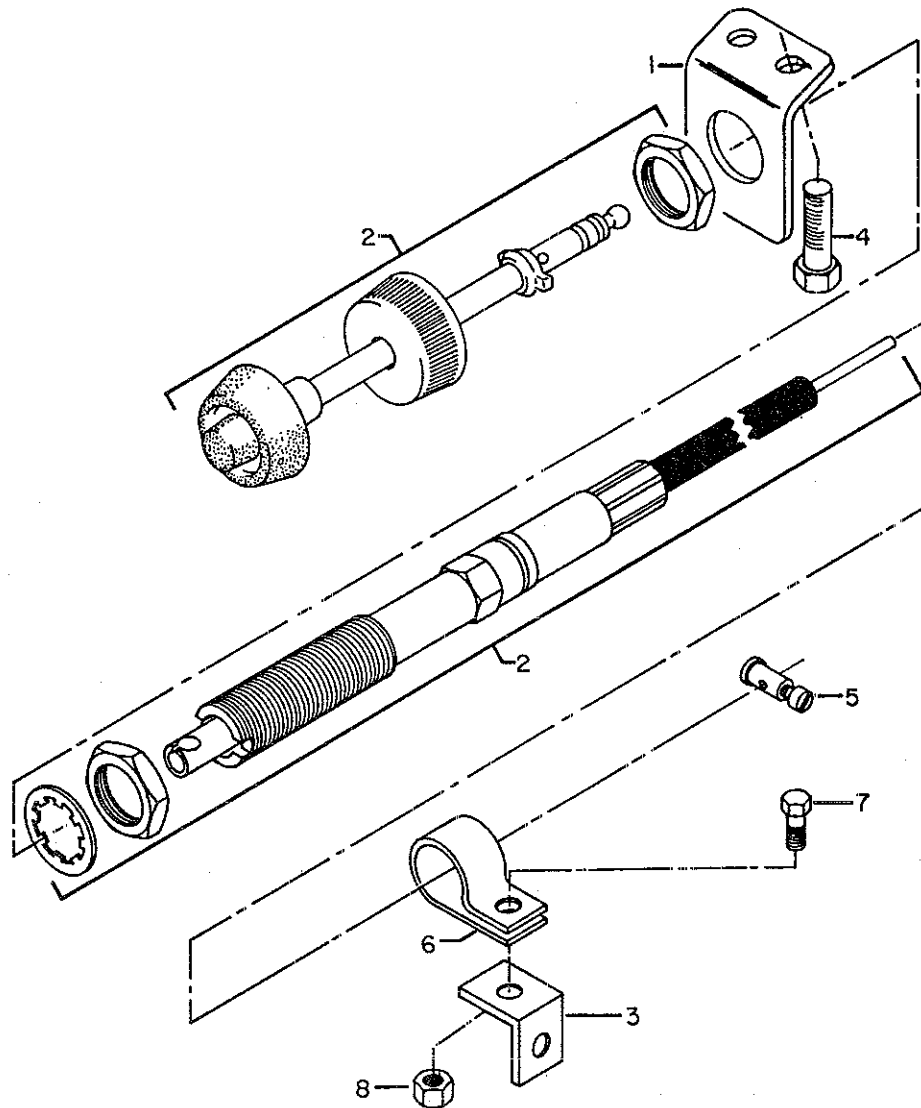
Figure D-19. DECAL KIT (95708202)





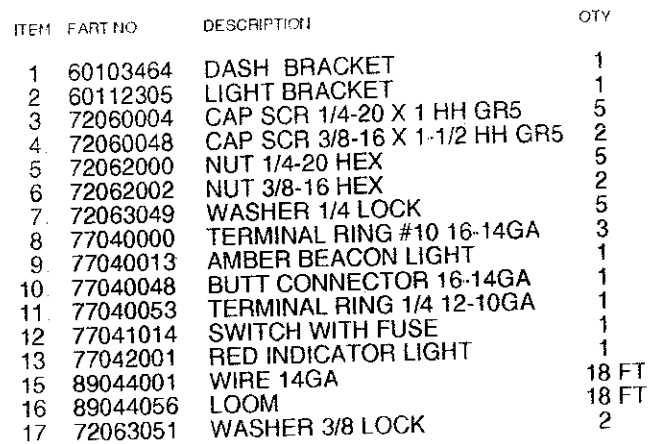
Item No.	Part No.	Description	Qty
1	52705080	SPD CONT BRACKET	1
2	60106760	LINKAGE BRACKET	1
3	60108086	PLUNGER BRACKET	1
4	72060002	CAP SCR 1/4-20 X 3/4 HH GR5	5
5	72061004	SCR #14 X 3/4 SHT MET	5
6	72062000	NUT 1/4-20 HEX	5
7	72062093	NUT #8-32 HEX	2
8	72063049	WASHER 1/4 LOCK	5
9	72066377	CABLE STOP	2
10	72066523	CLAMP	2
11	73054654	SOLENOID VALVE 12V	1
13	89058892	CASING	3-1/2
14	89058934	CABLE	4'
15	77041251	RELAY 12V	1
16	89044233	WIRE 14GA BRN	20
17	77040186	TERMINAL	4
18	60103535	SWITCH BRACKET (NOT SHWN)	2
19	77041345	TOGGLE SWITCH - SGL THRW (NOT SHWN)	2

Figure D-20. Throttle Control - Synchro Start (Part Number 31705270)

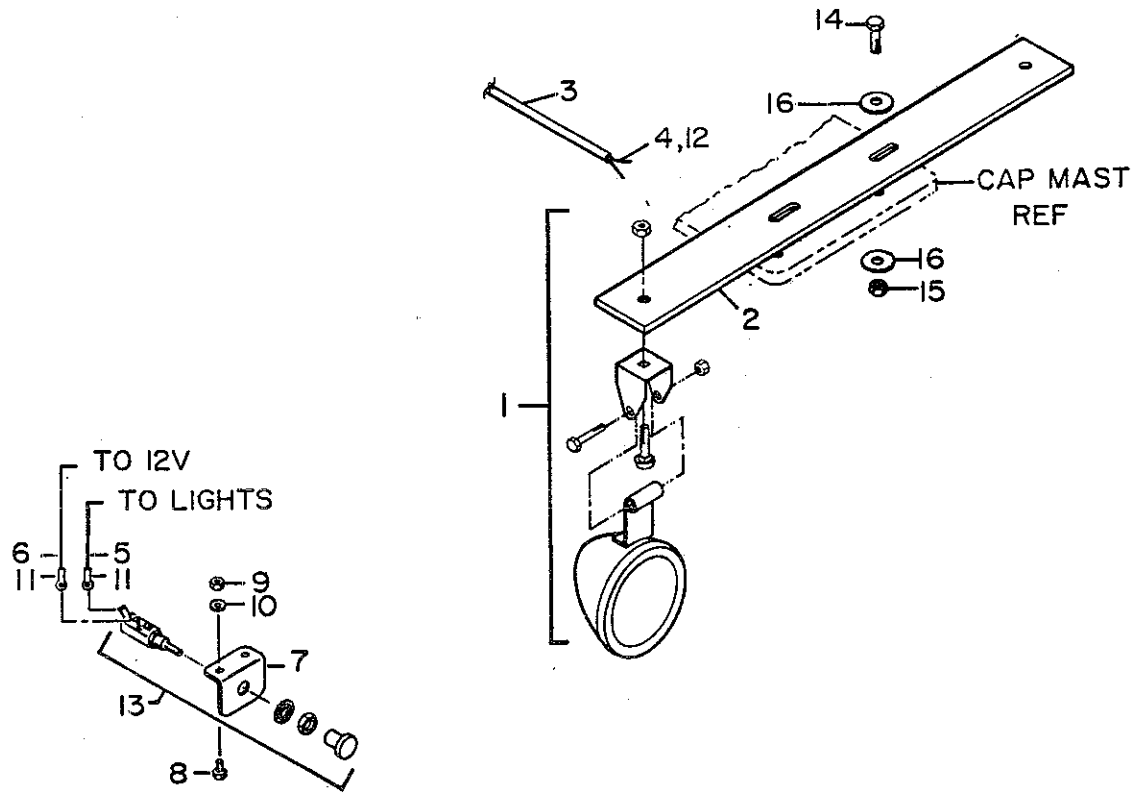


ITEM	PART NO	DESCRIPTION	QTY
1.	60105400	MOUNTING BRACKET	1
2.	70058067	THROTTLE CONTROL 18'	1
3.	60106760	LINKAGE BRACKET	1
4.	72060962	SCR 5/16-18 X 1 HH SLFTP	2
5.	72066377	CABLE STOP	1
6.	72066523	CLAMP	1
7.	72060636	MACH SCR #10-24 X 3/4 RDH	2
8.	72062106	NUT #10-24 LOCK	2

**Figure D-21. Throttle Control Kit - Manual 18' (Part Number 31702746)**

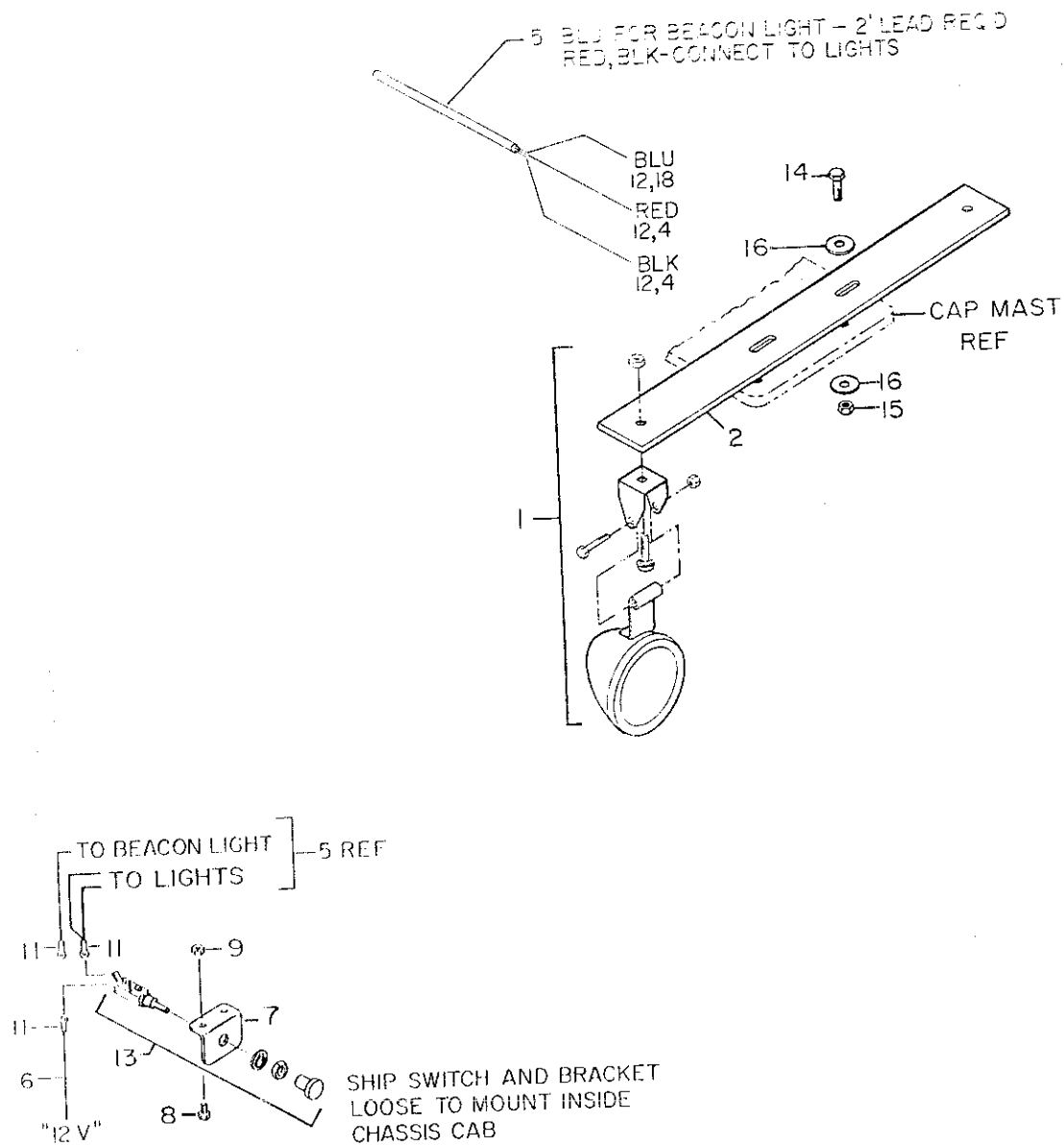


**Figure D-22. Beacon Light Kit (Part Number 51708392)**



ITEM	PART NO	DESCRIPTION	QTY
1.	77040281	FLOOD LIGHT - CHROME 12V	2
2.	60113425	LIGHT BRACKET	1
3.	89044351	LOOM	18 FT
4.	60030049	SPIRAL WRAP 10"	2
5.	89044274	WIRE 14GA BLK	36 FT
6.	60045056	WIRE 14GA BLK X 36"	1
7.	60103535	SWITCH BRACKET	1
8.	72060004	CAP SCR 1/4-20 X 1 HH GR5	2
9.	72062000	NUT 1/4-20 HEX	2
10.	72063049	WASHER 1/4 LOCK	2
11.	77040000	TERMINAL RING #10 16-14GA	2
12.	77040048	BUTT CONNECTOR 16-14GA	2
13.	77041014	SWITCH WITH FUSE	1
14.	72060048	CAP SCR 3/8-16 X 1-1/2 HH GR5	2
15.	72062103	NUT 3/8-16 LOCK	2
16.	72063003	WASHER 3/8 FLAT	4

**Figure D-23. Chrome Floodlight Kit (Part Number 51708400)**

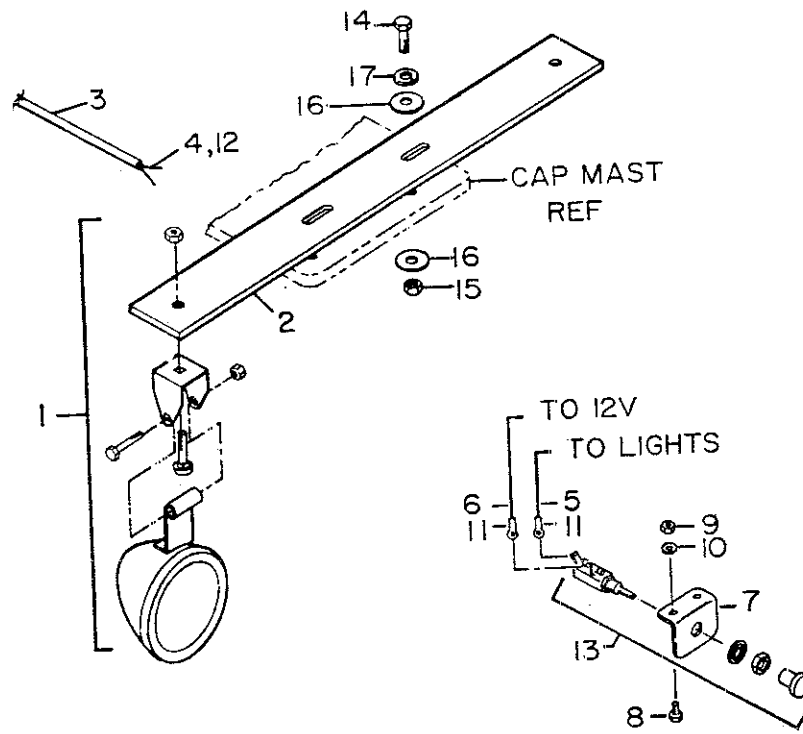


ITEM	PART NO.	DESCRIPTION	QTY
1	51709129	AIRCRAFT LIGHT	2
2	60113425	LIGHT BRACKET	1
4	60030049	SPIRAL WRAP 10"	2
5	89044371	CABLE 14GA/3WIRE	28 FT
6	60045056	WIRE 14GA BLK X 36"	1
7	60103535	SWITCH BRACKET	1
8	72060002	CAP SCR 1/4-20X3/4 HHGR5	2
9	72062104	NUT 1/4-20 HEX LOCK	2
11	77040000	TERMINAL RING #10 16-14GA	3
12	77040048	BUTT CONNECTOR 16-14GA	3
13	77041014	SWITCH WITH FUSE	1
14	72060048	CAP SCR 3/8-16 X 1-1/2 HH GR5	2
15	72062103	NUT 3/8-16 LOCK	2
16	72063003	WASHER 3/8 FLAT	4
18	89034048	SPIRAL WRAP-CLEAR	15 FT

Figure D-24. AIRCRAFT FLOODLIGHT KIT (51709309)

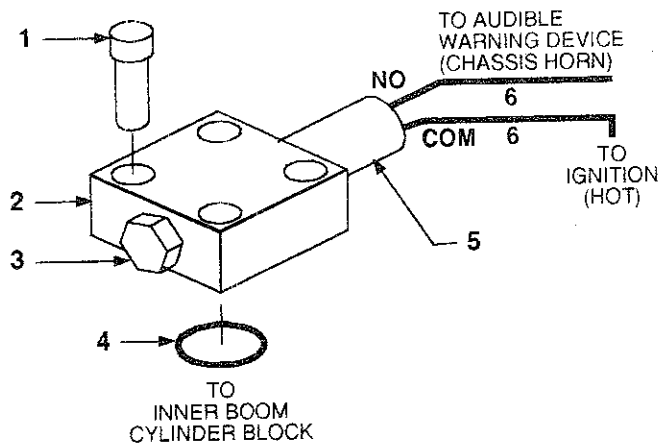


**Figure D-25. Halogen Floodlight Kit (Part Number 51709311)**



ITEM	PART NO	DESCRIPTION	QTY
1	77040026	FLOODLIGHT - BLK 12V	2
2	60113425	LIGHT BRACKET	1
3	89044351	LOOM	18 FT
4	60030049	SPIRAL WRAP 10"	2
5	89044274	WIRE 14GA BLK	36 FT
6	60045056	WIRE 14GA BLK X 36"	1
7	60103535	SWITCH BRACKET	1
8	72060000	CAP SCR 1/4-20 X 1/2 HH GR5	2
9	72062000	NUT 1/4-20 HEX	2
10	72063049	WASHER 1/4 LOCK	2
11	77040000	TERMINAL RING #10 16-14GA	2
12	77040048	BUTT CONNECTOR 16-14GA	2
13	77041014	SWITCH WITH FUSE	1
14	72060048	CAP SCR 3/8-16 X 1-1/2 HH GR5	2
15	72062103	NUT 3/8-16 LOCK	2
16	72063003	WASHER 3/8 FLAT	4
17	72063051	WASHER 3/8 LOCK	2

Figure D-26. Black Finish Floodlight Kit (Part Number 51709310)

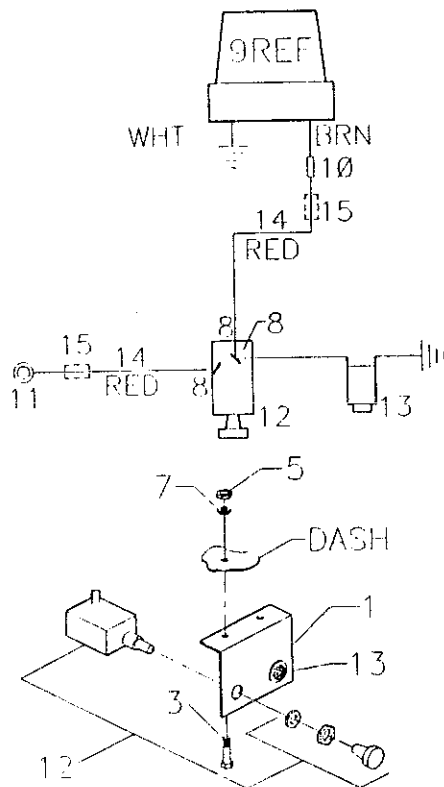
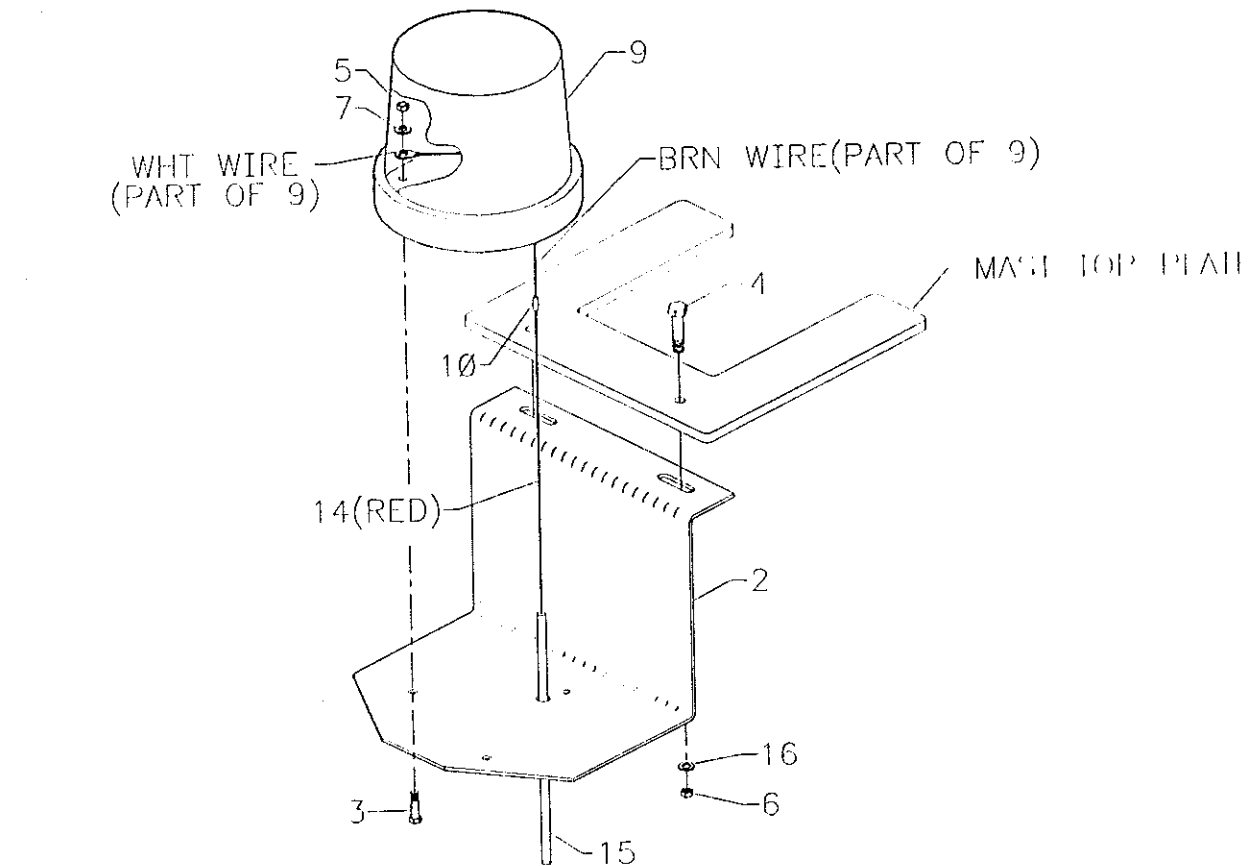
**NOTE**

This capacity alert system consists of a pressure switch mounted on the lift side of the inner boom lift cylinder which senses hydraulic pressure. It is to be connected electrically (by the customer) to an audible warning device such as the truck chassis horn, using 14-gauge wire

ITEM	PART NO	DESCRIPTION	QTY
1.	72060731	CAP SCR 5/16-18X3/4 SH	4
2.	60025221	MANIFOLD	1
3.	72532140	PLUG 9/16-18 STR THD HH	1
4.	7Q072015	O-RING	1
5.	77041283	PRESSURE SWITCH	1
6.	89044188	WIRE-14GA (Customer Supplied)	REF
7.	99900118	INSTALLATION DWG	1

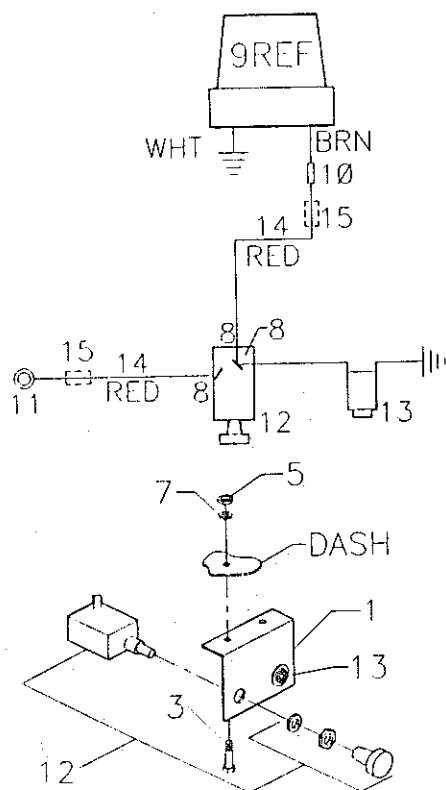
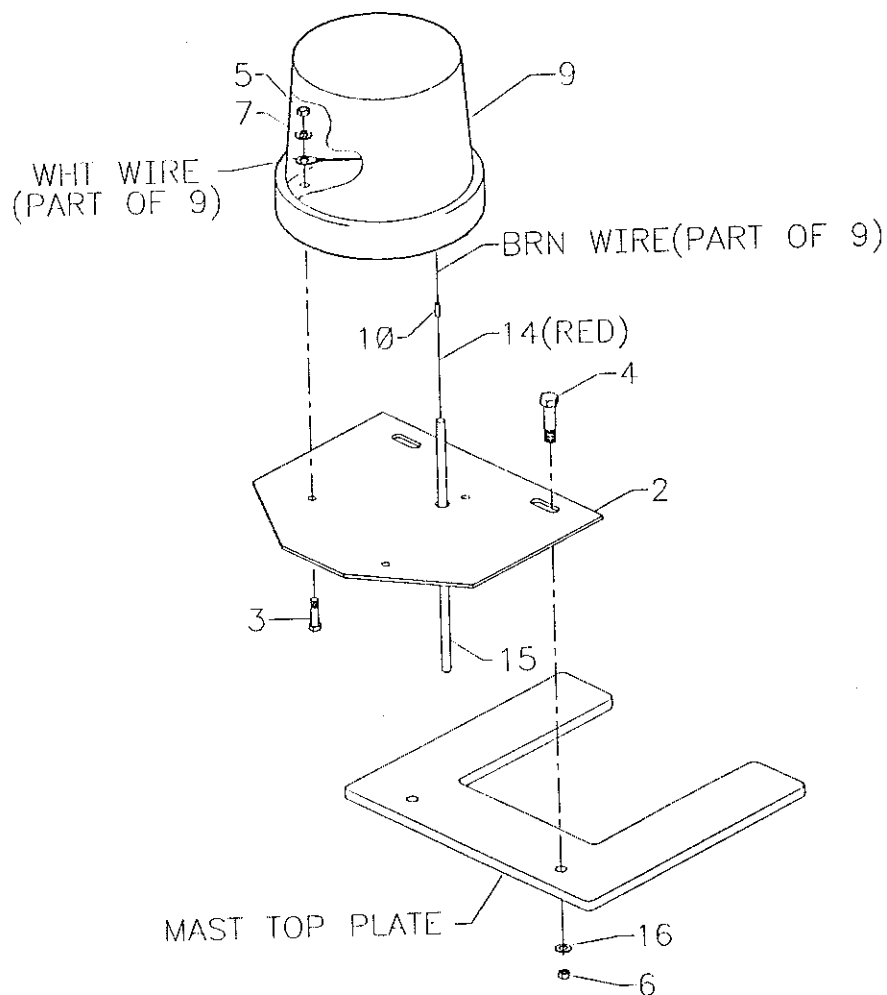
**Figure D-27. CAPACITY ALERT KIT - AUDIBLE (31705698)**





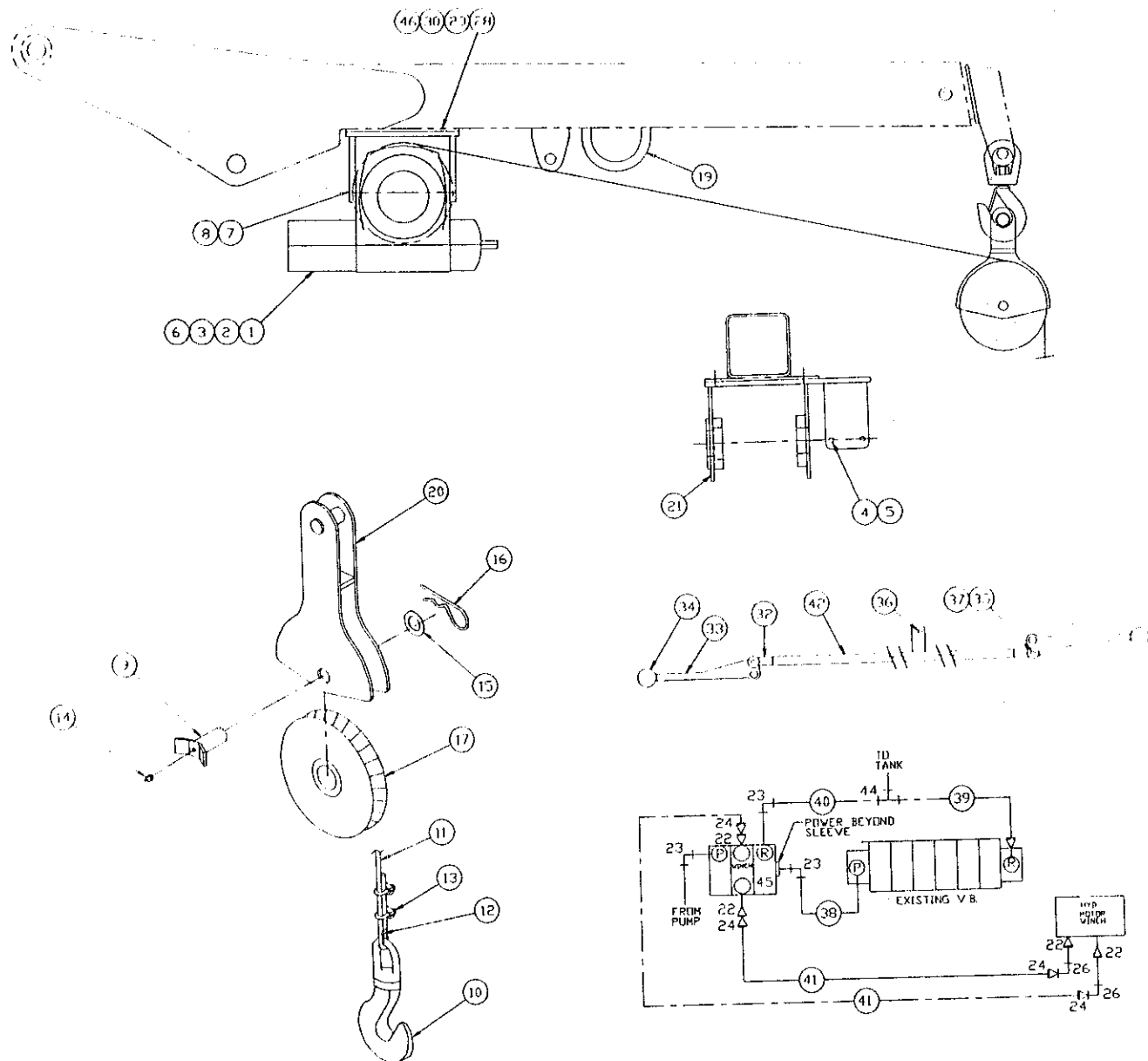
ITEM	PART NO	DESCRIPTION	QTY
1.	60103464	DASH BRACKET	1
2.	60116337	BRACKET-LOW MOUNT	1
3.	72060004	CAP SCR 1/4-20X1 HH GR5	5
4.	72060048	CAP SCR 3/8-16X1-1/2 HH GR5	2
5.	72062000	NUT 1/4-20 HEX	5
6.	72062002	NUT 3/8-16 HEX	2
7.	72063049	WASHER 1/4 LOCK	5
8.	77040000	TERMINAL RING #10 16-14GA	3
9.	77040013	BEACON LIGHT-AMBER	1
10.	77040048	BUTT CONNECTOR 16-14GA	1
11.	77040053	TERMINAL RING 1/4 12-10GA	1
12.	77041014	SWITCH-PUSH/PULL W/FUSE	1
13.	77042001	INDICATOR LIGHT-RED	1
14.	89044001	WIRE 14GA	18FT
15.	89044056	LOOM .31 ID	18FT
16.	72063051	WASHER 3/8 LOCK	2

Figure D-28. BEACON LIGHT KIT-LOW MOUNT (51710948)



ITEM	PART NO.	DESCRIPTION	QTY
1.	60103464	DASH BRACKET	1
2.	60112305	BRACKET-HIGH MOUNT	1
3.	72060004	CAP SCR 1/4-20X1 HH GR5	5
4.	72060048	CAP SCR 3/8-16X1-1/2 HH GR5	2
5.	72062000	NUT 1/4-20 HEX	5
6.	72062002	NUT 3/8-16 HEX	2
7.	72063049	WASHER 1/4 LOCK	5
8.	77040000	TERMINAL RING #10 16-14GA	3
9.	77040013	BEACON LIGHT-AMBER	1
10.	77040048	BUTT CONNECTOR 16-14GA	1
11.	77040053	TERMINAL RING 1/4 12-10GA	1
12.	77041014	SWITCH-PUSH/PULL W/FUSE	1
13.	77042001	INDICATOR LIGHT-RED	1
14.	89044001	WIRE 14GA	18FT
15.	89044056	LOOM .31 ID	18FT
16.	72063051	WASHER 3/8 LOCK	2

**Figure D-29. BEACON LIGHT KIT-HIGH MOUNT (51708392)**



ITEM	PART NO.	DESCRIPTION	QTY
1.	60025211	WINCH DRUM	1
2.	70055142	BEARING	1
3.	51711082	SPEED REDUCER	1
4.	72060046	CAP SCR 3/8-16X1 HH GR5	4
5.	72063051	WASHER 3/8 LOCK	4
6.	73051690	MOTOR	1
7.	72060063	CAP SCR 7/16-14X1-1/4 HH GR5	2
8.	72063052	WASHER 7/16 LOCK	2
9.	52704255	PIN	1
10.	71073921	HOOK 2-TON	1
11.	89058903	CABLE 5/16	65'
12.	70058026	THIMBLE	1
13.	70058909	CLAMP 5/16	2
14.	72053508	GREASE ZERK	1
15.	72063030	WASHER	1
16.	72066145	HAIR PIN 3/16	1
17.	60030082	SHEAVE 7"	1
18.	99990021	BASE-MODIFIED	1
19.	60107589	LOOP	1
20.	52711079	SHEAVE BRACKET	1
21.	52711081	WINCH MTG BRACKET	1
22.	72532722	ADAPTER #10MSTR #6FSTR	4
23.	72053764	ELBOW #10MSTR #8MJIC 90°	3
24.	72532353	ADAPTER #10MSTR #8 MJIC 90°	4

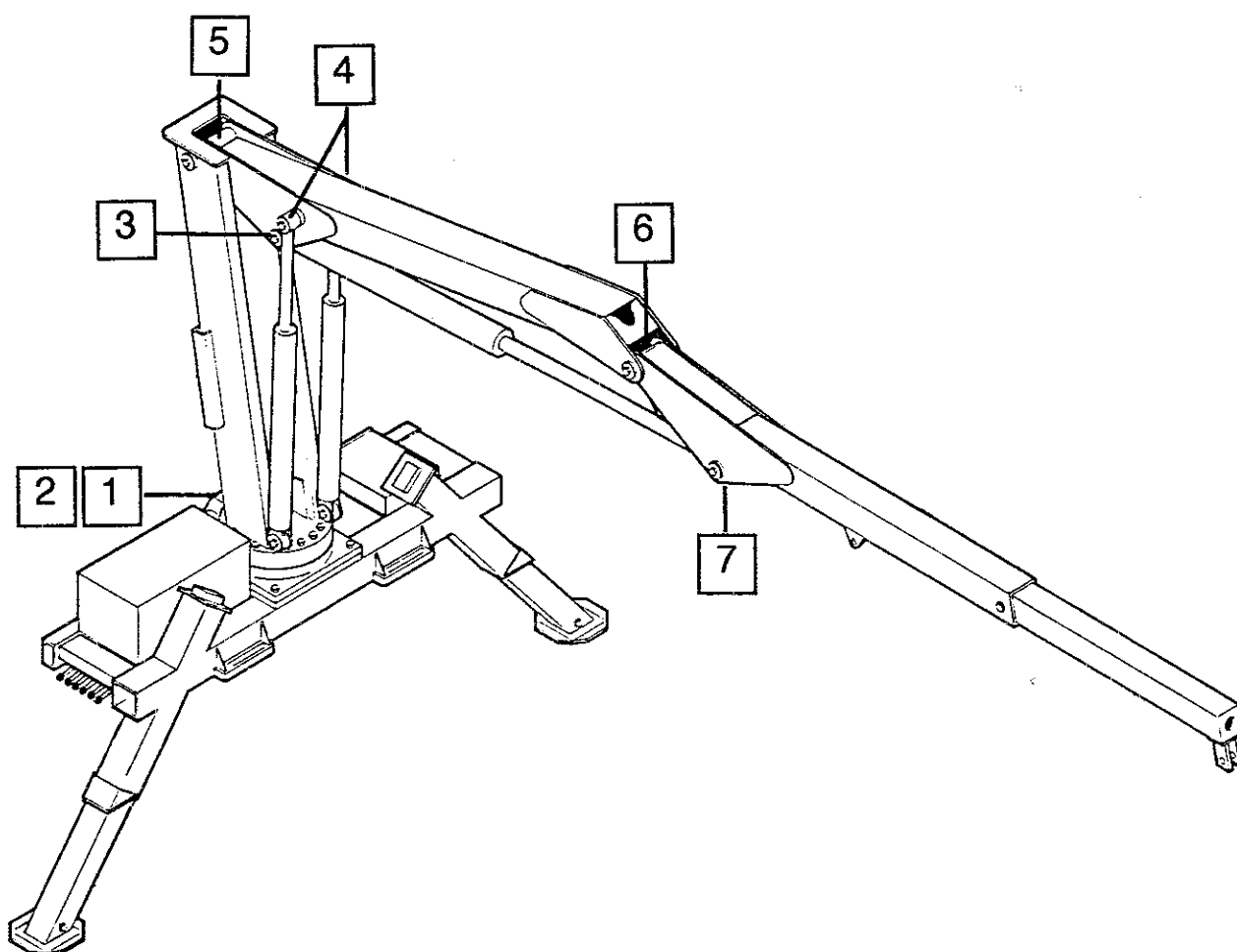
ITEM	PART NO.	DESCRIPTION	QTY
25.	51711085	HOSE ASM 258" FF	2
26.	72532699	ELBOW #6MSTR #4MJIC 90°	1
27.	72533052	ADAPTER #8MSTR #6FSTR	4
28.	72060093	CAP SCR 1/2-13X1-1/2 HH GR5	4
29.	72062004	NUT 1/2-13 HEX	4
30.	72063053	WASHER 1/2 LOCK	4
31.	99990020	MODIFICATION DRAWING	1
32.	52704745	CONTROL ROD M	2
33.	70029451	CONTROL HANDLE	2
34.	71039096	KNOB	2
35.	72066338	CLEVIS PIN	2
36.	72661169	CLEVIS PIN	1
37.	72066168	COTTER PIN	3
38.	51706163	HOSE ASM 3/8X22 FF	1
39.	51707726	HOSE ASM 3/8X20 FF	1
40.	51711130	HOSE ASM 3/8X16 FF	1
41.	51711129	HOSE ASM 1/4X216 FF	2
42.	52711133	CONTROL ROD F	1
43.	71393608	CAPACITY PLACARD	2
44.	72531205	TEE MJIC	1
45.	51711132	VALVEBANK SECTION	1
46.	60116624	WINCH MTG PLATE	1
47.	60116625	CONTROL HANDLE SUPPORT	2
48.	60116626	VB MTG BRACKET	1

Figure D-30. WINCH KIT WITH MANUAL CONTROLS (31711131)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70144163	COVER	1
2.	70732788	DIPSTICK ASSEMBLY	1
3.	70034410	DIFFUSER 3/4NPT 33GPM	1
4.	70732792	SCREEN 30MESH	1
5.	70144325	STRAINER 1NPT 100MESH	1
6.	73052001	PLUG 3/4NPTF SQHD MAG	1
7.	76393565	O-RING 6 ID X 6.5 OD	1

**Figure D-31. RESERVOIR ASSEMBLY (70732577)**

## Section 5. REFERENCE



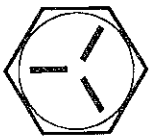

ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	WORM GEAR	SHELL ALVANIA 2EP OR SHELL RETINAX "A"	WEEKLY
2.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING		
3.	OUTER CYLINDER BASE		
4.	INNER CYLINDER RODS		
5.	MAST/INNER BOOM HINGE PIN		
6.	INNER BOOM/OUTER BOOM HINGE PIN		
7.	OUTER CYLINDER ROD		

NOTE: All application points must be greased weekly under normal work loads and moderate weather conditions. Under severe operating conditions, lubrication should be performed more frequently. See Volume 1; Operation, Maintenance and Repair for additional lubrication requirements.



**Figure E-1. Grease Zerk Locations and Lubricant Requirements**

# TORQUE DATA CHART

## FINE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		SAE J429 GRADE 5		SAE J429 GRADE 8	
		PLAIN (LB FT)	PLATED (LB FT)	PLAIN (LB FT)	PLATED (LB FT)
5/16-24	0.3125	19	14	27	20
3/8-24	0.3750	35	26	49	35
7/16-20	0.4375	55	41	78	58
1/2-20	0.5000	90	64	120	90
9/16-18	0.5625	120	90	170	130
5/8-18	0.6250	170	130	240	180
3/4-16	0.7500	300	225	420	315
7/8-11	0.8750	445	325	670	500
1-12	1.0000	645	485	995	745
1 1/8-12	1.1250	890	670	1445	1085
1 1/4-12	1.2500	1240	930	2010	1510
1-3/8-12	1.3750	1675	1255	2710	2035
1 1/2-12	1.5000	2195	1645	3560	2670

## COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		SAE J429 GRADE 5		SAE J429 GRADE 8	
		PLAIN (LB FT)	PLATED (LB FT)	PLAIN (LB FT)	PLATED (LB FT)
5/16-18	0.3125	17	13	25	18
3/8-16	0.3750	31	23	44	33
7/16-14	0.4375	49	37	70	52
1/2-13	0.5000	75	57	105	80
9/16-12	0.5625	110	82	155	115
5/8-11	0.6250	150	115	220	160
3/4-10	0.7500	265	200	375	280
7/8-9	0.8750	395	295	605	455
1-8	1.0000	590	445	910	680
1 1/8-7	1.1250	795	595	1290	965
1 1/4-7	1.2500	1120	840	1815	1360
1-3/8-6	1.3750	1470	1100	2380	1780
1 1/2-6	1.5000	1950	1460	3160	2370

When using the torque data in the charts above, the following rules should be observed.

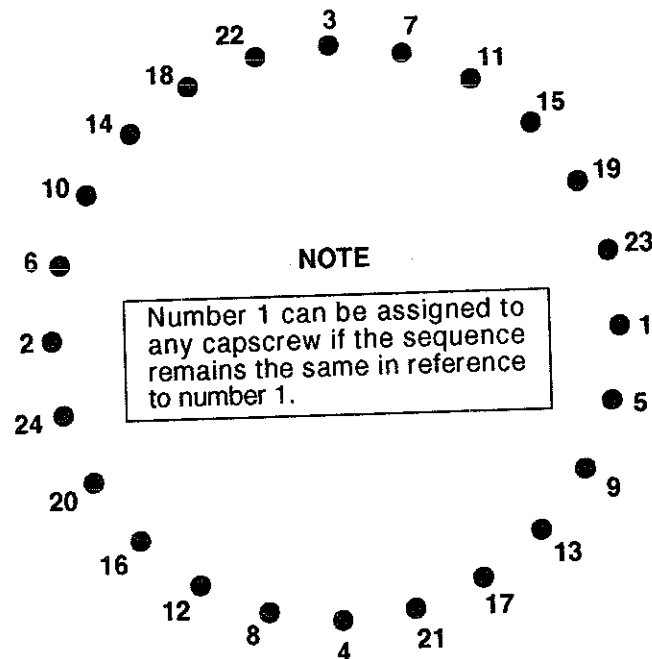
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, colloidal copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of Loctite does not affect the torque values listed above.
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

### WARNING

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue causing serious injury or DEATH.

Figure E-2. TORQUE DATA CHART

Refer to the diagram below for proper tightening/torquing sequence of the turntable bearing to the crane base and crane mast. The total quantity of cap screws varies dependent on crane model.



#### TIGHTENING PROCEDURE:

1. Refer to the Torque Data Chart to determine the proper torque value to apply to the size of cap screw used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of cap screws may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all cap screws to approximately 40% of the specified torque value, by following the sequence. (EXAMPLE:  $40 \times 265 \text{ FT-LBS} = 106 \text{ FT-LBS}$ )
4. Repeat Step 3, but torquing all cap screws to 75% of the specified torque value. Continue to follow the tightening sequence. (EXAMPLE:  $75 \times 265 \text{ FT-LBS} = 199 \text{ FT-LBS}$ )
5. Using the proper sequence, torque all cap screws to the listed torque value as determined from the Torque Data Chart.

**Figure E-3. TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE**

Before a bearing is removed from a crane for inspection, one of the following conditions should be evident:

1. Metal particles present in the bearing lubricant.
2. Increased drive power required to rotate the crane
3. Noise emitting from the bearing during crane rotation.
4. Rough crane rotation.
5. Uneven or excessive wear between the pinion gear and turntable gear.

If none of the above conditions exists, the bearing is functioning properly and need not be replaced. But, if one or more of the above conditions exists, inspection may be required. Limits are measured in "TILT" which is dependent on the internal clearances of the bearing. TILT is the most practical determination of a bearing's internal clearance once mounted on a crane.

Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

## TEST PROCEDURE

### STEP 1.

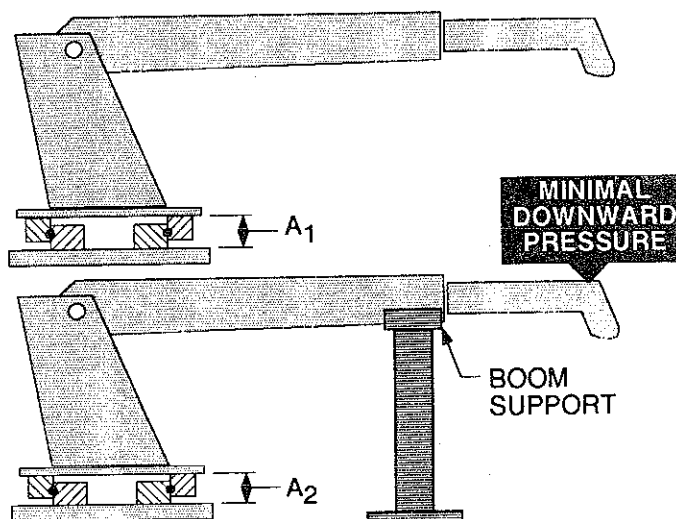
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing ( $A_1$ ), using a dial indicator for accuracy.

### STEP 2.

Reverse the load by applying minimal downward pressure on the boom while the boom is in the boom support or on a solid surface. Again measure  $A_2$ .

### STEP 3.

Subtract  $A_1$  from  $A_2$  to determine tilt and compare the result with the accompanying chart.



COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION					
<b>NOTE</b>  THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED  IF THERE IS REASON TO SUSPECT AN EXCESS OF BEARING WEAR AND THE MEASURED TILT DIMENSION EXCEEDS THE DIMENSION LISTED, REMOVE THE BEARING FOR INSPECTION.	IMT CRANE OR TIREHAND MODEL	814 1007 1014 2010 215 2015 2109 2815 3016 315A 320H 3515 3617 3625 421 425 5016 TH7 BODY ROT'N TH1449A BODY ROT'N TH15A CLAMP TH1836A CLAMP TH2551 CLAMP TH2557 CLAMP TH2557A CLAMP	4817 4825 516 525 5826 6014 6425 725 7020 7025 8025 8031 TH10 BODY ROT'N TH12 BODY ROT'N	32018 32030 HAWK-H1150 HAWK-H1150TL HAWK-H4961	9616 9825 9831 10020 10025 1216 1325 1331 13031 13034 13426 14018 14048 14126 15033 1725 18026 20017 TH1836 BODY ROT'N TH1836A BODY ROT'N TH2551 BODY ROT'N TH2557 BODY ROT'N TH2557A BODY ROT'N
	BALL DIA. (REF)	.875" (22mm)	1.00" (25mm)	1.18" - 1.25" (30 - 32mm)	1.75" (44mm)
	TILT DIM. ( $A_1 - A_2$ )	.060" (1.524mm)	.070" (1.778mm)	.075" (1.905mm)	.090" (2.286mm)

Figure E-4. TURNTABLE BEARING INSPECTION FOR REPLACEMENT



## Spare Parts List

### 1-Year Supply

This spare parts list does not necessarily indicate that the items can be expected to fail in the course of a year. It is intended to provide the user with a stock of parts sufficient to keep the unit operating with no down-time waiting for parts. Obviously, there may be part failures not covered by this list. Only the standard model is listed.

The item numbers shown on this list correspond to the item numbers on the Figure listed.

FIGURE NO.	ITEM NO.	PART NO.	DESCRIPTION	QTY
D-4.	4	60030116	THRUST BEARING	2
D-4.	7	70055147	BEARING	1
D-4.	8	70055148	BEARING	1
D-4.	9	70056395	TURNTABLE BEARING	1
D-4.	16	72062162	NUT 9/16-12 HEX GR8	23
D-4.	19	72063117	WASHER 9/16 HARD GR8	23
D-4.	23	72601510	CAP SCR 9/16-12 X 3-3/4 HH GR8	23
D-4.	24	73051482	MOTOR	1
D-4.	25	70056397	WORM GEAR	1
D-4.	31	60030097	WEAR PAD	2
D-5.	8	73054004	HOLDING VALVE	2
D-5.	9	9B081012	SEAL KIT	2
D-5A.	4	73054004	HOLDING VALVE	2
D-5A.	8	8B081012	SEAL KIT	2
D-6.	4	72063117	WASHER 9/16 FLAT GR8	14
D-6.	6	72601144	CAP SCR 9/16-12 X 2 HH GR8	14
D-7.	3	7BF81215	BUSHING	4
D-7.	4	7BF81215	BUSHING	4
D-8.	4	7BF81015	BUSHING	4
D-8.	9	73054304	COUNTERBALANCE VALVE	2
D-8.	10	9B101414	SEAL KIT	2
D-9.	6	7BF81215	BUSHING	4
D-9.	7	60030138	WEAR PAD	2
D-9.	8	60030140	WEAR PAD	1
D-10.	2	7BF81015	BUSHING	4
D-10.	6	7BF80715	BUSHING	2
D-10.	7	7BF81015	BUSHING	2
D-10.	12	73054304	COUNTERBALANCE VALVE	1
D-10.	13	9C141820	SEAL KIT	1
D-13.	3	60030137	WEAR PAD	1
D-13.	4	71073920	HOOK - 3 TON	1
D-14.	8	73054004	HOLDING VALVE	1
D-14.	9	9B101220	SEAL KIT	1
		73052006	RETURN FILTER ELEMENT	3
		73052014	SUCTION FILTER ELEMENT	3



The information within this manual has been compiled and checked but errors do occur. To provide our customers with a method of communicating those errors we have provided the Manual Change Request form below. In addition to error reporting, you are encouraged to suggest changes or additions to the manual which would be of benefit to you. We cannot guarantee that these additions will be made but we do promise to consider them. When completing the form, please write or print clearly. Submit a copy of the completed form to the address listed below.

## MANUAL CHANGE REQUEST

DATE	PRODUCT MANUAL	2815 Crane	MANUAL PART NO.	99900216-2/91
SUBMITTED BY				
COMPANY				
ADDRESS				
CITY, STATE, ZIP				
TELEPHONE				

☐ ERROR FOUND

LOCATION OF ERROR (page no.): \_\_\_\_\_

DESCRIPTION OF ERROR: \_\_\_\_\_

☐ REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: \_\_\_\_\_

REASON FOR ADDITION: \_\_\_\_\_

MAIL TO: IOWA MOLD TOOLING Co., Inc.  
Box 189,  
Garner IA 50438  
ATTN: Technical Publications

# MANUFACTURER'S LIMITED WARRANTY

**WARRANTY COVERAGE** - Products manufactured by Iowa Mold Tooling Co., Inc. (IMT) are warranted to be free from defects in material and workmanship, under proper use, application and maintenance in accordance with IMT's written recommendations, instructions and specifications as follows:

1. Ninety (90) days; labor on IMT workmanship from the date of delivery to the end user
2. One (1) year; original IMT parts from the date of delivery to the end user

IMT's obligation under this warranty is limited to, and the sole remedy for any such defect shall be the repair or replacement (at IMT's option) of unaltered parts returned to IMT, freight prepaid, provided such defect occurs within the above stated warranty period and is reported within fourteen (14) days of its occurrence

**IMPLIED WARRANTY EXCLUDED** - This is the only authorized IMT warranty and is in lieu of all other express or implied warranties or representations, including any implied warranties of merchantability or fitness for any particular purpose or of any other obligations on the part of IMT.

**ITEMS EXCLUDED** - The manufacturer gives no warranty on any components or parts purchased by the manufacturer, and such components as are covered only by the warranties of their respective manufacturers.

**WARRANTY CLAIMS** - Warranty claims must be submitted and shall be processed in accordance with IMT's established warranty claim procedure

**WARRANTY SERVICE** - Warranty service will be performed by any IMT distributor authorized to sell new IMT products of the type involved or by any IMT Service Center authorized to service the type of product involved or by IMT in the event of direct sales made by IMT. At the time of requesting warranty service, the purchaser must present evidence of the date of delivery of the product. The purchaser shall pay any premium for overtime labor requested by the purchaser, any charge for making service calls and for transporting the equipment to the place where warranty work is performed

**WARRANTY VOIDED** - All obligations of IMT under this warranty shall be terminated: (1) if service other than normal maintenance or normal replacement of service items is performed by someone other than an authorized IMT dealer, (2) if product is modified or altered in ways not approved by IMT.

**PURCHASER'S RESPONSIBILITY** - This warranty covers only defective material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper protection in storage, or improper use. The purchaser has the obligation of performing the care and maintenance duties discussed in IMT's written recommendations, instructions and specifications. Any damage which results because of purchaser's failure to perform such duties shall not be covered by this warranty. The cost of normal maintenance and normal replacement of service items such as filters, belts, etc. shall be paid by the purchaser.

**CONSEQUENTIAL DAMAGES** - The only remedies the purchaser has in connection with the breach or performance of any warranty on IMT products are those set forth above. In no event will the dealer, IMT or any company affiliated with IMT, be liable for business interruptions, loss of sales and/or profits, rental or substitute equipment, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

**REPRESENTATIONS EXCLUDED** - IMT products are subject to no expressed, implied or statutory warranty other than herein set forth, and no agent, representative or distributor of the manufacturer has any authority to alter the terms of this warranty in any way whatsoever or to make any representations or promises, express or implied, as to the quality or performance of IMT products other than those set forth above.

**CHANGE IN DESIGN** - IMT reserves the right to make changes in design or improvements upon its products without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

Effective January, 1984

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**IOWA MOLD TOOLING Co., Inc.**

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