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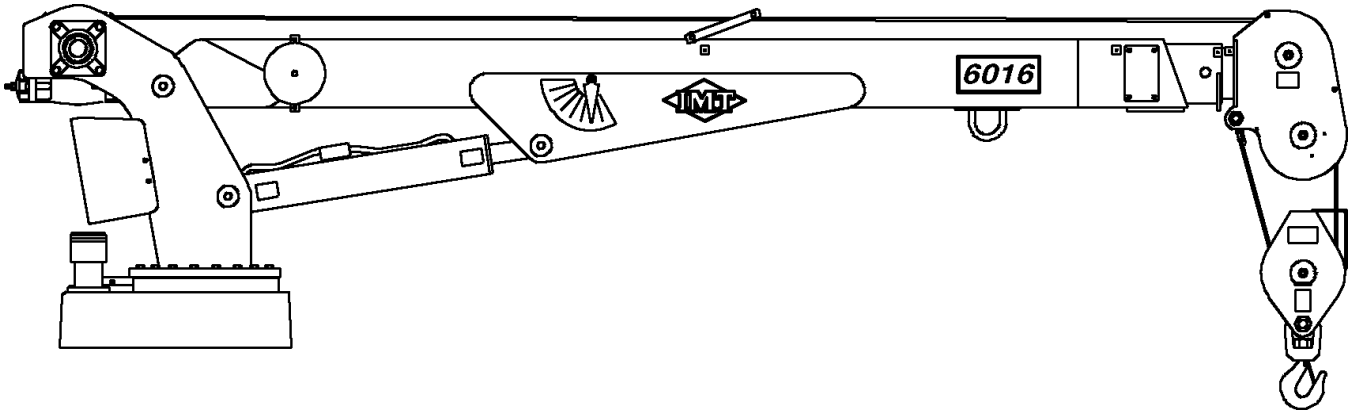
Model 6016 Crane

Volume 2 - PARTS AND SPECIFICATIONS



IOWA MOLD TOOLING CO., INC.
BOX 189, GARNER, IA 50438-0189
TEL: 515-923-3711
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MANUAL PART NUMBER 99900739

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 B30.5
MOBILE and LOCOMOTIVE 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 6016 CRANE SPECIFICATIONS

NOTES

MODEL 6016 CRANE SPECIFICATIONS

GENERAL SPECIFICATIONS

	6016-1H	6016-1H1M
CRANE RATING	60,000 ft-lbs 8.4 ton-meters	60,000 ft-lbs 8.4 ton-meters
REACH - from centerline of rotation	16'-0" 4.88m	20'-0" 6.10m
HYDRAULIC EXTENSION	60" 152.4cm	60" 152.4cm
MANUAL EXTENSION	—	48" 121.9cm
LIFTING HEIGHT - from base of crane	18'-5" 5.61m	22'-4" 6.81m
WEIGHT OF CRANE	1790 lbs 771 kg	1915 lbs 869 kg
OUTRIGGER SPAN (required option) crane side from centerline of chassis	90" 228.6cm	90" 228.6cm
opposite crane side from centerline of chassis	48" 121.9cm	48" 121.9cm
STORAGE HEIGHT - crane only	40-1/2" 102.9cm	40-1/2" 102.9cm
MOUNTING SPACE REQUIRED (crane base)	19" x 27-1/2" 48.3cm x 69.9cm	19" x 27-1/2" 48.3cm x 69.9cm
TIE-DOWN BOLT PATTERN	14-3/4" x 14-3/4" 37.5cm x 37.5cm on center	14-3/4" x 14-3/4" 37.5cm x 37.5cm on center
HORIZONTAL CENTER OF GRAVITY - from centerline of rotation	26" 66.0cm	26" 66.0cm
VERTICAL CENTER OF GRAVITY - from bottom of crane base	18" 45.7cm	18" 45.7cm
OPTIMUM PUMP CAPACITY	10 U.S. Gallons/minute 38 liters/minute	10 U.S. Gallons/minute 38 liters/minute
SYSTEM PRESSURE	3000 PSI 207 bar	3000 PSI 207 bar
ROTATIONAL TORQUE	7375 ft-lbs 1020 kg-m	7375 ft-lbs 1020 kg-m

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PERFORMANCE CHARACTERISTICS

ROTATION:	450° (7.85 Rad.)	42 seconds
LOWER BOOM ELEVATION:	-10° to +80° (-0.17 Rad. to +1.40 Rad.)	11 seconds
EXTENSION CYLINDER:	60" (152.4cm)	8 seconds

POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be used - minimum power required is 22 horsepower based on 10 GPM at 3000 PSI (38 liters/min. at 207 bar).

ROTATION SYSTEM

Turntable bearing powered by a high-torque hydraulic motor through a ring-and-pinion type spur-gear train. Total gear reduction is 43 to 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 breakage or other hydraulic component failure.

The extend side of the lower boom cylinder is equipped with a counter balance 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.

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, 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 winch may be lowered or the extension boom retracted.

WINCH

The winch is powered by means of a hydraulic motor driving a 27:1 worm gear arrangement with a mechanical brake. Maximum single line lifting capacity of the winch, achieved on the second layer of wire rope, is 5500 lbs. (2495 kg.). Maximum two-part line winch capacity is 10,400 lbs. (4717 kgs). The winch is equipped with 100 ft. (30.5 m) 7/16 in. (1.1 cm) 6 x 25 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 to wire rope diameter is 18.7:1 for the winch drum and 18:1 for the load block and boom tip sheave. An anti-two block device is included to prevent the lower block or hook assembly from coming in contact with the boom sheave assembly.

SINGLE LINE SPEED

1st Layer - 25 ft/min
2nd Layer - 27 ft/min
3rd Layer - 30 ft/min

HYDRAULIC SYSTEM

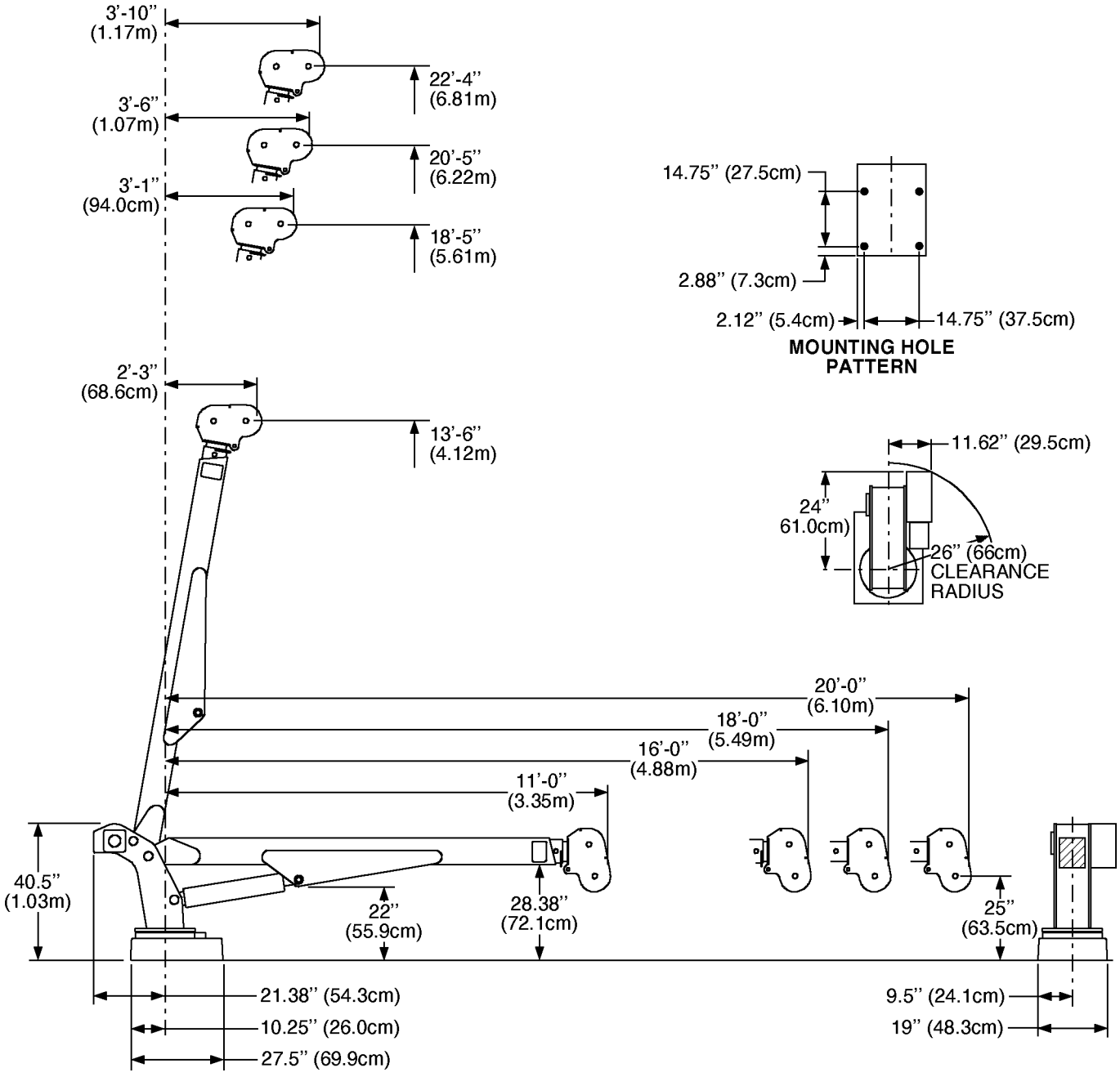
The hydraulic system is an open center, full pressure system requiring maximum flow of 10 GPM (38 liters/min.) at 3000 psi (207 bar). It is equipped with a four section, electric remote, stack type control valve with a 30 ft. (9.14 m) control cable. The system includes a separate hydraulic oil reservoir, suction line filter, return line filter and control valve.

MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	Conventional Cab	Conventional Cab
WHEEL BASE	154"	391cm
CAB TO AXLE	84"	213cm
FRAME SECTION MODULUS	12"3	196.7cc
RBM	600,000 in-lbs	6913 kg-meter
FRONT AXLE RATING	7000 lbs	3175 kg
REAR AXLE RATING	17500 lbs	7938 kg
GROSS VEHICLE RATING	24500 lbs	11113 kg
TRANSMISSION	5 speed	5 speed

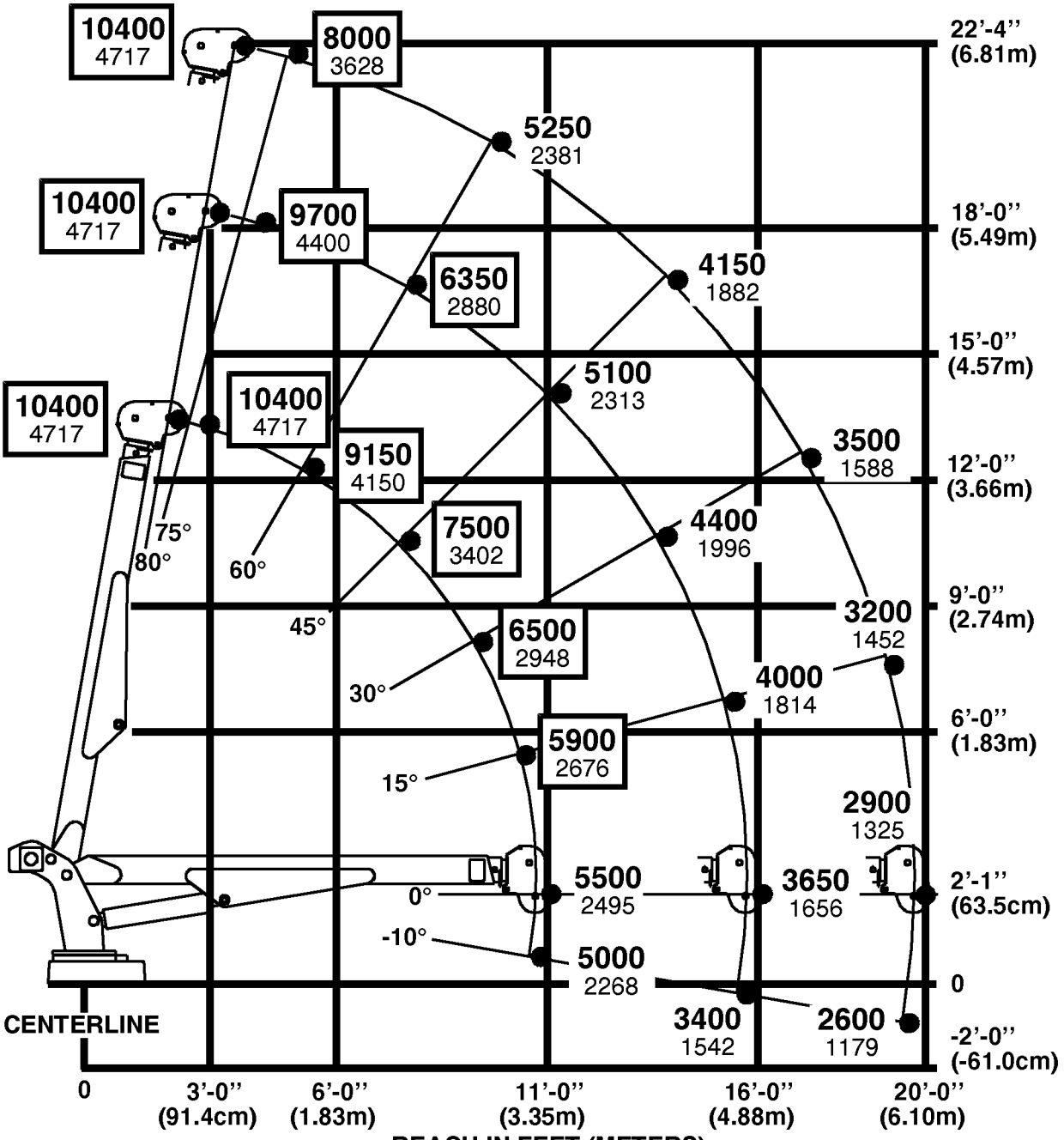
In addition to these specifications, heavy duty electrical and cooling systems are required. It is recommended that the vehicle be equipped with an engine tachometer, auxiliary brake lock, and power steering.

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



GEOMETRIC CONFIGURATION

6016 CAPACITY CHART



Maximum 1-part line capacity is 5500 lbs (2495 kgs).
For greater loads, use 2-part line.

Weight of load handling devices are part of the load lifted and must be deducted from the capacity.

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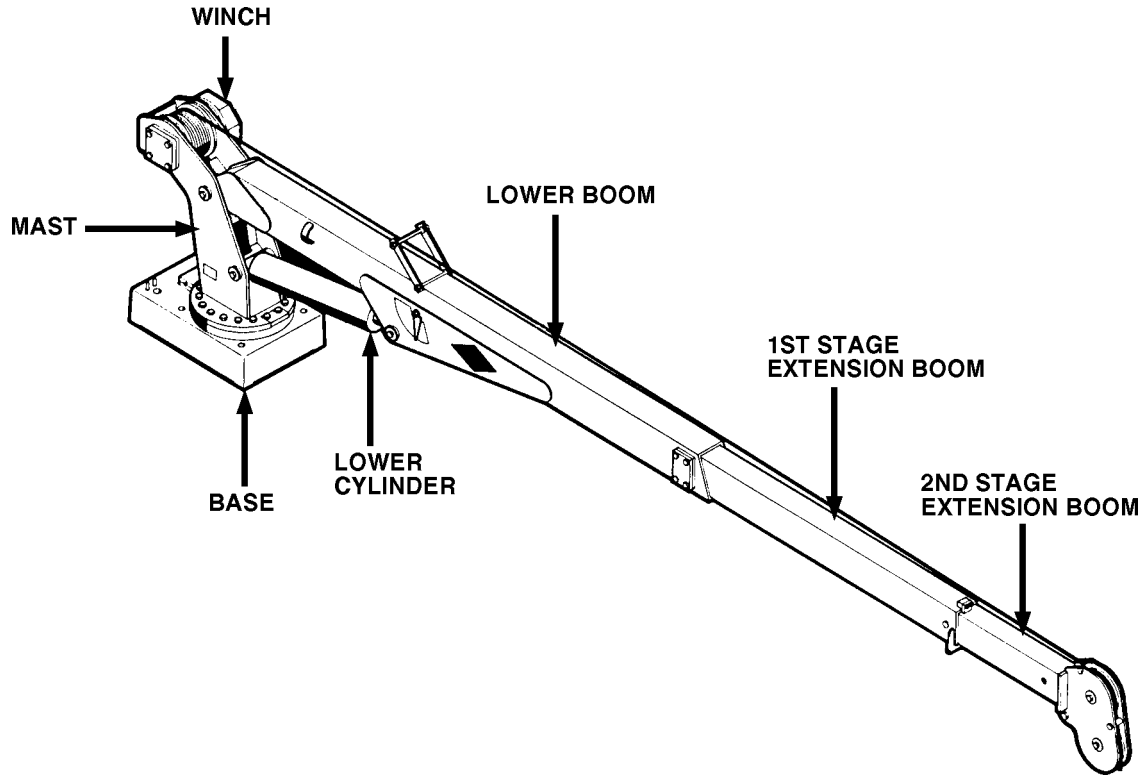
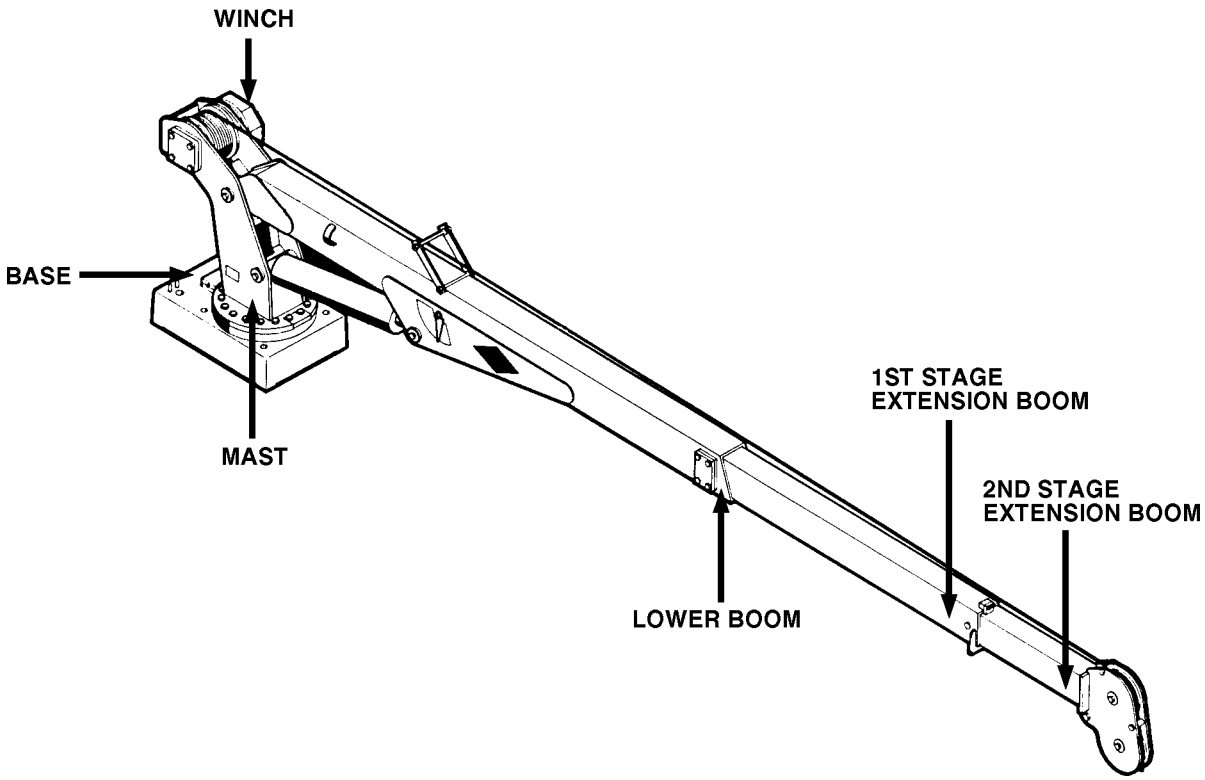
SECTION 2. MODEL 6016 CRANE REFERENCE

NOTES

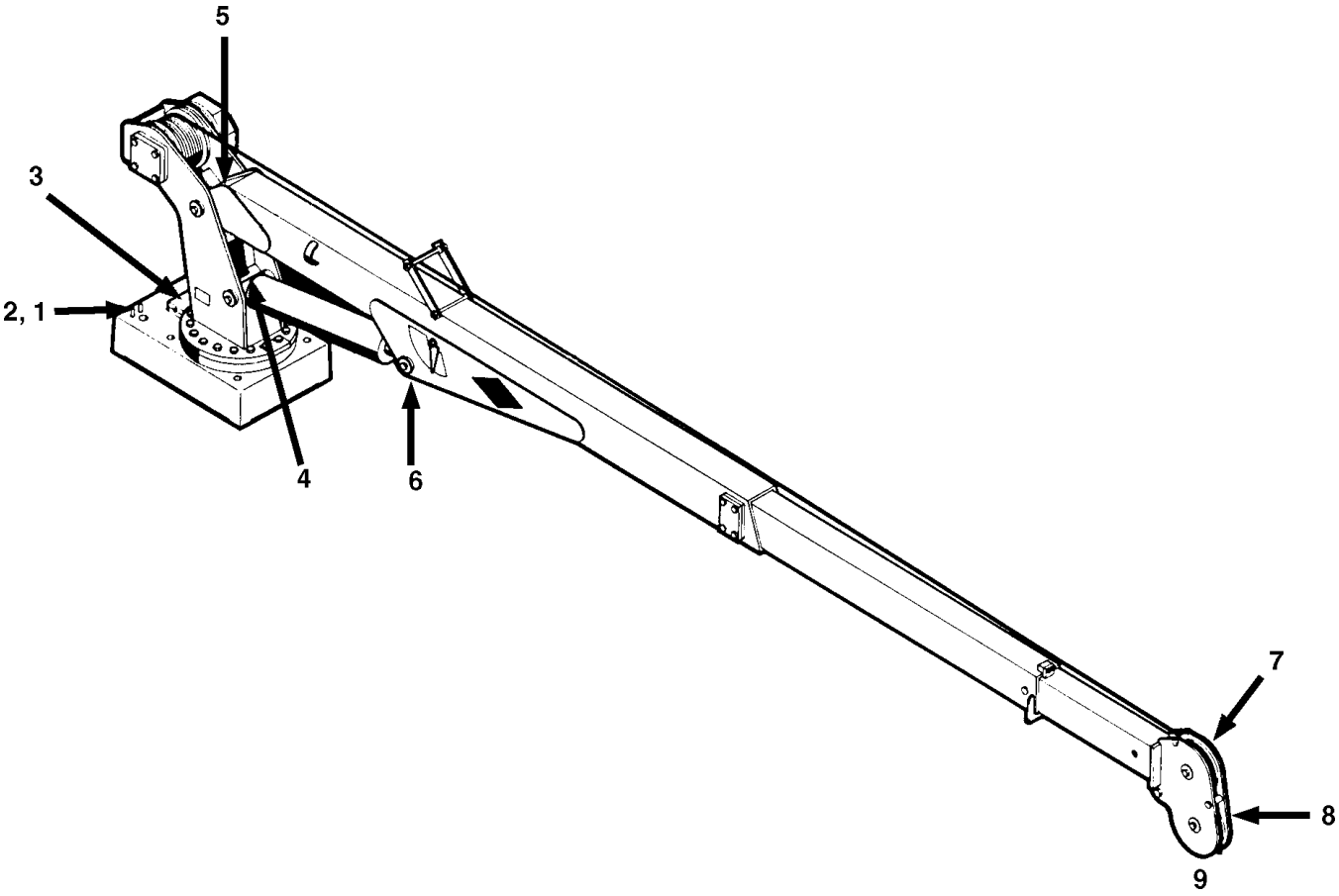


MAJOR CRANE ASSEMBLIES



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		
7.	UPPER SHEAVE PIN		
8.	LOWER SHEAVE PIN		
9.	SNATCH BLOCK 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 Volume 1; Operation, Maintenance and Repair for additional lubrication requirements.

RECOMMENDED SPARE PARTS LIST

1 YEAR SUPPLY
MODEL 6016 TELESCOPING CRANE
FOR MANUAL: 99900739

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
41707659.01.19961011	**BASE ASM**						
	3	60020114	BUSHING	1	W		
	4	60020115	BUSHING	1	W		
	5	60020116	BUSHING	1	W		
	6	60020154	BUSHING	1	W		
	14	7Q072112	O-RING	2	W		
	15	71056010	PINION GEAR	1	C		
	33	73054538	C'BALANCE VALVE CARTRIDGE	2	C		
41712180.01.19960422	**LOWER BOOM ASM**						
	5	7BF81520	BUSHING	4	W		
	6	60030015	WEAR PAD	2	W		
	7	60030139	WEAR PAD	1	W		
3C038940.01.19960422	**LOWER BOOM CYLINDER**						
	3	7BF81520	BUSHING	6	W		
	5	73054242	C'BALANCE VALVE	1	W		
	6	6I503181	PISTON	1	W		
	7	6H050025	HEAD	1	W		
	8	9B043920	SEAL KIT	1	W		
73054900.01.19960422	**LOCKING HOLDING VALVE**						
	2	73054661	C'BALANCE VALVE	1	C		
	3	7Q072112	O-RING	3	W		
73054004.01.19960422	**HOLDING VALVE**			1	C		
	1	7Q072014	O-RING	3	W		
41707662.01.19960422	**EXTENSION BOOM ASM 16'**						
	3	60030189	WEAR PAD	1	W		
3B309820.01.19960422	**EXTENSION BOOM CYLINDER**						
	4	6H025015	HEAD	1	W		
	5	6IX02512	PISTON	1	W		
	9	73054900	HOLDING VALVE	1	C		
	10	9B101220	SEAL KIT	1	W		
41707663.01.19970107	**EXTENSION BOOM ASM 20'**						
	5	60030189	WEAR PAD	1	W		
41709440.01.19970107	**EXTENSION BOOM W/FLIP SHEAVE**						
	5	60030189	WEAR PAD	1	W		
41712179.01.19960422	**WINCH/CABLE/HOOK KIT**						
	6	60030255	SHEAVE	3	W		
	12	70055117	FLANGE BEARING	1	W		
	16	70732882	HOOK	1	C		
	42	51713168	CORD REEL	1	W		
31712207.01.19960422	**WINCH/CABLE/HOOK KIT-FLIP SHEAVE**						
	6	60030255	SHEAVE	3	W		
	12	70055117	FLANGE BEARING	1	W		
	16	70732882	HOOK	1	C		
	42	51713168	CORD REEL	1	W		
73733057.01.19970825	**VALVEBANK**						
	4	73054935	RELIEF VALVE	1	W		
	5	73054936	SOLENOID VALVE	4	W		
	6	7Q072013	O-RING	10	W		
	17	77044595	VALVE DRIVER	1	C		
99900855.01.19960422	**PROPORTIONAL REMOTE CONTROL**						
	5	7Q072015	O-RING	1	W		
	11	77041283	PRESSURE SWITCH 2800	1	W		
	14	77041237	SOLENOID 12V 150A	1	W		
	15	77041251	RELAY	3	W		
51713182.01.19971111	**PROPORTIONAL REMOTE HANDLE ASM**			1	C		
	16	77040371	TOGGLE SWITCH SPST	2	W		
	17	77040372	TOGGLE SWITCH SPDT	4	W		
	18	77040373	TOGGLE SWITCH SPST	2	W		
	19	77040374	TOGGLE SWITCH SPDT	1	W		
93707664.01.19970829	**INSTALLATION KIT**						
		73052006	ELEMENT-RET. FILTER 10MIC	6	P		

(BLANK)

INSTALLATION

GENERAL

This section contains specific 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 (refer to Section 5, Volume 1). 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.

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. Install the 6016 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:

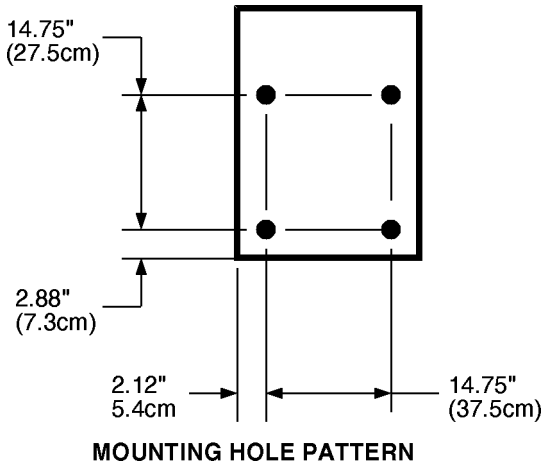
1. Use a lifting device capable of lifting the weight of the crane, 1,915 lbs. (869kg.). Attach the lifting device to the lift brackets of the crane. The lift brackets are located on both sides of the lower boom, approximately 30 inches from the mast hinge. Lift the crane, apply a bead of waterproof 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.

2. Install the mounting tie rods, washers, and nuts to secure the crane base to the truck body (see Figure below).

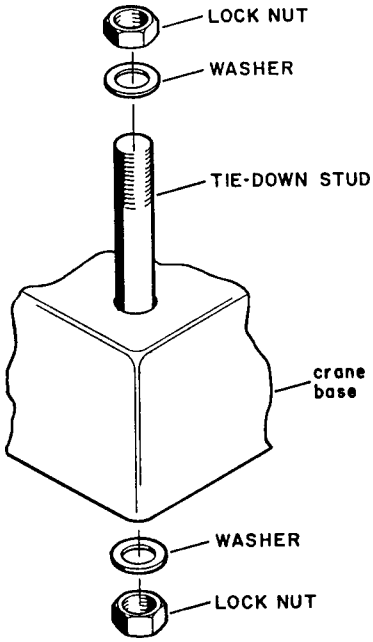
CAUTION

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.



MOUNTING HOLE PATTERN



HYDRAULIC INSTALLATION

Before installation, see installation kit drawing in the parts section for specific hydraulic components.

1. Install the gate valve to the suction port, and the return filter to the return port of the standard reservoir with a 1-1/4 to 3/4" reducer bushing, 3/4" pipe nipples and 3/4" gate valve.

2. Install the 1" diameter hose between the pump and the suction filter, using barbed nipples and hose clamps. See figure below.

3. Install the 1/2" diameter hose between the pump and the valve bank inlet section.

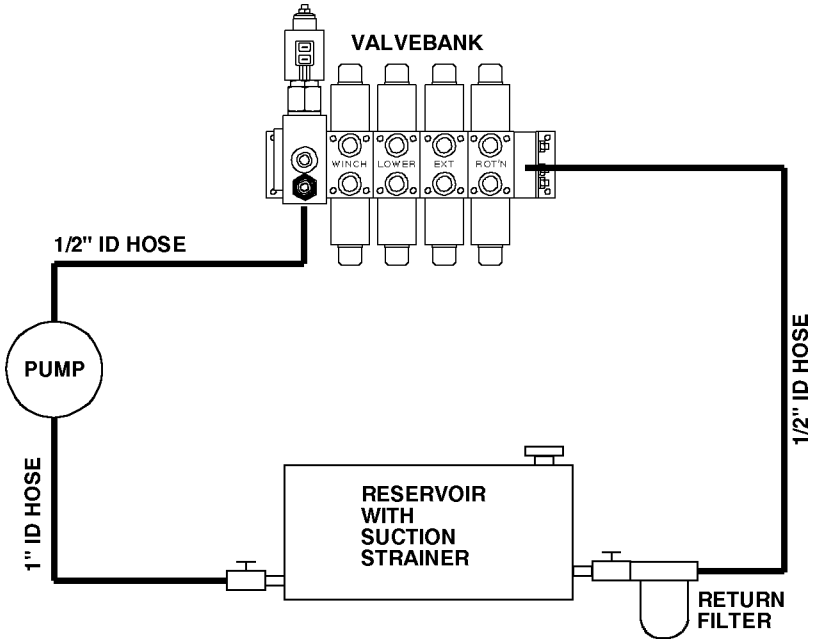
4. Install the 1/2" diameter hose between the valve bank outlet section and the reservoir.

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

6. Check all connections for leaks.

7. 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.

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



HYDRAULIC INSTALLATION

CONTROL VALVE TROUBLESHOOTING

GENERAL

This section describes the operating characteristics of the main control valvebank (73733057) used on this model of crane. It also provides troubleshooting information which applies to this valvebank. See figure on following page for reference.

ELECTRICAL-AMP DRIVER

POWER LED

The Power LED illuminates red while power is being applied to the valve amplifier. If the LED is not illuminated, no power is being applied to the valve amplifier.

If the Power LED does not function as described, inspect input wiring and repair or replace as necessary. When input power is applied, the LED should illuminate.

PMW% LED

The PMW% LED indicates the condition of the output current flowing to the proportional valve. The LED will change colors from, red to yellow to green. The change of colors indicates the variance of current flowing to the proportional valve. Red indicates minimum current and green indicates maximum current. This represents the flow condition going from low flow (red) to maximum flow (green), thus varying the speed of crane functions.

If the LED stays red, as the speed control trigger is activated, a dead short is present in the circuit. This could be the result of a wiring problem, shorted out proportional coil, etc. Inspect the wiring and replace the proportional coil, if required.

MIN POTENTIOMETER

The Min adjustment pot will be used to set the minimum amount of movement of an individual function at the valvebank when the corresponding function switch at the handset is depressed. To adjust, set engine at high speed control setting. Depress the “Rotation” function switch at the handset. Adjust the Min pot at the AMP driver card clockwise until crane begins to rotate or counter-clockwise until motion begins to stop. No other electrical adjustments are required to properly operate the crane.

HYDRAULICS-VALVEBANK

RELIEF VALVE

The relief valve limits the maximum system pressure. Pressure limits the amount of torque or force an actuator will see. This pressure is preset to 3000 psi at 5 gpm. If the relief valve should fail, it would likely stick open. This would prevent system pressure from developing and cause a lack of torque/force at the actuator. The relief valve can be changed easily by screwing it out and replacing with a new one.

PROPORTIONAL VALVE

The proportional valve varies the oil flow to the individual crane functions. Doing so dictates the speed of the crane functions. As the electrical current increases to the valve, by using the trigger on the control handle, more oil is ported downstream to the crane function. If the valve coil burns out, the operator would be unable to vary the flow to the crane functions. If the valve spool becomes stuck, the operator would be unable to vary the downstream flow. If speed control is the problem, it is likely an indication of a proportional valve problem. It is necessary to verify that current is flowing to the coil correctly, and that it is not an electrical problem.

The proportional valve can also be operated manually for test purposes. The valve stem can be screwed in manually to port oil downstream. Doing so will manually position the valve spool and hold it in the manually commanded position.

DIRECTIONAL VALVES

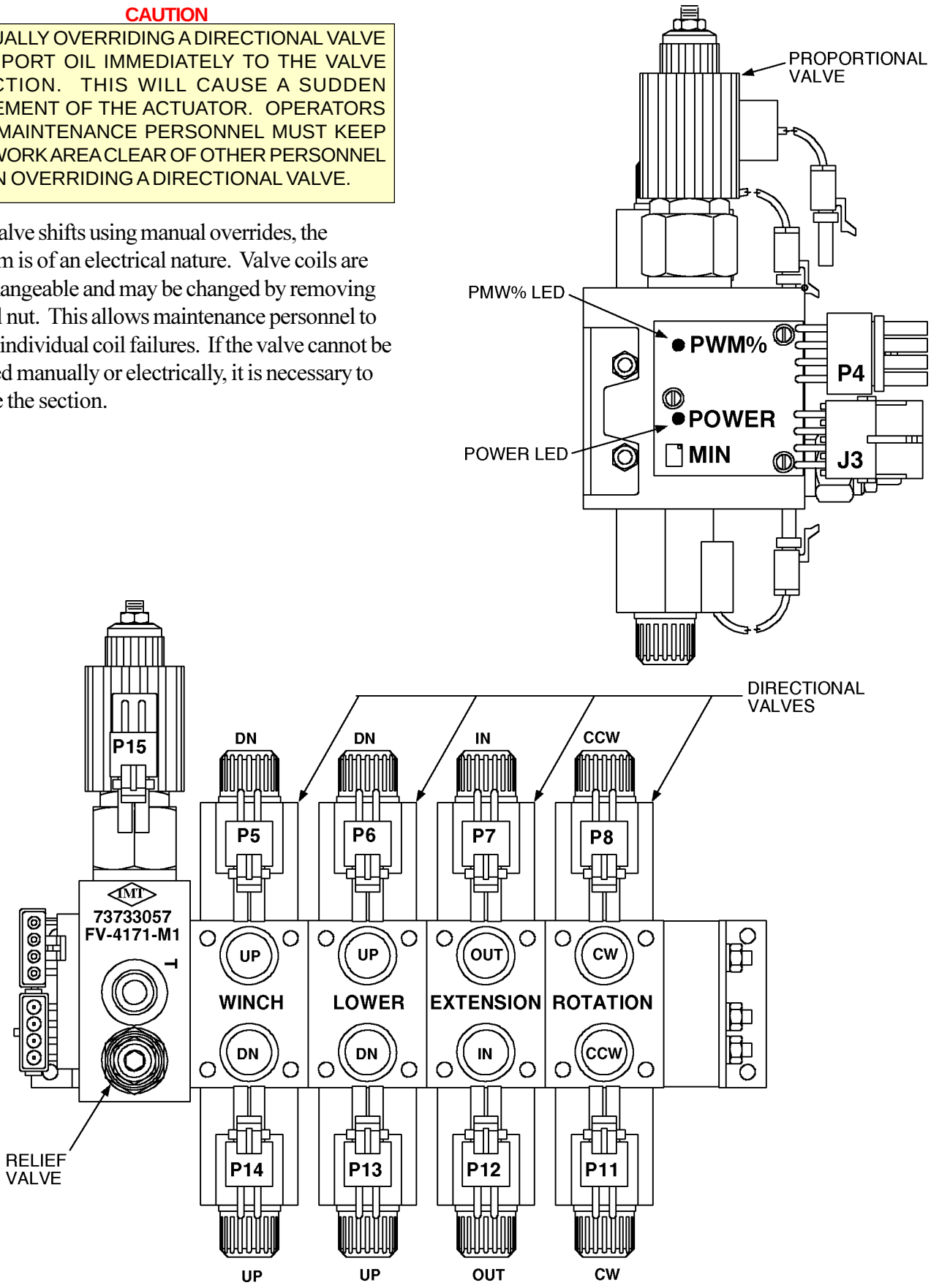
The directional valves (4) control the direction of the crane functions. When one of the solenoids is energized, it shifts the valve spool. This allows oil to flow out one of the valve ports. If a function does not work, a directional valve may be to blame.

These valves have a standard manual override. You may manually shift the valve by pushing the pin, located in the middle of the solenoid.

CAUTION

MANUALLY OVERRIDING A DIRECTIONAL VALVE WILL PORT OIL IMMEDIATELY TO THE VALVE FUNCTION. THIS WILL CAUSE A SUDDEN MOVEMENT OF THE ACTUATOR. OPERATORS AND MAINTENANCE PERSONNEL MUST KEEP THE WORK AREA CLEAR OF OTHER PERSONNEL WHEN OVERRIDING A DIRECTIONAL VALVE.

If the valve shifts using manual overrides, the problem is of an electrical nature. Valve coils are interchangeable and may be changed by removing the coil nut. This allows maintenance personnel to isolate individual coil failures. If the valve cannot be actuated manually or electrically, it is necessary to replace the section.



VALVEBANK

RELAY BOARD OPERATION

INTRODUCTION

To understand how the relay board operates, it is necessary to understand how the individual relays function.

The Bosch relay (part number 77041251) is a normally open relay between terminals 30 and 87 and normally closed between terminals 30 and 87a. Terminals 85 and 86 energize the relay through the coil. See Figure 1 and 2.

Figure 3 shows the relay board with eight relays identified with the letters "A" through "G" and by their basic function. Example: Relay "A" is the "Power ON/OFF" relay, "C" is the "Compressor Speed Control", etc. The small numbers shown on the individual terminals of the relay indicate where that terminal is connected through the circuit board, to the terminal bar. Example: Relay "A" top terminal (#9) is connected to terminal 9 of the terminal bar. The terminal bar is provided with 16 individual terminals of which the last two (15 and 16) are not used. Wires connected to the terminal bar have been identified according to their function in the circuit. The number of terminals used vary with each application. Solid lines between relay terminals indicate existing wiring connections, through the circuit board.

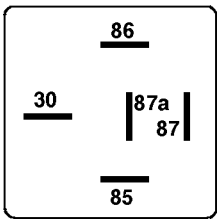


FIGURE 1. BOTTOM VIEW OF RELAY

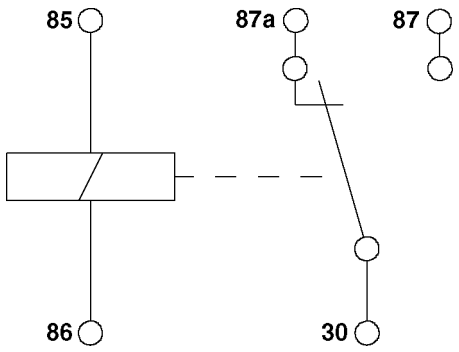


FIGURE 2. INTERNAL WIRING

The relay board is primarily used on vehicles with remote controlled cranes and remote control cranes and compressors. The circuitry prevents remote starting of the truck engine unless the brakes are applied and the PTO is engaged. It also isolates the crane speed control from the compressor speed control.

OPERATION

IGNITION "ON"

When the ignition switch of the vehicle is turned "ON", terminal 9 of the terminal bar is "HOT". The coil of relay "A" is energized and voltage from terminal 1 of the terminal bar becomes present at terminals "A" of relays "A", "B", "E" and "H". See Figure 3.

REMOTE STARTING THE VEHICLE

The vehicle can be remotely started from the remote control handle by toggling the "Crane-OFF-Compressor" switch to the "Crane" position.

To start the vehicle, the engine start switch at the handle must be depressed. When this is accomplished, terminal 11 of the terminal block becomes "HOT". See Figure 5.

The truck starter is energized when terminals 11 and 12 of the terminal bar are connected through the relay board. When terminal 11 is "HOT", the coil in relay "F" is energized connecting relay terminal 12 and "B" on relays "F" and "G". If terminal 14 of relay "H" and terminal 13 of relay "G" are grounded (brakes and PTO engaged) terminals "B" of relays "F" and "G" are "HOT". Since terminal "B" of relay "F" is "HOT", the truck starter solenoid is activated. Energized circuits are shown as bold in Figure 5.

REMOTE ENGINE STOP

When the engine stop button is depressed on the remote control handle, voltage is applied to terminal 6 of the terminal block and of relay "D". The coil in relay "D" is energized and the ground of the fuel solenoid/distributor coil is interrupted because current can no longer flow from terminal 7 to 8. Relay "D" is normally closed between terminals 7 and 8. See Figure 3.

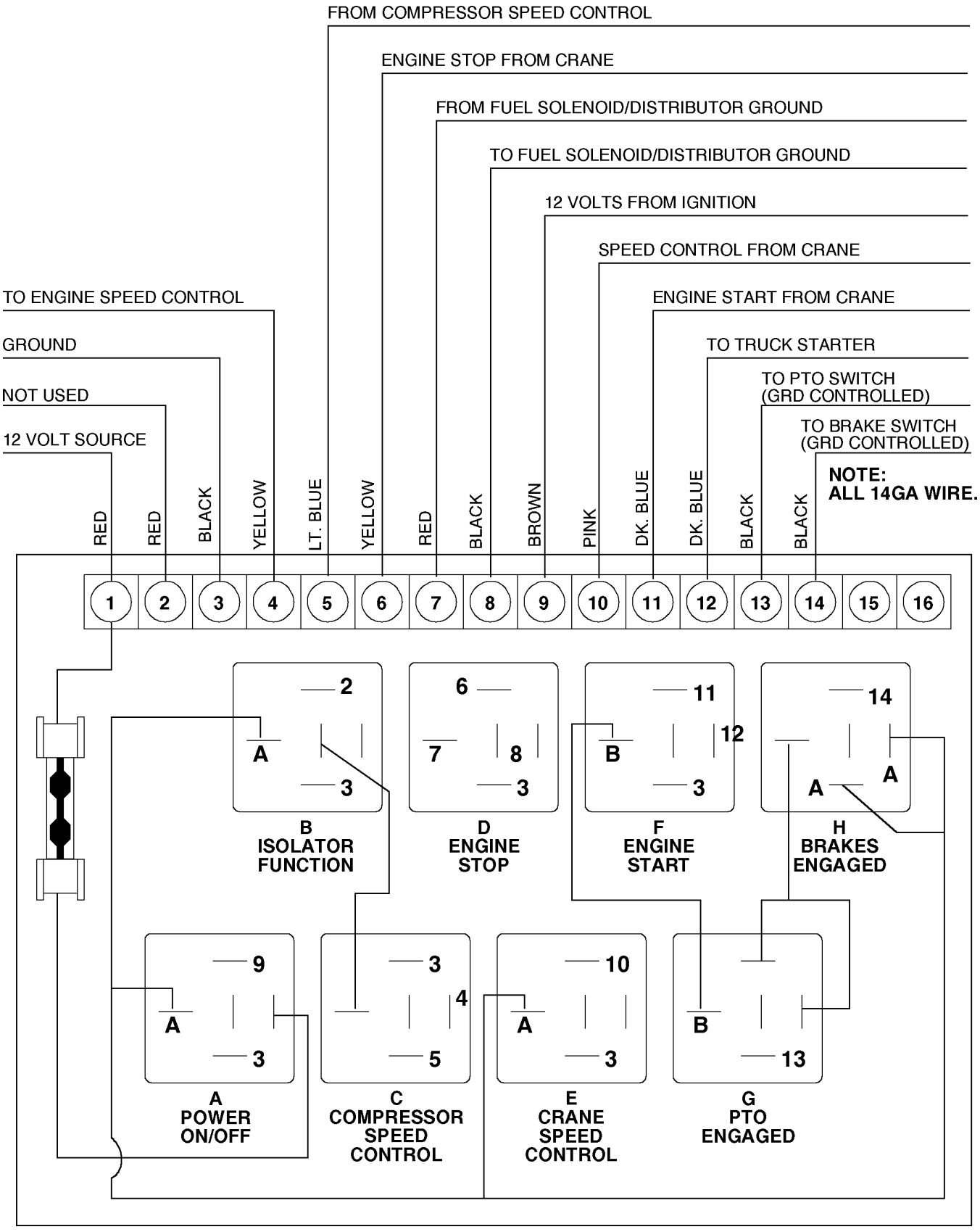


FIGURE 3. RELAY BOARD - COMPONENTS & WIRING

REMOTE ENGINE SPEED (FROM CRANE)

Engine speed can be controlled from the remote control handle. When the engine speed switch is activated, voltage is applied at terminal 10 of relay "E". The coil of relay "E" is energized and current is allowed to flow to the signal input of the speed control currently installed. The speed of the engine will remain higher as long as the engine speed switch in the remote control handle is allowed to remain in the same position. If this switch is returned to its original position, the engine speed control coil will be de-energized through relay "E".

Compressor operation will begin when the "Compressor-OFF-Crane" switch on the handset is toggled to the "Compressor" position. At that time, the power from the handset will provide power to the pressure switch on the compressor. When the pressure switch signals a need for more air pressure, the switch will trip and provide a signal to terminal 5 of the relay board.

Relay "C" energizes the coil in the relay, connecting terminal 4 to terminal "C" of the relay which is "HOT" from relay "B". Reference Figure 6 showing circuits energized (in bold) when engine speed is increased by the compressor. This will provide a "HOT" signal at terminal 4 which then provides a 12-volt signal to input of the speed control currently installed.

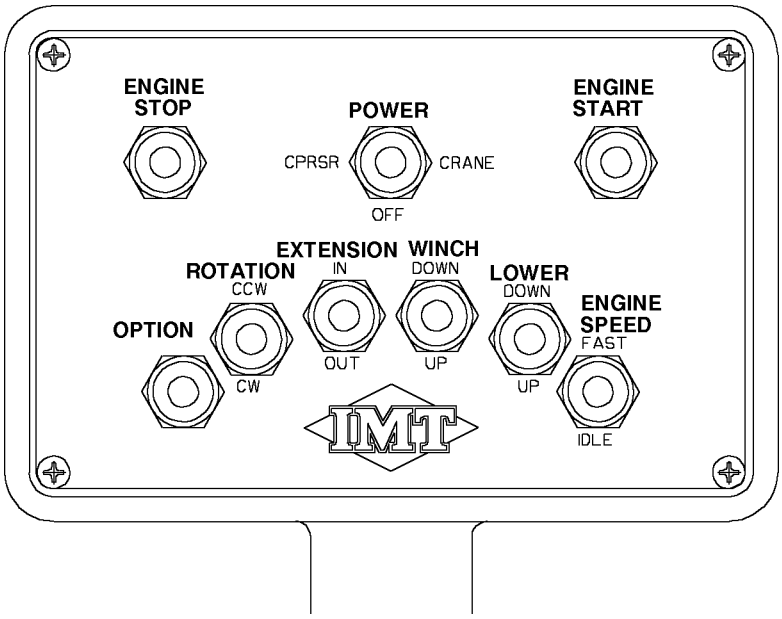


FIGURE 4. REMOTE CONTROL HANDLE

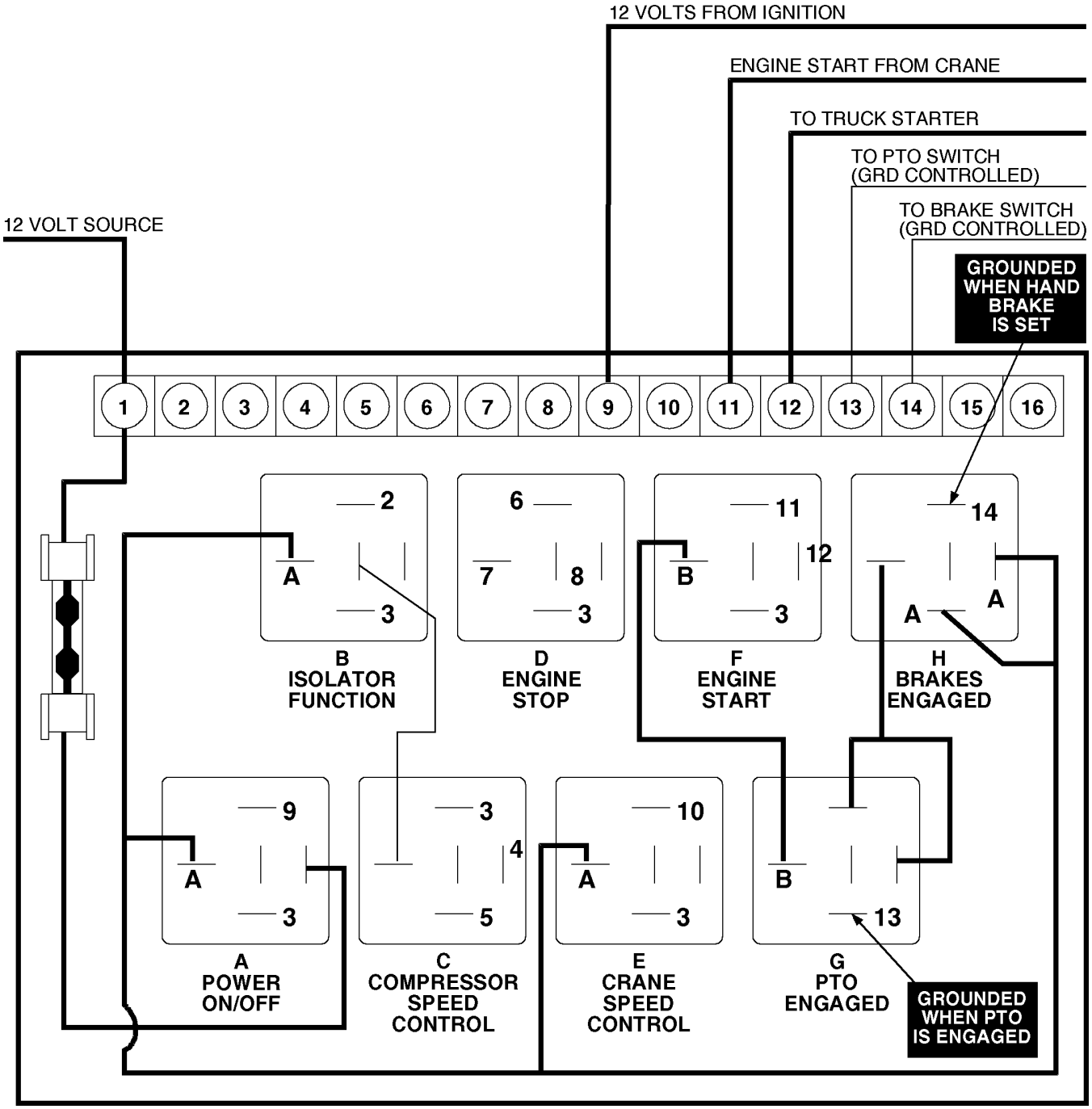


FIGURE 5. REMOTE STARTING OF VEHICLE - IGNITION "ON"

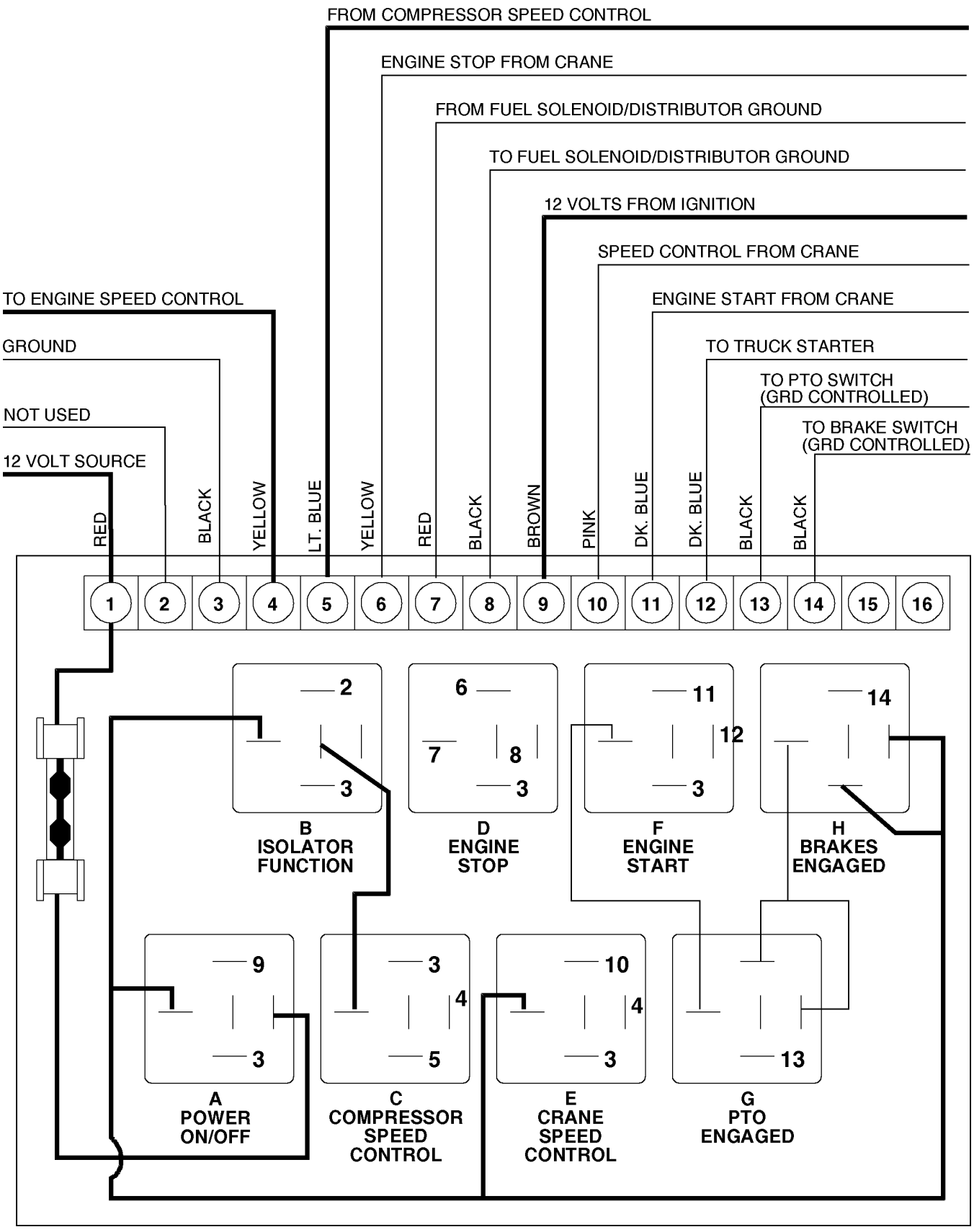


FIGURE 6. SPEED CONTROL - COMPRESSOR ONLY

INSTALLATION

1. Locate an area in the engine compartment that will both provide some protection against damage and accessibility for wiring.

2. Provide adequate space between the mounting surface and the back of the circuit board in order to prevent electrical contact. Failure to do so will cause erratic operation and/or circuit board failure.

3. Connect control wiring as indicated in Wiring Chart.

4. Jumper wires connections:

4-1. Jumper wires must connect J to K, and L to M for 12 volts excited systems. Remove the connecting wires between Ito J and M to N.

4-2. Jumper wires must connect I to J, and M to N for ground excited systems*. Remove the connecting wires between J to K and L to M.

WARNING

Failure to remove the extra connecting wire will cause the relay board to fail. Check jumper wire connections of relay board being replaced. (Most relay boards are wired as stated in item 4-1.)

*** NOTES**

Circuits that could be ground excited are 6 - 10 & 11.
Quick Check: (Before connecting wires to circuit board)
Activate the engine stop switch from the crane. If terminal 6 is hot, wire per 4-1. If not, wire per 4-2.

WIRING CHART

TERM	WIRING CONNECTION
1	12-VOLT
2	NC
3	GROUND
4	TO SPEED CONTROL
5	SPEED CONTROL FROM COMPRESSOR
6	ENGINE STOP FROM CRANE
7	FROM FUEL SOLENOID / DISTRIBUTOR GROUND
8	TO FUEL SOLENOID / DISTRIBUTOR GROUND
9	12-VOLT FROM IGNITION
10	SPEED CONTROL FROM CRANE
11	ENGINE START FROM CRANE
12	TO TRUCK STARTER
13	TO PTO SWITCH, CONTROLLED
14	TO BRAKE SWITCH, CONTROLLED
15	NC
16	NC

RELAY	FUNCTION
A	ON / OFF, POWER
B	ISOLATION, SPEED CONTROL
C	COMPRESSOR, SPEED CONTROL
D	ENGINE STOP
E	CRANE SPEED CONTROL
F	ENGINE START
G	PTO SWITCH
H	BRAKE SWITCH, CONTROLLED

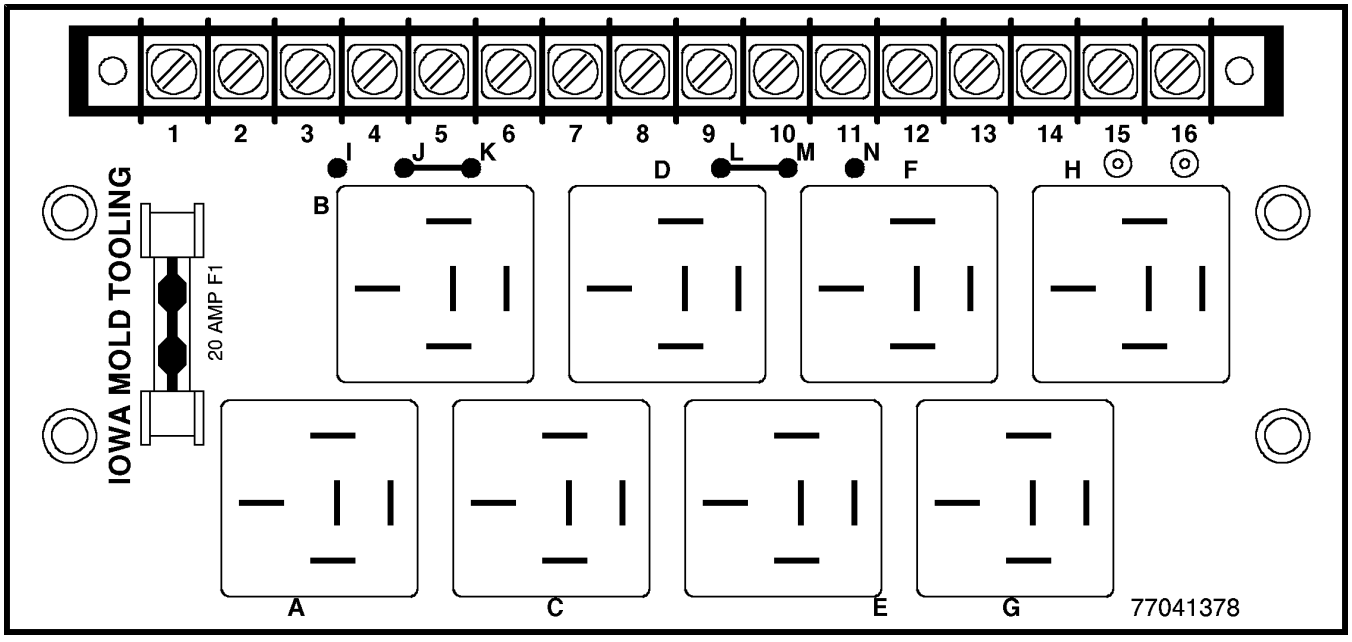


FIGURE 7. RELAY BOARD (77041378) WIRING INSTRUCTIONS

FLIP-UP BOOM SHEAVE

GENERAL

This section contains information regarding the operation of the Flip-up boom sheave which is an available option on the 6016-20' Crane only. Refer to following figure for parts reference.

SINGLE-PART LINE OPERATION

To position the crane for single-line operation:

1. Disconnect the cable wedge socket (item 14) from the boom tip dead end link (item 51) by removing the other pin and keeper (items 53 and 35).

2. Remove the link by removing the other pin and keeper (items 53 and 35)and rotate the flip sheave weldment (item 52) to the horizontal position and insert one of theretaining pins and keepers (items 53 and 35) through the lower hole in the boom tip

.3. Remove the two-part line snatch block (item 4) by removing the sheave (item 6) which is held in place by the pin (item 3), retainer plate (item 11) and wing bolt (item 50).

4. After the cable is freed from the snatch block, reassemble the sheave and snatch block. Store the snatch block assembly (items 3, 4 and 6) and the dead end link (item 51) in the chassis cab or a body compartment, if available.

5. Locate the 3-ton hook (item 55) which is stored separately on the chassis. Connect the hook to the cable wedge socket using the pin and keeper (items 53 and 35).

The crane should now be in position for single-part line operation. Note that no change in mounting of the anti two-blocking system is required.

TWO-PART LINE OPERATION

To position the crane for two-part line operation:

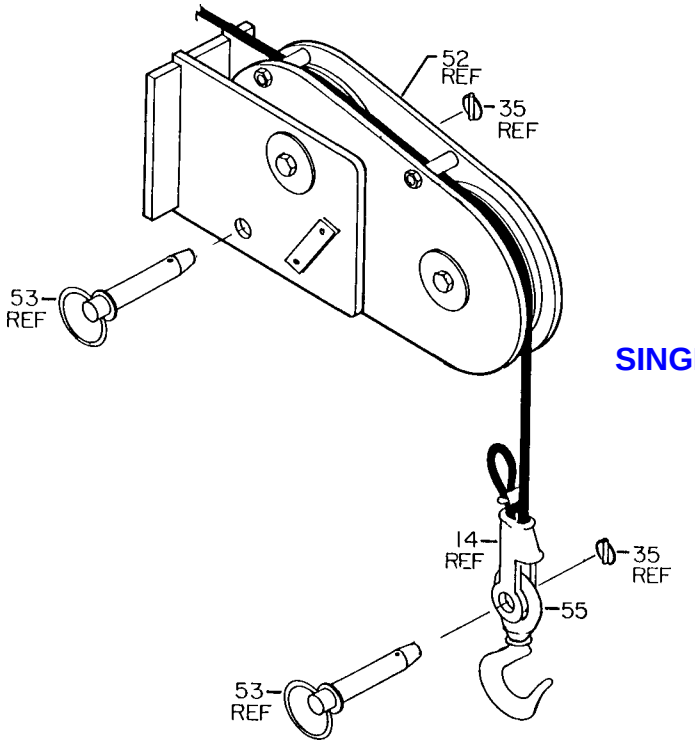
1. Disconnect the 3-ton hook (item 55) from the cable wedge socket (item 14) byremoval of the pin and keeper (items 53 and 35). Store the hook in the chassis cab or a body compartment if available.

2. Locate the two-part line snatch block assembly (items 3, 4, 6 & 16) and cable dead end link (item 51) which are stored separately on the chassis.

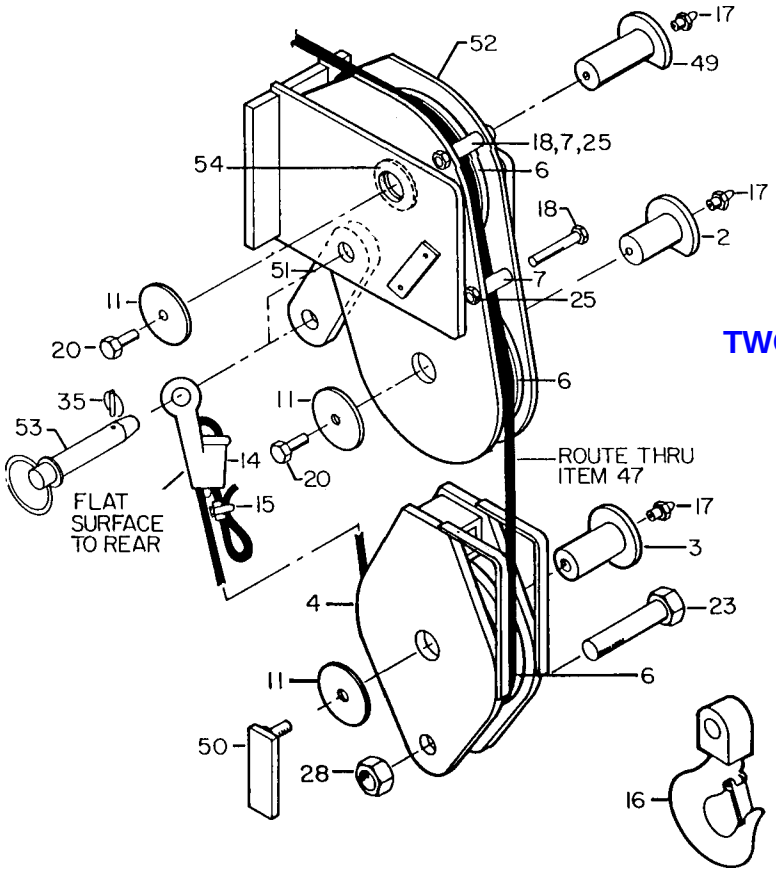
3. Remove the pin and keeper (items 53 and 35) from the boom tip and rotate the flip sheave weldment (item 52) to the vertical position. Position the dead end link (item 51) in position with the sheave weldment (item 52) and insert the pin and keeper (items 53 and 35).

4. Disassemble the snatch block assembly (items 3, 4, 6 & 16) and string the cable through and reassemble the snatch block. Connect the cable wedge socket (item 14) to the dead end link (item 51) by using the other pin and keeper (items 53 and 35).

The crane should now be in position for two-part line operation. Note that no changes in mounting of the anti two-blocking system is required.



SINGLE-PART LINE OPERATION



TWO-PART LINE OPERATION

FLIP-UP BOOM SHEAVE OPTION

WINCH TROUBLESHOOTING

POSSIBLE CAUSE	PROBABLE CURE
WINCH WON'T LIFT HEAVY LOADS	
TOO MUCH LOAD	RIG TO REDUCE LOADING ON WINCH
LOW OR NO GEARBOX OIL	CHECK OIL LEVEL AND ADD PROPER OIL IF NECESSARY
MOTOR INLET PRESSURE LESS THAN SPECIFICATIONS WITH LOAD STALLED	TEST HYDRAULIC PUMP CHECK MAIN RELIEF - SHOULD BE 3000 PSI
MOTOR OUTLET PRESSURE TOO HIGH WITH LOAD STALLED	FIND AND REMOVE SOURCE OF RESTRICTION
BRAKE SHOULD ENGAGE IN PAYOUT DIRECTION ONLY	RUN WINCH WITH NO LOAD IN BOTH DIRECTIONS. SYSTEM PRESSURE SHOULD BE SLIGHTLY HIGHER IN PAYOUT DIRECTION.
CHECK FLOW TO WINCH MOTOR WITH WINCH UNDER LOAD	TEST PUMP IF NOT TO SPECIFICATIONS
CHECK END PLAY IN WORM	IF GREATER THAN 0.030", INSPECT WORM BEARINGS FOR WEAR. REPLACE IF NECESSARY.
WINCH WON'T HOLD LOAD	
BRAKE MAY NEED ADJUSTMENT	TURN ADJUSTING SCREW CLOCKWISE 1/4 TURN AT A TIME AND TEST WINCH AGAIN
BRAKE DISKS MAY BE WORN	INSPECT AND REPLACE IF NECESSARY. ADJUST AND RETEST
CAM CLUTCH IN BRAKE MAY BE INSTALLED INCORRECTLY	REVERSE CLUTCH AND RETEST
JOURNAL ON WORM WHERE CAM CLUTCH RUNS MAY BE GALLED OR WORN	INSPECT AND REPLACE WORM IF NECESSARY
WINCH RUNS TOO SLOW	
SYSTEM MAY HAVE LOW FLOW	INSTALL FLOW METER IN SYSTEM AND TEST UNDER LOAD. IF FLOW IS BELOW SPECIFICATIONS, INSPECT PUMP.
MOTOR WORN OUT	REPLACE MOTOR
WINCH WILL NOT RUN UNDER NO LOAD (RELIEF VALVE OPENS WITHOUT WINCH TURNING)	
MOTOR SEIZED UP	REMOVE MOTOR FROM WINCH AND TEST IF OPERABLE. IF NOT, REPLACE MOTOR.
WORM AND GEAR SET DAMAGED	REPAIR GEARBOX

See Section 3 for parts drawing.

(BLANK)

ANTI TWO-BLOCKING DEVICE

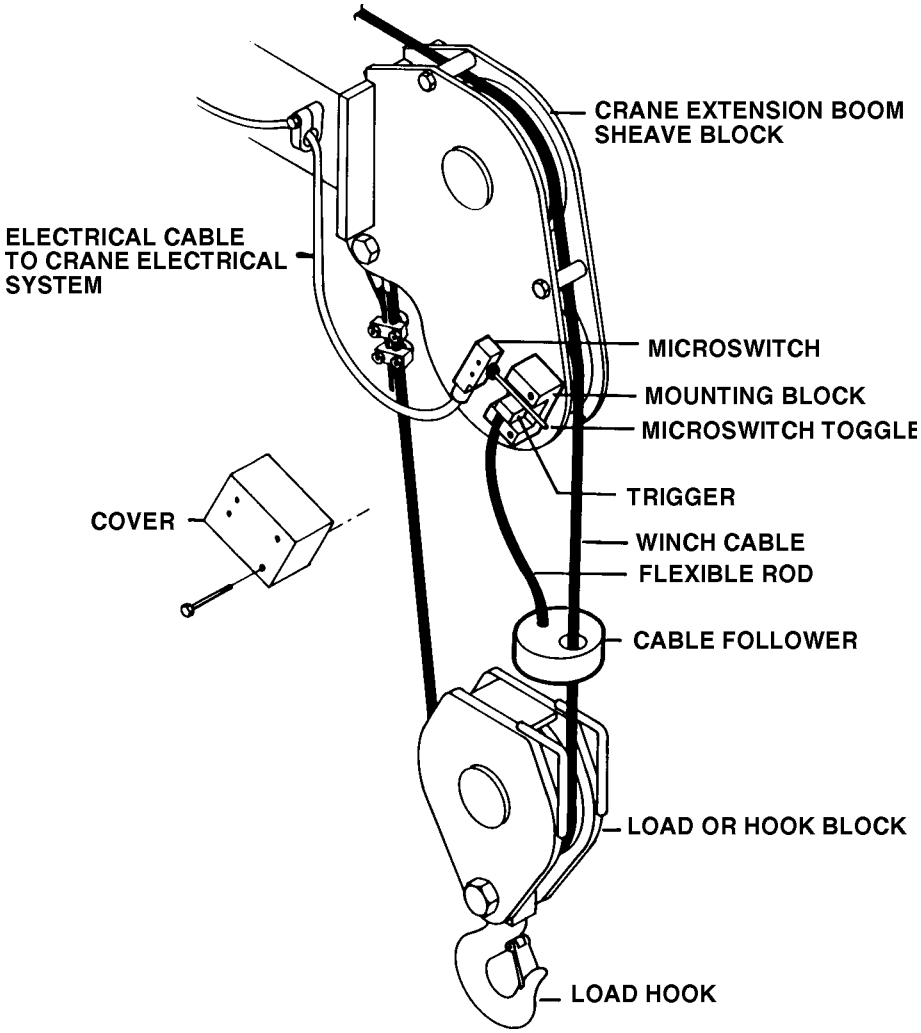
IMT telescoping cranes using a winch are equipped with an Anti Two-Blocking Device which is designed to provide a method of sensing an approaching Two-Blocking situation and prevent the crane from entering that situation. It is the operator's responsibility to avoid Two-Blocking and not to rely on this device alone. The device must be checked daily for proper operation.

Keeping the system clean and the microswitch in operating condition, the system should function properly. The flexible rod should also be checked for unusual distortion.

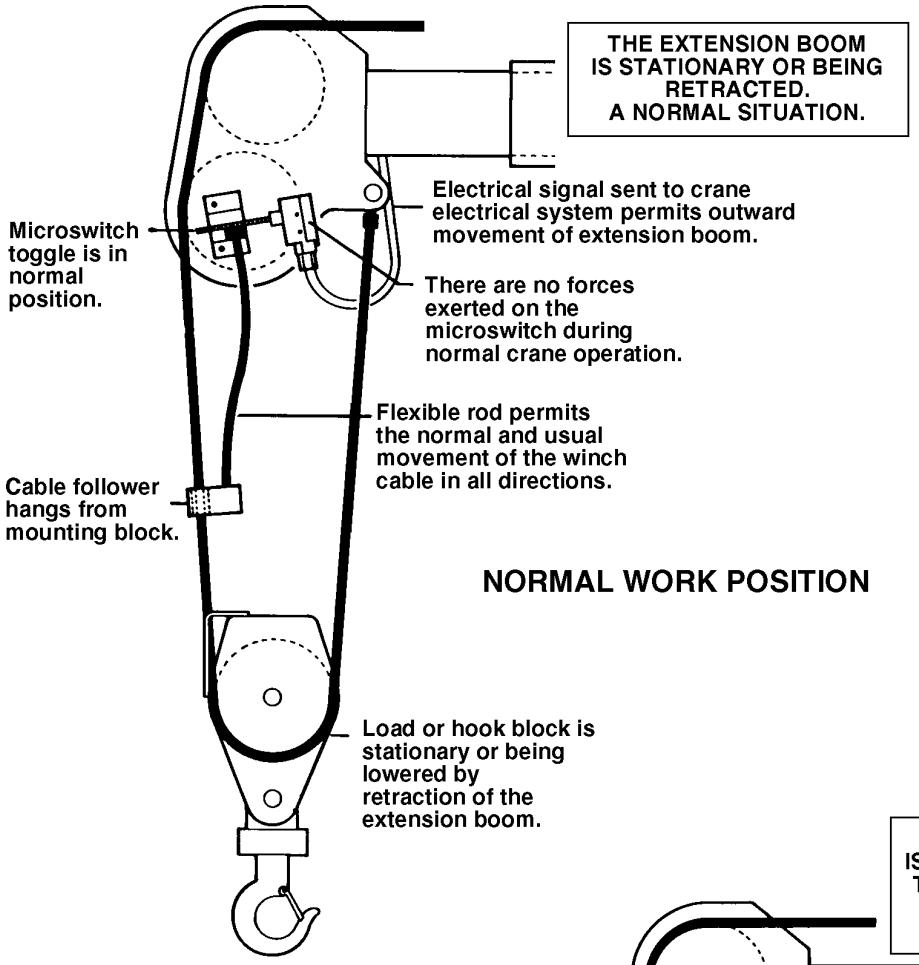
NOTE

"Two-Blocking" is the condition in which the lower load block or hook assembly comes in contact with the upper load block or boom point sheave assembly.

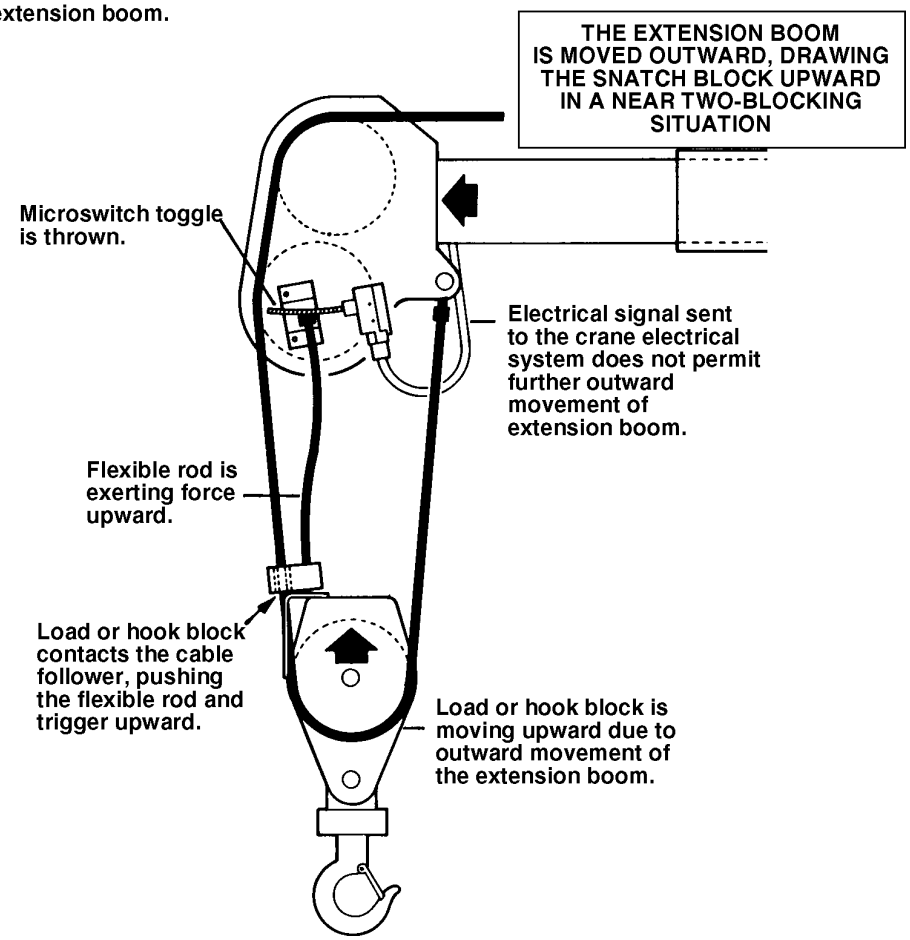
Three means are available to relieve a two-blocking condition. The load may be lowered to the ground, the extension boom may be retracted, or the lower boom may be raised, thus reducing the reach of the crane.



ANTI TWO-BLOCKING DEVICE COMPONENTS



NORMAL WORK POSITION



APPROACHING TWO-BLOCKING SITUATION

SECTION 3. MODEL 6016 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 reprsentative.

WARNING

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

CRANE IDENTIFICATION

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

Iowa Mold Tooling Co., Inc.
Box 189, Garner, IA 50438-0189
Telephone: 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.

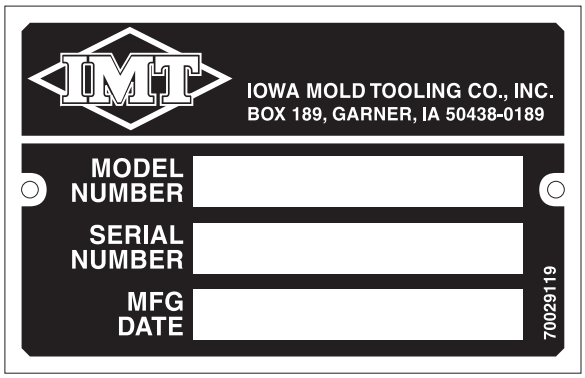
WELDMENT IDENTIFICATION

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.

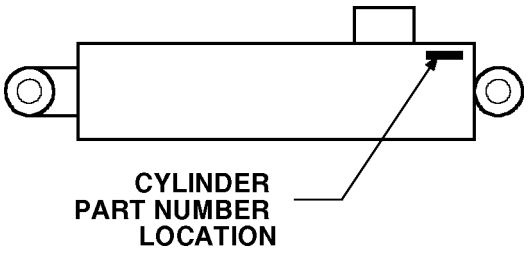
ORDERING REPAIR PARTS

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



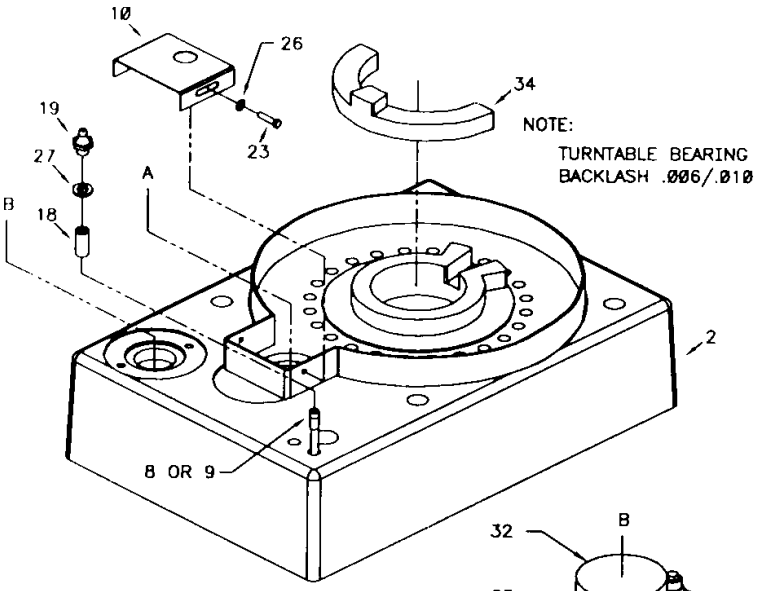
CYLINDER PART NUMBER LOCATION

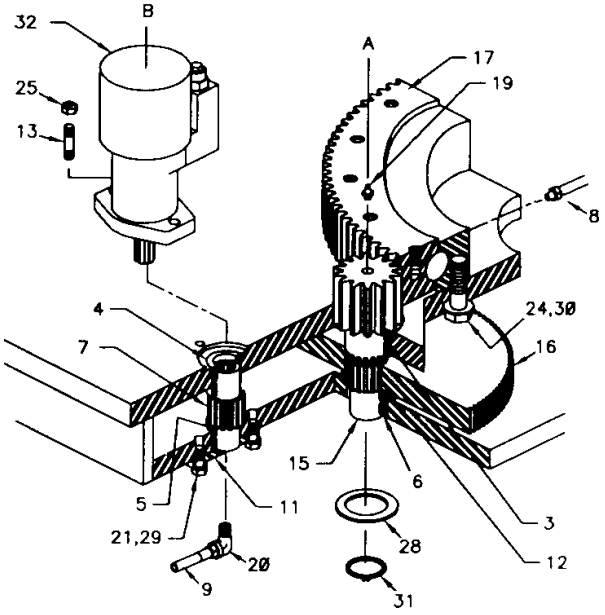
BASE ASM (41707659)

ITEM	PART NO.	DESCRIPTION	QTY
2.	52707658	BASE (INCL: 3 - 7)	1
3.	60020114	BUSHING (PART OF 2)	1REF
4.	60020115	BUSHING (PART OF 2)	1REF
5.	60020116	BUSHING (PART OF 2)	1REF
6.	60020154	BUSHING (PART OF 2)	1REF
7.	71056011	DRIVE GEAR (PART OF 2)	1REF
8.	53000704	GREASE EXTENSION 34"	1
9.	53000715	GREASE EXTENSION 18"	1
10.	60010235	PINION GEAR COVER	1
11.	60121351	GREASE PLATE	1
12.	60104694	SPACER	1
13.	60106032	STUD 1/2-13X2	2
15.	71056010	PINION GEAR	1
16.	71056012	INTERMEDIATE GEAR	1
17.	71056389	TURNTABLE BEARING	1
18.	72053301	COUPLING 1/8NPT	2
19.	72053508	GREASE ZERK 1/8NPT	3
20.	72053589	STREET ELBOW 1/8NPT 90°	1
21.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	2
23.	72060833	SCR 5/16-18X3/4 HH SLF LKG	2
24.	72060931	CAP SCR 5/8-11X2-3/4 HHGR8	24
25.	72062080	NUT 1/2-13 LOCK	2
26.	72063002	WASHER 5/16 WRT	2
27.	72063003	WASHER 3/8 WRT	2
28.	72063035	MACH BUSHING 1-1/4X10GA	1
29.	72063053	WASHER 1/2 LOCK	2
30.	72063119	WASHER 5/8 FLAT HARD GR8	24
31.	72066084	RETAINING RING 1-1/4 STD EXT	1
32.	73540004	HYD MOTOR (FROM 5-15-98)	1
	73051004	HYD MOTOR (TO 5-15-98)	1
	73054538	C'BALANCE VALVE (TO 5-15-98)	2
	72060738	CAP SCR (TO 5-15-98)	4
	7Q072112	O-RING (TO 5-15-98)	2
	5V151830	MOTOR BLOCK (TO 5-15-98)	1
34.	71143519	ROTATION SLIDE - 450°	1

WARNING

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



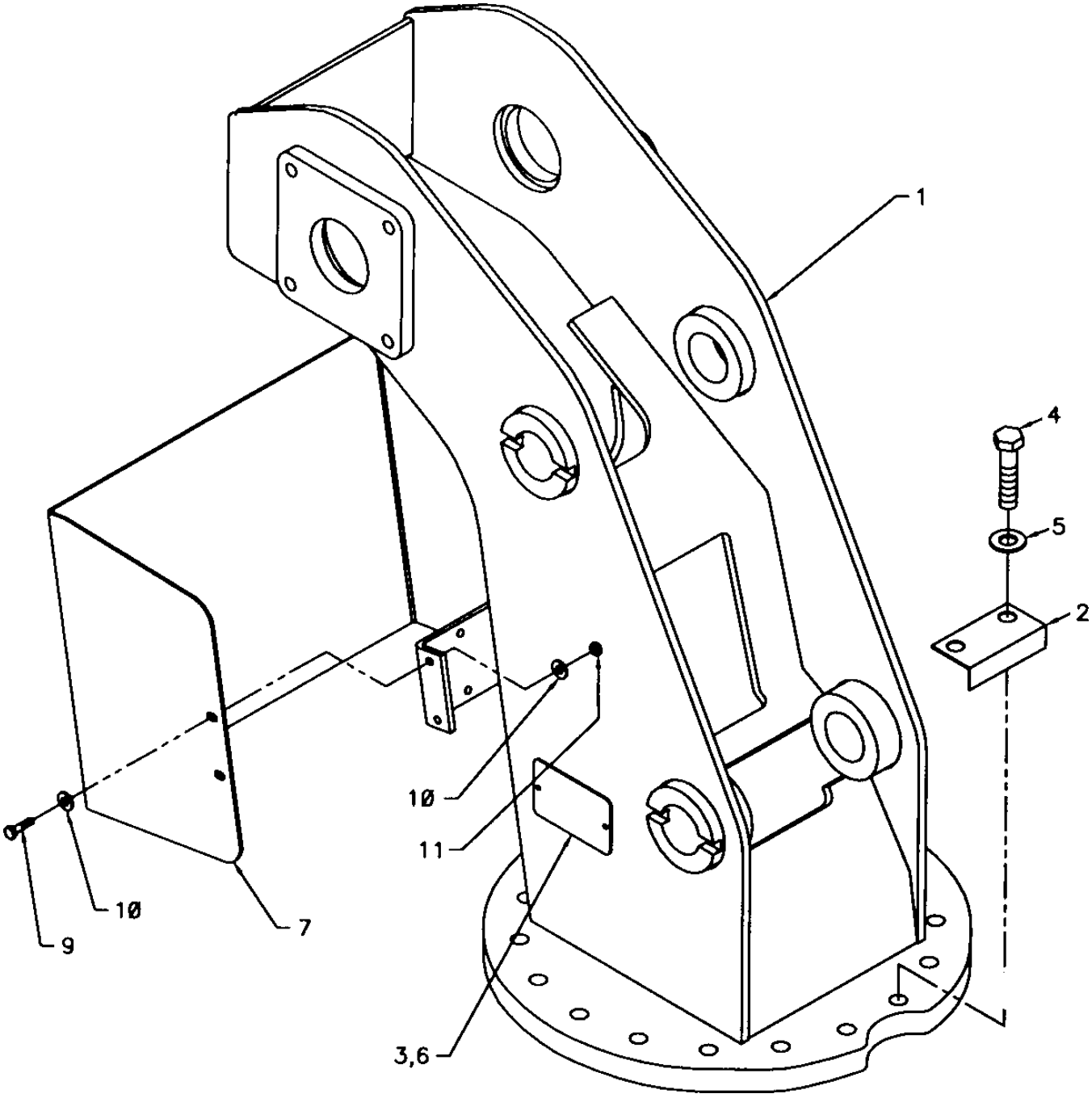


MAST ASM (41712184)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52712157	MAST	1
2.	60104540	PINION COVER	1
3.	70029119	SERIAL NUMBER PLACARD	1
4.	72060931	CAP SCR 5/8-11X2-3/4 HHGR8	18
5.	72063119	WASHER 5/8 FLAT HRDND GR8	18
6.	72066340	POP RIVET 1/8	2
7.	60119127	BACKPLATE	1
9.	72060004	CAP SCREW 1/4-20 X 1 HH GR5	4
10.	72063001	WASHER 1/4 WRT	8
11.	72062104	NUT 1/4-20 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.

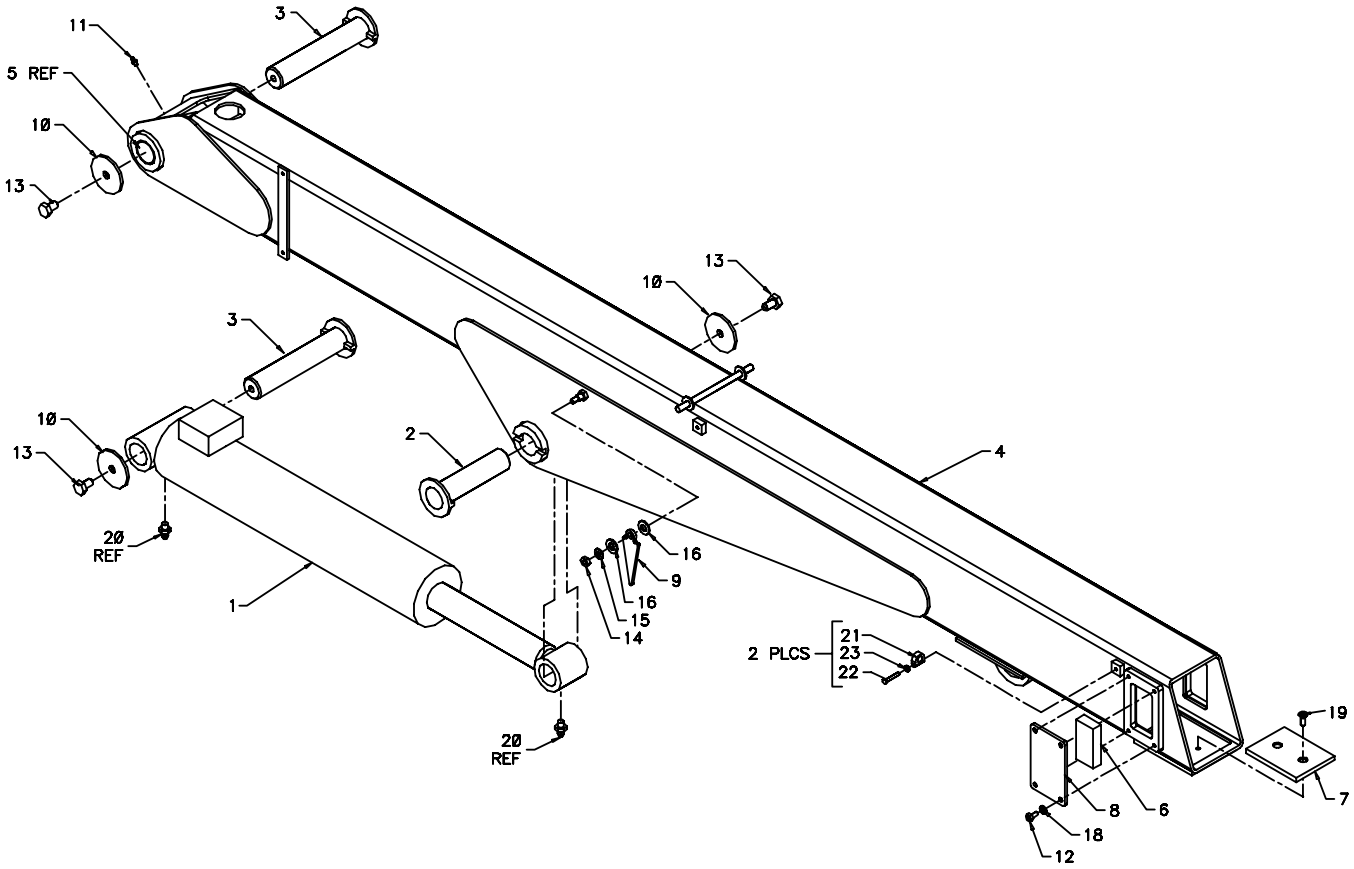


LOWER BOOM ASM (41712180)

ITEM	PARR NO.	DESCRIPTION	QTY
1.	3C126990	CYLINDER (INCL. 20)	1
2.	52703748	PIN	1
3.	52703747	PIN	2
4.	52712159	LOWER BOOM (INCL: 5)	1
5.	7BF81520	BUSHING (PART OF 4)	4REF
6.	60030015	WEAR PAD	2
7.	60030139	WEAR PAD	1
8.	60103463	RETAINER PLATE	2
9.	60105544	ANGLE INDICATOR	2
10.	60106331	PIN RETAINER PLATE 3-1/2"	3
11.	72053508	GREASE ZERK 1/8 NPT	1
12.	72060023	CAP SCR 5/16-18X3/4 HHGR5	8
13.	72060147	CAP SCR 5/8-11X1 HHGR5	3
14.	72062103	NUT 3/8-16 LOCK	2
15.	72063003	WASHER 3/8 WRT	2
16.	72063005	WASHER 1/2 WRT	4
18.	72063050	WASHER 5/16 LOCK	8
19.	72601043	CAP SCR 3/8-16X3/4 FLH SOC	2
20.	72053507	GREASE ZERK 1/4-28 (PART 1)	2REF
21.	70034381	CORD GUIDE	2
22.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
23.	72063049	WASHER 1/4 LOCK	2

NOTE

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



LOWER BOOM CYLINDER (3C126990)

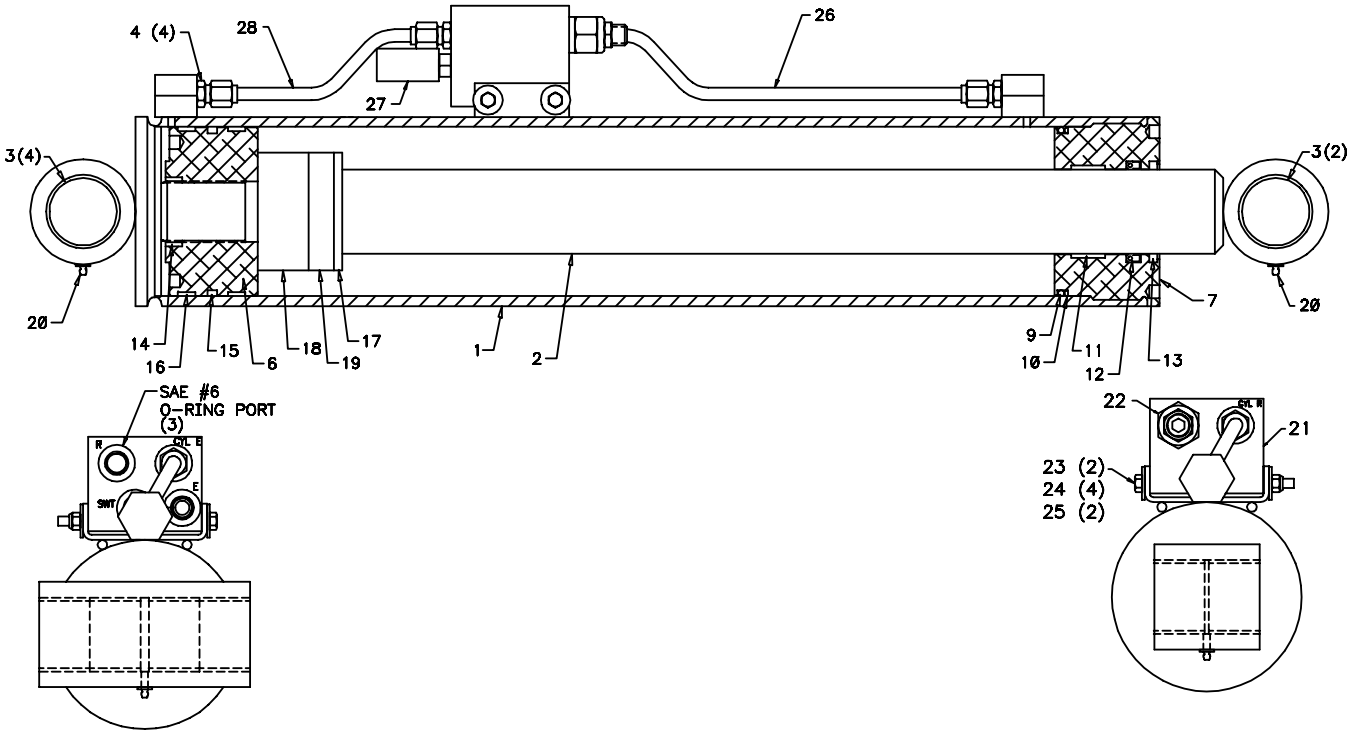
ITEM	PART NO.	DESCRIPTION	QTY
1.	4C126990	CASE ASM (INCL: 3,4,20)	1
2.	4G038940	ROD ASM (INCL: 3,20)	1
3.	7BF81520	BUSHING (PART OF 1 & 2)	6REF
4.	72533186	ADAPTER #6MFACE #6MSTR	4
6.	6I503181	PISTON	1
7.	6H050025	HEAD	1
8.	9B043920	SEAL KIT (INCL: 9-17)	1
9.	7Q072350	O-RING (PART OF 8)	1REF
10.	7Q10P350	BACKUP RING (PART OF 8)	1REF
11.	7T2N8027	WEAR RING (PART OF 8)	1REF
12.	7R546025	U-CUP (PART OF 8)	1REF
13.	7R14P025	ROD WIPER (PART OF 8)	1REF
14.	7T61N181	LOCK RING (PART OF 8)	1REF
15.	7T66P500	PISTON SEAL (PART OF 8)	1REF
16.	7T2N4050	WEAR RING (PART OF 8)	2REF
17.	6A025025	WAFER LOCK (PART OF 8)	1REF
18.	6C150025	STOP TUBE	1
19.	6C075025	STOP TUBE	1
20.	72053507	GREASE ZERK (PART OF 1 & 2)	2REF
21.	73540022	C'BAL VALVE (INCL:22,27)	1
22.	73540039	C'BAL VALVE (PART OF 21)	1REF
23.	72060037	CAP SCR 5/16-18X4 HHGR5	2
24.	72063002	WASHER 5/16 WRT	4
25.	72062109	NUT 5/16-18 LOCK	2
26.	70145927	TUBE ASM	1
27.	77041561	PR. SWITCH (PART OF 21)	1REF
28.	70145753	TUBE ASM	1

NOTE

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

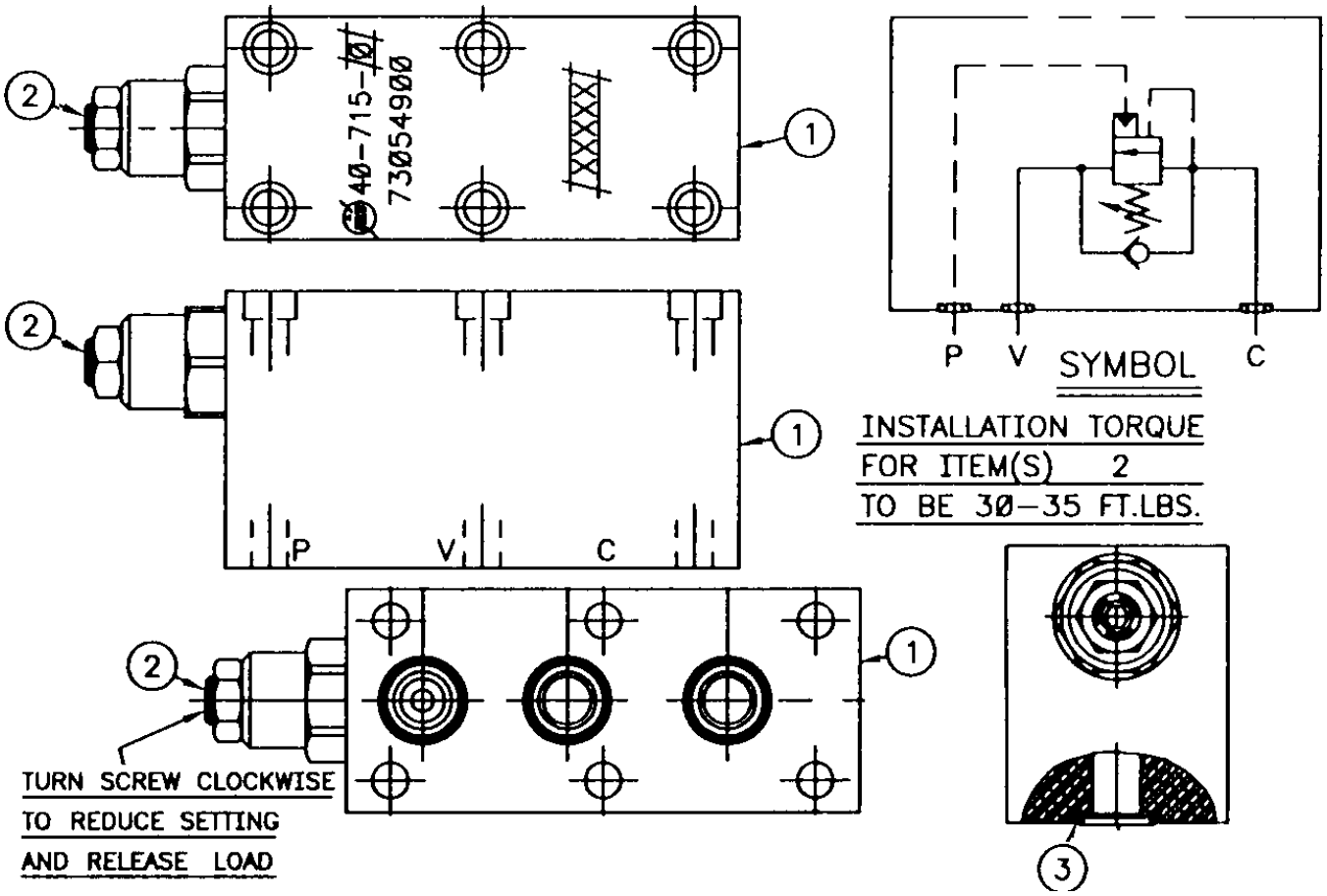
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY,MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD AND CASE THREADS.



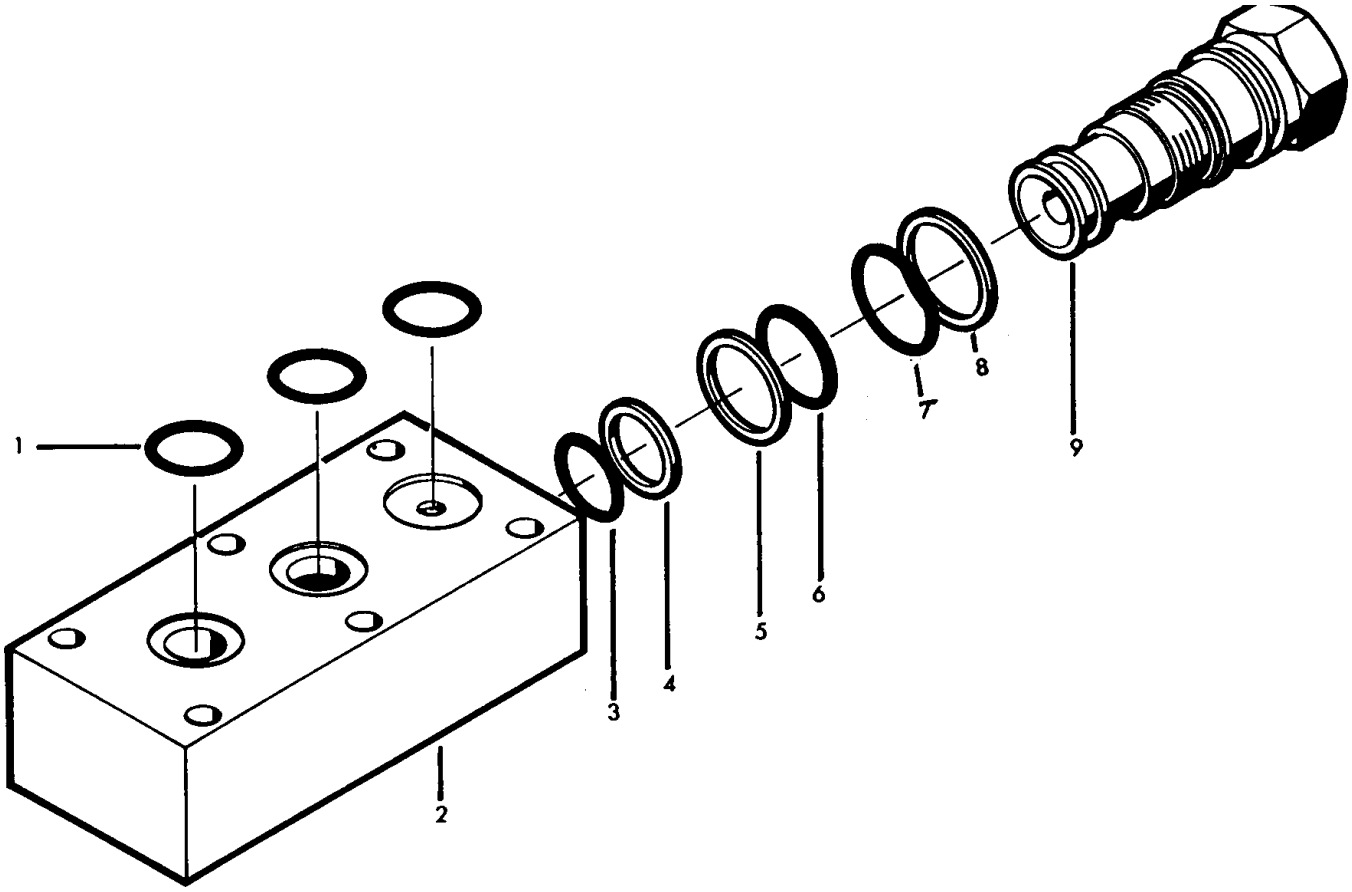
LOCKING/HOLDING VALVE (73054900)

ITEM	PART NO.	DESCRIPTION	QTY
1.	5V245940	VALVE BODY	1
2.	73054999	COUNTERBALANCE VALVE	1
3.	7Q072112	O-RING	3



HOLDING VALVE (73054004)

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

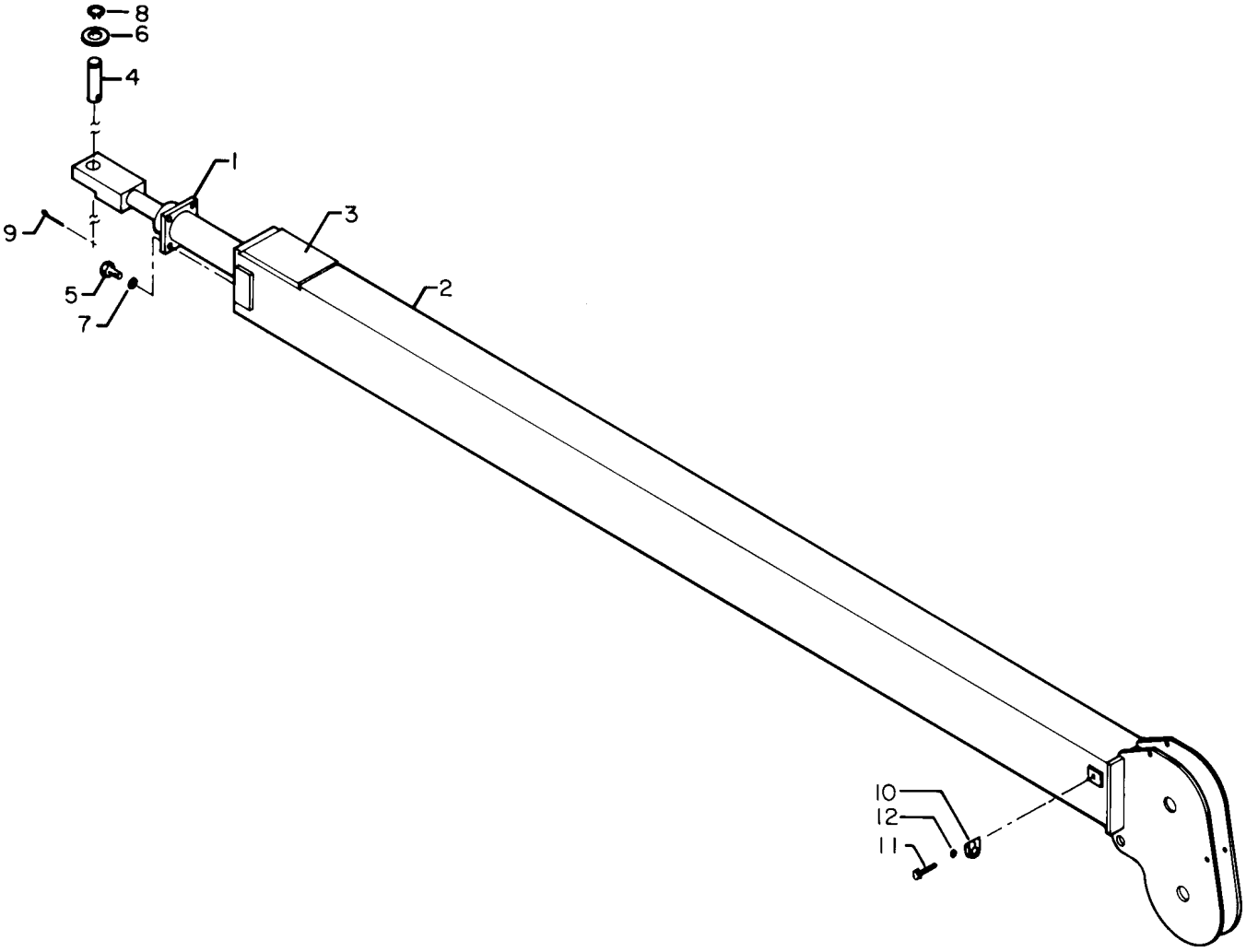


EXTENSION BOOM ASM (41707662)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B309820	EXTENSION CYLINDER	1
2.	52707725	EXTENSION BOOM	1
3.	60030189	WEAR PAD	1
4.	60101905	PIN	1
5.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
6.	72063034	MACH BUSHING 1 X 10GA	1
7.	72063053	WASHER 1/2 LOCK	4
8.	72066125	RETAINING RING 1" HD EXT	1
9.	72066145	HAIR PIN .19	1
10.	70034381	CORD GUIDE	1
11.	72060006	CAP SCR 1/4 X 1-1/2 HH GR5	1
12.	72063049	WASHER 1/4 LOCK	1

NOTE

CORD GUIDE (70034381) SHOULD BE INSTALLED WITH GUIDE HOLE UP.



EXTENSION BOOM CYLINDER (3B309820)

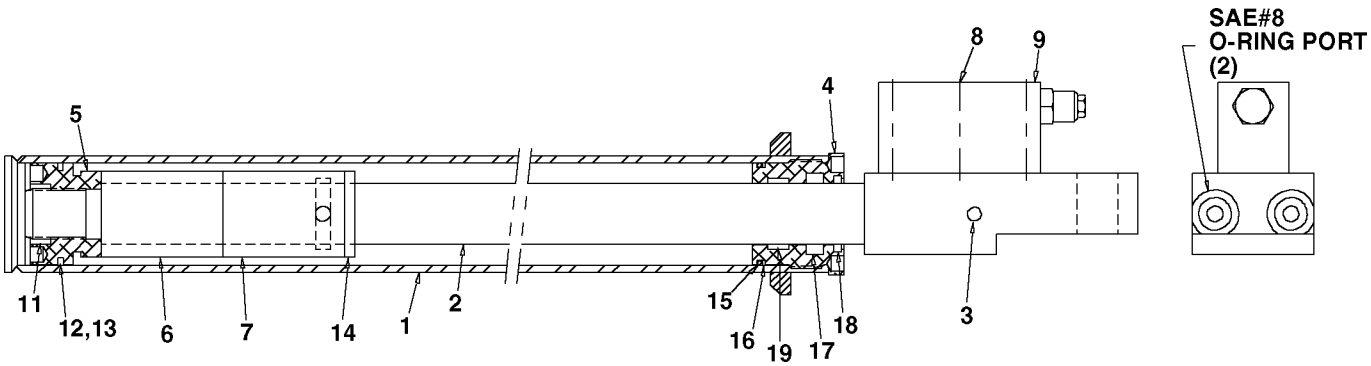
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B309820	CASE (INCL:3)	1
2.	4H309820	ROD (INCL:)	1
3.	7PNPXT02	PLUG (PART OF 1)	3REF
4.	6H025015	HEAD	1
5.	6IX02512	PISTON	1
6.	6C300015	STOP TUBE	1
7.	6C309820	STOP TUBE	1
8.	72060713	CAP SCR 1/4-20X2-1/2 SH	6
9.	73054900	HOLDING VALVE	1
10.	9B101220	SEAL KIT (INCL: 11-19)	1
11.	7T61N125	LOCK RING SEAL (PART OF 10)	1REF
12.	7T66P025	PISTON SEAL (PART OF 10)	1REF
13.	7Q072137	O-RING (PART OF 10)	1REF
14.	6A025015	WAFER LOCK RING(PART OF10)	1REF
15.	7Q072228	O-RING (PART OF 10)	1REF
16.	7Q10P228	BACK-UP RING (PART OF 10)	1REF
17.	7R546015	ROD SEAL (PART OF 10)	1REF
18.	7R14P015	ROD WIPER (PART OF 10)	1REF
19.	7T2N8015	WEAR RING (PART OF 10)	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, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

APPLY “NEVER-SEEZ” REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD AND CASE THREADS.

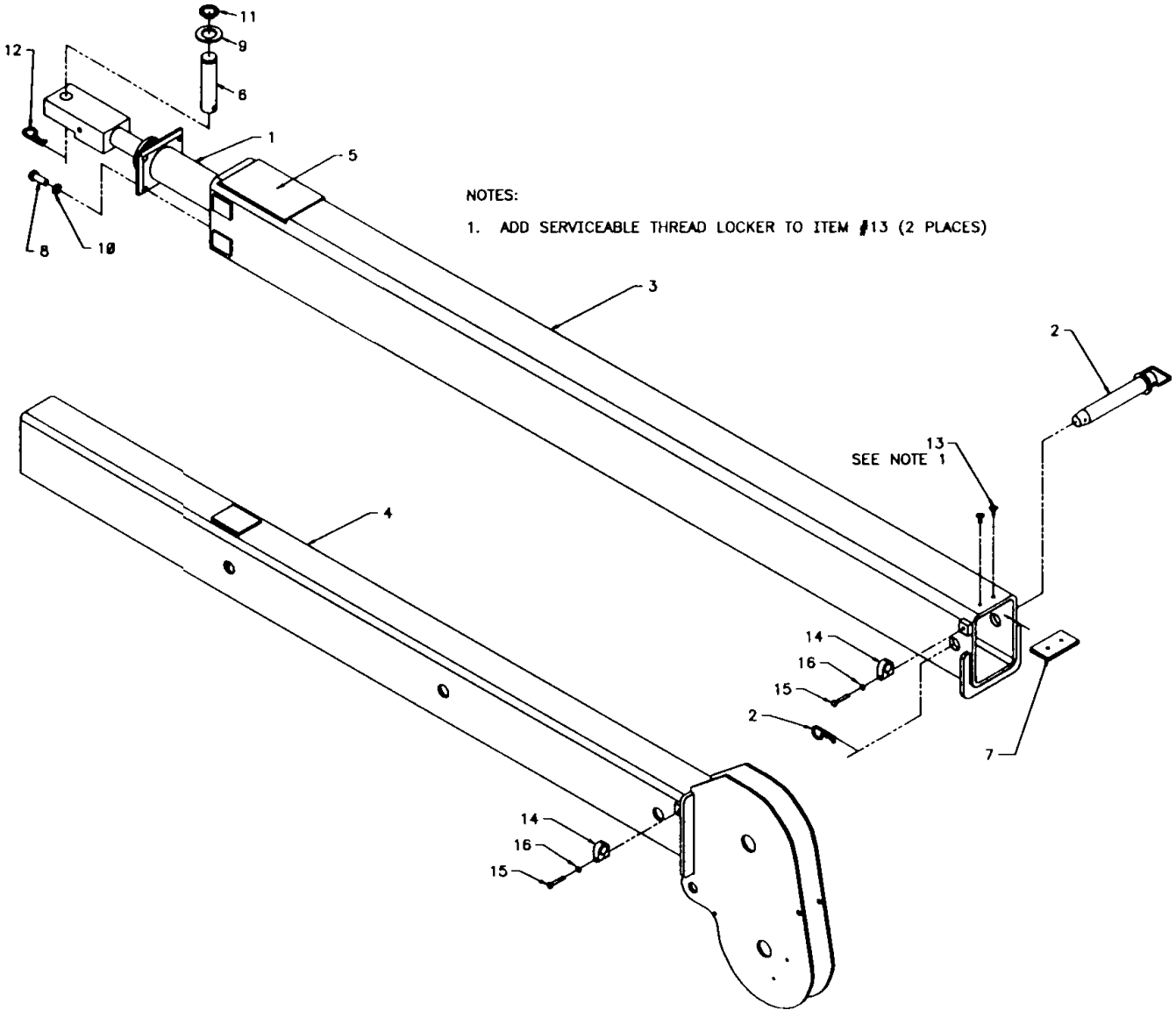


6016-20' EXT BOOM ASM (41707663)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B309820	EXTENSION CYLINDER	1
2.	73733171	PIN 1X6 LOCK W/HAIRPIN	1
3.	52707723	1ST STAGE EXT BOOM	1
4.	52707724	2ND STAGE EXT BOOM	1
5.	60030189	WEAR PAD	1
6.	60101905	PIN	1
7.	60121447	STROKE STOP (FROM 7-1-98)	1
	60121131	STROKE STOP (TO 7-1-98)	1
8.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
9.	72063034	MACH BUSHING 1X10GA	1
10.	72063053	WASHER 1/2 LOCK	4
11.	72066125	RETAINING RING 1 HD EXT	1
12.	72066145	HAIR PIN .19	1
13.	72601750	CAP SCR 3/8-16X1/2BTNHDSOC (FROM 7-1-98)	2
	72601746	CAP SCR 5/16-24X5/8 FLHSOC (TO 7-1-98)	2
14.	70034381	CORD GUIDE	2
15.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
16.	72063049	WASHER 1/4 LOCK	2

NOTE

CORD GUIDE (70034381) SHOULD BE INSTALLED WITH GUIDE HOLE UP.

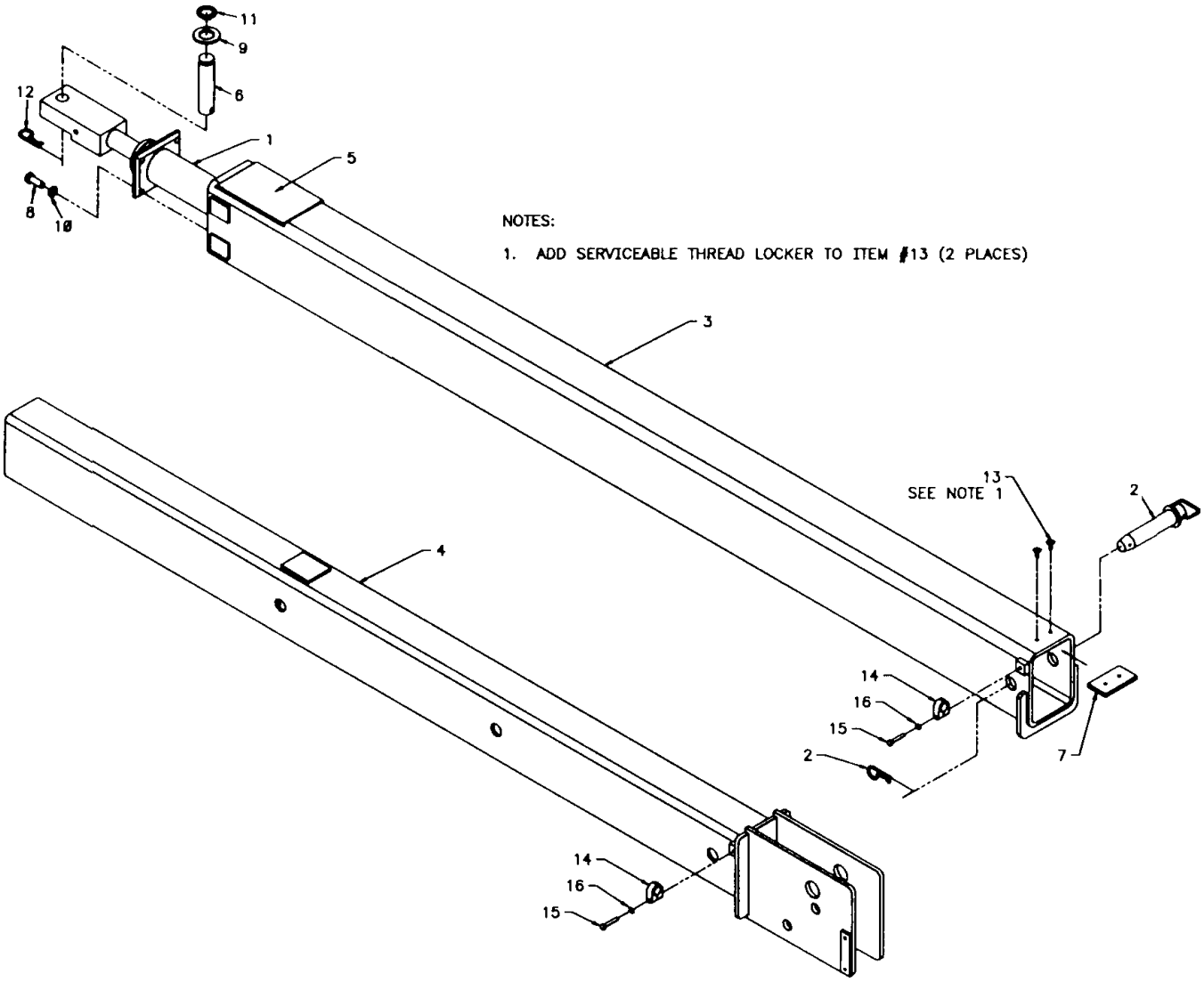


6016-20' EXT BOOM W/FLIP SHEAVE ASM (41709440)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B309820	EXTENSION CYLINDER	1
2.	73733171	PIN 1X6 LOCK W/HAIRPIN	1
3.	52707723	1ST STAGE EXT BOOM	1
4.	52709456	2ND STAGE EXT BOOM	1
5.	60030189	WEAR PAD	1
6.	60101905	PIN	1
7.	60121447	STROKE STOP (FROM 7-1-98)	1
	60121131	STROKE STOP (TO 7-1-98)	1
8.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
9.	72063034	MACH BUSHING 1 X 10GA	1
10.	72063053	WASHER 1/2 LOCK	4
11.	72066125	RETAINING RING 1 HD EXT	1
12.	72066145	HAIR PIN .19	1
13.	72601750	CAP SCR 3/8-16X1/2 BTNHDSOC (FROM 7-1-98)	2
	72601746	CAP SCR 5/16-24X5/8 (TO 7-1-98)	2
14.	70034381	CORD GUIDE	2
15.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
16.	72063049	WASHER 1/4 LOCK	2

NOTE

CORD GUIDE (70034381) SHOULD BE INSTALLED WITH GUIDE HOLE UP.

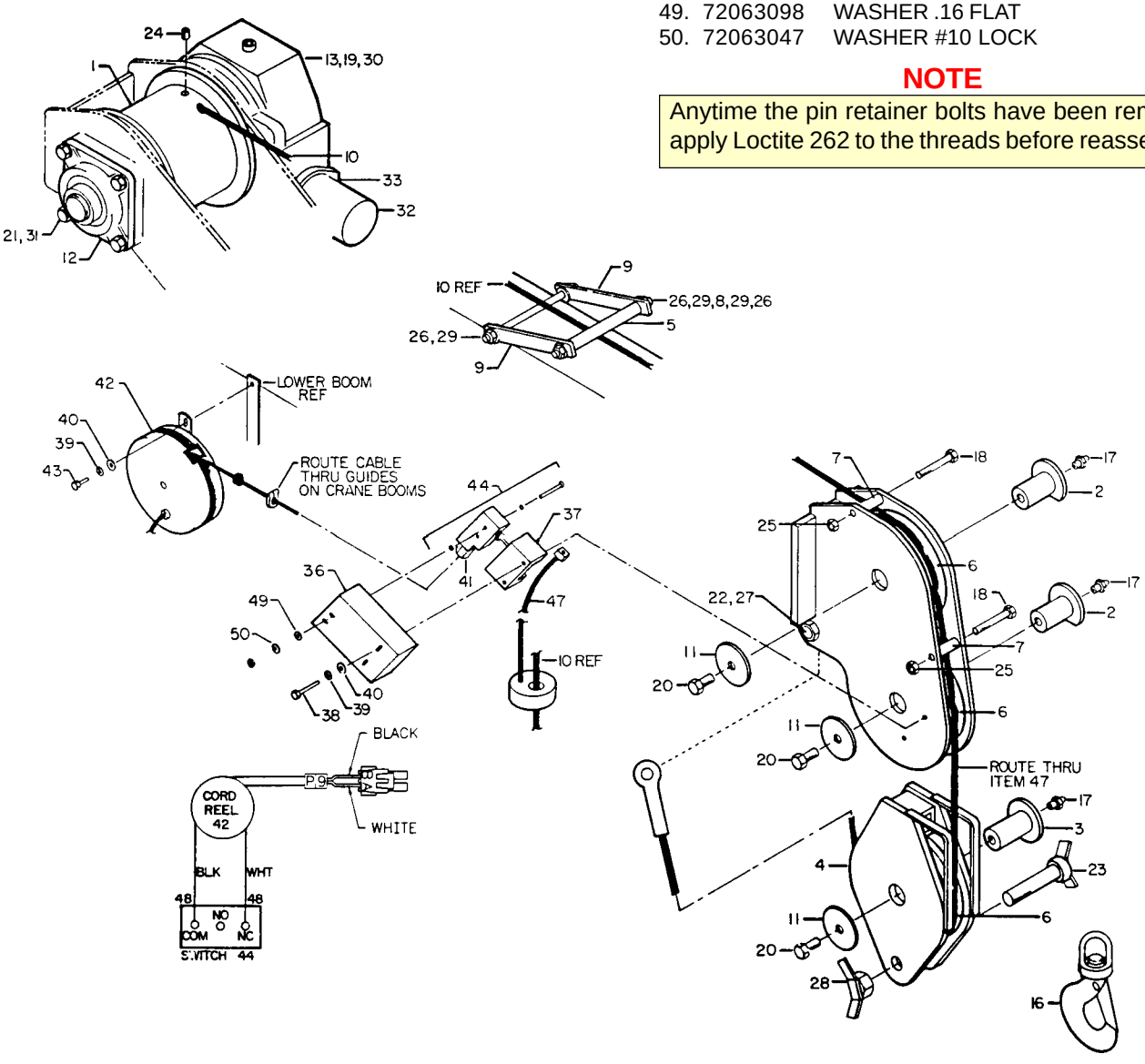


WINCH/CABLE/HOOK KIT (41712179)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52712162	WINCH DRUM	1
2.	52707730	PIN	2
3.	52707731	PIN	1
4.	52707735	SNATCH BLOCK	1
5.	60030108	ROLLER - CABLE GUIDE	1
6.	60030255	SHEAVE	3
7.	60102596	SPACER	2
8.	60105538	STUD- CABLE GUIDE	1
9.	60105540	CABLE GUIDE SIDE BAR	2
10.	70580089	CABLE 7/16 x 100' IWRC-XIP	1
11.	60109337	PIN RETAINER PLATE 3"	3
12.	70055117	BEARING, FLANGE	1
13.	70570198	WINCH	1
16.	70732882	HOOK-SWVL POS LOCK 5.9TON	1
17.	72053508	ZERK 1/8 NPT	3
18.	72060893	CAP SCR 3/8-16X3-1/4 HHGR5	2
19.	72060921	CAP SCR 1/2-13X3-3/4 HHGR5	4
20.	72060147	CAP SCR 5/8-11X1 HHGR5	3
21.	72060148	CAP SCR 5/8-11X1-1/4 HHGR5	4
22.	72060217	CAP SCR 7/8-9X4 HHGR5	1
23.	52712181	PIN	1
24.	72060596	SET SCREW 1/2-13X3/4 SH	1
25.	72062103	NUT 3/8-16 LOCK	2
26.	72062080	NUT 1/2-13 LOCK	4
27.	72062120	NUT 7/8-9 LOCK	1
28.	52712183	RETAINER 3/4-10 HEX	1
29.	72063005	WASHER 1/2 WRT	4
30.	72063053	WASHER 1/2 LOCK	4
31.	72063055	WASHER 5/8 LOCK	4
32.	73051513	HYDRAULIC MOTOR	1
33.	72060064	CAP SCR 7/16-14X1-1/2 HHGR5	2
36.	60113593	COVER	1
37.	60113594	MOUNTING BLOCK	1
38.	72060008	CAP SCR 1/4-20X2 HHGR5	2
39.	72063049	WASHER 1/4 LOCK	4
40.	72063001	WASHER 1/4 FLAT	4
41.	77044468	STRAIN RELIEF	1
42.	51713168	CORD REEL	1
43.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
44.	77041291	SWITCH	1
45.	77040047	TERMINAL	1
46.	77040186	TERMINAL	1
47.	52709413	ANTI 2-BLOCK CABLE	1
48.	77040051	TERMINAL	2
49.	72063098	WASHER .16 FLAT	2
50.	72063047	WASHER #10 LOCK	2

NOTE

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

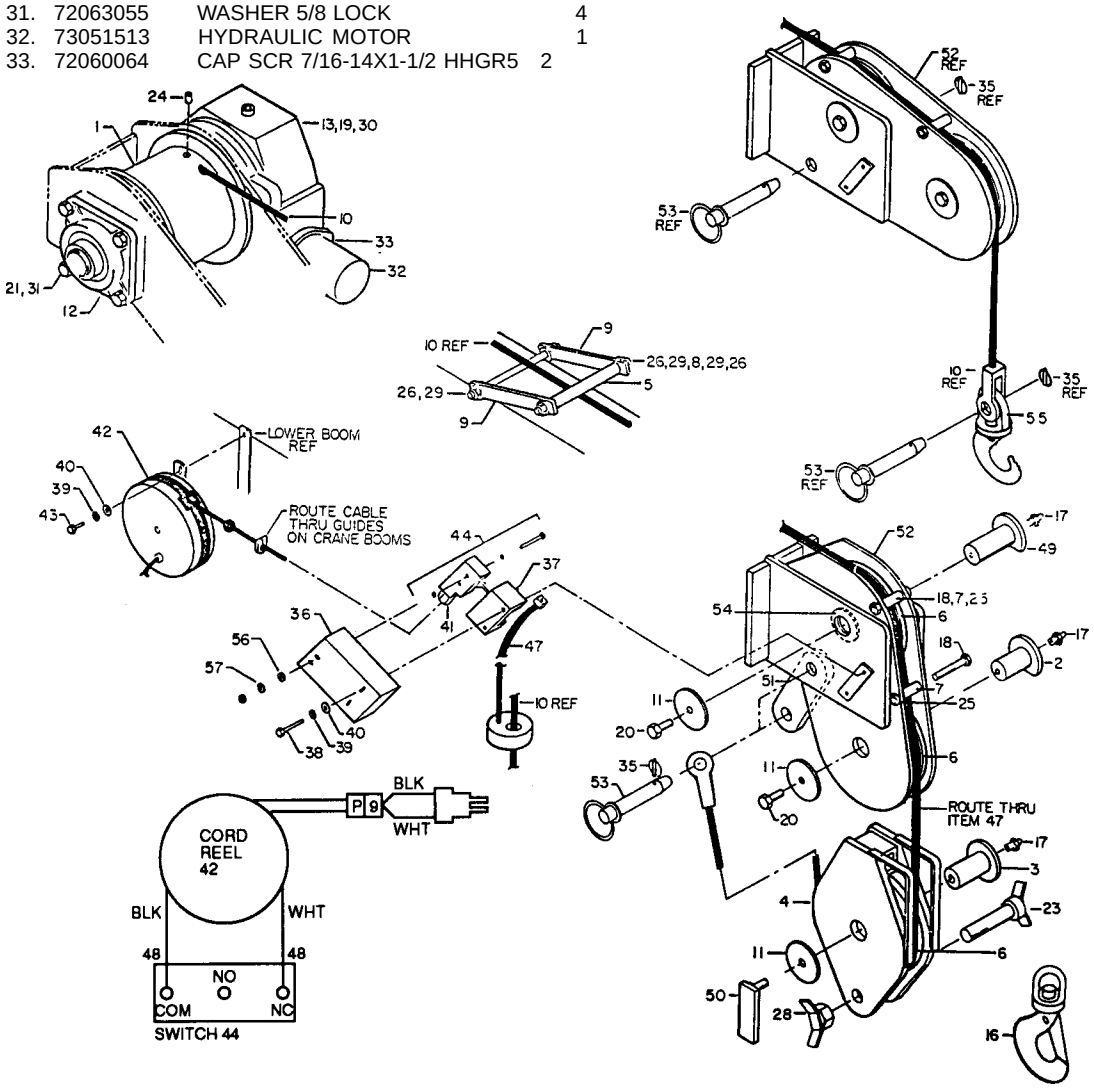


WINCH/CABLE/HOOK KIT W/FLIP SHEAVE (31712207)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52712162	WINCH DRUM	1
2.	52707730	PIN	1
3.	52707731	PIN	1
4.	52707735	SNATCH BLOCK	1
5.	60030108	ROLLER - CABLE GUIDE	1
6.	60030255	SHEAVE	3
7.	60102596	SPACER	2
8.	60105538	STUD- CABLE GUIDE	1
9.	60105540	CABLE GUIDE SIDE BAR	2
10.	70580089	CABLE 7/16 x 100' IWRC-XIP	1
11.	60109337	PIN RETAINER PLATE 3"	3
12.	70055117	BEARING, FLANGE	1
13.	70570198	WINCH	1
16.	70732882	HOOK-SWVL POS LOCK 5.9TON	1
17.	72053508	ZERK 1/8 NPT	3
18.	72060893	CAP SCR 3/8-16X3-1/4 HHGR5	2
19.	72060921	CAP SCR 1/2-13X3-3/4 HHGR5	4
20.	72060147	CAP SCR 5/8-11X1 HHGR5	2
21.	72060148	CAP SCR 5/8-11X1-1/4 HHGR5	4
23.	52712181	PIN	1
24.	72060596	SET SCREW 1/2-13X3/4 SH	1
25.	72062103	NUT 3/8-16 LOCK	2
26.	72062080	NUT 1/2-13 LOCK	4
28.	52712183	RETAINER 3/4-10 HEX	1
29.	72063005	WASHER 1/2 WRT	4
30.	72063053	WASHER 1/2 LOCK	4
31.	72063055	WASHER 5/8 LOCK	4
32.	73051513	HYDRAULIC MOTOR	1
33.	72060064	CAP SCR 7/16-14X1-1/2 HHGR5	2
35.	72661367	PIN-QUICK	2
36.	60113593	COVER	1
37.	60113594	MOUNTING BLOCK	1
38.	72060008	CAP SCR 1/4-20X2 HHGR5	2
39.	72063049	WASHER 1/4 LOCK	4
40.	72063001	WASHER 1/4 FLAT	4
41.	77044468	STRAIN RELIEF	1
42.	51713168	CORD REEL	1
43.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
44.	77041291	SWITCH	1
45.	77040047	TERMINAL	1
46.	77040186	TERMINAL	1
47.	52709413	ANTI 2-BLOCK CABLE	1
48.	77040051	TERMINAL	2
49.	52709438	PIN	1
50.	52709458	WING BOLT	1
51.	60113679	LINK	1
52.	52709455	FLIP SHEAVE	1
53.	72661365	PIN W/HANDLE	2
54.	72063037	MACH BUSHING 1-1/2 10GA	2
55.	71073920	HOOK-3 TON SWIVEL	1
	70074000	SAFETY LATCH	REF
56.	72063098	WASHER .16 FLAT	2
57.	72063047	WASHER #10 LOCK	2

NOTE

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

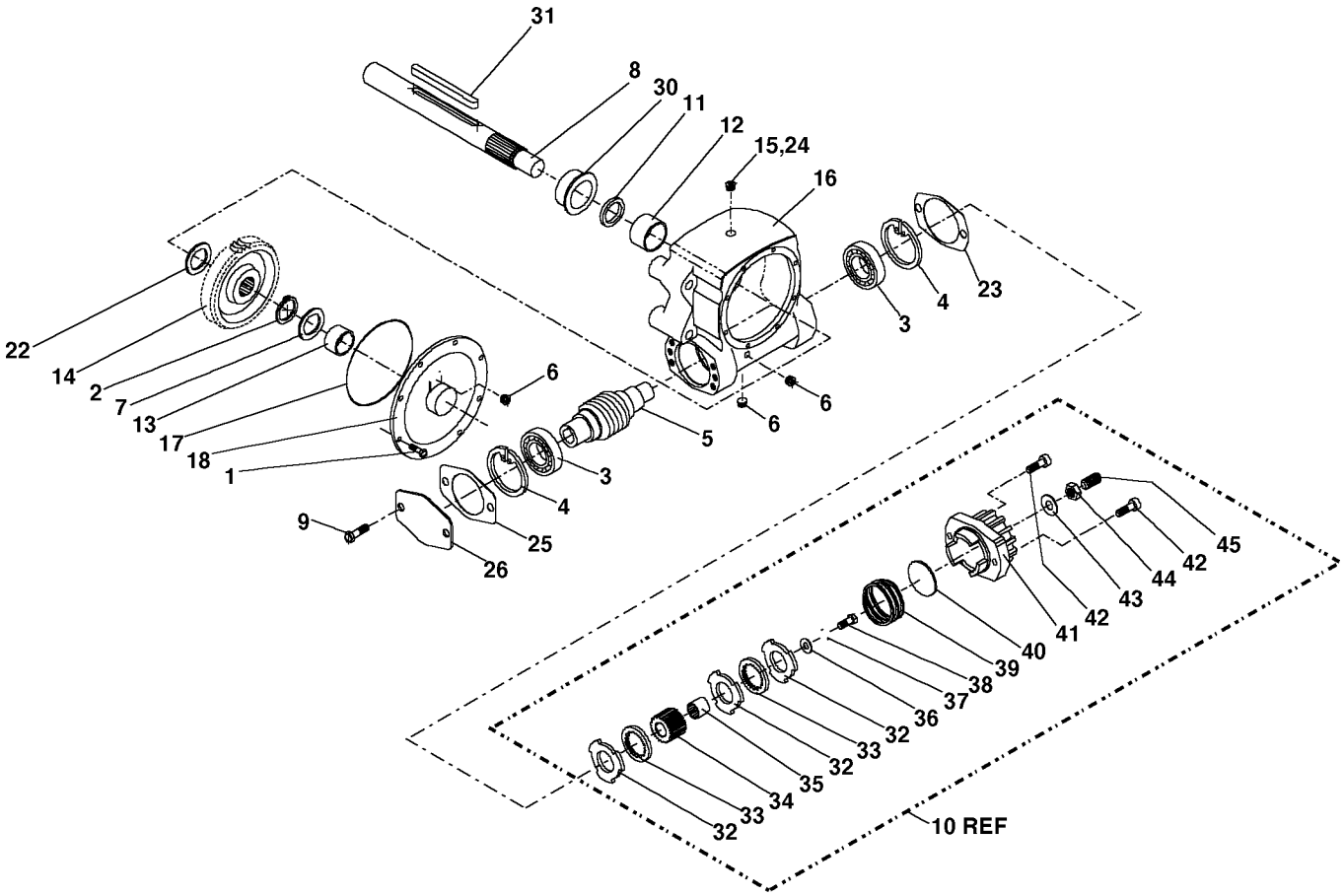


WINCH (70570198)

ITEM	PART NO.	DESCRIPTION	QTY
1.	72601568	CAP SCREW	8
2.	70143945	RETAINING RING	1
3.	70055220	BALL BEARING	2
4.	72661403	RETAINING RING	2
5.	70056522	WORM-SR	1
6.	70143865	PIPE PLUG	2
7.	70143946	THRUST WASHER	1
8.	70145384	OUTPUT SHAFT	1
9.	72601567	CAP SCREW	2
10.	70733135	BRAKE KIT (INCL:32-45)	1
11.	76393419	OIL SEAL	1
12.	70143948	BUSHING	1
13.	70143949	BUSHING	1
14.	70056521	WORM GEAR-SR	1
15.	70048156	BREATHER	1
16.	70143950	HOUSING	1
17.	76393420	O-RING	1
18.	70143951	COVER	1
19.	70029559	TAG-NAMEPLATE	1
22.	70143952	WASHER	1
23.	76394300	GASKET	1
24.	70143861	PIPE BUSHING	1
25.	76393171	GASKET	1
26.	—	PROTECTOR (DISCARD)	REF
30.	70145383	SPACER	1
31.	70145382	KEY	1
32.	70145381	*STATOR PLATE	3REF
33.	70145380	*FRICTION DISC	2REF
34.	70145379	*BRAKE HUB	1REF
35.	70143662	*CAM CLUTCH	1REF
36.	70145377	*WASHER	1REF
37.	72063188	*LOCKWASHER	1REF
38.	72601724	*CAP SCREW	1REF
39.	70145376	*BRAKE SPRING	1REF
40.	70143660	*THRUST WASHER	1REF
41.	70143666	*BRAKE HOUSING	1REF
42.	72601721	*CAP SCREW	2REF
43.	76393172	*WASHER-SEAL	1REF
44.	72601722	*LOCKNUT-SEAL	1REF
45.	72601723	*SET SCREW	8REF

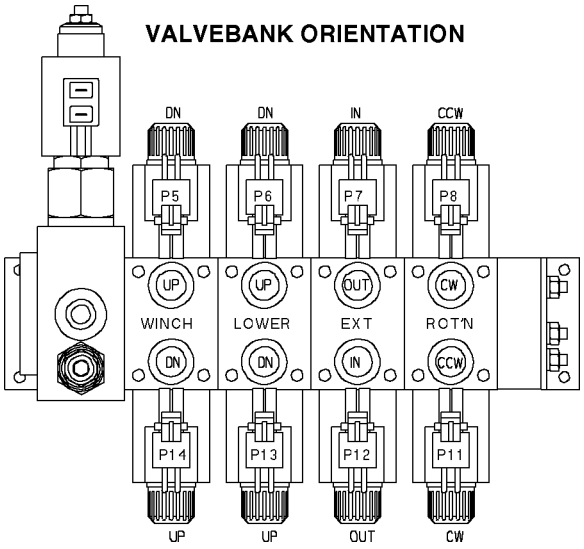
* PART OF ITEM 10.

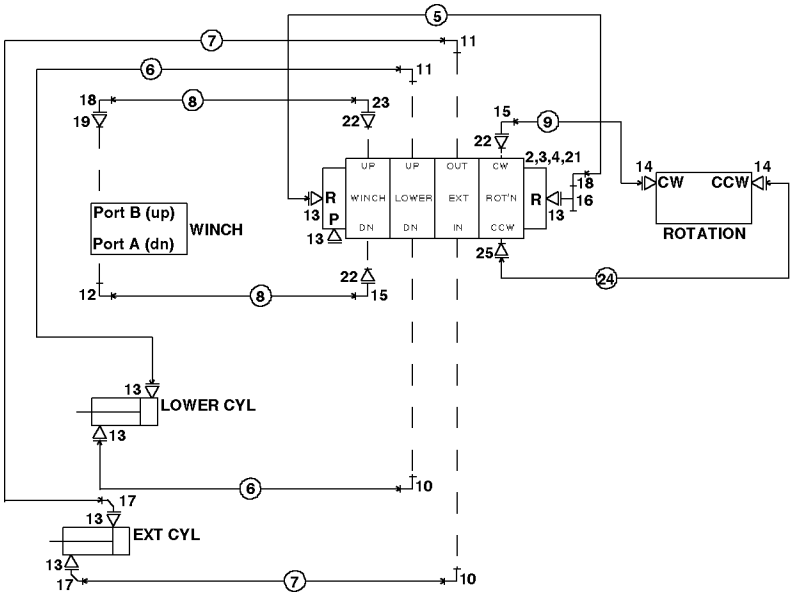
GEAR RATIO: 27:1
OUTPUT TORQUE: 27328 IN-LBS
MAX INPUT TORQUE: 2249 IN-LBS
MAX INPUT SPEED: 316 RPM
INSTALLED WEIGHT: 62 LBS
LUBRICATION: EP 140

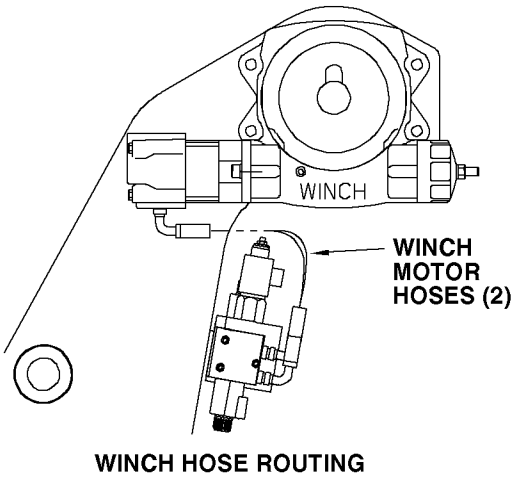


HYD KIT-PROP'L RMT CTRL (91712185)

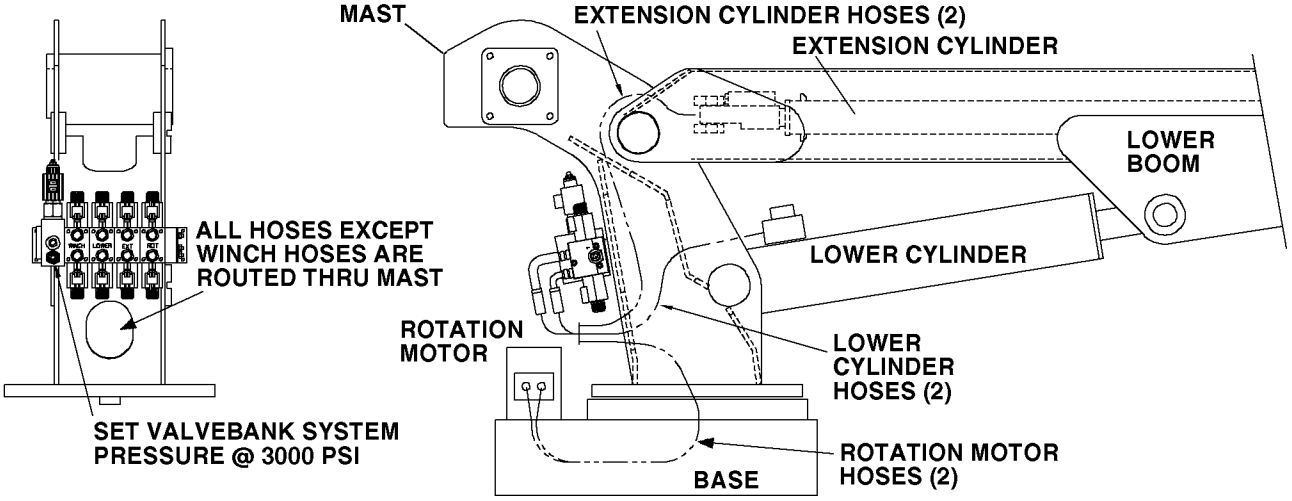
ITEM	PART NO.	DESCRIPTION	QTY
1.	51713275	VALVEBANK 4-SECTION (INCL:10,11,13,15,16,21,22,23,25)	1
2.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
3.	72062104	NUT 1/4-20 LOCK	4
4.	72063001	WASHER 1/4 WRT	4
5.	51394212	HOSE 1/2X15FJ#8#8(PART OF 20)	1REF
6.	51392462	HOSE 3/8X27FF#8#8(PART OF 20)	1REF
7.	51394231	HOSE 3/8X36FF#8#8(PART OF 20)	1REF
8.	51392464	HOSE 3/8X23FF#6#8(PART OF 20)	2REF
9.	51394224	HOSE 1/4X59FF#4#6(PART OF 20)	1REF
10.	72053763	ELBOW #8MSTR#8MJIC90°(PART 1)	2REF
11.	72532666	ELBOW #8MSTR#8MJIC (PART 1)	2REF
12.	72053764	ELBOW #10MSTR #8MJIC 90°	1
13.	72532358	ADAPTER #8MSTR #8MJIC	4
	72532358	ADPTR #8MSTR#8MJIC(PART OF 1)	3REF
14.	72532351	ADPTR #4MSTR #4MJIC	2
15.	72532700	ELBOW #6MSTR#6MJIC(PART OF 1)	2REF
16.	72532671	TEE #8JIC SWVL (PART OF 1)	1REF
17.	72532670	ELBOW #8MJIC #8FJIC 45°	2
18.	72532658	ELBOW #8MJIC #8FJIC SWVL	2
19.	72532359	ADAPTER #10MSTR #8MJIC	1
20.	51713153	HOSE KIT (INCL:5-9,18,24)	1
21.	73733057	VALVEBANK (PART OF 1)	1REF
22.	72533052	ADPTR #8MSTR#8FSTR(PART OF 1)	3REF
23.	72053760	ELBOW #6MSTR#6MJIC90°(PART 1)	1REF
24.	51394226	HOSE 1/4X60FJ#4#4(PART OF 20)	1REF
25.	72532792	ADPTR#8MSTR#4MJIC(PART OF 1)	1REF





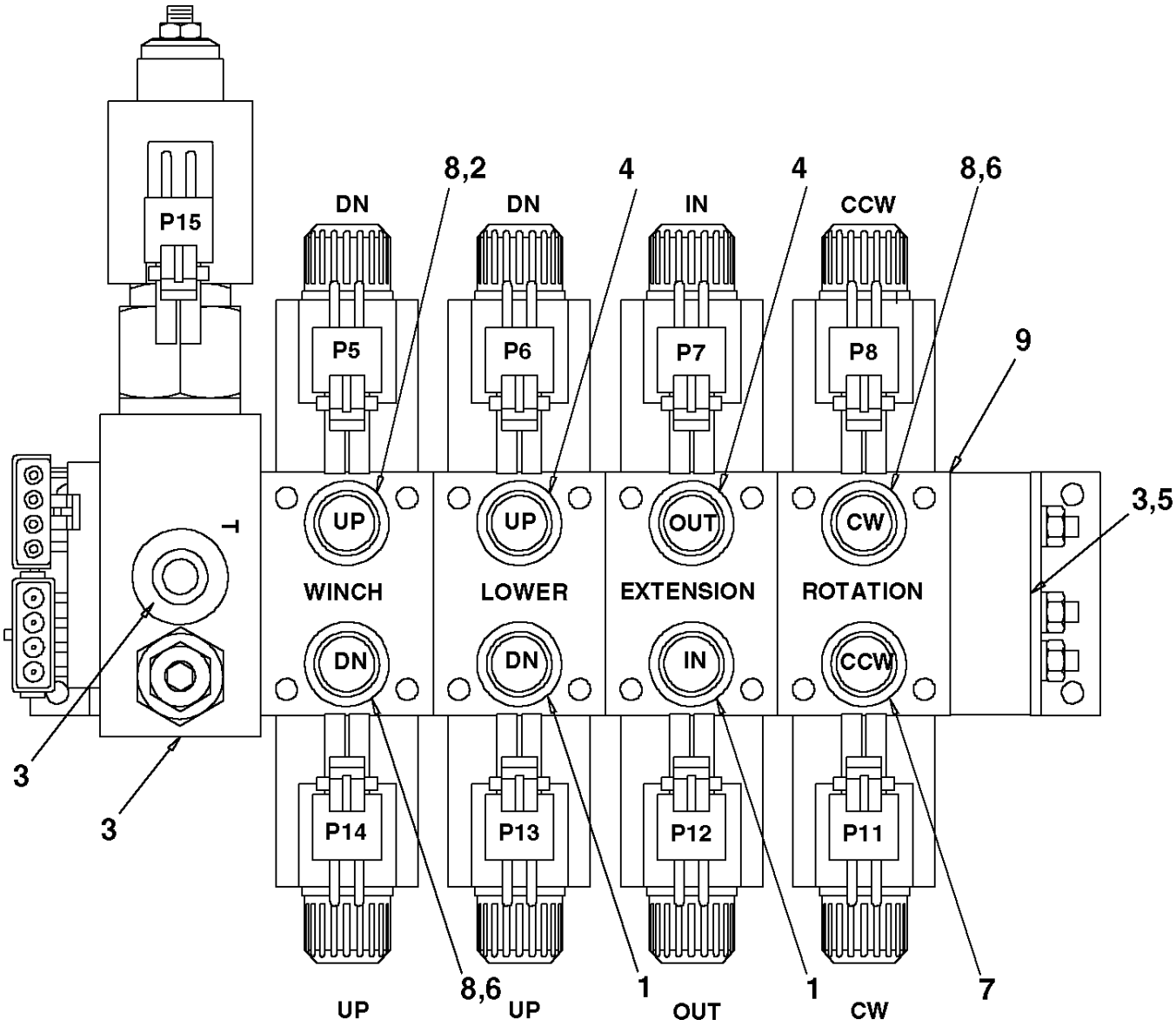


WINCH HOSE ROUTING



VALVEBANK ASM-4 SECT-PROP'L RMT CTRL (51713275)

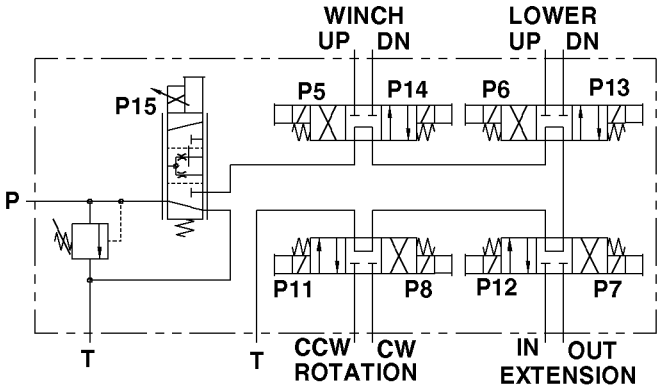
ITEM	PART NO.	DESCRIPTION	QTY
1.	72053763	ELBOW #8MSTR #8MJIC 90°	2
2.	72053760	ELBOW #6MSTR #6MJIC 90°	1
3.	72532358	ADAPTER #8MSTR #8MJIC	3
4.	72532666	ELBOW #8MSTR #8MJIC XLG	2
5.	72532671	TEE #8JIC SWVL NUT BRANCH	1
6.	72532700	ELBOW #6MSTR #6MJIC XLG	2
7.	72532792	ADAPTER #8MSTR #4MJIC	1
8.	72533052	ADAPTER #8MSTR #6FSTR	3
9.	73733057	VALVEBANK (SEE DWG)	1



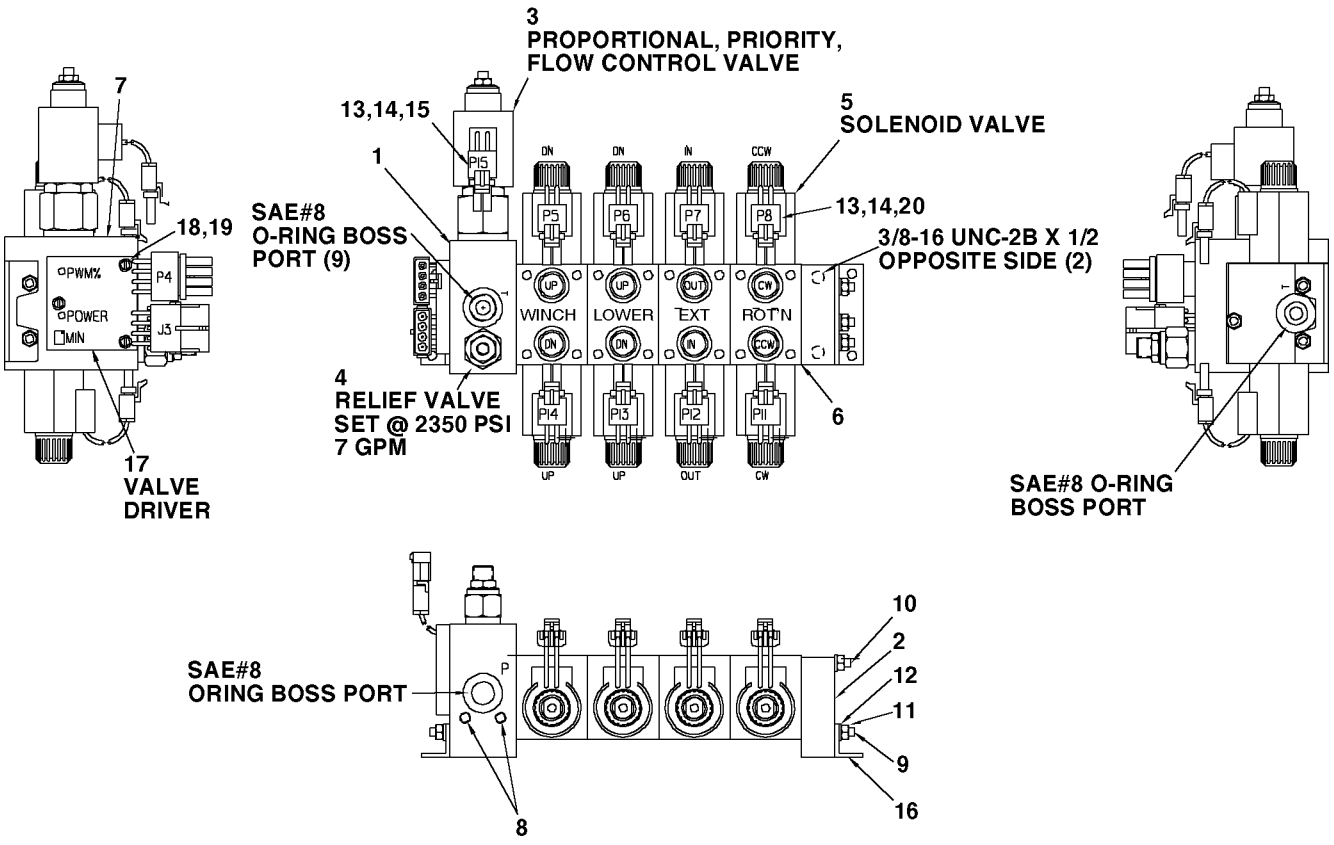
VALVEBANK (73733057-1)

CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
1.	73054938	INLET BODY	1
2.	73054937	OUTLET BODY	1
3.	73054934	PROPORTIONAL SOLENOID	1
4.	73054935	RELIEF VALVE	1
5.	73054936	SOLENOID VALVE	4
	77041518	COIL-SOLENOID	REF
6.	7Q072013	O-RING	10
7.	72533477	PLUG #4 HEX SOCHD	1
8.	72533478	EXPANDER PLUG	2
9.	60119363	THRD ROD 1/4-20X12-1/2 GR8	2
10.	60119354	THRD ROD 1/4-20X10-9/16 GR8	1
11.	72062000	NUT 1/4-20	5
12.	72063047	WASHER 1/4 LOCK	5
13.	77044574	PACKARD CONNECTOR TOWER	9
14.	77044577	PACKARD CONNECTOR TERM	18
15.	77044578	CABLE SEAL-GRN	2
16.	70145264	MOUNTING FOOT	2
17.	77044595	VALVE DRIVER	1
18.	72601704	MACH SCR #6-32X3/4 (LOCTITE)	3
19.	72601705	WASHER #6 FLAT	3
20.	77044594	CABLE SEAL-RED	16
21.	70733066	WIRING HARNESS	1



HYDRAULIC SCHEMATIC



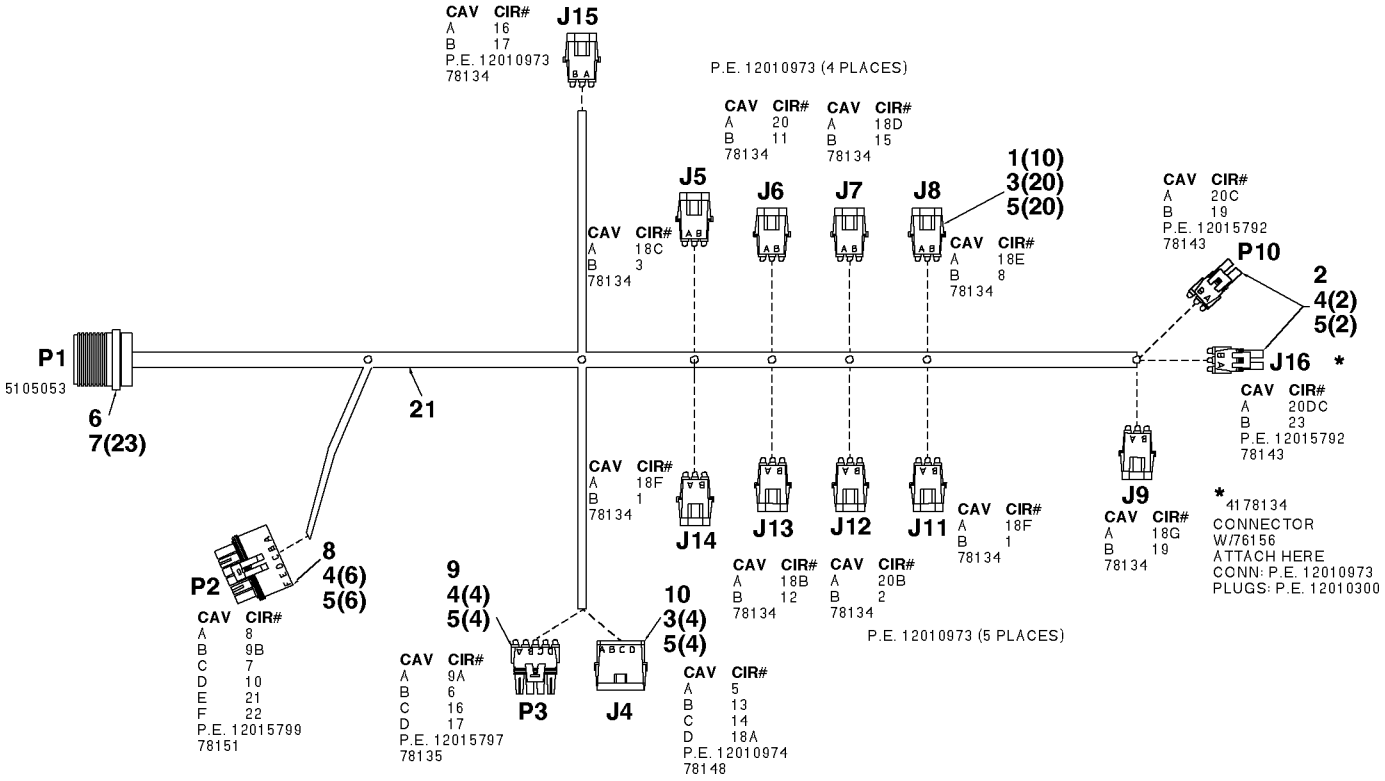
VALVEBANK-WIRING DIAGRAM (73733057-2)

FOR REFERENCE ONLY

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044573	SHROUD CONNECTOR	10REF
2.	77044574	TOWER CONNECTOR	2REF
3.	77044576	TERMINAL-MALE 20-18GA	24REF
4.	77044577	TERMINAL-FEMALE 20-18GA	14REF
5.	77044578	CABLE SEAL-GRN	38REF
6.	77044620	CONN RCPT	1REF
7.	77044580	SOCKET	23REF
8.	77044622	TOWER CONNECTOR-6 CONT	1REF
9.	77044623	TOWER CONNECTOR-4 CONT	1REF
10.	77044624	SHROUD CONN	1REF

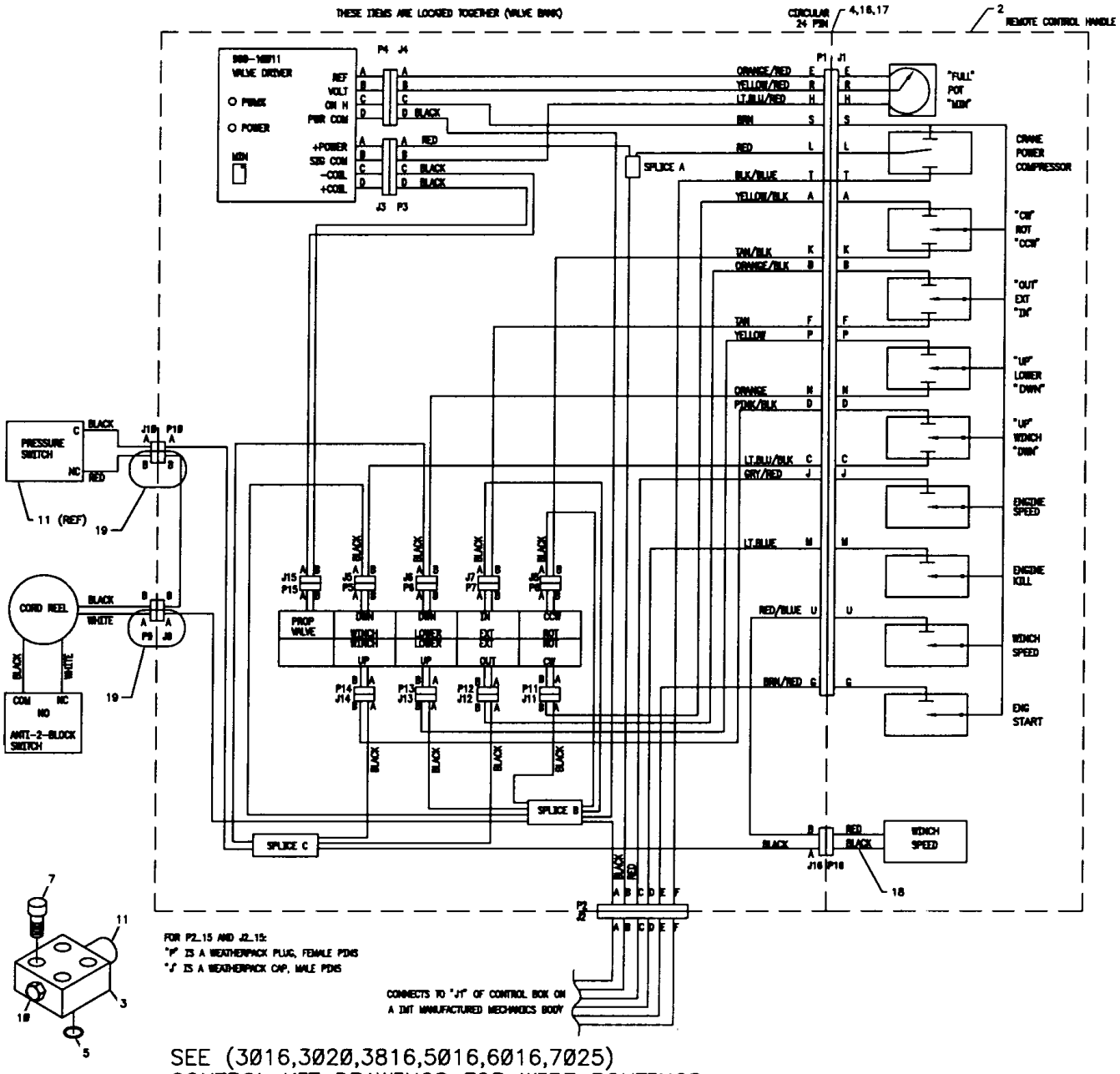
WIRE LEGEND

CIR	5105053	COLOR	GA	WEATHER PAK	LABELING	FUNCTION
	PIN CAVITY			CONNECTOR		
1	A	YELLOW/BLK	18	PIA TO: JI1B	ROTJI1B	ROTATE CW
2	B	ORANGE/BLK	18	PIB TO: JI2B	EXTJI2B	BOOM EXT OUT
3	C	LT.BLUE/BLK	18	PIC TO: J5B	WIN J5B	WINCH DOWN
4	D	PINK/BLK	18	PID TO: JI4B	WIN JI4B	WINCH UP
5	E	ORANGE/RED	18	PIE TO: J4A	J4A	REF
6	H	LT.BLUE/RED	18	PIH TO: P3B	P3B	SIGNAL COMM.
7	J	GRAY/RED	18	PIJ TO: P2C	P2C	SPEED RELAY
8	K	TAN/BLK	18	PIK TO: J8B	ROTJ8B	ROTATE CCW
9	L	RED	16	PI TO: SPL A	N/A	PI TO SPLICE
9A		RED	16	P3A TO: SPL A	P3A	POWER +
9B		RED	16	P2B TO: SPL A	P2B	IGNITION SOLENOID
10	M	LT.BLUE	18	PIM TO: P2D	P2D	KILL RELAY
11	N	ORANGE	18	PIN TO: J6B	LOWER J6B	LOWER DOWN
12	P	YELLOW	18	PIP TO: JI3B	LOWER JI3B	LOWER UP
13	R	YELLOW/RED	18	PIR TO: J4B	J4B	VOLTAGE
14	S	BROWN	18	PIS TO: J4C	J4C	ON H
15	F	TAN	18	PIF TO: J7B	EXT J7B	BOOM EXT IN
16		BLACK	16	P3C TO: JI5A	PRVLV JI5A	PROP. VALVE & COIL -
17		BLACK	16	P3D TO: JI5B	PRVLV JI5B	PROP. VALVE & COIL +
18		BLACK	16	P2A TO: SPL B	P2A	BATTERY -
18A		BLACK	16	J4D TO: SPL B	J4D	POWER COMMON
18B		BLACK	16	JI3A TO: SPL B	LOWER JI3A	LOWER UP
18C		BLACK	16	J5A TO: SPL B	WINCH J5A	WINCH
18D		BLACK	16	J7A TO: SPL B	EXT J7A	BOOM EXT IN
18E		BLACK	16	J8A TO: SPL B	ROT J8A	ROTATE CCW
18F		BLACK	16	JIIA TO: SPL B	ROT JIIA	ROTATE CW
18G		BLACK	16	J9A TO: SPL B	ATB J9A	ANTI-TWO
19		BLACK	16	PIOB TO: J9B	PIOB & J9B	OPRES & ANTI-TWO
20		BLACK	16	J6A TO: SPL C	LOWER J6A	LOWER DOWN
20A		BLACK	16	JI4A TO: SPL C	WINCH JI4A	WINCH
20B		BLACK	16	JI2A TO: SPL C	EXT JI2A	BOOM EXT OUT
20C		BLACK	16	PIOA TO: SPL C	OPSI PIOA	OVERPRESSURE
20D		BLACK	16	JI6A TO: SPL C	WNSPD JI6A	WINCH TWO SPEED
21	G	BRN/RED	16	PIG TO: P2E	P2 E	ENGINE START
22	T	BLK/BLUE	16	PIT TO: P2F	P2 F	COMPRESSOR
23	U	RED/BLUE	16	PIU TO: JI6B	WNSPD JI6B	WINCH TWO SPEED



ELECTRICAL SCHEMATIC-PROP'L RMT CTRL (99900855)

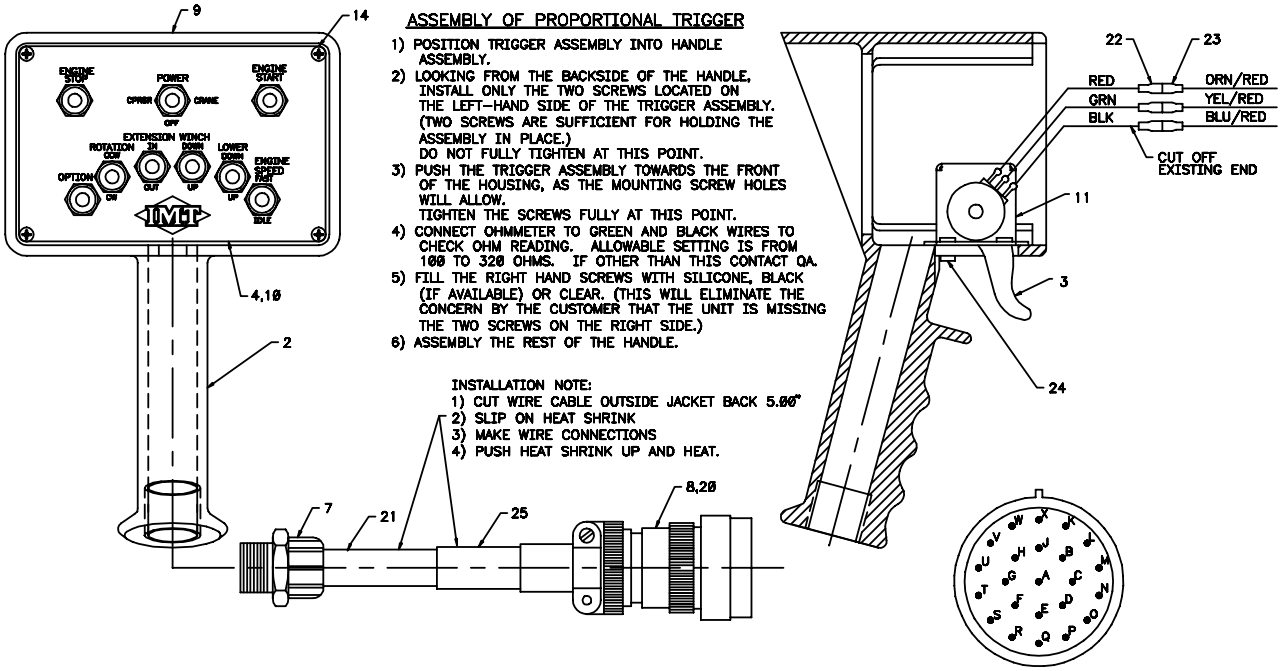
ITEM	PART NO.	DESCRIPTION	QTY
2.	51713182	HANDLE ASM	1
3.	60025221	MANIFOLD-CAPACITY ALERT	1
4.	60119299	BRACKET	1
5.	7Q072015	O-RING	1
7.	72060731	CAP SCR 5/16-18X3/4 SH	4
10.	72532140	PLUG #6 HH STL	1
11.	77041543	PR SWITCH 2800	1
16.	77044645	NUT-DEUTSCH CONNECTOR	1
17.	77044646	LOCKWASHER-DEUTSCH CONN	1
18.	51713343	CABLE ASM 14GA/2 WIREX16 (NOT USED ON 5016)	1
19.	70034439	LOCK WIRE LEAD SEAL 8" (INSTALL AT TEST)	2

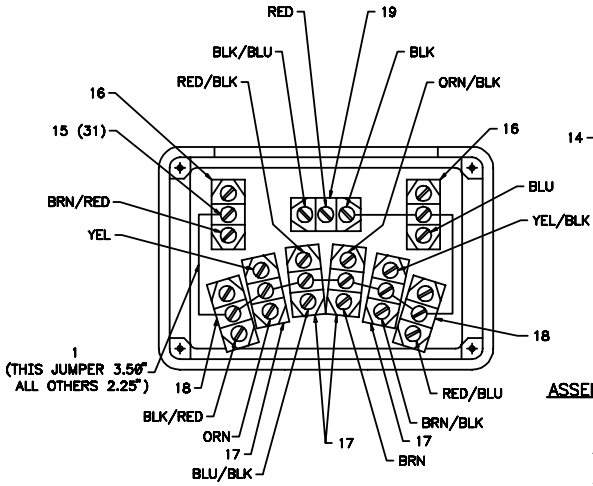


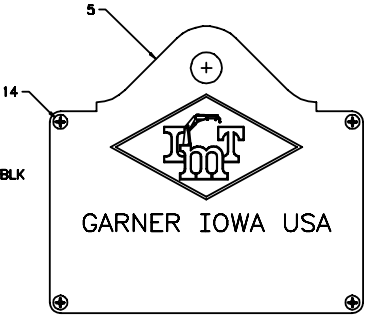
SEE (3016,3020,3816,5016,6016,7025) CONTROL KIT DRAWINGS FOR WIRE ROUTINGS

PROP'L RMT HANDLE ASM (51713182)

ITEM	PART NO.	DESCRIPTION	QTY
1.	89044214	WIRE 18GA GRN	1.61FT
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.	70394142	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	30FT
22.	77040147	TERM-FSLPON 1/4TAB 22-18	3
23.	77040047	TERM-MSLPON 1/4TAB 16-14	3
24.	72060602	MACH SCR #6-32X3/8 RDHD	4
25.	70145495	TUBING-HEAT SHRINK	.5FT





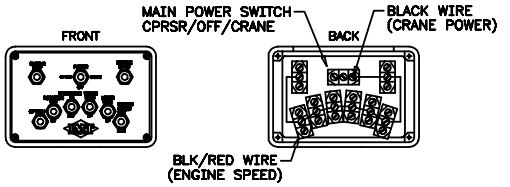


ASSEMBLY OF SWITCHES ONTO FACE PLATE.

1) INSTALL (1) STAR WASHER BETWEEN SWITCH & FACE PLATE.
2) INSTALL (1) LOCK NUT ON FRONT OF FACE PLATE TO RETAIN SWITCH.
3) DISCARD ALL OTHER MOUNTING HARDWARE.

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	–
P	YEL	LOWER UP
Q	BRN/BLU	–
R	YEL/RED	–
S	BLK	CRANE
T	BLK/BLU	CPRSR
U	RED/BLU	OPTION
V	BLU/ORN	–
W	ORN/BLU	–
X	YEL/BLU	–
–	RED/ORN	–

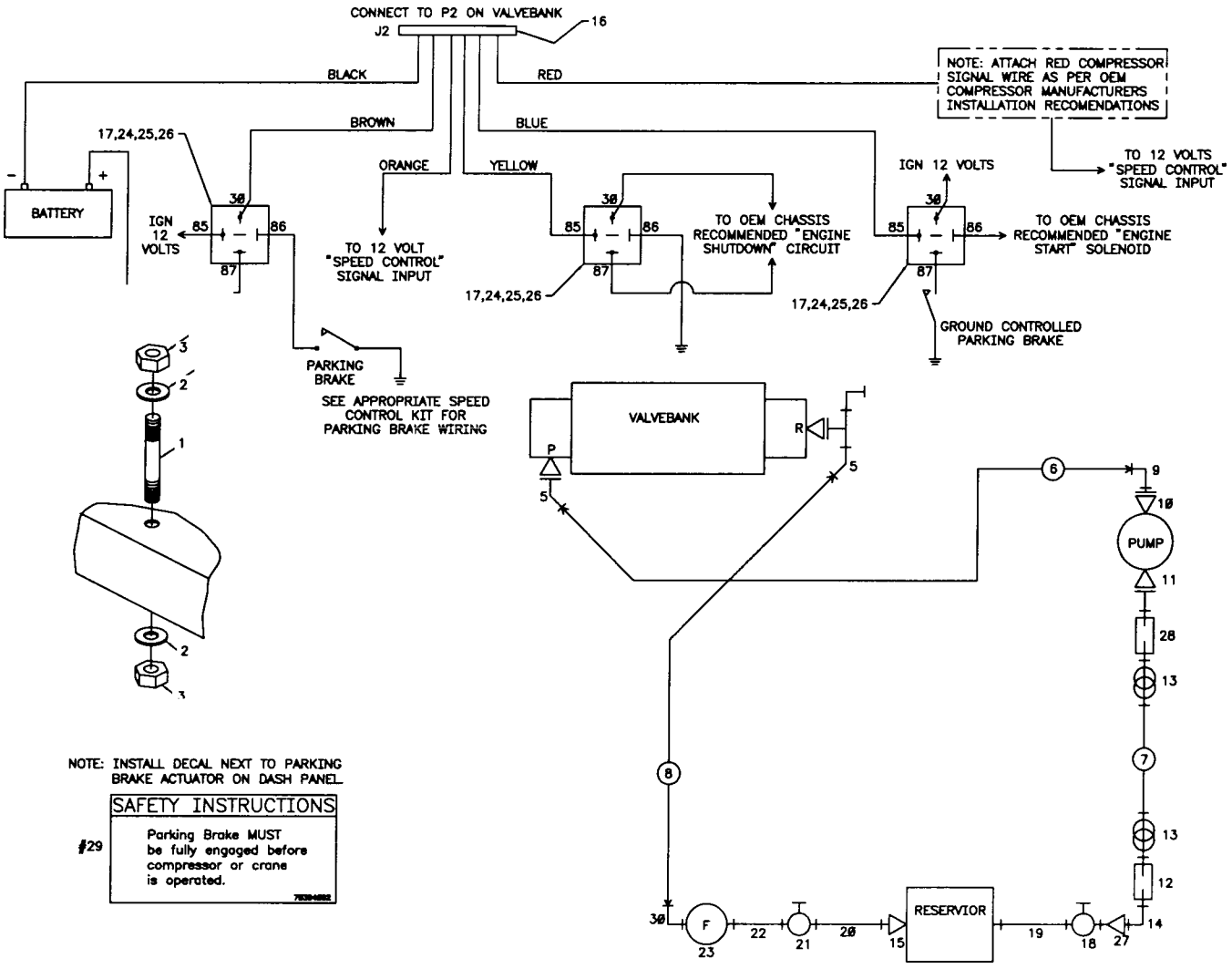
REWIRE CRANE REMOTE HANDLE TO ALLOW FOR THE OPERATION OF THE SOLENOID VALVE WHEN THE CRANE IS CHOSEN ON A TRUCK WITH AN AUTOMATIC TRANSMISSON



MOVE THE BLK/RED WIRE FROM THE ENGINE SPEED SWITCH TO THE MAIN POWER SWITCH POST THAT HAS THE CRANE POWER HOOKED TO IT (BLACK WIRE).

INSTALLATION KIT (93707664)

ITEM	PART NO.	DESCRIPTION	QTY
1.	60106481	STUD 1-8X12-1/2	4
2.	72063066	WASHER 1" HI-STRENGTH	8
3.	72062141	NUT 1-8 LOCK STL INSERT	8
5.	72532670	ELBOW #8MJIC #8FJIC 45°	2
6.	51704458	HOSE 1/2X252 FF	1
7.	60035958	HOSE 100R4 1X48	1
8.	51703613	HOSE ASM 1/2X192 FF	1
9.	72053763	ELBOW #8MSTR #8MJIC 90°	1
10.		ADPTR(DETERMINED BY PUMP)	1REF
11.		ADPTR(DETERMINED BY PUMP)	1REF
12.	72532470	BARBED NIPPLE 1"BARB 1"NPT	1
13.	72066515	HOSE CLAMP 1"	2
14.	72053286	STREET ELBOW 1NPT 90°	1
15.	72531836	REDUCER BUSHG 1-1/4MPT 3/4	1
16.	51713199	CABLE ASM 14GA/6WIREX35	1
17.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	3
18.	73054130	GATE VALVE 1-1/4NPT	1
19.	72053216	NIPPLE 1-1/4NPT X 6	1
20.	72053146	NIPPLE 3/4NPT X 6	1
21.	73054129	GATE VALVE 3/4NPT	1
22.	72053141	NIPPLE 3/4NPT X CLOSE	1
23.	73052000	RETURN FILTER	1
24.	72062104	NUT 1/4-20 HEX NYLOC	3
25.	72063001	WASHER 1/4W FLAT	3
26.	77041251	RELAY	3
27.	72053377	REDUCER BUSH 1-1/4MPT 1FPT	1
28.	72531195	BARBED NIPPLE 1NPT 45°	1
29.	70394092	DECAL-CAUTION BRK/CPRSR	1
30.	72531422	ELBOW 3/4NPT #8MJIC 90°	1

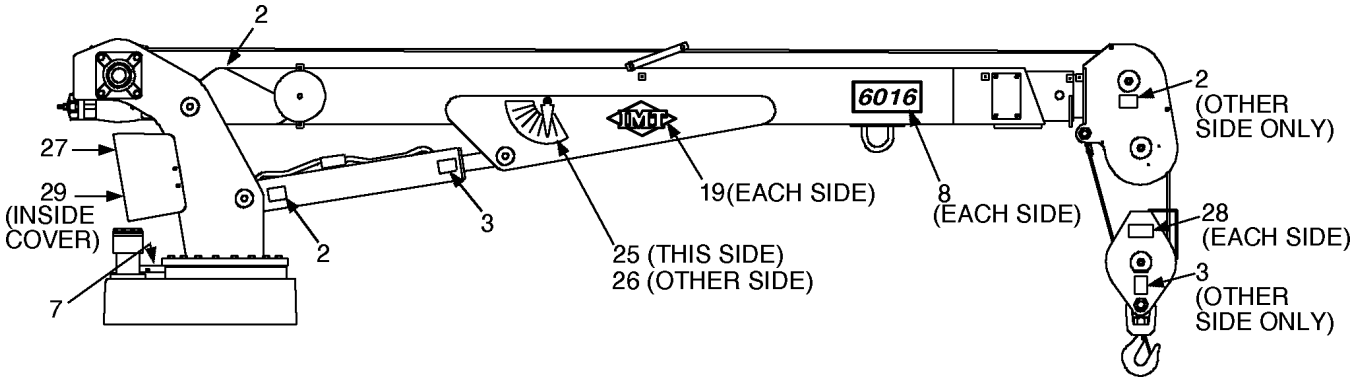


DECAL KIT (95712187)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70391598	DECAL-WARNING OUTRIGGER	2
2.	70391612	DECAL-GREASE WEEKLY LH	3
3.	70391613	DECAL-GREASE WEEKLY RH	2
4.	70392108	DECAL-SUCTION LINE	1
5.	70392109	DECAL-RETURN LINE	1
6.	70392213	DECAL-CAUTION WASH/WAX	1
7.	70392524	DECAL-ROTATE/GREASE	1
8.	70393858	DECAL-6016 IDENTIFICATION	2
9.	70394444	DECAL-DGR ELECTROCUTION	1
10.	70392814	DECAL-DANGER TRAINING	1
11.	70392815	DECAL-DANGER OPERATION	1
12.	70392861	DECAL-DANGER 2-BLOCKING	1
13.	70392863	DECAL-DANGER HOIST PERS	1
14.	70392864	DECAL-DGR OR STAND CLEAR	2
15.	70394445	DECAL-DGR ELECTROCUTION	4
16.	70392866	DECAL-DANGER OPER COND	1
17.	70392867	DECAL-DANGER OR MOVING	1
18.	70392868	DECAL-DANGER LOADLINE	4
19.	70029251	DECAL-IMT DIAMOND	2
20.	70392888	DECAL-DANGER RESTRICTION	1
21.	70394446	DECAL-DANGER RC ELECTRO	1
22.	70392891	DECAL-DANGER DRIVELINE	1
23.	70392982	DECAL-CONTACT IMT	1
24.	71039134	DECAL-CAUTION OIL LEVEL	1
25.	71391522	DECAL-ANGLE CHART RH	1
26.	71391523	DECAL-ANGLE CHART LH	1
27.	71393859	CAPACITY CHART	2
28.	70393860	DECAL-LOAD BLOCK RATING	2
29.	70394166	DECAL-MANUAL OPERATION	1
30.	70394189	DECAL-RECOMMEND HYD OIL	1
31.	70394443	DECAL-DGR FREEFALL BOOM	1

DECAL PLACEMENT

ITEM NO.	LOCATION
6,9,10,11,12,13,16, 17,20,21,23,24,27	AT OR NEAR REMOTE CONTROL STORAGE POINT
1,14	ONE ON EACH OUTRG.
15,18	ONE ON EACH SIDE OF CARRIER VEHICLE
5	ON RESERVOIR AT THE RETURN LINE
4	ON RESERVOIR AT THE SUCTION LINE
30	AT OR NEAR HYD RESERVOIR
22	AT OR NEAR DRIVELINE
31	AT OR NEAR MNL BOOM EXT RETENTION MECHANISM



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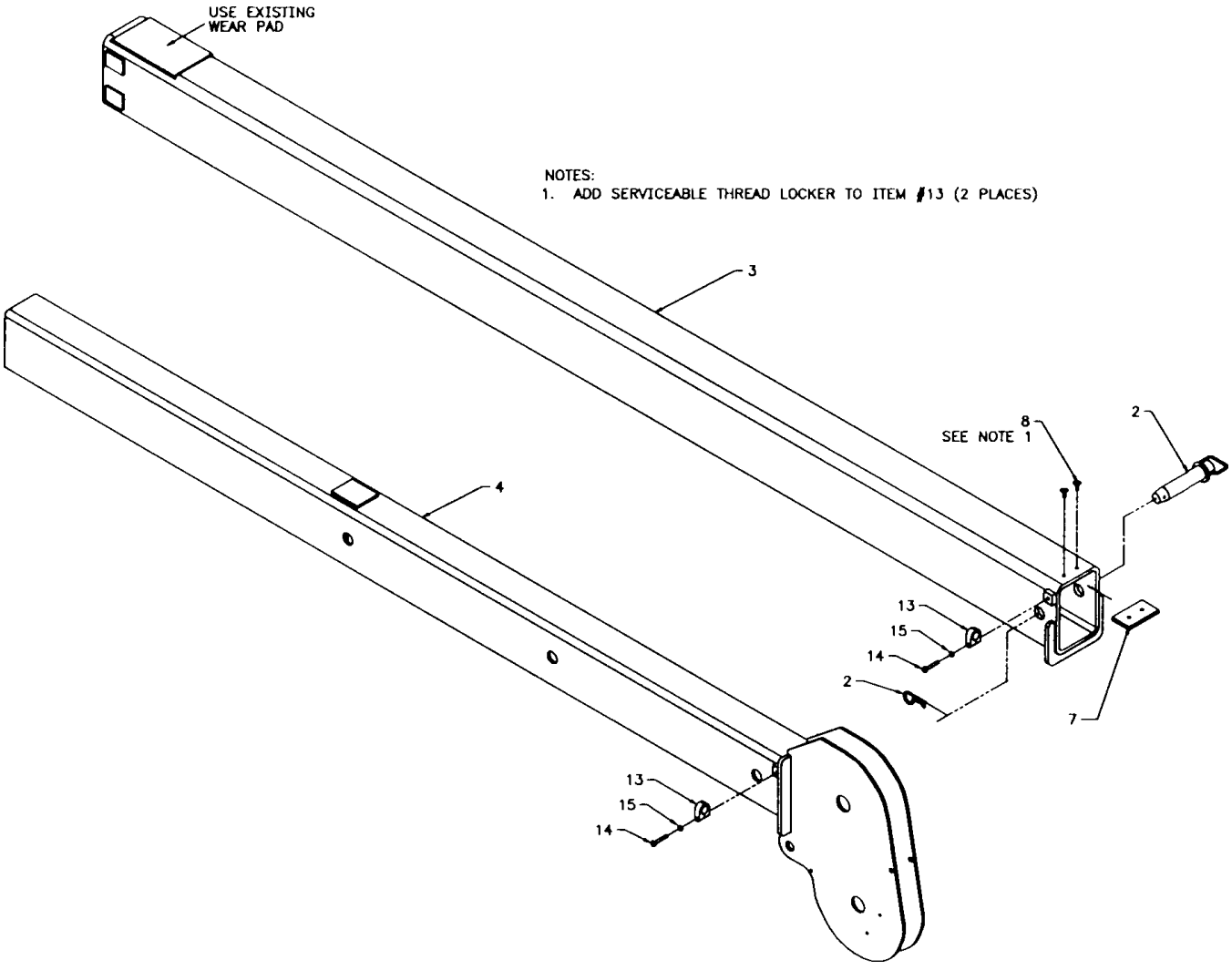
OPTION-CONVERSION KIT-6016 TO 6016-20' (95709041)

ITEM	PART NO.	DESCRIPTION	QTY
2.	73733171	PIN 1X6 LOCK W/HAIRPIN	1
3.	52707723	EXTENSION BOOM-1ST STAGE	1
4.	52707724	EXTENSION BOOM-2ND STAGE	1
7.	60121174	STROKE STOP (FROM 7-1-98)	1
	60121131	STROKE STOP (TO 7-1-98)	1
8.	72601750	CAP SCR 3/8-16X1/2BTNHDSOC (FROM 7-1-98)	2
	72601746	CAP SCR 5/16-24X5/8FLHSOC (TO 7-1-98)	2
10.	72063053	WASHER 1/2 LOCK	2
13.	70034381	CORD GUIDE	2
14.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
15.	72063049	WASHER 1/4 LOCK	2

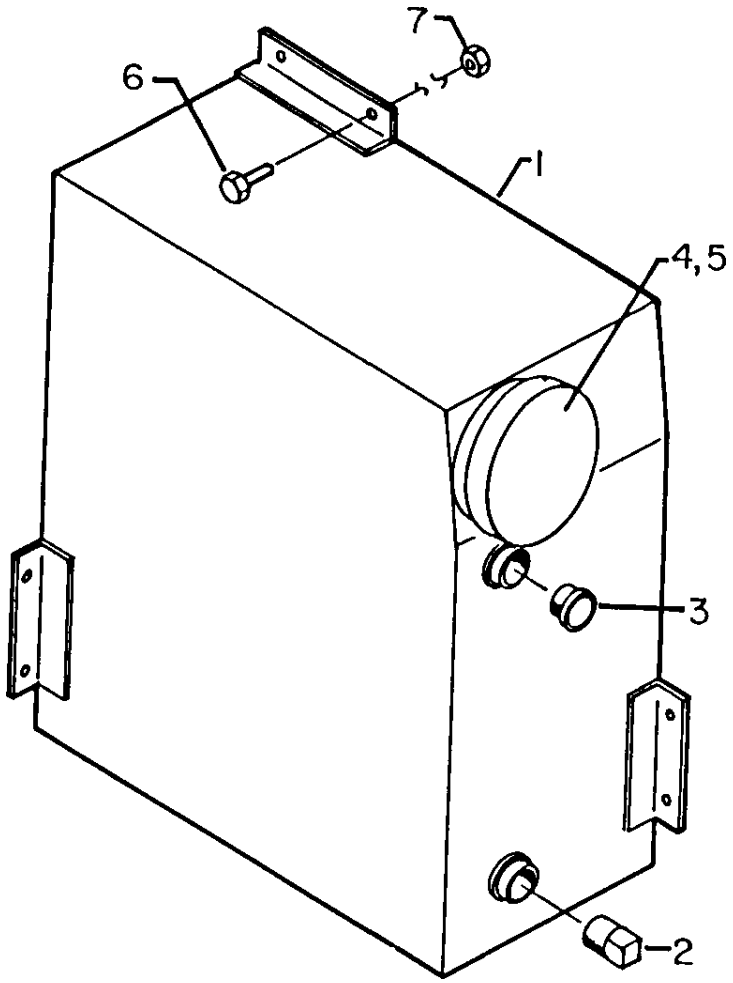


OPTION-RESERVOIR (51709256)

FOR SHIPOUT APPLICATIONS ONLY

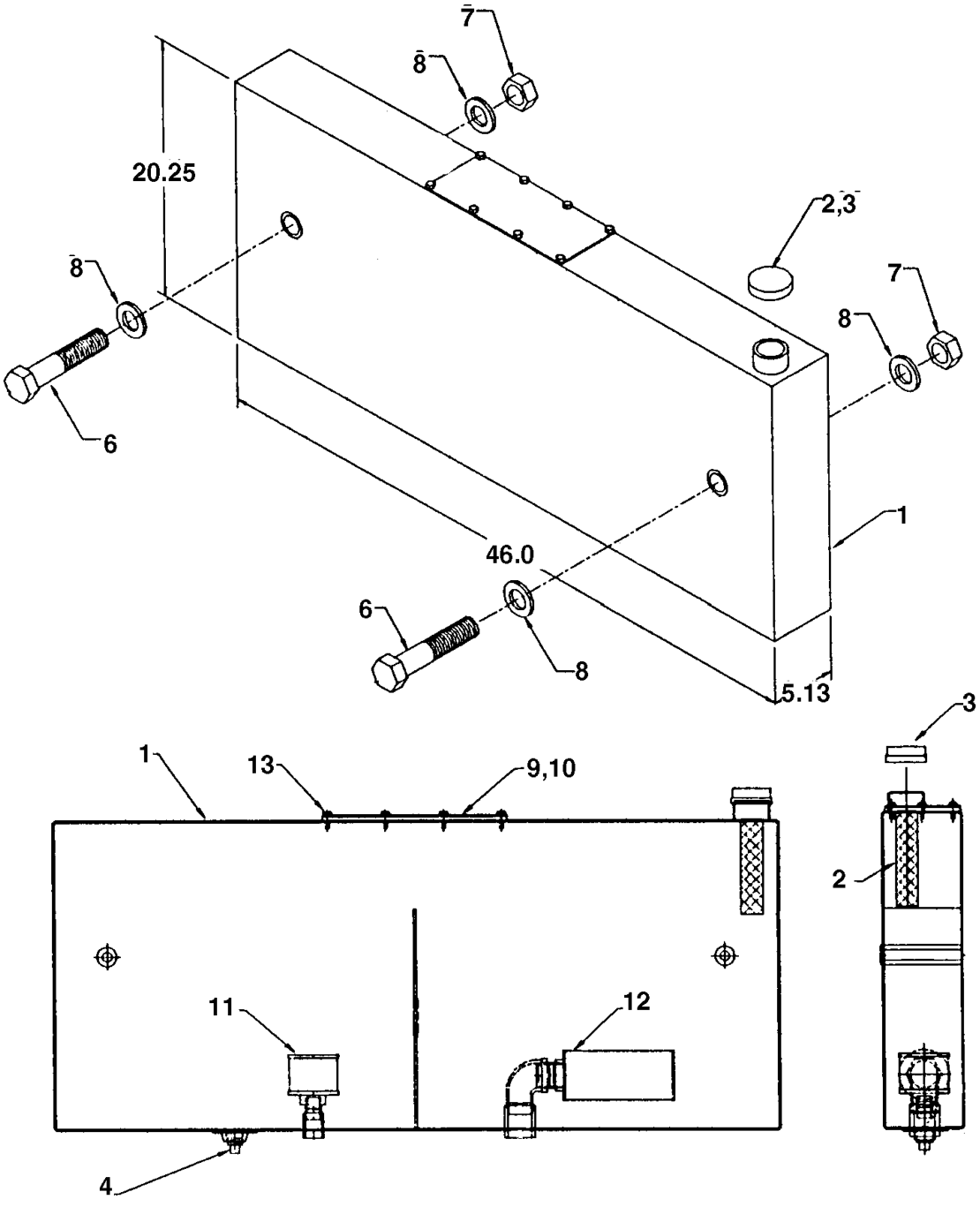
ITEM	PART NO.	DESCRIPTION	QTY
1.	52703440	RESERVOIR, 12 GAL.	1
2.	72053415	PLUG, 3/4 NPT	1
3.	72532261	PLUG, SIGHT GAUGE, 3/4 NPT	1
4.	73014671	CAP, FILL	1
5.	73141276	SCREEN, FILL NECK	1
6.	72060046	CAP SCREW, 3/8 X 1 GR5	6
7.	72062103	NUT, SELF LOCKING, 3/8	6
8.	73052012	SUCTION FILTER	1*
9.	72053211	PIPE NIPPLE	1*

* ITEMS 8 & 9 ARE SHIPPED LOOSE.



OPTION-RESERVOIR (51707798)

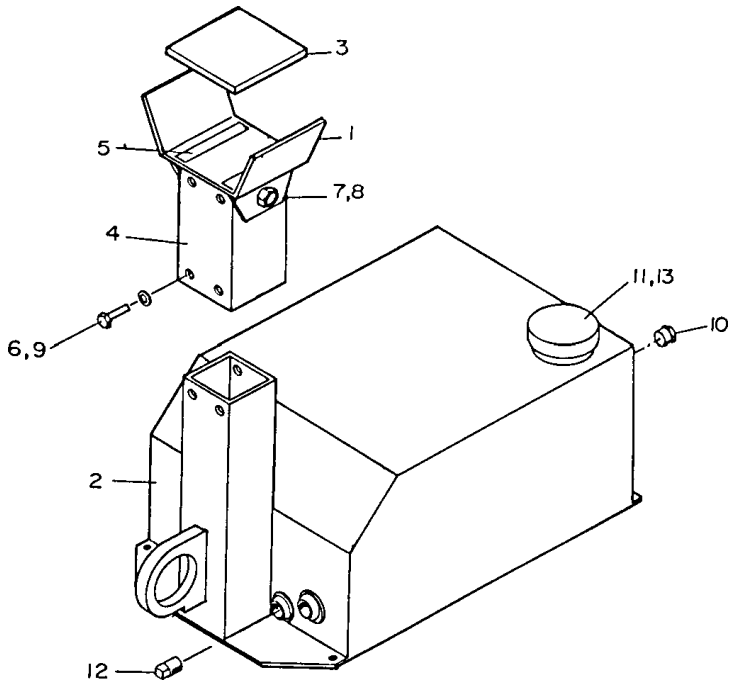
ITEM	PART NO.	DESCRIPTION	QTY
1.	52711432	RESERVOIR WELDMENT	1REF
2.	70142482	FILL NECK STRAINER	1REF
3.	70142483	FILL CAP	1REF
4.	72053503	PIPE PLUG 3/4NPT SQHD	1REF
6.	72060104	CAP SCR 1/2-13X6-1/2 HHGR5	2
7.	72062080	NUT 1/2-13 LOCK	2
8.	72063005	WASHER 1/2 WRT	8
9.	76394152	GASKET 1/4X4-5/8X11-5/8	1
10.	60119158	COVER PLATE	1
11.	70733058	DIFFUSER-33 GAL 3/4NPT	1
12.	70733059	STRAINER-20GPM 1-1/4NPT	1
13.	72061151	SCR 1/4X1 SLFTPG W/SEAL	10
	51711433	RESERVOIR ASM (INCL:1-4)	1REF



OPTION-BOOM SUPPORT/RESERVOIR 20 GAL (51706910)

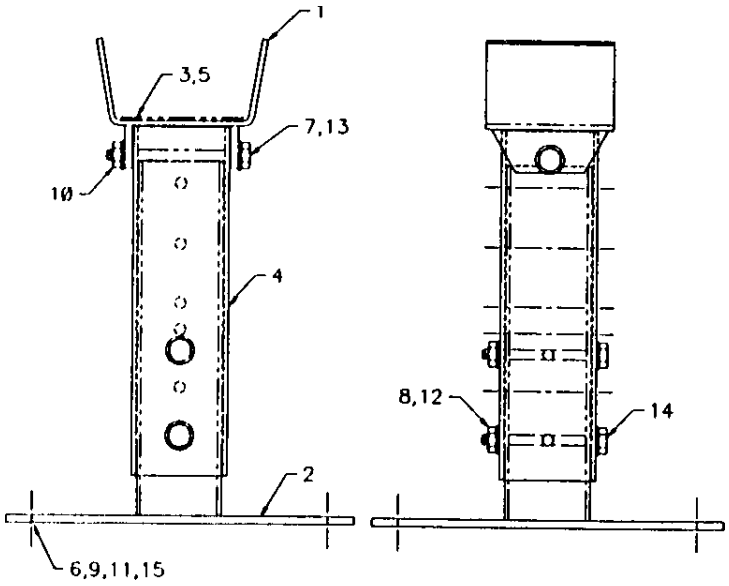
ITEM	PART NO.	DESCRIPTION	QTY
1.	52705061	SADDLE	1
2.	52706909	RESERVOIR, 20 GAL.	1
3.	72060092	CAP SCREW, 1/2 X 1 1/4 GR5	4
4.	72063053	WASHER, LOCK, 1/2	4
5.	73014671	CAP, FILL	1
6.	73052001	PLUG, MAGNETIC, 3/4 NPT	1
7.	73141276	SCREEN, FILL NECK	1
8.	60030162	PAD, WEAR	1
9.	70086054	TAPE	12"
10.	60109252	TUBE, SADDLE	1
11.	72060195	CAP SCREW, 3/4 X 7 GR5	1
12.	72062114	NUT, SELF LOCKING, 3/4	1
13.	72532261	PLUG, SIGHT GAUGE, 3/4	1
14.	72060046	CAP SCREW, 3/8 X 1 GR5	4
15.	72062103	NUT, SELF LOCKING, 3/8	4
16.	72063003	WASHER, FLAT, 3/8	4
17.	76392821	SEAL, THREAD, 3/8	4
18.	73052012	SUCTION FILTER	1*
19.	72053211	PIPE NIPPLE	1*

* ITEMS 18 & 19 ARE SHIPPED LOOSE.



OPTION-BOOM SUPPORT (51708161)

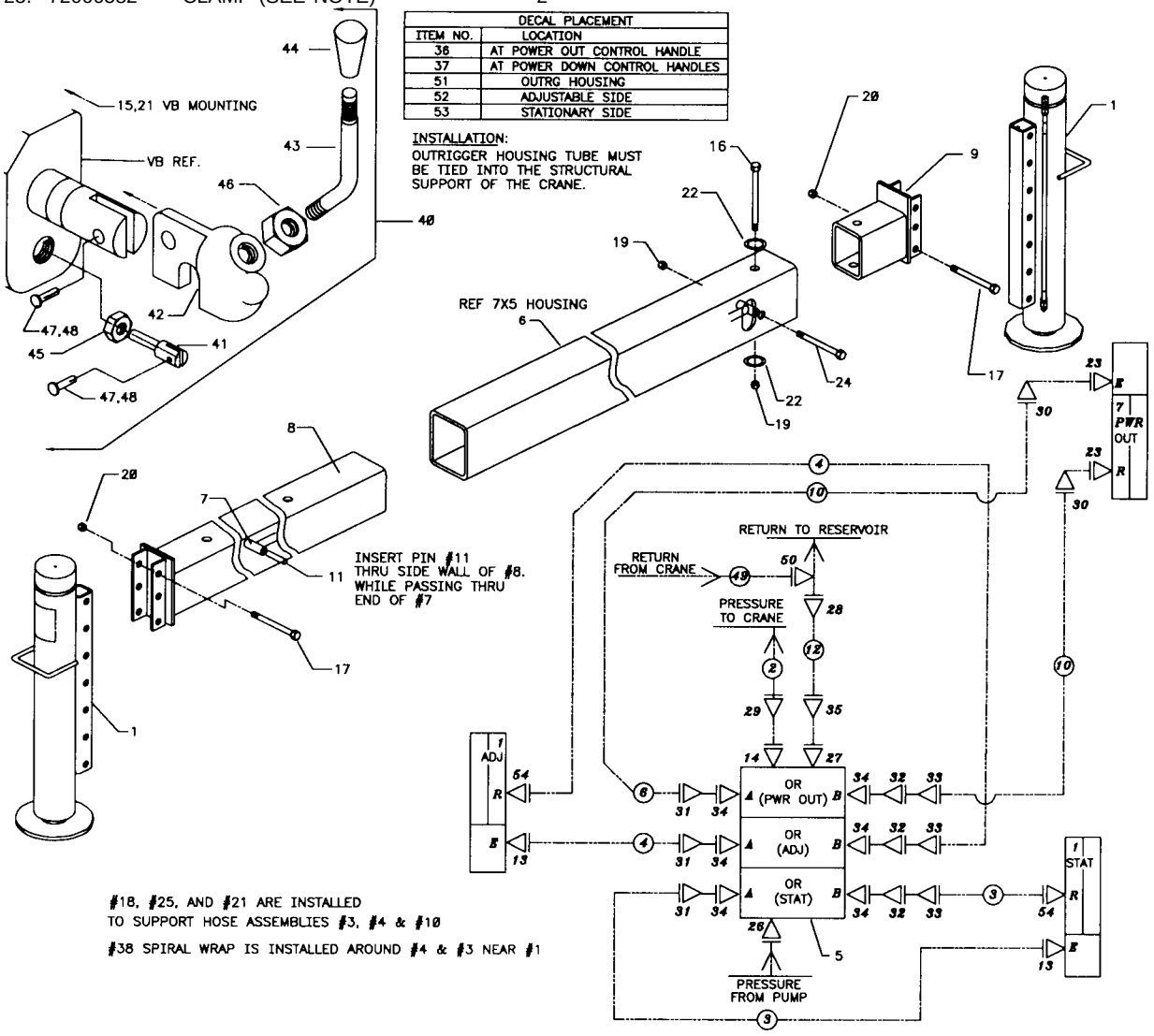
ITEM	PART NO.	DESCRIPTION	QTY
1.	52705061	SADDLE	1
2.	52708159	PEDESTAL	1
3.	60030162	WEAR PAD	1
4.	60112040	TUBE	1
5.	70086054	TAPE 1" STRUCTURAL	1FT
6.	72060046	CAP SCR 3/8-16X1-1/4 HHGR5	4
7.	72060195	CAP SCR 3/4-10X7 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	2
9.	72062103	NUT 3/8-16 LOCK	4
10.	72062114	NUT 3/4-10 LOCK	1
11.	72063003	WASHER 3/8 WRT	4
12.	72063005	WASHER 1/2 WRT	4
13.	72063008	WASHER 3/4 WRT	2
14.	72601297	CAP SCR 1/2-13X5-3/4	2
15.	76392821	WASHER 3/8 BONDED	4



OPTION-AUX OUTRIGGERS-PO/PD-7X5 (31712739)

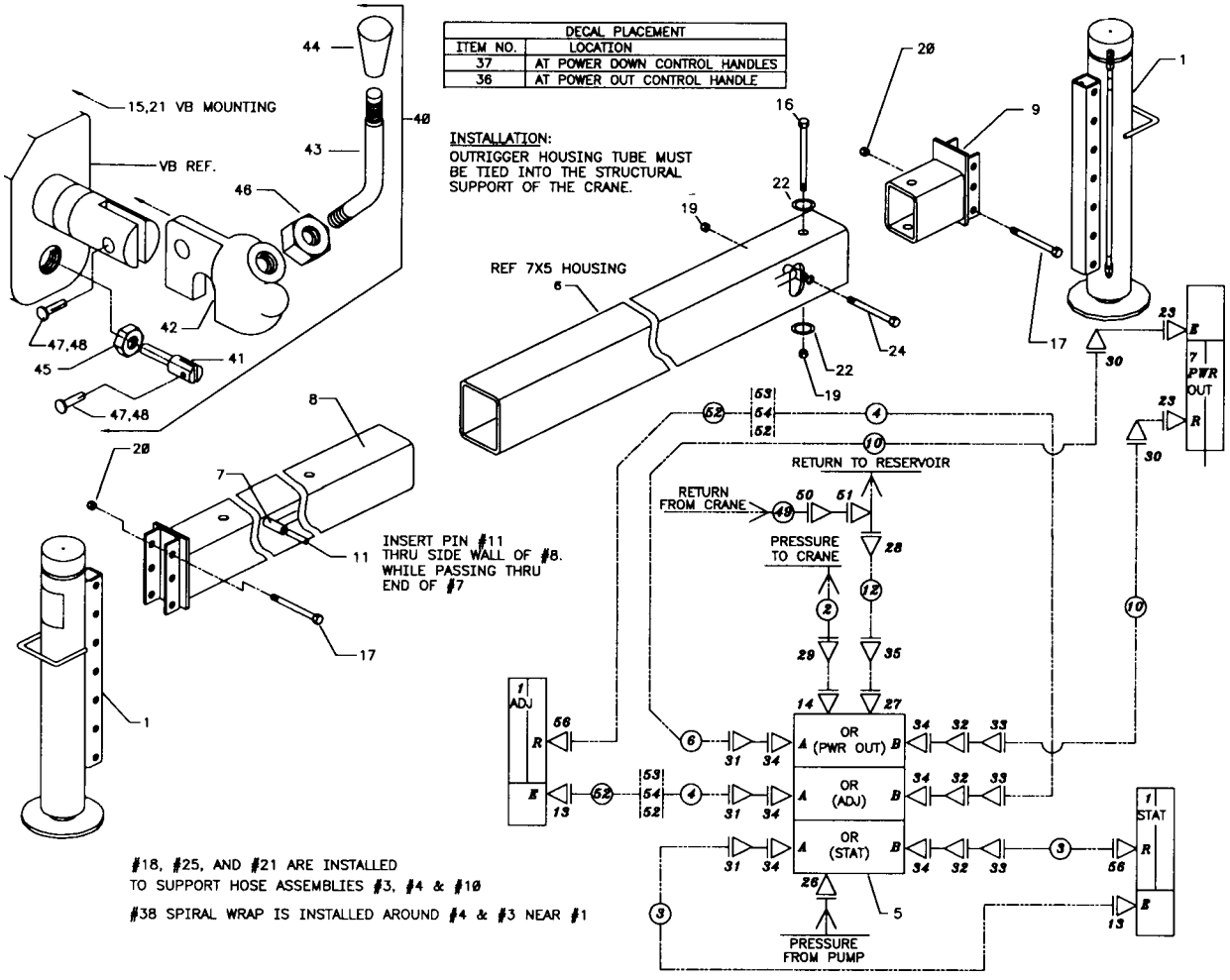
(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER	2
2.	51705639	HOSE ASM 1/2X150 FF	1
3.	51705364	HOSE ASM 1/4X128 FF	2
4.	51705191	HOSE ASM 1/4X96 FF	2
5.	51705984	VALVE BANK (INCL: 40)	1
6.	60118680	TUBE	1
7.	3B142860	POWER OUT CYLINDER	1
8.	52712735	ARM-ADJUSTABLE	1
9.	52712736	ARM-STATIONARY	1
10.	51707597	HOSE ASM 1/4X105 FF	2
11.	72661472	PIN-SPRING 1/2X4	1
12.	51703296	HOSE ASM 3/4X48 FF	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	2
14.	72053764	ELBOW #10MSTR #8MJIC 90°	1
15.	72060025	CAP SCR 5/16-18X1 HHGR5	3
16.	72060107	CAP SCR 1/2-13X8 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR-5/16-18X3/4THRDCTG(NOTE)	2
19.	72062080	NUT 1/2-13 HEX NYLOCK	2
20.	72062091	NUT 5/8-11 HEX NYLOCK	4
21.	72063002	WASHER 5/16W FLAT	5
22.	72063005	WASHER 1/2W FLAT	2
23.	72532351	ADPTR #4MSTR #4MJIC	4
24.	72601297	CAP SCR 1/2-13X5-3/4 HHGR5	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADPTR #8MSTR #8MJIC	1
27.	72532365	ADPTR #10MSTR #12MJIC	1
28.	72531205	TEE-MALE JIC 3/4-16 1/2 TUBE	1
29.	72532658	ELBOW #8MJIC #8FJIC SW	1
30.	72532690	ELBOW #4MJIC #4FJIC SW	2
31.	72532699	ELBOW #6MSTR #4MJIC 90°	3
32.	72532700	ELBOW 9/16MSTR9/16MJIC90°XLG	3
33.	72532707	ADPTR #4MJIC #6FJIC	3
34.	72532722	ADPTR #10MSTR #6FSTR	6
35.	72532696	ELBOW #12MJIC #12FJIC SW	1
36.	71392277	DECAL-OUTRG POWER OUT	1
37.	76391511	DECAL-UP & DOWN STAB. R&L	1
38.	89034049	SPIRAL WRAP-BLK (SEE NOTE)	4'
39.	99900644	MANUAL-AUX OUTRG	1
40.	51731580	HANDLE ASM (INCLS: 34-41) (PART OF 5)	2REF
41.	70142648	PIVOT LEVER (PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	LEVER-CTRL HDL (PART OF 40)	2REF
44.	71392269	KNOB-CTRL HDL (PART OF 40)	2REF
45.	72062021	NUT 5/16-18 HEX (PART OF 40)	2REF
46.	72062024	NUT 1/2-13 HEX (PART OF 40)	2REF
47.	72066162	COTTER PIN (PART OF 40)	4REF
48.	72661204	PIN-CLEVIS (PART OF 40)	4REF
49.	51703939	HOSE ASM 1/2X96 FF	1
50.	72532972	ADPTR #8MJIC #12FJIC	1
51.	70392864	DECAL-DGR OUTRG STD CLR	2
52.	70392867	DECAL-DGR OUTRG (MOVING)	1
53.	71392257	DECAL-OUTRG PWR DWN SS	1
54.	72533567	ELBOW #4MSTR #4MJIC XLG	2



OPTION-OUTRIGGER KIT-PO/PD-7X5 (31712731)

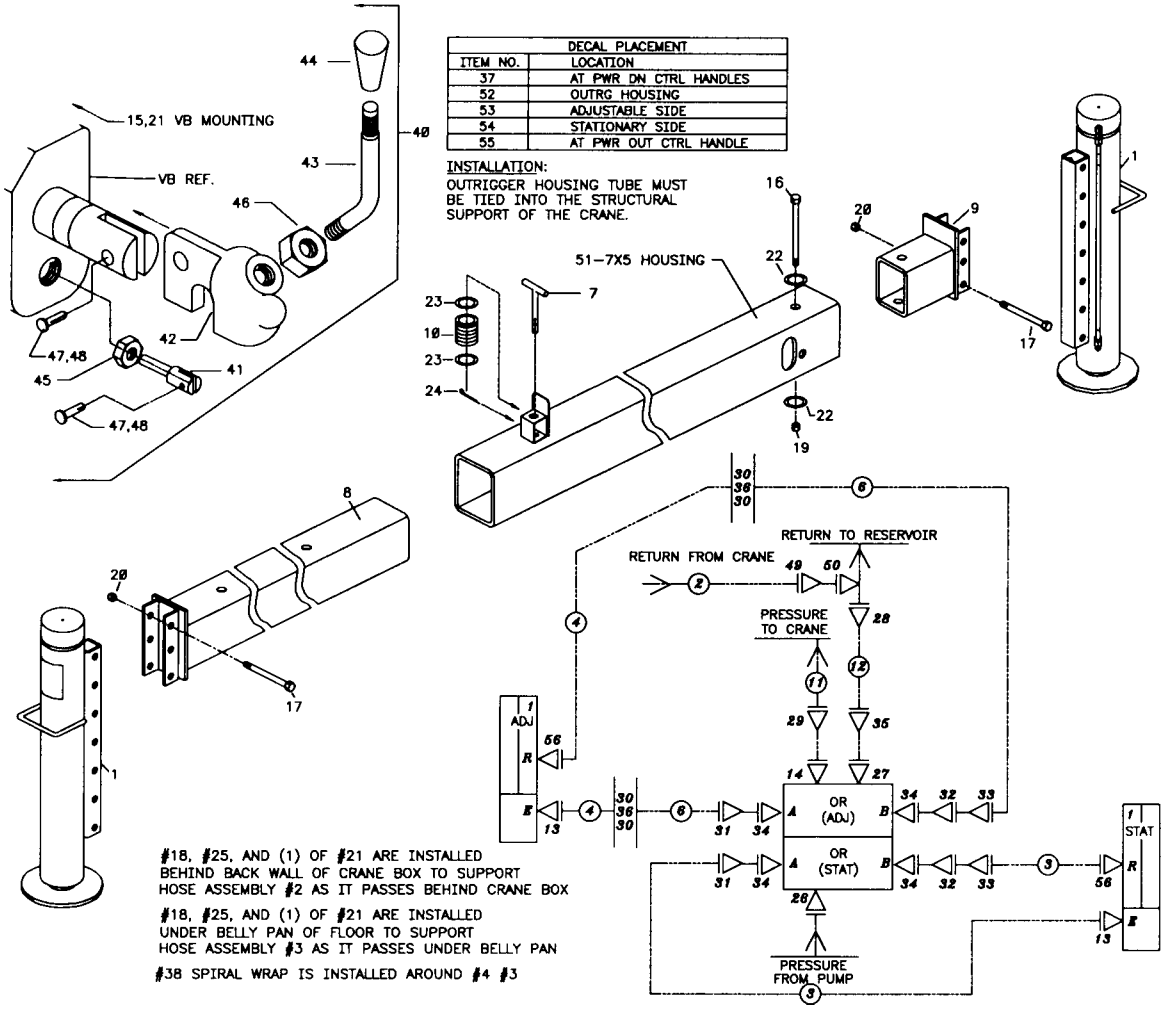
ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER	2
2.	51394690	HOSE 1/2X153 8F8F (PART OF 55)	1REF
3.	51394693	HOSE 1/4X130-1/2 4F4F (PART 55)	2REF
4.	51394691	HOSE 1/4X38-1/2 4F4F(PART OF 55)	2REF
5.	51705984	VALVEBANK 3-SECT (INCL:40)	1
6.	60118680	TUBE	1REF
7.	3B142860	CYLINDER-PWR OUT	1
8.	52712735	ARM-ADJUSTABLE	1
9.	52712736	ARM-STATIONARY	1
10.	51394914	HOSE 1/4X108 4F4F (PART OF 55)	2REF
11.	72661472	PIN	1
12.	51394915	HOSE 3/4X48 12F12F (PART OF 55)	1REF
13.	72053758	ELBOW #4MSTR #4MJIC 90°	2
14.	72053764	ELBOW #10MSTR #8MJIC 90°	1
15.	72060025	CAP SCR 5/16-18X1 HHGR5	3
16.	72060107	CAP SCR 1/2-13X8 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR 5/16-18X3/4 THRDCTG (NOTE)	2
19.	72062080	NUT 1/2-13 LOCK	2
20.	72062091	NUT 5/8-11 LOCK	4
21.	72063002	WASHER 5/16 WRT	5
22.	72063005	WASHER 1/2 WRT	2
23.	72532351	ADAPTER #4MSTR #4MJIC	2
24.	72601297	CAP SCR 1/2-13X5-3/4 HHGR5	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADAPTER #8MSTR #8MJIC	1
27.	72532365	ADAPTER #10MSTR #12MJIC	1
28.	72531205	TEE 3/4MJIC 1/2TUBE	1
29.	72532658	ELBOW #8MJIC #8FJIC SW	1
30.	72532690	ELBOW #4MJIC #4FJIC SW	2
31.	72532699	ELBOW #6MSTR #4MJIC 90°	3
32.	72532700	ELBOW #6MSTR #6MJIC 90° XLG	3
33.	72532707	ADAPTER #4MJIC #6FJIC	3
34.	72532722	ADAPTER #10MSTR #6FSTR	6
35.	72532696	ELBOW #12MJIC #12FJIC SW	1
36.	71392277	DECAL-PWR OUT	1
37.	76391511	DECAL-STABILIZER	1
38.	89034049	SPIRAL WRAP (SEE NOTE)	4
'39.	99900644	MANUAL-OUTRIGGER	1
40.	51731580	HANDLE (INCL:41-48,PART OF 5)	2REF
41.	70142648	PIVOT-LEVER (PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	LEVER-CTRL (PART OF 40)	2REF
44.	71392269	KNOB (PART OF 40)	2REF
45.	72062021	NUT 5/16-18 HEXJAM (PART OF 40)	2REF
46.	72062024	NUT 1/2-13 HEXJAM (PART OF 40)	2REF
47.	72066162	COTTER PIN (PART OF 40)	4REF
48.	72661204	CLEVIS PIN (PART OF 40)	4REF
49.	51394916	HOSE 1/2X99 8F8F (PART OF 55)	1REF
50.	72532972	ADAPTER #8MJIC #12FJIC	1
51.	72532980	ADAPTER #8JIC PR SW IN-LINE	1
52.	51394115	HOSE 1/4X59 4F4F (PART OF 55)	2REF
53.	72532690	ELBOW #4MJIC #4FJIC SW	4
54.	72533024	UNION-BULKHD #4JIC	2
55.	51714497	HOSE KIT-7X5 PO/PD OUTRG KIT (INCLS: 2,3,4,10,12,49,52)	1
56.	72533567	ELBOW #4MSTR #4MJIC XLG	2



OPTION-AUX OUTRIGGERS-MO/PD-7X5 (31712740)

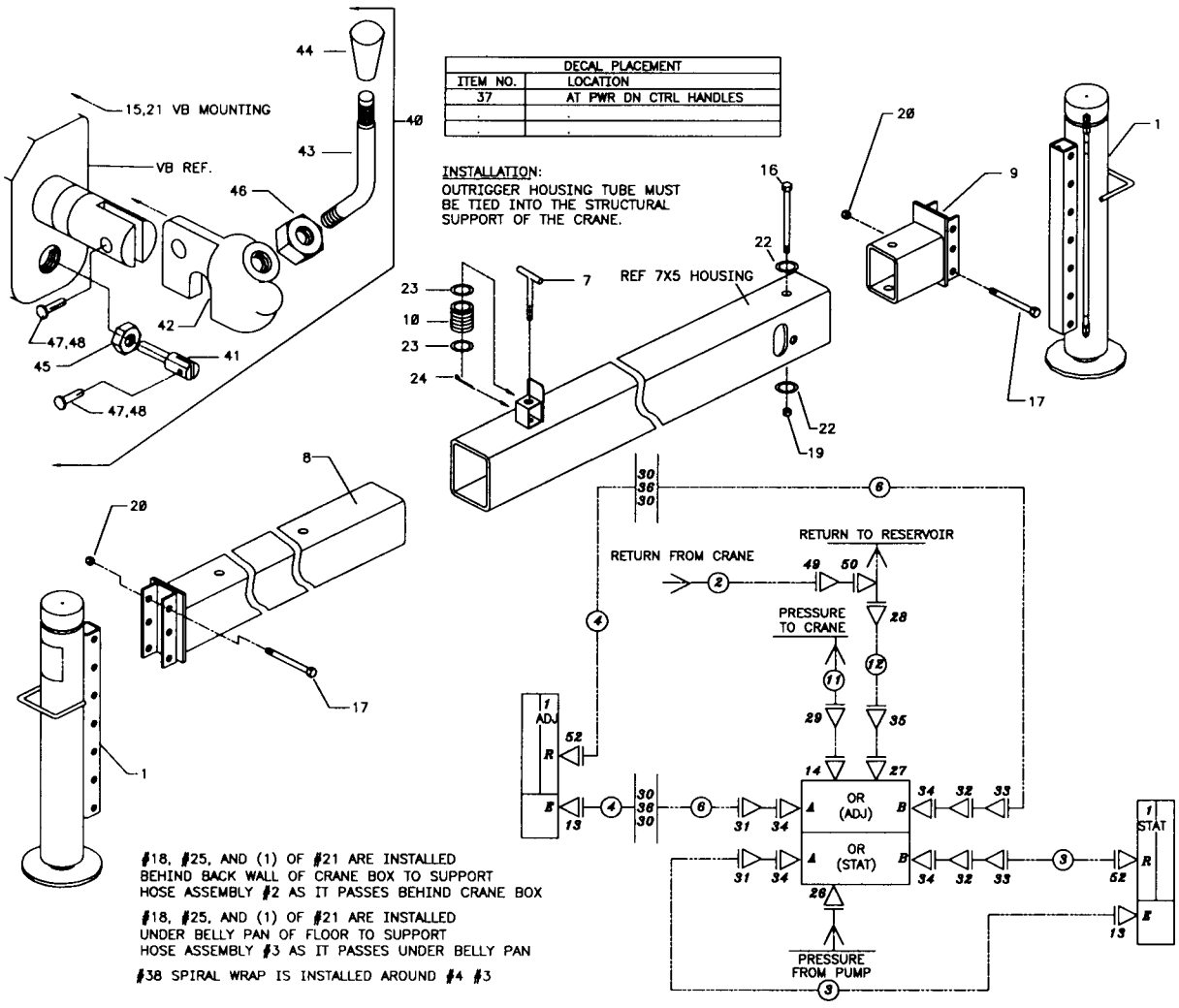
(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER	2
2.	51703939	HOSE 1/2X96 FF	1
3.	51705364	HOSE 1/4X128 FF	2
4.	51705365	HOSE 1/4X56 FF	2
5.	51705983	VALVEBANK 2-SECT (INCLS: 40)	1
6.	51706152	HOSE 1/4X36 FF	2
7.	52070138	T-PIN	1
8.	52712735	ARM-ADJUSTABLE	1
9.	52712736	ARM-STATIONARY	1
10.	60010351	SPRING	1
11.	51705639	HOSE 1/2X150 FF	1
12.	51703296	HOSE 3/4X48 FF	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	2
14.	72053764	ELBOW #10MSTR #8MJIC 90°	1
15.	72060025	CAP SCR 5/16-18X1 HHGR5	3
16.	72060107	CAP SCR 1/2-13X8 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR 5/16-18X3/4THRDCTG(NOTE)	2
19.	72062080	NUT 1/2-13 LOCK	1
20.	72062091	NUT 5/8-11 LOCK	4
21.	72063002	WASHER 5/16W FLAT	5
22.	72063005	WASHER 1/2W FLAT	2
23.	72063027	BUSHING-MACH	2
24.	72066185	COTTER PIN 5/32X1	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADPTR #8MSTR #8MJIC	1
27.	72532365	ADPTR #10MSTR #12MJIC	1
28.	72531205	TEE-MJIC 3/4-16 1/2TUBE	1
29.	72532658	ELBOW #8MJIC #8FJIC SW	1
30.	72532690	ELBOW #4MJIC #4FJIC SW	4
31.	72532699	ELBOW #6MSTR #4MJIC 90°	2
32.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	2
33.	72532707	ADPTR #4MJIC #6FJIC	2
34.	72532722	ADPTR #10MSTR #6FSTR	4
35.	72532696	ELBOW #12MJIC #12FJIC SW	1
36.	72533024	UNION	2
37.	76391511	DECAL-UP & DOWN STAB R&L	1
38.	89034049	SPIRAL WRAP-BLK (SEE NOTE)	4'
39.	99900644	MANUAL-AUX OUTRGS	1
40.	51731580	HANDLE ASM (INCL:34-41) (PART OF 5)	2REF
41.	70142648	LEVER PIVOT (PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	LEVER (PART OF 40)	2REF
44.	71392269	KNOB (PART OF 40)	2REF
45.	72062021	NUT 5/16-18 JAM (PART OF 40)	2REF
46.	72062024	NUT 1/2-13 JAM (PART OF 40)	2REF
47.	72066162	COTTER PIN (PART OF 40)	4REF
48.	72661204	CLEVIS PIN (PART OF 40)	4REF
49.	72532972	ADPTR #8MJIC #12FJIC	1
50.	72532980	ADPTR PR SW IN-LINE 3/4JIC	1
51.	52712734	OUTRG HSG 7X5	1
52.	70392864	DECAL-DGR STAND CLEAR	2
53.	70392867	DECAL-DGR OUTRG MOVING	1
54.	71392257	DECAL-OUTRG PWR DWN SS	1
55.	71392277	DECAL-OUTRG PWR OUT	1
56.	72533567	ELBOW #4MSTR #4MJIC XLG	2



OPTION-OUTRIGGER KIT-MO/PD-7X5 (31712732)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER	2
2.	51394916	HOSE 1/2X99 8F8F (PART OF 51)	1
3.	51394693	HOSE 1/4X130-1/2 4F4F (PART 51)	2
4.	51394115	HOSE 1/4X59 4F4F (PART OF 51)	2
5.	51705983	VALVEBANK 2-SECT (INCL:40)	1
6.	51394691	HOSE 1/4X38-1/2 4F4F (PART 51)	2
7.	52070138	T-PIN	1
8.	52712735	ARM-ADJUSTABLE	1
9.	52712736	ARM-STATIONARY	1
10.	60010351	SPRING	1
11.	51394690	HOSE 1/2X153 8F8F (PART OF 51)	1
12.	51394689	HOSE 3/4X51 12F12F (PART OF 51)	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	2
14.	72053764	ELBOW #10MSTR #8MJIC 90°	1
15.	72060025	CAP SCR 5/16-18X1 HHGR5	3
16.	72060107	CAP SCR 1/2-13X8 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR-5/16-18X3/4THRDCTG(NOTE)	2
19.	72062080	NUT 1/2-13 LOCK	1
20.	72062091	NUT 5/8-11 LOCK	4
21.	72063002	WASHER 5/16W FLAT	5
22.	72063005	WASHER 1/2W FLAT	2
23.	72063027	BUSHING-MACHY 5/8X14GA	2
24.	72066185	COTTER PIN 5/32X1	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADAPTER MSTR MJIC	1
27.	72532365	ADPTR #10MSTR #12MJIC	1
28.	72531205	TEE MJIC 3/4-16 1/2TUBE	1
29.	72532658	ELBOW #8MJIC #8FJIC SWVL	1
30.	72532690	ELBOW #4MJIC #4FJIC SWVL	4
31.	72532699	ELBOW #6MSTR #4MJIC 90°	2
32.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	2
33.	72532707	ADPTR #4MJIC #6FJIC	2
34.	72532722	ADPTR #10MSTR #6FSTR	4
35.	72532696	ELBOW #12MJIC #12FJIC SWVL	1
36.	72533024	BULKHEAD UNION #4JIC	2
37.	76391511	DECAL-UP & DWN STAB R&L	1
38.	89034049	SPIRAL WRAP-BLK (SEE NOTE)	4
'39.	99900644	MANUAL-AUX OUTRGS	1
40.	51731580	HANDLE ASM (INCL:34-41)(PART OF 5)	2REF
41.	70142648	LEVER PIVOT (PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	LEVER (PART OF 40)	2REF
44.	71392269	KNOB (PART OF 40)	2REF
45.	72062021	NUT 5/16-18 JAM (PART OF 40)	2REF
46.	72062024	NUT 1/2-13 JAM (PART OF 40)	2REF
47.	72066162	COTTER PIN (PART OF 40)	4REF
48.	72661204	CLEVIS PIN (PART OF 40)	4REF
49.	72532972	ADPTR #8MJIC #12FJIC	1
50.	72532980	ADAPTER 3/4JIC IN-LINE PR SW	1
51.	51714498	HOSE KIT (INCL: 2,3,4,6,11,12)	1
52.	72533567	ELBOW #4MSTR #4MJIC XLG	2



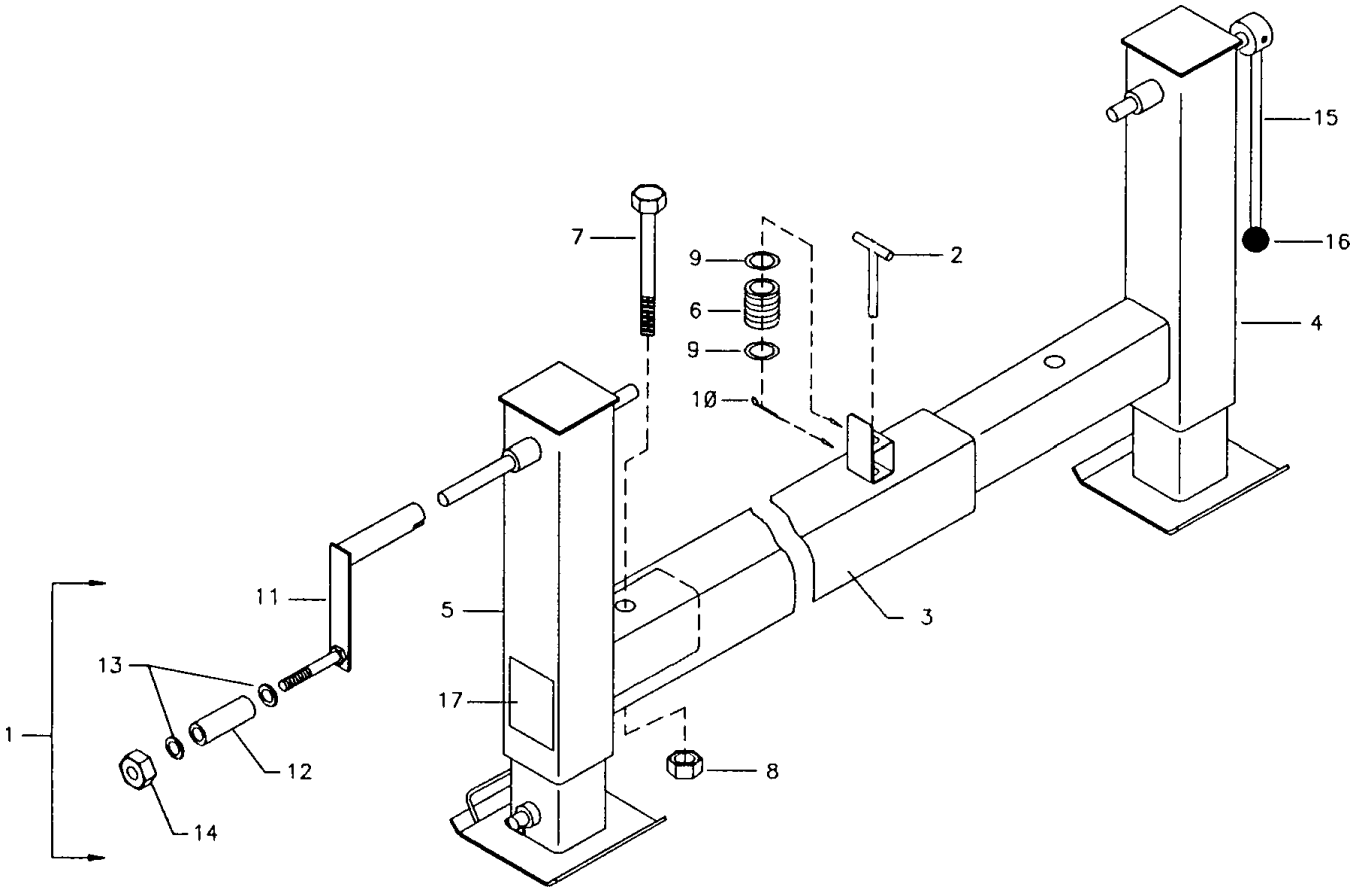
OPTION-AUX OUTRIGGERS-MO/CRANK DN-7X5 (31712741)

(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51705040	CRANK ASM (INCL:11-14)	1
2.	52070138	T-PIN	1
3.	52712734	OUTRIGGER HOUSING 7X5	1
4.	52712737	ARM-ADJUSTABLE	1
5.	52712738	ARM-STATIONARY	1
6.	60010351	SPRING	1
7.	72060107	CAP SCR 1/2-13X8 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063007	WASHER 5/8 WRT	2
10.	72066185	COTTER PIN 5/32X1	1
11.	52705039	CRANK (PART OF 1)	1REF
12.	60030099	ROLLER (PART OF 1)	1REF
13.	72063003	WASHER 3/8 WRT (PART OF 1)	2REF
14.	72062103	NUT 3/8-16 LOCK (PART OF 1)	1REF
15.	52703319	CRANK HANDLE	1
16.	71039096	KNOB	1
17.	70392864	DECAL-DANGER STAND CLEAR	2

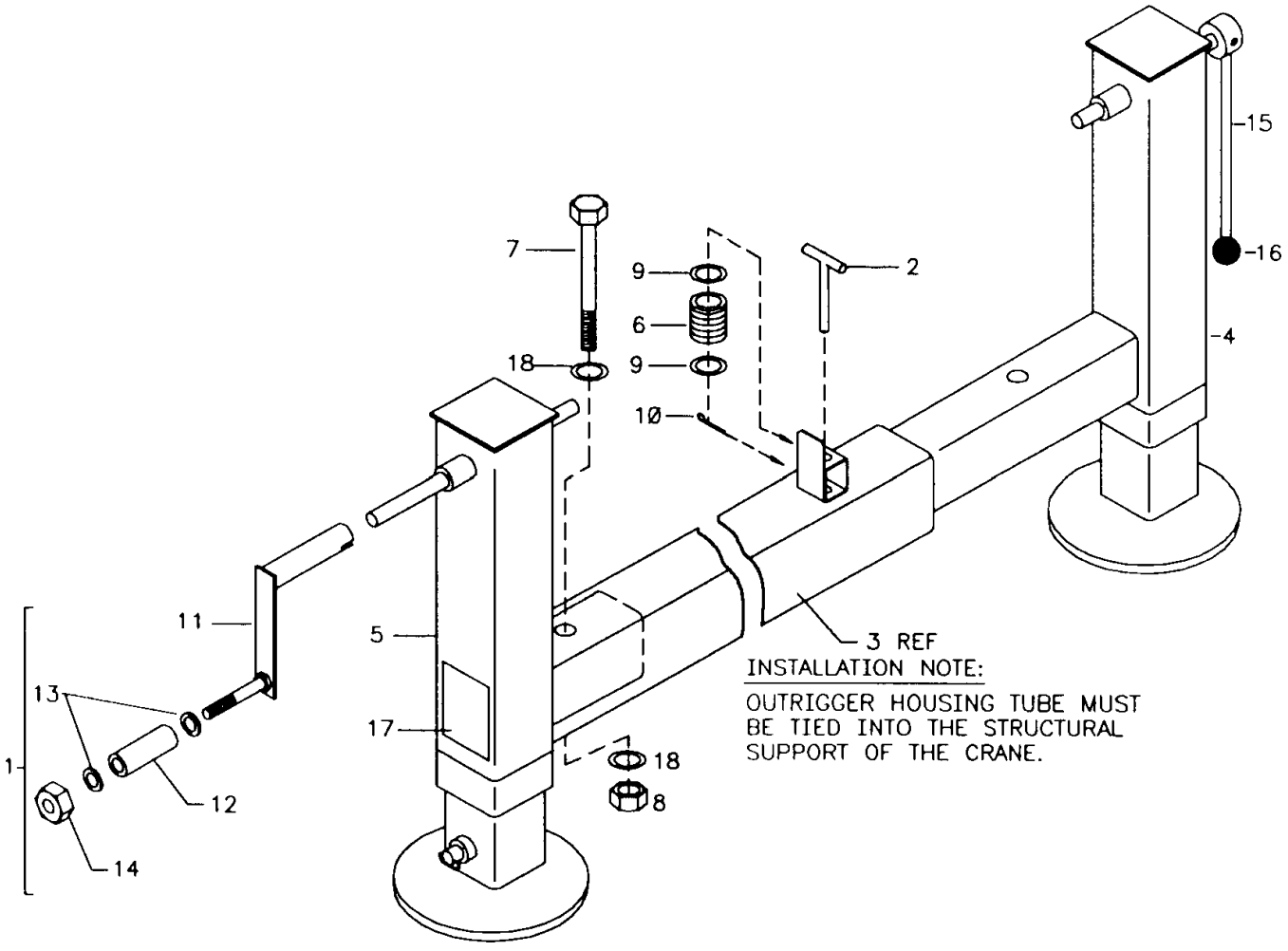
INSTALLATION NOTE

OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



OPTION-OUTRIGGER KIT-MO/CRANK DN-7X5 (31712733)

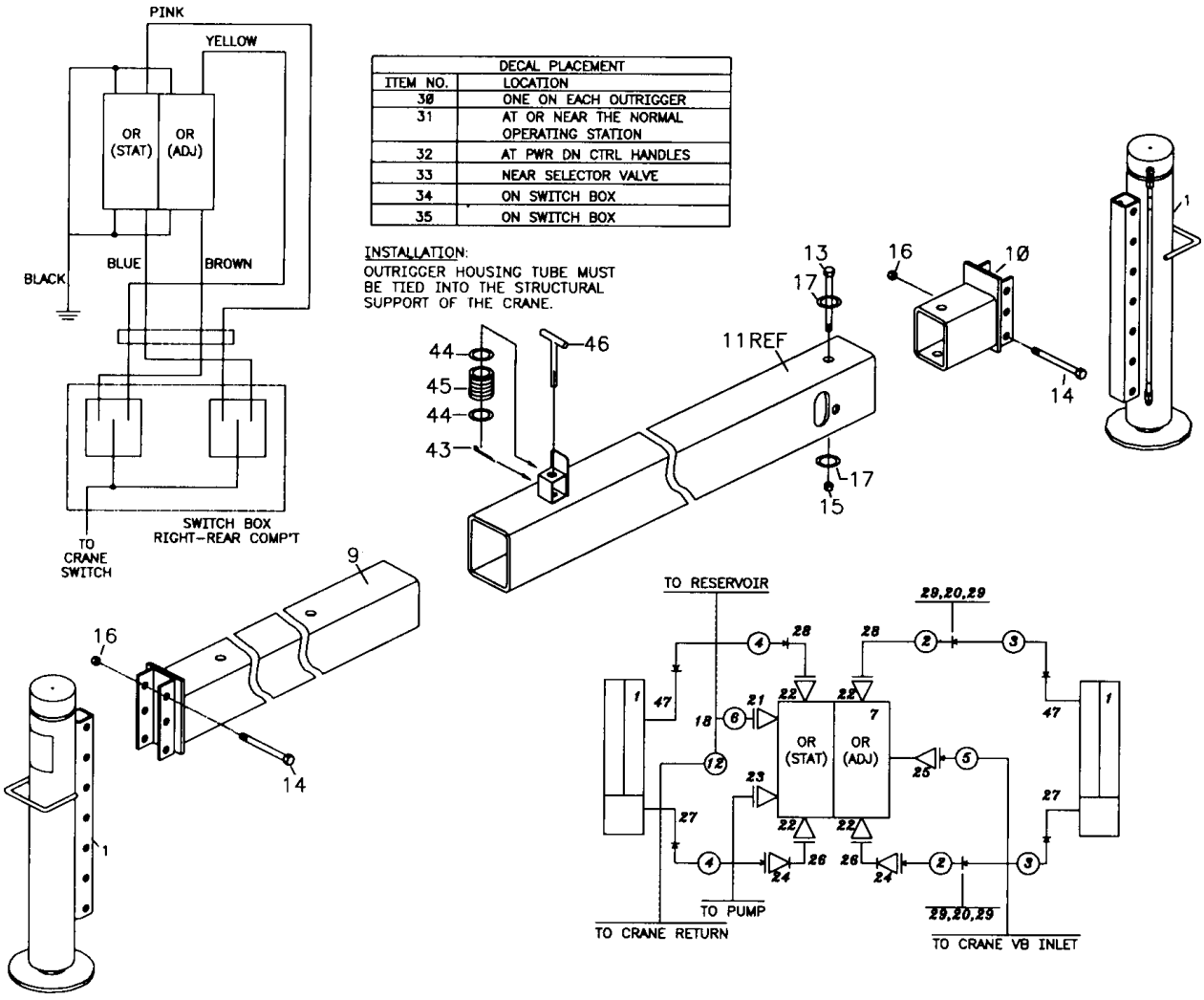
ITEM	PART NO.	DESCRIPTION	QTY
1.	51705040	CRANK ASM (INCL:11-14)	1
2.	52070138	T-PIN	1
3.		OUTRIGGER HOUSING 7X5	REF
4.	52712737	ARM-ADJUSTABLE	1
5.	52712738	ARM-STATIONARY	1
6.	60010351	SPRING	1
7.	72060107	CAP SCR 1/2-13X8 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063027	MACH BUSHING 5/8	2
10.	72066185	COTTER PIN 5/32X1	1
11.	52705039	CRANK (PART OF 1)	1REF
12.	60030099	ROLLER (PART OF 1)	1REF
13.	72063003	WASHER 3/8 WRT (PART OF 1)	2REF
14.	72062103	NUT 3/8-16 LOCK (PART OF 1)	1REF
15.	52703319	CRANK HANDLE	1
16.	71039096	KNOB	1
17.	70392864	DECAL-DANGER STAND CLEAR	2
18.	72063005	WASHER 1/2 WRT	2



OPTION-OUTRIGGER KIT-ELEC PO/MD-7X5 (31712886)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER	2
2.	51710569	HOSE ASM 1/4X36 FF	2
3.	51704024	HOSE ASM 1/4X54 FF	2
4.	51705364	HOSE ASM 1/4X128 FF	2
5.	51703939	HOSE ASM 1/2X96 FF	1
6.	51707005	HOSE ASM 3/4X39 FF	1
7.	73732445	VALVEBANK 2-SECT 7GPM	1
8.	60114313	GUARD-SWITCH BOX	1*
9.	52712735	ARM-ADJUSTABLE	1
10.	52712736	ARM-STATIONARY	1
11.		OUTRIGGER HOUSING	REF
12.	72532980	ADAPTER #8JIC IN-LINE PR SW	1
13.	72060107	CAP SCR 1/2-13X8 HHGR5	1
14.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
15.	72062080	NUT 1/2-13 LOCK	1
16.	72062091	NUT 5/8-11 LOCK	4
17.	72063005	WASHER 1/2 WRT	2
18.	72532695	TEE #12MJIC 3/4TUBE	1
20.	72533024	UNION #4JIC 37° W/NUT	2
21.	72532365	ADAPTER #10MSTR #12MJIC	1
22.	72532722	ADAPTER #10MSTR #6FSTR	4
23.	72532358	ADAPTER #8MSTR #8MJIC	1
24.	72532707	ADAPTER #4MJIC #6MJIC	2
25.	72053764	ELBOW #10MSTR #8MJIC 90°	1
26.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	2
27.	72053758	ELBOW #4MSTR #4MJIC 90°	2
28.	72532699	ELBOW #6MSTR #4MJIC 90°	2
29.	72532690	ELBOW #4MJIC #4FJIC SWVL	4
30.	70392864	DECAL-DANGER STAND CLEAR	2
31.	70392867	DECAL-DGR OUTRGR MOVING	1
32.	71392257	DECAL-CONTROL PD SS	1
33.	70393467	DECAL-SELECTOR VALVE	1
34.	71392971	DECAL-CTRL LH	1
35.	71392972	DECAL-CTRL RH	1
36.	73054420	SELECTOR VALVE 24GPM	1*
37.	77040137	TERMINAL 1/4 FSLPON 12-10GA	4*
38.	77040186	TERMINAL 1/4 FSLPON 16-14GA	6*
39.	77041197	JIC BOX	1*
40.	77041345	TOGGLE SWITCH-SGL THROW	1*
41.	77041346	TOGGLE SWITCH-DBL THROW	2*
42.	89044354	CABLE-14GA 6WIRE	5*
43.	72066185	COTTER PIN .16X1	1
44.	72063027	MACH BUSHING 5/8	2
45.	60010351	SPRING	1
46.	52070138	T-PIN	1
47.	72533567	ELBOW #4MSTR #4MJIC XLG	2

* NOT SHOWN



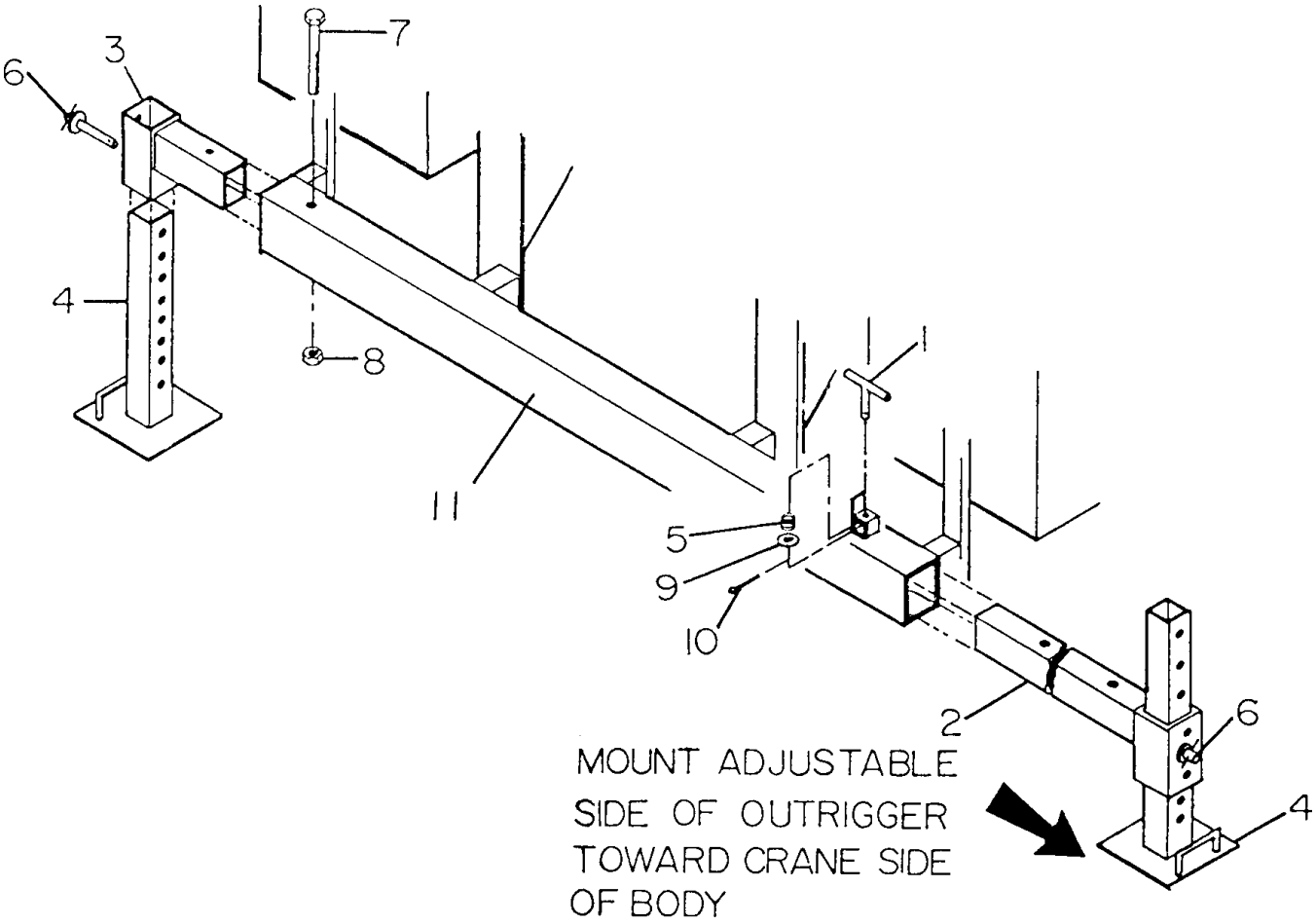
OPTION-AUX OUTRIGGERS-MO/MD-7X5 (31712902)

(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52070138	T-PIN	1
2.	52712889	ARM-ADJUSTABLE	1
3.	52712890	ARM-STATIONARY	1
4.	52703353	LEG	2
5.	60010351	SPRING	1
6.	71731361	T-PIN-QUICK RELEASE	2
7.	72060107	CAP SCR 1/2-13X8 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063007	WASHER 5/8 WRT	1
10.	72066185	COTTER PIN 1/16X1	1
11.	52712734	OUTRIGGER HOUSING 7X5	1

INSTALLATION NOTE

OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



CYLINDER-PWR DN (3B288970)

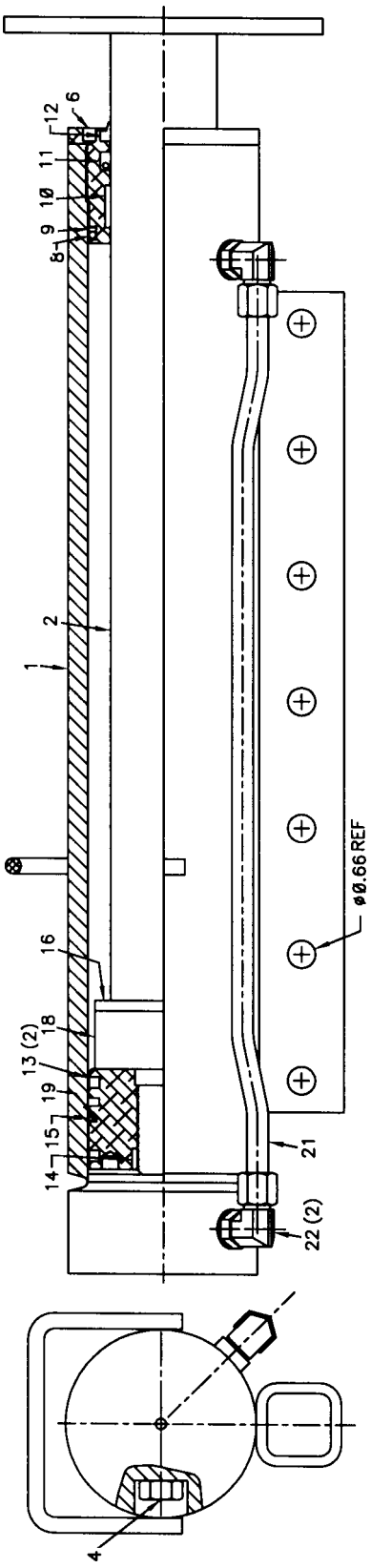
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B288970	CASE ASM	1
2.	4G048870	ROD ASM	1
4.	73054681	VALVE	1
6.	6H350025	HEAD	1
7.	6I035125	PISTON	1
8.	7Q072338	O-RING (PART OF 17)	1REF
9.	7Q10P338	BACK-UP RING (PART OF 17)	1REF
10.	7T2N8027	WEAR RING (PART OF 17)	1REF
11.	7R546025	ROD SEAL (PART OF 17)	1REF
12.	7R14P025	ROD WIPER (PART OF 17)	1REF
13.	7T65I035	PISTON RING (PART OF 17)	2REF
14.	7T61N125	LOCK RING SEAL (PART OF 17)	1REF
15.	7T66P035	PISTON SEAL (PART OF 17)	1REF
16.	6A025025	WAFER LOCK (PART OF 17)	1REF
17.	9C142020	SEAL KIT (INCL:8-16,19)	1
18.	6C015025	STOP TUBE	1
19.	7Q072151	O-RING (PART OF 17)	1REF
21.	5P288970	PORT TUBE	1
22.	72053763	ELBOW #8MSTR #8MJIC 90°	2

NOTE

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

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

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



CYLINDER-PWR OUT (3B142860)

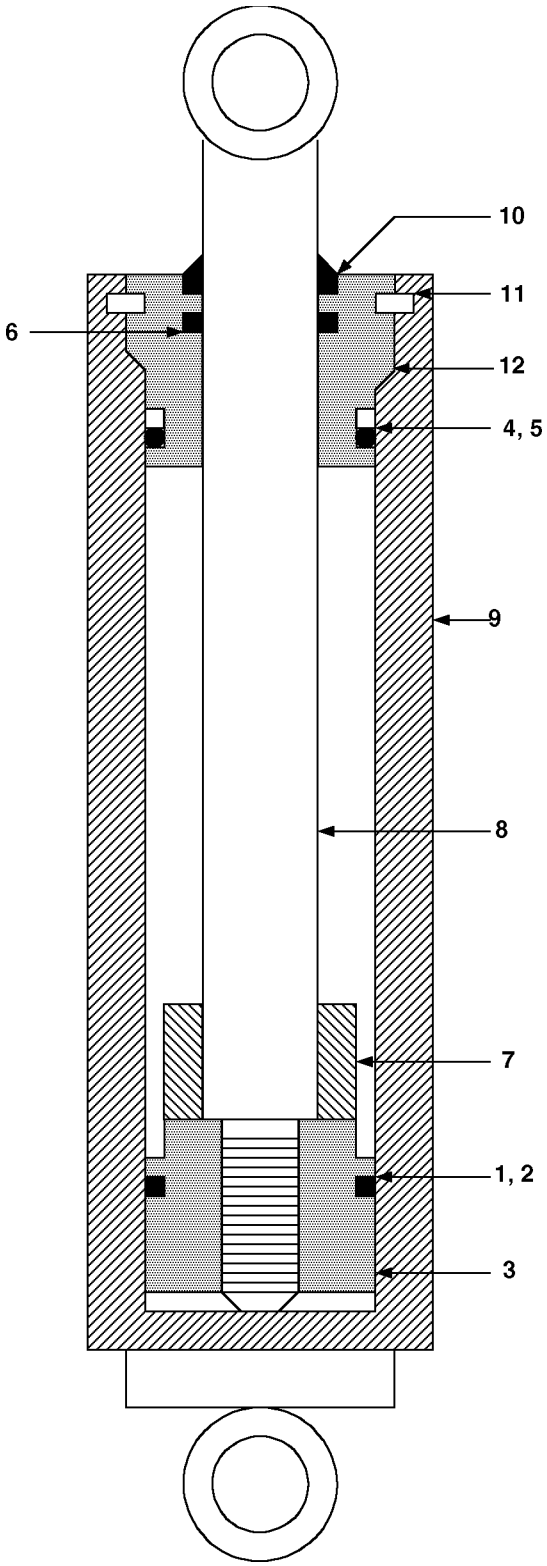
ITEM	PART NO.	DESCRIPTION	QTY
1.	7Q072021	O-RING (PART OF 13)	1REF
2.	7T66P012	PISTON SEAL (PART OF 13)	1REF
3.	6I012050	PISTON	1
4.	7Q072214	O-RING (PART OF 13)	1REF
5.	7Q10P214	BACK-UP RING (PART OF 13)	1REF
6.	7R100750	ROD SEAL (PART OF 13)	1REF
7.	6C125007	STOP TUBE	1
8.	4G142860	ROD ASM	1
9.	4B142860	CASE ASM	1
10.	7R13P007	ROD WIPER (PART OF 13)	1REF
11.	72066029	RETAINING RING	1
12.	6H012007	HEAD	1
13.	9B050608	SEAL KIT (INCL:1,2,4-6,10)	1

NOTE

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

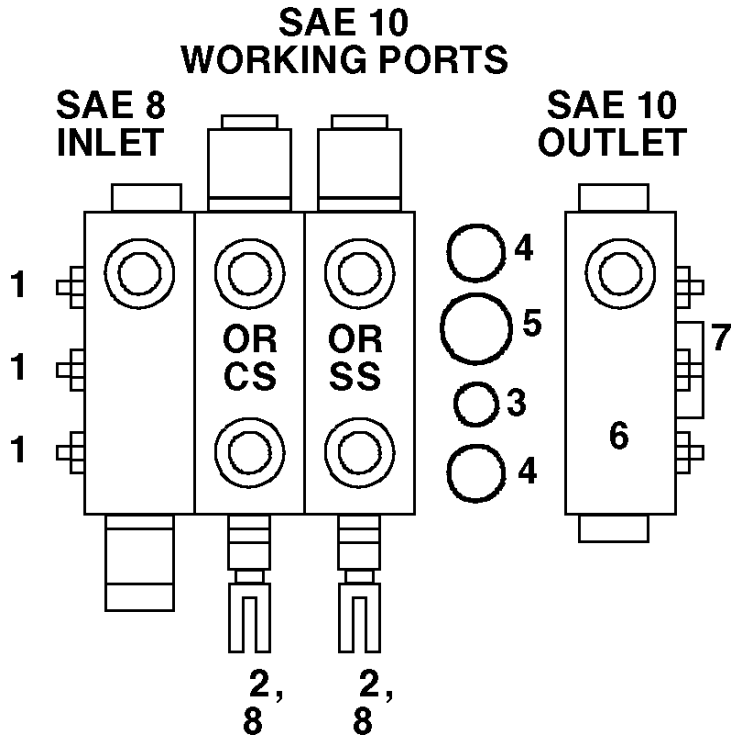
APPLY “LUBRIPLATE #630-2” MEDIUM HEAVY,MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

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



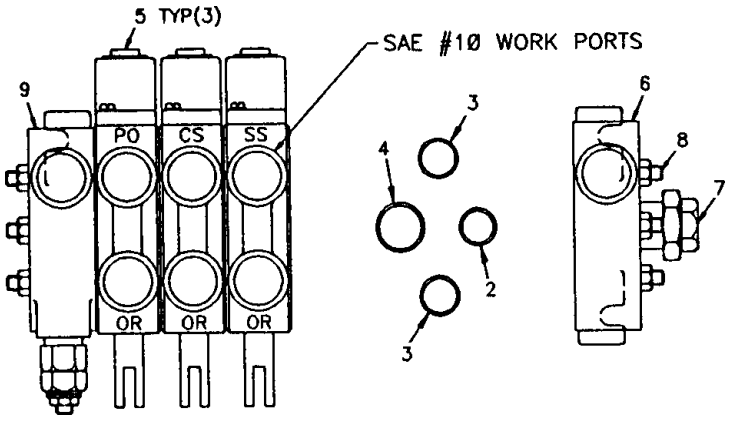
VALVEBANK ASM-2 SECT (51705983)

ITEM	PART NO.	DESCRIPTION	QTY
1.	94731764	TIE ROD KIT	3
2.	73054490	TANDEM VALVE SECTION	2
3.	7Q072017	O-RING SM	3
4.	7Q072018	O-RING MED	6
5.	7Q072021	O-RING LG	3
6.	73731576	END CAP - RH	1
7.	73731763	POWER BEYOND SLEEVE	1
8.	51731580	LEVER ASM (NOT SHOWN)	2



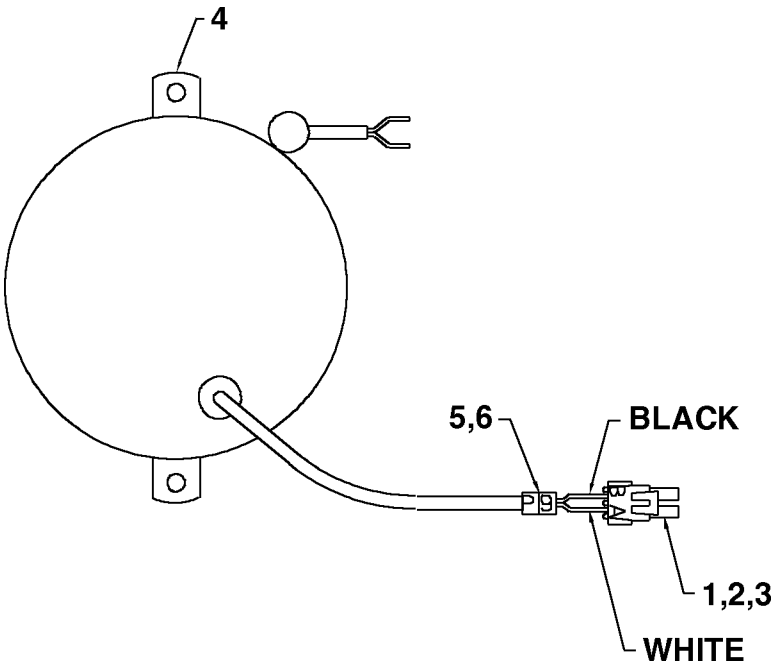
VALVEBANK ASM-3 SECT (51705984)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51731580	LEVER ASM (NOT SHOWN)	3
2.	7Q072017	O-RING SM	4
3.	7Q072018	O-RING MED	8
4.	7Q072021	O-RING LG	4
5.	73054490	TANDEM VALVE SECTION	3
6.	73731576	END CAP - RH	1
7.	73731763	POWER BEYOND SLEEVE	1
8.	94731764	TIE ROD KIT	3
9.	73054488	END COVER LH	1



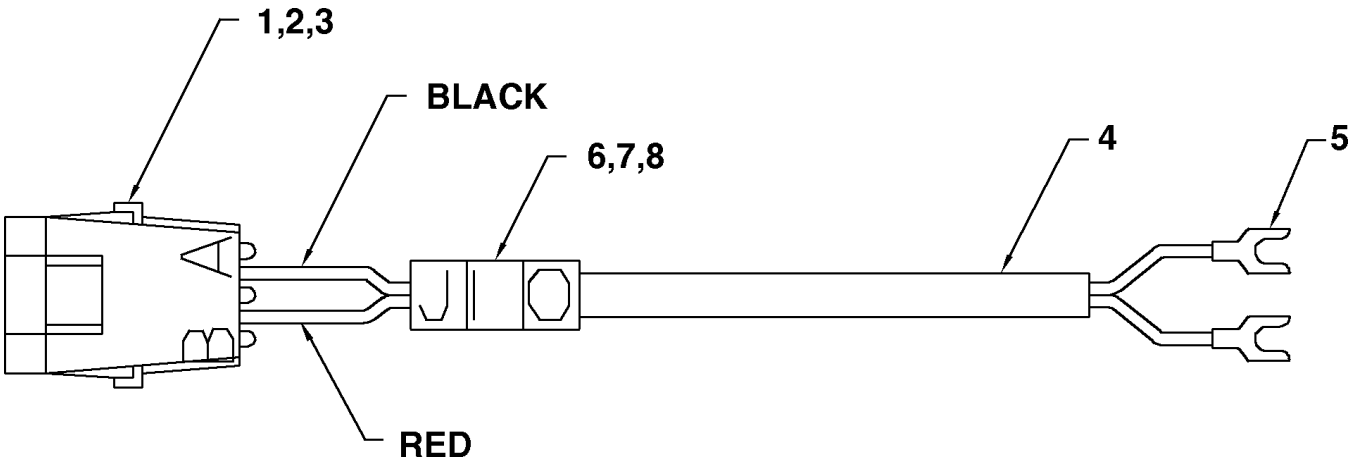
CORD REEL ASM (51713168)

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044574	TOWER CONNECTOR	1
2.	77044552	PIN 18-20GA	2
3.	70394069	CABLE SEAL	2
4.	70732193	CORD REEL	1
5.	77041493	WIRE MARKER-PA2-P-YEL	1
6.	77041491	WIRE MARKER-PA2-9-YEL	1



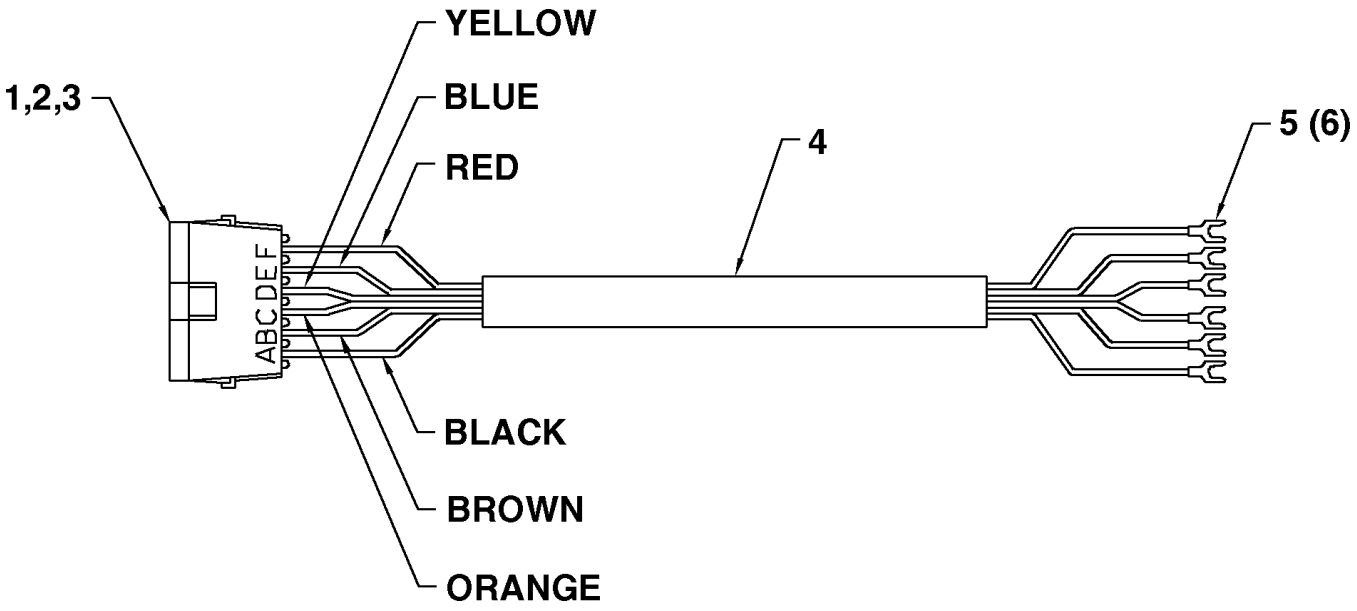
CABLE ASM 14GA 2WIRE X 30" (51713167)

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044573	SHROUD CONNECTOR	1
2.	77044550	TERMINAL PIN	2
3.	70394069	CABLE SEAL	2
4.	89044188	CABLE	1
5.	77040051	TERMINAL-SPRSPADE	2
6.	77041492	WIRE MARKER PA2-J-YEL	1
7.	77041490	WIRE MARKER PA2-1-YEL	1
8.	77041489	WIRE MARKER PA2-0-YEL	1



CABLE ASM 14GA 6WIRE X 35' (51713199)

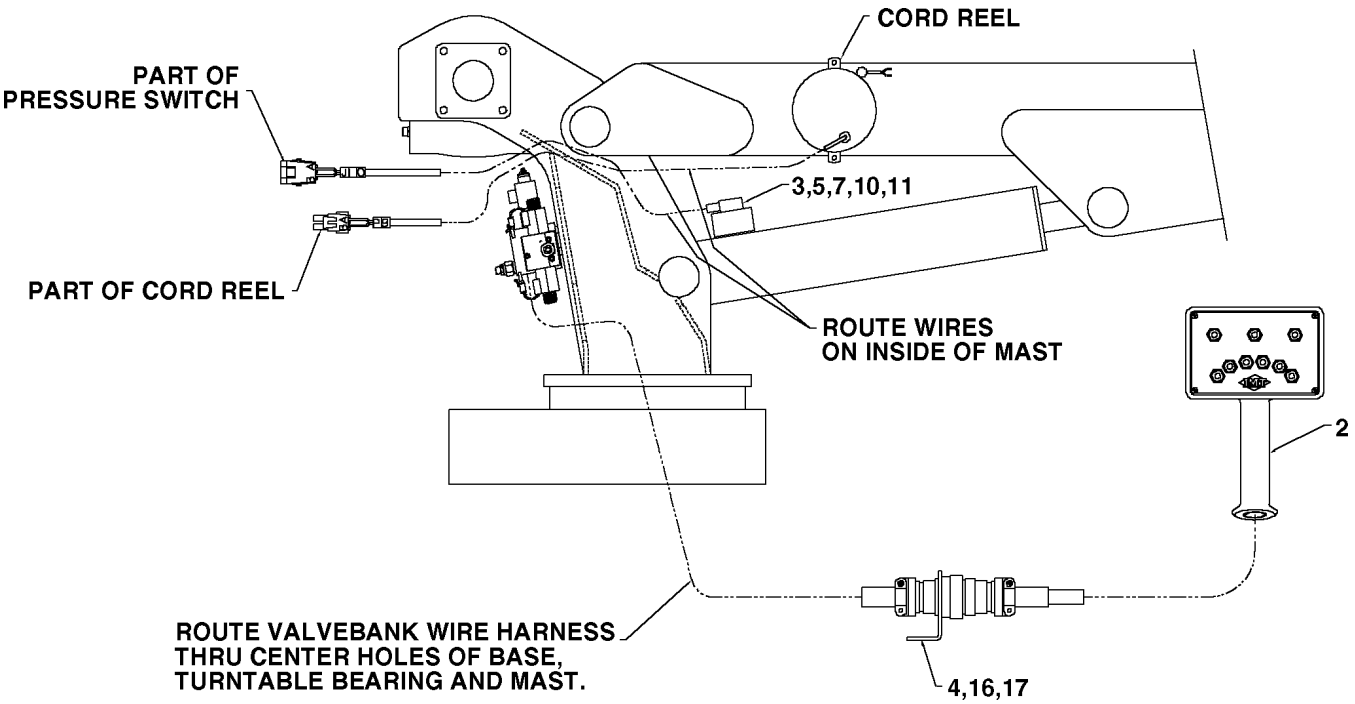
ITEM	PART NO.	DESCRIPTION	QTY
1.	77044575	SHROUD CONNECTOR	1
2.	77044552	TERMINAL	6
3.	70394069	CABLE SEAL	6
4.	89044354	CABLE	1
5.	77040051	TERMINAL-SPRSPADE	6



ELECTRICAL WIRE ROUTING-PROP'L VALVE (90713192)

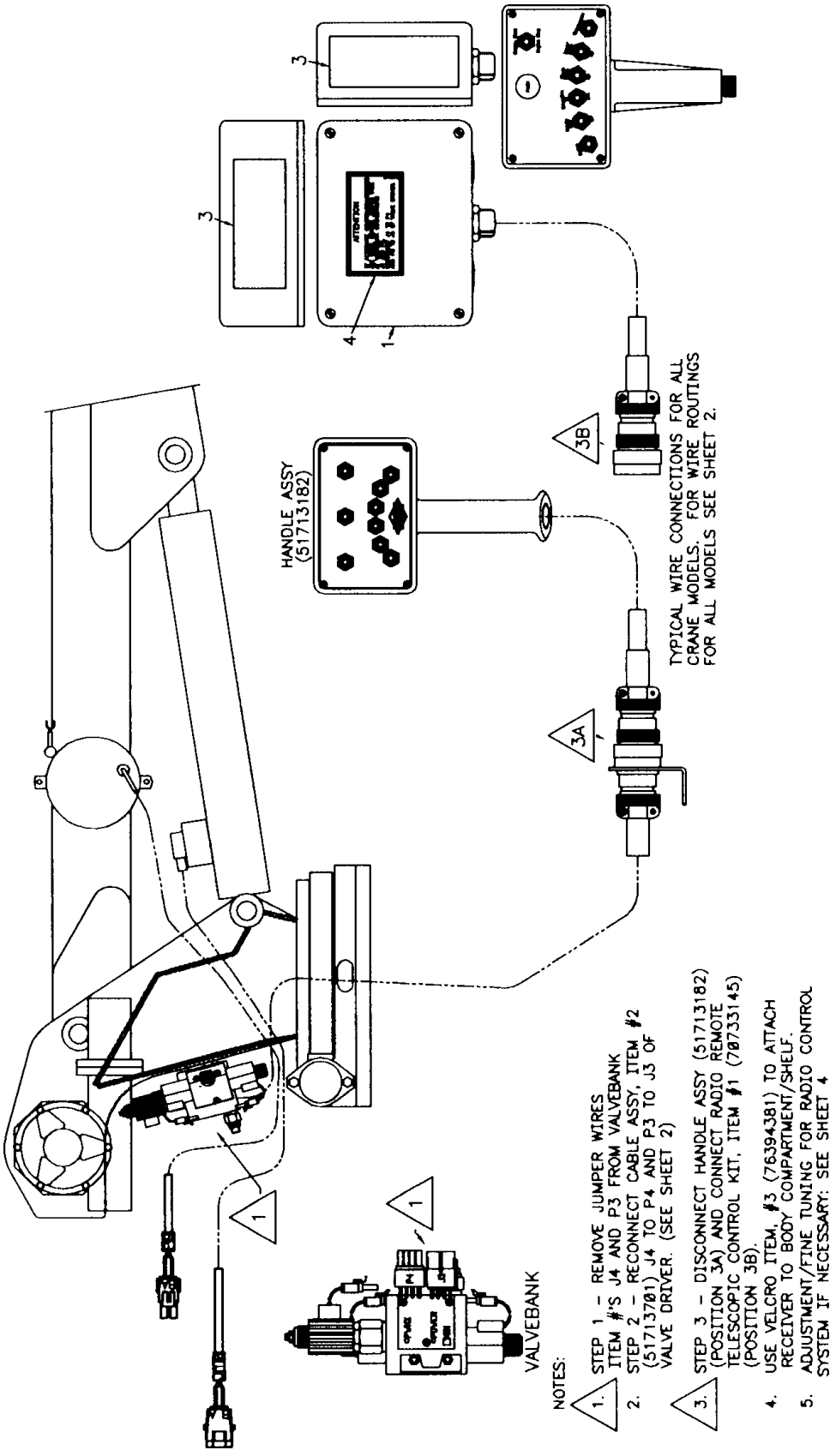
NOTE

SEE DRAWING 99900855 FOR WIRE CONNECTIONS AND ELECTRICAL SCHEMATIC.



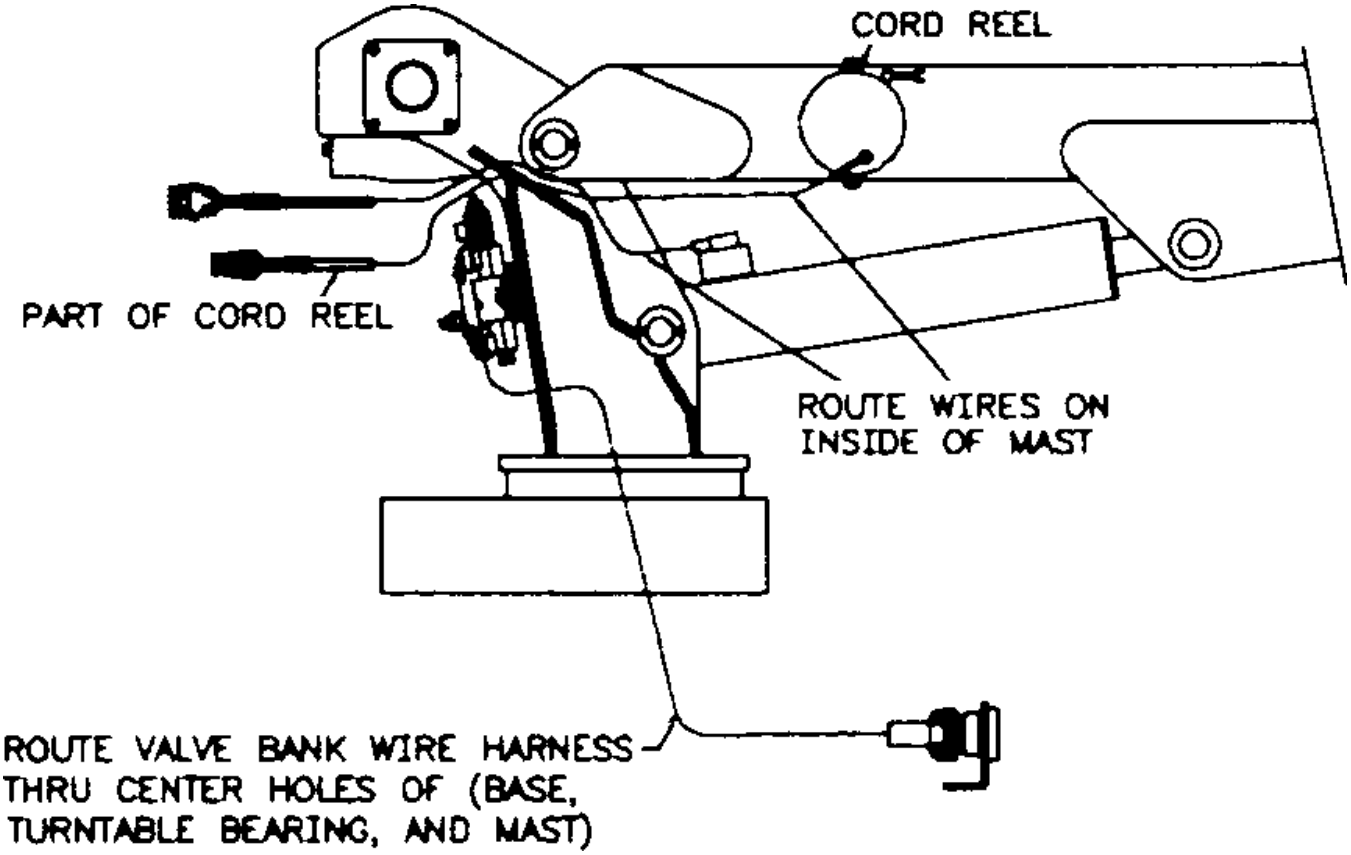
CONTROL KIT-RADIO REMOTE (90713710-1)

CONTINUED



CONTROL KIT-RADIO REMOTE (90713710-2)

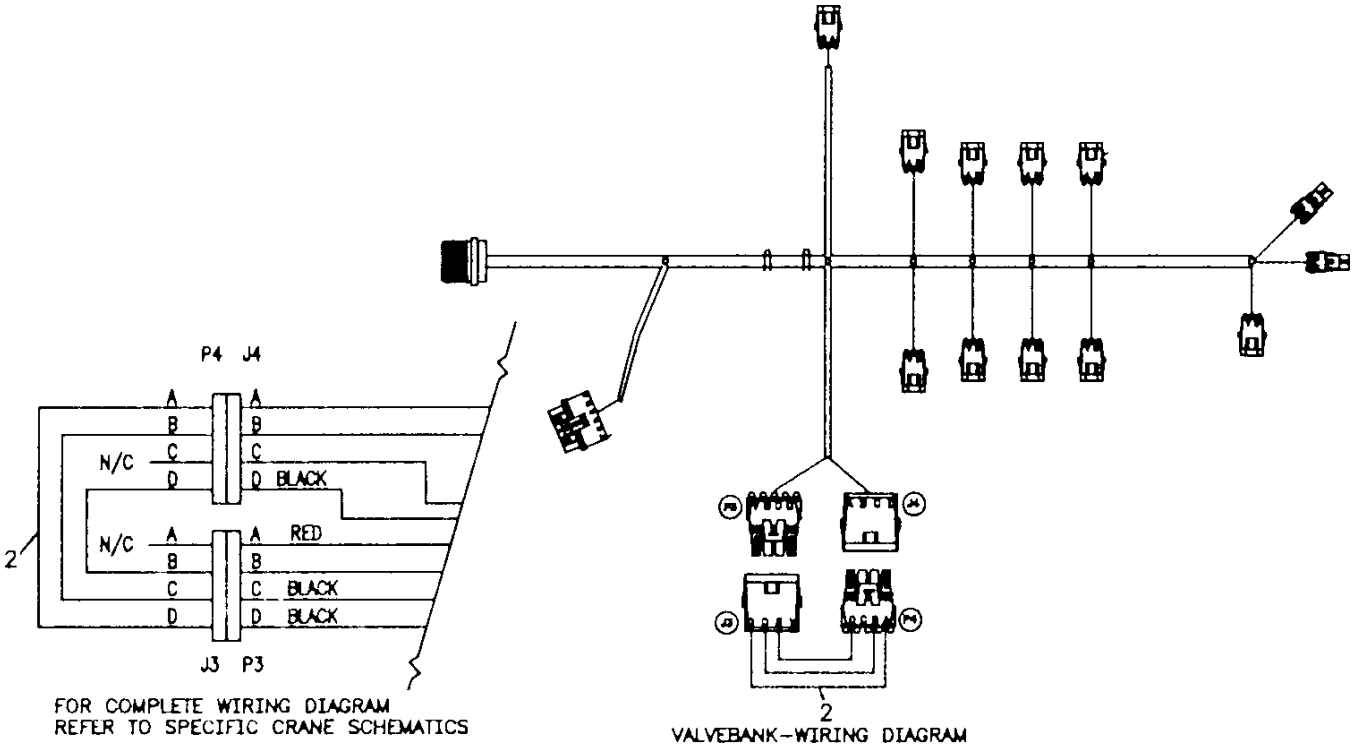
CONTINUED



CONTINUED

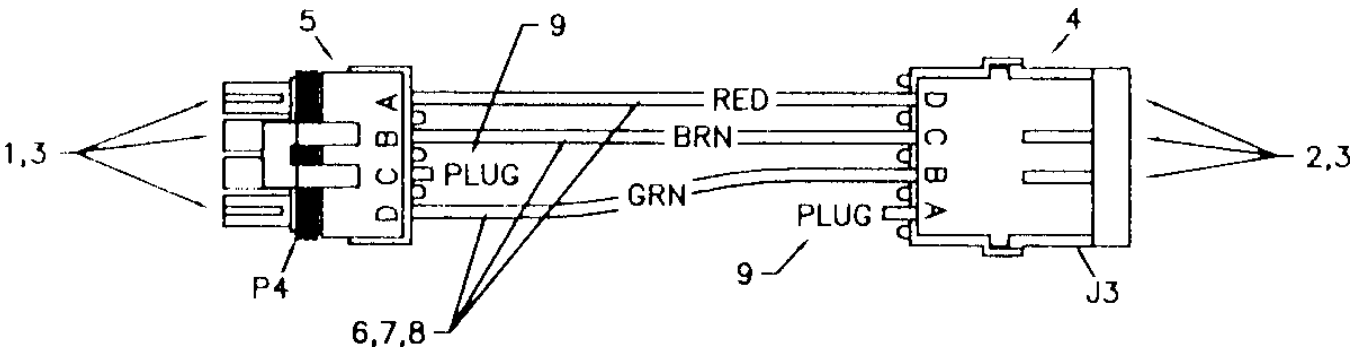
CONTROL KIT-RADIO REMOTE (90713710-3)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70733145	RADIO REMOTE-14 FUNC	1
2.	51713701	CABLE ASM 18GA 3WIRE X 4	1
3.	76394381	VELCRO 2X4 2-PCS	.66FT
4.	70394200	DECAL-HET CTRL BOX	1

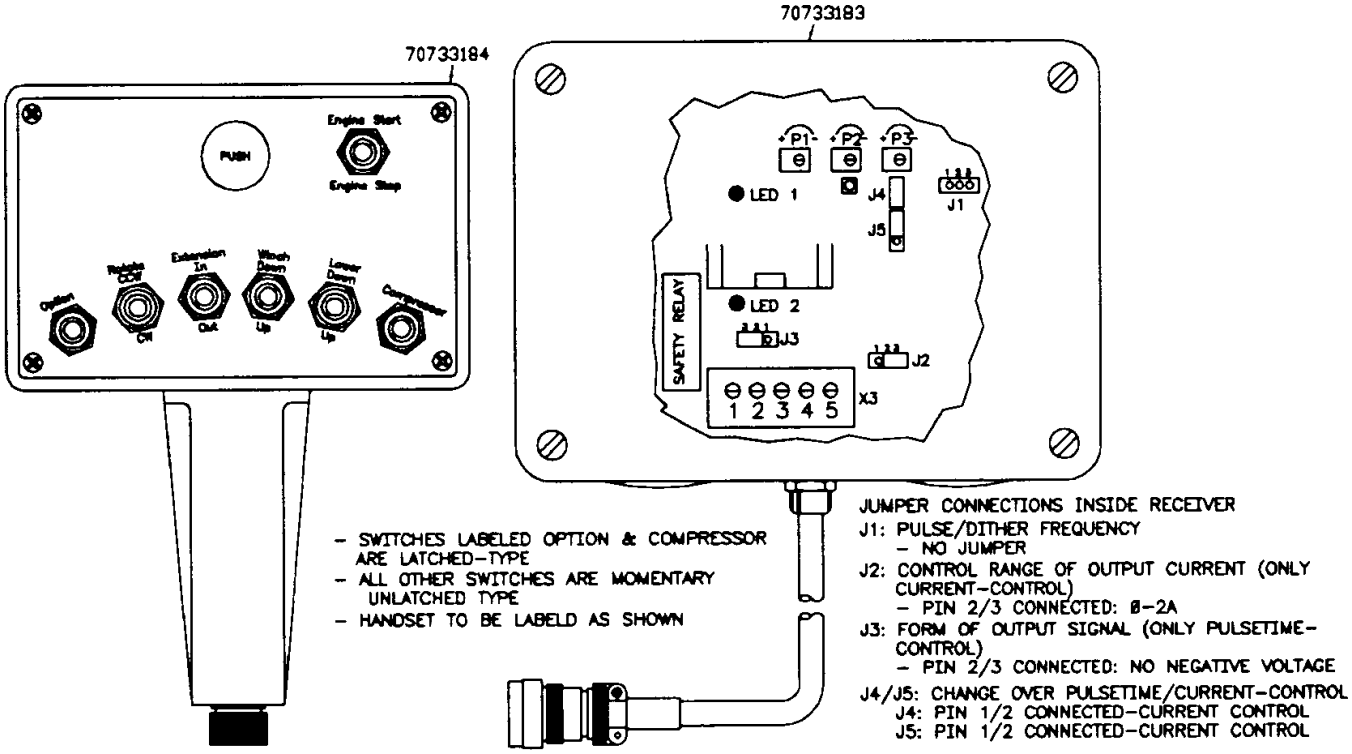


CABLE ASM 18GA/3WIRE X 4 (51713701)

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044550	TERMINAL	3
2.	77044552	TERMINAL	3
3.	70394069	SEAL	6
4.	77044624	CONNECTOR	1
5.	77044623	CONNECTOR	1
6.	89044213	WIRE 18GA RED	5”
7.	89044429	WIRE 18GA BRN	5”
8.	89044214	WIRE 18GA GRN	5”
9.	77044676	PLUG	2



CONTROL KIT-RADIO REMOTE (90713710-4)



- SWITCHES LABELED OPTION & COMPRESSOR ARE LATCHED-TYPE
- ALL OTHER SWITCHES ARE MOMENTARY UNLATCHED TYPE
- HANDSET TO BE LABELD AS SHOWN

JUMPER CONNECTIONS INSIDE RECEIVER

J1: PULSE/DITHER FREQUENCY
- NO JUMPER

J2: CONTROL RANGE OF OUTPUT CURRENT (ONLY CURRENT-CONTROL)
- PIN 2/3 CONNECTED: 0-2A

J3: FORM OF OUTPUT SIGNAL (ONLY PULSETIME-CONTROL)
- PIN 2/3 CONNECTED: NO NEGATIVE VOLTAGE

J4/J5: CHANGE OVER PULSETIME/CURRENT-CONTROL
J4: PIN 1/2 CONNECTED-CURRENT CONTROL
J5: PIN 1/2 CONNECTED-CURRENT CONTROL

CONNECTOR PIN LETTER	INT ASSIGNED FUNCTION
A	ROT CW
B	EXT OUT
C	WINCH DOWN
D	WINCH UP
E	POT (REF)
F	EXT IN
G	ENGINE START
H	POT (SIG COM)
J	ENG SPD
K	ROT CCW
L	12 VOLT
M	ENGINE STOP
N	LOWER DOWN
O	NOT USED
P	LOWER UP
Q	NOT USED
R	POT (VOLT)
S	NOT USED - TOGGLE W/"T"
T	COMPRESSOR
U	OPTION
V	NOT USED - TOGGLE W/"U"
W	NOT USED
X	NOT USED

P1: TRIMMING POTENTIOMETER FOR MAXIMUM VALUES. ON TRANSMITTER HANDLE, ENGAGE ROTATION CW OR CCW FUNCTION SWITCH AND PULL TRIGGER FULLY ON. CRANE MAY OR MAY NOT BEGIN TO MOVE AT THIS TIME DUE TO P1 INITIAL SETTING. TURN P1 POTENTIOMETER COUNTERCLOCKWISE UNTIL DESIRED MAXIMUM SPEED IS OBTAINED OR UNTIL SPEED NO LONGER CONTINUES TO INCREASE.

P2: TRIMMING POTENTIOMETER FOR INITIAL VALUE ADJUSTMENT. ON TRANSMITTER, ENGAGE ROTATION CW OR CCW FUNCTION SWTICH. WITHOUT PULLING TRIGGER, ADJUST P2 COUNTERCLOCKWISE UNTIL CRANE BEGINS TO MOVE. AT THIS TIME, ADJUST P2 CLOCKWISE UNTIL NO MOVEMENT IS DETECTED. SLIGHTLY ENGAGE TRIGGER AND ADJUST P2 TO FINE TUNE.

P3: TRIMMING POTENTIOMETER TO ADJUST DITHERAMPLITUDE: ADJUST CLOCKWISE OR COUNTERCLOCKWISE FOR SMOOTHNESS OF OPERATION.

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

FREQUENCY	ITEM	KEY	✔ = SATISFACTORY ✘ = DEFICIENCY (must be corrected prior to operation) INSPECTION DESCRIPTION	***R*** = RECOMMENDATION (should be considered for corrective action) ***NA*** = NOT APPLICABLE	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

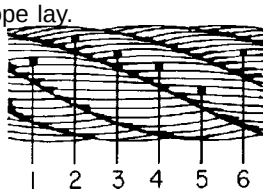
If additional space is required, reproduce this page and attach to this report.

WIRE ROPE INSPECTION

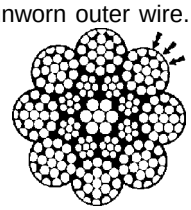
Wire rope with any of the deficiencies shown below shall be removed and replaced immediately.

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

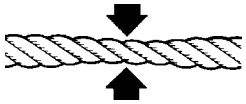
B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



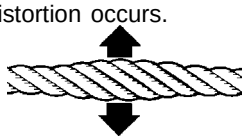
C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



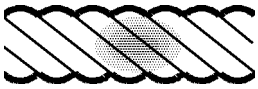
D. When there is a decrease of diameter indicating a core failure.



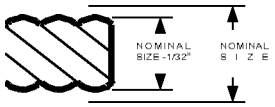
E. When kinking, crushing, birdcaging or other distortion occurs.



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.)

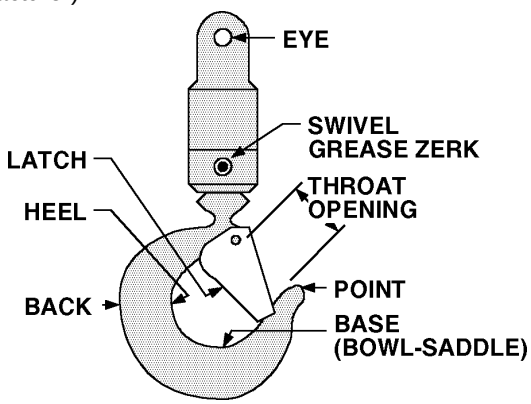
D. LATCH

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

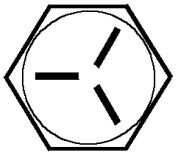
2. Examine cord for damage, cuts or breaks. Grasp cord and pull to check operation of cord reel. The cord should retract on reel when released.

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.

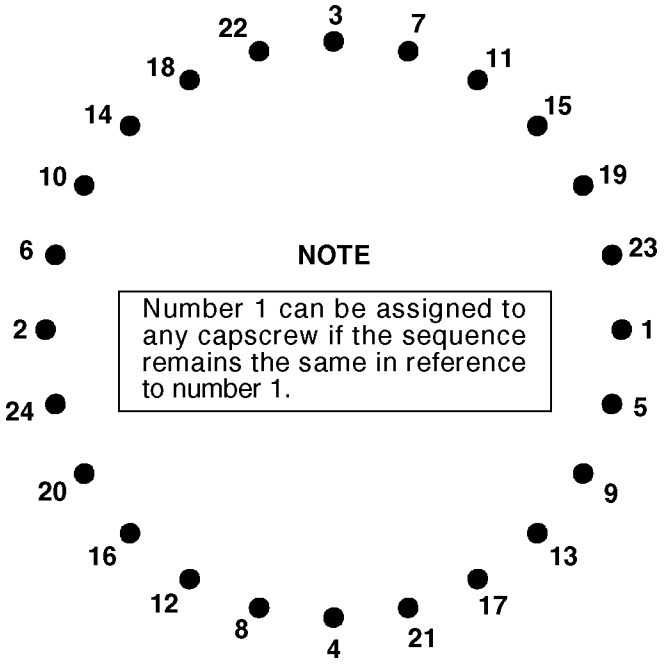
5. Torque values for socket-head capscrews are the same as for Grade 8 capscrews.

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.

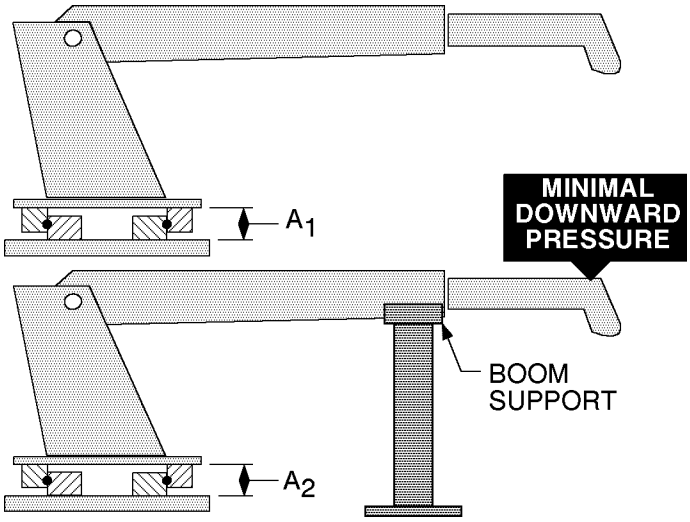
Periodic readings indicating a steady increase in TILT may be an indicator of bearing wear. Note that a bearing found to have no raceway cracks or other structural irregularities should be reassembled and returned to service.

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: _____

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☐ REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

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REASON FOR ADDITION: _____

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_____

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