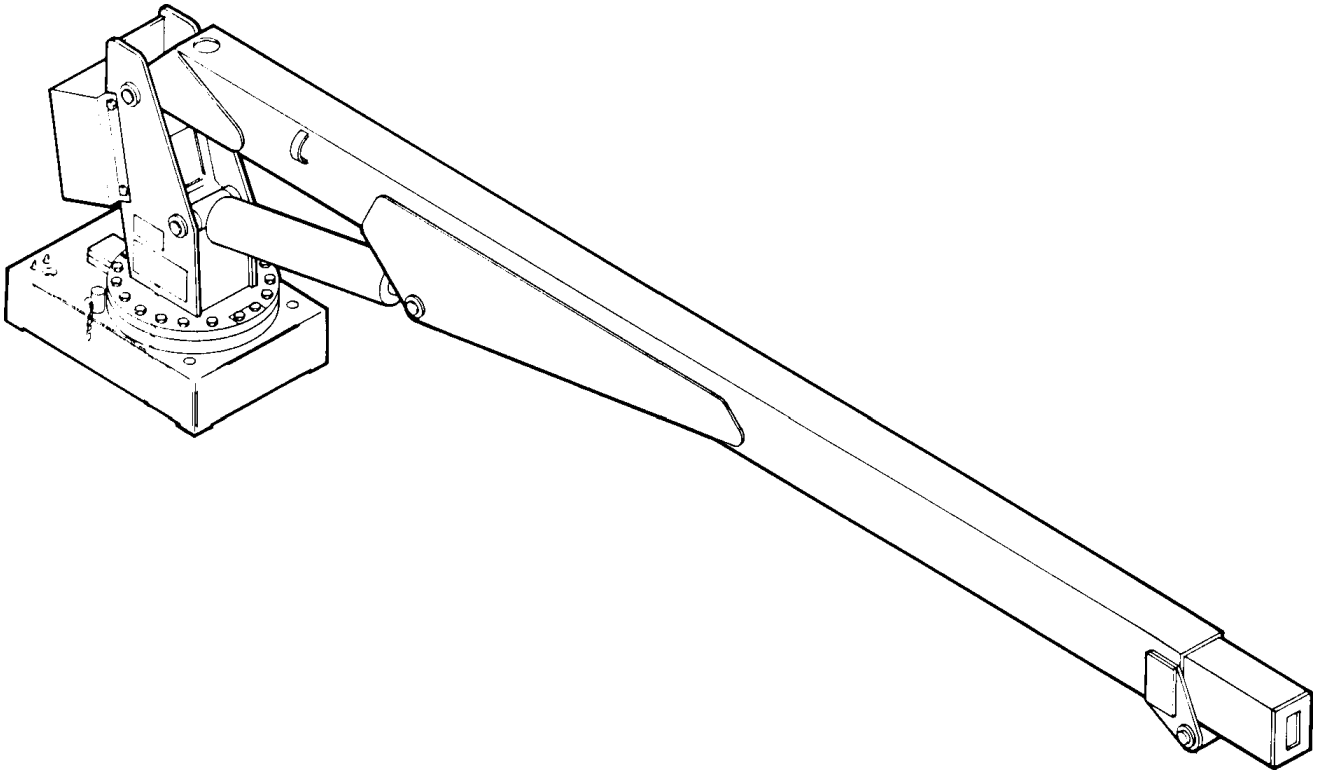
000321GH:99900412: 19990209

Model 321GH Crane

REF PART NO. 719321GH

Volume 2 - PARTS AND SPECIFICATIONS

Section 1 CRANE SPECIFICATIONS
Section 2 CRANE REFERENCE
Section 3 REPLACEMENT PARTS
Section 4 GENERAL REFERENCE



IOWA MOLD TOOLING CO., INC.

BOX 189, GARNER, IA 50438-0189
TEL: 515-923-3711
TECHNICAL SUPPORT FAX: 515-923-2424

MANUAL PART NUMBER 99900412

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.

SECTION 1. MODEL 321GH CRANE SPECIFICATIONS

NOTES

MODEL 321GH CRANE SPECIFICATIONS

GENERAL SPECIFICATIONS

CRANE RATING	36,000 ft-lbs (4.99 ton-meters)
REACH (from centerline of rotation)	21'-0" (6.40m)
HYDRAULIC EXTENSION	84" (213.4cm)
LIFTING HEIGHT (from base of crane)	18'-1" (5.51m)
WEIGHT OF CRANE	1960 lbs (889 kg)
OUTRIGGER SPAN (required option)	
Crane side from centerline of truck	90" (228.6cm)
Opposite side from centerline of truck	48" (121.9cm)
VERTICAL CENTER OF GRAVITY (from base of crane)	19" (48.3cm)
HORIZONTAL CENTER OF GRAVITY (from centerline of rotation)	22" (55.9cm)
STORAGE HEIGHT (crane only)	39" (99.1cm)
MOUNTING SPACE	20" X 28" (50.8cm X 71.1cm)
TIE-DOWN BOLT PATTERN	14-3/4" X 14-3/4" on center (37.5cm X 37.5cm on center)
OPTIMUM PUMP CAPACITY	5 U.S. GPM (18.9 liter/minute)
DESIGN FACTORS (pins and hydraulics)	4/1

PERFORMANCE CHARACTERISTICS

ROTATION: 370° (6.45 Rad.)	30 seconds
LOWER CYLINDER: -15° to +46° (-0.26 Rad. to +0.80 Rad.)	14 seconds
EXTENSION CYLINDER: 72" (182.9cm)	24 seconds

CYLINDERS

	BORE	STROKE
LOWER BOOM CYLINDER	4-1/2" (11.4cm)	15-1/4" (38.7cm)
EXTENSION BOOM CYLINDER	3" (7.6cm)	84" (213.4cm)

MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	CONVENTIONAL CAB
WHEEL BASE	154" (391cm)
CAB TO AXLE	84" (213cm)
FRAME SECTION MODULUS	$12"^3$ (196.7cc)
RBM	432,000 in-lbs (4982 kg-m)
FRONT AXLE RATING	5000 lbs (2268 kg)
REAR AXLE RATING	13,000 lbs (5897 kg)
TRANSMISSION	4 speed

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

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HYDRAULIC SYSTEM

Open-centered, full-pressure system that requires 5 GPM (18.9 liter/min.) optimum oil flow at 2350 PSI (162 bar). Three-spool, electric, remote, stack-type control valve with a 50'-0" (15.24m) control cable. System includes separate oil reservoir, suction-line filter, control valve and return-line filter.

POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be used - minimum power required is 8 horsepower based on 5 GPM at 2350 PSI (18.9 liter/min. at 162 bar).

ROTATION

Turntable bearing powered by a high-torque hydraulic motor through a ring-and-pinion type spur-gear train. Total gear reduction is 43:1.

CYLINDER HOLDING VALVES

The base end of the extension cylinder is equipped with a pilot-operated locking-holding valve to prevent sudden cylinder collapse in the event of a hose or other hydraulic failure.

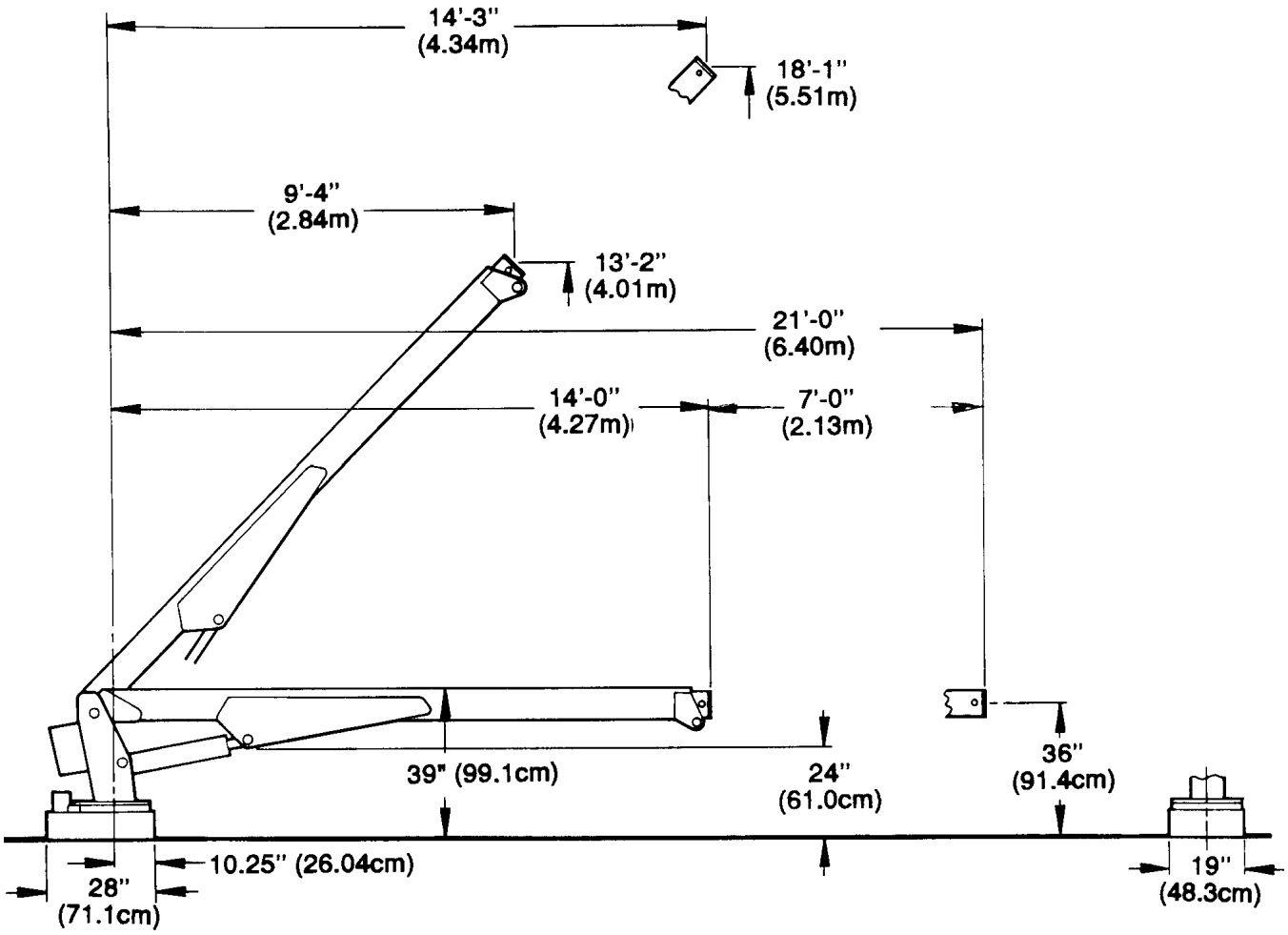
The extend side of the lower boom cylinder is equipped with a 10 GPM counter-balance valve. The counter-balance valve serves several functions. First, it is a holding valve. Second, it is so constructed that it will control the lowering function and allow that motion to be feathered while under load. Finally, if a hose breaks, the only oil loss will be that in the hose.

CAPACITY ALERT SYSTEM

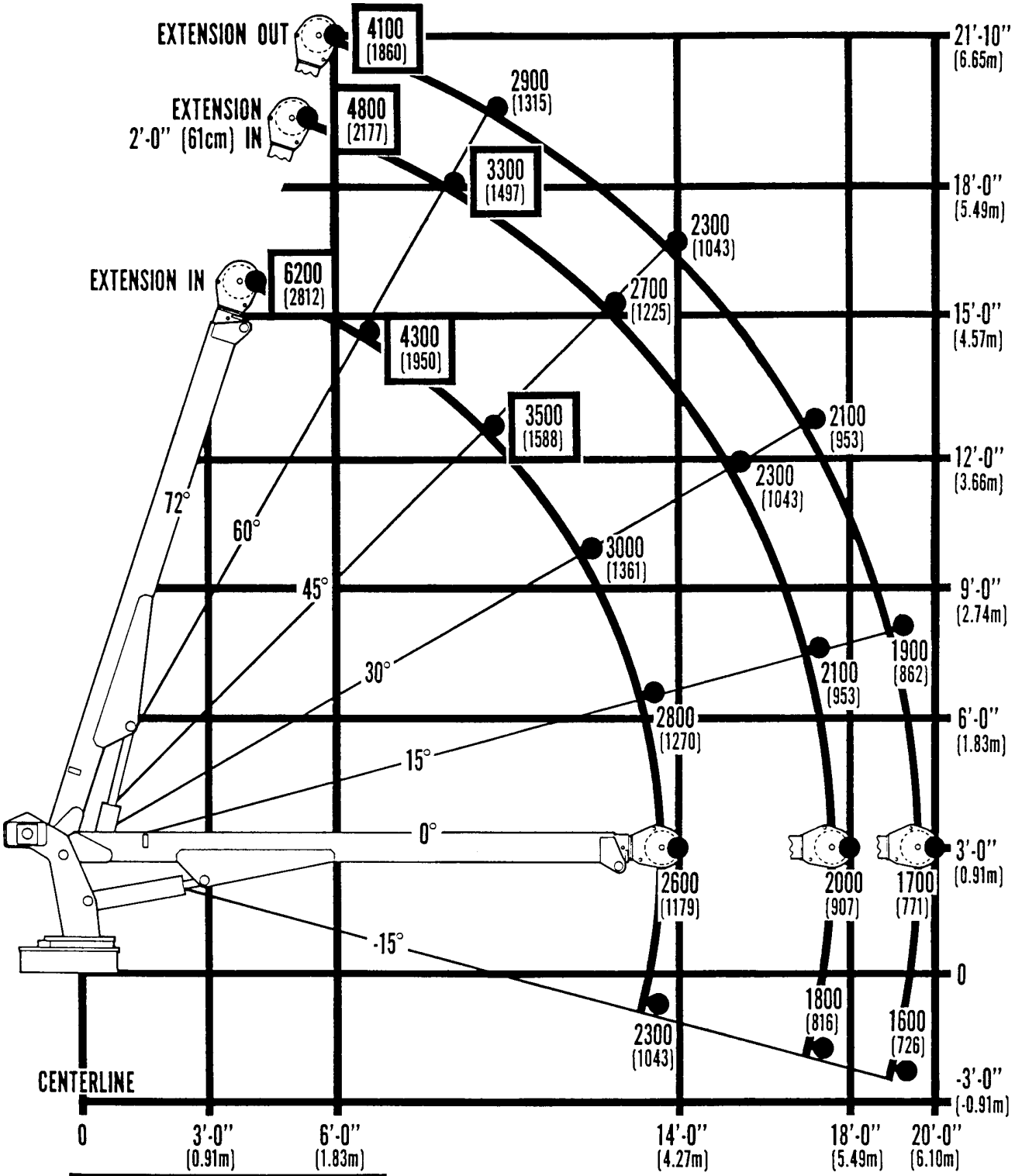
A pressure switch mounted on the extend side of the lower boom cylinder and connected electrically to the lift side of the winch and the extend side of the extension boom provides a capacity alert system. If the operator tries to lift a load in excess of the crane capacity, the winch lift and extension out functions will not operate. To relieve the condition, the winch can be lowered or the extension boom retracted.

IMT reserves the right to change specifications without notice.

GEOMETRIC CONFIGURATION



CAPACITY CHART



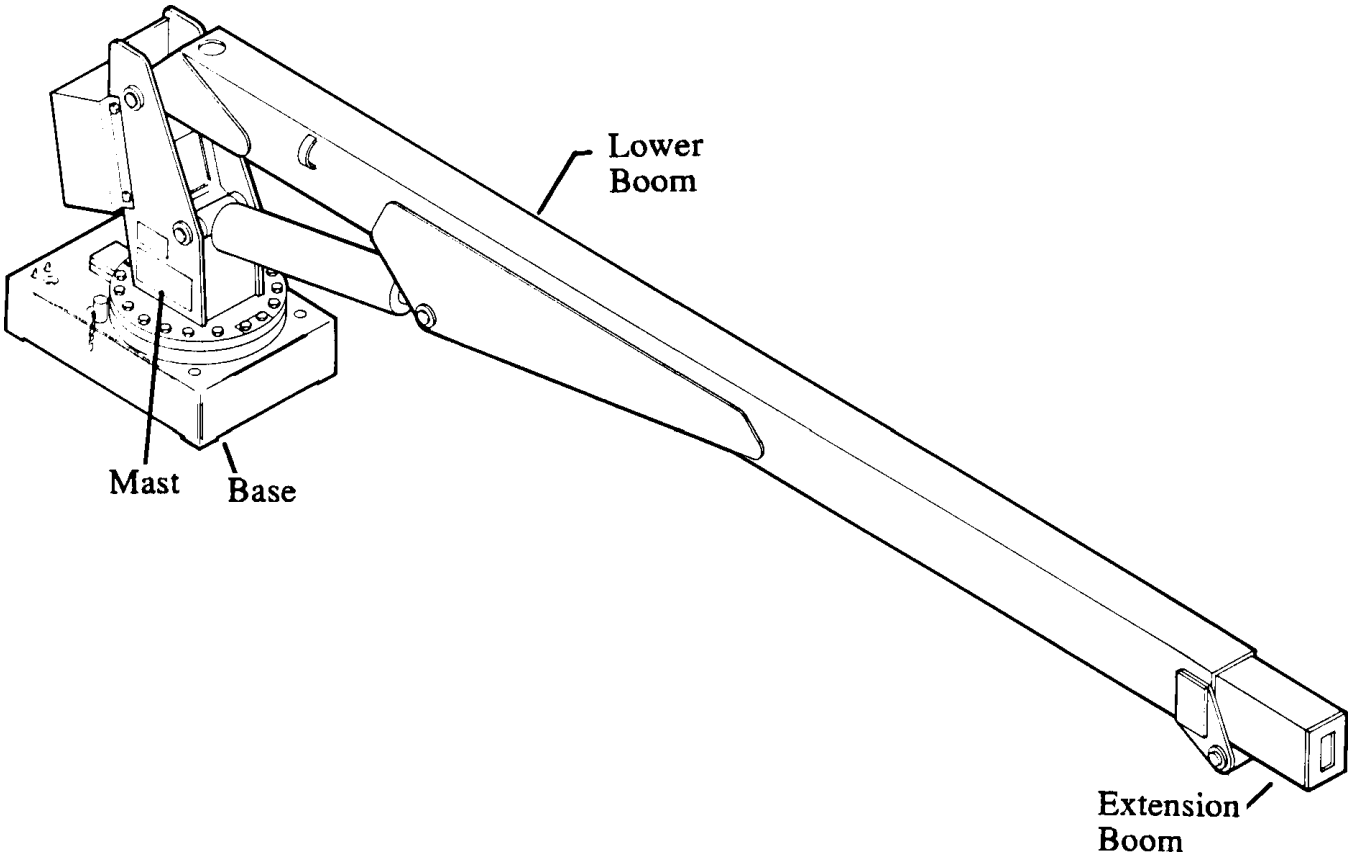
Maximum 1-part line capacity is 3100 lbs (1406 kgs).
For greater loads, use 2-part line.

Reach in Feet (Meters)

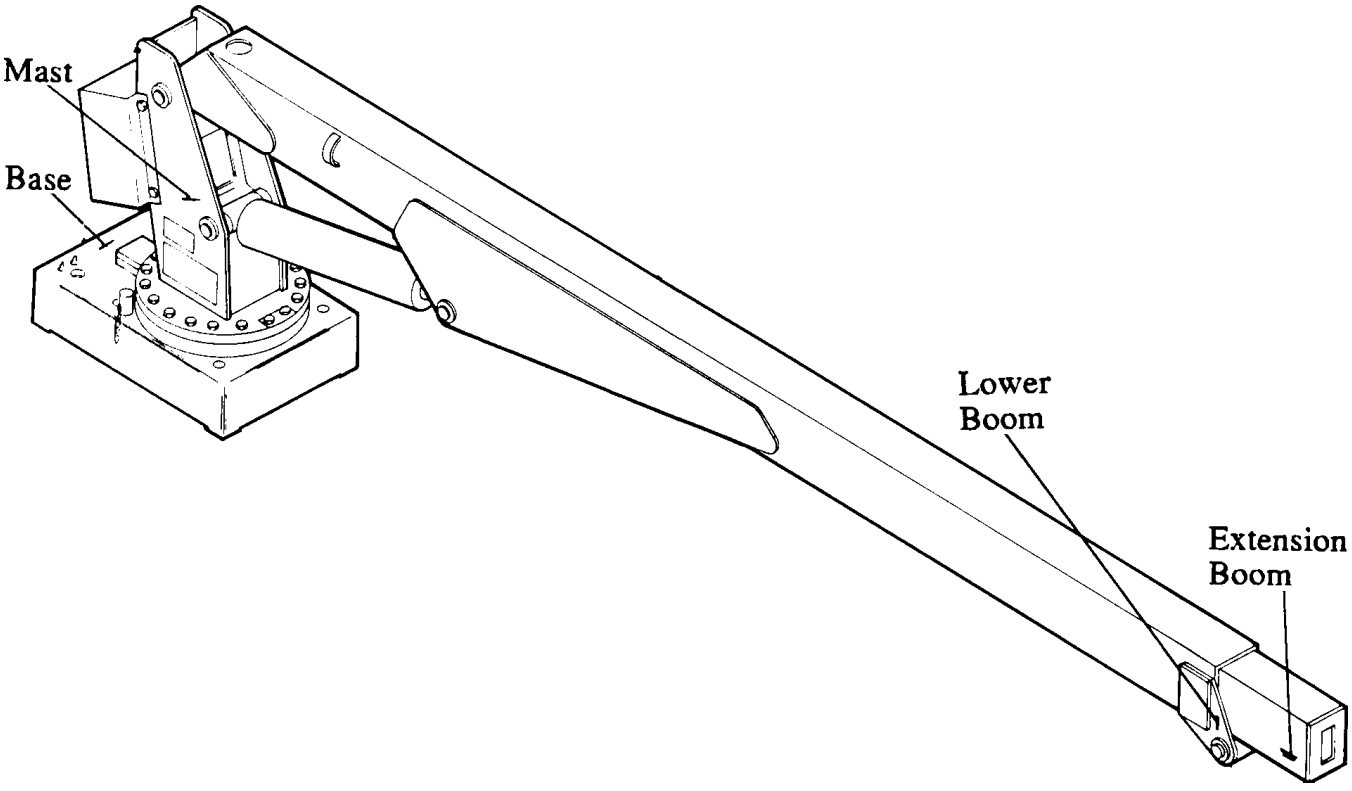
● Capacity in Pounds (Kilograms)

SECTION 2. MODEL 321GH CRANE REFERENCE

NOTES

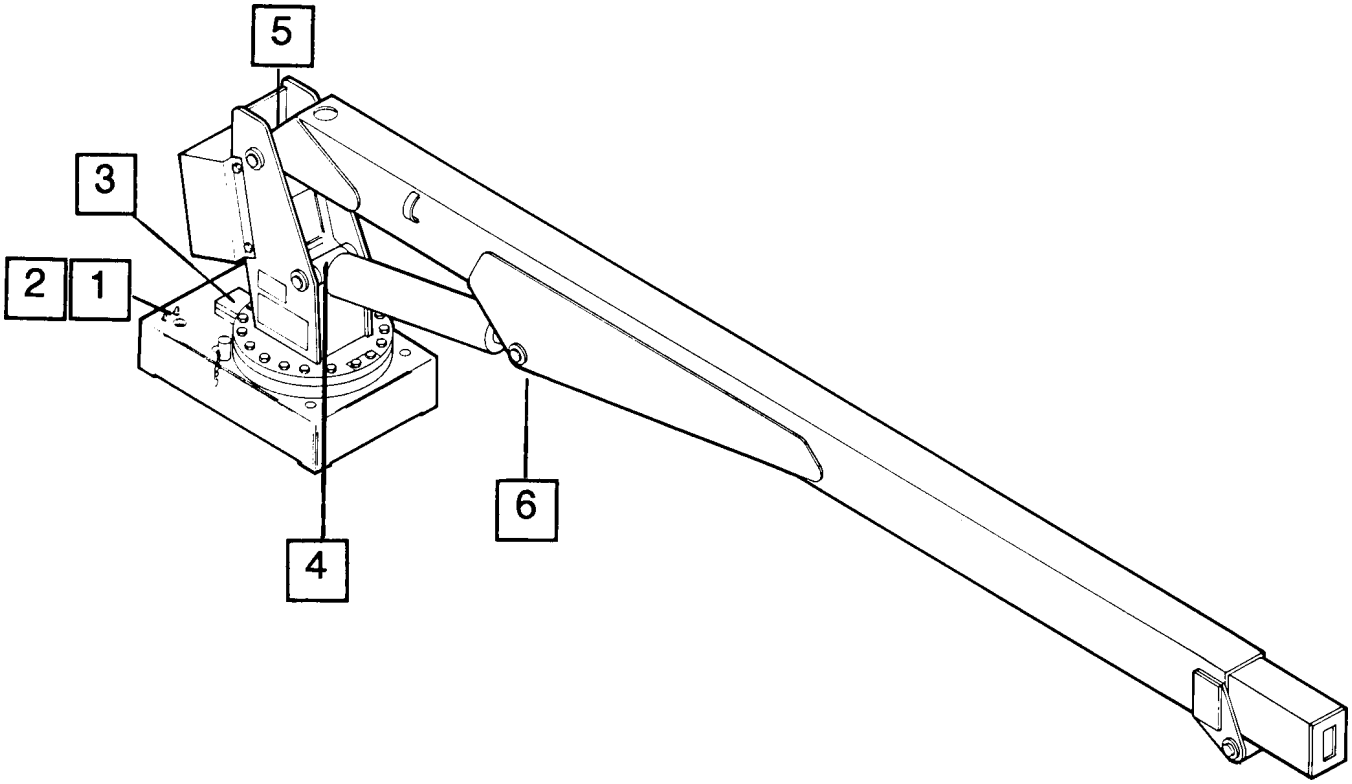


MAJOR CRANE ASSEMBLIES



WELDMENT PART NUMBER LOCATIONS

GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING	SHELL ALVANIA 2EP OR SHELL RETINAX “A”	WEEKLY
2.	DRIVE GEAR GREASE EXTENSION		
3.	PINION GEAR		
4.	LOWER CYLINDER BASE		
5.	MAST/LOWER BOOM HINGE PIN		
6.	LOWER CYLINDER ROD		

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

RECOMMENDED SPARE PARTS LIST

1 YEAR SUPPLY
MODEL 321GH CRANE
FOR MANUAL: 99900412

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
41709279.01.19961011	**BASE ASM**						
	2	60020114	BUSHING	1	W		
	3	60020115	BUSHING	1	W		
	4	60020116	BUSHING	1	W		
	5	60020154	BUSHING	1	W		
	6	71056011	DRIVE GEAR	1	W		
	12	71056010	PINION GEAR	1	W		
	13	71056012	INTERMEDIATE GEAR	1	W		
	14	71056062	TURNTABLE BEARING	1	W		
	20	72060151	CAP SCREW	23	W		
	27	72063119	WASHER	23	W		
	29	73051378	MOTOR	1	W		
41709280.01.19950509	**MAST ASM**						
	7	72060151	CAP SCREW	18	W		
	9	72063119	WASHER	18	W		
41710059.01.19940404	**LOWER BOOM ASM**						
	3	7BF81215	BUSHING	4	W		
	5	60030015	WEAR PAD	2	W		
	6	60030083	WEAR PAD	1	W		
3C241890.01.19980112	**LOWER BOOM CYLINDER**						
	2	7BF81015	BUSHING	4	W		
	4	7BF81215	BUSHING	2	W		
	12	72054304	VALVE	1	W		
	13	9C181823	SEAL KIT	1	W		
41709980.01.19940912	**EXTENSION BOOM ASM**						
	4	60030016	WEAR PAD	1	W		
3B353900.01.19980112	**EXTENSION BOOM CYLINDER**						
	15	73054004	VALVE	1	W		
	18	9C121617	SEAL KIT	1	W		
91709982.01.19950609	**HYDRAULIC KIT**						
	22	73054487	CHECK VALVE	1	W		
	23	73054710	RELIEF VALVE	1	W		
90709284.01.19920409	**CONTROL KIT**						
	18	77041237	SOLENOID	1	W		
	19	77041222	PRESSURE SWITCH	1	W		
	20	77041251	RELAY	2	W		
	22	7Q072015	O-RING	1	W		
51709287.01.19910830	**REMOTE CONTROL HANDLE**						
	11	77041345	TOGGLE SWITCH	2	W		
	12	77041346	TOGGLE SWITCH	4	W		
	13	77041347	TOGGLE SWITCH	1	W		
93709981.01.19950509	**INSTALLATION KIT**						
	REF	73052006	RETURN FILTER ELEMENT	6	P		

(BLANK)

INSTALLATION

GENERAL

This section is intended as a guide in the installation of your crane. Since each installation is cosidered unique, certain components, such as hoses, may need to be cut to the proper length. Prior to beginning the installation, the installer must be familiar with all material in this manual.

CRANE INSTALLATION

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.

The crane base requires an area of at least 20" x 28" (50.8cm x 71.1cm). The platform should be reinforced as shown in Figure below.

To install the crane:

1. Locate and drill the four mounting holes and the center hole for the hoses and remote control cables (Figure on next page). Make certain that the holes are located to properly orient the front of the crane base toward the front of the truck.

2. Use a lifting device capable of lifting the weight of the crane, 1960 lbs (889 kg). Attach the lifting device to the lift brackets of the crane. The lift brackets are located on both sides of the lower boom, approximately 18 inches from the mast hinge. 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.

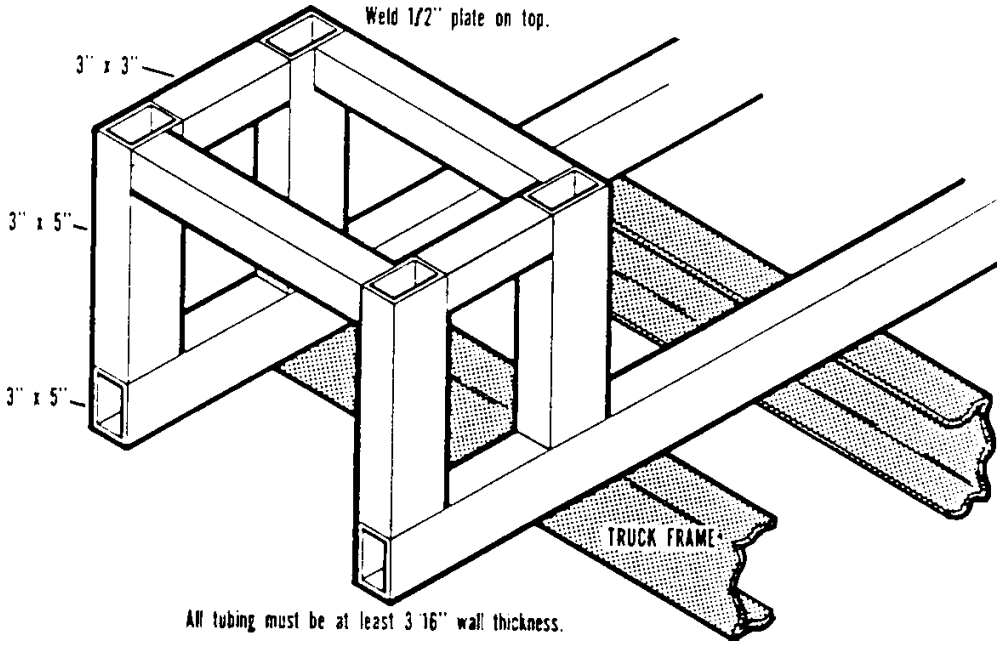
3. Install the mounting tie rods, washers, and nuts to secure the crane base to the truck body (Figure on next page). Tighten and torque to 200 ft- lbs. (28 kg-m).

CAUTION

DO NOT ATTEMPT TO APPLY THE SAME TORQUE TO THE SELF LOCKING NUTS AND TIE RODS AS SHOWN IN THE TORQUE DATA CHART. DO NOT EXCEED 200 FT- LBS. EXCEEDING THE STATED TORQUE OF 200 FT- LBS. (28 KG-M) MAY DAMAGE EITHER THE CRANE BASE OR THE BODY.

POWER WRENCHING OF THE NUT IS NOT RECOMMENDED UNTIL THE LEAD THREAD OF THE NUT INSERT IS ENGAGED BY HAND TURNING.

4. Install the engine speed and engine stop functions as outlined in Volume 1.



BODY REINFORCEMENT

HYDRAULIC INSTALLATION

1. Install the pressure hose between the pump and the crane control valve (Figure below).

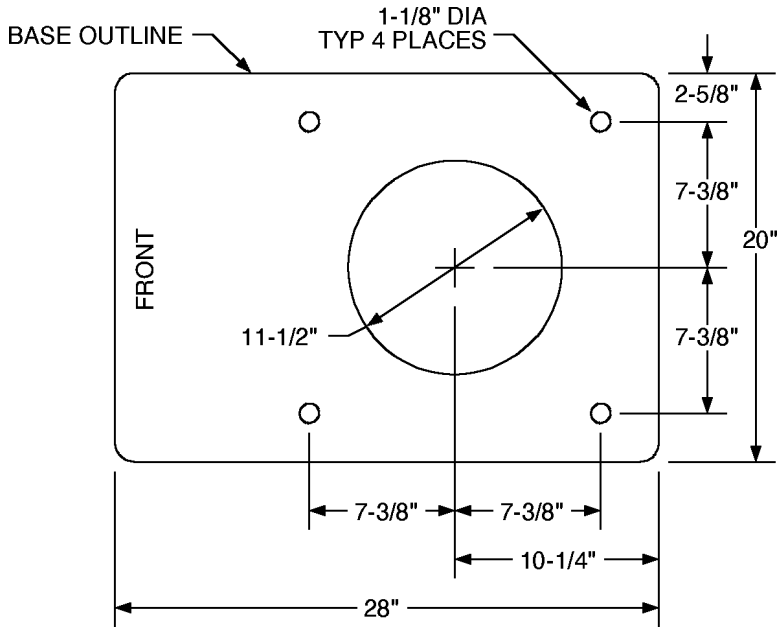
2. Install the return hose between the reservoir and the crane control valve outlet.

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

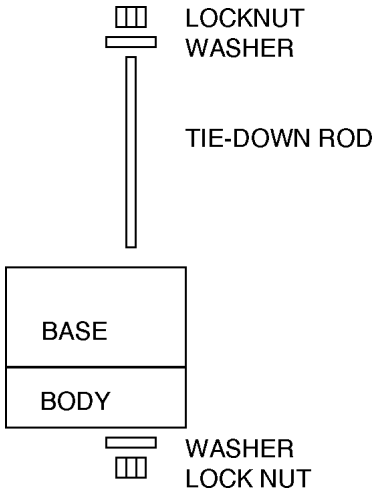
4. Check all connections for leaks.

5. 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.

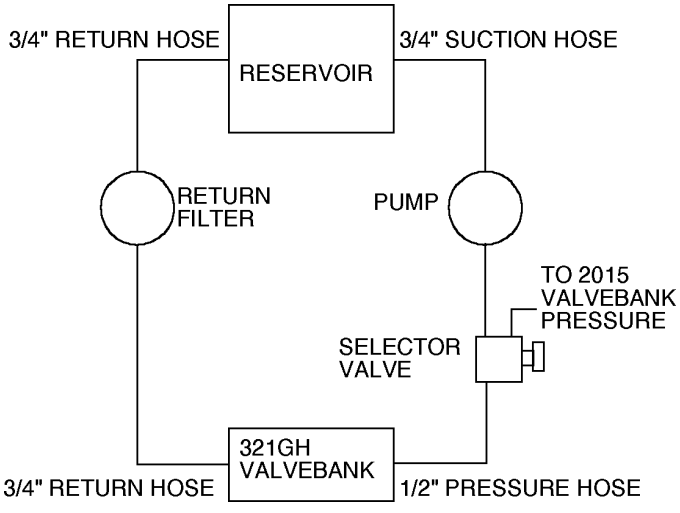
6. Check the oil level in the reservoir and add oil if necessary.



MOUNTING HOLE LAYOUT

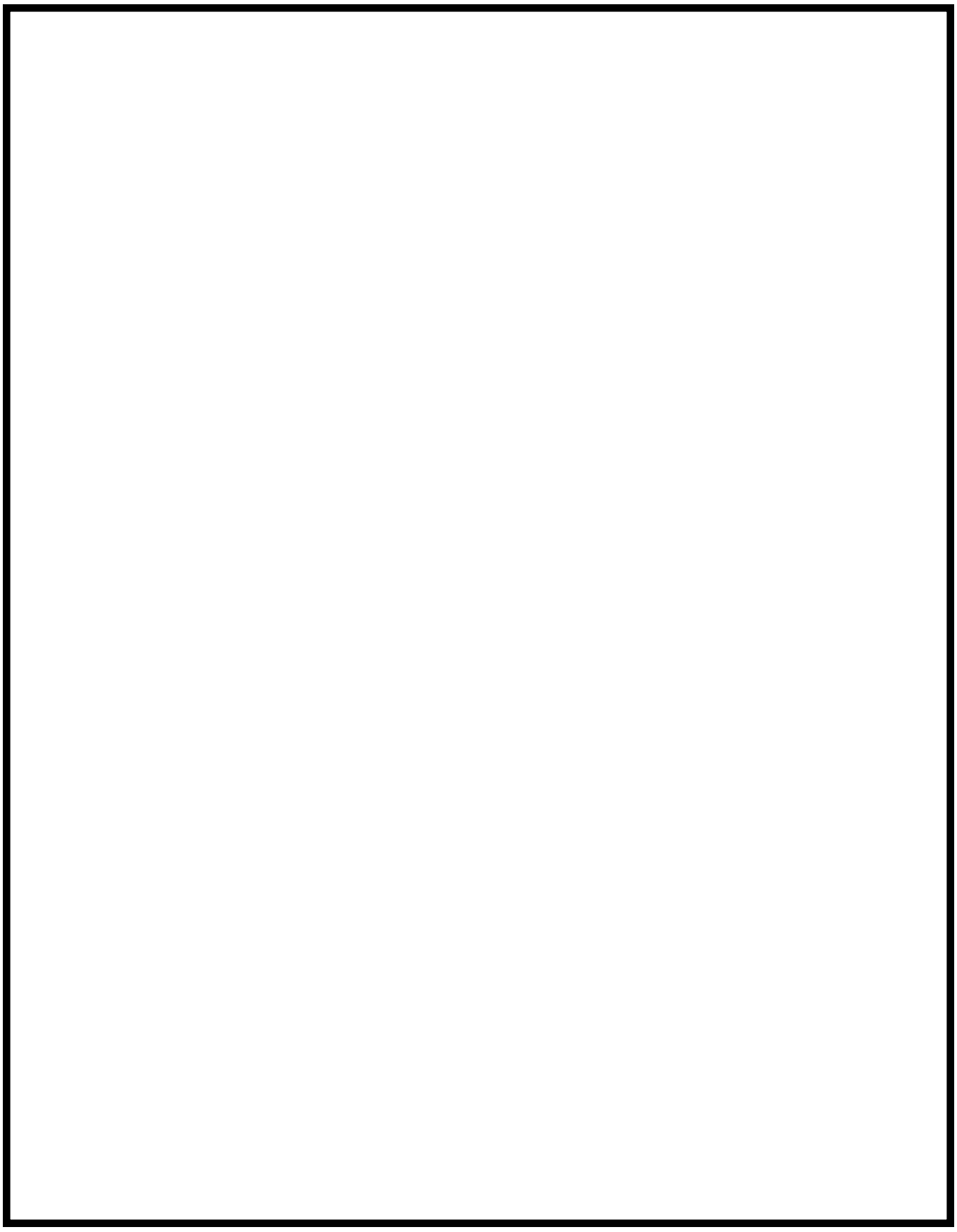


TIE-ROD INSTALLATION



HYDRAULIC INSTALLATION

SECTION 3. MODEL 321GH REPLACEMENT PARTS



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 representative.

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: 515-923-3711
Technical Support Fax: 515-923-2424

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.

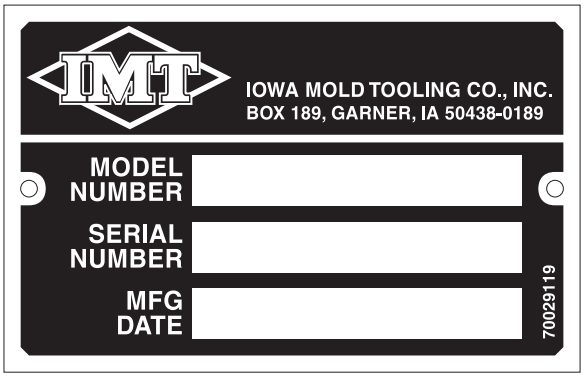
WELDMENT IDENTIFICATION

Each of the major weldments, base, mast, lower boom, extension boom, and outriggers, 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 Section 2.

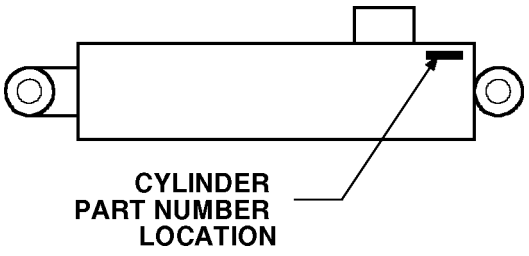
ORDERING REPAIR PARTS

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.



SERIAL NUMBER PLACARD



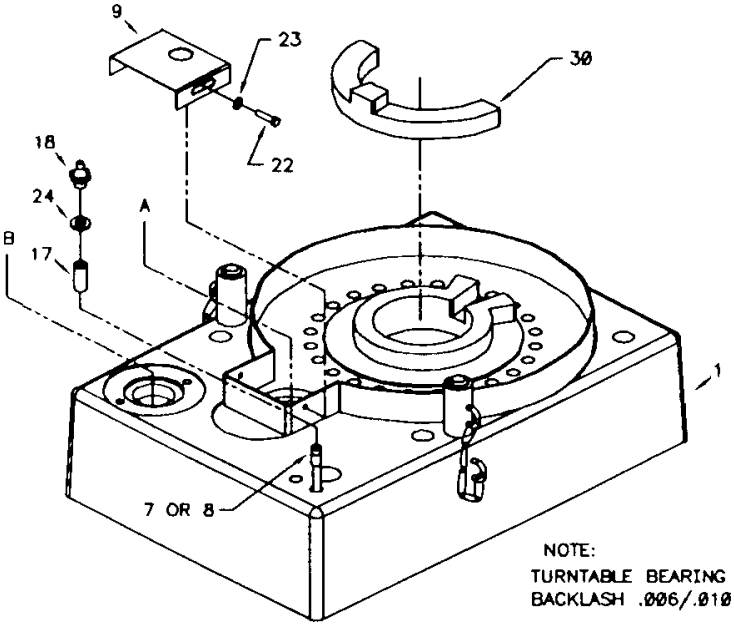
CYLINDER PART NUMBER LOCATION

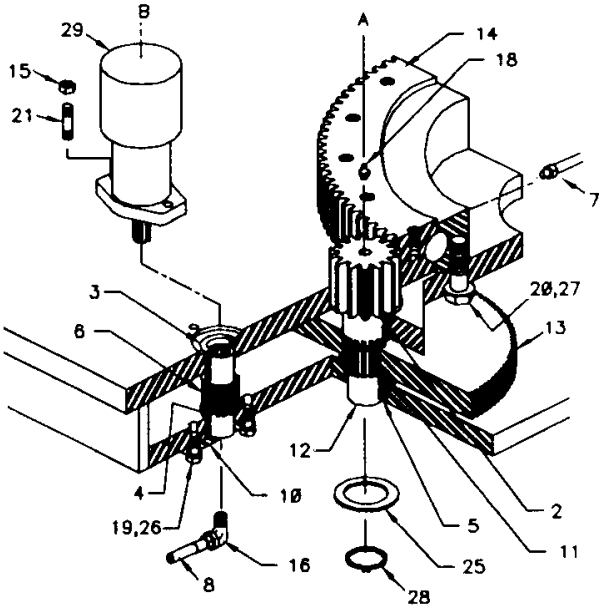
BASE ASM (41709279)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52709274	BASE (INCL: 2-6)	1
2.	60020114	BUSHING (PART OF 1)	1REF
3.	60020115	BUSHING (PART OF 1)	1REF
4.	60020116	BUSHING (PART OF 1)	1REF
5.	60020154	BUSHING (PART OF 1)	1REF
6.	71056011	DRIVE GEAR (PART OF 1)	1REF
7.	53000704	GREASE EXTENSION 34"	1
8.	53000715	GREASE EXTENSION 18"	1
9.	60010235	PINION COVER	1
10.	60010844	GREASE PLATE	1
11.	60104694	PINION SPACER	1
12.	71056010	PINION GEAR	1
13.	71056012	INTERMEDIATE GEAR	1
14.	71056062	TURNTABLE-BEARING	1
15.	72062080	NUT 1/2-13 LOCK	2
16.	72053589	STRT ELBOW 1/8NPT 90°	1
17.	72053301	COUPLING 1/8NPT	2
18.	72053508	ZERK 1/8NPT	3
19.	72060092	CAP SCR 1/2-13X1-1/4 HH	2
20.	72060151	CAP SCR 5/8-11X2 HH GR8	23
21.	60106032	STUD 1/2-13X2	2
22.	72060833	CAP SCR 5/16-18X3/4 SLFTPG	2
23.	72063002	WASHER 5/16 WRT	2
24.	72063005	WASHER 1/2 WRT	2
25.	72063035	MACH BUSHING 1-1/4X10GA	1
26.	72063053	WASHER 1/2 LOCK	2
27.	72063119	WASHER 5/8 FLAT GR8	23
28.	72066084	RETAINING RING 1-1/4	1
29.	73051378	MOTOR	1
30.	71143519	SLIDE	1

WARNING

ANYTIME A GEAR-BEARING BOLT IS REMOVED, IT MUST BE REPLACED WITH A NEW BOLT OF THE IDENTICAL SIZE AND GRADE. FAILURE TO REPLACE GEAR-BEARING BOLTS MAY RESULT IN BOLT FAILURE DUE TO METAL FATIGUE CAUSING SERIOUS INJURY OR DEATH.



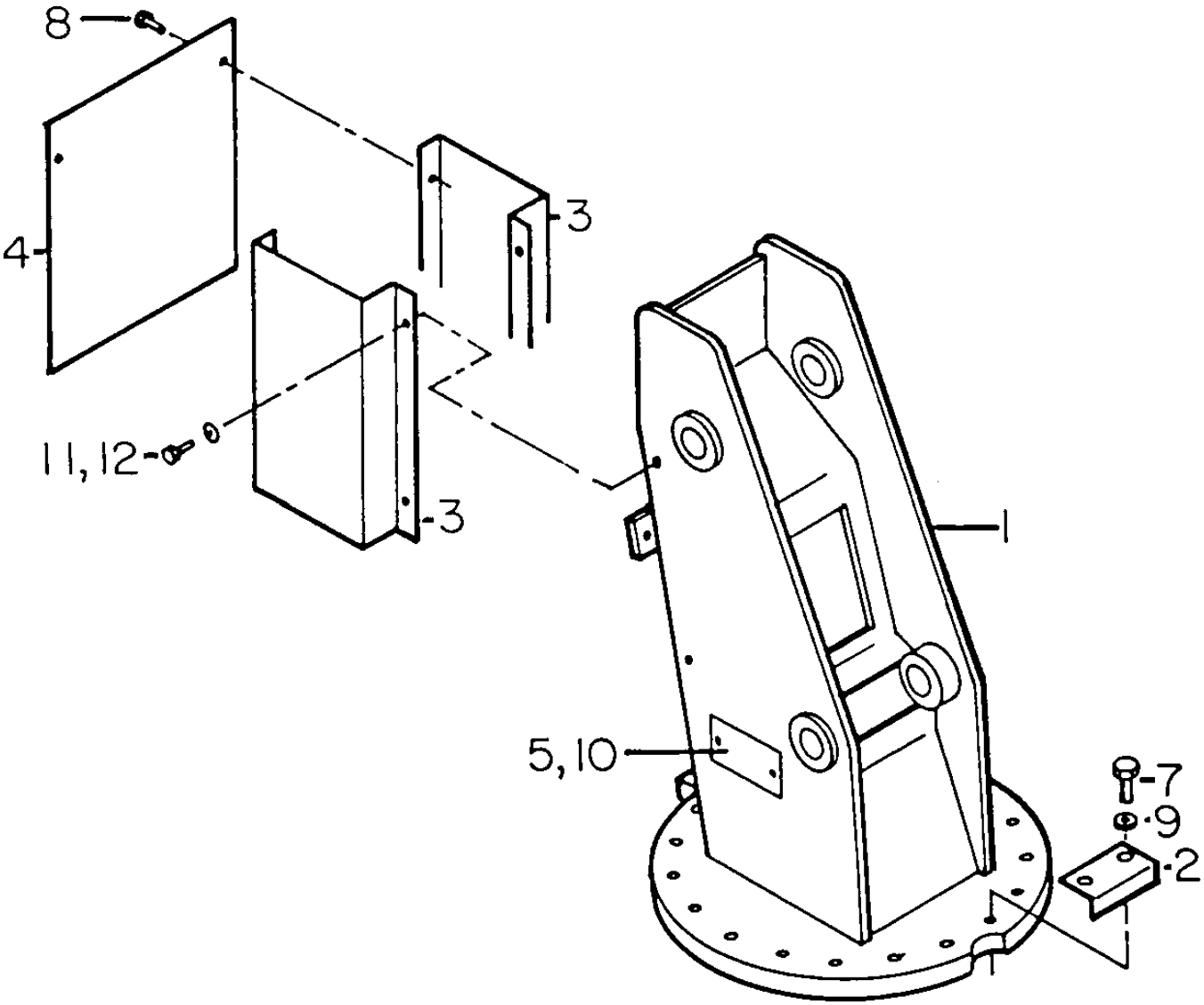


MAST ASM (41709280)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52709275	MAST	1
2.	60104540	PINION COVER	1
3.	60108120	VB COVER - SIDE	2
4.	60108121	VB COVER - BACK	1
5.	70029119	SERIAL NUMBER PLACARD	1
7.	72060151	CAP SCR 5/8-11 X 2 HH GR8	18
8.	72060833	CAP SCR 5/16-18 X 3/4 HH SLFTPG	4
9.	72063119	WASHER 5/8 FLAT GR8	18
10.	72661216	GRIPNAIL	2
11.	72060023	CAP SCR 5/16-18 X 3/4 HH GR5	4
12.	72063050	WASHER 5/16 LOCK	4

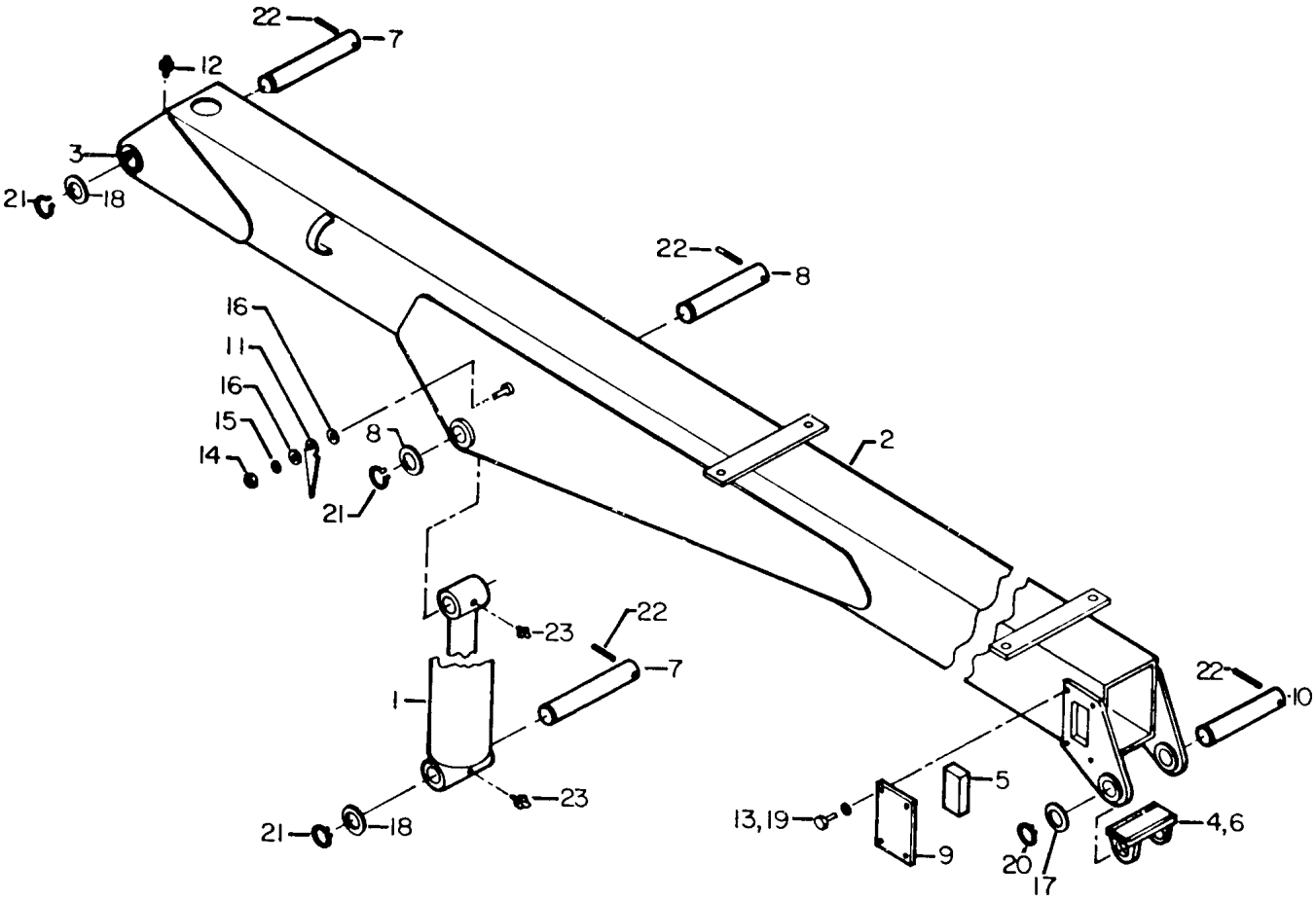
WARNING

ANYTIME 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.



LOWER BOOM ASM (41710059)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3C241890	LOWER CYLINDER (INCL:23)	1
2.	52710058	LOWER BOOM (INCL: 3)	1
3.	7BF81215	BUSHING (PART OF 2)	4REF
4.	52705105	TRUNNION	1
5.	60030015	WEAR PAD	2
6.	60030083	WEAR PAD	1
7.	60102376	PIN	2
8.	60102388	PIN	1
9.	60103463	RETAINER PLATE	2
10.	60105495	PIN	1
11.	60105544	ANGLE INDICATOR	2
12.	72053508	ZERK 1/8NPT	1
13.	72060023	CAP SCR 5/16-18X3/4 HHGR5	8
14.	72062103	NUT 3/8-16 LOCK	2
15.	72063003	WASHER 3/8 WRT	2
16.	72063005	WASHER 1/2 WRT	4
17.	72063035	MACH BUSHING 1-1/4 X 10GA	1
18.	72063037	MACH BUSHING 1-1/2 X 10GA	3
19.	72063049	WASHER 5/16 LOCK	8
20.	72066129	RETAINING RING 1-1/4	1
21.	72066132	RETAINING RING 1-1/2	3
22.	72661157	GROOVE PIN 1/2 X 2-1/2	4
23.	72053507	ZERK 1/4-28 (PART OF 1)	2REF



LOWER BOOM CYLINDER (3C241890)

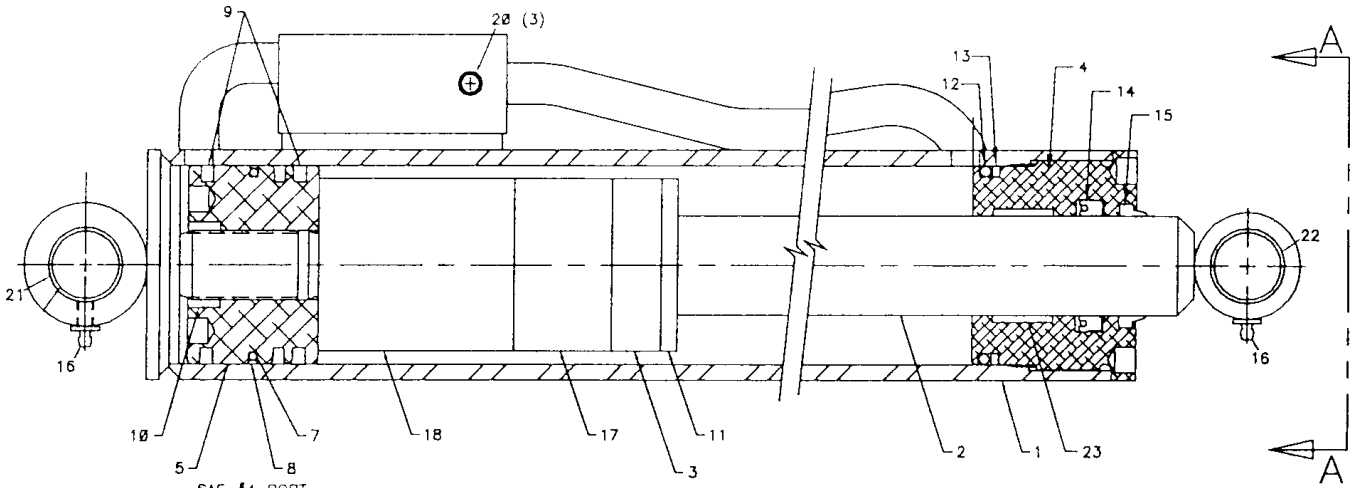
ITEM	PART NO.	DESCRIPTION	QTY
1.	4C290912	CASE (INCL:16, 20, 21)	1
2.	4G290910	ROD (INCL: 16 & 22)	1
3.	6C075022	STOP TUBE	1
4.	6H045022	HEAD	1
5.	6I045143	PISTON	1
6.	9C181823	SEAL KIT (INCL: 7-15,23)	1
7.	7Q072155	O-RING (PART OF 6)	1REF
8.	7T66P045	PISTON SEAL (PART OF 6)	1REF
9.	7T65I045	PISTON RING (PART OF 6)	2REF
10.	7T61N143	LOCK RING (PART OF 6)	1REF
11.	6A025022	WAFER LOCK (PART OF 6)	1REF
12.	7Q072345	O-RING (PART OF 6)	1REF
13.	7Q10P346	BACK-UP RING (PART OF 6)	1REF
14.	7R546022	U-CUP LOADED (PART OF 6)	1REF
15.	7R14P022	ROD WIPER (PART OF 6)	1REF
16.	72053507	ZERK (PART OF 1 & 2)	2REF
17.	6C150022	STOP TUBE	1
18.	6C300022	STOP TUBE	1
19.	73054304	VALVE	1
20.	7PNPXT02	PLUG (PART OF 1)	3REF
21.	7BF81015	BUSHING (PART OF 1)	4REF
22.	7BF81215	BUSHING (PART OF 2)	2REF
23.	7T2N8025	WEAR RING (PART OF 6)	1REF

NOTE

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

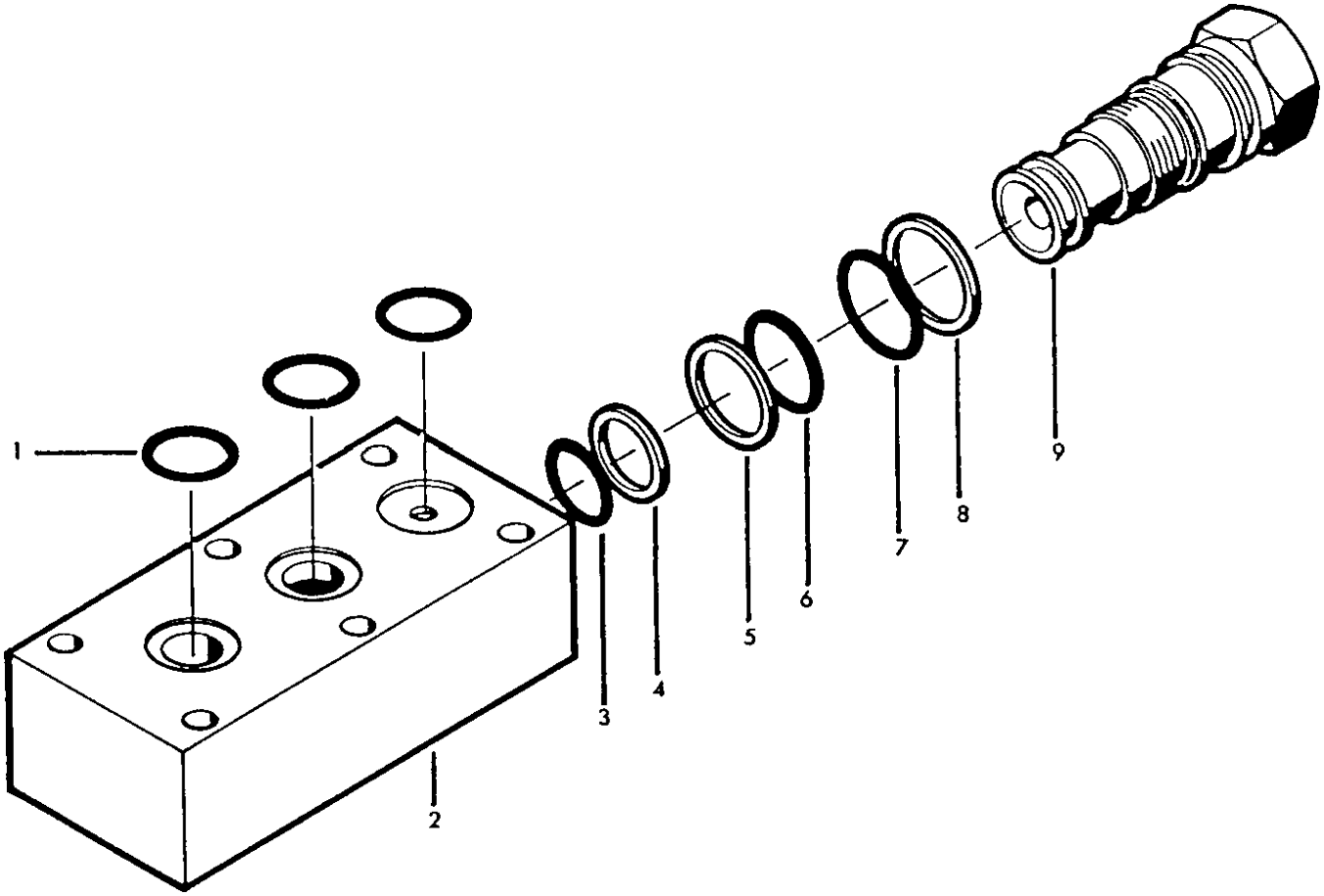
APPLY “LUBRIPLATE #630-2” MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

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



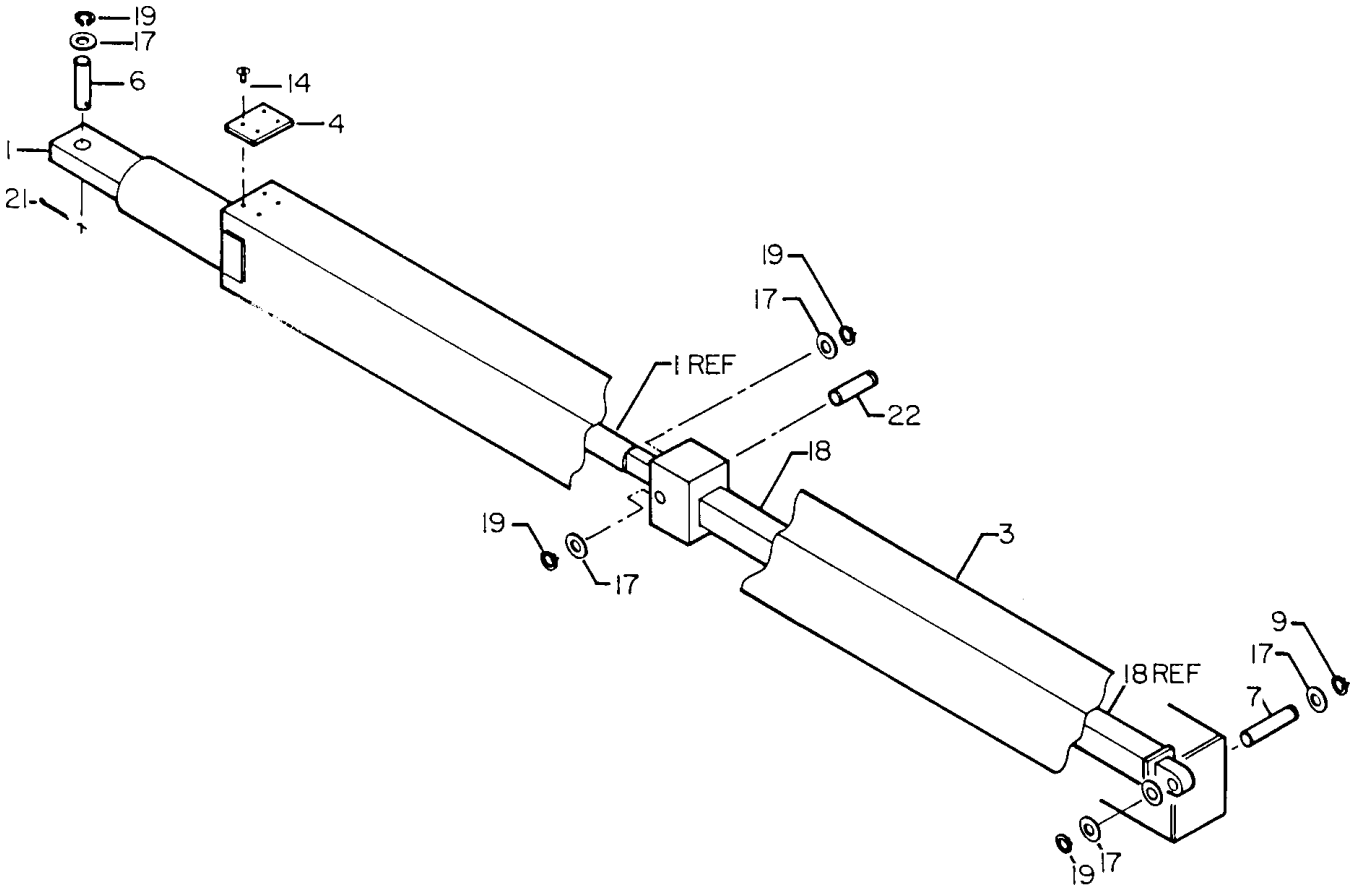
LOCKING HOLDING VALVE (73054004)

ITEM	PART NO.	DESCRIPTION	QTY
1.	7Q072014	O-RING (PART OF 10)	3REF
2.		VALVE BLOCK (PART OF 10)	1REF
3.	7Q072015	O-RING (PART OF 10)	1REF
4.	7Q10P015	BACK-UP RING (PART OF 10)	1REF
5.	7Q10P017	BACK-UP RING (PART OF 10)	1REF
6.	7Q072017	O-RING (PART OF 10)	1REF
7.	7Q072018	O-RING (PART OF 10)	1REF
8.	7Q10P018	BACK-UP RING (PART OF 10)	1REF
9.		VALVE BODY (PART OF 10)	1REF
10.	73054004	COMPLETE VALVE (INCL:1-9)	1



EXTENSION BOOM ASM (41709980)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B353900	EXTENSION CYLINDER	1
3.	52709979	EXTENSION BOOM	1
4.	60030016	WEAR PAD	1
6.	60101905	PIN	1
7.	60102099	PIN	1
14.	72060836	CAP SCR 1/4-20 X 3/4 FLTHD	4
17.	72063034	MACH BUSHING 1 X 10GA	5
18.	52705109	EXTENSION CYLINDER LINK	1
19.	72066125	RETAINING RING 1"	5
21.	72066145	HAIR PIN .19	1
22.	60102281	PIN	1



EXTENSION BOOM CYLINDER (3B353900)

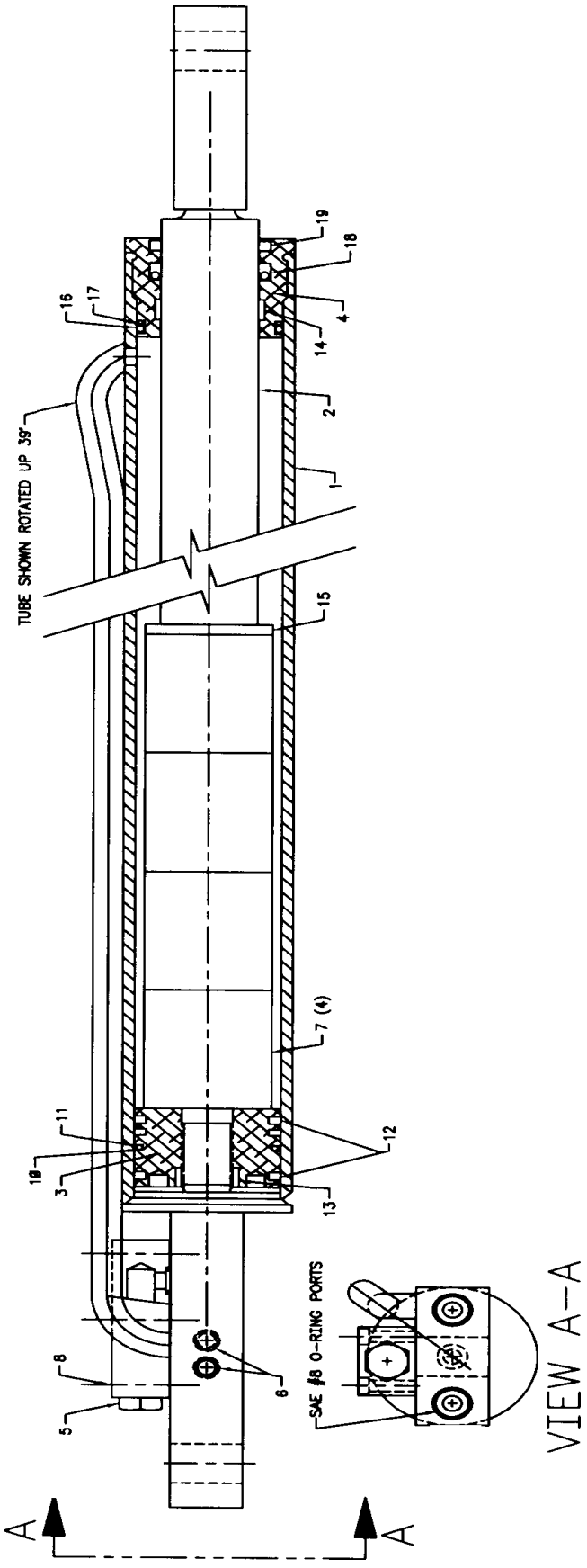
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B353900	CASE (INCL: 6)	1
2.	4G250316	ROD	1
3.	6I030106	PISTON	1
4.	6H030020	HEAD	1
5.	73054004	VALVE	1
6.	7PNPXT02	PLUG 1/8NPT (PART OF 1)	2REF
7.	6C300020	STOP TUBE	4
8.	72060708	CAP SCR 1/4-20 X 1-1/4 SH	6
9.	9C121617	SEAL KIT (INCL: 10-19)	1
10.	7Q072145	O-RING (PART OF 9)	1REF
11.	7T66P030	PISTON SEAL (PART OF 9)	1REF
12.	7T65I030	PISTON RING (PART OF 9)	2REF
13.	7T61N106	LOCK RING (PART OF 9)	1REF
14.	7T2N4022	WEAR RING-ROD (PART OF 9)	1REF
15.	6A025020	WAFER LOCK (PART OF 9)	1REF
16.	7Q072334	O-RING (PART OF 9)	1REF
17.	7Q10P334	BACK-UP RING (PART OF 9)	1REF
18.	7R546020	U-CUP LOADED (PART OF 9)	1REF
19.	7R14P020	ROD WIPER (PART OF 9)	1REF

NOTE

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

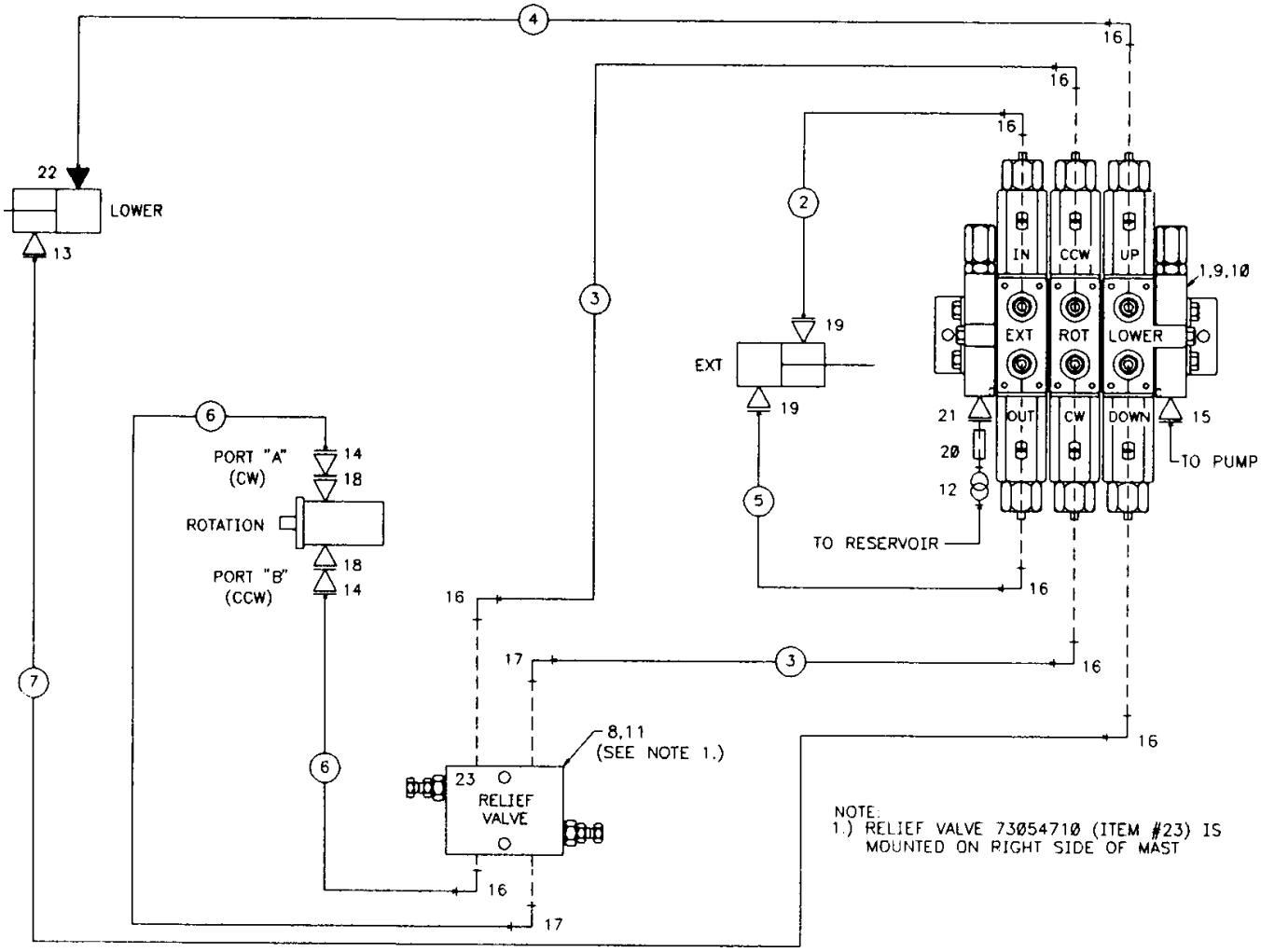
APPLY “LUBRIPLATE #630-2” MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

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



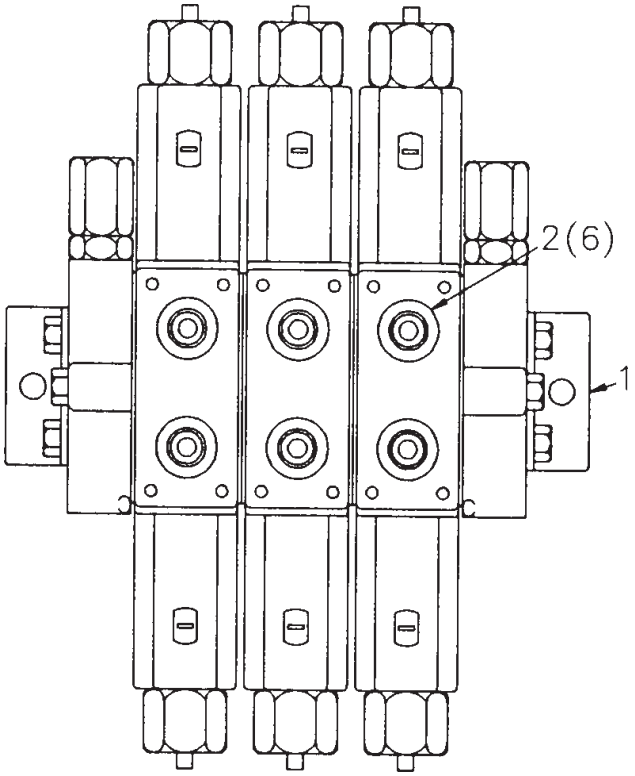
HYDRAULIC KIT (91709982)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70732224	VALVEBANK	1
2.	51703787	HOSE ASM 1/4X15 #4F#4F	1
3.	51704620	HOSE ASM 1/4X20 #4F#4F	4
4.	51704621	HOSE ASM 1/4X22 #4F#4F	1
5.	51705118	HOSE ASM 1/4X16 #4F#4F	1
6.	51705119	HOSE ASM 1/4X61 #4F#4F	2
7.	51705733	HOSE ASM 1/4X24 #4F#4F	1
8.	72060011	CAP SCR 1/4-20 X 2-3/4 HHGR5	2
9.	72060046	CAP SCR 3/8-16 X 1 HH GR5	2
10.	72062103	NUT 3/8-16 LOCK	2
11.	72063049	WASHER 1/4 LOCK	2
12.	72066000	HOSE CLAMP SAE12	1
13.	72532351	ADAPTER #4MSTR #4MJIC	1
14.	72532353	ADAPTER #6MSTR #4MJIC	2
15.	72532357	ADAPTER #6MSTR #8MJIC	1
16.	72532699	ELBOW #6MSTR #4MJIC 90°	8
17.	72532700	ELBOW #6MSTR #6MJIC XLG	2
18.	72532722	ADAPTER #10MSTR #6FSTR	2
19.	72532792	ADAPTER #8MSTR #4MJIC	2
20.	72532794	BARB NIPPLE 3/8MPT 3/4HOSE	1
21.	72532795	ADAPTER #6MSTR 3/8FPT	1
22.	73054487	CHECK VALVE	1
23.	73054710	RELIEF VALVE	1



VALVEBANK ASM-3 SECT MINIPAK (51713267)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70732224	VALVEBANK	1
2.	72532699	ELBOW #6MSTR #4MJIC 90°	6

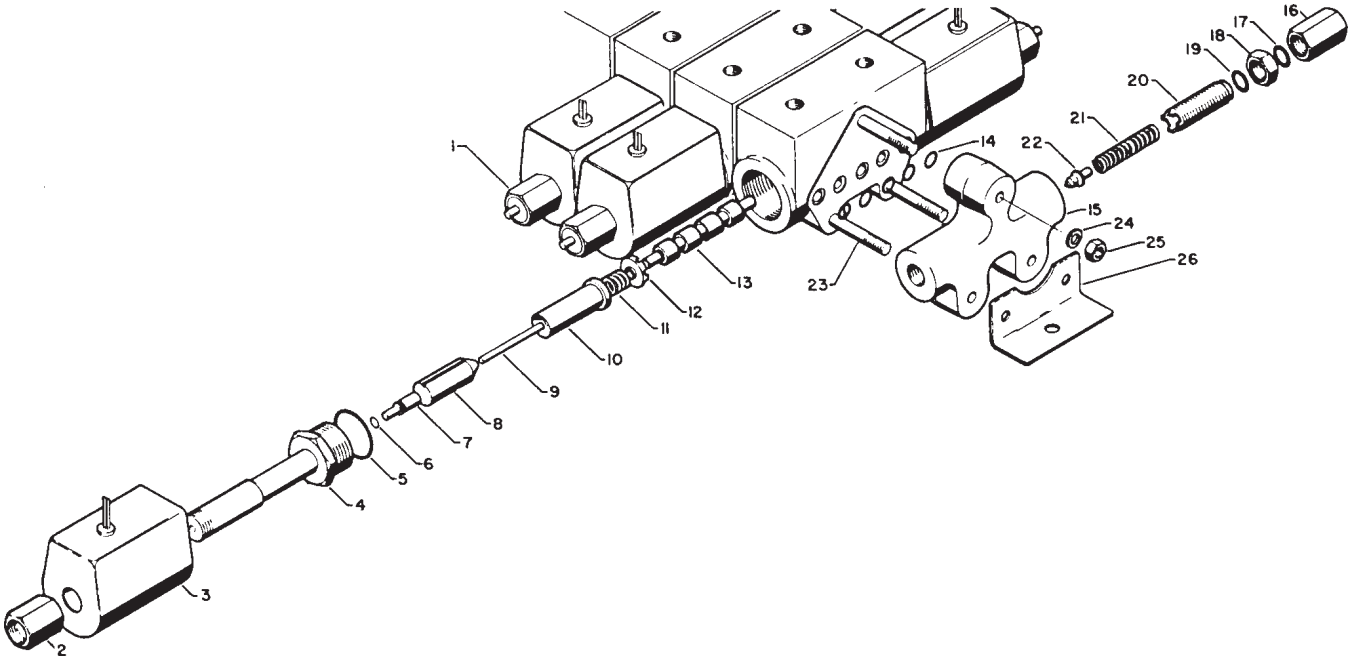


VALVEBANK (70732224)

ITEM	PART NO.	DESCRIPTION	QTY
1.	73054077	VALVE SECTION (INCL:2-14)	3
2.	73014950	NUT (PART OF 1)	2REF*
3.	77041016	COIL 12VDC (PART OF 1)	2REF*
4.	73014958	TUBE (PART OF 1)	2REF*
5.	7Q072113	O-RING (PART OF 1)	2REF*
6.	7Q072008	O-RING (PART OF 1)	2REF*
7.	73014957	BUTTON (PART OF 1)	2REF*
8.	73014956	PLUNGER (PART OF 1)	2REF*
9.	73014954	PIN (PART OF 1)	2REF*
10.	73014955	PLUG (PART OF 1)	2REF*
11.	73014953	SPRING (PART OF 1)	2REF*
12.	73014952	SPRING RETAINER (PART OF 1)	2REF*
13.	51014951	SPOOL&BODY SET (PART OF 1)	1REF*
14.	7Q072012	O-RING (PART OF 1)	5REF*
15.	73014948	INLET W/ RELIEF (INCL:16-22)	1
16.	**	ADJ RELIEF CAP (PART OF 15)	1REF
17.	**	O-RING (PART OF 15)	1REF
18.	**	JAM NUT (PART OF 15)	1REF
19.	**	O-RING (PART OF 15)	1REF
20.	**	ADJ ROD (PART OF 15)	1REF
21.	**	SPRING (PART OF 15)	1REF
22.	**	NEEDLE (PART OF 15)	1REF
23.	73014960	TIE ROD	3
24.	72063002	WASHER 5/16	6
25.	72062001	NUT 5/16-18	6
26.	73014959	BRACKET	2

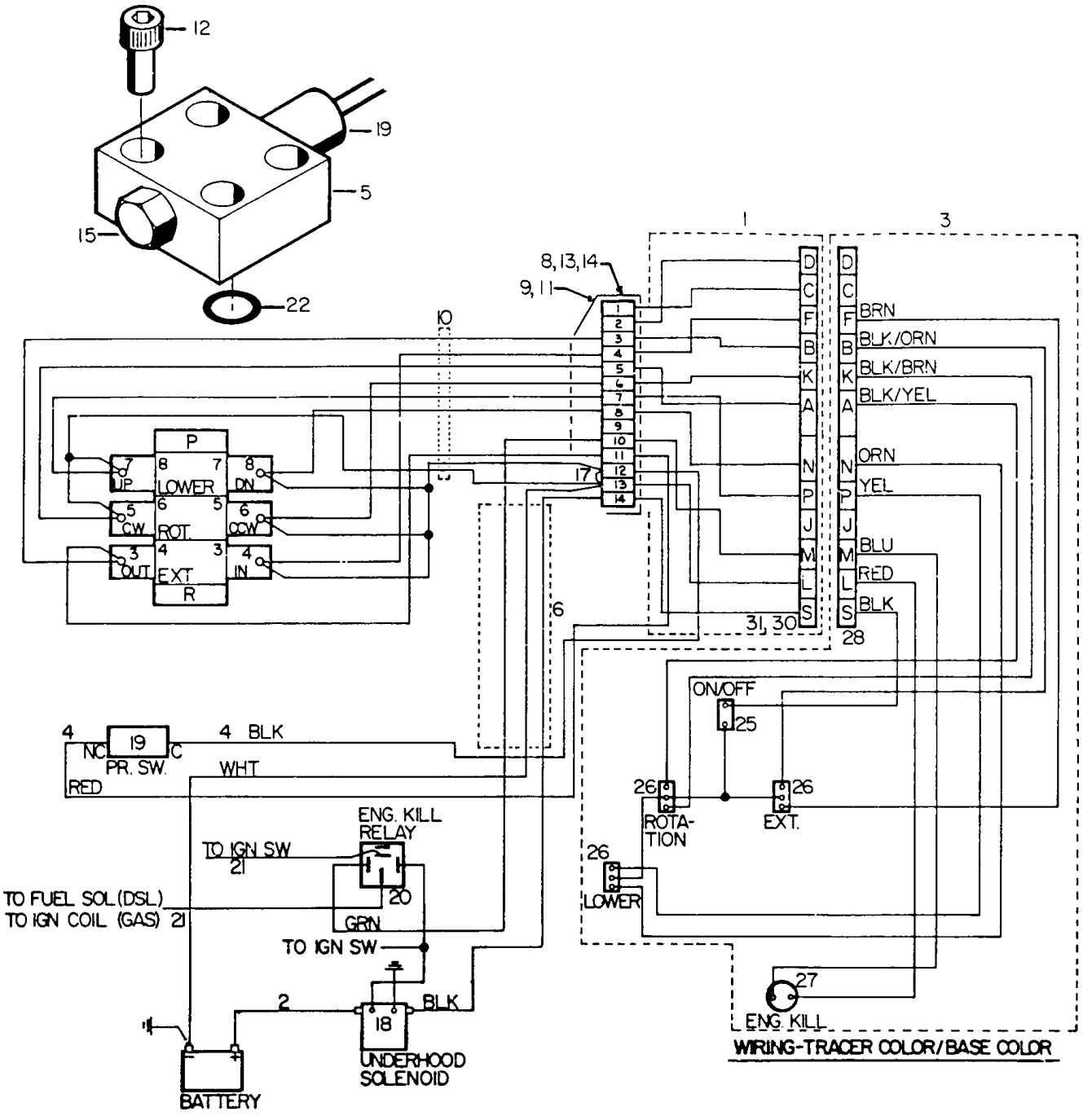
* INDICATES QUANTITY PER VALVE SECTION.
** NOT AVAILABLE SEPARATELY. IMT DOES NOT RECOMMEND THAT THE USER ATTEMPT TO REPAIR OR ADJUST THE FACTORY-SET RELIEF PRESSURE.

94014962 TUBE KIT INCLUDES ITEMS 4-10



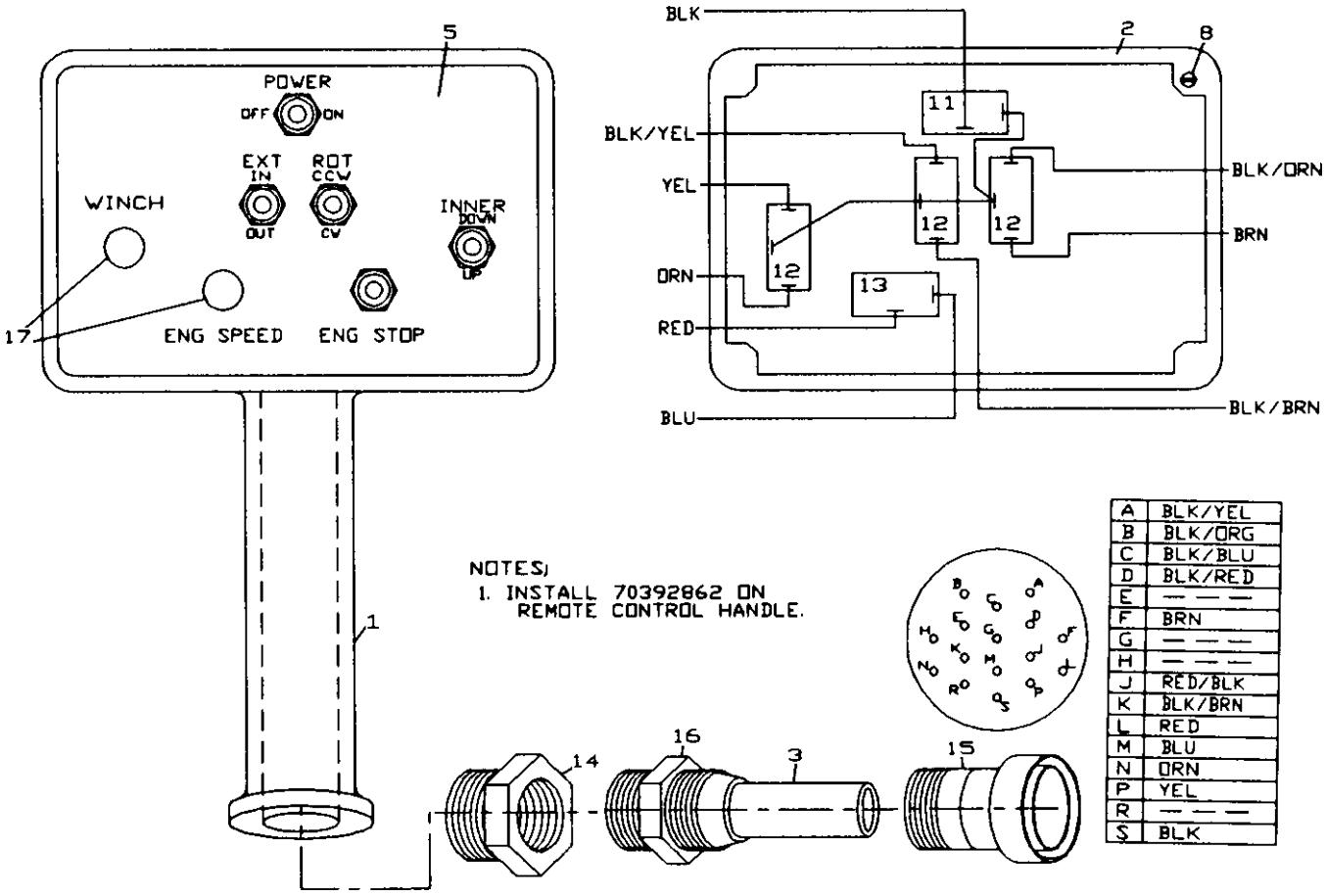
CONTROL KIT (90709284)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51704975	CABLE 18GA 12WIRE X 72"	1
2.	51704784	CABLE #1 WIRE X 6"	1
3.	51709287	HANDLE & CABLE ASM	1
4.	51705244	CABLE 14GA 2WIRE X 36"	1
5.	60025221	MANIFOLD	1
6.	60045019	CABLE 16GA 4WIRE X 300"	1
8.	77044309	TERMINAL 14 CONTACT	1
9.	60105825	TERMINAL MOUNTING BLOCK	1
10.	70034060	TIE	4
11.	72060002	CAP SCR 1/4-20 X 3/4 HH GR5	2
12.	72060731	CAP SCR 5/16-18 X 3/4 SH	4
13.	72061009	SHT MTL SCREW #6 X 3/4	2
14.	72066525	HOSE CLAMP 3/4	1
15.	72532140	PLUG 9/16MSTR HH	1
16.	77040051	TERMINAL	14
17.	77040130	JUMPER	1
18.	77041237	SOLENOID 12V 150A	1
19.	77041222	PRESSURE SWITCH 2400PSI	1
20.	77041251	RELAY	2
21.		EXISTING WIRING	REF
22.	7Q072015	O-RING	1
25.		TOGGLE SWITCH ST	REF
26.		TOGGLE SWITCH DT	REF
27.		PUSHBUTTON SWITCH	REF
28.		PLUG 16 CONTACT	REF
30.		RECEPTICAL 16 CONTACT	REF
31.	72060000	CAP SCR 1/4-20 X 1-1/2 HHGR5	2



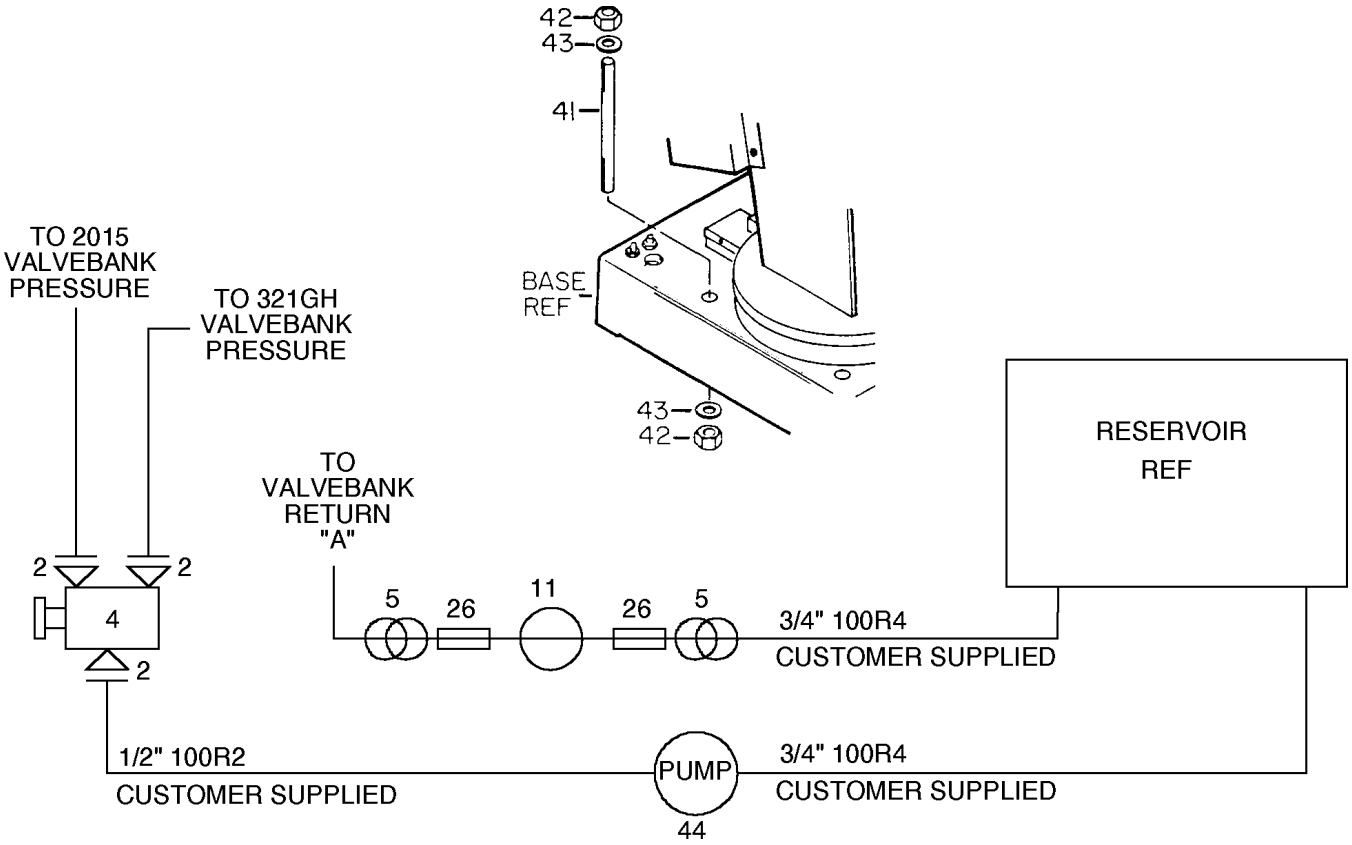
CONTROL HANDLE (51709287)

ITEM	PART NO.	DESCRIPTION	QTY
1.	60111140	HANDLE	1
2.	70034306	BACK	1
3.	89044136	CABLE 18GA 12WIRE X 6	1
4.	89044214	WIRE 18GA GRN	1.00'
5.	70393261	DECAL-RMT CTRL	1
6.	70392862	DECAL-DANGER RC ELECTRO	1
7.	70029119	SERIAL NO. PLACARD	1
8.	72061009	SHT MTL SCR #6X3/4 PH	4
9.	72066340	POP RIVET 1/8	2
10.	77040186	TERMINAL 1/4 FSLPON	13
11.	77041345	TOGGLE SWITCH ST	1
12.	77041346	TOGGLE SWITCH DT	3
13.	77041347	TOGGLE SWITCH DT MOMEN.	1
14.	72531833	REDUCER BUSHING 3/4-1/2NPT	1
15.	77044170	CONNECTOR 16-PIN	1
16.	77044096	CORD GRIP	1
17.	70392785	PLUG 1/2	2



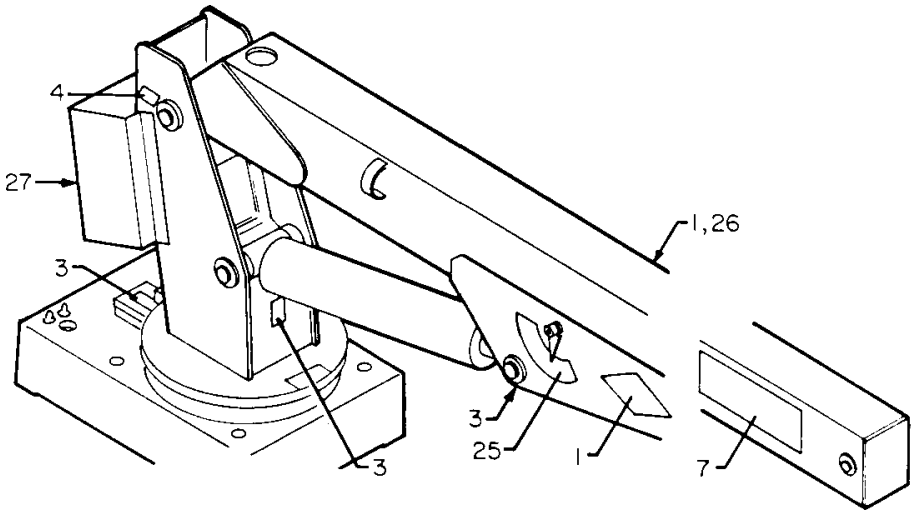
INSTALLATION KIT (93709981)

ITEM	PART NO.	DESCRIPTION	QTY
2.	72532360	ADAPTER 1-1/16MSTR 3/4MJIC	3
4.	73054420	SELECTOR VALVE	1
5.	72066000	HOSE CLAMP SAE12	3
6.	95709983	DECAL KIT (SEE DWG)	2
11.	73052000	RETURN FILTER	1
25.	72532794	BARB NIPPLE 3/8MPT 3/4HOSE	REF
26.	72053458	BARB NIPPLE 3/4MPT 3/4HOSE	2
33.	72532357	ADAPTER 9/16MSTR 3/4MJIC	REF
41.	60106481	TIE-DOWN STUD 1-8 X 12-1/2	4
42.	72062141	NUT 1-8 STEEL INSERT LOCK	8
43.	72063066	WASHER 1" HIGH STRENGTH	8
44.		PUMP	REF



DECAL KIT (95709983)

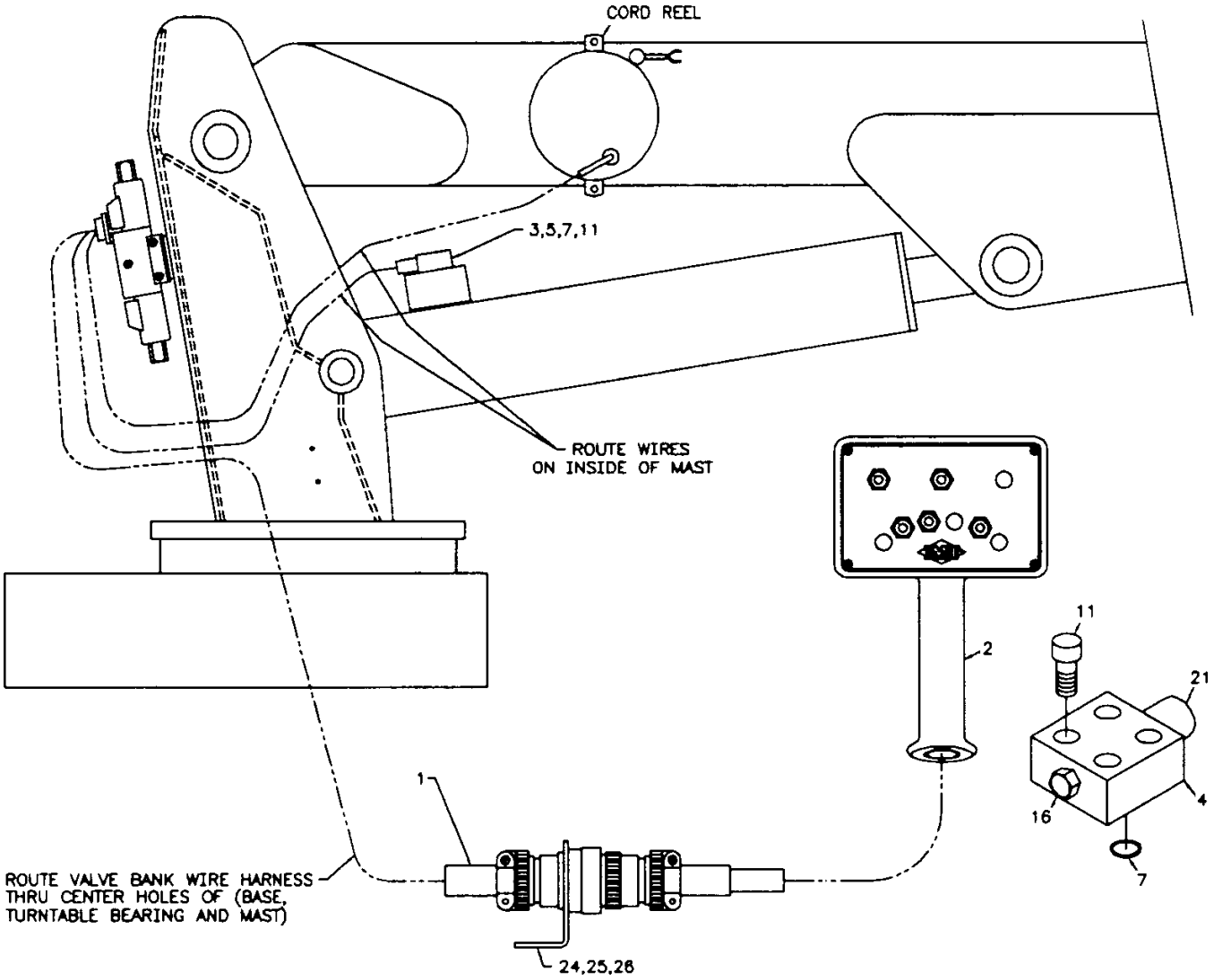
ITEM	PART NO.	DESCRIPTION	QTY
1.	70029251	PLACARD-IMT DIAMOND	2
2.	70391598	DECAL-WARNING OUTRIGGER	2
3.	70391612	DECAL-GREASE WEEKLY LEFT	3
4.	70391613	DECAL-GREASE WEEKLY RIGHT	1
5.	70392108	DECAL-SUCTION LINE	1
6.	70392109	DECAL-RETURN LINE	1
7.	70393313	DECAL-321GH IDENTIFICATION	2
8.	70392213	DECAL-CAUTION DON'T WASH	1
9.	70392864	DECAL-DGR OUTRG STD CLR	2
10.	70392524	DECAL-ROTATE CRN/GREASE	1
11.	70392813	DECAL-DANGER ELECTROC'N	1
12.	70392814	DECAL-DANGER OPERATOR	1
13.	70392815	DECAL-DANGER OPERATION	1
14.	70394189	DECAL-RECOMMEND HYD OIL	1
16.	70392865	DECAL-DANGER ELECTROC'N	4
17.	70392866	DECAL-DANGER OPER COND	1
18.	70392867	DECAL-DGR OUTRG MOVING	1
19.	70392868	DECAL-DANGER LOADLINE	4
20.	70392888	DECAL-DGR OPER RESTRICT	1
21.	70392889	DECAL-DANGER RC	1
22.	70392982	DECAL-CONTACT IMT	1
23.	70392891	DECAL-DANGER DRIVELINE	1
24.	71039134	DECAL-CAUTION OIL LEVEL	1
25.	71391522	DECAL-ANGLE CHART LEFT	1
26.	71391523	DECAL-ANGLE CHART RIGHT	1
27.	71392558	PLACARD-CAPACITY	2



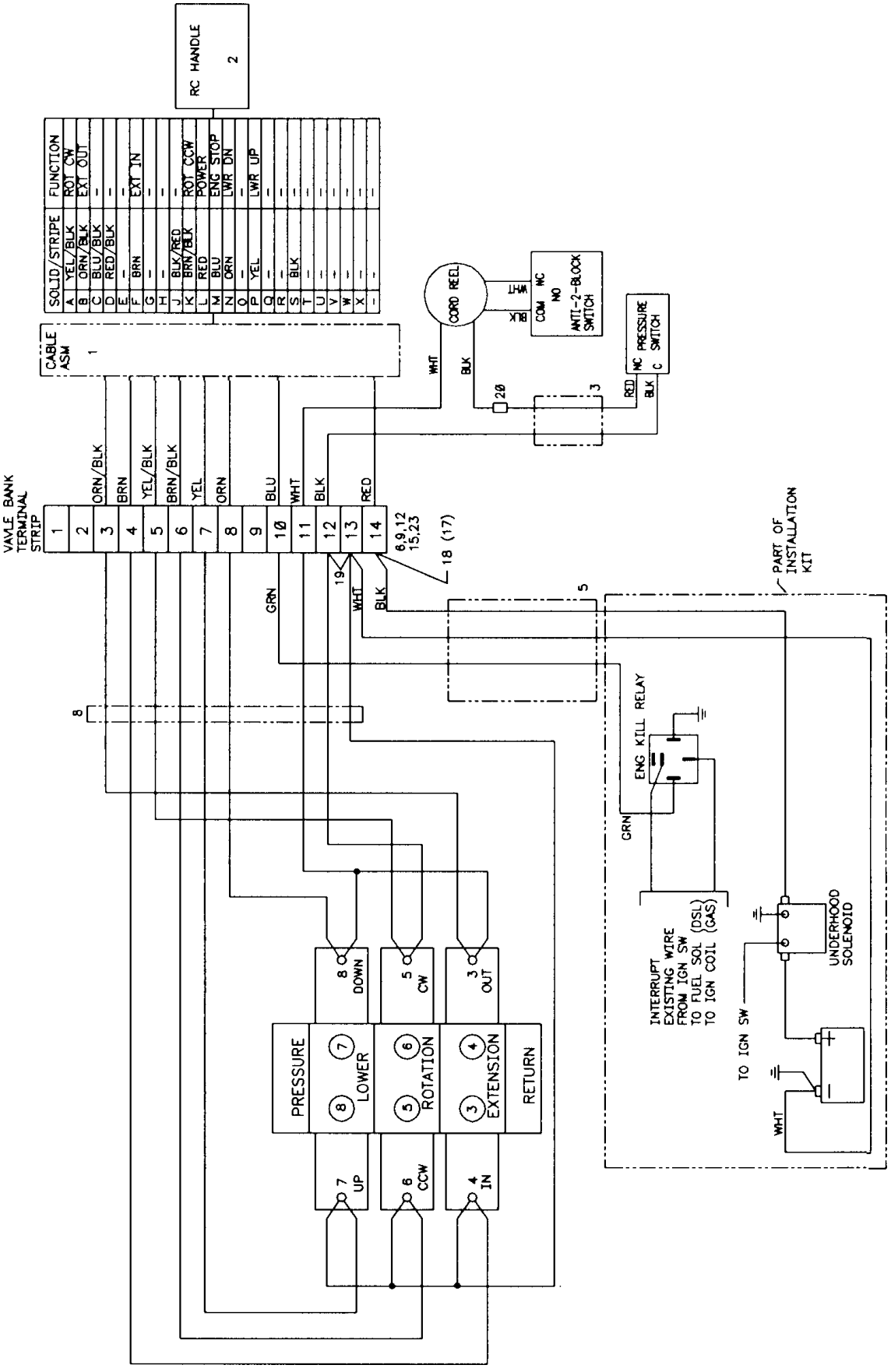
DECAL PLACEMENT	
ITEM NO.	LOCATION
8, 11, 12, 13, 17, 21, 22, 23, 24, 27	AT OR NEAR THE REMOTE 18, 20, CONTROL STORAGE POINT
2, 9	ONE ON EACH OUTRIGGER
16, 19	ONE ON EACH SIDE OF CARRIER VEHICLE
10	AT THE TURNTABLE GREASE ZERK
3,4	AT ALL GREASE ZERKS
6	ON THE RESERVOIR, AT THE RETURN LINE
5	ON THE RESERVOIR, AT THE SUCTION LINE
14	ON RESERVOIR

REMOTE CONTROL KIT-PTO (90713679-1)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713680	CABLE ASM 18GA/12WIRE X 72	1
2.	51713670	HANDLE ASM	1
3.	51705244	CABLE ASM 14GA/2WIRE X 36	1
4.	60025221	MANIFOLD-CAPACITY ALERT	1
5.	60045019	CABLE 16GA/4WIRE X 300	1
6.	60105825	TERMINAL BLOCK MTG	1
7.	7Q072015	O-RING	1
8.	70034060	TIE	4
9.	72060002	CAP SCR 1/4-20X3/4 HHGR5	1
11.	72060731	CAP SCR 5/16-18X3/4 SH	4
12.	72061009	SHT MTL SCR #6X3/4 PH	2
15.	72066525	HOSE CLAMP	1
16.	72532140	PLUG #6STR HH STL	1
18.	77040051	TERM #8 SPRSPD 16-14GA	14
19.	77040130	JUMPER BAR	1
20.	77040186	TERM 1/4 FSLPON 16-14GA	1
21.	77041222	PRESSURE SWITCH	1
23.	77044309	TERMINAL BLOCK-14	1
24.	60119299	MTG BRACKET	1
25.	77044645	NUT-CONNECTOR	1
26.	77044646	WASHER-LOCK CONNECTOR	1
27.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	2
28.	72062104	NUT 1/4-20 LOCK	2
29.	72063001	WASHER 1/4 WRT	2

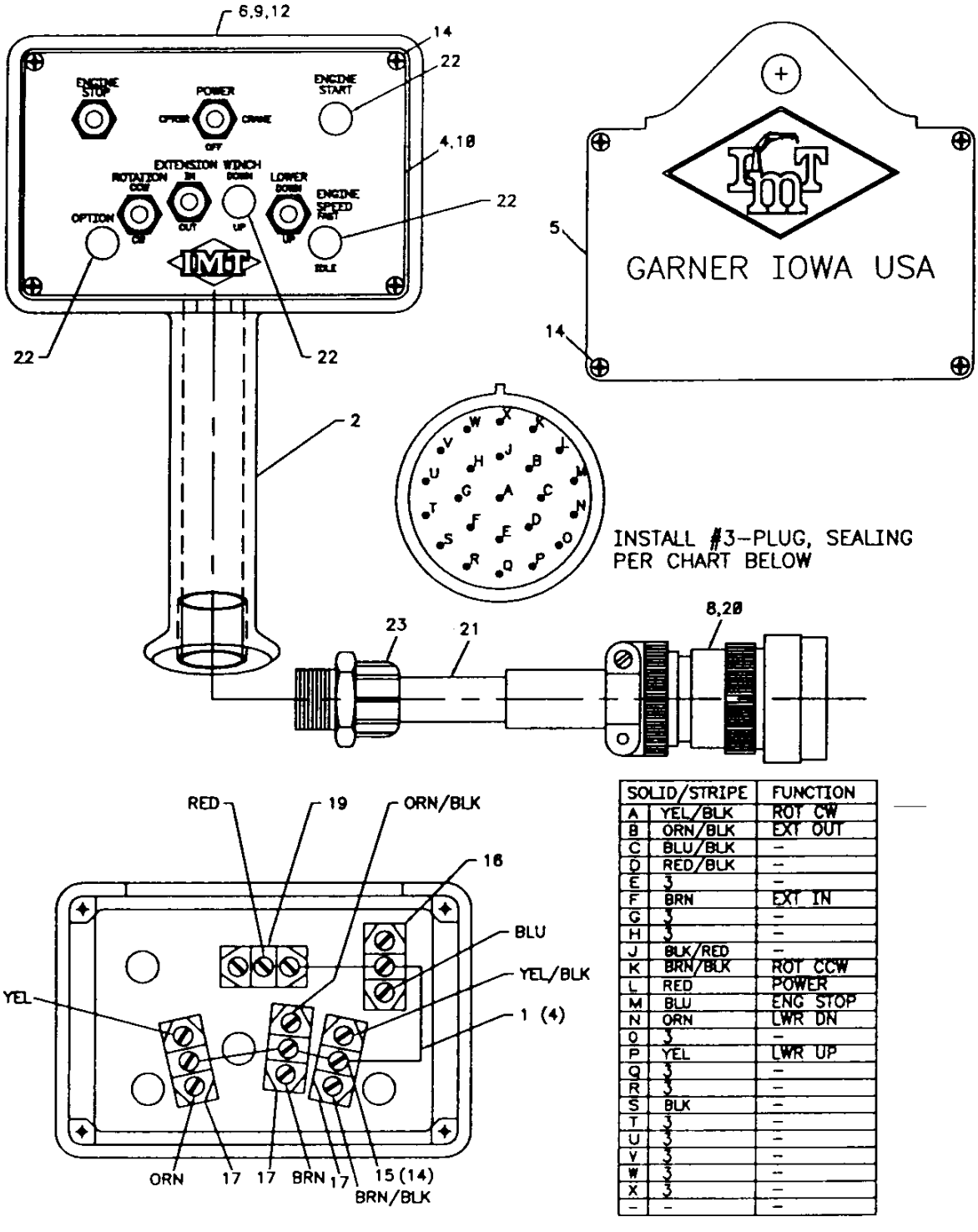


REMOTE CONTROL KIT-PTO (90713679-2)



REMOTE HANDLE ASM-PTO (51713670)

ITEM	PART NO.	DESCRIPTION	QTY
1.	60045031	WIRE 18GA X 4 GRN	4
2.	60119335	CONTROL HANDLE	1
3.	77044668	PLUG-SEALING	11
4.	60119277	COVER-FRONT	1
5.	70034306	COVER-BACK	1
6.	70029119	SER NO PLACARD	1
8.	77044621	PIN	12
9.	70394447	DECAL-DGR RC ELECTRO SM	1
10.	70394142	DECAL-REMOTE	1
12.	72066340	POP RIVET	2
14.	72061009	SHT MTL SCR #6X3/4 PH	8
15.	77040051	TERM #8 SPRSPD 16-14GA	13
16.	77040371	TOGGLE SWITCH SPST	1
17.	77040372	TOGGLE SWITCH SPDT	3
19.	77040374	TOGGLE SWITCH SPDT	1
20.	77044579	CONNECTOR	1
21.	89044136	CABLE 18GA/12WIRE X 50FT	1
22.	70392785	PLUG 1/2	4
23.	77044196	CONNECTOR 3/4 STRAIN RLF	1



SOLID/STRIPE		FUNCTION
A	YEL/BLK	ROT CW
B	ORN/BLK	EXT OUT
C	BLU/BLK	–
D	RED/BLK	–
E	3	–
F	BRN	EXT IN
G	3	–
H	3	–
J	BLK/RED	–
K	BRN/BLK	ROT CCW
L	RED	POWER
M	BLU	ENG STOP
N	ORN	LWR DN
O	3	–
P	YEL	LWR UP
Q	3	–
R	3	–
S	BLK	–
T	3	–
U	3	–
V	3	–
W	3	–
X	3	–
–	–	–

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: 6-18-99

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 "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 (✘) 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.

✔ = SATISFACTORY
✘ = DEFICIENCY (must be corrected prior to operation)
R = RECOMMENDATION (should be considered for corrective action)
NA = NOT APPLICABLE

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS ✔ , ✘ *R, NA*
D	1	Labels	All load charts, safety & warning labels, & control labels are present and legible.	
D	2		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	Rope	Proper reeving of wire rope on sheaves & winch drum.	
D	8	Pins	Proper engagement of all connecting pins & pin retaining devices.	
D	9	General	Overall observation of crane for damaged or missing parts, cracked welds & 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 & 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 2-Blocking	Operate anti 2-blocking device to check for proper operation.	
D	14		Other	
D	15		Other	

Inspection Checklist — CRANES — 2

✔ = SATISFACTORY
✘ = DEFICIENCY (must be corrected prior to operation)
R = RECOMMENDATION (should be considered for corrective action)
NA = NOT APPLICABLE

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS ✔ , ✘ R, NA
M	16	Daily	All daily inspection items.	
M	17	Cylinders	Visual inspection of cylinders for leakage at rod, fittings & welds. Damage to rod & case.	
M	18	Valves	Holding valves for proper operation.	
M	19	Valves	Control valve for leaks at fittings & between sections.	
M	20	Valves	Control valve linkages for wear, smoothness of operation & tightness of fasteners.	
M	21	General	Bent, broken or significantly rusted/corroded parts.	
M	22	Electrical	Electrical systems for presence of dirt, moisture & frayed wires.	
M	23	Structure	All structural members for damage.	
M	24	Welds	All welds for breaks & cracks.	
M	25	Pins	All pins for proper installation & condition.	
M	26	Hardware	All bolts, fasteners & retaining rings for tightness, wear & corrosion	
M	27	Wear Pads	Presence of wear pads.	
M	28	Pump & Motor	Hydraulic pumps & motors for leakage at fittings, seals & between sections.	
M	29	PTO	Transmission/PTO for leakage, abnormal vibration & noise.	
M	30	Hyd Fluid	Quality of hydraulic fluid and for presence of water.	
M	31	Hyd Lines	Hoses & tubes for leakage, abrasion damage, blistering, cracking, deterioration, fitting leakage & secured properly.	
M	32	Hook	Load hook for abnormal throat distance, twist, wear & cracks.	
M	33	Rope	Condition of load line.	
M	34	Manual	Presence of operator's manuals with unit.	
M	35		Other	
Q	36	Daily	All daily inspection items.	
Q	37	Monthly	All monthly inspection items.	
Q	38		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 & corrosion.	
	42		● Base	
	43		● Outrigger beams & 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, bearings, shafts, gears, rollers, & locking devices for wear, cracks, corrosion & distortion.	
	52		● Rotation bearing(s)	
	53		● Inner boom pivot pin(s) & retainer(s)	
	54		● Outer boom pivot pin(s) & retainer(s)	
	55		● Inner boom cylinder pin(s) & retainer(s)	
	56		● Outer boom cylinder pin(s) & retainer(s)	
	57		● Extension cylinder pin(s) & retainer(s)	
	58		● Jib boom pin(s) & retainer(s)	
	59		● Jib cylinder pin(s) & retainer(s)	
	60		● Jib extension cylinder pin(s) & retainer(s)	
	61		● Boom tip attachments	
	62		● Other	
Q	63	Hyd Lines	Hoses, fittings & tubing for proper routing, leakage, blistering, deformation & 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	

Inspection Checklist — CRANES — 3

✔ = SATISFACTORY
✘ = DEFICIENCY (must be corrected prior to operation)
R = RECOMMENDATION (should be considered for corrective action)
NA = NOT APPLICABLE

FREQUENCY	ITEM	KEY	INSPECTION DESCRIPTION	STATUS ✔, ✘ R, NA
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	
	76		● Load holding valve(s)	
	77		● Outrigger or auxiliary control valve(s)	
	78		● Other	
	79		● Other	
Q	80	Cylinders	Hydraulic cylinders for drifting, rod seal leakage & leakage at welds. Rods for nicks, scores & dents. Case for damage. Case & rod ends for damage & 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	
Q	89	Winch	Winch, sheaves & drums for damage, abnormal wear, abrasions & 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 pressures & relief valve settings	
A	96	Valves	Safety valve calibration for correct pressures & 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 & cracks.	
A	99	Lubrication	Gear oil change in rotation drive system per maintenance schedule.	
A	100	Hardware	Check tightness of all fasteners and bolts.	
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 (✘) may constitute a hazard. ✘ 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 (✘) listed must be followed by the corresponding corrective action taken (**CA**).*

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

✘, R, CA	ITEM #	EXPLANATION	DATE CORRECTED

Deficiency / Recommendation / Corrective Action Report (cont) 4

✘, R, CA	ITEM #	EXPLANATION	DATE CORRECTED

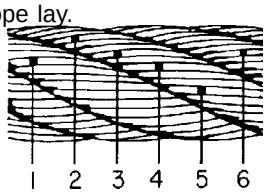
If additional space is required, reproduce this page and attach to this report.

WIRE ROPE INSPECTION

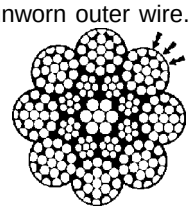
Wire rope with any of the deficiencies shown below shall be removed and replaced immediately.

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

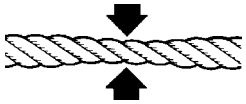
B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



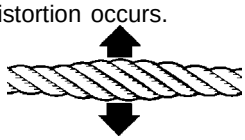
C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



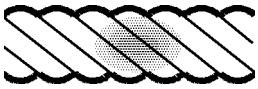
D. When there is a decrease of diameter indicating a core failure.



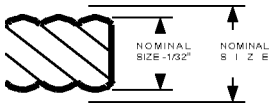
E. When kinking, crushing, birdcaging or other distortion occurs.



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.)

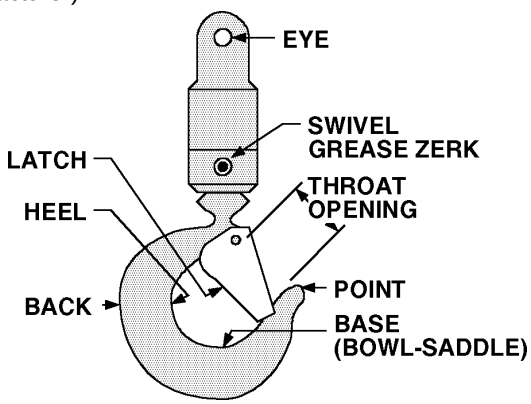
D. LATCH

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.

ANTI-TWO BLOCKING DEVICE INSPECTION

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

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

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

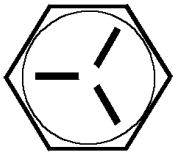
2. Examine cord for damage, cuts or breaks. Grasp cord and pull to check operation of cord reel. The cord should retract on reel when released.

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

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

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

COARSE THREAD BOLTS

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

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

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

2. Flat washers of equal strength must be used.

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

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

5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

WARNING

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

TORQUE DATA CHART - DOMESTIC

FINE THREAD BOLTS

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

COARSE THREAD BOLTS

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

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

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

2. Flat washers of equal strength must be used.

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

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

5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

WARNING

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

TORQUE DATA CHART - METRIC

FINE THREAD BOLTS

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

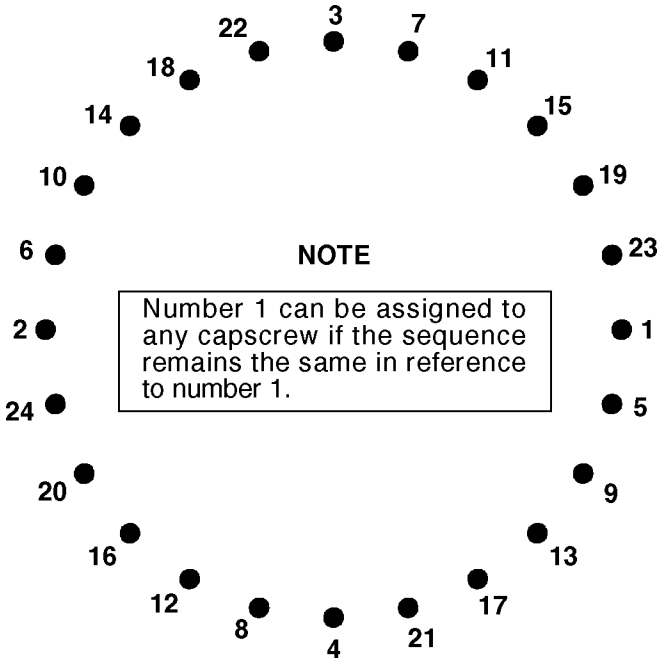
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

WARNING

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

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.

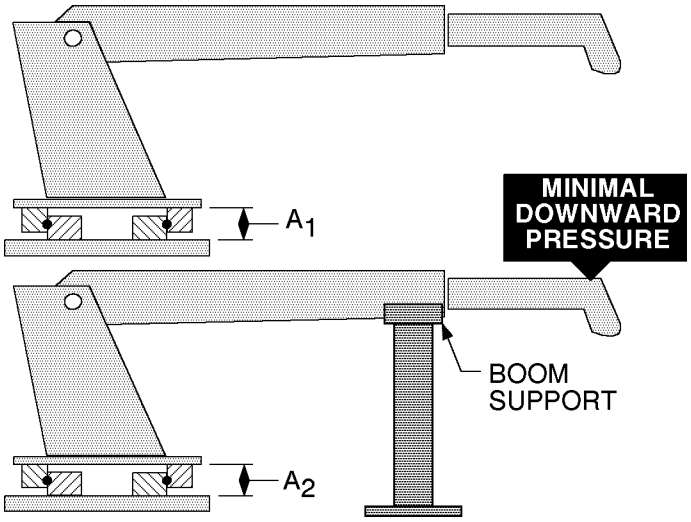
Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

TEST PROCEDURE

STEP 1.
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A1), using a dial indicator for accuracy.

STEP 2.
Reverse the load by applying minimal downward pressure on the boom while the boom is in the boom support or on a solid surface. Again measure A2.

STEP 3.
Subtract A1 from A2 to determine tilt and compare the result with the accompanying chart.



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 2015 2020 2109 3000 3016 3816 3020 425 4300 5016 6016 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 32030 T30 T40	9800 12916 13031 13034 14000 15000 18000 20017 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)**

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: _____

_____

_____

_____

_____

_____

_____

_____

☐ REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

_____

_____

_____

REASON FOR ADDITION: _____

_____

_____

_____

MAIL TO: IOWA MOLD TOOLING Co., Inc.
Box 189,
Garner IA 50438-0189
ATTN: Technical Publications

LIMITED WARRANTY

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

1. Ninety (90) days; labor on IMT workmanship from the date of shipment to the end user.

2. One (1) year; original IMT parts from the date of shipment to the end user.

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

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

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

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

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

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

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

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

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

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

Effective January, 1985

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