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Manual # 99900218

3016 Crane Parts & Specifications

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Model 3016 Crane

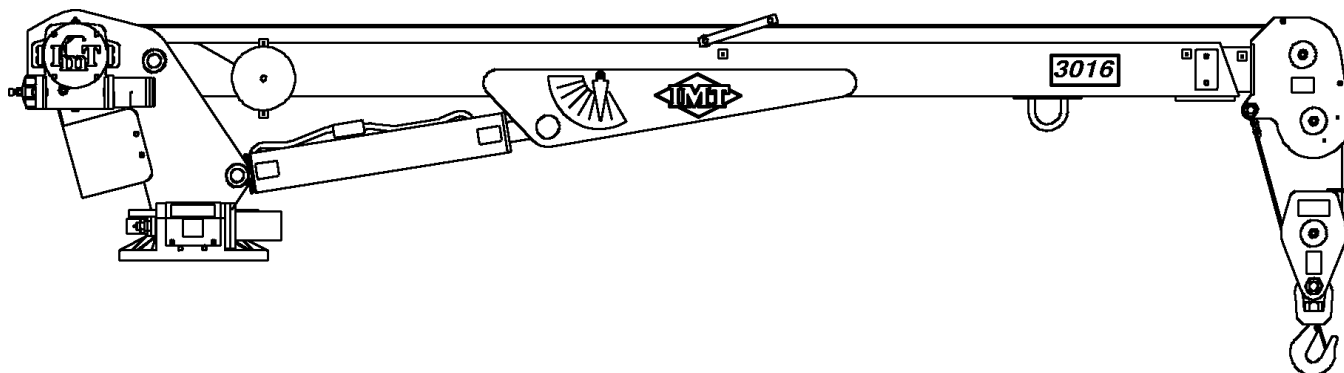
Volume 2 - PARTS AND SPECIFICATIONS

Section 1 CRANE SPECIFICATIONS

Section 2 CRANE REFERENCE

Section 3 REPLACEMENT PARTS

Section 4 GENERAL REFERENCE



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MANUAL PART NUMBER 99900218

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.**

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MODEL 3016 CRANE SPECIFICATIONS

GENERAL SPECIFICATIONS

	<u>3016 CRANE</u>	<u>3016-20 CRANE</u>
CRANE RATING	30,000 ft-lbs 4.15 ton-meters	30,000 ft-lbs 4.15 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'-0" 5.49m	22'-4" 6.81m
WEIGHT OF CRANE	1040 lbs 472 kgs	1150 lbs 522 kgs
OUTRIGGER SPAN (required option) crane side from centerline of chassis	83" 210.8cm	83" 210.8cm
STORAGE HEIGHT - crane only	28" 71.1cm	28" 71.1cm
MOUNTING SPACE REQUIRED (crane base)	17" x 18-3/4" 43.2cm x 47.6cm	17" x 18-3/4" 43.2cm x 47.6cm
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	28" 71.1cm	28" 71.1cm
VERTICAL CENTER OF GRAVITY - from bottom of crane base	16" 40.6cm	17" 43.2cm
OPTIMUM PUMP CAPACITY	7 U.S. Gallons/minute 26.5 liters/minute	7 U.S. Gallons/minute 26.5 liters/minute
SYSTEM PRESSURE	2350 psi 162 bar	2350 psi 162 bar
ROTATIONAL TORQUE	4500 ft-lbs .62 ton-meters	4500 ft-lbs .62 ton-meters

PERFORMANCE CHARACTERISTICS

ROTATION: 400° (6.98 Rad.)	33 seconds
LOWER BOOM ELEVATION: -5° to +80° (-0.09 Rad. to +1.40 Rad.)	11 seconds
EXTENSION CYLINDER: 60" (152.4cm)	12 seconds

CYLINDERS

	BORE	STROKE
LOWER BOOM CYLINDER	4" (10.2cm)	21-5/8" (54.9cm)
EXTENSION BOOM CYLINDER	2-1/2" (6.4cm)	60" (152.4cm)

POWER SOURCE

Integral-mounted hydraulic pump and PTO application. Other standard power sources may be used - minimum power required is 12.5 horsepower based on 7 GPM at 2350 PSI (26.5 liters/min. at 162 bar).

ROTATION SYSTEM

Turntable bearing with external worm gear powered with a high-torque hydraulic motor through a self-locking worm. Total gear reduction is 73 to 1.

CYLINDER HOLDING VALVES

The base end of the extension cylinder is equipped with a pilot operated holding valve to prevent sudden cylinder collapse in the event of a hose breakage. The extend side of the lower boom cylinder is equipped with a 10 GPM counter balance valve. The counter balance valve serves several functions. First, it is a holding valve. 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 38:1 worm gear. The line speed of 20 ft/minute (6m/min), under no load, is achieved at an optimum oil flow of 7 GPM (26.5 liters/min) and one-part line. Maximum single line lifting capacity of the winch is 3000 lbs (1361 kg). The winch is equipped with 80 ft (24.4m), 5/16" (.79cm), 6X25 FW PRF RRL IWRC XIPS wire rope. Nylon sheaves are located at the tip of the extension boom. The ratio of winch drum and sheave pitch diameter is 18.6:1 for the drum and 18:1 for the snatch block and boom tip sheave. An anti-two block device is included to prevent the lower block or hook assembly from coming in contact with the boom sheave assembly.

HYDRAULIC SYSTEM

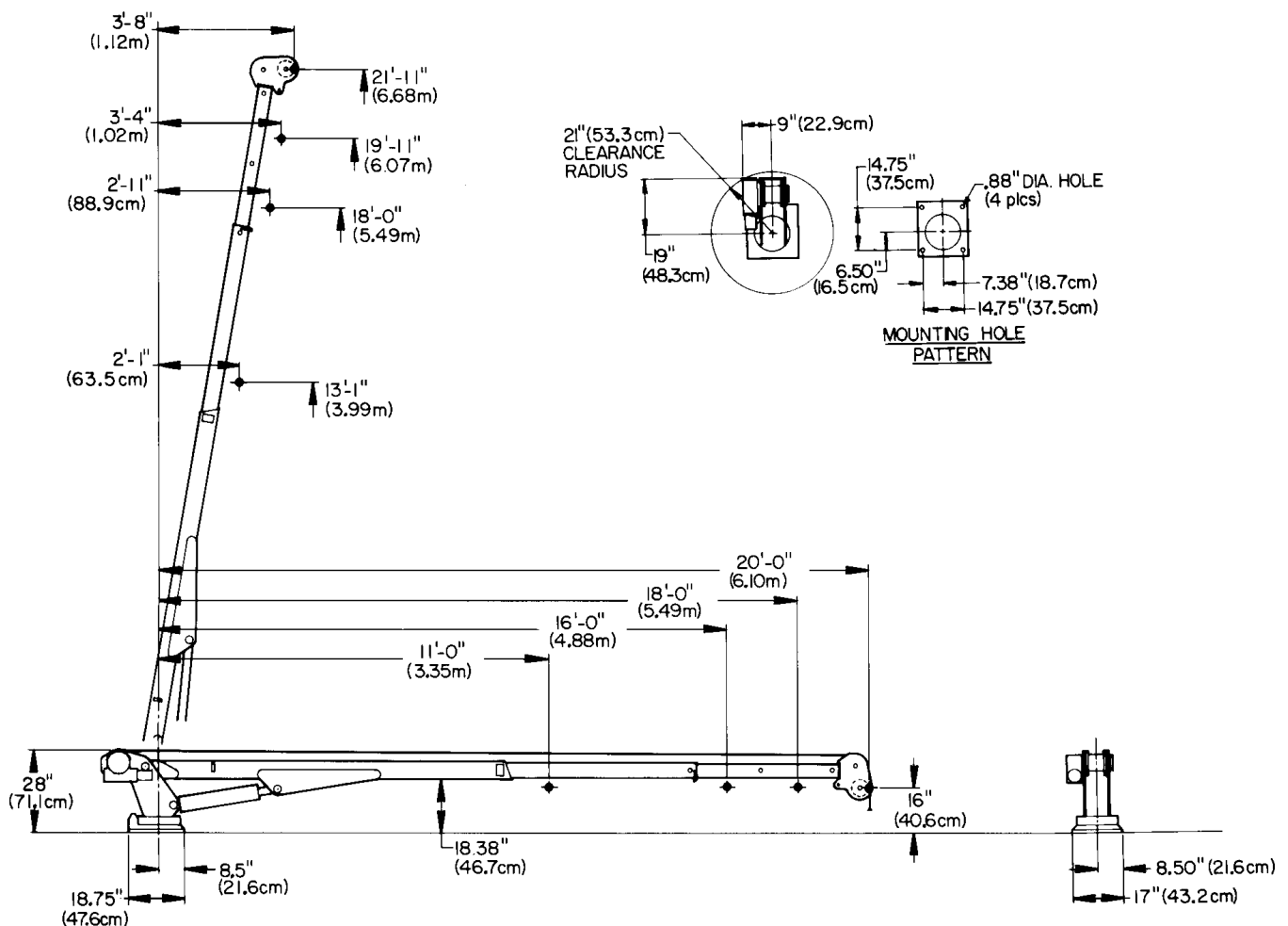
The hydraulic system is an open center, full pressure system requiring maximum flow of 7 GPM (26.5 liters/min.) at 2350 psi (162 bar). It is equipped with a four section, electric remote, stack type control valve with a 30 ft. (9.14 m) control cable. The system includes a separate hydraulic oil reservoir, suction line filter, and return line filter.

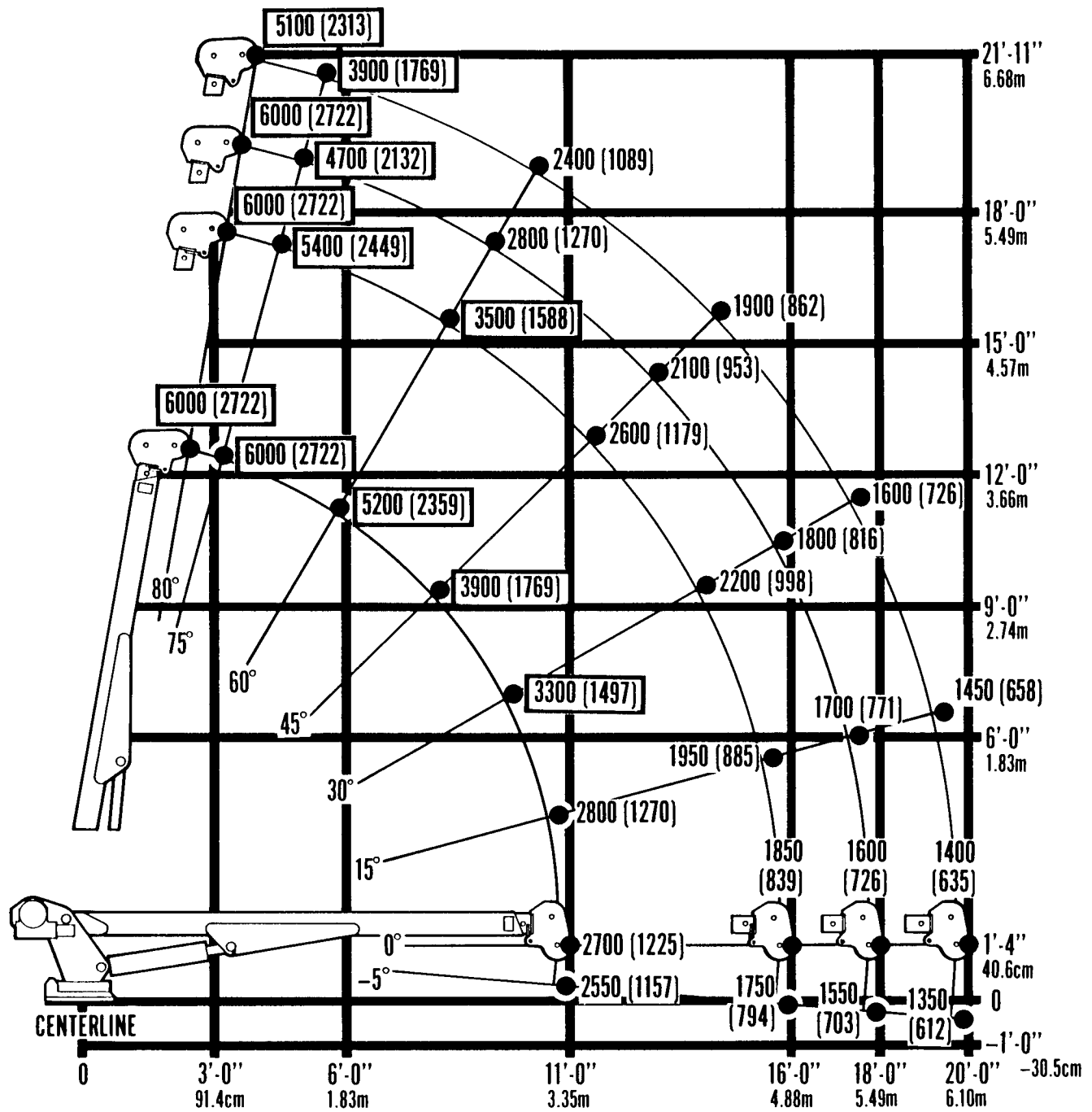
MINIMUM CHASSIS SPECIFICATIONS

BODY STYLE	Conventional Cab	Conventional Cab
WHEEL BASE	154"	391cm
CAB TO AXLE	84"	213cm
FRAME SECTION MODULUS	10 ³	163.9cc
RBM	360,000 in-lbs	4149 kg-meter
FRONT AXLE RATING	5000 lbs	2268 kg
REAR AXLE RATING	9500 lbs	4309 kg
GROSS VEHICLE RATING	14,500 lbs	6577 kg
TRANSMISSION	4 speed	4 speed

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

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

**GEOMETRIC CONFIGURATION**

CAPACITY CHART

REACH IN FEET (METERS)

● CAPACITY IN POUNDS (KILOGRAMS)

Maximum 1-part line capacity is 3000 lbs (1360 kgs).
For greater loads, use 2-part line.

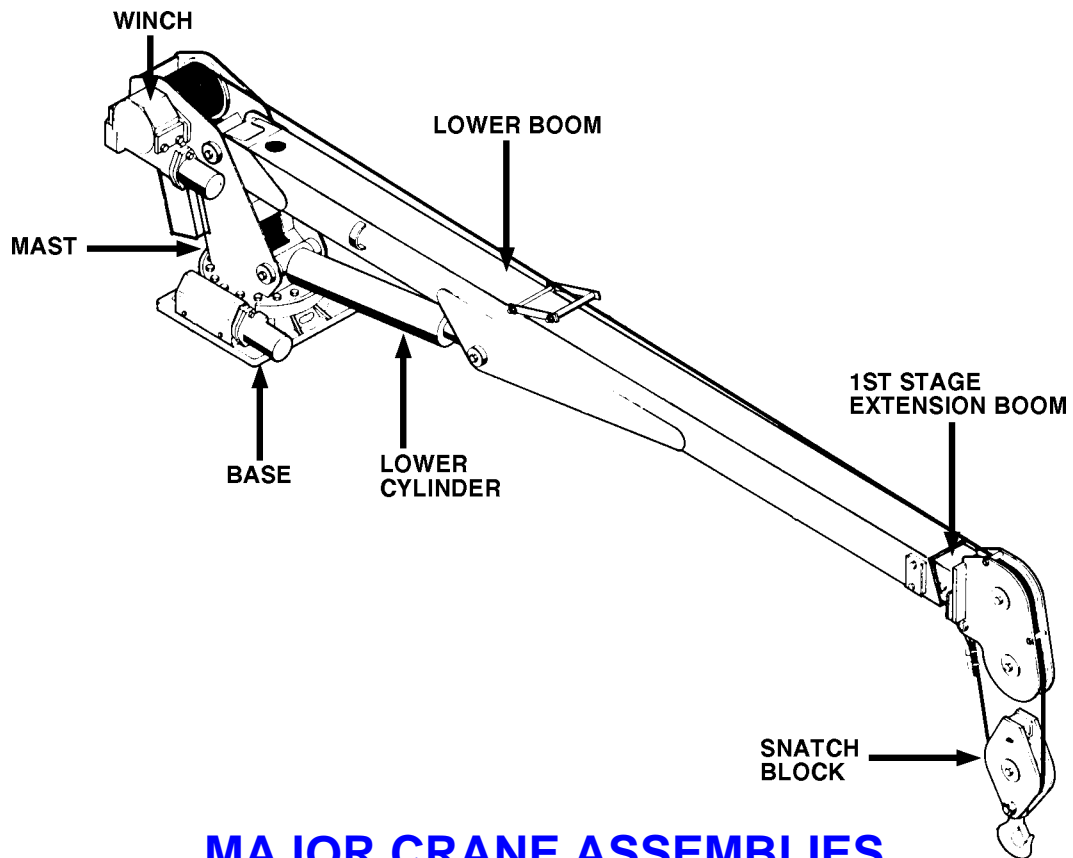
Weight of load handling devices are part of the load lifted and must be deducted from the capacity.

SECTION 2. MODEL 3016 CRANE REFERENCE

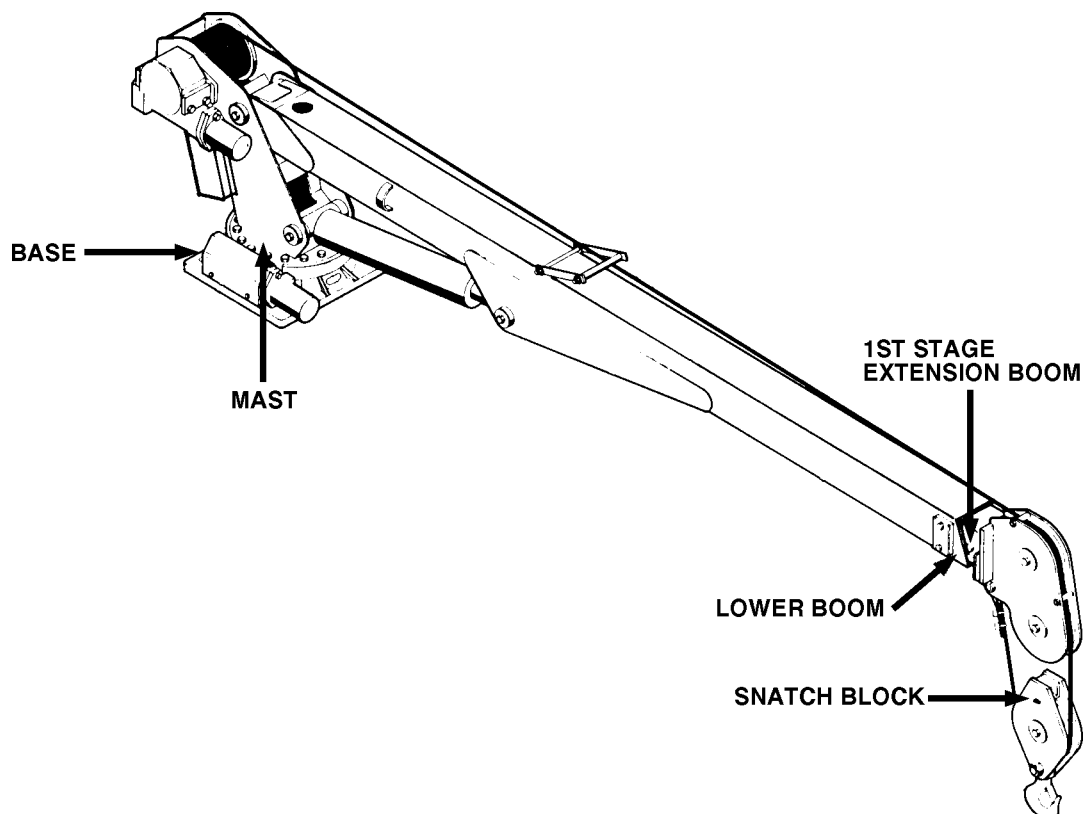
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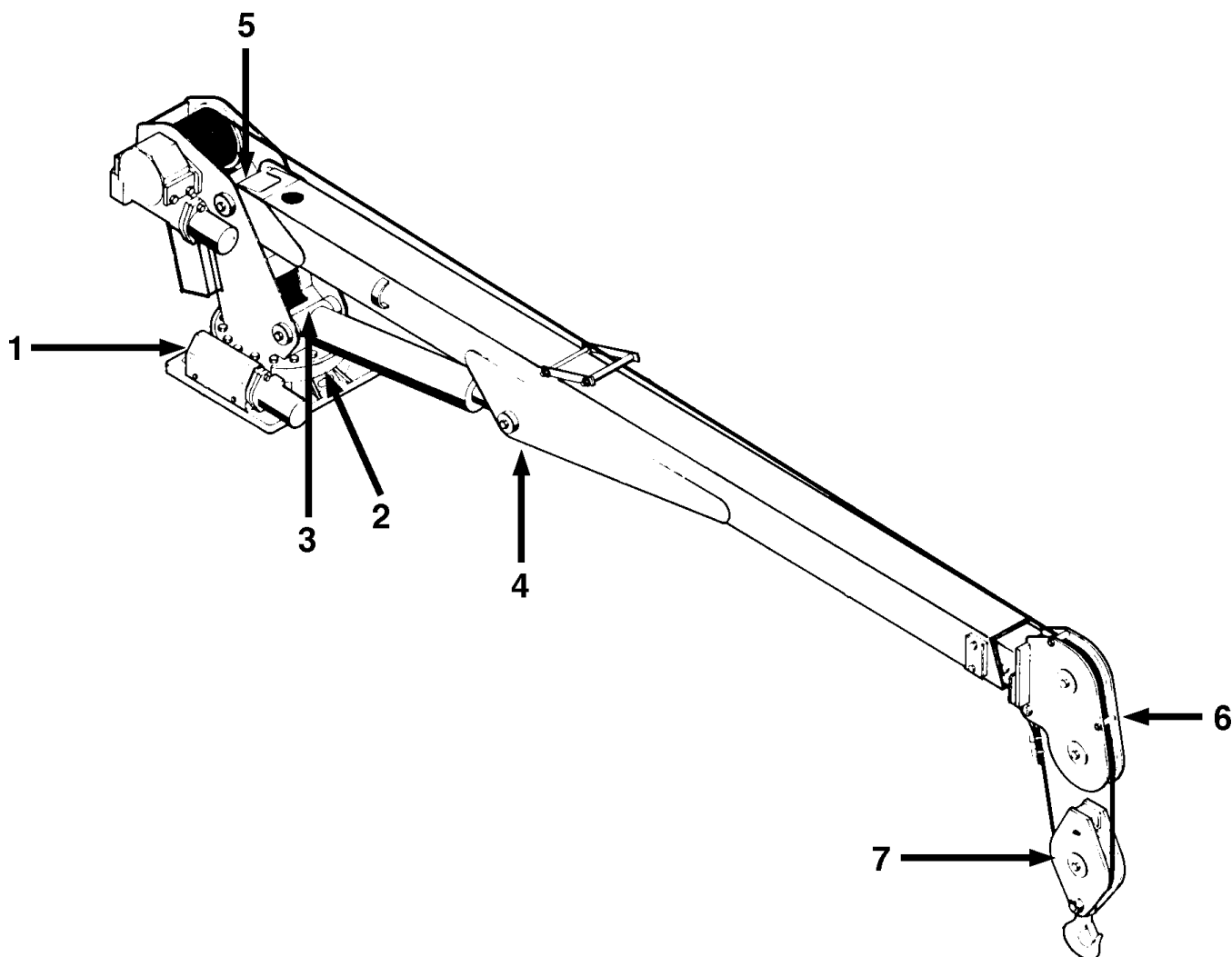


MAJOR CRANE ASSEMBLIES



WELDMENT PART NUMBER LOCATIONS

GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	WORM GEAR	SHELL ALVANIA 2EP OR SHELL RETINAX "A"	WEEKLY
2.	TURNTABLE/BEARING GREASE EXTENSION *ROTATE CRANE WHILE GREASING		
3.	LOWER CYLINDER BASE		
4.	LOWER CYLINDER ROD		
5.	MAST/LOWER BOOM HINGE PIN		
6.	SHEAVE PIN		
7.	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 3016 TELESCOPING CRANE
FOR MANUAL: 99900218

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
41707846.01.19961007 BASE ASSEMBLY							
	5	60030116	THRUST BEARING	2	W	N/A	
	8	70055147	ROLLER BEARING	1	W	N/A	
	9	70055148	ROLLER BEARING	1	W	N/A	
	10	70056397	WORM GEAR	1	W	N/A	
		89086159	MOLUB	2	P	N/A	
41707848.01.19960430 LOWER BOOM ASSEMBLY							
	5	60030007	WEAR PAD	2	W	N/A	
	6	60030139	WEAR PAD	1	W	N/A	
	17	7BF81215	BUSHING	4	W	N/A	
3B036880.01.19960430 LOWER BOOM CYLINDER							
	3	6H040022	HEAD	1	W	N/A	
	4	6I040143	PISTON	1	W	N/A	
	7	73054304	C'BALANCE VALVE 10GPM	1	C	N/A	
	8	9C161823	SEAL KIT	1	W	N/A	
	19	7BF81015	BUSHING	4	W	N/A	
	20	7BF81215	BUSHING	2	W	N/A	
41707849.01.19960430 EXTENSION BOOM ASSEMBLY							
	3	60030189	WEAR PAD	1	W	N/A	
3B040880.01.19960430 EXTENSION BOOM CYLINDER							
	5	6H025015	HEAD	1	W	N/A	
	6	6IX02512	PISTON	1	W	N/A	
	9	73054004	HOLDING VALVE	1	C	N/A	
	10	9B101220	SEAL KIT	1	W	N/A	
73054004.01.19960430 HOLDING VALVE							
	1	7Q072014	O-RING	1	C		
				3	W	N/A	
41707924.01.19970107 3016-20' EXTENSION BOOM ASSEMBLY							
	3	60030189	WEAR PAD	1	W	N/A	
31709198.01.19960430 WINCH/CABLE/HOOK KIT							
	6	60030136	SHEAVE	3	W	N/A	
	12	70055185	FLANGE BEARING	1	W	N/A	
	16	71073920	HOOK	1	C	N/A	
	42	77041291	SWITCH	1	W	N/A	
	44	51713168	CORD REEL	1	C	N/A	
73733057.01.19970825 PROPORTIONAL VALVEBANK							
	3	73054934	PROPORTIONAL SOLENOID	1	C	N/A	
	4	73054935	RELIEF VALVE	1	W	N/A	
	5	73054936	SOLENOID VALVE	4	W	N/A	
	6	7Q072013	O-RING	10	W	N/A	
	17	77044595	VALVE DRIVER	1	C	N/A	
93708163.01.19960430 INSTALLATION KIT							
	REF	73052006	ELEMENT-RET. FILTER 10MIC	6	P	N/A	
51713182.01.19960430 PROPORTIONAL REMOTE HANDLE ASSEMBLY							
	16	77040371	TOGGLE SWITCH SPST	1	C		
	17	77040372	TOGGLE SWITCH SPDT	2	W	N/A	
	18	77040373	TOGGLE SWITCH SPST	4	W	N/A	
	19	77040374	TOGGLE SWITCH SPDT	2	W	N/A	
				1	W	N/A	
99900855.01.19960430 PROPORTIONAL REMOTE CONTROL							
	5	7Q072015	O-RING	1	W	N/A	
	11	77041283	PRESSURE SWITCH 2800	1	W	N/A	
	14	77041237	SOLENIOD 12V 150A	1	W	N/A	
	15	77041251	RELAY	3	W	N/A	

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INSTALLATION

GENERAL

This section contains instructions for the installation of your crane. Prior to installing the crane and hydraulic components, make sure that the chassis is ready to receive the crane (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 3016 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.

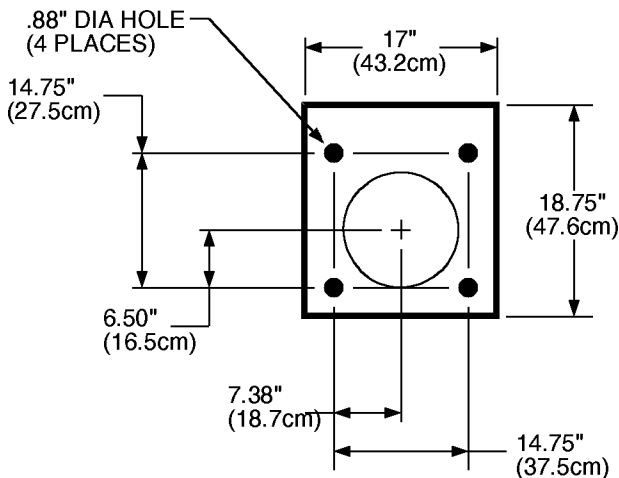
To install the crane:

1. Use a lifting device capable of lifting the weight of the crane, 1,150 lbs (522 kg). Attach the lifting device to the lift brackets of the crane. The lift brackets are located on both sides of the lower boom, approximately 18 inches from the mast hinge. Lift the crane, apply a bead of waterproof compound, such as silicon based caulk, to the bottom of the base. Move the chassis under the crane and lower the crane into the desired position.
2. Install the mounting tie rods, washers, and nuts to secure the crane base to the truck body (see Figure below).

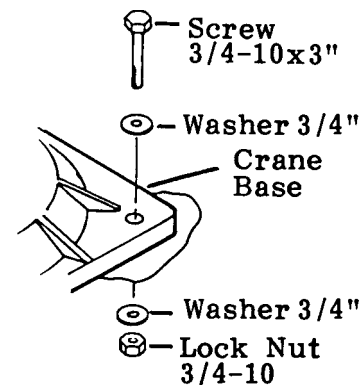
CAUTION

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



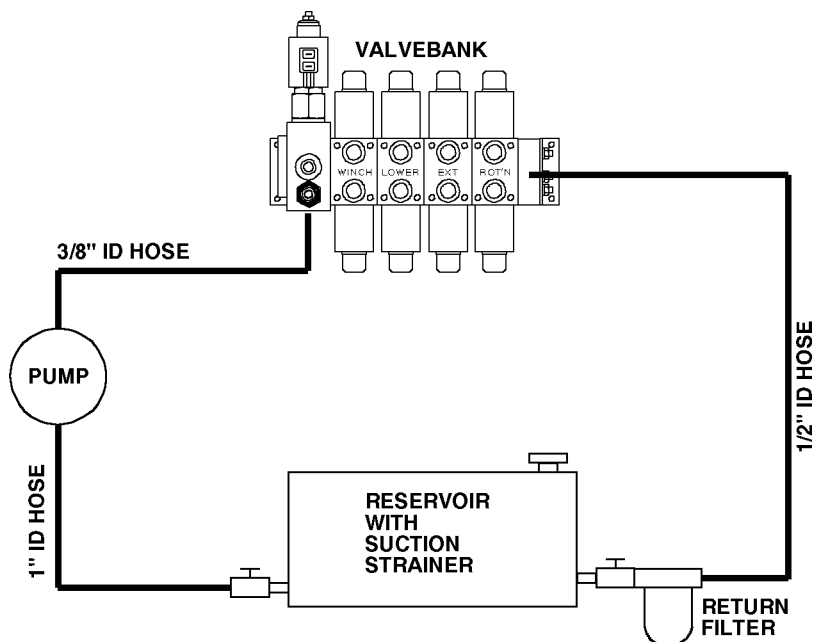
CRANE INSTALLATION

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 3/4" pipe nipple and 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 3/8" 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 counterclockwise 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 2350 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

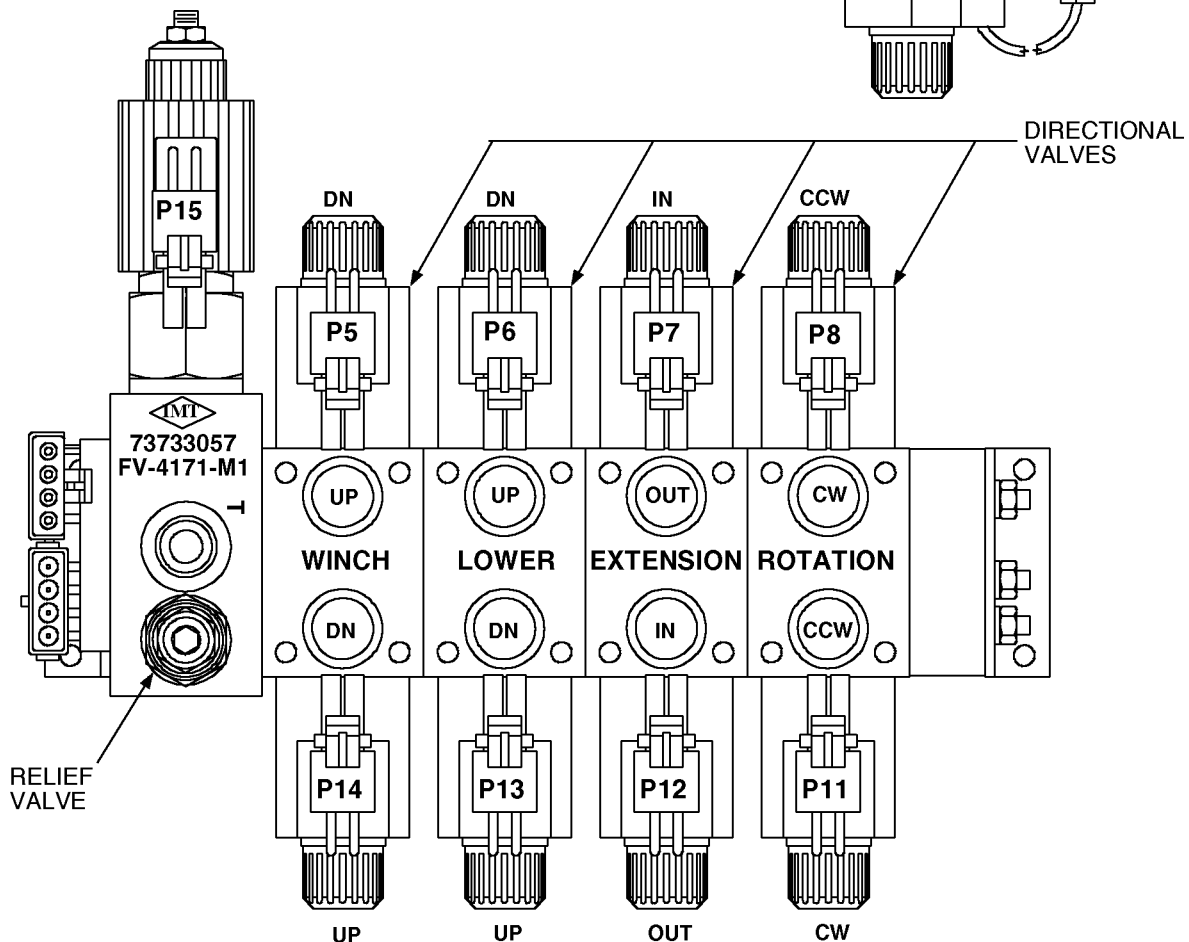
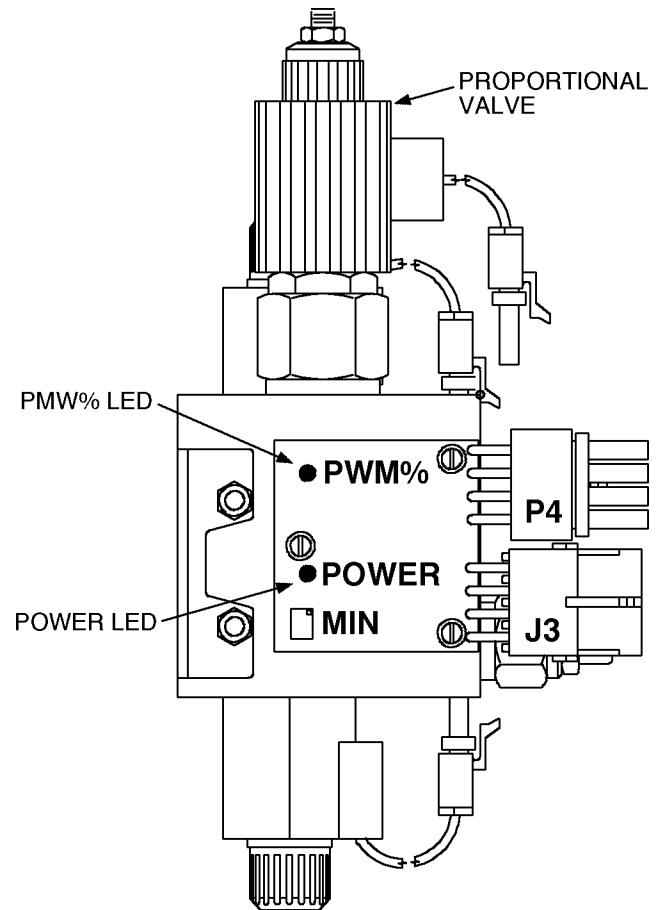
The directional valves (4) control the direction of the crane functions. When one of the solenoids is energized, it shifts the valve spool. This allows oil to flow out one of the valve ports. If a function does not work, a directional valve may be to blame.

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.

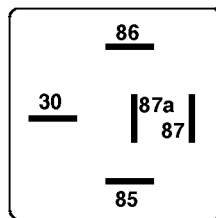


FIGURE 1. BOTTOM VIEW OF RELAY

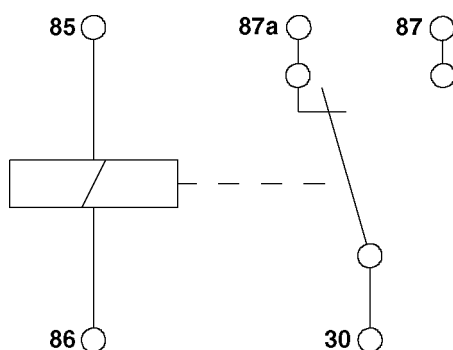


FIGURE 2. INTERNAL WIRING

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.

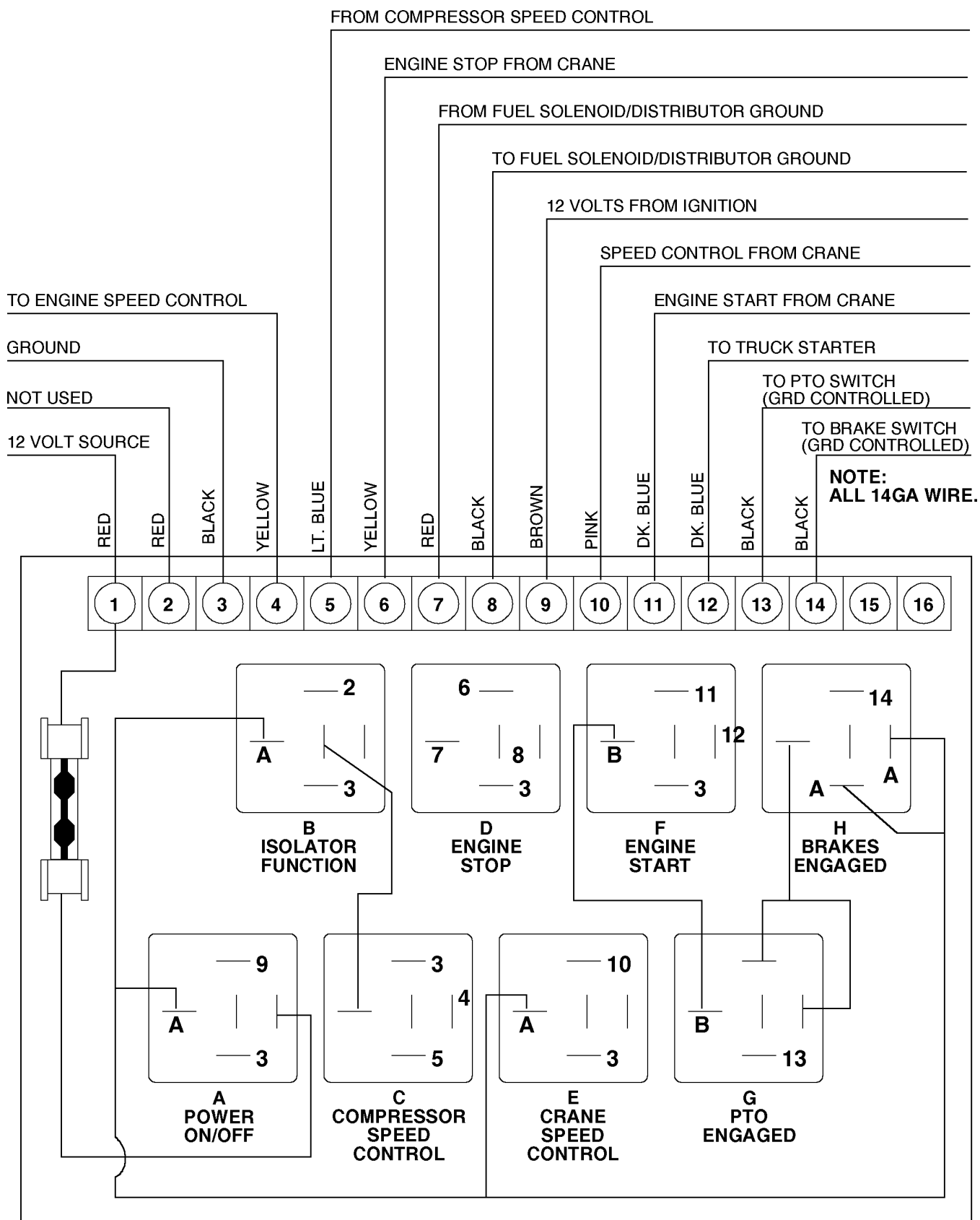


FIGURE 3. RELAY BOARD - COMPONENTS & WIRING

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.

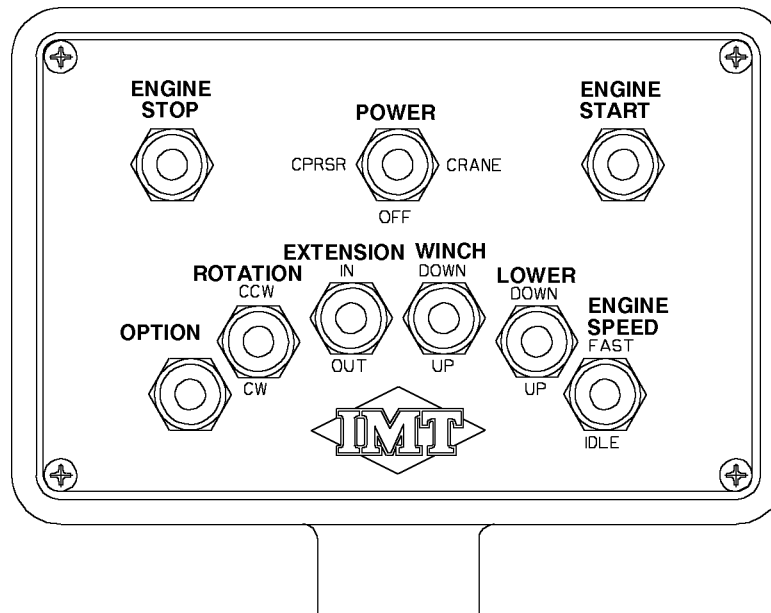


FIGURE 4. REMOTE CONTROL HANDLE

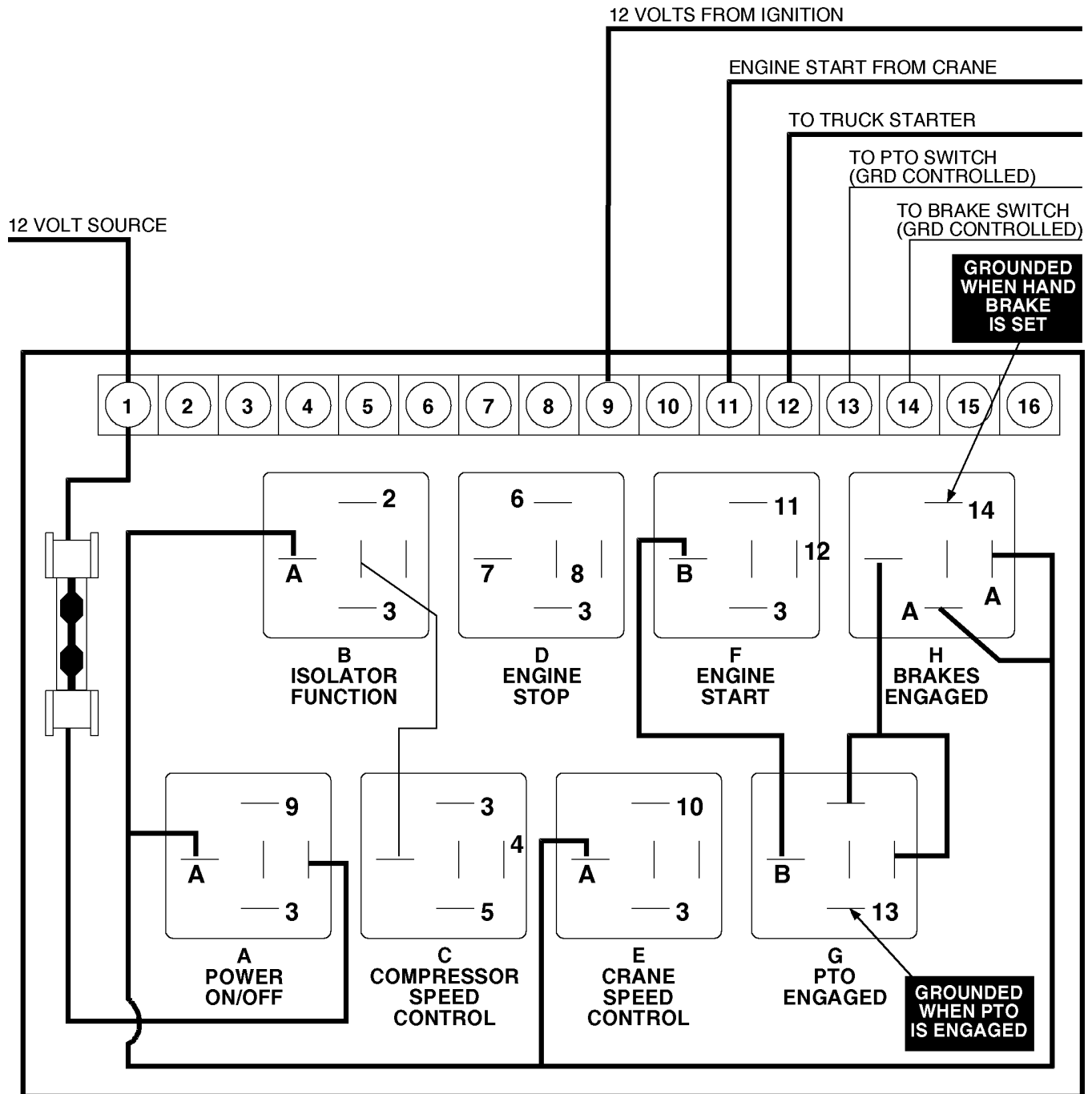


FIGURE 5. REMOTE STARTING OF VEHICLE - IGNITION "ON"

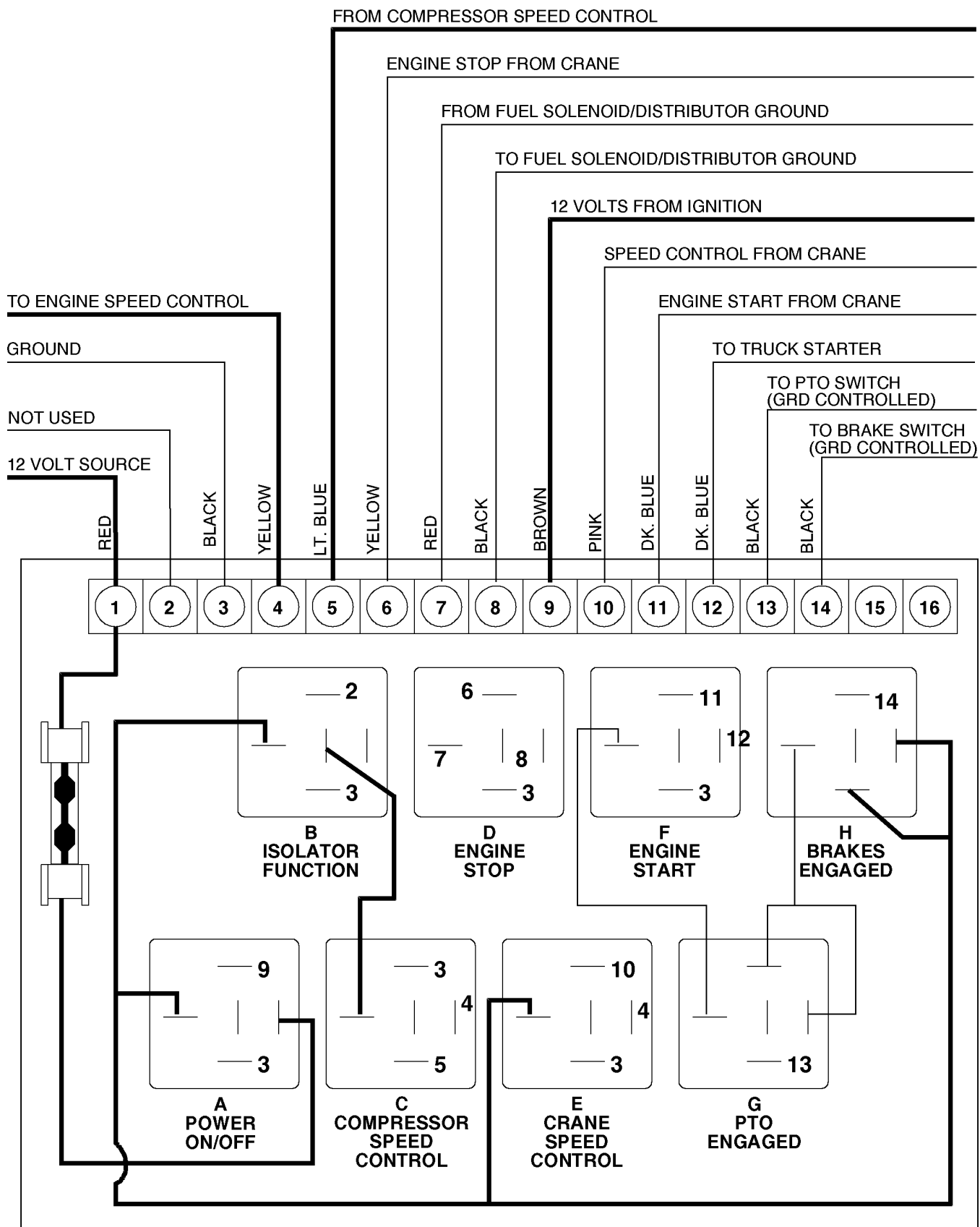


FIGURE 6. SPEED CONTROL - COMPRESSOR ONLY

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 I to 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
8	GROUND
9	TO FUEL SOLENOID / DISTRIBUTOR
10	GROUND
11	12-VOLT FROM IGNITION
12	SPEED CONTROL FROM CRANE
13	ENGINE START FROM CRANE
14	TO TRUCK STARTER
15	TO PTO SWITCH, CONTROLLED
16	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

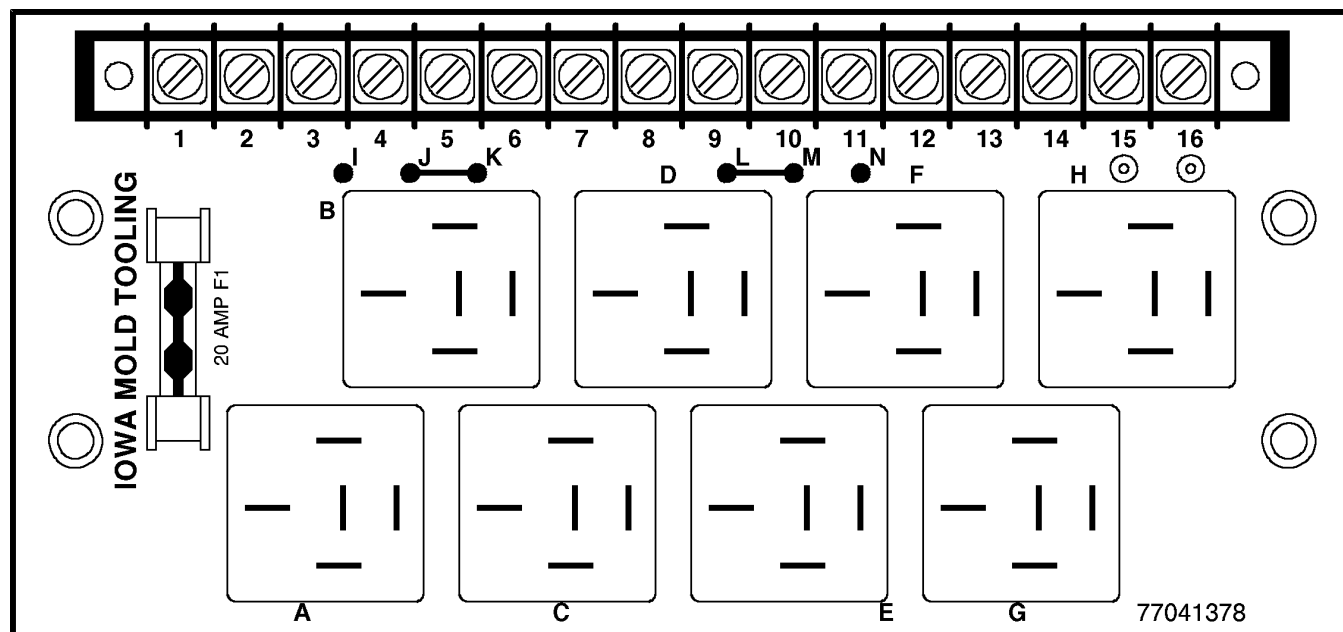


FIGURE 7. RELAY BOARD (77041378) WIRING INSTRUCTIONS

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.

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2-18
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ANTI TWO-BLOCKING DEVICE

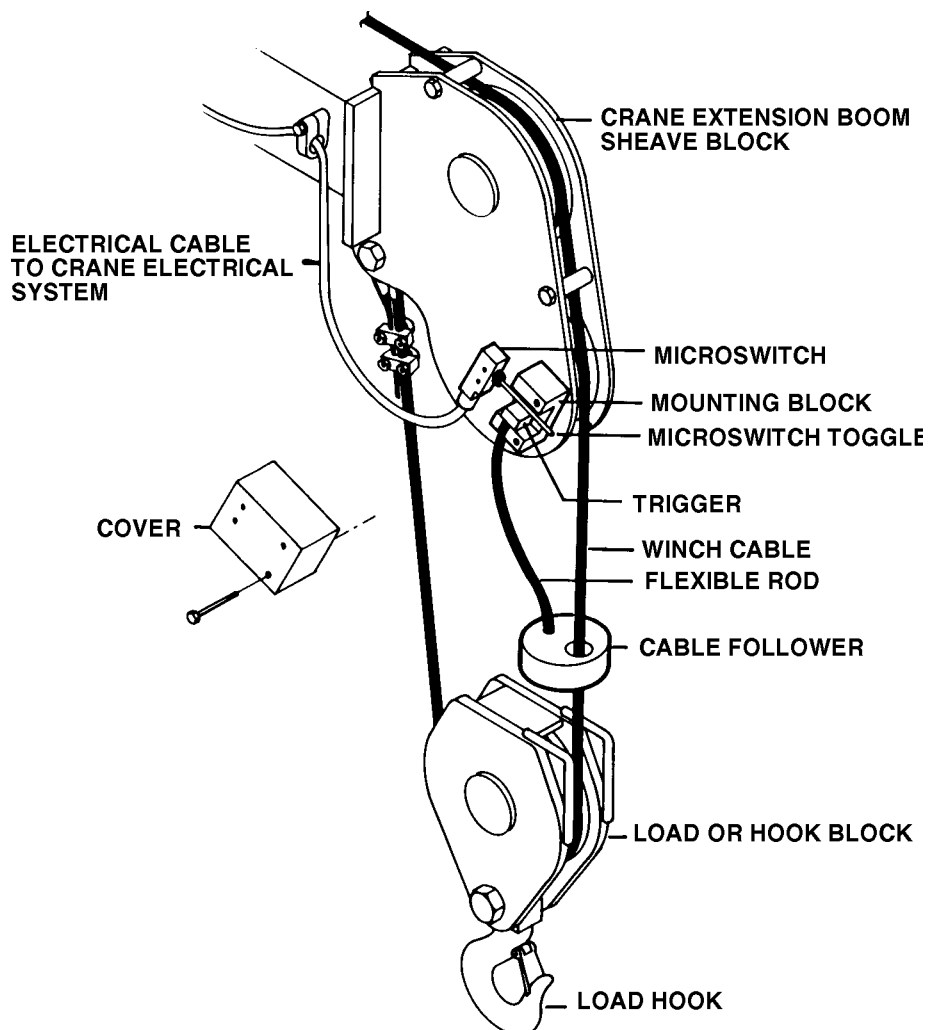
IMT telescoping cranes using a winch are equipped with an Anti Two-Blocking Device which is designed to provide a method of sensing an approaching Two-Blocking situation and prevent the crane from entering that situation. It is the operator's responsibility to avoid Two-Blocking and not to rely on this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

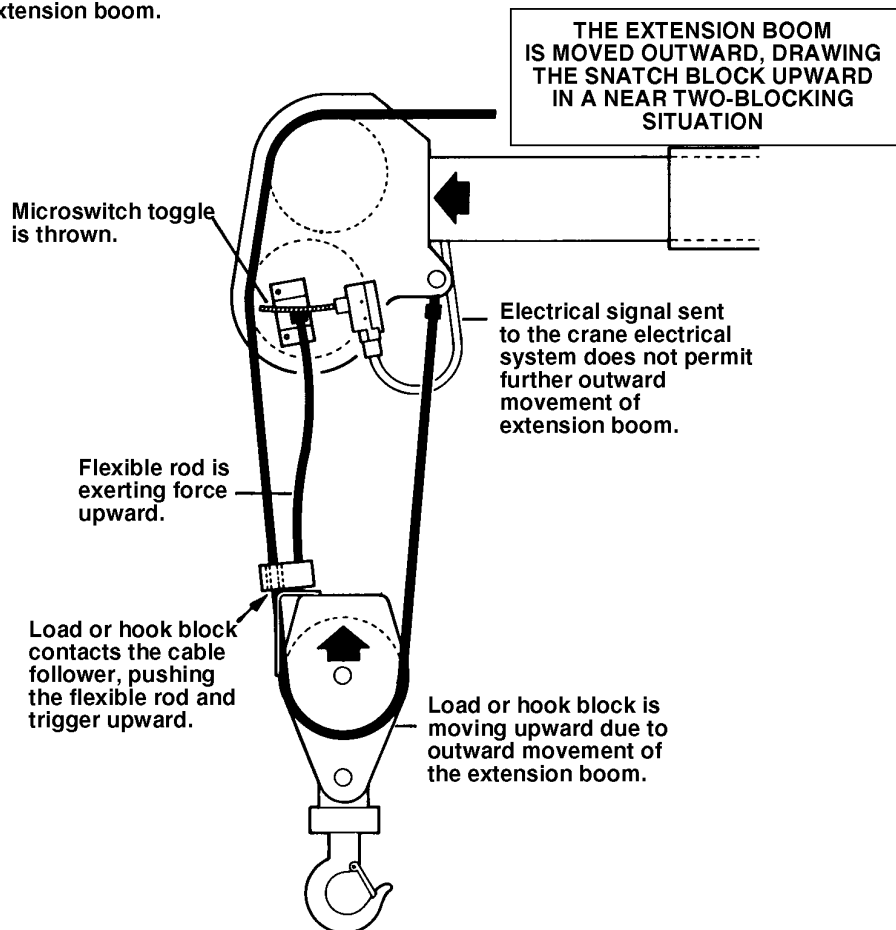
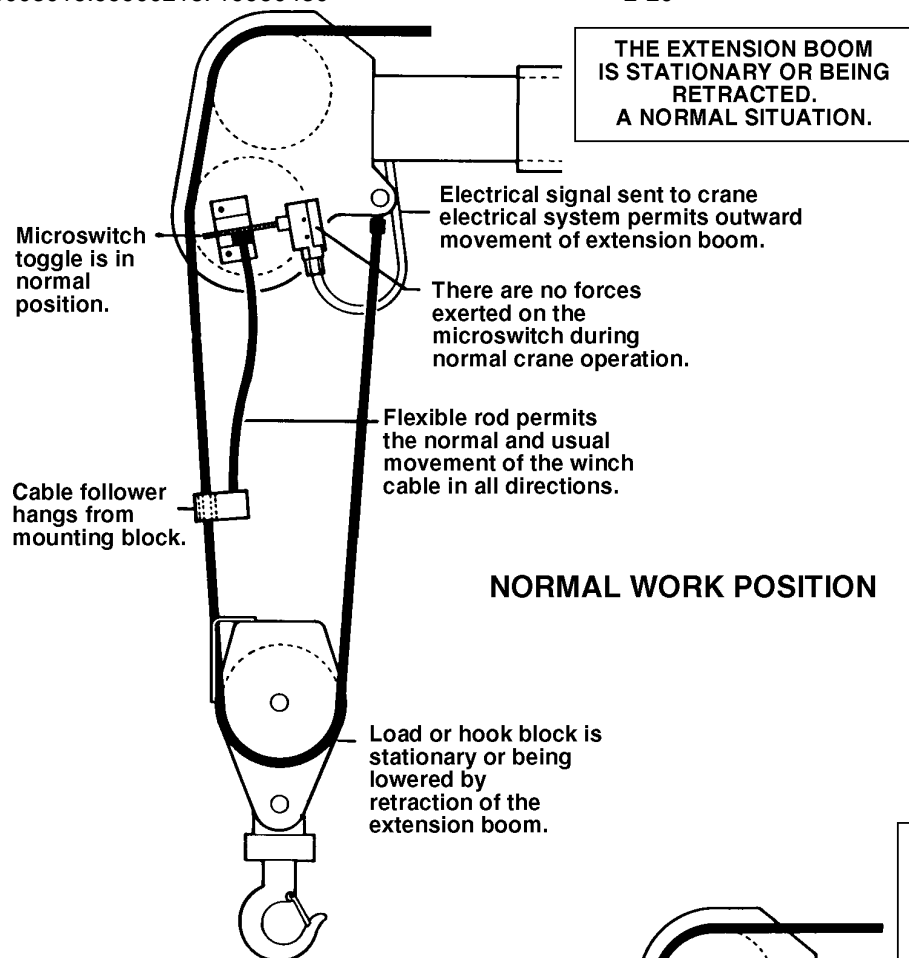
NOTE

"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



APPROACHING TWO-BLOCKING SITUATION

SECTION 3. MODEL 3016 REPLACEMENT PARTS

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BASE ASM (41707846)	4
MAST ASM (41707847)	5
LOWER BOOM ASM (41707848)	6
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3016 EXT BOOM ASM (41707849)	8
EXT BOOM CYLINDER (3B040880)	9
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HYD KIT-PROP'L RMT CTRL (91708429)	14
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VALVEBANK (73733057-1)	16
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OPTION-AUX OUTRIGGERS-MO/MD-6X4 (31703350)	33
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PARTS INFORMATION

GENERAL

This section contains the exploded parts drawings and accompanying parts lists for the assemblies used on this crane. These drawings are intended to be used in conjunction with the instructions found in the REPAIR section in Volume 1. For optional equipment, refer to the appropriate manual, or consult your IMT sales representative.


WARNING

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

CRANE IDENTIFICATION

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

Iowa Mold Tooling Co., Inc.
Box 189, Garner, IA 50438-0189
Telephone: 515-923-3711
Product Support Fax: 515-923-2424

 IOWA MOLD TOOLING CO., INC. BOX 189, GARNER, IA 50438-0189	
MODEL NUMBER	
SERIAL NUMBER	
MFG DATE	
70029119	

SERIAL NUMBER PLACARD

CYLINDER IDENTIFICATION

To insure that the proper cylinder replacement parts are received, 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.

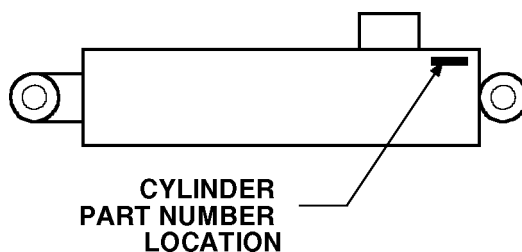
WELDMENT IDENTIFICATION

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.



CYLINDER PART NUMBER LOCATION

BASE ASM (41707846)

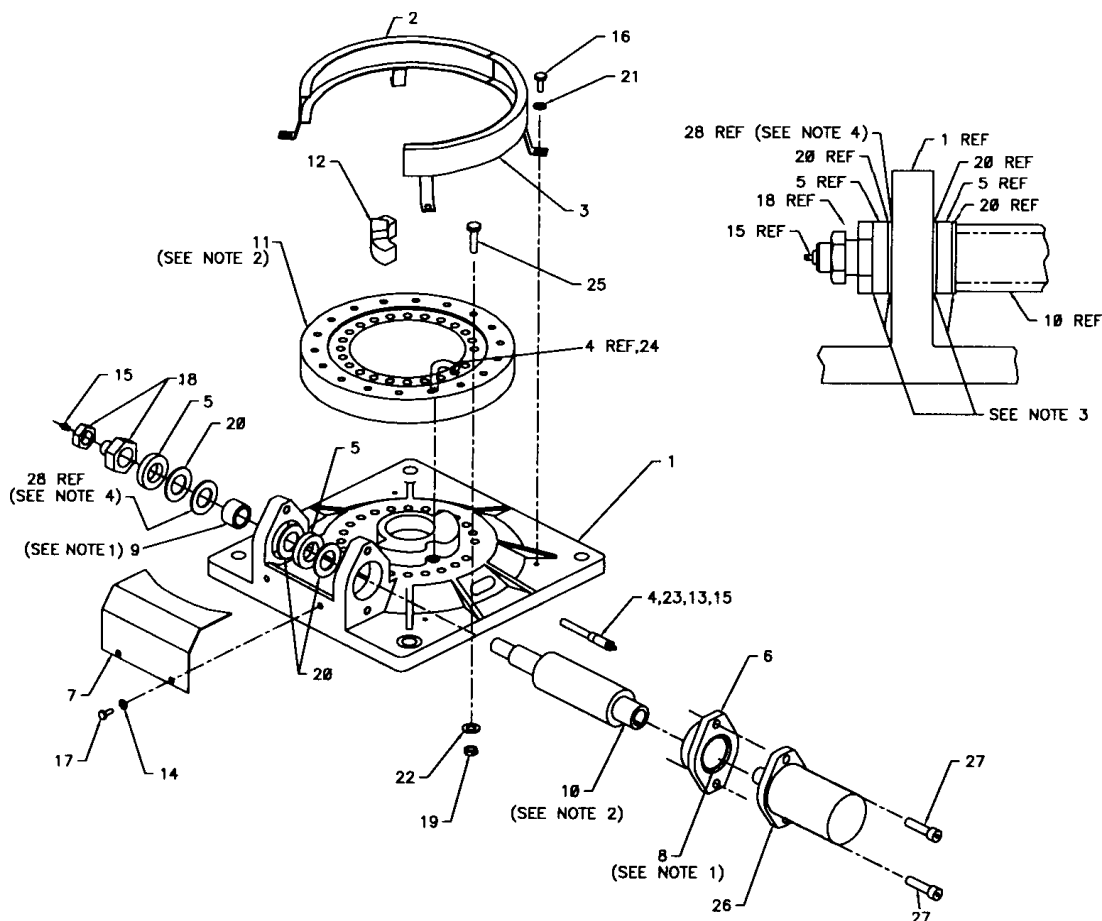
ITEM	PART NO.	DESCRIPTION	QTY
1.	51707512	BASE	1
2.	52713754	TURNTABLE GUARD-RH	1
3.	52713755	TURNTABLE GUARD-LH	1
4.	60030086	TUBING 1/4 X 6	1
5.	60030116	THRUST BEARING	2
6.	60107543	WORM SUPPORT PLATE	1
7.	60111627	WORM COVER	1
8.	70055147	ROLLER BEARING	1
9.	70055148	ROLLER BEARING	1
10.	70056397	WORM GEAR	1
11.	71056682	TURNTABLE GEAR BEARING	1
12.	71143165	ROTATION STOP	1
13.	72053301	COUPLING 1/8 NPT	1
14.	72063050	WASHER 5/16 LOCK	2
15.	72053508	GREASE ZERK, 1/8 NPT	2
16.	72060000	CAP SCR 1/4-20X1/2 HHGR5	4
17.	72060023	CAP SCR 5/16-18X3/4 HHGR5	2
18.	72062251	LOCKNUT 7/8-9 DRAKE	1
19.	72062162	NUT 9/16-12 HEX GR8	23
20.	72063161	WASHER 1-1/8 HARDENED	3
21.	72063049	WASHER 1/4 LOCK	4
22.	72063117	WASHER 9/16 GR8	23
23.	72531731	ADAPTER, 1/8NPT 1/4TUBE	1
24.	72531746	ADAPTER 1/8NPT 1/4TUBE 90°	1
25.	72601510	CAP SCR 9/16-12X3-3/4 GR8	23
26.	73051482	HYDRAULIC MOTOR	1
27.	72060796	CAP SCR 1/2-13X2 SH	2
28.	60121433	SHIM 2.25X1.81X16GA	REF

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.

NOTE

1. Bearings must be packed with grease at assembly.
2. Apply Molub-Alloy 936 to turntable bearing and worm teeth at assembly.
3. Initial lubrication of both sides of thrust bearings is required at the time of assembly.
Approved lubricants are Slip Plate, Lubri-Plate, or other lubricants containing graphite or MSO_2 .
4. Shim as required if needed.

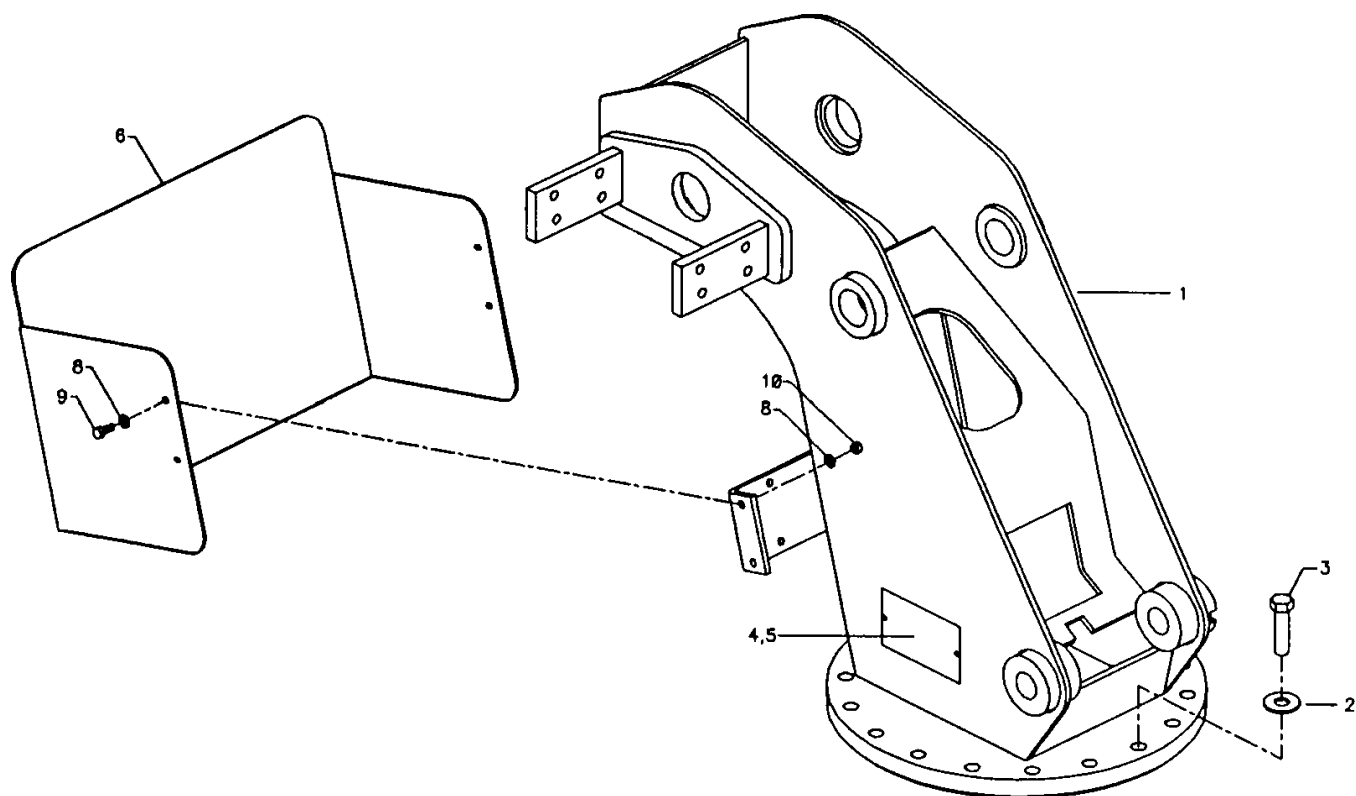


MAST ASM (41707847)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52707912	MAST	1
2.	72063117	WASHER 9/16-12 FLAT HARD	18
3.	72601144	CAP SCR 9/16-12X2 HHGR8	18
4.	70029119	SERIAL NUMBER PLACARD	1
5.	72066340	POP RIVET 1/8	2
6.	60119128	VB COVER	1
8.	72063001	WASHER 1/4 WRT	8
9.	72060004	CAP SCR 1/4-20X1 HHGR5	4
10.	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.



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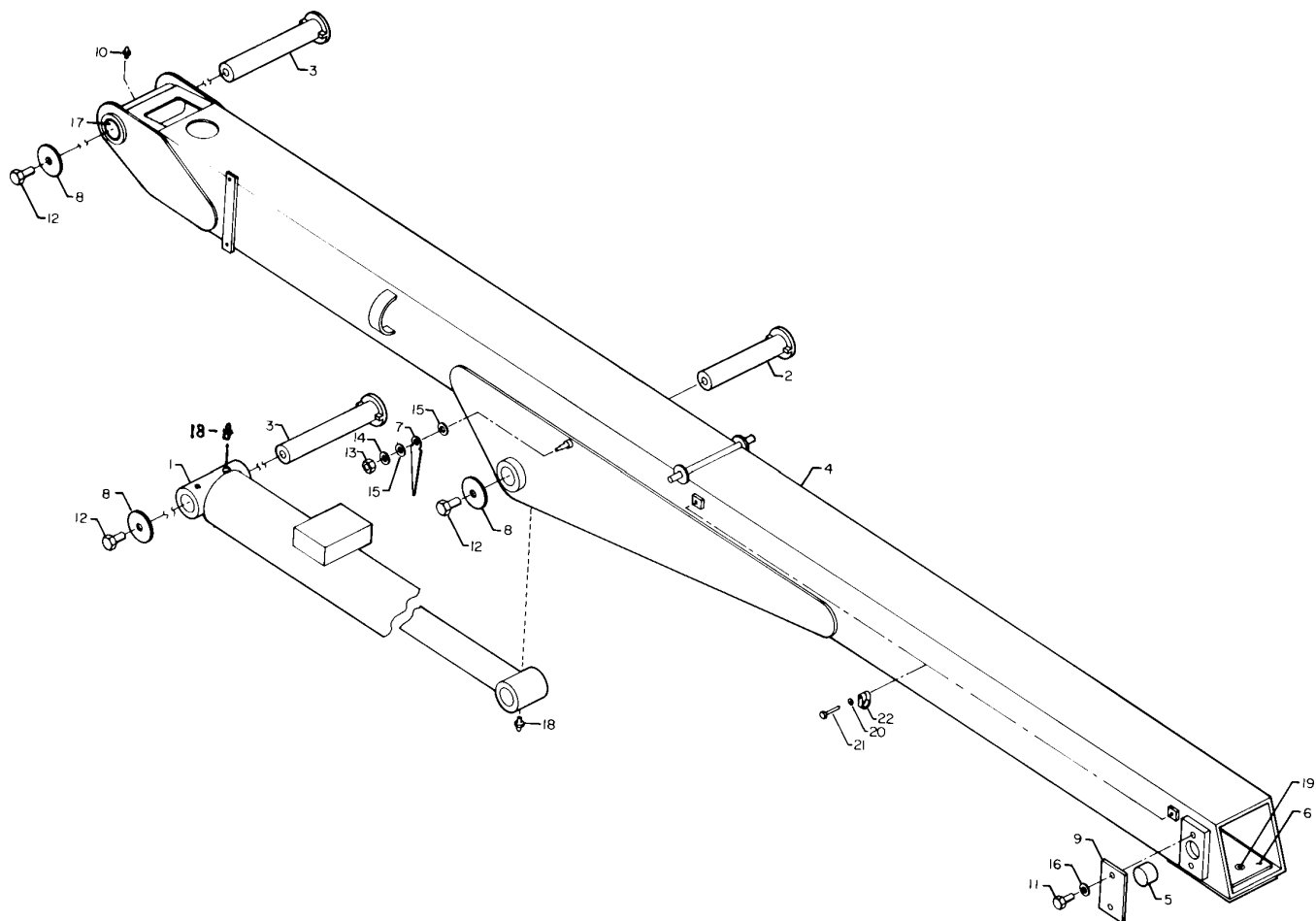
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LOWER BOOM ASM (41707848)

NOTE

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

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B036880	CYLINDER (INCL. 18)	1
2.	52703765	PIN	1
3.	52707685	PIN	2
4.	52707915	LOWER BOOM (INCL. 17)	1
5.	60030007	WEAR PAD	2
6.	60030139	WEAR PAD	1
7.	60105544	ANGLE INDICATOR	2
8.	60106333	PIN RETAINER PLATE	3
9.	60107550	WEAR PAD RETAINER PLATE	2
10.	72053508	ZERK 1/8 NPT	1
11.	72060044	CAP SCR 3/8-16X3/4 HHGR5	4
12.	72060147	CAP SCR 5/8-11X1 HHGR5	3
13.	72062103	NUT 3/8-16 LOCK	2
14.	72063003	WASHER 3/8 WRT	2
15.	72063005	WASHER 1/2 WRT	4
16.	72063051	WASHER 3/8 LOCK	4
17.	7BF81215	BUSHING (PART OF 4)	4REF
18.	72053507	ZERK 1/4-28 (PART OF 1)	2REF
19.	72060915	CAP SCR 3/8-16X1 FLTHD SOC	2
20.	72063049	WASHER 1/4 LOCK	2
21.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
22.	70034381	CORD GUIDE	2



LOWER BOOM CYLINDER (3B036880)

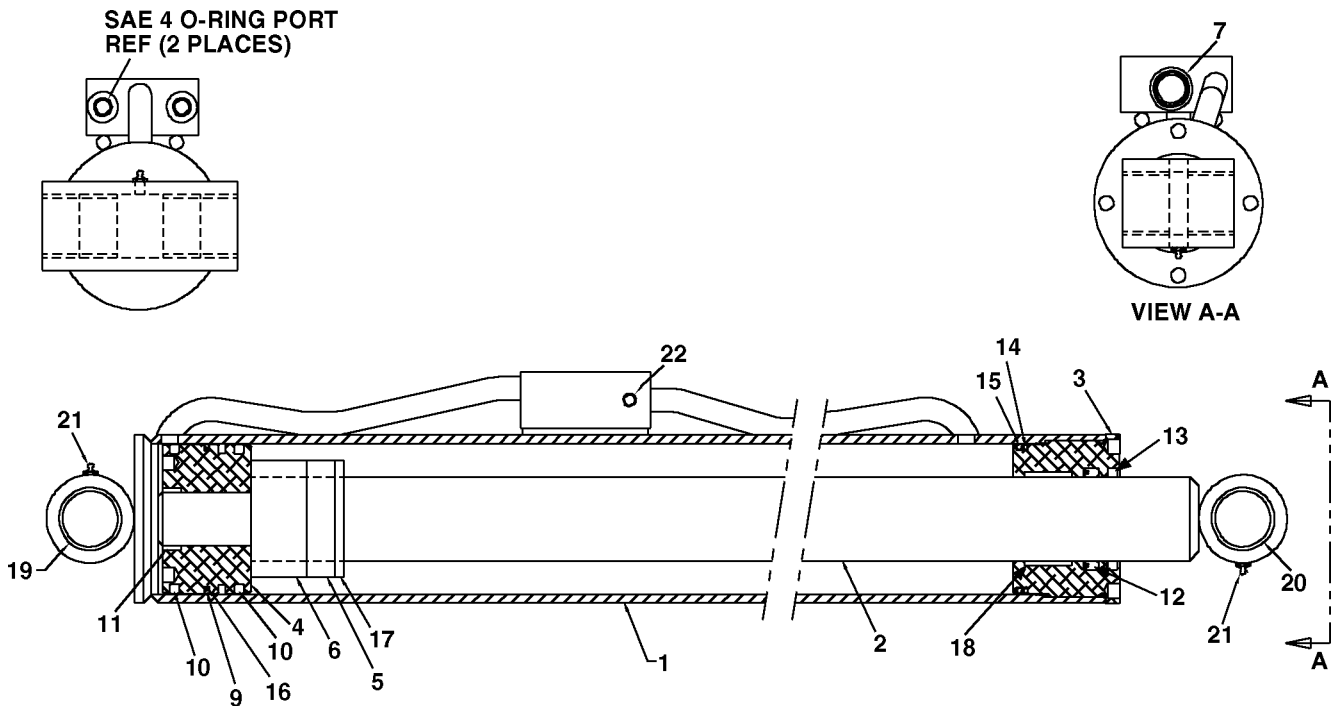
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B036880	CASE (INCL: 19-22)	1
2.	4G036880	ROD (INCL. 20&21)	1
3.	6H040022	HEAD	1
4.	6I040143	PISTON	1
5.	6C075022	STOP TUBE	1
6.	6C150022	STOP TUBE	1
7.	73054304	C'BALANCE VALVE 10GPM	1
8.	9C161823	SEAL KIT (INCL:9-18)	1
9.	7T66P040	PISTON SEAL (PART OF 8)	1REF
10.	7T65I040	PISTON RING (PART OF 8)	2REF
11.	7T61N143	SEAL LOCK RING (PART OF 8)	1REF
12.	7R546022	ROD SEAL (PART OF 8)	1REF
13.	7R14P022	ROD WIPER (PART OF 8)	1REF
14.	7Q10P342	BACK-UP RING (PART OF 8)	1REF
15.	7Q072342	O-RING (PART OF 8)	1REF
16.	7Q072153	O-RING (PART OF 8)	1REF
17.	6A025022	WAFFER LOCK RING (PART OF 8)	1REF
18.	7T2N8025	ROD WEAR RING (PART OF 8)	1REF
19.	7BF81015	BUSHING (PART OF 1)	4REF
20.	7BF81215	BUSHING (PART OF 2)	2REF
21.	72053507	ZERK 1/4-28 (PART OF 1&2)	2REF
22.	7PNPXT02	PLUG 1/8 NPT (PART OF 1)	3REF

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.

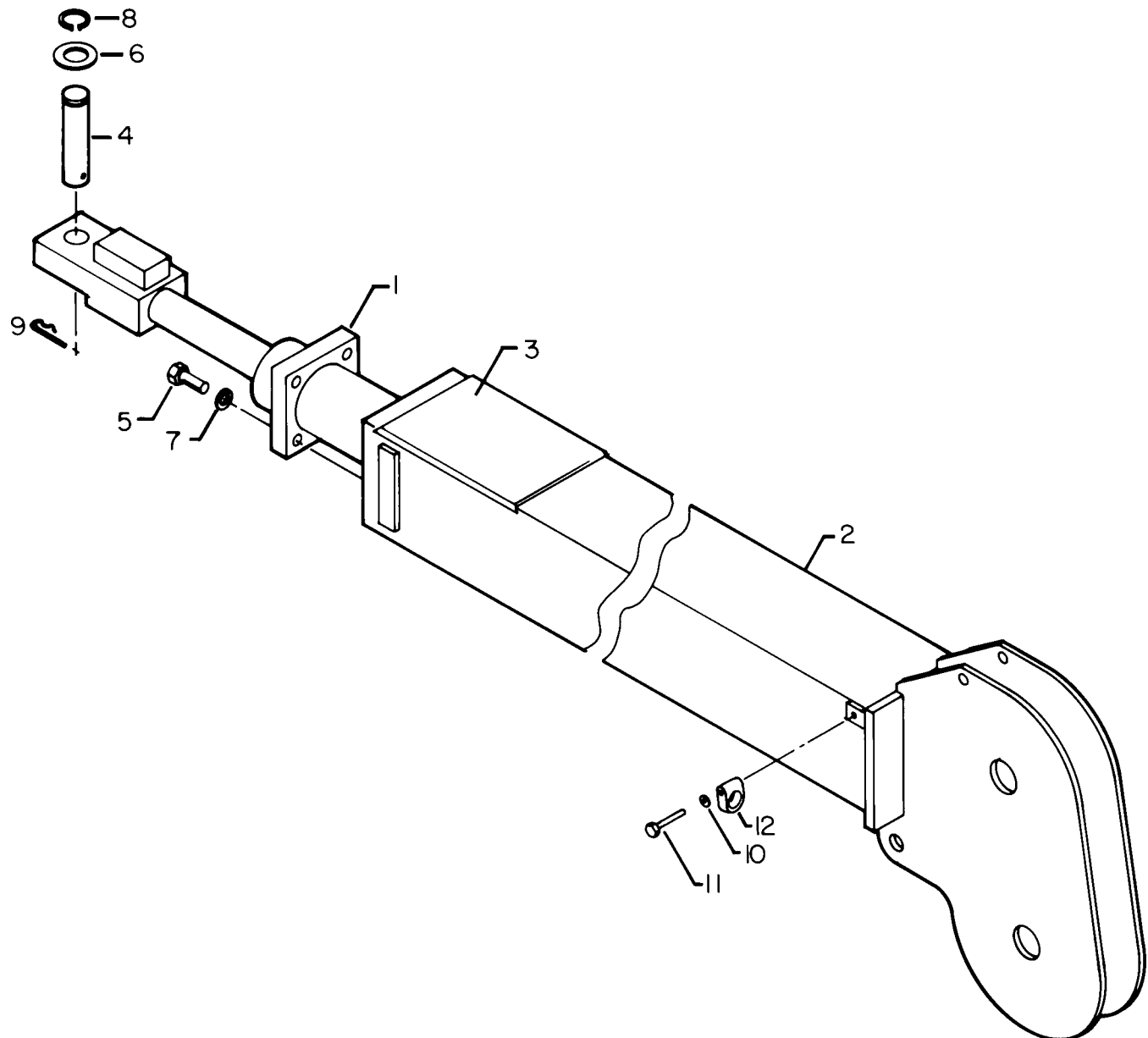
APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD AND CASE THREADS.



3016 EXT BOOM ASM (41707849)**NOTE**

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

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B040880	EXTENSION CYLINDER	1
2.	52707921	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 1X10GA	1
7.	72063053	WASHER 1/2 LOCK	4
8.	72066125	RETAINING RING 1" HD EXT	1
9.	72066145	HAIR PIN .19	1
10.	72063049	WASHER 1/4 LOCK	1
11.	72060006	CAP SCR 1/4X1-1/2 HHGR5	1
12.	70034381	CORD GUIDE	1



EXT BOOM CYLINDER (3B040880)

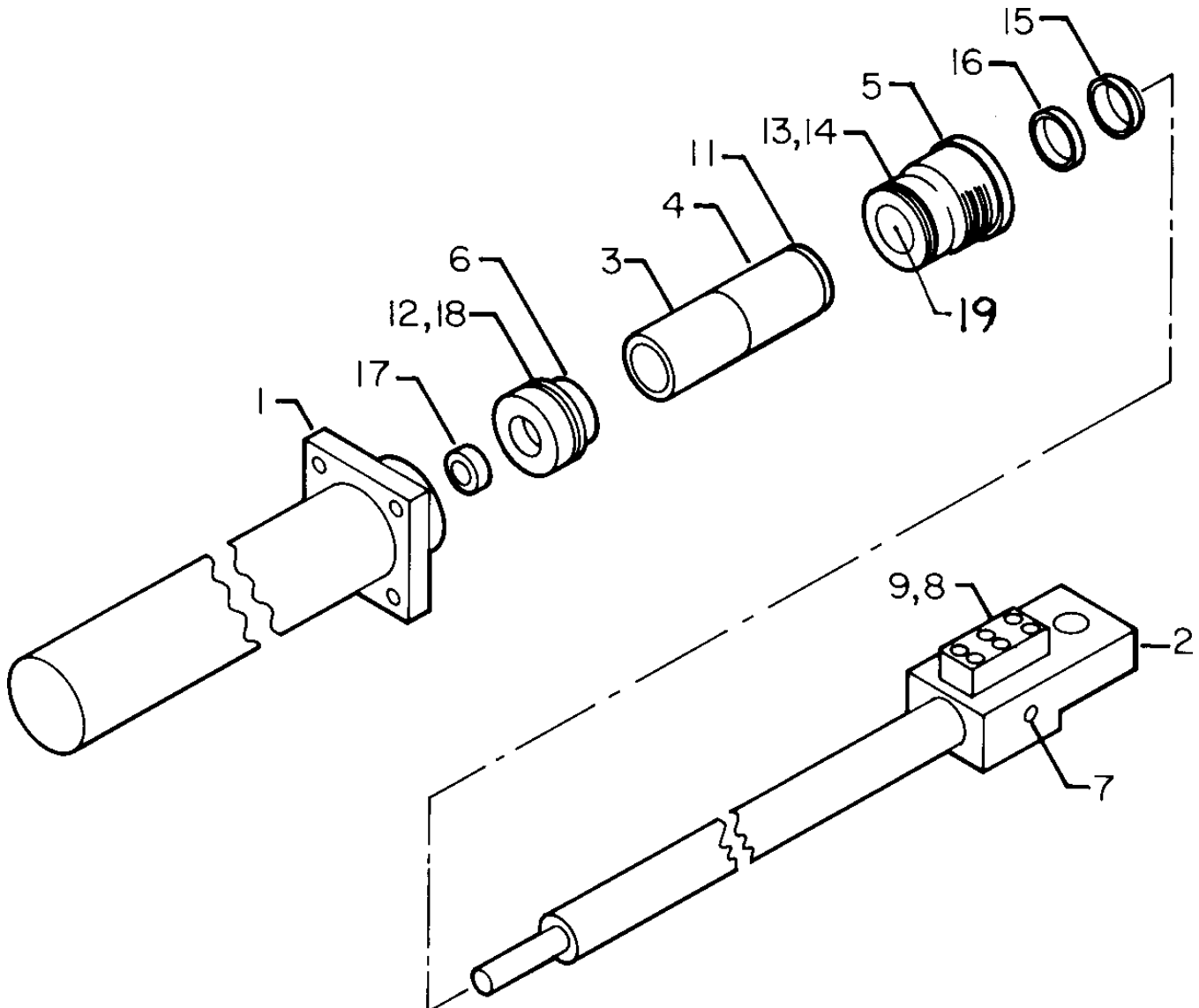
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B040880	CASE	1
2.	4H309820	ROD (INCL: 7)	1
3.	6C300015	STOP TUBE	1
4.	6C309820	STOP TUBE	1
5.	6H025015	HEAD	1
6.	6IX02512	PISTON	1
7.	7PNPXT02	PLUG, 1/8 NPT (PART OF 2)	1REF
8.	72060708	SCREW 1/4-20X1-1/4 SH	6
9.	73054004	HOLDING VALVE	1
10.	9B101220	SEAL KIT (INCL. 11-19)	1
11.	6A025015	WAFER LOCK RING (PART 10)	1REF
12.	7Q072137	O-RING (PART OF 10)	1REF
13.	7Q072228	O-RING (PART OF 10)	1REF
14.	7Q10P228	O-RING BACK-UP (PART OF 10)	1REF
15.	7R14P015	ROD WIPER (PART OF 10)	1REF
16.	7R546015	ROD SEAL (PART OF 10)	1REF
17.	7T61N125	LOCK RING SEAL (PART OF 10)	1REF
18.	7T66P025	PISTON SEAL (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.

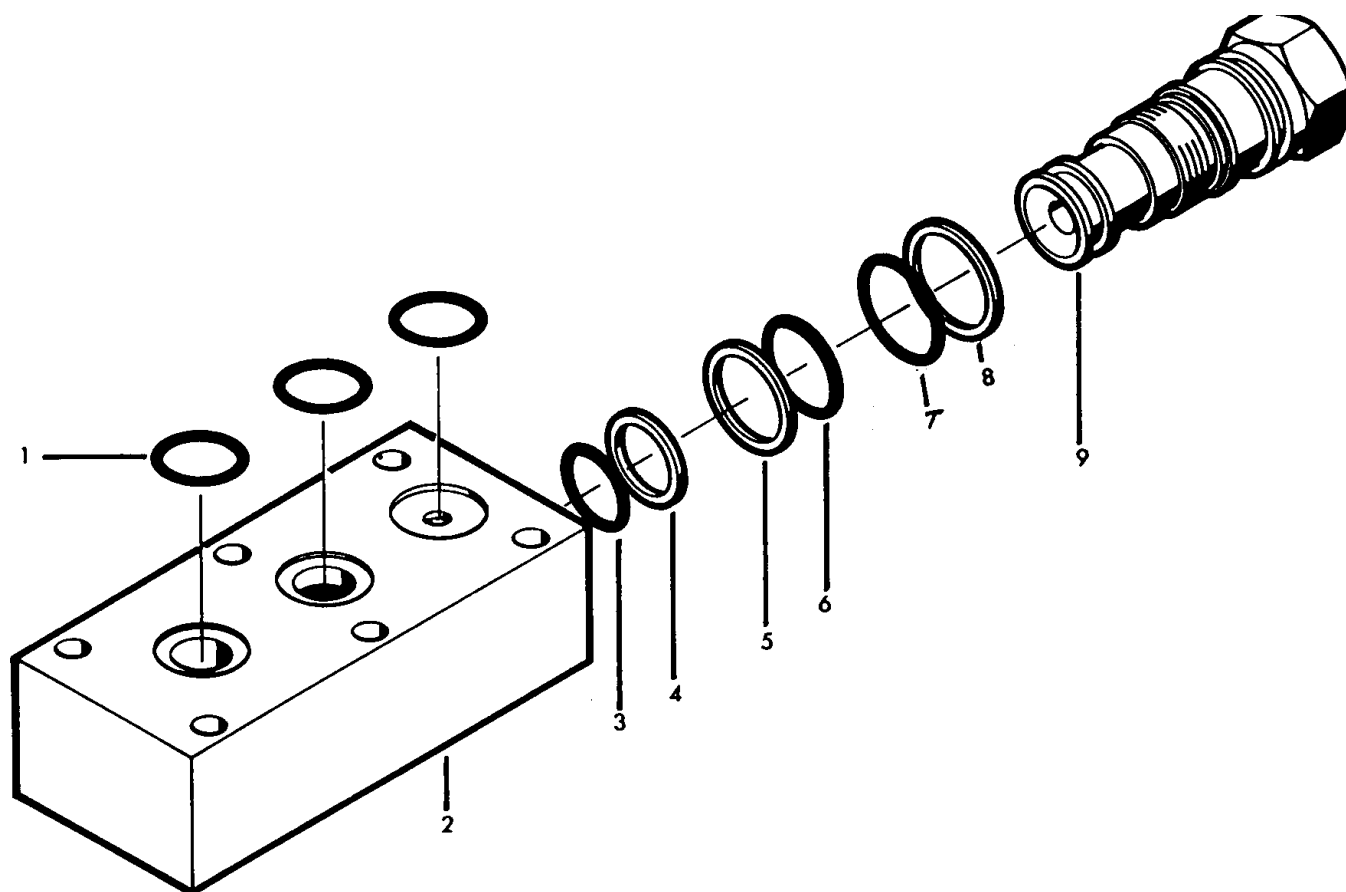
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

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



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

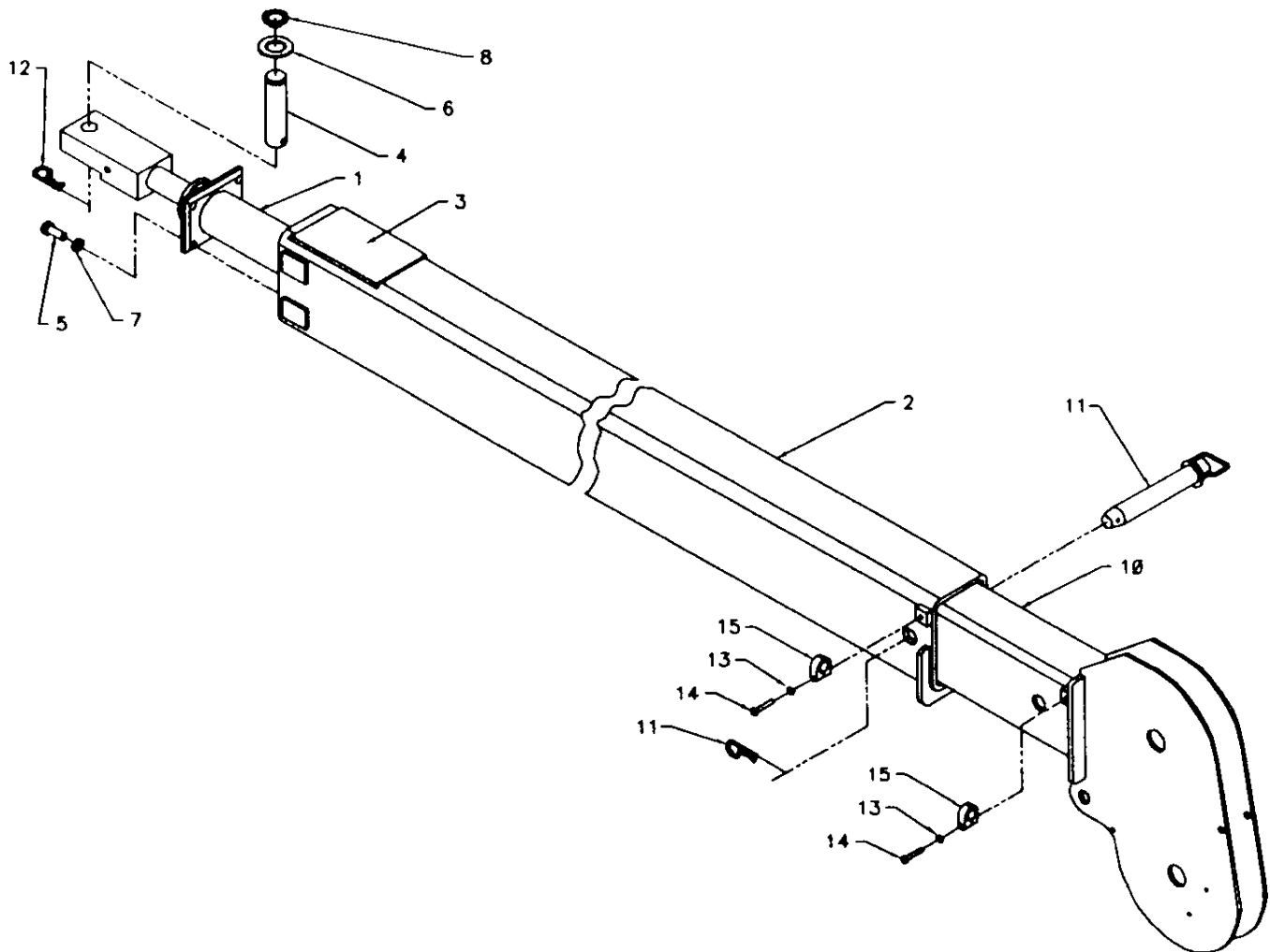


3016-20' EXT BOOM ASM (41707924)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B040880	EXTENSION CYLINDER	1
2.	52707922	1ST STAGE EXT 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" HX EXT	1
10.	52707923	2ND STAGE EXT BOOM	1
11.	73733171	PIN 1X6 LOCK W/HAIRPIN	1
12.	72066145	HAIR PIN .19	1
13.	72063049	WASHER 1/4 LOCK	2
14.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
15.	70034381	CORD GUIDE	2

NOTE

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



00003016: 31709198.01.19960430

3-12

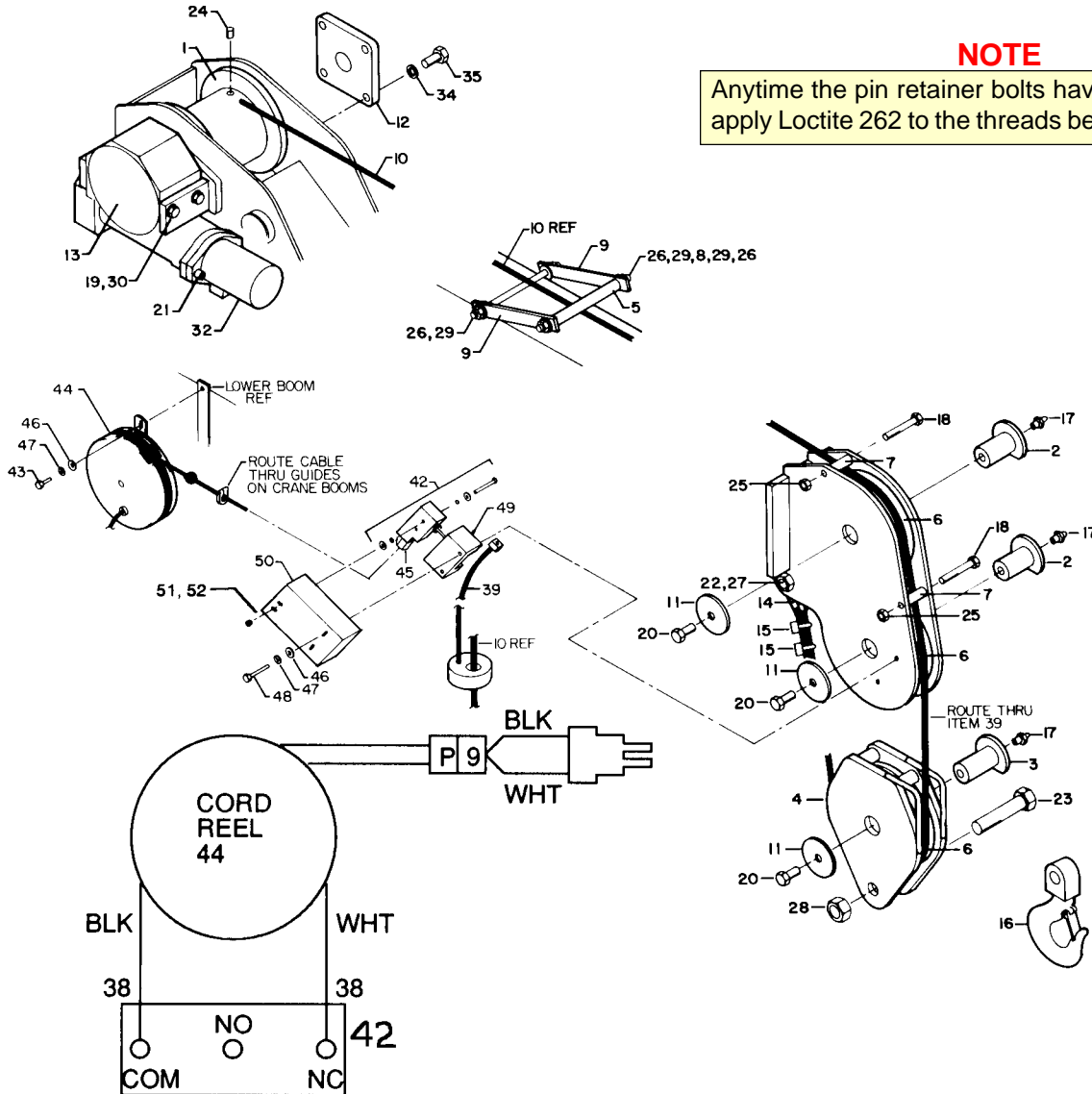
WINCH/CABLE/HOOK KIT (31709198)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51707867	DRUM	1
2.	52707730	PIN	2
3.	52707731	PIN	1
4.	52707932	SNATCH BLOCK	1
5.	60030108	ROLLER - CABLE GUIDE	1
6.	60030136	SHEAVE	3
7.	60102596	SPACER	2
8.	60105538	STUD- CABLE GUIDE	1
9.	60105540	CABLE GUIDE SIDE BAR	2
10.	51707928	CABLE ASM (incl:14-15)	1
11.	60109337	PIN RETAINER PLATE 3"	3
12.	70055185	BEARING, FLANGE	1
13.	71057936	WINCH	1
14.	70058026	THIMBLE (part of 10)	1REF
15.	70058909	CLAMP (part of 10)	2REF
16.	71073920	HOOK	1
	70074000	SAFETY LATCH ASM	REF
17.	72053508	ZERK 1/8 NPT	3
18.	72060054	CAP SCR 3/8-16X3 HHGR5	2
19.	72060046	CAP SCR 3/8-16X1 HHGR5	4
20.	72060147	CAP SCR 5/8-11X1 HHGR5	3
21.	72060774	CAP SCR 7/16-14X1-1/4 SH	2
22.	72060217	CAP SCR 7/8-9X4 HHGR5	1

23.	72060247	CAP SCR 1-8X4-1/2 HHGR5	1
24.	72060579	SET SCR 3/8-16X1/2 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.	72062137	NUT 1-8 LOCK	1
29.	72063005	WASHER 1/2 WRT	4
30.	72063051	WASHER 3/8 LOCK	4
32.	73051760	HYDRAULIC MOTOR	1
34.	72063054	WASHER 9/16 LOCK	4
35.	72601499	CAP SCR 9/16-12X1-1/4 HHGR5	4
38.	77040051	TERMINAL	2
39.	52709413	CABLE WELDMENT	1
40.	77040186	TERMINAL	1
41.	77040047	TERMINAL	1
42.	77041291	SWITCH	1
43.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
44.	51713168	CORD REEL	1
45.	77044468	STRAIN RELIEF	1
46.	72063001	WASHER 1/4 WRT	4
47.	72063049	WASHER 1/4 LOCK	4
48.	72060008	CAP SCR 1/4-20X2 HHGR5	2
49.	60113594	MOUNTING BLOCK COVER	1
50.	60113593	SWITCH COVER	1
51.	72063098	WASHER .16 FLAT	2
52.	72063047	WASHER #10 LOCK	2

NOTE

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



WINCH (71057936)

ITEM	PART NO.	DESCRIPTION	QTY
1.	70143673	SHAFT-OUTPUT	1
2.	70143672	HOUSING	1
3.	70048142	BUSHING & BREATHER KIT 3/8	1
4.	70145277	COVER	1
5.	76393174	O-RING	1
6.	72601568	CAP SCREW	4
7.	76393173	OIL SEAL	1
8.	70143670	BUSHING	2
9.	70143669	WASHER	2
10.	70143668	KEY	2
11.	70056428	GEAR-SR	1
12.	70056427	WORM-SR	1
14.	72661348	RETAINING RING	2
15.	70055202	BALL BEARING	2
16.	70143865	PIPE PLUG	2
18.	72601567	CAP SCREW	2
20.	70732542	BRAKE KIT (INCL:27-38)	1
21.	76393171	GASKET	2
23.	—	PROTECTOR (DISCARD)	1REF
24.	70143658	KEY	1
27.	70143664	*FRICTION DISC	2REF

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

GEAR RATIO: 38:1

OUTPUT TORQUE: 19800 IN-LBS

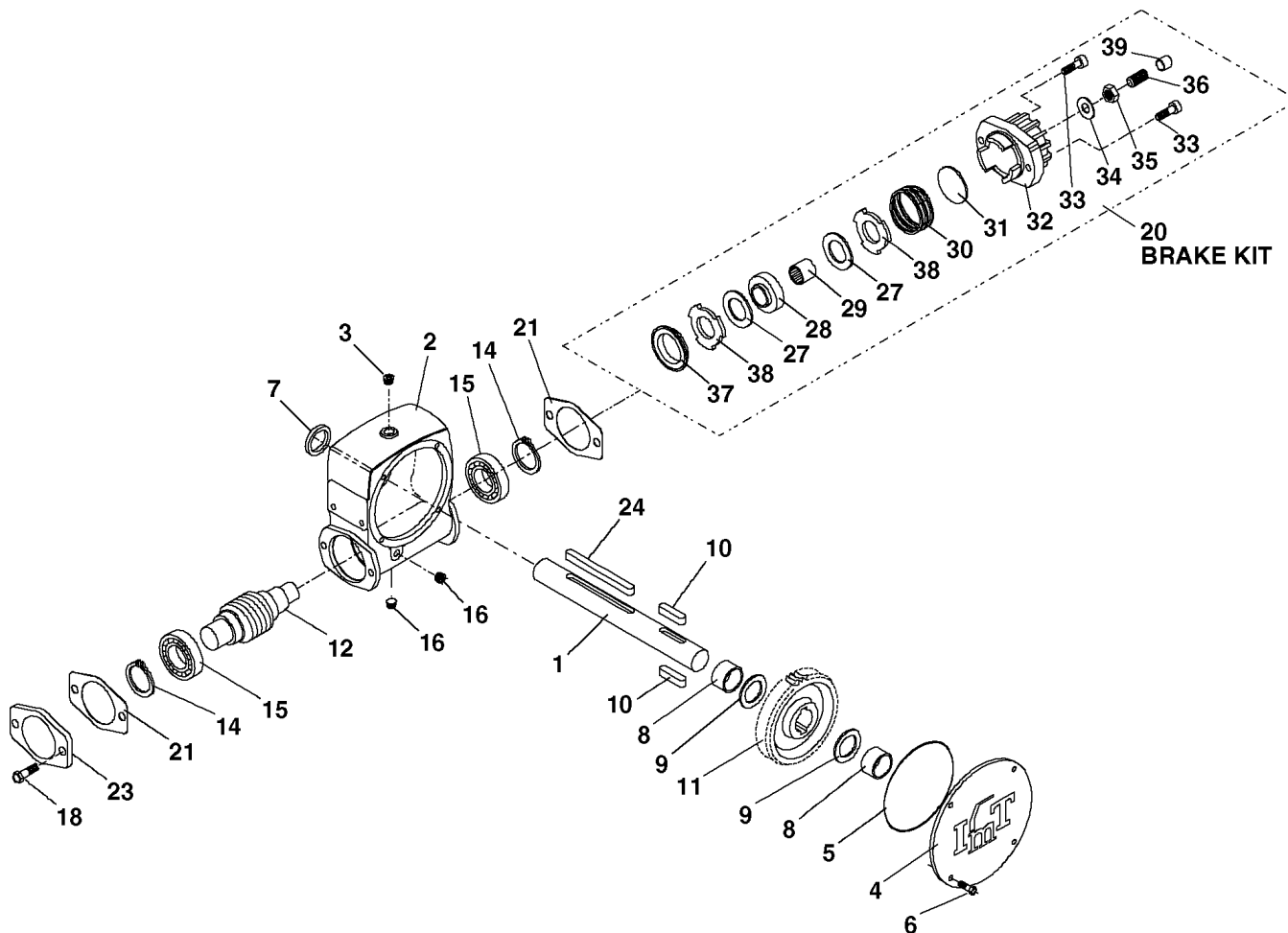
MAX INPUT TORQUE: 983 IN-LBS

MAX INPUT SPEED: 400 RPM

INSTALLED WEIGHT: 41 LBS

LUBRICATION: EP 140 (1 US PINT)

ULTIMATE OUTPUT TORQUE: 39600 IN-LBS

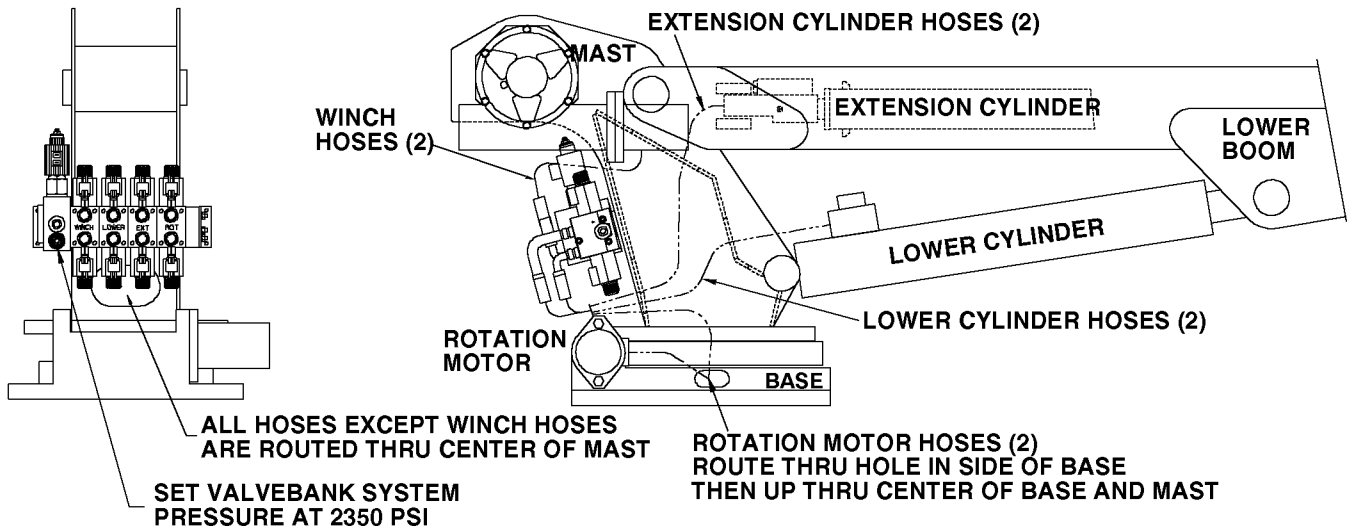
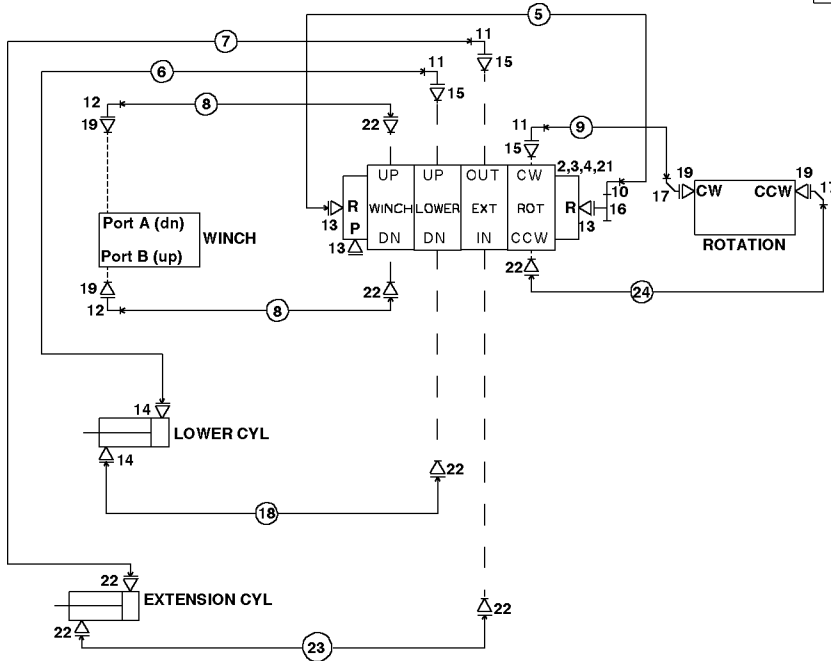
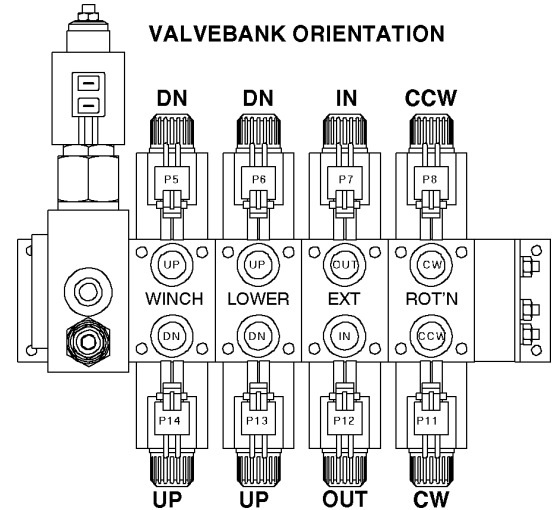


HYD KIT-PROP'L RMT CTRL (91708429)

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713277	VALVEBANK 4-SECT (INCL:10,11,13,15,16,21,22)	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 ASM 1/2X15 FJ #8#8	*1REF
6.	51394214	HOSE ASM 1/4X32 FF #4#6	*1REF
7.	51394217	HOSE ASM 1/4X27.5FF #4#6	*1REF
8.	51394213	HOSE ASM 1/4X16.5FJ #4#4	*2REF
9.	51394219	HOSE ASM 1/4X35FF #4#6	*1REF
10.	72532658	ELBOW #8MJIC #8FJIC SWVL	1
11.	72532700	ELBOW #6MSTR #6MJIC XLG (PART OF 1)	3REF
12.	72532699	ELBOW #6MSTR #4MJIC 90°	2
13.	72532358	ADPTR #8MSTR #8MJIC(PART OF 1)3REF	
14.	72532351	ADAPTER #4MSTR #4MJIC	2
15.	72533052	ADPTR #8MSTR#6FSTR(PART OF 1)3REF	
16.	72532671	TEE #8JIC SWVL NUT(PART OF 1)	1REF
17.	72532985	ELBOW #6MSTR #4MJIC 45°	2

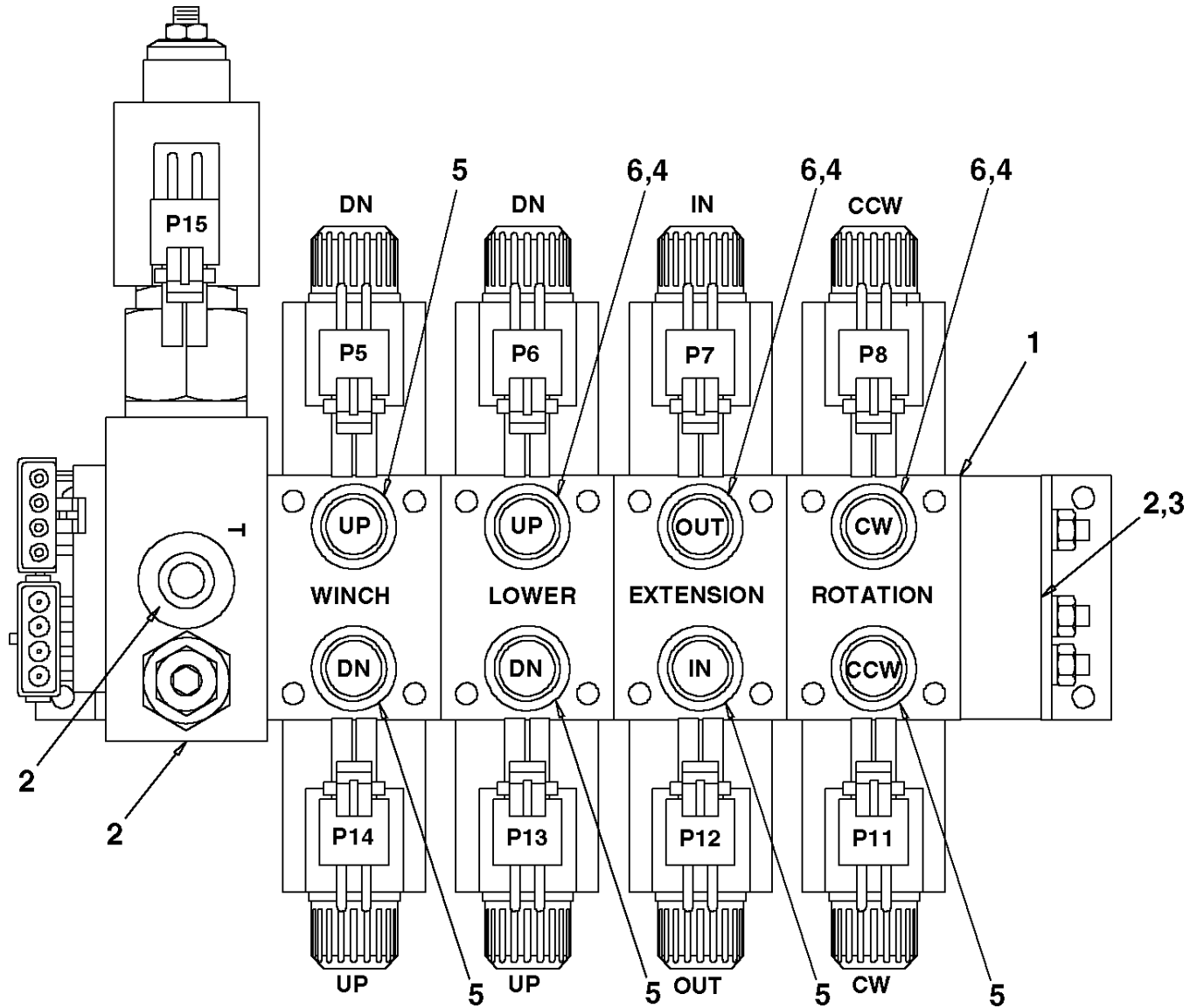
18.	51394215	HOSE ASM 1/4X30.5FJ #4#4	*1REF
19.	72532722	ADAPTER #10MSTR #6FSTR HOSE	4
20.	51713256	KIT (INCL:5-9,18,23,24)	1
21.	73735154	VALVE BANK 4SEC 4R 10GPM TELE	1REF
22.	72532792	ADPTR #8MSTR #4MJIC(PART OF 1)	2
23.	51394222	HOSE ASM 1/4X27 FJ #4#4	*1REF
24.	51394218	HOSE ASM 1/4X35 FJ #4#4	*1REF

* Part of 20



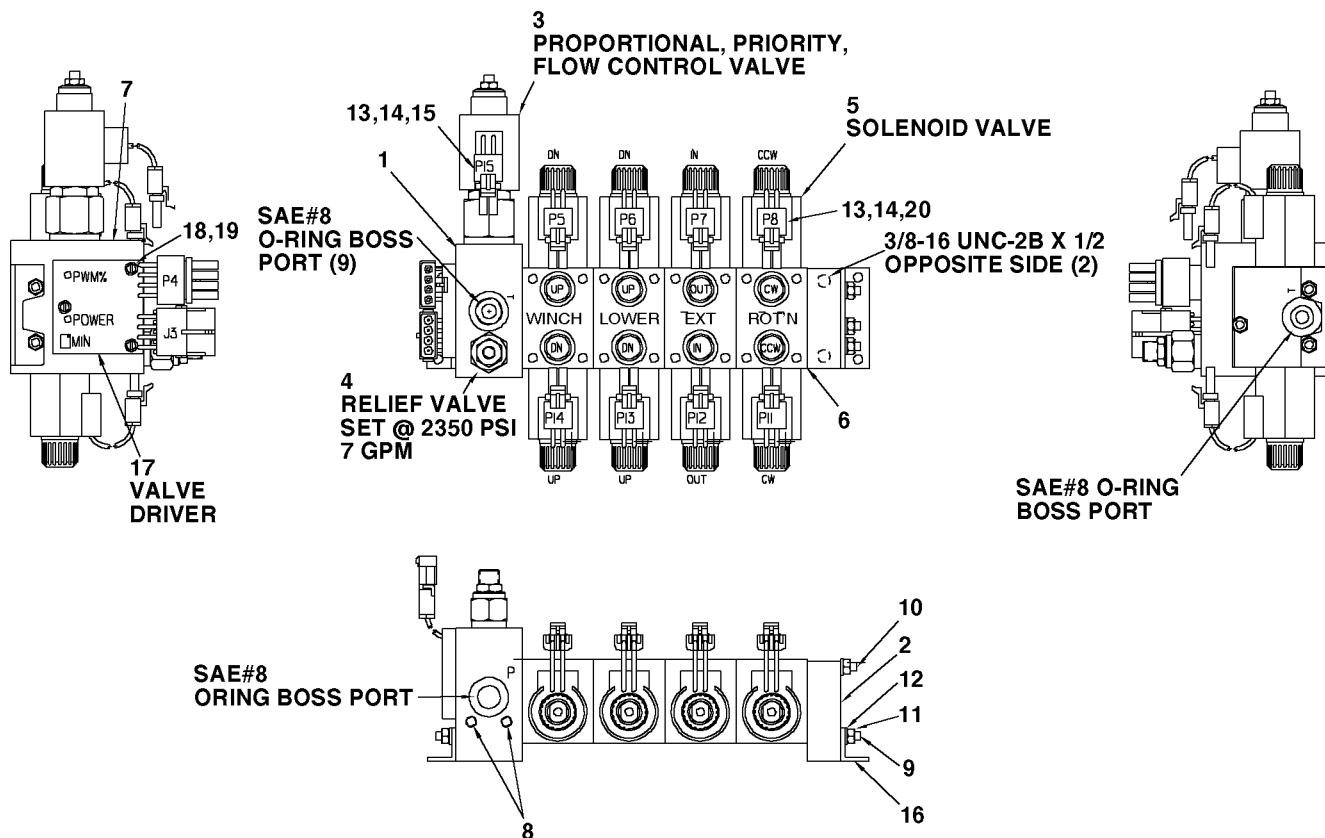
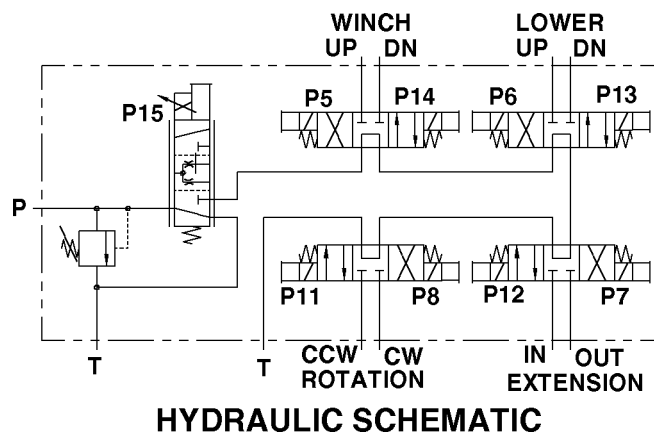
VALVEBANK ASM-4 SECT PROP'L RMT CTRL (51713277)

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



VALVEBANK (73733057-1)

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



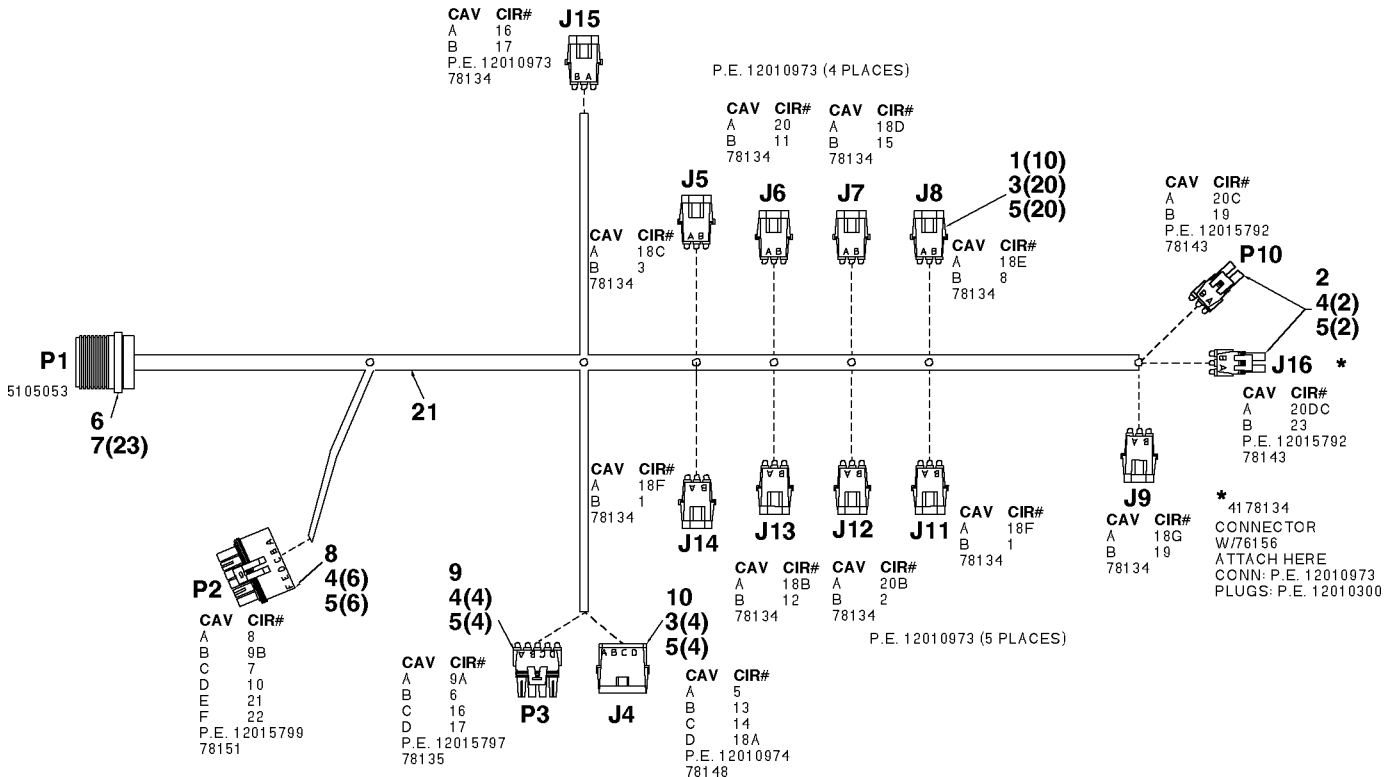
VALVEBANK-WIRING DIAGRAM (73733057)

FOR REFERENCE ONLY

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044573	SHROUD CONNECTOR	10REF
2.	77044574	TOWER CONNECTOR	2REF
3.	77044576	TERMINAL-MALE 20-18GA	4REF
4.	77044577	TERMINAL-FEMALE 20-18GA	4REF

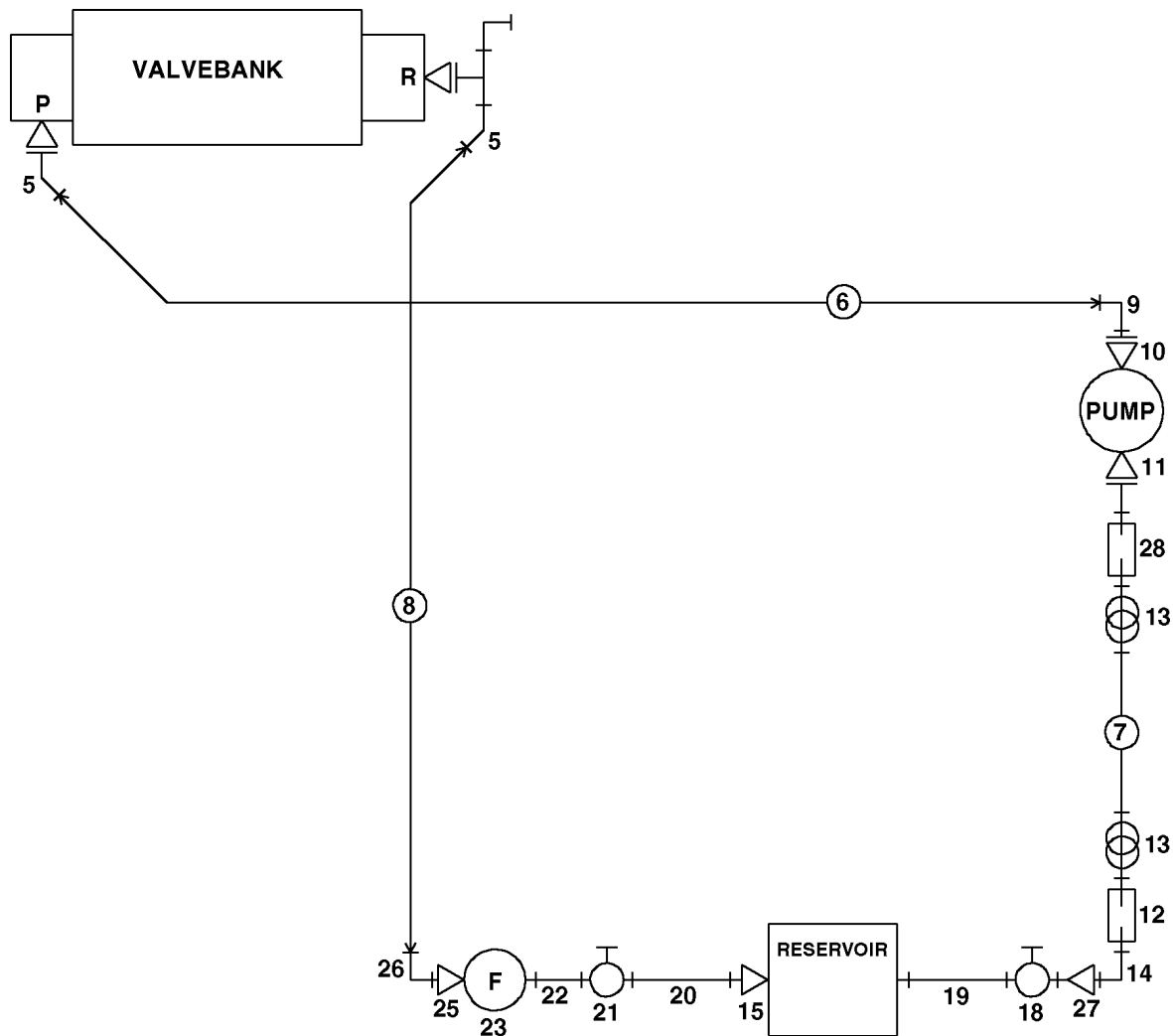
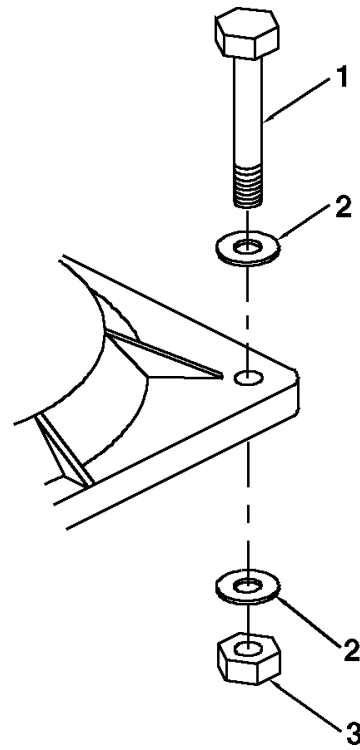
5.	77044578	CABLE SEAL-GRN	38REF
6.	77044620	CONN RCPT	1REF
7.	77044580	SOCKET	23REF
8.	77044622	TOWER CONNECTOR-6 CONT	1REF
9.	77044623	TOWER CONNECTOR-4 CONT	1REF
10.	77044624	SHROUD CONN	1REF

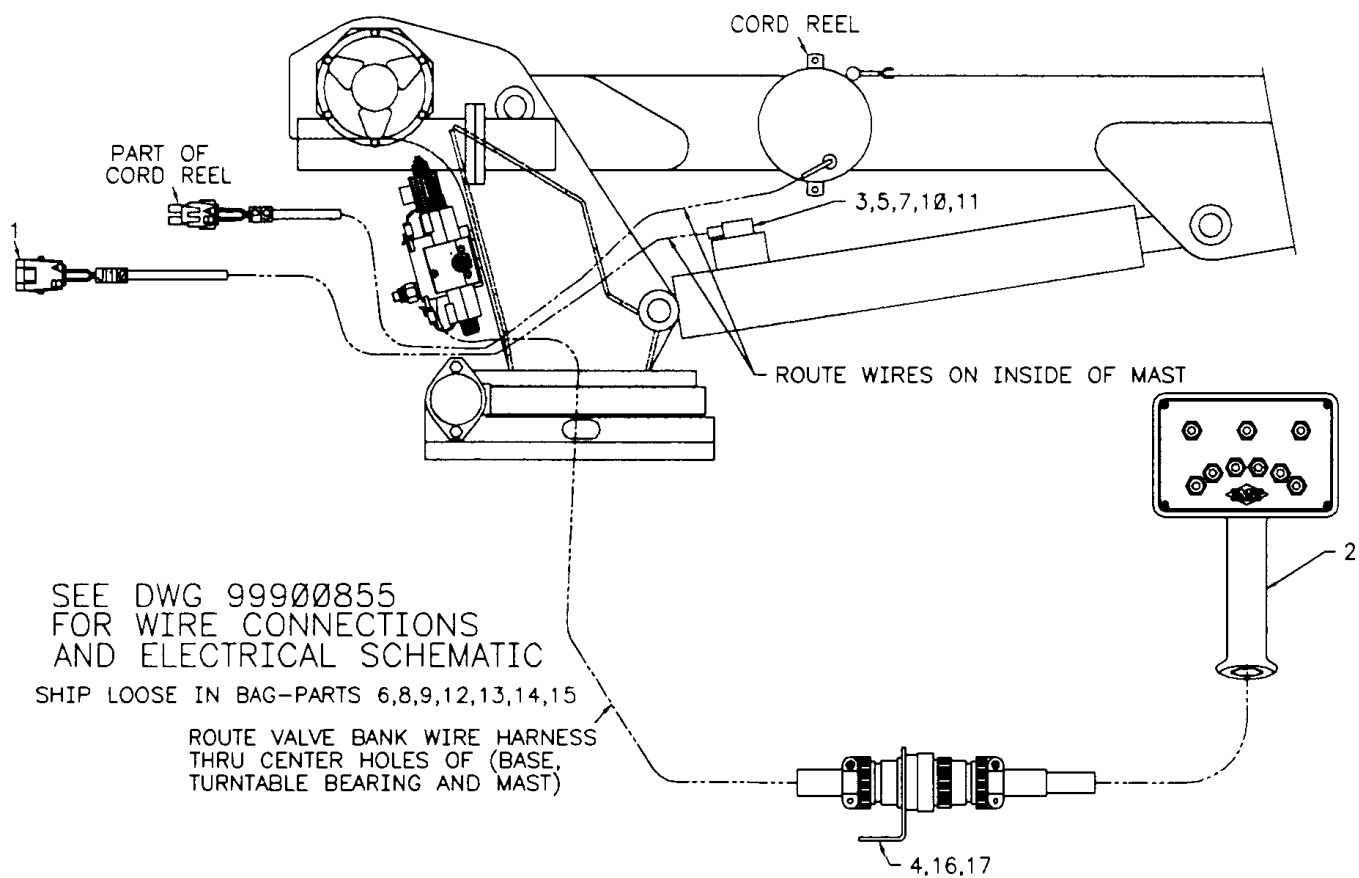
WIRE LEGEND						
CIR	5105053	COLOR	GA	WEATHER PAK	LABELING	FUNCTION
	PIN CAVITY			CONNECTOR		
1	A	YELLOW/BLK	18	PIA TO: J11B	ROT J11B	ROTATE CW
2	B	ORANGE/BLK	18	PIB TO: J12B	EXT J12B	BOOM EXT OUT
3	C	LT.BLUE/BLK	18	PIC TO: J5B	WIN J5B	WINCH DOWN
4	D	PINK/BLK	18	PID TO: J14B	WIN J14B	WINCH UP
5	E	ORANGE/RED	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	ROT J8B	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: J13B	LOWER J13B	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: J15A	PRVLV J15A	PROP. VALVE & COIL -
17		BLACK	16	P3D TO: J15B	PRVLV J15B	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	J13A TO: SPL B	LOWER J13A	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	J11A TO: SPL B	ROT J11A	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	J14A TO: SPL C	WINCH J14A	WINCH
20B		BLACK	16	J12A TO: SPL C	EXT J12A	BOOM EXT OUT
20C		BLACK	16	PIQA TO: SPL C	OPSI PIOA	OVERPRESSURE
20D		BLACK	16	J16A TO: SPL C	WNSPD J16A	WINCH TWO SPEED
21	G	BRN/RED	16	PIG TO: P2E	P2E	ENGINE START
22	T	BLK/BLUE	16	PIT TO: P2F	P2F	COMPRESSOR
23	U	RED/BLUE	16	PIU TO: J16B	WNSPD J16B	WINCH TWO SPEED



INSTALLATION KIT (93708163)

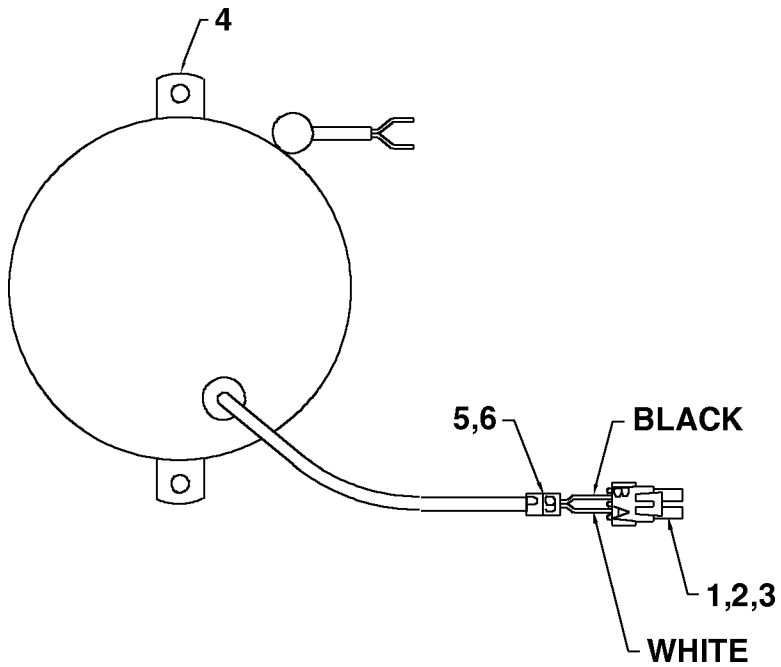
ITEM	PART NO.	DESCRIPTION	QTY
1.	72060187	CAP SCR 3/4-10X3 HHGR5	4
2.	72063008	WASHER 3/4 WRT	8
3.	72062140	NUT 3/4 LOCK	4
5.	72532670	ELBOW #8MJIC #8FJIC 45°	2
6.	51703725	HOSE ASM 3/8X252 FF	1
7.	89039481	HOSE 1" 100R4 X 48	1
8.	51703613	HOSE 1/2X192	1
9.	72053763	ADAPTER #8MSTR #8MJIC 90°	1
10.		ADPTR(DETERMINED BY PUMP) 1 REF	
11.		ADPTR(DETERMINED BY PUMP) 1 REF	
12.	72532470	BARBED NIPPLE 1 BARB 1 NPT	1
13.	72066515	HOSE CLAMP 1	2
14.	72053286	STREET ELBOW 1 NPT 90°	1
15.	72531836	RED. BUSHING 1-1/4 MPT 3/4 FPT	1
18.	73054130	GATE VALVE 1-1/4 NPT	1
19.	72053216	NIPPLE 1-1/4 NPT X 6	1
20.	72053146	NIPPLE 3/4 NPT X 6	1
21.	73054129	GATE VALVE 3/4 NPT	1
22.	72053141	NIPPLE 3/4 NPT X CLOSE	1
23.	73052000	RETURN FILTER	1
25.	72531832	BUSHING 3/4 MPT 3/8 FPT	1
26.	72531420	ELBOW 3/8 MPT 3/4 MJIC 90°	1
27.	72053377	RED. BUSHING 1-1/4 MPT 1 FPT	1
28.	72531195	BARBED NIPPLE 1 NPT 45°	1



**ELECTRICAL WIRE ROUTING-PROP'L
VALVE (90713314)**

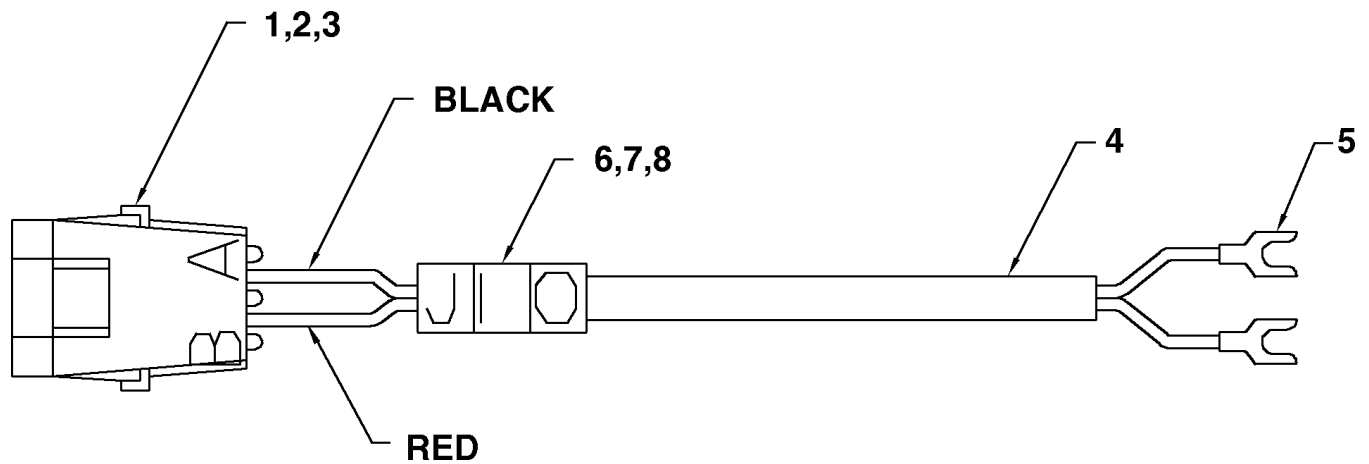
CORD REEL ASM (51713168)

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



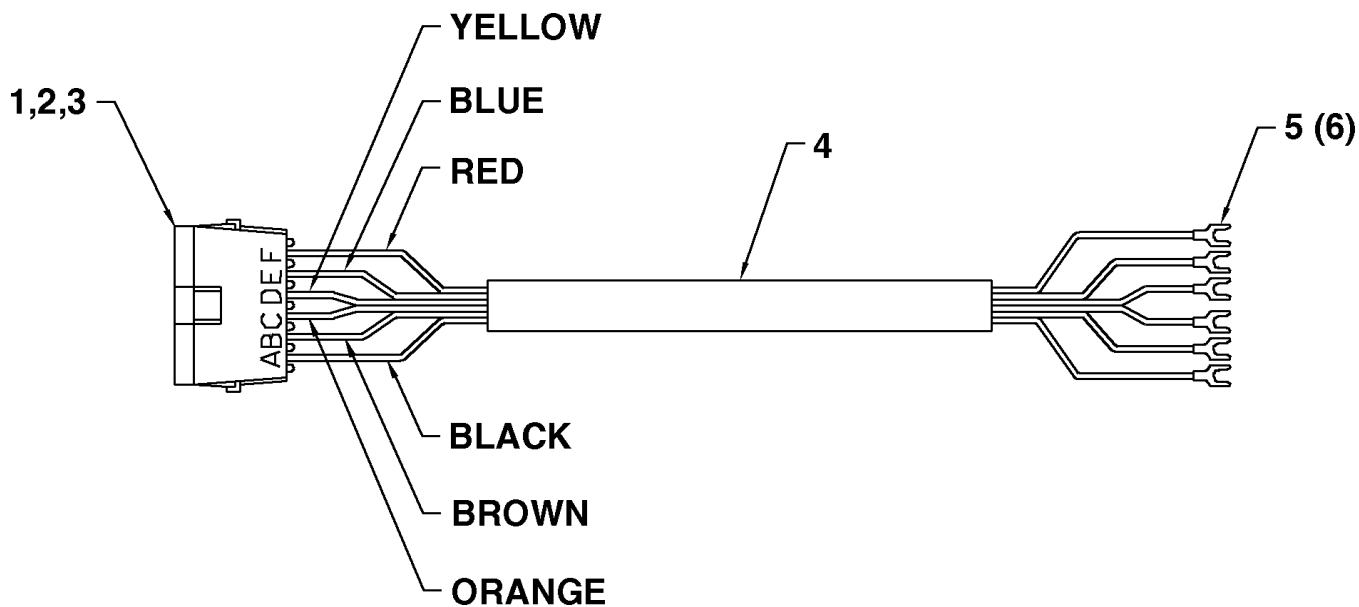
CABLE ASM 14GA 2WIRE X 30"
(51713167)

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.	77044576	TERMINAL	6
3.	77044578	CABLE SEAL	6
4.	89044354	CABLE	1
5.	77040051	TERMINAL-SPRSPADE	6

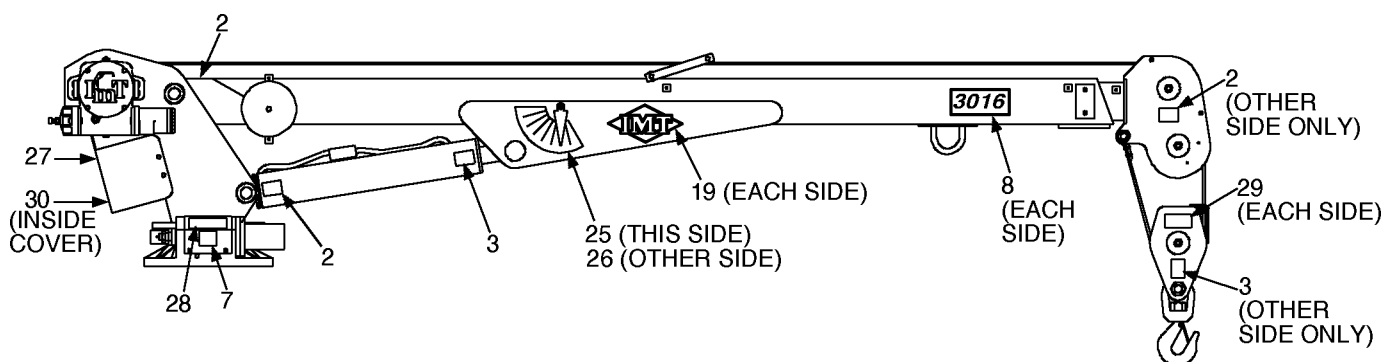


DECAL KIT (95708162)

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-ROTATE CRN-GREASE	1
7.	70392524	DECAL-ROTATE CRN-GREASE	1
8.	70392794	DECAL-3016 IDENTIFICATION	2
9.	70394444	DECAL-DGR ELECTROCUTION	1
10.	70392814	DECAL-DGR OPER TRAINING	1
11.	70392815	DECAL-DANGER OPERATION	1
12.	70392861	DECAL-DANGER 2-BLOCKING	1
13.	70392863	DECAL-DGR HOIST PERSONNEL	1
14.	70392864	DECAL-DGR OUTRG STD CLR	2
15.	70394445	DECAL-DGR ELECTROCUTION	4
16.	70392866	DECAL-DANGER OPER COND	1
17.	70392867	DECAL-DGR OUTRG MOVING	1
18.	70392868	DECAL-DGR CRANE LOADLINE	4
19.	70392887	DECAL-IMT DIAMOND	2
20.	70392888	DECAL-DGR OPER RESTRICT	1
21.	70394446	DECAL-DANGER RC ELEC	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.	71392793	PLACARD-3016 CAPACITY	2
28.	70392399	DECAL-LUBRICATE WORM	1
29.	71394081	DECAL-3 TON	2
30.	70394166	DECAL-MANUAL OPERATION	1
31.	70394189	DECAL-RECOMMEND HYD OIL	1
32.	70394443	DECAL-DGR FREEFALL BOOM	1

DECAL PLACEMENT

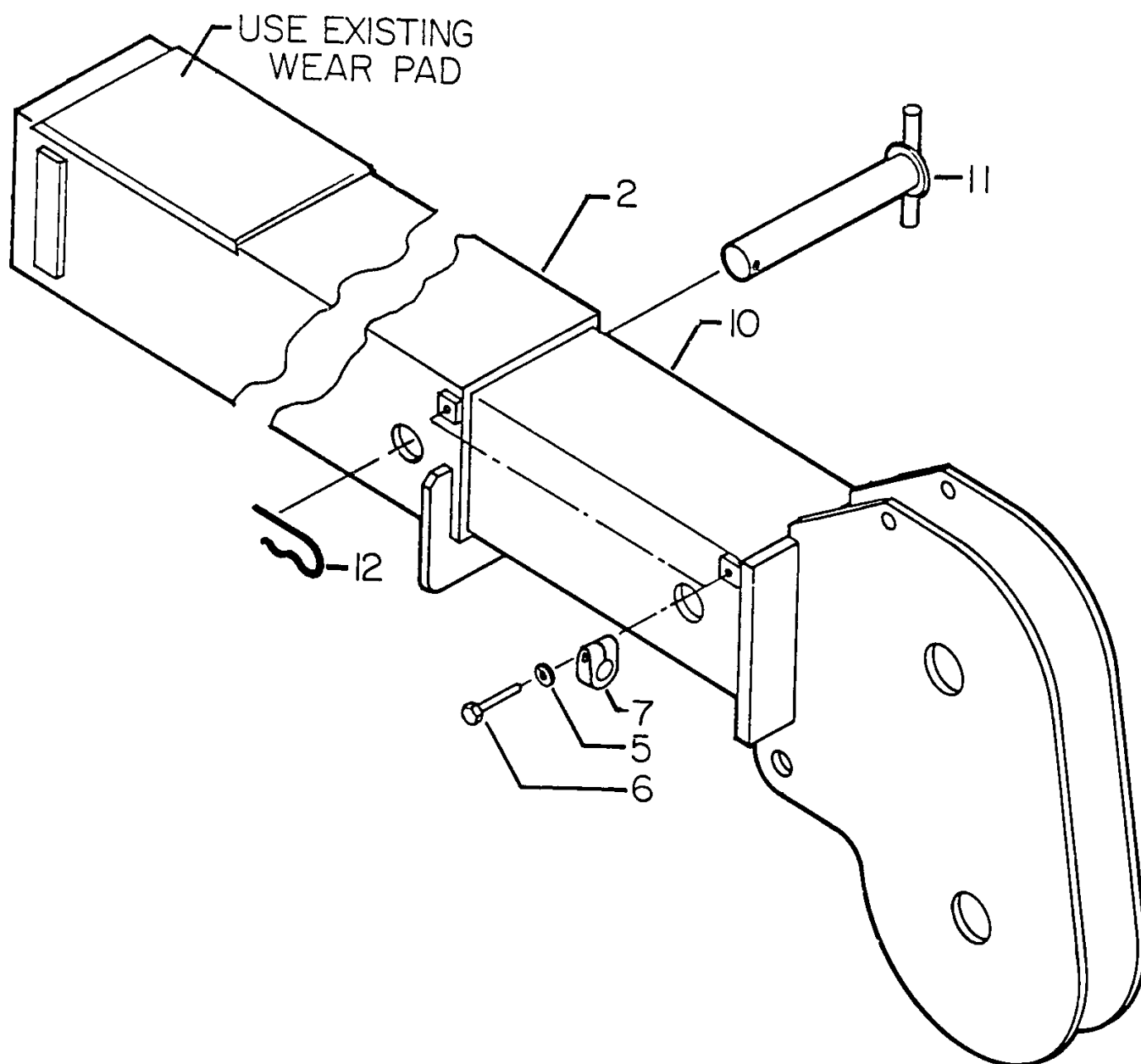
ITEM NO.	LOCATION
6,9,10,11,12,13,16,17,20,21,23,24,27	AT OR NEAR REMOTE CONTROL STORAGE POINT
1,14	ONE ON EACH OUTRG.
15,18	ONE ON EACH SIDE OF CARRIER VEHICLE
5	ON RESERVOIR AT THE RETURN LINE
4	ON RESERVOIR AT THE SUCTION LINE
31	ON OR NEAR HYD RESERVOIR
22	AT OR NEAR DRIVELINE
32	AT OR NEAR MNL BOOM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



(BLANK)

OPTION-CONVERSION KIT-3016 TO 3016-20' (95709040)

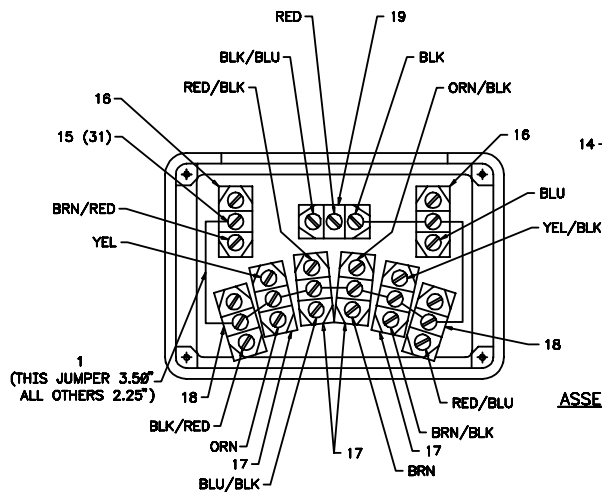
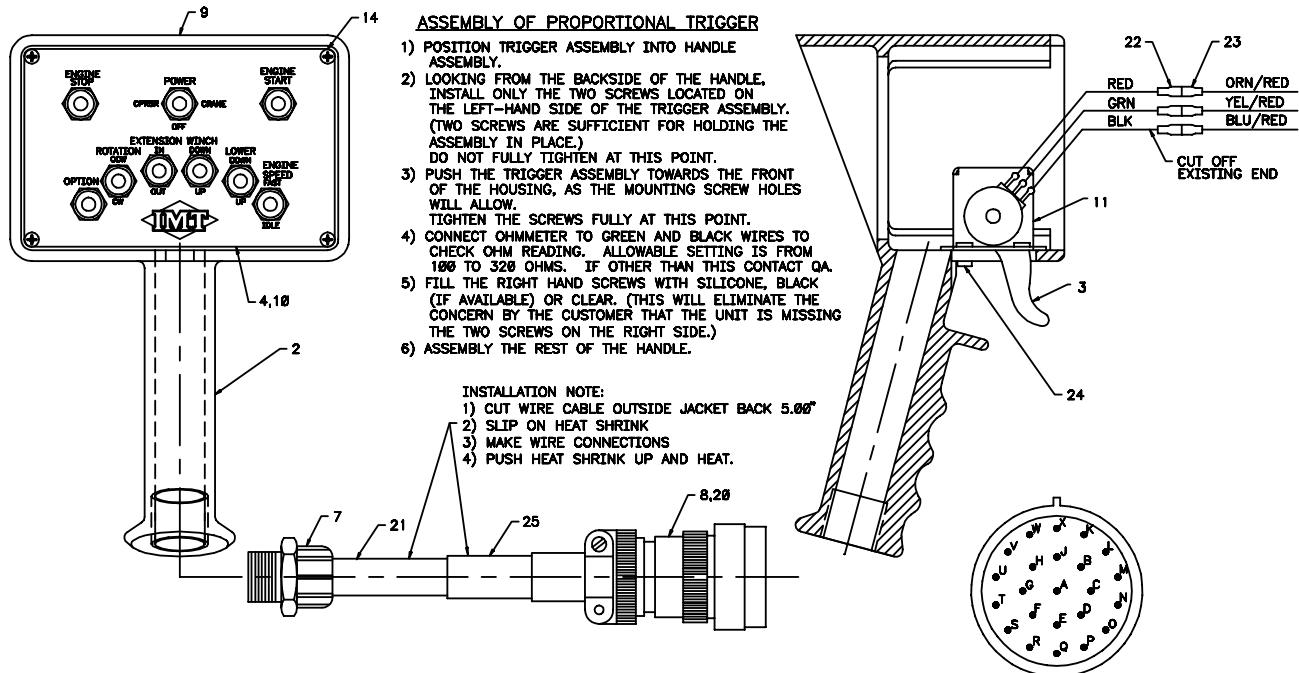
ITEM	PART NO.	DESCRIPTION	QTY
2.	52707922	EXTENSION BOOM-1ST STAGE	1
5.	72063049	WASHER 1/4 LOCK	2
6.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
7.	70034381	PLASTIC CORD GUID	2
10.	52707923	EXTENSION BOOM-2ND STAGE	1
11.	52070152	PIN	1
12.	72066145	HAIR PIN 3/16	1



PROP'L RMT HANDLE ASM (51713182)

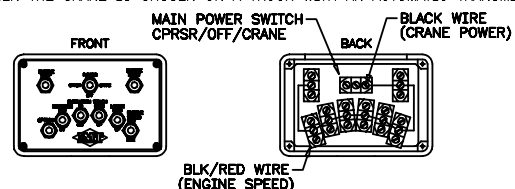
ITEM	PART NO.	DESCRIPTION	QTY
1.	89044214	WIRE 18GA GRN	1.61FT
2.	60119335	CONTROL HANDLE	1
3.	60111141	TRIGGER (PART OF 11)	1REF
4.	60119277	COVER	1
5.	70034306	BACK COVER	1
7.	77044196	STRAIN RELIEF 3/4	1
8.	77044621	PIN	23
9.	70394447	DECAL-DGR RC ELECTRO SM	1
10.	70394142	DECAL-CTRL	1
11.	70394183	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



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	-

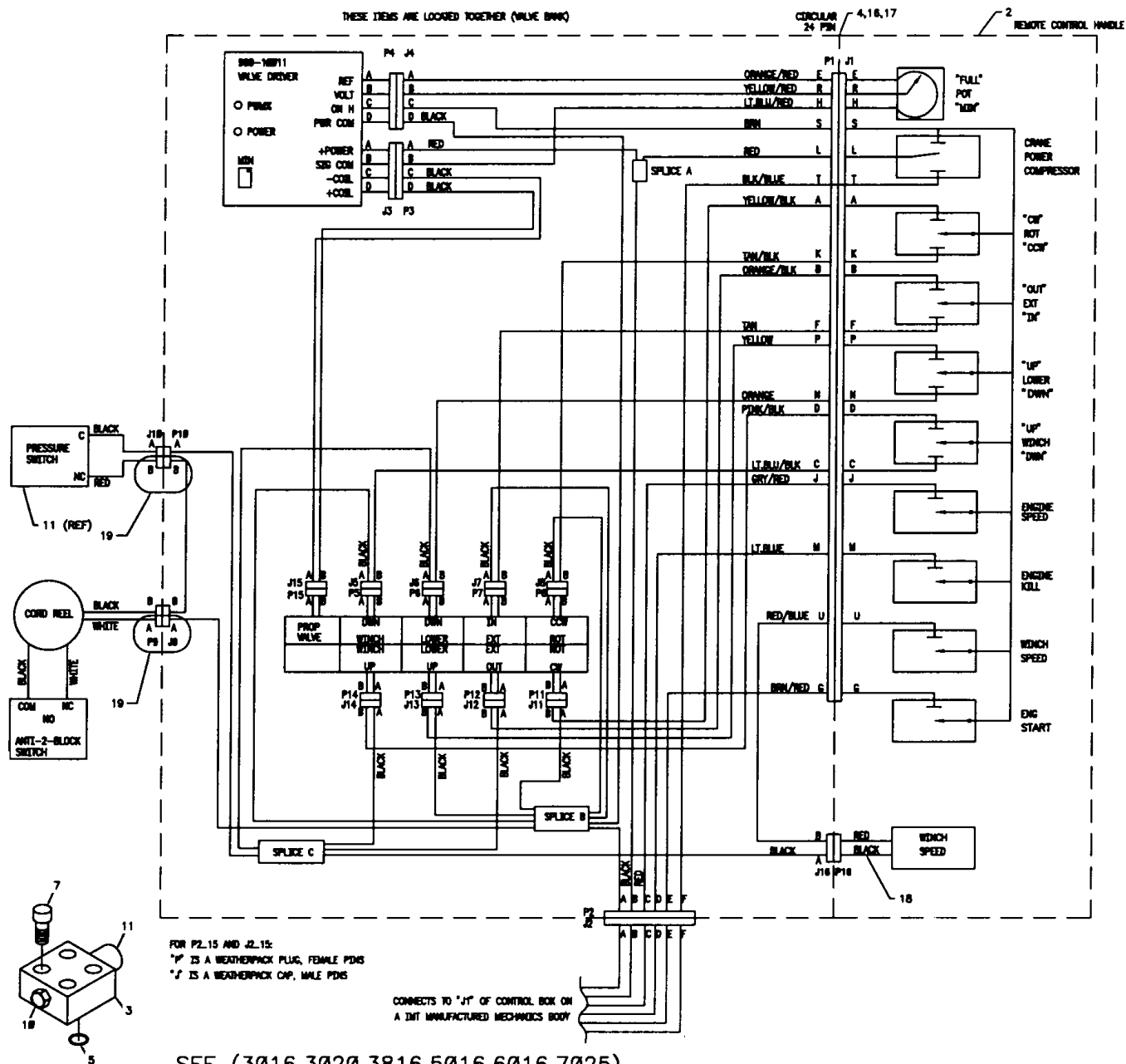
REWIRE CRANE REMOTE HANDLE TO ALLOW FOR THE OPERATION OF THE SOLENOID VALVE WHEN THE CRANE IS CHOSEN ON A TRUCK WITH AN AUTOMATIC TRANSMISSION



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).

**ELECTRICAL SCHEMATIC-PROP'L RMT
CTRL (99900855)**

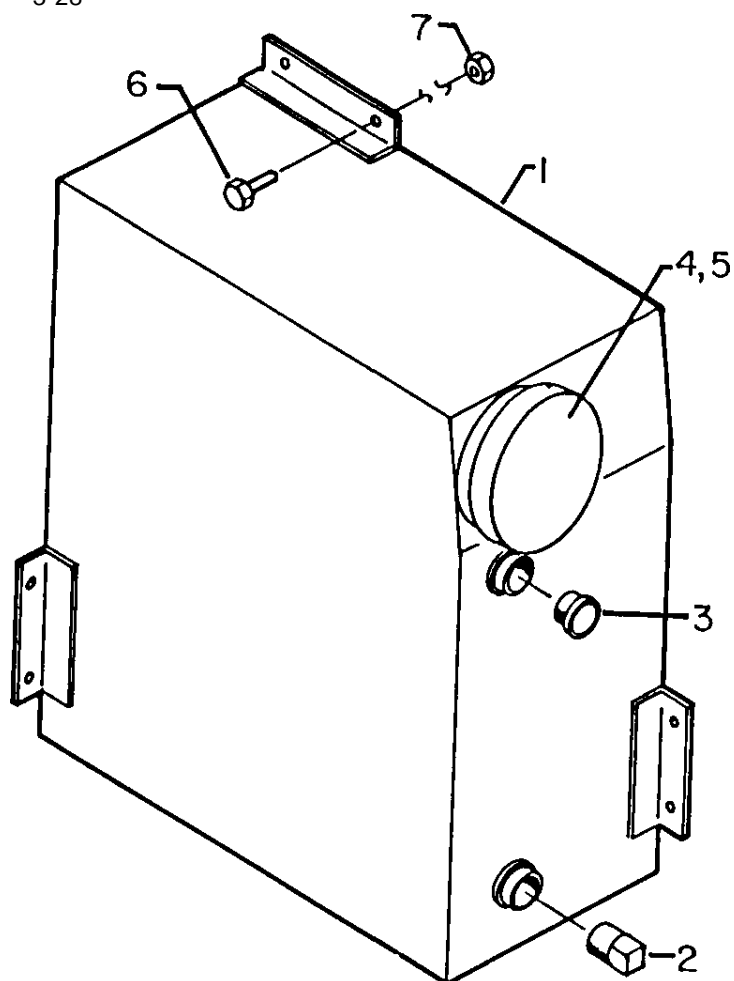
ITEM	PART NO.	DESCRIPTION	QTY
2.	51713182	HANDLE ASM	1
3.	60025221	MANIFOLD-CAPACITY ALERT	1
4.	60119299	BRACKET	1
5.	7Q072015	O-RING	1
7.	72060731	CAP SCR 5/16-18X3/4 SH	4
10.	72532140	PLUG #6 HH STL	1
11.	77041543	PR SWITCH 2800	1
16.	77044645	NUT-DEUTSCH CONNECTOR	1
17.	77044646	LOCKWASHER-DEUTSCH CONN	1
18.	51713343	CABLE ASM-14GA/2 WIREX16 (NOT USED ON 3016)	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

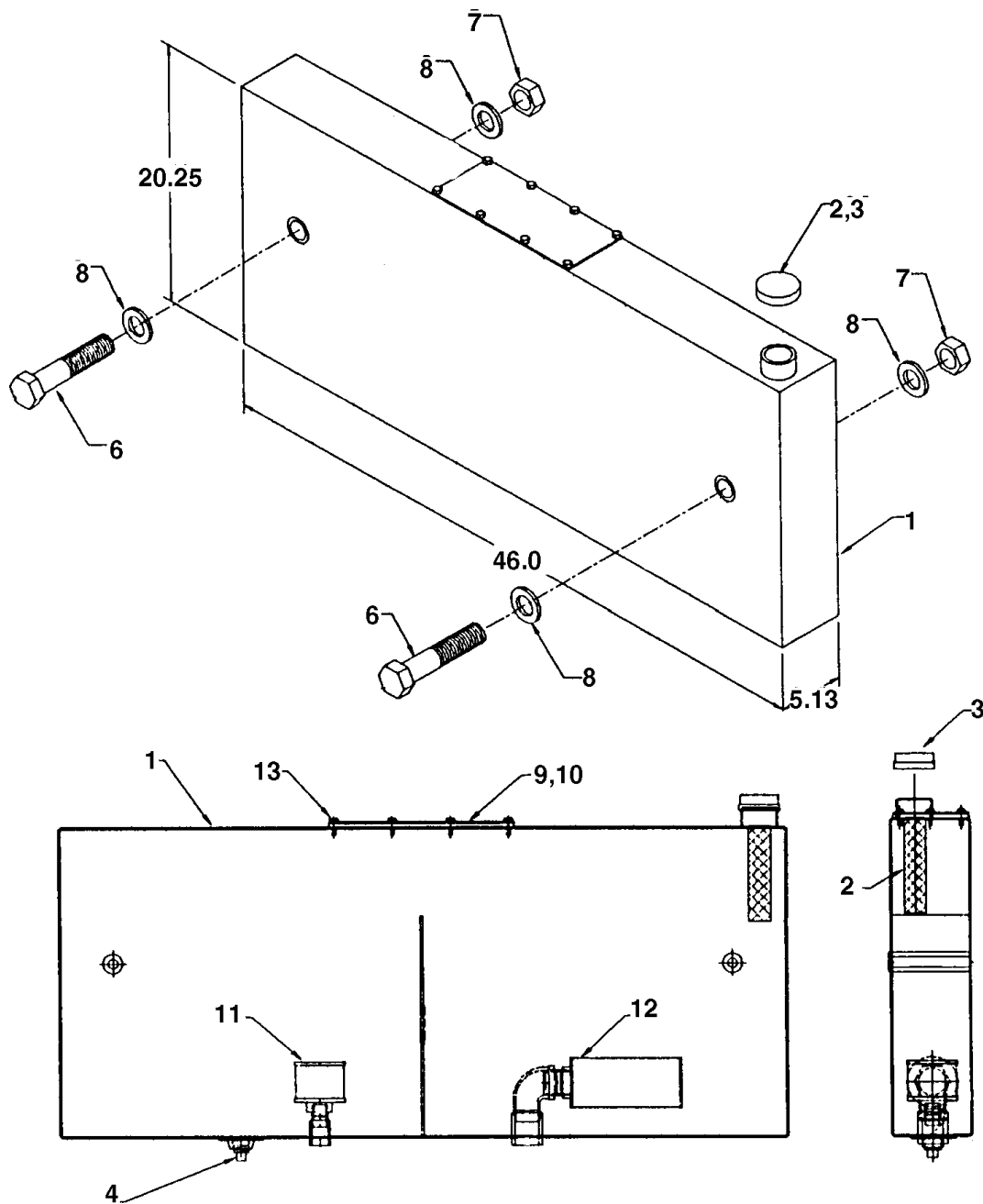
OPTION-RESERVOIR 12 GAL (51709256)**(FOR SHIPOUT APPLICATIONS ONLY)**

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 18 GAL- BULKHEAD (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

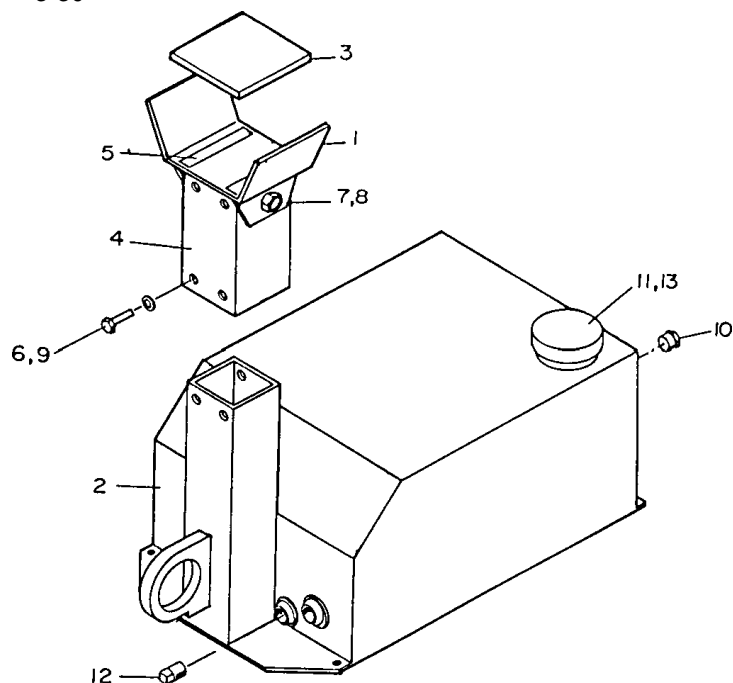


OPTION-BOOM SUPPORT/RESERVOIR

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*

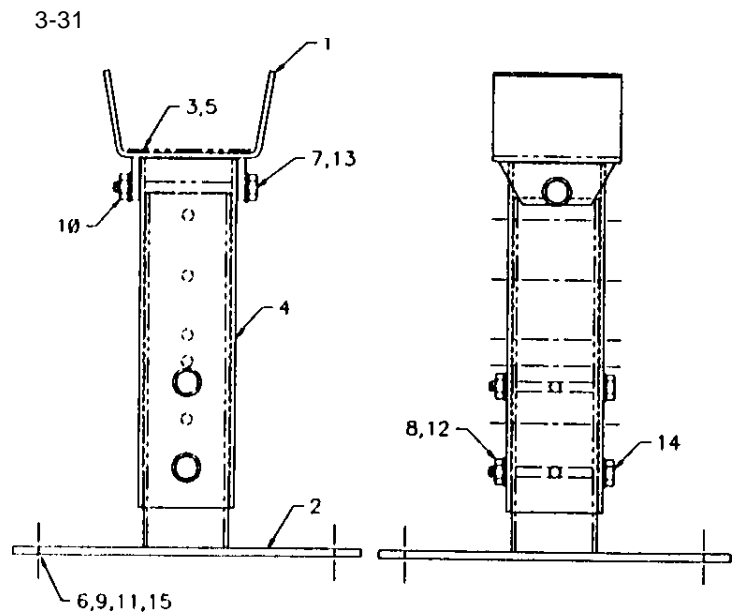
* ITEMS 18 & 19 ARE SHIPPED LOOSE.



00003016: 51708161.01.19960430

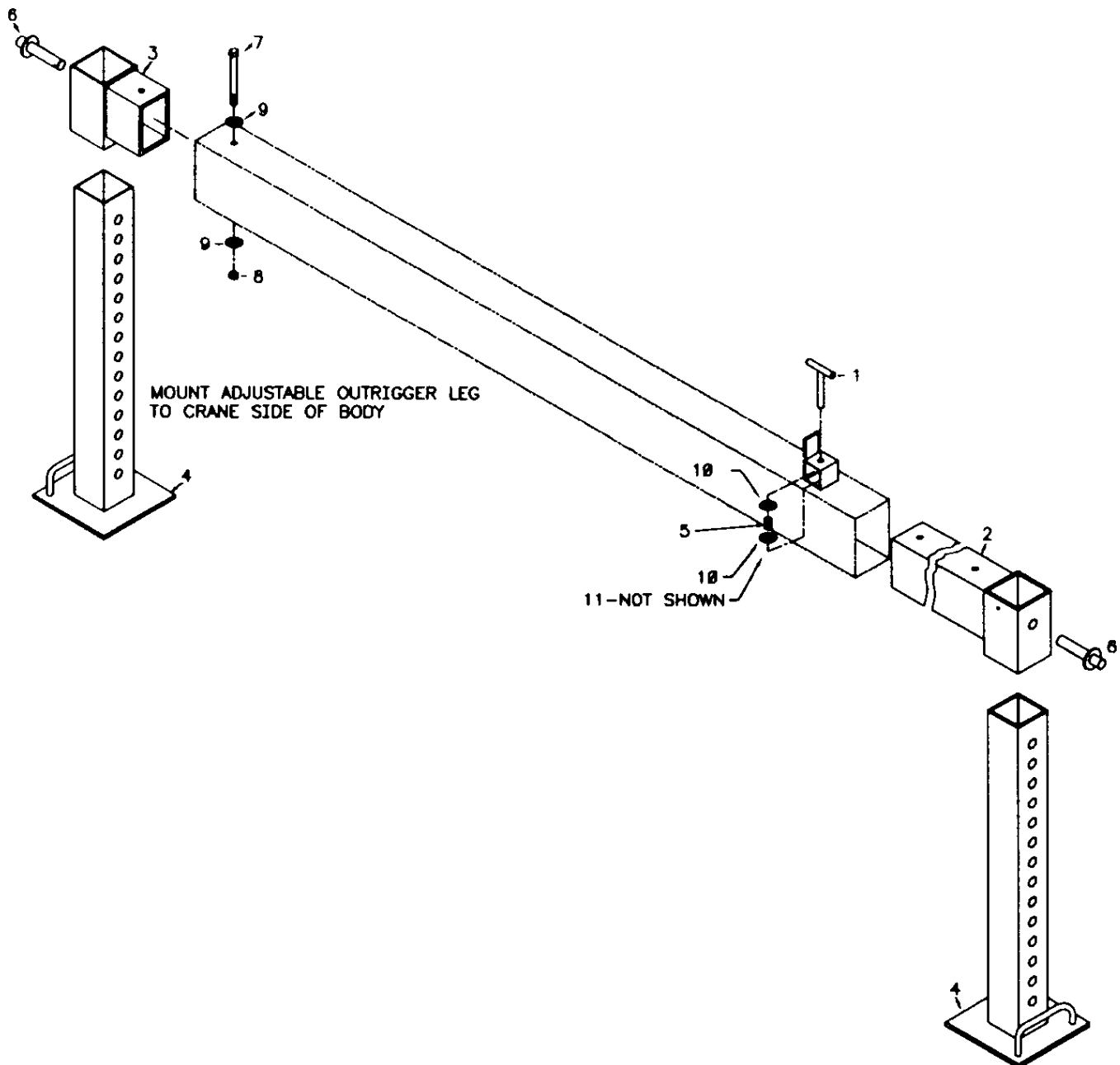
OPTION-BOOM SUPPORT (51708161)

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-OUTRIGGER KIT-MO/MD-6X4 (51704772)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52070138	T-PIN	1
2.	52703351	ADJUSTABLE ARM	1
3.	52703352	STATIONARY ARM	1
4.	52703353	LEG	2
5.	60010351	SPRING	1
6.	71731361	QUICK RELEASE PIN 3/4	2
7.	72060105	CAP SCR 1/2-13X7 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063005	WASHER 1/2 WRT	2
10.	72063027	MACH BUSHING 5/8	2
11.	72066185	COTTER PIN 1/16X1	1



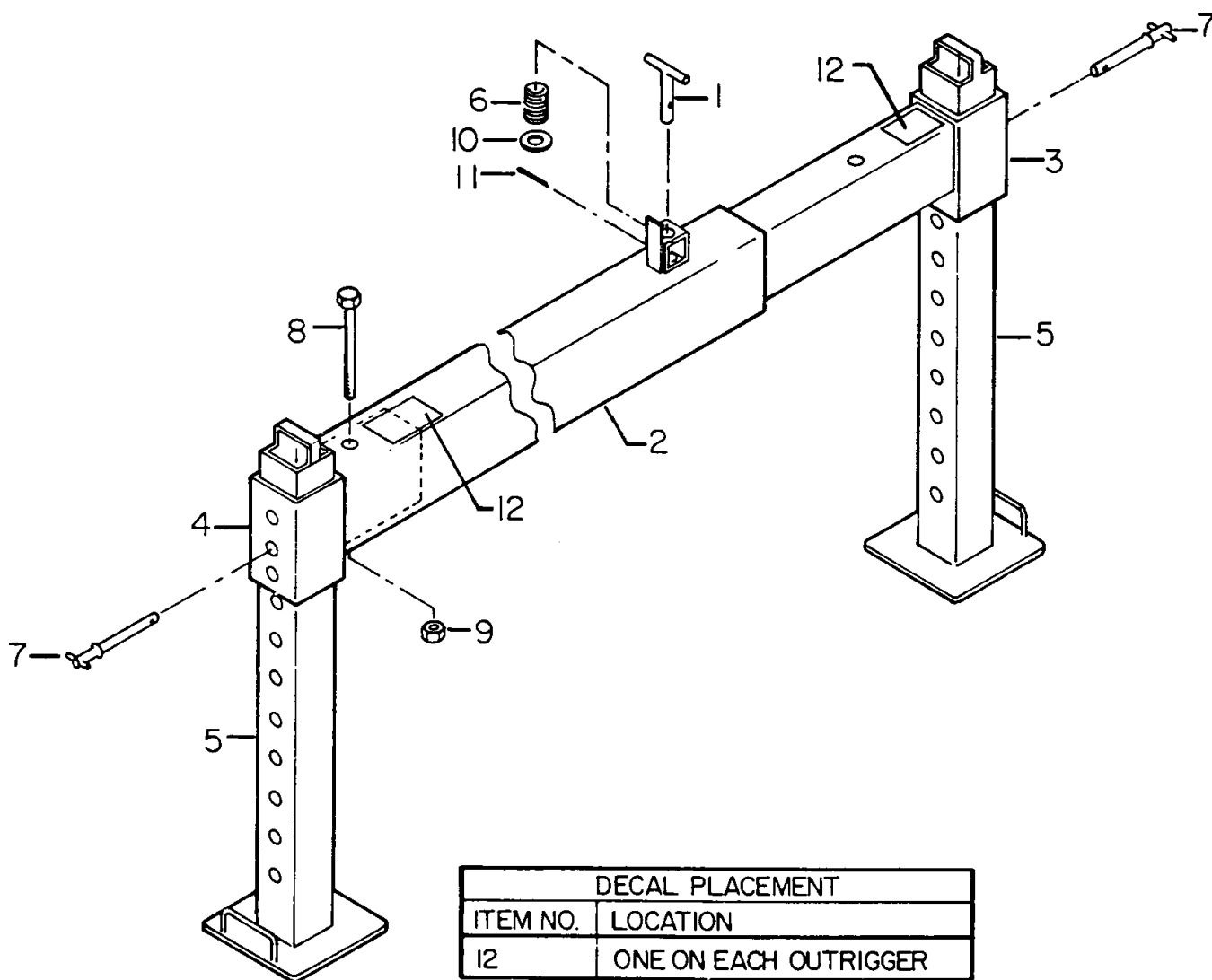
OPTION-AUX OUTRIGGERS-MO/MD-6X4 (31703350)

(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	52070138	T-PIN	1
2.	52703334	TUBE	1
3.	52703351	ARM	1
4.	52703352	STATIONARY HOUSING	1
5.	52703353	LEG	2
6.	60010351	SPRING	1
7.	71731361	QUICK RELEASE PIN	2
8.	72060105	CAP SCR 1/2-13X7 HH GR5	1
9.	72062080	NUT 1/2-13 LOCK	1
10.	72063007	WASHER 5/8 WRT	1
11.	72066185	COTTER PIN .06X1	1
12.	70392864	DECAL-DANGER STD CLR	2

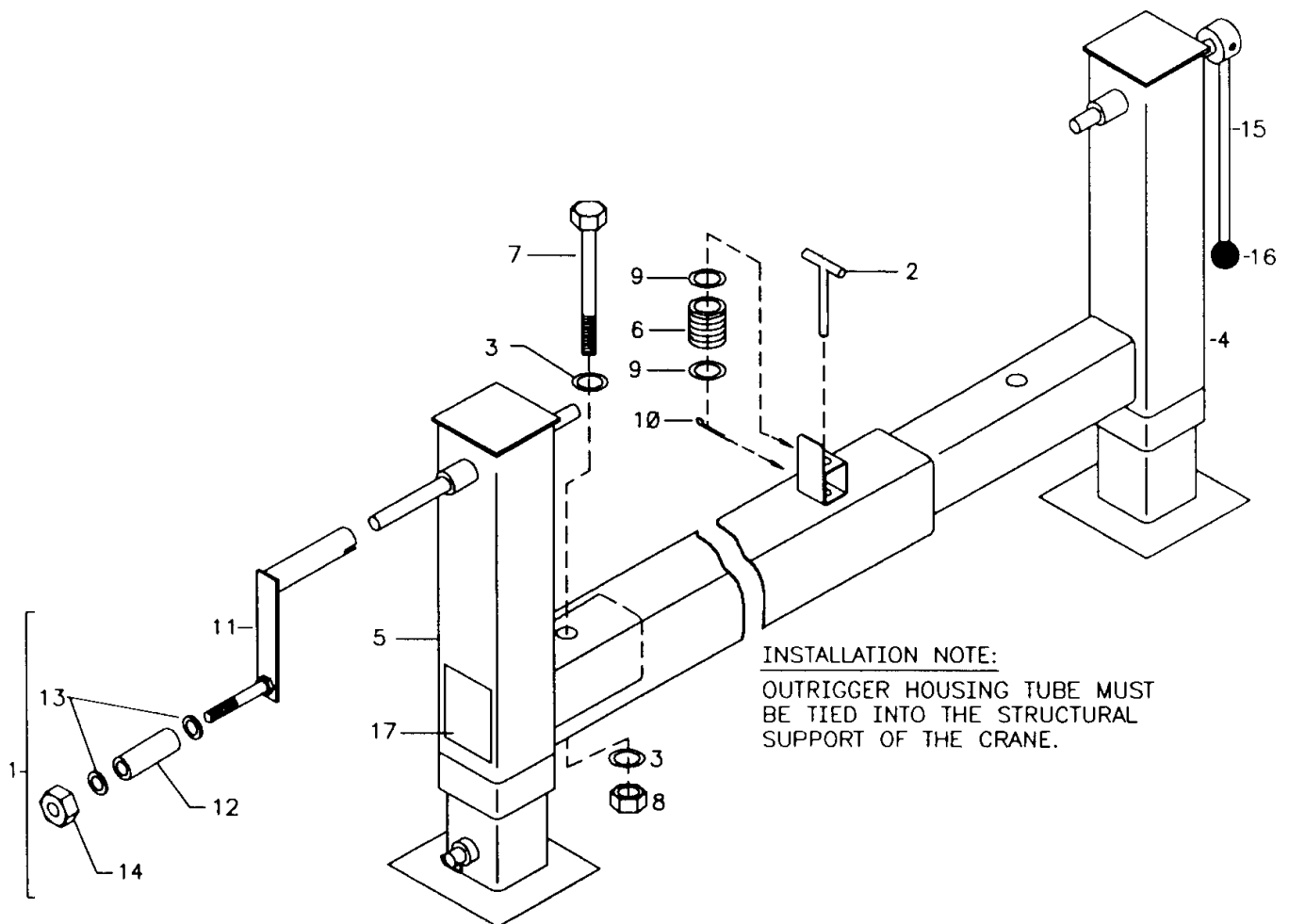
INSTALLATION NOTE

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



OPTION-OUTRIGGER KIT-MO/CRANK **DN-6X4 (51704773)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51705040	CRANK ASM (INCL:11-14)	1
2.	52070138	T-PIN	1
3.	72063005	WASHER 1/2 WRT	2
4.	52703355	PULL-OUT OUTRIGGER	1
5.	52703356	STATIONARY OUTRIGGER	1
6.	60010351	SPRING	1
7.	72060105	CAP SCR 1/2-13X7 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063027	MACH BUSHING 5/8	2
10.	72066185	COTTER PIN 1/16X1	1
11.	52705039	CRANK WLD MNT (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 1-1/2 BLACK	1
17.	70392864	DECAL-DANGER STD CLR	2



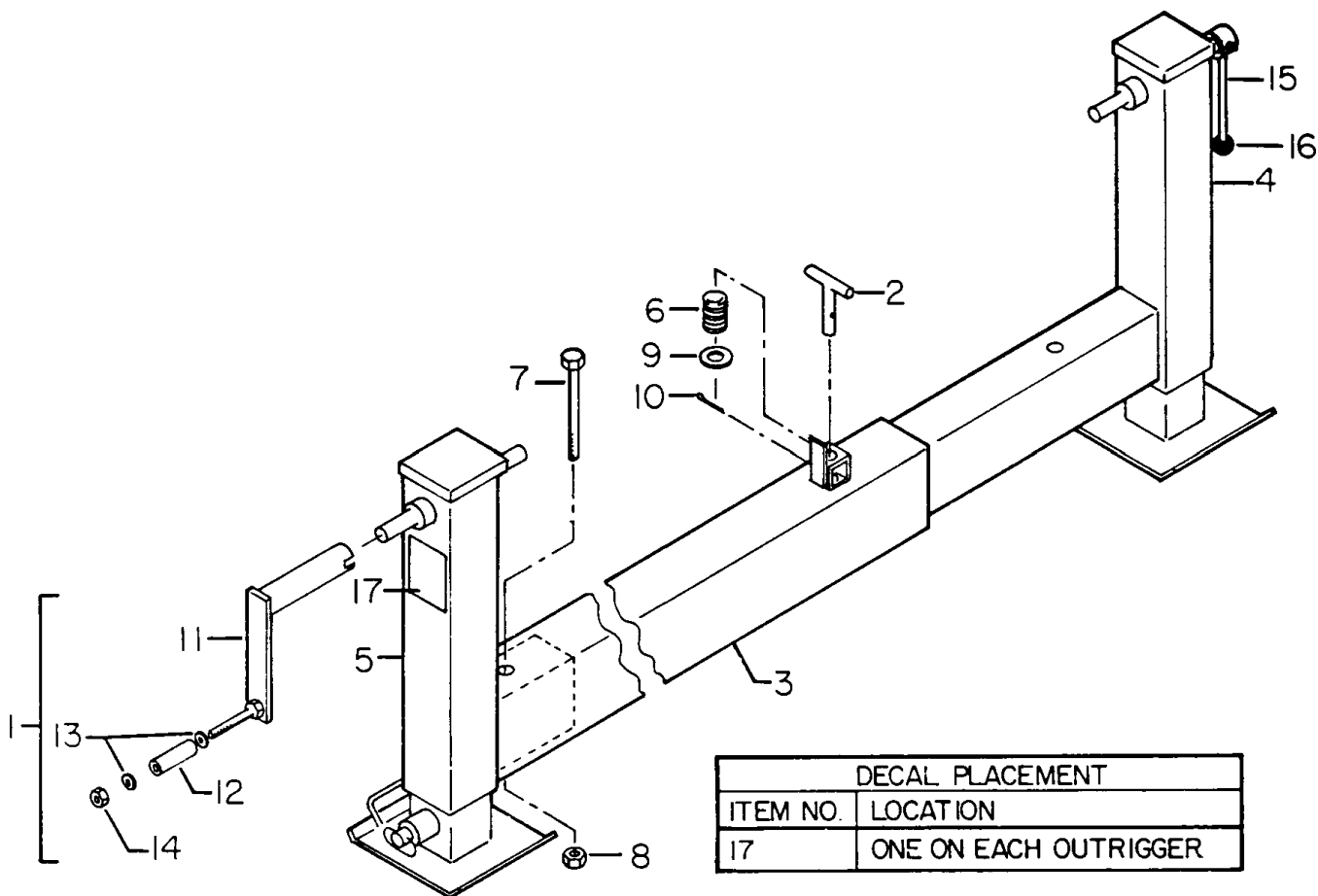
OPTION-AUX OUTRIGGERS-MO/CRANK DN-6X4 (31703354)

(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.	52703334	TUBE WELDMENT	1
4.	52703355	PULL-OUT OUTRIGGER	1
5.	52703356	STATIONARY OUTRIGGER	1
6.	60010351	SPRING	1
7.	72060105	CAP SCR 1/2-13X7 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.	52705039	CRANK WLDMT (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 1-1/2 BLACK	1
17.	70392864	DECAL-DANGER STD CLR	2

INSTALLATION NOTE

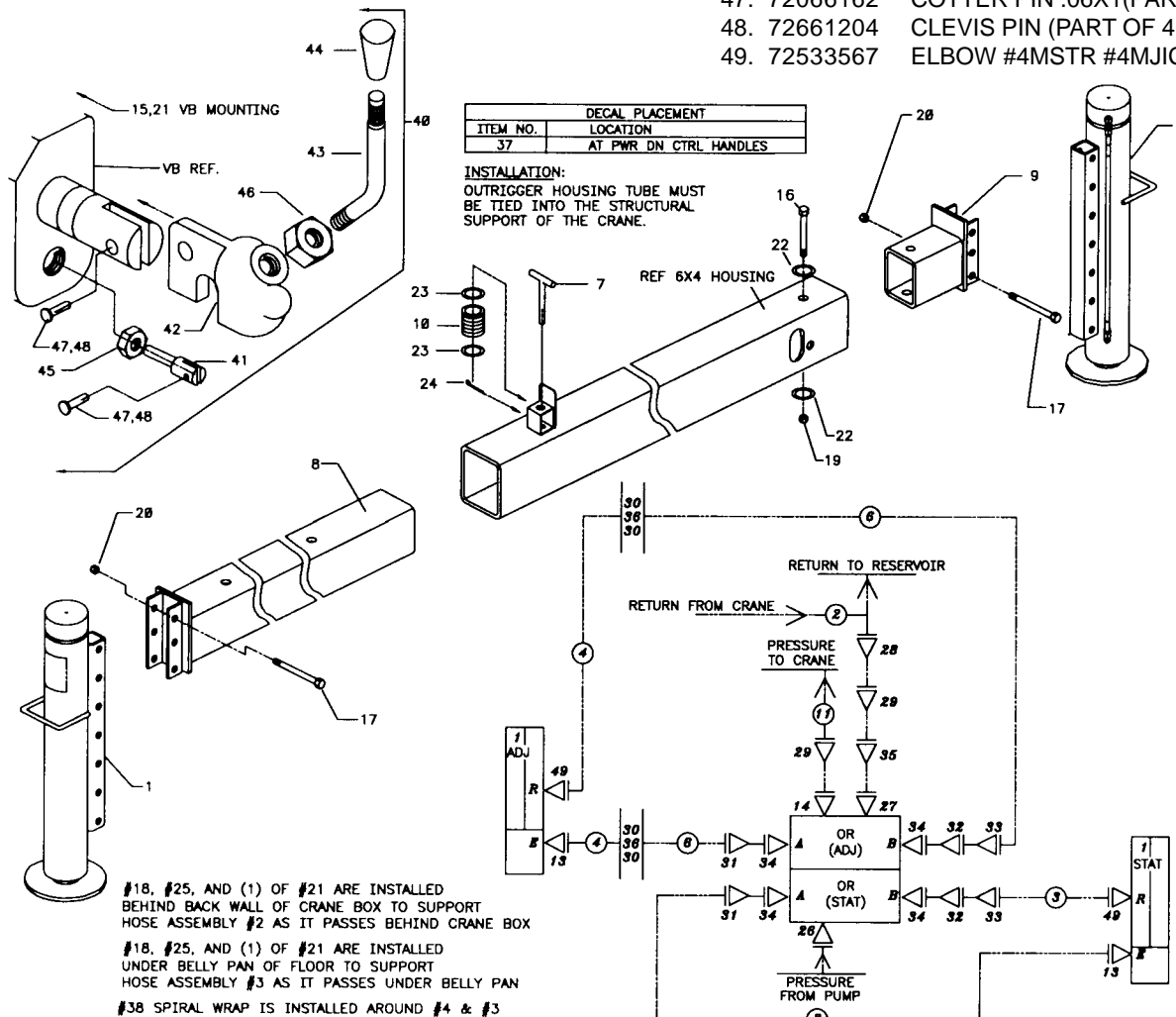
OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



OPTION-OUTRIGGER KIT-MO/PD-6X4 (31705760)

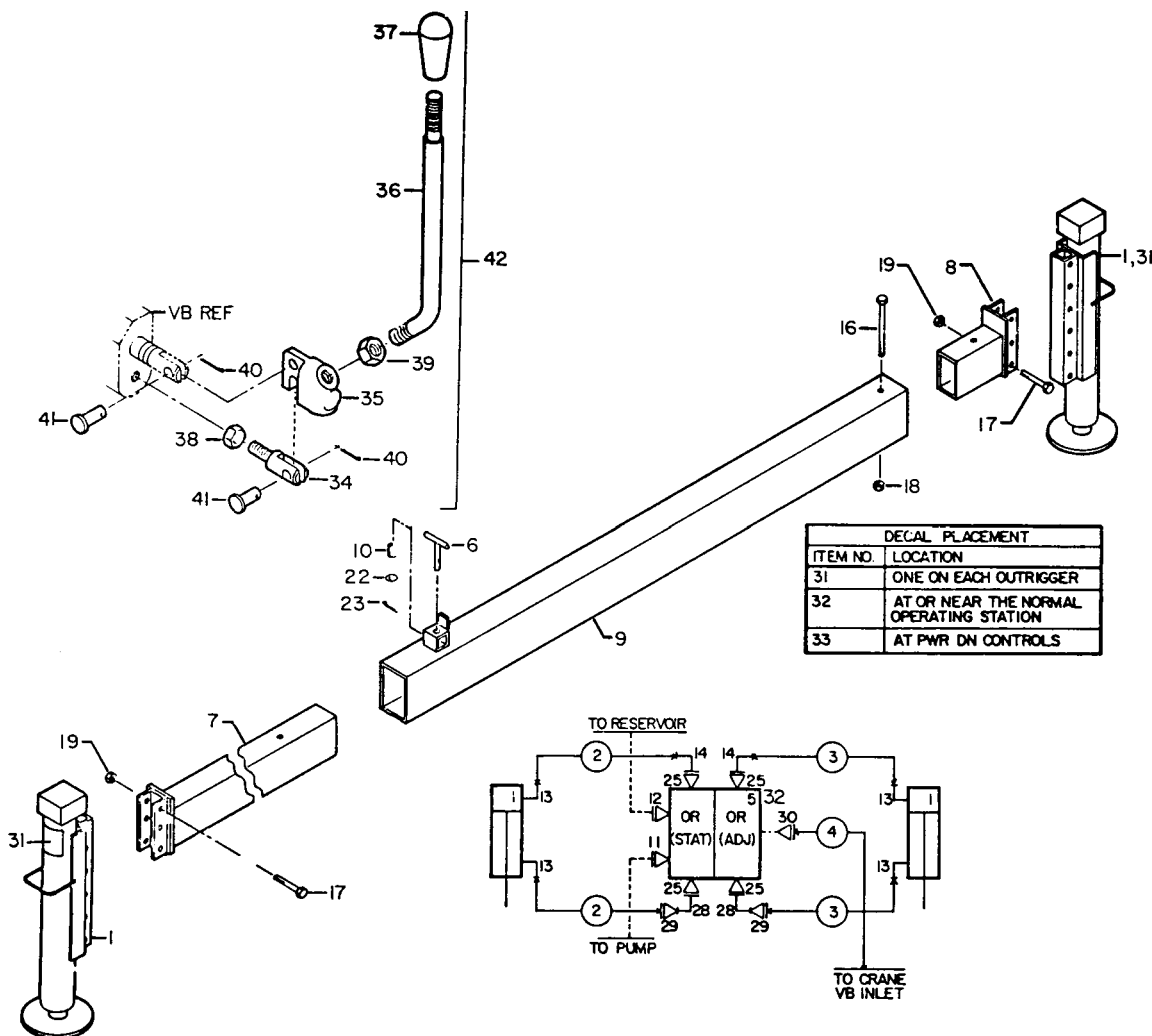
ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	PWR DN CYLINDER	2
2.	51394917	HOSE 1/2X137 8F8F(PART 12)	1REF
3.	51394693	HOSE 1/4X130-1/2 4F4F (PART OF 12)	2REF
4.	51394115	HOSE 1/4X59 4F4F (PART 12)	2REF
5.	51705983	VALVEBANK 2-SECT (INCL:40)	1
6.	51394691	HOSE 1/4X38-1/2 4F4F(PART 12)	2REF
7.	52070138	T-PIN	1
8.	52705725	ADJUSTABLE ARM	1
9.	52705726	STATIONARY ARM	1
10.	60010351	SPRING	1
11.	51394402	HOSE 3/8X141 8F8F (PART 12)	1REF
12.	51714499	HOSE KIT (INCL: 2,3,4,6,11)	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.	72060105	CAP SCR 1/2-13X7 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR 5/16-18X3/4 THRDCTG (SEE 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	MACH BUSHING 5/8X14GA	2
24.	72066185	COTTER PIN .16X1	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADPTR #8MSTR #8MJIC	1
27.	72532365	ADPTR #10MSTR #12MJIC	1
28.	72532657	TEE-SWVL NUT RUN 3/4JIC	1
29.	72532658	ELBOW #8MJIC #8FJIC SWVL	2
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.	72532972	ADPTR #8MJIC #12FJIC	1
36.	72533024	UNION BULKHEAD	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:41-48,PART OF 5)	2REF
41.	70142648	LEVER PIVOT(PART OF 40)	2REF
42.	70142650	LEVER SUPPORT (PART OF 40)	2REF
43.	70142651	CTRL LEVER (PART OF 40)	2REF
44.	71392269	KNOB (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 .06X1(PART OF 40)	4REF
48.	72661204	CLEVIS PIN (PART OF 40)	4REF
49.	72533567	ELBOW #4MSTR #4MJIC XLG	2



ITEM	PART NO.	DESCRIPTION	QTY
1.	3B048870	PWR DN CYLINDER	2
2.	51703596	HOSE ASM 1/4X120 FF	2
3.	51705191	HOSE ASM 1/4X96	2
4.	51705377	HOSE ASM 3/8X48 FF	1
5.	51705983	VALVEBANK 2-SECT (INCL:42)	1
6.	52070138	T-PIN	1
7.	52705725	ADJUSTABLE ARM	1
8.	52705726	STATIONARY ARM	1
9.	52703334	HOUSING	1
10.	60010351	SPRING	1
11.	72532358	ADAPTER #8MSTR #8MJIC	1
12.	72532365	ADAPTER #10MSTR #12MJIC	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	4
14.	72532699	ELBOW #6MSTR #4MJIC 90°	2
16.	72060105	CAP SCR 1/2-13X7 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	6
18.	72062080	NUT 1/2-13 LOCK	1
19.	72062091	NUT 5/8-11 LOCK	6
22.	72063007	WASHER 5/8 WRT	1
23.	72066185	COTTER PIN .16X1	1
25.	72532722	ADAPTER #10MSTR #6FSTR	4

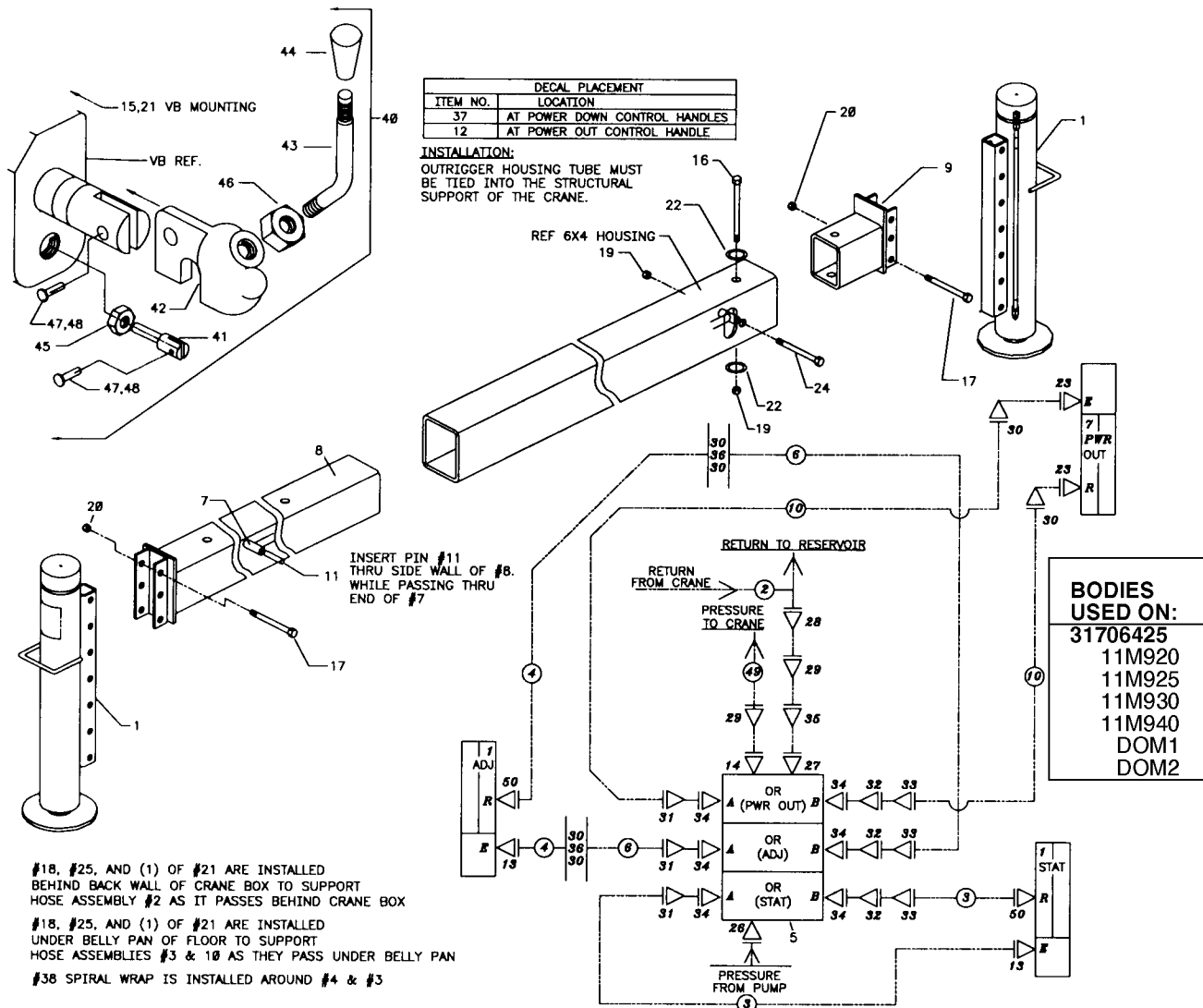
OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



OPTION-OUTRIGGER KIT-PO/PD 6X4 (31706425)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B288970	CYLINDER-PWR DN	2
2.	51703871	HOSE ASM 1/2X134 FF	1
3.	51705364	HOSE ASM 1/4X128 FF	2
4.	51705365	HOSE ASM 1/4X56 FF	2
5.	51705984	VB 3-SECT (PART OF 40)	1
6.	51706152	HOSE ASM 1/4X36 FF	2
7.	3B142860	CYLINDER-PWR OUT	1
8.	52705725	ARM-ADJUSTABLE	1
9.	52705726	ARM-STATIONARY	1
10.	51707597	HOSE ASM 1/4X105 FF	2
11.	72661473	PIN	1
12.	71392277	DECAL-PWR OUT	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.	72060105	CAP SCR 1/2-13X7 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	4
18.	72060833	SCR 5/16-18X3/4 THRDCTG (SEE 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.	72060101	CAP SCR 1/2-13X5 HHGR5	1
25.	72066582	CLAMP (SEE NOTE)	2
26.	72532358	ADAPTER #8MSTR #8MJIC	1
27.	72532365	ADAPTER #10MSTR #12MJIC	1
28.	72532657	TEE 3/4JIC SWVLNUTRUN	1
29.	72532658	ELBOW #8MJIC #8FJIC SW	2
30.	72532690	ELBOW #4MJIC #4FJIC SW	6
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.	72532972	ADAPTER #8MJIC #12FJIC	1
36.	72533024	UNION-BULKHD #4JIC	2
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	KOB (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	CLEVIS PIN (PART OF 40)	4REF
49.	51703604	HOSE ASM 3/8X138 FF	1
50.	72533567	ELBOW #4MSTR #4MJIC XLG	2

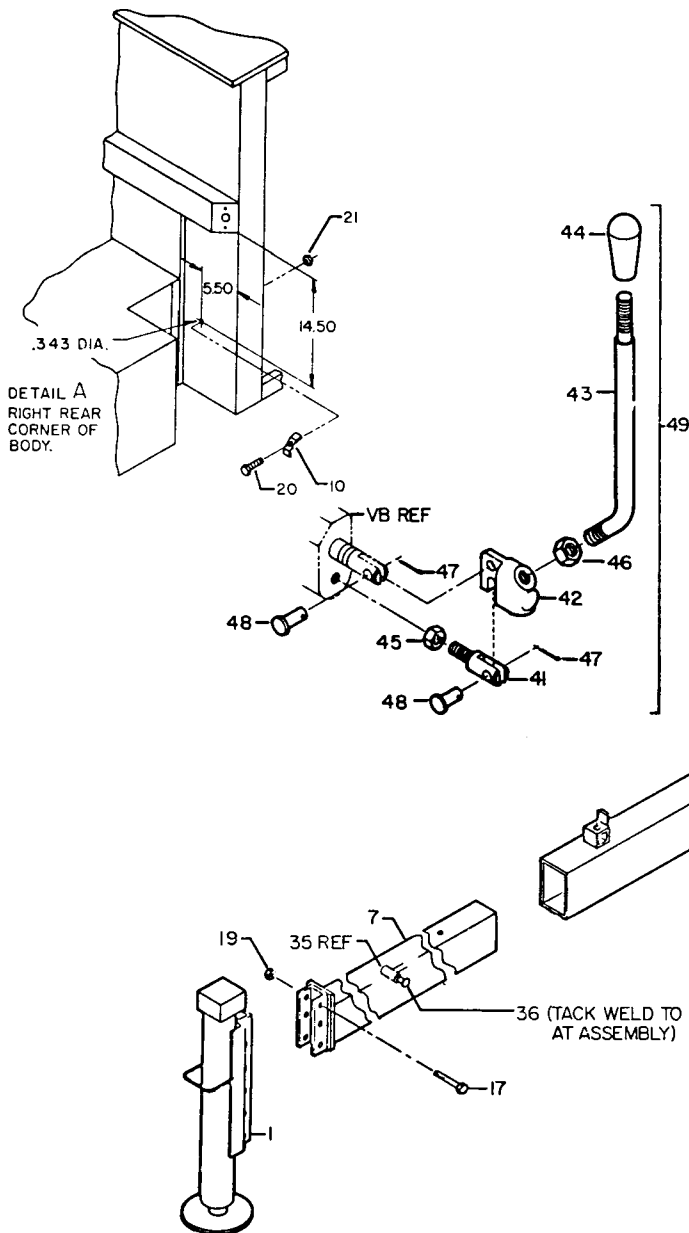


OPTION-AUX OUTRIGGERS-PO/PD-6X4 (31710967)

(Non-IMT Mechanic Service Body Application)

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B048870	PWR DN CYLINDER	2
2.	51706893	HOSE ASM 1/4X90	4
3.	51705191	HOSE ASM 1/4X96	2
4.	51703939	HOSE ASM 3/8X48	1
5.	51705984	VBK 3-SECTW/PWR BYND	1
6.	51704576	HOSE ASM 3/4X72	1
7.	52705725	ADJUSTABLE ARM	1
8.	52705726	STATIONARY ARM	1
9.	51703334	HOUSING	1
10.	60107648	HOSE CLAMP	1
12.	72053764	ELBOW #10MSTR #8MJIC 90°	1
13.	72053758	ELBOW #4MSTR #4MJIC 90°	4
14.	72532699	ELBOW #6MSTR #4MJIC 90°	3
16.	72060105	CAP SCR 1/2-13X7 HHGR5	1
17.	72060155	CAP SCR 5/8-11X3-1/2 HHGR5	6
18.	72062080	NUT 1/2-13 LOCK	1
19.	72062091	NUT 5/8-11 LOCK	6

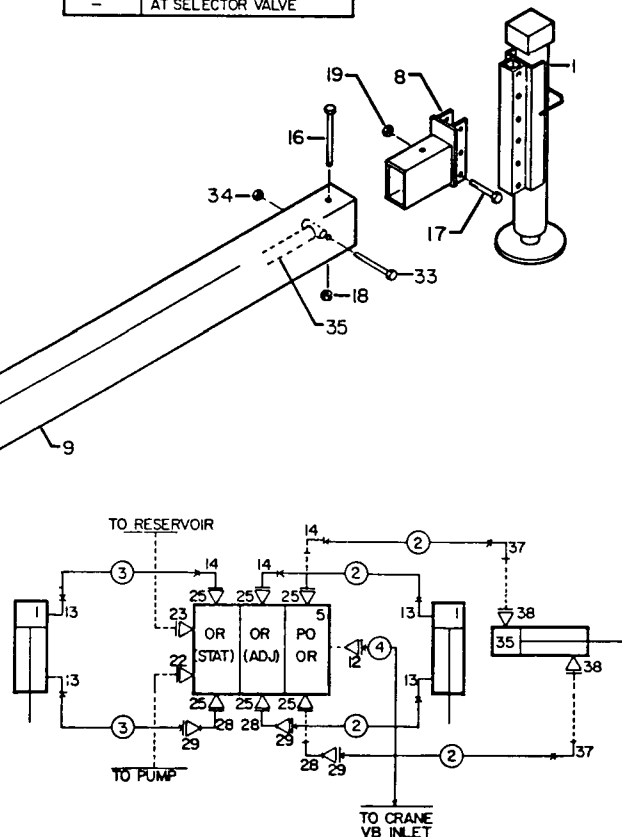
20.	72060030	CAP SCR 5/16-18X2-1/4 HHGR5	1
21.	72062109	NUT 5/16-18 LOCK	1
22.	72532358	ADAPTER #8MSTR #8MJIC	1
23.	72532365	ADAPTER #10MSTR #12MJIC	1
25.	72532722	ADAPTER #10MSTR #6FSTR	6
28.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	3
29.	72532707	ADAPTER #4MJIC #6FJIC	3
30.	70392864	DECAL-DANGER STD CLR	2
31.	70392867	DECAL-DANGER OR. MOVING	1
33.	72060102	CAP SCR 1/2-13X5-1/2 HHGR5	1
34.	72062080	NUT 1/2-13 LOCK	1
35.	3B142860	PWR OUT CYLINDER	1
36.	52706424	PIN	1
37.	72532690	ELBOW #4FJIC #4MJIC	2
38.	72532351	ADAPTER #4MSTR #4MJIC	2
39.	71392277	DECAL-PWR OUT	1
40.	71392257	DECAL-PWR DN	1
41.	70142648	LEVER PIVOT (PART OF 49)	3REF
42.	70142650	LEVER SUPPORT (PART OF 49)	3REF
43.	70142651	CONTROL LEVER (PART OF 49)	3REF
44.	71392269	KNOB (PART OF 49)	3REF
45.	72062021	NUT 5/16-18 HEX (PART OF 49)	3REF
46.	72062024	NUT 1/2-13 HEX (PART OF 49)	3REF
47.	72066162	COTTER PIN (PART OF 49)	6REF
48.	72661204	CLEVIS PIN (PART OF 49)	6REF
49.	51731580	HANDLE ASM (INCL:41-48,PART OF 5)	3REF



INSTALLATION NOTE

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

DECAL PLACEMENT	
ITEM NO.	LOCATION
30	ONE ON EACH OUTRIGGER
31	AT OR NEAR THE NORMAL OPERATING STATION
40	AT PWR DN CTRL HANDLES
39	AT PWR OUT CTRL HANDLE
-	AT SELECTOR VALVE



CYLINDER-PWR DN (3B288970)

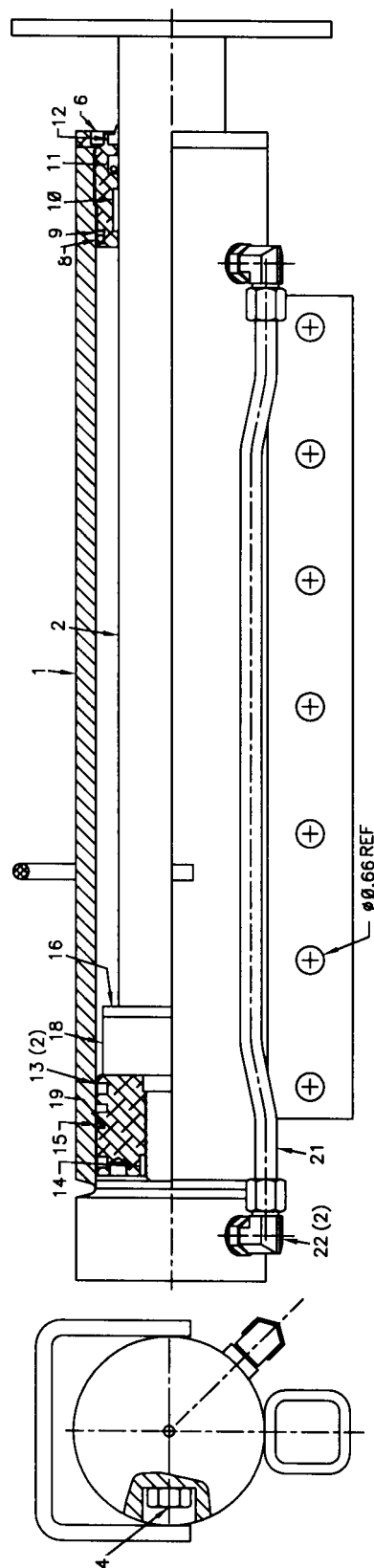
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B288970	CASE ASM	1
2.	4G048870	ROD ASM	1
4.	73054681	VALVE	1
6.	6H350025	HEAD	1
7.	6I035125	PISTON	1
8.	7Q072338	O-RING (PART OF 17)	1REF
9.	7Q10P338	BACK-UP RING (PART OF 17)	1REF
10.	7T2N8027	WEAR RING (PART OF 17)	1REF
11.	7R546025	ROD SEAL (PART OF 17)	1REF
12.	7R14P025	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	WAFFER 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)

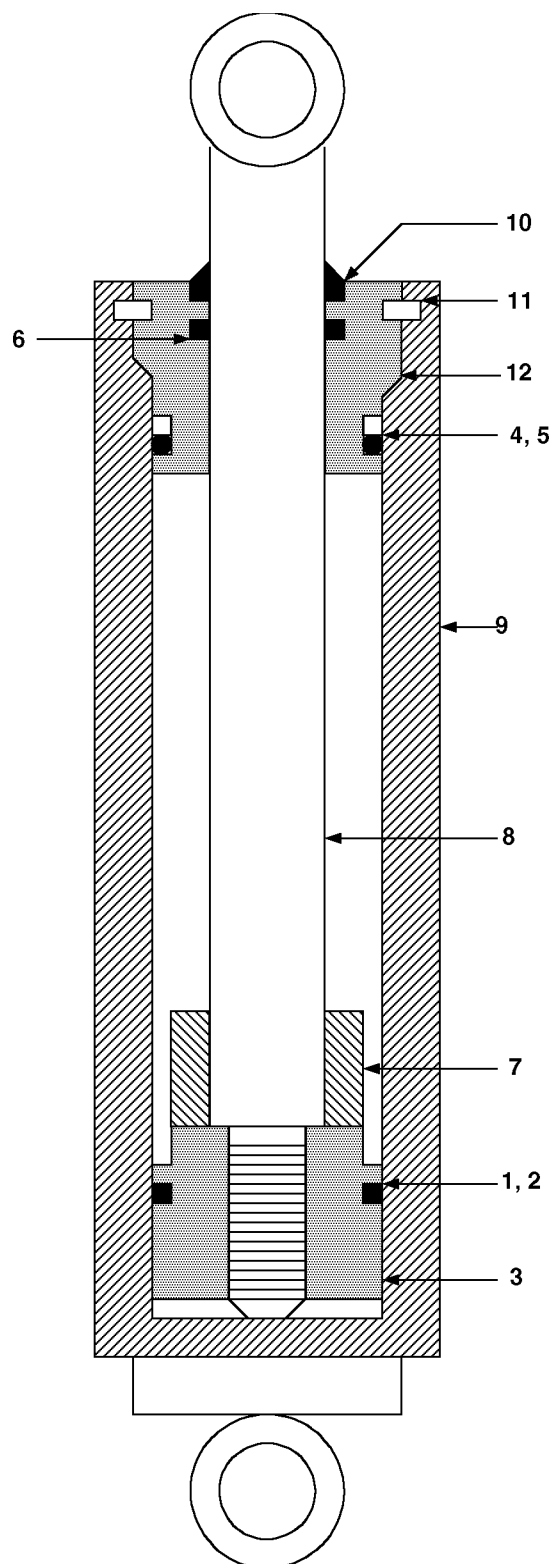
ITEM	PART NO.	DESCRIPTION	QTY
1.	7Q072021	O-RING (PART OF 13)	1REF
2.	7T66P012	PISTON SEAL (PART OF 13)	1REF
3.	6I012050	PISTON	1
4.	7Q072214	O-RING (PART OF 13)	1REF
5.	7Q10P214	BACK-UP RING (PART OF 13)	1REF
6.	7R100750	ROD SEAL (PART OF 13)	1REF
7.	6C125007	STOP TUBE	1
8.	4G142860	ROD ASM	1
9.	4B142860	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.

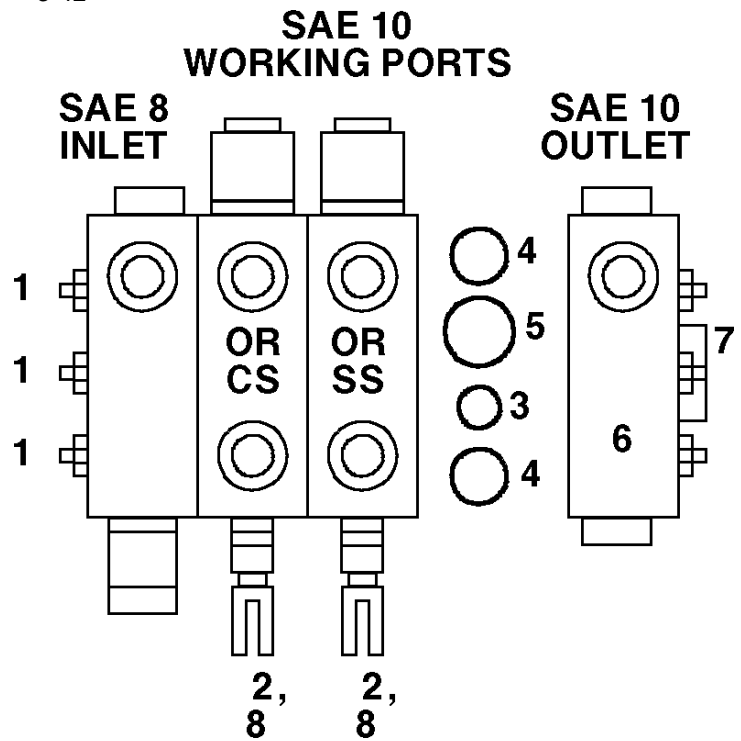
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON AND HEAD GLANDS, LOCK RING AND ROD THREADS BEFORE ASSEMBLY.

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



VALVEBANK ASM-2 SECT (51705983)

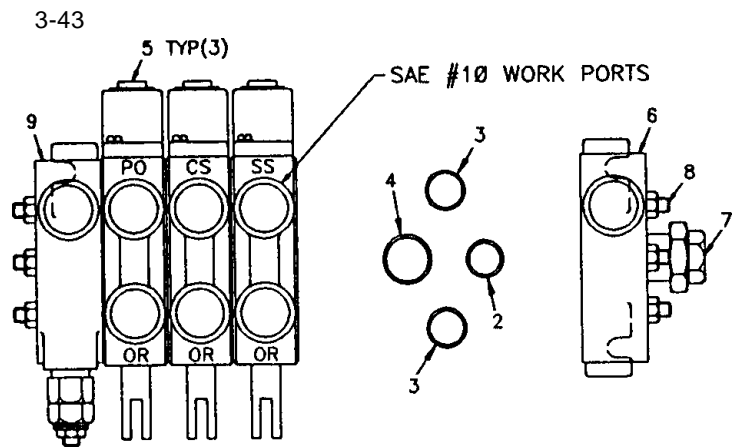
ITEM	PARTNO.	DESCRIPTION	QTY
1.	94731764	TIE ROD KIT	3
2.	73054490	TANDEM VALVE SECTION	2
3.	7Q072017	O-RING SM	3
4.	7Q072018	O-RING MED	6
5.	7Q072021	O-RING LG	3
6.	73731576	END CAP - RH	1
7.	73731763	POWER BEYOND SLEEVE	1
8.	51731580	LEVER ASM (NOT SHOWN)	2



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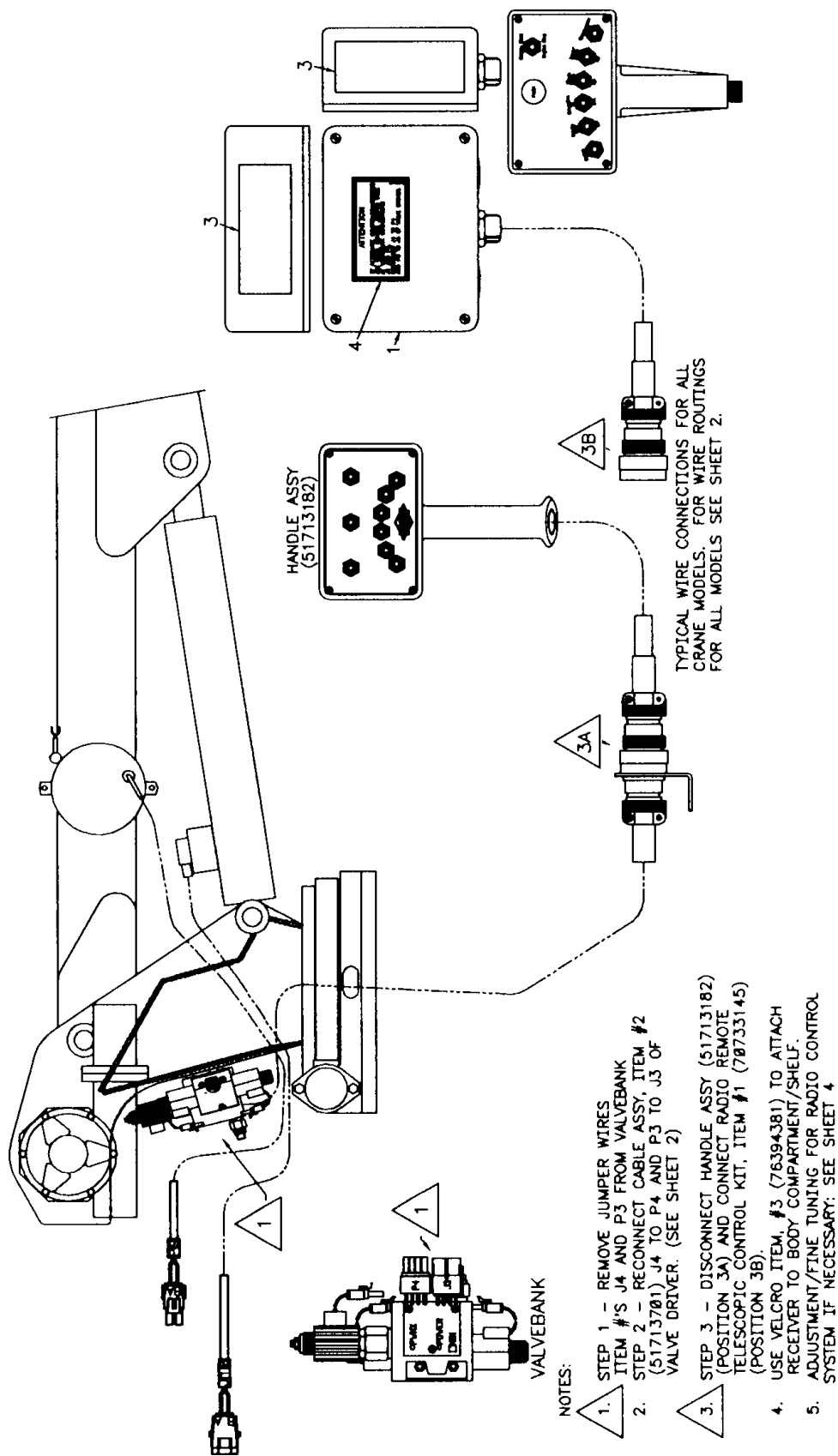
VALVEBANK ASM-3 SECT (51705984)

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



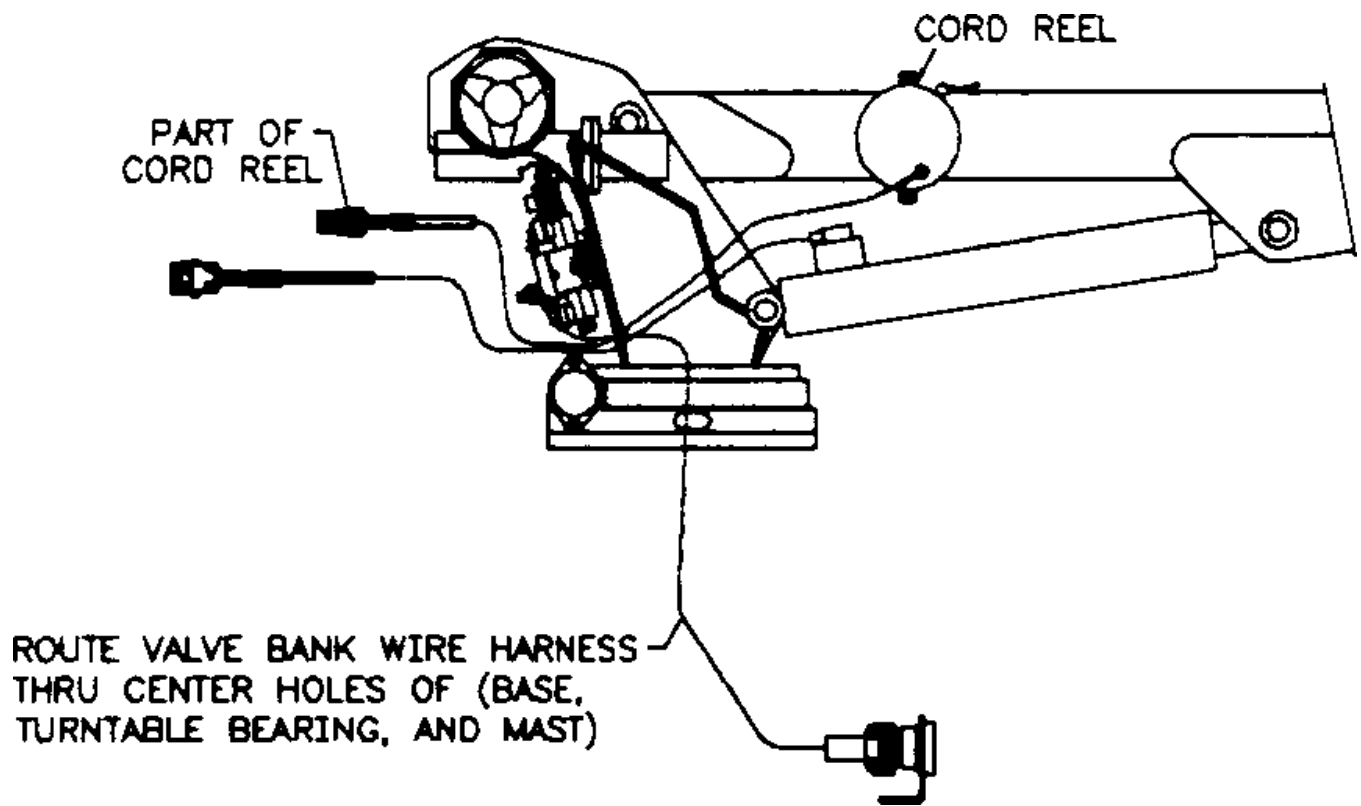
CONTROL KIT-RADIO REMOTE (90713710-1)

CONTINUED



**CONTROL KIT-RADIO REMOTE
(90713710-2)**

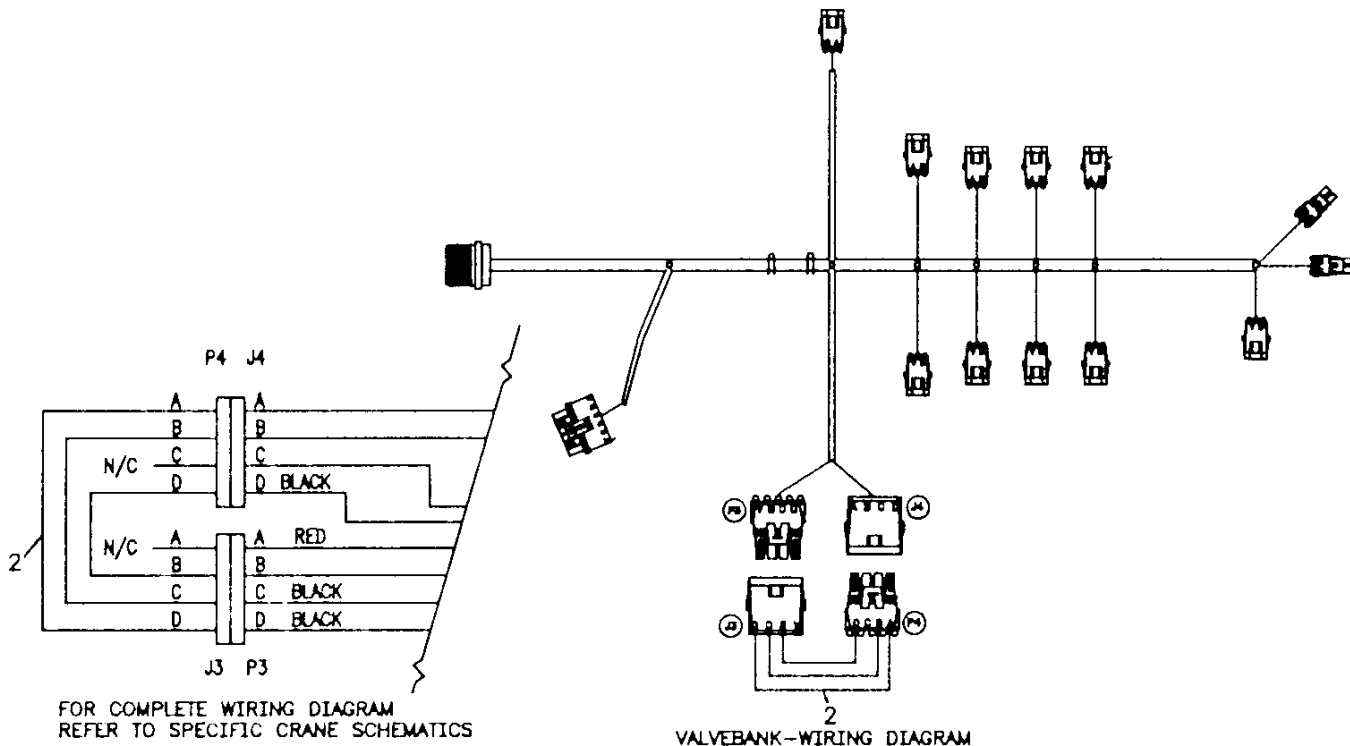
CONTINUED



CONTROL KIT-RADIO REMOTE (90713710-3)

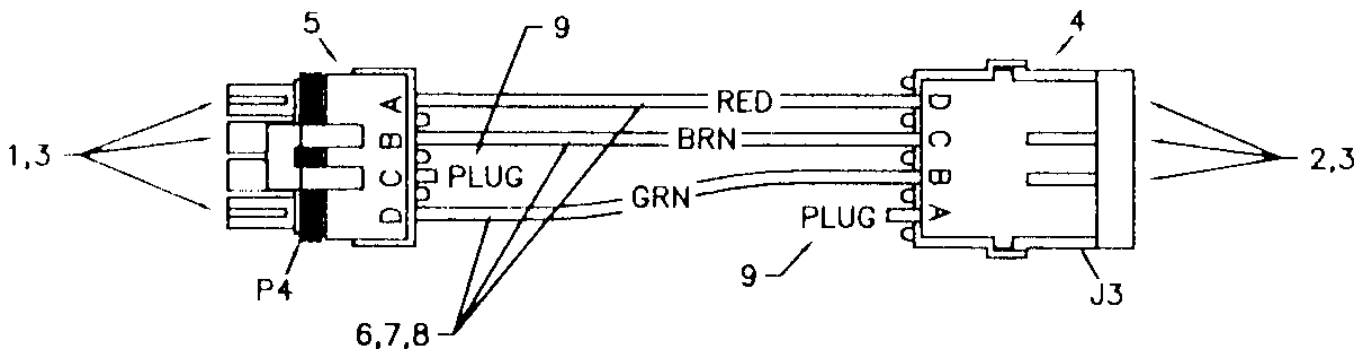
CONTINUED

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

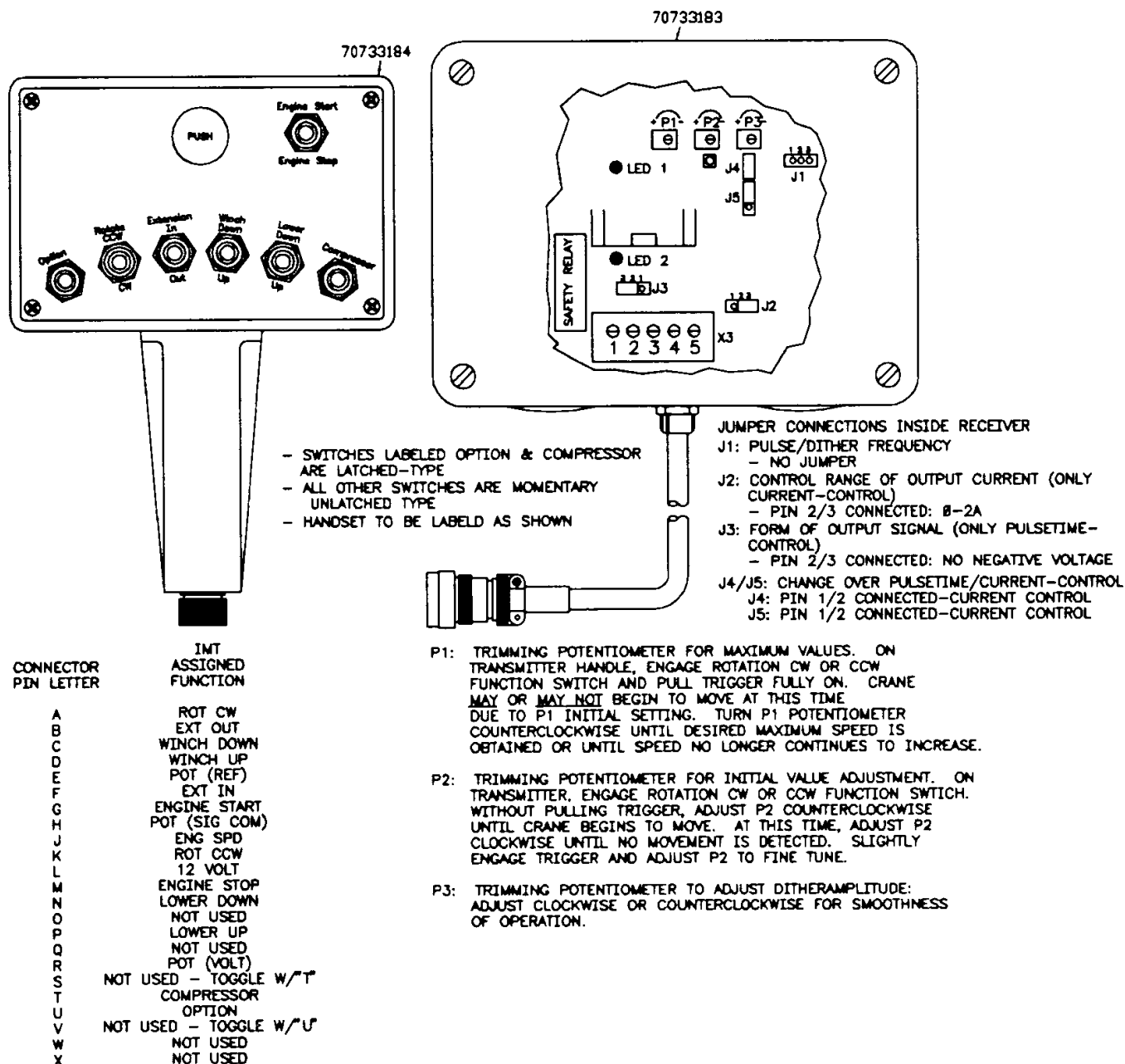


CABLE ASM 18GA/3WIRE X 4 (51713701)

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)



SECTION 4. GENERAL REFERENCE

INSPECTION CHECKLIST 3

WIRE ROPE INSPECTION 7

HOOK INSPECTION 7

HOLDING VALVE INSPECTION 8

ANTI-TWO BLOCKING DEVICE INSPECTION 8

TORQUE DATA CHART-DOMESTIC 9

TORQUE DATA CHART-METRIC 10

TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE 11

TURNTABLE BEARING INSPECTION FOR REPLACEMENT 12

LIMITED WARRANTY 14

NOTES

[illegible]

NOTICE

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

OWNER/COMPANY

CONTACT PERSON

CRANE MAKE & MODEL

CRANE SERIAL NUMBER

UNIT I.D. NUMBER

LOCATION OF UNIT

Inspection Checklist**CRANES****1**

REV: 6-18-99

TYPE OF INSPECTION (check one)

☐

DAILY (if deficiency found)

☐

QUARTERLY

☐

MONTHLY

☐

ANNUAL

DATE INSPECTED

HOUR METER READING (if applicable)

INSPECTED BY (print)

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 (**X**) 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.

FREQUENCY	ITEM	KEY	✓ = SATISFACTORY ✗ = DEFICIENCY (must be corrected prior to operation)	R = RECOMMENDATION (should be considered for corrective action) NA= NOT APPLICABLE	STATUS ✓ , ✗ R, NA
			INSPECTION DESCRIPTION		
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)	R = RECOMMENDATION (should be considered for corrective action) NA = NOT APPLICABLE	STATUS ✓, ✕, R, NA
			INSPECTION DESCRIPTION		
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		

3

Deficiency / Recommendation / Corrective Action Report

GUIDELINES

- A. A deficiency (**X**) may constitute a hazard. **X** must be corrected and/or faulty parts replaced before resuming operation.
- B. Recommendations (**R**) should be considered for corrective actions. Corrective action for a particular recommendation depends on the facts in each situation.
- C. Corrective actions (**CA**), repairs, adjustments, parts replacement, etc. are to be performed by a qualified person in accordance with all manufacturer's recommendations, specifications and requirements.

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

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

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Deficiency / Recommendation / Corrective Action Report (cont)

4

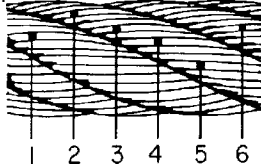
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If additional space is required, reproduce this page and attach to this report.

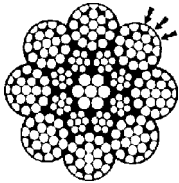
WIRE ROPE INSPECTION

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

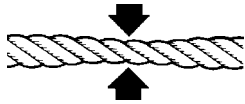
- A. Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.
- B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



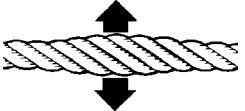
- C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



- 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

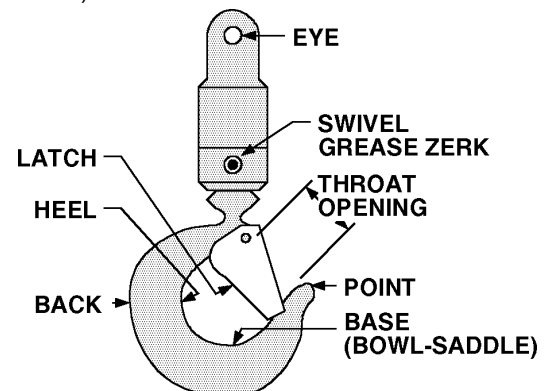
Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% of its original value. (Or as recommended by the manufacturer) (A qualified person may authorize continued 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)

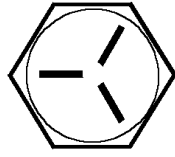

The anti two block system should be checked daily as follows:

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.

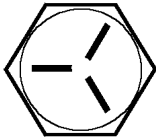

1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special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

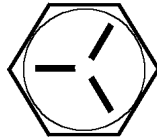

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing.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

TORQUE DATA CHART - DOMESTIC

FINE THREAD BOLTS

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

TORQUE DATA CHART - METRIC

FINE THREAD BOLTS

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

COARSE THREAD BOLTS

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

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

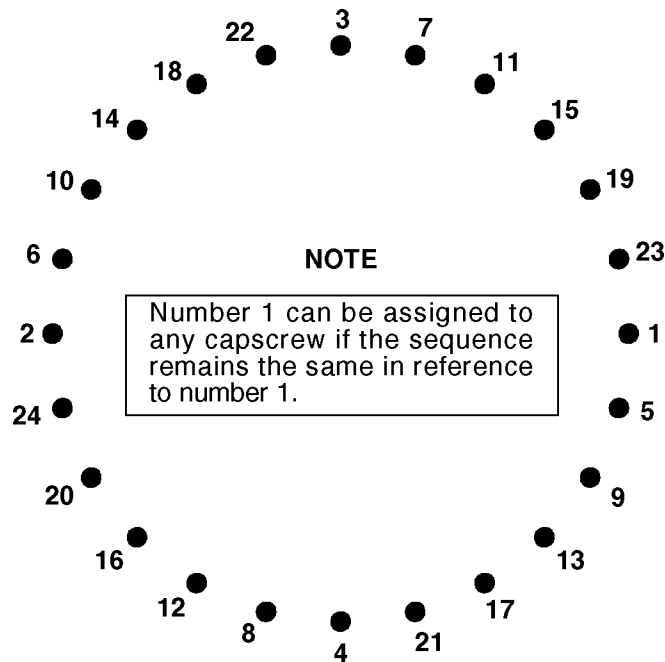
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in kilogram-meters.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants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

TURNTABLE BEARING FASTENER TIGHTENING SEQUENCE

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



TIGHTENING PROCEDURE:

1. Refer to the Torque Data Chart to determine the proper torque value to apply to the size of cap screw used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of cap screws may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all cap screws to approximately 40% of the specified torque value, by following the sequence.
 (EXAMPLE: $.40 \times 265 \text{ FT-LBS} = 106 \text{ FT-LBS}$)
 (EXAMPLE-METRIC: $.40 \times 36 \text{ KG-M} = 14.4 \text{ KG-M}$)
4. Repeat Step 3, but torquing all cap screws to 75% of the specified torque value. Continue to follow the tightening sequence.
 (EXAMPLE: $.75 \times 265 \text{ FT-LBS} = 199 \text{ FT-LBS}$)
 (EXAMPLE-METRIC: $.75 \times 36 \text{ KG-M} = 27 \text{ KG-M}$)
5. Using the proper sequence, torque all cap screws 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 bearing's internal clearance once mounted on a crane.

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

TEST PROCEDURE

STEP 1.

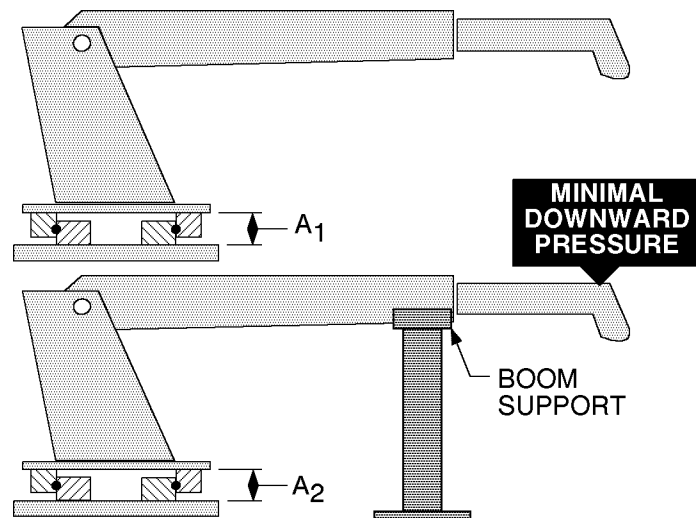
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A_1), using a dial indicator for accuracy.

STEP 2.

Reverse the load by applying minimal downward pressure on the boom while the boom is in the boom support or on a solid surface. Again measure A_2 .

STEP 3.

Subtract A_1 from A_2 to determine tilt and compare the result with the accompanying chart.



COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION

NOTE THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED. IF THERE IS REASON TO SUSPECT AN EXCESS OF BEARING WEAR AND THE MEASURED TILT DIMENSION EXCEEDS THE DIMENSION LISTED, REMOVE THE BEARING FOR INSPECTION.	IMT CRANE, LOADER OR TIREHAND MODEL	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. (A₁-A₂)	.060" (1.524mm)	.070" (1.778mm)	.075" (1.905mm)	.090" (2.286mm)

The information within this manual has been compiled and checked but errors do occur. To provide our customers with a method of communicating those errors we have provided the Manual Change Request form below. In addition to error reporting, you are encouraged to suggest changes or additions to the manual which would be of benefit to you. We cannot guarantee that these additions will be made but we do promise to consider them. When completing the form, please write or print clearly. Submit a copy of the completed form to the address listed below.

MANUAL CHANGE REQUEST

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

☐ ERROR FOUND

LOCATION OF ERROR (page no.): _____

DESCRIPTION OF ERROR: _____

☐ REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: _____

REASON FOR ADDITION: _____

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

LIMITED WARRANTY

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

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

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

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

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