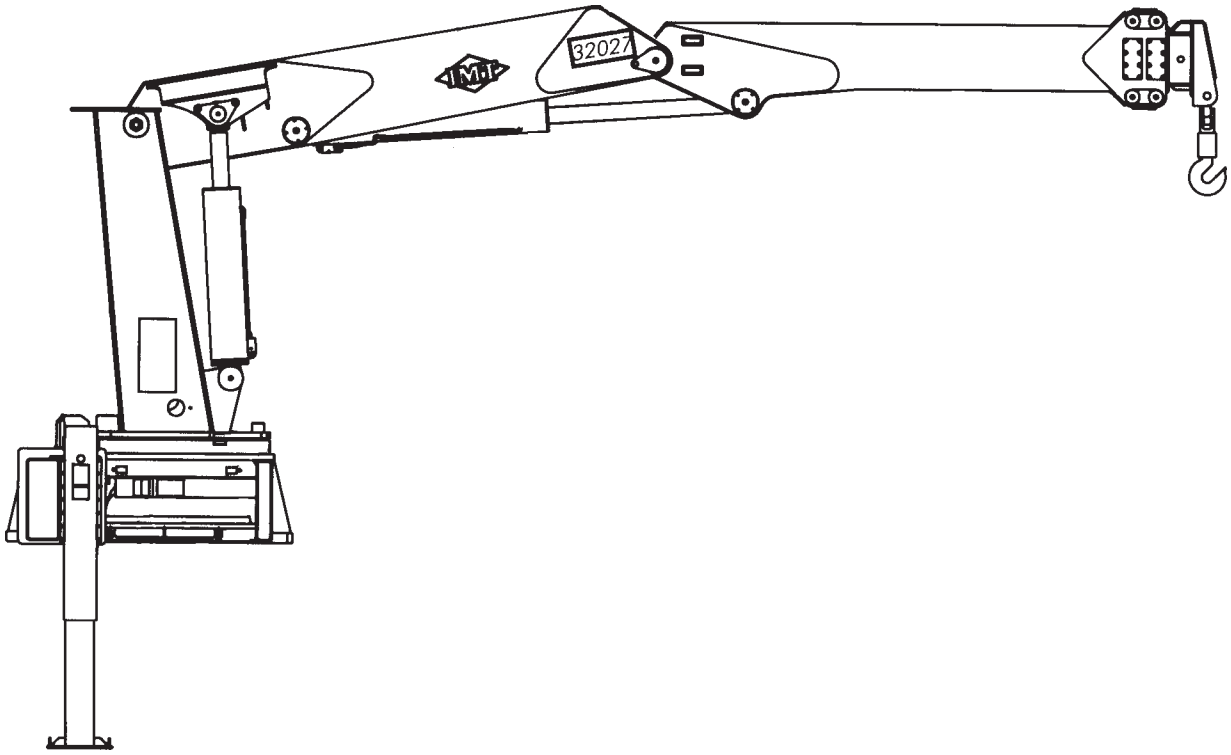
Model 32027 Crane

Volume 2 - PARTS AND SPECIFICATIONS



IOWA MOLD TOOLING CO., INC.
BOX 189, GARNER, IA 50438-0189
TEL: 641-923-3711

MANUAL PART NUMBER 99901210

Iowa Mold Tooling Co., Inc. is an Oshkosh Corporation company.

REVISIONS LIST

DATE	LOCATION	DESCRIPTION OF CHANGE
20000905	3-31	ECN 9000-51714218-ADD 73052088 ELEMENT & 76395851 GASKET
20001003	3-31	ECN9000-51714218-ADD O-RING KIT 94074101 REF
	3-33	ADD CTRL BOX ASM 51715077
20010208	2-05	CORRECTED SPARE PARTS LIST
20040520	3-29	ECN 9459 - CHANGED FLOODLIGHT KIT 51709314
20061106	1-1, 3-3	NEW OWNERSHIP STATEMENT; UPDATED SERIAL TAG LOCATION INFO.
20111223	THROUGHOUT	ECN 11628 - UPDATED STABILIZER WORDING, ADDED CRANE LEVEL, STABILIZER DEPLOY DECALS

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 this volume be kept in a safe place in the office.

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

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

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

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

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

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

NOTE

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

CAUTION

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

WARNING

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

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

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

NOTES

SECTION 1. MODEL 32027 CRANE SPECIFICATIONS

NOTES

SPECIFICATIONS-MODEL 32027 CRANE

GENERAL SPECIFICATIONS

***CRANE RATING (ANSI B30.22)** ..... 320,000 ft-lbs (44.25 ton-m)

***MAXIMUM CRANE RATING** ..... 320,000 ft-lbs (44.25 ton-m)

HORIZONTAL REACH from centerline of rotation ..... 27’-6” (8.38m)

HYDRAULIC EXTENSION ..... 78” (1.98m)

VERTICAL REACH from mounting surface ..... 33’-5” (10.18m)

VERTICAL REACH from ground / 43” frame ht. ..... 37’-0” (11.28m)

CRANE WEIGHT ..... 16,500 lbs (7485 kgs)

STABILIZER SPAN - BASE MOUNTED ..... 18’-0” (5.49m)

STABILIZER SPAN - AUXILIARY (required) ..... 14’-0” (4.27m)

STABILIZER PADS ..... 16” x 16” (40.64 x 40.64cm)

STABILIZER PADS - AUXILIARY ..... 14” x 14” (35.56 x 35.56cm)

CRANE STORAGE HEIGHT from mounting surface ..... 9’-5” (2.87m)

CRANE STORAGE HEIGHT from ground / 43” frame ht. ..... 13’-0” (3.96m)

****MOUNTING SPACE REQUIRED** ..... 70” (1.78m)

ROTATIONAL TORQUE ..... 38,320 ft-lbs (5.30 ton-m)

OPTIMUM PUMP CAPACITY ..... 35 gpm (132.5 lpm)

SYSTEM OPERATING PRESSURE ..... 3000 psi (207 bar)

OIL RESERVOIR CAPACITY ..... 60 U.S. gallons (227 liters)

HOOK APPROACH - HORIZONTAL from centerline of rotation ..... 7’-1” (2.16 m)

HOOK APPROACH - VERTICAL from mounting surface ..... 7’-10” (2.39m)

*****HORIZONTAL CENTER OF GRAVITY** ..... 50” (1.27m)
from centerline of rotation away from stabilizers

*****VERTICAL CENTER OF GRAVITY** from mounting surface ..... 6’-0” (1.83m)

* Maximum Crane Rating (ft-lbs) is defined as that rated load (lbs) which when multiplied by its respective distance (ft) from centerline of rotation gives the greatest ft-lb value.

ANSI B30.22 Crane Rating (ft-lbs) = With all extensions retracted and inner plus outer boom in a horizontal position, rated load (lbs) X respective distance (ft) from centerline of rotation = nominal ft-lb value.

** Mast swing within the confines of the crane base requiring no additional space behind the cab.

*** Crane in stowed position.

PERFORMANCE CHARACTERISTICS

ROTATION:	400°	29 sec
INNER BOOM ELEVATION:	-30° to +70°	28 sec (ext), 22 sec (retract)
OUTER BOOM ARTICULATION:	127°	32 sec (ext), 23 sec (retract)
TELESCOPIC EXTENSION:	78” (1.98m)	20 sec (ext), 20 sec (retract)
POWER-OUT STABILIZER:	60” (1.52m)	8 sec
POWER-DOWN STABILIZER:	26” (66cm)	13 sec

POWER SOURCE

Load sensing piston pump and PTO application. Minimum horsepower required is 68 HP.

CYLINDER HOLDING VALVES

The holding sides of all standard cylinders are equipped with integral-mounted holding or counterbalance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure. The power-out and power-down stabilizer cylinders have positive, pilot operated holding valves that open only upon command.

The counterbalance 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.

ROTATION SYSTEM

Rotation of the crane is accomplished through a turntable bearing, powered by two high-torque hydraulic disc-valve motors through two planetary gear boxes. A fail-safe, spring-loaded brake is an integral part of each planetary gear box which provides rotational and parking brake action. Total gear reduction is 99:1.

HYDRAULIC SYSTEM

The hydraulic system is a closed center, load sensing, standby pressure system providing 35 GPM (132.5 LPM) optimum oil flow at 3000 PSI (207 bar). Stack type control valve with radio remote plus single operational control handles located on driver’s side of the crane for all lift, telescope and swing functions is standard. Single control lever for each stabilizer function, located on the same side as the stabilizer, is standard. System includes hydraulic oil reservoir, return line filters, closed center, load sensing control valve and a variable displacement radial piston pump.

SELECTED WEIGHTS OF ANCILLARY EQUIPMENT

AUXILIARY STABILIZERS	1770 lbs	(803 kgs)
18’ SUB-FRAME	1800 lbs	(816 kgs)
PUMP & PTO	140 lbs	(64 kgs)
MOUNTING HARDWARE	520 lbs	(235 kgs)
OIL RESERVOIR	190 lbs	(86 kgs)
OIL (60 gallons / 227 liters)	420 lbs	(190 kgs)

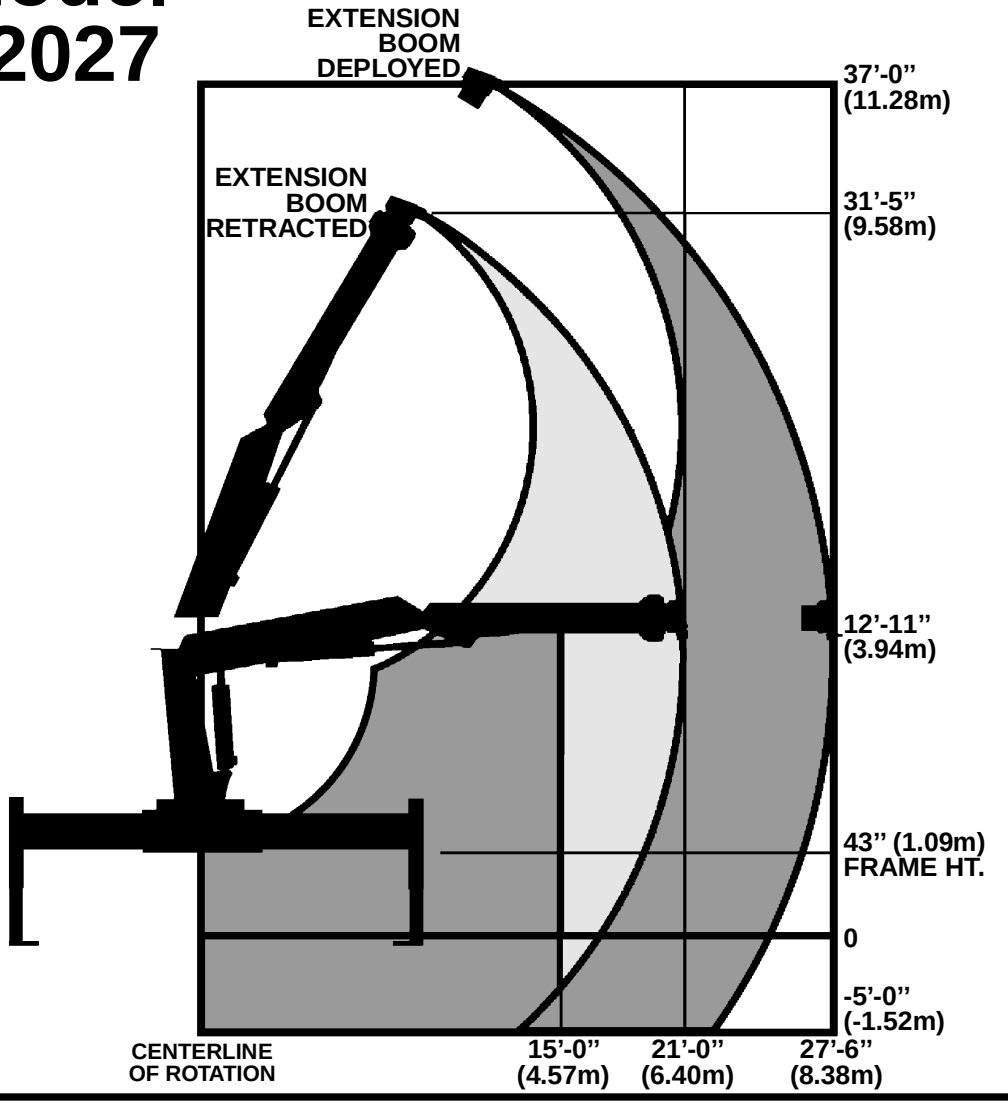
IMT reserves the right to change specifications and design without notice.

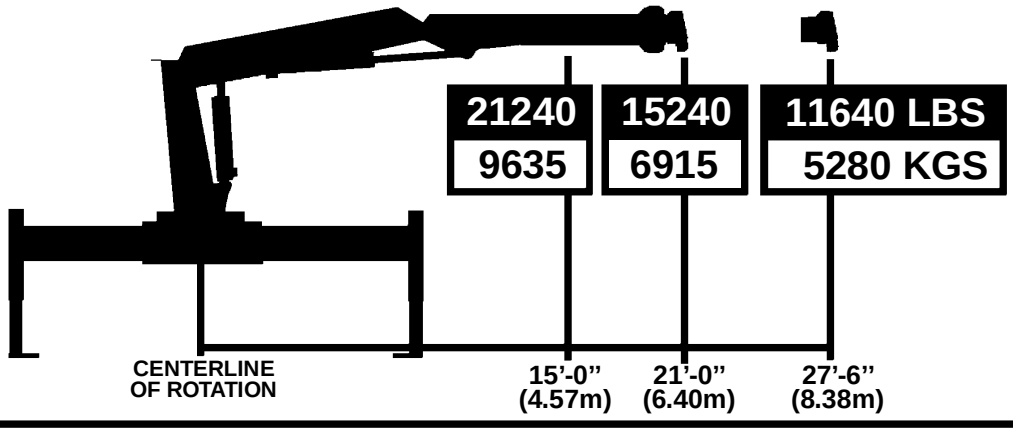
IOWA MOLD TOOLING CO., INC. ●BOX 189 ●GARNER ●IA ●50438 ●641-923-3711
Capacities through geometric range are limited to those shown in horizontal position.

Model 32027

Loads shown are based on crane structural or hydraulic capability. Before lift is made, stability must be checked per SAE J765A.

Working loads will be limited to those shown. Deduct the weight of load handling devices.





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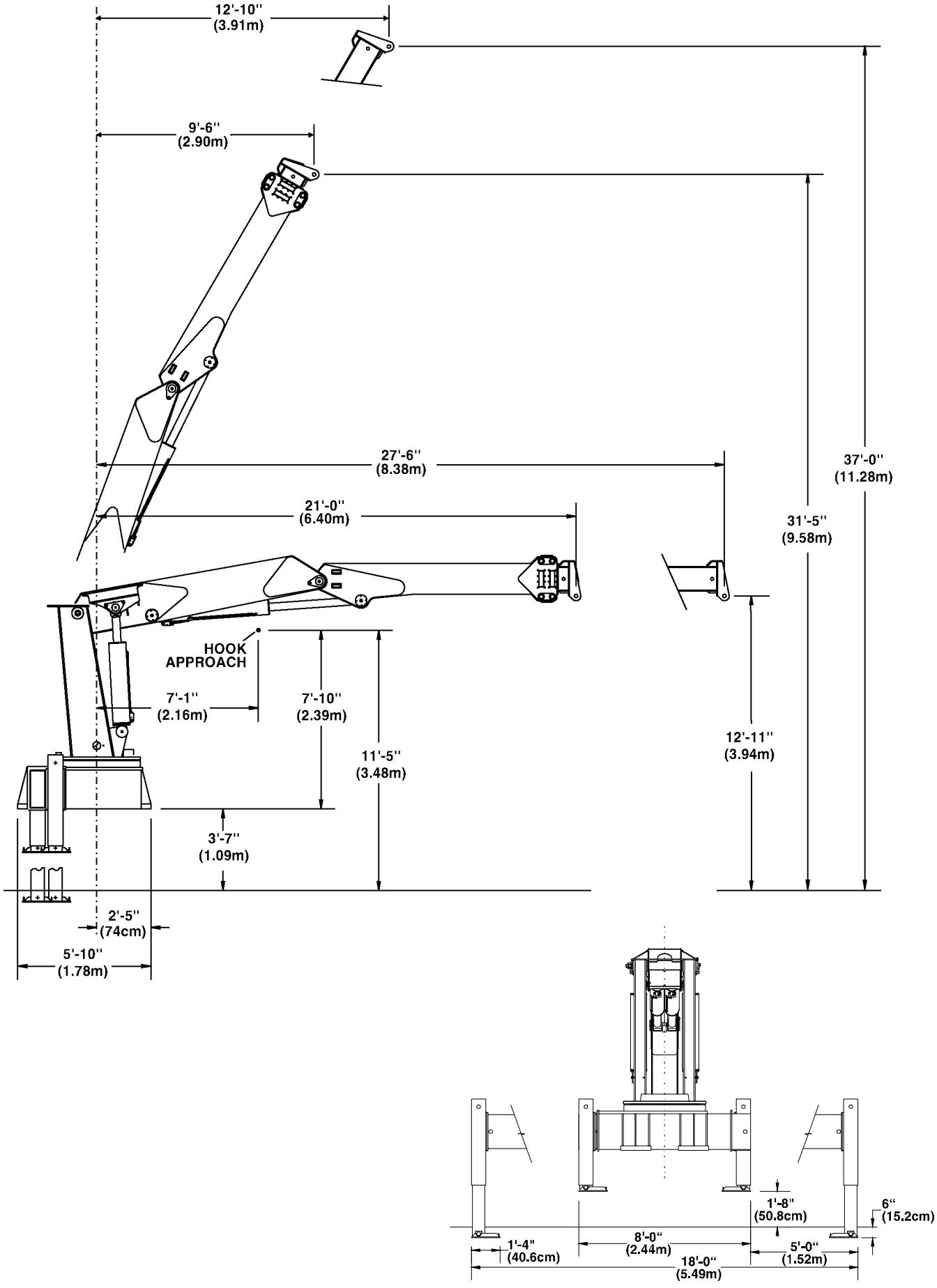
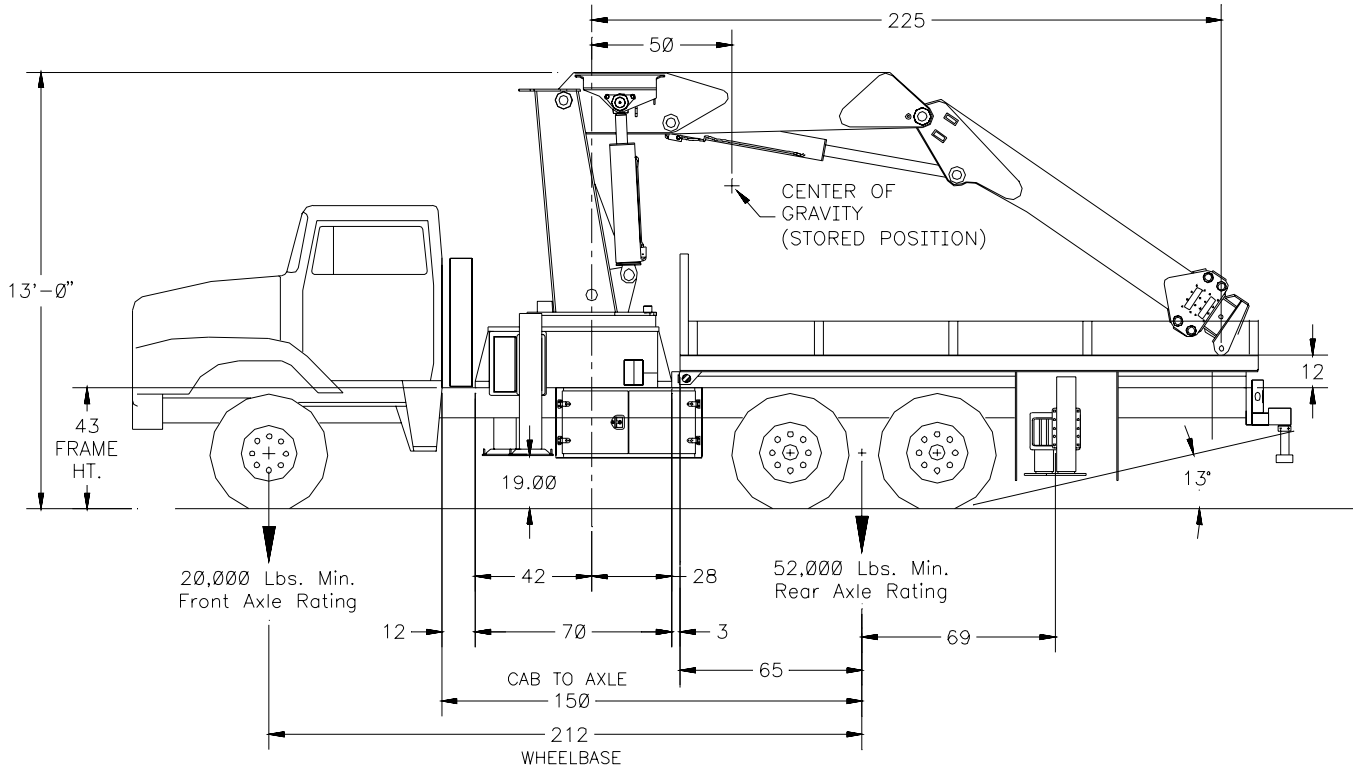
GEOMETRIC CONFIGURATION



CRANE MOUNTED ON CHASSIS



MINIMUM CHASSIS SPECIFICATIONS
For Standard 32027 Crane

CRANE MOUNT ..... Behind Cab

CRANE WORKING AREA ..... 360°

CHASSIS STYLE ..... Conventional Cab

FRONT AXLE RATING (GAWR) ..... 20000 lbs (9072 kg)

REAR AXLE RATING (GAWR) ..... 52000 lbs (23587 kg) Tandem Axle

WHEELBASE ..... 212'' (5385mm)

CAB-TO-AXLE ..... 150'' (3810mm)

FRAME HEIGHT FROM GROUND ..... 43'' (1092mm) maximum

RBM ..... 4,740,000 in-lbs (587,760 kgs/m)
FRAME SECTION MODULUS ..... 40.45 cubic inches (663cc)
FRAME YIELD STRENGTH ..... 110,000 PSI (77,341,000 kgs/m^2)

MIN AFTER FRAME ..... 140” (3556mm)

CHASSIS FRAME RAIL WIDTHS
OUTSIDE DIMENSION ..... 34” (864mm) minimum to 40” (1016mm) maximum
INSIDE DIMENSION ..... 24” (610mm) minimum to 30” (762mm) maximum

To maintain vehicle stability, it will be necessary to provide auxiliary stabilizers which have, at a minimum, 14'-0'' (4.26m) span. A subframe/torsion box must be used to tie the auxiliary stabilizers to the crane. For each application contact IMT for a weight distribution and stability analysis.

NOTES:
1. GAWR means Gross Axle Weight Rating and is dependent on all components of the vehicle such as axles, tires, wheels, springs, brakes, steering and frame strength meeting the manufacturer’s recommendations. Always specify GAWR when purchasing a truck.
2. Minimum axle requirements may increase with use of diesel engines, longer wheelbase or service bodies. Contact the factory for further information.
3. Weight distribution calculations are required to determine final axle loading.
4. All chassis and crane combinations must be stability tested to ensure stability per ANSI B30.22

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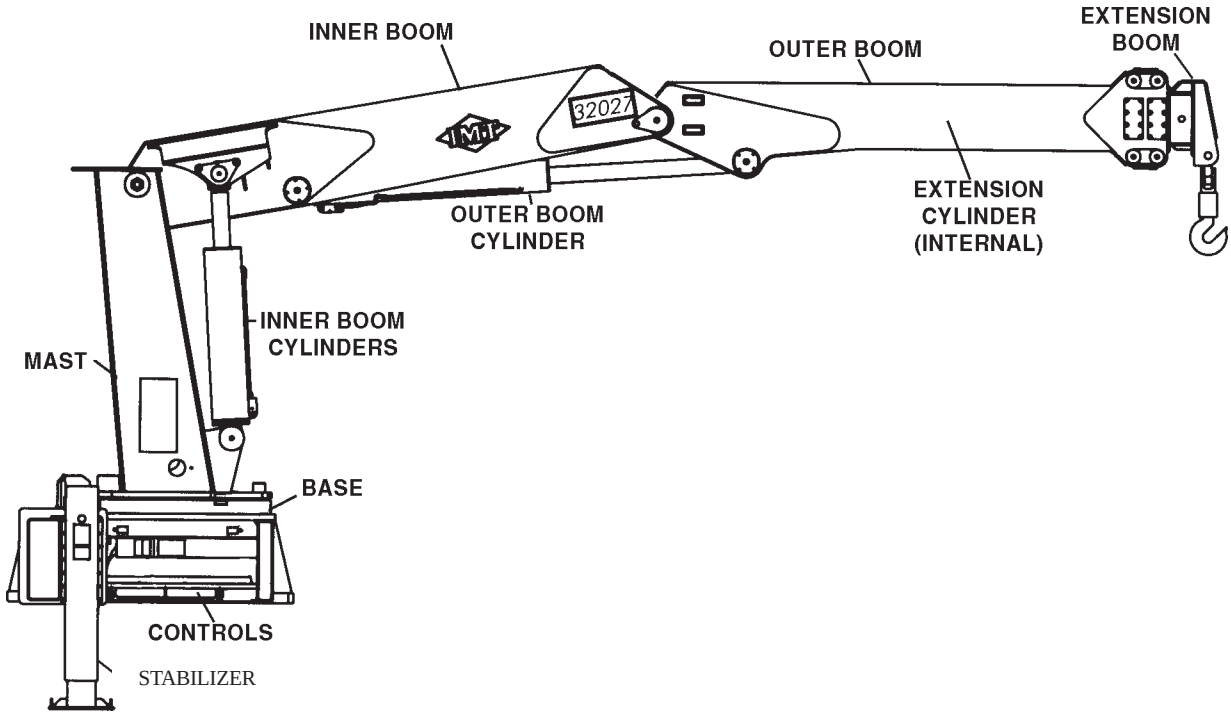
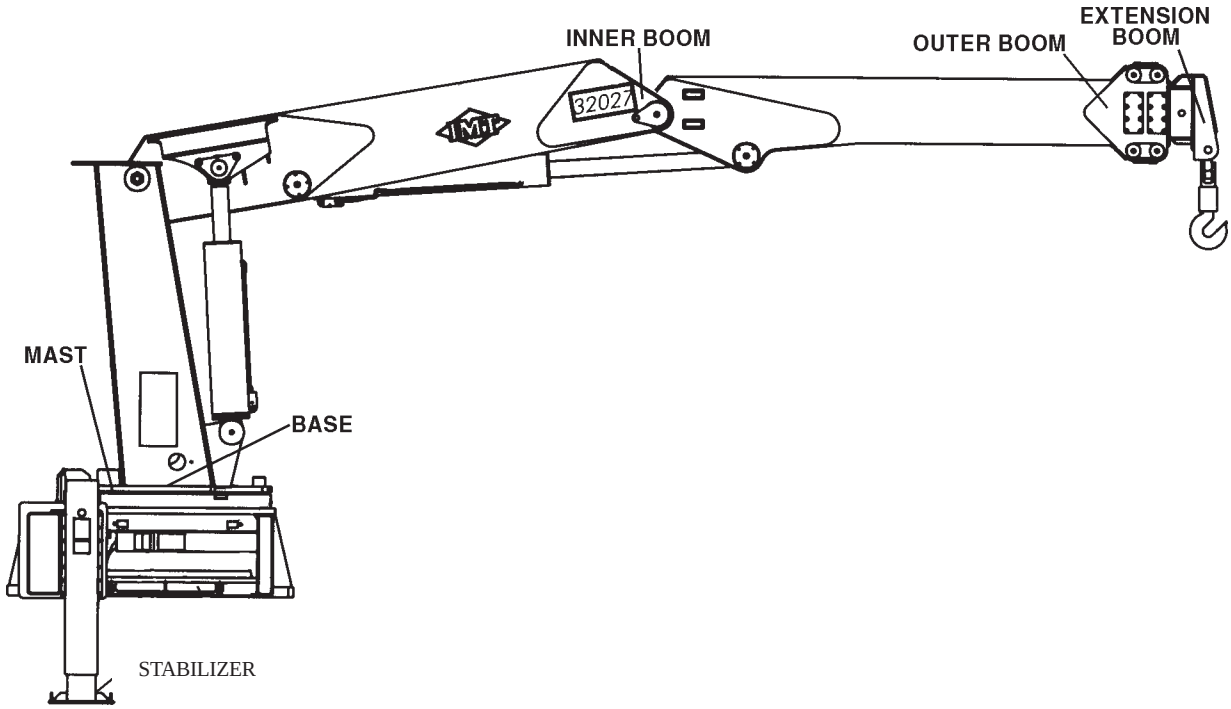
SECTION 2. MODEL 32027 CRANE REFERENCE

NOTES

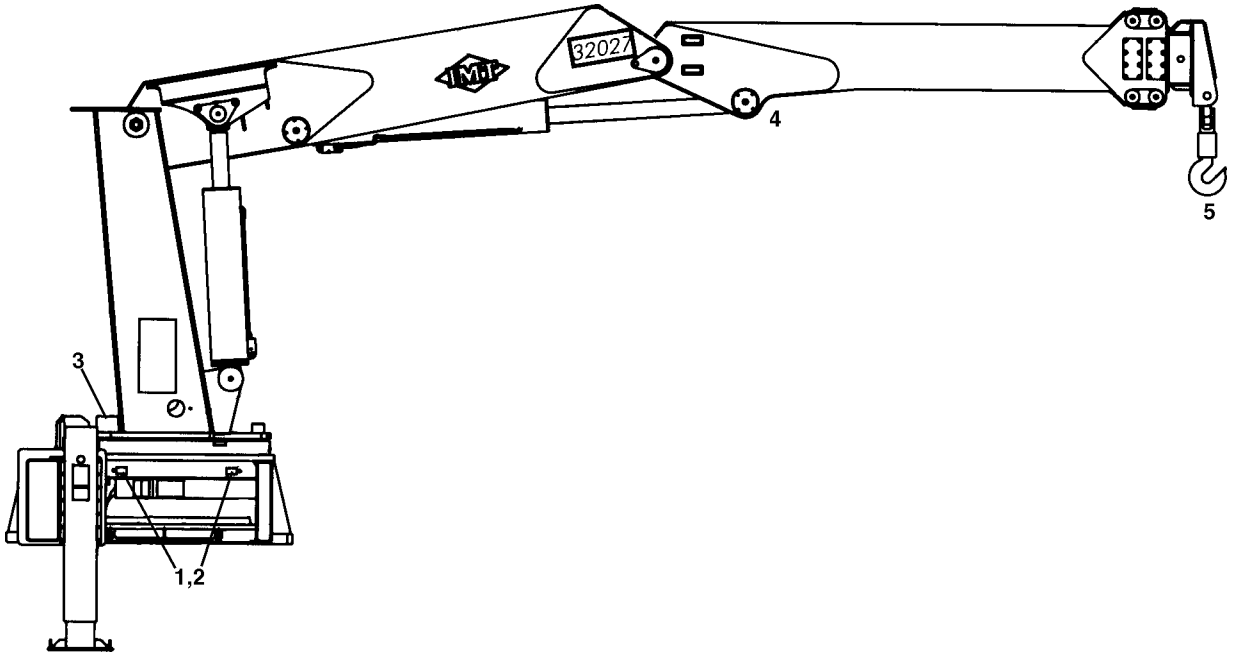
MAJOR CRANE ASSEMBLIES



WELDMENT PART NUMBER LOCATIONS



GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1. 2. 3. 4. 5.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING DRIVE GEAR GREASE EXTENSION LATCH PIN OUTER BOOM TRUNNION SHEAVE PIN (OPTIONAL CABLE & HOOK KIT)	SHELL ALVANIA 2EP OR SHELL RETINAX “A”	WEEKLY

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.

RECOMMENDED SPARE PARTS LIST

1 YEAR SUPPLY
MODEL 32027 TELESCOPING CRANE
FOR MANUAL: 99901210

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 the minimal down-time waiting for parts. There may be parts failures not covered by this list. Parts not listed are considered as not being Critical or Normal Wear items during the first year of operations and you need to contact the distributor or manufacturer for availability.

ASSEMBLY DESIGNATION	ITEM NO.	PART NO.	DESCRIPTION	QTY	CODE	SHELF LIFE (MO)	ORDER QTY
41714211.01.19980515	**BASE ASM**						
	43	7BF81225	BUSHING	2	W		
	48	7Q072017	O-RING	4	W		
	49	73054538	C'BALANCE VALVE CARTRIDGE	4	C		
3B144860.01.19980515	**PWR OUT STABILIZER CYLINDER**						
	5	73054004	VALVE	2	C		
	8	9B101214	SEAL KIT	2	W		
3C145860.01.19980515	**PWR DN STABILIZER CYLINDER**						
	1	9C202029	SEAL KIT	2	W		
	17	73054304	VALVE 10GPM	4	C		
	20	7BF81520	BUSHING	4	W		
31706397.01.19980515	**AUX STABILIZER ASSEMBLY**						
	7	60030067	WEAR PAD	2	W		
	8	60030085	WEAR PAD	2	W		
3B020860.01.19980515	**AUX STABILIZER PWR DN CYLINDER**						
	4	73054304	CBAL VALVE 10GPM	4	C		
	7	9C161623	SEAL KIT	2	W		
	18	7BF81215	BUSHING	4	W		
3B148860.01.19980515	**AUX STABILIZER PWR OUT CYLINDER**						
	5	73054004	VALVE	2	C		
	8	9B101214	SEAL KIT	2	W		
41714189.01.19980515	**MAST ASM**						
	2	70034275	BEARING	2	W		
41714190.01.19980515	**INNER BOOM ASM**						
	12	70034274	BEARING	4	W		
	17	70034279	BEARING	12	W		
3D203970.01.19980515	**INNER BOOM CYLINDER**						
	1	9X323239	SEAL KIT	2	W		
	7	6IX80243	PISTON	2	W		
	17	6HXB0040	HEAD	2	W		
	18	73054887	C'BALANCE VALVE	2	W		
	19	70034279	BEARING	8	W		
41714214.01.19980515	**OUTER BOOM ASM**						
	9	60030307	WEAR PAD	8	W		
	18	60030160	WEAR PAD	4	W		
	20	70034274	BEARING	4	W		
3C204970.01.19980515	**OUTER BOOM CYLINDER**						
	1	9C283235	SEAL KIT	1	W		
	16	6HX70040	HEAD	1	W		
	17	73054887	C'BAL VALVE	2	C		
	18	70034279	BEARING	4	W		
41714215.01.19980515	**EXTENSION BOOM ASM**						
	5	60030158	WEAR PAD	4	W		
	9	60030304	WEAR PAD	2	W		
3C209970.01.19980515	**EXTENSION BOOM CYLINDER**						
	3	6I503200	PISTON	1	W		
	4	6H050030	HEAD	1	W		
	5	73054887	C'BAL VALVE	2	C		
	6	9C020940	SEAL KIT	1	W		
	18	60030289	WEAR PAD	4	W		
31711302.01.19980515	**CAPACITY ALERT KIT**						
	1	77041258	PRESSURE SWITCH	1	C		
	2	7Q072015	O-RING	1	W		
51714218.01.19980515	**OIL RESERVOIR ASM-60 GAL**						
	-	73052087	RETURN TANK FILTER	3	P		

NOTES

INSTALLATION

GENERAL

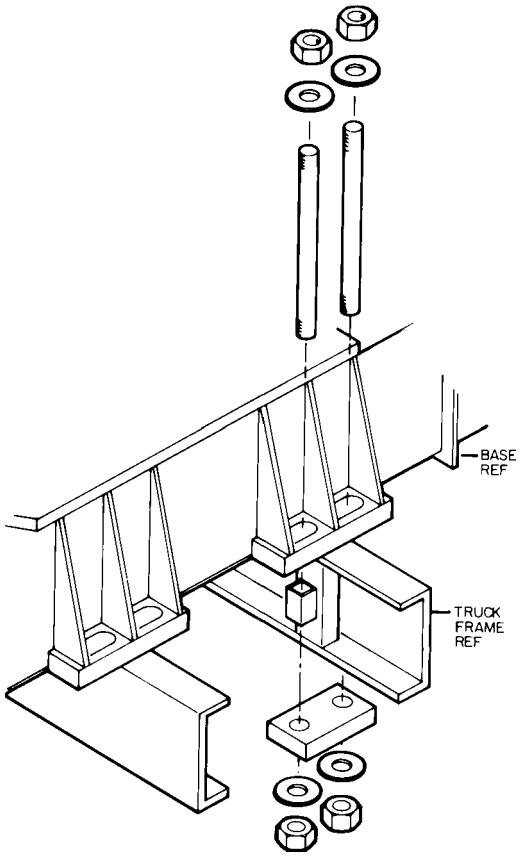
This section contains specific instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure the chassis is ready to receive the crane (refer to VOLUME 1, Installation).

Components used in each installation may vary. It is important to use hoses of proper length, pumps of correct size, and PTO's of adequate speed ratio and power rating.

CRANE MOUNTING

1. In addition to meeting Minimum Chassis Specifications in Section 1, there must be sufficient room for mounting the crane and the platform must be strong enough to support the crane and rated load. 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 reposition crane until mounting surface is level.



CRANE INSTALLATION

2. Install the truck frame support so that the tie-down studs pass through the supports (See figure below). Cut the support to the inside dimensions of the truck frame. Allow about 1/16" (1.6mm) 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, or other obstructions, and crane base. 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 below. Note position of support weldments on truck frame. Hand tighten nuts. Observe underside of crane base. No clearance between base and frame is allowed.

4. Torque the 2"-4 1/2 mounting hardware to 1125 ft-lbs (510 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.

E. Touch-up paint around mounting anchor plates.

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 1125 FT. LBS. (156 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.

HYDRAULIC INSTALLATION

1. Install a 2-1/2" nipple and gate valve to the reservoir..

2. Install the 2-1/2" diameter suction hose between the pump and the reservoir, using barbed nipples, hose clamps, and adapter fittings as needed (See figure below).

3. Install the 3/4" diameter pressure hose between the pump and the valve bank inlet section.

4. Install the 1-1/4" diameter return hose between the valve bank outlet section and the return line filter.

5. Install the 3/8" pressure hose from the load sense port on the control valves to the load sense port on the pump through series of shuttle valves (see figure).

6. Install kidney loop valve using 3/8” hoses. The pressure line of pump to port ‘s’ on the valve. The load sense line on the pump goes to port ‘x’ on the valve. Port ‘t’ on the valve returns to the reservoir.

7. Fill the hydraulic reservoir (refer to Volume 1 for hydraulic oil specifications).

8. Check all connections for leaks.

9. Start the vehicle engine and test each crane function individually. Conduct a visual inspection to make certain that there are no leaks and that everything is operating properly.

10. Lightly turn the flow compensator (load sense) adjustment in until it stops.

11. Turn the pressure compensator adjustment until desired system pressure is reached (see specifications). Lock the adjustment lock nut.

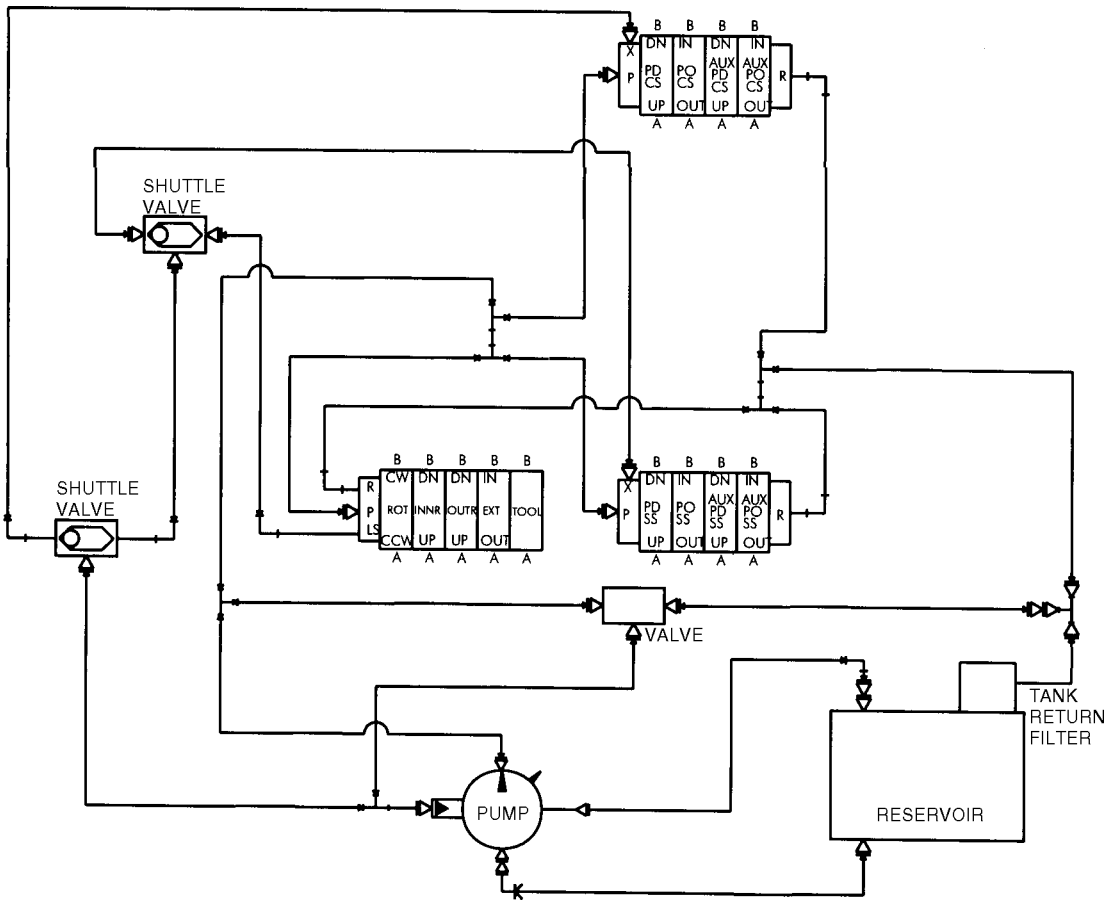
12. Turn the flow compensator adjustment out until standby pressure of approximately 250 PSI (17.24 bar) is reached. Lock the flow compensator adjustment lock nut.

13. Operate all hydraulic functions to ensure proper pressure settings.

NOTE

PUMP PRESSURE ADJUSTMENTS MAY VARY SLIGHTLY FROM ONE MANUFACTURER TO ANOTHER.

14. Check the oil level in the reservoir. Add oil if needed.



HYDRAULIC INSTALLATION

SECTION 3. MODEL 32027 REPLACEMENT PARTS

NOTES

PARTS INFORMATION

GENERAL

This section contains the exploded parts drawings and accompanying parts lists 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, refer to the appropriate manual, or consult your IMT sales reprsentative.

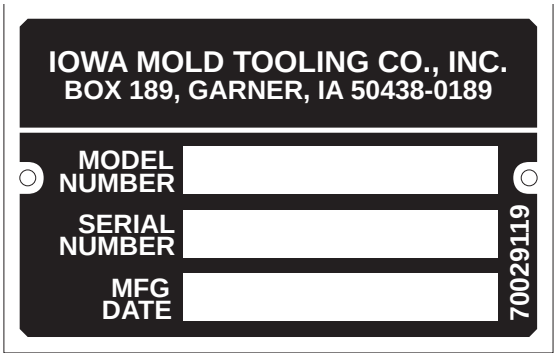
WARNING

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

CRANE IDENTIFICATION

Every IMT crane has an identification placard attached to the mast or to one of the booms in a prominent location. When ordering parts, communicating warranty information, or referring to the unit in correspondence, always include the serial number and model number. All inquiries should be directed to:

Iowa Mold Tooling Co., Inc.
Box 189, Garner, IA 50438-0189
Telephone: 641-923-3711
Product Support Fax: 641-923-2424



SERIAL NUMBER PLACARD

CYLINDER IDENTIFICATION

To insure that the proper cylinder replacement parts are recieved, it is necessary to specify the complete number/letter sequence for any part requested. Part numbers must be verified by checking the number stamped on the cylinder case (See figure below) against the information included in the service manual. You must include the part number stamped on the cylinder case when ordering parts.

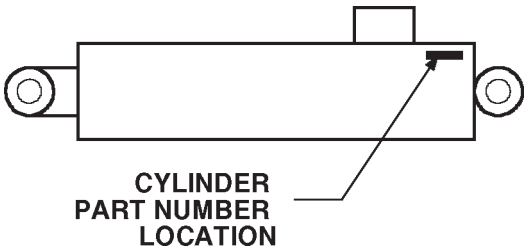
WELDMENT IDENTIFICATION

Each of the major weldments, base, mast, inner boom, outer boom, extension boom, and stabilizers, have a part number stamped on them. Any time one of the weldments is to be replaced, it is necessary to specify the complete part number as stamped on that weldment. The location of the part numbers are shown in Section 2.

ORDERING REPAIR PARTS

When ordering replacement parts it is important to follow the steps as outlined below.

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.



CYLINDER PART NUMBER LOCATION

BASE & STABILIZER ASM (41714211-1)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B144860	CYLINDER-PWR OUT	2
2.	3C145860	CYLINDER-PWR DN	2
3.	51706327	ROTATION LATCH (INCL:43)	1
4.	52706309	OUTIGGER ARM	2
5.	52706313	STABILIZER LEG/PAD	2
6.	52706314	COVER-STABILIZER TUBE	2
7.	52706315	HOUSING-STABILIZER	2
8.	52706325	PIN	1
9.	52714210	BASE	1
10.	60101720	PIN	2
11.	60104239	LATCH FOLLOWER	1
12.	60104241	DETENT HOUSING	1
13.	60109500	PIN	2
14.	60109501	PIN	2
15.	60109502	PIN	2
16.	60109538	COVER-PINION GEAR	2
17.	60121530	COVER-CTRL HANDLE-SS	1
18.	60121564	COVER-VB	1
19.	7Y016724	SPRING	1
20.	71056373	TURNTABLE GEAR BEARING	1
21.	70057696	ROT'N GEAR BOX (PART OF 29)	REF
22.	72053508	ZERK 1/8NPT	3
23.	72060002	CAP SCR 1/4-20X3/4 HHGR5	24
24.	72060091	CAP SCR 1/2-13X1 HHGR5	1
25.	72060095	CAP SCR 1/2-13X2 HHGR5	4
26.	72060812	CAP SCR 5/8-11X1-1/2 SH	28
27.	72060833	SCR 5/16-18X3/4 SLFTPG HH	4
28.	72060920	CAP SCR 1/2-13X3-1/4 HHGR5	8
29.	51710622	GEAR BOX ASM (INCL:21&44)	2
30.	72063001	WASHER 1/4 WRT	24
31.	72063002	WASHER 5/16 WRT	4
32.	72063034	MACH BUSHING 1X10GA NR	8
33.	72063049	WASHER 1/4 LOCK	16
34.	72063053	WASHER 1/2 LOCK	5
35.	72063055	WASHER 5/8 LOCK	28
36.	72063039	MACH BUSHING 2X10GA NR	8
37.	72063116	WASHER 3/4 FLAT HARD	36
38.	72066125	RETAINING RING 1"HD	8
39.	72066136	RETAINING RING 2"HD	8
40.	72066444	BALL 9/16DIA	1
41.	72601468	CAP SCR 3/4-10X4-1/2 HHGR8	36
42.	60109518	COVER	2
43.	7BF81225	BUSHING (PART OF 3)	2REF
44.	73051473	HYD MOTOR (PART OF 29)	REF
45.	72062107	NUT 1/2-13 HEX CTR LK	8
46.	70731795	VALVE BLOCK (INCL:48-53)	2
47.	72060757	CAP SCR 3/8-16X2-1/2 SH	6
48.	7Q072017	O-RING (PART OF 46)	4REF
49.	73054538	CARTRIDGE VALVE(PART OF 46)	4REF
50.	70142935	SHUTTLE BALL (PART OF 46)	2REF
51.	70142934	SHUTTLE SEAL (PART OF 46)	2REF
52.	70142933	PLUG (PART OF 46)	2REF
53.	70143099	BODY (PART OF 46)	2REF
54.	60107648	HOSE CLAMP	6
55.	72062103	NUT 3/8-16 LOCK	10
56.	53000717	GREASE EXT	2
57.	60114210	MTG BAR	1
58.	72053438	COUPLING 1/8NPT	2
59.	72060048	CAP SCR 3/8-16X1-1/2 HHGR5	3
60.	60010118	HOSE CLAMP	1
61.	60121562	CABLE GUIDE	1
62.	72063003	WASHER 3/8 WRT	2
63.	72062080	NUT 1/2-13 LOCK	4
64.	60106032	STUD	4

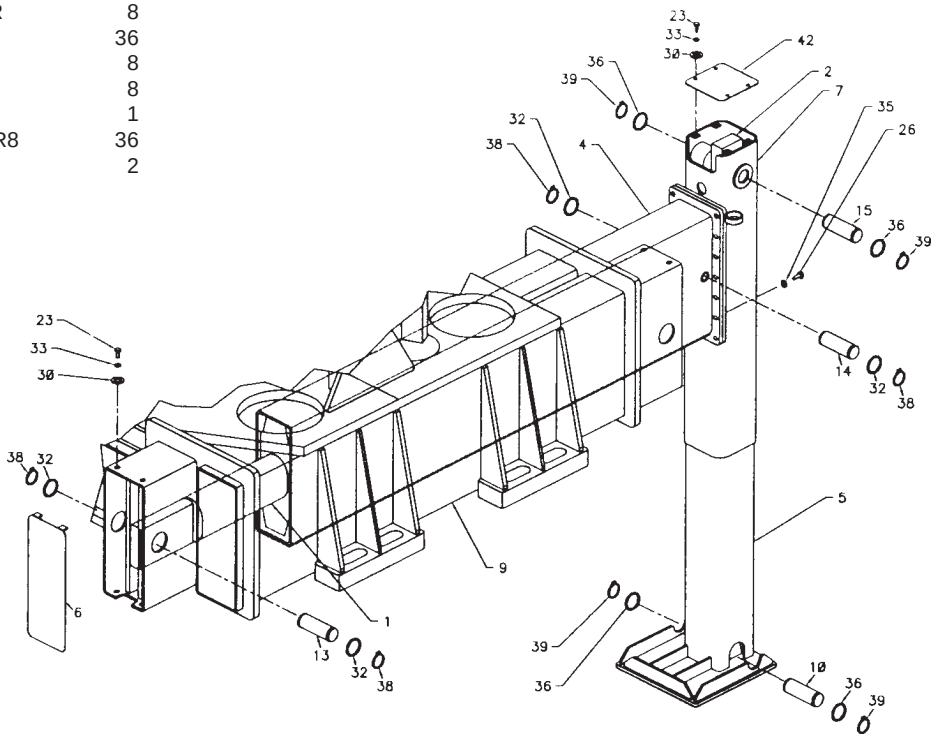
WARNING

Any time the gear-bearing bolts have been removed, they must be replaced with new bolts of identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue causing serious injury or death.

NOTES

Motor (44) and gearbox (21) come assembled-Check oil level. Use 80-90 WT oil if needed.

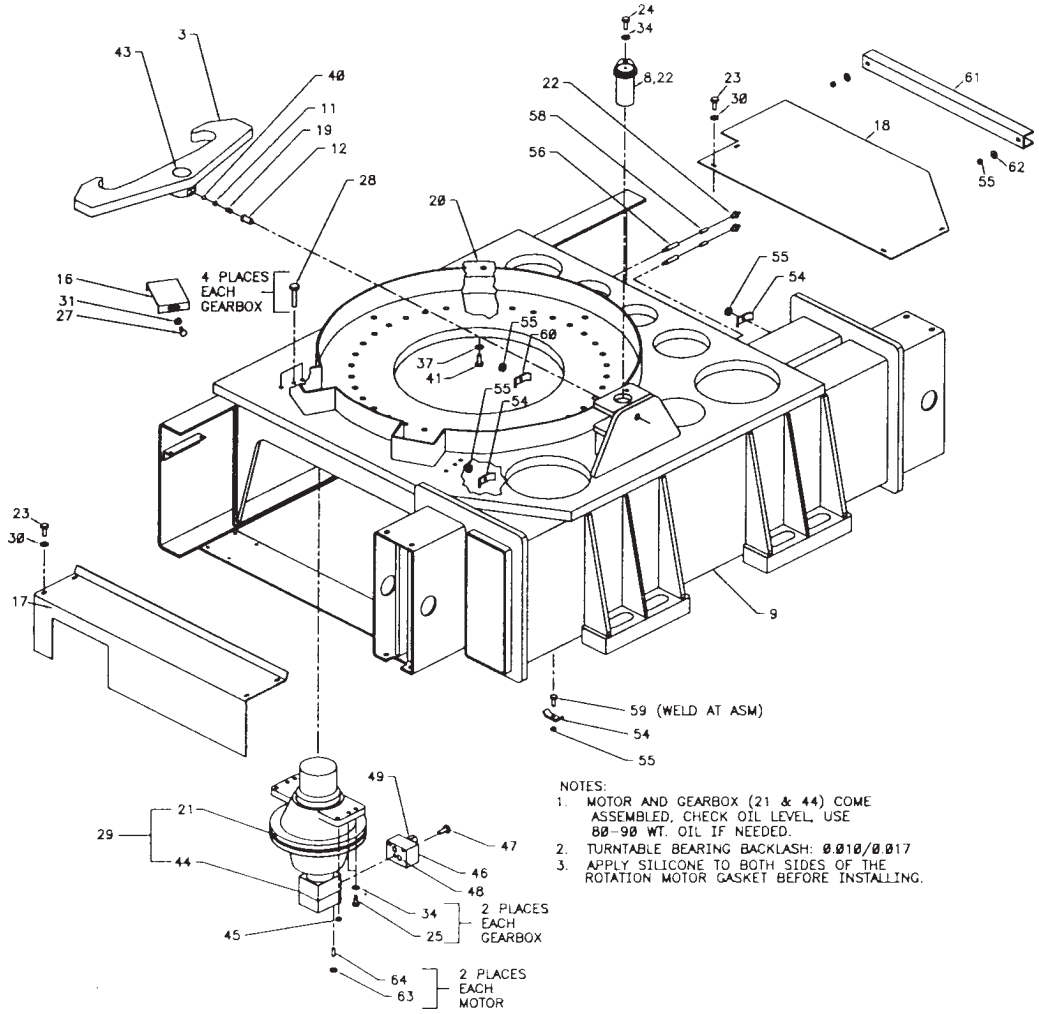
CONTINUED ON FOLLOWING PAGE



NOTE

INSTALL 70399271 - DECAL-FULLY DEPLOYED - ON TOP OF STABILIZER BEAMS WHEN BEAMS ARE FULLY EXTENDED. DECAL MUST BE VISIBLE.

BASE & STABILIZER ASM (41714211-2)



PWR OUT STABILIZER CYLINDER (3B144860)

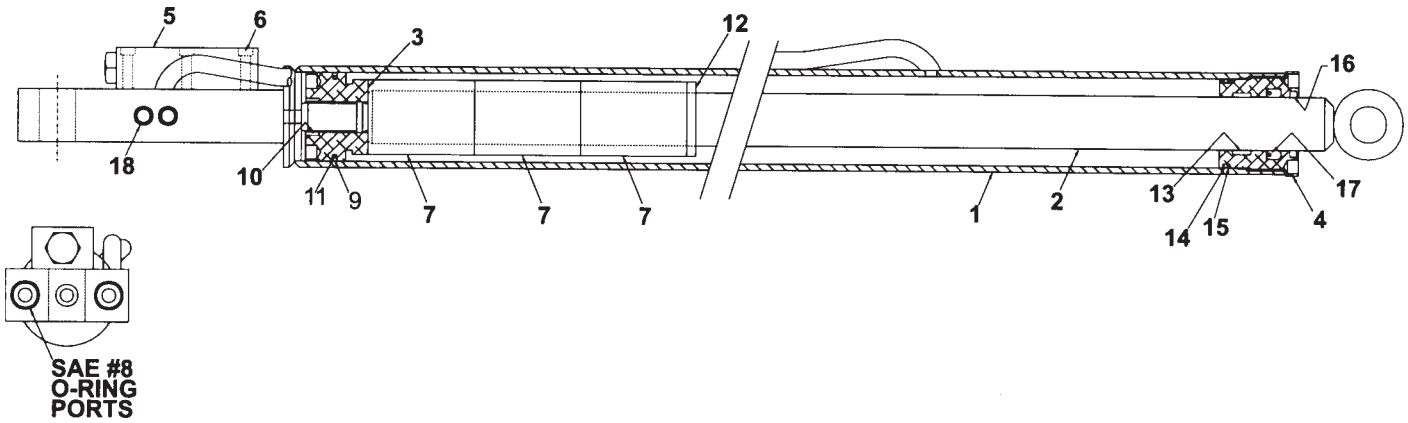
1.	4B144860	CASE ASM (INCL:18)	1
2.	4G144860	ROD ASM	1
3.	6I025087	PISTON	1
4.	6H025015	HEAD	1
5.	73054004	VALVE	1
6.	72060708	CAP SCR 1/4-20X1-1/4 SH	6
7.	6C300015	STOP TUBE	3
8.	9B101214	SEAL KIT (INCL:9-17)	1
9.	7T66P025	PISTON SEAL (PART OF 8)	1REF
10.	7T61N087	LOCK RING SEAL (PART OF 8)	1REF
11.	7Q072137	O-RING (PART OF 8)	1REF
12.	6A025015	WAFER LOCK (PART OF 8)	1REF
13.	7T2N8015	WEAR RING (PART OF 8)	1REF
14.	7Q072228	O-RING (PART OF 8)	1REF
15.	7Q10P228	BACK-UP RING (PART OF 8)	1REF
16.	7R14P015	ROD WIPER (PART OF 8)	1REF
17.	7R546015	ROD SEAL (PART OF 8)	1REF
18.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	2REF

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.



PWR DN STABILIZER CYLINDER (3C145860)

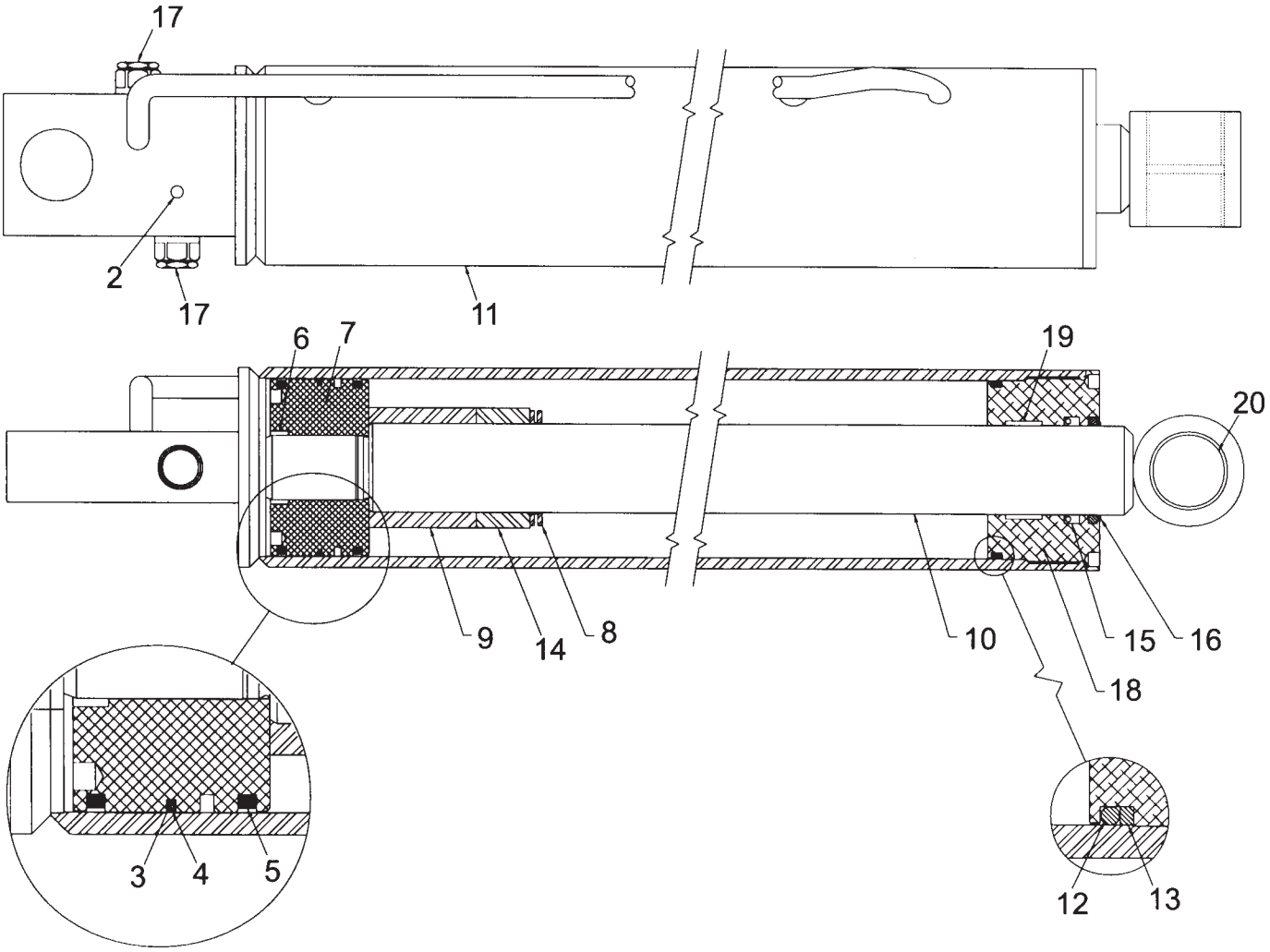
1.	9C202029	SEAL KIT(INCL:3-6,8,12,13,15,16,19)	1
2.	7PNPXT02	PLUG 1/8NPT (PART OF 11)	2REF
3.	7Q072157	O-RING (PART OF 1)	1REF
4.	7T66P050	PISTON SEAL (PART OF 1)	1REF
5.	7T65I050	PISTON RING (PART OF 1)	2REF
6.	7T61N181	LOCK RING SEAL (PART OF 1)	1REF
7.	6I050181	PISTON	1
8.	6A025025	WAFER LOCK (PART OF 1)	1REF
9.	6C300025	STOP TUBE	1
10.	4G145860	ROD ASM (INCL:20)	1
11.	4C145860	CASE ASM (INCL:2)	1
12.	7Q072350	O-RING (PART OF 1)	1REF
13.	7Q10P350	BACK-UP RING (PART OF 1)	1REF
14.	6C150025	STOP TUBE	1
15.	7R546025	ROD SEAL (PART OF 1)	1REF
16.	7R14P025	ROD WIPER (PART OF 1)	1REF
17.	73054304	VALVE 10GPM	2
18.	6H050025	HEAD	1
19.	7T2N8027	WEAR RING (PART OF 1)	1REF
20.	7BF81520	BUSHING (PART OF 10)	2REF

NOTE

It is recommended that all components of the seal kit be replaced whenever the cylinder is disassembled. This will reduce future downtime.

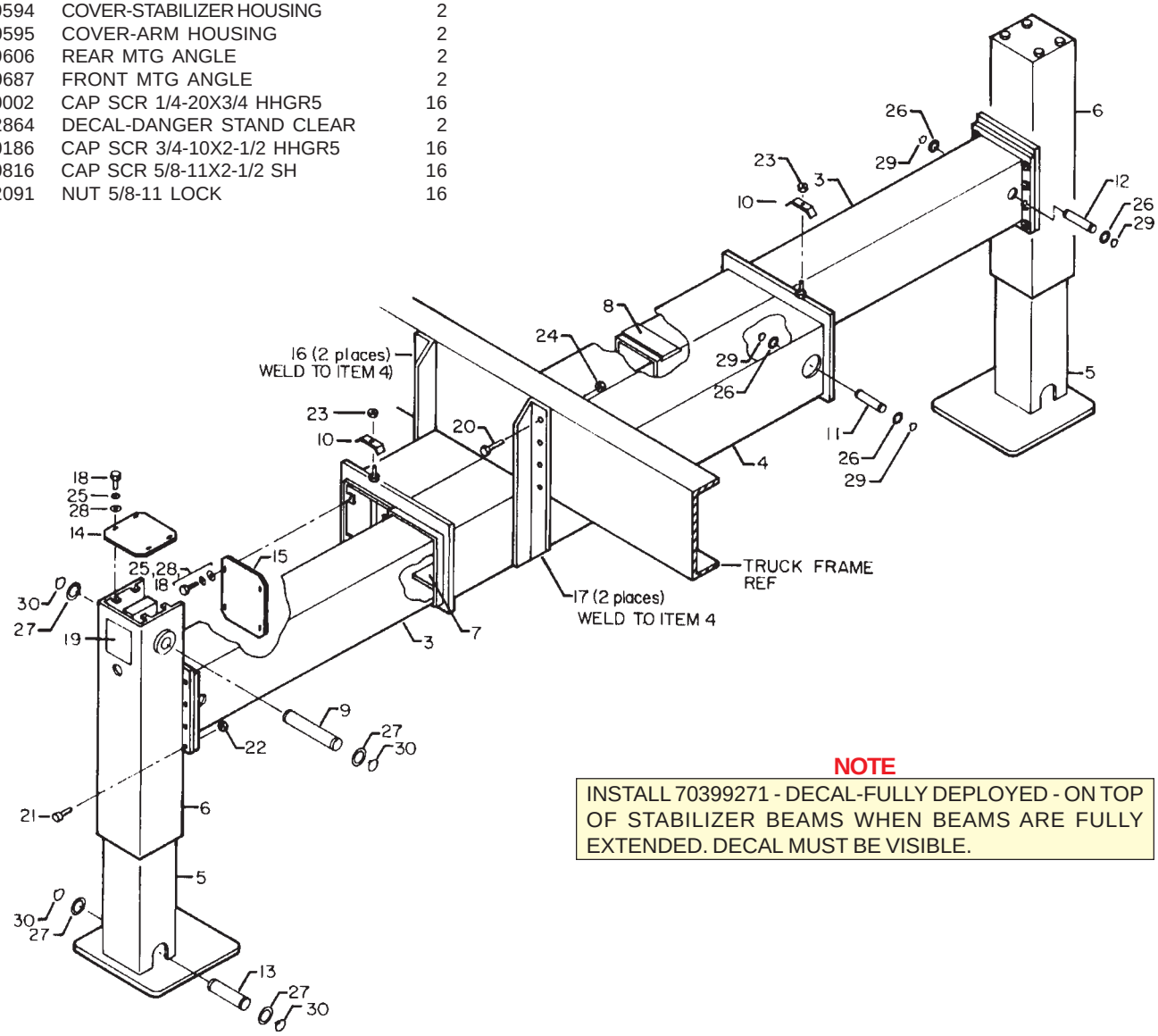
Apply “Lubriplate #630-2” medium heavy, multi-purpose lubricant or equivalent to all piston and head glands, lock ring and rod threads, before assembly.

Use “Never-Seez” or equivalent between the head and the case when assembling the cylinder.



AUX STABILIZER ASM (31706397)

1.	3B020860	CYLINDER-PWR DN	2
2.	3B148860	CYLINDER-PWR OUT	2
3.	52706375	OUTIGGER ARM	2
4.	52706385	ARM HOUSING	1
5.	52706388	LEG	2
6.	52706396	HOUSING-STABILIZER	2
7.	60030067	WEAR PAD	2
8.	60030085	WEAR PAD	2
9.	60105321	PIN	2
10.	60107648	HOSE CLAMP	2
11.	60109500	PIN	2
12.	60109501	PIN	2
13.	60109593	PIN	2
14.	60109594	COVER-STABILIZER HOUSING	2
15.	60109595	COVER-ARM HOUSING	2
16.	60109606	REAR MTG ANGLE	2
17.	60109687	FRONT MTG ANGLE	2
18.	72060002	CAP SCR 1/4-20X3/4 HHGR5	16
19.	70392864	DECAL-DANGER STAND CLEAR	2
20.	72060186	CAP SCR 3/4-10X2-1/2 HHGR5	16
21.	72060816	CAP SCR 5/8-11X2-1/2 SH	16
22.	72062091	NUT 5/8-11 LOCK	16
23.	72062103	NU 3/8-16 LOCK	2
24.	72062114	NUT 3/4-10 LOCK	16
25.	72063001	WASHER 1/4 WRT	16
26.	72063034	MACH BUSHING 1X10GA NR	8
27.	72063037	MACH BUSHING 1-1/2X10GA NR	8
28.	72063049	WASHER 1/4 LOCK	16
29.	72066125	RETAINING RING 1"EXT HD	8
30.	72066132	RETAINING RING 1-1/2"EXT HD	8
31.	70399271	DECAL-FULLY DEPLOYED	2



NOTE

INSTALL 70399271 - DECAL-FULLY DEPLOYED - ON TOP OF STABILIZER BEAMS WHEN BEAMS ARE FULLY EXTENDED. DECAL MUST BE VISIBLE.

AUX STABILIZER PWR DN CYLINDER (3B020860)

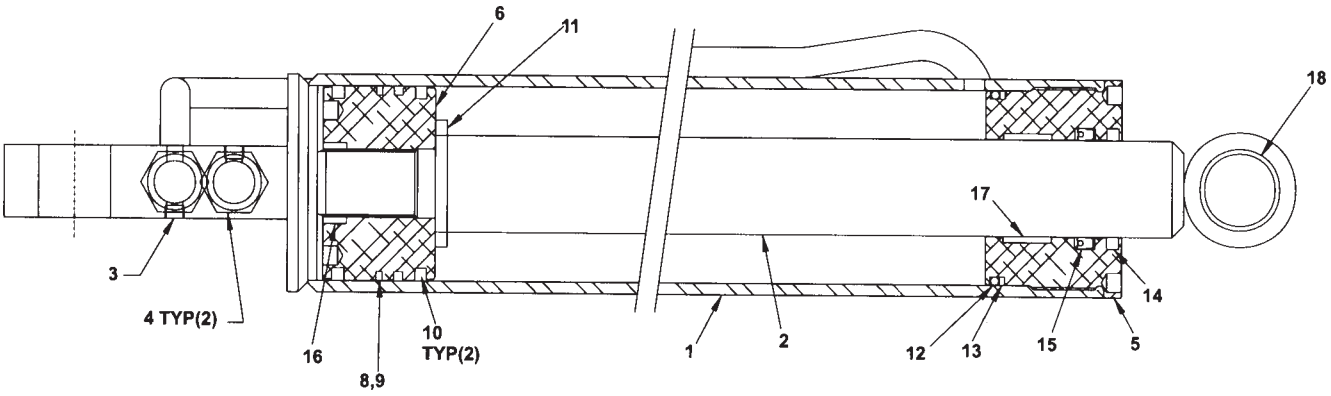
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B020860	CASE ASM (INCL:3)	1
2.	4G020860	ROD ASM (INCL:17)	1
3.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 1)	2REF
4.	73054304	COUNTERBALANCE VALVE 10GPM	2
5.	6H040020	HEAD	1
6.	6I040143	PISTON	1
7.	9C161623	SEAL KIT (INCL:8-17)	1
8.	7Q072153	O-RING (PART OF 7)	1REF
9.	7T66P040	PISTON SEAL (PART OF 7)	1REF
10.	7T65I040	PISTON RING (PART OF 7)	2REF
11.	6A025020	WAFER LOCK (PART OF 7)	1REF
12.	7Q072342	O-RING (PART OF 7)	1REF
13.	7Q10P342	BACK-UP RING (PART OF 7)	1REF
14.	7R14P020	ROD WIPER (PART OF 7)	1REF
15.	7R546020	U-CUP SEAL (PART OF 7)	1REF
16.	7T61N143	LOCK RING (PART OF 7)	1REF
17.	7T2N8022	ROD WEAR RING (PART OF 7)	1REF
18.	7BF81215	BUSHING (PART OF 2)	2REF

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.



AUX STABILIZER PWR OUT CYLINDER (3B148860)

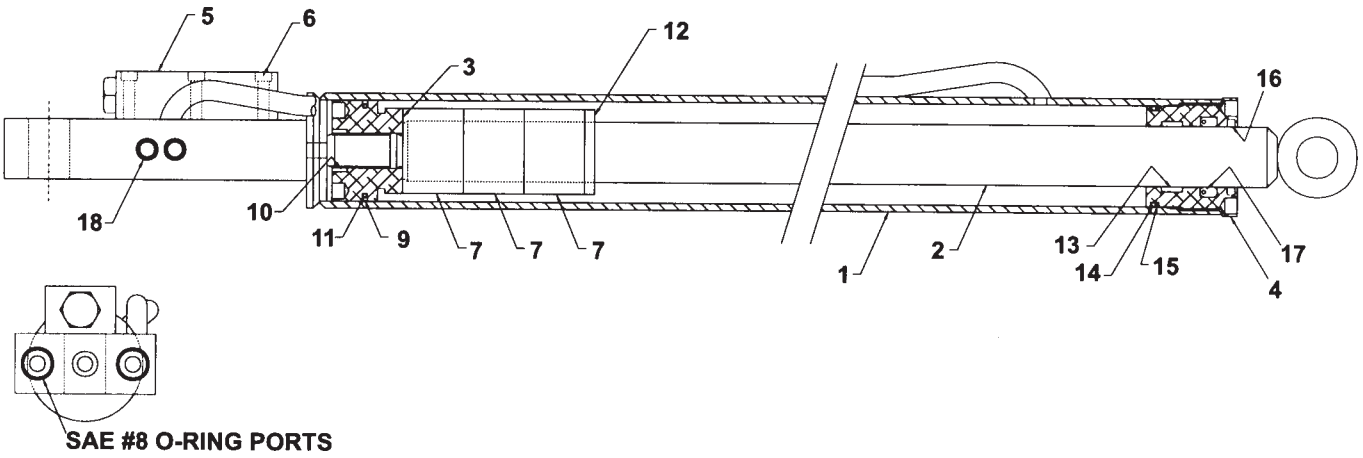
1.	4B148860	CASE ASM	1
2.	4G148860	ROD ASM	1
3.	6I025087	PISTON	1
4.	6H025015	HEAD	1
5.	73054004	VALVE	1
6.	72060708	CAP SCR 1/4-20X1-1/4 SH	6
7.	6C150015	STOP TUBE	3
8.	9B101214	SEAL KIT (INCL:9-17)	1
9.	7T66P025	PISTON SEAL (PART OF 8)	1REF
10.	7T61N087	LOCK RING (PART OF 8)	1REF
11.	7Q072137	O-RING (PART OF 8)	1REF
12.	6A025015	WAFER LOCK (PART OF 8)	1REF
13.	7T2N8015	WEAR RING (PART OF 8)	1REF
14.	7Q072228	O-RING (PART OF 8)	1REF
15.	7Q10P228	BACK-UP RING (PART OF 8)	1REF
16.	7R14P015	ROD WIPER (PART OF 8)	1REF
17.	7R546015	U-CUP LOADED (PART OF 8)	1REF
18.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 1)	2REF

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.



MAST ASM (41714189)

1.	51714178	MAST (INCL:2)	1
2.	70034275	BEARING (PART OF 1)	2REF
3.	72063116	WASHER 3/4 FLAT HARD	36
4.	72601466	CAP SCR 3/4-10X5 HHGR8	36
5.	60010118	HOSE CLAMP	4
6.	72060051	CAP SCR 3/8-16X2-1/4 HHGR5	8
7.	72062103	NUT 3/8-16 LOCK	8
8.	70029119	SERIAL NUMBER PLACARD	1
10.	72066340	POP RIVET 1/8X3/8GRIP	2
12.	60114209	HOSE HOLDER	2

WARNING

Anytime the gear bearing bolts have been removed, they must be replaced with bolts of identical grade and size. Failure to replace the gear bearing bolts may result in serious injury or death.

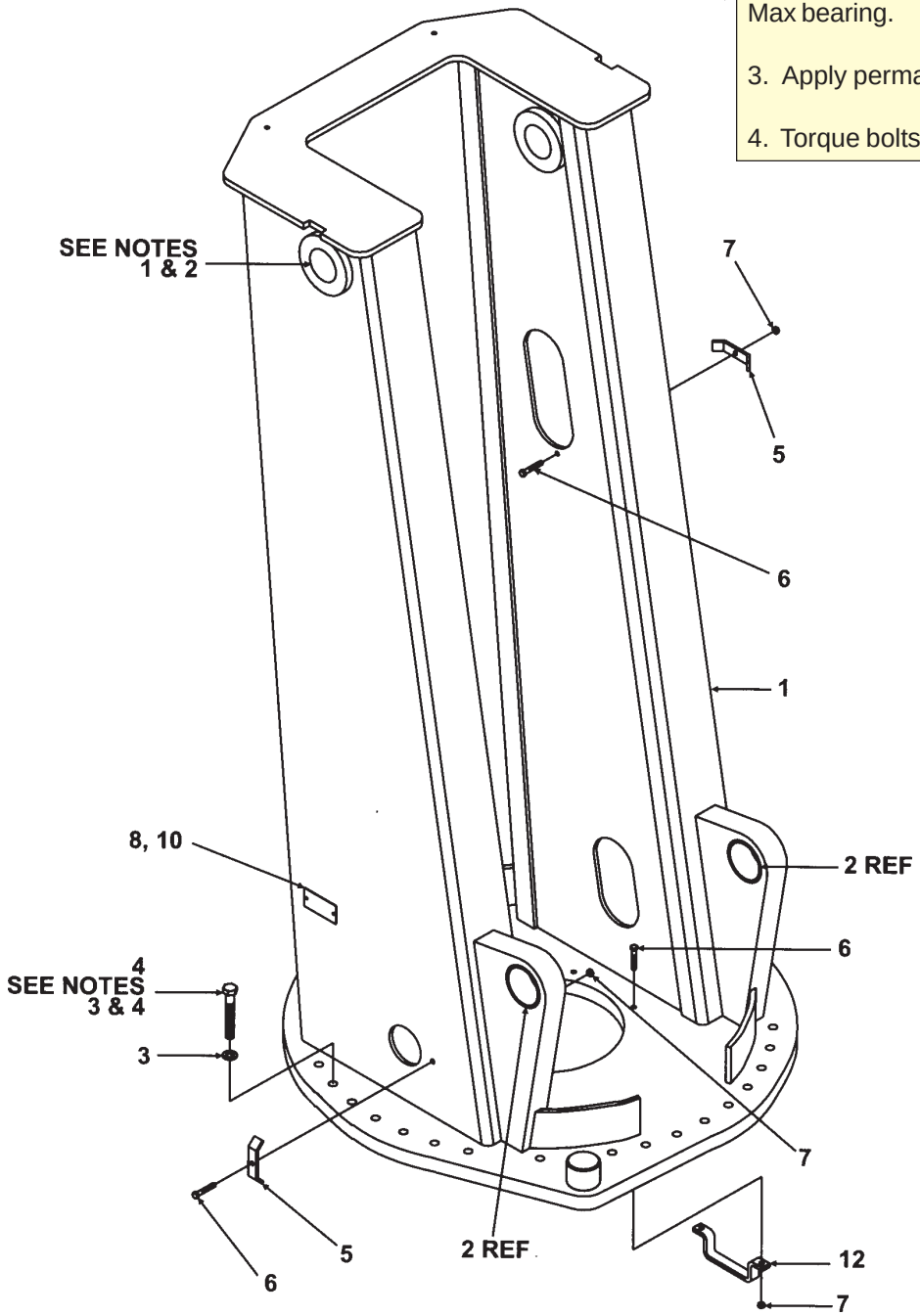
NOTES

1. Apply Never-Seez to collar ID.

2. It is imperative that Never-Seez be applied in such a manner that it does not come in contact with any Gar-Max bearing.

3. Apply permanent thread lock to bolts.

4. Torque bolts to 280 ft-lbs (38.7 kg-m)



INNER BOOM ASM (41714190)

1.	41714189	MAST ASM	REF
2.	51714188	INNER BOOM (INCL:12)	1
3.	52706294	PIN	1
4.	52706295	PIN	2
5.	60109452	PIN RETAINER PLATE 6”	4
6.	60109456	PIN	2
7.	60109472	PIN RETAINER PLATE 6”	1
8.	72060147	CAP SCR 5/8-11X1 HHGR5	4
9.	72060183	CAP SCR 3/4-10X1-1/2 HHGR5	4
10.	72062273	NUT 1 3/4-5 LOCK	1
11.	3D203970	CYLINDER (INCL:17)	2
12.	70034274	BEARING (PART OF 2)	4REF
13.	31711302	KIT-CAPACITY ALERT 3000PSI	1
14.	70145685	TUBE ASM	2
15.	70034432	HOSE CLAMP	2
16.	70143829	COVER PLATE	2
17.	70034279	BEARING (PART OF 11)	12REF
18.	72601729	NUT	2
19.	72060026	CAP SCR 5/16-18X1-1/4 HHGR5	2

NOTES

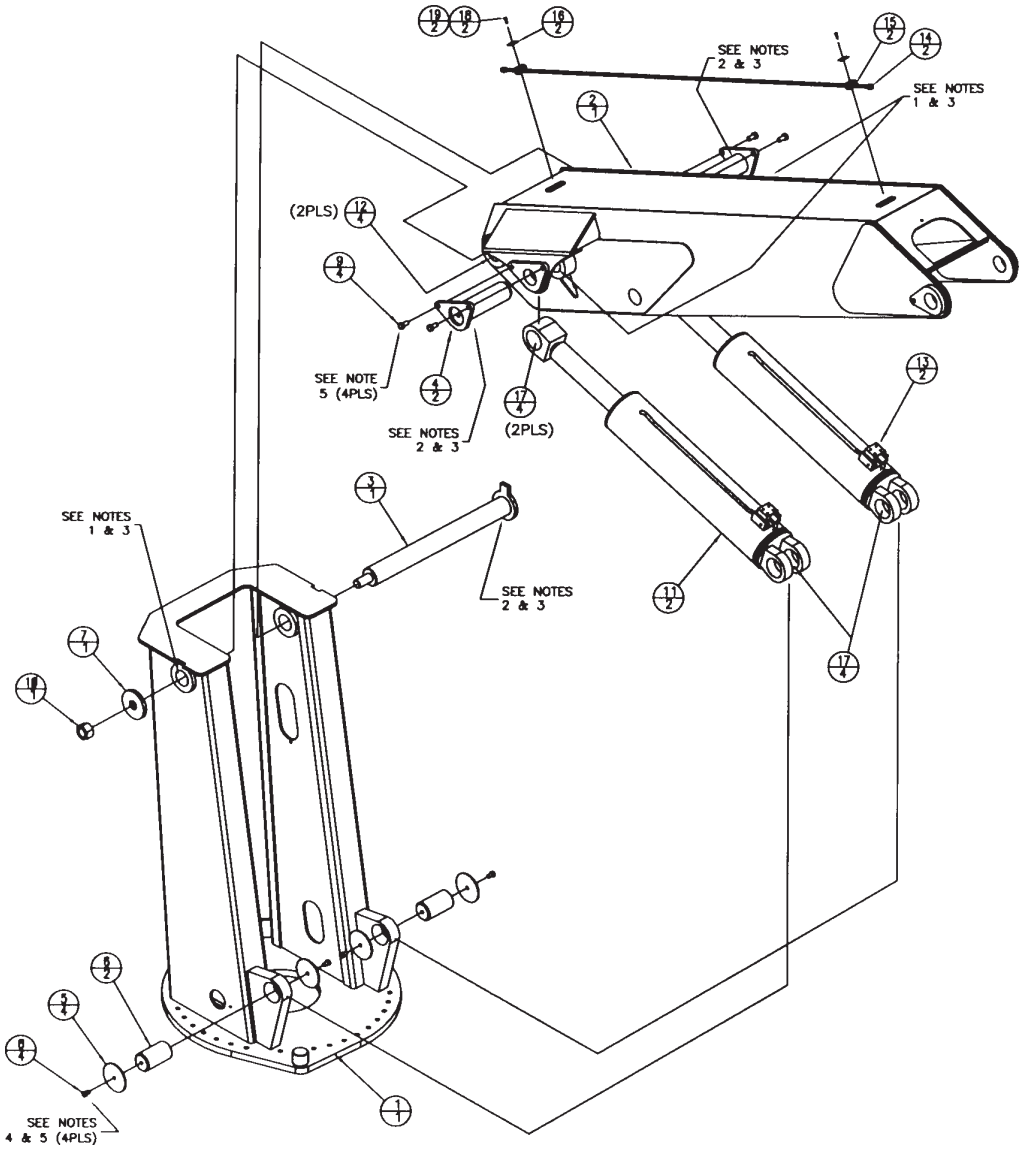
1. Apply Never-Seez to collar ID.

2. Apply Never-Seez to pin at pin cap, not to exceed the width of the collar.

3. It is imperative that Never-Seez be applied in such a manner that it does not come in contact with any Gar-Max bearing.

4. If required, shim pin retainer plates flush (-0/+0.06”) with outside of collar using 3/4 flat washers, as required.

5. Clean/primer all pin retaining plate cap screws and apply a serviceable thread locker to a minimum of three threads. Torque pin retainer plate cap screws as follows:
3/4-10 cap screw (gr5 plated) - 200 ft-lbs (27.7 kg-m)
5/8-11 cap screw (gr5 plated) - 115 ft-lbs (15.9 kg-m)



INNER BOOM CYLINDER (3D203970)

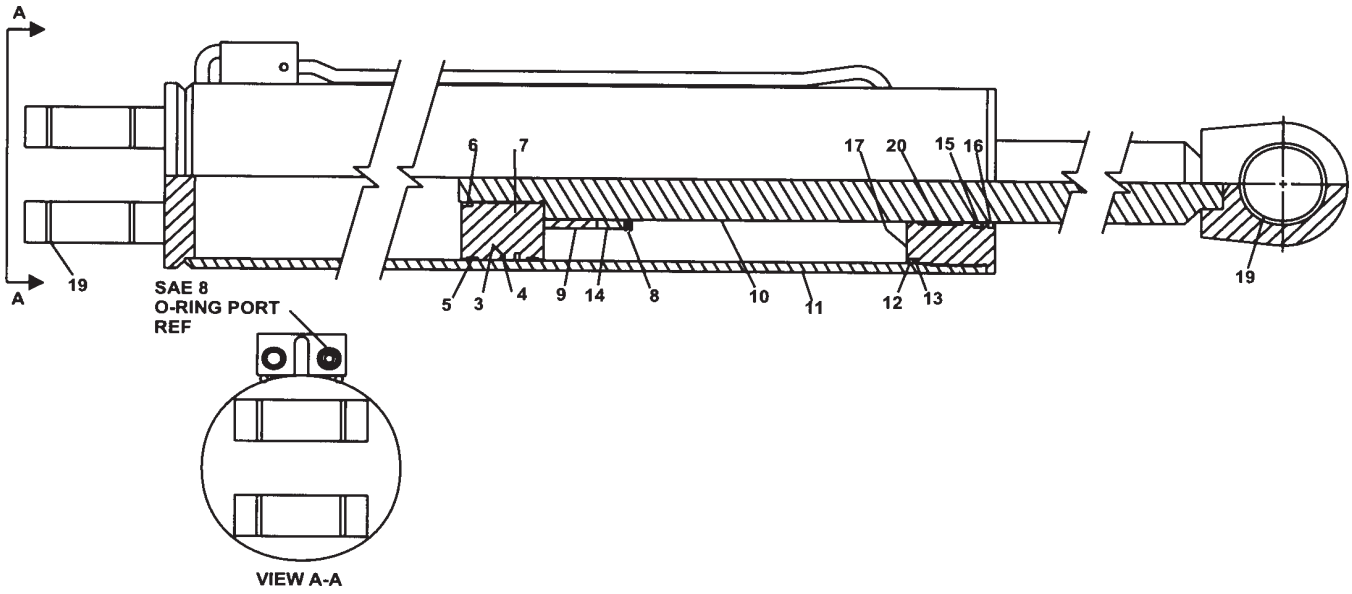
1.	9X323239	SEAL KIT (INCL:3-6,8,12,13,15,16,20)	1
2.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 11)	3REF
3.	7Q072263	BACK-UP RING (PART OF 1)	1REF
4.	7T66P080	PISTON SEAL (PART OF 1)	1REF
5.	7T2N4080	WEAR RING (PART OF 1)	2REF
6.	7T61N243	LOCK RING (PART OF 1)	1REF
7.	6IX80243	PISTON	1
8.	6A025040	WAFER LOCK (PART OF 1)	1REF
9.	6C300040	STOP TUBE	1
10.	4G115870	ROD ASM (INCL:19)	1
11.	4D115870	CASE ASM (INCL:2&19)	1
12.	7Q072443	O-RING (PART OF 1)	1REF
13.	7Q10P443	BACK-UP RING (PART OF 1)	1REF
14.	6C075040	STOP TUBE	1
15.	7R546040	U-CUP LOADED (PART OF 1)	1REF
16.	7R14P040	ROD WIPER (PART OF 1)	1REF
17.	6HXB0040	HEAD	1
18.	73054887	COUNTERBALANCE VALVE 25GPM	1
19.	70034279	BEARING (PART OF 10&11)	4REF
20.	7T2N2X42	WEAR RING (PART OF 1)	1REF

NOTE

It is recommended that all components of the seal kit be replaced whenever the cylinder is disassembled. This will reduce future downtime.

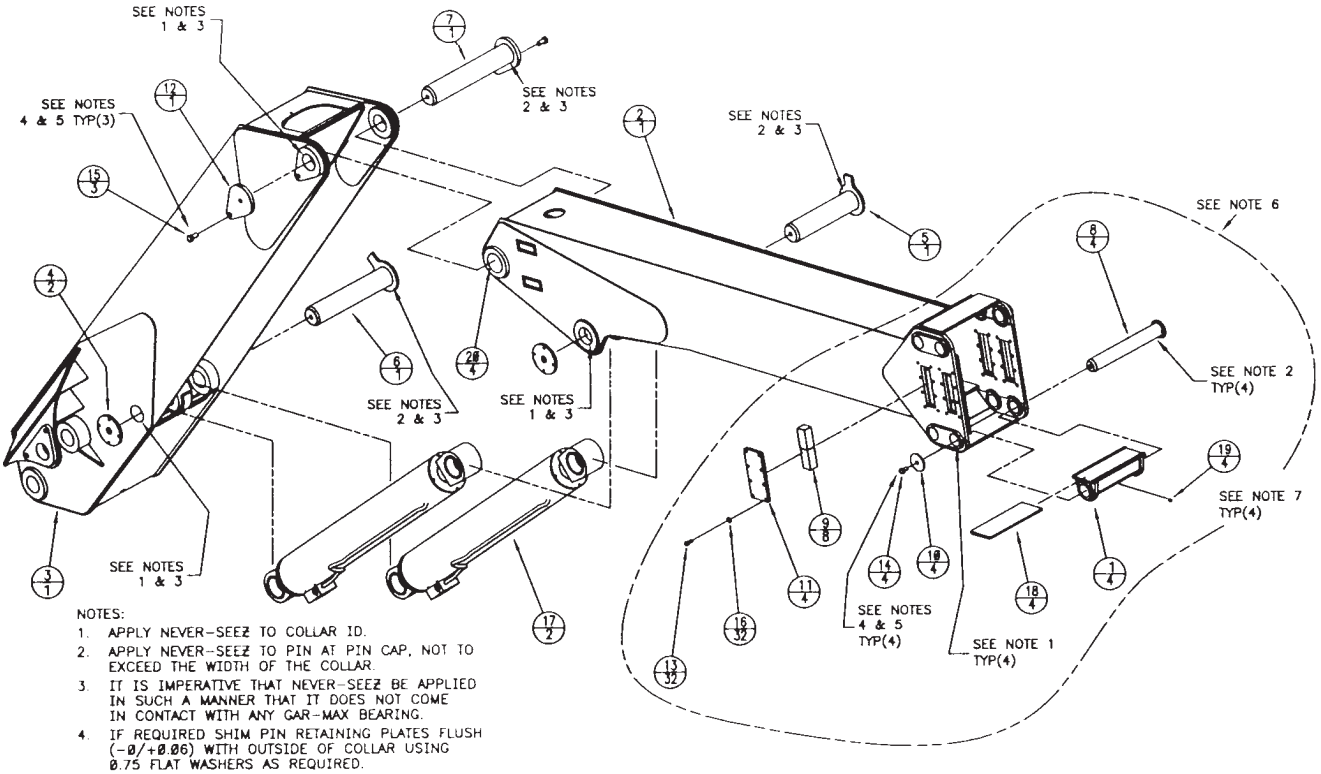
Apply “Lubriplate #630-2” medium heavy, multi-purpose lubricant or equivalent to all piston and head glands, lock ring and rod threads, before assembly.

Use “Never-Seez” or equivalent between the head and the case when assembling the cylinder.



OUTER BOOM ASM (41714214)

1.	51706269	TRUNNION	4
2.	51714186	OUTER BOOM (INCL:20)	1
3.	51714188	INNER BOOM	REF
4.	52706274	PIN RETAINER PLATE 6”	2
5.	52706275	PIN	1
6.	52714241	PIN	1
7.	52714242	PIN	1
8.	52714264	PIN	4
9.	60030307	WEAR PAD	8
10.	60106331	PIN RETAINER PLATE 3-1/2”	4
11.	60109344	SIDE RETAINER PLATE	4
12.	60109422	PIN RETAINER CAP 3-3/4	1
13.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	32
14.	72060147	CAP SCR 5/8-11X1 HHGR5	4
15.	72060183	CAP SCR 3/4-10X1-1/2 HHGR5	3
16.	72063053	WASHER 1/2 LOCK	32
17.	3C204970	OUTER CYLINDER	2
18.	60030160	WEAR PAD	4
19.	72053391	ZERK 1/8NPT	4
20.	70034274	BEARING (PART OF 2)	4REF



NOTES:

1. APPLY NEVER-SEEZ TO COLLAR ID.
2. APPLY NEVER-SEEZ TO PIN AT PIN CAP, NOT TO EXCEED THE WIDTH OF THE COLLAR.
3. IT IS IMPERATIVE THAT NEVER-SEEZ BE APPLIED IN SUCH A MANNER THAT IT DOES NOT COME IN CONTACT WITH ANY GAR-MAX BEARING.
4. IF REQUIRED SHIM PIN RETAINING PLATES FLUSH (-Ø/+Ø.Ø6) WITH OUTSIDE OF COLLAR USING Ø.75 FLAT WASHERS AS REQUIRED.
5. CLEAN/PRIMER ALL PIN RETAINING PLATE CAP SCREWS AND APPLY A SERVICEABLE THREAD LOCKER TO A MINIMUM OF THREE THREADS. TORQUE PIN RETAINING PLATE CAP SCREWS AS FOLLOWS:

   Ø.75-10 CAP SCREW (GR5 PLATED) - 200 FT-LBS.
   Ø.62-11 CAP SCREW (GR5 PLATED) - 115 FT-LBS.

6. WEAR PADS TO BE ASSEMBLED AFTER EXTENSION BOOM IS INSERTED INTO OUTER BOOM.
7. INSTALL GREASE ZERKS #72053508 INTO TRUNNIONS TO APPLY NEVER-SEEZ TO THE PINS. REMOVE ZERKS AND PLUG HOLE WITH PIPE PLUG #72053391

OUTER BOOM CYLINDER (3C204970)

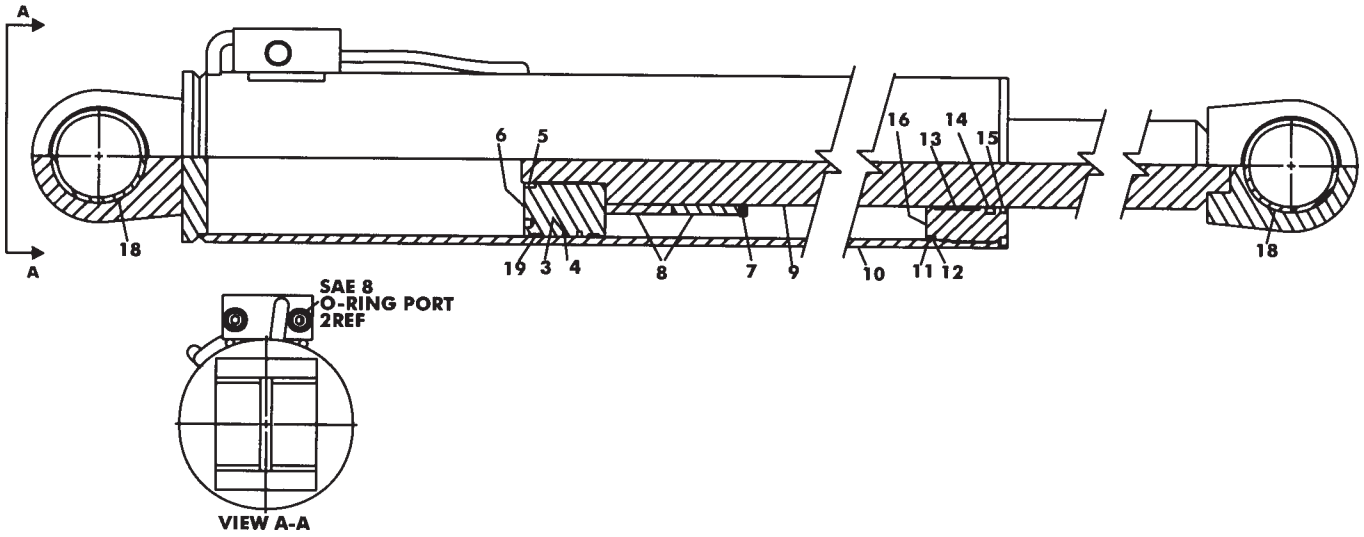
ITEM	PART NO.	DESCRIPTION	QTY
1.	9C283235	SEAL KIT (INCL:3-5,7,11-15,19)	1
2.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 10)	2REF
3.	7Q072259	BACK-UP RING (PART OF 1)	1REF
4.	7T66P070	PISTON SEAL (PART OF 1)	1REF
5.	7T61N218	LOCK RING (PART OF 1)	1REF
6.	6IX70218	PISTON	1
7.	6A025040	WAFER LOCK (PART OF 1)	1REF
8.	6C300040	STOP TUBE	2
9.	4G112870	ROD ASM (INCL:18)	1
10.	4C112870	CASE ASM (INCL:2&18)	1
11.	7Q072363	O-RING (PART OF 1)	1REF
12.	7Q10P363	BACK-UP RING (PART OF 1)	1REF
13.	7T2N2X42	WEAR RING (PART OF 1)	1REF
14.	7R546040	U-CUP LOADED (PART OF 1)	1REF
15.	7R14P040	ROD WIPER (PART OF 1)	1REF
16.	6HX70040	HEAD	1
17.	73054887	COUNTERBALANCE VALVE 25GPM	2
18.	70034279	BEARING (PART OF 10&11)	4REF
19.	7T2N4070	WEAR RING (PART OF 1)	2REF

NOTE

It is recommended that all components of the seal kit be replaced whenever the cylinder is disassembled. This will reduce future downtime.

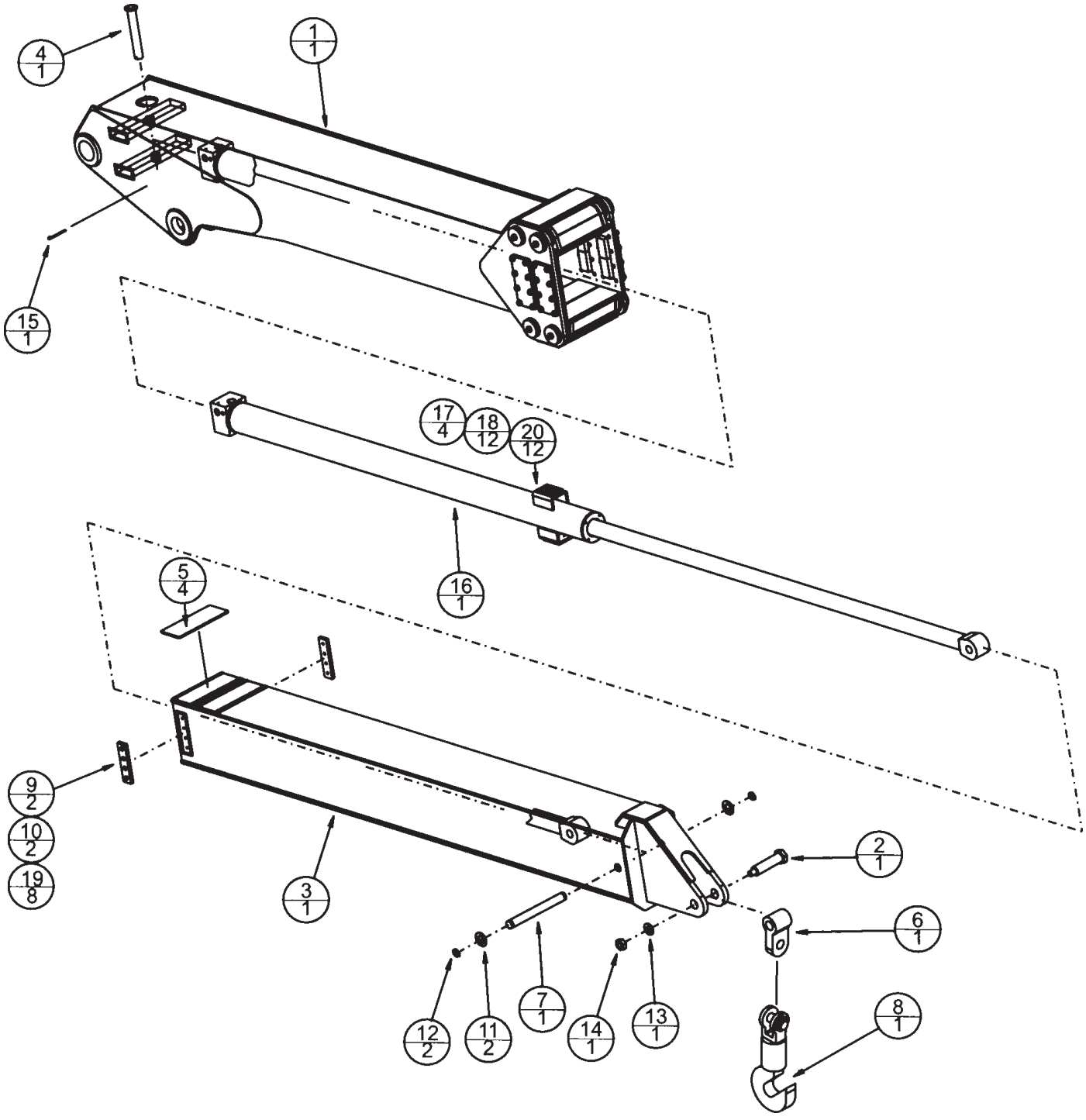
Apply “Lubriplate #630-2” medium heavy, multi-purpose lubricant or equivalent to all piston and head glands, lock ring and rod threads, before assembly.

Use “Never-Seez” or equivalent between the head and the case when assembling the cylinder.



EXTENSION BOOM ASM (41714215)

1.	51714186	OUTER BOOM	1REF
2.	52706221	PIN	1
3.	52714187	EXTENSION BOOM	1
4.	52714231	PIN	1
5.	60030158	WEAR PAD	4
6.	60109323	SWIVEL LINK-15 TON	1
7.	60120713	PIN	1
8.	70731776	HOOK-SWIVEL 15TON W/LATCH	1
9.	60030304	WEAR PAD	2
10.	72601611	CAP SCR 3/8-16X1-1/2 FLATHD SOC	8
11.	72063014	WASHER 1-1/2 WRT	2
12.	72066132	RETAINING RING 1-1/2 EXT HD	2
13.	72063012	WASHER 1-1/4 WRT	1
14.	72062142	NUT 1 1/4-7 HEX STL INSERT GR5	1
15.	72066145	HAIR PIN 3/16	1
16.	3C209970	EXT CYLINDER (INCL:17,18&20`)	1
17.	60030289	WEAR PAD (PART OF 16)	4REF
18.	72601713	CAP SCR 1/4-20 SH(PART OF 16)	12REF
19.	72062103	NUT 3/8-16 LOCK	8
20.	72062104	NUT 1/4-20 LOCK (PART OF 16)	12REF



EXTENSION BOOM CYLINDER (3C209970)

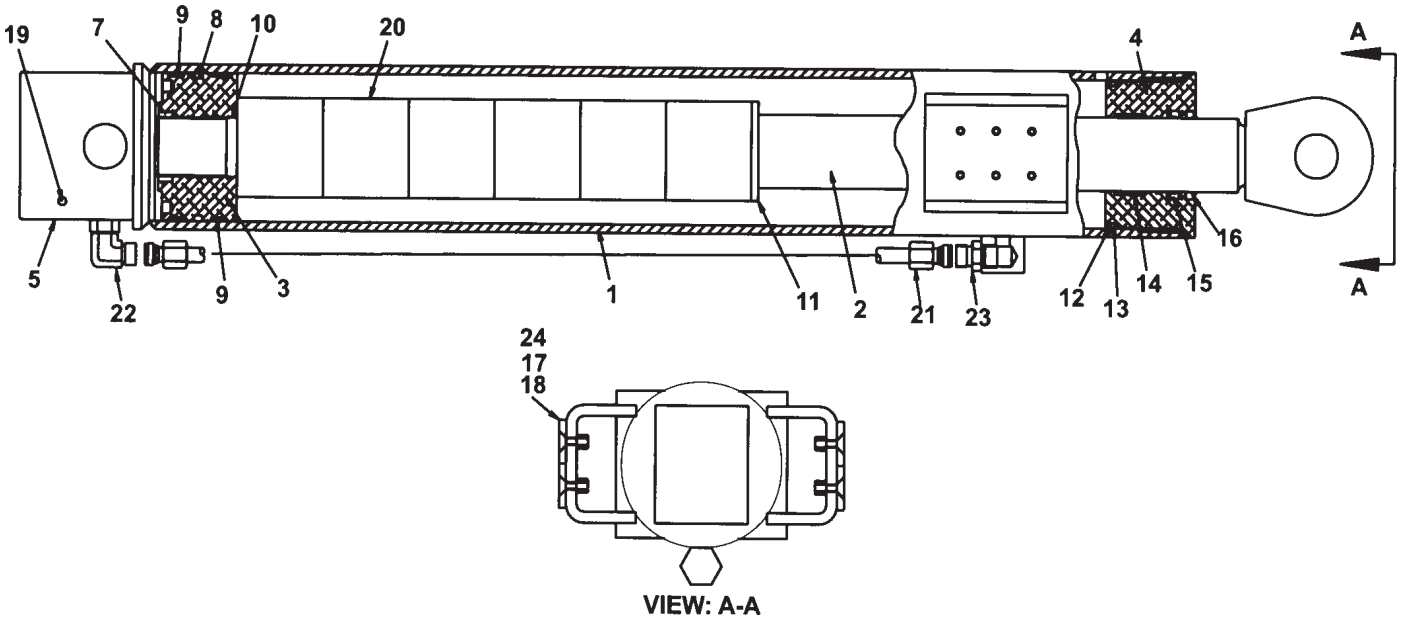
1.	4C209970	CASE ASM (INCL:19)	1
2.	4G209970	ROD ASM	1
3.	6I503200	PISTON	1
4.	6H050030	HEAD	1
5.	73054887	COUTERBALANCE VALVE 25GPM	2
6.	9C020940	SEAL KIT (INCL:7-16)	1
7.	7T61N200	LOCK RING (PART OF 6)	1REF
8.	7T66P500	PISTON SEAL (PART OF 6)	1REF
9.	7T2N4050	WEAR RING (PART OF 6)	2REF
10.	7Q072033	O-RING (PART OF 6)	1REF
11.	6A025030	WAFER LOCK (PART OF 6)	1REF
12.	7Q072350	O-RING (PART OF 6)	1REF
13.	7Q10P350	BACK-UP RING (PART OF 6)	1REF
14.	7T2N8032	WEAR RING (PART OF 6)	1REF
15.	7R546030	U-CUP SEAL (PART OF 6)	1REF
16.	7R14P030	ROD WIPER (PART OF 6)	1REF
17.	72601713	CAP SCR 1/4-20X1-1/4 FLATHDSOC	12
18.	60030289	WEAR PAD	4
19.	7PNPXT02	PIPE PLUG 1/8NPT (PART OF 1)	2REF
20.	6C300030	STOP TUBE	6
21.	70145614	PORT TUBE	1
22.	72533162	ELBOW #8MSTR #8MFACE	1
23.	72533166	ADAPTER #8MSTR #8MFACE	1
24.	72062104	NUT 1/4-20 LOCK	12

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.

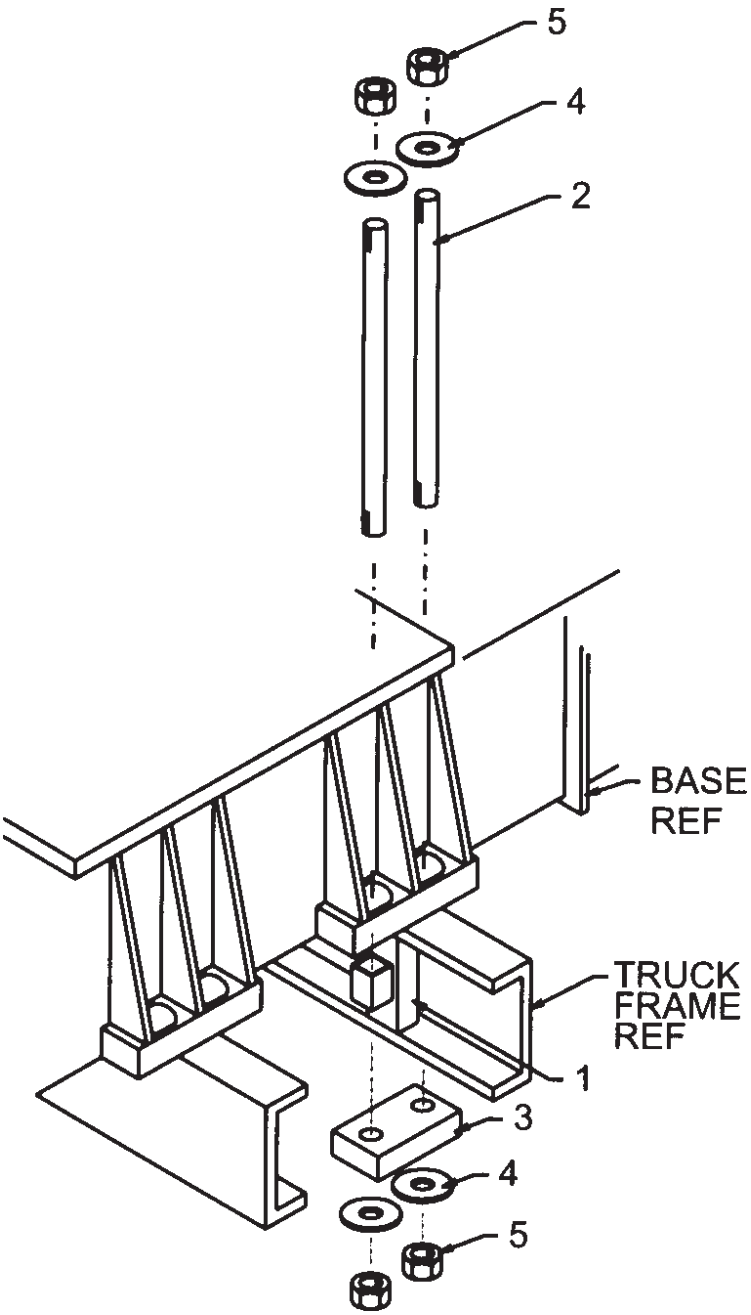
Use “Never-Seez” or equivalent between the head and the case when assembling the cylinder.



VIEW: A-A

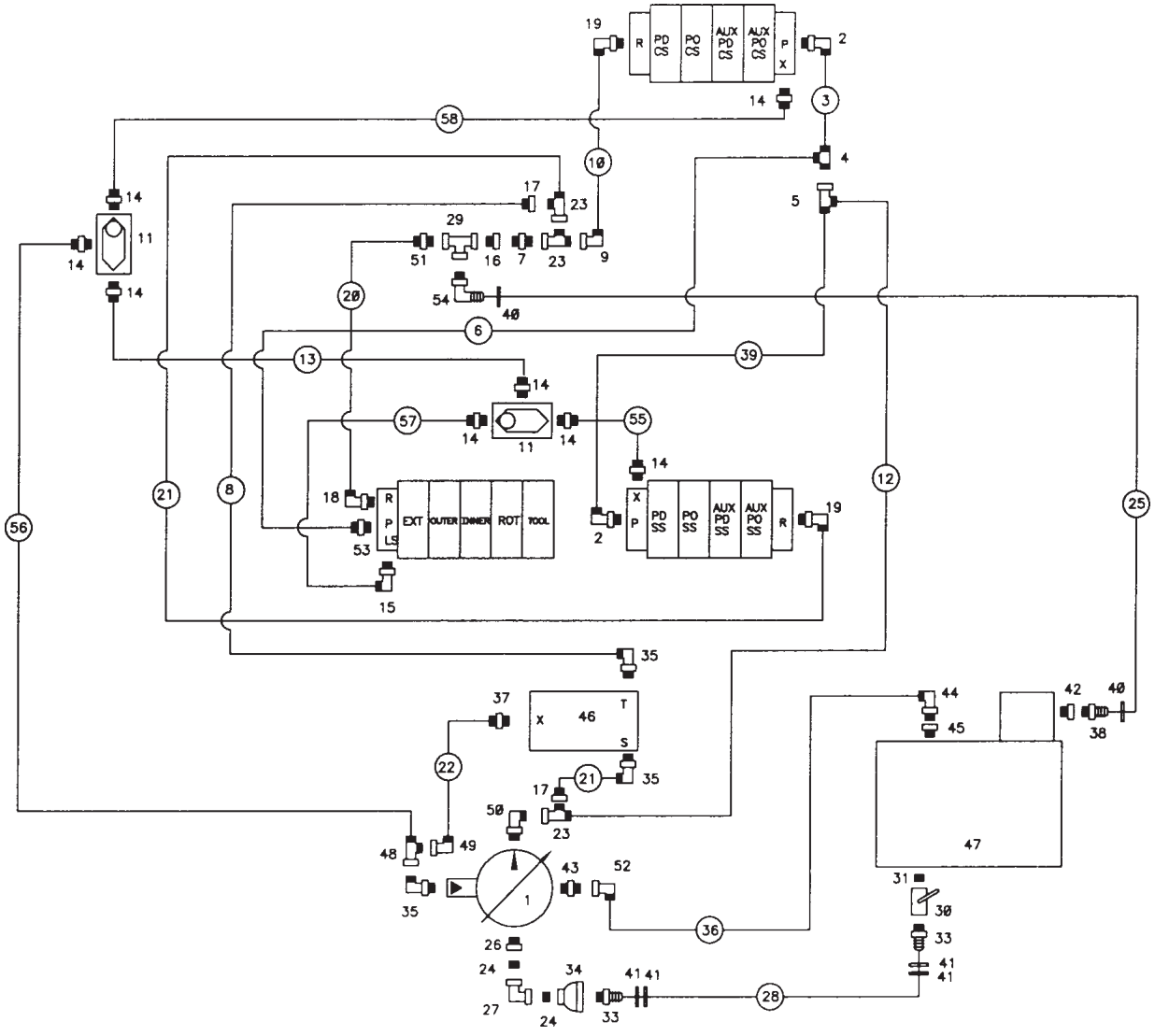
INSTALLATION KIT (93714217-1)

1.	52706374	SUPPORT	4
2.	60109531	TIE-DOWN STUD 2-4 1/2X26	8
3.	60109532	CLAMP PLATE	4
4.	72063168	WASHER 2 FLAT	16
5.	72062198	NUT 2-4 1/2 HEX STL INSERT GR5	16



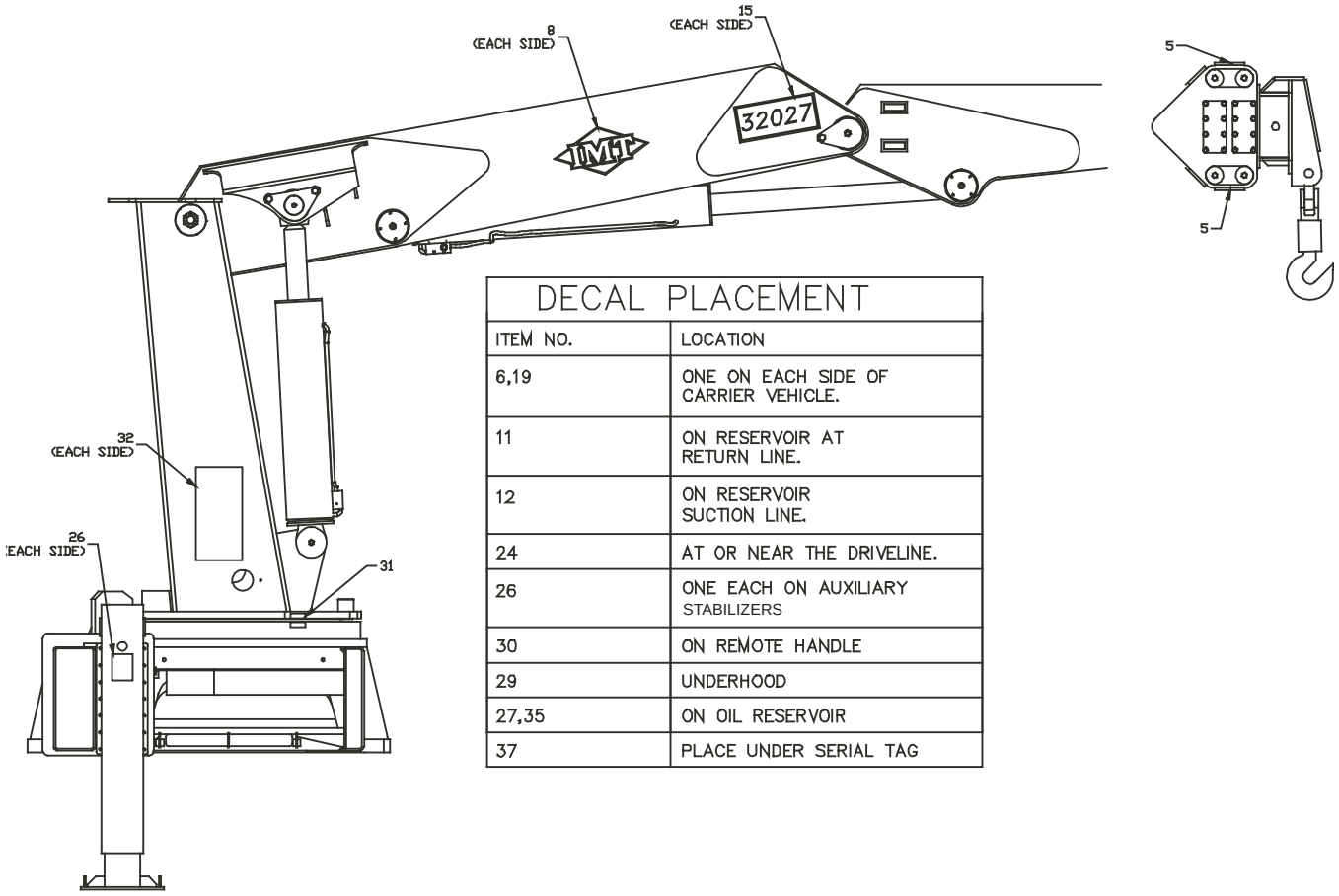
INSTALLATION KIT (93714217-2)

1.	73051903	PUMP	1REF
2.	72533528	ELBOW #10MSTR #12MFACE	2
3.	51395228	HOSE 3/4X40 #12#12	1
4.	72533556	TEE #12 UNION FACE	1
5.	72533189	TEE #12 RUN FACE	1
6.	51395139	HOSE 3/4X48 #12#12	1
7.	72053676	ADAPTER #12MJIC 3/4MPT	1
8.	51395138	HOSE 3/4X36 #12#12	1
9.	72532696	ELBOW #12MJIC #12FJIC SWVL	1
10.	51395141	HOSE 3/4X60 #12#12	1
11.	73054785	SHUTTLE VALVE	2
12.	51395229	HOSE 3/8X72 #12#12	1
13.	51394806	HOSE 3/8X12 #6#6	1
14.	72533186	ADAPTER #6MSTR #6MFACE	8
15.	72533163	ELBOW #6MSTR #6MFACE	1
16.	72531836	REDUCER BUSHING 1-1/4 3/4NPT	1
17.	72532972	ADAPTER #8MJIC #12FJIC	1
18.	72533319	ELBOW #12MSTR #16MJIC	1
19.	72053766	ELBOW #10MSTR #12MJIC	2
20.	51395118	HOSE 1X60 #16#16 FF	1
21.	51395137	HOSE 3/8X24 #6#8 FF	2
22.	51395136	HOSE 3/8X24 #6#16 FF	3
23.	72532950	TEE #12JIC RUN	1
24.	72053251	NIPPLE 1-1/2NPT X CLOSE	2
25.	89393401	HOSE 1-1/4	108”
26.	72053796	ADAPTER #24MSTR 1-1/2FPT SW	1
27.	72053328	ELBOW 1-1/2NPT	1
28.	89395073	HOSE 2-1/2	120”
29.	72053615	TEE 1-1/4NPT STL	1
30.	73540025	BALL VALVE 2-1/2NPT	1
31.	72533601	NIPPLE 2-1/2NPT X CLOSE	1
33.	72533599	BARB NIPPLE 2-1/2NPT	2
34.	72533600	BELL COUPLING 2-1/2 1-1/2NPT	1
35.	72053760	ELBOW #6MSTR #6MJIC	3
36.	51395120	HOSE 3/8X72 #8#8 FF	1
37.	72532355	ADAPTER #6MSTR #6MJIC	1
38.	72531550	BARB NIPPLE 1-1/4MPT	1
39.	51395140	HOSE 3/4X24	1
40.	72066516	HOSE CLAMP 1-1/4	2
41.	72066062	HOSE CLAMP 2-1/2	4
42.	72531838	REDUCER BUSHING 1-1/2 1-1/4NPT	1
43.	72532357	ADAPTER #6MSTR #8MJIC	1
44.	72531421	ELBOW #8MJIC 1/2MPT	1
45.	72531832	REDUCER BUSHING 3/4-3/8NPT	1
46.	73054986	VALVE	1REF
47.	51714218	OIL RESERVOIR ASM	1
48.	72533374	TEE #6JIC SWVL NUT RUN	1
49.	72532772	ELBOW #6JIC SWVL	1
50.	72533372	ELBOW #16MSTR #12MJIC	1
51.	72533564	ADAPTER 1-1/4MPT #16MJIC	1
52.	72532658	ELBOW #8MJIC #8FJIC SWVL	1
53.	72533420	ADAPTER #12MSTR #12MFACE	1
54.	72532346	BARB NIPPLE ELBOW 1-1/4 1-1/4	1
55.	51395227	HOSE 3/8X48	1
56.	51395119	HOSE 3/8X48	1
57.	51395230	HOSE 3/8X26 #6#6	1
58.	51395190	HOSE 3/8X19 #6#6	1



DECAL KIT (95714074)

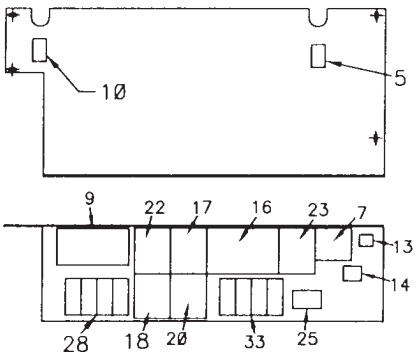
5.	70391612	DECAL-GREASE WEEKLY-LEFT	3
6.	70392868	DECAL-WARNING LOADLINE	4
7.	70392863	DECAL-WARNING HOIST PERSON	2
8.	70029252	PLACARD-IMT DIAMOND	2
9.	70391583	DECAL-SET UP/STOW INSTR	2
10.	70391613	DECAL-GREASE WEEKLY-RIGHT	1
11.	70392109	DECAL-RETURN LINE	1
12.	70392108	DECAL-SUCTION LINE	1
13.	70392213	DECAL-CAUTION WASH WAX	1
14.	70392524	DECAL-ROTATE CRANE/GREASE	1
15.	71394816	DECAL-32027 IDENTIFICATION	2
16.	70392813	DECAL-DANGER ELECTROCUTION	2
17.	70392814	DECAL-WARNING OPER TRAINING	2
18.	70392815	DECAL-WARNING OPERATION	2
19.	70392865	DECAL-DANGER ELEC HZD-LG	4
20.	70392866	DECAL-WARNING OPER CONDITION	2
22.	70392888	DECAL-WARNING OPER RESTRICT	2
23.	70392890	DECAL-DANGER STOW/UNFOLD	2
24.	70392891	DECAL-DANGER DRIVELINE	2
25.	70392982	DECAL-CONTACT IMT	1
26.	70392864	DECAL-WARNING STAB STD CLR	4
27.	71039134	DECAL-CAUTION OIL LEVEL	2
28.	70394865	DECAL-CONTROL SS	1
29.	70395096	DECAL-SPD CTRL/ENG KILL	1
30.	70395095	CAPACITY DECAL-HANDLE	1
31.	71392365	DECAL-ALIGN CRANE	1
32.	70394861	PLACARD-CAPACITY	2
33.	70395028	DECAL-CONTROL STAB SS	2
34.	70395027	DECAL-CONTROL STAB CS	2
35.	70394189	DECAL-OIL RECOMMENDATIONS	1
36.	70395094	DECAL-CTRL AUX STAB CS	1
37.	70395323	DECAL-ASME/ANSI B30.22	1
38.	72042097	LEVEL	2



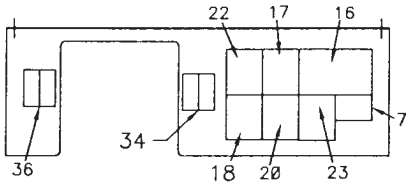
DECAL PLACEMENT	
ITEM NO.	LOCATION
6,19	ONE ON EACH SIDE OF CARRIER VEHICLE.
11	ON RESERVOIR AT RETURN LINE.
12	ON RESERVOIR SUCTION LINE.
24	AT OR NEAR THE DRIVELINE.
26	ONE EACH ON AUXILIARY STABILIZERS
30	ON REMOTE HANDLE
29	UNDERHOOD
27,35	ON OIL RESERVOIR
37	PLACE UNDER SERIAL TAG

NOTE: PLACE ITEM #38, LEVEL, ON FRONT AND SIDE OF CRANE BASE.

STREET SIDE VALVE BANK COVER



CURB SIDE VALVE BANK COVER



HYDRAULIC KIT (91714213-1)

1.	72533166	ADAPTER #8MSTR #8MFACE	4
2.	51395114	HOSE-BBX 3/4X24 #12#10	2
3.	51395113	HOSE-BBY 3/4X24 #12#10	2
4.	72533532	PRESSURE SWVL #12FACE	4
5.	51394787	HOSE-BBBB 3/4X12 #12#12	4
6.	72533556	TEE #12MFACE	4
7.	51394788	HOSE-BBBB 1/2X135 #12#8	2
8.	51394789	HOSE-BBBB 1/2X45 #12#8	4
9.	51394790	HOSE-BBX 1/2X31 #8#8	1
10.	51394791	HOSE-BBY 1/2X31 #8#8	1
11.	72533538	PRESSURE SWVL #8FACE	2
12.	51395115	HOSE-BBCC 1/2X135 #8#8	2
13.	72533187	ADAPTER #10MSTR #8MFACE	2
14.	72533608	ADAPTER #10MSTR #10MFACE	4
15.	51395116	HOSE-BBF 1/2X135 #12#8	2
16.	72533451	NIPPLE-DIAG W/CAP 9/16-18	1

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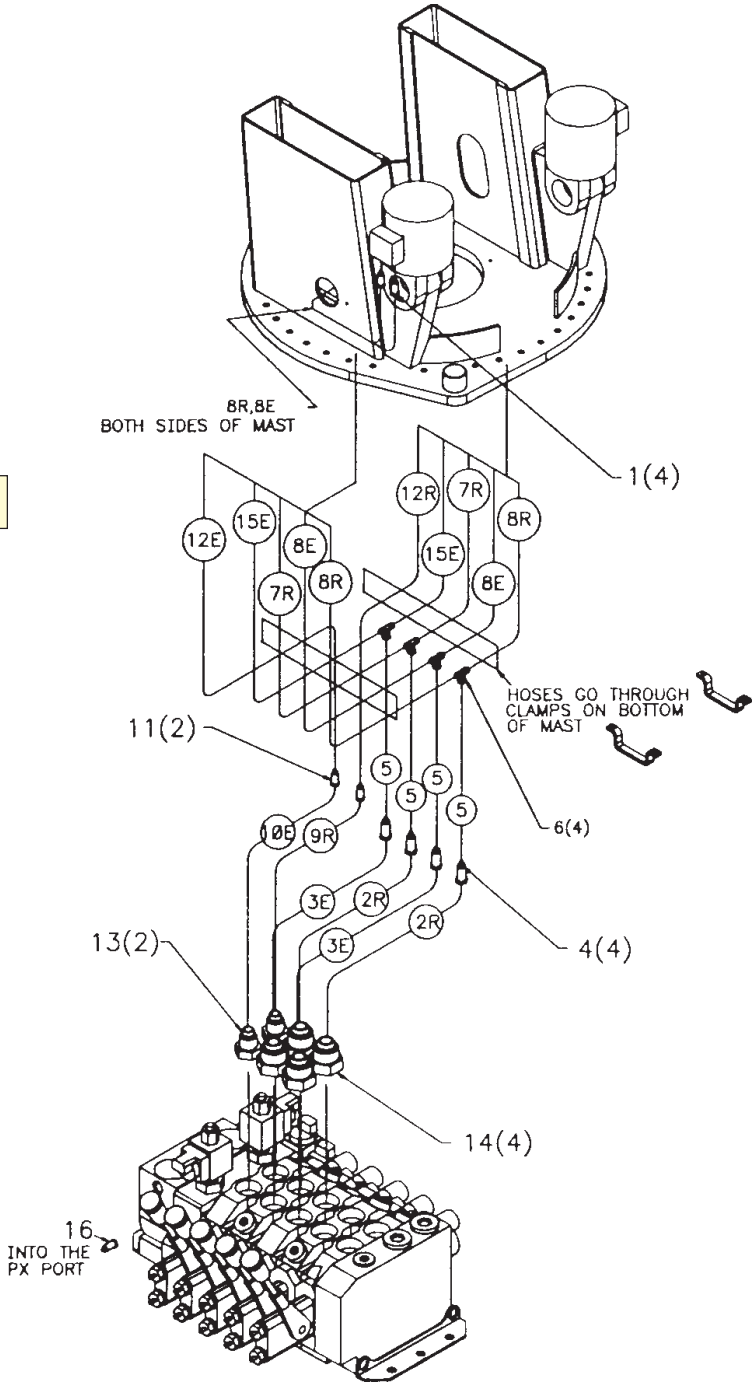

HYDRAULIC KIT (91714213-2)

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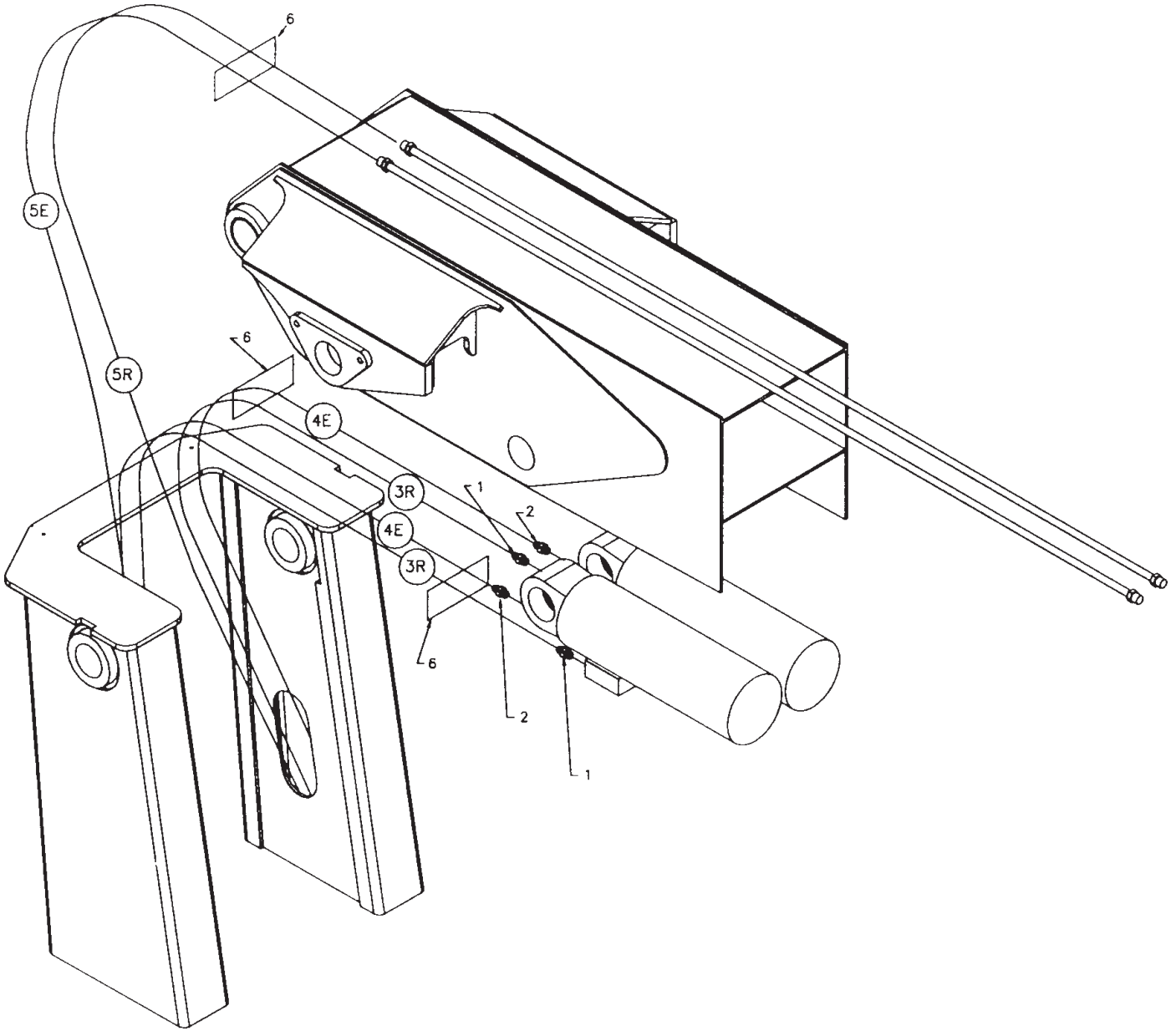
1.	72533166	ADAPTER #8MSTR #8MFACE	2
2.	72532358	ADAPTER #8MSTR #8MJIC	2
3.	51394788	HOSE-BBBB .50X135 #12#8	2
4.	51395116	HOSE-BBF .50X135 #12#8	2
5.	51395115	HOSE-BBCC .50X135 #12#8	2
6.	89034049	SPIRAL WRAP	20FT



HYDRAULIC KIT (91714213-3)

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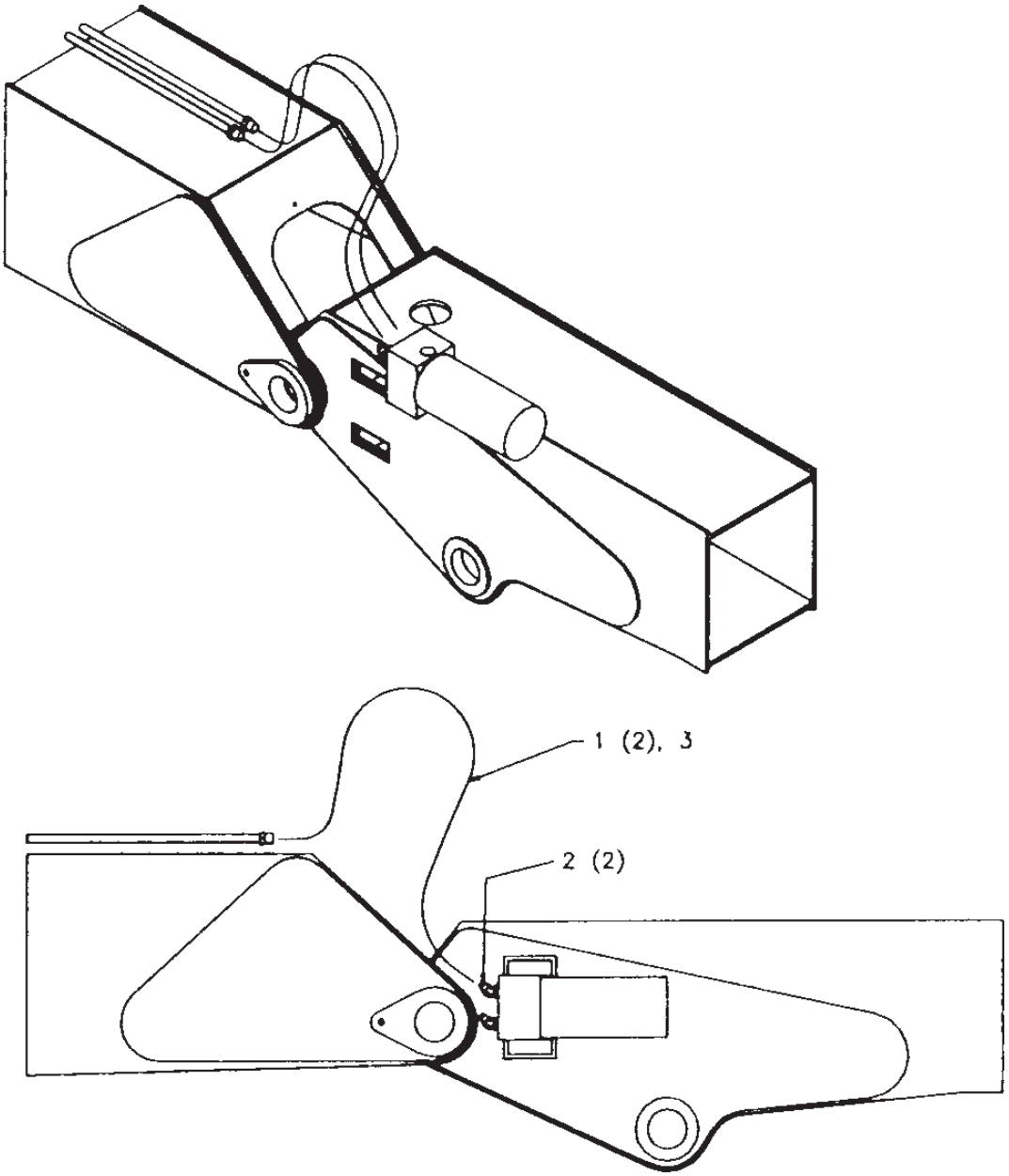
1.	51395117	HOSE-BBCC .50X46 #8#8	2
2.	72533418	ELBOW #8MSTR #8MFACE 45°	2
3.	89034049	SPIRAL WRAP	6FT



HYDRAULIC KIT (91714213-4)

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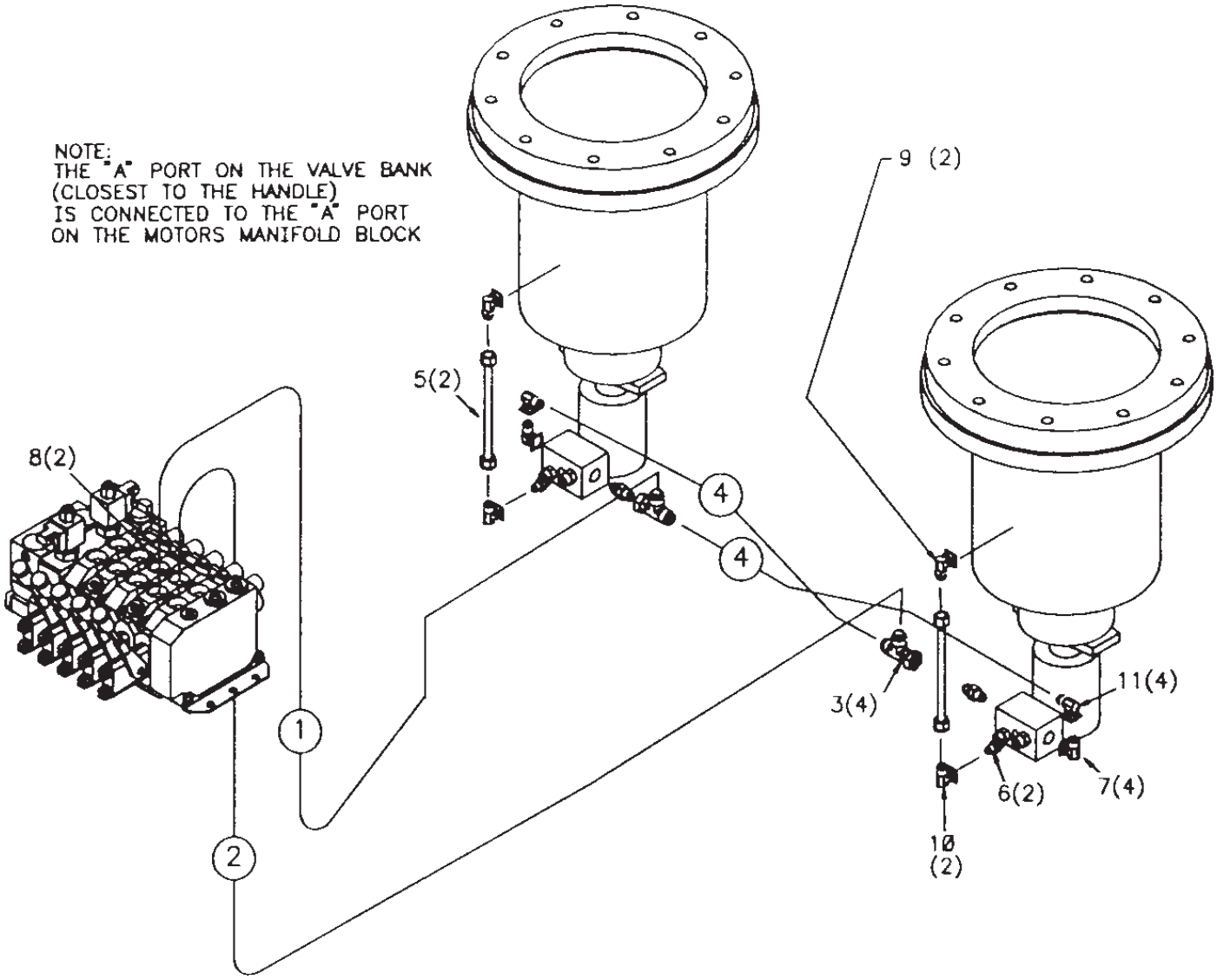
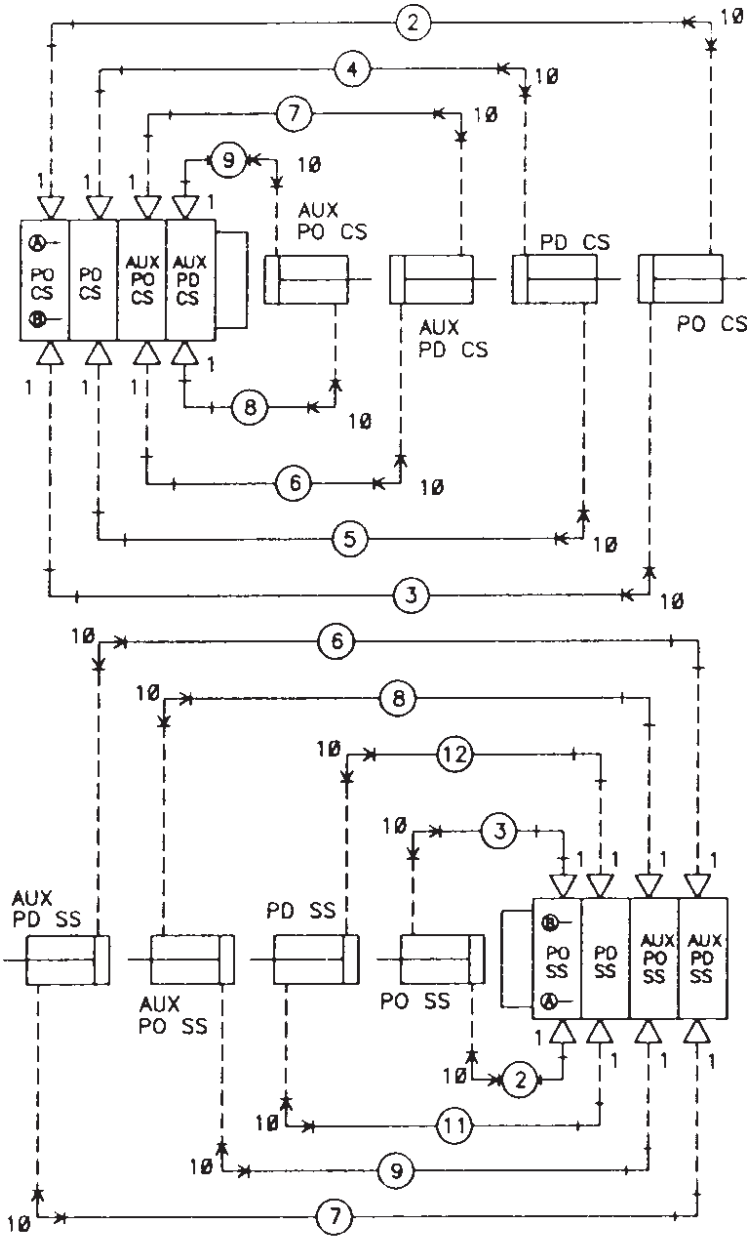
1.	51395192	HOSE-XX 1/2X84 #8#8	1
2.	51395193	HOSE-XX 1/2X96 #8#8	1
3.	72533160	TEE #8MFACE	2
4.	51394784	HOSE-BBBB 1/2X18 #8#8	2
5.	51394742	HOSE-BBBB 1/4X8 #4#4	2
6.	72533376	ADAPTER #4MSTR #4MFACE	2
7.	72533162	ELBOW #8MSTR #8MFACE 90°	4
8.	72533187	ADAPTER #10MSTR #8MFACE	2
9.	72533158	ELBOW #4MSTR #4MFACE 90°	2
10.	72533530	ELBOW #4MFACE #4FFACE 90°SW	2
11.	72533164	ELBOW #8MFACE #8FFACE 90°SW	2



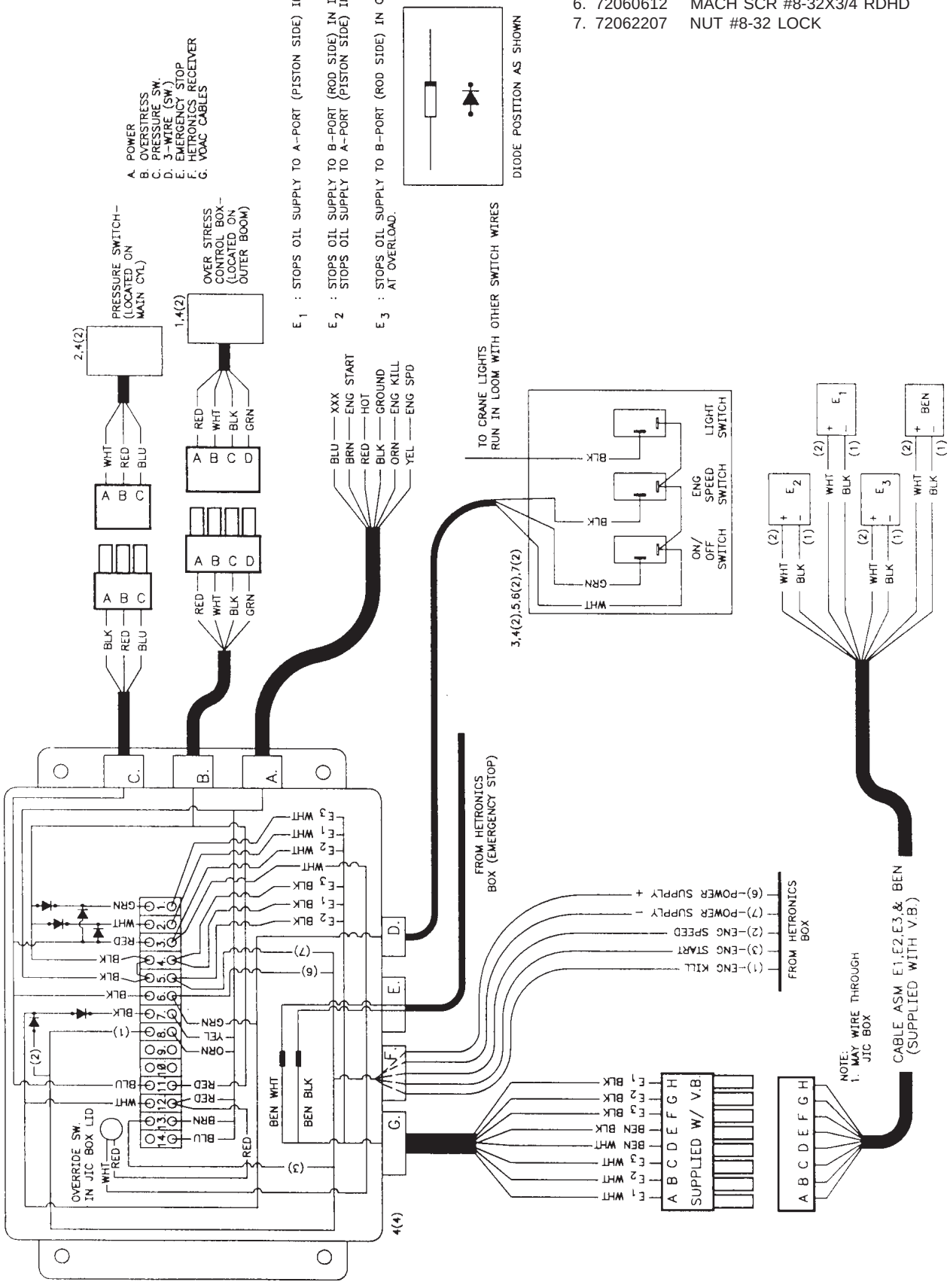
HYDRAULIC KIT (91714213-5)

1.	72533166	ADAPTER #8MSTR #8MFACE	8
2.	51394795	HOSE-BBX 1/2X60 #8#8	2
3.	51394796	HOSE-BBY 1/2X60 #8#8	2
4.	51394797	HOSE-BBX 1/2X160 #8#8	1
5.	51394798	HOSE-BBY 1/2X160 #8#8	1
6.	51394799	HOSE-BBY 1/2X300 #8#8	2
7.	51394800	HOSE-BBX 1/2X300 #8#8	2
8.	51395111	HOSE-BBY 1/2X264 #8#8	2
9.	51395112	HOSE-BBX 1/2X264 #8#8	2
10.	72533162	ELBOW #8MSTR #8MFACE 90°	16
11.	51394793	HOSE-BBX 1/2X130 #8#8	1
12.	51394794	HOSE-BBY 1/2X130 #8#8	1



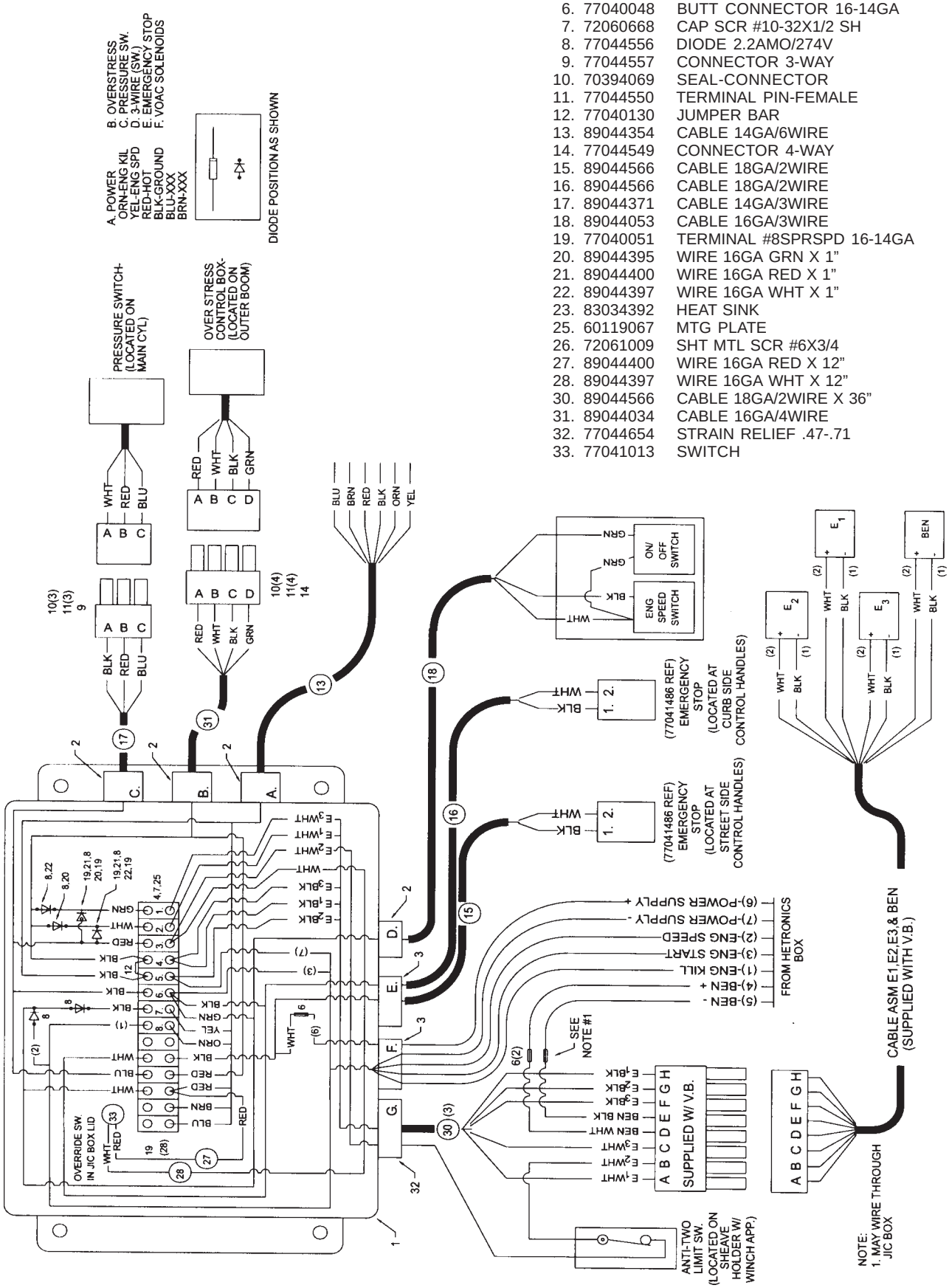
REMOTE CONTROL KIT (90714209)

1.	51715077	CONTROL BOX-OVERLOAD SYS	1
2.	51712856	CABLE ASM-PR SW/BOX	1
3.	60121474	MTG BRKT-SWITCHES	1
4.	72060002	CAP SCR 1/4-20X3/4 HHGR5	8
5.	60121561	SWITCH BRKT	1
6.	72060612	MACH SCR #8-32X3/4 RDHD	2
7.	72062207	NUT #8-32 LOCK	2



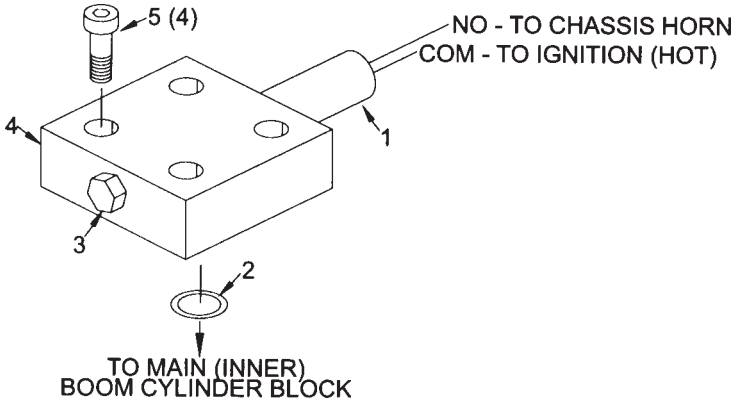
CABLE ASM-JIC BOX (51712880)

1.	60120413	JIC BOX	1
2.	77044671	STRAIN RELIEF .24-.47	4
3.	77044653	STRAIN RELIEF .39-.55	2
4.	77044309	TERMINAL BLOCK-14 CONTACT	1
6.	77040048	BUTT CONNECTOR 16-14GA	3
7.	72060668	CAP SCR #10-32X1/2 SH	4
8.	77044556	DIODE 2.2AMO/274V	6
9.	77044557	CONNECTOR 3-WAY	1
10.	70394069	SEAL-CONNECTOR	7
11.	77044550	TERMINAL PIN-FEMALE	7
12.	77040130	JUMPER BAR	1
13.	89044354	CABLE 14GA/6WIRE	33FT
14.	77044549	CONNECTOR 4-WAY	1
15.	89044566	CABLE 18GA/2WIRE	3FT
16.	89044566	CABLE 18GA/2WIRE	8FT
17.	89044371	CABLE 14GA/3WIRE	9FT
18.	89044053	CABLE 16GA/3WIRE	4FT
19.	77040051	TERMINAL #8SPRSPD 16-14GA	30
20.	89044395	WIRE 16GA GRN X 1”	2
21.	89044400	WIRE 16GA RED X 1”	2
22.	89044397	WIRE 16GA WHT X 1”	2
23.	83034392	HEAT SINK	4
25.	60119067	MTG PLATE	1
26.	72061009	SHT MTL SCR #6X3/4	4
27.	89044400	WIRE 16GA RED X 12”	1
28.	89044397	WIRE 16GA WHT X 12”	1
30.	89044566	CABLE 18GA/2WIRE X 36”	3
31.	89044034	CABLE 16GA/4WIRE	30FT
32.	77044654	STRAIN RELIEF .47-.71	1
33.	77041013	SWITCH	1



CAPACITY ALERT KIT-3000 PSI (31711302)

1.	77041258	PRESSURE SWITCH 3000PSI	1
2.	7Q072015	O-RING	1
3.	72532140	PLUG 9/16-18 HH	1
4.	60025221	MANIFOLD	1
5.	72060731	CAP SCR 5/16-18X3/4 SH	4



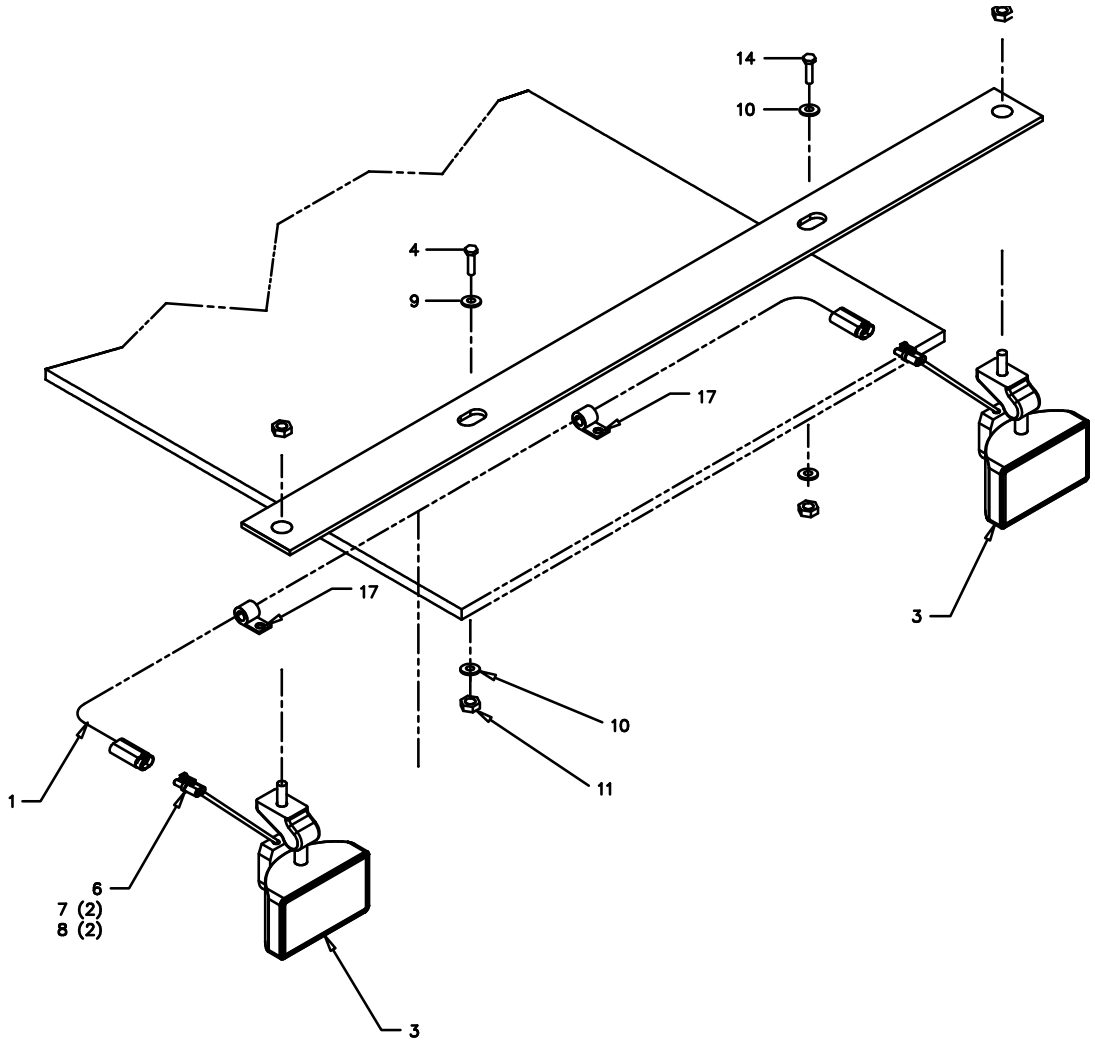
FLOODLIGHT KIT (51709314)

(EFFECTIVE 4-15-04)

1.	51717219	CABLE ASM	1
2.	60113427	BRACKET	1
3.	77040424	FLOODLIGHT, TOP MOUNT	2
4.	72060048	CAP SCR 3/8-16X1.5 HHGR5Z	2
5.	72056580	CLAMP-UMP 20	REF
6.	77044574	CONNECTOR	2
7.	77044550	TERMINAL 18-20 GA FEM	4
8.	70394069	SEAL CABLE CONNECTOR	4
9.	72063003	WASHER 3/8 FLAT	2
10.	72063051	WASHER 3/8 LOCK	2
11.	72062103	NUT 3/8-16 HEX	2

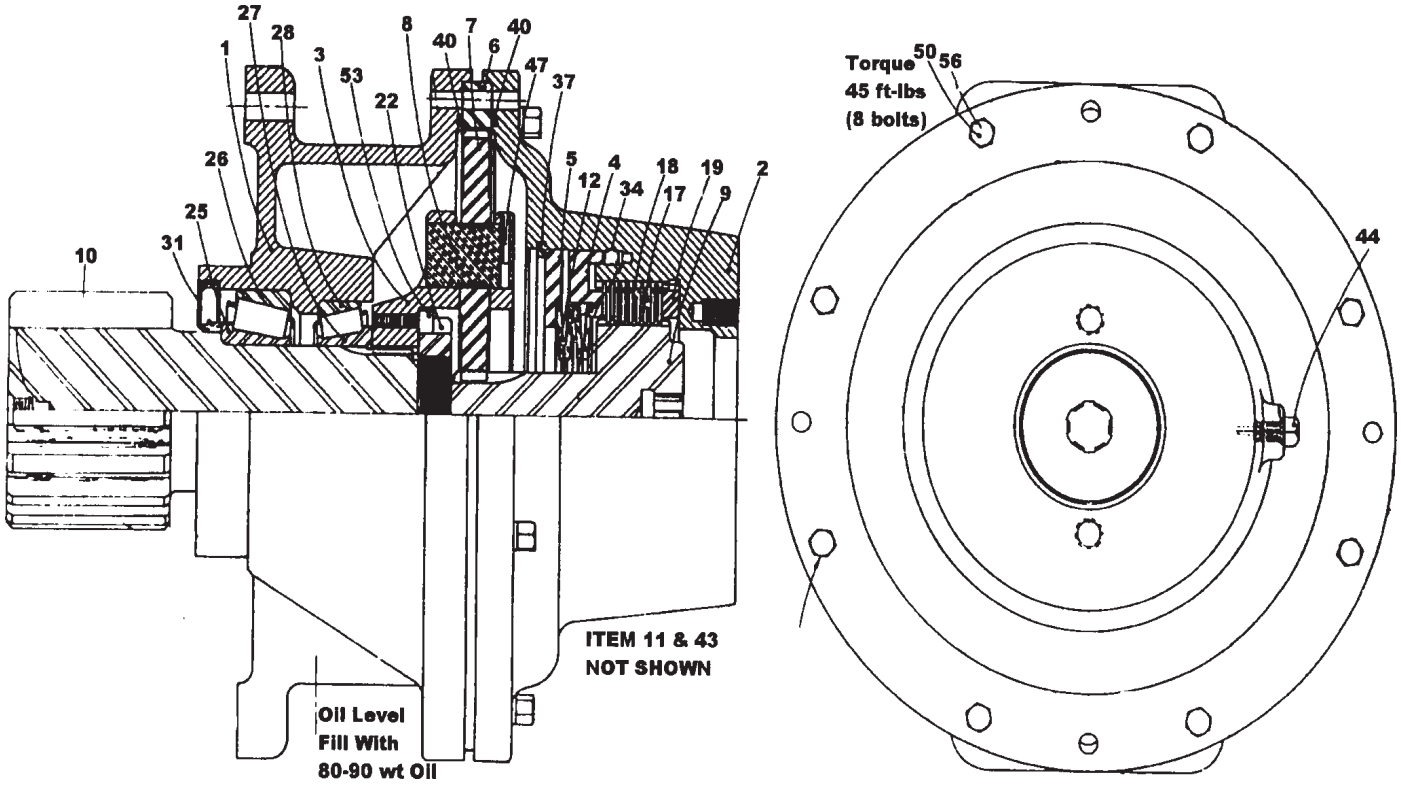
(PARTS LIST THROUGH 4-15-04)

1.	77040281	FLOODLIGHT 12V CHROME	2
2.	77040280	MOUNTING KIT	2REF
3.	60113427	LIGHT BRACKET	1
4.	89044351	LOOM	16FT
5.	89044274	WIRE 14GA BLK X 18FT	2
6.	60045056	WIRE 14GA BLK X 36”	1
7.	60103535	SWITCH BRACKET	1
8.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
9.	72062000	NUT 1/4-20 HEX	2
10.	72063049	WASHER 1/4 LOCK	2
11.	77040000	TERMINAL #10STUD 16-14GA	2
12.	77040048	BUTT CONNECTOR 16-14GA	2
13.	77041014	SWITCH PUSH/PULL W/FUSE	1
14.	72060048	CAP SCR 3/8-16X1-1/2 HHGR5	2
15.	72062103	NUT 3/8-16 LOCK	2
16.	72063003	WASHER 3/8 FLAT	4
17.	72063051	WASHER 3/8 LOCK	2
18.	60030049	SPIRAL WRAP X 10”	2

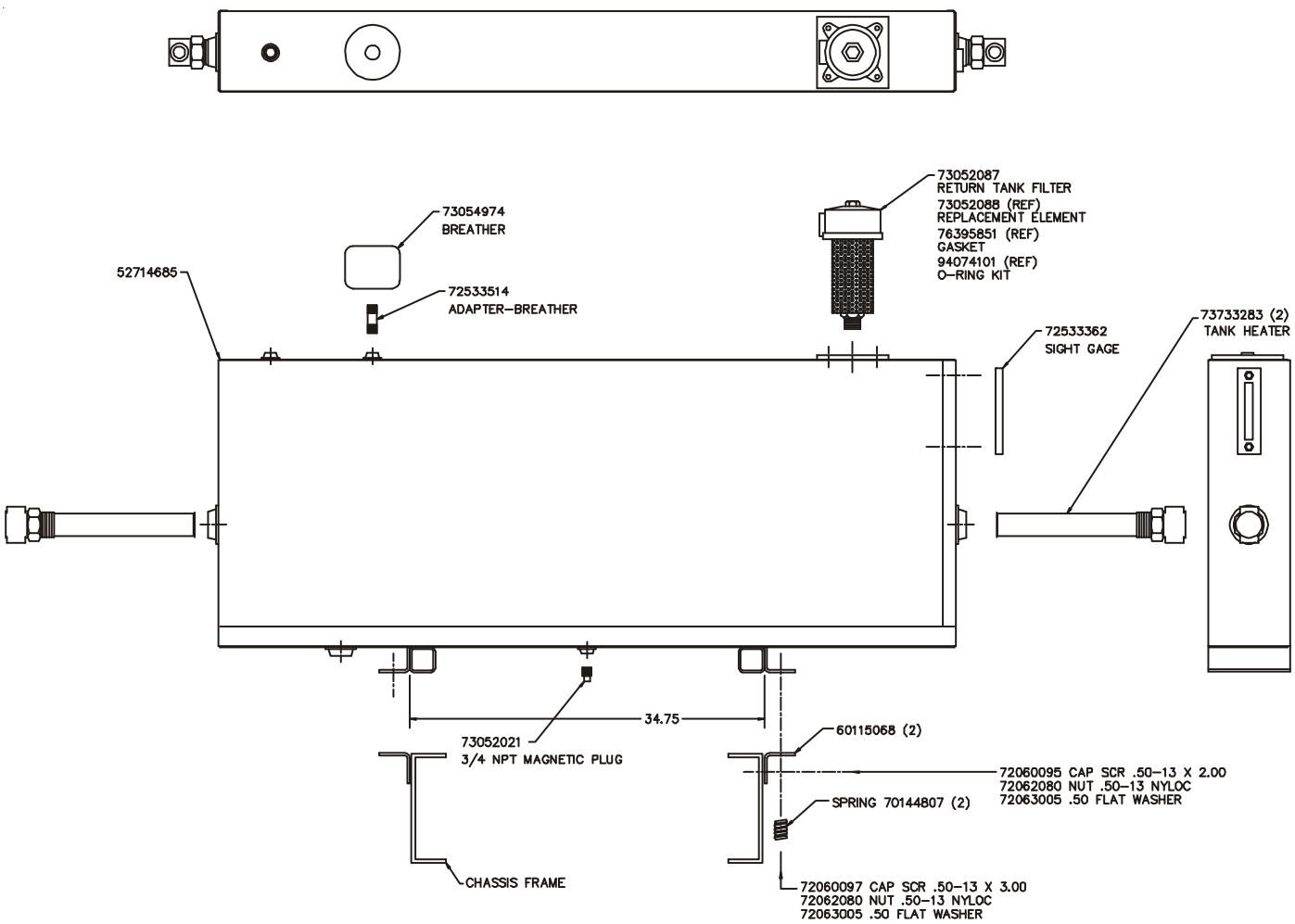


ROTATION SPEED REDUCER (70057696)

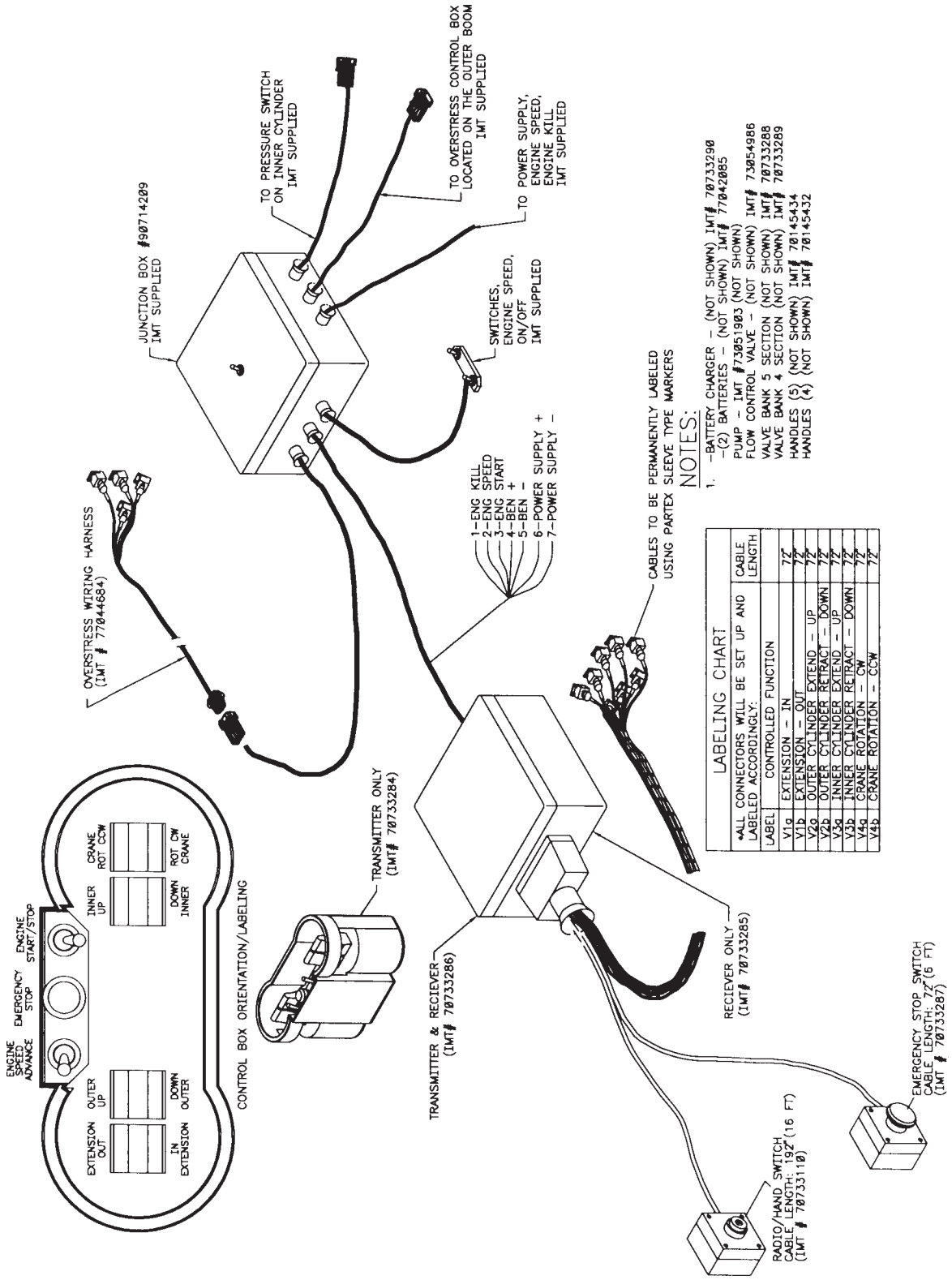
1.	70143192	BASE	1
2.	71056381	CYLINDER BRAKE	1
3.	70143193	CARRIER-PLANET	1
4.	70143194	PISTON-BRAKE	1
5.	70143195	PLATE-BACKUP	1
6.	70056382	GEAR-RING	1
7.	70056383	GEAR-PLANET	3
8.	70143196	SHAFT-PLANET	3
9.	70056384	GEAR-INPUT	1
10.	70143197	SHAFT-OUTPUT	1
12.	70142377	SPRING	4
14.	70143199	COVER-SHIPPING	1
15.	76392682	GASKET-HYD MOTOR	1
17.	70143200	DISC-FRICTION	8
18.	70143201	DISC-BRAKE	8
19.	70143202	PLATE-BACKUP	1
22.	70143203	NUT	1
25.	70055176	CONE-BEARING	1
26.	70055177	CUP-BEARING	1
27.	70055178	CONE-BEARING	1
28.	70055179	CUP-BEARING	1
31.	76392683	SEAL	1
34.	76392121	SEAL	1
37.	70143204	SNAP RING	1
40.	76392684	O-RING	2
43.	70143205	PIPE PLUG	1
44.	70143206	O-RING	1
47.	72066695	ROLL PIN	3
49.	72060091	BOLT-SHIPPING	2
50.	72601487	BOLT	8
53.	72060729	CAP SCR	1
56.	72063174	WASHER	8



OIL RESERVOIR ASM-60 GAL (51714218)

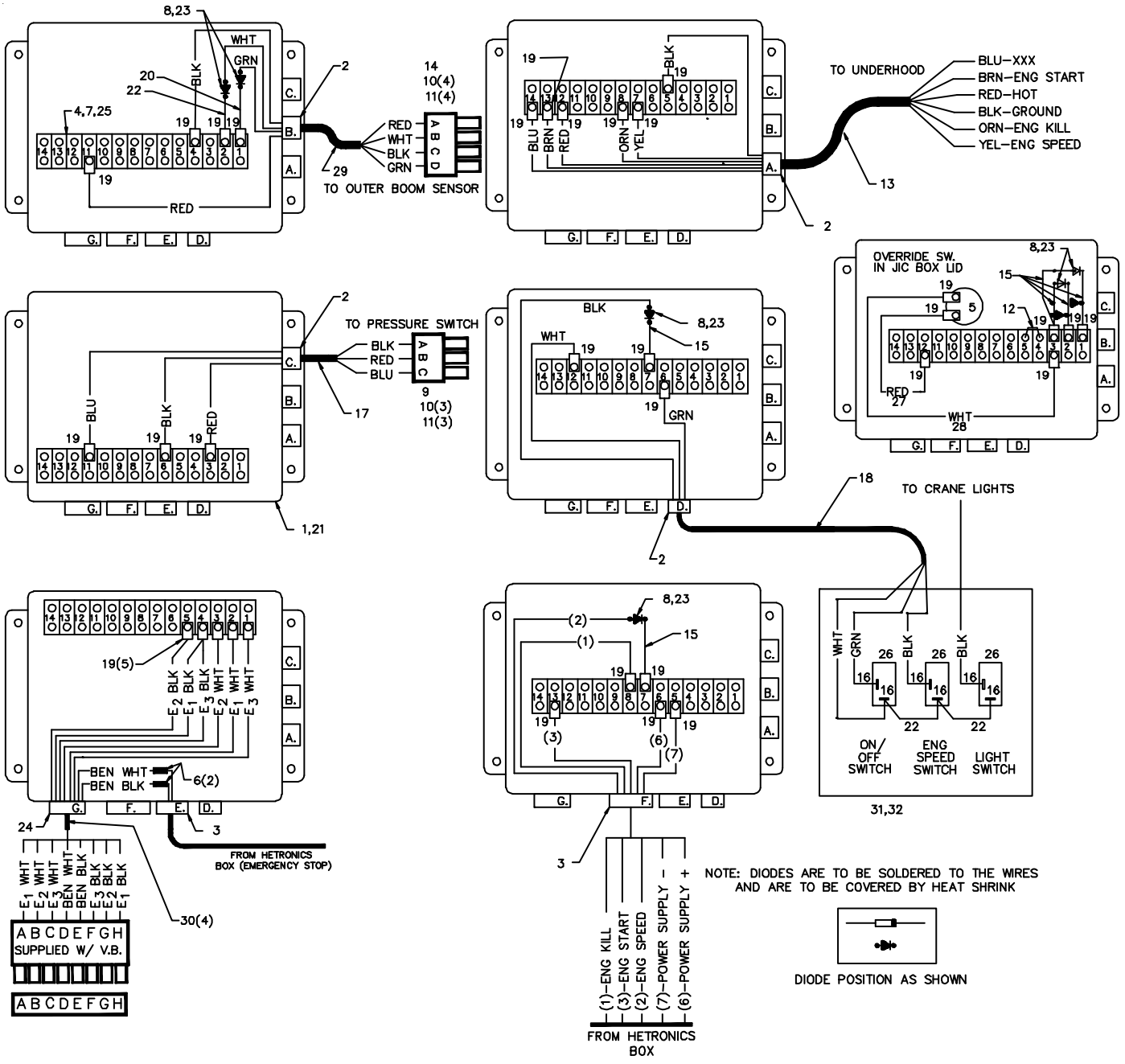


KIT-CONTROL (73733212)



CTRL BOX-RADIO (51715077)

1.	60120413	JIC BOX	1
2.	77044671	STRAIN RELIEF .24-.47	4
3.	77044653	STRAIN RELIEF .39-.55	2
4.	77044309	TERMINAL BLOCK-14 CONTACT	1
5.	77041013	SWITCH-MAIN	1
6.	77040048	BUTT CONNECTOR 16-14GA	2
7.	72060668	CAP SCR #10-32X1/2 SH	4
8.	77044556	DIODE 2.2A 274V	6
9.	77044557	CONNECTOR 3WAY F	1
10.	70394069	SEAL	7
11.	77044550	TERMINAL PIN	7
12.	77040130	JUMPER BAR	1
13.	89044354	CABLE 14GA 6WIRE	33FT
14.	77044549	CONNECTOR 4WAY F	1
15.	89044397	WIRE 16GA BLK 3”	6
16.	77040186	TERMINAL-FSLPON 1/4 16-14GA	6
17.	89044371	CABLE 14GA 3WIRE RED/BLU/BLK	8FT
18.	89044053	CABLE 16GA 3WIRE RED/BLK/GRN	3FT
19.	77040051	TERMINAL-SPRSPD #8 16-14GA	33
20.	89044231	WIRE 14GA GRN 3”	1
21.	70394146	DECAL-EMERGENCY OVERLD REL	1
22.	89044397	WIRE 16GA WHT 3”	1
23.	83034392	HEAT SHRINK	6
24.	77044654	STRAIN RELIEF .47-.71	1
25.	60119067	MTG PLATE-TERM STRIP	1
26.	77041345	SWITCH	3
27.	89044400	WIRE 16GA RED 12”	1
28.	89044397	WIRE 16GA WHT 12”	1
29.	89044034	CABLE 16GA 4WIRE	25FT
30.	89044566	CABLE 18GA 2WIRE 36”	4
31.	60119077	SWITCH BOX	1
32.	70395096	DECAL-SWITCH BOX	1



SECTION 4. GENERAL REFERENCE

NOTES

NOTICE

The user of this form is responsible in determining that these inspections satisfy all applicable regulatory requirements

Inspection Checklist

CRANES

1

REV: 11-22-11

OWNER/COMPANY	*TYPE OF INSPECTION (check one)* ☐ *DAILY (if deficiency found)* ☐ *QUARTERLY* ☐ *MONTHLY* ☐ *ANNUAL*
CONTACT PERSON	
CRANE MAKE & MODEL	*DATE INSPECTED*
CRANE SERIAL NUMBER	*HOUR METER READING (if applicable)*
UNIT I.D. NUMBER	*INSPECTED BY (print)*
LOCATION OF UNIT	*SIGNATURE OF INSPECTOR*

TYPE OF INSPECTION

NOTES:

Daily and monthly inspections are to be performed by a "competent person", who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Quarterly and annual inspections are to be performed by a "qualified person" who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.

One hour of normal crane operation assumes 20 complete cycles per hour. If operation exceeds 20 cycles per hour, inspection frequency should be increased accordingly.

Consult Operator / Service Manual for additional inspection items, service bulletins and other information.

Before inspecting and operating crane, crane must be set up away from power lines and leveled with stabilizers deployed according to the crane manufacturer's directions.

DAILY (D): Before each shift of operation, those items designated with a (**D**) must be inspected.

MONTHLY (M): Monthly inspections or 100 hours of normal operation (which ever comes first) includes all daily inspections plus items designated with an (**M**). This inspection must be recorded and retained for a minimum of 3 months.

QUARTERLY (Q): Every three months or 300 hours of normal operation (which ever comes first) includes all daily and monthly inspection items plus items designated with a (**Q**). This inspection must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection.

ANNUAL (A): Each year or 1200 hours of normal operation (which ever comes first) includes all items on this form which encompasses daily, monthly and quarterly inspections plus those items designated by (**A**). This inspection must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection.

✓ = SATISFACTORY
R = RECOMMENDATION (Should be considered for corrective action)
NA = Not Applicable
X = Deficient (Note: If a deficiency is found, an immediate determination must be made as to whether the deficiency constitutes a safety hazard and must be corrected prior to operation.)

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS ✓, R, X, NA
D	1	Labels	All load charts, safety & warning labels, & control labels are present and legible.	
D	2	Crane	Check all safety devices for proper operation.	
D	3	Controls	Control mechanisms for proper operation of all functions, leaks & cracks.	
D	4	Station	Control and operator's station for dirt, contamination by lubricants, & foreign materials.	
D	5	Hyd System	Hydraulic system (hoses, tubes & fittings) for leakage & proper oil level.	
D	6	Hook	Presence & proper operation of hook safety latches.	
D	7	Wire Rope	Inspect for apparent deficiencies per applicable requirements and manufacturer's specifications.	
D	8	Pins	Proper engagement of all connecting pins & pin retaining devices.	
D	9	General covers.	Overall observation of crane for damaged or missing parts, cracked welds & presence of safety	
D	10	Operation	During operation, observe crane for abnormal performance, unusual wear (loose pins, wire rope damage, etc.). If observed, discontinue use & determine cause & severity of hazard.	
D	11	Remote Ctrls	Operate remote control devices to check for proper operation.	
D	12	Electrical	Operate all lights, alarms, etc. to check for proper operation.	
D	13	Anti Two-Block or Two-Block Damage Prevention	Operate anti-two-blocking or two-block prevention devices to check for proper operation.	

Inspection Checklist — CRANES — 2

FREQUENCY	ITEM	KEY	✓ = SATISFACTORY **R** = RECOMMENDATION (Should be considered for corrective action) ***NA*** = Not Applicable **X** = Deficient (Note: If a deficiency is found, an immediate determination must be made as to whether the deficiency constitutes a safety hazard and must be corrected prior to operation.) **INSPECTION DESCRIPTION**	STATUS ✓, R, X, NA
D	14	Tires	Check tires (when in use) for proper inflation and condition.	
D or similar.	15	Ground conditions	Ground conditions around the equipment for proper support, including ground settling under and around and around stabilizers and supporting foundations, ground water accumulation,	
D	16	Level Position	The equipment for level position within tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.	
D	17	Operator Cab Windows	Significant cracks, breaks, or other deficiencies that would hamper the operator 's view.	
D	18	Rails, rail stops, clamps, supporting surfaces.	Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling.	
D	19	Safety Devices	Safety devices and operational aids for proper operation.	
D	20	Electrical	Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.	
D	21	Other		
D	22	Other		
M	23	Daily	All daily inspection items.	
M	24	Cylinders	Visual inspection of cylinders for leakage at rod, fittings & welds. Damage to rod & case.	
M	25	Valves	Holding valves for proper operation.	
M	26	Valves	Control valve for leaks at fittings & between sections.	
M	27	Valves	Control valve linkages for wear , smoothness of operation & tightness of fasteners. Relief valve for proper pressure settings.	
M	28	General	Bent, broken or significantly rusted/corroded parts.	
M	29	Electrical	Electrical apparatus for malfunctioning, signs of apparent excess deterioration, dirt or moisture accumulation. Electrical systems for presence of dirt, moisture and frayed wires.	
M	30	Structure	All structural members for damage.	
M	31	Welds	All welds for breaks & cracks.	
M	32	Pins	All pins for proper installation & condition.	
M	33	Hardware	All bolts, fasteners & retaining rings for tightness, wear & corrosion	
M	34	Wear Pads	Condition of wear pads.	
M	35	Pump & Motor mounting bolts.	Hydraulic pumps & motors for leakage at fittings, seals & between sections. Check tightness of	
M	36	PTO	Transmission/PTO for leakage, abnormal vibration & noise, alignment & mounting bolt torque.	
M	37	Hyd Fluid	Quality of hydraulic fluid and for presence of water .	
M	38	Hyd Lines	Hoses & tubes for leakage, abrasion damage, blistering, cracking, deterioration, fitting leakage & secured properly .	
M	39	Hook	Load hook for abnormal throat distance, twist, wear & cracks.	
M	40	Wire Rope	Condition of load line.	
M	41	Manual	Presence of operator's manuals with unit.	
M	42		Other	
M	43		Other	
Q	44	Daily	All daily inspection items.	
Q	45	Monthly	All monthly inspection items.	
Q	46	Rotation Sys	Rotation bearing for proper torque of all mounting bolts.	
Q	47	Hardware	Base mounting bolts for proper torque.	
Q	48	Structure	All structural members for deformation, cracks & corrosion.	
	49		● Base	
	50		● Stabilizer beams & legs	
	51		● Mast	
	52		● Inner boom	
	53		● Outer boom	
	54		● Extension(s)	
	55		● Jib boom	
	56		● Jib extension(s)	
	57		● Other	
Q	58	Hardware	Pins, bearings, shafts, gears, rollers, & locking devices for wear , cracks, corrosion & distortion.	

Inspection Checklist — CRANES — 3

FREQUENCY	ITEM	KEY	✓ = SATISFACTORY **R** = RECOMMENDATION (Should be considered for corrective action) ***NA*** = Not Applicable X = Deficient (Note: If a deficiency is found, an immediate determination must be made as to whether the deficiency constitutes a safety hazard and must be corrected prior to operation.) **INSPECTION DESCRIPTION**	STATUS ✓, *R, X, NA*
	59		● Rotation bearing(s)	
	60		● Inner boom pivot pin(s) & retainer(s)	
	61		● Outer boom pivot pin(s) & retainer(s)	
	62		● Inner boom cylinder pin(s) & retainer(s)	
	63		● Outer boom cylinder pin(s) & retainer(s)	
	64		● Extension cylinder pin(s) & retainer(s)	
	65		● Jib boom pin(s) & retainer(s)	
	66		● Jib cylinder pin(s) & retainer(s)	
	67		● Jib extension cylinder pin(s) & retainer(s)	
	68		● Boom tip attachments	
	69		● Other	
Q	70	Hyd Lines	Hoses, fittings & tubing for proper routing, leakage, blistering, deformation & excessive abrasion.	
	71		● Pressure line(s) from pump to control valve	
	72		● Return line(s) from control valve to reservoir	
	73		● Suction line(s) from reservoir to pump	
	74		● Pressure line(s) from control valve to each function	
	75		● Load holding valve pipe(s) and hose(s)	
	76		● Other	
Q	77	Pumps & Motors	Pumps & motors for loose bolts/fasteners, leaks, noise, vibration, loss of performance, heating & excess pressure.	
	78		● Winch motor(s)	
	79		● Rotation motor(s)	
	80		● Other	
Q	81	Valves	Hydraulic valves for cracks, spool return to neutral, sticking spools, proper relief valve setting, relief valve failure.	
	82		● Main control valve	
	83		● Load holding valve(s)	
	84		● Stabilizer or auxiliary control valve(s)	
	85		● Other	
	86		● Other	
Q	87	Cylinders	Hydraulic cylinders for drifting, rod seal leakage & leakage at welds. Rods for nicks, scores & dent s. Case for damage. Case & rod ends for damage & abnormal wear .	
	88		● Stabiliizer cylinder(s)	
	89		● Inner boom cylinder(s)	
	90		● Outer boom cylinder(s)	
	91		● Extension cylinder(s)	
	92		● Rotation cylinder(s)	
	93		● Jib lift cylinder(s)	
	94		● Jib extension cylinder(s)	
	95		● Other	
Q	96	Winch	Winch, sheaves & drums for damage, abnormal wear , abrasions & other irregularities.	
Q	97	Hyd Filters	Hydraulic filters for replacement per maintenance schedule.	
A	98	Daily	All daily inspection items.	
A	99	Monthly	All monthly inspection items.	
A	100	Quarterly	All quarterly inspection items.	
A	101	Hyd Sys	Hydraulic fluid change per maintenance schedule.	
A	102	Controls	Control valve calibration for correct pressures & relief valve settings	
A	103	Valves	Safety valve calibration for correct pressures & relief valve settings.	
A	104	Valves	Valves for failure to maintain correct settings.	
A	105	Rotation Sys	Rotation drive system for proper backlash clearance & abnormal wear , deformation & cracks.	
A	106	Lubrication	Gear oil change in rotation drive system per maintenance schedule.	
A	107	Hardware	Check tightness of all fasteners and bolts.	
A	108	Wear Pads	Wear pads for excessive wear .	
A	109	Loadline	Loadline for proper attachment to drum.	

Deficiency / Recommendation / Corrective Action Report 4

DATE	OWNER	UNIT I.D. NUMBER

GUIDELINES

A. A deficiency (**X**) may constitute a hazard. **X** must be corrected and/or faulty parts replaced before resuming operation.

B. Recommendations (**R**) should be considered for corrective actions. Corrective action for a particular recommendation depends on the facts in each situation.

C. Corrective actions (**CA**), repairs, adjustments, parts replacement, etc. are to be performed by a qualified person in accordance with all manufacturer's recommendations, specifications and requirements.

NOTE: *Deficiencies (X) listed must be followed by the corresponding corrective action taken (**CA**).*

X = DEFICIENCY **R** = RECOMMENDATION **CA** = CORRECTIVE ACTION TAKEN

X, R, CA	ITEM #	EXPLANATION	DATE CORRECTED

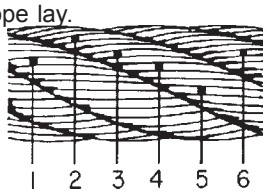
If additional space is required, reproduce this page and attach to this report.

WIRE ROPE INSPECTION

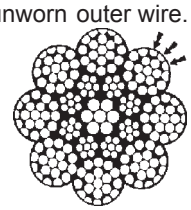
Wire rope with any of the deficiencies shown below shall be removed and replaced immediately .

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

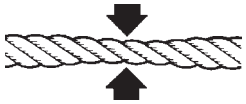
B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



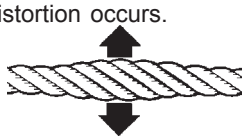
C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



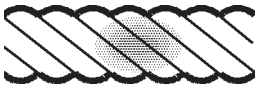
D. When there is a decrease of diameter indicating a core failure.



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.)

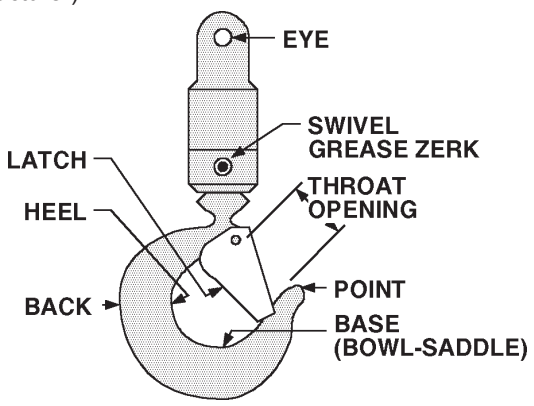
D. LATCH

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.

TWO BLOCK PREVENTION DEVICE INSPECTION

(See Vol. 1, Operation, Maintenance and Repair for a complete description)

The two block prevention system halts the "winch-up" and "extension-out" crane functions before the block contacts the sheave. The two block prevention 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.

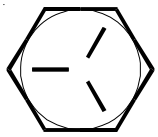
3. Start vehicle, engage PTO and slowly winch loadline up until anti-two block weight comes in contact with the hook end of the loadline cable. At the moment the weight is fully supported by the hook end, the winch up function should become non-functioning, because the two-block damage prevention switch will stop further movement.

If operation other than as described occurs, stop immediately and investigate. Failure to do so will risk damage to the cable or the crane.

Then, extend the winch cable to relieve the two-block condition, and actuate the boom extend function slowly . Again, once the weight is fully supported by the hook end, the boom extend function should become non-functioning, because the two-block damage prevention switch will stop further movement. If operation other than described occurs, stop immediately , reverse the function, and check the system.

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

COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (FT-LBS)	PLATED (FT-LBS)	PLAIN (FT-LBS)	PLATED (FT-LBS)
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.

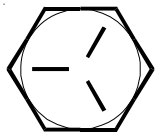
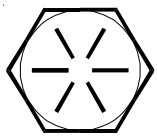
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special 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.

WARNING

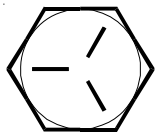
Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads af ter torquing.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

TORQUE DATA CHART - DOMESTIC

FINE THREAD BOLTS

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

COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (FT-LBS)	PLATED (FT-LBS)	PLAIN (FT-LBS)	PLATED (FT-LBS)
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.

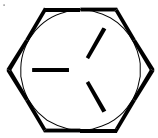
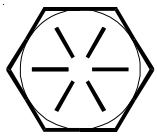
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, collodial copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of Loctite does not affect the torque values listed above.

WARNING

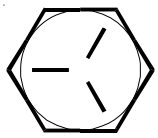
Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing.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

TORQUE DATA CHART - METRIC

FINE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-24	0.3125	3	2	4	3
3/8-24	0.3750	5	4	7	5
7/16-20	0.4375	8	6	11	8
1/2-20	0.5000	12	9	17	12
9/16-18	0.5625	17	12	24	18
5/8-18	0.6250	24	18	33	25
3/4-16	0.7500	41	31	58	44
7/8-11	0.8750	62	45	93	69
1-12	1.0000	89	67	138	103
1 1/8-12	1.1250	123	93	200	150
1 1/4-12	1.2500	171	129	278	209
1 3/8-12	1.3750	232	174	375	281
1 1/2-12	1.5000	304	228	492	369

COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-18	0.3125	2	2	3	2
3/8-16	0.3750	4	3	6	5
7/16-14	0.4375	7	5	10	7
1/2-13	0.5000	10	8	15	11
9/16-12	0.5625	15	11	21	16
5/8-11	0.6250	21	16	30	22
3/4-10	0.7500	37	28	52	39
7/8-9	0.8750	55	41	84	63
1-8	1.0000	82	62	126	94
1 1/8-7	1.1250	110	82	178	133
1 1/4-7	1.2500	155	116	251	188
1 3/8-6	1.3750	203	152	329	246
1 1/2-6	1.5000	270	210	438	328

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 kilogram-meters.

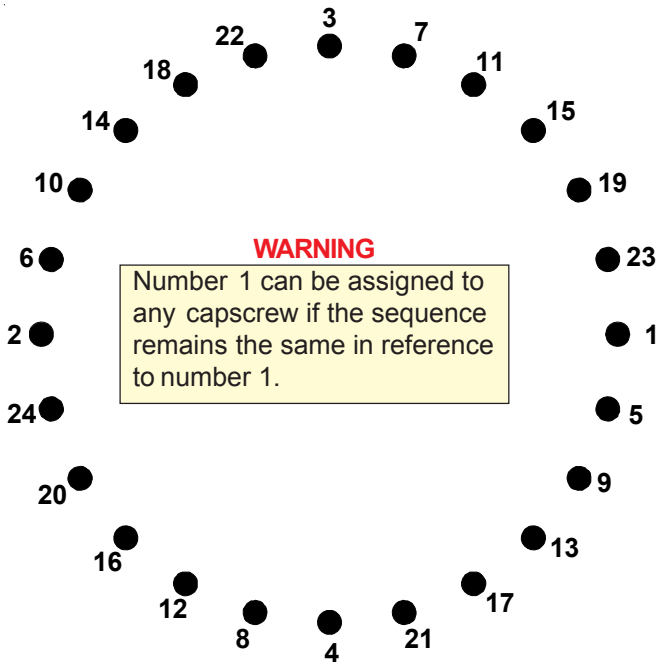
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants of high stress ability, such as Never-Seez compound graphite and oil, molybdenum disulphite, collodial copper or white lead are applied, multiply the torque values in the charts by the factor .90. The use of Loctite does not affect the torque values listed above.

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.

TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE

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)
   (EXAMPLE-METRIC: .40 x 36 KG-M = 14.4 KG-M)

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)
   (EXAMPLE-METRIC: .75 x 36 KG-M = 27 KG-M)

5. Using the proper sequence, torque all capscrews to the listed torque value as determined from the Torque Data Chart.

TURNTABLE BEARING INSPECTION FOR REPLACEMENT

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

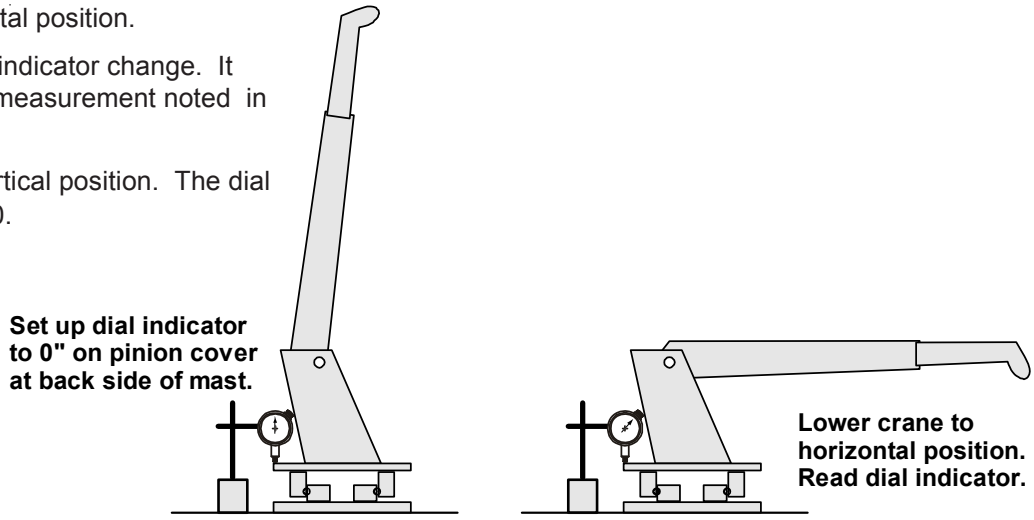
1. Metal particles present in the bearing lubricant.
2. Increased drive power required to rotate the crane.
3. Noise emitting from the bearing during crane rotation.
4. Rough crane rotation.
5. Uneven or excessive wear between the pinion gear and turntable gear.

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

1. Place crane in vertical position.
2. Set a dial indicator at 0 on the pinion cover plate at back side of mast.
3. Lower crane to the horizontal position.
4. Check and record the dial indicator change. It should not exceed the tilt measurement noted in the chart below.
5. Return the crane to the vertical position. The dial indicator should return to 0.



COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION

NOTE	IMT CRANE, LOADER OR TIREHAND MODEL				
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.		1007 1014 1014A 1015 2015/2020 2109 3000 3816/3820 3016/3020 421/425 4300 5016/5020 6016/6020 TH7 BODY ROT'N TH1449 BODY ROT'N TH15B CLAMP TH2551B CLAMP TH2557A CLAMP	5200 5200R 5217 5800 7020 7025 7200 7415 9000 TH10 BODY ROT'N TH14 BODY ROT'N	16000 32018 32027 32030 T30 T40	9800 12916 13031 13034 14000 15000 18000 20017 8000L H1200 H1200RR T50 TH2551B BODY ROT'N TH2557B 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)**

20000710

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	MANUAL PART NO.
SUBMITTED BY		
COMPANY		
ADDRESS		
CITY, STATE, ZIP		
TELEPHONE		

☐ ERROR FOUND

LOCATION OF ERROR (page no.): _____

DESCRIPTION OF ERROR: _____

☐ ERROR FOUND

DESCRIPTION OF ADDITION: _____

REASON FOR ADDITION: _____

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