



# *Model 3816 Crane*

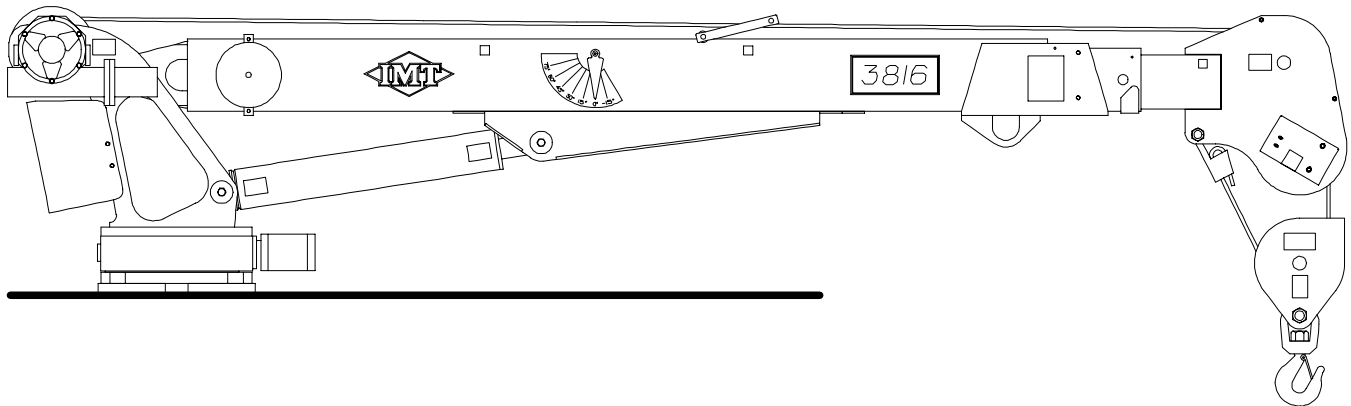
## **Volume 2 - PARTS AND SPECIFICATIONS**

**Section 1 CRANE SPECIFICATIONS**

**Section 2 CRANE REFERENCE**

**Section 3 REPLACEMENT PARTS**

**Section 4 GENERAL REFERENCE**



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MANUAL PART NUMBER 99900954

## 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 3816 CRANE SPECIFICATIONS

### GENERAL SPECIFICATIONS

<b>CRANE RATING</b>	38,000 ft-lbs 5.26 ton-meters
<b>REACH - from centerline of rotation</b>	20'-0" 6.10m
<b>HYDRAULIC EXTENSION</b>	60" 152.4cm
<b>MANUAL EXTENSION</b>	48" 121.9cm
<b>LIFTING HEIGHT - from base of crane</b>	21'-6" 6.55m
<b>WEIGHT OF CRANE</b>	1400 lbs 635 kgs
<b>OUTRIGGER SPAN (required option) crane side from centerline of chassis</b>	83" 210.8cm
<b>STORAGE HEIGHT - crane only</b>	30" 76.2cm
<b>MOUNTING SPACE REQUIRED</b>	20" x 21" (crane base) 50.8cm x 53.3cm
<b>TIE-DOWN BOLT PATTERN</b>	14-3/4" x 14-3/4" 37.5cm x 37.5cm on center
<b>HORIZONTAL CENTER OF GRAVITY - from centerline of rotation</b>	36" 91.4cm
<b>VERTICAL CENTER OF GRAVITY - from bottom of crane base</b>	19" 48.3cm
<b>OPTIMUM PUMP CAPACITY</b>	10 U.S. Gallons/minute 37.85 liters/minute
<b>SYSTEM PRESSURE</b>	3000 psi 207 bar
<b>ROTATIONAL TORQUE</b>	9000 ft-lbs 1.24 ton-meters

## PERFORMANCE CHARACTERISTICS

ROTATION: 400° (6.98 Rad.)	33.0 seconds
LOWER BOOM ELEVATION: -5° to +80° (-0.09 Rad. to +1.40 Rad.)	8.5 seconds
EXTENSION CYLINDER: 60" (152.4cm)	9.5 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 23.5 horsepower based on 10 GPM at 3000 PSI (37.85 liters/min. at 207 bar).

## ROTATION SYSTEM

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

## CYLINDER HOLDING VALVES

The base 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 25.0 ft/minute (7.62m/min), under no load, is achieved at an optimum oil flow of 10 GPM (37.85 liters/min) and one-part line. Maximum single line lifting capacity of the winch is 3900 lbs (1770 kg). Maximum two-part line lifting capacity of the winch is 7500 lbs (3400 kg). The winch is equipped with 85 ft (25.9m), 3/8" (9.5mm), 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

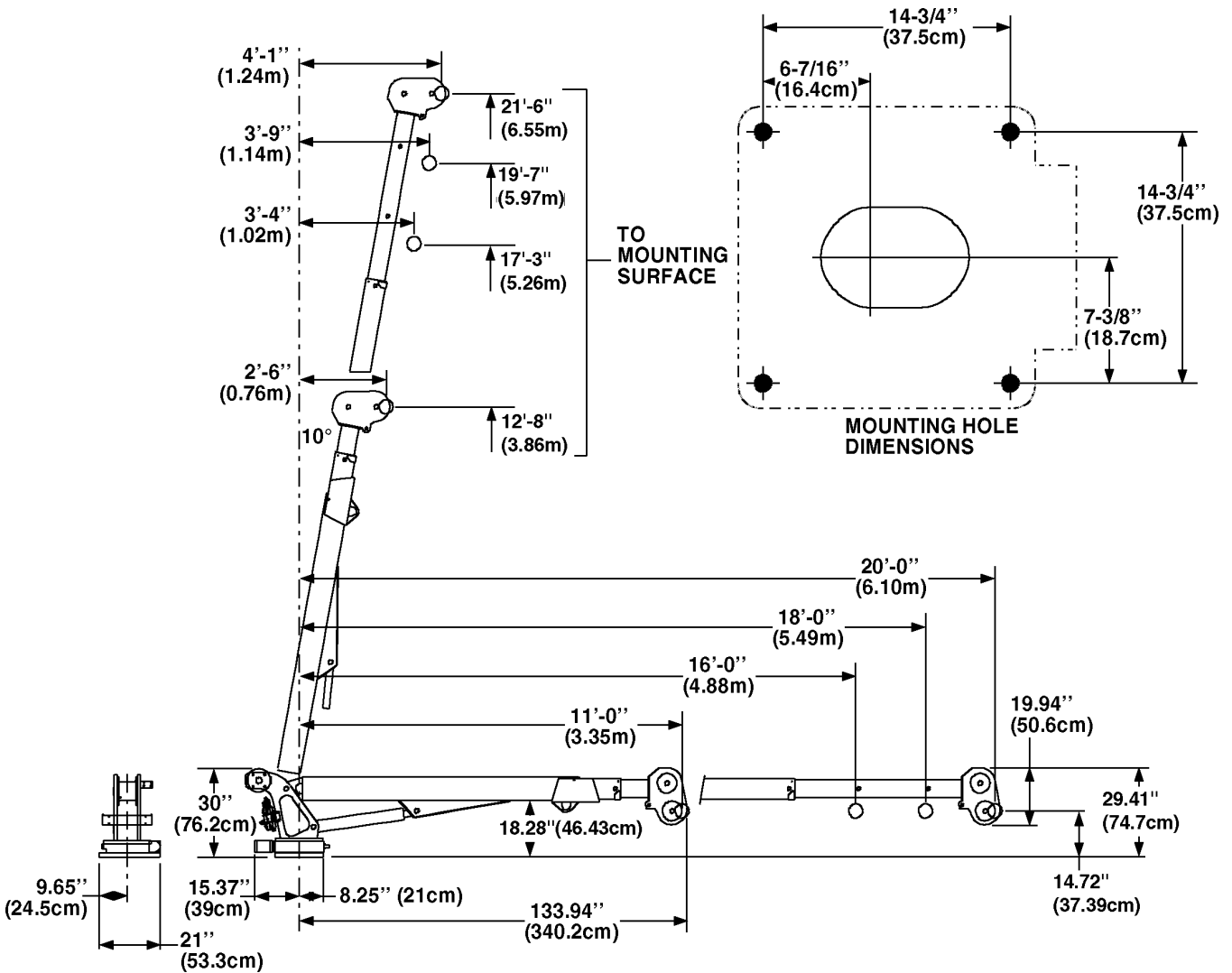
The hydraulic system is an open center, full pressure system requiring maximum flow of 10 GPM (37.85 liters/min.) at 3000 psi (207 bar). It is equipped with a four section, electric remote, stack type control valve with a 30 ft. (9.14 m) control cable. The system includes a separate hydraulic oil reservoir, suction line filter, 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 <sup>3</sup>	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

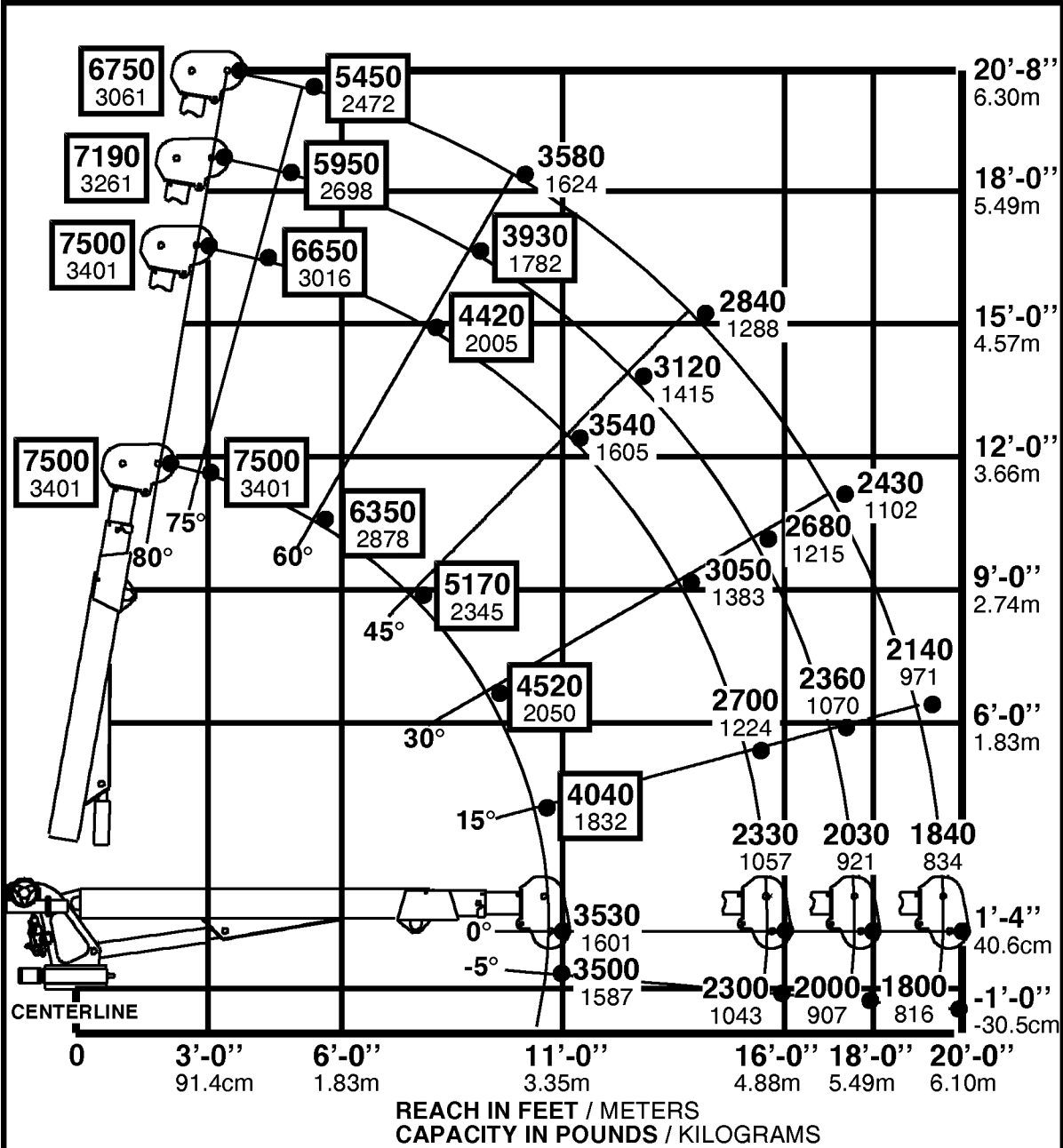
In addition to these specifications, heavy duty electrical and cooling systems are required. It is recommended that the vehicle be equipped with an engine tachometer, auxiliary brake lock, and power steering.

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



**GEOMETRIC CONFIGURATION**

# 3816 CAPACITY CHART



Maximum 1-part line capacity is 3800 lbs (1725 kgs). For greater loads, use 2-part line.

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



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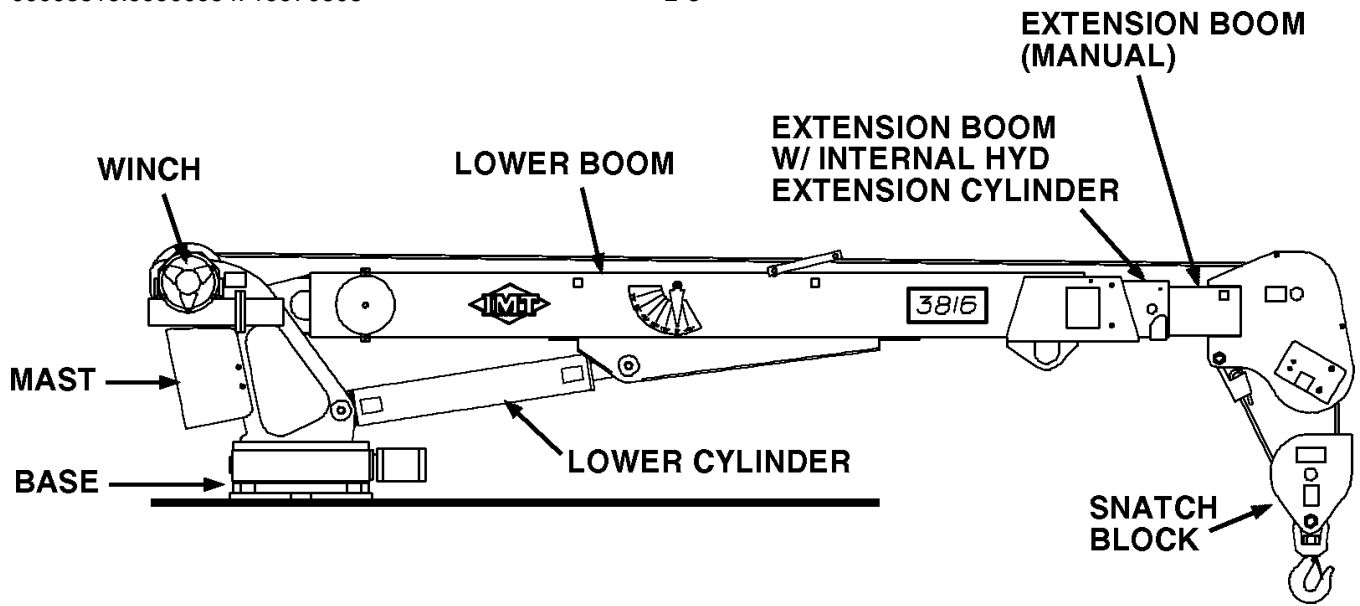
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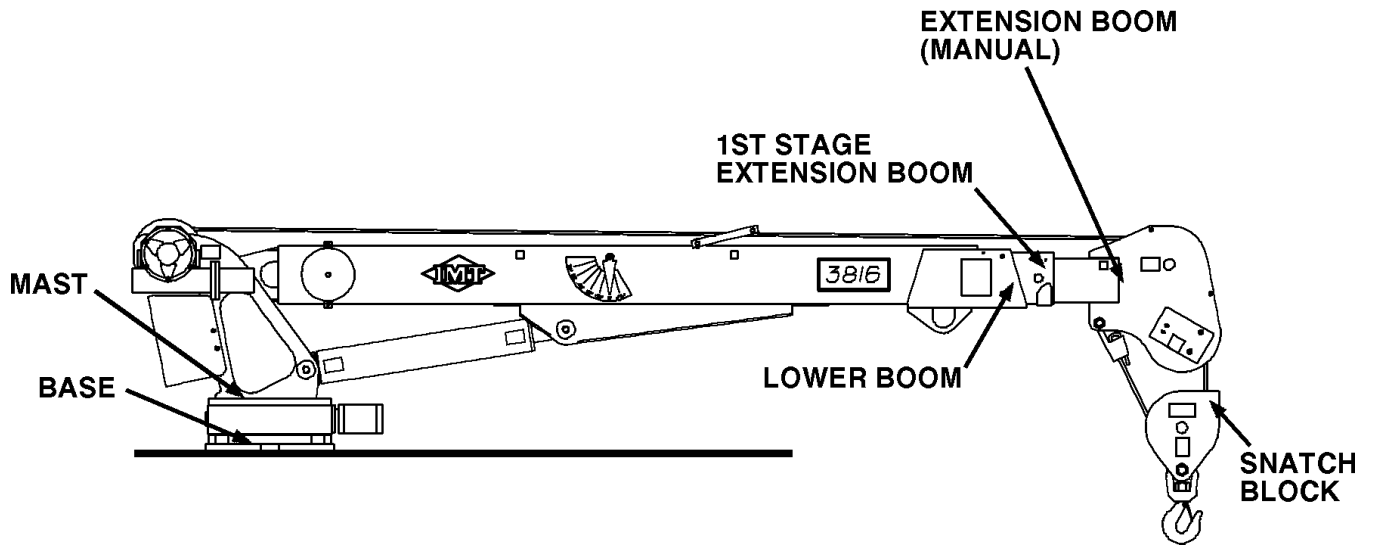
## **SECTION 2. MODEL 3816 CRANE REFERENCE**

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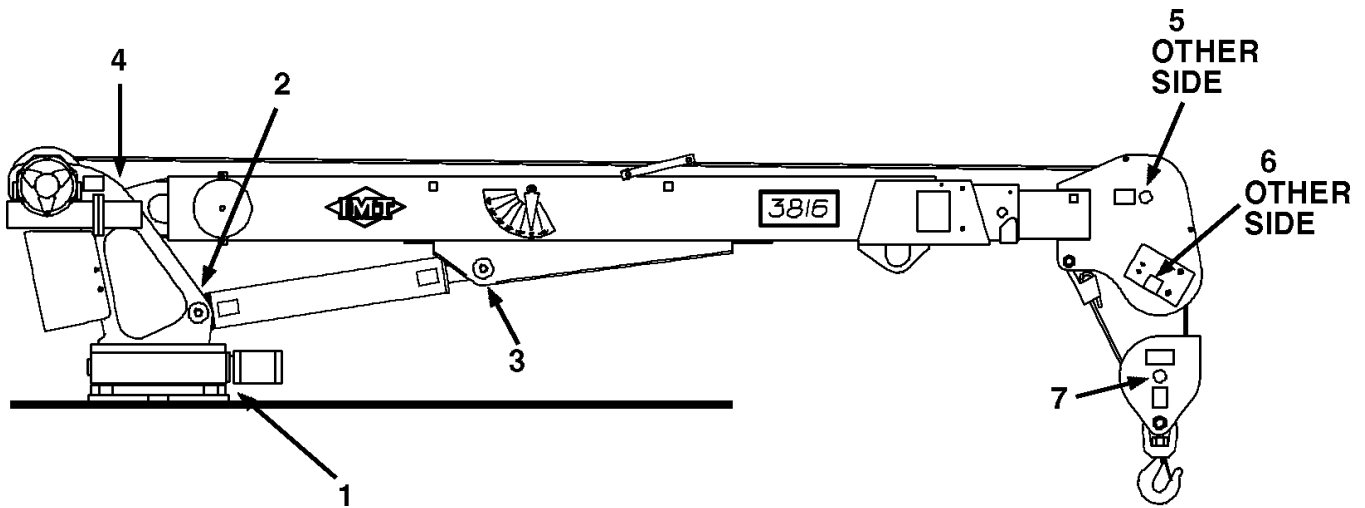


## MAJOR CRANE ASSEMBLIES



## WELDMENT PART NUMBER LOCATIONS

# GREASE ZERK LOCATIONS & LUBRICANT REQUIREMENTS



ITEM	LOCATION DESCRIPTION	LUBRICANT	FREQUENCY
1.	GEAR ROTATOR GREASE EXTENSION *ROTATE CRANE WHILE GREASING	SHELL ALVANIA 2EP  OR	WEEKLY
2.	LOWER CYLINDER BASE		
3.	LOWER CYLINDER ROD		
4.	MAST/LOWER BOOM HINGE PIN		
5.	UPPER SHEAVE PIN	SHELL RETINAX "A"	
6.	LOWER SHEAVE PIN		
7.	SNATCH BLOCK SHEAVE PIN		

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

**RECOMMENDED SPARE PARTS LIST****1 YEAR SUPPLY  
MODEL 3816 TELESCOPING CRANE  
FOR MANUAL: 99900954**

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
41714695.01.19981030 BASE ASSEMBLY							
	2	73051919	HYDRAULIC MOTOR	1	C	N/A	
	6	60035479	TUBING 12"	1	P	N/A	
41713811.01.19970821 LOWER BOOM ASSEMBLY							
	1	3B348960	LOWER CYLINDER	1	C	N/A	
	3	60120124	WEAR PAD	4	W	N/A	
	4	72601170	CAP SCR 5/16-24X1 HHGR5	8	W	N/A	
3B348960.01.19970829 LOWER CYLINDER							
	7	73054304	COUNTERBALANCE VALVE	1	C	N/A	
	8	9C161823	SEAL KIT	1	W	N/A	
41713812.01.19970818 EXTENSION BOOM ASSEMBLY							
	1	3B313960	EXTENSION CYLINDER	1	C	N/A	
	4	60030189	WEAR PAD	1	W	N/A	
	6	60030134	SHEAVE	2	W	N/A	
3B313960.01.19970829 EXTENSION CYLINDER							
	8	73054661	COUNTERBALANCE VALVE	1	C	N/A	
	10	9B101220	SEAL KIT	1	W	N/A	
31713815.01.19970829 WINCH/CABLE/HOOK KIT							
	3	73051905	HYDRAULIC MOTOR	1	C	N/A	
	9	60120135	CABLE 3/8 IWRC XIP X 85FT	1	W	N/A	
	15	51713168	CORD REEL	1	C	N/A	
	20	77041291	SWITCH	1	C	N/A	
	23	52709413	CABLE STOP	1	W	N/A	
	28	60030108	ROLLER-CABLE GUIDE	1	W	N/A	
	43	60030134	SHEAVE	1	W	N/A	
	44	71073035	HOOK	1	W	N/A	
	46	70074004	HOOK SAFETY LATCH	1	C	N/A	
71057936.01.19970808 WINCH ASSEMBLY							
	5	76393174	O-RING	1	W	N/A	
	7	76393173	OIL SEAL	1	W	N/A	
	15	70055202	BALL BEARING	2	W	N/A	
	20	70732542	BRAKE KIT	1	W	N/A	
	21	76393171	GASKET	2	W	N/A	
51713182.01.19970829 PROPORTIONAL REMOTE HANDLE ASSEMBLY							
		51713182	PROP REMOTE HANDLE ASM	1	W	N/A	
	11	70394183	TRIGGER ASM	1	C	N/A	
	16	77040371	TOGGLE SWITCH SPST	1	C	N/A	
	17	77040372	TOGGLE SWITCH SPDT	2	C	N/A	
	18	77040373	TOGGLE SWITCH SPST	1	C	N/A	
51713199.01.19970808 CABLE ASSEMBLY 14GA 6WIRE X 35'							
		51713199	CABLE ASM	1	W	N/A	
73733057.01.19970825 VALVEBANK							
	3	73054934	PROPORTIONAL SOLENOID	1	C	N/A	
	5	73054936	SOLENOID VALVE	1	W	N/A	
	17	77044595	VALVE DRIVER	1	C	N/A	
93715267.01.19981030 INSTALLATION KIT							
		73052006	FILTER ELEMENT 10MIC	2	P	N/A	
71056525.01.19970821 GEAR ROTATOR							
	6	73145506	SHIM .005	2	W	N/A	
	7	73145505	SHIM .015	2	W	N/A	
	8	73145504	SHIM .030	2	W	N/A	
	13	76394540	SEAL	1	W	N/A	
	14	76394539	SEAL	1	W	N/A	
	16	76394538	O-RING	1	W	N/A	



## INSTALLATION

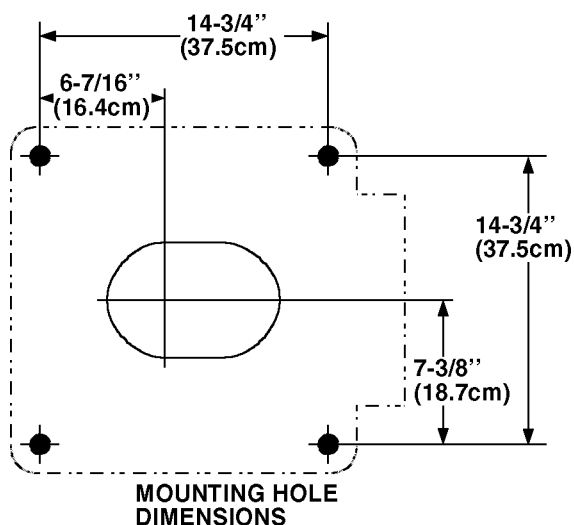
### GENERAL

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. Study the applicable installation kit in the parts section before attempting any installation.

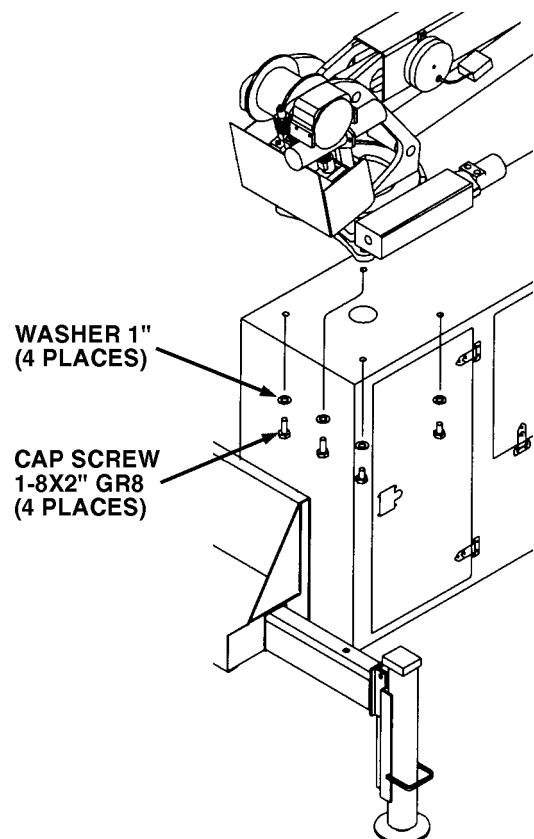
### CRANE INSTALLATION

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 3816 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, 1,400 lbs (635 kg). Attach fabric slings to the crane lower boom, centered approximately 18 inches from the mast hinge. Make certain the crane is well balanced on the slings by slowly lifting approximately 6" off the ground. Lift the crane, apply a bead of waterproof compound, such as silicon based caulk, to the bottom of the base. Move the chassis under the crane and lower the crane into the desired position.
2. Install the 1-8x2" mounting cap screws and 1" washers to secure the crane base to the truck body (see Figure below). Torque the cap screws to 680 ft-lbs (94 kg-m).



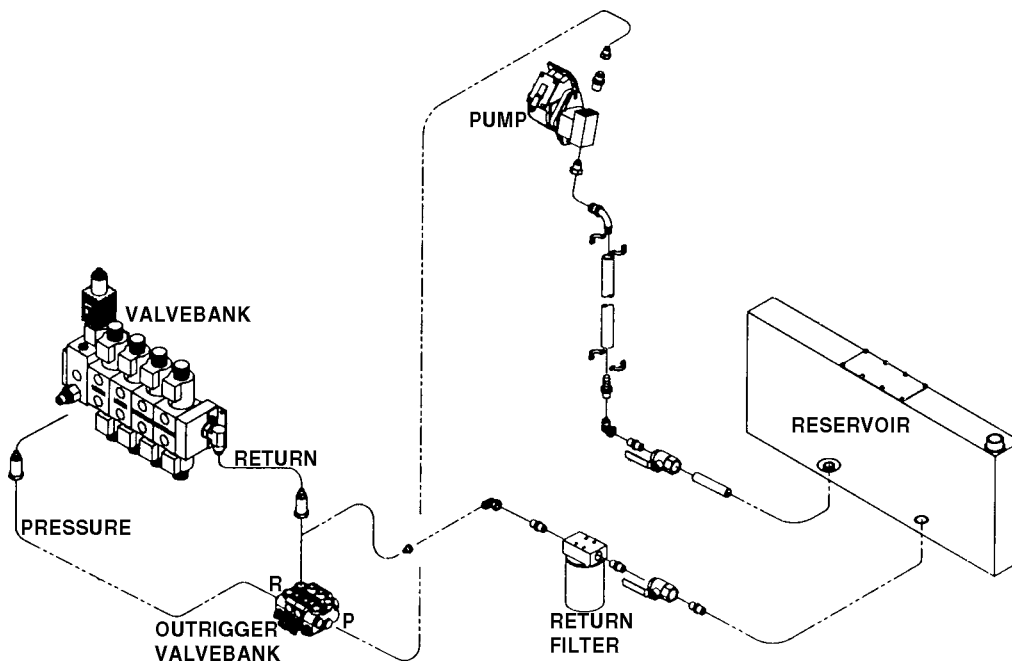
### CRANE INSTALLATION

## HYDRAULIC INSTALLATION

Before installation, familiarize yourself with the installation kit drawing in the parts section for specific hydraulic components used. The figure below is used to show major components and general hose routings only.

1. Plumb the hydraulic components as shown in the applicable installation kit in the parts section. Make certain all fittings are securely tightened and that hoses are free of possible chafing or contact with hot or sharp edges which could cause damage.

2. Refer to Volume 1 for hydraulic oil specifications. Fill the hydraulic reservoir.
3. Check all connections for leaks.
4. 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.
5. Check 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 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 3000 psi at 10 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.

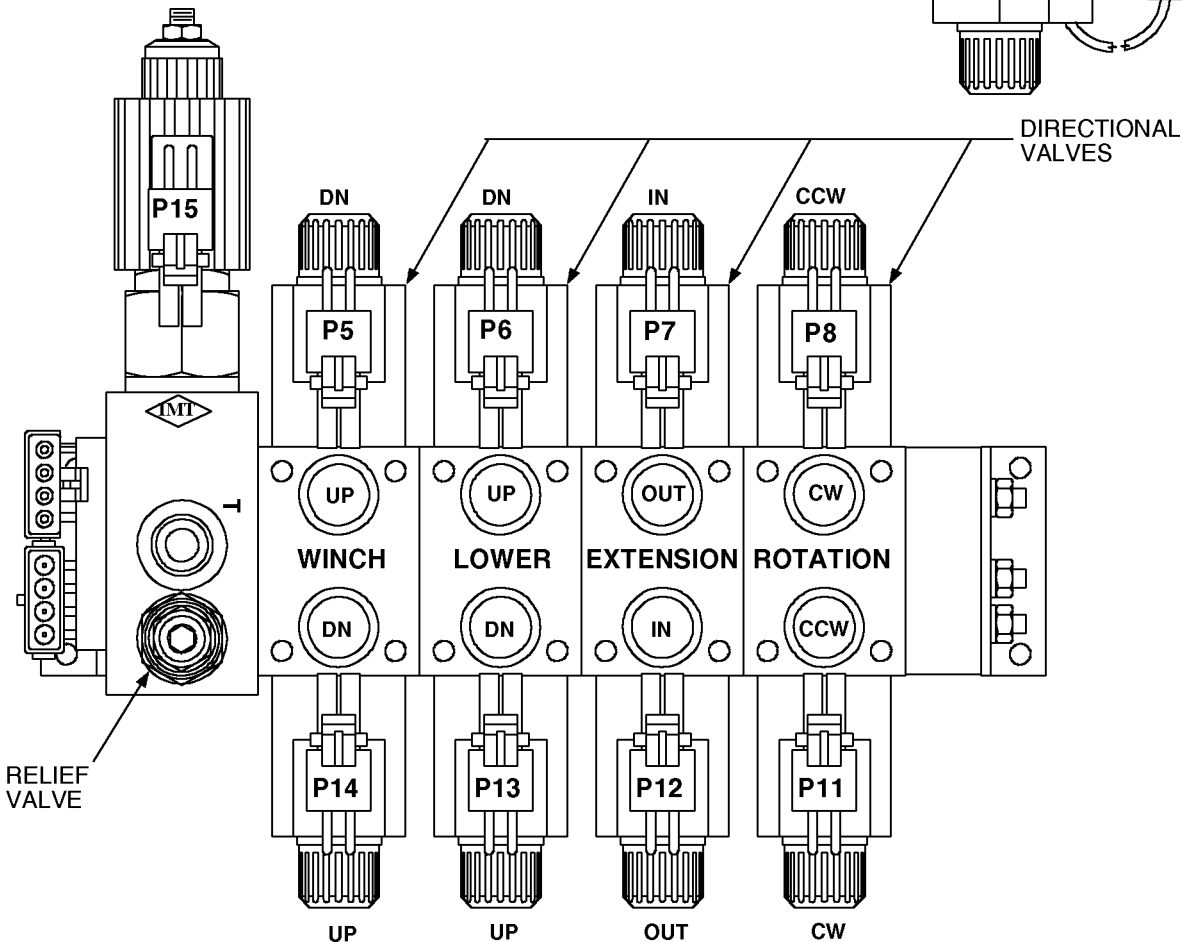
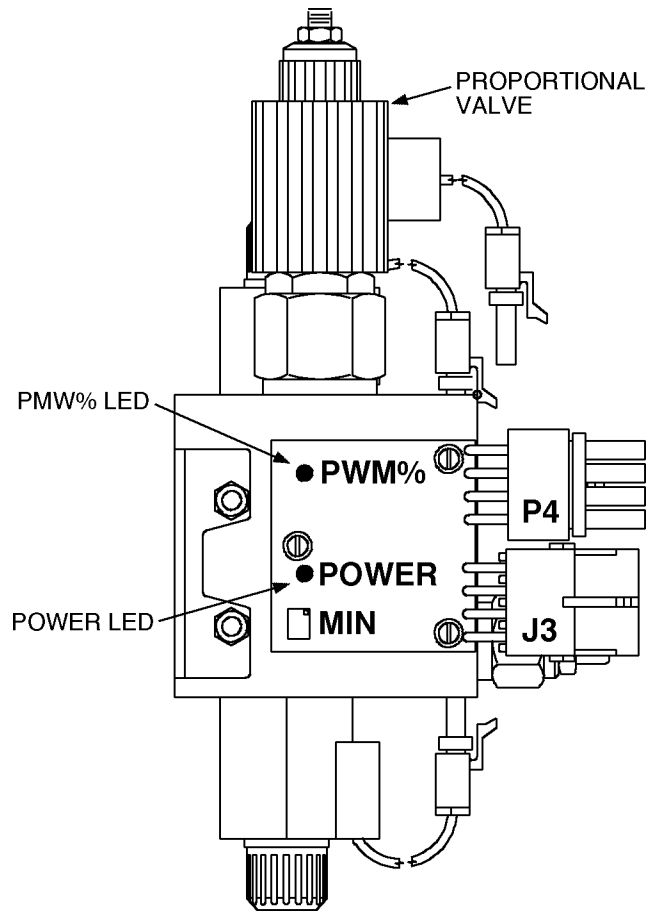
### DIRECTIONAL VALVES

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**

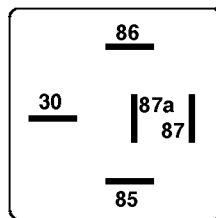
## RELAY BOARD OPERATION

### INTRODUCTION

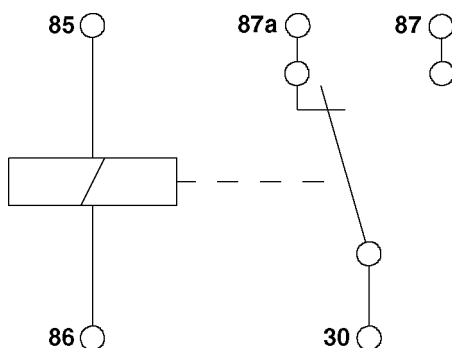
To understand how the relay board operates, it is necessary to understand how the individual relays function.

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

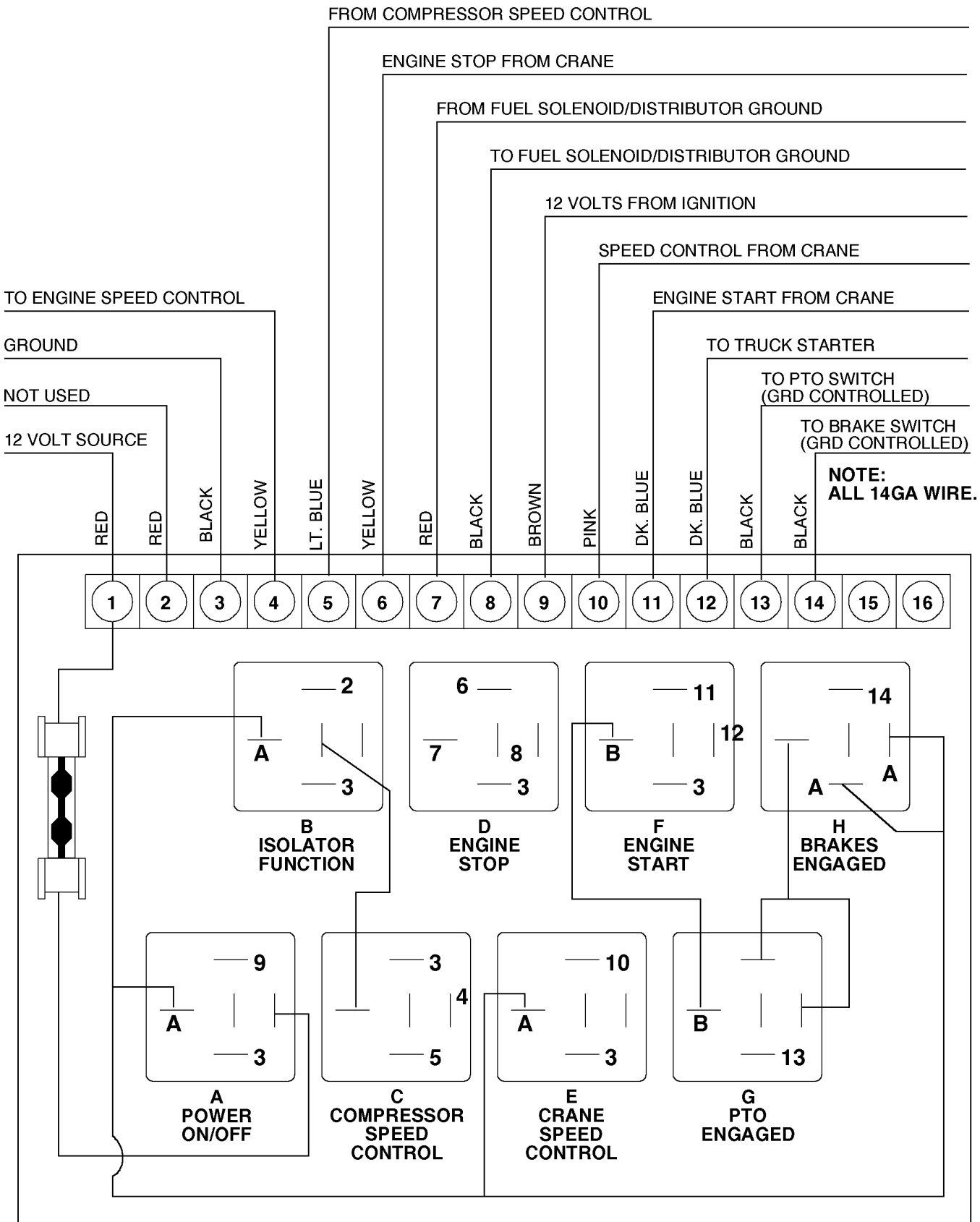
The vehicle can be remotely started from the remote control handle by toggling the "Crane-OFF-Compressor" switch to the "Crane" position.

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.

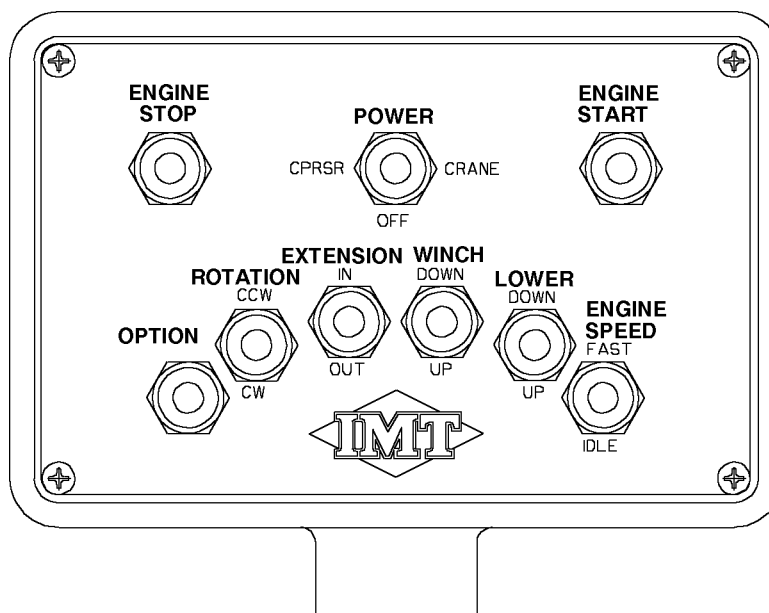


FIGURE 4. REMOTE CONTROL HANDLE

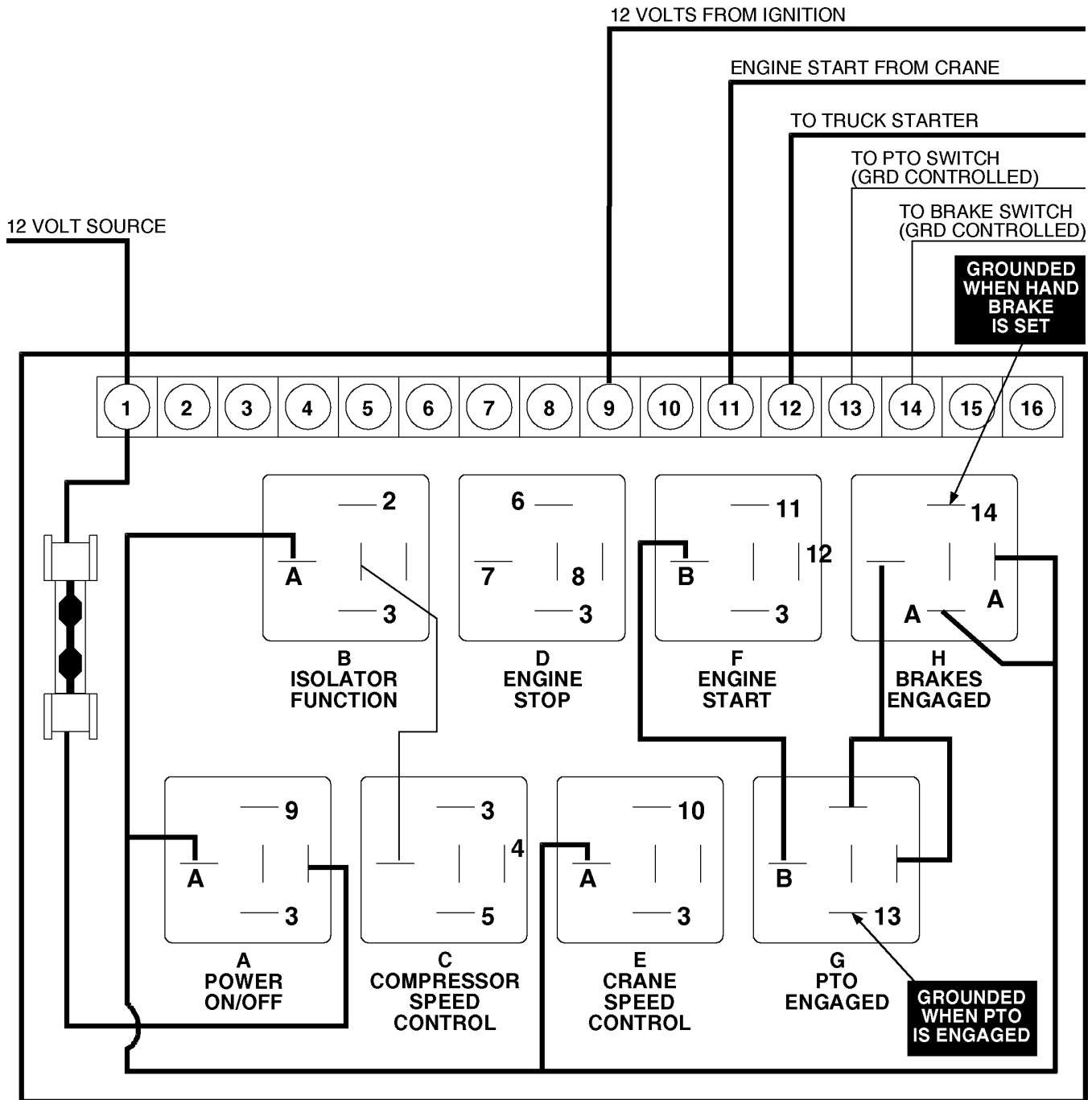


FIGURE 5. REMOTE STARTING OF VEHICLE - IGNITION "ON"

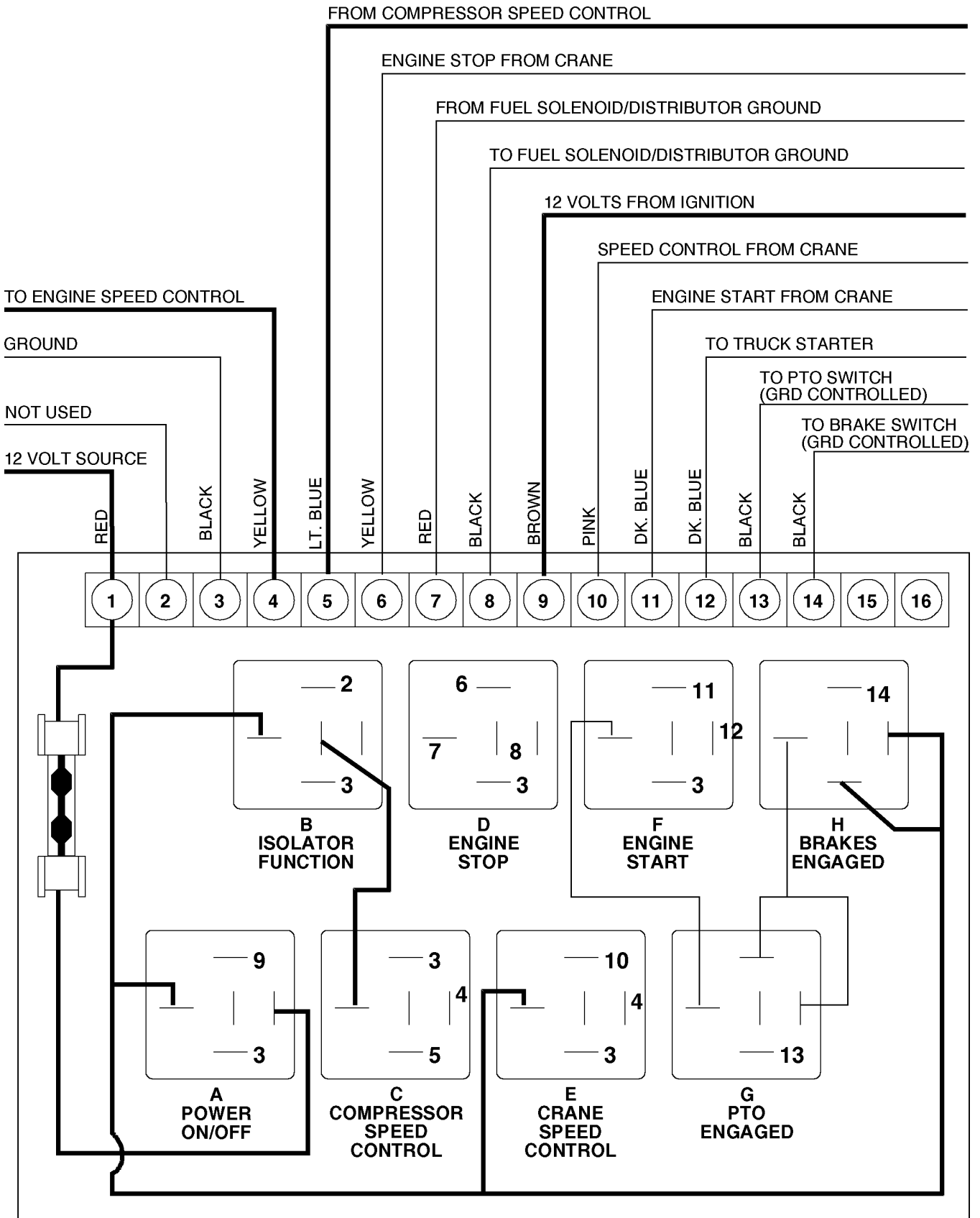


FIGURE 6. SPEED CONTROL - COMPRESSOR ONLY

**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**

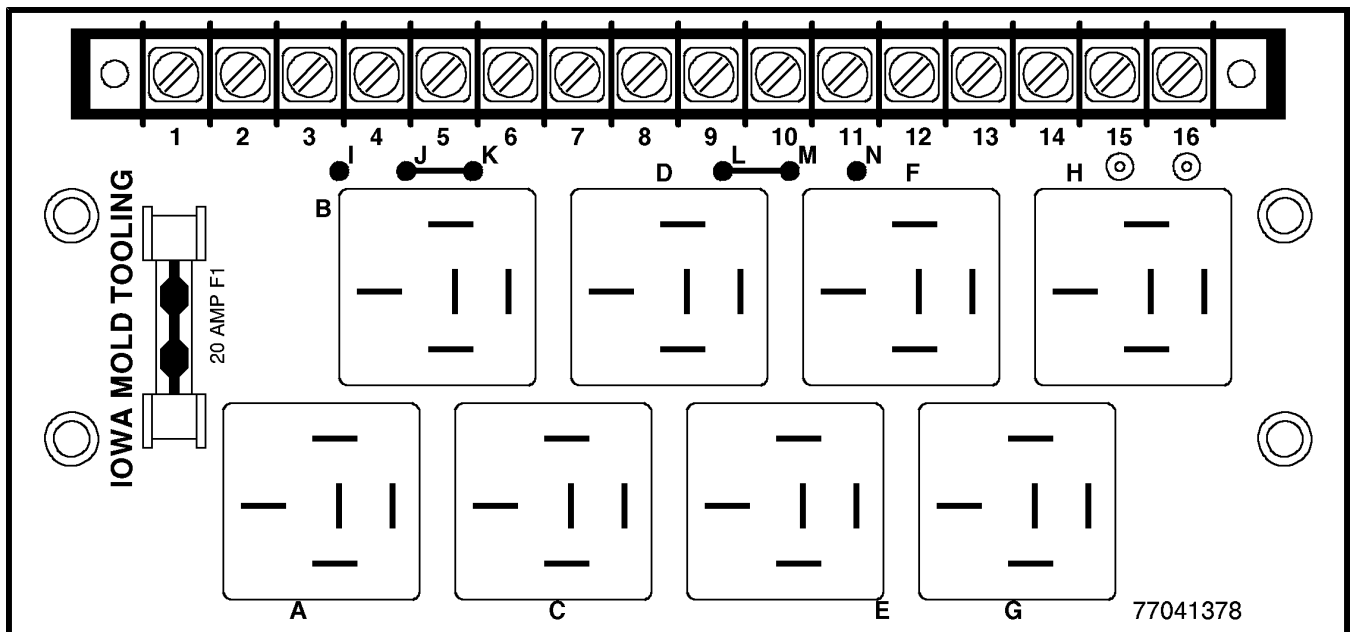
Circuits that could be ground excited are 6 - 10 & 11.  
Quick Check: (Before connecting wires to circuit board)  
Activate the engine stop switch from the crane. If terminal 6 is hot, wire per 4-1. If not, wire per 4-2.

**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
<b>WINCH WON'T LIFT HEAVY LOADS</b>	
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.
<b>WINCH WON'T HOLD LOAD</b>	
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
<b>WINCH RUNS TOO SLOW</b>	
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
<b>WINCH WILL NOT RUN UNDER NO LOAD (RELIEF VALVE OPENS WITHOUT WINCH TURNING)</b>	
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.

00003816:99900954: 19970808

2-18  
(BLANK)

## ANTI TWO-BLOCKING DEVICE

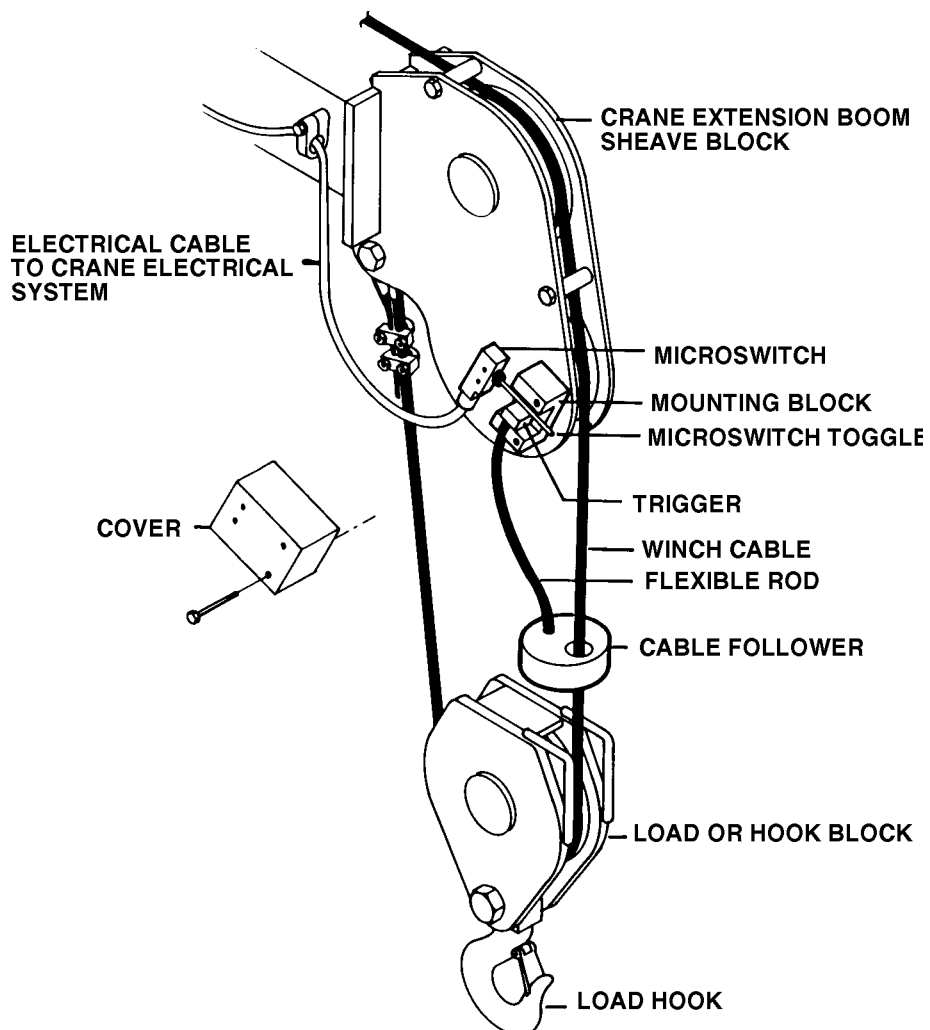
IMT telescoping cranes using a winch are equipped with an Anti Two-Blocking Device which is designed to provide a method of sensing an approaching Two-Blocking situation and prevent the crane from entering that situation. It is the operator's responsibility to avoid Two-Blocking and not to rely on this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

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

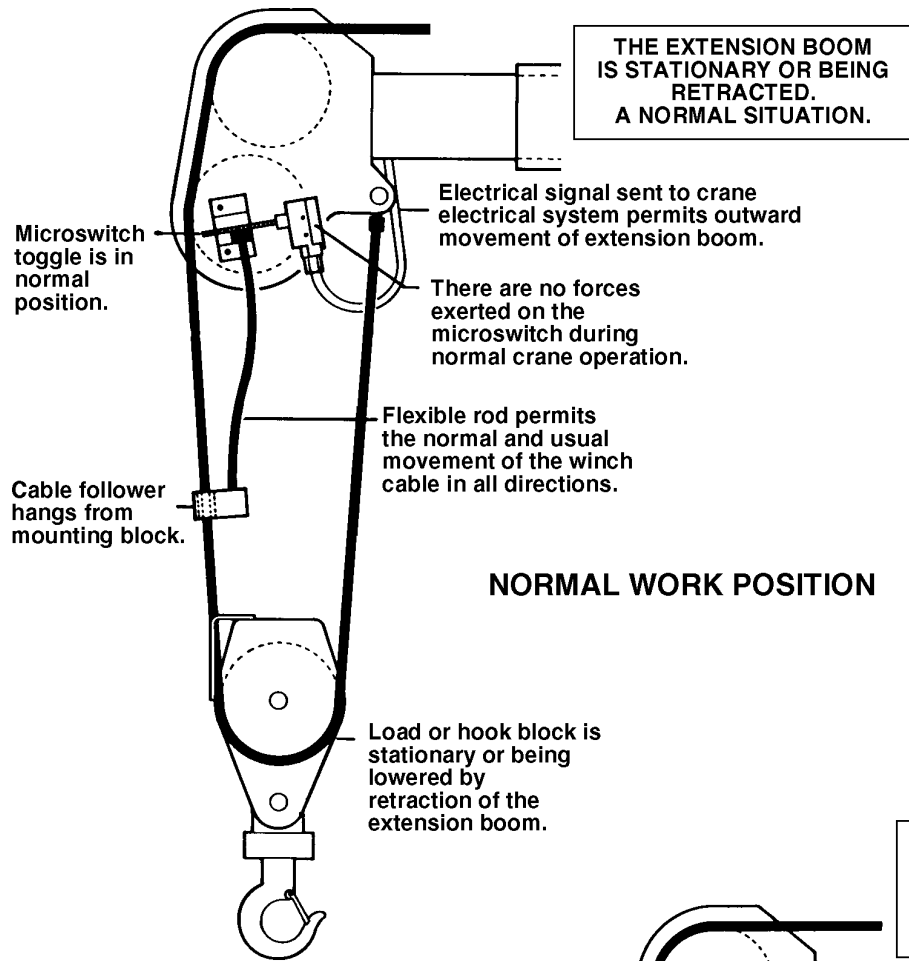
### NOTE

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

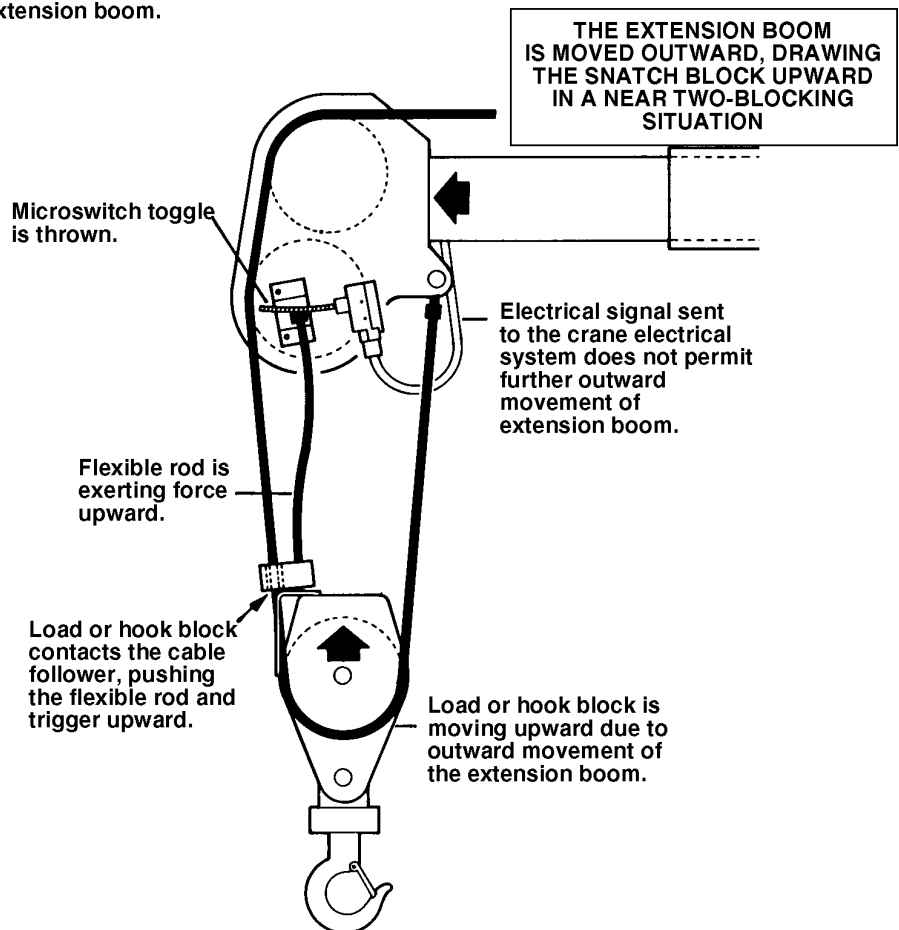
Three means are available to relieve a two-blocking condition. The load may be lowered to the ground, the extension boom may be retracted, or the lower boom may be raised, thus reducing the reach of the crane.



ANTI TWO-BLOCKING DEVICE COMPONENTS



**NORMAL WORK POSITION**



**APPROACHING TWO-BLOCKING SITUATION**

## SECTION 3. MODEL 3816 REPLACEMENT PARTS

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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  
 Technical Support Fax: 515-923-2424

## 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.

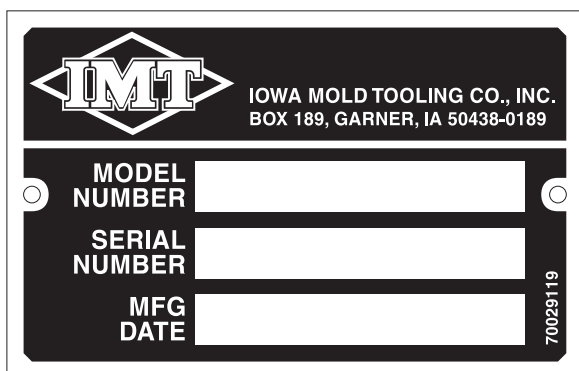
## WELDMENT IDENTIFICATION

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.

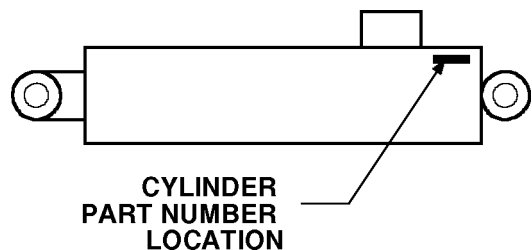
## ORDERING REPAIR PARTS

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.



**SERIAL NUMBER PLACARD**



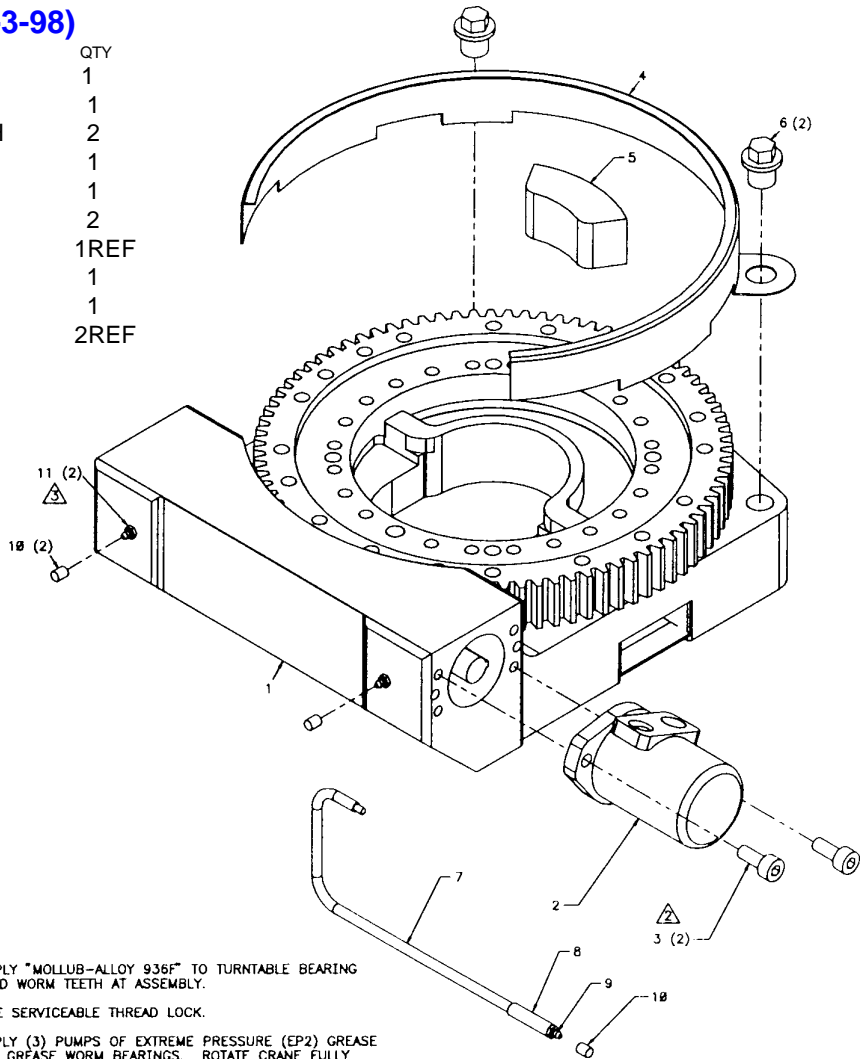
**CYLINDER PART NUMBER LOCATION**

41713980.01.19981030  
 00003816: 41714695.01.19990108

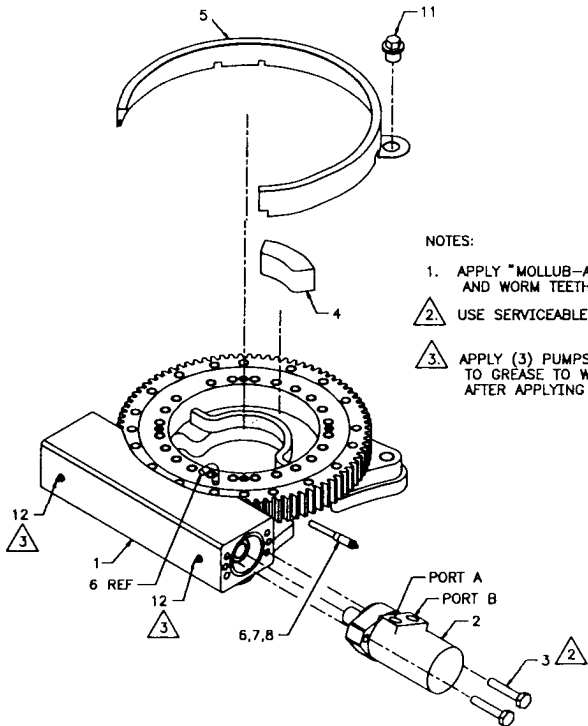
3-4

**BASE ASM (41714695) (EFF: 12-3-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	71056543	GEAR ROTATOR	1
2.	73051919	HYDRAULIC MOTOR	1
3.	72060794	CAP SCR 1/2-13X1-1/4 SH	2
4.	60120192	GEAR GUARD	1
5.	60120138	SLIDE	1
6.	70029595	PLUG 1-8	2
7.	51395121	HOSE	1REF
8.	72053301	COUPLING 1/8NPT	1
9.	72053508	ZERK 1/8NPT	1
10.	72533605	ZERK(PART OF 1)	2REF



- NOTES:
1. APPLY "MOLLUB-ALLOY 936F" TO TURNTABLE BEARING AND WORM TEETH AT ASSEMBLY.
- ⚠ USE SERVICEABLE THREAD LOCK.
- ⚠ APPLY (3) PUMPS OF EXTREME PRESSURE (EP2) GREASE TO GREASE WORM BEARINGS. ROTATE CRANE FULLY AFTER APPLYING GREASE.



- NOTES:
1. APPLY "MOLLUB-ALLOY 936SF" TO TURNTABLE BEARING AND WORM TEETH AT ASSEMBLY.
- ⚠ USE SERVICEABLE THREAD LOCK
- ⚠ APPLY (3) PUMPS OF EXTREME PRESSURE (EP2) GREASE TO GREASE TO WORM BEARINGS. ROTATE CRANE FULLY AFTER APPLYING GREASE.

**BASE ASM (41713980) (EFF: TO 12-2-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	71056525	GEAR ROTATOR(SEE DWG)	1
2.	73051919	HYDRAULIC MOTOR	1
3.	72060794	CAP SCR 1/2-13X1-1/4 SH	2
4.	60120138	SLIDE	1
5.	60120192	GEAR GUARD	1
6.	51395121	HOSE-AA 1/8X13-1/2(2-2) (PART OF HOSE KIT)	1REF
7.	72053301	COUPLING 1/8NPT	1
8.	72053508	ZERK 1/8NPT	1
11.	70029595	PLUG 1-8	2
12.	72533605	ZERK-GREASE (PART OF 1)	2REF



### GEAR ROTATOR (71056525)

ITEM	PART NO.	DESCRIPTION	QTY
1.	76394541	GASKET 1/32	1
2.	70145503	DRIVE SCREW	2
3.	70145502	MAIN HOUSING	1
4.	70145501	BEARING RETAINER	1
5.	70145500	MOUNTING PLATE	1
6.	73145506	SHIM .005	2
7.	73145505	SHIM .015	2
8.	73145504	SHIM .030	2
9.	70056528	WORM	1
10.	70056527	SRB	1
11.	70055271	BEARING-CONE	2
12.	70055270	BEARING-CUP	2
13.	76394540	SEAL	1
14.	76394539	SEAL	2
15.	70145499	SNAP RING	1

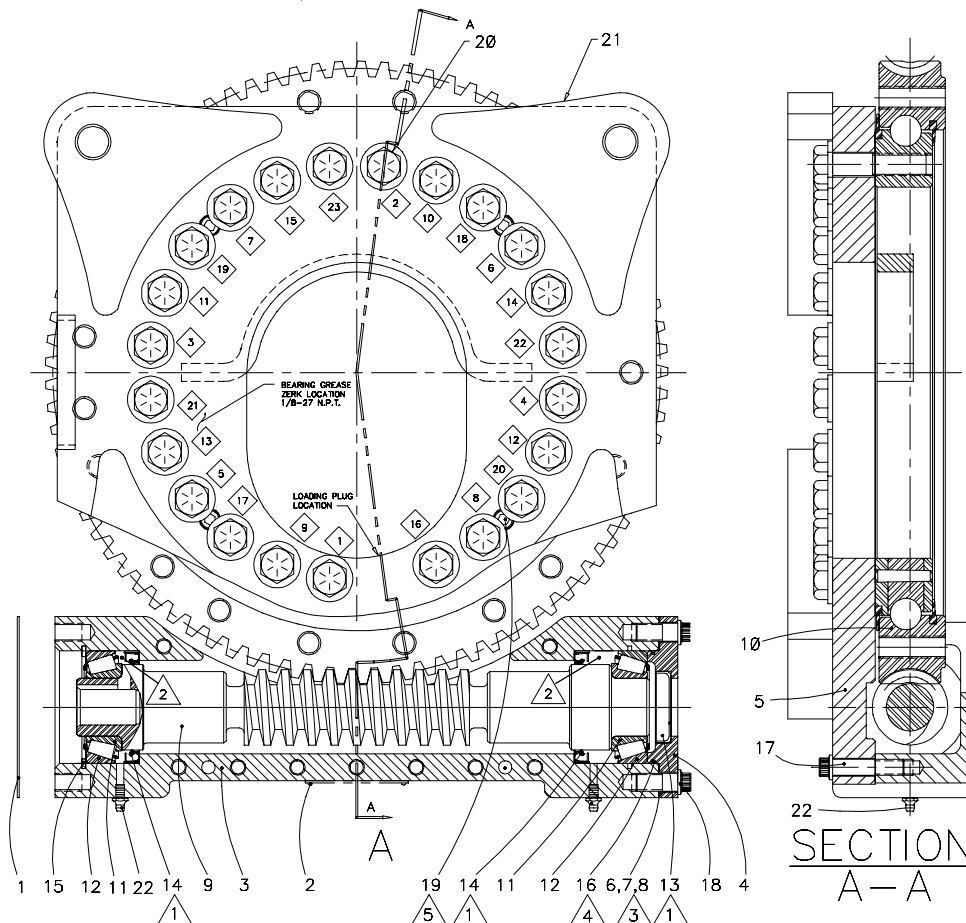
16.	76394538	O-RING	1
17.	72601735	CAP SCR 7/16NCX1-1/2	9
18.	72601733	CAP SCR 1/2NCX1-1/4	4
19.	72601734	CAP SCR 3/8NCX1-1/4	4
20.	72601736	CAP SCR 5/8-11X2-3/4	23
21.	51714146	ADAPTER PLATE	1
22.	72533605	ZERK	2

**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.

ASSEMBLY NOTES:

1. INSTALL SEALS #14 AND #13 WITH LOCTITE PLASTIC GASKET (54931) ON O.D. LUBRICATE SEAL SURFACE BEFORE ASSEMBLY.
  2. PACK CAVITIES WITH EPO GREASE.
  3. SHIM TO OBTAIN .000/.004 END PLAY ON WORM SHAFT.
  4. LUBRICATE O'RING #16 WITH WORM GEAR OIL BEFORE INSTALLING.
  5. INSTALL BOLTS #20 WITH LOCTITE 242.
6. SET BACKLASH BETWEEN WORM AND ROTATION BEARING .005-.012.
7. DO NOT GREASE WORM/BEARING TEETH

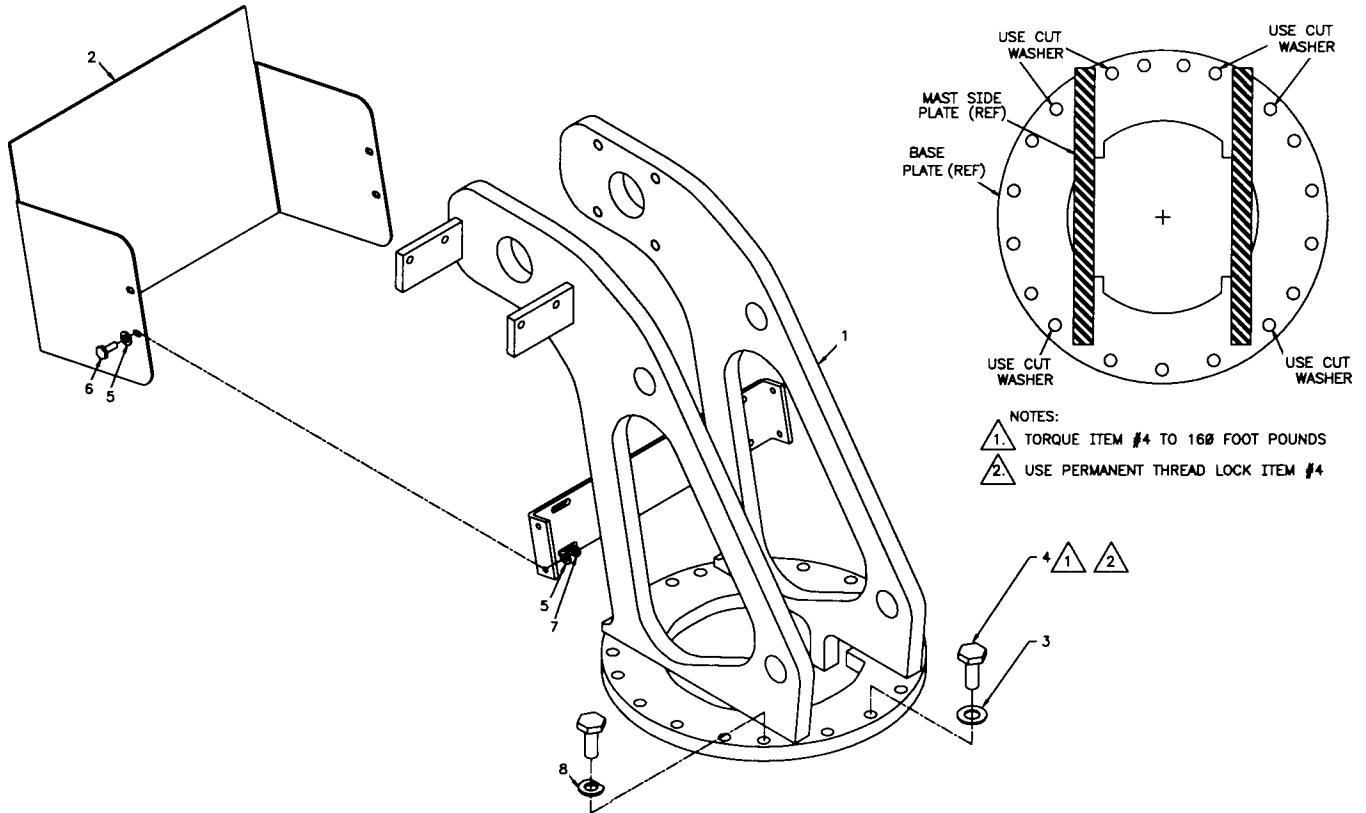


**MAST ASM (41713806) EFF: TO 11-2-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52713803	MAST	1
2.	60119128	VALVEBANK COVER	1
3.	72063119	WASHER 5/8 FLAT HARD GR8	13
4.	72601482	CAP SCR 5/8-11X2-1/2 HHGR8	19
5.	72063001	WASHER 1/4 WRT	8
6.	72060004	CAP SCR 1/4-20X1 HHGR5	4
7.	72062104	NUT 1/4-20 LOCK	4
8.	72063216	WASHER 5/8 FLAT HARD-CUT	6

**WARNING**

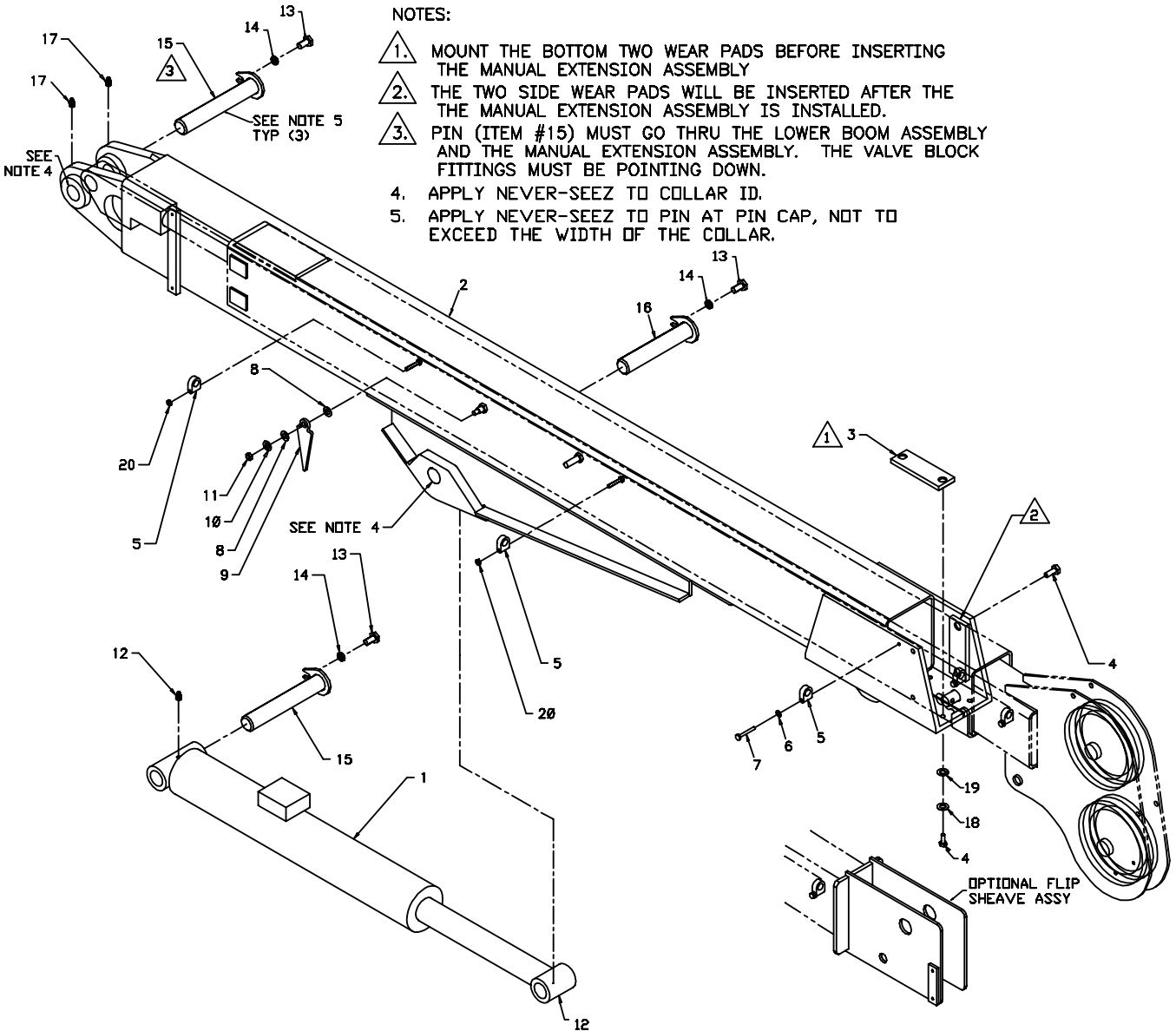
Anytime the gear-bearing bolts have been removed, they must be replaced with new bolts of identical grade and size. Failure to replace gear-bearing bolts may result in bolt failure due to metal fatigue, causing serious injury or death.



**LOWER BOOM ASM-EFF: 4-1-99  
(41715436)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B308980	LOWER CYLINDER (INCL:12)	1
2.	52714979	LOWER BOOM	1
3.	60120124	WEAR PAD	4
4.	72060293	CAP SCR 5/16-24X1 HHGR5	8
5.	70034381	CORD GUIDE	3
6.	72063049	WASHER 1/4 LOCK	1
7.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	1
8.	72063005	WASHER 1/2 WRT	4

9.	60105544	ANGLE INDICATOR	2
10.	72063003	WASHER 3/8 WRT	2
11.	72062103	NUT 3/8-16 LOCK	2
12.	72053507	ZERK 1/4-28 (PART OF 1)	2REF
13.	72060091	CAP SCR 1/2-13X1 HHGR5	3
14.	72063053	WASHER 1/2 LOCK	3
15.	52714976	PIN	2
16.	52715266	PIN	1
17.	72053508	ZERK 1/8NPT	2
18.	72063002	WASHER 5/16 WRT	8
19.	72063050	WASHER 5/16 LOCK	8
20.	72062104	NUT 1/4-20 LOCK	2



**LOWER CYLINDER-EFF:4-1-99  
(3B308980)**

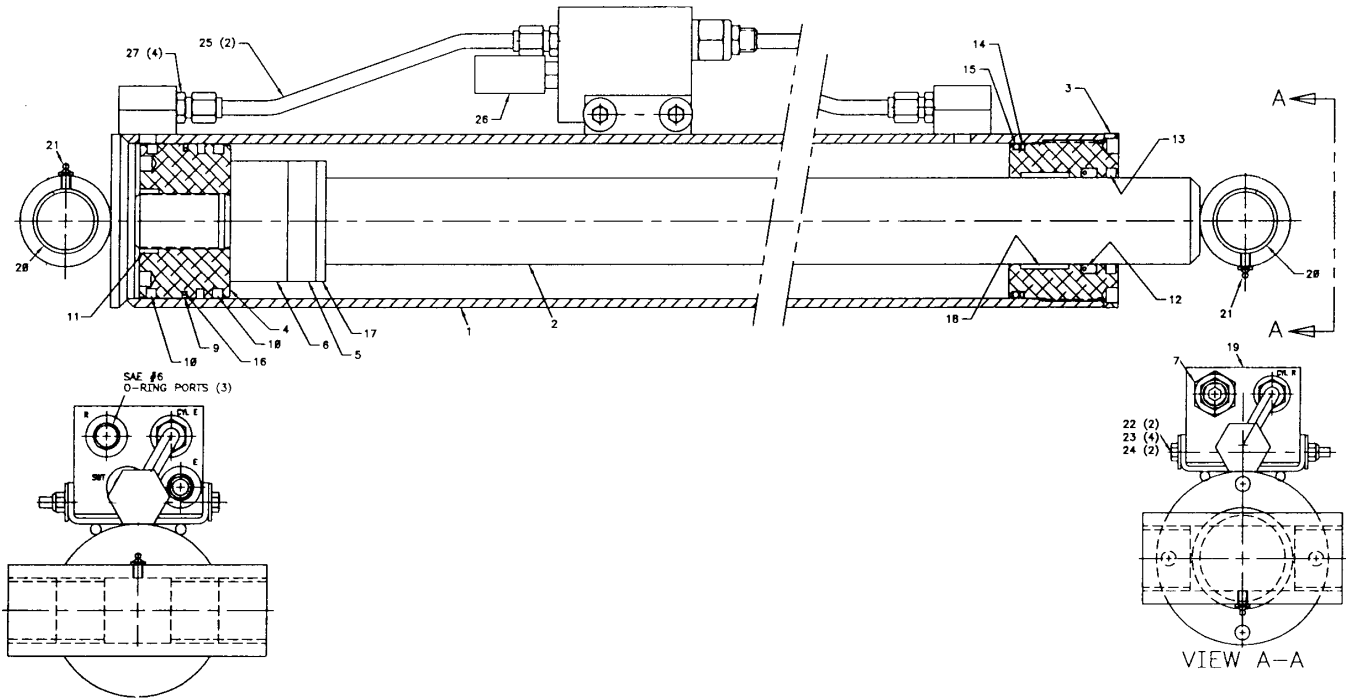
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B308980	CASE ASM	1
2.	4G245980	ROD ASM	1
3.	6H040022	HEAD	1
4.	6I040143	PISTON	1
5.	6C075022	STOP TUBE 3/4"	1
6.	6C150022	STOP TUBE 1-1/2"	1
7.	73540039	C'BAL VALVE (PART OF 19)	1REF
8.	9C161823	SEAL KIT (INCL:9-18)	1
9.	7T66P040	PISTON SEAL (PART OF 8)	1REF
10.	7T65I040	PISTON RING (PART OF 8)	2REF
11.	7T61N143	LOCK RING (PART OF 8)	1REF
12.	7R546022	U-CUP SEAL (PART OF 8)	1REF
13.	7R14P022	ROD WIPER (PART OF 8)	1REF
14.	7Q10P342	BACKUP RING (PART OF 8)	1REF
15.	7Q072342	O-RING (PART OF 8)	1REF
16.	7Q072153	O-RING (PART OF 8)	1REF
17.	6A025022	WAFER LOCK (PART OF 8)	1REF
18.	7T2N8025	WEAR RING (PART OF 8)	1REF
19.	73540038	C'BAL VALVE (INCL:7,26)	1
20.	7BF81215	BUSHING (PART OF 1&2)	6REF
21.	72053507	ZERK 1/4-28 (PART OF 1&2)	2REF
22.	72060037	CAP SCR 5/16-18X4 HHGR5	2
23.	72063002	WASHER 5/16 WRT	4
24.	72062109	NUT 5/16-18 LOCK	2
25.	70145864	TUBE ASM	2
26.	77041561	PR SWITCH (PART OF 19)	1REF
27.	72533186	ADAPTER #6MFACE #6MSTR	4

**NOTE**

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

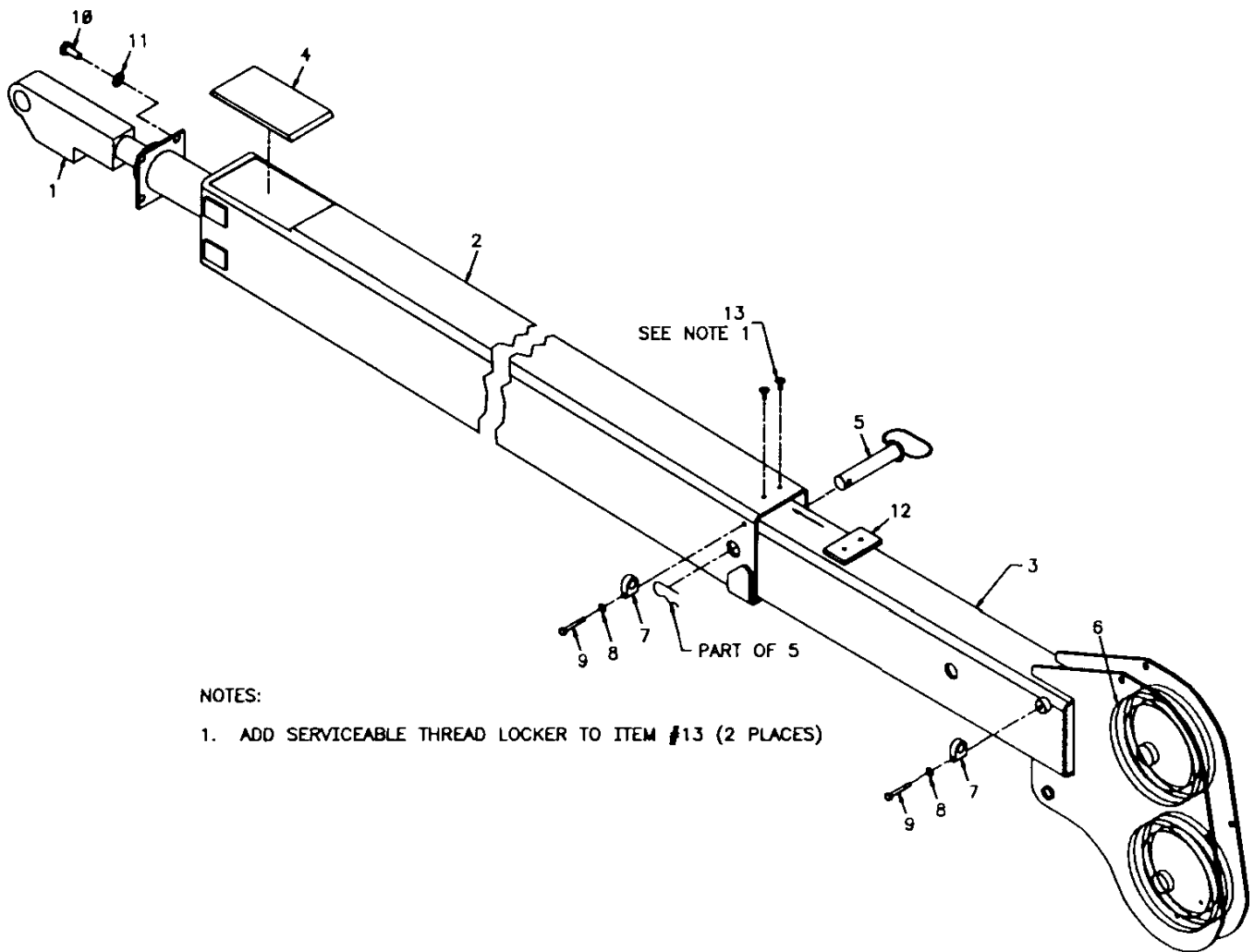
APPLY "LUBRIPLATE #630-2" MEDIUM HEAVY, MULTI-PURPOSE LUBRICANT OR EQUIVALENT TO ALL PISTON, HEAD GLAND, AND HOLDING VALVE SEALS, NYLON LOCK RING, CAST IRON PISTON RINGS, AND ROD STINGER THREADS.

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



**EXT BOOM ASM (41713812) EFF: TO 7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B313960	EXT CYLINDER	1
2.	52713804	EXT BOOM	1
3.	52713810	EXT BOOM-MANUAL (INCL:6)	1
4.	60030189	WEAR PAD	1
5.	73733171	LOCK PIN W/HAIRPIN	1
6.	60030134	SHEAVE (PART OF 3)	2REF
7.	70034381	CORD GUIDE	2
8.	72063049	WASHER 1/4 LOCK	2
9.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
10.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
11.	72063053	WASHER 1/2 LOCK	4
12.	60121174	STOP BLOCK	1
13.	72601750	CAP SCR 3/8-16X1/2 BTNHSOC	2



**NOTES:**

1. ADD SERVICEABLE THREAD LOCKER TO ITEM #13 (2 PLACES)

**EXT CYLINDER (3B313960)**

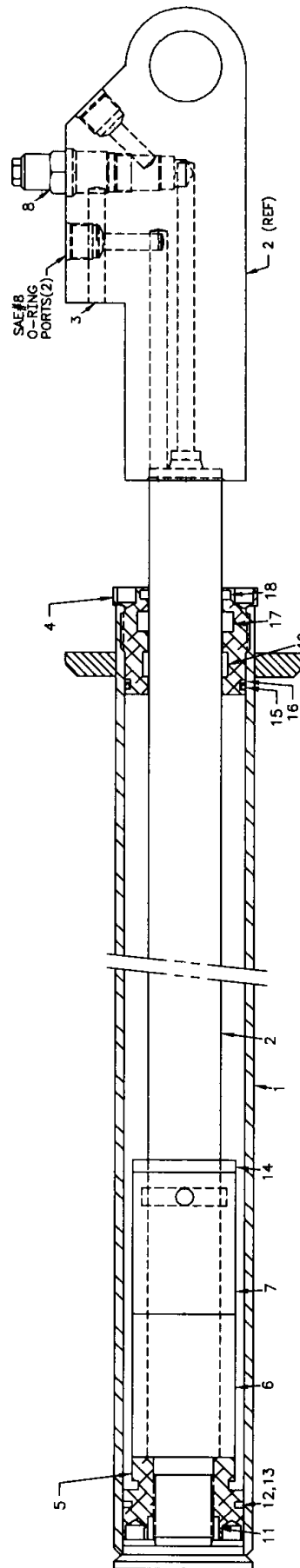
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B309820	CASE ASM	1
2.	4H312960	ROD ASM	1
3.	7PNPXT02	PIPE PLUG 1/8NPT(PART OF 1)	1REF
4.	6H025015	HEAD	1
5.	6IX02512	PISTON	1
6.	6C300015	STOP TUBE 3"	1
7.	6C309820	STOP TUBE 3"	1
8.	73054999	COUNTERBALANCE VALVE	1
10.	9B101220	SEAL KIT (INCL:11-19)	1
11.	7T61N125	LOCK RING (PART OF 10)	1REF
12.	7T66P025	PISTON SEAL (PART OF 10)	1REF
13.	7Q072137	O-RING (PART OF 10)	1REF
14.	6A025015	WAFER LOCK (PART OF 10)	1REF
15.	7Q072228	O-RING (PART OF 10)	1REF
16.	7Q10P228	BACKUP RING (PART OF 10)	1REF
17.	7R546015	U-CUP SEAL (PART OF 10)	1REF
18.	7R14P015	ROD WIPER (PART OF 10)	1REF
19.	7T2N8015	WEAR RING (PART OF 10)	1REF

**NOTE**

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

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

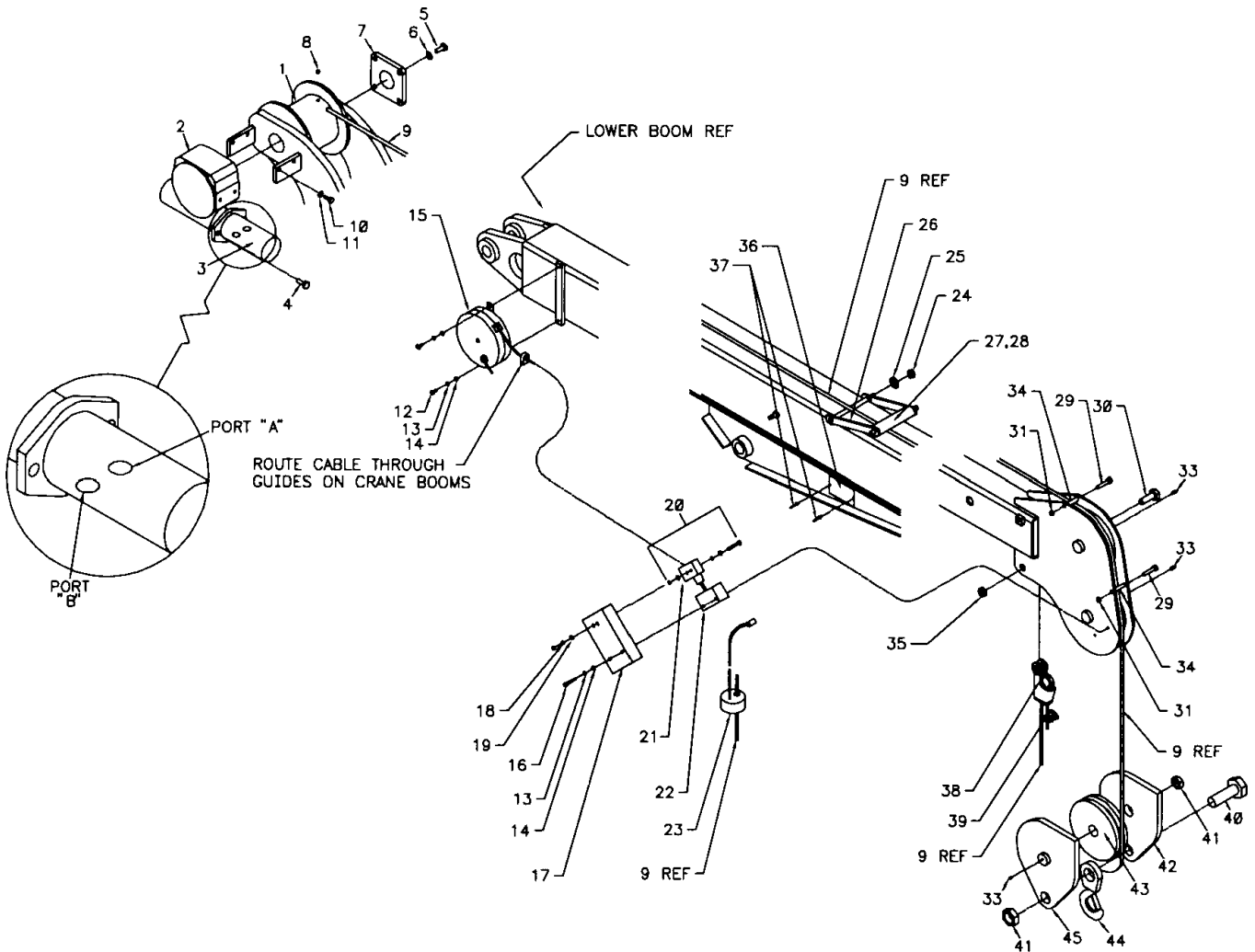
APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD THREADS. KEEP AWAY FROM ALL SEALS.



**WINCH/CABLE/HOOK KIT (31713815)**  
**EFF: TO 7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713808	WINCH DRUM	1
2.	71057936	WINCH (SEE DWG)	1
3.	73051905	MOTOR-HYDRAULIC	1
4.	72060774	CAP SCR 7/16-14X1-1/4 SH	2
5.	72601499	CAP SCR 9/16-12X1-1/4 HHGR5	5
6.	72063054	WASHER 9/16 LOCK	4
7.	70055185	BEARING FLANGE	1
8.	72060596	SET SCR 1/2-13X3/4 SH	1
9.	60120135	CABLE 3/8 IWRC XIP X 85FT	1
10.	72060046	CAP SCR 3/8-16X1 HHGR5	4
11.	72063051	WASHER 3/8 LOCK	4
12.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
13.	72063049	WASHER 1/4 LOCK	4
14.	72063001	WASHER 1/4 WRT	4
15.	51713168	CORD REEL (SEE DWG)	1
16.	72060008	CAP SCR 1/4-20X2 HHGR5	2
17.	60113593	SWITCH COVER	1
18.	72063098	WASHER #10 FLAT	2
19.	72063047	WASHER #10 LOCK	2
20.	77041291	SWITCH	1
21.	77044468	STRAIN RELIEF	1

22.	60113594	COVER-MTG BLOCK	1
23.	52709413	CABLE	1
24.	72062080	NUT 1/2-13 LOCK	4
25.	72063005	WASHER 1/2 WRT	4
26.	60105540	CABLE GUIDE-SIDE BAR	2
27.	60105538	STUD-CABLE GUIDE	1
28.	60030108	ROLLER-CABLE GUIDE	1
29.	72066054	CAP SCR 3/8-16X3 HHGR5	2
30.	72060217	CAP SCR 7/8-9X4 HHGR5	1
31.	72062103	NUT 3/8-16 LOCK	2
33.	72053508	ZERK 1/8NPT	3
34.	60102596	SPACER	2
35.	72062120	NUT 7/8-9 LOCK	1
36.	70029119	SERIAL NUMBER PLACARD	1
37.	72066340	POP RIVET 1/8X3/8GRIP	2
38.	70058015	WEDGE SOCKET 3/8 COMPLETE	1
39.	70058033	CLAMP	1
40.	72060248	CAP SCR 1-8X5 HHGR5	1
41.	72062137	NUT 1-8 LOCK	2
42.	60120181	SIDE PLATE-LH	1
43.	60030134	SHEAVE	1
44.	71073035	HOOK	1
	70074004	HOOK SAFETY LATCH	REF
45.	52713814	SNATCH BLOCK	1



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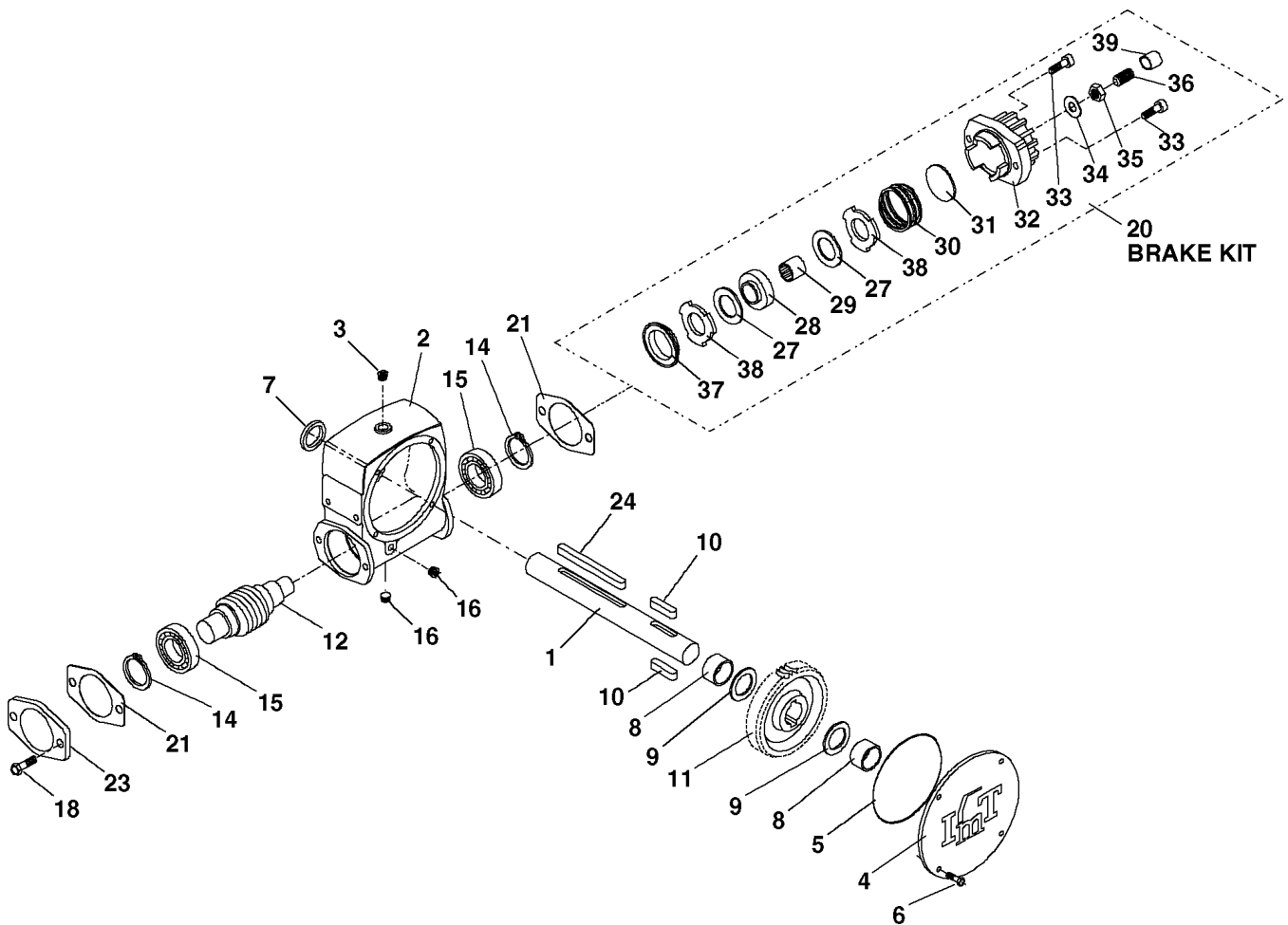
**WINCH (71057936)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70143673	SHAFT-OUTPUT	1
2.	70143672	HOUSING	1
3.	70048142	BUSHING & BRTHER KIT 3/8NPT	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

3-12

ITEM	PART NO.	DESCRIPTION	QTY
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.	

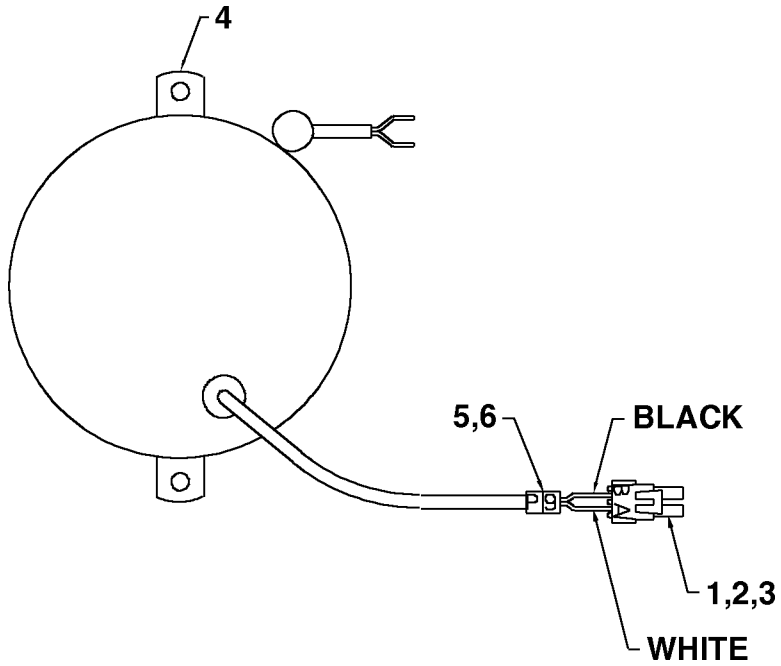
GEAR RATIO: 38:1  
 OUTPUT TORQUE: 19800 IN-LBS  
 MAX INPUT TORQUE: 983 IN-LBS  
 MAX INPUT SPEED: 400 RPM  
 INSTALLED WEIGHT: 41 LBS  
 LUBRICATION: EP 140 (1 US PINT)  
 ULTIMATE OUTPUT TORQUE: 39600 IN-LBS





### CORD REEL ASM (51713168)

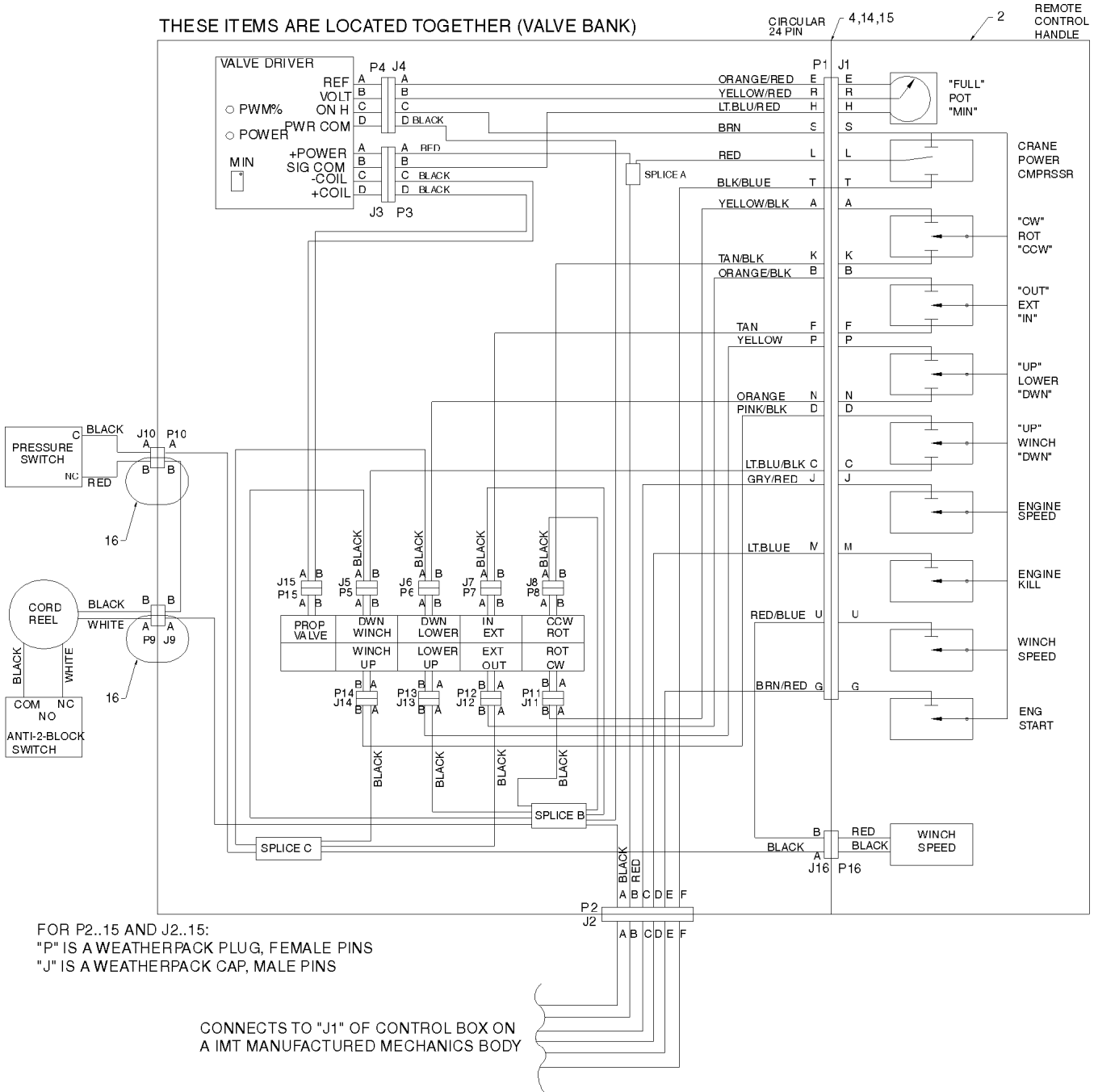
ITEM	PART NO.	DESCRIPTION	QTY
1.	77044574	TOWER CONNECTOR	1
2.	77044552	PIN 18-20GA	2
3.	70394069	CABLE SEAL	2
4.	70732193	CORD REEL	1
5.	77041493	WIRE MARKER-PA2-P-YEL	1
6.	77041491	WIRE MARKER-PA2-9-YEL	1



**ELECTRICAL SCHEMATIC (99900990)**

ITEM	PART NO.	DESCRIPTION	QTY
2.	51713182	HANDLE ASM-PROP'L PTO	1
	51713384	HANDLE ASM-ON/OFF PTO	1
4.	60119299	MTG BRACKET	1
14.	77044645	NUT-CONNECTOR	1
15.	77044646	LOCKWASHER-CONNECTOR	1
16.	70034439	LOCK WIRE LEAD SEAL 8"	2

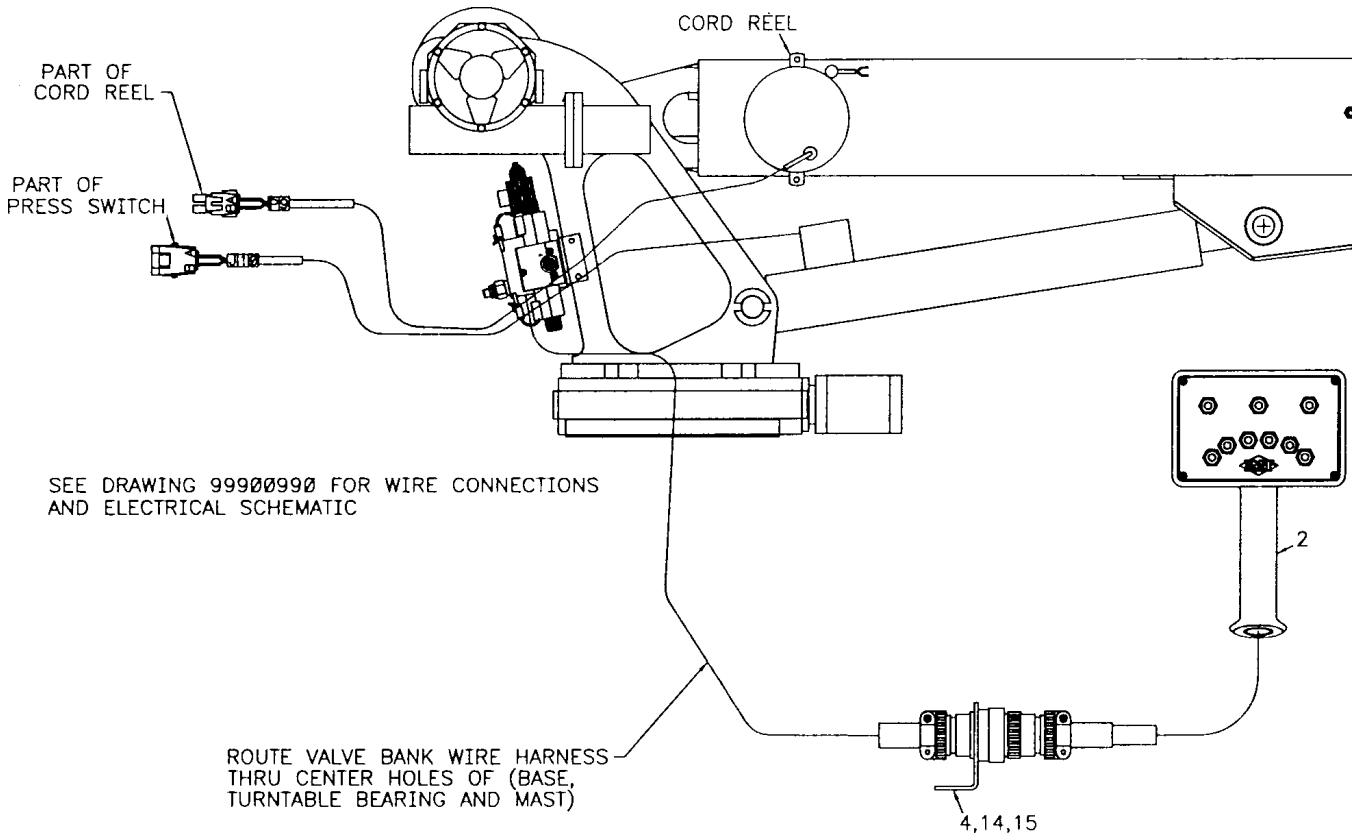
THESE ITEMS ARE LOCATED TOGETHER (VALVE BANK)



FOR P2..15 AND J2..15:  
 "P" IS A WEATHERPACK PLUG, FEMALE PINS  
 "J" IS A WEATHERPACK CAP, MALE PINS

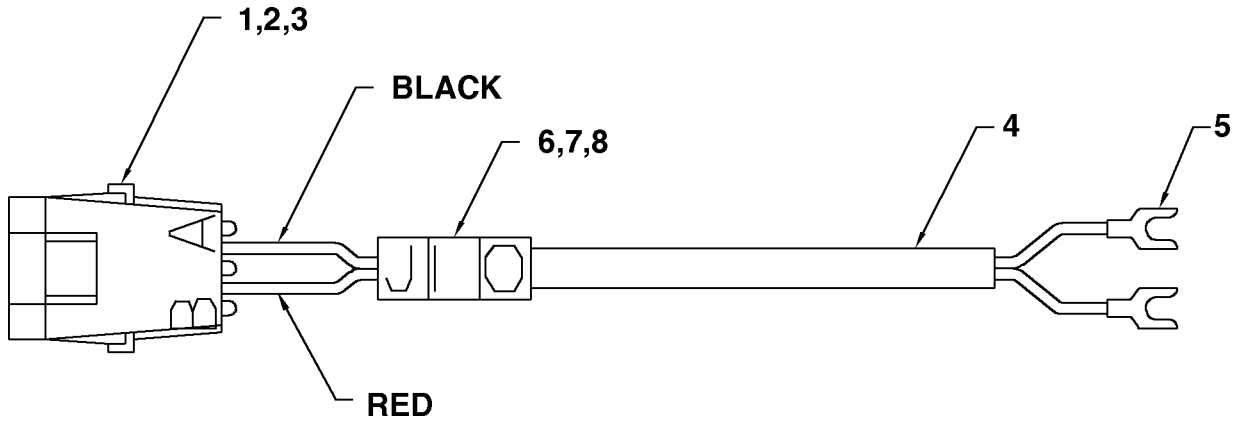
CONNECTS TO "J1" OF CONTROL BOX ON  
 A IMT MANUFACTURED MECHANICS BODY

SEE 99900990 FOR PARTS LIST



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

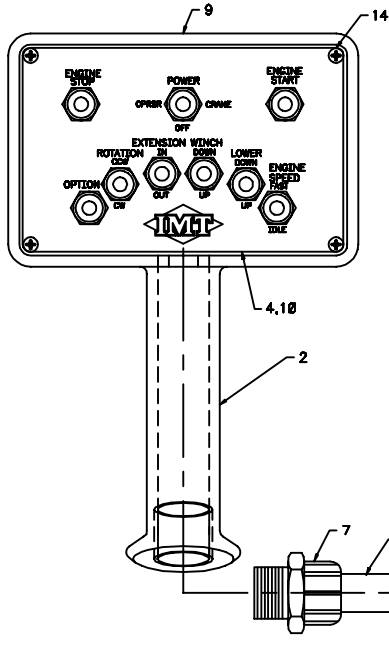
ITEM	PART NO.	DESCRIPTION	QTY
1.	77044573	SHROUD CONNECTOR	1
2.	77044550	TERMINAL PIN	2
3.	70394069	CABLE SEAL	2
4.	89044188	CABLE	1
5.	77040051	TERMINAL-SPRSPADE	2
6.	77041492	WIRE MARKER PA2-J-YEL	1
7.	77041490	WIRE MARKER PA2-1-YEL	1
8.	77041489	WIRE MARKER PA2-0-YEL	1



**PROP'L RMT HANDLE ASM (51713182)**

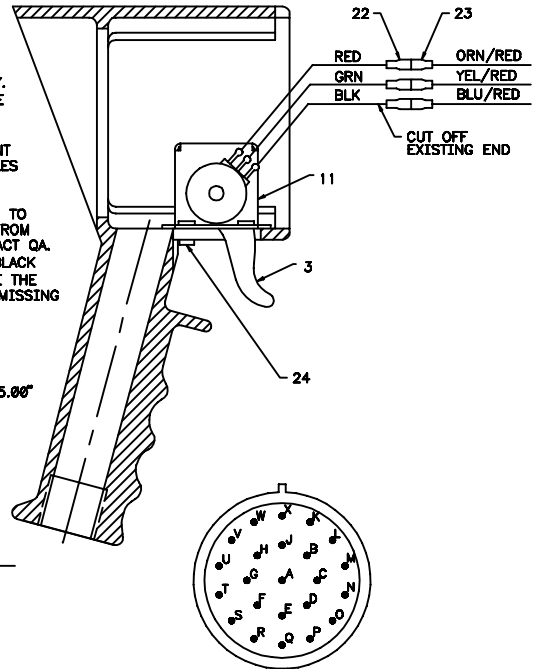
ITEM	PART NO.	DESCRIPTION	QTY
1.	89044214	WIRE 18GA GRN	1.61FT
2.	60119335	CONTROL HANDLE	1
3.	60111141	TRIGGER (PART OF 11)	1REF
4.	60119277	COVER	1
5.	70034306	BACK COVER	1
7.	77044196	STRAIN RELIEF 3/4	1
8.	77044621	PIN	23
9.	70394447	DECAL-DGR RC ELECTRO SM	1
10.	70394142	DECAL-CTRL	1
11.	70394183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

14.	72061009	SHT MTL SCR #6X3/4 PH	8
15.	77040051	TERM-SPRSPD #8 16-14GA	31
16.	77040371	TOGGLE SWITCH SPST	2
17.	77040372	TOGGLE SWITCH SPDT	4
18.	77040373	TOGGLE SWITCH SPST	2
19.	77040374	TOGGLE SWITCH SPDT	1
20.	77044579	CONNECTOR	1
21.	89044100	CABLE 18GA 24WIRE	30FT
22.	77040147	TERM-FSLPON 1/4TAB 22-18	3
23.	77040047	TERM-MSLPON 1/4TAB 16-14	3
24.	72060602	MACH SCR #6-32X3/8 RDHD	4
25.	70145495	TUBING-HEAT SHRINK	.5FT



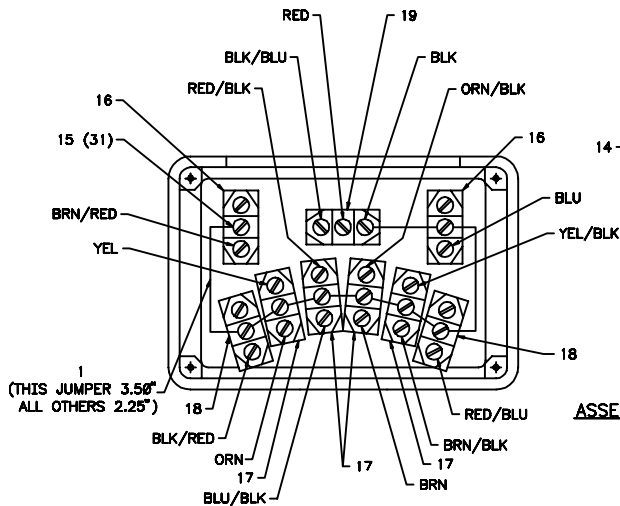
**ASSEMBLY OF PROPORTIONAL TRIGGER**

- 1) POSITION TRIGGER ASSEMBLY INTO HANDLE ASSEMBLY.
- 2) LOOKING FROM THE BACKSIDE OF THE HANDLE, INSTALL ONLY THE TWO SCREWS LOCATED ON THE LEFT-HAND SIDE OF THE TRIGGER ASSEMBLY. (TWO SCREWS ARE SUFFICIENT FOR HOLDING THE ASSEMBLY IN PLACE.)  
DO NOT FULLY TIGHTEN AT THIS POINT.
- 3) PUSH THE TRIGGER ASSEMBLY TOWARDS THE FRONT OF THE HOUSING, AS THE MOUNTING SCREW HOLES WILL ALLOW.  
TIGHTEN THE SCREWS FULLY AT THIS POINT.
- 4) CONNECT OHMMETER TO GREEN AND BLACK WIRES TO CHECK OHM READING. ALLOWABLE SETTING IS FROM 100 TO 320 OHMS. IF OTHER THAN THIS CONTACT QA.
- 5) FILL THE RIGHT HAND SCREWS WITH SILICONE, BLACK (IF AVAILABLE) OR CLEAR. (THIS WILL ELIMINATE THE CONCERN BY THE CUSTOMER THAT THE UNIT IS MISSING THE TWO SCREWS ON THE RIGHT SIDE.)
- 6) ASSEMBLY THE REST OF THE HANDLE.



**INSTALLATION NOTE:**

- 1) CUT WIRE CABLE OUTSIDE JACKET BACK 5.00"
- 2) SLIP ON HEAT SHRINK
- 3) MAKE WIRE CONNECTIONS
- 4) PUSH HEAT SHRINK UP AND HEAT.

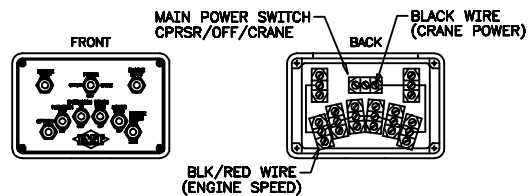


**ASSEMBLY OF SWITCHES ONTO FACE PLATE.**

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

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

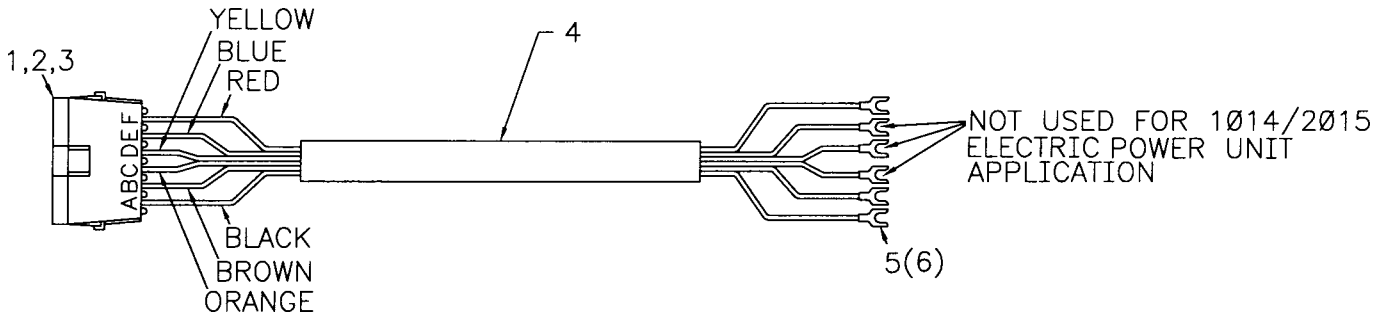
REWIRE CRANE REMOTE HANDLE TO ALLOW FOR THE OPERATION OF THE SOLENOID VALVE WHEN THE CRANE IS CHOSEN ON A TRUCK WITH AN AUTOMATIC TRANSMISSION



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).

**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

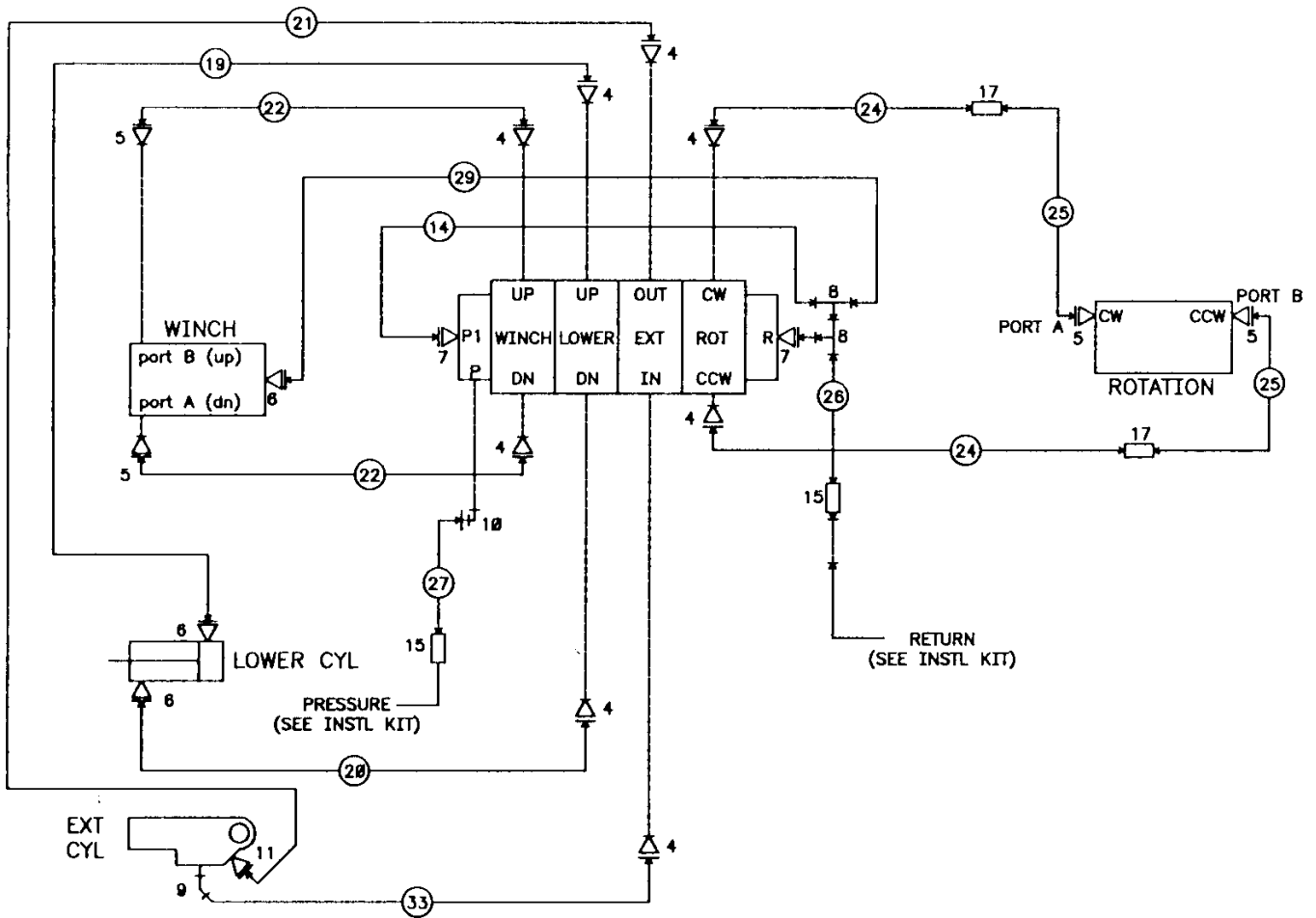


**HYD KIT (91713816-1) PROP'L RMT CTRL  
(EFF: BEFORE 12-1-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
2.	72062104	NUT 1/4-20 LOCK	4
3.	51714381	VALVEBANK ASM	1
4.	72533425	ADAPTER #4MFACE#8MSTR	*8REF
5.	72533296	ADAPTER #6MFACE#10MSTR	*4REF
6.	72533376	ADAPTER #4MFACE#4MSTR	*3REF
7.	72533166	ADAPTER #8MFACE#8MSTR	*2REF
8.	72533410	TEE #8FACE SWVL NUT B	*2REF
9.	72533417	ELBOW #8MFACE #8MFACE 45°	*1REF
10.	72533162	ELBOW #8MSTR #8MFACE 90°	*1REF
11.	72533533	ADAPTER #4MFACE#8MSTR	*1REF
14.	51394704	HOSE XX 1/2X15 #8#8	*1REF

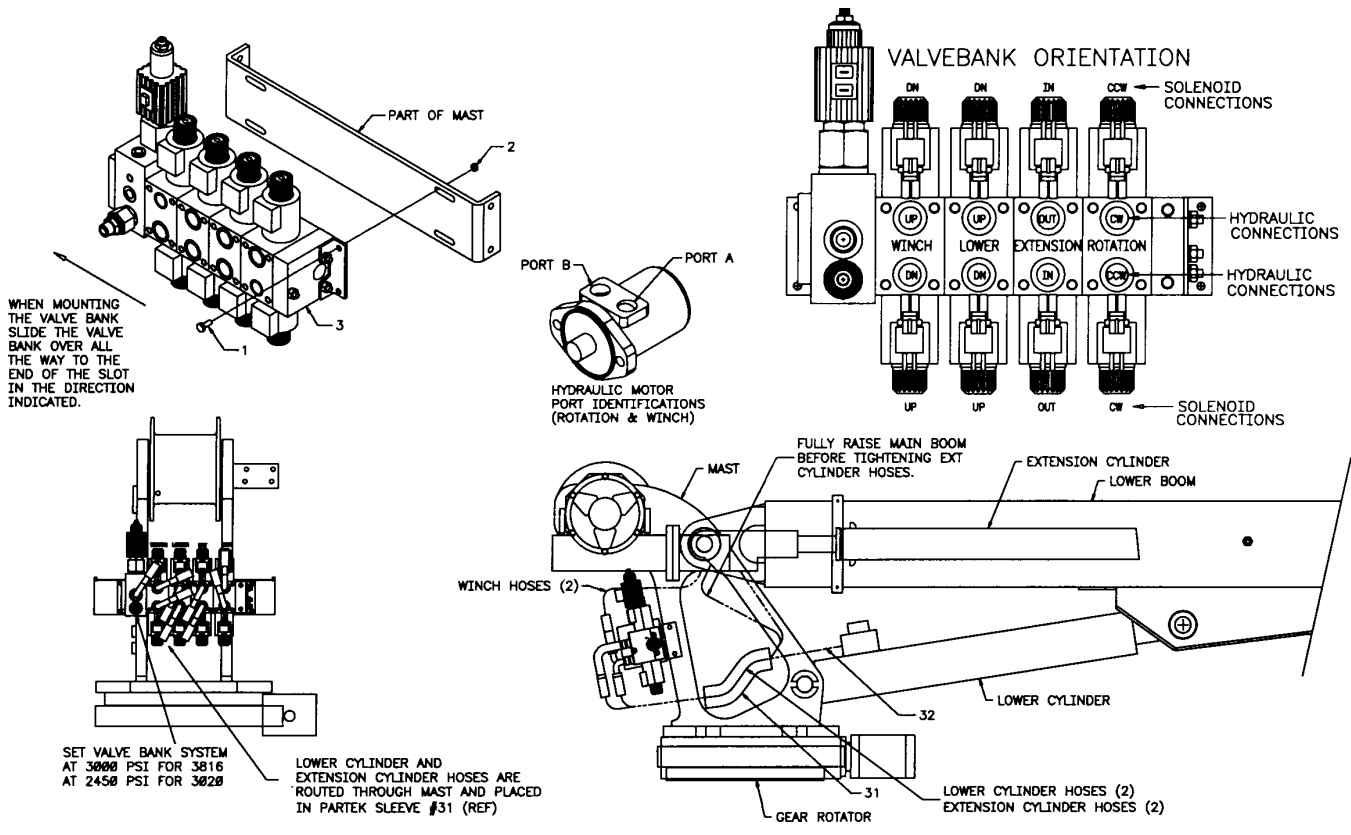
15.	72533538	SWIVEL #8FACE#8FACE	*2REF
17.	72533540	SWIVEL #4FACE#4FACE	*2REF
18.	51714149	HOSE & ADAPTER KIT (INCL:*)	1
19.	51394700	HOSE BBX 1/4X36 #4#4	*1REF
20.	51394701	HOSE BBX 1/4X33-1/2 #4#4	*1REF
21.	51394702	HOSE BBX 1/4X43 #4#4	*1REF
22.	51394703	HOSE YX 1/4X18-1/2 #4#6	*2REF
24.	51394705	HOSE BBX 1/4X31 #4#4	*2REF
25.	51395147	HOSE BBX 1/4X19-1/2 #4#6	*2REF
26.	51394707	HOSE BBX 1/2X24 #8#8	*1REF
27.	51394708	HOSE BBX 1/2X33-1/2 #8#8	*1REF
29.	51394710	HOSE WX 1/4X15 #8#4	*1REF
31.	60350073	SLEEVE-HOSE 12"	1
32.	70394558	TIE 8"	1
33.	51394718	HOSE BBX 1/4X43 #6#4	*1REF

SEE FOLLOWING PAGES FOR DRAWINGS

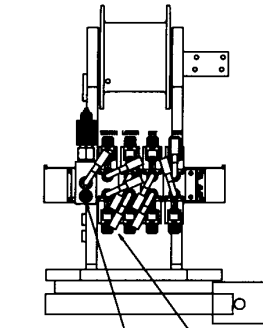
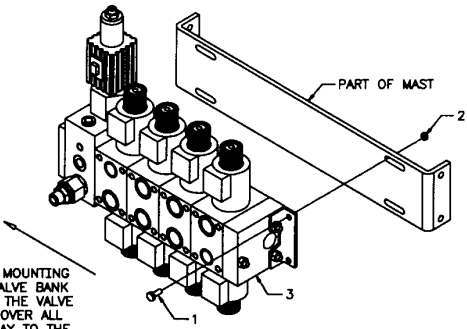


**HYD KIT (91713816-2) PROP'L RMT CTRL**

SEE PREVIOUS PAGE FOR PARTS LIST



WHEN MOUNTING THE VALVE BANK SLIDE THE VALVE BANK OVER ALL THE WAY TO THE END OF THE SLOT IN THE DIRECTION INDICATED.

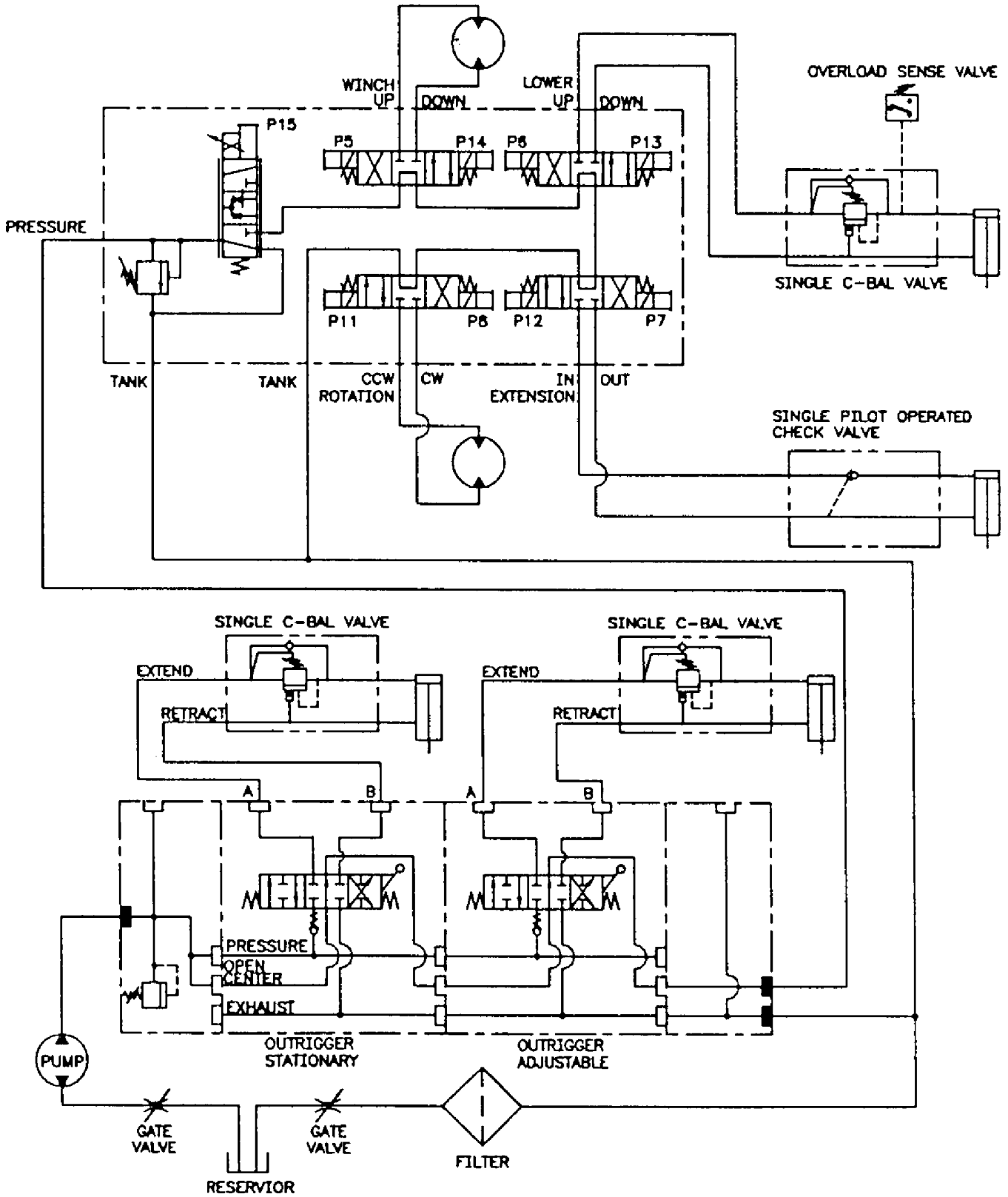


SET VALVE BANK SYSTEM AT 3000 PSI FOR 3816 AT 2450 PSI FOR 3020

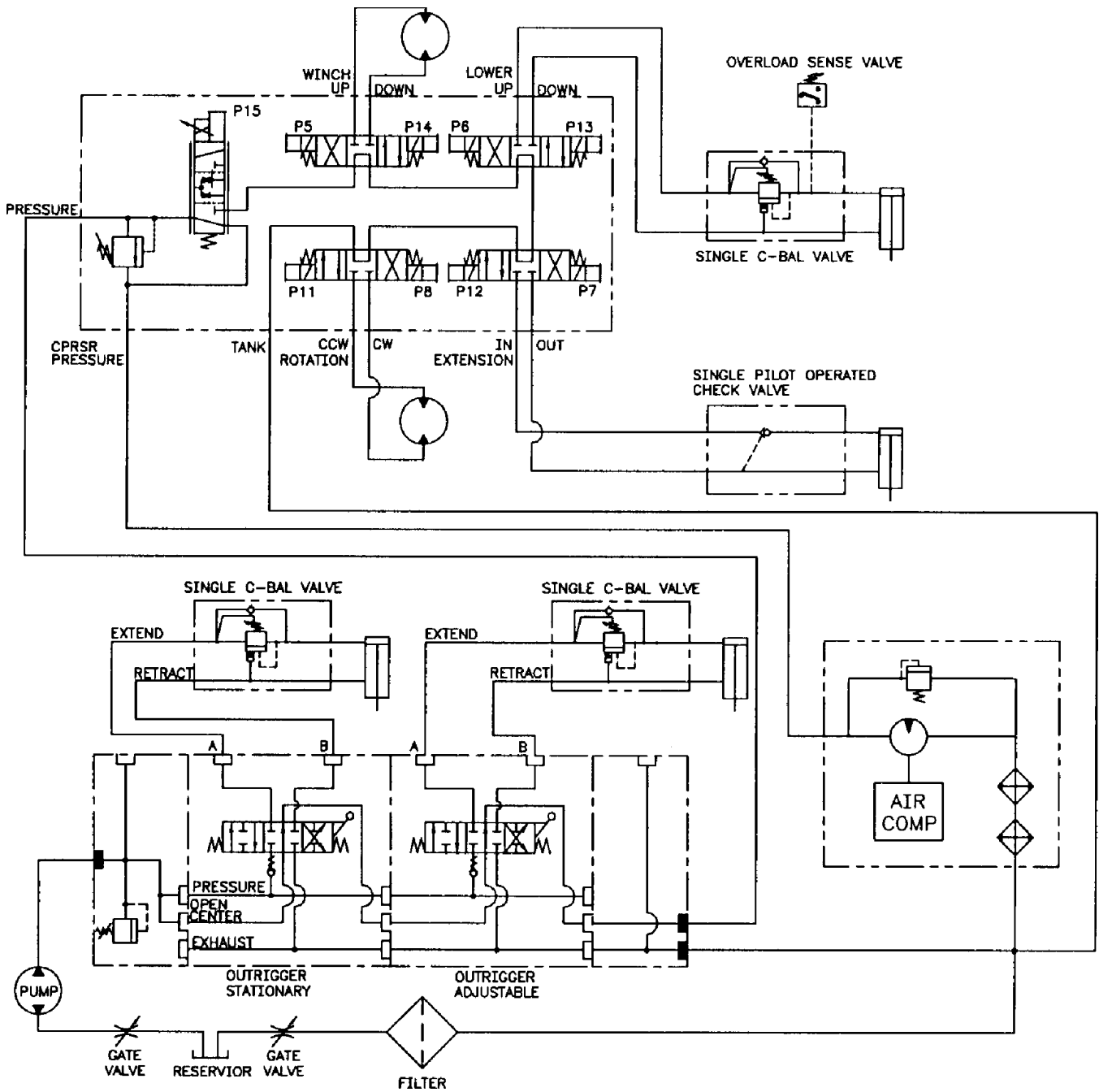
LOWER CYLINDER AND EXTENSION CYLINDER HOSES ARE ROUTED THROUGH MAST AND PLACED IN PARTEK SLEEVE #31 (REF)



HYD KIT (91713816-3) PROP'L RMT CTRL

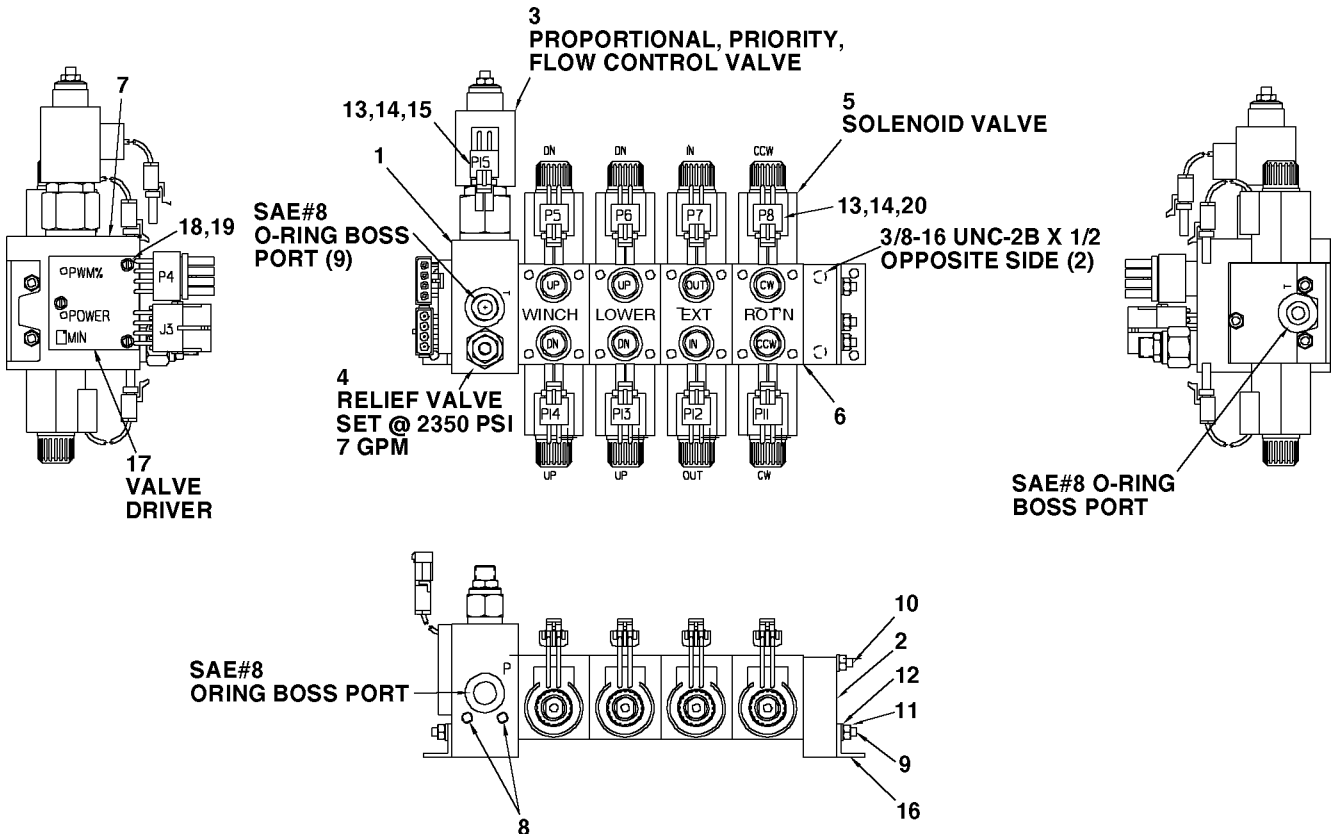
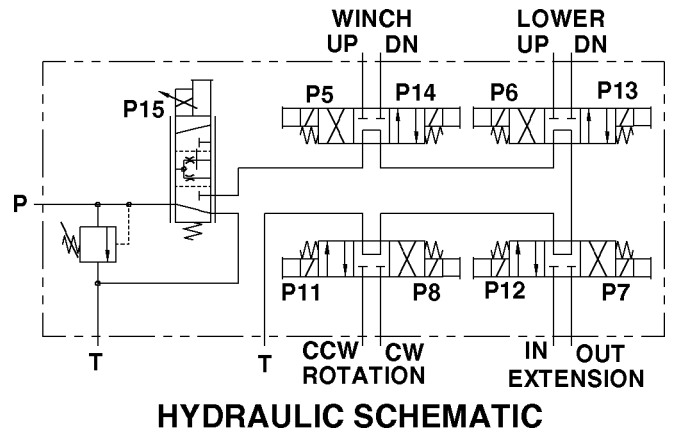


HYD KIT W/CMPSR (91713816-4) PROP'L RMT CTRL



**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	THR D ROD 1/4-20X12-1/2 GR8	2
10.	60119354	THR D 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

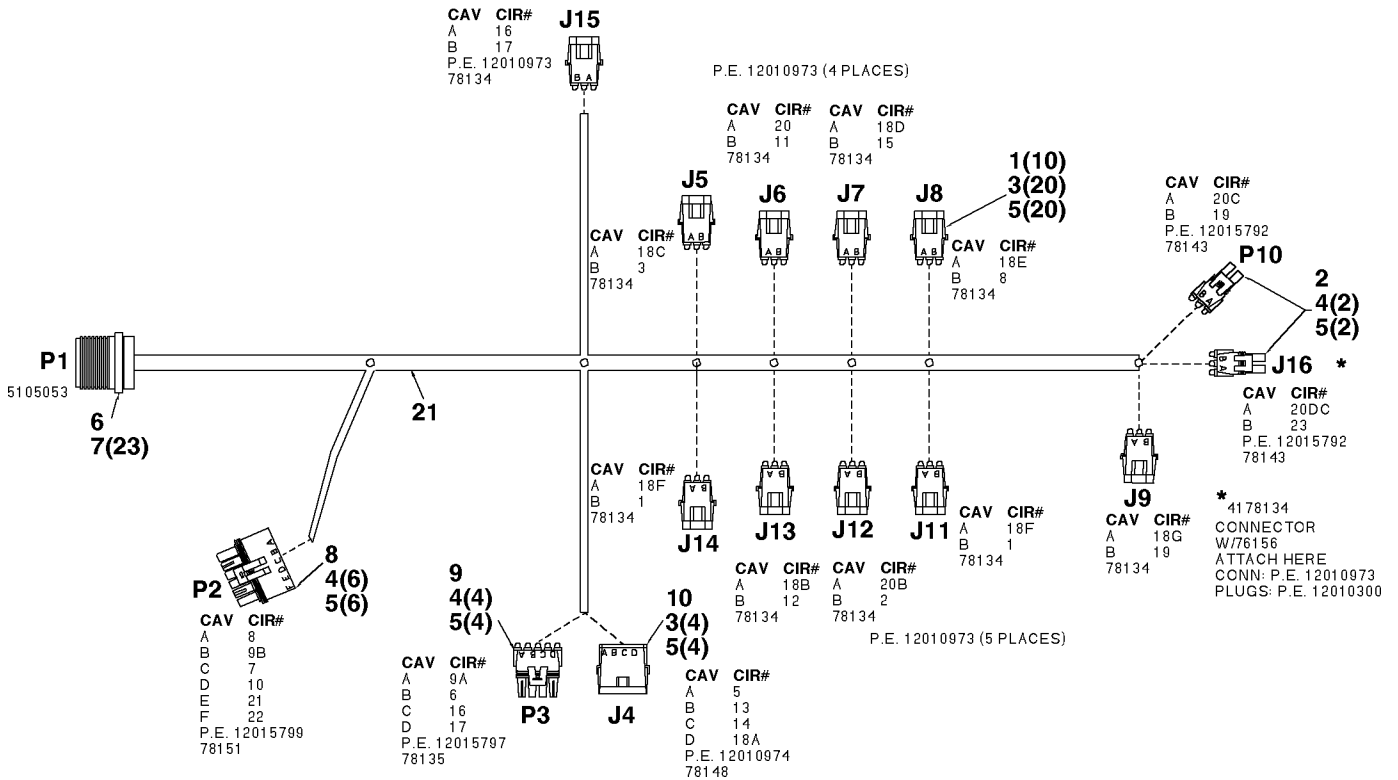


# VB-WIRING DIAGRAM (73733057-2) REF ONLY

ITEM	PART NO.	DESCRIPTION	QTY
1.	77044573	SHROUD CONNECTOR	10REF
2.	77044574	TOWER CONNECTOR	2REF
3.	77044576	TERMINAL-MALE 20-18GA	24REF

4.	77044577	TERMINAL-FEMALE 20-18GA	14REF
5.	77044578	CABLE SEAL-GRN	38REF
6.	77044620	CONN RCPT	1REF
7.	77044580	SOCKET	23REF
8.	77044622	TOWER CONNECTOR-6 CONT	1REF
9.	77044623	TOWER CONNECTOR-4 CONT	1REF
10.	77044624	SHROUD CONN	1REF

WIRE LEGEND						
CIR	5105053	COLOR	GA	WEATHER PAK	LABELING	FUNCTION
	PIN CAVITY			CONNECTOR		
1	A	YELLOW/BLK	18	PIA TO: 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: J4B	WIN J4B	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	PI S 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	PIOA TO: SPL C	OPSI P10A	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

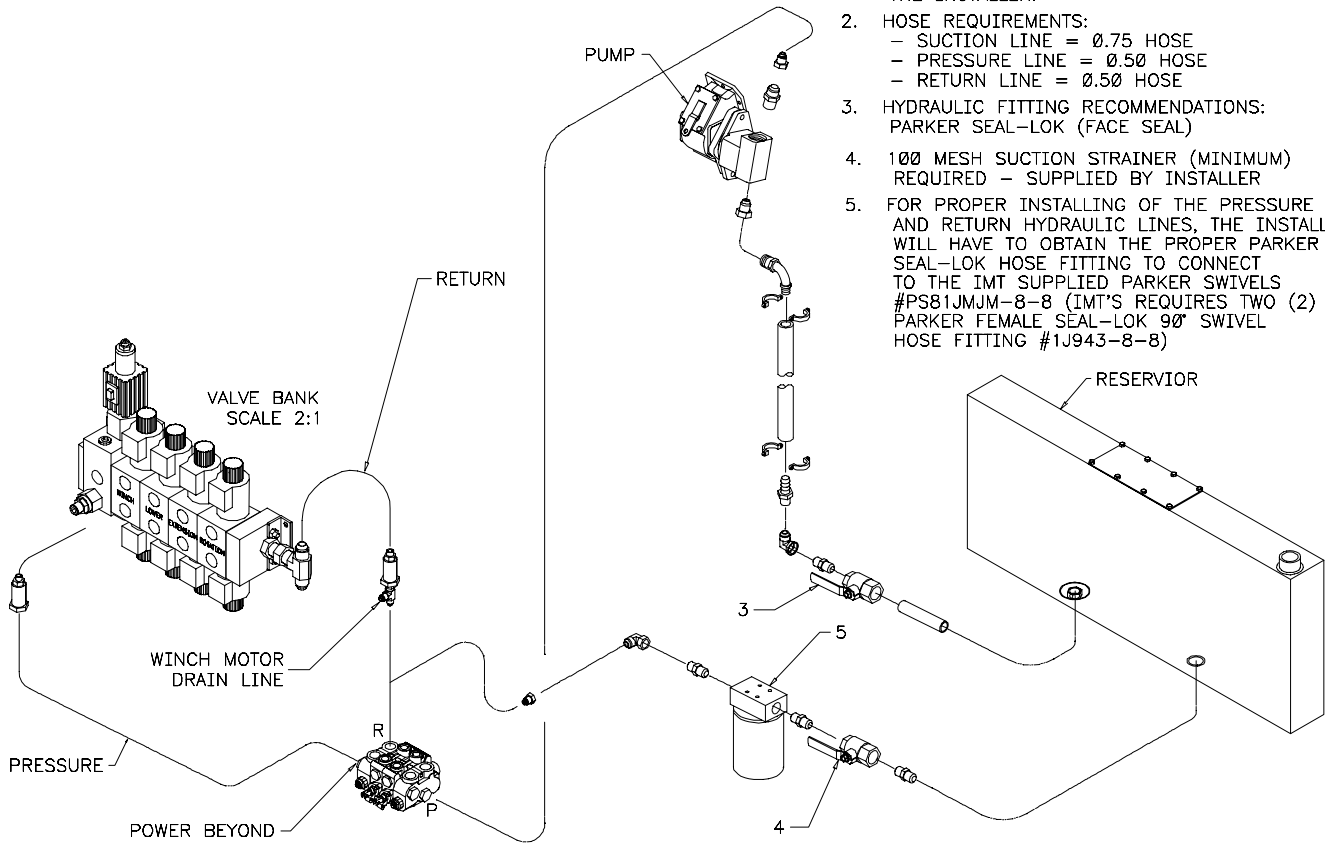


**INSTALLATION KIT (93713878-1) (EFF:TO 12-2-98)**

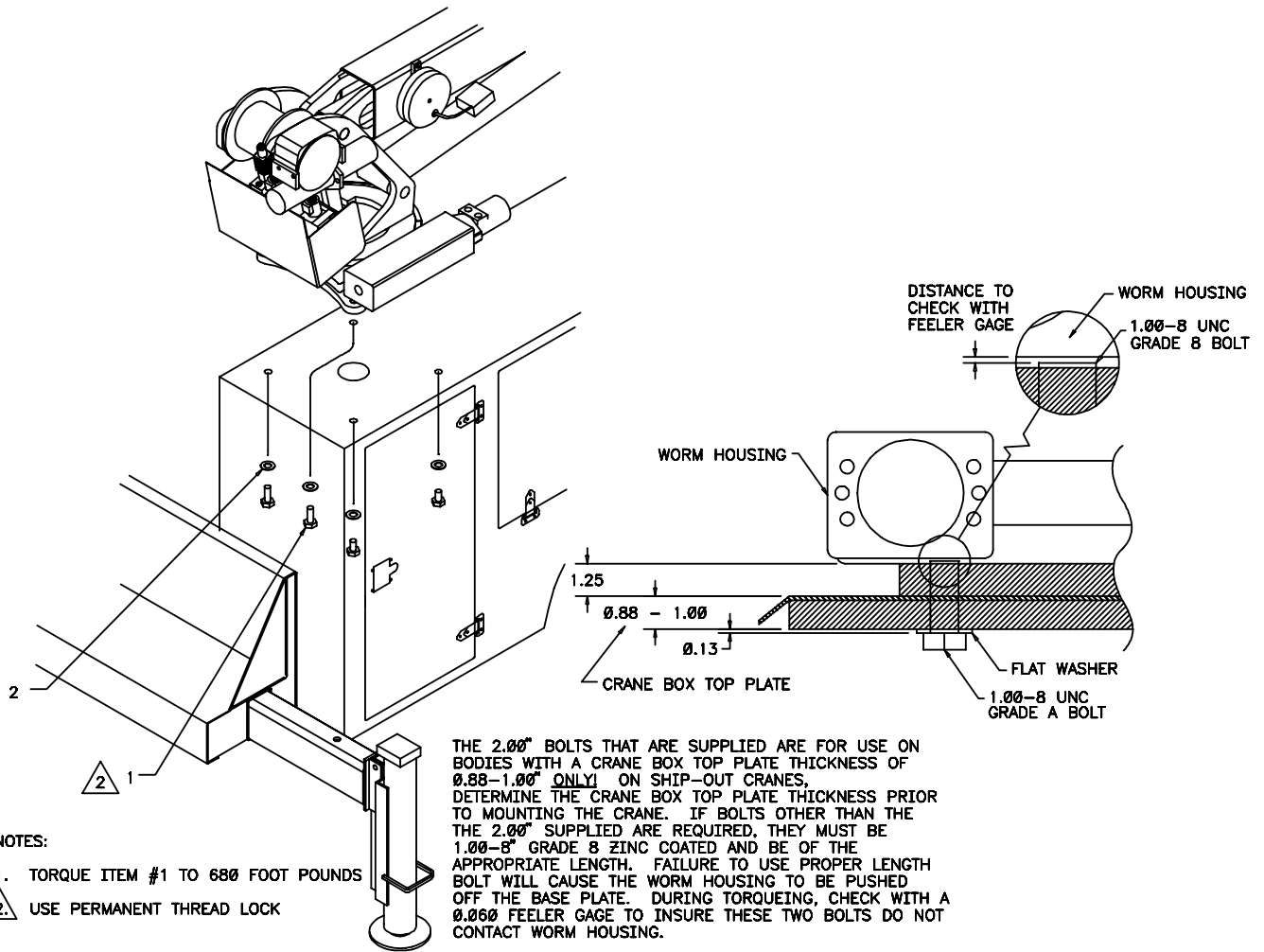
ITEM	PART NO.	DESCRIPTION	QTY
1.	72601737	CAP SCR 1-8X2 HHGR8	4
2.	72063066	WASHER 1 WRT	4
3.	73054232	BALL VALVE 1-1/4NPT	1
4.	73054230	BALL VALVE 3/4NPT	1
5.	73052000	HYD FILTER 10MIC 3/4FPT	1
	73052006	FILTER ELEMENT 10MIC	REF

NOTES:

1. ALL HOSES AND FITTINGS ARE SHOWN AS REFERENCE AND ARE TO BE PROVIDED BY THE INSTALLER.
2. HOSE REQUIREMENTS:
  - SUCTION LINE = 0.75 HOSE
  - PRESSURE LINE = 0.50 HOSE
  - RETURN LINE = 0.50 HOSE
3. HYDRAULIC FITTING RECOMMENDATIONS: PARKER SEAL-LOK (FACE SEAL)
4. 100 MESH SUCTION STRAINER (MINIMUM) REQUIRED - SUPPLIED BY INSTALLER
5. FOR PROPER INSTALLING OF THE PRESSURE AND RETURN HYDRAULIC LINES, THE INSTALLER WILL HAVE TO OBTAIN THE PROPER PARKER SEAL-LOK HOSE FITTING TO CONNECT TO THE IMT SUPPLIED PARKER SWIVELS #PS81JMJM-8-8 (IMT'S REQUIRES TWO (2) PARKER FEMALE SEAL-LOK 90° SWIVEL HOSE FITTING #1J943-8-8)



**INSTALLATION KIT (93713878-2) (EFF:TO 12-2-98)**



**INSTALLATION KIT (93713878-3) (EFF:TO 12-2-98)**

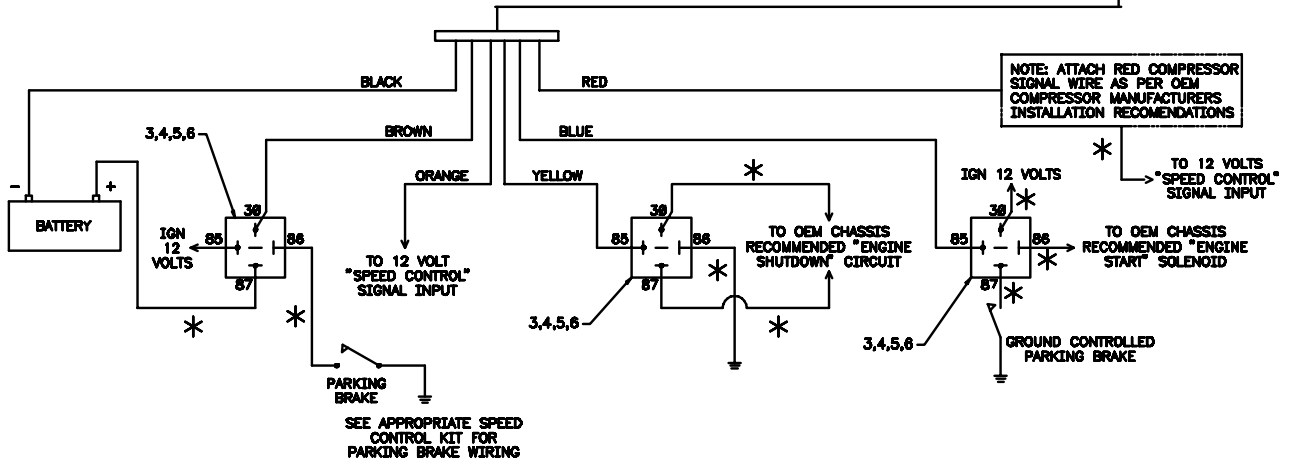
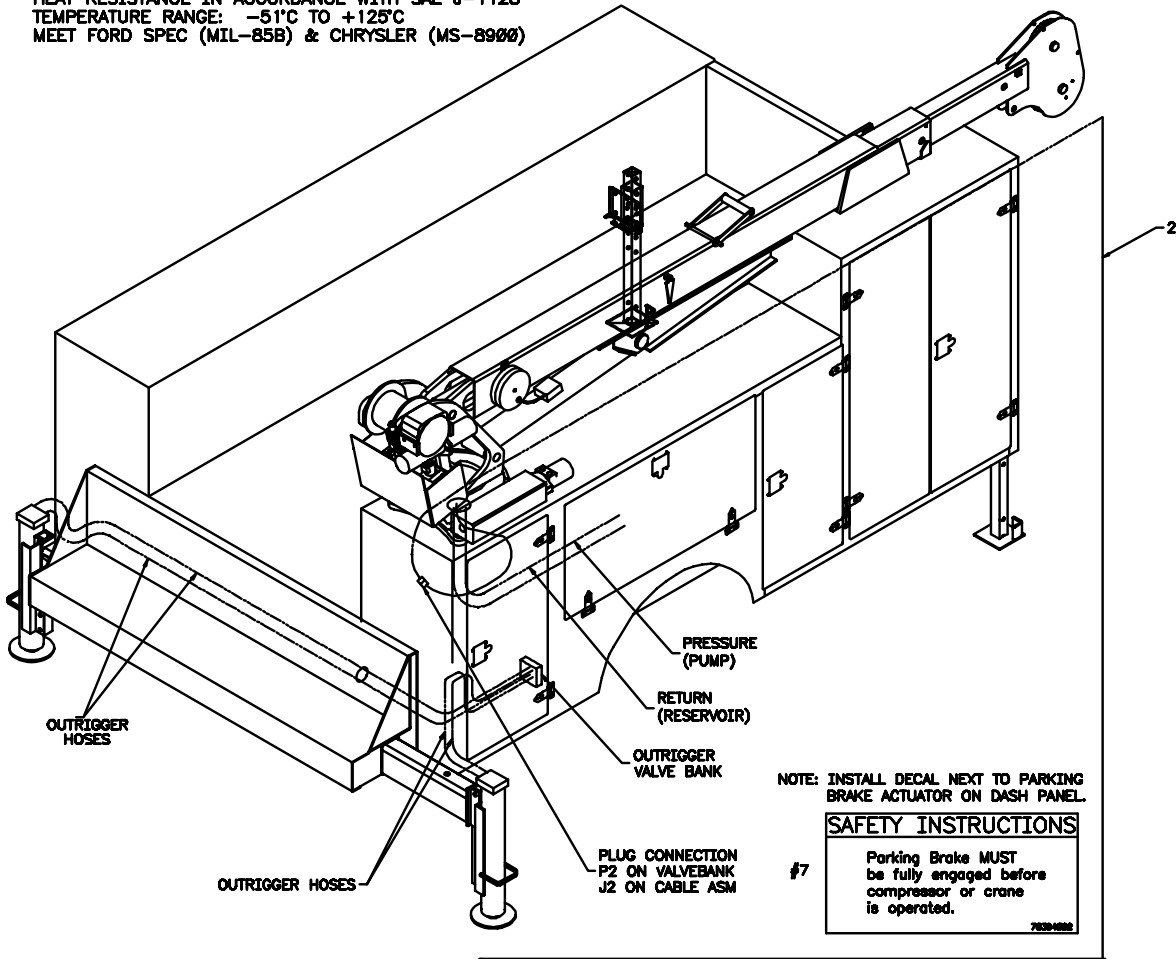
ITEM	PART NO.	DESCRIPTION	QTY
2.	51713199	CABLE ASM 14GA/6 WIREX35	1
3.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	3
4.	72062104	NUT 1/4-20 HEX NYLOC	3
5.	72063001	WASHER 1/4W FLAT	3
6.	77041251	RELAY	3
7.	70394092	DECAL-CAUTION BRK/CPRSR	1

**NOTES:**

1. \* = RECOMMENDED WIRE (SEE WIRE SPECIFICATION)

2. WIRE SPECIFICATION:

GAUGE: 14 GA.  
 NO. OF STRANDS: 19/27  
 INSULATION THICKNESS: 0.023 MILS-NOM.  
 HEAT RESISTANCE IN ACCORDANCE WITH SAE J-1128  
 TEMPERATURE RANGE: -51°C TO +125°C  
 MEET FORD SPEC (MIL-85B) & CHRYSLER (MS-8900)

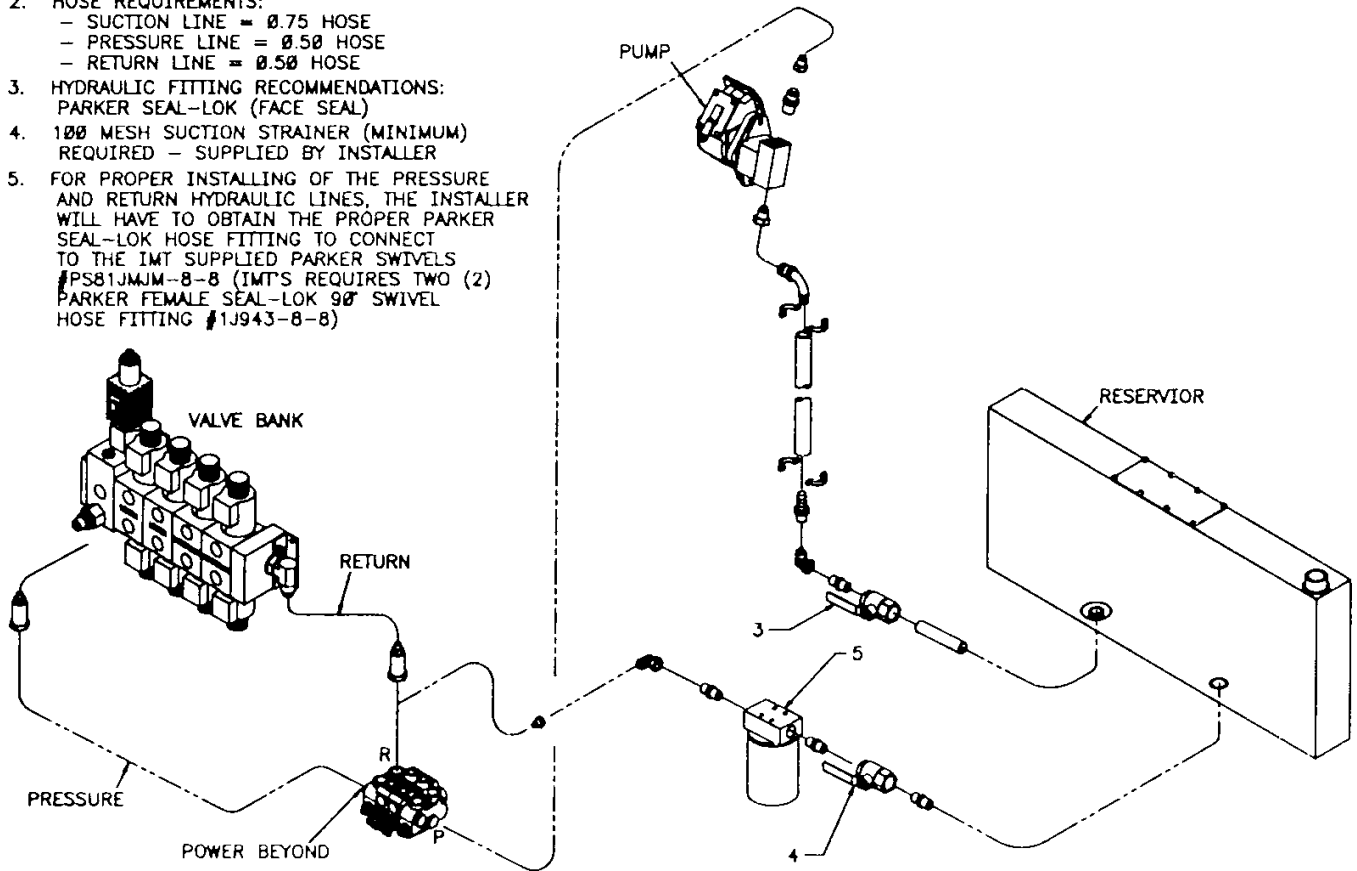


**INSTALLATION KIT (93715267-1) (EFF:FROM 12-3-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	72601752	CAP SCR 1-8X2-3/4 HHGR8	4
2.	72063066	WASHER 1 WRT	4
3.	73054232	BALL VALVE 1-1/4NPT	1
4.	73054230	BALL VALVE 3/4NPT	1
5.	73052000	HYD FILTER 10MIC 3/4FPT	1
	73052006	FILTER ELEMENT 10MIC	REF

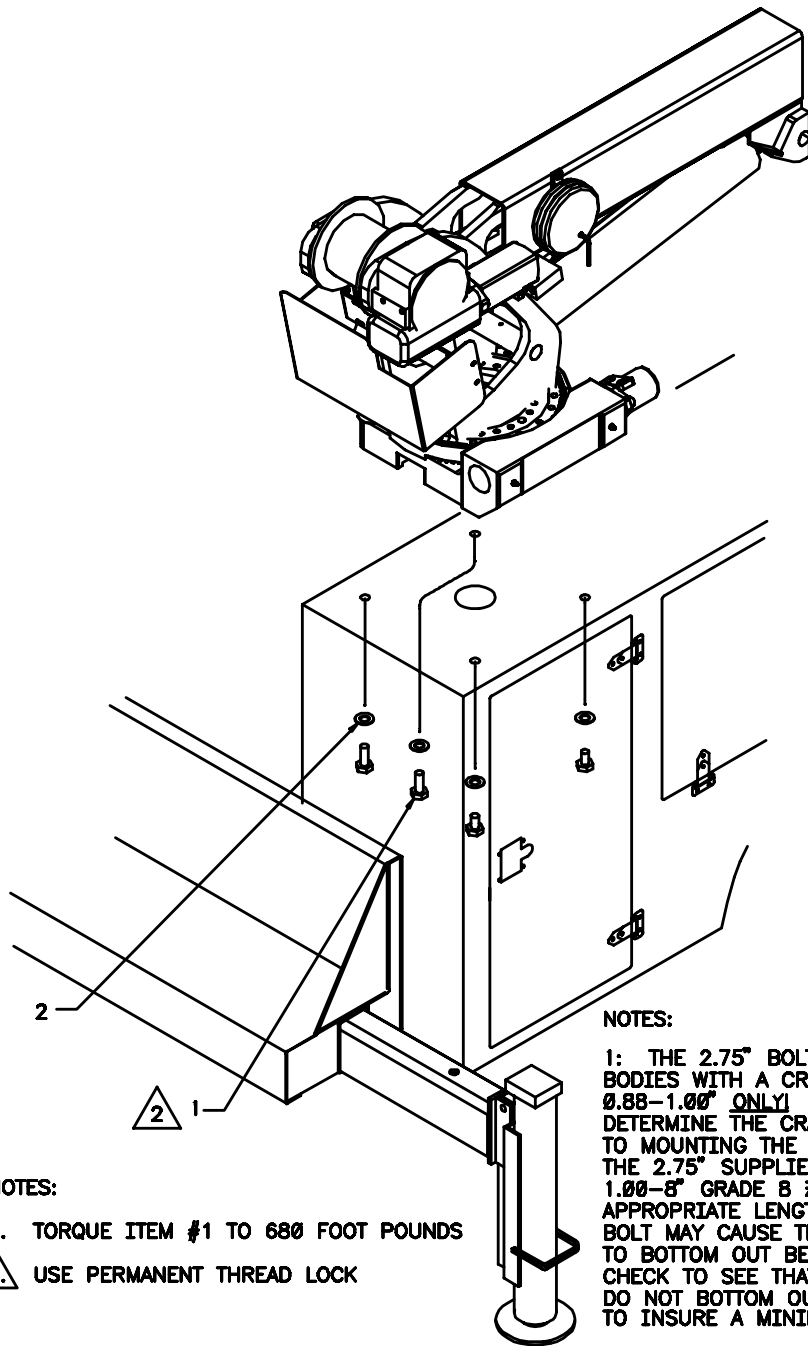
NOTES:

- ALL HOSES AND FITTINGS ARE SHOWN AS REFERENCE AND ARE TO BE PROVIDED BY THE INSTALLER.
- HOSE REQUIREMENTS:
  - SUCTION LINE = Ø.75 HOSE
  - PRESSURE LINE = Ø.50 HOSE
  - RETURN LINE = Ø.50 HOSE
- HYDRAULIC FITTING RECOMMENDATIONS: PARKER SEAL-LOK (FACE SEAL)
- 100 MESH SUCTION STRAINER (MINIMUM) REQUIRED - SUPPLIED BY INSTALLER
- FOR PROPER INSTALLING OF THE PRESSURE AND RETURN HYDRAULIC LINES, THE INSTALLER WILL HAVE TO OBTAIN THE PROPER PARKER SEAL-LOK HOSE FITTING TO CONNECT TO THE IMT SUPPLIED PARKER SWIVELS #PS81JMJM--8-8 (IMT'S REQUIRES TWO (2) PARKER FEMALE SEAL-LOK 90° SWIVEL HOSE FITTING #1J943-8-8)





**INSTALLATION KIT (93715267-2) (EFF:FROM 12-3-97)**



**NOTES:**

1. TORQUE ITEM #1 TO 680 FOOT POUNDS

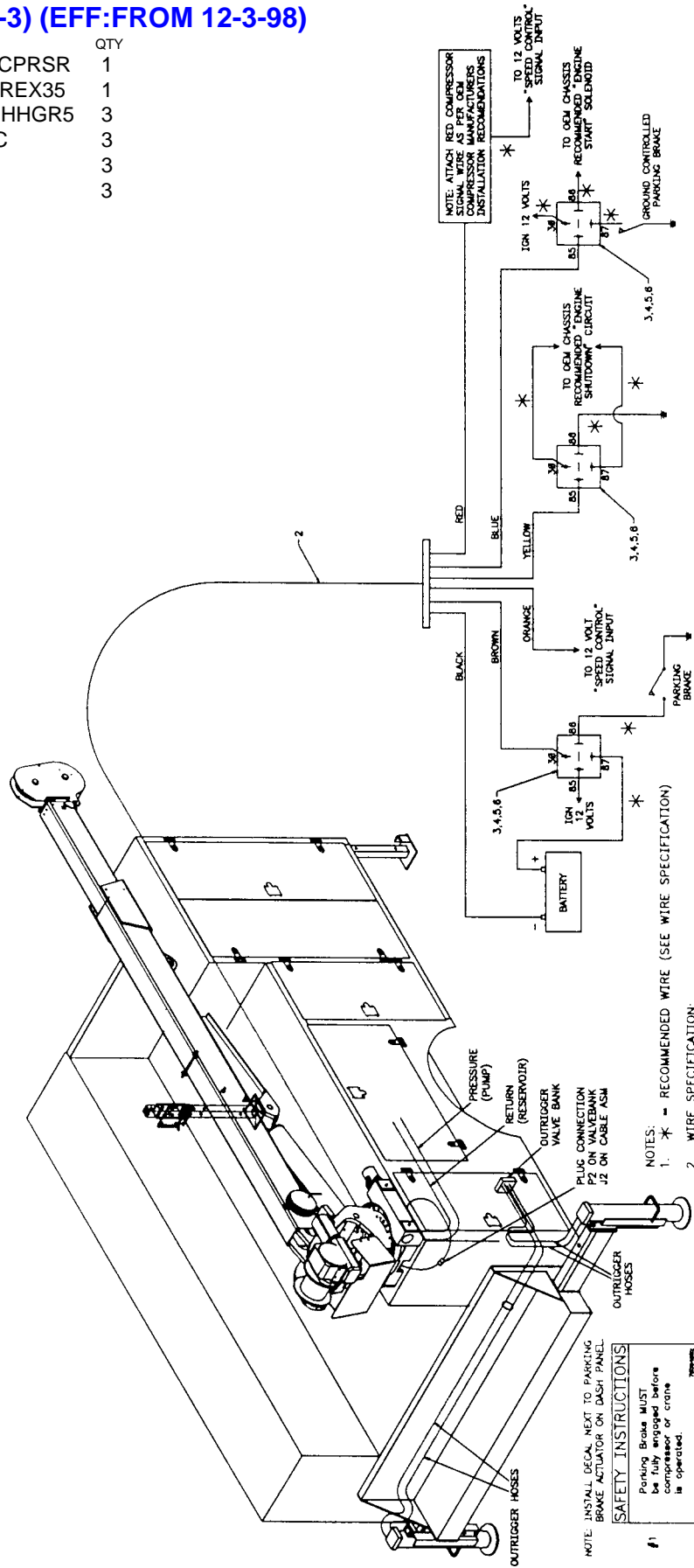
2. USE PERMANENT THREAD LOCK

**NOTES:**

1: THE 2.75" BOLTS THAT ARE SUPPLIED ARE FOR USE ON BODIES WITH A CRANE BOX TOP PLATE THICKNESS OF 0.88-1.00" ONLY! ON SHIP-OUT CRANES, DETERMINE THE CRANE BOX TOP PLATE THICKNESS PRIOR TO MOUNTING THE CRANE. IF BOLTS OTHER THAN THE 2.75" SUPPLIED ARE REQUIRED, THEY MUST BE 1.00-8" GRADE 8 ZINC COATED AND BE OF THE APPROPRIATE LENGTH. FAILURE TO USE PROPER LENGTH BOLT MAY CAUSE THE CAP SCREWS UNDER THE WORM HOUSING TO BOTTOM OUT BEFORE BEING TORQUED. DURING TORQUEING, CHECK TO SEE THAT THE BOLTS GET TORQUED AND THAT THEY DO NOT BOTTOM OUT ON THE WORM HOUSING. SIZE CAPSCREWS TO INSURE A MINIMUM OF 1.50" THREAD ENGAGEMENT.

**INSTALLATION KIT (93715267-3) (EFF:FROM 12-3-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70394092	DECAL-CAUTION BRK/CPRSR	1
2.	51713199	CABLE ASM 14GA/6 WIREX35	1
3.	72060005	CAP SCR 1/4-20X1-1/4 HHGRS	3
4.	72062104	NUT 1/4-20 HEX NYLOC	3
5.	72063001	WASHER 1/4W FLAT	3
6.	77041251	RELAY	3



NOTE: INSTALL DECAL NEXT TO PARKING BRAKE ACTUATOR ON DASH PANEL

**SAFETY INSTRUCTIONS**  
 Parking Brake MUST be fully engaged before compressor or crane is operated.

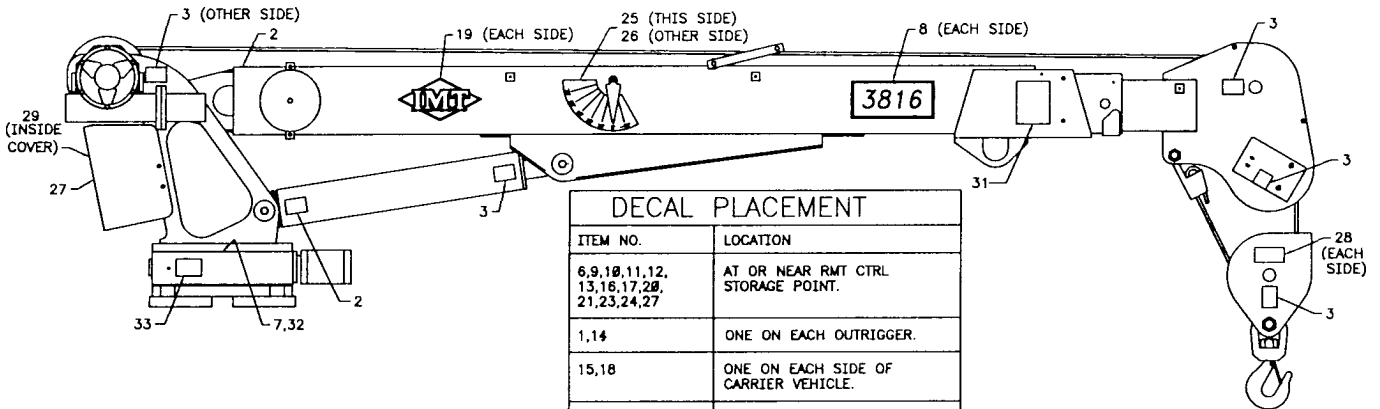
- NOTES:
- 1. \* = RECOMMENDED WIRE (SEE WIRE SPECIFICATION)
  - 2. WIRE SPECIFICATION:  
 NO. OF STRANDS: 19/27  
 GAUGE: 14 GA  
 INSULATION THICKNESS: .0023 MILS-NOM  
 HEAT RESISTANCE IN ACCORDANCE WITH SAE J-1128  
 TEMPERATURE RANGE: -51°C TO +125°C  
 MEET FORD SPEC (MIL-856) & CHRYSLER (MS-8900)

SEE APPROPRIATE SPEED CONTROL KIT FOR PARKING BRAKE WIRING

**DECAL KIT (95713880)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70391598	DECAL-WARNING OUTRIGGER	2
2.	70391612	DECAL-GREASE WKLY LH	2
3.	70391613	DECAL-GREASE WKLY RH	5
4.	70392108	DECAL-SUCTION LINE	1
5.	70392109	DECAL-RETURN LINE	1
6.	70392213	DECAL-CAUTION WASH/WAX	1
7.	70392524	DECAL-ROTATE/GREASE	1
8.	70394280	DECAL-3816 IDENTIFICATION	2
9.	70394444	DECAL-DANGER ELECTRO	1
10.	70392814	DECAL-DANGER OP TRAINING	1
11.	70392815	DECAL-DANGER OPERATION	1
12.	70392861	DECAL-DANGER 2-BLOCKING	1
13.	70392863	DECAL-DANGER HOIST PERS	1
14.	70392864	DECAL-DGR STAND CLEAR	2
15.	70394445	DECAL-DANGER ELEC HZD LG	4
16.	70392866	DECAL-DGR OPER COND	1

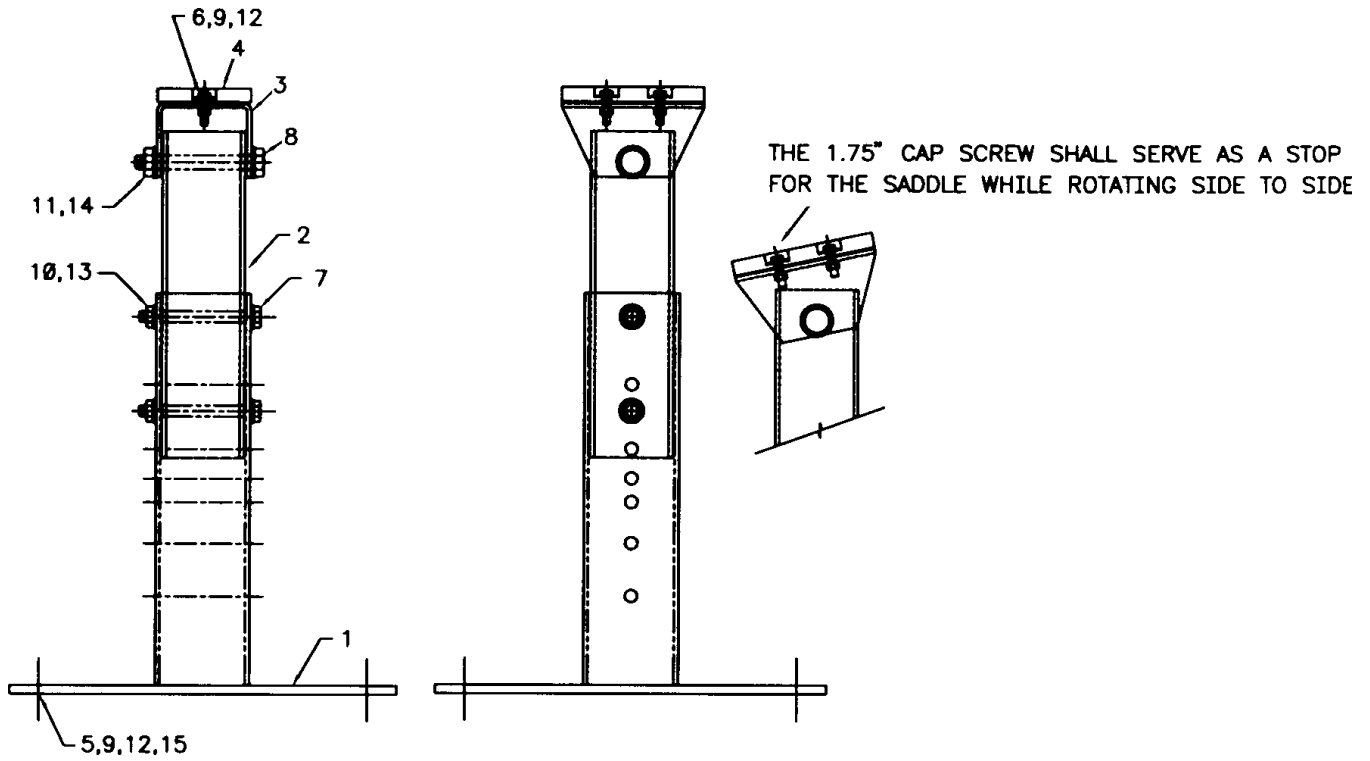
17.	70392867	DECAL-DANGER OR MOVING	1
18.	70392868	DECAL-DANGER LOADLINE	4
19.	70392887	DECAL-IMT DIAMOND	2
20.	70392888	DECAL-DANGER OP RESTRICT	1
21.	70394446	DECAL-DANGER RC ELECT LG	1
22.	70392891	DECAL-DANGER DRIVELINE	1
23.	70392982	DECAL-SERVICE&REPAIR	1
24.	71039134	DECAL-CAUTION OIL LEVEL	1
25.	71391522	DECAL-ANGLE INDICATOR RH	1
26.	71391523	DECAL-ANGLE INDICATOR LH	1
27.	70394449	CAPACITY PLACARD	2
28.	70394453	DECAL-LOAD BLK RTG 4TON	2
29.	70394166	DECAL-INSTR MNL OP	1
30.	70394189	DECAL-OIL FILL REC	1
31.	70394443	DECAL-DGR FALLING BOOM	1
32.	70392399	DECAL-LUBE WORM	1
33.	70395090	DECAL-GREASE WORM BRGS	1



ITEM NO.	LOCATION
6,9,10,11,12,13,16,17,20,21,23,24,27	AT OR NEAR RMT CTRL STORAGE POINT.
1,14	ONE ON EACH OUTRIGGER.
15,18	ONE ON EACH SIDE OF CARRIER VEHICLE.
5	ON RESERVOIR AT RETURN LINE.
4	ON RESERVOIR SUCTION LINE.
30	AT OR NEAR THE HYDRAULIC RESERVOIR.
22	AT OR NEAR THE DRIVELINE.

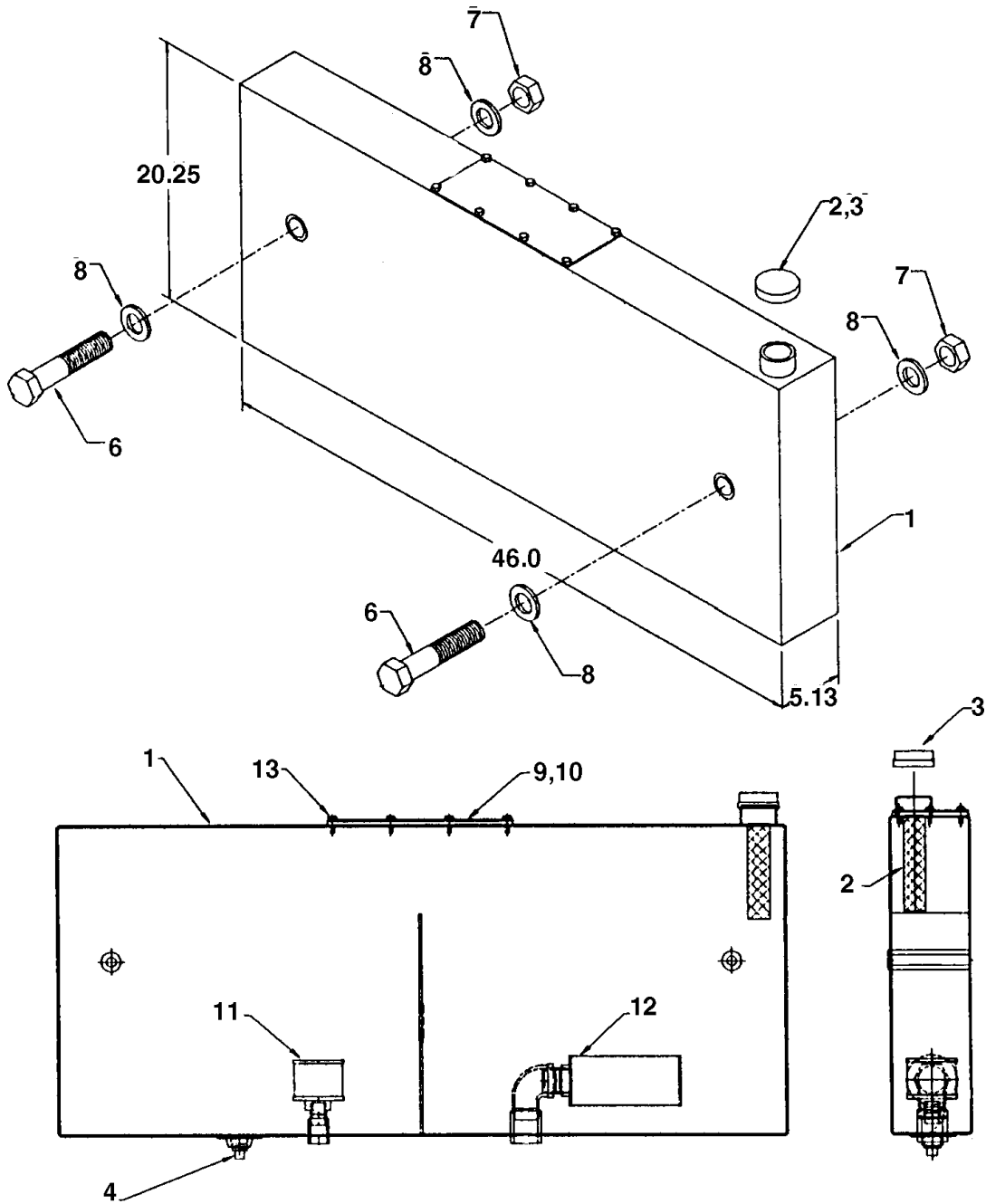
**BOOM SUPPORT ASM-3816/DOM1  
(51714181)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52708159	PEDESTAL	1
2.	60120515	TUBE	1
3.	60120516	SADDLE	1
4.	60030306	WEAR PAD	1
5.	72060047	CAP SCR 3/8-16X1-1/4 HHGR5	4
6.	72060049	CAP SCR 3/8-16X1-3/4 HHGR5	2
7.	72060101	CAP SCR 1/2-13X5 HHGR5	2
8.	72601671	CAP SCR 3/4-10X5-1/2 HHGR5	1
9.	72062103	NUT 3/8-16 LOCK	6
10.	72062080	NUT 1/2-13 LOCK	2
11.	72062114	NUT 3/4-10 LOCK	1
12.	72063003	WASHER 3/8 WRT	6
13.	72063005	WASHER 1/2 WRT	4
14.	72063008	WASHER 3/4 WRT	2
15.	76392821	WASHER-BONDED PLTD	4



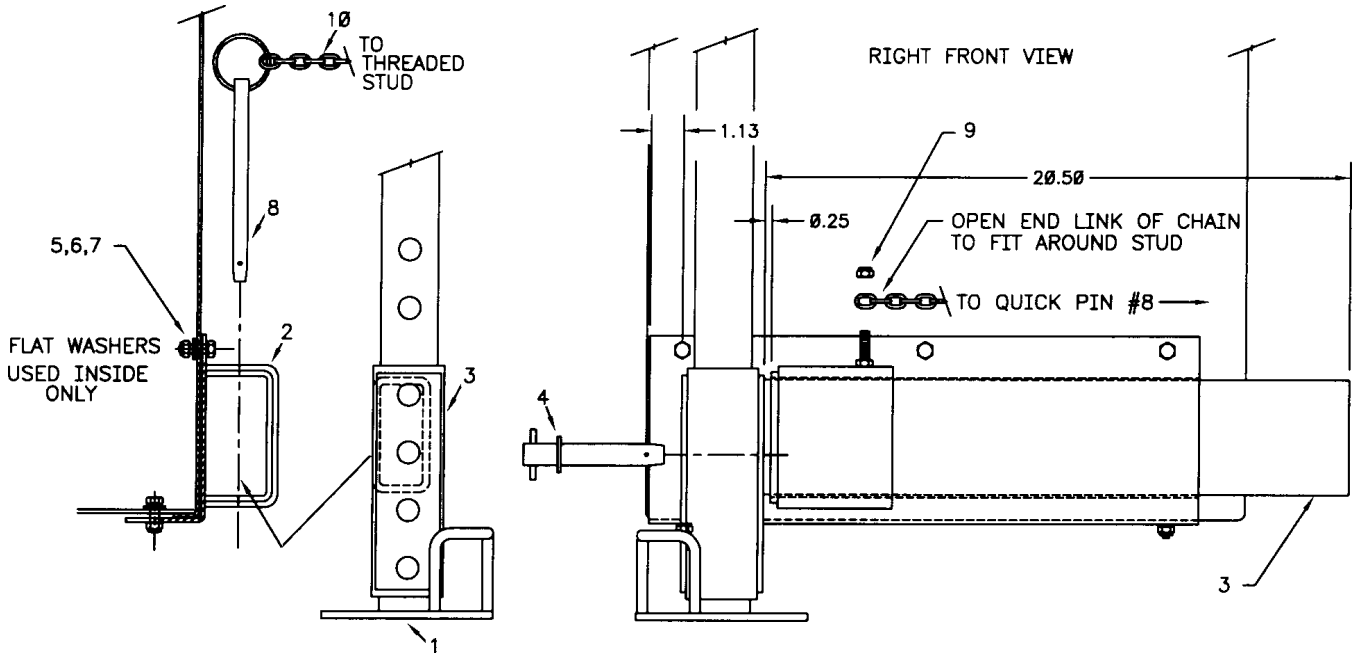
**OPTION-RESERVOIR 18-GAL  
BULKHEAD (51707798)**

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



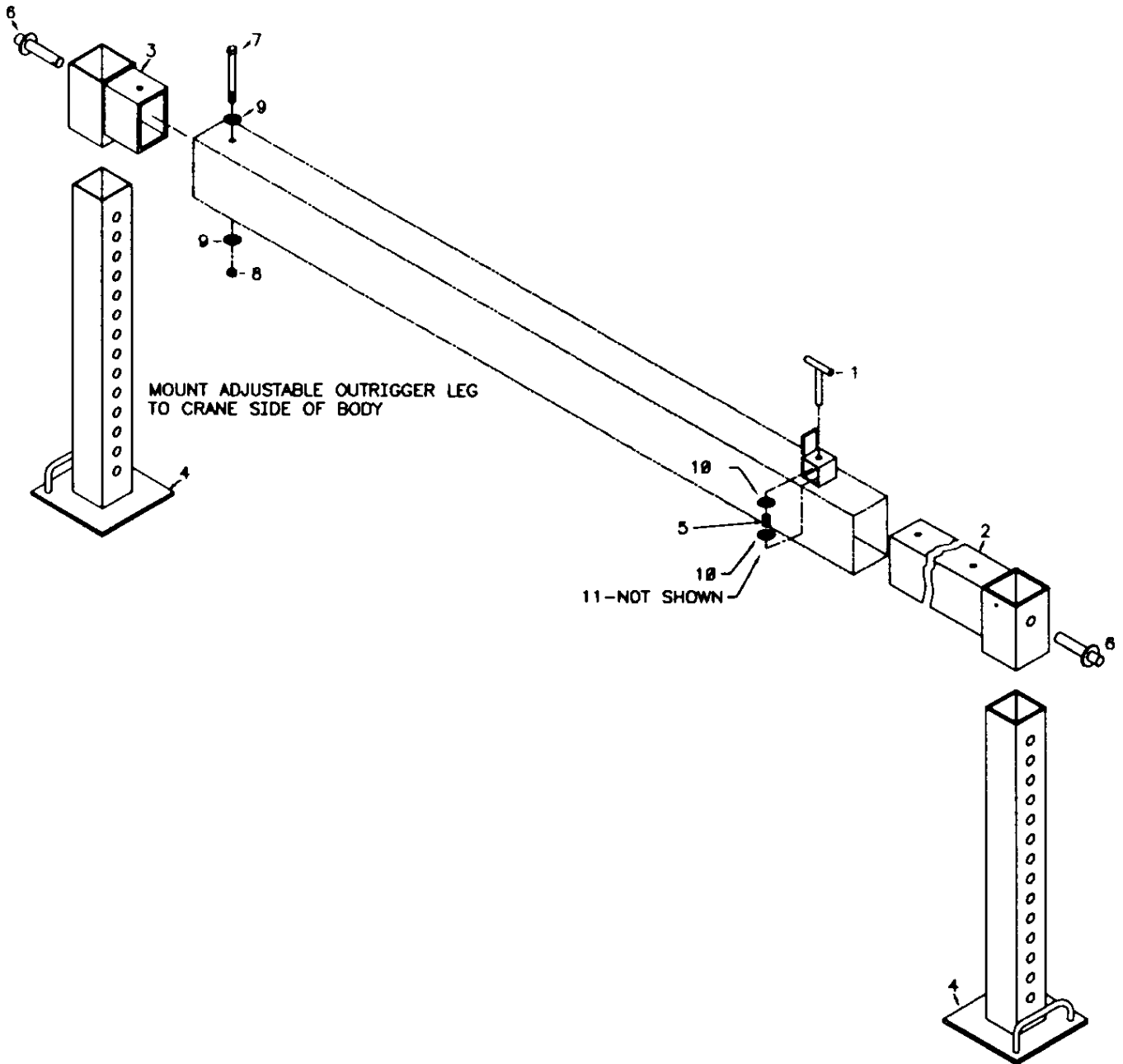
**OUTRIGGER KIT-RH FRONT PULLOUT  
(51714110)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52714182	LEG	1
2.	52715282	HOUSING	1
3.	52715283	ARM	1
4.	71731372	PIN 3/4X3 QUICK RELEASE	1
5.	72060046	CAP SCR 3/8-16X14 HHGR5	5
6.	72062103	NUT 3/8-16 LOCK	5
7.	72063003	WASHER 3/8 WRT	5
8.	71733327	PIN-QUICK REL 1/2X5	1
9.	72062104	NUT 1/4-20 LOCK	1
10.	60114940	CHAIN 1/8X9	1



**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



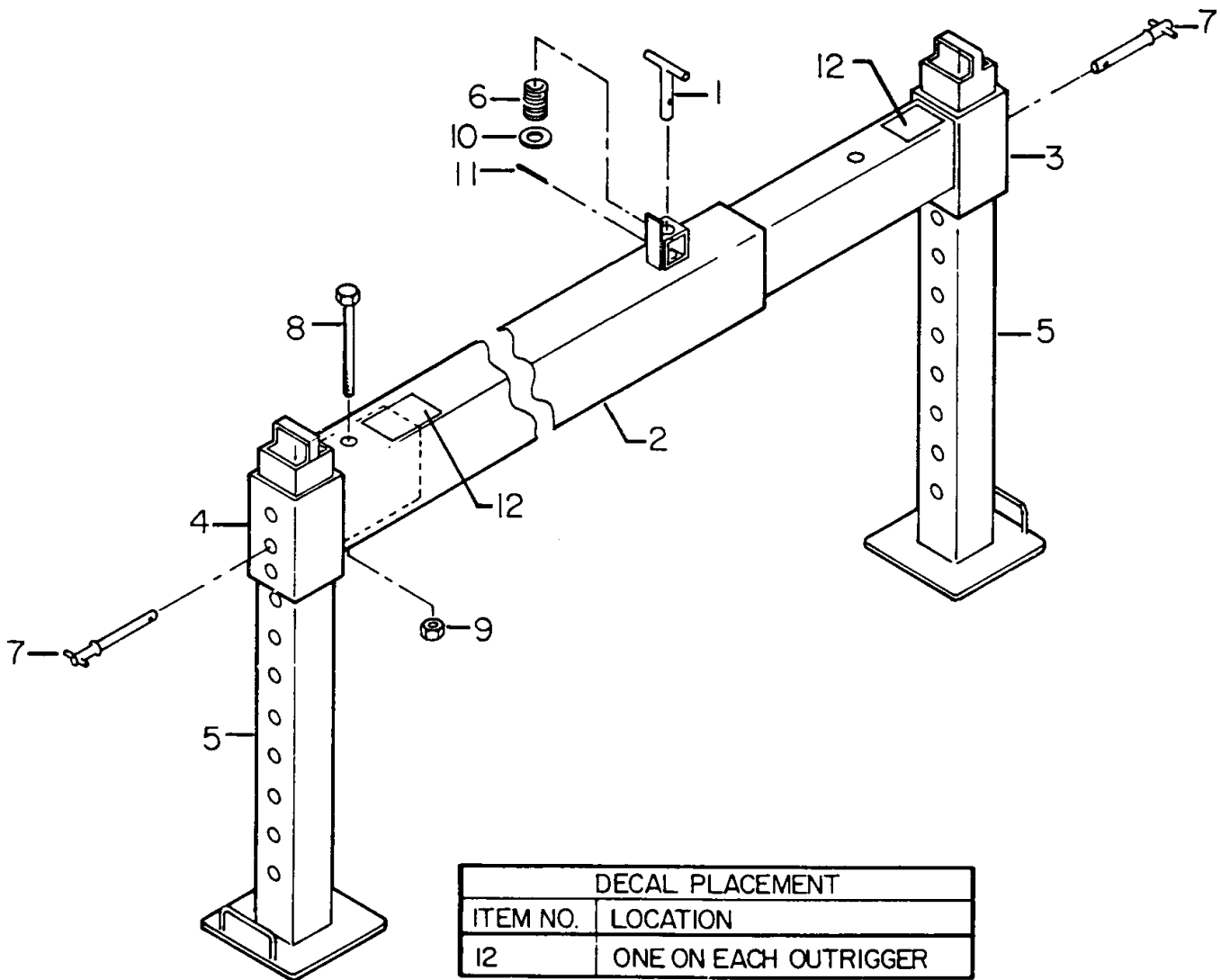
**OPTION-AUX OUTRIGGERS-MO/MD-6X4  
(31703350)**

**(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.



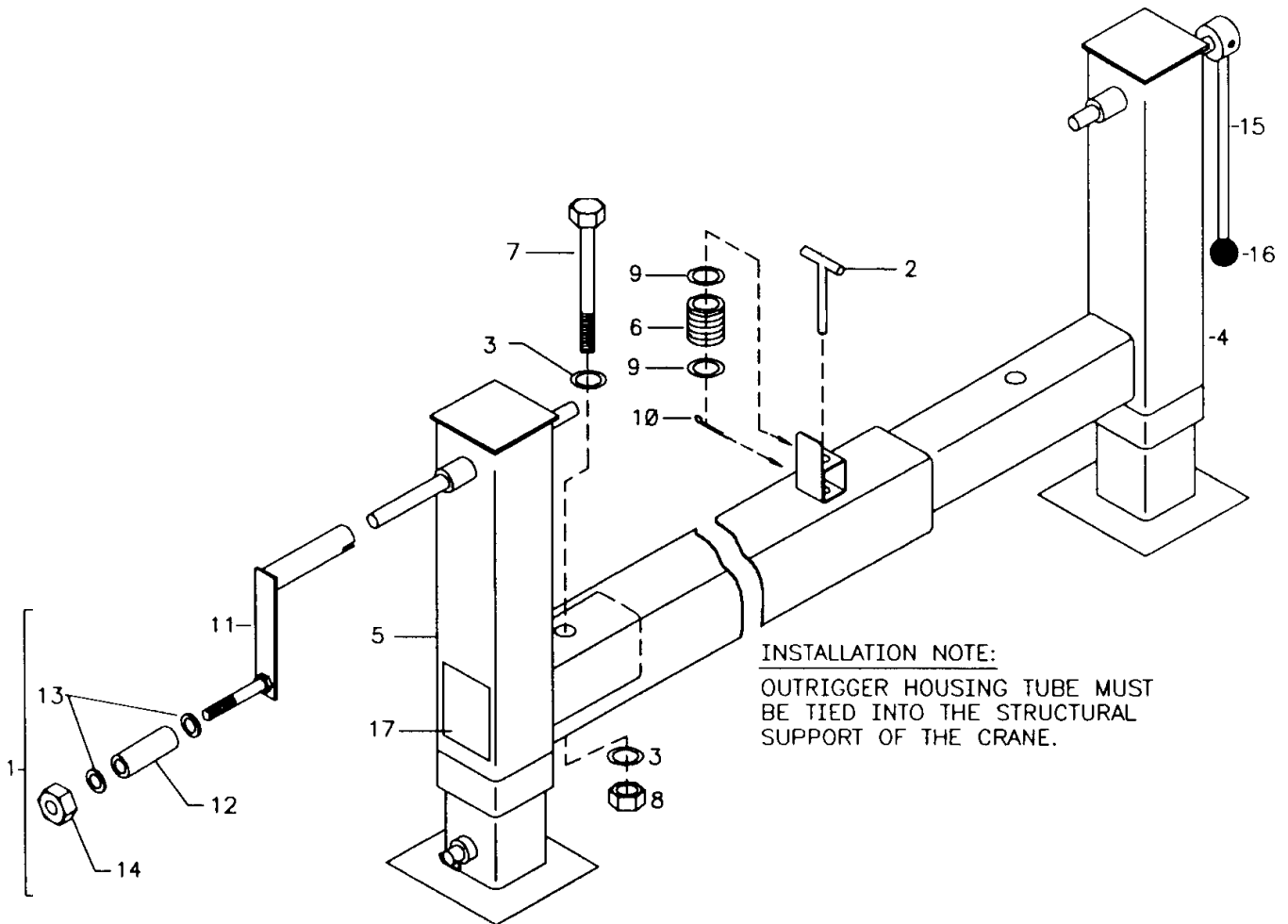


**OPTION-OUTRIGGER KIT-MO/CRANK  
DN-6X4 (51704773)**

**NOTE**

PLACE ONE ITEM 17 ON EACH OUTRIGGER.

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 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.	DECAL-DANGER STD CLR	2	



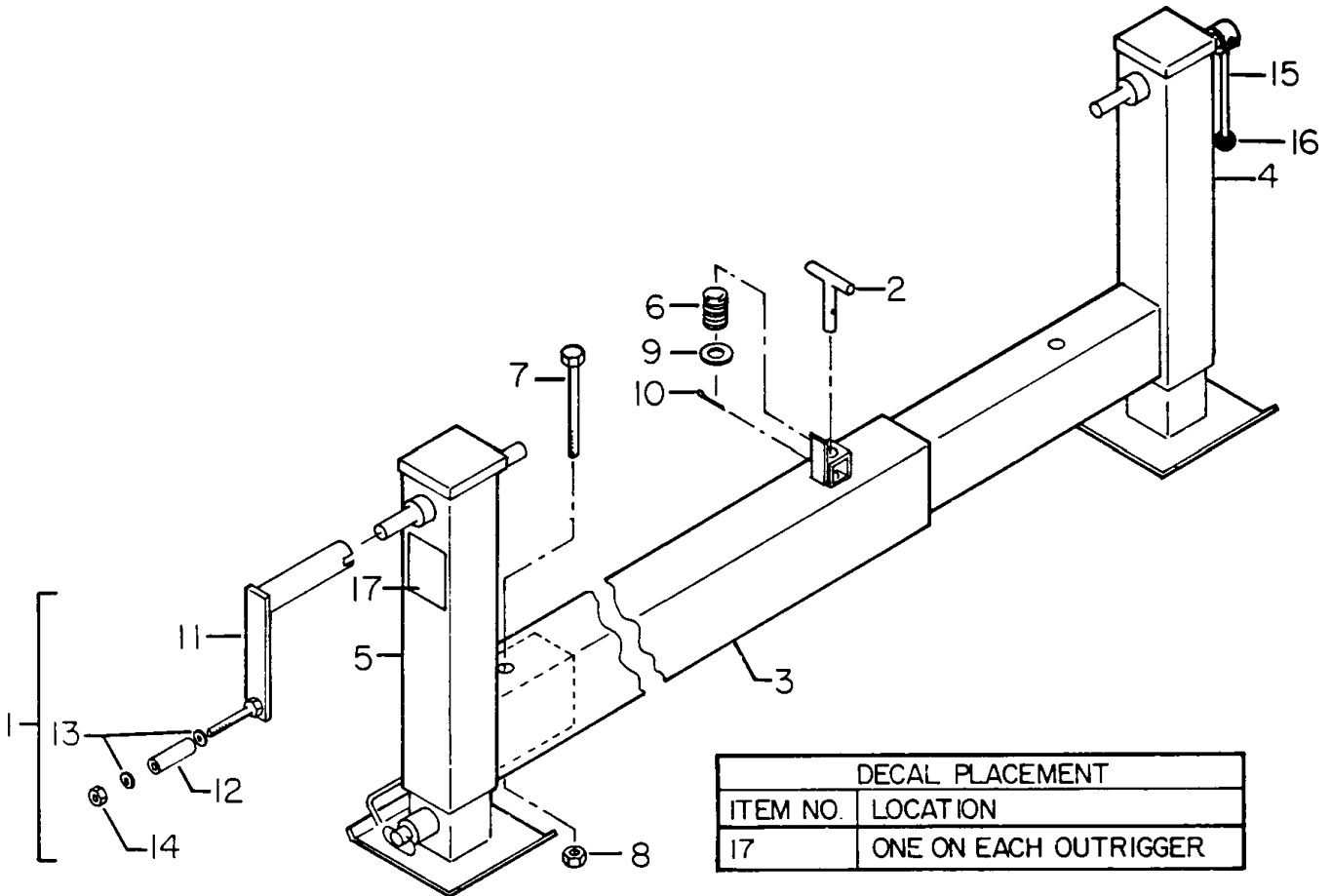
**OPTION-AUX OUTRIGGERS-MO/CRANK  
DN-6X4 (31703354)**

**INSTALLATION NOTE**

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

**(Non-IMT Mechanic Service Body Application)**

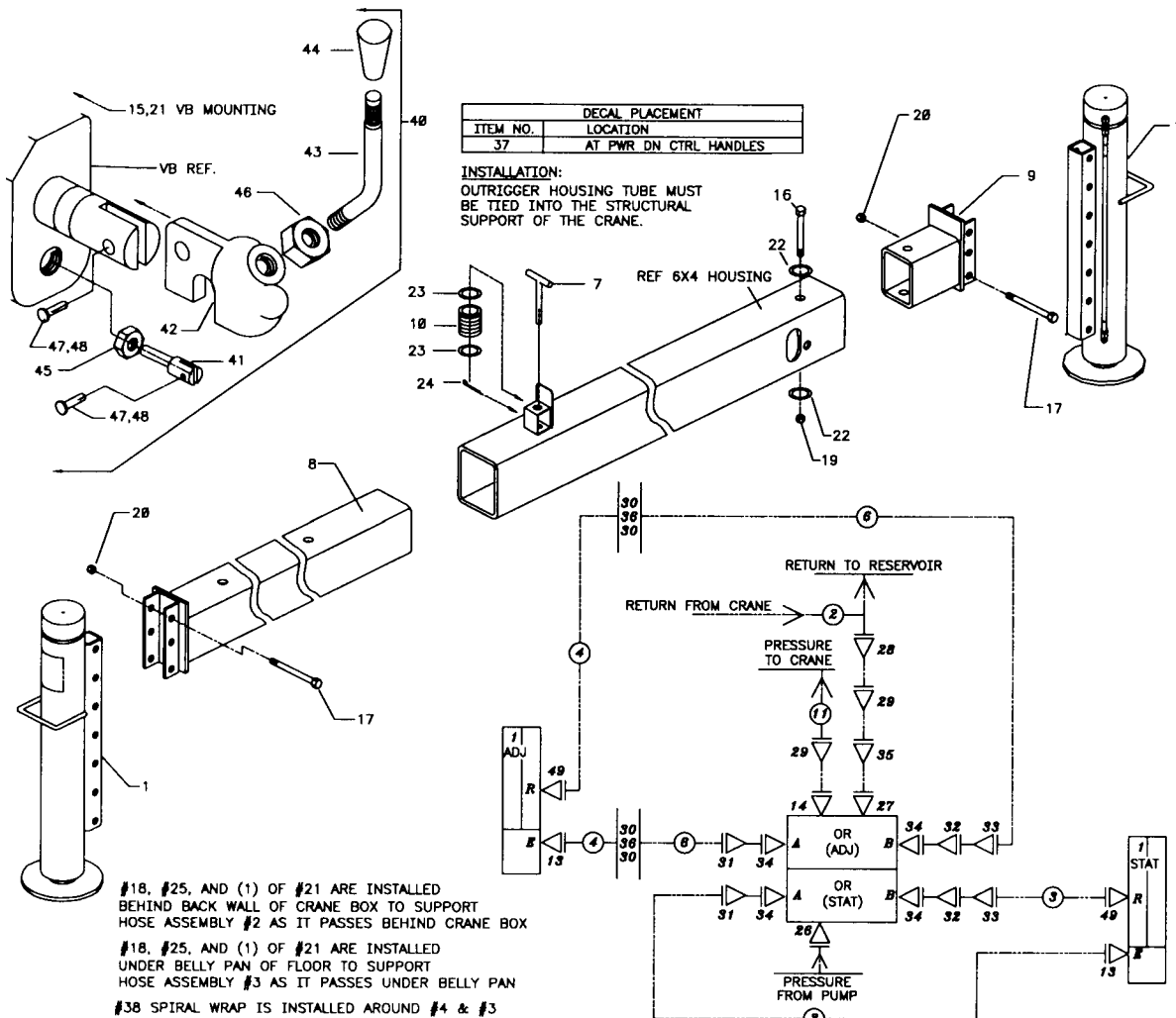
ITEM	PART NO.	DESCRIPTION	QTY
1.	51705040	CRANK ASM (INCL:11-14)	1
2.	52070138	T-PIN	1
3.	52703334	TUBE WELDMENT	1
4.	52703355	PULL-OUT OUTRIGGER	1
5.	52703356	STATIONARY OUTRIGGER	1
6.	60010351	SPRING	1
7.	72060105	CAP SCR 1/2-13X7 HHGR5	1
8.	72062080	NUT 1/2-13 LOCK	1
9.	72063007	WASHER 5/8 WRT	1
10.	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



DECAL PLACEMENT	
ITEM NO.	LOCATION
17	ONE ON EACH OUTRIGGER

**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 OF 12)	1REF			
3.	51394693	HOSE 1/4X130-1/2 4F4F (PART 12)	2REF			
4.	51394115	HOSE 1/4X59 4F4F (PART OF 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 OF 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(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			



**OPTION-AUX OUTRIGGERS-MO/PD-6X4  
(31710966)**

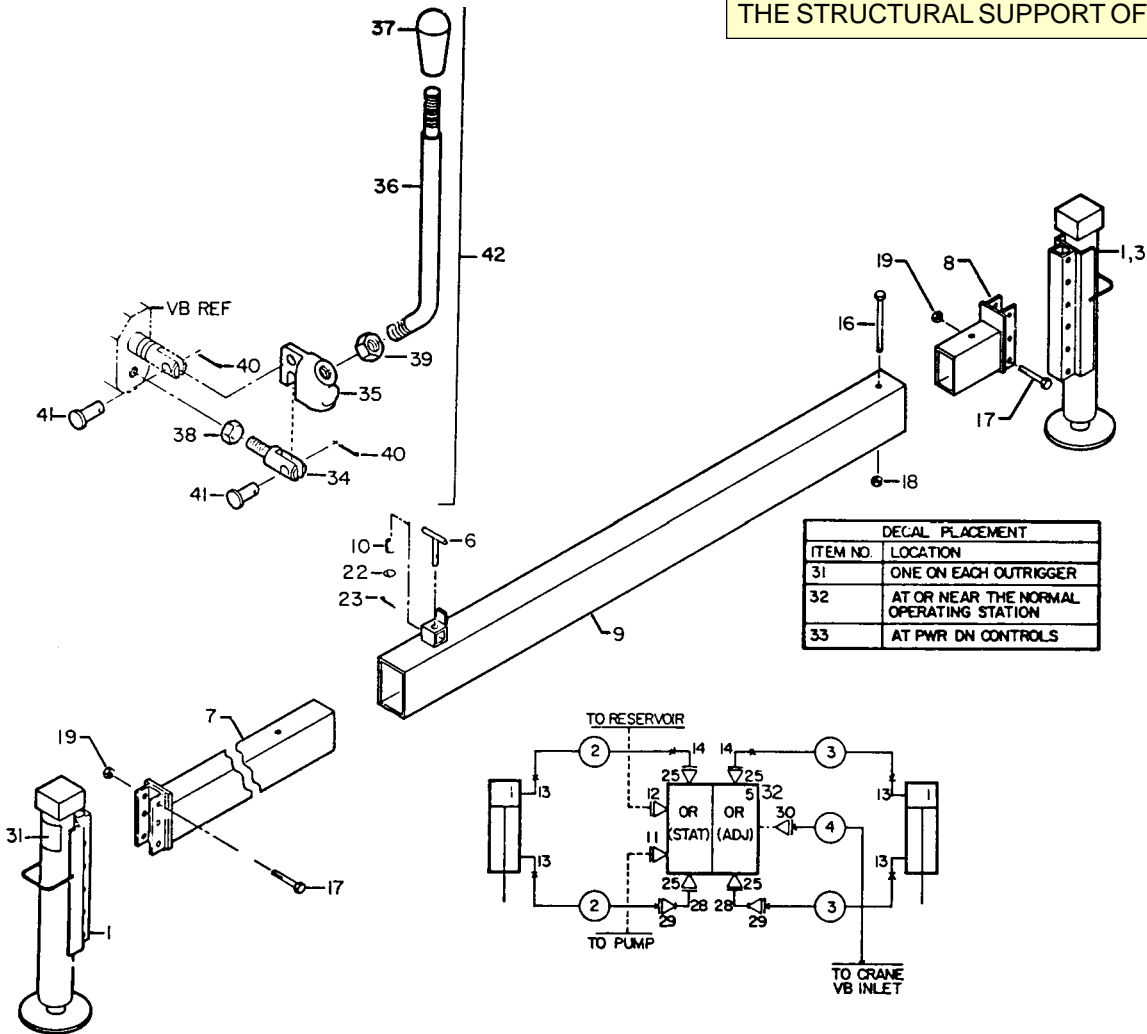
**(Non-IMT Mechanic Service Body Application)**

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
28.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	2
29.	72532707	ADAPTER #4MJIC #6FJIC	2
30.	72053764	ELBOW #10MSTR #8MJIC 90°	1
31.	70392864	DECAL-DANGER STAND CLEAR	2
32.	70392867	DECAL-DANGER MOVING	1
33.	71392257	DECAL-PWR DN SS	1
34.	70142648	LEVER PIVOT (PART OF 42)	2REF
35.	70142650	LEVER SUPPORT (PART OF 42)	2REF
36.	70142651	CTRL LEVER (PART OF 42)	2REF
37.	71392269	KNOB (PART OF 42)	2REF
38.	72062021	NUT 5/16-18 HEX JAM (PART OF 42)	2REF
39.	72062024	NUT 1/2-13 HEX JAM (PART OF 42)	2REF
40.	72066162	COTTER PIN .06X1 (PART OF 42)	4REF
41.	72661204	CLEVIS PIN (PART OF 42)	4REF
42.	51731580	HANDLE ASM (INCL:34-41,PART OF 5)	2REF
43.	70392864	DECAL-DANGER STD CLR	2

**INSTALLATION NOTE**

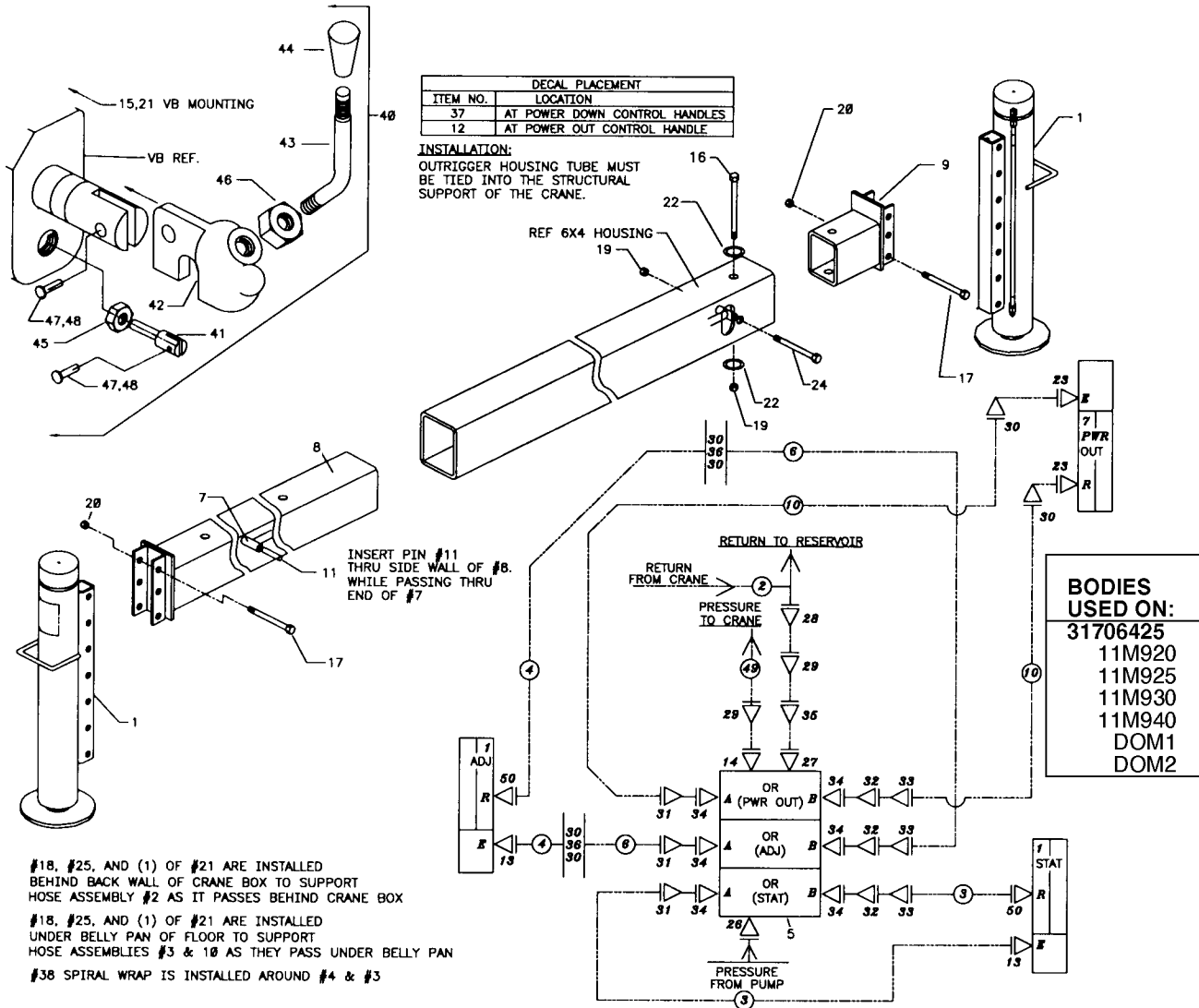
OUTRIGGER HOUSING TUBE MUST BE TIED INTO THE STRUCTURAL SUPPORT OF THE CRANE.



**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	VALVEBANK 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 SWV/LNUTRUN	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

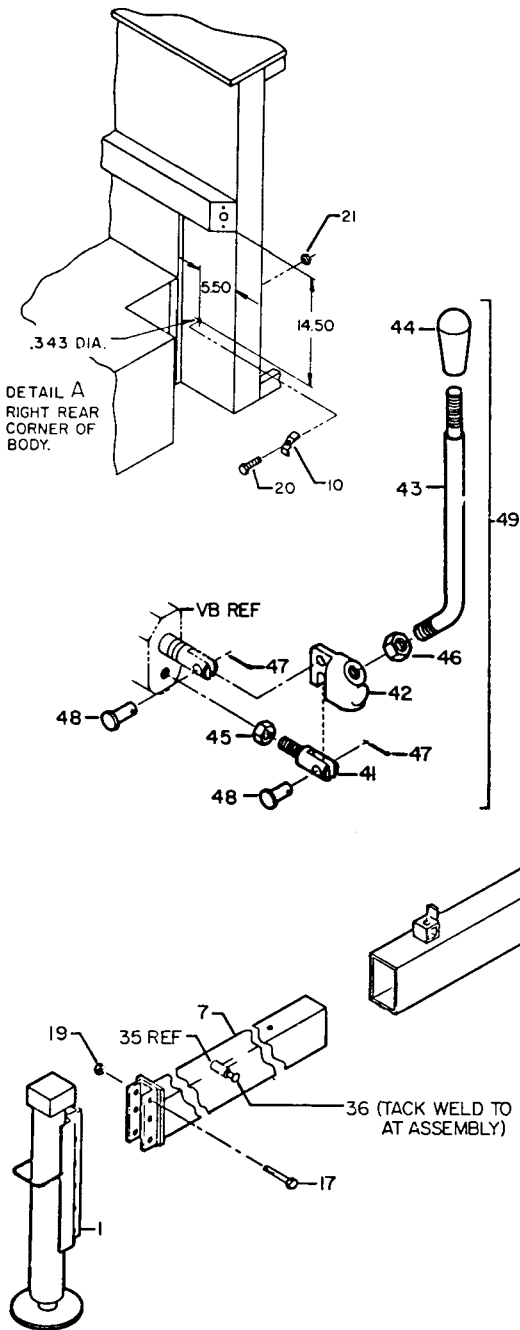


**OPTION-AUX OUTRIGGERS-PO/PD-6X4  
(31710967)**

**(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	VB 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

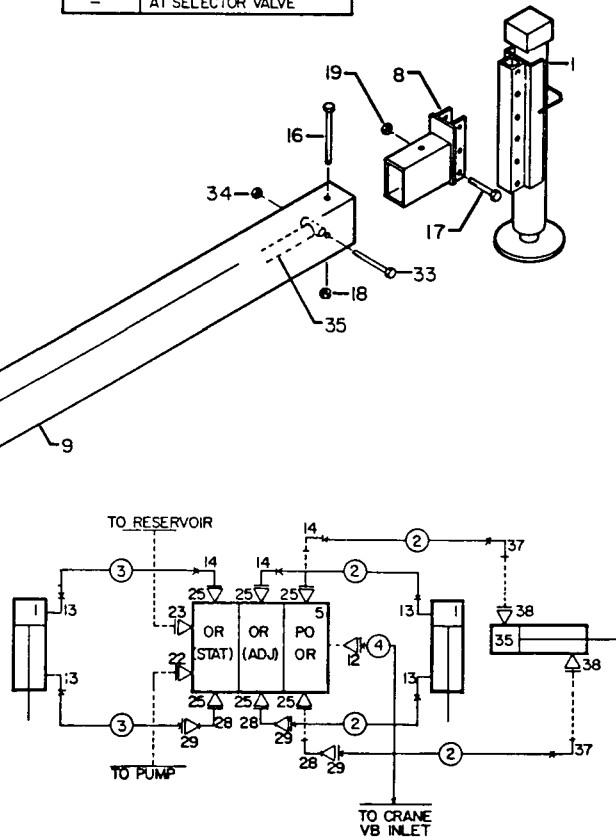
18.	72062080	NUT 1/2-13 LOCK	1
19.	72062091	NUT 5/8-11 LOCK	6
20.	72060030	CAP SCR 5/16-18X2-1/4 HHGR5	1
21.	72062109	NUT 5/16-18 LOCK	1
22.	72532358	ADAPTER #8MSTR #8MJIC	1
23.	72532365	ADAPTER #10MSTR #12MJIC	1
25.	72532722	ADAPTER #10MSTR #6FSTR	6
28.	72532700	ELBOW #6MSTR #6MJIC XLG 90°	3
29.	72532707	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 JAM (PART OF 49)	3REF
46.	72062024	NUT 1/2-13 HEX JAM (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)**

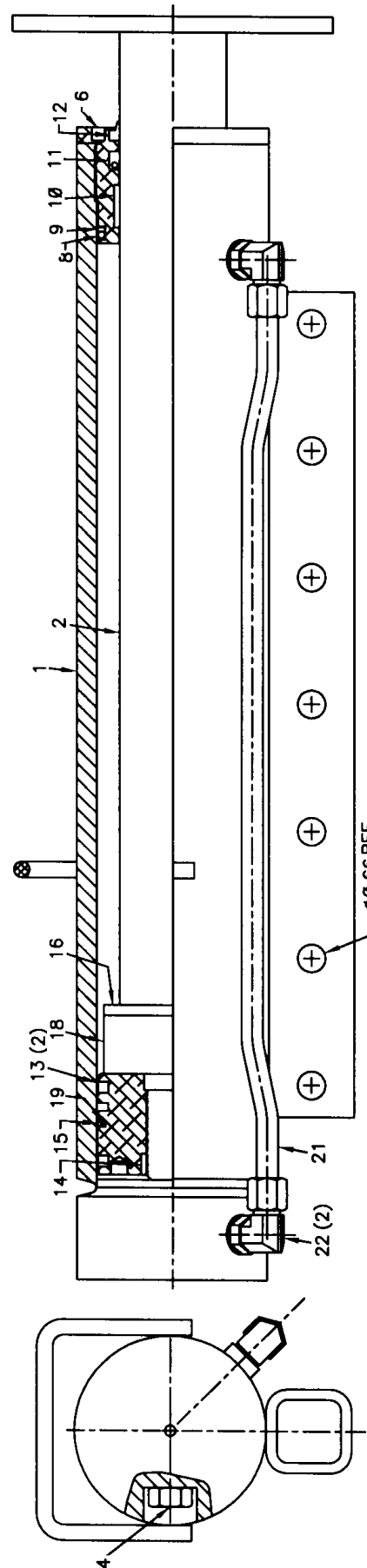
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B288970	CASE ASM	1
2.	4G048870	ROD ASM	1
4.	73054681	VALVE	1
6.	6H350025	HEAD	1
7.	6I035125	PISTON	1
8.	7Q072338	O-RING (PART OF 17)	1REF
9.	7Q10P338	BACK-UP RING (PART OF 17)	1REF
10.	7T2N8027	WEAR RING (PART OF 17)	1REF
11.	7R546025	ROD SEAL (PART OF 17)	1REF
12.	7R14P025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

**NOTE**

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

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

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



**CYLINDER-PWR OUT (3B142860)**

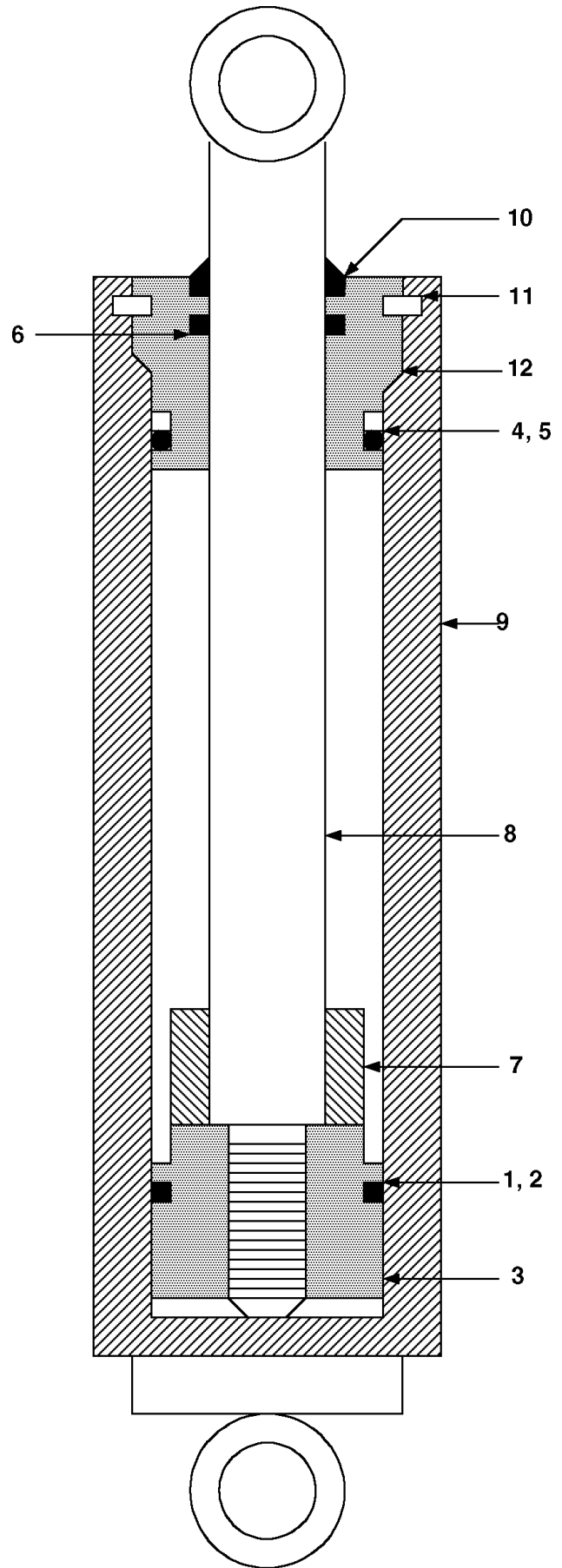
ITEM	PART NO.	DESCRIPTION	QTY
1.	7Q072021	O-RING (PART OF 13)	1REF
2.	7T66P012	PISTON SEAL (PART OF 13)	1REF
3.	6I012050	PISTON	1
4.	7Q072214	O-RING (PART OF 13)	1REF
5.	7Q10P214	BACK-UP RING (PART OF 13)	1REF
6.	7R100750	ROD SEAL (PART OF 13)	1REF
7.	6C125007	STOP TUBE	1
8.	4G142860	ROD ASM	1
9.	4B142860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

**NOTE**

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

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

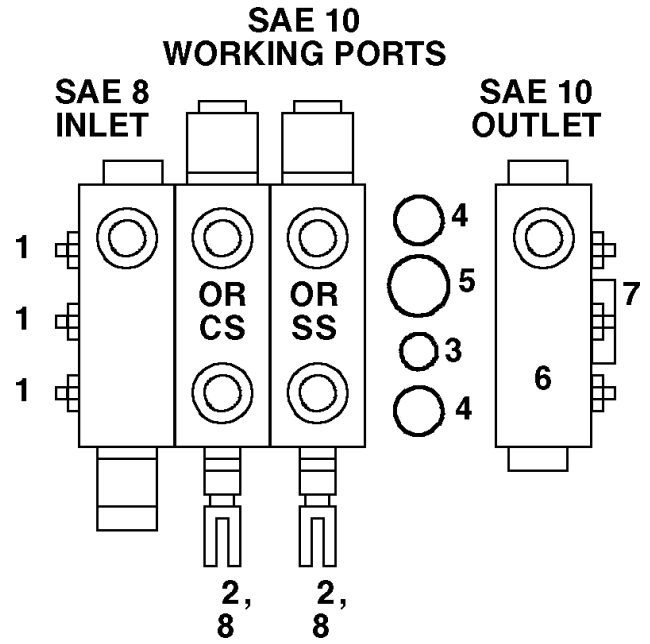
USE "NEVER-SEEZ" OR EQUIVALENT BETWEEN THE HEAD AND THE CASE WHEN ASSEMBLING THE CYLINDER.





**VALVEBANK ASM-2 SECT (51705983)**

ITEM	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

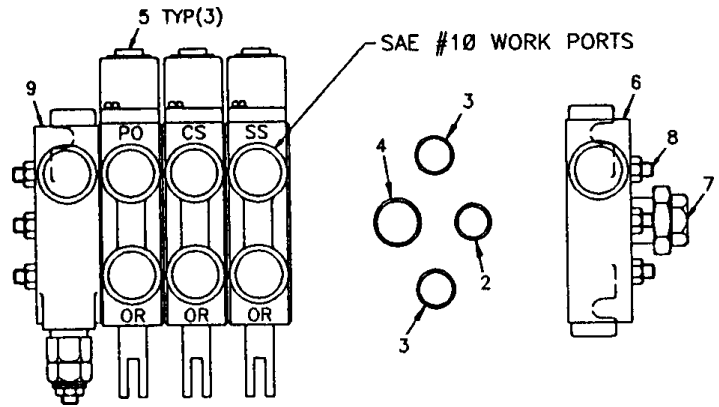


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**VALVEBANK ASM-3 SECT (51705984)**

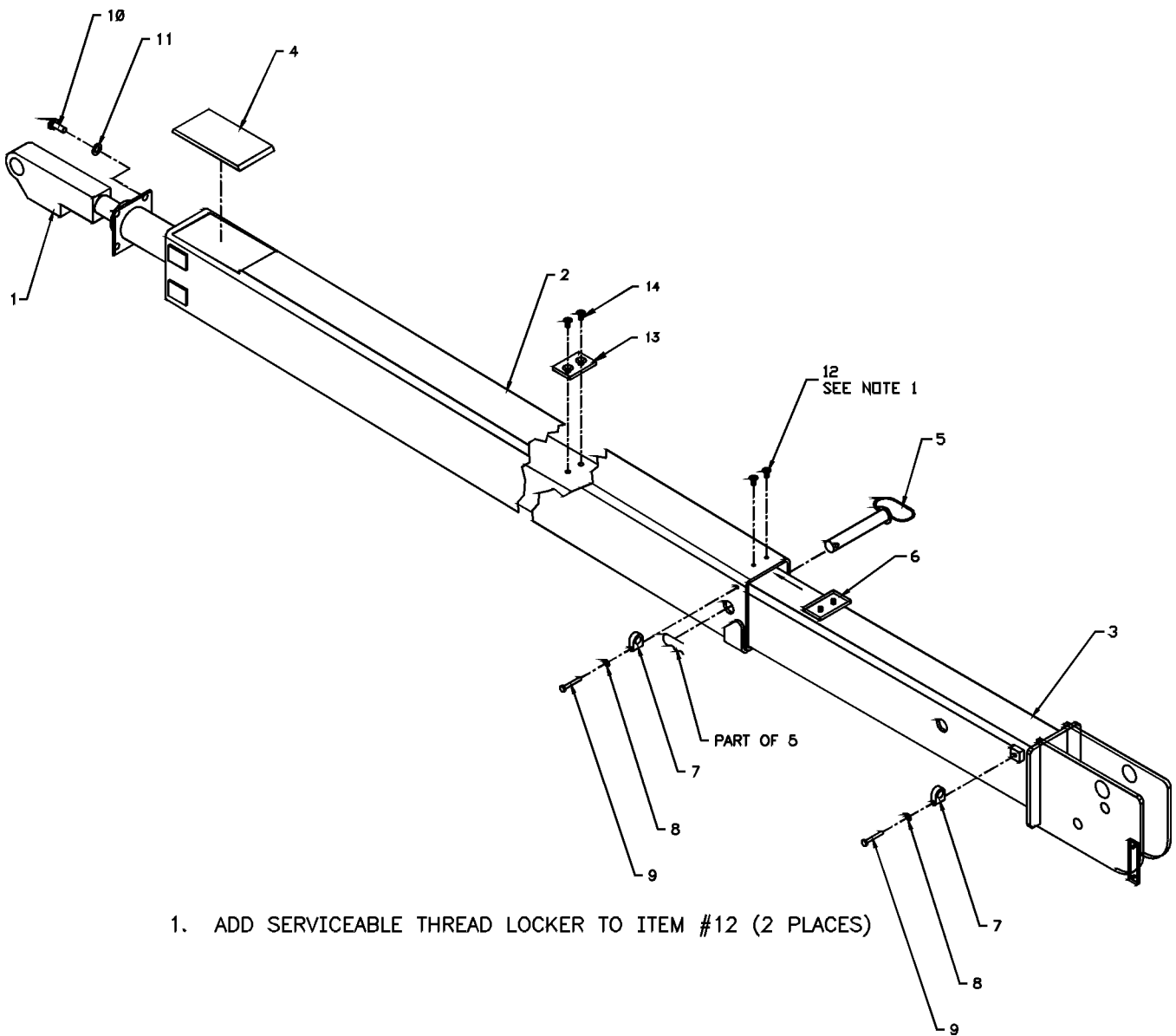
ITEM	PARTNO.	DESCRIPTION	QTY
1.	51731580	LEVER ASM (NOT SHOWN)	3
2.	7Q072017	O-RING SM	4
3.	7Q072018	O-RING MED	8
4.	7Q072021	O-RING LG	4
5.	73054490	TANDEM VALVE SECTION	3
6.	73731576	END CAP - RH	1
7.	73731763	POWER BEYOND SLEEVE	1
8.	94731764	TIE ROD KIT	3
9.	73054488	END COVER LH	1

3-46



**EXT BOOM ASM-FLIPSHEAVE  
(41714239)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B313960	EXT CYLINDER	1
2.	52713804	EXT BOOM	1
3.	52714260	EXT BOOM-MANUAL	1
4.	60030189	WEAR PAD	1
5.	73733171	LOCK PIN W/HAIRPIN	1
6.	60121174	STOP BLOCK	1
7.	70034381	CORD GUIDE	2
8.	72063049	WASHER 1/4 LOCK	2
9.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
10.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
11.	72063053	WASHER 1/2 LOCK	4
12.	72601750	CAP SCR 5/16-24X5/8 FLHSOC	2
13.	60121888	STOP BLOCK	1
14.	72601043	CAP SCR 3/8-16X3/4 FLTHDSH	2

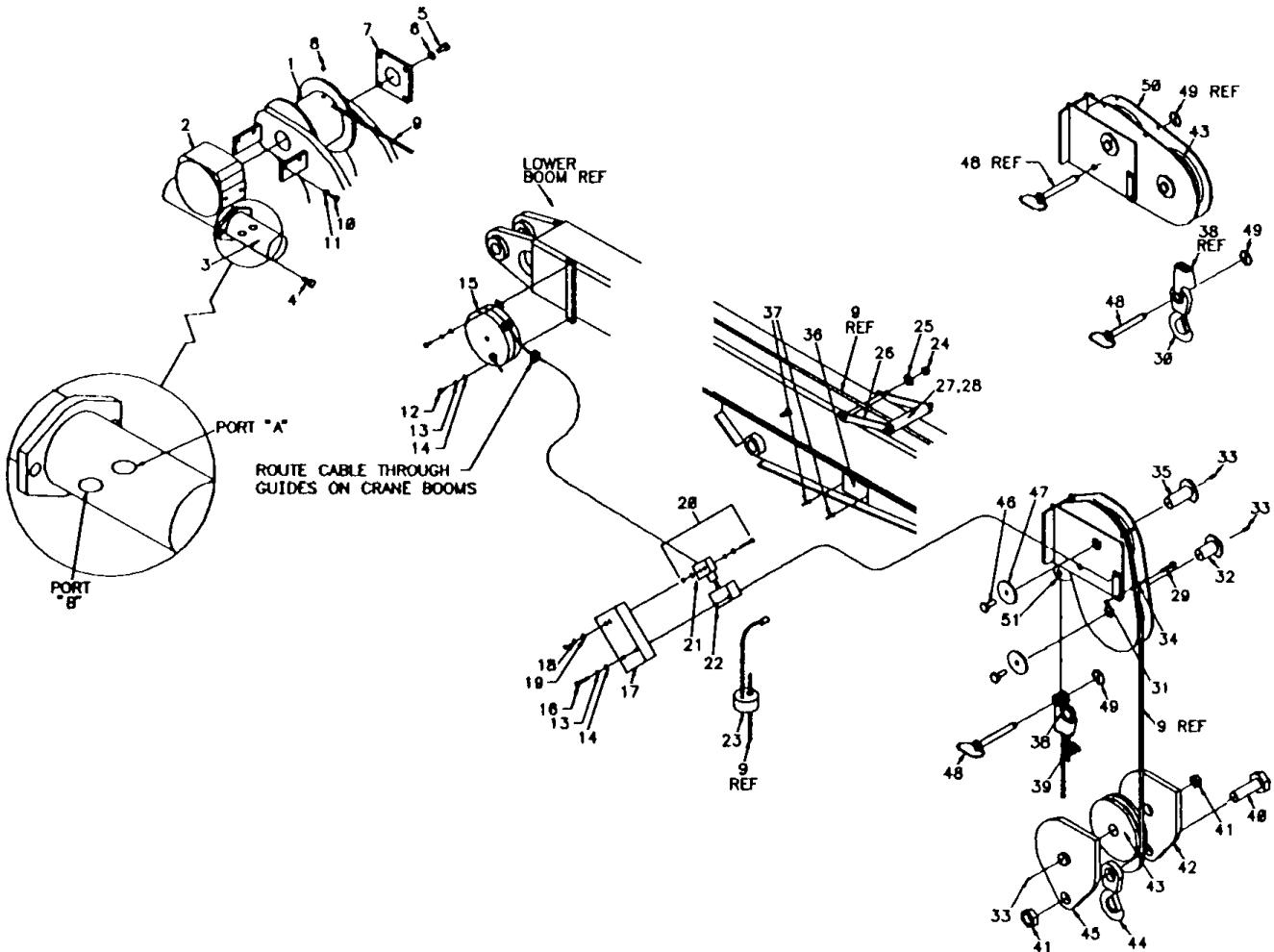


1. ADD SERVICEABLE THREAD LOCKER TO ITEM #12 (2 PLACES)

**WINCH/CABLE/HOOK KIT-FLIPSHEAVE  
(31714238) EFF: TO 7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713808	WINCH DRUM	1
2.	71057936	WINCH (SEE DWG)	1
3.	73051905	MOTOR-HYDRAULIC	1
4.	72060774	CAP SCR 7/16-14X1-1/4 SH	2
5.	72601499	CAP SCR 9/16-12X1-1/4 HHGR5	4
6.	72063054	WASHER 9/16 LOCK	4
7.	70055185	BEARING FLANGE	1
8.	72060596	SET SCR 1/2-13X3/4 SH	1
9.	60120135	CABLE 3/8 IWRC XIP X 85FT	1
10.	72060046	CAP SCR 3/8-16X1 HHGR5	4
11.	72063051	WASHER 3/8 LOCK	4
12.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
13.	72063049	WASHER 1/4 LOCK	4
14.	72063001	WASHER 1/4 WRT	4
15.	51713168	CORD REEL (SEE DWG)	1
16.	72060008	CAP SCR 1/4-20X2 HHGR5	2
17.	60113593	SWITCH COVER	1
18.	72063098	WASHER #10 FLAT	2
19.	72063047	WASHER #10 LOCK	2
20.	77041291	SWITCH	1
21.	77044468	STRAIN RELIEF	1
22.	60113594	COVER-MTG BLOCK	1
23.	52709413	CABLE	1
24.	72062080	NUT 1/2-13 LOCK	4

25.	72063005	WASHER 1/2 WRT	4
26.	60105540	CABLE GUIDE-SIDE BAR	2
27.	60105538	STUD-CABLE GUIDE	1
28.	60030108	ROLLER-CABLE GUIDE	1
29.	72060054	CAP SCR 3/8-16X3 HHGR5	2
30.	71073920	HOOK 3.0TON SWVL	1
31.	72062103	NUT 3/8-16 LOCK	2
32.	52707730	PIN	1
33.	72053508	ZERK 1/8NPT	3
34.	60102596	SPACER	2
35.	52709438	PIN	1
36.	70029119	SERIAL NUMBER PLACARD	1
37.	72066340	POP RIVET 1/8X3/8GRIP	2
38.	70058015	WEDGE SOCKET 3/8 COMPLETE	1
39.	70058033	CLAMP	1
40.	72060248	CAP SCR 1-8X5 HHGR5	1
41.	72062137	NUT 1-8 LOCK	2
42.	60120181	SIDE PLATE-LH	1
43.	60030134	SHEAVE	3
44.	71073035	HOOK	1
45.	52713814	SNATCH BLOCK	1
46.	72060147	CAP SCR 5/8-11X1 HHGR5	2
47.	60109337	PIN RETAINER PLATE 3"	2
48.	72661365	PIN	2
49.	72661367	PIN-QUICK	2
50.	52709455	SHEAVE	1
51.	60113679	LINK	1

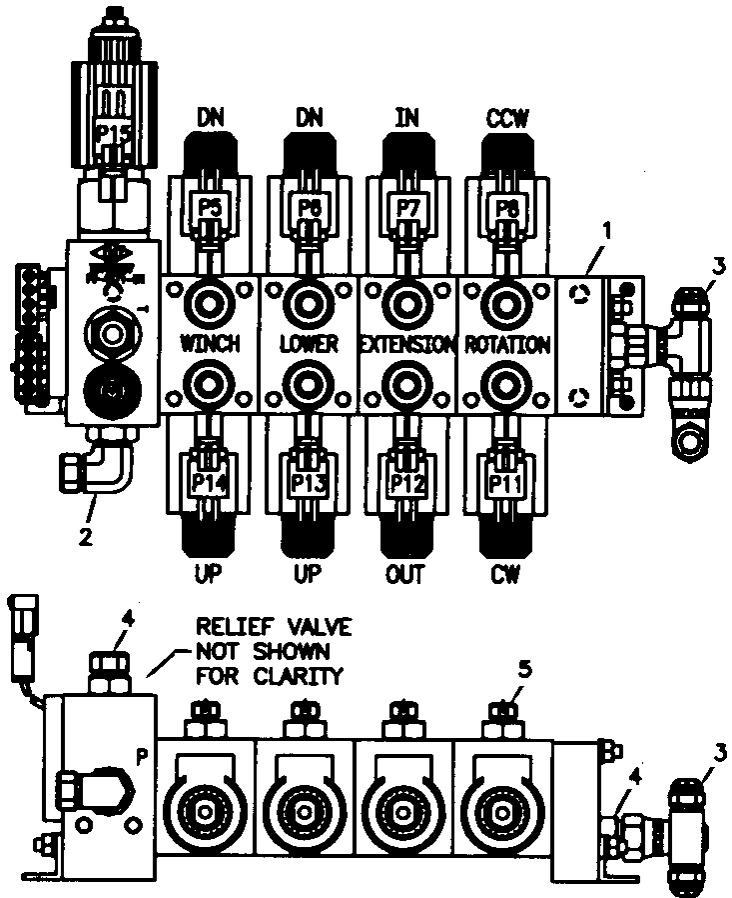


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### VALVEBANK ASM (51714381)

ITEM	PARTNO.	DESCRIPTION	QTY
1.	73733057	VB (SEE DWG)	1
2.	72533162	ELBOW #8MSTR #8MFACE 90°	1
3.	72533410	TEE #8FACE SWVLNUTRUN	2
4.	72533166	ADAPTER #8MFACE #8MSTR	2
5.	72533425	ADAPTER #4MFACE #8MSTR	8

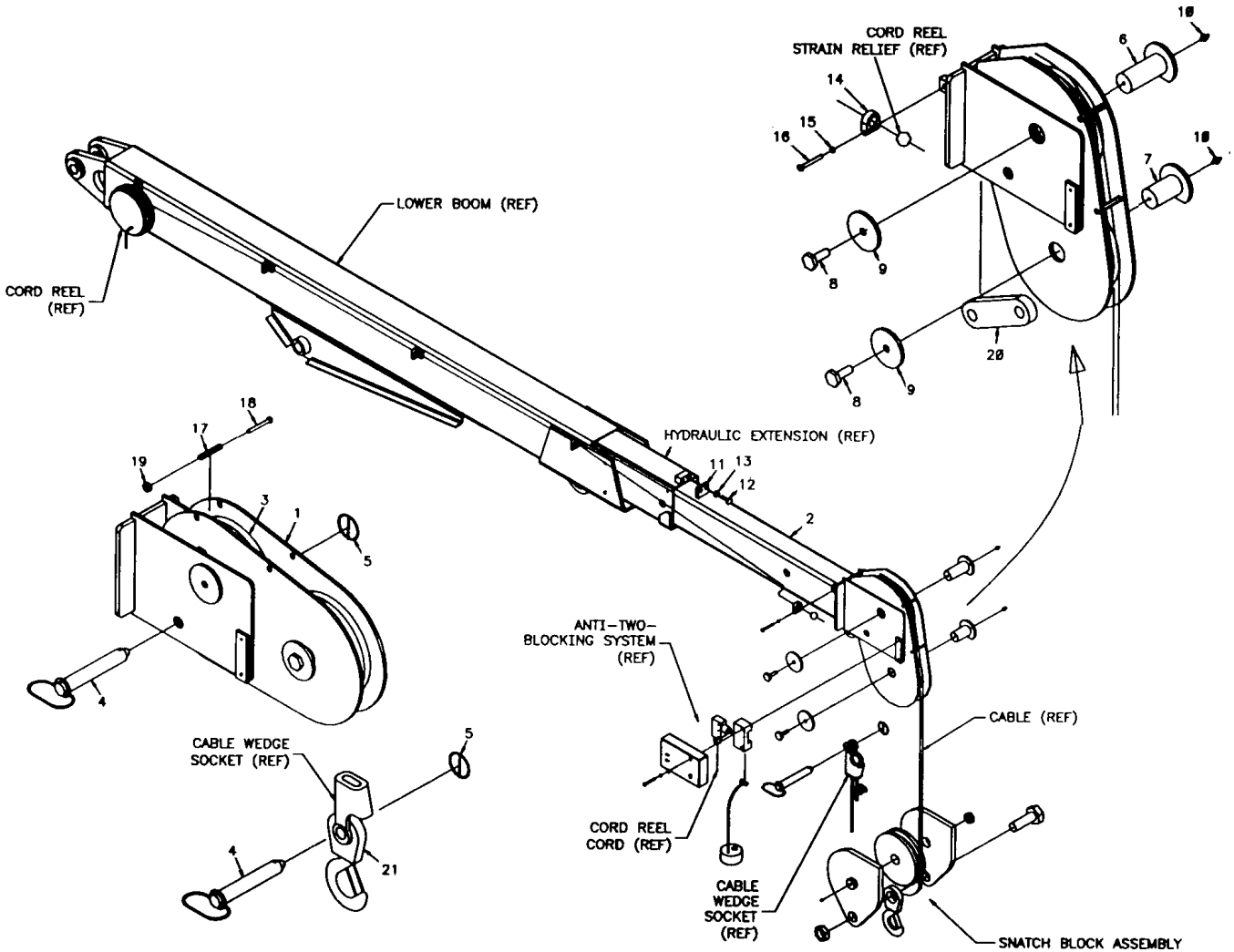
3-49



**RETROFIT KIT-FLIP SHEAVE (99901152)**

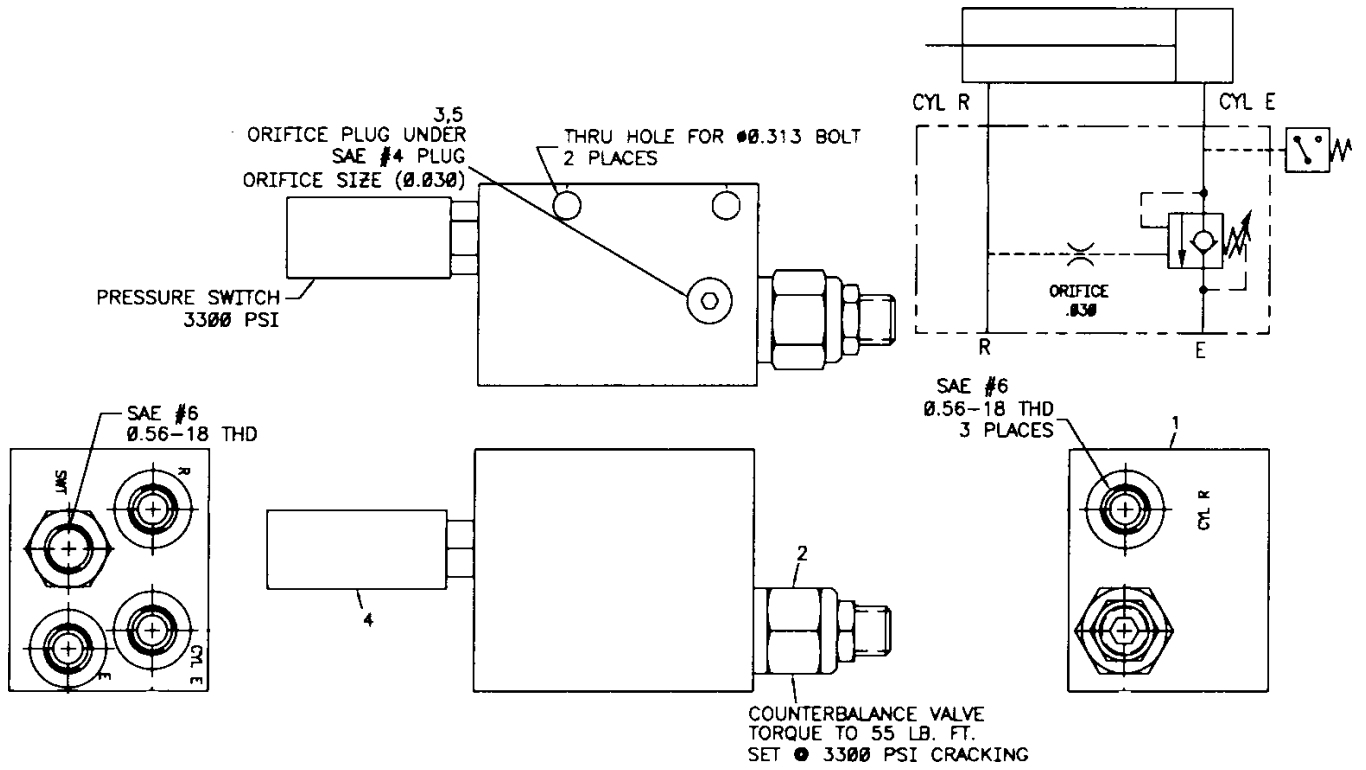
ITEM	PART NO.	DESCRIPTION	QTY
1.	52709455	FLIP SHEAVE	1
2.	52714260	EXT BOOM	1
3.	60030134	SHEAVE	2
4.	72661365	PIN	2
5.	72661367	PIN	2
6.	52709438	PIN-TYPE M 1-1/2X3-1/2	1
7.	52707730	PIN-TYPE M 1-1/2X2-1/2	1
8.	72060147	CAP SCR 5/8-11X11 HHGR5Z	2
9.	60109337	RETAINER PLT-PIN 3"DIA	2
10.	72053508	ZERK	2

11.	60107294	STROKE STOP-EXT	1
12.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	2
13.	72063053	LOCK WASHER 1/2	2
14.	70034381	CORD GUIDE	1
15.	72063049	LOCK WASHER 1/4	1
16.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	1
17.	60102596	SPACER	2
18.	72060054	CAP SCR 3/8-16X3 HHGR5	2
19.	72062103	LOCKNUT 3/8-16	2
20.	60113679	FLIP SHEAVE LINK	1
21.	71073920	SWVL HOOK	1



**COUNTERBALANCE VALVE (73540038)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	73540018	C'BAL VALVE BLOCK	1
2.	73540039	C'BAL VALVE	1
3.	70145750	ORIFICE	1
4.	77041561	PRESSURE SWITCH	1
5.	72533477	PLUG 7/16STR HOLHEX	2



**GEAR ROTATOR (71056543)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	70056527	ROTATION BEARING	1
2.	70395074	O-RING	1
3.	70395076	SEAL	2
4.	70145786	SNAP RING	1
5.	70055271	BEARING-CONE	2
6.	70055281	BEARING-CUP	2
7.	70145501	BEARING RETAINER	1
8.	70056550	WORM	1
9.	70145787	HOUSING	1
10.	72601734	CAP SCR 3/8-16X1-1/4 SH	4
11.	72601733	CAP SCR 1/2-13X1-1/4 FERRY	4
12.	73145506	SHIM .005THK	2
13.	73145505	SHIM .015THK	2

14.	73145504	SHIM .030THK	2
15.	76395075	GASKET	1
16.	72533604	PLUG	1
17.	72661504	PIN 3/8X1	2
18.	72601751	CAP SCR 5/8-11X2-3/4 HHGR8	23
19.	72063219	WASHER 5/8 FLAT HARD	23
20.	72533605	ZERK	2
21.	72533439	VENT PLUG	2

**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.

ASSEMBLY NOTES:

- 1. INSTALL SEALS (3) AND (2) WITH LOCTITE PLASTIC GASKET (54931) ON O.D. LUBRICATE SEAL SURFACE BEFORE ASSEMBLY.
- 2. PACK CAVITIES WITH EPO GREASE.
- 3. SHIM TO OBTAIN .000/.004 END PLAY ON WORM SHAFT.
- 4. LUBRICATE O-RING (2) WITH WORM GEAR OIL BEFORE INSTALLING.
- 5. INSTALL BOLTS (14) WITH LOCTITE 242.
- 6. SET BACKLASH BETWEEN WORM AND ROTATION BEARING .005-.012.

- 7. TIGHTEN 5/8-11UNC GRADE 8 MOUNTING BOLTS AS FOLLOWS:

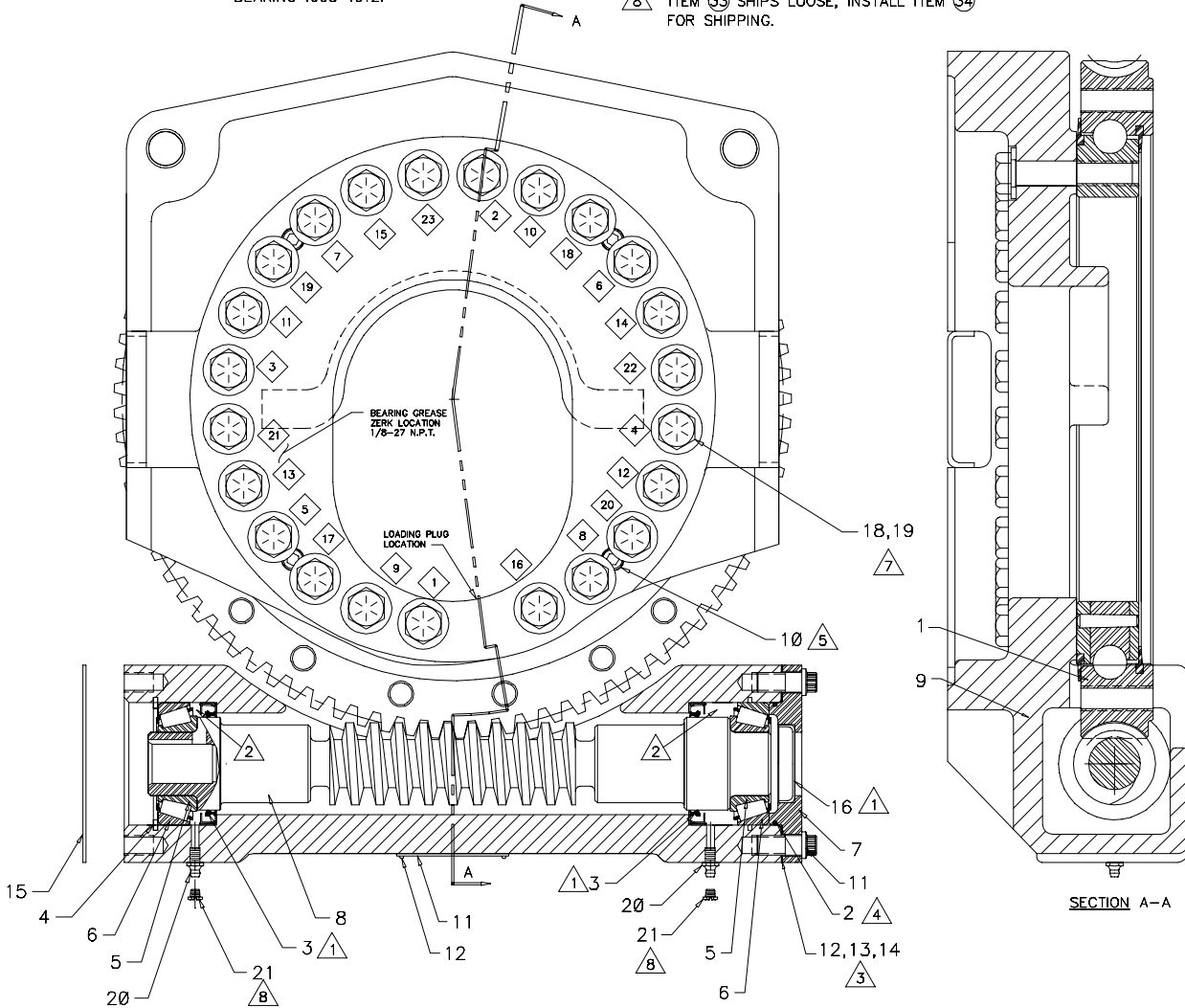
1. TIGHTENING MUST BE PROGRESSIVE AND AT 180 DEGREE INTERVALS.

FIRST INTERVAL IS AT 70 FT. LBS.  
SECOND INTERVAL IS AT 140 FT. LBS.  
THIRD INTERVAL IS AT 210 FT. LBS.

2. TIGHTEN BOLTS IN ORDER SHOW IN ◊.

3. DO NOT USE LOCTITE ON MOUNTING BOLTS.

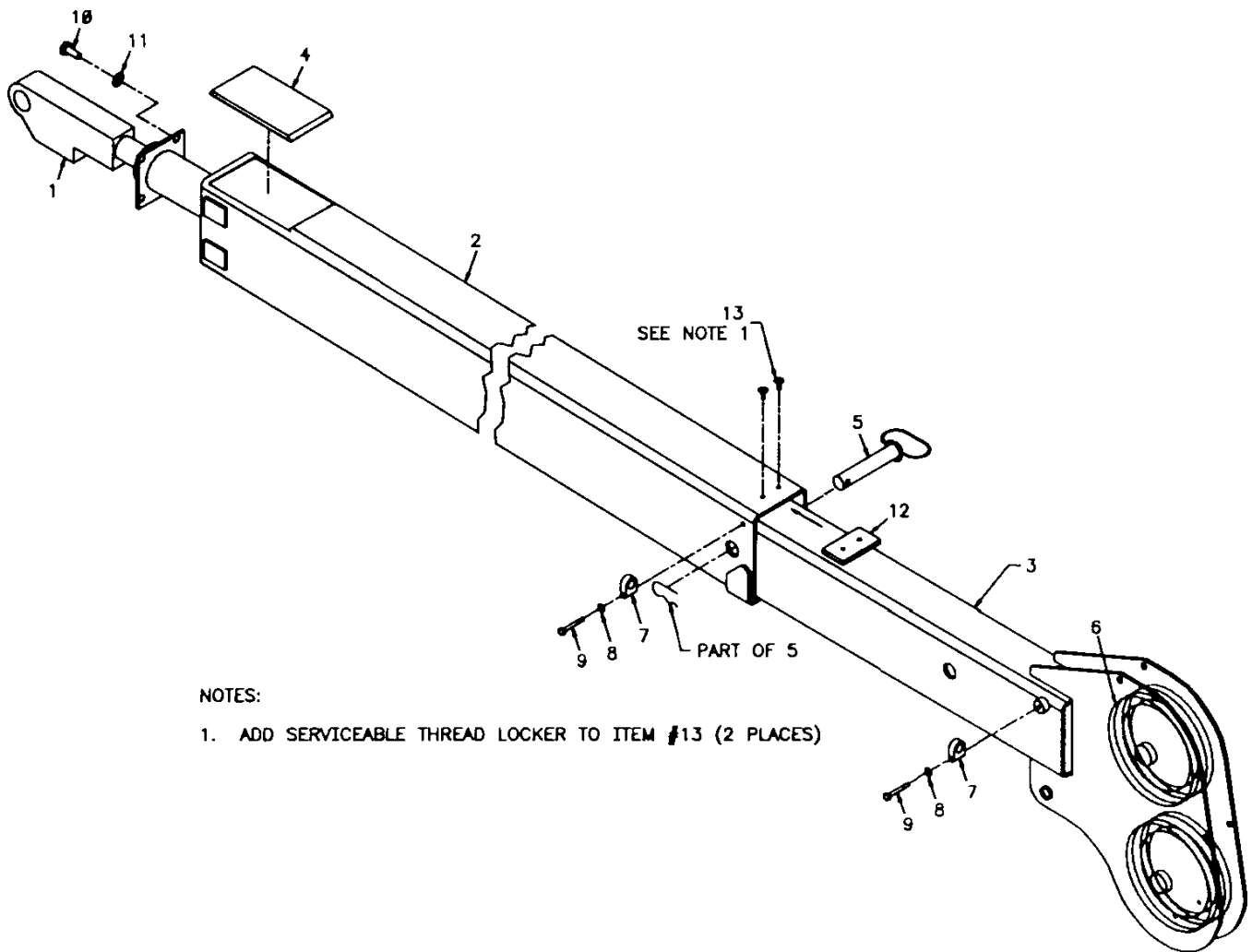
- 8. ITEM (33) SHIPS LOOSE, INSTALL ITEM (34) FOR SHIPPING.





**EXT BOOM ASM (41714920) EFF:FROM  
7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	3B313960	EXT CYLINDER	1
2.	52713804	EXT BOOM	1
3.	52714923	EXT BOOM-MANUAL (INCL:6)	1
4.	60030189	WEAR PAD	1
5.	73733171	LOCK PIN W/HAIRPIN	1
6.	60030134	SHEAVE (PART OF 3)	2REF
7.	70034381	CORD GUIDE	2
8.	72063049	WASHER 1/4 LOCK	2
9.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	2
10.	72060092	CAP SCR 1/2-13X1-1/4 HHGR5	4
11.	72063053	WASHER 1/2 LOCK	4
12.	60121174	STOP BLOCK	1
13.	72601750	CAP SCR 3/8-16X1/2 BTNHSOC	2



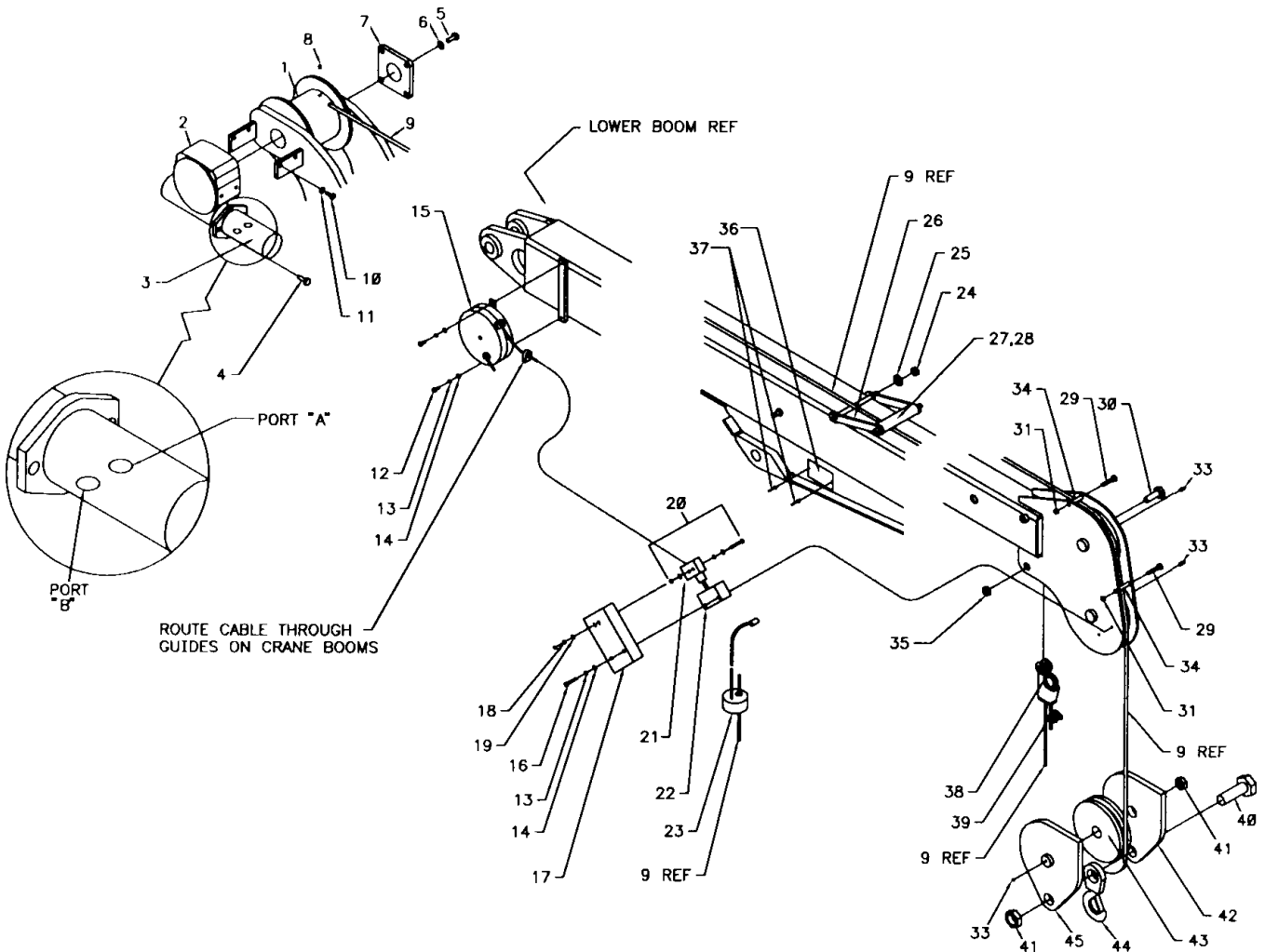
**NOTES:**

1. ADD SERVICEABLE THREAD LOCKER TO ITEM #13 (2 PLACES)

**WINCH/CABLE/HOOK KIT (31714921)**  
**EFF:FROM 7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713808	WINCH DRUM	1
2.	71057936	WINCH (SEE DWG)	1
3.	73051905	MOTOR-HYDRAULIC	1
4.	72060774	CAP SCR 7/16-14X1-1/4 SH	2
5.	72601499	CAP SCR 9/16-12X1-1/4 HHGR5	5
6.	72063054	WASHER 9/16 LOCK	4
7.	70055185	BEARING FLANGE	1
8.	72060596	SET SCR 1/2-13X3/4 SH	1
9.	60120135	CABLE 3/8 IWRC XIP X 85FT	1
10.	72060046	CAP SCR 3/8-16X1 HHGR5	4
11.	72063051	WASHER 3/8 LOCK	4
12.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
13.	72063049	WASHER 1/4 LOCK	4
14.	72063001	WASHER 1/4 WRT	4
15.	51713168	CORD REEL (SEE DWG)	1
16.	72060008	CAP SCR 1/4-20X2 HHGR5	2
17.	60113593	SWITCH COVER	1
18.	72063098	WASHER #10 FLAT	2
19.	72063047	WASHER #10 LOCK	2
20.	77041291	SWITCH	1
21.	77044468	STRAIN RELIEF	1

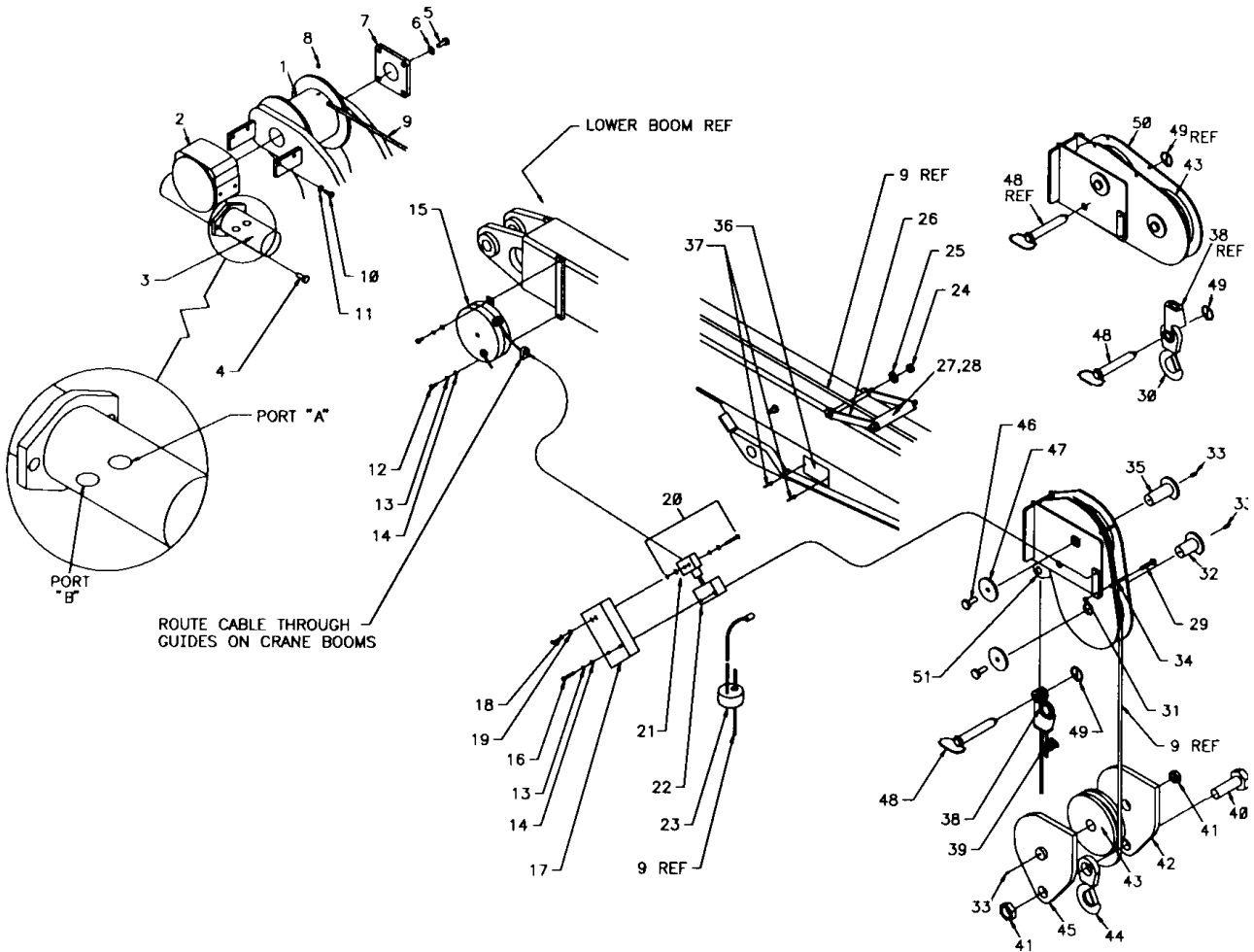
22.	60113594	COVER-MTG BLOCK	1
23.	52709413	CABLE	1
24.	72062080	NUT 1/2-13 LOCK	4
25.	72063005	WASHER 1/2 WRT	4
26.	60105540	CABLE GUIDE-SIDE BAR	2
27.	60105538	STUD-CABLE GUIDE	1
28.	60030108	ROLLER-CABLE GUIDE	1
29.	72066054	CAP SCR 3/8-16X3 HHGR5	2
30.	72060217	CAP SCR 7/8-9X4 HHGR5	1
31.	72062103	NUT 3/8-16 LOCK	2
33.	72053508	ZERK 1/8NPT	3
34.	60102596	SPACER	2
35.	72062120	NUT 7/8-9 LOCK	1
36.	70029119	SERIAL NUMBER PLACARD	1
37.	72066340	POP RIVET 1/8X3/8GRIP	2
38.	70058015	WEDGE SOCKET 3/8 COMPLETE	1
39.	70058033	CLAMP	1
40.	72060248	CAP SCR 1-8X5 HHGR5	1
41.	72062137	NUT 1-8 LOCK	2
42.	60120181	SIDE PLATE-LH	1
43.	60030134	SHEAVE	1
44.	71073035	HOOK	1
	70074004	HOOK SAFETY LATCH	REF
45.	52713814	SNATCH BLOCK	1



**WINCH/CABLE/HOOK KIT-FLIPSHEAVE  
(31714922) EFF: FROM 7-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	51713808	WINCH DRUM	1
2.	71057936	WINCH (SEE DWG)	1
3.	73051905	MOTOR-HYDRAULIC	1
4.	72060774	CAP SCR 7/16-14X1-1/4 SH	2
5.	72601499	CAP SCR 9/16-12X1-1/4 HHGR5	4
6.	72063054	WASHER 9/16 LOCK	4
7.	70055185	BEARING FLANGE	1
8.	72060596	SET SCR 1/2-13X3/4 SH	1
9.	60120135	CABLE 3/8 IWRC XIP X 85FT	1
10.	72060046	CAP SCR 3/8-16X1 HHGR5	4
11.	72063051	WASHER 3/8 LOCK	4
12.	72060000	CAP SCR 1/4-20X1/2 HHGR5	2
13.	72063049	WASHER 1/4 LOCK	4
14.	72063001	WASHER 1/4 WRT	4
15.	51713168	CORD REEL (SEE DWG)	1
16.	72060008	CAP SCR 1/4-20X2 HHGR5	2
17.	60113593	SWITCH COVER	1
18.	72063098	WASHER #10 FLAT	2
19.	72063047	WASHER #10 LOCK	2
20.	77041291	SWITCH	1
21.	77044468	STRAIN RELIEF	1
22.	60113594	COVER-MTG BLOCK	1
23.	52709413	CABLE	1
24.	72062080	NUT 1/2-13 LOCK	4

25.	72063005	WASHER 1/2 WRT	4
26.	60105540	CABLE GUIDE-SIDE BAR	2
27.	60105538	STUD-CABLE GUIDE	1
28.	60030108	ROLLER-CABLE GUIDE	1
29.	72060054	CAP SCR 3/8-16X3 HHGR5	2
30.	71073920	HOOK 3.0TON SWVL	1
31.	72062103	NUT 3/8-16 LOCK	2
32.	52707730	PIN	1
33.	72053508	ZERK 1/8NPT	3
34.	60102596	SPACER	2
35.	52709438	PIN	1
36.	70029119	SERIAL NUMBER PLACARD	1
37.	72066340	POP RIVET 1/8X3/8GRIP	2
38.	70058015	WEDGE SOCKET 3/8 COMPLETE	1
39.	70058033	CLAMP	1
40.	72060248	CAP SCR 1-8X5 HHGR5	1
41.	72062137	NUT 1-8 LOCK	2
42.	60120181	SIDE PLATE-LH	1
43.	60030134	SHEAVE	3
44.	71073035	HOOK	1
45.	52713814	SNATCH BLOCK	1
46.	72060147	CAP SCR 5/8-11X1 HHGR5	2
47.	60109337	PIN RETAINER PLATE 3"	2
48.	72661365	PIN	2
49.	72661367	PIN-QUICK	2
50.	52709455	SHEAVE	1
51.	60113679	LINK	1



**LOWER BOOM CYLINDER-EFF: T0 4-1-99  
(3B245980)**

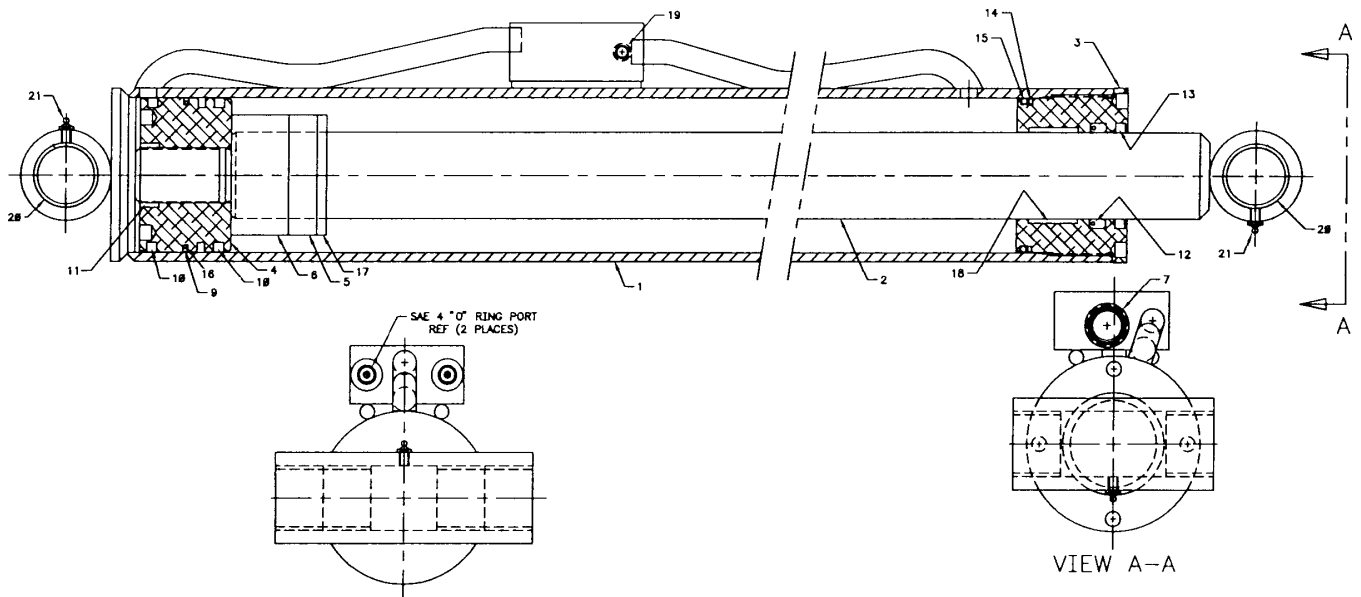
ITEM	PART NO.	DESCRIPTION	QTY
1.	4B348960	CASE ASM	1
2.	4G245980	ROD ASM	1
3.	6H040022	HEAD	1
4.	6I040143	PISTON	1
5.	6C075022	STOP TUBE	1
6.	6C150022	STOP TUBE	1
7.	73054304	CBAL VALVE 10GPM	1
8.	9C161823	SEAL KIT (INCL 9-18)	1
9.	7T66P040	PISTON SEAL (PART OF 9)	1REF
10.	7T65I040	PISTON RING (PART OF 9)	2REF
11.	7T61N143	LOCK RING (PART OF 9)	1REF
12.	7R546022	U-CUP SEAL (PART OF 9)	1REF
13.	7R14P022	ROD WIPER (PART OF 9)	1REF
14.	7Q10P342	BACKUP RING (PART OF 9)	1REF
15.	7Q072342	O-RING (PART OF 9)	1REF
16.	7Q072153	O-RING (PART OF 9)	1REF
17.	6A025022	WAFER LOCK (PART OF 9)	1REF
18.	7T2N8025	WEAR RING (PART OF 9)	1REF
19.	7PNPXT02	PIPE PLUG (PART OF 1)	3REF
20.	7BF81215	BUSHING-STL (PART OF 1&2)	6REF
21.	72053507	ZERK (PART OF 1&2)	2REF

**NOTE**

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

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

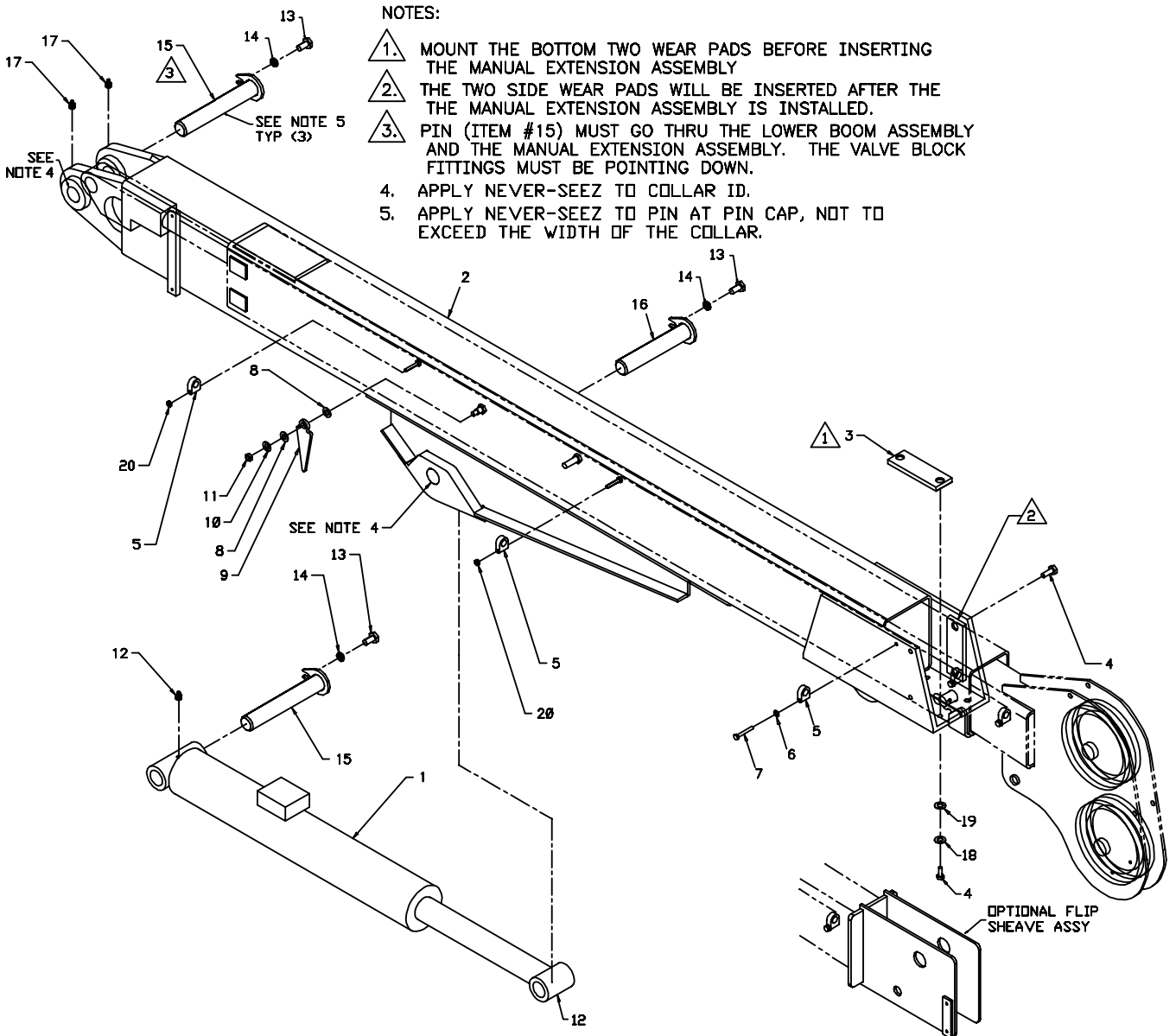
APPLY "NEVER-SEEZ" REGULAR GRADE ANTI-SEIZE AND LUBRICATING COMPOUND TO CYLINDER HEAD THREADS. KEEP AWAY FROM ALL SEALS.



**LOWER BOOM ASM-EFF: T0 4-1-99  
(41714978)**

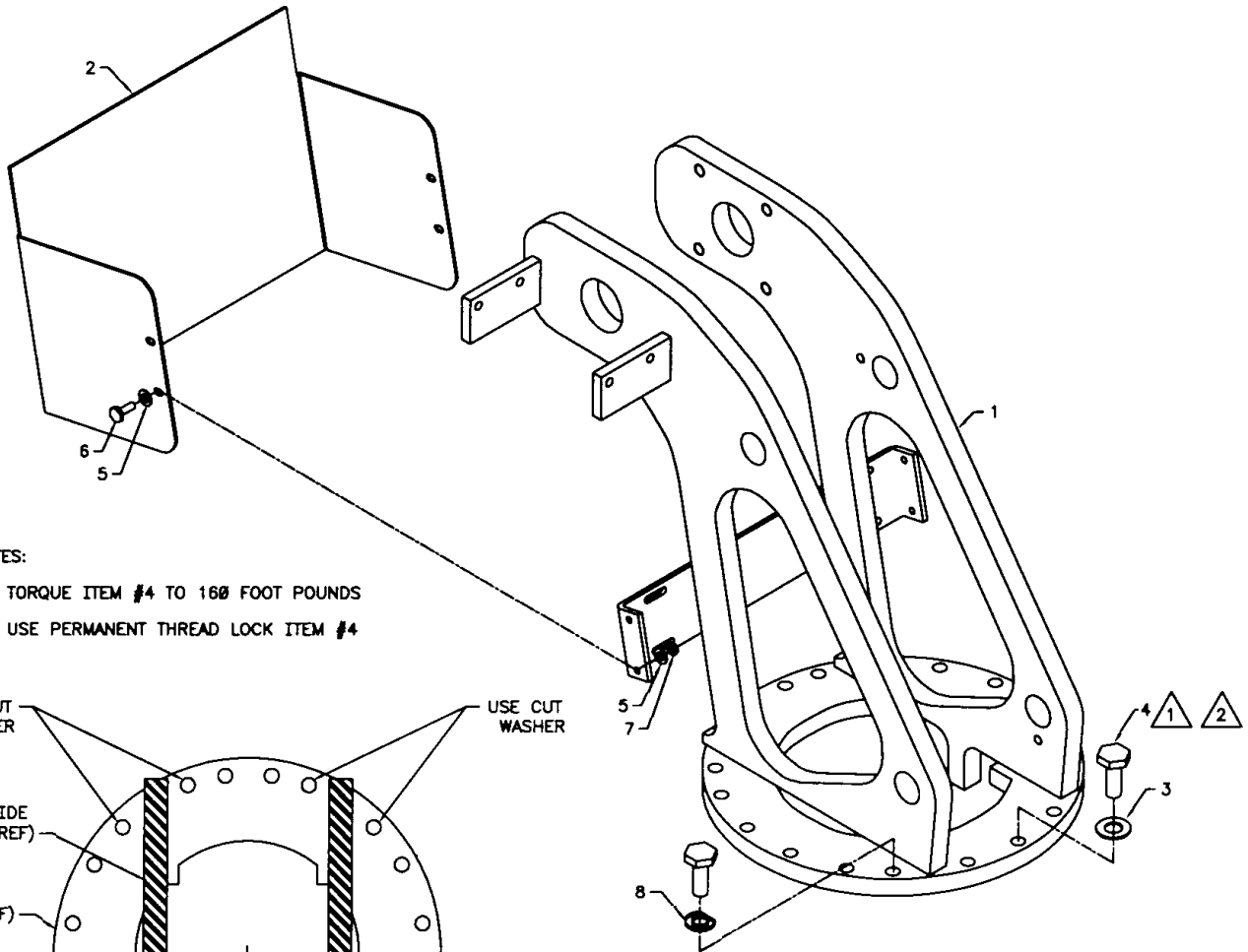
ITEM	PART NO.	DESCRIPTION	QTY
1.	3B245980	LOWER CYLINDER (INL 12)	1
2.	52714979	LOWER BOOM WLDMT	1
3.	60120124	WEAR PAD	4
4.	72060293	CAP SCR 5/16-24X1 HHGR5	8
5.	70034381	PLASTIC CORD GUIDE	3
6.	72063049	LOCK WASHER 1/4	1
7.	72060006	CAP SCR 1/4-20X1-1/2 HHGR5	1
8.	72063005	WASHER 1/2W	4

9.	60105544	INDICATOR-ANGLE	2
10.	72063003	WASHER 3/8W	2
11.	72062103	NUT 3/8-16 HEX SELF-LOCKING	2
12.	72053507	ZERK 1/4-28 (PART OF 1)	2REF
13.	72060793	CAP SCR 1/2-13 X 1 SH Z	3
14.	72063053	WASHER 1/2 LOCK ZINC	3
15.	52714976	PIN-TYPE II 1-1/2X9-5/16	2
16.	52715266	PIN-TYPE II 1-1/2X8-5/16	1
17.	72053508	ZERK 1/8 NPT	2
18.	72063002	FLAT WASHER 5/16	8
19.	72063050	LOCK WASHER 5/16 ZINC	8
20.	72062104	NUT 1/4-20 LOCK	2



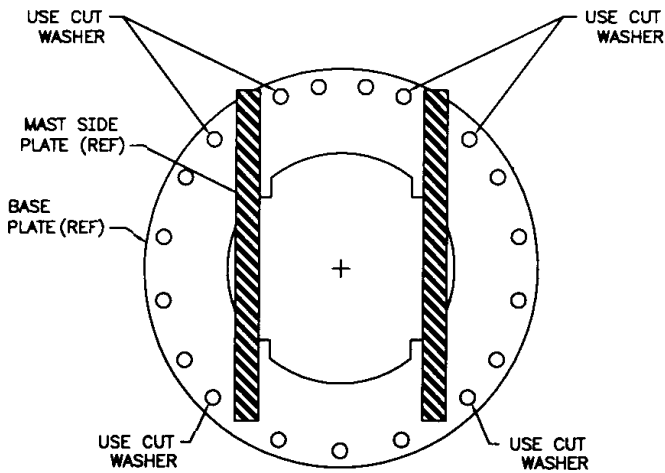
**MAST ASM (41715268) (EFF:FROM 11-2-98)**

ITEM	PART NO.	DESCRIPTION	QTY
1.	52714977	MAST WLDMT	1
2.	60119128	VALVEBANK COVER	1
3.	72063119	WASHER 5/8 GR8 FLAT	13
4.	72601482	CAP SCR 5/8-11X2-1/2 HHGR8	19
5.	72063001	WASHER 1/4WRT	8
6.	72060004	CAP SCR 1/4-20X1 HHGR5	4
7.	72062104	NUT 1/4-20 HEX SELF LOCKING	4
8.	72063216	WASHER 5/8N FLAT-CUT	6



NOTES:

- 1. TORQUE ITEM #4 TO 160 FOOT POUNDS
- 2. USE PERMANENT THREAD LOCK ITEM #4

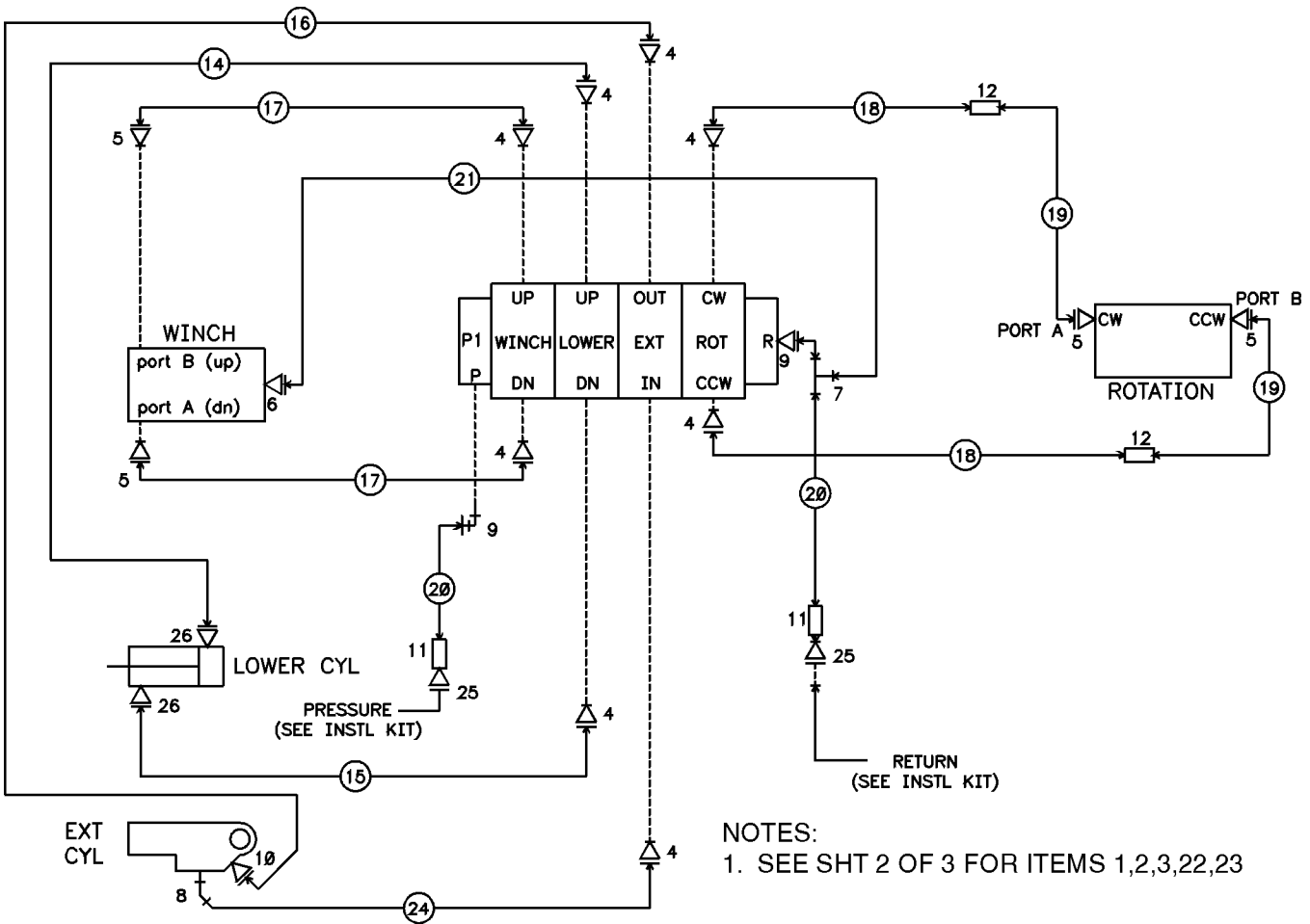


**HYD KIT-INT BYPASS (91714930-1)  
EFF:FROM 12-1-98**

ITEM	PART NO.	DESCRIPTION	QTY
1.	72060005	CAP SCR 1/4-20X1-1/4 HHGR5	4
2.	72062104	NUT 1/4-20 LOCK	4
3.	73733309	VALVEBANK	1
4.	72533425	ADAPTER #4MFACE #8MSTR(PART OF 3)	8REF
5.	72533296	ADAPTER #6MFACE #10MSTR(*)	4REF
6.	72533376	ADAPTR #4MFACE #4MSTR(*)	1REF
7.	72533413	TEE #8 SW NUT RUN(*)	1REF
8.	72533417	ELBOW #8MSTR #6MFACE 45°(*)	1REF
9.	72533162	ELBOW #8MSTR #8MFACE 90°(PART OF 3)	2REF
10.	72533533	ADAPTER #4MFACE #8MSTR(*)	1REF
11.	72533538	SWIVEL #8FACE (*)	2REF

12.	72533540	SWIVEL #4FACE 90°(*)	2REF
13.	51714927	HOSE/ADPTR KIT(INCL:*)	1
14.	51394700	HOSE-BBX 1/4X36 #4#4(*)	1REF
15.	51394701	HOSE-BBX 1/4X33-1/2 #4#4(*)	1REF
16.	51394702	HOSE-BBX 1/4X43 #4#4(*)	1REF
17.	51394703	HOSE-YX 1/4X18-1/2 #4#6 (*)	2REF
18.	51394705	HOSE-BBX 1/4X31 #4#4 (*)	2REF
19.	513945147	HOSE-BBX 1/4X19-1/2 #4#6(*)	2REF
20.	51394707	HOSE-BBX 1/2X24 #8#8(*)	2REF
21.	51394710	HOSE-WX 1/4X15 #8#4(*)	2REF
22.	60350073	SLEEVE	1
23.	70394558	TIE 8"	1
24.	51394718	HOSE-BBX 1/4X43 #6#4(*)	1REF
25.	72533612	ADAPTER #8FFACE #8MJIC (*)	2REF
26.	72533337	ADAPTER #4MFACE #6MSTR (*)	2REF

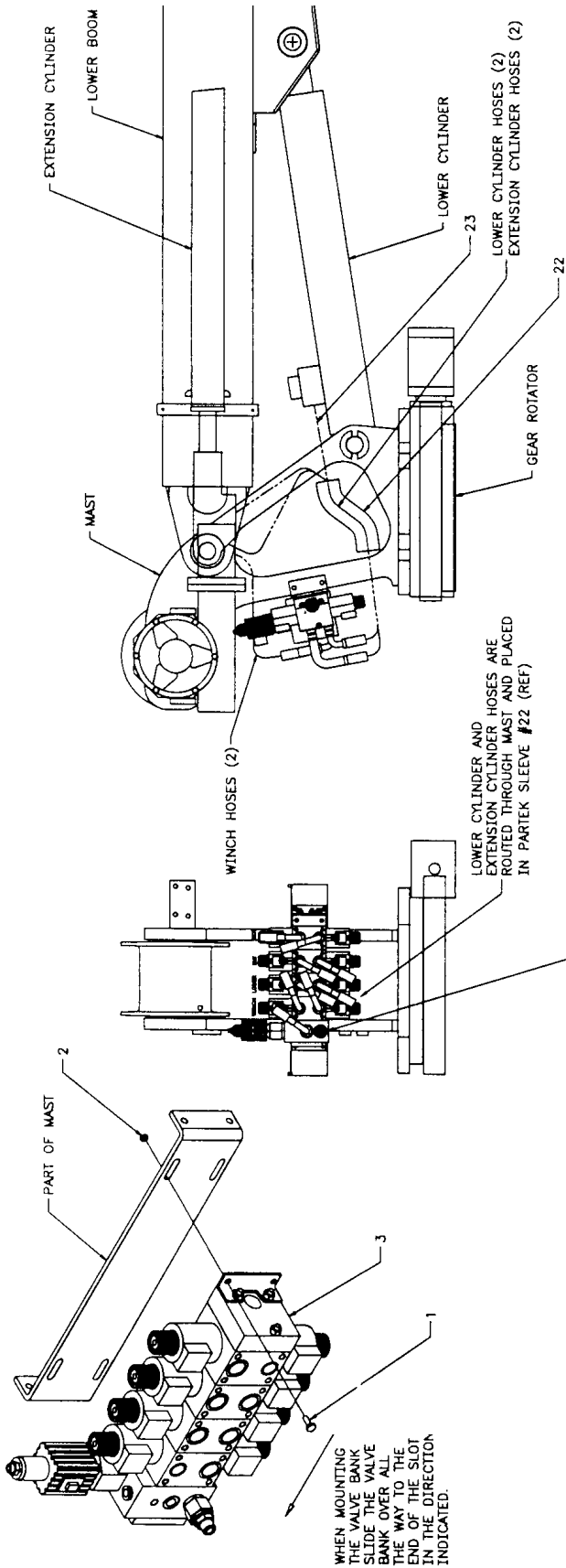
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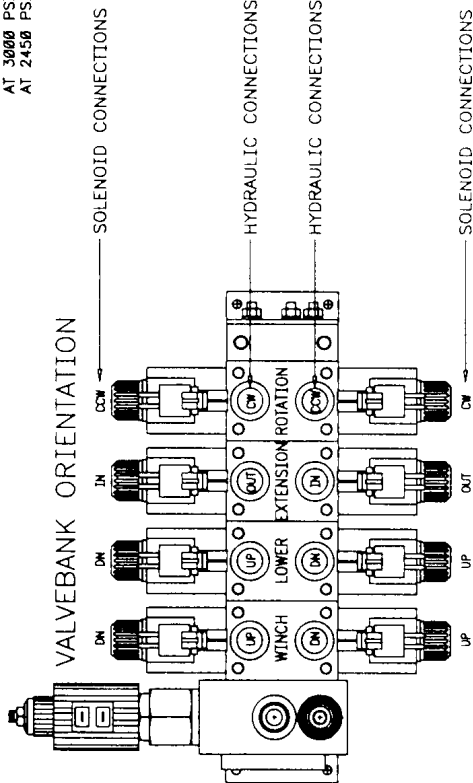
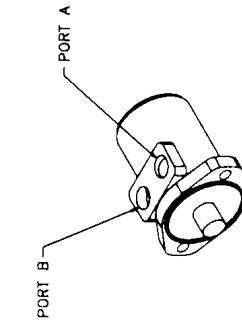
NOTES:  
1. SEE SHT 2 OF 3 FOR ITEMS 1,2,3,22,23

**HYD KIT-INT BYPASS (91714930-2)**  
**EFF:FROM 12-1-98**

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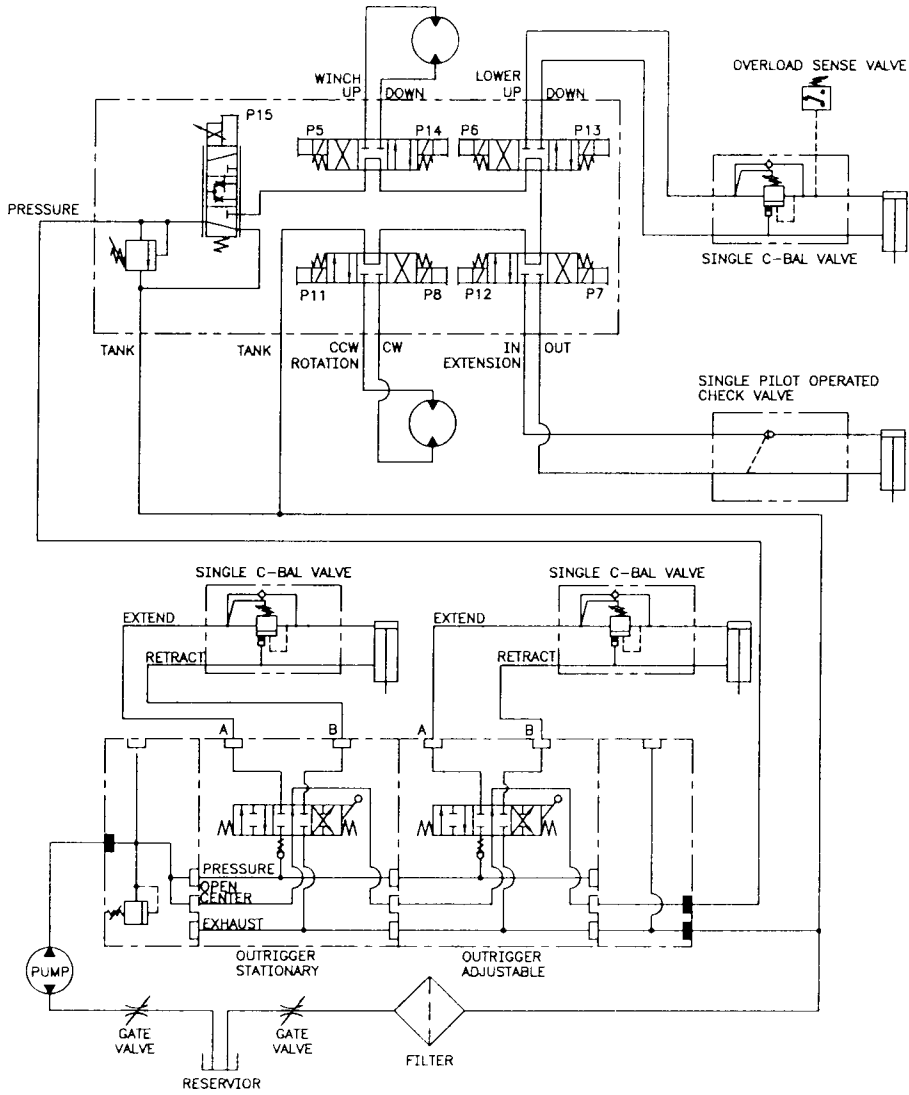


SET VALVE BANK SYSTEM  
 AT 3000 PSI FOR 3816  
 AT 2450 PSI FOR 3920





**HYD KIT-INT BYPASS (91714930-3)**  
**EFF:FROM 12-1-98**



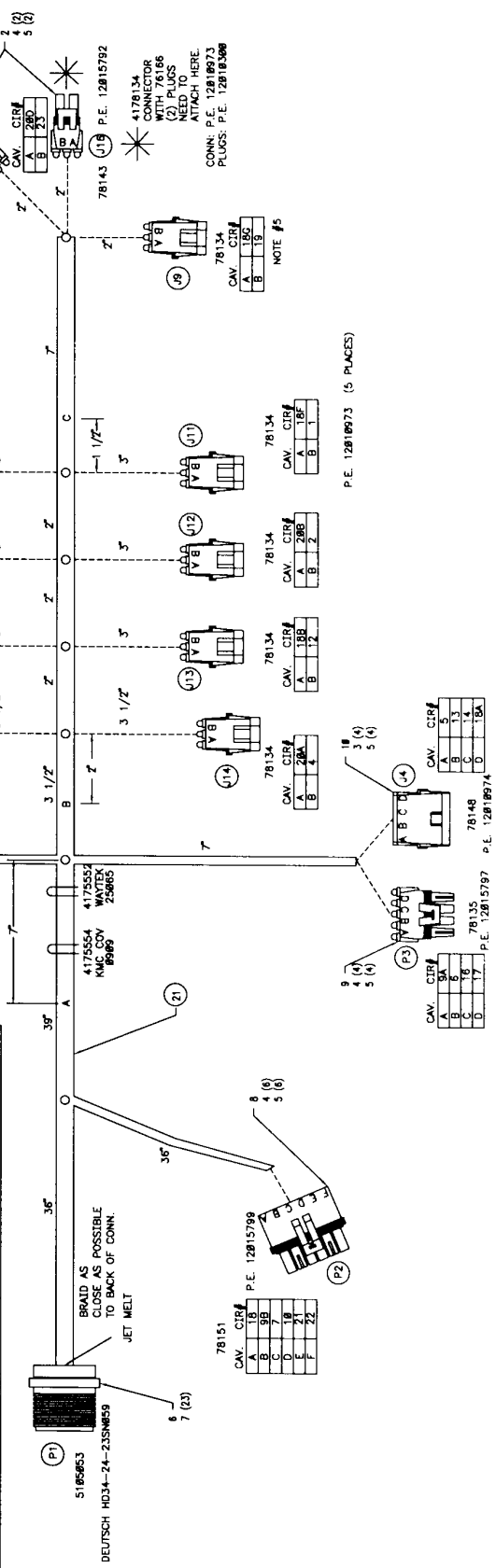
**WIRE HARNESS-VB (70733066)**  
**EFF:FROM 12-1-98**

ITEM PART NO. DESCRIPTION

**ALL PARTS ARE REFERENCE ONLY**

ITEM PART NO.	DESCRIPTION	QTY
1. 77044572	SHROUD CONN 2-CONTACT	10REF
2. 77044574	TOWER CONN 2-CONTACT	2REF
3. 77044576	TERMINAL	24REF
4. 77044577	TERMINAL	14REF
5. 77044578	CABLE SEAL	38REF
6. 77044620	CONN RCPT	1REF
7. 77044580	SOCKET	23REF
8. 77044622	TOWER CONN 6-CONTACT	1REF
9. 77044623	TOWER CONN 4-CONTACT	1REF
10. 77044624	SHROUD CONN 4-CONTACT	1REF

CIR	5185853	COLOR	WEATHER PAK	FUNCTION
1	CA	CONNECTOR		
2	18	YELLOW/BLK	ROTATE CW	
3	18	LT BLUE/BLK	BOOM EXT OUT	
4	18	PINK/BLK	WINCH OUT	
5	18	PINK/BLK	WINCH UP	
6	18	ORANGE/RED	REF	
7	18	LT BLUE/RED	SIGNAL COMM.	
8	18	GRAY/RED	P2C	
9	18	TAN/BLK	ROTATE B	
10	18	RED	SPEED RELAY	
11	18	RED	P1 TO SPLICE	
12	18	RED	POWER +	
13	18	RED	IGNITION SOLENOID	
14	18	RED	KILL RELAY	
15	18	RED	LOWER DOWN	
16	18	YELLOW/RED	LOWER UP	
17	18	BROWN	VOLTAGE	
18	18	TAN	ON H	
19	18	BLACK	EXT J7 B	
20	18	BLACK	BOOM EXT IN	
21	18	BLACK	PROP. VALVE & COIL -	
22	18	BLACK	PROP. VALVE & COIL +	
23	18	BLACK	BATTERY	
24	18	BLACK	POWER COMMON	
25	18	BLACK	J4D	
26	18	BLACK	LOWER UP	
27	18	BLACK	WINCH J5A	
28	18	BLACK	EXT J7 A	
29	18	BLACK	ROT J8 A	
30	18	BLACK	BOOM EXT IN	
31	18	BLACK	ROTATE CW	
32	18	BLACK	ROTATE CW	
33	18	BLACK	ANTI-TWO	
34	18	BLACK	AT1B & J9 A	
35	18	BLACK	P11B TO J9B	
36	18	BLACK	OPRES & ANTI-TWO	
37	18	BLACK	LOWER DOWN	
38	18	BLACK	WINCH J6A	
39	18	BLACK	WINCH	
40	18	BLACK	BOOM EXT OUT	
41	18	BLACK	EXT J12 A	
42	18	BLACK	OPRES	
43	18	BLACK	OVERPRESSURE	
44	18	BLACK	WINCH TWO SPEED	
45	18	BLACK	WINCH TWO SPEED	
46	18	BLK/RED	COMPRESSOR	
47	18	BLK/BLUE	P2 E	
48	18	RED/BLUE	WNSPD J16 B	
49	18	RED/BLUE	WINCH TWO SPEED	



P.E. 12818973 (5 PLACES)

P.E. 12818973 (4 PLACES)

P.E. 12818973

P.E. 12818973

P.E. 12818973

P.E. 12818973

P.E. 12818973

P.E. 12818973

P.E. 12818973

P.E. 12818973

BRAID AS POSSIBLE  
CLOSE AS POSSIBLE  
TO BACK OF CONN.  
JET MELT

4178134  
CONN. P.E. 12818973  
WITH 78166  
(2) PLUGS  
NEED TO  
ATTACH HERE.  
CONN. P.E. 12818973  
PLUGS: P.E. 12818973

NOTE #5

NOTE #5

NOTE #5

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NOTE #5

## SECTION 4. GENERAL REFERENCE

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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



<b>NOTICE</b>	
<b>The user of this form is responsible in determining that these inspections satisfy all applicable regulatory requirements</b>	
OWNER/COMPANY	
CONTACT PERSON	
CRANE MAKE & MODEL	
CRANE SERIAL NUMBER	
UNIT I.D. NUMBER	
LOCATION OF UNIT	

<i>Inspection Checklist</i>	
<b>CRANES</b>	
TYPE OF INSPECTION (check one) <input type="checkbox"/> DAILY (if deficiency found) <input type="checkbox"/> QUARTERLY <input type="checkbox"/> MONTHLY <input type="checkbox"/> ANNUAL	
DATE INSPECTED	
HOUR METER READING (if applicable)	
INSPECTED BY (print)	
SIGNATURE OF INSPECTOR	

REV. 6-18-99

1

**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 Ctrl	Operate remote control devices to check for proper operation.		
D	12	Electrical	Operate all lights, alarms, etc. to check for proper operation.		
D	13	Anti 2-Blocking	Operate anti 2-blocking device to check for proper operation.		
D	14		Other		
D	15		Other		

<i>Inspection Checklist</i>	<b>CRANES</b>	<b>2</b>
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FREQUENCY	ITEM	KEY	✓ = SATISFACTORY ✗ = DEFICIENCY (must be corrected prior to operation)	R = RECOMMENDATION (should be considered for corrective action) NA = NOT APPLICABLE	STATUS
			INSPECTION DESCRIPTION	✓, ✗, R, NA	
M	16	Daily	All daily inspection items.		
M	17	Cylinders	Visual inspection of cylinders for leakage at rod, fittings & welds. Damage to rod & case.		
M	18	Valves	Holding valves for proper operation.		
M	19	Valves	Control valve for leaks at fittings & between sections.		
M	20	Valves	Control valve linkages for wear, smoothness of operation & tightness of fasteners.		
M	21	General	Bent, broken or significantly rusted/corroded parts.		
M	22	Electrical	Electrical systems for presence of dirt, moisture & frayed wires.		
M	23	Structure	All structural members for damage.		
M	24	Welds	All welds for breaks & cracks.		
M	25	Pins	All pins for proper installation & condition.		
M	26	Hardware	All bolts, fasteners & retaining rings for tightness, wear & corrosion		
M	27	Wear Pads	Presence of wear pads.		
M	28	Pump & Motor	Hydraulic pumps & motors for leakage at fittings, seals & between sections.		
M	29	PTO	Transmission/PTO for leakage, abnormal vibration & noise.		
M	30	Hyd Fluid	Quality of hydraulic fluid and for presence of water.		
M	31	Hyd Lines	Hoses & tubes for leakage, abrasion damage, blistering, cracking, deterioration, fitting leakage & secured properly.		
M	32	Hook	Load hook for abnormal throat distance, twist, wear & cracks.		
M	33	Rope	Condition of load line.		
M	34	Manual	Presence of operator's manuals with unit.		
M	35		Other		
Q	36	Daily	All daily inspection items.		
Q	37	Monthly	All monthly inspection items.		
Q	38		Condition of wear pads		
Q	39	Rotation Sys	Rotation bearing for proper torque of all accessible mounting bolts.		
Q	40	Hardware	Base mounting bolts for proper torque.		
Q	41	Structure	All structural members for deformation, cracks & corrosion.		
	42		● Base		
	43		● Outrigger beams & legs		
	44		● Mast		
	45		● Inner boom		
	46		● Outer boom		
	47		● Extension(s)		
	48		● Jib boom		
	49		● Jib extension(s)		
	50		● Other		
Q	51	Hardware	Pins, bearings, shafts, gears, rollers, & locking devices for wear, cracks, corrosion & distortion.		
	52		● Rotation bearing(s)		
	53		● Inner boom pivot pin(s) & retainer(s)		
	54		● Outer boom pivot pin(s) & retainer(s)		
	55		● Inner boom cylinder pin(s) & retainer(s)		
	56		● Outer boom cylinder pin(s) & retainer(s)		
	57		● Extension cylinder pin(s) & retainer(s)		
	58		● Jib boom pin(s) & retainer(s)		
	59		● Jib cylinder pin(s) & retainer(s)		
	60		● Jib extension cylinder pin(s) & retainer(s)		
	61		● Boom tip attachments		
	62		● Other		
Q	63	Hyd Lines	Hoses, fittings & tubing for proper routing, leakage, blistering, deformation & excessive abrasion.		
	64		● Pressure line(s) from pump to control valve		
	65		● Return line(s) from control valve to reservoir		
	66		● Suction line(s) from reservoir to pump		
	67		● Pressure line(s) from control valve to each function		
	68		● Load holding valve pipe(s) and hose(s)		
	69		● Other		



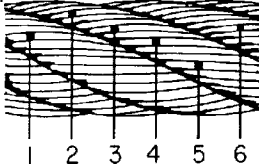




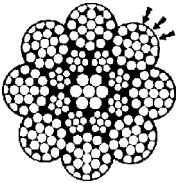
**WIRE ROPE INSPECTION**

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

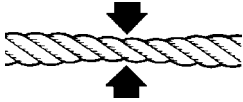
- A. Corrosion can be cause for replacement. Any development of corrosion must be noted and monitored closely.
- B. When there are either 3 broken wires in one strand or a total of six broken wires in all strands in any one rope lay.



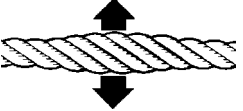
- C. When flat spots on the outer wires appear and those outside wires are less than 2/3 the thickness of the unworn outer wire.



- 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**

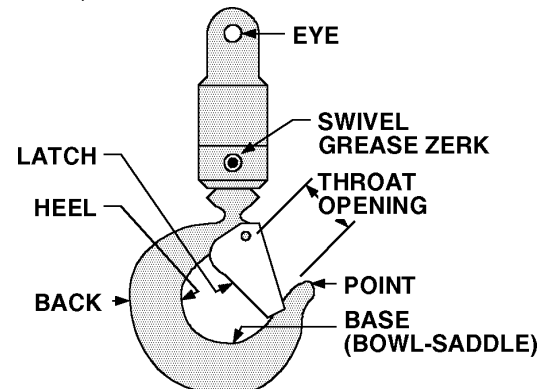
Repair of cracks, nicks, and gouges shall be carried out by a designated person by grinding longitudinally, following the contour of the hook, provided that no dimension is reduced more than 10% of its original value. (Or as recommended by the manufacturer) (A qualified person may authorize continued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

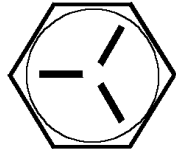

The anti two block system should be checked daily as follows:

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-TP)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
					
		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.

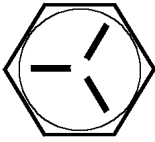

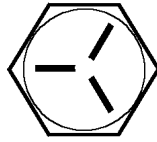

#### WARNING

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

## COARSE THREAD BOLTS

SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE				SIZE (DIA-TPI)	BOLT DIA (INCHES)	TIGHTENING TORQUE			
		 SAE J429 GRADE 5		 SAE J429 GRADE 8				 SAE J429 GRADE 5		 SAE J429 GRADE 8	
		PLAIN (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)			PLAIN (FT-LB)	PLATED (FT-LB)	PLAIN (FT-LB)	PLATED (FT-LB)
5/16-24	0.3125	19	14	27	20	5/16-18	0.3125	17	13	25	18
3/8-24	0.3750	35	26	49	35	3/8-16	0.3750	31	23	44	33
7/16-20	0.4375	55	41	78	58	7/16-14	0.4375	49	37	70	52
1/2-20	0.5000	90	64	120	90	1/2-13	0.5000	75	57	105	80
9/16-18	0.5625	120	90	170	130	9/16-12	0.5625	110	82	155	115
5/8-18	0.6250	170	130	240	180	5/8-11	0.6250	150	115	220	160
3/4-16	0.7500	300	225	420	315	3/4-10	0.7500	265	200	375	280
7/8-11	0.8750	445	325	670	500	7/8-9	0.8750	395	295	605	455
1-12	1.0000	645	485	995	745	1-8	1.0000	590	445	910	680
1 1/8-12	1.1250	890	670	1445	1085	1 1/8-7	1.1250	795	595	1290	965
1 1/4-12	1.2500	1240	930	2010	1510	1 1/4-7	1.2500	1120	840	1815	1360
1-3/8-12	1.3750	1675	1255	2710	2035	1-3/8-6	1.3750	1470	1100	2380	1780
1 1/2-12	1.5000	2195	1645	3560	2670	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.

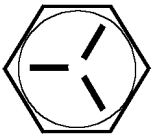

1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in foot-pounds. To convert to inch-pounds, multiply by 12.
4. Torque values specified are for bolts with residual oils or no special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

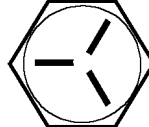

Anytime a gear-bearing bolt is removed, it must be replaced with a new bolt of the identical grade and size. Once a bolt has been torqued to 75% of its proof load and then removed, the torque coefficient may no longer be the same as when the bolt was new thus giving indeterminate clamp loads after torquing.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

# TORQUE DATA CHART - 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.

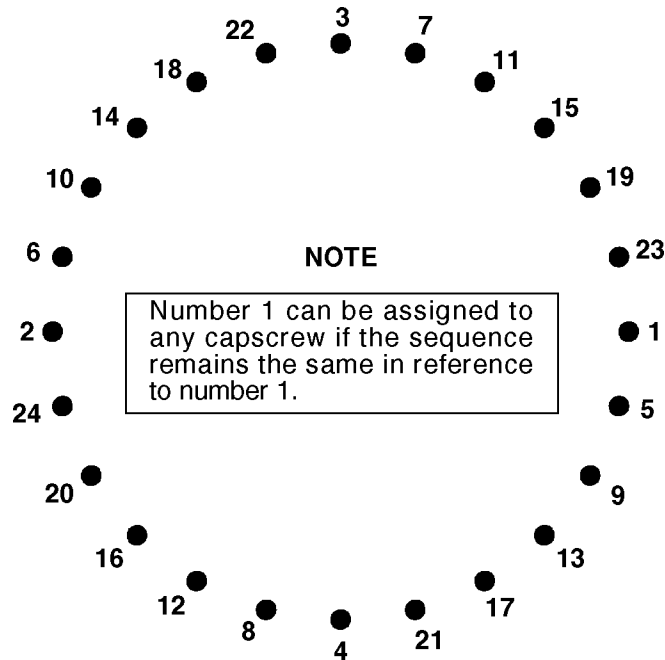
1. Bolt manufacturer's particular specifications should be consulted when provided.
2. Flat washers of equal strength must be used.
3. All torque measurements are given in kilogram-meters.
4. Torque values specified are for bolts with residual oils or no special lubricants applied. If special lubricants 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 capscrew used.
2. Follow the tightening sequence shown in the diagram. Note that the quantity of capscrews may differ from the diagram, but the sequence must follow the criss-cross pattern as shown in the diagram.
3. Torque all capscrews to approximately 40% of the specified torque value, by following the sequence.  
(EXAMPLE:  $.40 \times 265 \text{ FT-LBS} = 106 \text{ FT-LBS}$ )  
(EXAMPLE-METRIC:  $.40 \times 36 \text{ KG-M} = 14.4 \text{ KG-M}$ )
4. Repeat Step 3, but torquing all capscrews 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 capscrews to the listed torque value as determined from the Torque Data Chart.

# TURNTABLE BEARING INSPECTION FOR REPLACEMENT

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

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

If none of the above conditions exists, the bearing is functioning properly and need not be replaced. But, if one or more of the above conditions exists, inspection may be required. Limits are measured in "TILT" which is dependent on the internal clearances of the bearing. TILT is the most practical determination of a 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.

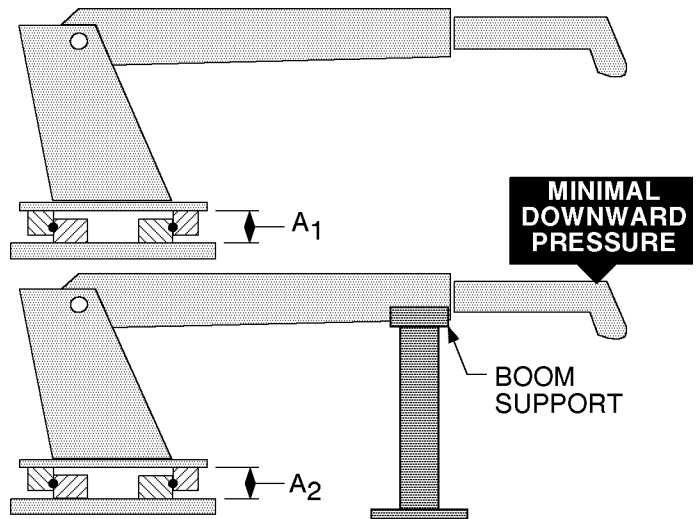
With the crane horizontal and fully extended, measure between the top and bottom mounting surfaces of the turntable bearing (A1), using a dial indicator for accuracy.

### STEP 2.

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

### STEP 3.

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



COMPARISON CHART - MODEL TO MEASURED TILT DIMENSION					
<p><b>NOTE</b> THE FIGURES LISTED IN THIS CHART ARE SERVICE GUIDELINES AND DO NOT, IN THEMSELVES, REQUIRE THAT THE BEARING BE INSPECTED.</p> <p>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.</p>	<p><b>IMT CRANE, LOADER OR TIREHAND MODEL</b></p>	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
	<p><b>BALL DIA. (REF)</b></p>	<p><b>.875"</b> (22mm)</p>	<p><b>1.00"</b> (25mm)</p>	<p><b>1.18"-1.25"</b> (30-32mm)</p>	<p><b>1.75"</b> (44mm)</p>
	<p><b>TILT DIM. (A<sub>1</sub>-A<sub>2</sub>)</b></p>	<p><b>.060"</b> (1.524mm)</p>	<p><b>.070"</b> (1.778mm)</p>	<p><b>.075"</b> (1.905mm)</p>	<p><b>.090"</b> (2.286mm)</p>

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

## MANUAL CHANGE REQUEST

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

ERROR FOUND

LOCATION OF ERROR (page no.): \_\_\_\_\_

DESCRIPTION OF ERROR: \_\_\_\_\_

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REQUEST FOR ADDITION TO MANUAL

DESCRIPTION OF ADDITION: \_\_\_\_\_

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REASON FOR ADDITION: \_\_\_\_\_

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

## LIMITED WARRANTY

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

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

IMT's obligation under this warranty is limited to, and the sole remedy for any such defect shall be the repair or replacement (at IMT's option) of unaltered parts returned to IMT, freight prepaid, and proven to have such defect, provided such defect occurs within the above stated warranty period and is reported within fourteen (14) days of its 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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**IOWA MOLD TOOLING CO., INC.**  
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 TEL: 515-923-3711  
 TECHNICAL SUPPORT FAX: 515-923-2424