Volume 2
Parts and Specifications
Model 13034 Crane

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MANUAL PART NUMBER 99900137
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INTRODUCTION

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

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 you IMT truck-mounted articulating crane. It also contains additional instructions regarding you 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 B30.5A-1984
ARTICULATING 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.

Read and familiarize yourself with the IMT OPERATOR'S CRANE SAFETY MANUAL before operating or performing any maintenance on your crane.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Section 1. MODEL 13034 CRANE SPECIFICATIONS

1-1. GENERAL

Crane Rating	130,000 ft-lbs (17.97 ton-meters)
Reach (from centerline of rotation)	33'-7" (10.24m)
Hydraulic Extension	84" (213cm)
* Lifting Height	45'-2" (13.77m)
Crane Weight without platform and chair	8250 lbs (3742 kg)
Crane Weight with platform and chair	8700 lbs (3946 kg)
Outrigger Span	15'-0" (4.57m)
*Crane Storage Height	13'-3" (4.04m)
** Mounting Space Required	36" (91.4cm)
Optimum Pump Capacity - tandem pump (each section)	16 U.S. GPM (60.6 liters/min)
Oil Reservoir Capacity	39 U.S. gallons (147.6 liters)
***Vertical Center of Gravity from base of crane	58" (147.3cm)
***Horizontal Center of Gravity from centerline of rotation	74" (188.0cm)
Design Factor (Pins and Hydraulics)	4/1

* Based on 41" (104.1 cm.) truck frame height.
** Allow an additional 5" (12.7cm) between the truck cab and crane base for swing clearance.
*** Based on crane with chair and platform in stored position, extension boom retracted with fork and rotator installed - fork, rotator and link weigh approximately 600 lbs (272 kg).

1-2. LIFTING CAPACITY (from centerline of rotation)

26'-7" (8.10m)	4900 lbs (2222 kg)
33'-7" (10.24m)	3900 lbs (1769 kg)

1-3. PERFORMANCE CHARACTERISTICS

Rotation: 450° (7.85 rad.)	37 seconds
Inner Boom Elevation: -5° to +80° (-0.09 rad. to +1.40 rad.)	25 seconds
Outer Boom Articulation: 170° (2.97 rad.)	21 seconds
Extension Boom: 84" (213.4cm)	10 seconds
Outrigger Extension: 29-1/4" (74.3cm)	32 seconds

* All times are theoretical and based on an optimum pump capacity of 16 GPM (60.6 liters/min).

1-4. CYLINDERS

	Bore	Stroke
Inner Boom Cylinder	5-1/2" (14.0cm)	28-1/4" (71.8cm)
Outer Boom Cylinder	6-1/2" (16.5cm)	50" (127.0cm)
Extension Boom Cylinder	3" (7.6cm)	84" (213.4cm)
Outrigger Cylinders	6-1/2" (16.5cm)	29-1/4" (74.3cm)

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1-5. POWER SOURCE

Integral-mounted tandem hydraulic pump and PTO application. Other standard power sources may be utilized. Minimum power required is 55 horsepower.

1-6. 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 component failure. In addition, the outer, extension and outrigger cylinders feature double counter-balance valves.

The counter-balance valve 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.

1-7. ROTATION SYSTEM

Turntable bearing powered by 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 hydraulic motor providing rotational and parking brake action. Total gear reduction is 68.3 to 1.

1-8. HYDRAULIC SYSTEM

Open-centered, full-pressure system with tandem pump requiring 16 U.S. GPM (60.6 liters/minute) optimum oil flow at 2500 psi (172.4 bar). Control valve consists of two four-spool, stack type valvebanks. All crane (excluding outriggers) and wallboard functions are operated by either joy sticks or foot throttles via a pilot source of oil from the valve banks. Outrigger controls - located at the base of the crane - are of the push/pull type, connected directly to the valvebank. System includes hydraulic oil reservoir, suction-filter, return-filter and control valvebank.

1-9. CAPACITY ALERT

A pressure sensor mounted on the inner-boom cylinders and connected hydraulically to the down side of the inner boom, the lift side of the outer boom and extend side of the extension boom provides a capacity alert system. If the operator tries to lift a load in excess of crane capacity, the inner boom lift and lower, the outer boom lift and the extension out functions will not operate. To relieve the condition, the outer boom can be lowered or the extension retracted.

1-10. MINIMUM CHASSIS SPECIFICATIONS

Body Style	Conventional Cab	Conventional Cab
Wheelbase	259"	(657.9cm)
Cab-to-axle	200"	(508.0cm)
Frame Section Modulus	30 in^3	(492 cc)
RBM	3,300,000 in-lbs	(38,021 kg-m)
Front Axle Rating	16,000 lbs	(7258 kg)
Rear Axle Rating	38,000 lbs	(17,237 kg)
Transmission	5-speed	5-speed

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

Iowa Mold Tooling Co., Inc. reserves the right to change specifications and design without notice.

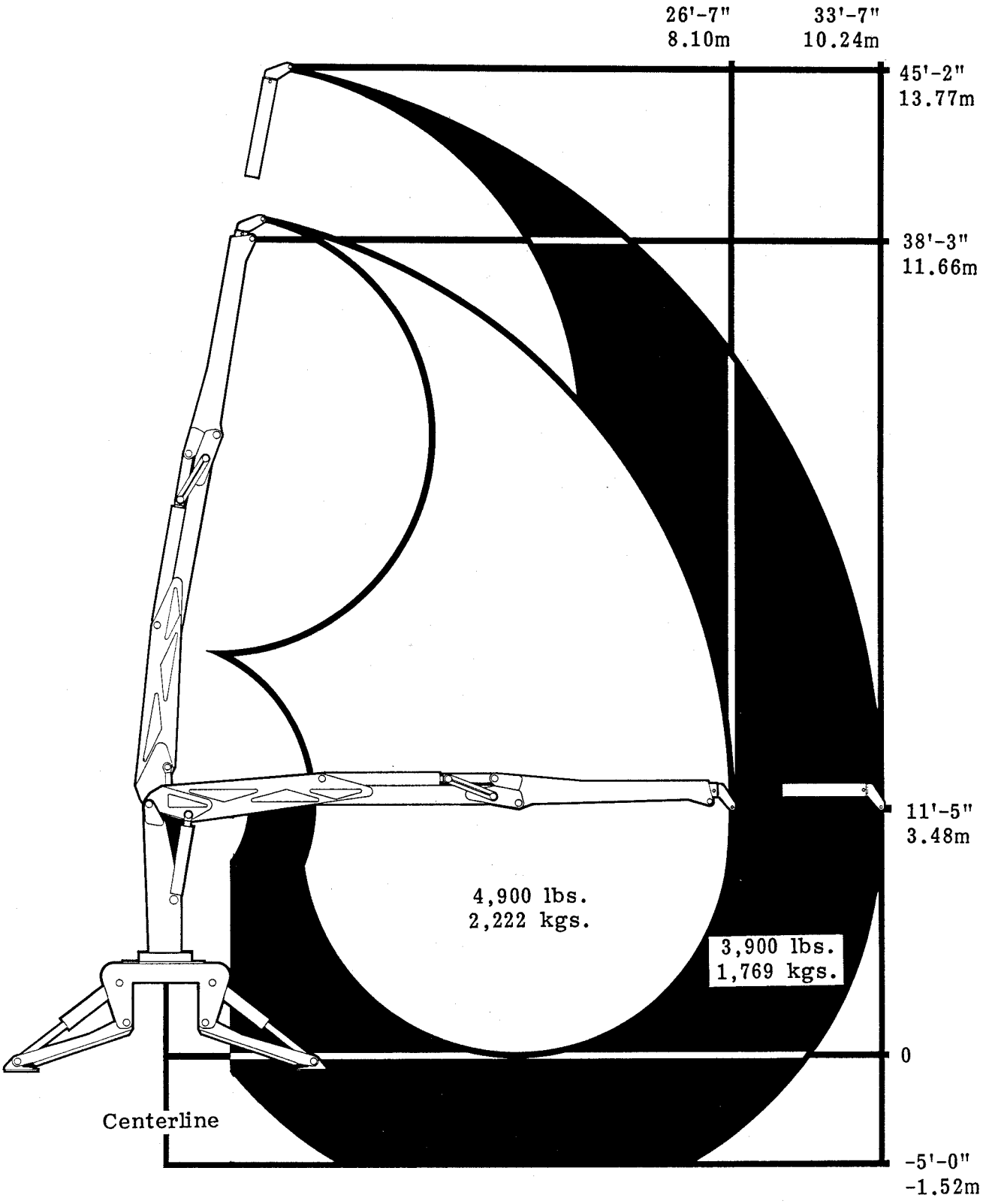


Figure A-1. CAPACITY CHART

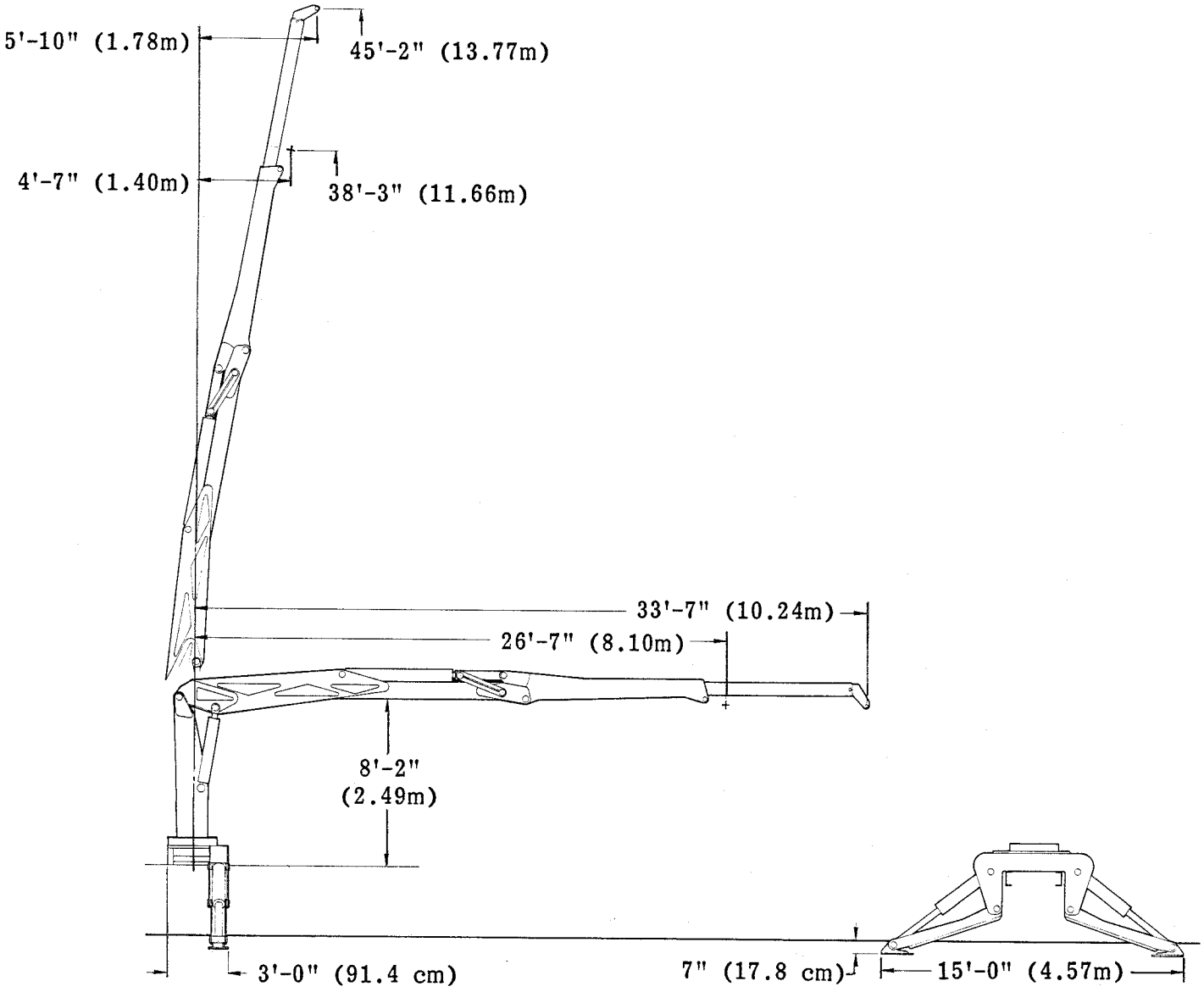


Figure A-2. GEOMETRIC CONFIGURATION

Section 2. CRANE DESCRIPTION

2-1. GENERAL

The 13034 Crane is designed primarily for use as a wallboard-handling crane. This section describes the major assemblies used on the 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 450° (7.85 Rad.) rotation mechanism and outriggers. The outriggers are powered through double-acting hydraulic cylinders, and provide stabilization during crane operation. Maximum outrigger span is 15'-0" (4.57m).

2-3. MAST

The mast provides the necessary elevation for crane operation as well as a hinge point for the inner boom.

2-4. INNER BOOM

The inner boom will swing through a full 85° (1.49 Rad.) from -5° to +80° (-0.09 to +1.40 Rad.). It is raised and lowered through the use of a twin, double-acting hydraulic cylinders.

2-5. OUTER BOOM

The outer boom is articulated through 170° (2.97 Rad.). The boom is raised and lowered through the use of a double-acting hydraulic cylinder mounted above the inner boom and outer boom hinge point. It also provides storage for the extension boom in the retracted position.

2-6. EXTENSION BOOM

The single-stage extension boom increases the operating range of the crane from 26'-7" (8.10m) to 33'-7" (10.24m).

2-7. CONTROLS

There are two joy stick control handles mounted at the operator's station: one provides for inner boom elevation and crane rotation and the other for outer boom articulation and fork rotation. In addition, foot-pedal controls provide the means for operating the extension boom and fork tilt. These controls manipulate the crane via a pilot pressure source of oil from the main valvebank. Outrigger controls - located at the base of the crane - are of the push-pull type with the handles connected directly to the valvebank.

2-8. HYDRAULICS

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

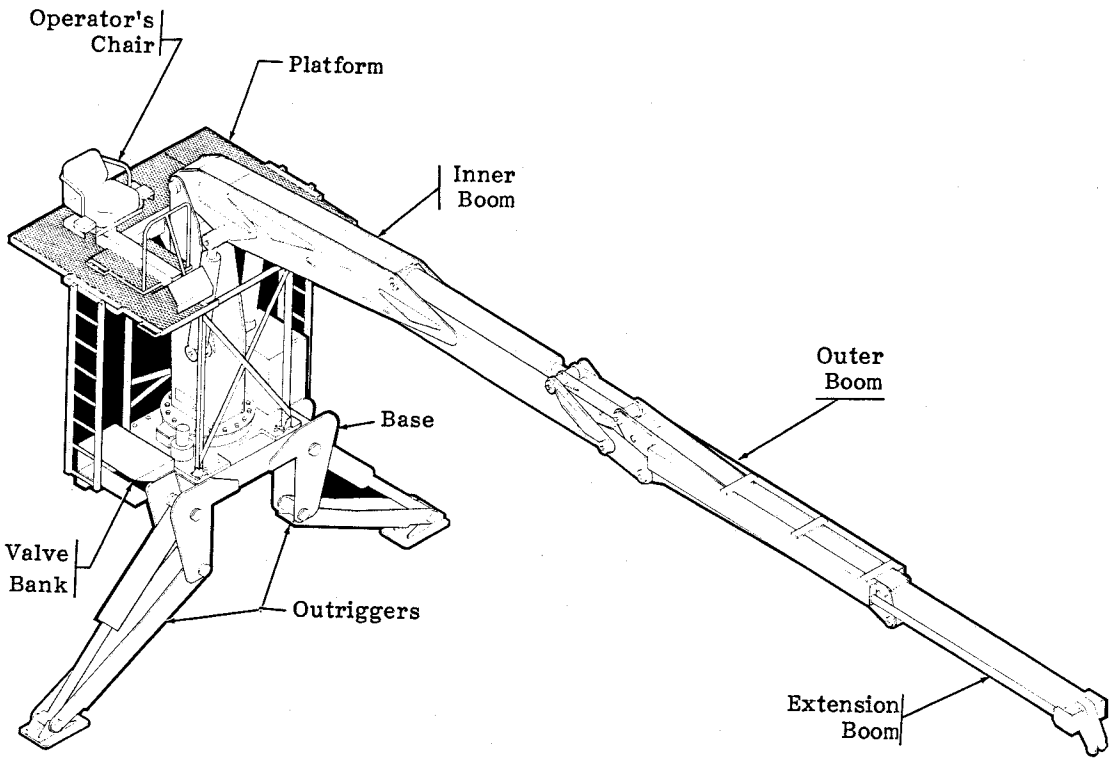


Figure B-1. 13034 CRANE GROUP

Section 3. INSTALLATION

3-1. GENERAL

This section contains specific instructions 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 VOLUME 1, Installation).

3-2. CRANE MOUNTING

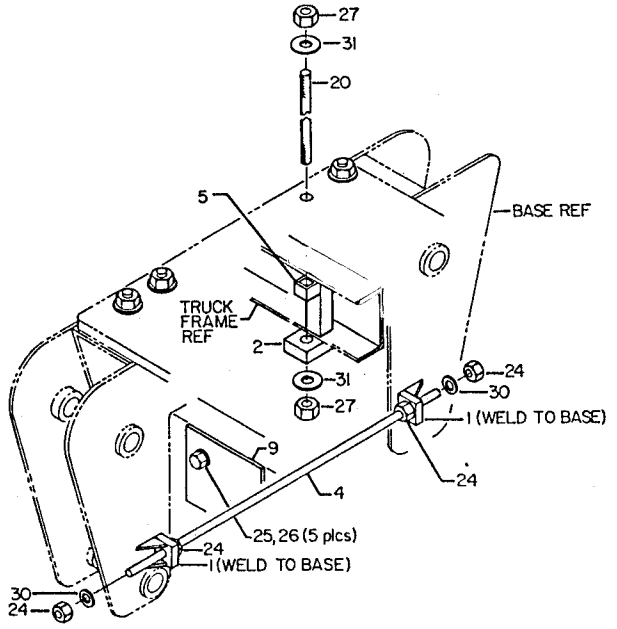
1. See SPECIFICATIONS in Section 1 for crane weight. Using an overhead hoist and fabric slings of adequate capacity, lift the crane about a foot to see if the crane is adequately balanced. If not, lower hoist and adjust slings. Re-check balance and re-position crane until mounting surface is level.
2. Install the truck frame support so that the tie-down studs pass through the supports (Figure C-1). Cut the support to the inside dimensions of the truck frame. Allow about 1/16" extra. Grind the end of the support to fit inside the frame channel. Use a hammer to drive it into position if necessary.
3. Allow sufficient clearance between the cab and crane base, at least 3" (7.6cm). Position the crane on the chassis per the applicable installation drawing, centering the mounting slots over the truck frame rails. While holding crane with hoist, start mounting hardware per Figure C-1. Note position of support weldments on truckframe. Hand tighten nuts. Observe underside of crane base. No clearance between base and frame is allowed.
4. Torque the 1 1/4"-7 UNC Grade 5 mounting hardware to 840 ft-lbs (116 kg-m). When torquing the mounting hardware the following precautions must be followed:
   A. Never use lock washers.
   B. Hardened washers must be used, and under the turning element, whether the turning element is the nut or the head of the bolt.
   C. Torque values specified are with residual oils or without special lubricants applied to the threads. If special lubricants are used, such as Never-Seize compound graphite and oil, molybdenum disulphite collodial copper or white lead, reduce torque values 10%. Torque values for threaded fasteners are not affected with the use of Loctite.
   D. Do not use rusty fasteners, the rust will alter torque values significantly.

CAUTION

Do not attempt to apply the same torque to the tie rod and self-locking nuts as shown in the Torque Data Chart. Do not exceed 840 ft. lbs. (116 kg-m). Exceeding this torque value could damage either the chassis or crane base.

Power wrenching is not recommended until the lead thread of the nut insert is engaged by hand turning.

4. Install the tie-plate (Figure C-1) on the truck chassis. Drill four holes using the plate as a template and install the bolts and lock nuts. Torque the bolts to 200 ft-lbs (28 kg-m). Weld the tie-plate to the crane base with 3/8" continuous fillet weld.
5. Weld the tension bar blocks to the crane base with a 3/8" continuous fillet weld. Install the tension bar with nuts and washers as shown. Tighten the outside nuts first to about 200 ft-lbs (28 kg-m) to preload the tension bar. Then tighten the inner nuts to 466 ft-lbs (65 kg-m).
6. Touch up paint on crane and chassis as necessary.



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	TIE-BAR BLOCK	20.	TIE-DOWN ROD
2.	CLAMP BLOCK	24.	NUT
4.	TENSION BAR	25.	CAP SCR
5.	FRAME SUPPORT	27.	LOCK NUT
9.	PLATE	30.	LOCK WASHER
		31.	HARD WASHER

Figure C-1. CRANE INSTALLATION

3-3. HYDRAULIC INSTALLATION

To install the hydraulic hoses, fittings, etc.:

1. Plumb the suction line filter as shown in Figure C-2.
2. Install the 1-1/4" ID suction hose between the suction line filters and the pump inlets. Tighten the hose clamps.
3. Install the 3/4" pressure hose between the pump outlets and the inlet ports on the valvebanks.
4. Install the return line between the reservoir return line filters and valvebank (if applicable).
5. Fill the hydraulic oil reservoir.
6. 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.

7. Open the return gate valve.
8. 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 filters (should read 8" mercury or less). If the vacuum reading is too high, check to make certain that the gate valves are opened completely. If the valve is fully opened, check for a collapsed or restricted suction line.
9. Cycle all hydraulic functions. Check for leaks, and refill the reservoir if necessary.

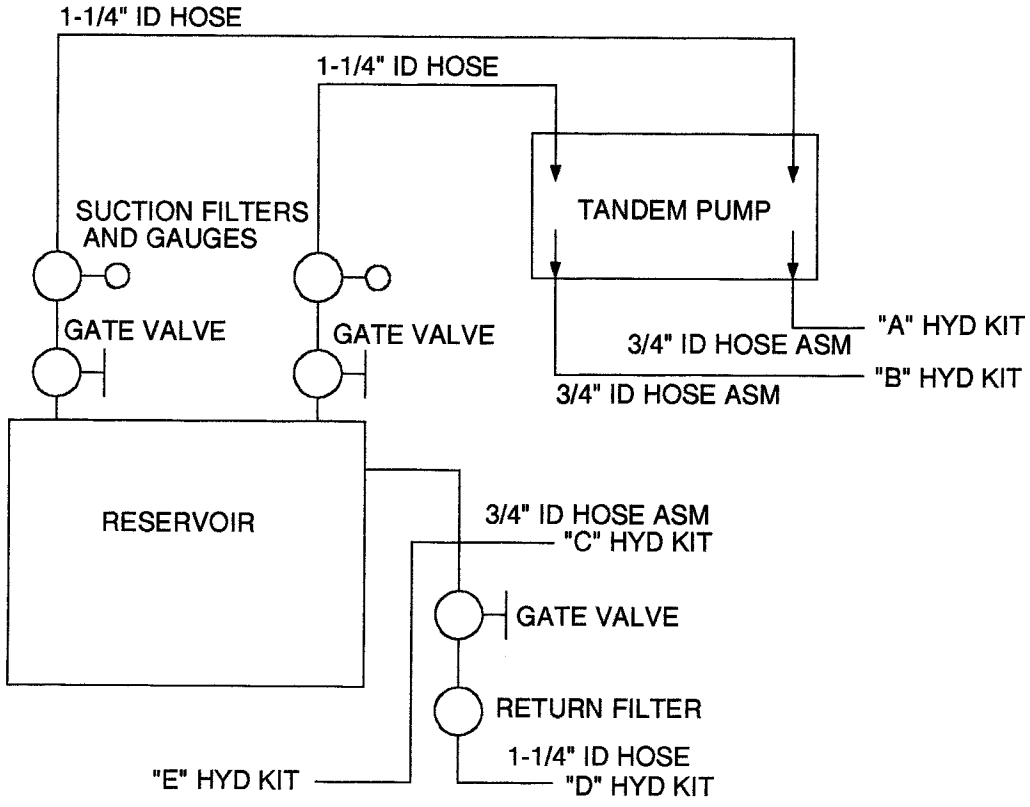


Figure C-2. HYDRAULIC INSTALLATION

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, INJURY OR 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 Company, Inc.
Box 189, Garner, Iowa 50438-0189
Telephone: 515-923-3711
Product Support Fax: 515-923-2424

or

IMT Cranes Canada, Ltd.
385 West Street South
Orillia, Ontario. L3V 5H2, Canada
Telephone: 705-325-7458
Fax: 705-325-7624

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 of 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.

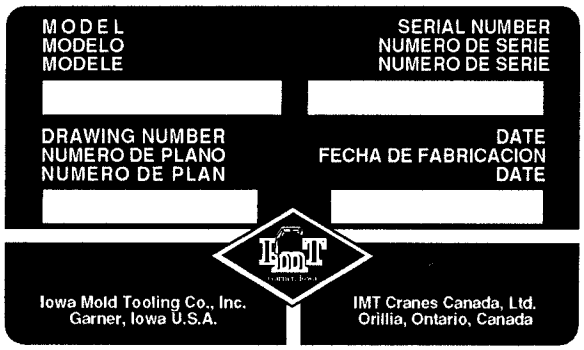


Figure D-1. SERIAL NUMBER PLACARD

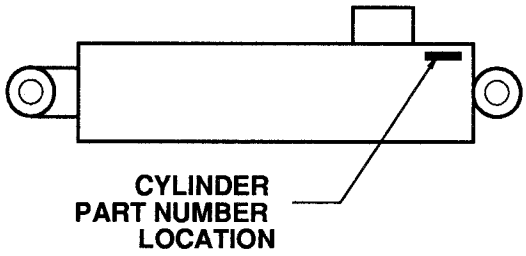


Figure D-2. CYLINDER PART NUMBER LOCATION

4-4. WELDMENT INDENTIFICATION

Each of the major weldments - base, mast, inner boom, outer boom, extension boom and outrigger leg 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.

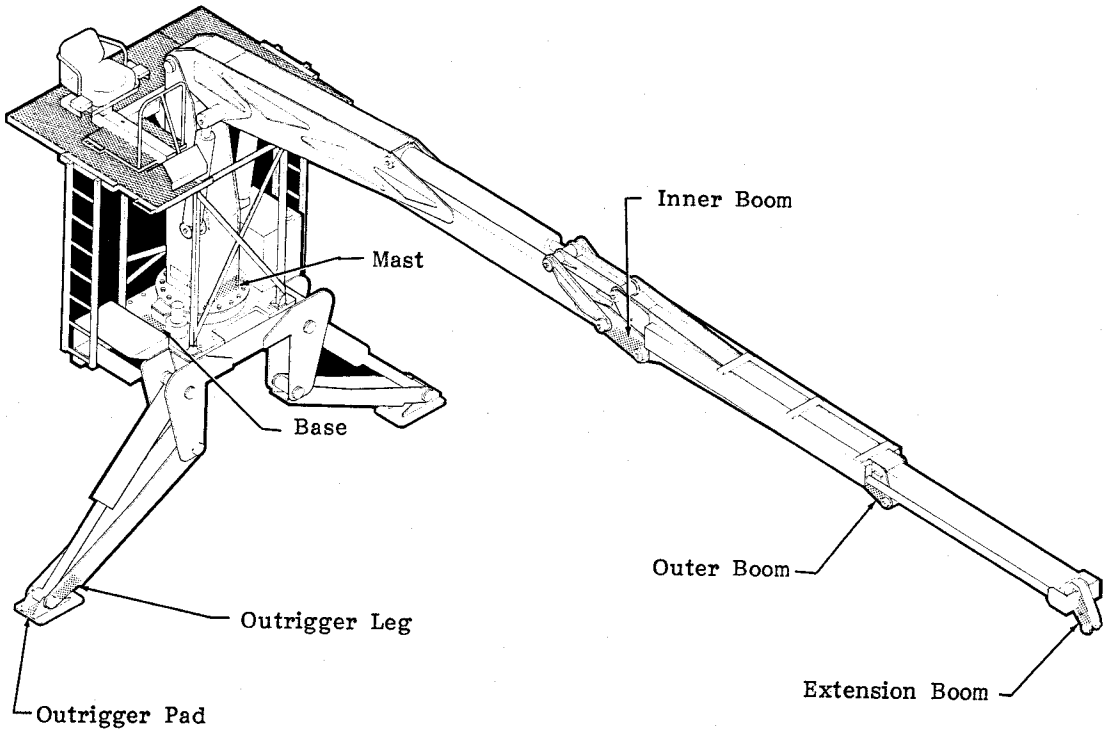


Figure D-3. WELDMENT PART NUMBER LOCATION

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

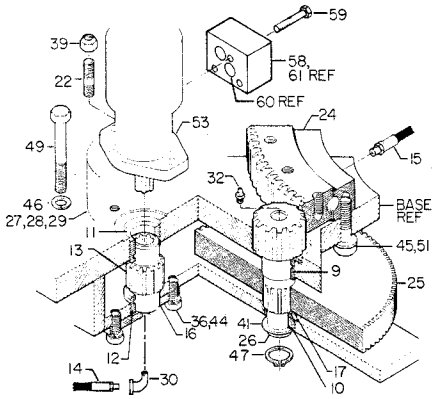
Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before reassembly.

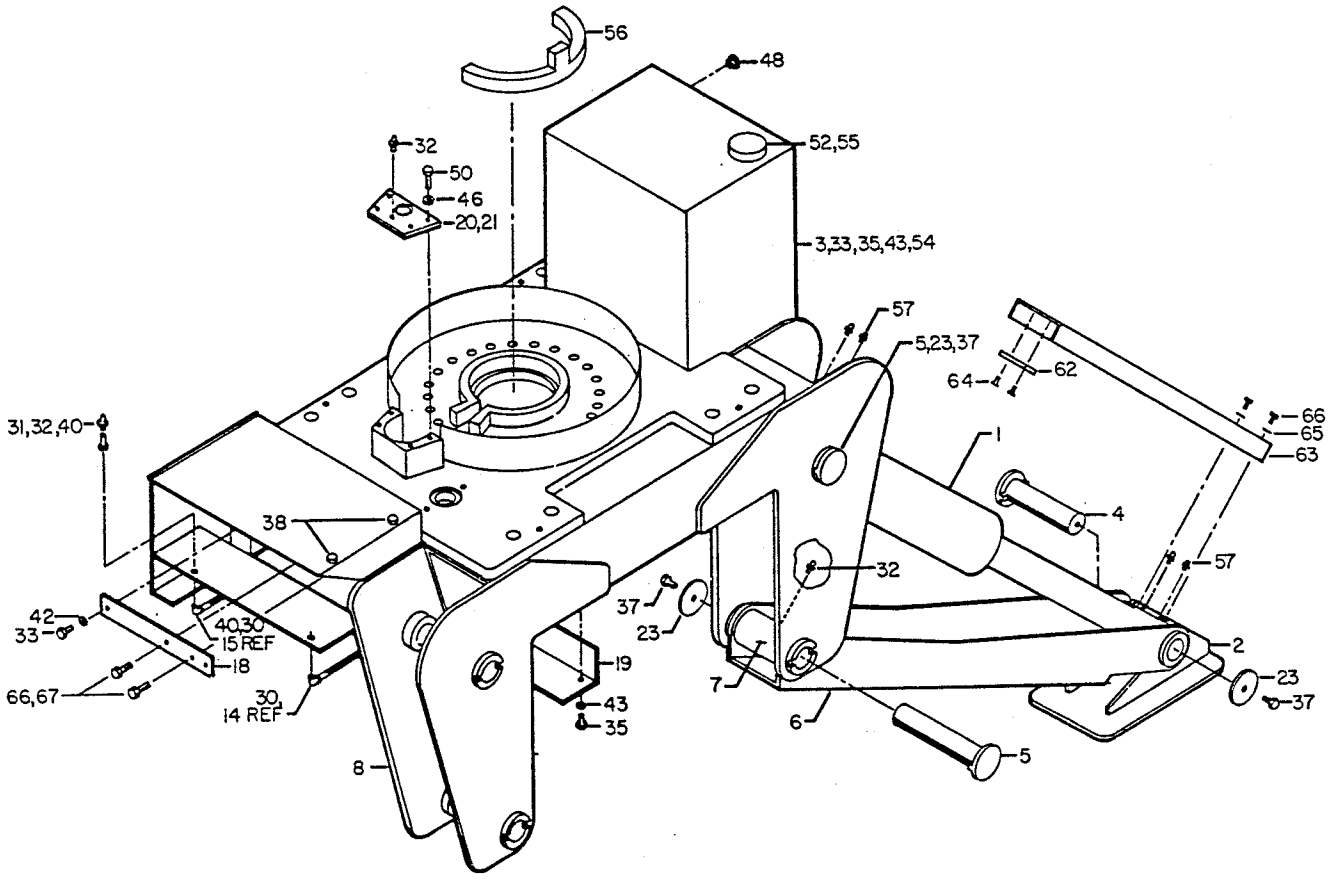
Turntable bearing backlash= .008"-.013" (.203-.330mm)

SEE PAGE 4-4 FOR DRAWING

ITEM	PART	DESCRIPTION	QTY	ITEM	PART	DESCRIPTION	QTY
1.	3C323911	OUTRIGGER CYLINDER	2	35.	72060023	CAP SCR 5/16-18X3/4 HH GR5	10
2.	52701412	OUTRIGGER PAD	2	36.	72060092	CAP SCR 1/2-13X1-1/4 HH GR5	2
3.	52701853	RESERVOIR 40-GAL	1	37.	72060147	CAP SCR 5/8-11X1 HH GR5	6
4.	52703694	PIN	2	38.	72060857	SCR 5/16-18X5/8 HH SLFTPG	2
5.	52703695	PIN	4	39.	72062080	NUT 1/2-13 LOCK	2
6.	52706578	OUTRIGGER LEG (INCL: 7)	2	40.	72063003	WASHER 3/8 WRT	4
7.	7BF81225	BUSHING (PART OF 6)	8REF	41.	72063039	MACH BUSHING 2 X 10GA NR	1
8.	52706577	BASE (INCL: 9-13)	1	42.	72063049	WASHER 1/4 LOCK	2
9.	60020124	BUSHING (PART OF 8)	1REF	43.	72063050	WASHER 5/16 LOCK	10
10.	60020122	BUSHING (PART OF 8)	1REF	44.	72063053	WASHER 1/2 LOCK	2
11.	60020120	BUSHING (PART OF 8)	1REF	45.	72063115	WASHER 7/8 FLAT GR8	23
12.	60020121	BUSHING (PART OF 8)	1REF	46.	72063117	WASHER 9/16 FLAT GR8	6
13.	71056074	DRIVE GEAR (PART OF 8)	1REF	47.	72066095	RETAINING RING 2" EXT STD	1
14.	53000719	GREASE EXT 19"	1	48.	72532261	SIGHT GAUGE 3/4	1
15.	53000716	GREASE EXT 46"	1	49.	72601037	CAP SCR 9/16-12X4-1/2 HH GR8	2
16.	60010844	GREASE PLATE	1	50.	72601144	CAP SCR 9/16-12X2 HH GR8	4
17.	60020123	THRUST WASHER	1	51.	72601472	CAP SCR 7/8-9X4-1/2 HH GR8	23
18.	60103728	COVER	1	52.	73014671	FILL CAP	1
19.	60103729	GEAR GUARD	1	53.	73051478	MOTOR	1
20.	60105964	PINION SUPPORT (INCL:21)	1	54.	73052001	PIPE PLUG 3/4 SQHD MAGNETIC	1
21.	70034295	BEARING (PART OF 20)	1REF	55.	73141276	FILL NECK SCREEN	1
22.	60106032	STUD 1/2-13X2	2	56.	71143520	SLIDE 450°	1
23.	60106332	PIN RETAINER PLATE 4"	6	57.	72053507	ZERK 1/4-28 (PART OF 1)	8REF
24.	70055167	TURNTABLE BEARING	1	58.	70731795	VALVE BLOCK (INCL:60,61)	1
25.	71056072	INTERMEDIATE GEAR	1	59.	72060757	CAP SCR 3/8-16X2-1/2 SH	3
26.	71056073	PINION GEAR	1	60.	7Q072017	O-RING (PART OF 58)	2REF
27.	71056374	HYD BRAKE (INCL:28,29)	1	61.	73054538	VALVE (PART OF 58)	2REF
28.	76391497	GASKET (PART OF 27)	1REF	62.	60030176	WEAR PAD	2
29.	76391498	GASKET (PART OF 27)	1REF	63.	52706739	CYL GUARD	2
30.	72053281	STREET ELBOW 1/8NPT 90°	3	64.	72060836	CAP SCR 1/4-20X3/4 FLTHDSOC	4
31.	72053301	COUPLING 1/8NPT	2	65.	72063051	WASHER 3/8 LOCK	4
32.	72053508	ZERK 1/8NPT	6	66.	72060044	CAP SCR 3/8-16X3/4 HH GR5	6
33.	72060002	CAP SCR 1/4-20X3/4 HH GR5	3	67.	72062103	NUT 3/8-16 LOCK	2

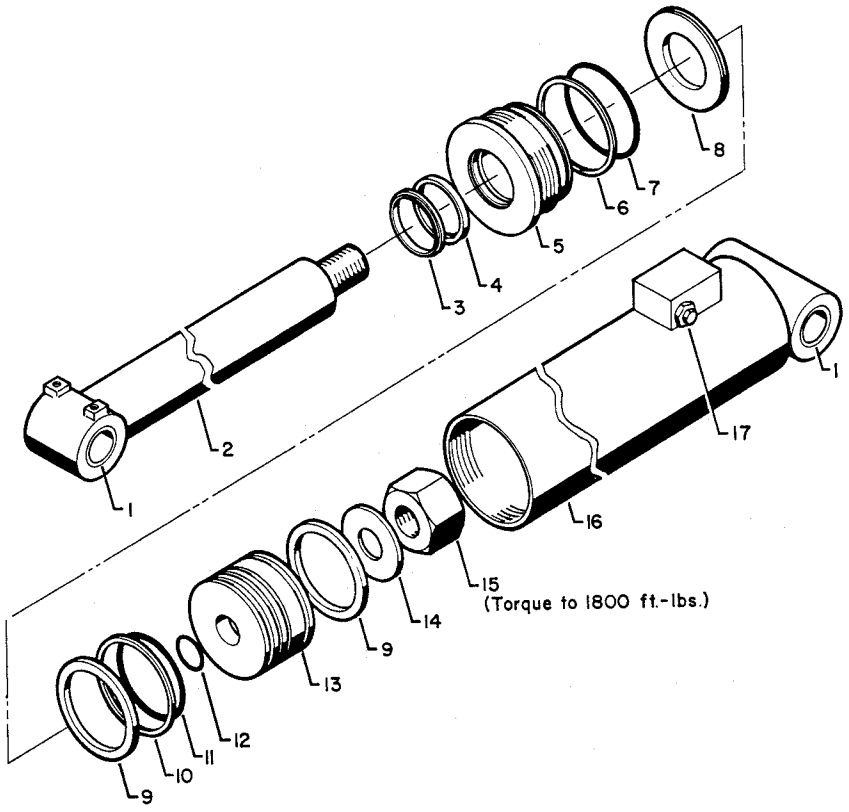
Figure D-4. BASE AND OUTRIGGER ASSEMBLY (41706566)





SEE PAGE 4-3 FOR PARTS LIST

Figure D-4A. BASE AND OUTRIGGER ASSEMBLY (41706566)



DIMENSIONS

Bore	6-1/2"
Stroke	29-1/4"
C-C Closed	42-1/8"
Rod diameter	3-1/2"
Pin diameter	2-1/2"

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.	7BF81225	BUSHING (PART OF 2 & 16)	7REF
2.	4G323910	ROD ASM (INCL: 1,19)	1
3.	7R14P035	ROD WIPER (PART OF 20)	1REF
4.	7R546035	ROD SEAL (PART OF 20)	1REF
5.	6H065035	HEAD	1
6.	7Q10P361	BACK-UP RING (PART OF 20)	1REF
7.	7Q072361	O-RING (PART OF 20)	1REF
8.	6A025035	WAFER LOCK (PART OF 20)	1REF
9.	7T65I065	PISTON RING (PART OF 20)	2REF
10.	7T66P065	PISTON SEAL (PART OF 20)	1REF
11.	7Q072257	O-RING (PART OF 20)	1REF
12.	7Q072227	O-RING (PART OF 20)	1REF
13.	6IX65200	PISTON	1
14.	72063016	WASHER 2" WRT	1
15.	72062144	NUT 2" BUTRESS	1
16.	4C263513	CASE (INCL: 1,19)	1
17.	73054304	VALVE 10-GPM	2
18.	7PNPXT02	PLUG 1/8NPT (PART OF 16)	4REF
19.	72053507	ZERK (PART OF 2 & 16)	4REF
20.	9X262832	SEAL KIT (INCL:3,4,6-12)	1

Figure D-5. OUTRIGGER CYLINDER (3C323911)

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

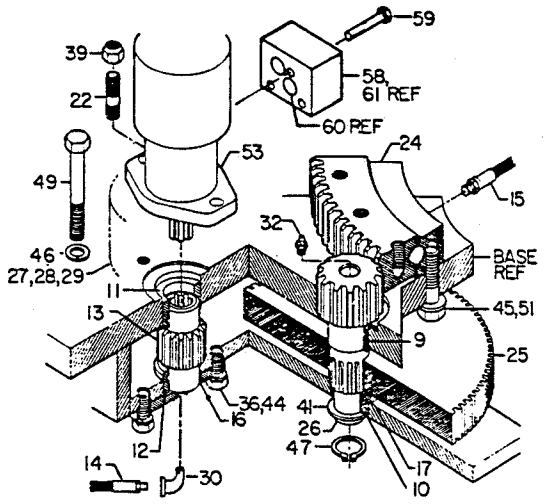
Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before reassembly.

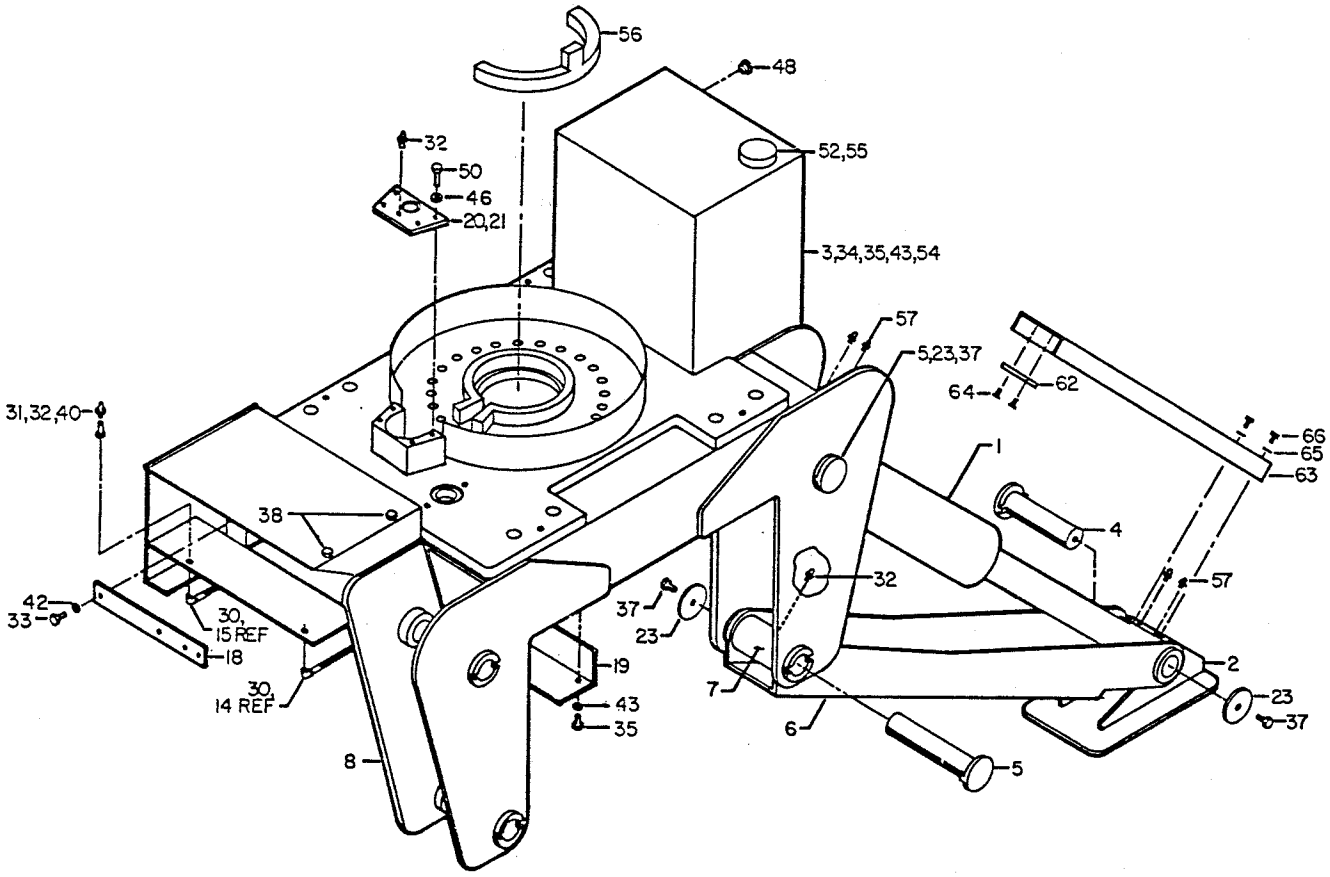
Turntable bearing backlash= .008"-.013" (.203-.330mm)

SEE PAGE 4-7 FOR DRAWING

ITEM	PART	DESCRIPTION	QTY
1.	3C323911	OUTRIGGER CYLINDER	2
2.	52701412	OUTRIGGER PAD	2
3.	52701853	RESERVOIR 40-GAL	1
4.	52703694	PIN	2
5.	52703695	PIN	4
6.	52706578	OUTRIGGER LEG (INCL: 7)	2
7.	7BF81225	BUSHING (PART OF 6)	8REF
8.	52706840	BASE (INCL: 9-13)	1
9.	60020124	BUSHING (PART OF 8)	1REF
10.	60020122	BUSHING (PART OF 8)	1REF
11.	60020120	BUSHING (PART OF 8)	1REF
12.	60020121	BUSHING (PART OF 8)	1REF
13.	71056074	DRIVE GEAR (PART OF 8)	1REF
14.	53000703	GREASE EXT 20"	1
15.	53000716	GREASE EXT 46"	1
16.	60010844	GREASE PLATE	1
17.	60020123	THRUST WASHER	1
18.	60103728	COVER	1
19.	60103729	GEAR GUARD	1
20.	60105964	PINION SUPPORT (INCL:21)	1
21.	70034295	BEARING (PART OF 20)	1REF
22.	60106032	STUD 1/2-13X2	2
23.	60106332	PIN RETAINER PLATE 4"	6
24.	70055167	TURNTABLE BEARING	1
25.	71056072	INTERMEDIATE GEAR	1
26.	71056073	PINION GEAR	1
27.	71056374	HYD BRAKE (INCL:28,29)	1
28.	76391497	GASKET (PART OF 27)	1REF
29.	76391498	GASKET (PART OF 27)	1REF
30.	72053281	STREET ELBOW 1/8NPT 90°	3
31.	72053301	COUPLING 1/8NPT	2
32.	72053508	ZERK 1/8NPT	6
33.	72060002	CAP SCR 1/4-20X3/4 HH GR5	2
34.	72060021	CAP SCR 5/16-18X1/2 HH GR5	6
35.	72060023	CAP SCR 5/16-18X3/4 HH GR5	4
36.	72060091	CAP SCR 1/2-13X1HH GR5	2
37.	72060147	CAP SCR 5/8-11X1 HH GR5	6
38.	72060857	SCR 5/16-18X5/8 HH SLFTPG	2
39.	72062080	NUT 1/2-13 LOCK	2
40.	72063004	WASHER 7/16 WRT	2
41.	72063039	MACH BUSHING 2 X 10GA NR	1
42.	72063049	WASHER 1/4 LOCK	2
43.	72063050	WASHER 5/16 LOCK	10
44.	72063053	WASHER 1/2 LOCK	2
45.	72063115	WASHER 7/8 FLAT GR8	23
46.	72063117	WASHER 9/16 FLAT GR8	6
47.	72066095	RETAINING RING 2" EXT STD	1
48.	72532261	SIGHT GAUGE 3/4	1
49.	72601037	CAP SCR 9/16-12X4-1/2 HH GR8	2
50.	72601144	CAP SCR 9/16-12X2 HH GR8	4
51.	72601472	CAP SCR 7/8-9X4-1/2 HH GR8	23
52.	73014671	FILL CAP	1
53.	73051478	MOTOR	1
54.	73052001	PIPE PLUG 3/4 SQHD MAGNETIC	1
55.	73141276	FILL NECK SCREEN	1
56.	71143520	SLIDE 450°	1
57.	72053507	ZERK 1/4-28 (PART OF 1)	8REF
58.	70731795	VALVE BLOCK (INCL:60,61)	1
59.	72060757	CAP SCR 3/8-16X2-1/2 SH	3
60.	7Q072017	O-RING (PART OF 58)	2REF
61.	73054538	VALVE (PART OF 58)	2REF
62.	60030176	WEAR PAD	2
63.	52706739	CYL GUARD	2
64.	72060836	CAP SCR 1/4-20X3/4 FLTHDSOC	4
65.	72063051	WASHER 3/8 LOCK	4
66.	72060044	CAP SCR 3/8-16X3/4 HH GR5	6

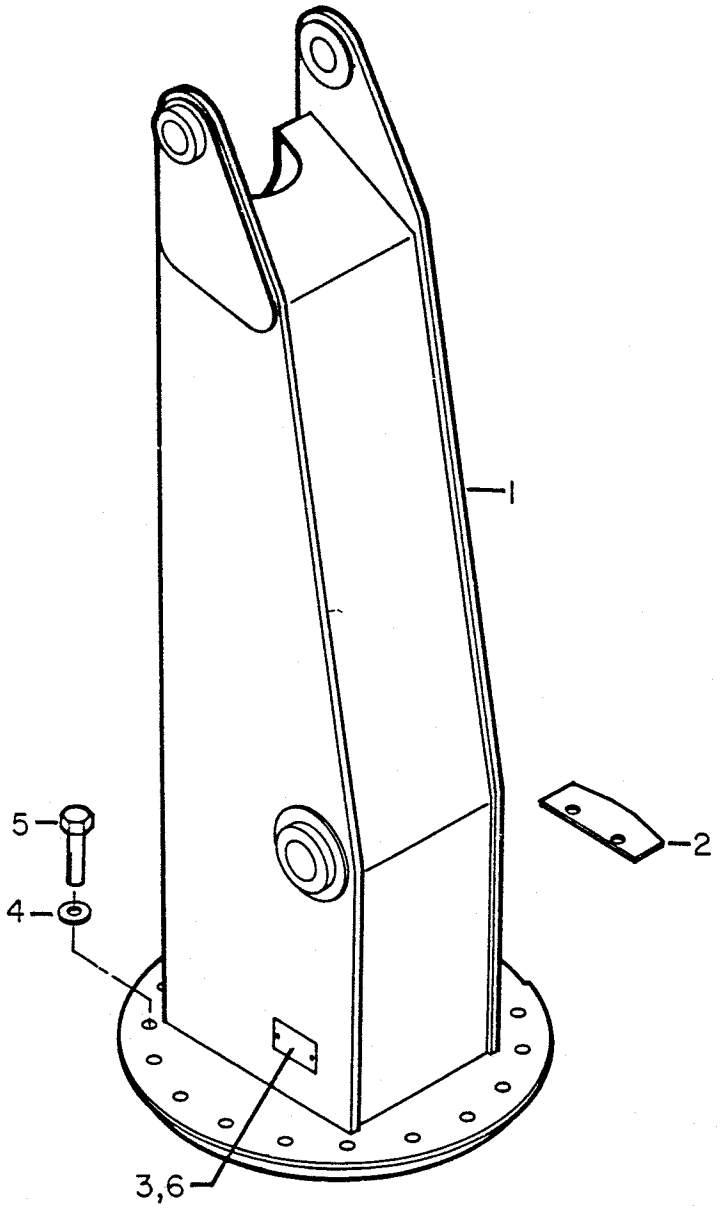
Figure D-6. OPTION - BASE AND OUTRIGGER ASSEMBLY-HIGH FRAME (41706839)





SEE PAGE 4-6 FOR PARTS LIST

Figure D-6A. OPTION - BASE AND OUTRIGGER ASSEMBLY-HIGH FRAME (41706839)

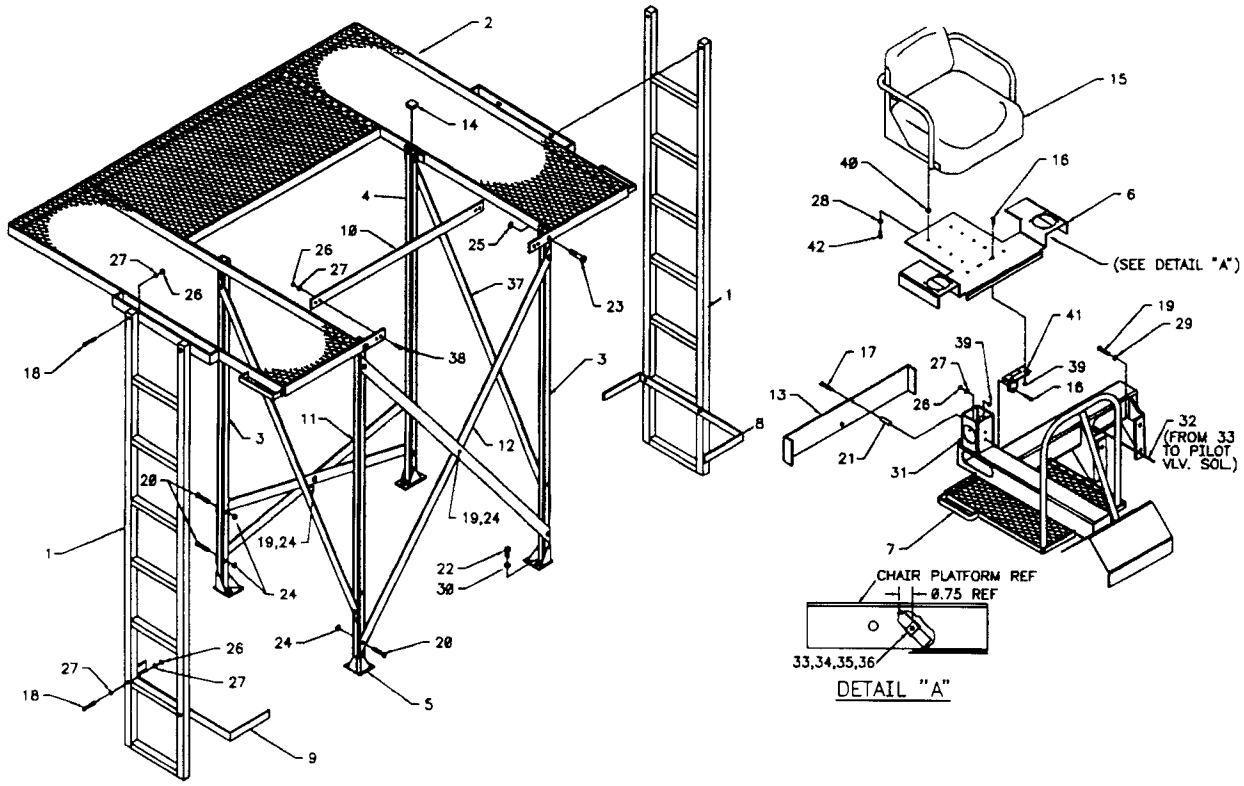


WARNING

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.

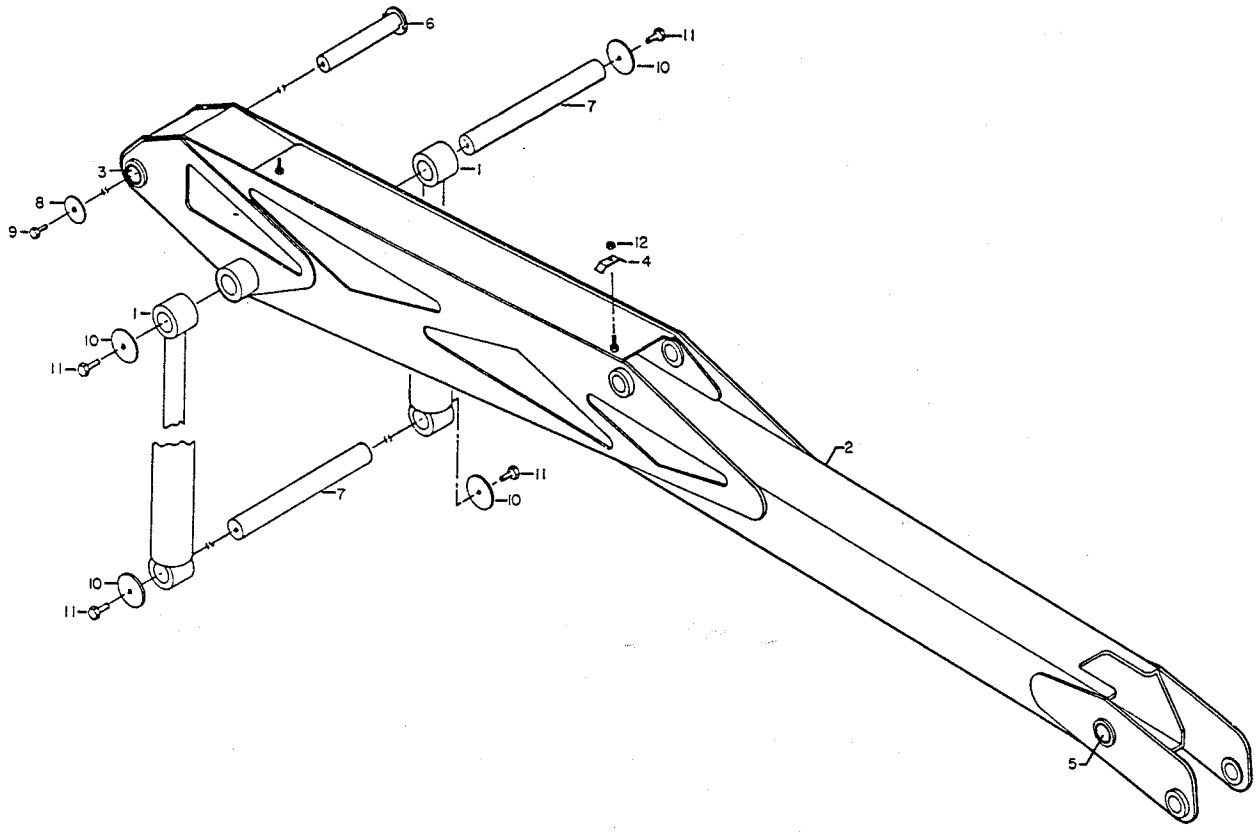
ITEM	PART NO.	DESCRIPTION	STD QTY	HIGH QTY
1.	52706580	MAST	1	
	52706842	MAST HI-FRAME		1
2.	60104246	PINION COVER	1	1
3.	70029119	SERIAL NUMBER PLACARD	1	1
4.	72063116	WASHER 3/4 FLAT HARD	18	18
5.	72601468	CAP SCR 3/4-10X4-1/2 HH GR8	18	18
6.	72661216	GRIPNAIL FASTENER	2	2

Figure D-7. MAST ASSEMBLY (41706567) & MAST ASSEMBLY-HIGH FRAME (41706841)



ITEM	PART NO.	DESCRIPTION	STD QTY	HIGH QTY
1.	52706597	LADDER	2	
	52706848	LADDER-HIGH FRAME		2
2.	52706598	PLATFORM	1	
	52706598	PLATFORM-HIGH FRAME		1
3.	52706599	LEG	2	
	52706845	LEG		2
4.	52706600	LEG	1	
	52706847	LEG		1
5.	52706601	LEG	1	
	52706846	LEG		1
6.	60117608	SEAT BRACKET	1	1
7.	52706603	CHAIR PLATFORM	1	1
8.	60109878	LADDER MTG BRACKET LH	1	1
9.	60109879	LADDER MTG BRACKET RH	1	1
10.	60109936	ACCESS BAR (PART OF 2)	1REF	1REF
11.	60109940	CROSS BRACE	2	2
12.	60109941	CROSS BRACE	2	
	60110229	CROSS BRACE		2
13.	60109964	HOSE GUARD	1	1
14.	70302310	PLUG	4	4
15.	70731411	CHAIR	1	1
16.	72060025	CAP SCR 5/16-18X1 HHGR5	4	4
17.	72060053	CAP SCR 3/8-16X2-34 HHGR5	2	2
18.	72060052	CAP SCR 3/8-16X2-1/2 HHGR5	8	8
19.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	6	6
20.	72060096	CAP SCR 1/2-13X2-1/2 HHGR5	12	12
21.	60118860	SPACER 3/8X1-3/4	2	2
22.	72060148	CAP SCR 5/8-11X1-1/4 HHGR5	8	8
23.	72060154	CAP SCR 5/8-11X3 HHGR5	4	4
24.	72062080	NUT 1/2-13 LOCK	14	14
25.	72062091	NUT 5/8-11 LOCK	4	4
26.	72062103	NUT 3/8-16 LOCK	12	12
27.	72063003	WASHER 3/8 WRT	16	16
28.	72063050	WASHER 5/16 LOCK	4	4
29.	72063053	WASHER 1/2 LOCK	4	4
30.	72063055	WASHER 5/8 LOCK	8	8
31.	60035938	EDGE LINER	2	2
32.	89044188	WIRE 14GA 2WIRE	164"	164"
33.	77041249	MERCURY SWITCH	1	1
34.	77041250	SWITCH CLIP	1	1
35.	72060612	MACH SCR #8-32X3/4 RDHD	1	1
36.	72062207	NUT #8-32 FLTHD	1	1
37.	60113835	CROSS BRACE	2	
	60113836	CROSS BRACE		2
38.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	2	2
39.	72062109	NUT 5/16-18 LOCK	4	4
40.	60113703	SLEEVE	4	4
41.	72661357	BUTT HINGE	1	1
42.	72060029	CAP SCR 5/16-18X2 HHGR5	4	4

Figure D-8. PLATFORM / CHAIR ASM (41706568)
PLATFORM / CHAIR ASSEMBLY-HIGH FRAME (41706844)



NOTE

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

ITEM	PART NO.	DESCRIPTION	QTY
1.	3C134860	INNER CYLINDER	2
2.	51706582	INNER BOOM (INCL:3 & 5)	1
3.	70034283	BUSHING (PART OF 2)	4REF
4.	60107648	HOSE CLAMP	2
5.	70034284	BUSHING (PART OF 2)	3REF
6.	52706583	PIN	1
7.	60109897	PIN	2
8.	60106332	PIN RETAINER 4"	1
9.	72060147	CAP SCR 5/8-11X1 HH GR5	1
10.	60106681	PIN RETAINER 5"	4
11.	72060181	CAP SCR 3/4-10X1 HH GR5	4
12.	72062103	NUT 3/8-16 LOCK	2

Figure D-9. INNER BOOM ASSEMBLY (41706569)

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	5.50"
STROKE	28.25"
C-C CLSD	45.50"
ROD DIA	3.00"
PIN DIA	3.00"

ITEM	PART NO.	DESCRIPTION	QTY
1.	4C134860	CASE (INCL:8,19)	1
2.	4G134860	ROD (INCL:19)	1
3.	70034285	BUSHING (PART OF 1 & 2)	2REF
4.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 1)	3REF
5.	6HX05530	HEAD	1
6.	6IX05520	PISTON	1
7.	73054242	VALVE 25GPM	1
8.	9CX55200	SEAL KIT (INCL:3,9-17)	1
9.	7Q072354	O-RING (PART OF 20)	1REF
10.	7Q10P354	BACK-UP RING (PART OF 20)	1REF
11.	7T2N8032	WEAR RING (PART OF 20)	1REF
12.	7R546030	ROD WIPER (PART OF 20)	1REF
13.	7R14P030	ROD WIPER (PART OF 20)	1REF
14.	7T66P550	PISTON SEAL (PART OF 20)	1REF
15.	7T2N4055	WEAR RING (PART OF 20)	2REF
16.	7T61N200	LOCK RING SEAL (PART OF 20)	1REF
17.	6A025030	WAFER LOCK (PART OF 20)	1REF
18.	6C150030	STOP TUBE	1
19.	6C075030	STOP TUBE	1

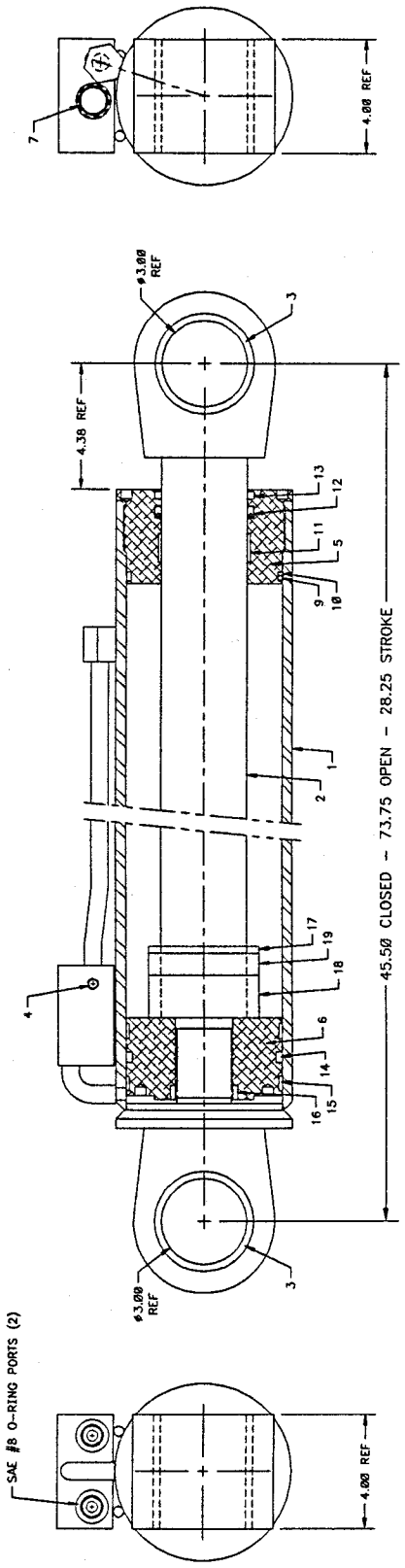
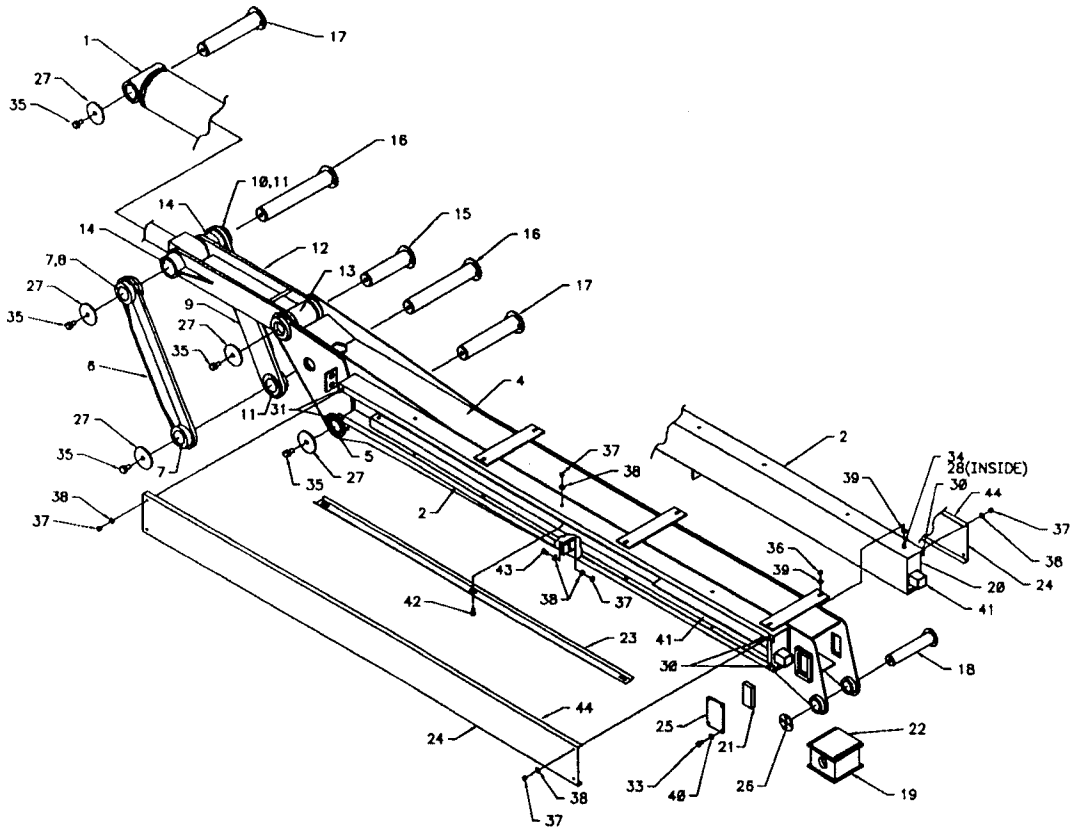


Figure D-10. INNER CYLINDER (3C134860)



CAUTION

The hoses within the enclosure (item 24) were lubricated at assembly. We recommend they be lubricated monthly, under normal usage, using a silicone spray lubricant. Failure to do so may result in premature hose failure.

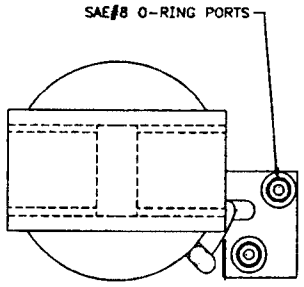
NOTE

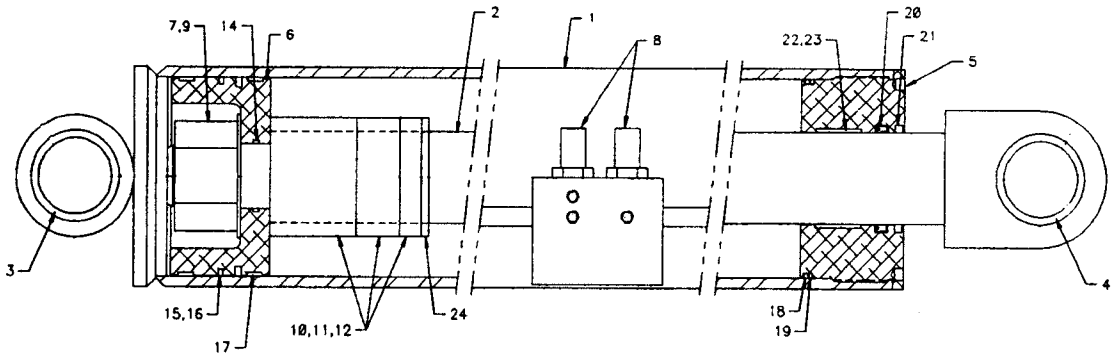
Anytime the pin retainer plate bolts have been removed, apply Loctite 262 to the threads before re-assembly.

ITEM	PART NO.	DESCRIPTION	QTY
1.	3C170860	OUTER CYLINDER	1
3.	52706588	TRUMPET GUARD LH	2
4.	51706586	OUTER BOOM (INCL:5)	1
5.	70034283	BUSHING (PART OF 4)	4REF
6.	60109919	OUTER LINK (INCL:7,8)	1
7.	7BF81025	BUSHING (PART OF 6)	3REF
8.	7BF81225	BUSHING (PART OF 6)	1REF
9.	60109920	OUTER LINK (INCL:10,11)	1
10.	7BF81025	BUSHING (PART OF 9)	1REF
11.	7BF81225	BUSHING (PART OF 9)	2REF
12.	60109918	INNER LINK (INCL:13,14)	1
13.	70034283	BUSHING (PART OF 12)	3REF
14.	70034284	BUSHING (PART OF 12)	2REF
15.	52703694	PIN	1
16.	52703697	PIN	2
17.	52703698	PIN	2
18.	52706832	PIN	1
19.	52706587	TRUNNION	1
20.	60030017	TRUMPET GUIDE	2
21.	60030028	WEAR PAD	2
22.	60030167	WEAR PAD	1

ITEM	PART NO.	DESCRIPTION	QTY
23.	60109867	HOSE GUARD	2
24.	60103318	TRUMPET COVER	2
25.	60104191	RETAINER PLATE	2
26.	52706831	RETAINER	1
27.	60106332	PIN RETAINER 4"	5
28.	72063004	WASHER 7/16 WRT	6
30.	72601530	CARR. BOLT 5/16-18X3-3/4 SQNK	4
31.	72060023	CAP SCR 5/16-18X3/4 HHGR5	4
33.	72060044	CAP SCR 3/8-16X3/4 HHGR5	8
34.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	6
35.	72060147	CAP SCR 5/8-11X1 HHGR5	5
36.	72062103	NUT 3/8-16 LOCK	6
37.	72062109	NUT 5/16-18 LOCK	16
38.	72063002	WASHER 5/16 WRT	18
39.	72063003	WASHER 3/8 WRT	12
40.	72063051	WASHER 3/8 LOCK	8
41.	52702099	TRUMPET TUBE	2
42.	72060027	CAP SCR 5/16-18X1-1/2 HHGR5	6
43.	72060026	CAP SCR 5/16-18X1-1/4 HHGR5	2
44.	89039658	WEATHERSTRIP 3/16X1/2	4 FT

Figure D-11. OUTER BOOM ASSEMBLY (41706570)





ITEM	PART NO.	DESCRIPTION	QTY
1.	4C170860	CASE (INCL:3)	1
2.	4G170860	ROD (INCL:4)	1
3.	70034284	BUSHING (PART OF 1)	2REF
4.	70034283	BUSHING (PART OF 2)	2REF
5.	6H065030	HEAD	1
6.	6IX65002	PISTON	1
7.	72062144	NUT 2" BUTRESS	1
8.	73054242	VALVE 25GPM	2
9.	72063016	WASHER	1
10.	6C075030	STOP TUBE	1
11.	6C150030	STOP TUBE	1
12.	6C300030	STOP TUBE	1
13.	9X170086	SEAL KIT (INCL:14-24)	1
14.	7Q072227	O-RING (PART OF 13)	1REF
15.	7Q072257	O-RING (PART OF 13)	1REF
16.	7T66P065	PISTON SEAL (PART OF 13)	1REF
17.	7T2N4065	WEAR RING (PART OF 13)	2REF
18.	7Q072361	O-RING (PART OF 13)	1REF
19.	7Q10P361	BACK-UP RING (PART OF 13)	1REF
20.	7R746030	ROD SEAL (PART OF 13)	1REF
21.	7R17P030	ROD WIPER (PART OF 13)	1REF
22.	7T2N4032	WEAR RING (PART OF 13)	1REF
23.	7T2N8032	WEAR RING (PART OF 13)	1REF
24.	6A025030	WAFER LOCK (PART OF 13)	1REF

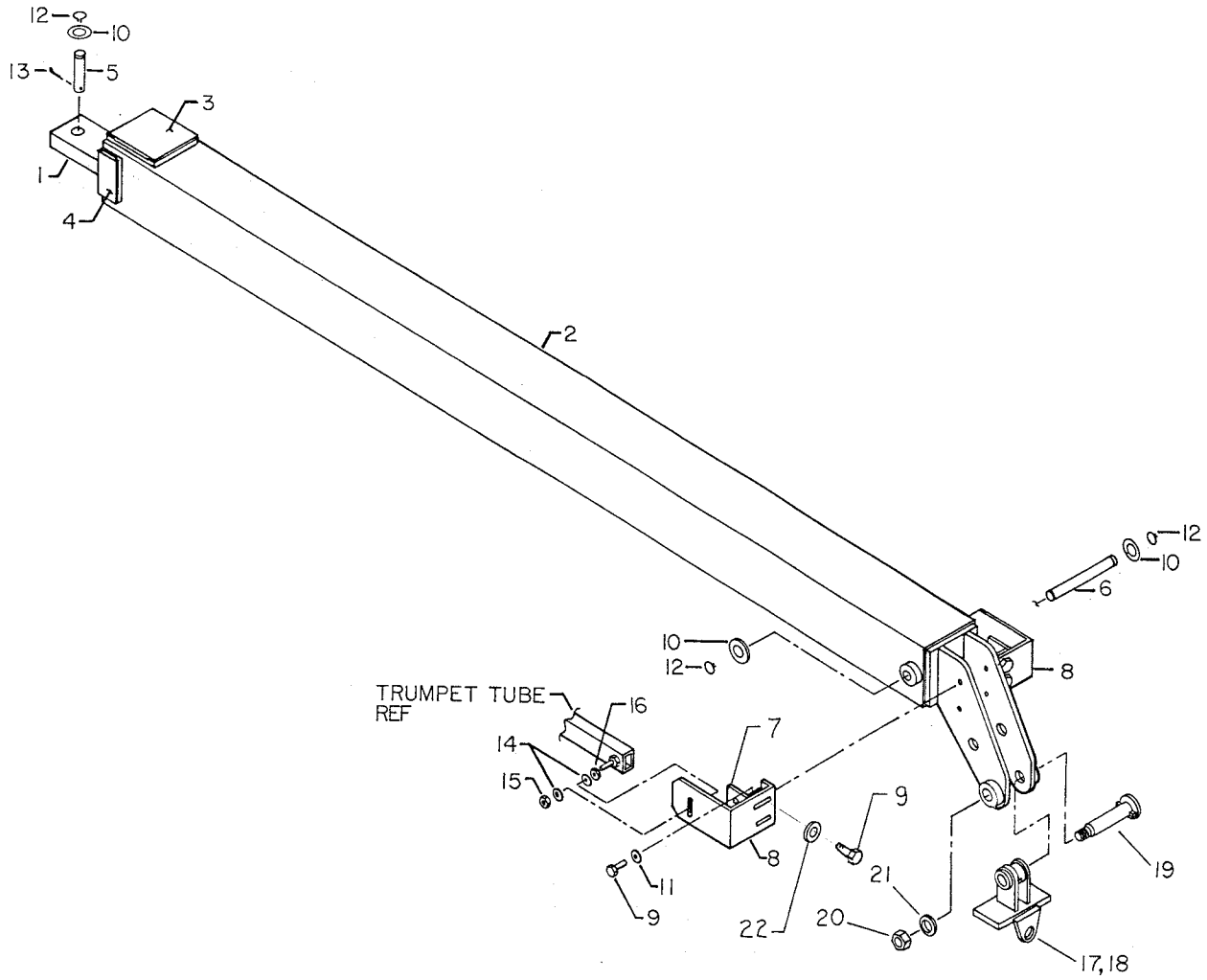
NOTE

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.

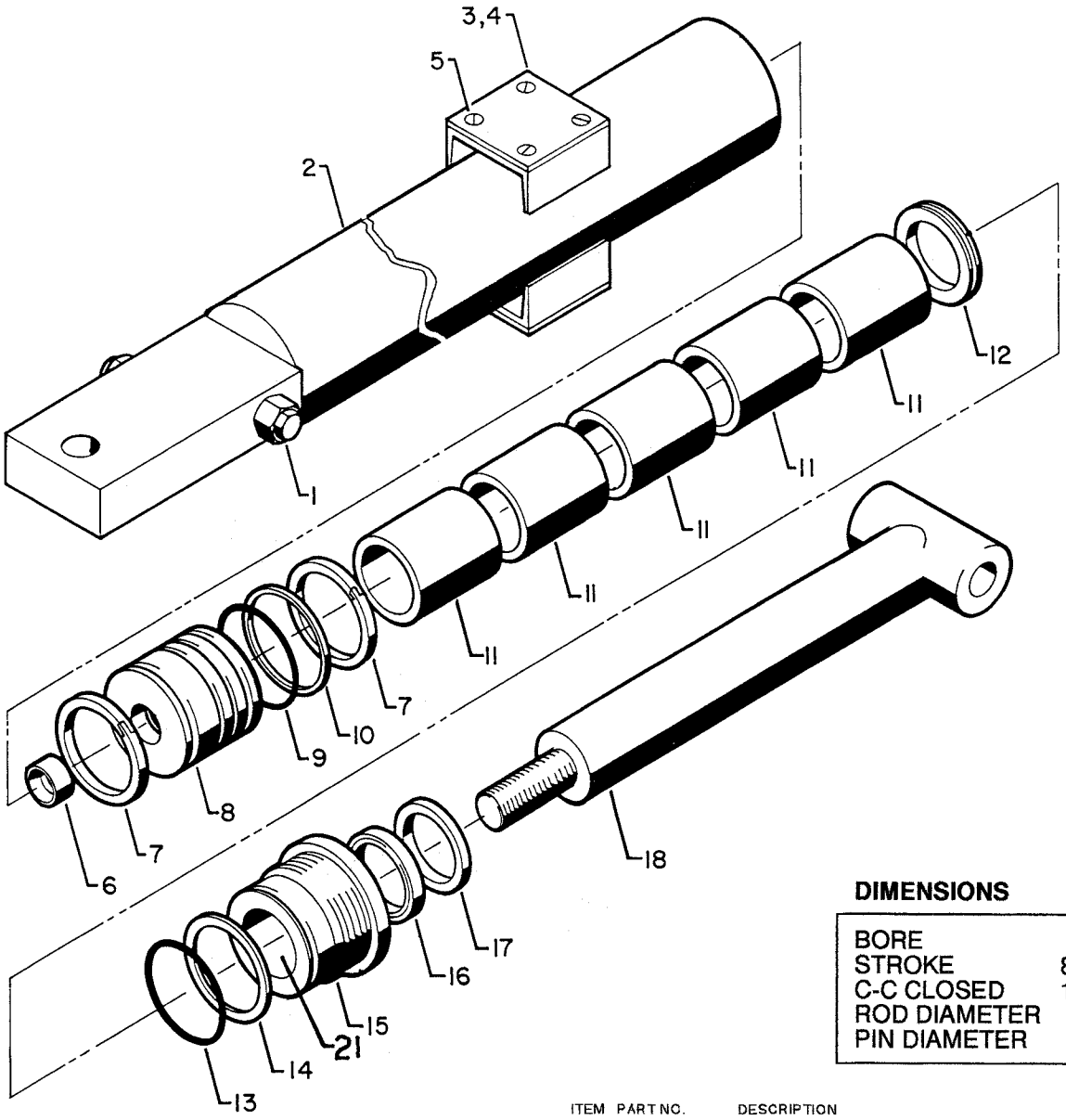
USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.

Figure D-12. OUTER CYLINDER (3C170860)



ITEM	PART NO.	DESCRIPTION	QTY
1.	3B137913	EXTENSION CYLINDER	1
2.	52706590	EXTENSION BOOM	1
3.	60030169	WEAR PAD	1
4.	60030168	WEAR PAD	2
5.	60101905	PIN	1
6.	60103821	PIN	1
7.	60109982	BULKHEAD PLATE	2
8.	60109983	GUARD	2
9.	72060044	CAP SCR 3/8-16X3/4 HH GR5	4
10.	72063034	MACH BUSHING 1X10GA NR	3
11.	72063051	WASHER 3/8 LOCK	4
12.	72066125	RETAINING RING 1" HD EXT	3
13.	72066197	COTTER PIN 3/16X2-1/2	1
14.	72063005	WASHER 1/2 WRT	4
15.	72062080	NUT 1/2-13 LOCK	2
16.	72062107	NUT 1/2-13 CTR LOCK	2
17.	51709475	SWIVEL LINK (INCL:18)	1
18.	70055207	BUSHING (PART OF 17)	2REF
19.	52706610	PIN	1
20.	72062141	NUT 1-8 LOCK	1
21.	72063066	WASHER 1 HIGH STRENGTH	1
22.	72063008	WASHER 3/4 WRT	4

Figure D-13. EXTENSION BOOM ASSEMBLY (41706571)



DIMENSIONS

BORE	3"
STROKE	84"
C-C CLOSED	114-1/2"
ROD DIAMETER	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.

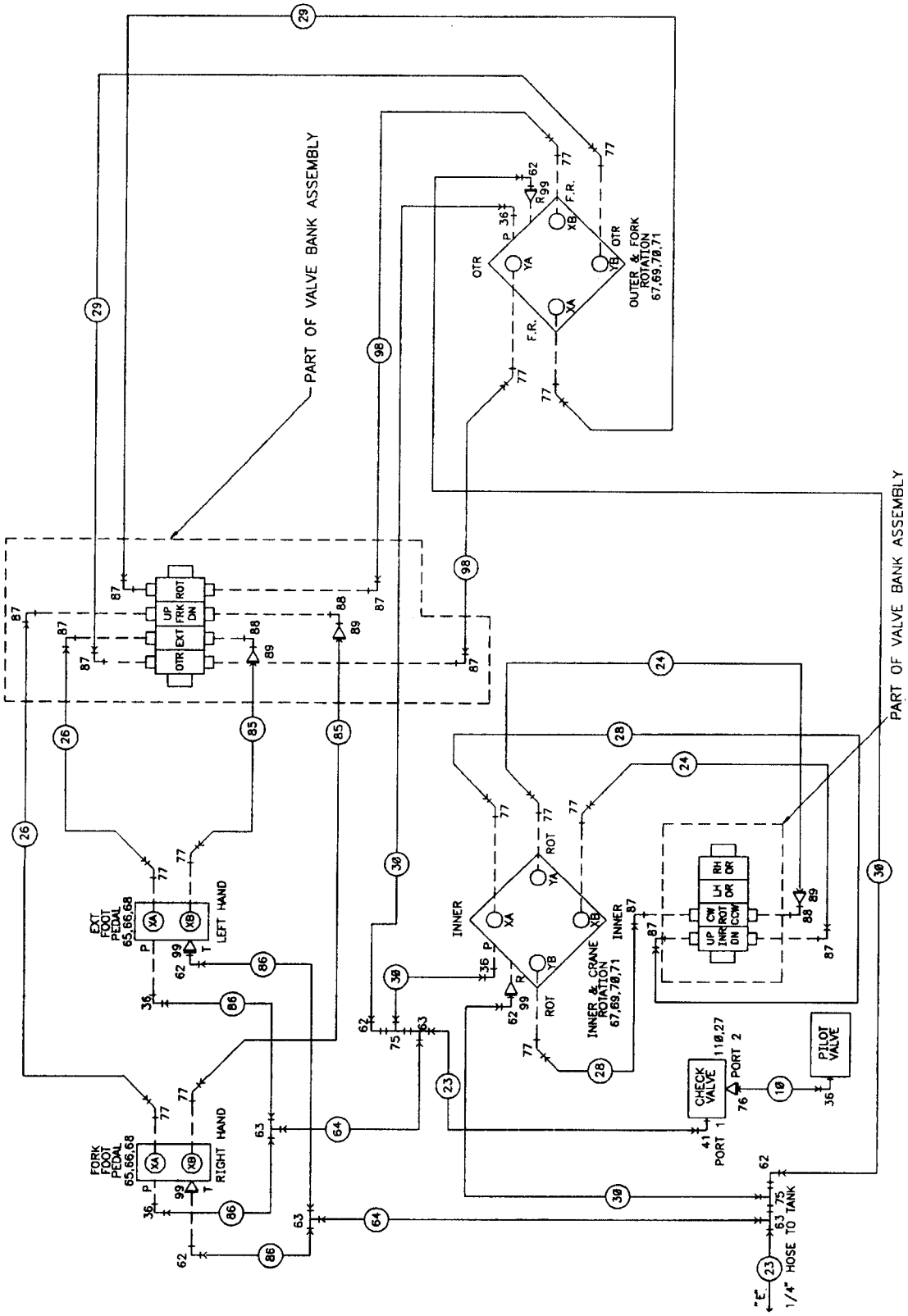
ITEM	PART NO.	DESCRIPTION	QTY
1.	73054304	VALVE 10GPM	2
2.	4B137913	CASE ASM	1
3.	60030004	WEAR PAD	2
4.	60106350	SPACER	2
5.	72060836	SCREW 1/4-20X3/4 FLAT HD	8
6.	7T61N106	LOCK RING SEAL (PART OF 20)	1REF
7.	7T65I030	PISTON RING (PART OF 20)	2REF
8.	6I030106	PISTON	1
9.	7Q072145	O-RING (PART OF 20)	1REF
10.	7T66P030	PISTON SEAL (PART OF 20)	1REF
11.	6C300020	STOP TUBE	5
12.	6A025020	WAFER LOCK (PART OF 20)	1REF
13.	7Q072334	O-RING (PART OF 20)	1REF
14.	7Q10P334	BACK-UP RING (PART OF 20)	1REF
15.	6H030020	HEAD	1
16.	7R546020	ROD SEAL (PART OF 20)	1REF
17.	7R14P020	ROD WIPER (PART OF 20)	1REF
18.	4G220710	ROD	1
19.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 2)	2REF
20.	9C121617	SEAL KIT (INCL:6,7,9,10,12-14,16,17,21)	1
21.	7T2N4022	WEAR RING-ROD (PART OF 20)	1REF

Figure D-14. EXTENSION CYLINDER (3B137913)

SEE NEXT 2 PAGES FOR DRAWING

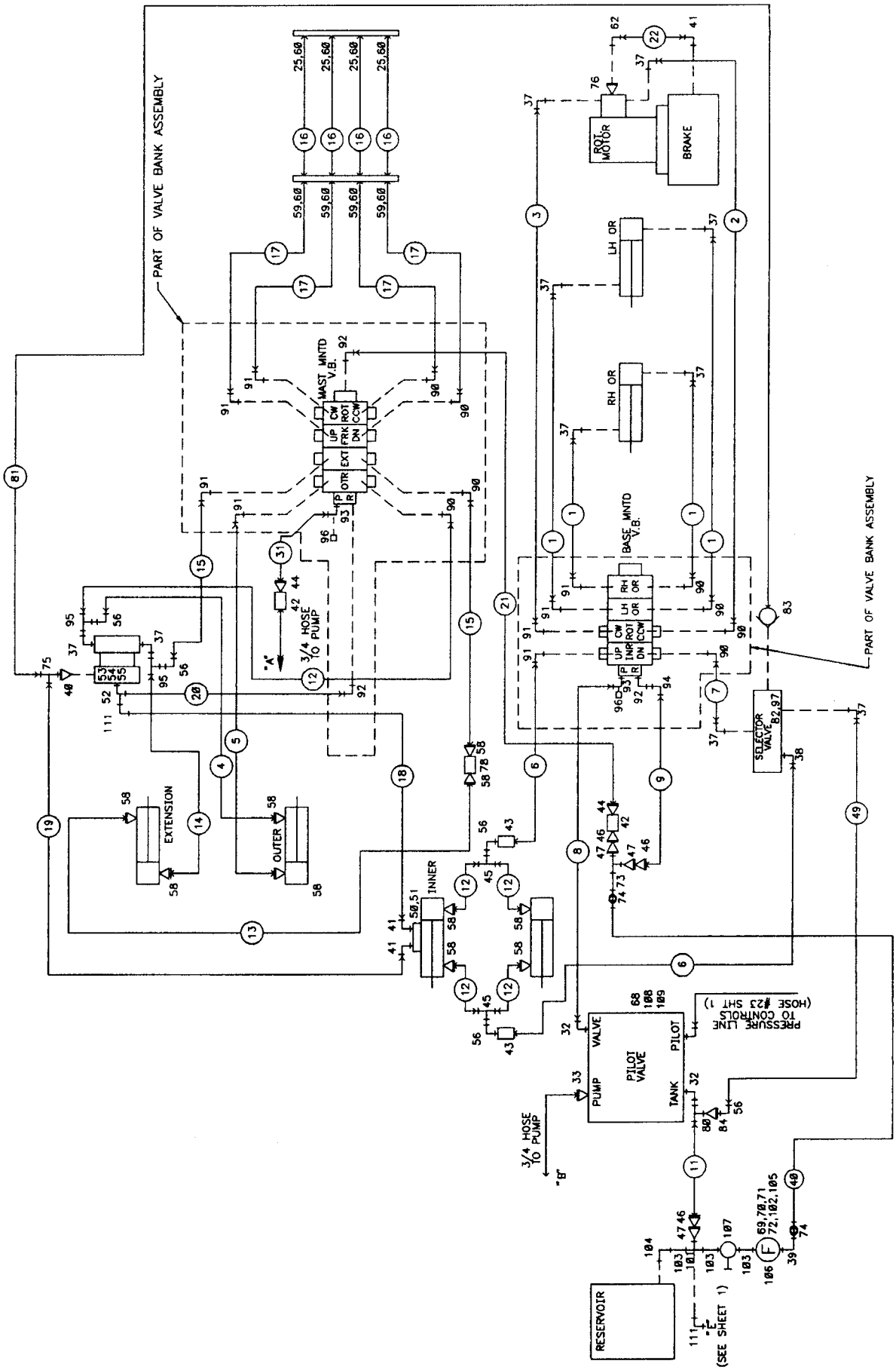
ITEM	PART NO.	DESCRIPTION	QTY
1.	51706528	HOSE ASM 1/2X80 (PART OF 100)	4REF
2.	51706519	HOSE ASM 3/8X24 (PART OF 100)	1REF
3.	51706889	HOSE ASM 3/8X20 (PART OF 100)	1REF
4.	51706618	HOSE ASM 1/2X196 (PART OF 100)	1REF
5.	51706631	HOSE ASM 1/2X200 (PART OF 100)	1REF
6.	51706892	HOSE ASM 1/2X66 (PART OF 100)	2REF
7.	51706525	HOSE ASM 1/2X26 (PART OF 100)	1REF
8.	51706533	HOSE ASM 3/4X17 (PART OF 100)	1REF
9.	51706535	HOSE ASM 3/4X33 (PART OF 100)	1REF
10.	51712102	HOSE ASM 1/4X10 FF	1
11.	51706552	HOSE ASM 3/4X80 (PART OF 100)	1REF
12.	51706891	HOSE ASM 1/2X24 (PART OF 100)	5REF
13.	51706620	HOSE ASM 1/2X290 (PART OF 100)	1REF
14.	51706532	HOSE ASM 1/2X304 (PART OF 100)	1REF
15.	51706890	HOSE ASM 1/2X21 (PART OF 100)	2REF
16.	51706521	HOSE ASM 3/8X300 (PART OF 100)	4REF
17.	51706520	HOSE ASM 3/8X234 (PART OF 100)	4REF
18.	51711556	HOSE ASM 1/4X24 (PART OF 100)	1REF
19.	51711555	HOSE ASM 1/4X22 (PART OF 100)	1REF
20.	51706624	HOSE ASM 3/4X28 (PART OF 100)	1REF
21.	51706537	HOSE ASM 3/4X45 (PART OF 100)	1REF
22.	51711554	HOSE ASM 1/4X8-1/2(PART OF 100)	1REF
23.	51709653	HOSE ASM 3/4X130	2
24.	51704588	HOSE ASM 1/4X174	2
25.	72532986	ELBOW 3/4MJIC 90°	4
26.	51711794	HOSE ASM 1/4X123	2
27.	72060007	CAP SCR 1/4X1-3/4	2
28.	51709654	HOSE ASM 1/4X160	2
29.	51709651	HOSE ASM 1/4X103	2
30.	51709650	HOSE ASM 1/4X43	4
31.	51706632	HOSE ASM 3/4X47 (PART OF 100)	1REF
32.	72053767	ELBOW 1-1/16MSTR 1-1/16MJIC 90°	2
33.	72532366	ADAPTER 1-1/16MSTR 1-1/16MJIC	1
36.	72532699	ELBOW 9/16MSTR 7/16MJIC 90°	5
37.	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	10
38.	72532666	ELBOW 3/4MSTR 3/4MJIC 90° XLG	1
39.	72532346	BARB NIPPLE 1-1/4NPT 1-1/4HOSE 90°	1
40.	60035936	HOSE 1-1/4 100R4 X 42	1
41.	72053758	ELBOW 7/16MSTR 7/16MJIC 90°	4
42.	72532973	ADAPTER 1-1/16FJIC PR-SW IN-LINE	2
43.	72532980	ADAPTER 3/4FJIC PR-SW IN-LINE	2
44.	72532855	ADAPTER 1-1/16MJIC 1-1/16MJIC	2
45.	72531205	TEE #8	2
46.	72053676	ADAPTER 3/4MPT 1-1/16MJIC	3
47.	72531836	REDUCER BUSHING 1-1/4 3/4NPT	3
48.	72053615	TEE 1-1/4NPT	1
49.	51706463	HOSE ASM 1/2X18 (PART OF 100)	1REF
50.	73054425	SENSOR VALVE	1
51.	72060734	CAP SCR 5/16-18X1-1/2 SH	4
52.	60114669	ELBOW-MODIFIED	1
53.	73054424	OVERSTRESS VALVE	1
54.	72060050	CAP SCR 3/8-16X2 HH GR5	2
55.	72062103	NUT 3/8-16 LOCK	2
56.	72532658	ELBOW 3/4MJIC 3/4FJIC SWVL	5
58.	72532358	ADAPTER 3/4MSTR 3/4MJIC	10
59.	72532672	BULKHEAD UNION 3/4JIC	4
60.	72531708	BULKHEAD NUT 3/4JIC	8
62.	72532690	ELBOW 7/16MJIC 7/16FJIC SWVL	7
63.	72532768	TEE 7/16MJIC	4
64.	51705320	HOSE ASM 1/4X52 FF	2
65.	70731800	FOOT PEDAL CONTROL	2
66.	72060023	CAP SCR 5/16-18X3/4 HH GR5	8
67.	70731801	JOYSTICK CONTROL	2
68.	72062109	NUT 5/16-18 LOCK	10
69.	72060002	CAP SCR 1/4-20X3/4 HH GR5	10
70.	72063001	WASHER 1/4 WRT	9
71.	72063049	WASHER 1/4 LOCK	9
72.	72060025	CAP SCR 5/16-18X3/4 HHGR5	2
73.	72531550	BARB NIPPLE 1-1/4NPT 1-1/4HOSE	1
74.	72066516	HOSE CLAMP 1-1/4	2
75.	72532981	TEE 7/16JIC SWVL NUT RUN	3
76.	72532351	ADAPTER 7/16MSTR 7/16MJIC	2
77.	72532985	ELBOW 3/4MSTR 3/4MJIC 45°	12
78.	73054426	RELIEF VALVE-ADJUSTABLE	1
80.	72532950	TEE SWVL NUT RUN	1
81.	51711562	HOSE ASM 1/4X90 (PART OF 100)	1REF
82.	73054462	SELECTOR VALVE-PILOT OPER	1
83.	73054549	CHECK VALVE	1
84.	72532972	ADAPTER #8MJIC #12FJIC	1
85.	51704833	HOSE ASM 1/4X138	2
86.	51711793	HOSE ASM 1/4X6	4
87.	72532699	ELBOW 9/16MSTR 7/16MJIC 90° (PART OF VB)	9REF
88.	72532700	ELBOW 9/16MSTR 9/16MJIC 90° (PART OF VB)	3REF
89.	72532707	ADAPTER 7/16MJIC 9/16FJIC (PART OF VB)	3REF
90.	72532666	ELBOW 3/4MSTR 3/4MJIC 90° (PART OF VB)	8REF
91.	72053763	ELBOW 3/4MSTR 3/4MJIC 90° (PART OF VB)	8REF
92.	72053767	ELBOW 1-1/16MSTR 1-1/16MJIC90° (PART OF VB)	3REF
93.	60114669	ELBOW PRESSUE GAUGE (PART OF VB)	2REF
94.	72532696	ELBOW 1-1/16MJIC 1-1/16FJIC SWVL (PART OF VB)	1REF
95.	72532657	TEE #8 RUN	2
96.	72532987	DISCONNECT NIPPLE 1/4 (PART OF VB)	2REF
97.	72060028	CAP SCR 5/16-18X1-3/4 HH GR5	2
98.	51709652	HOSE ASM 1/4X117	2
99.	72532353	ADAPTER #6MSTR #4MJIC	4
100.	51708150	HOSE KIT	1
101.	60107571	TEE-HYD OVERLOAD	1
102.	60112266	OIL FILTER BRACKET	1
103.	72053211	PIPE NIPPLE 1-1/4NPT X CLOSE	3
104.	72053287	STREET ELBOW 1-1/4NPT 90°	1
105.	72063050	WASHER 5/16 LOCK	2
106.	73052040	FILTER-HYD RETURN	1
107.	73054130	GATE VALVE	1
108.	73054542	PILOT VALVE	1
109.	72060029	CAP SCR 5/16-18X2	2
110.	73054940	CHECK VALVE-SOLENOID OP	1
111.	72531412	ELBOW #4MJIC 1/4MPT	1

Figure D-15. HYDRAULIC KIT (91706549)



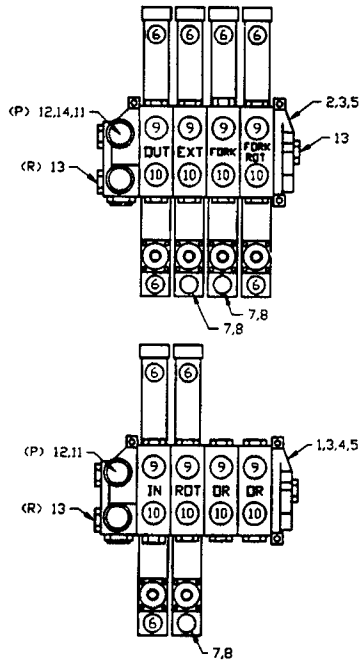
SEE PAGE 4-17 FOR PARTS

Figure D-15A. HYDRAULIC KIT (91706549)



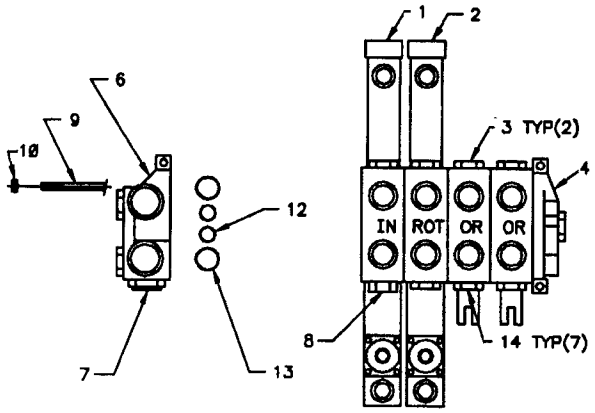
SEE PAGE 4-17 FOR PARTS

Figure D-15B. HYDRAULIC KIT (91706549)



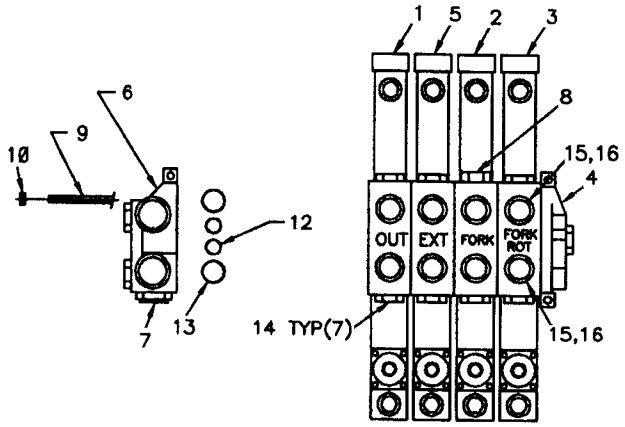
ITEM	PART NO.	DESCRIPTION	QTY
1.	70731810	VALVEBANK 4-SECT (BASE)	1
2.	70731811	VALVEBANK 4-SECT (MAST)	1
3.	72060032	CAP SCR 5/16-18X2-3/4 HHGR5	6
4.	72062109	NUT 5/16-18 LOCK	3
5.	72063002	WASHER 5/16 WRT	6
6.	72532699	ELBOW 9/16MSTR 7/16MJIC 90°	9
7.	72532700	ELBOW 9/16MSTR 9/16MJIC XLG	3
8.	72532707	ADAPTER 7/16MJIC 9/16FJIC	3
9.	72053763	ELBOW 3/4MSTR 3/4MJIC 90°	8
10.	72532666	ELBOW 3/4MSTR 3/4MJIC XLG	8
11.	60107995	ELBOW-PR GAUGE MOD	2
12.	72532987	DISCONNECT NIPPLE 1/4	2
13.	72053767	ELBOW 1-1/16MSTR 1-1/16MJIC 90°	3
14.	72531131	STREET ELBOW 1/4NPT 90°	1

Figure D-16. VALVE BANK ASSEMBLY (51706605)



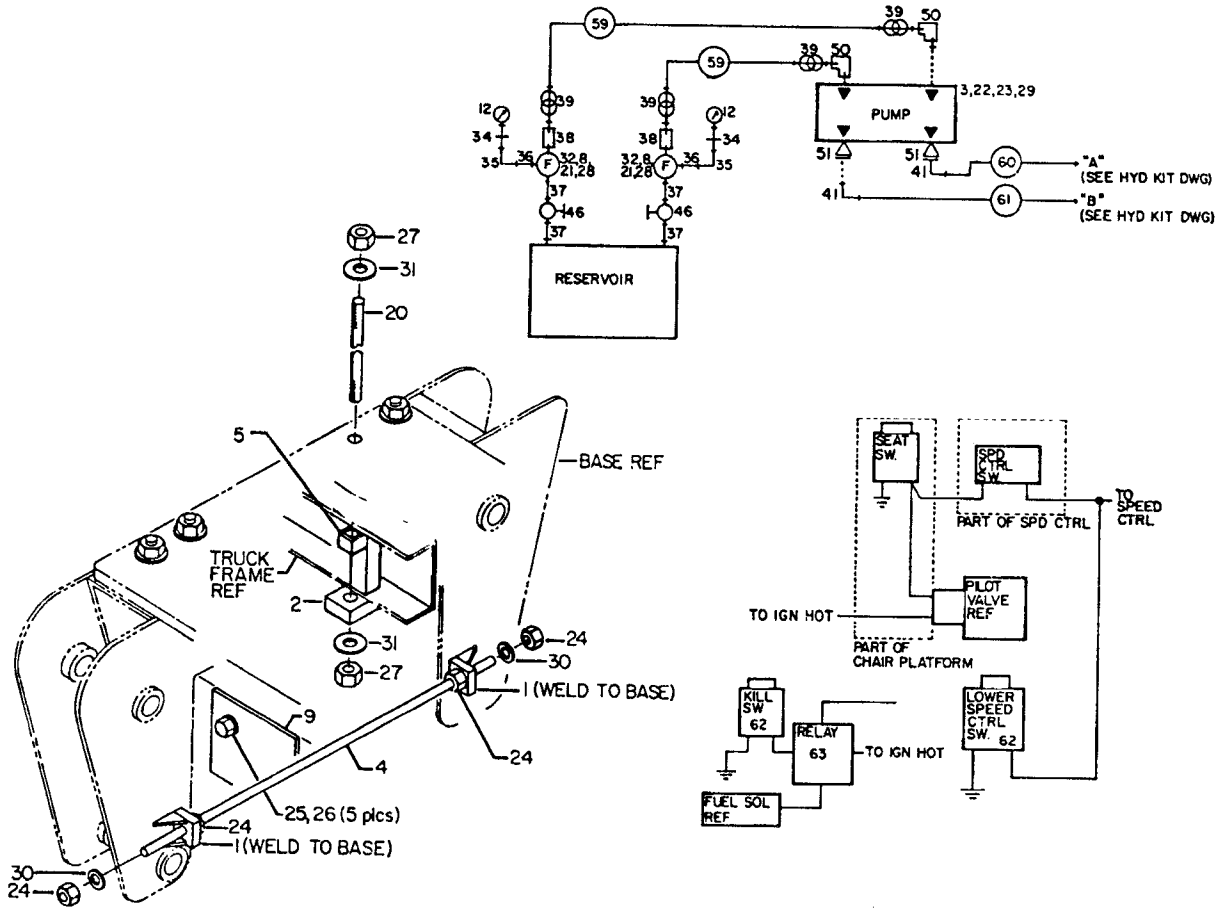
ITEM	PART NO.	DESCRIPTION	QTY
1.	73054595	VALVE SECT HRH 1000PSI	1
2.	73054943	VALVE SECT HRH BLEED	1
3.	73054597	VALVE SECT CVHA	2
4.	73733046	END COVER RH W/TA PLUG	1
6.	73731424	END COVER LH (INCL:7)	1
7.	73054673	RELIEF VALVE (PART OF 6)	1REF
8.	73054592	CHECK 1000PSI	1
9.	73014649	STUD 3/8X11-3/4	3
10.	72062037	NUT 3/8-24 HEX	6
11.	51393494	O-RING KIT	REF
12.	7Q072117	O-RING	10
13.	7Q072119	O-RING	10
14.	73054893	VALVE-ANTI CAVITATION	7

Figure D-16A. VALVE BANK (70731810)



ITEM	PART NO.	DESCRIPTION	QTY
1.	73054598	VALVE SECT HRH	2
2.	73054599	VALVE SECT HRH 1800PSI	1
3.	73054600	VALVE SECT HRH .062 ORIFICE	1
4.	73731241	END COVER RH W/CONV PLUG	1
5.	73054596	VALVE SECT-HRH FREE FLOW	1
6.	73731424	END COVER LH (INCL:7)	1
7.	73054673	RELIEF VALVE (PART OF 6)	1REF
8.	73054356	CHECK 1800PSI	1
9.	73014630	STUD 3/8X10	3
10.	72062037	NUT 3/8-24 HEX	6
11.	51393494	O-RING KIT	REF
12.	7Q072117	O-RING	10
13.	7Q072119	O-RING	10
14.	73054893	VALVE-ANTI CAVITATION	7
15.	70143140	ORIFICE PLATE	2
16.	70142403	SPRING	2

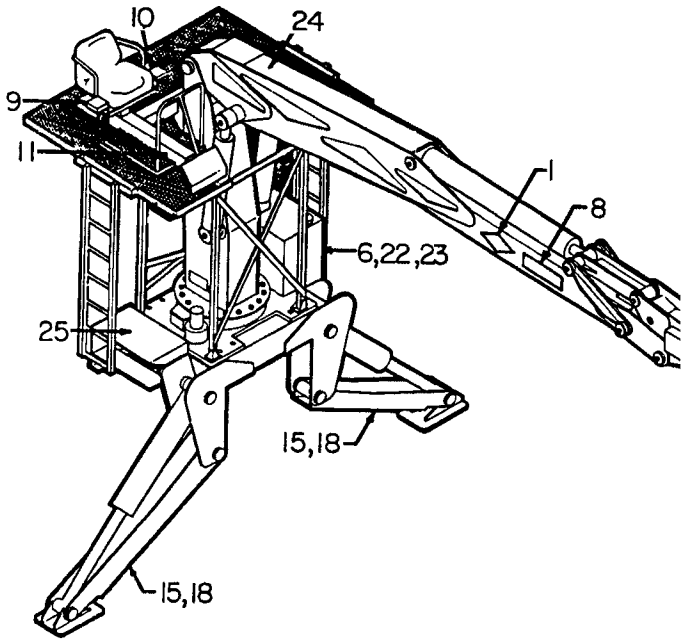
Figure D-16B. VALVE BANK (70731811)



ITEM	PART NO.	DESCRIPTION	QTY
1.	52702539	TIE BAR BLOCK	2
2.	60010665	CLAMP PLATE	4
3.	60103041	TANDEM PUMP SUPPORT	1
4.	60103204	TENSION BAR	1
5.	52706660	SUPPORT	4
8.	60103870	OIL FILTER BRACKET	2
9.	60105107	PLATE	2
12.	70048031	VACUUM GAUGE	2
20.	71014847	TIE DOWN STUD 1-1/4X28-1/2	8
21.	72060025	CAP SCR 5/16-18X1 HH GR5	4
22.	72060046	CAP SCR 3/8-16X1 HH GR5	2
23.	72062002	NUT 3/8-16 HEX	2
24.	72062009	NUT 1-8 HEX	4
25.	72060186	CAP SCR 3/4-10X2-1/2 HH GR5	10
26.	72062114	NUT 3/4-10 LOCK	10
27.	72062142	NUT 1-1/4-7 LOCK	16
28.	72063050	WASHER 5/16 LOCK	4
29.	72063051	WASHER 3/8 LOCK	2
30.	72063058	WASHER 1 LOCK	2

ITEM	PART NO.	DESCRIPTION	QTY
31.	72063067	WASHER 1-1/4 HI-STRGTH	16
32.	73052012	SUCTION FILTER	2
34.	72053301	COUPLING 1/8NPT BLK	2
35.	72053281	STREET ELBOW 1/8NPT 90°	2
36.	72053002	PIPE NIPPLE 1/8NPT X 2	2
37.	72053211	PIPE NIPPLE 1-1/4NPT X CLOSE	4
38.	72531550	BARB NIPPLE 1-1/4NPT 1-1/4	2
39.	72066516	HOSE CLAMP 1-1/4	4
41.	72053767	ELBOW 1-1/16MSTR 1-1/16MJIC 90°	2
46.	73054130	GATE VALVE 1-1/4NPT	2
50.	72532710	BEAD NIPPLE 1-5/8STR 1-1/4HOSE 90°	2
51.	72532949	ADAPTER 1-5/8MSTR 1-1/16FSTR	2
59.	60035950	HOSE 1-1/4 X 60	2
60.	51706629	HOSE ASM 3/4X63	1
61.	51706630	HOSE ASM 3/4X138	1
62.	77041013	MAIN SWITCH (KILL)	2
63.	77041251	RELAY	1

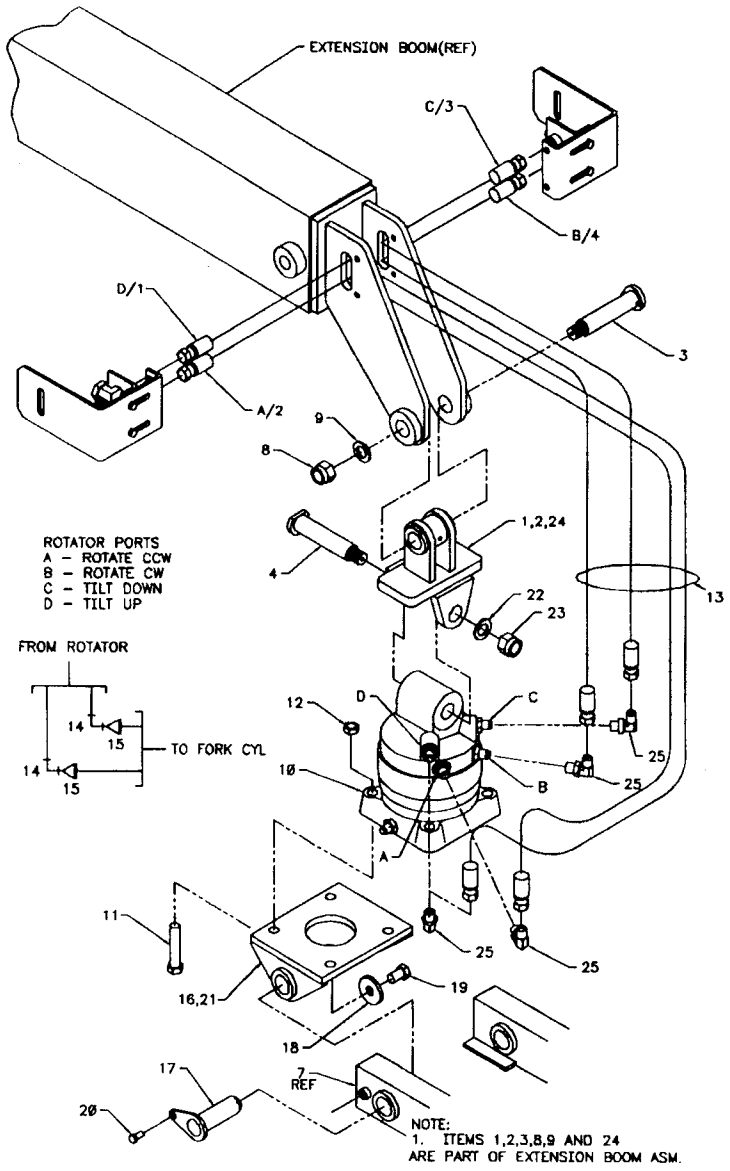
Figure D-17. INSTALLATION KIT (93706551)



ITEM	PART	DESCRIPTION	QTY
1.	70029252	PLACARD - IMT DIAMOND	2
2.	70391612	DECAL-GREASE WEEKLY LEFT	5
3.	70391613	DECAL-GREASE WEEKLY RIGHT	5
4.	70392108	DECAL-SUCTION LINE	2
5.	70392109	DECAL-RETURN LINE	1
6.	70392213	DECAL-CAUTION WASH/WAX	1
7.	70392524	DECAL-ROTATE CRANE/GREASE	1
8.	70392568	DECAL-13034 IDENT	2
9.	70392578	DECAL-JOYSTICK CTRL RH	1
10.	70392579	DECAL-JOYSTICK CTRL LH	1
11.	70392580	DECAL-PEDAL CONTROL	1
12.	70392813	DECAL DANGER ELECTRO	2
13.	70392814	DECAL-DANGER OPER TRAINING	2
14.	70392815	DECAL-DANGER OPERATION	2
15.	70392864	DECAL-DANGER OR STD CLR	2
16.	70392890	DECAL-DANGER STOW/UNFOLD	2
17.	70392866	DECAL-DANGER OPER COND	2
18.	70392867	DECAL-DANGER OR MOVING	2
19.	70392888	DECAL-DANGER OPER RESTRICT	2
20.	70392891	DECAL-DANGER DRIVELINE	2
21.	70392865	DECAL-DANGER ELECTRO LG	4
22.	70392982	DECAL-CONTACT IMT	1
23.	71039134	DECAL-CAUTION OIL LEVEL	2
24.	71392569	CAPACITY PLACARD	2
25.	76391511	DECAL-WB STABILIZER	1
26.	70394189	DECAL-RECOMMENDED HYD OIL	1

DECAL PLACEMENT	
ITEM NO.	LOCATION
12,13,14,17, 19,20,16	ONE AT RC STORAGE POINT. ONE AT STREETSIDE CONTROLS.
15,18	ONE ON EACH OUTRIGGER
21	ONE ON EACH SIDE OF CARRIER VEHICLE
7	AT THE TURNTABLE GREASE ZERK
2,3	AT ALL GREASE ZERKS
5	ON THE RESERVOIR, AT THE RETURN LINE
4	ON THE RESERVOIR, AT THE SUCTION LINE
26	ON RESERVOIR

Figure D-18. DECAL KIT (95708771)



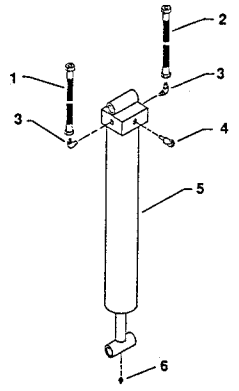
ITEM	PART NO.	DESCRIPTION	QTY
1.	51709475	SWIVEL LINK (INCL: 2,24)	1REF
2.	70055207	BUSHING (PART OF 1)	2REF
3.	52706610	PIN	1REF
4.	70143730	ROTATOR PIN (PART OF 5)	1REF
7.		FORK	1REF
8.	72062141	NUT 1-8 LOCK STL INSERT	1REF
9.	72063066	WASHER 1" HI STRENGTH	1REF
10.	70731554	ROTATOR	1
11.	72060932	CAP SCR 5/8-11X3-1/4 HHGR5	4
12.	72062091	NUT 5/8-11 LOCK	4
13.	51704008	HOSE ASM 3/8X38 FF	4
14.	72533011	ADAPTER #4MJIC M18X1.5	2
15.	72532690	ELBOW #4MJIC #4FJIC SW	2
16.	51706711	SWIVEL MTG PLATE (INCL: 21)	1
17.	52706713	PIN	2
18.	60105874	PIN RETAINER 2"	2
19.	72060147	CAP SCR 5/8-11X1 HHGR5	2
20.	72060044	CAP SCR 3/8-16X3/4 HHGR5	2
21.	70055168	BUSHING (PART OF 16)	2REF
22.	72063182	WASHER - FLAT	1
23.	72062234	NUT - LOCK	1
24.	72053508	ZERK 1/8NPT (PART OF 1)	1REF
25.	72533476	ELBOW #8MJIC M18X1.5 90°	4

OPTION-FORK MOUNTING KIT-LIFTALL (51706613)

WALLBOARD FORK ASSEMBLIES

A.	48"-60" SPREAD	71731908
B.	48"-84" SPREAD	71731909
C.	54"-60" SPREAD	71732796
D.	54"-84" SPREAD	71732795

ITEM	PART NO.	DESCRIPTION	QTY
1.	70143189	LEG 'A' & 'B' 48"	1
	70144724	LEG 'C' & 'D' 54"	1
2.	70143187	BAR 'A' & 'C' 60"	1
	70143188	BAR 'B' & 'D' 84"	1
3.	70731879	TINE ASM (INCL: 4-10)	1
4.	70143186	TINE (PART OF 3)	2REF
5.	60030135	WEAR PAD (PART OF 3)	2REF
6.	60111549	PAD LOCK'G PLATE (PART OF 3)	2REF
7.	70731978	STOP PIN ASM (PART OF 3)	2REF
8.	60030012	ROLLER(PART OF 3)	2REF
9.	72060193	CAP SCR 3/4-10X6 HHGR5 (PART OF 3)	2REF
10.	72062114	NUT 3/4-10 LOCK (PART OF 3)	2REF
11.	73050120	CYLINDER ASM (INCL: 12-19)	1
12.	73050118	CYLINDER (PART OF 11)	1REF
13.	72053508	ZERK 1/8NPT (PART OF 11)	2REF
14.	72531412	ELBOW 1/4MPT 7/16MJIC 90° (PART OF 11)	3REF
15.	72533005	TEE 7/16MJIC 1/4MPT BRANCH (PART OF 11)	1REF
16.	70731859	VALVE (PART OF 11)	1REF
17.	51392676	HOSE ASM 1/4 X 16 (PART OF 11)	1REF
18.	51392675	HOSE ASM 1/4X24 (PART OF 11)	1REF
19.	51392674	HOSE ASM 1/4X15 (PART OF 11)	1REF
20.	70143179	FORK STOP	2
21.	60112223	PIN 1	
26.	70143366	PIN 1	
27.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	2
28.	70143365	PIN RETAINER PLATE	2
29.	72533016	GREASE FITTING	2
30.	70143180	"T"-PIN 1	
31.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
32.	72601486	CAP SCR 1/2-13X1-3/4 SH	4
33.	72063051	WASHER 3/8 LOCK	2
35.	72661255	HAIR PIN 1	
37.	72063053	WASHER 1/2 LOCK	4
38.	72063003	WASHER 3/8 WRT	2
39.	70143364	BUSHING	2
40.	76392849	O-RING 2	
41.	77060095	CAP SCR 1/2-13X2 HH GR5	1
42.	72060028	CAP SCR 5/16-18X1-3/4 HHGR5	1
43.	72062109	NUT 5/16-18 LOCK	1
45.	94392698	CYLINDER OVERHAUL KIT	REF



CYLINDER FROM 6-1-94		A&B	C&D
1.	51392676 HOSE ASM 1/4X16 FF	1	
	51712367 HOSE ASM 1/4X27 FF		1
2.	51392674 HOSE ASM 1/4X15 FF	1	
	51712367 HOSE ASM 1/4X27 FF		1
3.	72531412 ELBOW 1/4MPT 7/16MJIC 90°	2	2
4.	73054661 VALVE (PART OF 5)	REF	REF
5.	70732929 CYLINDER ASM (INCL:4&7)	1	1
6.	72053508 ZERK 1/8NPT	1	1
7.	94393889 SEAL KIT (PART OF 5)	REF	REF

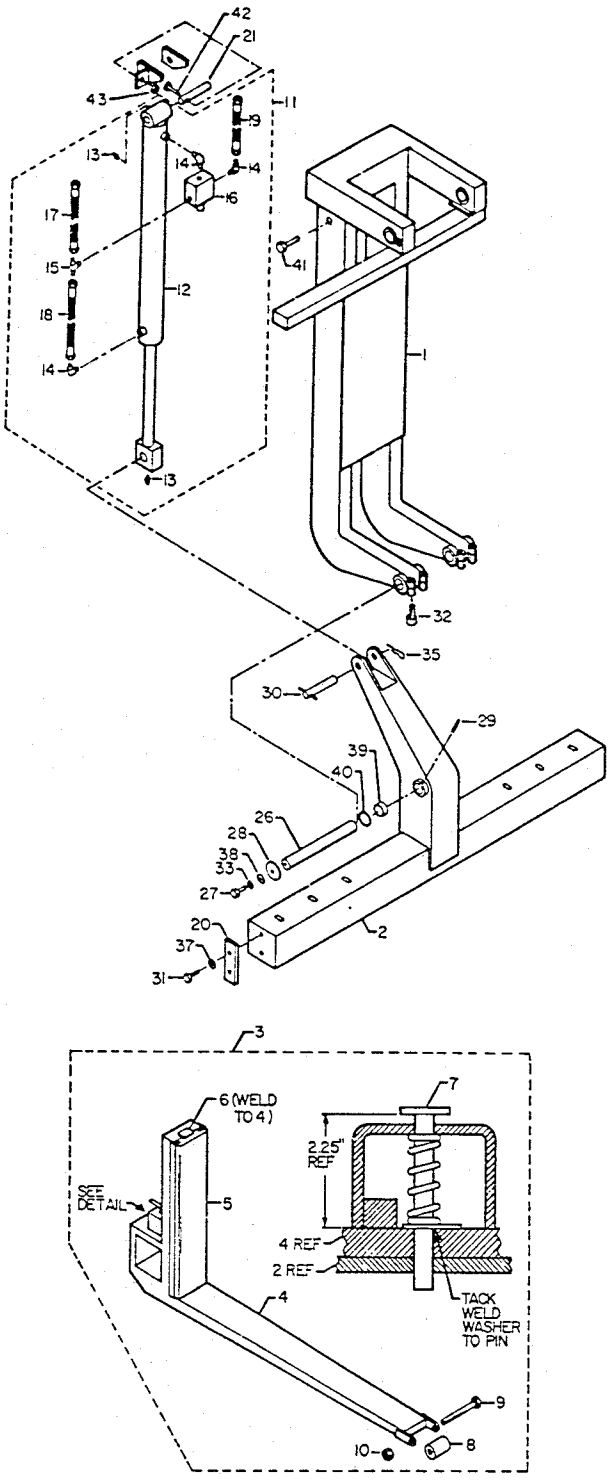
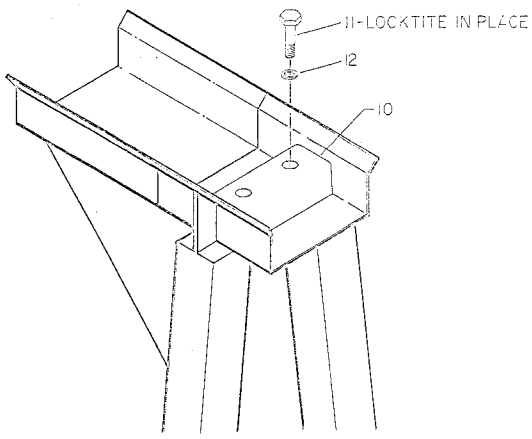
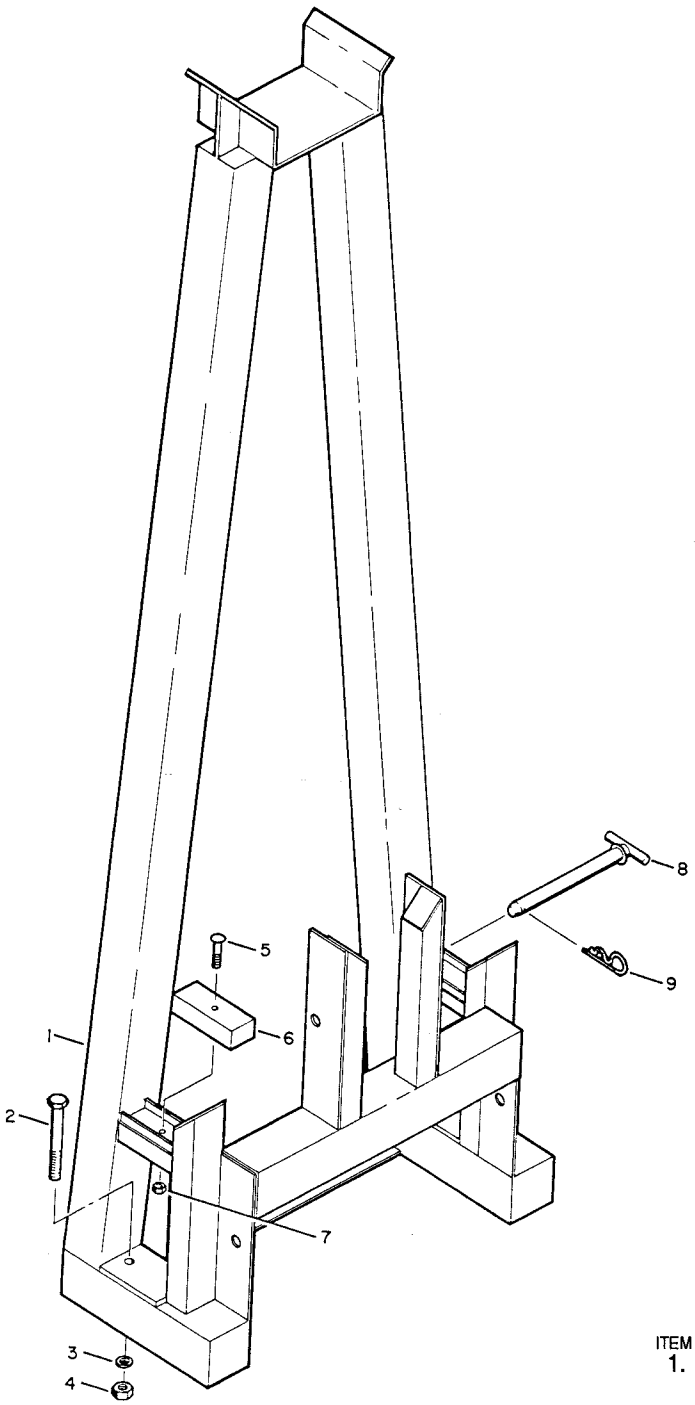


Figure D-21. WALLBOARD FORK





BOOM SUPPORTS KITS

A.	48" FORK / 18'-6" OR 24'-6" BODY	51707160
B.	48" FORK / 21'-6" OR 23'-0" BODY	51706455
C.	54" FORK / 18'-6" OR 24'-6" BODY	51711323
D.	54" FORK / 21'-6" OR 23'-0" BODY	51711320

ITEM	PART	DESCRIPTION	QTY
1.	52707159	BOOM SUPPORT 'A'	1
	52706454	BOOM SUPPORT 'B'	1
	52711322	BOOM SUPPORT 'C'	1
	52711321	BOOM SUPPORT 'D'	1
2.	72060194	CAP SCR 3/4-10X6-1/2 HH GR5	4
3.	72063008	WASHER 3/4 WRT	4
4.	72062114	NUT 3/4-10 LOCK	4
5.	72060959	CARR BOLT 3/8-16X2-1/2	2
6.	60035889	PAD	2
7.	72062103	NUT 3/8-16 LOCK	2
8.	52707817	PIN	1
9.	72066144	HAIR PIN	1
10.	76393209	BUMPER	1
11.	72060097	CAP SCR 1/2-13X3 HHGR5	2
12.	72063005	WASHER 1/2 WRT	2

Figure D-22. BOOM SUPPORT ASSEMBLIES

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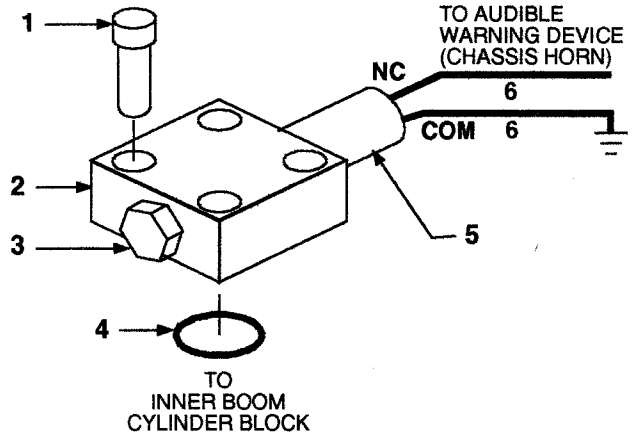
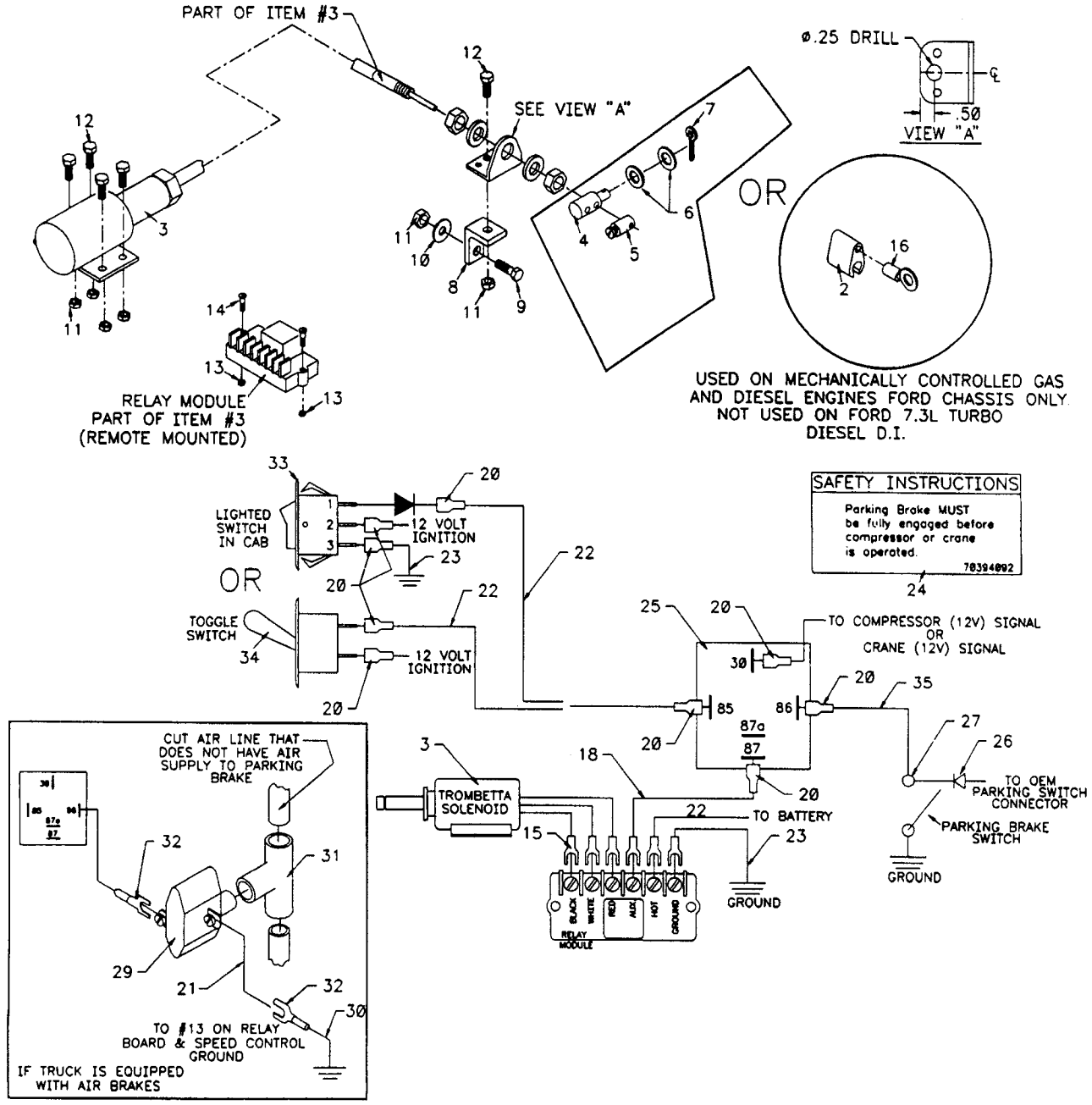


NOTE

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

Figure D-24. CAPACITY ALERT KIT - AUDIBLE (31705698)

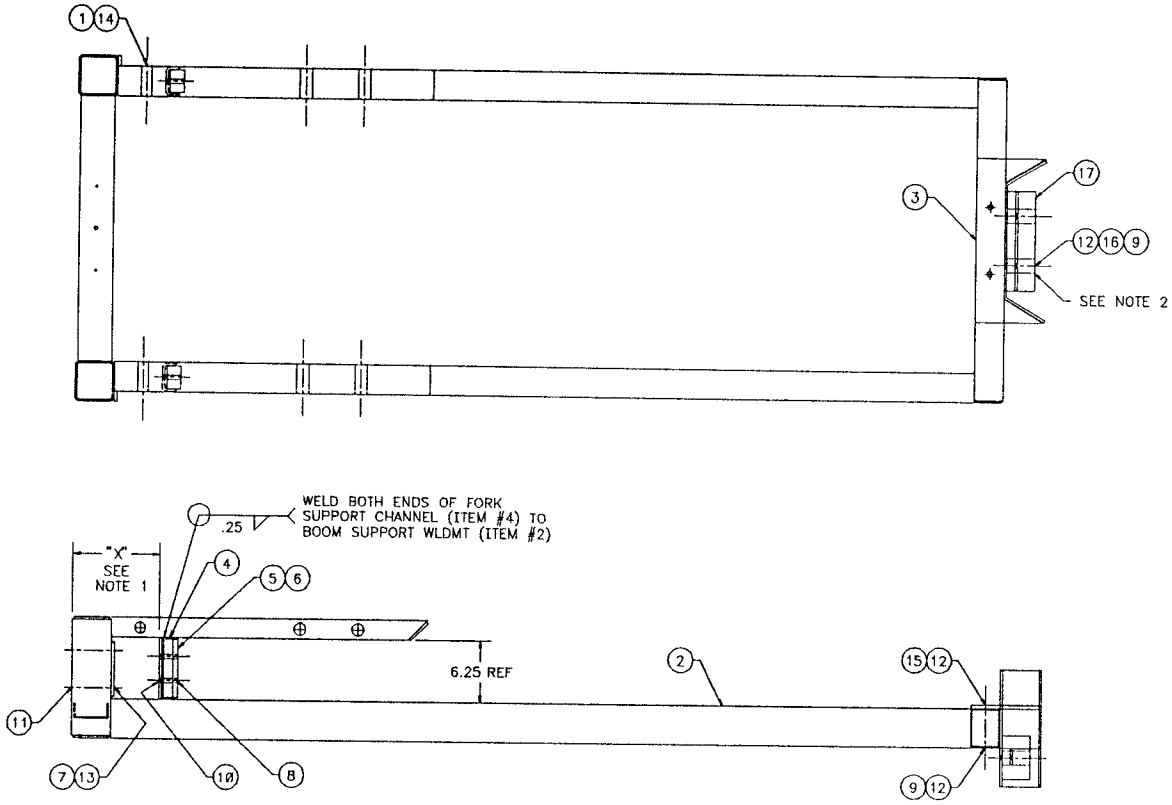


ITEM	PART NO.	DESCRIPTION	QTY
2.	77040283	CABLE END	1
3.	77041479	SOLENOID W/CABLE	1
4.	60113812	CABLE CONNECTOR-KILL SW	1
5.	72066377	CABLE STOP	1
6.	72063000	WASHER 3/16 WRT	2
7.	72066168	COTTER PIN 3/32 X 3/4	1
8.	60118524	LINKAGE BRACKET	1
9.	72060004	CAP SCR 1/4-20X1 HHGR5	1
10.	72063001	WASHER 1/4 WRT	1
11.	72062104	NUT 1/4 LOCK	6
12.	72060002	CAP SCR 1/4-20X3/4 HHGR5	5
13.	72062106	NUT #10-24 LOCK	2
14.	72060638	MACH SCR #10-24X1 RDHD	2
15.	77040051	TERMINAL #8SPRSPD 16-14GA	8
16.	77040053	TERMINAL 1/4STUD 12-10GA	2
17.	77040052	TERMINAL 3/8STUD 12-10GA	2
18.	89044371	CABLE 14GA 3WIRE X 40	1

ITEM	PART NO.	DESCRIPTION	QTY
19.	77040048	BUTT CONNECTOR 16-14GA	3
20.	77040186	TERMINAL 1/4FSLPON 16-14GA	7
21.	89044371	CABLE 14GA 3WIRE X 240	1
22.	89044232	WIRE 14GA RED X 240	1
23.	89044235	WIRE 14GA WHT X 48	1
24.	70394092	DECAL-CAUTION BRK/COMP	1
25.	77041251	RELAY-P&B	1
26.	51712961	PROTECTOR-DIODE BRK/COMP	1
27.	77040282	TERMINAL 1/4PIGBAC 16-14GA	1
28.	88800817	INSTALLATION DRAWING	1
29.	77041008	PRESSURE SWITCH	*1
30.	89044235	WIRE 14GA WHT X 60	*1
31.	72533495	TEE 3/8NPT BRASS	*1
32.	77040051	TERMINAL #18SPADE 16-14GA	*2
33.	51713190	PROTECTOR-DIODE MASTER SW	1
34.	77041386	SWITCH-SGL POLE	1
35.	89044274	WIRE 14GA BLK X 48	1

* USED WITH AIR BRAKES ONLY

TROMBETTA SOLENOID ENGINE THROTTLE CONTROL KIT (93091419)
ALL MECHANICAL CONTROLLED DIESEL OR GAS ENGINES ONLY

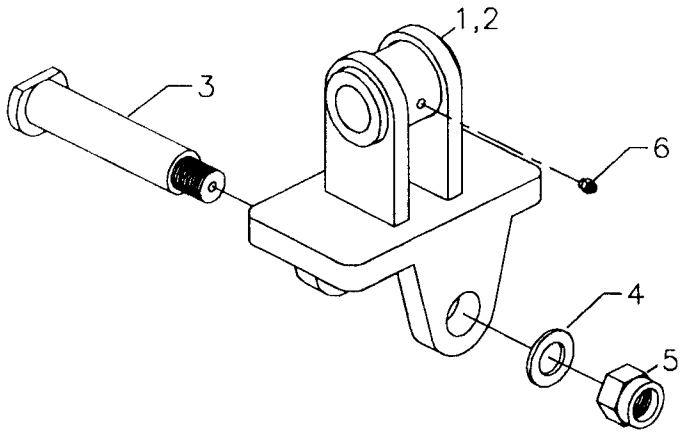


NOTE:

1. WELD FORK SUPPORT CHANNEL, ITEM #4, IN PLACE AFTER FORK IS MOUNTED ONTO CRANE AND POSITIONED INTO BOOM SUPPORT. FOLLOWING DIMENSIONS REPRESENT APPROXIMATE PLACEMENT OF FORK SUPPORT, ITEM #4
   "X" = 8.62" FOR 54" FORK APPLICATION ON 13Ø34 CRANE
   "X" = 1Ø.62" FOR 54" FORK APPLICATION ON 16Ø35/16Ø42 CRANE
   "X" = 14.62" FOR 48" FORK APPLICATION ON 13Ø34 CRANE
   "X" = 16.62" FOR 48" FORK APPLICATION ON 16Ø35/16Ø42 CRANE
2. RUBBER PAD AND HARDWARE, ITEMS #12, 16, & 17 ARE USED ONLY ON 13Ø34 CRANE/24'6" BODY APPLICATIONS

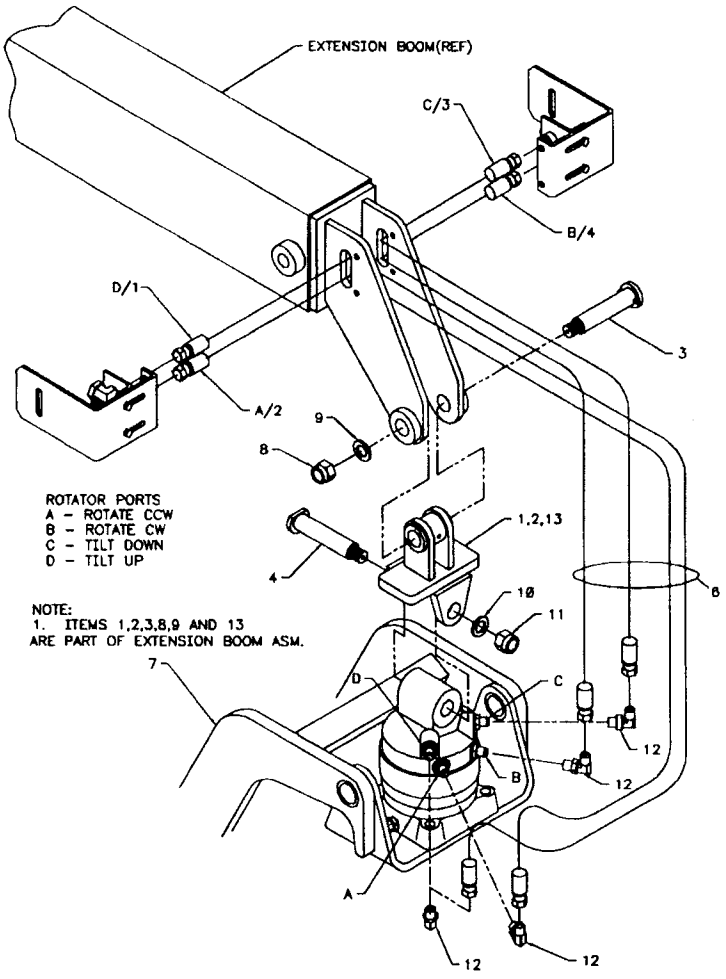
ITEM	PART NO.	DESCRIPTION	QTY
1.	60119499	PIN	1
2.	52712757	BOOM SUPPORT	1
3.	52712761	SADDLE	1
4.	60118671	CHANNEL	2
5.	60118670	PLATE	2
6.	60118677	PAD	4
7.	72060194	CAP SCR 3/4-10X6-1/2 HHGR5	4
8.	72060959	CRG BOLT 3/8-16X2-1/2 SQNK GR2	4
9.	72062080	NUT 1/2-13 LOCK	4
10.	72062103	NUT 3/8-16 LOCK	4
11.	72062114	NUT 3/4-10 LOCK	4
12.	72063005	WASHER 1/2 WRT	8
13.	72063008	WASHER 3/4 WRT	4
14.	72661367	QUICK PIN	2
15.	72601585	CAP SCR 1/2-13X5-1/2 HHGR8	2
16.	72060097	CAP SCR 1/2-13X3 HHGR5	2
17.	76393209	BUMPER	1

Figure D-26. BOOM SUPPORT ASSEMBLY (51712758)



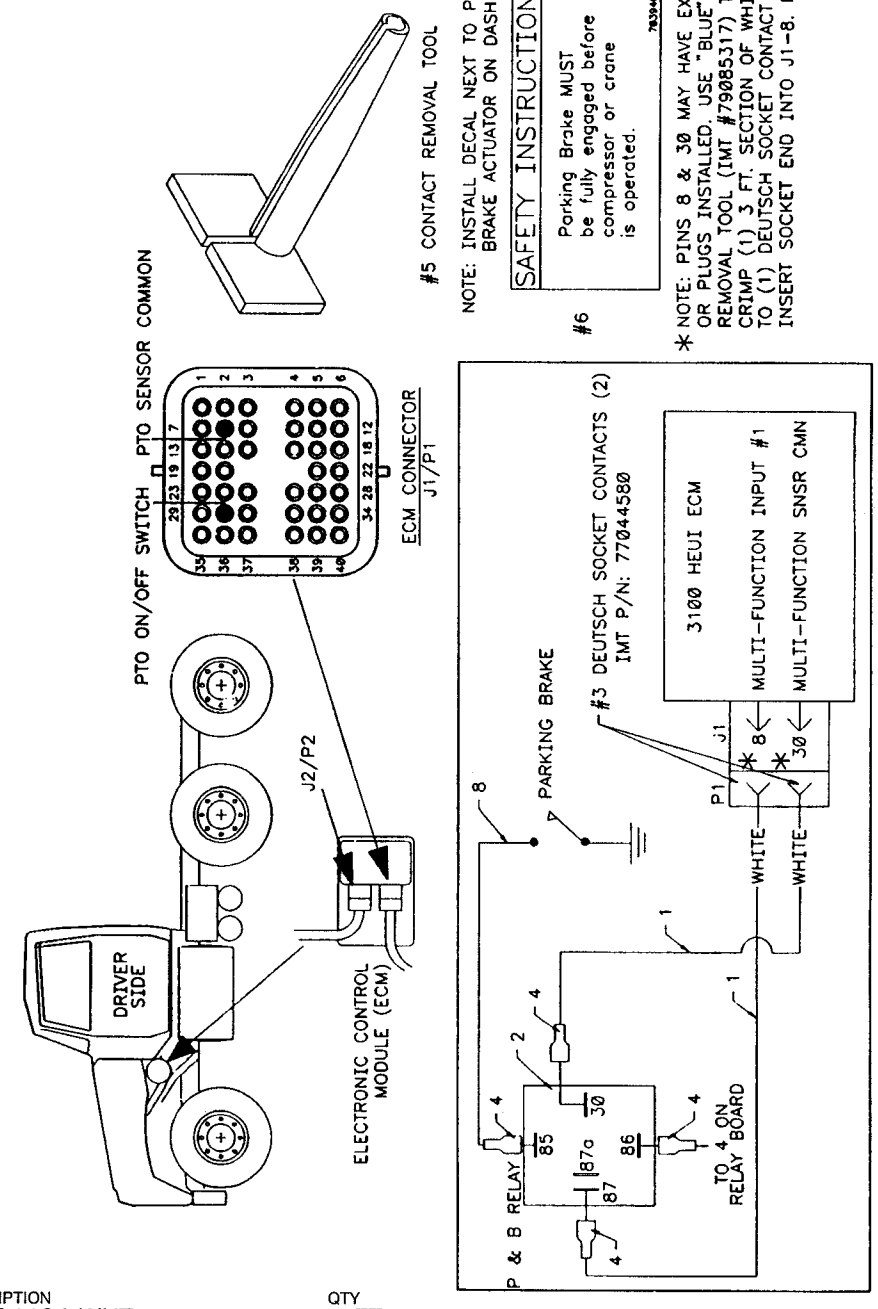
ITEM	PART NO.	DESCRIPTION	QTY
1.	51709475	SWIVEL LINK (INCL: 2,6)	1
2.	70055207	BUSHING (PART OF 1)	2REF
3.	70143730	ROTATOR PIN	1
4.	72063182	WASHER-FLAT	1
5.	72062234	NUT-LOCK	1
6.	72053508	ZERK 1/8NPT (PART OF 1)	1REF

KIT-SWIVEL LINK (51709479)



ITEM	PART NO.	DESCRIPTION	QTY
1.	51709475	SWIVEL LINK (INCL: 2,13)	1REF
2.	70055207	BUSHING (PART OF 1)	2REF
3.	52706610	PIN	1REF
4.	70143730	ROTATOR PIN (PART OF 7)	1REF
6.	51704008	HOSE ASM 3/8X25 FF	4
7.		FORK (INCL:4,10-12)	1REF
8.	72062141	NUT 1-8 LOCK STL INSERT	1REF
9.	72063066	WASHER 1" HI STRENGTH	1REF
10.	72063182	WASHER-FLAT (PART OF 7)	1REF
11.	72062234	NUT-LOCK (PART OF 7)	1REF
12.	72533476	ELBOW #8MJIC M18X1.5 (7)	4REF
13.	72053508	ZERK 1/8NPT (PART OF 1)	1REF

OPTION-FORK MOUNTING KIT-KINSHOFER (51712215)



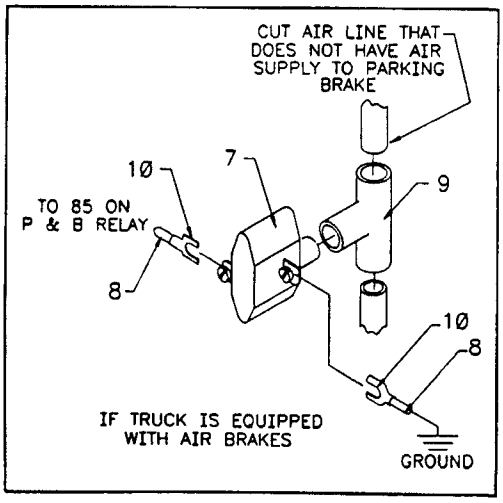
ITEM	PART NO.	DESCRIPTION	QTY
1.	89044235	WIRE 14GA WHT	6FT
2.	77041251	P&B RELAY	1
3.	77044580	SOCKET	2
4.	77040186	TERMINAL 1/4 FSLPON 16-14GA	4
5.	79085317	CONTACT REMOVAL TOOL	1
6.	70394092	DECAL-CAUTION BRK/COMP	1
7.	77041008	PRESSURE SWITCH	*1
8.	89044235	WIRE 14GA WHT	5FT
9.	72533495	TEE 3/8NPT BRASS	*1
10.	77040051	TERMINAL #18 SPADE 16-14GA	*2

CONTINUED ON FOLLOWING PAGE

ELECTRONIC THROTTLE CONTROL KIT (93091608-1)
CATERPILLAR MODELS 3116, 3126, 3176B & 3406E

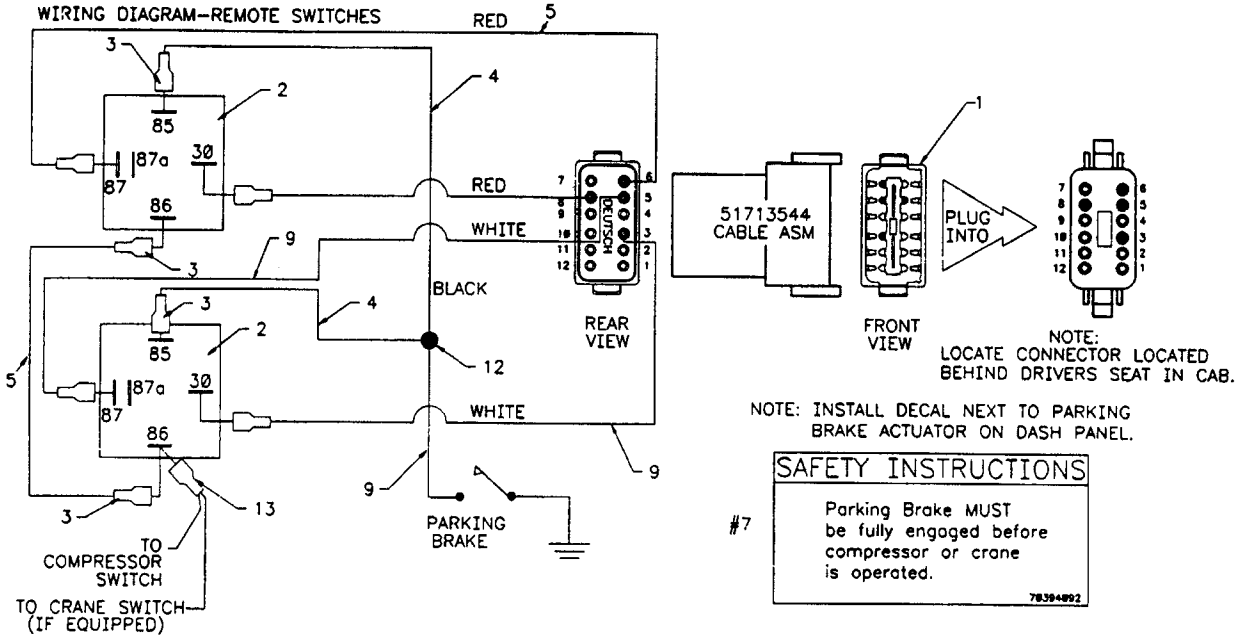
DEDICATED PTO PARAMETERS	NEW VALUES	AVAILABLE RANGE/OPTIONS	DEFAULT
PTO CONFIGURATION	REMOTE SWITCH	REMOTE SWITCHES, CAB SWITCHES, REMOTE THROTTLE, OFF	OFF
PTO TOP ENGINE LIMIT	1250 RPM *	600 TO 2120 RPM	2120 RPM
PTO ENGINE RPM SET SPEED	1250 RPM *	LOW IDLE–PTO TEL	Ø RPM
PTO TO SET SPEED	YES	YES	NO
PTO CAB THROTTLE RPM LIMIT	TEL	PTO TEL	TEL
IDLE/PTO RPM RAMP RATE	500 RPM/SEC.	5 TO 1000 RPM/SEC	50 RPM/SEC

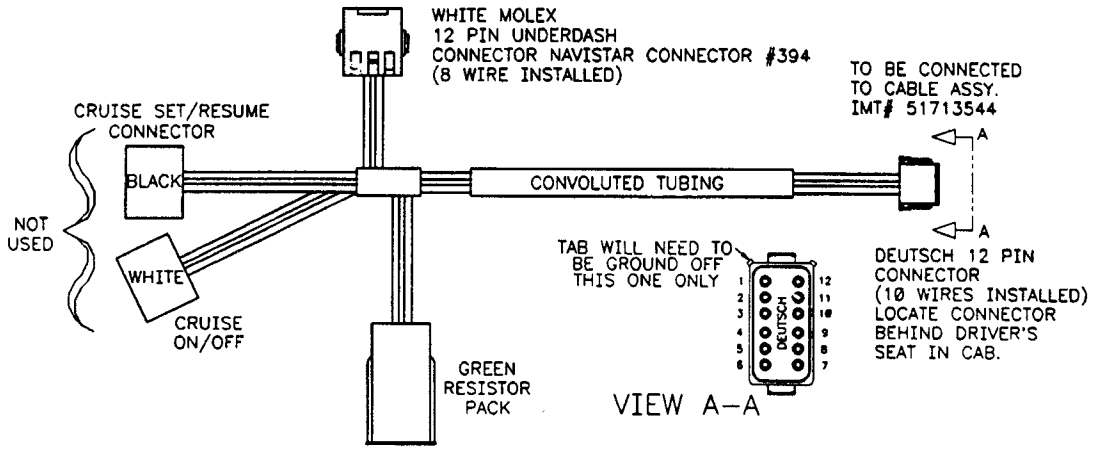
* VALUES TO BE DETERMINED BY END USER. (MUST BE THE SAME)



HAVE AUTHORIZED CATERPILLAR® DEALER USE MPSI PRO-LINC 9000 TO CHANGE THE ABOVE ECM PARAMETERS FROM DEFAULT TO NEW VALUES TO ENABLE PROPER ENGINE IDLE CONTROL.

ELECTRONIC THROTTLE CONTROL KIT (93091608-2)
CATERPILLAR MODELS 3116, 3126, 3176B & 3406E





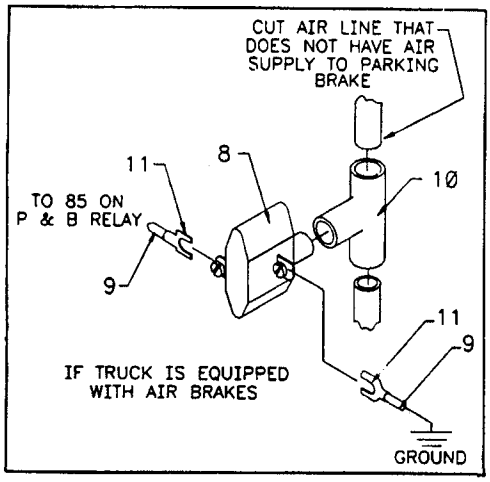
ITEM #6 INTERFACE CABLE ASSEMBLY FOR NAVISTAR ELECTRONIC THROTTLE SHOWN HERE.
PART NO.: 77044666

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713544	CABLE ASM 12-PIN (SEE DWG)	1
2.	77041251	P&B RELAY	2
3.	77040186	TERMINAL 1/4 FSLPON 16-14GA	4
4.	89044274	WIRE 14GA BLK X 12	2
5.	89044232	WIRE 14GA RED X 12	1
6.	77044666	CABLE ASM-NAVISTAR	1
7.	70394092	DECAL-CAUTION BRK/COMP	1
8.	77041008	PRESSURE SWITCH	*1
9.	89044235	WIRE 14GA WHT X 60	1
10.	72533495	TEE 3/8NPT BRASS	*1
11.	77040051	TERMINAL #18 SPADE 16-14GA	*2
12.	77040049	BUTT CONNECTOR 12-10GA	1
13.	77040282	TERMINAL 1/4 PIGBAC 16-14GA	1

* USED WITH AIR BRAKES ONLY.

CONTINUED ON FOLLOWING PAGE

ELECTRONIC THROTTLE CONTROL KIT (93091609-1)
NAVISTAR MODELS T444E & T466E



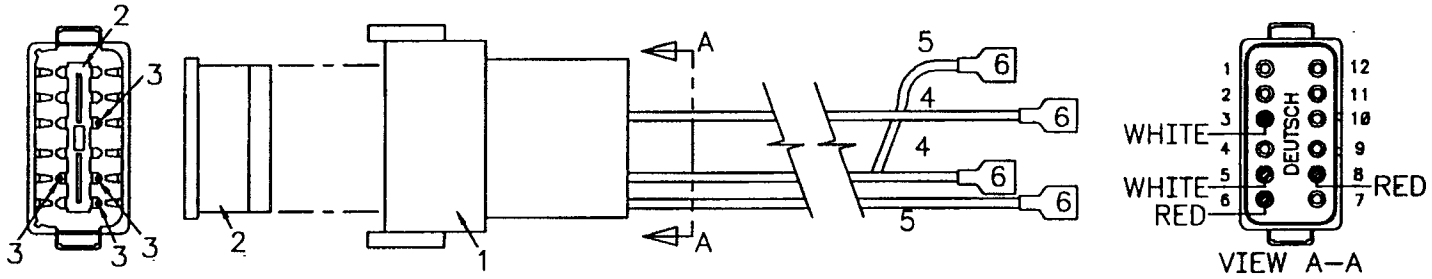
PROGRAMMABLE PARAMETER SETTINGS FOR PRESET ENGINE SPEED CONTROL.

USE MPSI PRO-LINK 9000 @ AUTHORIZED NAVISTAR® DEALER.

SERVICE TOOL NAME	PARAMETER SETTING
PTO MODE	IN-CAB AND REMOTE
IN-CAB PTO MODE	PRESET
DISABLE CAB CONTROLS	YES
SET SWITCH SPEED	PROGRAM AS REQUIRED USER TO DETERMINE RPM SELECTION
RESUME SWITCH SPEED	SAME AS SET SWITCH SPEED
ENGINE RAMP RATE	500 RPM/SEC.

NOTICE:
SALES CODE 12VVS & 12VVW MUST BE ORDERED AND INSTALLED ON TRUCK PRIOR TO INSTALLING IMT # 93091609 SPEED CONTROL KIT.

ELECTRONIC THROTTLE CONTROL KIT (93091609-2)
NAVISTAR MODELS T444E & T466E

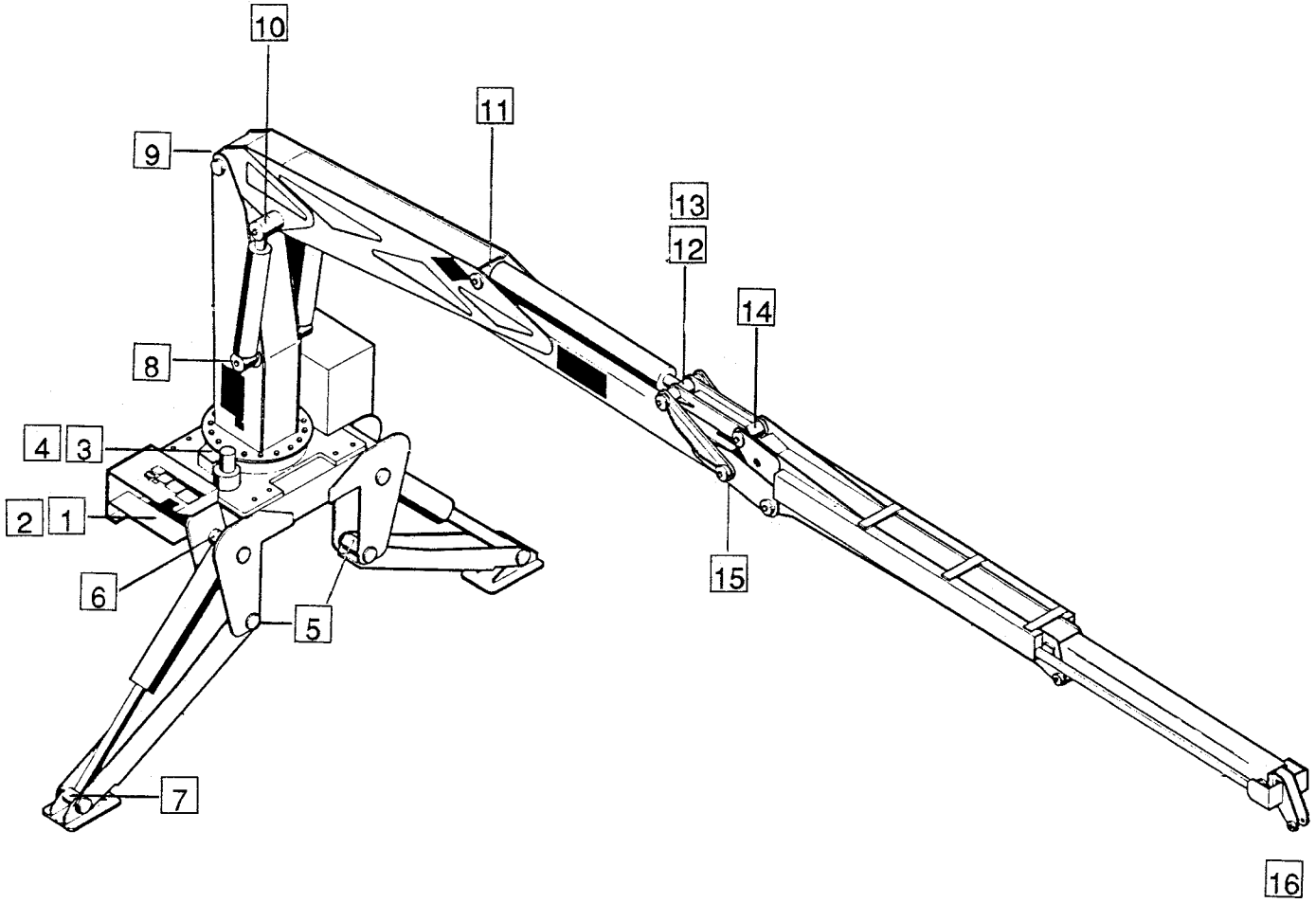


ITEM	PART NO.	DESCRIPTION	QTY
1.	77040381	RECEPTACLE 12-WAY	1
2.	77040379	WEDGELOCK	1
3.	77044621	PIN	4
4.	89044397	WIRE 16GA WHT X 26	2
5.	89044400	WIRE 16GA RED X 26	2
6.	77040186	TERMINAL 1/4 FSLPON 16-14GA	4

THIS ASSEMBLY USED ON 93091609

CABLE ASSEMBLY-12 PIN (51713544)

Section 5. REFERENCE



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	DRIVE GEAR GREASE EXTENSION	SHELL ALVANIA 2EP OR SHELL RETINAX "A"	WEEKLY
2.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING		
3.	PINION GEAR		
4.	PINION COVER		
5.	OUTRIGGER LEG / BASE HINGE PIN		
6.	OUTRIGGER CYLINDER BASE		
7.	OUTRIGGER CYLINDER ROD		
8.	INNER CYLINDER BASE		
9.	MAST/INNER BOOM HINGE PIN		
10.	INNER BOOM/INNER CYLINDER HINGE PIN		
11.	INNER BOOM/OUTER CYLINDER HINGE PIN		
12.	OUTER CYLINDER ROD		
13.	INNER LINK/OUTER CYLINDER HINGE PIN		
14.	INNER LINK/OUTER BOOM HINGE PIN		
15.	OUTER LINK/OUTER BOOM HINGE PIN		
16.	WALLBOARD FORKS (NOT SHOWN)		

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 PLAIN (LB FT)	SAE J429 GRADE 5 PLATED (LB FT)	SAE J429 GRADE 8 PLAIN (LB FT)	SAE J429 GRADE 8 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 PLAIN (LB FT)	SAE J429 GRADE 5 PLATED (LB FT)	SAE J429 GRADE 8 PLAIN (LB FT)	SAE J429 GRADE 8 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.

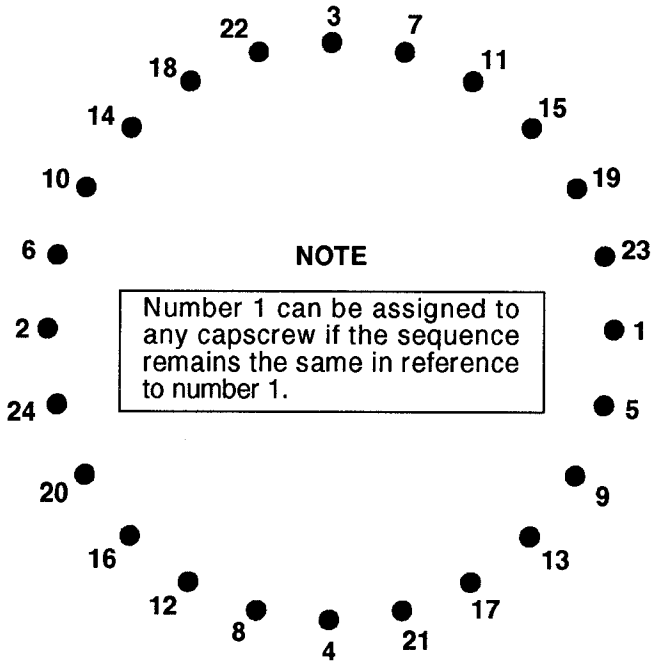
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, collodial 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 fatique causing serious injury or DEATH.

Figure E-2. TORQUE DATA CHART

Refer to the diagram below for proper tightening/torqueing 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 capscrew used.

2. Follow the tightening sequence shown in the diagram. Note that the quantity of capscrews may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.

3. Torque all capscrews to approximately 40% of the specified torque value, by following the sequence. (EXAMPLE: .40 x 265 FT-LBS = 106 FT-LBS)

4. Repeat Step 3, but torqueing all capscrews to 75% of the specified torque value. Continue to follow the tightening sequence. (EXAMPLE: .75 x 265 FT-LBS = 199 FT-LBS)

5. Using the proper sequence, torque all capscrews 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 bearings internal clearance once mounted on a crane.

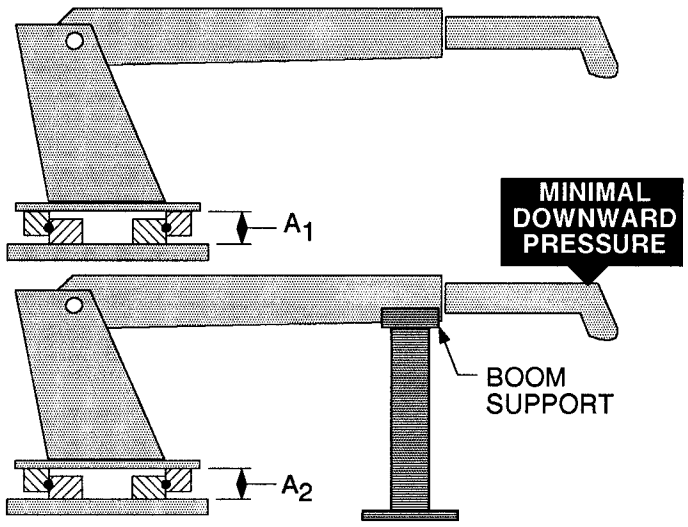
Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

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

NOTE					
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 HAWK-H1200 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
(Major Assemblies Only)
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 minimal down-time waiting for parts. Obviously, there may be part failures not covered by this list.

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

FIGURE	ITEM	PART NO.	DESCRIPTION	QTY
D-4.	**BASE AND OUTRIGGER ASSEMBLY (41706566)**			
D-6.	**BASE AND OUTRIGGER ASSEMBLY-HIGH FRAME (41706839)**			
	7	7BF81225	BUSHING	8
	9	60020124	BUSHING	1
	10	60020122	BUSHING	1
	11	60020120	BUSHING	1
	12	60020121	BUSHING	1
	13	71056074	DRIVE GEAR	1
	17	60020123	THRUST WASHER	1
	21	70034295	BEARING	1
	24	70055167	TURNTABLE BEARING	1
	25	71056072	INTERMEDIATE GEAR	1
	26	71056073	PINION GEAR	1
	45	72063115	WASHER 7/8 FLAT GR8	23
	46	72063117	WASHER 9/16 FLAT HARD	6
	49	72601037	CAP SCR 9/16-12X4-1/2 HHGR8	2
	50	72601144	CAP SCR 9/16-12X2 HHGR8	4
	51	72601472	CAP SCR 7/8-9X4-1/2 HH GR8	23
	53	73051478	MOTOR	1
	60	7Q072017	O-RING	2
	61	73054538	VALVE	2
	62	60030176	WEAR PAD	2
D-5.	**OUTRIGGER CYLINDER (3C323911)**			
	1	7BF81225	BUSHING	14
	17	73054304	VALVE 10GPM	4
	20	9X262832	SEAL KIT	2
D-7.	**MAST ASSEMBLY (41706567)**			
	MAST ASSEMBLY-HIGH FRAME (41706841)			
	4	72063116	WASHER 3/4 FLAT HARD	18
	5	72601468	CAP SCR 3/4-10X4-1/2 HH GR8	18
D-8.	**PLATFORM/CHAIR ASSEMBLY (41706568)**			
	PLATFORM/CHAIR ASSEMBLY-HIGH FRAME			
	33	77041249	MERCURY SWITCH	1
D-9.	**INNER BOOM ASSEMBLY (41706569)**			
	3	70034283	BUSHING	4
	5	70034284	BUSHING	3
D-10.	**INNER CYLINDER (3C134860)**			
	3	70034285	BUSHING	8
	7	73054242	VALVE 25GPM	2
	8	9CX55200	SEAL KIT	2
D-11.	**OUTER BOOM ASSEMBLY (41706570)**			
	5	70034283	BUSHING	4
	7	7BF81025	BUSHING	3
	8	7BF81225	BUSHING	1
	10.	7BF81025	BUSHING	1
	11	7BF81225	BUSHING	2
	13	70034283	BUSHING	3
	14	70034284	BUSHING	2
	21	60030028	WEAR PAD	2
	22	60030167	WEAR PAD	1
D-12.	**OUTER CYLINDER (3C170860)**			
	3	70034284	BUSHING	2
	4	70034283	BUSHING	2
	8	73054242	VALVE 25GPM	2
	13	9X170086	SEAL KIT	1
D-13.	**EXTENSION BOOM ASSEMBLY (41706571)**			
	3	60030169	WEAR PAD	1
	4	60030168	WEAR PAD	2
	18	70055207	BUSHING	2
D-14.	**EXTENSION CYLINDER (3B137913)**			
	1	73054304	VALVE 10GPM	2
	3	60030004	WEAR PAD	2
	5	72060836	SCREW 1/4-20X3/4 FLT HD	8
	20	9C121617	SEAL KIT	1
REF		70048149	ELEMENT-FILTER 100MESH	6
REF		73052014	ELEMENT-FILTER SPIN-ON 25MIC	6

CRANE OPERATION NEAR HEAD BOARD

To operate the crane with the load in close proximity to the head board, do so with the inner boom elevated, as shown in Figure 1. Operation of the crane as shown in Figure 2 will result in metal to metal contact of outer and extension booms, causing premature failure. Also, damage will result to hoses and fittings at rotator, causing premature failure.

CAUTION

DO NOT POSITION THE LOAD AS SHOWN IN FIGURE 2.

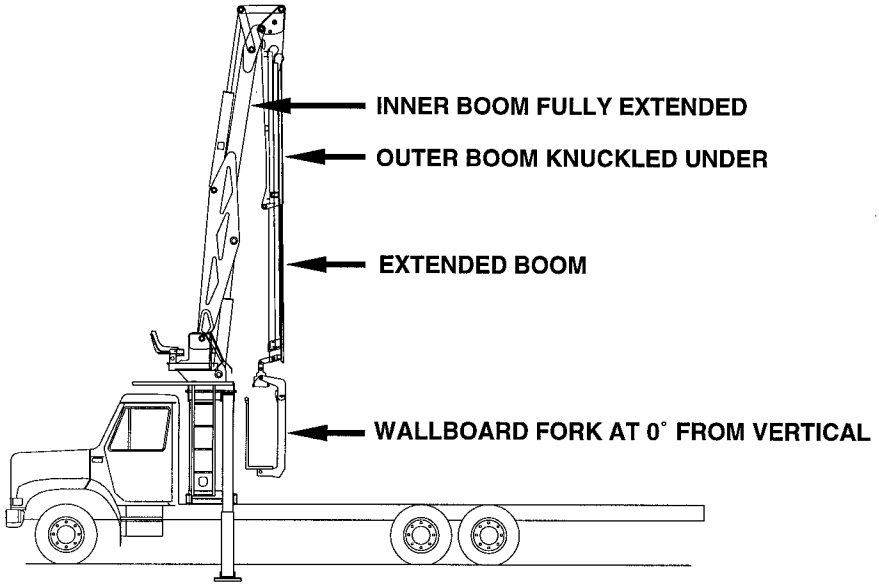


Figure 1. CORRECT OPERATION NEAR HEAD BOARD

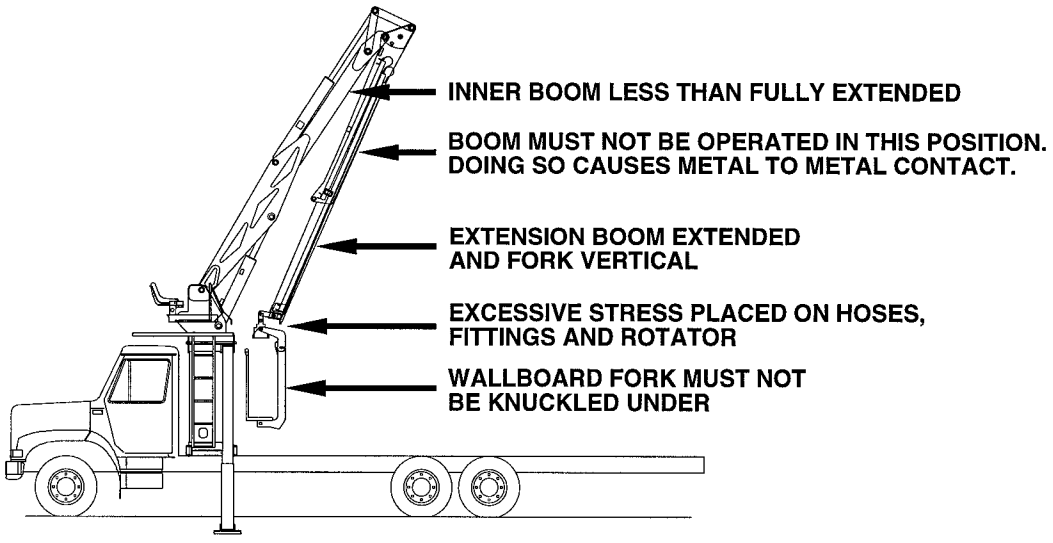


Figure 2. IMPROPER OPERATION NEAR HEAD BOARD

Section 6.

O.S.H.A. Crane Inspection Requirements

O.S.H.A. 1926.550 requires employers to perform daily and monthly inspections and to maintain the results of inspections for each hoisting machine and piece of equipment. It also requires a thorough annual inspection of hoisting machinery. This ispection is to be made by a competent person, or by a government or private agency recognized by the U. S. Department of Labor. Records of the dates and results of inspections for each hoisting machine and piece of equipment must also be maintained by the employer. The following inspections are to be performed on Iowa Mold Tooling Co., Inc. truck-mounted hydraulic cranes in order to comply with O.S.H.A. Regulation 1926.550.

TO BE FILLED IN BY OWNER OF CRANE
CRANE SERIAL NO:
DATE LAST INSPECTED:
NEXT INSPECTION DUE:
INSPECTED BY:

TO BE FILLED IN BY A COMPETENT PERSON, OR BY A GOVERNMENT OR PRIVATE AGENCY RECOGNIZED BY THE U.S. DEPT OF LABOR		
DATE INSPECTED:		
IS THE UNIT OPEATIONAL?	YES ☐	NO ☐
SIGNATURE		

INSTRUCTIONS

All inspections listed below should be performed as the schedule indicates. It is not necessary to record daily inspections but they must be verified and recorded monthly. The inspections listed on this form do not eliminate or replace any other prescribed maintenance or inspections which may be referenced in other manuals pertaining to your equipment. A copy of this completed form should remain with the applicable unit at all times.

INSPECTIONS TO BE PERFORMED BY EMPLOYER

ITEM	DESCRIPTION	FREQUENCY			INSP. RESULT		REPAIRED?		DATE INSPECTED
		DAILY	WEEKLY	MONTHLY	ACCEPT	REJECT	YES(Y) NO(N)	DATE	
HYDRAULIC SYSTEM LEAKS	Visually inspect hoses, hyd tubes and fittings for hydraulic leaks.								
LOOSE PARTS	Check for the presence of loose parts, missing fasteners and safety guards.								
STRUCTURAL DAMAGE	Visually examine crane for broken welds, cracks, deficiencies, bends and dents.								
ROTATION SYSTEM LEAKS	Visually check rotation system motor, brake, and connections for leaks.								
WIRE ROPE	Check for conditions outlined in "Wire Rope Inspection".								
ELECTRICAL-REMOTE CONTROL OPTION	Operate remote control to check for proper operation.								
ELECTRIC-LIGHTS AND OPTIONS	Operate lights and other electrical devices to check for proper operation.								
HYDRAULIC FLUID LEVEL	Visually check hydraulic fluid level of reservoir.								
CONTROL VALVES-LEAKS / CRACKS	Visually examine control valves for leaks, cracks or other deficiencies.								
CONTROL VALVES-OPERATION	Operate control valves to check for smooth operation of each function and possible excessive wear of valves.								
ANTI-TWO BLOCKING DEVICE	Test the Anti-Two Blocking Device as described in "Anti-Two Blocking Device Inspection".								

CONTINUED ON FOLLOWING PAGE

INSPECTIONS TO BE PERFORMED BY EMPLOYER (continued)

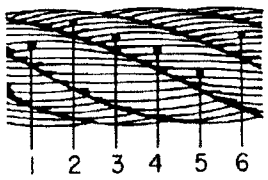
ITEM	DESCRIPTION	FREQUENCY			INSP. RESULT		REPAIRED?		DATE INSPECTED
		DAILY	WEEKLY	MONTHLY	ACCEPT	REJECT	YES(Y) NO(N)	DATE	
CRANE HOOK	Visually examine hook for enlarged throat opening, twist and presence of safety latch. Also check for conditions outlined in "Hook Inspection".								
ELECTRICAL SYSTEM WEAR	Check for deterioration of parts, the presence of dirt or moisture near contacts, and worn or frayed wiring.								
HYDRAULIC HOSE WEAR	Visually examine all hydraulic hoses and fittings for possible blistering, abrasions, cuts, cracking or deterioration.								
HOLDING VALVES-LOAD TEST	Perform a load holding test with loaded boom. See "Holding Valve Inspection".								
POWER TAKE-OFF	Check transmission for proper lubrication, signs of leakage, alignment and PTO mounting bolt torque.								
ROTATION SYSTEM	Check torque of both upper and lower rotation gear bearing mounting bolts.								
ALL FASTENERS	Visually examine all fasteners (screws, nuts & retaining rings) for looseness, deformation and corrosion.								
STRUCTURAL DAMAGE	Visually examine crane for any broken welds, cracks, structural deficiencies, bends or dents.								
CONTROLS	Check all controls for excessive wear, cleanliness and proper functioning.								
ROTATION SYSTEM MOUNTING BOLTS	Check torque of both upper and lower rotation gear bearing mounting bolts.								
HYDRAULIC FLUID	Check quality of hydraulic fluid and for the presence of water.								
PUMP & MOTOR	Check for loose fasteners, unusual noise, vibration, reduced operating speed and excessive heating.								
HYDRAULIC CYLINDERS	Visually examine all cylinders for leaks; scored, nicked or dented rods; dented case, deformed pin boss, and corrosion.								
WINCH, SHEAVES & DRUM	Check for cracks, and worn or damaged sheaves. Visually examine winch drum for irregularities.								
DECALS	Visually examine the crane for the presence of all warning decals, instructional decals and capacity charts. Inspect all decals for legibility.								

WIRE ROPE INSPECTION

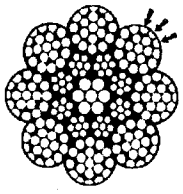
Wire rope with any of the deficiencies shown below shall be removed and replaced immediately.

A. Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.

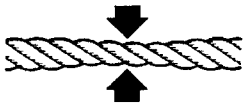
B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



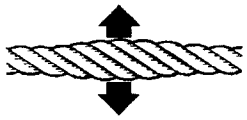
C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



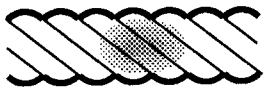
D. When there is a decrease of diameter indicating a core failure.



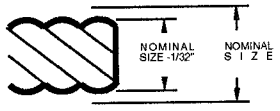
E. When kinking, crushing, birdcaging or other distortion occurs.



F. When there is noticeable heat damage (discoloration) of the rope by any means.



G. When the diameter is reduced from nominal size by 1/32" or more.



H. If a broken wire protrudes or loops out from the core of the rope.

HOOK INSPECTION

Hooks having any of the listed deficiencies shall be removed from service unless a qualified person approves their continued use and initiates corrective action. Hooks approved for continued use shall be subjected to periodic inspection.

A. DISTORTION

Bending / Twisting

A bend or twist exceeding 10° from the plane of the unbent hook.

Increased Throat Opening

HOOK WITHOUT LATCH: An increase in throat opening exceeding 15% (Or as recommended by the manufacturer)

HOOK WITH LATCH: An increase of the dimension between a fully-opened latch and the tip section of the hook exceeding 8% (Or as recommended by the manufacturer)

B. WEAR

If wear exceeds 10% of the original sectional dimension. (Or as recommended by the manufacturer)

C. CRACKS, NICKS, GOUGES

Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% of its original value. (Or as recommended by the manufacturer) (A qualified person may authorize continued use if the reduced area is not critical.)

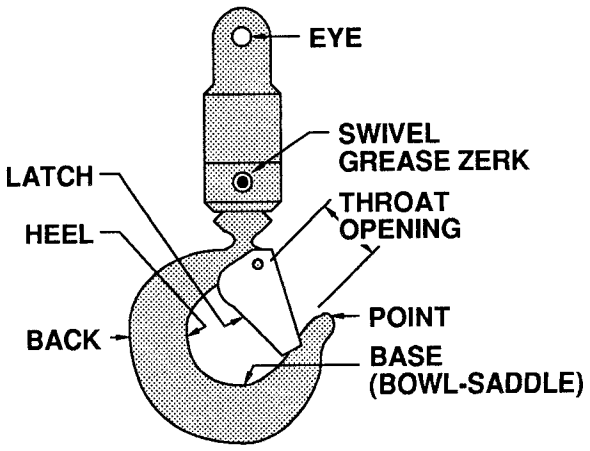
D. LATCH

Engagement, Damage & Malfunction

If a latch becomes inoperative because of wear or deformation, and is required for the service involved, it shall be replaced or repaired before the hook is put back into service. If the latch fails to fully close the throat opening, the hook shall be removed from service or "moused" until repairs are made.

E. HOOK ATTACHMENTS & SECURING MEANS

If any indication of distortion, wear, cracks, nicks or gouges are present, unless a qualified person authorizes their use. (Or as recommended by the manufacturer)



HOLDING VALVE INSPECTION

The cylinders are equipped with holding valves that prevent sudden movement of the cylinder rods in the event of a hydraulic hose or other hydraulic component failure. The valve is checked in the following manner:

1. With a full rated load, extend the cylinder in question and kill the engine.

2. Operate the control valve to retract the cylinder. If the cylinder "creeps", replace the holding valve. If the cylinder does not "creep", the valve is serviceable.

ANTI-TWO BLOCKING DEVICE INSPECTION (See Vol. 1, Operation, Maintenance and Repair for a complete description)

The anti two block system should be checked daily as follows:

1. Examine flexible rod and weight to insure free unrestricted mechanical operation

2. Examine cord for damage, cuts or breaks. Grasp cord and pull to check operation of cord reel. The cord should retract on reel when released.

3. Start vehicle, engage PTO and slowly winch loadline up until anti-two block weight comes in contact with the hook end of the loadline cable. At the moment the weight is fully supported, a marked difference in winch operation should be noted. At this point, the winch up function should become very sluggish or non-functioning and have very little pull capability. Slowly increase truck engine speed while simultaneously actuating the winch up function. The winch characteristics should remain sluggish with little or no tensioning of the cable. If operation other than as described occurs, stop immediately and investigate. Failure to do so will risk damage to the cable or the crane.

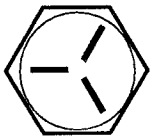
If all is well at this point, actuate the boom extend function slowly, and gradually increase to full actuation. Once again the function should be sluggish or non-existent with no tightening of the winch cable. If operation other than described occurs, stop immediately and reverse the function.

The final check involves actuating both the winch up and extend functions together and checking for proper operation of the anti two blocking circuit. Once again, start slowly and stop if it appears the cable is being tensioned.

If the anti two block function appears to be functioning normally, winch the cable down until the sensing weight swings free.

TORQUE DATA CHART

COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)
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, collodial 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 fatique causing serious injury or DEATH.

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 13034	MANUAL PART NO. 99900137-7/91
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

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 shipment to the end user.

2. One (1) year; original IMT parts from the date of shipment 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, and proven to have such defect, provided such defect occurs within the above stated warranty period and is reported within fourteen (14) days of its occurence.

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 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, 1985

IOWA MOLD TOOLING CO., INC.
BOX 189, GARNER, IA 50438-0189
TEL: 515-923-3711
PRODUCT SUPPORT FAX: 515-923-2424