Manual Part # 99904521

3020 Parts & Specifications

Effective August 15, 2008

Revision Date 20110210

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Contents

Revisions

DATE	LOCATION	DESCRIPTION
20081110	THROUGHOUT	3020 MANUAL RE-RELEASE
20100617	73734473	ECN 11134 - VALVEBANK 73734473 REPLACED 73734194
20110210	REPL. VALVE COILS	ADDED INFORMATION ON REPLACING VALVE COILS

3020 Manual Effectivity

Manual 99904521 is effective for model 3020 cranes produced from 2008 forward, with crane serial numbers beginning with the sequence "3020SII08...". However, some 3020 cranes which have serial numbers which indicate they were produced prior to the design change but they include the new design. Cranes with the following serial numbers were built with the new design, and include the parts in manual 99904521:

3020071001
3020071002
3020071006
3020071007
3020071008
3020081002
3020081004
3020081006
3020081007
3020081008
3020081009
3020081010
3020081011
3020081012
3020081013
3020081014
3020081016

CHAPTER 1

Introduction

This volume deals with information applicable to your particular crane. For operating, maintenance and repair instructions, refer to Telescopic Crane Volume 1: OPERATION, MAINTENANCE AND REPAIR. (IMT part number 99903514.)

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. This crane was designed and built to meet the standards of ANSI/ASME B30.5, Mobile & Locomotive Cranes. Contact the American Society of Mechanical Engineers (www.asme.org) for more information.

Throughout this manual, three means are used to draw the attention of personnel. They are NOTEs, CAUTIONs and WARNINGs 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.

For a safe work environment, treat this equipment with respect and service it regularly.

CHAPTER 2

Specifications

In This Chapter

Specifications

GENERAL SPECIFICATIONS

CRANE RATING *	30,000 ft-lb (4.15 ton-meters)
REACH (from centerline of rotation)	20'-6" (6.2 m)
HYDRAULIC EXTENSIONS (2)	60" (152.4 cm)
MANUAL EXTENSION	48" (121.9 cm)
LIFTING HEIGHT (from base of crane)	22'-5" (6.8 m)
CRANE WEIGHT	1460 lb (660 kg)
OUTRIGGER SPAN (required option) - Crane Side from Centerline of Chassis	89" (226 cm)
STORAGE HEIGHT (crane only)	39" (99 cm)
MOUNTING SPACE REQUIRED (crane base)	20" x 21" (50.8 cm x 53.3 cm)
TIE-DOWN BOLT PATTERN	14-3/4" x 14-3/4" (37.5 cm x 37.5 cm on center)
HORIZONTAL CENTER OF GRAVITY (from centerline of rotation)	39" (99.1 cm)
VERTICAL CENTER OF GRAVITY (from bottom of crane base)	19" (48.3 cm)
OPTIMUM PUMP CAPACITY (PTO Driven)	10 U.S. GPM
SYSTEM OPERATING PRESSURE	2500 psi (172 bar)
ROTATIONAL TORQUE	7500 ft-lb (1.04 ton-meters)
* Crane rating (ft-lb) is the rated load (lb) multiplied by the respective distance (ft) from centerline of rotation with all extensions retracted and lower boom in horizontal position.	

SPEEDS

ROTATION	400° (7.0 rad)	33 seconds
LOWER BOOM ELEVATION	-10° to +80° (-0.2 to +1.4 rad)	9 seconds
EXTENSION CYLINDER	60" (152.4 cm)	9.5 seconds

* All times based on 10 GPM (37.9 lpm) PTO delivery rate.

CYLINDERS

LOWER BOOM CYLINDER	4" bore; 22.5" stroke (10.2 cm bore; 57.29 cm stroke)
EXTENSION BOOM CYLINDER	2.5" bore; 60" + 48" stroke (6.4 cm bore; 152.4 cm + 121.0 cm stroke)

POWER SOURCE

PTO DRIVEN - Integral mounted hydraulic pump and PTO application. Other standard power sources may be used. Minimum power required is 23.5 horsepower based on 10 GPM (37.9 liters/min) at 3,000 PSI (207 bar).

ROTATION SYSTEM

Turntable bearing with external worm gear powered with a high-torque hydraulic motor through a self-locking worm. Total gear reduction is 85 to 1.

CYLINDER HOLDING VALVES

The base ends (extend sides) of the lower boom and extension cylinders are equipped with integral-mounted counter-balance valves to prevent sudden cylinder collapse in case of hose or other hydraulic failure. The extend side of the lower boom cylinder is equipped with a 10 gpm counterbalance valve. The counter balance valve serves several functions. First, it is a holding valve. Secondly, it is designed to control the speed at which the lowering function operates, and allows that motion to be metered under load. Finally, it prevents the loss of an excess amount of oil in the event of a hose failure. Only the oil in the hose, at the time of the failure, will be lost.

EXCESSIVE LOAD LIMIT SYSTEM (ELLS)

A pressure switch which is mounted on the extend side of the lower boom cylinder and connected electrically to the lift side of the winch, the extend side of the extension boom, and the down side of the lower boom provides the capacity alert system. If the operator attempts to lift a load exceeding the rated capacity of the crane, the winch lift, extension out and lower boom down functions will not operate. To relieve the situation, the operator may set the load down (winch down) or retract the extension boom (extension in).

WINCH

The winch is powered using a hydraulic motor driving a 38:1 worm gear. The line speed of 27.0 ft/minute (8.1 m/min), under no load, is achieved at an optimum oil flow of 10 GPM (37.9 liters/min) and one-part line. Maximum single line winch lifting capacity is 3000 lb (1360 kg), and

maximum two-part line lifting capacity is 6000 lb (2720 kg). The winch is equipped with 85 feet (25.9 m), 3/8" (9.5 mm), 6X25 FW PRF RRL IWRC XIPS wire rope. Nylon sheaves are located at the tip of the extension boom. The ratio of winch drum and sheave pitch diameter is 18.6:1 for the drum and 18:1 for the snatch block and boom tip sheave. A compact anti-two block device is included to prevent the lower block or hook assembly from coming in contact with the boom sheave assembly.

HYDRAULIC SYSTEM

The hydraulic system is an open-centered, full-pressure system that requires 10 GPM (37.85 liters/min.) optimum oil flow at 2500 psi (172 bar). It is equipped with a four-section, stack-type, electric, remote control valve with 30-foot control cable. The system includes separate hydraulic oil reservoir, suction line filter, and return-line filter.

MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	Conventional Cab
WHEELBASE	154" (391 cm)
CAB-TO-AXLE	84" (213 cm)
RESISTANCE TO BENDING MOMENT	360,000 in-lb (4149 kg-m)
FRAME SECTION MODULUS	10 cubic inches (163.9 cc)
FRONT AXLE RATING (GAWR)	5000 lb (2268 kg)
REAR AXLE RATING (GAWR)	9500 lb (4309 kg)
GROSS VEHICLE RATING	14,500 lb (6577 kg)
TRANSMISSION	4 speed

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

NOTES:

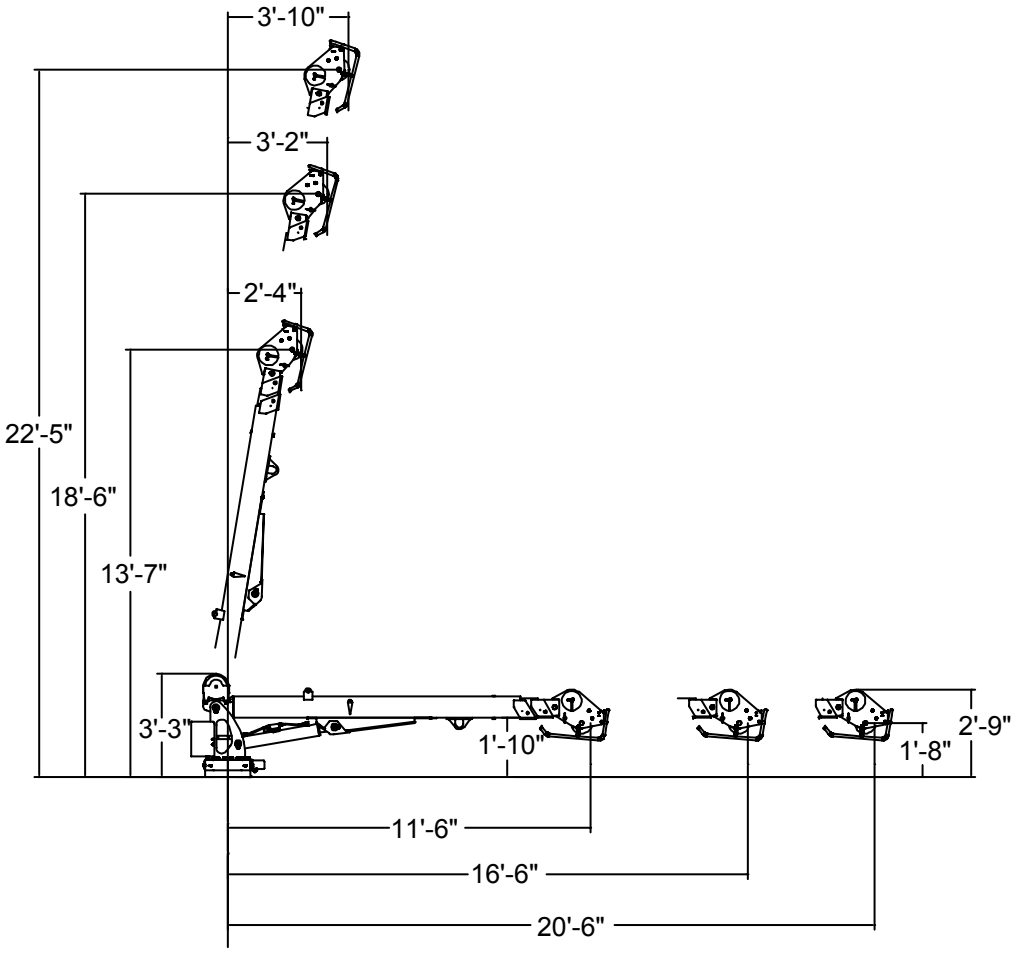
1 GAWR means Gross Axle Weight Rating. GAWR is dependent on all vehicle components including axles, tires, wheels, springs, brakes, steering and frame strength meeting the manufacturer's recommendations. Always specify GAWR when purchasing a truck.

2 Minimum axle requirements may increase with use of diesel engines, longer wheelbase or service bodies. Contact the factory for more information.

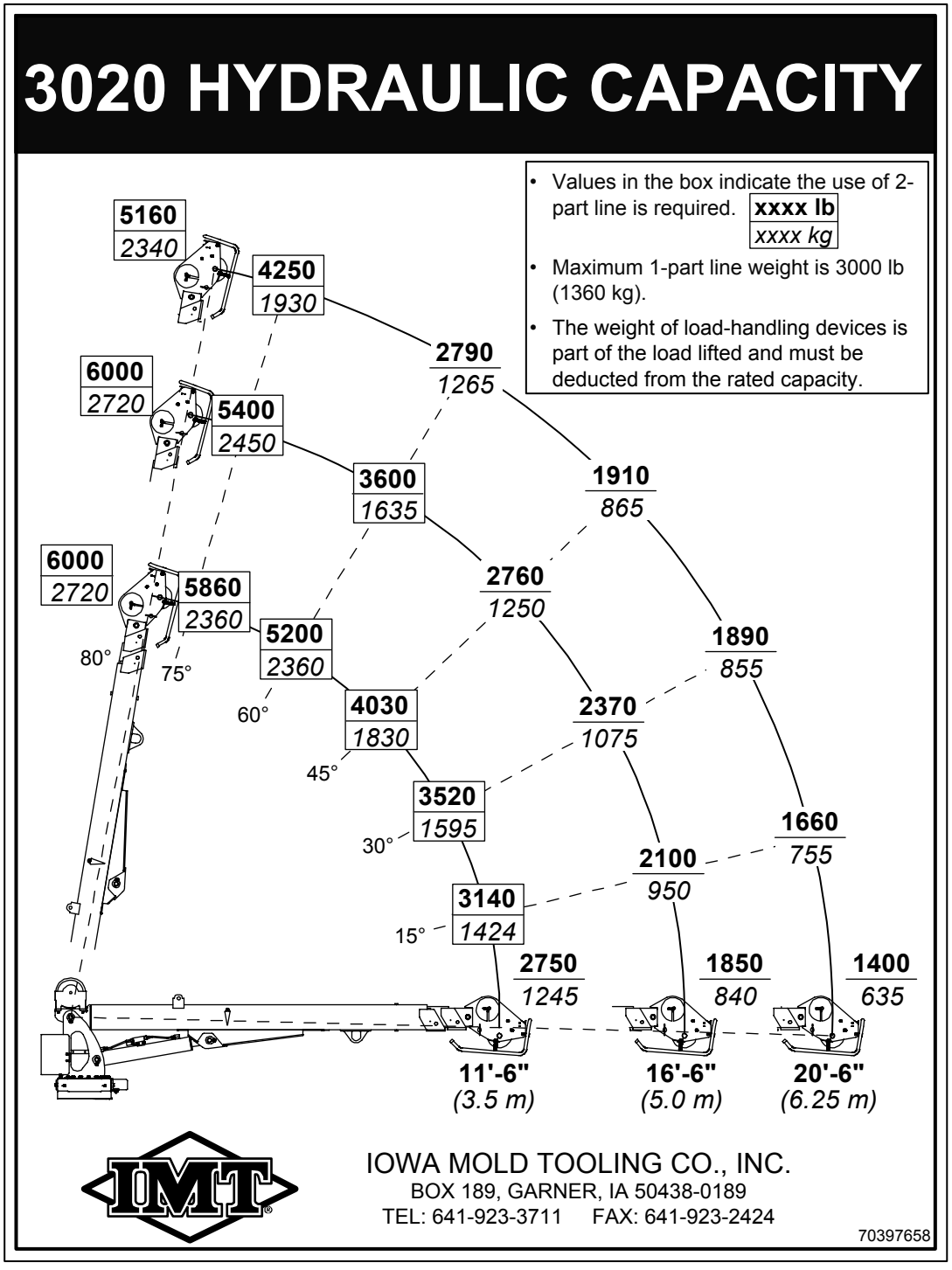
3 Weight distribution calculations are required to determine final axle loading.

All chassis, crane and body combinations must be stability-tested to ensure stability per ANSI B30.5

Geometric Configuration



Capacity Placard, 3020

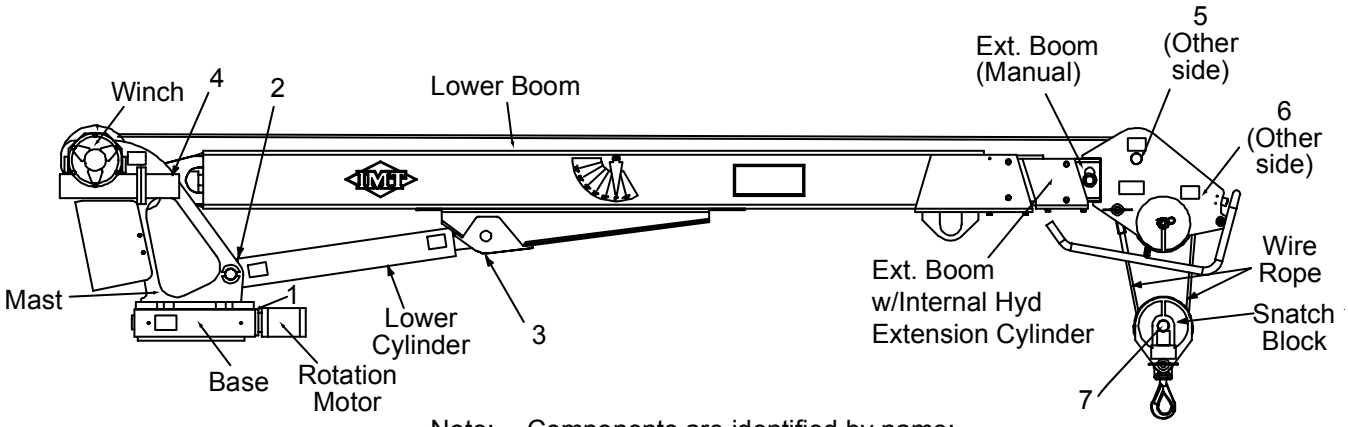


CHAPTER 3

Crane Reference

In This Chapter

Assemblies and Grease Zerk Locations



Note: Components are identified by name; grease zerks are identified by number.

ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	Gear Rotator Grease Extension *Rotate Crane While Greasing.	Shell Alvania 2EP or Shell Retinax "A"	Weekly
2.	Lower Cylinder Base		
3.	Lower Cylinder Rod		
4.	Mast/Lower Boom Hinge Pin		
5.	Upper Sheave Pin		
6.	Lower Sheave Pin		
7.	Snatch Block Sheave Pin		

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 the Volume 1: Telescopic Crane Operation & Safety (99903514) for additional lubrication requirements.

3020 Recommended Spare Parts List

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 not considered as normal wear items during the first year of operations and you need to contact the distributor or manufacturer for availability.

ASSEMBLY DESCRIPTION		
PART #	**SPARE PART DESCRIPTION**	**QUANTITY**
BASE & MAST ASSEMBLY		
73051919	HYDRAULIC MOTOR	1
72060794	CAP SCREW 1/2-13X1.25 SH PLAIN	2
76039295	GASKET	1
GEAR ROTATOR (71056543)		
70395074	O-RING	1
70395076	SEAL	1
70145786	SNAP RING	1
70055271	BEARING-CONE	2
70055281	BEARING-CUP	2
70145501	BEARING RETAINER	1
70056550	WORM	1
73145506	SHIM .005	2
73145505	SHIM .015	2
73145504	SHIM .030	2
76395075	GASKET	1
CRANE & WINCH ASSEMBLY		
70580143	WIRE ROPE ASSEMBLY (WORM WINCH)	1
71073035	HOOK W/LATCH	1
	DOWNHAUL WEIGHT	
52719629	PIN	2
52719630	PIN	1
WINCH, WORM (71057936)		
94396834	SEAL KIT	1
76393174	O-RING	1
76393173	OIL SEAL	1
70055202	BALL BEARING	2
70732542	BRAKE KIT	1
76393171	GASKET	2
CYLINDER, LOWER (51720921)		
51744131	SEAL KIT	1
73540052	COUNTERBALANCE VALVE	1
77041561	PRESSURE SWITCH	1
7BF81215	BUSHING	4

BOOM & WINCH ASSEMBLY (99903683)		
51713168	CORD REEL ASSEMBLY	1
60030330	WEAR PAD	1
60030331	WEAR PAD	1
60030339	WEAR PAD	4
60030340	WEAR PAD	1
60030341	WEAR PAD	1
60122985	WEAR PAD	4
77041459	LIMIT SWITCH	1
CYLINDER, EXTENSION (51720936)		
9D101220	SEAL KIT	1
73054999	COUNTERBALANCE VALVE	1
VALVEBANK, WORM WINCH (73734473)		
73540252	VALVE, PROP FLOW	1
73540254	VALVE-RELIEF	1
73540375	SOLENOID VALVE SECTION	4
INSTALLATION KIT (93719692)		
73052092	HYDRAULIC FILTER ELEMENT	1

3020 Crane Installation

GENERAL

This section contains instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure that the chassis is ready to receive the crane (see the Installation Section of the IMT Telescopic Crane Operation & Safety Manual, 99903514).

Reinforce the chassis frame, as necessary, and install the PTO and pump.

Each installation may vary in components used. It is important to use hoses of proper length, pumps of correct size, and PTO's of adequate speed. Study the applicable installation kit in the parts section before attempting any installation.

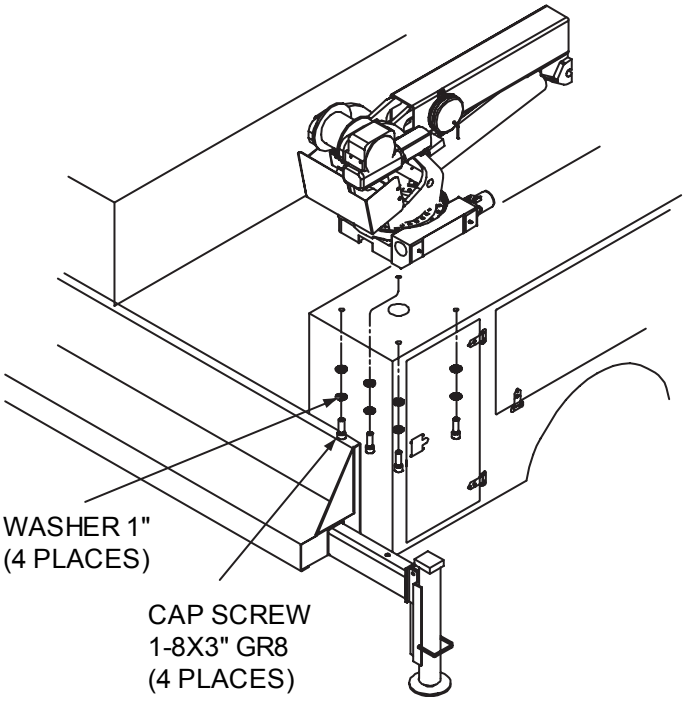
CRANE INSTALLATION

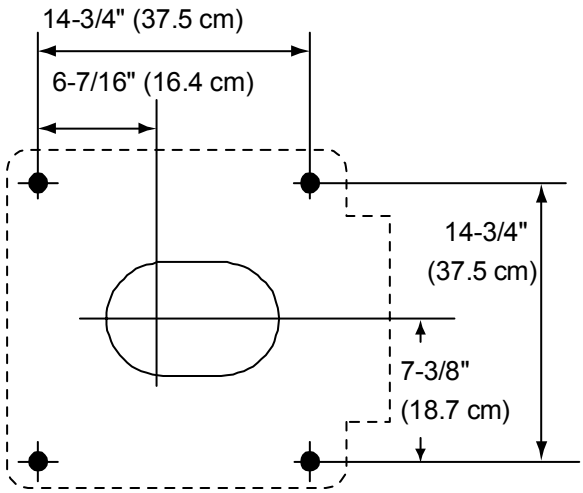
In addition to meeting the ***minimum chassis specifications*** , there must be sufficient room for mounting the crane and the platform must be strong enough to support the crane and rated load. Install the 3020 crane only on an IMT designed and approved truck body. The body must be designed to sustain the forces imposed by the crane when lifting the full rated load. In addition, an IMT designed body is designed to take full advantage of the standard reservoir placement. This reservoir is installed in the cargo area of the body. Before attempting to install the crane, the body must be installed.

To install the crane:

1 Use a lifting device capable of lifting the weight of the crane, up to 1460 lb (635 kg). Attach fabric slings to the crane lower boom, centered approximately 18 inches from the mast hinge. Make certain the crane is well balanced on the slings by slowly lifting approximately 6" off the ground. Lift the crane, apply a bead of waterproof compound, such as silicon based caulk, to the bottom of the base. Move the chassis under the crane and lower the crane into the desired position.

2 Install the 1-8x3" mounting cap screws and 1" washers to secure the crane base to the truck body (see figure). Torque the cap screws to 680 ft-lb (94 kg-m).

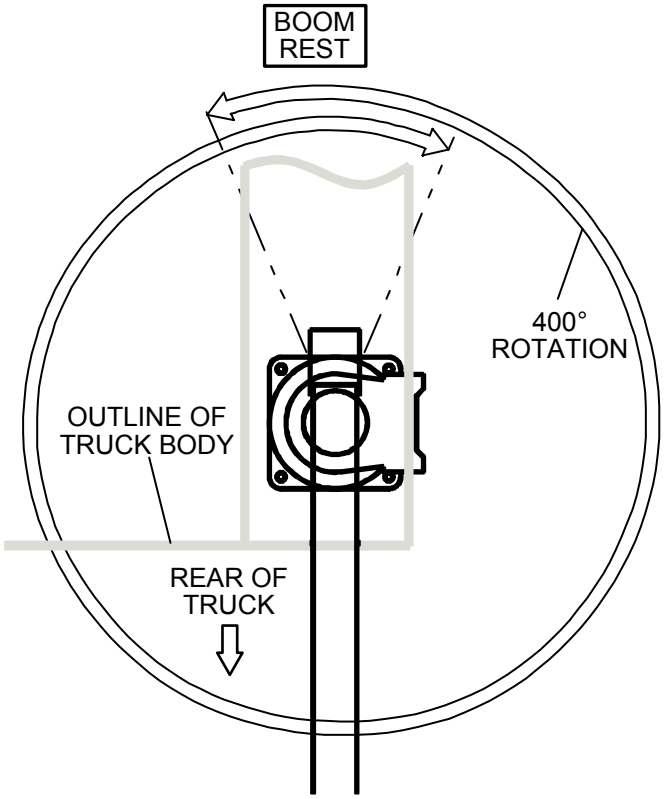




MOUNTING HOLE DIMENSIONS

Telescopic Crane Orientation

When an IMT telescopic crane is not factory-installed on a body, the crane is packed with the boom oriented as it is built on a test stand to facilitate handling. Install the crane on the body with boom pointing backward. Once the crane is bolted down, it can be rotated 180° (3.14 radians) to the boom rest.



Crane Control

IMT's telescopic cranes are controlled by radio or tethered remote controls. This telescopic crane includes a tethered remote control with a radio remote control option. For complete details on operating your telescopic crane, refer to the IMT Telescopic Crane Operation & Safety Manual (part number 99903514).

CHAPTER 4

Parts

In This Chapter

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 maintenance and repair manuals for this crane family. For optional equipment such as winches and remote controls, refer to the appropriate service manual.

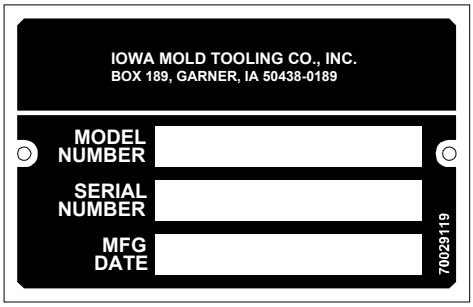
WARNING

DO NOT ATTEMPT TO REPAIR ANY COMPONENT WITHOUT READING THE INFORMATION CONTAINED IN THE REPAIR SECTION. 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

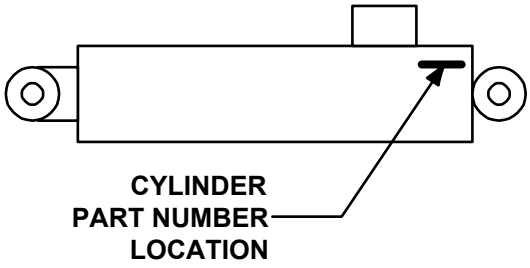
Every IMT crane has an identification placard (see figure). This placard is attached to the inner boom, mast, or crane base. When ordering parts, communicating warranty information, or referring to the unit in correspondence, always include the serial number and model numbers. Address all inquiries to your authorized IMT distributor or to:

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



CYLINDER IDENTIFICATION

To insure proper replacement parts are received, it is necessary to specify the complete number/letter sequence for any part requested. Part numbers may be cross checked by comparing the stamped identification on the cylinder case (See figure below) against the information contained 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 outrigger weldments bear a stamped part number. Any time a major weldment is replaced, you must specify the complete part number as stamped on the weldment. The locations of the part numbers are shown in the Crane Reference Section.

ORDERING REPAIR PARTS

When ordering replacement parts:

1 Give the model number of the unit.

2 Give the serial number of the unit.

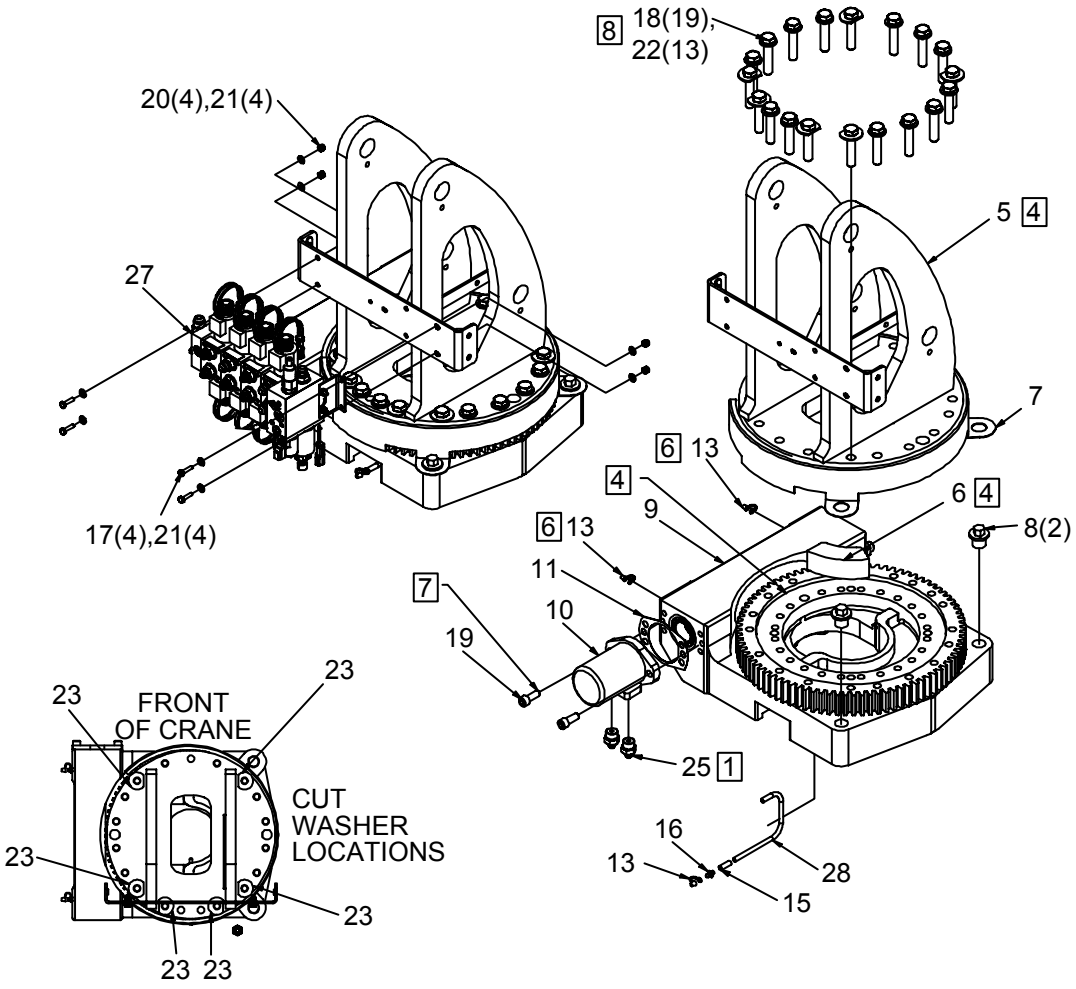
3 Specify the complete part number. When ordering cylinder parts, or one of the main weldments, always give the stamped part number.

4 Give a complete description of the part.

5 Specify the quantity required.

Base and Mast Assemblies

Base & Mast Assembly (99903947) (Primary Configuration)



NOTES (IF TIED TO DRAWING, SEE REFERENCE # IN BOX □):

1 HYDRAULIC FITTINGS ARE PART OF 91720110 (PLANETARY WINCH) OR 91720113 (WORM DRIVE WINCH) HOSE KITS.

2 USE 70034060 AS NEEDED TO SECURE WIRE HARNESS.

3 USE ITEMS #32, 33, AND 34 FOR PLANETARY WINCH APPLICATIONS.

4 USE RUST PREVENTATIVE ON SLIDE STOP, BEARING RACE AND BOTTOM OF MAST.

5 INSTALL HARNESS JUMPER AND CONNECTORS PER WIRING HARNESS DRAWING.

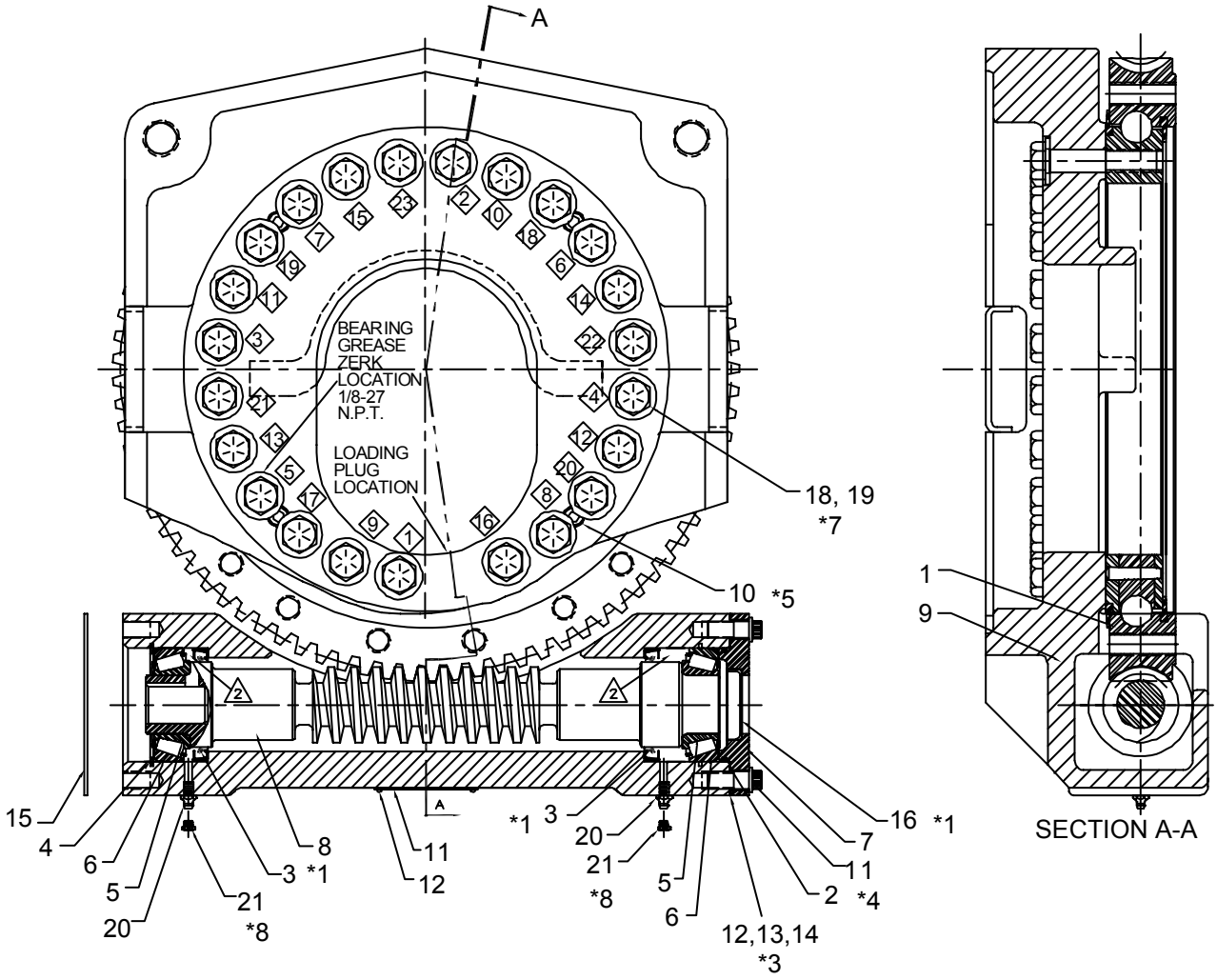
6 REMOVE PLUGS AND INSTALL GREASE ZERKS WITH GEAR ROTATOR, #9.

7 USE BLUE THREAD LOCKER.

8 TORQUE TO 160 FT-LB

99903947 PARTS LIST				
ITEM	PART #	DESCRIPTION	KIT #	QUANTITY
1.	51720119	HARDWARE KIT-BASE & MAST (INCL 13-23)		1
3.	91720110	HOSE KIT-PLANETARY WINCH (INCL 24,25,28,33)		1 REF
4.	91720113	HOSE KIT-WORM WINCH (INCL 25,28)		1 REF
5.	52719628	MAST WELDMENT		1
6.	60120138	SLIDE-ROTATION STOP		1
7.	60120192	GEAR GUARD		1
8.	70029595	THREADED PLUG 1.00-8		2
9.	71056543	GEAR ROTATOR		1
10.	73051919	MOTOR-HYD (WAS 73511070 THRU 9-15-08)		1
11.	76039295	GASKET		1
12.	77441204	HARNESS-TELESCOPIC RADIO REMOTE (WAS 77441184 THROUGH 8-1-06)		1
13.	70034382	CAP-GREASE	#1	3
14.	70034060	TIES-PLASTIC	#1	5
15.	72053301	COUPLING-BLK .12	#1	1
16.	72053508	ZERK-NPT .12	#1	1
17.	72060004	CAP SCR .25-20X 1.00 HH GR5 Z	#1	4
18.	72060177	CAP SCR .62-11X 3.00 HH GR8 Z	#1	19
19.	72060794	CAP SCR .50-13X 1.25 SH PLAIN	#1	2
20.	72062104	NUT .25-20 HEX NYLOCK (WAS 6)	#1	4
21.	72063001	WASHER .25 FLAT (WAS 12)	#1	8
22.	72063119	WASHER .62 FLAT ASTM F436	#1	13
23.	72063216	WASHER .62 N FLAT-CUT 3816	#1	6
24.	72053758	ELBOW-M STR/90/M JIC 4 4	#3	2 REF
25.	72533613	ADPTR-M STR/M JIC 10 6	#3 OR #4	2 REF
27.	73734473	VALVE BANK-MODIFIED INLET (WAS 73734194 THROUGH S/N 3820S2091216, 5020S2091012)		1
28.	51395121	HOSE-AA .13 X 13.50 OAL (2-2)	#3 OR #4	1
29.	77045945	CONNECTOR-DEUTSCH DT 2 PIN RECEPT		1
30.	77044668	PLUG-SEAL DEUTSCH 114017		2
31.	77441191	HARNESS-PRESSURE SWITCH JUMPER		1
33.	72532351	ADPTR-M STR/M JIC 4 4		1
REV. D 20100609				

Gear Rotator (71056543) (Primary)



NOTES (*)

1 INSTALL SEALS #3 AND #16 WITH LOCTITE PLASTIC GASKET ON O.D. LUBRICATE SEAL SURFACE BEFORE ASSEMBLY.

2 PACK CAVITIES WITH EPO GREASE

3 SHIM TO OBTAIN 0.000 / 0.004 END PLAY ON WORM SHAFT.

4 LUBRICATE O-RING #2 WITH WORM GEAR OIL BEFORE INSTALLING.

5 INSTALL BOLTS #10 WITH LOCTITE #242.

6 SET BACKLASH BETWEEN WORM AND ROTATION BEARING 0.005 - 0.012.

7 TIGHTEN 5/8-11 UNC GRADE 8 MOUNTING BOLTS AS FOLLOWS: TIGHTEN PROGRESSIVELY AND AT 180º INTERVALS. FIRST INTERVAL AT 70 FT-LB. SECOND INTERVAL AT 140 FT-LB. THIRD INTERVAL AT 210 FT-LB. TIGHTEN BOLTS IN ORDER SHOWN IN DIAMONDS (<>). DO NOT USE LOCTITE ON MOUNTING BOLTS.

8 ITEM #20 SHIPS LOOSE. INSTALL ITEM #21 FOR SHIPPING.

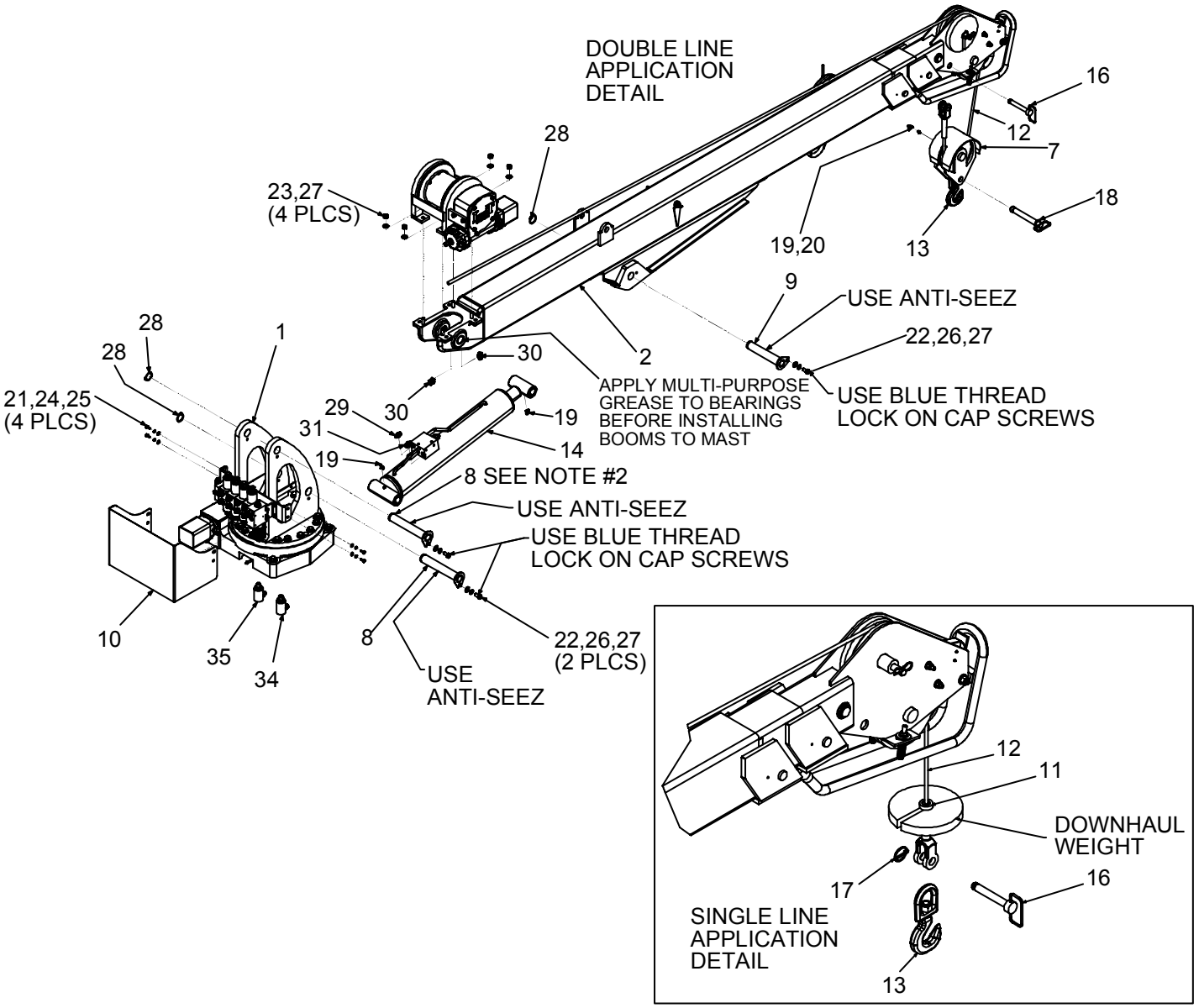
WARNING

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 DEATH OR SERIOUS INJURY.

71056543 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	70056527	ROTATION BEARING	1
2.	70395074	O-RING	1
3.	70395076	SEAL	2
4.	70145786	SNAP RING	1
5.	70055271	BEARING-CONE	2
6.	70055281	BEARING-CUP	2
7.	70145501	BEARING RETAINER	1
8.	70056550	WORM	1
9.	70145787	HOUSING	1
10.	72601734	CAP SCR 3/8-16X1-1/4 SH	4
11.	72601733	CAP SCR 1/2-13X1-1/4 FERRY	4
12.	73145506	SHIM .005THK	2
13.	73145505	SHIM .015THK	2
14.	73145504	SHIM .030THK	2
15.	76395075	GASKET	1
16.	72533604	PLUG	1
17.	72661504	PIN 3/8X1	2
18.	72601751	CAP SCR 5/8-11X2-3/4 HHGR8	23
19.	72063219	WASHER 5/8 FLAT HARD	23
20.	72533605	ZERK	2
21.	72533439	VENT PLUG	2

REV. B 20031029

Crane & Worm Winch Assembly (99903948) (Primary Configuration)



NOTES:

1 FOR DOUBLE LINE APPLICATION, INSTALL PIN #16 THROUGH BOOM SIDE PLATE, THEN THROUGH WIRE ROPE CLEVIS. FOR SINGLE LINE APPLICATION, INSTALL PIN #16 THROUGH WIRE ROPE CLEVIS AS SHOWN.

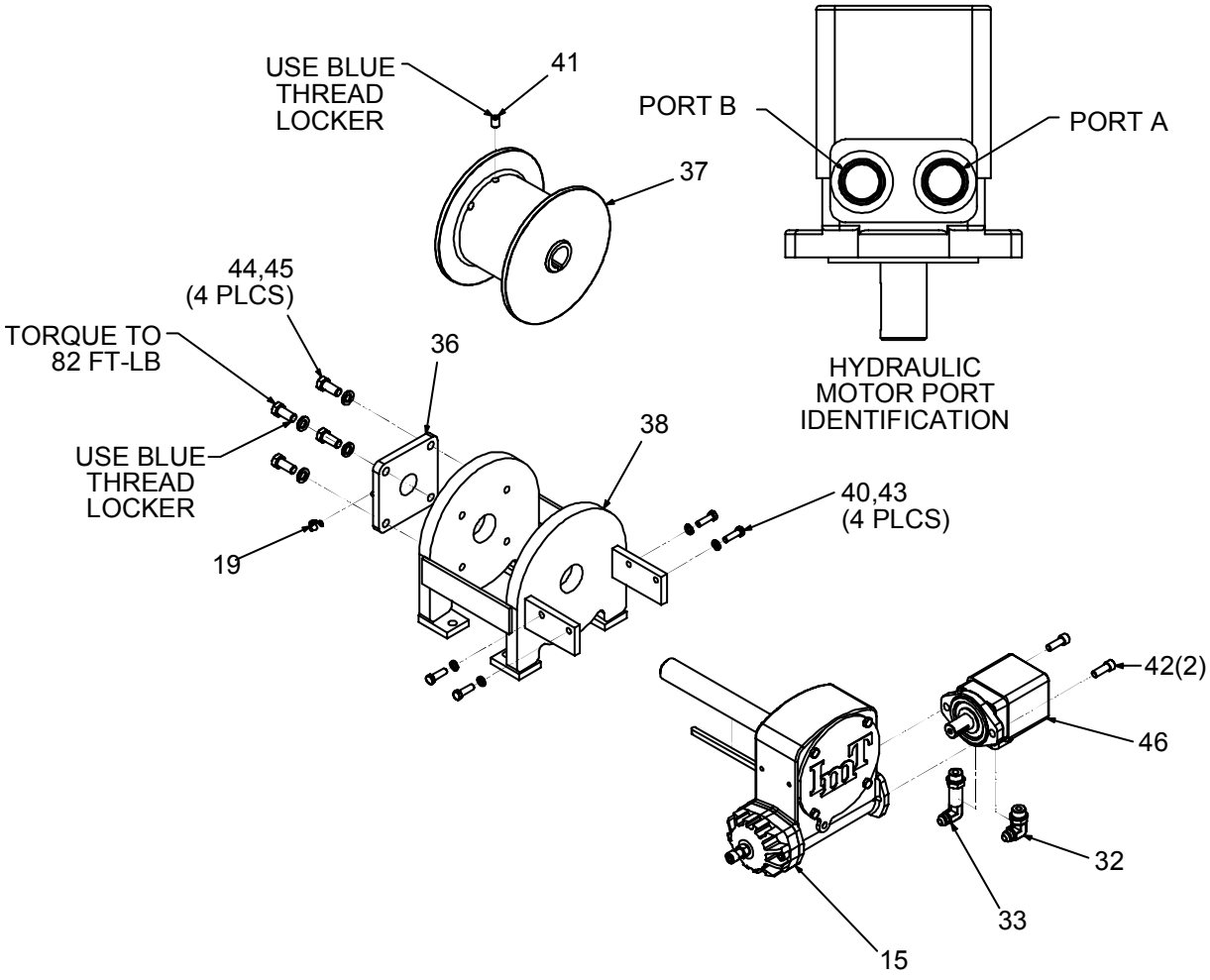
2 IF REQUIRED, USE 72063037 MACHINERY BUSHINGS BETWEEN MAST & BOOM WHEN INSTALLING PIN #8.

3 FOR SINGLE LINE, MOUNT DOWNHAUL WEIGHT OVER CLEVIS.

4 USE 70034069 AS NEEDED TO SECURE WIRE HARNESS.

5 VIEW SHOWN WITH CRANE AS POSITIONED ON ASSEMBLY STAND.

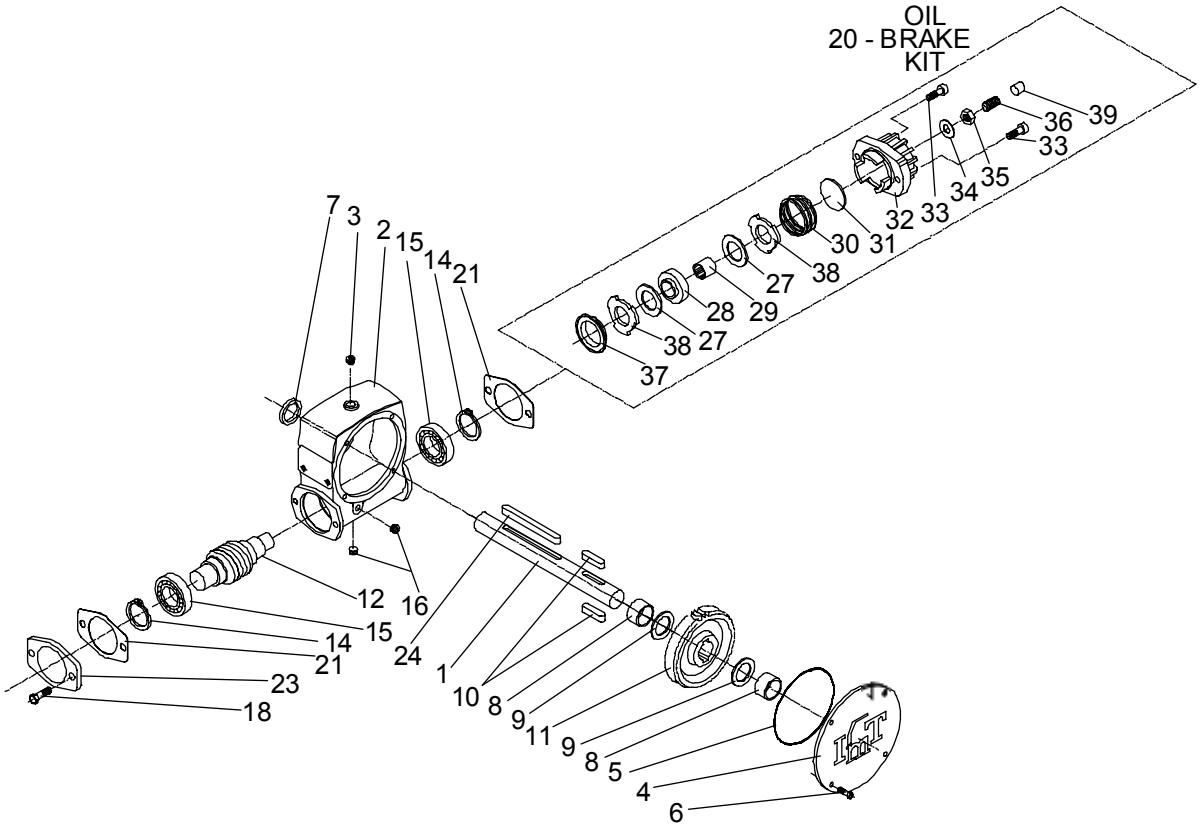
99903948 WINCH & MOTOR ASSEMBLY



99903948 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	99903947	DWG-BASE & MAST ASY	REF
2.	99903683	DWG-BOOM ASY	REF
3.	99903944	HYD INSTALLATION DWG-WORM WINCH	REF
4.			1
5.	91720113	HOSE KIT-WORM WINCH (INCL 29-35)	1
6.	51719762	HARDWARE KIT-CRANE & WORM WINCH (INCL 19-28,40-44)	1
7.	52715836	GUARD WELDMENT SNATCH BLOCK	1
8.	52719629	PIN-TYPE MM 1.50X 9.75 (9.19)	2
9.	52719630	PIN-TYPE MM 1.50X 8.75 (8.19)	1
10.	60127985	COVER-VALVE BANK	1
11.	70149793	COLLAR-SHAFT	1
12.	70580143	CABLE ASM	1
13.	71073035	HOOK-SWVL W/LATCH	1

99903948 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
14.	51720916	CYLINDER (5020) (WAS 71412008 THRU 4/3/07)	REF
14.	51720921	CYLINDER (3820) (WAS 71411871 THRU 5/17/07)	REF
15.	71057936	WINCH (3820)	REF
15.	70570501	WINCH (5020)	REF
16.	72661514	PIN-LOCK W/HANDLE .875 X 4.25	1
17.	72661543	PIN-QUICK 316-10QP	2
18.	73733171	PIN LOCK 1X6 W/HAIR PIN	1
19.	70034382	CAP-GREASE	4
20.	72053508	ZERK-NPT .12	1
21.	72060002	CAP SCR .25-20X .75 HH GR5 Z	4
22.	72060091	CAP SCR .50-13X 1.00 HH GR5 Z	3
23.	72062107	NUT .50-13 HEX CENTER LOCK Z	4
24.	72063001	WASHER .25 FLAT	4
25.	72063049	WASHER .25 LOCK	4
26.	72063053	WASHER .50 LOCK	3
27.	72063132	WASHER .50 FLAT ASTM F436	7
28.	72066132	RETAINING RING-EXT 1.50 HD	3
29.	72532355	ADPTR-M STR/M JIC 6 6	1 REF
30.	72532356	ADPTR-M STR/M JIC 8 6	2 REF
31.	72532357	ADPTR-M STR/M JIC 6 8	1 REF
32.	72053764	ELBOW-M STR/90/M JIC 10 8	1 REF
33.	72534435	ELBOW-M STR/90/M JIC XLG 10 8	1 REF
34.	72534412	SWIVEL-M JIC/90/M JIC 10 10	1 REF
35.	72533648	SWIVEL-M JIC/90/M JIC 8 8	3 REF
36.	70055185	BEARING-FLANGE BLK FC4-35-1.5	1
37.	51713808	WINCH DRUM - MACHINED 3816	1
38.	52719749	WINCH MNT-WLDMNT	1
39.	70034069	TIES-PLASTIC	2
40.	72060047	CAP SCR .38-16X 1.25 HH GR5 Z	4
41.	72060596	SET SCR .50-13X .75 SH PLAIN	1
42.	72060774	CAP SCR .44-14X 1.25 SH PLAIN	2
43.	72063051	WASHER .38 LOCK	4
44.	72063054	WASHER .56 LOCK	4
45.	72601499	CAP SCR .56-12X 1.25 HH GR5 Z	4
46.	73051940	MOTOR (5020)	REF
46.	73511069	MOTOR (3820)	REF
REV C 20090114			

Winch, Worm (71057936)

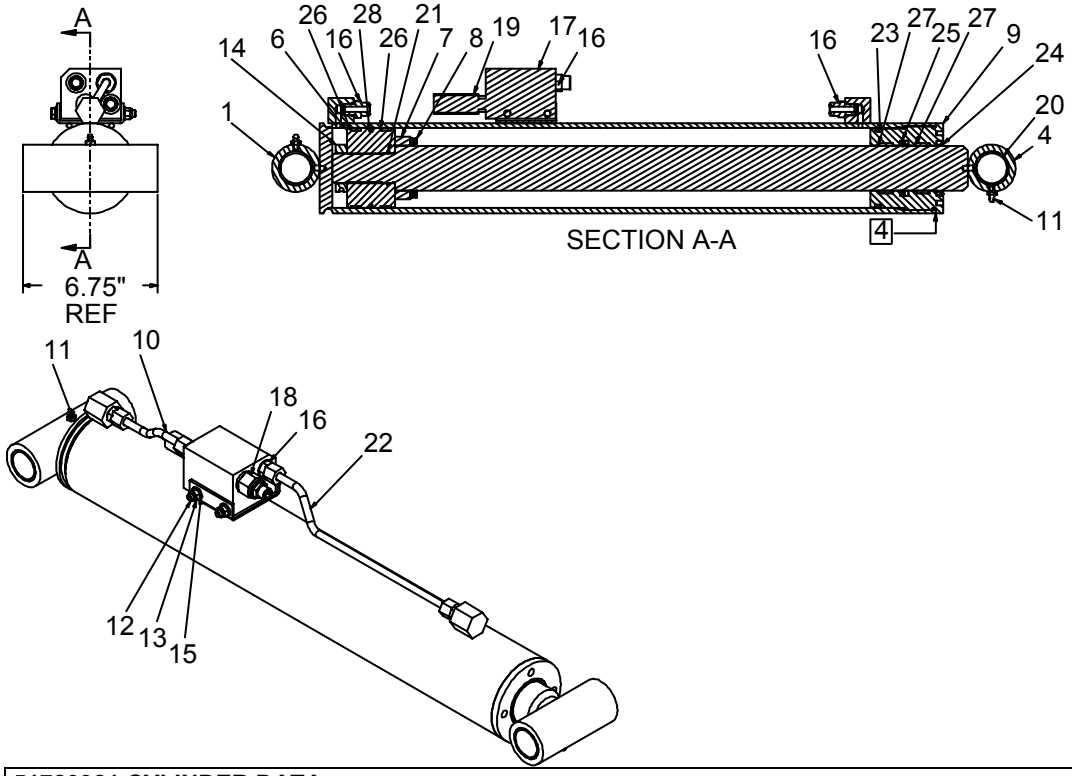


71057936 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	70143673	SHAFT-OUTPUT	1
2.	70143672	HOUSING	1
3.	70048142	BUSHING & BRTHER KIT 3/8 NPT	1
4.	70145277	COVER	1
5.	76393174	O-RING	1
6.	72601568	CAP SCREW	4
7.	76393173	OIL SEAL	1
8.	70143670	BUSHING	2
9.	70143669	WASHER	2
10.	70143668	KEY	2
11.	70056428	GEAR-SR	1
12.	70056427	WORM-SR	1
14.	72661348	RETAINING RING	2
15.	70055202	BALL BEARING	2
16.	70143865	PIPE PLUG	2
18.	72601567	CAP SCREW	2
20.	70732542	BRAKE KIT (INCL:27-38)	1
21.	76393171	GASKET	2
23.	—	PROTECTOR (DISCARD)	1REF

71057936 PARTS LIST			
24.	70143658	KEY	1
27.	70143664	*FRICTION DISC	2REF
28.	70143665	*BRAKE HUB	1REF
29.	70143662	*CAM CLUTCH	1REF
30.	70143661	*SPRING	1REF
31.	70143660	*THRUST WASHER	1REF
32.	70143666	*BRAKE HOUSING	1REF
33.	72601565	*CAP SCREW-SOC HD	2REF
34.	76393172	*WASHER-SEAL	1REF
35.	72601722	*LOCKNUT-SEAL	1REF
36.	72601723	*SET SCREW	1REF
37.	70143659	*BRAKE SPACER	1REF
38.	70143663	*STATOR PLATE	2REF
39.	70034440	*CAP-PLASTIC	1REF
	94396834	SEAL KIT - MOTOR	REF
	* PART OF ITEM 20.		

REV. D 20031201

Cylinder, Lower, 3820 (51720921) (Eff. 5-17-07)



51720921 CYLINDER DATA	
EXTENDED	12.57 IN², 1.18 GAL
RETRACTED	8.59 IN², 0.80 GAL
CASE	ø4.5 X 4.08 X 30.31" LONG
ROD	ø2.25" X 32.94" LONG (1.50 S)
DRY WEIGHT	99 LB
TEST PRESSURE	3600 PSI
OPERATING PRESSURE	2350 PSI

NOTES (IF TIED TO DRAWING, SEE REFERENCE NUMBER IN □):

1 REPLACE ALL COMPONENTS OF THE SEAL KIT WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

2 APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO THREADS ON THE CYLINDER HEAD ONLY. KEEP AWAY FROM SEALS.

3 APPLY "LUBRIPLATE" NO. 630-2 MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT TO ALL PISTON, HEAD GLANDS, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

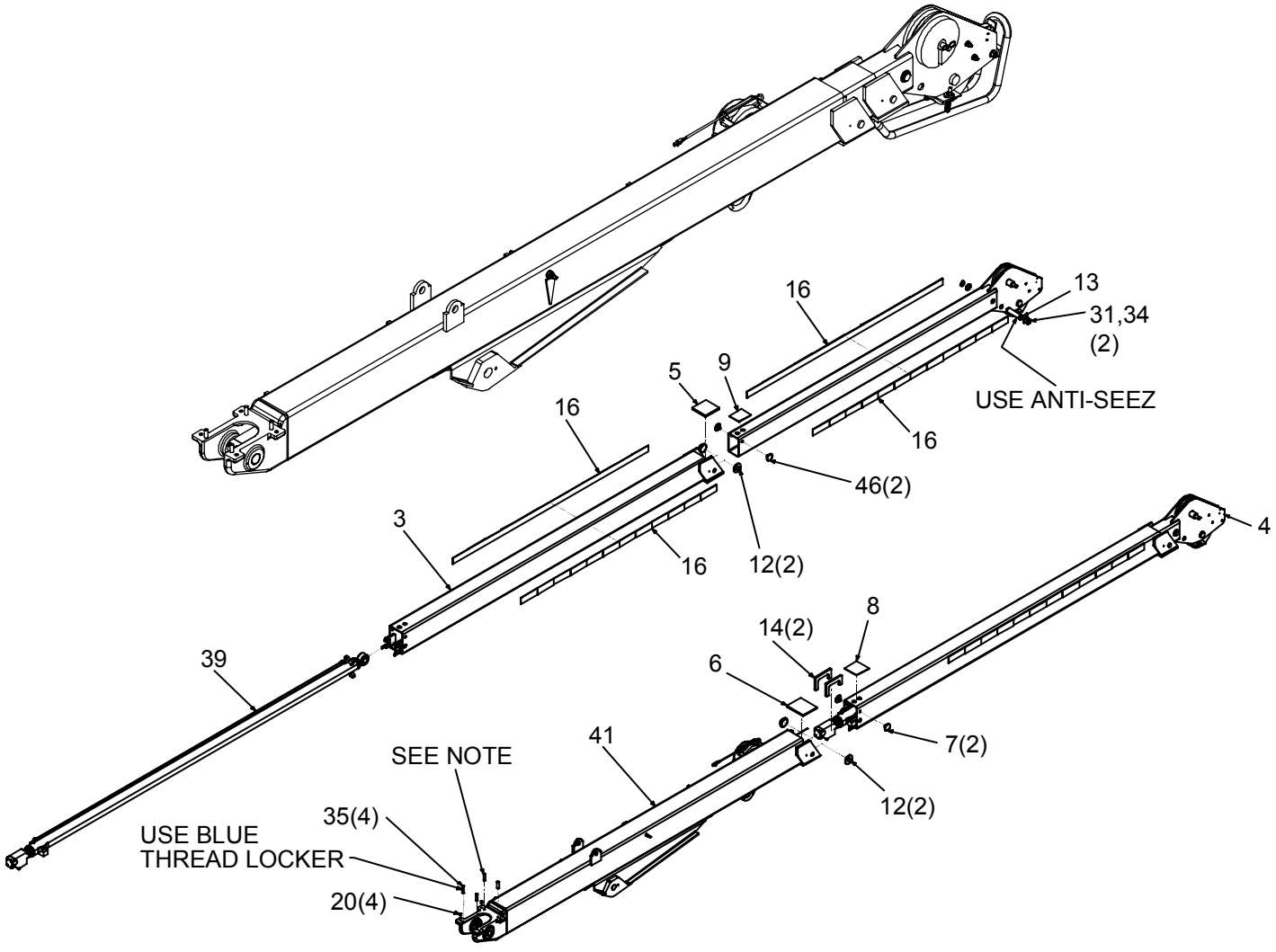
4 DRILL #15 HOLE, 3/16" DEEP. PRESS IN PIN # 60125699.

51720921 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	52720923	CASE ASSEMBLY (INCL 11,20)	1
2.	51720921A	CYLINDER (INCL 1,3,4,6,7,9,14)	1
3.	51744131	SEAL KIT (INCL 6,8,21,23-28)	1
4.	52720922	ROD ASM (INCL 11,20)	1
5.	60125699	PIN - LOCK TUBE	1
6.	60125918	PISTON	1
7.	60125920	STOP TUBE	1
8.	6A025022	WAFER LOCK	1
9.	6HD40022	HEAD	1
10.	71412660	TUBE ASM	1
11.	72053507	ZERK - STR THD .25-28	2
12.	72060037	CAP SCR .31-18X 4.00 HH GR5 Z	2
13.	72062109	NUT .31-18 HEX NYLOCK	2
14.	72062305	COLLAR-LOCK 1-1/2-12 X 2.375 X .563	1
15.	72063002	WASHER .31 FLAT	4
16.	72533186	ADPTR-M FACE/M STR 6 6	4
17.	73540035	VALVE-CBAL 1.75:1 NV (INCL 18,19)	1
18.	73540052	VALVE-CBAL	1
19.	77041561	PRESSURE SWITCH	1
20.	7BF81215	BUSHING - STL 1.50 PIN X 1.25 LG	6
21.	7Q072128	O RING 1.487X 1.693X 0.103 70	1
22.	71412665	TUBE ASM	1
23.	7Q10P342	BACK-UP RING 3.62 BORE 4 O.D. 0.07 THK	1
24.	7R14P022	ROD WIPER-TYPE D 2.25 ROD	1
25.	7R546022	U-CUP LOADED 2.25X2.75X.38 "B	1
26.	7T2N4040	WEAR RING - PISTON 4.00 O.D. X .50 W	2
27.	7T2NX625	WEAR RING-ROD 2.25 IDX0.75	2
28.	7T66P040	PISTON SEAL DYNAMIC 4.00"	1
29.	7Q072342	O-RING - 3.62 X 4 0.19 70	1
NEW 20070410			

Boom Assemblies & Cylinders

Boom & Winch Assembly (99904008) (Eff. 8-1-06)

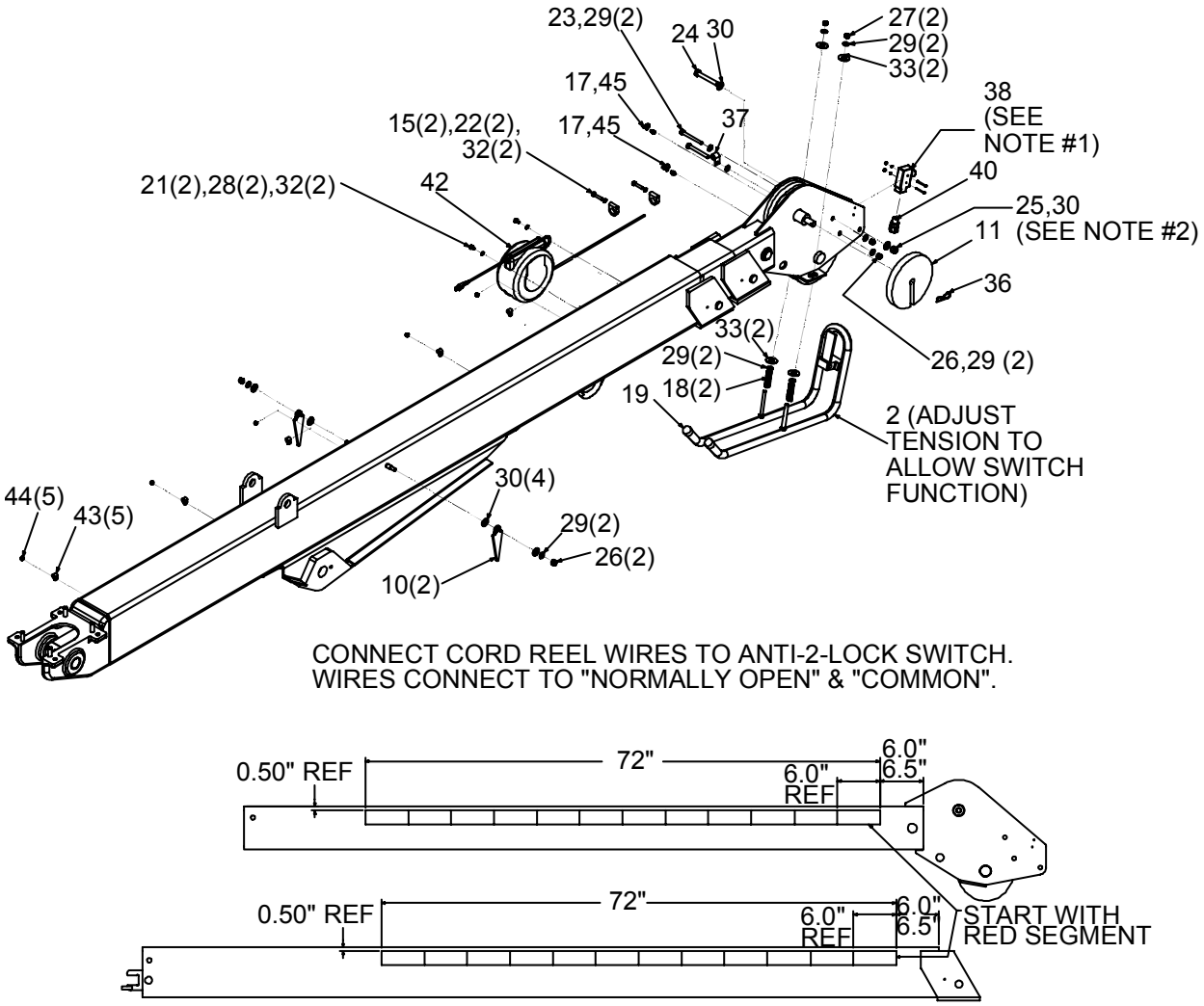
Boom & Winch Assembly 99904008 uses Cord Reel Assembly 51720302.



NOTES:

1 INSTALL STUDS IN APPROPRIATE HOLES; OUTSIDE HOLES FOR 71057781 WINCH, INSIDE HOLES FOR 52719749 WINCH MOUNT WELDMENT.

99904008 DRAWING



NOTES:

1 MOUNTING HARDWARE IS INCLUDED WITH THE SWITCH. USE O-RINGS, SCREWS, AND #6 NYLOCK HEX NUTS.

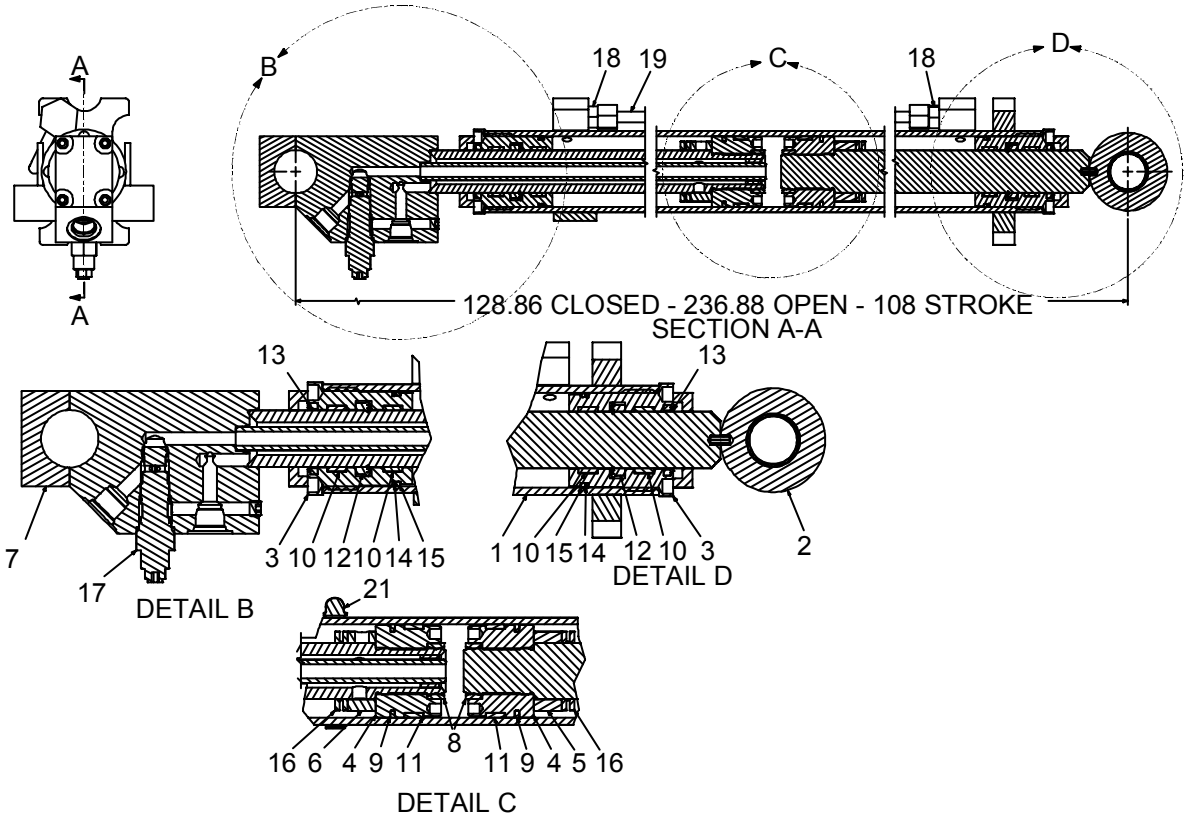
2 DO NOT OVER-TIGHTEN NUT - ANTI-TUBE LOCK MUST BE FREE TO PIVOT.

3 APPLY BOOM LENGTH INDICATOR TAPE ON BOTH SIDES OF BOOM AND EXTENSION.

99904008 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	51719591	HARDWARE KIT, BOOM ASSEMBLY (INCL 15,17-37,44-46)	1
2.	52718005	TUBE WELDMENT- ANTI TWO BLOCK	1
3.	52719119	BOOM-1st STAGE EXT WLDMT	1
4.	52719120	BOOM-2nd STAGE EXT WLDMT	1
5.	60030330	WEAR PAD-RC 0.50 X 4.88 X 5.00	1
6.	60030331	WEAR PAD-RC 0.50 X 4.938 X 5.88	1

99904008 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
7.	60030339	WEAR PAD-RND 2.00 DIA X .60 DIA X 1.0 L (WAS QTY 4)	2
8.	60030340	WEAR PAD-BLOCK 4.50 X 4.50 X .44	1
9.	60030341	WEAR PAD-BLOCK 4.50 X 3.50 X .44	1
10.	60105544	PLATE-ANGLE PLASTIC	2
11.	60122263	PLATE-SINGLE SHEAVE	1
12.	60122985	WEAR PAD-RND	4
13.	60123971	PIN-TYPE A 1.25X 4.91 (4.32)	1
14.	60127979	PLATE-EXT CYL C-CLIP	2
15.	70034381	SUPPORT	2
16.	70396734	DECAL-BOOM LENGTH INDICATOR	4
17.	70034382	CAP-GREASE	2
18.	70146096	SPRING 0.62 X 2.50 X 14 GA.	2
19.	70396121	CAP-PLSTC 1.00 TUBE OD X 0.68 HGT BLACK	2
20.	72034479	PLUG-PLSTC .50-13X .50UNC-2B	4
21.	72060000	CAP SCR .25-20X .50 HH GR5 Z	2
22.	72060006	CAP SCR .25-20X 1.50 HH GR5 Z	2
23.	72060055	CAP SCR .38-16X 3.50 HH GR5 Z	2
24.	72060098	CAP SCR .50-13X 3.50 HH GR5 Z	1
25.	72062080	NUT .50-13 HEX NYLOCK	1
26.	72062103	NUT .38-16 HEX NYLOCK	4
27.	72062179	NUT .38-16 HEX CENTER LOCKING	2
28.	72063001	WASHER .25 FLAT	2
29.	72063003	WASHER .38 FLAT	10
30.	72063005	WASHER .50 FLAT	6
31.	72063035	MACHY BUSHING 1.25X10 GA NR	2
32.	72063049	WASHER .25 LOCK	4
33.	72063117	WASHER .56 FLAT ASTM F436	4
34.	72066129	RETAINING RING-EXT 1.25 HD	2
35.	72601757	STUD .30-13X 2.00 NC GR5 STL	4
36.	72066145	HAIR PIN .19 ZINC	1
37.	72661312	CLAMP- .50 LOOP CUSHIONED	1
38.	77041459	SWITCH-LIMIT	1
39.	51720936	CYLINDER (WAS 71411883 THRU 4-07)	1
40.	77441096	CONNECTOR- .50 STR RLF .25-.38	1
41.	52720320	BOOM-LOWER WLDMT ASM	1
42.	51720302	CORD REEL ASM- 10'	1
43.	72034485	CLAMP-PLASTIC 1/4" CABLE	5
44.	72062106	NUT 10-24 HEX NYLOCK	5
45.	72053508	ZERK-NPT .12	2
46.	60030369	WEAR PAD-RND 2.00 DIA X .60 DIA X 0.75 L	2
REV. D 20070516			

Cylinder, Extension (51720936) (Eff. 5-07)



NOTES:

1 REPLACE ALL COMPONENTS OF THE SEAL KIT WHENEVER THE CYLINDER IS DISASSEMBLED. THIS WILL REDUCE FUTURE DOWNTIME.

2 APPLY REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO THREADS ON CYLINDER HEAD ONLY. KEEP AWAY FROM ALL SEALS.

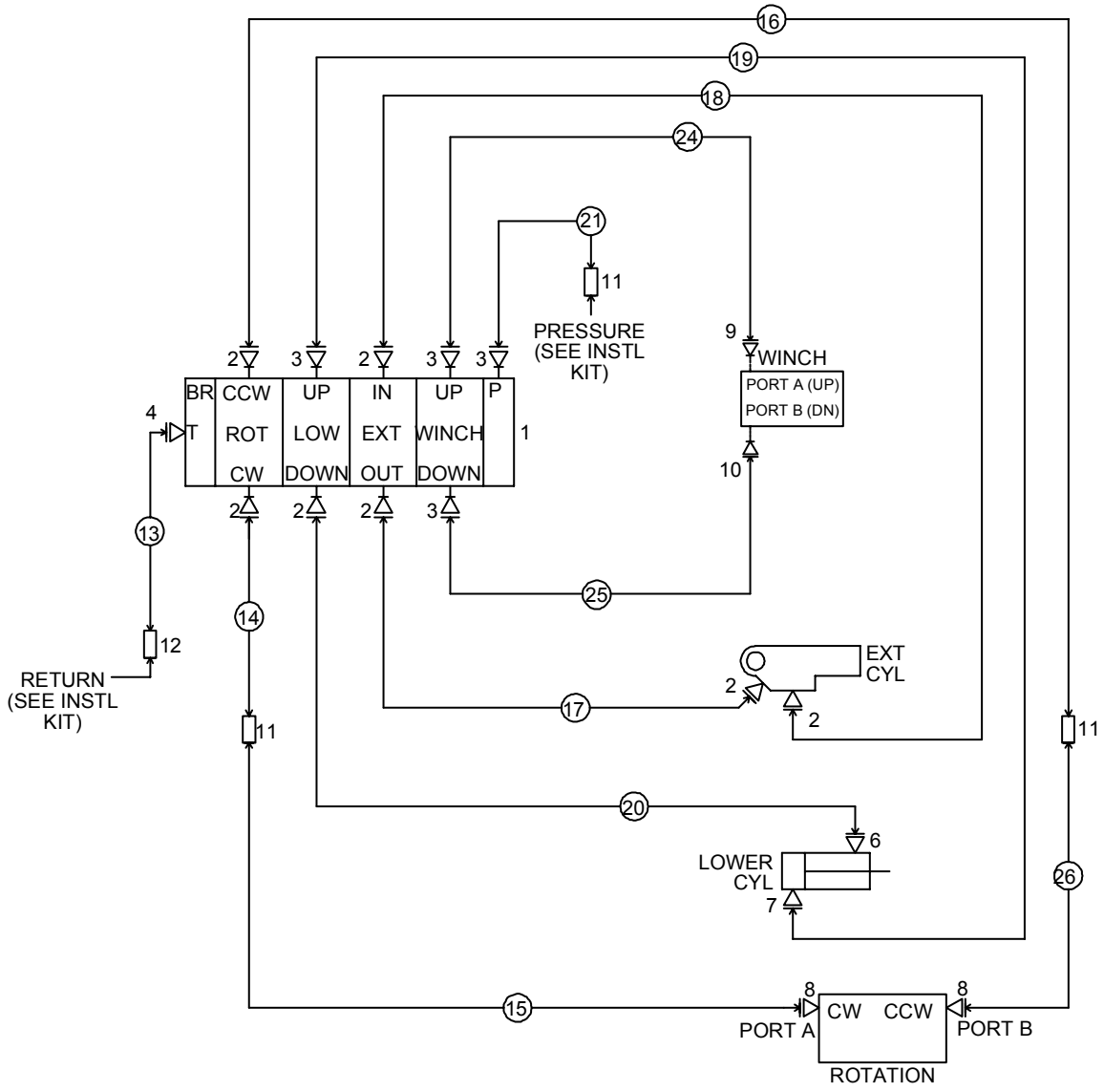
3 APPLY "LUBRIPLATE" NO. 630-2 MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT, TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

51720936 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	52720934	CASE ASM-2.50 BORE X 119.21 LONG	1
2.	4G022020	ROD ASM-1.50 DIA X 56.38 LG 1.25 S	1
3.	6HD25015	HEAD-2.50 BORE X 1.50 ROD (DUCTILE IRON)	2
4.	6ID25125	PISTON-2.50 BORE X 1.25 STGR (DUCT IRON)	2
5.	6C075015	STOP TUBE-1.50 ROD X .75 LONG	1
6.	6C022020	STOP TUBE-W/HOLES 1.50 ROD X 0.75 LONG	1
7.	52720935	ROD ASM-1.50 DIA X 72.00 LG 1.25 S	1
8.	7T61N125	LOCK RING-NYLON 1.25	2
9.	7T66P025	PISTON SEAL DYNAMIC 2.50	2
10.	7T2NX417	WEAR RING-ROD 1.50 IDX0.50W	4
11.	7T2N4025	WEAR RING-PISTON 2.50 ODX .50W	2

51720936 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
12.	7R546015	U-CUP 1.50 ID X 2.00 OD	2
13.	7R14P015	ROD WIPER TYPE D 1.50 ROD	2
14.	7Q10P228	BACKUP RING-2.25 ID X 2.50 OD	2
15.	7Q072228	O RING 2.25X 2.50X .12 70	2
16.	6A025015	WAFER LOCK IMT 1.50	2
17.	73054999	VALVE-CBAL	1
18.	72533186	ADPTR-M FACE/M STR 6 6	2
19.	70146464	TUBE ASM-HYD EXT CYL 3820 2H	1
20.	9D101220	SEAL KIT (INCLUDES ITEMS 8-16)	2
21.	72661286	CLAMP-HOSE 2.56-3.50 SAE #48	3
REV. A 20070516			

Hydraulics

Hydraulic Installation, Worm Winch (99903944)



NOTES:

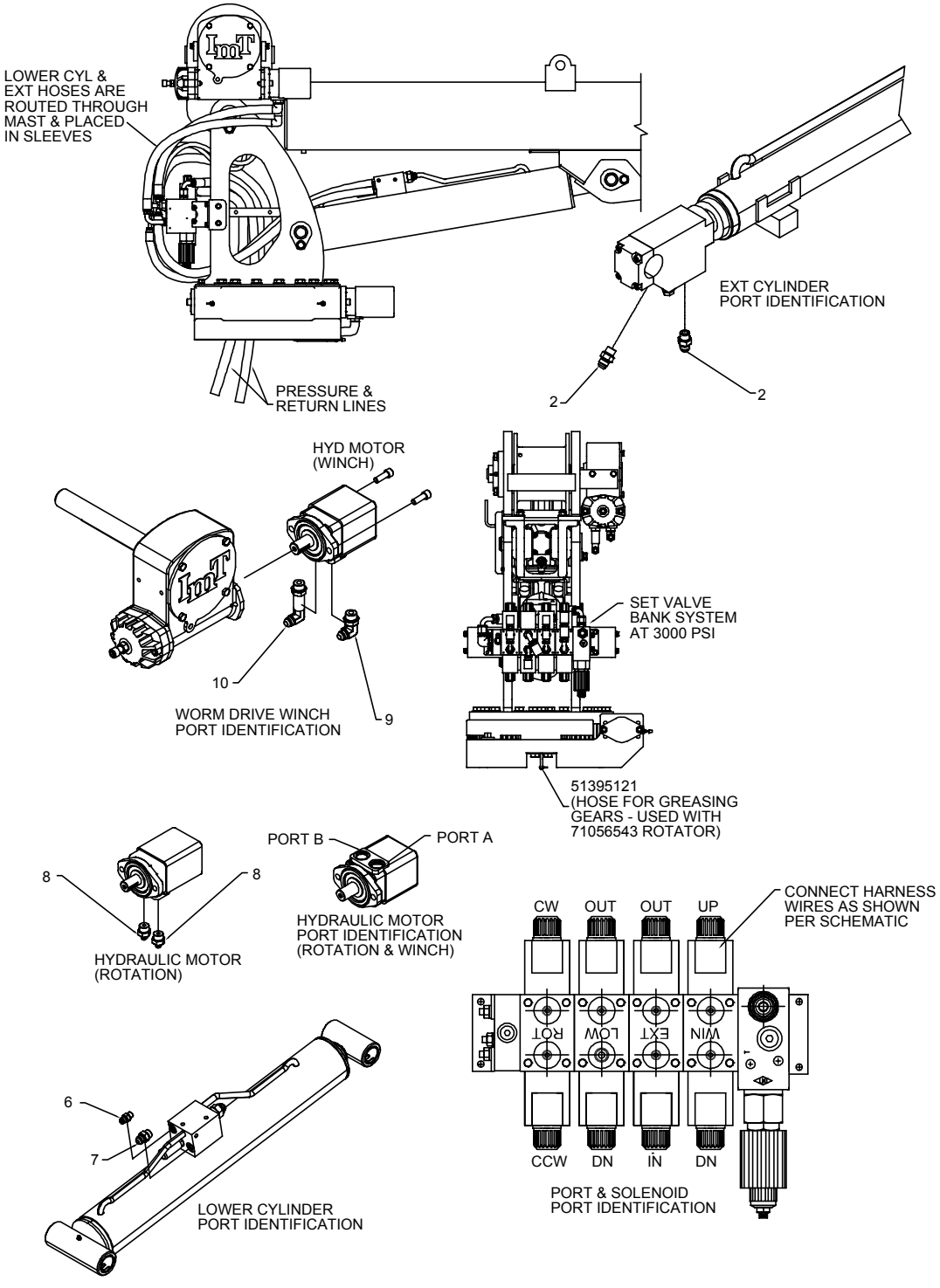
1 INSTALL 60350141 ON HOSES (#17 AND 18) AND (#19 AND 20).

2 INSTALL 60350142 ON HOSES (#24 AND 25) AND ON HOSES (#13, 14, 16 AND 21).

3 ITEM #1, 73734194 VALVEBANK, USED ON CRANES WITH SERIAL NUMBERS OF 3820S2071163 AND BEYOND.

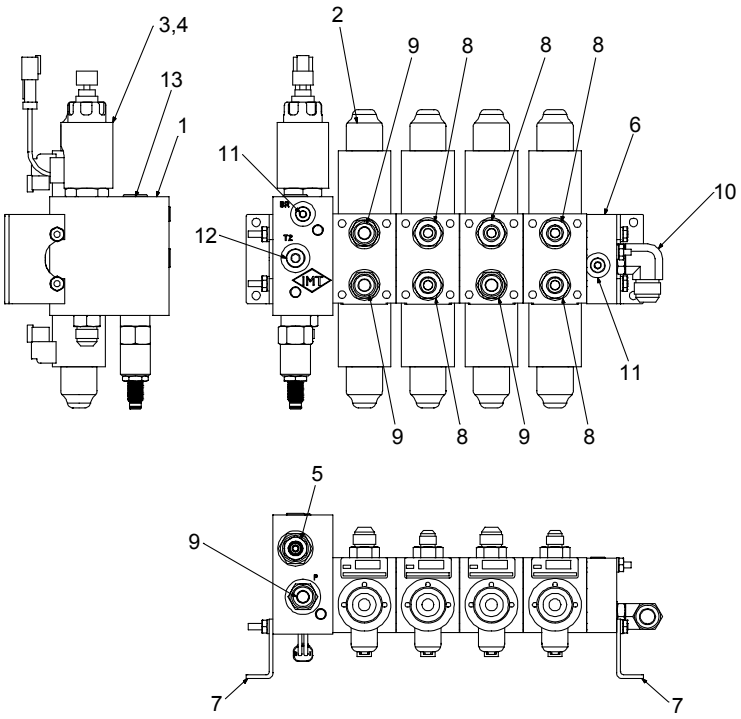
99903944 PARTS LIST				
ITEM	PART #	DESCRIPTION	KIT #	QUANTITY
1.	73734473	VALVE BANK, WORM WINCH (WAS 73734194 FROM FROM S/N 3820S2071163 THROUGH 3820S2091216) (WAS 51720111 THRU 5-4-07)		1
2.	72532356	ADAPTER #8MSTR #6MJIC	#1, #5	7
3.	72532358	ADAPTER #8MSTR #8MJIC	#1	4
4.	72533507	ELBOW #8MSTR #10MJIC 90°	#1	1
5.	91720113	HOSE KIT-WORM WINCH (INCL. 2,6-25)		1
6.	72532355	ADAPTER, #6MSTR #6MJIC	#5	1
7.	72532357	ADAPTER, #6MSTR #8MJIC	#5	1
8.	72533613	ADAPTER, #10MSTR #6MJIC	#5	2
9.	72053764	ELBOW #10MSTR 90° #8MJIC	#5	1
10.	72534435	ELBOW #10MSTR 90° #8MJIC	#5	1
11.	72533648	SWIVEL #8MJIC #8MJIC 90°	#5	3
12.	72534412	SWIVEL #10MJIC #10MJIC 90°	#5	1
13	51397080	HOSE FJ 0.62 X 30 OAL (10-10) (WAS 51396806)	#5	1
14.	51396807	HOSE FZ 0.38 X 33.5 OAL (8-6)	#5	1
15.	51396808	HOSE FJ 0.38 X 20 OAL (8-6) (WAS 2)	#5	1
16.	51396809	HOSE FJ 0.38 X 42 OAL (8-6)	#5	1
17.	51396810	HOSE JZ 0.38 X 21.5 OAL (6-6)	#5	1
18.	51396811	HOSE JZ 0.38 X 23 OAL (6-6)	#5	1
19.	51396878	HOSE FZ 0.50 X 37 OAL (8-8)	#5	1
20.	51396879	HOSE FJ 0.38 X 39.5 OAL (6-6)	#5	1
21.	51396017	HOSE FJ 0.50 X 30 OAL(8-8) (WAS 51396816)	#5	1
22.	60350141	SLEEVE-HOSE	#5	2
23.	60350142	SLEEVE-HOSE (WAS 1)	#5	2
24.	51396828	HOSE-FJ 1/2X27 (8-8)	#5	1
25.	51396829	HOSE-FZ 1/2X27 (8-8)	#5	1
26.	51397079	HOSE-FJ 3/8 X 24 (8-6)	#5	1
REV C 20100609				

HYDRAULIC INSTALLATION, WORM WINCH (99903944)



Valve Bank, Worm Winch (73734473) (Eff. 1-10)

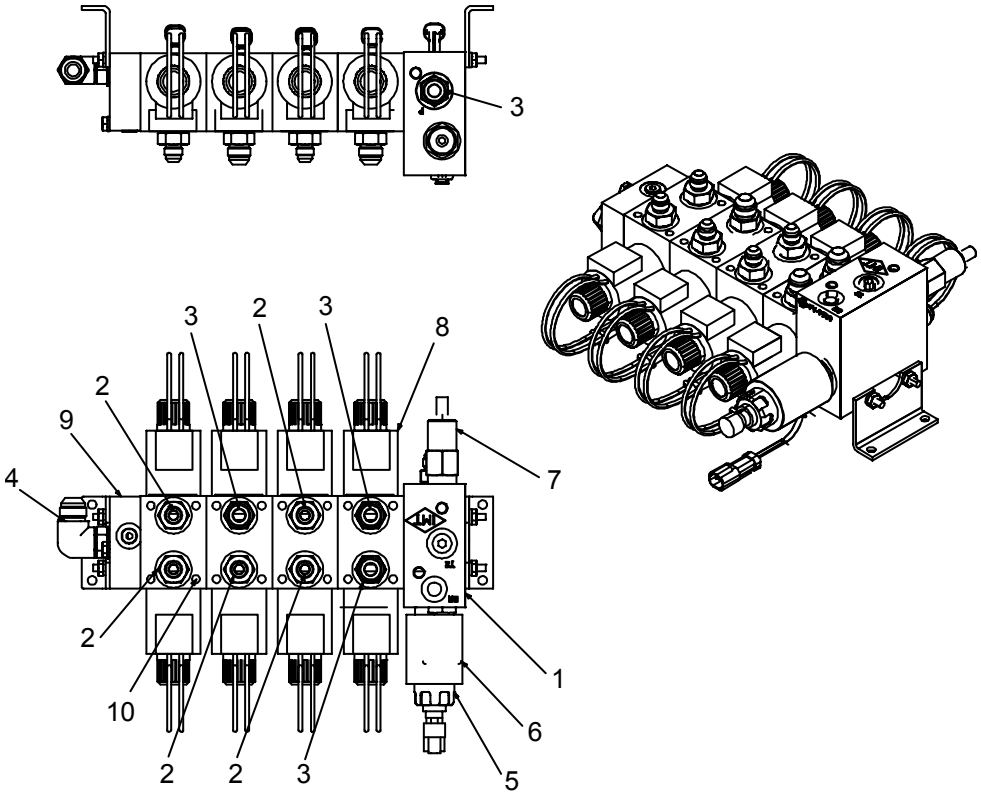
NOTE: 73734473 replaced 73734194 effective 1-2010. 73734473 used on cranes starting with these serial numbers: 3020101005, 3820S2091216, 5020S2091012.



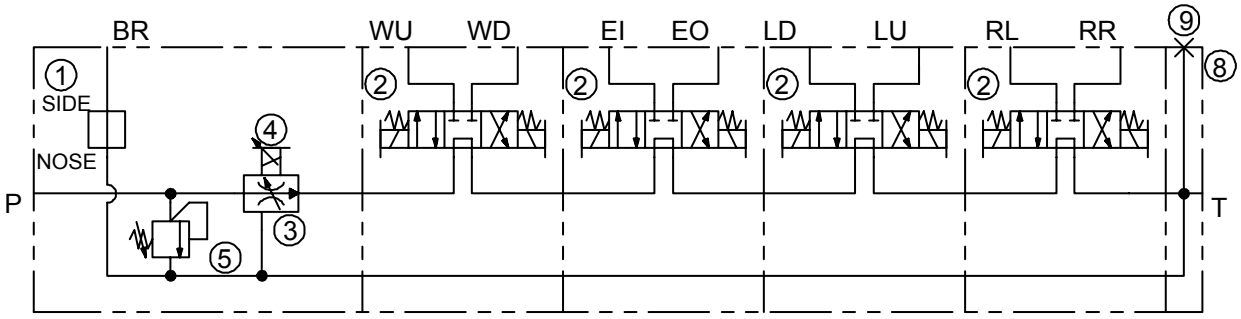
73734473 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	73540394	VALVE BODY	1
2.	73540375	VALVE SECTION	4
	90744198	REPLACEMENT COIL KIT FOR 73540375	REF
3.	73540252	FLOW CONTROL VALVE	1
4.	73540253	COIL FOR 73540252	1
5.	73540396	RELIEF VALVE	1
6.	73540027	END PLATE	1
7.	70145830	MOUNTING FOOT	2
8.	72532356	ADAPTER-MSTR/MJIC 8 6	5
9.	72532358	ADAPTER-MSTR/MJIC 8 8	4
10.	72533507	ELBOW-MSTR/90/MJIC 8 10	1
11.	72534560	PLUG-STR SOCKET HEAD STL 4 ZERO LEAK	2
12.	72534561	PLUG-STR SOCKET HEAD STL 6 ZERO LEAK	1
13.	72534562	PLUG-STR SOCKET HEAD STL 8 ZERO LEAK	1
NEW 20100608			

Valve Bank, Worm Winch (73734194) (From 5-4-07 to 12-09)

NOTE: 73734473 replaced 73734194 effective 1-2010. 73734473 used on cranes starting with these serial numbers: 3820S2091216, 5020S2091012.



73734194 SCHEMATIC



73734194 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	73540251	VALVE-BODY	1
2.	72532356	ADPTR-M STR/M JIC 8 6	5
3.	72532358	ADPTR-M STR/M JIC 8 8	4
4.	72533507	ELBOW-M STR/90/M JIC 8 10	1

73734194 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
5.	73540252	VALVE-P.FLOW CONTROL (INCLUDES COIL 73540253)	1
6.	73540253	VALVE-COIL	1
7.	73540254	VALVE-RELIEF	1
8.	77041715	COIL - SOLENOID VALVE SECT	8
9.	73540027	END CAP-VB	1
10.	73540375	VALVE-SECTION W/ SOLENOID (WAS 73054214)	4
	91722709	COIL KIT (PART OF 10)	REF
REV. 20100615			

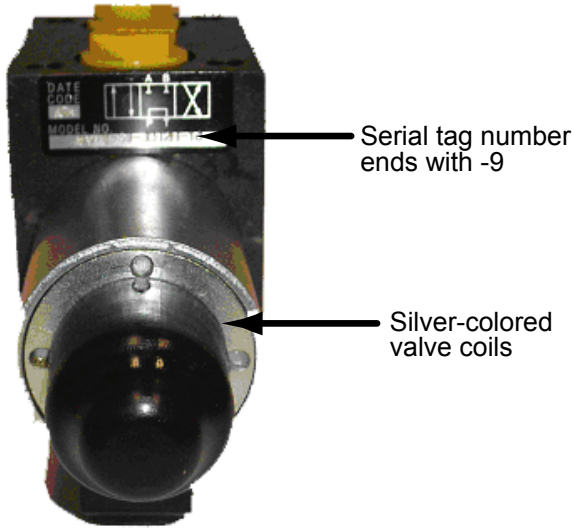
Telescopic Valve Bank Replacement (99904783)

From November 2009 through April 2010, IMT telescopic cranes may have been built with a hybrid valve section due to a supplier model change. When ordering replacement parts, note the serial number on the valve section and the appearance of the complete valvebank to determine which parts are required.

Valve for 73734193 and 73734194 Valvebanks

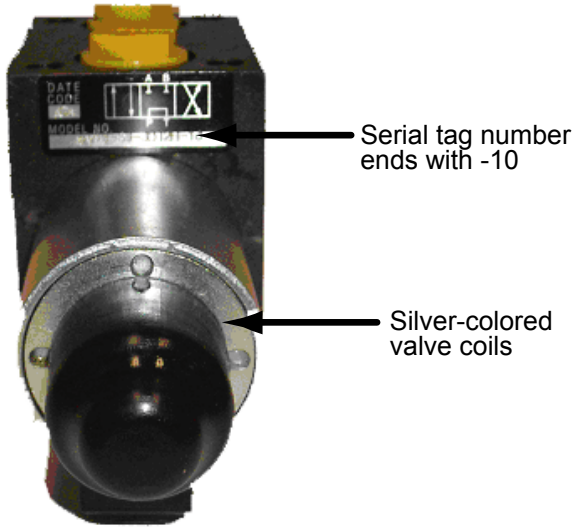
- Valve Model: BV18 with 5/8 threads IP65
- Serial # tag has no dash at the end of the number.
- Coils are gold.

Hybrid Valve Section - Added to 73734193 to make 73734495, and added to 73734194 to make 73734496



- Valve Model: BV18 with 5/8 threads IP69 Hybrid
- Serial # tag ends with -9
- Coils are silver.

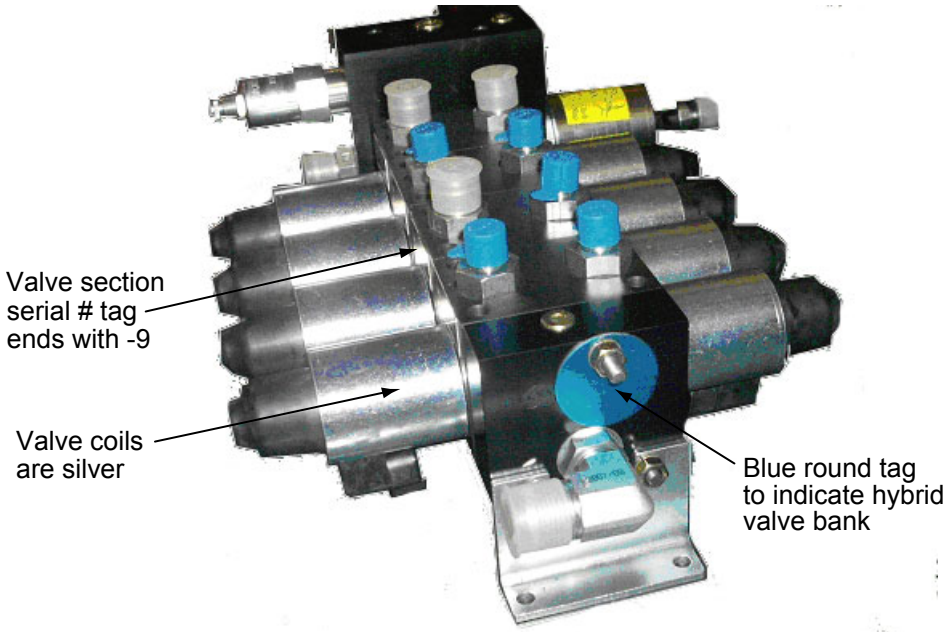
New Valve Section - Valve for 73734472 and 73734473 Valvebanks



- Valve Model: BV18 with M19 threads
- Serial # tag ends with -10
- Coils are silver.

Hybrid Valve Bank 73734495 or 73734496

- Valve Model: BV18 with 5/8 threads IP69 Hybrid
- Serial # tag ends with -9
- Coils are silver.
- A blue tag has been attached to the end of the valvebank to indicate it includes all hybrid valves.



Replacement Valve Coils

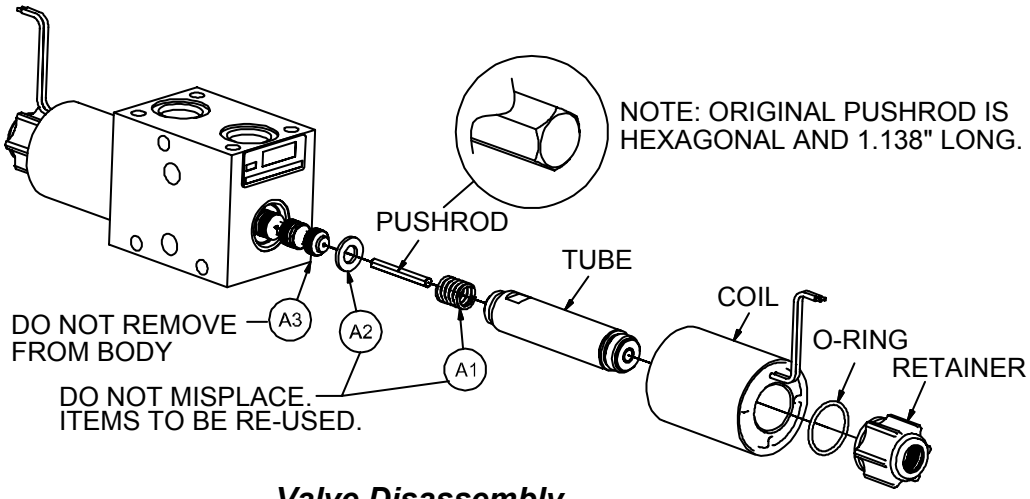
Disassemble the valve as follows:

1 Remove retainer by rotating counterclockwise with pliers.

2 Slide o-ring and coil over tube to remove.

3 Remove tube using an 11/16” open-end wrench. Turn counterclockwise. NOTE: Do not remove valve spool (A3), or misplace washer (A2) or spring (A1). Do not contaminate valve!

4 Remove pushrod.



Valve Disassembly

Install the components of repair kit 91722709 as follows:

1 Position washer (A2) on valve spool (A3).

2 Insert pushrod and spring (A1) onto tube.

3 Install tube clockwise with ¾" (19 mm) crows foot wrench. Torque to 180 in-lb.

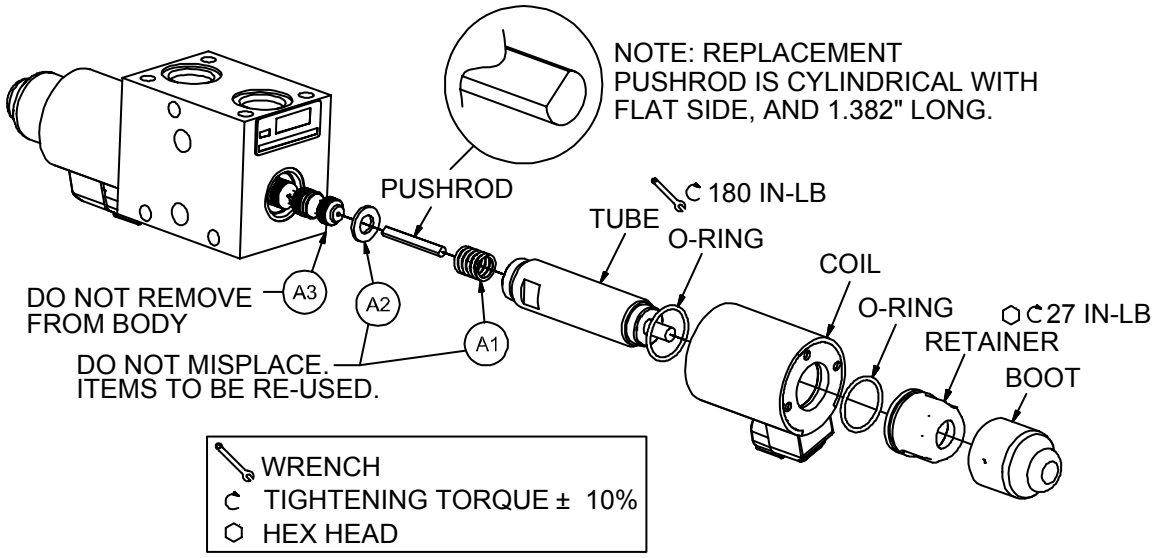
4 Slide o-ring, coil, and second o-ring over tube.

5 Install retainer clockwise onto tube with 1-1/16" socket. Torque to 27 in-lb.

6 Stretch boot over retainer.

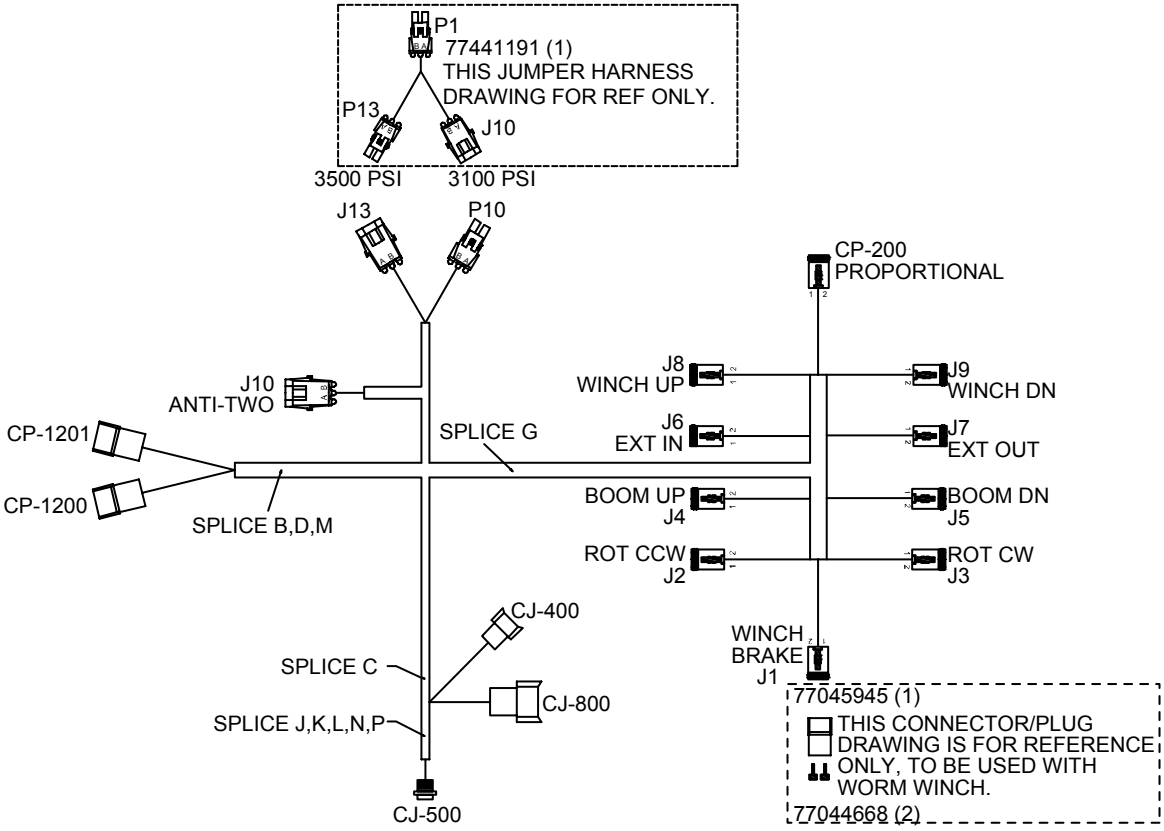
7 You may need a jumper harness (IMT # 77441393) to electrically connect the valve section to the crane. Two of these jumper harnesses were included with kit 91722709. Plug the jumper harnesses into the plugs on the coils as shown in Figure 3 and connect them to the crane wiring.

8 Kit 91722709 has components to repair both sides of the valve section. Repair each side individually, but be sure to repair both sides before re-installing the valve on the crane.

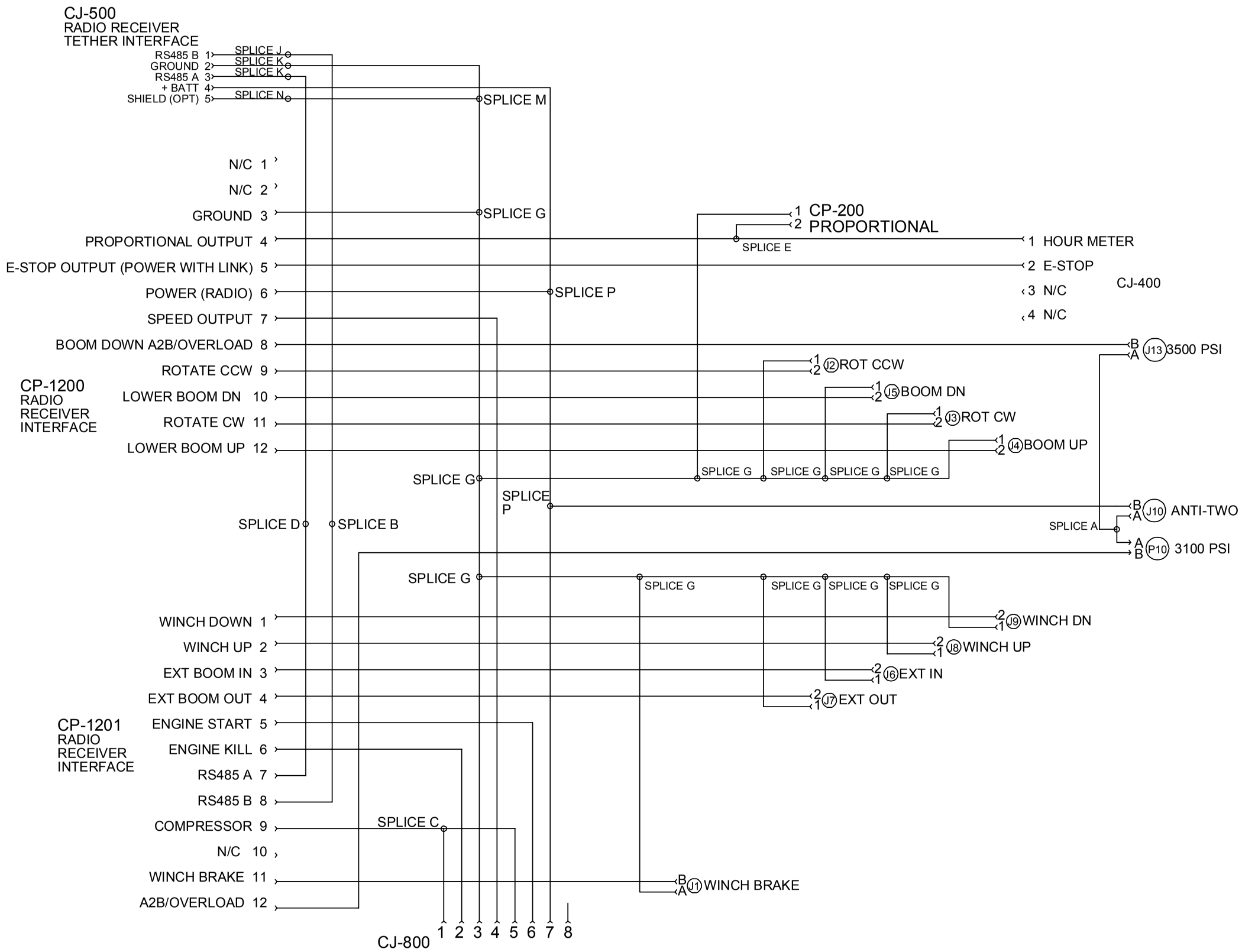


Valve Assemblv

Harness, Valvebank (77441204) (Eff. 8-1-06)

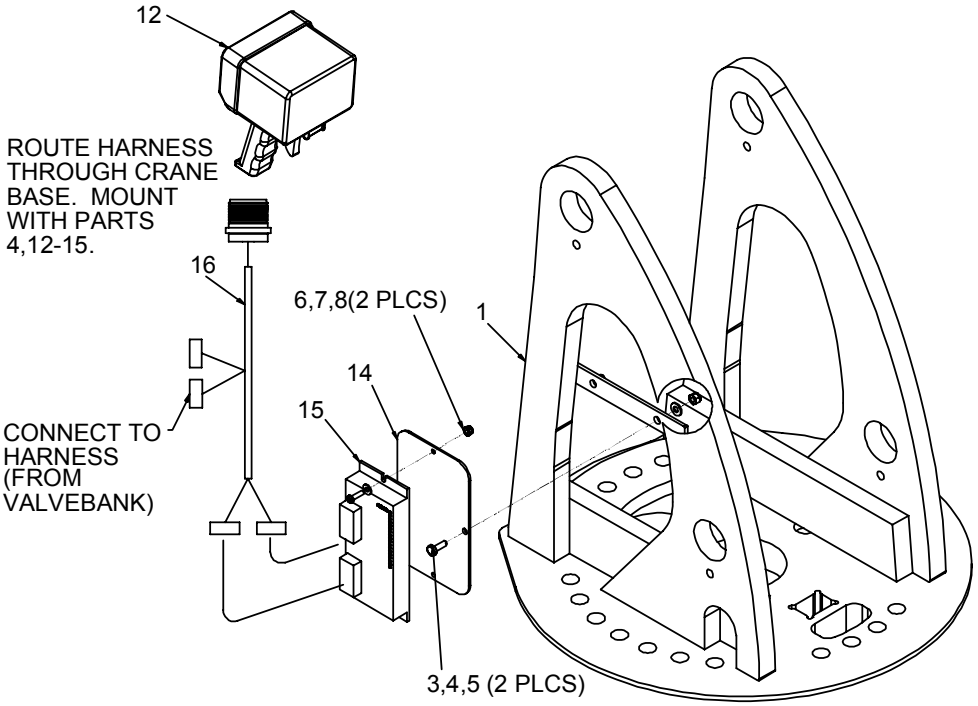


77441204 ELECTRICAL SCHEMATIC



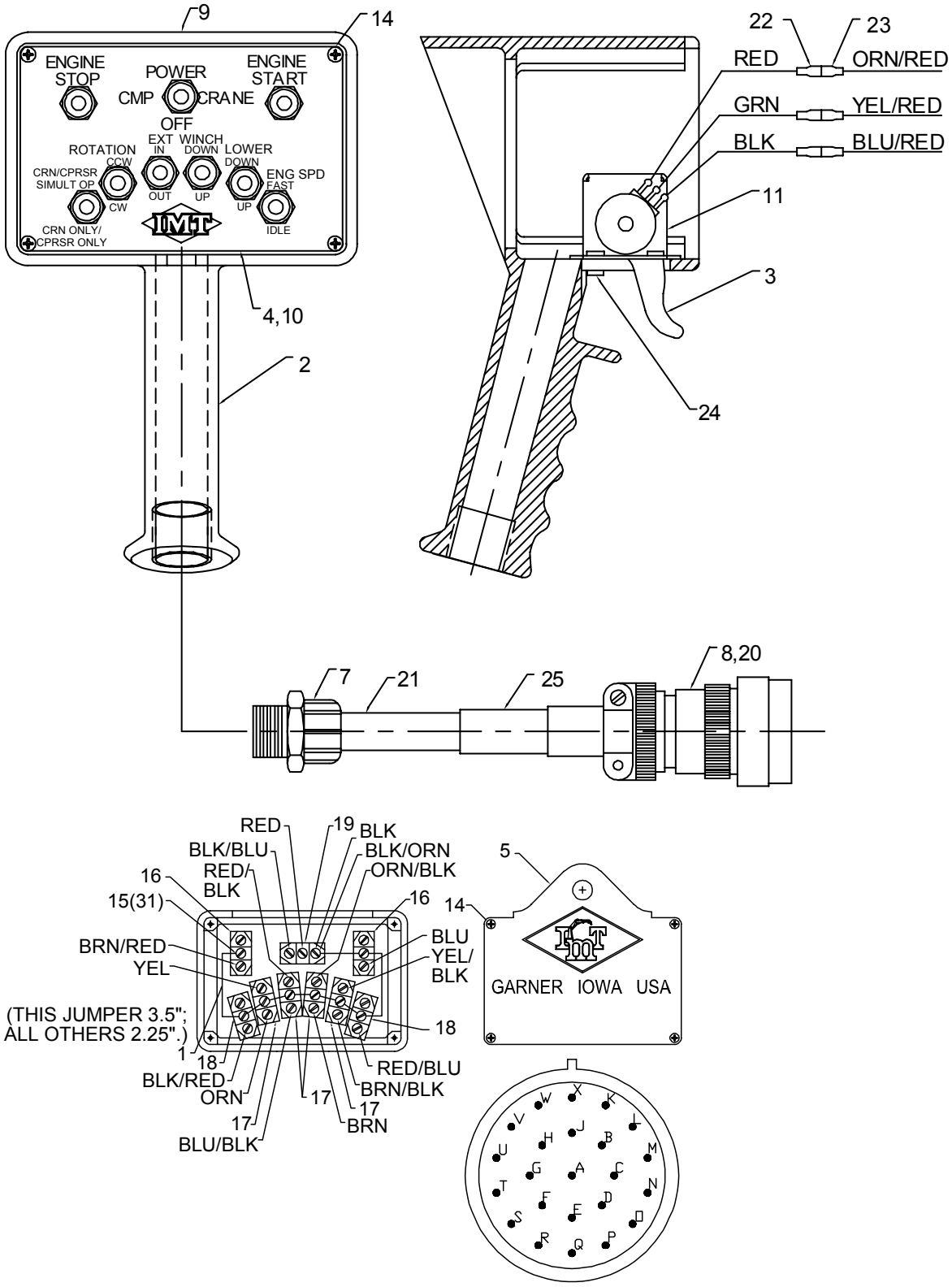
Controls

Controls Installation, Tethered (Kit 90719399/Dwg. 99903697)



90719399 TETHERED CONTROLS PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	N/A	MAST WLDMNT	1
2.	51719412	HARDWARE KIT - TELE CRANE, TETH CONTROLS (INCL 3-11)	REF
3.	72601827	CAP SCR-SS .25-20X .75 HH GR5	2
4.	72063166	WASHER-SS .25 R WRT18-8 .62OD	2
5.	72062194	NUT-SS .25-20 NYLOC	2
6.	72060636	SCR-MACH#10-24X .75 RDH PH Z	2
7.	72062106	NUT 10-24 HEX NYLOCK	2
8.	72063000	WASHER .19 W FLAT ANSI B27.2Z	2
9.	77044645	NUT-DEUTSCH 24 SHELL112263-90	1
10.	77044646	WASHER-LOCK DEUTSCH 112264	1
11.	72601330	CAP SCR-SS .25-20X 1.00 HH	2
12.	51719470	HANDLE ASSEMBLY	1
13.	60119299	BRACKET-MTG	1
14.	60128881	BRACKET-CONTROLLER	1
15.	71411554	TETHER LOGIC MODULE	1
16.	77441164	HARNESS-TETHER	1
REV. B 20050513			

Handle Assembly, Tethered Remote w/Engine Start (51719470)



51719470 HANDLE ASSEMBLY WIRE FUNCTIONS

SOLID/STRIPE		FUNCTION
A	YEL/BLK	ROT CW
B	ORN/BLK	EXT OUT
C	BLU/BLK	WINCH DN
D	RED/BLK	WINCH UP
E	ORN/RED	-
F	BRN	EXT IN
G	BRN/RED	ENG START
H	BLU/RED	-
J	BLK/RED	ENG SPEED
K	BRN/BLK	ROT CCW
L	RED	POWER
M	BLU	ENG STOP
N	ORN	LOWER DN
O	BLK/ORN	SOL POWER
P	YEL	LOWER UP
Q	BRN/BLU	-
R	YEL/RED	-
S	BLK	CRANE
T	BLK/BLU	CPRSR
U	RED/BLU	SIMULTANEOUS
V	BLU/ORN	-
W	ORN/BLU	-
X	YEL/BLU	-
-	RED/RON	-

51719470 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	89044214	WIRE 18GA GRN	1.61 FT
2.	60119335	CONTROL HANDLE	1
3.	60111141	TRIGGER (PART OF 11)	1REF
4.	60119277	COVER	1
5.	70034306	BACK COVER	1
7.	77044196	STRAIN RELIEF 3/4	1
8.	77044621	PIN	23
9.	70394447	DECAL-DGR RC ELECTRO SM	1
10.	70396719	DECAL-CTRL	1
11.	70394183	TRIGGER ASM (INCL 3)	1
14.	72061009	SHT MTL SCR #6X3/4 PH	8
15.	77040051	TERM-SPRSPD #8 16-14GA	31
16.	77040371	TOGGLE SWITCH SPST	2
17.	77040372	TOGGLE SWITCH SPDT	4
18.	77040373	TOGGLE SWITCH SPST	2
19.	77040374	TOGGLE SWITCH SPDT	1
20.	77044579	CONNECTOR	1
21.	89044100	CABLE 18GA 24WIRE (NOTE: MUST ORDER 40 FT)	40 FT
REF	51717817	TETHERED CABLE, 40' (INCL 8, 15 (24) 20, 21, 25)	1
22.	77040147	TERM-FSLPON 1/4TAB 22-18	3

51719470 PARTS LIST			
23.	77040047	TERM-MSLPON 1/4TAB 16-14	3
24.	72060602	MACH SCR #6-32X3/8 RDHD	4
25.	70145495	TUBING-HEAT SHRINK	.5 FT
REV 20071016			

NOTE: KIT # 51717817, TETHERED CABLE - 40 FEET, INCLUDES ITEMS 8, 15 (QTY 24), 20, 21, AND 25. ORDER 51717817 TO REPLACE THE CABLE ASSEMBLY.

Tethered Remote Calibration Mode

To enter the calibration mode on the tethered remote control,

1 Turn on the CRANE switch.

2 With the trigger released, hold the momentary EXTENSION OUT and WINCH UP switches while activating the momentary LOWER DOWN switch four (4) times in succession.

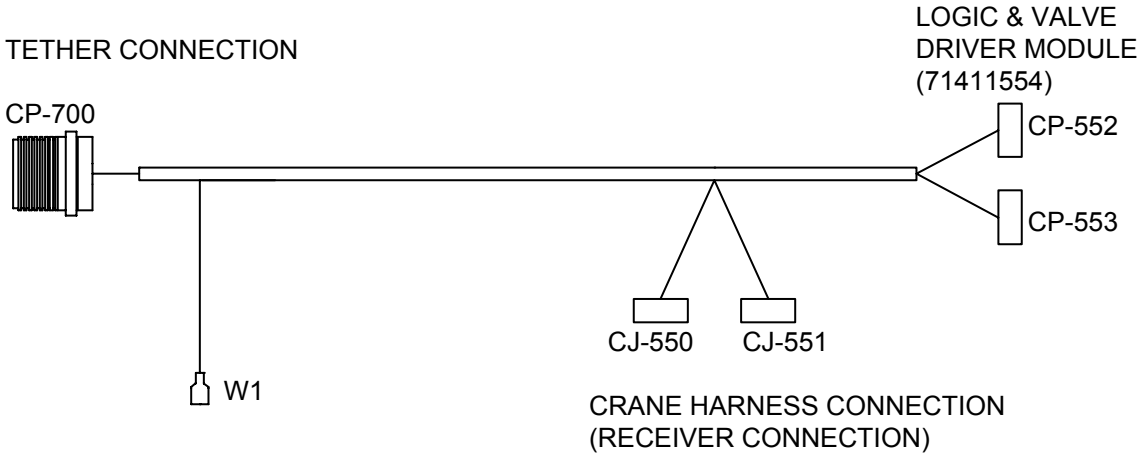
3 The CRANE AND COMPRESSOR ON output and LED will begin to flash, indicating successful entry to the calibration mode. Release momentary switches at this time.

4 Use the CCW/CW momentary switches to adjust the minimum output to the valve. CCW will increase the minimum output and CW will decrease the minimum output.

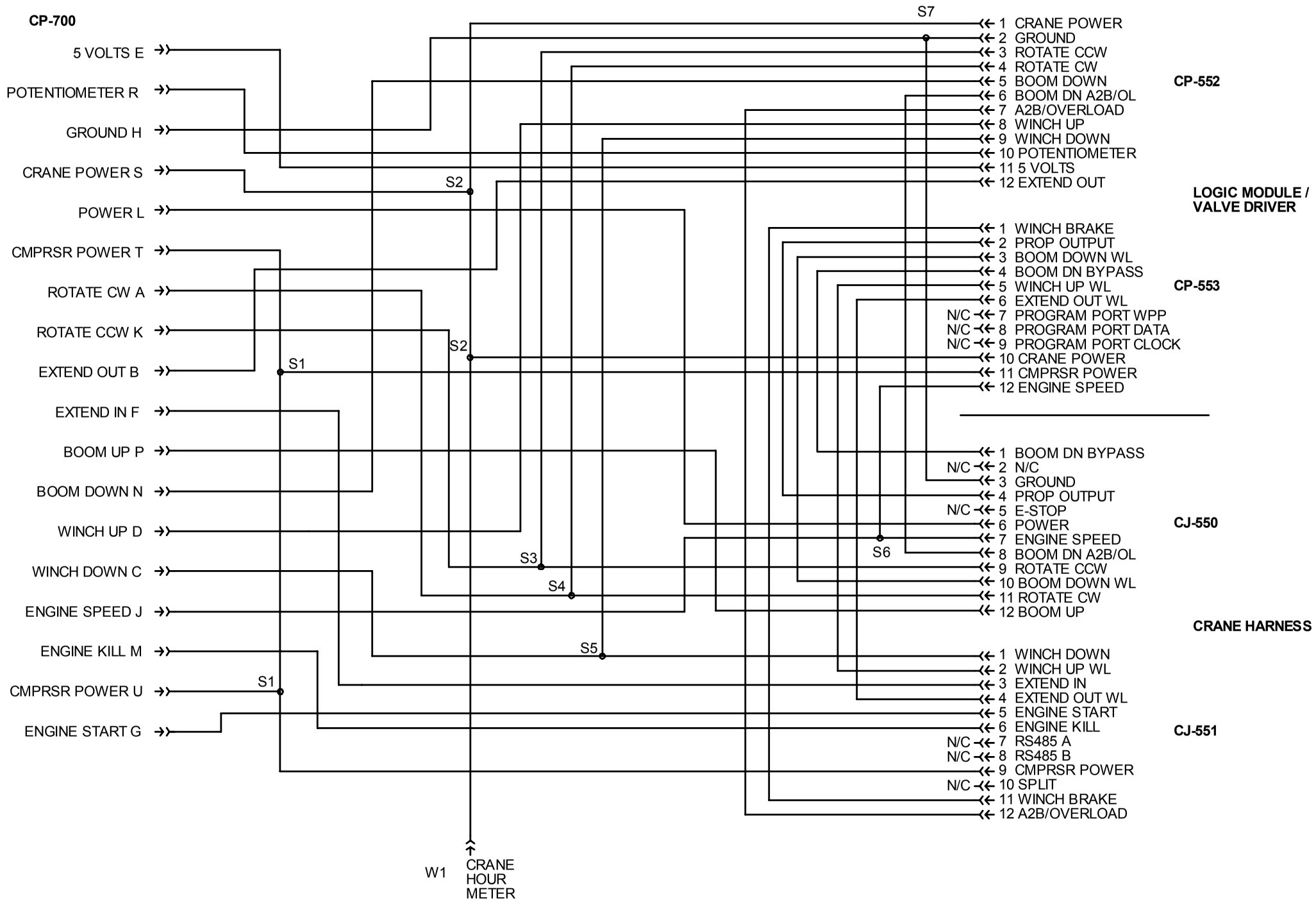
5 To adjust the maximum output to the valve, squeeze the trigger all the way and use the CCW/CW switches in a similar manner. CCW will increase the maximum output and CW will decrease the maximum output.

6 When finished, move the CRANE switch to the OFF position to save the new values to flash memory and exit the calibration mode.

Electrical Harness, Tethered Remote (77441164)

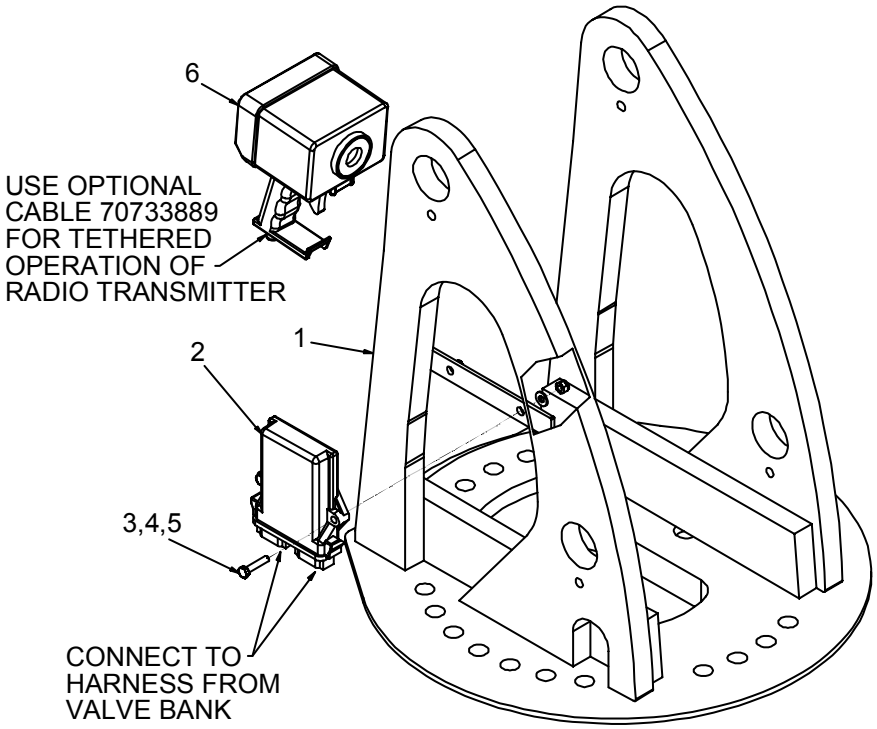


Electrical Schematic, Tethered (77441164)



REV. C 20051213

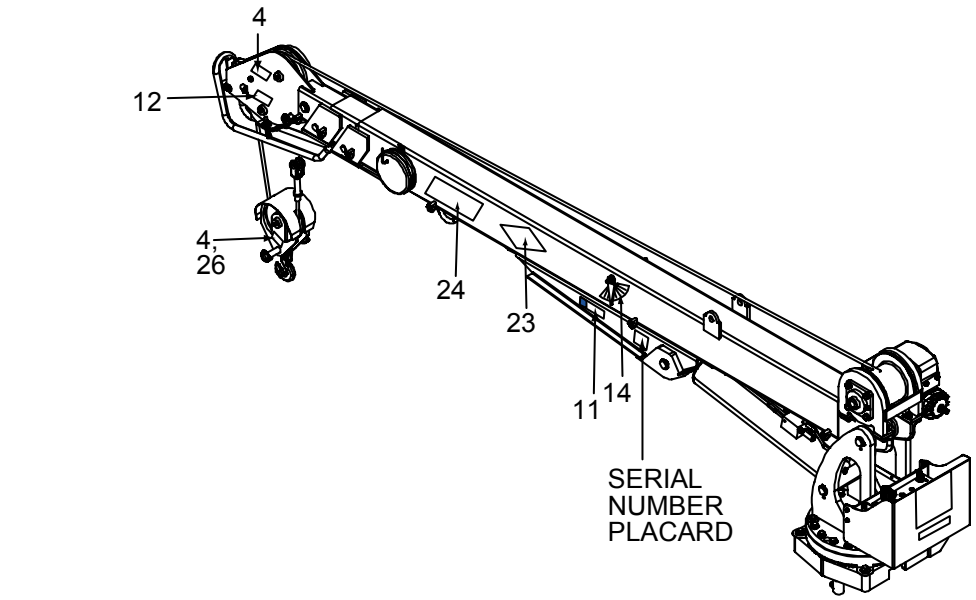
Controls Installation / Radio Remote (Kit 90719400/Dwg. 99903697)

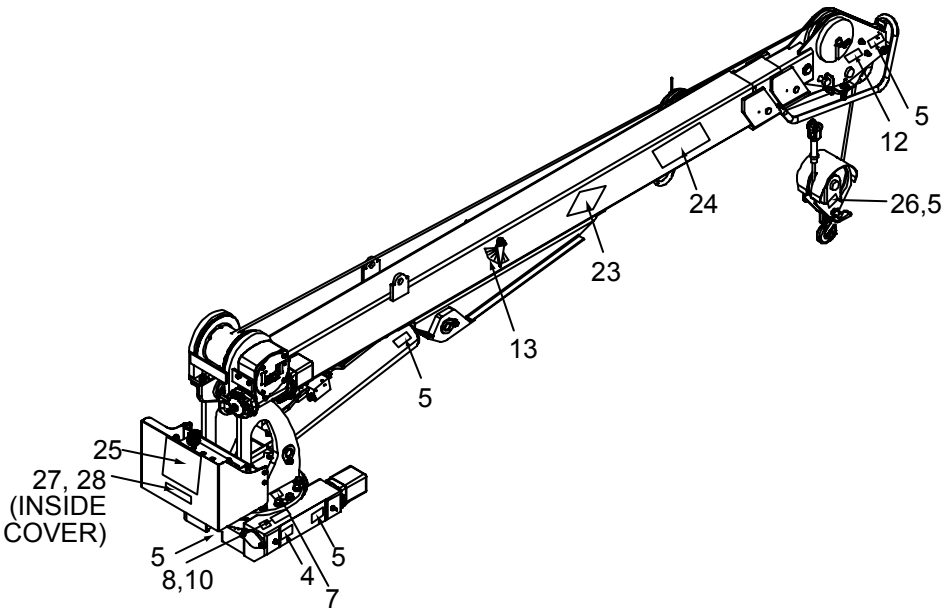


90719400 TETHERED CONTROLS PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	N/A	MAST WELDMENT	1
2.	70733956	RECEIVER - RADIO REMOTE TELE VORC	1
3.	72601846	CAP SCR-SS .25-20X 1.25 HH	2
4.	72063166	WASHER-SS .25 R WRT 18-8 .62OD	2
5.	72062194	NUT-SS .25-20 NYLOC	2
6.	70733883	TRANSMITTER-RADIO REMOTE TELE	1
7.	51719413	HARDWARE KIT-TELE CRANE RADIO CONTROLS	REF
NEW 20050329			

Miscellaneous

3020 SII Decal Kit (95721952)





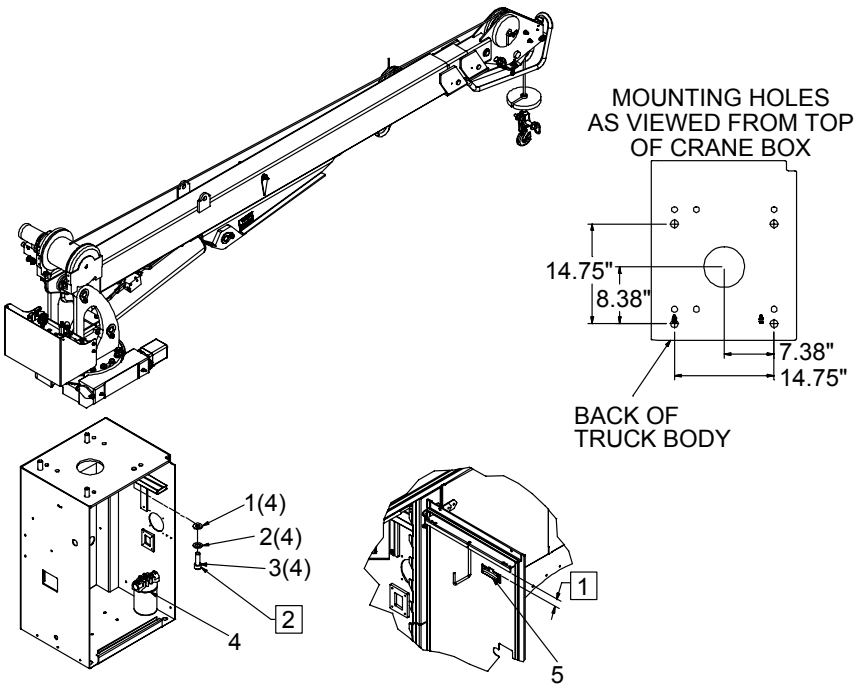
DECAL PLACEMENT (IF NOT SHOWN ON CRANE)	
ITEM #	PLACEMENT
21,22,25, 29	AT OR NEAR REMOTE HANDLE STORAGE POINT
15	ON OUTRIGGERS OR BUMPER GUSSET

16	2 ON REAR OUTRIGGERS, 2 ON SIDEPACK FRONT WALLS
18	AT OR NEAR DRIVELINE
17,20	ON ALL FOUR SIDES OF CARRIER VEHICLE
19	ON OIL RESERVOIR
7,8,10	ON TOP OF BASE OVER WORM DRIVE

99903752 PARTS LIST

ITEM	PART #	DESCRIPTION	KIT #	QUANTITY
1.	95719347	DECAL KIT, TELESCOPIC (COMMON) (INCL. 4-14, 28)		1
2.	95719348	DECAL KIT, BODY (COMMON) (INCL. 15-22,29)		1
3.	95721952	DECAL KIT, 3020		1
4.	70391612	DECAL-GREASE WEEKLY, LEFT	1	3
5.	70391613	DECAL-GREASE WEEKLY, RIGHT	1	5
7.	70392399	DECAL-LUBRICATION	1	1
8.	70392524	DECAL-ROTATE WHILE GREASING	1	1
10.	70395090	DECAL-GREASE WORM DRIVE BRNGS	1	1
11.	70395324	DECAL-ASME/ANSI B30.5	1	1
12.	70395670	DECAL-CAUTION, DOWNHAUL WT	1	2
13.	71391522	DECAL-ANGLE INDICATOR (RH)	1	1
14.	71391523	DECAL-ANGLE INDICATOR (LH)	1	1
15.	70391598	DECAL-WARNING, MANUAL O/R	2	2
16.	70392864	DECAL-OUTRIGGER STAND CLEAR	2	4
17.	70392868	DECAL-DANGER LOADLINE (TRUCK)	2	4
18.	70392891	DECAL-DANGER DRIVELINE	2	1
19.	70394189	DECAL-OIL RESERVOIR	2	1
20.	70394445	DECAL-DANGER ELECTROCUTION	2	4
21.	70396613	DECAL-CRANE OPERATION	2	1
22.	71039134	DECAL-CAUTION, OIL LEVEL	2	1
23.	70392887	DECAL-DIAMOND IMT 5.00 X 10.00	3	2
24.	70397659	DECAL-3020 ID	3	2
25.	70397658	DECAL-CP, 3020	3	2
26.	70394453	DECAL-4 TON LD BLOCK RATING	3	2
27.	70396631	DECAL-MANUAL OP	3	1
28.	70394166	DECAL-MANUAL OVERRIDE INST.	1	1
29.	70392982	DECAL-SERVICE & REPAIR	2	1

Installation Kit (93719692)



CAUTION

THE 3" BOLTS SUPPLIED ARE FOR USE ON BODIES WITH A CRANE BOX TOP PLATE THICKNESS OF 7/8" TO 1" ONLY. DETERMINE THE CRANE BOX TOP PLATE THICKNESS PRIOR TO MOUNTING. IF DIFFERENT LENGTH BOLTS ARE REQUIRED, THEY MUST BE 1-8, GRADE 8, ZINC COATED, OF THE PROPER LENGTH. FAILURE TO USE PROPER LENGTH BOLTS MAY CAUSE THE BOLTS UNDER THE WORM HOUSING TO BOTTOM OUT BEFORE TORQUEING. INSURE A MINIMUM OF 1-1/2" THREAD ENGAGEMENT.

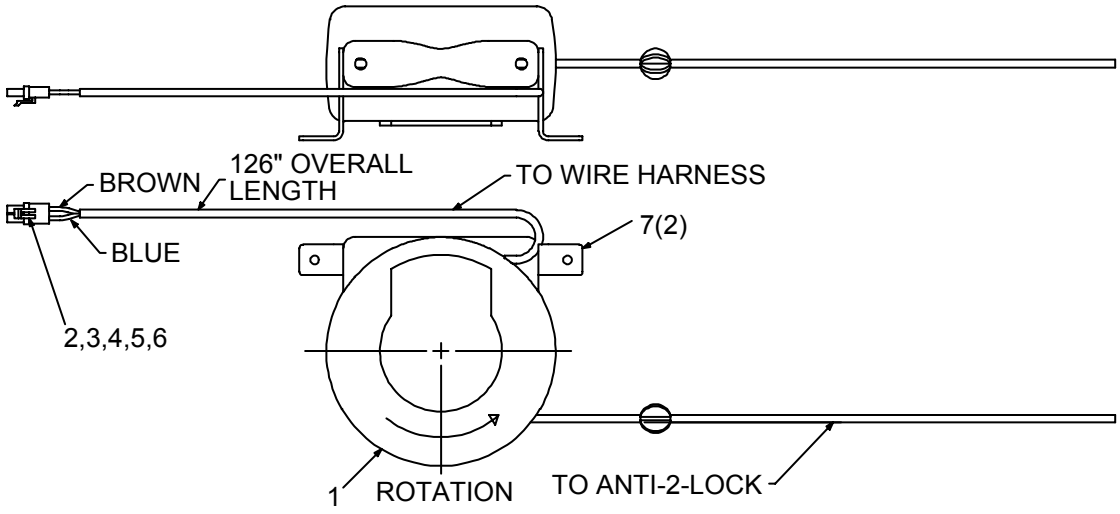
NOTE:

1 LEVEL INDICATOR MUST BE INSTALLED PARALLEL TO THE DOOR REINFORCEMENTS.

2 TORQUE TO 680 FT-LB.

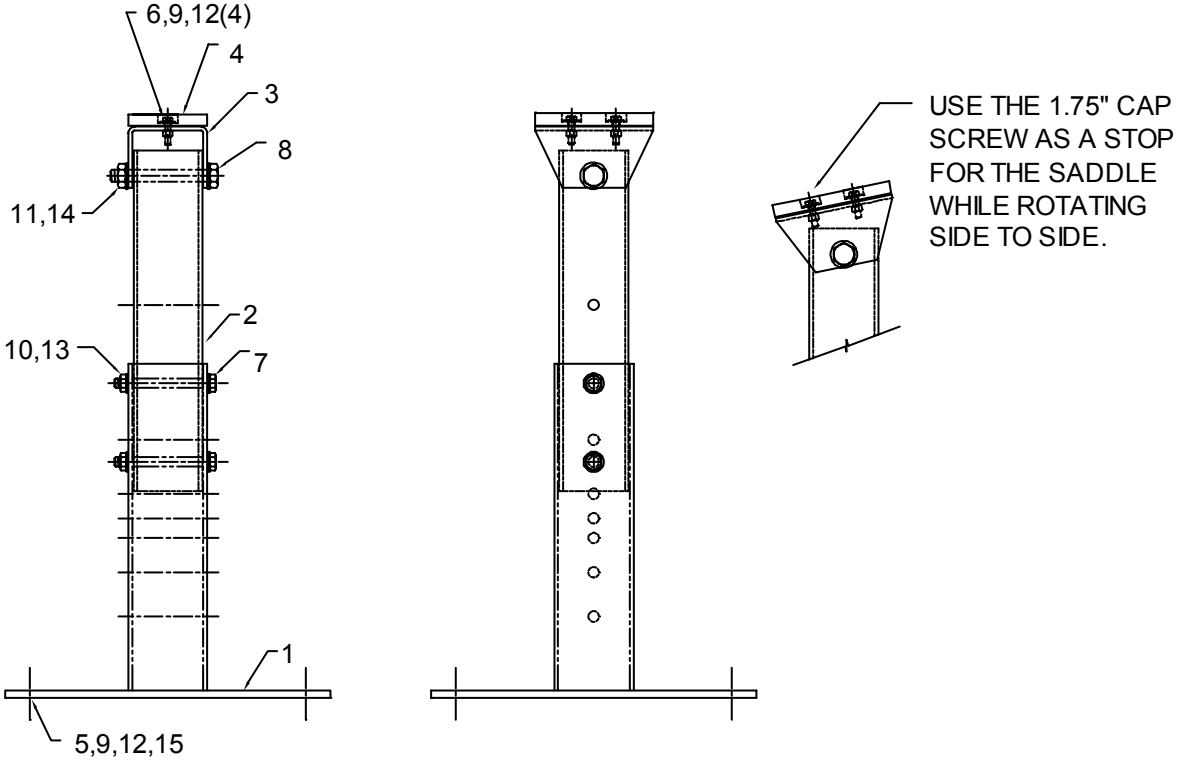
93719692 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	60123848	WASHER-SPECIAL 1.00 X 2.00 X 0.25	4
2	72063066	WASHER 1.00 FLAT HI STR	4
3.	72601748	CAP SCR 1.00- 8X 3.00 SH GR8	4
4.	73052091	FILTER-HYD RET 10MIC 1.25 NPTF	1
5.	72042097	LEVEL INDICATOR	1
REV. E 20080515			

Cord Reel Assembly (51720302)



51720302 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	70734075	CORD REEL	1
2.	77044574	CONNECTION-WP 2CAV FEMALE/TOWER	1
3.	77044550	TERMINAL-WP 18-20GA FEMALE	2
4.	70394069	SEAL	2
5.	77041493	WIRE MARKER	1
6.	77041491	WIRE MARKER	1
7.	60128001	BRACKET, CORD REEL	2
REV. A 20060815			

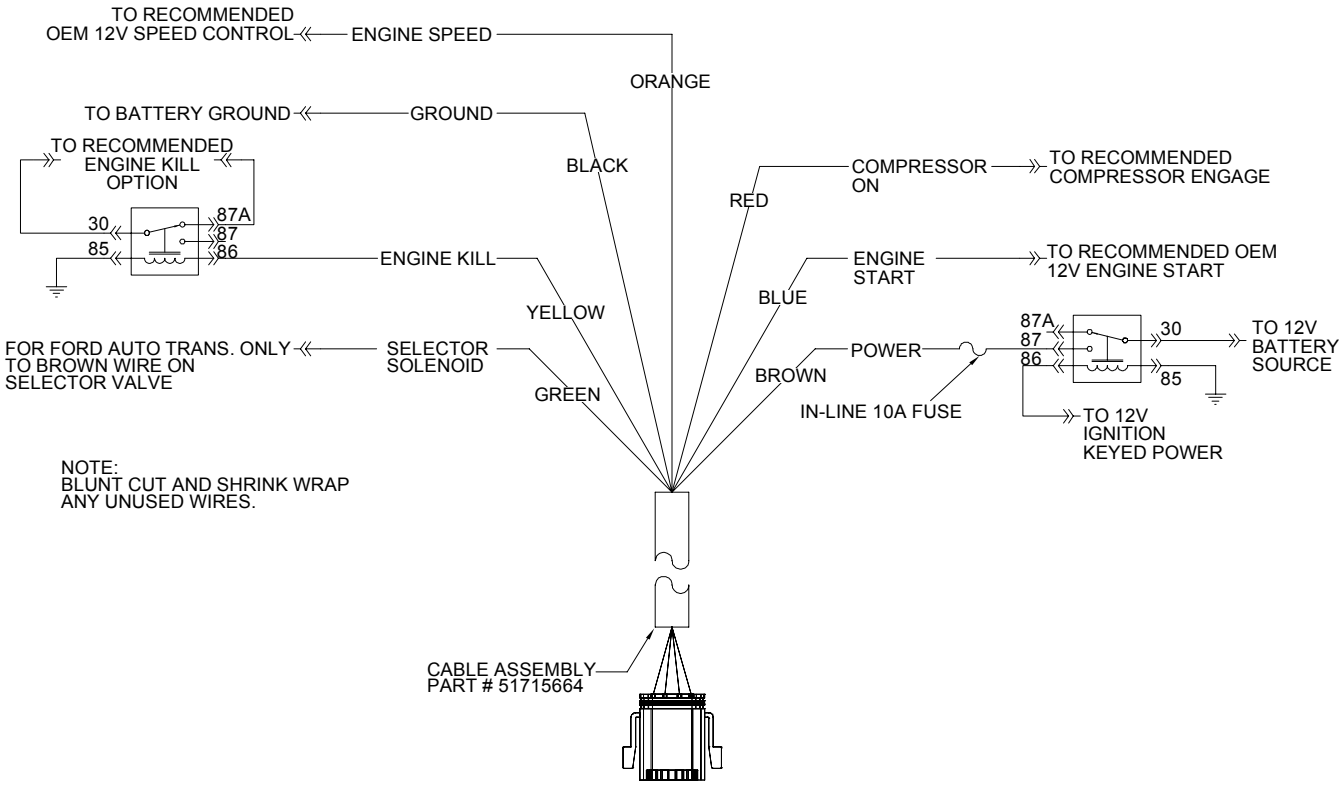
Boom Support Assembly (51714181)



51714181 PARTS LIST			
ITEM	PART #	DESCRIPTION	QUANTITY
1.	52708159	PEDESTAL	1
2.	60121853	TUBE	1
3.	60120516	SADDLE	1
4.	60030306	WEAR PAD	1
5.	72060048	CAP SCR 3/8-16X1-1/2 HHGR5	4
6.	72060049	CAP SCR 3/8-16X1-3/4 HHGR5	2
7.	72060101	CAP SCR 1/2-13X5 HHGR5	2
8.	72601671	CAP SCR 3/4-10X5-1/2 HHGR5	1
9.	72062103	NUT 3/8-16 LOCK	6
10.	72062080	NUT 1/2-13 LOCK	2
11.	72062114	NUT 3/4-10 LOCK	1
12.	72063003	WASHER 3/8 WRT	12
13.	72063005	WASHER 1/2 WRT	4
14.	72063008	WASHER 3/4 WRT	2
15.	76392821	WASHER-BONDED PLTD	4
16.	51716384	HARDWARE KIT (INCL. 5-15)	1

REV. E 20040206

Chassis Wiring Harness (99903340)



Note: Used on all ship-out IMT telescopic cranes.

CHAPTER 5

General Reference

In This Chapter

Inspection Checklist

NOTICE:

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

OWNER/COMPANY:	TYPE OF INSPECTION (circle one):			
CONTACT PERSON:	DAILY	MONTHLY	QUARTERLY	ANNUAL
CRANE MAKE & MODEL:	DATE INSPECTED:			
CRANE SERIAL NUMBER:	HOURMETER 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 "designated" person, who has been selected or assigned by the employer or the employer's representative as being competent to perform specific duties.

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

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 outriggers fully extended.

DAILY (D): Before each day of operation, those items designated with a (D) must be inspected. This inspection need not be recorded unless a deficiency (8) is found. If the end user chooses to record all daily inspections and those daily inspections include the monthly inspection requirements, there would be no need for a separate monthly inspection.

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.

QUARTERLY (Q): Every three to four 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 recorded.

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 recorded.

INSPECTION CHECKLIST STATUS KEY:	
S = Satisfactory	R = Recommendation (should be considered for corrective action)
X = Deficient (must be corrected prior to operation)	NA = Not Applicable

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
D	1	Labels	All load charts, safety & warning labels, and 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 and cracks.	
D	4	Station	Control and operator's station for dirt, contamination by lubricants, and foreign material.	
D	5	Hydraulic System	Hydraulic system (hoses, tubes, fittings) for leakage and proper oil level.	
D	6	Hook	Presence and proper operation of hook safety latches.	
D	7	Rope	Proper reeving of wire rope on sheaves and winch drum.	
D	8	Pins	Proper engagement of all connecting pins and pin retaining devices.	
D	9	General	Overall observation of crane for damaged or missing parts, cracked welds, and presence of safety covers.	
D	10	Operation	During operation, observe crane for abnormal performance, unusual wear (loose pins, wire rope damage, etc.). If observed, discontinue use and determine cause and severity of hazard.	
D	11	Remote Ctrl	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 2-Block	Operate anti 2-block device to check for proper operation.	
D	14		Other (Per customer requirements)	
D	15		Other (Per customer requirements)	
M	16	Daily	All daily inspection items.	
M	17	Cylinders	Visual inspection of cylinders for leakage at rod, fittings, and welds. Damage to rod and case.	
M	18	Valves	Holding valves for proper operation.	
M	19	Valves	Control valves for leaks at fittings and between stations.	
M	20	Valves	Control valve linkages for wear, smoothness of operation, and tightness of fasteners.	
M	21	General	Bent, broken, or significantly rusted/corroded parts.	
M	22	Electrical	Electrical systems for presence of dirt, moisture, and frayed wires.	
M	23	Structure	All structural members for damage.	
M	24	Welds	All welds for breaks and cracks.	
M	25	Pins	All pins for proper installation and condition.	
M	26	Hardware	All bolts, fasteners and retaining rings for tightness, wear and corrosion.	
M	27	Wear Pads	Presence of wear pads.	
M	28	Pump & Motor	Hydraulic pumps and motors for leakage at fittings, seals, and between sections.	
M	29	PTO	Transmission/PTO for leakage, abnormal vibration, and noise.	
M	30	Hyd Fluid	Quality of hydraulic fluid and presence of water.	

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
M	31	Hyd Lines	Hoses & tubes for leakage, abrasion damage, blistering, cracking, deterioration, fitting leakage, and secured properly.	
M	32	Hook	Load hook for abnormal throat distance, twist, wear, and cracks.	
M	33	Rope	Condition of load line.	
M	34	Manual	Presence of operator's manual with unit.	
M	35		Other	
Q	36	Daily	All daily inspection items.	
Q	37	Monthly	All monthly inspection items.	
Q	38	Extensions	Condition of wear pads.	
Q	39	Rotation Sys	Rotation bearing for proper torque of all accessible mounting bolts.	
Q	40	Hardware	Base mounting bolts for proper torque.	
Q	41	Structure	All structural members for deformation, cracks and corrosion.	
	42		• Base	
	43		• Outrigger beams and legs	
	44		• Mast	
	45		• Inner Boom	
	46		• Outer Boom	
	47		• Extension(s)	
	48		• Jib boom	
	49		• Jib extension(s)	
	50		• Other	
Q	51	Hardware	Pins, bearing, shafts, gears, rollers, and locking devices for wear, cracks, corrosion and distortion.	
	52		• Rotation bearing(s)	
	53		• Inner boom pivot pin(s) and retainer(s)	
	54		• Outer boom pivot pin(s) and retainer(s)	
	55		• Inner boom cylinder pin(s) and retainer(s)	
	56		• Outer boom cylinder pin(s) and retainer(s)	
	57		• Extension cylinder pin(s) and retainer(s)	
	58		• Jib boom pin(s) and retainer(s)	
	59		• Jib cylinder pin(s) and retainer(s)	
	60		• Jib extension cylinder pin(s) and retainer(s)	
	61		• Boom tip attachment	
	62		• Other	
Q	63	Hyd Lines	Hoses, fittings and tubing for proper routing, leakage, blistering, deformation and excessive abrasion.	
	64		• Pressure line(s) from pump to control valve	
	65		• Return line(s) from control valve to reservoir	
	66		• Suction line(s) from reservoir to pump	
	67		• Pressure line(s) from control valve to each function	
	68		• Load holding valve pipe(s) and hose(s)	
	69		• Other	
Q	70	Pumps, PTO's & Motors	Pumps, PTO's & motors for loose bolts/fasteners, leaks, noise, vibration, loss of performance, heating & excess pressure.	
	71		• Winch motor(s)	
	72		• Rotation motor(s)	
	73		• Other	
Q	74	Valves	Hydraulic valves for cracks, spool return to neutral, sticking spools, proper relief valve setting, relief valve failure.	
	75		• Main control valve	

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS (S,R,X,NA)
	76		• Load holding valve(s)	
	77		• Outrigger or auxiliary control valve(s)	
	78		• Other valves (per customer requirements)	
	79		• Other (per customer requirements)	
Q	80	Cylinders	Hydraulic cylinders for drifting, rod seal leakage and leakage at welds. Rods for nicks, scores and dents. Case for damage. Case and rod ends for damage and abnormal wear.	
	81		• Outrigger cylinder(s)	
	82		• Inner boom cylinder(s)	
	83		• Outer boom cylinder(s)	
	84		• Extension cylinder(s)	
	85		• Rotation cylinder(s)	
	86		• Jib lift cylinder(s)	
	87		• Jib extension cylinder(s)	
	88		• Other (per customer requirements)	
Q	89	Winch	Winch, sheaves and drums for damage, abnormal wear, abrasions and other irregularities.	
Q	90	Hyd Filters	Hydraulic filters for replacement per maintenance schedule.	
A	91	Daily	All daily inspection items.	
A	92	Monthly	All monthly inspection items.	
A	93	Quarterly	All quarterly inspection items.	
A	94	Hyd Sys	Hydraulic fluid change per maintenance schedule.	
A	95	Controls	Control valve calibration for correct pressure & relief valve settings.	
A	96	Valves	Safety valve calibration for correct pressure & relief valve settings.	
A	97	Valves	Valves for failure to maintain correct settings.	
A	98	Rotation Sys	Rotation drive system for proper backlash clearance & abnormal wear, deformation and cracks.	
A	99	Lubrication	Gear oil change in rotation drive system per maintenance schedule.	
A	100	Hardware	Check tightness of all fasteners and bolts, using torque specifications on component drawings or torque chart.	
A	101	Wear Pads	Wear pads for excessive wear.	
A	102	Loadline	Loadline for proper attachment to drum.	

Deficiency / Recommendation / Corrective Action Report

DATE:	OWNER:	UNIT I.D. NUMBER:

GUIDELINES

a A deficiency (X) may constitute a hazard. Deficiency 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

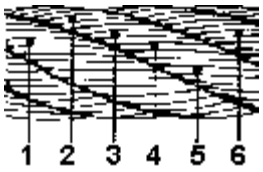
X,R,CA	ITEM #	EXPLANATION	DATE CORRECTED

Wire Rope Inspection & Replacement

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

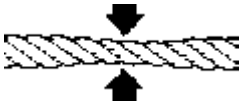
a Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.

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

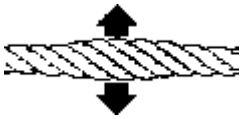


c When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.

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

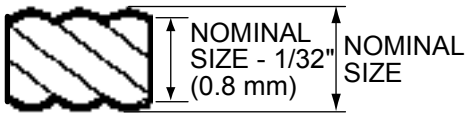


e When kinking, crushing, birdcaging or other distortion occurs.



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" (0.8 mm) 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).

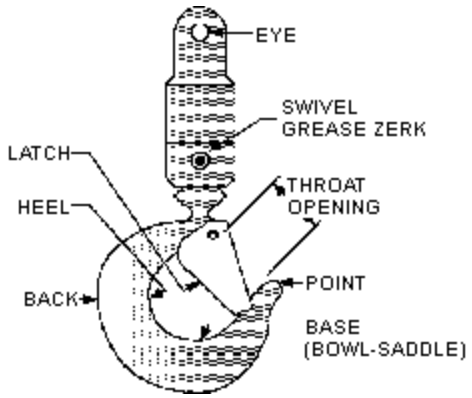
d LATCH

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 wired closed (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-Block Device Inspection

(See the operation, maintenance, and repair manual for this crane 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.

4 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.

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

Thread Torques

WARNING

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

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

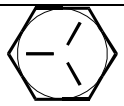
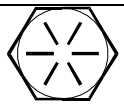
1 Bolt manufacturer's particular specifications should be consulted when provided.

2 Flat washers of equal strength must be used.

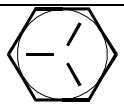
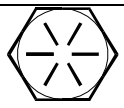
3 All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.

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.

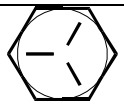
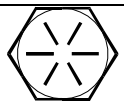
FINE THREAD TORQUE CHART (ENGLISH)

TIGHTENING TORQUE					
SIZE (DIA-TPI)	BOLT DIA. (INCHES)	 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)
5/16-24	0.3125	19	14	27	20
3/8-24	0.375	35	26	49	35
7/16-20	0.4375	55	41	78	58
1/2-20	0.5	90	64	120	90
9/16-18	0.5625	120	90	170	130
5/8-18	0.625	170	130	240	180
3/4-16	0.75	300	225	420	315
7/8-11	0.875	445	325	670	500
1-12	1	645	485	995	745
1 1/8-12	1.125	890	670	1445	1085
1 1/4-12	1.25	1240	930	2010	1510
1 3/8-12	1.375	1675	1255	2710	2035
1 1/2-12	1.5	2195	1645	3560	2670

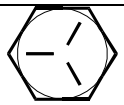
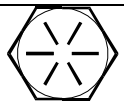
COARSE THREAD TORQUE CHART (ENGLISH)

TIGHTENING TORQUE					
SIZE (DIA-TPI)	BOLT DIA. (INCHES)	 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	0.375	31	23	44	33
7/16-14	0.4375	49	37	70	52
1/2-13	0.5	75	57	105	80
9/16-12	0.5625	110	82	155	115
5/8-11	0.625	150	115	220	160
3/4-10	0.75	265	200	375	280
7/8-9	0.875	395	295	605	455
1-8	1	590	445	910	680
1 1/8-7	1.125	795	595	1290	965
1 1/4-7	1.25	1120	840	1815	1360
1 3/8-6	1.375	1470	1100	2380	1780
1 1/2-6	1.5	1950	1460	3160	2370

FINE THREAD TORQUE CHART (METRIC)

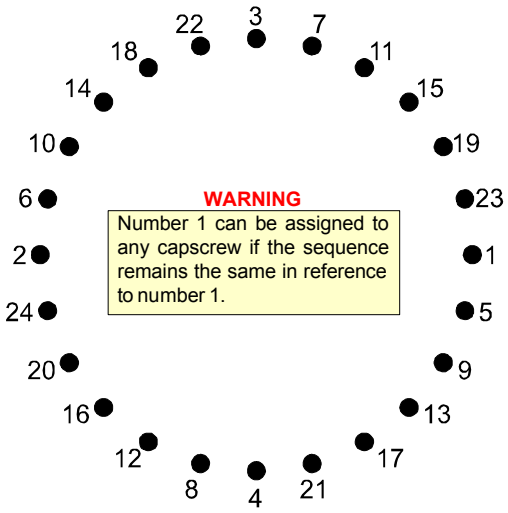
TIGHTENING TORQUE					
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
SIZE (DIA-TPI)	BOLT DIA. (INCHES)	PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-24	0.3125	3	2	4	3
3/8-24	0.375	5	4	7	5
7/16-20	0.4375	8	6	11	8
1/2-20	0.5	12	9	17	12
9/16-18	0.5625	17	12	24	18
5/8-18	0.625	24	18	33	25
3/4-16	0.75	41	31	58	44
7/8-11	0.875	62	45	93	69
1-12	1	89	67	138	103
1 1/8-12	1.125	123	93	200	150
1 1/4-12	1.25	171	129	278	209
1 3/8-12	1.375	232	174	375	281
1 1/2-12	1.5	304	228	492	369

COARSE THREAD TORQUE CHART (METRIC)

TIGHTENING TORQUE					
		 SAE J429 GRADE 5		 SAE J429 GRADE 8	
SIZE (DIA-TPI)	BOLT DIA. (INCHES)	PLAIN (KG-M)	PLATED (KG-M)	PLAIN (KG-M)	PLATED (KG-M)
5/16-18	0.3125	2	2	3	2
3/8-16	0.375	4	3	6	5
7/16-14	0.4375	7	5	10	7
1/2-13	0.5	10	8	15	11
9/16-12	0.5625	15	11	21	16
5/8-11	0.625	21	16	30	22
3/4-10	0.75	37	28	52	39
7/8-9	0.875	55	41	84	63
1-8	1	82	62	126	94
1 1/8-7	1.125	110	82	178	133
1 1/4-7	1.25	155	116	251	188
1 3/8-6	1.375	203	152	329	246
1 1/2-6	1.5	270	210	438	328

Turntable Bearing Thread Tightening Sequence

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



TIGHTENING PROCEDURE

1 Refer to the Torque Data Chart to determine the proper torque value to apply to the size of 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-LB = 106 FT-LB)

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

4 Repeat Step 3, but torquing all capscrews to 75% of the specified torque value. Continue to follow the tightening sequence.

(EXAMPLE: .75 x 265 FT-LB = 199 FT-LB)

(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

Turntable bearings may experience wear. One of the following conditions may indicate turntable bearing wear:

1 Metal particles present in the bearing lubricant.

2 Increased drive power required to rotate the crane.

3 Noise emitting from the bearing during rotation.

4 Rough rotation.

5 Uneven or excessive wear between the pinion gear and turntable gear.

If one or more of the above conditions exists, further 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. You can measure the tilt using the ***Turntable Bearing Tilt Test.*** (see "Turntable Bearing Tilt Test" on page 81)

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.**

Turntable Bearing Tilt Test

1 Place crane in vertical position.

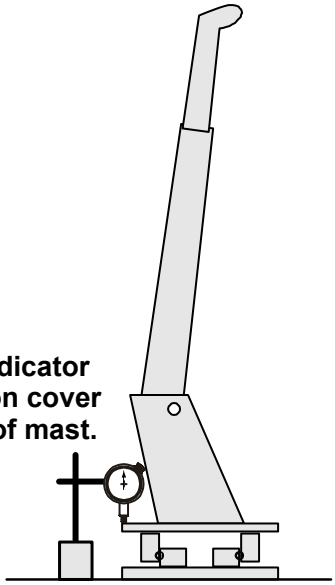
2 Set a dial indicator at 0 on the pinion cover plate at back side of mast.

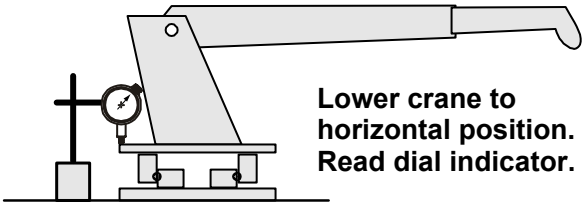
3 Lower crane to the horizontal position.

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.

Set up dial indicator to 0" on pinion cover at back side of mast.





Lower crane to horizontal position. Read dial indicator.

COMPARISON CHART - MEASURED TILT DIMENSION PER CRANE MODEL					
NOTE: The tilt dimensions 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, Loader or Tirehand Model	1007 1014/1014A 1015 2015/2020 2109 2820 3000 3016/3020 3203i 3816/3820 4004i 421/425 4300 5005i 5016/5020 6006i 6016/6020 6022 5525 / 6025 / 6625 EZ Hauler I, II EZ Hauler 3000 / 5500	5200 5200R 5217 5800 7020 7025 7200 7415 8025 9000	16000-I, II, III 32018 32027 32030 T30 T40	23516 14K160TH COMMANDER IV	1221R 1225R 8000L 9800 12916 13031 13034 14000 15000 18000 20017 8000L H1200 H1200RR T50
Ball Dia. (Ref)	.875" (22 mm)	1.00" (25 mm)	1.18 - 1.25" (30-32 mm)	1.5” (38 mm)	1.75" (44 mm)
Tilt Dim.	.060" (1.524 mm)	.070" (1.778 mm)	.075" (1.905 mm)	.085” (2.159 mm)	.090" (2.286 mm)

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